

Polypropylene (PP) Capacitors for Pulse Applications with Metal Foil Electrodes and Metallized Internal Series Connection in PCM 15 mm to 52.5 mm. Capacitances from 100 pF to 4.7 μ F. Rated Voltages from 400 VDC to 6000 VDC.

Special Features

- Extremely high pulse duty
- Self-healing
- Internal series connection
- Very low dissipation factor
- Negative capacitance change versus temperature
- According to RoHS 2011/65/EU

Typical Applications

For high pulse and high frequency applications e.g.

- Switch mode power supplies
- Converters in drives and power electronics
- Deflection systems in monitors and TV-sets
- Electronic ballasts

Construction

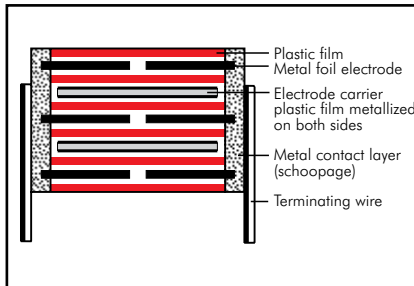
Dielectric:

Polypropylene (PP) film

Capacitor electrodes:

Aluminium foil and 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: Yellow

Electrical Data

Capacitance range:

100 pF to 4.7 μ F (E12-values on request)

Rated voltages:

400 VDC, 630 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC, 4000 VDC, 6000 VDC

Capacitance tolerances:

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

Operating temperature range:

-55°C to $+100^\circ\text{C}$

Climatic test category:

55/100/56 in accordance with IEC

Test voltage:

$2 U_r$, 2 sec / 6 kV: $1.6 U_r$, 2 sec.

Dielectric absorption: 0.05%

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

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

$C \leq 0.1 \mu\text{F}$: $\geq 1 \times 10^5 \text{ M}\Omega$

(mean value: $5 \times 10^5 \text{ M}\Omega$)

$C > 0.1 \mu\text{F}$: $\geq 30\,000 \text{ sec} (\text{M}\Omega \times \mu\text{F})$

(mean value: 100 000 sec)

Measuring voltage: 100 V/1 min.

Voltage derating:

A voltage derating factor of 1.35 % per K must be applied from $+85^\circ\text{C}$ for DC voltages and from $+75^\circ\text{C}$ for AC voltages

Reliability:

Operational life > 300 000 hours

Failure rate < 1 fit ($0.5 \times U_r$ and 40°C)

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

Capacitance pF/ μ F	max. pulse rise time V/ μ sec at $T_A < 40^\circ\text{C}$							
	400VDC	630VDC	1000VDC	1250VDC	1600VDC	2000VDC	4000VDC	6000VDC
100 ... 220	-	-	-	-	56000	56000	-	-
330 ... 680	-	-	-	-	51000	56000	56000	56000
1000 ... 2200	29000	29000	29000	29000	46000	51000	51000	51000
3300 ... 6800	9000	14000	27000	29000	29000	29000	29000	29000
0.01 ... 0.022	9000	11000	11000	11000	11000	13000	13000	13000
0.033 ... 0.068	9000	11000	11000	11000	11000	11000	13000	13000
0.1 ... 0.22	7000	11000	11000	11000	11000	11000	13000	13000
0.33 ... 0.68	6000	10000	11000	11000	11000	11000	13000	13000
1.0 ... 2.2	5000	6600	8300	9500	11000	-	-	-
3.3 ... 4.7	2500	-	-	-	-	-	-	-

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	400 VDC/250 VAC*					630 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	5	11	18	15	FKP1G011004B_____	5	11	18	15	FKP1J011004B_____
1500 „	5	11	18	15	FKP1G011504B_____	5	11	18	15	FKP1J011504B_____
2200 „	5	11	18	15	FKP1G012204B_____	5	11	18	15	FKP1J012204B_____
3300 „	5	11	18	15	FKP1G013304B_____	5	11	18	15	FKP1J013304B_____
4700 „	5	11	18	15	FKP1G014704B_____	5	11	18	15	FKP1J014704B_____
6800 „	5	11	18	15	FKP1G016804B_____	6	12.5	18	15	FKP1J016804C_____
0.01 µF	5	11	18	15	FKP1G021004B_____	7	14	18	15	FKP1J021004D_____
0.015 „	6	12.5	18	15	FKP1G021504C_____	5	14	26.5	22.5	FKP1J021005A_____
0.022 „	7	14	18	15	FKP1G022204D_____	8	15	18	15	FKP1J021504F_____
0.033 „	5	14	26.5	22.5	FKP1G022205A_____	6	15	26.5	22.5	FKP1J021505B_____
0.047 „	8	15	18	15	FKP1G023304F_____	7	16.5	26.5	22.5	FKP1J022205D_____
0.068 „	6	15	26.5	22.5	FKP1G023305B_____	8.5	18.5	26.5	22.5	FKP1J023305F_____
	7	16.5	26.5	22.5	FKP1G024705D_____	10.5	20.5	26.5	22.5	FKP1J024705H_____
	8.5	18.5	26.5	22.5	FKP1G026805F_____	9	19	31.5	27.5	FKP1J024706A_____
						11	21	31.5	27.5	FKP1J026806B_____
						9	19	41.5	37.5	FKP1J026807A_____
0.1 µF	10.5	20.5	26.5	22.5	FKP1G031005H_____	13	24	31.5	27.5	FKP1J031006D_____
	9	19	31.5	27.5	FKP1G031006A_____	11	22	41.5	37.5	FKP1J031007B_____
0.15 „	11	21	31.5	27.5	FKP1G031506B_____	13	24	41.5	37.5	FKP1J031507C_____
0.22 „	13	24	31.5	27.5	FKP1G032206D_____	15	26	41.5	37.5	FKP1J032207D_____
	11	22	41.5	37.5	FKP1G032207B_____					
0.33 „	13	24	41.5	37.5	FKP1G033307C_____	19	32	41.5	37.5	FKP1J033307F_____
0.47 „	15	26	41.5	37.5	FKP1G034707D_____	20	39.5	41.5	37.5	FKP1J034707G_____
0.68 „	19	32	41.5	37.5	FKP1G036807F_____	24	45.5	41.5	37.5	FKP1J036807H_____
1.0 µF	20	39.5	41.5	37.5	FKP1G041007G_____	35	50	41.5	37.5	FKP1J041007J_____
1.5 „	24	45.5	41.5	37.5	FKP1G041507H_____	40	55	41.5	37.5	FKP1J041507K_____
						35	50	57	52.5	FKP1J041509F_____
2.2 „	31	46	41.5	37.5	FKP1G042207I_____	45	55	57	52.5	FKP1J042209H_____
3.3 „	40	55	41.5	37.5	FKP1G043307K_____					
4.7 „	45	55	57	52.5	FKP1G044709H_____					

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

 New values

** PCM = Printed circuit module = pin spacing

Dims. in mm.

The values of the WIMA FKP 4 range according to main catalogue 2015 are still available on request.

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 143.		

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Continuation

General Data

Capacitance	1000 VDC/600 VAC*					1250 VDC/600 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	5	11	18	15	FKP1O111004B_	5	11	18	15	FKP1R011004B_
1500 "	5	11	18	15	FKP1O111504B_	5	11	18	15	FKP1R011504B_
2200 "	5	11	18	15	FKP1O112204B_	5	11	18	15	FKP1R012204B_
3300 "	5	11	18	15	FKP1O113304B_	6	12.5	18	15	FKP1R013304C_
4700 "	6	12.5	18	15	FKP1O114704C_	7	14	18	15	FKP1R014704D_
6800 "	7	14	18	15	FKP1O116804D_	8	15	18	15	FKP1R016804F_
						5	14	26.5	22.5	FKP1R016805A_
0.01 µF	8	15	18	15	FKP1O121004F_	7	16.5	26.5	22.5	FKP1R021005D_
	6	15	26.5	22.5	FKP1O121005B_					
0.015 "	6	15	26.5	22.5	FKP1O121505B_	8.5	18.5	26.5	22.5	FKP1R021505F_
0.022 "	8.5	18.5	26.5	22.5	FKP1O122205F_	10.5	20.5	26.5	22.5	FKP1R022205H_
0.033 "	10.5	20.5	26.5	22.5	FKP1O123305H_	11	21	31.5	27.5	FKP1R023306B_
	9	19	31.5	27.5	FKP1O123306A_	9	19	41.5	37.5	FKP1R023307A_
0.047 "	11	21	31.5	27.5	FKP1O124706B_	13	24	31.5	27.5	FKP1R024706D_
						11	22	41.5	37.5	FKP1R024707B_
0.068 "	13	24	31.5	27.5	FKP1O126806D_	11	22	41.5	37.5	FKP1R026807B_
	11	22	41.5	37.5	FKP1O126807B_					
0.1 µF	13	24	41.5	37.5	FKP1O131007C_	15	26	41.5	37.5	FKP1R031007D_
0.15 "	15	26	41.5	37.5	FKP1O131507D_	17	29	41.5	37.5	FKP1R031507E_
0.22 "	19	32	41.5	37.5	FKP1O132207F_	19	32	41.5	37.5	FKP1R032207F_
0.33 "	24	45.5	41.5	37.5	FKP1O133307H_	24	45.5	41.5	37.5	FKP1R033307H_
0.47 "	31	46	41.5	37.5	FKP1O134707I_	31	46	41.5	37.5	FKP1R034707I_
0.68 "	35	50	41.5	37.5	FKP1O136807J_	35	50	41.5	37.5	FKP1R036807J_
1.0 µF	40	55	41.5	37.5	FKP1O141007K_	35	50	57	52.5	FKP1R041009F_
	35	50	57	52.5	FKP1O141009F_					
1.5 "	45	55	57	52.5	FKP1O141509H_	45	65	57	52.5	FKP1R041509J_
2.2 "	45	65	57	52.5	FKP1O142209J_					

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

New values

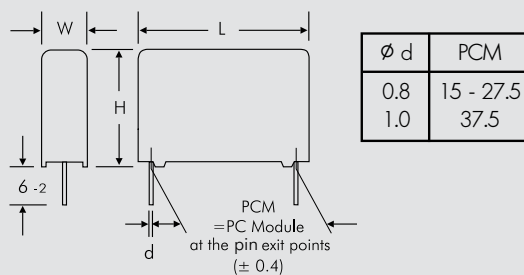
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Dims. in mm.

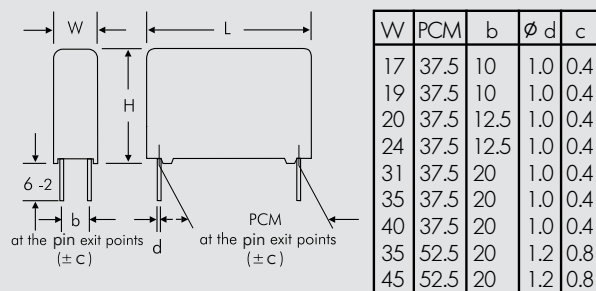
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

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 143.	

2-pin version



4-pin version



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Continuation

General Data

Capacitance	1600 VDC/650 VAC*					2000 VDC/700 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	5	11	18	15	FKP1T001004B_	5	11	18	15	FKP1U001004B_
150 "	5	11	18	15	FKP1T001504B_	5	11	18	15	FKP1U001504B_
220 "	5	11	18	15	FKP1T002204B_	5	11	18	15	FKP1U002204B_
330 "	5	11	18	15	FKP1T003304B_	6	12.5	18	15	FKP1U003304C_
470 "	5	11	18	15	FKP1T004704B_	6	12.5	18	15	FKP1U004704C_
680 "	5	11	18	15	FKP1T006804B_	6	12.5	18	15	FKP1U006804C_
1000 pF	6	12.5	18	15	FKP1T011004C_	7	14	18	15	FKP1U011004D_
	5	14	26.5	22.5	FKP1T011005A_	5	14	26.5	22.5	FKP1U011005A_
1500 "	7	14	18	15	FKP1T011504D_	6	15	26.5	22.5	FKP1U011505B_
	5	14	26.5	22.5	FKP1T011505A_					
2200 "	8	15	18	15	FKP1T012204F_	7	16.5	26.5	22.5	FKP1U012205D_
	5	14	26.5	22.5	FKP1T012205A_					
3300 "	6	15	26.5	22.5	FKP1T013305B_	7	16.5	26.5	22.5	FKP1U013305D_
4700 "	7	16.5	26.5	22.5	FKP1T014705D_	8.5	18.5	26.5	22.5	FKP1U014705F_
6800 "	8.5	18.5	26.5	22.5	FKP1T016805F_	10.5	20.5	26.5	22.5	FKP1U016805H_
0.01 µF	10.5	20.5	26.5	22.5	FKP1T021005H_	11	21	31.5	27.5	FKP1U021006B_
0.015 "	11	21	31.5	27.5	FKP1T021506B_	13	24	31.5	27.5	FKP1U021506D_
0.022 "	11	21	31.5	27.5	FKP1T022206B_	15	26	31.5	27.5	FKP1U022206F_
						13	24	41.5	37.5	FKP1U022207C_
0.033 "	13	24	31.5	27.5	FKP1T023306D_	13	24	41.5	37.5	FKP1U023307C_
	13	24	41.5	37.5	FKP1T023307C_					
0.047 "	13	24	41.5	37.5	FKP1T024707C_	17	29	41.5	37.5	FKP1U024707E_
0.068 "	15	26	41.5	37.5	FKP1T026807D_	19	32	41.5	37.5	FKP1U026807F_
0.1 µF	17	29	41.5	37.5	FKP1T031007E_	20	39.5	41.5	37.5	FKP1U031007G_
0.15 "	20	39.5	41.5	37.5	FKP1T031507G_	24	45.5	41.5	37.5	FKP1U031507H_
0.22 "	24	45.5	41.5	37.5	FKP1T032207H_	35	50	41.5	37.5	FKP1U032207J_
0.33 "	31	46	41.5	37.5	FKP1T033307I_	40	55	41.5	37.5	FKP1U033307K_
0.47 "	40	55	41.5	37.5	FKP1T034707K_	45	55	57	52.5	FKP1U034709H_
0.68 "	35	50	57	52.5	FKP1T036809F_	45	65	57	52.5	FKP1U036809J_
1.0 µF	45	55	57	52.5	FKP1T041009H_					

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

■ New values

** PCM = Printed circuit module = pin spacing

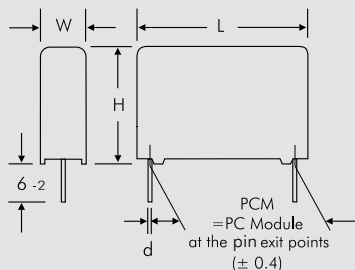
Dims. in mm.

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

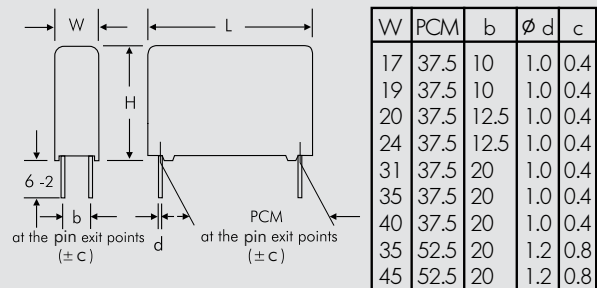
Part number completion:

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 143.	

2-pin version



4-pin version



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Continuation

General Data

Capacitance	4000 VDC/700 VAC*					6000 VDC/700 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
470 pF	5	14	26.5	22.5	FKP1X004705A	5	14	26.5	22.5	FKP1Y004705A
680 "	5	14	26.5	22.5	FKP1X006805A	5	14	26.5	22.5	FKP1Y006805A
1000 pF	5	14	26.5	22.5	FKP1X011005A	5	14	26.5	22.5	FKP1Y011005A
1500 "	7	16.5	26.5	22.5	FKP1X011505D	7	16.5	26.5	22.5	FKP1Y011505D
2200 "	8.5	18.5	26.5	22.5	FKP1X012205F	10.5	20.5	26.5	22.5	FKP1Y012205H
3300 "	10.5	20.5	26.5	22.5	FKP1X013305H	10.5	20.5	26.5	22.5	FKP1Y013305H
4700 "	11	21	31.5	27.5	FKP1X014706B	11	21	31.5	27.5	FKP1Y014706B
6800 "	13	24	31.5	27.5	FKP1X016806D	13	24	31.5	27.5	FKP1Y016806D
0.01 µF	15	26	31.5	27.5	FKP1X021006F	15	26	31.5	27.5	FKP1Y021006F
0.015 "	13	24	41.5	37.5	FKP1X021507C	13	24	41.5	37.5	FKP1Y021507C
0.022 "	17	29	41.5	37.5	FKP1X022207E	17	29	41.5	37.5	FKP1Y022207E
0.033 "	20	39.5	41.5	37.5	FKP1X023307G	20	39.5	41.5	37.5	FKP1Y023307G
0.047 "	24	45.5	41.5	37.5	FKP1X024707H	24	45.5	41.5	37.5	FKP1Y024707H
0.068 "	31	46	41.5	37.5	FKP1X026807I	31	46	41.5	37.5	FKP1Y026807I
0.1 µF	35	50	41.5	37.5	FKP1X031007J	35	50	41.5	37.5	FKP1Y031007J
0.15 "	40	55	41.5	37.5	FKP1X031507K	40	55	41.5	37.5	FKP1Y031507K
0.22 "	45	55	57	52.5	FKP1X032209H	45	55	57	52.5	FKP1Y032209H
0.33 "	45	65	57	52.5	FKP1X033309J	45	65	57	52.5	FKP1Y033309J

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

■ New values

** PCM = Printed circuit module = pin spacing

Dims. in mm.

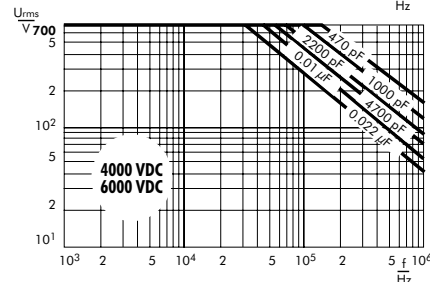
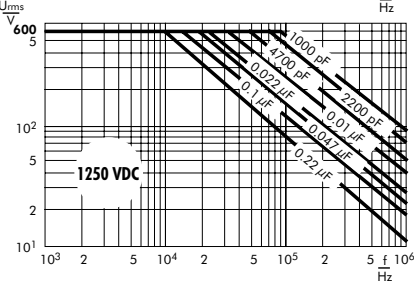
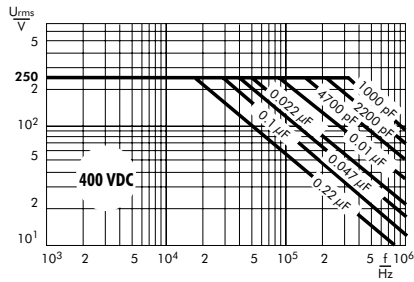
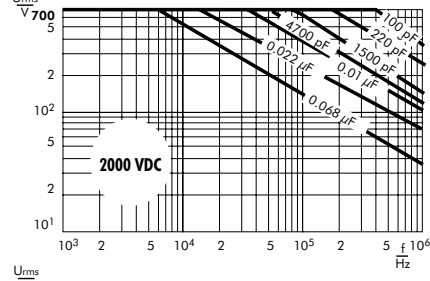
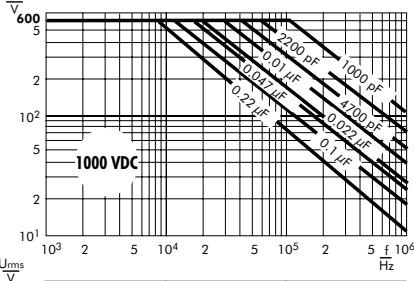
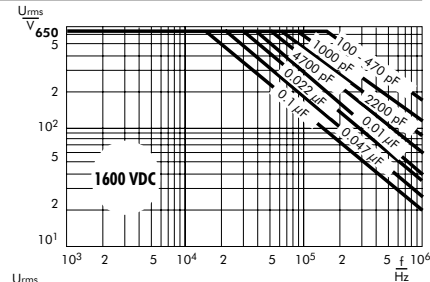
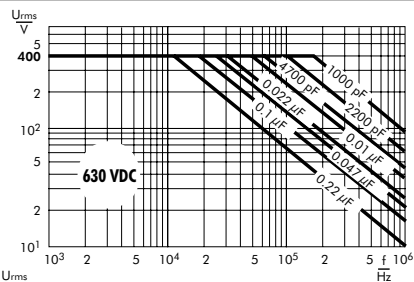
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

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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 143.

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

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

Single wave soldering

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

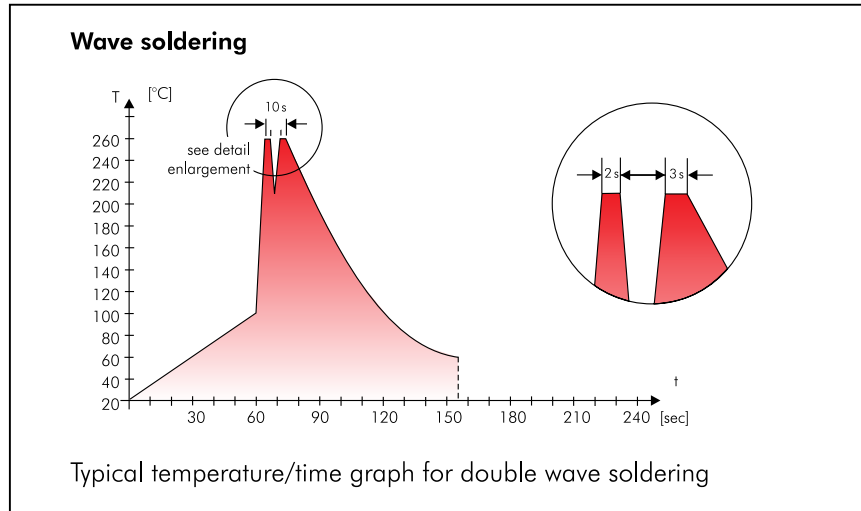
Dwell time: $t < 5 \text{ sec}$

Double wave soldering

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

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 infaz (Institut für Auditierung und Zertifizierung) 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
- 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 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

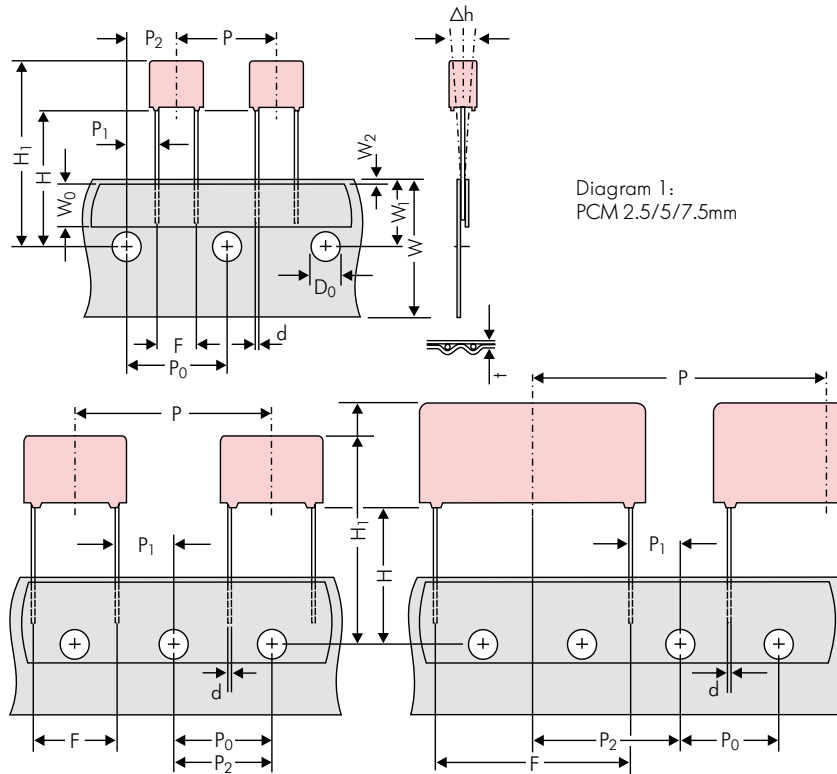


Diagram 1:
PCM 2.5/5/7.5mm

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 144)	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 145.							

Dims in mm.

* Diameter of pins see General Data.

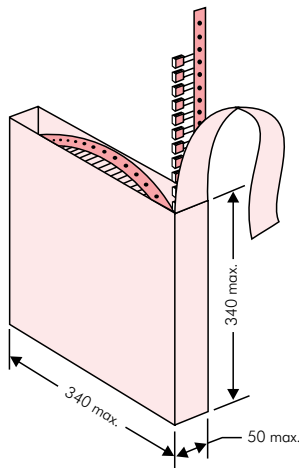
* PCM 10 and PCM 15 can be crimped to PCM 7.5.

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

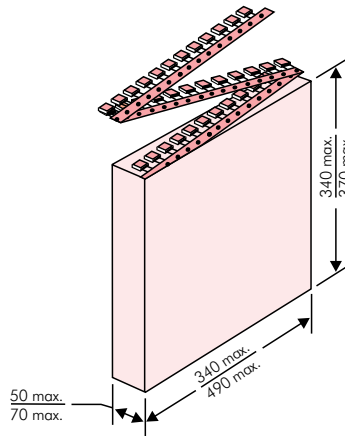
Please clarify customer-specific deviations with the manufacturer.

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

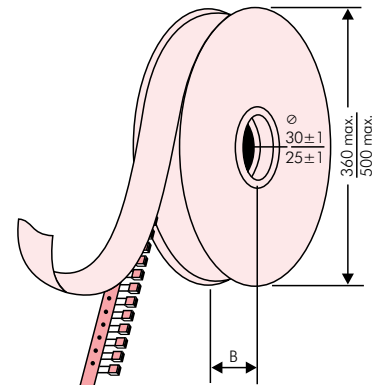
■ ROLL Packaging



■ 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
		Gross Weight [g]: 1870
WIMA Confirmation No.: 0001004053000100	WIMA Part No.: MKS2C034701C00K8SD	
Handling Unit: MKS 2	QTY: 5.000	COO: DE
	MKS 2 0.47 µF 63 VDC 3.5x8.5x7.2 RM5	
1000067326	Standard 10% Loss - Standard	Dichte 6-2
Vorlage Debitor 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 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	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		2700	
	5	10.5	10.3	2E	3000			1300	2500		1300			
	5.7	12.5	10.3	2F	2000			1000	2200		1100			
	7.2	12.5	10.3	2G	1500			900	1800		1000			
10 mm	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	570*				420				380	
	10.5	19	26.5	5G	594*				400				360	
	10.5	20.5	26.5	5H	594*				400				360	
	11	21	26.5	5I	561*				380				350	
	12	24	28	FJ	480*				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					
	W	H	L	Codes		S	N	O	ø 360		ø 500		340 x 340		490 x 370		
								H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5
								F	I	H	J	A	C	B	D		
27.5 mm	9	19	31.5	6A	567*	-	-	-	-	460/340*	-	-	420				
	11	21	31.5	6B	459*	-	-	-	-	380/280*	-	-	350				
	13	24	31.5	6D	378*	-	-	-	-	300	-	-	290				
	13	25	33	6K	405*	-	-	-	-	-	-	-	-				
	15	26	31.5	6F	324*	-	-	-	-	270	-	-	250				
	15	26	33	6L	324*	-	-	-	-	-	-	-	-				
	17	29	31.5	6G	198*	-	-	-	-	-	-	-	-				
	17	34.5	31.5	6I	198*	-	-	-	-	-	-	-	-				
	20	32	33	6M	162*	-	-	-	-	-	-	-	-				
	20	39.5	31.5	6J	162*	-	-	-	-	-	-	-	-				
37.5 mm	9	19	41.5	7A	441*	-	-	-	-	-	-	-	-				
	11	22	41.5	7B	357*	-	-	-	-	-	-	-	-				
	13	24	41.5	7C	294*	-	-	-	-	-	-	-	-				
	15	26	41.5	7D	252*	-	-	-	-	-	-	-	-				
	17	29	41.5	7E	154*	-	-	-	-	-	-	-	-				
	19	32	41.5	7F	140*	-	-	-	-	-	-	-	-				
	20	39.5	41.5	7G	126*	-	-	-	-	-	-	-	-				
	24	45.5	41.5	7H	112*	-	-	-	-	-	-	-	-				
	31	46	41.5	7I	84*	-	-	-	-	-	-	-	-				
	35	50	41.5	7J	35*	-	-	-	-	-	-	-	-				
	40	55	41.5	7K	28*	-	-	-	-	-	-	-	-				
48.5 mm	19	31	56	8D	120*	-	-	-	-	-	-	-	-				
	23	34	56	8E	80*	-	-	-	-	-	-	-	-				
	27	37.5	56	8H	84*	-	-	-	-	-	-	-	-				
	33	48	56	8J	25*	-	-	-	-	-	-	-	-				
	37	54	56	8L	25*	-	-	-	-	-	-	-	-				
52.5 mm	25	45	57	9D	70*	-	-	-	-	-	-	-	-				
	30	45	57	9E	60*	-	-	-	-	-	-	-	-				
	35	50	57	9F	25*	-	-	-	-	-	-	-	-				
	45	55	57	9H	20*	-	-	-	-	-	-	-	-				
	45	65	57	9J	20*	-	-	-	-	-	-	-	-				

* 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.

Updated data on www.wima.com



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

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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	K	S	2	C	0	2	1	0	0	1	A	0	0	M	S	S	D
MKS 2				63 VDC		0.01 µF			2.5x6.5x7.2		-		20%	bulk	6 -2		

<p>Type description:</p> <p>SMD-PET = SMDT SMD-PEN = SMDN SMD-PPS = SMDI FKP 02 = FKPO MKS 02 = MKS0 FKS 2 = FKS2 FKP 2 = FKP2 FKS 3 = FKS3 FKP 3 = FKP 3 MKS 2 = MKS2 MKP 2 = MKP2 MKS 4 = MKS4 MKP 4C = MKPC MKP 4 = MKP4 MKP 10 = MKP1 FKP 1 = FKP1 MKP-X2 = MKX2 MKP-X1 R = MKX1 MKP-Y2 = MKY2 MP 3-X2 = MPX2 MP 3-X1 = MPX1 MP 3-Y2 = MPY2 MP 3R-Y2 = MPRY MKP 4F = MKPF 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 DC-LINK HY = DCHY</p>	<p>Rated voltage:</p> <p>50 VDC = B0 63 VDC = C0 100 VDC = D0 250 VDC = F0 400 VDC = G0 450 VDC = H0 520 VDC = H2 600 VDC = I0 630 VDC = J0 700 VDC = K0 800 VDC = L0 850 VDC = M0 900 VDC = N0 1000 VDC = O1 1100 VDC = P0 1200 VDC = Q0 1250 VDC = R0 1500 VDC = S0 1600 VDC = T0 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 350 VAC = BW 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 1000 µF = 7100 1500 µF = 7150 ...</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 19x31x56 PCM 48.5 = 8D 25x45x57 PCM 52.5 = 9D ...</p> <p>Version code:</p> <p>Standard = 00 Version A1 = 1A Version A1.1.1 = 1B Version A2 = 2A ...</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/TPS Standard = S ...</p> <p>Pin length (untaped)</p> <p>3.5 ±0.5 = C9 6 -2 = SD 16 ±1 = P1 ...</p> <p>Pin length (taped)</p> <p>none = 00</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.