

Metallized Polyester (PET) Capacitors PCM 7.5 mm to 37.5 mm

Special Features

- High volume/capacitance ratio
- Self-healing
- According to RoHS 2011/65/EU

Typical Applications

For general DC-applications e.g.

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

Construction

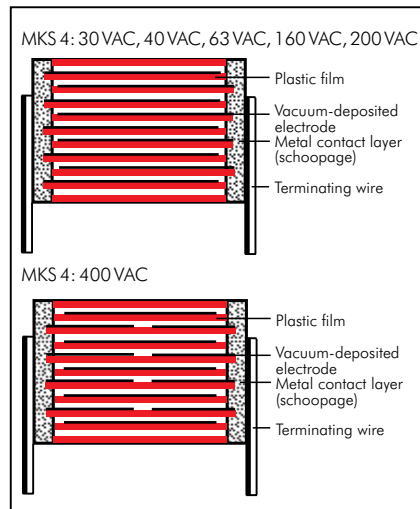
Dielectric:

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.
Epoxy resin seal: Red

Electrical Data

Capacitance range:

1000 pF to 220 μ F (E12-values on request)

Rated voltages:

50 VDC, 63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1500 VDC, 2000 VDC

Capacitance tolerances:

$\pm 20\%$, $\pm 10\%$ $\pm 5\%$

Operating temperature range:

$U_r = 50$ VDC: -55°C to $+100^\circ\text{C}$

$U_r \geq 63$ VDC: -55°C to $+125^\circ\text{C}$

Climatic test category:

55/100/56 in accordance with IEC

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

U_r	U_{test}	$C \leq 0.33 \mu\text{F}$	$0.33 \mu\text{F} < C \leq 220 \mu\text{F}$
50 VDC	10V	$\geq 5 \times 10^3 \text{ M}\Omega$ (mean value: $3 \times 10^4 \text{ M}\Omega$)	$\geq 1500 \text{ sec (M}\Omega \times \mu\text{F)}$ (mean value: 4500 sec)
63 VDC	50V	$\geq 1 \times 10^4 \text{ M}\Omega$ (mean value: $5 \times 10^4 \text{ M}\Omega$)	$\geq 3000 \text{ sec (M}\Omega \times \mu\text{F)}$ (mean value: 6000 sec)
100 VDC	100V	$\geq 1.5 \times 10^4 \text{ M}\Omega$ (mean value: $5 \times 10^4 \text{ M}\Omega$)	$\geq 5000 \text{ sec (M}\Omega \times \mu\text{F)}$ (mean value: 15000 sec)
≥ 250 VDC	100V	$\geq 3 \times 10^4 \text{ M}\Omega$ (mean value: $1 \times 10^5 \text{ M}\Omega$)	$\geq 10000 \text{ sec (M}\Omega \times \mu\text{F)}$ (mean value: 40000 sec)

Measuring time: 1 min.

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	$\leq 8 \times 10^{-3}$	$\leq 8 \times 10^{-3}$	$\leq 10 \times 10^{-3}$
10 kHz	$\leq 15 \times 10^{-3}$	$\leq 15 \times 10^{-3}$	—
100 kHz	$\leq 30 \times 10^{-3}$	—	—

Maximum pulse rise time: for pulses equal to the rated voltage

Capacitance pF/μF	Pulse rise time V/μsec max. operation/test								
	50VDC	63VDC	100VDC	250VDC	400VDC	630VDC	1000VDC	1500VDC	2000VDC
1000 ... 6800	—	—	—	—	—	—	70/700	90/900	100/1000
0.01 ... 0.022	—	30/300	30/300	35/350	38/380	40/400	50/500	50/500	60/600
0.033 ... 0.068	—	15/150	15/150	20/200	25/250	32/320	26/260	35/350	40/400
0.1 ... 0.22	10/100	10/100	12/120	15/150	15/150	17/170	20/200	35/350	40/400
0.33 ... 0.68	9/90	9/90	9/90	10/100	10/100	13/130	20/200	20/200	38/380
1.0 ... 2.2	6/60	6/60	5/50	6/60	9/90	13/130	14/140	15/150	15/150
3.3 ... 6.8	2.5/25	3/30	3/30	6/60	6/60	9/90	12/120	—	—
10 ... 220	2.5/25	2.5/25	2.5/25	3/30	6/60	6/60	—	—	—

Mechanical Tests

Pull test on pins:

$d \leq 0.8 \phi$: 10 N in direction of pins

$d > 0.8 \phi$: 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	50 VDC/30 VAC*					63 VDC/40 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 μF						2.5	7	10	7.5	MKS4C021002A
0.015 "						4	9	13	10	MKS4C021003C
0.022 "						2.5	7	10	7.5	MKS4C021502A
0.033 "						4	9	13	10	MKS4C021503C
0.047 "						2.5	7	10	7.5	MKS4C022202A
0.068 "						4	9	13	10	MKS4C022203C
						2.5	7	10	7.5	MKS4C023302A
						4	9	13	10	MKS4C023303C
						2.5	7	10	7.5	MKS4C024702A
						4	9	13	10	MKS4C024703C
						2.5	7	10	7.5	MKS4C026802A
						4	9	13	10	MKS4C026803C
0.1 μF	2.5	7	10	7.5	MKS4B031002A	2.5	7	10	7.5	MKS4C031002A
0.15 "	2.5	7	10	7.5	MKS4B031502A	4	9	13	10	MKS4C031003C
0.22 "	2.5	7	10	7.5	MKS4B032202A	2.5	7	10	7.5	MKS4C031502A
0.33 "	2.5	7	10	7.5	MKS4B033302A	4	9	13	10	MKS4C031503C
0.47 "	3	8.5	10	7.5	MKS4B034702B	3	8.5	10	7.5	MKS4C032202B
0.68 "	4	9	10	7.5	MKS4B036802C	4	9	13	10	MKS4C032203C
						4	9	10	7.5	MKS4C033302C
						4	9	13	10	MKS4C033303C
						4	9	10	7.5	MKS4C034702C
						4	9	13	10	MKS4C034703C
						5	10.5	10.3	7.5	MKS4C036802E
						4	9	13	10	MKS4C036803C
1.0 μF	4	9	10	7.5	MKS4B041002C	5	10.5	10.3	7.5	MKS4C041002E
1.5 "	5	10.5	10.3	7.5	MKS4B041502E	4	9	13	10	MKS4C041003C
2.2 "	5.7	12.5	10.3	7.5	MKS4B042202F	5.7	12.5	10.3	7.5	MKS4C041502F
3.3 "	5.7	12.5	10.3	7.5	MKS4B043302F	5	11	13	10	MKS4C041503F
4.7 "	7.2	12.5	10.3	7.5	MKS4B044702G	5	11	13	10	MKS4C042203F
6.8 "	6	12	13	10	MKS4B044703G	6	12.5	18	15	MKS4C042204C
	7.2	12.5	10.3	7.5	MKS4B046802G	6	12	13	10	MKS4C043303G
	6	12	13	10	MKS4B046803G	7	14	18	15	MKS4C043304D
						7	14	18	15	MKS4C044704D
						6	15	26.5	22.5	MKS4C044705B
						8	15	18	15	MKS4C046804F
						7	16.5	26.5	22.5	MKS4C046805D
10 μF	9	16	18	15	MKS4B051004J	8.5	18.5	26.5	22.5	MKS4C051005F
15 "	11	21	26.5	22.5	MKS4B051505I	11	21	31.5	27.5	MKS4C051006B
22 "	11	21	31.5	27.5	MKS4B052206B	11	21	26.5	22.5	MKS4C051505I
33 "	13	24	31.5	27.5	MKS4B053306D	11	21	31.5	27.5	MKS4C051506B
47 "	15	26	31.5	27.5	MKS4B054706F	13	24	31.5	27.5	MKS4C052206D
68 "	13	24	41.5	37.5	MKS4B054707C	15	26	31.5	27.5	MKS4C053306F
	20	39.5	31.5	27.5	MKS4B056806J	17	29	31.5	27.5	MKS4C054706G
	17	29	41.5	37.5	MKS4B056807E	17	29	41.5	37.5	MKS4C054707E
100 μF	19	32	41.5	37.5	MKS4B061007F	20	39.5	41.5	37.5	MKS4C056806J
150 "	20	39.5	41.5	37.5	MKS4B061507G	19	32	41.5	37.5	MKS4C056807F
220 "	24	45.5	41.5	37.5	MKS4B062207H	20	39.5	41.5	37.5	MKS4C061007G
						24	45.5	41.5	37.5	MKS4C061507H
						40	55	41.5	37.5	MKS4C062207K

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

**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 140.

Rights reserved to amend design data without prior notification.

Continuation

General Data

Capacitance	100 VDC/63 VAC*					250 VDC/160 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 μF	2.5	7	10	7.5	MKS4D021002A	3	8.5	10	7.5	MKS4F021002B
	4	9	13	10	MKS4D021003C	4	9	13	10	MKS4F021003C
0.015 "	2.5	7	10	7.5	MKS4D021502A	3	8.5	10	7.5	MKS4F021502B
	4	9	13	10	MKS4D021503C	4	9	13	10	MKS4F021503C
0.022 "	2.5	7	10	7.5	MKS4D022202A	3	8.5	10	7.5	MKS4F022202B
	4	9	13	10	MKS4D022203C	4	9	13	10	MKS4F022203C
0.033 "	2.5	7	10	7.5	MKS4D023302A	3	8.5	10	7.5	MKS4F023302B
	4	9	13	10	MKS4D023303C	4	9	13	10	MKS4F023303C
0.047 "	2.5	7	10	7.5	MKS4D024702A	3	8.5	10	7.5	MKS4F024702B
	4	9	13	10	MKS4D024703C	4	9	13	10	MKS4F024703C
0.068 "	2.5	7	10	7.5	MKS4D026802A	4	9	10	7.5	MKS4F026802C
	4	9	13	10	MKS4D026803C	4	9	13	10	MKS4F026803C
0.1 μF	2.5	7	10	7.5	MKS4D031002A	4	9	10	7.5	MKS4F031002C
	4	9	13	10	MKS4D031003C	4	9	13	10	MKS4F031003C
0.15 "	3	8.5	10	7.5	MKS4D031502B	5	10.5	10.3	7.5	MKS4F031502E
	4	9	13	10	MKS4D031503C	4	9	13	10	MKS4F031503C
0.22 "	3	8.5	10	7.5	MKS4D032202B	5	10.5	10.3	7.5	MKS4F032202E
	4	9	13	10	MKS4D032203C	5	11	13	10	MKS4F032203F
0.33 "	4	9	10	7.5	MKS4D033302C	5.7	12.5	10.3	7.5	MKS4F033302F
	4	9	13	10	MKS4D033303C	5	11	13	10	MKS4F033303F
0.47 "	4.5	9.5	10.3	7.5	MKS4D034702D	6	12	13	10	MKS4F034703G
	4	9	13	10	MKS4D034703C	6	12.5	18	15	MKS4F034704C
0.68 "	5	10.5	10.3	7.5	MKS4D036802E	7	14	18	15	MKS4F036804D
	4	9	13	10	MKS4D036803C					
1.0 μF	5.7	12.5	10.3	7.5	MKS4D041002F	8	15	18	15	MKS4F041004F
	5	11	13	10	MKS4D041003F	6	15	26.5	22.5	MKS4F041005B
1.5 "	6	12	13	10	MKS4D041503G	9	16	18	15	MKS4F041504J
	7	14	18	15	MKS4D041504D	7	16.5	26.5	22.5	MKS4F041505D
2.2 "	8	15	18	15	MKS4D042204F	10.5	19	26.5	22.5	MKS4F042205G
	6	15	26.5	22.5	MKS4D042205B	9	19	31.5	27.5	MKS4F042206A
3.3 "	9	16	18	15	MKS4D043304J	11	21	26.5	22.5	MKS4F043305I
	7	16.5	26.5	22.5	MKS4D043305D	11	21	31.5	27.5	MKS4F043306B
4.7 "	10.5	19	26.5	22.5	MKS4D044705G	11	21	31.5	27.5	MKS4F044706B
	9	19	31.5	27.5	MKS4D044706A					
6.8 "	10.5	19	26.5	22.5	MKS4D046805G	13	24	31.5	27.5	MKS4F046806D
	11	21	31.5	27.5	MKS4D046806B					
10 μF	13	24	31.5	27.5	MKS4D051006D	17	29	31.5	27.5	MKS4F051006G
15 "	13	24	31.5	27.5	MKS4D051506D	17	34.5	31.5	27.5	MKS4F051506I
						17	29	41.5	37.5	MKS4F051507E
22 "	15	26	31.5	27.5	MKS4D052206F	19	32	41.5	37.5	MKS4F052207F
33 "	17	29	31.5	27.5	MKS4D053306G	24	45.5	41.5	37.5	MKS4F053307H
	13	24	41.5	37.5	MKS4D053307C					
47 "	17	29	41.5	37.5	MKS4D054707E	31	46	41.5	37.5	MKS4F054707I
68 "	20	39.5	41.5	37.5	MKS4D056807G	40	55	41.5	37.5	MKS4F056807K
100 μF	24	45.5	41.5	37.5	MKS4D061007H					
150 "	31	46	41.5	37.5	MKS4D061507I					
220 "	40	55	41.5	37.5	MKS4D062207K					

* 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.

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 140.		

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Continuation

General Data

Capacitance	400 VDC/200 VAC*					630 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 μF	3	8.5	10	7.5	MKS4G021002B	3	8.5	10	7.5*	MKS4J021002B
	4	9	13	10	MKS4G021003C	4	9	13	10	MKS4J021003C
0.015 "	3	8.5	10	7.5	MKS4G021502B	4	9	10	7.5*	MKS4J021502C
	4	9	13	10	MKS4G021503C	4	9	13	10	MKS4J021503C
0.022 "	4	9	10	7.5	MKS4G022202C	4.5	9.5	10.3	7.5*	MKS4J022202D
	4	9	13	10	MKS4G022203C	4	9	13	10	MKS4J022203C
0.033 "	4	9	10	7.5	MKS4G023302C	5	10.5	10.3	7.5*	MKS4J023302E
	4	9	13	10	MKS4G023303C	5	11	13	10	MKS4J023303F
0.047 "	5	10.5	10.3	7.5	MKS4G024702E	5.7	12.5	10.3	7.5*	MKS4J024702F
	4	9	13	10	MKS4G024703C	6	12	13	10	MKS4J024703G
0.068 "	5	10.5	10.3	7.5	MKS4G026802E	6	12	13	10	MKS4J026803G
	4	9	13	10	MKS4G026803C	5	11	18	15	MKS4J026804B
0.1 μF	5	10.5	10.3	7.5	MKS4G031002E	6	12.5	18	15	MKS4J031004C
	5	11	13	10	MKS4G031003F	6	15	26.5	22.5	MKS4J031005B
0.15 "	5.7	12.5	10.3	7.5	MKS4G031502F	7	14	18	15	MKS4J031504D
	6	12	13	10	MKS4G031503G	6	15	26.5	22.5	MKS4J031505B
0.22 "	6	12	13	10	MKS4G032203G	8	15	18	15	MKS4J032204F
	6	12.5	18	15	MKS4G032204C	6	15	26.5	22.5	MKS4J032205B
0.33 "	8	15	18	15	MKS4G033304F	7	16.5	26.5	22.5	MKS4J033305D
						9	19	31.5	27.5	MKS4J033306A
0.47 "	8	15	18	15	MKS4G034704F	10.5	19	26.5	22.5	MKS4J034705G
	6	15	26.5	22.5	MKS4G034705B	9	19	31.5	27.5	MKS4J034706A
0.68 "	7	16.5	26.5	22.5	MKS4G036805D	11	21	26.5	22.5	MKS4J036805I
						11	21	31.5	27.5	MKS4J036806B
1.0 μF	10.5	19	26.5	22.5	MKS4G041005G	11	21	31.5	27.5	MKS4J041006B
	11	21	31.5	27.5	MKS4G041006B					
1.5 "	11	21	26.5	22.5	MKS4G041505I	15	26	31.5	27.5	MKS4J041506F
	11	21	31.5	27.5	MKS4G041506B					
2.2 "	11	21	31.5	27.5	MKS4G042206B	17	34.5	31.5	27.5	MKS4J042206I
						15	26	41.5	37.5	MKS4J042207D
3.3 "	13	24	31.5	27.5	MKS4G043306D	20	39.5	31.5	27.5	MKS4J043306J
						19	32	41.5	37.5	MKS4J043307F
4.7 "	17	29	31.5	27.5	MKS4G044706G	20	39.5	41.5	37.5	MKS4J044707G
6.8 "	17	34.5	31.5	27.5	MKS4G046806I	24	45.5	41.5	37.5	MKS4J046807H
	15	26	41.5	37.5	MKS4G046807D					
10 μF	19	32	41.5	37.5	MKS4G051007F	35	50	41.5	37.5	MKS4J051007J
15 "	20	39.5	41.5	37.5	MKS4G051507G	40	55	41.5	37.5	MKS4J051507K
22 "	31	46	41.5	37.5	MKS4G052207I					
33 "	35	50	41.5	37.5	MKS4G053307J					

* 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 140.		

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Continuation

General Data

Capacitance	1000 VDC/400 VAC*					1500 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	3	8.5	10	7.5	MKS4O111002B_____	4	9	13	10	MKS4S011003C_____
	4	9	13	10	MKS4O111003C_____					
1500 "	3	8.5	10	7.5	MKS4O111502B_____	4	9	13	10	MKS4S011503C_____
	4	9	13	10	MKS4O111503C_____					
2200 "	3	8.5	10	7.5	MKS4O112202B_____	4	9	13	10	MKS4S012203C_____
	4	9	13	10	MKS4O112203C_____					
3300 "	4	9	10	7.5	MKS4O113302C_____	4	9	13	10	MKS4S013303C_____
	4	9	13	10	MKS4O113303C_____					
4700 "	4	9	10	7.5	MKS4O114702C_____	4	9	13	10	MKS4S014703C_____
	4	9	13	10	MKS4O114703C_____	5	11	18	15	MKS4S014704B_____
6800 "	4.5	9.5	10.3	7.5	MKS4O116802D_____	5	11	13	10	MKS4S016803F_____
	4	9	13	10	MKS4O116803C_____	5	11	18	15	MKS4S016804B_____
0.01 µF	5	10.5	10.3	7.5	MKS4O121002E_____	6	12	13	10	MKS4S021003G_____
	5	11	13	10	MKS4O121003F_____	5	11	18	15	MKS4S021004B_____
0.015 "	5.7	12.5	10.3	7.5	MKS4O121502F_____	6	12.5	18	15	MKS4S021504C_____
	6	12	13	10	MKS4O121503G_____					
0.022 "	5	11	18	15	MKS4O122204B_____	7	14	18	15	MKS4S022204D_____
						6	15	26.5	22.5	MKS4S022205B_____
0.033 "	6	12.5	18	15	MKS4O123304C_____	8	15	18	15	MKS4S023304F_____
	6	15	26.5	22.5	MKS4O123305B_____	6	15	26.5	22.5	MKS4S023305B_____
0.047 "	7	14	18	15	MKS4O124704D_____	7	16.5	26.5	22.5	MKS4S024705D_____
	6	15	26.5	22.5	MKS4O124705B_____					
0.068 "	8	15	18	15	MKS4O126804F_____	8.5	18.5	26.5	22.5	MKS4S026805F_____
	6	15	26.5	22.5	MKS4O126805B_____					
0.1 µF	9	16	18	15	MKS4O131004J_____	10.5	19	26.5	22.5	MKS4S031005G_____
	7	16.5	26.5	22.5	MKS4O131005D_____	9	19	31.5	27.5	MKS4S031006A_____
0.15 "	8.5	18.5	26.5	22.5	MKS4O131505F_____	11	21	31.5	27.5	MKS4S031506B_____
0.22 "	10.5	19	26.5	22.5	MKS4O132205G_____	13	24	31.5	27.5	MKS4S032206D_____
0.33 "	11	21	26.5	22.5	MKS4O133305I_____	17	34.5	31.5	27.5	MKS4S033306I_____
	11	21	31.5	27.5	MKS4O133306B_____	17	29	41.5	37.5	MKS4S033307E_____
0.47 "	13	24	31.5	27.5	MKS4O134706D_____	20	39.5	31.5	27.5	MKS4S034706J_____
						17	29	41.5	37.5	MKS4S034707E_____
0.68 "	15	26	31.5	27.5	MKS4O136806F_____	20	39.5	41.5	37.5	MKS4S036807G_____
1.0 µF	17	29	31.5	27.5	MKS4O141006G_____	24	45.5	41.5	37.5	MKS4S041007H_____
	17	29	41.5	37.5	MKS4O141007E_____					
1.5 "	19	32	41.5	37.5	MKS4O141507F_____	31	46	41.5	37.5	MKS4S041507I_____
2.2 "	20	39.5	41.5	37.5	MKS4O142207G_____	35	50	41.5	37.5	MKS4S042207J_____
3.3 "	24	45.5	41.5	37.5	MKS4O143307H_____					
4.7 "	35	50	41.5	37.5	MKS4O144707J_____					
6.8 "	40	55	41.5	37.5	MKS4O146807K_____					

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

New box sizes

** PCM = Printed circuit module = pin spacing

Dims. in mm.

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 140.		

Rights reserved to amend design data without prior notification.

Continuation page 54

Continuation

General Data

Capacitance	W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKS4U011003C
1500 "	4	9	13	10	MKS4U011503C
2200 "	5	11	13	10	MKS4U012203F
3300 "	6	12	13	10	MKS4U013303H
	5	11	18	15	MKS4U013304B
4700 "	5	11	18	15	MKS4U014704B
6800 "	6	12.5	18	15	MKS4U016804C
0.01 µF	7	14	18	15	MKS4U021004D
	6	15	26.5	22.5	MKS4U021005B
0.015 "	6	15	26.5	22.5	MKS4U021505B
0.022 "	7	16.5	26.5	22.5	MKS4U022205D
0.033 "	10.5	19	26.5	22.5	MKS4U023305G
0.047 "	11	21	26.5	22.5	MKS4U024705I
	11	21	31.5	27.5	MKS4U024706B
0.068 "	11	21	31.5	27.5	MKS4U026806B
0.1 µF	13	24	31.5	27.5	MKS4U031006D
0.15 "	17	29	31.5	27.5	MKS4U031506G
	13	24	41.5	37.5	MKS4U031507C
0.22 "	17	29	41.5	37.5	MKS4U032207E
0.33 "	20	39.5	41.5	37.5	MKS4U033307G
0.47 "	24	45.5	41.5	37.5	MKS4U034707H
0.68 "	31	46	41.5	37.5	MKS4U036807I
1.0 µF	40	55	41.5	37.5	MKS4U041007K

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

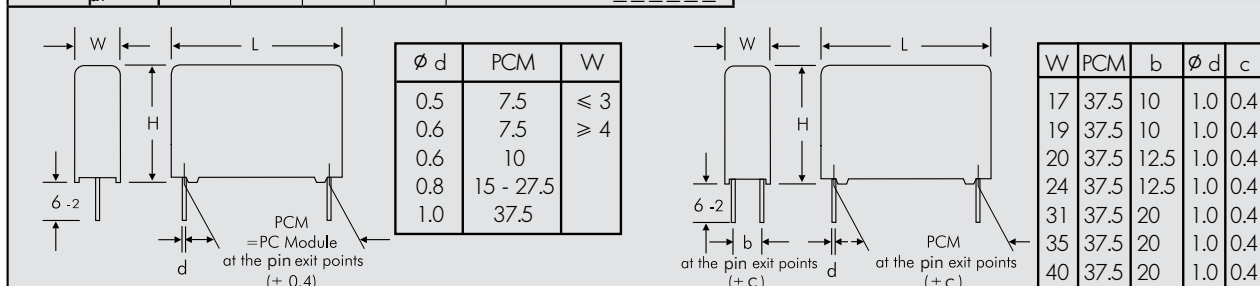
** PCM = Printed circuit module = pin spacing

Dims. in mm.

The values of the WIMA MKM 4 ranges according to the main catalogue 2009 are still available on request.

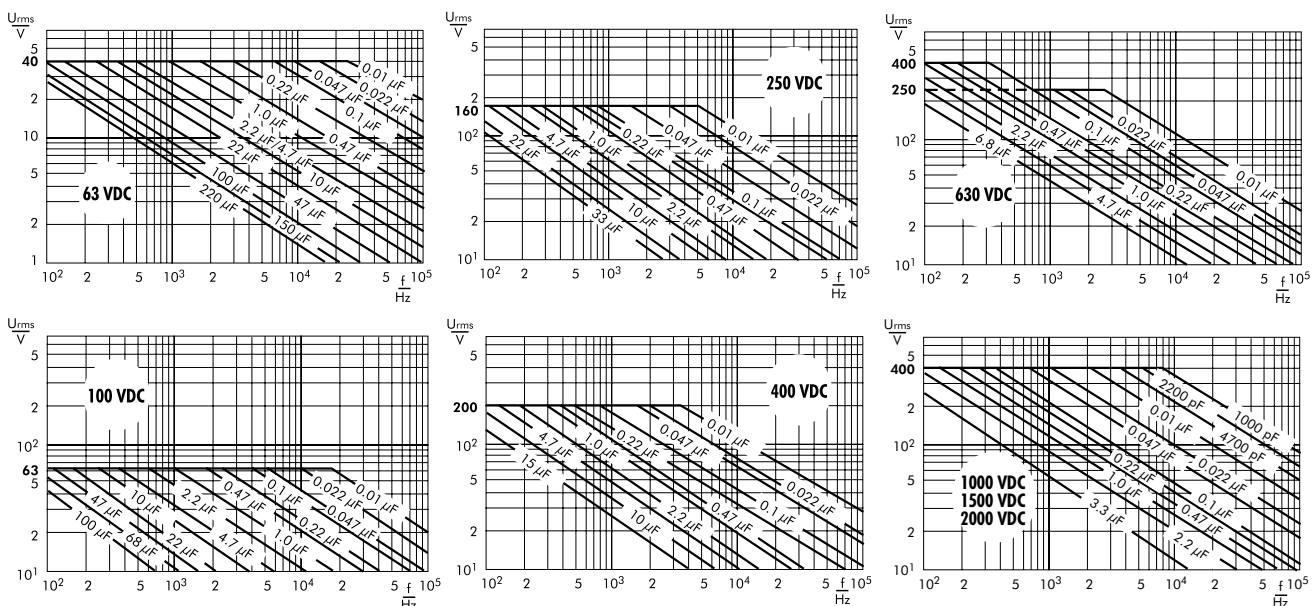
Part number completion:

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 140.		



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: $T_{\max.} \leq 125^{\circ}\text{C}$
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: $T < 260^{\circ}\text{C}$

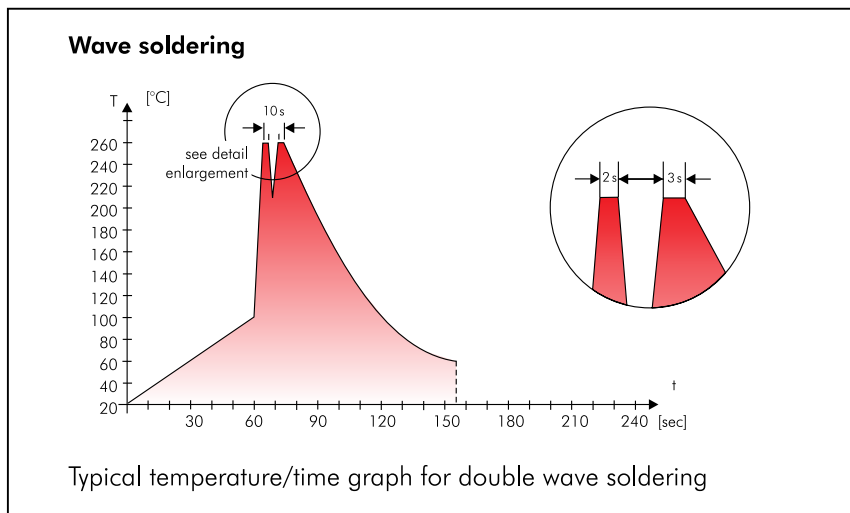
Dwell time: $t < 5\text{ sec}$

Double wave soldering

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

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

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 | – PBB/PBDE |
| – PCB | – Arsenic |
| – CFC | – Cadmium |
| – Hydrocarbon chloride | – Mercury |
| – Chromium 6+ | – 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

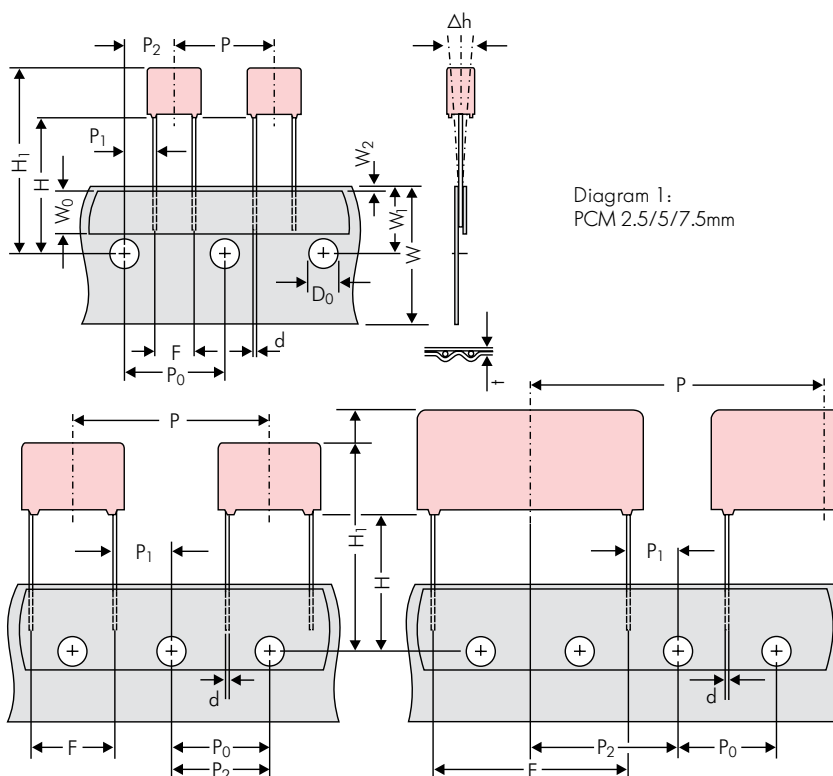


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5*mm

*PCM 27.5 tapping possible with two feed holes between components

Dimensions for Radial Taping								
Designation	Symbol	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	16.5 ±0.3	16.5 ±0.5	16.5 ±0.5	16.5 ±0.5	16.5 ±0.5	16.5 ±0.5
		18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±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 141)		ROLL/AMMO			AMMO			
		REEL ø 360 max. ø 30 ±1	B 52 ±2 B 58 ±2	} depending on comp. dimensions	REEL ø 360 max. ø 30 ±1	52 ±2 B 58 ±2 or 66 ±2	REEL ø 500 max. ø 25 ±1	54 ±2 B 60 ±2 68 ±2
see details page 142.								

Dims in mm.

* Diameter of pins see General Data.

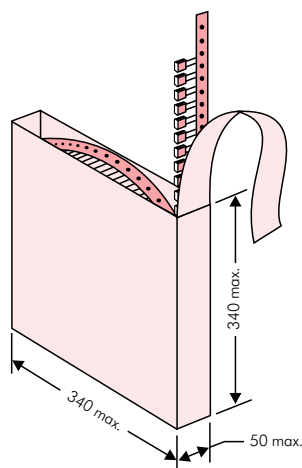
Please clarify customer-specific deviations with the manufacturer.

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

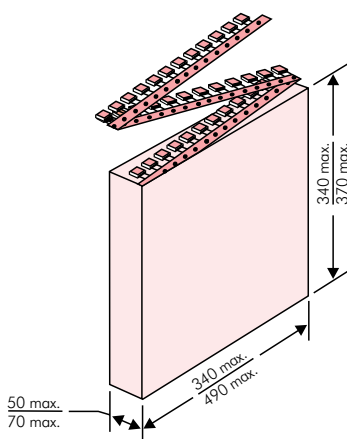
Position of components according to PCM 7.5 (sketch 11). P₀ = 12.7 or 15.0 is possible

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

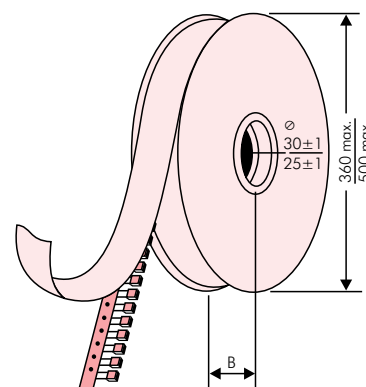
■ ROLL Packaging



■ AMMO Packaging



■ REEL Packaging



BAR CODE (Labelling)

Labelling of package units in plain text and with 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.

WIMA Best Capacitors Made in Germany		Werk Unna	
Supplier-ID: 123456789	RoHS 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	
WIMA Confirmation No.: 0001004063000100		Gross Weight [g]: 1870	
WIMA Part No.: MKS2C034701C00K88D			
Handling Unit:	MKS 2	QTY: 5.000	COO: DE
	MKS 2 0.47 µF 63 VDC 3.5x8.5x7.2 RMS		
	Standard 10% Loss - Standard	Drühte 6-2	
1000067326	Vorlage Debitur 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 × 340		490 × 370			
						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	ROLL		pcs. per packing unit				AMMO			
								REEL							
	W	H	L	Codes		H16.5	H18.5	ø 360	ø 500	340 × 340	490 × 370	H16.5	H18.5	H16.5	H18.5
					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*	–	–	–	–	–	–	–	–	–	–
	27	15	41.5	7M	100*	–	–	–	–	–	–	–	–	–	–
	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				2.5×6.5×7.2		-		20%	bulk	6 -2					
Type description: SMD-PET = SMDT SMD-PEN = SMDN SMD-PPS = SMDI FKP 02 = FKPO 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-X1 R = MKX1 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 = DCP5 DC-LINK MKP 5 = DCP5 DC-LINK MKP 6 = DCP6 DC-LINK HC = DCHC				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 305 VAC = AW 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 1500 μF = 7150 ...				Size: 4.8×3.3×3 Size 1812 = KA 4.8×3.3×4 Size 1812 = KB 5.7×5.1×3.5 Size 2220 = QA 5.7×5.1×4.5 Size 2220 = QB 7.2×6.1×3 Size 2824 = TA 7.2×6.1×5 Size 2824 = TB 10.2×7.6×5 Size 4030 = VA 12.7×10.2×6 Size 5040 = XA 15.3×13.7×7 Size 6054 = YA 2.5×7×4.6 PCM 2.5 = 0B 3×7.5×4.6 PCM 2.5 = 0C 2.5×6.5×7.2 PCM 5 = 1A 3×7.5×7.2 PCM 5 = 1B 2.5×7×10 PCM 7.5 = 2A 3×8.5×10 PCM 7.5 = 2B 3×9×13 PCM 10 = 3A 4×9×13 PCM 10 = 3C 5×11×18 PCM 15 = 4B 6×12.5×18 PCM 15 = 4C 5×14×26.5 PCM 22.5 = 5A 6×15×26.5 PCM 22.5 = 5B 9×19×31.5 PCM 27.5 = 6A 11×21×31.5 PCM 27.5 = 6B 9×19×41.5 PCM 37.5 = 7A 11×22×41.5 PCM 37.5 = 7B 19×31×56 PCM 48.5 = 8D 35×50×57 PCM 52.5 = 9F ...				Tolerance: ±20% = M ±10% = K ±5% = J ±2.5% = H ±1% = E ...				Packing: AMMO H16.5 340×340 = A AMMO H16.5 490×370 = B AMMO H18.5 340×340 = C AMMO H18.5 490×370 = 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 ...			



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