

## Metallized Polypropylene (PP) RFI-Capacitors Class X1 with Internal Series Connection in PCM 10 mm to 37.5 mm. Capacitances from 1000 pF to 2.2 µF. Rated Voltage 440 VAC.

### Special Features

- Reliable self-healing
- Increased corona inception level due to internal series connection
- High degree of interference suppression due to good attenuation and low ESR
- According to RoHS 2011/65/EU

### Typical Applications

Class X1 RFI applications to meet EMC regulations

- Capacitors connected to the mains between phase and neutral or phase and phase conductors
- High peak voltage applications, pulse peak voltage  $\leq 4$  kV

### Construction

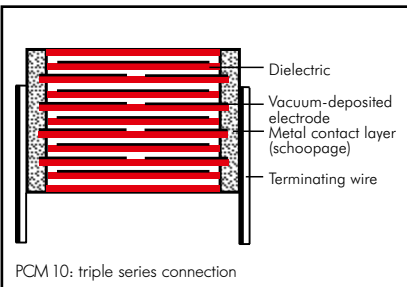
#### Dielectric:

Polypropylene (PP) film

#### Capacitor electrodes:

Vacuum-deposited

#### Internal construction:



#### Encapsulation:

Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0

#### Terminations:

Tinned wire.

#### Marking:

Colour: Red. Marking: Black.

### Electrical Data

**Capacitance range:** 1000 pF to 2.2 µF

**Rated voltage:** 440 VAC

**Continuous DC voltage\*** (general guide):  $\leq 1000$  V

**Capacitance tolerances:**  $\pm 20\%$ ,  $\pm 10\%$ ,  $\pm 5\%$

**Operating temperature range:**  $-55^\circ\text{C}$  to  $+105^\circ\text{C}$

#### Climatic test category:

55/105/56 in accordance with IEC

Passive flammability class:

B for capacitors with  $V > 1750$  mm<sup>3</sup>

C for capacitors with  $V \leq 1750$  mm<sup>3</sup>

#### Test specifications:

In accordance with IEC 60384-14

#### Dissipation factors at $+20^\circ\text{C}$ : $\tan \delta$

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	$\leq 18 \times 10^{-4}$	$\leq 20 \times 10^{-4}$	$\leq 30 \times 10^{-4}$
10 kHz	$\leq 20 \times 10^{-4}$	$\leq 60 \times 10^{-4}$	-
100 kHz	$\leq 100 \times 10^{-4}$	-	-

**Insulation resistance** at  $+20^\circ\text{C}$ :

$C \leq 0.33 \mu\text{F}$ :  $\geq 1.5 \times 10^4$  MΩ

$C > 0.33 \mu\text{F}$ :  $\geq 5000$  sec (MΩ x µF)

Measuring voltage: 100 V/1 min.

#### Maximum pulse rise time:

100 V/µsec for pulses equal to a voltage amplitude with  $\sqrt{2} \times 440$  VAC = 623 V according to IEC 60384-14

#### Test voltage:

$C \leq 1.0 \mu\text{F}$ : 2260 VDC, 2sec.

$C > 1.0 \mu\text{F}$ : 1900 VDC, 2sec.

#### Reliability:

Operational life  $> 300\,000$  hours

Failure rate  $< 2$  fit ( $0.5 \times U_r$  and  $40^\circ\text{C}$ )

### Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14/4		40041297
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14		E 134915

### Mechanical Tests

**Pull test on pins:** 10 N in direction of pins according to IEC 60068-2-21

**Vibration:** 6 hours at 10...2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6

**Low air density:** 1kPa = 10 mbar in accordance with IEC 60068-2-13

**Bump test:** 4000 bumps at 390 m/sec<sup>2</sup> in accordance with IEC 60068-2-29

\* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time  $du/dt$  ( $F_{\text{max}}$ ) will be subject to a reduction according to

$$F_{\text{max}} = F_r \times \sqrt{2} \times \text{UAC} / \text{UDC}$$

if the DC operating voltage UDC is higher than  $\sqrt{2} \times \text{UAC}$

### 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

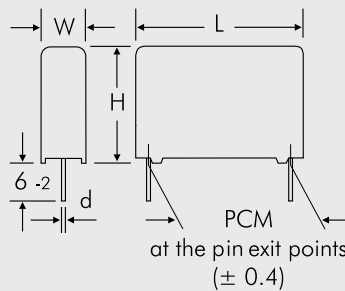
Capacitance	440 VAC*				PCM**	Part number
	W	H	L			
1000 pF	4	9.5	13		10	MKX14W11003D00_
1200 "	4	9.5	13		10	MKX14W11203D00_
1500 "	4	9.5	13		10	MKX14W11503D00_
1800 "	4	9.5	13		10	MKX14W11803D00_
2200 "	4	9.5	13		10	MKX14W12203D00_
2700 "	4	9.5	13		10	MKX14W12703D00_
3300 "	4	9.5	13		10	MKX14W13303D00_
3900 "	4	9.5	13		10	MKX14W13903D00_
4700 "	5	11	13		10	MKX14W14703F00_
5600 "	5	11	13		10	MKX14W15603F00_
6800 "	6	12.5	13		10	MKX14W16803H00_
	5	11	18		15	MKX14W16804B00_
8200 "	6	12.5	13		10	MKX14W18203H00_
	5	11	18		15	MKX14W18204B00_
0.01 µF	8	12	13		10	MKX14W21003I00_
	5	11	18		15	MKX14W21004B00_
0.012 "	5	11	18		15	MKX14W21204B00_
0.015 "	5	11	18		15	MKX14W21504B00_
0.018 "	5	11	18		15	MKX14W21804B00_
0.022 "	6	12.5	18		15	MKX14W22204C00_
0.027 "	6	12.5	18		15	MKX14W22704C00_
0.033 "	8	15	18		15	MKX14W23304F00_
0.039 "	8	15	18		15	MKX14W23904F00_
0.047 "	8	15	18		15	MKX14W24704F00_
0.056 "	8	15	18		15	MKX14W25604F00_
0.068 "	9	16	18		15	MKX14W26804J00_
	6	15	26.5		22.5	MKX14W26805B00_
0.082 "	7	16.5	26.5		22.5	MKX14W28205D00_

\* f = 50/60 Hz

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

Dims. in mm.

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



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 161.	

Rights reserved to amend design data without prior notification.

Continuation page 98

## Continuation

### General Data

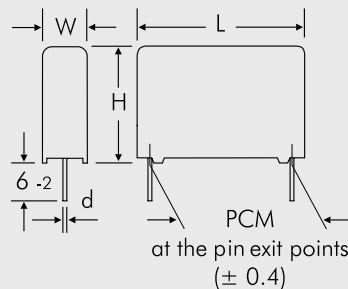
Capacitance	440 VAC*				PCM**	Part number
	W	H	L			
0.1 $\mu$ F	6	15	26.5		22.5	MKX14W31005B00_____
	7	16.5	26.5		22.5	MKX14W31005D00_____
0.12 "	7	16.5	26.5		22.5	MKX14W31205D00_____
	8.5	18.5	26.5		22.5	MKX14W31205F00_____
0.15 "	7	16.5	26.5		22.5	MKX14W31505D00_____
	8.5	18.5	26.5		22.5	MKX14W31505F00_____
0.18 "	9	19	31.5		27.5	MKX14W31506A00_____
	8.5	18.5	26.5		22.5	MKX14W31805F00_____
	10.5	19	26.5		22.5	MKX14W31805G00_____
0.22 "	9	19	31.5		27.5	MKX14W31806A00_____
	8.5	18.5	26.5		22.5	MKX14W32205F00_____
	11	21	26.5		22.5	MKX14W32205I00_____
0.27 "	9	19	31.5		27.5	MKX14W32206A00_____
	10.5	19	26.5		22.5	MKX14W32705G00_____
	9	19	31.5		27.5	MKX14W32706A00_____
0.33 "	11	21	31.5		27.5	MKX14W32706B00_____
	11	21	26.5		22.5	MKX14W33305I00_____
	9	19	31.5		27.5	MKX14W33306A00_____
0.39 "	11	21	31.5		27.5	MKX14W33306B00_____
	13	24	41.5		37.5	MKX14W33307C00_____
	11	21	31.5		27.5	MKX14W33906B00_____
	13	24	31.5		27.5	MKX14W33906D00_____
0.47 "	13	24	41.5		37.5	MKX14W33907C00_____
	11	21	31.5		27.5	MKX14W34706B00_____
	15	26	31.5		27.5	MKX14W34706F00_____
0.56 "	13	24	41.5		37.5	MKX14W34707C00_____
	13	24	31.5		27.5	MKX14W35606D00_____
	15	26	31.5		27.5	MKX14W35606F00_____
	13	24	41.5		37.5	MKX14W35607C00_____
0.68 "	15	26	41.5		37.5	MKX14W35607D00_____
	15	26	31.5		27.5	MKX14W36806F00_____
	17	29	31.5		27.5	MKX14W36806G00_____
	13	24	41.5		37.5	MKX14W36807C00_____
0.82 "	15	26	41.5		37.5	MKX14W36807D00_____
	17	29	41.5		37.5	MKX14W36807E00_____
	15	26	31.5		27.5	MKX14W38206F00_____
	17	34.5	31.5		27.5	MKX14W38206I00_____
	13	24	41.5		37.5	MKX14W38207C00_____
	17	29	41.5		37.5	MKX14W38207E00_____
	19	32	41.5		37.5	MKX14W38207F00_____

\* f = 50/60 Hz

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

Dims. in mm.

d = 0.8  $\phi$  if PCM  $\leq$  27.5  
d = 1.0  $\phi$  if PCM = 37.5



Part number completion:

Tolerance: 20 % = M

10 % = K

5 % = J

Packing: bulk = S

Pin length: 6-2 = SD

Taped version see page 161.

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## Continuation

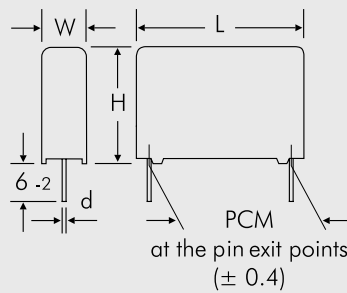
### General Data

Capacitance	440 VAC*				
	W	H	L	PCM**	Part number
1.0 $\mu$ F	17	29	31.5	27.5	MKX14W41006G00_____
	20	39.5	31.5	27.5	MKX14W41006J00_____
	15	26	41.5	37.5	MKX14W41007D00_____
	17	29	41.5	37.5	MKX14W41007E00_____
	20	39.5	41.5	37.5	MKX14W41007G00_____
1.2 "	17	34.5	31.5	27.5	MKX14W41206I00_____
	17	29	41.5	37.5	MKX14W41207E00_____
1.5 "	20	39.5	31.5	27.5	MKX14W41506J00_____
	19	32	41.5	37.5	MKX14W41507F00_____
1.8 "	19	32	41.5	37.5	MKX14W41807F00_____
2.2 "	20	39.5	41.5	37.5	MKX14W42207G00_____

\*  $f = 50/60$  Hz

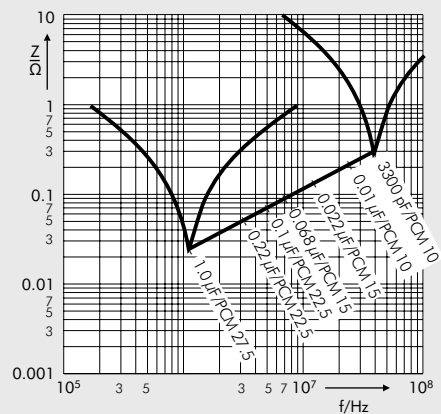
\*\* PCM = Printed circuit module = pin spacing

Dims. in mm.



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 161.	

$d = 0.8 \varnothing$  if PCM = 27.5  
 $d = 1.0 \varnothing$  if PCM = 37.5



Impedance change with frequency (general guide).

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## 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:  $T_{max.} \leq 110^{\circ}C$

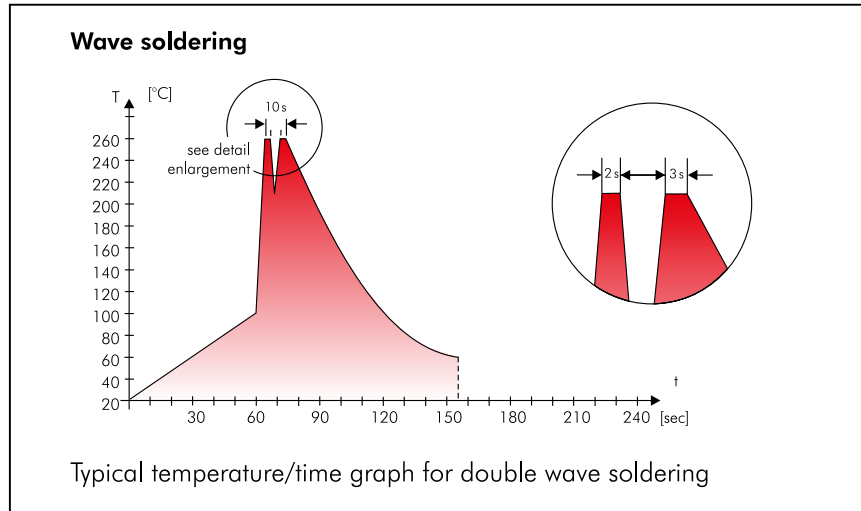
### Single wave soldering

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 9001:2015 Certification

ISO 9001:2015 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2015 of our factories by the infaz (Institut für Auditierung und Zertifizierung) certifies that organisation, equipment and monitoring of quality assurance in our factories correspond to internationally recognized standards.

### WIMA WPCS

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

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

### WIMA Environmental Policy

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

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

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

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

We almost completely refrain from using packing materials such as:

- adhesive tapes made of plastic
- metal clips

### RoHS Compliance

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

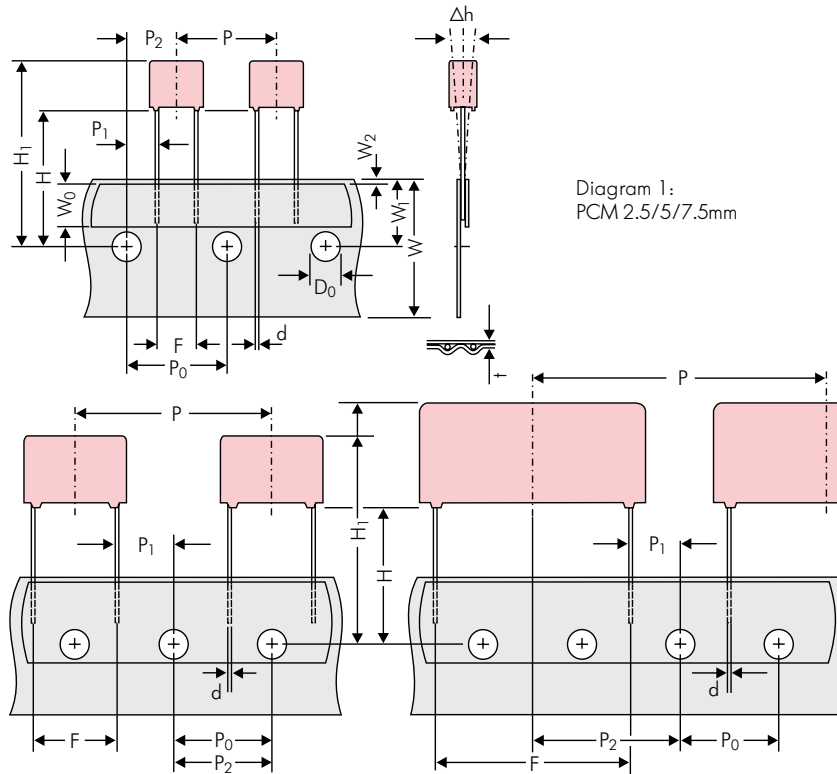


Diagram 1:  
PCM 2.5/5/7.5mm

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 <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 162)	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	52 ±2 58 ±2 or 66 ±2	REEL	φ 500 max. φ 25 ±1
Unit	see details page 163.							

Dims in mm.

\* Diameter of pins see General Data.

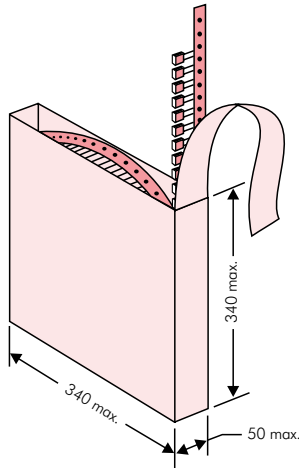
\* PCM 10 and PCM 15 can be crimped to PCM 7.5.

Position of components according to PCM 7.5 (sketch 11). P<sub>0</sub> = 12.7 or 15.0 is possible

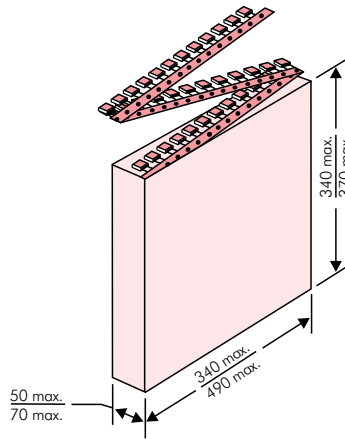
Please clarify customer-specific deviations with the manufacturer.

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

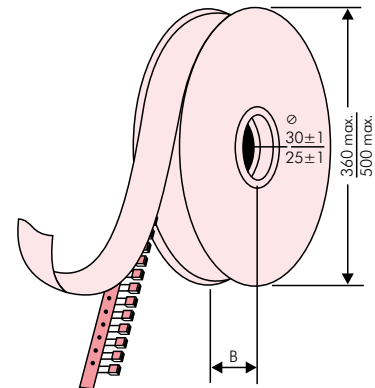
### ■ ROLL Packaging



### ■ AMMO Packaging



### ■ REEL Packaging



## BAR CODE (Labelling)

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

- 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 Best Capacitors Made in Germany</b>	
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
<b>WIMA - MKP 10</b> WIMA Part No.: MKP1F041006B00KSSD MKP 10 1.0 µF 250 VDC 11x21x31.5 RM27.5 Standard 10%    Lose - Standard    Drähte 6-2 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	pcs. per packing unit									
						ROLL		REEL				AMMO			
	W	H	L	Codes		S	H16.5 N	H18.5 O	ø 360 H16.5 F	ø 500 H18.5 I	H16.5 H	H18.5 J	340 x 340 H16.5 A	490 x 370 H18.5 C	H16.5 B
<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		-
<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		2700
	5	10.5	10.3	<b>2E</b>	3000		-		1300		2500		1300		-
	5.7	12.5	10.3	<b>2F</b>	2000		-		1000		2200		1100		-
	7.2	12.5	10.3	<b>2G</b>	1500		-		900		1800		1000		-
<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
<b>15 mm</b>	8	12	13	<b>3I</b>	2000		-		400		800		-		740
	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
<b>22.5 mm</b>	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
	5	14	26.5	<b>5A</b>	1200		-		-		800		-		770
	6	15	26.5	<b>5B</b>	1000		-		-		700		-		640
	7	16.5	26.5	<b>5D</b>	760		-		-		600		-		550
	8	20	28	<b>FH</b>	500		-		-		500		-		480
	8.5	18.5	26.5	<b>5F</b>	500		-		-		480		-		450
10	22	28	<b>FI</b>	570*		-		-		420		-		380	
10.5	19	26.5	<b>5G</b>	594*		-		-		400		-		360	
10.5	20.5	26.5	<b>5H</b>	594*		-		-		400		-		360	
11	21	26.5	<b>5I</b>	561*		-		-		380		-		350	
12	24	28	<b>FJ</b>	480*		-		-		350		-		310	

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

■ Moulded versions.

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 x 340		490 x 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>	567*	-	-	-	-	460/340*	-	-	-	-	-	-	-
	11	21	31.5	<b>6B</b>	459*	-	-	-	-	380/280*	-	-	-	-	-	-	-
	13	24	31.5	<b>6D</b>	378*	-	-	-	-	300	-	-	-	-	-	-	-
	13	25	33	<b>FK</b>	405*	-	-	-	-	-	-	-	-	-	-	-	-
	15	26	31.5	<b>6F</b>	324*	-	-	-	-	270	-	-	-	-	-	-	-
	15	26	33	<b>FL</b>	324*	-	-	-	-	-	-	-	-	-	-	-	-
	17	29	31.5	<b>6G</b>	198*	-	-	-	-	-	-	-	-	-	-	-	-
	17	34.5	31.5	<b>6I</b>	198*	-	-	-	-	-	-	-	-	-	-	-	-
	20	32	33	<b>FM</b>	162*	-	-	-	-	-	-	-	-	-	-	-	-
20	39.5	31.5	<b>6J</b>	162*	-	-	-	-	-	-	-	-	-	-	-	-	
<b>37.5 mm</b>	9	19	41.5	<b>7A</b>	441*	-	-	-	-	-	-	-	-	-	-	-	
	11	22	41.5	<b>7B</b>	357*	-	-	-	-	-	-	-	-	-	-	-	
	13	24	41.5	<b>7C</b>	294*	-	-	-	-	-	-	-	-	-	-	-	
	15	26	41.5	<b>7D</b>	252*	-	-	-	-	-	-	-	-	-	-	-	
	17	29	41.5	<b>7E</b>	154*	-	-	-	-	-	-	-	-	-	-	-	
	19	32	41.5	<b>7F</b>	140*	-	-	-	-	-	-	-	-	-	-	-	
	20	39.5	41.5	<b>7G</b>	126*	-	-	-	-	-	-	-	-	-	-	-	
	24	45.5	41.5	<b>7H</b>	112*	-	-	-	-	-	-	-	-	-	-	-	
	28	38	41.5	<b>7L</b>	84*	-	-	-	-	-	-	-	-	-	-	-	
	31	46	41.5	<b>7I</b>	84*	-	-	-	-	-	-	-	-	-	-	-	
	35	50	41.5	<b>7J</b>	35*	-	-	-	-	-	-	-	-	-	-	-	
40	55	41.5	<b>7K</b>	28*	-	-	-	-	-	-	-	-	-	-	-		
<b>48.5 mm</b>	19	31	56	<b>8D</b>	120*	-	-	-	-	-	-	-	-	-	-		
	23	34	56	<b>8E</b>	80*	-	-	-	-	-	-	-	-	-	-		
	27	37.5	56	<b>8H</b>	84*	-	-	-	-	-	-	-	-	-	-		
	33	48	56	<b>8J</b>	25*	-	-	-	-	-	-	-	-	-	-		
	37	54	56	<b>8L</b>	25*	-	-	-	-	-	-	-	-	-	-		
<b>52.5 mm</b>	25	45	57	<b>9D</b>	70*	-	-	-	-	-	-	-	-	-			
	30	45	57	<b>9E</b>	60*	-	-	-	-	-	-	-	-	-			
	35	50	57	<b>9F</b>	25*	-	-	-	-	-	-	-	-	-			
	45	55	57	<b>9H</b>	20*	-	-	-	-	-	-	-	-	-			
	45	65	57	<b>9J</b>	20*	-	-	-	-	-	-	-	-	-			

\* for 2-inch transport pitches.

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

■ Moulded versions. 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
<b>M</b>	<b>K</b>	<b>S</b>	<b>2</b>	<b>C</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>A</b>	<b>0</b>	<b>0</b>	<b>M</b>	<b>S</b>	<b>S</b>	<b>D</b>
MKS 2				63 VDC		0.01 µF			2.5x6.5x7.2		-		20%	bulk	6 -2		

<p><b>Type description:</b></p> <p>SMD-PET = SMDT  SMD-PEN = SMDN  SMD-PPS = SMDI  FKP 02 = FKPO  MKS 02 = MKS0  FKS 2 = FKS2  FKP 2 = FKP2  FKS 3 = FKS3  FKP 3 = FKP 3  MKS 2 = MKS2  MKP 2 = MKP2  MKS 4 = MKS4  MKP 4 = MKP4  MKP 10 = MKP1  FKP 4 = FKP4  FKP 1 = FKP1  MKP-X2 = MKX2  MKP-X1 R = MKX1  MKP-Y2 = MKY2  MP 3-X2 = MPX2  MP 3-X1 = MPX1  MP 3-Y2 = MPY2  MP 3R-Y2 = MPRY  MKP 4F = MKPF  Snubber MKP = SNMP  Snubber FKP = SNFP  GTO MKP = GTOM  DC-LINK MKP 4 = DCP4  DC-LINK MKP 6 = DCP6  DC-LINK HC = DCHC</p>	<p><b>Rated voltage:</b></p> <p>50 VDC = B0  63 VDC = C0  100 VDC = D0  250 VDC = F0  400 VDC = G0  450 VDC = H0  520 VDC = H2  600 VDC = I0  630 VDC = J0  700 VDC = K0  800 VDC = L0  850 VDC = M0  900 VDC = N0  1000 VDC = O1  1100 VDC = P0  1200 VDC = Q0  1250 VDC = R0  1500 VDC = S0  1600 VDC = T0  1700 VDC = TA  2000 VDC = U0  2500 VDC = V0  3000 VDC = W0  4000 VDC = X0  6000 VDC = Y0  250 VAC = 0W  275 VAC = 1W  300 VAC = 2W  305 VAC = AW  350 VAC = BW  440 VAC = 4W  500 VAC = 5W  ...</p>	<p><b>Capacitance:</b></p> <p>22 pF = 0022  47 pF = 0047  100 pF = 0100  150 pF = 0150  220 pF = 0220  330 pF = 0330  470 pF = 0470  680 pF = 0680  1000 pF = 1100  1500 pF = 1150  2200 pF = 1220  3300 pF = 1330  4700 pF = 1470  6800 pF = 1680  0.01 µF = 2100  0.022 µF = 2220  0.047 µF = 2470  0.1 µF = 3100  0.22 µF = 3220  0.47 µF = 3470  1 µF = 4100  2.2 µF = 4220  4.7 µF = 4470  10 µF = 5100  22 µF = 5220  47 µF = 5470  100 µF = 6100  220 µF = 6220  1000 µF = 7100  1500 µF = 7150  ...</p>	<p><b>Size:</b></p> <p>4.8x3.3x3 Size 1812 = KA  4.8x3.3x4 Size 1812 = KB  5.7x5.1x3.5 Size 2220 = QA  5.7x5.1x4.5 Size 2220 = QB  7.2x6.1x3 Size 2824 = TA  7.2x6.1x5 Size 2824 = TB  10.2x7.6x5 Size 4030 = VA  12.7x10.2x6 Size 5040 = XA  15.3x13.7x7 Size 6054 = YA  2.5x7x4.6 PCM 2.5 = 0B  3x7.5x4.6 PCM 2.5 = 0C  2.5x6.5x7.2 PCM 5 = 1A  3x7.5x7.2 PCM 5 = 1B  2.5x7x10 PCM 7.5 = 2A  3x8.5x10 PCM 7.5 = 2B  3x9x13 PCM 10 = 3A  4x9x13 PCM 10 = 3C  5x11x18 PCM 15 = 4B  6x12.5x18 PCM 15 = 4C  5x14x26.5 PCM 22.5 = 5A  6x15x26.5 PCM 22.5 = 5B  9x19x31.5 PCM 27.5 = 6A  11x21x31.5 PCM 27.5 = 6B  9x19x41.5 PCM 37.5 = 7A  11x22x41.5 PCM 37.5 = 7B  19x31x56 PCM 48.5 = 8D  25x45x57 PCM 52.5 = 9D  ...</p>	<p><b>Tolerance:</b></p> <p>±20% = M  ±10% = K  ±5% = J  ±2.5% = H  ±1% = E  ...</p> <p><b>Packing:</b></p> <p>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  ...</p>
			<p><b>Version code:</b></p> <p>Standard = 00  Version A1 = 1A  Version A1.1.1 = 1B  Version A2 = 2A  ...</p>	<p><b>Pin length (untaped)</b></p> <p>3.5 ±0.5 = C9  6 -2 = SD  16 ±1 = P1  ...</p> <p><b>Pin length (taped)</b></p> <p>none = 00</p>

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.