

**Compact Type: Metallized Polypropylene (PP)- Capacitors**  
**in PCM 10 mm to 22.5 mm. Capacitances from 0.068 µF to 2.2 µF.**  
**Rated Voltages from 450 VDC to 630 VDC.**

## Special Features

- Very compact size, high volume/capacitance ratio
- Self-healing
- Very high ripple and peak current
- High frequency AC operation capability
- High voltage capability
- According to RoHS 2011/65/EU

## Typical Applications

For high frequency applications e.g.

- PFC (power factor correction)

## Construction

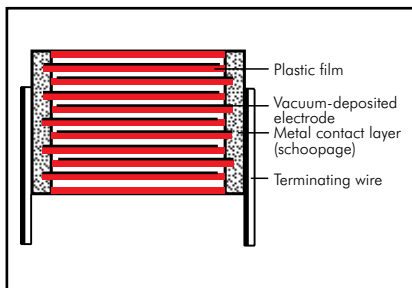
### Dielectric:

Polypropylene (PP) film

### Capacitor electrodes:

Vacuum-deposited

### 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:

0.068 µF to 2.2 µF (E12-values on request)

### Rated voltages:

450 VDC, 520 VDC, 630 VDC

### Capacitance tolerances:

±20%, ±10%, ±5%

### Operating temperature range:

-55° C to +110° C

### Climatic test category:

55/110/56 in accordance with IEC

### Insulation resistance at +20° C:

$C \leq 0.33 \mu\text{F}$ :  $\geq 1 \times 10^5 \text{ M}\Omega$

$C > 0.33 \mu\text{F}$ :  $\geq 30\,000 \text{ sec } (\text{M}\Omega \times \mu\text{F})$

Measuring voltage: 100 V/1 min.

### Test specifications:

In accordance with 60384-16

### Test voltage:

$1.6 U_r$ , 2sec

### Dielectric absorption:

0.05%

### Reliability:

Operational life > 300 000 hours

Failure rate < 24 fit ( $0.5 \times U_r$  and 40° C)

### Dissipation factors at +20° C: $\tan \delta$

| at f    | $C \leq 0.1 \mu\text{F}$  | $0.1 \mu\text{F} < C \leq 1.0 \mu\text{F}$ | $C > 1.0 \mu\text{F}$    |
|---------|---------------------------|--|--------------------------|
| 1 kHz   | $\leq 10 \times 10^{-4}$  | $\leq 10 \times 10^{-4}$                   | $\leq 10 \times 10^{-4}$ |
| 10 kHz  | $\leq 25 \times 10^{-4}$  | $\leq 25 \times 10^{-4}$                   | -                        |
| 100 kHz | $\leq 150 \times 10^{-4}$ | -  | -                        |

Reference frequency 1 kHz in accordance with IEC 60384-1

### Maximum pulse rise time:

| PCM  | max. pulse rise time $t_V/\mu\text{sec}$ at $T_A < 40^\circ \text{C}$ |         |         |
|------|---|---------|---------|
|      | 450 VDC   | 520 VDC | 630 VDC |
| 10   | 140   | 200     | 250     |
| 15   | 120   | 160     | 180     |
| 22.5 | 100   | 110     | 130     |

for pulses equal to the rated voltage

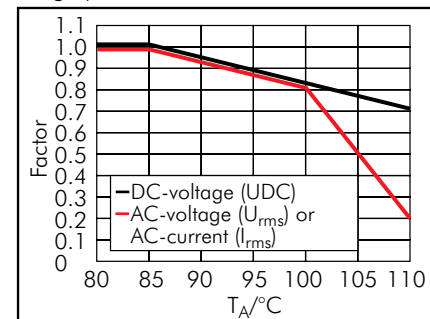
### Derating:

$85^\circ \text{C} < T_A \leq 110^\circ \text{C}$ : UDC;  $U_{\text{rms}}$

Compared to nominal voltage, the admissible AC voltage ( $U_{\text{rms}}$ ) and DC voltage (UDC) have to be reduced by 1.33% per K according to the graph.

$100^\circ \text{C} \leq T_A$ :  $I_{\text{rms}}$ ;  $U_{\text{rms}}$

The admissible AC voltage ( $U_{\text{rms}}$ ) or the admissible AC current ( $I_{\text{rms}}$ ) must be reduced by a derating factor according to the graph:



## 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<sup>2</sup> 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         | 450 VDC/160 VAC* |      |      |       |                     | 520 VDC/200 VAC* |      |      |       |                     |
|---------------------|------------------|------|------|-------|---------------------|------------------|------|------|-------|---------------------|
|                     | W                | H    | L    | PCM** | Part number         | W                | H    | L    | PCM** | Part number         |
| 0.068 $\mu\text{F}$ | 4                | 9    | 13   | 10    | MKPCH026803C00_____ | 4                | 9    | 13   | 10    | MKPCH226803C00_____ |
| 0.1 $\mu\text{F}$   | 4                | 9    | 13   | 10    | MKPCH031003C00_____ | 5                | 11   | 13   | 10    | MKPCH231003F00_____ |
|                     | 5                | 11   | 18   | 15    | MKPCH031004B00_____ |                  |      |      |       |                     |
| 0.15 "              | 4                | 9    | 13   | 10    | MKPCH031503C00_____ | 5                | 11   | 13   | 10    | MKPCH231503F00_____ |
|                     |                  |      |      |       |                     |                  |      |      |       |                     |
| 0.22 "              | 5                | 11   | 13   | 10    | MKPCH032203F00_____ | 6                | 12   | 13   | 10    | MKPCH232203G00_____ |
|                     |                  |      |      |       |                     |                  |      |      |       |                     |
| 0.33 "              | 6                | 12   | 13   | 10    | MKPCH033303G00_____ | 6                | 12.5 | 18   | 15    | MKPCH233304C00_____ |
|                     |                  |      |      |       |                     |                  |      |      |       |                     |
| 0.47 "              | 8                | 12   | 13   | 10    | MKPCH034703I00_____ | 7                | 14   | 18   | 15    | MKPCH234704D00_____ |
|                     |                  |      |      |       |                     |                  |      |      |       |                     |
| 0.68 "              | 6                | 12.5 | 18   | 15    | MKPCH036804C00_____ | 9                | 14   | 18   | 15    | MKPCH236804H00_____ |
|                     |                  |      |      |       |                     |                  |      |      |       |                     |
| 1.0 $\mu\text{F}$   | 7                | 14   | 18   | 15    | MKPCH041004D00_____ | 9                | 16   | 18   | 15    | MKPCH241004J00_____ |
|                     | 6                | 15   | 26.5 | 22.5  | MKPCH041005B00_____ | 7                | 16.5 | 26.5 | 22.5  | MKPCH241005D00_____ |
| 1.5 "               | 7                | 16.5 | 26.5 | 22.5  | MKPCH041505D00_____ | 10.5             | 19   | 26.5 | 22.5  | MKPCH241505G00_____ |
| 2.2 "               | 8.5              | 18.5 | 26.5 | 22.5  | MKPCH042205F00_____ | 10.5             | 20.5 | 26.5 | 22.5  | MKPCH242205H00_____ |

| Capacitance         | 630 VDC/200 VAC* |      |      |       |                     |
|---------------------|------------------|------|------|-------|---------------------|
|                     | W                | H    | L    | PCM** | Part number         |
| 0.068 $\mu\text{F}$ | 4                | 9    | 13   | 10    | MKPCJ026803C00_____ |
| 0.1 $\mu\text{F}$   | 5                | 11   | 13   | 10    | MKPCJ031003F00_____ |
|                     | 6                | 12   | 13   | 10    | MKPCJ031503G00_____ |
| 0.15 "              | 5                | 11   | 18   | 15    | MKPCJ031504B00_____ |
|                     | 8                | 12   | 13   | 10    | MKPCJ032203I00_____ |
| 0.22 "              | 6                | 12.5 | 18   | 15    | MKPCJ032204C00_____ |
|                     | 7                | 14   | 18   | 15    | MKPCJ033304D00_____ |
| 0.33 "              | 6                | 15   | 26.5 | 22.5  | MKPCJ033305B00_____ |
|                     | 8                | 15   | 18   | 15    | MKPCJ034704F00_____ |
| 0.47 "              | 6                | 15   | 26.5 | 22.5  | MKPCJ034705B00_____ |
|                     | 9                | 16   | 18   | 15    | MKPCJ036804J00_____ |
| 0.68 "              | 7                | 16.5 | 26.5 | 22.5  | MKPCJ036805D00_____ |
|                     | 8.5              | 18.5 | 26.5 | 22.5  | MKPCJ041005F00_____ |
| 1.0 $\mu\text{F}$   | 8.5              | 18.5 | 26.5 | 22.5  | MKPCJ041005F00_____ |
| 1.5 "               | 10.5             | 19   | 26.5 | 22.5  | MKPCJ041505G00_____ |
| 2.2 "               | 11               | 21   | 26.5 | 22.5  | MKPCJ042205I00_____ |

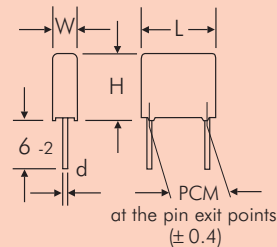
Part number completion:  
 Tolerance: 20 % = M  
 10 % = K  
 5 % = J  
 Packing: bulk = S  
 Pin length: 6-2 = SD  
 Taped version see page 148.

\* AC voltages:  $f \leq 1$  kHz

\*\* PCM = Printed circuit module = pin spacing

Dims. in mm.

$d = 0.6 \phi$  if PCM = 10  
 $d = 0.8 \phi$  if PCM = 15 - 22.5

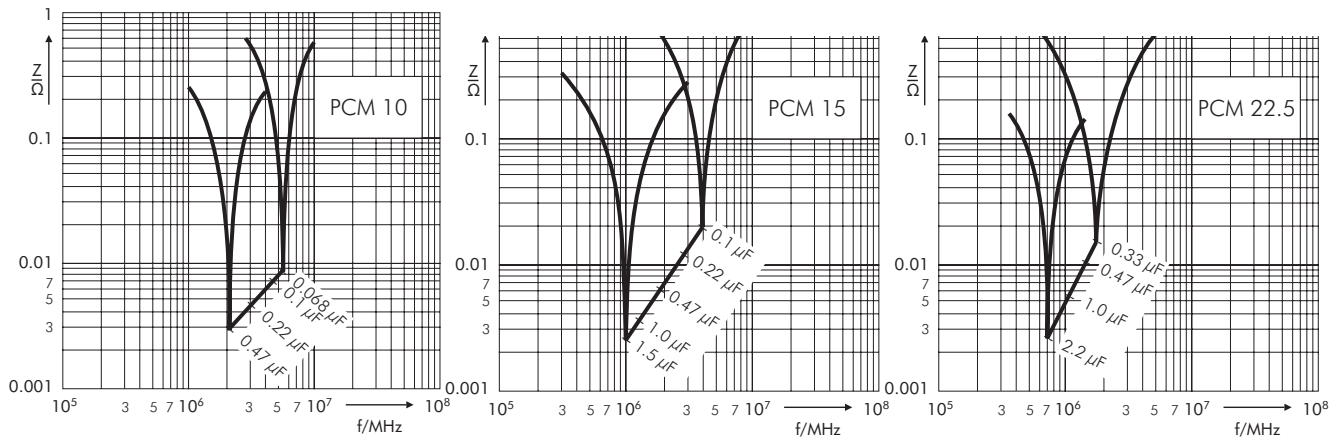


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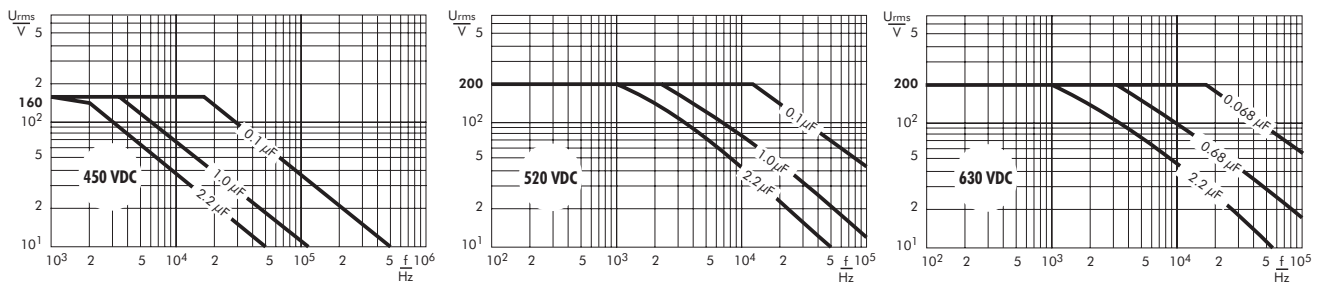
Continuation page 58

## Continuation

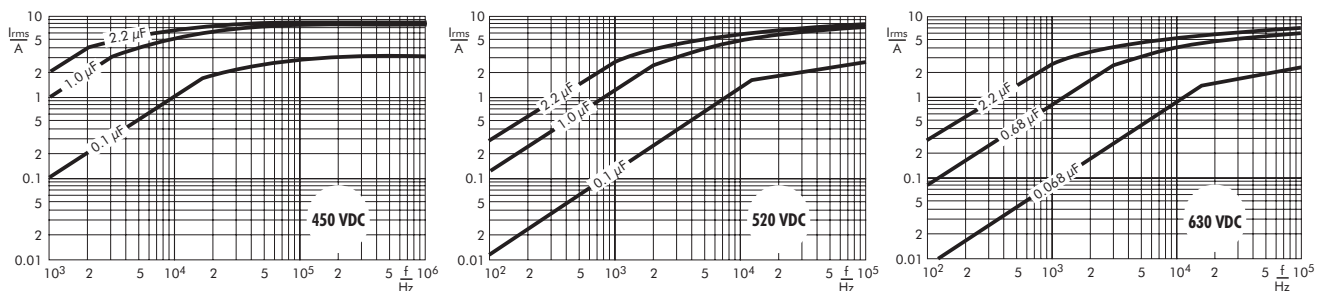
Impedance change with frequency  
(general guide).



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



Permissible AC current 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:  $T_{max.} \leq 125^{\circ}C$   
soldering:  $T_{max.} \leq 135^{\circ}C$

Polypropylene: preheating:  $T_{max.} \leq 100^{\circ}C$   
soldering:  $T_{max.} \leq 110^{\circ}C$

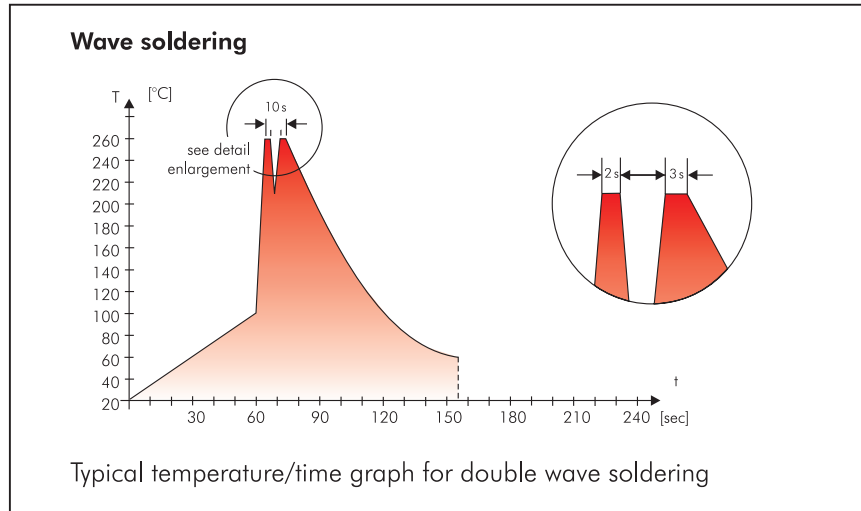
### Single wave soldering

Soldering bath temperature:  $T < 260^{\circ}C$   
Dwell time:  $t < 5 \text{ sec}$

### Double wave soldering

Soldering bath temperature:  $T < 260^{\circ}C$   
Dwell time:  $\Sigma t < 5 \text{ sec}$

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



## WIMA Quality and Environmental Philosophy

### ISO 9001:2008 Certification

ISO 9001:2008 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2008 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:

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

### RoHS Compliance

According to the RoHS Directive 2011/65/EU 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 refrained from using such substances since years already.



WIMA Kondensatoren sind bleifrei konform RoHS 2011/65/EU

WIMA capacitors are lead free in accordance with RoHS 2011/65/EU

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

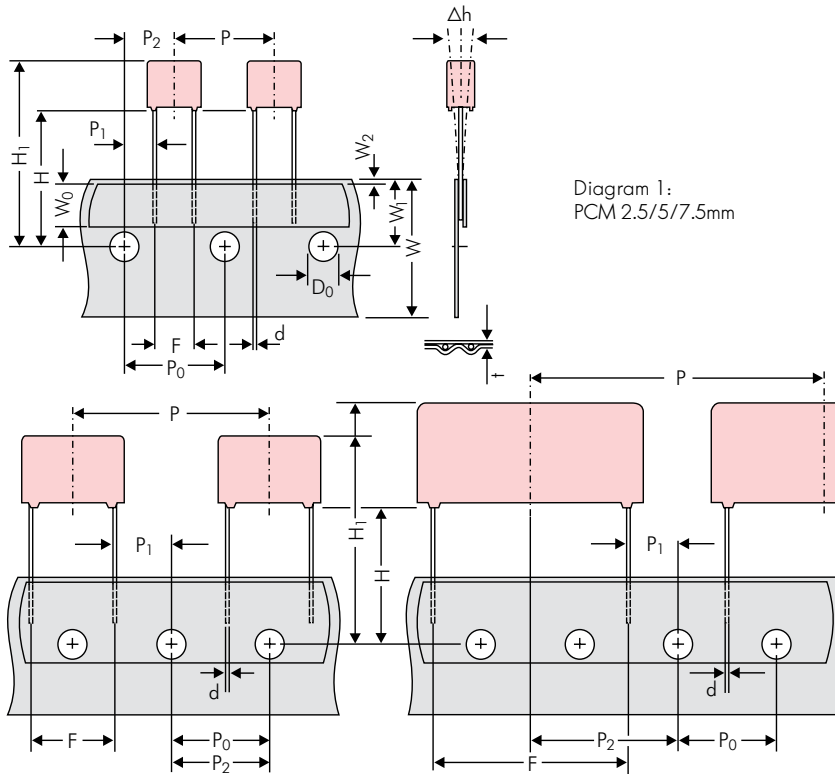


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5\*mm

\*PCM 27.5 tapping possible with two feed holes between components

| Designation                                      | Symbol                | Dimensions for Radial Taping                             |  |   |   |   |   |   |      |                       |                  |
|--|-----------------------|--|--|---|---|---|---|---|------|-----------------------|------------------|
|  |                       | PCM 2.5 tapping  | PCM 5 tapping  | PCM 7.5 tapping   | PCM 10 tapping*   | PCM 15 tapping*   | PCM 22.5 tapping  | PCM 27.5 tapping  |      |                       |                  |
| 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 <sub>0</sub>        | 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 <sub>1</sub>        | 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 <sub>2</sub>        | 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 <sub>0</sub>        | 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 <sub>0</sub>        | 12.7 ±0.3<br>cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3<br>cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3<br>cumulative pitch error max. 1.0 mm/20 pitch  | 12.7 ±0.3<br>cumulative pitch error max. 1.0 mm/20 pitch  | 12.7 ±0.3<br>cumulative pitch error max. 1.0 mm/20 pitch  | 12.7 ±0.3<br>cumulative pitch error max. 1.0 mm/20 pitch  | 12.7 ±0.3<br>cumulative pitch error max. 1.0 mm/20 pitch  |      |                       |                  |
| Feed hole centre to pin                          | P <sub>1</sub>        | 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 <sub>2</sub>        | 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 <sub>1</sub>        | H+H <sub>component</sub> < H <sub>1</sub><br>32.25 max.  | H+H <sub>component</sub> < H <sub>1</sub><br>32.25 max.  | H+H <sub>component</sub> < H <sub>1</sub><br>24.5 to 31.5 | H+H <sub>component</sub> < H <sub>1</sub><br>25.0 to 31.5 | H+H <sub>component</sub> < H <sub>1</sub><br>26.0 to 37.0 | H+H <sub>component</sub> < H <sub>1</sub><br>30.0 to 43.0 | H+H <sub>component</sub> < H <sub>1</sub><br>35.0 to 45.0 |      |                       |                  |
| Pin spacing at upper edge of carrier tape        | F                     | 2.5 ±0.5   | 5.0 <sup>+0.8</sup> <sub>-0.2</sub>                      | 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 <sup>+0.06</sup> <sub>-0.05</sub>        | 0.5 ±0.05 or 0.6 <sup>+0.06</sup> <sub>-0.05</sub>        | 0.8 <sup>+0.08</sup> <sub>-0.05</sub>                     | 0.8 <sup>+0.08</sup> <sub>-0.05</sub>                     | 0.8 <sup>+0.08</sup> <sub>-0.05</sub>                     |      |                       |                  |
| 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 149)                      | ROLL/AMMO             |  |  |   | AMMO  |   |   |   |      |                       |                  |
|  | REEL                  | φ 360 max.<br>φ 30 ±1                                    | B 52 ±2<br>58 ±2   | depending on comp. dimensions                             |   | REEL  | φ 360 max.<br>φ 30 ±1                                     | B 52 ±2<br>58 ±2 or 66 ±2                                 | REEL | φ 500 max.<br>φ 25 ±1 | B 60 ±2<br>68 ±2 |
| Unit   | see details page 150. |  |  |   |   |   |   |   |      |                       |                  |

Dims in mm.

\* Diameter of pins see General Data.

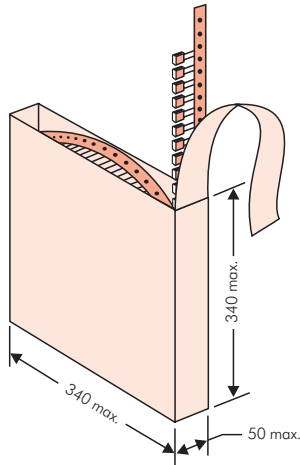
\* PCM 10 and PCM 15 can be crimped to PCM 7.5.

Position of components according to PCM 7.5 (sketch 1). P<sub>0</sub> = 12.7 or 15.0 is possible

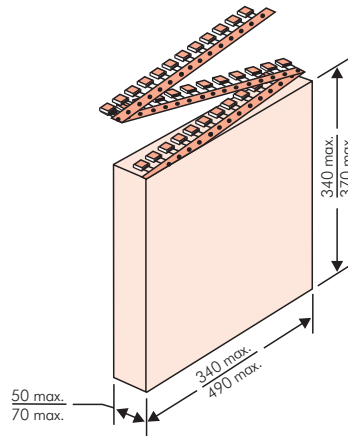
Please clarify customer-specific deviations with the manufacturer.

## Types of Tape Packaging of Capacitors for Automatic Radial Insertion

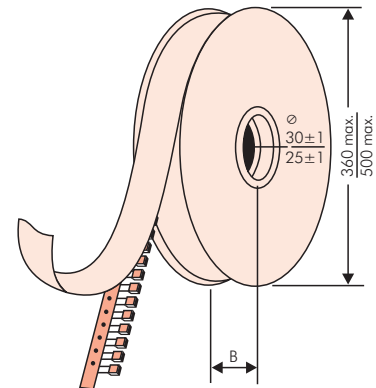
### ■ ROLL Packaging



### ■ AMMO Packaging



### ■ REEL Packaging



## BAR CODE (Labelling)

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

Scanner decoding of

- WIMA supplier number
- Customer's P/O number
- Customer's part number
- WIMA confirmation number
- WIMA part number
- Lot number
- Date code
- Quantity

In addition part description of

- article
- capacitance value
- rated voltage
- dimensions
- capacitance tolerance
- packing

as well as gross weight and customer's name are indicated in plain text.

|   |   |                          |              |
|---|---|--------------------------|--------------|
| <b>WIMA</b> Best Capacitors Made in Germany |   | Werk Unna                |              |
| Supplier-ID: 123456789                      | <b>RoHS</b><br>2011/65/EU                   | Date Code: 08.10.10      |              |
|   |   |                          |              |
| Purchase Order No. (P/O): Bestellung xyz    |   | Quantity: 5.000          |              |
|   |   |                          |              |
| Customer Part No.: KUNDETEILENUMMER         |   | Customer No.: 0000100002 |              |
|   |   | Gross Weight [g]: 1870   |              |
| WIMA Confirmation No.: 0001004053000100     | WIMA Part No.: MKS2C034701C00K88D           |                          |              |
|   |   |                          |              |
| Handling Unit: <b>MKS 2</b>                 | <b>QTY: 5.000</b>                           | <b>COO: DE</b>           |              |
|   | <b>MKS 2 0.47 µF 63 VDC 3.5x8.5x7.2 RMS</b> |                          |              |
| <b>1000067326</b>                           | Standard 10% Loss - Standard                | Drühte 6-2               | Week 03/2011 |
|   | Vorlage Debitor Inland                      |                          |              |

BARCODE „Code 39“



## 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      |      |   |
|         | W    | H    | L         | Codes     |      | S                     | H16.5 | H18.5 | ø 360 | ø 500 | 340 × 340 | 490 × 370 |      |   |
|         |      |      |           |           | N    | O                     | F     | I     | H     | J     | A         | C         | B    | D |
| 2.5 mm  | 2.5  | 7    | 4.6       | <b>0B</b> | 5000 |                       | 2200  | 2500  |       |       | 2800      |           |      |   |
|         | 3    | 7.5  | 4.6       | <b>0C</b> | 5000 |                       | 2000  | 2300  |       |       | 2300      |           |      |   |
|         | 3.8  | 8.5  | 4.6       | <b>0D</b> | 5000 |                       | 1500  | 1800  |       |       | 1800      |           |      |   |
|         | 4.6  | 9    | 4.6       | <b>0E</b> | 5000 |                       | 1200  | 1500  |       |       | 1500      |           |      |   |
|         | 5.5  | 10   | 4.6       | <b>0F</b> | 5000 |                       | 900   | 1200  |       |       | 1200      |           |      |   |
| 5 mm    | 2.5  | 6.5  | 7.2       | <b>1A</b> | 5000 |                       | 2200  | 2500  |       |       | 2800      |           |      |   |
|         | 3    | 7.5  | 7.2       | <b>1B</b> | 5000 |                       | 2000  | 2300  |       |       | 2300      |           |      |   |
|         | 3.5  | 8.5  | 7.2       | <b>1C</b> | 5000 |                       | 1600  | 2000  |       |       | 2000      |           |      |   |
|         | 4.5  | 6    | 7.2       | <b>1D</b> | 6000 |                       | 1300  | 1500  |       |       | 1500      |           |      |   |
|         | 4.5  | 9.5  | 7.2       | <b>1E</b> | 4000 |                       | 1300  | 1500  |       |       | 1500      |           |      |   |
|         | 5    | 10   | 7.2       | <b>1F</b> | 3500 |                       | 1100  | 1400  |       |       | 1400      |           |      |   |
|         | 5.5  | 7    | 7.2       | <b>1G</b> | 4000 |                       | 1000  | 1200  |       |       | 1200      |           |      |   |
|         | 5.5  | 11.5 | 7.2       | <b>1H</b> | 2500 |                       | 1000  | 1200  |       |       | 1200      |           |      |   |
|         | 6.5  | 8    | 7.2       | <b>1I</b> | 2500 |                       | 800   | 1000  |       |       | 1000      |           |      |   |
|         | 7.2  | 8.5  | 7.2       | <b>1J</b> | 2500 |                       | 700   | 1000  |       |       | 1000      |           |      |   |
|         | 7.2  | 13   | 7.2       | <b>1K</b> | 2000 |                       | 700   | 950   |       |       | 1000      |           |      |   |
|         | 8.5  | 10   | 7.2       | <b>1L</b> | 2000 |                       | 600   | 800   |       |       | 800       |           |      |   |
|         | 8.5  | 14   | 7.2       | <b>1M</b> | 1500 |                       | 600   | 800   |       |       | 800       |           |      |   |
| 11      | 16   | 7.2  | <b>1N</b> | 1000      |      | 500                   | 600   |       |       | 400   |           |           |      |   |
| 7.5 mm  | 2.5  | 7    | 10        | <b>2A</b> | 5000 |                       |       | 2500  | 4400  |       | 2500      |           |      |   |
|         | 3    | 8.5  | 10        | <b>2B</b> | 5000 |                       |       | 2200  | 4300  |       | 2300      |           | 4150 |   |
|         | 4    | 9    | 10        | <b>2C</b> | 4000 |                       |       | 1700  | 3200  |       | 1700      |           | 3100 |   |
|         | 4.5  | 9.5  | 10.3      | <b>2D</b> | 3500 |                       |       | 1500  | 2900  |       | 1400      |           | 2700 |   |
|         | 5    | 10.5 | 10.3      | <b>2E</b> | 3000 |                       |       | 1300  | 2500  |       | 1300      |           |      |   |
|         | 5.7  | 12.5 | 10.3      | <b>2F</b> | 2000 |                       |       | 1000  | 2200  |       | 1100      |           |      |   |
|         | 7.2  | 12.5 | 10.3      | <b>2G</b> | 1500 |                       |       | 900   | 1800  |       | 1000      |           |      |   |
| 10 mm   | 3    | 9    | 13        | <b>3A</b> | 3000 |                       |       | 1100  | 2200  |       |           |           | 1900 |   |
|         | 4    | 8.5  | 13.5      | <b>FA</b> | 3000 |                       |       | 900   | 1600  |       |           |           | 1450 |   |
|         | 4    | 9    | 13        | <b>3C</b> | 3000 |                       |       | 900   | 1600  |       |           |           | 1450 |   |
|         | 4    | 9.5  | 13        | <b>3D</b> | 3000 |                       |       | 900   | 1600  |       |           |           | 1400 |   |
|         | 5    | 10   | 13.5      | <b>FB</b> | 2000 |                       |       | 700   | 1300  |       |           |           | 1200 |   |
|         | 5    | 11   | 13        | <b>3F</b> | 3000 |                       |       | 700   | 1300  |       |           |           | 1200 |   |
|         | 6    | 12   | 13        | <b>3G</b> | 2400 |                       |       | 550   | 1100  |       |           |           | 1000 |   |
|         | 6    | 12.5 | 13        | <b>3H</b> | 2400 |                       |       | 550   | 1100  |       |           |           | 1000 |   |
| 8       | 12   | 13   | <b>3I</b> | 2000      |      |                       | 400   | 800   |       |       |           | 740       |      |   |
| 15 mm   | 5    | 11   | 18        | <b>4B</b> | 2400 |                       |       | 600   | 1200  |       |           |           | 1150 |   |
|         | 5    | 13   | 19        | <b>FC</b> | 1000 |                       |       | 600   | 1200  |       |           |           | 1200 |   |
|         | 6    | 12.5 | 18        | <b>4C</b> | 2000 |                       |       | 500   | 1000  |       |           |           | 1000 |   |
|         | 6    | 14   | 19        | <b>FD</b> | 1000 |                       |       | 500   | 1000  |       |           |           | 1000 |   |
|         | 7    | 14   | 18        | <b>4D</b> | 1600 |                       |       | 450   | 900   |       |           |           | 850  |   |
|         | 7    | 15   | 19        | <b>FE</b> | 1000 |                       |       | 450   | 900   |       |           |           | 850  |   |
|         | 8    | 15   | 18        | <b>4F</b> | 1200 |                       |       | 400   | 800   |       |           |           | 740  |   |
|         | 8    | 17   | 19        | <b>FF</b> | 500  |                       |       | 400   | 800   |       |           |           | 740  |   |
|         | 9    | 14   | 18        | <b>4H</b> | 1200 |                       |       | 350   | 700   |       |           |           | 650  |   |
|         | 9    | 16   | 18        | <b>4J</b> | 900  |                       |       | 350   | 700   |       |           |           | 650  |   |
|         | 10   | 18   | 19        | <b>FG</b> | 500  |                       |       | 300   | 650   |       |           |           | 590  |   |
| 11      | 14   | 18   | <b>4M</b> | 1000      |      |                       | 300   | 600   |       |       |           | 540       |      |   |
| 22.5 mm | 5    | 14   | 26.5      | <b>5A</b> | 1200 |                       |       |       | 800   |       |           |           | 770  |   |
|         | 6    | 15   | 26.5      | <b>5B</b> | 1000 |                       |       |       | 700   |       |           |           | 640  |   |
|         | 7    | 16.5 | 26.5      | <b>5D</b> | 760  |                       |       |       | 600   |       |           |           | 550  |   |
|         | 8    | 20   | 28        | <b>FH</b> | 500  |                       |       |       | 500   |       |           |           | 480  |   |
|         | 8.5  | 18.5 | 26.5      | <b>5F</b> | 500  |                       |       |       | 480   |       |           |           | 450  |   |
|         | 10   | 22   | 28        | <b>FI</b> | 570* |                       |       |       | 420   |       |           |           | 380  |   |
|         | 10.5 | 19   | 26.5      | <b>5G</b> | 594* |                       |       |       | 400   |       |           |           | 360  |   |
|         | 10.5 | 20.5 | 26.5      | <b>5H</b> | 594* |                       |       |       | 400   |       |           |           | 360  |   |
|         | 11   | 21   | 26.5      | <b>5I</b> | 561* |                       |       |       | 380   |       |           |           | 350  |   |
|         | 12   | 24   | 28        | <b>FJ</b> | 480* |                       |       |       | 350   |       |           |           | 310  |   |

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

■ Moulded versions.

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## 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 |           |   |           |
|                | W    | H    | L    | Codes     |      | S                     | H16.5 | H18.5 | ø 360 |          | ø 500 |      | 340 × 340 |   | 490 × 370 |
|                |      |      |      |           | N    | O                     | F     | I     | H     | J        | A     | C    | B         | D |           |
| <b>27.5 mm</b> | 9    | 19   | 31.5 | <b>6A</b> | 567* | –                     | –     | –     | –     | 460/340* | –     | –    | 420       |   |           |
|                | 11   | 21   | 31.5 | <b>6B</b> | 459* | –                     | –     | –     | –     | 380/280* | –     | –    | 350       |   |           |
|                | 13   | 24   | 31.5 | <b>6D</b> | 378* | –                     | –     | –     | –     | 300      | –     | –    | 290       |   |           |
|                | 13   | 25   | 33   | <b>FK</b> | 405* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 15   | 26   | 31.5 | <b>6F</b> | 324* | –                     | –     | –     | –     | 270      | –     | –    | 250       |   |           |
|                | 15   | 26   | 33   | <b>FL</b> | 324* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 17   | 29   | 31.5 | <b>6G</b> | 198* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 17   | 34.5 | 31.5 | <b>6I</b> | 198* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 20   | 32   | 33   | <b>FM</b> | 162* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 20   | 39.5 | 31.5 | <b>6J</b> | 162* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
| <b>37.5 mm</b> | 9    | 19   | 41.5 | <b>7A</b> | 441* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 11   | 22   | 41.5 | <b>7B</b> | 357* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 13   | 24   | 41.5 | <b>7C</b> | 294* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 15   | 26   | 41.5 | <b>7D</b> | 252* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 17   | 29   | 41.5 | <b>7E</b> | 154* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 19   | 32   | 41.5 | <b>7F</b> | 140* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 20   | 39.5 | 41.5 | <b>7G</b> | 126* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 24   | 45.5 | 41.5 | <b>7H</b> | 112* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 31   | 46   | 41.5 | <b>7I</b> | 84*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 35   | 50   | 41.5 | <b>7J</b> | 35*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 40   | 55   | 41.5 | <b>7K</b> | 28*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
| <b>48.5 mm</b> | 19   | 31   | 56   | <b>8D</b> | 120* | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 23   | 34   | 56   | <b>8E</b> | 80*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 27   | 37.5 | 56   | <b>8H</b> | 84*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 33   | 48   | 56   | <b>8J</b> | 25*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 37   | 54   | 56   | <b>8L</b> | 25*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
| <b>52.5 mm</b> | 25   | 45   | 57   | <b>9D</b> | 70*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 30   | 45   | 57   | <b>9E</b> | 60*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 35   | 50   | 57   | <b>9F</b> | 25*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 45   | 55   | 57   | <b>9H</b> | 20*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |
|                | 45   | 65   | 57   | <b>9J</b> | 20*  | –                     | –     | –     | –     | –        | –     | –    | –         |   |           |

\* for 2-inch transport pitches.

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

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Updated data on [www.wima.com](http://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             |   |   | 2.5x6.5x7.2                |    | -                     | 20% | bulk | 6-2                    |    |    |    |
| <b>Type description:</b> |   |   |   | <b>Rated voltage:</b> |   | <b>Capacitance:</b> |   |   | <b>Size:</b>               |    | <b>Tolerance:</b>     |     |      | <b>Packing:</b>        |    |    |    |
| SMD-PET = SMDT           |   |   |   | 50 VDC = B0           |   | 22 pF = 0022        |   |   | 4.8x3.3x3 Size 1812 = KA   |    | ±20% = M              |     |      | AMMO H16.5 340x340 = A |    |    |    |
| SMD-PEN = SMDN           |   |   |   | 63 VDC = C0           |   | 47 pF = 0047        |   |   | 4.8x3.3x4 Size 1812 = KB   |    | ±10% = K              |     |      |                        |    |    |    |
| SMD-PPS = SMDI           |   |   |   | 100 VDC = D0          |   | 100 pF = 0100       |   |   | 5.7x5.1x3.5 Size 2220 = QA |    | ±5% = J               |     |      | AMMO H16.5 490x370 = B |    |    |    |
| FKP 02 = FKPO            |   |   |   | 250 VDC = F0          |   | 150 pF = 0150       |   |   | 5.7x5.1x4.5 Size 2220 = QB |    | ±2.5% = H             |     |      | AMMO H18.5 340x340 = C |    |    |    |
| MKS 02 = MKS0            |   |   |   | 400 VDC = G0          |   | 220 pF = 0220       |   |   | 7.2x6.1x3 Size 2824 = TA   |    | ±1% = E               |     |      | AMMO H18.5 490x370 = D |    |    |    |
| FKS 2 = FKS2             |   |   |   | 450 VDC = H0          |   | 330 pF = 0330       |   |   | 7.2x6.1x5 Size 2824 = TB   |    | ...                   |     |      | REEL H16.5 360 = F     |    |    |    |
| FKP 2 = FKP2             |   |   |   | 520 VDC = H2          |   | 470 pF = 0470       |   |   | 10.2x7.6x5 Size 4030 = VA  |    | REEL H16.5 500 = H    |     |      | REEL H18.5 360 = I     |    |    |    |
| FKS 3 = FKS3             |   |   |   | 600 VDC = I0          |   | 680 pF = 0680       |   |   | 12.7x10.2x6 Size 5040 = XA |    |                       |     |      |                        |    |    |    |
| FKP 3 = FKP 3            |   |   |   | 630 VDC = J0          |   | 1000 pF = 1100      |   |   | 15.3x13.7x7 Size 6054 = YA |    | ROLL H16.5 = N        |     |      | REEL H18.5 500 = J     |    |    |    |
| MKS 2 = MKS2             |   |   |   | 700 VDC = K0          |   | 1500 pF = 1150      |   |   | 2.5x7x4.6 PCM 2.5 = 0B     |    |                       |     |      |                        |    |    |    |
| MKP 2 = MKP2             |   |   |   | 800 VDC = L0          |   | 2200 pF = 1220      |   |   | 3x7.5x4.6 PCM 2.5 = 0C     |    | ROLL H18.5 = O        |     |      | BLISTER W12 180 = P    |    |    |    |
| MKS 4 = MKS4             |   |   |   | 850 VDC = M0          |   | 3300 pF = 1330      |   |   | 2.5x6.5x7.2 PCM 5 = 1A     |    |                       |     |      |                        |    |    |    |
| MKP 4C = MKPC            |   |   |   | 900 VDC = N0          |   | 4700 pF = 1470      |   |   | 3x7.5x7.2 PCM 5 = 1B       |    | BLISTER W16 330 = R   |     |      | BLISTER W24 330 = T    |    |    |    |
| MKP 4 = MKP4             |   |   |   | 1000 VDC = O1         |   | 6800 pF = 1680      |   |   | 2.5x7x10 PCM 7.5 = 2A      |    |                       |     |      |                        |    |    |    |
| MKP 10 = MKP1            |   |   |   | 1100 VDC = P0         |   | 0.01 µF = 2100      |   |   | 3x8.5x10 PCM 7.5 = 2B      |    | Bulk/TPS Standard = S |     |      | ...                    |    |    |    |
| FKP 1 = FKP1             |   |   |   | 1200 VDC = Q0         |   | 0.022 µF = 2220     |   |   | 3x9x13 PCM 10 = 3A         |    |                       |     |      |                        |    |    |    |
| MKP-X2 = MKX2            |   |   |   | 1250 VDC = R0         |   | 0.047 µF = 2470     |   |   | 4x9x13 PCM 10 = 3C         |    | ...                   |     |      | Pin length (untaped)   |    |    |    |
| MKP-X1 R = MKX1          |   |   |   | 1500 VDC = S0         |   | 0.1 µF = 3100       |   |   | 5x11x18 PCM 15 = 4B        |    |                       |     |      |                        |    |    |    |
| MKP-Y2 = MKY2            |   |   |   | 1600 VDC = T0         |   | 0.22 µF = 3220      |   |   | 6x12.5x18 PCM 15 = 4C      |    | 3.5 ±0.5 = C9         |     |      | Pin length (taped)     |    |    |    |
| MP 3-X2 = MPX2           |   |   |   | 2000 VDC = U0         |   | 0.47 µF = 3470      |   |   | 5x14x26.5 PCM 22.5 = 5A    |    | 6-2 = SD              |     |      | ...                    |    |    |    |
| MP 3-X1 = MPX1           |   |   |   | 2500 VDC = V0         |   | 1 µF = 4100         |   |   | 6x15x26.5 PCM 22.5 = 5B    |    | 16 ±1 = P1            |     |      | none = 00              |    |    |    |
| MP 3-Y2 = MPY2           |   |   |   | 3000 VDC = W0         |   | 2.2 µF = 4220       |   |   | 9x19x31.5 PCM 27.5 = 6A    |    | ...                   |     |      |                        |    |    |    |
| MP 3R-Y2 = MPRY          |   |   |   | 4000 VDC = X0         |   | 4.7 µF = 4470       |   |   | 11x21x31.5 PCM 27.5 = 6B   |    |                       |     |      |                        |    |    |    |
| MKP 4F = MKPF            |   |   |   | 6000 VDC = Y0         |   | 10 µF = 5100        |   |   | 9x19x41.5 PCM 37.5 = 7A    |    |                       |     |      |                        |    |    |    |
| Snubber MKP = SNMP       |   |   |   | 250 VAC = 0W          |   | 22 µF = 5220        |   |   | 11x22x41.5 PCM 37.5 = 7B   |    |                       |     |      |                        |    |    |    |
| Snubber FKP = SNFP       |   |   |   | 275 VAC = 1W          |   | 47 µF = 5470        |   |   | 19x31x56 PCM 48.5 = 8D     |    |                       |     |      |                        |    |    |    |
| GTO MKP = GTOM           |   |   |   | 300 VAC = 2W          |   | 100 µF = 6100       |   |   | 25x45x57 PCM 52.5 = 9D     |    |                       |     |      |                        |    |    |    |
| DC-LINK MKP 3 = DCP3     |   |   |   | 305 VAC = AW          |   | 220 µF = 6220       |   |   | ...                        |    |                       |     |      |                        |    |    |    |
| DC-LINK MKP 4 = DCP4     |   |   |   | 350 VAC = BW          |   | 1000 µF = 7100      |   |   | ...                        |    |                       |     |      |                        |    |    |    |
| DC-LINK MKP 4S = DCP5    |   |   |   | 440 VAC = 4W          |   | 1500 µF = 7150      |   |   | ...                        |    |                       |     |      |                        |    |    |    |
| DC-LINK MKP 5 = DCP5     |   |   |   | 500 VAC = 5W          |   | ...                 |   |   | ...                        |    |                       |     |      |                        |    |    |    |
| DC-LINK MKP 6 = DCP6     |   |   |   | ...                   |   | ...                 |   |   | ...                        |    |                       |     |      |                        |    |    |    |
| DC-LINK HC = DCHC        |   |   |   | ...                   |   | ...                 |   |   | ...                        |    |                       |     |      |                        |    |    |    |
| DC-LINK HY = DCHY        |   |   |   | ...                   |   | ...                 |   |   | ...                        |    |                       |     |      |                        |    |    |    |

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.