# WIMA MKP 10

## Polypropylene (PP) Capacitors for Pulse Applications with Double-Sided Metallized Electrodes and Schoopage Contacts PCM 7.5 mm to 52.5 mm

### Special Features

- **Pulse duty construction**
- **Self-healing**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **According to RoHS 2011/65/EU**

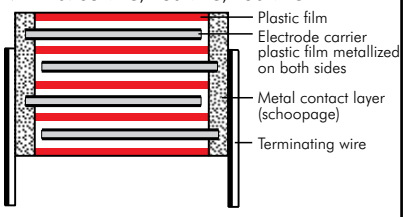
### Typical Applications

**For pulse applications e.g.**
- **Switch mode power supplies**
- **TV and monitor sets**
- **Lighting**
- **Audio/video equipment**

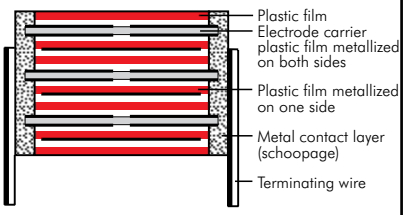
### Construction

**Dielectric:** Polypropylene (PP) film
**Capacitor electrodes:**
Double-sided metallized plastic film
**Internal construction:**

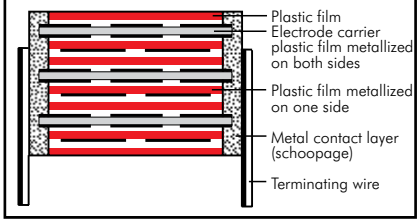
MKP 10: 63 VAC, 180 VAC, 250 VAC




MKP 10: 400 VAC, 600 VAC, 650 VAC, 700 VAC




MKP 10: 900 VAC (PCM 15 = 3-section)




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

### Electrical Data

**Capacitance range:**
1000 pF to 47 µF (E12-values on request)
**Rated voltages:** 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1600 VDC, 2000 VDC, 2500 VDC, 3000 VDC
**Capacitance tolerances:**
±20%, ±10%, ±5%
**Operating temperature range:**
–55° C to +100° C
**Insulation resistance** at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x $10^5$ MΩ
(mean value: 5 x $10^5$ MΩ)
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
(mean value: 100 000 sec)
Measuring voltage: 100 V/1 min.
**Test voltage:** 2 sec.

| L | ⩽ 2000 VDC | 2500 VDC | ⩾ 3000 VDC |
|---|---|---|---|
| < 41.5 | 1.6 $U_r$ | 1.4 $U_r$ | 1.2 $U_r$ |
| 41.5 | 1.4 $U_r$ | 1.4 $U_r$ | 1.2 $U_r$ |
| 57 | 1.2 $U_r$ | 1.2 $U_r$ | 1.2 $U_r$ |

**Climatic test category:**
55/100/56 in accordance with IEC
**Dielectric absorption:** 0.05 %
**Voltage derating:**
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
**Reliability:**
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x $U_r$ and 40° C)
**Specific dissipation:**

| Box size* WxHxL in mm | Specific dissipation in Watts per K above the ambient temperature |
|---|---|
| 35 x 50 x 57 | 0.132 |
| 45 x 55 x 57 | 0.164 |
| 45 x 65 x 57 | 0.184 |

* other box sizes see page 10.

**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 | ⩽ 3 x $10^{-4}$ | ⩽ 3 x $10^{-4}$ | ⩽ 3 x $10^{-4}$ |
| 10 kHz | ⩽ 4 x $10^{-4}$ | ⩽ 6 x $10^{-4}$ | – |
| 100 kHz | ⩽ 15 x $10^{-4}$ | – | – |

**Maximum pulse rise time** for pulses equal to the rated voltage

| Capacitance pF/µF | max. pulse rise time V/µsec at $T_A$ < 40° C | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 100 VDC | 250 VDC | 400 VDC | 630 VDC | 1000 VDC | 1600 VDC | 2000 VDC | 2500 VDC | 3000 VDC |
| 1000 ... 2200 | 1000 | 1800 | 1800 | 1800 | 2800 | 5400 | 9000 | 11000 | – |
| 3300 ... 6800 | 900 | 1200 | 1200 | 1200 | 2800 | 5400 | 9000 | 11000 | – |
| 0.01 ... 0.022 | 700 | 1100 | 1200 | 1800 | 2100 | 3000 | 3400 | 11000 | 3400 |
| 0.033 ... 0.068 | 400 | 800 | 900 | 1800 | 2100 | 2100 | 2100 | – | 2100 |
| 0.1 ... 0.22 | 200 | 500 | 500 | 900 | 1400 | 1400 | 1400 | – | 1400 |
| 0.33 ... 0.68 | 100 | 300 | 400 | 700 | 900 | 900 | 900 | – | 900 |
| 1.0 ... 2.2 | 70 | 200 | 200 | 400 | 400 | 500 | 320 | – | 400 |
| 3.3 ... 4.7 | 50 | 80 | 100 | 150 | 180 | 250 | – | – | |
| 6.8 ... 15 | 35 | 50 | 70 | 130 | – | – | – | – | |
| 22 ... 47 | 25 | 35 | 35 | – | – | – | – | – | – |

### 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:** 1kPa = 10 mbar in accordance with IEC 60068-2-13
**Bump test:** 4000 bumps at 390 m/sec$^2$ in accordance with IEC 60068-2-29

### Packing

Available taped and reeled 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 | 100 VDC/63 VAC* | | | | | 250 VDC/180 VAC* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | W | H | L | PCM** | Part number | W | H | L | PCM** | Part number |
| 1000 pF | 4 | 9 | 10 | **7.5** | MKP1D011002C_____ | 4 | 9 | 10 | **7.5** | MKP1F011002C_____ |
| 1500 „ | 4 | 9 | 10 | **7.5** | MKP1D011502C_____ | 4 | 9 | 10 | **7.5** | MKP1F011502C_____ |
| 2200 „ | 4 | 9 | 10 | **7.5** | MKP1D012202C_____ | 4 | 9 | 10 | **7.5** | MKP1F012202C_____ |
| 3300 „ | 4 | 9 | 10 | **7.5** | MKP1D013302C_____ | 4 | 9 | 10 | **7.5** | MKP1F013302C_____ |
| 4700 „ | 4 | 9 | 10 | **7.5** | MKP1D014702C_____ | 4 | 9 | 10 | **7.5** | MKP1F014702C_____ |
| 6800 „ | 4 | 9 | 10 | **7.5** | MKP1D016802C_____ | 4 | 9 | 10 | **7.5** | MKP1F016802C_____ |
| 0.01 µF | 4 | 9 | 10 | **7.5** | MKP1D021002C_____ | 4 | 9 | 10 | **7.5** | MKP1F021002C_____ |
| | | | | | | 4 | 9 | 13 | 10 | MKP1F021003C_____ |
| 0.015 „ | 4 | 9 | 10 | **7.5** | MKP1D021502C_____ | 4 | 9 | 10 | **7.5** | MKP1F021502C_____ |
| | | | | | | 4 | 9 | 13 | 10 | MKP1F021503C_____ |
| 0.022 „ | 4 | 9 | 10 | **7.5** | MKP1D022202C_____ | 4 | 9 | 10 | **7.5** | MKP1F022202C_____ |
| | | | | | | 4 | 9 | 13 | 10 | MKP1F022203C_____ |
| 0.033 „ | 5 | 10.5 | 10.3 | **7.5** | MKP1D023302E_____ | 5 | 10.5 | 10.3 | **7.5** | MKP1F023302E_____ |
| | 4 | 9 | 13 | 10 | MKP1D023303C_____ | 4 | 9 | 13 | 10 | MKP1F023303C_____ |
| 0.047 „ | 5 | 10.5 | 10.3 | **7.5** | MKP1D024702E_____ | 5 | 10.5 | 10.3 | **7.5** | MKP1F024702E_____ |
| | 4 | 9 | 13 | 10 | MKP1D024703C_____ | 4 | 9 | 13 | 10 | MKP1F024703C_____ |
| 0.068 „ | 5 | 11 | 13 | 10 | MKP1D026803F_____ | 5 | 11 | 13 | 10 | MKP1F026803F_____ |
| | | | | | | 5 | 11 | 18 | 15 | MKP1F026804B_____ |
| 0.1 µF | 6 | 12 | 13 | 10 | MKP1D031003G_____ | 6 | 12 | 13 | 10 | MKP1F031003G_____ |
| | | | | | | 5 | 11 | 18 | 15 | MKP1F031004B_____ |
| 0.15 „ | 6 | 12.5 | 18 | 15 | MKP1D031504C_____ | 6 | 12.5 | 18 | 15 | MKP1F031504C_____ |
| | | | | | | 6 | 15 | 26.5 | 22.5 | MKP1F031505B_____ |
| 0.22 „ | 7 | 14 | 18 | 15 | MKP1D032204D_____ | 7 | 14 | 18 | 15 | MKP1F032204D_____ |
| | | | | | | 6 | 15 | 26.5 | 22.5 | MKP1F032205B_____ |
| 0.33 „ | 8 | 15 | 18 | 15 | MKP1D033304F_____ | 8 | 15 | 18 | 15 | MKP1F033304F_____ |
| | | | | | | 6 | 15 | 26.5 | 22.5 | MKP1F033305B_____ |
| 0.47 „ | 9 | 16 | 18 | 15 | MKP1D034704J_____ | 9 | 16 | 18 | 15 | MKP1F034704J_____ |
| | 7 | 16.5 | 26.5 | 22.5 | MKP1D034705D_____ | 7 | 16.5 | 26.5 | 22.5 | MKP1F034705D_____ |
| 0.68 „ | 8.5 | 18.5 | 26.5 | 22.5 | MKP1D036805F_____ | 8.5 | 18.5 | 26.5 | 22.5 | MKP1F036805F_____ |
| | | | | | | 9 | 19 | 31.5 | 27.5 | MKP1F036806A_____ |
| 1.0 µF | 10.5 | 19 | 26.5 | 22.5 | MKP1D041005G_____ | 11 | 21 | 26.5 | 22.5 | MKP1F041005I_____ |
| | | | | | | 11 | 21 | 31.5 | 27.5 | MKP1F041006B_____ |
| 1.5 „ | 11 | 21 | 31.5 | 27.5 | MKP1D041506B_____ | 13 | 24 | 31.5 | 27.5 | MKP1F041506D_____ |
| | | | | | | 13 | 24 | 41.5 | 37.5 | MKP1F041507C_____ |
| 2.2 „ | 13 | 24 | 31.5 | 27.5 | MKP1D042206D_____ | 15 | 26 | 31.5 | 27.5 | MKP1F042206F_____ |
| | | | | | | 13 | 24 | 41.5 | 37.5 | MKP1F042207C_____ |
| 3.3 „ | 17 | 29 | 31.5 | 27.5 | MKP1D043306G_____ | 17 | 34.5 | 31.5 | 27.5 | MKP1F043306I_____ |
| | | | | | | 17 | 29 | 41.5 | 37.5 | MKP1F043307E_____ |
| 4.7 „ | 20 | 39.5 | 31.5 | 27.5 | MKP1D044706J_____ | 20 | 39.5 | 31.5 | 27.5 | MKP1F044706J_____ |
| | 17 | 29 | 41.5 | 37.5 | MKP1D044707E_____ | 19 | 32 | 41.5 | 37.5 | MKP1F044707F_____ |
| 6.8 „ | 19 | 32 | 41.5 | 37.5 | MKP1D046807F_____ | 20 | 39.5 | 41.5 | 37.5 | MKP1F046807G_____ |
| 10 µF | 20 | 39.5 | 41.5 | 37.5 | MKP1D051007G_____ | 24 | 45.5 | 41.5 | 37.5 | MKP1F051007H_____ |
| 15 „ | 24 | 45.5 | 41.5 | 37.5 | MKP1D051507H_____ | 35 | 50 | 41.5 | 37.5 | MKP1F051507J_____ |
| | 31 | 46 | 41.5 | 37.5 | MKP1D051507I_____ | 35 | 50 | 57 | 52.5 | MKP1F051509F_____ |
| 22 „ | 35 | 50 | 41.5 | 37.5 | MKP1D052207J_____ | 35 | 50 | 57 | 52.5 | MKP1F052209F_____ |
| 33 „ | 40 | 55 | 41.5 | 37.5 | MKP1D053307K_____ | 45 | 65 | 57 | 52.5 | MKP1F053309J_____ |
| | 35 | 50 | 57 | 52.5 | MKP1D053309F_____ | | | | | |
| 47 „ | 45 | 65 | 57 | 52.5 | MKP1D054709J_____ | | | | | |

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

New values

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.



| 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 128.



Continuation page 58

## Continuation

### General Data

| Capacitance | 400 VDC/250 VAC* W | H | L | PCM** | Part number | 630 VDC/400 VAC* W | H | L | PCM** | Part number |
|---|---|---|---|---|---|---|---|---|---|---|
| 1000 pF | 4 | 9 | 10 | **7.5** | MKP1G011002C_____ | 4 | 9 | 10 | **7.5*** | MKP1J011002C_____ |
| 1500 „ | 4 | 9 | 10 | **7.5** | MKP1G011502C_____ | 4 | 9 | 10 | **7.5*** | MKP1J011502C_____ |
| 2200 „ | 4 | 9 | 10 | **7.5** | MKP1G012202C_____ | 4 | 9 | 10 | **7.5*** | MKP1J012202C_____ |
| 3300 „ | 4 | 9 | 10 | **7.5** | MKP1G013302C_____ | 4 | 9 | 10 | **7.5*** | MKP1J013302C_____ |
| 4700 „ | 4 | 9 | 10 | **7.5** | MKP1G014702C_____ | 4 | 9 | 10 | **7.5*** | MKP1J014702C_____ |
| 6800 „ | 4 | 9 | 10 | **7.5** | MKP1G016802C_____ | 4 | 9 | 10 | **7.5*** | MKP1J016802C_____ |
| | | | | | | 4 | 9 | 13 | 10 | MKP1J016803C_____ |
| 0.01 µF | 4 | 9 | 10 | **7.5** | MKP1G021002C_____ | 5 | 10.5 | 10.3 | **7.5*** | MKP1J021002E_____ |
| | 4 | 9 | 13 | 10 | MKP1G021003C_____ | 4 | 9 | 13 | 10 | MKP1J021003C_____ |
| 0.015 „ | 5 | 10.5 | 10.3 | **7.5** | MKP1G021502E_____ | 5 | 11 | 13 | 10 | MKP1J021503F_____ |
| | 4 | 9 | 13 | 10 | MKP1G021503C_____ | 5 | 11 | 18 | 15 | MKP1J021504B_____ |
| 0.022 „ | 5 | 10.5 | 10.3 | **7.5** | MKP1G022202E_____ | 5 | 11 | 13 | 10 | MKP1J022203F_____ |
| | 4 | 9 | 13 | 10 | MKP1G022203C_____ | 5 | 11 | 18 | 15 | MKP1J022204B_____ |
| 0.033 „ | 5.7 | 12.5 | 10.3 | **7.5** | MKP1G023302F_____ | 6 | 12 | 13 | 10 | MKP1J023303G_____ |
| | 5 | 11 | 13 | 10 | MKP1G023303F_____ | 5 | 11 | 18 | 15 | MKP1J023304B_____ |
| 0.047 „ | 6 | 12 | 13 | 10 | MKP1G024703G_____ | 6 | 12.5 | 18 | 15 | MKP1J024704C_____ |
| | 5 | 11 | 18 | 15 | MKP1G024704B_____ | 6 | 15 | 26.5 | 22.5 | MKP1J024705B_____ |
| 0.068 „ | 6 | 12.5 | 18 | 15 | MKP1G026804C_____ | 7 | 14 | 18 | 15 | MKP1J026804D_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1G026805B_____ | 6 | 15 | 26.5 | 22.5 | MKP1J026805B_____ |
| 0.1 µF | 7 | 14 | 18 | 15 | MKP1G031004D_____ | 9 | 16 | 18 | 15 | MKP1J031004J_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1G031005B_____ | 7 | 16.5 | 26.5 | 22.5 | MKP1J031005D_____ |
| 0.15 „ | 8 | 15 | 18 | 15 | MKP1G031504F_____ | 8.5 | 18.5 | 26.5 | 22.5 | MKP1J031505F_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1G031505B_____ | 9 | 19 | 31.5 | 27.5 | MKP1J031506A_____ |
| 0.22 „ | 9 | 16 | 18 | 15 | MKP1G032204J_____ | 8.5 | 18.5 | 26.5 | 22.5 | MKP1J032205F_____ |
| | 7 | 16.5 | 26.5 | 22.5 | MKP1G032205D_____ | 9 | 19 | 31.5 | 27.5 | MKP1J032206A_____ |
| 0.33 „ | 8.5 | 18.5 | 26.5 | 22.5 | MKP1G033305F_____ | 11 | 21 | 26.5 | 22.5 | MKP1J033305I_____ |
| | 9 | 19 | 31.5 | 27.5 | MKP1G033306A_____ | 11 | 21 | 31.5 | 27.5 | MKP1J033306B_____ |
| 0.47 „ | 10.5 | 19 | 26.5 | 22.5 | MKP1G034705G_____ | 11 | 21 | 31.5 | 27.5 | MKP1J034706B_____ |
| | 9 | 19 | 31.5 | 27.5 | MKP1G034706A_____ | | | | | |
| 0.68 „ | 11 | 21 | 26.5 | 22.5 | MKP1G036805I_____ | 15 | 26 | 31.5 | 27.5 | MKP1J036806F_____ |
| | 11 | 21 | 31.5 | 27.5 | MKP1G036806B_____ | 13 | 24 | 41.5 | 37.5 | MKP1J036807C_____ |
| 1.0 µF | 13 | 24 | 31.5 | 27.5 | MKP1G041006D_____ | 17 | 29 | 31.5 | 27.5 | MKP1J041006G_____ |
| | 13 | 24 | 41.5 | 37.5 | MKP1G041007C_____ | 15 | 26 | 41.5 | 37.5 | MKP1J041007D_____ |
| 1.5 „ | 17 | 29 | 31.5 | 27.5 | MKP1G041506G_____ | 20 | 39.5 | 31.5 | 27.5 | MKP1J041506J_____ |
| | 13 | 24 | 41.5 | 37.5 | MKP1G041507C_____ | 19 | 32 | 41.5 | 37.5 | MKP1J041507F_____ |
| 2.2 „ | 20 | 39.5 | 31.5 | 27.5 | MKP1G042206J_____ | 20 | 39.5 | 41.5 | 37.5 | MKP1J042207G_____ |
| | 17 | 29 | 41.5 | 37.5 | MKP1G042207E_____ | | | | | |
| 3.3 „ | 20 | 39.5 | 41.5 | 37.5 | MKP1G043307G_____ | 24 | 45.5 | 41.5 | 37.5 | MKP1J043307H_____ |
| 4.7 „ | 20 | 39.5 | 41.5 | 37.5 | MKP1G044707G_____ | 35 | 50 | 41.5 | 37.5 | MKP1J044707J_____ |
| 6.8 „ | 24 | 45.5 | 41.5 | 37.5 | MKP1G046807H_____ | 40 | 55 | 41.5 | 37.5 | MKP1J046807K_____ |
| | | | | | | 35 | 50 | 57 | 52.5 | MKP1J046809F_____ |
| 10 µF | 35 | 50 | 41.5 | 37.5 | MKP1G051007J_____ | 45 | 55 | 57 | 52.5 | MKP1J051009H_____ |
| | 35 | 50 | 57 | 52.5 | MKP1G051009F_____ | | | | | |
| 15 „ | 40 | 55 | 41.5 | 37.5 | MKP1G051507K_____ | | | | | |
| | 35 | 50 | 57 | 52.5 | MKP1G051509F_____ | | | | | |
| 22 „ | 45 | 65 | 57 | 52.5 | MKP1G052209J_____ | | | | | |

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

New values

** PCM = Printed circuit module = pin spacing

* Admissible AC voltage 280 VAC mam..

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

| 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 128.



Continuation page 59

## Continuation

### General Data

| Capacitance | 1000 VDC/600 VAC* | | | | | 1600 VDC/650 VAC* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | W | H | L | PCM** | Part number | W | H | L | PCM** | Part number |
| 1000 pF | 4 | 9 | 10 | **7.5** | MKP1O111002C_____ | 4 | 9 | 13 | 10 | MKP1T011003C_____ |
| | 4 | 9 | 13 | 10 | MKP1O111003C_____ | | | | | |
| 1500 „ | 4 | 9 | 10 | **7.5** | MKP1O111502C_____ | 4 | 9 | 13 | 10 | MKP1T011503C_____ |
| | 4 | 9 | 13 | 10 | MKP1O111503C_____ | | | | | |
| 2200 „ | 4 | 9 | 10 | **7.5** | MKP1O112202C_____ | 4 | 9 | 13 | 10 | MKP1T012203C_____ |
| | 4 | 9 | 13 | 10 | MKP1O112203C_____ | | | | | |
| 3300 „ | 4 | 9 | 10 | **7.5** | MKP1O113302C_____ | 4 | 9 | 13 | 10 | MKP1T013303C_____ |
| | 4 | 9 | 13 | 10 | MKP1O113303C_____ | | | | | |
| 4700 „ | 4.5 | 9.5 | 10.3 | **7.5** | MKP1O114702D_____ | 5 | 11 | 13 | 10 | MKP1T014703F_____ |
| | 4 | 9 | 13 | 10 | MKP1O114703C_____ | | | | | |
| 6800 „ | 5.7 | 12.5 | 10.3 | **7.5** | MKP1O116802F_____ | 6 | 12 | 13 | 10 | MKP1T016803G_____ |
| | 5 | 11 | 13 | 10 | MKP1O116803F_____ | 5 | 11 | 18 | 15 | MKP1T016804B_____ |
| 0.01 µF | 5 | 11 | 13 | 10 | MKP1O121003F_____ | 5 | 11 | 18 | 15 | MKP1T021004B_____ |
| | 5 | 11 | 18 | 15 | MKP1O121004B_____ | | | | | |
| 0.015 „ | 6 | 12 | 13 | 10 | MKP1O121503G_____ | 6 | 12.5 | 18 | 15 | MKP1T021504C_____ |
| | 5 | 11 | 18 | 15 | MKP1O121504B_____ | 6 | 15 | 26.5 | 22.5 | MKP1T021505B_____ |
| 0.022 „ | 6 | 12.5 | 18 | 15 | MKP1O122204C_____ | 7 | 14 | 18 | 15 | MKP1T022204D_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1O122205B_____ | 6 | 15 | 26.5 | 22.5 | MKP1T022205B_____ |
| 0.033 „ | 7 | 14 | 18 | 15 | MKP1O123304D_____ | 8 | 15 | 18 | 15 | MKP1T023304F_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1O123305B_____ | 6 | 15 | 26.5 | 22.5 | MKP1T023305B_____ |
| 0.047 „ | 8 | 15 | 18 | 15 | MKP1O124704F_____ | 7 | 16.5 | 26.5 | 22.5 | MKP1T024705D_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1O124705B_____ | 9 | 19 | 31.5 | 27.5 | MKP1T024706A_____ |
| 0.068 „ | 7 | 16.5 | 26.5 | 22.5 | MKP1O126805D_____ | 10.5 | 19 | 26.5 | 22.5 | MKP1T026805G_____ |
| | | | | | | 9 | 19 | 31.5 | 27.5 | MKP1T026806A_____ |
| 0.1 µF | 8.5 | 18.5 | 26.5 | 22.5 | MKP1O131005F_____ | 11 | 21 | 26.5 | 22.5 | MKP1T031005I_____ |
| | 11 | 21 | 31.5 | 27.5 | MKP1O131006B_____ | 11 | 21 | 31.5 | 27.5 | MKP1T031006B_____ |
| 0.15 „ | 11 | 21 | 26.5 | 22.5 | MKP1O131505I_____ | 13 | 24 | 31.5 | 27.5 | MKP1T031506D_____ |
| | 11 | 21 | 31.5 | 27.5 | MKP1O131506B_____ | | | | | |
| 0.22 „ | 11 | 21 | 31.5 | 27.5 | MKP1O132206B_____ | 15 | 26 | 31.5 | 27.5 | MKP1T032206F_____ |
| | | | | | | 13 | 24 | 41.5 | 37.5 | MKP1T032207C_____ |
| 0.33 „ | 15 | 26 | 31.5 | 27.5 | MKP1O133306F_____ | 17 | 34.5 | 31.5 | 27.5 | MKP1T033306I_____ |
| | 13 | 24 | 41.5 | 37.5 | MKP1O133307C_____ | 17 | 29 | 41.5 | 37.5 | MKP1T033307E_____ |
| 0.47 „ | 17 | 29 | 31.5 | 27.5 | MKP1O134706G_____ | 20 | 39.5 | 31.5 | 27.5 | MKP1T034706J_____ |
| | 13 | 24 | 41.5 | 37.5 | MKP1O134707C_____ | 19 | 32 | 41.5 | 37.5 | MKP1T034707F_____ |
| 0.68 „ | 20 | 39.5 | 31.5 | 27.5 | MKP1O136806J_____ | 20 | 39.5 | 41.5 | 37.5 | MKP1T036807G_____ |
| | 17 | 29 | 41.5 | 37.5 | MKP1O136807E_____ | | | | | |
| 1.0 µF | 20 | 39.5 | 41.5 | 37.5 | MKP1O141007G_____ | 24 | 45.5 | 41.5 | 37.5 | MKP1T041007H_____ |
| 1.5 „ | 24 | 45.5 | 41.5 | 37.5 | MKP1O141507H_____ | 31 | 46 | 41.5 | 37.5 | MKP1T041507I_____ |
| 2.2 „ | 31 | 46 | 41.5 | 37.5 | MKP1O142207I_____ | 40 | 55 | 41.5 | 37.5 | MKP1T042207K_____ |
| | | | | | | 35 | 50 | 57 | 52.5 | MKP1T042209F_____ |
| 3.3 „ | 40 | 55 | 41.5 | 37.5 | MKP1O143307K_____ | 45 | 65 | 57 | 52.5 | MKP1T043309J_____ |
| | 35 | 50 | 57 | 52.5 | MKP1O143309F_____ | | | | | |
| 4.7 „ | 45 | 55 | 57 | 52.5 | MKP1O144709H_____ | | | | | |

* AC voltage: $f \leqslant 1000$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

New values

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

| 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 128.



Continuation page 60

## Continuation

### General Data

| Capacitance | 2000 VDC/700 VAC* W | H | L | PCM** | Part number | 2500 VDC/900 VAC* W | H | L | PCM** | Part number |
|---|---|---|---|---|---|---|---|---|---|---|
| 1000 pF | 4 | 9 | 13 | 10 | MKP1U011003C_____ | 5 | 11 | 18 | 15 | MKP1V011004B_____ |
| | | | | | | 6 | 15 | 26.5 | 22.5 | MKP1V011005B_____ |
| 1500 „ | 4 | 9 | 13 | 10 | MKP1U011503C_____ | 5 | 11 | 18 | 15 | MKP1V011504B_____ |
| | | | | | | 6 | 15 | 26.5 | 22.5 | MKP1V011505B_____ |
| 2200 „ | 5 | 11 | 13 | 10 | MKP1U012203F_____ | 5 | 11 | 18 | 15 | MKP1V012204B_____ |
| | 5 | 11 | 18 | 15 | MKP1U012204B_____ | 6 | 15 | 26.5 | 22.5 | MKP1V012205B_____ |
| 3300 „ | 5 | 11 | 18 | 15 | MKP1U013304B_____ | 5 | 11 | 18 | 15 | MKP1V013304B_____ |
| | | | | | | 6 | 15 | 26.5 | 22.5 | MKP1V013305B_____ |
| 4700 „ | 5 | 11 | 18 | 15 | MKP1U014704B_____ | 6 | 12.5 | 18 | 15 | MKP1V014704C_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1U014705B_____ | 6 | 15 | 26.5 | 22.5 | MKP1V014705B_____ |
| 6800 „ | 6 | 12.5 | 18 | 15 | MKP1U016804C_____ | 7 | 14 | 18 | 15 | MKP1V016804D_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1U016805B_____ | 7 | 16.5 | 26.5 | 22.5 | MKP1V016805D_____ |
| 0.01 µF | 7 | 14 | 18 | 15 | MKP1U021004D_____ | 8.5 | 18.5 | 26.5 | 22.5 | MKP1V021005F_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1U021005B_____ | | | | | |
| 0.015 „ | 8 | 15 | 18 | 15 | MKP1U021504F_____ | 10.5 | 19 | 26.5 | 22.5 | MKP1V021505G_____ |
| | 6 | 15 | 26.5 | 22.5 | MKP1U021505B_____ | | | | | |
| 0.022 „ | 9 | 16 | 18 | 15 | MKP1U022204J_____ | 11 | 21 | 26.5 | 22.5 | MKP1V022205I_____ |
| | 7 | 16.5 | 26.5 | 22.5 | MKP1U022205D_____ | | | | | |
| 0.033 „ | 8.5 | 18.5 | 26.5 | 22.5 | MKP1U023305F_____ | | | | | |
| | 9 | 19 | 31.5 | 27.5 | MKP1U023306A_____ | | | | | |
| 0.047 „ | 10.5 | 19 | 26.5 | 22.5 | MKP1U024705G_____ | | | | | |
| | 11 | 21 | 31.5 | 27.5 | MKP1U024706B_____ | | | | | |
| 0.068 „ | 11 | 21 | 26.5 | 22.5 | MKP1U026805I_____ | | | | | |
| | 11 | 21 | 31.5 | 27.5 | MKP1U026806B_____ | | | | | |
| 0.1 µF | 13 | 24 | 31.5 | 27.5 | MKP1U031006D_____ | | | | | |
| 0.15 „ | 15 | 26 | 31.5 | 27.5 | MKP1U031506F_____ | | | | | |
| | 13 | 24 | 41.5 | 37.5 | MKP1U031507C_____ | | | | | |
| 0.22 „ | 17 | 34.5 | 31.5 | 27.5 | MKP1U032206I_____ | | | | | |
| | 17 | 29 | 41.5 | 37.5 | MKP1U032207E_____ | | | | | |
| 0.33 „ | 19 | 32 | 41.5 | 37.5 | MKP1U033307F_____ | | | | | |
| 0.47 „ | 20 | 39.5 | 41.5 | 37.5 | MKP1U034707G_____ | | | | | |
| 0.68 „ | 24 | 45.5 | 41.5 | 37.5 | MKP1U036807H_____ | | | | | |
| 1.0 µF | 35 | 50 | 41.5 | 37.5 | MKP1U041007J_____ | | | | | |
| 1.5 „ | 40 | 55 | 41.5 | 37.5 | MKP1U041507K_____ | | | | | |
| | 35 | 50 | 57 | 52.5 | MKP1U041509F_____ | | | | | |
| 2.2 „ | 45 | 55 | 57 | 52.5 | MKP1U042209H_____ | | | | | |

* AC voltage: $f \leqslant 1000$ Hz; $1.4 \times U_{rms} + UDC \leqslant U_r$

New values

** PCM = Printed circuit module = pin spacing

Dims. in mm.

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

| 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 128.



Continuation page 61

## Continuation

### General Data

| Capacitance | 3000 VDC/700 VAC* W | H | L | PCM** | Part number |
|---|---|---|---|---|---|
| 0.01 µF | 6 | 15 | 26.5 | 22.5 | MKP1W021005B_____ |
| 0.015 „ | 7 | 16.5 | 26.5 | 22.5 | MKP1W021505D_____ |
| 0.022 „ | 8.5 | 18.5 | 26.5 | 22.5 | MKP1W022205F_____ |
| 0.033 „ | 11 | 21 | 26.5 | 22.5 | MKP1W023305I_____ |
| | 9 | 19 | 31.5 | 27.5 | MKP1W023306A_____ |
| 0.047 „ | 11 | 21 | 31.5 | 27.5 | MKP1W024706B_____ |
| 0.068 „ | 13 | 24 | 31.5 | 27.5 | MKP1W026806D_____ |
| 0.1 µF | 15 | 26 | 31.5 | 27.5 | MKP1W031006F_____ |
| | 13 | 24 | 41.5 | 37.5 | MKP1W031007C_____ |
| 0.15 „ | 17 | 34.5 | 31.5 | 27.5 | MKP1W031506I_____ |
| | 15 | 26 | 41.5 | 37.5 | MKP1W031507D_____ |
| 0.22 „ | 19 | 32 | 41.5 | 37.5 | MKP1W032207F_____ |
| 0.33 „ | 24 | 45.5 | 41.5 | 37.5 | MKP1W033307H_____ |
| 0.47 „ | 31 | 46 | 41.5 | 37.5 | MKP1W034707I_____ |
| 0.68 „ | 35 | 50 | 41.5 | 37.5 | MKP1W036807J_____ |
| 1.0 µF | 40 | 55 | 41.5 | 37.5 | MKP1W041007K_____ |
| | 35 | 50 | 57 | 52.5 | MKP1W041009F_____ |
| 1.5 „ | 45 | 55 | 57 | 52.5 | MKP1W041509H_____ |

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

New range

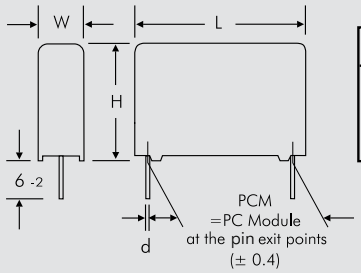
** PCM = Printed circuit module = pin spacing

Dims. in mm.

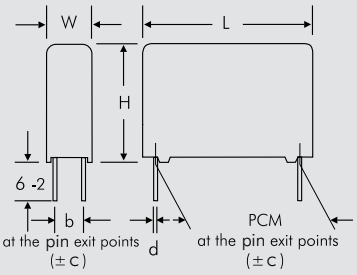
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

| 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 128.



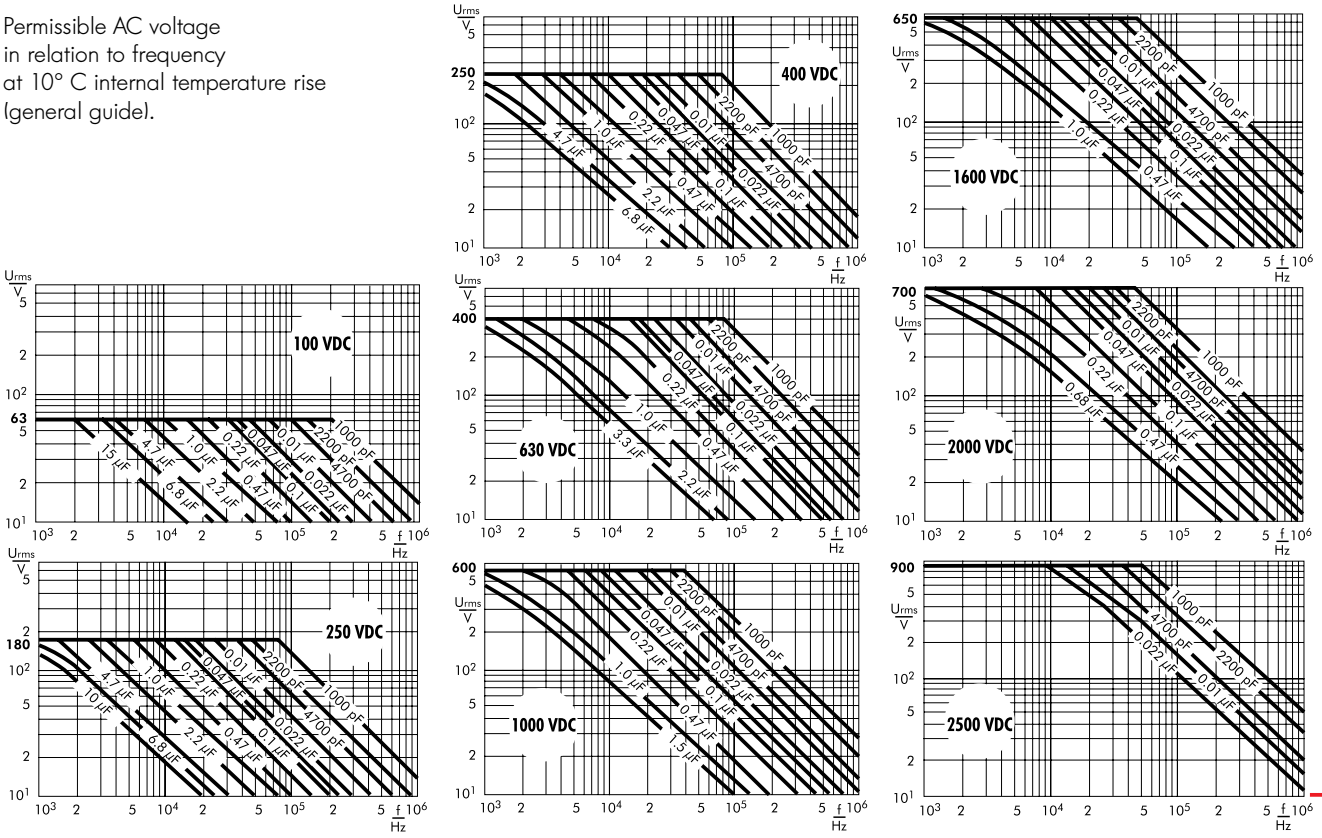

| ø d | PCM |
|---|---|
| 0.6 | 7,5 -10 |
| 0.8 | 15 - 27.5 |
| 1.0 | 37.5 |




| W | PCM | b | ø d | c |
|---|---|---|---|---|
| 17 | 37.5 | 10 | 1.0 | 0.4 |
| 19 | 37.5 | 10 | 1.0 | 0.4 |
| 20 | 37.5 | 12.5 | 1.0 | 0.4 |
| 24 | 37.5 | 12.5 | 1.0 | 0.4 |
| 31 | 37.5 | 20 | 1.0 | 0.4 |
| 35 | 37.5 | 20 | 1.0 | 0.4 |
| 40 | 37.5 | 20 | 1.0 | 0.4 |
| 35 | 52.5 | 20 | 1.2 | 0.8 |
| 45 | 52.5 | 20 | 1.2 | 0.8 |



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



# Recommendation for Processing and Application of Through-Hole Capacitors

## Soldering Process

Internal temperature of the capacitor must be kept as follows:

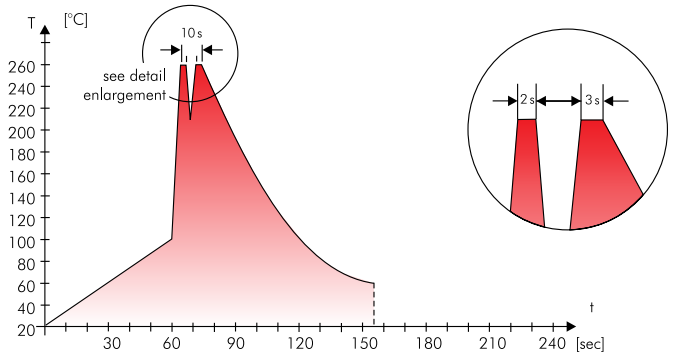
| | | |
|---|---|---|
| Polyester: | preheating: | $T_{max.} \leqslant 125°$ C |
| | soldering: | $T_{max.} \leqslant 135°$ C |
| Polypropylene: | preheating: | $T_{max.} \leqslant 100°$ C |
| | soldering: | $T_{max.} \leqslant 110°$ C |

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

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

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

**Wave soldering**




Typical temperature/time graph for double wave soldering

# WIMA Quality and Environmental Philosophy

## ISO 9001:2008 Certification

ISO 9001:2008 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2008 of our factories by the VDE inspectorate certifies that organisation, equipment and monitoring of quality assurance in our factories correspond to internationally recognized standards.

## WIMA WPCS

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

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

## WIMA Environmental Policy

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

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

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

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

We almost completely refrain from using packing materials such as:

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

## RoHS Compliance

According to the RoHS Directive 2011/65/EU certain hazardous substances like e.g. lead, cadmium, mercury must not be used any longer in electronic equipment as of July 1st, 2006. For the sake of the environment WIMA has refraind from using such substances since years already.




Tape for lead-free WIMA capacitors

## DIN EN ISO 14001:2004

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

# Typical Dimensions for Taping Configuration

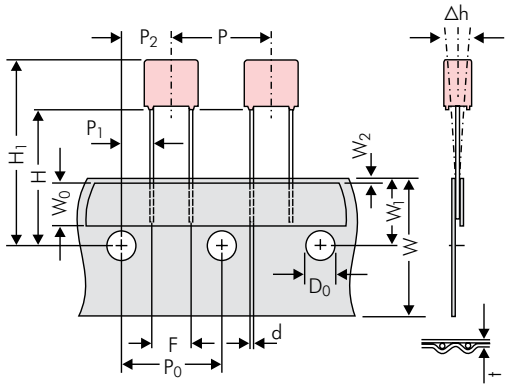



Diagram 1:
PCM 2.5/5/7.5mm

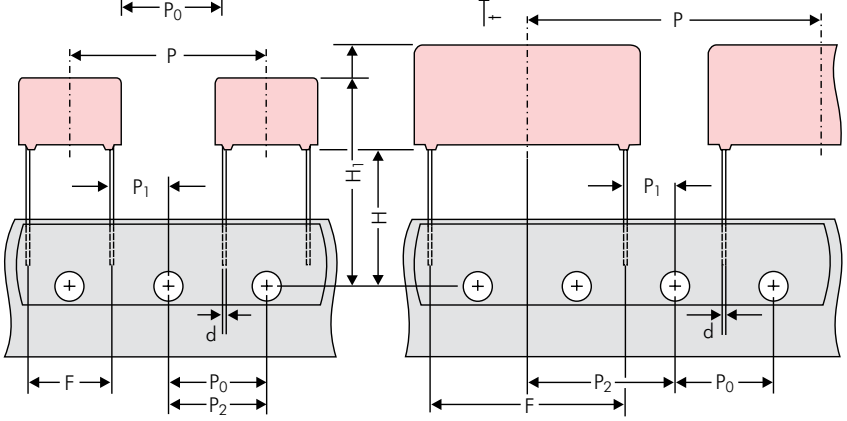



Diagram 2: PCM 10/15 mm

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

| Designation | Symbol | Dimensions for Radial Taping | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **PCM 2.5 taping** | **PCM 5 taping** | **PCM 7.5 taping** | **PCM 10 taping*** | **PCM 15 taping*** | **PCM 22.5 taping** | **PCM 27.5 taping** |
| Carrier tape width | W | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 | 18.0 ±0.5 |
| Hold-down tape width | $W_0$ | 6.0 for hot-sealing adhesive tape | 6.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape | 12.0 for hot-sealing adhesive tape |
| Hole position | $W_1$ | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 | 9.0 ±0.5 |
| Hold-down tape position | $W_2$ | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. | 0.5 to 3.0 max. |
| Feed hole diameter | $D_0$ | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 | 4.0 ±0.2 |
| Pitch of component | P | 12.7 ±1.0 | 12.7 ±1.0 | 12.7 ±1.0 | 25.4 ±1.0 | 25.4 ±1.0 | 38.1 ±1.5 | *38.1 ±1.5 or 50.8 ±1.5 |
| Feed hole pitch | $P_0$ | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch | 12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch |
| Feed hole centre to pin | $P_1$ | 5.1 ±0.5 | 3.85 ±0.7 | 2.6 ±0.7 | 7.7 ±0.7 | 5.2 ±0.7 | 7.8 ±0.7 | 5.3 ±0.7 |
| Hole centre to component centre | $P_2$ | 6.35 ±1.3 | 6.35 ±1.3 | 6.35 ±1.3 | 12.7 ±1.3 | 12.7 ±1.3 | 19.05 ±1.3 | 19.05 ±1.3 |
| Feed hole centre to bottom edge of the component | H | 16.5 ±0.3<br>18.5 ±0.5 | 16.5 ±0.3<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 | 16.5 ±0.5<br>18.5 ±0.5 |
| Feed hole centre to top edge of the component | $H_1$ | $H+H_{component} < H_1$ 32.25 max. | $H+H_{component} < H_1$ 32.25 max. | $H+H_{component} < H_1$ 24.5 to 31.5 | $H+H_{component} < H_1$ 25.0 to 31.5 | $H+H_{component} < H_1$ 26.0 to 37.0 | $H+H_{component} < H_1$ 30.0 to 43.0 | $H+H_{component} < H_1$ 35.0 to 45.0 |
| Pin spacing at upper edge of carrier tape | F | 2.5 ±0.5 | 5.0 $^{+0.8}_{-0.2}$ | 7.5 ±0.8 | 10.0 ±0.8 | 15 ±0.8 | 22.5 ±0.8 | 27.5 ±0.8 |
| Pin diameter | d | 0.4 ±0.05 | 0.5 ±0.05 | •0.5 ±0.05 or 0.6 $^{+0.06}_{-0.05}$ | •0.5 ±0.05 or 0.6 $^{+0.06}_{-0.05}$ | 0.8 $^{+0.08}_{-0.05}$ | 0.8 $^{+0.08}_{-0.05}$ | 0.8 $^{+0.08}_{-0.05}$ |
| Component alignment | Δh | ± 2.0 max. | ± 2.0 max. | ± 3.0 max. | ± 3.0 max. | ± 3.0 max. | ± 3.0 max. | ± 3.0 max. |
| Total tape thickness | t | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 | 0.7 ±0.2 |
| Package (see also page 129) | | ROLL/AMMO | | AMMO | | | | |
| | | REEL ø 360 max. ø 30 ±1 B 52 ±2 / 58 ±2 } depending on comp. dimensions | | REEL ø 360 max. ø 30 ±1 B 52 ±2 / 58 ±2 / 66 ±2 or REEL ø 500 max. ø 25 ±1 B 54 ±2 / 60 ±2 / 68 ±2 } depending on PCM and component dimensions | | | | |
| Unit | | see details page 130. | | | | | | |

Dims in mm.

• Diameter of pins see General Data.

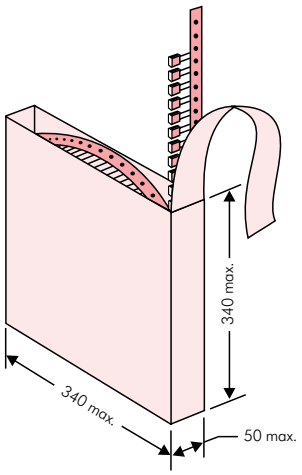
Please clarify customer-specific deviations with the manufacturer.

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

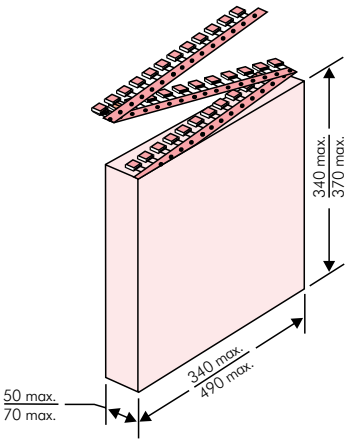
02.14

# Types of Tape Packaging of Capacitors for Automatic Radial Insertion

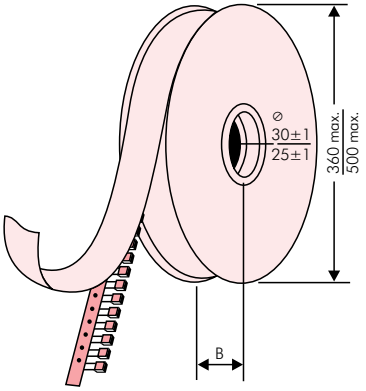
## ROLL Packaging




## AMMO Packaging




## REEL Packaging




## BAR CODE (Labelling)

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

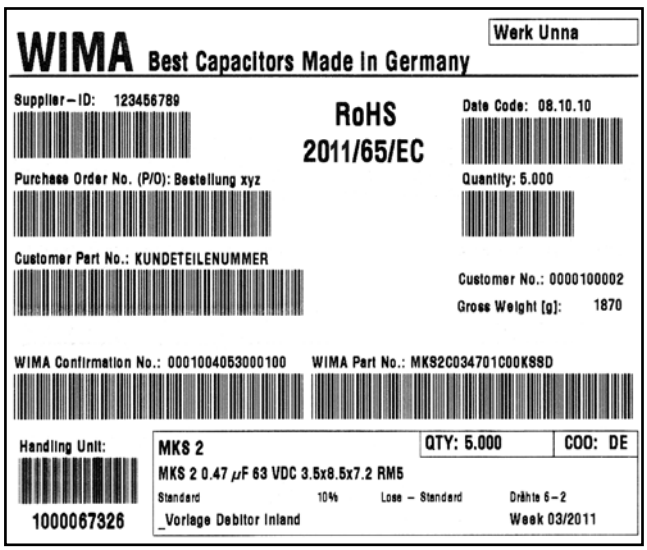
Scanner decoding of

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

In addition part description of

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

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




BARCODE „Code 39"

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

| PCM | Size | | | | pcs. per packing unit | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | bulk | ROLL | | REEL | | | | AMMO | | | | |
| | | | | | | | | ø 360 | | ø 500 | | 340 × 340 | | 490 × 370 | | |
| | | | | | | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 | |
| | W | H | L | Codes | S | N | O | F | I | H | J | A | C | B | D | |
| **2.5 mm** | 2.5 | 7 | 4.6 | **0B** | 5000 | 2200 | | 2500 | | – | | 2800 | | – | | |
| | 3 | 7.5 | 4.6 | **0C** | 5000 | 2000 | | 2300 | | – | | 2300 | | – | | |
| | 3.8 | 8.5 | 4.6 | **0D** | 5000 | 1500 | | 1800 | | – | | 1800 | | – | | |
| | 4.6 | 9 | 4.6 | **0E** | 5000 | 1200 | | 1500 | | – | | 1500 | | – | | |
| | 5.5 | 10 | 4.6 | **0F** | 5000 | 900 | | 1200 | | – | | 1200 | | – | | |
| **5 mm** | 2.5 | 6.5 | 7.2 | **1A** | 5000 | 2200 | | 2500 | | – | | 2800 | | – | | |
| | 3 | 7.5 | 7.2 | **1B** | 5000 | 2000 | | 2300 | | – | | 2300 | | – | | |
| | 3.5 | 8.5 | 7.2 | **1C** | 5000 | 1600 | | 2000 | | – | | 2000 | | – | | |
| | 4.5 | 6 | 7.2 | **1D** | 6000 | 1300 | | 1500 | | – | | 1500 | | – | | |
| | 4.5 | 9.5 | 7.2 | **1E** | 4000 | 1300 | | 1500 | | – | | 1500 | | – | | |
| | 5 | 10 | 7.2 | **1F** | 3500 | 1100 | | 1400 | | – | | 1400 | | – | | |
| | 5.5 | 7 | 7.2 | **1G** | 4000 | 1000 | | 1200 | | – | | 1200 | | – | | |
| | 5.5 | 11.5 | 7.2 | **1H** | 2500 | 1000 | | 1200 | | – | | 1200 | | – | | |
| | 6.5 | 8 | 7.2 | **1I** | 2500 | 800 | | 1000 | | – | | 1000 | | – | | |
| | 7.2 | 8.5 | 7.2 | **1J** | 2500 | 700 | | 1000 | | – | | 1000 | | – | | |
| | 7.2 | 13 | 7.2 | **1K** | 2000 | 700 | | 950 | | – | | 1000 | | – | | |
| | 8.5 | 10 | 7.2 | **1L** | 2000 | 600 | | 800 | | – | | 800 | | – | | |
| | 8.5 | 14 | 7.2 | **1M** | 1500 | 600 | | 800 | | – | | 800 | | – | | |
| | 11 | 16 | 7.2 | **1N** | 1000 | 500 | | 600 | | – | | 400 | | – | | |
| **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 | | 3100 | | |
| | 4.5 | 9.5 | 10.3 | **2D** | 3500 | – | | 1500 | | 2900 | | 1400 | | 2800 | | |
| | 5 | 10.5 | 10.3 | **2E** | 3000 | – | | 1300 | | 2500 | | 1300 | | – | | |
| | 5.7 | 12.5 | 10.3 | **2F** | 2000 | – | | 1000 | | 2200 | | 1100 | | – | | |
| | 7.2 | 12.5 | 10.3 | **2G** | 1500 | – | | 900 | | 1800 | | 1000 | | – | | |
| **10 mm** | 3 | 9 | 13 | **3A** | 3000 | – | | 1100 | | 2200 | | – | | 1900 | | |
| | 4 | 8.5 | 13.5 | **FA** | 3000 | – | | 900 | | 1600 | | – | | 1450 | | |
| | 4 | 9 | 13 | **3C** | 3000 | – | | 900 | | 1600 | | – | | 1450 | | |
| | 4 | 9.5 | 13 | **3D** | 3000 | – | | 900 | | 1600 | | – | | 1400 | | |
| | 5 | 10 | 13.5 | **FB** | 2000 | – | | 700 | | 1300 | | – | | 1200 | | |
| | 5 | 11 | 13 | **3F** | 3000 | – | | 700 | | 1300 | | – | | 1200 | | |
| | 6 | 12 | 13 | **3G** | 2400 | – | | 550 | | 1100 | | – | | 1000 | | |
| | 6 | 12.5 | 13 | **3H** | 2400 | – | | 550 | | 1100 | | – | | 1000 | | |
| | 8 | 12 | 13 | **3I** | 2000 | – | | 400 | | 800 | | – | | 740 | | |
| **15 mm** | 5 | 11 | 18 | **4B** | 2400 | – | | 600 | | 1200 | | – | | 1150 | | |
| | 5 | 13 | 19 | **FC** | 1000 | – | | 600 | | 1200 | | – | | 1200 | | |
| | 6 | 12.5 | 18 | **4C** | 2000 | – | | 500 | | 1000 | | – | | 1000 | | |
| | 6 | 14 | 19 | **FD** | 1000 | – | | 500 | | 1000 | | – | | 1000 | | |
| | 7 | 14 | 18 | **4D** | 1600 | – | | 450 | | 900 | | – | | 850 | | |
| | 7 | 15 | 19 | **FE** | 1000 | – | | 450 | | 900 | | – | | 850 | | |
| | 8 | 15 | 18 | **4F** | 1200 | – | | 400 | | 800 | | – | | 740 | | |
| | 8 | 17 | 19 | **FF** | 500 | – | | 400 | | 800 | | – | | 740 | | |
| | 9 | 14 | 18 | **4H** | 1200 | – | | 350 | | 700 | | – | | 650 | | |
| | 9 | 16 | 18 | **4J** | 900 | – | | 350 | | 700 | | – | | 650 | | |
| | 10 | 18 | 19 | **FG** | 500 | – | | 300 | | 650 | | – | | 590 | | |
| | 11 | 14 | 18 | **4M** | 1000 | – | | 300 | | 600 | | – | | 540 | | |
| **22.5 mm** | 5 | 14 | 26.5 | **5A** | 1200 | – | | – | | 800 | | – | | 770 | | |
| | 6 | 15 | 26.5 | **5B** | 1000 | – | | – | | 700 | | – | | 640 | | |
| | 7 | 16.5 | 26.5 | **5D** | 760 | – | | – | | 600 | | – | | 550 | | |
| | 8 | 20 | 28 | **FH** | 500 | – | | – | | 500 | | – | | 480 | | |
| | 8.5 | 18.5 | 26.5 | **5F** | 500 | – | | – | | 480 | | – | | 450 | | |
| | 10 | 22 | 28 | **FI** | 540* | – | | – | | 420 | | – | | 380 | | |
| | 10.5 | 19 | 26.5 | **5G** | 680* | – | | – | | 400 | | – | | 360 | | |
| | 10.5 | 20.5 | 26.5 | **5H** | 680* | – | | – | | 400 | | – | | 360 | | |
| | 11 | 21 | 26.5 | **5I** | 680* | – | | – | | 380 | | – | | 350 | | |
| | 12 | 24 | 28 | **FJ** | 450* | – | | – | | 350 | | – | | 310 | | |

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

Moulded versions.

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

| PCM | Size | | | | bulk | pcs. per packing unit | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ROLL | | REEL | | | | AMMO | | | |
| | | | | | | | | ø 360 | | ø 500 | | 340 × 340 | | 490 × 370 | |
| | | | | | | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 | H16.5 | H18.5 |
| | W | H | L | Codes | S | N | O | F | I | H | J | A | C | B | D |
| **27.5 mm** | 9 | 19 | 31.5 | **6A** | 640* | – | | – | | 460/340* | | – | | 420 | |
| | 11 | 21 | 31.5 | **6B** | 544* | – | | – | | 380/280* | | – | | 350 | |
| | 13 | 24 | 31.5 | **6D** | 448* | – | | – | | 300 | | – | | 290 | |
| | 13 | 25 | 33 | **FK** | 336* | – | | – | | – | | – | | – | |
| | 15 | 26 | 31.5 | **6F** | 384* | – | | – | | 270 | | – | | 250 | |
| | 15 | 26 | 33 | **FL** | 288* | – | | – | | – | | – | | – | |
| | 17 | 29 | 31.5 | **6G** | 176* | – | | – | | – | | – | | – | |
| | 17 | 34.5 | 31.5 | **6I** | 176* | – | | – | | – | | – | | – | |
| | 20 | 32 | 33 | **FM** | 216* | – | | – | | – | | – | | – | |
| | 20 | 39.5 | 31.5 | **6J** | 144* | – | | – | | – | | – | | – | |
| **37.5 mm** | 9 | 19 | 41.5 | **7A** | 480* | – | | – | | – | | – | | – | |
| | 11 | 22 | 41.5 | **7B** | 408* | – | | – | | – | | – | | – | |
| | 13 | 24 | 41.5 | **7C** | 252* | – | | – | | – | | – | | – | |
| | 15 | 26 | 41.5 | **7D** | 144* | – | | – | | – | | – | | – | |
| | 17 | 29 | 41.5 | **7E** | 132* | – | | – | | – | | – | | – | |
| | 19 | 32 | 41.5 | **7F** | 108* | – | | – | | – | | – | | – | |
| | 20 | 39.5 | 41.5 | **7G** | 108* | – | | – | | – | | – | | – | |
| | 24 | 45.5 | 41.5 | **7H** | 84* | – | | – | | – | | – | | – | |
| | 31 | 46 | 41.5 | **7I** | 72* | – | | – | | – | | – | | – | |
| | 35 | 50 | 41.5 | **7J** | 35* | – | | – | | – | | – | | – | |
| | 40 | 55 | 41.5 | **7K** | 28* | – | | – | | – | | – | | – | |
| **48.5 mm** | 19 | 31 | 56 | **8D** | 50* | – | | – | | – | | – | | – | |
| | 23 | 34 | 56 | **8E** | 72* | – | | – | | – | | – | | – | |
| | 27 | 37.5 | 56 | **8H** | 60* | – | | – | | – | | – | | – | |
| | 33 | 48 | 56 | **8J** | 48* | – | | – | | – | | – | | – | |
| | 37 | 54 | 56 | **8L** | 25* | – | | – | | – | | – | | – | |
| **52.5 mm** | 35 | 50 | 57 | **9F** | 25* | – | | – | | – | | – | | – | |
| | 45 | 55 | 57 | **9H** | 20* | – | | – | | – | | – | | – | |
| | 45 | 65 | 57 | **9J** | 20* | – | | – | | – | | – | | – | |

* for 2-inch transport pitches.

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

Moulded versions.

# WIMA Part Number System

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

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

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

**Type description:**

| | |
|---|---|
| SMD-PET | = SMDT |
| SMD-PPS | = SMDI |
| FKP 02 | = FKP0 |
| MKS 02 | = MKS0 |
| FKS 2 | = FKS2 |
| FKP 2 | = FKP2 |
| MKS 2 | = MKS2 |
| MKP 2 | = MKP2 |
| FKS 3 | = FKS3 |
| FKP 3 | = FKP3 |
| MKS 4 | = MKS4 |
| MKP 4 | = MKP4 |
| MKP 10 | = MKP1 |
| FKP 4 | = FKP4 |
| FKP 1 | = FKP1 |
| MKP-X2 | = MKX2 |
| MKP-X2 R | = MKXR |
| MKP-Y2 | = MKY2 |
| MP 3-X2 | = MPX2 |
| MP 3-X1 | = MPX1 |
| MP 3-Y2 | = MPY2 |
| MP 3R-Y2 | = MPRY |
| Snubber MKP | = SNMP |
| Snubber FKP | = SNFP |
| GTO MKP | = GTOM |
| DC-LINK MKP 3 | = DCP3 |
| DC-LINK MKP 4 | = DCP4 |
| DC-LINK MKP 4S | = DCPS |
| DC-LINK MKP 5 | = DCP5 |
| DC-LINK MKP 6 | = DCP6 |
| DC-LINK HC | = DCH_ |
| DC-LINK HY | = DCHY |

**Rated voltage:**

| | |
|---|---|
| 50 VDC | = B0 |
| 63 VDC | = C0 |
| 100 VDC | = D0 |
| 250 VDC | = F0 |
| 400 VDC | = G0 |
| 450 VDC | = H0 |
| 600 VDC | = I0 |
| 630 VDC | = J0 |
| 700 VDC | = K0 |
| 800 VDC | = L0 |
| 850 VDC | = M0 |
| 900 VDC | = N0 |
| 1000 VDC | = O1 |
| 1100 VDC | = P0 |
| 1200 VDC | = Q0 |
| 1250 VDC | = R0 |
| 1500 VDC | = S0 |
| 1600 VDC | = T0 |
| 2000 VDC | = U0 |
| 2500 VDC | = V0 |
| 3000 VDC | = W0 |
| 4000 VDC | = X0 |
| 6000 VDC | = Y0 |
| 250 VAC | = 0W |
| 275 VAC | = 1W |
| 300 VAC | = 2W |
| 400 VAC | = 3W |
| 440 VAC | = 4W |
| 500 VAC | = 5W |
| ... | |

**Capacitance:**

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

**Size:**

| | |
|---|---|
| 4.8 x 3.3 x 3 Size 1812 | = KA |
| 4.8 x 3.3 x 4 Size 1812 | = KB |
| 5.7 x 5.1 x 3.5 Size 2220 | = QA |
| 5.7 x 5.1 x 4.5 Size 2220 | = QB |
| 7.2 x 6.1 x 3 Size 2824 | = TA |
| 7.2 x 6.1 x 5 Size 2824 | = TB |
| 10.2 x 7.6 x 5 Size 4030 | = VA |
| 12.7 x 10.2 x 6 Size 5040 | = XA |
| 15.3 x 13.7 x 7 Size 6054 | = YA |
| 2.5 x 7 x 4.6 PCM 2.5 | = 0B |
| 3 x 7.5 x 4.6 PCM 2.5 | = 0C |
| 2.5 x 6.5 x 7.2 PCM 5 | = 1A |
| 3 x 7.5 x 7.2 PCM 5 | = 1B |
| 2.5 x 7 x 10 PCM 7.5 | = 2A |
| 3 x 8.5 x 10 PCM 7.5 | = 2B |
| 3 x 9 x 13 PCM 10 | = 3A |
| 4 x 9 x 13 PCM 10 | = 3C |
| 5 x 11 x 18 PCM 15 | = 4B |
| 6 x 12.5 x 18 PCM 15 | = 4C |
| 5 x 14 x 26.5 PCM 22.5 | = 5A |
| 6 x 15 x 26.5 PCM 22.5 | = 5B |
| 9 x 19 x 31.5 PCM 27.5 | = 6A |
| 11 x 21 x 31.5 PCM 27.5 | = 6B |
| 9 x 19 x 41.5 PCM 37.5 | = 7A |
| 11 x 22 x 41.5 PCM 37.5 | = 7B |
| 94 x 49 x 182 DCH_ | = H0 |
| 94 x 77 x 182 DCH_ | = H1 |
| ... | |

**Version code:**

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

**Tolerance:**

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

**Packing:**

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

**Pin length (untaped)**

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

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

02.14