

## Snubber MKP Capacitors for Pulse Applications with Double-Sided Metallized Electrodes and Internal Series Connection. Capacitances from 0.047 $\mu\text{F}$ to 8.0 $\mu\text{F}$ . Rated Voltages from 700 VDC to 3000 VDC.

### Special Features

- Pulse duty construction
- Self-healing
- Particularly reliable contact-configurations: 4-pin versions and screwable plate connections
- 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 requiring extremely reliable contacts e.g.

- IGBT-applications

### Construction

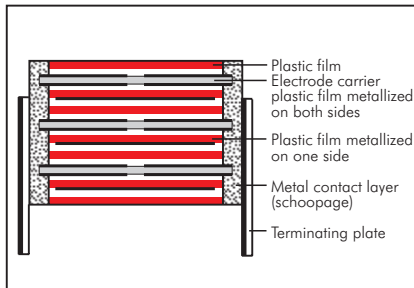
#### Dielectric:

Polypropylene (PP) film

#### Capacitor electrodes:

Double-sided metallized plastic film

#### Internal construction:



#### Encapsulation:

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

#### Terminations:

Tinned wire or plates.

#### Marking:

Colour: Red. Marking: Black.  
Epoxy resin seal: Red

### Electrical Data

**Capacitance range:** 0.047  $\mu\text{F}$  to 8.0  $\mu\text{F}$

**Rated voltages:** 700 VDC, 850 VDC, 1000 VDC, 1250 VDC, 1700 VDC, 2000 VDC, 2500 VDC, 3000 VDC

#### Capacitance tolerances:

$\pm 20\%$ ,  $\pm 10\%$ ,  $\pm 5\%$  (other tolerances are available subject to special enquiry)

#### Operating temperature range:

$-55^\circ\text{C}$  to  $+100^\circ\text{C}$

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

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

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

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

(mean value: 100 000 sec)

Measuring voltage: 100 V/1 min.

#### Test voltage: 2 sec

L	$\leq 2000 \text{ VDC}$	2500 VDC	$\geq 3000 \text{ VDC}$
$< 41.5$	$1.6 U_r$	$1.4 U_r$	$1.2 U_r$
41.5	$1.4 U_r$	$1.4 U_r$	$1.2 U_r$
56	$1.2 U_r$	$1.2 U_r$	$1.2 U_r$

#### 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	$\leq 6 \times 10^{-4}$	$\leq 6 \times 10^{-4}$	$\leq 6 \times 10^{-4}$
10 kHz	$\leq 6 \times 10^{-4}$	$\leq 6 \times 10^{-4}$	-
100 kHz	$\leq 15 \times 10^{-4}$	-	-

#### Maximum pulse rise time:

Capacitance $\mu\text{F}$	max. pulse rise time V/ $\mu\text{sec}$ at $T_A < 40^\circ\text{C}$								
	700 VDC	850 VDC	1000 VDC	1250 VDC	1700 VDC	2000 VDC	2500 VDC	3000 VDC	
0.047 ... 0.22	1150	1150	1800	1800	1800	1800	1800	1800	
0.33 ... 0.68	900	900	1150	1150	1150	1150	1150	1150	
1.0 ... 2.2	500	500	500	500	650	650	650	650	
2.5 ... 6.8	190	190	390	390	500	-	-	-	
7.0 ... 8.0	90	90	-	-	-	-	-	-	

for pulses equal to the rated voltage

### Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the plates the screw torque is to be limited to max. 5 Nm.

For further details and graphs please refer to Technical Information.

#### Climatic test category:

55/100/56 in accordance with IEC

#### Voltage derating:

A voltage derating factor of 1.35 % per K must be applied from  $+85^\circ\text{C}$  for DC voltages and from  $+75^\circ\text{C}$  for AC voltages

#### Reliability:

Operational life  $> 300\,000$  hours

Failure rate  $< 1$  fit ( $10.5 \times U_r$  and  $40^\circ\text{C}$ )

#### Specific dissipation:

Box size* WxHxL in mm	Specific dissipation in Watts per K above the ambient temperature
19x31x56	0.068
23x34x56	0.079
27x37.5x56	0.092
33x48x56	0.122
37x54x56	0.142

\* other box sizes see page 11.

### Packing

Packing units at the end of the catalogue.

Packing quantities may vary depending on the plate version.

## Continuation

### General Data

Capacitance	700 VDC/420 VAC*				850 VDC/450 VAC*				1000 VDC/600 VAC*				
	W	H	L	Part number	W	H	L	Part number	W	H	L	Part number	
0.22 "										11	21	31.5	SNMPO132206B
										11	22	41.5	SNMPO132207B
0.33 "					15	26	31.5	SNMPM033306F		15	26	31.5	SNMPO133306F
					13	24	41.5	SNMPM033307C		13	24	41.5	SNMPO133307C
0.47 "	11	21	31.5	SNMPK034706B	17	29	31.5	SNMPM034706G		17	29	31.5	SNMPO134706G
	11	22	41.5	SNMPK034707B	15	26	41.5	SNMPM034707D		15	26	41.5	SNMPO134707D
0.68 "	15	26	31.5	SNMPK036806F	17	29	41.5	SNMPM036807E		17	29	41.5	SNMPO136807E
	13	24	41.5	SNMPK036807C									
1.0 µF	17	29	31.5	SNMPK041006G	19	32	41.5	SNMPM041007F		20	39.5	41.5	SNMPO141007G
	15	26	41.5	SNMPK041007D						23	34	56	SNMPO141008E
1.5 "	19	32	41.5	SNMPK041507F	20	39.5	41.5	SNMPM041507G		24	45.5	41.5	SNMPO141507H
					23	34	56	SNMPM041508E		23	34	56	SNMPO141508E
2.0 "	20	39.5	41.5	SNMPK042007G	24	45.5	41.5	SNMPM042007H		31	46	41.5	SNMPO142007I
					23	34	56	SNMPM042008E		27	37.5	56	SNMPO142008H
2.2 "	20	39.5	41.5	SNMPK042207G	24	45.5	41.5	SNMPM042207H		31	46	41.5	SNMPO142207I
					23	34	56	SNMPM042208E		27	37.5	56	SNMPO142208H
2.5 "	24	45.5	41.5	SNMPK042507H	31	46	41.5	SNMPM042507I		35	50	41.5	SNMPO142507J
					27	37.5	56	SNMPM042508H		33	48	56	SNMPO142508J
3.0 "	24	45.5	41.5	SNMPK043007H	31	46	41.5	SNMPM043007I		40	55	41.5	SNMPO143007K
					27	37.5	56	SNMPM043008H		33	48	56	SNMPO143008J
3.3 "	24	45.5	41.5	SNMPK043307H	35	50	41.5	SNMPM043307J		40	55	41.5	SNMPO143307K
					33	48	56	SNMPM043308J		33	48	56	SNMPO143308J
4.0 "	31	46	41.5	SNMPK044007I	35	50	41.5	SNMPM044007J		37	54	56	SNMPO144008L
					33	48	56	SNMPM044008J					
4.7 "	31	46	41.5	SNMPK044707I	33	48	56	SNMPM044708J		37	54	56	SNMPO144708L
5.0 "	31	46	41.5	SNMPK045007I	33	48	56	SNMPM045008J		37	54	56	SNMPO145008L
6.0 "	35	50	41.5	SNMPK046007J	37	54	56	SNMPM046008L		37	54	56	SNMPO146008L
	33	48	56	SNMPK046008J									
7.0 "	40	55	41.5	SNMPK047007K	37	54	56	SNMPM047008L					
	33	48	56	SNMPK047008J									
8.0 "	37	54	56	SNMPK048008L									

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

New range and values

Dims. in mm.

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

Versions and dimensional drawings see page 108.

Part number completion:	
Version codes see page 110.	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
	none = 00 (for plate versions)

Rights reserved to amend design data without prior notification.

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## Continuation

### General Data

Capacitance	1250 VDC/600 VAC*				1700 VDC/650 VAC*				2000 VDC/700 VAC*			
	W	H	L	Part number	W	H	L	Part number	W	H	L	Part number
0.068 $\mu$ F									11	21	31.5	SNMPTA026806B
									11	22	41.5	SNMPTA026807B
0.1 $\mu$ F					11	21	31.5	SNMPTA31006B	13	24	31.5	SNMPTA031006D
					11	22	41.5	SNMPTA31007B	11	22	41.5	SNMPTA031007B
0.15 "					13	24	31.5	SNMPTA31506D	15	26	31.5	SNMPTA031506F
					11	22	41.5	SNMPTA31507B	13	24	41.5	SNMPTA031507C
0.22 "	11	21	31.5	SNMPTA32206B	15	26	31.5	SNMPTA32206F	15	26	41.5	SNMPTA032207D
	11	22	41.5	SNMPTA32207B	13	24	41.5	SNMPTA32207C				
0.33 "	15	26	31.5	SNMPTA33306F	17	34.5	31.5	SNMPTA33306L	19	32	41.5	SNMPTA033307F
	13	24	41.5	SNMPTA33307C	15	26	41.5	SNMPTA33307D				
0.47 "	17	29	31.5	SNMPTA34706G	19	32	41.5	SNMPTA34707F	20	39.5	41.5	SNMPTA034707G
	15	26	41.5	SNMPTA34707D					23	34	56	SNMPTA034708E
0.68 "	17	29	41.5	SNMPTA36807E	20	39.5	41.5	SNMPTA36807G	24	45.5	41.5	SNMPTA036807H
					23	34	56	SNMPTA36808E	27	37.5	56	SNMPTA036808H
1.0 $\mu$ F	20	39.5	41.5	SNMPTA41007G	24	45.5	41.5	SNMPTA41007H	35	50	41.5	SNMPTA041007J
	23	34	56	SNMPTA41008E	27	37.5	56	SNMPTA41008H	33	48	56	SNMPTA041008J
1.5 "	24	45.5	41.5	SNMPTA41507H	31	46	41.5	SNMPTA41507I	40	55	41.5	SNMPTA041507K
	23	34	56	SNMPTA41508E	27	37.5	56	SNMPTA41508H	33	48	56	SNMPTA041508J
2.0 "	31	46	41.5	SNMPTA42007I	40	55	41.5	SNMPTA42007K	37	54	56	SNMPTA042008L
	27	37.5	56	SNMPTA42008H	33	48	56	SNMPTA42008J				
2.2 "	31	46	41.5	SNMPTA42207I	40	55	41.5	SNMPTA42207K	37	54	56	SNMPTA042208L
	27	37.5	56	SNMPTA42208H	33	48	56	SNMPTA42208J				
2.5 "	35	50	41.5	SNMPTA42507J	37	54	56	SNMPTA42508L				
	33	48	56	SNMPTA42508J								
3.0 "	40	55	41.5	SNMPTA43007K	37	54	56	SNMPTA43008L				
	33	48	56	SNMPTA43008J								
3.3 "	40	55	41.5	SNMPTA43307K								
	33	48	56	SNMPTA43308J								
4.0 "	37	54	56	SNMPTA44008L								
4.7 "	37	54	56	SNMPTA44708L								
5.0 "	37	54	56	SNMPTA45008L								
6.0 "	37	54	56	SNMPTA46008L								

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

New range, box sizes and values

Dims. in mm.

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

Versions and dimensional drawings see page 108.

Part number completion:	
Version codes	see page 110.
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
	none = 00 (for plate versions)

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## Continuation

### General Data

Capacitance	2500 VDC/700 VAC*				3000 VDC/700 VAC*			
	W	H	L	Part number	W	H	L	Part number
0.047 $\mu$ F	11	21	31.5	SNMPV024706B	11	21	31.5	SNMPW024706B
	11	22	41.5	SNMPV024707B	11	22	41.5	SNMPW024707B
	13	24	31.5	SNMPV026806D	13	24	31.5	SNMPW026806D
	11	22	41.5	SNMPV026807B	11	22	41.5	SNMPW026807B
0.1 $\mu$ F	15	26	31.5	SNMPV031006F	15	26	31.5	SNMPW031006F
	13	24	41.5	SNMPV031007C	13	24	41.5	SNMPW031007C
0.15 "	15	26	41.5	SNMPV031507D	15	26	41.5	SNMPW031507D
0.22 "	19	32	41.5	SNMPV032207F	19	32	41.5	SNMPW032207F
0.33 "	24	45.5	41.5	SNMPV033307H	24	45.5	41.5	SNMPW033307H
0.47 "	31	46	41.5	SNMPV034707I	31	46	41.5	SNMPW034707I
	27	37.5	56	SNMPV034708H	27	37.5	56	SNMPW034708H
0.68 "	35	50	41.5	SNMPV036807J	35	50	41.5	SNMPW036807J
	33	48	56	SNMPV036808J	33	48	56	SNMPW036808J
1.0 $\mu$ F	40	55	41.5	SNMPV041007K	40	55	41.5	SNMPW041007K
	33	48	56	SNMPV041008J	33	48	56	SNMPW041008J
1.5 "	37	54	56	SNMPV041508L	37	54	56	SNMPW041508L

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

New range and values

Dims. in mm.

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

Versions and dimensional drawings see page 108.

#### Part number completion:

Version codes see page 110.

Tolerance: 20 % = M

10 % = K

5 % = J

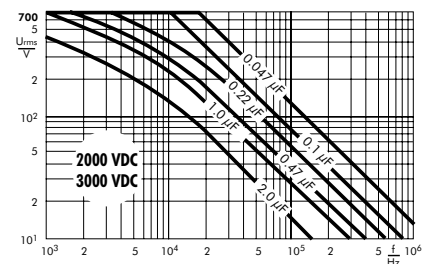
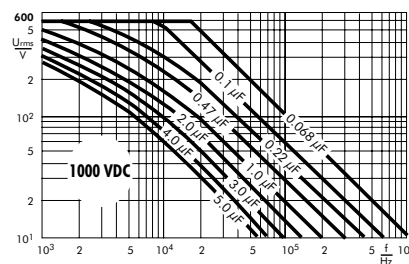
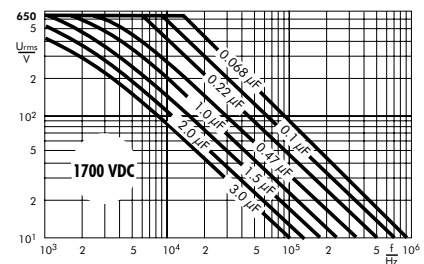
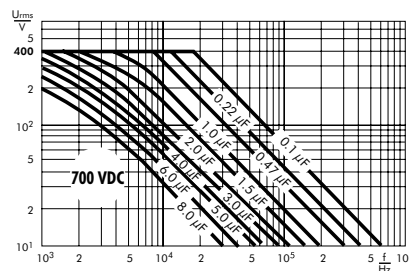
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Pin length: 6-2 = SD

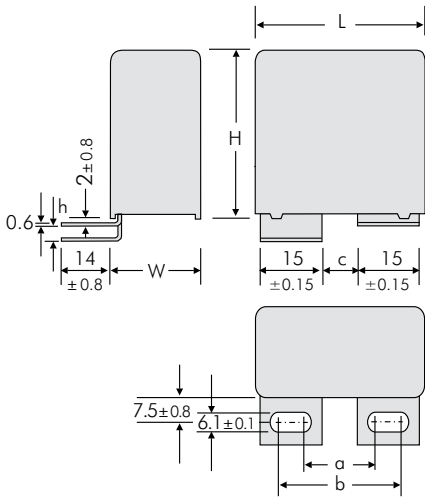
none = 00 (for plate versions)

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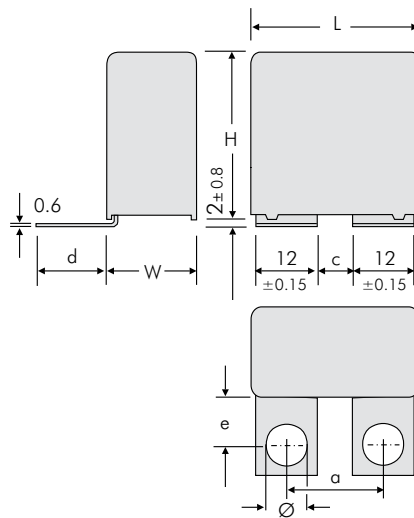
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



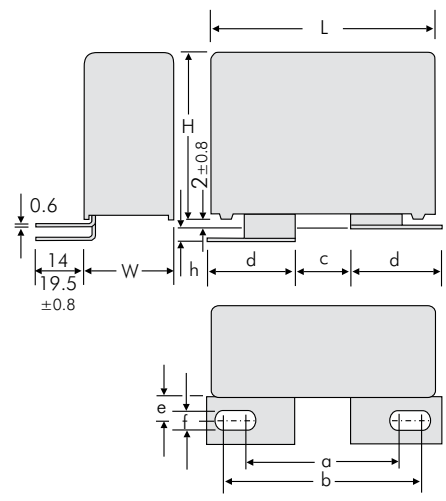
# Versions of WIMA Snubber- and DC-LINK MKP 4- Capacitors



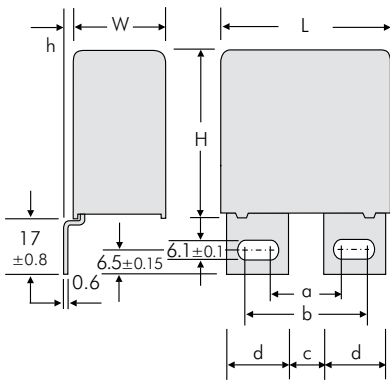
Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
<b>A1</b>	41.5	17.5	28	7.5	0
<b>A1.5</b>	41.5	17.5	28	7.5	3.5
<b>A1</b>	56	20	30	10	0
<b>A1.1.1</b>	56	28	38	18	0
<b>A1.4.1</b>	56	28	38	18	3.5



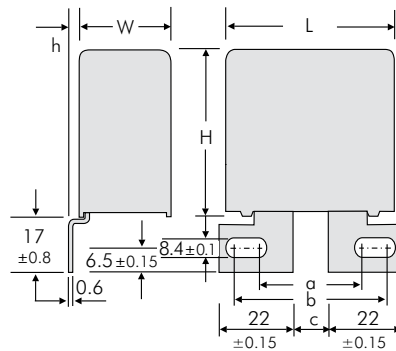
Version	L	a ±0.5	c ±0.5	d ±0.8	e ±0.8	∅ ±0.1
<b>A1.6</b>	41.5	18	6	21.5	16	7
<b>A1.6.1</b>	41.5	22	10	18.5	13	7
<b>A1.6.2</b>	41.5	23	10	18.5	13	8
<b>A1.6</b>	56	29	17	21.5	16	7



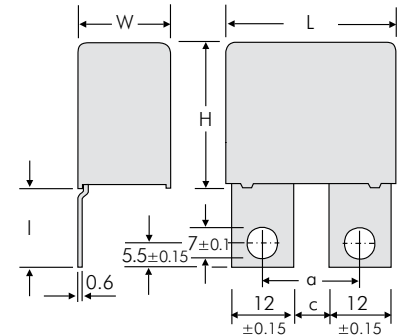
Version	L	a ±0.5	b ±0.5	c ±0.5	d ±0.15	e ±0.8	f ±0.1	h ±0.8
<b>A2</b>	41.5	36	46.5	14.5	22	7.5	8.4	0
<b>A2.4.1</b>	41.5	33.5	39.5	7.5	22	13	8.4	0
<b>A2.6.1</b>	41.5	31.5	41.5	14	22	13	6.1	3.5
<b>A2.6.2</b>	41.5	31.5	41.5	14	22	13	6.1	0
<b>A2.8</b>	41.5	36	46.5	14.5	22	7.5	8.4	3.5
<b>A2.1</b>	56	39.5	45.5	13.5	22	7.5	8.4	0
<b>A2.1.2</b>	56	36	45.5	14.5	21.5	7.5	8.4	0



Version	L	a ±0.5	b ±0.5	c ±0.5	d ±0.15	h ±0.8
<b>A3</b>	41.5	17.5	27.5	7.5	15	0
<b>A3.5</b>	41.5	17.5	27.5	7.5	15	3
<b>A3.12</b>	41.5	17.5	30	7.5	16.5	0
<b>A3</b>	56	20	30	10	15	0
<b>A3.1</b>	56	28	38	18	15	0
<b>A3.5</b>	56	20	30	10	15	3
<b>A3.10</b>	56	28	38	18	15	3

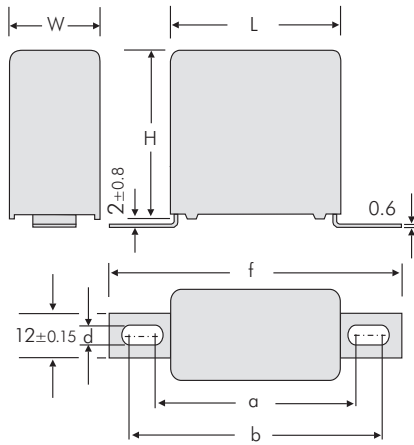


Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
<b>A3.9</b>	41.5	36	46.5	14.5	0
<b>A3.11</b>	41.5	36	46.5	14.5	3
<b>A3.2</b>	56	36	46.5	14.5	0
<b>A3.3</b>	56	36	46.5	14.5	3

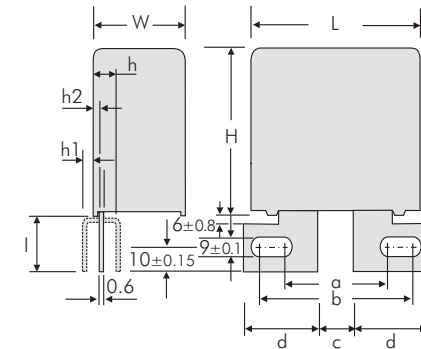


Version	L	a ±0.5	c ±0.5	l ±0.8
<b>A3.8</b>	41.5W ≥ 17	18	6	23
<b>A3.8.1</b>	41.5W ≥ 17	22	10	17.5
<b>A3.8.2</b>	41.5W ≥ 17	22	10	23

# Versions of WIMA Snubber- and DC-LINK MKP 4- Capacitors

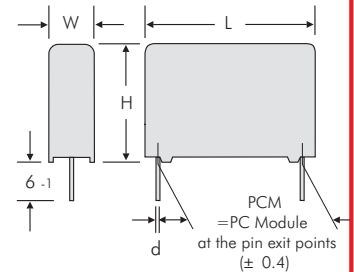


Version	L	a ±0.8	b ±0.8	f ±0.8	d ±0.1
<b>A4.9</b>	31.5 W ≥ 15	44	47	57	4.5
<b>A4.10</b>	31.5 W ≥ 15	43	59	69	6.1
<b>A4.2</b>	41.5 W ≥ 15	54	57	67	4.5
<b>A4</b>	41.5 W ≥ 15	53	69	79	6.1
<b>A4.7</b>	56	65	68	78	4.5
<b>A4</b>	56	64	80	90	6.1



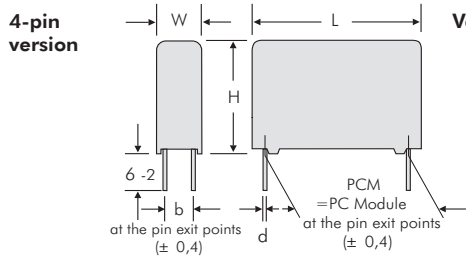
Version	W	a ±0.5	b ±0.5	c ±0.5	d ±0.15	h ±0.8	h1 ±0.8	h2 ±0.8	l ±0.8
<b>A6</b>	≥ 23	41.5	45.5	15.5	24.15	7	-	-	26
<b>A6.3</b>	≥ 19	35	39	18	19	-	5	3	25
<b>A6.4</b>	≥ 23	42.8	44.8	21	21.5	-	-	6.4	26

2-pin version

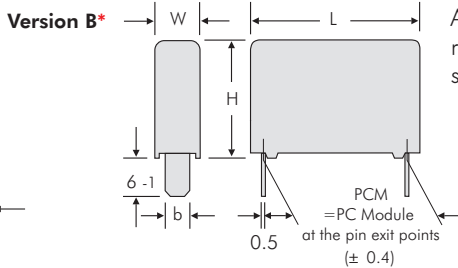


PCM	d
28.5	0.8
38.5	1.2
49.5	1.2

Dims. in mm



W	H	L	PCM	b	d
11	21	31.5	27.5	5	0.8
13	24	31.5	27.5	7.5	0.8
15	26	31.5	27.5	7.5	0.8
17	29	31.5	27.5	10	0.8
19	30	31.5	27.5	10	0.8
17	34.5	31.5	27.5	10	0.8
20	39.5	31.5	27.5	12.5	0.8
22	43.5	31.5	27.5	12.5	0.8
11	22	41.5	37.5	5	1
13	24	41.5	37.5	7.5	1
15	26	41.5	37.5	7.5	1
17	29	41.5	37.5	10	1
19	32	41.5	37.5	10	1
20	39.5	41.5	37.5	12.5	1
24	45.5	41.5	37.5	12.5	1
31	46	41.5	37.5	20	1
35	50	41.5	37.5	20	1
40	55	41.5	37.5	20	1
19	31	56	48.5	12.5	1
23	34	56	48.5	15	1
27	37.5	56	48.5	15	1
33	48	56	48.5	20	1
37	54	56	48.5	20	1



L	PCM	b ±0.15
31.5	28.5	8
41.5	38.5	8
56	49.5	8

Additional special versions can be realized. Please contact us with your specific needs.

\* Processing notification:  
Processing should be done within 3 month after manufacturing.



## Versions of WIMA Snubber- and DC-LINK MKP 4- Capacitors

Version code		D2	D4	B8*	1A	1B	1G	1H	1I	1J	1S	2A	2B	2Q	2F	2J	2K	2M	3A	3C	3D	3E	3G	3K	3L	3M	3N	3O	3P	3Q	4A	4C	4J	4L	4M	6A	6B	6C											
W x H x L	Size code	2-pin	4-pin	B8	A1	A1.1	A1.1	A1.4	A1.5	A1.6	A1.6.1	A1.6.2	A2	A2.1	A2.2	A2.4	A2.6	A2.6.1	A2.6.2	A2.8	A3	A3.1	A3.2	A3.3	A3.5	A3.8	A3.8.1	A3.8.2	A3.9	A3.10	A3.11	A3.12	A4	A4.2	A4.7	A4.9	A4.10	A6	A6.3	A6.4									
		11 x 21 x 31.5	<b>6B</b>																																														
13 x 24 x 31.5	<b>6D</b>																																																
15 x 26 x 31.5	<b>6F</b>																																																
17 x 29 x 31.5	<b>6G</b>																																																
17 x 34.5 x 31.5	<b>6I</b>																																																
11 x 22 x 41.5	<b>7B</b>																																																
13 x 24 x 41.5	<b>7C</b>																																																
15 x 26 x 41.5	<b>7D</b>																																																
17 x 29 x 41.5	<b>7E</b>																																																
19 x 32 x 41.5	<b>7F</b>																																																
20 x 39.5 x 41.5	<b>7G</b>																																																
24 x 45.5 x 41.5	<b>7H</b>																																																
31 x 46 x 41.5	<b>7I</b>																																																
35 x 50 x 41.5	<b>7J</b>																																																
40 x 55 x 41.5	<b>7K</b>																																																
19 x 31 x 56	<b>8D</b>																																																
23 x 34 x 56	<b>8E</b>																																																
27 x 37.5 x 56	<b>8H</b>																																																
33 x 48 x 56	<b>8J</b>																																																
37 x 54 x 56	<b>8L</b>																																																

Possible connecting respective plate versions - depending on box size.

■ 4-pin versions on request.

\* Processing notification:  
Processing should be done within  
3 month after manufacturing.

## 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:  $T < 260^{\circ}C$

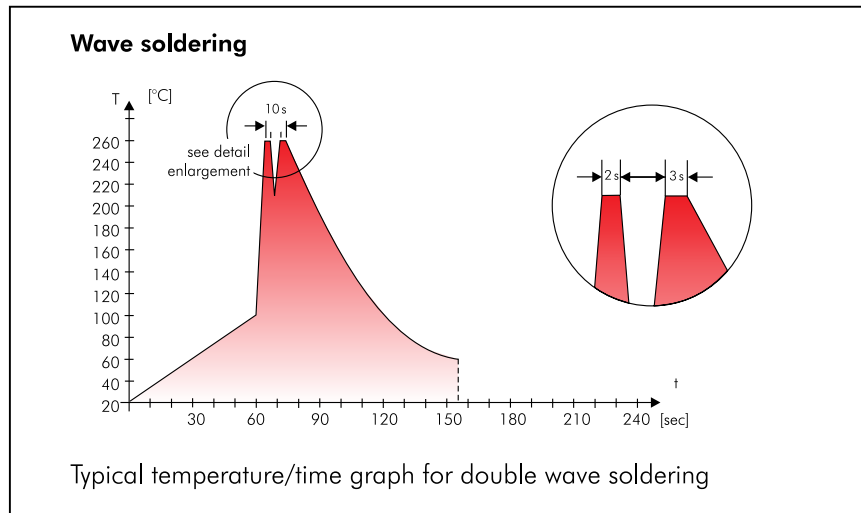
Dwell time:  $t < 5 \text{ sec}$

#### 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

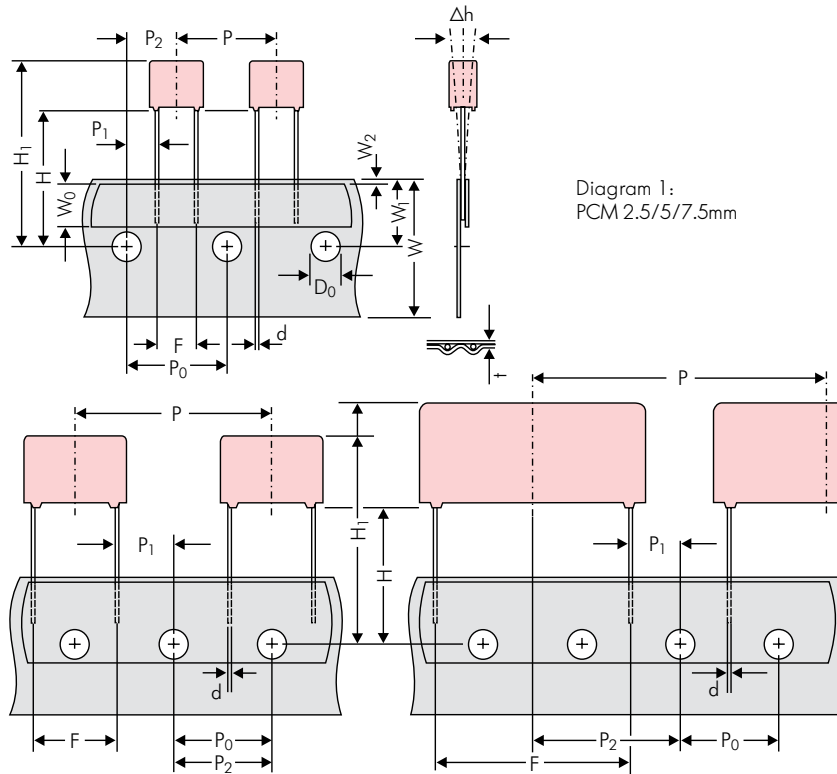


Diagram 1:  
PCM 2.5/5/7.5mm

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	0.7 ±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 144)	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 145.							

Dims in mm.

\* Diameter of pins see General Data.

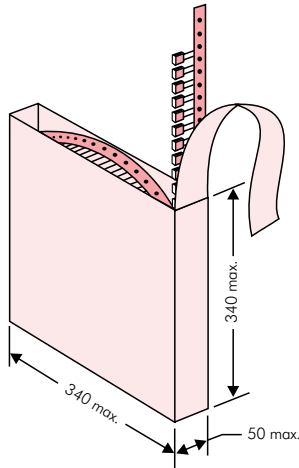
\* PCM 10 and PCM 15 can be crimped to PCM 7.5.

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

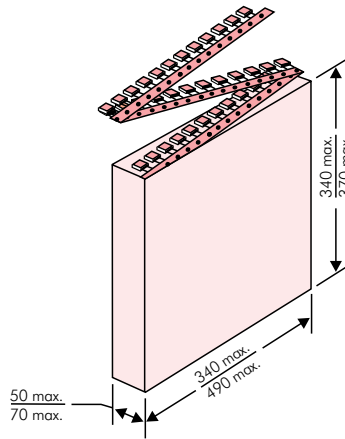
Please clarify customer-specific deviations with the manufacturer.

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

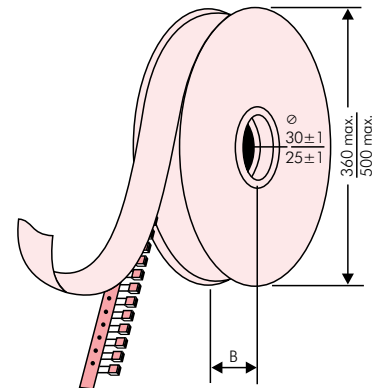
### ■ ROLL Packaging



### ■ AMMO Packaging



### ■ REEL Packaging



## BAR CODE (Labelling)

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

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.: MKS2C034701C00K8SD	
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 RM5</b>	
1000067326	Standard 10% Loss - Standard	Dichte 6-2
Vorlage Debitor Inland		Week 03/2011

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

\* for 2-inch transport pitches.

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

■ 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 4C = MKPC  MKP 4 = MKP4  MKP 10 = MKP1  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 3 = DCP3  DC-LINK MKP 4 = DCP4  DC-LINK MKP 4S = DCP5  DC-LINK MKP 5 = DCP5  DC-LINK MKP 6 = DCP6  DC-LINK HC = DCHC  DC-LINK HY = DCHY</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  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  ...  <b>Pin length (taped)</b>  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.