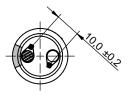
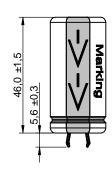
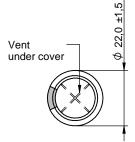
## **Dimensions: [mm]**





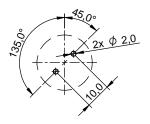






Scale - 1:1,5

## **Recommended Hole Pattern: [mm]**

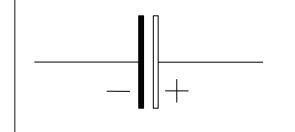


Scale - 1:1,5

## **Electrical Properties:**

Properties		Test conditions	Value	Unit	Tol.
Capacitance	С	10 mA/ F	100	F	+30%/-10%
Rated Voltage	V <sub>R</sub>	@ 65 °C	2.7	٧	max.
Rated Voltage	V <sub>R</sub>	@ 85 °C	2.3	V	max.
Surge Voltage	V <sub>S</sub>	@ 65 °C	2.85	V	max.
ESR	R <sub>ESR DC</sub>	10 ms	12	mΩ	max.
ESR	R <sub>ESR AC</sub>	5 mV @ 1 kHz	9	mΩ	max.
Rated Discharge Current	I <sub>Rated</sub>		21.7	А	typ.
Max. Discharge Current	I <sub>Max</sub>		61.3	А	typ.
Leakage Current	I <sub>Leak</sub>	72 hrs. @ VR	0.55	mA	typ.
Power Density	Р		7.23	kW/ kg	typ.
Energy Density	E		4.8	Wh/ kg	typ.

## **Schematic:**



## **General Information:**

CHECKED

ReKa

REVISION

001.003

Storage Conditions (in original packaging)	15 °C up to + 35 °C; 10 % rH up to 75 % rH						
Operating Temperature	-40 °C up to +65 °C						
Moisture Sensitivity Level (MSL)	1						
Life Cycle	500000 Cycles						
Weight	m	21	g				
Test conditions of electrical pro-	properties: +20 °C, 35 % rH if not specified differently						
Component conform to	ponent conform to REACh and RoHS requirements and standards						



Tel. +49 (0) 79 42 945 - 0 www.we-online.com eiSos@we-online.com

**WCAP-SISC Supercapacitors** (EDLC's)

DATE (YYYY-MM-DD)

2025-06-12

SIP2245107Q2R7DSIBB5000

PROJECTION METHOD

ORDER CODE

851617031001

SIZE/TYPE STATUS BUSINESS UNIT PAGE 22.0 x 45.0 eiCap Valid 1/11

GENERAL TOLERANCE

DIN ISO 2768-1m

MORE THAN YOU EXPECT

## **Component Marking:**

1 <sup>st</sup> Horizontal Line	RU					
2 <sup>nd</sup> Horizontal Line	Supercapacitor					
3 <sup>rd</sup> Horizontal Line	EDLC Energy Capacity: 0.1 Wh					
4 <sup>th</sup> Horizontal Line	Rated Voltage: 2.7 V , Capacitance Value: 100 F , max. Temp. 65 °C					
5 <sup>th</sup> Horizontal Line	WCAP-SISC					
1 <sup>st</sup> Verticall Line	Marking -NEG					

## **Lifetime Performance:**

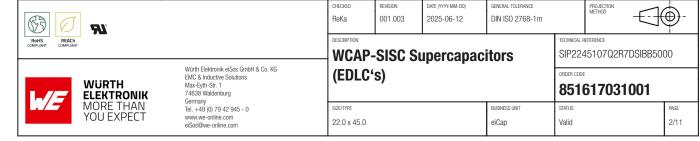
<b>Test Condition</b>	Shelf Life	Cycle Life	Endurance
Lifetime	up to 2 years	after 500000 cycles	1000 h, @65°C
Voltage	None	V <sub>R</sub> applied	V <sub>R</sub> applied
Current	None	I <sub>R</sub>	I <sub>R</sub>
ΔC	≤ 10% of initial value	≤ 30 % of initial measured value	≤ 30 % of initial measured value
ΔESR	≤ 50% of specified value	≤ 2 x ESR	≤ 2 x ESR
Comments	$25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ / $60\% \pm 15\%$ RH (dry and cool condition); discharged $\leq 0.2 \text{ V}$		

## **Certification:**

RoHS Approval	Compliant [2011/65/EU&2015/863]					
REACh Approval	Conform or declared [(EC)1907/2006]					
UL Approval	810A					

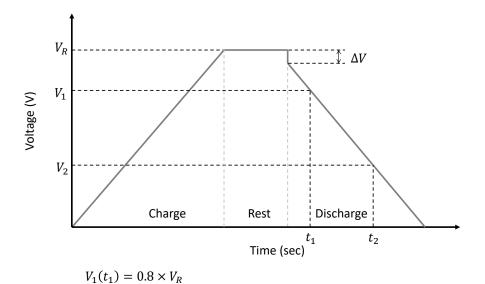
#### Additional Information:

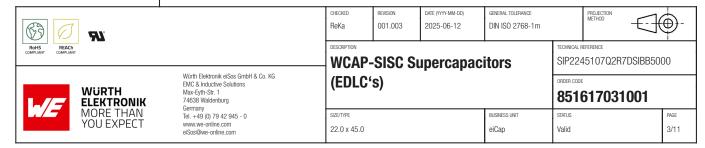
Additional information:		
Properties	Description	Formula
Max. Discharge Current  I <sub>max</sub> – [A]	Current to discharge from $V_R$ to $V_{R/2}$ within 1 sec.	$I_{max} = \frac{v_R/2}{1  sec/C + R_s}$
Rated Discharge Current I <sub>Rated</sub> – [A]	Current to discharge from $V_{\text{R}}$ to $V_{\text{R}/2}$ within 5 sec.	$I_{Rated} = \frac{v_R/2}{5  sec/c + R_s}$
Leakage Current  I <sub>Leak</sub> – [mA]	is measured at 25°C (after holding 72 h at $\ensuremath{V_{\text{R}}}\xspace)$	
Power Density P – [W/kg]	impedance matched with m (kg) as net weight for Capacitor	$P_{max} = \frac{V_R^2}{4 * R_s * m}$
Energy Density E – [Wh/kg]	with m(kg) as net weight for Capacitor	$E = \frac{C * V_R^2}{3600 * 2 * m}$
ESR R <sub>ESR</sub> – [mΩ]	R <sub>ESR AC</sub> : measured by contact resistance meter, conditions: Amplitude: 5 mV Frequency 1 kHz R <sub>ESR DC</sub> : Measured by constant current discharge method (i.a.w. IEC62391), deltaV: Voltage drop during <20 ms I <sub>CC</sub> : constant discharge current	$R_{DC} = rac{\Delta V}{I_{cc}}$
Capacitance C – [F]	$I_{CC}$ [A]: constant discharge current $V_1$ [V]: $V_R \times 0.8$ $V_2$ [V]: $V_R \times 0.4$ $t_1$ [sec]: time at $V_1$ $t_2$ [sec]: time at $V_2$	$C = \frac{dQ}{dV} = I_{cc} * \frac{t_2 - t_1}{V_1 - V_2}$



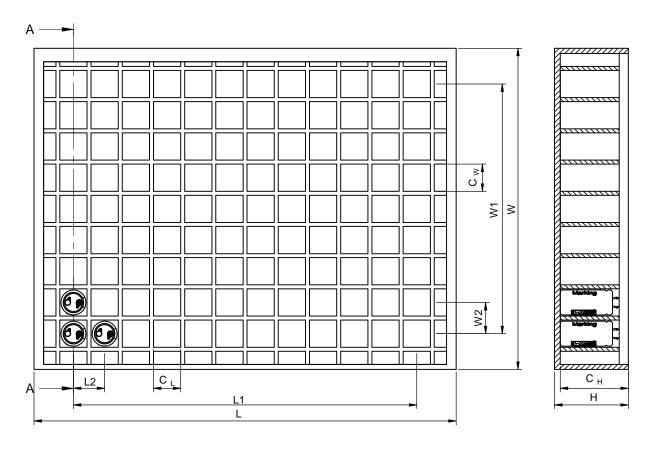
## **Charge & Discharge Characterictis:**

 $V_2(t_2) = 0.4 \times V_R$ 



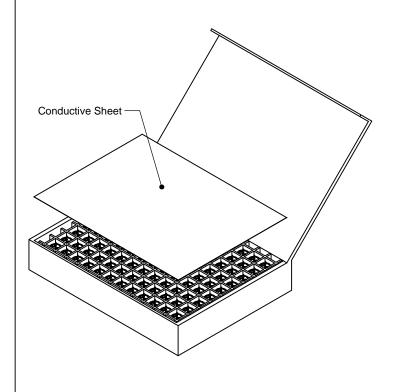


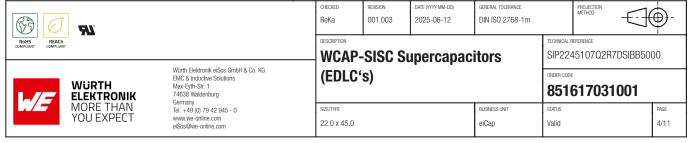
## Packaging Specification - Carton: [mm]



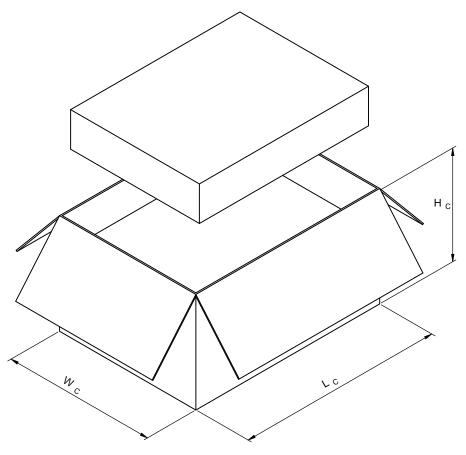
	L (mm)	L1 (mm)	L2 (mm)	C <sub>L</sub> (mm)	W (mm)	W1 (mm)	W2 (mm)	C <sub>W</sub> (mm)	H (mm)	C <sub>H</sub> (mm)	Qty. (pcs.)	Material
Tolerance	typ.	typ.	typ.	typ.	typ.	typ.	typ.	typ.	typ.	typ.		
Value	380.00	302 50	27.50	24 00	283.00	220.00	27.50	24.00	72.00	65.00	108	PFT

## Packaging Specification - Inner Carton: [mm]

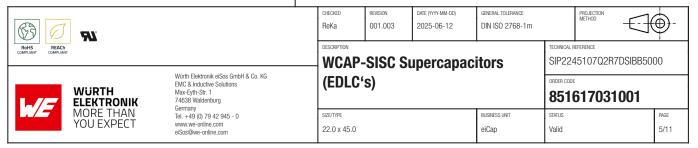




## Packaging Specification - Outer Carton: [mm]



	L <sub>C</sub> (mm)	W <sub>C</sub> (mm)		No. of Inner Carton (pcs.)	Qty. (pcs.)	Material
Tolerance	typ.	typ.	typ.			
Value	404	300	240	3	144	Paner



## **Classification Wave Soldering Profile:**



## **Classification Wave Soldering Profile:**

Profile Feature		Pb-Free Assembly	Sn-Pb Assembly
Preheat Temperature Min	T <sub>s min</sub>	100 °C	100 °C
Preheat Temperature Typical	T <sub>s typical</sub>	120 °C	120 °C
Preheat Temperature Max	T <sub>s max</sub>	130 °C	130 °C
Preheat Time $t_s$ from $T_{s  min}$ to $T_{s  max}$	t <sub>s</sub>	70 seconds	70 seconds
Ramp-up Rate $\Delta$ Temperature from T $_{s\ typical}$ to T $_{p}$	ΔΤ	150 °C max.	150 °C max.
Peak Temperature	T <sub>p</sub>	250 °C - 260 °C	235 °C - 260 °C
Time of actual peak temperature	t <sub>p</sub>	max. 10 seconds max. 5 seconds each wave	max. 10 seconds max. 5 seconds each wave
Ramp-down Rate, Min		~ 2 K/ second	~ 2 K/ second
Ramp-down Rate, Typical		~ 3.5 K/ second	~ 3.5 K/ second
Ramp-down Rate, Max		~ 5 K/ second	~ 5 K/ second
Time 25 °C to 25 °C		4 minutes	4 minutes

refer to EN61760-1:2006

		ReKa	REVISION 001.003	DATE (YYYY-MM-DD) 2025-06-12	GENERAL TOLERANCE DIN ISO 2768-1m		PROJECTION METHOD	<b>-</b>
		1		ıpercapac	itors	TECHNICAL F	EFFERENCE 45107Q2R7DSIBB5	000
Würth Elektronik eißos GmbH & Co. KG EMC & Inductive Solutions Max-Eyth-Str. 1 74638 Waldenburg Germany Germany		(EDLC	s)			8510	617031001	
MORE THAN YOU EXPECT	Tel. +49 (0) 79 42 945 - 0 www.we-online.com eiSos@we-online.com	SIZE/TYPE 22.0 x 45.0			eiCap	status Valid		PAGE 6/11

### **Further information**

#### **Component Libraries:**

3D <u>Download\_3D\_851617031001</u>

Altium Altium\_WCAP-SISC (22c)
Cadence17-2 Cadence\_WCAP-SISC (23a)

Eagle Eagle\_WCAP-SISC (22a)

IGS <u>Download\_IGS\_851617031001</u>

 KiCad
 KiCad\_WCAP-SISC (25a)

 PSpice
 PSpice\_WCAP-SISC (22a)

STP Download\_STP\_851617031001

#### Free Sample Order:

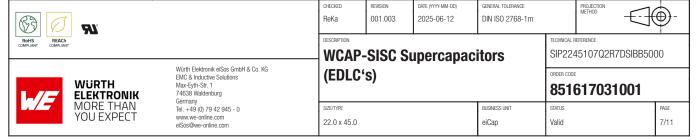
Order free samples of this article directly here!

#### **Tutorials:**

Capacitor Portfolio Flyer (PDF)

#### **REDEXPERT:**

Analyse the article 851617031001 in REDEXPERT



## **Cautions and Warnings:**

# The following conditions apply to all goods within the product series of Supercapacitors (EDLC's) 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 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.
- 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.
- 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.

#### **Packaging**

• The packaging specifications apply only to purchase orders comprising whole packaging units. If the ordered quantity exceeds or is lower than the specified packaging unit, packaging in accordance with the packaging specifications cannot be ensured.

#### **Polarity**

- The product has a polarity. In operation this polarity needs to be considered and adhered. Reverse voltage can damage or destroy the
  product.
- The polarity is marked with a stripe and the word NEG as well as a negative sign on the lateral surface of the capacitor.

#### **Overvoltage**

- Avoid any overvoltage and do not apply a continuous overvoltage. If an overvoltage is applied to the capacitor, the leakage current can
  increase drastically. This can shorten the lifetime.
- The applied working voltage is not allowed to exceed the rated working voltage of the specific capacitor.

#### **Operating Temperature**

- The capacitor shall not be operated outside the operating temperature, which is stated within this datasheet of the specific capacitor.
- The achievable lifetime of the capacitor is correlating to the applied temperature.
- During charging and discharging in a short cycles, self-heating is generated by internal resistance. The operating temperature should not exceed the above stated operating temperature, including any self-heating.

#### **Charge and Discharge**

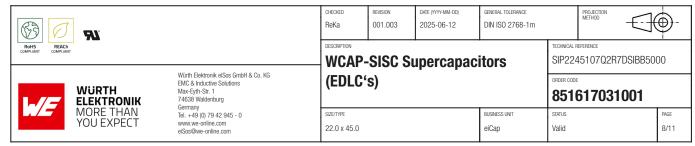
- Frequent and guick charge / discharge cycles may generate heat inside the capacitor.
- Do not exceed the above stated discharge current. Exceeding the maximal current, stated above, can cause a decrease of capacitance, an increase of leakage current or breakdown.
- For assistance with your application please consult our technical support.

#### Vent

- On this capacitor, 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.

#### Sleeve

- If excessive heat is applied to the sleeve (e.g. soldering process, etc.), the sleeve may crack or deform. If the capacitor will be exposed
  to xylene, toluene or likewise and will be afterwards heated, the sleeve may crack or deform.
- The sleeve does not assure any electrical insulation. It is to avoid using / placing the product on a spot where electrical insulation is needed. To assure electrical insulation, especially to the case of capacitor, further actions need to be taken.



#### **Soldering**

- The solder profile must comply with the technical soldering specification. All other profiles will void the warranty.
- All other soldering methods are at the customers' 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 avoid 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.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- During wave soldering only the pins / terminals should have contact with hot solder bath / wave. Assure that no direct contact of
  capacitor body with hot solder bath / wave or any other component will happen. Soldering must be done from the opposite PCB side
  where capacitor body is placed.

#### 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 casing
- Halogenated solvents: may cause corrosion and failure of the capacitor
- · Acetone: component marking may be erased
- Aromatic solvents like 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 characteristics
- 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.

All other cleaning processes and cleaning agents are not approved by Würth Elektronik. All cleaning methods need to be tested and validated by the customer.

#### **Adhesives and Coating Materials**

The usage of any adhesive or coating material, which is containing halogenated solvents, is not allowed. In general, all adhesives as well
as filling and coating materials need to be tested and validated by the customer.

Before applying adhesives or coating materials, make sure that the following points are fulfilled:

- Take care that the surface and capacitor is dry and clean before applying adhesive or coating, to avoid any contamination with flux residues or cleaning solvents.
- Assure that no flux residue or spot is left between the rubber seal material of the capacitor and the PCB.
- If the used adhesive, coating or molding material is containing halogen ions in a large amount, the halogen ions can diffuse and creep into the capacitor and can damage the capacitor. Both above explained circumstances can result in serious failures.
- Follow the specified heating and curing instructions given by supplier of the used adhesive or coating material. Avoid excessive pressure
  or heat on the capacitor by applying coating or adhesive.
- Take care that hardening of adhesive, coating material was correctly done, so that no solvents do remain.
- Be aware, that used solvents within adhesive and coating materials can damage the sleeve of the capacitor and can result in changes of the appearance of the sleeve (color, shine and marking).

#### Operation and usage of the capacitor

In operation and usage take care about the following points.

Do not use the capacitor within the following environmental conditions:

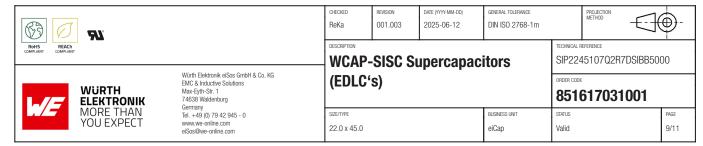
- Environment with high mechanical stress/ shocks or vibration (please see this specific datasheet for permitted limits).
- Environment with high amount of damp condensation, water or types of oil.
- Direct sunlight, ozone, any kind of radiation or ultraviolet rays.
- Toxic gases (e.g. ammonium, chlorine and compounds, bromine and compounds, hydrogen sulfide, sulfuric acid).

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).

#### **Dangerous Goods and Handling**

- Due to the European agreement concerning the international carriage of dangerous good by road (ADR) capacitors with an energy storage capacity of 0.3 Wh or more are considered as dangerous goods. Refer to special provision 361 for detailed information.
- Each capacitor should be protected against unintended short circuit or be fitted with a metal strap connecting the terminals, if transported.
- Capacitors installed in equipment shall be either in an uncharged state or protected against short circuit.
- A fully charged capacitor shall not be short circuited without a protective resistor.



#### 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 the vent operated for pressure relief and if any leakage of electrolyte has taken place.
- Measurement of electrical characteristics of the capacitor (according to datasheet, especially leakage current, capacitance and ESR).

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

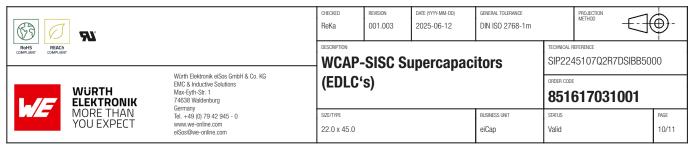
#### **Emergency case**

- 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 will not be 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 of contact with the electrolyte on skin, wash the skin immediately with soap and water. If the eyes will get in contact with the
  releasing gas, immediately wash the eyes with water. Whether the gas was inhaled, directly use gargle.

#### Disposal

This capacitor shall be disposed of as industrial waste in accordance with local laws and regulations. Discharge capacitor before
disposal. Never throw this device into fire. To avoid any explosion of capacitor, punch holes into the can or crush the capacitor before
industrial waste 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. V2.0



## **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. Therefore it needs to be verified with the field sales engineer or the internal sales person in charge about the current product availability expectancy before or when the product for application design-in disposal is considered. The approach named above does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

#### 7. Property Rights

All the rights for contractual products produced by Würth Elektronik eiSos GmbH & Co. KG on the basis of ideas, development contracts as well as models or templates that are subject to copyright, patent or commercial protection supplied to the customer will remain with Würth Elektronik eiSos GmbH & Co. KG does not warrant or represent that any license, either expressed or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, application, or process in which Würth Elektronik eiSos GmbH & Co. KG components or services are used.

#### 8. General Terms and Conditions

Unless otherwise agreed in individual contracts, all orders are subject to the current version of the "General Terms and Conditions of Würth Elektronik eiSos Group", last version available at www.we-online.com.

