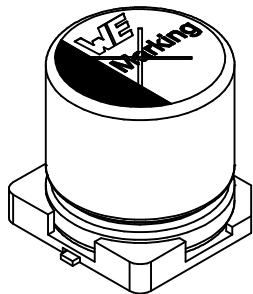
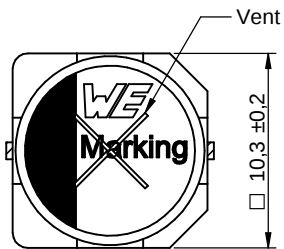
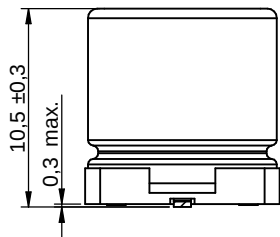
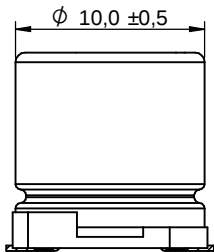
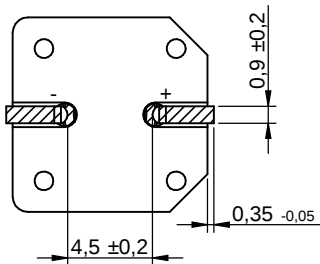
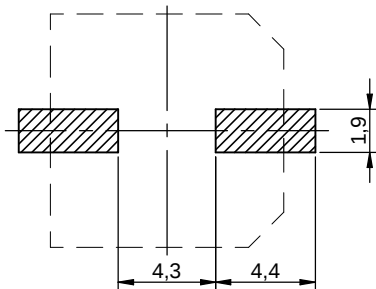


Dimensions: [mm]



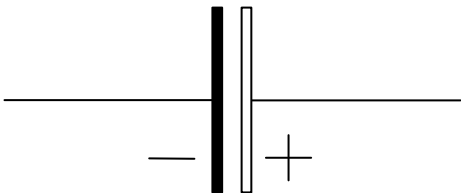
Scale - 2,5:1

Recommended Land Pattern: [mm]



Scale - 2,5:1

Schematic:



Electrical Properties:

Properties		Test conditions	Value	Unit	Tol.
Capacitance	C	0.25 V/ 120 Hz/ +20 °C	330	µF	±20%
Rated Voltage	V _R		16	V (DC)	max.
Surge Voltage	V _S	1000 cycles @ 20 °C	20	V (DC)	max.
Leakage Current	I _{Leak}	2 min./ +20 °C	52.8	µA	max.
Dissipation Factor	DF	0.25 V/ 120 Hz/ +20 °C	16	%	max.
Ripple Current	I _{RI</}				

Component Marking:

1 st Line	Capacitance Value: 330 µF (Coding: 331)
2 nd Line	WCAP-HSG5 & Datecode: YWW
3 rd Line	Rated Voltage: 16 V(DC)

Multiplier for Ripple Current vs. Frequency

Frequency	100 Hz ≤ freq. < 300 Hz	300 Hz ≤ freq. < 500 Hz	500 Hz ≤ freq. < 1 kHz	1 kHz ≤ freq. < 2 kHz	2 kHz ≤ freq. < 3 kHz	3 kHz ≤ freq. < 5 kHz	5 kHz ≤ freq. < 10 kHz
Muliplier	0,1	0,15	0,2	0,3	0,4	0,45	0,5

Multiplier for Ripple Current vs. Frequency

Frequency	10 kHz ≤ freq. < 15 kHz	15 kHz ≤ freq. < 20 kHz	20 kHz ≤ freq. < 40 kHz	40 kHz ≤ freq. < 50 kHz	50 kHz ≤ freq. < 100 kHz	100 kHz ≤ freq. < 500 kHz	500 kHz ≤ freq. < 1000 kHz
Muliplier	0,6	0,65	0,75	0,8	0,85	1	1,05

Lifetime Performance:

Test Conditions	Endurance	Moisture Resistance
Lifetime	10000 h @ 105 °C	1000 h, stored @ 85 °C, RH 85 %
Voltage	V _R applied	V _R applied
Current	I _R applied	None
Δ C	≤ ±30 % of initial measured value	≤ ±20 % of initial measured value
DF	≤ 200 % of the initial specified value	≤ 120 % of the initial specified value
ESR	≤ 200 % of the initial specified value	≤ the initial specified value
Leakage Current	≤ the initial specified value	≤ the initial specified value

Certification:

Packaging Specification - Tape: [mm]

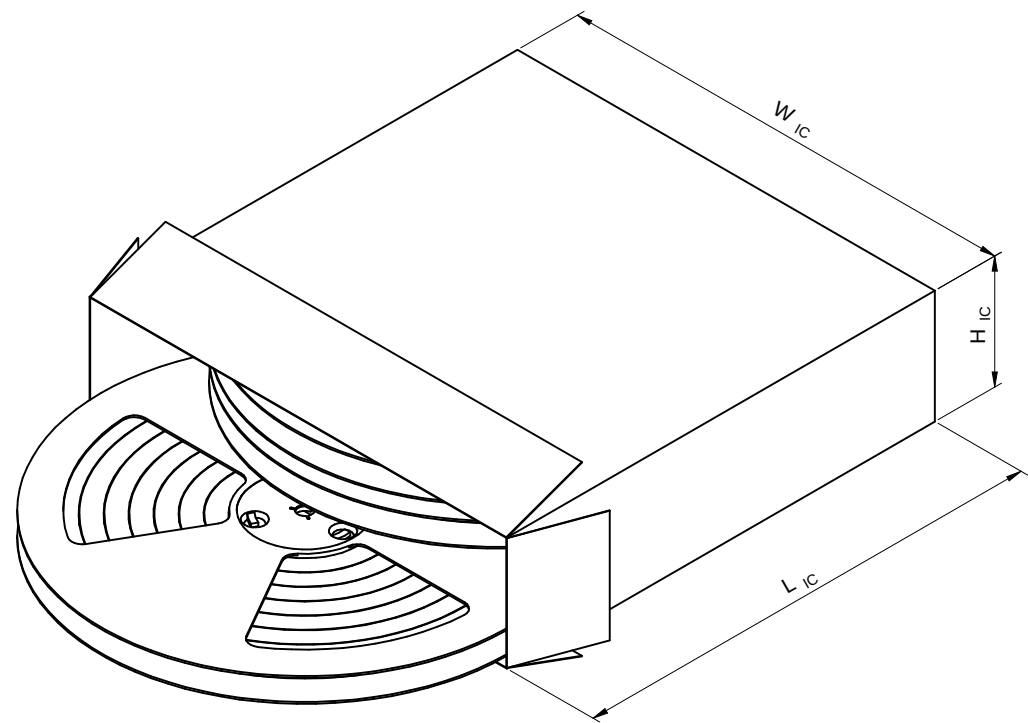


Packaging is referred to the international standard IEC 60286-3:2019

	Tape Type	A0 (mm)	B0 (mm)	W (mm)	T (mm)	T1 (mm)	T2 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	D0 (mm)	E1 (mm)	E2 (mm)	F (mm)	Material	Qty. (pcs.)
Tolerance		±0,2	±0,2	±0,3	±0,05	max.	±0,2	typ.	±0,1	±0,1	±0,05	±0,1	±0,1	min.	±0,1		
Value	2a	10,70	10,70	24,00	0,40	0,10	11,00	10,84	4,00	16,00	2,00	1,50	1,75	22,25	11,50	Polystyrene	500

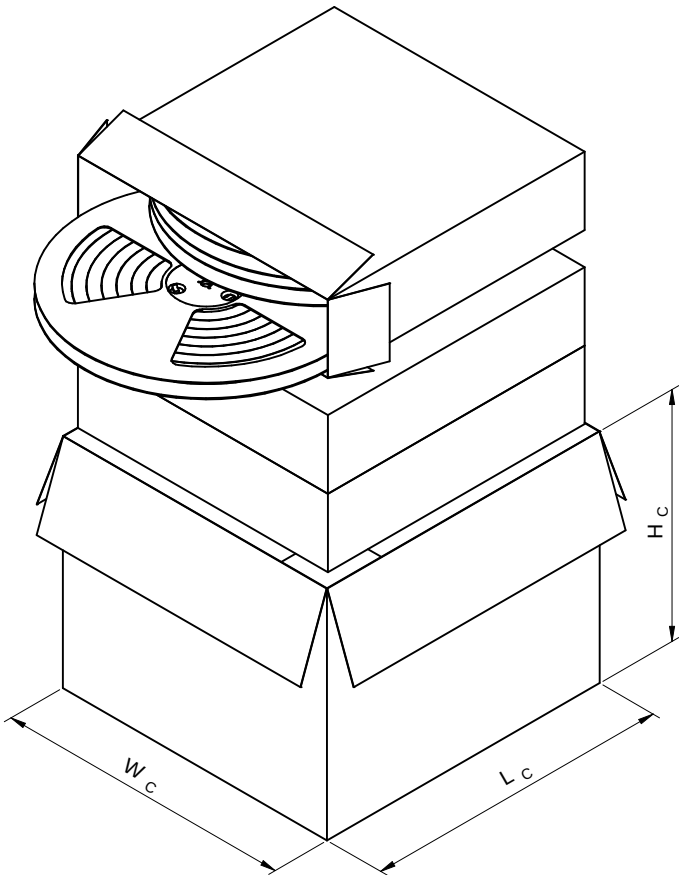


Packaging Specification - Inner Carton: [mm]



	L _{IC} (mm)	W _{IC} (mm)	H _{IC} (mm)	No. of Reel (pcs.)	Qty. (pcs.)	Material
Tolerance	typ.	typ.	typ.			
Value	400,00	390,00	106,00	3	1500	Paper

Packaging Specification - Outer Carton: [mm]



	L _C (mm)	W _C (mm)	H _C (mm)	No. of Inner Carton (pcs.)	Qty. (pcs.)	Material
Tolerance	typ.	typ.	typ.			
Value	425,00	412,00	340,00	3	4500	Paper

 RoHS COMPLIANT  REACH COMPLIANT  HALOGEN FREE <td data-cs="3" data-kind="parent">  WÜRTH ELEKTRONIK MORE THAN YOU EXPECT Würth Elektronik eiSos GmbH & Co. KG EMC & Inductive Solutions Max-Eyth-Str. 1 74638 Waldenburg Germany Tel. +49 (0) 79 42 945 - 0 www.we-online.com eiSos@we-online.com </td> <td>CHECKED FPU</td> <td>REVISION</td>	 WÜRTH ELEKTRONIK MORE THAN YOU EXPECT Würth Elektronik eiSos GmbH & Co. KG EMC & Inductive Solutions Max-Eyth-Str. 1 74638 Waldenburg Germany Tel. +49 (0) 79 42 945 - 0 www.we-online.com eiSos@we-online.com	CHECKED FPU	REVISION
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Classification Reflow Profile for SMT components:



Classification Reflow Soldering Profile:

Profile Feature		Value
Preheat Temperature Min	$T_{s\ min}$	150 °C
Preheat Temperature Max	$T_{s\ max}$	200 °C
Preheat Time t_s from $T_{s\ min}$ to $T_{s\ max}$	t_s	60 - 120 seconds
Ramp-up Rate (T_L to T_p)		3 °C/ second max.
Liquidous Temperature	T_L	217 °C
Time t_L maintained above T_L	t_L	60 - 150 seconds
Peak package body temperature	T_p	$T_p \leq T_c$, see Table below
Time within 5°C of actual peak temperature	t_p	20 - 30 seconds
Ramp-down Rate (T_p to T_L)		6 °C/ second max.
Time 25°C to peak temperature		8 minutes max.

refer to IPC/ JEDEC J-STD-020E

Package Classification Reflow Temperature (T_c):

Properties	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
PB-Free Assembly Package Thickness < 1.6 mm	260 °C	260 °C	260 °C
PB-Free Assembly Package Thickness 1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
PB-Free Assembly Package Thickness > 2.5 mm			

Cautions and Warnings

The following conditions apply to all goods within the product series of Aluminum Hybrid Polymer V-Chip SMT Capacitors of Würth Elektronik eiSos GmbH & Co. KG:

General

- This electronic component is designed and manufactured for use in general electronic equipment.
- Würth Elektronik must be asked for a written approval (following the certain PPAP level procedure) before incorporating the components into any equipment in the field such as military, aerospace, aviation, nuclear control, submarine, transportation (automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network etc. where higher safety and reliability are especially required and/or if there is the possibility of direct damage or human injury.
- Electronic components that will be used in safety-critical or high-reliability applications, should be pre-evaluated by the customer.
- Direct mechanical impact to the product shall be prevented as material of the body, pins or termination could flake or in the worst case it could break.
- Avoid any water or heavy dust on capacitors surface, which may cause electrical leakage, damage, overheating or corrosion.
- Würth Elektronik products are qualified according to international standards, which are listed in each product reliability report. Würth Elektronik does not warrant any customer qualified product characteristic, beyond Würth Elektronik specifications, for its validity and sustainability over time.
- The customer is responsible for the functionality of his or her own products. All technical specifications for standard products also apply to customer specific products.
- The component is designed and manufactured to be used within the datasheet specified values. If the usage and operation conditions specified in the datasheet are not met the body, pins or termination may be damaged or dissolved.
- Do not apply any kind of flexural or compressive force onto soldered or unsoldered component.
- The capacitance tolerance as specified within the datasheet is only valid on the date of delivery and according specified measurement criteria.

Product specific

Storage conditions

- A storage of Würth Elektronik products for longer than 12 months is not recommended. Within other effects, the terminals may suffer degradation, resulting in bad solderability. Therefore, all products shall be used within the period of 12 months based on the day of shipment.
- Do not expose the components into direct sunlight.
- The storage conditions in the original packaging is defined according to DIN EN 61760-2.
- The environment in which the capacitors are operated and stored has to have atmospheric characteristics and must be free of dew condensation and toxic gases (e.g. chlorine, ammonia, sulfur, hydrogen sulphide and hydrogen sulfate).
- Do not expose the capacitor to environments with hazardous gas, ozone, ultraviolet rays or any kind of radiation. Avoid any contact of the capacitor with direct sunshine, saltwater, spray of water or types of oil during storage.

- If a capacitor is stored for a long time without applying voltage or storage conditions of 35 °C or above and more than 75 % relative humidity, the leakage current may increase.
- The leakage current will return to normal level when applying the rated voltage to the capacitor before use. If the capacitor was stored for a long period of time, it is recommended to apply DC working voltage to the capacitor for 30 minutes through a 1 kΩ protective series resistor.
- The storage conditions stated in the original packaging apply to the storage time and not to the transportation time of the components.</

Charge and discharge

- Frequent and quick charge / discharge cycles may generate heat inside the capacitor. In worst case, this can cause a decrease of capacitance, an increase of leakage current or breakdown.
- Applications with rapid charge and discharge cycles should be avoided. For assistance with your application, please consult our technical support.

Vent

- On most aluminum electrolytic capacitor types, a predetermined breaking point is given on the top of the component, which is the so-called vent. The vent is there to assure a possible pressure relief and to avoid that the capacitor can explode due to internal pressure, which can occur by applying reverse voltage or a too high ripple current.
- A space of at least 3 mm above the vent is recommended, in order to assure the full function of the vent. If less space is present, the vent may not operate correctly/ completely.

Soldering

- The solder profile must comply with the technical product specifications. All other profiles will void the warranty.
- All other soldering methods are at the customer's own risk.
- Strong forces which may affect the coplanarity of the component's electrical connection with the PCB (i.e. pins), can damage the part, resulting in void of the warranty.
- Customer needs to ensure that the applied solder paste, the paste thickness and solder conditions are enough to guarantee a sufficient solder result according to the relevant criteria of IPC-A-610.
- Excessive amount of solder may lead to higher tensile force and chip cracking. Insufficient amount of solder may detach the capacitor due to defective contacts
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.

Cleaning and washing

Do not wash the assembled capacitors with the following cleaning agents:

- Petroleum system solvents: may cause degeneration of the rubber seal material
- Alkali system solvents: may cause corrosion and dissolve of the aluminum case
- Halogenated solvents: may cause corrosion and failure of the capacitor
- Acetone: component marking may be erased
- Xylene: may cause deterioration of the rubber seal material

Verify the following points when washing is applied to capacitors:

- Please monitor conductivity, pH-value, specific gravity and the water content of cleaning agents. Contamination adversely affects the performance of the capacitor.
- Be sure to not expose the capacitors under solvent rich conditions or keep capacitors inside a closed container. In addition, please dry the solvents on the PCB and the capacitor sufficiently with an air knife (temperature should be less than the maximum rated category temperature of the capacitor) for 10 minutes.
- Capacitors can be characteristically and catastrophically damaged by halogen ions, particularly by chlorine ions. The degree of the damage mainly depends upon the characteristics of the electrolyte and rubber seal material. When halogen ions come into contact with the inside of the capacitors, the foil may corrode, when a voltage is applied. This corrosion causes an extremely high leakage current, which results in venting and an open circuit defect.

User should never touch the terminals of the capacitor directly.

Avoid short circuit between terminals with any kind of conductive material (e.g. metal, fluid, acid, alkaline solution).

Maintenance

For industrial applications it is recommended to perform periodic inspections. Power supplies shall be turned off before inspection to discharge the capacitor. Check the following points in case of an inspection:

- Visual inspection of the capacitor to see, if there is a good appearance of the capacitors.
- Measurement of electrical characteristics of the capacitor (according to datasheet, especially leakage current, capacitance and dissipation factor).

In case of deviation or failure according to the specified characteristics, take care to start appropriate actions (e.g. replacement of capacitor).

Emergency case

- In case of excessive pressure within the capacitor, the vent may operate and release this pressure. In case of vent operation, gas becomes visible when the component is in operation. If so, directly turn off the application and disconnect it from the power source. If the application is not turned off, a possible short circuit of capacitor or a short circuit due to bridging of liquefied gas can possibly damage the circuit and, in worst case, the application may be dramatically damaged.
- Do not stay or position body or face above or in direction of the vent, because in the event of any vent operation, the releasing gas temperature may have over 100 °C.
- In case the electrolyte gets in contact with skin, wash the skin immediately with plenty of soap and water. If the released gas gets in contact with eyes, rinse immediately with plenty of water and seek medical advice. In case the gas was inhaled, gargle immediately with plenty of water and seek medical advice.
- If two or more aluminum hybrid polymer capacitors are to be connected in series connection, please contact our technical staff before usage.

Disposal

- Please contact your local responsible or organization for proper disposal of capacitor. In addition, take care to be compliant with your local governmental law and restrictions.
- In case of incineration, it should be done with more than 800 °C. Lower temperatures of incineration can result in toxic gases (e.g. chlorine). To avoid any explosion of capacitor, punch holes into the can or crush the capacitor before incineration.

These cautions and warnings comply with the state of the scientific and technical knowledge and are believed to be accurate and reliable. However, no responsibility is assumed for inaccuracies or incompleteness.(V1.0)

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Important Notes

The following conditions apply to all goods within the product range of Würth Elektronik eiSos GmbH & Co. KG:

1. General Customer Responsibility

Some goods within the product range of Würth Elektronik eiSos GmbH & Co. KG contain statements regarding general suitability for certain application areas. These statements about suitability are based on our knowledge and experience of typical requirements concerning the areas, serve as general guidance and cannot be estimated as binding statements about the suitability for a customer application. The responsibility for the applicability and use in a particular customer design is always solely within the authority of the customer. Due to this fact it is up to the customer to evaluate, where appropriate to investigate and decide whether the device with the specific product characteristics described in the product specification is valid and suitable for the respective customer application or not.

2. Customer Responsibility related to Specific, in particular Safety-Relevant Applications

It has to be clearly pointed out that the possibility of a malfunction of electronic components or failure before the end of the usual lifetime cannot be completely eliminated in the current state of the art, even if the products are operated within the range of the specifications. In certain customer applications requiring a very high level of safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health it must be ensured by most advanced technological aid of suitable design of the customer application that no injury or damage is caused to third parties in the event of malfunction or failure of an electronic component. Therefore, customer is cautioned to verify that data sheets are current before placing orders. The current data sheets can be downloaded at www.we-online.com.

3. Best Care and Attention

Any product-specific notes, cautions and warnings must be strictly observed. Any disregard will result in the loss of warranty.

4. Customer Support for Product Specifications

Some products within the product range may contain substances which are subject to restrictions in certain jurisdictions in order to serve specific technical requirements. Necessary information is available on request. In this case the field sales engineer or the internal sales person in charge should be contacted who will be happy to support in this matter.

5. Product R&D

Due to constant product improvement product specifications may change from time to time. As a standard reporting procedure of the Product Change Notification (PCN) according to the JEDEC-Standard inform about minor and major changes. In case of further queries regarding the PCN, the field sales engineer or the internal sales person in charge should be contacted. The basic responsibility of the customer as per Section 1 and 2 remains unaffected.

6. Product Life Cycle

Due to technical progress and economical evaluation we also reserve the right to discontinue production and delivery of products. As a standard reporting procedure of the Product Termination Notification (PTN) according to the JEDEC-Standard we will inform at an early stage about inevitable product discontinuance. According to this we cannot guarantee that all products within our product range will always be available

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