# WIMA MKS 2-XL NEW

## Metallized Polyester (PET) Capacitors in PCM 5 mm

### Special Features

- **High volume/capacitance ratio**
- **Self-healing**
- **According to RoHS 2002/95/EC**

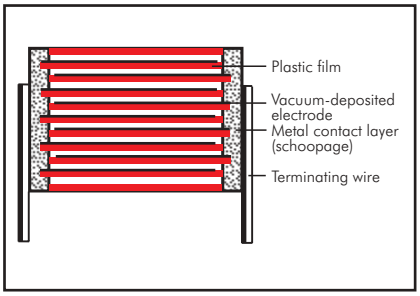
### Typical Applications

**For general DC-applications e.g.**

- **By-pass**
- **Blocking**
- **Coupling and decoupling**
- **Timing**

### Construction

**Dielectric:**
Polyethylene-terephthalate (PET) film
**Capacitor electrodes:**
Vacuum-deposited
**Internal construction:**




**Encapsulation:**
Solvent-resistant, flame-retardent plastic case with epoxy resin seal, UL 94 V-0
**Terminations:**
Tinned wire.
**Marking:**
Colour: Red. Marking: Silver/White. Epoxy resin seal: Red

### Electrical Data

**Capacitance range:**
10 µF to 22 µF
**Rated voltages:**
16 VDC, 50 VDC
**Capacitance tolerances:**
±20%, ±10%, ±5%
**Operating temperature range:**
–55° C to +100° C
**Climatic test category:**
55/100/21 in accordance with IEC
**Insulation resistance** at +20° C:
⩾1000 sec (MΩ x µF) (mean value: 3000 sec)
Measuring voltage: 10 V/1 min.
**Dissipation factors** at + 20° C:
tan δ ⩽ 10 x $10^{-3}$ at 1kHz
**Maximum pulse rise time:**

| Capacitance µF | Pulse rise time V/µsec max. operation/test | |
|---|---|---|
| | 16 VDC | 50 VDC |
| 10 … 15 | 3/30 | 2.5/25 |
| 22 | 2.5/25 | – |

for pulses equal to the rated voltage

**Test specifications:**
In accordance with IEC 60384-2 and EN 130400
**Test voltage:** 1.6 $U_r$, 2 sec.
**Voltage derating:**
A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
**Reliability:**
Operational life > 300000 hours
Failure rate < 2 fit (0.5 x $U_r$ and 40° C)

### Mechanical Tests

**Pull test on leads:**
10 N in direction of leads according to IEC 60068-2-21
**Vibration:**
6 hours at 10 … 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6
**Low air density:**
1kPa = 10 mbar in accordance with IEC 60068-2-13
**Bump test:**
4000 bumps at 390 m/$sec^2$ in accordance with IEC 60068-2-29

### Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

## Continuation

### General Data

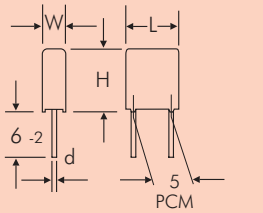
| Capacitance | 16 VDC/10 VAC* | | | | 50 VDC/30 VAC* | | | |
|---|---|---|---|---|---|---|---|---|
| | W | H | L | PCM** | W | H | L | PCM** |
| 10 µF | 8.5 | 14 | 7.2 | **5** | 11 | 16 | 7.2 | **5** |
| 15 „ | 8.5 | 14 | 7.2 | **5** | | | | |
| 22 „ | 11 | 16 | 7.2 | **5** | | | | |

* AC voltage: f = 50 Hz; 1.4 x $U_{rms}$ + UDC ⩽ $U_r$

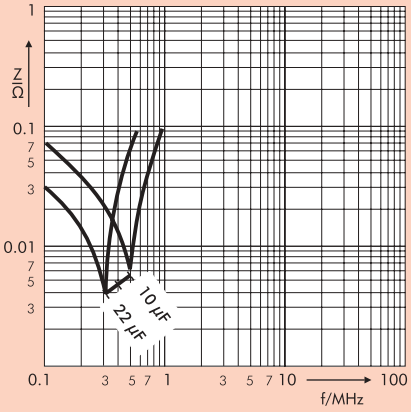
** PCM = Printed circuit module = lead spacing

Dims. in mm.

Taped version see page 104.



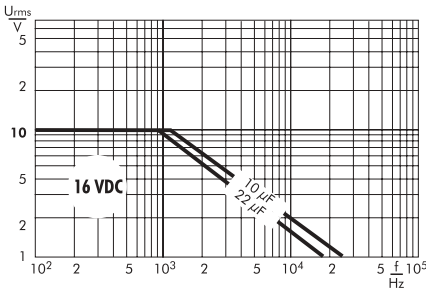

d = 0.5 ⌀

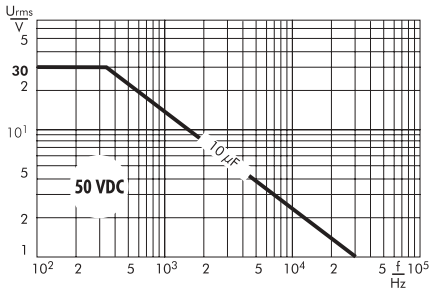



Impedance change with frequency (general guide).



Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



# Recommendation for Processing and Application of Through-Hole Capacitors

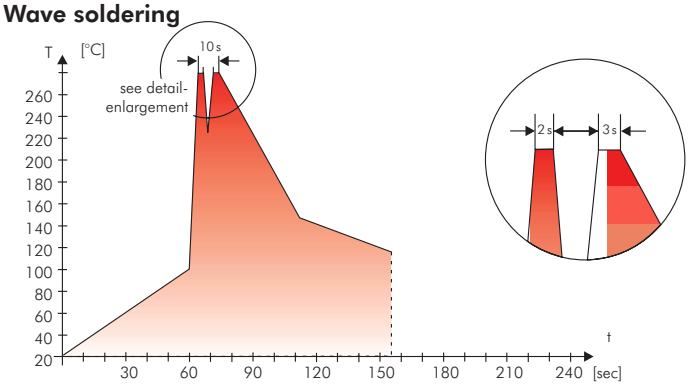
## Soldering Process

A preheating of through-hole WIMA capacitors is allowed for temperatures $T_{max} < 100°C$.
In practice a preheating duration of $t < 5$ min. has been proven to be best.

**Single wave soldering**
Soldering bath temperature: $T < 260°C$
Immersion time: $t < 5$ sec

**Double wave soldering**
Soldering bath temperature: $T < 260°C$
Immersion time: $2 \times t < 3$ sec

**Wave soldering**




Temperature/time graph for the maximum permissible solder bath temperature for the wave soldering of through-hole WIMA capacitors

# WIMA Quality and Environmental Philosophy

## ISO 9001:2000 Certification

ISO 9001:2000 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2000 of our factories by the VDE inspectorate certifies that organisation, equipment and monitoring of quality assurance in our factories correspond to internationally recognized standards.

## WIMA WPCS

The WIMA Process Control System (WPCS) is a quality surveillance and optimization system developed by WIMA. WPCS is a major part of the quality-oriented WIMA production. Points of application of WPCS during production process:

- **incoming material inspection**
- **metallization**
- **film inspection**
- **schoopage**
- **pre-healing**
- **lead attachment**
- **cast resin preparation/ encapsulation**
- **100% final inspection**
- **AQL check**

## WIMA Environmental Policy

All WIMA capacitors, irrespective of whether through-hole devices or SMD, are made of environmentally friendly materials. Neither during manufacture nor in the product itself any toxic substances are used, e.g.

- **Lead**
- **PCB**
- **CFC**
- **Hydrocarbon chloride**
- **Chromium 6+**
- **PBB/PBDE**
- **Arsenic**
- **Cadmium**
- **Mercury**
- **etc.**

We merely use pure, recyclable materials for packing our components, such as:

- **carton**
- **cardboard**
- **adhesive tape made of paper**
- **polystyrene**

We almost completely refrain from using packing materials such as:

- **foamed polystyrene (Styropor®)**
- **adhesive tapes made of plastic**
- **metal clips**

## RoHS Compliance

According to the RoHS Directive 2002/95/EC certain hazardous substances like e.g. lead, cadmium, mercury must not be used any longer in electronic equipment as of July 1st, 2006. For the sake of the environment WIMA has refraind from using such substances since years already.




Tape for lead-free WIMA capacitors

## DIN EN ISO 14001:2005

WIMA's environmental management has been established in accordance with the guidelines of DIN EN ISO 14001:2005. The certification has been granted in June 2006.

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# Typical Dimensions for Taping Configuration

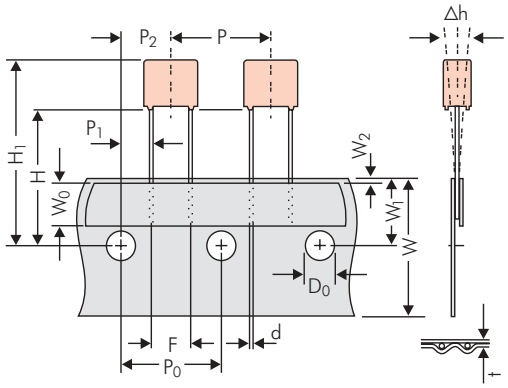


Diagram 1:
PCM 2.5/5/7.5mm

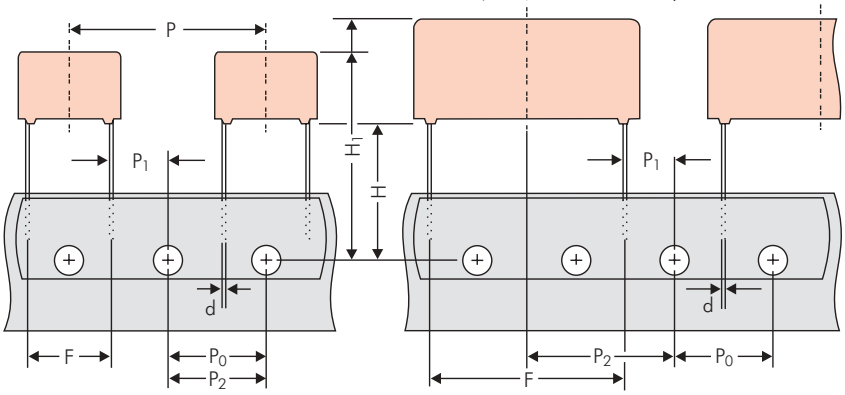


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5*mm
*PCM 27.5 taping possible with two feed holes between components

| Designation | Symbol | Dimensions for Radial Taping | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **PCM 2.5 taping** | **PCM 5 taping** | **PCM 7.5 taping** | **PCM 10 taping*** | **PCM 15 taping*** | **PCM 22.5 taping** | **PCM 27.5 taping** |
| Carrier tape width | W | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 |
| Hold-down tape width | $W_0$ | 6.0 for hot-sealing adhesive tape | 6.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape |
| Hole position | $W_1$ | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 |
| Hold-down tape position | $W_2$ | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. |
| Feed hole diameter | $D_0$ | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 |
| Pitch of component | P | 12.7 ±1.0 | 12.7 ±1.0 | 12.7 ±1.0 | 25.4 ±1.0 | 25.4 ±1.0 | 38.1 ±1.5 | *38.1 ±1.5 or 50.8 ±1.5 |
| Feed hole pitch | $P_0$ | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch |
| Feed hole centre to lead | $P_1$ | 5.1 ±0.5 | 3.85 ±0.7 | 2.6 ±0.7 | 7.7 ±0.7 | 5.2 ±0.7 | 7.8 ±0.7 | 5.3 ±0.7 |
| Hole centre to component centre | $P_2$ | 6.35 ±1.3 | 6.35 ±1.3 | 6.35 ±1.3 | 12.7 ±1.3 | 12.7 ±1.3 | 19.05 ±1.3 | 19.05 ±1.3 |
| Feed hole centre to bottom edge of the component | H▲ | 16.5 ±0.3<br>18.5 ±0.5 | 16.5 ±0.3<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 |
| Feed hole centre to top edge of the component | $H_1$ | $H+H_{component} < H_1$<br>32.25 max. | $H+H_{component} < H_1$<br>32.25 max. | $H+H_{component} < H_1$<br>24.5 to 31.5 | $H+H_{component} < H_1$<br>25.0 to 31.5 | $H+H_{component} < H_1$<br>26.0 to 37.0 | $H+H_{component} < H_1$<br>30.0 to 43.0 | $H+H_{component} < H_1$<br>35.0 to 45.0 |
| Lead spacing at upper edge of carrier tape | F | 2.5 ±0.5 | 5.0 +0.8 −0.2 | 7.5 ±0.8 | 10.0 ±0.8 | 15 ±0.8 | 22.5 ±0.8 | 27.5 ±0.8 |
| Lead diameter | d | 0.4 ±0.05 | 0.5 ±0.05 | •0.5 ±0.05 or 0.6 +0.06 −0.05 | •0.5 ±0.05 or 0.6 +0.06 −0.05 | 0.8 +0.08 −0.05 | 0.8 +0.08 −0.05 | 0.8 +0.08 −0.05 |
| Component alignment | Δh | ± 2.0 max. | ± 2.0 max. | ± 3.0 max. | ± 3.0 max. | ± 3.0 max. | ± 3.0 max. | ± 3.0 max. |
| Total tape thickness | t | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 |
| Package (see also page 105) | ▲ | ROLL/AMMO | | AMMO | | | | |
| | | REEL ø 360 max. ø 30 ±1 B 52 ±2 / 58 ±2 } depending on comp. dimensions | | REEL ø 360 max. ø 30 ±1 B 52 ±2 / 58 ±2 or 66 ±2 REEL ø 500 max. ø 25 ±1 B 54 ±2 / 60 ±2 / 68 ±2 } depending on PCM and component dimensions | | | | |
| Unit | | see details page 107. | | | | | | |

▲ Please give „H" dimensions and desired packaging type when ordering.

• Diameter of leads see General Data.

* PCM 10 and PCM 15 can be crimped to PCM 7.5.
Position of components according to PCM 7.5 (sketch 1). $P_0$ = 12.7 or 15.0 is possible

Dims in mm.

Please clarify customer-specific deviations with the manufacturer.

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