WIMA MKP 10

Polypropylene (PP) Capacitors for Pulse Applications with Double-Sided Metallized Electrodes and Schoopage Contacts PCM 7.5 mm to 52.5 mm

Special Features

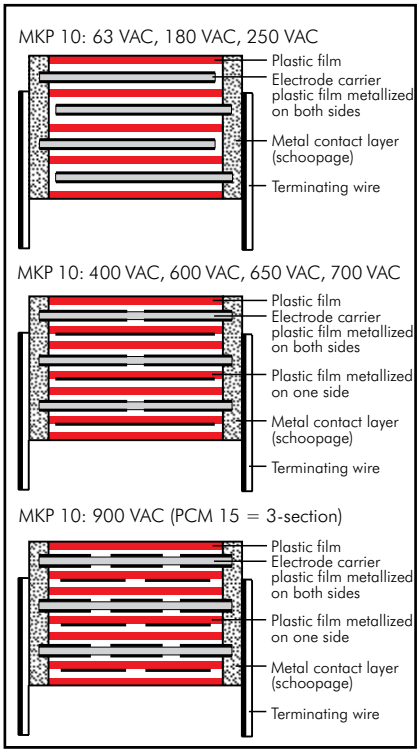
- **Pulse duty construction**
- **Self-healing**
- **Very low dissipation factor**
- **Negative capacitance change versus temperature**
- **According to RoHS 2011/65/EU**

Typical Applications

For pulse applications e.g.
- **Switch mode power supplies**
- **TV and monitor sets**
- **Lighting**
- **Audio/video equipment**

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

Electrical Data

Capacitance range:
1000 pF to 47 µF (E12-values on request)
Rated voltages: 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1600 VDC, 2000 VDC, 2500 VDC, 3000 VDC
Capacitance tolerances:
±20%, ±10%, ±5%
Operating temperature range:
–55° C to +100° C
Insulation resistance at +20° C:
C ⩽ 0.33 µF: ⩾ 1 x 10^5 MΩ
(mean value: 5 x 10^5 MΩ)
C > 0.33 µF: ⩾ 30 000 sec (MΩ x µF)
(mean value: 100 000 sec)
Measuring voltage: 100 V/1 min.
Test voltage: 2 sec.

L	⩽ 2000 VDC	2500 VDC	⩾ 3000 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
57	1.2 U_r	1.2 U_r	1.2 U_r

Climatic test category:
55/100/56 in accordance with IEC
Dielectric absorption: 0.05 %
Voltage derating:
A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.
Reliability:
Operational life > 300 000 hours
Failure rate < 1 fit (0.5 x U_r and 40° C)
Specific dissipation:

Box size* WxHxL in mm	Specific dissipation in Watts per K above the ambient temperature
35 x 50 x 57	0.132
45 x 55 x 57	0.164
45 x 65 x 57	0.184

* other box sizes see page 10.

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	⩽ 3 x 10^{-4}	⩽ 3 x 10^{-4}	⩽ 3 x 10^{-4}
10 kHz	⩽ 4 x 10^{-4}	⩽ 6 x 10^{-4}	–
100 kHz	⩽ 15 x 10^{-4}	–	–

Maximum pulse rise time for pulses equal to the rated voltage

Capacitance pF/µF	max. pulse rise time V/µsec at T_A < 40° C								
	100 VDC	250 VDC	400 VDC	630 VDC	1000 VDC	1600 VDC	2000 VDC	2500 VDC	3000 VDC
1000 ... 2200	1000	1800	1800	1800	2800	5400	9000	11000	–
3300 ... 6800	900	1200	1200	1200	2800	5400	9000	11000	–
0.01 ... 0.022	700	1100	1200	1800	2100	3000	3400	11000	3400
0.033 ... 0.068	400	800	900	1800	2100	2100	2100	–	2100
0.1 ... 0.22	200	500	500	900	1400	1400	1400	–	1400
0.33 ... 0.68	100	300	400	700	900	900	900	–	900
1.0 ... 2.2	70	200	200	400	400	500	320	–	400
3.3 ... 4.7	50	80	100	150	180	250	–	–	
6.8 ... 15	35	50	70	130	–	–	–	–	
22 ... 47	25	35	35	–	–	–	–	–	–

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: 1kPa = 10 mbar in accordance with IEC 60068-2-13
Bump test: 4000 bumps at 390 m/sec^2 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	100 VDC/63 VAC*					250 VDC/180 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	10	**7.5**	MKP1D011002C_____	4	9	10	**7.5**	MKP1F011002C_____
1500 „	4	9	10	**7.5**	MKP1D011502C_____	4	9	10	**7.5**	MKP1F011502C_____
2200 „	4	9	10	**7.5**	MKP1D012202C_____	4	9	10	**7.5**	MKP1F012202C_____
3300 „	4	9	10	**7.5**	MKP1D013302C_____	4	9	10	**7.5**	MKP1F013302C_____
4700 „	4	9	10	**7.5**	MKP1D014702C_____	4	9	10	**7.5**	MKP1F014702C_____
6800 „	4	9	10	**7.5**	MKP1D016802C_____	4	9	10	**7.5**	MKP1F016802C_____
0.01 µF	4	9	10	**7.5**	MKP1D021002C_____	4	9	10	**7.5**	MKP1F021002C_____
						4	9	13	10	MKP1F021003C_____
0.015 „	4	9	10	**7.5**	MKP1D021502C_____	4	9	10	**7.5**	MKP1F021502C_____
						4	9	13	10	MKP1F021503C_____
0.022 „	4	9	10	**7.5**	MKP1D022202C_____	4	9	10	**7.5**	MKP1F022202C_____
						4	9	13	10	MKP1F022203C_____
0.033 „	5	10.5	10.3	**7.5**	MKP1D023302E_____	5	10.5	10.3	**7.5**	MKP1F023302E_____
	4	9	13	10	MKP1D023303C_____	4	9	13	10	MKP1F023303C_____
0.047 „	5	10.5	10.3	**7.5**	MKP1D024702E_____	5	10.5	10.3	**7.5**	MKP1F024702E_____
	4	9	13	10	MKP1D024703C_____	4	9	13	10	MKP1F024703C_____
0.068 „	5	11	13	10	MKP1D026803F_____	5	11	13	10	MKP1F026803F_____
						5	11	18	15	MKP1F026804B_____
0.1 µF	6	12	13	10	MKP1D031003G_____	6	12	13	10	MKP1F031003G_____
						5	11	18	15	MKP1F031004B_____
0.15 „	6	12.5	18	15	MKP1D031504C_____	6	12.5	18	15	MKP1F031504C_____
						6	15	26.5	22.5	MKP1F031505B_____
0.22 „	7	14	18	15	MKP1D032204D_____	7	14	18	15	MKP1F032204D_____
						6	15	26.5	22.5	MKP1F032205B_____
0.33 „	8	15	18	15	MKP1D033304F_____	8	15	18	15	MKP1F033304F_____
						6	15	26.5	22.5	MKP1F033305B_____
0.47 „	9	16	18	15	MKP1D034704J_____	9	16	18	15	MKP1F034704J_____
	7	16.5	26.5	22.5	MKP1D034705D_____	7	16.5	26.5	22.5	MKP1F034705D_____
0.68 „	8.5	18.5	26.5	22.5	MKP1D036805F_____	8.5	18.5	26.5	22.5	MKP1F036805F_____
						9	19	31.5	27.5	MKP1F036806A_____
1.0 µF	10.5	19	26.5	22.5	MKP1D041005G_____	11	21	26.5	22.5	MKP1F041005I_____
						11	21	31.5	27.5	MKP1F041006B_____
1.5 „	11	21	31.5	27.5	MKP1D041506B_____	13	24	31.5	27.5	MKP1F041506D_____
						13	24	41.5	37.5	MKP1F041507C_____
2.2 „	13	24	31.5	27.5	MKP1D042206D_____	15	26	31.5	27.5	MKP1F042206F_____
						13	24	41.5	37.5	MKP1F042207C_____
3.3 „	17	29	31.5	27.5	MKP1D043306G_____	17	34.5	31.5	27.5	MKP1F043306I_____
						17	29	41.5	37.5	MKP1F043307E_____
4.7 „	20	39.5	31.5	27.5	MKP1D044706J_____	20	39.5	31.5	27.5	MKP1F044706J_____
	17	29	41.5	37.5	MKP1D044707E_____	19	32	41.5	37.5	MKP1F044707F_____
6.8 „	19	32	41.5	37.5	MKP1D046807F_____	20	39.5	41.5	37.5	MKP1F046807G_____
10 µF	20	39.5	41.5	37.5	MKP1D051007G_____	24	45.5	41.5	37.5	MKP1F051007H_____
15 „	24	45.5	41.5	37.5	MKP1D051507H_____	35	50	41.5	37.5	MKP1F051507J_____
	31	46	41.5	37.5	MKP1D051507I_____	35	50	57	52.5	MKP1F051509F_____
22 „	35	50	41.5	37.5	MKP1D052207J_____	35	50	57	52.5	MKP1F052209F_____
33 „	40	55	41.5	37.5	MKP1D053307K_____	45	65	57	52.5	MKP1F053309J_____
	35	50	57	52.5	MKP1D053309F_____					
47 „	45	65	57	52.5	MKP1D054709J_____					

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

New values

** PCM = Printed circuit module = pin spacing

Dims. in mm.

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

Rights reserved to amend design data without prior notification.

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 128.

Continuation page 58

Continuation

General Data

Capacitance	400 VDC/250 VAC* W	H	L	PCM**	Part number	630 VDC/400 VAC* W	H	L	PCM**	Part number
1000 pF	4	9	10	**7.5**	MKP1G011002C_____	4	9	10	**7.5***	MKP1J011002C_____
1500 „	4	9	10	**7.5**	MKP1G011502C_____	4	9	10	**7.5***	MKP1J011502C_____
2200 „	4	9	10	**7.5**	MKP1G012202C_____	4	9	10	**7.5***	MKP1J012202C_____
3300 „	4	9	10	**7.5**	MKP1G013302C_____	4	9	10	**7.5***	MKP1J013302C_____
4700 „	4	9	10	**7.5**	MKP1G014702C_____	4	9	10	**7.5***	MKP1J014702C_____
6800 „	4	9	10	**7.5**	MKP1G016802C_____	4	9	10	**7.5***	MKP1J016802C_____
						4	9	13	10	MKP1J016803C_____
0.01 µF	4	9	10	**7.5**	MKP1G021002C_____	5	10.5	10.3	**7.5***	MKP1J021002E_____
	4	9	13	10	MKP1G021003C_____	4	9	13	10	MKP1J021003C_____
0.015 „	5	10.5	10.3	**7.5**	MKP1G021502E_____	5	11	13	10	MKP1J021503F_____
	4	9	13	10	MKP1G021503C_____	5	11	18	15	MKP1J021504B_____
0.022 „	5	10.5	10.3	**7.5**	MKP1G022202E_____	5	11	13	10	MKP1J022203F_____
	4	9	13	10	MKP1G022203C_____	5	11	18	15	MKP1J022204B_____
0.033 „	5.7	12.5	10.3	**7.5**	MKP1G023302F_____	6	12	13	10	MKP1J023303G_____
	5	11	13	10	MKP1G023303F_____	5	11	18	15	MKP1J023304B_____
0.047 „	6	12	13	10	MKP1G024703G_____	6	12.5	18	15	MKP1J024704C_____
	5	11	18	15	MKP1G024704B_____	6	15	26.5	22.5	MKP1J024705B_____
0.068 „	6	12.5	18	15	MKP1G026804C_____	7	14	18	15	MKP1J026804D_____
	6	15	26.5	22.5	MKP1G026805B_____	6	15	26.5	22.5	MKP1J026805B_____
0.1 µF	7	14	18	15	MKP1G031004D_____	9	16	18	15	MKP1J031004J_____
	6	15	26.5	22.5	MKP1G031005B_____	7	16.5	26.5	22.5	MKP1J031005D_____
0.15 „	8	15	18	15	MKP1G031504F_____	8.5	18.5	26.5	22.5	MKP1J031505F_____
	6	15	26.5	22.5	MKP1G031505B_____	9	19	31.5	27.5	MKP1J031506A_____
0.22 „	9	16	18	15	MKP1G032204J_____	8.5	18.5	26.5	22.5	MKP1J032205F_____
	7	16.5	26.5	22.5	MKP1G032205D_____	9	19	31.5	27.5	MKP1J032206A_____
0.33 „	8.5	18.5	26.5	22.5	MKP1G033305F_____	11	21	26.5	22.5	MKP1J033305I_____
	9	19	31.5	27.5	MKP1G033306A_____	11	21	31.5	27.5	MKP1J033306B_____
0.47 „	10.5	19	26.5	22.5	MKP1G034705G_____	11	21	31.5	27.5	MKP1J034706B_____
	9	19	31.5	27.5	MKP1G034706A_____					
0.68 „	11	21	26.5	22.5	MKP1G036805I_____	15	26	31.5	27.5	MKP1J036806F_____
	11	21	31.5	27.5	MKP1G036806B_____	13	24	41.5	37.5	MKP1J036807C_____
1.0 µF	13	24	31.5	27.5	MKP1G041006D_____	17	29	31.5	27.5	MKP1J041006G_____
	13	24	41.5	37.5	MKP1G041007C_____	15	26	41.5	37.5	MKP1J041007D_____
1.5 „	17	29	31.5	27.5	MKP1G041506G_____	20	39.5	31.5	27.5	MKP1J041506J_____
	13	24	41.5	37.5	MKP1G041507C_____	19	32	41.5	37.5	MKP1J041507F_____
2.2 „	20	39.5	31.5	27.5	MKP1G042206J_____	20	39.5	41.5	37.5	MKP1J042207G_____
	17	29	41.5	37.5	MKP1G042207E_____					
3.3 „	20	39.5	41.5	37.5	MKP1G043307G_____	24	45.5	41.5	37.5	MKP1J043307H_____
4.7 „	20	39.5	41.5	37.5	MKP1G044707G_____	35	50	41.5	37.5	MKP1J044707J_____
6.8 „	24	45.5	41.5	37.5	MKP1G046807H_____	40	55	41.5	37.5	MKP1J046807K_____
						35	50	57	52.5	MKP1J046809F_____
10 µF	35	50	41.5	37.5	MKP1G051007J_____	45	55	57	52.5	MKP1J051009H_____
	35	50	57	52.5	MKP1G051009F_____					
15 „	40	55	41.5	37.5	MKP1G051507K_____					
	35	50	57	52.5	MKP1G051509F_____					
22 „	45	65	57	52.5	MKP1G052209J_____					

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

New values

** PCM = Printed circuit module = pin spacing

* Admissible AC voltage 280 VAC mam..

Dims. in mm.

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

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 128.

Rights reserved to amend design data without prior notification.

Continuation page 59

Continuation

General Data

Capacitance	1000 VDC/600 VAC*					1600 VDC/650 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	10	**7.5**	MKP1O111002C_____	4	9	13	10	MKP1T011003C_____
	4	9	13	10	MKP1O111003C_____					
1500 „	4	9	10	**7.5**	MKP1O111502C_____	4	9	13	10	MKP1T011503C_____
	4	9	13	10	MKP1O111503C_____					
2200 „	4	9	10	**7.5**	MKP1O112202C_____	4	9	13	10	MKP1T012203C_____
	4	9	13	10	MKP1O112203C_____					
3300 „	4	9	10	**7.5**	MKP1O113302C_____	4	9	13	10	MKP1T013303C_____
	4	9	13	10	MKP1O113303C_____					
4700 „	4.5	9.5	10.3	**7.5**	MKP1O114702D_____	5	11	13	10	MKP1T014703F_____
	4	9	13	10	MKP1O114703C_____					
6800 „	5.7	12.5	10.3	**7.5**	MKP1O116802F_____	6	12	13	10	MKP1T016803G_____
	5	11	13	10	MKP1O116803F_____	5	11	18	15	MKP1T016804B_____
0.01 µF	5	11	13	10	MKP1O121003F_____	5	11	18	15	MKP1T021004B_____
	5	11	18	15	MKP1O121004B_____					
0.015 „	6	12	13	10	MKP1O121503G_____	6	12.5	18	15	MKP1T021504C_____
	5	11	18	15	MKP1O121504B_____	6	15	26.5	22.5	MKP1T021505B_____
0.022 „	6	12.5	18	15	MKP1O122204C_____	7	14	18	15	MKP1T022204D_____
	6	15	26.5	22.5	MKP1O122205B_____	6	15	26.5	22.5	MKP1T022205B_____
0.033 „	7	14	18	15	MKP1O123304D_____	8	15	18	15	MKP1T023304F_____
	6	15	26.5	22.5	MKP1O123305B_____	6	15	26.5	22.5	MKP1T023305B_____
0.047 „	8	15	18	15	MKP1O124704F_____	7	16.5	26.5	22.5	MKP1T024705D_____
	6	15	26.5	22.5	MKP1O124705B_____	9	19	31.5	27.5	MKP1T024706A_____
0.068 „	7	16.5	26.5	22.5	MKP1O126805D_____	10.5	19	26.5	22.5	MKP1T026805G_____
						9	19	31.5	27.5	MKP1T026806A_____
0.1 µF	8.5	18.5	26.5	22.5	MKP1O131005F_____	11	21	26.5	22.5	MKP1T031005I_____
	11	21	31.5	27.5	MKP1O131006B_____	11	21	31.5	27.5	MKP1T031006B_____
0.15 „	11	21	26.5	22.5	MKP1O131505I_____	13	24	31.5	27.5	MKP1T031506D_____
	11	21	31.5	27.5	MKP1O131506B_____					
0.22 „	11	21	31.5	27.5	MKP1O132206B_____	15	26	31.5	27.5	MKP1T032206F_____
						13	24	41.5	37.5	MKP1T032207C_____
0.33 „	15	26	31.5	27.5	MKP1O133306F_____	17	34.5	31.5	27.5	MKP1T033306I_____
	13	24	41.5	37.5	MKP1O133307C_____	17	29	41.5	37.5	MKP1T033307E_____
0.47 „	17	29	31.5	27.5	MKP1O134706G_____	20	39.5	31.5	27.5	MKP1T034706J_____
	13	24	41.5	37.5	MKP1O134707C_____	19	32	41.5	37.5	MKP1T034707F_____
0.68 „	20	39.5	31.5	27.5	MKP1O136806J_____	20	39.5	41.5	37.5	MKP1T036807G_____
	17	29	41.5	37.5	MKP1O136807E_____					
1.0 µF	20	39.5	41.5	37.5	MKP1O141007G_____	24	45.5	41.5	37.5	MKP1T041007H_____
1.5 „	24	45.5	41.5	37.5	MKP1O141507H_____	31	46	41.5	37.5	MKP1T041507I_____
2.2 „	31	46	41.5	37.5	MKP1O142207I_____	40	55	41.5	37.5	MKP1T042207K_____
						35	50	57	52.5	MKP1T042209F_____
3.3 „	40	55	41.5	37.5	MKP1O143307K_____	45	65	57	52.5	MKP1T043309J_____
	35	50	57	52.5	MKP1O143309F_____					
4.7 „	45	55	57	52.5	MKP1O144709H_____					

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

New values

** PCM = Printed circuit module = pin spacing

Dims. in mm.

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

Part number completion:		
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 128.

Rights reserved to amend design data without prior notification.

Continuation page 60

Continuation

General Data

Capacitance	2000 VDC/700 VAC* W	H	L	PCM**	Part number	2500 VDC/900 VAC* W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKP1U011003C_____	5	11	18	15	MKP1V011004B_____
						6	15	26.5	22.5	MKP1V011005B_____
1500 „	4	9	13	10	MKP1U011503C_____	5	11	18	15	MKP1V011504B_____
						6	15	26.5	22.5	MKP1V011505B_____
2200 „	5	11	13	10	MKP1U012203F_____	5	11	18	15	MKP1V012204B_____
	5	11	18	15	MKP1U012204B_____	6	15	26.5	22.5	MKP1V012205B_____
3300 „	5	11	18	15	MKP1U013304B_____	5	11	18	15	MKP1V013304B_____
						6	15	26.5	22.5	MKP1V013305B_____
4700 „	5	11	18	15	MKP1U014704B_____	6	12.5	18	15	MKP1V014704C_____
	6	15	26.5	22.5	MKP1U014705B_____	6	15	26.5	22.5	MKP1V014705B_____
6800 „	6	12.5	18	15	MKP1U016804C_____	7	14	18	15	MKP1V016804D_____
	6	15	26.5	22.5	MKP1U016805B_____	7	16.5	26.5	22.5	MKP1V016805D_____
0.01 µF	7	14	18	15	MKP1U021004D_____	8.5	18.5	26.5	22.5	MKP1V021005F_____
	6	15	26.5	22.5	MKP1U021005B_____					
0.015 „	8	15	18	15	MKP1U021504F_____	10.5	19	26.5	22.5	MKP1V021505G_____
	6	15	26.5	22.5	MKP1U021505B_____					
0.022 „	9	16	18	15	MKP1U022204J_____	11	21	26.5	22.5	MKP1V022205I_____
	7	16.5	26.5	22.5	MKP1U022205D_____					
0.033 „	8.5	18.5	26.5	22.5	MKP1U023305F_____					
	9	19	31.5	27.5	MKP1U023306A_____					
0.047 „	10.5	19	26.5	22.5	MKP1U024705G_____					
	11	21	31.5	27.5	MKP1U024706B_____					
0.068 „	11	21	26.5	22.5	MKP1U026805I_____					
	11	21	31.5	27.5	MKP1U026806B_____					
0.1 µF	13	24	31.5	27.5	MKP1U031006D_____					
0.15 „	15	26	31.5	27.5	MKP1U031506F_____					
	13	24	41.5	37.5	MKP1U031507C_____					
0.22 „	17	34.5	31.5	27.5	MKP1U032206I_____					
	17	29	41.5	37.5	MKP1U032207E_____					
0.33 „	19	32	41.5	37.5	MKP1U033307F_____					
0.47 „	20	39.5	41.5	37.5	MKP1U034707G_____					
0.68 „	24	45.5	41.5	37.5	MKP1U036807H_____					
1.0 µF	35	50	41.5	37.5	MKP1U041007J_____					
1.5 „	40	55	41.5	37.5	MKP1U041507K_____					
	35	50	57	52.5	MKP1U041509F_____					
2.2 „	45	55	57	52.5	MKP1U042209H_____					

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

New values

** PCM = Printed circuit module = pin spacing

Dims. in mm.

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

Part number completion:		
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 128.

Rights reserved to amend design data without prior notification.

Continuation page 61

Continuation

General Data

Capacitance	3000 VDC/700 VAC* W	H	L	PCM**	Part number
0.01 µF	6	15	26.5	22.5	MKP1W021005B_____
0.015 „	7	16.5	26.5	22.5	MKP1W021505D_____
0.022 „	8.5	18.5	26.5	22.5	MKP1W022205F_____
0.033 „	11	21	26.5	22.5	MKP1W023305I_____
	9	19	31.5	27.5	MKP1W023306A_____
0.047 „	11	21	31.5	27.5	MKP1W024706B_____
0.068 „	13	24	31.5	27.5	MKP1W026806D_____
0.1 µF	15	26	31.5	27.5	MKP1W031006F_____
	13	24	41.5	37.5	MKP1W031007C_____
0.15 „	17	34.5	31.5	27.5	MKP1W031506I_____
	15	26	41.5	37.5	MKP1W031507D_____
0.22 „	19	32	41.5	37.5	MKP1W032207F_____
0.33 „	24	45.5	41.5	37.5	MKP1W033307H_____
0.47 „	31	46	41.5	37.5	MKP1W034707I_____
0.68 „	35	50	41.5	37.5	MKP1W036807J_____
1.0 µF	40	55	41.5	37.5	MKP1W041007K_____
	35	50	57	52.5	MKP1W041009F_____
1.5 „	45	55	57	52.5	MKP1W041509H_____

* AC voltage: f ⩽ 1000 Hz; 1.4 x U_{rms} + UDC ⩽ U_r

New range

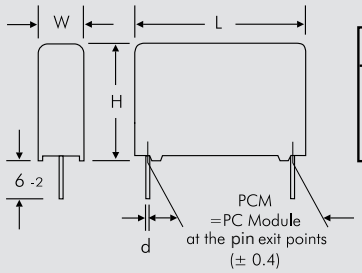
** PCM = Printed circuit module = pin spacing

Dims. in mm.

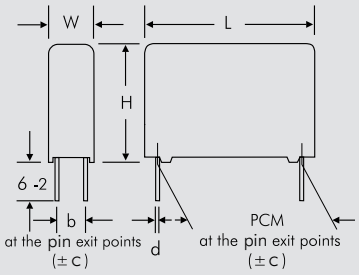
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:		
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 128.



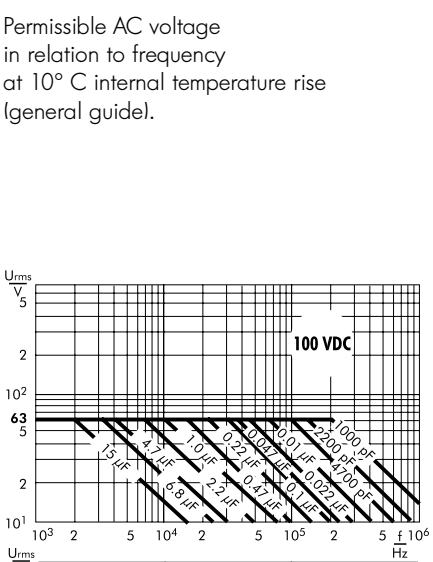
ø d	PCM
0.6	7,5 -10
0.8	15 - 27.5
1.0	37.5

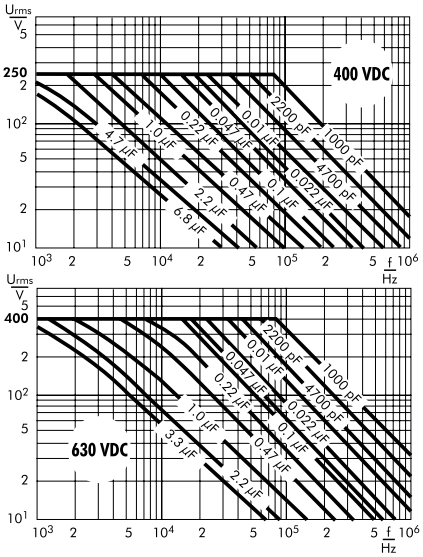


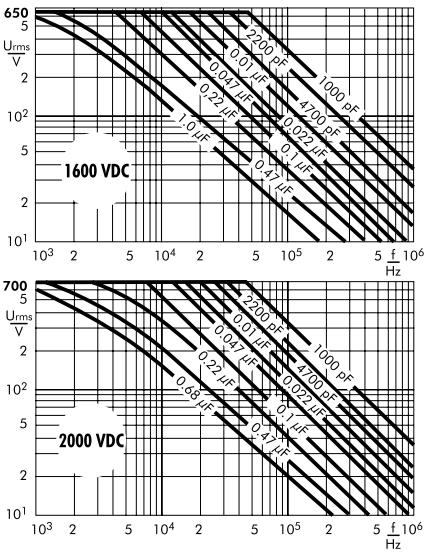
W	PCM	b	ø d	c
17	37.5	10	1.0	0.4
19	37.5	10	1.0	0.4
20	37.5	12.5	1.0	0.4
24	37.5	12.5	1.0	0.4
31	37.5	20	1.0	0.4
35	37.5	20	1.0	0.4
40	37.5	20	1.0	0.4
35	52.5	20	1.2	0.8
45	52.5	20	1.2	0.8

Rights reserved to amend design data without prior notification.

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:

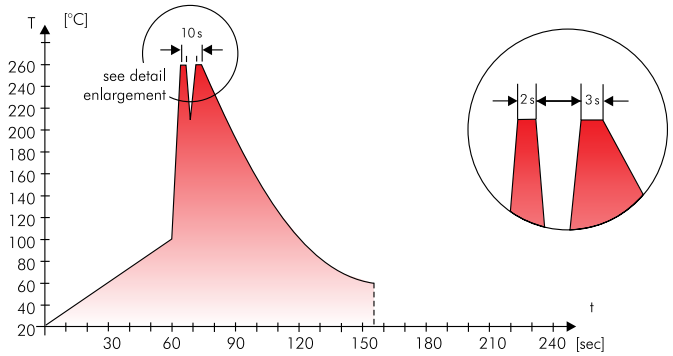
Polyester:	preheating:	$T_{max.} \leqslant 125°$ C
	soldering:	$T_{max.} \leqslant 135°$ C
Polypropylene:	preheating:	$T_{max.} \leqslant 100°$ C
	soldering:	$T_{max.} \leqslant 110°$ C

Single wave soldering
Soldering bath temperature: $T < 260°$ C
Dwell time: $t < 5$ sec

Double wave soldering
Soldering bath temperature: $T < 260°$ C
Dwell time: $\Sigma t < 5$ 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 9001:2008 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**
- **AQL check**

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 refraind from using such substances since years already.

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

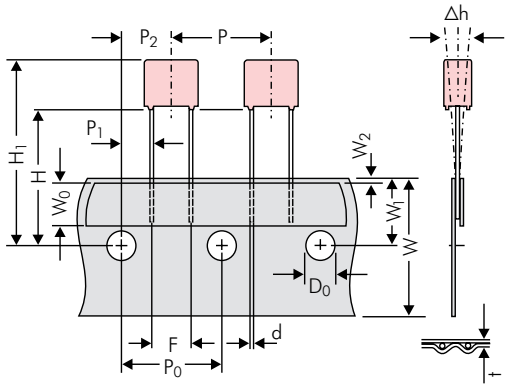


Diagram 1:
PCM 2.5/5/7.5mm

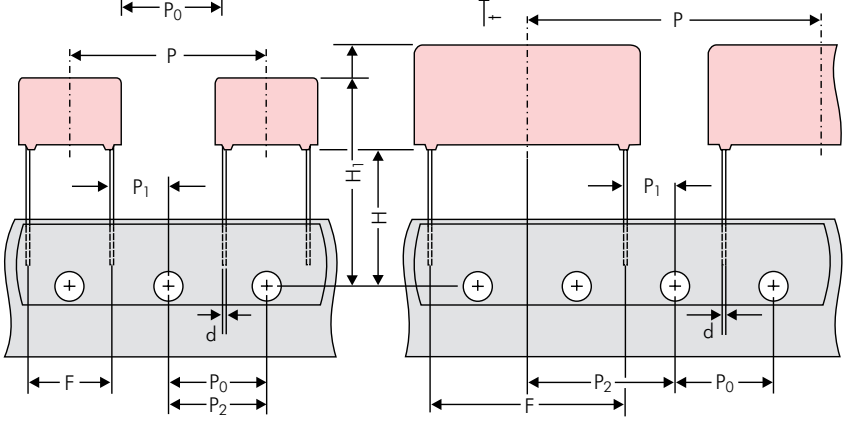


Diagram 2: PCM 10/15 mm

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 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_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 ±0.5 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_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	0.7 ±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 129)		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 / 66 ±2 or REEL ø 500 max. ø 25 ±1 B 54 ±2 / 60 ±2 / 68 ±2 } depending on PCM and component dimensions				
Unit		see details page 130.						

Dims in mm.

• Diameter of pins see General Data.

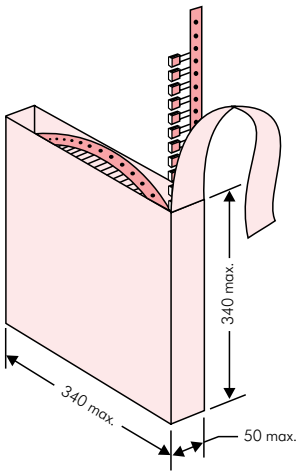
Please clarify customer-specific deviations with the manufacturer.

* PCM 10 and PCM 15 can be crimped to PCM 7.5.
Position of components according to PCM 7.5 (sketch 1). P_0 = 12.7 or 15.0 is possible

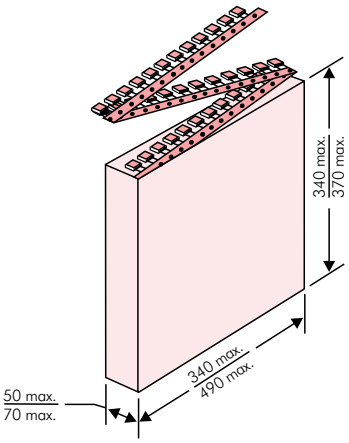
02.14

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

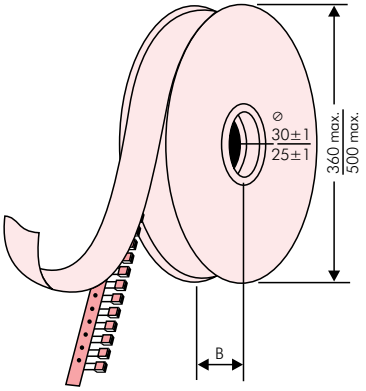
ROLL Packaging



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.

BARCODE „Code 39"

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

PCM	Size				pcs. per packing unit											
					bulk	ROLL		REEL				AMMO				
								ø 360		ø 500		340 × 340		490 × 370		
						H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	
	W	H	L	Codes	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		–		400		–		
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		3100		
	4.5	9.5	10.3	**2D**	3500	–		1500		2900		1400		2800		
	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	3	9	13	**3A**	3000	–		1100		2200		–		1900		
	4	8.5	13.5	**FA**	3000	–		900		1600		–		1450		
	4	9	13	**3C**	3000	–		900		1600		–		1450		
	4	9.5	13	**3D**	3000	–		900		1600		–		1400		
	5	10	13.5	**FB**	2000	–		700		1300		–		1200		
	5	11	13	**3F**	3000	–		700		1300		–		1200		
	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		
	5	13	19	**FC**	1000	–		600		1200		–		1200		
	6	12.5	18	**4C**	2000	–		500		1000		–		1000		
	6	14	19	**FD**	1000	–		500		1000		–		1000		
	7	14	18	**4D**	1600	–		450		900		–		850		
	7	15	19	**FE**	1000	–		450		900		–		850		
	8	15	18	**4F**	1200	–		400		800		–		740		
	8	17	19	**FF**	500	–		400		800		–		740		
	9	14	18	**4H**	1200	–		350		700		–		650		
	9	16	18	**4J**	900	–		350		700		–		650		
	10	18	19	**FG**	500	–		300		650		–		590		
	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	20	28	**FH**	500	–		–		500		–		480		
	8.5	18.5	26.5	**5F**	500	–		–		480		–		450		
	10	22	28	**FI**	540*	–		–		420		–		380		
	10.5	19	26.5	**5G**	680*	–		–		400		–		360		
	10.5	20.5	26.5	**5H**	680*	–		–		400		–		360		
	11	21	26.5	**5I**	680*	–		–		380		–		350		
	12	24	28	**FJ**	450*	–		–		350		–		310		

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

Moulded versions.

Rights reserved to amend design data without prior notification.

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

PCM	Size				bulk	pcs. per packing unit									
						ROLL		REEL				AMMO			
								ø 360		ø 500		340 × 340		490 × 370	
						H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5
	W	H	L	Codes	S	N	O	F	I	H	J	A	C	B	D
27.5 mm	9	19	31.5	**6A**	640*	–		–		460/340*		–		420	
	11	21	31.5	**6B**	544*	–		–		380/280*		–		350	
	13	24	31.5	**6D**	448*	–		–		300		–		290	
	13	25	33	**FK**	336*	–		–		–		–		–	
	15	26	31.5	**6F**	384*	–		–		270		–		250	
	15	26	33	**FL**	288*	–		–		–		–		–	
	17	29	31.5	**6G**	176*	–		–		–		–		–	
	17	34.5	31.5	**6I**	176*	–		–		–		–		–	
	20	32	33	**FM**	216*	–		–		–		–		–	
	20	39.5	31.5	**6J**	144*	–		–		–		–		–	
37.5 mm	9	19	41.5	**7A**	480*	–		–		–		–		–	
	11	22	41.5	**7B**	408*	–		–		–		–		–	
	13	24	41.5	**7C**	252*	–		–		–		–		–	
	15	26	41.5	**7D**	144*	–		–		–		–		–	
	17	29	41.5	**7E**	132*	–		–		–		–		–	
	19	32	41.5	**7F**	108*	–		–		–		–		–	
	20	39.5	41.5	**7G**	108*	–		–		–		–		–	
	24	45.5	41.5	**7H**	84*	–		–		–		–		–	
	31	46	41.5	**7I**	72*	–		–		–		–		–	
	35	50	41.5	**7J**	35*	–		–		–		–		–	
	40	55	41.5	**7K**	28*	–		–		–		–		–	
48.5 mm	19	31	56	**8D**	50*	–		–		–		–		–	
	23	34	56	**8E**	72*	–		–		–		–		–	
	27	37.5	56	**8H**	60*	–		–		–		–		–	
	33	48	56	**8J**	48*	–		–		–		–		–	
	37	54	56	**8L**	25*	–		–		–		–		–	
52.5 mm	35	50	57	**9F**	25*	–		–		–		–		–	
	45	55	57	**9H**	20*	–		–		–		–		–	
	45	65	57	**9J**	20*	–		–		–		–		–	

* for 2-inch transport pitches.

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

Moulded versions.

Rights reserved to amend design data without prior notification.

WIMA Part Number System

A WIMA part number consists of 18 digits and is composed as follows:

Field 1 - 4: Type description
Field 5 - 6: Rated voltage
Field 7 - 10: Capacitance
Field 11 - 12: Size and PCM
Field 13 - 14: Version code (e.g. Snubber versions)
Field 15: Capacitance tolerance
Field 16: Packing
Field 17 - 18: Pin length (untaped)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	**K**	**S**	**2**	**C**	**0**	**2**	**1**	**0**	**0**	**1**	**A**	**0**	**0**	**M**	**S**	**S**	**D**
MKS 2				63 VDC		0.01 µF				2.5 x 6.5 x 7.2		-		20%	bulk	6 -2	

Type description:

SMD-PET	= SMDT
SMD-PPS	= SMDI
FKP 02	= FKP0
MKS 02	= MKS0
FKS 2	= FKS2
FKP 2	= FKP2
MKS 2	= MKS2
MKP 2	= MKP2
FKS 3	= FKS3
FKP 3	= FKP3
MKS 4	= MKS4
MKP 4	= MKP4
MKP 10	= MKP1
FKP 4	= FKP4
FKP 1	= FKP1
MKP-X2	= MKX2
MKP-X2 R	= MKXR
MKP-Y2	= MKY2
MP 3-X2	= MPX2
MP 3-X1	= MPX1
MP 3-Y2	= MPY2
MP 3R-Y2	= MPRY
Snubber MKP	= SNMP
Snubber FKP	= SNFP
GTO MKP	= GTOM
DC-LINK MKP 3	= DCP3
DC-LINK MKP 4	= DCP4
DC-LINK MKP 4S	= DCPS
DC-LINK MKP 5	= DCP5
DC-LINK MKP 6	= DCP6
DC-LINK HC	= DCH_
DC-LINK HY	= DCHY

Rated voltage:

50 VDC	= B0
63 VDC	= C0
100 VDC	= D0
250 VDC	= F0
400 VDC	= G0
450 VDC	= H0
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
400 VAC	= 3W
440 VAC	= 4W
500 VAC	= 5W
...	

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
...	

Size:

4.8 x 3.3 x 3 Size 1812	= KA
4.8 x 3.3 x 4 Size 1812	= KB
5.7 x 5.1 x 3.5 Size 2220	= QA
5.7 x 5.1 x 4.5 Size 2220	= QB
7.2 x 6.1 x 3 Size 2824	= TA
7.2 x 6.1 x 5 Size 2824	= TB
10.2 x 7.6 x 5 Size 4030	= VA
12.7 x 10.2 x 6 Size 5040	= XA
15.3 x 13.7 x 7 Size 6054	= YA
2.5 x 7 x 4.6 PCM 2.5	= 0B
3 x 7.5 x 4.6 PCM 2.5	= 0C
2.5 x 6.5 x 7.2 PCM 5	= 1A
3 x 7.5 x 7.2 PCM 5	= 1B
2.5 x 7 x 10 PCM 7.5	= 2A
3 x 8.5 x 10 PCM 7.5	= 2B
3 x 9 x 13 PCM 10	= 3A
4 x 9 x 13 PCM 10	= 3C
5 x 11 x 18 PCM 15	= 4B
6 x 12.5 x 18 PCM 15	= 4C
5 x 14 x 26.5 PCM 22.5	= 5A
6 x 15 x 26.5 PCM 22.5	= 5B
9 x 19 x 31.5 PCM 27.5	= 6A
11 x 21 x 31.5 PCM 27.5	= 6B
9 x 19 x 41.5 PCM 37.5	= 7A
11 x 22 x 41.5 PCM 37.5	= 7B
94 x 49 x 182 DCH_	= H0
94 x 77 x 182 DCH_	= H1
...	

Version code:

Standard	= 00
Version A1	= 1A
Version A1.1.1	= 1B
Version A2	= 2A
...	

Tolerance:

±20%	= M
±10%	= K
±5%	= J
±2.5%	= H
±1%	= E
...	

Packing:

AMMO H16.5 340 x 340	= A
AMMO H16.5 490 x 370	= B
AMMO H18.5 340 x 340	= C
AMMO H18.5 490 x 370	= 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
...	

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.

02.14