



Catalog 1773096 Revised 4-12

# Power Connectors & Interconnection Systems



Power Connectors & Interconnection Systems



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**Need more information?**

Call Technical Support at the numbers listed below.

Technical Support is staffed with specialists well versed in all TE products. They can provide you with:

- Technical Support
- Catalogs
- Technical Documents
- Product Samples
- TE Authorized Distributor Locations

**Restriction on the use of Hazardous Substances (RoHS)**

At TE, we're ready to support your RoHS requirements. We've assessed more than 1.5 million end items/components for RoHS compliance, and issued new part numbers where any change was required to eliminate the restricted materials. Part numbers in this catalog are identified as:

**RoHS Compliant** — Part numbers in this catalog are RoHS Compliant, unless marked otherwise. These products comply with European Union Directive 2002/95/EC as amended 1 January 2006 that restricts the use of lead, mercury, cadmium, hexavalent chromium, PBB, and PBDE in certain electrical and electronic products sold into the EU as of 1 July 2006.

NOTE: For purposes of this Catalog, included within the definition of RoHS Compliant are products that are clearly "Out of Scope" of the RoHS Directive such as hand tools and other non-electrical accessories.

**5 of 6 Compliant** — A "●" symbol identifies these part numbers. These products do not fully comply with the European Union Directive 2002/95/EC because they contain lead in solderable interfaces (they do not contain any of the other five restricted substances above allowable limits). However, these products may be suitable for use in RoHS applications where there is an application-based exception for lead in solders, such as the server, storage, or networking infrastructure exemption.

NOTE: Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For latest compliance status, refer to our website referenced at right.

**Getting the Information You Need**

Our comprehensive on-line RoHS Customer Support Center provides a forum to answer your questions and support your RoHS needs. A RoHS FAQ (Frequently Asked Questions) is available with links to more detailed information. You can also submit RoHS questions and receive a response within 24 hours during a normal work week. The Support Center also provides:

- Cross-Reference from Non-compliant to Compliant Products
- Ability to browse RoHS Compliant Products in our on-line catalog
- Downloadable Technical Data Customer Information Presentation
- More detailed information regarding the definitions used above
- So whatever your questions when it comes to RoHS, we've got the answers at [www.te.com/leadfree](http://www.te.com/leadfree)



**Products Listed in this Catalog**

**Integrated Backplane Power Systems  
Pages 50-61**

- Universal Power Modules
- Slim UPM Product
- MINIPAK HDE Connectors
- Z-PACK Futurebus+ Power Modules
- MULTIGIG RT Power Modules
- Guide Hardware
- Z1 Power AdvancedTCA Connectors

**Mezzanine/Stacking  
Pages 191-192**

- Mini CROWN EDGE Products

**Bus Bar-to-Board**

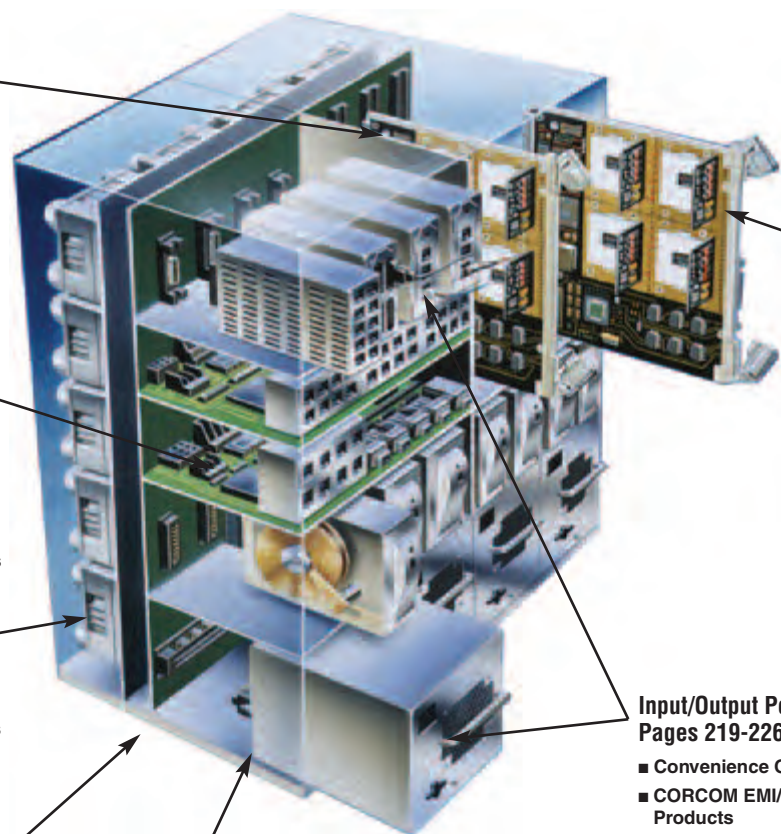
- CROWN EDGE Products
- CROWN CLIP Series Sockets
- CROWN CLIP Junior
- CROWN LINE
- ICCON Connectors
- ELCON DRAWER Series Connectors

**Power — Board-to-Board  
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- MULTI-BEAM XL and MULTI-BEAM XLE Connectors
- FLATPAQ Modular Connectors
- MINIPAK Connectors
- MINIPAK HD (MicroTCA) Connectors
- CROWN EDGE Connectors
- SEC-II Power Products
- ICCON Connectors
- MINIPAK HDL Connectors

**Power — Cable-to-Cable/Board  
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- AMP DRAWER Series
- AMP-DUAC PL Products
- AMP-DUAC UPC Connectors
- Universal MATE-N-LOK Family
- AMPINNERGY Product
- AMP Power Series
- CPC
- Mini Power Drawer (MPD)
- AMPOWER Wave Crimp System
- RAPID LOCK Connectors
- AMP Power Tap
- Domino Series Connectors
- HTS Power Connectors
- ET Connector



**VRM/Power PODs  
Pages 188-193**

- SEC-II, Mini CROWN EDGE (32 Bit) Connectors
- VR372 Power POD Connector

**Laptops/Portable  
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- Battery Interconnects
- Coin Cell Battery Holder
- Multi-Directional Interface (MDI) Connectors
- DC Power Jacks

**Input/Output Power  
Pages 219-226, 236**

- Convenience Outlets
- CORCOM EMI/RFI Filter Products
- Custom Cable Assemblies

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### Product Selection Chart

Technology

Product Listing	Application Style					Application Type			Current Level				Special Features			Standards	Page
	Wire-to-Wire	Wire-to-Board	Board-to-Board	Card Edge	Battery	Bus Bar or Other	Power Only	Power & Signal	Low Current		Middle Current Contacts 25A-50A	High Current Contacts >50A	True Hot-Plug	Blind-Mate	Low Inductance	Industry Standard	
									Contacts <10A	Contacts 10A-25A							
AdvancedTCA Z1 Power Connectors	X		X				X		X						PICMG 3.0	60	
AMP DUAC PL Product		X					X	X	X							104	
AMPINERGY Connectors	X	X					X		X							115	
AMP Power Series Connectors	X						X		X	X	X					138	
AMP Power Taps		X					X		X	X						166	
AMPOWER Wave Crimp System	X	X					X	X		X			X			204	
Battery Interconnects		X	X		X		X		X							227	
Circular Plastic Connectors (CPC)	X						X	X		X					VDE Standard 0627	123	
Coin Cell Battery Holders					X	X	X		X							233	
Commercial Pin & Socket	X						X			X						113	
CROWN CLIP Series				X		X	X					X	X	X		192	
CROWN EDGE Product				X		X	X			X			X			173	
CROWN LINE Connectors				X		X	X					X		X		202	
DC Power Jack		X					X		X							234	
Domino Product	X	X						X	X	X	X	X	X	X		153	
ELCON Drawer Connectors	X	X						X	X	X	X	X	X	X		62	
ET Power Connectors		X					X			X						102	
FLATPAQ Product <sup>1</sup>			X				X			X			X	X		40	
Grace Inertia Connectors	X						X		X							113	
HTS Connectors	X	X					X			X	X		X			160	
Hybrid Blind-Mate Drawer	X						X	X						X		85	
Hybrid Mini-Drawer		X						X		X						96	
ICCON Products <sup>1</sup>		X	X				X			X						45	
MATE-N-LOK	X	X	X				X			X						115	
Micro MATE-N-LOK Connectors	X	X					X		X							113	
Mini CROWN EDGE Product				X			X	X		X				X	VRM 10.2, 11	189	
Mini Power Drawer (MPD)		X					X			X			X	X		83	
Mini Universal MATE-N-LOK	X	X					X		X							114	
MINIPAK HD Connectors			X					X		X			X		AMC 1.0	36	
MINIPAK HDE Connectors			X				X			X			X			38	
MINIPAK HDL			X					X		X			X	X		34	
MULTI-BEAM XL/XLE Connectors <sup>1</sup>	X	X	X				X	X		X	X		X	X	SSI (MPS, DPS)	10	
MULTIGIG RT Power Product			X				X		X							52	
Power Double Lock	X	X					X			X						114	
RAPID LOCK Product		X				X	X					X				162	
Special Blind-Mate Drawer	X	X					X	X						X	X	88	
Standard Blind-Mate Drawer	X	X					X	X	X					X		92	
Standard Edge II Card Edge <sup>1</sup>			X	X			X	X	X	X					VRM 8.5-10.1, ISA	183	
Universal MATE-N-LOK	X	X					X			X					U.L. Standard 1410, MIL STD 202	115	
Universal Power Module (UPM)	X		X				X			X			X		PICMG EXP.0	53	
VAL-U-LOK	X	X					X			X						114	
VR 372 Power POD Connector for MONTECITO VRMs			X				X					X			VR372	188	
Z-PACK 2 mm Futurebus+ Product	X		X				X		X						IEC 61076-4-0X	56	

<sup>1</sup>Co-planar products

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## Power Distribution Connector Overview

### TE Power Connector Technology

For years, TE has pioneered the development of new power interconnect technologies. As the industry leader in Power Interconnects, TE produces power connectors used in laptops through super computers, automobiles, telecommunications base stations, consumer appliances, power utility, industrial controls, locomotives and many other applications.

The products in this catalog are focused on the higher performing power connectors used in the Computer and Telecommunications industries.

Some key factors in the design of these new connectors are the selection of the right contact and housing materials, platings and contact designs. Many of the older single or dual point of contact intercon-

nects have been replaced with new/next generation designs which can offer significant reductions in contact resistance, insertion/mating force, connector size and total applied cost. In addition, several of the newest designs have significant increases in current and signal density all combined into a single power distribution connector.

As power delivery applications vary widely, TE also produces many variations of the products listed in this catalog for unique applications. If you don't find the product needed for your application, please feel free to contact our Product Information Center or your local TE Sales Engineers.

### High Performance Started with the ELCON CROWN BAND Power Contact Technology



One of the popular technologies used in high current connects is based on the ELCON CROWN BAND Power Contact Technology. Made from high conductivity alloys and used with solid screw machined pin and socket contacts, these contacts deliver superior performance. Many of the high current Drawer Connectors in this catalog use this technology.

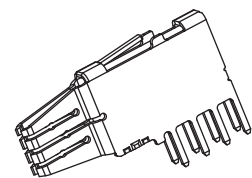
- 1/4th to 1/10th the Contact Resistance
- Maximum Contact Surface Area
- Low Voltage Drop, Low Temperature Rise
- Higher Cycle Durability
- Used in High Performance Pin & Socket Drawer Connectors
- Safety Agency Approved Hot-Plug Contacts Available



### CROWN BAND Performance in Stamped & Formed Configurations

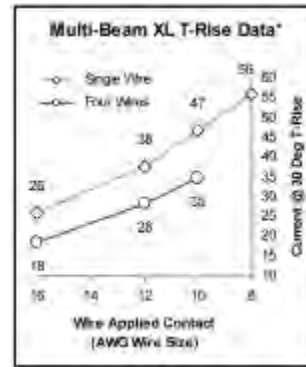
FLATPAQ Connectors, MINIPAK Connectors, CROWN EDGE Connectors, Mini CROWN EDGE Connectors, MULTI-BEAM XL Connectors, AMPOWER Wave Crimp Products, CROWN CLIP Sockets, Pluggable Bus Bar Products.

These product lines all utilize the multiple point of contact design. With the 6, 8, 10, 12 or more contact points per stamping, the contact resistance remains very low and the mating cycle durability remains high.



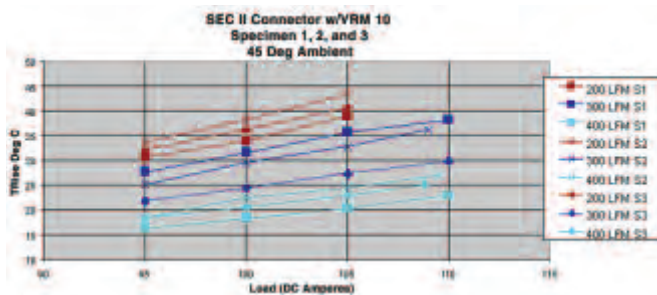
## Extensive Product Qualification

TE has played a major role in influencing the industry to evaluate power connectors based upon End-Of-Design-Life conditions. This involves a variety of accelerated life tests used to determine the expected results of the power connectors after years of use in demanding applications.



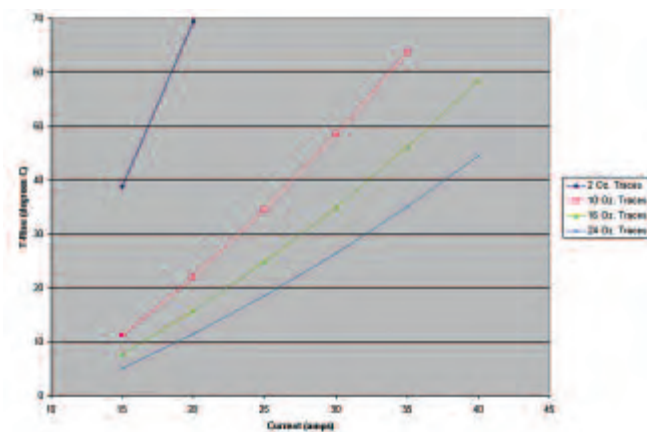
Temperature Rise charts using a single contact have been replaced with more useful data taken from tests of actual fully loaded connectors carrying their maximum current.

The tests are run with pre-stressed (end-of-life) connectors to provide worst case results based on the environmental exposure the connectors will see.



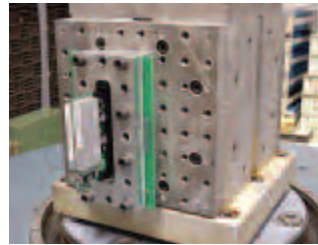
In many cases the common safety agency approvals are also provided. While these tests are typically far less stringent than TE's internal test sequences,

they provide additional safety/regulatory information for end users to help them make the connector selection easier.



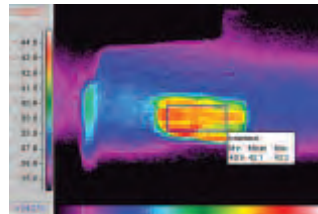
### Shock & Vibration

Shock and vibration testing is used to verify the mechanical integrity of the connector system. Shock capability to test half-sine, saw-tooth, and trapezoidal waveforms up to 3000 g's. Vibration capability to test sinusoidal, random, sine-on-random, and narrow band random-on-random profiles up to 2000 Hz.



### Thermal Image

Thermography is used to optimize the design and to pinpoint the exact hot spot on the contacts — to measure the true worst case temperature-rise. Then thermocouples are placed on the hot spot to confirm the temperature at the end-of-life conditions.



### Durability and Hot-Plug Set-Up

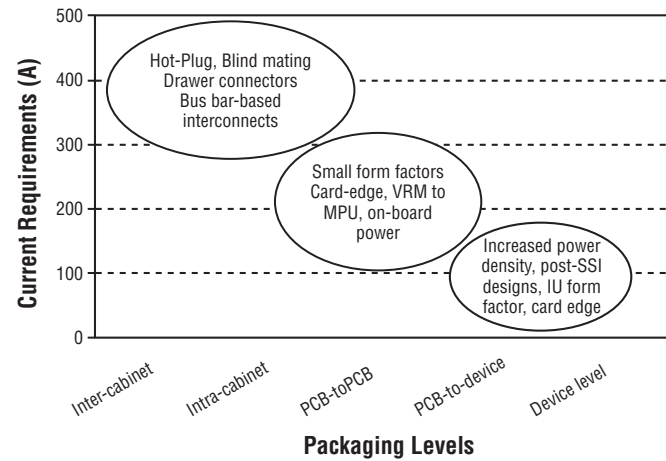
Current Interrupt (hot-plug) tests are performed to customer-specific requirements to determine the ability of the connector to sustain repeated make & break cycles under load. Power generation capability up to 600 VDC.

Durability tests are performed in accordance with both industry (EIA 364-70) standards and TE documented test sequences. With this, the user knows exactly what was tested and how it was tested, in order to achieve the specified durability rating.



Technology

## TE Delivers Both Industry Standard and Application-Specific Power Connectors



### Industry or De-Facto Standard Products

- MULTI-BEAM XL Connectors (SSI and AdvancedTCA 300 Standards)
- Z1 Power Connector (AdvancedTCA)
- MINIPAK HD Connector (MicroTCA)
- Universal MATE-N-LOK Connectors
- VRM Card Edge Connectors (VRM 8.5 – 11.0)
- Universal Power Module (CPCI Express)
- Power Series (50 – 350 Amp DC power)
- CORCOM EMI/RFI Filter Products (IEC 320)

### Application Specific Products

- Drawer Series (Top Drawer — Mini Drawer)
- CROWN EDGE & Mini CROWN EDGE Connectors
- FLATPAQ Connectors
- MINIPAK Connectors
- CROWN CLIP Connectors
- ICCON Connectors
- RAPID LOCK Connectors

## Standards Activities / Safety Agency Approvals

TE has a broad line of power interconnects meeting the industry's most stringent safety standards:

TE End-Of-Design-Life (EODL) accelerated life testing has influenced many new standards for power interconnects.



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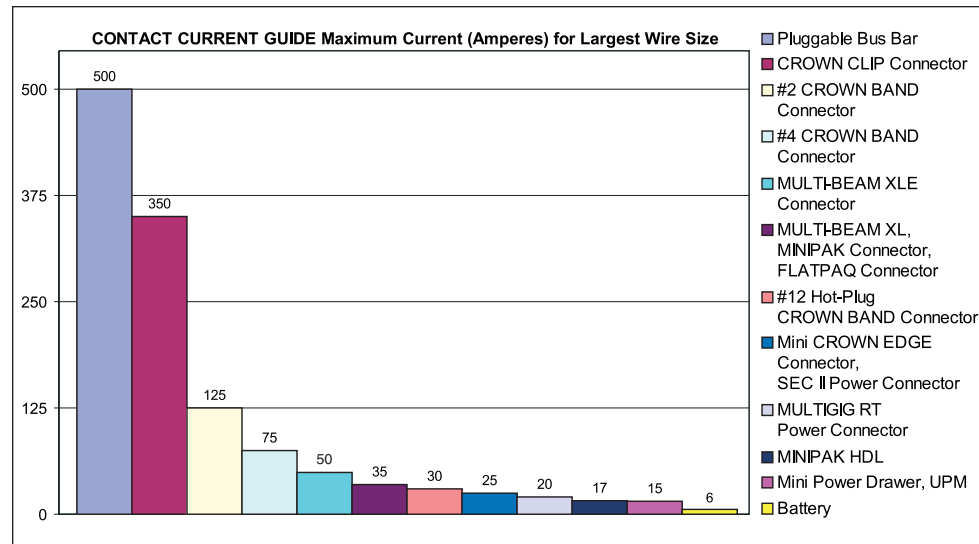
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## Current Carrying Capabilities

TE offers a wide range of power contacts, which handle up to 500 Amps. The total current capacity of each contact in a given connector is dependent upon the heat rise resulting from the combination of electrical loads of the contacts in the connector arrangement and the maximum ambient temperature in which the connector will be operating. Caution must be taken so that this combination of conditions does not cause the internal temperature of the connector to exceed the maximum operating temperature of the housing material. Several variables which must be considered when determining this maximum current capability for your application are:

- **Wire Size** — Larger wire will carry more current since it has less internal resistance to current flow and generates less heat. The wire also conducts heat away from the connector.
- **Connector Size** — In general, with more circuits in a connector, less current per contact can be carried.
- **Current Load Distribution** — Spreading those lines with greater current loads throughout the connector, particularly around the outer perimeter, will enhance heat dissipation.
- **Ambient Temperature** — With higher ambient temperatures, less current can be carried.



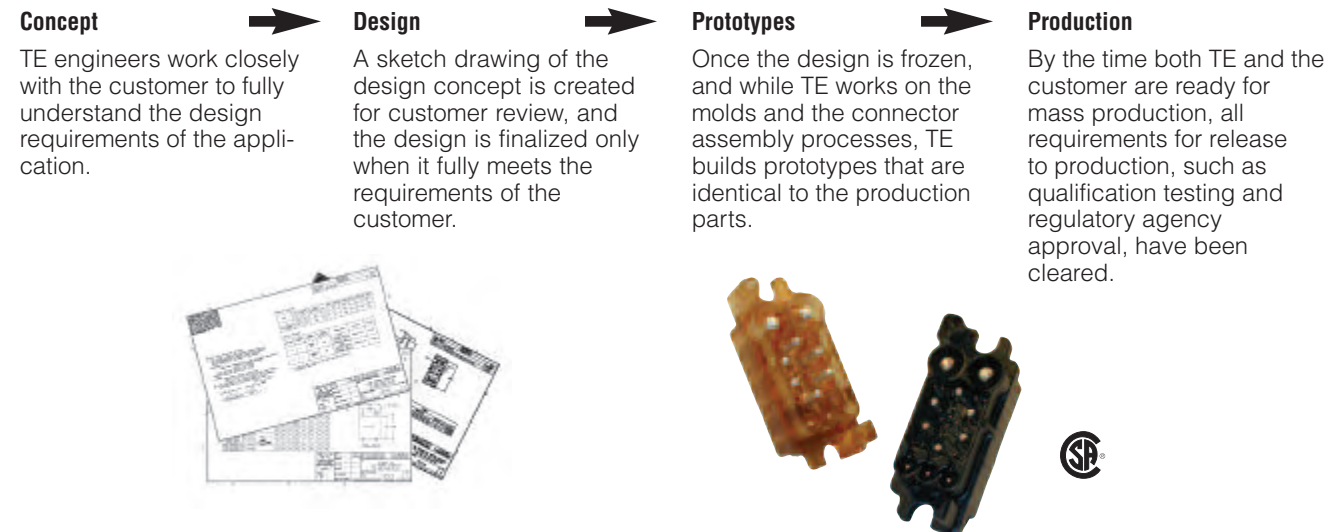
Technology

**Note:** The current ratings in this chart are based upon single contact loading and a 30° C temperature rise. More useful "fully loaded" ratings are available and are dependent upon the variables listed above.

## Application-Specific Designs

**In the shortest time to market in the industry.**

If none of our standard products satisfies your requirements, TE can develop a design specific to your application. We will work closely with your engineers to fully understand the design requirements and develop an interconnect solution that meets your exact needs. After the concept and design stages, TE produces prototypes that perform both electrically and mechanically the same as production parts. These machined parts are used for testing, regulatory agency evaluations, and even as pre-production components, allowing the shortest lead time from concept to manufacturing in the industry.



**MULTI-BEAM XL and MULTI-BEAM XLE Power Distribution Connector Systems**
**Board-Mount Connectors**
**Product Facts**

- Single-piece molded housings
- Custom configurable modular design
- AC and DC power in the same connector — Meets UL safety requirements
- Current Interrupt ratings per UL 1977 — for “Hot-Plug” applications
- Compact size — suitable for distributed DC power applications
- Molded-in guide pins provide generous blind-mateability
- Up to 3 levels of contact sequencing:
  - 1st — Pwr/Gnd
  - 2nd — Pwr & Signals
  - 3rd — Trigger Signals
- Low Mating and Un-mating force
- Solder or press-fit termination to PCB
- Meets SSI power connector requirements for DPS, MPS and HPS applications
- 30 micro-inch [0.76 micro-meters] gold post-plated contacts for high reliability
- All MULTI-BEAM XL and MULTI-BEAM XLE products in this section are RoHS compliant



The MULTI-BEAM XL and MULTI-BEAM XLE modules are a blind-mateable board-to-board power distribution connector system. With a variety of available power contacts and a modular design, customers are able to customize this connector to their exact needs. In addition to selecting the number of power and signal contacts, customers are also able to choose the mating sequence of contacts they need for their specific application.

MULTI-BEAM XL connectors feature dual-beam and four-beam power contacts,

rated at 35A. The new MULTI-BEAM connector features a true hot-plug designed three-beam contact, rated at 43A.

The product is also available in versions complying with the Server Systems Infrastructure (SSI) Standard. MULTI-BEAM XL and MULTI-BEAM XLE products offer high reliability and high current density in a package designed specifically for modular hot-swappable power distribution systems. They are ideal for blind-mating in modular and rack mounted systems. The high perform-

ance design and heavy gold plated contacts meet requirements across many applications including compact (1U) computer servers through high-end servers, fault-tolerant computers, networking equipment, telecommunication switches, medical instrumentation, and industrial control equipment.

The compact design also meets the I/O standard of modern modular and hot-swappable redundant (N+1) power supplies and uninterruptible power supplies.

**Technical Documents**
**Product Specification**

108-1973

**Application Specification**

114-13038

File # E28476

File # LR7189

**For More Information**

Check out product information at:  
<http://mbxl.te.com>

Technical Support Center  
 1-800-522-6752

**MULTI-BEAM XL and MULTI-BEAM XLE Power Distribution Connector Systems** (Continued)

**MULTI-BEAM XL Connector**

- Expandable length to accommodate up to 36 power contacts
- Contact spacings are expandable to accommodate higher voltages and/or higher current requirements
- 4-beam or dual beam power contacts available
- Base metal made from high conductivity copper alloy (over 98% copper) offers superior performance compared to alternative materials

**MULTI-BEAM XLE Connector**

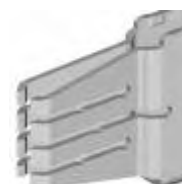
- Features new 3-beam power contact
- Two hot-pluggable power contacts to choose from:
  - 50A High power contact (35% increase compared to MULTI-BEAM XL connector)
  - 20A Low power contact (occupies 50% less PCB space than MULTI-BEAM XL power contact)
- Slimmer housing design allows 40% more current in the same space
- Over 40% lower mating force than original MULTI-BEAM XL connector
- Vented housing allows for better air flow

Board-to-Board Products

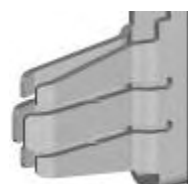
**Evolution of MULTI-BEAM Power Contacts**



- Dual-Beam Contact**
- Original design
  - .017" thick stock

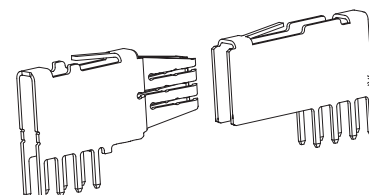


- 4-Beam Contact**
- .017" thick stock
  - 35A current rating
  - Features eight independent beams
  - Parallel current paths yield a lower contact resistance
  - Tuned beam design provides lower mating forces and higher durability life cycles

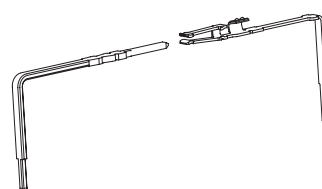


- 3-Beam Contact**
- Offered on new MULTI-BEAM XLE connector
  - .020" Thick Stock
  - 50A Current Rating
  - Improved design offers lowest mating force available in MULTI-BEAM product line
  - True hot-plug design preserves the separable contact interface to provide long term reliability after hot-mate and un-mate cycles

**Power Contacts**



**Signal Contacts**



**Contact Wipe**

Contact Type	Description	Sequence	Minimum Wipe
Power (or GND) Contact	Make First Break Last (MFBL)	1	0.200" [5.08 mm]
Power Contact	Standard	2	0.150" [3.81 mm]
Signal Contact	Standard	2	0.150" [3.81 mm]
Signal (trigger) Contact	Make Last Break First (MLBF)	3	0.100" [2.54 mm]

The MLBF power contact and the Standard Signal contact are sequenced to mate at the same time ... sequence #2.

**Product Configurations and Part Numbers**

The connector configuration is described by reading Left-to-Right on the Plug mating interface and Right-to-Left on the Receptacle mating interface. Custom configurations can be produced due to the modular design of the product.

**Configuration Description:** ACP indicates AC Power, P indicates DC Power, HDP indicates High Density Power, LP indicates Low Power (MULTI-BEAM XLE connector only), S indicates Signal. The corresponding contact spacing and voltage ratings are shown below.

ACP	P	HDP	LP	S
0.300" [7.62 mm] spacing	0.250" [6.35 mm] spacing	0.200" [5.08 mm] spacing	.115" [3.81 mm] spacing	0.100" [2.54 mm] grid
300 Volts*	200 Volts*	Connection to same voltage*	200 Volts*	60 Volts*

\* With circuit board designed to UL 1950, IEC 60950

## MULTI-BEAM XL Power Distribution Connector Systems

### Board-Mount Connectors

#### Right-Angle Receptacles



Configuration *	Part Number	Application	Overall Length " and [mm]	PCB Tail Type (Solder, Press-Fit)	Power Contact Sequencing
1P/24S/1P	6450160-3	SSI "DPS"	1.925" [48.90 mm]	Solder	No
2P/24S/2P	1-6450160-0	Distributed DC Power + Signal	2.250" [57.15 mm]	Solder	No
3P/24S/3P	6450570-2	Distributed DC Power + Signal	2.750" [69.85 mm]	Press-fit	Yes
3ACP/24S/6P	6450170-8	AC and DC Power + Signal	3.650" [92.71 mm]	Solder	Yes
5P/24S/6P	6450160-5	SSI "MPS"	4.350" [110.49 mm]	Solder	No
7P/32S/7P	6450560-4	Distributed DC Power + Signal	4.350" [110.49 mm]	Press-fit	No
8P/28S	6450172-2	Distributed DC Power + Signal	3.350" [85.09 mm]	Solder	Yes
8P/32S/8P	6450160-1	AC and DC Power + Signal	5.450" [138.43 mm]	Solder	No
3ACP	6450173-1	AC Power	1.550" [39.37 mm]	Solder	Yes
8P	6450163-2	DC Power	2.650" [67.31 mm]	Solder	No
14P/32S	6450172-1	Distributed DC Power + Signal	4.950" [125.73 mm]	Solder	Yes
16S/4P	6450161-1	Distributed DC Power + Signal	2.050" [52.07 mm]	Solder	No
24S/6P	6450161-2	Distributed DC Power + Signal	2.750" [69.85 mm]	Solder	No
24S/8P	6450161-6	Distributed DC Power + Signal	3.250" [82.55 mm]	Solder	No

\* Custom configurations are available — see page 29 for instructions to have TE build your custom part.

#### Vertical Receptacles



Configuration *	Part Number	Application	Overall Length " and [mm]	PCB Tail Type (Solder, Press-Fit)	Power Contact Sequencing
1P/24S/1P	6450540-1	SSI "DPS"	1.925" [48.90 mm]	Press-fit	No
2P/24S/2P	6450140-5	Distributed DC Power + Signal	2.250" [57.15 mm]	Solder	No
3P/24S/3P	1-6450140-0	Distributed DC Power + Signal	2.750" [69.85 mm]	Solder	No
4P/24S/4P	6450150-6	Distributed DC Power + Signal	3.350" [85.09 mm]	Solder	Yes
4P/24S/3ACP	6450150-3	AC and DC Power + Signal	3.150" [80.01 mm]	Solder	Yes
5P/24S/6P	6450540-2	SSI "DPS"	4.350" [110.49 mm]	Press-fit	No
6P/24S/6P	4-6450550-5	Distributed DC Power + Signal	4.250" [107.95 mm]	Press-fit	No
10P/24S/12P	3-6450550-2	Distributed DC Power + Signal	5.800" [147.32 mm]	Press-fit	Yes
3P	6450543-1	DC Power	1.400" [35.56 mm]	Press-fit	No
3ACP	6450543-6	AC Power	1.550" [39.37 mm]	Press-fit	No
4P	6450543-5	DC Power	1.650" [41.91 mm]	Press-fit	No
6P	6450553-2	DC Power	2.050" [52.07 mm]	Press-fit	Yes
7P	6450543-3	DC Power	2.400" [60.96 mm]	Press-fit	No
8P/28S	6450142-3	Distributed DC Power + Signal	3.350" [85.09 mm]	Solder	No
14P/32S	6450152-1	Distributed DC Power + Signal	4.950" [125.73 mm]	Solder	Yes
24S/6P	6450551-1	Distributed DC Power + Signal	2.750" [69.85 mm]	Press-fit	Yes
24S/3ACP	6450151-3	Distributed DC Power + Signal	2.200" [55.88 mm]	Solder	Yes
24S/8P	6450541-5	Distributed DC Power + Signal	3.250" [82.55 mm]	Press-fit	No

\* Custom configurations are available — see page 29 for instructions to have TE build your custom part.

Note: All part numbers are RoHS compliant.

**MULTI-BEAM XL Power Distribution Connector Systems** (Continued)

**Board-Mount Connectors**

**Right-Angle Plugs**



Board-to-Board Products

Configuration *	Part Number	Application	Overall Length * and [mm]	PCB Tail Type (Solder, Press-Fit)	Signal Contact Sequencing
1P/24S/1P	6450330-1	SSI "DPS"	1.925" [48.90 mm]	Solder	Yes
2P/24S/2P	6450120-2	Distributed DC Power + Signal	2.250" [57.15 mm]	Solder	No
3P/24S/3P	6450130-6	Distributed DC Power + Signal	2.750" [69.85 mm]	Solder	Yes
4P/24S/3ACP	6450130-4	AC and DC Power + Signal	3.150" [80.01 mm]	Solder	Yes
3ACP/24S/6P	1-6450130-4	AC and DC Power + Signal	3.650" [92.71 mm]	Solder	Yes
5P/24S/6P	6450230-1	SSI "DPS"	4.350" [110.49 mm]	Solder	Yes
5P/32S/5P	2-6450120-4	Distributed DC Power + Signal	3.950" [100.33 mm]	Solder	No
6P/24S/6P	2-6450120-7	Distributed DC Power + Signal	4.250" [107.95 mm]	Solder	No
8P/32S/8P	6450120-1	Distributed DC Power + Signal	5.450" [138.43 mm]	Solder	No
10P/24S/12P	4-6450130-6	Distributed DC Power + Signal	5.800" [147.32 mm]	Solder	Yes
16S/4P	6450231-1	Distributed DC Power + Signal	2.050" [52.07 mm]	Solder	Yes
24S/6P	6450131-7	Distributed DC Power + Signal	2.750" [69.85 mm]	Solder	Yes
24S/3ACP	6450121-3	Distributed DC Power + Signal	2.200" [55.88 mm]	Solder	No
3ACP	6450123-3	AC Power	1.550" [39.37 mm]	Solder	N/A
3P	6450123-1	DC Power	1.400" [35.56 mm]	Solder	N/A
4P	6450123-2	DC Power	1.650" [41.91 mm]	Solder	N/A
6P	6450523-2	DC Power	2.050" [52.07 mm]	Press-fit	N/A
7P	6450123-5	DC Power	2.400" [60.96 mm]	Solder	N/A
8P/28S	6450132-3	Distributed DC Power + Signal	3.350" [85.09 mm]	Solder	Yes
14P/32S	6450132-4	Distributed DC Power + Signal	4.950" [125.73 mm]	Solder	Yes

\* Custom configurations are available — see page 29 for instructions to have TE build your custom part.

**Vertical Plugs**



Configuration *	Part Number	Application	Overall Length * and [mm]	PCB Tail Type (Solder, Press-Fit)	Signal Contact Sequencing
1P/16S/1P	6600333-9	Distributed DC Power + Signal	1.650" [41.91 mm]	Press-fit	Yes
1P/24S/1P	6600330-4	SSI "DPS"	1.925" [48.90 mm]	Solder	Yes
2P/16S/2P	1-6600333-0	Distributed DC Power + Signal	2.150" [54.61 mm]	Press-fit	Yes
2P/24S/2P	1-6600333-2	Distributed DC Power + Signal	2.250" [57.15 mm]	Press-fit	Yes
3P/16S/3P	6600333-7	Distributed DC Power + Signal	2.650" [67.31 mm]	Press-fit	Yes
3ACP/24S/3ACP	1-6600333-1	AC Power + Signal	3.150" [80.01 mm]	Press-fit	No
4P/24S/4P	6600333-6	Distributed DC Power + Signal	3.350" [85.09 mm]	Press-fit	Yes
5ACP/24S/5ACP	6600333-1	Distributed DC Power + Signal	4.350" [110.49 mm]	Press-fit	Yes
7P/32S/7P	6600330-5	Distributed DC Power + Signal	4.350" [110.49 mm]	Solder	No
24S/8P	6600323-2	Distributed DC Power + Signal	3.250" [82.55 mm]	Press-fit	No
3ACP	6450503-3	AC Power	1.550" [39.37 mm]	Press-fit	N/A
8P	6600303-1	DC Power	2.650" [67.31 mm]	Press-fit	N/A

\* Custom configurations are available — see page 29 for instructions to have TE build your custom part.

**Note:** All part numbers are RoHS compliant.

**MULTI-BEAM XL Power Distribution Connector Systems** (Continued)

**Board-Mount Connectors**

**Specifications**

**Materials**

**Housing** — High temperature thermo-plastic, UL 94V-0

**Power Contacts** — High conductivity Copper alloy

**Signal Contacts** — Copper alloy

**Boardlocks** — Phosphor bronze

**Finish**

**Power and Signal Contacts** — 30 microinches [.76 micrometers] min. gold over 50 microinches [1.27 micrometers] min. nickel on mating surfaces, 100 microinches [2.54 micrometers] min. tin over 50 microinches [1.27 micrometers] min. nickel at PCB terminations

**Note:** Tin-lead plating also available on press-fit connectors

**Performance Specifications**

Up to 55 Amps per power contact, de-rated to 35 Amps in equally energized (8 adjacent positions) connector.

Up to 4 Amps per signal contact, de-rated to 1.5 Amps in equally energized 24-position pin field.

**Maximum Continuous Operating Temperature** — 105°C.

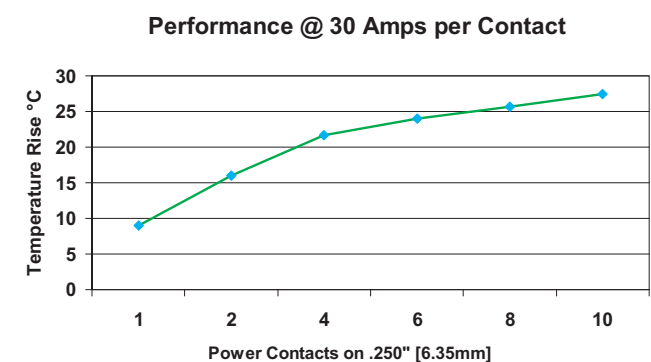
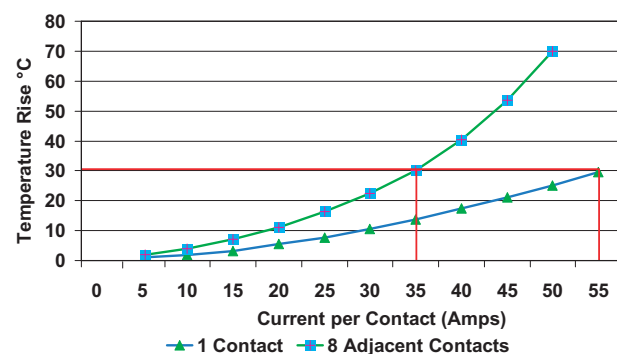
**Contact Resistance** — 0.7 milli-ohm

**Durability** — 250 cycle

**Radial Mis-alignment Capability** —

± 0.075" [1.91 mm]

Minimum of 0.100" [2.45 mm] of contact wipe on shortest signal contact



See Cable Connectors on Pages 19-28



**“NEW” MULTI-BEAM XLE Connectors**

**NEW**

**Product Facts**

- Two NEW hot-pluggable power contacts to choose from:
  - 50 Amp high power contact
  - 20 Amp low power contact
- Over 35% lower mating force than original MULTI-BEAM XL connectors
- Over 40% more current in the same over all PCB space
- Low-wear contact design passes Telcordia environmental exposure requirements
- New design allows more angular mis-alignment



TE's new MULTI-BEAM XLE connectors are the latest addition to the MULTI-BEAM XL power connector product family. MULTI-BEAM XLE connectors feature a new 3-beam contact, made from a thicker/higher conductivity material than the original single beam or 4-beam designs.

The new 3-beam design allows for a greater angular mis-alignment between mating connectors and offers a lower mating force. In addition, MULTIBEAM XLE connectors offer a slimmer

housing design that reduces the overall PCB footprint and has the option of using a low power contact — the industry proven Universal Power Module (UPM) contact.

The new contacts and housing design allows more power in the same footprint — over 35% more current in the same space. MULTI-BEAM XLE connectors are as modular as the original MULTI-BEAM XL connectors in that they can be designed to fit specific customer needs.

**Applications**

- Modular Hot-Swappable Power Supplies
- 1U / 2U Servers
- High-end Computer & Telecommunications

**Equipment**

- Power Distribution Circuit Boards
- Power Distribution Cable Assemblies

Board-to-Board Products

**“NEW” MULTI-BEAM XLE Connectors** (Continued)

**Specifications**
**Materials**

**Housing** — High temperature thermo-plastic, UL 94V-0

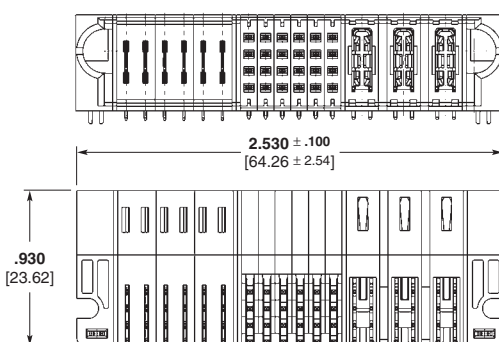
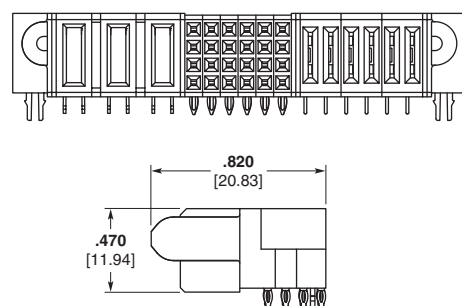
**Power Contacts** — High conductivity Copper alloy

**Signal Contacts** — Copper alloy

**Boardlocks** — Phosphor bronze

**Finish**

**Power and Signal Contacts** — 30 microinches [7.6 micrometers] min. gold over 50 microinches [1.27 micrometers] min. nickel on mating surfaces, 100 microinches [2.54 micrometers] min. tin over 50 microinches [1.27 micrometers] min. nickel at PCB terminations

 Part Number 6450830-2  
Right-Angle Plug

 Part Number 6450880-1  
Right-Angle Receptacle

**MULTI-BEAM XLE Connector Part Numbers**

Available Configurations	Part Numbers			Mating Part Numbers	
	Right-Angle Plugs	Vertical Plugs	Overall Length of Plug	Right-Angle Receptacle	Vertical Receptacle
1P/24S/1P	6450840-7	6450820-2	1.54" [39.12 mm]	6450870-5	6450850-3
2LP/8S/2LP	6450830-1	—	1.175" [29.84 mm]	—	6450860-1
6LP/24S/3P	6450830-2	—	2.555" [64.89 mm]	6450880-1	6450850-2
2P/32S/2LP	6450830-4	—	2.020" [51.30 mm]	6450870-1	—
2P/24S/2P	6450830-5	—	2.040" [51.81 mm]	6450870-3	—
3P/24S/3P	6450830-9	—	2.54" [64.52 mm]	6450870-4	—
3P/32S/3P	6450820-3	—	2.79" [70.87 mm]	6450870-8	—
32S/4LP	6450831-1	—	1.750" [44.45 mm]	6450871-1	—
6LP/24S/10P	1-6450830-0	—	3.86" [97.92 mm]	—	6450860-5
12P/48S/8LP	6450840-3	—	5.600" [142.24 mm]	6450880-4	6450860-3
4ACP/48S/12HDP	6450840-4	6450810-1	5.390" [136.90 mm]	6450880-3	6450860-2

**Electrical**
**Current Carrying Capacity:**

- 50 Amp high power contact (over 35% increase compared to MULTI-BEAM XL product)
- 20 Amp low power contact (occupies 50% PCB space than MULTI-BEAM XL power contact)

**Contact resistance:** 0.7 milliohm per contact at rated current

**Configuration Description**

ACP	P	HDP	LP	S
.300" [7.62 mm] spacing	.250" [6.35 mm] spacing	.200" [5.08 mm] spacing	.115" [2.92 mm] spacing	.100" [2.54 mm] spacing
300 Volts	200 Volts	50 Volts	200 Volts	50 Volts

ACP indicates the high power contact on 300 VAC spacing.

P indicates the high power contact on 200 VDC spacing.

LP indicates the low power contact on 200 VDC spacing.

S indicates the signal contact on 60 VDC spacing.

**Application Tooling**
**Right-Angle Plugs:**

Flat-rock seating tools (no unique tools required)

**Right-Angle Receptacles:**

Flat-rock seating tools (no unique tools required)

**Vertical Plugs:**

Contact TE for required seating tools

**Vertical Receptacles:**

Flat-rock seating tools (no unique tools required)

**Note:** All part numbers are RoHS compliant.



## MULTI-BEAM XL Current Pass-Thru Power Distribution Connector System

### Product Facts

- Combines PCB and cable mounted contacts
- Ideal for separating AC input from DC input
- Eliminates FASTON tab interface at the back of the connector housing
- Requires less space than two housing designs
- Terminates 12 AWG and 10 AWG wire
- Mates with TE vertical and right-angle PCB plugs
- High strength housing materials
- RoHS Compliant

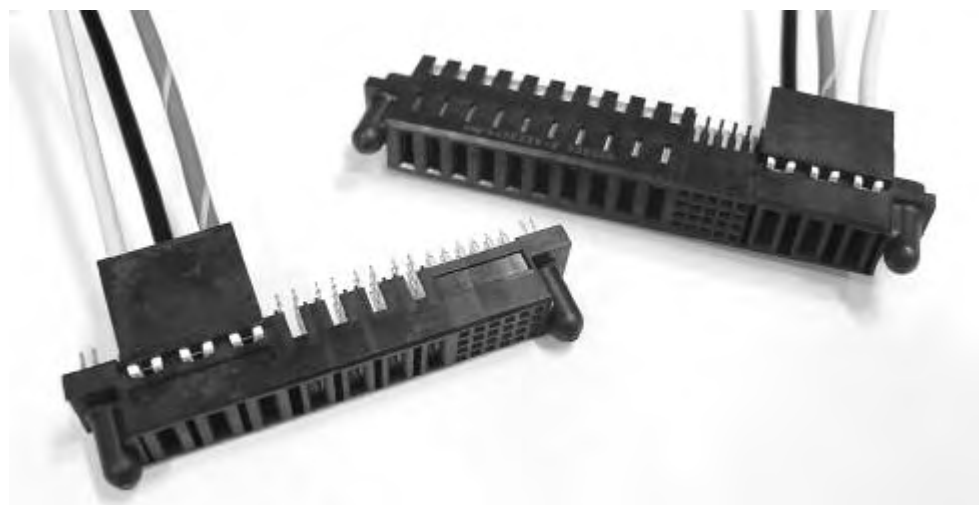
### Technical Documents

#### Product Specification

108-1973 and 108-2157

#### Application Specification

114-13038



The Cable Pass-Thru MULTI-BEAM XL receptacles securely terminate up to a 10 AWG wire directly into MULTI-BEAM XL PCB mounted receptacles. The design includes a “terminal position assurance” (TPA) feature that confirms the manually inserted wires are fully seated. The product offers a unique way of using the MULTI-BEAM XL PCB receptacles as a sort of “docking” connector. A single docking connector is far easier to mate to and to design around in a blind-mate application, than multiple power and signal connectors. By separating

some circuits to be cable terminated and some to be PCB terminated it allows both high voltage (AC) and low voltage (DC) power to pass through the same connector.

This separation of the AC and DC power eliminates the concerns of high voltage power running through circuit boards better suited to carry only low voltage circuitry. Additional applications may include designs where the power is better routed directly to a different PCB, through cables, yet passes through a single docking connector for ease in system design.

The Cable Pass-Thru connector is offered in both right-angle or vertical PCB-mount orientations and is supplied with either press-fit or solder pc tails. The connector is mate-able to either PCB mounted or cable mounted MULTI-BEAM XL or MULTI-BEAM XLE plugs. All MULTI-BEAM XL cable connectors are supplied pre-assembled by TE.

Board-to-Board Products

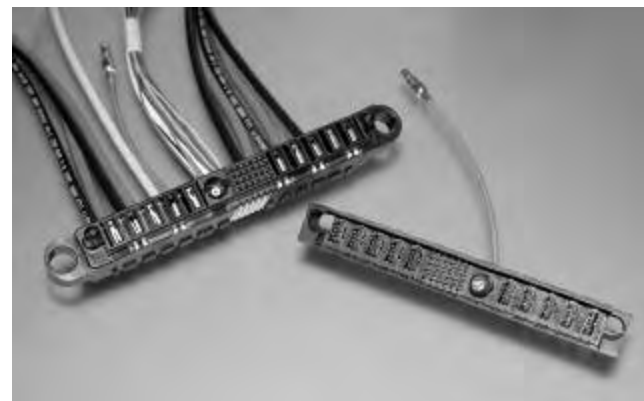
**MULTI-BEAM XL Current Pass-Thru Power Distribution Connector System** (Continued)

Available Configurations	Part Numbers			
	Pass-Thru Right-Angle Receptacles	Mating Right-Angle Plugs	Pass-Thru Vertical Receptacles	Mating Vertical Plugs
3CP/1P/24S/2P	6450178-1	6450130-2	—	—
3CP/24S/2P	6450178-2	2-6450130-6	—	—
3CP/24S/3ACP	1888179-1	2-6450330-6	—	—
3CP/4P/24S	6450578-1	1-6450132-3	6450558-1	6600310-5
3ACP/24S/6P	—	1-6450130-4	6450558-2	—
3CP/8P/12S	1888132-1	—	—	—
3CP/20S/10P	6450578-2	6-6450130-2	—	—
3CP/16S	6450668-1	6450622-1	—	—

**Note:** Receptacles are the only MULTI-BEAM XL parts with Pass-Thru capability.

**Configuration Description**

CP	ACP	P	HDP	S
AC Power	AC Power	DC Power	High Density Power	Signal
Cable Power .300" spacing	PCB-Mount .300" spacing	PCB-Mount .250" spacing	PCB-Mount .200" spacing	PCB-Mount .100" grid



**MULTI-BEAM XL Coax Pass-Thru Connector — Combine power, coax and signal all in one connector**

Right-Angle Plug	Cable Receptacle
292495-1	292491-1

**The following coax contacts may be used with the coax pass-thru housings:**

Pin Contact	Socket Contact
5221980-5	5221981-5

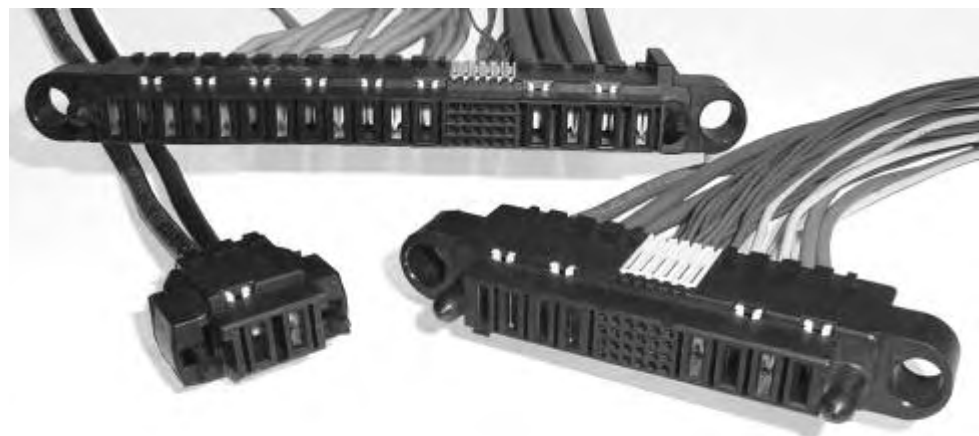
**Note:** All part numbers are RoHS compliant.

## MULTI-BEAM XL Power Distribution Connector System Cable Receptacle Assemblies

### Cable Receptacle Assemblies

#### Product Facts

- Single one-piece housing design
- Terminal Position Assurance (TPA) Secondary Locks on contacts help prevent contact back-out
- Pre-assembled made-to-order cable assemblies
- Installation to panel provides float in X, Y and Z directions
- Insulation crimp on all contacts
- 30 microinch (.76 micrometers) gold plated contacts for high reliability
- Touch-safe design passes UL1977 and IEC 60950 finger probe test
- AC and DC power in the same connector — meets UL & IEC safety requirements
- All MULTI-BEAM XL products in this section are RoHS compliant



MULTI-BEAM XL Cable Assemblies allow designers freedom to connect power supplies and power distribution subassemblies in a wide variety of applications. Expanding beyond board-to-board applications the cable assemblies are available for both cable-to-board or panel-mount applications and can terminate 8-16 AWG and 22-26 AWG wires all in one connector, without using adapter circuit boards. In addition, the power contacts are designed to be able to accept two-wire terminations which can further reduce harness complexity by reducing or eliminating mid-wire splices.

The use of high temperature glass filled housing materials, redundant contact retention and high conductivity contact materials allows the use of this connector in very high current density applications. The features work together to result in a highly durable and compact power connector, which offers industry leading minimum millivolt drop through the connection. The connector was designed to pass the UL 1977 and IEC 60950 finger probe test which makes the connector touch-safe. The insulation crimp adds further safety by keeping the insulation from being pulled away from the termination point.

These features eliminate the need for a secondary cable clamp which often can be size prohibitive.

The cable connectors are designed to mate to the de-facto standard TE MULTI-BEAM XL right-angle or vertical PCB plugs. The combination of PCB and cable connections, both with mixed power and signal arrangements provides a universal power distribution connector systems.

The cable assemblies are all RoHS compliant, designed to specific customer requirements and manufactured in TE's cable assembly manufacturing facilities.

Board-to-Board Products

#### Technical Documents

Product Specification

108-2157

Application Specification

114-13112

#### For More Information

Internet <http://te.com>

Check out product information at: <http://mbxl.te.com>

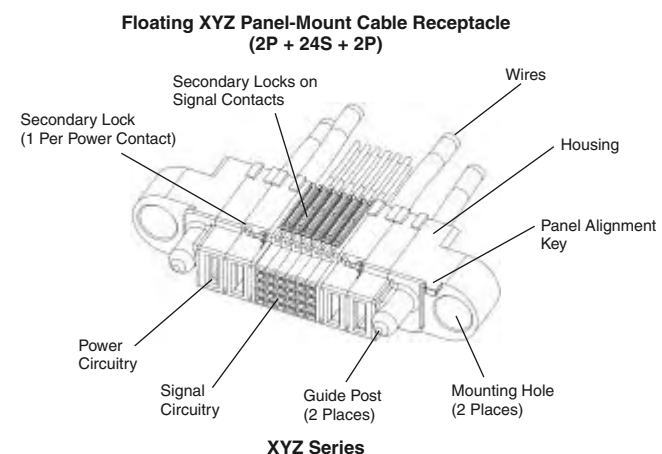
Technical Support Center 1-800-522-6752

## MULTI-BEAM XL Power Distribution Connector System Cable Receptacle Assemblies (Continued)

### Configurations/Applications

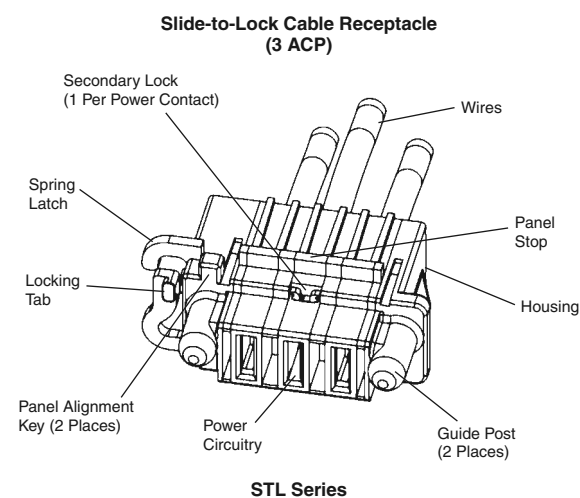
#### Floating XYZ Panel-Mount Receptacle

- 0.060" [1.52] Nominal Float in X, Y and Z direction
- For modular installation of large power distribution systems
- Single connector replaces multiple power and signal connectors



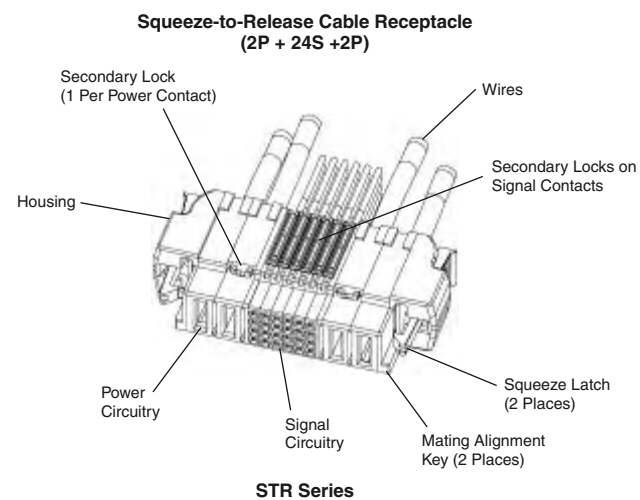
#### Slide-to-Lock Receptacle

- 0.030" [0.76] nominal float in X and Y direction
- Ideal for modular installation of smaller systems requiring less space and less float — such as fan trays
- Replaces connectors which use multiple low power contacts to carry the total current
- Power only or Power Plus signal mixed



#### Cable-to-Board Receptacle

- Easy to mate/disconnect with squeeze-to-release latches
- Mates to right-angle or vertical MULTI-BEAM XL STR plugs
- Replaces two traditional connectors (1 signal and 1 power) with just 1 connector



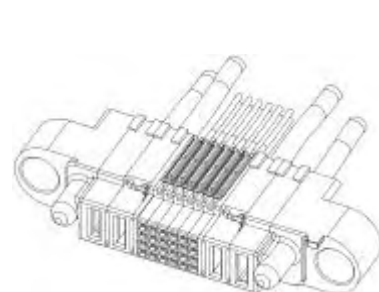
## MULTI-BEAM XL Power Distribution Connector System Cable Receptacle Assemblies (Continued)

### Panel-Mount Receptacles

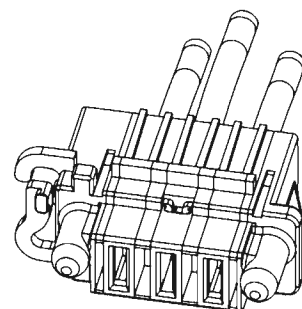
#### Product Facts

- High strength glass-filled housing materials
- Expandable/modular housing design
- PMT Series floats +/- 0.060" [1.52] in X, Y and Z directions
- STL series floats 0.030" [0.76] in X and Y directions
- Mounting Hardware Kits:  
Part Number 1600914-1 — Standard  
Part Number 1600914-3 — High Force

Part numbers shown identify the main receptacle connector housing. Additional components (contacts, contact locks, etc.) are used to complete the cable assembly. See page 23 for contacts, secondary locks and application equipment information.



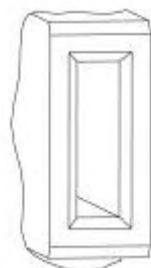
X, Y, Z Floating Receptacle



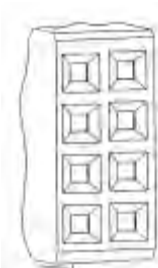
Slide-to-Lock Receptacle

#### Power and Signal Module Specifications

Power Module Widths:	Module Designation	Maximum Wire Size AWG [mm <sup>2</sup> ]	Max. Insulation Dia. inches [mm]
0.300 [7.62] (ACP)	300 (ACP)	8 [10.5]	0.272 [6.91]
0.250 [6.35] (P)	250 (P)	10 [6.6]	0.215 [5.46]
0.200 [5.08] (HDP)	200 (HDP)	12 [2.6]	0.156 [3.96]
Signal Module Width	Module Designation	Wire Range AWG [mm <sup>2</sup> ]	Insulation Range inches [mm]
0.200 [5.08] (8 Contacts)	Signals	22-26 [0.14-0.32]	0.036-0.054 [0.91-1.37]



Power Module



Signal Module

#### Configurations/Part Numbers

Available Configurations	Part Numbers			
	XYZ Series	STL Series	Mating PCB Plugs	
			Vertical	Right-Angle
3ACP	1600606-2	292499-1	6600303-7	6450123-3
4P	—	292499-4	6600303-2	6450123-2
4ACP	—	292499-3	6600303-3	—
5P	1600606-1	1761419-2	—	6450123-6
6P	—	292499-8	6600303-6	—
1P/16S/1P	1-1600636-3	1761819-4	6600333-9	—
1P/24S/1P	1600636-9	—	6600330-4	6450330-1
2P/16S/2P	1-1600636-0	—	1-6600333-0	—
2P/24S/2P	1600636-2	1761819-2	6600333-5	1-6450330-4
3P/16S/3P	1600636-8	—	6600333-7	—
3ACP/24S/3ACP	1-1600636-4	—	1-6600333-1	—
4P/24S/4P	1-1600636-5	—	6600333-6	—
4ACP/24S/12P	1600636-6	—	—	2-6450120-6
5ACP/24S/5ACP	1600636-1	—	6600333-1	5-6450130-0
7P/48S/7P	1-1600636-6	—	—	3-6450120-4

Note: All part numbers are RoHS compliant.

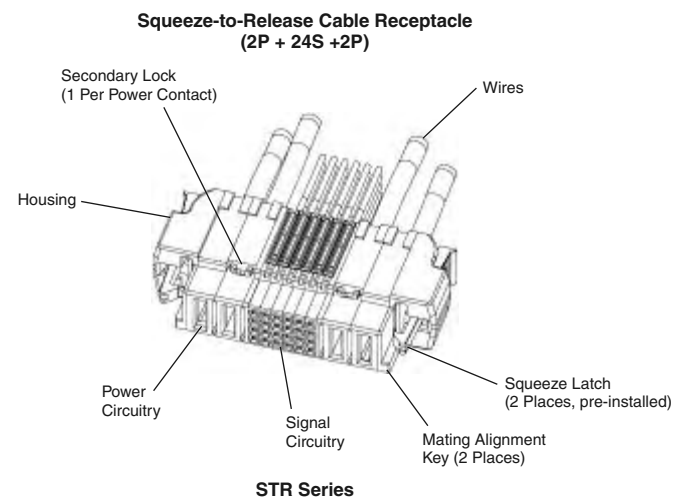
Board-to-Board Products

## MULTI-BEAM XL Power Distribution Connector System Cable Receptacle Assemblies (Continued)

### Cable-to-Board Squeeze-to-Release Receptacles

#### Product Facts

- High strength glass-filled housing
- Pre-installed squeeze-to-release latches
- Expandable/modular housing design
- Mates to TE vertical or right-angle PCB plugs



STR Series

#### Power and Signal Module Specifications

Power Module Widths:	Module Designation	Maximum Wire Size AWG [mm <sup>2</sup> ]	Max. Insulation Dia. inches [mm]
0.300 [7.62] (ACP)	300 (ACP)	8 [10.5]	.272 [6.91]
0.250 [6.35] (P)	250 (P)	10 [6.6]	.215 [5.46]
0.200 [5.08] (HDP)	200 (HDP)	12 [2.6]	.156 [3.96]
Signal Module Width	Module Designation	Wire Range AWG [mm <sup>2</sup> ]	Insulation Range inches [mm]
0.200 [5.08] (8 Contacts)	Signals	22-26 [0.14-0.32]	.036-.054 [0.91-1.37]

#### Technical Documents:

##### Product Specification

108-2157

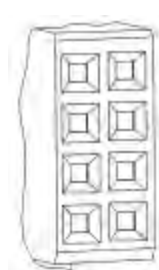
##### Application Specification

114-13112

See page 23 for contacts, secondary locks and application equipment information.



Power Module



Signal Module

#### Configurations/Part Numbers

Available Configurations	Part Numbers		
	STR Series	Mating PCB Plugs	
		Vertical	Right-Angle
2ACP	1600798-2	6600393-1	6450129-1
3P	1600798-3	6600393-2	6450129-2
3ACP	1600798-5	—	—
4P	1600798-4	6600390-1	6450129-3
6P	1600798-1	6600393-3	6450129-5
1P/24S/1P	1600788-8	6600380-2	6450128-1
2P/8S/2P	1-1600788-3	—	6450128-6
2P/16S/2P	1-1600788-0	6600383-5	—
2P/24S/2P	1600788-1	6600383-3	6450128-2
3ACP/24S/3ACP	1-1600788-2	6600383-6	—
4P/24S/4P	1-1600788-4	6600383-7	6450128-5
4ACP/24S/4ACP	1-1600788-5	6600383-9	—
6P/24S/6P	1-1600788-7	—	6450128-8
6P/32S/6P	1600788-7	6600383-1	—

Note: All part numbers are RoHS compliant.

## MULTI-BEAM XL Power Distribution Connector System Cable Receptacle Assemblies (Continued)

### Cable Receptacle Components

#### Material and Finish

**Body** — 50 micro inches nickel over high conductivity copper alloy

**Mating Area** — 30 micro inches gold

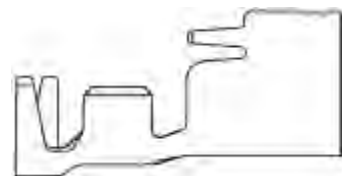
#### Technical Documents

##### Product Specification

108-2157-1

##### Application Specification

114-13164



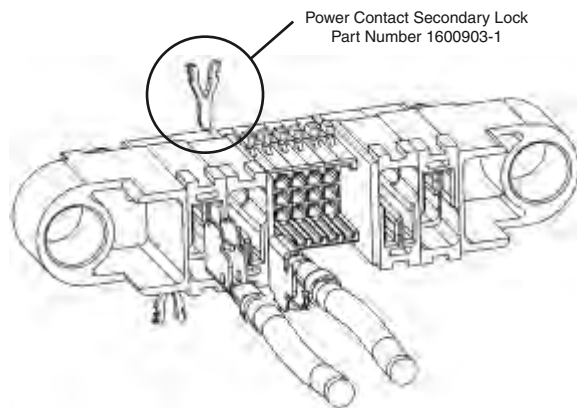
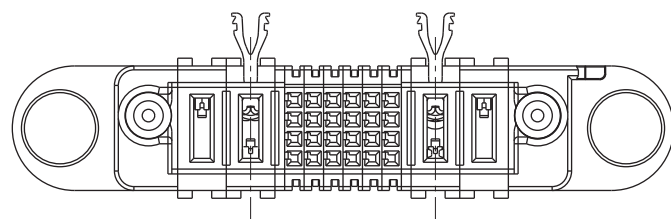
Power Contact

#### Power Contacts

Wire Size Range AWG	Insulation Diameter	Housing Width	Part Number	Applicator Tool	Hand Tool
12	.156 Max. [3.96]	.200 or .250 [5.08 or 6.35]	1-1600961-7 (make-first-break-last)	1385635-3	2063500-1
	.156-.176 [3.96-4.47]	.250 [6.35]		1385636-3	
14	.120-.156 [3.05-3.96]	.200 or .250 [5.08 or 6.35]	1-1600961-8 (Standard)	1385635-3	
	.090 Max. [2.29]	.250 [6.35]		1385636-3	
Wire Size Range AWG	Insulation Diameter	Housing Width	Part Number	Applicator Tool	Hand Tool
8	.215-.272 [5.46-6.91]	.300 [7.62]	1-1600960-7 (make-first-break-last)	1385637-3	N/A
10	.176-.215 [4.47-5.46]	.200 or .300 [6.35 or 7.62]		1385638-3	
2 @ 12	.130 Max. [3.30]	.300 [7.62]	1-1600960-8 (Standard)	1385637-3	
2 @ 14	.137 Max. [3.48]	.300 [7.62]		1385637-3	

Extraction Tool: Part Number 2063080-1

**Note:** Check the customer drawing for the applicable MULTI-BEAM XL housing to confirm the quantity of standard or make-first-break-last contacts needed. Standard and make-first-break-last contacts cannot be interchanged within the housing.



Secondary Power Locks:  
Part Number 1600903-1

**Note:** One secondary lock needed for each power contact.



SDA SA Hand Tool  
Part Number 2063500-1

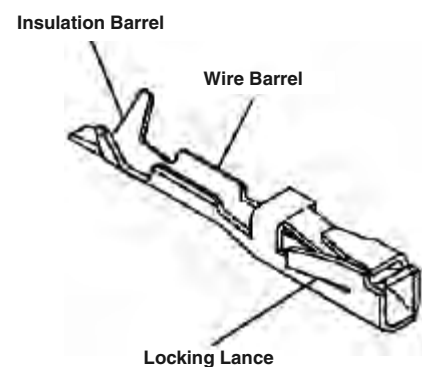
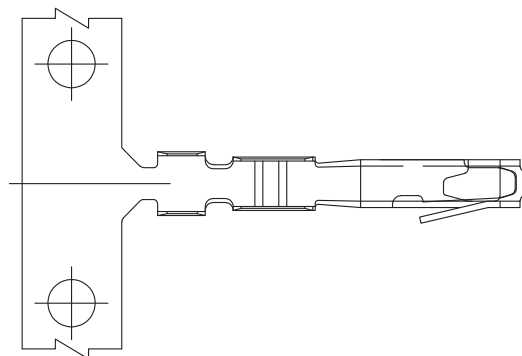
**Note:** All part numbers are RoHS compliant.

## MULTI-BEAM XL Power Distribution Connector System Cable Receptacle Assemblies (Continued)

### Cable Receptacle Components (Continued)

#### Material and Finish

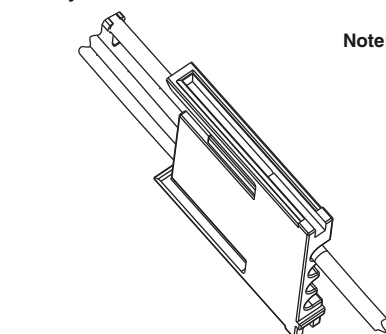
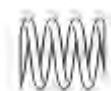
**Contact** — Phosphor bronze plated gold over nickel in mating area



### Signal Contacts

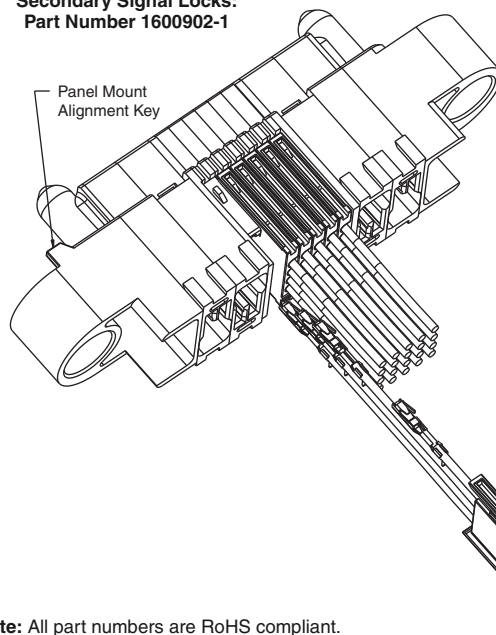
Wire Size Range AWG	Insulation Diameter	Version	Part Number	Extraction Tool	Hand Tool	Applicator
22-26	.036-.054 [0.91-1.37]	Low Pressure	5531216-5 (reel)	91156-2	91531-1	1426685-2
	.036-.054 [0.91-1.37]	High Pressure	5531224-6 (reel)			

### Secondary Locks



**Note:** One secondary lock needed for each column of signal contacts

**Secondary Signal Locks:**  
Part Number 1600902-1



**CERTI-CRIMP Hand Tool**  
Part Number 91531-1

**Float-Mount Hardware Kit**  
Part Number 1600914-1  
(Standard Force)  
Part Number 1600914-3  
(High Force)  
1 Kit / Cable Assembly;  
Kit includes 2 screws, 2 washers  
and 2 springs

**Note:** Kit not needed for STR or STL housings

**Note:** All part numbers are RoHS compliant.



## MULTI-BEAM XL Power Distribution Connector System Cable Receptacle Assemblies (Continued)

### Specifications

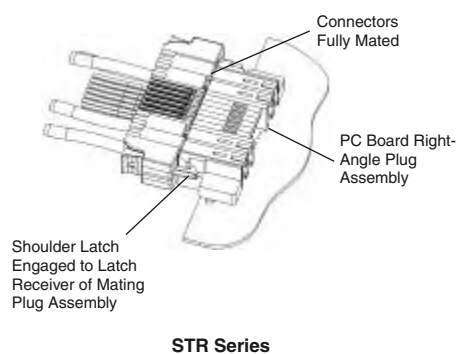
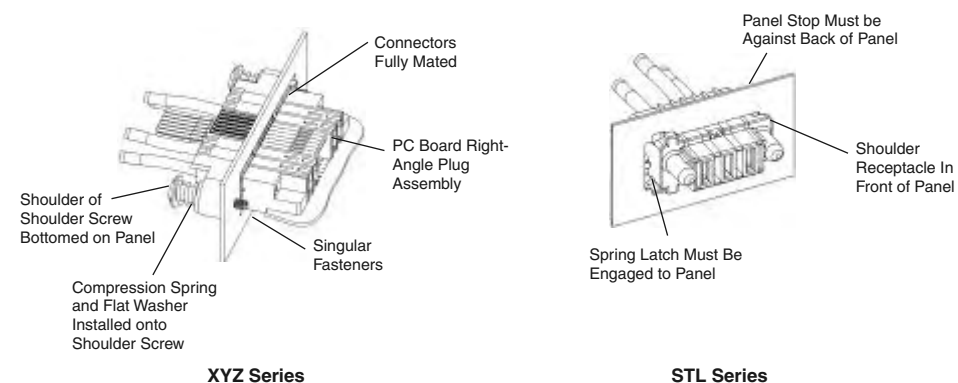
#### Product Specifications

**Power Contacts** —  
50 Amps on single 8 AWG wire

**Signal Contacts** —  
5 Amps on single 22 AWG wire  
0.050" [1.27] minimum float in X,  
Y and Z direction

**Sequenced Mating** —  
3 Levels Pwr/Grnd, Pwr & Signal,  
Signal 250 Cycle Durability

### Installed Connector Illustration

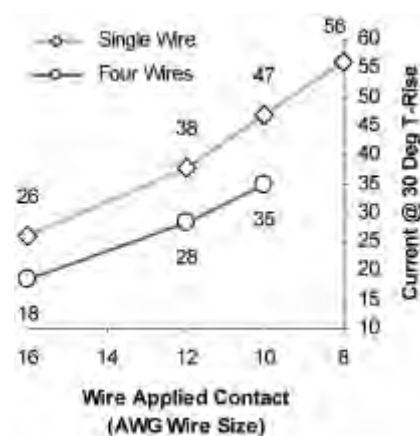


Board-to-Board Products

Additional temperature-rise data available, contact TE Product Engineering.

Current/temperature rise data shown — from End-Of-Life qualification test.

**MULTI-BEAM XL Product T-Rise Data**



For more information see the product website @ <http://mbxl.te.com>

## MULTI-BEAM XL Power Distribution Connector System Cable Plug Assemblies

### Cable Plug Assemblies

#### Product Facts

- High strength housing materials
- Hot-Pluggable
- Installation provides float in X, Y and Z directions
- Sequenced mating
- RoHS compliant
- Modular mold design provides configuration flexibility
- Integral cable clamp supports contacts and provides strain relief in minimum amount of space
- 30 microinch (0.76 micrometers) gold plated contacts for high reliability
- Sold only as part of a pre-assembled cable assembly



The newest addition to the MULTI-BEAM XL cable assemblies are the cable mounted plugs. Produced with modular molds, the connectors can be made in a wide variety of sizes. The PCB mounted MULTI-BEAM XL plugs are typically rigidly mounted to hot-swappable power supplies and the systems they connect with. The "float blind-mate drawer connector" design of the MULTI-BEAM XL cable connectors helps eliminate the concern of an inadequately aligned chassis. The connector can accept mating parts misaligned by as much as 3 mm ( $\pm 1.5$  mm), and still mate

without applying stress to solder or complaint pin terminations. The MULTI-BEAM cable plugs can terminate 8-14 AWG and 22-26 AWG wires all in one connector, without using adapter circuit boards. The use of high temperature glass filled housing materials, redundant contact retention and high conductivity contact materials allows the use of this connector in very high density applications.

The cable assemblies are all RoHS compliant designed to specific customer requirements and manufactured in TE's internal cable assembly manufacturing facilities.

#### Technical Documents

##### Product Specification

108-2157-1

##### Application Specification

114-13164

#### For More Information

##### Internet

<http://te.com>

##### Check out product information at:

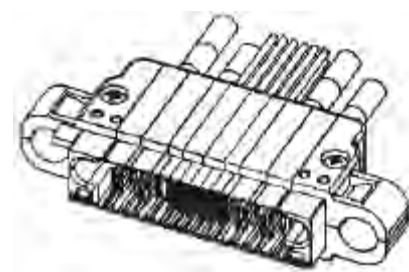
<http://mbxl.te.com>

##### Technical Support Center

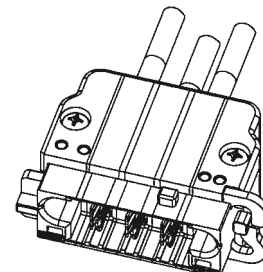
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## MULTI-BEAM XL Power Distribution Connector System Cable Plug Assemblies (Continued)

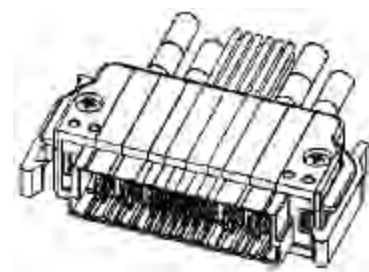
### Configurations/ Part Numbers



PMT



STL

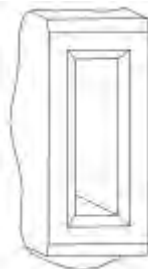


STR

Board-to-Board Products

#### Power Module Widths:

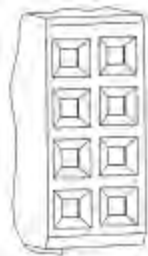
0.300" (ACP)  
0.250" (P)  
0.200" (HDP)



Module Designation	Maximum Wire Size		Max. Insulation Dia.
	AWG	mm <sup>2</sup>	
300 (ACP)	8	10.5	.272 6.91
250 (P)	10	6.6	.215 5.46
200 (HDP)	12	2.6	.156 3.96

#### Signal Module Width:

0.200" (8 Contacts)



Module Designation	Maximum Wire Size		Max. Insulation Dia.
	AWG	mm <sup>2</sup>	
Signals	22-26	0.14-0.32	.036-.054 0.91-1.37

Configuration	PMT Series Plug	STL Series Plug	Mating Receptacles*		STR Series Plug	Mating Receptacles Vertical
			Vertical	Right-Angle		
3 ACP	—	1761421-1	6450543-6	6450173-1	—	—
4 P	—	1761421-3	6450543-5	—	1600814-2	—
1P/16S/1P	1600236-5	1600820-2	—	2-6450170-0	1600238-4	6450740-4
1P/24S/1P	1600236-4	1600820-1	6450540-1	6450160-3	1600238-3	6450740-5
2P/24S/2P	1600236-6	1600820-3	5-6450540-9	2-6450170-1	1600238-5	6450740-6
3ACP/24S/3ACP	1600236-7	1600820-4	4-6450550-1	2-6450170-2	1600238-6	6450740-7

PMT Series — Panel-Mount with total 3 mm float in X, Y and Z directions  
 STL Series — Panel-Mount with total 1.5 mm float in X and Y directions  
 STR Series — Squeeze-to-Release for removeable Cable-to-Board / I/O Applications  
 \*Specifications on mating PCB mountable receptacles:  
 Product Specification 108-2157-1  
 Application Specification 114-13164

**Note:** All part numbers are RoHS compliant.

## MULTI-BEAM XL Power Distribution Connector System Cable Plug Assemblies (Continued)

### Connector Styles

Intermateable with TE MULTI-BEAM XL PCB mounted receptacles

### Specifications

**Wire Gauge** — 8 AWG — 14 AWG

**Sequenced Mating** — 3 Levels: Pwr/Gnd, Pwr & Signal, Signal

**Current Carrying Capacity** —  
Power Contacts — 45 Amps\* on single 8 AWG wire  
Signal Contacts — 4 Amps on single 22 AWG wire

**Durability** — 250 Cycle

**Temperature Range** — 40°C – 105°C

**Float** — 1.5 mm float in X, Y, and Z Direction\*\*

**RoHS Compliant**

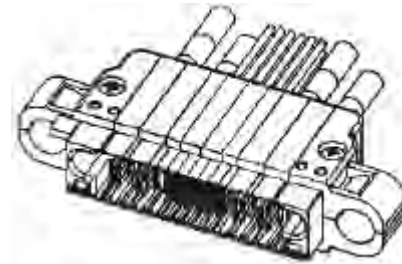
**UL, CSA, VDE Approvals Pending**

\*Based on End-of-Design Life Qualification Tests

\*\*Mated to TE MULTI-BEAM XL receptacles only

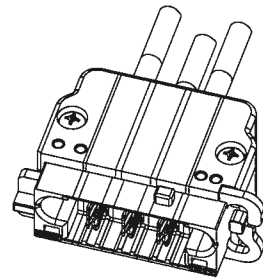
### PMT (Panel-Mount) for True X, Y, Z Floating

- Single-piece contact design — eliminates multiple contact interfaces
- Insulation crimp on all contacts
- Installation to panel provides float in X, Y and Z directions



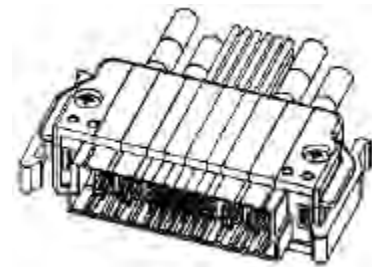
### STL (Slide-to-Lock) — Most Economical — Still Offering X and Y Floating

- Single-piece contact design — eliminates multiple contact interfaces
- Insulation crimp on all contacts
- Installation to panel provides float in X and Y directions



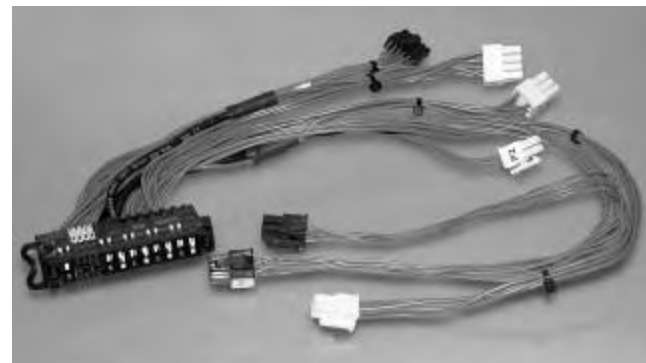
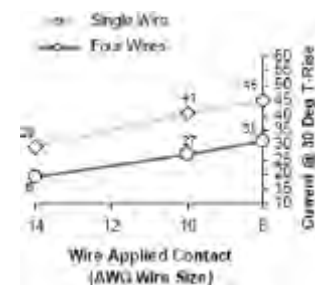
### STR (Squeeze-to-Release) — To Connect Sub-assemblies

- Single-piece contact design — eliminates multiple contact interfaces
- Insulation crimp on all contacts
- Easy to mate/disconnect with squeeze-to-release latches

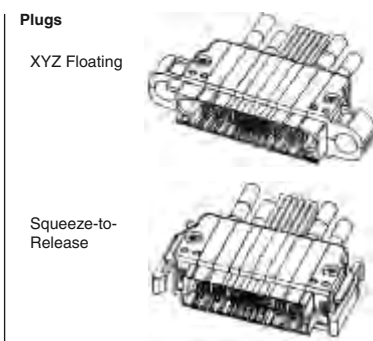
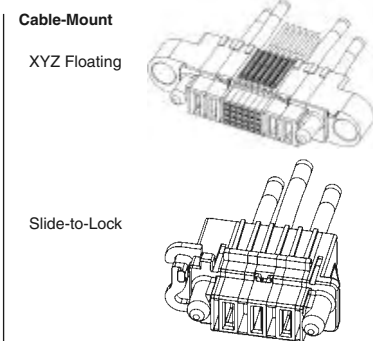
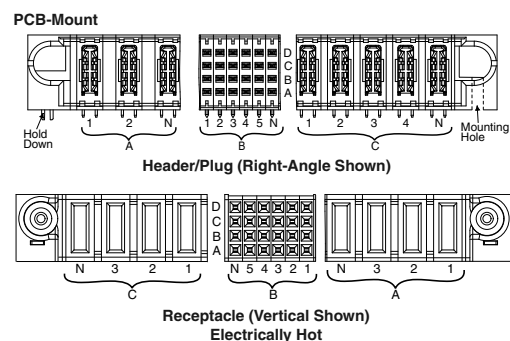


- Offered as pre-assembled, fully tested cable assemblies, as shown below
- Combines multiple power and signal connectors into a single Power I/O Connector

**MULTI-BEAM XL Cable Plug T-Rise Data\***



### MULTI-BEAM XL and MULTI-BEAM XLE Connectors Custom Configuration Worksheet



To create a unique configuration for MULTI-BEAM connectors simply complete this worksheet and forward it to your TE sales engineer.

<b>1. Performance Grade</b>	<input type="checkbox"/> MULTI-BEAM XL Connector	<input type="checkbox"/> MULTI-BEAM XLE Connector
<b>2. Application</b>	<input type="checkbox"/> Board-to-Board	<input type="checkbox"/> Cable-to-Board
<b>3. Gender</b>	<input type="checkbox"/> Plug (Male)	<input type="checkbox"/> Receptacle (Female)
<b>4. Orientation</b>	Cable Only → <input type="checkbox"/> Blind-Mate specify Floating or Slide-to-Lock Receptacle	<input type="checkbox"/> Latching
	PCB Only → <input type="checkbox"/> Right-Angle	<input type="checkbox"/> Vertical
<b>5. Termination</b>	(Cable Only) Power <input type="checkbox"/> 8 AWG <input type="checkbox"/> 10 AWG <input type="checkbox"/> 12 AWG <input type="checkbox"/> 14 AWG	
	Signal <input type="checkbox"/> 22 AWG <input type="checkbox"/> 24 AWG <input type="checkbox"/> 26 AWG	
<b>6. Termination Style (PCB Only)</b>	<input type="checkbox"/> Solder Tail .135" [3.43 mm]	<input type="checkbox"/> Press-Fit .120" [3.05 mm]
	<input type="checkbox"/> Solder Tail .165" [4.19 mm]	<input type="checkbox"/> Press-Fit .135" [3.43 mm]
		<input type="checkbox"/> Press-Fit .165" [4.19 mm]
<b>7. Mounting to PCB</b>	<input type="checkbox"/> Hold Downs (one on either end)	
	<input type="checkbox"/> .122" [3.10 mm] Mounting holes (Accepts #4 screws, right-angle connectors only)	
	<input type="checkbox"/> .150" [3.81 mm] Mounting holes (Accepts #6 screws, right-angle connectors only)	
<b>8. Select # of Contacts</b>	___ Enter Power Contact Type (LP - Low Power, HP - High Power)	
<b>Section A: (Power Contacts)</b>	___ Enter # of Power Contacts (Loaded with standard length Power Contacts)	
	___ Enter the position(s) to be loaded with Pre-mate contact (Receptacles only) (Mate-First-Break-Last) ( i.e. #1,#3, etc.)	
Contact Centerline Spacings:	<input type="checkbox"/> .200" [5.08 mm] (for High Power only)	
	<input type="checkbox"/> .250" [6.35 mm] (for High Power only)	
	<input type="checkbox"/> .300" [7.62 mm] (for High Power only)	
<b>Section B: (Signal Contacts)</b>	___ Enter # of Signal Contacts (Multiples of 8 are standard, i.e. 16, 24, 32...)	
	___ Enter the positions with Post-Mate Contacts (Mate-Last-Break-First, Plugs only) Note: Row A is standard (i.e. A1, A3, etc.)	
<b>Section C: (Power Contacts)</b>	___ Enter Power Contact Type (LP - Low Power, HP - High Power)	
	___ Enter # of Power Contacts (Loaded with standard length Power Contacts)	
	___ Enter the positions to be loaded with Pre-Mate Contacts (Receptacles only) (Mate-First-Break-Last, i.e. #1, #3, etc.)	
Contact Centerline Spacings:	<input type="checkbox"/> .200" [5.08 mm] (HDP) <input type="checkbox"/> .250" [6.35 mm] (P) <input type="checkbox"/> .300" [7.62 mm](ACP)	

**9. Additional Requirements**

\_\_\_\_\_

\_\_\_\_\_

**10. Customer Information**

Name: \_\_\_\_\_ Company: \_\_\_\_\_ Location: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ e-mail: \_\_\_\_\_

(Submit to your local TE Sales Engineer)

MULTI-BEAM XL, MULTI-BEAM XLE, and the TE connectivity (logo) are trademarks of the TE Connectivity Ltd. family of companies.

Board-to-Board Products

## MINIPAK High-Density Board-to-Board Power Connectors

### Product Facts

- High current per linear inch
- Various configurations to meet requirements using less board space
- Built-in alignment feature
- Shrouded insulator design
- Meets safety regulatory requirements
- All MINIPAK products in this section are RoHS compliant

### Typical Applications

- Telecom and computer applications
- Routers
- Servers, mini and supercomputers
- Removable battery packs
- Uninterruptible power systems (UPS)
- Hot-swap N+1 power distribution



MINIPAK connectors are a family of board-to-board power connectors designed to deliver more current using less board real estate.

### Product Varieties

This product family includes **MINIPAK high-density power connectors**, which are custom configurable and offer a combination of alignment guides, signal contacts, and DualBlade power contacts to meet different requirements. Following the PICMG  $\mu$ TCA.0 Standard, the **MINIPAK HD** connector is also available

in this product line and is ideal for hot-plug telecommunications applications. With a two-row configuration, the **MINIPAK HDE** connector, designed to serve in both PCB-to-PCB and backplane power systems, occupies minimal PCB edge space. For applications needing a low profile solution, TE offers **MINIPAK HDL**, a blind-mateable board-to-board connector, which stands only 8 mm off the edge of the printed circuit board.

### Wide Selection of Configurations

MINIPAK connectors are available in numerous configurations. Which MINIPAK connector is most suited to your application will depend on requirements such as AC input current and voltage, DC output currents and voltages, board-mount style, and available board space. TE will work with you to help determine the best solution to your application and can custom tool MINIPAK configurations if needed.

**MINIPAK High-Density Board-to-Board Power Connectors** (Continued)



**MINIPAK High-Density Power Connectors**

- 32 Amps per contact, fully loaded
- Features an innovative Dual Blade contact that allows splitting 4.5 mm pitch contacts into multiple voltage rails
- Various alignment guides, signal contacts, and power contacts available to use on 4.5 mm, 6.0 mm, and 7.5 mm pitches



**MINIPAK HDL Connectors**

- High density blind-mateable connector
- Low profile-stands just 8.0 mm off the PCB
- Solder and press-fit tails available
- Current rating of 17A
- Low contact resistance with mating forces less than 0.3lbs per contact



**MINIPAK HD Connectors**

- Designed to the PICMG MicroTCA.0 Standard
- Combines 24 power contacts and 72 high density signal contacts
- Rugged contact design helps provide long-term reliability
- Hot-plug design controls arc during hot mate/unmate cycles
- 3 mating levels



**MINIPAK HDE Connectors**

- Very high current density
- Two row configuration saves PCB space
- Two levels of contact sequencing available for mate-first-break-last operation
- Uses a hot-plug contact approved by UL for current interrupt applications

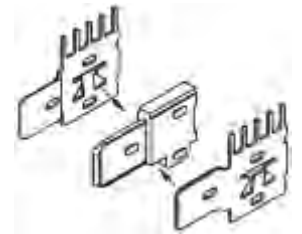
Board-to-Board Products

**MINIPAK High-Density Board-to-Board Power Connectors** (Continued)



Part Number	Right-Angle PCB Plug				Mating Pair Overall Length	Vertical PCB Receptacle		
	No. 30A Pwr	No. 15A Pwr	Signal Contacts	Tails		Mating Part Number	Tails	Special Feature
6651672-2	3	2	6	Solder	1.38 35.00	6651673-1	Compliant Press-Fit	DualBlade
6651670-1	3	2	24	Solder	2.87 73.00	6651671-1	Compliant Press-Fit	DualBlade
6651742-1	8	12	58	Solder	3.78 96.00	6651743-1	Compliant Press-Fit	Stacked
6651668-1	21	0	24	Solder	5.71 145.00	6651669-1	Compliant Press-Fit	—
6651380-1	6	5	36	Solder	4.50 114.50	6651381-2	Compliant Press-Fit	DualBlade

\*The remaining power contacts are 30 Amps each



**DualBlade Contact**  
DualBlade Contact provides two 15 Amp contacts in the space of one 30 Amp contact



**DualBlade Contact Housing Assembly**



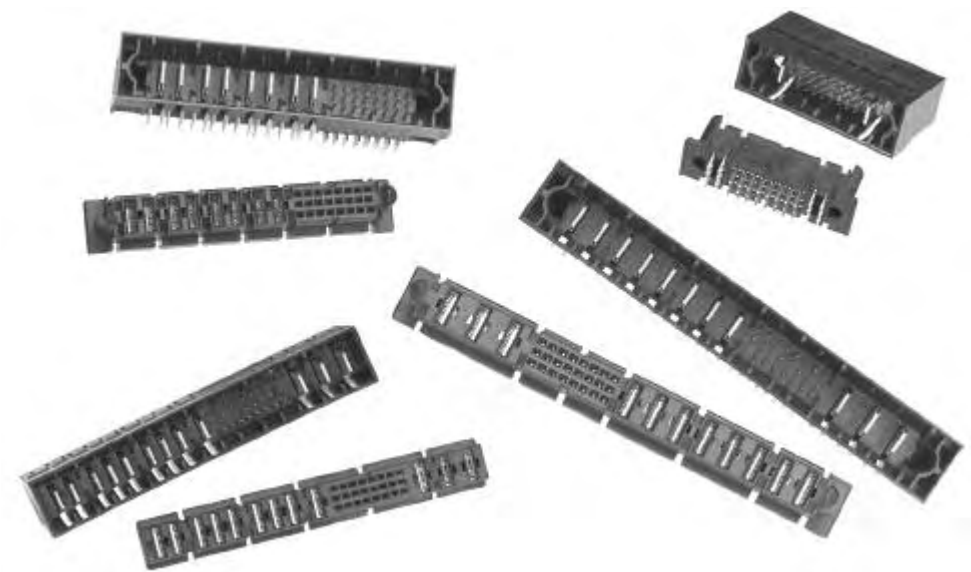
**Stacked MINIPAK Connector**

**Co-Planar Stacked MINIPAK Connector**

Part Number	Right-Angle PCB Plug				Mating Pair Overall Length	Right-Angle PCB Receptacle		
	No. 30A Pwr	No. 15A Pwr	Signal Contacts	Tails		Mating Part Number	Tails	Special Feature
1766056-1	2	6	36	Solder	1.55 39.30	1766057-1	Solder	Stacked

**Custom MINIPAK Connector Configurations**

If the standard MINIPAK connector configuration does not meet your application requirements, TE may be able to tool a custom MINIPAK connector solution depending on your requirements and production volume. Please consult Customer Service for details.



**Note:** All part numbers are RoHS compliant.



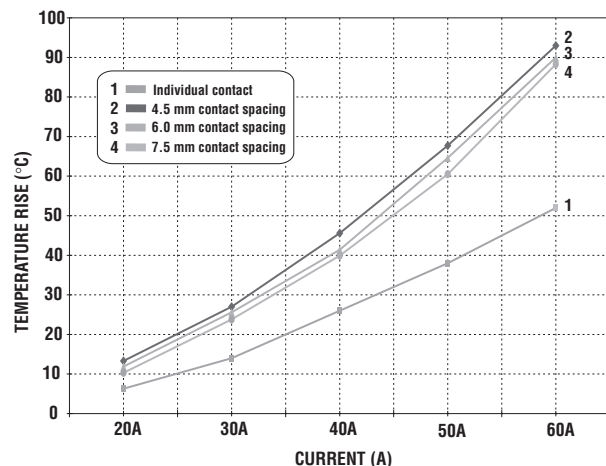
### MINIPAK High-Density Board-to-Board Power Connectors (Continued)

Material	
Insulators	PPA, UL 94V-0 flammability rated, color black
Socket contacts	Phosphor bronze alloy
Signal pins	Brass alloy
Power blades	Copper alloy
Plating	
Contacts	Selective 30 microinches gold over nickel
Terminals	Tin over nickel
Environmental/Mechanical	
Connector operating temperature range	-40°C to +130°C
Mating forces	Power: 1.5lb/contact typical Signal: 0.2lb/contact typical
Electrical	
Contact current rating	Individual power contact: 65A max. <sup>1</sup>
Voltage ratings	AC Power: 125/250VAC, signal & DC power: up to 60V
Insulation resistance	5000Ω at 500V DC for 2 minutes, per MIL-STD 1344, Method 3003
Dielectric strength	Power 1,500VAC, signal 250VAC; for 1 minute, per MIL-STD 1344, Method 3001

<sup>1</sup> This is the UL rating for an individual power contact. Current rating for any given configuration with multiple contacts will depend on contact layout, quantity and spacing.

#### Contact Current Ratings

The graph to the right shows the current carrying capabilities of an individual power contact, and that of multiple contacts at 4.5, 6.0 and 7.5 mm contact spacing.

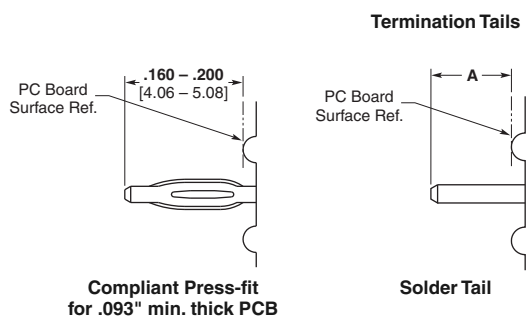


#### Safety Regulatory Agency Compliance

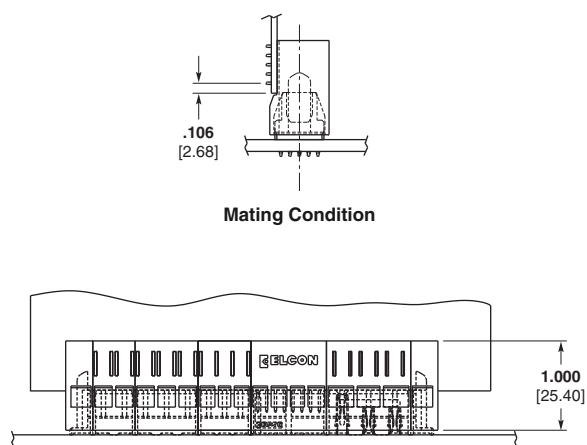
MINIPAK connectors have been evaluated and found to comply with the UL1977 standard and the CSA standard C22.2 No. 182.3-M1987. TE will work with customers to obtain application-specific regulatory certifications if needed.



#### Connector Mounting



Dimension "A"	
Long Tail	Short Tail
.180 ± .020	.120 ± .020
4.57 ± 0.51	3.07 ± 0.51



**“NEW” MINIPAK HDL Connectors**

**NEW**

**Product Facts**

- High-density, low profile, power/signal, blind-mate connector
- Developed to meet next generation 1U application by reducing airflow impedance
- Design is customizable
- Serves both solder reflow and press-fit applications with the same contact

**Applications**

- 1U Servers
- High End Servers
- Telecommunications Switches, requiring low profile
- Hot-pluggable power supplies

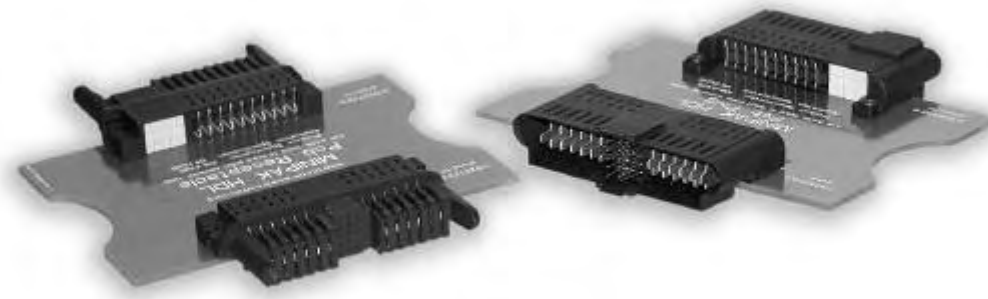
**Technical Documents**

**Product Specification**

108-2325

**Application Specification**

114-13215

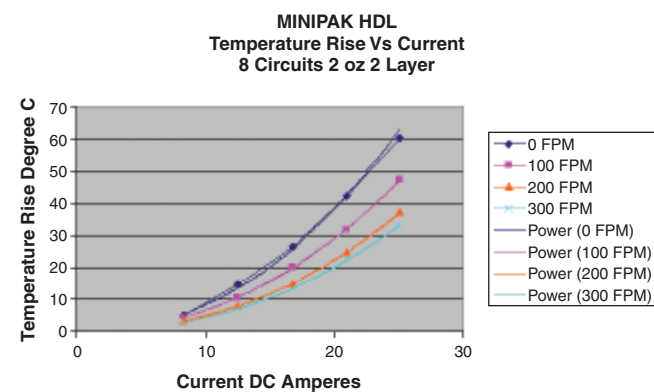


TE's new MINIPAK HDL connector combines a high-density power interface into a blind-mateable board-to-board connector, which stands only 8 mm off the edge of the printed circuit board.

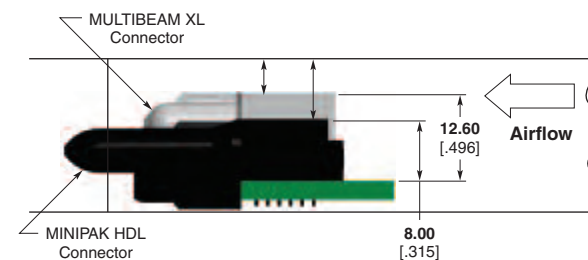
The MINIPAK HDL product consists of a right-angle plug and right-angle receptacle, which utilizes an eye of the needle tail that can be used in both solder and press-fit applications. The contact offers a current rating of 17 amps, low contact resistance, and mating forces less than 0.3 pounds per contact.

The connector is designed and manufactured to be mass-customizable, allowing the customer to select a wide array of configurations and layouts. MINIPAK HDL connectors also contain three levels of mating sequences. This product is designed specifically for modular hot-swappable power distribution systems. The MINIPAK HDL connector offers 20% more current density in a smaller package than other products currently offered in the market.

**Temperature Rise Chart**



**Simulated Side View of 1U Chassis**



**“NEW” MINIPAK HDL Connectors** (Continued)

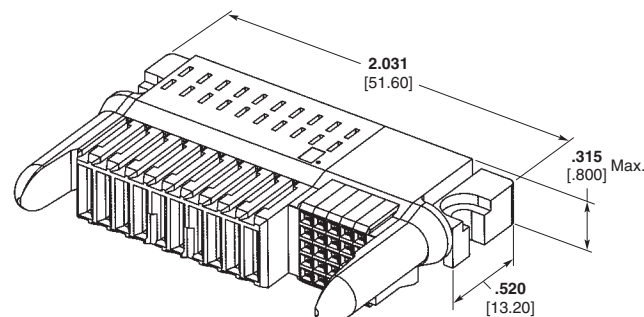
**Contacts**

**Plating** — Gold over nickel, or gold over palladium-nickel in mating area

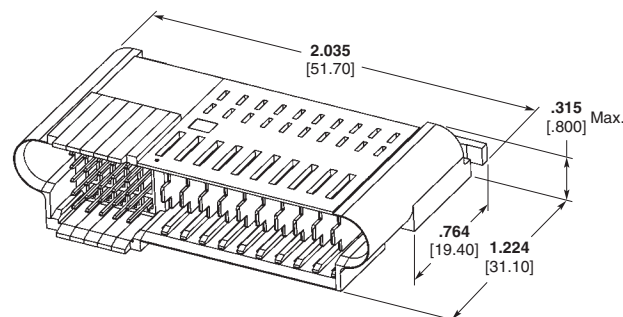
**Performance Data**

**Current Rating** — 16 Amps

**Max. Operating Temperature** — 120°C



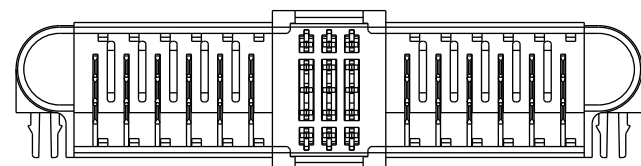
**Right-Angle Receptacle**  
Part Number 2-1926733-5



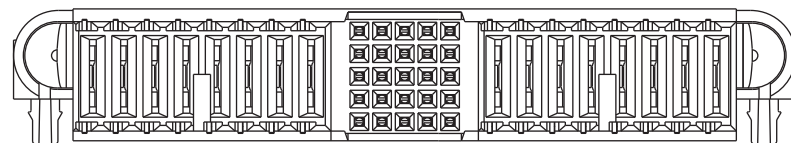
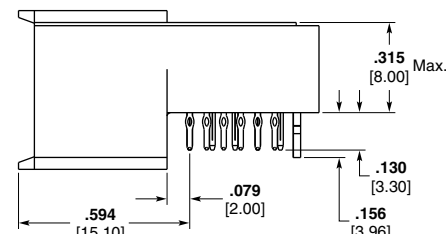
**Right-Angle Plug**  
Part Number 2-1926732-5

Board-to-Board Products

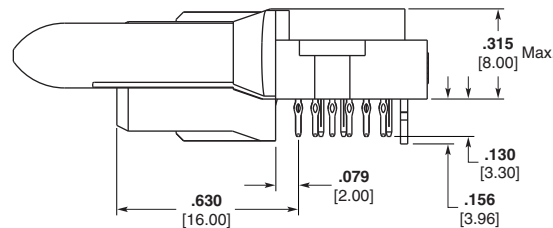
Configuration	Part Numbers	
	Right-Angle Plug	Right-Angle Receptacle
25S X 8P	1-1926732-8	1-1926733-8
25S X 10P	2-1926732-5	2-1926733-5
25S X 16P	4-1926732-6	4-1926733-6
40S X 24P	7-1926732-7	7-1926733-7
2P X 15S X 2P	1926720-2	1926721-2
6P X 15S X 6P	1-1926720-6	1-1926721-6
8P X 25S X 8P	2-1926720-5	2-1926721-5



Part Number 2-1926720-5



Part Number 2-1926721-5

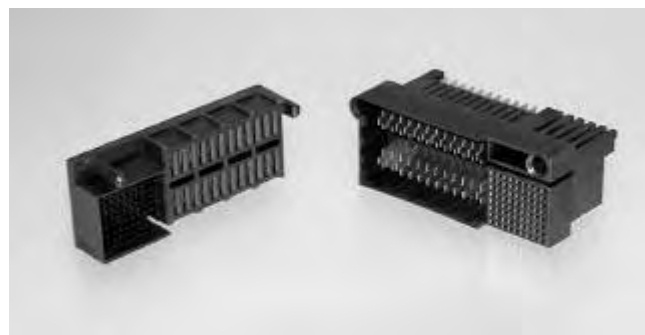


**Note:** All part numbers are RoHS compliant.

## MINIPAK HD Connectors

### Product Facts

- Designed to the PICMG MicroTCA.0 Standard
- 30 microinches gold plating over nickel
- RoHS compliant
- 24 high current density power contacts, able to carry up to 14.5 Amps per contact when fully loaded
- Industry proven Universal Power Module (UPM) power contacts
- Hot-plug contact design controls arc during hot mate/unmate cycles
- 3 mating levels

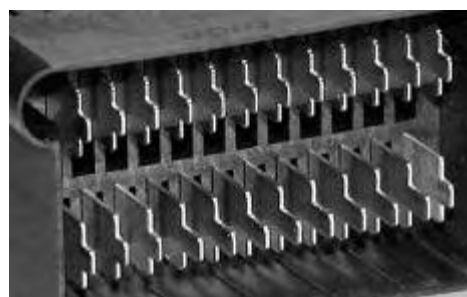


TE supplies the Power Entry Module (PEM) connector specified in the PICMG MicroTCA Standard. The PICMG MicroTCA.0 Standard is one of the latest standards addressing future telecommunications needs. The MINIPAK HD connector combines 24 power contacts and 72 high density signal contacts. The power contacts are the industry proven contacts utilized in

the Universal Power Module (UPM) and are capable of carrying 14.5 Amps per contact when fully energized. Rugged contact design ensures long-term reliability and sacrificed contact tip, controls arcing during hot mate/unmate cycles. The MINIPAK HD also features 3 levels of mating and selective gold plating on contacts.

### Contact Blades Product Facts

- Designed for Hot Swap applications
- Extended sacrificial contact tip absorbs arc
- Main contacts stay free of contaminants



MINIPAK HD Contact Blades

### Technical Documents

#### Product Specification

108-2253

#### Application Specification

114-13182

#### Industry Standard

PICMG MicroTCA R1.0

MicroTCA and PICMG are trademarks of PICMG-PCI Industrial Computer Manufacturers Group, Inc.

**MINIPAK HD Connectors** (Continued)

**MicroTCA Connectors —  
MINIPAK HD Board-to-  
Board Connector**

**Vertical Receptacle,  
Compliant Press-Fit**

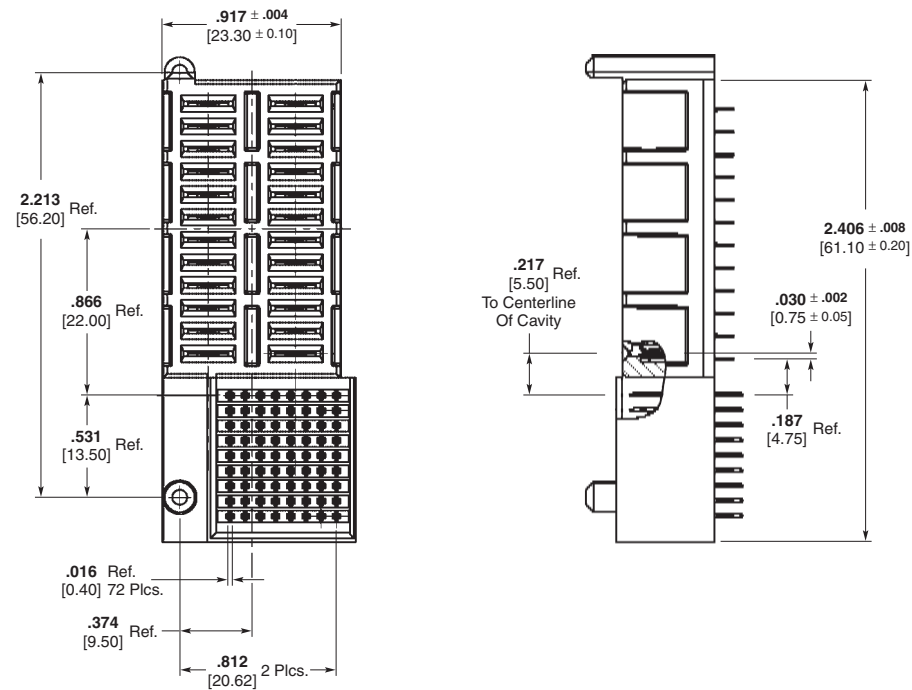
**Part Number 1469920-1  
(Tin-lead PCB Tails)**

**Part Number 1469920-2  
(Tin Plated PCB Tails)**

The vertical connector consists of 72 2 mm pin and 24 Universal Power Module (UPM) receptacle contacts. The contacts have compliant pin tails for press-fit applications.



**PCB Seating Tool**  
Part Number 1901650-1



**Part Number 1469920-1**



Board-to-Board Products

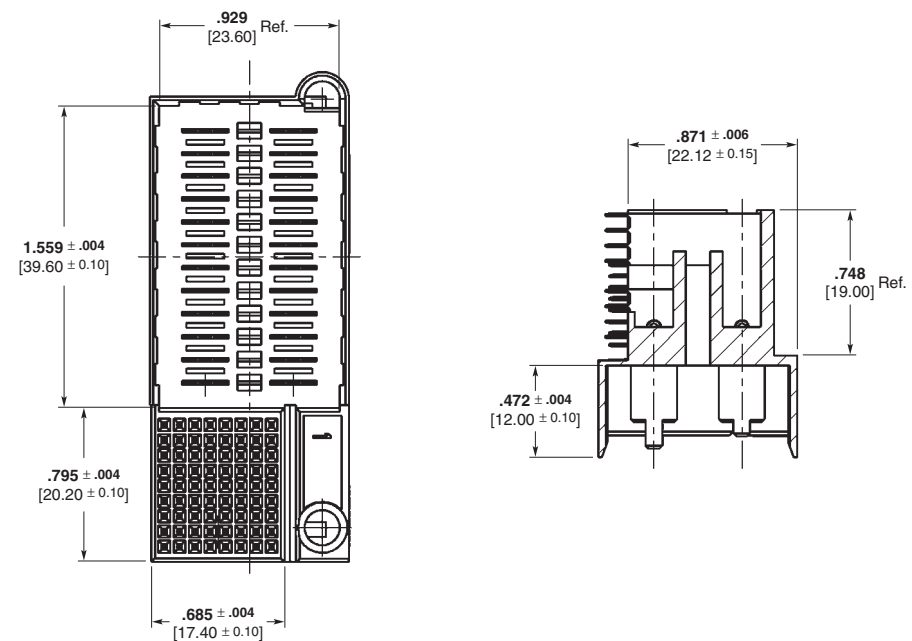
**Right-Angle Plug, Solder  
Tail or Compliant Press-Fit**

**Part Number 1469921-1  
(Solder Tail)**

**Part Number 1469922-1  
(Press-Fit)**

**Part Number 1469922-2  
(Press-Fit, Tin-Lead PCB  
Tails)**

The right-angle connector consists of 72 high density signal pins and 24 right-angle UPM blades that feature 2 mating lengths for the mate first/break last ground sequencing. The right-angle connectors come in 2 piece tail variations, press-fit and solder.



**Part Number 1469921-1**

**Note:** All part numbers are RoHS compliant.

## MINIPAK HDE Connectors

### Product Facts

- Compatible with 2 mm equipment practices per IEC 61076-4-101
- One-piece molded housing — fewer parts to assemble to PCB
- Very high current density — 18 Amps per contact on each contact in an 8-position (2 x 4) connector
- 4 PCB tails distributes the current with just 4.5 amps per plated through hole
- Hot-pluggable contact design reduces contact degradation associated with live PCB insertions / extractions
- Two-levels of contact sequencing for mate-first-break-last operation



### Technical Documents

**Product Specification**  
108-2289

**Instruction Sheet**  
408-10157

The new MINIPAK HDE connector is the latest high current power module designed to serve in both backplane power distribution and general PCB-to-PCB applications. It was designed to complement the most popular high-speed backplane connectors offered by TE, including HM-Zd, Z-PACK TinMan and MULTIGIG RT connectors.

The two-row configuration offers a benefit to the PCB designer. The power can be fed from either the top or bottom row, with the return path routed through the other remaining row. Alternatively, the same voltage rail can be routed to

both the top and bottom rows and the return path can be routed to both the top and bottom rows of adjacent contacts.

The two row configuration offers the additional benefit of occupying just half the linear PCB edge space of other types of board-to-board power modules.

The low mating force contact reduces the moment / stresses on the connector during mating and reduces the plating wear for long-term reliability.

The MINIPAK HDE connector has two-levels of blade lengths to provide mate-first-break-last operation

for hot swap operation. In addition, in the event the connector is used to mate or un-mate to a live load, the sacrificial contact tip absorbs the arc to keep the remaining contact mating surfaces free of damage. This “hot-plug” contact design has been approved by UL for current interrupt applications.

All MINIPAK HDE connectors are easily applied to the PCB with common “flat-rock” seating tools. The connector mates with TE’s Universal Power Module connectors found on page 55.

**MINIPAK HDE Connectors** (Continued)

**Contacts**

Industry proven Universal Power Module (UPM) style contacts

**Performance Data**

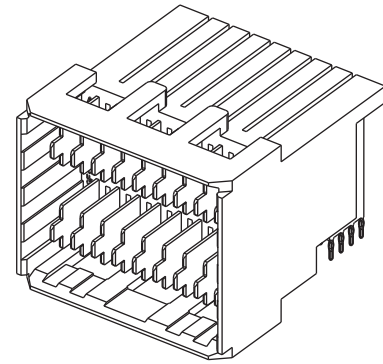
**Current Rating** — 18 Amps on each contact in the 8-position (2x4) connector

**Low Level Contact Resistance** — 2 milli-ohms max

**Operating Temperature** — -40°C to +105°C

**Technical Documents**

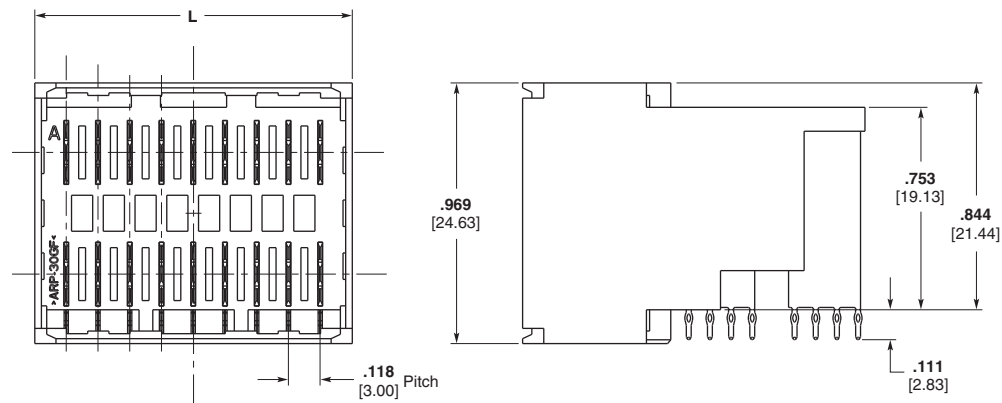
**Product Specification**  
108-2289



Board-to-Board Products

Description	Part Number	Dimension L	Mating Connector*
2 x 3	1926223-1	.472" [12.00]	5-5223955-2
2 x 4	1926224-1	.590" [15.00]	120953-1
2 x 5	1926225-1	.708" [18.00]	120953-2
2 x 6	1926226-1	.826" [21.00]	120953-3
2 x 7	1926227-1	.944" [24.00]	120953-4
2 x 8	1926228-1	1.06" [27.00]	120953-5
2 x 9	1926229-1	1.18" [30.00]	120953-6
2 x 10	1926271-1	1.30" [33.00]	120953-7
2 x 11	1926272-1	1.42" [36.00]	120953-8
2 x 12	1926273-1	1.54" [39.00]	120953-9

\*Mating connectors are single row, MINIPAK HDE requires 2 x mating connectors.  
**Note:** For more information on the mating connector please see page 52. Receptacle Seating Tool Part Number 1585309-X.



**Note:** All part numbers are RoHS compliant.

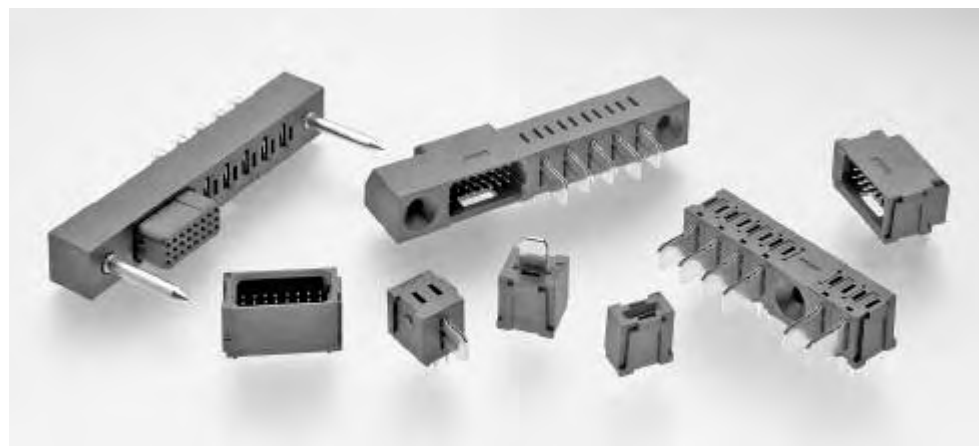
## FLATPAQ Modular Board-to-Board Power Connectors — Our Most Modular Board-to-Board Power Connector

### Product Facts

- 32 Amp high-performance ELCON CROWN BAND power contacts
- True hot-plug power contacts available for current interruption under load
- Versatile modular design allows customized configuration to meet your specific application requirements
- Perpendicular, parallel and co-planar styles available
- Sequenced mating of power and signal contacts
- Solder and compliant press-fit termination to the board
- Unique active guide modules double as alignment guide and power contact
- All FLATPAQ products in this section are RoHS compliant

### Typical Applications

- Board-to-board power interconnections
- Hot-swap N+1 power distribution for telecommunications, servers and mini-computers
- Uninterruptible power systems (UPS)
- Removable battery packs



FLATPAQ connectors provide hot-pluggable AC and DC power in board-to-board applications. Customized configurations of up to 45A power contacts, signal & logic lines, and guides (both active and passive) are enabled by the assembly of various standard modules. This allows the designer to specify guidance for blind-mating situations, contact mating sequence, spacing for voltage ratings, and current interruption under load (true hot-plug), to meet custom design requirements without incurring any tooling expense.

### Product Highlights Highly Configurable

FLATPAQ connectors are custom configurable using standard modules that can be arranged in any order to meet the application requirements. It is even possible to have both power blades and power sockets in the same connector side. Using off-the-shelf, modular components enables quick turnaround of sample requests, typically within one week, to allow your design to move forward on schedule.

### High-performance ELCON Power Contacts

FLATPAQ socket modules use proven CROWN BAND technology, for low insertion and extraction forces, minimal voltage drop and reduced temperature rise. The latest generation contacts are 45A USR rated (32.5A CNR) and can handle even higher currents when mounted on boards with 5 oz copper traces or on bus bars.

hot-pluggable socket contacts are rated at 35A USR, 20A CNR. Both hot-plug and regular sockets can be mixed in the same connector (as can both power blades and power sockets).

Standard power modules utilize the same contacts as the MINIPAK connectors for cost effectiveness. The original "float" mounted blade modules are still available where physically isolating the blade from the PCB solder joints is desired.

24-position straight mount Signal socket modules are now available in a cost effective 1A design.

### Power and Signal Sequencing

Power contacts are available in Standard, Premate and Postmate lengths to meet your power sequencing requirements. Signal contacts have Standard and Premate length options, consult Customer Service for details.



## FLATPAQ Modular Board-to-Board Power Connectors — Our Most Modular Board-to-Board Power Connector (Continued)

### Various Contact Termination Styles

All connectors are available in two lengths of solder termination, .115" (2.9 mm) nominal for 0.062" (1.6 mm) thick boards, and 0.177" (4.5 mm) for 0.093" (2.4 mm) and 0.125" (3.18 mm) boards.

Straight mount socket connectors are also available with compliant 'Eye of the Needle' design press-fit terminals for 0.093" (2.4 mm) minimum thickness boards and bus

### Electrical Performance

The graphs below show the performance of the FLATPAQ contact design in terms of temperature rise against current. Tests were performed on 250 V power modules mounted on PC boards with 2 oz, 3 oz, and 5 oz copper traces.

bars. TE will provide details of the recommended pressing fixture for each assembly.

All terminations fit 0.040 +/- .0030" (1.02 +/- .08 mm) diameter plated through holes.

### Alignment Guides and Mounting Ears

FLATPAQ connector alignment guides improve gatherability in blind-mate situations and can be either electrically active (35A rated) or passive.

guides should be used in conjunction with mounting ears when placed at the end of the connector. Mounting ears should also be considered on right-angle mounted connectors.

### Finished Connector Drawing

TE will provide a customer drawing showing all envelope dimensions and PCB mounting pattern based on the configuration indicated using the layout sheet available at [www.te.com](http://www.te.com). See page 44 for details on completing

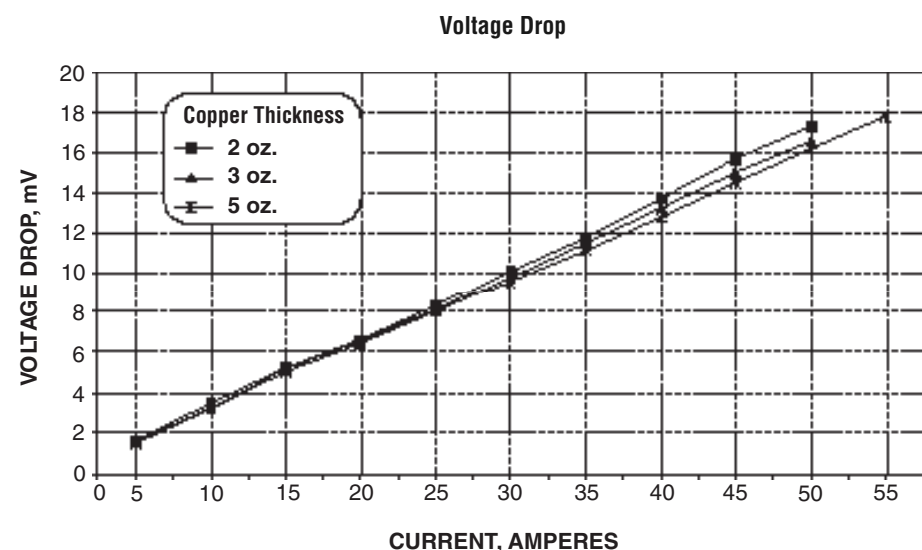
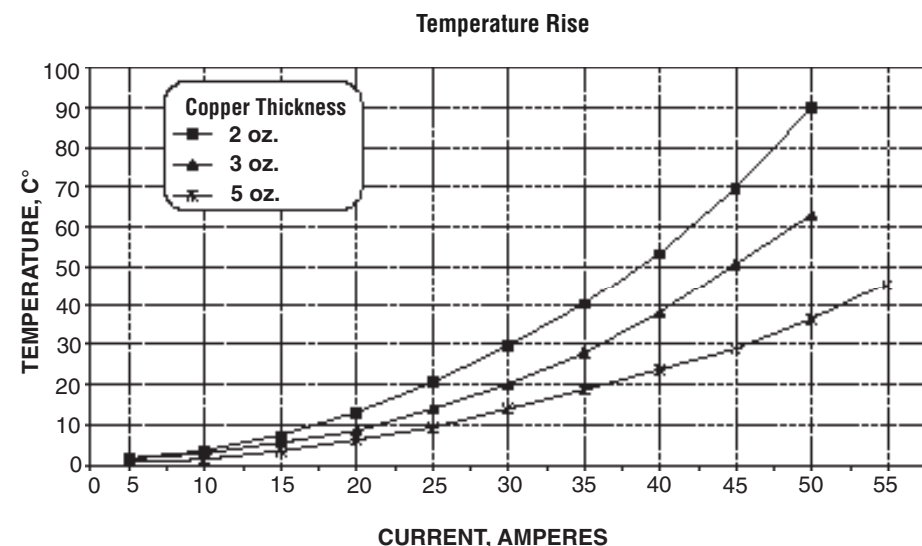
the layout sheet. A drawing with general contact sequencing and alignment information is available; please contact Customer Service for a copy.

### Safety Regulatory Agency Compliance

FLATPAQ connector has been evaluated by safety regulatory agencies for use in data, signal, control and power applications. Consult Customer Service for details.



Board-to-Board Products



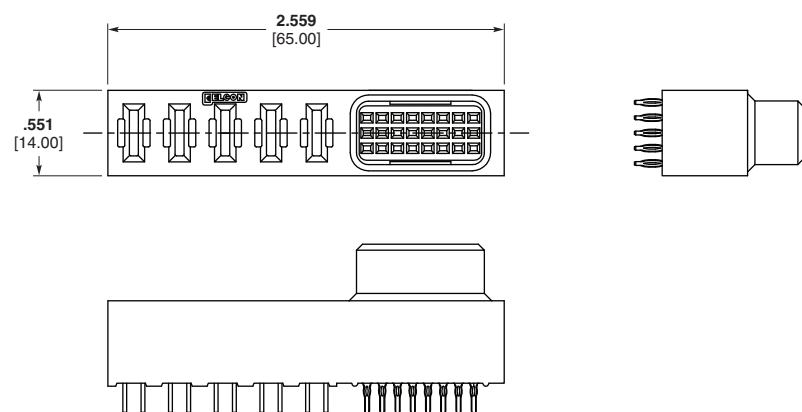
## FLATPAQ Connector Product Specifications



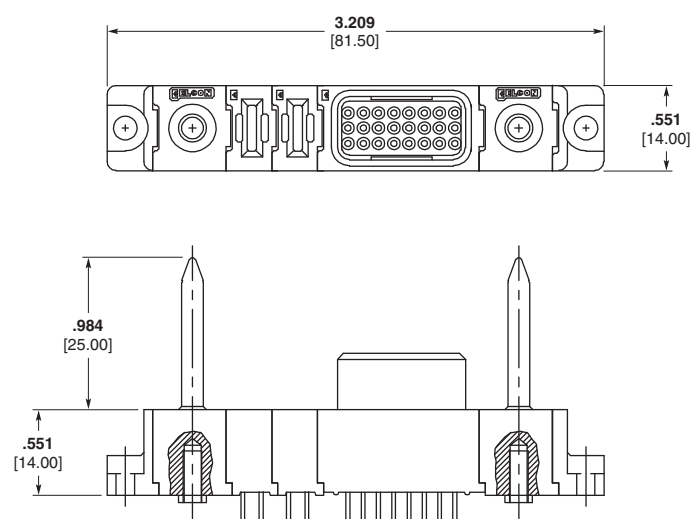
Materials		
Insulators	PPA, UL 94V-0 flammability rated, color black	
Power Blades	Copper alloy	
Power Sockets	Phosphor Bronze	
Hot-Plug Power Sockets & Active Guide Sockets	Crown Bands: Beryllium Copper Holder: Phosphor Bronze	
Signal Pin Contacts	Solder termination: Brass Press-fit: Phosphor Bronze	
Signal Socket Contacts	1 Amp: Phosphor Bronze 3 Amp: Beryllium Copper	
Passive Guide Pin	Brass	
Active Guide Pin	Copper alloy	
Finishes		
Contacts	Selectively plated gold (30 microinches minimum) with tin on terminations, all over nickel	
Passive Guide Pin	Nickel	
Active Guide Pin	Silver	
Electrical		
Current Rating	UL	45 Amp
Power Contacts	CUR/CSA	32.5 Amp
Current Rating, Hot-Plug Power Contacts	UL	35 Amp at 250V, 50 cycles
	CUR/CSA	20 Amp at 250V, 50 cycles
Signal Contacts, 1 Amp	UL	1 Amp, 250 VAC
	CUR/CSA	1 Amp, 250 VAC
Signal Contacts, 3 Amp	UL	3 Amp, 250 VAC
	CUR/CSA	2.5 Amp, 250 VAC
Contact resistance	Power	2 mΩ maximum initial, (3 mΩ maximum after 500 cycles durability), at 35A per MIL-STD-1344, Method 3004
	Signal	15 mΩ maximum initial, (30 mΩ maximum after 500 cycles durability), at 100mA, 20 mV, per MIL-STD-1344, Method 3002
Insulation Resistance	5,000 MΩ minimum at 500VDC for 2 minutes, per MIL-STD-1344, Method 3003	
Dielectric Strength	1,500 VDC for 1 minute, per MIL-STD-1344, Method 3001	
Mechanical		
Insertion Force	Power	4.0 lbf (17.8 N) maximum
	Signal	5.0 ozf (1.4 N) maximum, using .0305" (.775 mm) diameter steel test pin
Extraction Force	Power	1.0 lbf (4.4 N) minimum
	Signal	0.5 ozf (0.1 N) minimum, using .0295" (.749 mm) diameter steel test pin
Contact Retention (in insulator)	Power	10.0 lbf (44.4 N) minimum
	Signal	5.0 lbf (22.2 N) minimum
Durability	500 Cycles, per MIL-STD-1344, Method 2016	
Operating Temperature	-40 to +105° C	
Recommended PCB Hole	Finished hole: 0.040 +/- .0030" dia. (1.02 +/- .08 mm dia.) Drilled hole: 0.0453 +/- .0005" dia. (1.15 +/- .013 mm dia.) Copper Plate: 0.0010" (.025 mm) min. per surface Tin Plate: 0.0003" (.008 mm) min. per surface	
Press-Fit Tooling	Press fixture is recommended for compliant press-fit assemblies. Consult TE for tool drawing	
Marking	Connectors are marked with manufacturer's logo, part number and lot code	

### FLATPAQ Connectors

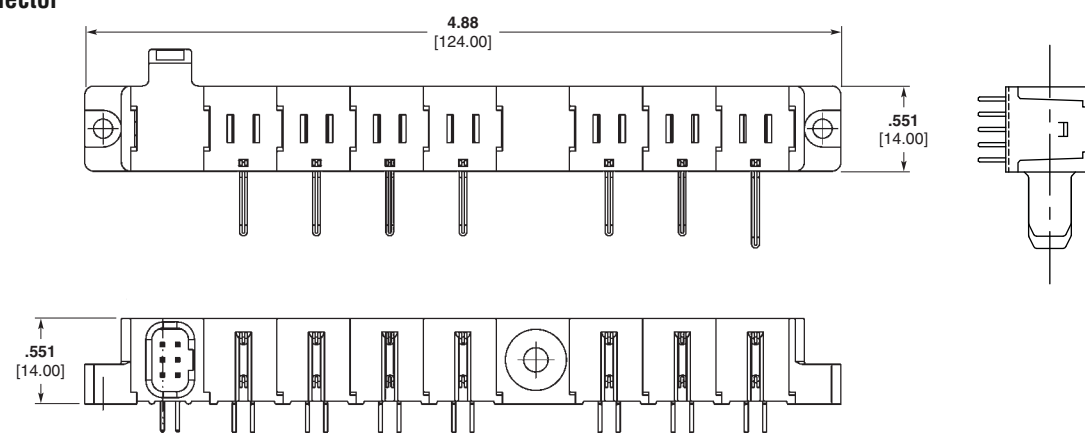
**Part Number 6646465-1**  
**FLATPAQ 250V Straight**  
**Socket Connector**  
**4 Power, 24 Signal Contacts**



**Part Number 6646597-1**  
**FLATPAQ 250V**  
**Straight Socket Connection**  
**with Active Guide Pin**  
**2 (250V) Power,**  
**2 amps Signal Contacts**



**Part Number 6646722-1**  
**FLATPAQ 600v**  
**Right-Angle Pin Connector**  
**with Guide Socket**  
**7 (600V) Power,**  
**6 Signal Contacts**



**Note:** All part numbers are RoHS compliant.

Board-to-Board Products

## How to Specify Your Modular FLATPAQ Connector

In order to build your Modular FLATPAQ connector, it is necessary to specify all application-specific requirements such as required modules, their order, termination, and sequencing. For this purpose, a Modular FLATPAQ Connector layout form such as the one shown below is available. Just complete the form and send it to TE Customer Service. We will generate a Customer Drawing for you to check and approve prior to connector production. Samples are also available upon request.

- 1 Enter your contact information, including signature and date.
- 2 Indicate the connector layout by filling in the FP number of each module required in the boxes, one per box. Use one form per mated pair. The left to right order of the modules should match the mating face views of the connector. When laying out right-angle assemblies, make sure you look at the mating face with the termination tails facing downwards.
- 3 For solder terminated assemblies, indicate the tail length for each half of the connector using the checkboxes to the right of the layout grid.

### Sample Modular FLATPAQ Connector Layout Form

#### Instructions

1. Indicate the connector layout by filling in the FP number of each module required in the boxes, one per box. Use one form per mated pair.
2. The left to right order of the modules should match the **mating face views** of the connector. When laying out right-angle assemblies, make sure you look at the mating face with the termination tails facing downwards.
3. For solder terminated assemblies, indicate the tail length for each half of the connector using the checkboxes to the right of the layout grid.
4. Sign, date and send the completed form to your local TE Sales Engineer.

Upon receipt of this form, TE will generate a Customer Drawing for you to check and approve prior to connector production.

ENTER CUSTOMER INFORMATION	
Company	Location
Contact Name	Title
Telephone	Fax
Email Address	
I am: <input type="checkbox"/> End user <input type="checkbox"/> Contract manufacturer (end user: _____)	
Signature	Today's Date
Annual Quantity Required	

Submit to your local TE Sales Engineer.

Write the "FP" numbers to indicate the layout of one half of the connector assembly, matching the left to right order with the mating face view of the connector (right-angle assembly tails facing downwards).

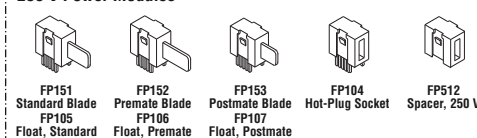
FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	Solder Tail Options	
														<input type="checkbox"/> .115" (2.9 mm); .062" thick boards	<input type="checkbox"/> .177" (4.5 mm); .093/.125" boards	

Write the "FP" numbers to indicate the layout of the mate of the above assembly, matching the left to right order with the mating face view of the connector (right-angle assembly tails facing downwards).

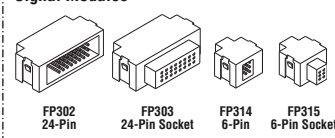
FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	Solder Tail Options	
														<input type="checkbox"/> .115" (2.9 mm); .062" thick boards	<input type="checkbox"/> .177" (4.5 mm); .093/.125" boards	

#### Right-Angle Mount

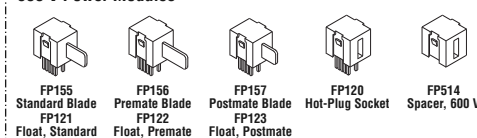
##### 250 V Power Modules



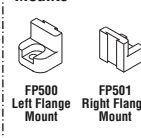
##### Signal Modules



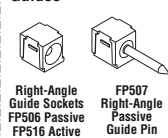
##### 600 V Power Modules



##### Mounts

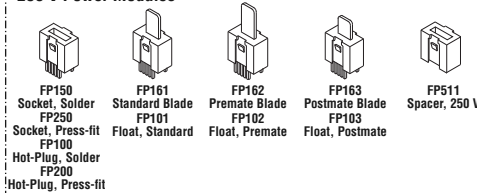


##### Guides

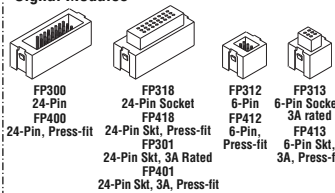


#### Straight Mount

##### 250 V Power Modules

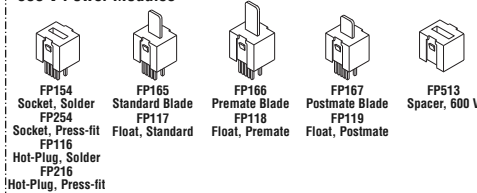


##### Signal Modules

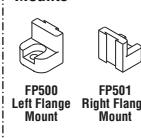


Note: All modules are solder tail termination unless indicated as compliant Press-fit. Select solder tail length using check boxes to the right of the connector layout grid above. 0.093" or thicker boards are recommended for compliant Press-fit termination style. Consult TE for signal module sequencing. See Catalog 1773096 for benefits of Hot-Plug and Float options.

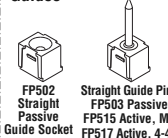
##### 600 V Power Modules



##### Mounts



##### Guides



### How to Obtain Modular FLATPAQ Connector Layout Forms

Modular FLATPAQ Connector layout forms can be obtained directly from Customer Service or through your TE Sales Engineer. They can also be downloaded from the website; at <http://www.te.com>.

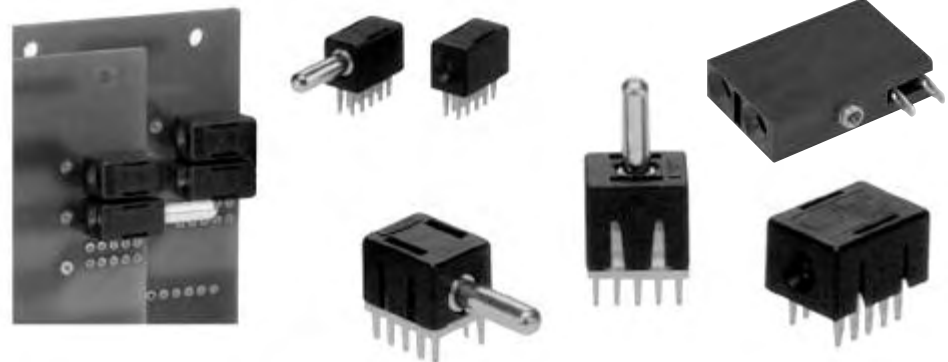
## ICCON Single Pole Power Connectors

### Product Facts

- Uses high-performance Crown contact
- 35A current rating
- True compliant press-fit and solder tails
- Pin locking feature option
- Standard DIP footprint .300 x .100 and ICCON SLIMLINE connector .100 x .100
- Insulator rated at 105°C, UL 94V-0
- Meets safety regulatory requirements
- #8 AWG wire size
- Parallel and perpendicular
- Sequencing capability
- All ICCON products in this section are RoHS compliant

### Typical Applications

- Power distribution
- Board-to-board interconnection
- Board-to-busbar interconnection
- Board-to-wire interconnection
- High-density power designs
- Board stacking



ICCON connectors provide a reliable high current power interconnection with quick connect/disconnect function for space constrained motherboard-daughterboard, cable-board and board-busbar power delivery applications.



### Product Highlights

#### High Performance Contact

ICCON connectors use ELCON CROWN BAND Contact, a multifingered spring which provides a greater surface contact area, thus ensuring small millivolt drop, minimum heat generation and very low insertion and extraction forces.

#### Optional Locking Feature

The optional locking feature provides minimum 5 lbs. (2.21kg) retention force to improve connection integrity, securing against accidental unmating in harsh mechanical conditions.

#### Support for Multiple Mounting Styles

ICCON connectors are available with press-fit or solder tails for mounting on both PC boards and bus bars. TE uses eye of the needle true compliant tails for the most reliable mounting using solderless techniques. Each ICCON connector has a 10 pin DIP footprint for convenient industry standard mounting. Through hole socket connectors can be used in "bottom entry" applications.

### Mating with Discrete Contacts

For further versatility, ICCON connector products can mate with discrete contacts, available in a variety of termination types.

#### ICCON SLIMLINE Connectors

With a footprint close to 30% smaller than the standard ICCON connector products, the ICCON SLIMLINE connector products allow integrating more components in less board real estate, providing substantial space savings compared to connectors of this type in the same performance range.

#### Stacked ICCON

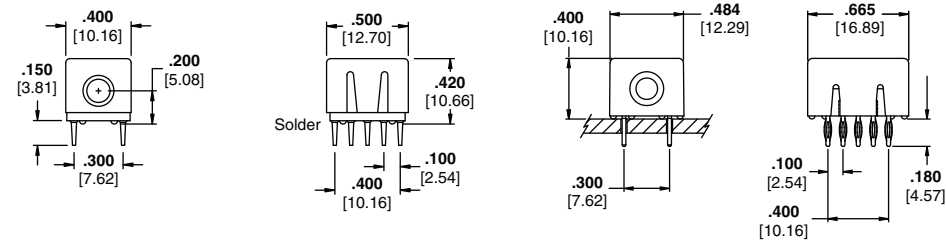
Designed for motherboard-to-daughtercard power distribution systems, the Stacked ICCON combined power/guide module occupies significantly less PCB edge space than separate modules. Providing more than 200 Amps/inch, this right-angle mounted connector is ideal for applications needing high current density.

Board-to-Board Products

**ICCON Standard DIP Connectors (.300 x .100 footprint)**

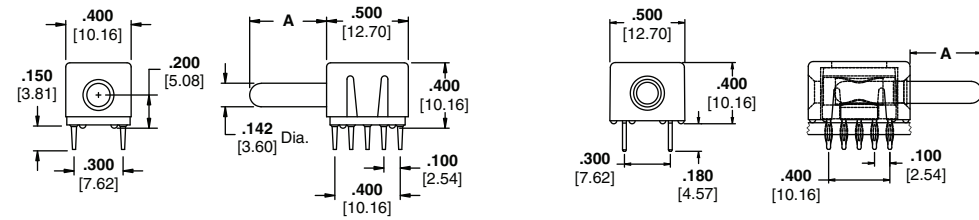
**Right-Angle Receptacle**

Part Number 6643232-1 Solder  
Part Number 6643272-1 Compliant



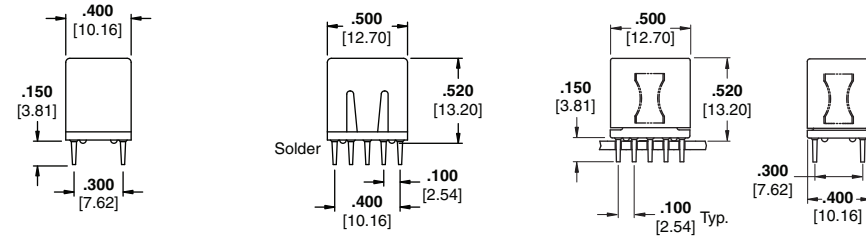
**Right-Angle Pin**

For Part Numbers and "A" Dimension  
See Table Below



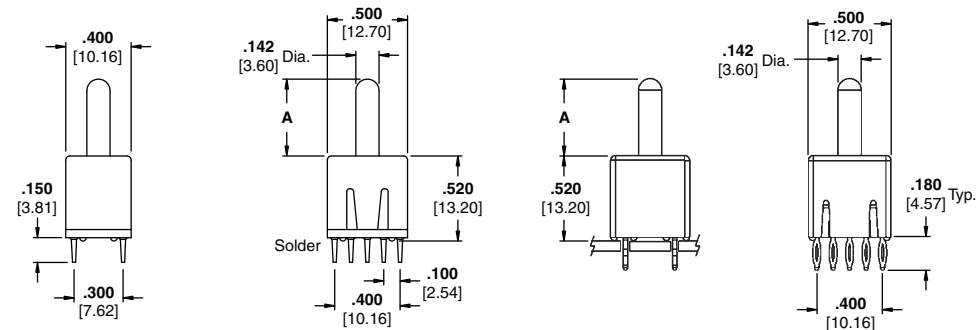
**Vertical Receptacle**

Part Number 6643264-1 Through Hole, Solder  
Part Number 6643219-1 Closed, Solder  
Part Number 6643269-1 Through Hole, Compliant



**Vertical Pin**

For Part Numbers and "A" Dimension  
See Table Below



Right-Angle Pins Solder Tail	Compliant	Locking Style	Length "A"
6643281-1	6643275-1	Non-Lock	.470 [11.93]
6643276-1	6643273-1	Lock	.470 [11.93]
6643431-1	6643442-1	Non-Lock	.570 [14.48]
6643432-1	6643443-1	Non-Lock	.750 [19.05]
6643433-1	6643444-1	Non-Lock	1.000 [25.40]
6643434-1	6643445-1	Non-Lock	1.250 [31.75]
6650785-1	6643446-1	Non-Lock	1.500 [38.10]
6643435-1	6643447-1	Non-Lock	1.750 [44.45]

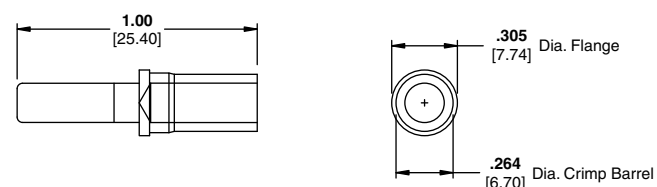
Vertical Pins Solder Tail	Compliant	Locking Style	Length "A"
6643283-1	6643274-1	Non-Lock	.470 [11.93]
6643266-1	6643271-1	Lock	.470 [11.93]
6643436-1	6643449-1	Non-Lock	.570 [14.48]
6643437-1	6643450-1	Non-Lock	.750 [19.05]
6643438-1	6643451-1	Non-Lock	1.000 [25.40]
6643439-1	6766439-1	Non-Lock	1.250 [31.75]
6643440-1	6766440-1	Non-Lock	1.500 [38.10]
6643441-1	6766441-1	Non-Lock	1.750 [44.45]

Note: All part numbers are RoHS compliant.

## ICCON Discrete Contacts

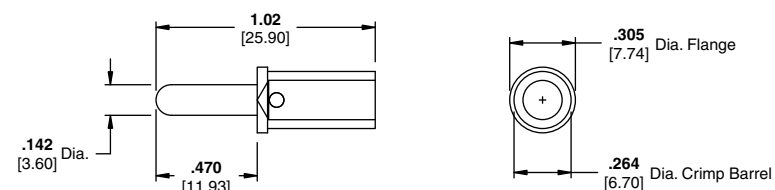
### Crimp Socket

Part Number 6648317-1 #8 AWG



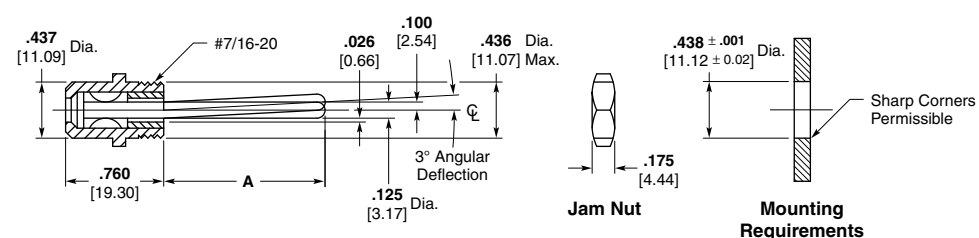
### Crimp Pins

Part Number 1766163-1 #8 AWG Non-Lock  
 Part Number 1766160-1 #8 AWG Lock  
 Part Number 1766816-1 #10 AWG Non-Lock  
 Part Number 1766161-1 #10 AWG Lock



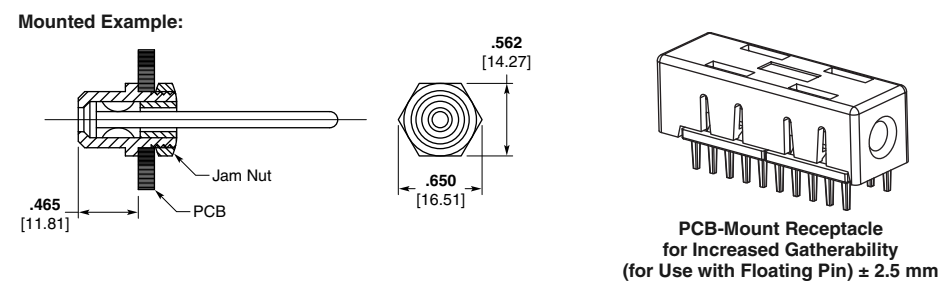
### Board-Mount Pin — Floating

Part Number 6643252-1 "A" = 1.250 (31.75)  
 Part Number 6643253-1 "A" = 1.350 (34.29)



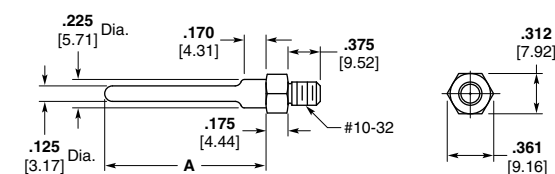
### Mating PCB-Mount

Part Number 6643248-1



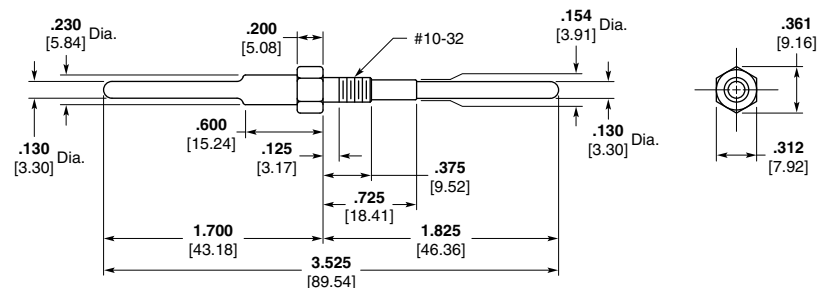
### Board-Mount Pin

Part Number 1766815-1 "A" = 1.250 (31.75)  
 Part Number 1766157-1 "A" = 1.350 (34.29)



### Double-Ended Board-Mount Pin

Part Number 1766817-1



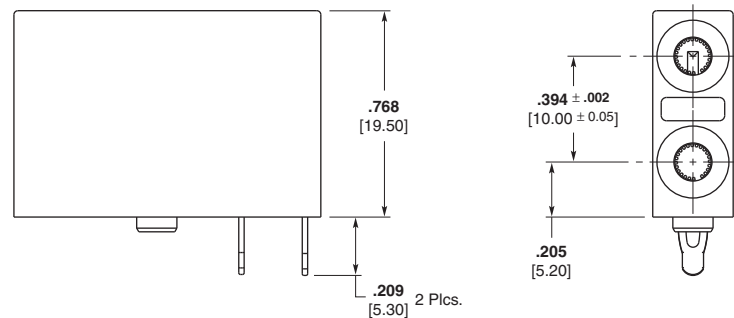
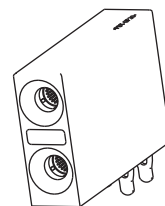
Note: All part numbers are RoHS compliant.

Board-to-Board Products

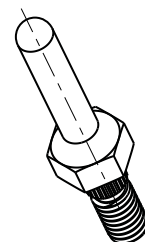
**ICCON Connector Electrical Performance**

**Stacked ICCON  
2-Position Right-Angle  
Socket Assembly**

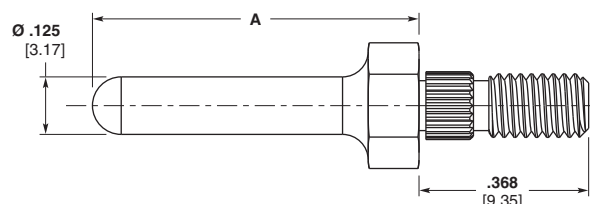
25 Amps per socket  
Part Number 2085181-1



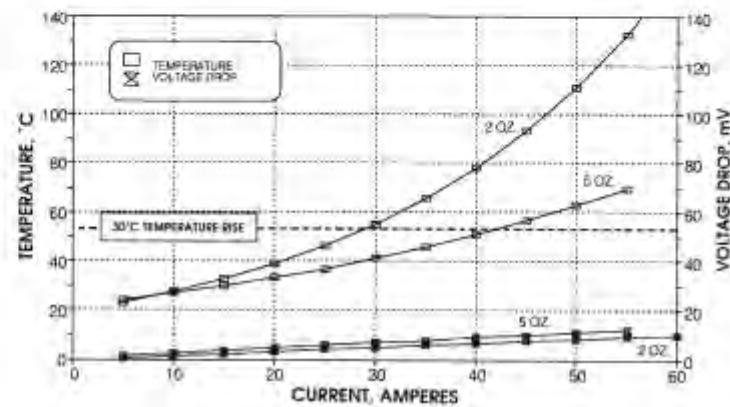
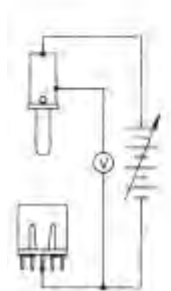
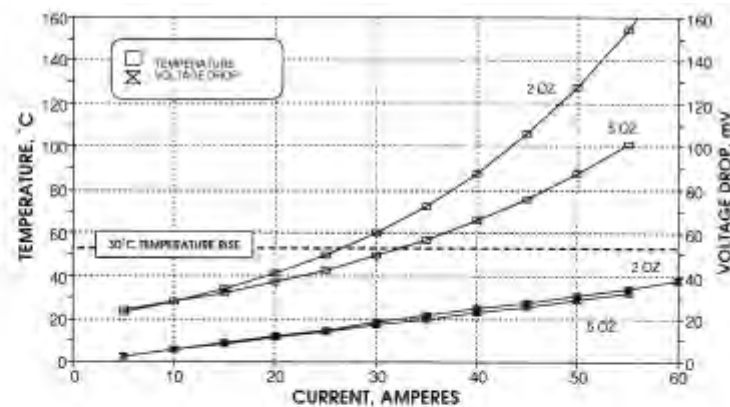
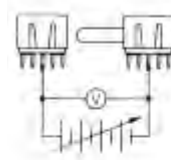
**Stacked ICCON Pins**



Dim. A	Part Number
.630 16.00	1766663-1
.709 18.00	1766663-2
.787 20.00	1766663-6



**Electrical Performance**



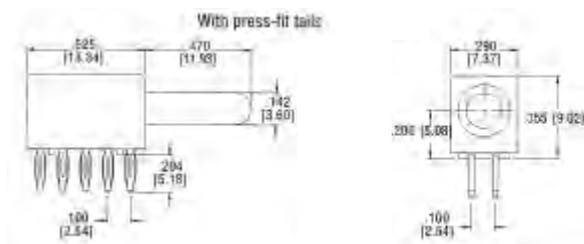
Note: All part numbers are RoHS compliant.



### ICCON SLIMLINE Connectors (.100 x .100 Footprint)

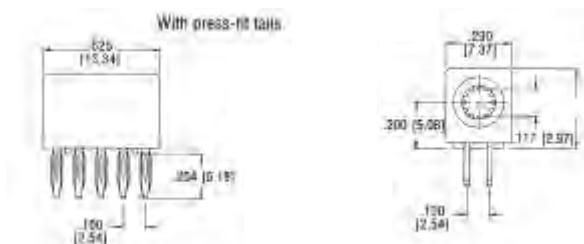
#### Parallel Pin

Part Number 6643228-1 Solder  
 Part Number 6643227-1 Solder w/Locking Feature  
 Part Number 6643222-1 Compliant  
 Part Number 6643223-1 Compliant w/ Locking Feature



#### Parallel Socket

Part Number 6643229-1 Solder  
 Part Number 6643220-1 Press-Fit



#### Connector Mounting

The ICCON SLIMLINE Connector is optimized for a board thickness of .093" (2.38 mm), but can be successfully used on boards from .062" to .125" (1.58 mm to 3.17 mm)



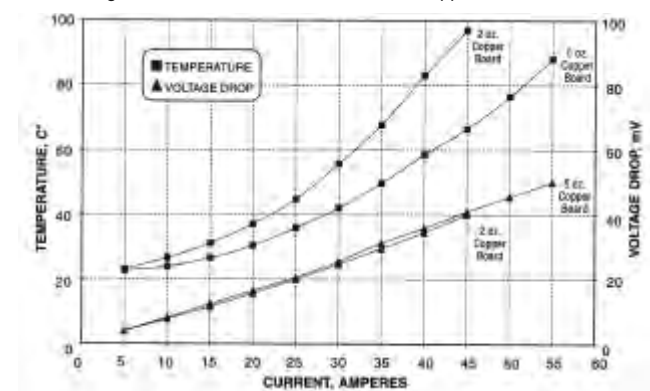
Board-to-Board Products

#### Specifications

<b>Finishes</b>	
Crowns	30 microinches Gold plated over nickel
Pin Contacts	Silver over nickel
<b>Material</b>	
Housing	Polyester, 30% glass-filled, UL 94V-0 black
Body and pin contacts	Copper alloy
Crowns	Copper alloy
<b>Electrical</b>	
Ratings UL (USR)	35A at 250V
UL (CNR)	25A at 250V
Voltage drop at UL rating	27.2mV

#### Contact System Performance, ICCON SLIMLINE Connector Current Ratings vs. mV Drop/Temperature Rise


Non-locking version, mounted on 2 oz. and 5 oz. copper boards



Note: All part numbers are RoHS compliant.

## Mini Power Modules

### Product Facts

- **Hard Metric design compatible with Z-PACK 2 mm HM, Z-PACK HM-Zd, MULTIGIG RT and Futurebus+ Connectors**
- **Sequenced contact options for “make-first-break-last” applications**
- **Compliant press-fit connections to PCB**
- **High Durability 200 Cycles — MULTIGIG RT, UPM Connectors 100 Cycles — Futurebus+ Connectors**
- **Optional Guide Pins & Sockets for blind-mate applications**
- **Bellcore approved (contact TE for specific part numbers)**  

- **Recognized to US and Canadian requirements under the Component Recognition program of Underwriters Laboratories, File #E28476**
- **Produced under a Quality Management System certified to ISO 9001**  
A copy of the certificate is available upon request.



The TE Mini Power Module family of products are designed specifically to compliment the Hard Metric board-to-board backplane interconnects. These products include, MULTIGIG RT, Z-PACK 2 mm HM, Z-PACK HM-Zd, Futurebus+ and other Connectors. Available in “Standard” and “Reverse” orientations, the power modules can provide touch-safe protection (per IEC 60950) to either side of the connection (backplane or daughter card.)

Both the headers and receptacle offer compliant pin connections to the PCB. The Universal Power Module and MULTIGIG RT Connectors use the ACTION PIN Contact compliant design to provide maximum surface connection to the plated through hole. The range of products offers power contacts rated as low as 3 amps per contact (Futurebus+ Connectors) up through 20 Amps per contact

(MULTIGIG RT Connectors). In addition, the newest products offer high conductivity contacts which improve the current carrying capacity by as much as 50%.

The low contact normal force, available lubricated surface coating (UPM) and high conductivity materials combine to produce a high durability cycle rating and high current density. In addition, the high temperature housing and contact materials make these power modules suitable for a wide variety of applications including modular hot-swap power supplies used in computer, telecommunications, medical, and industrial equipment.

Generous alignment features designed into the housings on the Mini Power Drawer Connector and optional guidance hardware make these Power Modules ideal for blind-mating applications.

### Need more information?

Call Technical Support at the numbers listed below.

Technical Support is staffed with specialists well versed in all TE products. They can provide you with:

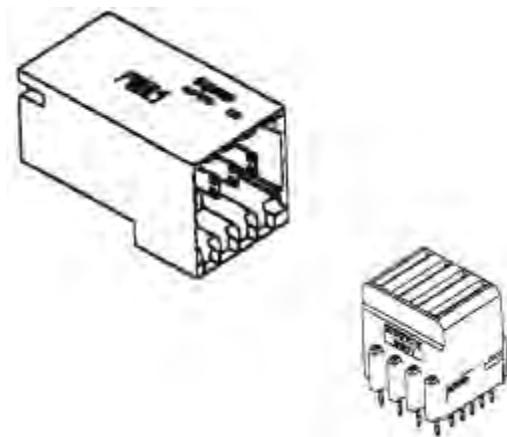
- Technical Support
- Catalogs
- Technical Documents
- Product Samples
- TE Authorized Distributor Locations

## Mini Power Modules for PCB-to-PCB Power Distribution

### MULTIGIG RT Power Modules

The newest of the power modules. Designed specifically for use with TE 2 mm Backplane Connectors. Suitable for 0.8 mm Card Spacing and made from high conductivity copper alloys, these power modules offer improved power density and high cycle life. The distribution to the PCB is through **six ACTION PIN compliant tails**

which offer maximum surface area contact to the plated through hole. The design offers electrical protection with its sacrificial contact design and mechanical protection by recessing the power contacts. Contacts are rated for up to 20 Amps per contact, which delivers up to **120 Amps per linear inch**. Three contact mating lengths are available, in 1.5 mm sequence levels.

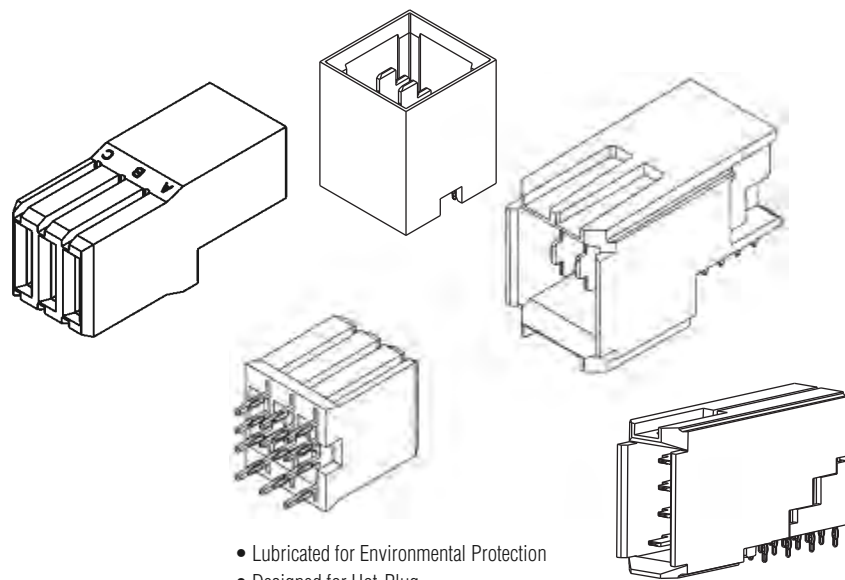


- Designed for Hot-Plug Operation
- 6 PCB tails per contact

Board-to-Board Products

### Universal Power Module (UPM)

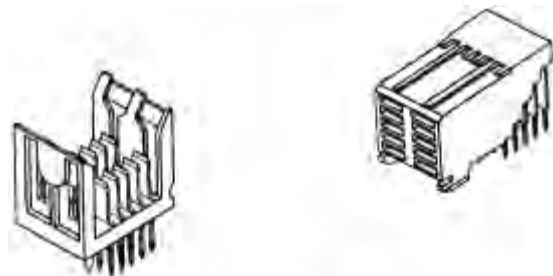
Also designed to complement TE 2 mm Backplane Connectors, the design meets IEC 60950 touch-safe requirements by reversing the orientation as compared to the Futurebus+ Power Modules. The touch-safe receptacle is applied to the “hot” side, which is typically the backplane side of the connection. Offered in both a Standard Power grade, rated at 10 Amps per contact and High Power grade which carries 16 Amps per contact — resulting in up to **100 Amps per linear inch**. Hot-plug design and low normal force provide high durability and high reliability. Three contact mating lengths are available in 1.6 mm sequence levels. Multiple contact sequence patterns are available.



- Lubricated for Environmental Protection
- Designed for Hot-Plug
- 4 PCB Tails per Contact

### Z-PACK 2 mm Futurebus+ Power Modules

The power modules, designed to IEC 61076-4-OX, are used along with TE Futurebus+ Backplane Connectors. The contacts are rated for 3 Amps and fully loaded will carry approx. 50 Amps per linear inch. Three contact mating lengths available in 0.75 mm increments.



## MULTIGIG RT Power Modules

### Right-Angle Headers

#### Material and Finish

**Housing** — Liquid Crystal Polymer

**Contacts** — Phosphor Bronze

**Plating** — .000050 [0.00127] min gold in mating area. .000020 [0.000508] min. tin on PCB tail over .000050 [0.00127] min. nickel over all

#### Related Product Data

**Guiding Hardware (Optional)** — pages 58 and 59

**Seating Tooling** —

Headers — No tool required  
— Flat Rock

Receptacles — See application specification

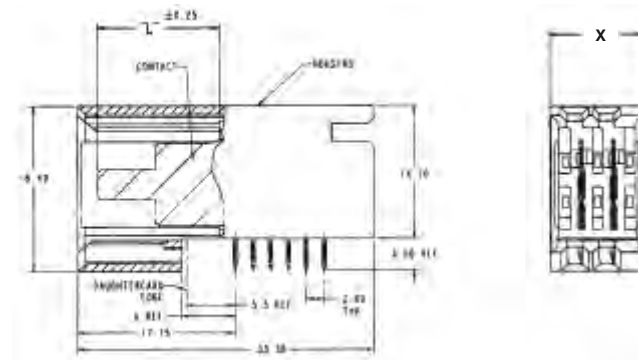
#### Technical Documents

**Product Specification**

108-2062

**Application Specification**

114-13062



No. of Positions	Dimension X	Sequence	Part Number
2	.417 [10.6]	L,L	1410279-7
		M,L	1410279-8
		S,L	1410279-9
		S,S	1-1410279-0
		S,M	1-1410279-1
		M,M	1-1410279-2
4	.701 [17.8]	L,L,L,L	1-1410271-1
		M,L,L,M	1-1410271-2
		S,L,L,M	1-1410271-3
		S,L,L,S	1-1410271-4
		S,M,L,M	1-1410271-5
		M,M,M,M	1-1410271-6
		S,M,M,S	1-1410271-7
		S,S,S,S	1-1410271-8
		M,S,S,M	2-1410271-0

Sequencing reads left-to-right along mating face.  
L (long) = 0.541 [13.75], M (medium) = 0.482 [12.25], S (short) = 0.423 [10.75]

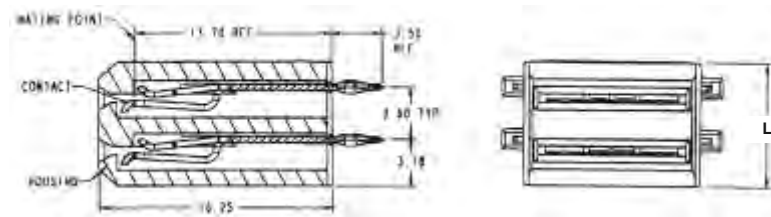
### Vertical Receptacle

#### Material and Finish

**Housing** — Liquid Crystal Polymer

**Contacts** — Phosphor Bronze

**Plating** — 0.00127 (.000050) min gold in mating area. 0.000580 (.000020) min. tin on PCB tail over 0.00127 (.000050) min. nickel over all



No. of Positions	Dimension L	Part Number
2	.333 [8.45]	1410278-2
4	.616 [15.65]	1410270-2

#### Related Product Data

**Guiding Hardware (Optional)** — pages 58 and 59

**Seating Tooling** —

Headers — No tool required  
— Flat Rock

Receptacles — See application specification

#### Technical Documents

**Product Specification**

108-2062

**Application Specification**

114-13062

**Note:** All part numbers are RoHS compliant.

## Universal Power Module (UPM)

### Right-Angle Plug

#### Material and Finish

**Housing** — PBT  
Natural color UL 94V-0

**Contacts** —  
**Standard Power** —  
Phosphor Bronze

**High Power** —  
High Conductivity Copper Alloy

**Plating** — 0.00127 [.000050] min. gold in mating area, 0.0050 [.000020] min. tin-lead on ACTION PIN post area, with entire contact underplated 0.00127 [.000050] min. nickel

**Notes:** 1. Environmental lubrication pre-applied  
2. RoHS compliant parts have tin plated ACTION PIN posts

#### Related Product Data

**Durability** — 250 cycles

**Guiding Hardware (Optional)** — pages 58 and 59

**Seating Tooling** —  
**Header**

Seating Tool 224441-X  
Board Support Fixture 224442-1

**Receptacle**

Seating Tool 224421-X  
Board Support Fixture 217602-1

#### Technical Documents

##### Product Specification

108-1651

##### SLIM UPM Product Specification

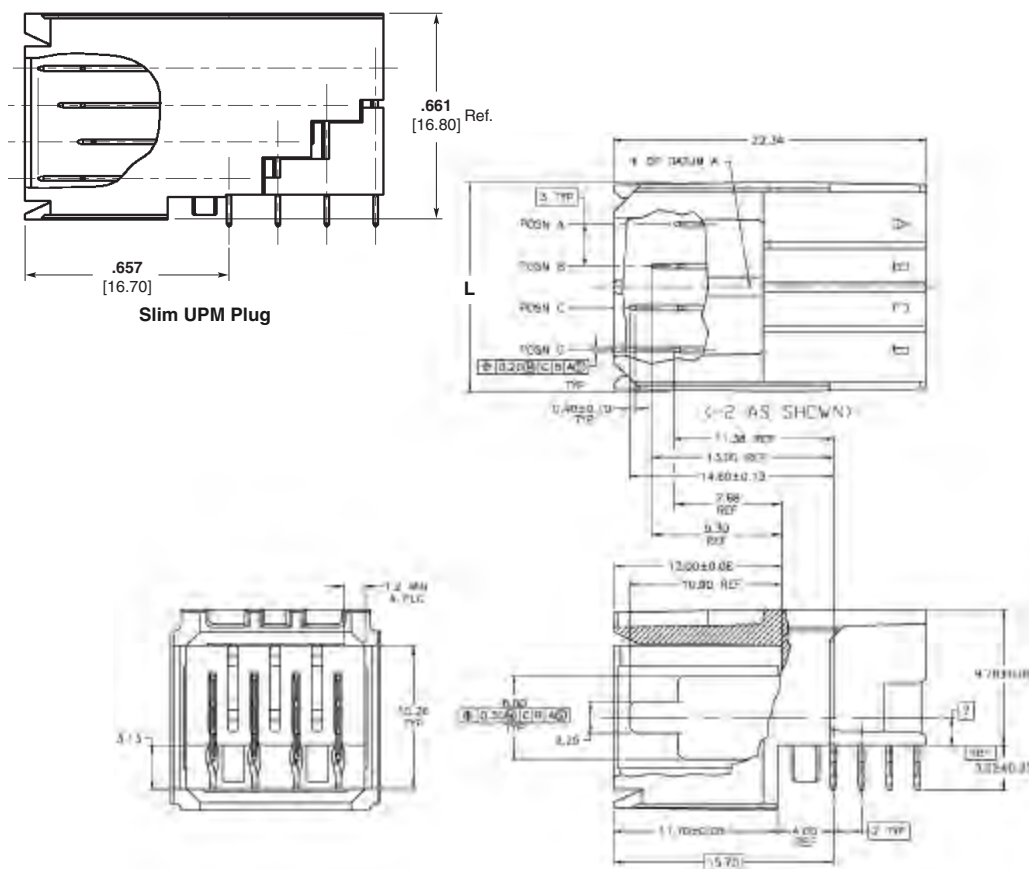
108-78387

##### Application Specification

114-1103

##### Instruction Sheet

408-4169 (Receptacle)  
Seating Tool 224421-X)



Board-to-Board Products

Number of Positions	Dimension L	Standard Power 10 Amps/Contact Sequence* Pattern	Part Number	High Power 16 Amps/Contact Sequence* Pattern	Part Number
3	.472 [12.0]	L,L,L	5223961-1	L,L,L	5-5223961-1
		M,L,M	5223963-1	M,L,M	5-5223963-1
4	.591 [15.0]	L,L,L,L	5646954-1	L,L,L,L	120954-1
		S,M,L,S	5646954-2	L,M,S,S	120954-2
5	.709 [18.0]	L,L,L,L,L	5646955-1	L,L,L,L,L	120955-1
		M,M,M,M,L	5646955-2	M,M,L,M,M	120955-2
6	.827 [21.0]	L,L,L,L,L,L	5646956-1	L,L,L,L,L,L	120956-1
		L,M,M,M,M,L	5646956-2	L,M,S,S,S,S	120956-2
7	.945 [24.0]	L,L,L,L,L,L,L	5646957-1	L,L,L,L,L,L,L	120957-1
		**	**	L,S,S,L,S,S,L	120957-2
8	1.063 [27.0]	L,L,L,L,L,L,L,L	5646958-1	L,L,L,L,L,L,L,L	120958-1
		L,S,L,S,L,S,L,S	5646958-2	L,M,S,S,S,S,S,S	120958-2

\*Sequencing Reads left-to-right along mating face.

L (long) = 0.429 [10.9], M (medium) = 0.366 [9.3], S (short) = 0.302 [7.68]

\*\*Other sequence patterns available. See on-line customer drawing.

#### Slim UPM Right-Angle Plug

Number of Positions	Width	Part Number
4	0.335 [8.5]	1903977-1
		1903977-2

**Note:** All part numbers are RoHS compliant.

**Universal Power Module (UPM) (Continued)**
**Vertical Plug**
**Material and Finish**

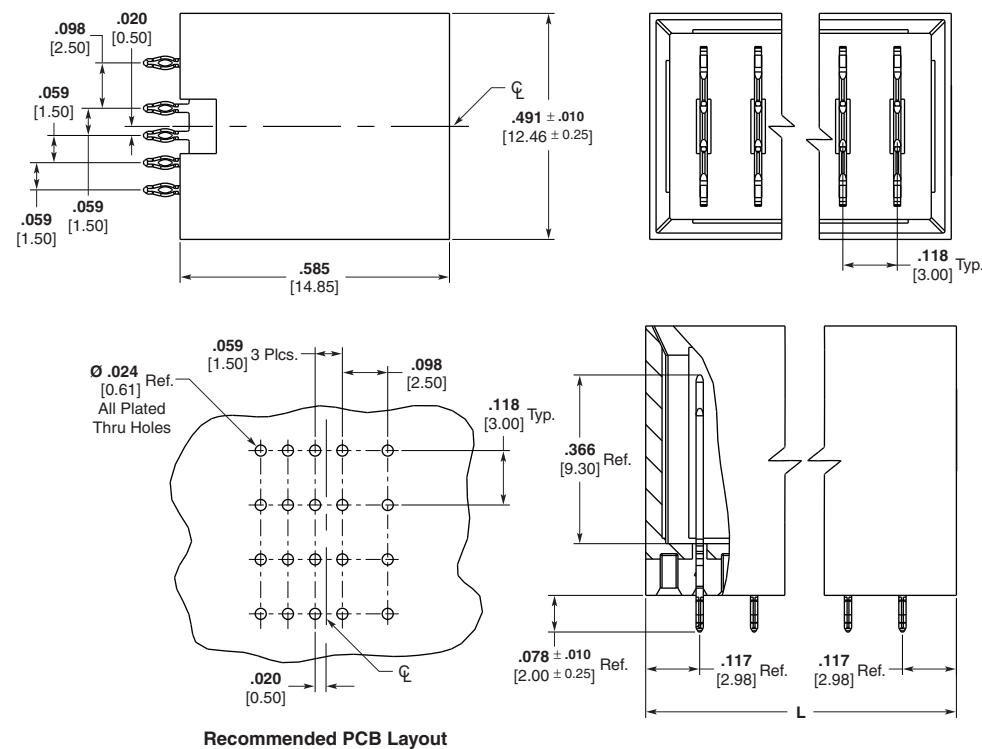
- Housing** — PBT  
Natural color UL 94V-0
- Contacts** —  
**Standard Power** —  
Phosphor Bronze
- High Power** —  
High Conductivity Copper Alloy
- Plating** — 0.00127 [0.00050] min. gold in mating area, 0.0050 [0.00020] min. tin-lead on ACTION PIN post area, with entire contact underplated 0.00127 [0.00050] min. nickel
- Notes:** 1. Environmental lubrication pre-applied  
2. RoHS compliant parts have tin plated ACTION PIN posts

**Related Product Data**

- Durability** — 250 cycles
- Guiding Hardware (Optional)** —  
pages 58 and 59
- Seating Tooling** —  
**Header**  
Seating Tool 224441-X  
Board Support Fixture 224442-1
- Receptacle**  
Seating Tool 224421-X  
Board Support Fixture 217602-1

**Technical Documents**

- Product Specification**  
108-1651
- Application Specification**  
114-1103

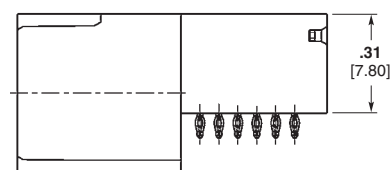
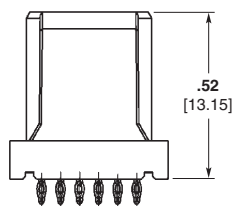

**Recommended PCB Layout**

Number of Positions	Dimension L	Part Numbers	
		15 mm Stack Height	18 mm Stack Height
3	.470 [11.95]	1645498-1	1645499-1
4	.589 [14.95]	1645498-2	1645499-2
5	.707 [17.95]	1645498-3	1645499-3
6	.825 [20.95]	1645498-4	1645499-4
7	.943 [23.95]	1645498-5	1645499-5
8	1.061 [26.95]	1645498-6	1645499-6
9	1.179 [29.95]	1645498-7	1645499-7

# NEW

**“NEW” Low Profile Universal Power Module**
**Material and Finish**

- Housing** — LCP
- Contacts** —  
High Conductivity Copper Alloy
- Current Rating** —  
18 Amps per contact


**Right-Angle Plug**  
Part Number 1982260-5

**Vertical Receptacle**  
Part Number 1982257-5

**Note:** All part numbers are RoHS compliant.

**Universal Power Module (UPM)** (Continued)

**Vertical and Right-Angle Receptacles**

**Material and Finish**

**Housing** — PBT

Natural color

UL 94V-0

**Contacts** —

**Standard Power** —

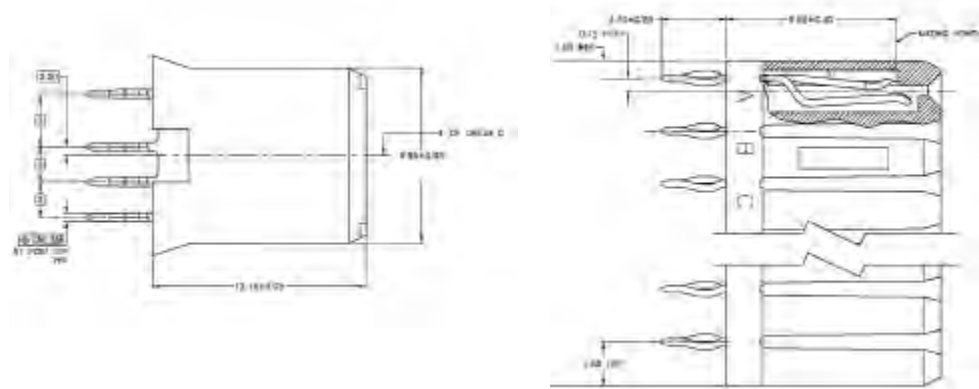
Phosphor Bronze

**High Power** —

High Conductivity Copper Alloy

**Plating** — 0.00127 (.000050) min. gold in mating area, 0.0050 (.000020) min. tin-lead on ACTION PIN post area, with entire contact underplated 0.00127 (.000050) min. nickel

**Notes:** 1. Environmental lubrication pre-applied  
2. RoHS compliant parts have tin plated ACTION PIN posts



Board-to-Board Products

**Related Product Data**

**Durability** — 250 cycles

**Mating Force** — 1.0N per contact

**Unmating Force** — .5N per contact

**Guiding Hardware (Optional)** — pages 58 and 59

**Seating Tooling** —

**Header**

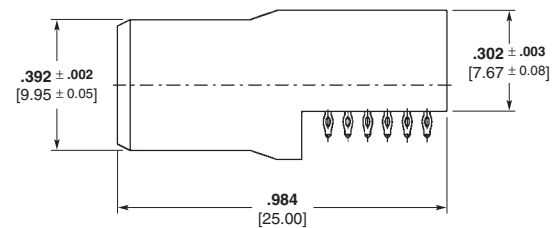
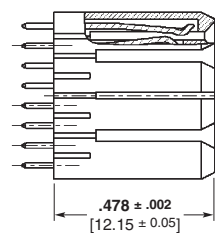
Seating Tool 224441-X

Board Support Fixture 224442-1

**Receptacle**

Seating Tool 224421-X

Board Support Fixture 217602-1



Part Number 1903978

Right-Angle Part Number 120943

**Technical Documents**

**Product Specification**

108-1651 (UPM)

108-78387 (Slim UPM)

**Application Specification**

114-1103

**Instruction Sheet**

408-4169 (Receptacle)

Seating Tool 224421-X

**New short PCB tail available. Contact TE for more information.**

No. of Circuit Positions	Vertical		Right-Angle
	Standard Power 10 Amps/Contact Part Numbers	High Power 16 Amps/Contact Part Numbers	High Power 16 Amps/Contact Part Numbers
3	5223955-2	5-5223955-2	120943-1
4	5223995-1	120953-1	120943-2
5	5223995-2	120953-2	120943-3
6	5223995-3	120953-3	120943-4
7	5223995-4	120953-4	120943-5
8	5223995-5	120953-5	120943-6
9	5223995-6	120953-6	120943-7



Seating Tool

**Slim UPM Vertical Receptacle**

Number of Positions	Width	Part Number
4	.236 [6.00]	1903978-1
		1903978-2

**Note:** All part numbers are RoHS compliant.

### Z-PACK 2 mm Futurebus+ Power Modules

#### Vertical Pin Assemblies with Solder Leads and Compliant Press-Fit Leads

##### Material and Finish

**Housing** — Liquid crystal polymer  
**Pin Contacts** — Phosphor bronze, mating surface plating conforms to all testing specified for Telcordia Uncontrolled Environment, with entire contact underplated with 0.00127 min. nickel. See customer drawing for specific lead plating.

##### Related Product Data

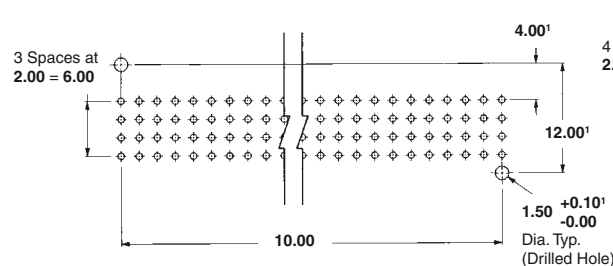
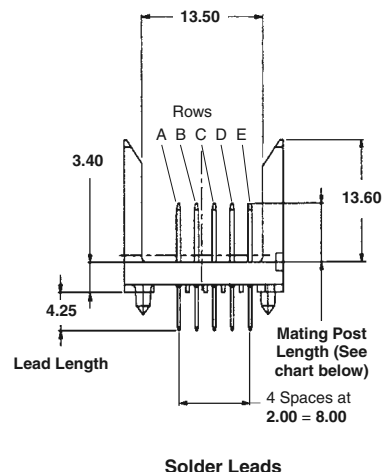
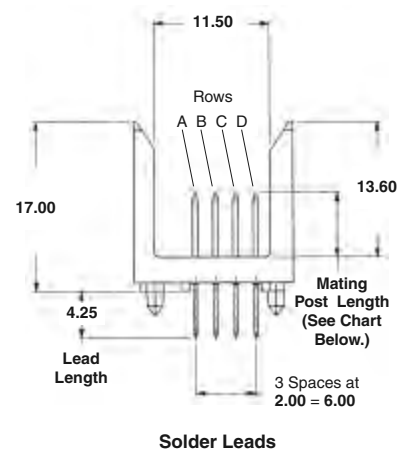
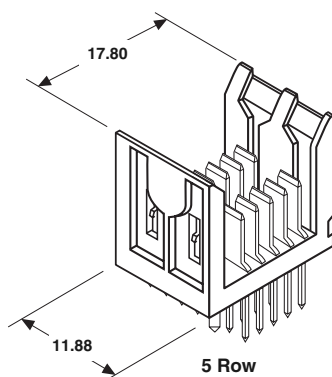
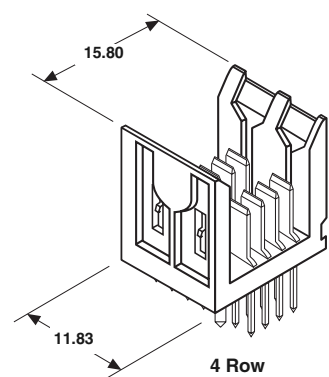
**Current Rating** — 5 Amps per contact  
**Mating Force** — 2.4N per contact max.  
**Unmating Force** — 0.3N per contact max.  
**Durability** — 250 cycles

##### Technical Documents

**Product Specification**  
 108-1441

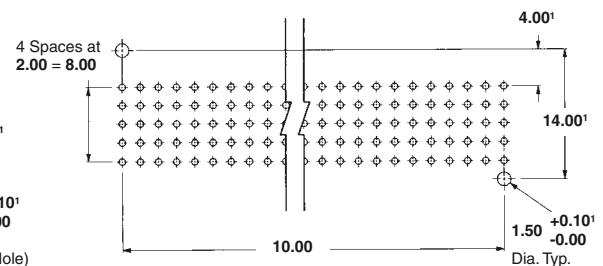
**Application Specification**  
 114-1075

**Instruction Sheets**  
 408-6927, 408-4157, 408-4488



Recommended PC Board Hole Layout per IPC-D-300, Type II, Class C (Component Side)

<sup>1</sup>Dimensions apply to solder lead versions only.



Recommended PC Board Hole Layout per IPC-D-300, Type II, Class C (Component Side)

<sup>1</sup>Dimensions apply to solder lead versions only.

Reference specification 114-1075 for plated through hole requirements.



Number of Positions	Mating Post Lengths	Part Numbers			Housing Shroud	Seating Tooling
		4.25 Solder Lead	3.2 Solder Lead	Press-Fit		
8	.256 [6.50]	5536600-1	5536628-1	5536603-1	536565-X	58512-1
	.285 [7.25]	5536625-1	—	—		
	.315 [8.00]	5536623-1	—	5536620-1		
10	.256 [6.50]	—	—	5536642-1	223041-X	1214224-1
	.315 [8.00]	—	—	5536642-7		

Note: All part numbers are RoHS compliant.



**Z-PACK 2 mm Futurebus+ Power Modules** (Continued)

**Right-Angle Receptacle Assemblies with Solder Leads and Compliant Press-Fit Leads**

**Material and Finish**

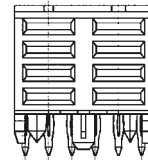
**Housing** — Liquid crystal polymer  
**Receptacle Contacts** — Phosphor bronze, mating surface plating conforms to all testing specified for Telcordia Uncontrolled Environment, with entire contact underplated with 0.00127 min. nickel. See customer drawing for specific lead plating.

**Technical Documents**

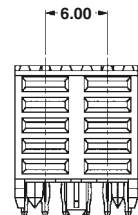
**Product Specification**  
108-1441

**Application Specification**  
114-1075

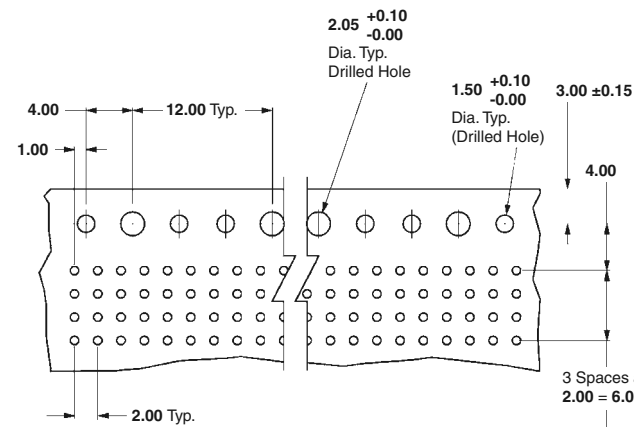
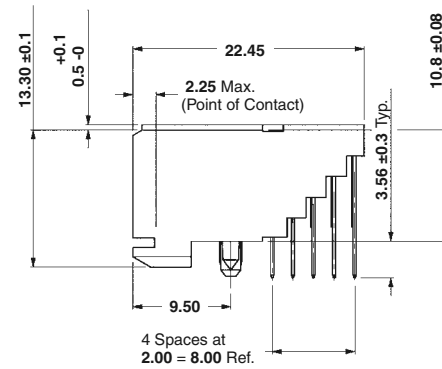
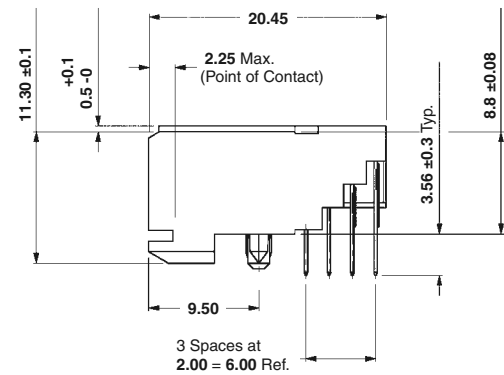
**Instruction Sheets**  
408-6927



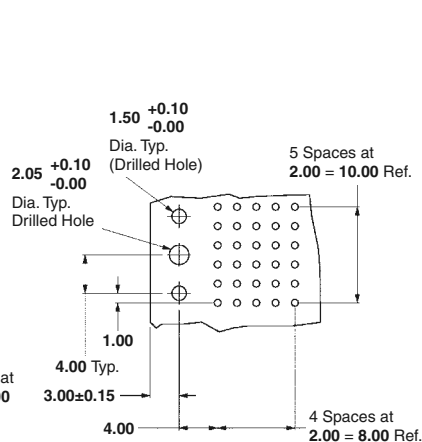
4 Row



5 Row



Recommended PC Board Hole Layout per IPC-D-300, Type II, Class C (Component Side)



Recommended PC Board Hole Layout per IPC-D-300, Type II, Class C (Component Side)

Reference specification 114-1075 for plated through hole requirements.



Number of Positions	Part Numbers		Press-Fit 0.140 [3.56]	Seating Tool
	Solder Tail Length			
	0.107 [2.73]	0.139 [3.53]		
8	5536607-1	5536613-1	5536614-1	Industry Standard Flat Rock
10	5223092-1	5223093-1	5536649-1	Industry Standard Flat Rock

Note: All part numbers are RoHS compliant.

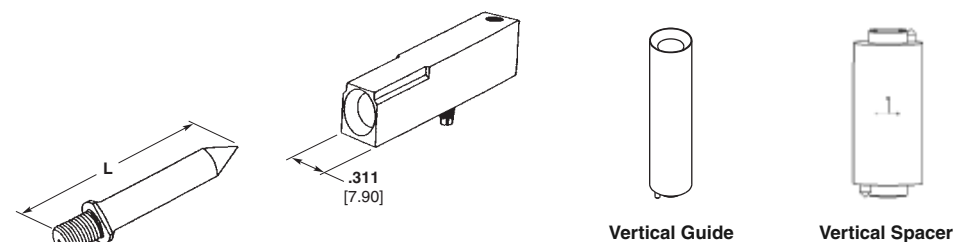
Board-to-Board Products

## Backplane and Co-Planar Guide Modules

### Un-keyed Guide Modules

Stainless Steel Pin  
Die Cast Receptacle  
Multiple thread lengths available  
Gatherability +/-0.100"

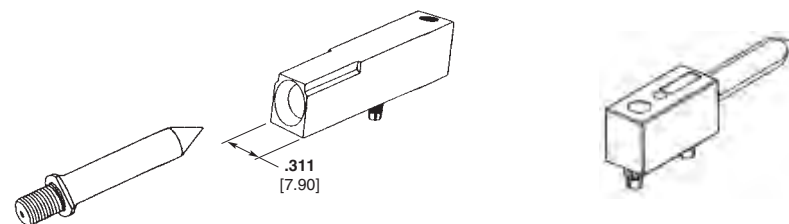
Seating Tool — Part Number 224440-1  
Board Support Fixture —  
Part Number 217603-1



Type	Dim. L	Part Number			
		Vertical Guide Pin	Right-Angle Guide Module	Vertical Guide Module	Vertical Spacer Module
M4, 6.2 mm Thread Length	1.235 [31.36]	223956-1	5223957-1 (As Shown)		1645545-1 (15 mm)
M4, 7.5 mm Thread Length	1.269 [32.23]	223982-1			
M4, 12.7 mm Thread Length	1.491 [37.86]	223969-1	5223979-1 (with Dual Mounting Position)	1934988-1	1645545-2 (18 mm)
8-32, 12.7 mm Thread Length	1.491 [37.86]	223969-4			
M4, 9.2 mm Thread Length	1.353 [34.36]	223969-7			
M4, Internal Thread	1.378 [35.00]	1857988-1			

### Keyed Guide Modules

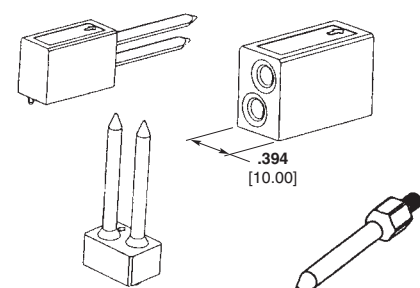
Die Cast Pin and Receptacle  
Keyed to prevent mis-mating daughter cards  
Multiple thread lengths available  
Gatherability +/-0.100"



Type	Right-Angle Guide Module		Vertical Pin	Right-Angle Pin
	4-40	M2.5		
0°	5223986-1	5120913-1		1469265-1
90°	5223986-3	5120913-3	5223985-1	1469265-3
180°	5223986-5	5120913-5		1469265-5
225°	5223986-6	5120913-6		1469265-6

### AdvancedTCA Guide Modules

Die Cast Pins and Receptacles  
Keyed to prevent mis-mating daughter cards  
Twin Pins — provide more keying options  
Meets PICMG 3.0 Specifications  
Gatherability +/-0.50"



Type	Part Number			AdvancedTCA Module Designation
	Both Pins Keyed 0°	Top Pin Keyed 270° Bottom Pin Keyed 90°	Not Keyed	
Right-Angle Pin Long	1-1469372-1	3-1469372-7	—	A2
Vertical Pin Short	1-1469387-1	3-1469387-7	—	A1
Vertical Pin Long	1-1469388-1	3-1469388-7	—	A2
Right-Angle Receptacle	1-1469373-1	3-1469373-7	1469374-1	K1/K2
Single Pin Rear Assembly	—	—	1469269-X*	rK1

\*-X identified by PCB thickness. See customer drawing for details.

AdvancedTCA is a trademark of PICMG-PCI Industrial Computer Manufacturers Group, Inc.

**Note:** All part numbers are RoHS compliant.

### Backplane and Co-Planar Guide Modules (Continued)

#### 10.8 Guide Modules

Rugged design — to support heavier cards

Better gatherability +/-3.5 mm

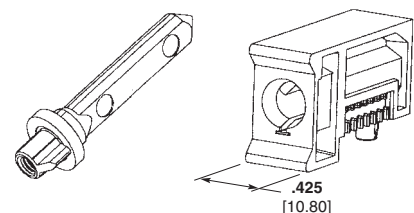
10.8 mm width

Die Cast Pin

Die Cast Receptacle

ESD Ground Option

Finish: Nickel plated



Type	Right-Angle		Vertical Pin	
	With ESD	Without ESD	Internal M3.5 Thread	External M5 Thread
0	1-1410297-1	1-1410546-1		
90	1-1410297-3	1-1410546-3		
180	1-1410297-5	1-1410546-5	1410548-3	1-1410773-2
225	1-1410297-6	1-1410546-6		

\*See customer drawing for dash numbers

#### 9.0 VITA 46 Guide Modules

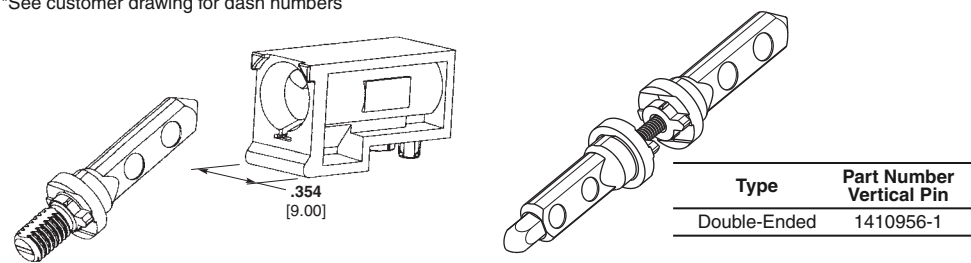
Die Cast Pins and Receptacles

Keyed to prevent mis-mating daughter cards

Meets VITA 46 Specification

Gatherability +/-3.5 mm

Finish: Silver plated



Type	Right-Angle*	Vertical Pin Thread Depth		
		10 mm	11.6 mm	13.1 mm
0°	1-1469492-1			
45°	1-1469492-2			
90°	1-1469492-3			
270°	1-1469492-7	1-1469491-2	1-1469491-3	1-1469491-4
315°	1-1469492-8			
Un-keyed	1-1469492-9			

\*Mounting screw Part Number 1410946-X required

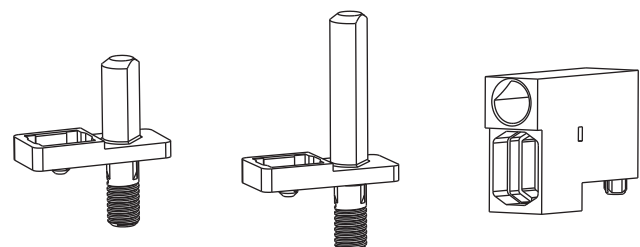
#### VITA 41 Guide Modules

Die Cast Pins and Receptacles

Meets VITA 41 Specification

Gatherability +/-2 mm

Finish: Clear Chromate



Key	Part Number		
	Vertical Short Pin	Vertical Long Pin	Right-Angle Module
0°	1410962-1	1410963-1	1410465-1
270°	1410962-7	1410963-7	1410465-7

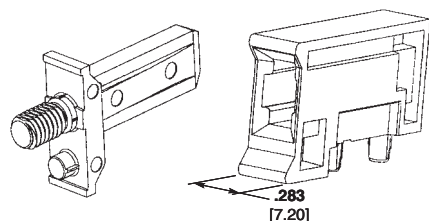
#### 7.2 Thin Guide Modules

Die Cast Pin and Receptacle

7.2 mm width

Gatherability +/-2.5 mm

Finish: Trivalent Chromium



Right-Angle	Vertical Pin Thread Length	
	8.7 mm	11.6 mm
1410714-3	1-1410710-1	1-1410710-3

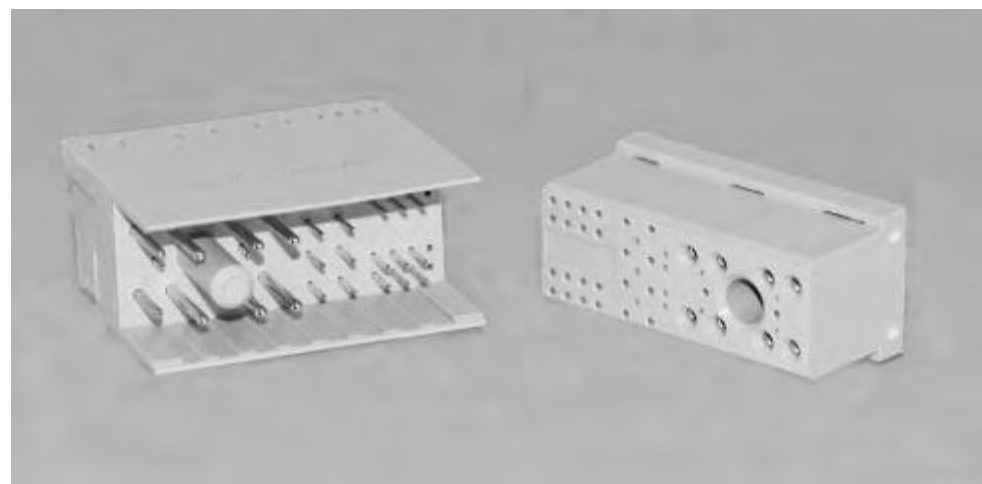
Note: All part numbers are RoHS compliant.

Board-to-Board Products

## Z1 Power Connector for AdvancedTCA Zone 1 Applications

### Product Facts

- Designed to PICMG 3.0 Standard
- High conductivity copper alloy on Size 16 power contacts
- .76 micro-meters [30 microinch] gold over 1.27 micrometers [50 microinch] nickel plating at contact interface
- Gold-thickness controlled on inside of socket and outside of pin — at contact interface points
- RoHS compliant
- Stainless steel spring provides contact normal force — resists relaxation at elevated temperatures
- Eye of the needle compliant press-fit termination
- No special tools needed to seat connectors to PCB — standard Flat-Rock seating tools
- Additional PCB retention hardware not required



### Technical Documents

#### Product Specification

108-2216

#### Application Specification

114-13156

#### Industry Standard

PICMG 3.0, Rev. 2.0



### Introduction

TE supplies both the power and the signal connectors specified in the Advanced Telecommunications Computer Architecture (AdvancedTCA) Standard. This standard (PICMG 3.0) is one of the latest standards addressing future telecommunications needs. The AdvancedTCA Power Connector, designated for use in Zone 1 per PICMG 3.0, combines 8 High Conductivity Size 16 pin & socket contacts along with 22 Size 22 pin & socket contacts, plus guidance into a compact interface. Both connector halves feature proven compliant press-fit contacts for easy solder-less termination to printed circuit boards.

Based on years of reliable long-term field installations the power contact design is based upon TE's famous Type III+ contact design. By adding the use of a high conductivity copper alloy and the low-force Eye-Of-Needle compliant pin sec-

tion, the new contact delivers both ease of installation (with flat-rock seating tools) as well as industry-leading current carrying capability. The power contacts are capable of carrying 20 amps per contact and the signals are capable of carrying 2 amps per contact.

The housing design also offers improvements compared to other industry alternatives. The lead-in design for the contact cavities provides better resistance from contact stubbing. The contact retention has also been designed to eliminate the need for additional hardware sometimes used to hold the connectors to the PCB after pressing in to the PCB.

The result is a connector which is easy to install, meets all the PICMG 3.0 performance requirements and stays retained to the PCB without the additional labor required to add hardware.

### Typical Electrical Properties

**Current Ratings** — tested in accordance with CSA C22.2 No. 182.3-M1987 and IEC 60512-3, Test 5a requirements:

Positions 1–24, 27, 32 — 1 Amp each, per the PICMG 3.0 Specification

Positions 25, 26, 28–31, and 34 — 20 Amps each, exceeds the PICMG 3.0 Specification

**Dielectric Withstanding Voltage** —

Positions 1–16 — 1000 Volts rms

Positions 17–24 — 2000 Volts rms

Positions 25–34 — 2000 Volts rms

### Environmental Parameters

**Maximum Continuous Operating Temperature** — 105°C

**Durability Rating** — 250 cycles, per PICMG 3.0

**Z1 Power Connector for AdvancedTCA Zone 1 Applications** (Continued)

**Material and Finish**

**Insulators** — Thermoplastic, glass reinforced, UL 94V-0

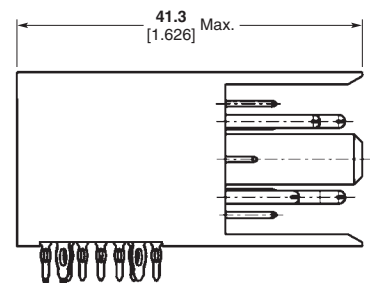
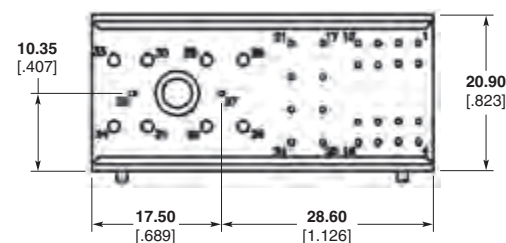
**Signal Pins** — Copper alloy

**Power Contacts** — High conductivity copper alloy, plated 0.00076 [0.00030] min. gold in mating area over 0.00127 [0.00050] min. nickel

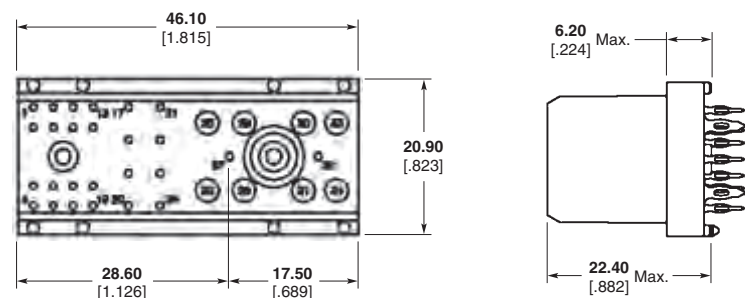
**Compliant PCB Tails** — 0.0030 – 0.0043 [0.00120 – .00170] tin plated, matte finish

**Notes:**

1. Mounting hardware — self tapping screw (customer supplied) can be used but not required on receptacle
2. Positions 1–4 not populated and reserved for future use for 308 22 position connectors.



Right-Angle Plug Part Number	Power Contacts	Signal Contacts	Tail Type
1766502-1	8	14	Sn Press-Fit
1766502-2			SnPb Press-Fit
1766500-1		22	Sn Press-Fit
1766500-2			SnPb Press-Fit
1888803-1		26	Sn Press-Fit
1888803-2			SnPb Press-Fit



Vertical Receptacle Part Number	Power Contacts	Signal Contacts	Tail Type
1766503-1	8	14	Sn Press-Fit
1766503-2			SnPb Press-Fit
1766501-1		22	Sn Press-Fit
1766501-2			SnPb Press-Fit
1888804-1		26	Sn Press-Fit
1888804-2			SnPb Press-Fit

**Note:** All part numbers are RoHS compliant.

Board-to-Board Products

## ELCON Drawer Series Connectors True Hot-Plug, Blind-Mating Mixed Signal and Power Connectors

### Product Facts

- Wide variety of contact sizes and styles from 1 Amp signals up to power contacts rated at up to 200 Amps each
- Sequenced contacts for “mate-first-break-last” operation
- Floating panel-mount connectors float up to +/- 2 mm
- High durability specific products ranging from 100 to 1000 mate/un-mate cycles
- Customizable products allow the freedom to add or remove power or signal contacts to meet specific application requirement
- Most products recognized to US and Canadian requirements under the Component Recognition program of Underwriters Laboratories File No. E28476



### Typical Applications

- Low noise power supplies
- Switch-mode power supplies (SMPS)
- Power factor-correcting (PFC) power supplies
- Systems requiring mounting to backplane or chassis
- Redundant (N + 1) power systems
- “Live” hot-plug power supplies
- All ELCON drawer connectors in this section are RoHS compliant

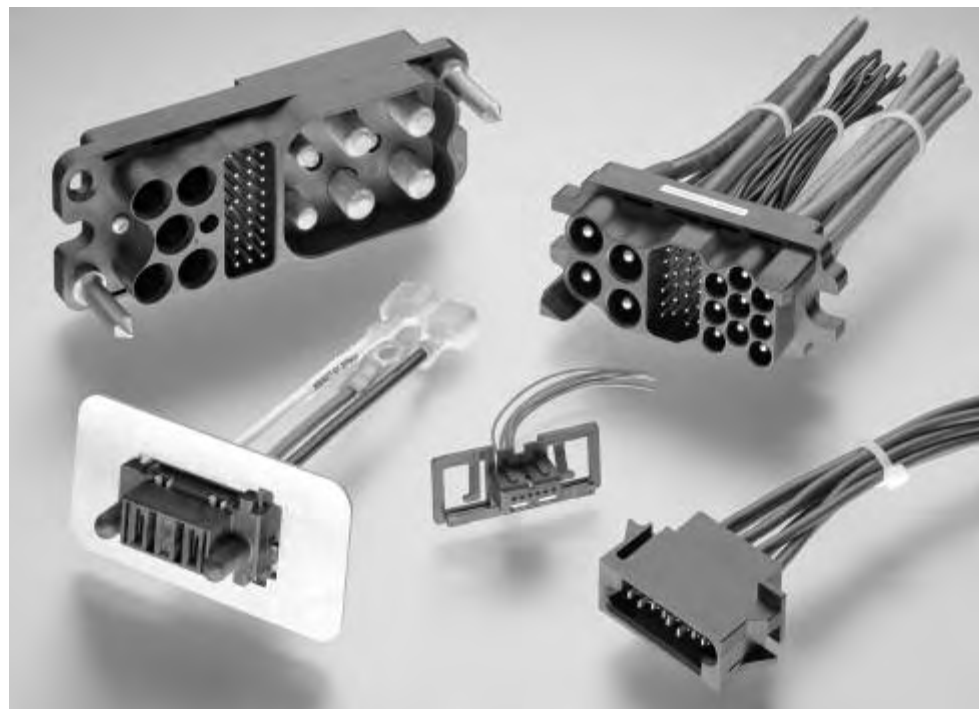
### Technical Documents

#### Product Specification

108-2285

#### Application Specification

114-13206



TE offers a wide selection of blind-mateable “drawer” connectors to suit modular equipment designs. The term “drawer connector” was created to describe a cabinet drawer where the connector is installed at the back of the drawer and is mated by closing the drawer. Since the “drawer” is often times made with a somewhat loose fit — to enable easy opening and closing, the drawer connector must provide sufficient self-alignment and ideally a floating connection to the cabinet or drawer to keep the connection from binding.

The power drawer connectors in this catalog are divided into two separate categories: high power drawers and low power drawers. Specifically, the product line names in these two categories are:

### High Power Drawer Connectors

- ELCON Drawer Series Connectors

### Low Power Drawer Connectors

- AMP Drawer Series Connectors
  - Mini Power Drawer
  - Blind-mate Drawer Connectors
  - Hybrid Mini Drawer Connectors

Some of the benefits of the power drawer connectors from TE are the robustness of the housing designs and the durability of the contacts. High-end applications such as networking switches and servers want the lowest possible voltage drop across the connector. For these applications the high conductivity screw-machined contacts with either gold or silver plating offer the best performance. The contacts are the core

of the ELCON drawer series connectors. For cost sensitive applications the different hybrid drawer connectors offer a wide variety of shapes and sizes aimed at keeping cost minimized and still providing a reliable separable interface.

Regardless of the application, TE offers a wide variety of power & signal blind-mateable drawer connectors.

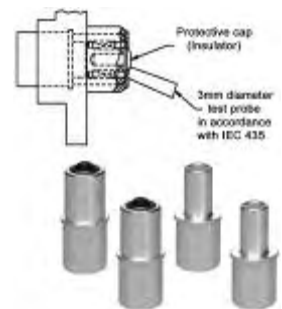
### Need more information?

Call Technical Support at the numbers listed below.

Technical Support is staffed with specialists well versed in all TE products. They can provide you with:

- Technical Support
- Catalogs
- Technical Documents
- Product Samples
- TE Authorized Distributor Locations

## ELCON Drawer Series Connectors True Hot-Plug, Blind-Mating Mixed Signal and Power Connectors (Continued)



3 mm Diameter Test Probe in Accordance with IEC 435 Protective Cap (insulator)

### Probe-proof Double CROWN BAND Contacts

The size #0 contacts used in the Top Drawer, Double Drawer, DualPower and QuadPower connectors are also available in a probe-proof double CROWN BAND version. These contacts are specially suited for operator-serviced power supplies that require extra safety protection.

### Signal/Power Sequencing

All signal and some power contacts are available in various lengths to allow multiple levels of sequencing, thus giving the engineer further design flexibility.

### Mating Polarization

To provide for positive housing mating of connectors, polarization is provided in the form of molded-in guide posts or pre-installed guide pins.

### Regulatory Agency Certifications

TE ELCON drawer series connectors have been evaluated and found to comply with the UL1977 standard and the CSA standard C22.2 No. 182.3-M1987.

TE can also work with the customer to obtain application-specific regulatory certifications if needed.



Cable Mounted Products

### Wide Array of Standard Contacts

ELCON drawer connectors support various termination styles, including crimp for cable, solder tail and compliant press-fit for mounting

to PCB, and internal/external threads for termination to lugs and/or busbars. See table below for details.

Contact Size	Termination				
	PC Tail	Press-fit	Crimp	Threaded	
				Internal	External
#20	•	•	•		
#16	•	•	•		
#12	•	•	•		
#8	•	•	•	•	•
#4			•	•	•
#0			•	•	•

### Application-Specific Designs

If none of our standard drawer connectors satisfies your requirements, TE can develop an ELCON connector design specific to your application. We will work

closely with your engineers to fully understand the design requirements and develop an interconnect solution that meets your stated needs. After the con-

cept and design stages, TE produces prototypes that perform both electrically and mechanically the same as production parts. These machined parts are used for

testing, regulatory agency evaluations and even as pre-production components, allowing the shortest lead time from concept to manufacturing in the industry.

### Concept

TE engineers work closely with the customer to fully understand the design requirements.

### Design

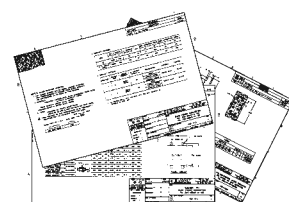
A sketch drawing of the design concept is created for customer review, and the design is finalized only when it fully meets the requirements of the customer.

### Prototypes

The design is frozen and work on the mold tools starts. Meanwhile, TE builds prototypes that are identical to the production parts.

### Production

By the time the customer is ready for production, all requirements for release to production, such as qualification and regulatory agency approval, have been cleared.



## How to Tailor Your ELCON Drawer Connector

If you selected a standard drawer connector for your application, before placing an order you need to specify your application-specific requirements, such as housing type, contact loading, and termination style. Layout forms for all standard drawer connectors, such as the one shown below, are available online at <http://www.te.com> or can be obtained from TE customer service for this purpose.

Complete a form for the pin and socket side of your connector as indicated in the instructions and fax it to your TE sales engineer. We will issue a unique part number specific to your configuration, which you can then use to place orders. Samples and customer drawings are also available upon request.

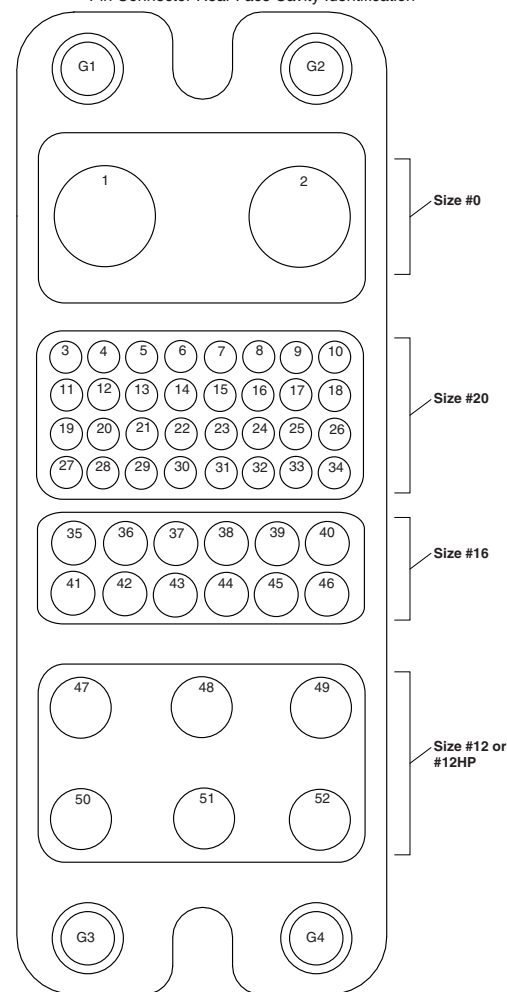
### Pin Assembly

1. Choose one housing from the **Pin Housing Selection Menu** table. Place an X in the appropriate guide pin circles, if guide pins are required.
2. Write the total quantity of each pin contact you require for each pin assembly in the **Qty** column of the **Pin Contact Selection Menu** table.
3. Crimp contacts are shipped uninstalled. Threaded and PCB tail contacts are installed by TE; enter the letter reference of the desired contact in the appropriate contact positions on the drawing: e.g., if you need a size #20 premate PCB tail standard contact to be installed in contact position #10, write "Q" in circle #10.
4. Sign, date and send the completed form to your local TE Sales Engineer.

#### Pin Connector (Rear Face)

Pin Contact Insertion Side

Pin Connector Rear Face Cavity Identification



Top Assembly Part Number Assigned by TE

ENTER CUSTOMER INFORMATION	
Company	Location
Contact Name	Title
Telephone	Fax
Email Address	
I am: <input type="checkbox"/> End user <input type="checkbox"/> Contract manufacturer (end user: _____)	
Signature	Today's Date
	Annual Quantity Required

Submit to your local TE Sales Engineer.

Pin Housing Selection Menu			Check One
Part Number	Description		
1648183-1	Housing without guides		
	Housing with guides (#6-32 thread)		
	Housing with guides (M3 x 0.5 thread)		

Pin Contact Selection Menu					
Size	Ref.	Part Number	Termination Style & Pin Length	Qty.	
#0	A =	1766811-1	Crimp		
	B =	1766819-1	Probe Proof, crimp		
	C =	1766230-1	1/4-20 Internal Thread		
	D =	1766274-1	M6 x 1 Internal Thread		
	E =	1766269-1	Probe Proof, 1/4-20 Internal Thread		
	F =	1766275-1	Probe Proof, M6 x 1 Internal Thread		
	G =	1766268-1	1/4-20 External Thread		
	H =	1766231-1	M6 x 1 External Thread		
	J =	1766270-1	Probe Proof, 1/4-20 External Thread		
	K =	1766276-1	Probe Proof, M6 x 1 External Thread		
	#20	L =	1650155-1	Crimp, standard	
M =		1650161-1	Crimp, premate		
N =		1650162-2	Crimp, postmate		
P =		1650283-1	PCB tail, standard		
Q =		1650065-1	PCB tail, premate		
R =		1650226-1	PCB tail, postmate		
#16		S =	1766196-1	Crimp, standard	
		T =	1766198-1	Crimp, premate	
	U =	1766199-2	Crimp, postmate		
	V =	1766222-1	PCB tail, standard		
	W =	1766223-1	PCB tail, premate		
	X =	1766818-1	PCB tail, postmate		
#12	Y =	1766193-1	Crimp, standard		
	Z =	1766195-1	Crimp, premate		
	AA =	1766196-1	Crimp, postmate		
	AB =	1766245-1	PCB tail, standard		
	AC =	1766250-1	PCB tail, premate		
	AD =	1766249-1	PCB tail, postmate		
#12 Hot-Plug	AE =	1650153-2	Crimp, standard, Hot-Plug		
	AF =	1650156-2	Crimp, premate, Hot-Plug		
	AG =	1650060-2	PCB tail, standard, Hot-Plug		
	AH =	1650074-3	PCB tail, premate, Hot-Plug		

Crimp and Threaded contacts are removable. PCB tail contacts are non-removable.

Float-Mount Shoulder Screw		
Part Number	Description	Qty.
1650399-1	Screw, No 10-32 UNC 2A	
1650401-1	Screw, M5 x 0.8	



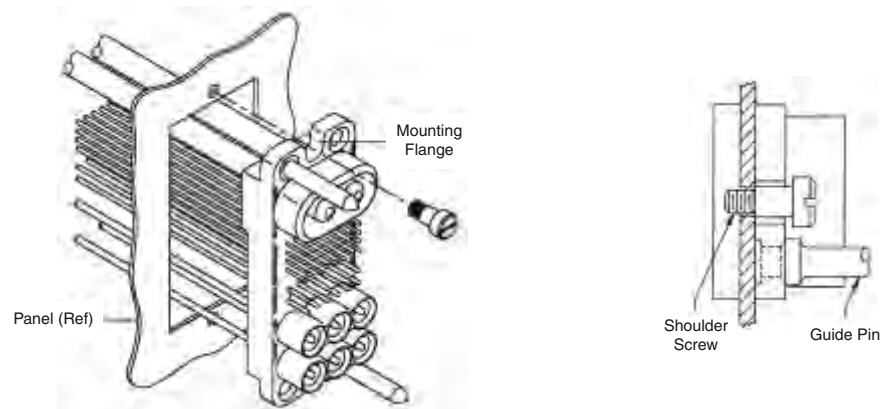
## ELCON Drawer Connector Mounting

All ELCON drawer series connectors can be fix-mounted or float-mounted using the designated shoulder screws to allow improved gatherability for blind-mating of the connector. Panel cut out dimensions are shown on the customer drawing specific to your ELCON drawer connector.

### Panel Float Mounting

When float-mounting to a panel or chassis, use the stainless steel shoulder screws specified in the layout sheet or customer drawing specific to your ELCON drawer connector. Shown in the sketch below is an example of how the Top Drawer connector is float-mounted to a panel.

Float-Mount of Top Drawer (Example)



Screw Description	Part Number	Used On
#10-32 UNF 2A Thread	1650399-1	Top and Double Drawer, Dual and QuadPower, In-Line QuadPower, W5 Drawer
M5 x 0.8 Metric Thread	1650401-1	
#8-32 UNF 2A Thread	1650402-1	
#6-32 UNF 2A Thread	1650106-1	All Other Drawers
M4 x 0.7 Metric Thread	1650589-1	

Cable Mounted Products

### Panel Fix Mounting

As a rule of thumb, ELCON drawer connectors can be fix-mounted to a panel, in two ways: (1) by attaching a screw through the top and bottom mounting flange of the housing; or (2) by attaching a screw into a threaded guide pin (for those connectors that have one). An example of each case is shown in the sketches below.

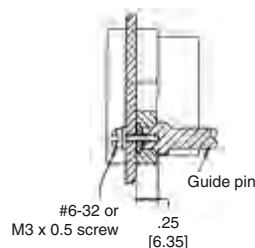
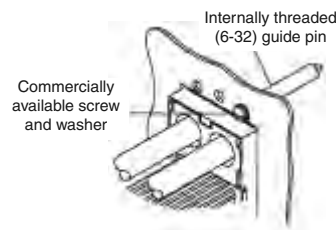
#### Screw Through Mounting Flange of Housing

Fix to the panel by attaching a commercially available screw and a washer through the top and bottom mounting flange of the housing.



#### Screw Into Thread of Guide Pin (When Applicable)

You can optionally fix-mount housings that have a guide pin by attaching a commercially available screw and washer into the thread on the back of the guide pin, as shown in the figures below.

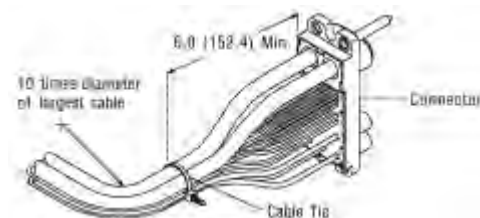


Note: All part numbers are RoHS compliant.

## ELCON Drawer Connector Mounting (Continued)

### Strain Relief and Wire Dress

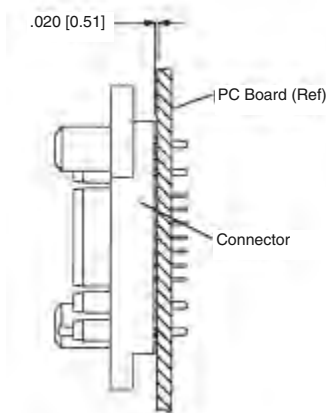
If required, wires can be bundled together and supported with cable ties. Wires must not be stretched or confined in any way that would restrict the floating action of the connectors. Therefore, the wires must remain perpendicular to the connector and avoid an excessively sharp bend radius. The minimum recommended distance for the cable tie, and the minimum bend radius of a wire bundle are shown in the figure to the right.



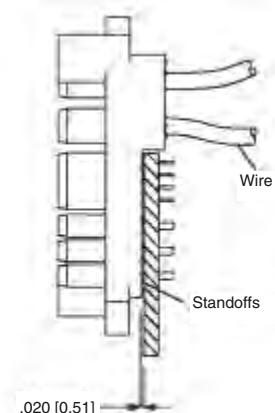
### PCB Fix Mounting

When mounting to a PC board, the connector standoffs must be seated on the board. Hold-downs are recommended to provide stability during the soldering procedure. PCB-mount hole patterns are shown on the customer drawing specific to your ELCON drawer connector.

Flush PCB-Mount Drawer Connectors

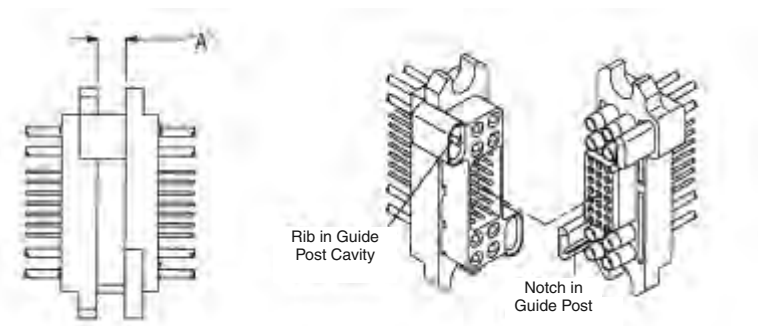


Drawer Connectors with Cabled AC IN



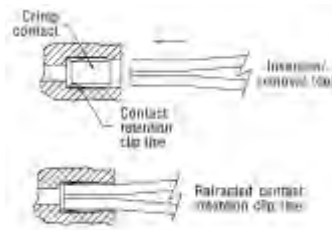
### Connector Engagement

To provide for proper mating of the connector when the power supply unit is fully engaged into the system, the gap between the pin and socket (shown as dimension "A" in the sketch below) must be within the limit specified in the customer drawing for your ELCON drawer connector. Failure to meet this requirement may compromise contact wipe. Refer to the customer drawing for details. ELCON drawer connectors are polarized and will only mate in the correct orientation (see sketch below).



## ELCON Drawer Connector Tooling

**Insertion/Removal (I/R) Tools:** Industry standard plastic I/R tooling is compatible with all crimp contacts for pin and socket removal. The following tools are available from TE.

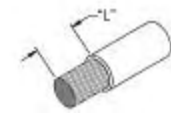


### I/R Tools

Part Numbers	Size	Color Code
1643917-1	Size #20 I/R tool	Red/White
1643916-1	Size #16 I/R tool	Blue/White
1643915-1	Size #12 I/R tool	Yellow/White
1643914-1	Size #8 removal tool	Red
1643922-1	Size #4 removal tool	Blue
1643921-1	Size #0 removal tool	Light Yellow

**Note:** PCB tail contacts are non-removable.

**Wire strip length:** If inserting stranded wire into crimp style contacts, please use the table below to determine the proper strip length of the wire.



Contact Size	Wire Size AWG	"L" + .020 [0.51]	
		inches	mm
#20	#24 - #20	0.210	5.33
#16	#20 - #16	0.270	6.86
#12	#14 - #12	0.270	6.86
#8	#10* - #8	0.500	12.70
#4	#6* - #4	0.500	12.70
#0	#2* - #0	0.600	15.24

\*Ref: MS3348 "Contact Bushing, Electric, Wire Barrel"

**Crimp Tools:** The following table lists applicable MIL-STD crimp tools for contacts



Size	Type	MIL-STD	Part Number
12 - 24	Crimp Tool	M22520/1-01	601967-1
	Turret head/locator	M22520/1-02	601967-2
8 - 10	Crimp Tool	M22520/23-01	—
	Indenter head	M22520/23-02	—
	Locator	M22520/23-09	—
4	Crimp Tool	M22520/23-01	—
	Indenter head	M22520/23-04	—
	Locator	M22520/23-11	—
0	Crimp Tool	M22520/23-01	—
	Indenter head	M22520/23-05	—
	Locator	M22520/23-13	—

**Crimp Termination Wire Sizes:** The following table shows crimp rear release contacts and their respective wire sizes when crimped with applicable industry standard terminal tools.

Contact Size	Wire Range	
	AWG	mm <sup>2</sup>
#20	20 - 24	0.241 - 0.616
#16	16 - 18	0.963 - 1.23
#12	12 - 14	1.94 - 2.98
#8	10 - 8	4.74 - 8.61
#4	4 <sup>(1)</sup>	21.60
#0	1/0	53.00

**Note:** <sup>(1)</sup> Consult TE for smaller wire sizes in #4 contacts

**Note:** All part numbers are RoHS compliant.

Cable Mounted Products

## ELCON Drawer Product Specifications

Materials			
Housing	Polyester, 30% glass-filled, UL 94V-0 black		
Crimp Contacts	High conductivity copper alloy		
PCB Tails	Brass		
Socket Contact Hoods (when applicable)	305 corrosion resistant steel		
Size #12 hoods, Hot-Plug	Beryllium copper		
Crown contacts	Beryllium copper		
Plating			
Size #20 and #12HP	Gold plated over nickel		
Sizes #0, #4, #8, #16 and non-HP #12	Silver plated over nickel		
Hot-Plug hoods and pin contacts	Gold plated over nickel		
Socket Contact Hoods (when applicable)	Passivated		
Mechanical			
Typical Insertion Forces of individual contacts	Size #20	0.2 lb.	0.09 kg
	Size #16	2.3 lb.	1.04 kg
	Size #12	2.9 lb.	1.32 kg
	Size #12 Hot-Plug	2.9 lb.	1.32 kg
	Size #8	4.4 lb.	2.00 kg
	Size #4	3.8 lb.	1.72 kg
	Size #0	4.7 lb.	2.13 kg
	Size #0 w/double Crown	4.8 lb.	2.18 kg
	Size #20	0.1 lb.	0.05 kg
	Size #16	0.7 lb.	0.32 kg
Typical Extraction Forces of individual contacts	Size #12	1.9 lb.	0.86 kg
	Size #12 Hot-Plug	1.9 lb.	0.86 kg
	Size #8	2.4 lb.	1.07 kg
	Size #4	3.0 lb.	1.36 kg
	Size #0	3.0 lb.	1.36 kg
	Size #0 w/double Crown	3.5 lb.	1.59 kg
	Size #0	3.0 lb.	1.36 kg
Electrical			
Typical Voltage drop of individual contacts	Size #20	1.7 mV at 5A	
	Size #16	3 mV at 15A	
	Size #12	4.2 mV at 35A	
	Size #12 Hot-Plug	4.7 mV at 35A	
	Size #8	6.5 mV at 75 A	
	Size #4	8.4 mV at 125A	
	Size #0	6.3 mV at 200A	
	Size #0 w/double Crown	5.6 mV at 200A	
Insulator dielectric strength	1,500 VDC for 1 minute, per MIL-STD 1344, Method 3001		

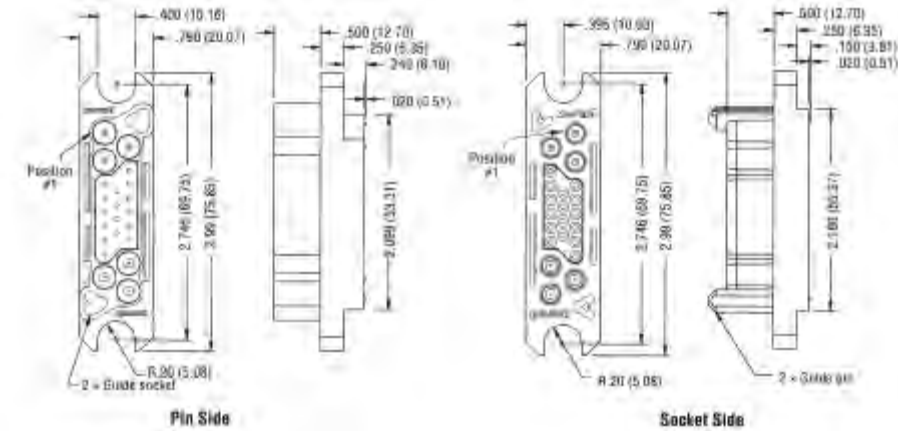
## Regulatory Agency Evaluations

Contacts	CSA-22.2 No. 0-M91 182.30 M1987 (CNR)	UL 498 and UL 1977 (USR)
AWG #20	4A / 250V	5A / 250V
AWG #16	10A / 250V	15A / 250V
AWG #12 Top Drawer	25A / 600V	35A / 600V
AWG #12 Others	25A / 250V	35A / 250V
AWG #12 with sockets	25A / 250V	35A / 250V
Size #12 hot-plug	25A / 250V	25A / 250VAC
		35A / 120V
Size #8	55A / 250V	75A / 250V
Size #0 with single or double Crown	150A / 250V	200A / 250V
Size #0 using bus bar	—	200A / 250V
Size #4	100A / 250V	125A / 250V

## ELCON Drawer Series Connectors

### Mini Drawer

- Dimensions** —  
2.99" x 0.79" (75.9 x 20.1 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** —  
Size 12 / 16 x 6 contacts  
Size 20 x 16 contacts
- Current Rating** — Up to 35 Amps per size 12 contact
- Contact Features** — Hot-Plug size 12 contact option
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
Size 12: Crimp and PCB tail  
Size 16: Crimp and PCB tail  
Size 20: Crimp and PCB tail



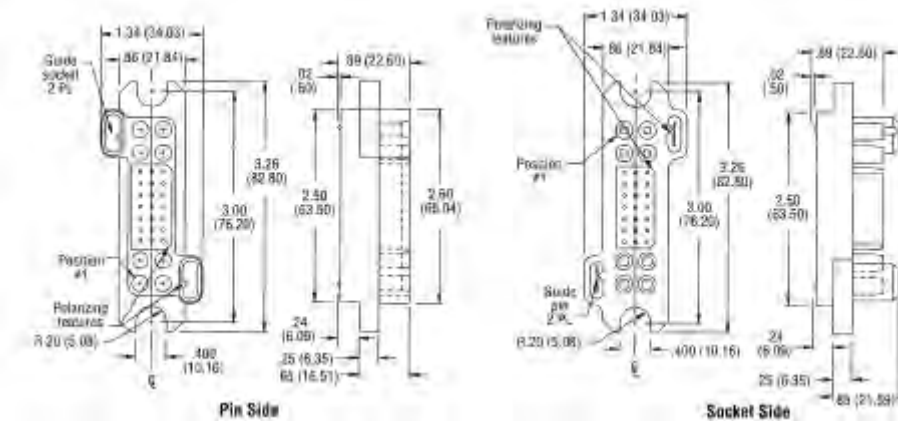
#### Base Housing Part Numbers

Pin Housing		Socket Housing	
1648110-1	Size 12 + Size 20 + Size 12	1648115-1	Size 12 + Size 20 + Size 12
1648111-1	Size 16 + Size 20 + Size 16	1648116-1	Size 16 + Size 20 + Size 16
1648112-1	Size 12 + Size 20 + Size 16	1648117-1	Size 12 + Size 20 + Size 16

Cable Mounted Products

### Lower Drawer

- Dimensions** —  
3.26" x 1.34" (82.8 x 34.0 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** —  
Size 12 / 16 x 8 contacts  
Size 20 x 21 contacts
- Current Rating** — Up to 35 Amps per size 12 contact
- Contact Features** — Hot-Plug size 12 contact option
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
Size 12: Crimp and PCB tail  
Size 16: Crimp and PCB tail  
Size 20: Crimp and PCB tail



#### Base Housing Part Numbers

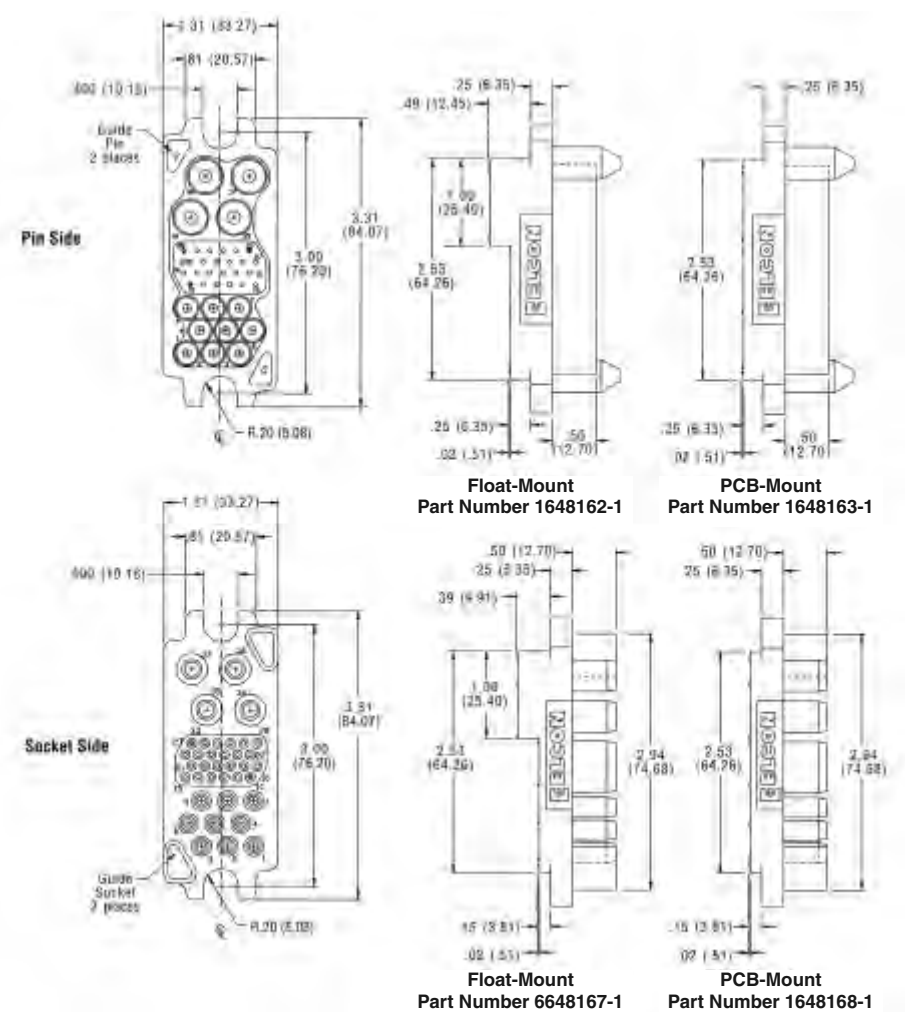
Pin Housing		Socket Housing	
1648203-1	Size 12 + Size 20 + Size 12	1648206-1	Size 12 + Size 20 + Size 12
1648204-1	Size 16 + Size 20 + Size 16	1648207-1	Size 16 + Size 20 + Size 16
1648205-1	Size 12 + Size 20 + Size 16	1648208-1	Size 12 + Size 20 + Size 16

**Note:** All part numbers are RoHS compliant.

**ELCON Drawer Series Connectors** (Continued)

**75A Middle Drawer**

- Dimensions** — 3.31" x 1.31" (84.1 x 33.3 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** —  
 Size 8 x 4 contacts  
 Size 12 x 9 contacts  
 Size 20 x 24 contacts
- Current Rating** — Up to 75 Amps per size 8 contact
- Contact Features** — Hot-Plug size 12 contact option
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
 Size 8: Crimp, internal/external thread and PCB tail  
 Size 12: Crimp and PCB tail  
 Size 20: Crimp and PCB tail



**Base Housing Part Numbers**

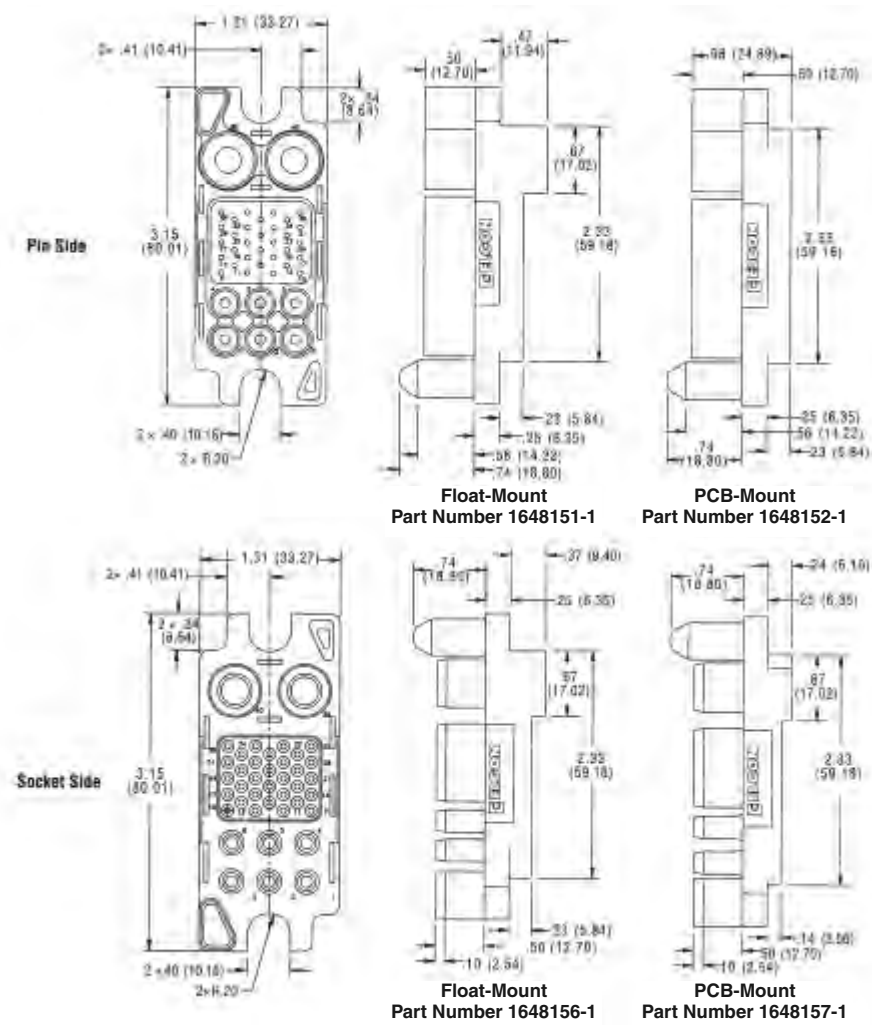
Pin Housing		Socket Housing	
1648162-1	Float-Mount	6648167-1	Float-Mount w/ reinforced housing
1648163-1	PCB-Mount	1648168-1	PCB-Mount

**Note:** All part numbers are RoHS compliant.

**ELCON Drawer Series Connectors** (Continued)

**125A Middle Drawer**

- Dimensions** — 3.15" x 1.31" (80.0 x 33.3 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** —  
 Size 4 x 2 contacts  
 Size 12 x 6 contacts  
 Size 20 x 32 contacts
- Current Rating** — Up to 125 Amps per size 4 contact
- Contact Features** — Hot-Plug size 12 contact option
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
 Size 4: Crimp and internal/external thread  
 Size 12: Crimp and PCB tail  
 Size 20: Crimp and PCB tail



Cable Mounted Products

**Base Housing Part Numbers**

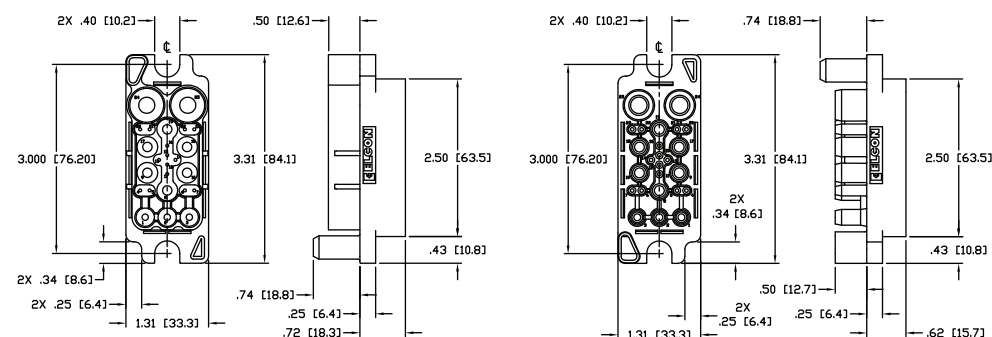
Pin Housing		Socket Housing	
1648151-1	Float-Mount	1648156-1	Float-Mount
1648152-1	PCB-Mount	1648157-1	PCB-Mount

**Note:** All part numbers are RoHS compliant.

## ELCON Drawer Series Connectors (Continued)

### 200A Middle Drawer

- Dimensions** —  
3.31" x 1.31" (84.1 x 33.3 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** —  
Size 4 x 2 contacts  
Size 8 x 6 contacts  
Size 12 x 3 contacts  
Size 20 x 14 contacts
- Current Rating** — Up to 125 Amps per size 4 contact
- Contact Features** — Hot-Plug size 12 contact option
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
Size 4: Crimp and internal/external thread  
Size 8: Crimp, internal/external thread and PCB tail  
Size 12: Crimp and PCB tail  
Size 20: Crimp and PCB tail

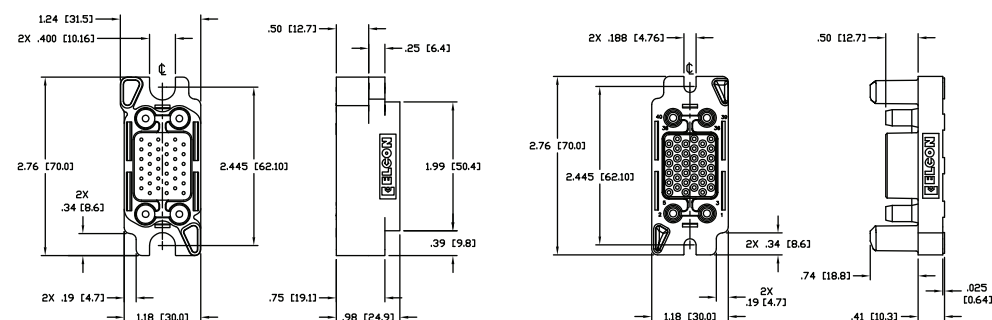


#### Base Housing Part Numbers

Pin Housing	Socket Housing
1648134-1	1648135-1

### Square Drawer

- Dimensions** —  
2.76" x 1.24" (70.1 x 31.5 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** —  
Size 12 x 4 contacts  
Size 20 x 36 contacts
- Current Rating** — Up to 35 Amps per size 12 contact
- Contact Features** — Hot-Plug size 12 contact option
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
Size 12: Crimp and PCB tail  
Size 20: Crimp and PCB tail



#### Base Housing Part Numbers

Pin Housing	Socket Housing
1648132-1	1648133-1

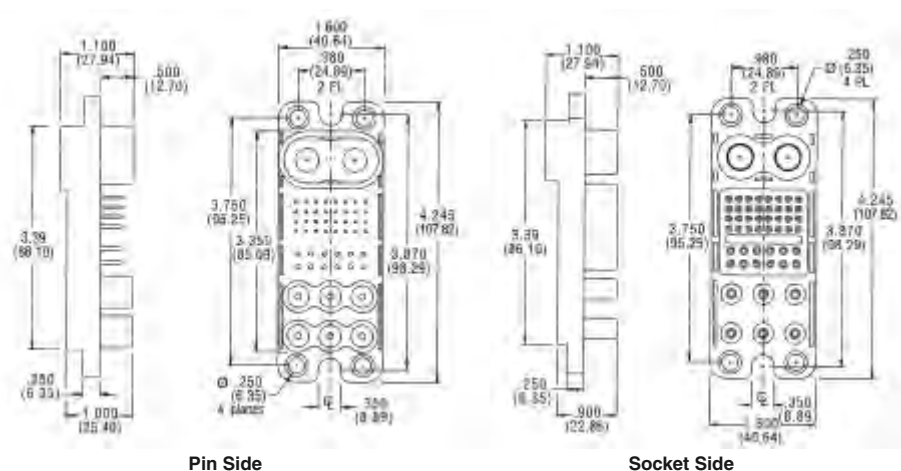
Note: All part numbers are RoHS compliant.



## ELCON Drawer Series Connectors (Continued)

### Top Drawer

- Dimensions** — 4.24" x 1.60" (107.8 x 40.7 mm)
- Housing Variations** — Various guide pin configurations available.
- Guides and Polarization** — Optional Steel Guide Pins with either #6-32 or M3 internal thread
- Available Contacts** —  
 Size 0 x 2 contacts  
 Size 12 x 6 contacts  
 Size 16 x 12 contacts  
 Size 20 x 32 contacts
- Current Rating** — Up to 200 Amps per size 0 contact
- Contact Features** — Hot-Plug size 12 contact option  
 Probe-proof size 0 contact option
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
 Size 0: Crimp and internal/external thread  
 Size 12: Crimp and PCB tail  
 Size 16: Crimp and PCB tail  
 Size 20: Crimp and PCB tail



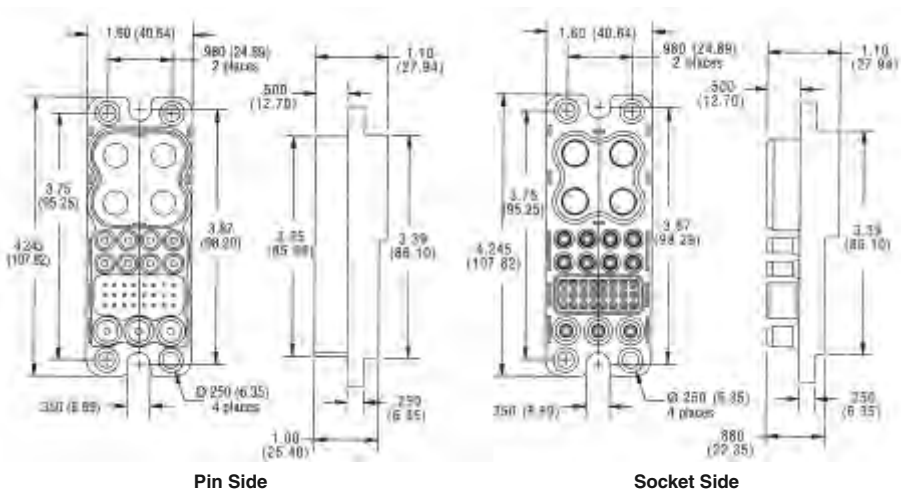
#### Base Housing Part Numbers

Pin Housing	Socket Housing
1648183-1	1648186-1

Optional guide posts are available for improved alignment. Consult Customer Service for details.

### Double Drawer

- Dimensions** — 4.24" x 1.60" (107.8 x 40.7 mm)
- Housing Variations** — Various guide pin configurations available.
- Guides and Polarization** — Optional Steel Guide Pins with either #6-32 or M3 internal thread
- Available Contacts** —  
 Size 0 x 4 contacts  
 Size 12 x 11 contacts  
 Size 20 x 24 contacts
- Current Rating** — Up to 200 Amps per size 0 contact
- Contact Features** — Hot-Plug size 12 contact option  
 Probe-proof size 0 contact option
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
 Size 0: Crimp and internal/external thread  
 Size 12: Crimp and PCB tail  
 Size 20: Crimp and PCB tail



#### Base Housing Part Numbers

Pin Housing	Socket Housing
1648552-1	1648578-1

Optional guide posts are available for improved alignment. Consult Customer Service for details.

**Note:** All part numbers are RoHS compliant.

Cable Mounted Products

## ELCON Drawer Series Connectors (Continued)

### DualPower Drawer

**Dimensions** —  
1.80" x 1.60" (45.7 x 40.7 mm)

**Housing Variations** — Various guide pin configurations available.

**Guides and Polarization** —  
Optional Steel Guide Pins with either #6-32 or M3 internal thread

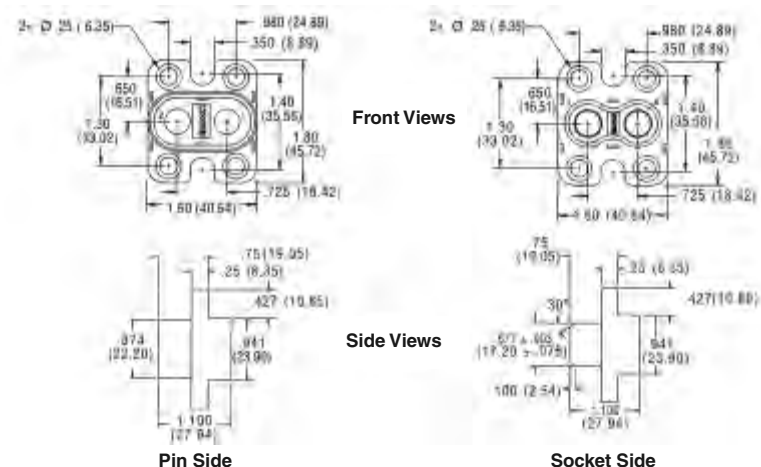
**Available Contacts** — Size 0 x 2 contacts

**Current Rating** — Up to 200 Amps per contact

**Contact Features** — Probe-proof size 0 contact option

**Contact Sequencing** — Standard only

**Contact Terminations** —  
Size 0: Crimp and internal/external thread



#### Base Housing Part Numbers

Pin Housing	Socket Housing
1648549-1	1648575-1

Optional guide posts are available for improved alignment. Consult Customer Service for details.

### QuadPower Drawer

**Dimensions** —  
2.50" x 1.60" (63.5 x 40.7 mm)

**Housing Variations** — Various guide pin configurations available.

**Guides and Polarization** —  
Optional Steel Guide Pins with either #6-32 or M3 internal thread

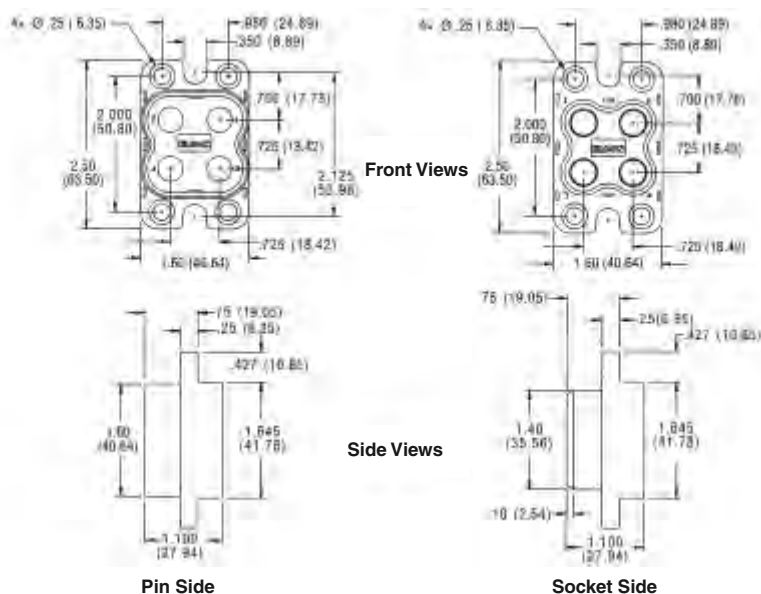
**Available Contacts** — Size 0 x 4 contacts

**Current Rating** — Up to 200 Amps per contact

**Contact Features** — Probe-proof size 0 contact option

**Contact Sequencing** — Standard only

**Contact Terminations** —  
Size 0: Crimp and internal/external thread



#### Base Housing Part Numbers

Pin Housing	Socket Housing
1648548-1	1648574-1

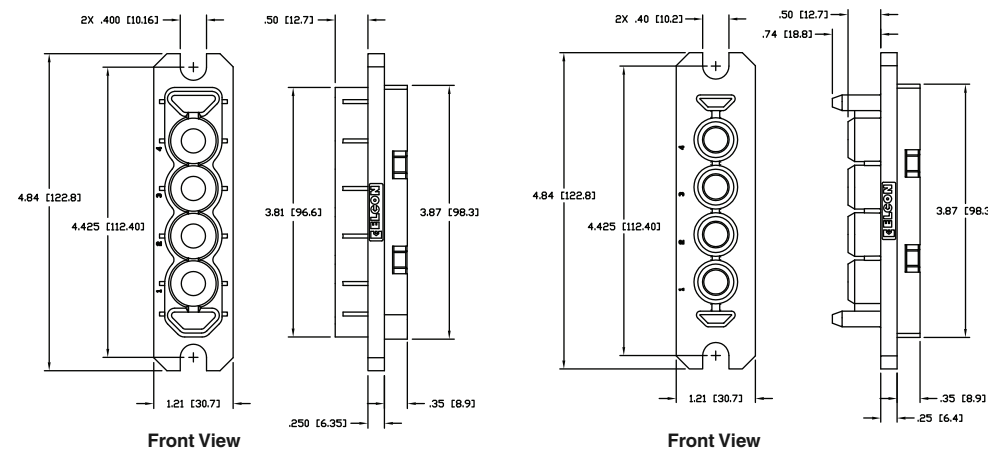
Optional guide posts are available for improved alignment. Consult Customer Service for details.

**Note:** All part numbers are RoHS compliant.

## ELCON Drawer Series Connectors (Continued)

### In-Line QuadPower Drawer

- Dimensions** — 4.84" x 1.21" (122.8 x 30.7 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** — Size 0 x 4 contacts
- Current Rating** — Up to 200 Amps per contact
- Contact Features** — Probe-proof size 0 contact option
- Contact Sequencing** — Standard only
- Contact Terminations** — Size 0: Crimp and internal/external thread



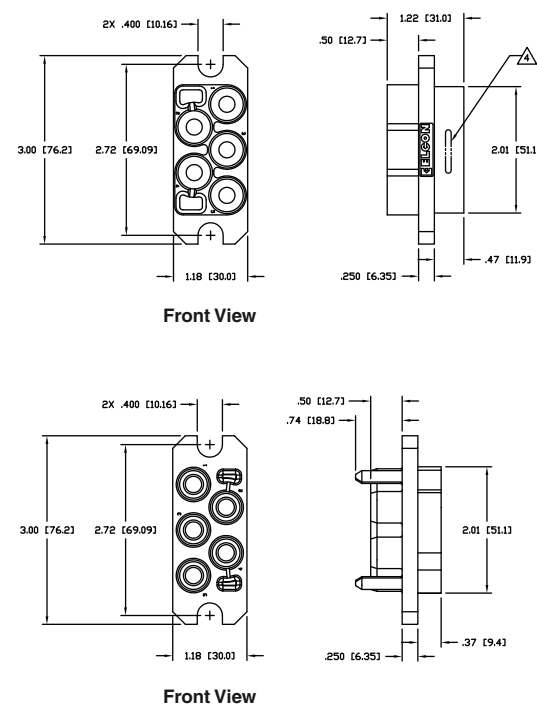
#### Base Housing Part Numbers

Pin Housing	Socket Housing
6651493-1	6651494-1

Cable Mounted Products

### W5 Power Drawer

- Dimensions** — 3.00" x 1.18" (76.2 x 30.0 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** — Size 4 x 5 contacts
- Current Rating** — Up to 100 Amps per contact
- Contact Features** — Probe-proof size 0 contact option
- Contact Sequencing** — Standard only
- Contact Terminations** — Size 4: Crimp and internal/external thread



#### Base Housing Part Numbers

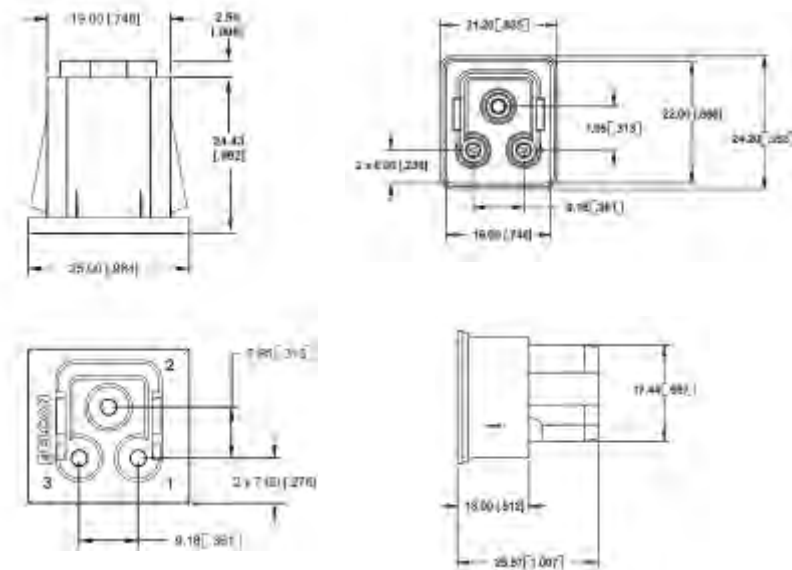
Pin Housing	Socket Housing
6651457-1	6651458-1

**Note:** All part numbers are RoHS compliant.

**ELCON Drawer Series Connectors** (Continued)

**P3S0 Drawer**

- Dimensions** — 0.99" x 0.95" (25.0 x 24.0 mm)
- Housing Variations** — See Part Numbers
- Cable Socket to Panel-Mount Pin
- Guides and Polarization** — Polarization only
- Available Contacts** — Size 12 x 3 contacts
- Current Rating** — Up to 35 Amps per size 12 contact
- Contact Features** — Hot-Plug size 12 contact option
- Contact Sequencing** — Multi-level for power
- Contact Terminations** — Size 12: Crimp only

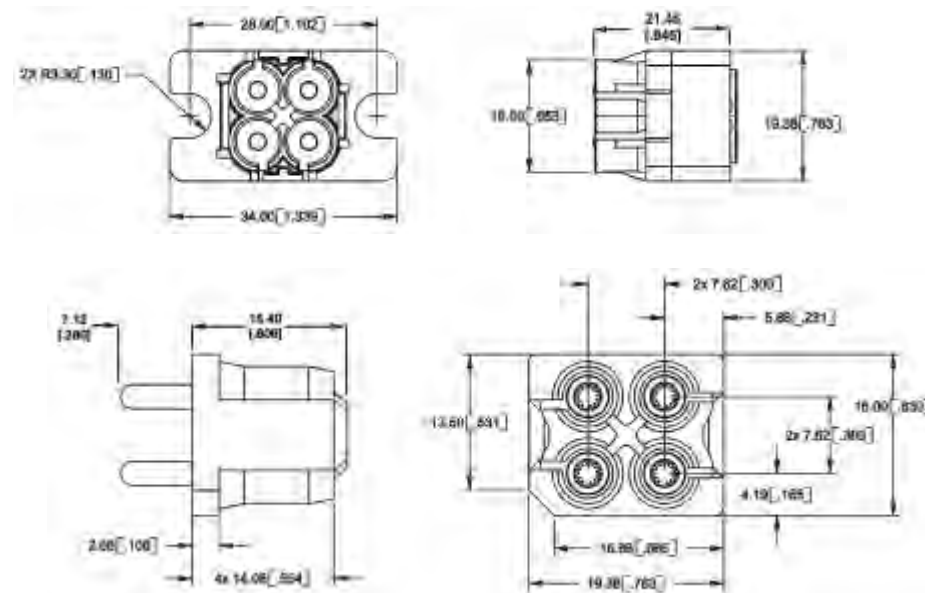


**Base Housing Part Numbers**

Pin Housing	Socket Housing
1766447-1	1766448-1

**P4S0 Drawer**

- Dimensions** — 1.34" x .76" (34.0 x 19.4 mm)
- Housing Variations** — See Part Numbers
- Cable Pin to PCB-Mount Socket
- Guides and Polarization** — Polarization only
- Available Contacts** — Size 12 x 4 contacts
- Current Rating** — Up to 35 Amps per size 12 contact
- Contact Sequencing** — Standard only
- Contact Terminations** — Size 12: Crimp Pin and PCB tail Socket
- Note:** Supplied as kit, including contacts



**Base Housing Part Numbers**

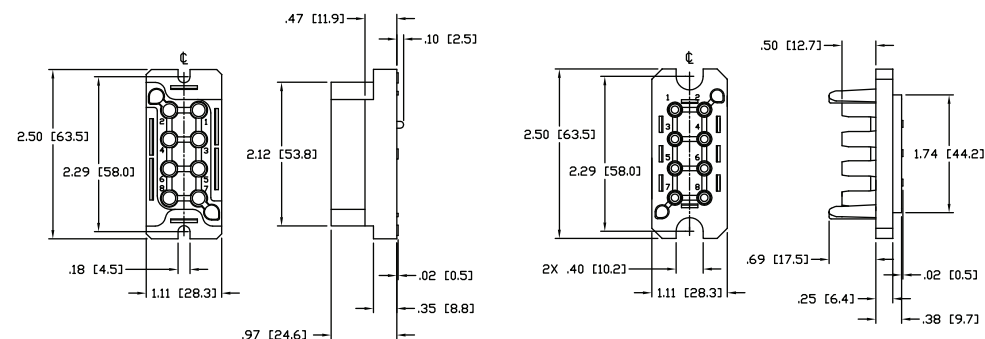
Pin Side Kit	Socket Side Kit
6766014-1	6766015-1

**Note:** All part numbers are RoHS compliant.

**ELCON Drawer Series Connectors** (Continued)

**HV8P Drawer**

**Dimensions** —  
2.50" x 1.11" (63.5 x 28.2 mm)  
**Housing Variations** — See Part Numbers  
600 V High Voltage Design  
**Guides and Polarization** — Built in  
**Available Contacts** — Size 12 x 8 contacts  
**Current Rating** — Up to 35 Amps per size 12 contact  
**Contact Features** — Hot-Plug size 12 contact option  
**Contact Sequencing** — Multi-level for power  
**Contact Terminations** — Size 12: Crimp and PCB tail



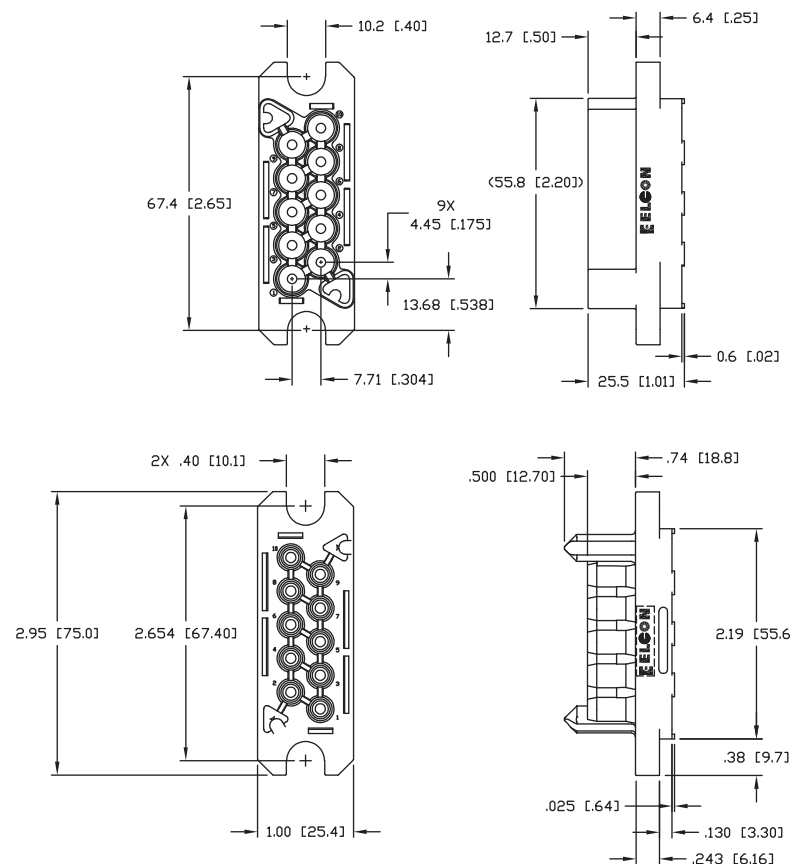
**Base Housing Part Numbers**

Pin Housing	Socket Housing
1648127-1	1648128-1

Cable Mounted Products

**P10S0 Drawer**

**Dimensions** —  
2.96" x 1.00" (75.0 x 25.4 mm)  
**Housing Variations** — See Part Numbers  
**Guides and Polarization** — Built in  
**Available Contacts** — Size 12 x 10 contacts  
**Current Rating** — Up to 35 Amps per size 12 contact  
**Contact Features** — Hot-Plug size 12 contact option  
**Contact Sequencing** — Multi-level for power  
**Contact Terminations** — Size 12: Crimp and PCB tail



**Base Housing Part Numbers**

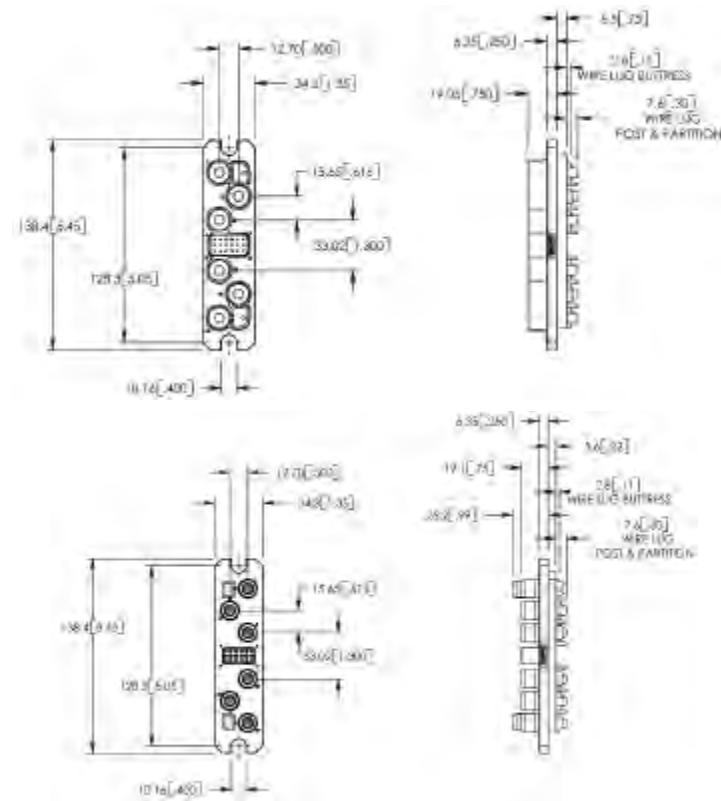
Pin Housing	Socket Housing
1648568-1	1648596-1

**Note:** All part numbers are RoHS compliant.

**ELCON Drawer Series Connectors** (Continued)

**P6S18 Drawer**

- Dimensions** —  
5.45" x 1.35" (138.4 x 34.3 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** —  
Size 4 x 6 contacts  
Size 20 x 18 contacts
- Current Rating** — Up to 100 Amps per size 4 contact
- Contact Features** — Standard
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
Size 4: Crimp and internal/external thread  
Size 20: Crimp and PCB tail

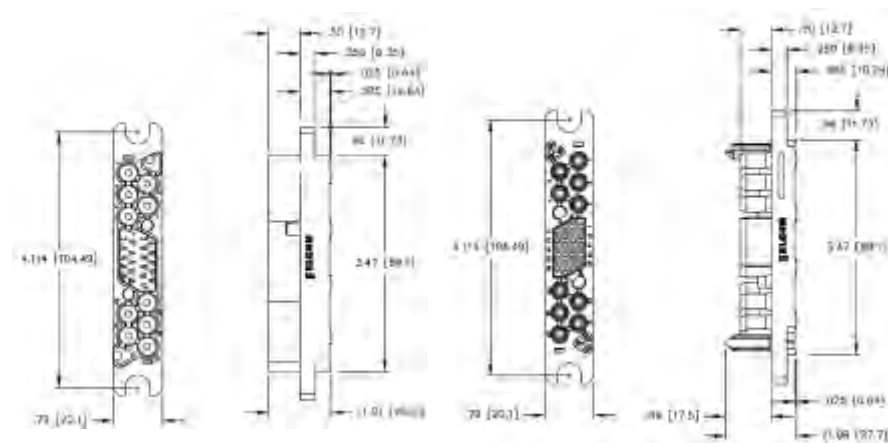


**Base Housing Part Numbers**

Pin Housing	Socket Housing
6766615-1	6651810-1

**P10S22 Drawer**

- Dimensions** —  
4.12" x 0.79" (104.5 x 20.1 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** —  
Size 12 x 10 contacts  
Size 20 x 22 contacts
- Current Rating** — Up to 35 Amps per size 12 contact
- Contact Features** — Hot-Plug size 12 contact option
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** —  
Size 12: Crimp and PCB tail  
Size 20: Crimp and PCB tail



**Base Housing Part Numbers**

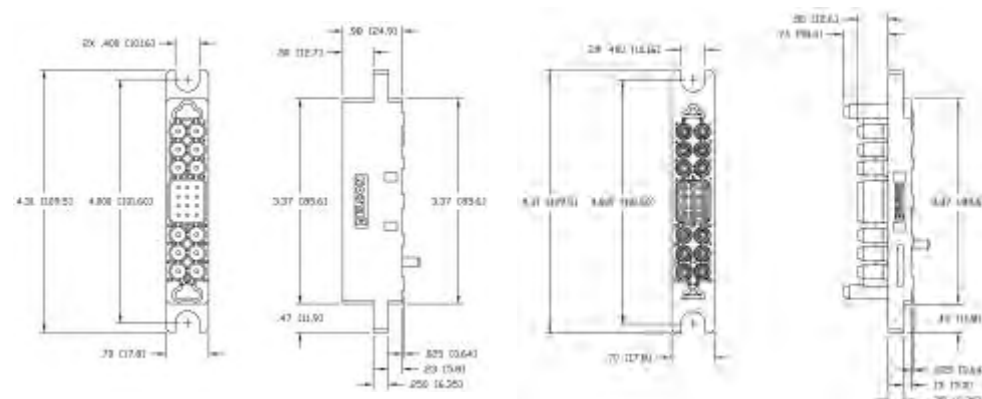
Pin Housing	Socket Housing
1648211-1	1648212-1

**Note:** All part numbers are RoHS compliant.

## ELCON Drawer Series Connectors (Continued)

### P12S12 Drawer

- Dimensions** — 4.31" x 0.70" (109.5 x 17.8 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** — Size 16 x 12 contacts  
Size 20 x 12 contacts
- Current Rating** — Up to 15 Amps per size 16 contact
- Contact Features** — Standard only
- Contact Sequencing** — Multi-level for power and signal
- Contact Terminations** — Size 16: Crimp and PCB tail  
Size 20: Crimp and PCB tail

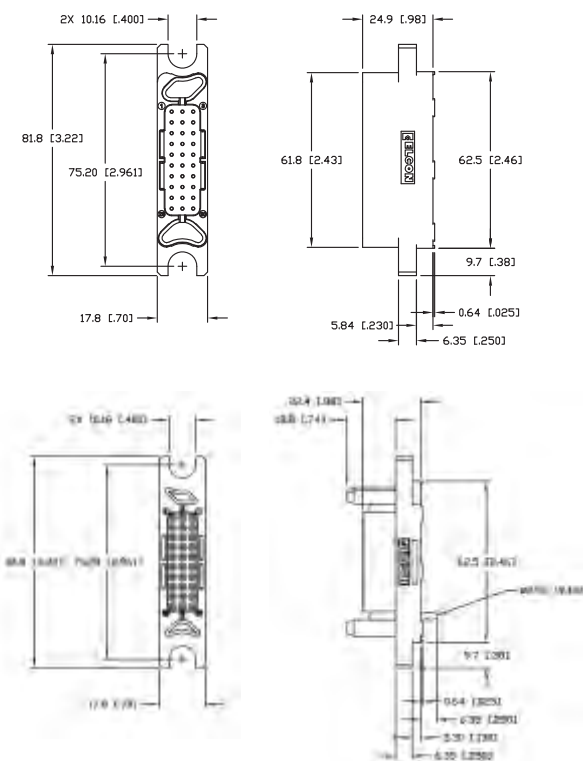


#### Base Housing Part Numbers

Pin Housing	Socket Housing
1651202-1	1651203-1

### POS30 Drawer

- Dimensions** — 3.22" x 0.70" (81.8 x 17.8 mm)
- Housing Variations** — See Part Numbers
- Guides and Polarization** — Built in
- Available Contacts** — Size 20 x 30 contacts
- Current Rating** — Up to 5 Amps per size 20 contact
- Contact Features** — Standard only
- Contact Sequencing** — Multi-level for signal
- Contact Terminations** — Size 20: Crimp and PCB tail



#### Base Housing Part Numbers

Pin Housing	Socket Housing
6651204-1	6651205-1

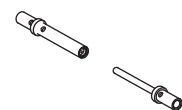
Note: All part numbers are RoHS compliant.

Cable Mounted Products

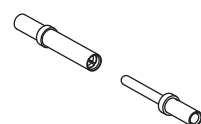
## ELCON Drawer Standard Contacts

The ELCON drawer series connectors use standard contacts across the product line. This section shows the standard contacts available in different sizes and various lengths and termination styles, with their respective part numbers.

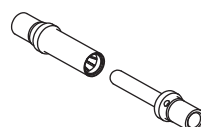
### Pin Side Contacts



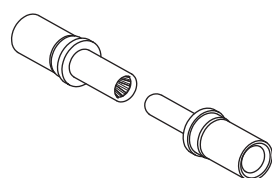
Contact Size #20



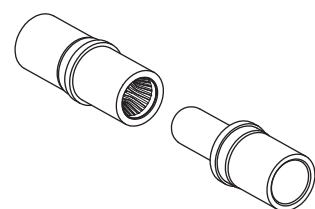
Contact Size #16



Contact Size #12



Contact Size #8



Contact Size #4

Note: All part numbers are RoHS compliant.

#### Contact Size #20 — For use in most drawer connectors

Termination Type	Contact Part Number	Dimensions	A	
			in	mm
Crimp, standard	1650155-1		0.32	[8.12]
Crimp, premate	1650161-1		0.47	[11.93]
Crimp, postmate	1650162-2		0.27	[6.85]
PCB tail, standard	1650283-1		0.32	[8.12]
PCB tail, premate	1650065-1		0.47	[11.93]
PCB tail, postmate	1650226-1		0.27	[6.85]

#### Contact Size #16 — For use in Mini Drawer, Lower Drawer, Top Drawer, and P12S12

Termination Type	Contact Part Number	Dimensions	A	
			in	mm
Crimp, standard	1766194-1		0.33	[8.38]
Crimp, premate	1766198-1		0.48	[12.19]
Crimp, postmate	1766199-1		0.29	[7.36]
PCB tail, standard	1766222-1		0.33	[8.38]
PCB tail, premate	1766223-1		0.48	[12.19]
PCB tail, postmate	1766818-1		0.29	[7.36]

#### Contact Size #12 — For use in Mini Drawer, Lower Drawer, 75A, 125A and 200A Middle Drawer; Square Drawer, TOP Drawer & Double Drawer; P3S0 and P4S0, HV8P, P10S0, P10S22

Termination Type	Contact Part Number		Dimensions	A	
	Gold Plated	Silver Plated		in	mm
Crimp, standard	1650153-2	1766193-1		0.43	[10.92]
Crimp, premate	1650156-2	1766195-1		0.46	[11.68]
Crimp, postmate	1650158-2	1766196-1		0.39	[9.90]
PCB tail, standard	1650060-2	1766245-1		0.43	[10.92]
PCB tail, premate	1650074-3	1766250-1		0.46	[11.68]
PCB tail, postmate	1650073-3	1766249-1		0.39	[9.90]

Note: For applications using the #12 hot-plug socket use of gold plated pins are recommended.

#### Contact Size #8 - For use in 75A and 200 A Middle Drawer

Termination Type	Contact Part Number	Dimensions	A	
			in	mm
Crimp, standard	1766192-1		0.43	[10.92]
Crimp, premate	1766197-1		0.48	[12.19]
Crimp, postmate	1766821-1		0.33	[8.38]
PCB tail, standard	1766262-1		0.43	[10.92]
PCB tail, premate	1766263-1		0.48	[12.19]

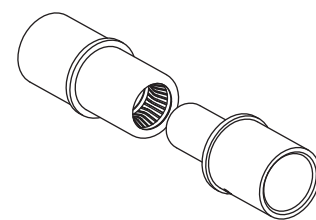
#### Contact Size #4 - For use in 125A and 200A Middle Drawer. P6S18 Drawer, W5 Power Drawer

Termination Type	Contact Part Number	Dimensions	A	
			in	mm
Crimp, Standard	1766232-1		0.51	[12.95]
1/4 - 20 x .050 DP External Thread	1766812-1		0.51	[12.95]
M5 x 0.8 x 9.6 mm DP M5 Internal Thread	1766283-1		0.51	[12.95]

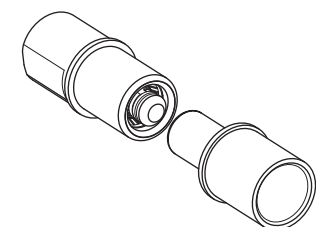


### ELCON Drawer Standard Contacts (Continued)

#### Pin Side Contacts (Continued)



Contact Size #0



Contact Size #0  
Probe-proof

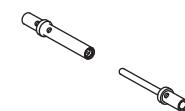
#### Contact Size #0<sup>1</sup> - For use in Top Drawer, Double Drawer, DualPower & QuadPower, In-Line QuadPower

Termination Type	Contact Part Number	Dimensions	A	
			in	mm
Crimp	1766811-1		0.495	[12.57]
Probe-proof crimp <sup>2</sup>	1766819-1		0.430	[10.92]
1/4 - 20 x .050 DP Internal thread	1766230-1		0.495	[12.57]
M6 x 1 x 12.7 mm DP Internal thread	1766274-1		0.495	[12.57]
1/4 - 20 x .050 DP Probe-proof/internal thread <sup>2</sup>	1766269-1		0.430	[10.92]
M6 x 1 x 12.7 mm DP Probe-proof/Internal thread <sup>2</sup>	1766275-1		0.430	[10.92]
1/4 - 20 x .050 DP External thread	1766268-1		0.495	[12.57]
M6 x 1 x 12.7 mm DP External thread	1766231-1		0.495	[12.57]
1/4 - 20 x .050 DP Probe-proof/external thread <sup>2</sup>	1766270-1		0.430	[10.92]
M6 x 1 x 12.7 mm DP Probe-proof/external thread <sup>2</sup>	1766276-1		0.430	[10.92]

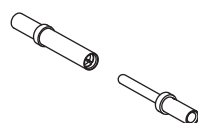
**Notes:** <sup>1</sup>Contact TE for alternate contact terminations.  
<sup>2</sup>Use only with probe-proof socket contacts.  
<sup>3</sup>Crimp and threaded contact are insertable/removable.

Cable Mounted Products

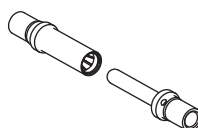
#### Socket Side Contacts



Contact Size #20



Contact Size #16



Contact Size #12

#### Contact Size #20

Termination Type	Contact Part Number
Crimp	1648325-1
PCB Tail	1648382-1

#### Contact Size #16

Termination Type	Contact Part Number
Crimp	6648319-1
PCB Tail	6648383-1

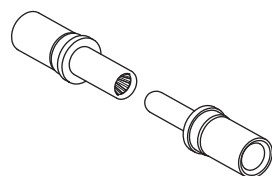
#### Contact Size #12

Termination Type	Contact Part Number
Crimp	6648318-1
Hot-Plug Crimp	1648384-1
PCB Tail	6648374-1
Hot-Plug PCB Tail	1648387-1

**Note:** For applications using the #12 hot-plug socket, the use of gold plated pins are recommended (see page 80).

**Note:** All part numbers are RoHS compliant.

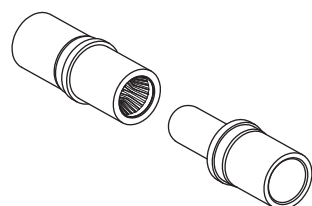
**ELCON Drawer Standard Contacts** (Continued)

**Socket Side Contacts**


Contact Size #8

**Contact Size #8**

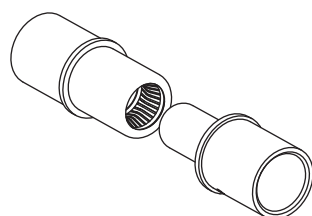
Termination Type	Contact Part Number
Crimp	6648317-1
PCB Tail	6648400-1



Contact Size #4

**Contact Size #4**

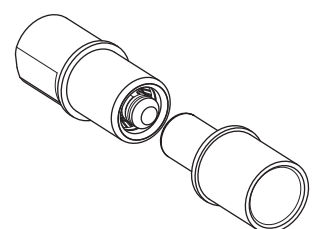
Termination Type	Contact Part Number
Crimp, Standard	6648434-1
1/4 - 20 x .050 DP External Thread	6648435-1
M5 x 0.8 x 9.6 mm DP M5 Internal Thread	6648335-1



Contact Size #0

**Contact Size #0<sup>1</sup>**

Termination Type	Contact Part Number
Crimp	6648405-1
Probe-proof crimp <sup>2</sup>	6648418-1
1/4 - 20 x .050 DP Internal thread	6648416-1
M6 x 1 x 12.7 mm DP Internal thread	6648428-1
1/4 - 20 x .050 DP Probe-proof/internal thread <sup>2</sup>	6648419-1
M6 x 1 x 12.7 mm DP Probe-proof/Internal thread <sup>2</sup>	6648429-1
1/4 - 20 x .050 DP External thread	6648417-1
M6 x 1 x 12.7 mm DP External thread	6648430-1
1/4 - 20 x .050 DP Probe-proof/external thread <sup>2</sup>	6648420-1
M6 x 1 x 12.7 mm DP Probe-proof/external thread <sup>2</sup>	6648431-1



Contact Size #0 Probe-proof

**Notes:** <sup>1</sup>Contact TE for alternate contact terminations.  
<sup>2</sup>Use only with probe-proof Pin contacts.  
<sup>3</sup>Crimp and threaded contact are insertable/removable.

**Non-Standard Contacts**

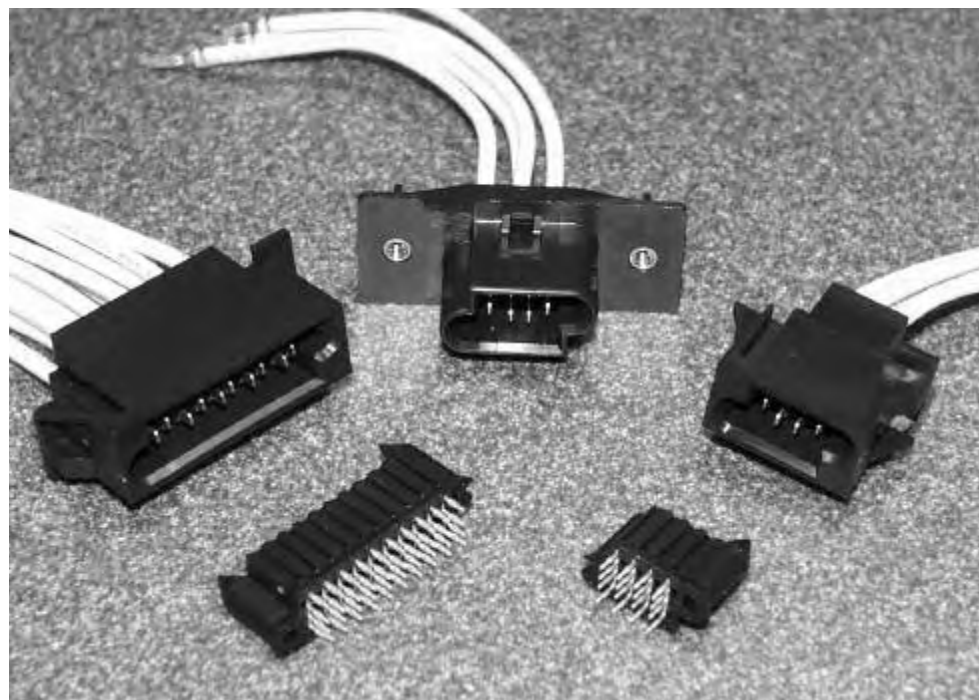
Contacts with pin lengths and terminations other than standard are available. Consult customer service if your design requires contacts different from the ones shown in this catalog.

**Note:** All part numbers are RoHS compliant.

## AMP Miniature Power Drawer (MPD) Connectors

### Product Facts

- High mating cycle life
- Low Mating and Un-mating force (< 0.2lbs per contact)
- Single-piece molded housing
- Molded-in guide pins provide generous blind-mateability
- Sizes: 3 – 10 positions
- Compact size is ideal for distributed DC power applications
- Two Levels of contact sequencing
- One contact for either solder or press-fit termination
- Hardware — Less or traditional shoulder bolt mounting
- Minimum of 3 mm contact wipe on shortest power contact
- All MPD connectors in this section are RoHS compliant



Cable Mounted Products

### Specifications

Up to 16 Amps per contact  
 250 mating cycle durability  
 +/- 1.25 mm radial mis-alignment capability. (Total float is 2.5 mm!)  
 1.6 mm sequencing distance — ideal for modular sheet metal construction applications  
 Minimum of 3 mm contact wipe on shortest power contact  
 Maximum continuous operating temperature — 105°C  
 UL 94 V-0 High-temperature thermoplastic housings

### Technical Documents

#### Product Specification

108-1998

#### Application Specification

114-13067

The miniature power drawer connector combines a high density power interface in a blind-mateable wire-to-board connector. The MPD contact interface has been previously qualified to requirements similar to BellCore GR-1217 in board-to-board applications. Now available in a crimp-to-wire version, the contacts are rated for up to 15 Amps on 14 AWG wire. In addition, the MPD contacts are designed to meet UL 1977 hot-plug requirements for up to 7.8 Amps at 48VDC.

The connection consists of a vertical pcb mountable receptacle and a panel-mounted floating plug. The vertical receptacle pcb tails are designed for use in either through hole solder or press-fit applications. The float-mount plug is easily installed from the inside of the chassis without any additional hardware, lending itself to easy assembly of pre-made cable assemblies. Additionally, the staggered wire exit pattern permits the maximum number of contact interfaces in the least amount of connector volume.

The compact design is ideal for bringing power to small rack-mounted devices such as 1U computer servers and telecommunications switches. The 3 mm center-line satisfies UL 1977 safety requirements for 48 VDC distributed power applications. For higher voltage applications such as AC input, the contacts can be selectively loaded to handle up to 300 V AC or DC.

**AMP Miniature Power Drawer (MPD) Connectors** (Continued)

**Crimp Contacts**

**Current Ratings**

**Standard Power** — 10 Amps

**High Power** — 16 Amps

**Material and Finish**

**Standard Power:**

**Crimp Blade Contacts** — Brass

**Receptacle Contacts** —

Phos. Bronze.

**Finish** — 0.38µm Gold over 1.27µm Nickel

**High Power:**

**Blades** — High Conductivity Cu Alloy

**Receptacle** — High Conductivity Cu Alloy

**Finish** — 1.27µm Gold over 1.27µm Nickel

**Contact Mating Length (Min.) —**

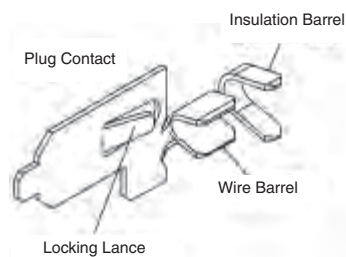
Type A — 4.6 mm

Type B — 3.0 mm

**Hot-Pluggability (With High Current Contacts only) —**

**250 Cycles** — 7.8 Amps @ 48VDC

**Note:** All contacts are Sn plated in the crimp barrel or Sn in pcb interface



**PRO-CRIMPER Hand Tool**  
Part Number 91363-1

**Crimp Blade Contacts**

Wire Size	Type	Cycles	Mating Length	Part Number Strip Form	Applicator	Hand Tool
16-20 AWG	Standard Power	100	A	1489128-8	1385248-3	91363-1
			B	1489128-7		
	High Power	250	A	1-1489128-0		
			B	1489128-9		

Heavy Duty Miniature (HDM) Applicator for AMP-O-LECTRIC Model G Machine - #1385248-3.  
PRO-CRIMPER Hand Tool #354940-1, Die set # 91363-2

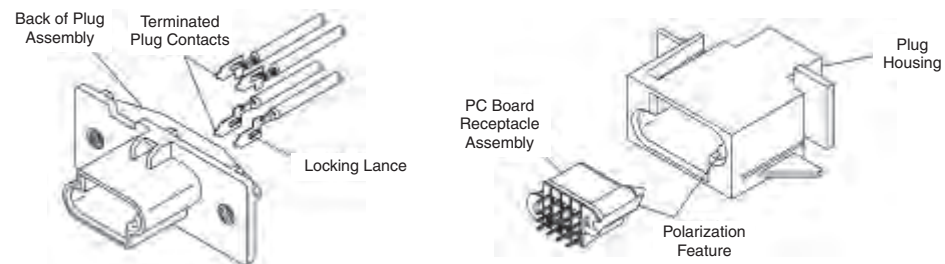
**Plugs and Receptacles**

**Materials**

UL 94V-0 Thermoplastic

105°C Max. Operating temperature

**Note:** Vertical PCB Mt. Receptacles supplied with press-fit ACTION PIN contacts.



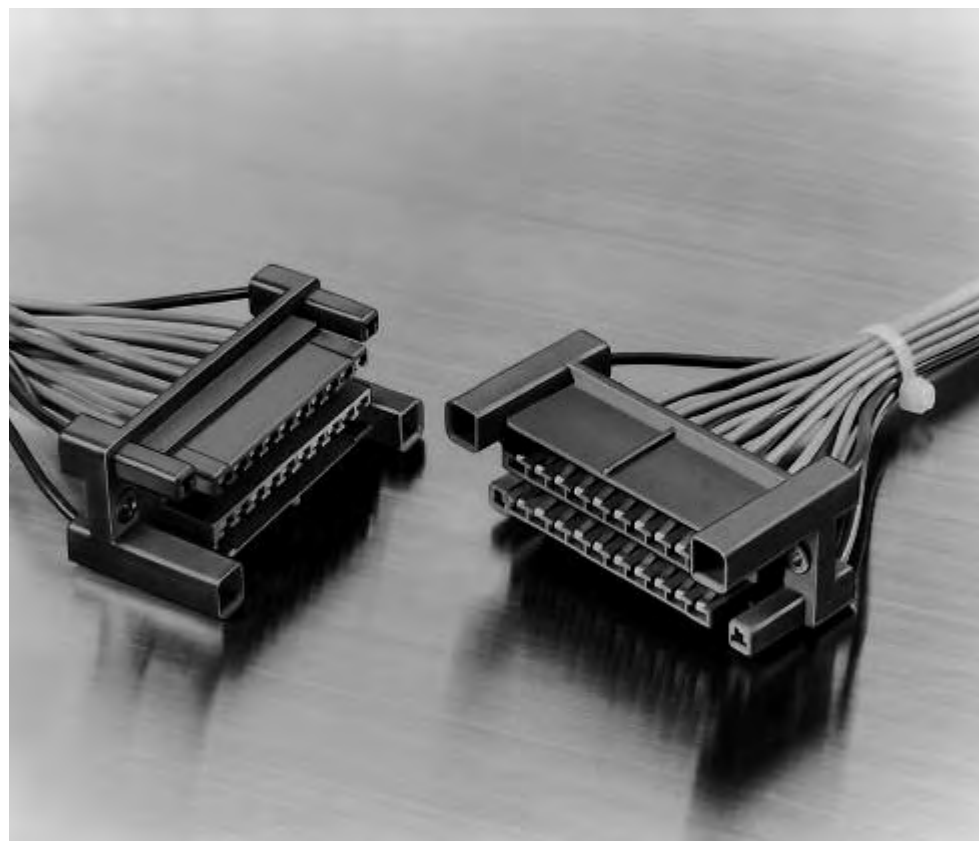
Number of Positions	Part Number			
	Panel-Mount Plug		PCB-Mount Receptacles	
	Snap-In	Shoulder Bolt	Standard Power	High Current
3	1489127-1	—	1489715-1	1-1489715-1
4	1489127-2	1489701-1	1489715-2	1-1489715-2
5	1489127-3	—	1489715-3	1-1489715-3
6	1489127-4	—	1489715-4	1-1489715-4
7	1489127-5	—	1489715-5	1-1489715-5
8	1489127-6	—	1489715-6	1-1489715-6
9	1489127-7	—	1489715-7	1-1489715-7
10	1489127-8	—	1489715-8	1-1489715-8

**Note:** All part numbers are RoHS compliant.

## Hybrid Blind-Mate Drawer Connectors

### Product Facts

- High current circuits and signal circuits can be mixed in the same connector
- High current circuits use MIC connector contacts located at four corners of the housing
- Signal circuits use Standard Drawer Connector contacts
- 24 positions
- Hermaphroditic housing can be mated with top and bottom turned while maintaining polarity



Cable Mounted Products

Hybrid Drawer Connectors offer high current and signal circuits mixed in the same connector system.

High current circuits use MIC connector contacts which are located at the four corners of the housing.

Signal circuits use the same

hermaphroditic crimp snap-in contacts that are used in the Standard Drawer Connector.

The hermaphroditic housings are available in a popular 24-position size. These housings can be mated with top and bottom turned while maintaining polarity.

### Performance Specifications

**Voltage Rating** — 250 VAC

**Current Rating (Max.)** —  
 Signal Circuit (Drawer);  
 4 Amps — 24 AWG [0.2 mm<sup>2</sup>] Wire  
 5 Amps — 22 AWG [0.3-0.4 mm<sup>2</sup>] Wire  
 7 Amps — 20 AWG [0.5-0.6 mm<sup>2</sup>] Wire  
 Power Circuit (MIC);  
 10 Amps

**Low Level Resistance** —  
 Signal Circuit (Drawer);  
 10 milliohms max. (Initial)  
 20 milliohms max. (Final)  
 Power Circuit (MIC);  
 3 milliohms (Initial)  
 6 milliohms (Final)

**Dielectric Withstanding Voltage** —  
 5000 milliohms (Initial)  
 2000 milliohms (Final)

**Operating Temperature** —  
 -20°C to +120°C

### Hybrid Blind-Mate Drawer Connectors (Continued)

#### Housings (Hermaphroditic), 24 Positions

#### Material

**Housing** — Glass-filled polybutylene terephthalate (PBT), blue

**Bushing** — Brass, zinc-plated

#### Related Product Data

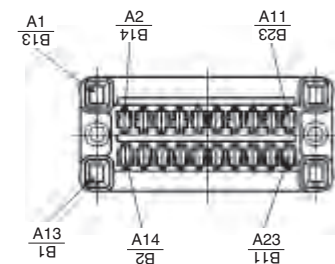
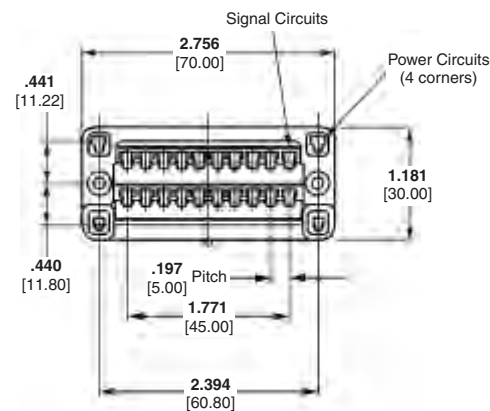
**Performance Specifications** — page 85

**MIC Contacts** — page 87

**Crimp Snap-In Contacts** — page 87

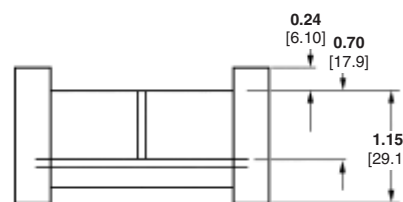
#### Technical Documents

**Product Specification**  
108-5371



**Note:** Reverse figures show circuit numbers.

(Example =  $\frac{A1}{81B}$  The hole used for No. 1 circuit is used for No. 13 on the reverse side.)

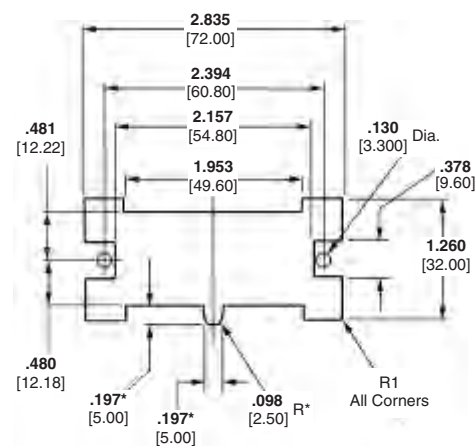


Panel Mounting Position (Front Mounting)

Floating of Bushing	Housing Part Numbers
Up- and downward = 0.05 [.002] Circumferential = 0.14 [.006]	5176916-1
Up- and downward = 0.30 [.012] Circumferential = 0.80 [.031]	5176916-2

Upward and downward = Axial clearance  
Circumferential = Floating

#### Recommended Panel Cutout



\*Dimensions applicable for rear mounting.

**Note:** All part numbers are RoHS compliant.

## Hybrid Blind-Mate Drawer Connectors (Continued)

### MIC Contacts (Used for Power Circuits)

#### Material and Finish

Phosphor bronze, plated .000030 [0.00076] gold in contact area, remainder of contact gold flash, with entire contact underplated nickel

#### Related Product Data

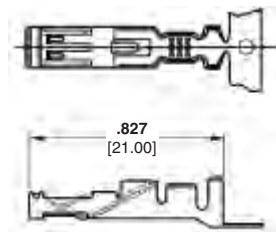
**Performance Specifications**—page 85

**Housings**—page 86

#### Technical Documents

##### Instruction Sheets

408-089J, 408-369J, 408-370J



Wire Size Range		Insulation Diameter	Part Numbers		
AWG	mm <sup>2</sup>		Receptacle Contact		Hand Tool
			Strip Form	Loose Piece	Applicator
20-14	0.5-2.0	.087-.134 2.20-3.40	170286-4	170289-3	755338-1* 755339-1

\*Part Number 755338-1 is used on wire for automotive application; Part Number 755339-1 is used on other types of wire.

\*\*Call TE for applicators.

Extraction Tool Part Number 723735-1

### Crimp Snap-In Contacts (Hermaphroditic, Used for Signal Circuits)

#### Material and Finish

Phosphor bronze, plated gold in contact area (for length of .236 [6.0] from tip), with entire contact underplated nickel

#### Related Product Data

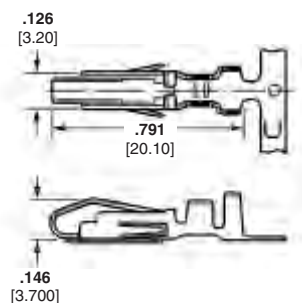
**Performance Specifications**—page 85

**Housings**—page 86

#### Technical Documents

##### Instruction Sheets

408-097J, 408-151J



Wire Size Range		Insulation Diameter	Part Numbers		
AWG	mm <sup>2</sup>		Contact		Applicator for AMP-O-ELECTRIC Machine*
			Strip Form	Loose Piece	Hand Tool
24-20	0.2-0.6	.060-.077 1.50-1.95	170311-1	170313-1	567324-2
20-16	0.5-1.4	.071-.130 1.80-3.30	170484-1	170485-1	567241-2

\*Applicators are for Model "K" machines. Consult TE for applicators for other bench machines and lead-making machines.

Notes: For applicable wire, use wire specified in UL 1015 or 1007.

Extraction Tool Part Number 723986-1

### Tab Contacts

#### Material and Finish

Brass, plated .000030 [0.00076] gold in contact area, with entire contact underplated nickel

#### Related Product Data

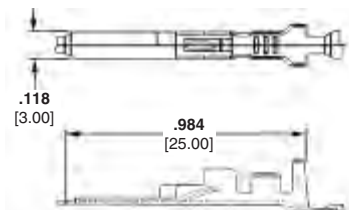
**Performance Specifications**—page 85

**Housings**—page 86

#### Technical Documents

##### Instruction Sheets

408-144J, 408-369J, 408-370J



Wire Size Range		Insulation Diameter	Part Numbers	
AWG	mm <sup>2</sup>		Tab Contact	
			Strip Form	Loose Piece
20-14	0.5-2.0	.087-.134 2.20-3.40	170221-4	170222-3

\*Part Number 755338-1 is used on wire for automotive application; Part Number 755339-1 is used on other types of wire.

Extraction Tool Part Number 724763-1

Note: All part numbers are RoHS compliant.

Cable Mounted Products

### Special Blind-Mate Drawer Connectors (uses AMP-LEAF Contacts)

#### Product Facts

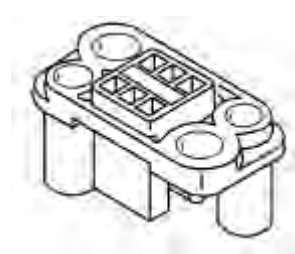
- Blind-mate connectors accept AMP-LEAF crimp snap-in and solder dip contacts
- Contacts are phosphor bronze, gold-over-nickel plated
- 6 and 10 positions
- Housings made of polybutylene terephthalate (PBT)



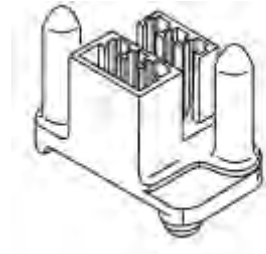
Cable Mounted Products

Special blind-mate drawer connectors are available in 6- and 10-position configurations and provide wire-to-board and wire-to-wire connection capabilities. These connectors offer the integrity of AMP-LEAF contacts with maximum travel wiping action.

Housings feature molded-in guide pins and diagonally aligned sockets for correct polarization and to facilitate blind-mating. The PC header guide pins extend through the PC board to secure the header to the board prior to soldering.



**6-Position Socket Housing**  
(Accepts AMP-LEAF Crimp Snap-In Contacts)



**6-Position PC Board Header Housing**  
(Fully loaded with AMP-LEAF Solder Dip Contacts)



**10-Position Socket Housing**  
(Accepts AMP-LEAF Crimp Snap-In Contacts)



**10-Position Header Housing**  
(Accepts AMP-LEAF Crimp Snap-In and Solder Dip Contacts)

#### Performance Specifications

**Current Rating** —  
4 Amps (max.) — 26-22 AWG  
[0.12-0.4 mm<sup>2</sup>] wire

**Voltage Rating** — 50 VDC

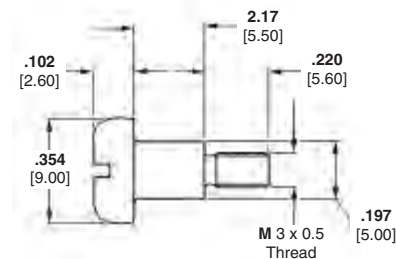
**Temperature Rating** —  
-10°C to +80°C

#### Mounting Screw (2 Required per Socket Housing)

**Part Number 343404-1**

#### Material and Finish

Steel, plated bright zinc chromate



**Note:** All part numbers are RoHS compliant.



**Special Blind-Mate Drawer Connectors** (Continued)

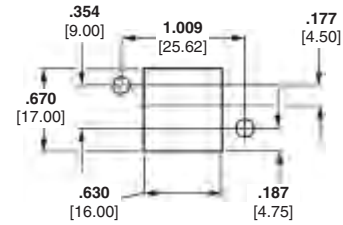
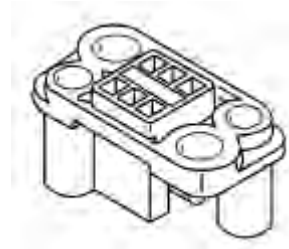
**Socket Housing, 6 Positions**

**Part Number 343886-1**

Accepts the following AMP-LEAF Crimp Snap-In Contacts:

Part Number 583990-3 (loose piece)  
Part Number 583204-2 (strip form)

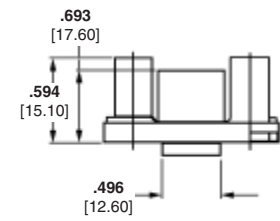
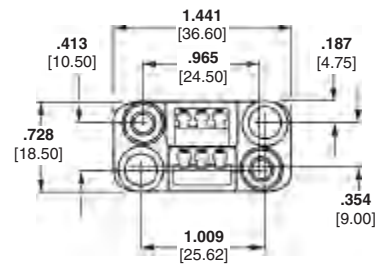
Contacts must be ordered separately.



Recommended Panel Cutout

**Material**

Glass-filled polybutylene terephthalate (PBT), black



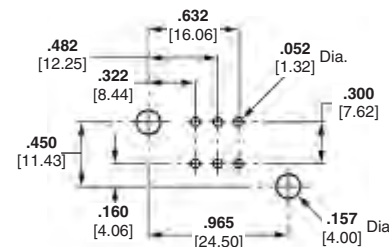
Cable Mounted Products

**PC Board Header Housing, 6 Positions with Board Retention**

**Part Number 343887-1**

Accepts AMP-LEAF Crimp Snap-In Contact Part Number 343371-1 and Solder Dip Contact Part Number 583294-2

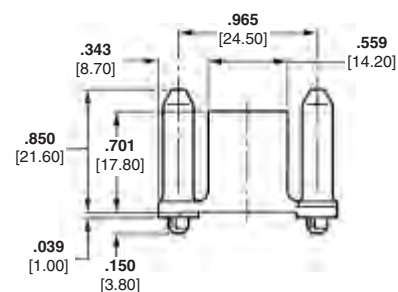
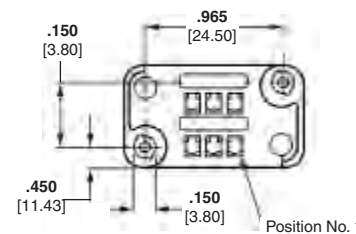
Contacts must be ordered separately; refer to contact specification pages for details.



Recommended PC Board Layout

**Material**

Glass-filled polybutylene terephthalate (PBT), black



Note: All part numbers are RoHS compliant.

**Special Blind-Mate Drawer Connectors** (Continued)

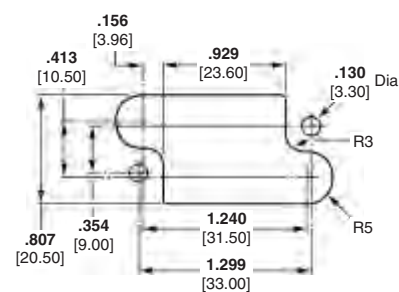
**Socket Housing, 10 Positions**

**Part Number 343348-1**

Accepts the following AMP-LEAF Crimp Snap-In Contacts:

Part Number 343371-1 (strip form)  
Part Number 583204-2 (strip form)

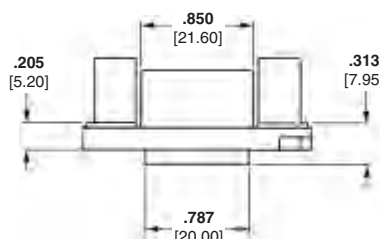
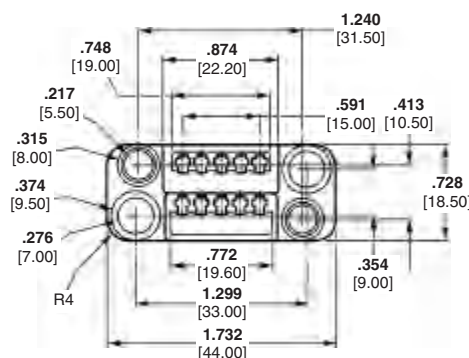
Contacts must be ordered separately.



**Recommended Panel Cutout**

**Material**

Glass-filled polybutylene terephthalate (PBT), black

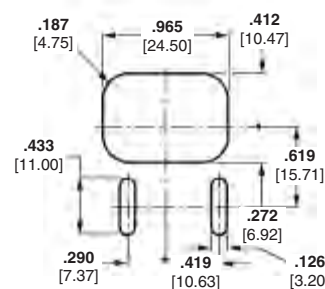
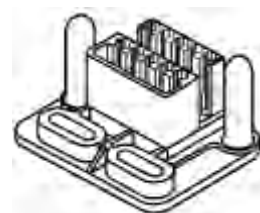


**Header Housing, 10 Positions**

**Part Number 343347-1**

Accepts AMP-LEAF Crimp Snap-In Contact Part Number 343371-1 and Solder Dip Contact Part Number 583294-2

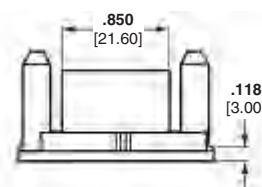
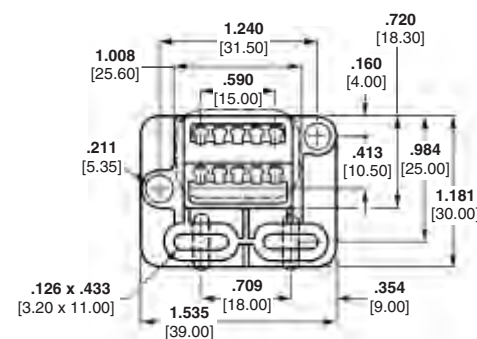
Contacts must be ordered separately; refer to contact specification pages for details.



**Recommended Panel Cutout**

**Material**

Glass-filled polybutylene terephthalate (PBT), black



**Note:** All part numbers are RoHS compliant.

### Special Blind-Mate Drawer Connectors (Continued)

#### Crimp, Snap-In Contacts

##### Material and Finish

Phosphor bronze, plated as follows:

**Plating A** — .000100-.000200 [0.00254-0.00508] tin (lubricant must be used)

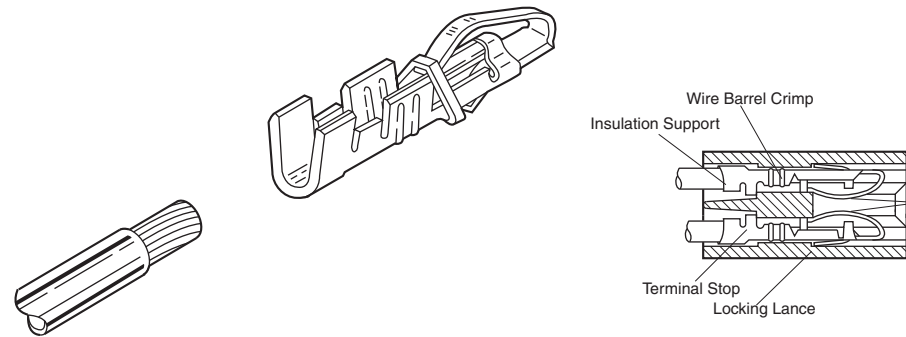
**Plating B** — .000030 [0.00076] min. gold in mating area, gold flash on remainder of contact, with entire contact underplated .000050 [0.00127] min. nickel

**Plating C** — .000015 [0.00038] min. gold in mating area, gold flash on remainder of contact, with entire contact underplated .000050 [0.00127] min. nickel

**Plating D** — .000030 [0.00076] min. gold over .000050 [0.00127] min. nickel in mating area, remainder of contact gold flash over .000015 [0.00038] min. nickel

**Plating E** — .000030 [0.00076] min. gold in mating area, with entire contact underplated .000050 [0.00127] min. nickel

**Plating F** — .000015 [0.00038] min. gold in mating area, with entire contact underplated .000050 [0.00127] min. nickel



Wire Range AWG/mm²	Insulation Range		Part Numbers				
	Single Wire	Double Wire	Loose Piece	Strip Form	Contact Finish	Applicator for AMP-O-LECTRIC Machine*	Hand Tool
26-22 0.12-0.4	.050-.064 1.27-1.63	—	583990-3	583204-2	B	466366-2	90028-3
			—	343371-1	D		
22-18 0.3-0.9	.055-.080 1.40-2.03	.120 3.05 Max.	—	583361-2	A	466367-2	90017-3 (1 #22-20) 90028-3 (2 #22) 90101-3 (1 #20)
			583989-3	583361-3	B		
			583989-4	583361-4	C		
			—	583555-4	E		
			—	583555-6	F		
16 1.25-1.40	.108 2.74 Max.	.080-.160 2.03-4.06	583991-3	60151-6	B	466368-2	90031-8 (2 #18) 90101-3 (2 #20) 90101-3 (1 #16)

\*Applicators are for AMP-O-LECTRIC Model "K" machines. Consult TE for applicators for other bench machines and lead-making machines.

- Notes:** 1. Shorting contacts are available, consult TE.  
2. Contacts and housings to accommodate .093 [2.36] thick PC boards can be made available, consult TE.

Cable Mounted Products

#### Technical Documents

##### Product Specifications

108-9013, 108-9043

##### Application Specification

114-9003

##### Instruction Sheets

408-6591, 408-7045, 408-7622, 408-7623, 408-7624, 408-7625, 408-7626

##### Crimp Inspection Sheet

CI 8050-33

#### Hand Crimping Tool

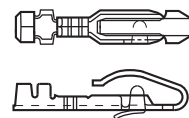


#### Contact Extraction Tool



Extraction Tool	Part Number	
	Used with Housings	
465195-1	480110-2, -5	
	480142-2, -3	
	582140-5	
	582147-5	
	582264-2	
	582500-2	
	582963-2	
	583167-3	
	583280-1	
	583617-1	
	583680-1	
	583685-1	
	583722-1	
	583723-1	
	583724-1	
583725-1		
583726-1		
465195-2	480133-2	

#### Dummy Contact



Plain Finish—  
**Part Number 66084-1**  
Tin Finish—  
**Part Number 66084-2**  
Gold Finish—  
**Part Number 66084-3**

#### Material

Phosphor bronze

#### Technical Documents

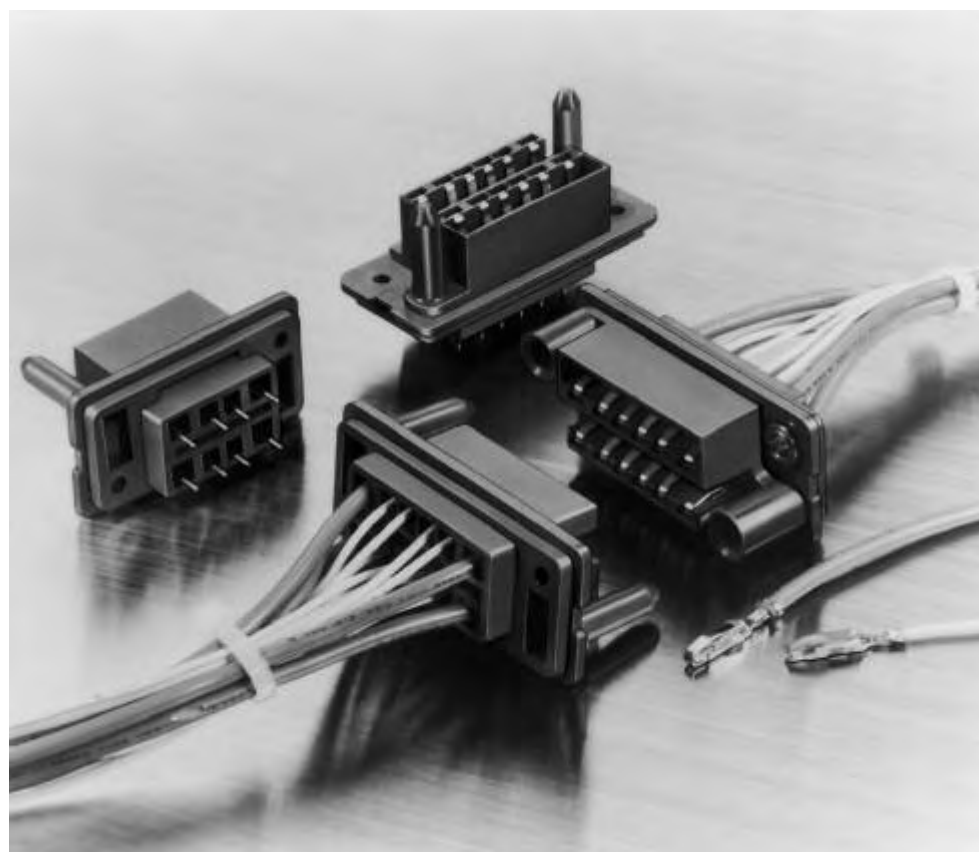
Instruction Sheet 408-7037

**Note:** All part numbers are RoHS compliant.

## Standard Blind-Mate Drawer Connectors

### Product Facts

- Designed for rack and panel applications
- Durable—withstands multiple mating/unmating
- Low insertion and withdrawal force
- Hermaphroditic contacts
- Accepts signal and power contacts
- Provides excellent creep distance
- Mated connectors dust-proof
- Configurations available in 8, 12, 16, 20 and 24 positions
- Contacts accept wire sizes 24-14 AWG [0.2-2.0 mm<sup>2</sup>]
- Accept wire insulation diameter — .059-.154 [1.5-3.9]
- Recognized under the Component Program of the Underwriters Laboratories Inc.



Drawer connectors are designed as an economical rack and panel connector. They are used in copying machines, control panels, power distribution boards, industrial equipment, power supplies and other electronic equipment.

Blind-mate drawer connectors feature excellent durability and provide low insertion and withdrawal force. Leaf-type hermaphroditic contacts ensure reliable, positive contact.

Contacts are on .197 [5.00] centerlines for signal circuits, and .260 [6.60] centerlines for power circuits (2-circuits at each end of the double row of contacts) for a total of 4. Row-to-row spacing is .390 [9.90].

Housings are made of UL 94V-0 rated thermoplastic and feature molded-in guide pins and sockets for positive connector mating.

Other features include wire outlets which provide for sufficient creep distance, plus mated assemblies are completely dust-proof.

Additional economies are achieved through the use of strip-form contacts suitable for high-speed automatic machine terminations. For prototype, maintenance and repair applications, contacts are available in loose piece for easy termination with TE hand crimping tools.

### Performance Specifications

**Voltage Rating** — 250 VAC

**Current Rating** —  
 4 Amps — 24 AWG [0.2 mm<sup>2</sup>] Wire  
 5 Amps — 22 AWG [0.3-0.4 mm<sup>2</sup>] Wire  
 7 Amps — 20 AWG [0.5-0.6 mm<sup>2</sup>] Wire  
 8 Amps — 18 AWG [0.8-0.9 mm<sup>2</sup>] Wire  
 12 Amps — 16 AWG [1.25-1.4 mm<sup>2</sup>] Wire  
 15 Amps — 14 AWG [2.0 mm<sup>2</sup>] Wire

**Contact Resistance** —  
 10 milliohms max. (Initial)  
 20 milliohms max. (Final)

**Insulation Resistance** —  
 5000 milliohms min. (Initial)  
 2000 milliohms min. (Final)

**Dielectric Withstanding Voltage** —  
 2000 VAC/1 minute

**Operating Temperature** —  
 -20°C to +120°C (Includes T-Rise)

**Insertion/Extraction Force** —  
 Insertion—4 kg max. (Initial) —  
 16-position  
 Extraction—0.7 kg min. (Initial) —  
 16-position

**Durability** —  
 Tested to 1000 Mate/Unmate cycles

**Standard Blind-Mate Drawer Connectors** (Continued)

**Plug Connectors, PCB-Mount**

**Material and Finish**

**Housing** — Glass-filled polybutylene terephthalate (PBT), blue, 94V-0 rated

**Contacts** — Phosphor bronze, plated gold in contact area over nickel underplating; board-mount tails are brass, plated tin over steel underplating

**Related Product Data:**

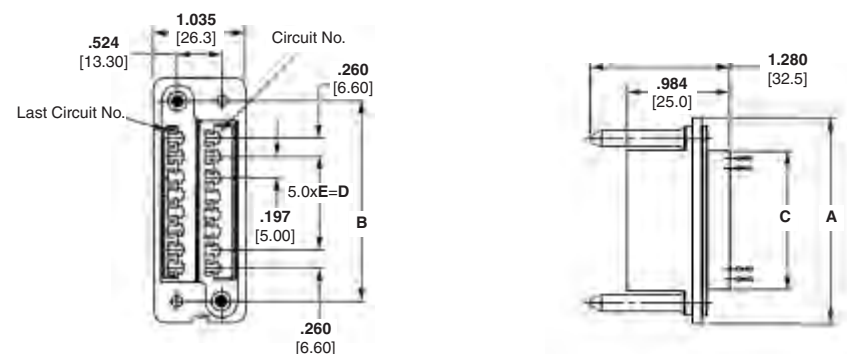
**Performance Specifications** — page 92

**Mating Receptacles** — page 94

**Technical Documents**

**Product Specification**  
108-5125

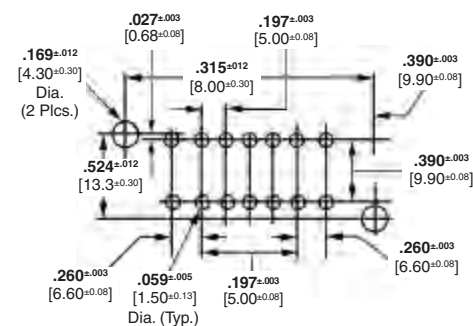
**Application Specification**  
114-5044



Cable Mounted Products

No. of Pos.	Dimensions					Plug Connector Part Numbers
	A	B	C	D	E	
8	2.016 51.2	1.500 38.0	1.055 26.8	.197 5.00	1	172653-2
12	2.409 61.2	1.890 48.0	1.449 36.8	.591 15.0	3	172653-3
16	2.803 71.2	2.283 58.0	1.843 46.8	.984 25.0	5	172653-1

**Note:** To ensure proper contact alignment, connectors must be mated during the soldering process.



**Recommended PC Board Layout**

**Note:** All part numbers are RoHS compliant.

**Standard Blind-Mate Drawer Connectors** (Continued)

**Housings for Crimp Snap-In Contacts**

**Material**

Polybutylene terephthalate (PBT), blue, 94V-0 rated

**Related Product Data**

**Performance Specifications** — page 92

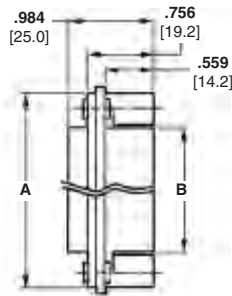
**Crimp Snap-In Contacts** — page 95

**Panel Cutout** — page 95

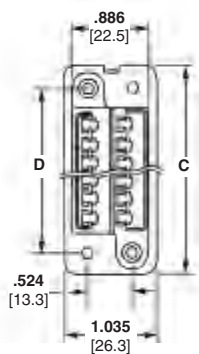
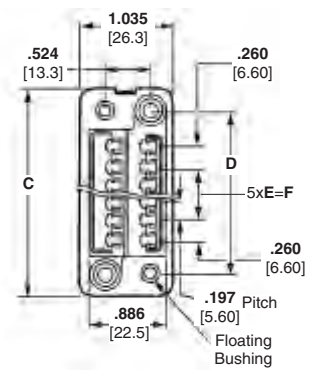
**Technical Documents**

**Product Specification** 108-5125

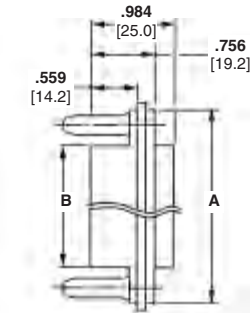
**Application Specification** 114-5044



Receptacle



Plug



No. of Pos.	Dimensions						Receptacle		Plug	
	A	B	C	D	E	F	Floating Bushing Size	Part Numbers	Panel-Mount Hole Diameter	Part Numbers
8	1.858 47.20	1.055 26.80	2.016 51.20	1.500 38.00	1	.197 5.00	.118 3.00	5172070-1	.130 3.30	172063-1
							.157 4.00	5172070-3	.169 4.30	172063-3
12	2.252 57.20	1.449 36.80	2.410 61.20	1.890 48.00	3	.591 15.00	.118 3.00	5172069-1	.130 3.30	172061-1
							.157 4.00	5172069-3	.169 4.30	172061-3
16	2.657 67.20	1.843 46.80	2.803 71.20	2.283 58.00	5	.984 25.00	.118 3.00	5172068-1	.130 3.30	172059-1
							.157 4.00	5172068-3	.169 4.30	172059-3
20	3.039 77.20	2.236 56.80	3.197 81.20	2.677 68.00	7	1.378 35.00	.157 4.00	5173033-3	.169 4.30	173032-3
							.118 3.00	5172625-1	.130 3.30	172624-1
24	3.433 87.20	2.630 66.80	3.591 91.20	3.071 78.00	9	1.772 45.00	.157 4.00	5172625-3	.169 4.30	172624-3

Note: All part numbers are RoHS compliant.

### Standard Blind-Mate Drawer Connectors (Continued)

#### Crimp Snap-In Contacts (Hermaphroditic)

##### Material and Finish

Phosphor bronze, plated gold in contact area (for length of .236 [6.0] from tip), with entire contact underplated nickel

##### Related Product Data

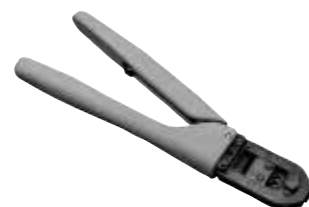
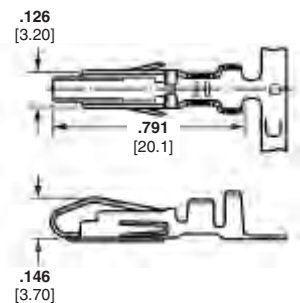
Performance Specifications — page 92

Housings — page 94

##### Technical Documents

##### Instruction Sheets

408-097J, 408-098J, 408-151J



CERTI-CRIMP Hand Tool  
Part Number 91591-1

Wire Size Range AWG	Wire Size Range mm <sup>2</sup>	Insulation Dia. Range	Part Numbers		Applicator for AMP-O-ELECTRIC Machine*	Hand Tool Numbers
			Contact Strip Form	Contact Loose Piece		
24-20	0.2-0.6	.059-.077 1.50-1.95	170311-1	170313-1	567324-2	91591-1
20-16	0.5-1.4	.071-.130 1.80-3.30	170484-1	170485-1	567241-2	91590-1
18-14	0.8-2.0	.091-.154 2.30-3.90	170312-1	170314-1	567325-2	2063849-1

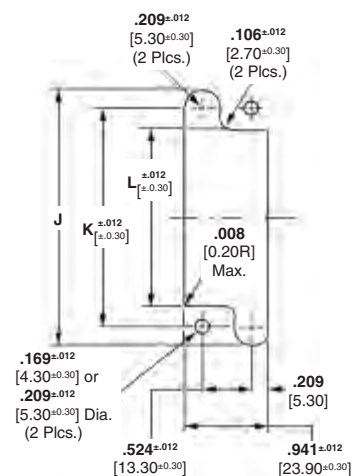
\*Applicators are for Model "K" machines. Consult TE for applicators for other bench machines and lead-making machines.

**Notes:** 1. For applicable wire, use wire specified in UL 1015 or 1007.  
2. Contacts for 18-14 AWG [0.8-2.0 mm<sup>2</sup>] wire are used at the four corners of the connector as power contacts (8 required per assembly).

Extraction Tool **Part Number 723986-1**

Cable Mounted Products

#### Recommended Panel Cutout



Rear Panel-Mount

No. of Pos.	Rear Panel-Mount Dimensions		
	J	K	L
8	1.913 48.60	1.500 38.00	1.110 28.20
12	2.307 58.60	1.890 48.00	1.504 38.20
16	2.701 68.60	2.283 58.00	1.898 48.20
20	3.094 78.60	2.677 68.00	2.291 58.20
24	3.488 88.60	3.071 78.00	2.685 68.20

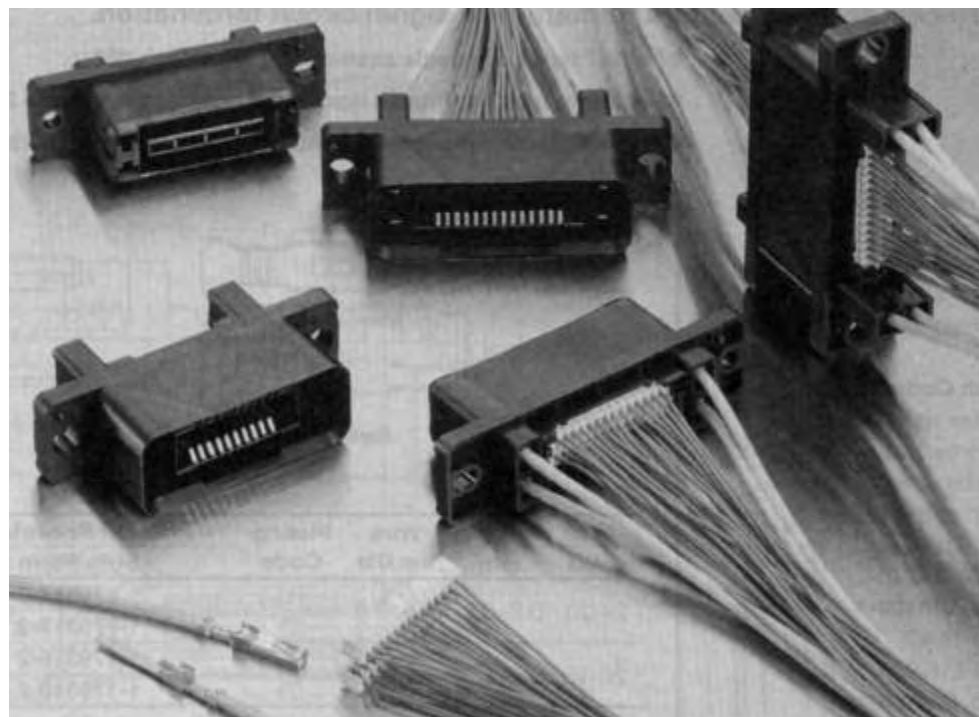
**Note:** Mounting holes of .209 [5.30] dia. are used when mounting receptacle housings with .157 [4.0] long floating bushings and the mating plug housings. Panel thickness is .063 [1.60]. Panel cutout shown above is for use with plug housings. For receptacle housings, use the mirror-image cutout.

**Note:** All part numbers are RoHS compliant.

## Hybrid Mini-Drawer Connectors

### Product Facts

- Combine signal circuits and power circuits into one connector
- Power circuits can be used for high current of up to 15A
- Signal circuits accept CT connector in the back, reducing harnessing costs
- Power circuits use crimp-type tab and receptacle contacts
- Meet requirements for creepage distance and spatial distance for primary power supply as set forth in IEC-950, safety specifications for business machines and OA equipment. Creepage distance on active power side: 5 mm  
Spatial distance on active power side: 4.5 mm



### Technical Documents

**Product Specification**  
108-60022

**Application Specification**  
114-5182

Hybrid mini-drawer connectors are designed for use in rack and panel application to serve as an I/O connector for copying machines, laser-beam printers and other OA equipment. They provide an economical means of combining into one connector signal circuits and power circuits which were packaged separately in the past.

A major design feature of these hybrid mini-drawer connectors is that mini-drawer connectors mate with one another on the connector mating side and in the back, signal circuits accept a pre-terminated CT receptacle connector.

Also, for power circuits, crimp-type power contacts are used by inserting them into the four corners of the mini-drawer connector.

The housing has an integrated guide-pin and socket to facilitate mating of the connector halves. Provision is also made to prevent dust from entering.

This product line includes:

- 12-position connector (4 positions for power and 8 positions for signal circuits)
- 24-position connector (4 positions for power and 20 positions for signal circuits)
- 32-position connector (4 positions for power and 28 positions for signal circuits)

Drawer connectors are available in the following types depending on application: (For details contact our sales department)

- Mini-drawer connectors
- Standard drawer connectors
- High current drawer connectors

### Performance Data

**Voltage Rating** —  
250V AC (power)  
30V AC (signal)

**Current Rating** —  
15A max. (power)  
2A max. (signal)

**Contact Resistance** —  
10 mm  $\Omega$  max. (power)  
40 mm  $\Omega$  max. (signal)

**Insulation Resistance** —  
100M  $\Omega$  max.

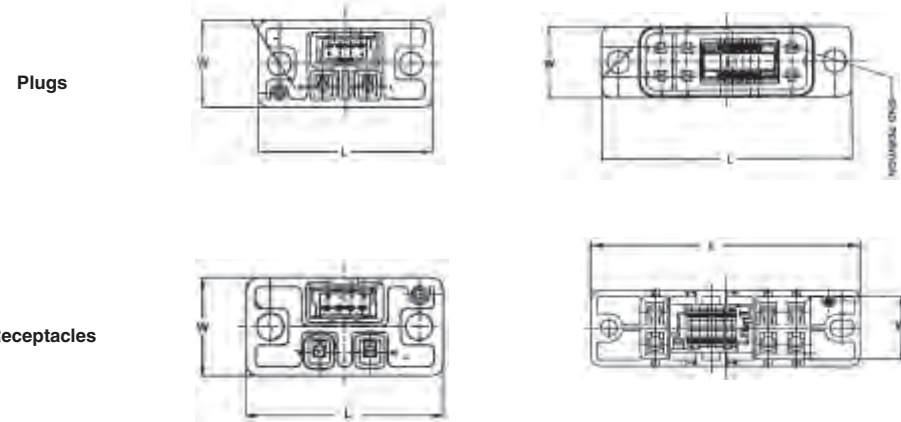
**Dielectric Withstanding Voltage** —  
1.8KV AC/min. (power)  
1.0KV AC/min. (signal)

**Durability** — 3,000 cycles min.



**Hybrid Mini-Drawer Connectors** (Continued)

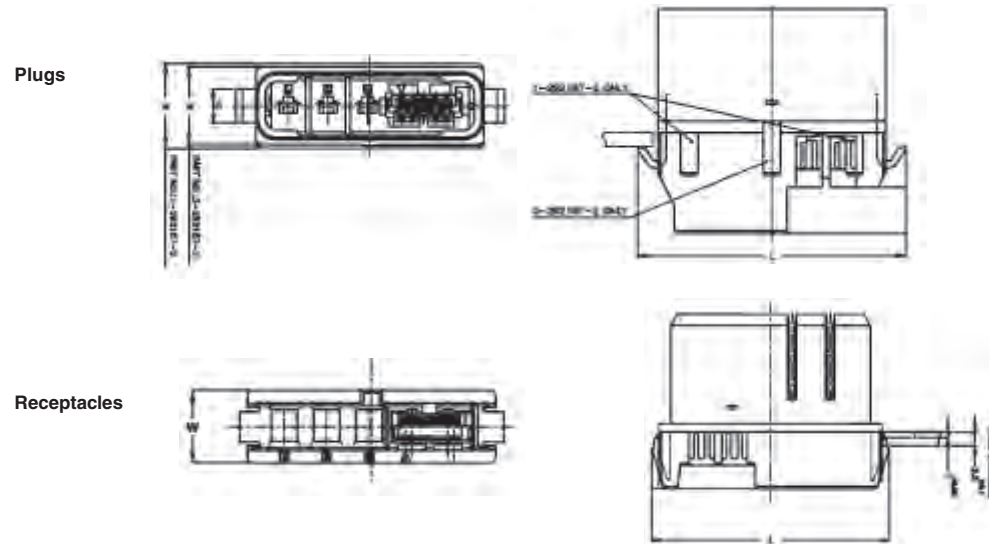
**Standard Width**



Type	Part Number	Number of Power Contacts	Number of Signal Contacts	L	W
Plug	292180-1	2	4	1.299 [33.00]	.646 [16.40]
Receptacle	292184-1	2	4	1.299 [33.00]	.646 [16.40]
Plug	1-292183-2	6	12	2.638 [67.00]	.748 [19.00]
Receptacle	1-292186-2	6	12	2.638 [67.00]	.748 [19.00]

Cable Mounted Products

**Slim Width**



Type	Part Number	Number of Power Contacts	Number of Signal Contacts	L	W
Plug	1-292187-2	3	5	1.870 [47.50]	.591 [15.00]
Receptacle	2-292190-2	3	5	1.713 [43.50]	.472 [12.00]
Plug	3-292187-2	4	5	2.146 [54.50]	.531 [13.50]
Receptacle	4-292190-2	4	5	1.988 [50.50]	.472 [12.00]
Plug	2-292189-3	3	7	2.028 [51.50]	.591 [15.00]
Receptacle	1-292192-3	3	7	1.870 [47.50]	.472 [12.00]

**Note:** All part numbers are RoHS compliant.

**Hybrid Mini-Drawer Connectors** (Continued)

**Power Contacts**
**Material**

 Copper alloy  
 For finish, see table below.

**Finish Codes**

1) Over nickel underplated, contact area:

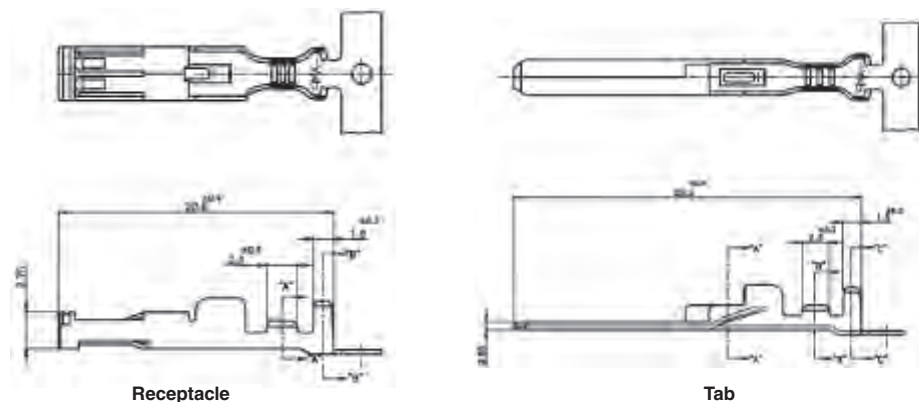
gold plated, crimp area: tin plated

2) Tin plated all over.

Hand Tool AWG #20-24

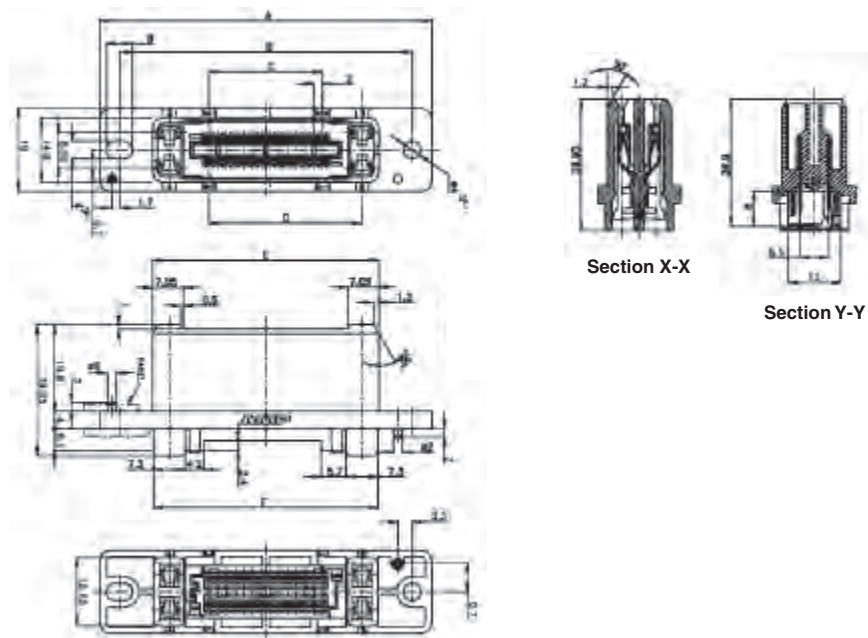
**Part No. 934199-1 (411-5662)**

AWG #16-20

**Part No. 934198-1 (411-5661)**


Wire Range		Wire Ins. Dia.	Plating Code	Receptacle Part Number	Tab Part Number
AWG	mm <sup>2</sup>			Strip Form	Strip Form
24-20	0.2-0.5	1.4-2.6	1	179317-2	179322-2
			2	1-179317-2	1-179322-2
20-16	0.5-1.25	1.6-2.8	1	179316-2	179321-2
			2	1-179316-2	1-179321-2

**Receptacle Assembly**
**Material and Finish**
**Housing** — Thermoplastic, black

**Contact** — Copper alloy, gold plated on mating side over nickel underplate, tin plated on CT mating side over nickel underplate.


No. of Pos. (Power/ Signal)	Dimensions								Mini-Drawer Receptacle Assembly Part No.	Required Number of Power Contact	Required Number of CT Connector
	A	B	C	D	E	F	G	H			
12 (4-8)	56.0	47.0	6.0	24.1	31.8	31.4	38.0	32.4	292185-8	4	4 Pos. x 2
24 (4-20)	68.0	59.0	18.0	36.1	43.8	43.4	50.0	44.4	2-292185-0	4	10 Pos. x 2
32 (4-28)	76.0	67.0	26.0	44.1	51.8	51.4	58.0	52.4	2-292185-8	4	14 Pos. x 2

**Note:** All part numbers are RoHS compliant.

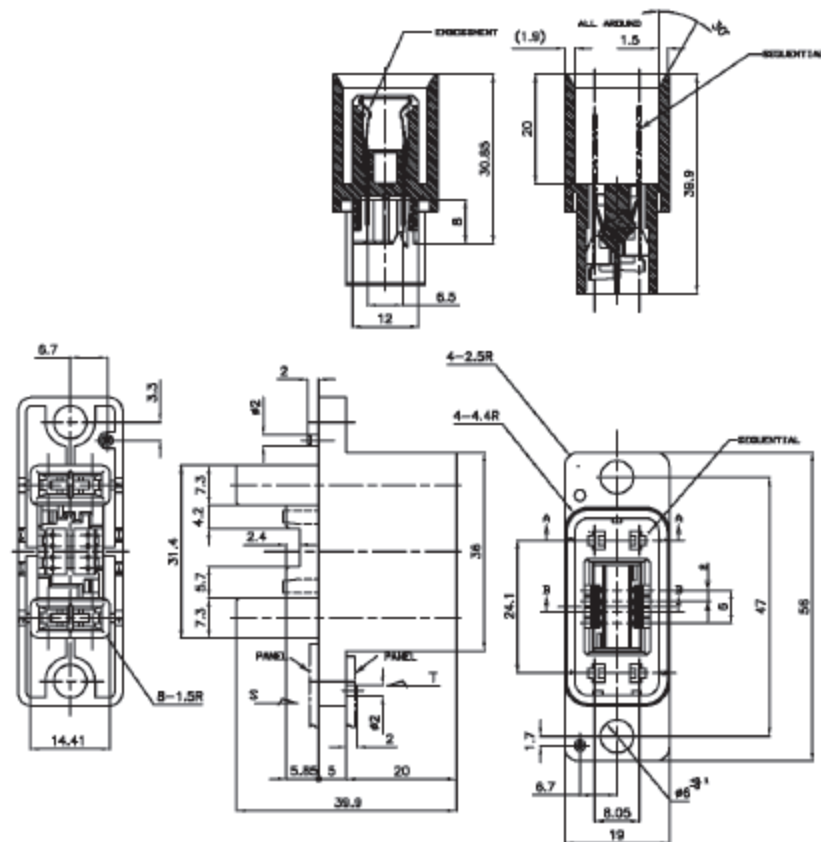
**Hybrid Mini-Drawer Connectors** (Continued)

**Plug Assembly**

**Material and Finish**

**Housing** — Thermoplastic, black  
UL94V-0

**Contact** — Copper alloy, gold plated  
on mating side over nickel underplate,  
tin plated platen on CT mating side over  
nickel underplate.



Cable Mounted Products

No. of Pos. (Power/ Signal)	Dimensions								Mini-Drawer Receptacle Assembly Part No.	Required Number of Power Contact	Required Number of CT Connector
	A	B	C	D	E	F	G	H			
12 (4-8)	56.0	47.0	6.0	24.1	36.0	31.4	33.4	38.0	292182-8	4	4 Pos. x 2
24 (4-20)	68.0	59.0	18.0	36.1	48.0	43.4	45.4	50.0	2-292181-0**	4	10 Pos. x 2
32 (4-28)	76.0	67.0	26.0	44.1	56.0	51.4	53.4	58.0	2-292181-8	4	14 Pos. x 2

\*12-Position connector is provided with sequential feature in one power circuit position. Other connector sizes have sequential feature in power circuits and signal circuits.

\*\*Optional part numbers offer sequential mating – see customer drawings for details.

**Note:** All part numbers are RoHS compliant.

**Hybrid Mini-Drawer Connectors** (Continued)

**CT Receptacle Connectors to Mate with Signal Circuit Terminator with Insulation Displacement Contacts**

**Receptacle Assemblies (Wire Application Side)**

**Material and Finish**

**Housing** — UL94V-0 rated, glass-filled P.B.T. see chart below for color.

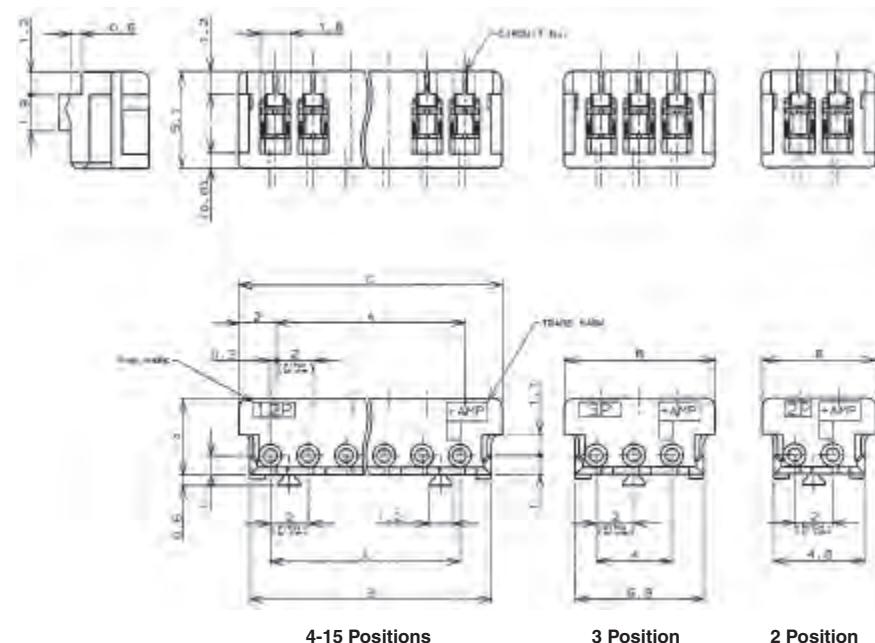
**Contact** — Pre-tinned phosphor bronze

**Wire Size** — AWG #28-26 (0.08-0.15 mm<sup>2</sup>)

**Insulation Dia.** — 0.85-1.05 mm

**Wire Size** — AWG #24 (0.20-0.22 mm<sup>2</sup>)

**Insulation Dia.** — 0.95-1.05 mm<sup>2</sup> (For AWG #24 wire, see notes under the table)



Cable Mounted Products

No. of Positions	Dimensions			Part Number	
	A	B	C	Receptacle Assembly**	
				AWG #28-26*	AWG #24***
2	2.0	4.8	6.0	173977-2	2-179694-2
3	4.0	6.8	8.0	173977-3	2-179694-3
4	6.0	8.8	10.0	173977-4	2-179694-4
5	8.0	10.8	12.0	173977-5	2-179694-5
6	10.0	12.8	14.0	173977-6	2-179694-6
7	12.0	14.8	16.0	173977-7	2-179694-7
8	14.0	16.8	18.0	173977-8	2-179694-8
9	16.0	18.8	20.0	173977-9	2-179694-9
10	18.0	20.8	22.0	1-173977-0	3-179694-0
11	20.0	22.8	24.0	1-173977-1	3-179694-1
12	22.0	24.8	26.0	1-173977-2	3-179694-2
13	24.0	26.8	28.0	1-173977-3	3-179694-3
14	26.0	28.8	30.0	1-173977-4	3-179694-4
15	28.0	30.8	32.0	1-173977-5	3-179694-5

\* The color of housing is natural. Other colors available include blue, yellow and black. For details contact our Sales Department

\*\* For wire to be used, contact our Sales Department as there are wires that have been tested by TE and can be recommended for your use.

\*\*\* The color of housing is gray.

**Note:** All part numbers are RoHS compliant.

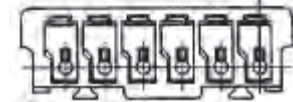
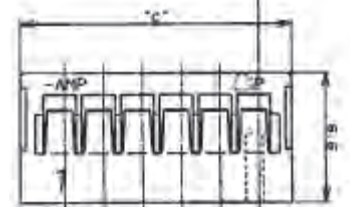
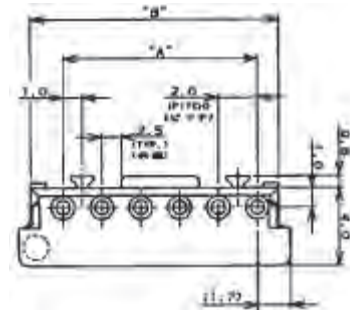
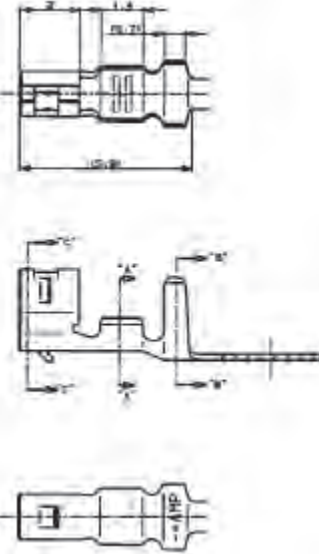
**Hybrid Mini-Drawer Connectors** (Continued)

**CT Receptacle Contacts to Mate with Signal Circuit Termination with Crimp Type Contacts**

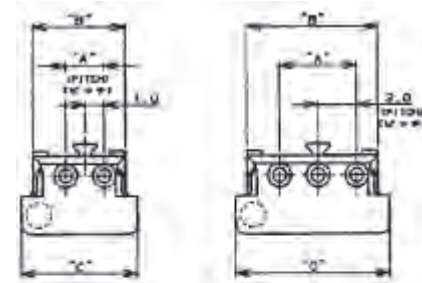
Wire Size AWG (mm <sup>2</sup> )	Insulation Dia. (mm)	Material and Finish	Part Number		
			Strip Form	Loose Piece	Hand Tool
30-26 (0.05-0.12)	0.65-1.35	Phosphor bronze (0.20 mm thickness), tin plated	179609-1	—	234169-1 (411-5711)
26-22 (0.12-0.35)	0.93-1.5		179227-1	179518-1	91572-1 (408-8547)

**Note:** Loose piece contacts, being small in size, are supplied in the form of a comb with 10 pieces on 7.5 mm pitch. There is a slit at the root of each contact and it can be snapped off easily.

**Receptacle Contact**

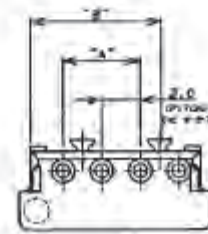


4-15 Positions



2 Position

3 Position



4 Position

**Receptacle Housing Material**

UL94-0 rated, 66 nylon, natural color (white)

No. of Positions	Dimensions			Part Number Receptacle Assembly*
	A	B	C	
2	2.0	4.8	6.0	179228-2
3	4.0	6.8	8.0	179228-3
4	6.0	8.8	10.0	179228-4
5	8.0	10.8	12.0	179228-5
6	10.0	12.8	14.0	179228-6
7	12.0	14.8	16.0	179228-7
8	14.0	16.8	18.0	179228-8
9	16.0	18.8	20.0	179228-9
10	18.0	20.8	22.0	1-179228-0
11	20.0	22.8	24.0	1-179228-1
12	22.0	24.8	26.0	1-179228-2
13	24.0	26.8	28.0	1-179228-3
14	26.0	28.8	30.0	1-179228-4
15	28.0	30.8	32.0	1-179228-5

\* The color of housing is natural. Other colors available include blue, yellow and black. For details contact our Sales Department

**Note:** All part numbers are RoHS compliant.

Cable Mounted Products

## ET Power Connector

### Product Facts

- Right-angle and vertical mounts available
- Low profile right-angle connector  $\leq 8$  mm above pcb
- 2.5 mm<sup>2</sup> (14 AWG) to 6 mm<sup>2</sup> (10 AWG) wire range
- Refer to current v temp rise graphs for current capability
- Coding contacts for sense function
- Positive metal latch retention
- Up to 30 Amps per contact. See temperature rise charts on page 103



### Description

- Cable to pcb
- Low profile Right Angle
- Vertical Mount
- High reliability interface
- Excellent price to performance ratio

Designed for low-profile power distribution units requiring small form factor connector with high current, the ET power connector is a low loss, highly reliable and cost effective solution for cable-to-pcb applications.

The connector is available in both a vertical mount and a right-angle mount, which stands at just 8 mm off of the board. A unique feature of the ET power series is integrated coding contacts which allow different electronic functions such as sense and enable to be

designed into the PDU electronics with activation on full insertion of the cable connector.

Crimp contacts from the industry proven "Standard Power Timer" range for use with 2.5 mm<sup>2</sup> (14 AWG), 4 mm<sup>2</sup> (12 AWG) and 6 mm<sup>2</sup> (10 AWG) wire.

The cable connector has a positive latching mechanism providing no accidental un-mating even with pull forces up to 100N.

### Application

- Power Distribution
- Power Supplies
- Telecoms Base Stations
- Computer Servers and Storage Systems
- Industrial Electronic Equipment Cabinets

### Material and Finish

**Housing ST Cable** — Black glass-filled thermoplastic, UL 94V-0 rated

**Latch** — Stainless Steel

**Housing ST & Right-angle PCB** — Black glass-filled thermoplastic, UL 94V-0 rated

**Power Contacts** — Copper alloy, 3.0  $\mu$ m Ag min.

**Contact Detection** — 0.8  $\mu$ m gold min. in contact place; 1.27  $\mu$ m nickel min. contact place

### Technical Documents

#### Product Specification

108-19346

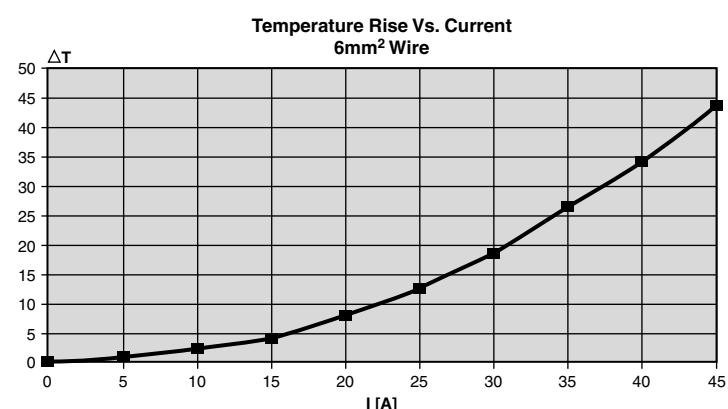
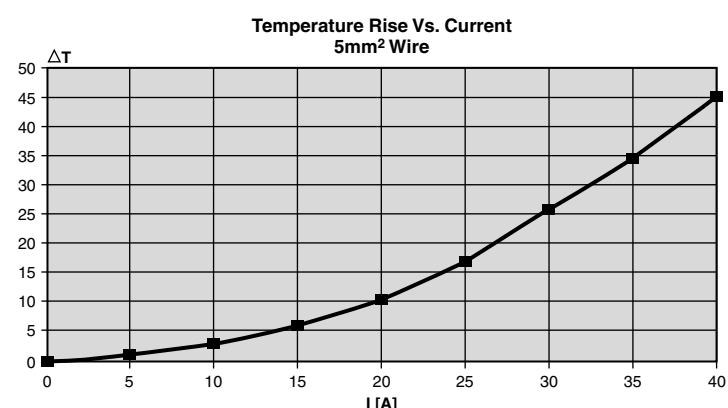
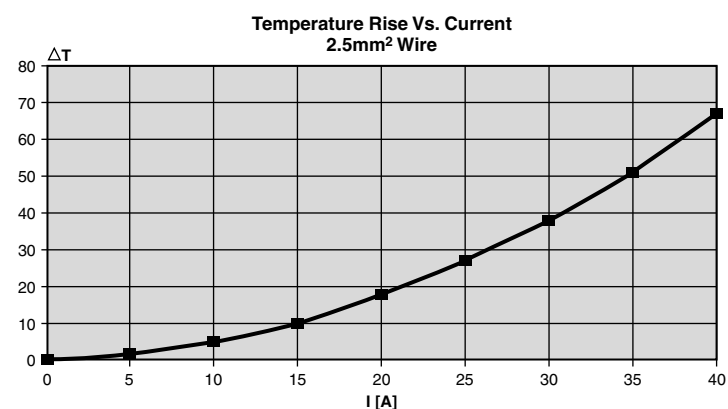
#### Application Specification

114-19110

**ET Power Connector** (Continued)

**Test Results**

**Temperature Rise vs. Current Results**

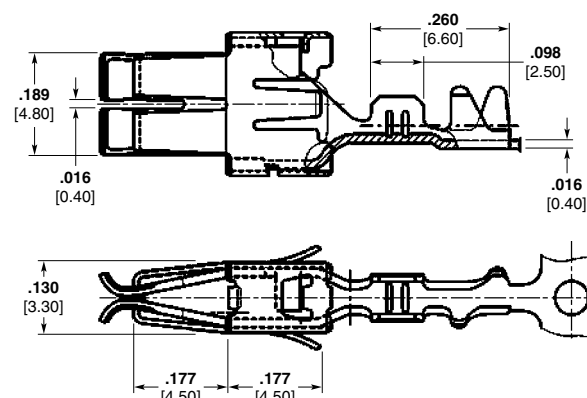


Cable Mounted Products

**Contact Summary**

Refer to Standard Timer catalog 889759 for detailed information or Product/ Application Specification.

Wire Size Range mm <sup>2</sup>	Part Number
0.2 – 0.5	927840-4
0.5 – 1.0	927831-4
>1.0 – 2.5	927837-4
>2.5 – 4.0	927829-5
>4.0 – 6.0	963709-5



**Material**  
**Plating** — Silver

**Technical Documents**  
**Product Specification**  
108-18025  
**Application Specification**  
114-18037

**Note:** All part numbers are RoHS compliant.

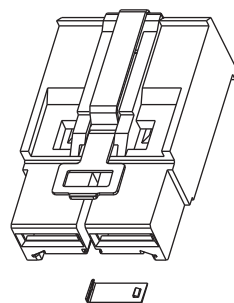
**ET Power Connector** (Continued)

**ET Power Cable Connector**

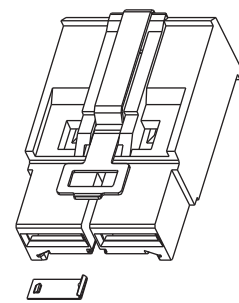
**Material and Finish**

**Housing** — Thermoplastic, UL 94V-0 rated

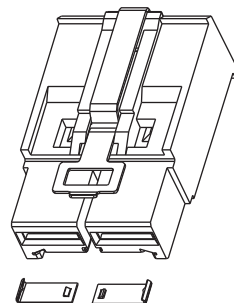
**Latch** — Stainless Steel



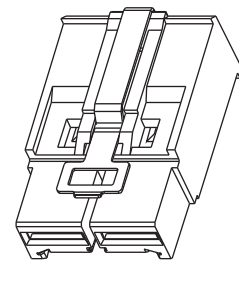
**Part Number 1982299-1**  
With Right Coding Key Only



**Part Number 1982299-2**  
With Left Coding Key Only



**Part Number 1982299-3**  
With Two Coding Keys



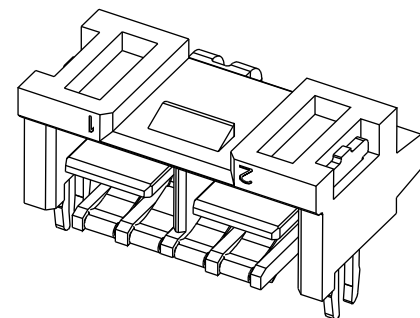
**Part Number 1982299-4**  
Without Coding Keys

**Right-Angle PCB Header**

**Material and Finish**

**Housing** — High temperature liquid crystal polymer, UL 94V-0 rated

**Contacts** — Silver plated copper alloy



**Part Number 1982295-1**  
With Coding Contacts

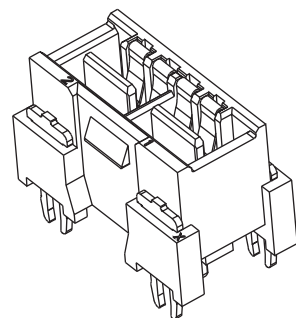
**Part Number 1982295-2**  
Without Coding Contacts

**Vertical PCB Header**

**Material and Finish**

**Housing** — High temperature liquid crystal polymer, UL 94V-0 rated

**Contacts** — Silver plated copper alloy



**Part Number 2042274-1**  
With Coding Contacts



**Part Number 2042274-2**  
Without Coding Contacts

**Note:** All part numbers are RoHS compliant.



## AMP-DUAC PL Connectors

### Product Facts

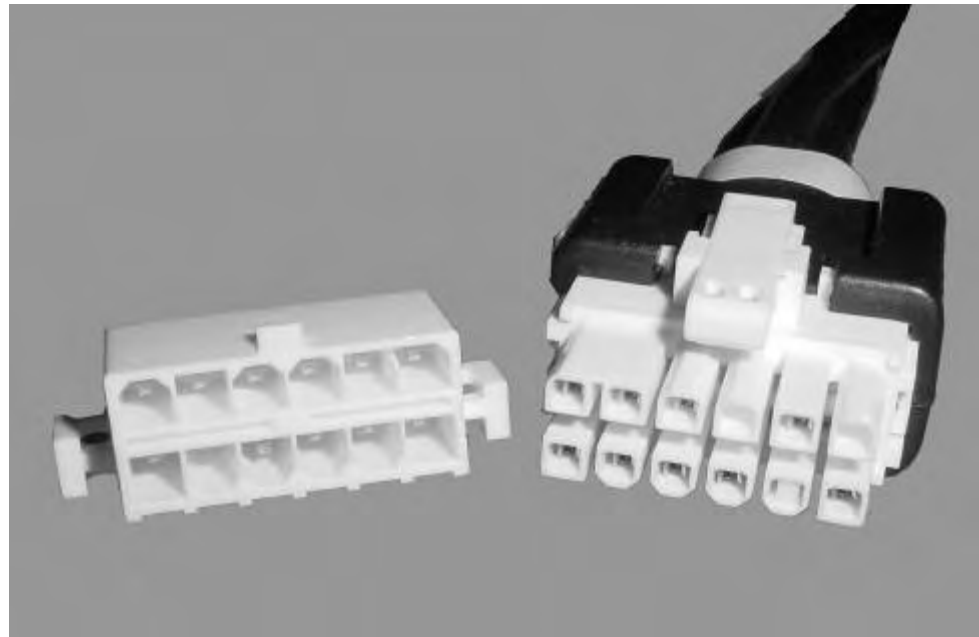
- Wire to board connection system
- Improved dual-action contact design — provides better contact lead-in and reduces contact mating force
- Sequenced contacts available for mate-first break-last operation
- 4-, 6- and 12-position right-angle headers and free hanging receptacles
- 4.2 mm x 5.5 mm centerline
- Receptacle contacts designed for 26-16 AWG stranded wire
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476 
- Certified by Canadian Standards Association, File No. LR7189 

### Technical Documents

- Product Specification**  
108-1646
- Application Specification**  
114-6067-Crimping Contacts
- Qualification Test Report**  
501-394

### Performance Data

- Voltage Rating** — 600 VAC
- Current Rating** — 9 Amps maximum in 2-position application
- Low Level Resistance** — 10 megohms max.
- Dielectric Withstanding Voltage** — 1500 VAC/min.
- Insulation Resistance** — 1000 Megohms minimum
- Operating Temperature** — -55°C to + 105°C [-67°F to +221°F]



Cable Mounted Products

The latest addition to the 4.2 mm Wire-to-Board Power Connectors is the AMP-DUAC PL Connector. This product uses the industry proven AMP-DUAC contacts with the addition of several housing improvements to offer significant overall improvements in connector reliability. The product is available in both component form and as fully assembled custom cable assemblies.

The AMP-DUAC PL housings are designed to confirm that all electrical contacts are fully seated. The “PL” refers to “Positive

Locking” of the contacts. It is also referred to as terminal position assurance. Contacts are inserted into the receptacle housing and the contact lock is installed to lock all the contacts into position. If any one of the contacts is not fully inserted, the contact lock cannot be installed. This feature eliminates a common concern of operator fatigue and the resulting contact back-out, which occurs when a contact is not installed properly. An improved mounting flange has also been added for more secure printed circuit board mounting.

Finally, the housings have been re-designed to provide an improved latch, which offers a metal spring instead of the original plastic spring/latch. An extended latch arm is also available for hard to reach installations or where the connectors are stacked in close proximity.

All the housings are polarized to help prevent mis-mating.

**AMP-DUAC PL Connectors** (Continued)

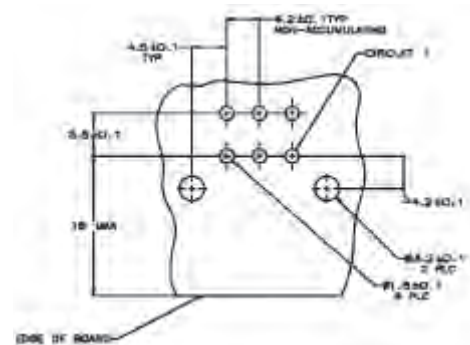
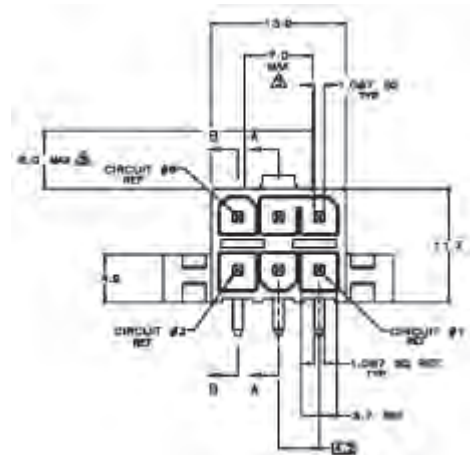
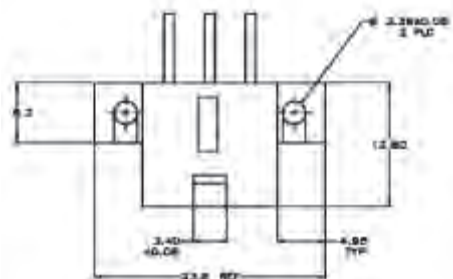
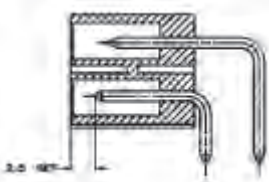
**AMP-DUAC PL PCB Headers**

**Material**

**Housings** — Nylon, UL 94V-0  
Color, white

**Contacts** — Brass, tin-lead

**Finish** — 0.00038 [0.00030] gold in mating area, tin-lead in solder tail, all over 0.00127 [0.00050] nickel



Recommended Mounting Hole Pattern  
For 1.78 Max. Thick PC Board  
Component Side Shown

No. of Positions	Mate-First Break-Last Position #	Part Number
4	All Standard	5794172-2
	Length 3	5794172-3
6	All Standard	5794173-2
	Length 3	5794173-3
12	All Standard	5794176-2
	Length 4	5794176-3

Note: All part numbers are RoHS compliant.

**AMP-DUAC PL Connectors** (Continued)

**AMP-DUAC PL Receptacles**

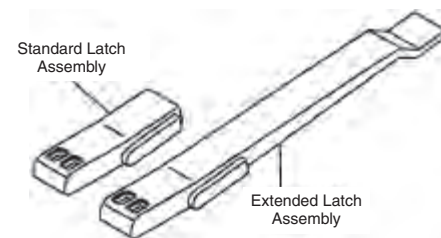
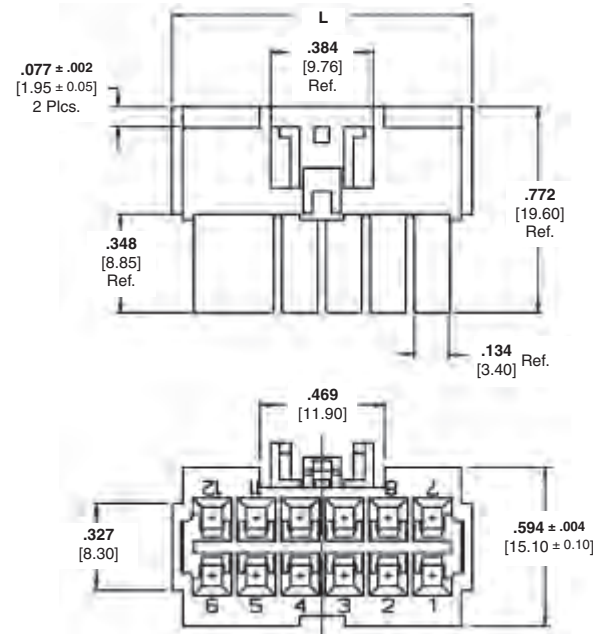
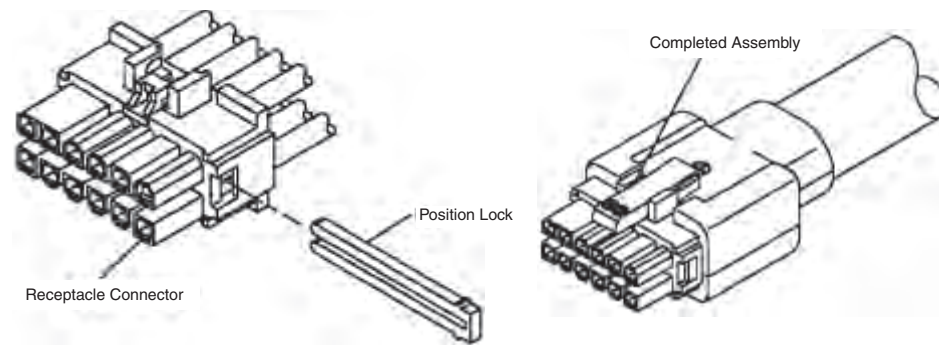
**Material**

**Housings** — Nylon, UL94V-0

Color, White

**Technical Documents** — page 105

**Contacts** — page 113



No. of Positions	Dimension L	Part Numbers			
		Housing	Housing with Positive Lock	Standard Latch	Extended Latch
4	15.9	794152-1*	794318-1		
6	20.1	794153-1	794319-1	794150	794149
12	28.6	794156-1	794322-1		

\*Latch items ordered separately  
Optional keying plug — Part No. 794144-1


**Note:** Position Lock Required — use one per housing — Part No. 794145-3

**Note:** All part numbers are RoHS compliant.

Cable Mounted Products

## AMP-DUAC PL-II Connectors

### Product Facts

- Wire-to-board connection system combining power and signal contacts
  - 10A power contacts
  - 4A signal contacts
- High conductivity copper alloy power contacts yield 30% gain in current carrying capacity compared to alternative designs
- Dual action contact design — reduces mating forces by up to 50% compared to alternative designs
- 9 power and 20 signal contacts
- Positive Lock (PL) feature on both power and signal contacts ensures contacts remain in position in cable receptacle
- Pin and receptacle contacts offered in three sizes:
  - 16 AWG
  - 18 AWG
  - 20-22 AWG
- Wide 5.2 X 5.5 mm contact spacing allows for 300V applications.
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476
   




The AMP-DUAC PL-II Connectors bring both shielding and a power / signal mix to the popular AMP-DUAC product family. In addition, the wider contact spacing and the use of high conductivity materials results in a higher current carrying capacity than the original 4.2 mm pitch AMP-DUAC product.

The deep back shell allows for gathering the larger wire and insulation diameters involves with combination power / signal and shielding all in the same cable. Traditional signal connectors do not accept the range of wire sizes covered by the AMP-DUAC PL-II product.

For applications involving higher voltage cabled power distribution, this product is the ideal solution. The AMP-DUAC PL-II connector uses the original industry proven dual-action contact design which provides a lower mating force and less plating wear than alternate contact designs. The signal contacts also feature a twin-cantilever beam that mates on the milled contact surface to provide low plating wear and high long-term reliability.

The cable mounted receptacle uses the popular “Positive Lock” devices proven throughout the automotive industry to ensure all the contacts are fully seated. The “positive locks” are also referred to as “terminal position assurance”. If any one of the contacts is not properly/ completely installed into the housing, then the “Positive Lock” can not be installed. This feature reduces the common concern of operator fatigue and the resulting contact back-out which occurs when a contact is not properly seated.

The shielding system fully encapsulates the inner conductors and cable braids and provides a reliable conduction to the faceplate of the mating equipment.

Finally, the cable retention is accomplished through two rear-accessed over molded jackscrews for easy installation and removal.

### Technical Documents

#### Product Specification

108-2218

#### Application Specification

Contact TE

### Performance Data

**Voltage Rating** — 600 VAC

**Current Rating** —  
10 Amps max on a single contact  
6 Amps on each contact in 48 pos. connector

**Low Level Resistance** —  
10 milliohms max

**Insulation Resistance** —  
1000 Megohms minimum

**Operating Temperature** —  
-40°C to +105°C

### Materials

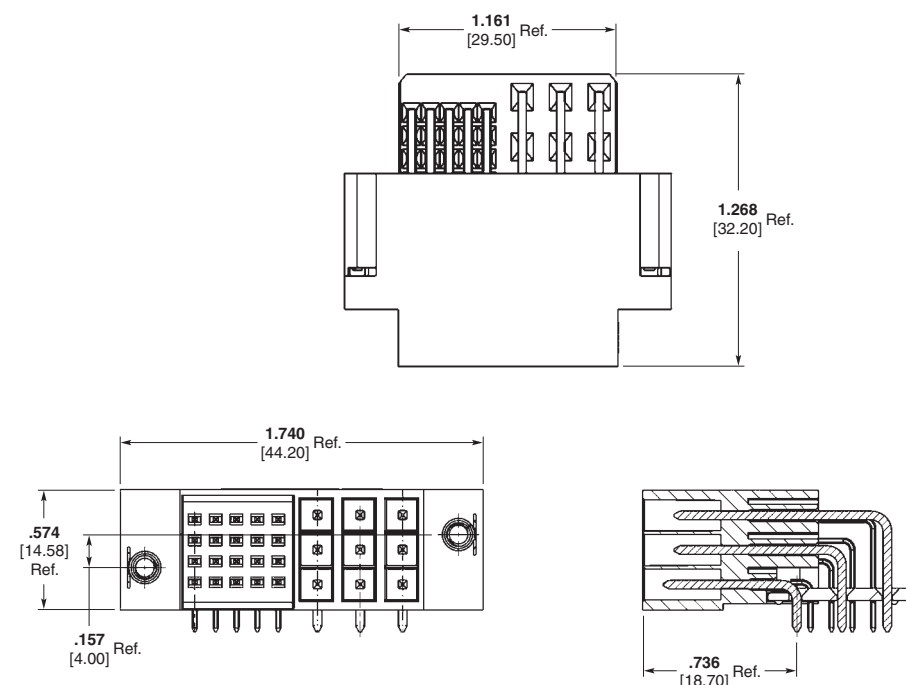
**Housing Material** — PBT, UL 94V-0

#### Colors

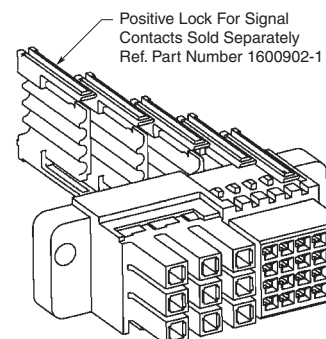
Plugs and Receptacles — Black  
Positive Locks — White

**AMP-DUAC PL-II Connectors** (Continued)

**PCB Plug**  
Part Number 6469602-3

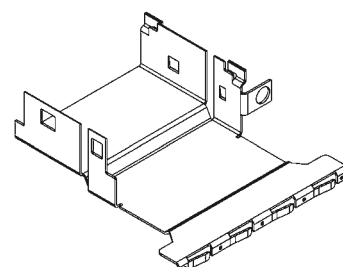


Cable Mounted Products

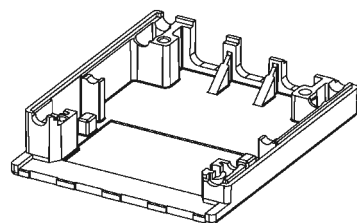


**Free-Hanging Receptacle**  
Shown with Positive Locks  
Part Number 1469606-1

Positive Lock For Signal  
Contacts Sold Separately  
Ref. Part Number 1600902-1



**Shield**  
Part Number 1469609-2



**Cable Clamp**  
Part Number 1469610-1

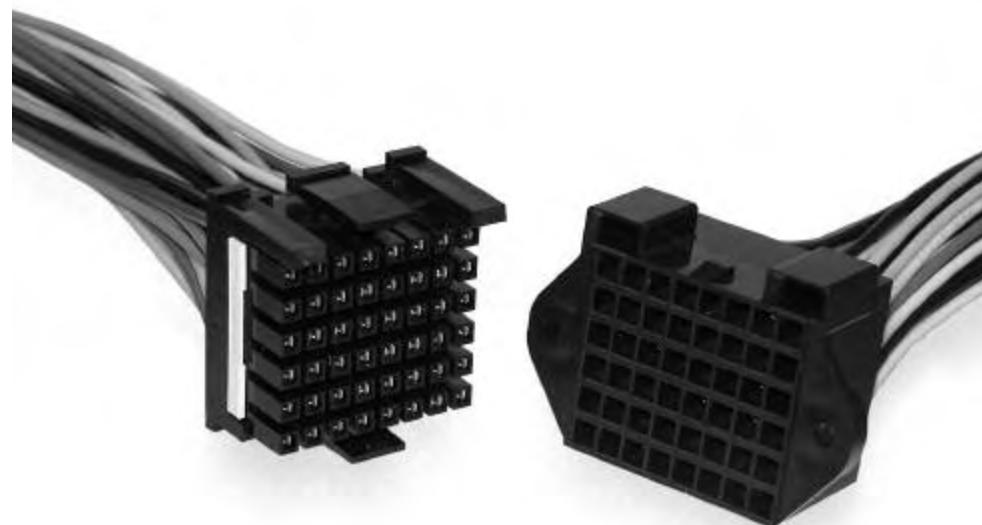
**Note:** Other cable components required.  
Cable receptacle components shown not  
sold separately. Receptacle only sold as  
part of a finished cable assembly.

**Note:** All part numbers are RoHS compliant.

## AMP-DUAC UPC Connectors

### Product Facts

- Wire-to-wire connection system
- High conductivity copper alloy contacts yield 30% gain in current carrying capacity compared to alternative designs
- Dual action contact design — reduces mating forces by up to 50% compared to alternative designs
- Sequenced contacts for make-first-break-last operation
- 48 and 66 position housings
- 4.4 mm X 5.3 mm contact grid
- Pin and Receptacle contacts offered in three sizes:
  - 16 AWG
  - 18 AWG
  - 20-22 AWG
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476



The latest addition to the AMP-DUAC product family is the AMP-DUAC UPC connector. The UPC connector offers much higher pin counts and a variety of product improvements to make the connector more reliable and easier to use. The UPC connector uses the original industry proven dual-action contact design along with very high conductivity copper alloys to improve the current carrying capacity.

The first noticeable difference of the UPC connector is the large pin count. With either 48 or 66 positions, the housing can serve as a common mating I/O point where multiple low current power connector cables are combined into one interface. Other connectors would yield an excessive mating force when mating this number of wires, however, the low mating force of the AMP-DUAC / UPC connector allows up to 66 wires to be mated with less than a 20 lb mating force.

The next key improvement is the use of molded-in guide pins. The guide pins make the mating process very easy and provide a visual polarization of the connector. The housings mate together easily.

The use of two locking latches provides a more secure connection and the screw-mounts for the panel mounted plug provide better retention than plastic latches.

Finally, the free-hanging receptacle uses the popular "Positive Lock" device to confirm all the contacts are fully seated. The "positive locks" are also referred to as "terminal position assurance". If any one of the contacts is not properly/ completely installed into the housing, then the "Positive Lock" can not be installed. This feature eliminates the common concern of operator fatigue and the resulting contact back-out which occurs when a contact is not properly seated.

### Technical Documents

#### Product Specification

108-2248

#### Application Specification

114-13195

### Performance Data

**Voltage Rating** — 600 VAC

**Current Rating** —  
11 Amps max on a single contact  
4 Amps on each contact in 48 pos. connector

**Low Level Resistance** —  
10 milliohms max

**Insulation Resistance** —  
1.2 E16 ohms minimum

**Operating Temperature** —  
-40°C to +105°C

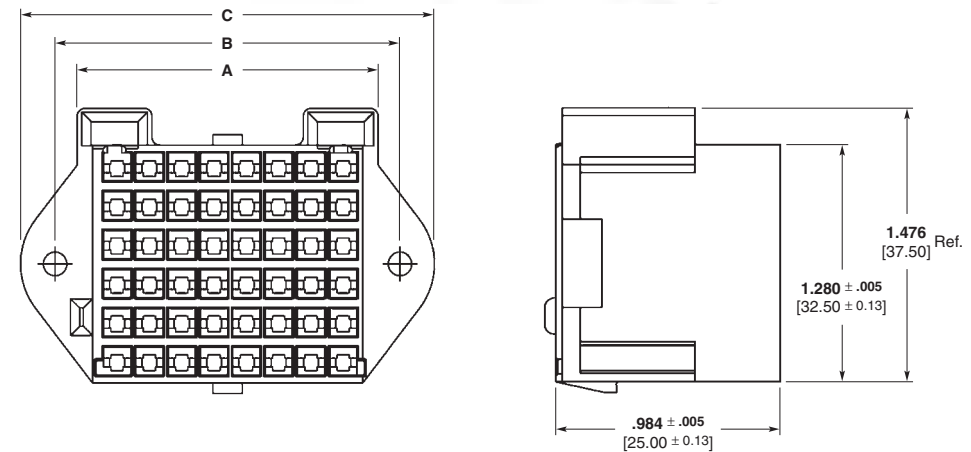
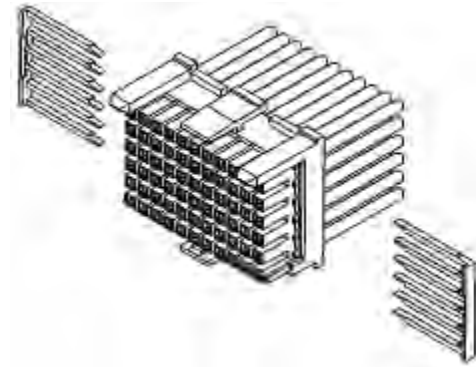
### Materials

**Housing Material** — PBT, UL 94V-0

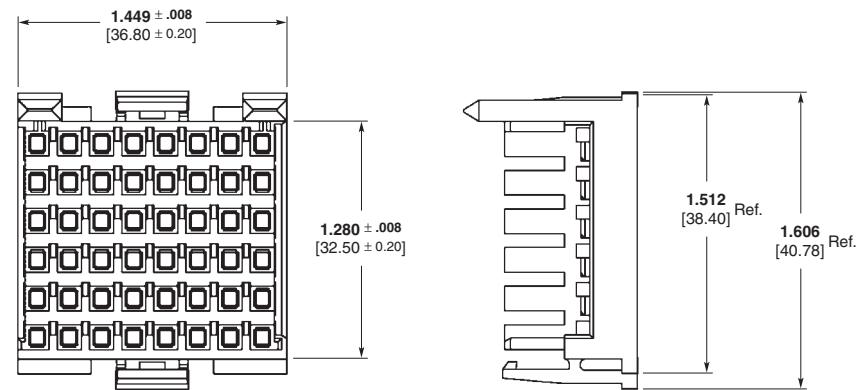
**Colors** —

Plugs and Receptacles — Black  
Positive Locks — White

**AMP-DUAC UPC Connectors** (Continued)



**Panel-Mount Plug**  
(Accepts contacts on page 112)



**Free-Hanging Receptacle**  
(Accepts contacts on page 113)

Size (No. Circuits)	Panel-Mount Plug	Dimensions			Free-Hanging Receptacle	Positive Lock*
		A	B	C		
48	1934142-1	1.61 41.0	1.85 47.0	2.22 56.4	1934144-1	1469910-1
66	1934143-1	2.13 54.2	2.37 60.2	2.74 69.6	1934145-1	1934017-1

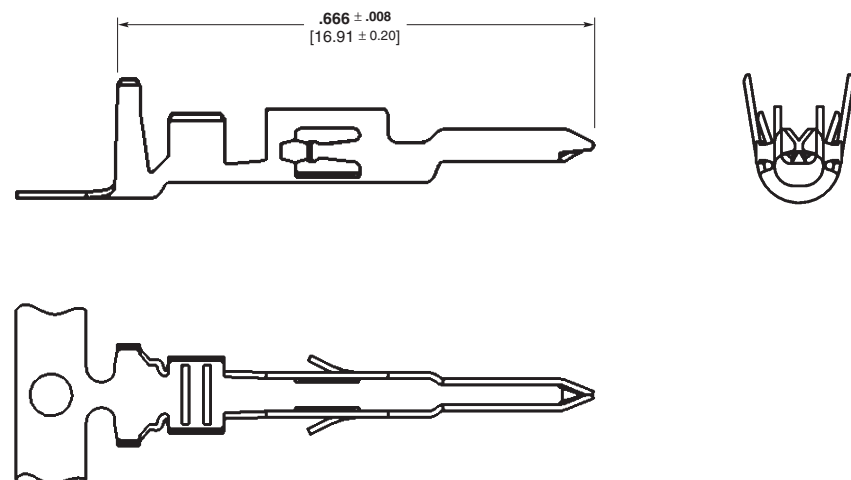
\*Two (2) required for each receptacle housing. Not used in plug housings.  
Additional configurations possible. For information, please contact your TE sales engineer.

**Note:** All part numbers are RoHS compliant.

Cable Mounted Products

**Contacts for AMP-DUAC PL, PL-II and UPC Connectors**

**Materials** — High Conductivity  
Copper Alloy  
**Finish** — Pre-Tin or Gold Plated



Cable Mounted Products

**Contacts, Male**

**Technical Documents**

**Product Specification**  
108-2248 AMP-DUAC UPC

**Application Specification**

114-6067 AMP-DUAC PL  
114-13195 AMP-DUAC UPC

**AMP-DUAC PL or UPC Contacts**

Wire Size Range AWG [mm <sup>2</sup> ]	Ins. Dia. Range	Plating	Part Number (Continuous Strip)	Applicator
22-20 [0.3-0.5]	.590-.094 [1.50-2.40]	Gold	794576-4	680308-3
18 or 18+22 [0.8-1.1]	.087-.154 [2.20-3.90]	Gold	1934185-4	1852467-3
16 or 2 @ 18 [1.3-1.6]	.098-.173 [2.50-4.40]	Gold	1934184-4	1852468-3

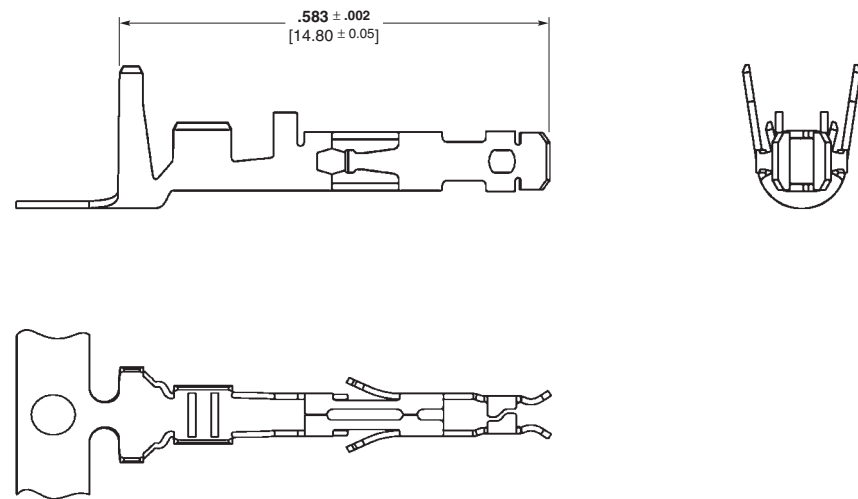
Application Equipment: Extraction Tool 1976132  
\*Made from Phosphor-Bronze material (low conductivity)

**Note:** All part numbers are RoHS compliant.



**Contacts for AMP-DUAC PL, PL-II and UPC Connectors** (Continued)

**Materials** — High Conductivity  
Copper Alloy  
**Finish** — Gold Plated



Cable Mounted Products

**Contacts, Female**

**Technical Documents**

**Product Specification**

108-2248 AMP-DUAC UPC

**Application Specification**

114-6067 AMP-DUAC PL

114-13195 AMP-DUAC UPC

**AMP-DUAC PL or UPC Contacts**

Wire Size Range AWG [mm <sup>2</sup> ]	Ins. Dia. Range	Plating	Part Number (Continuous Strip)	Applicator
22-20 [0.3-0.5]	.590-.094 [1.50-2.40]	Gold	1934193-4	1852469-3
18 or 18+22 [0.8-1.1]	.087-.154 [2.20-3.90]	Gold	1934183-4	1852467-3
16 or 2 @ 18 [1.3-1.6]	.098-.173 [2.50-4.40]	Gold	1934182-4	1852468-3

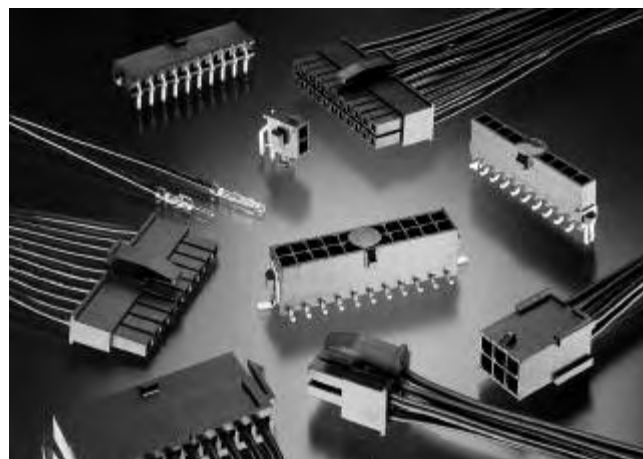
Application Equipment: Extraction Tool 1976382

**Note:** All part numbers are RoHS compliant.

## Other Soft Shell Pin & Socket Connectors

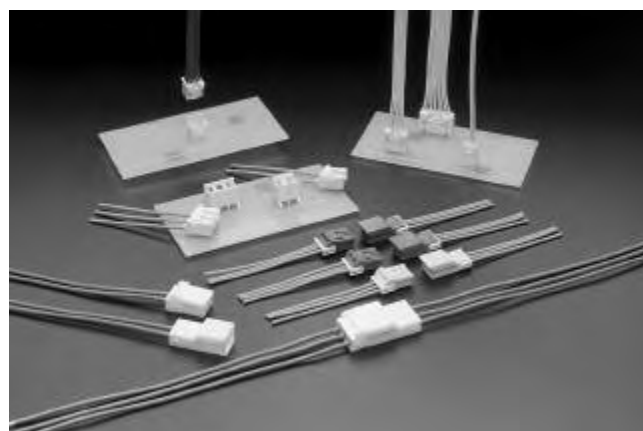
### Micro MATE-N-LOK 3 mm Connector System

- Wire-to-wire and wire-to-board, pin and receptacle connectors
- 3.0 mm [.118] centerline spacing
- 2-12 positions – single row
- 2-24 positions – dual row
- Ratings: 5A, 250 VAC
- Accommodates 30-20 AWG wire
- Panel-mount or free-hanging versions
- Dual beam receptacle contact design for improved reliability
- PCB-mount pin header assemblies available in both vertical and right-angle styles; surface-mount or through hole versions
- Available in a low profile design (<4.7 mm)



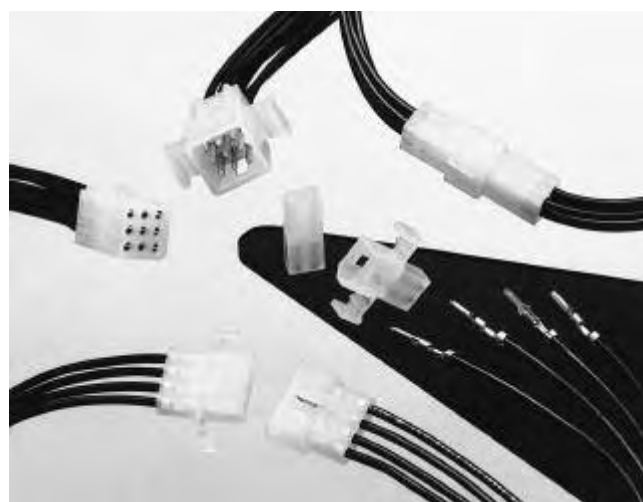
### Grace Inertia Connector System

- Wire-to-wire and wire-to-board, blade and receptacle connectors
- Wire-to-wire
  - 2.5 mm, 3.5 mm and 6.2 mm centerline spacing
  - Select 2-12 position depending on centerline spacing
- Wire-to board
  - 2.0 mm, 3.3 mm, 6.5 mm, 7.92 mm, 9.0 mm and 12.4 mm centerline spacing
  - Select 2-20 position depending on centerline spacing
- Four kinds of keying per color-coded housings
- Inertia locking mechanism on the housing which simultaneously locks when mated to prevent mismatching
- Robust connections for use in high vibration or transportation applications



### Commercial Pin and Socket Connector System

- Panel-mount or free-hanging, wire-to-wire, pin and socket connectors
- 3.68 mm [.145"] and 5.03 mm [.198"] centerline spacing
- High density, 1-9 positions – 2, 3 & 4 in-line and 4, 6 & 9 matrix
- Standard density, 1-15 positions – 2-6 in-line and 4, 6, 9, 12 & 15 matrix
- Ratings: 7A (high density) or 13A, 250 VAC or VDC
- High density system accommodates 30-18 AWG wire
- Standard density system accommodates 24-14 AWG wire
- Dual contact locking lances provide optimum contact stability
- Low contact-mating force



For more Information Order Catalog 82181, "Soft Shell Pin and Socket Connectors"

**Other Soft Shell Pin & Socket Connectors** (Continued)

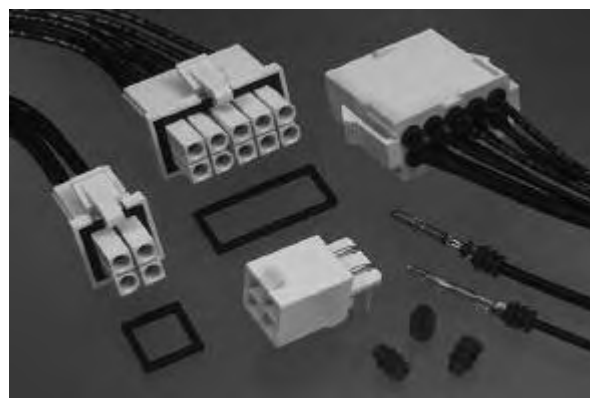
**Power Double Lock Connector System**

- Wire-to-wire and wire-to-board, blade and receptacle connectors
- 3.96 mm [.156] and 6.5 mm [.256] centerline spacing
- High density, 1-12 positions – 2, 3 & 4 in-line and 4, 6, 8, 9, 10 & 12 matrix
- Standard density, 2-12 positions – 2, 3 & 4 in-line and 4, 6, & 12 matrix
- Ratings: 14A, 300 VAC
- Accommodates 26-16 AWG wire
- Panel-mount or free-hanging versions
- Optional double lock plate on the wire side that confirms contact seating
- Lanceless contacts prevent entanglement of contacts with each other
- Housings are polarized with four types of special keying to prevent mismatching



**Mini-Universal MATE-N-LOK and Mini-Universal MATE-N-LOK II Connector System**

- Wire-to-wire and wire-to-board, pin and socket connectors
- 4.14 mm [.163"] centerline
- 1-24 and 2-24 positions, respectively
- Ratings: 9.5A and 10.5A respectively  
600 VAC or VDC
- Accommodates 30-16 AWG wire
- Compact, durable housings
- Contacts protected in the housings
- Fully polarized to provide proper mating
- Seals available for splash protection (Mini-Universal MATE-N-LOK system only)



**VAL-U-LOK Connector System**

- Wire-to-wire and wire-to-board, pin and receptacle connectors
- 4.2 mm [.165] centerline
- 2-24 position dual row and 3-5 single row configurations
- Ratings: 9A, 600 VAC
- Accommodates 26-18 AWG wire
- Easy-to-mate, positive locking housings
- Fully isolated terminals
- Panel-mount or free-hanging versions
- Black, red and blue in addition to the standard white
- PCB headers are available in vertical, right-angle, screw-mount, and blind-mate configurations
- Intermateable with similar connectors from other manufacturers



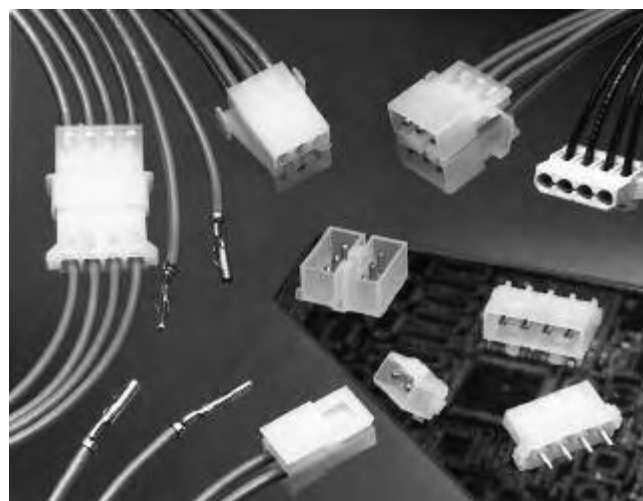
Cable Mounted Products

For more Information Order Catalog 82181, "Soft Shell Pin and Socket Connectors"

**Other Soft Shell Pin & Socket Connectors** (Continued)

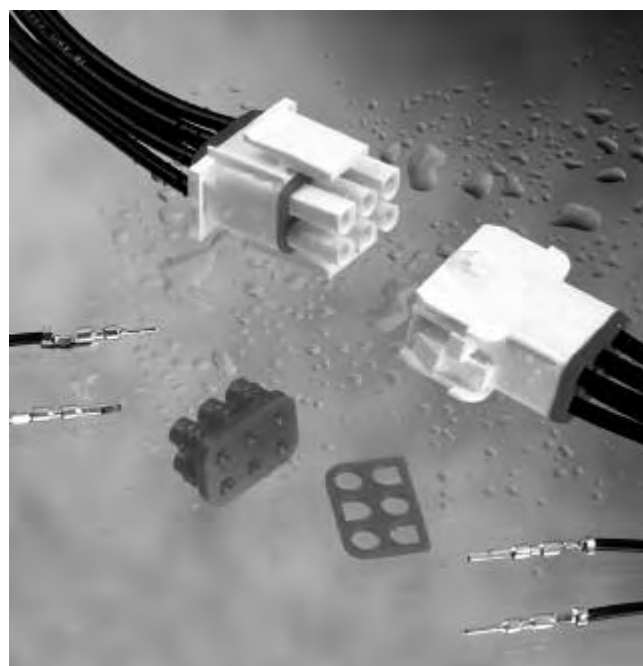
**Commercial MATE-N-LOK Connector System**

- Wire-to-wire and wire-to-board, pin and socket connectors
- 5.08 mm [.200"] centerline
- Panel-mount or free-hanging versions
- 1-16 positions
- Ratings: 19A, 250 VAC or VDC
- Accommodates 30-14 AWG wire
- Fully polarized housings
- Contact stabilization and self-aligning features
- Hot side is egg-crated for safety
- Locking devices are integral part of design



**Universal MATE-N-LOK and Universal MATE-N-LOK II Connector System**



- Wire-to-wire and wire-to-board, pin and socket connectors
- 6.35 mm [.250"] centerline
- 1-15 and 2-15 positions, respectively
- Panel-mount or free-hanging versions
- Ratings: 19A, 600 VAC or VDC
- Accommodates 30-10 AWG wire
- Contacts protected in the housings
- Special keying to prevent incorrect mating
- Additional offerings include:
  - UV resistant materials
  - High temperature materials
  - Glow wire approved products
  - Special high retention contacts
  - Seals available for splash protection (UMNL only)
  - Color housings available (UMNL only)

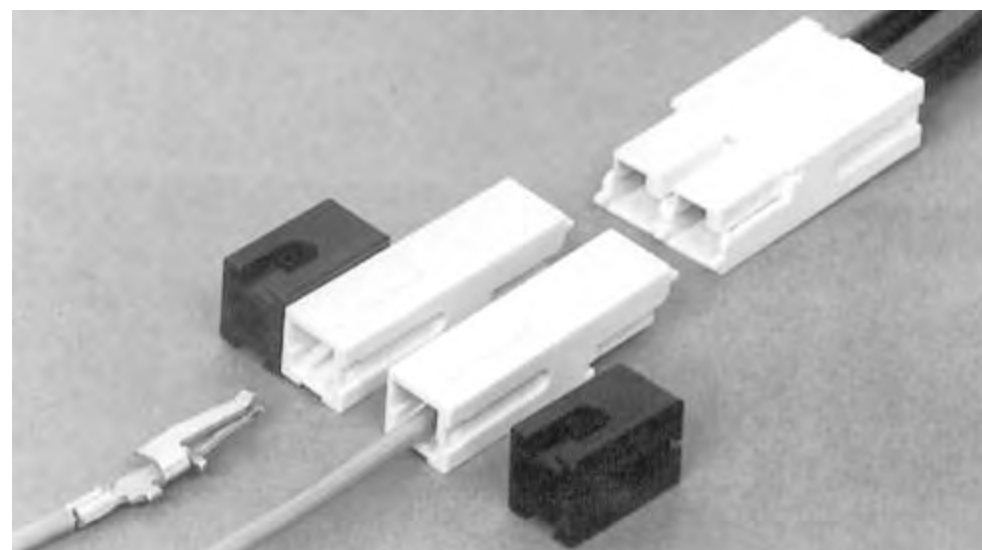


For more Information Order Catalog 82181, "Soft Shell Pin and Socket Connectors"

## AMPINNERGY Wire-To-Wire Connectors

### Product Facts

- Rated to 600 VAC (RMS)
- Flame retardant housings 94V-0
- Housings, adapters, and power terminals keyed for proper assembly
- Stackable housings provide easy wire routing and neat wire dressing
- Built-in interlocking features better resist shock and vibration
- Usable as in-line connector, or as panel and surface-mount connector
- Available in six different colors for circuit coding and identification
- Choice of two power terminals accommodates 10-12 AWG and 14-16-18 AWG conductors
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476 
- Certified by Canadian Standards Association, File No. LR7189 
- VDE Registered #5133



AMPINNERGY wire-to-wire (WTW) Connectors provide a reliable and efficient means of interconnecting conductors employed to carry up to 600 VAC in power circuits or networks.

The WTW connectors consist of mating hermaphroditic, flame retardant polycarbonate housings into which customer terminated power contacts are inserted. Stackable in four directions through the use of molded interlocking keyways, the connectors make wire routing and dressing orderly and easy to accomplish. More importantly, the built-in interlocking features on the connectors and the accessory mounting adapters provide better resistance to the effects of shock and vibration, keeping the interconnect more stable and secure.

The design features of the WTW connector make it easily applicable to free-hanging, surface mounted or panel mounted applications. By simply sliding the accessory mounting adapters into the molded keyways of the connector housing, a free-hanging connector can be trans-

formed into a surface-mount connector or a panel-mount connector. Customer supplied 8-32 screws and nuts may be used to secure the connectors configured with the mounting adapters to printed circuit boards or distribution panels. The same hardware may be used to secure the connectors to pre-cut openings in the panels.

Furthermore, WTW connector housings, mounting adapters and power terminals are all provided with alignment or keying features that make it difficult to improperly assemble and apply the connector. Alignment slots and tabs on the plastic connector housings provide for easy mating of the housings, even in the dark! Mounting adapters have a keyway on one side and a key on the other side providing for easy assembly to the connector by touch alone if necessary. And the power terminals have a side tab that helps prevent the incorrect insertion of the terminated conductor into the housing. Once inserted, the contacts firmly

latch within the connector housing.

The WTW connector system is available in six different and distinctive colors which makes circuit differentiation and identification possible. The crimped power terminals will accommodate either 10-12 AWG or 14-16-18 AWG stranded conductors. Depending upon the conductor size and the number of conductors in the connector configuration, the current rating ranges from 10 Amps to 55 Amps.

### Technical Documents

**Product Specification**  
108-1373 AMPINNERGY WTW Connectors

**Application Specification**  
114-6051

**Instruction Sheets**  
408-3277 AMPINNERGY Wire-To-Wire Stackable Connectors  
408-3198 Inspection of AMPINNERGY System Power Contacts

Cable Mounted Products

For more information, request Catalog 1308885.

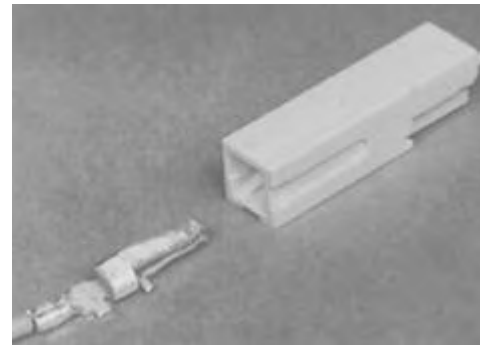
**AMPINNERGY Wire-To-Wire Connectors** (Continued)

**Housings**

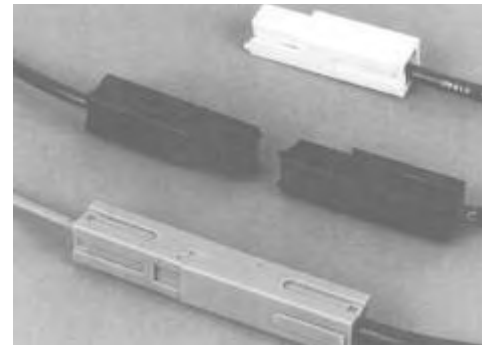
**Material and Finish**

**Housing** — Polycarbonate, 94V-0

For surface mounting and panel mounting information, see Instruction Sheet 408-3277, AMPINNERGY Wire-To-Wire Stackable Connectors.

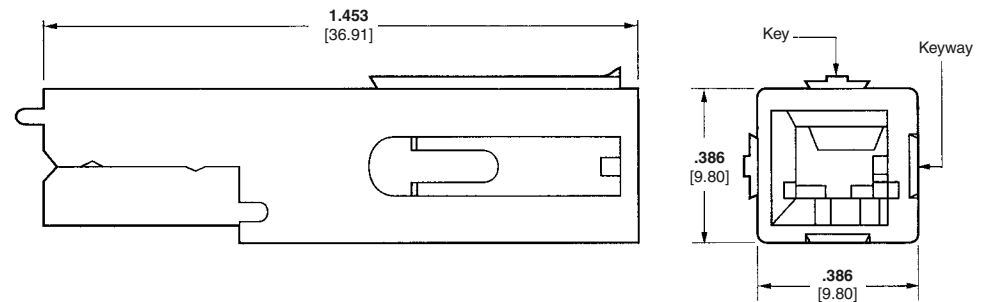


Customer terminated power contacts are inserted into housings



Free-Hanging Interconnections

Color	Housing Part Numbers
White	556137-1
Black	556137-2
Green	556137-3
Red	556137-4
Blue	556137-6
Gray	556137-8



Wire-To-Wire Connector Housing

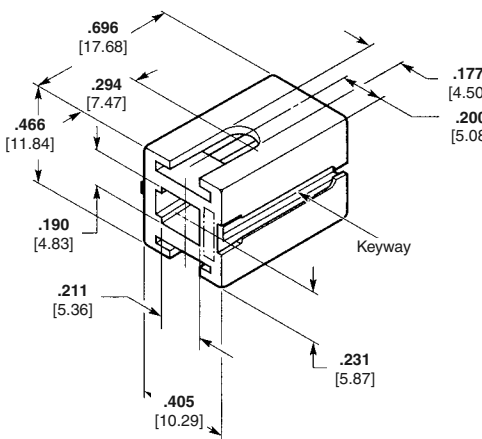
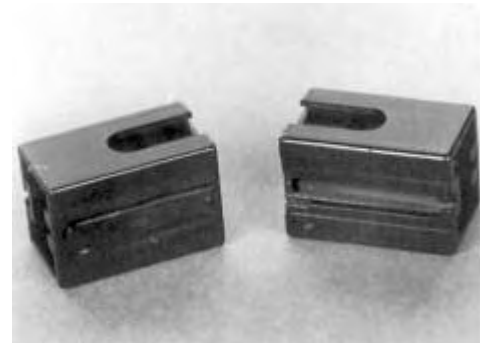
**Mounting Adapters**

**Part Number** 557313-1

**Material and Finish**

**Housing** — Polycarbonate, Black

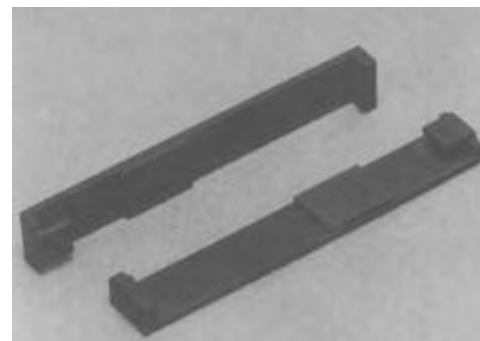
Two mounting adapters can be used with one or more connector housings to provide thru-panel or horizontal surface mounting capability of the completed assembly.



**External Locking Latch Clip**

**Part Number** 557640-1

AMPINNERGY wire-to-wire connector housings have an integral locking feature designed to keep housings mated in most applications. However, the external locking latch clip may be used as needed in applications where severe vibration or tension may pull mated housings apart.



AMPINNERGY Wire-To-Wire Clips  
Part Number 557640-1



AMPINNERGY Wire-To-Wire Clips (Installed)  
Part Number 557640-1

**Note:** All part numbers are RoHS compliant.

**AMPINNERGY Wire-To-Wire Connectors** (Continued)

**Power Terminals**

**Material and Finish**

**Contacts** — Copper alloy plated with .000100 [0.00254] minimum tin

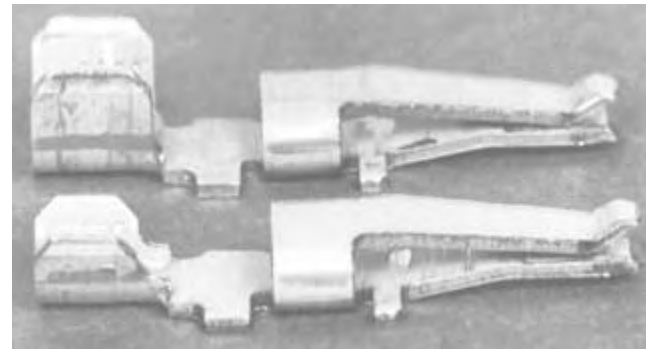
The wire-to-wire connector power contacts are available in either strip form or in loose piece form.

Contacts in strip form are terminated on continuous feed type terminators and the loose piece contacts are terminated with the hand tool or pneumatic tool.

For wire preparation and crimped contact inspection information, refer to Instruction Sheet 408-3198, Inspection of AMPINNERGY System Power Contacts.

**Loose Piece**

**Part Number** 556136-2



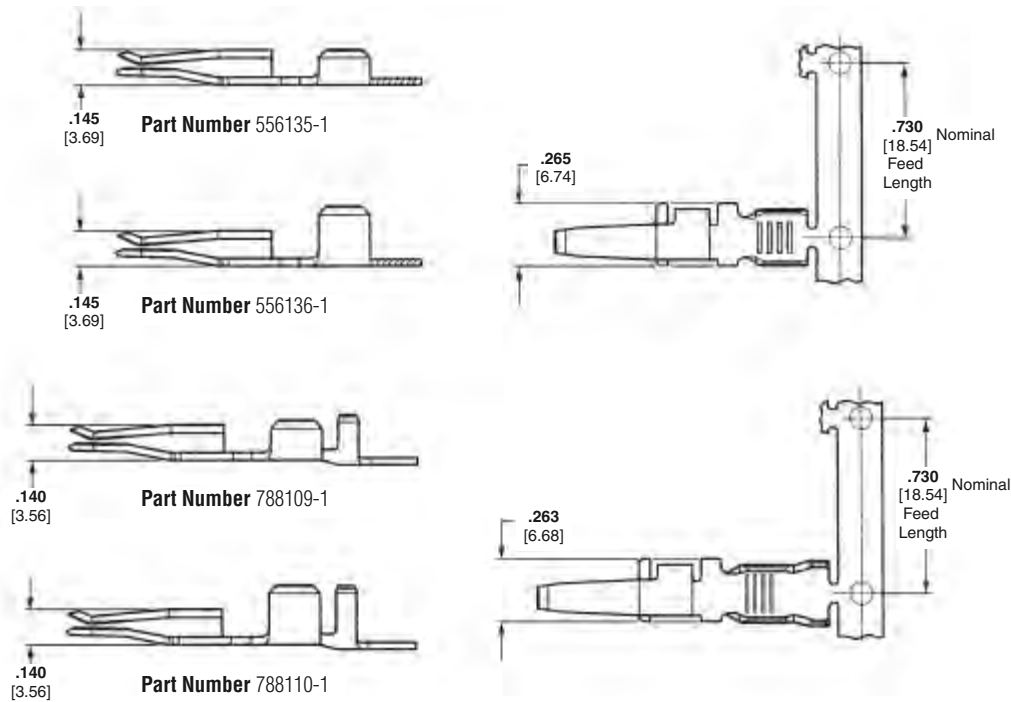
**Part Number** 556135-2

Contact Part Numbers	Wire Size (AWG)	Hand Tool Part Number	Pneumatic Tool Part Numbers	Die Set Part Numbers
556135-2 (loose piece)	18-16			58493-1
	14	69710-1	189721-2*	58492-1
556136-2 (loose piece)	12			58490-1
	10			58491-1

\*Requires "C" head adapter part number 318161-1 and adapter holder part number 189928-1. See Catalog 124208 for more information.

**Note:** The same hand tool or pneumatic tool and die sets may be used to apply the wire-to-board connector terminals.

**Strip Form**





Contact Part Numbers	Wire Size (AWG)	AMP-O-LECTRIC Model G Terminating Machine	Applicator Part Numbers
556135-1 (strip)	18-16-14	354500-1	567403-3
556136-1 (strip)	10-12	354500-1	567256-6
788109-1 (strip)	18-14	354500-1	680447-3
788110-1 (strip)	10-12	354500-1	680449-3

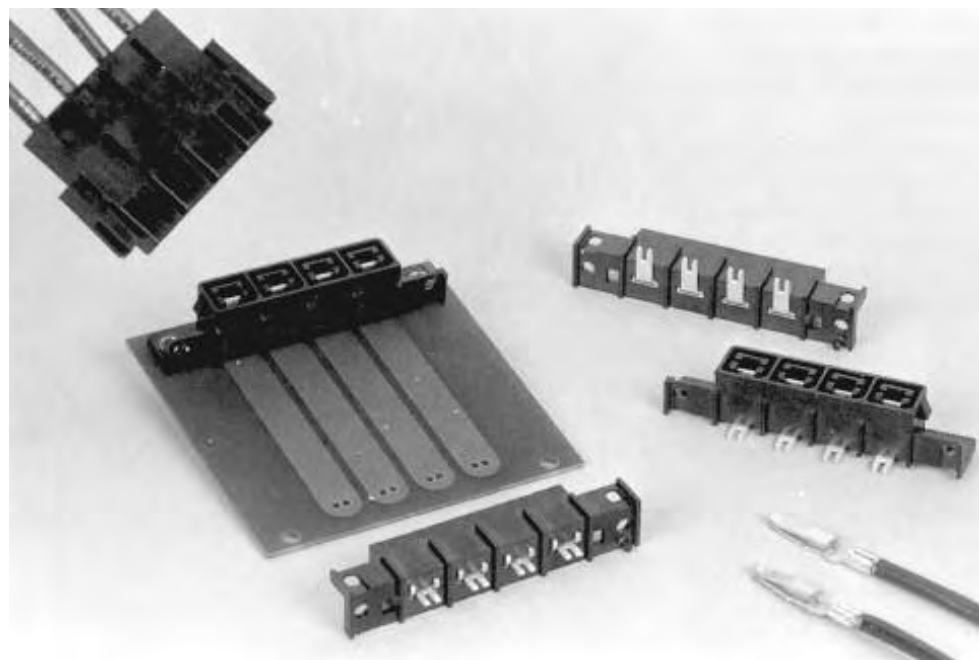
**Note:** All part numbers are RoHS compliant.

Cable Mounted Products

## AMPINNERGY Wire-To-Board Connectors

### Product Facts

- Ratings: 600 VAC (RMS), current ratings range from 12-35 Amps
- Receptacles polarized to plug
- Receptacles and plugs available in contact configurations of 2 through 8 positions
- Vertical receptacle polarized to PCB
- Receptacle contacts have dual solder posts for efficient heat dissipation, low millivolt drop and mechanical strength
- Receptacles may be mounted on PCBs .062 to .125 inch thick
- Plugs have positive latching to receptacles
- Removable crimp contacts latch firmly in plug
- Plugs are one-piece design
- Two ranges of crimped contacts accommodate either 10-12 AWG or 14-16-18 AWG conductors
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476 
- Certified by Canadian Standards Association, File No. LR7189-239 



### AMPINNERGY Wire-To-Board (WTB) Connectors

Connectors provide a convenient and efficient means of delivering up to 600 VAC to component printed circuit boards and other power distribution devices in computers and peripherals, telephone systems and appliances. The WTB connectors also have automotive and industrial applications.

#### Receptacles

The AMPINNERGY WTB connector receptacles can be installed on pc boards varying in thickness from .062 inch to .125 inch. A polarizing pin is provided on the vertical receptacle assembly to aid in proper positioning on the pc board. Both the vertical and right-angle assemblies are polarized for accurate mating to the plug assemblies. The receptacle

assemblies are available in contact configurations ranging from two to eight positions.

#### Plugs

The single piece plug housings are available in contact configurations to mate with the receptacles. The plug is equipped with positive latches to allow full and more secure mating to the respective receptacle.

A make-first/break-last feature is designed into position 1 of the plug assemblies to provide grounding protection.

#### Contacts

The crimp contacts will accommodate either 10-12 AWG or 14-16-18 AWG conductors. The contacts latch firmly within the plug housing.

### Technical Documents

**Product Specification**  
108-1349 AMPINNERGY WTB Connectors

**Application Specification**  
114-6044 AMPINNERGY WTB Connectors

**Instruction Sheets**  
408-3236 Installation of AMPINNERGY WTB Connectors  
408-3198 Inspection of AMPINNERGY Contacts



**AMPINNERGY Wire-To-Board Connectors** (Continued)

**Vertical PCB Receptacles**

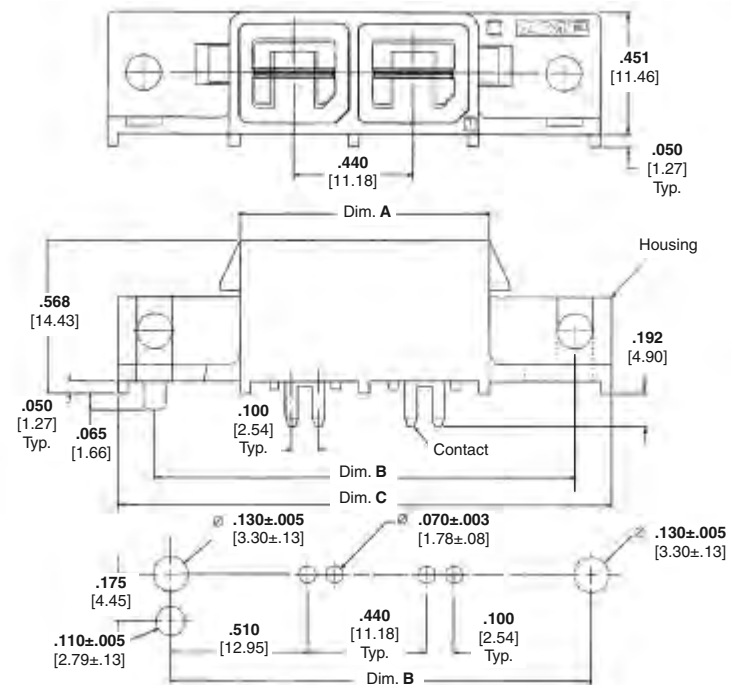
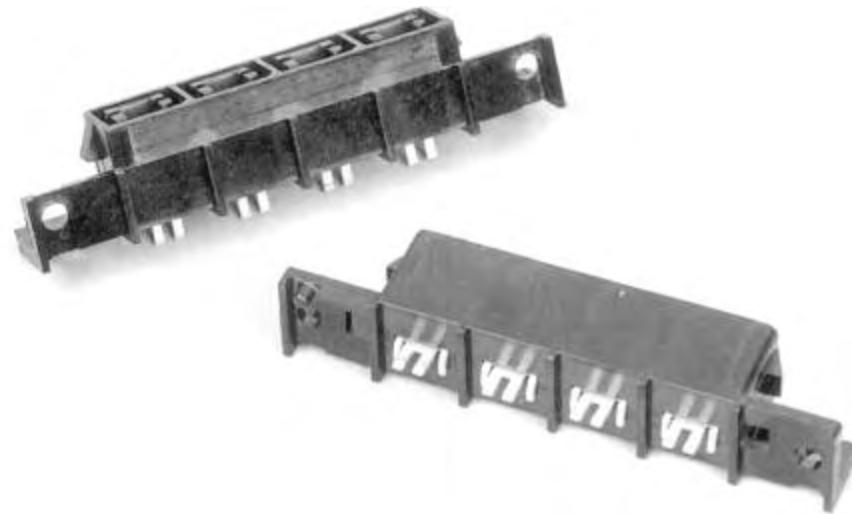
**Product Facts**

- Withstands vapor phase, infrared and wave soldering processes
- .040 inch minimum standoff to PCB
- Polarized to PCB; to plug
- Contact centerline spacing: .440 inch
- Overall height on PCB: .600 inch
- Fits PCB thickness .062 through .125 inch
- Contacts have dual solder posts for efficient heat dissipation, low millivolt drop and mechanical strength
- Positive latching to mating plug

**Material and Finish**

**Housing** — Polyphenylene Sulfide, Black, 94V-0

**Contacts** — Tin Plated Copper Alloy



**PCB Thickness — .062-.125 inch**

No. of Positions	Dimensions			Receptacle Part Numbers
	A	B	C	
2	.93 23.50	1.56 39.62	1.84 46.61	556881-2
3	1.37 34.68	2.00 50.80	2.28 57.79	556881-3
4	1.81 45.85	2.44 61.98	2.72 68.97	556881-4
5	2.25 57.03	2.88 73.15	3.16 80.14	556881-5
6	2.69 68.20	3.32 84.33	3.60 91.32	556881-6
7	3.13 79.38	3.76 95.50	4.04 102.49	556881-7
8	3.57 90.56	4.20 106.68	4.48 113.67	556881-8

**PCB Thickness — .250 inch**

No. of Positions	Receptacle Part Numbers
4	558574-1
6	558084-1

**Note:** All part numbers are RoHS compliant.

Cable Mounted Products

**AMPINNERGY Wire-To-Board Connectors** (Continued)

**Right-Angle PCB Receptacles**

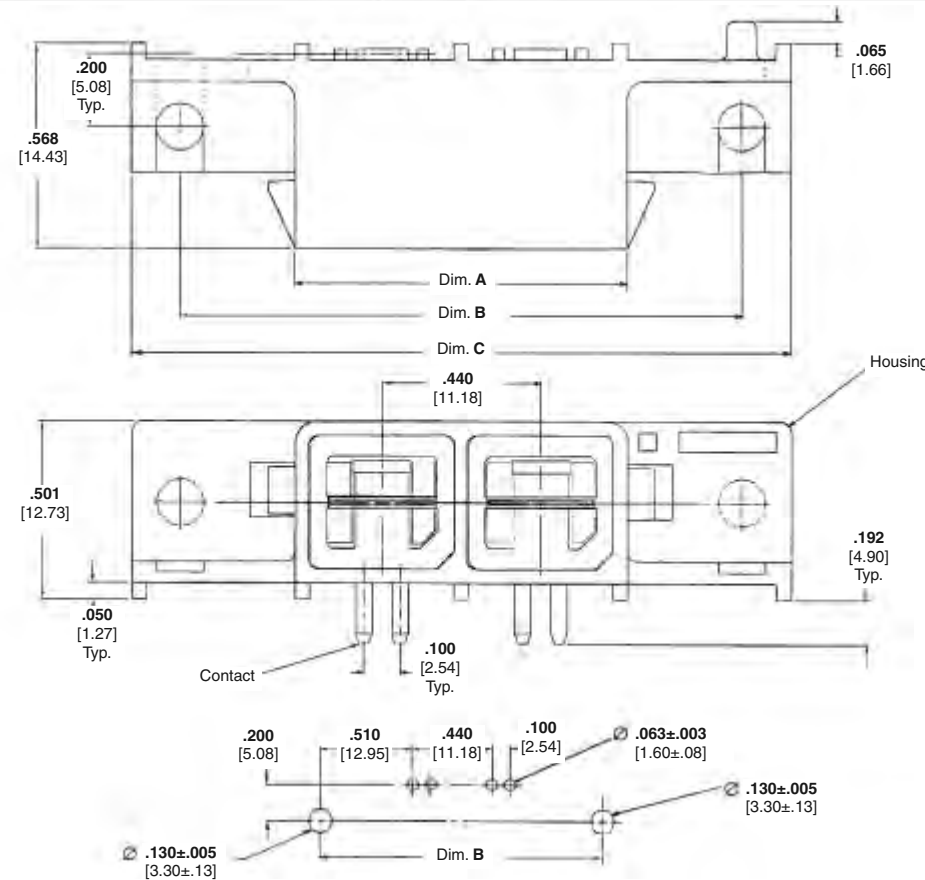
**Product Facts**

- Withstands vapor phase, infrared and wave soldering processes
- .040 inch minimum standoff to PCB
- Receptacles polarized to plug
- Contact centerline spacing: .440 inch
- Overall height on PCB: .600 inch
- Fits PCB thickness .062 through .125 inch
- Contacts have dual solder posts for efficient heat dissipation, low millivolt drop and mechanical strength
- Positive latching to mating plug

**Material and Finish**

**Housing** — Polyphenylene Sulfide, Black, 94V-0

**Contacts** — Tin Plated Copper Alloy



**PCB Thickness — .062-.125 inch**

No. of Positions	Dimensions			Receptacle Part Numbers
	A	B	C	
2	.93 23.50	1.56 39.62	1.84 46.61	556882-2
3	1.37 34.68	2.00 50.80	2.28 57.79	556882-3
4	1.81 45.85	2.44 61.98	2.72 68.97	556882-4
5	2.25 57.03	2.88 73.15	3.16 80.14	556882-5
6	2.69 68.20	3.32 84.33	3.60 91.32	556882-6
7	3.13 79.38	3.76 95.50	4.04 102.49	556882-7
8	3.57 90.56	4.20 106.68	4.48 113.67	556882-8

**Note:** All part numbers are RoHS compliant.

**AMPINNERGY Wire-To-Board Connectors** (Continued)

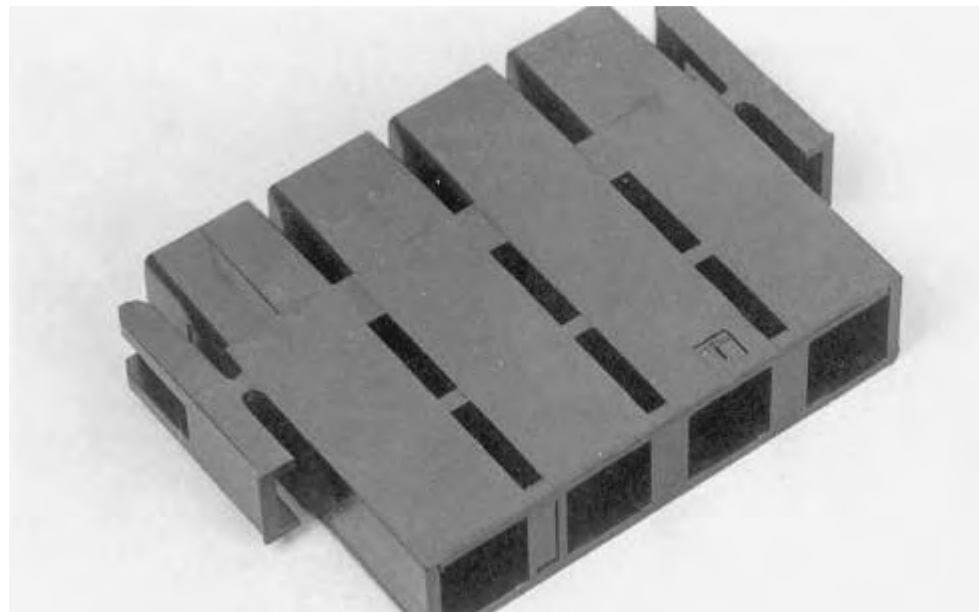
**Plug Housings**

**Product Facts**

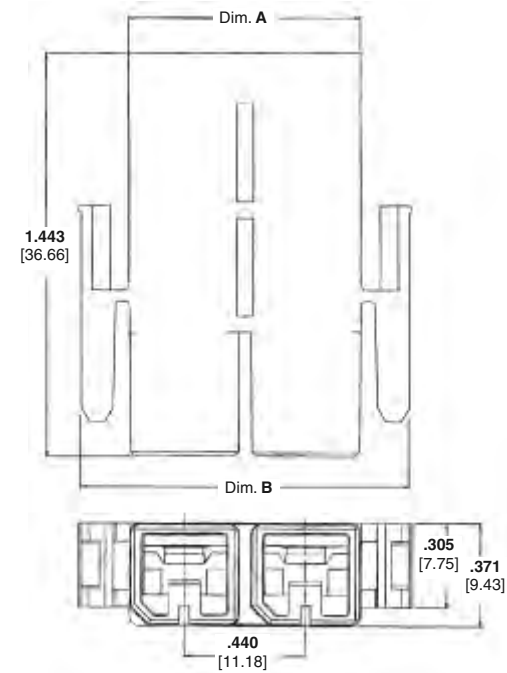
- One-piece housing
- Polarized to mating receptacles
- Positive latching to mating receptacles
- Accepts crimp contacts  
Part Numbers 556880-2 and 556883-1
- Internal latching of crimp contact

**Material**

**Housing** — Polycarbonate, Black, 94V-0



Cable Mounted Products



No. of Positions	Dimensions		Plug Part Numbers
	A	B	
2	.85 21.42	1.20 30.31	556879-2
3	1.29 32.59	1.64 41.48	556879-3
4	1.73 43.77	2.08 52.66	556879-4
5	2.17 54.94	2.52 63.83	556879-5
6	2.61 77.30	2.96 75.01	556879-6
7	3.05 77.30	3.40 86.19	556879-7
8	3.49 88.47	3.84 97.36	556879-8

**Note:** All part numbers are RoHS compliant.

**AMPINNERGY Wire-To-Board Connectors** (Continued)

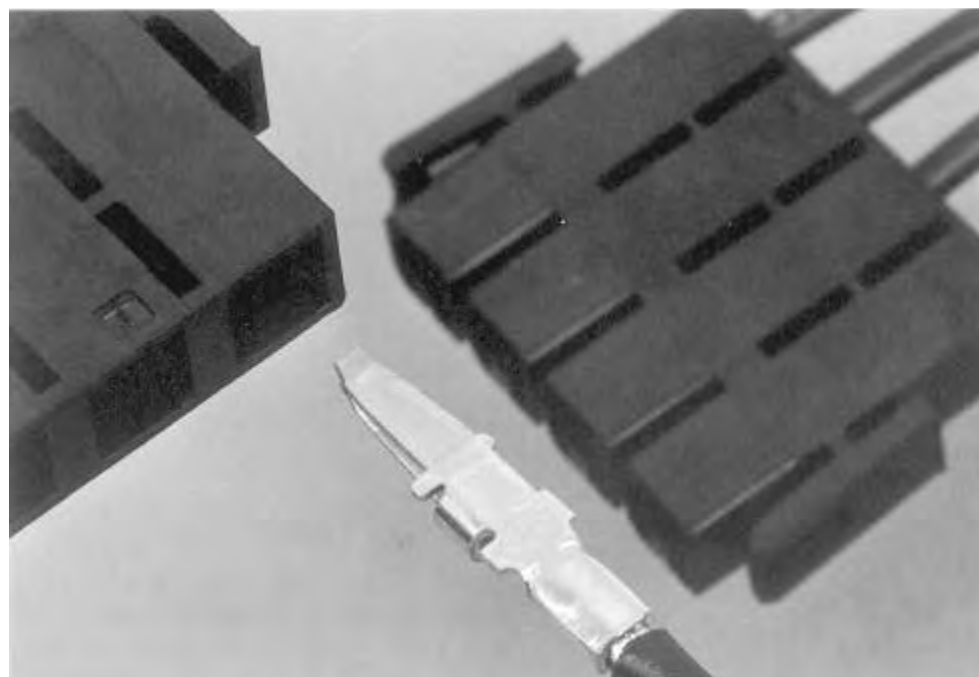
**Crimp Contacts**

**Product Facts**

- Contacts are dual beam design

**Material and Finish**

**Contacts**—Tin Plated Copper Alloy



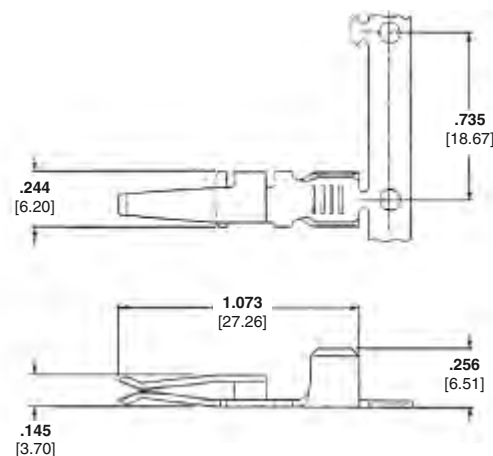
**Wire barrel accepts one 10 or 12 AWG stranded copper conductor**

**Part Number** 556880-2 Strip  
**Part Number** 556880-1 Loose Piece

**Application Tooling**

**Applicator Part Number**

- 567256-3 (for Lead Makers)
- 567256-4 (for AMP-O-LECTRIC Model K Machine)
- 567256-6 (for AMP-O-LECTRIC Model G Machine)

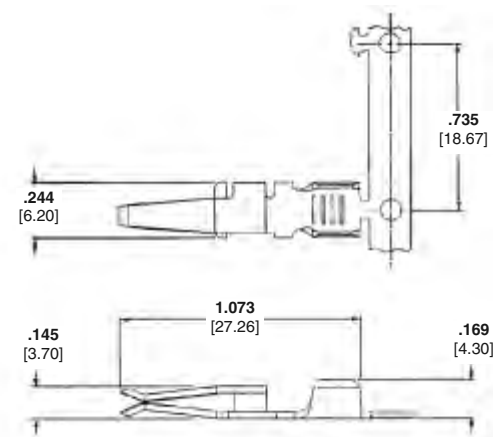


**Wire barrel accepts one 14, 16 or 18 AWG stranded copper conductor**

**Part Number** 556883-1 Loose Piece  
**Part Number** 556883-2 Strip

**Application Tooling Part Number**

- 69710-1 Hand Tool
- 58492-1 Die Set (14 AWG)
- 58493-1 Die Set (18-16 AWG)
- 91308-1 Extraction Tool



**Note:** All part numbers are RoHS compliant.

## Circular (CPC) Connectors for Commercial Signal and Power Applications

### Product Facts

- Lightweight, all-plastic and metal-shell connectors
- CPC connectors are UL 94V-0 rated and made of stabilized, heat resistant, self-extinguishing thermoplastic material
- Metal-shell CPC connector housings made of UL 94V-0 rated thermoplastic
- Operating temperature range: -55°C to +125°C
- Available in panel- or chassis-mount and free-hanging configurations
- Quick connect/disconnect capability with thread assist, positive detent coupling
- Built-in pin and socket protection
- Polarized for proper mating of connector halves
- Special connector configurations offer special solder and posted contacts, special receptacles with or without threaded inserts
- Full complement of optional accessories
- Recognized under the Component Program of Underwriters Laboratories Inc.  for 250 VAC, rms or 250 VDC, Service+; Series 1 and Series 3 (600 V); Series 2, Series 4, Series 5 and Series 6 (250 V)  
File No. E28476

‡Select connectors are recognized for 600 volts service.

- Certified by Canadian Standards Association,  File No. LR 7189

- Certain products meet VDE Standard 0627 



- Produced under a Quality Management System certified to ISO 9001

A copy of the certificate is available upon request.

### Connector series for different interconnection requirements:

- Series 3 — Low density, power applications with Type XII contacts capable of carrying up to 35 Amps of current
- Series 4 — Combination of standard and power density application with Type III+ and Type XII contacts
- Series 5 — Power density application with Size 8 screw machined and precision formed contacts
- Series 6 — Combination of standard and power density application with Type III+ and Size 8 contacts

### Type XII, Precision Formed, Crimp Contacts



Male

Female

### High Current Type XII Crimp Contacts



High Current Type XII Socket

High Current Type XII Pin

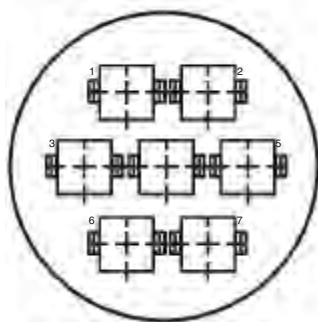
Cable Mounted Products

For more information, request Catalog 82021.

**Circular (CPC) Connectors for Commercial Signal and Power Applications** (Continued)

**Connector Series and Types**

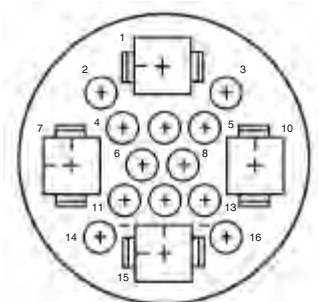
Cable Mounted Products



**Series 3 — Power Contacts**

Series 3 connectors accept Type XII power contacts which can carry up to 25 Amps per contact. These contacts will accommodate a wire size range of 16 to

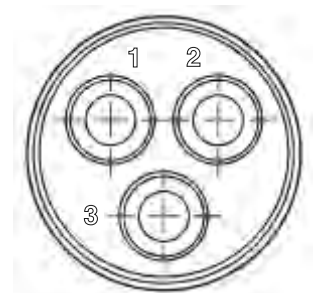
10 AWG [1.4 to 5 mm<sup>2</sup>]. Two connector sizes are available in both standard and reverse sex connector arrangements **3 and 7 positions**.



**Series 4 — Combination Size 16 and Power Contacts**

Series 4 connectors accept Size 16 Multimate and Type XII power contacts, combining the signal and coaxial circuit capabilities of Series 1 connectors with the

power circuit capabilities of Series 3 connectors. Available in two connector sizes offering power mixing combinations totaling **16 and 22 positions**.

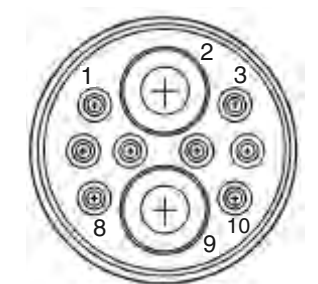


**Series 5 — Power Contacts .125 POWERBAND**

Series 5 connectors combine the revolutionary performance of the new POWERBAND Contact, high current contact in configurations similar to the Series 3 connectors. POWERBAND contacts offer the electrical perform-

ance of the best Mil Spec Size 8 screw-machined contacts with the economy and productivity of strip-fed, precision formed contacts. Series 5 connectors are environmentally sealable to meet IEC IP 65 and IP 67 specifications.

Rated at 600 VAC or VDC, 45 Amps maximum in a single contact, the connectors are available in free-hanging and panel-mount applications — **one connector configuration containing three .125 POWERBAND contacts**.



**Series 6 — Combination, Size 16 and .125 POWERBAND Contacts**

Series 6 combines the high current and environmental sealing capability of Series 5, POWERBAND contacts, and the reliability of signal carrying, low current Type III+ contacts. This

combination of power and signal contacts is offered in **one connector configuration containing two .125 POWERBAND contacts and eight Type III+ signal pin and socket contacts**.

For more information, request Catalog 82021.

**Circular (CPC) Connectors for Commercial Signal and Power Applications** (Continued)

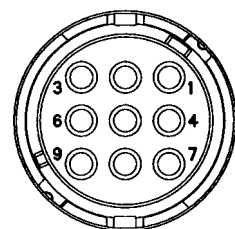
**Connector Series and Types**  
(Continued)



**Metal-Shell, Circular Plastic Connectors (Series 3 and 4)**

Metal-Shell CPC connectors consist of a black thermo-plastic insert in a nickel-plated, zinc alloy shell. These connectors

are currently available in **shell sizes 14, 22 and 28, and in two basic configurations consisting of plugs and square flange receptacles.**



**Miniature CPC Connectors**

These compact connectors accept existing Mini-Universal MATE-N-LOK pin and socket contacts, 30-18 AWG [.05-.8 mm<sup>2</sup>].

Two shell sizes (8 or 11) are available, accommodating **from 1 to 4 and 5 to 9 positions.**

Featuring high contact density and IP67 sealing, these durable connectors are well suited for many wire-to-wire, wire-to-board, and wire-to-panel applications.



Cable Mounted Products

For more information, request Catalog 82021.

Catalog 1773096  
Revised 4-12

www.te.com

Dimensions are shown for reference purposes only. Specifications subject to change.

Dimensions are in inches and millimeters unless otherwise specified.  
USA: +1 (800) 522-6752

Canada: +1 (905) 475-6222  
Mexico/C. Am.: +52 (0) 55-1106-0800  
Latin/S. Am.: +54 (0) 11-4733-2200  
Germany: +49 (0) 6251-133-1999

UK: +44 (0) 800-267666  
France: +33 (0) 1-3420-8686  
Netherlands: +31 (0) 73-6246-999  
China: +86 (0) 400-820-6015

### High Current Products (LOUVERTAC Contacts)

**Product Facts**

- Pins and sockets have low insertion force
- High current ratings with very low resistance
- All plated products are gold or silver plated
- LOUVERTAC bands have a temperature range from -196°C to +200°C available
- Formed bands are available for up to 1.250 [31.75] pin diameter

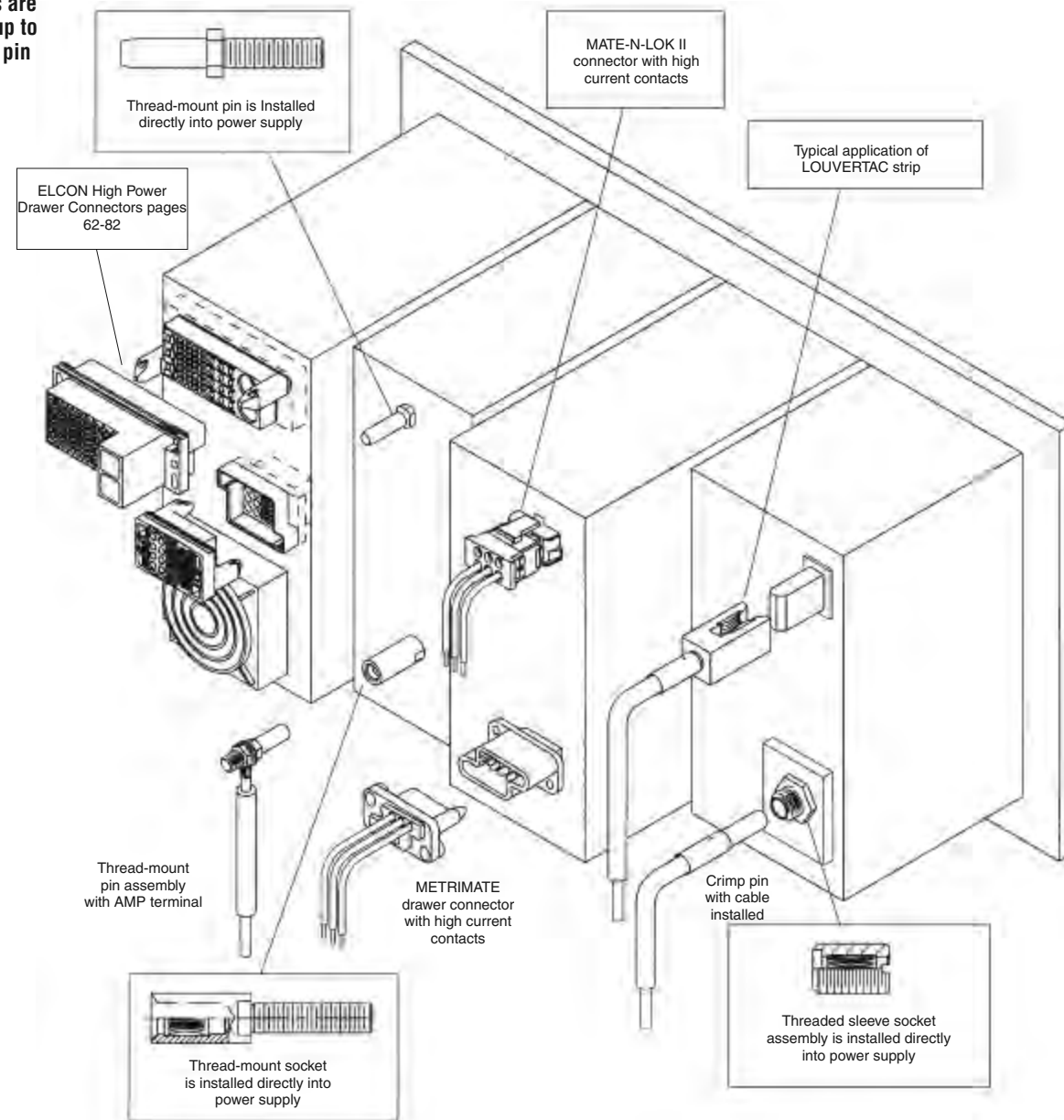
The transfer of high current with manageable insertion and withdrawal forces has always presented a challenge to the connector industry.

LOUVERTAC bands provide a unique means of transferring high amperage with a resultant space and weight

savings. TE offers a wide range of pin and socket sizes for your applications. Strip and formed LOUVERTAC bands are also offered for customer use in their own contact design. The wide variety of flat and formed male and female bands provide the ability to

design electrical connections more inexpensively and quickly. LOUVERTAC products are your high current applications solution.

The variety of pins and sockets available from TE provide a quick and simple solution to most high current applications.

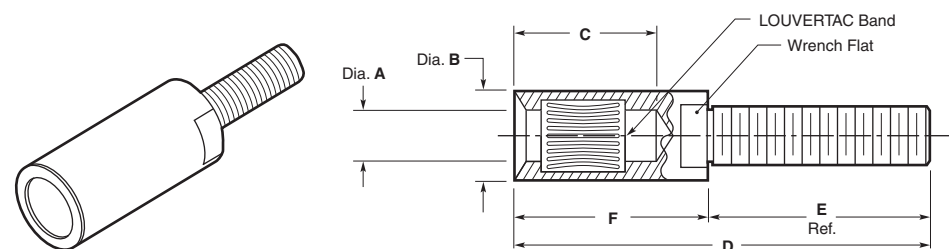




**High Current Products (LOUVERTAC Contacts)** (Continued)

**Thread-Mount Sockets**

These sockets are designed for easy installation and removal. The large variety of sizes have ratings from 30 continuous Amps and can be mated with Thread-Mount Pins and Crimp Pins.



**Material**

**Body**—Brass  
**LOUVERTAC Band**—Beryllium Copper

**Finish**

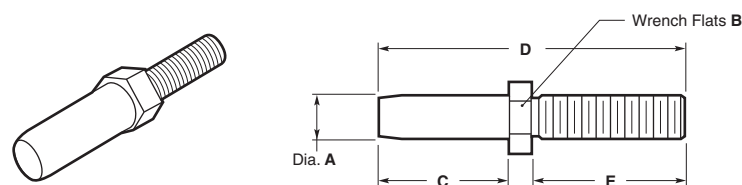
**Body**—Silver  
**LOUVERTAC Band**—See Table

Mating Pin Dia.	Part Number	Thread	Contin. Current (Amp)	Voltage Drop (mV)	Dimensions						LOUVERTAC Band Plating
					A Dia.	B Dia.	C	D	E Ref.	F	
2 mm	192059-1	M3x0.5	30	12	.080 2.0	.220 5.6	.670 17.0	1.42 36.1	.630 16	.790 20.1	Silver
4 mm	192129-1	10-32	60	10	.160 4.1	.280 7.1	.790 20.1	2.00 50.8	1.00 25.4	1.00 25.4	Gold
6 mm	192211-1	1/4-28	100	11	.240 6.1	.410 10.4	.800 20.3	2.09 53.1	1.00 25.4	1.09 27.7	Gold
8 mm	192271-1	5/16-24	185	12	.320 8.1	.560 14.2	1.40 35.6	3.07 78	1.42 36.0	1.65 41.9	Silver

Cable Mounted Products

**Thread-Mount Pins**

These pins are designed for thread-mount. The large variety of sizes have ratings from 30 continuous Amps and are designed to be mated with Thread-Mount Sockets, Threaded Sleeve Sockets and Crimp Sockets.



**Material**—Brass

**Finish**—Silver

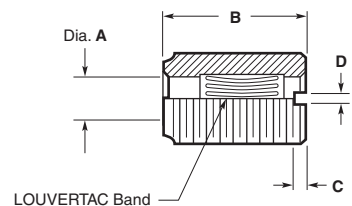
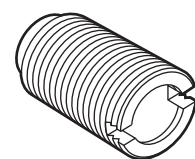
Pin Dia.	Part Number	Thread	Contin. Current (Amp)	Dimensions				
				A Dia.	B	C	D	E Ref.
2 mm	192085-1	M3x0.5	30	.080 2.0	.16 4.1	.65 16.5	1.40 35.6	.63 15.0
4 mm	192161-1	10-32	60	.160 4.1	.25 6.4	.77 19.6	1.91 48.5	.99 25.1
6 mm	192244-1	1/4-28	100	.240 6.1	.31 7.9	.77 19.6	2.03 51.6	1.11 25.2
8 mm	192293-1	5/16-24	185	.320 8.1	.44 11.2	1.30 33.0	2.95 74.9	1.47 37.3

**Note:** All part numbers are RoHS compliant.

**High Current Products (LOUVERTAC Contacts)** (Continued)

**Threaded Sleeve Sockets**

The Threaded Sleeve Socket Assembly is designed for High Current in a restricted space. The Sleeve can be screwed directly into a threaded bus bar or it may be inserted into a drilled hole in the bus bar with tightened nuts on each side of the bus bar. A Crimp Pin or Thread-Mount Pin can be attached to a cable for the completed connector.



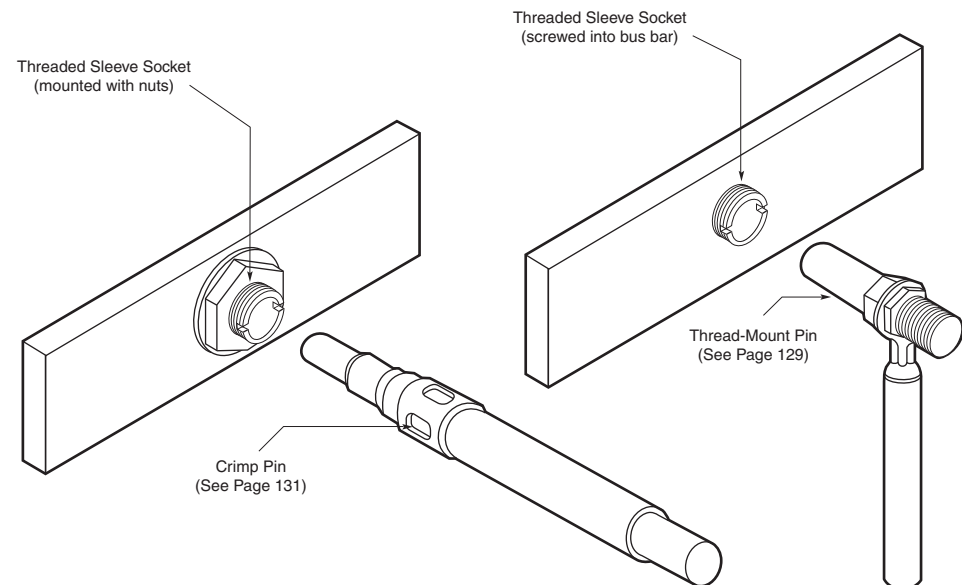
**Material**

**Body**—Brass  
**LOUVERTAC Band**—Beryllium Copper

**Finish**

**Body**—Silver  
**LOUVERTAC Band**—See Table

Mating Pin Dia.	Part Number	Thread	Contin. Current (Amp)	Voltage Drop (mV)	Dimensions				LOUVERTAC Band Plating
					A Dia.	B	C	D	
2 mm	1-192447-0	5/16-32	30	12	.090 2.3	.650 16.5	.060 1.5	.060 1.5	Silver
4 mm	192447-8	5/16-32	60	10	.160 4.1	.770 19.6	.060 1.5	.060 1.5	Gold
6 mm	192447-2	1/2-20	100	11	.240 6.1	.770 19.6	.078 2.0	.078 2.0	Gold
8 mm	1-192447-8	9/16-18	185	12	.320 8.1	1.35 34.3	.100 2.5	.100 2.5	Silver
12 mm	1-192447-2	3/4-16 UNF -2A	290	13	.479 12.2	1.34 34.0	.130 3.3	.130 3.3	Silver

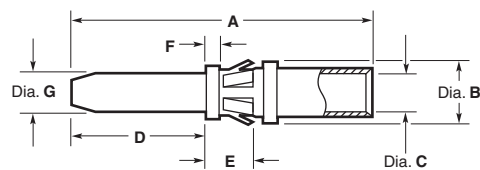


**Note:** All part numbers are RoHS compliant.

**High Current Products (LOUVERTAC Contacts)** (Continued)

**Crimp Pins**

Crimp Pins feature a mechanism for locking the pin into a housing designed by the customer. The 2 mm and 4 mm pins are crimped with a Daniels Hand Crimp Tool. Pin sizes from 6 mm to 8 mm may be crimped with the indicated tooling and a DYNA-CRIMP 69120-1 electric-hydraulic power unit. The large variety of sizes have ratings from 24 continuous Amps and can be mated with Thread-Mount Socket Assemblies, Threaded Sleeve Socket Assemblies or Crimp Sockets.



Cable Mounted Products

**Material**

**Body**—Copper Alloy  
**Retention Spring**—Stainless Steel or Beryllium Copper

**Finish**

**Body**—Silver

Pin Dia.	Part Number	Contin. Current (Amp)	Voltage Drop (mV)	Dimensions								Use with AWG	Tooling Part Numbers		
				A	B Dia.	C Dia.	D	E	F	G Dia.	Crimp Die		Crimp Head	Extraction Tool	
2 mm	193837-1	30	12	1.40 35.6	.225 5.72	.100 2.54	.640 16.3	.211 5.36	.050 1.27	.080 2.0	12-14	M310	TP1019	318813-1	
	193837-2	44	8	1.53 38.9	.300 7.6	.145 3.7	.750 19.1	.211 5.36	.050 1.27	.160 4.0	10	M310	TP1020	679916-1	
4 mm	193837-3	60	8	1.53 38.9	.300 7.6	.181 4.60	.750 19.1	.211 5.36	.050 1.27	.160 4.0	8	M310	TP1020	679916-1	
	193837-4	76	9	1.64 41.7	.410 10.4	.235 5.97	.760 19.3	.211 5.36	.050 1.27	.240 6.0	6	69133-1	69099	679917-1	
6 mm	193837-5	100	9	1.73 43.9	.410 10.4	.290 7.37	.760 19.3	.211 5.36	.050 1.27	.240 6.0	4	69134-2	69099	679917-1	
	193837-6	135	10	2.50 63.5	.570 14.5	.390 9.91	1.30 33.0	.211 5.36	.050 1.27	.320 8.0	2	46765-3	69099	679918-1	
8 mm	193837-7	185	12	2.63 66.8	.570 14.5	.487 12.37	1.30 33.0	.211 5.36	.050 1.27	.320 8.0	1/0	46766-2	69099	679918-1	

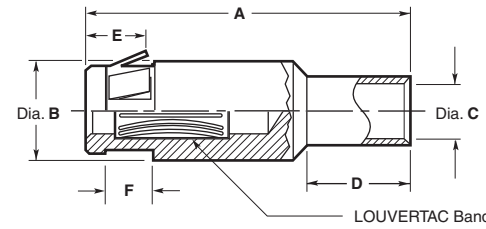
**Notes:** 1. Additional information on AMPPOWER terminal hydraulic crimping is available in Catalog 82025.  
 2. Application Specification — 114-16022

**Note:** All part numbers are RoHS compliant.

**High Current Products (LOUVERTAC Contacts)** (Continued)

**Crimp Sockets**

Crimp Sockets feature a mechanism for locking the socket into a housing designed by the customer. A TE extraction tool is offered to remove the contact. The 2 mm and 4 mm sockets are crimped with a Daniels Hand Crimp Tool. Socket sizes from 6 mm to 8 mm may be crimped with the indicated tooling and a DYNA-CRIMP 69120-1 electric-hydraulic power unit. The large variety of sizes have ratings from 24 continuous Amps and can be mated with Thread-Mount Pins or Crimp Pins.



**Material**

- Body**—Copper Alloy
- LOUVERTAC Band**—Beryllium Copper
- Retention Spring**—Stainless Steel or Beryllium Copper

**Finish**

- Body**—Silver
- LOUVERTAC Band**—Silver

Mating Pin Dia.	Part Number	Contin. Current (Amp)	Voltage Drop (mV)	Dimensions						Use with AWG	Tooling Part Numbers		
				A	B Dia.	C Dia.	D	E	F		Crimp Die	Crimp Head	Extraction Tool
2 mm	193673-1	24	10	1.13 28.7	.230 5.8	.100 2.54	.420 10.7	.211 5.36	.209 5.31	14	M310	TP1021	318813-1
	193673-1	30	12	1.13 28.7	.230 5.8	.100 2.54	.420 10.7	.211 5.36	.209 5.31	12	M310	TP1021	318813-1
4 mm	193673-2	44	8	1.31 33.3	.300 7.6	.145 3.68	.400 10.2	.211 5.36	.209 5.31	10	M310	TP1022	679916-1
	193673-3	60	8	1.31 33.3	.300 7.6	.181 4.60	.410 10.4	.211 5.36	.209 5.31	8	M310	TP1022	679916-1
6 mm	193673-4	76	9	1.42 36.1	.410 10.4	.235 5.97	.460 11.7	.211 5.36	.209 5.31	6	69133-1	69099	679917-1
	193673-5	100	9	1.48 37.6	.410 10.4	.290 7.37	.530 13.5	.211 5.36	.209 5.31	4	69134-2	69099	679917-1
8 mm	193673-6	135	10	2.26 57.4	.570 14.5	.390 9.91	.640 16.3	.211 5.36	.209 5.31	2	46765-3	69099	679918-1
	193673-7	185	12	2.45 62.2	.570 14.5	.487 12.37	—	.211 5.36	.209 5.31	1/0	46766-2	69099	679918-1
12 mm	193673-8*	290	13	2.51 63.7	.795 20.19	.541 13.74	.930 23.62	—	—	2/0	46767-2	69099	—
20 mm	1-193673-2*	480	11	3.17 80.5	1.072 27.23	.721 18.31	1.24 31.50	—	—	250 MCM	46751-2	69099	—

\* Socket contact uses retention ring (not supplied) for locking contact in housing. See Application Specification 114-16022 for details.

- Notes:** 1. Additional information on AMPPOWER terminal hydraulic crimping is available in Catalog 82025.  
2. Application Specification—114-16022

**Note:** All part numbers are RoHS compliant.

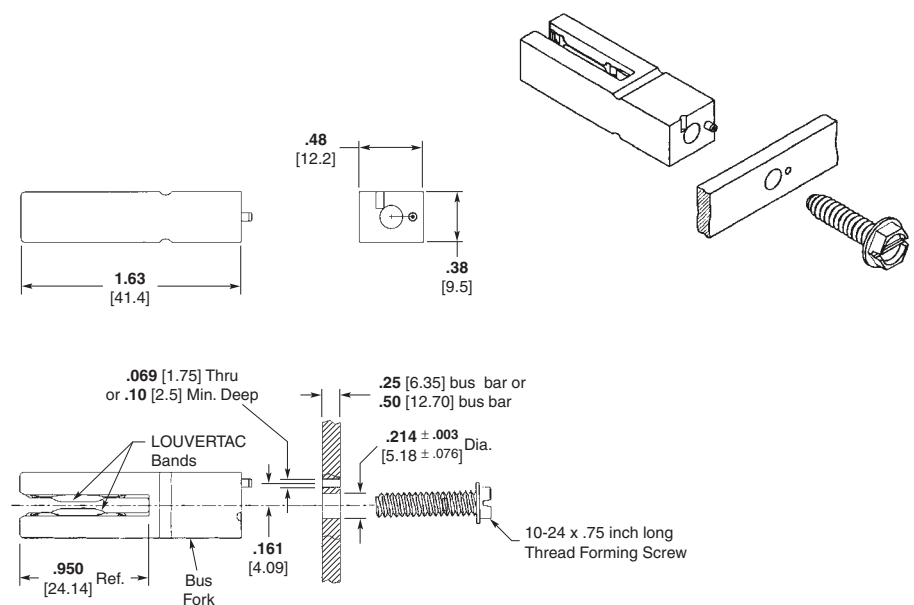
**High Current Products (LOUVERTAC Contacts) (Continued)**

**Thread-Mount Fork**

The Thread-Mount Fork was developed to mount onto a plate or bus bar designed and fabricated by the customer. The Fork is rated at 84 Amps (Upper Tolerance Limit) and accepts a .087 thick blade or circuit board. The anti-rotation pin is in place to help prevent the Fork from rotating while tightening the screw.

**Material**

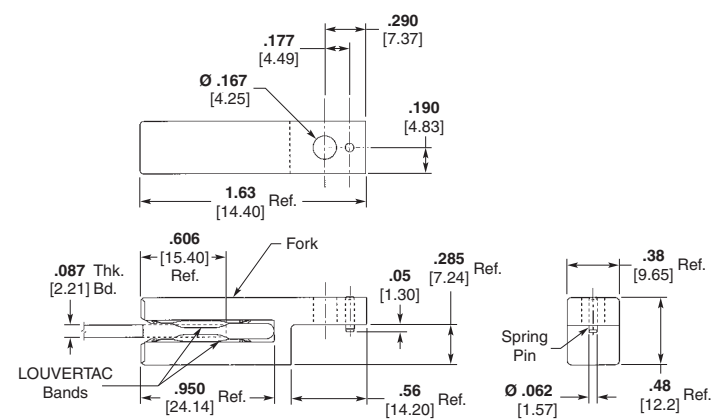
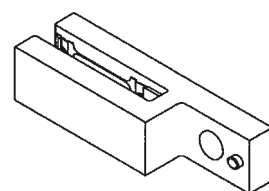
- Fork** — Zinc Al Alloy
- LOUVERTAC Bands** — Copper Alloy
- Screw** — Steel
- Finish**
- Fork** — Silver
- LOUVERTAC Bands** — Silver
- Screw** — Zinc



Part Number 194257-1

Cable Mounted Products

**Right-Angle Thread-Mount Fork**



Part Number 194305-1

**Material**

- Fork** — Zinc Al Alloy
- LOUVERTAC Bands** — Copper Alloy
- Spring Pin** — Stainless Steel
- Finish**
- Fork** — Silver
- LOUVERTAC Bands** — Silver

Note: All part numbers are RoHS compliant.

**High Current Products (LOUVERTAC Contacts)** (Continued)

**LOUVERTAC Strip, Torsional Louver Type**

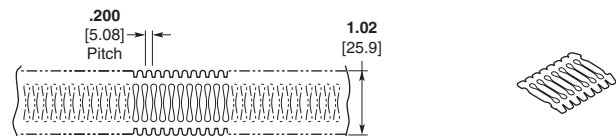
The Torsional Louver Type Band was designed as an electrical interface that allows the transfer of high current and a more generous tolerance between mating surfaces. A strip can be sized with scissors in an on-site installation. They are available for use in flat and circular applications. A male band is used on the outside diameter of a pin. The female band is used on the inside diameter of a socket.

**Material** — Beryllium Copper

**Finish** — See Tables

**LAO .092 [2.27] Louver Height**

Tooth Angle — 15°  
Minimum Diameter — 1.75 inches

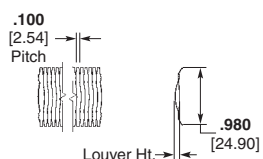


Part Number	Application	Material Thickness	Suggested Current Limit per inch	Finish
192000-2	Flat or Female	.006 .15	150	Silver
192000-9	Flat or Female	.010 .25	250	Silver
192001-4	Flat or Male	.006 .15	150	Silver

**LAOG**

**Louvers Height** — See Table

Tooth Angle — 45°  
Minimum Diameter — 1.75 inches

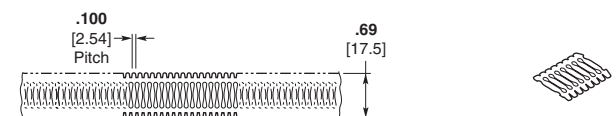


Part Number	Application	Material Thickness	Suggested Current Limit per inch	Louvers Height	Finish
192002-1	Flat or Female	.006 .15	300	.105 2.67	Unplated
192002-2	Flat or Female	.006 .15	300	.105 2.67	Silver
192002-3	Flat or Female	.010 .25	500	.110 2.79	Unplated

**LAIA**

**.050 [1.27] Louver Height**

Tooth Angle — See Table  
Minimum Diameter — 1½ inches



Part Number	Application	Material Thickness	Suggested Current Limit per inch	Tooth Angle	Finish
192004-4	Flat or Female	.004 .10	150	15°	Silver
192004-6	Flat or Female	.004 .10	150	45°	Silver
192004-8	Flat or Female	.006 .15	250	15°	Silver
1-192004-1	Flat or Female	.006 .15	250	15°	Gold
1-192004-4	Flat or Female	.006 .15	250	45°	Silver
192007-7	Flat or Male	.006 .15	250	15°	Silver
192008-1	Flat or Male	.004 .10	150	45°	Silver

- Notes:** 1. Product will be sold by the foot except where length is specified.  
2. Suggested current limits are application dependent.  
3. Additional sizes are available upon request.

**Note:** All part numbers are RoHS compliant.

**High Current Products (LOUVERTAC Contacts)** (Continued)

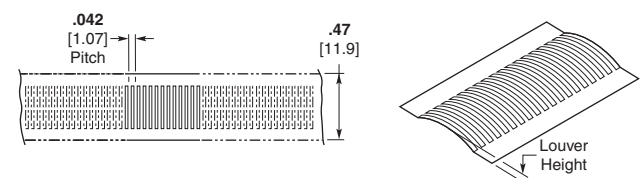
**LOUVERTAC Strip, Bridge Louver Type**

The Bridge Louver Type Band was designed to transfer high currents in very small spaces. A strip can be sized with scissors in an on-site installation. They are available for use in flat and circular applications. A male band is used on the outside diameter of a pin. The female band is used on the inside diameter of a socket.

**Material**—Beryllium Copper

**LAIII  
.034 [.86] Louver Height**

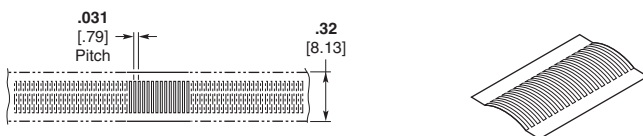
Minimum Diameter — 1 inch  
Suggested Current Limit  
Per Inch — 150 Amps  
Material Thickness — .006 [.15]



Part Number	Application	Finish
192038-6	Female	Silver
192039-5	Male	Silver

**LAIV  
.026 [.66] Louver Height**

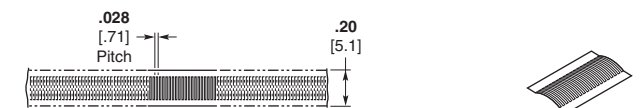
Minimum Diameter — 3/4 inch  
Suggested Current Limit  
Per Inch — 150 Amps  
Material Thickness — See Table



Part Number	Application	Finish	Material Thickness
1-192041-2	Female	Silver	.006 .15
192042-5	Male	Silver	.006 .15
192048-2	Male	Gold	.004 .10

**LAV  
.022 [.56] Louver Height**

Minimum Diameter — 3/4 inch  
Suggested Current Limit  
Per Inch — 120 Amps  
Material Thickness — See Table



Part Number	Application	Finish	Material Thickness
1-192044-9	Female	Silver	.005 .13
192045-5	Male	Silver	.005 .13
192045-2	Male	Gold	.004 .10
1-192045-2	Male	Gold	.004 .10

**Notes:** 1. Product will be sold by the foot except where length is specified.  
2. Suggested current limits are application dependent.  
3. Additional sizes are available upon request.

**Note:** All part numbers are RoHS compliant.

Cable Mounted Products

**High Current Products (LOUVERTAC Contacts)** (Continued)

**Preformed Female LOUVERTAC Bands**

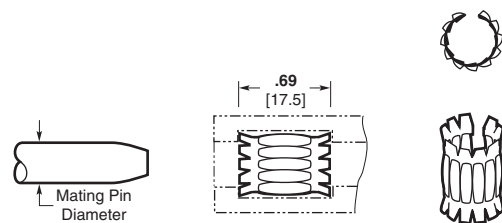
**Female Torsional Formed Type**

**LA1A/LA1B .050 [1.27] Louver Height**

**Material** — Beryllium Copper

**Finish** — See Table

**Tooth Angle** — See Table



LOUVERTAC Bands can be manufactured as preformed diameters. This will allow the insertion of the band into a socket.

The diameter indicated is the mating pin diameter that will be inserted into the socket assembly.

Consult Product Engineering for mounting details.

Part Number	Mating Pin Dia.	Material Thickness	Suggested Current Limit (A)	Finish	Tooth Angle	Band Type
4-192013-3	.312 [7.92]	.004 [.10]	150	Silver	15°	LA1A
4-192013-5	.312 [7.92]	.006 [.15]	250	Silver	15°	LA1A
5-192013-1	.355 [9.01]	.006 [.15]	275	Gold	15°	LA1A
5-192013-4	.375 [9.53]	.006 [.15]	300	Silver	15°	LA1A
5-192013-5	.394 [10.00]	.006 [.15]	325	Silver	15°	LA1A
5-192013-8	.434 [11.02]	.006 [.15]	350	Gold	15°	LA1A
5-192013-9	.437 [11.10]	.006 [.15]	350	Silver	15°	LA1A
6-192013-7	.472 [11.99]	.006 [.15]	375	Silver	15°	LA1A
6-192013-9	.472 [11.99]	.008 [.20]	375	Silver	15°	LA1A
7-192013-1	.500 [12.70]	.006 [.15]	400	Silver	15°	LA1A
7-192013-6	.551 [14.00]	.006 [.15]	450	Silver	15°	LA1A
8-192013-2	.625 [15.88]	.006 [.15]	500	Silver	15°	LA1A
8-192013-6	.625 [15.88]	.008 [.20]	475	Silver	15°	LA1A
8-192013-9	.685 [17.40]	.006 [.15]	550	Silver	15°	LA1A
9-192013-6	.750 [19.05]	.006 [.15]	600	Silver	15°	LA1A
192033-3	.750 [19.05]	.008 [.20]	600	Silver	15°	LA1A
1-192033-9	.875 [22.22]	.006 [.15]	675	Gold	15°	LA1A
2-192033-0	.875 [22.22]	.006 [.15]	700	Silver	15°	LA1A
2-192033-6	1.000 [25.40]	.006 [.15]	775	Silver	15°	LA1A
3-192033-4	1.250 [31.75]	.006 [.15]	975	Silver	15°	LA1A
5-192033-2	1.000 [25.40]	.008 [.20]	800	Silver	15°	LA1A
3-192013-8	1.187 [30.10]	.006 [.15]	950	Silver	45°	LA1B
5-192033-0	.812 [20.62]	.008 [.20]	625	Silver	45°	LA1B

**Notes:** 1. Suggested current limits are application dependent.  
2. Additional sizes are available upon request.

**Note:** All part numbers are RoHS compliant.



**High Current Products (LOUVERTAC Contacts)** (Continued)

**Preformed Female LOUVERTAC Bands**

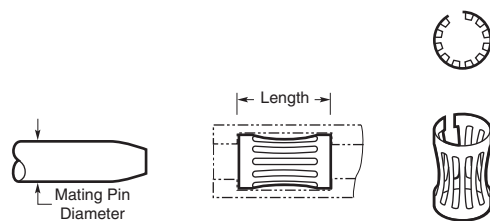
(Continued)

**Female Bridge Formed Type**

**LAIII through LAVI**

**Material** — Beryllium Copper

**Finish** — See Table



Part Number	Mating Pin Dia.	Length	Material Thickness	Suggested Current Limit (A)	Finish	Band Type
1-192038-9	.125 [3.18]	.47 [11.9]	.004 [.10]	40	Nickel	LAIII
2-192038-8	.197 [5.00]	.47 [11.9]	.006 [.15]	90	Gold	LAIII
3-192038-7	.236 [6.00]	.47 [11.9]	.006 [.15]	100	Gold	LAIII
4-192038-0	.236 [6.00]	.47 [11.9]	.008 [.20]	120	Gold	LAIII
4-192038-1	.236 [6.00]	.47 [11.9]	.008 [.20]	120	Gold	LAIII
4-192038-8	.250 [6.35]	.47 [11.9]	.006 [.15]	110	Silver	LAIII
4-192038-9	.250 [6.35]	.47 [11.9]	.006 [.15]	110	Gold	LAIII
5-192038-4	.250 [6.35]	.47 [11.9]	.008 [.20]	125	Gold	LAIII
6-192038-0	.280 [7.11]	.47 [11.9]	.008 [.20]	165	Silver	LAIII
6-192038-1	.280 [7.11]	.47 [11.9]	.008 [.20]	125	Gold	LAIII
6-192038-2	.250 [6.35]	.47 [11.9]	.006 [.15]	125	Unplated	LAIII
6-192038-5	.315 [8.00]	.47 [11.9]	.008 [.20]	185	Silver	LAIII
6-192038-6	.315 [8.00]	.47 [11.9]	.008 [.20]	185	Gold	LAIII
7-192038-7	.394 [10.00]	.47 [11.9]	.008 [.20]	250	Silver	LAIII
8-192038-1	.437 [11.10]	.47 [11.9]	.008 [.20]	270	Silver	LAIII
8-192038-6	.472 [11.99]	.47 [11.9]	.008 [.20]	300	Silver	LAIII
9-192038-4	.500 [12.70]	.47 [11.9]	.008 [.20]	300	Tin	LAIII
192040-8	.375 [9.53]	.47 [11.9]	.008 [.20]	200	Gold	LAIII
2-192040-7	.250 [6.35]	.47 [11.9]	.006 [.15]	110	Gold	LAIII
2-192041-9	.025 [0.64]	.32 [8.13]	.005 [.13]	15	Gold	LAIV
4-192041-0	.062 [1.57]	.32 [8.13]	.006 [.15]	25	Silver	LAIV
4-192041-1	.062 [1.57]	.32 [8.13]	.006 [.15]	25	Gold	LAIV
4-192041-4	.080 [2.03]	.32 [8.13]	.006 [.15]	35	Gold	LAIV
5-192041-0	.093 [2.36]	.32 [8.13]	.005 [.13]	40	Gold	LAIV
5-192041-9	.100 [2.54]	.32 [8.13]	.006 [.15]	50	Gold	LAIV
6-192041-9	.125 [3.18]	.32 [8.13]	.006 [.15]	60	Gold	LAIV
7-192041-4	.157 [4.00]	.32 [8.13]	.006 [.15]	65	Gold	LAIV
7-192041-7	.157 [4.00]	.32 [8.13]	.006 [.15]	65	Silver	LAIV
7-192041-8	.157 [4.00]	.32 [8.13]	.006 [.15]	65	Gold	LAIV
8-192041-4	.157 [4.00]	.32 [8.13]	.008 [.20]	75	Gold	LAIV
8-192041-9	.173 [4.39]	.32 [8.13]	.006 [.15]	70	Gold	LAIV
192043-6	.218 [5.54]	.32 [8.13]	.006 [.15]	95	Silver	LAIV
1-192043-5	.254 [6.45]	.32 [8.13]	.006 [.15]	110	Silver	LAIV
1-192043-6	.250 [6.35]	.32 [8.13]	.006 [.15]	120	Gold	LAIV
2-192043-0	.280 [7.11]	.32 [8.13]	.006 [.15]	130	Gold	LAIV
2-192043-7	.315 [8.00]	.32 [8.13]	.006 [.15]	165	Silver	LAIV
4-192043-5	.375 [9.53]	.32 [8.13]	.006 [.15]	175	Gold	LAIV
5-192043-0	.375 [9.50]	.32 [8.13]	.007 [.18]	175	Tin	LAIV
6-192043-7	.602 [15.30]	.32 [8.13]	.006 [.15]	285	Gold	LAIV
7-192043-2	.125 [3.18]	.32 [8.13]	.006 [.15]	60	Silver	LAIV
9-192043-3	.157 [4.00]	.32 [8.13]	.006 [.15]	65	Silver	LAIV
9-192043-6	.725 [18.40]	.32 [8.13]	.006 [.15]	350	Silver	LAIV
4-192044-1	.030 [0.76]	.20 [5.10]	.005 [.13]	13	Gold	LAV
4-192044-2	.030 [0.76]	.20 [5.10]	.005 [.13]	11	Unplated	LAV
4-192044-4	.055 [1.40]	.20 [5.10]	.005 [.13]	20	Gold	LAV
4-192044-7	.060 [1.54]	.20 [5.10]	.004 [.10]	22	Gold	LAV
5-192044-6	.062 [1.57]	.20 [5.10]	.005 [.13]	25	Gold	LAV
5-192044-8	.065 [1.65]	.20 [5.10]	.005 [.13]	23	Unplated	LAV
6-192044-0	.080 [2.03]	.20 [5.10]	.004 [.10]	30	Silver	LAV
6-192044-4	.080 [2.03]	.20 [5.10]	.005 [.13]	30	Gold	LAV

**Note:** All part numbers are RoHS compliant.

**Notes:** 1. Suggested current limits are application dependent.  
2. Additional sizes are available upon request.

Cable Mounted Products

**High Current Products (LOUVERTAC Contacts)** (Continued)

**Preformed Female LOUVERTAC Bands**

(Continued)

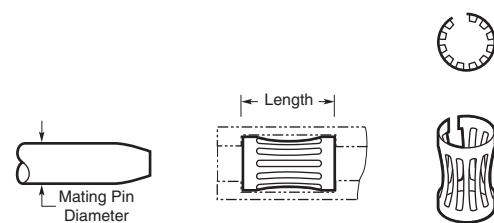
**Female Bridge Formed Type**

**LAVI through LAVI**

(Continued)

**Material** — Beryllium Copper

**Finish** — See Table



Part Number	Mating Pin Dia.	Length	Material Thickness	Suggested Current Limit (A)	Finish	Band Type
6-192044-6	.080 [2.03]	.20 [5.10]	.008 [.20]	30	Gold	LAV
7-192044-1	.093 [2.36]	.20 [5.10]	.005 [.13]	35	Gold	LAV
8-192044-1	.125 [3.18]	.20 [5.10]	.004 [.10]	45	Gold	LAV
8-192044-3	.125 [3.18]	.20 [5.10]	.005 [.13]	45	Silver	LAV
8-192044-4	.125 [3.18]	.20 [5.10]	.005 [.13]	45	Gold	LAV
8-192044-7	.125 [3.18]	.20 [5.10]	.005 [.13]	45	Unplated	LAV
192046-6	.172 [4.40]	.20 [5.10]	.006 [.15]	65	Gold	LAV
1-192046-6	.225 [5.70]	.20 [5.10]	.006 [.15]	85	Gold	LAV
1-192046-9	.250 [6.35]	.20 [5.10]	.006 [.15]	110	Gold	LAV
2-192046-0	.250 [6.30]	.20 [5.10]	.006 [.15]	95	Tin	LAV
3-192046-0	.400 [10.2]	.20 [5.10]	.005 [.13]	150	Gold	LAV
5-192046-0	.750 [19.0]	.20 [5.10]	.005 [.13]	285	Gold	LAV
5-192046-9	.134 [3.40]	.20 [5.10]	.006 [.15]	50	Gold	LAV
1-192047-4	.040 [1.00]	.10 [2.54]	.004 [.10]	15	Gold	LAVI
1-192047-9	.062 [1.60]	.10 [2.54]	.004 [.10]	22	Gold	LAVI
3-192047-7	.125 [3.20]	.10 [2.54]	.004 [.10]	45	Gold	LAVI
5-192047-1	.256 [6.50]	.10 [2.54]	.004 [.10]	95	Gold	LAVI
5-192047-3	.272 [6.90]	.10 [2.54]	.004 [.10]	65	Gold	LAVI
7-192047-5	.256 [6.50]	.10 [2.54]	.004 [.10]	95	Unplated	LAVI

**Note:** All part numbers are RoHS compliant.

**Notes:** 1. Suggested current limits are application dependent.  
2. Additional sizes are available upon request.

**High Current Products (LOUVERTAC Contacts)** (Continued)

**Preformed Male LOUVERTAC Bands**

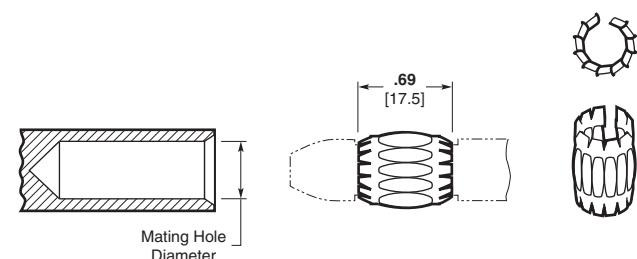
**Male Torsional Formed Type**

**LA1AS/LA1BS**

**Material**—Beryllium Copper

**Finish**—See Table

**Tooth Angle**—See Table



LOUVERTAC Bands can be formed into a "male" shape for use on a pin. Selection begins with the amperage requirement and then the mating hole diameter. Consult Product Engineering for mounting details.

Part Number	Mating Hole Dia.	Material Thickness	Suggested Current Limit (A)	Finish	Tooth Angle	Band Type
192007-9	.312 [7.92]	.006 [.15]	200	Silver	15°	LA1AS
1-192007-9	.620 [15.7]	.006 [.15]	425	Silver	15°	LA1AS
2-192007-5	.750 [19.0]	.008 [.20]	550	Silver	15°	LA1AS
3-192007-1	1.000 [25.4]	.006 [.15]	750	Silver	15°	LA1AS
192008-6	.500 [12.7]	.006 [.15]	350	Silver	45°	LA1BS
1-192008-3	.750 [19.0]	.008 [.20]	550	Silver	45°	LA1BS
1-192008-5	.781 [19.8]	.006 [.15]	575	Silver	45°	LA1BS
2-192008-1	.875 [22.22]	.008 [.20]	650	Silver	45°	LA1BS
3-192008-4	1.197 [30.4]	.008 [.20]	900	Silver	45°	LA1BS
4-192008-2	1.450 [36.8]	.006 [.15]	1100	Silver	45°	LA1BS



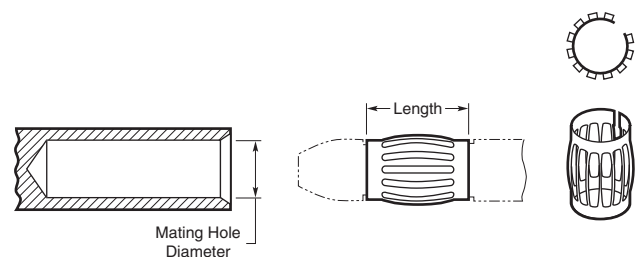
Cable Mounted Products

**Male Bridge Formed Type**

**LAIIS through LAVIS**

**Material**—Beryllium Copper

**Finish**—See Table



Part Number	Mating Hole Dia.	Length	Material Thickness	Suggested Current Limit (A)	Finish	Band Type
1-192039-7	.157 [4.0]	.470 [11.9]	.008 [.20]	75	Gold	LAIIS
2-192039-1	.250 [6.35]	.470 [11.9]	.008 [.20]	130	Silver	LAIIS
2-192039-3	.248 [6.3]	.470 [11.9]	.008 [.20]	130	Silver	LAIIS
2-192039-7	.311 [7.9]	.470 [11.9]	.008 [.20]	175	Unplated	LAIIS
2-192039-9	.311 [7.9]	.470 [11.9]	.008 [.20]	175	Silver	LAIIS
3-192039-0	.311 [7.9]	.470 [11.9]	.008 [.20]	175	Gold	LAIIS
5-192039-3	.236 [6.0]	.470 [11.9]	.008 [.20]	120	Nickel	LAIIS
5-192039-4	.157 [4.0]	.470 [11.9]	.008 [.20]	75	Nickel	LAIIS
1-192042-5	.080 [2.0]	.320 [8.13]	.005 [.12]	30	Nickel	LAVIS
2-192042-5	.157 [4.0]	.320 [8.13]	.006 [.15]	65	Unplated	LAVIS
2-192042-8	.157 [3.99]	.320 [8.13]	.006 [.15]	60	Gold	LAVIS
4-192042-8	.500 [1.27]	.320 [8.13]	.005 [.12]	235	Unplated	LAVIS
6-192042-6	.368 [9.38]	.320 [8.13]	.004 [.10]	170	Unplated	LAVIS
6-192042-7	.375 [9.53]	.320 [8.13]	.006 [.15]	175	Tin	LAVIS
6-192042-8	.375 [9.53]	.320 [8.13]	.006 [.15]	175	Gold	LAVIS
2-192045-3	.250 [6.35]	.200 [5.10]	.006 [.15]	95	Gold	LAVIS
192048-6	.051 [1.3]	.100 [2.54]	.004 [.10]	17	Gold	LAVIS
1-192048-1	.127 [3.23]	.100 [2.54]	.004 [.10]	22	Gold	LAVIS
2-192048-4	.156 [3.96]	.100 [2.54]	.004 [.10]	65	Gold	LAVIS

**Note:** All part numbers are RoHS compliant.

**Notes:** 1. Suggested current limits are application dependent.  
2. Additional sizes are available upon request.

## AMP Power Series Connectors

### Product Facts

- Single-pole and 2-pole (battery) quick connect/disconnect connectors
- Eight Series, based on approximate current-carrying capability:
  - Series 15/30/45 (Single-Pole)
  - Series 50 (2-Pole Battery)
  - Series 50 Finger Probe Resistant (FPR)
  - Series 75 (Single-Pole)
  - Series 120 (Single- and 2-Pole)
  - Series 175 (2-Pole Battery)
  - Series 180 (Single-Pole)
  - Series 350 (2-Pole Battery)
- Voltage rating: 600 V AC/DC
- Color-coded housings, UL 94V-0
- Hermaphroditic (genderless) housings reduce inventory
- Modular, single-pole housings are stackable in four directions
- Polarity (+ and -) molded into 2-pole housings promotes proper wiring
- Mechanical keys help prevent two different color-coded housings from mating
- Stainless steel retaining springs secure contacts in housings
- Stamped and formed, open barrel contacts (6-20 AWG) on reels for automatic and semiautomatic machine termination
- Loose piece, cold-headed contacts (6 AWG – 300 MCM) for manual and hydraulic hand tools; reducing bushings accommodate smaller wire sizes
- Compatible with industry standard crimp tooling from Pico Corporation (<http://www.picotools.com>)
- Connectors intermateable with similar connectors from other manufacturers



- Series 15/30/45, single-pole connectors designed to meet Amateur Radio Emergency Service (ARES)/Radio Amateur Civil Emergency Service (RACES) Standard Power Connector requirements
- Accessories available for mounting, vibration protection, and strain relief
- Component Recognized by Underwriters Laboratories Inc. to US and Canadian Standards, File No. E28476



AMP power series connectors provide a durable, quick connect/disconnect means to transmit “power” levels of current and voltage (15-275 A, 600 V AC/DC).

This product family is primarily comprised of single-pole and 2-pole (battery) connector housings, crimp snap-in contacts, and accessories. Housings are offered in various colors. Two-pole housings have different polarization configurations; with the exception of black housings, each color identifies a different keying configuration. In general, only like color housings will mate. Contacts are either cold-headed or stamped and formed, depending upon the connector series.

AMP power series connectors are divided into eight series, based on approximate current-carrying capability.

### Applications

AC/DC power supplies and charging systems, rechargeable batteries, material handling equipment (e.g. forklift trucks), electric vehicles (e.g., golf carts, sweepers, wheelchairs), office furniture/panels, amateur emergency radios, and industrial equipment.

**AMP Power Series Connectors** (Continued)



**AMP Power Series 15/30/45**

Single-pole connector housings are stackable side-to-side and top-to-bottom. For example, Series 30 red and black housings joined side-to-side, are commonly used as standard power connectors for handheld, mobile, or base amateur radio equipment.

Modular housings can also be grouped into plug frames with or without latches, which mate with receptacle housings. Typically, these are used as quick disconnects for electrical power distribution in office furniture and panels.



**AMP Power Series 50**

Two-pole (battery) housings are available in bulk quantities or in kit form (i.e., 1 housing and 2 contacts). These high durability connectors are designed for repeated mating and unmating.



**AMP Power Series 50 Finger Probe Resistant (FPR)**

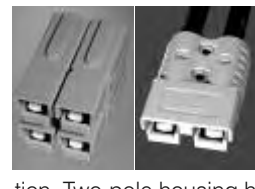
This new, 2-pole, FPR version helps prevent finger access, which allows it to be more safely used at elevated voltages and in user access areas.



**AMP Power Series 75**

Single-pole, stackable housings, in locking and non-locking versions, are available in a variety of colors. Housings accept stamped and formed or cold-headed contacts. Bulk quantities and connector kits (1 housing and 1 contact) can be ordered. Accessories include: mounting wings for through-panel or surface mounting and mounting clamp sets for ganging housings.

1 contact) can be ordered. Accessories include: mounting wings for through-panel or surface mounting and mounting clamp sets for ganging housings.



**AMP Power Series 120**

This Series includes both single- and 2-pole (battery) versions. Single-pole housings with molded-in dovetails allow stacking. Housing retaining pins provide more vibration protection. Two-pole housing have slots designed to accept mounting clamp sets for easier panel mounting.



**AMP Power Series 175**

Two-pole (battery) housings accept cold-headed contacts (4-1/0 AWG). Basically, these connectors offer the same features as the two-pole Series 50 connectors.



**AMP Power Series 180**

These stackable, single-pole connectors accept cold-headed contacts (4-1/0 AWG). Most features are similar to the smaller, single-pole, Series 120 connectors.



**AMP Power Series 350**

Rugged, 2-pole housings accept only loose piece, cold-headed contacts (1/0-300 MCM). Rated at 275 A, these connectors have been tested up to 275 A, with 4/0 AWG wire.

Cable Mounted Products

**Selection Guide**

Series	Housing Type	Stackable Housing	Current Max. (A)	Voltage, Max. (V, AC or DC)	Cold-headed Contact (AWG)	Stamped & Formed Contact (AWG)	Housing Colors	Approvals
15	Single-Pole	Yes	15	600	—	16-20	Blue, Black, White, Red, Green, Yellow, Orange, Gray	UL File No. E28476
30	Single-Pole	Yes	30	600	—	12-16	Blue, Black, White, Red, Green, Yellow, Orange, Gray	UL File No. E28476
45	Single-Pole	Yes	40*	600	—	10-14	Blue, Black, White, Red, Green, Yellow, Orange, Gray	UL File No. E28476
50	2-Pole	No	50	600	6, 8, 10-12	6-10,10-12	Red, Gray, Blue, Black, Yellow	UL File No. E28476
75	Single-Pole	Yes	75	600	6, 8,10-12	6-10,10-12	Blue, Black, White, Green, Red (Single-Pole)	UL File No. E28476
120	Single-Pole	Yes	120	600	2, 4, 6	—	Blue, Black, White, Green, Red (Single-Pole)	UL File No. E28476
120	2-Pole	No	120	600	2, 4, 6	—	Blue, Gray (2-Pole)	UL File No. E28476
175	2-Pole	No	175	600	1/0, 1, 2, 4	—	Blue, Gray, Orange, Yellow, Red	UL File No. E28476
180	Single-Pole	Yes	180	600	1/0, 1, 2, 4	—	Blue, Black, White, Green, Red	UL File No. E28476
350	2-Pole	No	275**	600	1/0, 2/0, 3/0, 4/0, 300 MCM	—	Blue, Green, Red, Yellow, Orange, Gray	UL File No. E28476

\*Performance equivalent to competition \*\*Tested to 275 Amps with 4/0 AWG wire

## AMP Power Series 15/30/45 Connectors (Single-Pole)

### Product Facts

- Color-coded UL 94V-0 housings: blue, black, white, green, red, yellow, orange and gray
- Genderless housings reduce inventory
- 3 contact offerings available: Series 15, 30 and 45
- Built-in interlocking features (dovetails) allow stacking
- Series 15/30/45, single-pole connectors designed to meet Amateur Radio Emergency Service (ARES)/Radio Amateur Civil Emergency Service (RACES) Standard Power Connector requirements
- Plug frames (with or without latches) and receptacle housings accept stacked single-pole housings (2 to 8 poles)
- File No. E28476

### Material and Finish

**Housing**—Polycarbonate, UL 94V-0

**Retaining Spring**—Stainless Steel

**Contacts**—Copper with silver or tin plating

**Mounting Wings & Spacers**—Polycarbonate, UL 94V-0

**Retaining Pins**—Stainless steel

### Electrical Characteristics

**Current Carrying Capability**—

40 A w/10 AWG wire (Series 45)

30 A w/12 AWG wire (Series 30)

20 A w/16 AWG wire (Series 15)

**Operating Voltage**—600 V, AC or DC

**Dielectric Withstanding Voltage**—2200 VDC

**Average Initial Contact**

**Resistance**—525 micro-ohms

### Mechanical Characteristics

**Contact Retention**—25 lbs.

[111.2 N]

**Average Mating/Unmating**

**Force**—4.7 [20.9 N]

**Max. Wire Insulation Diameter**—

175 [18.16]

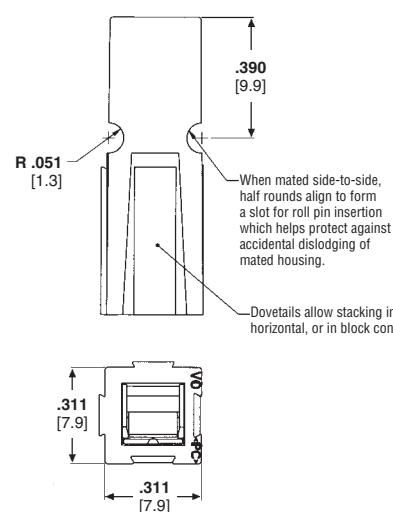
**Wire Size Range**—10-20 AWG

[5-0.5 mm<sup>2</sup>]

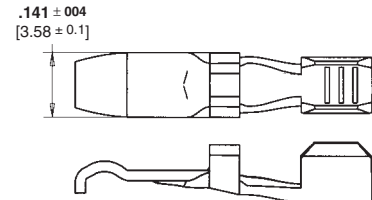
### Related Product Data

**Accessories**—page 151

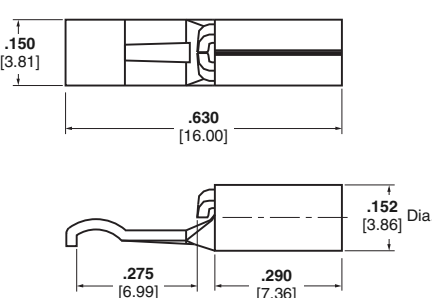
### Single-Pole Housing



### Stamped and Formed Contact (Strip)



### Closed Barrel Contact (Loose Piece)



### AMP Power Series 15

Housing <sup>1</sup>		Contact Part Number	
Color	Part Number	Strip Form (16, 18, 20 AWG)	Loose Piece (16-20 AWG)
Blue	1445957-1		
Black	1445957-2		
White	1445957-3		
Green	1445957-4	1604113-1 (silver) <sup>2</sup>	1744042-1
Red	1445957-5	1604113-2 (tin) <sup>2</sup>	
Yellow	1445957-6		
Orange	1445957-7		
Gray	1445957-8		

### AMP Power Series 30

Housing <sup>1</sup>		Contact Part Number	
Color	Part Number	Strip Form (12, 14, 16 AWG)	Loose Piece (12-16 AWG)
Blue	1445957-1		
Black	1445957-2		
White	1445957-3		
Green	1445957-4	1604112-1 (silver) <sup>3</sup>	1744041-1 Dimensions shown above.
Red	1445957-5	1604112-2 (tin) <sup>3</sup>	
Yellow	1445957-6		
Orange	1445957-7		
Gray	1445957-8		

### AMP Power Series 45

Housing <sup>1</sup>		Contact Part Number	
Color	Part Number	Strip Form (10, 12, 14 AWG)	
Blue	1445957-1		
Black	1445957-2		
White	1445957-3		
Green	1445957-4	1445962-1 (silver) <sup>4</sup>	
Red	1445957-5	1445962-2 (tin) <sup>4</sup>	
Yellow	1445957-6		
Orange	1445957-7		
Gray	1445957-8		

<sup>1</sup> Housings are bulk packaged.

<sup>2</sup> Use Applicator Part No. 1385450-3

<sup>3</sup> Use Applicator Part No. 1385468-3

<sup>4</sup> Use Applicator Part No. 1385469-3

**Note:** TE does NOT recommend intermating connectors with different contact platings.

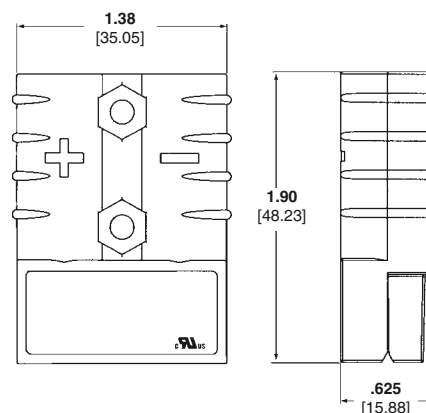
**Note:** All part numbers are RoHS compliant.

## AMP Power Series 50 Connectors (2-Pole Battery)

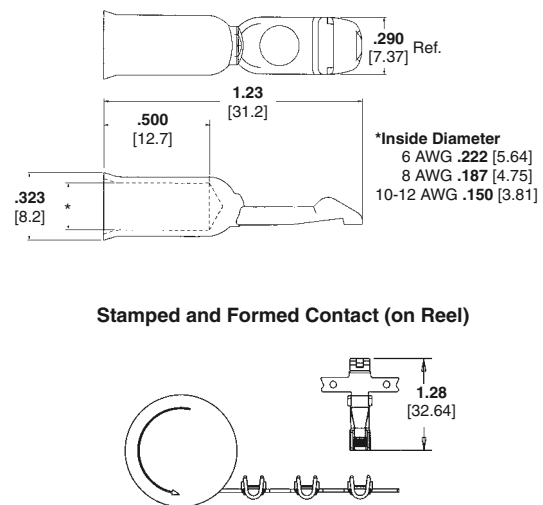
### Product Facts

- Color-coded UL 94V-0 housings: gray, red, blue, yellow and black; other colors available upon request  
**Note: Black color housing has the same mechanical key as the gray housing**
- Mechanical keys help prevent two different voltage color-coded housings from mating
- Polarity (+ and -) molded into housings
- Genderless housings reduce inventory
- Cold-headed contact wire range: 6, 8, 10-12 AWG (Taped version of the cold-headed contacts available.)
- File No. E28476

### 2-Pole Housing



### Cold-headed Contact



\*Inside Diameter  
6 AWG .222 [5.64]  
8 AWG .187 [4.75]  
10-12 AWG .150 [3.81]

Cable Mounted Products

### AMP Power Series 50 (2-Pole)

Housing <sup>2,3</sup>		Contact <sup>2</sup>		Connector Kit Part Number <sup>1</sup>
Color	Part Number	Wire Size	Part Number	
Red	647845-3	6 AWG	647877-1	647892-3
		10-12 AWG	647879-1	647893-3
Gray	647845-4	6 AWG	647877-1	647892-4
		10-12 AWG	647879-1	647893-4
Blue	647845-5	6 AWG	647877-1	647892-5
		10-12 AWG	647879-1	647893-5
Black <sup>4</sup>	647845-7	6 AWG	647877-1	647892-7
		10-12 AWG	647879-1	647893-7
Yellow	647845-8	6 AWG	647877-1	647892-8
		10-12 AWG	647879-1	647893-8
Cold-headed Contact		8 AWG	647878-1	—
<sup>5</sup> Stamped and Formed contacts, on Reel		6-10 AWG	1604433-1 <sup>7</sup>	
<sup>6</sup> Stamped and Formed contacts, on Reel		10-12 AWG	1604433-2 <sup>7</sup>	

<sup>1</sup> 1 Housing and 2 contacts.  
<sup>2</sup> Housings and contacts are bulk packaged.  
<sup>3</sup> Mechanical keys molded in housings generally will engage only with housings of same color.  
<sup>4</sup> Black color housing has the same mechanical key as the gray housing.  
<sup>5</sup> Use Heavy Duty Mini-Applicator (HDM) for 6 to 8 AWG - Part Number 1385663-2 (Use with AMP-O-LECTRIC Model K Terminator)  
<sup>6</sup> Use Heavy Duty Mini-Applicator (HDM) for 10 to 12 AWG - Part Number 1385664-2 (Use with AMP-O-LECTRIC Model K Terminator)  
<sup>7</sup> Use Power Lock Machine Part Number 68296-1

### Material and Finish

**Housing**—Polycarbonate, UL 94V-0  
**Retaining Spring**—Stainless Steel  
**Contacts**—Copper with silver plating  
**Reducing Bushings**—Copper with silver plating

### Electrical Characteristics

**Current Carrying Capability**—50 Amps per circuit w/6 AWG wire  
**Max. Operating Voltage**—600 V, AC or DC  
**Dielectric Withstanding Voltage**—2200 VDC  
**Average Initial Contact Resistance**—200 micro-ohms

### Mechanical Characteristics

**Contact Retention**—50 lbs. [222.4 N]  
**Average Mating/Unmating Force**—15 lbs. [66.7 N]  
**Max. Wire Insulation Diameter**—.44 [11.18]  
**Wire Size Range**—6-12 AWG (also 6-16 AWG w/Reducing Bushings)

### Related Product Data

**Accessories**—page 151

### Voltage Key Color Chart

Housing Color	Voltage
Yellow	12V
Red	24V
Gray	36V
Blue	48V
Black	80V

Color code given for various voltages is only a suggestion, other codes and keys available upon request.

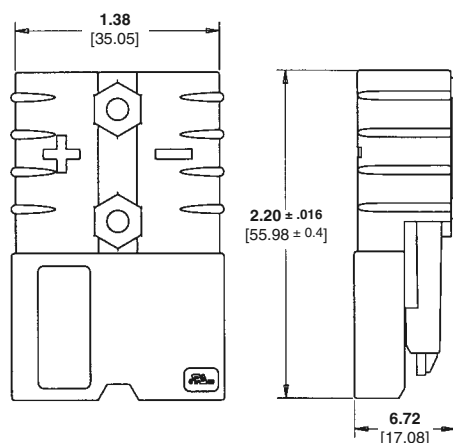
**Note:** All part numbers are RoHS compliant.

## AMP Power Series 50 FPR (Finger Probe Resistant) Connectors

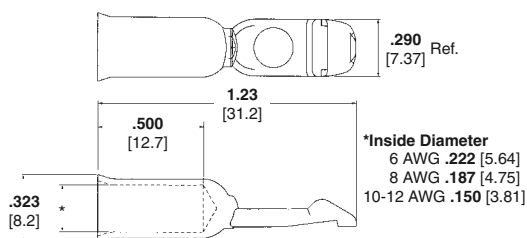
### Product Facts

- Complies with UL 60950 finger probe requirements
- Utilizes AMP Power Series 50 contacts
- Brown and white housing colors available (other colors possible)
- Two keying configurations available (up to 6 keying configurations possible)
- File No. E28476

### 2-Pole Housing

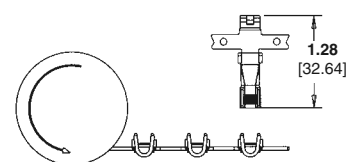


### Cold-headed Contact



\*Inside Diameter  
6 AWG .222 [5.64]  
8 AWG .187 [4.75]  
10-12 AWG .150 [3.81]

### Stamped and Formed Contact (on Reel)



### Material and Finish

**Housing**—Polycarbonate, UL 94V-0  
**Retaining Spring**—Stainless Steel  
**Contacts**—Copper  
**Reducing Bushings**—Copper with silver plating

### Electrical Characteristics

**Current Capability**—50 A max.  
**Voltage Rating**—600 V, AC or DC  
**Dielectric Withstanding Voltage**—2200 VDC

### Mechanical Characteristics

Meets UL finger probe as outlined in UL 60950  
**Contact Retention**—50 lbs. [222.4 N]  
**Wire Size**—6-12 AWG [15-3 mm<sup>2</sup>]  
**Max. Wire Insulation Diameter**—.44 [11.18]

### Related Product Data

**Accessories**—page 151

### Applications

- Uninterruptible Power Supplies
- Power Supplies
- Battery Banks

### AMP Power Series 50 FPR (2-Pole)

Housing <sup>1,2</sup>		Wire Size	Contact Part Number <sup>1</sup>		
Color	Part Number		Cold-headed <sup>5</sup>		Stamped and Formed/Strip <sup>3,4,6</sup>
			Loose Piece	On Tape	On Reel
Brown	1604342-1	6 AWG	647877-1	647754-1	6-10 AWG 1604433-1 <sup>6</sup>
White	1604342-2	8 AWG	647878-1	647755-1	10-12 AWG 1604433-2 <sup>6</sup>
		10-12 AWG	647879-1	647756-1	

<sup>1</sup> Housings and contacts are bulk packaged.

<sup>2</sup> Mechanical keys molded in housings will engage only with housings of same color.

<sup>3</sup> Use Heavy Duty Mini-Applicator (HDM) for 6 to 8 AWG - Part Number 1385663-2 (Use with AMP-O-LECTRIC Model K Terminator)

<sup>4</sup> Use Heavy Duty Mini-Applicator (HDM) for 10 to 12 AWG - Part Number 1385664-2 (Use with AMP-O-LECTRIC Model K Terminator)

<sup>5</sup> Hand Tool for Cold-headed Contact - Part Number 1526955-1

Tap version can be terminated using the AMP-TAPETRONIC Machine

<sup>6</sup> Use Power Lock Machine Part Number 68296-1

**Note:** All part numbers are RoHS compliant.



## AMP Power Series 75 Connectors (Single-Pole)

### Product Facts

- Color-coded UL 94V-0 housings: blue, black, white, green and red
- Genderless housings reduce inventory
- Cold-headed contact wire range: 6, 8, 10-12 AWG
- Stamped and formed contacts available:  
6-8 AWG Part Number 1604433-1 (strip);  
10-12 AWG Part Number 1604433-2 (strip)
- File No. E28476

### Material and Finish

- Housing**—Polycarbonate, UL 94V-0
- Retaining Spring**—Stainless Steel
- Contacts**—Copper with silver plating
- Reducing Bushings**—Copper with silver plating
- Mounting Wings**—Polycarbonate, UL 94V-0
- Retaining Pins**—Stainless steel

### Electrical Characteristics

#### Current Carrying Capability (with 6 AWG)—Configuration:

- Single-Pole 75 A
- 1x2 Stacked 62 A
- 2x2 Stacked 60 A
- 1x3 Stacked 58 A
- 2x3 Stacked 52 A

#### Operating Voltage—600 V, AC or DC

#### Dielectric Withstanding Voltage—2200 VDC

#### Average Initial Contact Resistance—200 micro-ohms

### Mechanical Characteristics

#### Contact Retention—50 lbs. [222.4 N]

#### Average Mating/Unmating Force—15 lbs. [66.7 N]

#### Max. Wire Insulation Diameter—.44 [11.18]

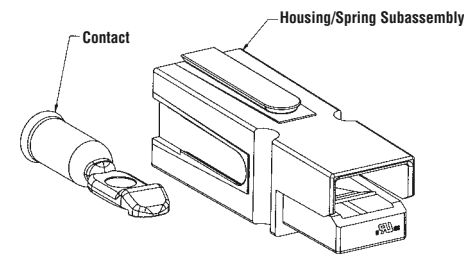
#### Wire Size Range—6-12 AWG [15-3 mm<sup>2</sup>]

### Related Product Data

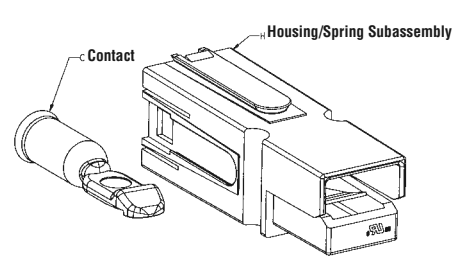
Accessories—page 151

Application Tooling—page 153

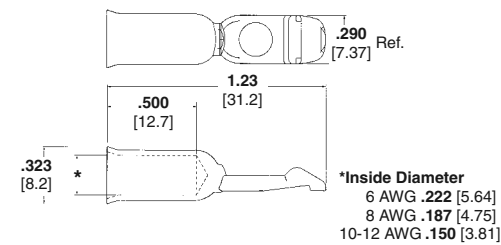
#### Housing without Locking Feature



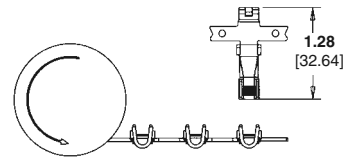
#### Housing with Locking Feature



#### Cold-headed Contact



#### Stamped and Formed Contact (on Reel)



### AMP Power Series 75 (Single-Pole)

Housing <sup>2</sup>		Cold-headed Contact <sup>2</sup>		Connector Kit Part Number <sup>1</sup>
Color	Part Number	Wire Size	Part Number	
<b>Non-Locking Version</b>				
Blue	1445715-1	6 AWG	647877-1	1445716-1
Black	1445715-2	6 AWG	647877-1	1445716-2
White	1445715-3	6 AWG	647877-1	1445716-3
Green	1445715-4	6 AWG	647877-1	1445716-4
Red	1445715-5	6 AWG	647877-1	1445716-5
<b>Locking Version</b>				
Blue	1445715-6	6 AWG	647877-1	1445716-6
Black	1445715-7	6 AWG	647877-1	1445716-7
White	1445715-8	6 AWG	647877-1	1445716-8
Green	1445715-9	6 AWG	647877-1	1445716-9
Red	1-1445715-0	6 AWG	647877-1	1-1445716-0

<sup>1</sup>Samples available on loose housing and contacts only.

### Contacts

Description	Wire Size	Part Number	Die Set Part Number <sup>3</sup>	Applicator Part No. for AMP-O-LECTRIC Model K Terminator
Cold-headed (Loose Piece) <sup>4</sup>	6 AWG	647877-1	—	—
	8 AWG	647878-1	—	—
	10-12 AWG	647879-1	—	—
Cold-headed (Tape) <sup>3, 4</sup>	6 AWG	647754-1	68344-1	—
	8 AWG	647755-1	68344-1	—
	10-12 AWG	647756-1	68313-1	—
Stamped and Formed (Strip)	6-8 AWG	1604433-1	—	1385664-2
	10-12 AWG	1604433-2	—	1385663-2

<sup>1</sup> 1 housing and 1 contact

<sup>2</sup> Housings and contacts are bulk packaged.

<sup>3</sup> Taped version can be terminated using the AMP-TAPETRONIC machine Part Number 68250-1.

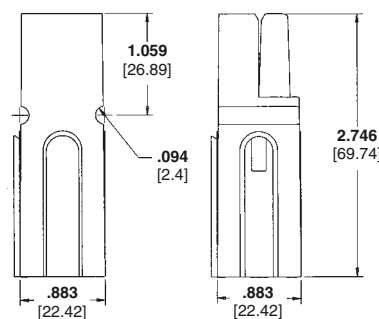
<sup>4</sup> Use hand tool Part Number 1526955-1 for Cold-headed contacts

Note: All part numbers are RoHS compliant.

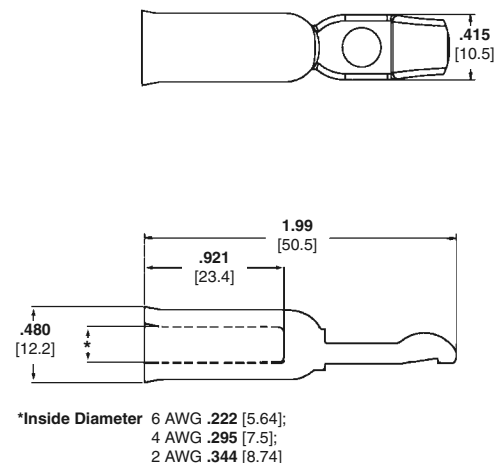
Cable Mounted Products

## AMP Power Series 120 Connectors (Single-Pole)

Single-Pole Housing



Cold-headed Contact



### Product Facts

- Color-coded modular housings: blue, black, white, green and red
- Genderless housings reduce inventory
- Cold-headed contact wire range: 2, 4, and 6 AWG
- Built-in interlocking features (dovetails) allow stacking and wire routing
- Self-wiping contacts increase product life and improve conductivity
- Integral stainless steel locking spring in housing for contact retention
- Rugged design
- File No. E28476

### Material and Finish

**Housing**—Polycarbonate, UL 94V-0  
**Retaining Spring**—Stainless Steel  
**Contacts**—Copper with silver plating  
**Reducing Bushings**—Copper with silver plating  
**Mounting Clamp Sets**—Aluminum

### Electrical Characteristics

**Current Carrying Capability**—  
 Single-Pole—120 A  
 2x1 Stacked Array—115 A  
 2x2 Stacked Array—115 A  
**Voltage Rating**—600 V (both AC and DC)  
**Dielectric Withstanding Voltage**—2200 VDC  
**Average Initial Contact Resistance**—136 micro-ohms

### Mechanical Characteristics

**Contact Retention**—100 lbs. [444.8 N]  
**Average Mating/Unmating Force**—8 lbs. [35.6 N]  
**Temperature Rating**—-4°F to 221°F [-20°C to 105°C]  
**Max. Wire Insulation Diameter**—.6 [15.24]  
**Wire Size Range**—2-6 AWG

### AMP Power Series 120 (Single-Pole)

Housing		Contact		Connector Kit Part Number <sup>1</sup>
Color	Part Number	Wire Size	Part Number	
Blue	1604001-1	2 AWG	1445995-1	1604002-1
Black	1604001-2	2 AWG	1445995-1	1604002-2
White	1604001-3	2 AWG	1445995-1	1604002-3
Green	1604001-4	2 AWG	1445995-1	1604002-4
Red	1604001-5	2 AWG	1445995-1	1604002-5
—	—	4 AWG	1445996-1	—
—	—	6 AWG	1445997-1	—

<sup>1</sup> 1 Housing and 1 contact.

### Related Product Data

**Accessories**—page 152  
**Application Tooling**—page 153  
**Technical Documents**—page 154

**Note:** All part numbers are RoHS compliant.

## AMP Power Series 120 Connectors (2-Pole Battery)



### Product Facts

- Color-coded UL 94V-0 housings: gray and blue
- Keying feature helps prevent two different voltage color-coded housings from mating
- Genderless housings reduce inventory
- Contact wire range: 2, 4, 6 AWG
- Molded-in panel-mount grooves
- Integral stainless steel locking spring in housing for contact retention
- Rugged design
- File No. E28476

### Material and Finish

**Housing**—Polycarbonate, UL 94V-0  
**Retaining Spring**—Stainless Steel  
**Contacts**—Copper with silver plating  
**Reducing Bushings**—Copper with silver plating

### Electrical Characteristics

**Current Carrying Capability**—115 A with 2 AWG  
**Voltage Rating**—600 V (both AC and DC)  
**Dielectric Withstanding Voltage**—2200 VDC  
**Avg. Initial Contact Resistance**—136 micro-ohms

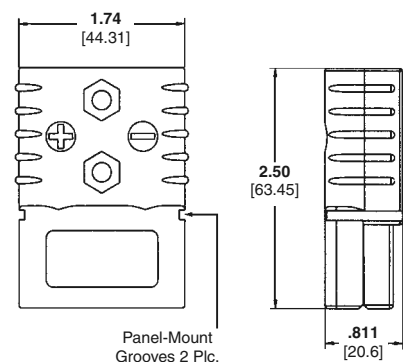
### Mechanical Characteristics

**Contact Retention**—100 lbs. [444.8 N]  
**Average Mating/Unmating Force**—18 lbs. [80.1 N]  
**Temperature Rating**—-4°F to 221°F [-20°C to 105°C]  
**Max. Wire Insulation Diameter**—.6 [15.24]  
**Wire Size Range**—2-6 AWG

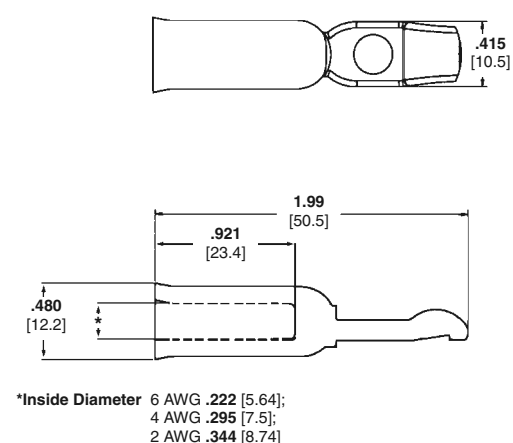
### Related Product Data

**Accessories**—page 152  
**Application Tooling**—page 153  
**Technical Documents**—page 154

### 2-Pole Housing



### Cold-headed Contact



### AMP Power Series 120 (2-Pole)

Housing <sup>2,3</sup>		Contact <sup>2</sup>		Connector Kit Part Number <sup>1</sup>
Color	Part Number	Wire Size	Part Number	
Gray	1445994-1	2 AWG	1445995-1	1445998-1
Blue	1445994-2	2 AWG	1445995-1	1445998-2
Gray	1445994-1	4 AWG	1445996-1	1445999-1
Blue	1445994-2	4 AWG	1445996-1	1445999-2
Gray	1445994-1	6 AWG	1445997-1	1446000-1
Blue	1445994-2	6 AWG	1445997-1	1446000-2

<sup>1</sup> 1 Housing and 2 contacts.

<sup>2</sup> Housings and contacts are bulk packaged.

<sup>3</sup> Mechanical keys molded in connectors will engage only with connectors of same color.

### Voltage Key Color Chart

Housing <sup>2,3</sup> Color	Voltage
Gray	36 V
Blue	48 V

Color code given for various voltages is only a suggestion, other codes and keys available upon request.

Cable Mounted Products

**Note:** All part numbers are RoHS compliant.

## AMP Power Series 175 Connectors (2-Pole Battery)

### Product Facts

- Color-coded UL 94V-0 housings: yellow, orange, red, gray, blue, and black
- Keying feature helps prevent two different voltage color-coded housings from mating
- Genderless housings reduce inventory
- Contact wire range: 1/0, 1, 2, 4 AWG
- Integral stainless steel locking spring in housing for contact retention
- Reducing bushings down to 10 gauge
- File No. E28476

### Material and Finish

**Housing**—Polycarbonate, UL 94V-0

**Retaining Spring**—Stainless Steel

**Contacts**—Copper with silver plating

**Reducing Bushings**—Copper with silver plating

### Electrical Characteristics

**Current Carrying Capability**—  
175 Amp @ 80.42° F [26.9° C] T-Rise  
with 1/0 AWG wire

**Voltage Rating**—600 V (both AC and DC)

**Dielectric Withstanding Voltage**—  
2200 VDC

**Avg. Initial Contact Resistance**—  
100 micro-ohms

### Mechanical Characteristics

**Average Mating/Unmating**

**Force**—25 lbs. [111.21 N]

**Max. Wire Insulation Diameter**—  
.750 [19.05]

**Wire Size Range**—1/0, 1, 2, 4 AWG  
[53, 40, 35, 21 mm<sup>2</sup>]

**Contact Retention**—300 lbs.  
[1,334.47 N]

**Temperature Rating**—-4° F to  
221° F [-20° C to 105° C]

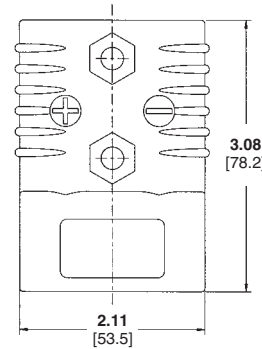
### Related Product Data

**Accessories**—page 152

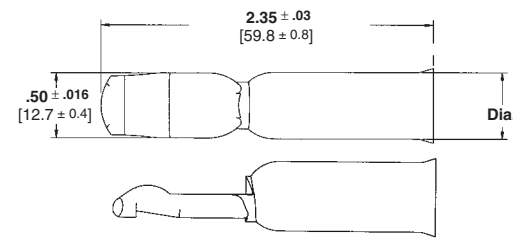
**Application Tooling**—page 153

**Technical Documents**—page 154

### 2-Pole Housing



### Cold-headed Contact



Inside Diameter .516±.005 [13.1±0.13] for 1/0 AWG  
.512±.005 [13.0±0.13] for 1 AWG,  
2 AWG, and 4 AWG

### AMP Power Series 175 (2-Pole)

Housing		Connector Kit Part Numbers <sup>1,2</sup>			
Color	Part Number	4 AWG	2 AWG	1 AWG	1/0 AWG
Yellow	1604037-1	1604044-1	1604043-1	1604045-1	1604042-1
Orange	1604037-2	1604044-2	1604043-2	1604045-2	1604042-2
Red	1604037-3	1604044-3	1604043-3	1604045-3	1604042-3
Gray	1604037-4	1604044-4	1604043-4	1604045-4	1604042-4
Blue	1604037-5	1604044-5	1604043-5	1604045-5	1604042-5
Black <sup>3</sup>	1604037-6	1604044-6	1604043-6	1604045-6	1604042-6

<sup>1</sup> 1 Housing and 2 contacts.

<sup>2</sup> Housings and contacts are bulk packaged.

<sup>3</sup> Black housing mates with any other housing.

### Contacts (Cold-headed)

Wire Size	Part Number
4 AWG	1604040-1
2 AWG	1604039-1
1 AWG	1604041-1
1/0 AWG	1604038-1

### Voltage Key Color Chart

Housing Color	Voltage
Yellow	12 V
Orange	18 V
Red	24 V
Gray	36 V
Blue	48 V
Black	80 V

Color code given for various voltages is only a suggestion, other codes and keys available upon request.

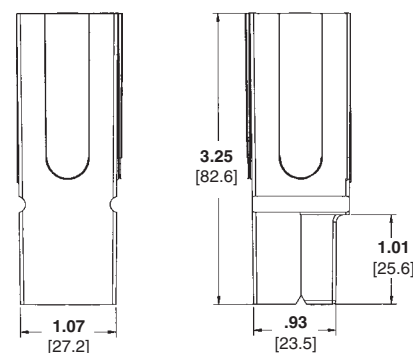
Note: All part numbers are RoHS compliant.

## AMP Power Series 180 Connectors (Single-Pole)

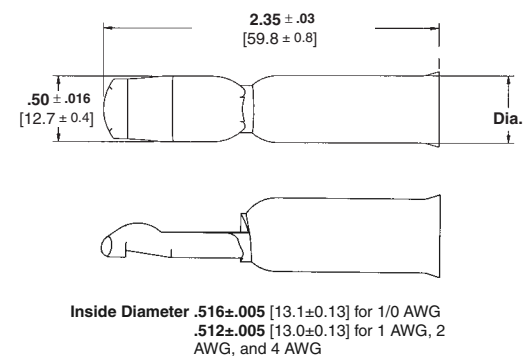
### Product Facts

- Color-coded modular housings: blue, black, white, red and green
- Genderless housings reduce inventory
- Contact wire range: 1/0, 1, 2, 4 AWG
- Integral stainless steel locking spring in housing for contact retention
- Built-in interlocking features (dovetails) allow stacking and wire routing
- Reducing bushings down to 10 gauge
- File No. E28476

### Single-Pole Housing



### Cold-headed Contact



Cable Mounted Products

### Material and Finish

**Housing**—Polycarbonate, UL 94V-0  
**Retaining Spring**—Stainless Steel  
**Contacts**—Copper with silver plating  
**Mounting Clamp Sets**—Aluminum  
**Reducing Bushings**—Copper with silver plating

### Electrical Characteristics

**Current Carrying Capability**—  
 (1/0 AWG Wire)  
 1 x 1 — 180 A, 84.9°F [29.4°C] T-Rise  
 2 x 1 — 165 A, 78.3°F [25.7°C] T-Rise  
 2 x 2 — 150 A, 76.6°F [24.8°C] T-Rise  
**Voltage Rating**—600 V (both AC and DC)  
**Dielectric Withstanding Voltage**—  
 2200 VDC  
**Avg. Initial Contact Resistance**—  
 100 micro-ohms

### Mechanical Characteristics

**Average Mating/Unmating Force**—20 lb. [89 N]  
**Max. Wire Insulation Diameter**—  
 .900 [22.86]  
**Wire Size Range**—1/0, 1, 2, 4 AWG  
 [53, 40, 35, 21 mm<sup>2</sup>]  
**Contact Retention**—170 lb. [756 N]  
**Temperature Rating**—-4°F to  
 221°F [-20°C to 105°C]

### Related Product Data

**Accessories**—page 152  
**Application Tooling**—page 153  
**Technical Documents**—page 154

### AMP Power Series 180 (Single-Pole)

Housing		Connector Kit Part Numbers <sup>1,2</sup>			
Color	Part Number	4 AWG	2 AWG	1 AWG	1/0 AWG
Blue	1604062-1	1604395-1	1604396-1	1604397-1	1604398-1
Black	1604062-2	1604395-2	1604396-2	1604397-2	1604398-2
White	1604062-3	1604395-3	1604396-3	1604397-3	1604398-3
Red	1604062-4	1604395-4	1604396-4	1604397-4	1604398-4
Green	1604062-5	1604395-5	1604396-5	1604397-5	1604398-5

<sup>1</sup> 1 Housing and 1 contact.

<sup>2</sup> Housings and contacts are bulk packaged.

### Contacts (Cold-headed)

Wire Size	Part Number
4 AWG	1604040-1
2 AWG	1604039-1
1 AWG	1604041-1
1/0 AWG	1604038-1

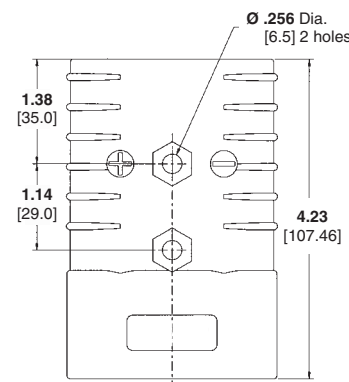
**Note:** All part numbers are RoHS compliant.

## AMP Power Series 350 Connectors (2-Pole Battery)

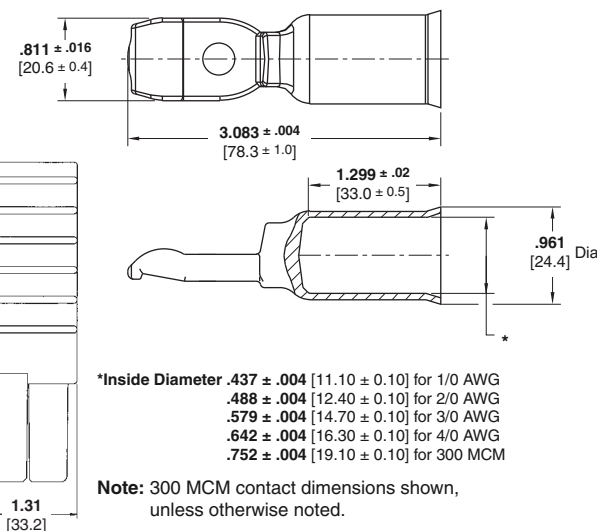
### Product Facts

- Color-coded UL 94V-0 housings: yellow, orange, red, gray, blue, and green
- Keying feature helps prevent two different voltage color-coded housings from mating
- Genderless housings reduce inventory
- Contact wire range: 1/0, 2/0, 3/0, 4/0, 300 MCM
- Replaceable contacts
- Integral stainless steel locking spring in housing for contact retention
- File No. E28476

### 2-Pole Housing



### Cold-headed Contact



### Material and Finish

**Housing**—Polycarbonate, UL 94V-0  
**Retaining Spring**—Stainless Steel  
**Contacts**—Copper with silver plating  
**Reducing Bushings**—Copper with silver plating

### Electrical Characteristics

**Current Carrying Capability**—275 Amp @ 83.3°F [28.5°C] T-Rise with 4/0 AWG wire  
**Voltage Rating**—600 V, AC or DC  
**Dielectric Withstanding Voltage**—2200 VDC  
**Average Initial Contact Resistance**—50 micro-ohms

### Mechanical Characteristics

**Contact Retention**—500 lbs. [2224.1 N]  
**Average Mating/Unmating Force**—30 lbs. [133.5 N]  
**Max. Wire Insulation Diameter**—1.10 [27.94]  
**Temperature Rating**—-4°F to 221°F [-20°C to 105°C]  
**Wire Size Range**—1/0, 2/0, 3/0, 4/0, 300 MCM [53, 67, 85, 107, 152 mm<sup>2</sup>]

### Related Product Data

**Accessories**—page 152  
**Application Tooling**—page 153  
**Technical Documents**—page 154  
**Reducing Bushing**—(1/0 to 2/0 AWG)  
**Part No.** 1604121-6  
**Cable Clamp**—Part No. 647688-1

### AMP Power Series 350 (2-Pole)

Housing		Connector Kit Part Numbers <sup>1,2</sup>				
Color	Part Number	1/0 AWG	2/0 AWG	3/0 AWG	4/0 AWG	300 MCM
Yellow	1604050-1	1604060-1	1604059-1	1604058-1	1604057-1	1604056-1
Orange	1604050-2	1604060-2	1604059-2	1604058-2	1604057-2	1604056-2
Red	1604050-3	1604060-3	1604059-3	1604058-3	1604057-3	1604056-3
Gray	1604050-4	1604060-4	1604059-4	1604058-4	1604057-4	1604056-4
Blue	1604050-5	1604060-5	1604059-5	1604058-5	1604057-5	1604056-5
Green	1604050-6	1604060-6	1604059-6	1604058-6	1604057-6	1604056-6

<sup>1</sup> 1 Housing and 2 contacts.

<sup>2</sup> Housings and contacts are bulk packaged.

### Contacts (Cold-headed)

Wire Size	Part Number
1/0 AWG	1604055-1
2/0 AWG	1604054-1
3/0 AWG	1604053-1
4/0 AWG	1604052-1
300 MCM	1604051-1

### Voltage Key Color Chart

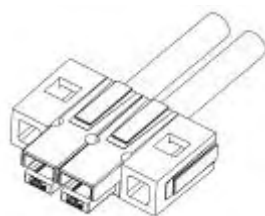
Housing Color	Voltage
Yellow	12V
Orange	18V
Red	24V
Gray	36V
Blue	48V
Green	72V

Color code given for various voltages is only a suggestion, other codes and keys available upon request.

Note: All part numbers are RoHS compliant.

### AMP Power Series Accessories

#### AMP Power Series 15/30/45 Mounting Wings

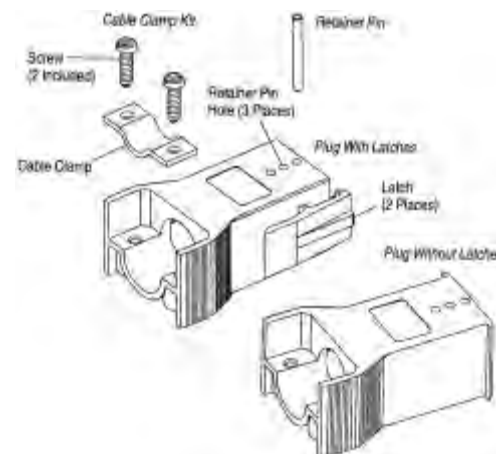


#### AMP Power Series 15/30/45 Accessories

Part Number	Description
<b>Mounting Wings</b>	
1445960-1	Red, UL 94V-0
<b>Spacers</b>	
1445959-1	Red, UL 94V-0, Short
1445959-2	Red, UL 94V-0, Long
<b>Retaining Pins for use with 15 A/30 A/45 A</b>	
1445886-4	.25 [6.35] length
1445886-5	.44 [11.18] length

Part Number	Description
<b>Hardware Kits</b> (Cable clamp, screws & retaining pins)	
647747-3	4 pole
647747-2	6 pole
647747-1	8 pole

#### AMP Power Series 15/30/45 Hardware Kits



Cable Mounted Products

#### AMP Power Series 50 Accessories

Part Number	Description
1744077-1	Dust Cover, Black
1445762-1	Reducing Bushing — 6 to 8 AWG
647840-1	Reducing Bushing — 6 to 10-12 AWG
1445763-1	Reducing Bushing — 6 to 14-16 AWG

Please contact Product Engineering or Product Management for availability. (permits use of smaller wires with 6 AWG contact Part Number 647877-1)

#### AMP Power Series 75 Accessories

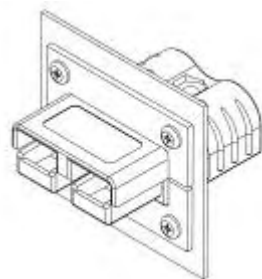
Part Number	Description
<b>Mounting Wings</b>	
1445729-1	Blue, oval mounting hole
1445729-2	Blue, round mounting hole
<b>Retaining Pins for use with 75 A/120 A/180 A</b>	
1445886-1	75 A/120 A/180 A hsgs, 1 high block
1445886-2	75 A/120 A/180 A hsgs, 2 high block
<b>Reducing Bushings for Series 50 A and 75 A</b>	
1445762-1	6 to 8 AWG
647840-1	6 to 10-12 AWG
1445763-1	6 to 14-16 AWG

Mounting clamp set part numbers available.

**Note:** All part numbers are RoHS compliant.

**AMP Power Series Accessories** (Continued)

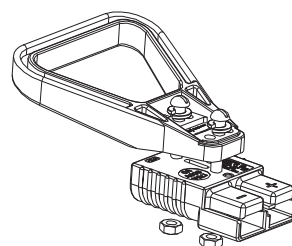
**AMP Power Series 120 Panel Mounting Clamp**



**AMP Power Series 120 Accessories**

Part Number	Type	Description
<b>Retaining Pins for use with 75A/120A/180A</b>		
1445886-1	Single-Pole	1 high block
1445886-2	Single-Pole	2 high block
<b>Reducing Bushings</b>		
1604072-3	Single/2-Pole	2 to 4 AWG
1604072-2	Single/2-Pole	2 to 6 AWG
1604072-1	Single/2-Pole	2 to 8 AWG
<b>Mounting Clamp Sets</b>		
647721-1	Single-Pole	2- & 4- pole configuration
647722-1	Single-Pole	3-pole configuration
<b>Panel Mounting Clamp</b>		
1744090-1	2-Pole	—

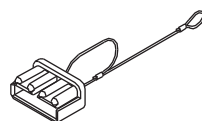
**AMP Power Series 175 & 350 Handle Kit**



**AMP Power Series 175, 180 & 350 Accessories**

Part Number	Type	Description
<b>Reducing Bushings</b>		
1604121-1	175/180	10 to 1/0 AWG
1604121-2	175/180	6 to 1/0 AWG
1604121-5	175/180	4 to 1/0 AWG
1604121-4	175/180	2 to 1/0 AWG
1604121-3	175/180	1 to 1/0 AWG
1604121-6	350	1/0 to 2/0 AWG
<b>Handle Kit</b>		
647737-1	175 2-Pole	Red
647737-2	175 2-Pole	Gray
1-647737-1	350 2-Pole	Red
1-647737-2	350 2-Pole	Gray

**AMP Power Series 175 Dust Cover Assembly**



**AMP Power Series 175 & 180 Accessories**

Part Number	Type	Description
<b>Cable Clamps</b>		
647720-1	180	2 pole version
647719-1	180	3 pole version
<b>Dust Cover</b>		
647691-1	175	Dust Cover Assembly (Shown)
647692-1	175	Dust Cover Housing

**Note:** All part numbers are RoHS compliant.



### AMP Power Series Tooling

**Power Applicator**  
Part Number 68296-1  
(Customer Manual 409-2661)



The semiautomatic power applicator is designed to produce a carefully controlled uniform pressure crimp while providing a high rate of production. The applicator features matching dies that fully bottom at the completion of the crimp to provide proper crimp height. The one die set is fully adjustable to provide the full range of crimp heights for all wire sizes.

**500 MCM Heavy Duty Cable Cutter**  
Part No. 605742-1 (408-4557)



- Designed to cut aluminum or copper cable up to 500 MCM.
- Light weight tubular steel handles with hand grips
- 21" overall length

**Cable Insulation Stripper/Slitter**  
Part No. 606700-1 (408-9688)



- Used on single or multiple conductor cable up to 1.75" in diameter

**Contact Extraction Tool**  
Part No. 68265-1 or standard insulated screwdriver



**Hand Tools for Cold-Headed Contacts and Heavy-Duty Lug Terminals (Single-Indent Crimp)**



For AMP Power Series 50 and 75 Contacts			TE Crimp Tool Part No. 1526955-1 Includes Adapter		OR American Electrical Terminal (AET) Crimp Tool Part No. T-406 Includes Adapter		Also For Heavy-Duty Lug Terminals	
Wire Size (AWG)	Strip Length	Part No.	Part Number	Marking	Part Number	Marking	Wire Size (AWG)	Strip Length
6		647877-1	1527508-1	A	5992	A	6	7/16 [11.11]
8	475-.525 [12.06-13.33]	647878-1					4	1/2 [12.70]
10-12		647879-1					1/0	11/16 [17.46]
—	—	—	1527507-1	B	5991	B	2/0	11/16 [17.46]
			1527505-1	C	5989	C	2	9/16 [14.29]
			No Adapter	—	No Adapter	—	1	5/8 [15.87]
							3/0	3/4 [19.05]
							4/0	13/16 [20.64]

**Pneumatic Tools for Cold-Headed Contacts (Dual-Indent Crimp) and Heavy-Duty Lug Terminals**



AMP Power Series Contacts			PICO* Pneumatic Tools**					
Series	Wire Size (AWG)	Part No.	400 Series Power Unit		Die	Locator		Closure Dim.
			Preferred	Alternate		Preferred	Alternate	
50/50 FPR/75	6	647877-1			414DA-4583			.152 [3.86]
	8	647878-1	400-BEC	400-BHD	414DA-4583	4582-1	9616-1	.152 [3.86]
	10-12	647879-1			414DA-4582			.134 [3.40]
120	2	1445995-1						
	4	1445996-1	400-BEC	400-BHD	414DA-4580	4580-1	None	.200 [5.08]
	6	1445997-1						
<b>500 Series Power Unit</b>								
50/50 FPR/75	6	647877-1			514DA-7033			.152 [3.86]
	8	647878-1	500-DEC	500-D	514DA-7033	7033-1	7034-1	.152 [3.86]
	10-12	647879-1			514DA-7034			.134 [3.40]
120	2	1445995-1						
	4	1445996-1	500-DEC	500-D	514DA-7035	7035-1	None	.200 [5.08]
	6	1445997-1						
175/180	1/0	1604038-1						
	2	1604039-1	500-DEC	500-D	514DA-10023	10034-1	None	.225 [5.72]
	4	1604040-1						
	1	1604041-1						
300 MCM	1604051-1							
350	4/0	1604052-1			514DA-10027	10023-2		.475 [12.07]
	3/0	1604053-1	500-DEC	500-D	514DA-10026	10023-2		.400 [10.16]
	2/0	1604054-1			514DA-10025	10023-2	None	.360 [9.14]
	1/0	1604055-1			514DA-10024	10023-1		.325 [8.26]
					514DA-10023	10023-1		.225 [5.72]

\* Pico Corporation, 444 Constitution Ave., Camarillo, CA 93012-8505; Tel: (805) 388-5510

\*\* Pneumatic Tool consists of a power unit, die, and locator; it can be used as a portable hand tool, bench-mounted hand tool, or foot-controlled unit.

Note: All part numbers are RoHS compliant.

## AMP Power Series Connectors (Continued)

### Technical Documents

Various technical documents are available for your use:

**Product Specifications** describe technical performance characteristics and verification tests. They are intended for the Design, Component and Quality Engineer.

<b>108-1349</b>	AMPINNERGY WTB Connectors
<b>108-1373</b>	AMPINNERGY WTW Connectors
<b>108-2104</b>	AMP Power Series 50 Connectors
<b>108-2149</b>	AMP Power Series 15 Connectors
<b>108-2150</b>	AMP Power Series 30 Connectors
<b>108-2151</b>	AMP Power Series 45 Connectors
<b>108-2152</b>	AMP Power Series 75 Connectors
<b>108-2153</b>	AMP Power Series 120 Connectors
<b>108-2154</b>	AMP Power Series 175 Connectors
<b>108-2155</b>	AMP Power Series 180 Connectors
<b>108-2156</b>	AMP Power Series 350 Connectors

**Application Specifications** describe requirements for using the product in its intended application and/or crimping information. They are intended for the Packaging and Design Engineer and the Machine Setup Person.

<b>114-6044</b>	AMPINNERGY WTB Connectors
<b>114-6051</b>	AMPINNERGY WTW Connectors
<b>114-13071</b>	AMP Power Series 50 (Double-Pole) and 75 (Single Pole) Connector Assemblies
<b>114-13107</b>	AMP Power Series 120 (Single- and Double-Pole) Connector Assemblies
<b>114-13118</b>	AMP Power Series 175 (Double-Pole) and 180 (Single-Pole) Connector Assemblies
<b>114-13119</b>	AMP Power Series 350 (Double-Pole) Connector Assemblies
<b>114-13127</b>	AMP Power Series 15, 30 and 45 (Single-Pole) Connector Assemblies

**Instruction Sheets** provide instructions for assembling or applying the product. They are intended for the Manufacturing Assembler or Operator.

<b>408-3198</b>	Inspection of AMPINNERGY System Power Contacts
<b>408-3236</b>	Installation of AMPINNERGY WTB Connectors
<b>408-3277</b>	AMPINNERGY Wire-To-Wire Stackable Connectors
<b>408-8636</b>	AMP Power Series 50 Connector Assemblies
<b>408-8868</b>	AMP Power Series 175 and 350 Connector Assemblies with Cable Clamp Kits
<b>408-4557</b>	Heavy Duty Cable Cutter Hand Tool 605743-1
<b>408-4559</b>	Heavy Duty Cable Cutter Hand Tool 605744-1
<b>408-4561</b>	Heavy Duty Cable Cutter Hand Tool 6057469-1
<b>408-8540</b>	Crimp Tool 1526955-1
<b>408-9688</b>	Cable Stripper/Slitter Tool 606700-1
<b>408-9816</b>	Handling of Reeled Products

### Test Summary

<b>502-1136</b>	50/75 Product Evaluation
<b>502-1160</b>	15/30/45 Product Evaluation
<b>502-1166</b>	120 Product Evaluation
<b>502-1167</b>	120 Competitive Evaluation
<b>502-1172</b>	AMP Power Series 175/180 Product Evaluation
<b>502-1173</b>	AMP Power Series 350 Product Evaluation
<b>502-1189</b>	15/30/45 Intermate
<b>502-1206</b>	15/30/45 Stamped and Formed Contact Evaluation

### Customer Manual

<b>409-5128</b>	AMP-O-ELECTRIC Model K Terminator Machine 1-471273-2
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**Note:** All part numbers are RoHS compliant.

## Domino Series Connectors

### Hot-Plug High Current Modular Power Connectors

#### Key Features

- Modular construction
- Blind-mating
- High current CROWN BAND contacts
- Logic/Signal
- Locking system
- Uses ELCON drawer contacts

#### Typical Applications

- Power Supplies
- Telecommunications
- Automatic Test Equipment
- Computer Hardware
- Process Control
- Uninterruptible Power Systems
- All Domino products in this section are RoHS compliant



The ELCON Domino connector system is a modular high-current connector system consisting of interchangeable modules which can provide AC, DC, logic and signal, float mounting, and pin sequencing. All Domino modules incorporate CROWN BAND technologies, tried and tested under the most arduous conditions. The high current capabilities virtually eliminate the need for bussing or splitting current, with resulting space savings and economies.

The Domino connector system allows the user to configure a connector specific to an application, from off-the-shelf components. It can be purchased as separate modules and assembled by the user, but is more

generally ordered as a connector assembly using an assembly part number which TE assigns to a specific configuration. Consult TE for assistance in laying out a new connector. If required, Domino connector assembly is simple: once the locking rails are cut to size, the only tool required is a Phillips screwdriver for tightening the end-caps.

Most Domino contacts are the same as used in ELCON drawer connectors. Modules A through E and R are sold as housings with retention clips; the contacts are ordered separately. See page 80 for available contact options and plating information, page 67 for tooling. Modules K, L, and M are sold pre-loaded with contacts. Domino assemblies are shipped complete with contacts.

The Domino system is ideal for use with hot-pluggable power supplies of the type employed for load-sharing and/or redundant power for computer systems. Current interruption capability is standard in the L module and an available option in the A module.

The CROWN BAND contact is a small louvered cylindrical receptacle of beryllium copper. Manufactured on progressive dies to allow consistent, even insertion and withdrawal forces, its design helps ensure maximum surface contact area for minimum voltage drop and minimum heat generation. CROWN BAND contacts also provide excellent shock and vibration resistance.

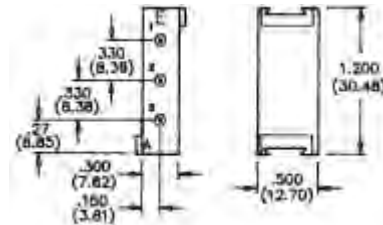
Cable Mounted Products

**Domino Series Connectors** (Continued)

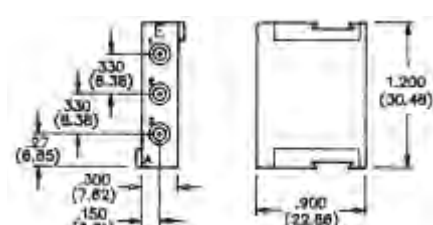
**A Modules — 3 x #12 Power Contacts, Hot-Plug option available**

**Note:** Supplied without contacts. Crimp insertable/removable, PCB insertable/non-removable

Specifications: Contact rating 35 Amps UL, 20 Amps CSA, 250V; Hot-plug 35 Amps UL, 30 Amps CSA, 120 V ac, 50 cycles; Fully loaded module nominal forces: insertion 9.2 lbs, extraction 5.5 lbs (Hot-plug insertion 11.5 lbs, extraction 6.4 lbs)



**Pin Housing**  
(without contacts)  
Part Number 1648461-1

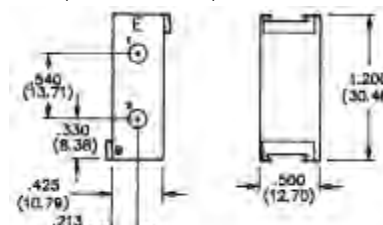


**Socket Housing**  
(without contacts)  
Part Number 1648466-1

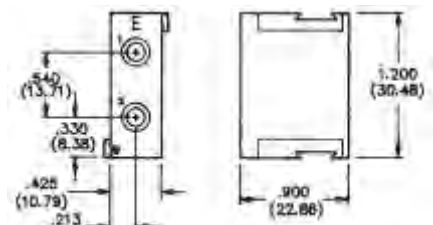
**B Modules — 2 x #8 Power Contacts**

**Note:** Supplied without contacts. Crimp insertable/removable, PCB insertable/non-removable

Specifications: Contact rating 75 Amps UL, 40 Amps CSA, 250V; Fully loaded module nominal forces: insertion 6.7 lbs, extraction 3.9 lbs



**Pin Housing**  
(without contacts)  
Part Number 1648462-1

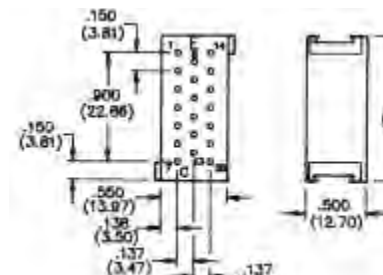


**Socket Housing**  
(without contacts)  
Part Number 1648467-1

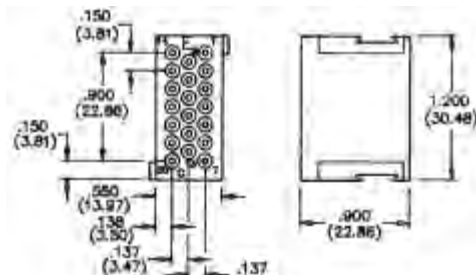
**C Modules — 20 x #20 Signal Contacts**

**Note:** Supplied without contacts. Crimp insertable/removable, PCB insertable/non-removable

Specifications: Contact rating 5 Amps UL, 4 Amps CSA, 125V; Fully loaded module nominal forces: insertion 2.4 lbs, extraction 2.6 lbs



**Pin Housing**  
(without contacts)  
Part Number 1648463-1

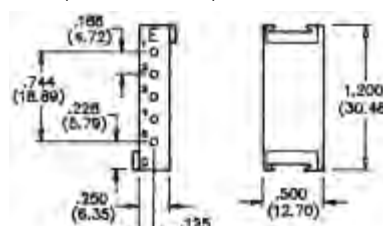


**Socket Housing**  
(without contacts)  
Part Number 1648468-1

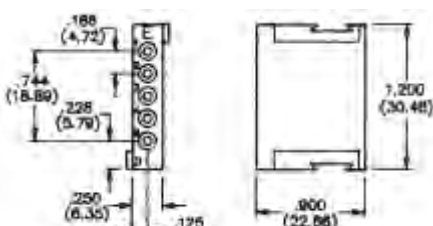
**D Module — 5 x #16 Power Contacts**

**Note:** Supplied without contacts. Crimp insertable/removable, PCB insertable/non-removable

Specifications: Contact rating 15 Amps UL, 10 Amps CSA, 125V; Fully loaded module nominal forces: insertion 18.6 lbs, extraction 13.0 lbs



**Pin Housing**  
(without contacts)  
Part Number 1648464-1



**Socket Housing**  
(without contacts)  
Part Number 1648469-1

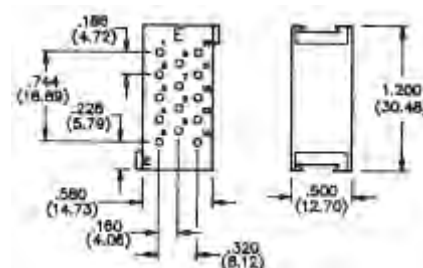
**Note:** All part numbers are RoHS compliant.

**Domino Series Connectors** (Continued)

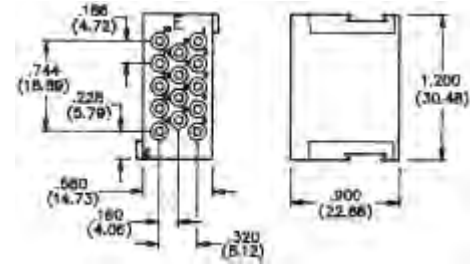
**E Modules — 14 x #16 Power Contacts**

**Note:** Supplied without contacts. Crimp insertable/removable, PCB insertable/non-removable

Specifications: Contact rating 15 Amps UL, 10 Amps CSA, 125V; Fully loaded module nominal forces: insertion 43.1 lbs, extraction 33.7 lbs



**Pin Housing**  
(without contacts)  
Part Number 1648465-1



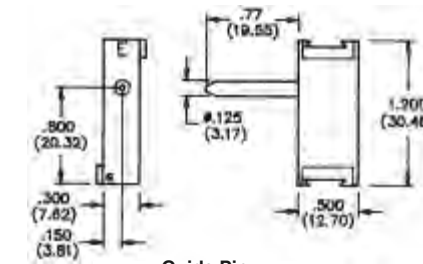
**Socket Housing**  
(without contacts)  
Part Number 1648470-1

Cable Mounted Products

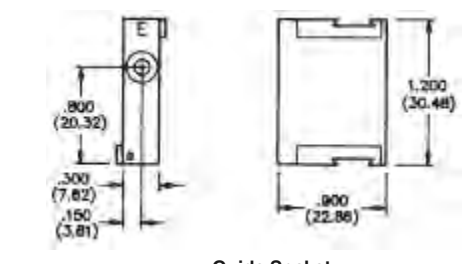
**G Modules - Non-electrical Guide Module**

**Note:** May be turned through 180 in the horizontal plane

Specifications: Guide pin type 303 Stainless Steel, passivated



**Guide Pin**  
Part Number 1648505-1

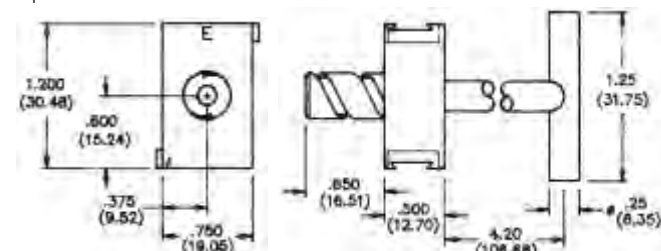


**Guide Socket**  
Part Number 1648473-1

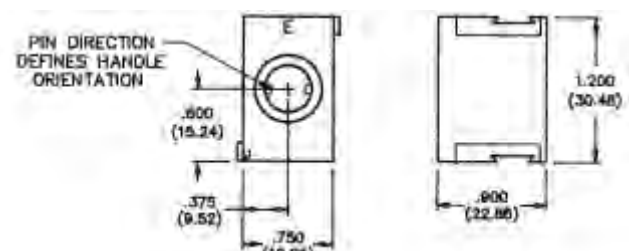
**J Modules — Jackscrew Locking Module**

**Note:** Select socket side to match desired orientation of T-handle in locked position

Specifications: Corrosion resistant Steel



**Pin Side**  
4.20" T-Handle Part  
Number 1648482-1



**Parallel Socket Side**  
Part Number 6650679-1

**Perpendicular Socket Side**  
Part Number 6650680-1

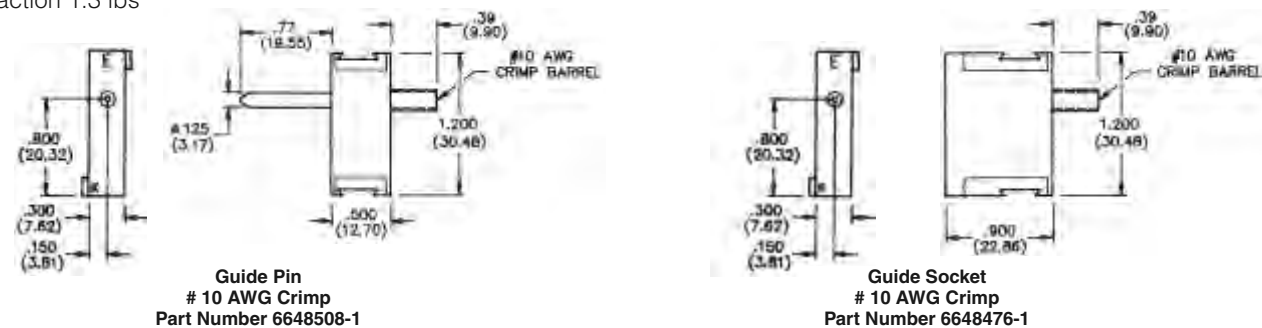
**Note:** All part numbers are RoHS compliant.

**Domino Series Connectors** (Continued)

**K Modules — Electrically Active Ground/Guide Module**

**Note:** May be turned through 180 in the horizontal plane. Use Crimp Tool PN 1766453-1

Specifications: Contact rating 40 Amps UL, 15 Amps CSA, 250V; Fully loaded module nominal forces: insertion 3.0 lbs, extraction 1.3 lbs

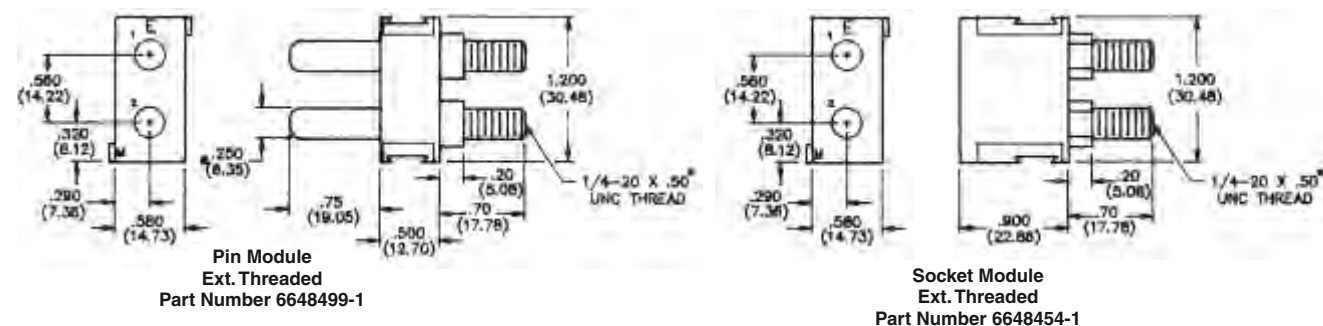


Guide Pin  
# 10 AWG Crimp  
Part Number 6648508-1

Guide Socket  
# 10 AWG Crimp  
Part Number 6648476-1

**M Modules — Pre-installed Dual In-Line Crown Pin & Socket**

Specifications: Contact rating 125 Amps UL/CSA, 250V; Fully loaded module nominal forces: insertion 14.9 lbs, extraction 9.8 lbs



Pin Module  
Ext. Threaded  
Part Number 6648499-1

Socket Module  
Ext. Threaded  
Part Number 6648454-1

Recommended torque value 40 lb.in (4.52 N.m)

**R Modules — 2 x 1/4" Power Contacts**

**Note:** Supplied without contacts; available contacts: Crimp insertable/removable, Ext. Threaded insertable/non-removable, consult TE for contact part numbers and available Double Crown option.

Specifications: Contact rating 150 Amps UL, 110 Amps CSA, 250V; Fully loaded module nominal forces: insertion 9.4 lbs, extraction 6.0 lbs



Pin Module  
(without contacts)  
Part Number 6648515-1

Socket Module  
(without contacts)  
Part Number 6648457-1

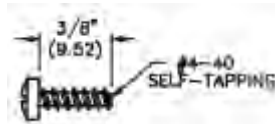
**Spacer Module — Non-electrical**

**Note:** any module may be ordered without contacts for use as spacers; consult sales engineer for options and part numbers.

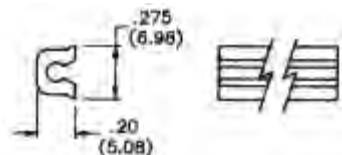
**Note:** All part numbers are RoHS compliant.

**Domino Series Connectors** (Continued)

**Domino Assembly  
Mounting Accessories**



Screw Part Number 1766829-1, Steel



Locking Rail Part Number 1648990-1,  
Aluminum alloy, gold anodized finish, 36" length.  
Requires cutting to size.

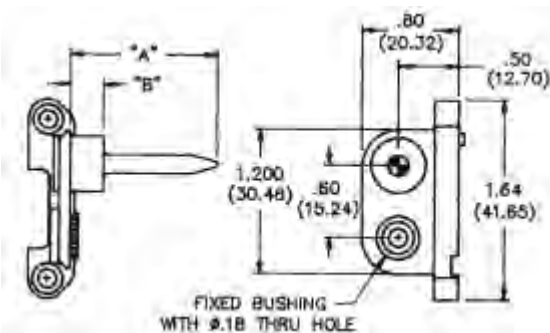
Locking Rail (at 1' interval)  
Part Number 1650469-1



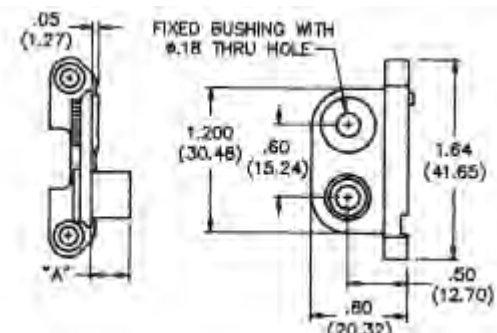
Cable Mounted Products

**End Caps — Zinc die cast, CRS hardware, trivalent chromate finish**

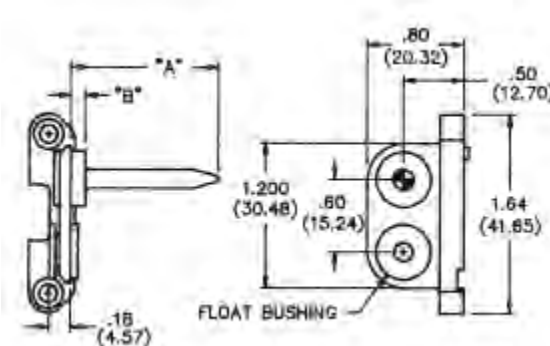
End caps secure the modules when screwed into the locking rails providing rigid assembly and a means of mounting assembly to frames, bulkheads, etc. Float-mount styles correct for misalignment during mating. Any end cap may be used to mount either pin or socket sides.



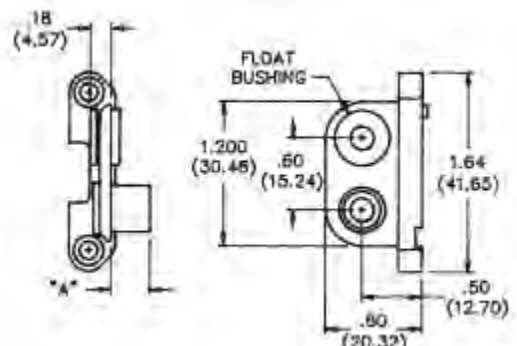
Fix-Mount, Guide Pin  
Part Number 6648259-1  
A = 1.22 (30.98), B = .275 (6.98)



Fix-Mount, Guide Socket  
Part Number 6648263-1  
A = .175 (4.44)



Float-Mount, Guide Pin  
Part Number 6648251-1  
Standard  
A = 1.22 (30.98), B = .275 (6.98)  
Part Number 6648253-1  
L-Module  
A = 1.62 (41.14), B = .125 (3.17)



Float-Mount, Guide Socket  
Part Number 6648252-1  
Standard  
A = .175 (4.44)  
Part Number 6648254-1  
L-Module  
A = .325 (8.25)

Note: All part numbers are RoHS compliant.

**Domino Series Connectors** (Continued)

**Domino Module Assembly Process**

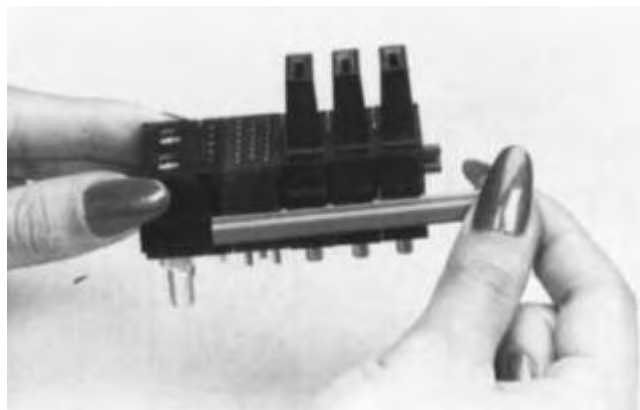
Cable Mounted Products



1. Align modules in desired order.



2. Measure length of assembly, and add .100" (2.54 mm) to determine overall rail length. Cut rails to length.



3. Slide locking rails into position on both sides of module assembly via the molded rail tracks.



4. Position end caps over locking rail ends and secure using Phillips head screws.



## Domino Connector Layout Form

### Instructions

1. Indicate the connector layout by filling in the Module letter for each module required in the boxes below, one per box. Use one form per mated pair.
2. Contacts are required for most modules, and are sold separately. Please see the High Current Drawer Section Contacts for specific part numbers.
3. The left to right order of the modules should match the **mating face views** of the connector.
4. Sign, date and send the completed form to your local TE Sales Engineer.

Upon receipt of this form, TE will generate a Customer Drawing for you to check and approve prior to connector production.

ENTER CUSTOMER INFORMATION	
Company	Location
Contact Name	Title
Telephone	Fax
Email Address	
I am: <input type="checkbox"/> End user <input type="checkbox"/> Contract manufacturer (end user: )	
Signature	Today's Date
	Annual Quantity Required

### Pin Side:

--	--	--	--	--	--	--	--	--	--

### Socket Side:

--	--	--	--	--	--	--	--	--	--

**A Modules**  
3 x #12 Power Contacts Hot Plug

**B Modules**  
2 x #8 Power Contacts

**C Modules**  
20 x #20 Signal Contacts

**D Modules**  
5 x #16 Power Contacts

**E Modules**  
14 x #16 Power Contacts

**G Modules**  
Non-Electrical Guide Modules

**J Modules**  
Jackscrew Locking Module

**K Modules**  
Electrically Active Guide/ Ground Module

**M Modules**  
Pre-Installed Dual In-Line Crown Pin & Socket

**R Modules**  
2 x /14" Power Contacts

### Domino Mounting Accessories

**Screw (Steel)**  
Part Number 1766827-1

**Locking Rail**  
Aluminum Alloy, 36" length (must cut to size)  
Part Number 1648990-1

**Locking Rail, 1' Interval**  
Part Number 1650469-1

**Fix-Mount End Cap**  
with Guide Pin

**Float-Mount End Cap**  
with Guide Pin

### Contacts

Please reference Power Connectors & Interconnection Systems Catalog 1773096 for contact part numbers.

Part Number	Quantity

Part Number	Quantity

Note: All part numbers are RoHS compliant.

Cable Mounted Products

## HTS Power Connectors

### Product Facts

- Heavy-duty, rectangular, multiple-position, pin and socket connectors
- Current rating: 10-500 A
- Voltage rating: 1-1.4 kV
- Number of contact positions: 1 through 216
- Connectors are designated by four components: base and hood, and male and female inserts
- Contact inserts provide for three types of wire termination: screw (no crimp tool required), crimp (higher pin count), and cage clamp (fastest)
- HE Series inserts (screw terminated) are the most popular
- Bases provide environmental (IP 55, 65 and 68) and electrical protection (NEMA 4 and 4X)
- Bases share an industry standard panel cutout and mounting hole pattern
- Hoods offer top, side, or angled cable entry. Hoods are tapped to accommodate metric or PG fittings
- Automated tooling matched to contact
- DIN/VDE, UL, CSA and SEV approved



HTS power connectors are heavy-duty, rectangular, multiple-position, pin and socket connectors. They are commonly referred to as “rectangular” or “European metal shell” connectors.

HTS connectors are designated by four components: base and hood, and male and female inserts. The designation is driven by electrical specifications; pin count and current rating define the inserts needed. From 1 to 216 contact positions are available. Current ratings range from 10-500 A.

The appropriate housing size (1-12) to accommodate selected inserts is then defined. Housing selection criteria include: base mounting style, latch type, hood cable entry location, and hood gland size. The most popular housing sizes are: Shell Size 1 (3 or 4 positions), Shell Size 3 (6 positions), Shell Size 6 (16 positions), Shell Size 8 (24 positions), and Shell Size 5 (25 positions).

HTS connectors have many applications: industrial machinery (automotive, plastics, semiconductors, material handling, packaging and printing), and railroad and mass transit (A/C and brake subsystems, power transformers, door systems, switches and signals, and drive motor enclosures).

For more information on the entire line of HTS heavy-duty connectors, see Catalog 889745-2.

**HTS Power Connectors** (Continued)

**Contact Inserts**

**Series HVS**

- High Variable System
- Zinc Frames Size 3 to 8 (acc. to Housing)
- For up to 6 Single Modules

**Material**

- PBT
- Flammability Rating: acc. UL 94 V-0



Cable Mounted Products

To offer a maximum of flexibility and reliability with a minimum of installation or maintenance effort TE developed the HVS product range (high variable system).

This system enables customers to build their own application specific connection and due to the combination variety of the different modules customers benefit in terms of reduced costs (cost efficiency) and less mounting space.

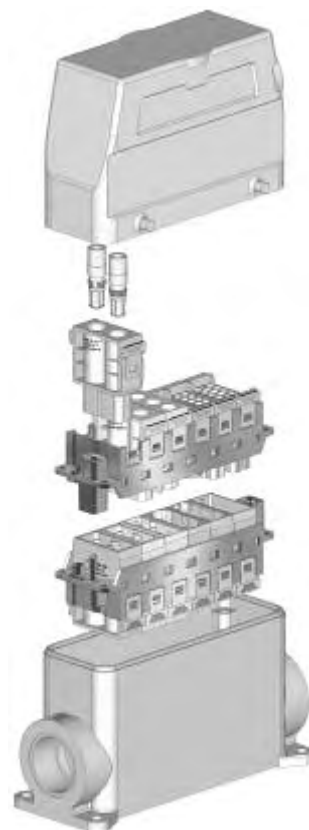
The HVS range comprises more than 25 different modules and the particular zinc frames which can then be mounted into all standard hoods and housings from TE. There is no tooling needed to put the modules in and out of the frame due to lever snap-in technology.

Up to 6 single modules can be used in a size 8 frame whereby the customer can individually define the combination of modules.

Signal, high current and high voltage, high density, Fire Wire, RJ45, USB, Coax, twisted pair, high speed and also pressure air are only some of the different connector modules. According to the insert contacts can be used individually.

In combination with the TE's hoods and housings IP ratings of IP 65 or even IP 68 can be realized. Customers also benefit from EMI- and corrosion-protection dependent on housing.

A large variety of customer specific applications complete the product range.




For more information on the entire line of HTS heavy-duty connectors, see Catalog 889745-2.

## RAPID LOCK Quick Connect/Disconnect Bus Bar Connectors

### Product Facts

- Replaces power lugs
- Locking feature “snaps” each contact to mating pin
- Up to 250 Amps per contact
- CROWN BAND connector technology provides low contact resistance

### Typical Applications

- Power Distribution Systems
- Recognized under the Component Program of Underwriters Laboratories, File No. E28476 



The RAPID LOCK connector is a single-pole, quick connect/disconnect replacement for lug connections, used in bus bar and backplane power distribution applications. RAPID LOCK connectors allow a reliable and safe connection, as well as better serviceability, than bolt-fitted lugs. The cable mounted sockets have a right-angle configuration, and feature an insulator cap that provides the retention mechanism on the pin. The pin contacts can be attached to a bus bar by screw or swage, and to a backplane by press fit and backup screw.

### Secure Power Distribution

By replacing power lugs fitted using nuts and bolts, the RAPID LOCK connector offers an extremely secure interconnect mechanism that totally frees the power distribution system from the risk of loose connections, which can cause arcing.

### Safety Locking Feature

A locking feature is provided on the pins for protection against accidental unlatching of the cable. Although connection of the cable is easily performed by hand, disconnection requires a simple tool to provide the leverage needed to overcome the locking feature.

### Improved Ease of Service

Service in the field becomes very easy with RAPID LOCK connectors because there are no nuts and washers to lose in the equipment. The RAPID LOCK connector is available with red or black color insulators.

### CROWN BAND Technology

The RAPID LOCK connector enjoys all the benefits of the ELCON CROWN BAND technology, providing a stable connection with excellent mechanical and electrical performance with ratings up to 300 Amps depending on wire gauge and application.

**Note:** All RAPID LOCK Products in this section are RoHS compliant.

**Note:** All part numbers are RoHS compliant.

**RAPID LOCK Quick Connect/Disconnect Bus Bar Connectors** (Continued)

**RAPID LOCK Connectors  
Ordering Information**

Size	Crimp Size	Part Numbers				
		Socket			Pin	
		Black	Red	Blue	Swage	Screw
#8	AWG #8	6648228-1	6648228-2	N/A	6648221-1	—
	AWG #12	6648237-1	6648237-2	N/A	6648221-1	N/A
	AWG #6	1766484-1	1766484-2	N/A	6648221-1	—
#4	AWG #8	6648235-1	6648235-2	N/A	6648222-1	—
	AWG #4	6648236-1	6648236-2	N/A	6648222-1	6648224-1
	AWG #6	6648239-1	6648239-2	N/A	6648222-1	—
#2	AWG #0	6648234-1	6648234-2	N/A	6648223-1	6648226-1
	AWG #2	6648238-1	6648238-2	N/A	6648223-1	6648226-1
12 mm	95 Sq. mm	N/A	1857547-1	1857547-2	1857523-3	N/A

Size	Insulation Boot			
	Black	Red	Grey	Blue
#4/#8	1651003-1	1651003-2	1651003-3	1651003-4
#2	1766600-1	1766600-2	1766600-3	1766600-4

Cable Mounted Products

**Product Specifications**

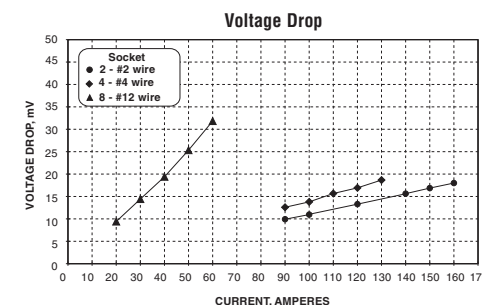
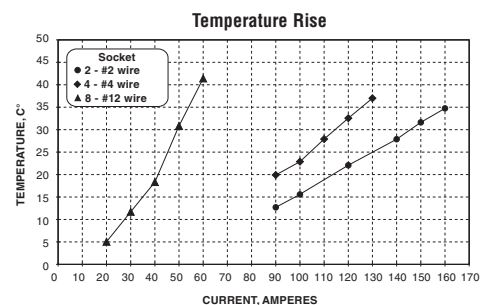
Materials	
Insulator	Thermoplastic, UL 94V-0 flammability rated
Socket Contact Body	Copper alloy, plated Silver over nickel
CROWN BAND	Beryllium Copper, plated Gold (30 micro inches minimum) over nickel
Pin Contact	Copper alloy, plated Silver over nickel
Electrical	
Current Rating @ 30°C T-rise	Size 8 — 50 Amps on 8 AWG wire Size 4 — 115 Amps on 4 AWG wire Size 2 — 145 Amps on 2 AWG wire Size 12 mm — 250 Amps on 95 mm <sup>2</sup> wire
Contact Resistance	Size 8 — 0.5mΩ Size 4 — 0.15 mΩ Size 2 — 0.12 mΩ
Voltage Drop	See graphs
Mechanical	
Removal Tool	Part Number 1857376-1

**Note:** For more information about tooling, call Tooling Sales at 888-777-5917, (717)-810-2080 or e-mail toolingsales@te.com.

**Test Data**

Shown below is current versus temperature rise of the five different available socket sizes.

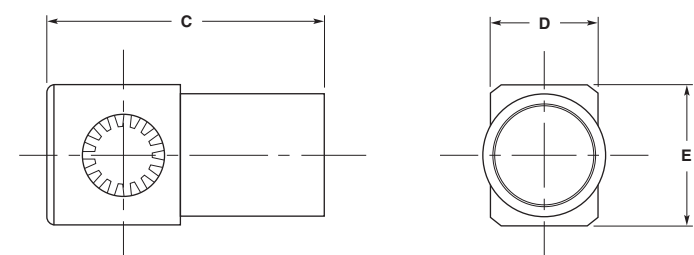
Shown below is current versus voltage drop performance of the five different available socket sizes.



**Note:** All part numbers are RoHS compliant.

**RAPID LOCK Quick Connect Sockets and Pins**
**Cable Mounted Sockets**

RAPID LOCK sockets are crimped to AWG #4, #6 or #8 size cable depending on the application requirements. Envelope dimensions are common except for the crimp barrel diameter.



Part Number	Size	Dimensions			Cable AWG
		C	D	E	
6648228-X	#8	1.080	.500	.500	8
6648237-X		27.43	12.70	12.70	12
1766484-X					6
6648235-X	#4	1.08	.500	.500	8
6648236-X		27.43	12.70	12.70	4
6648239-X					6
6648234-X	#2	1.280	.490	.640	0
6648238-X		32.51	12.45	16.26	2
1857178-X					1/0
1857547-X	12.0 mm	1.920	.930	.930	3/0
		48.70	23.70	23.70	

Note: X refers to available color variants.

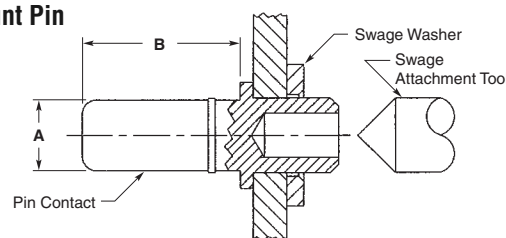
**Pin Contacts**

RAPID LOCK pin contacts are offered in either swage or screw & washer mounting options for .125" (3.18 mm) or 3 mm (.118") thick PCB or bus bars. Consult TE Customer Service for other bus bar and back-plane thicknesses and designs.

**Press Fit Pin Contacts**

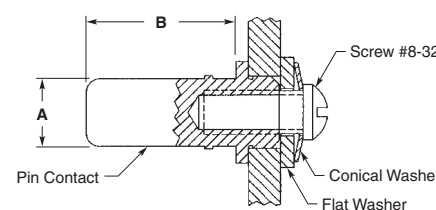
Attach Type	Pin Size	Mounts to
Screw and Washer	#4	Bus bar/Backplane
Swage	#4	Bus bar

Note: All part numbers include attachment hardware (screw, washer, etc.)

**Swage-Mount Pin**


Part Number	Size	Dimensions	
		A	B
6648221-1	#8	.142	.550
		3.81	13.97
6648222-1	#4	.250	.550
		6.35	13.97
6648223-1	#2	.375	.550
		9.53	13.97
1857523-3*	12.0 mm	.470	.850
		12.00	21.70

\*Requires washer Part Number 1857513-2

**Screw-Mount Pin**


Part Number	Size	Dimensions	
		A	B
6648224-1	#4	.250	.550
		6.35	13.97
6648226-1	#2	.375	.550
		9.53	13.97

Note: All part numbers are RoHS compliant.

### Custom RAPID LOCK Connector Products

In addition to the flexibility offered with standard RAPID LOCK connector products, the basic technology and standard components may also be packaged to suit specific customer needs. Some examples of custom packages are given below.

#### Snap-Lock Sockets

Discrete pins are generally offered with or without a locking feature. A locking feature for a discrete socket is provided by a special two piece molding (94 V-0). This enables the socket to snap over a locking pin, and provides a 5 lb withdrawal force. The molding will also lock into a panel or holder of .125 (3.18) thickness.



Part Numbers	Wire Size	Color
1643279-1		Black
1643279-2	8 AWG	Red
1643279-3		Blue
1651766-1	4 AWG	Black

Cable Mounted Products

#### Press-Fit Discrete Contacts

Pins and sockets of the type shown are designed for press-fit to board or bus bar, and allow plug-in removal of a variety of board-mount components, discrete contacts, and flat-pack power supplies. Each socket contains a CROWN BAND contact, providing high current capacity and minimum loss, and accommodating misalignment.

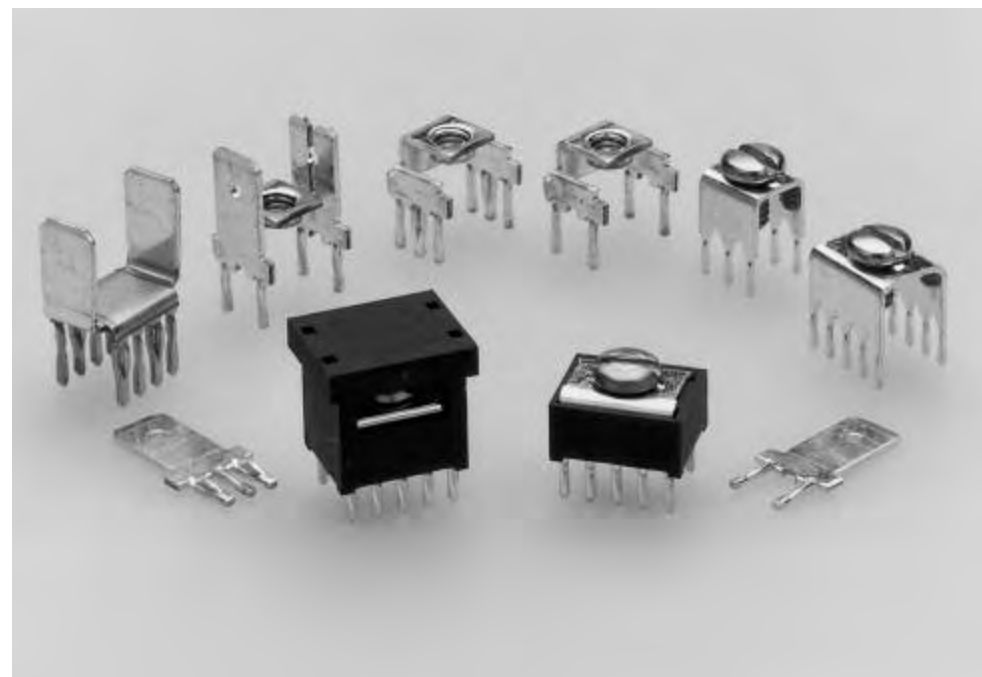


**Note:** All part numbers are RoHS compliant.

## AMP Power Taps

### Product Facts

- **ACTION PIN contacts eliminate soldering**
- **Provides high current, separable connection to pc board traces**
- **Wire-to-board connection using common terminals**
- **All metal-to-metal assembly for long-term integrity**
- **Standard DIP outlines (7.62 x 2.54 [.300 x .100]), 10 positions, and 6.35 x 3.18 [.250 x .125], 6 and 10 positions, plus high current versions on 10.16 x 5.08 [.400 x .200] footprint in 4 and 6 positions, 7.62 x 2.54 [.300 x .100] in 8 positions, and both 2 and 3 position in-line 2.54 [.100] tab taps**
- **Low resistance interface**
- **Internally threaded tap to secure screw to terminal**
- **Anti-rotational embossments hold wire and terminal in place**
- **Standard power taps rated at 2.5 Amps per pin — 6 position 15 Amps, 10 position 25 Amps current carrying capability**
- **High current power taps rated at up to 5 Amps per pin — 2 position 10 Amps, 3 position 15 Amps, 4 and 6 position 20 Amps and 8 position 40 Amps**
- **30 Amp inverse sex power tap**



AMP power taps are designed for the growing need for power to printed circuit board applications required in today's electronic industry. The taps provide a high current, separable connection to a pc board. Pin configuration is of the standard DIP outline with 7.62 x 2.54 [.300 x .100] or 6.35 x 3.18 [.250 x .125] for the standard versions, plus 10.16 x 5.08 [.400 x .200], 7.62 x 2.54 [.300 x .100] and in-line spacing for the high current versions.

ACTION PIN contacts provide a low resistance interface with tin-plated through holes in the pc board, thereby eliminating the need for soldering.

The variety of available power taps allow for various installation schemes. The uninsulated tap and low profile tap can be used in bus bar pattern. The high profile and low profile taps offer insulation protection from other components. The high current versions provide a greater power

density option with current ratings from 10 Amps on the 2 position in-line 6.35 [.250] tab tap up to 40 Amps on the 8 position dual 6.35 [.250] tab tap.

All AMP power tap configurations are easily inserted into the pc board with a simple TE or customer supplied tool.



**AMP Power Taps** (Continued)

**Material and Finish**

**Connector Body and Lid** — Nylon, 105°C 94V-0 rated

**Contact** — Copper alloy, bright tin-lead or tin plated

**Screw** — Plated steel

**Electrical and Mechanical Characteristics**

**Resistance** — 2 milliohms, max. (stud hole to ACTION PIN contact)

**Insertion Force** — 40 lbs. [177.9N], max. per pin

**Retention Force** — 7 lbs. [31.1N], min. per pin

**Technical Documents**

**Product Specification**

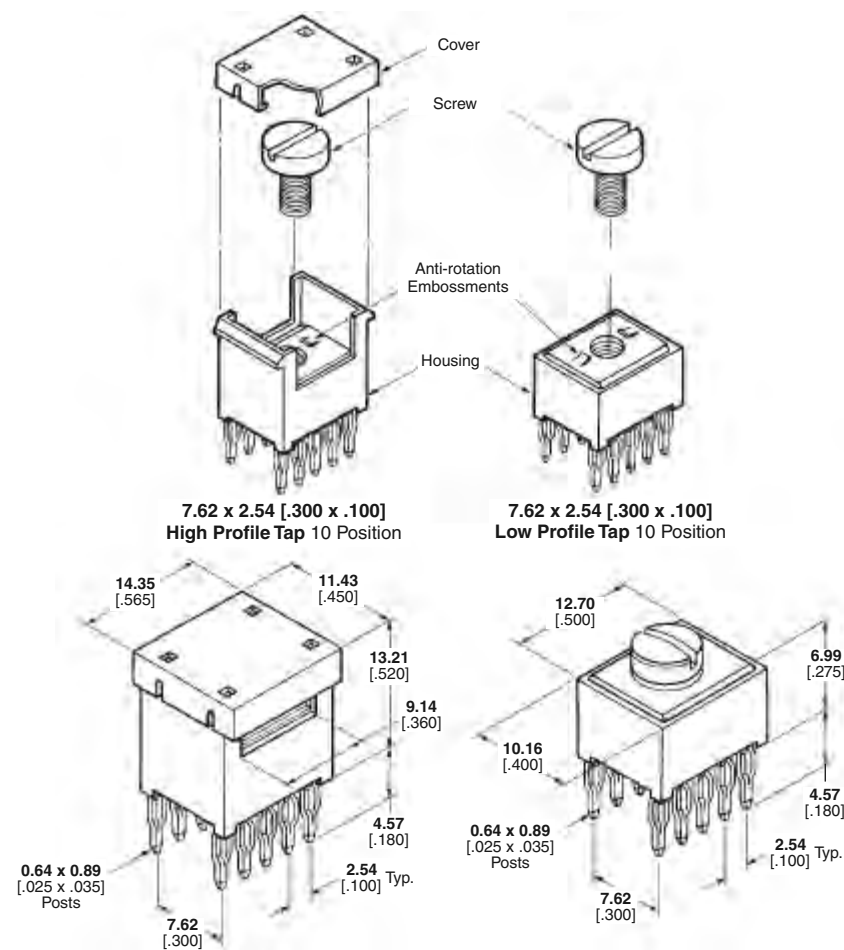
108-11030 Tap, Power Distribution

**Application Specification**

114-11000 Tap, Power Distribution

**Handbook**

5697 Guide to Application of ACTION PIN Connectors



Cable Mounted Products

Tap Version	PCB Thickness	Description	Screw Hole Size	Part Number	
				Tin Lead	Tin
High Profile	1.57-3.18 0.62-.125	Housing and Contact Assembled With Screw <sup>1,2</sup>	6-32	55557-4●	5055557-4
Low Profile	1.57-3.18 .062-.125	Housing and Contact Assembled With Screw <sup>2</sup>	6-32	55556-4●	5055556-4
Low Profile	1.57-3.18 .062-.125	Housing and Contact Assembled With Screw <sup>2,3</sup>	6-32	55673-2●	5055673-2
Low Profile	1.57-3.18 .062-.125	Housing and Contact Assembled Without Screw	M4	55556-9●	5055556-9

<sup>1</sup>Cover not Assembled

<sup>2</sup>Screw not Assembled

<sup>3</sup>No Anti-rotational Embossments

**Note:** Part Numbers are RoHS compliant except: ● Indicates "5 of 6 compliant" (lead in solderable interface only).

**AMP Power Taps** (Continued)

**Material and Finish**

**Contact**—Copper alloy, post plated bright tin-lead or tin plated

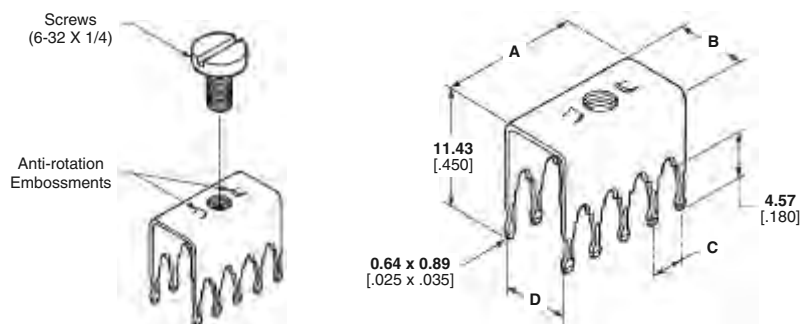
**Screw**—Stainless steel, passivated

**Electrical and Mechanical Characteristics**

**Resistance** — 2 milliohms, max. (stud hole to ACTION PIN contact)

**Insertion Force** — 40 lbs. [177.9N] max. per pin

**Retention Force** — 7 lbs. [31.1N] min. per pin



Size	PCB Thickness	Dimensions				Description	Screw Size	Part Number	
		A	B	C	D			Tin Lead	Tin
7.62 x 2.54 .300 x .100 10 Position	1.57-3.18 .062-.125	11.18 .440	8.26 .325	2.54 .100	7.62 .300	Without Screw	6-32	55558-3●	5055558-3
						With Screw	6-32	55558-4●	5055558-4
6.35 x 3.18 .250 x .125 6 Position	1.57-3.18 .062-.125	8.13 .320	6.99 .275	3.18 .125	6.35 .250	Without Screw	6-32	55323-5●	5055323-5
						With Screw	6-32	55323-9●	5055323-9
6.35 x 3.18 .250 x .125 10 Position	1.57-3.18 .062-.125	14.48 .570	6.99 .275	3.18 .125	6.35 .250	Without Screw	6-32	55323-6●	5055323-6
						With Screw	6-32	1-55323-0●	1-5055323-0

**High Current\* Power Taps**

\*Up to 20 Amps

**Material and Finish**

**Contact** — Phosphor bronze, tin-lead or tin plated

**Screw** — Stainless steel, passivated

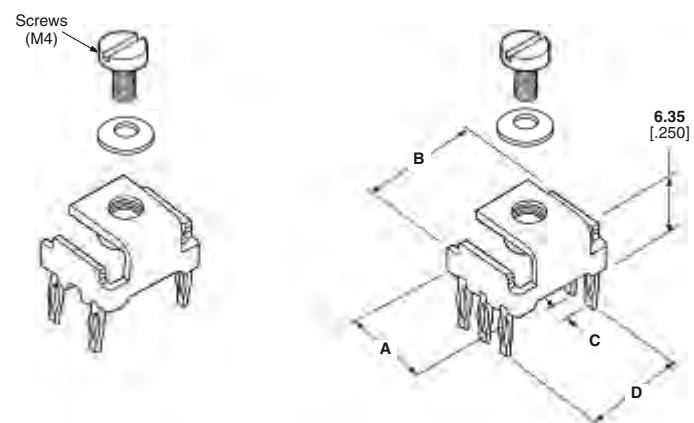
**Washer** — Stainless steel

**Electrical and Mechanical Characteristics**

**Current Rating** — 20 Amps max.

**Insertion Force** — 40 lbs. [180N] max. per pin

**Retention Force** — 7 lbs. [30N] min. per pin



Size	PCB Thickness	Dimensions				Description	Part Number	
		A	B	C	D		Tin Lead	Tin
4 Position	1.57-3.18 .062-.125	9.09 .358	10.95 .431	5.08 .200	10.16 .400	With Screw, Washer	213815-1●	5213815-1
						Without Screw	216906-1● <sup>1</sup>	—
6 Position	1.57-3.18 .062-.125	9.09 .358	10.95 .431	2.54 .100	10.16 .400	With Screw, Washer	213816-1●	5213816-1
						Without Screw	216907-1● <sup>1</sup>	—

<sup>1</sup>No Anti-rotation Embossments featured on High Current Taps. Therefore, if application requires product supplied without washer and screw, use of lock-washers with a high surface contact area are strongly recommended.

**For High Current and FASTON Taps**

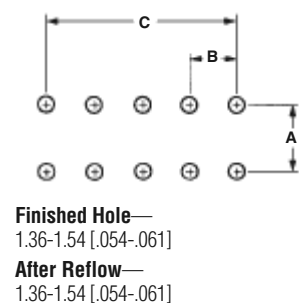
Use with Hand Press 677430-1

**Recommended PC Board Layout**

**Drilled Hole Diameter**—  
1.60±0.03 [.063±.001]

**Cu Thickness**—  
0.03-0.08 [.001-.003]

**SnPb Thickness**—  
0.004 min. [.0002 min.]



**Finished Hole**—  
1.36-1.54 [.054-.061]  
**After Reflow**—  
1.36-1.54 [.054-.061]

Type	A	B	C
4 Position	10.16 .400	5.08 .200	5.08 .200
6 Position	10.16 .400	2.54 .100	5.08 .200
I	—	5.08 .200	5.08 .200
II	—	2.54 .100	5.08 .200
III	10.16 .400	5.08 .200	5.08 .200
IV	7.62 .300	2.54 .100	7.62 .300

**Note:** Part Numbers are RoHS compliant except: ● Indicates "5 of 6 compliant" (lead in solderable interface only).

**AMP Power Taps** (Continued)

\*Up to 5 Amps per pin

**Mating Connectors**  
**FASTON Receptacles**

**Material and Finish**

**Contact** — Phosphor bronze, post plated tin-lead or tin plated

**Screw** — Stainless steel, passivated

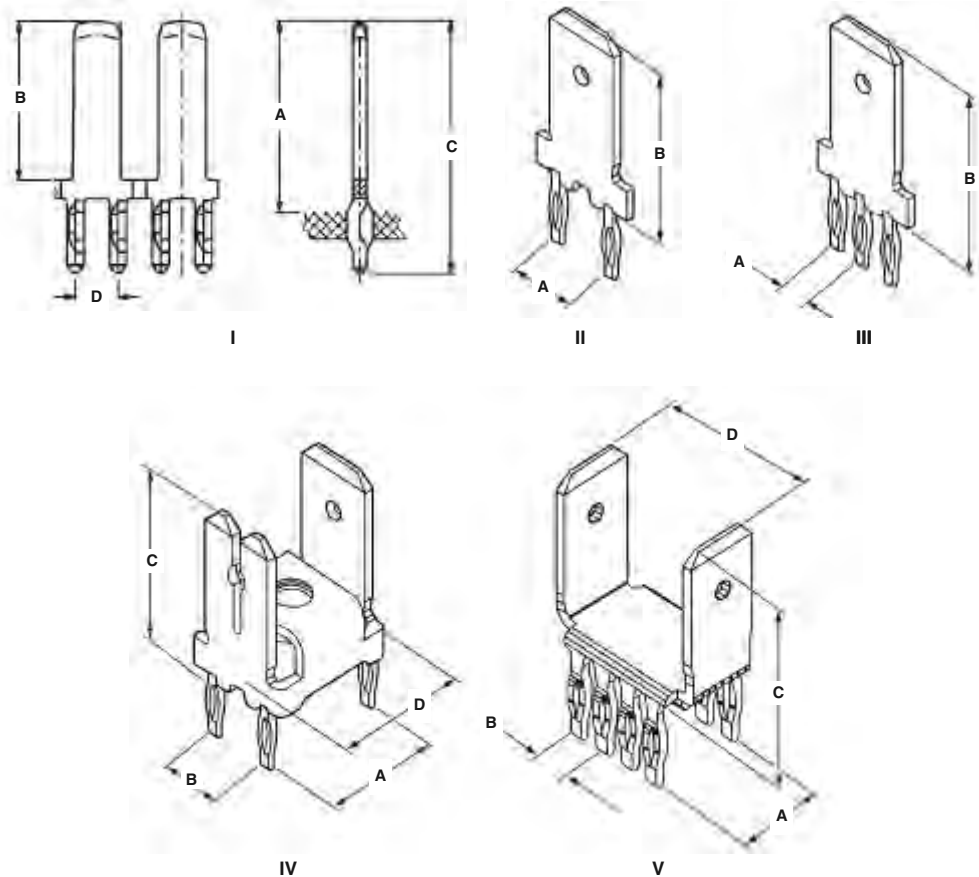
**Washer** — Stainless steel

**Electrical and Mechanical Characteristics**

**Current Rating** — 5 Amps max. per pin

**Insertion Force** — 40 lbs. [180N] max. per pin

For Recommended PC Board Layout, see page 170.



Cable Mounted Products

Style	PCB Thickness	Dimensions				Description	Part Number	Receptacle Mating
		A	B	C	D			
I	1.39 x 1.54 .055 x .061	13.50 .531	10.75 .423	18.50 .728	2.54 .100	2.8 x 0.80 .110 x .031 Tab	338429-2	Positive Lock
II	1.57 x 3.18 .062 x .125	5.08 .200	13.49 .531	—	—	6.35 x 0.81 .250 x .032 Tab	216926-1	Positive Lock
III	1.57 x 3.18 .062 x .125	2.54 .100	13.49 .531	—	—	6.35 x 0.81 .250 x .032 Tab	216843-1	Positive Lock
IV	1.57 x 3.18 .062 x .125	10.16 .400	5.08 .200	13.49 .531	10.95 .431	1-6.35 x 0.81 .250 x .032 Tab	216905-1 <sup>1</sup>	Positive Lock
						2-2.79 x 0.81 .110 x .032 Tab		
V	3.18 .125	7.62 .300	2.54 .100	12.32 .485	12.70 .500	2-6.35 x 0.81 .250 x .032 Tab	167892-3 <sup>2</sup>	FASTON Rcpt.
						With Hole		167892-6 <sup>2</sup>

<sup>1</sup>No Anti-rotation Embossments featured on High Current Taps. Therefore, if application requires product supplied without washer and screw, use of lock-washers with a high surface contact area are strongly recommended.

<sup>2</sup>Phosphor Bronze, post plated matte tin

Note: All part numbers are RoHS compliant.

**AMP Power Taps** (Continued)

**Application Tooling/  
PCB Layout**

**For Standard Threaded  
Taps Only**

**Recommended PC Board  
Layout**

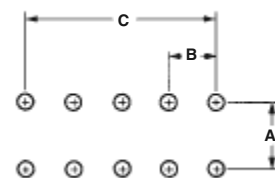
**Drilled Hole Diameter—**  
.0453<sup>+0.001</sup> [1.15<sup>+0.03</sup>]

**After Plating**  
.037-.043 [0.94-1.09]

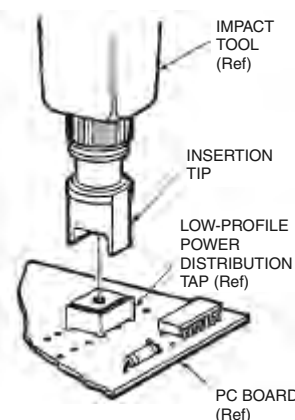
**After Reflow—**  
.036-.043 [0.91-1.09]

**Installation and Extraction  
Tooling**

**Impact Insertion Tool Number**  
313102-1  
(Insertion Tip No. 58133-1 required)



Size	Dimensions		
	A	B	C
<b>.300 x .100</b> 7.62 x 2.54 10 Position	<b>.300</b> 7.62	<b>.100</b> 2.54	<b>.400</b> 10.16
<b>.250 x .125</b> 6.35 x 3.18 6 Position	<b>.250</b> 6.35	<b>.125</b> 3.18	<b>.250</b> 6.35
<b>250 x .125</b> 6.35 x 3.18 10 Position	<b>.250</b> 6.35	<b>.125</b> 3.18	<b>.500</b> 12.7



Extraction Tool  
Part Number 68380-1

**For High Current and  
FASTON Taps**

Use with Hand Press **677430-1**

**Recommended PC Board  
Layout**

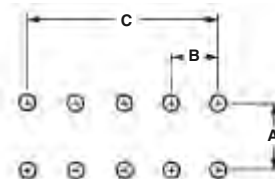
**Drilled Hole Diameter—**  
.063<sup>+0.001</sup> [1.60<sup>+0.03</sup>]

**Cu Thickness—**  
.001-.003 [0.03-0.08]

**SnPb Thickness—**  
.0002 min.[0.004 min.]

**Finished Hole—**  
.055-.061 [1.39-1.54]

**After Reflow—**  
.054-.061 [1.36-1.54]



Type	A	B	C
4 Position	<b>.400</b> 10.16	<b>.200</b> 5.08	<b>.200</b> 5.08
6 Position	<b>.400</b> 10.16	<b>.100</b> 2.54	<b>.200</b> 5.08
I	—	<b>.200</b> 5.08	<b>.200</b> 5.08
II	—	<b>.100</b> 2.54	<b>.200</b> 5.08
III	<b>.400</b> 10.16	<b>.200</b> 5.08	<b>.200</b> 5.08
IV	<b>.300</b> 7.62	<b>.100</b> 2.54	<b>.300</b> 7.62

**Installation Tooling**

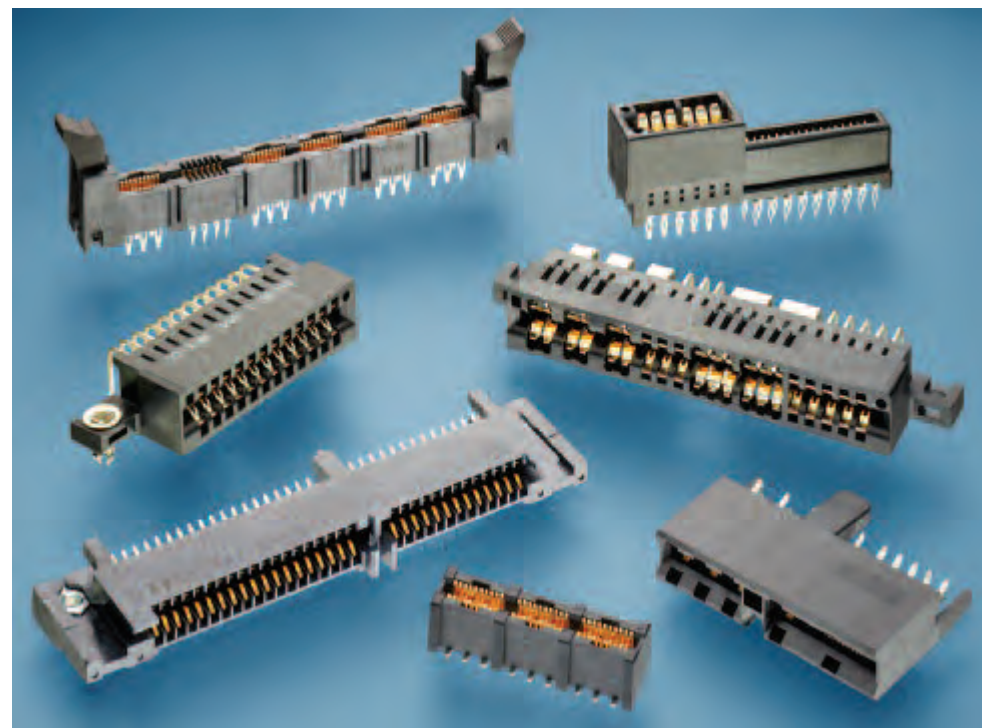
Type	Part Number	Upper Tool	Lower Tool
High Current 4 & 6 Positions	216906-1 216907-1	432848-1	433600-2 or 432130-2
High Current Style I, II	216926-1 216843-1	432845-1	433600-2 or 432130-2
High Current Style III	216905-1	432847-1	433600-2 or 432130-2
High Current Style IV	5167892-3 167892-6	432849-1	433600-2 or 432130-2

**Note:** All part numbers are RoHS compliant.

## Introduction to High Current Card Edge Connectors

### Product Facts

- Contacts on .100 [2.54] Centerlines
- Selective gold plating of contacts for high performance at low cost
- Flow solder applications
- Glass-filled polyester housing is 94V-0 rated
- Available in vertical, right-angle or straddle PCB-mount
- Solder tails for wave solder applications
- Compliant press-fit PCB tails for solder-less applications
- 50% to 100% greater current carrying capacity than traditional card edge connectors
- Accepts double sided PC boards, .054-.070 [1.27-1.78] thick
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476
- Certified by Canadian Standards Association, File No. LR 7189



### Introduction

The High Current Edge family of connectors provides high reliability and economy in packages compatible with industry standards. While many new card edge connectors for signal applications have moved toward higher density configurations (0.050" and 1 mm centerlines), TE has redesigned the 0.100" standard edge product family to carry more current, for low power distribution.

This product family includes the following:

- CROWN EDGE Products
- Standard Edge Connector — 2nd generation
- SEC-II Power Products

The connectors serve low durability cycle applications which do not have the available room for a traditional 2-piece power distribution connector. In other applications, a low-profile connector is needed to allow for better airflow / less airflow restriction. This grouping of power card edge connectors is focused on providing high current density with the favored multi-point contact design which reduces contact interface resistance.

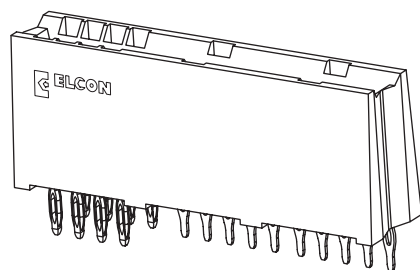
The connectors were used originally in the ISA Standard for computer expansion cards. Today these connectors are being

used in applications such as; DC-to-DC converters, low-wattage power supplies, industrial grade card extenders and general low cost I/O applications requiring durable/rugged card edge contacts. The improvements made still allows use in the original applications and they provide a lower resistance connection due to the high conductivity contacts plated with a minimum 30 micro inches gold.

The options include vertical or right-angle PCB mounting as well as straddle-mount configurations for co-planar PCB applications.

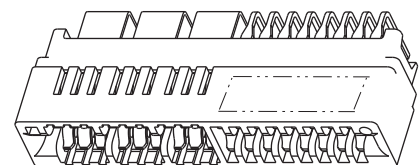
Card Edge Products

**Introduction to High Current Card Edge Connectors** (Continued)



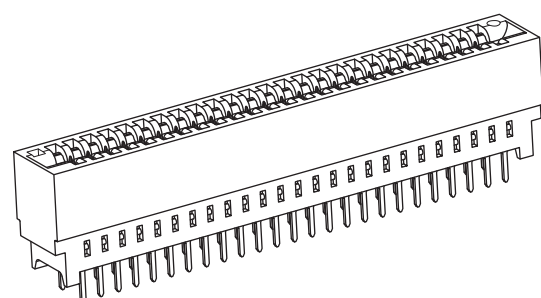
**CROWN EDGE Connector**

- Design based on CROWN BAND technology
- 35A per power contact
- True hot-plug power modules
- Flexible modular design
- Mates with .062 [1.6] thick card edge or bus bar tab



**SEC-II Power Connector**

- High current density than high current SEC II
- Uses new MULTI-BEAM style power contact
- Vertical, straddle or right-angle PCB mounting
- 22A (straddle) or 28A (vertical) power contact +3A signal contact



**SEC-II Connectors**

- Provides high reliability in packages compatible with industry standards for double-sided printed circuit boards
- Uses signal style contact
- High IACS copper alloy contacts available to improve current carrying capability
- Accepts double-sided boards .054 [1.27]-.070 [1.78] thick
- Maximum number of dual positions
  - .100 [2.54] Centerlines — 70 positions
  - .125 [3.18] Centerlines — 50 positions
  - .150 [3.81] Centerlines — 31 positions

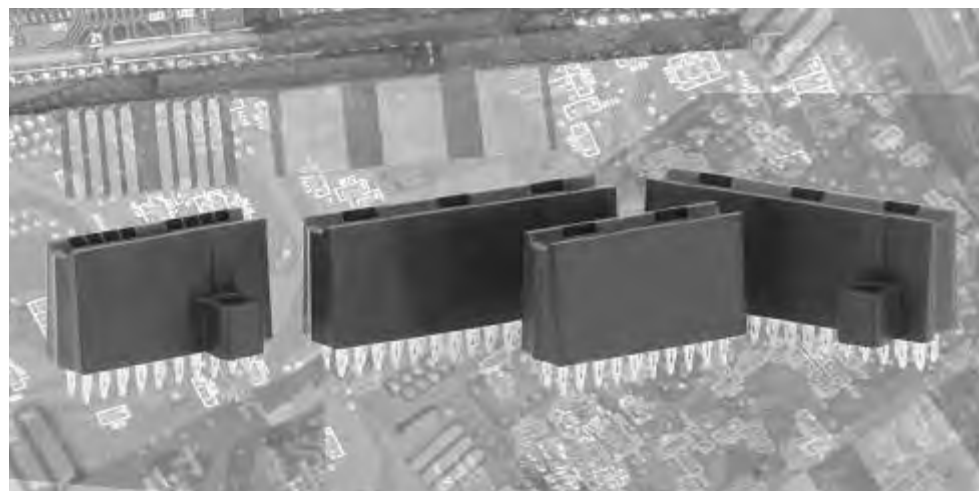
## CROWN EDGE Card Edge-style High Current Connectors

### Product Facts

- Low cost power solution
- Power, signal and mixed modules
- 35A per power contact
- Mates with .062 (1.6 mm) thick card edge or bus bar tab
- Press-fit or solder tail terminations
- True hot-plug power modules
- Meets regulatory safety requirements
- All CROWN EDGE products in this section are RoHS compliant.

### Typical Applications

- Board-to-board power connections
- DC-DC converters
- Uninterruptible Power Supply (UPS)
- Power supplies



CROWN EDGE connectors are a board-to-board power interconnect solution that uses ELCON high performance CROWN BAND contact technology configured to mate directly with a printed circuit board edge or — for higher currents — with a solid bus bar. Power and signal can be combined and mounted end-to-end to meet the requirements of the applications.

### Product Highlights

#### High-current Card Edge Interface

CROWN EDGE connectors use TE proven ELCON CROWN BAND contacts that provide multiple points of contact for high current, and low voltage drop and minimal heat generation. The desired current rating for most applications can be achieved by bussing multiple contacts or even modules. For even higher currents, CROWN EDGE connectors can be mounted onto a bus bar, and mate directly with a bus bar tab. Optimum interface to the mounting PC board is achieved through five termination tails.

#### Flexible Modular Design

To make easy work of power distribution design, CROWN EDGE connectors are available in modules of 2 and 3 contact segments with power or signal contacts or a combination of both in a single module. Modules can be placed end-to-end for assemblies up to 8" (203.20 mm) long. Custom molded configurations are possible on high-volume projects. Consult TE or your local TE sales representative for details.

#### Versatile Power Arrangements

Opposing contacts are isolated, so power connections at different voltage levels can be on one side of the board, with ground or power return on the other side.

#### True Hot-Plug Support

CROWN EDGE power modules that support current interruption under load as defined by safety regulatory agencies are also available for mating to a metal blade or bus bar tab. These true hot-plug modules allow current interruption under load by incorporating a contact design that restricts the effects of arcing to areas that do not compromise the integrity of the connection.

Card Edge Products

## CROWN EDGE Card Edge-style High Current Connectors (Continued)

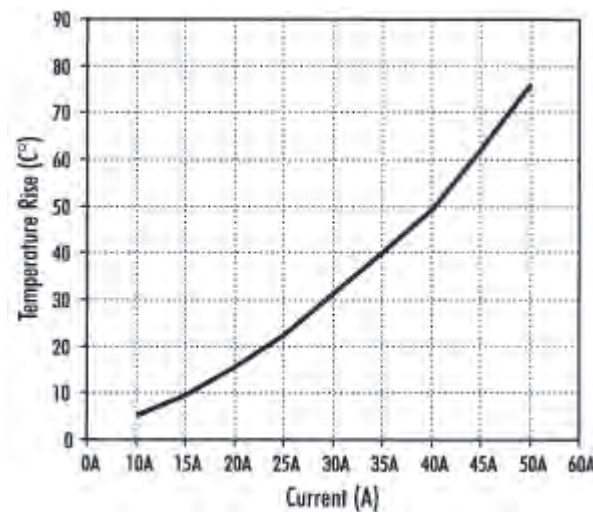
### Product Specifications

Materials & Finishes			
Insulators		PPA, UL 94-V-0 flammability rated, color black	
Contacts	Non-hot-plug power contact	Copper alloy, selectively plated with gold (30 micro inches minimum) and tin on terminations, all over nickel	
	Hot-plug power contact	Contact holder	Phosphor bronze alloy, selectively plated with tin on terminations, over nickel
		CROWN BAND element	Beryllium copper alloy, selectively plated with gold (30 micro inches minimum), over nickel
Signal contacts		Phosphor bronze alloy, selectively plated with gold (30 micro inches minimum) and tin on terminations, all over nickel	
Electrical			
Current ratings	Power contact	35A (see graph below)	
	Signal contact	3A max.	
Insulation resistance		5,000MΩ minimum at 500 VDC for 2 minutes, power MIL-STD 1344, Method 3003	
Dielectric strength		1,500VDC for 1 minute, per MIL-STD 1344, Method 3001	
Mechanical			
Mating PCB thickness		.062" 91.6 mm ±.006" (0.15 mm)	
Insertion Forces	2 segment power module	5.0 lbf typical using .062" (1.6 mm) thick mating board with 5 oz. of copper	
	3 segment power module	6.0 lbf typical using .062" (1.6 mm) thick mating board with 5 oz. of copper	
Extraction Forces	2 segment power module	3.0 lbf typical using .062" (1.6 mm) thick mating board with 5 oz. of copper	
	3 segment power module	5.0 lbf typical using .062" (1.6 mm) thick mating board with 5 oz. of copper	
Tooling		Press fixture is recommended for compliant press-fit assemblies Consult TE customer service for details	

### Current Ratings

The chart below demonstrates the performance of the CROWN EDGE power contact by showing the temperature rise at different current levels applied to two power contacts connected in series.

Current rating for any given application will depend, among other things, on the module combination, PCB copper trace volume, and internal equipment temperature/air flow. Mounting and mating to a bus bar will increase current ratings.



### Safety Regulatory Compliance

CROWN EDGE connectors have been evaluated by Underwriters Laboratories and have been found to comply with the requirements of U.S. standard UL1997 and Canadian standard C22.2 No. 182.3-M1987.



### Compliance with Current Interruption Requirements

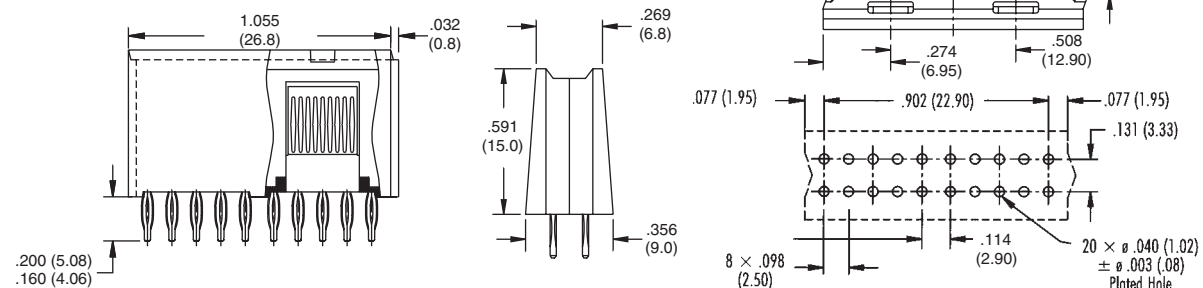
Hot-plug CROWN EDGE modules are available for applications that require current interruption as defined by safety regulatory agencies. These power-only modules have been evaluated and recognized by Underwriters Laboratories for current interruption up to 50 cycles as per the UL1977 standard. See hot-plug requirements on page 180.



### CROWN EDGE Card Edge-style High Current Connectors (Continued)

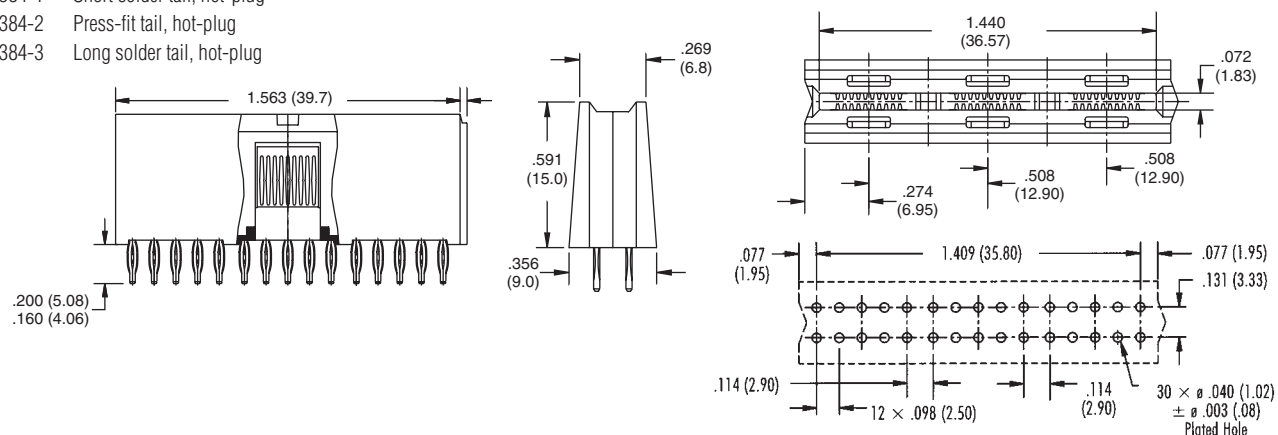
#### 4-Position Power Module Part Numbers

- 6651170-1 Long solder tail, non-hot-plug\*      \* Also available for .093" (2.4 mm) thick mating board.
- 6651170-2 Press-fit tail, non-hot-plug\*      Contact TE Customer Service for details.
- 6651170-3 Short solder tail, non-hot-plug\*
- 6651331-1 Press-fit tail, hot-plug
- 6650380-1 Short solder tail, hot-plug
- 6650380-2 Long solder tail, hot-plug



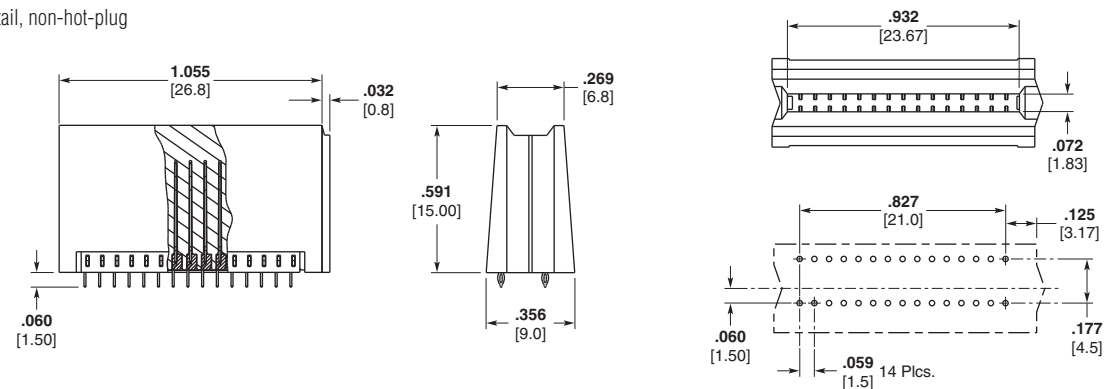
#### 6-Position Power Module Part Numbers

- 6650383-1 Press-fit tail, non-hot-plug
- 6650383-2 Long solder tail, non-hot-plug
- 6650383-3 Short solder tail, non-hot-plug
- 6650384-1 Short solder tail, hot-plug
- 6650384-2 Press-fit tail, hot-plug
- 6650384-3 Long solder tail, hot-plug



#### 30-Position Signal Module Part Number

- 1926088-1 Press-fit tail, non-hot-plug



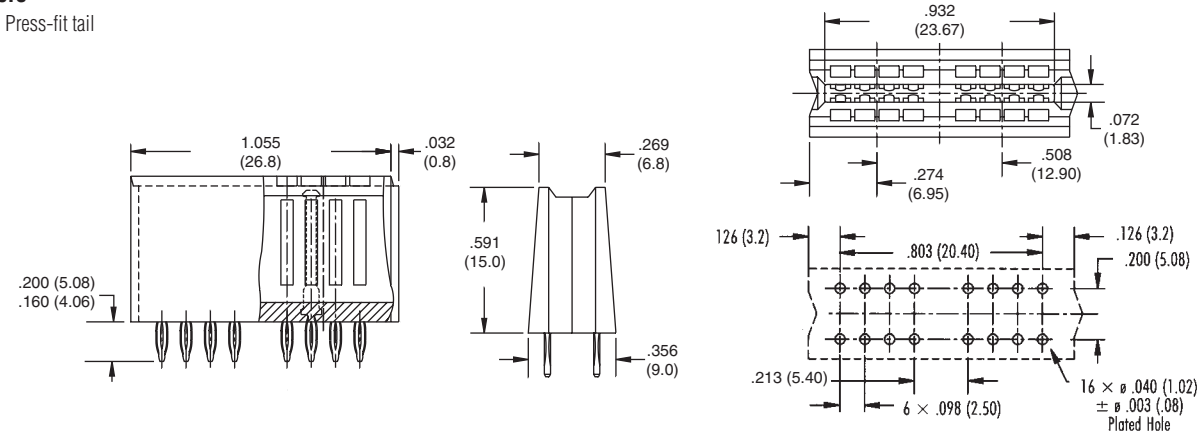
Note: All part numbers are RoHS compliant.

Card Edge Products

**CROWN EDGE Card Edge-style High Current Connectors** (Continued)

**16-Position Signal Module**  
**Part Numbers**

6650534-1 Press-fit tail

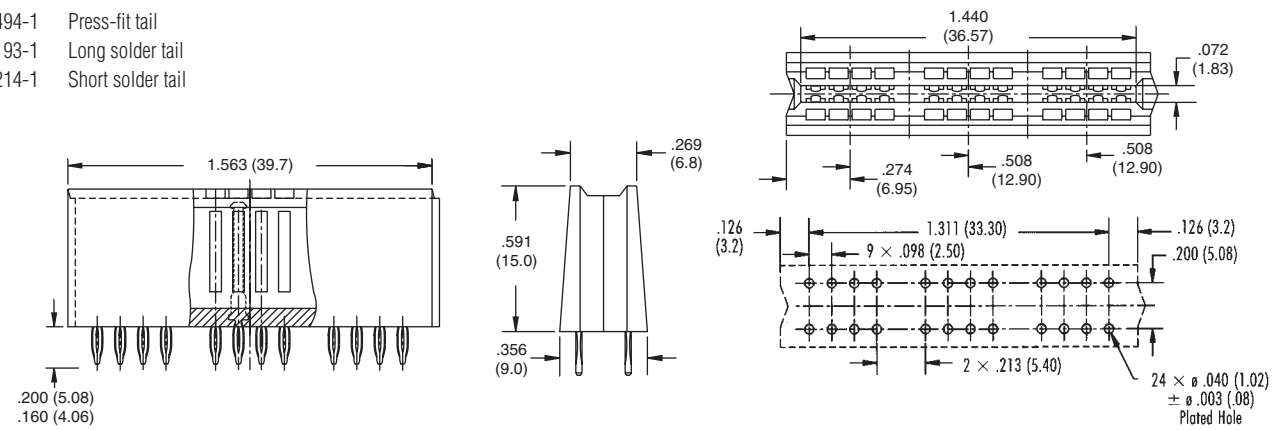


**24-Position Signal Module**  
**Part Numbers**

6650494-1 Press-fit tail

6651193-1 Long solder tail

6651214-1 Short solder tail

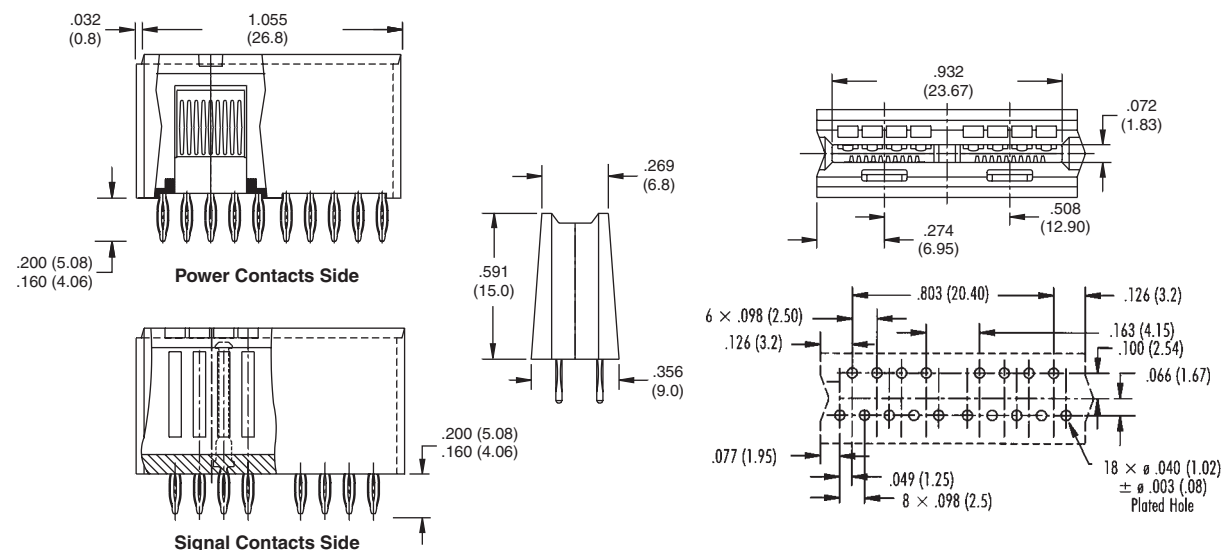


Note: All part numbers are RoHS compliant.

**CROWN EDGE Card Edge-style High Current Connectors** (Continued)

**2 Power + 8 Signal Modules**  
**Part Numbers**

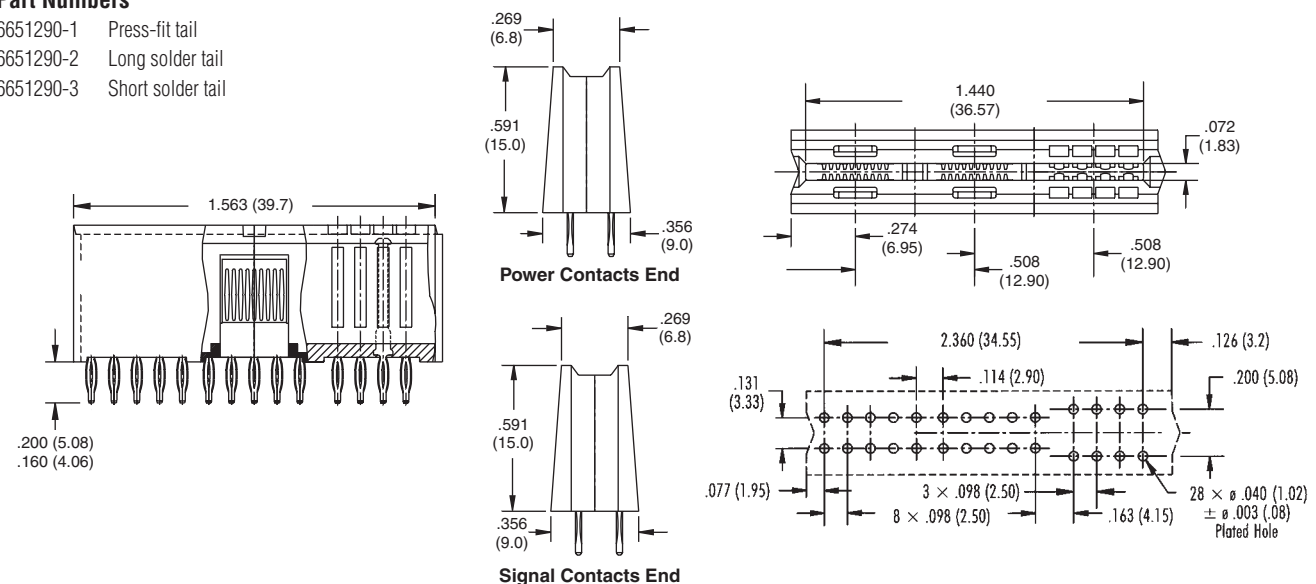
- 6643460-1 Short solder tail
- 6643460-2 Long solder tail
- 6643460-3 Press-fit tail



Card Edge Products

**4 Power + 8 Signal Modules**  
**Part Numbers**

- 6651290-1 Press-fit tail
- 6651290-2 Long solder tail
- 6651290-3 Short solder tail



Note: All part numbers are RoHS compliant.

**CROWN EDGE Card Edge-style High Current Connectors** (Continued)

**Design Notes**
**Mating PCB Requirements**

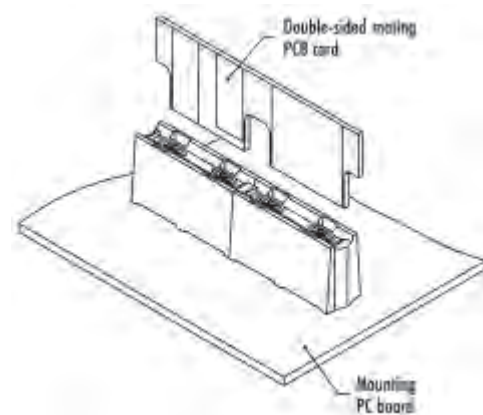
Mating PCB edge fingers should be gold plated, have .050" (1.3 mm) side margins, and be of suitable copper weight for power applications. Mating board thickness is .062 [1.60].

**Sequenced Mating**

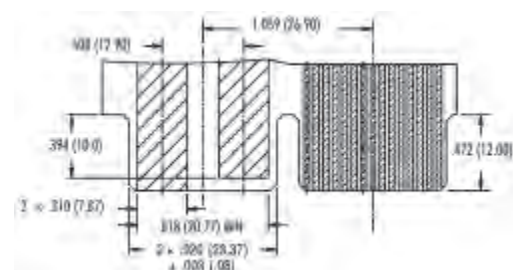
Sequenced mating can be achieved by designing one or more setback traces on the mating card edge, or by notching the edge of the card.

**End-to-end Mounting**

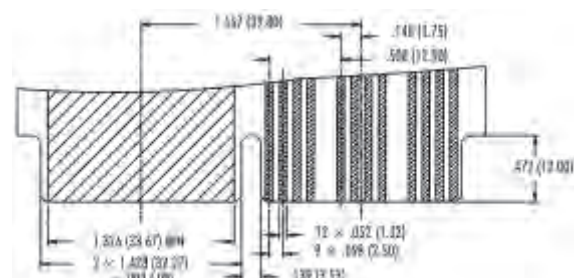
CROWN EDGE modules can be placed end-to-end for connector assemblies up to 8" (203.20 mm) long.


**Mating PC Card Edge Samples**

The drawings below show two PC card edge samples with signal and power lines designed to mate with 2 and 3-segment CROWN EDGE modules.



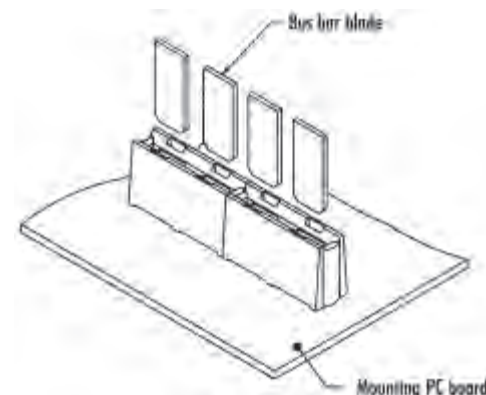
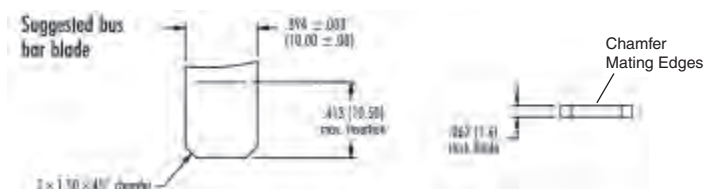
**2 x 2 Segment Modules Provide Two Sequenced Power Traces and 30 Signal Traces**



**2 x 3 Segment Modules Provide Ground Plane and 12 Signal Lines**

**Hot-Plug Requirements**

Hot-plug application of this product requires the use of the CROWN EDGE true hot-plug modules (see part numbers on pages 177-179) mated with a customer-supplied metal blade or bus bar. Dimensions of a sample mating blade for use with CROWN EDGE hot-plug modules is shown below.

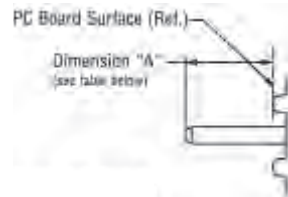


**CROWN EDGE Card Edge-style High Current Connectors** (Continued)

**Connector Mounting**

**Solder Tails**

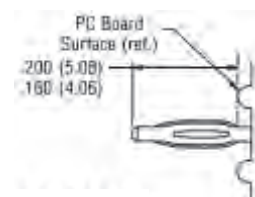
Solder termination is available in two lengths. See table below for board thicknesses and recommended tail lengths.



Solder Tail Detail

**Press-fit Tails**

CROWN EDGE connectors use truly compliant eye of the needle press-fit tails designed for boards 0.093" thick and above.



Press-fit Tail Detail

**Tail Length vs. Board Thickness**

Board Thickness	Dimension "A"
.062" (1.6 mm)	.100" - .140" (2.55 - 3.57 mm) [.115" (2.92 mm) nominal]
.092"/.125" (2.3/3.0 mm)	.160" - .200" (4.06 - 5.08 mm) [1.77" (4.5 mm) nominal]

**Tooling for Compliant Press-fit Assemblies**

Pressing fixtures are recommended for compliant press-fit assemblies. Contact TE for a detailed tool drawing.

**Suggested Printed Circuit Hole for Power and 2.5 mm Signal**

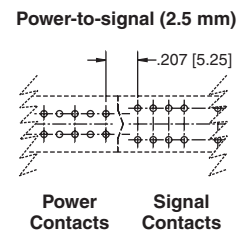
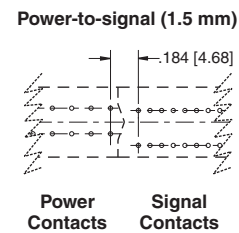
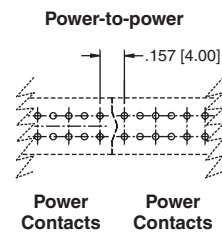
Finished Hole:  $\varnothing .040 \pm .003$  [ $\varnothing 1.02 \pm .08$ ]  
 Drilled Hole:  $\varnothing .0453 \pm .005$  [ $\varnothing 1.151 \pm .013$ ]  
 Copper Plate: .0010 [.025] min. (per surface)  
 Tin Plate: .0003 [.008] min. (per surface)

**Suggested Printed Circuit Hole for 1.5 mm Signal**

Finished Hole:  $\varnothing .022 \pm .002$  [ $\varnothing 0.56 \pm 0.05$ ]  
 Drilled Hole:  $\varnothing .026 \pm .002$  [ $\varnothing 0.65 \pm 0.02$ ]  
 Copper Plate: .0010 [.025] min. (per surface)  
 Tin Plate: .0003 [.008] min (per surface)

**Spacing Between Modules in End-to-end Mounting**

This spacing between plated thru-holes for end-to-end mounting varies depending on the chosen module combination. Spacing for the three possible combinations is shown below.



**Custom Solutions**

**Non-standard Modules**

In case the standard CROWN EDGE modules do not meet your design requirements, TE has the capability to mold any combination of power and signal contact layouts in 2 and 3 segment modules.



**Application-specific Custom Designs**

TE has a long history of designing and building application specific custom connectors, and CROWN EDGE connectors are no exception. A one-piece CROWN EDGE insulator, instead of a combination of several modules, provides a more robust interconnection design, as well as cost savings in high volume projects. Consult TE Customer Service for details.



Card Edge Products

## SEC-II Power Products

### Product Facts

- Combines industry standard 0.100" pitch card edge format in a high power density design
- Industry-proven multi-beam power contact design
- High conductivity contact materials
- High temperature housing materials
- UL 94V-0
- Selective gold plating for high performance with low cost
- .000030 [0.00076] gold in contact area. Tin/lead on posts with entire contact nickel underplated
- Power Contact Current Ratings:
  - 38 amps — Single Contact
  - 22 amps — on each of 4 adjacent pairs (8 power contacts)
- Signal Contact Ratings:
  - 6 amps — Single Contact
  - 4 amps — on each of 6 adjacent contacts



The trends in electronic power supplies require high current density and lower cost. In addition, smaller sized connectors are needed to provide less airflow restriction for cooling the power supplies. The SEC-II power connectors offer an ideal combination of low-current and high-current connections in a single, durable design.

SEC-II power connectors are built on an expandable tooling platform which

allows for a variety of combinations of power and signal contacts, all combined in a single molded housing. The vertical press-fit versions are ideal for high density stacking of cards into a backplane or for low air restriction of blade-style power supply designs. The straddle mount style offers a true co-planar interconnection with a total height of less than 4 mm from the top surface of the PCB.

SEC-II power connectors are currently in use in high-end computer and data storage equipment. Extensive testing in exposure to high vibration and shock has proven these connectors equally suited for industrial applications as well, where low contact resistance and high current density is required.

### Product Specification

108-2202

### Qualification Test Report

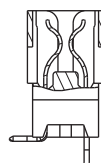
501-608



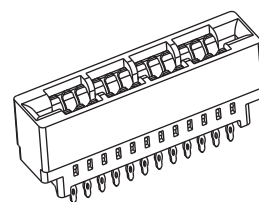
Vertical



Co-Planar

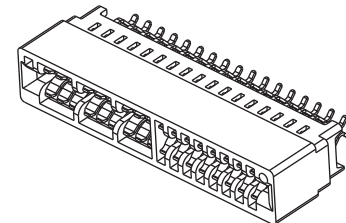


Right-Angle



8P

Power Only



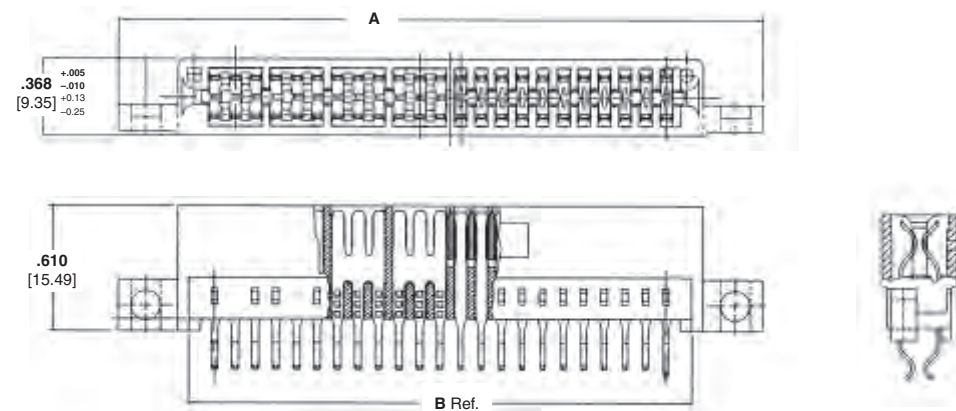
6P + 16S

Power and Signal

Note: See page 183 for part numbers and details.

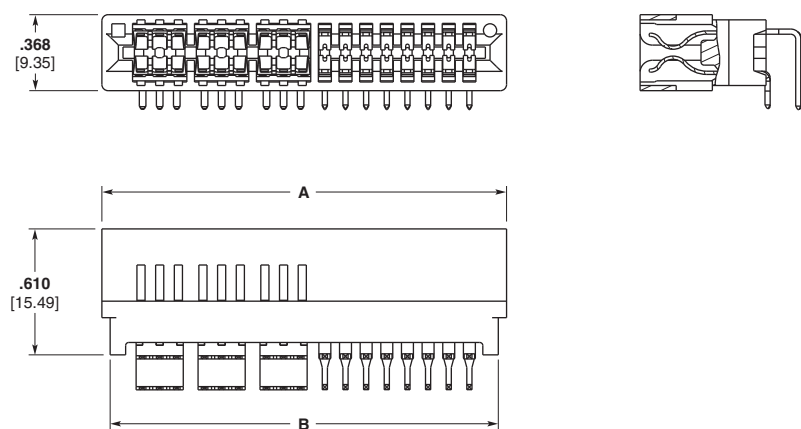
**SEC-II Power Products** (Continued)

**Co-Planar Application**  
**Straddle-Mount to .062 [1.6]**  
**PCB**



No. of Power Contacts	No. of Signal Contacts	Dimensions		With or Without Mounting Ears	Part Number
		"A" Length	"B" Card Slot		
4	16	1.66	1.500	Without	2007088-2
		42.16	38.10		
6	16	1.960	1.800	Without	2007088-1
		49.78	45.72		
6	20	2.745	2.000	With	1761500-1
8	16	2.260	2.100	Without	2007088-3
		57.40	53.40		
8	22	3.145	2.400	With	1761879-1
		79.88	60.96		

Card Edge Products



No. of Power Contacts	No. of Signal Contacts	Dimensions		Part Number
		"A" Length	"B" Card Slot	
6	16	1.960	1.880	2057372-1
		49.78	47.75	

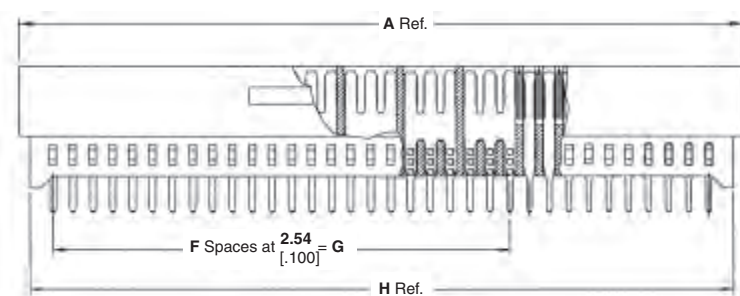
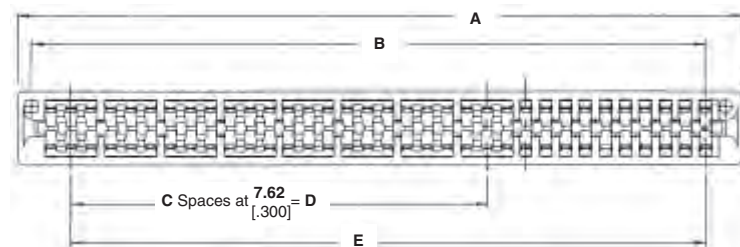
**Note:** All part numbers are RoHS compliant.

**SEC-II Power Products** (Continued)

**Vertical PCB-Mount**

Seating tool required

\*See customer drawing for details



Dimensions								No. of Power Contacts	No. of Signal Contacts	Omitted PIN	Molded Key Location	Part Number
A	B	C	D	E	F	G	H					
<b>Power and Signal, Solder Tail</b>												
92.93 [3.660]	88.90 [3.500]	7	53.34 [2.100]	81.28 [3.200]	23	58.42 [2.300]	90.18 [3.550]	16	20	None	None	1761426-1
70.1 [2.760]	66.07 [2.600]	4	30.48 [1.200]	58.42 [2.300]	14	35.56 [1.400]	67.31 [2.650]	10	20	None	None	1761426-2
54.86 [2.160]	50.80 [2.000]	2	15.24 [0.600]	43.18 [1.700]	8	20.32 [0.800]	52.07 [2.050]	6	20	None	None	1761426-3
<b>Power and Signal, Press-Fit</b>												
54.61 [2.150]	50.80 [2.000]	3	22.86 [0.900]	40.64 [1.600]	17	43.16 [1.700]	49.53 [1.950]	8	12	None	None	1761786-1
<b>Power only, Press-Fit</b>												
24.13 [0.950]	20.32 [0.800]	1	3.81 [0.150]	12.70 [0.500]	5	N/A	18.79 [0.740]	4	0	None	None	1888946-1
31.75 [1.250]	27.94 [1.100]	2	7.62 [0.300]	20.32 [0.800]	8	N/A	26.42 [1.040]	6	0	None	None	1888946-2
39.37 [1.550]	35.56 [1.400]	3	11.43 [0.450]	27.94 [1.100]	11	N/A	34.03 [1.340]	8	0	None	None	1888946-3

Note: All part numbers are RoHS compliant.



## Standard Edge II Card Edge Connectors

### Product Facts

- Maximum number of dual positions  
.100 [2.54] Centerlines-70,  
.125 [3.18] Centerlines-50,  
.150 [3.81] Centerlines-31
- Selective gold plating of contacts for high performance at low cost
- .025 [0.64] square solid posts meet standard wrap-type specifications
- For flow solder applications
- Glass-filled polyester housing is 94V-0 rated
- Accepts double sided PC boards, .054-.070 [1.27-1.78] thick
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476
- Certified by Canadian Standards Association, File No. LR 7189

### Performance Specifications

**Contact Rating\*** — 3 Amps continuous (UL and CSA)

**Contact Resistance** — 10 milliohms max.

**Operating Temperature** — -55°C to +85°C

**Voltage Rating (Sea Level)** —  
.100 [2.54] centerline — 1000 VAC (test)  
.125 [3.18] centerline — 1500 VAC (test)  
.150 [3.81] centerline — 1500 VAC (test)

**Insulation Resistance** —  
5000 megohms min., after exposure to humidity

**Vibration Tolerance** — 10 to 500 Hz

**Contact Engagement Force** —  
12 oz [3.3 N] average per pair with .062 [1.57] PC board

**Contact Separation Force** —  
2 oz [0.6 N] average per pair with .062 [1.57] PC board

**Humidity Tolerance** — 90%-95% for 96 hours



TE Standard Edge II Connectors provide high reliability and economy in packages compatible with industry standards for double sided printed circuit boards.

TE offers Standard Edge II Connectors with or without mounting ears, for rack mounting and soldering. Contacts are arranged on .100 [2.54] centers, .125 [3.18] centers, .150 [3.81] centers, .200 [5.08] row-to-row; and .250 [6.35] row-to-row.

Right-angle connectors are also available with contacts arranged on .100 [2.54] centers, .150 [3.81] row-to-row or .200 [5.08] row-to-row.

Card extenders with contacts on .100 [2.54] and .125 [3.18] centers also are available.

Precision formed phosphor bronze contacts are selectively gold plated. Phosphor bronze has excellent strength characteristics which help the connector absorb load deflection movement of a PC board while maintaining sufficient contact force for good electrical connection. Bifurcated cantilever beam contacts provide redundant contact.



Card Edge Products

\*Consult TE engineering when paralleling contacts for power applications.

**Standard Edge II Card Edge Connectors** (Continued)

**.100 [2.54] Centerline, Vertical Solder Posts, Without Mounting Ears**

**Material and Finish**

**Housing** — Black glass-filled polyester, 94V-0 rated

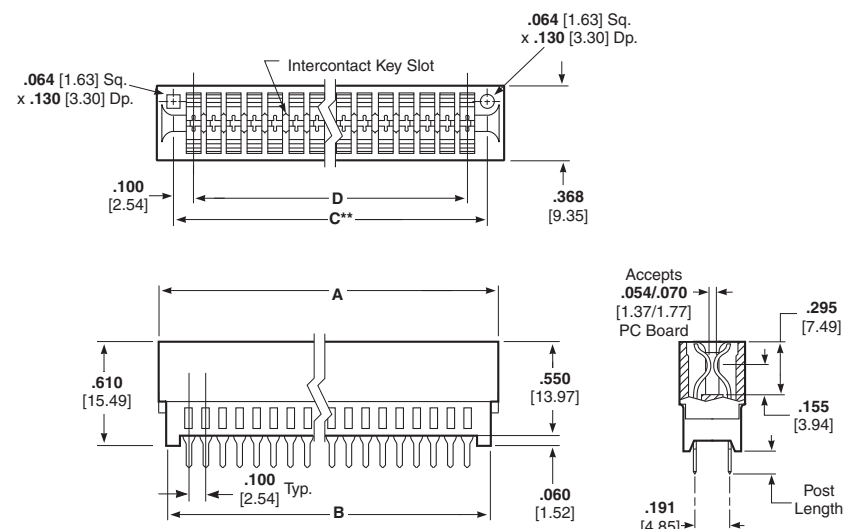
**Contacts** — Phosphor bronze, duplex plated as follows:

**Plating** — .000030 [0.00076] gold in contact area, tin on posts, with entire contact nickel underplated

**Technical Documents**

**Product Specification**  
108-9039

**Qualification Test Report**  
501-227



No. of Dual Positions	Dimensions				Post Length*	Part Numbers*** Solder Tail
	A	B	C**	D		
6	.860 21.84	.750 19.05	.700 17.78	.500 12.70	.125 3.18	7-5530843-5
10	1.260 32.00	1.150 29.21	1.100 27.94	.900 22.86	.125 3.18	5-5530843-0
12	1.460 37.08	1.350 34.29	1.300 33.02	1.100 27.94	.125 3.18	8-5530843-3
15	1.760 44.70	1.650 41.91	1.600 40.64	1.400 35.56	.125 3.18	5530843-2
17	1.960 49.78	1.850 46.99	1.800 45.72	1.600 40.64	.125 3.18	5-5530843-3
18	2.060 52.32	1.950 49.53	1.900 48.26	1.700 43.18	.125 3.18	5530843-3
20	2.260 57.40	2.150 54.61	2.100 53.34	1.900 48.26	.125 3.18	5-5530843-4
22	2.640 62.48	2.350 59.69	2.300 58.42	2.100 53.34	.125 3.18	5530843-4
25	2.760 70.10	2.650 67.31	2.600 66.04	2.400 60.96	.125 3.18	5530843-5
28	3.060 77.72	2.950 74.93	2.900 73.66	2.700 68.58	.125 3.18	5530843-6
30	3.260 82.80	3.150 80.01	3.100 78.74	2.900 73.66	.125 and .187 3.18 and 4.75	5530843-7
31	3.360 85.34	3.250 82.55	3.200 81.28	3.000 76.20	.125 3.18	6-5530843-5
35	3.760 95.50	3.650 92.71	3.600 91.44	3.400 86.36	.125 3.18	2-5530843-3
36	3.860 98.04	3.750 95.25	3.700 93.98	3.500 88.90	.125 3.18	5530843-8
40	4.260 108.20	4.150 105.41	4.100 104.14	3.900 99.06	.187 4.75	2-5530843-0
50	5.260 133.60	5.150 130.81	5.100 129.54	4.900 124.46	.187 4.75	2-5530843-2

\*Contact TE for alternate post length.

\*\*C dimension is card slot length.

\*\*\*Press-fit parts can be made available, consult TE.

**Notes:** 1. Other connector sizes can be made available, consult TE.

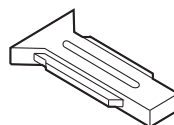
2. High temperature IR reflow compatible connectors can be made available, consult TE.

**Note:** All part numbers are RoHS compliant.

**Intercontact Keying Plug**

**Material**

Natural color polyester



**Part Number 650025-2**  
(.100 [2.54] Centerline)

### Standard Edge II Card Edge Connectors (Continued)

#### .100 [2.54] Right-Angle Solder Posts, with Low and No Mounting Ears

##### Material and Finish

**Housing** — Black glass-filled polyester, 94V-0 rated

**Contacts** — Phosphor bronze, duplex plated as follows:

**Plating A** — .000030 [0.00076] gold in contact area, tin on posts, with entire contact nickel underplated

**Plating B** — .000015 [0.00038] gold in contact area, tin on posts, with entire contact nickel underplated

##### Related Product Data

**Performance Specifications** — page 185

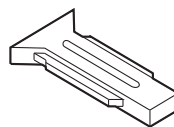
##### Technical Documents

**Product Specification** 108-9039

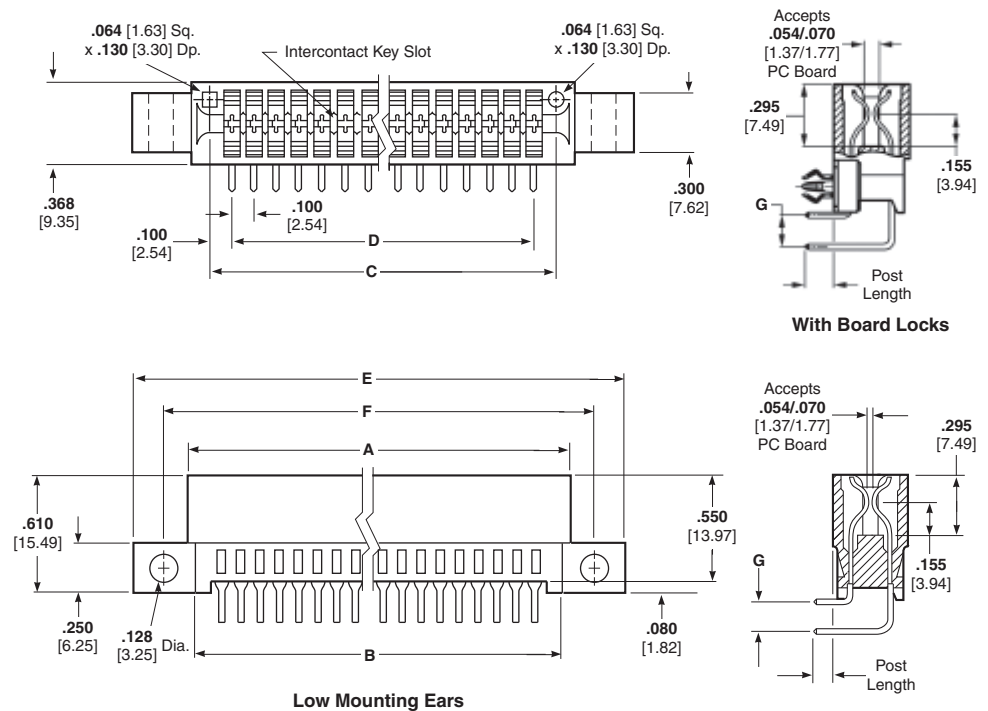
#### Intercontact Keying Plug

##### Material

Natural color polyester



**Part Number 650025-2**  
(.100 [2.54] Centerline)



#### Low Mounting Ears

No. of Dual Positions	Dimensions							Post Length <sup>2</sup>	Part Numbers (Plating A)
	A	B	C*	D	E	F	G <sup>1</sup>		
12	1.460 37.08	1.350 34.29	1.300 33.02	1.100 27.94	2.045 51.94	1.775 45.08	.100x .150	.090	5145089-1 <sup>3</sup>
18	2.060 52.32	1.950 49.53	1.900 48.26	1.700 43.18	2.645 67.18	2.375 60.32	.100x .150	.090	5645384-1
20	2.260 57.40	2.150 54.61	2.100 53.34	1.900 48.26	2.845 72.30	2.575 65.40	.100x .150	.090	5645384-3

\*C dimension is card slot length.

<sup>1</sup> Metric equivalent for .100 x .150 and .100 x .200 are [2.54 x 3.81] and [2.54 x 5.08].

<sup>2</sup> Metric equivalent for post length is .090 = [2.27].

<sup>3</sup> Connector with Board Locks.

**Note:** Other connector sizes can be made available, consult TE.

#### No Mounting Ears

No. of Dual Positions	Dimensions					Post Length <sup>2</sup>	Part Numbers	
	A	B	C*	D	G <sup>1</sup>		Plating A	Plating B
10	1.260 32.00	1.150 29.21	1.100 27.94	0.900 22.96	.100x .150	.090	5650118-2	—
15	1.760 44.70	1.650 41.91	1.600 40.64	1.400 35.56	.100x .150	.090	5650118-1	—
19	2.160 54.86	2.750 69.85	2.700 68.58	1.800 45.72	.100x .150	.090	—	5532600-6
25	2.760 70.10	2.350 67.61	2.600 66.04	2.400 60.96	.100x .150	.090	—	5532600-2
31	3.360 85.34	3.250 82.55	3.200 81.28	3.000 76.20	.100x .150	.090	—	5532600-4
32	3.460 87.88	3.350 85.09	3.300 83.82	3.100 78.74	.100x .150	.090	—	5532600-5

\*C dimension is card slot length.

<sup>1</sup> Metric equivalent for .100 x .150 and .100 x .200 are [2.54 x 3.81] and [2.54 x 5.08].

<sup>2</sup> Metric equivalent for post length is .090 = [2.27].

**Notes:** 1. Other connector sizes can be made available, consult TE.

2. High temperature IR reflow compatible connectors can be made available, consult TE.

**Note:** All part numbers are RoHS compliant.

Card Edge Products

## Voltage Regulation Module (VRM) Connectors

### Product Facts

- Available in latch versions for VRMs up to 3 oz.
- Available with metal clip for VRMs over 3 oz.
- VRM connectors to support a wide variety of power supply standards
- Solder tail, press-fit and right-angle versions to support specific customer needs
- Up to 5.5 Amps per contact in typical VRM applications
- New materials are 94 V-0 rated with max. operating temperature of 125°C — VRM 10.x Series
- Keying prevents plugging the wrong VRM into the connector

### Materials

**Housing** — PBT thermoplastic  
**Contact** — High conductivity copper alloy

### Technical Documents

**Product Specification**  
 108-9039-1 & -2  
**Qualification Test Report**  
 501-227-1 & -2



The new Voltage Regulation Module (VRM) family of connectors is designed to meet the needs of many existing and new power supply standards being developed. They are dual row card edge style connectors that are well known in the computer market. Currently the connectors are designed to carry up to 150 amps of DC power — that's 300 amps total running through the connector. The connector is PCB mounted and there are versions available in press-fit or right-angle. The connectors have card retention either in the form of a latch

or a metal retention clip which is added after the VRM is in place.

### Industry Applications

The VRM connector is controlled by various power supply standards. Current ones are EPS-1U, AD2D-VID, AD2D, VRM 8.5, VRM 9.0, VRM 9.1, VRM 10.0 and VRM 10.1. Many applications with a need to transmit high power from board to board can benefit from this connector and additional customer specific applications are developing.

### VRM Selection Chart

	Part Numbers						
	VRM 9.1	VRM 10.0	VRM 10.1	VRM 10.2 - 11.X	VRM 12.X	VR 372	TW
Solder	6489165-1	6489930-2	6489930-2	1651826-1	—	—	—
Press-Fit	6489651-1	—	—	1766436-1	—	—	—
Surface-Mount	—	—	—	1766336-1	1766735-2	1761347-2	1761122-1

**Note:** All part numbers are RoHS compliant.

**Voltage Regulation Module (VRM) Connectors** (Continued)



**VR 372 Power POD Connector for Intel MONTECITO VRMs**

- Industry favored design for MONTECITO VR372 voltage regulator modules
- 130 Amps DC Output Power (260A Total)
- 350 compressive contacts carry a total of 200 Amps — resulting in less than 0.75 Amps per contact
- 22 additional signal contacts
- Rated to carry 120 Amps DC output power
- Maximum continuous operating temperature 125° C



**Mini CROWN EDGE Connectors for 1U/2U Pluggable VRMs**

- Lowest profile available on the market (7 mm tall)
- High-performance CROWN BAND contacts that deliver 25A each
- High-density power designed for VRM 10.2 and beyond
- Multiple power and signal contacts allow flexible power PCB trace layouts
- SMT, pc tail and press-fit terminations
- Mating blade for board-stacking interconnection also available



**SEC-II with Latch for VRMs**

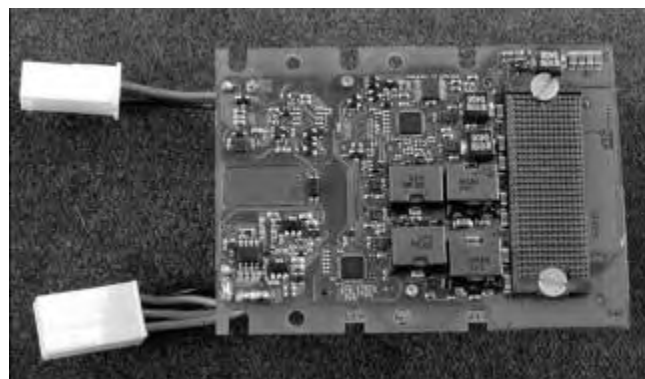
- High Conductivity Contacts & High Strength Plastic Latches
- Vertical or Right-Angle
- Solder or Press-Fit (vertical only)
- Meets Intel VRM 8.5, 9.0, 9.1, 10.0 and 10.1 Standards
- 4.3 Amps/contact

Voltage Regulation Module (VRM) Connectors

MONTECITO is a trademark of Intel Corporation.

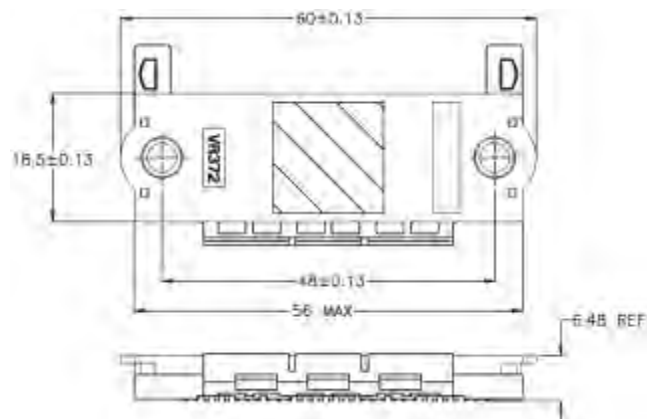
Other VRM Connectors such as “TW Power” and others are available. Please contact your local TE Sales Engineer for more information.

**VR 372 Power POD Connector — for Intel MONTECITO VRMs**

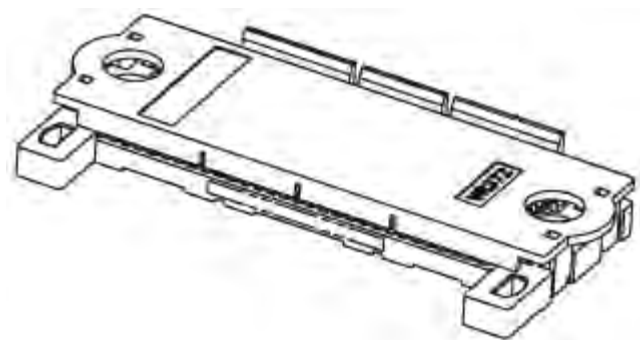


MONTECITO Voltage Regulator Module

Voltage Regulation Module (VRM) Connectors



Socket Assembly with Cover  
Reference Dimensions



Socket Assembly with Cover

**Material**

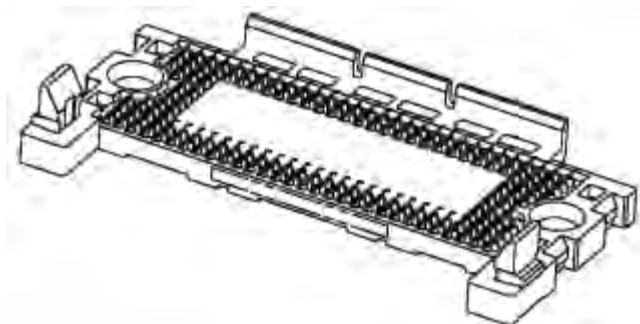
**Housing** — Liquid Crystal Polymer (LCP), 94V-0

**Colors** —  
Plugs and Receptacles — Black  
Positive Locks — White

**Technical Documents**

**Product Specification**  
108-2170

**Application Specification**  
114-13117



Socket Assembly with Alignment Plugs  
Alignment Plug Snap-On: Part Number 1761259-1

MONTECITO is a trademark of Intel Corporation.

**Note:** All part numbers are RoHS compliant.

## Mini CROWN EDGE Connector Configurations

### General Dimensions

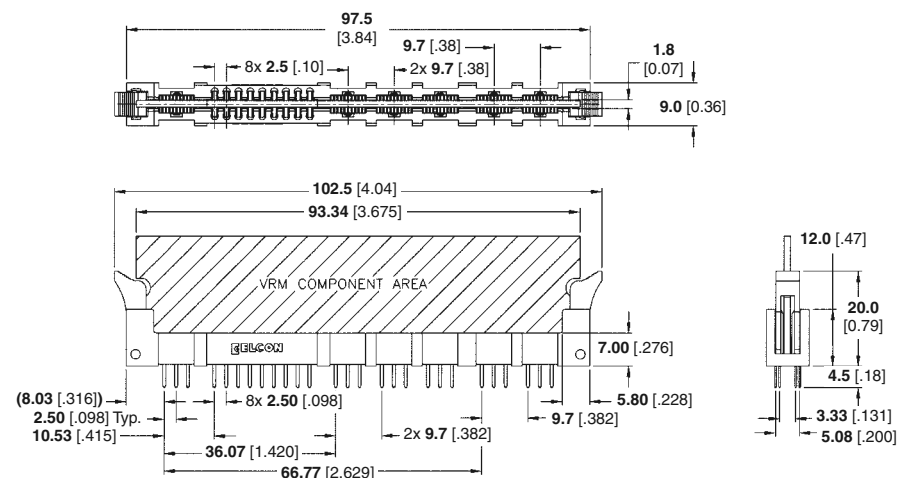
Mini CROWN EDGE connectors are available in several form factors designed to meet diverse application requirements. For other available Mini CROWN EDGE Connector configurations, please check our website at <http://www.te.com> or consult TE.

#### Configuration: P2/S18/P10

Meets Intel VRM 10.2 specifications  
Power contacts x 12  
Signal contacts x 18  
Mating board thickness — 0.062"

#### Reference Part Numbers:

Solder tail, 4.5 mm (0.18")  
Part Number 1651826-1  
Solder tail, 3.0 mm (0.12")  
Part Number 1651929-1  
Surface-Mount  
Part Number 1766336-1  
Compliant Press-fit 3.8 mm (0.15")  
Part Number 1766436-1



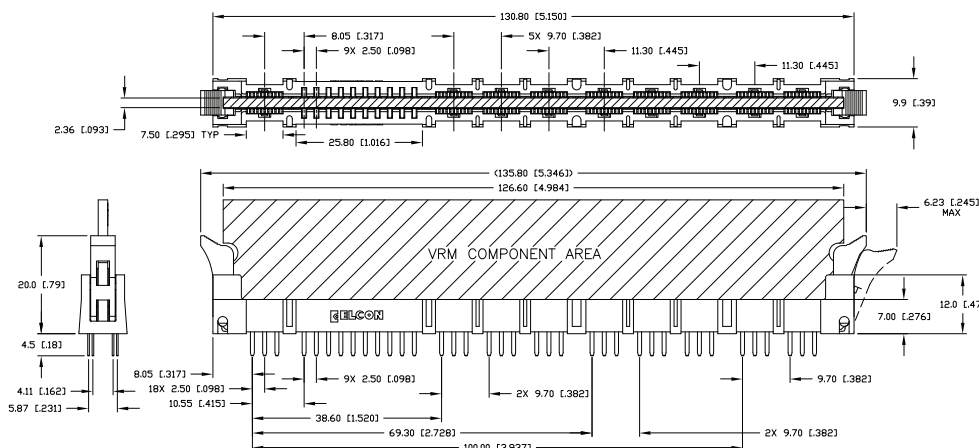
Voltage Regulation Module (VRM) Connectors

#### Configuration: P2/S20/P16

Meets AMD K8 specifications  
Power contacts x 18  
Signal contacts x 20  
Mating board thickness — 0.093"

#### Reference Part Numbers:

Solder tail, 4.5 mm (0.18")  
Part Number 1766442-1  
Solder tail, 3.0 mm (0.12")  
Part Number 1651864-1  
Compliant Press-fit 3.8 mm (0.15")  
Part Number 1766443-1



Note: All part numbers are RoHS compliant.

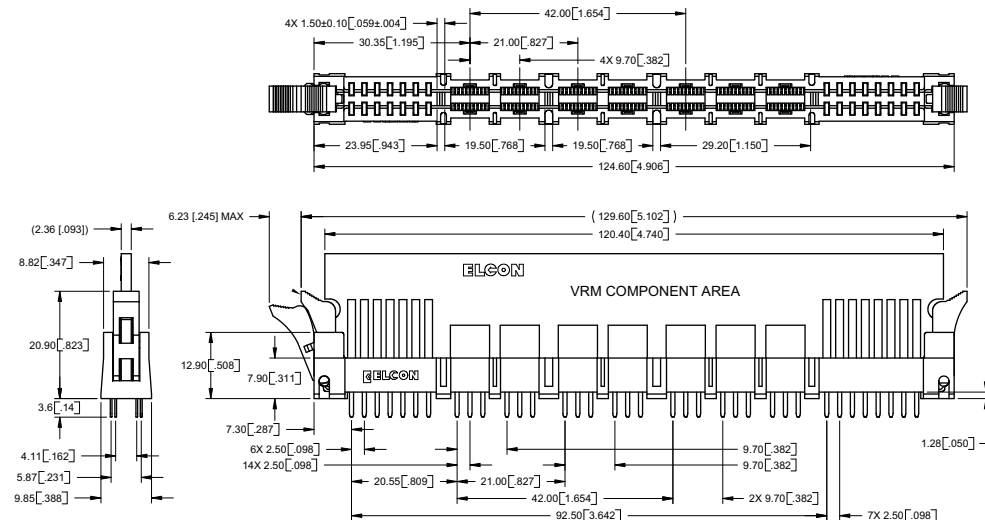
**Mini CROWN EDGE Connector Configurations (Continued)**

**Configuration: S14/P14/S16**

Meets AMD K9 specifications  
Power contacts x 14  
Signal contacts x 30  
Mating board thickness — 0.093"

**Reference Part Numbers:**

Solder tail, 4.5 mm (0.18")  
Part Number 1766308-1

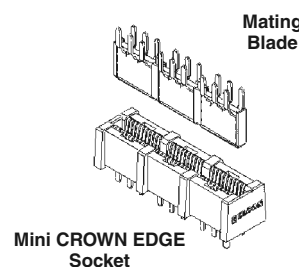


Configuration	Part Number	Overall Length	Mating Board Thickness	Tail Length	Type
P2/S24/P4	1926155-2	63.74 mm [2.509"]	1.57 mm [0.06"]	N/A	Surface-Mount
P2/S24/P8	1926024-2	83.14 mm [3.273"]	1.57 mm [0.06"]	N/A	Surface-Mount
P2/S18/P10	1651826-1	102.50 mm [4.040"]	1.57 mm [0.06"]	4.5 mm [0.18"]	Solder Tail
	1651929-1			3.0 mm [0.12"]	Solder Tail
	1766336-1			N/A	Surface-Mount
	1766436-1			3.8 mm [0.15"]	Compliant Press-Fit
P2/S24/P12	1766735-2	102.54 mm [4.037"]	1.57 mm [0.06"]	N/A	Surface-Mount
S14/P14/S16	1766308-1	129.60 mm [5.102"]	2.36 mm [0.09"]	4.5 mm [0.18"]	Solder Tail
	1766442-1			4.5 mm [0.18"]	Solder Tail
P2/S20/P16	1651864-1	135.80 mm [5.346"]	2.36 mm [0.09"]	3.0 mm [0.12"]	Solder Tail
	1766443-1			3.8 mm [0.15"]	Surface-Mount

Application without latches and custom layouts are available. Please contact TE Customer Service or your local sales engineer.

**OTHER Applications**

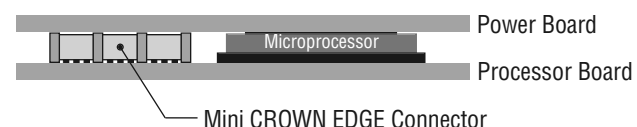
A mating blade that allows certain Mini CROWN EDGE Connector configurations to be used as a stacked board power interconnection device is also available.



Shown: P6  
Socket Part Number 1766685-1 (Solder Tail)  
6651712-1 (SMT)  
Blade Part Number 6651711-1 (Solder Tail)  
1926785-1 (SMT)

**Sample of Stacked Board Application**

In this application, a Mini CROWN EDGE connector is used in close proximity to the MPU for delivery of high-current from a power board stacked over the processor board.



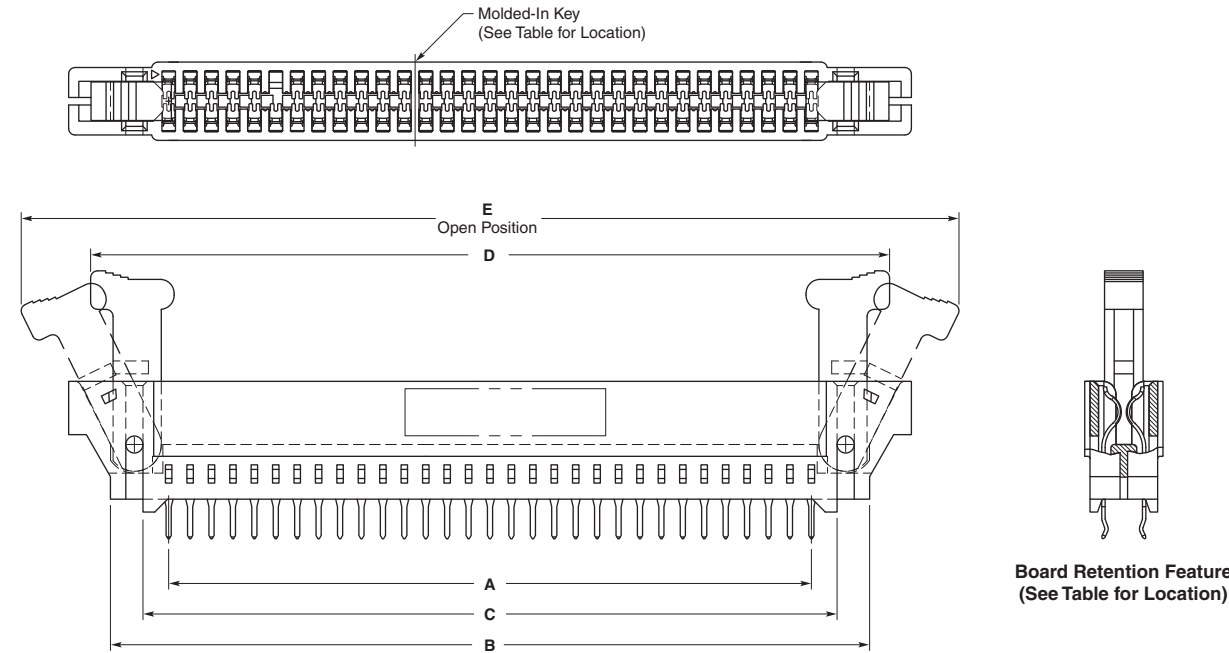
**Custom Layouts:**

Shown above are some of the currently tooled Mini CROWN EDGE connector layouts. If none of them meets your application requirements, TE can design a custom layout based on your specifications.

**Note:** All part numbers are RoHS compliant.



### SEC-II Connectors with Latches for VRMs



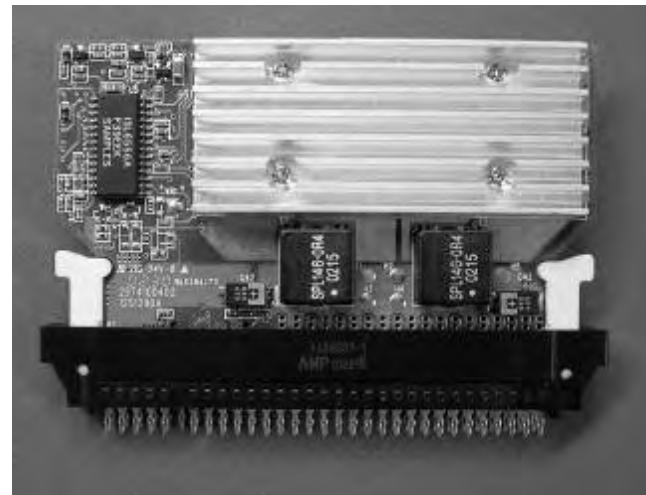
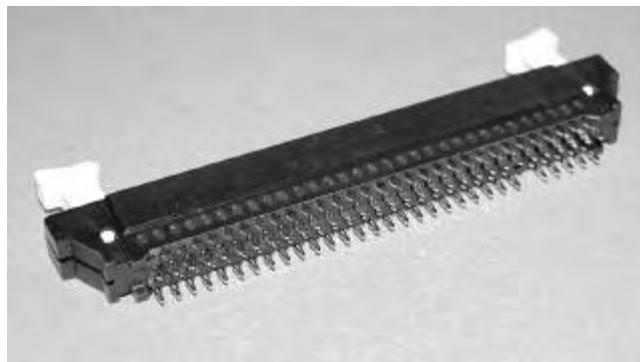
Voltage Regulation Module (VRM) Connectors

**Material**

**Housing** — Black glass-filled polyester  
**Latch** — Black glass-filled polyester  
**Contact** — Phosphor bronze, plated .000030 [0.00076] min. gold plating in contact area, .000100 [0.00254] min. tin on solder posts, all over .000050 [0.00127] min. nickel

Dimensions					No. of Dual Positions	Mount Type	Board Retention Feature	Molded Key Locations	Part Number
A	B	C	D	E					
<b>2.000</b> 60.96	<b>2.944</b> 74.78	<b>2.649</b> 67.28	<b>3.223</b> 81.86	<b>3.849</b> 97.76	25	Press-Fit	No	17 & 18	6489649-1
<b>3.249</b> 82.52	<b>3.544</b> 90.02	<b>3.249</b> 82.52	<b>3.823</b> 97.10	<b>4.449</b> 113.00	31	Solder	Yes	12 & 13	6489165-6
<b>3.400</b> 86.36	<b>3.944</b> 100.18	<b>3.649</b> 92.68	<b>4.130</b> 104.90	<b>4.850</b> 123.17	35	Solder	No	23 & 24	5145459-5

**Note:** See customer drawing for board retention locations.



**Note:** All part numbers are RoHS compliant.

## CROWN CLIP Series Sockets

### Product Facts

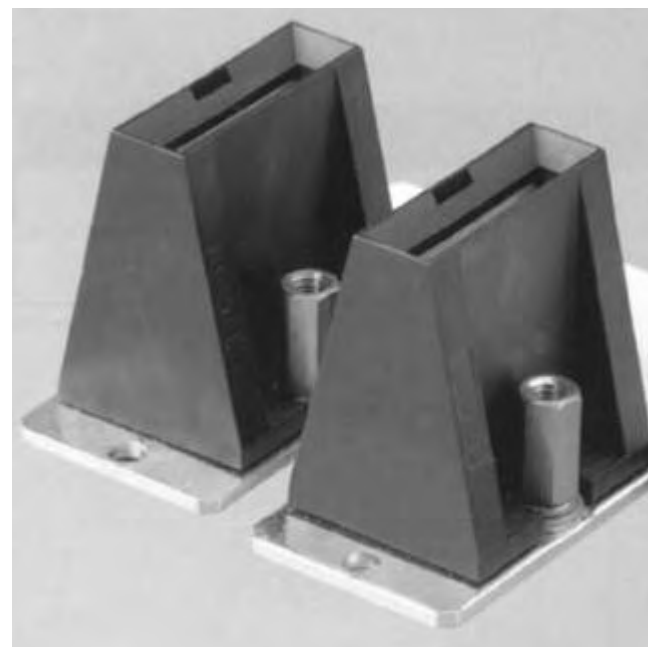
- Compact design
- High performance CROWN BAND contacts
- Currents to 350 Amps<sup>1</sup>
- Mates with solid or laminated blades
- Supports true hot-plug (current interruption)<sup>2</sup>
- Float-mount option reduces mating forces
- Meets UL (USR & CNR), and CSA safety requirements
- All CROWN CLIP products in this section are RoHS compliant

### Typical Applications

- Bus Bar based power distribution
- Power racks
- Rack mounted switching power supplies

#### Notes:

- 1 Dual CROWN CLIP socket using nickel plated mating tab, equivalent rating for other CROWN CLIP socket designs is 300A
- 2 Current interruption requires a gold plated, solid mating tab, and is not currently supported using a laminated mating tab



CROWN CLIP sockets are compact, high-current socket connectors for high current bus bar power distribution. Using ELCON high performance CROWN BAND technology, CROWN CLIP Sockets are available in single pole format to mate with a solid blade, handling up to 350 Amps, or in dual pole format to mate with laminated bus bar tabs for feed and return currents.

### Product Highlights

#### Hot-Plug Design

CROWN CLIP sockets also comply with safety regulatory requirements for current interruption under load. Compliance is achieved by a contact design that restricts the effects of arcing to areas that do not compromise the integrity of the connection. Hot-plugging requires a gold plated mating blade.

### Safety Agency Compliance

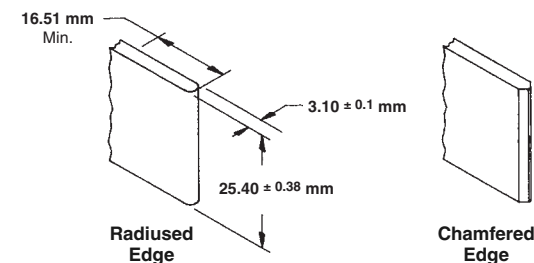
CROWN CLIP sockets comply with the UL1977 standard and CSA standard C22.2 No. 182.3-M1987. TE will work with customers to obtain application specific regulatory certifications if needed.



### Sample Application

CROWN CLIP sockets allow hot-plugging of rack-mounted switching power supplies.

Photo reproduced courtesy of Unipower Corporation.



### Mating Blades

Recommendations for customer supplied mating blades are:

**Insertion Length** — .650 [16.50] minimum, 1.00 [25.40] maximum

**Thickness** — .125 [3.18] or .118 [3.00]

**Material** — Copper, gold or nickel plated, with chamfered or rounded mating edge



**CROWN CLIP Series Sockets** (Continued)

**Original CROWN CLIP Sockets**

Part Number 1643906-1

**Product Specifications**

**Materials**

**Insulator** — Polyester, UL 94V-0

**CROWN BAND Contacts** —

Beryllium copper alloy, selectively plated with gold (30 micro inches minimum), over nickel

**Crown Holder** — Copper alloy

**Electrical**

**Current Rating, Steady State** —

Nickel plated solid tab: 300 Amp maximum; 200 Amp at 30°C maximum temperature rise

**Current Rating, Hot-Plug** — Gold plated solid tab: 200 Amp maximum, 42V; 100 Amp maximum, 48V

**Mechanical**

**Insertion Force** — 10.0 lbs (4.54 Kg) maximum

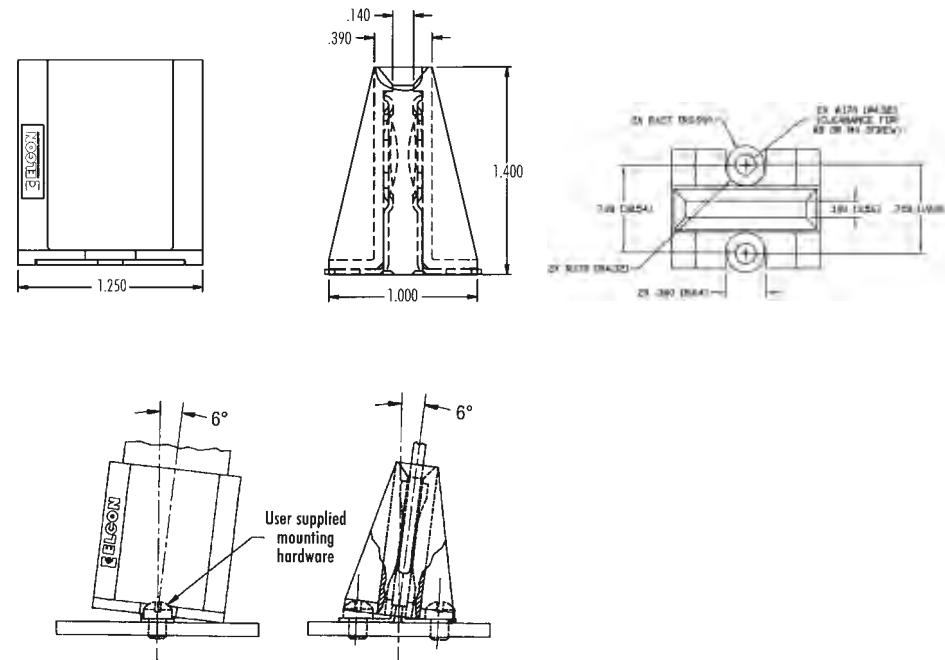
**Extraction Force** — 5.0 lbs (2.72 Kg) minimum

Single pole, float-mount socket design delivers 300 Amp current capability plus current interruption.

Float-mount design provides alignment for blind-mating of rack-mounted power supply units. Parallel cantilever design contacts include

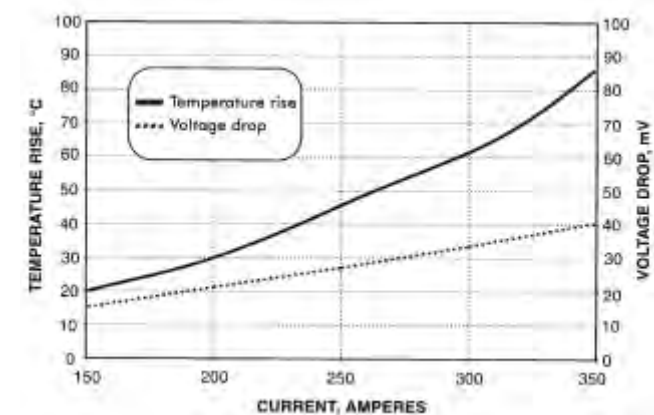
ELCON CROWN BAND contact elements to ensure low voltage drop and heat generation, plus consistent insertion and extraction forces. Current interruption ratings are 100A at 48V and 200A at 42V, both using a gold plated, solid tab.

Customer Drawing available upon request.



**CROWN CLIP Sockets Electrical Performance**

The graph at right shows the electrical performance of CROWN CLIP sockets in terms of temperature rise and volt-age drop at currents from 150 Amps to 350 Amps. The set up used for the test had six CROWN CLIP socket samples mounted on a .25" x 1.75" x 6.0" bus bar, mating with 1.0" long by .125" thick nickel plated blades connected in series using 1/0 AWG wire.



Note: All part numbers are RoHS compliant.

Bus Bar Products

**CROWN CLIP Series Sockets** (Continued)

**CROWN CLIP II Sockets**  
Part Number 1643903-1

**Product Specifications**

**Materials**

**Insulator** — Polyester, UL 94V-0

**Contact** — Copper alloy, selectively plated with gold (30 micro inches minimum), over nickel

**Electrical**

**Current Rating, Steady State** — Nickel plated solid tab: 300 Amp maximum; 230 Amp at 30°C maximum temperature rise

**Current Rating, Hot-Plug** — Gold plated solid tab: 200 Amp maximum, 42V; 100 Amp maximum, 48V

**Mechanical**

**Insertion Force** — 20.0 lbs (9.08 Kg) typical

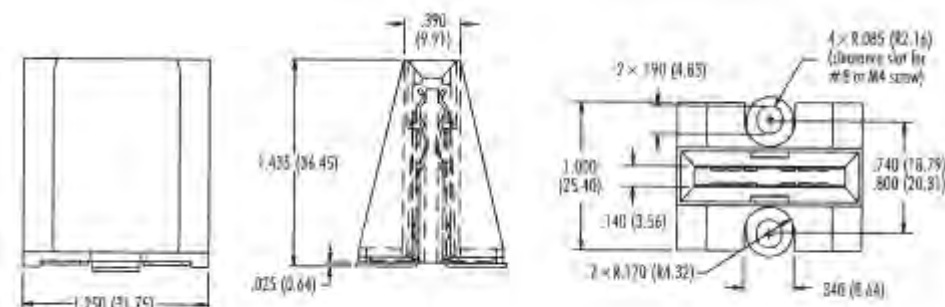
**Extraction Force** — 10.0 lbs (4.54 Kg) typical

Dual pole, float-mount socket design delivers 300 Amp current capability plus current interruption.

Float-mount design provides alignment for blind-mating of rack-mounted power supply units. The dual pole contact design allows mating to a

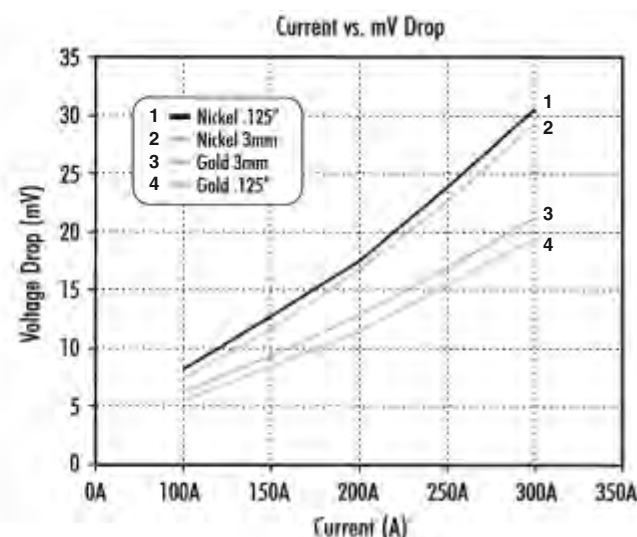
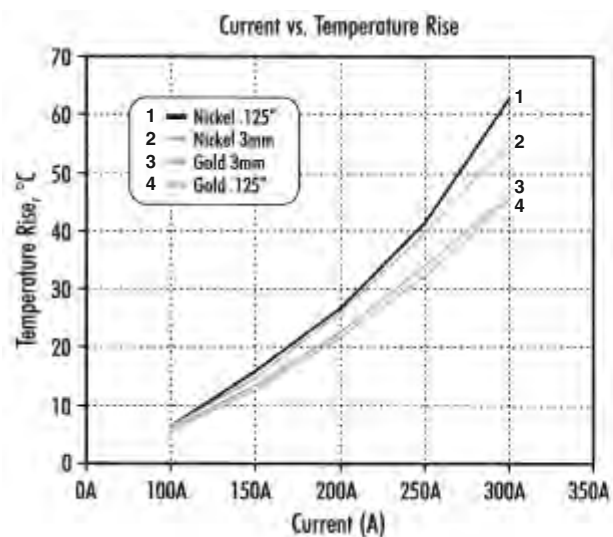
two pole laminated bus bar or double sided PCB tab, adding design flexibility by providing feed and return using a single socket. Current interruption ratings are 100 A at 48 V and 200 A at 42 V, both using a gold plated, solid tab.

Customer Drawing available upon request.



**CROWN CLIP Sockets II Connector Electrical Performance**

The graphs below show the electrical performance of CROWN CLIP II sockets in terms of temperature rise and voltage drop at currents from 150 Amps to 350 Amps. The set up used for the test had samples of six CROWN CLIP sockets mounted on a .25" x 1.75" x 6.0" bus bar, mating with 1.0" long by .125" thick nickel plated blades connected in series using 1/0 AWG wire.



Note: All part numbers are RoHS compliant.

**CROWN CLIP Series Sockets** (Continued)

**Dual CROWN CLIP Sockets**  
Part Number 1926671-1

**Product Specifications**

**Materials**

**Insulator** — Polyester, UL 94V-0  
**CROWN BAND** — Beryllium copper alloy, selectively plated with gold (30 micro inches minimum), over nickel  
**Crown Holder** — Copper alloy

**Electrical**

**Current Rating, Steady State** — Nickel plated solid tab: 350 Amp maximum; 225 Amp at 30°C maximum temperature rise

**Current Rating, Steady State** — Laminated bus bar tab: 130 Amp per side (260 A total) maximum; 75 Amp per side (150 A total) at 30°C maximum temperature rise

**Current Rating, Hot-Plug** — Gold plated solid tab: 200 Amp maximum, 5V; 100 Amp maximum, 60V

**Mechanical**

**Insertion Force** — 20.0 lbs (9.08 Kg) typical

**Extraction Force** — 13.0 lbs (5.9 Kg) typical

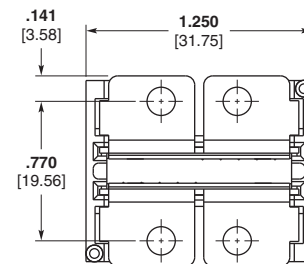
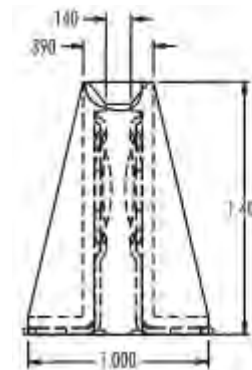
Dual pole, feed-through socket design delivers 350 Amp current capability plus current interruption. The dual pole contact design allows mating to a two pole laminated bus bar or double sided PCB tab, adding design flexibility by providing feed and return using a single socket. The feed-through design aspect allows insertion of mating

blade from both top and bottom of socket. The contacts include ELCON CROWN BAND contact elements to help provide low voltage drop and heat generation, plus consistent insertion and extraction forces. Current interruption ratings are 100A at 60V and 200A at 5V, both using a gold plated, solid tab.



Feed-Thru View

Customer Drawing available upon request.



Part Number 1926671-1  
4-hole CROWN CLIP  
300A

Bus Bar Products

**Sample Application**

ELCON Dual CROWN CLIP connectors mounted on a laminated power distribution bus bar in a large server.



Photos reproduced courtesy of Eldre Corporation

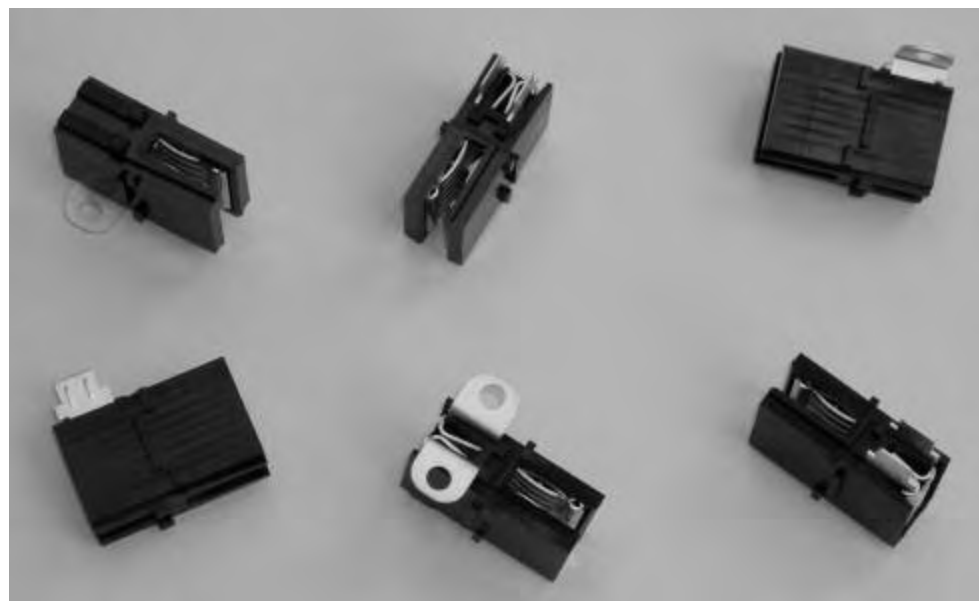
**Note:** All part numbers are RoHS compliant.

**CROWN CLIP Series Sockets** (Continued)

**CROWN CLIP Junior  
Direct Power Connection  
for Bus Bars**

**Product Facts**

- Current: 150 A
- Mating Force: 40 N max.
- Mating Bus Bar Thickness: 3.0 ± 0.1 mm
- Bus Bar misalignment: ± 1.0 mm
- Hot Pluggable
- Contact Resistance: 0.2 milliohms
- Blind Mateable
- Anti Over Stress Feature
- Reduced Installation Costs
- Screw Fix or PC Tail Option



**Applications**

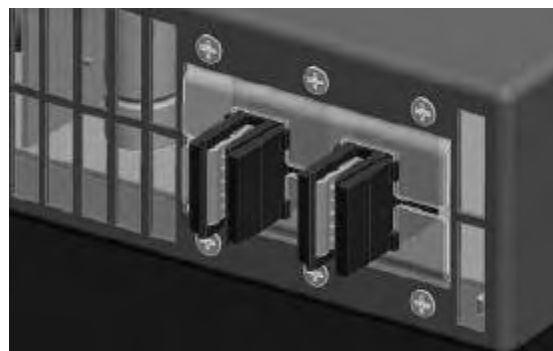
- Core Network Energy Systems
- Cellular Base Stations
- PSU Power Distribution
- Servers, Storage & Network Routers
- Industrial

The CROWN CLIP Junior connector provides a space efficient connector in solder or screw-mount configurations ideal for power supply/distribution applications. Satisfying the demand for low insertion/extraction forces, it is hot plug capable for controlled and reliable separation of high power.

The connector mates to a 3.0 mm thick plated bus bar that provides a separable interface to ease assembly, inspection and trouble shooting. The selective

plated, high conductivity copper contacts offer low resistance, low millivolt drop for efficient power distribution. In blind mate applications this connector can handle adverse tolerances through the unique anti-stress feature allowing reliable mating to misaligned bus bars.

The CROWN CLIP Junior connector can be soldered direct to a PCB or screwed to a bus bar for a 150 A current capacity.



**Technical Documents**

**Product Specification**

108-19360

**Application Specification**

114-19128

**CROWN CLIP Series Sockets** (Continued)

**CROWN CLIP Junior Direct Power Connection for Bus Bars** (Continued)

**Part Number 1982995-1 Screw-Mount**

**Material and Finish**

**Bus Bar**

**Conductor** — Copper, plated nickel or suitable alternative

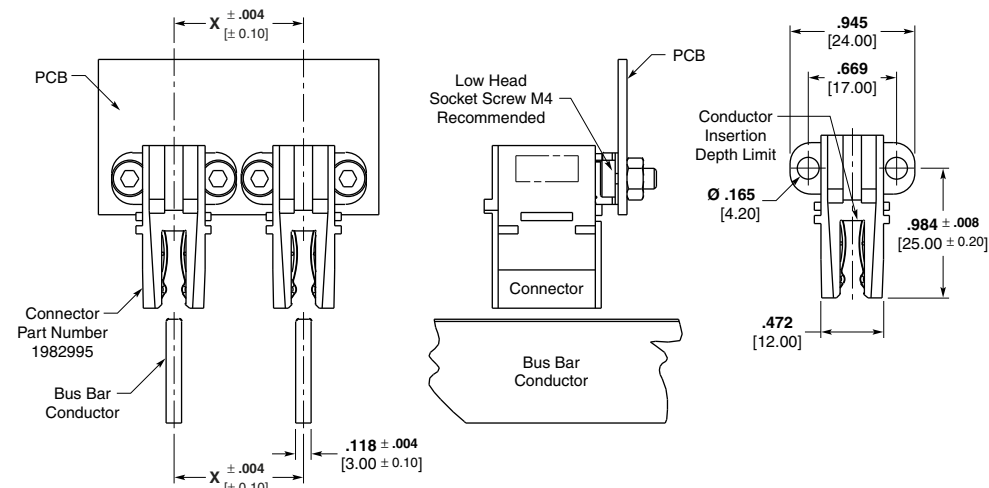
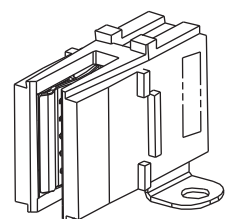
**Temperature** — -40°C to +125°C

**Connector**

**Conductor** — High conductivity copper alloy, plated nickel or suitable alternative

**Insulator** — Thermoplastic, glass reinforced

**Temperature** — -40°C to +125°C



Part Number 1982995-1

Bus Bar Products

**Part Number 1982530-1 Solder Tail**

**Material and Finish**

**Bus Bar**

**Conductor** — Copper, plated nickel or suitable alternative

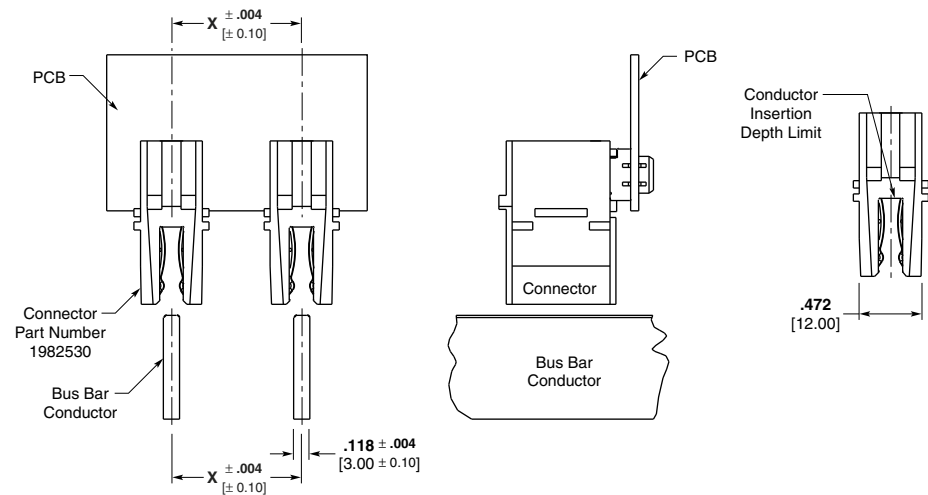
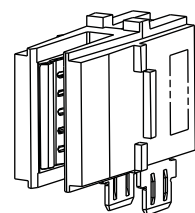
**Temperature** — -40°C to +125°C

**Connector**

**Conductor** — High conductivity copper alloy, plated nickel or suitable alternative

**Insulator** — Thermoplastic, glass reinforced

**Temperature** — -40°C to +125°C



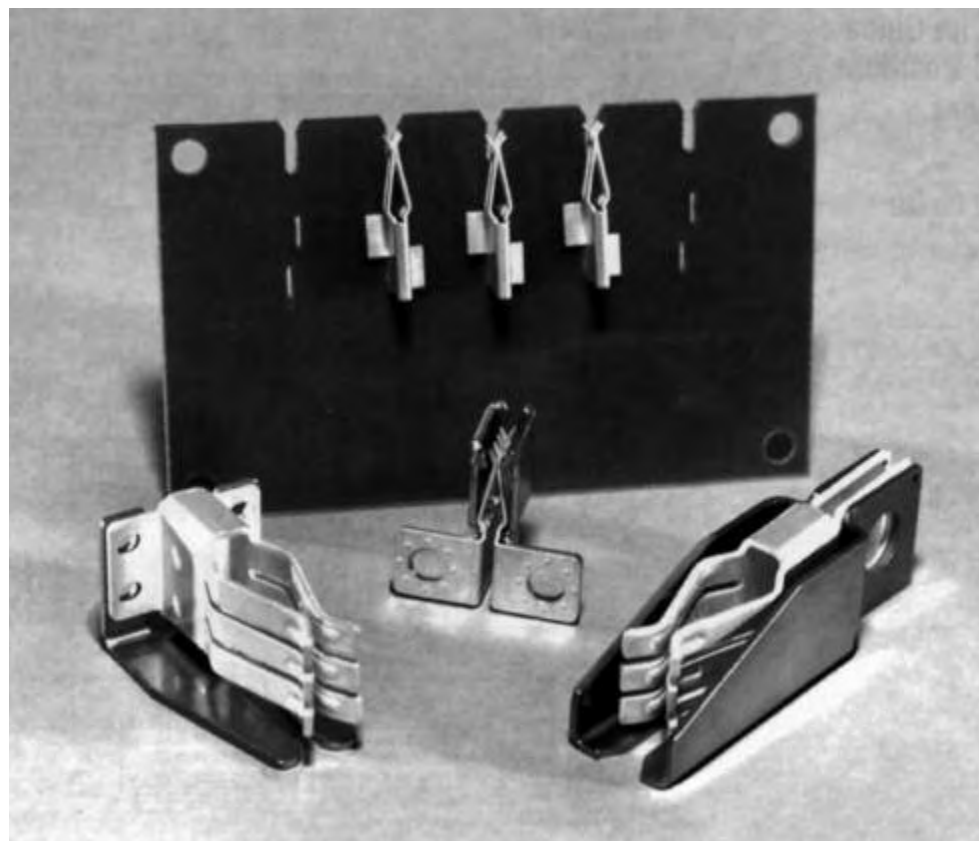
Part Number 1982530-1

Note: All part numbers are RoHS compliant.

## Pluggable Bus Bar Connectors

### Product Facts

- Separable bus bar connector
- 062 series for .062" [1.57] thick, 1/2" [12.7] minimum width bus bar
- 125 series for .125" [3.18] thick, 1" [25.4] minimum width bus bar
- Mounts direct to bus bar or terminated wire
- Low resistance, low millivolt drop
- High current rating: up to 500 amps for 125 series and 250 amps for 062 series
- Blind mateable (misalignment up to ± .060" [1.52 mm] for both series)
- Anti-overstress feature
- Component Recognition Underwriter's Laboratories File No. E113407



### Technical Documents

#### Applications Specifications

Provide instructions for assembling or applying product

114-2130 062 Series

114-2111 125 Series

#### Product Specifications

108-1380 062 Series

108-1101 125 Series

The TE pluggable bus bar connectors are suitable for computer, industrial control and modular power supply applications that demand low millivolt drop and reliable separation. This unique connector design replaces the nuts and bolts previously used to transfer power from the source to the bus bar and simplifies power distribution.

The pluggable bus bar connectors mate with .125" [3.18] or .062" [1.57] thick plated bus bars providing a separable connection that eases assembly, inspection and trouble shooting. The silver-plated, high conductivity copper alloy contacts offer a low resistance contact resulting in low millivolt drop providing efficient power distribution.

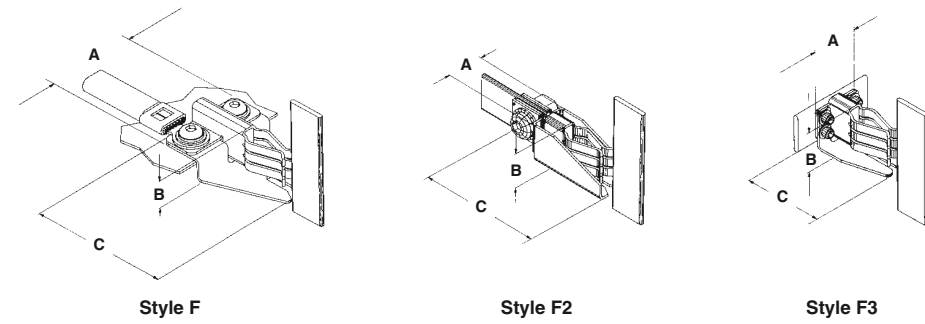
These blind mateable connectors feature a generous lead-in on the integral stainless steel guide plate. This permits mating if the bus bar is slightly misaligned and provides anti-overstress protection for the contact.

Pluggable bus bar connectors can be mounted directly to a bus bar or fed by a power supply cable as outlined in the Application Specifications.



**Pluggable Bus Bar Connectors** (Continued)

**125 Series**



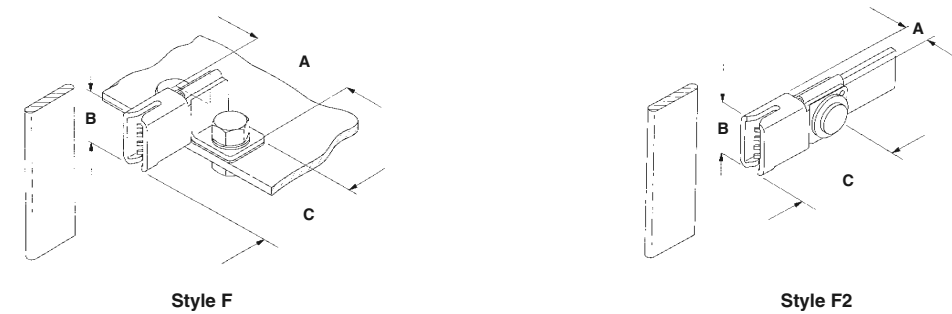
**Selection Data**

Series	Style	Dimensions			Part Number
		"A" (Width)	"B" (Height)	"C" (Length)	
125 Series Fits Bus Bar .125 [3.18] Thick	F *	2.290 58.17	1.141 28.99	3.200 81.28	104502-1
	F2	.850 21.59	1.122 28.5	3.294 83.67	104501-1
	F3	1.250 31.75	1.141 28.99	1.993 50.61	213647-1

\* Bus Bar or Cable Power Feed

Bus Bar Products

**062 Series**



**Selection Data**

Series	Style	Dimensions			Part Number
		"A" (Width)	"B" (Height)	"C" (Length)	
062 Series Fits Bus Bar .062 [1.57] Thick	F	1.360 34.54	.705 17.91	1.342 34.09	104729-1
	F2	.356 9.04	.705 17.91	1.342 34.09	104742-2

Note: All part numbers are RoHS compliant.

**Pluggable Bus Bar Connectors** (Continued)

**Materials**

**Contact** — Copper alloy, plated Silver over nickel

**Guide Plate** — Stainless steel

**Specifications**

**Rated Current** —  
 125 Series — Up to 500 amps at 30°C maximum t-rise \*  
 062 Series — Up to 250 amps at 30°C maximum t-rise \*

\*actual current rating is dependent on bus bar/wire and ambient conditions (see charts).

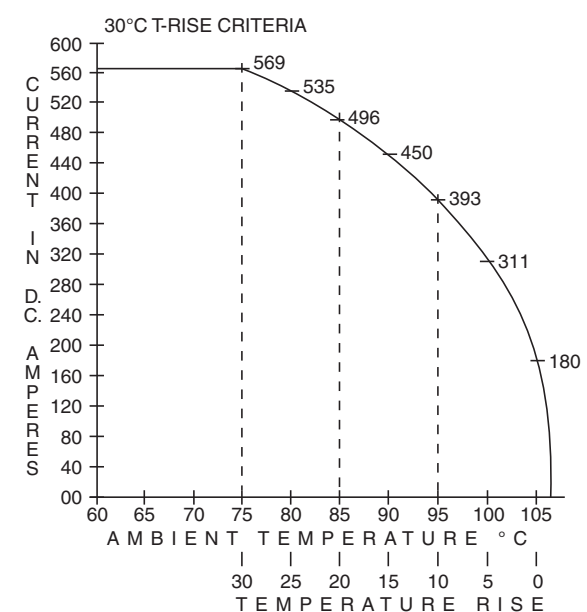
**Contact Resistance** —  
 125 Series — 10 milliohms maximum  
 062 Series — 50 milliohms maximum

**Mating Force** —  
 125 Series — 30 lb. [133.4 N] maximum  
 062 Series — 6 lb. [26.7 N] maximum

**Unmating Force** —  
 125 and 062 Series — 1 lb. [4.4 N] minimum

**Durability** —  
 125 Series — 100 cycle minimum  
 062 Series — 50 cycle minimum

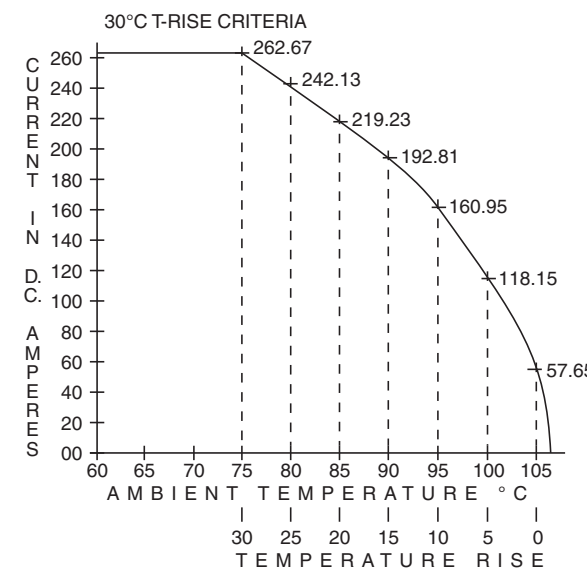
**125 Series**



**Current Carrying Capability**

Test Configuration	Multiplication Factor
Contact on 4x12 [101.6 x 304.8] bar mated with 4x12 [101.6 x 304.8] bar	1.00
Contact on 1x12 [25.4 x 304.8] bar mated with 1x23 [25.4 x 584.2] bar	0.40
Contact on AWG #00 mated with 1x12 [25.4 x 304.8] bar	0.38
Contact on AWG #2 mated with 1x12 [25.4 x 304.8] bar	0.32

**062 Series**



**Current Carrying Capability**

Test Configuration	Multiplication Factor
Contact on 1.5 x 6 [38.1 x 304.8] Bar mated with 1.5 x 12 [38.1 x 304.8] Bar	1.00
Contact on 1.0 x 6 [25.4 x 304.8] Bar mated with 1.0 x 12 [25.4 x 304.8] Bar	0.81
Contact on 0.5 x 6 [12.7 x 304.8] Bar mated with 0.5 x 12 [12.7 x 304.8] Bar	0.58

## CROWN LINE Power Distribution System

### Product Facts

- Currents up to 250 A
- Up to 2 Meters in Length
- Pluggable Breakers
- VDE Finger proof
- Flammability UL 94 V-0
- Easily Configurable
- Adaptable
- Space Efficient
- Reduced Cable
- Reduced Installation Costs
- Polarized Connector Fitting
- Left and Right Handed



### Applications

- Power Distribution
- Core Network Equipment
- Cellular Base Stations
- Servers, Storage & Network Routers
- Industrial

### Technical Documents

**Product Specification**  
108-19299

**Application Specification**  
114-19108

The CROWN LINE system is designed for cost effective power distribution in equipment cabinets, telecoms base stations, computer servers, storage systems and industrial applications.

The unique finger proof design is designed to reduce assembly time, give repeatable low impedance electrical performance and reduce wiring errors with pre-determined input/output connections. System thermal characteristics are improved with the use of flat copper conductors allowing better airflow and

reducing current skin effects compared to conventional use of large AWG cables.

The CROWN LINE system consists of an extruded profile holding two solid copper conductors. Power is supplied to conductors from a regulated power source using flexible power cables and color coded RAPID LOCK right-angle sockets. The option to vary conductor thickness provides a flexible and adaptable design up to 2 meters in length with the ability to preform conductors to fit into awkward spaces.

Power input and output connectors use proven CROWN BAND and CROWN CLIP contact systems for reliable, low loss connections.

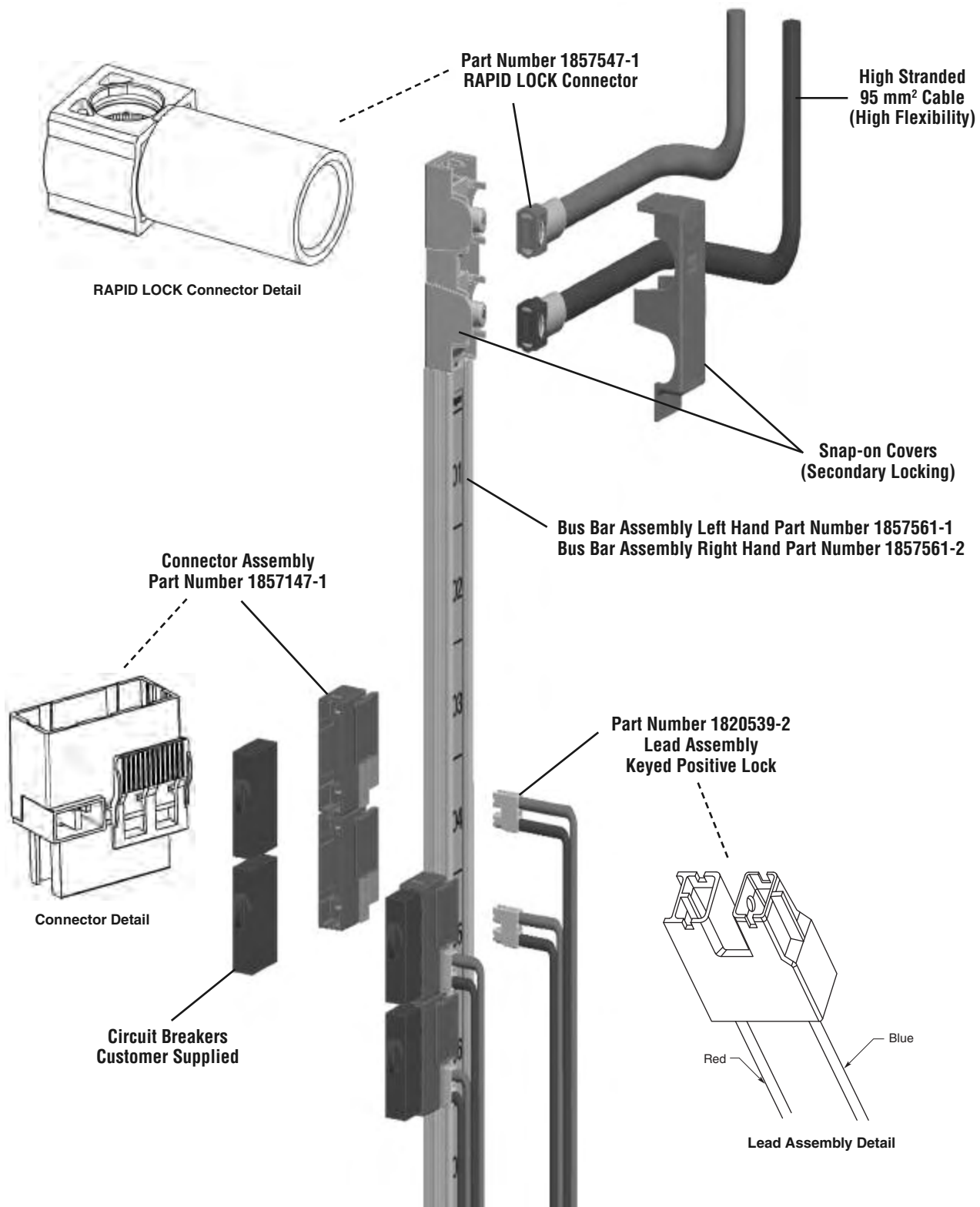
A connector with or without a circuit breaker, can be mated direct to the CROWN LINE System at any location along its length. The circuit breaker connector (CBC) accepts industry standard circuit breakers with tab terminals. A positive lock cable assembly connects from the CBC to deliver power where needed.



Bus Bar Products

**CROWN LINE Power Distribution System** (Continued)

Bus Bar Products

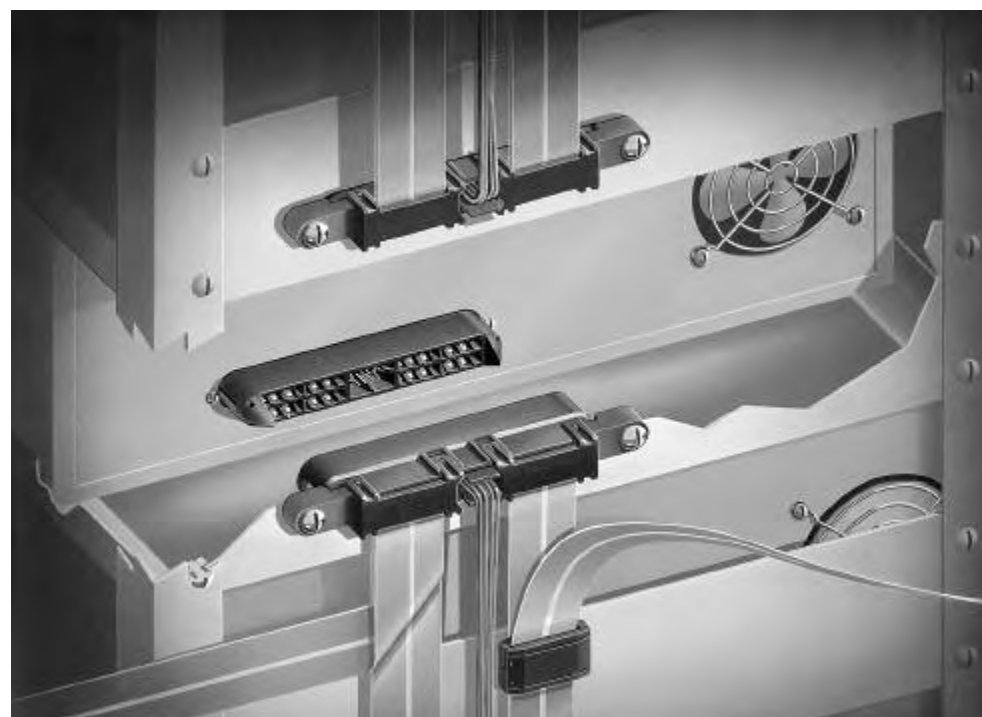


**Note:** All part numbers are RoHS compliant.

## AMPOWER Wave Crimp System

### Product Facts

- Termination of flat cable requires no stripping, does not reduce cable cross section and provides a reliable, low resistance, gas tight interface
- Separable interfaces have positive locking, polarization and contact shrouding
- Right-angle and vertical headers on 2.54 [.100] centers, accommodate standard 1.02 [.040] PCB hole diameters
- Four cable self-aligning connector can pickup 2.03 [.080] misalignment off a common axis and measures 80 amps per cable (at 30°C temperature rise) depending upon the application
- Unique tap permits branching of trunk lines to serve multiple distribution points
- Assemblies are measured at 80–110 amps (with 30°C temperature rise) depending upon mounting interface
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476, No. E13288, and No. E53799
- Certified by Canadian Standards Association, File No. LR7189A-149



Today's intelligent systems require more sophisticated power distribution solutions than ever before. Even the conductor geometry can make a significant impact on systems performance. Flat conductors offer desirable packaging advantages:

- Improved heat dissipation resulting in higher current capacity or reduced operating temperature.
- Low inductance, high capacitance power distribution.
- Reduced noise.
- Packaging flexibility.

The AMPOWER Wave Crimp System is the first power distribution system to offer a cost effective, totally mechanical termination method for insulated flat copper cable.

Assemblies provide: A fully shrouded and polarized separable interface with right-angle and vertical board-mount headers.

The first flat cable tap that allows branching from primary trunk lines, side tapping and discrete wire tapping.

Blindmate drawer connectors feature sequential mating and signal contacts.

AMPOWER flat cable assemblies provide a unique and effective means of distributing power from source to load in today's high speed, high density systems.

### Performance Data

**Voltage Rating** — 250 V AC RMS/DC. Single conductor cable assemblies are available with a 600 V AC RMS/DC rating.

**Dielectric Withstanding Voltage** — Power Contact: 1500 VAC  
Signal Contact: 1200 VAC

**Insulation Resistance** — 5000 megohms initial  
1000 megohms final

**Temperature Range** — -55°C to +105°C

**Current Rating** — Refer to Product and/or Application Specifications.

### Typical Applications

- Mass Storage
- Switches
- Various Power Distribution Applications

### Technical Documents

#### Product Specifications

- 108-1308 Separable Interface
- 108-1313 Terminal Block & Stud Interface
- 108-1315 Cable Tap Interface
- 108-1319 Drawer Connector
- 108-1387 FASTON Wire Tap
- 108-1391 Side Tap
- 108-1323 Cable Specification
- 108-1410 ACTION PIN Header
- 108-1436 Cable-to-Cable Drawer Connector
- 108-1479 ACTION PIN Self-Aligning Connector
- 108-1403 Self-Aligning Header and Receptacle
- 108-1408 Wave Crimp System (Cable-to-Cable)

#### Application Specification

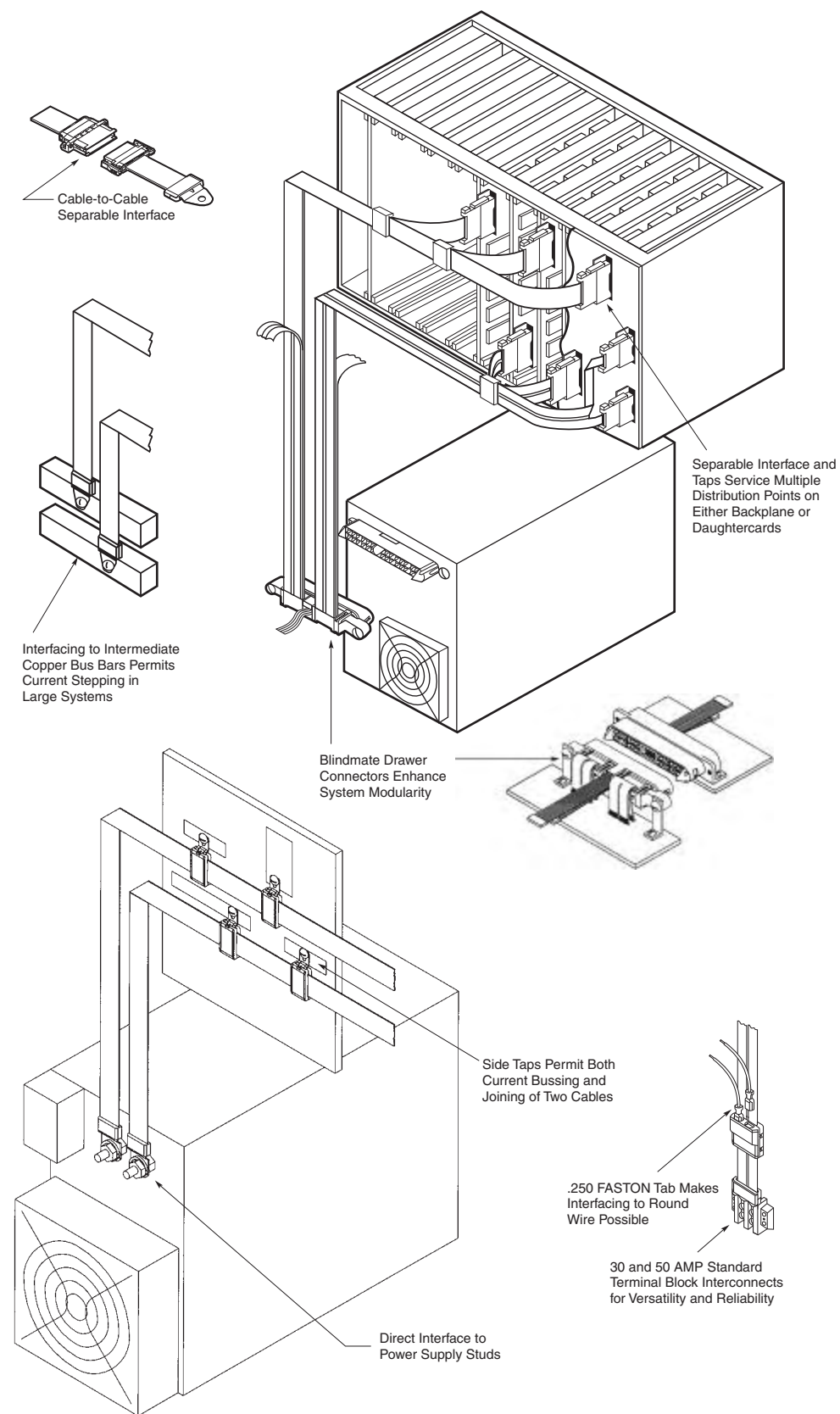
114-49005

AMPOWER Wave Crimp System

**AMPOWER Wave Crimp System** (Continued)

**Applications**

The variety of AMPOWER wave crimp system interfaces available from TE make flat copper cable a versatile and innovative systems solution to power distribution.



AMPOWER Wave Crimp System

**AMPOWER Wave Crimp System** (Continued)

**Copper Cable Options**

Copper cable used in AMPOWER wave crimp system assemblies are available in a variety of thicknesses and widths. The most common cable sizes are shown here.

Conductor Thickness	Resistance	
	Single	Dual
0.25 .010	.912	2.030
0.51 .020	.456	.996

**Note:** The D.C. resistance of a 304.80 [12.00] length of conductor, when measured at 25°C and 10 amps, shall be < this figure (in milliohms).

	Circular MILS	Approx AWG	Amps
	Per Conductor		
<p>Single Conductor</p>	12,566	9	80
<p>Dual Conductor</p>	5,729	13	40/40
<p>Single Conductor</p>	25,133	6	110
<p>Dual Conductor</p>	11,459	10	55/55

AMPOWER Wave Crimp System

**AMPOWER Wave Crimp System** (Continued)

**Terminal Block and Stud Interface**

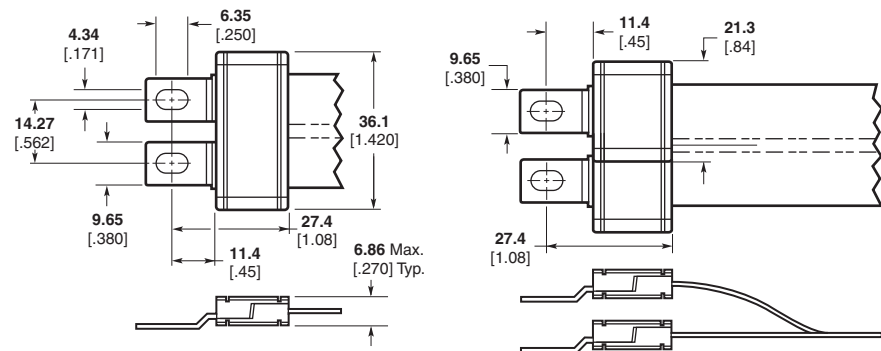
**Material and Finish**

**Housing** — UL 94V-0 rated thermoplastic, black

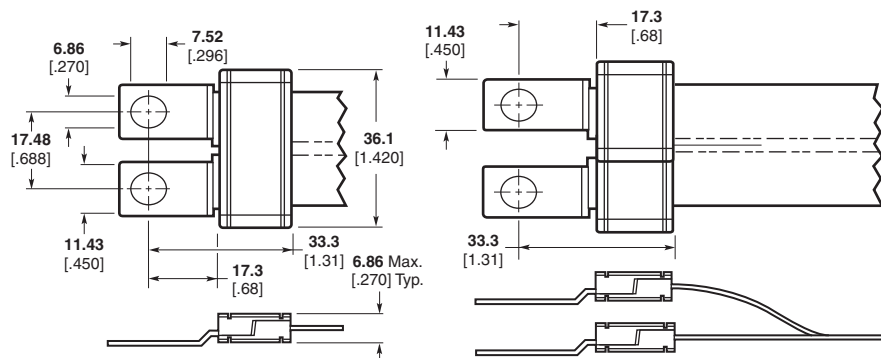
**Contacts** — Copper alloy silver on termination and mating interface.

All over nickel base plate.

**Terminal Block Interface (14.27 [.562] Centerline)**

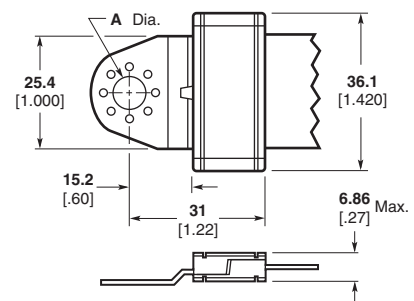


**Terminal Block Interface (17.48 [.688] Centerline)**



Centerline Spacing	Part Numbers	
	Termination Assembly	Cover
14.24 .562	—	765228-1 Full Width
—	—	765229-1 Half Width
17.48 .688	765225-1	765228-1 Full Width
—	765225-1	765229-1 Half Width

**Stud Interface**



Stud Size	Hole Size "A"	Part Numbers
		Cover (x2)
1/4"	6.76 .266	765228-1
5/16"	8.33 .328	765228-1

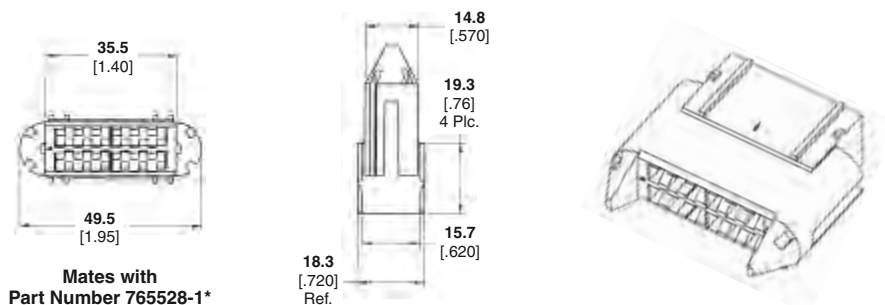
**Note:** All part numbers are RoHS compliant.



**AMPOWER Wave Crimp System** (Continued)

**Cable-to-Cable Blindmate Receptacle Housing**

Part Number 766569-1



Mates with Part Number 765528-1\*

\*Panel-mount (765530-1) or squeeze-to-release (765529-1) strain relief can be used on either 766569-1 or 765528-1 housing. At least one housing must have the squeeze-to-release strain relief; the panel-mount strain relief is optional on the mating housing.

**Separable Interface**

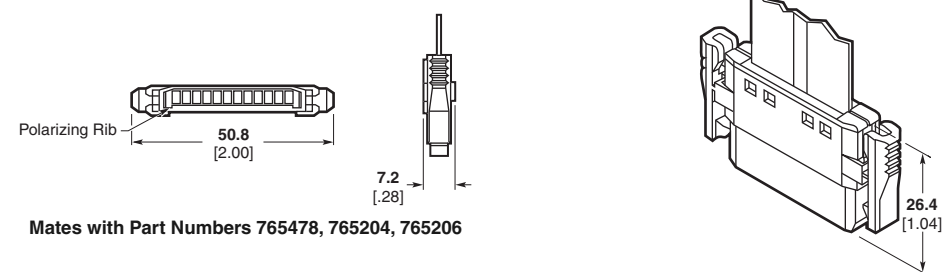
**Material and Finish**

**Housing** — UL94V-0 rated thermoplastic, black

**Contact** — Copper alloy silver on termination and mating interface.

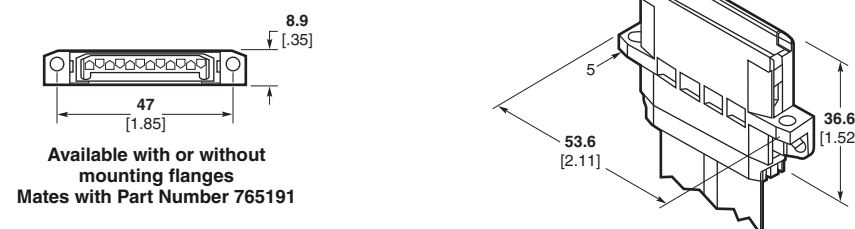
Tin-lead on header solder and ACTION PIN contact Tails. All over nickel base plate.

**Plug Part Number 765191-1**



Mates with Part Numbers 765478, 765204, 765206

**Cable-to-Cable Receptacle Part Number 765478-1**



Available with or without mounting flanges  
Mates with Part Number 765191

AMPOWER Wave Crimp System

Note: All part numbers are RoHS compliant.

**AMPOWER Wave Crimp System** (Continued)

**Separable Interface — Headers**

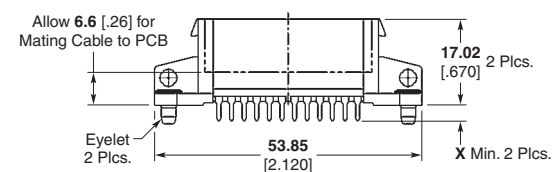
**Material and Finish**

**Housing** — UL94V-0 rated thermoplastic, black

**Contact** — Copper alloy silver on termination and mating interface.

Tin-lead on header solder and ACTION PIN contact Tails.  
All over nickel base plate.

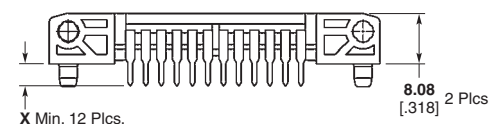
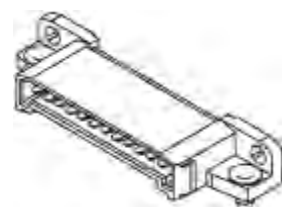
**Vertical Header**



"X"	Tail Type	Housing	Part Numbers
3.15 .124	Solder Tail	Standard Temp, Black	765206-1
5.72 .225	Solder Tail	Standard Temp, Black	765206-4
4.19 .165	Solder Tail	High Temp, Natural	765206-6
3.66 .144	ACTION PIN Tail	Standard Temp, Black	765271-1 <sup>1</sup>

<sup>1</sup>Uses insertion tool Part Number 765312-1

**Horizontal Header**



Mates with Part Number 766569-1

"X"	Tail Type	Housing	Part Numbers
4.19 .165	Solder Tail	Standard Temp, Black	765204-2
3.15 .124	Solder Tail	High Temp, Natural	765204-5
4.19 .165	Solder Tail	High Temp, Natural	765204-6

**Note:** Recommended mounting hardware, 2 #4-40 screws and nuts, or 2 eyelets TE Part Number 748572-2.

**Note:** All part numbers are RoHS compliant.

**AMPOWER Wave Crimp System** (Continued)

**Half Width Plug Header**

**Material and Finish**

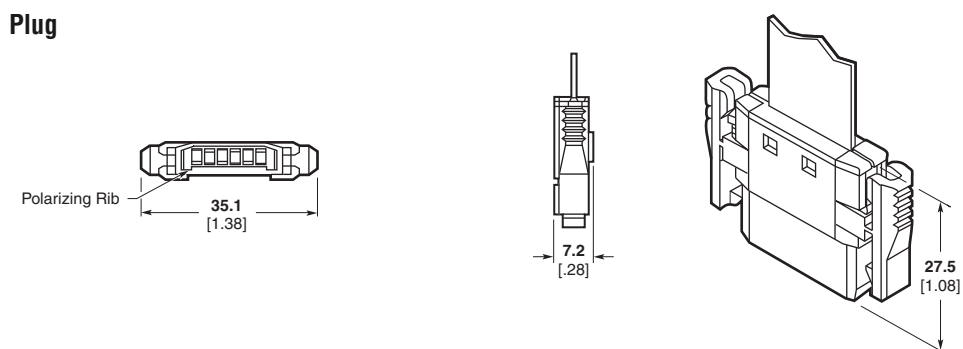
**Housing** — UL94V-0 rated thermoplastic, black

**Contact** — Copper alloy silver on termination and mating interface.

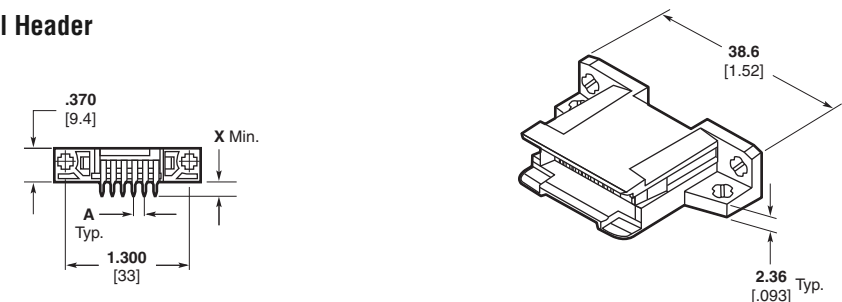
Tin-lead on header solder and ACTION PIN contact Tails.

All over nickel base plate.

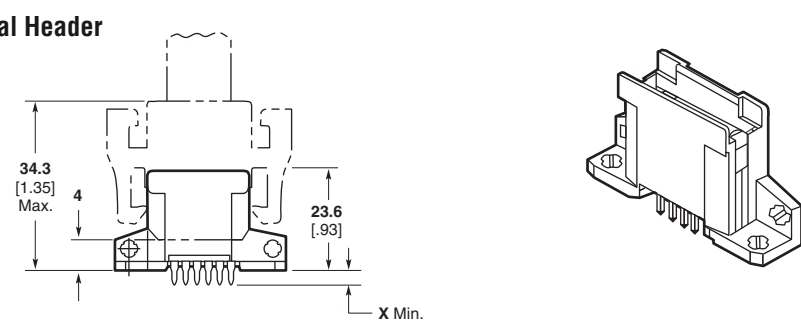
**Plug**



**Horizontal Header**



**Vertical Header**



AMPOWER Wave Crimp System

Header Pin Pitch "A"	"X"	Header Assembly Part Numbers		
		Tail Type	Horizontal	Vertical
2.54 .100	3.15 .124	Solder Tail	765450-1	765449-1
	4.19 .165	Solder Tail	765450-2	765449-2
	5.72 .225	Solder Tail	765450-4	765449-4
	3.66 .144	ACTION PIN Tail	—	765451-1

<sup>1</sup>High temperature material.

**Notes:** Recommended mounting hardware, 2 #4-40, screws and nuts or, 2 eyelets TE Part Number 748572-2, customer supplied.

Allow 5.65 [.262] for mating cable to PCB.

**Note:** All part numbers are RoHS compliant.

**AMPOWER Wave Crimp System** (Continued)

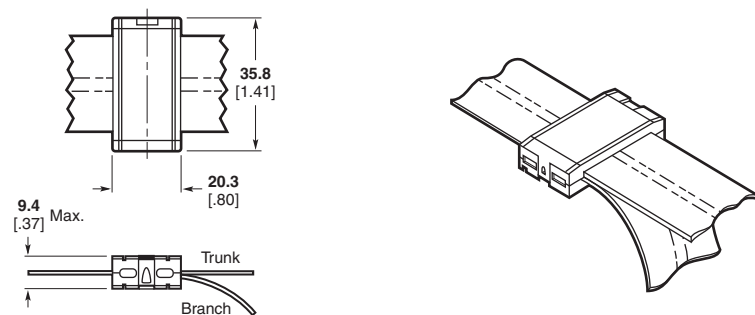
**Mid-Cable Terminations**

**Material and Finish**

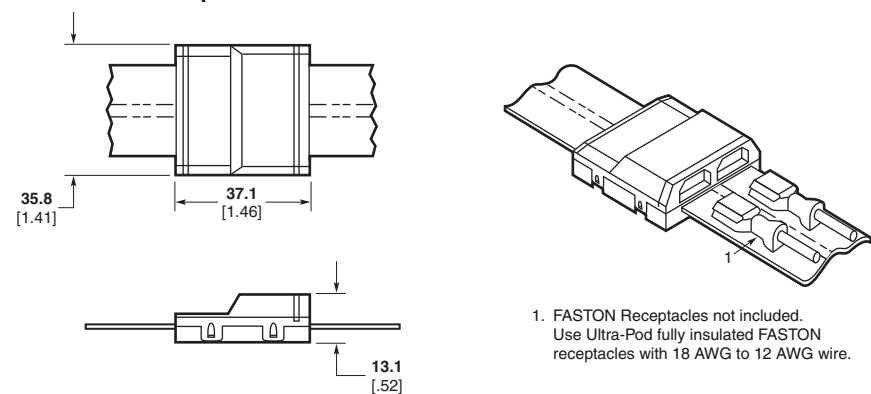
**Housing** — UL94V-0 rated thermoplastic, black

**Contact** — Silver plated copper alloy  
All over nickel base plate.

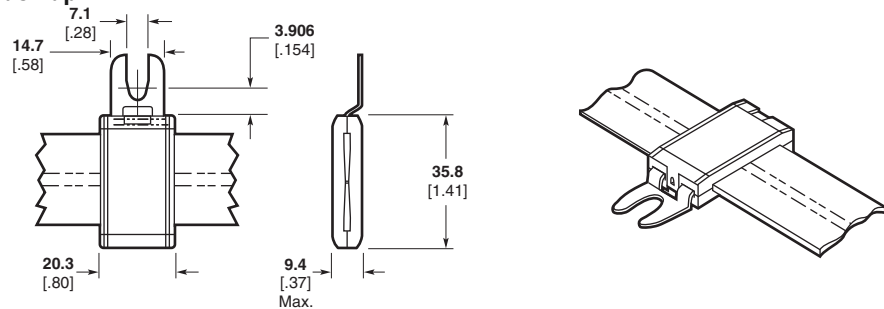
**Tap**



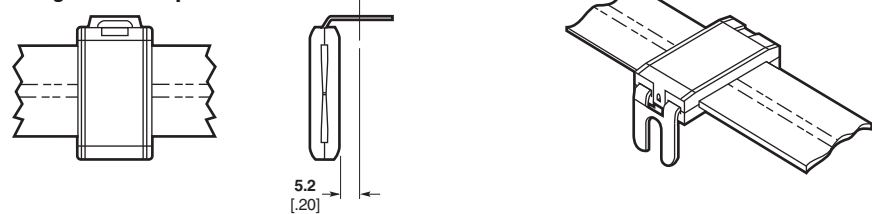
**.250 FASTON Tab Tap**



**Side-Tap**



**Right-Angle Side-Tap**



Termination Type	Part Numbers		
	Termination Assembly	Housing Cover	Housing Base
Flat Cable	765277-1	765278-1	—
.250 FASTON Tab	765276-1	765295-1	765296-1
¼" Stud	—	765278-1	—
¼" Stud	765311-1	765278-1	—

**Note:** Connectors on this page are capable of terminating up to two 0.51 [0.020] thick cables.

**Note:** All part numbers are RoHS compliant.

**AMPOWER Wave Crimp System** (Continued)

**Self-Aligning Headers**

**Material and Finish**

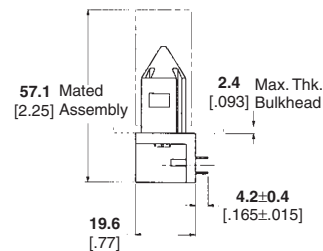
**Housing** — UL94V-0 rated thermoplastic, black

**Contact** — Copper alloy silver on mating interface

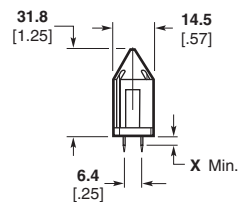
Tin-lead on solder tails.

ALL over nickel base plate.

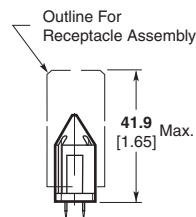
Signal contact gold plate.



Typical For All Right-Angle Headers

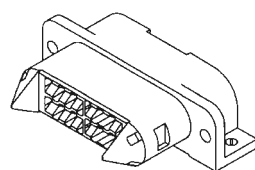
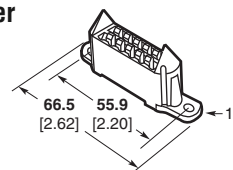


Typical For All Vertical Headers



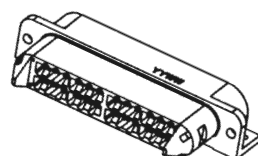
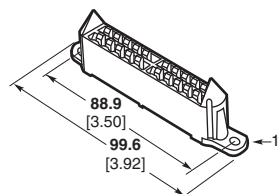
Typical For All Vertical Headers

**2 Cable Header**



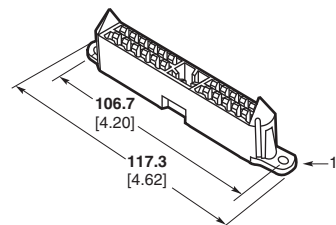
Part Number 765608-1

**4 Cable Header**

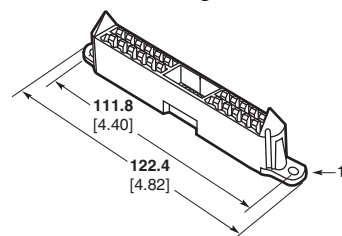


Part Number 766510-1

**4 Cable Header w/8 Signal Lines<sup>3,4</sup>**



**4 Cable Header w/21 Signal Lines<sup>3,4</sup>**



"X"	Tail Type	Part Numbers			
		2 Cable Header	4 Cable Header	4 Cable Header 8 Signal Lines <sup>3</sup>	4 Cable Header 21 Signal Lines <sup>3</sup>
3.10 .122	Solder Tail	765527-1	765208-1	765249-1	765265-1
3.96 .156	Solder Tail	765527-2	765208-2	765249-2	765265-2
3.66 .144	ACTION PIN Tail	765527-5	765208-5	765249-5	765265-5

<sup>1</sup>Mounting holes offset from centerline of part .76 [.030].

<sup>2</sup>High temperature material.

<sup>3</sup>Mates with MINI-TANDEM contact, TE Part Number 530553-x. Reference Catalog 82055.

<sup>4</sup>Signal pins not shown for clarity.

**Notes:** Tail length "x" is 4.20 (.165) for all right-angle headers.

Recommended mounting hardware, 2 #4-40, screws and nuts or, 2 eyelets TE Part Number 748572-2, customer supplied.

**Note:** All part numbers are RoHS compliant.

AMPOWER Wave Crimp System

**AMPOWER Wave Crimp System** (Continued)

**Self-Aligning Receptacles  
(Float-Mount)**

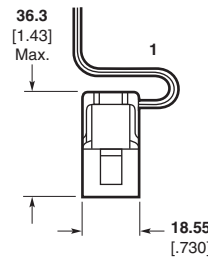
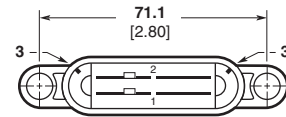
**Material and Finish**

**Housing** — UL94V-0 rated thermoplastic, black

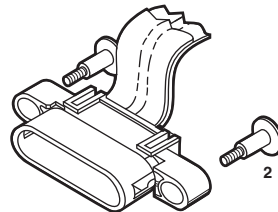
**Contact** — Copper alloy silver on termination and mating interface.

All over nickel base plate.  
Signal contact see page 213.

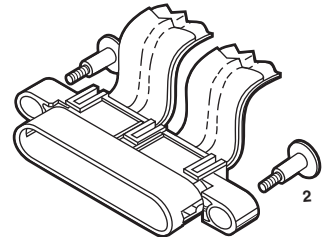
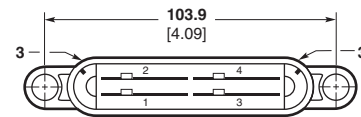
**2 Cable Receptacle**



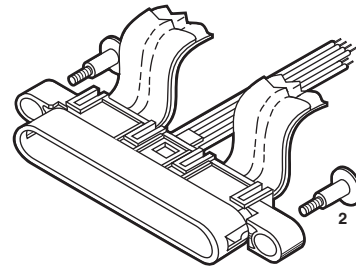
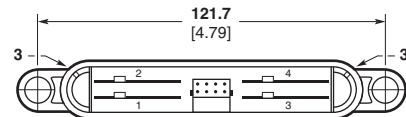
Typical For All Self-Aligning Receptacles



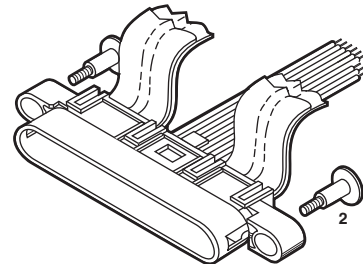
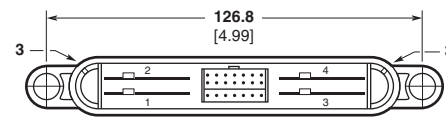
**4 Cable Receptacle**



**4 Cable Receptacle w/8 Signal Lines**



**4 Cable Receptacle w/21 Signal Lines**



	Part Numbers			
	2 Cable w/o Signal Lines	4 Cable w/o Signal Lines	4 Cable w/8 Signal Lines	4 Cable w/21 Signal Lines
Housing	765528-1	765247-1	765224-1	765261-1
Strain Relief	765530-1	765250-1	765238-1	765238-1
Ground Contacts	765209-1	765209-1	765209-1	765209-1
Power Contacts	765209-2	765209-2	765209-2	765209-2

<sup>1</sup>Service loop suggested, allows for connector float.

<sup>2</sup>Recommended mounting hardware, TE Part Number 208211-4, 2 required per kit and 2 #6-32 nuts (customer supplied).

<sup>3</sup>Polarizing ribs, 2 places.

**Note:** Custom signal module assemblies available with power assemblies.

**Note:** All part numbers are RoHS compliant.

**AMPOWER Wave Crimp System** (Continued)

**Self-Aligning Receptacles (Latching)**

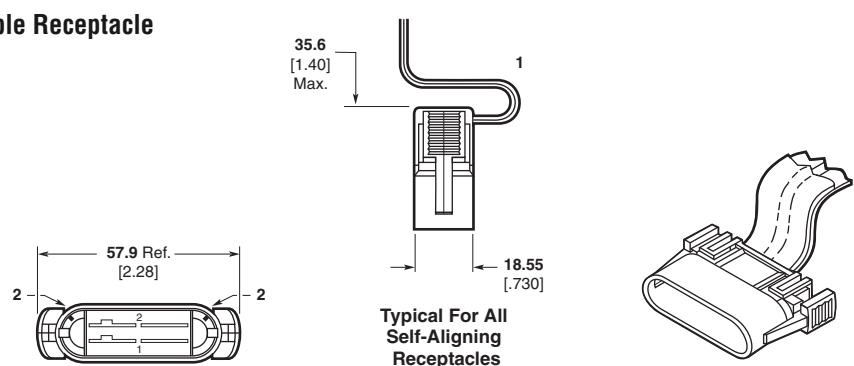
**Material and Finish**

**Housing** — UL94V-0 rated thermoplastic, black

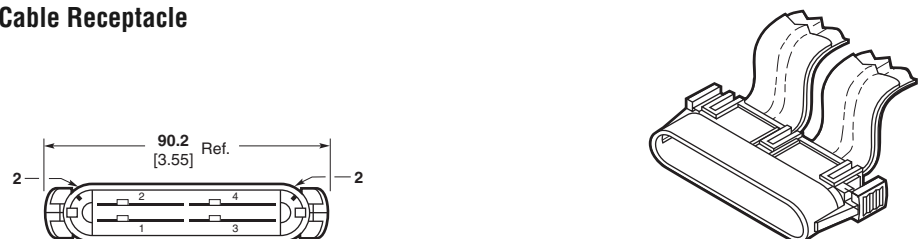
**Contact** — Copper alloy silver on termination and mating interface.

All over nickel base plate.  
Signal contact see page 213.

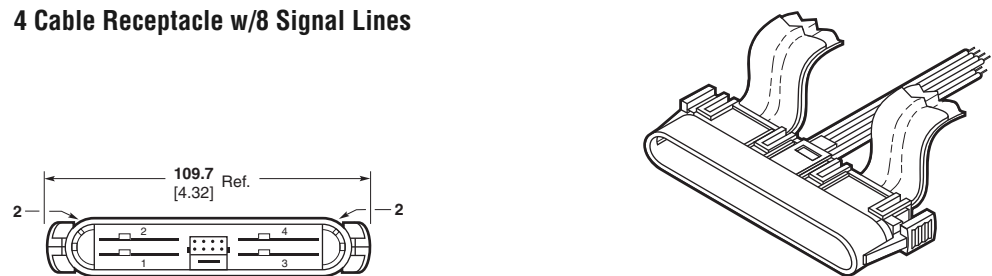
**2 Cable Receptacle**



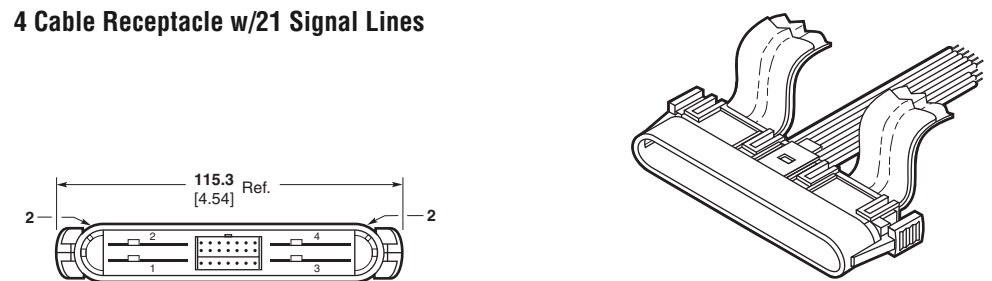
**4 Cable Receptacle**



**4 Cable Receptacle w/8 Signal Lines**



**4 Cable Receptacle w/21 Signal Lines**



	Part Numbers			
	2 Cable	4 Cable	4 Cable w/8 Signal Lines	4 Cable w/21 Signal Lines
Housing	765528-1	765247-1	765224-1	765261-1
Strain Relief	765529-1	765248-1	765251-1	765251-1
Ground Contacts	765209-1	765209-1	765209-1	765209-1
Power Contacts	765209-2	765209-2	765209-2	765209-2

<sup>1</sup>Service loop suggested, allows for connector disconnection.  
<sup>2</sup>Polarizing ribs, 2 places.  
**Note:** Custom signal module assemblies available with power assemblies.

**Note:** All part numbers are RoHS compliant.

AMPOWER Wave Crimp System

**AMPOWER Wave Crimp System (Continued)**

**Cable-to-Cable Plug Connector w/8 Signal Lines**

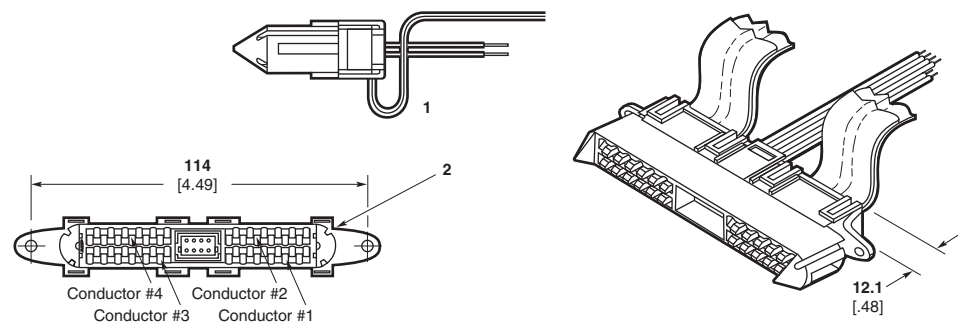
**Material and Finish**

**Housing** — UL94V-0 rated thermoplastic, black

**Contact** — Copper alloy silver plated

All over nickel base plate.

**Mates with** — Self-Aligning receptacle, with 8 signal lines.



Part Numbers 4 Cable w/8 Signal Lines	
Housing	765241-1
Strain Relief	765242-1

<sup>1</sup>Service loop suggested, when float-mount strain relief used (not shown).

<sup>2</sup>Polarizing slots, 2 places.

**Note:** Custom signal module assemblies available with power assemblies.

**Self-Aligning Right-Angle Connector w/48 Signal Lines**

**Product Facts**

- Right-angle header for .06"-.12" PWB thickness
- 8 DC contacts
- 48 signal contacts
- 3 possible levels of sequencing
- Blindmate with .19" total mismatch alignment
- Polarization
- Mechanical PWB fasteners
- Drop-in-place custom assemblies

**Material and Finish**

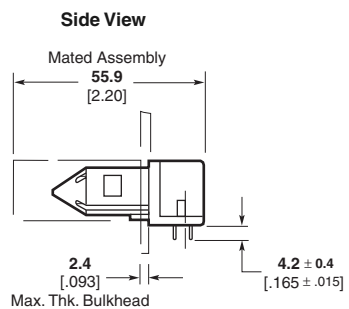
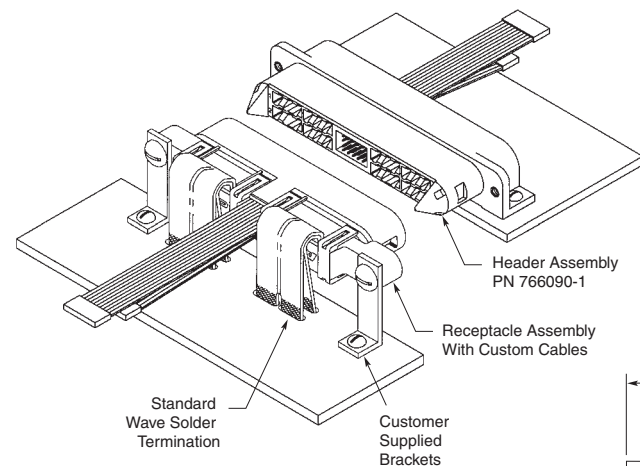
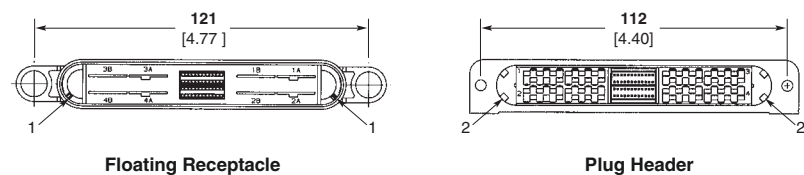
**Housing** — UL94V-0 rated thermoplastic, black

**Contact** — Copper alloy silver on mating interface

Tin-lead on header solder tails.

All over nickel base plate.

Signal contact gold plate.



<sup>1</sup>Polarizing rib, 2 places.  
<sup>2</sup>Polarizing slot, 2 places.

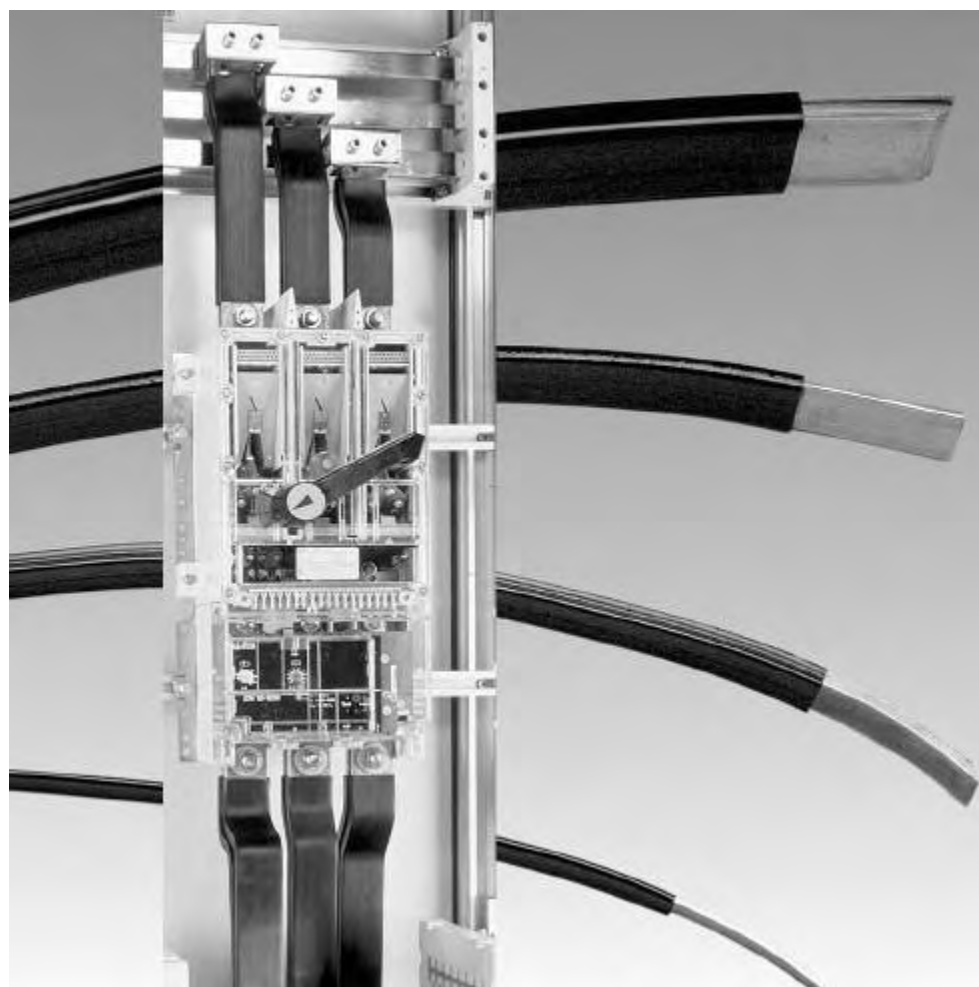
**Note:** All part numbers are RoHS compliant.



## ISOLAMES Flexible Bus Bar

### Products Facts

- Wide range of cross section  
21 to 1,200 mm<sup>2</sup>
- Various laminated copper layer widths enable connection on all main apparatus and copper busbars
- High dielectric strength
- Flame retardant insulating material
- Limited temperature rises compared to cables or non-insulated copper bars
- High flexibility enables bending by hand
- Space saving: ISOLAMES bus bar bend radius is smaller than equivalent copper cable one
- Standard delivery length: 2.00 m
- Also available on request:
  - Tin plated copper strips
  - Halogen-free insulation material
  - Longer bars (up to 4.00m)
- Approvals:  
LLOYD N° 93/30023  
CSA N° 099903  
UL105°C N° E113407



 Bulk Cable

### Applications

- Low voltage power distribution: connections of switchboards, panel boards, transformers, busbars

ISOLAMES bus bar flexible insulated bars are made of high flexibility laminated copper layers, coated with black colored, self-extinguishable insulating PVC compound.



For more information, request Catalog 1242405

**Engineering Notes**

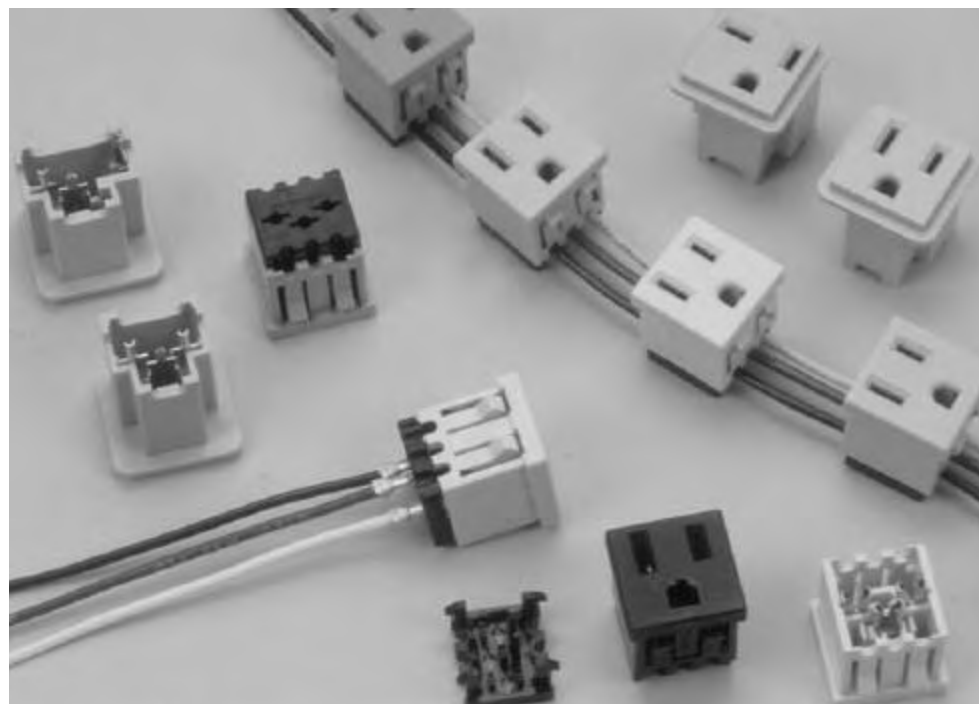


## Convenience Outlets

### Product Facts

- Panel-mount connector snaps in without the use of tools and holds securely without retention hardware
- Terminates solid copper wire using striplless insulation displacement terminals
- Terminates wire end or allows wire to feed thru
- Alternate connection uses FASTON 205 Series tabs (see Catalog 82004)
- Panel-mount connectors available in two sizes:  
14-12 AWG [2-3 mm<sup>2</sup>]  
18-16 AWG [0.8-1.4 mm<sup>2</sup>]
- Rated under the Component Recognition Program of Underwriters Laboratories Inc., File No. E146448, except for 213727-1
- Designed to UL Performance Std. 498

- Certified by Canadian Standards Association, File No. LR-7189A   
15 A, 12-14 AWG [3-2 mm<sup>2</sup>]  
13 A, 16 AWG [1.4 mm<sup>2</sup>]  
10 A, 18 AWG [0.8 mm<sup>2</sup>]  
File No. LR-7189A (213727-1 only)   
NRTL/C



The convenience outlets offer a fast and easy way to add an AC power outlet to a variety of electrical and/or electronic equipment. The connectors are available to snap-in to panels or to be mounted on a printed circuit board. The end applications vary from use in applications such as

multiple outlet strips and uninterruptible power supplies to industrial applications where a convenient AC power outlet is needed to be installed to the equipment in order to power external devices.

The panel-mount connectors use insulation displacement

technology to terminate the contacts to solid wires (from 18 AWG to 12 AWG). The printed circuit mounted connectors include both outlet jacks which are touch-safe and input jacks, which accept custom molded power cord receptacles.

AC Inputs

### Technical Documents

#### Instruction Sheets

408-6669 — 14-12 AWG [2-3 mm<sup>2</sup>]

IDC version

408-6698 — 18-16 AWG [0.8-1.4 mm<sup>2</sup>]

IDC version

For more information, request Catalog 82067.

### Convenience Outlets — Panel-Mount

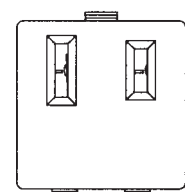
**Current Rating** —  
14-12 AWG — 15A  
16 AWG — 13A  
18 AWG — 10A

**Material**  
**Housing** — thermoplastic  
**Contact** — Copper alloy

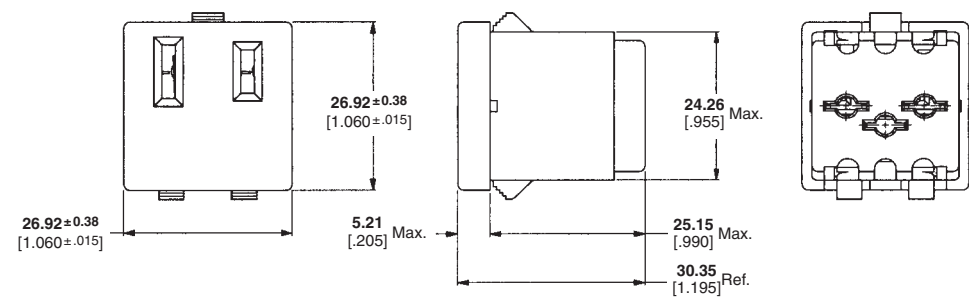
**205 Series FASTON Tab**  
**Part Number 62531-1\***

**Specifications**  
**Wire Range** — 18-14 AWG  
[0.8-2 mm<sup>2</sup>]  
**Insulation Diameter** —  
.120-.150 [3.05-3.81]  
**Material and Finish** —  
Brass, tin plated

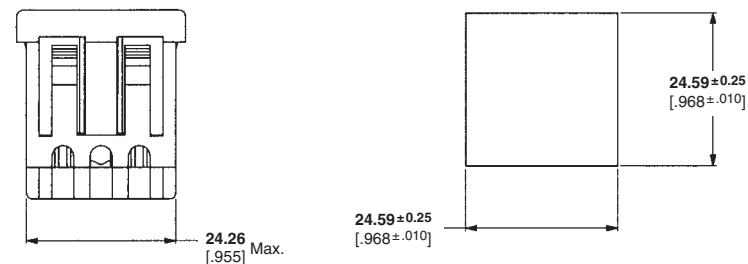
No. of Contacts	Part Numbers			Housing Color
	14-12 AWG [2-3 mm <sup>2</sup> ]	18-16 AWG 0.8-1.4 mm <sup>2</sup>	Panel Plug	
2 Plus Ground	208979-2	208697-2	—	Black
	208979-4	208697-4	—	Almond
	1-208979-0	—	—	Platinum
	1-208979-1	—	—	Gray
	1-208979-2	—	—	Orange
2 (No Ground)	1-208979-4	—	—	Putty White
	213878-1	—	—	Black
0 (Blank)	—	—	796285-1	Black



Part Number 213878-1



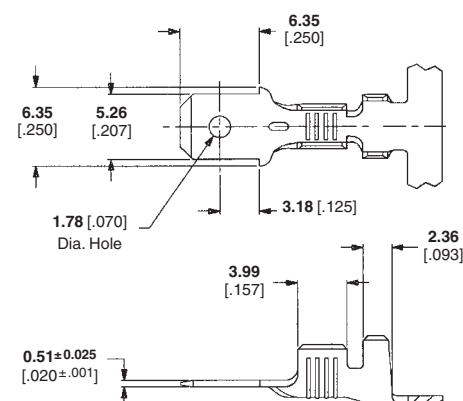
\*Reverse reeled for use in Model "K" Terminating Machine Part Number 585435-5 using Heavy Duty Miniature (HDM) Applicator Part Number 567069-2 or in Leadmakers using HDM Applicator Part Number 567069-1



Recommended Panel Cutout  
Panel Thickness — 0.76-1.78 [0.030-.070]

**205 Series FASTON Tab**  
**Part Number 62531-1\*\***

**Specifications**  
**Wire Range** — 18-14 AWG  
[0.8-2 mm<sup>2</sup>]  
**Insulation Diameter** —  
.120-.150 [3.05-3.81]  
**Material and Finish** —  
Brass, tin plated



\*\*Reeled for use in Model "G" and Model "K" Terminating Machine using Heavy Duty Miniature Applicator Part Number 567069-1

Note: All part numbers are RoHS compliant.

### Convenience Outlets — PCB-Mount

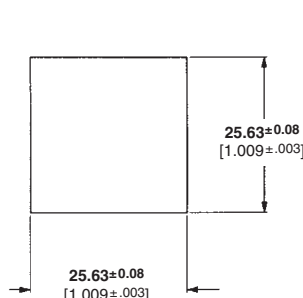
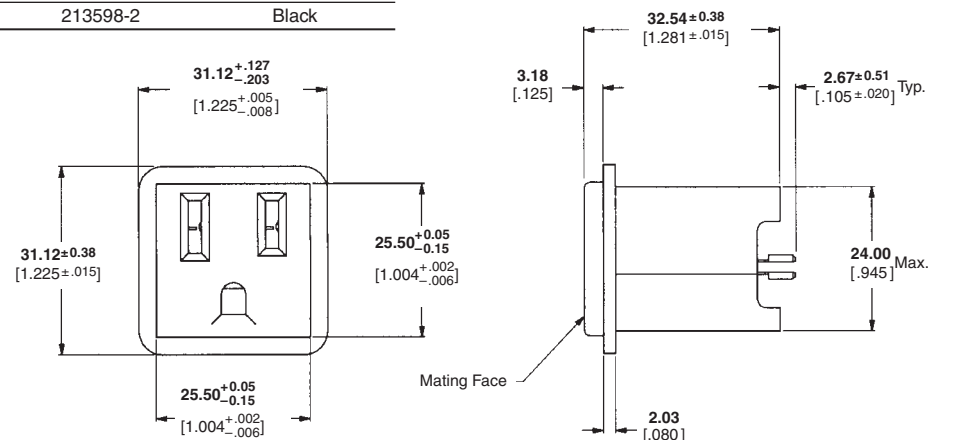
#### 15 Amps

##### Material and Finish

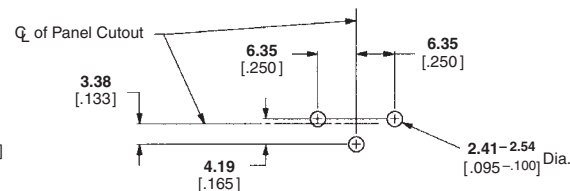
**Housing** — Nylon

**Contacts** — Brass plated .000100 [0.00254] min. tin-lead for a minimum length of .195 [4.95] on end opposite mating face, over .000050 [0.00127] min. nickel on entire contact

Part Numbers	Housing Color
213598-1	Gray
213598-2	Black



Recommended Panel Cutout



Recommended Hole Pattern

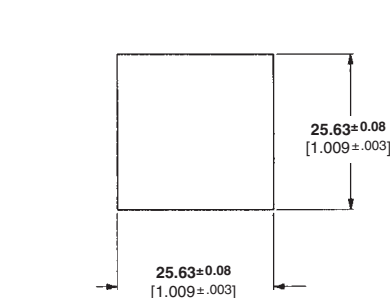
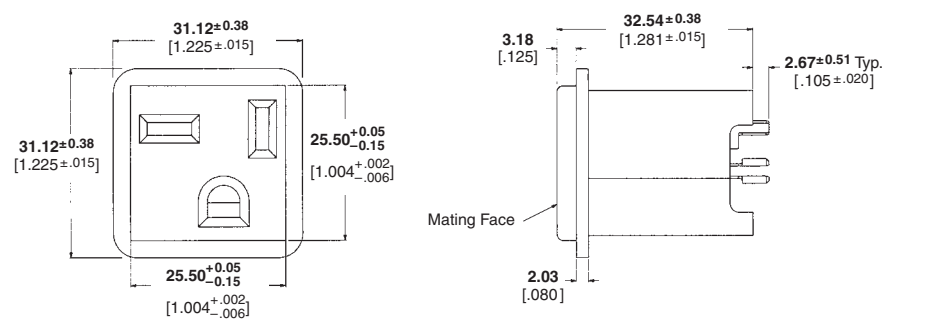
#### 20 Amps

##### Part Number 213727-1

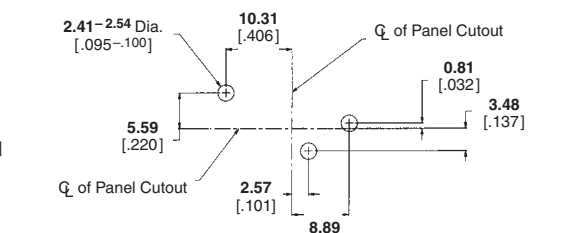
##### Material and Finish

**Housing** — Nylon, Gray

**Contacts** — Brass plated .000100 [0.00254] min. tin-lead for a minimum length of .195 [4.95] on end opposite mating face, over .000050 [0.00127] min. nickel on entire contact



Recommended Panel Cutout



Recommended Hole Pattern

AC Inputs

Note: All part numbers are RoHS compliant.

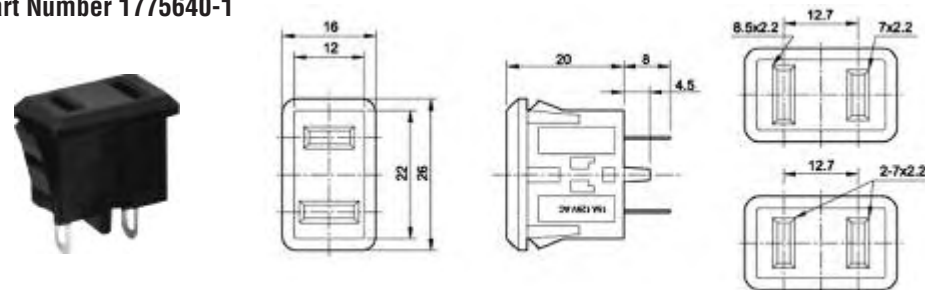
**Convenience Outlets**

**Product Facts**

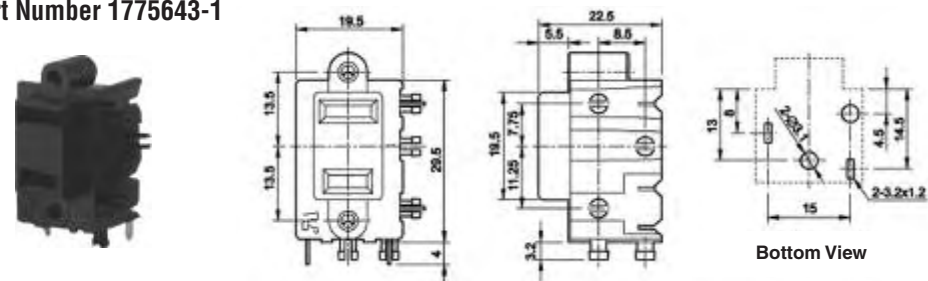
- PCB Mountable
- 15A Output (outlet) Jacks
- 7A Input Jacks
- Connectors feature PCB retention features
- Horizontal or Vertical Mount
- Combination Jacks ideal for compact inverters — saves space vs. separate input/output connectors

For specific part numbers, contact TE

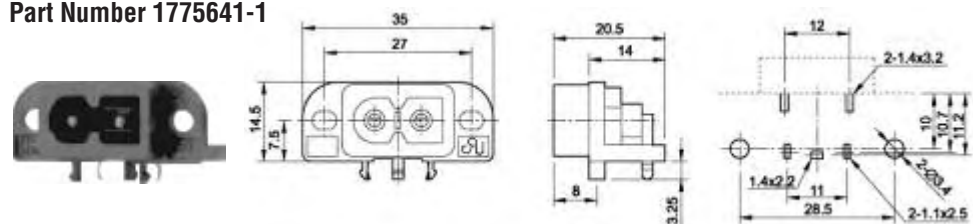
**AC Output Jack  
Panel-Mount with Solder Tabs  
Part Number 1775640-1**



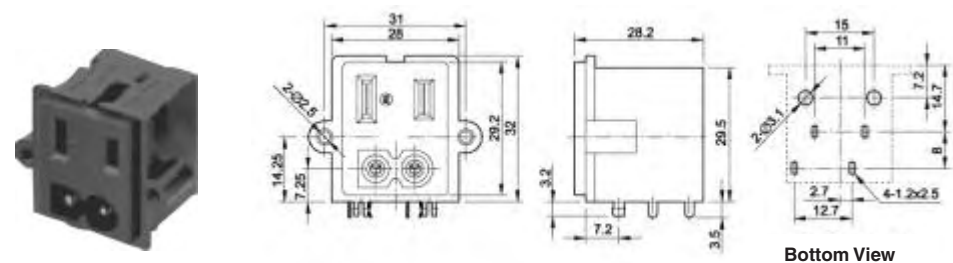
**AC Output Jack  
PCB-Mount  
Part Number 1775643-1**



**AC Input Jack  
PCB-Mount  
Part Number 1775641-1**



**Combination Input/Output Jack  
PCB-Mount  
Part Number 1775642-1 (UL94 V-1)  
Part Number 1-1775642-1 (UL94 V-0)**



Note: All part numbers are RoHS compliant.

## CORCOM EMI/RFI Filter Products

### Product Facts

- Broad range of single and three phase power line filters, IEC power inlet filters and power entry modules
- Wide range of current ratings
  - Power line filters (up to 400 amps)
  - IEC power inlet filters (up to 20 amps)
  - Power entry modules (up to 15 amps)
- Various termination options including:
  - Standard receptacle (IEC)
  - Quick connect
  - Stud termination
  - DIN type terminal block
- Safety agency approvals
- Complimentary screen room testing
- Consultation services
- Custom solutions available
- Technical support line to answer customer inquiries
  - CORCOMTechHelp@te.com
  - 847-573-6597



As electronic equipment becomes more complex, the need for proper filtering increases. TE offers a complete line of CORCOM filter products for controlling EMI/RFI in practically any application. CORCOM brand products are recognized globally as effective solutions for bringing electrical/electronic products into compliance with safety agency standards for EMI emissions and protecting equipment from the effects of incoming electronic noise.

Power line filters, IEC power inlet filters and power entry modules are available in a wide range of current ratings, termination styles and filtering performance. In addition to the extensive selection of catalog products, custom solutions are also available. All products are RoHS compliant and have safety agency approvals. For more detailed information on CORCOM brand products, visit our CORCOM website at [www.corcom.com](http://www.corcom.com).

AC Inputs

For more information, request Catalog 1654001.

Catalog 1773096  
Revised 4-12

[www.te.com](http://www.te.com)

Dimensions are shown for reference purposes only. Specifications subject to change.

Dimensions are in inches and millimeters unless otherwise specified.  
USA: +1 (800) 522-6752

Canada: +1 (905) 475-6222  
Mexico/C. Am.: +52 (0) 55-1106-0800  
Latin/S. Am.: +54 (0) 11-4733-2200  
Germany: +49 (0) 6251-133-1999

UK: +44 (0) 800-267666  
France: +33 (0) 1-3420-8686  
Netherlands: +31 (0) 73-6246-999  
China: +86 (0) 400-820-6015

## CORCOM DB Products

### Product Facts

- Compact connector for high-current DC applications
- Reliable performance in a compact assembly
- 60A DC current rating
- Polarized mating scheme
- Easy customer termination of power source
- Plug and receptacle available preterminated with standard wire lengths

### Standard and Specs

#### RFI Filter

- UL1283 Recognized
- CSA Certified C22.2 No. 8/TUV Certified EN60950-1 (Filter)

#### Connector System

- UL1977 Recognized/CSA 182.3 Certified (through UL)
- TUV Certified EN61984

### Application Tooling

#### (Unterminated Contacts Only)

- Insertion/Extraction tool recommended:  
Part Number 1643922-1 (for DBR/DBP only)
- No hand tool available. Must crimp per TE's application spec 114-13206
- Crimp tool: M22520/23-01
- Indenter head: M22520/23-04
- Locator: M22520/23-11

### Accessories

- Connector system locking kit available. (Contact TE)



### Applications

- Telecom equipment
- Automotive equipment
- Data communications
- Power distribution panels

TE has expanded the CORCOM product line with a new power inlet filter. Available in four levels of filtering and an unfiltered version, these inlets are designed to accept up to 60 amps of current at 150 volts DC (UL/CSA) and 120 volts DC (TUV) in the filtered versions and 300 volts AC or DC in the unfiltered version. Filtered versions include the basic clean-up DBJ style through the higher performing DB style and DBX style

which provides up to 68dB insertion loss within the 150kHz to 30Mhz frequency range. The DBF style uses feedthrough capacitors for improved high-frequency performance. Power input terminals are TE's #4 AWG ELCON "drawer style" contacts. The filters' load sides come prewired with #6 AWG hi-flex stranded wire. The unfiltered plugs and receptacles are available with pre-terminated, hi-flex wire of various lengths.

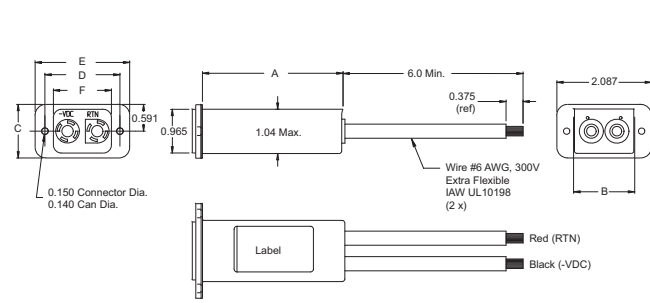
**Note: Tool required to disengage mated connector pair when using locking kit.**

**WARNING: This is not approved for hot swap or current interruption in DC applications. Doing so will result in irreparable damage to contact.**

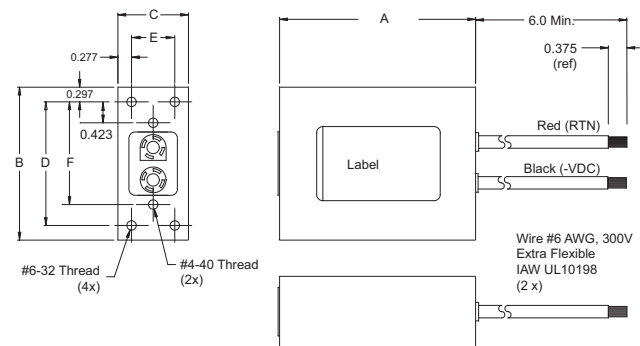
Note: All part numbers are RoHS compliant.



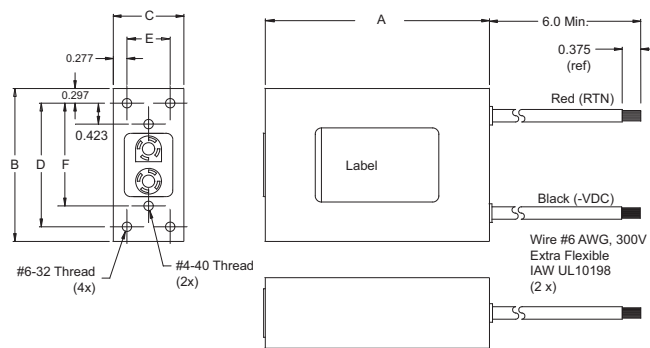
**CORCOM DB Products** (Continued)



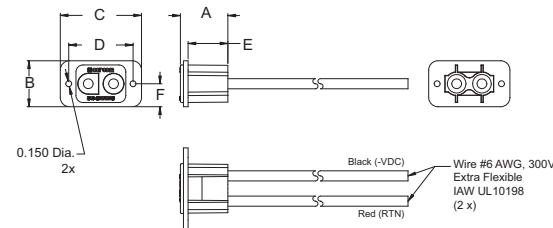
Part Number 60DBJ8



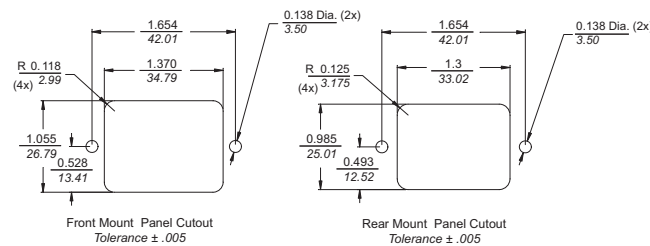
Part Number 60DB8 and 60DBF8



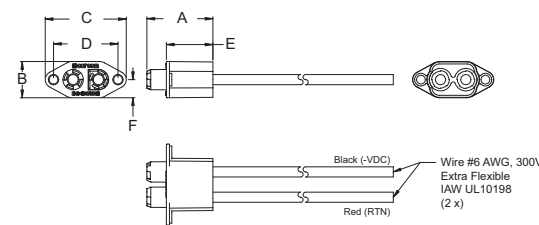
Part Number 60DBX8



Part Number 60DBRL



Part Number 60DBRL and 60DBJ8  
Panel Cutout



Part Number 60DBPL

AC Inputs

**Product Offering**

- Part Number 60DBR — Connector housing, receptacle with retention clips
- Part Number 60DBP — Connector housing, plug with retention clips
- Part Number 60DBPL1 — Mating connector plug terminated with 1 foot cable
- Part Number 60DBPL3 — Mating connector plug terminated with 3 foot cable
- Part Number 60DBPL9 — Mating connector plug terminated with 9 foot cable
- Part Number 60DBRL1 — Receptacle terminated with 1 foot cable
- Part Number 60DBRL3 — Receptacle terminated with 3 foot cable
- Part Number 60DBJ8 — Filter assembly with 6 inch wire leads
- Part Number 60DB8 — Filter assembly with conventional wire leaded capacitors
- Part Number 60DBF8 — Filter assembly with feedthrough capacitors
- Part Number 60DBX8 — High performance filter assembly

**Case Dimensions**

Part Number	Dimensions					
	A Max.	B Max.	C ±.025 ±0.635	D ±.025 ±0.635	E ±.025 ±0.635	F ±.025 ±0.635
60DBJ8	3.2	1.36	1.181	1.654	2.087	1.280
60DB8	4.06	3.20	1.45	2.50	.875	2.077
60DBF8	103.12	81.28	36.83	63.50	22.23	52.76
60DBX	6.06	3.50	1.45	2.876	.875	2.265
	153.92	88.90	36.83	73.05	22.23	57.53
60DBRL	1.22*	1.181*	2.087	1.654	1.023	.591
	30.98	29.99*	53.009	42.011	25.984	15.01
60DBPL	1.695*	.93*	2.08	1.654	1.195	.465
	43.05	23.62*	52.832	42.011	30.353	11.81

\* ±.025 [±0.635]

**WARNING:** This is not approved for hot swap or current interruption in DC applications. Doing so will result in irreparable damage to contact.

**Note:** All part numbers are RoHS compliant.

**CORCOM DB Products** (Continued)

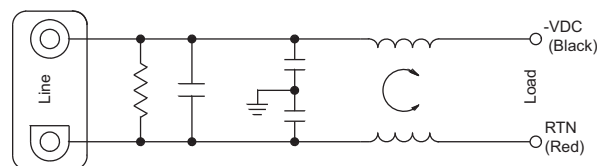
**Electrical Schematics**
**Line-to-ground in 50 ohm circuit (Frequency MHz)**

Part Number	0.01	0.015	0.5	1	5	10	20	30	50	100
60DBJ8	—	—	—	1	13	21	30	40	30	20

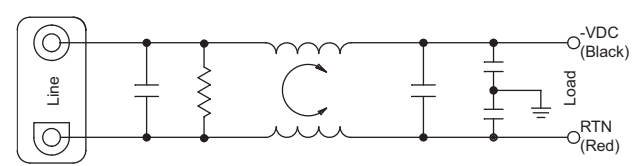
Part Number	0.05	0.1	0.15	0.5	1	3	5	10	20	30
60DB8	2	7	10	23	30	48	38	28	20	16
60DBF8	15	22	25	35	42	50	58	54	38	36
60DBX8	—	10	16	40	48	54	60	51	40	36

**Line-to-line in 50 ohm circuit (Frequency MHz)**

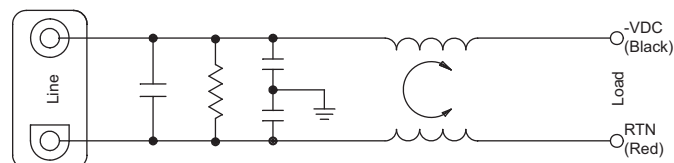
Part Number	0.05	0.1	0.15	0.5	1	3	5	10	20	30
60DBJ8	—	5	8	19	26	36	34	26	20	16
60DB8	20	26	29	43	53	30	30	24	20	18
60DBF8	9	15	18	30	34	40	44	44	48	52
60DBX8	31	30	30	70	70	54	50	60	54	50



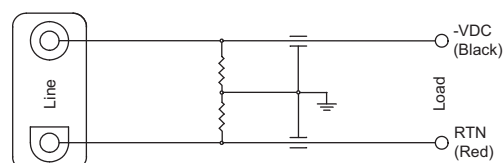
Part Number 60DBJ8



Part Number 60DBX8



Part Number 60DB8



Part Number 60DBF8

AC Inputs

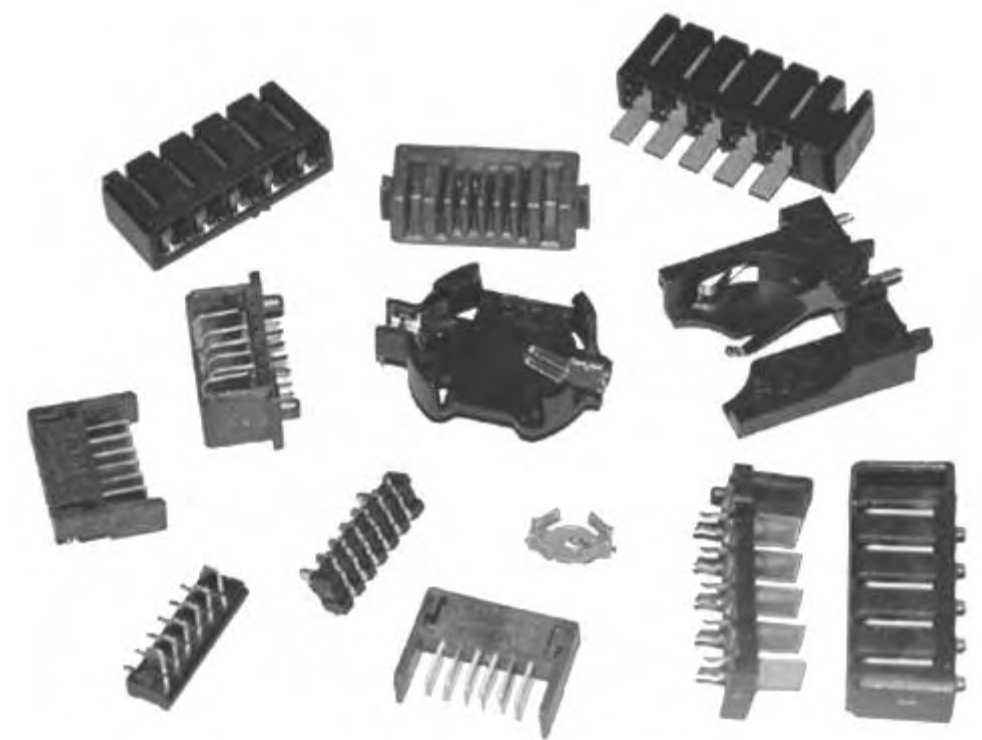
**WARNING:** This is not approved for hot swap or current interruption in DC applications. Doing so will result in irreparable damage to contact.

**Note:** All part numbers are RoHS compliant.

## Battery Interconnects

### Product Facts

- Total interface solution
- Current capacity — 7 Amps/ single contact at 30°C T-Rise
- Choice of right-angle or vertical mount headers with left, right or keyless polarization
- 5.0 mm pitch headers available for 7.2, 10.8, and 12.0 volt rechargeable batteries
- Receptacle connectors available with solder tails or weld tabs
- Consumer friendly mating/unmating of battery
- Produced under a Quality Management System certified to ISO 9001
- Blade Contacts for high durability
- Used Industry-wide for rechargeable battery I/O — in laptop computers
- Offered in a variety of key arrangements — for different voltage batteries
- 2.0 mm, 2.5 mm, 3.0 mm and 5.0 mm contact pitch batteries available
- MDI systems designed to mate at any angle
- Up to 7 Amps per contact
- Up to 2500 cycle durability
- Two pc tails per blade — for better current distribution



Since the introduction of the standard-size NiMH rechargeable battery to the computer and communications industries, TE has played a major role in the development and manufacture of reliable, high performance battery interconnect systems.

As the needs and applications of original equipment manufacturers have evolved, so have TE's battery interconnect systems. Today, we offer several types of connectors including:

- **Standard 5-position, 5.0 mm centerline assemblies**
- **Space efficient battery packs available at 2.0 mm, 2.5 mm, and 3.0 mm centerlines**

- **Multi-Directional Interconnection (MDI) systems**
- **Coin cell battery holders**

All battery interconnect assembly housings are made of high temperature, UL 94V-0 rated thermoplastic. Single contacts are rated at 7 Amps with a 30° T-Rise, and have an operating temperature rating of -30° to +70°C. These assemblies can be customized for various applications and are available with many keying and mounting options.

TE answers the need in the portable equipment market for a high density, robust, and versatile interconnection system with the Multi-

Directional Interconnection (MDI) System. This durable system, designed to permit mating/unmating at any angle between 0° and 90°, features AMP-DURAGOLD plated contacts for up to 2500 cycles.

Our coin-cell battery holders are ideal for a variety of electronic equipment needing a compact low wattage (typically less than 2 Watts) battery source. These holders are available in both horizontal and vertical mount. Surface-mount and re-flow compatible options are also ready to meet the newer PCB assembly requirements.

Laptops/Portables

## 2.0 mm Pitch Battery Assemblies

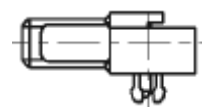
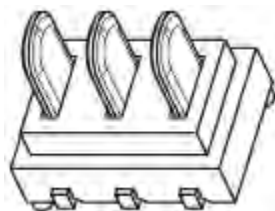
### 2.0 mm Pitch Plug Assemblies

#### Material and Finish

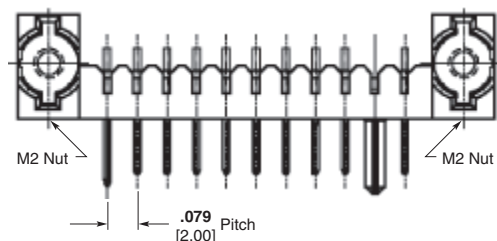
**Housing** — Black thermoplastic resin, UL 94V-0 rated

**Contacts** — High conductivity copper alloy, gold plating

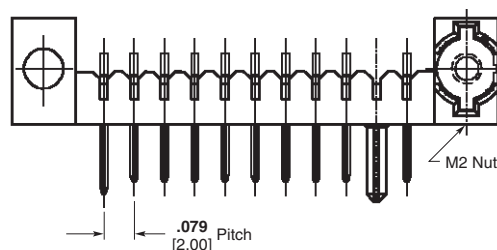
No. of Positions	Mount Type	Mount Angle	Part Number	Special Features
3	Surface-Mount	Vertical	1612898-1	
7	Through Hole	Right-Angle	1827654-1	Retention Leg
8	Through Hole	Right-Angle	1747785-1	
10	Surface-Mount	Vertical	2-1612962-3	Nut Plate (both sides)
	Surface-Mount	Vertical	1-1612962-3	
	Surface-Mount	Vertical	1717458-1	One side nut plate
	Through Hole	Right-Angle	1827501-1	



Retention Leg  
(Part Number 1827654-1 Feature)



2 mm Plug Assembly with Nut Plates



2 mm Plug Assembly with Nut Plate (One Side)

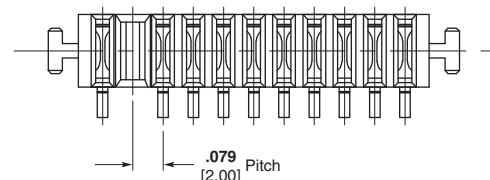
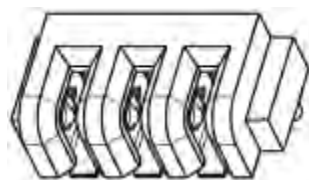
### 2.0 mm Pitch Receptacle Assemblies

#### Material and Finish

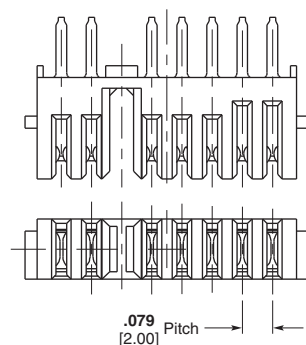
**Housing** — Black thermoplastic resin, UL 94V-0 rated

**Contacts** — High conductivity copper alloy, gold plating

No. of Positions	Mount Type	Mount Angle	Part Number
3	Surface-Mount	Vertical	1612901-1
7	Surface-Mount	Vertical	1827684-1
	Through Hole	Vertical	1827685-1
8	Surface-Mount	Vertical	1747786-1
10	Through Hole	Vertical	1612963-4
	Surface-Mount	Vertical	1612964-4



2.0 mm Receptacle Assembly,  
Surface-Mount



2.0 mm Receptacle Assembly,  
Through Hole Mount

**Note:** All part numbers are RoHS compliant. Tin-lead versions are available upon request.

## 2.0 mm Pitch Multi-Directional Interconnection (MDI) Systems

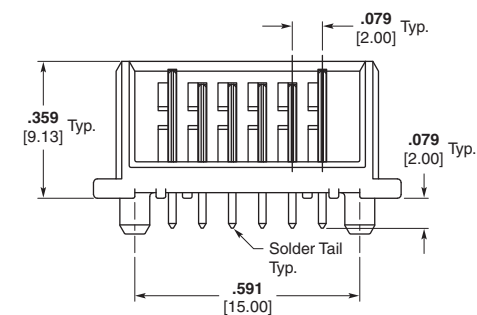
### 6-Position Multi-Directional Headers

#### Material and Finish

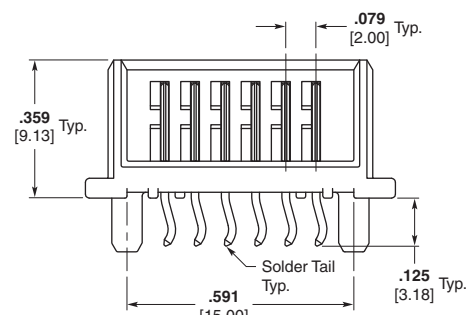
**Housing** — Black liquid crystal polymer, UL 94V-0 rated

**Contacts** — Brass, plated .000030 [0.00076] min. gold on mating area, .00015 [0.0038] min. tin on solder tail, all over .000050 [0.00127] min. nickel

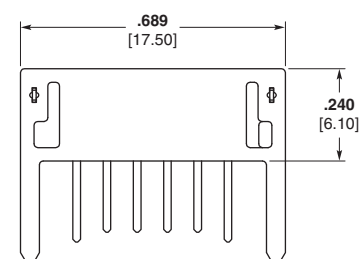
Mount Type	Boardlocks	Part Number	Special Features
Through Hole	With	5146877-1	Sequenced contacts
Retention Tails	Without	5787252-1	
Straight Solder		5787531-1	Sequenced contacts



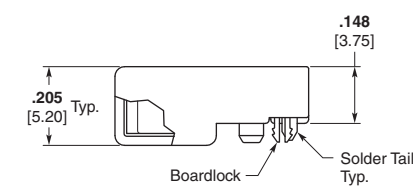
Part Number 5787531-1  
Straight Solder Tails



Part Number 5787252-1  
Below-the-Board Retention Tails



Part Number 5146877-1



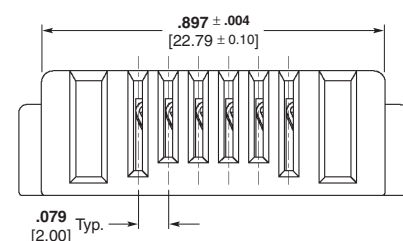
### 6-Position Multi-Directional Receptacles

#### Material and Finish

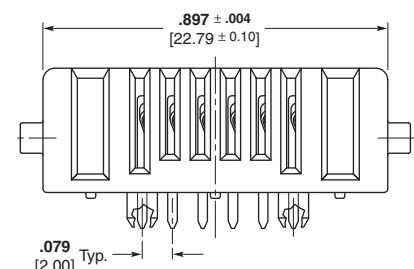
**Housing** — Black liquid crystal polymer, UL 94V-0 rated

**Contacts** — Phosphor bronze, plated .000030 [0.00076] min. gold on mating area, .00015 [0.0038] min. tin on solder tail, all over .000050 [0.00127] min. nickel

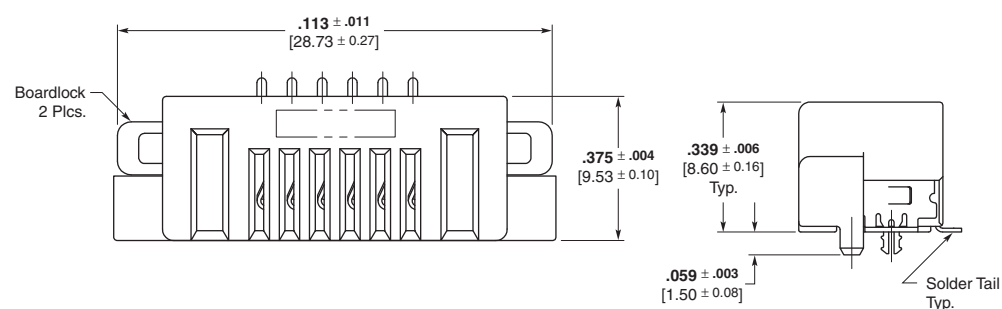
Mount Type	Boardlocks	Part Number
Surface-Mount	With	5787090-1
Through Hole	Without	5787253-1
		5787526-1



Part Number 5787253-1  
Through Hole Mount



Part Number 5787526-1  
Through Hole Mount



Part Number 5787090-1  
Surface-Mount with Boardlocks

Note: All part numbers are RoHS compliant.

Laptops/Portables

## 2.5 mm Pitch Battery Assemblies

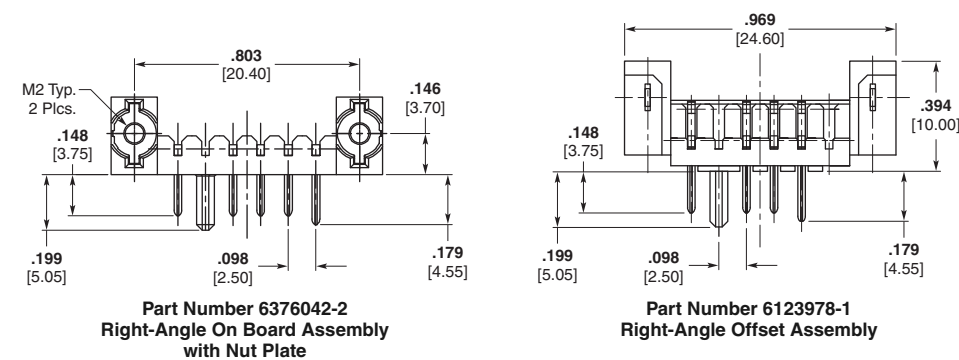
### 2.5 mm Pitch Plug Assemblies

#### Material and Finish

**Housing** — Black thermoplastic resin, UL 94V-0 rated

**Contacts** — High conductivity copper alloy, gold plating

No. of Positions	Mount Type	Mount Angle	Part Number	Special Features
4	Through Hole	Right-Angle Offset	6123987-1	M2 Nut Plate
	Through Hole	Right-Angle Offset	6123978-1	
5	Through Hole	Right-Angle On Board	6376042-2	M2 Nut Plate
	Through Hole	Right-Angle On Board	9-1612503-1	
	Through Hole	Right-Angle Offset	6318792-1	
6	Through Hole	Vertical	6473451-1	
	Through Hole	Right-Angle Offset	6318977-3	M2 Nut Plate
7	Through Hole	Right-Angle On Board	6318573-4	
	Through Hole	Right-Angle On Board	1747602-1	M2 Nut Plate
8	Through Hole	Right-Angle On Board	1717445-2	
	Through Hole	Right-Angle On Board	6123738-7	
10	Through Hole	Right-Angle On Board	1123822-7	M2 Nut Plate
	Through Hole	Right-Angle On Board	1123684-7	One Side M2 Nut Plate
	Through Hole	Right-Angle Offset	6473539-7	M2 Nut Plate



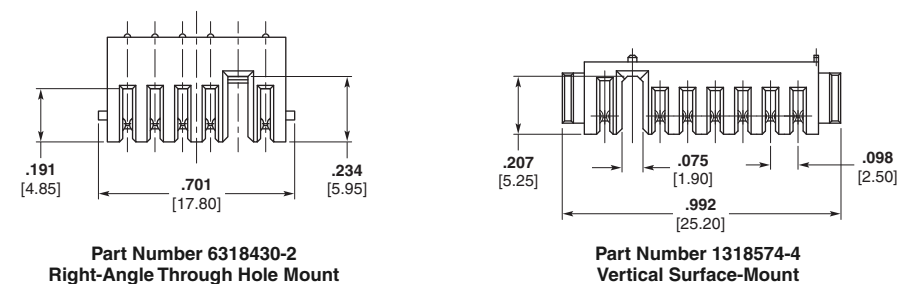
### 2.5 mm Pitch Receptacle Assemblies

#### Material and Finish

**Housing** — Black thermoplastic resin, UL 94V-0 rated

**Contacts** — High conductivity copper alloy, gold plating

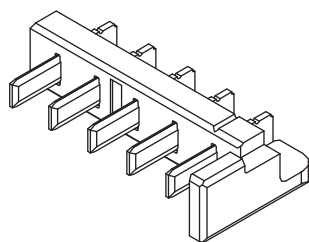
No. of Positions	Mount Type	Mount Angle	Part Number
4	Through Hole	Right-Angle	6123981-1
5	Through Hole	Right-Angle	6318430-2
	Surface-Mount	Right-Angle	1612504-1
6	Surface-Mount	Vertical	1123688-3
7	Surface-Mount	Vertical	1318574-4
8	Through Hole	Vertical	1717478-1
	Through Hole	Right-Angle	1717620-1
10	Surface-Mount	Vertical	1123688-7
	Through Hole	Vertical	1674231-1



Note: All part numbers are RoHS compliant.

### 5.0 mm Pitch Battery Plug Assemblies

#### 5.0 mm Pitch Right-Hand Key Plug Assemblies

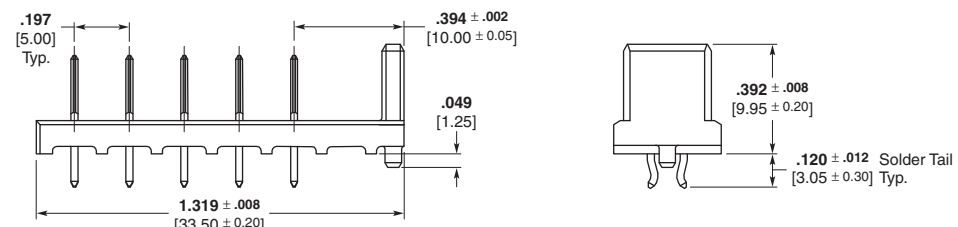


##### Material and Finish

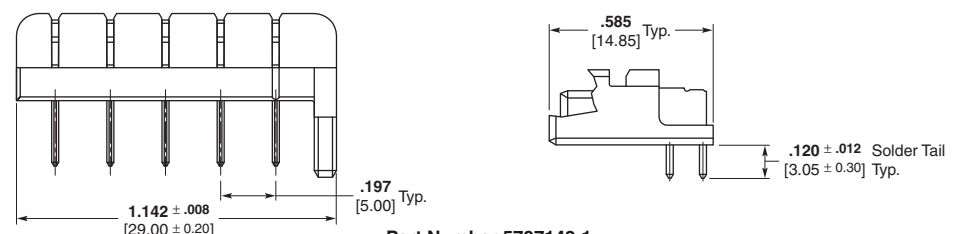
**Housing** — Polyphthalamide, UL 94V-0 rated, black

**Contacts** — Brass, plated .000100 [0.00254] min. tin on solder tail over .000075 [0.00190] min. nickel overall

Voltage	Mount Type	Mount Angle	Part Number
12.0	Retentive Solder	Right-Angle	5787424-1
	Straight Solder	Right-Angle	5787422-1
10.8	Straight Solder	Vertical	5787430-1
	Retentive Solder	Vertical	5787421-1
7.2	Straight Solder	Vertical	5787419-1
	Retentive Solder	Right-Angle	5787141-1
	Straight Solder	Vertical	5787334-1
	Straight Solder	Right-Angle	5787142-1

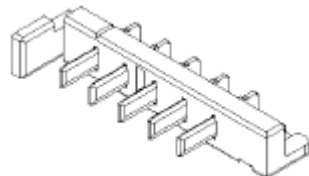


**Part Number 5787421-1**  
Vertical Assembly with Retentive Tails



**Part Number 5787142-1**  
Right-Angle Assembly with Straight Tails

#### 5.0 mm Pitch Left-Hand Key Plug Assemblies

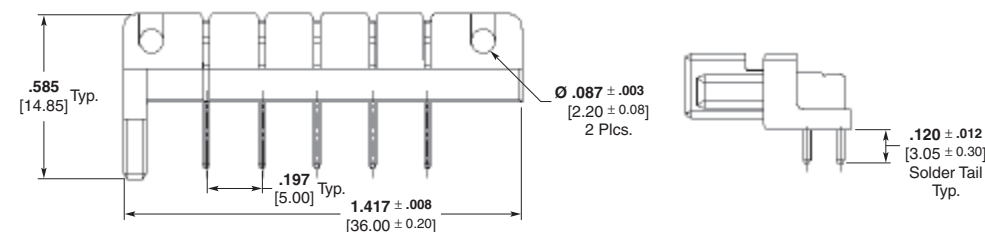


##### Material and Finish

**Housing** — Polyphthalamide, UL 94V-0 rated, black

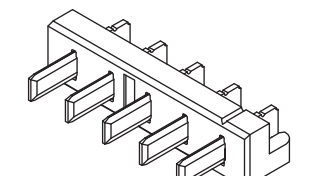
**Contacts** — Brass, plated .000100 [0.00254] min. tin on solder tail over .000075 [0.00190] min. nickel overall

Voltage	Mount Type	Mount Angle	Part Number	Special Features
12.0	Straight Solder	Right-Angle	5787428-1	Mounting Holes
10.8	Retentive Solder	Right-Angle	5787418-1	
	Straight Solder	Right-Angle	5787246-1	



**Part Number 5787428-1**  
Right-Angle Assembly with Mounting Holes

#### 5.0 mm Pitch Keyless Plug Assemblies

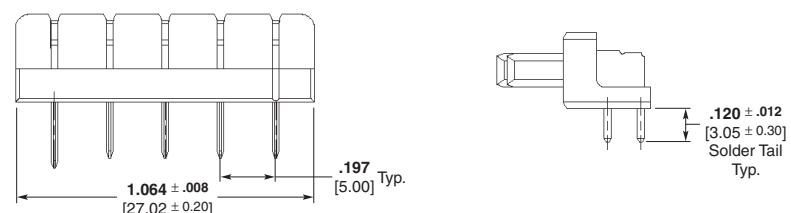


##### Material and Finish

**Housing** — Polyphthalamide, UL 94V-0 rated, black

**Contacts** — Brass, plated .000100 [0.00254] min. tin on solder tail over .000075 [0.00190] min. nickel overall

Voltage	Mount Type	Mount Angle	Part Number	Special Features
N/A	Straight Solder	Right-Angle	5787441-1	
	Retentive Solder	Right-Angle	5787443-1	
N/A	Straight Solder	Right-Angle	5796078-1	Sequenced Contacts
	Retentive Solder	Vertical	5787446-1	
	Straight Solder	Vertical	5787444-1	



**Part Number 5796078-1**  
Right-Angle Assembly with Straight Tails & Sequenced Contacts

**Note:** All part numbers are RoHS compliant.

Laptops/Portables

## 5.0 mm Pitch Battery Receptacle Assemblies

### 5.0 mm Pitch Right-Hand Key Receptacle Assemblies

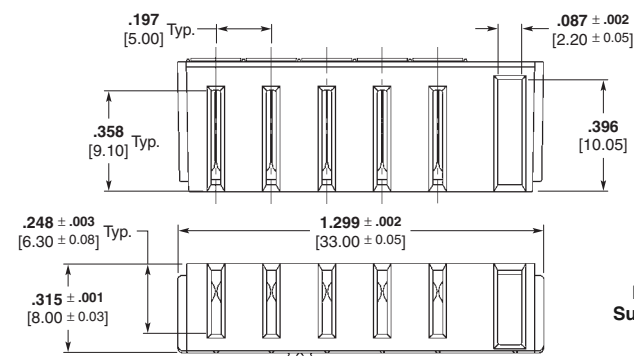
#### Material and Finish

**Housing** — Black polycarbonate, UL 94V-0 rated

**Contacts** — Copper alloy, plated .000075 [0.00190] min. nickel

Voltage	Mount Type	Part Number
12.0	Surface-Mount	787439-1
	Weld Tabs	787615-1
10.8	Weld Tabs	787614-1

**Note:** All receptacles include a dovetail locator.



Part Number 787439-1  
Surface-Mount Receptacle

### 5.0 mm Pitch Left-Hand Key Receptacle Assemblies

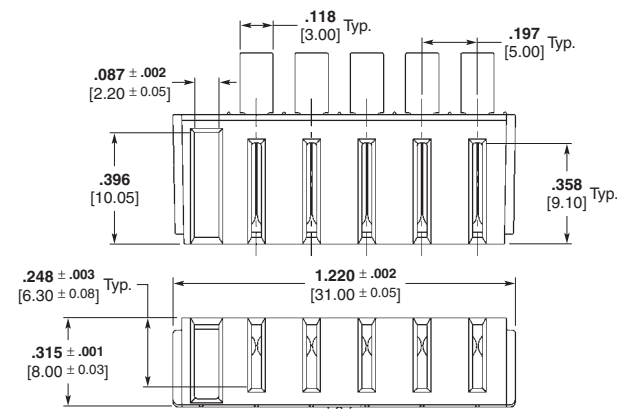
#### Material and Finish

**Housing** — Black polycarbonate, UL 94V-0 rated

**Contacts** — Copper alloy, plated .000075 [0.00190] min. nickel

Voltage	Mount Type	Part Number
7.2	Solder Tail	5787590-1
	Surface-Mount	787328-1
	Weld Tab	787613-1

**Note:** All receptacles include a dovetail locator.



Part Number 787613-1  
Weld Tab Receptacle

### 5.0 mm Pitch Keyless Receptacle Assemblies

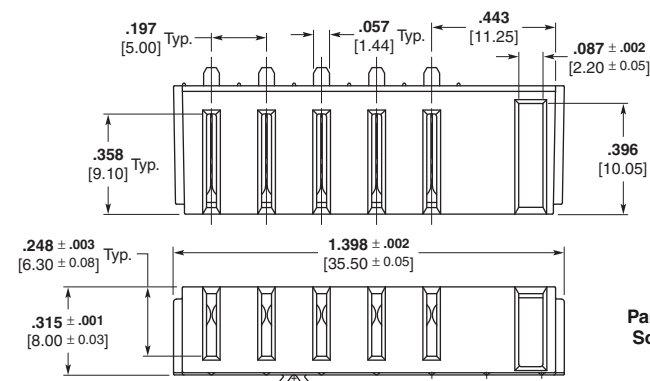
#### Material and Finish

**Housing** — Black polycarbonate, UL 94V-0 rated

**Contacts** — Copper alloy, plated .000075 [0.00190] min. nickel

Voltage	Mount Type	Part Number
N/A	Solder Tail	5787802-1
	Surface-Mount	146845-1

**Note:** All receptacles include a dovetail locator.



Part Number 5787802-1  
Solder Tail Receptacle

**Note:** All part numbers are RoHS compliant.

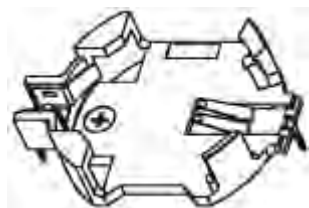


### Coin Cell Battery Holders

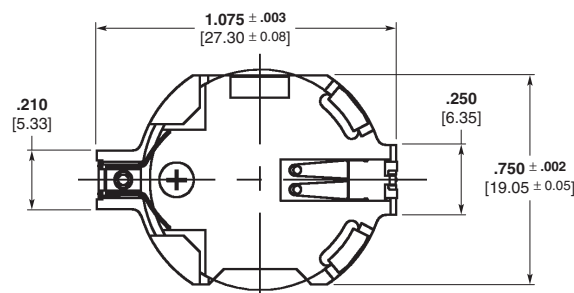
#### Horizontal Mount Battery Holders

##### Material and Finish

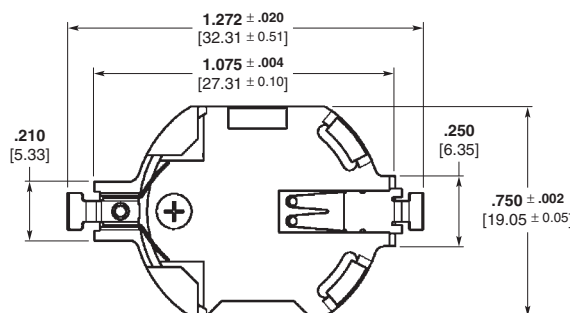
**Housing** — Black thermoplastic resin, UL 94V-0 rated



Mount Type	Part Number	Special Features
Surface-Mount	796136-1	
Through Hole	1734178-1	Flexible housing for easy removal
	120591-1	



Part Number 120591-1  
Through Hole Mount

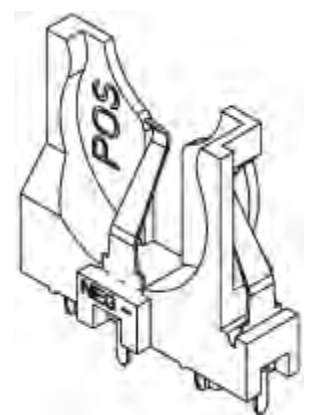


Part Number 796136-1  
Surface-Mount

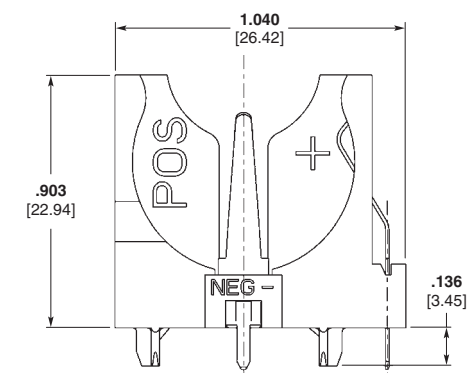
#### Vertical Mount Battery Holders

##### Material and Finish

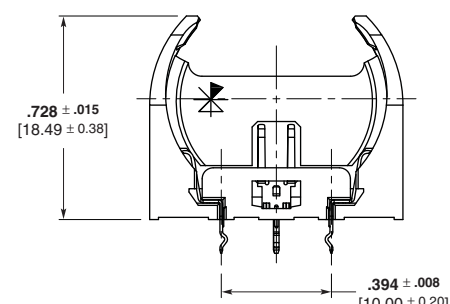
**Housing** — Black thermoplastic resin, UL 94V-0 rated



Mount Type	Part Number	Special Features
Through Hole	6339488-1	
	1775485-1	Low Profile



Part Number 6339488-1



Part Number 1775485-1  
Low Profile

**Note:** All part numbers are RoHS compliant.

Laptops/Portables

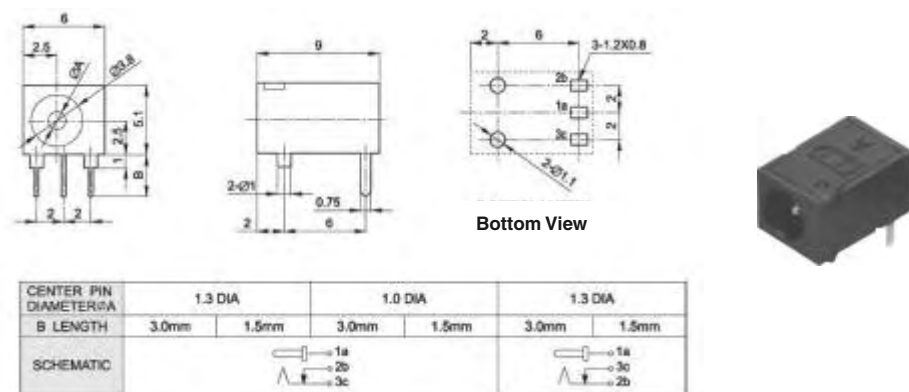


### DC Power Jacks (Continued)

#### Right-Angle DC Jacks Miniature Jacks

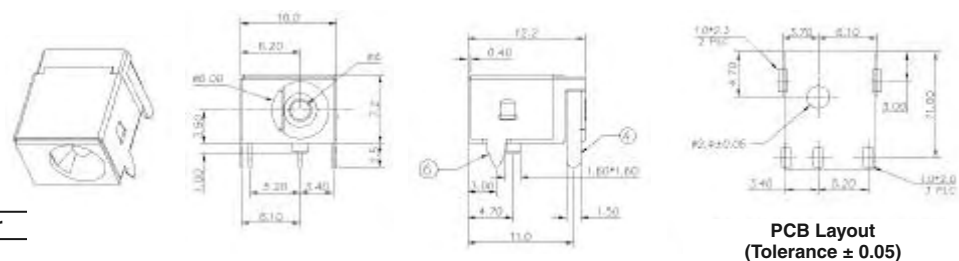
For specific part numbers, contact TE

Center Dia.	Tail Length	Part Number
1.30	3.00	1775529-1
	1.50	1775529-2
1.00	3.00	1-1775529-1
	1.50	1-1775529-2



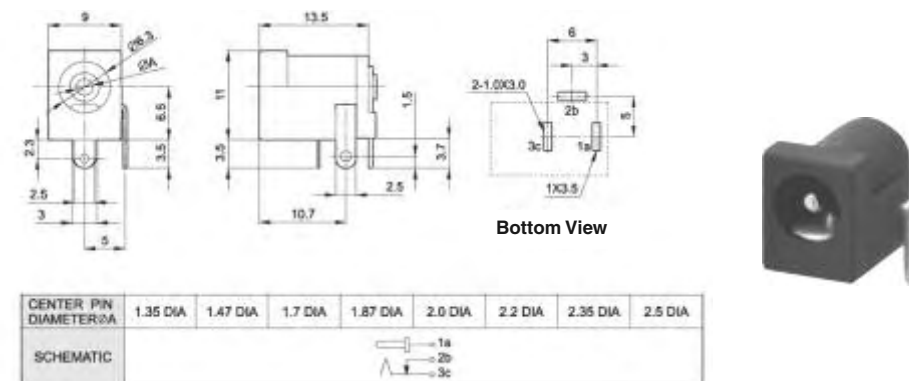
#### Shielded Jack

Dia. A	N.W. (g)	Part Number
2.0	1.8	1734894-1
2.5	2.0	1734894-2



#### Standard Jacks

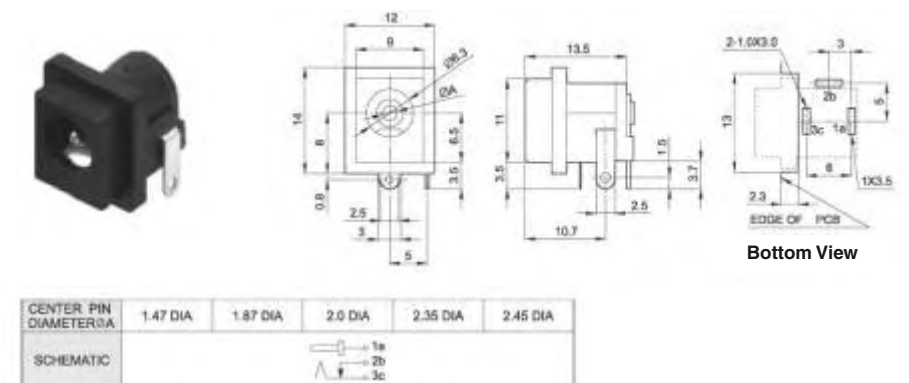
Center Diameter	Part Number
2.00	1775069-1
2.35	1775069-2
2.50	1775069-3



#### Standard Jack — Recessed Flange

For specific part numbers, contact TE

Center Diameter	Part Number
1.47	1775637-1
1.87	1775637-2
2.00	1775637-3
2.35	1775637-4
2.45	1775637-5



Note: All part numbers are RoHS compliant.

Laptops/Portables

### Custom Cable Assemblies



TE specializes in custom power cable assemblies for most applications. TE provides solutions using a wide array of connector styles and cable types, regardless of manufacturer.

TE currently supplies the major Original Equipment Manufacturers (OEM's),

with simple double-ended MATE-N-LOK assemblies, complex power harnesses, and even rugged mechanical line cords, to name a few.

If power distribution through cabling is what you need, TE engineering capabilities,

combined with global manufacturing and logistics are just the right combination to help you succeed. It is time you 'hooked up' with the leader in the power area, TE.

## Application Tooling



TE has long been recognized as a leader in providing the tools for wire harness and printed circuit manufacturing. Our products are designed to meet and anticipate our customers' ever-changing requirements and built to the highest quality standards, for longest, most productive performance lifetimes.

With a full range of tooling from hand tools to high volume, fully automated systems, TE is able to meet manufacturing demands worldwide. It's an ability that comes from our experience with manufacturers large and small, giving us a unique view of the trends and challenges in wire harness and PCB manufacturing. It all derives from our commitment to your manufacturing challenges, giving you the advantage in your marketplace.

**For technical support: Contact Tooling Assistance Center (TAC) at 800-722-1111 for applicator part numbers.**

**For sales support: Call 888-777-5917 or email: [toolingsales@te.com](mailto:toolingsales@te.com)**

Application Tooling

### Application Tooling — Hand Tools

#### CERTI-CRIMP Hand Tools

- Designed and manufactured to exacting specifications using the highest quality materials
- Ratchet control provides complete crimping cycle
- For most military, UL and CSA applications
- Calibrated; recalibration recommended every 6 months or 5,000 cycles
- Many SAHT and DAHT crimping heads, and many die sets, can be adapted for use with the Standard Die Envelope (SDE) System



#### Standard Die Envelope (SDE) System

The SDE System is a new approach to crimp die interchangeability. This flexibility in die options provides the capability to crimp a large variety of product types and wire sizes while using multiple application platforms from manual hand tools and electrical bench terminators to a portable battery-powered unit.



#### PRO-CRIMPER III Hand Tool

- Exceptional quality and performance at an affordable price
- Compatible with all SDE dies, with enhanced ergonomics, providing a thinner, more comfortable handle profile
- Precision stamping techniques permit close tolerance controls on critical parts



#### Battery Crimp Tool Kit, Part Number 1725837-1

- Compatible with all SDE dies
- Terminates wire range of 6-.03 mm<sup>2</sup> (10-22 AWG)
- Portable, 1.57kg (3.46lb) w/battery
- Kit includes tool, 2 batteries & charger (approx. 100 crimps per charge)



#### SDE Electric Terminator, Part Number 1490076-2

- SDE Electric Terminator, Part Number 1490076-2
- Compatible with all SDE dies
- Terminates wire range of 6-10 AWG
- Small footprint — 15.5 x 10 x 8" (390 x 260 x 220 mm); 29 lb (13kg)
- Foot actuated; Jog cycle; includes crimp adjustment



#### 6-26 Pneumatic Tool System

- Pneumatic powered; providing the ultimate in wire range flexibility
- Includes a jaw adapter compatible with SDE dies
- Available in hand or foot actuated versions, with ratchet control
- Also available in a number of integral die options that terminate up to #6 SOLISTRAND terminals



For technical support: Contact the Tooling Assistance Center (TAC) at 800-722-1111 for applicator part numbers.

For sales support: Call 888-777-5917 or email: [toolingsales@te.com](mailto:toolingsales@te.com)

Note: Part Numbers are RoHS compliant.

## Application Tooling — Semi-Automatic Machines

### AMP 3K/40 and 5K/40 Terminators

- 3,000 lb [1361 kg] max. crimp force (AMP-3K/40);  
5,000 lb [2268 kg] max. crimp force (AMP-5K/40)
- Tool-less removal of applicators and guards for quick and simple maintenance and product change over
- Jog capability
- Quiet and fast operation — 80/76 dBA and cycle time less than 0.400 seconds
- Accepts Heavy Duty Mini (HDM) style applicators
- Optional equipment includes tool-less precision crimp height adjust, batch counter, CQM capability and work light
- Universal electrical input — 100-240 VAC, 50/60 Hz



### Heavy-Duty Mini (HDM) Applicator

This is the standard TE applicator, accommodating most requirements for crimping TE and other terminals.

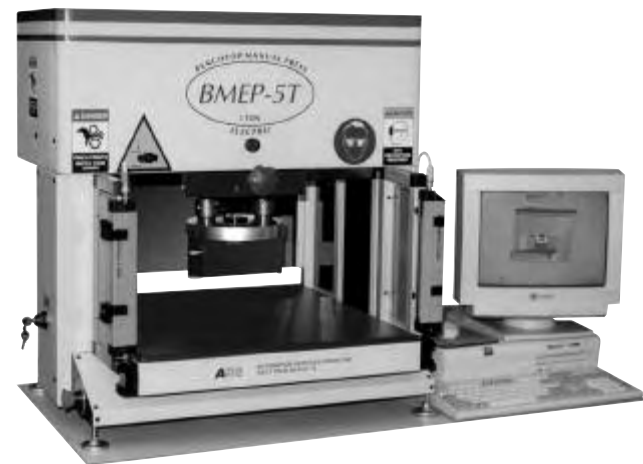
- Produces consistent, high quality terminations
- Fits TE terminator-style presses
- Hardware adjustment — English units
- Stroke 1.18 in. [30 mm] or 1.57 in. [40 mm]
- Fine adjust, pneumatic feed available
- Over 5,000 different designs to accommodate full range of over 13,000 terminals
- Custom designs available for nearly any terminal



### BMEP 3T / 5T Servo Electric Press

Benchtop electric press for the application of compliant pin products

- Servo electric press
- PCB capacity of 18" x 24" [460 mm x 610 mm]
- Press force capacity of 3 or 5 tons [27 or 44 kN]
- Ability to monitor and control force, distance and speed for every press cycle
- Full SPC data of every component pressed for quality assurance and traceability
- Database driven software for simple programming and automatic setup
- Small foot-print for low to medium volume product levels



Application Tooling

For technical support: Contact the Tooling Assistance Center (TAC) at 800-722-1111 for applicator part numbers.

For sales support: Call 888-777-5917 or email: [toolingsales@te.com](mailto:toolingsales@te.com)

Note: Part Numbers are RoHS compliant.

Wire Calculations and Instructions

### How to Compute Circular Mil Area of Various Wire Shapes

	U.S. Customary Dimensions	Metric Dimensions
<b>Stranded Wire AWG</b> 	Use Chart 1. Read circular mil area directly from table.  <b>Alternate Method</b> Multiply the diameter of one strand (in mils) by itself, and then multiply the result by the total number of strands. $CMA = D^2 \times N$	Use Chart 1. Read circular mil area directly from table.  <b>Alternate Method</b> Multiply the diameter of one strand in millimeters by itself, and then by the number of strands, and then by 1500.003. $CMA = D^2 \times N \times 1550.003$
<b>Round Solid Wire AWG</b> 	Use chart 1 or 2. Read circular mil area directly from table.  <b>Alternate Method</b> Multiply the diameter in mils by itself. $CMA = D^2$	Use chart 1 or 2. Read circular mil area directly from table.  <b>Alternate Method</b> Multiply the diameter in millimeters by itself by 1550.003. $CMA = D^2 \times 1550.003$
<b>Square or Rectangular Wire</b> 	Multiply the width of the wire cross section in mils by the thickness of the wire cross section in mils by 1.2732 and subtract the radius factor included below. $CMA = W \times T \times 1.2732 - \text{radius factor}$	Multiply the width of the wire cross section in millimeters by the thickness in millimeters by 1973.525 and subtract the radius factor included below. $CMA = W \times T \times 1973.525 - \text{radius factor}$

Conversion Table

To Convert From	To	Multiply By
CMA	mm <sup>2</sup>	0.0005067075
CMA	in <sup>2</sup>	0.000007854
mm <sup>2</sup>	in <sup>2</sup>	0.0015500030
mm <sup>2</sup>	CMA	1973.525

Radius Factor, U.S. Customary

Radius (in.)	Radius Factor To Subtract (CMA)
.010	110
.012	158
.016	280
.020	438
.026	740
.032	1121
.040	1752
.063	4346
.940	9675

Radius Factor, Metric

Radius (mm)	Radius Factor To Subtract (CMA)
0.25	106
0.30	153
0.35	208
0.40	272
0.50	424
0.60	611
0.80	1086
1.20	2444
0.94	9675



**How to Compute Circular Mil Area of Various Wire Shapes** (Continued)

Circular Mil Area (CMA) /  
Nominal Wire Sizes

CMA	Normal Wire Size		No.	Strands Diameter		Approximate Conductor Diameter	
	AWG	mm <sup>2</sup>		Inch	mm	Inch	mm
4.0	44	0.002	1	.00195	0.050	.002	0.051
16.0	38	0.008	1	.0040	0.102	.004	0.102
64.0	32	0.032	1	.0080	0.203	.008	0.203
175.0	28	0.089	7	.0050	0.127	.015	0.381
388	24	0.197	1	.0197	0.500	.020	0.508
397	24	0.201	10	.0063	0.160	.023	0.584
400	24	0.203	16	.0050	0.127	.023	0.584
400	24	0.203	4	.0100	0.254	.023	0.584
403	24	0.204	8	.0071	0.180	.023	0.584
634	22	0.321	8	.0089	0.226	.029	0.737
635	22	0.322	16	.0063	0.160	.029	0.737
640	22	0.324	10	.0080	0.203	.029	0.737
640	22	0.324	1	.0253	0.643	.025	0.635
992	20	0.503	1	.0315	0.800	.032	0.813
1000	20	0.507	10	.0100	0.254	.038	0.965
1008	20	0.511	20	.0071	0.180	.039	0.991
1024	20	0.519	16	.0080	0.203	.039	0.991
1600	18	0.811	16	.0100	0.254	.049	1.245
1608	18	0.815	19	.0092	0.234	.049	1.245
1617	18	0.819	7	.0152	0.386	.042	1.067
1624	18	0.823	1	.0403	1.024	.040	1.016
2521	16	1.277	50	.0071	0.180	.059	1.499
2540	16	1.287	16	.0126	0.320	.059	1.499
2581	16	1.308	1	.0508	1.290	.051	1.295
2800	16	1.419	7	.0200	0.508	.061	1.549
3831	14	1.941	19	.0142	0.361	.076	1.930
4099	14	2.077	7	.0242	0.615	.076	1.930
4109	14	2.082	1	.0641	1.628	.064	1.626
6503	12	3.295	19	.0185	0.470	.092	2.337
6512	12	3.300	7	.0305	0.775	.086	2.184
6529	12	3.308	1	.0808	2.052	.081	2.057
9072	10	4.597	7	.0360	0.914	.096	2.438
10080	10	5.108	1	.1004	2.550	.100	2.540
10404	10	5.272	19	.0234	0.594	.117	2.972
16512	8	8	1	.1285	3.260	.129	3.260
16533	8	8	7	.0486	1.230	.146	3.710
16535	8	8	19	.0295	0.750	.148	3.760
262218	6	13	7	.0612	1.550	.184	4.670
26244	6	13	1	.1620	4.110	.162	4.110
26292	6	15	19	.0372	0.940	.202	5.130
41616	4	21	1	.2040	5.182	.204	5.180
41718	4	21	7	.0772	1.961	.232	5.890
41792	4	21	19	.0469	1.191	.226	5.740
95509	0	50	19	.0709	1.800	.354	9.000
97610	0	50	396	.0157	0.400	.406	10.300
98409	0	50	702	.0118	0.300	.370	9.400

How To Compute Circular Mil Area

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**Engineering Notes**







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