

## 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 μF. 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

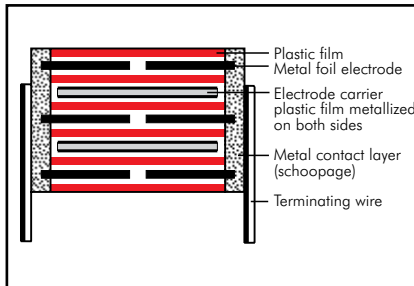
#### Dielectric:

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.

### Electrical Data

#### Capacitance range:

100 pF to 4.7 μF (E12-values on request)

#### Rated voltages:

400 VDC, 630 VDC, 850 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC, 4000 VDC, 6000 VDC

#### Capacitance tolerances:

±20%, ±10%, ±5% (other tolerances are available subject to special enquiry)

#### Operating temperature range:

-55° C to +100° C

#### Climatic test category:

55/100/56 in accordance with IEC

Test voltage: 2 U<sub>r</sub>, 2 sec / 6 kV: PCM < 37.5

1.6 U<sub>r</sub>, 2 sec, PCM 37.5 1.2 U<sub>r</sub>, 2 sec.

Dielectric absorption: 0.05%

Dissipation factors at +20° C: tan δ

at f	C ≤ 0.1 μF	0.1 μF < C ≤ 1.0 μF	C > 1.0 μF
1 kHz	≤ 5x10 <sup>-4</sup>	≤ 5x10 <sup>-4</sup>	≤ 5x10 <sup>-4</sup>
10 kHz	≤ 6x10 <sup>-4</sup>	≤ 6x10 <sup>-4</sup>	-
100 kHz	≤ 10x10 <sup>-4</sup>	-	-

#### Insulation resistance at +20° C:

C ≤ 0.1 μF: ≥ 1 x 10<sup>5</sup> MΩ

C > 0.1 μF: ≥ 30 000 sec (MΩ x μF)

Measuring voltage: 100 V/1 min.

#### Voltage derating:

A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages

#### Reliability:

Operational life > 300 000 hours

Failure rate < 1 fit (0.5 x U<sub>r</sub> and 40° C)

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

Capacitance pF/μF	max. pulse rise time V/μsec at T <sub>A</sub> < 40° C								
	400VDC	630VDC	850VDC	1000VDC	1250VDC	1600VDC	2000VDC	4000VDC	6000VDC
100 ... 220	-	-	-	-	-	56000	56000	-	-
330 ... 680	-	-	-	-	-	51000	56000	56000	56000
1000 ... 2200	29000	29000	29000	29000	29000	46000	51000	51000	51000
3300 ... 6800	9000	14000	27000	27000	29000	29000	29000	29000	29000
0.01 ... 0.022	9000	11000	11000	11000	11000	11000	13000	13000	13000
0.033 ... 0.068	9000	11000	11000	11000	11000	11000	11000	13000	13000
0.1 ... 0.22	7000	11000	11000	11000	11000	11000	11000	13000	13000
0.33 ... 0.68	6000	10000	11000	11000	11000	11000	11000	-	-
1.0 ... 2.2	5000	6600	8300	8300	9500	11000	-	-	-
3.3 ... 4.7	2500	-	-	-	-	-	-	-	-

### Mechanical Tests

#### Pull test on pins:

d ≤ 0.8 φ: 10 N in direction of pins

d > 0.8 φ: 20 N in direction of pins

according to IEC 60068-2-21

#### Vibration:

6 hours at 10 ... 2000 Hz and 0.75 mm

displacement amplitude or 10 g in

accordance with IEC 60068-2-6

#### Low air density:

1kPa = 10 mbar in accordance with

IEC 60068-2-13

#### Bump test:

4000 bumps at 390 m/sec<sup>2</sup>

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 „	17	29	41.5	37.5	FKP1G034707E_____	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 „	31	46	41.5	37.5	FKP1G041507I_____	40	55	41.5	37.5	FKP1J041507K_____
						35	50	57	52.5	FKP1J041509F_____
2.2 „	35	50	41.5	37.5	FKP1G042207J_____	45	55	57	52.5	FKP1J042209H_____
3.3 „	35	50	57	52.5	FKP1G043309F_____					
4.7 „	45	65	57	52.5	FKP1G044709J_____					

\* 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 148.		

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Continuation page 74

## Continuation

### General Data

Capacitance	850 VDC/450 VAC*					1000 VDC/600 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	5	11	18	15	FKP1M011004B	5	11	18	15	FKP1O111004B
1500 "	5	11	18	15	FKP1M011504B	5	11	18	15	FKP1O111504B
2200 "	5	11	18	15	FKP1M012204B	5	11	18	15	FKP1O112204B
3300 "	5	11	18	15	FKP1M013304B	5	11	18	15	FKP1O113304B
4700 "	6	12.5	18	15	FKP1M014704C	6	12.5	18	15	FKP1O114704C
6800 "	7	14	18	15	FKP1M016804D	7	14	18	15	FKP1O116804D
0.01 µF	8	15	18	15	FKP1M021004F	8	15	18	15	FKP1O121004F
	6	15	26.5	22.5	FKP1M021005B	6	15	26.5	22.5	FKP1O121005B
0.015 "	6	15	26.5	22.5	FKP1M021505B	6	15	26.5	22.5	FKP1O121505B
0.022 "	8.5	18.5	26.5	22.5	FKP1M022205F	8.5	18.5	26.5	22.5	FKP1O122205F
0.033 "	10.5	20.5	26.5	22.5	FKP1M023305H	10.5	20.5	26.5	22.5	FKP1O123305H
	9	19	31.5	27.5	FKP1M023306A	9	19	31.5	27.5	FKP1O123306A
0.047 "	11	21	31.5	27.5	FKP1M024706B	11	21	31.5	27.5	FKP1O124706B
0.068 "	13	24	31.5	27.5	FKP1M026806D	13	24	31.5	27.5	FKP1O126806D
	11	22	41.5	37.5	FKP1M026807B	11	22	41.5	37.5	FKP1O126807B
0.1 µF	13	24	41.5	37.5	FKP1M031007C	13	24	41.5	37.5	FKP1O131007C
0.15 "	15	26	41.5	37.5	FKP1M031507D	15	26	41.5	37.5	FKP1O131507D
0.22 "	19	32	41.5	37.5	FKP1M032207F	19	32	41.5	37.5	FKP1O132207F
0.33 "	20	39.5	41.5	37.5	FKP1M033307G	20	39.5	41.5	37.5	FKP1O133307G
0.47 "	31	46	41.5	37.5	FKP1M034707I	31	46	41.5	37.5	FKP1O134707I
0.68 "	35	50	41.5	37.5	FKP1M036807J	35	50	41.5	37.5	FKP1O136807J
1.0 µF	40	55	41.5	37.5	FKP1M041007K	40	55	41.5	37.5	FKP1O141007K
	35	50	57	52.5	FKP1M041009F	35	50	57	52.5	FKP1O141009F
1.5 "	45	55	57	52.5	FKP1M041509H	45	55	57	52.5	FKP1O141509H
2.2 "	45	65	57	52.5	FKP1M042209J	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 range and values

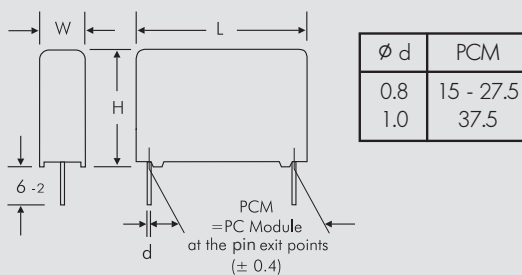
\*\* PCM = Printed circuit module = pin spacing

Dims. in mm.

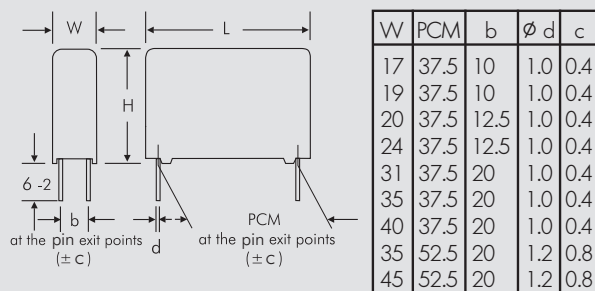
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

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 148.	

#### 2-pin version



#### 4-pin version



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Continuation page 75

## Continuation

### General Data

Capacitance	1250 VDC/600 VAC*					1600 VDC/650 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF						5	11	18	15	FKP1T001004B_____
150 "						5	11	18	15	FKP1T001504B_____
220 "						5	11	18	15	FKP1T002204B_____
330 "						5	11	18	15	FKP1T003304B_____
470 "						5	11	18	15	FKP1T004704B_____
680 "						5	11	18	15	FKP1T006804B_____
1000 pF	5	11	18	15	FKP1R011004B_____	6	12.5	18	15	FKP1T011004C_____
1500 "	5	11	18	15	FKP1R011504B_____	5	14	26.5	22.5	FKP1T011005A_____
2200 "	5	11	18	15	FKP1R012204B_____	7	14	18	15	FKP1T011504D_____
3300 "	5	11	18	15	FKP1R013304C_____	5	14	26.5	22.5	FKP1T011505A_____
4700 "	6	12.5	18	15	FKP1R014704D_____	8	15	18	15	FKP1T012204F_____
6800 "	7	14	18	15	FKP1R016804F_____	5	14	26.5	22.5	FKP1T012205A_____
	8	15	18	15	FKP1R016805A_____	6	15	26.5	22.5	FKP1T013305B_____
	5	14	26.5	22.5		7	16.5	26.5	22.5	FKP1T014705D_____
0.01 µF	7	16.5	26.5	22.5	FKP1R021005D_____	8.5	18.5	26.5	22.5	FKP1T016805F_____
0.015 "	8.5	18.5	26.5	22.5	FKP1R021505F_____	10.5	20.5	26.5	22.5	FKP1T021005H_____
0.022 "	10.5	20.5	26.5	22.5	FKP1R022205H_____	11	21	31.5	27.5	FKP1T021506B_____
0.033 "	11	21	31.5	27.5	FKP1R023306B_____	11	21	31.5	27.5	FKP1T022206B_____
	9	19	41.5	37.5	FKP1R023307A_____	13	24	31.5	27.5	FKP1T023306D_____
0.047 "	13	24	31.5	27.5	FKP1R024706D_____	13	24	41.5	37.5	FKP1T023307C_____
	11	22	41.5	37.5	FKP1R024707B_____	13	24	41.5	37.5	FKP1T024707C_____
0.068 "	11	22	41.5	37.5	FKP1R026807B_____	15	26	41.5	37.5	FKP1T026807D_____
0.1 µF	15	26	41.5	37.5	FKP1R031007D_____	17	29	41.5	37.5	FKP1T031007E_____
0.15 "	17	29	41.5	37.5	FKP1R031507E_____	20	39.5	41.5	37.5	FKP1T031507G_____
0.22 "	19	32	41.5	37.5	FKP1R032207F_____	24	45.5	41.5	37.5	FKP1T032207H_____
0.33 "	24	45.5	41.5	37.5	FKP1R033307H_____	31	46	41.5	37.5	FKP1T033307I_____
0.47 "	31	46	41.5	37.5	FKP1R034707I_____	40	55	41.5	37.5	FKP1T034707K_____
0.68 "	40	55	41.5	37.5	FKP1R036807K_____	35	50	57	52.5	FKP1T036809F_____
1.0 µF	35	50	57	52.5	FKP1R041009F_____	45	55	57	52.5	FKP1T041009H_____
1.5 "	45	65	57	52.5	FKP1R041509J_____					

\* 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 148.		

Rights reserved to amend design data without prior notification

Continuation page 76

## Continuation

### General Data

Capacitance	2000 VDC/700 VAC~*					4000 VDC/700 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
100 pF	5	11	18	15	FKP1U001004B_-----					
150 "	5	11	18	15	FKP1U001504B_-----					
220 "	5	11	18	15	FKP1U002204B_-----					
330 "	6	12.5	18	15	FKP1U003304C_-----					
470 "	6	12.5	18	15	FKP1U004704C_-----	5	14	26.5	22.5	FKP1X004705A_-----
680 "	6	12.5	18	15	FKP1U006804C_-----	5	14	26.5	22.5	FKP1X006805A_-----
1000 pF	7	14	18	15	FKP1U011004D_-----	5	14	26.5	22.5	FKP1X011005A_-----
	5	14	26.5	22.5	FKP1U011005A_-----					
1500 "	6	15	26.5	22.5	FKP1U011505B_-----	7	16.5	26.5	22.5	FKP1X011505D_-----
2200 "	7	16.5	26.5	22.5	FKP1U012205D_-----	8.5	18.5	26.5	22.5	FKP1X012205F_-----
3300 "	7	16.5	26.5	22.5	FKP1U013305D_-----	10.5	20.5	26.5	22.5	FKP1X013305H_-----
4700 "	8.5	18.5	26.5	22.5	FKP1U014705F_-----	11	21	31.5	27.5	FKP1X014706B_-----
6800 "	10.5	20.5	26.5	22.5	FKP1U016805H_-----	13	24	31.5	27.5	FKP1X016806D_-----
0.01 µF	11	21	31.5	27.5	FKP1U021006B_-----	15	26	31.5	27.5	FKP1X021006F_-----
0.015 "	13	24	31.5	27.5	FKP1U021506D_-----	13	24	41.5	37.5	FKP1X021507C_-----
0.022 "	15	26	31.5	27.5	FKP1U022206F_-----	17	29	41.5	37.5	FKP1X022207E_-----
	13	24	41.5	37.5	FKP1U022207C_-----					
0.033 "	13	24	41.5	37.5	FKP1U023307C_-----	20	39.5	41.5	37.5	FKP1X023307G_-----
0.047 "	17	29	41.5	37.5	FKP1U024707E_-----	24	45.5	41.5	37.5	FKP1X024707H_-----
0.068 "	19	32	41.5	37.5	FKP1U026807F_-----	31	46	41.5	37.5	FKP1X026807I_-----
0.1 µF	20	39.5	41.5	37.5	FKP1U031007G_-----	35	50	41.5	37.5	FKP1X031007J_-----
0.15 "	24	45.5	41.5	37.5	FKP1U031507H_-----	40	55	41.5	37.5	FKP1X031507K_-----
0.22 "	35	50	41.5	37.5	FKP1U032207J_-----	45	55	57	52.5	FKP1X032209H_-----
0.33 "	40	55	41.5	37.5	FKP1U033307K_-----					
0.47 "	45	55	57	52.5	FKP1U034709H_-----					
0.68 "	45	65	57	52.5	FKP1U036809J_-----					

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

■ New values

\*\* PCM = Printed circuit module = pin spacing

Dims. in mm.

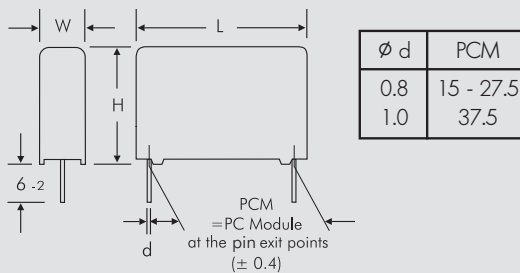
Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:

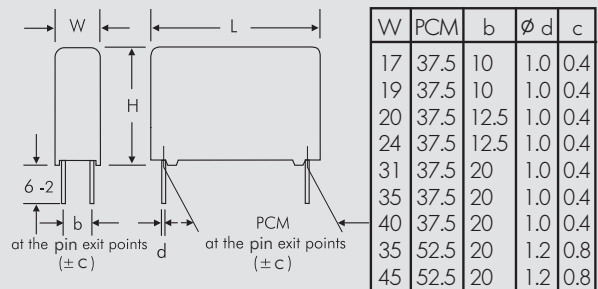
Version code: 2-pin = 00  
 4-pin = D4  
 Tolerance: 20 % = M  
 10 % = K  
 5 % = J  
 Packing: bulk = S  
 Pin length: 6-2 = SD

Taped version see page 148.

#### 2-pin version



#### 4-pin version



Rights reserved to amend design data without prior notification.

Continuation page 77

## Continuation

### General Data

Capacitance	6000 VDC/700 VAC*					Dims. in mm.
	W	H	L	PCM**	Part number	
470 pF	5	14	26.5	22.5	FKP1Y004705A	Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.
680 "	5	14	26.5	22.5	FKP1Y006805A	
1000 pF	5	14	26.5	22.5	FKP1Y011005A	
1500 "	7	16.5	26.5	22.5	FKP1Y011505D	
2200 "	10.5	20.5	26.5	22.5	FKP1Y012205H	
3300 "	10.5	20.5	26.5	22.5	FKP1Y013305H	
4700 "	11	21	31.5	27.5	FKP1Y014706B	
6800 "	13	24	31.5	27.5	FKP1Y016806D	
0.01 µF	15	26	31.5	27.5	FKP1Y021006F	
0.015 "	13	24	41.5	37.5	FKP1Y021507C	
0.022 "	17	29	41.5	37.5	FKP1Y022207E	
0.033 "	20	39.5	41.5	37.5	FKP1Y023307G	
0.047 "	24	45.5	41.5	37.5	FKP1Y024707H	
0.068 "	31	46	41.5	37.5	FKP1Y026807I	
0.1 µF	35	50	41.5	37.5	FKP1Y031007J	
0.15 "	40	55	41.5	37.5	FKP1Y031507K	
0.22 "	45	55	57	52.5	FKP1Y032209H	

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 148.

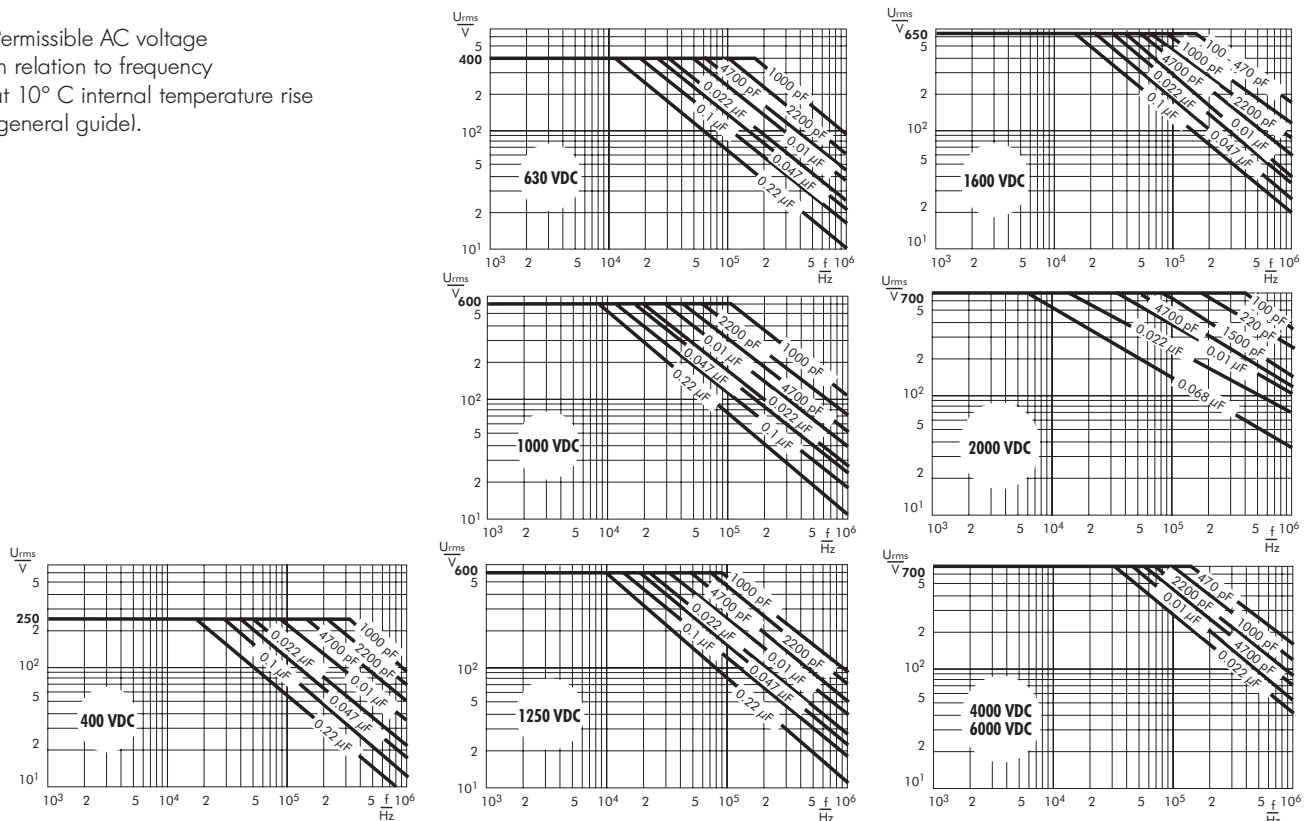
\* AC voltages:  $f \leq 1000 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + \text{UDC} \leq U_r$

■ New values

\*\* PCM = Printed circuit module = pin spacing

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

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

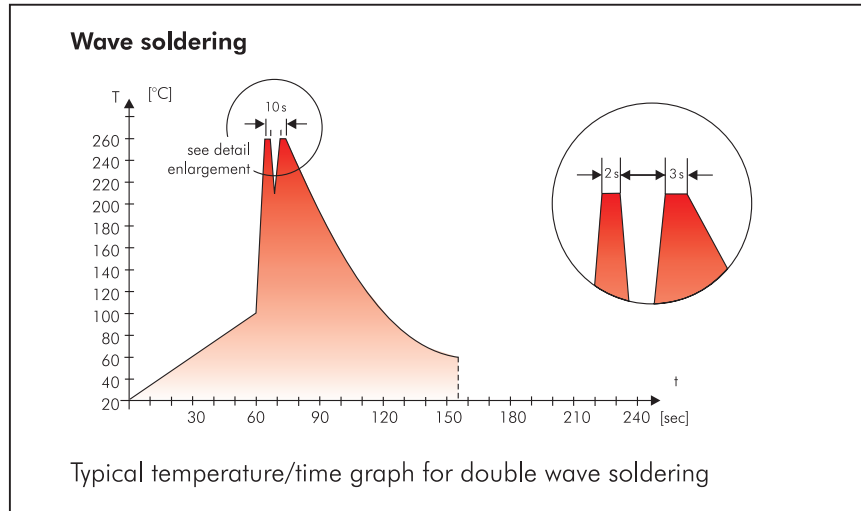
### Single wave soldering

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 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

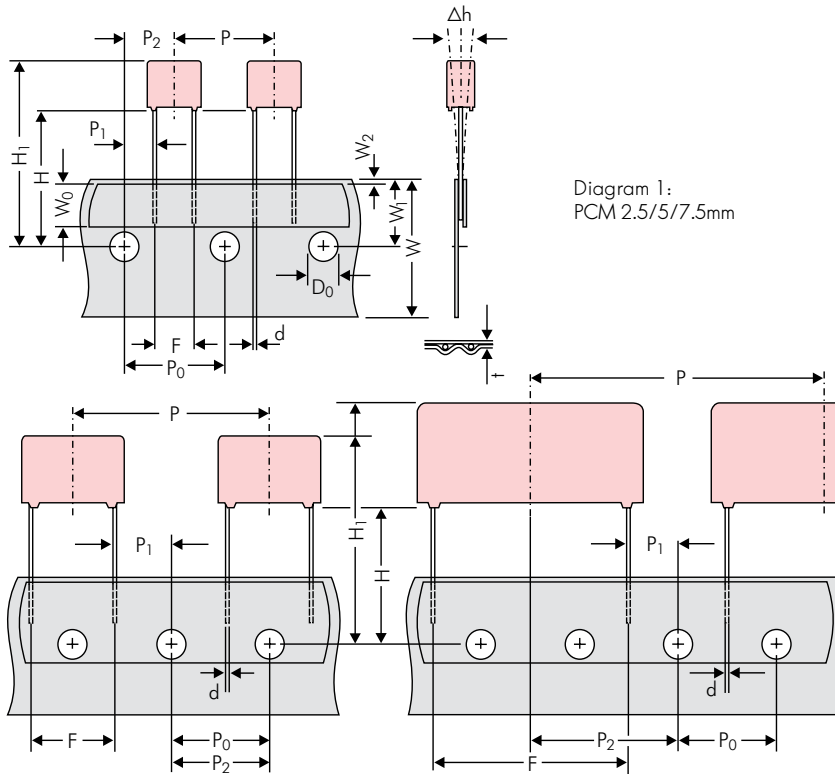


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5\*mm

\*PCM 27.5 tapping possible with two feed holes between components

Designation	Symbol	Dimensions for Radial Taping									
		PCM 2.5 tapping	PCM 5 tapping	PCM 7.5 tapping	PCM 10 tapping*	PCM 15 tapping*	PCM 22.5 tapping	PCM 27.5 tapping			
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 <sub>0</sub>	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 <sub>1</sub>	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 <sub>2</sub>	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 <sub>0</sub>	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 <sub>0</sub>	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 <sub>1</sub>	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 <sub>2</sub>	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 <sub>1</sub>	H+H <sub>component</sub> < H <sub>1</sub> 32.25 max.	H+H <sub>component</sub> < H <sub>1</sub> 32.25 max.	H+H <sub>component</sub> < H <sub>1</sub> 24.5 to 31.5	H+H <sub>component</sub> < H <sub>1</sub> 25.0 to 31.5	H+H <sub>component</sub> < H <sub>1</sub> 26.0 to 37.0	H+H <sub>component</sub> < H <sub>1</sub> 30.0 to 43.0	H+H <sub>component</sub> < H <sub>1</sub> 35.0 to 45.0			
Pin spacing at upper edge of carrier tape	F	2.5 ±0.5	5.0 <sup>+0.8</sup> <sub>-0.2</sub>	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 <sup>+0.06</sup> <sub>-0.05</sub>	0.5 ±0.05 or 0.6 <sup>+0.06</sup> <sub>-0.05</sub>	0.8 <sup>+0.08</sup> <sub>-0.05</sub>	0.8 <sup>+0.08</sup> <sub>-0.05</sub>	0.8 <sup>+0.08</sup> <sub>-0.05</sub>			
Component alignment	Δh	± 2.0 max.	± 2.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.			
Total tape thickness	t	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2	0.6 ±0.2			
Package (see also page 149)	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	B 52 ±2 58 ±2 or 66 ±2	REEL	φ 500 max. φ 25 ±1	B 60 ±2 68 ±2
Unit	see details page 150.										

Dims in mm.

\* Diameter of pins see General Data.

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

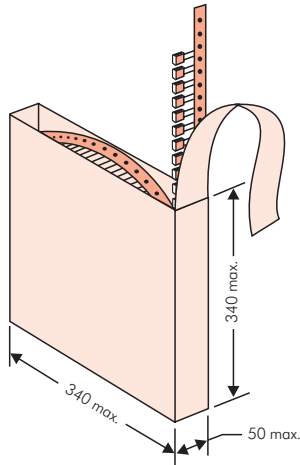
Position of components according to PCM 7.5 (sketch 1). P<sub>0</sub> = 12.7 or 15.0 is possible

Please clarify customer-specific deviations with the manufacturer.

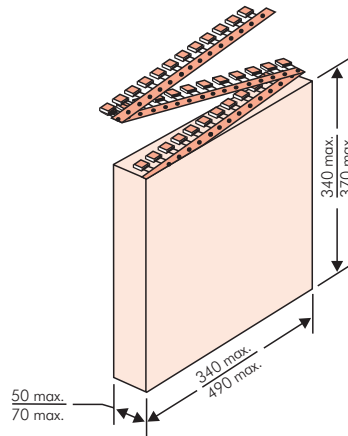


## Types of Tape Packaging of Capacitors for Automatic Radial Insertion

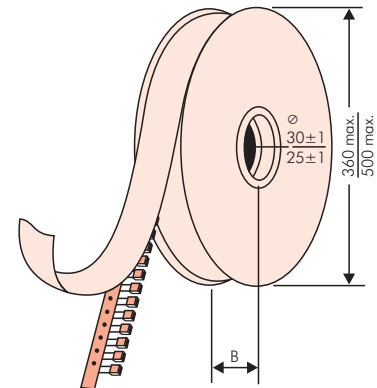
### ■ ROLL Packaging



### ■ 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.

<b>WIMA</b> Best Capacitors Made in Germany		Werk Unna
Supplier-ID: 123456789	<b>RoHS</b> 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.: MKS2C034701C00K88D	
Handling Unit: <b>MKS 2</b>	<b>QTY: 5.000</b>	<b>COO: DE</b>
	<b>MKS 2 0.47 µF 63 VDC 3.5x8.5x7.2 RMS</b>	
<b>1000067326</b>	Standard 10% Loss - Standard	Drühte 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 × 340	490 × 370		
					N	O	F	I	H	J	A	C	B	D
2.5 mm	2.5	7	4.6	<b>0B</b>	5000		2200	2500				2800		
	3	7.5	4.6	<b>0C</b>	5000		2000	2300				2300		
	3.8	8.5	4.6	<b>0D</b>	5000		1500	1800				1800		
	4.6	9	4.6	<b>0E</b>	5000		1200	1500				1500		
	5.5	10	4.6	<b>0F</b>	5000		900	1200				1200		
5 mm	2.5	6.5	7.2	<b>1A</b>	5000		2200	2500				2800		
	3	7.5	7.2	<b>1B</b>	5000		2000	2300				2300		
	3.5	8.5	7.2	<b>1C</b>	5000		1600	2000				2000		
	4.5	6	7.2	<b>1D</b>	6000		1300	1500				1500		
	4.5	9.5	7.2	<b>1E</b>	4000		1300	1500				1500		
	5	10	7.2	<b>1F</b>	3500		1100	1400				1400		
	5.5	7	7.2	<b>1G</b>	4000		1000	1200				1200		
	5.5	11.5	7.2	<b>1H</b>	2500		1000	1200				1200		
	6.5	8	7.2	<b>1I</b>	2500		800	1000				1000		
	7.2	8.5	7.2	<b>1J</b>	2500		700	1000				1000		
	7.2	13	7.2	<b>1K</b>	2000		700	950				1000		
	8.5	10	7.2	<b>1L</b>	2000		600	800				800		
	8.5	14	7.2	<b>1M</b>	1500		600	800				800		
11	16	7.2	<b>1N</b>	1000		500	600				400			
7.5 mm	2.5	7	10	<b>2A</b>	5000			2500	4400		2500			
	3	8.5	10	<b>2B</b>	5000			2200	4300		2300		4150	
	4	9	10	<b>2C</b>	4000			1700	3200		1700		3100	
	4.5	9.5	10.3	<b>2D</b>	3500			1500	2900		1400		2700	
	5	10.5	10.3	<b>2E</b>	3000			1300	2500		1300			
	5.7	12.5	10.3	<b>2F</b>	2000			1000	2200		1100			
	7.2	12.5	10.3	<b>2G</b>	1500			900	1800		1000			
10 mm	3	9	13	<b>3A</b>	3000			1100	2200				1900	
	4	8.5	13.5	<b>FA</b>	3000			900	1600				1450	
	4	9	13	<b>3C</b>	3000			900	1600				1450	
	4	9.5	13	<b>3D</b>	3000			900	1600				1400	
	5	10	13.5	<b>FB</b>	2000			700	1300				1200	
	5	11	13	<b>3F</b>	3000			700	1300				1200	
	6	12	13	<b>3G</b>	2400			550	1100				1000	
	6	12.5	13	<b>3H</b>	2400			550	1100				1000	
8	12	13	<b>3I</b>	2000			400	800				740		
15 mm	5	11	18	<b>4B</b>	2400			600	1200				1150	
	5	13	19	<b>FC</b>	1000			600	1200				1200	
	6	12.5	18	<b>4C</b>	2000			500	1000				1000	
	6	14	19	<b>FD</b>	1000			500	1000				1000	
	7	14	18	<b>4D</b>	1600			450	900				850	
	7	15	19	<b>FE</b>	1000			450	900				850	
	8	15	18	<b>4F</b>	1200			400	800				740	
	8	17	19	<b>FF</b>	500			400	800				740	
	9	14	18	<b>4H</b>	1200			350	700				650	
	9	16	18	<b>4J</b>	900			350	700				650	
	10	18	19	<b>FG</b>	500			300	650				590	
11	14	18	<b>4M</b>	1000			300	600				540		
22.5 mm	5	14	26.5	<b>5A</b>	1200				800				770	
	6	15	26.5	<b>5B</b>	1000				700				640	
	7	16.5	26.5	<b>5D</b>	760				600				550	
	8	20	28	<b>FH</b>	500				500				480	
	8.5	18.5	26.5	<b>5F</b>	500				480				450	
	10	22	28	<b>FI</b>	570*				420				380	
	10.5	19	26.5	<b>5G</b>	594*				400				360	
	10.5	20.5	26.5	<b>5H</b>	594*				400				360	
	11	21	26.5	<b>5I</b>	561*				380				350	
	12	24	28	<b>FJ</b>	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	H16.5	H18.5	ø 360		ø 500		340 × 340		490 × 370
					N	O	F	I	H	J	A	C	B	D	
<b>27.5 mm</b>	9	19	31.5	<b>6A</b>	567*	–	–	–	–	460/340*	–	–	420		
	11	21	31.5	<b>6B</b>	459*	–	–	–	–	380/280*	–	–	350		
	13	24	31.5	<b>6D</b>	378*	–	–	–	–	300	–	–	290		
	13	25	33	<b>FK</b>	405*	–	–	–	–	–	–	–	–		
	15	26	31.5	<b>6F</b>	324*	–	–	–	–	270	–	–	250		
	15	26	33	<b>FL</b>	324*	–	–	–	–	–	–	–	–		
	17	29	31.5	<b>6G</b>	198*	–	–	–	–	–	–	–	–		
	17	34.5	31.5	<b>6I</b>	198*	–	–	–	–	–	–	–	–		
	20	32	33	<b>FM</b>	162*	–	–	–	–	–	–	–	–		
	20	39.5	31.5	<b>6J</b>	162*	–	–	–	–	–	–	–	–		
<b>37.5 mm</b>	9	19	41.5	<b>7A</b>	441*	–	–	–	–	–	–	–	–		
	11	22	41.5	<b>7B</b>	357*	–	–	–	–	–	–	–	–		
	13	24	41.5	<b>7C</b>	294*	–	–	–	–	–	–	–	–		
	15	26	41.5	<b>7D</b>	252*	–	–	–	–	–	–	–	–		
	17	29	41.5	<b>7E</b>	154*	–	–	–	–	–	–	–	–		
	19	32	41.5	<b>7F</b>	140*	–	–	–	–	–	–	–	–		
	20	39.5	41.5	<b>7G</b>	126*	–	–	–	–	–	–	–	–		
	24	45.5	41.5	<b>7H</b>	112*	–	–	–	–	–	–	–	–		
	31	46	41.5	<b>7I</b>	84*	–	–	–	–	–	–	–	–		
	35	50	41.5	<b>7J</b>	35*	–	–	–	–	–	–	–	–		
40	55	41.5	<b>7K</b>	28*	–	–	–	–	–	–	–	–			
<b>48.5 mm</b>	19	31	56	<b>8D</b>	120*	–	–	–	–	–	–	–	–		
	23	34	56	<b>8E</b>	80*	–	–	–	–	–	–	–	–		
	27	37.5	56	<b>8H</b>	84*	–	–	–	–	–	–	–	–		
	33	48	56	<b>8J</b>	25*	–	–	–	–	–	–	–	–		
	37	54	56	<b>8L</b>	25*	–	–	–	–	–	–	–	–		
<b>52.5 mm</b>	25	45	57	<b>9D</b>	70*	–	–	–	–	–	–	–	–		
	30	45	57	<b>9E</b>	60*	–	–	–	–	–	–	–	–		
	35	50	57	<b>9F</b>	25*	–	–	–	–	–	–	–	–		
	45	55	57	<b>9H</b>	20*	–	–	–	–	–	–	–	–		
	45	65	57	<b>9J</b>	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](http://www.wima.com)



# 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			2.5x6.5x7.2		-		20%	bulk	6-2		
<b>Type description:</b>				<b>Rated voltage:</b>		<b>Capacitance:</b>			<b>Size:</b>		<b>Tolerance:</b>		<b>Packing:</b>				
SMD-PET = SMDT				50 VDC = B0		22 pF = 0022			4.8x3.3x3 Size 1812 = KA		±20% = M		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 ...				
SMD-PEN = SMDN				63 VDC = C0		47 pF = 0047			4.8x3.3x4 Size 1812 = KB		±10% = K						
SMD-PPS = SMDI				100 VDC = D0		100 pF = 0100			5.7x5.1x3.5 Size 2220 = QA		±5% = J						
FKP 02 = FKPO				250 VDC = F0		150 pF = 0150			5.7x5.1x4.5 Size 2220 = QB		±2.5% = H						
MKS 02 = MKS0				400 VDC = G0		220 pF = 0220			7.2x6.1x3 Size 2824 = TA		±1% = E						
FKS 2 = FKS2				450 VDC = H0		330 pF = 0330			7.2x6.1x5 Size 2824 = TB		...						
FKP 2 = FKP2				520 VDC = H2		470 pF = 0470			10.2x7.6x5 Size 4030 = VA								
FKS 3 = FKS3				600 VDC = I0		680 pF = 0680			12.7x10.2x6 Size 5040 = XA								
FKP 3 = FKP 3				630 VDC = J0		1000 pF = 1100			15.3x13.7x7 Size 6054 = YA								
MKS 2 = MKS2				700 VDC = K0		1500 pF = 1150			2.5x7x4.6 PCM 2.5 = 0B								
MKP 2 = MKP2				800 VDC = L0		2200 pF = 1220			3x7.5x4.6 PCM 2.5 = 0C								
MKS 4 = MKS4				850 VDC = M0		3300 pF = 1330			2.5x6.5x7.2 PCM 5 = 1A								
MKP 4C = MKPC				900 VDC = N0		4700 pF = 1470			3x7.5x7.2 PCM 5 = 1B								
MKP 4 = MKP4				1000 VDC = O1		6800 pF = 1680			2.5x7x10 PCM 7.5 = 2A								
MKP 10 = MKP1				1100 VDC = P0		0.01 µF = 2100			3x8.5x10 PCM 7.5 = 2B								
FKP 1 = FKP1				1200 VDC = Q0		0.022 µF = 2220			3x9x13 PCM 10 = 3A								
MKP-X2 = MKX2				1250 VDC = R0		0.047 µF = 2470			4x9x13 PCM 10 = 3C								
MKP-X1 R = MKX1				1500 VDC = S0		0.1 µF = 3100			5x11x18 PCM 15 = 4B								
MKP-Y2 = MKY2				1600 VDC = T0		0.22 µF = 3220			6x12.5x18 PCM 15 = 4C								
MP 3-X2 = MPX2				2000 VDC = U0		0.47 µF = 3470			5x14x26.5 PCM 22.5 = 5A								
MP 3-X1 = MPX1				2500 VDC = V0		1 µF = 4100			6x15x26.5 PCM 22.5 = 5B								
MP 3-Y2 = MPY2				3000 VDC = W0		2.2 µF = 4220			9x19x31.5 PCM 27.5 = 6A								
MP 3R-Y2 = MPRY				4000 VDC = X0		4.7 µF = 4470			11x21x31.5 PCM 27.5 = 6B								
MKP 4F = MKPF				6000 VDC = Y0		10 µF = 5100			9x19x41.5 PCM 37.5 = 7A								
Snubber MKP = SNMP				250 VAC = 0W		22 µF = 5220			11x22x41.5 PCM 37.5 = 7B								
Snubber FKP = SNFP				275 VAC = 1W		47 µF = 5470			19x31x56 PCM 48.5 = 8D								
GTO MKP = GTOM				300 VAC = 2W		100 µF = 6100			25x45x57 PCM 52.5 = 9D								
DC-LINK MKP 3 = DCP3				305 VAC = AW		220 µF = 6220			...								
DC-LINK MKP 4 = DCP4				350 VAC = BW		1000 µF = 7100											
DC-LINK MKP 4S = DCP5				440 VAC = 4W		1500 µF = 7150											
DC-LINK MKP 5 = DCP5				500 VAC = 5W		...											
DC-LINK MKP 6 = DCP6				...													
DC-LINK HC = DCHC																	
DC-LINK HY = DCHY																	
									<b>Version code:</b>		<b>Pin length (untaped)</b>						
									Standard = 00		3.5 ±0.5 = C9						
									Version A1 = 1A		6-2 = SD						
									Version A1.1.1 = 1B		16 ±1 = P1						
									Version A2 = 2A		...						
									...		<b>Pin length (taped)</b>						
									...		none = 00						

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.