

## Polypropylene (PP) Capacitors for Pulse Applications with Metal Foil Electrodes, Schoopage Contacts and Self-Healing, Internal Series Connection for Increased Current Carrying Capability PCM 15 mm to 37.5 mm

### Special Features

- High pulse duty
- Self-healing
- Internal series connection
- Very low dissipation factor
- Negative capacitance change versus temperature
- According to RoHS 2011/65/EU

### Typical Applications

For high pulse and high frequency applications e.g.

- Switch mode power supplies
- Converter in drives and power electronics
- Deflection systems in monitors and TV-sets
- Electronic ballasts

### Construction

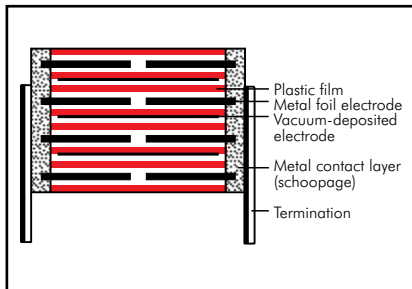
#### Dielectric:

Polypropylene (PP) film

#### Capacitor electrodes:

Aluminium foil and single-sided metallized plastic film

#### 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:

100 pF to 1.5 μF (E12-values on request)

#### Rated voltages:

400 VDC, 630 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC

#### Capacitance tolerances:

±20%, ±10%, ±5% (other tolerances are available subject to special enquiry)

#### Operating temperature range:

-55° C to +100° C

#### Climatic test category:

55/100/56 in accordance with IEC

#### Insulation resistance at +20° C:

$C \leq 0.1 \mu\text{F}$ :  $\geq 1 \times 10^5 \text{ M}\Omega$

(mean value:  $5 \times 10^5 \text{ M}\Omega$ )

$C > 0.1 \mu\text{F}$ :  $\geq 10000 \text{ sec (M}\Omega \times \mu\text{F)}$

(mean value: 100000 sec)

Measuring voltage: 100 V/1 min.

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

at f	$C \leq 0.1 \mu\text{F}$	$0.1 \mu\text{F} < C \leq 1.0 \mu\text{F}$	$C > 1.0 \mu\text{F}$
1 kHz	$\leq 3 \times 10^{-4}$	$\leq 3 \times 10^{-4}$	$\leq 3 \times 10^{-4}$
10 kHz	$\leq 4 \times 10^{-4}$	$\leq 6 \times 10^{-4}$	-
100 kHz	$\leq 10 \times 10^{-4}$	-	-

#### Maximum pulse rise time:

Capacitance pF/μF	max. pulse rise time V/μsec at $T_A < 40^\circ \text{C}$					
	400 VDC	630 VDC	1000 VDC	1250 VDC	1600 VDC	2000 VDC
100 ... 220	27000	31000	33000	39000	39000	39000
330 ... 680	19000	21000	31000	34000	34000	39000
1000 ... 2200	13000	15000	27000	27000	27000	39000
3300 ... 6800	9000	14000	15000	17000	17000	21000
0.01 ... 0.022	7000	11000	11000	11000	11000	11000
0.033 ... 0.068	7000	9000	9000	9000	9000	9000
0.1 ... 0.22	7000	9000	9000	9000	9000	9000
0.33 ... 0.68	3000	5000	5000	5000	5000	-
1.0 ... 1.5	1000	1600	2000	-	-	-

for pulses equal to the rated voltage

### Mechanical Tests

#### Pull test on pins:

$d \leq 0.8 \phi$ : 10 N in direction of pins

$d > 0.8 \phi$ : 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<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	400 VDC/250 VAC*					630 VDC/350 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	5	11	18	15	FKP4G001004B00_____	5	11	18	15	FKP4J001004B00_____
150 "	5	11	18	15	FKP4G001504B00_____	5	11	18	15	FKP4J001504B00_____
220 "	5	11	18	15	FKP4G002204B00_____	5	11	18	15	FKP4J002204B00_____
330 "	5	11	18	15	FKP4G003304B00_____	5	11	18	15	FKP4J003304B00_____
470 "	5	11	18	15	FKP4G004704B00_____	5	11	18	15	FKP4J004704B00_____
680 "	5	11	18	15	FKP4G006804B00_____	5	11	18	15	FKP4J006804B00_____
1000 pF	5	11	18	15	FKP4G011004B00_____	5	11	18	15	FKP4J011004B00_____
1500 "	5	11	18	15	FKP4G011504B00_____	5	11	18	15	FKP4J011504B00_____
2200 "	5	11	18	15	FKP4G012204B00_____	5	11	18	15	FKP4J012204B00_____
3300 "	5	11	18	15	FKP4G013304B00_____	5	11	18	15	FKP4J013304B00_____
4700 "	5	11	18	15	FKP4G014704B00_____	5	11	18	15	FKP4J014704B00_____
6800 "	5	11	18	15	FKP4G016804B00_____	5	11	18	15	FKP4J016804B00_____
0.01 μF	5	11	18	15	FKP4G021004B00_____	5	11	18	15	FKP4J021004B00_____
0.015 "	5	11	18	15	FKP4G021504B00_____	6	12.5	18	15	FKP4J021504C00_____
0.022 "	6	12.5	18	15	FKP4G022204C00_____	7	14	18	15	FKP4J022204D00_____
0.033 "	7	14	18	15	FKP4G023304D00_____	8	15	18	15	FKP4J023304F00_____
	5	14	26.5	22.5	FKP4G023305A00_____	6	15	26.5	22.5	FKP4J023305B00_____
0.047 "	8	15	18	15	FKP4G024704F00_____	9	16	18	15	FKP4J024704J00_____
	6	15	26.5	22.5	FKP4G024705B00_____	7	16.5	26.5	22.5	FKP4J024705D00_____
0.068 "	7	16.5	26.5	22.5	FKP4G026805D00_____	8.5	18.5	26.5	22.5	FKP4J026805F00_____
0.1 μF	8.5	18.5	26.5	22.5	FKP4G031005F00_____	10.5	19	26.5	22.5	FKP4J031005G00_____
						11	21	31.5	27.5	FKP4J031006B00_____
0.15 "	11	21	26.5	22.5	FKP4G031505I00_____	11	21	26.5	22.5	FKP4J031505I00_____
	9	19	31.5	27.5	FKP4G031506A00_____	11	21	31.5	27.5	FKP4J031506B00_____
0.22 "	11	21	31.5	27.5	FKP4G032206B00_____	13	24	31.5	27.5	FKP4J032206D00_____
0.33 "	13	24	31.5	27.5	FKP4G033306D00_____	15	26	31.5	27.5	FKP4J033306F00_____
0.47 "	17	29	31.5	27.5	FKP4G034706G00_____	17	34.5	31.5	27.5	FKP4J034706I00_____
0.68 "	17	34.5	31.5	27.5	FKP4G036806I00_____	20	39.5	41.5	37.5	FKP4J036807G00_____
1.0 μF	20	39.5	31.5	27.5	FKP4G041006J00_____	20	39.5	41.5	37.5	FKP4J041007G00_____
1.5 "	20	39.5	41.5	37.5	FKP4G041507G00_____	24	45.5	41.5	37.5	FKP4J041507H00_____

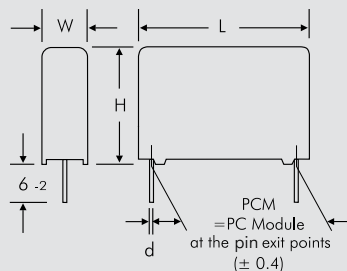
\* AC voltage:  $f \leq 1000 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

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

Dims. in mm.

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

∅ d	PCM
0.8	15 - 27.5
1.0	37.5



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 140.	

Rights reserved to amend design data without prior notification.

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## Continuation

### General Data

Capacitance	1000 VDC/400 VAC*					1250 VDC/450 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	5	11	18	15	FKP4O101004B00_____	5	11	18	15	FKP4R001004B00_____
150 "	5	11	18	15	FKP4O101504B00_____	5	11	18	15	FKP4R001504B00_____
220 "	5	11	18	15	FKP4O102204B00_____	5	11	18	15	FKP4R002204B00_____
330 "	5	11	18	15	FKP4O103304B00_____	5	11	18	15	FKP4R003304B00_____
470 "	5	11	18	15	FKP4O104704B00_____	5	11	18	15	FKP4R004704B00_____
680 "	5	11	18	15	FKP4O106804B00_____	5	11	18	15	FKP4R001684B00_____
1000 pF	5	11	18	15	FKP4O111004B00_____	5	11	18	15	FKP4R011004B00_____
1500 "	5	11	18	15	FKP4O111504B00_____	5	11	18	15	FKP4R011504B00_____
2200 "	5	11	18	15	FKP4O112204B00_____	5	11	18	15	FKP4R012204B00_____
3300 "	5	11	18	15	FKP4O113304B00_____	6	12.5	18	15	FKP4R013304C00_____
4700 "	5	11	18	15	FKP4O114704B00_____	7	14	18	15	FKP4R014704D00_____
6800 "	5	11	18	15	FKP4O116804B00_____	8	15	18	15	FKP4R016804F00_____
0.01 µF	6	12.5	18	15	FKP4O121004C00_____	9	16	18	15	FKP4R021004J00_____
	5	14	26.5	22.5	FKP4O121005A00_____	6	15	26.5	22.5	FKP4R021005B00_____
0.015 "	7	14	18	15	FKP4O121504D00_____	7	16.5	26.5	22.5	FKP4R021505D00_____
	6	15	26.5	22.5	FKP4O121505B00_____					
0.022 "	8	15	18	15	FKP4O122204F00_____	8.5	18.5	26.5	22.5	FKP4R022205F00_____
	6	15	26.5	22.5	FKP4O122205B00_____					
0.033 "	7	16.5	26.5	22.5	FKP4O123305D00_____	10.5	19	26.5	22.5	FKP4R023305G00_____
						9	19	31.5	27.5	FKP4R023306A00_____
0.047 "	8.5	18.5	26.5	22.5	FKP4O124705F00_____	11	21	31.5	27.5	FKP4R024706B00_____
	9	19	31.5	27.5	FKP4O124706A00_____					
0.068 "	11	21	26.5	22.5	FKP4O126805I00_____	13	24	31.5	27.5	FKP4R026806D00_____
	9	19	31.5	27.5	FKP4O126806A00_____					
0.1 µF	11	21	31.5	27.5	FKP4O131006B00_____	15	26	31.5	27.5	FKP4R031006F00_____
0.15 "	13	24	31.5	27.5	FKP4O131506D00_____	15	26	31.5	27.5	FKP4R031506F00_____
0.22 "	15	26	31.5	27.5	FKP4O132206F00_____	20	39.5	31.5	27.5	FKP4R032206J00_____
						17	29	41.5	37.5	FKP4R032207E00_____
0.33 "	17	34.5	31.5	27.5	FKP4O133306I00_____	19	32	41.5	37.5	FKP4R033307F00_____
	17	29	41.5	37.5	FKP4O133307E00_____					
0.47 "	19	32	41.5	37.5	FKP4O134707F00_____	20	39.5	41.5	37.5	FKP4R034707G00_____
0.68 "	20	39.5	41.5	37.5	FKP4O136807G00_____	24	45.5	41.5	37.5	FKP4R036807H00_____
1.0 µF	24	45.5	41.5	37.5	FKP4O141007H00_____					

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

\*\* 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:

Tolerance: 20 % = M  
10 % = K  
5 % = J

Packing: bulk = S  
Pin length: 6-2 = SD

Taped version see page 140.

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## Continuation

### General Data

Capacitance	1600 VDC/500 VAC*					2000 VDC/550 VAC*																		
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number														
100 pF	5	11	18	15	FKP4T001004B00	5	11	18	15	FKP4U001004B00														
150 "	5	11	18	15	FKP4T001504B00	5	11	18	15	FKP4U001504B00														
220 "	5	11	18	15	FKP4T002204B00	5	11	18	15	FKP4U002204B00														
330 "	5	11	18	15	FKP4T003304B00	5	11	18	15	FKP4U003304B00														
470 "	5	11	18	15	FKP4T004704B00	5	11	18	15	FKP4U004704B00														
680 "	5	11	18	15	FKP4T006804B00	5	11	18	15	FKP4U006804B00														
1000 pF	5	11	18	15	FKP4T011004B00	5	11	18	15	FKP4U011004B00														
1500 "	5	11	18	15	FKP4T011504B00	6	12.5	18	15	FKP4U011504C00														
2200 "	6	12.5	18	15	FKP4T012204C00	7	14	18	15	FKP4U012204D00														
3300 "	7	14	18	15	FKP4T013304D00	9	16	18	15	FKP4U013304J00														
4700 "	8	15	18	15	FKP4T014704F00	6	15	26.5	22.5	FKP4U013305B00														
6800 "	9	16	18	15	FKP4T016804J00	7	16.5	26.5	22.5	FKP4U014705D00														
	6	15	26.5	22.5	FKP4T016805B00	8.5	18.5	26.5	22.5	FKP4U016805F00														
0.01 μF	6	15	26.5	22.5	FKP4T021005B00	10.5	19	26.5	22.5	FKP4U021005G00														
0.015 "	8.5	18.5	26.5	22.5	FKP4T021505F00	11	21	26.5	22.5	FKP4U021505I00														
0.022 "	10.5	19	26.5	22.5	FKP4T022205H00	9	19	31.5	27.5	FKP4U021506A00														
0.033 "	9	19	31.5	27.5	FKP4T022206A00	11	21	31.5	27.5	FKP4U022206B00														
0.047 "	11	21	31.5	27.5	FKP4T023306B00	11	22	41.5	37.5	FKP4U022207B00														
0.068 "	13	24	31.5	27.5	FKP4T024706D00	13	24	31.5	27.5	FKP4U023306D00														
	15	26	31.5	27.5	FKP4T026806F00	13	24	41.5	37.5	FKP4U023307C00														
						15	26	31.5	27.5	FKP4U024706F00														
						15	26	41.5	37.5	FKP4U024707D00														
						17	34.5	31.5	27.5	FKP4U026806I00														
						17	29	41.5	37.5	FKP4U026807E00														
0.1 μF	17	34.5	31.5	27.5	FKP4T031006I00	19	32	41.5	37.5	FKP4U031007F00														
0.15 "	20	39.5	31.5	27.5	FKP4T031506J00	24	45.5	41.5	37.5	FKP4U031507H00														
	17	29	41.5	37.5	FKP4T031507E00	Dims. in mm. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">Part number completion:</th> </tr> </thead> <tbody> <tr> <td>Tolerance:</td> <td>20 % = M</td> </tr> <tr> <td></td> <td>10 % = K</td> </tr> <tr> <td></td> <td>5 % = J</td> </tr> <tr> <td>Packing:</td> <td>bulk = S</td> </tr> <tr> <td>Pin length:</td> <td>6-2 = SD</td> </tr> <tr> <td></td> <td>Taped version see page 140.</td> </tr> </tbody> </table>					Part number completion:		Tolerance:	20 % = M		10 % = K		5 % = J	Packing:	bulk = S	Pin length:	6-2 = SD		Taped version see page 140.
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0.22 "	19	32	41.5	37.5	FKP4T032207F00																			
0.33 "	20	39.5	41.5	37.5	FKP4T033307G00																			
0.47 "	24	45.5	41.5	37.5	FKP4T034707H00																			

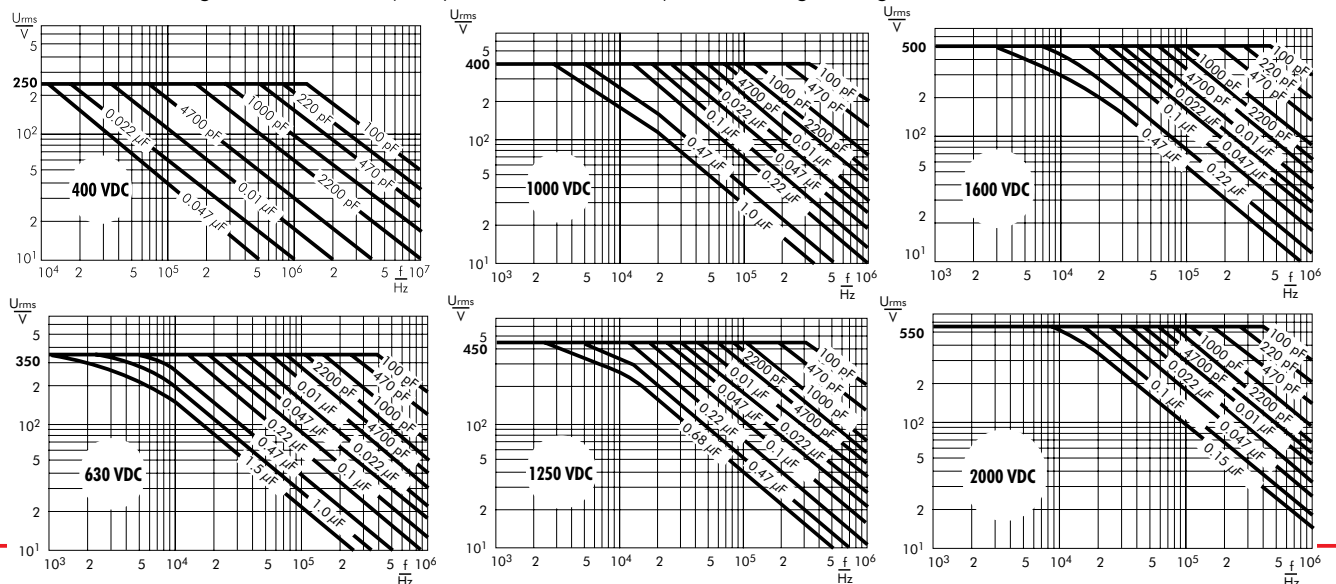
\* AC voltage:  $f \leq 1000 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

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

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

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



## Recommendation for Processing and Application of Through-Hole Capacitors

### Soldering Process

Internal temperature of the capacitor must be kept as follows:

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

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

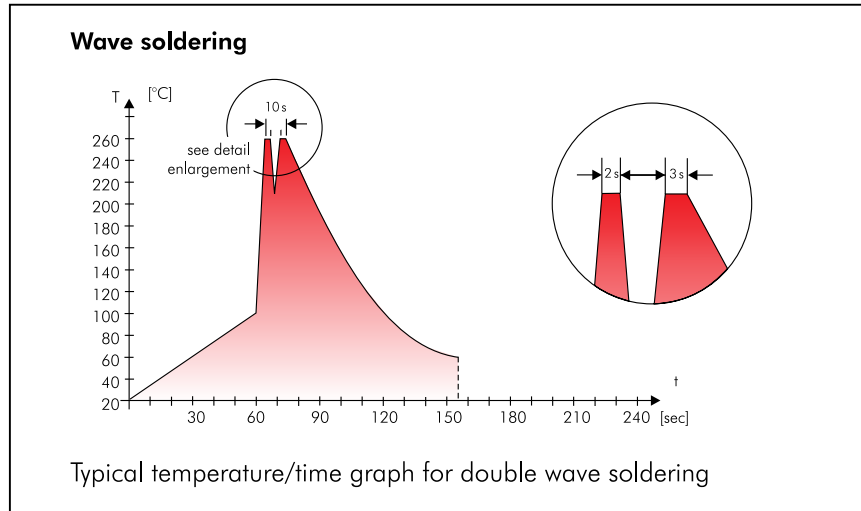
#### Single wave soldering

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

#### Double wave soldering

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

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



## WIMA Quality and Environmental Philosophy

### ISO 9001:2008 Certification

ISO 9001:2008 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2008 of our factories by the 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
- Testing as per customer requirements

### WIMA Environmental Policy

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

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

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

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

We almost completely refrain from using packing materials such as:

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

### RoHS Compliance

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



WIMA Kondensatoren sind bleifrei konform RoHS 2011/65/EU

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

Tape for lead-free WIMA capacitors

### DIN EN ISO 14001:2004

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

# Typical Dimensions for Taping Configuration

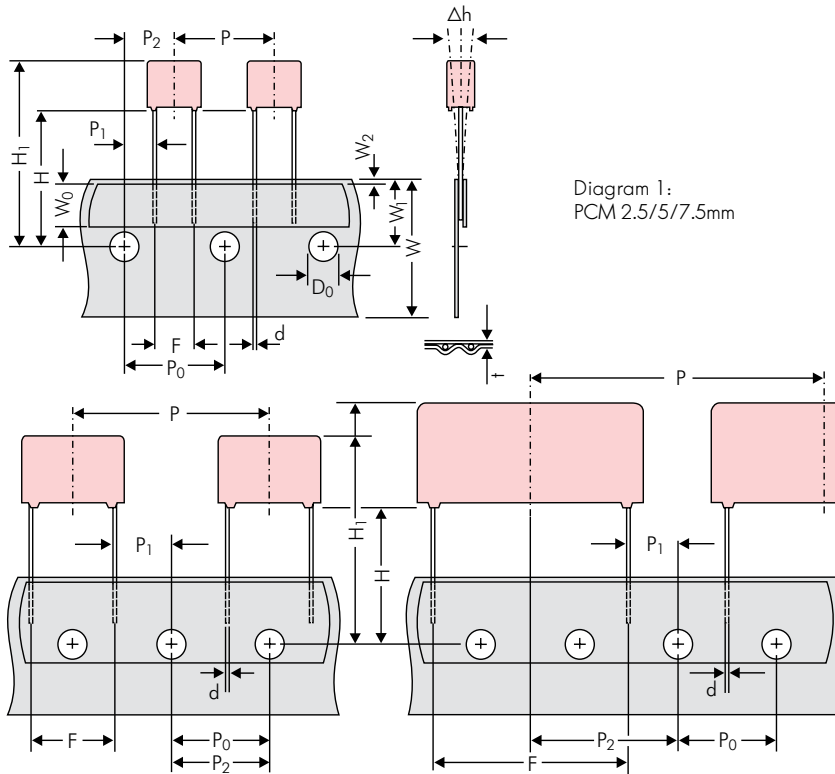


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5\*mm

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

Designation	Symbol	Dimensions for Radial Taping									
		PCM 2.5 tapping	PCM 5 tapping	PCM 7.5 tapping	PCM 10 tapping*	PCM 15 tapping*	PCM 22.5 tapping	PCM 27.5 tapping			
Carrier tape width	W	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5			
Hold-down tape width	W <sub>0</sub>	6.0 for hot-sealing adhesive tape	6.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape			
Hole position	W <sub>1</sub>	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5			
Hold-down tape position	W <sub>2</sub>	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.			
Feed hole diameter	D <sub>0</sub>	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2			
Pitch of component	P	12.7 ±1.0	12.7 ±1.0	12.7 ±1.0	25.4 ±1.0	25.4 ±1.0	38.1 ±1.5	38.1 ±1.5 or 50.8 ±1.5			
Feed hole pitch	P <sub>0</sub>	12.7 ±0.3 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 <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 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 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> 32.25 max.	H+H <sub>component</sub> < H <sub>1</sub> 32.25 max.	H+H <sub>component</sub> < H <sub>1</sub> 24.5 to 31.5	H+H <sub>component</sub> < H <sub>1</sub> 25.0 to 31.5	H+H <sub>component</sub> < H <sub>1</sub> 26.0 to 37.0	H+H <sub>component</sub> < H <sub>1</sub> 30.0 to 43.0	H+H <sub>component</sub> < H <sub>1</sub> 35.0 to 45.0			
Pin spacing at upper edge of carrier tape	F	2.5 ±0.5	5.0 <sup>+0.8</sup> <sub>-0.2</sub>	7.5 ±0.8	10.0 ±0.8	15 ±0.8	22.5 ±0.8	27.5 ±0.8			
Pin diameter	d	0.4 ±0.05	0.5 ±0.05	0.5 ±0.05 or 0.6 <sup>+0.06</sup> <sub>-0.05</sub>	0.5 ±0.05 or 0.6 <sup>+0.06</sup> <sub>-0.05</sub>	0.8 <sup>+0.08</sup> <sub>-0.05</sub>	0.8 <sup>+0.08</sup> <sub>-0.05</sub>	0.8 <sup>+0.08</sup> <sub>-0.05</sub>			
Component alignment	Δh	± 2.0 max.	± 2.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.			
Total tape thickness	t	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2			
Package (see also page 149)	ROLL/AMMO				AMMO						
	REEL	φ 360 max. φ 30 ±1	B 52 ±2 58 ±2	depending on comp. dimensions		REEL	φ 360 max. φ 30 ±1	B 52 ±2 58 ±2 or 66 ±2	REEL	φ 500 max. φ 25 ±1	B 60 ±2 68 ±2
Unit	see details page 150.										

Dims in mm.

\* Diameter of pins see General Data.

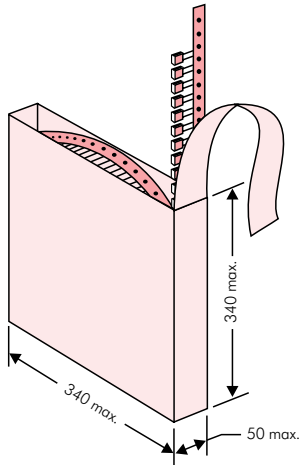
\* PCM 10 and PCM 15 can be crimped to PCM 7.5.

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

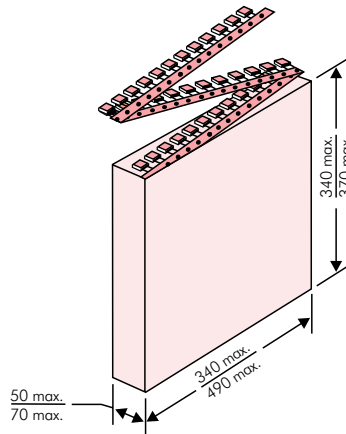
Please clarify customer-specific deviations with the manufacturer.

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

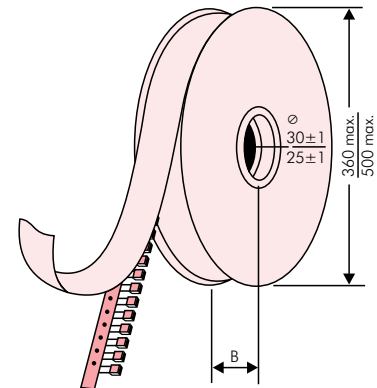
### ■ ROLL Packaging



### ■ AMMO Packaging



### ■ REEL Packaging



## BAR CODE (Labelling)

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

Scanner decoding of

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

In addition part description of

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

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

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

BARCODE „Code 39“





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

PCM	Size				bulk	pcs. per packing unit								
						ROLL		REEL				AMMO		
	W	H	L	Codes		S	H16.5	H18.5	ø 360	ø 500	340 × 340	490 × 370		
					N	O	F	I	H	J	A	C	B	D
<b>2.5 mm</b>	2.5	7	4.6	<b>0B</b>	5000		2200	2500				2800		
	3	7.5	4.6	<b>0C</b>	5000		2000	2300				2300		
	3.8	8.5	4.6	<b>0D</b>	5000		1500	1800				1800		
	4.6	9	4.6	<b>0E</b>	5000		1200	1500				1500		
	5.5	10	4.6	<b>0F</b>	5000		900	1200				1200		
<b>5 mm</b>	2.5	6.5	7.2	<b>1A</b>	5000		2200	2500				2800		
	3	7.5	7.2	<b>1B</b>	5000		2000	2300				2300		
	3.5	8.5	7.2	<b>1C</b>	5000		1600	2000				2000		
	4.5	6	7.2	<b>1D</b>	6000		1300	1500				1500		
	4.5	9.5	7.2	<b>1E</b>	4000		1300	1500				1500		
	5	10	7.2	<b>1F</b>	3500		1100	1400				1400		
	5.5	7	7.2	<b>1G</b>	4000		1000	1200				1200		
	5.5	11.5	7.2	<b>1H</b>	2500		1000	1200				1200		
	6.5	8	7.2	<b>1I</b>	2500		800	1000				1000		
	7.2	8.5	7.2	<b>1J</b>	2500		700	1000				1000		
	7.2	13	7.2	<b>1K</b>	2000		700	950				1000		
	8.5	10	7.2	<b>1L</b>	2000		600	800				800		
	8.5	14	7.2	<b>1M</b>	1500		600	800				800		
11	16	7.2	<b>1N</b>	1000		500	600				400			
<b>7.5 mm</b>	2.5	7	10	<b>2A</b>	5000			2500	4400		2500			
	3	8.5	10	<b>2B</b>	5000			2200	4300		2300		4150	
	4	9	10	<b>2C</b>	4000			1700	3200		1700		3100	
	4.5	9.5	10.3	<b>2D</b>	3500			1500	2900		1400		2800	
	5	10.5	10.3	<b>2E</b>	3000			1300	2500		1300			
	5.7	12.5	10.3	<b>2F</b>	2000			1000	2200		1100			
	7.2	12.5	10.3	<b>2G</b>	1500			900	1800		1000			
<b>10 mm</b>	3	9	13	<b>3A</b>	3000			1100	2200				1900	
	4	8.5	13.5	<b>FA</b>	3000			900	1600				1450	
	4	9	13	<b>3C</b>	3000			900	1600				1450	
	4	9.5	13	<b>3D</b>	3000			900	1600				1400	
	5	10	13.5	<b>FB</b>	2000			700	1300				1200	
	5	11	13	<b>3F</b>	3000			700	1300				1200	
	6	12	13	<b>3G</b>	2400			550	1100				1000	
	6	12.5	13	<b>3H</b>	2400			550	1100				1000	
8	12	13	<b>3I</b>	2000			400	800				740		
<b>15 mm</b>	5	11	18	<b>4B</b>	2400			600	1200				1150	
	5	13	19	<b>FC</b>	1000			600	1200				1200	
	6	12.5	18	<b>4C</b>	2000			500	1000				1000	
	6	14	19	<b>FD</b>	1000			500	1000				1000	
	7	14	18	<b>4D</b>	1600			450	900				850	
	7	15	19	<b>FE</b>	1000			450	900				850	
	8	15	18	<b>4F</b>	1200			400	800				740	
	8	17	19	<b>FF</b>	500			400	800				740	
	9	14	18	<b>4H</b>	1200			350	700				650	
	9	16	18	<b>4J</b>	900			350	700				650	
	10	18	19	<b>FG</b>	500			300	650				590	
11	14	18	<b>4M</b>	1000			300	600				540		
<b>22.5 mm</b>	5	14	26.5	<b>5A</b>	1200				800				770	
	6	15	26.5	<b>5B</b>	1000				700				640	
	7	16.5	26.5	<b>5D</b>	760				600				550	
	8	20	28	<b>FH</b>	500				500				480	
	8.5	18.5	26.5	<b>5F</b>	500				480				450	
	10	22	28	<b>FI</b>	540*				420				380	
	10.5	19	26.5	<b>5G</b>	680*				400				360	
	10.5	20.5	26.5	<b>5H</b>	680*				400				360	
	11	21	26.5	<b>5I</b>	680*				380				350	
	12	24	28	<b>FJ</b>	450*				350				310	

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

■ Moulded versions.

Rights reserved to amend design data without prior notification.





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

PCM	Size				bulk	pcs. per packing unit											
						ROLL		REEL				AMMO					
	W	H	L	Codes		S	N	O	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
								F	I	H	J	A	C	B	D		
<b>27.5 mm</b>	9	19	31.5	<b>6A</b>	640*						460/340*				420		
	11	21	31.5	<b>6B</b>	544*						380/280*				350		
	13	24	31.5	<b>6D</b>	448*						300				290		
	13	25	33	<b>6K</b>	336*												
	15	26	31.5	<b>6F</b>	384*						270				250		
	15	26	33	<b>6L</b>	288*												
	17	29	31.5	<b>6G</b>	176*												
	17	34.5	31.5	<b>6I</b>	176*												
	20	32	33	<b>6M</b>	216*												
	20	39.5	31.5	<b>6J</b>	144*												
<b>37.5 mm</b>	9	19	41.5	<b>7A</b>	480*												
	11	22	41.5	<b>7B</b>	408*												
	13	24	41.5	<b>7C</b>	252*												
	15	26	41.5	<b>7D</b>	144*												
	17	29	41.5	<b>7E</b>	132*												
	19	32	41.5	<b>7F</b>	108*												
	20	39.5	41.5	<b>7G</b>	108*												
	24	45.5	41.5	<b>7H</b>	84*												
	27	15	41.5	<b>7M</b>	100*												
	31	46	41.5	<b>7I</b>	72*												
	35	50	41.5	<b>7J</b>	35*												
	40	55	41.5	<b>7K</b>	28*												
<b>48.5 mm</b>	19	31	56	<b>8D</b>	50*												
	23	34	56	<b>8E</b>	72*												
	27	37.5	56	<b>8H</b>	60*												
	33	48	56	<b>8J</b>	48*												
	37	54	56	<b>8L</b>	25*												
<b>52.5 mm</b>	35	50	57	<b>9F</b>	25*												
	45	55	57	<b>9H</b>	20*												
	45	65	57	<b>9J</b>	20*												

\* for 2-inch transport pitches.

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

■ Moulded versions.

Rights reserved to amend design data without prior notification.



# 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 $\mu$ F			2.5x6.5x7.2		-	20%	bulk	6-2			
<b>Type description:</b>				<b>Rated voltage:</b>		<b>Capacitance:</b>			<b>Size:</b>		<b>Tolerance:</b>			<b>Packing:</b>			
SMD-PET = SMDT				50 VDC = B0		22 pF = 0022			4.8x3.3x3 Size 1812 = KA		±20% = M			<b>Packing:</b> AMMO H16.5 340x340 = A AMMO H16.5 490x370 = B AMMO H18.5 340x340 = C AMMO H18.5 490x370 = 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 ...			
SMD-PEN = SMDN				63 VDC = C0		47 pF = 0047			4.8x3.3x4 Size 1812 = KB		±10% = K						
SMD-PPS = SMDI				100 VDC = D0		100 pF = 0100			5.7x5.1x3.5 Size 2220 = QA		±5% = J						
FKP 02 = FKPO				250 VDC = F0		150 pF = 0150			5.7x5.1x4.5 Size 2220 = QB		±2.5% = H						
MKS 02 = MKS0				400 VDC = G0		220 pF = 0220			7.2x6.1x3 Size 2824 = TA		±1% = E						
FKS 2 = FKS2				450 VDC = H0		330 pF = 0330			7.2x6.1x5 Size 2824 = TB		...						
FKP 2 = FKP2				600 VDC = I0		470 pF = 0470			10.2x7.6x5 Size 4030 = VA								
MKS 2 = MKS2				630 VDC = J0		680 pF = 0680			12.7x10.2x6 Size 5040 = XA								
MKP 2 = MKP2				700 VDC = K0		1000 pF = 1100			15.3x13.7x7 Size 6054 = YA								
FKS 3 = FKS3				800 VDC = L0		1500 pF = 1150			2.5x7x4.6 PCM 2.5 = 0B								
FKP 3 = FKP3				850 VDC = M0		2200 pF = 1220			3x7.5x4.6 PCM 2.5 = 0C								
MKS 4 = MKS4				900 VDC = N0		3300 pF = 1330			2.5x6.5x7.2 PCM 5 = 1A								
MKP 4 = MKP4				1000 VDC = O1		4700 pF = 1470			3x7.5x7.2 PCM 5 = 1B								
MKP 10 = MKP1				1100 VDC = P0		6800 pF = 1680			2.5x7x10 PCM 7.5 = 2A								
FKP 4 = FKP4				1200 VDC = Q0		0.01 $\mu$ F = 2100			3x8.5x10 PCM 7.5 = 2B								
FKP 1 = FKP1				1250 VDC = R0		0.022 $\mu$ F = 2220			3x9x13 PCM 10 = 3A								
MKP-X2 = MKX2				1500 VDC = S0		0.047 $\mu$ F = 2470			4x9x13 PCM 10 = 3C								
MKP-X2 R = MKXR				1600 VDC = T0		0.1 $\mu$ F = 3100			5x11x18 PCM 15 = 4B								
MKP-X1 R = MKX1				2000 VDC = U0		0.22 $\mu$ F = 3220			6x12.5x18 PCM 15 = 4C								
MKP-Y2 = MKY2				2500 VDC = V0		0.47 $\mu$ F = 3470			5x14x26.5 PCM 22.5 = 5A								
MP 3-X2 = MPX2				3000 VDC = W0		1 $\mu$ F = 4100			6x15x26.5 PCM 22.5 = 5B								
MP 3-X1 = MPX1				4000 VDC = X0		2.2 $\mu$ F = 4220			9x19x31.5 PCM 27.5 = 6A								
MP 3-Y2 = MPY2				6000 VDC = Y0		4.7 $\mu$ F = 4470			11x21x31.5 PCM 27.5 = 6B								
MP 3R-Y2 = MPRY				250 VAC = 0W		10 $\mu$ F = 5100			9x19x41.5 PCM 37.5 = 7A								
Snubber MKP = SNMP				275 VAC = 1W		22 $\mu$ F = 5220			11x22x41.5 PCM 37.5 = 7B								
Snubber FKP = SNFP				300 VAC = 2W		47 $\mu$ F = 5470			19x31x56 PCM 48.5 = 8D								
GTO MKP = GTOM				305 VAC = AW		100 $\mu$ F = 6100			35x50x57 PCM 52.5 = 9F								
DC-LINK MKP 3 = DCP3				400 VAC = 3W		220 $\mu$ F = 6220			...								
DC-LINK MKP 4 = DCP4				440 VAC = 4W		1000 $\mu$ F = 7100											
DC-LINK MKP 4S = DCP4S				500 VAC = 5W		1500 $\mu$ F = 7150											
DC-LINK MKP 5 = DCP5				...		...											
DC-LINK MKP 6 = DCP6																	
DC-LINK HC = DCHC																	
									<b>Version code:</b>		<b>Pin length (untaped)</b>						
									Standard = 00		3.5 ±0.5 = C9						
									Version A1 = 1A		6-2 = SD						
									Version A1.1.1 = 1B		16 ±1 = P1						
									Version A2 = 2A		...						
									...								

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.