

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

Special Features

- High volume/capacitance ratio
- Self-healing
- According to RoHS 2002/95/EC

Typical Applications

For general DC-applications e.g.

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

Construction

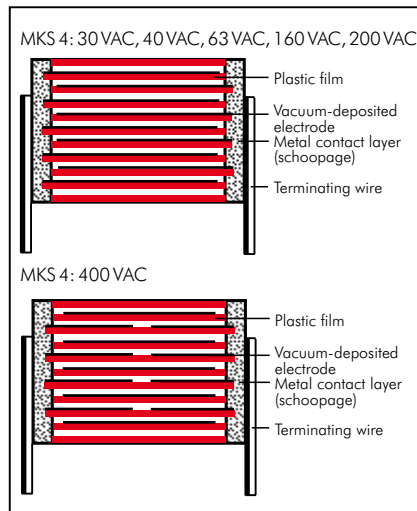
Dielectric:

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:

-55°C to $+100^\circ\text{C}$ ($+125^\circ\text{C}$ available subject to special enquiry)

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)
$\geq 250 \text{ VDC}$	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:

Capacitance pF/ μ F	Pulse rise time V/ μ sec 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	-
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	-	-	-	-

for pulses equal to the rated voltage

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:

1kPa = 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

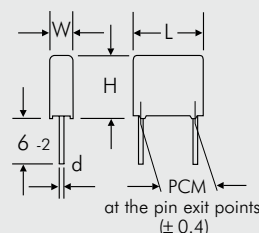
Capacitance	50 VDC/30 VAC*					63 VDC/40 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF						2.5	7	10	7.5	MKS4C021002A00
0.015 "						4	9	13	10	MKS4C021003C00
0.022 "						2.5	7	10	7.5	MKS4C021502A00
0.033 "						4	9	13	10	MKS4C021503C00
0.047 "						2.5	7	10	7.5	MKS4C022202A00
0.068 "						4	9	13	10	MKS4C022203C00
						2.5	7	10	7.5	MKS4C023302A00
						4	9	13	10	MKS4C023303C00
						2.5	7	10	7.5	MKS4C024702A00
						4	9	13	10	MKS4C024703C00
						2.5	7	10	7.5	MKS4C026802A00
						4	9	13	10	MKS4C026803C00
0.1 µF	2.5	7	10	7.5	MKS4B031002A00	2.5	7	10	7.5	MKS4C031002A00
0.15 "	2.5	7	10	7.5	MKS4B031502A00	4	9	13	10	MKS4C031003C00
0.22 "	2.5	7	10	7.5	MKS4B032202A00	2.5	7	10	7.5	MKS4C031502A00
0.33 "	2.5	7	10	7.5	MKS4B033302A00	4	9	13	10	MKS4C031503C00
0.47 "	3	8.5	10	7.5	MKS4B034702B00	3	8.5	10	7.5	MKS4C032202B00
0.68 "	4	9	10	7.5	MKS4B036802C00	4	9	13	10	MKS4C032203C00
						4	9	10	7.5	MKS4C033302C00
						4	9	13	10	MKS4C033303C00
						4	9	10	7.5	MKS4C034702C00
						4	9	13	10	MKS4C034703C00
						5	10.5	10.3	7.5	MKS4C036802E00
						4	9	13	10	MKS4C036803C00
1.0 µF	4	9	10	7.5	MKS4B041002C00	5	10.5	10.3	7.5	MKS4C041002E00
1.5 "	5	10.5	10.3	7.5	MKS4B041502E00	4	9	13	10	MKS4C041003C00
2.2 "	5.7	12.5	10.3	7.5	MKS4B042202F00	5.7	12.5	10.3	7.5	MKS4C041502F00
3.3 "	5.7	12.5	10.3	7.5	MKS4B043302F00	5	11	13	10	MKS4C041503F00
4.7 "	7.2	12.5	10.3	7.5	MKS4B044702G00	5	11	13	10	MKS4C042203F00
6.8 "	6	12	13	10	MKS4B044703G00	6	12.5	18	15	MKS4C042204C00
	7.2	12.5	10.3	7.5	MKS4B046802G00	6	12	13	10	MKS4C043303G00
	6	12	13	10	MKS4B046803G00	7	14	18	15	MKS4C043304D00
						7	14	18	15	MKS4C044704D00
						6	15	26.5	22.5	MKS4C044705B00
						8	15	18	15	MKS4C046804F00
						7	16.5	26.5	22.5	MKS4C046805D00
10 µF	9	16	18	15	MKS4B051004J00	8.5	18.5	26.5	22.5	MKS4C051005F00
15 "	11	21	26.5	22.5	MKS4B051505I00	11	21	31.5	27.5	MKS4C051006B00
22 "	11	21	31.5	27.5	MKS4B052206B00	11	21	26.5	22.5	MKS4C051505I00
33 "	13	24	31.5	27.5	MKS4B053306D00	11	21	31.5	27.5	MKS4C051506B00
47 "	15	26	31.5	27.5	MKS4B054706F00	13	24	31.5	27.5	MKS4C052206D00
68 "	13	24	41.5	37.5	MKS4B054707C00	15	26	31.5	27.5	MKS4C053306F00
	20	39.5	31.5	27.5	MKS4B056806J00	17	29	31.5	27.5	MKS4C054706G00
	17	29	41.5	37.5	MKS4B056807E00	17	29	41.5	37.5	MKS4C054707E00
						20	39.5	31.5	27.5	MKS4C056806J00
						19	32	41.5	37.5	MKS4C056807F00
100 µF	19	32	41.5	37.5	MKS4B061007F00	20	39.5	41.5	37.5	MKS4C061007G00
150 "	20	39.5	41.5	37.5	MKS4B061507G00	24	45.5	41.5	37.5	MKS4C061507H00
220 "	24	45.5	41.5	37.5	MKS4B062207H00					

* 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.

∅ d	PCM	W
0.5	7.5	≤ 3
0.6	7.5	≥ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	



Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 127.	

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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	MKS4D021002A00_	3	8.5	10	7.5	MKS4F021002B00_
	4	9	13	10	MKS4D021003C00_	4	9	13	10	MKS4F021003C00_
0.015 "	2.5	7	10	7.5	MKS4D021502A00_	3	8.5	10	7.5	MKS4F021502B00_
	4	9	13	10	MKS4D021503C00_	4	9	13	10	MKS4F021503C00_
0.022 "	2.5	7	10	7.5	MKS4D022202A00_	3	8.5	10	7.5	MKS4F022202B00_
	4	9	13	10	MKS4D022203C00_	4	9	13	10	MKS4F022203C00_
0.033 "	2.5	7	10	7.5	MKS4D023302A00_	3	8.5	10	7.5	MKS4F023302B00_
	4	9	13	10	MKS4D023303C00_	4	9	13	10	MKS4F023303C00_
0.047 "	2.5	7	10	7.5	MKS4D024702A00_	3	8.5	10	7.5	MKS4F024702B00_
	4	9	13	10	MKS4D024703C00_	4	9	13	10	MKS4F024703C00_
0.068 "	2.5	7	10	7.5	MKS4D026802A00_	4	9	10	7.5	MKS4F026802C00_
	4	9	13	10	MKS4D026803C00_	4	9	13	10	MKS4F026803C00_
0.1 μF	2.5	7	10	7.5	MKS4D031002A00_	4	9	10	7.5	MKS4F031002C00_
	4	9	13	10	MKS4D031003C00_	4	9	13	10	MKS4F031003C00_
0.15 "	3	8.5	10	7.5	MKS4D031502B00_	5	10.5	10.3	7.5	MKS4F031502E00_
	4	9	13	10	MKS4D031503C00_	4	9	13	10	MKS4F031503C00_
0.22 "	3	8.5	10	7.5	MKS4D032202B00_	5	10.5	10.3	7.5	MKS4F032202E00_
	4	9	13	10	MKS4D032203C00_	5	11	13	10	MKS4F032203F00_
0.33 "	4	9	10	7.5	MKS4D033302C00_	5.7	12.5	10.3	7.5	MKS4F033302F00_
	4	9	13	10	MKS4D033303C00_	5	11	13	10	MKS4F033303F00_
0.47 "	4.5	9.5	10.3	7.5	MKS4D034702D00_	6	12	13	10	MKS4F034703G00_
	4	9	13	10	MKS4D034703C00_	6	12.5	18	15	MKS4F034704C00_
0.68 "	5	10.5	10.3	7.5	MKS4D036802E00_	7	14	18	15	MKS4F036804D00_
	4	9	13	10	MKS4D036803C00_					
1.0 μF	5.7	12.5	10.3	7.5	MKS4D041002F00_	8	15	18	15	MKS4F041004F00_
	5	11	13	10	MKS4D041003F00_	6	15	26.5	22.5	MKS4F041005B00_
1.5 "	6	12	13	10	MKS4D041503G00_	9	16	18	15	MKS4F041504J00_
	7	14	18	15	MKS4D041504D00_	7	16.5	26.5	22.5	MKS4F041505D00_
2.2 "	8	15	18	15	MKS4D042204F00_	10.5	19	26.5	22.5	MKS4F042205G00_
	6	15	26.5	22.5	MKS4D042205B00_	9	19	31.5	27.5	MKS4F042206A00_
3.3 "	9	16	18	15	MKS4D043304J00_	11	21	26.5	22.5	MKS4F043305I00_
	7	16.5	26.5	22.5	MKS4D043305D00_	11	21	31.5	27.5	MKS4F043306B00_
4.7 "	10.5	19	26.5	22.5	MKS4D044705G00_	11	21	31.5	27.5	MKS4F044706B00_
	9	19	31.5	27.5	MKS4D044706A00_					
6.8 "	10.5	19	26.5	22.5	MKS4D046805G00_	13	24	31.5	27.5	MKS4F046806D00_
	11	21	31.5	27.5	MKS4D046806B00_					
10 μF	13	24	31.5	27.5	MKS4D051006D00_	17	29	31.5	27.5	MKS4F051006G00_
	13	24	31.5	27.5	MKS4D051506D00_	17	34.5	31.5	27.5	MKS4F051506I00_
22 "	15	26	31.5	27.5	MKS4D052206F00_	17	29	41.5	37.5	MKS4F051507E00_
	17	29	31.5	27.5	MKS4D053306G00_	19	32	41.5	37.5	MKS4F052207F00_
33 "	13	24	41.5	37.5	MKS4D053307C00_	24	45.5	41.5	37.5	MKS4F053307H00_
	17	29	41.5	37.5	MKS4D054707E00_					
47 "	17	29	41.5	37.5	MKS4D054707E00_					
	20	39.5	41.5	37.5	MKS4D056807G00_					
68 "	20	39.5	41.5	37.5	MKS4D056807G00_					
100 μF	24	45.5	41.5	37.5	MKS4D061007H00_					

* 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:

Tolerance: 20 % = M
10 % = K
5 % = J

Packing: bulk = S
Pin length: 6-2 = SD

Taped version see page 127.

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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 μ F	3	8.5	10	7.5	MKS4G021002B00_	3	8.5	10	7.5*	MKS4J021002B00_
	4	9	13	10	MKS4G021003C00_	4	9	13	10	MKS4J021003C00_
0.015 "	3	8.5	10	7.5	MKS4G021502B00_	4	9	10	7.5*	MKS4J021502C00_
	4	9	13	10	MKS4G021503C00_	4	9	13	10	MKS4J021503C00_
0.022 "	4	9	10	7.5	MKS4G022202C00_	4.5	9.5	10.3	7.5*	MKS4J022202D00_
	4	9	13	10	MKS4G022203C00_	4	9	13	10	MKS4J022203C00_
0.033 "	4	9	10	7.5	MKS4G023302C00_	5	10.5	10.3	7.5*	MKS4J023302E00_
	4	9	13	10	MKS4G023303C00_	5	11	13	10	MKS4J023303F00_
0.047 "	5	10.5	10.3	7.5	MKS4G024702E00_	5.7	12.5	10.3	7.5*	MKS4J024702F00_
	4	9	13	10	MKS4G024703C00_	6	12	13	10	MKS4J024703G00_
0.068 "	5	10.5	10.3	7.5	MKS4G026802E00_	6	12	13	10	MKS4J026803G00_
	4	9	13	10	MKS4G026803C00_	5	11	18	15	MKS4J026804B00_
0.1 μ F	5	10.5	10.3	7.5	MKS4G031002E00_	6	12.5	18	15	MKS4J031004C00_
	5	11	13	10	MKS4G031003F00_	6	15	26.5	22.5	MKS4J031005B00_
0.15 "	5.7	12.5	10.3	7.5	MKS4G031502F00_	7	14	18	15	MKS4J031504D00_
	6	12	13	10	MKS4G031503G00_	6	15	26.5	22.5	MKS4J031505B00_
0.22 "	6	12	13	10	MKS4G032203G00_	8	15	18	15	MKS4J032204F00_
	6	12.5	18	15	MKS4G032204C00_	6	15	26.5	22.5	MKS4J032205B00_
0.33 "	8	15	18	15	MKS4G033304F00_	7	16.5	26.5	22.5	MKS4J033305D00_
						9	19	31.5	27.5	MKS4J033306A00_
0.47 "	8	15	18	15	MKS4G034704F00_	10.5	19	26.5	22.5	MKS4J034705G00_
	6	15	26.5	22.5	MKS4G034705B00_	9	19	31.5	27.5	MKS4J034706A00_
0.68 "	7	16.5	26.5	22.5	MKS4G036805D00_	11	21	26.5	22.5	MKS4J036805I00_
						11	21	31.5	27.5	MKS4J036806B00_
1.0 μ F	10.5	19	26.5	22.5	MKS4G041005G00_	11	21	31.5	27.5	MKS4J041006B00_
	11	21	31.5	27.5	MKS4G041006B00_					
1.5 "	11	21	26.5	22.5	MKS4G041505I00_	15	26	31.5	27.5	MKS4J041506F00_
	11	21	31.5	27.5	MKS4G041506B00_					
2.2 "	11	21	31.5	27.5	MKS4G042206B00_	17	34.5	31.5	27.5	MKS4J042206I00_
						15	26	41.5	37.5	MKS4J042207D00_
3.3 "	13	24	31.5	27.5	MKS4G043306D00_	20	39.5	31.5	27.5	MKS4J043306J00_
						19	32	41.5	37.5	MKS4J043307F00_
4.7 "	17	29	31.5	27.5	MKS4G044706G00_	20	39.5	41.5	37.5	MKS4J044707G00_
6.8 "	17	34.5	31.5	27.5	MKS4G046806I00_	24	45.5	41.5	37.5	MKS4J046807H00_
	15	26	41.5	37.5	MKS4G046807D00_					
10 μ F	19	32	41.5	37.5	MKS4G051007F00_					
15 "	20	39.5	41.5	37.5	MKS4G051507G00_					

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

**PCM = Printed circuit module = pin spacing

* Admissible AC voltage 250 VAC max.

Dims. in mm.

Part number completion:

Tolerance: 20 % = M

10 % = K

5 % = J

Packing: bulk = S

Pin length: 6-2 = SD

Taped version see page 127.

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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	MKS4O111002B00_____	4	9	13	10	MKS4S011003C00_____
	4	9	13	10	MKS4O111003C00_____					
1500 "	3	8.5	10	7.5	MKS4O111502B00_____	4	9	13	10	MKS4S011503C00_____
	4	9	13	10	MKS4O111503C00_____					
2200 "	3	8.5	10	7.5	MKS4O112202B00_____	4	9	13	10	MKS4S012203C00_____
	4	9	13	10	MKS4O112203C00_____					
3300 "	4	9	10	7.5	MKS4O113302C00_____	4	9	13	10	MKS4S013303C00_____
	4	9	13	10	MKS4O113303C00_____					
4700 "	4	9	10	7.5	MKS4O114702C00_____	4	9	13	10	MKS4S014703C00_____
	4	9	13	10	MKS4O114703C00_____					
6800 "	4.5	9.5	10.3	7.5	MKS4O116802D00_____	5	11	13	10	MKS4S016803F00_____
	4	9	13	10	MKS4O116803C00_____					
0.01 µF	5	10.5	10.3	7.5	MKS4O121002E00_____	6	12	13	10	MKS4S021003G00_____
	5	11	13	10	MKS4O121003F00_____					
0.015 "	5.7	12.5	10.3	7.5	MKS4O121502F00_____	6	12.5	18	15	MKS4S021504C00_____
	6	12	13	10	MKS4O121503G00_____					
0.022 "	5	11	18	15	MKS4O122204B00_____	7	14	18	15	MKS4S022204D00_____
0.033 "	6	12.5	18	15	MKS4O123304C00_____	8	15	18	15	MKS4S023304F00_____
	6	15	26.5	22.5	MKS4O123305B00_____					
0.047 "	7	14	18	15	MKS4O124704D00_____	7	16.5	26.5	22.5	MKS4S024705D00_____
	6	15	26.5	22.5	MKS4O124705B00_____					
0.068 "	8	15	18	15	MKS4O126804F00_____	8.5	18.5	26.5	22.5	MKS4S026805F00_____
	6	15	26.5	22.5	MKS4O126805B00_____					
0.1 µF	9	16	18	15	MKS4O131004J00_____	10.5	19	26.5	22.5	MKS4S031005G00_____
	7	16.5	26.5	22.5	MKS4O131005D00_____					
0.15 "	8.5	18.5	26.5	22.5	MKS4O131505F00_____	11	21	31.5	27.5	MKS4S031506B00_____
0.22 "	10.5	19	26.5	22.5	MKS4O132205G00_____					
0.33 "	11	21	26.5	22.5	MKS4O133305I00_____	13	24	31.5	27.5	MKS4S032206D00_____
	11	21	31.5	27.5	MKS4O133306B00_____					
0.47 "	13	24	31.5	27.5	MKS4O134706D00_____	17	29	41.5	37.5	MKS4S033307E00_____
0.68 "	15	26	31.5	27.5	MKS4O136806F00_____	17	29	41.5	37.5	MKS4S034707E00_____
1.0 µF	17	29	31.5	27.5	MKS4O141006G00_____	24	45.5	41.5	37.5	MKS4S041007H00_____
	17	29	41.5	37.5	MKS4O141007E00_____					
1.5 "	19	32	41.5	37.5	MKS4O141507F00_____					
2.2 "	20	39.5	41.5	37.5	MKS4O142207G00_____					
3.3 "	24	45.5	41.5	37.5	MKS4O143307H00_____					

* 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:

Tolerance: 20 % = M

10 % = K

5 % = J

Packing: bulk = S

Pin length: 6-2 = SD

Taped version see page 127.

Rights reserved to amend design data without prior notification.

Continuation page 50

Continuation

General Data

Capacitance	2000 VDC/400 VAC*				
	W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKS4U011003C00_
1500 "	4	9	13	10	MKS4U011503C00_
2200 "	5	11	13	10	MKS4U012203F00_
3300 "	6	12	13	10	MKS4U013303H00_
	5	11	18	15	MKS4U013304B00_
4700 "	5	11	18	15	MKS4U014704B00_
6800 "	6	12.5	18	15	MKS4U016804C00_
0.01 µF	7	14	18	15	MKS4U021004D00_
	6	15	26.5	22.5	MKS4U021005B00_
0.015 "	6	15	26.5	22.5	MKS4U021505B00_
0.022 "	7	16.5	26.5	22.5	MKS4U022205D00_
0.033 "	10.5	19	26.5	22.5	MKS4U023305G00_
0.047 "	11	21	26.5	22.5	MKS4U024705I00_
	11	21	31.5	27.5	MKS4U024706B00_
0.068 "	11	21	31.5	27.5	MKS4U026806B00_
0.1 µF	13	24	31.5	27.5	MKS4U031006D00_
0.15 "	17	29	31.5	27.5	MKS4U031506G00_
	13	24	41.5	37.5	MKS4U031507C00_
0.22 "	17	29	41.5	37.5	MKS4U032207E00_
0.33 "	20	39.5	41.5	37.5	MKS4U033307G00_
0.47 "	24	45.5	41.5	37.5	MKS4U034707H00_

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

Part number completion:

Tolerance: 20 % = M
10 % = K
5 % = J

Packing: bulk = S
Pin length: 6-2 = SD

Taped version see page 127.

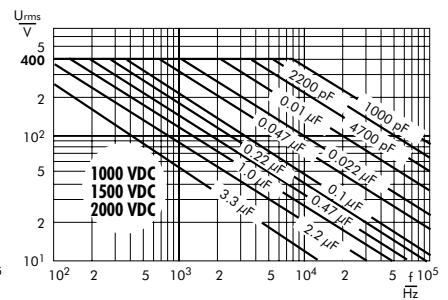
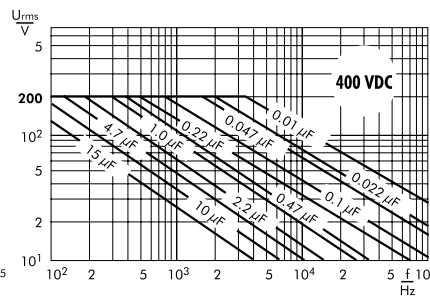
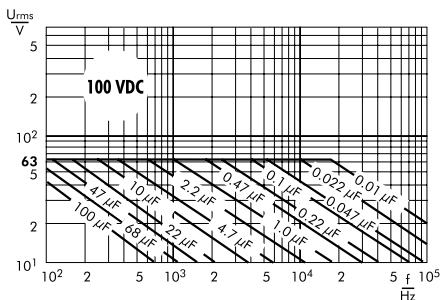
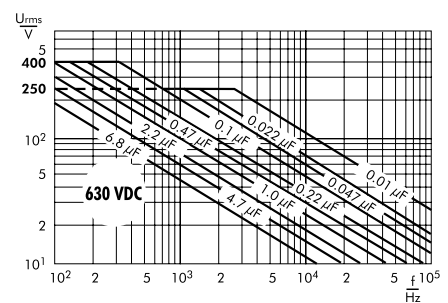
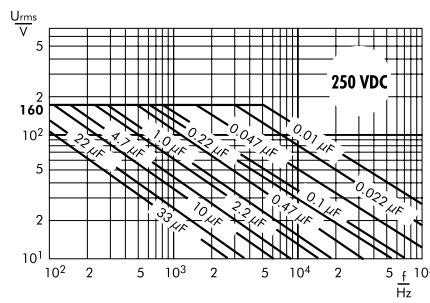
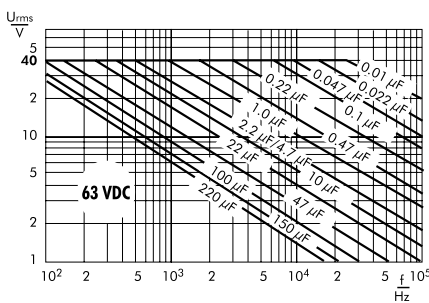
* AC voltage: $f = 50 \text{ Hz}$; $1.4 \times U_{\text{rms}} + \text{UDC} \leq U_r$

** PCM = Printed circuit module = pin spacing

Dims. in mm.

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

A preheating of through-hole WIMA capacitors is allowed for temperatures $T_{\max} < 100^{\circ}\text{C}$. In practice a preheating duration of $t < 5$ min. has been proven to be best.

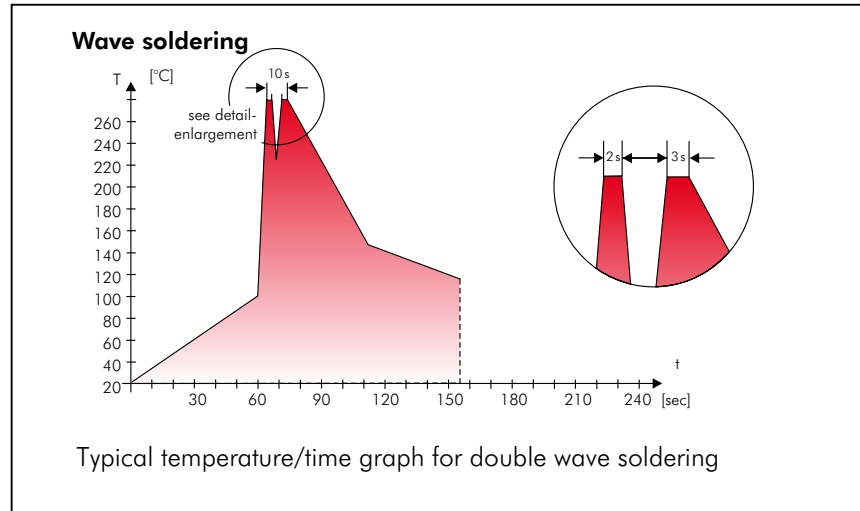
Single wave soldering

Soldering bath temperature: $T < 260^{\circ}\text{C}$
Immersion time: $t < 5$ sec

Double wave soldering

Soldering bath temperature: $T < 260^{\circ}\text{C}$
Immersion time: $2 \times t < 3$ 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
- 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 2002/95/EC 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 2002/95/EG

WIMA capacitors are lead free in accordance with RoHS 2002/95/EC

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

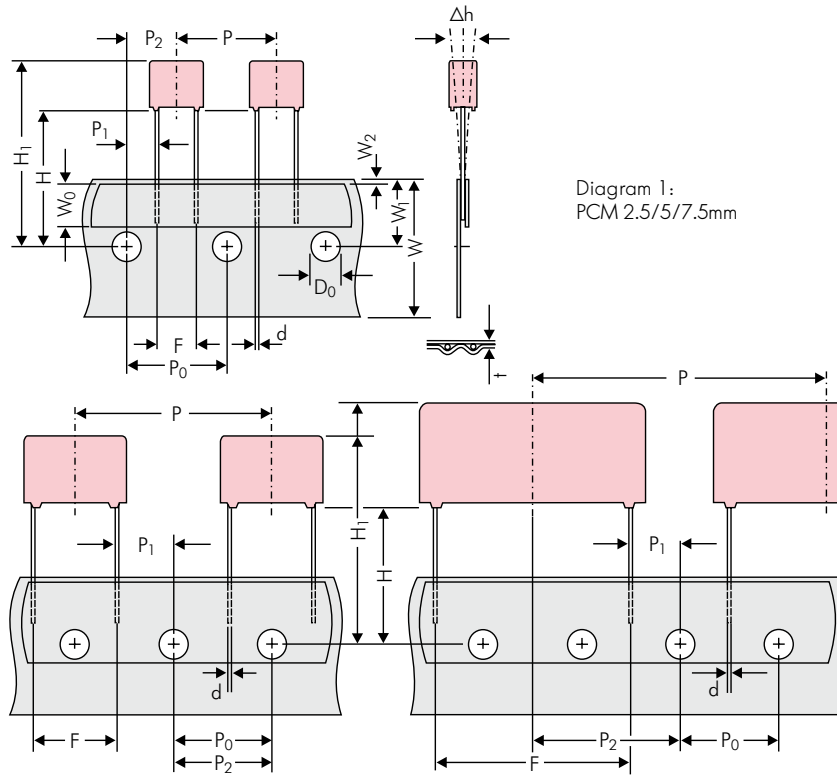


Diagram 1:
PCM 2.5/5/7.5mm

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 128)	ROLL/AMMO			AMMO				
	REEL	φ 360 max. φ 30 ±1	B 52 ±2 58 ±2 } depending on comp. dimensions	REEL	φ 360 max. φ 30 ±1	52 ±2 58 ±2 or 66 ±2	REEL	φ 500 max. φ 25 ±1
Unit	see details page 130.							

Dims in mm.

* Diameter of pins see General Data.

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

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

Please clarify customer-specific deviations with the manufacturer.

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



PCM	Size				bulk	pcs. per packing unit								
						ROLL		REEL				AMMO		
	W	H	L	Codes		S	H16.5	H18.5	ø 360	ø 500	340 x 340	490 x 370		
					N	O	F	I	H	J	A	C	B	D
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	700			700				
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	

* Tray Packing-System
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 2.5 mm to 22.5 mm

PCM	Size				bulk	pcs. per packing units								
						ROLL		REEL				AMMO		
	W	H	L	Codes		S	H16.5	H18.5	ø 360		ø 500		340 × 340	
					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	6K	336*	–	–	–	–	270	–	–	–	250
	15	26	31.5	6F	384*	–	–	–	–	–	–	–	–	–
	15	26	33	6L	288*	–	–	–	–	–	–	–	–	–
	17	29	31.5	6G	176*	–	–	–	–	–	–	–	–	–
	17	34.5	31.5	6I	176*	–	–	–	–	–	–	–	–	–
	19	30	31.5	6L	50*	–	–	–	–	–	–	–	–	–
	20	32	33	6M	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.

* Tray Packing System

Samples and pre-production needs on request.

■ Moulded versions.

Rights reserved to amend design data without prior notification.



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: Special features (e.g. Snubber versions)
- Field 15: Capacitance tolerance
- Field 16: Packing
- Field 17 - 18: Lead 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		

<p>Type description:</p> <p>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 4 = DCP4 DC-LINK MKP 5 = DCP5 DC-LINK MKP 6 = DCP6 DC-LINK HC = DCH_ SuperCap C = SCSC SuperCap MC = SCMC SuperCap R = SCSR SuperCap MR = SCMR</p>	<p>Rated voltage:</p> <p>2.5 VDC = A1 4 VDC = A2 14 VDC = A3 28 VDC = A4 40 VDC = A5 5 VDC = A6 50 VDC = B0 63 VDC = C0 100 VDC = D0 160 VDC = E0 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</p>	<p>Capacitance:</p> <p>22 pF = 0022 47 pF = 0047 100 pF = 0100 150 pF = 0150 220 pF = 0220 330 pF = 0330 470 pF = 0470 680 pF = 0680 1000 pF = 1100 1500 pF = 1150 2200 pF = 1220 3300 pF = 1330 4700 pF = 1470 6800 pF = 1680 0.01 µF = 2100 0.022 µF = 2220 0.047 µF = 2470 0.1 µF = 3100 0.22 µF = 3220 0.47 µF = 3470 1 µF = 4100 2.2 µF = 4220 4.7 µF = 4470 10 µF = 5100 22 µF = 5220 47 µF = 5470 100 µF = 6100 220 µF = 6220 1 F = A010 2.5 F = A025 50 F = A500 100 F = B100 110 F = B110 600 F = B600 1200 F = C120 ...</p>	<p>Size:</p> <p>4.8x3.3x3 Size 1812 = KA 4.8x3.3x4 Size 1812 = KB 5.7x5.1x3.5 Size 2220 = QA 5.7x5.1x4.5 Size 2220 = QB 7.2x6.1x3 Size 2824 = TA 7.2x6.1x5 Size 2824 = TB 10.2x7.6x5 Size 4030 = VA 12.7x10.2x6 Size 5040 = XA 15.3x13.7x7 Size 6054 = YA 2.5x7x4.6 PCM 2.5 = 0B 3x7.5x4.6 PCM 2.5 = 0C 2.5x6.5x7.2 PCM 5 = 1A 3x7.5x7.2 PCM 5 = 1B 2.5x7x10 PCM 7.5 = 2A 3x8.5x10 PCM 7.5 = 2B 3x9x13 PCM 10 = 3A 4x9x13 PCM 10 = 3C 5x11x18 PCM 15 = 4B 6x12.5x18 PCM 15 = 4C 5x14x26.5 PCM 22.5 = 5A 6x15x26.5 PCM 22.5 = 5B 9x19x31.5 PCM 27.5 = 6A 11x21x31.5 PCM 27.5 = 6B 9x19x41.5 PCM 37.5 = 7A 11x22x41.5 PCM 37.5 = 7B 94x49x182 DCH_ = H0 94x77x182 DCH_ = H1 ...</p> <p>Special features:</p> <p>Standard = 00 Version A1 = 1A Version A1.1.1 = 1B Version A1.2 = 1C ...</p>	<p>Tolerance:</p> <p>20% = M 10% = K 5% = J 2.5% = H 1% = E ...</p> <p>Packing:</p> <p>AMMO H16.5 340x340 = A AMMO H16.5 490x370 = B AMMO H18.5 340x340 = C AMMO H18.5 490x370 = D REEL H16.5 360 = F REEL H16.5 500 = H REEL H18.5 360 = I REEL H18.5 500 = J ROLL H16.5 = N ROLL H18.5 = O BLISTER W12 180 = P BLISTER W12 330 = Q BLISTER W16 330 = R BLISTER W24 330 = T Bulk Standard = S TPS Standard = Y ...</p> <p>Lead length (untaped)</p> <p>3.5 ±0.5 = C9 6 -2 = SD 16 ±1 = P1 ...</p>
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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.