

Snubber FKP Capacitors for High Pulse Applications with Metal Foil Electrodes, Schoopage Contacts and Self-Healing Internal Series Connection

Special Features

- High pulse duty
- Self-healing
- Particularly reliable contact-configurations: 4-lead versions and screwable plate connections
- Internal series connection
- Very low dissipation factor
- Negative capacitance change versus temperature
- According to RoHS 2002/95/EC

Typical Applications

- For high pulse and high frequency applications requiring extremely reliable contacts e.g.
- IGBT-applications

Construction

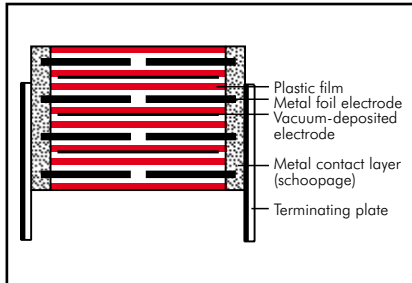
Dielectric:

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 or plates.

Marking:

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

Electrical Data

Capacitance range:

0.01 μF to 2.2 μF

Rated voltages:

630 VDC, 1000 VDC, 1600 VDC, 2000 VDC, 3000 VDC, 4000 VDC

Capacitance tolerances:

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

Operating temperature range:

-55°C to $+100^\circ\text{C}$

Climatic test category:

55/100/56 in accordance with IEC

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:

$L < 41.5$: $1.6 U_r$, 2 sec

$L = 41.5$: $1.4 U_r$, 2 sec

$L = 56$: $1.2 U_r$, 2 sec

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	$\leq 3 \times 10^{-4}$	$\leq 3 \times 10^{-4}$	$\leq 3 \times 10^{-4}$
10 kHz	$\leq 4 \times 10^{-4}$	$\leq 6 \times 10^{-4}$	-
100 kHz	$\leq 15 \times 10^{-4}$	-	-

Maximum pulse rise time:

Capacitance μF	max. pulse rise time V/ μsec at $T_A < 40^\circ\text{C}$					
	630 VDC	1000 VDC	1600 VDC	2000 VDC	3000 VDC	4000 VDC
0.01 ... 0.022	-	11000	11000	11000	11000	11000
0.033 ... 0.068	9000	9000	9000	9000	9000	9000
0.1 ... 0.22	9000	9000	9000	9000	9000	9000
0.33 ... 0.68	5000	5000	5000	5000	5000	5000
1.0 ... 2.2	1600	2000	-	-	-	-

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.

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 $< 1 \text{ fit (} 0.5 \times U_r \text{ and } 40^\circ\text{C)}$

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 12.

Packing

Transportation-safe packing in cardboard boxes.

For further details and graphs please refer to Technical Information.

Continuation

General Data

Capacitance	630 VDC/400 VAC*			1000 VDC/600 VAC*			1600 VDC/650 VAC*			2000 VDC/700 VAC*			3000 VDC/700 VAC*			4000 VDC/700 VAC*		
	W	H	L	W	H	L	W	H	L	W	H	L	W	H	L	W	H	L
0.01 μF							7	16.5	26.5	10.5	20.5	26.5	11	21	26.5	11	21	31.5
0.015 "							8.5	18.5	26.5	11	21	26.5	11	21	31.5	11	22	41.5
0.022 "				7	16.5	26.5	10.5	20.5	26.5	11	21	31.5	13	24	31.5	13	24	41.5
										11	22	41.5						
0.033 "				8.5	18.5	26.5	11	21	31.5	13	24	41.5	13	24	41.5	15	26	41.5
0.047 "	7	16.5	26.5	10.5	20.5	26.5	11	22	41.5	15	26	41.5	15	26	41.5	17	29	41.5
0.068 "	8.5	18.5	26.5	11	21	31.5	15	26	41.5	17	29	41.5	17	29	41.5	19	32	41.5
0.1 μF	10.5	20.5	26.5	11	22	41.5	17	29	41.5	17	29	41.5	19	32	41.5	20	39.5	41.5
0.15 "	11	21	26.5	15	26	41.5	19	32	41.5	20	39.5	41.5	20	39.5	41.5	24	45.5	41.5
0.22 "	13	24	31.5	17	29	41.5	20	39.5	41.5	24	45.5	41.5	24	45.5	41.5	27	37.5	56
0.33 "	15	26	31.5	19	32	41.5	24	45.5	41.5	27	37.5	56	27	37.5	56	33	48	56
0.47 "	17	29	41.5	20	39.5	41.5	27	37.5	56	27	37.5	56	33	48	56			
0.68 "	19	32	41.5	23	34	56	27	37.5	56									
1.0 μF	20	39.5	41.5	27	37.5	56												
1.5 "	24	45.5	41.5															
2.2 "	27	37.5	56															

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

On ordering please state the required version and box size.

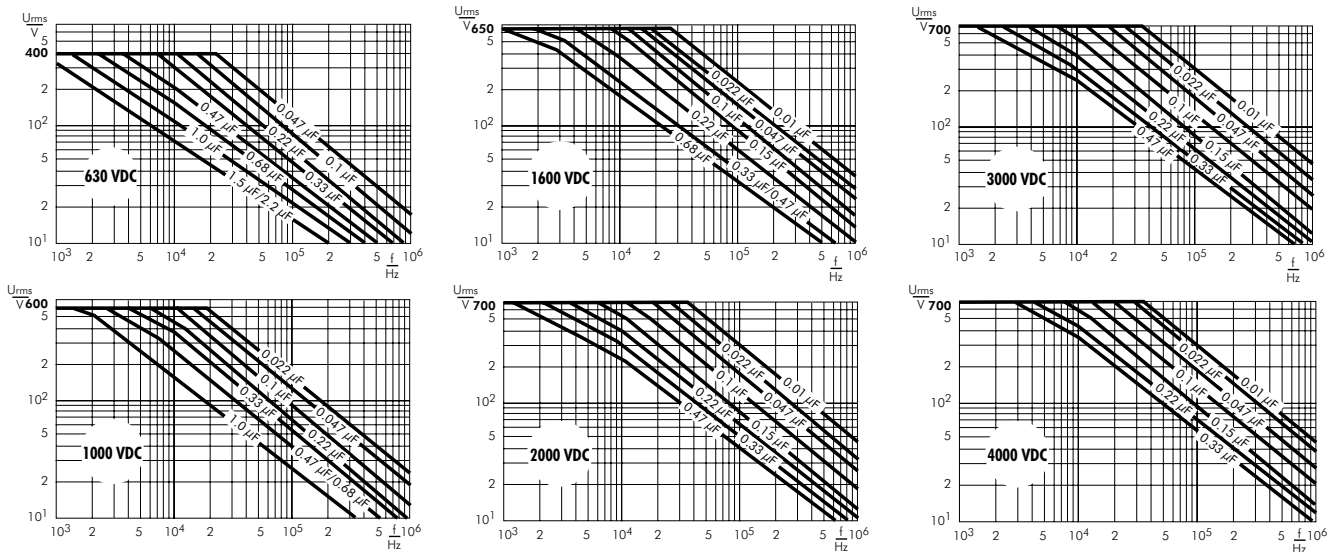
Versions and dimensional drawings see page 82.

Dims in mm.

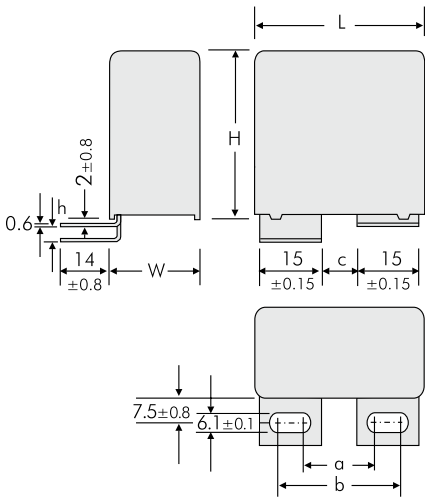
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

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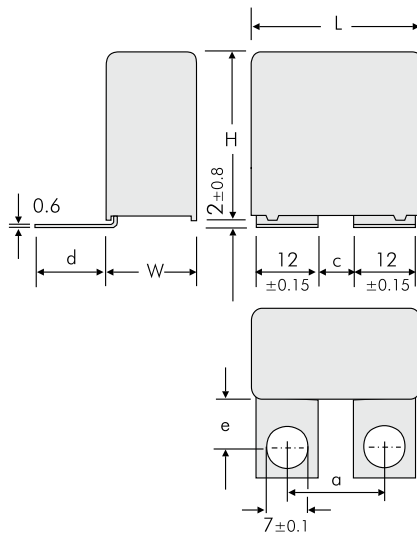
Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



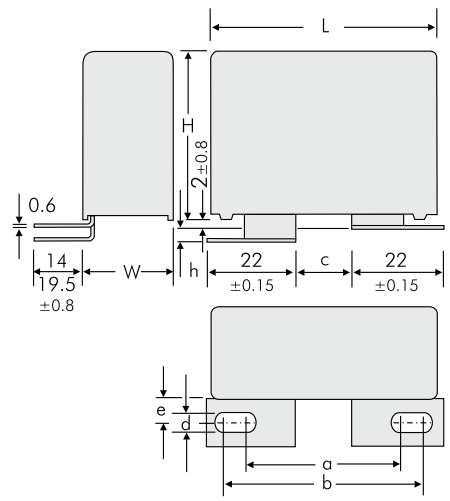
Versions of WIMA Snubber- and DC-LINK MKP 4 Capacitors



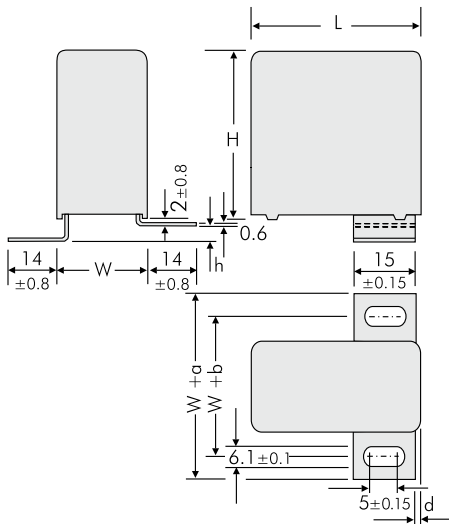
Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
A1	41.5	17.5	27.5	7.5	0
A1.5	41.5	17.5	27.5	7.5	3.5
A1	56	20	30	10	0
A1.1.1	56	28	38	18	0
A1.4	56	20	30	10	3.5
A1.4.1	56	28	38	18	3.5



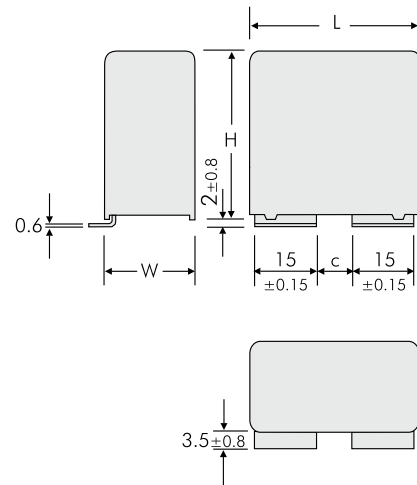
Version	L	a ±0.5	c ±0.5	d ±0.8	e ±0.8
A1.6	41.5	18	6	21.5	16
A1.6.1	41.5	22	10	18.5	13
A1.6	56	29	17	21.5	16



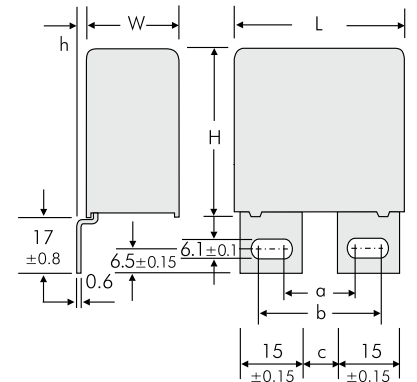
Version	L	a ±0.5	b ±0.5	c ±0.5	d ±0.1	e ±0.8	h ±0.8
A2	41.5	40.5	46.5	14.5	8.4	7.5	0
A2.2	41.5	31	37	5	8.4	7.5	3.5
A2.3	41.5	31	37	5	8.4	13	3.5
A2.4	41.5	33.5	39.5	7.5	8.4	13	3.5
A2.4.1	41.5	33.5	39.5	7.5	8.4	13	0
A2.5	41.5	29.5	39.5	5.5	6.1	7.5	3.5
A2.6	41.5	31.5	41.5	7.5	6.1	13	3.5
A2.6.1	41.5	31.5	41.5	14	6.1	13	3.5
A2.6.2	41.5	31.5	41.5	14	6.1	13	0
A2.8	41.5	40.5	46.5	14.5	8.4	7.5	3.5
A2.1	56	39.5	45.5	13.5	8.4	7.5	0
A2.7	56	39.5	45.5	13.5	8.4	7.5	3.5



Version	L	d ±1.0	h ±0.8	a ±0.8	b ±0.8	W
A1.3.1	31.5	2	0	47	34	19
A1.3.2	31.5	2	3.5	47	34	19
A1.2	41.5	2	3.5	47	34	19
A1.8	41.5	2	0	47	34	19
A1.8.1	41.5	2	0	56	43	28
A1.8.2	41.5	2	3.5	56	43	28

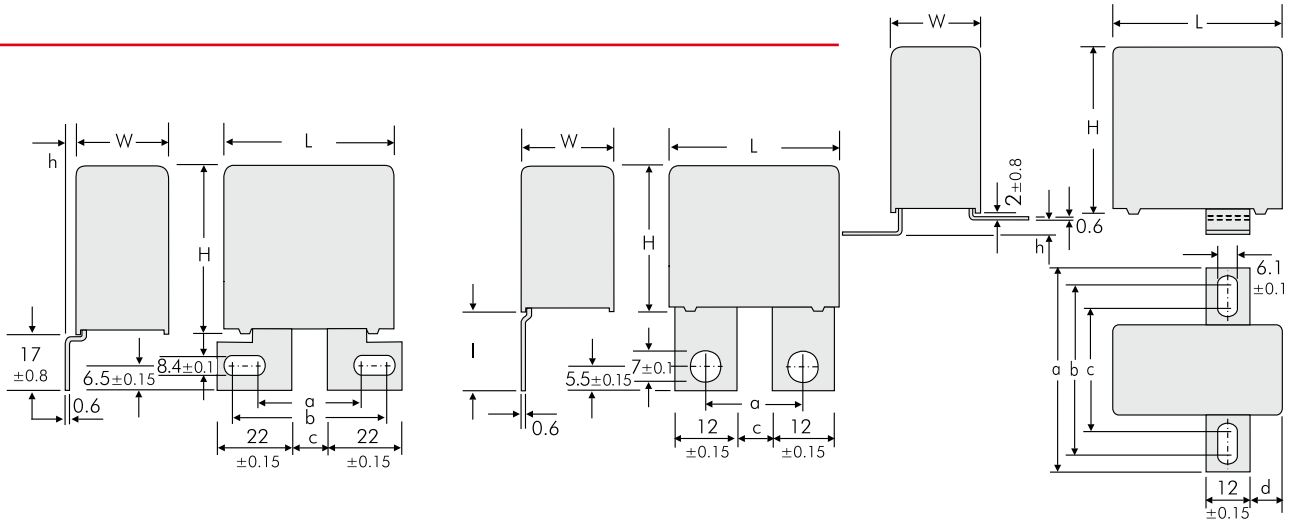


Version	L	c ±0.5
A1.7	41.5	7.5
A1.7	56	10
A1.7.1	56	18



Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
A3	41.5	17.5	27.5	7.5	0
A3.5	41.5	17.5	27.5	7.5	3
A3	56	20	30	10	0
A3.1	56	28	38	18	0
A3.5	56	20	30	10	3
A3.10	56	28	38	18	3

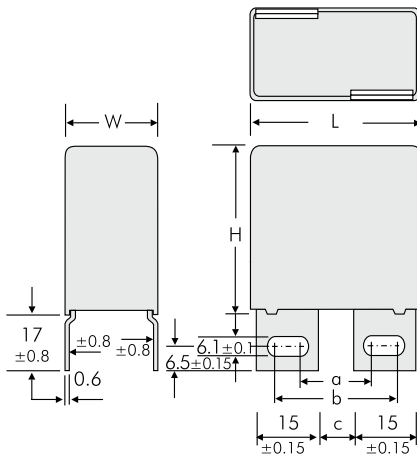
Versions of WIMA Snubber and DC-LINK MKP 4 Capacitors



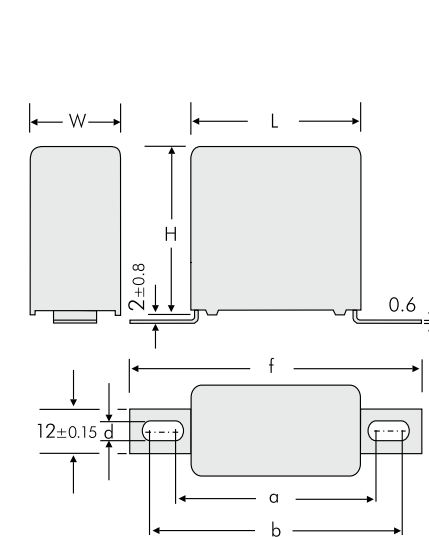
Version	L	a ±0.5	b ±0.5	c ±0.5	h ±0.8
A3.9	41.5	40.5	46.5	14.5	0
A3.11	41.5	40.5	46.5	14.5	3
A3.2	56	40.5	46.5	14.5	0
A3.3	56	40.5	46.5	14.5	3

Version	L	a ±0.5	c ±0.5	l ±0.8
A3.8	41.5 B ≥ 17	18	6	23
A3.8.1	41.5 B ≥ 17	22	10	17.5

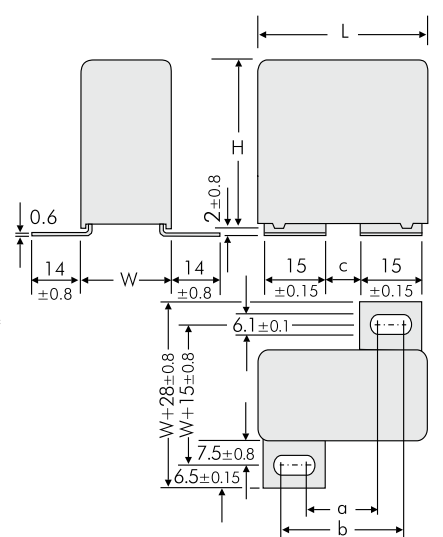
Version	L	a ±0.8	b ±0.8	c ±0.8	d ±1.0	h ±0.8	W
A4.3	31.5	57	47	31	1	3.5	19
A4.4	31.5	57	47	31	1	0	19
A4.6	31.5	44.6	34.6	31.6	1	3.5	19
A4.8	31.5	44.6	34.6	31.6	1	0	19
A4.1	41.5	57	47	31	6	3.5	19
A4.5	41.5	57	47	31	6	0	19
A4.5.1	41.5	63.5	53.5	37.5	6	0	28
A4.5.2	41.5	63.5	53.5	37.5	6	3.5	28



Version	L	a ±0.5	b ±0.5	c ±0.5
A3.6	41.5	17.5	27.5	7.5
A3.7	56	20	30	10



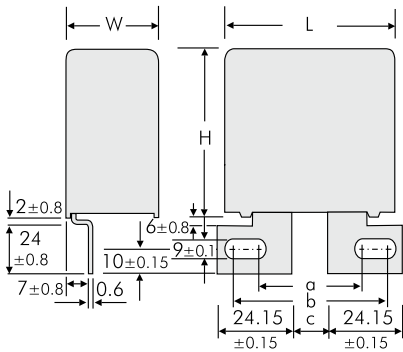
Version	L	a ±0.8	b ±0.8	f ±0.8	d ±0.1
A4.9	31.5 W ≥ 15	44	47	57	4.5
A4.10	31.5 W ≥ 15	43	59	69	6.1
A4.2	41.5 W ≥ 15	54	57	67	4.5
A4	41.5 W ≥ 15	53	69	79	6.1
A4.7	56	65	68	78	4.5
A4	56	64	80	90	6.1



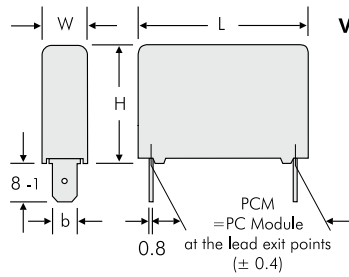
Version	L	a ±0.5	b ±0.5	c ±0.5
A5	41.5	17.5	27.5	7.5
A5	56	20	30	10



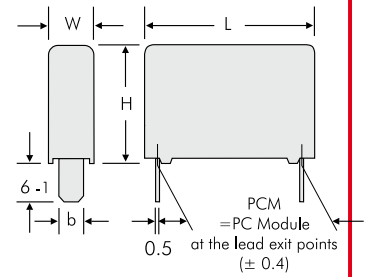
Versions of WIMA Snubber- and DC-LINK MKP 4 Capacitors



Version FS 6.3
with slip-on terminals
according to
DIN 46244



Version B

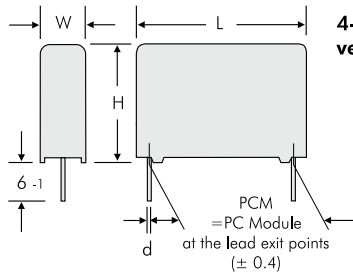


Version	L	a ±0.5	b ±0.5	c ±0.5
A6	56 W ≥ 23	41.5	45.5	15.5

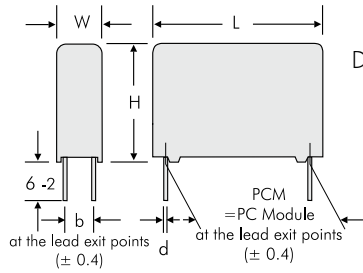
L	W	PCM	b ±0.15
26.5	≥ 11	23.5	6.3
31.5	≥ 11	28.5	6.3
41.5	≥ 11	38.5	6.3
56	≥ 11	49.5	6.3

L	PCM	b ±0.15
18	16	5
26.5	23.5	5
31.5	28.5	8
41.5	38.5	8
56	49.5	8

2-lead version



4-lead version



Dims. in mm.

PCM	d
15	0.8
22.5	0.8
27.5	0.8
38.5	1.2
49.5	1.2

W	H	L	PCM	b	d
10.5	19	26.5	22.5	5	0.8
10.5	20.5	26.5	22.5	5	0.8
11	21	26.5	22.5	5	0.8
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
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

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

Versions of WIMA Snubber and DC-LINK MKP 4 Capacitors



W x H x L	2-lead	4-lead	B5	B8	A1	A1.1*	A1.1.1	A1.2*	A1.3.1	A1.3.2	A1.4	A1.4.1	A1.5	A1.6	A1.6.1	A1.7	A1.7.1	A1.8*	A1.8.1	A1.8.2	A1.9*	A2	A2.1	A2.2	A2.3	A2.4	A2.5	A2.6	A2.6.1	A2.6.2	A2.7	A2.8	A3	A3.1	A3.2	A3.3	A3.5	A3.6	A3.7	A3.8	A3.8.1	A3.9	A3.10	A3.11						
5 x 11 x 18																																																		
6 x 12.5 x 18																																																		
7 x 14 x 18																																																		
8 x 15 x 18																																																		
7 x 16.5 x 26.5																																																		
8.5 x 18.5 x 26.5																																																		
10.5 x 19 x 26.5																																																		
10.5 x 20.5 x 26.5																																																		
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28 x 38 x 41.5																																																		
31 x 46 x 41.5																																																		
19 x 31 x 56																																																		
23 x 34 x 56																																																		
27 x 37.5 x 56																																																		
33 x 48 x 56																																																		
37 x 54 x 56																																																		

W x H x L	A4	A4.1*	A4.2	A4.3*	A4.4*	A4.5*	A4.5.1	A4.5.2	A4.6*	A4.7	A4.8*	A4.9	A4.10	A5	A6	A7	FS 6.3
11 x 21 x 26.5																	
11 x 21 x 31.5																	
13 x 24 x 31.5																	
15 x 26 x 31.5																	
17 x 29 x 31.5																	
19 x 30 x 31.5																	
17 x 34.5 x 31.5																	
11 x 22 x 41.5																	
13 x 24 x 41.5																	
15 x 26 x 41.5																	
17 x 29 x 41.5																	
19 x 32 x 41.5																	
20 x 39.5 x 41.5																	
24 x 45.5 x 41.5																	
28 x 38 x 41.5																	
31 x 46 x 41.5																	
19 x 31 x 56																	
23 x 34 x 56																	
27 x 37.5 x 56																	
33 x 48 x 56																	
37 x 54 x 56																	

Possible connecting respective plate versions - depending on box size.

* on request