# WIMA FKP 2

## Polypropylene (PP) Film/Foil Capacitors for Pulse Applications in PCM 5 mm. Capacitances from 33 pF to 0.033 µF. Rated Voltages from 63 VDC to 1000 VDC.

### Special Features

- **Pulse duty construction**
- **Close tolerances up to ±2.5 % (±1 % on request)**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **Very low dielectric absorption**
- **According to RoHS 2011/65/EU**

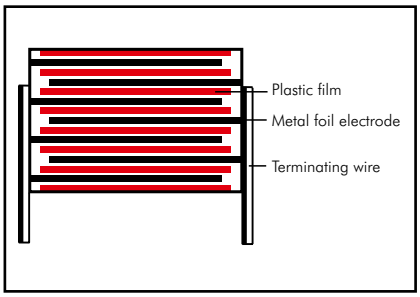
### Typical Applications

**For high frequency applications e.g.**

- **Sample and hold**
- **Timing**
- **LC-Filtering**
- **Oscillating circuits**
- **Audio equipment**

### Construction

**Dielectric:**
Polypropylene (PP) film
**Capacitor electrodes:**
Metal foil
**Internal construction:**




**Encapsulation:**
Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0
**Terminations:**
Tinned wire.
**Marking:**
Colour: Red. Marking: Black.

### Electrical Data

**Capacitance range:**
33 pF to 0.033 µF (E12-values on request)
**Rated voltages:**
63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 800 VDC, 1000 VDC
**Capacitance tolerances:**
±20%, ±10%, ±5%, ±2.5% (±2%, ±1.5% or ±1% available as precision capacitors subject to special enquiry)
**Operating temperature range:**
–55° C to +100° C
**Test specifications:**
In accordance with IEC 60384-13
**Climatic test category:**
55/100/56 in accordance with IEC
**Insulation resistance** at +20° C:
$\geqslant 3 \times 10^5$ MΩ
Measuring voltage:
$U_r =$ 63 V: $U_{test} =$ 50 V/1 min.
$U_r \geqslant$ 100 V: $U_{test} =$ 100 V/1 min.
**Dissipation factors** at +20° C: tan δ

| at f | C ⩽ 1000 pF | 1000 pF < C ⩽ 4700 pF | C > 4700 pF |
|---|---|---|---|
| 1 kHz | ⩽ $5 \times 10^{-4}$ | ⩽ $5 \times 10^{-4}$ | ⩽ $5 \times 10^{-4}$ |
| 10 kHz | ⩽ $6 \times 10^{-4}$ | ⩽ $6 \times 10^{-4}$ | ⩽ $6 \times 10^{-4}$ |
| 100 kHz | ⩽ $8 \times 10^{-4}$ | ⩽ $8 \times 10^{-4}$ | – |
| 1 MHz | ⩽ $10 \times 10^{-4}$ | – | – |

**Test voltage:** 2 $U_r$, 2 sec.
**Maximum pulse rise time:**
1000 V/µsec
**Dielectric absorption:**
0.05%
**Temperature coefficient:**
$-200 \times 10^{-6}$/° C (typical)
**Voltage derating:**
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages
**Reliability:**
Operational life > 300 000 hours
Failure rate < 5 fit (0.5 x $U_r$ and 40° C)

### Mechanical Tests

**Pull test on pins:**
10 N in direction of pins 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 | 63 VDC/40 VAC* | | | | | 100 VDC/63 VAC* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | W | H | L | PCM** | Part number | W | H | L | PCM** | Part number |
| 100 pF | 4.5 | 6 | 7.2 | **5** | FKP2C001001D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2D001001D00_ _ _ _ |
| 150 „ | 4.5 | 6 | 7.2 | **5** | FKP2C001501D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2D001501D00_ _ _ _ |
| 220 „ | 4.5 | 6 | 7.2 | **5** | FKP2C002201D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2D002201D00_ _ _ _ |
| 330 „ | 4.5 | 6 | 7.2 | **5** | FKP2C003301D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2D003301D00_ _ _ _ |
| 470 „ | 4.5 | 6 | 7.2 | **5** | FKP2C004701D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2D004701D00_ _ _ _ |
| 680 „ | 4.5 | 6 | 7.2 | **5** | FKP2C006801D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2D006801D00_ _ _ _ |
| 1000 pF | 4.5 | 6 | 7.2 | **5** | FKP2C011001D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2D011001D00_ _ _ _ |
| 1500 „ | 4.5 | 6 | 7.2 | **5** | FKP2C011501D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2D011501D00_ _ _ _ |
| 2200 „ | 4.5 | 6 | 7.2 | **5** | FKP2C012201D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2D012201D00_ _ _ _ |
| 3300 „ | 4.5 | 6 | 7.2 | **5** | FKP2C013301D00_ _ _ _ | 5.5 | 7 | 7.2 | **5** | FKP2D013301G00_ _ _ _ |
| 4700 „ | 4.5 | 6 | 7.2 | **5** | FKP2C014701D00_ _ _ _ | 5.5 | 7 | 7.2 | **5** | FKP2D014701G00_ _ _ _ |
| 6800 „ | 4.5 | 6 | 7.2 | **5** | FKP2C016801D00_ _ _ _ | 5.5 | 7 | 7.2 | **5** | FKP2D016801G00_ _ _ _ |
| 0.01 µF | 5.5 | 7 | 7.2 | **5** | FKP2C021001G00_ _ _ _ | 6.5 | 8 | 7.2 | **5** | FKP2D021001I00_ _ _ _ |
| 0.015 „ | 6.5 | 8 | 7.2 | **5** | FKP2C021501I00_ _ _ _ | 7.2 | 8.5 | 7.2 | **5** | FKP2D021501J00_ _ _ _ |
| 0.022 „ | 7.2 | 8.5 | 7.2 | **5** | FKP2C022201J00_ _ _ _ | 8.5 | 10 | 7.2 | **5** | FKP2D022201L00_ _ _ _ |
| 0.033 „ | 8.5 | 10 | 7.2 | **5** | FKP2C023301L00_ _ _ _ | | | | | |

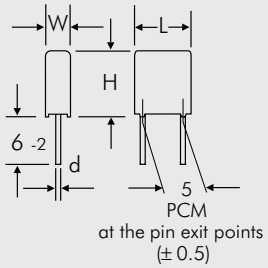
| Capacitance | 250 VDC/160 VAC* | | | | | 400 VDC/220 VAC* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | W | H | L | PCM** | Part number | W | H | L | PCM** | Part number |
| 100 pF | 4.5 | 6 | 7.2 | **5** | FKP2F001001D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2G001001D00_ _ _ _ |
| 150 „ | 4.5 | 6 | 7.2 | **5** | FKP2F001501D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2G001501D00_ _ _ _ |
| 220 „ | 4.5 | 6 | 7.2 | **5** | FKP2F002201D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2G002201D00_ _ _ _ |
| 330 „ | 4.5 | 6 | 7.2 | **5** | FKP2F003301D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2G003301D00_ _ _ _ |
| 470 „ | 4.5 | 6 | 7.2 | **5** | FKP2F004701D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2G004701D00_ _ _ _ |
| 680 „ | 4.5 | 6 | 7.2 | **5** | FKP2F006801D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2G006801D00_ _ _ _ |
| 1000 pF | 4.5 | 6 | 7.2 | **5** | FKP2F011001D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2G011001D00_ _ _ _ |
| 1500 „ | 4.5 | 6 | 7.2 | **5** | FKP2F011501D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2G011501D00_ _ _ _ |
| 2200 „ | 4.5 | 6 | 7.2 | **5** | FKP2F012201D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2G012201D00_ _ _ _ |
| 3300 „ | 5.5 | 7 | 7.2 | **5** | FKP2F013301G00_ _ _ _ | 5.5 | 7 | 7.2 | **5** | FKP2G013301G00_ _ _ _ |
| 4700 „ | 6.5 | 8 | 7.2 | **5** | FKP2F014701I00_ _ _ _ | 6.5 | 8 | 7.2 | **5** | FKP2G014701I00_ _ _ _ |
| 6800 „ | 6.5 | 8 | 7.2 | **5** | FKP2F016801I00_ _ _ _ | 7.2 | 8.5 | 7.2 | **5** | FKP2G016801J00_ _ _ _ |
| 0.01 µF | 7.2 | 8.5 | 7.2 | **5** | FKP2F021001J00_ _ _ _ | 8.5 | 10 | 7.2 | **5** | FKP2G021001L00_ _ _ _ |
| 0.015 „ | 8.5 | 10 | 7.2 | **5** | FKP2F021501L00_ _ _ _ | | | | | |

* AC voltage: f ⩽ 1000 Hz; 1.4 x $U_{rms}$ + UDC ⩽ $U_r$

** PCM = Printed circuit module = pin spacing.

E12 values and individual values available from 27 pF up on request.

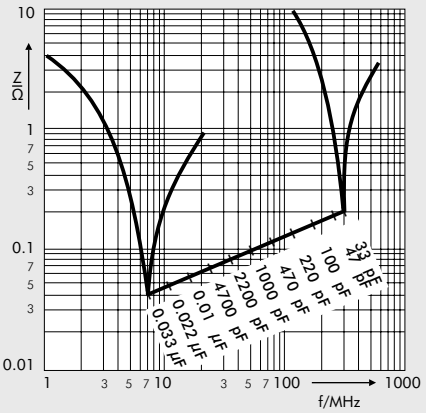
Dims. in mm.




d = 0.5 ø

| Part number completion: | |
|---|---|
| Tolerance: | 20 % = M |
| | 10 % = K |
| | 5 % = J |
| | 2.5 % = H |
| | 2 % = G |
| | 1.5 % = F |
| | 1 % = E |
| Packing: | bulk = S |
| Pin length: | 6-2 = SD |

Taped version see page 161.




Impedance change with frequency (general guide).

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Continuation page 36

## Continuation

### General Data

| Capacitance | 630 VDC/250 VAC* | | | | | 800 VDC/250 VAC* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | W | H | L | PCM** | Part number | W | H | L | PCM** | Part number |
| 100 pF | 4.5 | 6 | 7.2 | **5** | FKP2J001001D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2L001001D00_ _ _ _ |
| 150 „ | 4.5 | 6 | 7.2 | **5** | FKP2J001501D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2L001501D00_ _ _ _ |
| 220 „ | 4.5 | 6 | 7.2 | **5** | FKP2J002201D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2L002201D00_ _ _ _ |
| 330 „ | 4.5 | 6 | 7.2 | **5** | FKP2J003301D00_ _ _ _ | 4.5 | 6 | 7.2 | **5** | FKP2L003301D00_ _ _ _ |
| 470 „ | 4.5 | 6 | 7.2 | **5** | FKP2J004701D00_ _ _ _ | 5.5 | 7 | 7.2 | **5** | FKP2L004701G00_ _ _ _ |
| 680 „ | 4.5 | 6 | 7.2 | **5** | FKP2J006801D00_ _ _ _ | 5.5 | 7 | 7.2 | **5** | FKP2L006801G00_ _ _ _ |
| 1000 pF | 4.5 | 6 | 7.2 | **5** | FKP2J011001D00_ _ _ _ | 5.5 | 7 | 7.2 | **5** | FKP2L011001G00_ _ _ _ |
| 1500 „ | 4.5 | 6 | 7.2 | **5** | FKP2J011501D00_ _ _ _ | 5.5 | 7 | 7.2 | **5** | FKP2L011501G00_ _ _ _ |
| 2200 „ | 5.5 | 7 | 7.2 | **5** | FKP2J012201G00_ _ _ _ | 6.5 | 8 | 7.2 | **5** | FKP2L012201I00_ _ _ _ |
| 3300 „ | 6.5 | 8 | 7.2 | **5** | FKP2J013301I00_ _ _ _ | 7.2 | 8.5 | 7.2 | **5** | FKP2L013301J00_ _ _ _ |
| 4700 „ | 6.5 | 8 | 7.2 | **5** | FKP2J014701I00_ _ _ _ | 8.5 | 10 | 7.2 | **5** | FKP2L014701L00_ _ _ _ |
| 6800 „ | 7.2 | 8.5 | 7.2 | **5** | FKP2J016801J00_ _ _ _ | | | | | |
| 0.01 µF | 8.5 | 10 | 7.2 | **5** | FKP2J021001L00_ _ _ _ | | | | | |

| Capacitance | 1000 VDC/250 VAC* | | | | |
|---|---|---|---|---|---|
| | W | H | L | PCM** | Part number |
| 33 pF | 4.5 | 6 | 7.2 | **5** | FKP2O100331D00_ _ _ _ |
| 47 „ | 4.5 | 6 | 7.2 | **5** | FKP2O100471D00_ _ _ _ |
| 68 „ | 4.5 | 6 | 7.2 | **5** | FKP2O100681D00_ _ _ _ |
| 100 pF | 4.5 | 6 | 7.2 | **5** | FKP2O101001D00_ _ _ _ |
| 150 „ | 4.5 | 6 | 7.2 | **5** | FKP2O101501D00_ _ _ _ |
| 220 „ | 4.5 | 6 | 7.2 | **5** | FKP2O102201D00_ _ _ _ |
| 330 „ | 4.5 | 6 | 7.2 | **5** | FKP2O103301D00_ _ _ _ |
| 470 „ | 5.5 | 7 | 7.2 | **5** | FKP2O104701G00_ _ _ _ |
| 680 „ | 5.5 | 7 | 7.2 | **5** | FKP2O106801G00_ _ _ _ |
| 1000 pF | 6.5 | 8 | 7.2 | **5** | FKP2O111001I00_ _ _ _ |
| 1500 „ | 7.2 | 8.5 | 7.2 | **5** | FKP2O111501J00_ _ _ _ |
| 2200 „ | 8.5 | 10 | 7.2 | **5** | FKP2O112201L00_ _ _ _ |

E12 values and individual values available from 27 pF up on request.

Dims. in mm.

| Part number completion: | |
|---|---|
| Tolerance: | 20 % = M |
| | 10 % = K |
| | 5 % = J |
| | 2.5 % = H |
| | 2 % = G |
| | 1.5 % = F |
| | 1 % = E |
| Packing: | bulk = S |
| Pin length: | 6-2 = SD |

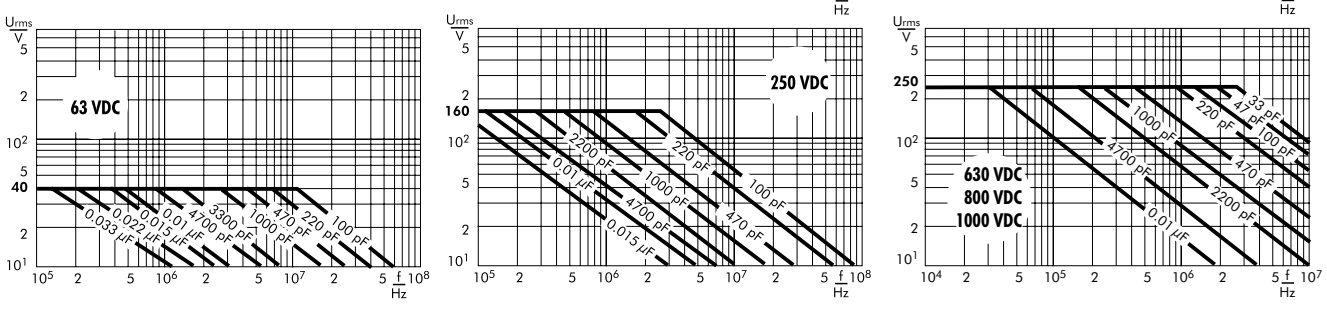
Taped version see page 161.

* AC voltage: f ⩽ 1000 Hz; 1.4 x $U_{rms}$ + UDC ⩽ $U_r$

** PCM = Printed circuit module = pin spacing.

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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

Internal temperature of the capacitor must be kept as follows:

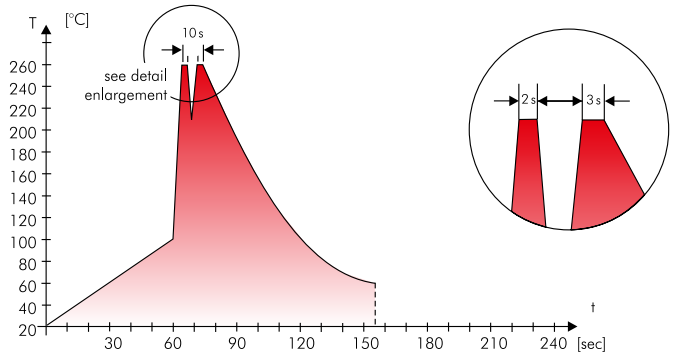
| | | |
|---|---|---|
| Polyester: | preheating: | $T_{max.} \leqslant 125°$ C |
| | soldering: | $T_{max.} \leqslant 135°$ C |
| Polypropylene: | preheating: | $T_{max.} \leqslant 100°$ C |
| | soldering: | $T_{max.} \leqslant 110°$ C |

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

**Double wave soldering**
Soldering bath temperature: T < 260° C
Dwell time: Σt < 5 sec

Due to different soldering processes and heat requirements the graphs are to be regarded as a recommendation only.

**Wave soldering**




Typical temperature/time graph for double wave soldering

# WIMA Quality and Environmental Philosophy

## ISO 9001:2015 Certification

ISO 9001:2015 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2015 of our factories by the infaz (Institut für Auditierung und Zertifizierung) 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 during production process:

- **incoming material inspection**
- **metallization**
- **film inspection**
- **schoopage**
- **pre-healing**
- **pin attachment**
- **cast resin preparation/ encapsulation**
- **100% final inspection**
- **Testing as per customer requirements**

## 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:

- **adhesive tapes made of plastic**
- **metal clips**

## RoHS Compliance

According to the RoHS Directive 2011/65/EU as amended from time to time 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 14001:2004

WIMA's environmental management has been established in accordance with the guidelines of DIN EN ISO 14001:2004 to optimize the production processes with regard to energy and resources.

# Typical Dimensions for Taping Configuration

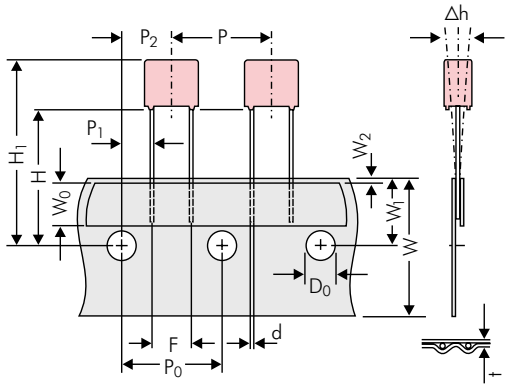



Diagram 1:
PCM 2.5/5/7.5mm

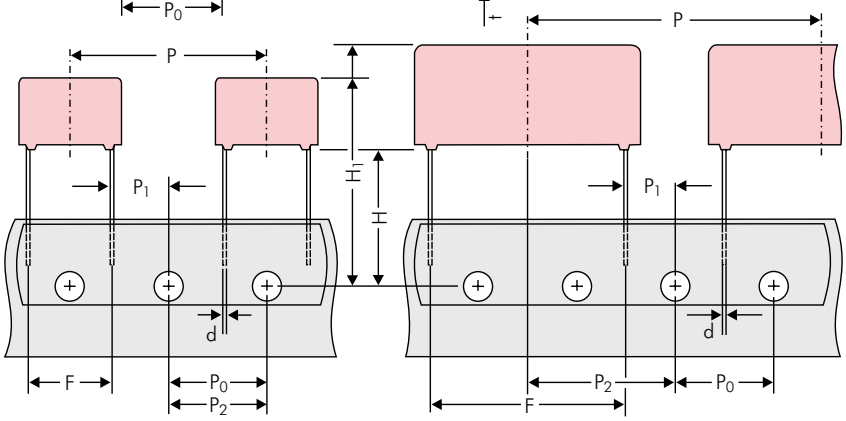



Diagram 2: PCM 10/15 mm




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 pin | $P_1$ | 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 | $H_1$ | $H+H_{component} < H_1$ 32.25 max. | $H+H_{component} < H_1$ 32.25 max. | $H+H_{component} < H_1$ 24.5 to 31.5 | $H+H_{component} < H_1$ 25.0 to 31.5 | $H+H_{component} < H_1$ 26.0 to 37.0 | $H+H_{component} < H_1$ 30.0 to 43.0 | $H+H_{component} < H_1$ 35.0 to 45.0 |
| Pin 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 |
| Pin 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 | 0.6 ±0.2 | 0.6 ±0.2 | 0.6 ±0.2 | 0.6 ±0.2 | 0.6 ±0.2 | 0.6 ±0.2 | 0.6 ±0.2 |
| Package (see also page 162) | | 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 / 66 ±2 or REEL ø 500 max. ø 25 ±1 B 54 ±2 / 60 ±2 / 68 ±2 } depending on PCM and component dimensions | | | | |
| Unit | | see details page 163. | | | | | | |

Dims in mm.

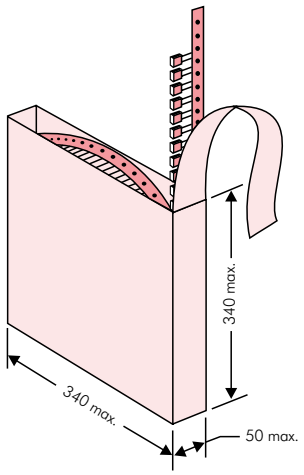
• Diameter of pins see General Data.

Please clarify customer-specific deviations with the manufacturer.

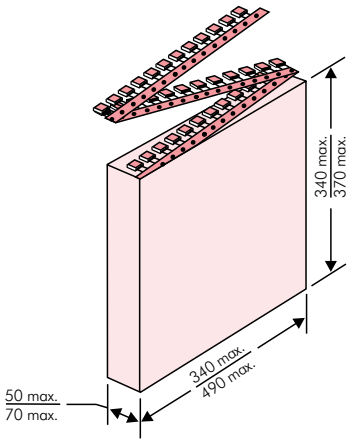
* PCM 10 and PCM 15 can be crimped to PCM 7.5.
Position of components according to PCM 7.5 (sketch 1). $P_0$ = 12.7 or 15.0 is possible

# Types of Tape Packaging of Capacitors for Automatic Radial Insertion

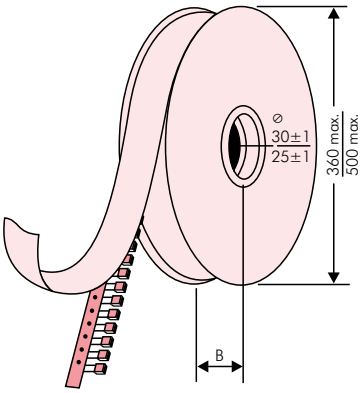
## ROLL Packaging




## AMMO Packaging




## REEL Packaging




# BAR CODE (Labelling)

Labelling of package units in plain text and with alphanumerical Bar Code

- WIMA supplier number
- Date code
- Customer's P/O number
- P/O line
- Customer's part number
- WIMA part number
- Quantity
- WIMA confirmation number
- Country of origin
- Customer name
- Handling unit number
- Week of delivery.

In addition part description of

– article
– capacitance value
– rated voltage
– dimensions
– technical note
– capacitance tolerance
– packing
– connecting information




BARCODE PDF417
BARCODE 2D Datamatrix

06.21

# Packing Quantities for Capacitors with Radial Pins in PCM 2.5 mm to 22.5 mm

| PCM | Size | | | | bulk | pcs. per packing unit | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ROLL | | REEL | | | | AMMO | | | |
| | | | | | | | | ø 360 | | ø 500 | | 340 × 340 | | 490 × 370 | |
| | | | | | | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 |
| | W | H | L | Codes | S | N | O | F | I | H | J | A | C | B | D |
| **2.5 mm** | 2.5 | 7 | 4.6 | **0B** | 5000 | 2200 | | 2500 | | – | | 2800 | | – | |
| | 3 | 7.5 | 4.6 | **0C** | 5000 | 2000 | | 2300 | | – | | 2300 | | – | |
| | 3.8 | 8.5 | 4.6 | **0D** | 5000 | 1500 | | 1800 | | – | | 1800 | | – | |
| | 4.6 | 9 | 4.6 | **0E** | 5000 | 1200 | | 1500 | | – | | 1500 | | – | |
| | 5.5 | 10 | 4.6 | **0F** | 5000 | 900 | | 1200 | | – | | 1200 | | – | |
| **5 mm** | 2.5 | 6.5 | 7.2 | **1A** | 5000 | 2200 | | 2500 | | – | | 2800 | | – | |
| | 3 | 7.5 | 7.2 | **1B** | 5000 | 2000 | | 2300 | | – | | 2300 | | – | |
| | 3.5 | 8.5 | 7.2 | **1C** | 5000 | 1600 | | 2000 | | – | | 2000 | | – | |
| | 4.5 | 6 | 7.2 | **1D** | 6000 | 1300 | | 1500 | | – | | 1500 | | – | |
| | 4.5 | 9.5 | 7.2 | **1E** | 4000 | 1300 | | 1500 | | – | | 1500 | | – | |
| | 5 | 10 | 7.2 | **1F** | 3500 | 1100 | | 1400 | | – | | 1400 | | – | |
| | 5.5 | 7 | 7.2 | **1G** | 4000 | 1000 | | 1200 | | – | | 1200 | | – | |
| | 5.5 | 11.5 | 7.2 | **1H** | 2500 | 1000 | | 1200 | | – | | 1200 | | – | |
| | 6.5 | 8 | 7.2 | **1I** | 2500 | 800 | | 1000 | | – | | 1000 | | – | |
| | 7.2 | 8.5 | 7.2 | **1J** | 2500 | 700 | | 1000 | | – | | 1000 | | – | |
| | 7.2 | 13 | 7.2 | **1K** | 2000 | 700 | | 950 | | – | | 1000 | | – | |
| | 8.5 | 10 | 7.2 | **1L** | 2000 | 600 | | 800 | | – | | 800 | | – | |
| | 8.5 | 14 | 7.2 | **1M** | 1500 | 600 | | 800 | | – | | 800 | | – | |
| | 11 | 16 | 7.2 | **1N** | 1000 | 500 | | 600 | | – | | 640 | | – | |
| **7.5 mm** | 2.5 | 7 | 10 | **2A** | 5000 | – | | 2500 | | 4400 | | 2500 | | – | |
| | 3 | 8.5 | 10 | **2B** | 5000 | – | | 2200 | | 4300 | | 2300 | | 4150 | |
| | 4 | 9 | 10 | **2C** | 4000 | – | | 1700 | | 3200 | | 1700 | | 3000 | |
| | 4.5 | 9.5 | 10.3 | **2D** | 3500 | – | | 1500 | | 2900 | | 1400 | | 2700 | |
| | 5 | 10.5 | 10.3 | **2E** | 3000 | – | | 1300 | | 2500 | | 1300 | | – | |
| | 5.7 | 12.5 | 10.3 | **2F** | 2000 | – | | 1000 | | 2200 | | 1100 | | – | |
| | 7.2 | 12.5 | 10.3 | **2G** | 1500 | – | | 900 | | 1800 | | 1000 | | – | |
| **10 mm** | 3 | 9 | 13 | **3A** | 3000 | – | | 1100 | | 2200 | | – | | 1900 | |
| | 4 | 8.5 | 13.5 | **FA** | 3000 | – | | 900 | | 1600 | | – | | 1450 | |
| | 4 | 9 | 13 | **3C** | 3000 | – | | 900 | | 1600 | | – | | 1450 | |
| | 4 | 9.5 | 13 | **3D** | 3000 | – | | 900 | | 1600 | | – | | 1400 | |
| | 5 | 10 | 13.5 | **FB** | 2000 | – | | 700 | | 1300 | | – | | 1200 | |
| | 5 | 11 | 13 | **3F** | 3000 | – | | 700 | | 1300 | | – | | 1100 | |
| | 6 | 12 | 13 | **3G** | 2400 | – | | 550 | | 1100 | | – | | 1000 | |
| | 6 | 12.5 | 13 | **3H** | 2400 | – | | 550 | | 1100 | | – | | 1000 | |
| | 8 | 12 | 13 | **3I** | 2000 | – | | 400 | | 800 | | – | | 740 | |
| **15 mm** | 5 | 11 | 18 | **4B** | 2400 | – | | 600 | | 1200 | | – | | 1150 | |
| | 5 | 13 | 19 | **FC** | 1000 | – | | 600 | | 1200 | | – | | 1200 | |
| | 6 | 12.5 | 18 | **4C** | 2000 | – | | 500 | | 1000 | | – | | 1000 | |
| | 6 | 14 | 19 | **FD** | 1000 | – | | 500 | | 1000 | | – | | 1000 | |
| | 7 | 14 | 18 | **4D** | 1600 | – | | 450 | | 900 | | – | | 850 | |
| | 7 | 15 | 19 | **FE** | 1000 | – | | 450 | | 900 | | – | | 850 | |
| | 8 | 15 | 18 | **4F** | 1200 | – | | 400 | | 800 | | – | | 740 | |
| | 8 | 17 | 19 | **FF** | 500 | – | | 400 | | 800 | | – | | 740 | |
| | 9 | 14 | 18 | **4H** | 1200 | – | | 350 | | 700 | | – | | 650 | |
| | 9 | 16 | 18 | **4J** | 900 | – | | 350 | | 700 | | – | | 650 | |
| | 10 | 18 | 19 | **FG** | 500 | – | | 300 | | 650 | | – | | 590 | |
| | 11 | 14 | 18 | **4M** | 1000 | – | | 300 | | 600 | | – | | 540 | |
| **22.5 mm** | 5 | 14 | 26.5 | **5A** | 1200 | – | | – | | 800 | | – | | 770 | |
| | 6 | 15 | 26.5 | **5B** | 1000 | – | | – | | 700 | | – | | 640 | |
| | 7 | 16.5 | 26.5 | **5D** | 760 | – | | – | | 600 | | – | | 550 | |
| | 8 | 20 | 28 | **FH** | 500 | – | | – | | 500 | | – | | 480 | |
| | 8.5 | 18.5 | 26.5 | **5F** | 500 | – | | – | | 480 | | – | | 450 | |
| | 10 | 22 | 28 | **FI** | 570* | – | | – | | 420 | | – | | 380 | |
| | 10.5 | 19 | 26.5 | **5G** | 594* | – | | – | | 400 | | – | | 360 | |
| | 10.5 | 20.5 | 26.5 | **5H** | 594* | – | | – | | 400 | | – | | 360 | |
| | 11 | 21 | 26.5 | **5I** | 561* | – | | – | | 380 | | – | | 350 | |
| | 12 | 24 | 28 | **FJ** | 480* | – | | – | | 350 | | – | | 310 | |

* TPS (Tray-Packing-System). Plate versions may have different packing units. Samples and pre-production needs on request.

Moulded versions.

Rights reserved to amend design data without prior notification.

# Packing Quantities for Capacitors with Radial Pins in PCM 27.5 mm to 52.5 mm

| PCM | Size | | | | bulk | pcs. per packing unit | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ROLL | | REEL | | | | AMMO | | | |
| | | | | | | | | ø 360 | | ø 500 | | 340 × 340 | | 490 × 370 | |
| | | | | | | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 |
| | W | H | L | Codes | S | N | O | F | I | H | J | A | C | B | D |
| **27.5 mm** | 9 | 19 | 31.5 | **6A** | 567* | – | | – | | 460/340* | | – | | – | |
| | 11 | 21 | 31.5 | **6B** | 459* | – | | – | | 380/280* | | – | | – | |
| | 13 | 24 | 31.5 | **6D** | 378* | – | | – | | 300 | | – | | – | |
| | 13 | 25 | 33 | **FK** | 405* | – | | – | | – | | – | | – | |
| | 15 | 26 | 31.5 | **6F** | 324* | – | | – | | 270 | | – | | – | |
| | 15 | 26 | 33 | **FL** | 324* | – | | – | | – | | – | | – | |
| | 17 | 29 | 31.5 | **6G** | 198* | – | | – | | – | | – | | – | |
| | 17 | 34.5 | 31.5 | **6I** | 198* | – | | – | | – | | – | | – | |
| | 20 | 32 | 33 | **FM** | 162* | – | | – | | – | | – | | – | |
| | 20 | 39.5 | 31.5 | **6J** | 162* | – | | – | | – | | – | | – | |
| **37.5 mm** | 9 | 19 | 41.5 | **7A** | 441* | – | | – | | – | | – | | – | |
| | 11 | 22 | 41.5 | **7B** | 357* | – | | – | | – | | – | | – | |
| | 13 | 24 | 41.5 | **7C** | 294* | – | | – | | – | | – | | – | |
| | 15 | 26 | 41.5 | **7D** | 252* | – | | – | | – | | – | | – | |
| | 17 | 29 | 41.5 | **7E** | 154* | – | | – | | – | | – | | – | |
| | 19 | 32 | 41.5 | **7F** | 140* | – | | – | | – | | – | | – | |
| | 20 | 39.5 | 41.5 | **7G** | 126* | – | | – | | – | | – | | – | |
| | 24 | 45.5 | 41.5 | **7H** | 112* | – | | – | | – | | – | | – | |
| | 28 | 38 | 41.5 | **7L** | 84* | – | | – | | – | | – | | – | |
| | 31 | 46 | 41.5 | **7I** | 84* | – | | – | | – | | – | | – | |
| | 35 | 50 | 41.5 | **7J** | 35* | – | | – | | – | | – | | – | |
| | 40 | 55 | 41.5 | **7K** | 28* | – | | – | | – | | – | | – | |
| **48.5 mm** | 19 | 31 | 56 | **8D** | 120* | – | | – | | – | | – | | – | |
| | 23 | 34 | 56 | **8E** | 80* | – | | – | | – | | – | | – | |
| | 27 | 37.5 | 56 | **8H** | 84* | – | | – | | – | | – | | – | |
| | 33 | 48 | 56 | **8J** | 25* | – | | – | | – | | – | | – | |
| | 37 | 54 | 56 | **8L** | 25* | – | | – | | – | | – | | – | |
| **52.5 mm** | 25 | 45 | 57 | **9D** | 70* | – | | – | | – | | – | | – | |
| | 30 | 45 | 57 | **9E** | 60* | – | | – | | – | | – | | – | |
| | 35 | 50 | 57 | **9F** | 25* | – | | – | | – | | – | | – | |
| | 45 | 55 | 57 | **9H** | 20* | – | | – | | – | | – | | – | |
| | 45 | 65 | 57 | **9J** | 20* | – | | – | | – | | – | | – | |

* for 2-inch transport pitches.

* TPS (Tray-Packing-System). Plate versions may have different packing units. Samples and pre-production needs on request.

Moulded versions.

Rights reserved to amend design data without prior notification.

Updated data on www.wima.com

# WIMA Part Number System

A WIMA part number consists of 18 digits and is composed as follows:

Field 1 - 4: Type description
Field 5 - 6: Rated voltage
Field 7 - 10: Capacitance
Field 11 - 12: Size and PCM
Field 13 - 14: Version code (e.g. Snubber versions)
Field 15: Capacitance tolerance
Field 16: Packing
Field 17 - 18: Pin length (untaped)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | **K** | **S** | **2** | **C** | **0** | **2** | **1** | **0** | **0** | **1** | **A** | **0** | **0** | **M** | **S** | **S** | **D** |
| MKS 2 | | | | 63 VDC | | 0.01 µF | | | | 2.5 x 6.5 x 7.2 | | - | | 20% | bulk | 6 -2 | |

**Type description:**

| | |
|---|---|
| SMD-PET | = SMDT |
| SMD-PEN | = SMDN |
| SMD-PPS | = SMDI |
| FKP 02 | = FKP0 |
| MKS 02 | = MKS0 |
| FKS 2 | = FKS2 |
| FKP 2 | = FKP2 |
| FKS 3 | = FKS3 |
| FKP 3 | = FKP 3 |
| MKS 2 | = MKS2 |
| MKP 2 | = MKP2 |
| MKS 4 | = MKS4 |
| MKP 4 | = MKP4 |
| MKP 10 | = MKP1 |
| FKP 4 | = FKP4 |
| FKP 1 | = FKP1 |
| MKP-X2 | = MKX2 |
| MKP-X1 R | = MKX1 |
| MKP-Y2 | = MKY2 |
| MP 3-X2 | = MPX2 |
| MP 3-X1 | = MPX1 |
| MP 3-Y2 | = MPY2 |
| MP 3R-Y2 | = MPRY |
| MKP 4F | = MKPF |
| Snubber MKP | = SNMP |
| Snubber FKP | = SNFP |
| GTO MKP | = GTOM |
| DC-LINK MKP 4 | = DCP4 |
| DC-LINK MKP 6 | = DCP6 |
| DC-LINK HC | = DCHC |

**Rated voltage:**

| | |
|---|---|
| 50 VDC | = B0 |
| 63 VDC | = C0 |
| 100 VDC | = D0 |
| 250 VDC | = F0 |
| 400 VDC | = G0 |
| 450 VDC | = H0 |
| 520 VDC | = H2 |
| 600 VDC | = I0 |
| 630 VDC | = J0 |
| 700 VDC | = K0 |
| 800 VDC | = L0 |
| 850 VDC | = M0 |
| 900 VDC | = N0 |
| 1000 VDC | = O1 |
| 1100 VDC | = P0 |
| 1200 VDC | = Q0 |
| 1250 VDC | = R0 |
| 1500 VDC | = S0 |
| 1600 VDC | = T0 |
| 1700 VDC | = TA |
| 2000 VDC | = U0 |
| 2500 VDC | = V0 |
| 3000 VDC | = W0 |
| 4000 VDC | = X0 |
| 6000 VDC | = Y0 |
| 250 VAC | = 0W |
| 275 VAC | = 1W |
| 300 VAC | = 2W |
| 305 VAC | = AW |
| 350 VAC | = BW |
| 440 VAC | = 4W |
| 500 VAC | = 5W |
| ... | |

**Capacitance:**

| | |
|---|---|
| 22 pF | = 0022 |
| 47 pF | = 0047 |
| 100 pF | = 0100 |
| 150 pF | = 0150 |
| 220 pF | = 0220 |
| 330 pF | = 0330 |
| 470 pF | = 0470 |
| 680 pF | = 0680 |
| 1000 pF | = 1100 |
| 1500 pF | = 1150 |
| 2200 pF | = 1220 |
| 3300 pF | = 1330 |
| 4700 pF | = 1470 |
| 6800 pF | = 1680 |
| 0.01 µF | = 2100 |
| 0.022 µF | = 2220 |
| 0.047 µF | = 2470 |
| 0.1 µF | = 3100 |
| 0.22 µF | = 3220 |
| 0.47 µF | = 3470 |
| 1 µF | = 4100 |
| 2.2 µF | = 4220 |
| 4.7 µF | = 4470 |
| 10 µF | = 5100 |
| 22 µF | = 5220 |
| 47 µF | = 5470 |
| 100 µF | = 6100 |
| 220 µF | = 6220 |
| 1000 µF | = 7100 |
| 1500 µF | = 7150 |
| ... | |

**Size:**

| | |
|---|---|
| 4.8 x 3.3 x 3 Size 1812 | = KA |
| 4.8 x 3.3 x 4 Size 1812 | = KB |
| 5.7 x 5.1 x 3.5 Size 2220 | = QA |
| 5.7 x 5.1 x 4.5 Size 2220 | = QB |
| 7.2 x 6.1 x 3 Size 2824 | = TA |
| 7.2 x 6.1 x 5 Size 2824 | = TB |
| 10.2 x 7.6 x 5 Size 4030 | = VA |
| 12.7 x 10.2 x 6 Size 5040 | = XA |
| 15.3 x 13.7 x 7 Size 6054 | = YA |
| 2.5 x 7 x 4.6 PCM 2.5 | = 0B |
| 3 x 7.5 x 4.6 PCM 2.5 | = 0C |
| 2.5 x 6.5 x 7.2 PCM 5 | = 1A |
| 3 x 7.5 x 7.2 PCM 5 | = 1B |
| 2.5 x 7 x 10 PCM 7.5 | = 2A |
| 3 x 8.5 x 10 PCM 7.5 | = 2B |
| 3 x 9 x 13 PCM 10 | = 3A |
| 4 x 9 x 13 PCM 10 | = 3C |
| 5 x 11 x 18 PCM 15 | = 4B |
| 6 x 12.5 x 18 PCM 15 | = 4C |
| 5 x 14 x 26.5 PCM 22.5 | = 5A |
| 6 x 15 x 26.5 PCM 22.5 | = 5B |
| 9 x 19 x 31.5 PCM 27.5 | = 6A |
| 11 x 21 x 31.5 PCM 27.5 | = 6B |
| 9 x 19 x 41.5 PCM 37.5 | = 7A |
| 11 x 22 x 41.5 PCM 37.5 | = 7B |
| 19 x 31 x 56 PCM 48.5 | = 8D |
| 25 x 45 x 57 PCM 52.5 | = 9D |
| ... | |

**Version code:**

| | |
|---|---|
| Standard | = 00 |
| Version A1 | = 1A |
| Version A1.1.1 | = 1B |
| Version A2 | = 2A |
| ... | |

**Tolerance:**

| | |
|---|---|
| ±20% | = M |
| ±10% | = K |
| ±5% | = J |
| ±2.5% | = H |
| ±1% | = E |
| ... | |

**Packing:**

| | |
|---|---|
| AMMO H16.5 340 x 340 | = A |
| AMMO H16.5 490 x 370 | = B |
| AMMO H18.5 340 x 340 | = C |
| AMMO H18.5 490 x 370 | = D |
| REEL H16.5 360 | = F |
| REEL H16.5 500 | = H |
| REEL H18.5 360 | = I |
| REEL H18.5 500 | = J |
| ROLL H16.5 | = N |
| ROLL H18.5 | = O |
| BLISTER W12 180 | = P |
| BLISTER W12 330 | = Q |
| BLISTER W16 330 | = R |
| BLISTER W24 330 | = T |
| Bulk/TPS Standard | = S |
| ... | |

**Pin length (untaped)**

| | |
|---|---|
| 3.5 ±0.5 | = C9 |
| 6 -2 | = SD |
| 16 ±1 | = P1 |
| ... | |

**Pin length (taped)**

| | |
|---|---|
| none | = 00 |

The data on this page is not complete and serves only to explain the part number system. Part number information is listed on the pages of the respective WIMA range.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

WIMA:

FKP2-330/100/2.5T FKP2D012201D00HI00 FKP2-.022/63/2.5T FKP2-3300/100/2.5T FKP20.033/63/2.5/TR
FKP2D012201D00JSSD FKP2D002201D00JSSD FKP2C013301D00KSSD FKP2C016801D00KSSD
FKP2D001001D00KSSD FKP2F002201D00JSSD FKP2F011001D00HSSD FKP2F011501D00KSSD
FKP2F013301G00HSSD FKP2J001001D00JSSD FKP2J001001D00KSSD FKP2J003301D00KSSD
FKP2J004701D00KSSD FKP2J011001D00KSSD FKP2O100471D00KSSD FKP2G021001L00JSSD
FKP2D016801G00HSSD FKP2D011501D00ESSD FKP2D014701G00HSSD FKP2D021501J00HSSD
FKP2D022201L00HSSD FKP2D011001D00JSSD FKP2F006801D00HSSD FKP2D011501D00HSSD
FKP2D004701D00JSSD FKP2C021001G00HSSD FKP2G013301G00JSSD FKP2D013301G00HSSD
FKP2D011001D00HSSD FKP2D001001D00HSSD FKP2D001001D00JSSD FKP2D006801D00HSSD
FKP2C013301D00HSSD FKP2C016801D00HSSD FKP2D002201D00HSSD FKP2D003301D00HSSD
FKP2D021001I00HSSD FKP2C014701D00HSSD FKP2C022201J00HSSD FKP2D001501D00HSSD
FKP2D022201L00KSSD FKP2C023301L00HSSD FKP2C021001G00JSSD FKP2C014701D00KSSD
FKP2C021501I00HSSD FKP2C021001G00ESSD FKP2D012201D00HSSD FKP2D003301D00JSSD
FKP2D004701D00HSSD FKP2C014701D00JSSD FKP2J004701D00JSSD FKP2D002201D00KSSD
FKP2D011501D00JSSD FKP2F004701D00JSSD FKP2O100471D00JSSD FKP2O100681D00JSSD
FKP2O100331D00KSSD FKP2O100331D00JSSD FKP2D001501D00JSSD FKP2C013301D00JSSD
FKP2O102201D00JSSD FKP2C016801D00JSSD FKP2O101001D00JSSD FKP2O112201L00JSSD
FKP2O103301D00JSSD FKP2O106801G00JSSD FKP2O111001I00JSSD FKP2D006801D00JSSD
FKP2O111501J00JSSD FKP2O104701G00JSSD FKP2O101501D00JSSD FKP2G006801D00KSSD
FKP2D011001D00KSSD FKP2C021501I00HSP1 FKP2D014701G00KSSD FKP2J011001D00JSSD
FKP2D022201L00JSSD FKP2D011501D00HC00 FKP2J002201D00JC00 FKP2C013301D00HC00
FKP2C013301D00JC00 FKP2C014701D00HC00 FKP2C016801D00HC00 FKP2C021001G00HC00
FKP2C021001G00KC00 FKP2C022201J00HC00 FKP2D001001D00KI00 FKP2D001501D00HC00
FKP2D001501D00JC00 FKP2D002201D00HC00 FKP2D002201D00JC00 FKP2D003301D00HC00
FKP2D004701D00HC00 FKP2D004701D00KC00 FKP2D004701D00KSSD