



# Aluminum electrolytic capacitors

Capacitors for pulse applications

**Series/Type:**            **B43417**

**Date:**                    February 2024

### Applications

- Medical appliances

### Features

- Compact design
- High charge/discharge proof, polar
- Low leakage current
- Low dissipation factor
- RoHS-compatible

### Construction

- Aluminum case, insulated with PET sleeve without insulation sheet at the can bottom
- Snap-in solder pins to hold component in place on PC-board
- Minus pole marking on shrinking sleeve
- Minus pole not insulated from case
- Overload protection by pressure relief device on the base
- Length up to 100 mm on request

### Terminals

- Standard version with 2 terminals,  
2 lengths available: 6.3 and 4.5 mm
- 3 terminals to ensure correct insertion: length 4.5 mm



**Specifications and characteristics in brief**

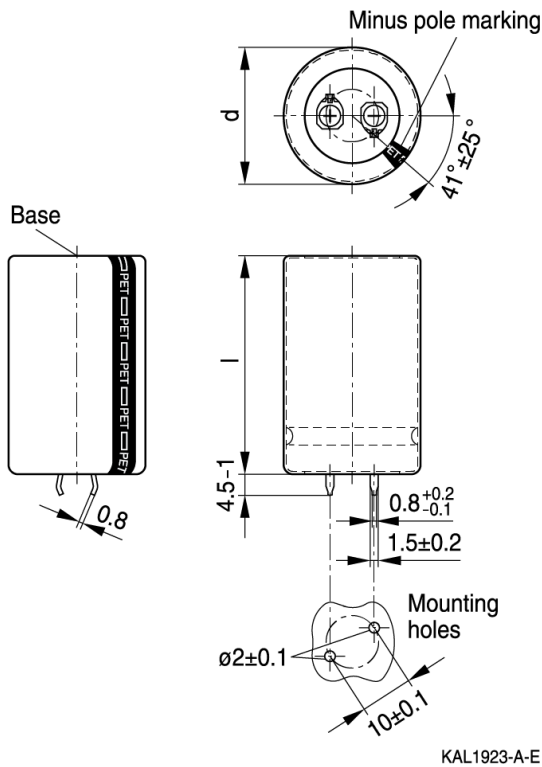
Rated voltage $V_R$	300 ... 400 V DC	
Rated capacitance $C_R$	170... 1650 $\mu$ F	
Capacitance tolerance	+/-10% = K	
Leakage current $I_{leak}$ (5 min, 20 °C)	$I_{leak} \leq 0.3 \mu A \cdot \left( \frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)^{0.7} + 4 \mu A$	
Dissipation factor $\tan \delta$ (20 °C, 120 Hz)	$\leq 0.20$	
Useful life <sup>1)</sup>	<p>&gt; 100000 discharges at:</p> <p>Case temperature <math>\leq 60</math> °C</p> <p>Discharge repetition rate <math>\geq 2</math> s</p> <p>Max. discharges per week <math>\leq 5000</math></p> <p>Charge resistance <math>&gt; 10</math> <math>\Omega</math></p> <p>Discharge resistance <math>&gt; 2</math> <math>\Omega</math></p>	<p>Requirements:</p> <p><math>\Delta C/C \leq \pm 20\%</math> of initial value</p> <p><math>\tan \delta \leq 3</math> times initial specified limit</p> <p><math>I_{leak} \leq</math> initial specified limit</p>
Vibration resistance test	<p>To IEC 60068-2-6, test Fc:</p> <p>Frequency range 10 ... 55 Hz, displacement amplitude 0.35 mm, acceleration max. 5 g, duration 3 x 2 h.</p> <p>Capacitor mounted by its body which is rigidly clamped to the work surface.</p> <p>If terminals are used for mechanical fixation of the capacitor, the vibration resistance can be reduced depending on capacitor size.</p>	
Climatic category	25/060/56 (-25°C/+60°C/56 days damp heat test)	

1) Refer to chapter "General technical information, 5 Useful life" on how to interpret useful life.

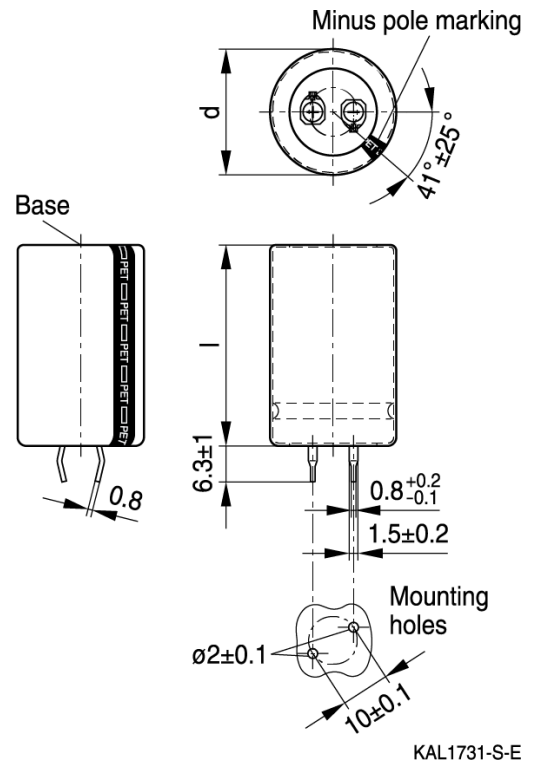
**Dimensional drawings**

**Snap-in capacitors with PET shrinking sleeve**

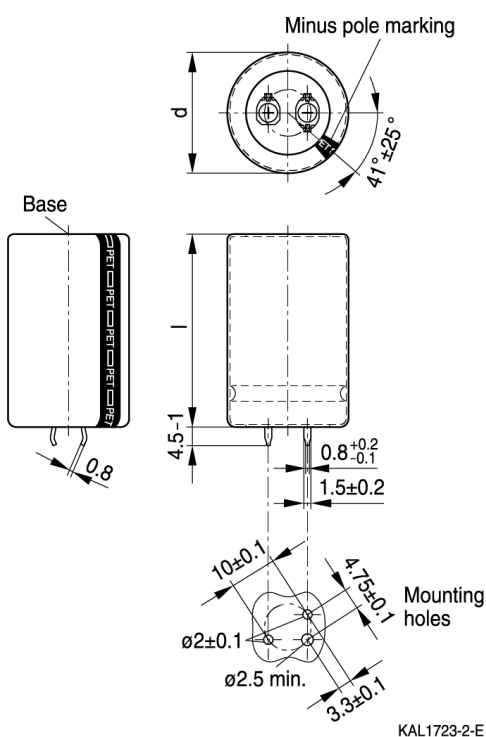
Insulation is marked with “PET” on the sleeve. Pressure relief device on the base.



Snap-in terminals (2 terminals, 4.5 mm)



Snap-in terminals (2 terminals, 6.3 mm)



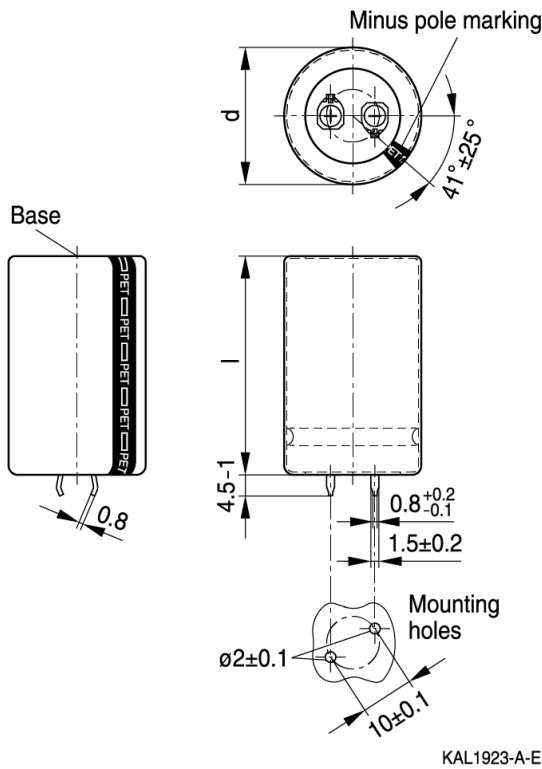
Snap-in terminals (3 terminals, 4.5 mm)

Dimensions (mm)		Approx. weight (g)	Packing units (pcs.)
d +1	l +2/-2		
22	25	9	160
22	30	12	160
22	35	15	160
22	40	18	160
22	45	20	160
22	50	24	160
Dimensions (mm)		Approx. weight (g)	Packing units (pcs.)
d +1	l +2/-2		
25	25	13	130
25	30	17	130
25	35	19	130
25	40	22	130
25	45	25	130
25	50	29	130

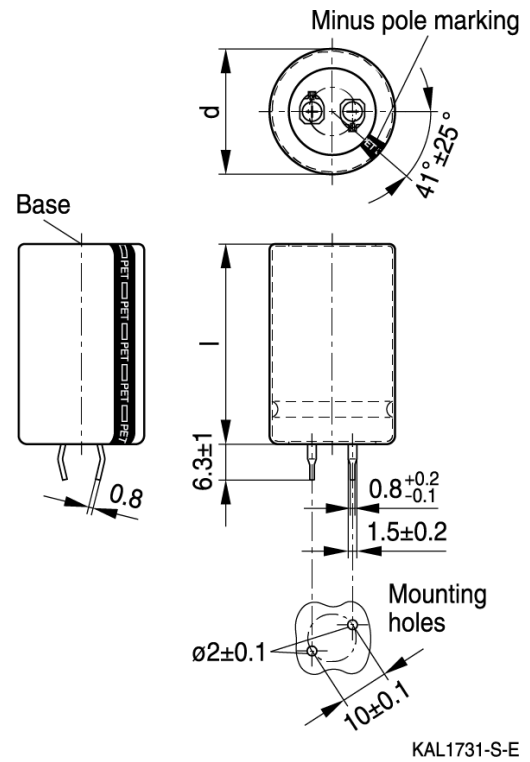
**Dimensional drawings**

**Snap-in capacitors with PET shrinking sleeve**

Insulation is marked with “PET” on the sleeve. Pressure relief device on the base.

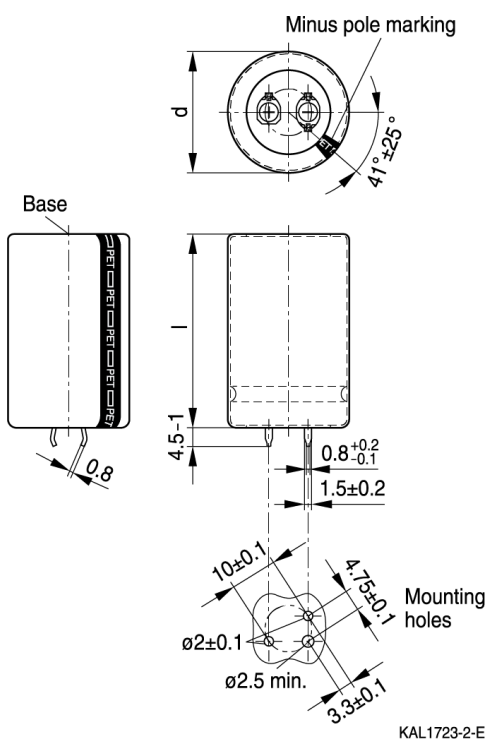


Snap-in terminals (2 terminals, 4.5 mm)



Snap-in terminals (2 terminals, 6.3 mm)

Dimensions (mm)		Approx. weight (g)	Packing units (pcs.)
d +1	l +2/-2		
30	25	17	80
30	30	23	80
30	35	29	80
30	40	36	80
30	45	41	80
30	50	46	80
30	55	53	80
30	60	58	60



Snap-in terminals (3 terminals, 4.5 mm)

**Overview of available types**

The capacitance and voltage ratings listed below are available in different case sizes upon request. Other voltage and capacitance ratings are also available upon request.

$V_R$ (V DC)	300	350	400
	Case dimensions d x l (mm)		
$C_R$ (μF)			
170			22 x 25
210		22 x 25	
220			22 x 30
230			25 x 25
250	22 x 25		
270		22 x 30	22 x 35
290		25 x 25	
300			25 x 30
320			22 x 40
330	22 x 30		
340		22 x 35	
350	25 x 25		30 x 25
370			22 x 45 25 x 35
380		25 x 30	
400		22 x 40	
410	22 x 35		
420			22 x 50
430			25 x 40
440		30 x 25	
450	25 x 30		
460		25 x 35	30 x 30
470		22 x 45	
480	22 x 40		
500			25 x 45
530		22 x 50	
540	30 x 25		
550		25 x 40	
560	22 x 45 25 x 35		30 x 35
570			25 x 50
580		30 x 30	

**Capacitors for pulse applications**
**B43417**
**Compact – up to 60 °C**

$V_R$ (V DC)	300	350	400
	Case dimensions d x l (mm)		
$C_R$ ( $\mu$ F)			
640	22 x 50	25 x 45	
660	25 x 40		
670			30 x 40
690	30 x 30		
710		30 x 35	
720		25 x 50	
770	25 x 45		30 x 45
840		30 x 40	
850	30 x 35		
870	25 x 50		
880			30 x 50
970		30 x 45	
980			30 x 55
1010	30 x 40		
1090			30 x 60
1110		30 x 50	
1170	30 x 45		
1240		30 x 55	
1330	30 x 50		
1370		30 x 60	
1490	30 x 55		
1650	30 x 60		

**Technical data and ordering codes**

$C_R$ 100 Hz 20 °C $\mu\text{F}$	Case dimensions d x l  mm	Ordering code
$V_R = 300 \text{ V DC}$		
250	22 x 25	B43417A3257K05#
330	22 x 30	B43417A3337K05#
350	25 x 25	B43417A3357K05#
410	22 x 35	B43417A3417K05#
450	25 x 30	B43417A3457K05#
480	22 x 40	B43417A3487K05#
540	30 x 25	B43417A3547K05#
560	22 x 45	B43417A3567K05#
560	25 x 35	B43417B3567K05#
640	22 x 50	B43417A3647K05#
660	25 x 40	B43417A3667K05#
690	30 x 30	B43417A3697K05#
770	25 x 45	B43417A3777K05#
850	30 x 35	B43417A3857K05#
870	25 x 50	B43417A3877K05#
1010	30 x 40	B43417A3108K15#
1170	30 x 45	B43417A3118K75#
1330	30 x 50	B43417A3138K35#
1490	30 x 55	B43417A3148K95#
1650	30 x 60	B43417A3168K55#

**Composition of ordering code**

- # = Terminal style
- 7 = Snap-in terminals (2 terminals, 4.5 mm)
- 2 = Snap-in terminals (3 terminals, 4.5 mm)
- 0 = Snap-in terminals (2 terminals, 6.3 mm)



**Technical data and ordering codes**

$C_R$ 100 Hz 20 °C $\mu\text{F}$	Case dimensions d x l  mm	Ordering code
$V_R = 350 \text{ V DC}$		
210	22 x 25	B43417A4217K05#
270	22 x 30	B43417A4277K05#
290	25 x 25	B43417A4297K05#
340	22 x 35	B43417A4347K05#
380	25 x 30	B43417A4387K05#
400	22 x 40	B43417A4407K05#
440	30 x 25	B43417A4447K05#
460	25 x 35	B43417A4467K05#
470	22 x 45	B43417A4477K05#
530	22 x 50	B43417A4537K05#
550	25 x 40	B43417A4557K05#
580	30 x 30	B43417A4587K05#
640	25 x 45	B43417A4647K05#
710	30 x 35	B43417A4717K05#
720	25 x 50	B43417A4727K05#
840	30 x 40	B43417A4847K05#
970	30 x 45	B43417A4977K05#
1110	30 x 50	B43417A4118K15#
1240	30 x 55	B43417A4128K45#
1370	30 x 60	B43417A4138K75#

**Composition of ordering code**

- # = Terminal style
- 7 = Snap-in terminals (2 terminals, 4.5 mm)
- 2 = Snap-in terminals (3 terminals, 4.5 mm)
- 0 = Snap-in terminals (2 terminals, 6.3 mm)

**Technical data and ordering codes**

$C_R$ 100 Hz 20 °C $\mu\text{F}$	Case dimensions d x l  mm	Ordering code
$V_R = 400 \text{ V DC}$		
170	22 x 25	B43417A9177K05#
220	22 x 30	B43417A9227K05#
230	25 x 25	B43417A9237K05#
270	22 x 35	B43417A9277K05#
300	25 x 30	B43417A9307K05#
320	22 x 40	B43417A9327K05#
350	30 x 25	B43417A9357K05#
370	22 x 45	B43417A9377K05#
370	25 x 35	B43417B9377K05#
420	22 x 50	B43417A9427K05#
430	25 x 40	B43417A9437K05#
460	30 x 30	B43417A9467K05#
500	25 x 45	B43417A9507K05#
560	30 x 35	B43417A9567K05#
570	25 x 50	B43417A9577K05#
670	30 x 40	B43417A9677K05#
770	30 x 45	B43417A9777K05#
880	30 x 50	B43417A9887K05#
980	30 x 55	B43417A9987K05#
1090	30 x 60	B43417A9108K95#

**Composition of ordering code**

- # = Terminal style
- 7 = Snap-in terminals (2 terminals, 4.5 mm)
- 2 = Snap-in terminals (3 terminals, 4.5 mm)
- 0 = Snap-in terminals (2 terminals, 6.3 mm)

**Packaging of snap-in capacitors**



For ecological reasons the packing is pure cardboard.

**Ordering codes for terminal styles and insulation features**

Identification in 3<sup>rd</sup> block of ordering code

Snap-in capacitors

Terminal version	Insulation
	PET sleeve
Snap-in terminals (2 terminals, 4.5 mm)	M*57
Snap-in terminals (3 terminals, 4.5 mm)	M*52
Snap-in terminals (2 terminals, 6.3 mm)	M*50

\* Digit used for nominal capacitance indication.

## Cautions and warnings

### Personal safety

The electrolytes used have been optimized both with a view to the intended application and with regard to health and environmental compatibility. They do not contain any solvents that are detrimental to health, e.g. dimethyl formamide (DMF) or dimethyl acetamide (DMAC). Furthermore, some of the high-voltage electrolytes used are self-extinguishing.

As far as possible, we do not use any dangerous chemicals or compounds to produce operating electrolytes, although in exceptional cases, such materials must be used in order to achieve specific physical and electrical properties because no alternative materials are currently known.

We do, however, restrict the amount of dangerous materials used in our products to an absolute minimum.

Materials and chemicals used in our aluminum electrolytic capacitors are continuously adapted in compliance with the TDK Electronics Corporate Environmental Policy and the latest EU regulations and guidelines such as RoHS, REACH/SVHC, GADSL, and ELV.

MDS (Material Data Sheets) are available on our website for all types listed in the data book.

MDS for customer specific capacitors are available upon request.

MSDS (Material Safety Data Sheets) are available for our electrolytes upon request.

Nevertheless, the following rules should be observed when handling aluminum electrolytic capacitors: No electrolyte should come into contact with eyes or skin. If electrolyte does come into contact with the skin, wash the affected areas immediately with running water. If the eyes are affected, rinse them for 10 minutes with plenty of water. If symptoms persist, seek medical treatment. Avoid inhaling electrolyte vapor or mists. Workplaces and other affected areas should be well ventilated. Clothing that has been contaminated by electrolyte must be changed and rinsed in water.

**Product safety**

The table below summarizes the safety instructions that must be observed without fail. A detailed description can be found in the relevant sections of separate file chapter "General technical information".

Topic	Safety information	Reference chapter "General technical information"
Polarity	Make sure that polar capacitors are connected with the right polarity.	1 "Basic construction of aluminum electrolytic capacitors"
Reverse voltage	Voltages of opposite polarity should be prevented by connecting a diode.	3.1.6 "Reverse voltage"
Mounting position of capacitors with screw or multi-pin terminals	Multi-pin capacitors with pressure relief vent on the can base must not be mounted with terminals facing up unless otherwise specified.	11.1 "Mounting positions of capacitors with screw or multi-pin terminals"
Robustness of terminals	The following maximum tightening torques must not be exceeded when connecting screw terminals: M5: 2.5 Nm M6: 4.0 Nm	11.2 "Mounting torques"
Mounting of single-ended capacitors	The internal structure of single-ended capacitors might be damaged if excessive force is applied to the lead wires. Avoid any compressive, tensile or flexural stress. Do not move the capacitor after soldering to PC board. Do not pick up the PC board by the soldered capacitor. Do not insert the capacitor on the PC board with a hole space different to the lead space specified.	11.3 "Mounting considerations for single-ended capacitors"
Soldering	Do not exceed the specified time or temperature limits during soldering.	11.5 "Soldering"
Soldering, cleaning agents	Do not allow halogenated hydrocarbons to come into contact with aluminum electrolytic capacitors.	11.6 "Cleaning agents"
Upper category temperature	Do not exceed the upper category temperature.	7.2 "Maximum permissible operating temperature"
Passive flammability	Avoid external energy, e.g. fire.	8.1 "Passive flammability"

Topic	Safety information	Reference chapter "General technical information"
Active flammability	Avoid overload of the capacitors.	8.2 "Active flammability"
Maintenance	Make periodic inspections of the capacitors. Before the inspection, make sure that the power supply is turned off and carefully discharge the capacitors. Do not apply excessive mechanical stress to the capacitor terminals when mounting.	10 "Maintenance"
Storage	Do not store capacitors at high temperatures or high humidity. Capacitors should be stored at +5 to +35 °C and a relative humidity of $\leq 75\%$ .	7.3 "Shelf life and storage conditions"
		Reference chapter "Capacitors with screw terminals"
Breakdown strength of insulating sleeves	Do not damage the insulating sleeve, especially when ring clips are used for mounting.	"Screw terminals – accessories"

### Display of ordering codes for TDK Electronics products

The ordering code for one and the same product can be represented differently in data sheets, data books, other publications, on the company website, or in order-related documents such as shipping notes, order confirmations and product labels. The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products.

Detailed information can be found on the Internet under [www.tdk-electronics.tdk.com/orderingcodes](http://www.tdk-electronics.tdk.com/orderingcodes).

**Symbols and terms**

Symbol	English	German
C	Capacitance	Kapazität
$C_R$	Rated capacitance	Nennkapazität
$C_S$	Series capacitance	Serienkapazität
$C_{S,T}$	Series capacitance at temperature T	Serienkapazität bei Temperatur T
$C_f$	Capacitance at frequency f	Kapazität bei Frequenz f
d	Case diameter, nominal dimension	Gehäusedurchmesser, Nennmaß
$d_{max}$	Maximum case diameter	Maximaler Gehäusedurchmesser
ESL	Self-inductance	Eigeninduktivität
ESR	Equivalent series resistance	Ersatzserienwiderstand
$ESR_f$	Equivalent series resistance at frequency f	Ersatzserienwiderstand bei Frequenz f
$ESR_T$	Equivalent series resistance at temperature T	Ersatzserienwiderstand bei Temperatur T
f	Frequency	Frequenz
I	Current	Strom
$I_{AC}$	Alternating current (ripple current)	Wechselstrom
$I_{AC,RMS}$	Root-mean-square value of alternating current	Wechselstrom, Effektivwert
$I_{AC,f}$	Ripple current at frequency f	Wechselstrom bei Frequenz f
$I_{AC,max}$	Maximum permissible ripple current	Maximal zulässiger Wechselstrom
$I_{AC,R}$	Rated ripple current	Nennwechselstrom
$I_{leak}$	Leakage current	Reststrom
$I_{leak,op}$	Operating leakage current	Betriebsreststrom
l	Case length, nominal dimension	Gehäuselänge, Nennmaß
$l_{max}$	Maximum case length (without terminals and mounting stud)	Maximale Gehäuselänge (ohne Anschlüsse und Gewindebolzen)
R	Resistance	Widerstand
$R_{ins}$	Insulation resistance	Isolationswiderstand
$R_{symm}$	Balancing resistance	Symmetrierwiderstand
T	Temperature	Temperatur
$\Delta T$	Temperature difference	Temperaturdifferenz
$T_A$	Ambient temperature	Umgebungstemperatur
$T_B$	Capacitor base temperature	Temperatur des Gehäusebodens
$T_C$	Case temperature	Gehäusetemperatur
t	Time	Zeit
$\Delta t$	Period	Zeitraum
$t_b$	Service life (operating hours)	Brauchbarkeitsdauer (Betriebszeit)
V	Voltage	Spannung
$V_F$	Forming voltage	Formierspannung
$V_{op}$	Operating voltage	Betriebsspannung
$V_R$	Rated voltage, DC voltage	Nennspannung, Gleichspannung
$V_S$	Surge voltage	Spitzenspannung
$X_C$	Capacitive reactance	Kapazitiver Blindwiderstand

Symbol	English	German
$X_L$	Inductive reactance	Induktiver Blindwiderstand
$Z$	Impedance	Scheinwiderstand
$Z_T$	Impedance at temperature T	Scheinwiderstand bei Temperatur T
$\tan \delta$	Dissipation factor	Verlustfaktor
$\lambda$	Failure rate	Ausfallrate
$\varepsilon_0$	Absolute permittivity	Elektrische Feldkonstante
$\varepsilon_r$	Relative permittivity	Dielektrizitätszahl
$\omega$	Angular frequency; $2 \cdot \pi \cdot f$	Kreisfrequenz; $2 \cdot \pi \cdot f$

**Note:**

All dimensions are given in mm.



## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule we are either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether a product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
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6. Unless otherwise agreed in individual contracts, **all orders are subject to our General Terms and Conditions of Supply**.

## Important notes

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The IATF certifications confirm our compliance with requirements regarding the quality management system in the automotive industry. Referring to customer requirements and customer specific requirements ("CSR") TDK always has and will continue to have the policy of respecting individual agreements. Even if IATF 16949 may appear to support the acceptance of unilateral requirements, we hereby like to emphasize that **only requirements mutually agreed upon can and will be implemented in our Quality Management System**. For clarification purposes we like to point out that obligations from IATF 16949 shall only become legally binding if individually agreed upon.
8. The trade names EPCOS, CarXield, CeraCharge, CeraDiode, CeraLink, CeraPad, CeraPlas, CSMP, CTVS, DeltaCap, DigiSiMic, FilterCap, FormFit, InsuGate, LeaXield, MediPlas, MiniBlue, MiniCell, MKD, MKK, ModCap, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, PiezoBrush, PlasmaBrush, PowerHap, PQSine, PQvar, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, SurfIND, ThermoFuse, WindCap, XieldCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at [www.tdk-electronics.tdk.com/trademarks](http://www.tdk-electronics.tdk.com/trademarks).

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