

Metallized Polyester (PET) Capacitors
in PCM 7.5 mm to 52.5 mm. Capacitances from 1000 pF to 220 µF.
Rated Voltages from 63 VDC to 2000 VDC.

Special Features

- High volume/capacitance ratio
- Self-healing
- AEC-Q200 qualified
- According to RoHS 2015/863/EU

Typical Applications

For general DC-applications e.g.

- By-pass
- Blocking
- Coupling and decoupling
- Smoothing
- Timing

Construction

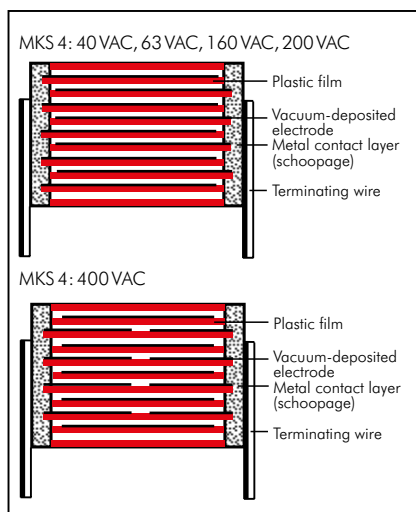
Dielectric:

Polyethylene-terephthalate (PET) 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 220 µF

Rated voltages: 63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1500 VDC, 2000 VDC

Capacitance tolerances:

± 20%, ± 10% ± 5%

Operating temperature range:

–55° C to +125° C

Climatic test category:

55/100/56 in accordance with IEC

Test voltage: 1.6 U_r, 2 sec.

Insulation resistance at +20° C:

Test specifications:

In accordance with IEC 60384-2

Voltage derating:

A voltage derating factor of 1.25 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.

Reliability:

Operational life > 300 000 hours (+125° C permitted for 1000 hours max. distributed over the entire operating life)

Failure rate < 2 fit (0.5 x U_r and 40° C)

U _r	U _{test}	C ≤ 0.33 µF	0.33 µF < C ≤ 220 µF
63 VDC	50 V	≥ 1 x 10 ⁴ MΩ	≥ 3000 sec (MΩ x µF)
100 VDC	100 V	≥ 1.5 x 10 ⁴ MΩ	≥ 5000 sec (MΩ x µF)
≥ 250 VDC	100 V	≥ 3 x 10 ⁴ MΩ	≥ 10000 sec (MΩ x µF)

Measuring time: 1 min.

Dissipation factors at +20° C: tan δ

at f	C ≤ 0.1 µF	0.1 µF < C ≤ 1.0 µF	C > 1.0 µF
1 kHz	≤ 8 x 10 ⁻³	≤ 8 x 10 ⁻³	≤ 10 x 10 ⁻³
10 kHz	≤ 15 x 10 ⁻³	≤ 15 x 10 ⁻³	–
100 kHz	≤ 30 x 10 ⁻³	–	–

Maximum pulse rise time:

Capacitance pF/µF	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC	1000 VDC	1500 VDC	2000 VDC
1000 ... 6800	–	–	–	–	–	70	90	100
0.01 ... 0.022	–	30	35	38	40	50	50	60
0.033 ... 0.068	–	15	20	25	32	26	35	40
0.33 ... 0.68	10	12	15	15	17	20	35	40
0.1 ... 0.22	9	9	10	10	13	20	20	38
1.0 ... 2.2	6	5	6	9	13	14	15	15
3.3 ... 6.8	3	3	6	6	9	12	–	–
10 ... 22	2.5	2.5	3	6	6	–	–	–
33 ... 68	2.5	2.5	3	3	–	–	–	–
100 ... 220	2.5	2.5	–	–	–	–	–	–

Mechanical Tests

Pull test on pins:

d ≤ 0.8 Ø: 10 N in direction of pins

d > 0.8 Ø: 20 N in direction of pins

according to IEC 60068-2-21

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

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

Bump test: 4000 bumps at 390 m/sec² 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	63 VDC/40 VAC*					100 VDC/63 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF						2.5	7	10	7.5	MKS4D021002A_-----
0.015 "						4	9	13	10	MKS4D021003C_-----
0.022 "						2.5	7	10	7.5	MKS4D021502A_-----
0.033 "						4	9	13	10	MKS4D021503C_-----
0.047 "						2.5	7	10	7.5	MKS4D022202A_-----
0.068 "						4	9	13	10	MKS4D022203C_-----
						2.5	7	10	7.5	MKS4D023302A_-----
						4	9	13	10	MKS4D023303C_-----
						2.5	7	10	7.5	MKS4D024702A_-----
						4	9	13	10	MKS4D024703C_-----
						2.5	7	10	7.5	MKS4D026802A_-----
						4	9	13	10	MKS4D026803C_-----
0.1 µF	2.5	7	10	7.5	MKS4C031002A_-----	2.5	7	10	7.5	MKS4D031002A_-----
	4	9	13	10	MKS4C031003C_-----	4	9	13	10	MKS4D031003C_-----
0.15 "	2.5	7	10	7.5	MKS4C031502A_-----	3	8.5	10	7.5	MKS4D031502B_-----
	4	9	13	10	MKS4C031503C_-----	4	9	13	10	MKS4D031503C_-----
0.22 "	3	8.5	10	7.5	MKS4C032202B_-----	3	8.5	10	7.5	MKS4D032202B_-----
	4	9	13	10	MKS4C032203C_-----	4	9	13	10	MKS4D032203C_-----
0.33 "	4	9	10	7.5	MKS4C033302C_-----	4	9	10	7.5	MKS4D033302C_-----
	4	9	13	10	MKS4C033303C_-----	4	9	13	10	MKS4D033303C_-----
0.47 "	4	9	10	7.5	MKS4C034702C_-----	4.5	9.5	10.3	7.5	MKS4D034702D_-----
	4	9	13	10	MKS4C034703C_-----	4	9	13	10	MKS4D034703C_-----
0.68 "	5	10.5	10.3	7.5	MKS4C036802E_-----	5	10.5	10.3	7.5	MKS4D036802E_-----
	4	9	13	10	MKS4C036803C_-----	4	9	13	10	MKS4D036803C_-----
1.0 µF	5	10.5	10.3	7.5	MKS4C041002E_-----	5.7	12.5	10.3	7.5	MKS4D041002F_-----
	4	9	13	10	MKS4C041003C_-----	5	11	13	10	MKS4D041003F_-----
1.5 "	5.7	12.5	10.3	7.5	MKS4C041502F_-----	6	12	13	10	MKS4D041503G_-----
	5	11	13	10	MKS4C041503F_-----	7	14	18	15	MKS4D041504D_-----
2.2 "	5	11	13	10	MKS4C042203F_-----	8	15	18	15	MKS4D042204F_-----
	6	12.5	18	15	MKS4C042204C_-----	6	15	26.5	22.5	MKS4D042205B_-----
3.3 "	6	12	13	10	MKS4C043303G_-----	9	16	18	15	MKS4D043304J_-----
	7	14	18	15	MKS4C043304D_-----	7	16.5	26.5	22.5	MKS4D043305D_-----
4.7 "	7	14	18	15	MKS4C044704D_-----	10.5	19	26.5	22.5	MKS4D044705G_-----
	6	15	26.5	22.5	MKS4C044705B_-----	9	19	31.5	27.5	MKS4D044706A_-----
6.8 "	8	15	18	15	MKS4C046804F_-----	10.5	19	26.5	22.5	MKS4D046805G_-----
	7	16.5	26.5	22.5	MKS4C046805D_-----	11	21	31.5	27.5	MKS4D046806B_-----
10 µF	9	16	18	15	MKS4C051004J_-----	11	21	31.5	27.5	MKS4D051006B_-----
	8.5	18.5	26.5	22.5	MKS4C051005F_-----					
15 "	11	21	26.5	22.5	MKS4C051505I_-----	13	24	31.5	27.5	MKS4D051506D_-----
	11	21	31.5	27.5	MKS4C051506B_-----					
22 "	11	21	31.5	27.5	MKS4C052206B_-----	13	24	31.5	27.5	MKS4D052206D_-----
33 "	13	24	31.5	27.5	MKS4C053306D_-----	17	29	31.5	27.5	MKS4D053306G_-----
						13	24	41.5	37.5	MKS4D053307C_-----
47 "	15	26	31.5	27.5	MKS4C054706F_-----	17	34.5	31.5	27.5	MKS4D054706I_-----
	13	24	41.5	37.5	MKS4C054707C_-----	17	29	41.5	37.5	MKS4D054707E_-----
68 "	17	34.5	31.5	27.5	MKS4C056806I_-----	20	39.5	31.5	27.5	MKS4D056806J_-----
	15	26	41.5	37.5	MKS4C056807D_-----	19	32	41.5	37.5	MKS4D056807F_-----
100 µF	20	39.5	31.5	27.5	MKS4C061006J_-----	24	45.5	41.5	37.5	MKS4D061007H_-----
	19	32	41.5	37.5	MKS4C061007F_-----					
150 "	20	39.5	41.5	37.5	MKS4C061507G_-----					
220 "	31	46	41.5	37.5	MKS4C062207I_-----					

* AC voltages: $f = 50 \text{ Hz}$; $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

■ New box sizes.

** PCM = printed circuit module = pin spacing

Dims. in mm.

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Continuation

General Data

Capacitance	250 VDC/160 VAC*					400 VDC/200 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	3	8.5	10	7.5	MKS4F021002B	3	8.5	10	7.5	MKS4G021002B
	4	9	13	10	MKS4F021003C	4	9	13	10	MKS4G021003C
0.015 "	3	8.5	10	7.5	MKS4F021502B	3	8.5	10	7.5	MKS4G021502B
	4	9	13	10	MKS4F021503C	4	9	13	10	MKS4G021503C
0.022 "	3	8.5	10	7.5	MKS4F022202B	4	9	10	7.5	MKS4G022202C
	4	9	13	10	MKS4F022203C	4	9	13	10	MKS4G022203C
0.033 "	3	8.5	10	7.5	MKS4F023302B	4	9	10	7.5	MKS4G023302C
	4	9	13	10	MKS4F023303C	4	9	13	10	MKS4G023303C
0.047 "	3	8.5	10	7.5	MKS4F024702B	5	10.5	10.3	7.5	MKS4G024702E
	4	9	13	10	MKS4F024703C	4	9	13	10	MKS4G024703C
0.068 "	4	9	10	7.5	MKS4F026802C	5	10.5	10.3	7.5	MKS4G026802E
	4	9	13	10	MKS4F026803C	4	9	13	10	MKS4G026803C
0.1 µF	4	9	10	7.5	MKS4F031002C	5	10.5	10.3	7.5	MKS4G031002E
	4	9	13	10	MKS4F031003C	5	11	13	10	MKS4G031003F
0.15 "	5	10.5	10.3	7.5	MKS4F031502E	5.7	12.5	10.3	7.5	MKS4G031502F
	4	9	13	10	MKS4F031503C	6	12	13	10	MKS4G031503G
0.22 "	5	10.5	10.3	7.5	MKS4F032202E	6	12	13	10	MKS4G032203G
	5	11	13	10	MKS4F032203F	6	12.5	18	15	MKS4G032204C
0.33 "	5.7	12.5	10.3	7.5	MKS4F033302F	8	15	18	15	MKS4G033304F
	5	11	13	10	MKS4F033303F					
0.47 "	6	12	13	10	MKS4F034703G	8	15	18	15	MKS4G034704F
	6	12.5	18	15	MKS4F034704C	6	15	26.5	22.5	MKS4G034705B
0.68 "	7	14	18	15	MKS4F036804D	7	16.5	26.5	22.5	MKS4G036805D
1.0 µF	8	15	18	15	MKS4F041004F	10.5	19	26.5	22.5	MKS4G041005G
	6	15	26.5	22.5	MKS4F041005B	11	21	31.5	27.5	MKS4G041006B
1.5 "	9	16	18	15	MKS4F041504J	11	21	26.5	22.5	MKS4G041505I
	7	16.5	26.5	22.5	MKS4F041505D	11	21	31.5	27.5	MKS4G041506B
2.2 "	10.5	19	26.5	22.5	MKS4F042205G	11	21	31.5	27.5	MKS4G042206B
	9	19	31.5	27.5	MKS4F042206A					
3.3 "	11	21	26.5	22.5	MKS4F043305I	13	24	31.5	27.5	MKS4G043306D
	11	21	31.5	27.5	MKS4F043306B					
4.7 "	11	21	31.5	27.5	MKS4F044706B	17	29	31.5	27.5	MKS4G044706G
	13	24	31.5	27.5	MKS4F046806D	17	34.5	31.5	27.5	MKS4G046806I
						15	26	41.5	37.5	MKS4G046807D
10 µF	17	29	31.5	27.5	MKS4F051006G	19	32	41.5	37.5	MKS4G051007F
	15	26	41.5	37.5	MKS4F051007D					
15 "	17	34.5	31.5	27.5	MKS4F051506I	20	39.5	41.5	37.5	MKS4G051507G
	17	29	41.5	37.5	MKS4F051507E					
22 "	20	39.5	41.5	37.5	MKS4F052207G	31	46	41.5	37.5	MKS4G052207I
33 "	24	45.5	41.5	37.5	MKS4F053307H	35	50	41.5	37.5	MKS4G053307J
47 "	31	46	41.5	37.5	MKS4F054707I					

* AC voltage: $f = 50 \text{ Hz}$; $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

**PCM = printed circuit module = pin spacing

Dims. in mm.

Part number completion:

Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD
Taped version see page 133		

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Continuation

General Data

Capacitance	630 VDC/400 VAC*					1000 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF						3	8.5	10	7.5	MKS4O111002B
1500 "						4	9	13	10	MKS4O111003C
2200 "						3	8.5	10	7.5	MKS4O111502B
3300 "						4	9	13	10	MKS4O111503C
4700 "						3	8.5	10	7.5	MKS4O112202B
6800 "						4	9	13	10	MKS4O112203C
						4	9	10	7.5	MKS4O113302C
						4	9	13	10	MKS4O113303C
						4	9	10	7.5	MKS4O114702C
						4	9	13	10	MKS4O114703C
						4.5	9.5	10.3	7.5	MKS4O116802D
						4	9	13	10	MKS4O116803C
0.01 µF	3	8.5	10	7.5*	MKS4J021002B	5	10.5	10.3	7.5	MKS4O121002E
	4	9	13	10	MKS4J021003C	5	11	13	10	MKS4O121003F
0.015 "	4	9	10	7.5*	MKS4J021502C	5.7	12.5	10.3	7.5	MKS4O121502F
	4	9	13	10	MKS4J021503C	6	12	13	10	MKS4O121503G
0.022 "	4.5	9.5	10.3	7.5*	MKS4J022202D	5	11	18	15	MKS4O122204B
	4	9	13	10	MKS4J022203C					
0.033 "	5	10.5	10.3	7.5*	MKS4J023302E	6	12.5	18	15	MKS4O123304C
	5	11	13	10	MKS4J023303F	6	15	26.5	22.5	MKS4O123305B
0.047 "	5.7	12.5	10.3	7.5*	MKS4J024702F	7	14	18	15	MKS4O124704D
	6	12	13	10	MKS4J024703G	6	15	26.5	22.5	MKS4O124705B
0.068 "	6	12	13	10	MKS4J026803G	8	15	18	15	MKS4O126804F
	5	11	18	15	MKS4J026804B	6	15	26.5	22.5	MKS4O126805B
0.1 µF	6	12.5	18	15	MKS4J031004C	9	16	18	15	MKS4O131004J
	6	15	26.5	22.5	MKS4J031005B	7	16.5	26.5	22.5	MKS4O131005D
0.15 "	7	14	18	15	MKS4J031504D	8.5	18.5	26.5	22.5	MKS4O131505F
	6	15	26.5	22.5	MKS4J031505B					
0.22 "	8	15	18	15	MKS4J032204F	10.5	19	26.5	22.5	MKS4O132205G
	6	15	26.5	22.5	MKS4J032205B					
0.33 "	7	16.5	26.5	22.5	MKS4J033305D	11	21	26.5	22.5	MKS4O133305I
	9	19	31.5	27.5	MKS4J033306A	11	21	31.5	27.5	MKS4O133306B
0.47 "	10.5	19	26.5	22.5	MKS4J034705G	13	24	31.5	27.5	MKS4O134706D
	9	19	31.5	27.5	MKS4J034706A					
0.68 "	11	21	26.5	22.5	MKS4J036805I	15	26	31.5	27.5	MKS4O136806F
	11	21	31.5	27.5	MKS4J036806B					
1.0 µF	11	21	31.5	27.5	MKS4J041006B	17	29	31.5	27.5	MKS4O141006G
						17	29	41.5	37.5	MKS4O141007E
1.5 "	15	26	31.5	27.5	MKS4J041506F	19	32	41.5	37.5	MKS4O141507F
2.2 "	17	34.5	31.5	27.5	MKS4J042206I	20	39.5	41.5	37.5	MKS4O142207G
	15	26	41.5	37.5	MKS4J042207D					
3.3 "	20	39.5	31.5	27.5	MKS4J043306J	24	45.5	41.5	37.5	MKS4O143307H
	19	32	41.5	37.5	MKS4J043307F					
4.7 "	20	39.5	41.5	37.5	MKS4J044707G	35	50	41.5	37.5	MKS4O144707J
6.8 "	24	45.5	41.5	37.5	MKS4J046807H	40	55	41.5	37.5	MKS4O146807K
						35	50	57	52.5	MKS4O146809F
10 µF	35	50	41.5	37.5	MKS4J051007J					
15 "	40	55	41.5	37.5	MKS4J051507K					

* AC voltage: $f = 50 \text{ Hz}$; $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

** PCM = printed circuit module = pin spacing

* Admissible AC voltage 250 VAC max.

Dims. in mm.

Part number completion:

Version code: 2-pin = 00
4-pin = D4
Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD

Taped version see page 133

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Continuation

General Data

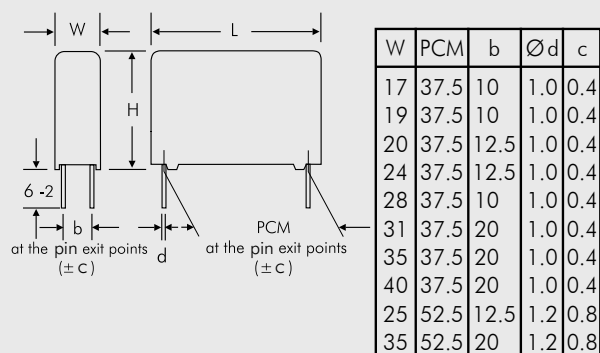
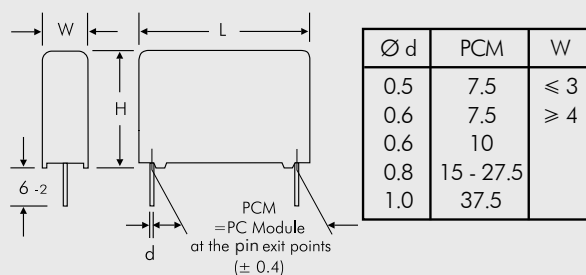
Capacitance	1500 VDC/400 VAC*					2000 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKS4S011003C	4	9	13	10	MKS4U011003C
1500 "	4	9	13	10	MKS4S011503C	4	9	13	10	MKS4U011503C
2200 "	4	9	13	10	MKS4S012203C	5	11	13	10	MKS4U012203F
3300 "	4	9	13	10	MKS4S013303C	6	12	13	10	MKS4U013303G
						5	11	18	15	MKS4U013304B
4700 "	4	9	13	10	MKS4S014703C	5	11	18	15	MKS4U014704B
	5	11	18	15	MKS4S014704B					
6800 "	5	11	13	10	MKS4S016803F	6	12.5	18	15	MKS4U016804C
	5	11	18	15	MKS4S016804B					
0.01 µF	6	12	13	10	MKS4S021003G	7	14	18	15	MKS4U021004D
	5	11	18	15	MKS4S021004B	6	15	26.5	22.5	MKS4U021005B
0.015 "	6	12.5	18	15	MKS4S021504C	6	15	26.5	22.5	MKS4U021505B
0.022 "	7	14	18	15	MKS4S022204D	7	16.5	26.5	22.5	MKS4U022205D
	6	15	26.5	22.5	MKS4S022205B					
0.033 "	8	15	18	15	MKS4S023304F	10.5	19	26.5	22.5	MKS4U023305G
	6	15	26.5	22.5	MKS4S023305B					
0.047 "	7	16.5	26.5	22.5	MKS4S024705D	11	21	26.5	22.5	MKS4U024705I
						11	21	31.5	27.5	MKS4U024706B
0.068 "	8.5	18.5	26.5	22.5	MKS4S026805F	11	21	31.5	27.5	MKS4U026806B
0.1 µF	10.5	19	26.5	22.5	MKS4S031005G	13	24	31.5	27.5	MKS4U031006D
	9	19	31.5	27.5	MKS4S031006A					
0.15 "	11	21	31.5	27.5	MKS4S031506B	17	29	31.5	27.5	MKS4U031506G
						13	24	41.5	37.5	MKS4U031507C
0.22 "	13	24	31.5	27.5	MKS4S032206D	17	29	41.5	37.5	MKS4U032207E
0.33 "	17	34.5	31.5	27.5	MKS4S033306I	20	39.5	41.5	37.5	MKS4U033307G
	17	29	41.5	37.5	MKS4S033307E					
0.47 "	20	39.5	31.5	27.5	MKS4S034706J	24	45.5	41.5	37.5	MKS4U034707H
	17	29	41.5	37.5	MKS4S034707E					
0.68 "	20	39.5	41.5	37.5	MKS4S036807G	31	46	41.5	37.5	MKS4U036807I
1.0 µF	24	45.5	41.5	37.5	MKS4S041007H	40	55	41.5	37.5	MKS4U041007K
						25	45	57	52.5	MKS4U041009D
1.5 "	31	46	41.5	37.5	MKS4S041507I					
2.2 "	35	50	41.5	37.5	MKS4S042207J					
	35	50	57	52.5	MKS4S042209F					

* AC voltage:
 $f = 50 \text{ Hz}; 1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

** PCM = printed circuit module = pin spacing

Dims. in mm.

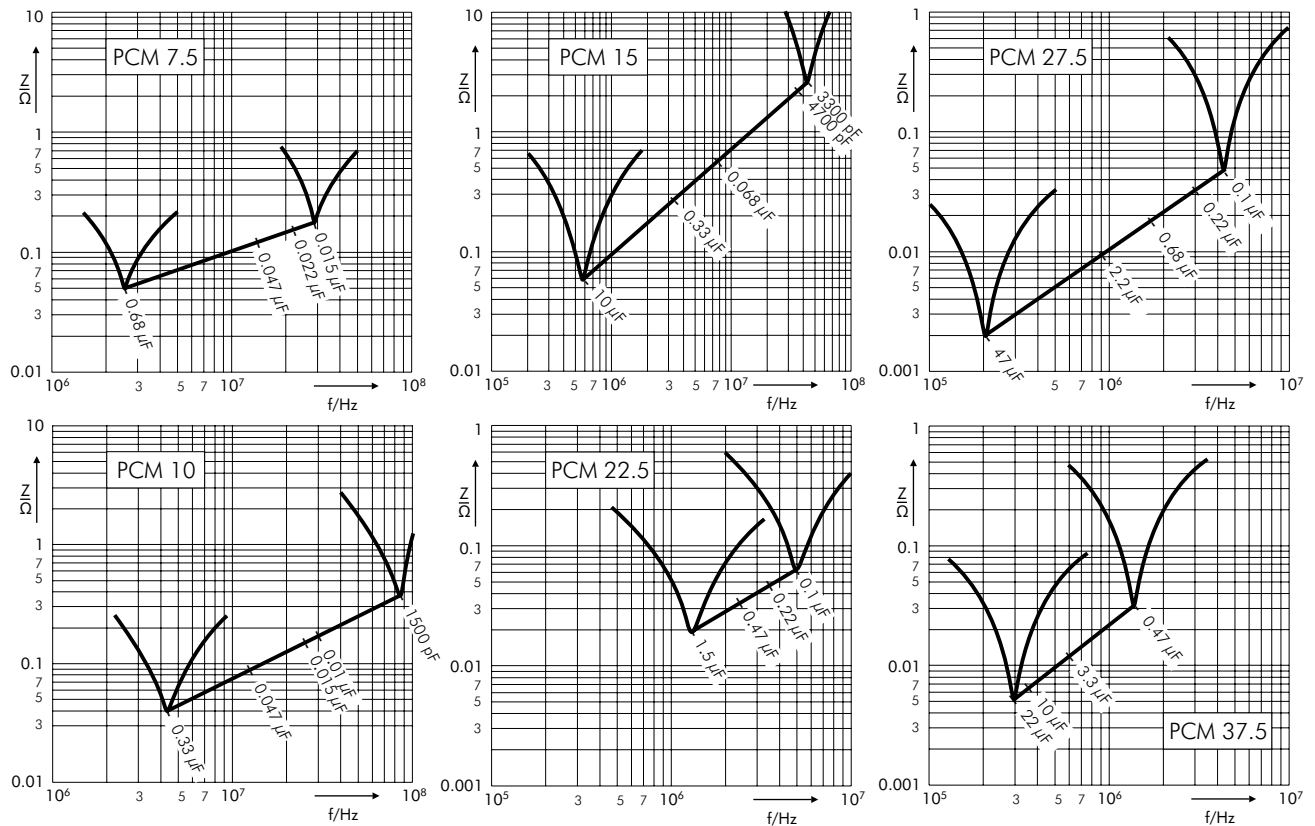
Part number completion:	
Version code:	2-pin = 00
	4-pin = D4
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 133	



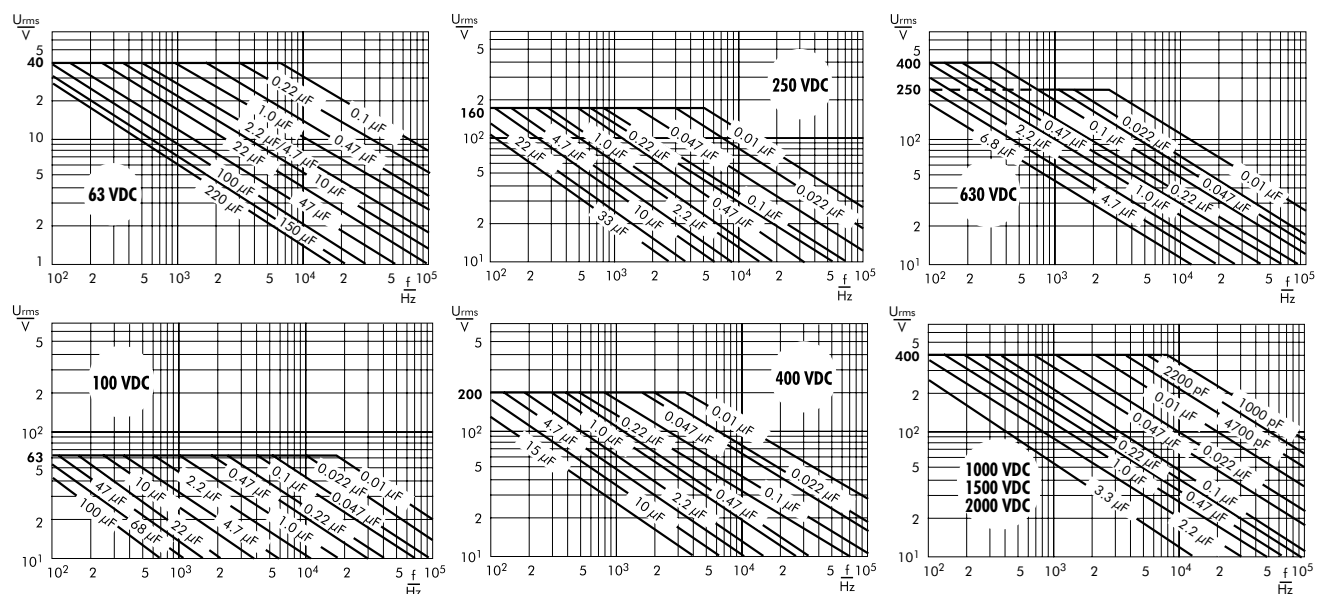
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Continuation

Impedance change with frequency (general guide).



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

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

Single wave soldering

Soldering bath temperature: $T < 260^{\circ}\text{C}$

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

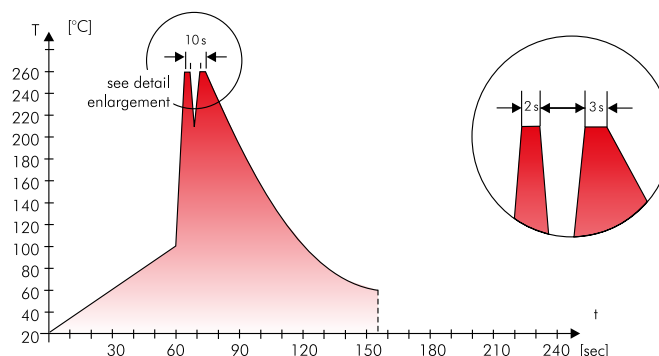
Double wave soldering

Soldering bath temperature: $T < 260^{\circ}\text{C}$

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

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

Wave soldering



Typical temperature/time graph for double wave soldering

WIMA Quality and Environmental Philosophy

ISO 9001:2015 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 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 2015/863/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 re-frained from using such substances since years already.



WIMA Kondensatoren sind bleifrei konform RoHS 2015/863/EU

WIMA capacitors are lead free in accordance with RoHS 2015/863/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

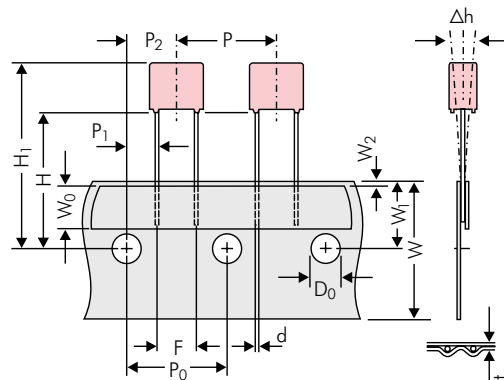


Diagram 1:
PCM 2.5/5/7.5mm

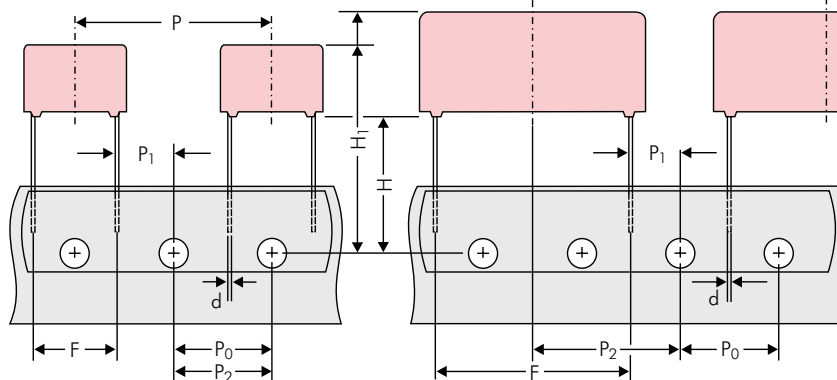


Diagram 2: PCM 10/15 mm

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 ₀	6.0 for hot-sealing adhesive tape	6.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape
Hole position	W ₁	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5
Hold-down tape position	W ₂	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.
Feed hole diameter	D ₀	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2
Pitch of component	P	12.7 ±1.0	12.7 ±1.0	12.7 ±1.0	25.4 ±1.0	25.4 ±1.0	38.1 ±1.5	*38.1 ±1.5 or 50.8 ±1.5
Feed hole pitch	P ₀	12.7 ±0.3 error max. 1.0 mm/20 pitch	12.7 ±0.3 error max. 1.0 mm/20 pitch	12.7 ±0.3 error max. 1.0 mm/20 pitch	12.7 ±0.3 error max. 1.0 mm/20 pitch	12.7 ±0.3 error max. 1.0 mm/20 pitch	12.7 ±0.3 error max. 1.0 mm/20 pitch	12.7 ±0.3 error max. 1.0 mm/20 pitch
Feed hole centre to pin	P ₁	5.1 ±0.5	3.85 ±0.7	2.6 ±0.7	7.7 ±0.7	5.2 ±0.7	7.8 ±0.7	5.3 ±0.7
Hole centre to component centre	P ₂	6.35 ±1.3	6.35 ±1.3	6.35 ±1.3	12.7 ±1.3	12.7 ±1.3	19.05 ±1.3	19.05 ±1.3
Feed hole centre to bottom edge of the component	H ▲	16.5 ±0.3 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5
Feed hole centre to top edge of the component	H ₁	H+H _{component} < H ₁ 32.25 max.	H+H _{component} < H ₁ 32.25 max.	H+H _{component} < H ₁ 24.5 to 31.5	H+H _{component} < H ₁ 25.0 to 31.5	H+H _{component} < H ₁ 26.0 to 37.0	H+H _{component} < H ₁ 30.0 to 43.0	H+H _{component} < H ₁ 35.0 to 45.0
Pin spacing at upper edge of carrier tape	F	2.5 ±0.5	5.0 ^{+0.8} _{-0.2}	7.5 ±0.8	10.0 ±0.8	15 ±0.8	22.5 ±0.8	27.5 ±0.8
Pin diameter	d	0.4 ±0.05	0.5 ±0.05	*0.5 ±0.05 or 0.6 ^{+0.06} _{-0.05}	*0.5 ±0.05 or 0.6 ^{+0.06} _{-0.05}	0.8 ^{+0.08} _{-0.05}	0.8 ^{+0.08} _{-0.05}	0.8 ^{+0.08} _{-0.05}
Component alignment	Δh	± 2.0 max.	± 2.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.
Total tape thickness	t	0.6 ±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 134)	▲	ROLL/AMMO			AMMO			
		REEL Ø 360 max. Ø 30 ±1	B 52 ±2 58 ±2 depending on comp. dimensions		REEL Ø 360 max. Ø 30 ±1	B 52 ±2 58 ±2 or 66 ±2	REEL Ø 500 max. Ø 25 ±1	B 54 ±2 60 ±2 or 68 ±2 depending on PCM and component dimensions
Unit		see details page 135.						

▲ When ordering please specify dimension H and required packaging type.

Dims in mm.

• Diameter of pins see General Data.

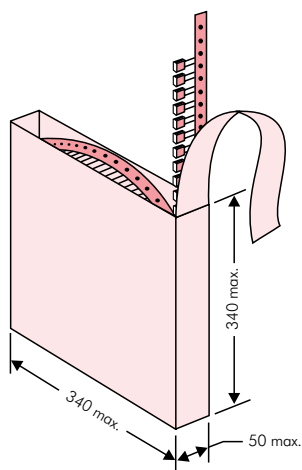
Please clarify customer-specific deviations with the manufacturer.

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

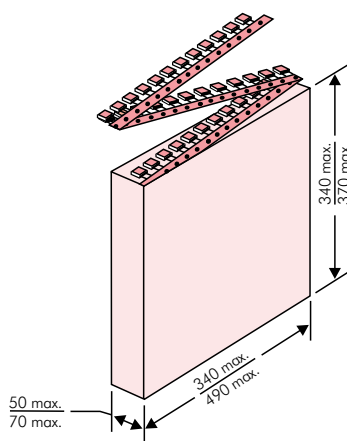
Position of components according to PCM 7.5 (sketch 1). P₀ = 12.7 or 15.0 is possible

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

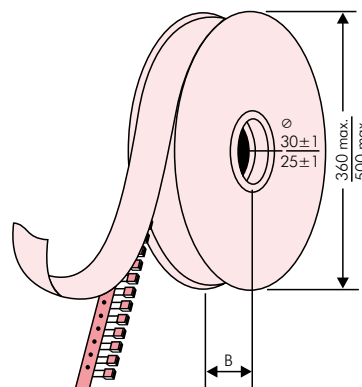
■ ROLL Packaging



■ AMMO Packaging



■ REEL Packaging



BAR CODE (Labelling)

Labelling of package units in plain text and with alphanumeric 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

WIMA Best Capacitors Made in Germany 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
	
WIMA – MKP 10 WIMA Part No.: MKP1F041006B00KSSD MKP 10 1.0 µF 250 VDC 11x21x31.5 RM27.5 Standard 10% Loss – 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	ROLL		pcs. per packing unit				AMMO			
								REEL							
	W	H	L	Codes		H16.5	H18.5	Ø 360	Ø 500	340 x 340	490 x 370	H16.5	H18.5	H16.5	H18.5
					S	N	O	F	I	H	J	A	C	B	D
2.5 mm	2.5	7	4.6	0B	5000	2200		2500		–		2800		–	
	3	7.5	4.6	0C	5000	2000		2300		–		2300		–	
	3.8	8.5	4.6	0D	5000	1500		1800		–		1800		–	
	4.6	9	4.6	0E	5000	1200		1500		–		1500		–	
	5.5	10	4.6	0F	5000	900		1200		–		1200		–	
5 mm	2.5	6.5	7.2	1A	5000	2200		2500		–		2800		–	
	3	7.5	7.2	1B	5000	2000		2300		–		2300		–	
	3.5	8.5	7.2	1C	5000	1600		2000		–		2000		–	
	4.5	6	7.2	1D	6000	1300		1500		–		1500		–	
	4.5	9.5	7.2	1E	4000	1300		1500		–		1500		–	
	5	10	7.2	1F	3500	1100		1400		–		1400		–	
	5.5	7	7.2	1G	4000	1000		1200		–		1200		–	
	5.5	11.5	7.2	1H	2500	1000		1200		–		1200		–	
	6.5	8	7.2	1I	2500	800		1000		–		1000		–	
	7.2	8.5	7.2	1J	2500	700		1000		–		1000		–	
	7.2	13	7.2	1K	2000	700		950		–		1000		–	
	8.5	10	7.2	1L	2000	600		800		–		800		–	
	8.5	14	7.2	1M	1500	600		800		–		800		–	
	11	16	7.2	1N	1000	500		600		–		640		–	
	11	18	7.2	1O	1000	500		600		–		640		–	
7.5 mm	2.5	7	10	2A	5000	–		2500		4400		2500		–	
	3	8.5	10	2B	5000	–		2200		4300		2300		4150	
	4	9	10	2C	4000	–		1700		3200		1700		3000	
	4.5	9.5	10.3	2D	3500	–		1500		2900		1400		2700	
	5	10.5	10.3	2E	3000	–		1300		2500		1300		–	
	5.7	12.5	10.3	2F	2000	–		1000		2200		1100		–	
	7.2	12.5	10.3	2G	1500	–		900		1800		1000		–	
10 mm	4	9	13	3C	3000	–		900		1600		–		1450	
	4	9.5	13	3D	3000	–		900		1600		–		1400	
	5	11	13	3F	3000	–		700		1300		–		1100	
	6	12	13	3G	2400	–		550		1100		–		1000	
	6	12.5	13	3H	2400	–		550		1100		–		1000	
	8	12	13	3I	2000	–		400		800		–		740	
15 mm	5	11	18	4B	2400	–		600		1200		–		1150	
	6	12.5	18	4C	2000	–		500		1000		–		1000	
	7	14	18	4D	1600	–		450		900		–		850	
	8	15	18	4F	1200	–		400		800		–		740	
	9	14	18	4H	1200	–		350		700		–		650	
	9	16	18	4J	900	–		350		700		–		650	
	11	14	18	4M	1000	–		300		600		–		540	
22.5 mm	5	14	26.5	5A	1200	–		–		800		–		770	
	6	15	26.5	5B	1000	–		–		700		–		640	
	7	16.5	26.5	5D	760	–		–		600		–		550	
	8.5	18.5	26.5	5F	500	–		–		480		–		450	
	10.5	19	26.5	5G	594*	–		–		400		–		360	
	10.5	20.5	26.5	5H	594*	–		–		400		–		360	
	11	21	26.5	5I	561*	–		–		380		–		350	

* for 2-inch transport pitches.

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

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	ROLL		pcs. per packing unit				AMMO			
								REEL							
						H16.5	H18.5	Ø 360	Ø 500	340 x 340	490 x 370	H16.5	H18.5	H16.5	H18.5
	W	H	L	Codes	S	N	O	F	I	H	J	A	C	B	D
27.5 mm	9	19	31.5	6A	567*	—	—	—	—	460/340*	—	—	—	—	—
	11	21	31.5	6B	459*	—	—	—	—	380/280*	—	—	—	—	—
	13	24	31.5	6D	378*	—	—	—	—	300	—	—	—	—	—
	15	26	31.5	6F	324*	—	—	—	—	270	—	—	—	—	—
	17	29	31.5	6G	198*	—	—	—	—	—	—	—	—	—	—
	17	34.5	31.5	6I	198*	—	—	—	—	—	—	—	—	—	—
	20	39.5	31.5	6J	162*	—	—	—	—	—	—	—	—	—	—
37.5 mm**	9	19	41.5	7A	441*	—	—	—	—	—	—	—	—	—	—
	11	22	41.5	7B	357*	—	—	—	—	—	—	—	—	—	—
	13	24	41.5	7C	294*	—	—	—	—	—	—	—	—	—	—
	15	26	41.5	7D	252*	—	—	—	—	—	—	—	—	—	—
	17	29	41.5	7E	154*	—	—	—	—	—	—	—	—	—	—
	19	32	41.5	7F	140*	—	—	—	—	—	—	—	—	—	—
	20	39.5	41.5	7G	126*	—	—	—	—	—	—	—	—	—	—
	24	45.5	41.5	7H	112*	—	—	—	—	—	—	—	—	—	—
	28	38	41.5	7L	84*	—	—	—	—	—	—	—	—	—	—
	31	46	41.5	7I	84*	—	—	—	—	—	—	—	—	—	—
	35	50	41.5	7J	35*	—	—	—	—	—	—	—	—	—	—
	40	55	41.5	7K	28*	—	—	—	—	—	—	—	—	—	—
48.5 mm**	19	31	56	8D	120*	—	—	—	—	—	—	—	—	—	—
	23	34	56	8E	80*	—	—	—	—	—	—	—	—	—	—
	27	37.5	56	8H	84*	—	—	—	—	—	—	—	—	—	—
	33	48	56	8J	25*	—	—	—	—	—	—	—	—	—	—
	37	54	56	8L	25*	—	—	—	—	—	—	—	—	—	—
52.5 mm	25	45	57	9D	70*	—	—	—	—	—	—	—	—	—	—
	30	45	57	9E	60*	—	—	—	—	—	—	—	—	—	—
	35	50	57	9F	25*	—	—	—	—	—	—	—	—	—	—
	45	55	57	9H	20*	—	—	—	—	—	—	—	—	—	—
	45	65	57	9J	20*	—	—	—	—	—	—	—	—	—	—

* TPS (Tray-Packing-System). Plate versions may have different packing units.

**For Snubber capacitors in 2-pin version the PCM is changing to 38.5 respective 49.5 mm.
Samples and pre-production needs on request.

Rights reserved to amend design data without prior notification.

Updated data on 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
M	K	S	2	C	0	2	1	0	0	1	A	0	0	M	S	S	D
MKS 2				63 VDC		0.01 µF				2.5x6.5x7.2		-		20%	bulk	6 -2	
Type description: SMD-PET = SMDT SMD-PPS = SMDI MKS 02 = MKS0 FKS 2 = FKS2 FKP 2 = FKP2 MKS 2 = MKS2 MKP 2 = MKP2 MKS 4 = MKS4 MKP 4 = MKP4 MKP 10 = MKP1 FKP 1 = FKP1 MKP-X2 = MKX2 MKP-X1 R = MKX1 MKP-Y2 = MKY2 Snubber MKP = SNMP Snubber FKP = SNFP GTO MKP = GTOM DC-LINK MKP 4 = DCP4 DC-LINK MKP 6 = DCP6 DC-LINK HC = DCHC				Rated voltage: 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 230 VAC = 3Y 275 VAC = 1W 300 VAC = 2W 305 VAC = AW 350 VAC = BW 440 VAC = 4W ...		Capacitance: 22 pF = 0022 47 pF = 0047 100 pF = 0100 150 pF = 0150 220 pF = 0220 330 pF = 0330 470 pF = 0470 680 pF = 0680 1000 pF = 1100 1500 pF = 1150 2200 pF = 1220 3300 pF = 1330 4700 pF = 1470 6800 pF = 1680 0.01 µF = 2100 0.022 µF = 2220 0.047 µF = 2470 0.1 µF = 3100 0.22 µF = 3220 0.47 µF = 3470 1 µF = 4100 2.2 µF = 4220 4.7 µF = 4470 10 µF = 5100 22 µF = 5220 47 µF = 5470 100 µF = 6100 220 µF = 6220 1000 µF = 7100 1500 µF = 7150 ...		Size: 4.8x3.3x3 Size1812 = KA 4.8x3.3x4 Size1812 = KB 5.7x5.1x3.5 Size2220 = QA 5.7x5.1x4.5 Size2220 = QB 7.2x6.1x3 Size2824 = TA 7.2x6.1x5 Size2824 = TB 10.2x7.6x5 Size4030 = VA 12.7x10.2x6 Size5040 = XA 15.3x13.7x7 Size6054 = YA 2.5x7x4.6 PCM2.5 = 0B 3x7.5x4.6 PCM2.5 = 0C 2.5x6.5x7.2 PCM5 = 1A 3x7.5x7.2 PCM5 = 1B 2.5x7x10 PCM7.5 = 2A 3x8.5x10 PCM7.5 = 2B 3x9x13 PCM10 = 3A 4x9x13 PCM10 = 3C 5x11x18 PCM15 = 4B 6x12.5x18 PCM15 = 4C 5x14x26.5 PCM22.5 = 5A 6x15x26.5 PCM22.5 = 5B 9x19x31.5 PCM27.5 = 6A 11x21x31.5 PCM27.5 = 6B 9x19x41.5 PCM37.5 = 7A 11x22x41.5 PCM37.5 = 7B 19x31x56 PCM 48.5 = 8D 25x45x57 PCM 52.5 = 9D ...		Tolerance: ±20% = M ±10% = K ±5% = J ±2.5% = H ±1% = E ...		Packing: 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 ...		Pin length (untaped) 3.5 ±0.5 = C9 6 -2 = SD 16 ±1 = P1 ... Pin length (taped) none = 00			