

# MULTILAYER CERAMIC CHIP CAPACITORS

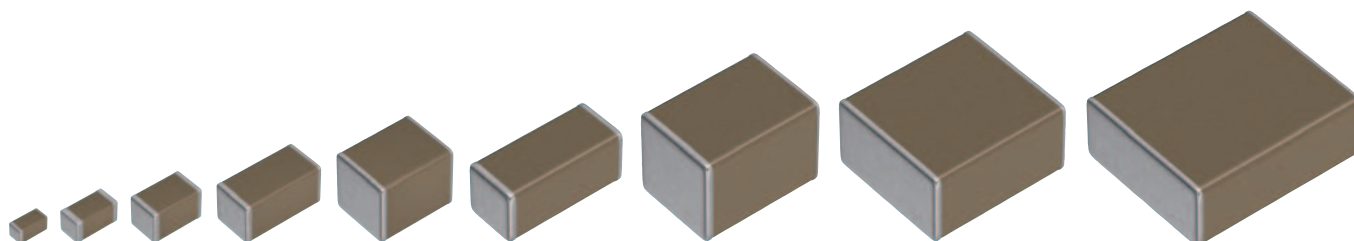
Automotive grade, soft termination

## CGA series

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|      |                  |
|------|------------------|
| CGA2 | 1005 [0402 inch] |
| CGA3 | 1608 [0603 inch] |
| CGA4 | 2012 [0805 inch] |
| CGA5 | 3216 [1206 inch] |
| CGA6 | 3225 [1210 inch] |
| CGA7 | 4520 [1808 inch] |
| CGA8 | 4532 [1812 inch] |
| CGA9 | 5750 [2220 inch] |
| CGAD | 7563 [3025 inch] |

\* Dimensions code: JIS[EIA]



# REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

## SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using this products.



### REMINDERS

- The products listed in this specification are intended for use in automotive applications under normal operation and usage conditions. The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality requires a more stringent level of safety or reliability, or whose failure, malfunction or defect could cause serious damage to society, person or property.

Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below or for any other use exceeding the range or conditions set forth in this specification sheet. If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in this specification, please contact us.

- |                                                                                      |                                                                              |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| (1) Aerospace/aviation equipment                                                     | (8) Public information-processing equipment                                  |
| (2) Transportation equipment (electric trains, ships, etc.)                          | (9) Military equipment                                                       |
| (3) Medical equipment (excepting Pharmaceutical Affairs Law classification Class1,2) | (10) Electric heating apparatus, burning equipment                           |
| (4) Power-generation control equipment                                               | (11) Disaster prevention/crime prevention equipment                          |
| (5) Atomic energy-related equipment                                                  | (12) Safety equipment                                                        |
| (6) Seabed equipment                                                                 | (13) Other applications that are not considered general-purpose applications |
| (7) Transportation control equipment                                                 |                                                                              |

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

In addition, although the products listed in this specification are intended for use in automotive applications as described above, they are not prohibited to use in general electronic equipment, whose performance and/or quality doesn't require a more stringent level of safety or reliability, or whose failure, malfunction or defect could not cause serious damage to society, person or property. Therefore, the description of this caution will be applied, when the products are used in general electronic equipment under a normal operation and usage conditions.

- We may modify products or discontinue production of a product listed in this catalog without prior notification.
- We provide "Delivery Specification" that explain precautions for the specifications and safety of each product listed in this catalog. We strongly recommend that you exchange these delivery specifications with customers that use one of these products.
- If you plan to export a product listed in this catalog, keep in mind that it may be a restricted item according to the "Foreign Exchange and Foreign Trade Control Law". In such cases, it is necessary to acquire export permission in harmony with this law.
- Any reproduction or transferring of the contents of this catalog is prohibited without prior permission from our company.
- We are not responsible for problems that occur related to the intellectual property rights or other rights of our company or a third party when you use a product listed in this catalog. We do not grant license of these rights.
- This catalog only applies to products purchased through our company or one of our company's official agencies. This catalog does not apply to products that are purchased through other third parties.

Notice: Effective January 2013, TDK will use a new catalog number which adds product thickness and packaging specification detail. This new catalog number should be referenced on all catalog orders going forward, and is not applicable for OEM part number orders.

Please be aware the last five digits of the catalog number will differ from the item description (internal control number) on the product label.

Contact your local TDK Sales representative for more information.

(Example)

| Catalog issued date    | Catalog number        | Item description (on delivery label) |
|------------------------|-----------------------|--------------------------------------|
| Prior to January 2013  | C1608C0G1E103J(080AA) | C1608C0G1E103JT000N                  |
| January 2013 and later | C1608C0G1E103J080AA   | C1608C0G1E103JT000N                  |

# CGA series

## Soft termination



Type: CGA2/1005 [0402 inch], CGA3/1608 [0603 inch], CGA4/2012 [0805 inch],  
CGA5/3216 [1206 inch], CGA6/3225 [1210 inch], CGA7/4520 [1808 inch],  
CGA8/4532 [1812 inch], CGA9/5750 [2220 inch], CGAD/7563 [3025 inch]

### SERIES OVERVIEW

Soft termination CGA series, automotive grade of TDK's multilayer ceramic chip capacitor, is a product incorporating a conductive resin layer into the terminal electrodes. The resin layer protects the ceramic body from cracks by relieving stress caused by thermal shock and board flexure.

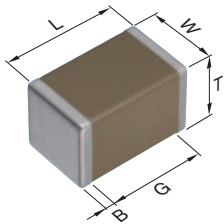
### FEATURES

- High resistance to mechanical stress and thermal shock by resin layers
- X8R and X8L type whose maximum temperature are up to 150°C are available
- C0G type having excellent stable temperature and DC-bias characteristics is also available
- AEC-Q200 compliant

### APPLICATIONS

- Fail-safe design for battery line
- Prevention of ceramic element crack by board bending
- Prevention of solder crack by thermal shock
- Equipment such as mobile devices and smart key having a high possibility of drop

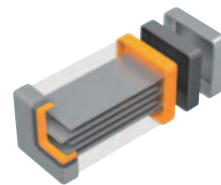
### SHAPE & DIMENSIONS



|   |                  |
|---|------------------|
| L | Body length      |
| W | Body width       |
| T | Body height      |
| B | Terminal width   |
| G | Terminal spacing |

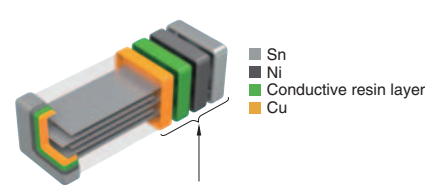
### TERMINAL ELECTRODE STRUCTURES

General type



3-layer structure of Cu, Ni and Sn.

Soft termination



4-layer structure including conductive resin layer.

Dimensions in mm

| Type | L               | W               | T               | B         | G         |
|------|-----------------|-----------------|-----------------|-----------|-----------|
| CGA2 | 1.00+0.15,-0.05 | 0.50+0.10,-0.05 | 0.50+0.10,-0.05 | 0.10 min. | 0.30 min. |
| CGA3 | 1.60+0.20,-0.10 | 0.80+0.15,-0.10 | 0.80+0.15,-0.10 | 0.20 min. | 0.30 min. |
| CGA4 | 2.00+0.45,-0.20 | 1.25+0.25,-0.20 | 1.25+0.25,-0.20 | 0.20 min. | 0.50 min. |
| CGA5 | 3.20+0.40,-0.20 | 1.60+0.30,-0.20 | 1.60+0.30,-0.20 | 0.20 min. | 1.00 min. |
| CGA6 | 3.20+0.50,-0.40 | 2.50±0.30       | 2.50±0.30       | 0.20 min. | —         |
| CGA7 | 4.50+0.50,-0.40 | 2.00+0.30,-0.20 | 1.30±0.20       | 0.20 min. | —         |
| CGA8 | 4.50+0.50,-0.40 | 3.20±0.40       | 2.50±0.30       | 0.20 min. | —         |
| CGA9 | 5.70+0.50,-0.40 | 5.00±0.40       | 2.50±0.30       | 0.20 min. | —         |
| CGAD | 7.50±0.50       | 6.30±0.50       | 2.50 max.       | 0.30 min. | —         |

\*Dimensional tolerances are typical values.

# MULTILAYER CERAMIC CHIP CAPACITORS



## CATALOG NUMBER CONSTRUCTION

| CGA | 6   | P   | 3   | X7R | 1E  | 226 | M   | 250 | A    | E    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |

### (1) Series

### (2) Dimensions L x W (mm)

| Code | EIA    | Length | Width | Terminal width |
|------|--------|--------|-------|----------------|
| 2    | CC0402 | 1.00   | 0.50  | 0.10           |
| 3    | CC0603 | 1.60   | 0.80  | 0.20           |
| 4    | CC0805 | 2.00   | 1.25  | 0.20           |
| 5    | CC1206 | 3.20   | 1.60  | 0.20           |
| 6    | CC1210 | 3.20   | 2.50  | 0.20           |
| 7    | CC1808 | 4.50   | 2.00  | 0.20           |
| 8    | CC1812 | 4.50   | 3.20  | 0.20           |
| 9    | CC2220 | 5.70   | 5.00  | 0.20           |
| D    | CC3025 | 7.50   | 6.30  | 0.30           |

### (3) Thickness code

| Code | Thickness |
|------|-----------|
| B    | 0.50 mm   |
| C    | 0.60 mm   |
| E    | 0.80 mm   |
| F    | 0.85 mm   |
| H    | 1.15 mm   |
| J    | 1.25 mm   |
| K    | 1.30 mm   |
| L    | 1.60 mm   |
| M    | 2.00 mm   |
| N    | 2.30 mm   |
| P    | 2.50 mm   |

### (4) Voltage condition for life test

| Symbol | Condition  |
|--------|------------|
| 1      | 1 × R.V.   |
| 2      | 2 × R.V.   |
| 3      | 1.5 × R.V. |
| 4      | 1.2 × R.V. |

### (5) Temperature characteristics

| Temperature characteristics | Temperature coefficient or capacitance change | Temperature range |
|-----------------------------|-----------------------------------------------|-------------------|
| C0G                         | 0±30 ppm/°C                                   | -55 to +125°C     |
| X7R                         | ±15%                                          | -55 to +125°C     |
| X7S                         | ±22%                                          | -55 to +125°C     |
| X7T                         | +22,-33%                                      | -55 to +125°C     |
| X8R                         | ±15%                                          | -55 to +150°C     |
| X8L                         | +15, -40%                                     | -55 to +150°C     |

### (6) Rated voltage (DC)

| Code | Voltage (DC) |
|------|--------------|
| 0J   | 6.3V         |
| 1A   | 10V          |
| 1C   | 16V          |
| 1E   | 25V          |
| 1V   | 35V          |
| 1H   | 50V          |
| 2A   | 100V         |
| 2E   | 250V         |
| 2W   | 450V         |
| 2J   | 630V         |
| 3A   | 1000V        |
| 3D   | 2000V        |
| 3F   | 3000V        |

### (7) Nominal capacitance (pF)

The capacitance is expressed in three digit codes and in units of pico Farads (pF). The first and second digits identify the first and second significant figures of the capacitance. The third digit identifies the multiplier. R designates a decimal point.

(Example) 0R5 = 0.5pF

101 = 100pF

225 = 2,200,000pF = 2.2μF

### (8) Capacitance tolerance

| Code | Tolerance |
|------|-----------|
| J    | ±5%       |
| K    | ±10%      |
| M    | ±20%      |

### (9) Thickness

| Code | Thickness |
|------|-----------|
| 050  | 0.50 mm   |
| 060  | 0.60 mm   |
| 080  | 0.80 mm   |
| 085  | 0.85 mm   |
| 115  | 1.15 mm   |
| 125  | 1.25 mm   |
| 130  | 1.30 mm   |
| 160  | 1.60 mm   |
| 200  | 2.00 mm   |
| 230  | 2.30 mm   |
| 250  | 2.50 mm   |

### (10) Packaging style

| Code | Style                  |
|------|------------------------|
| A    | 178mm reel, 4mm pitch  |
| B    | 178mm reel, 2mm pitch  |
| K    | 178mm reel, 8mm pitch  |
| L    | 330mm reel, 12mm pitch |

### (11) Special reserved code

| Code | Description      |
|------|------------------|
| E    | Soft termination |

## Capacitance range chart

CGA2/1005 [0402 inch]

| Capacitance |      | C0G          |             | X7R         |             |             |             | X7S         |             | X8R          |             |             |             |
|-------------|------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
| (pF)        | Code | 2A<br>(100V) | 1H<br>(50V) | 1H<br>(50V) | 1V<br>(35V) | 1E<br>(25V) | 1C<br>(16V) | 1C<br>(16V) | 1A<br>(10V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) |
| 100         | 101  |              |             |             |             |             |             |             |             |              |             |             |             |
| 150         | 151  |              |             |             |             |             |             |             |             |              |             |             |             |
| 220         | 221  |              |             |             |             |             |             |             |             |              |             |             |             |
| 330         | 331  |              |             |             |             |             |             |             |             |              |             |             |             |
| 470         | 471  |              |             |             |             |             |             |             |             |              |             |             |             |
| 680         | 681  |              |             |             |             |             |             |             |             |              |             |             |             |
| 1,000       | 102  |              |             |             |             |             |             |             |             |              |             |             |             |
| 1,500       | 152  |              |             |             |             |             |             |             |             |              |             |             |             |
| 2,200       | 222  |              |             |             |             |             |             |             |             |              |             |             |             |
| 3,300       | 332  |              |             |             |             |             |             |             |             |              |             |             |             |
| 4,700       | 472  |              |             |             |             |             |             |             |             |              |             |             |             |
| 6,800       | 682  |              |             |             |             |             |             |             |             |              |             |             |             |
| 10,000      | 103  |              |             |             |             |             |             |             |             |              |             |             |             |
| 15,000      | 153  |              |             |             |             |             |             |             |             |              |             |             |             |
| 22,000      | 223  |              |             |             |             |             |             |             |             |              |             |             |             |
| 33,000      | 333  |              |             |             |             |             |             |             |             |              |             |             |             |
| 47,000      | 473  |              |             |             |             |             |             |             |             |              |             |             |             |
| 100,000     | 104  |              |             |             |             |             |             |             |             |              |             |             |             |
| 220,000     | 224  |              |             |             |             |             |             |             |             |              |             |             |             |
| 470,000     | 474  |              |             |             |             |             |             |             |             |              |             |             |             |

Standard thickness 0.50 mm

Background gray: These products are not recommended for new designs.

For details such as the catalog numbers, please refer to the capacitance range table on page 11 and after.

## Capacitance range chart

CGA3/1608 [0603 inch]

| Capacitance |      | C0G          |              |             | X7R          |             |             |             | X7S          |             |             | X8R          |             |             |             |
|-------------|------|--------------|--------------|-------------|--------------|-------------|-------------|-------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|
| (pF)        | Code | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 2A<br>(100V) | 1H<br>(50V) | 1V<br>(35V) | 1E<br>(25V) | 2A<br>(100V) | 1C<br>(16V) | 1A<br>(10V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) |
| 100         | 101  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 330         | 331  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 470         | 471  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 680         | 681  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 1,000       | 102  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 1,200       | 122  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 1,500       | 152  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 1,800       | 182  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 2,200       | 222  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 2,700       | 272  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 3,300       | 332  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 3,900       | 392  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 4,700       | 472  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 5,600       | 562  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 6,800       | 682  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 8,200       | 822  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 10,000      | 103  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 15,000      | 153  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 22,000      | 223  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 33,000      | 333  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 47,000      | 473  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 68,000      | 683  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 100,000     | 104  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 150,000     | 154  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 220,000     | 224  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 330,000     | 334  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 470,000     | 474  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 1,000,000   | 105  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |
| 2,200,000   | 225  |              |              |             |              |             |             |             |              |             |             |              |             |             |             |

Standard thickness  0.8 mm Background gray: These products are not recommended for new designs. For details such as the catalog numbers, please refer to the capacitance range table on page 11 and after.

## Capacitance range chart

CGA4/2012 [0805 inch]

| Capacitance |      | C0G          |              |              |             | X7R          |              |             |             |             |             | X7S          |             |             |             |
|-------------|------|--------------|--------------|--------------|-------------|--------------|--------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
| (pF)        | Code | 2W<br>(450V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 1V<br>(35V) | 1E<br>(25V) | 1C<br>(16V) | 2A<br>(100V) | 1E<br>(25V) | 1C<br>(16V) | 1A<br>(10V) |
| 100         | 101  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 150         | 151  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 220         | 221  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 330         | 331  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 470         | 471  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 680         | 681  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 1,000       | 102  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 1,200       | 122  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 1,500       | 152  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 1,800       | 182  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 2,200       | 222  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 2,700       | 272  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 3,300       | 332  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 3,900       | 392  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 4,700       | 472  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 5,600       | 562  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 6,800       | 682  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 10,000      | 103  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 15,000      | 153  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 22,000      | 223  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 33,000      | 333  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 47,000      | 473  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 100,000     | 104  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 220,000     | 224  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 470,000     | 474  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 1,000,000   | 105  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 2,200,000   | 225  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 4,700,000   | 475  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |
| 10,000,000  | 106  |              |              |              |             |              |              |             |             |             |             |              |             |             |             |

| Capacitance |      | X7T          |              | X8R          |             |             |             | X8L         |             |             |             |
|-------------|------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| (pF)        | Code | 2W<br>(450V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 1H<br>(50V) | 1V<br>(35V) | 1E<br>(25V) | 1A<br>(10V) |
| 10,000      | 103  |              |              |              |             |             |             |             |             |             |             |
| 22,000      | 223  |              |              |              |             |             |             |             |             |             |             |
| 33,000      | 333  |              |              |              |             |             |             |             |             |             |             |
| 47,000      | 473  |              |              |              |             |             |             |             |             |             |             |
| 68,000      | 683  |              |              |              |             |             |             |             |             |             |             |
| 100,000     | 104  |              |              |              |             |             |             |             |             |             |             |
| 150,000     | 154  |              |              |              |             |             |             |             |             |             |             |
| 220,000     | 224  |              |              |              |             |             |             |             |             |             |             |
| 330,000     | 334  |              |              |              |             |             |             |             |             |             |             |
| 470,000     | 474  |              |              |              |             |             |             |             |             |             |             |
| 680,000     | 684  |              |              |              |             |             |             |             |             |             |             |
| 1,000,000   | 105  |              |              |              |             |             |             |             |             |             |             |
| 2,200,000   | 225  |              |              |              |             |             |             |             |             |             |             |
| 4,700,000   | 475  |              |              |              |             |             |             |             |             |             |             |
| 10,000,000  | 106  |              |              |              |             |             |             |             |             |             |             |

Standard thickness    0.60 mm    0.85 mm    1.25 mm

Background gray: These products are not recommended for new designs.

For details such as the catalog numbers, please refer to the capacitance range table on page 11 and after.

## Capacitance range chart

## CGA5/3216 [1206 inch]

| Capacitance |      | C0G          |              |              |              |             | X7R          |              |              |             |             |             |              | X7S          |
|-------------|------|--------------|--------------|--------------|--------------|-------------|--------------|--------------|--------------|-------------|-------------|-------------|--------------|--------------|
| (pF)        | Code | 2J<br>(630V) | 2W<br>(450V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 2J<br>(630V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 1V<br>(35V) | 1E<br>(25V) | 0J<br>(6.3V) | 2A<br>(100V) |
| 1,000       | 102  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 2,200       | 222  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 3,300       | 332  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 3,900       | 392  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 4,700       | 472  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 5,600       | 562  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 6,800       | 682  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 8,200       | 822  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 10,000      | 103  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 15,000      | 153  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 22,000      | 223  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 33,000      | 333  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 47,000      | 473  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 68,000      | 683  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 100,000     | 104  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 220,000     | 224  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 470,000     | 474  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 1,000,000   | 105  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 2,200,000   | 225  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 4,700,000   | 475  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 10,000,000  | 106  |              |              |              |              |             |              |              |              |             |             |             |              |              |
| 22,000,000  | 226  |              |              |              |              |             |              |              |              |             |             |             |              |              |

| Capacitance |      | X7T          |              |              | X8R          |             |             |             | X8L         |
|-------------|------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|
| (pF)        | Code | 2J<br>(630V) | 2W<br>(450V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 1E<br>(25V) |
| 47,000      | 473  |              |              |              |              |             |             |             |             |
| 100,000     | 104  |              |              |              |              |             |             |             |             |
| 150,000     | 154  |              |              |              |              |             |             |             |             |
| 220,000     | 224  |              |              |              |              |             |             |             |             |
| 330,000     | 334  |              |              |              |              |             |             |             |             |
| 470,000     | 474  |              |              |              |              |             |             |             |             |
| 680,000     | 684  |              |              |              |              |             |             |             |             |
| 1,000,000   | 105  |              |              |              |              |             |             |             |             |
| 1,500,000   | 155  |              |              |              |              |             |             |             |             |
| 2,200,000   | 225  |              |              |              |              |             |             |             |             |
| 3,300,000   | 335  |              |              |              |              |             |             |             |             |
| 4,700,000   | 475  |              |              |              |              |             |             |             |             |
| 10,000,000  | 106  |              |              |              |              |             |             |             |             |

Standard thickness 0.85 mm 1.15 mm 1.30 mm 1.60 mm

Background gray: These products are not recommended for new designs.

■ For details such as the catalog numbers, please refer to the capacitance range table on page 11 and after.



## Capacitance range chart

CGA6/3225 [1210 inch]

| Capacitance |      | C0G         |              |              |              |              | X7R          |              |              |             |             | X7S          |             | X7T          |              |              |
|-------------|------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|-------------|--------------|-------------|--------------|--------------|--------------|
| (pF)        | Code | 3A<br>(1kV) | 2J<br>(630V) | 2W<br>(450V) | 2E<br>(250V) | 2A<br>(100V) | 2J<br>(630V) | 2E<br>(250V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 2A<br>(100V) | 1H<br>(50V) | 2J<br>(630V) | 2W<br>(450V) | 2E<br>(250V) |
| 1,000       | 102  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 1,200       | 122  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 1,500       | 152  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 1,800       | 182  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 2,200       | 222  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 2,700       | 272  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 3,300       | 332  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 3,900       | 392  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 4,700       | 472  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 5,600       | 562  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 6,800       | 682  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 8,200       | 822  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 15,000      | 153  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 22,000      | 223  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 33,000      | 333  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 47,000      | 473  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 68,000      | 683  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 100,000     | 104  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 150,000     | 154  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 220,000     | 224  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 330,000     | 334  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 470,000     | 474  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 1,000,000   | 105  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 2,200,000   | 225  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 3,300,000   | 335  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 4,700,000   | 475  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 10,000,000  | 106  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |
| 22,000,000  | 226  |             |              |              |              |              |              |              |              |             |             |              |             |              |              |              |

| Capacitance |      | X8R          |             |             |
|-------------|------|--------------|-------------|-------------|
| (pF)        | Code | 2A<br>(100V) | 1E<br>(25V) | 1C<br>(16V) |
| 470,000     | 474  |              |             |             |
| 680,000     | 684  |              |             |             |
| 3,300,000   | 335  |              |             |             |
| 4,700,000   | 475  |              |             |             |
| 10,000,000  | 106  |              |             |             |

Standard thickness    1.60 mm    2.00 mm    2.30 mm    2.50 mm

■ For details such as the catalog numbers, please refer to the capacitance range table on page 11 and after.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range chart

CGA7/4520 [1808 inch]

| Capacitance |      | X7R         |
|-------------|------|-------------|
| (pF)        | Code | 3D<br>(2kV) |
| 1,000       | 102  |             |

Standard thickness

1.30 mm

■ For details such as the catalog numbers, please refer to the capacitance range table on page 11 and after.

## Capacitance range chart

CGA8/4532 [1812 inch]

| Capacitance |      | C0G         |              | X7R         |              |              | X7T          |              |              |
|-------------|------|-------------|--------------|-------------|--------------|--------------|--------------|--------------|--------------|
| (pF)        | Code | 3F<br>(3kV) | 2J<br>(630V) | 3D<br>(2kV) | 2J<br>(630V) | 2E<br>(250V) | 2J<br>(630V) | 2W<br>(450V) | 2E<br>(250V) |
| 330         | 331  |             |              |             |              |              |              |              |              |
| 2,200       | 222  |             |              |             |              |              |              |              |              |
| 33,000      | 333  |             |              |             |              |              |              |              |              |
| 100,000     | 104  |             |              |             |              |              |              |              |              |
| 220,000     | 224  |             |              |             |              |              |              |              |              |
| 470,000     | 474  |             |              |             |              |              |              |              |              |
| 1,000,000   | 105  |             |              |             |              |              |              |              |              |

Standard thickness 1.30 mm 2.00 mm 2.30 mm 2.50 mm

■ For details such as the catalog numbers, please refer to the capacitance range table on page 11 and after.

## Capacitance range chart

CGA9/5750 [2220 inch]

| Capacitance |      | C0G          |              |              | X7R          |              | X7S          | X7T          |              |              |
|-------------|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| (pF)        | Code | 2J<br>(630V) | 2E<br>(250V) | 2A<br>(100V) | 2J<br>(630V) | 2E<br>(250V) | 2A<br>(100V) | 2J<br>(630V) | 2W<br>(450V) | 2E<br>(250V) |
| 68,000      | 683  |              |              |              |              |              |              |              |              |              |
| 150,000     | 154  |              |              |              |              |              |              |              |              |              |
| 220,000     | 224  |              |              |              |              |              |              |              |              |              |
| 470,000     | 474  |              |              |              |              |              |              |              |              |              |
| 1,000,000   | 105  |              |              |              |              |              |              |              |              |              |
| 2,200,000   | 225  |              |              |              |              |              |              |              |              |              |
| 10,000,000  | 106  |              |              |              |              |              |              |              |              |              |

Standard thickness 2.30 mm 2.50 mm

■ For details such as the catalog numbers, please refer to the capacitance range table on page 11 and after.

## Capacitance range chart

CGAD/7563 [3025 inch]

| Capacitance |      | X7R         |
|-------------|------|-------------|
| (pF)        | Code | 1E<br>(25V) |
| 47,000,000  | 476  |             |

Standard thickness

2.30 mm

■ For details such as the catalog numbers, please refer to the capacitance range table on page 11 and after.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: C0G (–55 to +125°C, 0±30ppm/°C)

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number                       |                                      |                                      |                                      |
|-------------|------------|-----------------|-----------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|             |            |                 |                       | Rated voltage Edc: 3kV               | Rated voltage Edc: 1kV               | Rated voltage Edc: 630V              | Rated voltage Edc: 450V              |
| 100pF       | 2012       | 0.60±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4C4C0G2W101J060AE</a> |
| 150pF       | 2012       | 0.60±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4C4C0G2W151J060AE</a> |
| 220pF       | 2012       | 0.60±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4C4C0G2W221J060AE</a> |
| 330pF       | 2012       | 0.60±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4C4C0G2W331J060AE</a> |
|             | 4532       | 2.50±0.30       | ±10%                  | <a href="#">CGA8P1C0G3F331K250KE</a> |                                      |                                      |                                      |
| 470pF       | 2012       | 0.60±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4C4C0G2W471J060AE</a> |
| 680pF       | 2012       | 0.60±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4C4C0G2W681J060AE</a> |
| 1nF         | 2012       | 0.60±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4C4C0G2W102J060AE</a> |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A102J200AE</a> |                                      |                                      |
| 1.2nF       | 2012       | 0.60±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4C4C0G2W122J060AE</a> |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A122J200AE</a> |                                      |                                      |
| 1.5nF       | 2012       | 0.85±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4F4C0G2W152J085AE</a> |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A152J200AE</a> |                                      |                                      |
| 1.8nF       | 2012       | 0.85±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4F4C0G2W182J085AE</a> |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A182J200AE</a> |                                      |                                      |
| 2.2nF       | 2012       | 0.85±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4F4C0G2W222J085AE</a> |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A222J200AE</a> |                                      |                                      |
| 2.7nF       | 2012       | 1.25+0.25,-0.20 | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4J4C0G2W272J125AE</a> |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A272J200AE</a> |                                      |                                      |
| 3.3nF       | 2012       | 1.25+0.25,-0.20 | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4J4C0G2W332J125AE</a> |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A332J200AE</a> |                                      |                                      |
| 3.9nF       | 2012       | 1.25+0.25,-0.20 | ±5%                   |                                      |                                      |                                      | <a href="#">CGA4J4C0G2W392J125AE</a> |
|             | 3216       | 0.85±0.15       | ±5%                   |                                      |                                      | <a href="#">CGA5F4C0G2J392J085AE</a> |                                      |
| 4.7nF       | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A392J200AE</a> |                                      |                                      |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A472J200AE</a> |                                      |                                      |
| 5.6nF       | 3216       | 1.15±0.15       | ±5%                   |                                      |                                      | <a href="#">CGA5H4C0G2J562J115AE</a> |                                      |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A562J200AE</a> |                                      |                                      |
| 6.8nF       | 3216       | 1.15±0.15       | ±5%                   |                                      |                                      | <a href="#">CGA5H4C0G2J682J115AE</a> | <a href="#">CGA5H4C0G2W682J115AE</a> |
|             | 3225       | 2.00+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6M1C0G3A682J200AE</a> |                                      |                                      |
| 8.2nF       | 3216       | 1.15±0.15       | ±5%                   |                                      |                                      |                                      | <a href="#">CGA5H4C0G2W822J115AE</a> |
|             | 3225       | 1.60+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA5L4C0G2J822J160AE</a> |                                      |                                      |
| 10nF        | 3225       | 2.30+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6N1C0G3A822J230AE</a> |                                      |                                      |
|             | 3216       | 1.60+0.30,-0.20 | ±5%                   |                                      |                                      | <a href="#">CGA5L4C0G2J103J160AE</a> | <a href="#">CGA5L4C0G2W103J160AE</a> |
| 15nF        | 3225       | 1.60+0.30,-0.20 | ±5%                   |                                      |                                      | <a href="#">CGA6L4C0G2J153J160AE</a> |                                      |
|             | 3225       | 2.50±0.30       | ±5%                   |                                      |                                      | <a href="#">CGA6P4C0G2J333J250AE</a> | <a href="#">CGA6P4C0G2W333J250AE</a> |
| 33nF        | 4532       | 2.00+0.30,-0.20 | ±5%                   |                                      |                                      | <a href="#">CGA8M4C0G2J333J200KE</a> |                                      |
|             | 5750       | 2.30+0.30,-0.20 | ±5%                   |                                      |                                      | <a href="#">CGA9N1C0G2J683J230KE</a> |                                      |

Click the part numbers for details.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: C0G (–55 to +125°C, 0±30ppm/°C)

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number                       |                                      |                                      |
|-------------|------------|-----------------|-----------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|             |            |                 |                       | Rated voltage Edc: 250V              | Rated voltage Edc: 100V              | Rated voltage Edc: 50V               |
| 100pF       | 1005       | 0.50+0.10,-0.05 | ±5%                   |                                      | <a href="#">CGA2B2C0G2A101J050BE</a> | <a href="#">CGA2B2C0G1H101J050BE</a> |
|             | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      |                                      | <a href="#">CGA3E2C0G1H101J080AE</a> |
| 150pF       | 1005       | 0.50+0.10,-0.05 | ±5%                   |                                      | <a href="#">CGA2B2C0G2A151J050BE</a> | <a href="#">CGA2B2C0G1H151J050BE</a> |
| 220pF       | 1005       | 0.50+0.10,-0.05 | ±5%                   |                                      | <a href="#">CGA2B2C0G2A221J050BE</a> | <a href="#">CGA2B2C0G1H221J050BE</a> |
| 330pF       | 1005       | 0.50+0.10,-0.05 | ±5%                   |                                      | <a href="#">CGA2B2C0G2A331J050BE</a> | <a href="#">CGA2B2C0G1H331J050BE</a> |
|             | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E2C0G2A331J080AE</a> | <a href="#">CGA3E2C0G1H331J080AE</a> |
| 470pF       | 1005       | 0.50+0.10,-0.05 | ±5%                   |                                      | <a href="#">CGA2B1C0G2A471J050BE</a> | <a href="#">CGA2B2C0G1H471J050BE</a> |
|             | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E2C0G2A471J080AE</a> | <a href="#">CGA3E2C0G1H471J080AE</a> |
| 680pF       | 1005       | 0.50+0.10,-0.05 | ±5%                   |                                      | <a href="#">CGA2B1C0G2A681J050BE</a> | <a href="#">CGA2B2C0G1H681J050BE</a> |
|             | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E2C0G2A681J080AE</a> | <a href="#">CGA3E2C0G1H681J080AE</a> |
| 1nF         | 1005       | 0.50+0.10,-0.05 | ±5%                   |                                      | <a href="#">CGA2B1C0G2A102J050BE</a> | <a href="#">CGA2B2C0G1H102J050BE</a> |
|             | 1608       | 0.80+0.15,-0.10 | ±5%                   | <a href="#">CGA3E3C0G2E102J080AE</a> | <a href="#">CGA3E2C0G2A102J080AE</a> | <a href="#">CGA3E2C0G1H102J080AE</a> |
| 1.2nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   | <a href="#">CGA3E3C0G2E122J080AE</a> | <a href="#">CGA3E2C0G2A122J080AE</a> | <a href="#">CGA3E2C0G1H122J080AE</a> |
| 1.5nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   | <a href="#">CGA3E3C0G2E152J080AE</a> | <a href="#">CGA3E2C0G2A152J080AE</a> | <a href="#">CGA3E2C0G1H152J080AE</a> |
| 1.8nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   | <a href="#">CGA3E3C0G2E182J080AE</a> | <a href="#">CGA3E2C0G2A182J080AE</a> | <a href="#">CGA3E2C0G1H182J080AE</a> |
| 2.2nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E2C0G2A222J080AE</a> | <a href="#">CGA3E2C0G1H222J080AE</a> |
| 2.7nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E1C0G2A272J080AE</a> | <a href="#">CGA3E2C0G1H272J080AE</a> |
| 3.3nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E1C0G2A332J080AE</a> | <a href="#">CGA3E2C0G1H332J080AE</a> |
|             | 2012       | 0.85±0.15       | ±5%                   | <a href="#">CGA4F3C0G2E332J085AE</a> |                                      |                                      |
| 3.9nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E1C0G2A392J080AE</a> | <a href="#">CGA3E2C0G1H392J080AE</a> |
|             | 2012       | 1.25+0.25,-0.20 | ±5%                   | <a href="#">CGA4J3C0G2E392J125AE</a> |                                      |                                      |
| 4.7nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E1C0G2A472J080AE</a> | <a href="#">CGA3E2C0G1H472J080AE</a> |
|             | 2012       | 1.25+0.25,-0.20 | ±5%                   | <a href="#">CGA4J3C0G2E472J125AE</a> |                                      |                                      |
| 5.6nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E1C0G2A562J080AE</a> | <a href="#">CGA3E2C0G1H562J080AE</a> |
|             | 2012       | 1.25+0.25,-0.20 | ±5%                   | <a href="#">CGA4J3C0G2E562J125AE</a> |                                      |                                      |
| 6.8nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E1C0G2A682J080AE</a> | <a href="#">CGA3E2C0G1H682J080AE</a> |
|             | 2012       | 1.25+0.25,-0.20 | ±5%                   | <a href="#">CGA4J3C0G2E682J125AE</a> |                                      |                                      |
| 8.2nF       | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E1C0G2A822J080AE</a> | <a href="#">CGA3E2C0G1H822J080AE</a> |
|             | 1608       | 0.80+0.15,-0.10 | ±5%                   |                                      | <a href="#">CGA3E1C0G2A103J080AE</a> | <a href="#">CGA3E2C0G1H103J080AE</a> |
| 10nF        | 3216       | 1.15±0.15       | ±5%                   | <a href="#">CGA5H3C0G2E103J115AE</a> |                                      |                                      |
| 15nF        | 2012       | 0.85±0.15       | ±5%                   |                                      | <a href="#">CGA4F1C0G2A153J085AE</a> | <a href="#">CGA4F2C0G1H153J085AE</a> |
|             | 3216       | 1.60+0.30,-0.20 | ±5%                   | <a href="#">CGA5L3C0G2E153J160AE</a> |                                      |                                      |
| 22nF        | 2012       | 1.25+0.25,-0.20 | ±5%                   |                                      | <a href="#">CGA4J1C0G2A223J125AE</a> | <a href="#">CGA4J2C0G1H223J125AE</a> |
|             | 3225       | 1.60+0.30,-0.20 | ±5%                   | <a href="#">CGA6L3C0G2E223J160AE</a> |                                      |                                      |
| 33nF        | 2012       | 1.25+0.25,-0.20 | ±5%                   |                                      | <a href="#">CGA4J1C0G2A333J125AE</a> | <a href="#">CGA4J2C0G1H333J125AE</a> |
| 47nF        | 3216       | 1.15±0.15       | ±5%                   |                                      | <a href="#">CGA5H1C0G2A473J115AE</a> | <a href="#">CGA5H2C0G1H473J115AE</a> |
| 68nF        | 3216       | 1.60+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA5L1C0G2A683J160AE</a> | <a href="#">CGA5L2C0G1H683J160AE</a> |
|             | 3225       | 2.30+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA6N2C0G2A683J230AE</a> |                                      |
| 100nF       | 3216       | 1.60+0.30,-0.20 | ±5%                   |                                      | <a href="#">CGA5L1C0G2A104J160AE</a> | <a href="#">CGA5L2C0G1H104J160AE</a> |
| 150nF       | 5750       | 2.30+0.30,-0.20 | ±5%                   | <a href="#">CGA9N4C0G2E154J230KE</a> | <a href="#">CGA9N2C0G2A154J230KE</a> |                                      |

Click the part numbers for details.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: X7R (–55 to +125°C, ±15%)

| Capacitance | Dimensions | Thickness (mm)   | Capacitance tolerance | Catalog number         |                         |                         |                         |                        |
|-------------|------------|------------------|-----------------------|------------------------|-------------------------|-------------------------|-------------------------|------------------------|
|             |            |                  |                       | Rated voltage Edc: 2kV | Rated voltage Edc: 630V | Rated voltage Edc: 250V | Rated voltage Edc: 100V | Rated voltage Edc: 50V |
| 1nF         | 1005       | 0.50+0.10,-0.05  | ±10%                  |                        |                         |                         |                         | CGA2B2X7R1H102K050BE   |
|             |            |                  | ±20%                  |                        |                         |                         |                         | CGA2B2X7R1H102M050BE   |
|             | 1608       | 0.80 +0.15,-0.10 | ±10%                  |                        |                         |                         | CGA3E2X7R2A102K080AE    | CGA3E2X7R1H102K080AE   |
|             |            |                  | ±20%                  |                        |                         |                         | CGA3E2X7R2A102M080AE    | CGA3E2X7R1H102M080AE   |
|             | 2012       | 0.85±0.15        | ±10%                  |                        |                         | CGA4F3X7R2E102K085AE    | CGA4F2X7R2A102K085AE    |                        |
|             |            |                  | ±20%                  |                        |                         | CGA4F3X7R2E102M085AE    | CGA4F2X7R2A102M085AE    |                        |
| 2.2nF       | 3216       | 1.15±0.15        | ±10%                  |                        | CGA5H4X7R2J102K115AE    |                         |                         |                        |
|             |            |                  | ±20%                  |                        | CGA5H4X7R2J102M115AE    |                         |                         |                        |
|             | 4520       | 1.30±0.20        | ±10%                  | CGA7K1X7R3D102K130KE   |                         |                         |                         |                        |
|             |            |                  | ±20%                  | CGA7K1X7R3D102M130KE   |                         |                         |                         |                        |
|             | 1005       | 0.50+0.10,-0.05  | ±10%                  |                        |                         |                         |                         | CGA2B2X7R1H222K050BE   |
|             |            |                  | ±20%                  |                        |                         |                         |                         | CGA2B2X7R1H222M050BE   |
| 3.3nF       | 1608       | 0.80+0.15,-0.10  | ±10%                  |                        |                         |                         | CGA3E2X7R2A222K080AE    | CGA3E2X7R1H222K080AE   |
|             |            |                  | ±20%                  |                        |                         |                         | CGA3E2X7R2A222M080AE    | CGA3E2X7R1H222M080AE   |
|             | 2012       | 0.85±0.15        | ±10%                  |                        |                         | CGA4F3X7R2E222K085AE    | CGA4F2X7R2A222K085AE    |                        |
|             |            |                  | ±20%                  |                        |                         | CGA4F3X7R2E222M085AE    | CGA4F2X7R2A222M085AE    |                        |
|             | 3216       | 1.15±0.15        | ±10%                  |                        | CGA5H4X7R2J222K115AE    |                         |                         |                        |
|             |            |                  | ±20%                  |                        | CGA5H4X7R2J222M115AE    |                         |                         |                        |
| 4.7nF       | 4532       | 1.30±0.20        | ±10%                  | CGA8K1X7R3D222K130KE   |                         |                         |                         |                        |
|             |            |                  | ±20%                  | CGA8K1X7R3D222M130KE   |                         |                         |                         |                        |
|             | 3216       | 1.15±0.15        | ±10%                  |                        | CGA5H4X7R2J332K115AE    |                         |                         |                        |
|             |            |                  | ±20%                  |                        | CGA5H4X7R2J332M115AE    |                         |                         |                        |
|             | 1005       | 0.50+0.10,-0.05  | ±10%                  |                        |                         |                         |                         | CGA2B2X7R1H472K050BE   |
|             |            |                  | ±20%                  |                        |                         |                         |                         | CGA2B2X7R1H472M050BE   |
| 10nF        | 1608       | 0.80+0.15,-0.10  | ±10%                  |                        |                         |                         | CGA3E2X7R2A472K080AE    | CGA3E2X7R1H472K080AE   |
|             |            |                  | ±20%                  |                        |                         |                         | CGA3E2X7R2A472M080AE    | CGA3E2X7R1H472M080AE   |
|             | 2012       | 0.85±0.15        | ±10%                  |                        |                         | CGA4F3X7R2E472K085AE    | CGA4F2X7R2A472K085AE    |                        |
|             |            |                  | ±20%                  |                        |                         | CGA4F3X7R2E472M085AE    | CGA4F2X7R2A472M085AE    |                        |
|             | 3216       | 1.15±0.15        | ±10%                  |                        | CGA5H4X7R2J472K115AE    |                         |                         |                        |
|             |            |                  | ±20%                  |                        | CGA5H4X7R2J472M115AE    |                         |                         |                        |
| 22nF        | 1005       | 0.50+0.10,-0.05  | ±10%                  |                        |                         |                         |                         | CGA2B3X7R1H103K050BE   |
|             |            |                  | ±20%                  |                        |                         |                         |                         | CGA2B3X7R1H103M050BE   |
|             | 1608       | 0.80 +0.15,-0.10 | ±10%                  |                        |                         |                         | CGA3E2X7R2A103K080AE    | CGA3E2X7R1H103K080AE   |
|             |            |                  | ±20%                  |                        |                         |                         | CGA3E2X7R2A103M080AE    | CGA3E2X7R1H103M080AE   |
|             | 2012       | 0.85±0.15        | ±10%                  |                        |                         |                         | CGA4F2X7R2A103K085AE    |                        |
|             |            |                  | ±20%                  |                        |                         |                         | CGA4F2X7R2A103M085AE    |                        |
| 33nF        |            | 1.25 +0.25,-0.20 | ±10%                  |                        |                         | CGA4J3X7R2E103K125AE    |                         |                        |
|             |            |                  | ±20%                  |                        |                         | CGA4J3X7R2E103M125AE    |                         |                        |
|             | 3216       | 1.15±0.15        | ±10%                  |                        | CGA5H4X7R2J103K115AE    |                         |                         |                        |
|             |            |                  | ±20%                  |                        | CGA5H4X7R2J103M115AE    |                         |                         |                        |
|             | 1005       | 0.50+0.10,-0.05  | ±10%                  |                        |                         |                         |                         | CGA2B3X7R1H223K050BE   |
|             |            |                  | ±20%                  |                        |                         |                         |                         | CGA2B3X7R1H223M050BE   |
| 33nF        | 1608       | 0.80+0.15,-0.10  | ±10%                  |                        |                         |                         | CGA3E2X7R2A223K080AE    | CGA3E2X7R1H223K080AE   |
|             |            |                  | ±20%                  |                        |                         |                         | CGA3E2X7R2A223M080AE    | CGA3E2X7R1H223M080AE   |
|             | 2012       | 1.25 +0.25,-0.20 | ±10%                  |                        |                         | CGA4J3X7R2E223K125AE    | CGA4J2X7R2A223K125AE    |                        |
|             |            |                  | ±20%                  |                        |                         | CGA4J3X7R2E223M125AE    | CGA4J2X7R2A223M125AE    |                        |
|             |            | 1.15±0.15        | ±10%                  |                        |                         | CGA5H3X7R2E223K115AE    |                         |                        |
|             |            |                  | ±20%                  |                        |                         | CGA5H3X7R2E223M115AE    |                         |                        |
| 33nF        | 3216       | 1.30±0.20        | ±10%                  |                        | CGA5K4X7R2J223K130AE    |                         |                         |                        |
|             |            |                  | ±20%                  |                        | CGA5K4X7R2J223M130AE    |                         |                         |                        |
|             |            |                  | ±10%                  |                        | CGA5L4X7R2J333K160AE    |                         |                         |                        |
|             |            |                  | ±20%                  |                        | CGA5L4X7R2J333M160AE    |                         |                         |                        |

■ Gray items: These products are not recommended for new designs.  
Click the part numbers for details.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: X7R (–55 to +125°C, ±15%)

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number          |                         |                         |                        |
|-------------|------------|-----------------|-----------------------|-------------------------|-------------------------|-------------------------|------------------------|
|             |            |                 |                       | Rated voltage Edc: 630V | Rated voltage Edc: 250V | Rated voltage Edc: 100V | Rated voltage Edc: 50V |
| 47nF        | 1005       | 0.50+0.10,-0.05 | ±10%                  |                         |                         |                         | CGA2B3X7R1H473K050BE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA2B3X7R1H473M050BE   |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         |                         |                         | CGA3E2X7R1H473K080AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA3E2X7R1H473M080AE   |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                         | CGA4J2X7R2A473K125AE    |                        |
|             |            |                 | ±20%                  |                         |                         | CGA4J2X7R2A473M125AE    |                        |
| 68nF        | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         | CGA5L3X7R2E473K160AE    |                         |                        |
|             |            |                 | ±20%                  |                         | CGA5L3X7R2E473M160AE    |                         |                        |
|             | 3225       | 2.00+0.30,-0.20 | ±10%                  | CGA6M4X7R2J473K200AE    |                         |                         |                        |
|             |            |                 | ±20%                  | CGA6M4X7R2J473M200AE    |                         |                         |                        |
| 100nF       | 3225       | 2.00+0.30,-0.20 | ±10%                  | CGA6M4X7R2J683K200AE    |                         |                         |                        |
|             |            |                 | ±20%                  | CGA6M4X7R2J683M200AE    |                         |                         |                        |
|             | 1005       | 0.50+0.10,-0.05 | ±10%                  |                         |                         |                         | CGA2B3X7R1H104K050BE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA2B3X7R1H104M050BE   |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         |                         |                         | CGA3E2X7R1H104K080AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA3E2X7R1H104M080AE   |
| 220nF       | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                         | CGA4J2X7R2A104K125AE    | CGA4J2X7R1H104K125AE   |
|             |            |                 | ±20%                  |                         |                         | CGA4J2X7R2A104M125AE    | CGA4J2X7R1H104M125AE   |
|             | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         | CGA5L3X7R2E104K160AE    | CGA5L2X7R2A104K160AE    |                        |
|             |            |                 | ±20%                  |                         | CGA5L3X7R2E104M160AE    | CGA5L2X7R2A104M160AE    |                        |
|             | 3225       | 2.00+0.30,-0.20 | ±10%                  |                         | CGA6M3X7R2E104K200AE    |                         |                        |
|             |            |                 | ±20%                  |                         | CGA6M3X7R2E104M200AE    |                         |                        |
| 470nF       | 4532       | 2.30+0.30,-0.20 | ±10%                  | CGA8N4X7R2J104K230KE    |                         |                         |                        |
|             |            |                 | ±20%                  | CGA8N4X7R2J104M230KE    |                         |                         |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         |                         |                         | CGA3E3X7R1H224K080AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA3E3X7R1H224M080AE   |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                         |                         | CGA4J2X7R1H224K125AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA4J2X7R1H224M125AE   |
| 1µF         | 3216       | 1.15±0.15       | ±10%                  |                         |                         | CGA5H2X7R2A224K115AE    |                        |
|             |            |                 | ±20%                  |                         |                         | CGA5H2X7R2A224M115AE    |                        |
|             | 3225       | 2.00+0.30,-0.20 | ±10%                  |                         | CGA6M3X7R2E224K200AE    |                         |                        |
|             |            |                 | ±20%                  |                         | CGA6M3X7R2E224M200AE    |                         |                        |
|             | 5750       | 2.30+0.30,-0.20 | ±10%                  | CGA9N4X7R2J224K230KE    |                         |                         |                        |
|             |            |                 | ±20%                  | CGA9N4X7R2J224M230KE    |                         |                         |                        |
| 2.2µF       | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         |                         |                         | CGA3E3X7R1H474K080AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA3E3X7R1H474M080AE   |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                         |                         | CGA4J3X7R1H474K125AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA4J3X7R1H474M125AE   |
|             | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         |                         | CGA5L2X7R2A474K160AE    |                        |
|             |            |                 | ±20%                  |                         |                         | CGA5L2X7R2A474M160AE    |                        |
| 4.7µF       | 3225       | 2.00+0.30,-0.20 | ±10%                  |                         |                         | CGA6M2X7R2A474K200AE    |                        |
|             |            |                 | ±20%                  |                         |                         | CGA6M2X7R2A474M200AE    |                        |
|             | 4532       | 2.30+0.30,-0.20 | ±10%                  |                         | CGA8N3X7R2E474K230KE    |                         |                        |
|             |            |                 | ±20%                  |                         | CGA8N3X7R2E474M230KE    |                         |                        |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                         |                         | CGA4J3X7R1H105K125AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA4J3X7R1H105M125AE   |
| 10µF        | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         |                         | CGA5L2X7R2A105K160AE    | CGA5L3X7R1H105K160AE   |
|             |            |                 | ±20%                  |                         |                         | CGA5L2X7R2A105M160AE    | CGA5L3X7R1H105M160AE   |
|             | 3225       | 1.60+0.30,-0.20 | ±10%                  |                         |                         |                         | CGA6L2X7R1H105K160AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA6L2X7R1H105M160AE   |
|             | 3225       | 2.00+0.30,-0.20 | ±10%                  |                         |                         | CGA6M2X7R2A105K200AE    |                        |
|             |            |                 | ±20%                  |                         |                         | CGA6M2X7R2A105M200AE    |                        |
| 2.2µF       | 5750       | 2.30+0.30,-0.20 | ±10%                  |                         | CGA9N3X7R2E105K230KE    |                         |                        |
|             |            |                 | ±20%                  |                         | CGA9N3X7R2E105M230KE    |                         |                        |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                         |                         | CGA4J3X7R1H225K125AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA4J3X7R1H225M125AE   |
|             | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         |                         |                         | CGA5L3X7R1H225K160AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA5L3X7R1H225M160AE   |
| 4.7µF       | 3225       | 2.00+0.30,-0.20 | ±10%                  |                         |                         |                         | CGA6M3X7R1H225K200AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA6M3X7R1H225M200AE   |
|             | 3225       | 2.30+0.30,-0.20 | ±10%                  |                         |                         | CGA6N3X7R2A225K230AE    |                        |
|             |            |                 | ±20%                  |                         |                         | CGA6N3X7R2A225M230AE    |                        |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                         |                         | CGA4J1X7R1H475K125AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA4J1X7R1H475M125AE   |
| 10µF        | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         |                         |                         | CGA5L3X7R1H475K160AE   |
|             |            |                 | ±20%                  |                         |                         |                         | CGA5L3X7R1H475M160AE   |
| 10µF        | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         |                         |                         | CGA5L1X7R1H106K160AE   |

Click the part numbers for details.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: X7R (–55 to +125°C, ±15%)

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number                       |                                      |                                      |                                      |
|-------------|------------|-----------------|-----------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|             |            |                 |                       | Rated voltage Edc: 35V               | Rated voltage Edc: 25V               | Rated voltage Edc: 16V               | Rated voltage Edc: 6.3V              |
| 220nF       | 1005       | 0.50+0.10,-0.05 | ±10%                  | <a href="#">CGA2B1X7R1V224K050BE</a> | <a href="#">CGA2B3X7R1E224K050BE</a> | <a href="#">CGA2B2X7R1C224K050BE</a> |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA2B1X7R1V224M050BE</a> | <a href="#">CGA2B3X7R1E224M050BE</a> | <a href="#">CGA2B2X7R1C224M050BE</a> |                                      |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | <a href="#">CGA3E3X7R1V224K080AE</a> |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA3E3X7R1V224M080AE</a> |                                      |                                      |                                      |
| 470nF       | 1608       | 0.80+0.15,-0.10 | ±10%                  | <a href="#">CGA3E1X7R1V474K080AE</a> | <a href="#">CGA3E3X7R1E474K080AE</a> |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA3E1X7R1V474M080AE</a> | <a href="#">CGA3E3X7R1E474M080AE</a> |                                      |                                      |
| 1µF         | 1608       | 0.80+0.15,-0.10 | ±10%                  | <a href="#">CGA3E1X7R1V105K080AE</a> | <a href="#">CGA3E1X7R1E105K080AE</a> |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA3E1X7R1V105M080AE</a> | <a href="#">CGA3E1X7R1E105M080AE</a> |                                      |                                      |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  | <a href="#">CGA4J3X7R1V105K125AE</a> |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA4J3X7R1V105M125AE</a> |                                      |                                      |                                      |
| 2.2µF       | 2012       | 1.25+0.25,-0.20 | ±10%                  | <a href="#">CGA4J1X7R1V225K125AE</a> | <a href="#">CGA4J3X7R1E225K125AE</a> |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA4J1X7R1V225M125AE</a> | <a href="#">CGA4J3X7R1E225M125AE</a> |                                      |                                      |
|             | 3216       | 1.60+0.30,-0.20 | ±10%                  | <a href="#">CGA5L3X7R1V225K160AE</a> | <a href="#">CGA5L2X7R1E225K160AE</a> |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA5L3X7R1V225M160AE</a> | <a href="#">CGA5L2X7R1E225M160AE</a> |                                      |                                      |
| 4.7µF       | 2012       | 1.25+0.25,-0.20 | ±10%                  | <a href="#">CGA4J1X7R1V475K125AE</a> | <a href="#">CGA4J1X7R1E475K125AE</a> | <a href="#">CGA4J3X7R1C475K125AE</a> |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA4J1X7R1V475M125AE</a> | <a href="#">CGA4J1X7R1E475M125AE</a> | <a href="#">CGA4J3X7R1C475M125AE</a> |                                      |
|             | 3216       | 1.60+0.30,-0.20 | ±10%                  | <a href="#">CGA5L1X7R1V475K160AE</a> |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA5L1X7R1V475M160AE</a> |                                      |                                      |                                      |
| 10µF        | 3216       | 1.60+0.30,-0.20 | ±10%                  | <a href="#">CGA5L1X7R1V106K160AE</a> | <a href="#">CGA5L1X7R1E106K160AE</a> |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA5L1X7R1V106M160AE</a> | <a href="#">CGA5L1X7R1E106M160AE</a> |                                      |                                      |
| 22µF        | 3216       | 1.60+0.30,-0.20 | ±20%                  |                                      |                                      |                                      | <a href="#">CGA5L1X7RQJ226M160AE</a> |
| 47µF        | 3225       | 2.50±0.30       | ±20%                  |                                      | <a href="#">CGA6P3X7R1E226M250AE</a> |                                      |                                      |
|             | 7563       | 2.30 (2.50max.) | ±20%                  |                                      | <a href="#">CGADN3X7R1E476M230LE</a> |                                      |                                      |

Click the part numbers for details.

## Capacitance range table

Temperature characteristic: X7S (–55 to +125°C, ±22%)

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number                       |                                      |                                      |                                      |                                      |
|-------------|------------|-----------------|-----------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|             |            |                 |                       | Rated voltage Edc: 100V              | Rated voltage Edc: 50V               | Rated voltage Edc: 25V               | Rated voltage Edc: 16V               | Rated voltage Edc: 10V               |
| 47nF        | 1608       | 0.80+0.15,-0.10 | ±10%                  | <a href="#">CGA3E3X7S2A473K080AE</a> |                                      |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA3E3X7S2A473M080AE</a> |                                      |                                      |                                      |                                      |
| 100nF       | 1608       | 0.80+0.15,-0.10 | ±10%                  | <a href="#">CGA3E3X7S2A104K080AE</a> |                                      |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA3E3X7S2A104M080AE</a> |                                      |                                      |                                      |                                      |
| 220nF       | 2012       | 0.85±0.15       | ±10%                  | <a href="#">CGA4F3X7S2A224K085AE</a> |                                      |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA4F3X7S2A224M085AE</a> |                                      |                                      |                                      |                                      |
| 470nF       | 1005       | 0.50+0.10,-0.05 | ±10%                  |                                      |                                      |                                      | <a href="#">CGA2B1X7S1C474K050BE</a> | <a href="#">CGA2B3X7S1A474K050BE</a> |
|             |            |                 | ±20%                  |                                      |                                      |                                      | <a href="#">CGA2B1X7S1C474M050BE</a> | <a href="#">CGA2B3X7S1A474M050BE</a> |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  | <a href="#">CGA4J3X7S2A474K125AE</a> |                                      |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA4J3X7S2A474M125AE</a> |                                      |                                      |                                      |                                      |
| 1µF         | 2012       | 1.25+0.25,-0.20 | ±10%                  | <a href="#">CGA4J3X7S2A105K125AE</a> |                                      |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA4J3X7S2A105M125AE</a> |                                      |                                      |                                      |                                      |
| 2.2µF       | 1608       | 0.80+0.15,-0.10 | ±10%                  |                                      |                                      |                                      | <a href="#">CGA3E1X7S1C225K080AE</a> | <a href="#">CGA3E3X7S1A225K080AE</a> |
|             |            |                 | ±20%                  |                                      |                                      |                                      | <a href="#">CGA3E1X7S1C225M080AE</a> | <a href="#">CGA3E3X7S1A225M080AE</a> |
|             | 3216       | 1.60+0.30,-0.20 | ±10%                  | <a href="#">CGA5L3X7S2A225K160AE</a> |                                      |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA5L3X7S2A225M160AE</a> |                                      |                                      |                                      |                                      |
| 3.3µF       | 3225       | 2.00+0.30,-0.20 | ±10%                  | <a href="#">CGA6M3X7S2A335K200AE</a> |                                      |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA6M3X7S2A335M200AE</a> |                                      |                                      |                                      |                                      |
| 4.7µF       | 3225       | 2.00+0.30,-0.20 | ±10%                  | <a href="#">CGA6M3X7S2A475K200AE</a> |                                      |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA6M3X7S2A475M200AE</a> |                                      |                                      |                                      |                                      |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                                      | <a href="#">CGA6N3X7S1H475K230AE</a> |                                      |                                      |                                      |
|             |            |                 | ±20%                  |                                      | <a href="#">CGA6N3X7S1H475M230AE</a> |                                      |                                      |                                      |
| 10µF        | 2012       | 1.25+0.25,-0.20 | ±10%                  |                                      |                                      | <a href="#">CGA4J1X7S1E106K125AE</a> | <a href="#">CGA4J1X7S1C106K125AE</a> | <a href="#">CGA4J3X7S1A106K125AE</a> |
|             |            |                 | ±20%                  |                                      |                                      |                                      | <a href="#">CGA4J1X7S1C106M125AE</a> | <a href="#">CGA4J3X7S1A106M125AE</a> |
|             | 3225       | 2.50±0.30       | ±10%                  |                                      | <a href="#">CGA6P3X7S1H106K250AE</a> |                                      |                                      |                                      |
|             |            |                 | ±20%                  |                                      | <a href="#">CGA6P3X7S1H106M250AE</a> |                                      |                                      |                                      |
|             | 5750       | 2.30+0.30,-0.20 | ±10%                  | <a href="#">CGA9N3X7S2A106K230KE</a> |                                      |                                      |                                      |                                      |
|             |            |                 | ±20%                  | <a href="#">CGA9N3X7S2A106M230KE</a> |                                      |                                      |                                      |                                      |

Click the part numbers for details.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: X7T (–55 to +125°C, +22, –33%)

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number                       |                                      |                                      |
|-------------|------------|-----------------|-----------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|             |            |                 |                       | Rated voltage Edc: 630V              | Rated voltage Edc: 450V              | Rated voltage Edc: 250V              |
| 10 nF       | 2012       | 0.85±0.15       | ± 10%                 |                                      | <a href="#">CGA4F4X7T2W103K085AE</a> |                                      |
|             |            |                 | ± 20%                 |                                      | <a href="#">CGA4F4X7T2W103M085AE</a> |                                      |
| 22 nF       | 2012       | 1.25+0.25,-0.20 | ± 10%                 |                                      | <a href="#">CGA4J4X7T2W223K125AE</a> |                                      |
|             |            |                 | ± 20%                 |                                      | <a href="#">CGA4J4X7T2W223M125AE</a> |                                      |
| 47 nF       | 2012       | 1.25+0.25,-0.20 | ± 10%                 |                                      | <a href="#">CGA4J4X7T2W473K125AE</a> | <a href="#">CGA4J3X7T2E473K125AE</a> |
|             |            |                 | ± 20%                 |                                      | <a href="#">CGA4J4X7T2W473M125AE</a> | <a href="#">CGA4J3X7T2E473M125AE</a> |
|             | 3216       | 1.60+0.30,-0.20 | ± 10%                 | <a href="#">CGA5L1X7T2J473K160AE</a> |                                      |                                      |
|             |            |                 | ± 20%                 | <a href="#">CGA5L1X7T2J473M160AE</a> |                                      |                                      |
| 100 nF      | 2012       | 1.25+0.25,-0.20 | ± 10%                 |                                      |                                      | <a href="#">CGA4J3X7T2E104K125AE</a> |
|             |            |                 | ± 20%                 |                                      |                                      | <a href="#">CGA4J3X7T2E104M125AE</a> |
|             | 3216       | 1.60+0.30,-0.20 | ± 10%                 |                                      | <a href="#">CGA5L4X7T2W104K160AE</a> |                                      |
|             |            |                 | ± 20%                 |                                      | <a href="#">CGA5L4X7T2W104M160AE</a> |                                      |
| 150 nF      | 3225       | 1.60+0.30,-0.20 | ± 10%                 | <a href="#">CGA6L1X7T2J104K160AE</a> |                                      |                                      |
|             |            |                 | ± 20%                 | <a href="#">CGA6L1X7T2J104M160AE</a> |                                      |                                      |
|             | 3225       | 2.00+0.30,-0.20 | ± 10%                 | <a href="#">CGA6M1X7T2J154K200AE</a> |                                      |                                      |
|             |            |                 | ± 20%                 | <a href="#">CGA6M1X7T2J154M200AE</a> |                                      |                                      |
| 220 nF      | 3216       | 1.60+0.30,-0.20 | ± 10%                 |                                      |                                      | <a href="#">CGA5L3X7T2E224K160AE</a> |
|             |            |                 | ± 20%                 |                                      |                                      | <a href="#">CGA5L3X7T2E224M160AE</a> |
|             | 3225       | 2.00+0.30,-0.20 | ± 10%                 | <a href="#">CGA6M4X7T2W224K200AE</a> |                                      |                                      |
|             |            |                 | ± 20%                 | <a href="#">CGA6M4X7T2W224M200AE</a> |                                      |                                      |
| 330 nF      | 4532       | 2.00+0.30,-0.20 | ± 10%                 | <a href="#">CGA8M1X7T2J224K200KE</a> |                                      |                                      |
|             |            |                 | ± 20%                 | <a href="#">CGA8M1X7T2J224M200KE</a> |                                      |                                      |
|             | 3225       | 2.00+0.30,-0.20 | ± 10%                 |                                      |                                      | <a href="#">CGA6M3X7T2E334K200AE</a> |
|             |            |                 | ± 20%                 |                                      |                                      | <a href="#">CGA6M3X7T2E334M200AE</a> |
| 470 nF      | 4532       | 2.30+0.30,-0.20 | ± 10%                 |                                      | <a href="#">CGA8N4X7T2W474K230KE</a> |                                      |
|             |            |                 | ± 20%                 |                                      | <a href="#">CGA8N4X7T2W474M230KE</a> |                                      |
|             | 5750       | 2.50±0.30       | ± 10%                 | <a href="#">CGA9P1X7T2J474K250KE</a> |                                      |                                      |
|             |            |                 | ± 20%                 | <a href="#">CGA9P1X7T2J474M250KE</a> |                                      |                                      |
| 1 µF        | 4532       | 2.50±0.30       | ± 10%                 |                                      |                                      | <a href="#">CGA8P3X7T2E105K250KE</a> |
|             |            |                 | ± 20%                 |                                      |                                      | <a href="#">CGA8P3X7T2E105M250KE</a> |
|             | 5750       | 2.50±0.30       | ± 10%                 | <a href="#">CGA9P4X7T2W105K250KE</a> |                                      |                                      |
|             |            |                 | ± 20%                 | <a href="#">CGA9P4X7T2W105M250KE</a> |                                      |                                      |
| 2.2 µF      | 5750       | 2.50±0.30       | ± 10%                 |                                      |                                      | <a href="#">CGA9P3X7T2E225K250KE</a> |
|             |            |                 | ± 20%                 |                                      |                                      | <a href="#">CGA9P3X7T2E225M250KE</a> |

Click the part numbers for details.



## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: X8R (–55 to +150°C, ±15%)

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number          |                        |                        |                        |
|-------------|------------|-----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
|             |            |                 |                       | Rated voltage Edc: 100V | Rated voltage Edc: 50V | Rated voltage Edc: 25V | Rated voltage Edc: 16V |
| 150pF       | 1005       | 0.50+0.10,-0.05 | ±10%                  | CGA2B2X8R2A151K050BE    | CGA2B2X8R1H151K050BE   |                        |                        |
|             |            |                 | ±20%                  | CGA2B2X8R2A151M050BE    | CGA2B2X8R1H151M050BE   |                        |                        |
| 220pF       | 1005       | 0.50+0.10,-0.05 | ±10%                  | CGA2B2X8R2A221K050BE    | CGA2B2X8R1H221K050BE   |                        |                        |
|             |            |                 | ±20%                  | CGA2B2X8R2A221M050BE    | CGA2B2X8R1H221M050BE   |                        |                        |
| 330pF       | 1005       | 0.50+0.10,-0.05 | ±10%                  | CGA2B2X8R2A331K050BE    | CGA2B2X8R1H331K050BE   |                        |                        |
|             |            |                 | ±20%                  | CGA2B2X8R2A331M050BE    | CGA2B2X8R1H331M050BE   |                        |                        |
| 470pF       | 1005       | 0.50+0.10,-0.05 | ±10%                  | CGA2B2X8R2A471K050BE    | CGA2B2X8R1H471K050BE   |                        |                        |
|             |            |                 | ±20%                  | CGA2B2X8R2A471M050BE    | CGA2B2X8R1H471M050BE   |                        |                        |
| 680pF       | 1005       | 0.50+0.10,-0.05 | ±10%                  | CGA2B2X8R2A681K050BE    | CGA2B2X8R1H681K050BE   |                        |                        |
|             |            |                 | ±20%                  | CGA2B2X8R2A681M050BE    | CGA2B2X8R1H681M050BE   |                        |                        |
| 1nF         | 1005       | 0.50+0.10,-0.05 | ±10%                  | CGA2B2X8R2A102K050BE    | CGA2B2X8R1H102K050BE   |                        |                        |
|             |            |                 | ±20%                  | CGA2B2X8R2A102M050BE    | CGA2B2X8R1H102M050BE   |                        |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | CGA3E2X8R2A102K080AE    | CGA3E2X8R1H102K080AE   |                        |                        |
|             |            |                 | ±20%                  | CGA3E2X8R2A102M080AE    | CGA3E2X8R1H102M080AE   |                        |                        |
| 1.5nF       | 1005       | 0.50+0.10,-0.05 | ±10%                  | CGA2B2X8R2A152K050BE    | CGA2B2X8R1H152K050BE   |                        |                        |
|             |            |                 | ±20%                  | CGA2B2X8R2A152M050BE    | CGA2B2X8R1H152M050BE   |                        |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | CGA3E2X8R2A152K080AE    | CGA3E2X8R1H152K080AE   |                        |                        |
|             |            |                 | ±20%                  | CGA3E2X8R2A152M080AE    | CGA3E2X8R1H152M080AE   |                        |                        |
| 2.2nF       | 1005       | 0.50+0.10,-0.05 | ±10%                  | CGA2B2X8R2A222K050BE    | CGA2B2X8R1H222K050BE   |                        |                        |
|             |            |                 | ±20%                  | CGA2B2X8R2A222M050BE    | CGA2B2X8R1H222M050BE   |                        |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | CGA3E2X8R2A222K080AE    | CGA3E2X8R1H222K080AE   |                        |                        |
|             |            |                 | ±20%                  | CGA3E2X8R2A222M080AE    | CGA3E2X8R1H222M080AE   |                        |                        |
| 3.3nF       | 1005       | 0.50+0.10,-0.05 | ±10%                  | CGA2B3X8R2A332K050BE    | CGA2B2X8R1H332K050BE   |                        |                        |
|             |            |                 | ±20%                  | CGA2B3X8R2A332M050BE    | CGA2B2X8R1H332M050BE   |                        |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | CGA3E2X8R2A332K080AE    | CGA3E2X8R1H332K080AE   |                        |                        |
|             |            |                 | ±20%                  | CGA3E2X8R2A332M080AE    | CGA3E2X8R1H332M080AE   |                        |                        |
| 4.7nF       | 1005       | 0.50+0.10,-0.05 | ±10%                  |                         | CGA2B2X8R1H472K050BE   |                        |                        |
|             |            |                 | ±20%                  |                         | CGA2B2X8R1H472M050BE   |                        |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | CGA3E2X8R2A472K080AE    | CGA3E2X8R1H472K080AE   |                        |                        |
|             |            |                 | ±20%                  | CGA3E2X8R2A472M080AE    | CGA3E2X8R1H472M080AE   |                        |                        |
| 6.8nF       | 1005       | 0.50+0.10,-0.05 | ±10%                  |                         | CGA2B3X8R1H682K050BE   | CGA2B2X8R1E682K050BE   |                        |
|             |            |                 | ±20%                  |                         | CGA2B3X8R1H682M050BE   | CGA2B2X8R1E682M050BE   |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | CGA3E2X8R2A682K080AE    | CGA3E2X8R1H682K080AE   |                        |                        |
|             |            |                 | ±20%                  | CGA3E2X8R2A682M080AE    | CGA3E2X8R1H682M080AE   |                        |                        |
| 10nF        | 1005       | 0.50+0.10,-0.05 | ±10%                  |                         | CGA2B3X8R1H103K050BE   | CGA2B2X8R1E103K050BE   |                        |
|             |            |                 | ±20%                  |                         | CGA2B3X8R1H103M050BE   | CGA2B2X8R1E103M050BE   |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | CGA3E2X8R2A103K080AE    | CGA3E2X8R1H103K080AE   |                        |                        |
|             |            |                 | ±20%                  | CGA3E2X8R2A103M080AE    | CGA3E2X8R1H103M080AE   |                        |                        |
| 15nF        | 1005       | 0.50+0.10,-0.05 | ±10%                  |                         |                        | CGA2B3X8R1E153K050BE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA2B3X8R1E153M050BE   |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | CGA3E2X8R2A153K080AE    | CGA3E2X8R1H153K080AE   |                        |                        |
|             |            |                 | ±20%                  | CGA3E2X8R2A153M080AE    | CGA3E2X8R1H153M080AE   |                        |                        |
| 22nF        | 1005       | 0.50+0.10,-0.05 | ±10%                  |                         |                        | CGA2B3X8R1E223K050BE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA2B3X8R1E223M050BE   |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  | CGA3E3X8R2A223K080AE    | CGA3E2X8R1H223K080AE   |                        |                        |
|             |            |                 | ±20%                  | CGA3E3X8R2A223M080AE    | CGA3E2X8R1H223M080AE   |                        |                        |
| 33nF        | 2012       | 1.25+0.25,-0.20 | ±10%                  | CGA4J2X8R2A223K125AE    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA4J2X8R2A223M125AE    |                        |                        |                        |
|             | 1005       | 0.50+0.10,-0.05 | ±10%                  |                         |                        | CGA2B1X8R1E333K050BE   | CGA2B3X8R1C333K050BE   |
|             |            |                 | ±20%                  |                         |                        | CGA2B1X8R1E333M050BE   | CGA2B3X8R1C333M050BE   |
| 47nF        | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         | CGA3E2X8R1H333K080AE   |                        |                        |
|             |            |                 | ±20%                  |                         | CGA3E2X8R1H333M080AE   |                        |                        |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  | CGA4J3X8R2A333K125AE    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA4J3X8R2A333M125AE    |                        |                        |                        |
| 68nF        | 1005       | 0.50+0.10,-0.05 | ±10%                  |                         |                        | CGA2B1X8R1E473K050BE   | CGA2B3X8R1C473K050BE   |
|             |            |                 | ±20%                  |                         |                        | CGA2B1X8R1E473M050BE   | CGA2B3X8R1C473M050BE   |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         | CGA3E2X8R1H473K080AE   |                        |                        |
|             |            |                 | ±20%                  |                         | CGA3E2X8R1H473M080AE   |                        |                        |
| 82nF        | 2012       | 1.25+0.25,-0.20 | ±10%                  | CGA4J3X8R2A473K125AE    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA4J3X8R2A473M125AE    |                        |                        |                        |
| 100nF       | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         | CGA3E3X8R1H683K080AE   | CGA3E2X8R1E683K080AE   |                        |
|             |            |                 | ±20%                  |                         | CGA3E3X8R1H683M080AE   | CGA3E2X8R1E683M080AE   |                        |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  | CGA4J3X8R2A683K125AE    | CGA4J2X8R1H683K125AE   |                        |                        |
|             |            |                 | ±20%                  | CGA4J3X8R2A683M125AE    | CGA4J2X8R1H683M125AE   |                        |                        |

■ Gray items: These products are not recommended for new designs.  
Click the part numbers for details.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: X8R (–55 to +150°C, ±15%)

| Capacitance | Dimensions | Thickness (mm)  | Capacitance tolerance | Catalog number          |                        |                        |                        |
|-------------|------------|-----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
|             |            |                 |                       | Rated voltage Edc: 100V | Rated voltage Edc: 50V | Rated voltage Edc: 25V | Rated voltage Edc: 16V |
| 100nF       | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         | CGA3E3X8R1H104K080AE   | CGA3E2X8R1E104K080AE   |                        |
|             |            |                 | ±20%                  |                         | CGA3E3X8R1H104M080AE   | CGA3E2X8R1E104M080AE   |                        |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         | CGA4J2X8R1H104K125AE   |                        |                        |
|             |            |                 | ±20%                  |                         | CGA4J2X8R1H104M125AE   |                        |                        |
|             | 3216       | 1.15±0.15       | ±10%                  | CGA5H2X8R2A104K115AE    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA5H2X8R2A104M115AE    |                        |                        |                        |
| 150nF       | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         |                        | CGA3E3X8R1E154K080AE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA3E3X8R1E154M080AE   |                        |
|             | 2012       | 0.85±0.15       | ±10%                  |                         |                        | CGA4F2X8R1E154K085AE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA4F2X8R1E154M085AE   |                        |
|             |            | 1.25+0.25,-0.20 | ±10%                  |                         | CGA4J3X8R1H154K125AE   |                        |                        |
|             |            |                 | ±20%                  |                         | CGA4J3X8R1H154M125AE   |                        |                        |
| 220nF       | 3216       | 1.60+0.30,-0.20 | ±10%                  | CGA5L2X8R2A154K160AE    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA5L2X8R2A154M160AE    |                        |                        |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         |                        | CGA3E3X8R1E224K080AE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA3E3X8R1E224M080AE   |                        |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         | CGA4J3X8R1H224K125AE   | CGA4J2X8R1E224K125AE   |                        |
|             |            |                 | ±20%                  |                         | CGA4J3X8R1H224M125AE   | CGA4J2X8R1E224M125AE   |                        |
| 330nF       | 3216       | 1.60+0.30,-0.20 | ±10%                  | CGA5L3X8R2A224K160AE    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA5L3X8R2A224M160AE    |                        |                        |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         |                        | CGA3E1X8R1E334K080AE   | CGA3E3X8R1C334K080AE   |
|             |            |                 | ±20%                  |                         |                        | CGA3E1X8R1E334M080AE   | CGA3E3X8R1C334M080AE   |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                        | CGA4J2X8R1E334K125AE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA4J2X8R1E334M125AE   |                        |
| 470nF       | 3216       | 1.60+0.30,-0.20 | ±10%                  | CGA5L3X8R2A334K160AE    | CGA5L2X8R1H334K160AE   |                        |                        |
|             |            |                 | ±20%                  | CGA5L3X8R2A334M160AE    | CGA5L2X8R1H334M160AE   |                        |                        |
|             | 1608       | 0.80+0.15,-0.10 | ±10%                  |                         |                        |                        | CGA3E3X8R1C474K080AE   |
|             |            |                 | ±20%                  |                         |                        |                        | CGA3E3X8R1C474M080AE   |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                        | CGA4J3X8R1E474K125AE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA4J3X8R1E474M125AE   |                        |
| 680nF       | 3216       | 1.60+0.30,-0.20 | ±10%                  | CGA6M3X8R2A474K200AE    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA6M3X8R2A474M200AE    |                        |                        |                        |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                        | CGA4J1X8R1E684K125AE   | CGA4J3X8R1C684K125AE   |
|             |            |                 | ±20%                  |                         |                        | CGA4J1X8R1E684M125AE   | CGA4J3X8R1C684M125AE   |
|             | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         | CGA5L3X8R1H684K160AE   |                        |                        |
|             |            |                 | ±20%                  |                         | CGA5L3X8R1H684M160AE   |                        |                        |
| 1µF         | 3225       | 2.50±0.30       | ±10%                  | CGA6P3X8R2A684K250AE    |                        |                        |                        |
|             |            |                 | ±20%                  | CGA6P3X8R2A684M250AE    |                        |                        |                        |
|             | 2012       | 1.25+0.25,-0.20 | ±10%                  |                         |                        | CGA4J1X8R1E105K125AE   | CGA4J3X8R1C105K125AE   |
|             |            |                 | ±20%                  |                         |                        | CGA4J1X8R1E105M125AE   | CGA4J3X8R1C105M125AE   |
|             | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         | CGA5L3X8R1H105K160AE   | CGA5L2X8R1E105K160AE   |                        |
|             |            |                 | ±20%                  |                         | CGA5L3X8R1H105M160AE   | CGA5L2X8R1E105M160AE   |                        |
| 1.5µF       | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         |                        | CGA5L3X8R1E155K160AE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA5L3X8R1E155M160AE   |                        |
| 2.2µF       | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         |                        | CGA5L3X8R1E225K160AE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA5L3X8R1E225M160AE   |                        |
| 3.3µF       | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         |                        | CGA5L1X8R1E335K160AE   | CGA5L3X8R1C335K160AE   |
|             |            |                 | ±20%                  |                         |                        | CGA5L1X8R1E335M160AE   | CGA5L3X8R1C335M160AE   |
|             | 3225       | 2.50±0.30       | ±10%                  |                         |                        | CGA6P2X8R1E335K250AE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA6P2X8R1E335M250AE   |                        |
| 4.7µF       | 3216       | 1.60+0.30,-0.20 | ±10%                  |                         |                        | CGA5L1X8R1E475K160AE   | CGA5L3X8R1C475K160AE   |
|             |            |                 | ±20%                  |                         |                        | CGA5L1X8R1E475M160AE   | CGA5L3X8R1C475M160AE   |
|             | 3225       | 2.50±0.30       | ±10%                  |                         |                        | CGA6P3X8R1E475K250AE   |                        |
|             |            |                 | ±20%                  |                         |                        | CGA6P3X8R1E475M250AE   |                        |
| 10µF        | 3225       | 2.50±0.30       | ±10%                  |                         |                        | CGA6P1X8R1E106K250AE   | CGA6P3X8R1C106K250AE   |
|             |            |                 | ±20%                  |                         |                        | CGA6P1X8R1E106M250AE   | CGA6P3X8R1C106M250AE   |

Click the part numbers for details.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: X8L (–55 to +150°C, +15,–40%)

| Capacitance | Dimensions | Thickness<br>(mm) | Capacitance<br>tolerance | Catalog number                       |                                      |                                      |                                      |
|-------------|------------|-------------------|--------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|             |            |                   |                          | Rated voltage Edc: 50V               | Rated voltage Edc: 35V               | Rated voltage Edc: 25V               | Rated voltage Edc: 10V               |
| 470nF       | 2012       | 1.25+0.25,-0.20   | ±10%                     | <a href="#">CGA4J1X8L1H474K125AE</a> |                                      |                                      |                                      |
| 1µF         | 2012       | 1.25+0.25,-0.20   | ±10%                     | <a href="#">CGA4J1X8L1H105K125AE</a> |                                      |                                      |                                      |
| 2.2µF       | 2012       | 1.25+0.25,-0.20   | ±10%                     |                                      | <a href="#">CGA4J1X8L1V225K125AE</a> |                                      |                                      |
| 4.7µF       | 2012       | 1.25+0.25,-0.20   | ±10%                     |                                      |                                      | <a href="#">CGA4J1X8L1E475K125AE</a> |                                      |
| 10µF        | 2012       | 1.25+0.25,-0.20   | ±10%                     |                                      |                                      |                                      | <a href="#">CGA4J1X8L1A106K125AE</a> |
|             | 3216       | 1.60+0.30,-0.20   | ±10%                     |                                      |                                      | <a href="#">CGA5L1X8L1E106K160AE</a> |                                      |

Click the part numbers for details.