

**Metallized Polyester (PET) Capacitors**  
**in PCM 7.5 mm to 52.5 mm. Capacitances from 1000 pF to 220 µF.**  
**Rated Voltages from 63 VDC to 2000 VDC.**

## Special Features

- High volume/capacitance ratio
- Self-healing
- AEC-Q200 qualified
- According to RoHS 2015/863/EU

## Typical Applications

For general DC-applications e.g.

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

## Construction

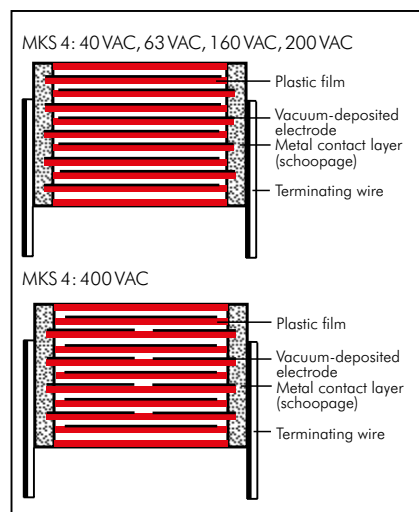
### Dielectric:

Polyethylene-terephthalate (PET) 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:** 1000 pF to 220 µF

**Rated voltages:** 63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1500 VDC, 2000 VDC

**Capacitance tolerances:**

± 20%, ± 10% ± 5%

**Operating temperature range:**

–55° C to +125° C

**Climatic test category:**

55/100/56 in accordance with IEC

**Test voltage:** 1.6 U<sub>r</sub>, 2 sec.

**Insulation resistance** at +20° C:

### Test specifications:

In accordance with IEC 60384-2

### 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 > 300 000 hours (+125° C permitted for 1000 hours max. distributed over the entire operating life)

Failure rate < 2 fit (0.5 x U<sub>r</sub> and 40° C)

| U <sub>r</sub> | U <sub>test</sub> | C ≤ 0.33 µF                | 0.33 µF < C ≤ 220 µF  |
|----------------|-------------------|----------------------------|-----------------------|
| 63 VDC         | 50 V              | ≥ 1 x 10 <sup>4</sup> MΩ   | ≥ 3000 sec (MΩ x µF)  |
| 100 VDC        | 100 V             | ≥ 1.5 x 10 <sup>4</sup> MΩ | ≥ 5000 sec (MΩ x µF)  |
| ≥ 250 VDC      | 100 V             | ≥ 3 x 10 <sup>4</sup> MΩ   | ≥ 10000 sec (MΩ x µF) |

Measuring time: 1 min.

**Dissipation factors** at +20° C: tan δ

| at f    | C ≤ 0.1 µF              | 0.1 µF < C ≤ 1.0 µF     | C > 1.0 µF              |
|---------|-------------------------|-------------------------|-------------------------|
| 1 kHz   | ≤ 8 x 10 <sup>-3</sup>  | ≤ 8 x 10 <sup>-3</sup>  | ≤ 10 x 10 <sup>-3</sup> |
| 10 kHz  | ≤ 15 x 10 <sup>-3</sup> | ≤ 15 x 10 <sup>-3</sup> | –                       |
| 100 kHz | ≤ 30 x 10 <sup>-3</sup> | –                       | –                       |

### Maximum pulse rise time:

| Capacitance<br>pF/µF | 63 VDC | 100 VDC | 250 VDC | 400 VDC | 630 VDC | 1000 VDC | 1500 VDC | 2000 VDC |
|----------------------|--------|---------|---------|---------|---------|----------|----------|----------|
| 1000 ... 6800        | –      | –       | –       | –       | –       | 70       | 90       | 100      |
| 0.01 ... 0.022       | –      | 30      | 35      | 38      | 40      | 50       | 50       | 60       |
| 0.033 ... 0.068      | –      | 15      | 20      | 25      | 32      | 26       | 35       | 40       |
| 0.33 ... 0.68        | 10     | 12      | 15      | 15      | 17      | 20       | 35       | 40       |
| 0.1 ... 0.22         | 9      | 9       | 10      | 10      | 13      | 20       | 20       | 38       |
| 1.0 ... 2.2          | 6      | 5       | 6       | 9       | 13      | 14       | 15       | 15       |
| 3.3 ... 6.8          | 3      | 3       | 6       | 6       | 9       | 12       | –        | –        |
| 10 ... 22            | 2.5    | 2.5     | 3       | 6       | 6       | –        | –        | –        |
| 33 ... 68            | 2.5    | 2.5     | 3       | 3       | –       | –        | –        | –        |
| 100 ... 220          | 2.5    | 2.5     | –       | –       | –       | –        | –        | –        |

## Mechanical Tests

### Pull test on pins:

d ≤ 0.8 Ø: 10 N in direction of pins

d > 0.8 Ø: 20 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:** 1 kPa = 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 up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

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        |
| 0.01 µF     |                |      |      |       |                    | 2.5             | 7    | 10   | 7.5   | MKS4D021002A_----- |
| 0.015 "     |                |      |      |       |                    | 4               | 9    | 13   | 10    | MKS4D021003C_----- |
| 0.022 "     |                |      |      |       |                    | 2.5             | 7    | 10   | 7.5   | MKS4D021502A_----- |
| 0.033 "     |                |      |      |       |                    | 4               | 9    | 13   | 10    | MKS4D021503C_----- |
| 0.047 "     |                |      |      |       |                    | 2.5             | 7    | 10   | 7.5   | MKS4D022202A_----- |
| 0.068 "     |                |      |      |       |                    | 4               | 9    | 13   | 10    | MKS4D022203C_----- |
|             |                |      |      |       |                    | 2.5             | 7    | 10   | 7.5   | MKS4D023302A_----- |
|             |                |      |      |       |                    | 4               | 9    | 13   | 10    | MKS4D023303C_----- |
|             |                |      |      |       |                    | 2.5             | 7    | 10   | 7.5   | MKS4D024702A_----- |
|             |                |      |      |       |                    | 4               | 9    | 13   | 10    | MKS4D024703C_----- |
|             |                |      |      |       |                    | 2.5             | 7    | 10   | 7.5   | MKS4D026802A_----- |
|             |                |      |      |       |                    | 4               | 9    | 13   | 10    | MKS4D026803C_----- |
| 0.1 µF      | 2.5            | 7    | 10   | 7.5   | MKS4C031002A_----- | 2.5             | 7    | 10   | 7.5   | MKS4D031002A_----- |
|             | 4              | 9    | 13   | 10    | MKS4C031003C_----- | 4               | 9    | 13   | 10    | MKS4D031003C_----- |
| 0.15 "      | 2.5            | 7    | 10   | 7.5   | MKS4C031502A_----- | 3               | 8.5  | 10   | 7.5   | MKS4D031502B_----- |
|             | 4              | 9    | 13   | 10    | MKS4C031503C_----- | 4               | 9    | 13   | 10    | MKS4D031503C_----- |
| 0.22 "      | 3              | 8.5  | 10   | 7.5   | MKS4C032202B_----- | 3               | 8.5  | 10   | 7.5   | MKS4D032202B_----- |
|             | 4              | 9    | 13   | 10    | MKS4C032203C_----- | 4               | 9    | 13   | 10    | MKS4D032203C_----- |
| 0.33 "      | 4              | 9    | 10   | 7.5   | MKS4C033302C_----- | 4               | 9    | 10   | 7.5   | MKS4D033302C_----- |
|             | 4              | 9    | 13   | 10    | MKS4C033303C_----- | 4               | 9    | 13   | 10    | MKS4D033303C_----- |
| 0.47 "      | 4              | 9    | 10   | 7.5   | MKS4C034702C_----- | 4.5             | 9.5  | 10.3 | 7.5   | MKS4D034702D_----- |
|             | 4              | 9    | 13   | 10    | MKS4C034703C_----- | 4               | 9    | 13   | 10    | MKS4D034703C_----- |
| 0.68 "      | 5              | 10.5 | 10.3 | 7.5   | MKS4C036802E_----- | 5               | 10.5 | 10.3 | 7.5   | MKS4D036802E_----- |
|             | 4              | 9    | 13   | 10    | MKS4C036803C_----- | 4               | 9    | 13   | 10    | MKS4D036803C_----- |
| 1.0 µF      | 5              | 10.5 | 10.3 | 7.5   | MKS4C041002E_----- | 5.7             | 12.5 | 10.3 | 7.5   | MKS4D041002F_----- |
|             | 4              | 9    | 13   | 10    | MKS4C041003C_----- | 5               | 11   | 13   | 10    | MKS4D041003F_----- |
| 1.5 "       | 5.7            | 12.5 | 10.3 | 7.5   | MKS4C041502F_----- | 6               | 12   | 13   | 10    | MKS4D041503G_----- |
|             | 5              | 11   | 13   | 10    | MKS4C041503F_----- | 7               | 14   | 18   | 15    | MKS4D041504D_----- |
| 2.2 "       | 5              | 11   | 13   | 10    | MKS4C042203F_----- | 8               | 15   | 18   | 15    | MKS4D042204F_----- |
|             | 6              | 12.5 | 18   | 15    | MKS4C042204C_----- | 6               | 15   | 26.5 | 22.5  | MKS4D042205B_----- |
| 3.3 "       | 6              | 12   | 13   | 10    | MKS4C043303G_----- | 9               | 16   | 18   | 15    | MKS4D043304J_----- |
|             | 7              | 14   | 18   | 15    | MKS4C043304D_----- | 7               | 16.5 | 26.5 | 22.5  | MKS4D043305D_----- |
| 4.7 "       | 7              | 14   | 18   | 15    | MKS4C044704D_----- | 10.5            | 19   | 26.5 | 22.5  | MKS4D044705G_----- |
|             | 6              | 15   | 26.5 | 22.5  | MKS4C044705B_----- | 9               | 19   | 31.5 | 27.5  | MKS4D044706A_----- |
| 6.8 "       | 8              | 15   | 18   | 15    | MKS4C046804F_----- | 10.5            | 19   | 26.5 | 22.5  | MKS4D046805G_----- |
|             | 7              | 16.5 | 26.5 | 22.5  | MKS4C046805D_----- | 11              | 21   | 31.5 | 27.5  | MKS4D046806B_----- |
| 10 µF       | 9              | 16   | 18   | 15    | MKS4C051004J_----- | 11              | 21   | 31.5 | 27.5  | MKS4D051006B_----- |
|             | 8.5            | 18.5 | 26.5 | 22.5  | MKS4C051005F_----- |                 |      |      |       |                    |
| 15 "        | 11             | 21   | 26.5 | 22.5  | MKS4C051505I_----- | 13              | 24   | 31.5 | 27.5  | MKS4D051506D_----- |
|             | 11             | 21   | 31.5 | 27.5  | MKS4C051506B_----- |                 |      |      |       |                    |
| 22 "        | 11             | 21   | 31.5 | 27.5  | MKS4C052206B_----- | 13              | 24   | 31.5 | 27.5  | MKS4D052206D_----- |
| 33 "        | 13             | 24   | 31.5 | 27.5  | MKS4C053306D_----- | 17              | 29   | 31.5 | 27.5  | MKS4D053306G_----- |
|             |                |      |      |       |                    | 13              | 24   | 41.5 | 37.5  | MKS4D053307C_----- |
| 47 "        | 15             | 26   | 31.5 | 27.5  | MKS4C054706F_----- | 17              | 34.5 | 31.5 | 27.5  | MKS4D054706I_----- |
|             | 13             | 24   | 41.5 | 37.5  | MKS4C054707C_----- | 17              | 29   | 41.5 | 37.5  | MKS4D054707E_----- |
| 68 "        | 17             | 34.5 | 31.5 | 27.5  | MKS4C056806I_----- | 20              | 39.5 | 31.5 | 27.5  | MKS4D056806J_----- |
|             | 15             | 26   | 41.5 | 37.5  | MKS4C056807D_----- | 19              | 32   | 41.5 | 37.5  | MKS4D056807F_----- |
| 100 µF      | 20             | 39.5 | 31.5 | 27.5  | MKS4C061006J_----- | 24              | 45.5 | 41.5 | 37.5  | MKS4D061007H_----- |
|             | 19             | 32   | 41.5 | 37.5  | MKS4C061007F_----- |                 |      |      |       |                    |
| 150 "       | 20             | 39.5 | 41.5 | 37.5  | MKS4C061507G_----- |                 |      |      |       |                    |
| 220 "       | 31             | 46   | 41.5 | 37.5  | MKS4C062207I_----- |                 |      |      |       |                    |

\* AC voltages:  $f = 50 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

■ New box sizes.

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

Dims. in mm.

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## Continuation

### General Data

| Capacitance  | 250 VDC/160 VAC* |      |      |       |                   | 400 VDC/200 VAC* |      |      |       |                   |
|--------------|------------------|------|------|-------|-------------------|------------------|------|------|-------|-------------------|
|              | W                | H    | L    | PCM** | Part number       | W                | H    | L    | PCM** | Part number       |
| 0.01 $\mu$ F | 3                | 8.5  | 10   | 7.5   | MKS4F021002B_____ | 3                | 8.5  | 10   | 7.5   | MKS4G021002B_____ |
|              | 4                | 9    | 13   | 10    | MKS4F021003C_____ | 4                | 9    | 13   | 10    | MKS4G021003C_____ |
| 0.015 "      | 3                | 8.5  | 10   | 7.5   | MKS4F021502B_____ | 3                | 8.5  | 10   | 7.5   | MKS4G021502B_____ |
|              | 4                | 9    | 13   | 10    | MKS4F021503C_____ | 4                | 9    | 13   | 10    | MKS4G021503C_____ |
| 0.022 "      | 3                | 8.5  | 10   | 7.5   | MKS4F022202B_____ | 4                | 9    | 10   | 7.5   | MKS4G022202C_____ |
|              | 4                | 9    | 13   | 10    | MKS4F022203C_____ | 4                | 9    | 13   | 10    | MKS4G022203C_____ |
| 0.033 "      | 3                | 8.5  | 10   | 7.5   | MKS4F023302B_____ | 4                | 9    | 10   | 7.5   | MKS4G023302C_____ |
|              | 4                | 9    | 13   | 10    | MKS4F023303C_____ | 4                | 9    | 13   | 10    | MKS4G023303C_____ |
| 0.047 "      | 3                | 8.5  | 10   | 7.5   | MKS4F024702B_____ | 5                | 10.5 | 10.3 | 7.5   | MKS4G024702E_____ |
|              | 4                | 9    | 13   | 10    | MKS4F024703C_____ | 4                | 9    | 13   | 10    | MKS4G024703C_____ |
| 0.068 "      | 4                | 9    | 10   | 7.5   | MKS4F026802C_____ | 5                | 10.5 | 10.3 | 7.5   | MKS4G026802E_____ |
|              | 4                | 9    | 13   | 10    | MKS4F026803C_____ | 4                | 9    | 13   | 10    | MKS4G026803C_____ |
| 0.1 $\mu$ F  | 4                | 9    | 10   | 7.5   | MKS4F031002C_____ | 5                | 10.5 | 10.3 | 7.5   | MKS4G031002E_____ |
|              | 4                | 9    | 13   | 10    | MKS4F031003C_____ | 5                | 11   | 13   | 10    | MKS4G031003F_____ |
| 0.15 "       | 5                | 10.5 | 10.3 | 7.5   | MKS4F031502E_____ | 5.7              | 12.5 | 10.3 | 7.5   | MKS4G031502F_____ |
|              | 4                | 9    | 13   | 10    | MKS4F031503C_____ | 6                | 12   | 13   | 10    | MKS4G031503G_____ |
| 0.22 "       | 5                | 10.5 | 10.3 | 7.5   | MKS4F032202E_____ | 6                | 12   | 13   | 10    | MKS4G032203G_____ |
|              | 5                | 11   | 13   | 10    | MKS4F032203F_____ | 6                | 12.5 | 18   | 15    | MKS4G032204C_____ |
| 0.33 "       | 5.7              | 12.5 | 10.3 | 7.5   | MKS4F033302F_____ | 8                | 15   | 18   | 15    | MKS4G033304F_____ |
|              | 5                | 11   | 13   | 10    | MKS4F033303F_____ |                  |      |      |       |                   |
| 0.47 "       | 6                | 12   | 13   | 10    | MKS4F034703G_____ | 8                | 15   | 18   | 15    | MKS4G034704F_____ |
|              | 6                | 12.5 | 18   | 15    | MKS4F034704C_____ | 6                | 15   | 26.5 | 22.5  | MKS4G034705B_____ |
| 0.68 "       | 7                | 14   | 18   | 15    | MKS4F036804D_____ | 7                | 16.5 | 26.5 | 22.5  | MKS4G036805D_____ |
| 1.0 $\mu$ F  | 8                | 15   | 18   | 15    | MKS4F041004F_____ | 10.5             | 19   | 26.5 | 22.5  | MKS4G041005G_____ |
|              | 6                | 15   | 26.5 | 22.5  | MKS4F041005B_____ | 11               | 21   | 31.5 | 27.5  | MKS4G041006B_____ |
| 1.5 "        | 9                | 16   | 18   | 15    | MKS4F041504J_____ | 11               | 21   | 26.5 | 22.5  | MKS4G041505I_____ |
|              | 7                | 16.5 | 26.5 | 22.5  | MKS4F041505D_____ | 11               | 21   | 31.5 | 27.5  | MKS4G041506B_____ |
| 2.2 "        | 10.5             | 19   | 26.5 | 22.5  | MKS4F042205G_____ | 11               | 21   | 31.5 | 27.5  | MKS4G042206B_____ |
|              | 9                | 19   | 31.5 | 27.5  | MKS4F042206A_____ |                  |      |      |       |                   |
| 3.3 "        | 11               | 21   | 26.5 | 22.5  | MKS4F043305I_____ | 13               | 24   | 31.5 | 27.5  | MKS4G043306D_____ |
|              | 11               | 21   | 31.5 | 27.5  | MKS4F043306B_____ |                  |      |      |       |                   |
| 4.7 "        | 11               | 21   | 31.5 | 27.5  | MKS4F044706B_____ | 17               | 29   | 31.5 | 27.5  | MKS4G044706G_____ |
|              | 13               | 24   | 31.5 | 27.5  | MKS4F046806D_____ | 17               | 34.5 | 31.5 | 27.5  | MKS4G046806I_____ |
|              |                  |      |      |       |                   | 15               | 26   | 41.5 | 37.5  | MKS4G046807D_____ |
| 10 $\mu$ F   | 17               | 29   | 31.5 | 27.5  | MKS4F051006G_____ | 19               | 32   | 41.5 | 37.5  | MKS4G051007F_____ |
|              | 15               | 26   | 41.5 | 37.5  | MKS4F051007D_____ |                  |      |      |       |                   |
| 15 "         | 17               | 34.5 | 31.5 | 27.5  | MKS4F051506I_____ | 20               | 39.5 | 41.5 | 37.5  | MKS4G051507G_____ |
|              | 17               | 29   | 41.5 | 37.5  | MKS4F051507E_____ |                  |      |      |       |                   |
| 22 "         | 20               | 39.5 | 41.5 | 37.5  | MKS4F052207G_____ | 31               | 46   | 41.5 | 37.5  | MKS4G052207I_____ |
| 33 "         | 24               | 45.5 | 41.5 | 37.5  | MKS4F053307H_____ | 35               | 50   | 41.5 | 37.5  | MKS4G053307J_____ |
| 47 "         | 31               | 46   | 41.5 | 37.5  | MKS4F054707I_____ |                  |      |      |       |                   |

\* AC voltage:  $f = 50 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + \text{UDC} \leq U_r$

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

Dims. in mm.

#### Part number completion:

|                            |       |      |
|----------------------------|-------|------|
| Version code:              | 2-pin | = 00 |
|                            | 4-pin | = D4 |
| Tolerance:                 | 20 %  | = M  |
|                            | 10 %  | = K  |
|                            | 5 %   | = J  |
| Packing:                   | bulk  | = S  |
| Pin length:                | 6-2   | = SD |
| Taped version see page 133 |       |      |

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## Continuation

### General Data

| Capacitance | 630 VDC/400 VAC* |      |      |       |              | 1000 VDC/400 VAC* |      |      |       |              |
|-------------|------------------|------|------|-------|--------------|-------------------|------|------|-------|--------------|
|             | W                | H    | L    | PCM** | Part number  | W                 | H    | L    | PCM** | Part number  |
| 1000 pF     |                  |      |      |       |              | 3                 | 8.5  | 10   | 7.5   | MKS4O111002B |
| 1500 "      |                  |      |      |       |              | 4                 | 9    | 13   | 10    | MKS4O111003C |
| 2200 "      |                  |      |      |       |              | 3                 | 8.5  | 10   | 7.5   | MKS4O111502B |
| 3300 "      |                  |      |      |       |              | 4                 | 9    | 13   | 10    | MKS4O111503C |
| 4700 "      |                  |      |      |       |              | 3                 | 8.5  | 10   | 7.5   | MKS4O112202B |
| 6800 "      |                  |      |      |       |              | 4                 | 9    | 13   | 10    | MKS4O112203C |
|             |                  |      |      |       |              | 4                 | 9    | 10   | 7.5   | MKS4O113302C |
|             |                  |      |      |       |              | 4                 | 9    | 13   | 10    | MKS4O113303C |
|             |                  |      |      |       |              | 4                 | 9    | 10   | 7.5   | MKS4O114702C |
|             |                  |      |      |       |              | 4                 | 9    | 13   | 10    | MKS4O114703C |
|             |                  |      |      |       |              | 4.5               | 9.5  | 10.3 | 7.5   | MKS4O116802D |
|             |                  |      |      |       |              | 4                 | 9    | 13   | 10    | MKS4O116803C |
| 0.01 µF     | 3                | 8.5  | 10   | 7.5*  | MKS4J021002B | 5                 | 10.5 | 10.3 | 7.5   | MKS4O121002E |
|             | 4                | 9    | 13   | 10    | MKS4J021003C | 5                 | 11   | 13   | 10    | MKS4O121003F |
| 0.015 "     | 4                | 9    | 10   | 7.5*  | MKS4J021502C | 5.7               | 12.5 | 10.3 | 7.5   | MKS4O121502F |
|             | 4                | 9    | 13   | 10    | MKS4J021503C | 6                 | 12   | 13   | 10    | MKS4O121503G |
| 0.022 "     | 4.5              | 9.5  | 10.3 | 7.5*  | MKS4J022202D | 5                 | 11   | 18   | 15    | MKS4O122204B |
|             | 4                | 9    | 13   | 10    | MKS4J022203C |                   |      |      |       |              |
| 0.033 "     | 5                | 10.5 | 10.3 | 7.5*  | MKS4J023302E | 6                 | 12.5 | 18   | 15    | MKS4O123304C |
|             | 5                | 11   | 13   | 10    | MKS4J023303F | 6                 | 15   | 26.5 | 22.5  | MKS4O123305B |
| 0.047 "     | 5.7              | 12.5 | 10.3 | 7.5*  | MKS4J024702F | 7                 | 14   | 18   | 15    | MKS4O124704D |
|             | 6                | 12   | 13   | 10    | MKS4J024703G | 6                 | 15   | 26.5 | 22.5  | MKS4O124705B |
| 0.068 "     | 6                | 12   | 13   | 10    | MKS4J026803G | 8                 | 15   | 18   | 15    | MKS4O126804F |
|             | 5                | 11   | 18   | 15    | MKS4J026804B | 6                 | 15   | 26.5 | 22.5  | MKS4O126805B |
| 0.1 µF      | 6                | 12.5 | 18   | 15    | MKS4J031004C | 9                 | 16   | 18   | 15    | MKS4O131004J |
|             | 6                | 15   | 26.5 | 22.5  | MKS4J031005B | 7                 | 16.5 | 26.5 | 22.5  | MKS4O131005D |
| 0.15 "      | 7                | 14   | 18   | 15    | MKS4J031504D | 8.5               | 18.5 | 26.5 | 22.5  | MKS4O131505F |
|             | 6                | 15   | 26.5 | 22.5  | MKS4J031505B |                   |      |      |       |              |
| 0.22 "      | 8                | 15   | 18   | 15    | MKS4J032204F | 10.5              | 19   | 26.5 | 22.5  | MKS4O132205G |
|             | 6                | 15   | 26.5 | 22.5  | MKS4J032205B |                   |      |      |       |              |
| 0.33 "      | 7                | 16.5 | 26.5 | 22.5  | MKS4J033305D | 11                | 21   | 26.5 | 22.5  | MKS4O133305I |
|             | 9                | 19   | 31.5 | 27.5  | MKS4J033306A | 11                | 21   | 31.5 | 27.5  | MKS4O133306B |
| 0.47 "      | 10.5             | 19   | 26.5 | 22.5  | MKS4J034705G | 13                | 24   | 31.5 | 27.5  | MKS4O134706D |
|             | 9                | 19   | 31.5 | 27.5  | MKS4J034706A |                   |      |      |       |              |
| 0.68 "      | 11               | 21   | 26.5 | 22.5  | MKS4J036805I | 15                | 26   | 31.5 | 27.5  | MKS4O136806F |
|             | 11               | 21   | 31.5 | 27.5  | MKS4J036806B |                   |      |      |       |              |
| 1.0 µF      | 11               | 21   | 31.5 | 27.5  | MKS4J041006B | 17                | 29   | 31.5 | 27.5  | MKS4O141006G |
|             |                  |      |      |       |              | 17                | 29   | 41.5 | 37.5  | MKS4O141007E |
| 1.5 "       | 15               | 26   | 31.5 | 27.5  | MKS4J041506F | 19                | 32   | 41.5 | 37.5  | MKS4O141507F |
| 2.2 "       | 17               | 34.5 | 31.5 | 27.5  | MKS4J042206I | 20                | 39.5 | 41.5 | 37.5  | MKS4O142207G |
|             | 15               | 26   | 41.5 | 37.5  | MKS4J042207D |                   |      |      |       |              |
| 3.3 "       | 20               | 39.5 | 31.5 | 27.5  | MKS4J043306J | 24                | 45.5 | 41.5 | 37.5  | MKS4O143307H |
|             | 19               | 32   | 41.5 | 37.5  | MKS4J043307F |                   |      |      |       |              |
| 4.7 "       | 20               | 39.5 | 41.5 | 37.5  | MKS4J044707G | 35                | 50   | 41.5 | 37.5  | MKS4O144707J |
| 6.8 "       | 24               | 45.5 | 41.5 | 37.5  | MKS4J046807H | 40                | 55   | 41.5 | 37.5  | MKS4O146807K |
|             |                  |      |      |       |              | 35                | 50   | 57   | 52.5  | MKS4O146809F |
| 10 µF       | 35               | 50   | 41.5 | 37.5  | MKS4J051007J |                   |      |      |       |              |
| 15 "        | 40               | 55   | 41.5 | 37.5  | MKS4J051507K |                   |      |      |       |              |

\* AC voltage:  $f = 50 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

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

\* Admissible AC voltage 250 VAC max.

Dims. in mm.

#### Part number completion:

Version code: 2-pin = 00  
4-pin = D4  
Tolerance: 20 % = M  
10 % = K  
5 % = J  
Packing: bulk = S  
Pin length: 6-2 = SD

Taped version see page 133

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## Continuation

### General Data

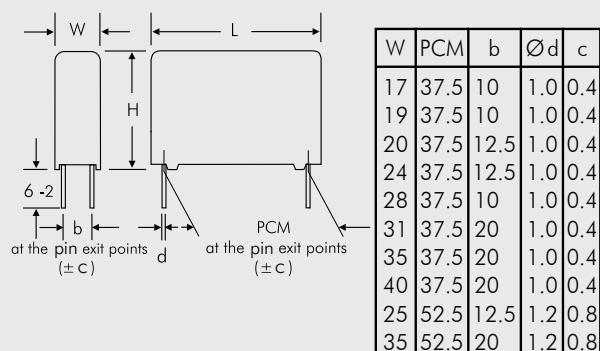
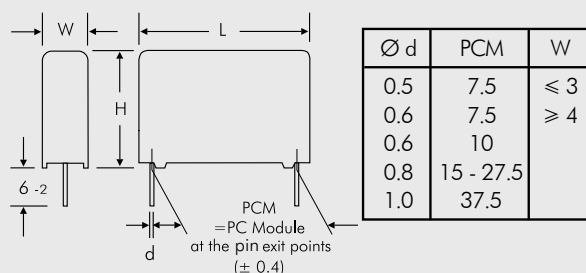
| Capacitance | 1500 VDC/400 VAC* |      |      |       |              | 2000 VDC/400 VAC* |      |      |       |              |
|-------------|-------------------|------|------|-------|--------------|-------------------|------|------|-------|--------------|
|             | W                 | H    | L    | PCM** | Part number  | W                 | H    | L    | PCM** | Part number  |
| 1000 pF     | 4                 | 9    | 13   | 10    | MKS4S011003C | 4                 | 9    | 13   | 10    | MKS4U011003C |
| 1500 "      | 4                 | 9    | 13   | 10    | MKS4S011503C | 4                 | 9    | 13   | 10    | MKS4U011503C |
| 2200 "      | 4                 | 9    | 13   | 10    | MKS4S012203C | 5                 | 11   | 13   | 10    | MKS4U012203F |
| 3300 "      | 4                 | 9    | 13   | 10    | MKS4S013303C | 6                 | 12   | 13   | 10    | MKS4U013303G |
|             |                   |      |      |       |              | 5                 | 11   | 18   | 15    | MKS4U013304B |
| 4700 "      | 4                 | 9    | 13   | 10    | MKS4S014703C | 5                 | 11   | 18   | 15    | MKS4U014704B |
|             | 5                 | 11   | 18   | 15    | MKS4S014704B |                   |      |      |       |              |
| 6800 "      | 5                 | 11   | 13   | 10    | MKS4S016803F | 6                 | 12.5 | 18   | 15    | MKS4U016804C |
|             | 5                 | 11   | 18   | 15    | MKS4S016804B |                   |      |      |       |              |
| 0.01 µF     | 6                 | 12   | 13   | 10    | MKS4S021003G | 7                 | 14   | 18   | 15    | MKS4U021004D |
|             | 5                 | 11   | 18   | 15    | MKS4S021004B | 6                 | 15   | 26.5 | 22.5  | MKS4U021005B |
| 0.015 "     | 6                 | 12.5 | 18   | 15    | MKS4S021504C | 6                 | 15   | 26.5 | 22.5  | MKS4U021505B |
| 0.022 "     | 7                 | 14   | 18   | 15    | MKS4S022204D | 7                 | 16.5 | 26.5 | 22.5  | MKS4U022205D |
|             | 6                 | 15   | 26.5 | 22.5  | MKS4S022205B |                   |      |      |       |              |
| 0.033 "     | 8                 | 15   | 18   | 15    | MKS4S023304F | 10.5              | 19   | 26.5 | 22.5  | MKS4U023305G |
|             | 6                 | 15   | 26.5 | 22.5  | MKS4S023305B |                   |      |      |       |              |
| 0.047 "     | 7                 | 16.5 | 26.5 | 22.5  | MKS4S024705D | 11                | 21   | 26.5 | 22.5  | MKS4U024705I |
|             |                   |      |      |       |              | 11                | 21   | 31.5 | 27.5  | MKS4U024706B |
| 0.068 "     | 8.5               | 18.5 | 26.5 | 22.5  | MKS4S026805F | 11                | 21   | 31.5 | 27.5  | MKS4U026806B |
|             |                   |      |      |       |              |                   |      |      |       |              |
| 0.1 µF      | 10.5              | 19   | 26.5 | 22.5  | MKS4S031005G | 13                | 24   | 31.5 | 27.5  | MKS4U031006D |
|             | 9                 | 19   | 31.5 | 27.5  | MKS4S031006A |                   |      |      |       |              |
| 0.15 "      | 11                | 21   | 31.5 | 27.5  | MKS4S031506B | 17                | 29   | 31.5 | 27.5  | MKS4U031506G |
|             |                   |      |      |       |              | 13                | 24   | 41.5 | 37.5  | MKS4U031507C |
| 0.22 "      | 13                | 24   | 31.5 | 27.5  | MKS4S032206D | 17                | 29   | 41.5 | 37.5  | MKS4U032207E |
| 0.33 "      | 17                | 34.5 | 31.5 | 27.5  | MKS4S033306I | 20                | 39.5 | 41.5 | 37.5  | MKS4U033307G |
|             | 17                | 29   | 41.5 | 37.5  | MKS4S033307E |                   |      |      |       |              |
| 0.47 "      | 20                | 39.5 | 31.5 | 27.5  | MKS4S034706J | 24                | 45.5 | 41.5 | 37.5  | MKS4U034707H |
|             | 17                | 29   | 41.5 | 37.5  | MKS4S034707E |                   |      |      |       |              |
| 0.68 "      | 20                | 39.5 | 41.5 | 37.5  | MKS4S036807G | 31                | 46   | 41.5 | 37.5  | MKS4U036807I |
|             |                   |      |      |       |              |                   |      |      |       |              |
| 1.0 µF      | 24                | 45.5 | 41.5 | 37.5  | MKS4S041007H | 40                | 55   | 41.5 | 37.5  | MKS4U041007K |
|             |                   |      |      |       |              | 25                | 45   | 57   | 52.5  | MKS4U041009D |
| 1.5 "       | 31                | 46   | 41.5 | 37.5  | MKS4S041507I |                   |      |      |       |              |
| 2.2 "       | 35                | 50   | 41.5 | 37.5  | MKS4S042207J |                   |      |      |       |              |
|             | 35                | 50   | 57   | 52.5  | MKS4S042209F |                   |      |      |       |              |

\* AC voltage:  
 $f = 50 \text{ Hz}; 1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

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

Dims. in mm.

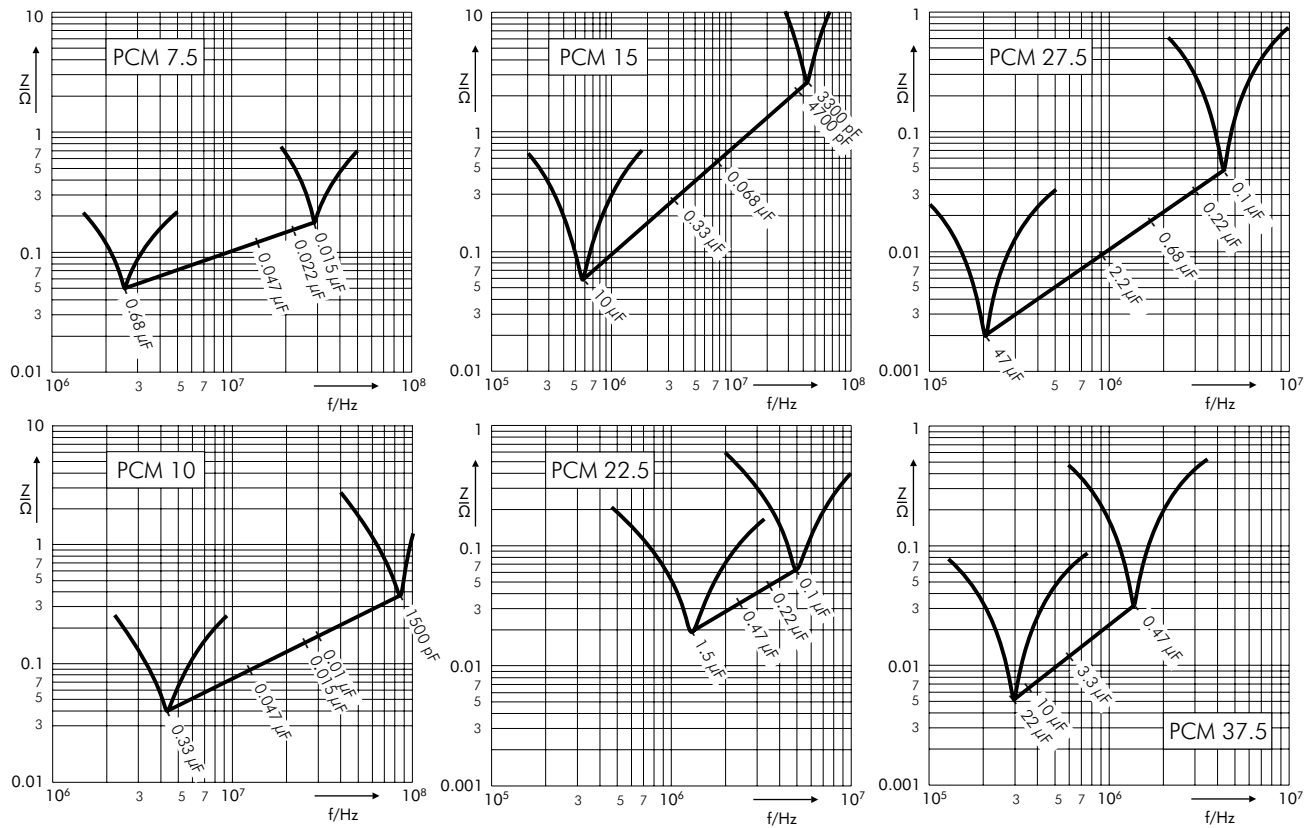
| Part number completion:    |            |
|----------------------------|------------|
| Version code:              | 2-pin = 00 |
|                            | 4-pin = D4 |
| Tolerance:                 | 20 % = M   |
|                            | 10 % = K   |
|                            | 5 % = J    |
| Packing:                   | bulk = S   |
| Pin length:                | 6-2 = SD   |
| Taped version see page 133 |            |



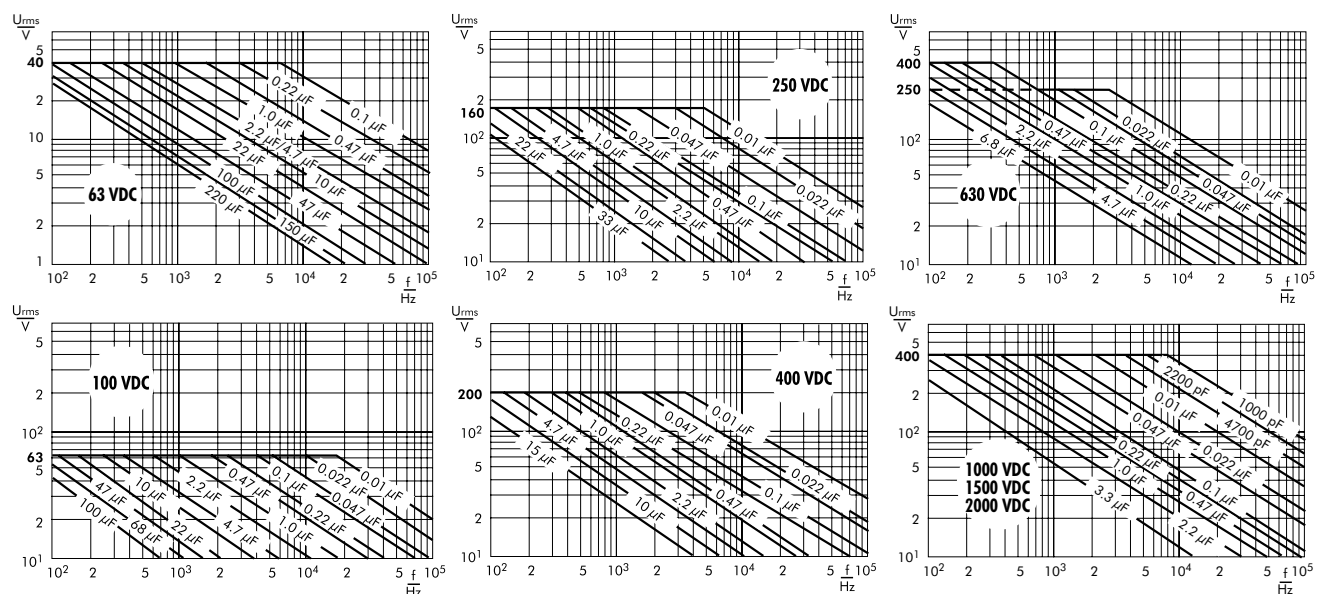
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## Continuation

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

Internal temperature of the capacitor must be kept as follows:

Polyester: preheating:  $T_{\max.} \leq 125^{\circ}\text{C}$   
soldering:  $T_{\max.} \leq 135^{\circ}\text{C}$

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

#### Single wave soldering

Soldering bath temperature:  $T < 260^{\circ}\text{C}$

Dwell time:  $t < 5\text{ sec}$

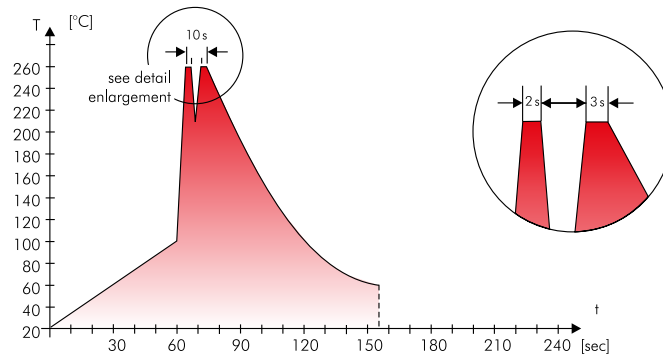
#### Double wave soldering

Soldering bath temperature:  $T < 260^{\circ}\text{C}$

Dwell time:  $\sum t < 5\text{ sec}$

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 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 2015/863/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 re-frained from using such substances since years already.



WIMA Kondensatoren sind bleifrei konform RoHS 2015/863/EU

WIMA capacitors are lead free in accordance with RoHS 2015/863/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

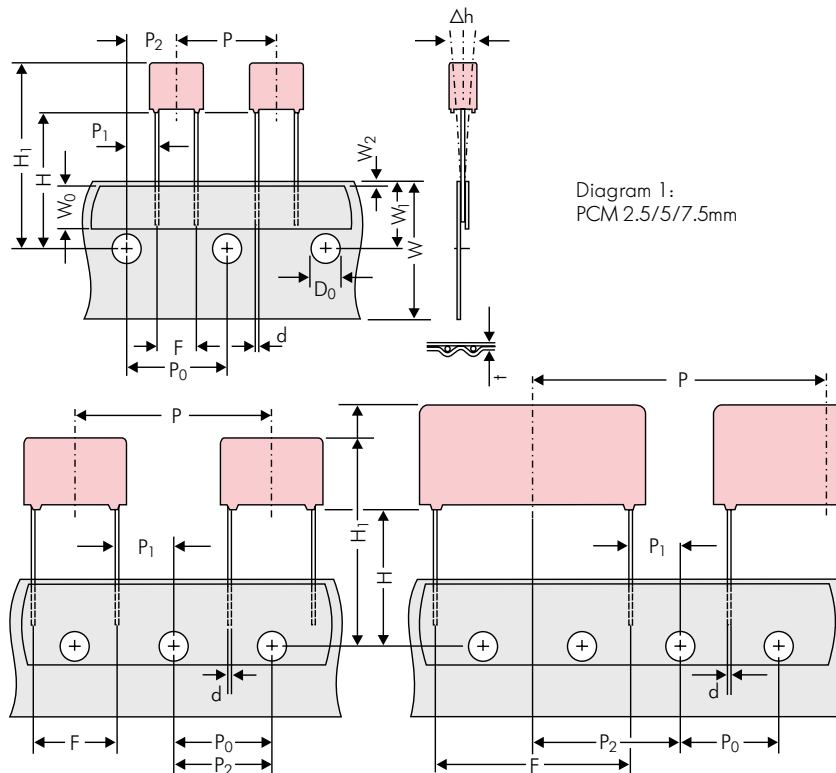


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5\*mm

\*PCM 27.5 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 <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 error max. 1.0 mm/20 pitch                    | 12.7 ±0.3 error max. 1.0 mm/20 pitch                    | 12.7 ±0.3 error max. 1.0 mm/20 pitch                      | 12.7 ±0.3 error max. 1.0 mm/20 pitch                      | 12.7 ±0.3 error max. 1.0 mm/20 pitch                      | 12.7 ±0.3 error max. 1.0 mm/20 pitch                      | 12.7 ±0.3 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 134)                      | ▲              | ROLL/AMMO                                               |                                                         |                                                           | AMMO                                                      |                                                           |                                                           |                                                                     |
|                                                  |                | REEL Ø 360 max.<br>Ø 30 ±1                              | B 52 ±2<br>58 ±2 depending on comp. dimensions          |                                                           | REEL Ø 360 max.<br>Ø 30 ±1                                | B 52 ±2<br>58 ±2 or 66 ±2                                 | REEL Ø 500 max.<br>Ø 25 ±1                                | B 54 ±2<br>60 ±2 or 68 ±2 depending on PCM and component dimensions |
| Unit                                             |                | see details page 135.                                   |                                                         |                                                           |                                                           |                                                           |                                                           |                                                                     |

▲ When ordering please specify dimension H and required packaging type.

Dims in mm.

• Diameter of pins see General Data.

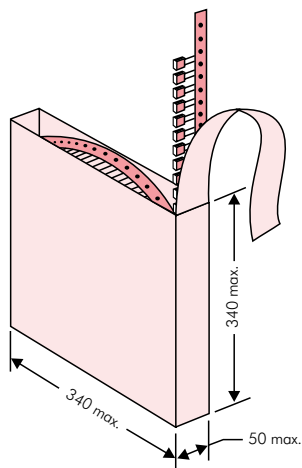
Please clarify customer-specific deviations with the manufacturer.

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

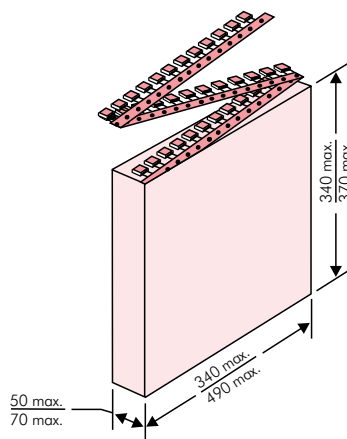
Position of components according to PCM 7.5 (sketch 1). P<sub>0</sub> = 12.7 or 15.0 is possible

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

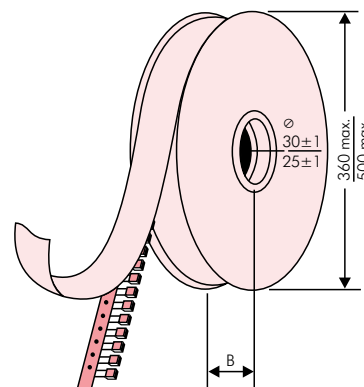
### ■ ROLL Packaging



### ■ AMMO Packaging



### ■ REEL Packaging



## BAR CODE (Labelling)

Labelling of package units in plain text and with alphanumeric 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

|                                                                                                                                                                                |                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>WIMA</b> Best Capacitors Made in Germany<br>Werk Aurich                                                                                                                     |                                                                                      |
| Supplier-ID: LIEF.NR.                                                                                                                                                          | Date Code: 20210419                                                                  |
|                                                                                             |  |
| Purchase Order No. (P/O): Bestellung xyz                                                                                                                                       | P/O line: 100                                                                        |
|                                                                                             |  |
| Customer Part No.: KUNDENTEILENUMMER                                                                                                                                           |                                                                                      |
|                                                                                             |                                                                                      |
| WIMA Part No.: MKP1F041006B00KSSD                                                                                                                                              | Quantity: 459                                                                        |
|                                                                                             |  |
| WIMA Confirmation No.: 0001105072000100                                                                                                                                        |                                                                                      |
|                                                                                             |                                                                                      |
| Customer No.: 0000100002                                                                                                                                                       | RoHS 2011/65/EU                                                                      |
| Gross Weight [g]: 4557                                                                                                                                                         | COO: DE                                                                              |
|                                                                                             |  |
| WIMA – MKP 10      WIMA Part No.: MKP1F041006B00KSSD<br>MKP 10 1.0 µF 250 VDC 11x21x31.5 RM27.5<br>Standard 10%      Loss – Standard      Drähte 6–2<br>Vorlage Debitor Inland |                                                                                      |
|                                                                                             | 0001105072000100                                                                     |
| 1002021443                                                                                                                                                                     | QTY: 459      Week 19/2021                                                           |

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



| PCM     | Size |      |      |       | bulk | ROLL  |       | pcs. per packing unit |       |           |           | AMMO  |       |       |       |
|---------|------|------|------|-------|------|-------|-------|-----------------------|-------|-----------|-----------|-------|-------|-------|-------|
|         |      |      |      |       |      |       |       | REEL                  |       |           |           |       |       |       |       |
|         | W    | H    | L    | Codes |      | H16.5 | H18.5 | Ø 360                 | Ø 500 | 340 x 340 | 490 x 370 | H16.5 | H18.5 | H16.5 | H18.5 |
|         |      |      |      |       | 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   |       | –     |       |
|         | 11   | 18   | 7.2  | 1O    | 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   | 4    | 9    | 13   | 3C    | 3000 | –     |       | 900                   |       | 1600      |           | –     |       | 1450  |       |
|         | 4    | 9.5  | 13   | 3D    | 3000 | –     |       | 900                   |       | 1600      |           | –     |       | 1400  |       |
|         | 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  |       |
|         | 6    | 12.5 | 18   | 4C    | 2000 | –     |       | 500                   |       | 1000      |           | –     |       | 1000  |       |
|         | 7    | 14   | 18   | 4D    | 1600 | –     |       | 450                   |       | 900       |           | –     |       | 850   |       |
|         | 8    | 15   | 18   | 4F    | 1200 | –     |       | 400                   |       | 800       |           | –     |       | 740   |       |
|         | 9    | 14   | 18   | 4H    | 1200 | –     |       | 350                   |       | 700       |           | –     |       | 650   |       |
|         | 9    | 16   | 18   | 4J    | 900  | –     |       | 350                   |       | 700       |           | –     |       | 650   |       |
|         | 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   |       |
|         | 8.5  | 18.5 | 26.5 | 5F    | 500  | –     |       | –                     |       | 480       |           | –     |       | 450   |       |
|         | 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   |       |

\* for 2-inch transport pitches.

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

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 | ROLL  |       | pcs. per packing unit |       |           |           | AMMO  |       |       |       |
|------------------|------|------|------|-----------|------|-------|-------|-----------------------|-------|-----------|-----------|-------|-------|-------|-------|
|                  |      |      |      |           |      |       |       | REEL                  |       |           |           |       |       |       |       |
|                  | W    | H    | L    | Codes     |      | H16.5 | H18.5 | Ø 360                 | Ø 500 | 340 x 340 | 490 x 370 | H16.5 | H18.5 | H16.5 | H18.5 |
|                  |      |      |      |           | S    | 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*  | —         | —     | —     | —     | —     |
|                  | 11   | 21   | 31.5 | <b>6B</b> | 459* | —     | —     | —                     | —     | 380/280*  | —         | —     | —     | —     | —     |
|                  | 13   | 24   | 31.5 | <b>6D</b> | 378* | —     | —     | —                     | —     | 300       | —         | —     | —     | —     | —     |
|                  | 15   | 26   | 31.5 | <b>6F</b> | 324* | —     | —     | —                     | —     | 270       | —         | —     | —     | —     | —     |
|                  | 17   | 29   | 31.5 | <b>6G</b> | 198* | —     | —     | —                     | —     | —         | —         | —     | —     | —     | —     |
|                  | 17   | 34.5 | 31.5 | <b>6I</b> | 198* | —     | —     | —                     | —     | —         | —         | —     | —     | —     | —     |
|                  | 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* | —     | —     | —                     | —     | —         | —         | —     | —     | —     | —     |
|                  | 28   | 38   | 41.5 | <b>7L</b> | 84*  | —     | —     | —                     | —     | —         | —         | —     | —     | —     | —     |
|                  | 31   | 46   | 41.5 | <b>7I</b> | 84*  | —     | —     | —                     | —     | —         | —         | —     | —     | —     | —     |
|                  | 35   | 50   | 41.5 | <b>7J</b> | 35*  | —     | —     | —                     | —     | —         | —         | —     | —     | —     | —     |
| <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*  | —     | —     | —                     | —     | —         | —         | —     | —     | —     | —     |

\* TPS (Tray-Packing-System). Plate versions may have different packing units.

\*\*For Snubber capacitors in 2-pin version the PCM is changing to 38.5 respective 49.5 mm.  
Samples and pre-production needs on request.

Rights reserved to amend design data without prior notification.

Updated data on [www.wima.com](http://www.wima.com)



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><br>SMD-PET = SMDT<br>SMD-PPS = SMDI<br>MKS 02 = MKS0<br>FKS 2 = FKS2<br>FKP 2 = FKP2<br>MKS 2 = MKS2<br>MKP 2 = MKP2<br>MKS 4 = MKS4<br>MKP 4 = MKP4<br>MKP 10 = MKP1<br>FKP 1 = FKP1<br>MKP-X2 = MKX2<br>MKP-X1 R = MKX1<br>MKP-Y2 = MKY2<br>Snubber MKP = SNMP<br>Snubber FKP = SNFP<br>GTO MKP = GTOM<br>DC-LINK MKP 4 = DCP4<br>DC-LINK MKP 6 = DCP6<br>DC-LINK HC = DCHC |   |   |   | <b>Rated voltage:</b><br>63 VDC = C0<br>100 VDC = D0<br>250 VDC = F0<br>400 VDC = G0<br>450 VDC = H0<br>520 VDC = H2<br>600 VDC = I0<br>630 VDC = J0<br>700 VDC = K0<br>800 VDC = L0<br>850 VDC = M0<br>900 VDC = N0<br>1000 VDC = O1<br>1100 VDC = P0<br>1200 VDC = Q0<br>1250 VDC = R0<br>1500 VDC = S0<br>1600 VDC = T0<br>1700 VDC = TA<br>2000 VDC = U0<br>2500 VDC = V0<br>3000 VDC = W0<br>4000 VDC = X0<br>6000 VDC = Y0<br>230 VAC = 3Y<br>275 VAC = 1W<br>300 VAC = 2W<br>305 VAC = AW<br>350 VAC = BW<br>440 VAC = 4W<br>... |   | <b>Capacitance:</b><br>22 pF = 0022<br>47 pF = 0047<br>100 pF = 0100<br>150 pF = 0150<br>220 pF = 0220<br>330 pF = 0330<br>470 pF = 0470<br>680 pF = 0680<br>1000 pF = 1100<br>1500 pF = 1150<br>2200 pF = 1220<br>3300 pF = 1330<br>4700 pF = 1470<br>6800 pF = 1680<br>0.01 µF = 2100<br>0.022 µF = 2220<br>0.047 µF = 2470<br>0.1 µF = 3100<br>0.22 µF = 3220<br>0.47 µF = 3470<br>1 µF = 4100<br>2.2 µF = 4220<br>4.7 µF = 4470<br>10 µF = 5100<br>22 µF = 5220<br>47 µF = 5470<br>100 µF = 6100<br>220 µF = 6220<br>1000 µF = 7100<br>1500 µF = 7150<br>... |   | <b>Size:</b><br>4.8x3.3x3 Size1812 = KA<br>4.8x3.3x4 Size1812 = KB<br>5.7x5.1x3.5 Size2220 = QA<br>5.7x5.1x4.5 Size2220 = QB<br>7.2x6.1x3 Size2824 = TA<br>7.2x6.1x5 Size2824 = TB<br>10.2x7.6x5 Size4030 = VA<br>12.7x10.2x6 Size5040 = XA<br>15.3x13.7x7 Size6054 = YA<br>2.5x7x4.6 PCM2.5 = 0B<br>3x7.5x4.6 PCM2.5 = 0C<br>2.5x6.5x7.2 PCM5 = 1A<br>3x7.5x7.2 PCM5 = 1B<br>2.5x7x10 PCM7.5 = 2A<br>3x8.5x10 PCM7.5 = 2B<br>3x9x13 PCM10 = 3A<br>4x9x13 PCM10 = 3C<br>5x11x18 PCM15 = 4B<br>6x12.5x18 PCM15 = 4C<br>5x14x26.5 PCM22.5 = 5A<br>6x15x26.5 PCM22.5 = 5B<br>9x19x31.5 PCM27.5 = 6A<br>11x21x31.5 PCM27.5 = 6B<br>9x19x41.5 PCM37.5 = 7A<br>11x22x41.5 PCM37.5 = 7B<br>19x31x56 PCM 48.5 = 8D<br>25x45x57 PCM 52.5 = 9D<br>... |    |             |    | <b>Tolerance:</b><br>±20% = M<br>±10% = K<br>±5% = J<br>±2.5% = H<br>±1% = E<br>... |    |     |    | <b>Packing:</b><br>AMMO H16.5 340x340 = A<br>AMMO H16.5 490x370 = B<br>AMMO H18.5 340x340 = C<br>AMMO H18.5 490x370 = D<br>REEL H16.5 360 = F<br>REEL H16.5 500 = H<br>REEL H18.5 360 = I<br>REEL H18.5 500 = J<br>ROLL H16.5 = N<br>ROLL H18.5 = O<br>BLISTER W12 180 = P<br>BLISTER W12 330 = Q<br>BLISTER W16 330 = R<br>BLISTER W24 330 = T<br>Bulk/TPS Standard = S<br>... |      |  |  | <b>Pin length (untaped)</b><br>3.5 ±0.5 = C9<br>6 -2 = SD<br>16 ±1 = P1<br>...<br><b>Pin length (taped)</b><br>none = 00 |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                        |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |             |    |                                                                                     |    |     |    |                                                                                                                                                                                                                                                                                                                                                                                 |      |  |  |                                                                                                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                        |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |             |    |                                                                                     |    |     |    |                                                                                                                                                                                                                                                                                                                                                                                 |      |  |  |                                                                                                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                        |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |             |    |                                                                                     |    |     |    |                                                                                                                                                                                                                                                                                                                                                                                 |      |  |  |                                                                                                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                        |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |             |    |                                                                                     |    |     |    |                                                                                                                                                                                                                                                                                                                                                                                 |      |  |  |                                                                                                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                        |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |             |    |                                                                                     |    |     |    |                                                                                                                                                                                                                                                                                                                                                                                 |      |  |  |                                                                                                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                        |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |             |    |                                                                                     |    |     |    |                                                                                                                                                                                                                                                                                                                                                                                 |      |  |  |                                                                                                                          |  |  |  |
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