

Metallized Paper (MP) RFI-Capacitors Class Y2 with Internal Series Connection PCM 15 mm to 27.5 mm

Special Features

- Particularly high reliability against active and passive flammability
- Twice the safety by internal series connection
- High degree of interference suppression due to good attenuation and low ESR
- For temperatures up to +110° C
- According to RoHS 2011/65/EU

Typical Applications

Class Y2 RFI applications to meet EMC regulations

- Capacitors connected to the mains between phase or neutral and earthed casing
- By-passing of the basic or supplementary insulation, pulse peak voltage ≤ 5 kV

Construction

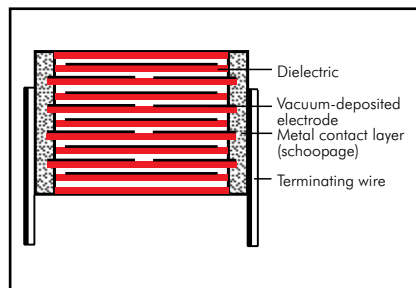
Dielectric:

Paper, epoxy resin impregnated

Capacitor electrodes:

Vacuum-deposited

Internal construction:



Encapsulation:

Self-extinguishing epoxy resin, UL 94 V-0, metal foil

Terminations:

Tinned wire.

Marking:

Marking: Black on Silver.

Electrical Data

Capacitance range:

1000 pF to 0.1 μ F (E12-values on request)

Rated voltage:

300 VAC

Continuous DC voltage* (general guide):

≤ 1250 V

Capacitance tolerances:

$\pm 20\%$

Operating temperature range:

-40° C to $+110^{\circ}$ C

Climatic test category:

40/110/56/B according to IEC

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

$\geq 12 \times 10^3$ M Ω

Measuring voltage: 100 V/1 min.

Dissipation factors:

$\tan \delta \leq 13 \times 10^{-3}$ at 1 kHz and $+20^{\circ}$ C

Test specifications:

In accordance with IEC 60384-14

Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14/3		40032534
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14		E 134915

Maximum pulse rise time:

Capacitance pF/ μ F	Pulse rise time V/ μ sec max. operation
1000 ... 4700	2500
6800 ... 0.015	1850
0.022 ... 0.1	600

for pulses equal to a voltage amplitude with $\sqrt{2} \times 300$ VAC = 425 V according to IEC 60384-14

Test voltage: 3000 VDC, 2 sec.

Reliability:

Operational life > 300 000 hours

Failure rate < 1 fit (0.5 x U_r and 40° C)

Mounting Recommendation

To minimize or avoid shock and/or vibration stresses to terminating wires and solder connections we recommend to fix voluminous resin-potted MP capacitors as from e.g. PCM 22.5 mm in an appropriate way since for constructional reasons they do not sit tight on the board.

* If safety-approved EMI suppression capacitors are operated with a DC voltage being above the specified AC voltage rating the given approvals are no longer valid (IEC 60384-14).

Furthermore the permissible pulse rise time du/dt ($F_{max.}$) will be subject to a reduction according to

$$F_{max.} = F_r \times \sqrt{2} \times UAC / UDC$$

if the DC operating voltage UDC is higher than $\sqrt{2} \times UAC$

Packing

Available taped and reeled up to and including PCM 22.5 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	W	H	300 VAC*	PCM**	Part number
1000 pF	5	13	19	15	MPRY2W1100FC00_____
1500 „	5	13	19	15	MPRY2W1150FC00_____
2200 „	5	13	19	15	MPRY2W1220FC00_____
3300 „	5	13	19	15	MPRY2W1330FC00_____
4700 „	6	14	19	15	MPRY2W1470FD00_____
6800 „	7	15	19	15	MPRY2W1680FE00_____
0.01 µF	8	17	19	15	MPRY2W2100FF00_____
0.015 „	10	18	19	15	MPRY2W2150FG00_____
0.022 „	8	20	28	22.5	MPRY2W2220FH00_____
0.033 „	8	20	28	22.5	MPRY2W2330FH00_____
0.047 „	10	22	28	22.5	MPRY2W2470FI00_____
0.068 „	12	24	28	22.5	MPRY2W2680FJ00_____
0.1 µF	13	25	33	27.5	MPRY2W3100FK00_____

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Upon request with long pins 35-2 mm max.

Dims. in mm.

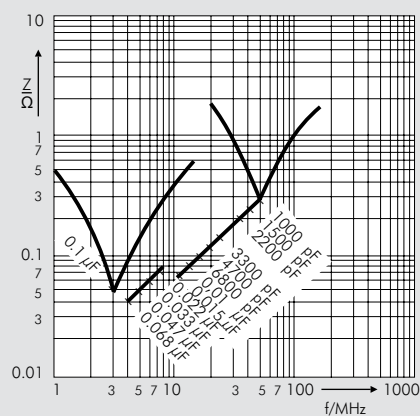
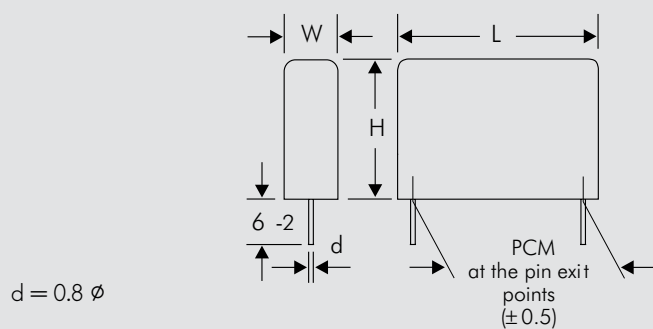
Part number completion:

Tolerance: 20 % = M

Packing: bulk = S

Pin length: 6-2 = SD

Taped version see page 140.



Rights reserved to amend design data without prior notification.

Recommendation for Processing and Application of Through-Hole Capacitors

Soldering Process

Internal temperature of the capacitor must be kept as follows:

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

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

Single wave soldering

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

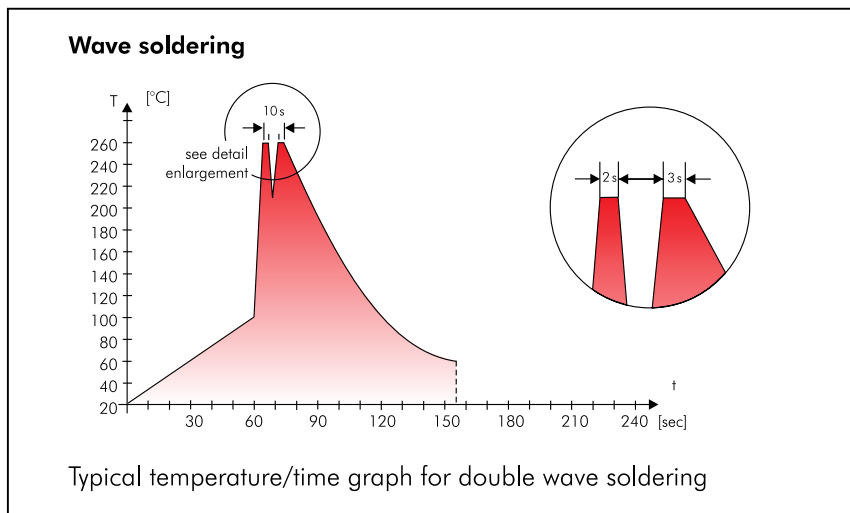
Dwell time: $t < 5\text{ sec}$

Double wave soldering

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

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

Due to different soldering processes and heat requirements the graphs are to be regarded as a recommendation only.



WIMA Quality and Environmental Philosophy

ISO 9001:2008 Certification

ISO 9001:2008 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2008 of our factories by the VDE inspectorate certifies that organisation, equipment and monitoring of quality assurance in our factories correspond to internationally recognized standards.

WIMA WPCS

The WIMA Process Control System (WPCS) is a quality surveillance and optimization system developed by WIMA. WPCS is a major part of the quality-oriented WIMA production. Points of application of WPCS during production process:

- incoming material inspection
- metallization
- film inspection
- schoopage
- pre-healing
- pin attachment
- cast resin preparation/encapsulation
- 100% final inspection
- Testing as per customer requirements

WIMA Environmental Policy

All WIMA capacitors, irrespective of whether through-hole devices or SMD, are made of environmentally friendly materials. Neither during manufacture nor in the product itself any toxic substances are used, e.g.

- | | |
|------------------------|------------|
| – Lead | – PBB/PBDE |
| – PCB | – Arsenic |
| – CFC | – Cadmium |
| – Hydrocarbon chloride | – Mercury |
| – Chromium 6+ | – etc. |

We merely use pure, recyclable materials for packing our components, such as:

- carton
- cardboard
- adhesive tape made of paper
- polystyrene

We almost completely refrain from using packing materials such as:

- foamed polystyrene (Styropor®)
- adhesive tapes made of plastic
- metal clips

RoHS Compliance

According to the RoHS Directive 2011/65/EU certain hazardous substances like e.g. lead, cadmium, mercury must not be used any longer in electronic equipment as of July 1st, 2006. For the sake of the environment WIMA has refrained from using such substances since years already.



WIMA Kondensatoren sind bleifrei
konform RoHS 2011/65/EU

WIMA capacitors are lead free
in accordance with RoHS 2011/65/EU

Tape for lead-free WIMA capacitors

DIN EN ISO 14001:2004

WIMA's environmental management has been established in accordance with the guidelines of DIN EN ISO 14001:2004 to optimize the production processes with regard to energy and resources.

Typical Dimensions for Taping Configuration

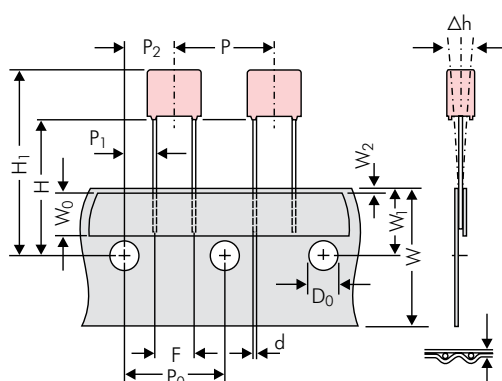


Diagram 1:
PCM 2.5/5/7.5mm

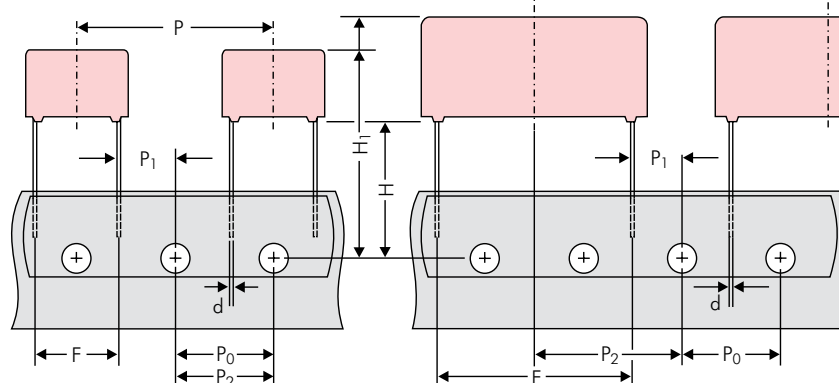


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5*mm

*PCM 27.5 tapping possible with two feed holes between components

Dimensions for Radial Taping								
Designation	Symbol	PCM 2.5 taping	PCM 5 taping	PCM 7.5 taping	PCM 10 taping*	PCM 15 taping*	PCM 22.5 taping	PCM 27.5 taping
Carrier tape width	W	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5
Hold-down tape width	W ₀	6.0 for hot-sealing adhesive tape	6.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape
Hole position	W ₁	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5
Hold-down tape position	W ₂	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.
Feed hole diameter	D ₀	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2
Pitch of component	P	12.7 ±1.0	12.7 ±1.0	12.7 ±1.0	25.4 ±1.0	25.4 ±1.0	38.1 ±1.5	38.1 ±1.5 or 50.8 ±1.5
Feed hole pitch	P ₀	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch
Feed hole centre to pin	P ₁	5.1 ±0.5	3.85 ±0.7	2.6 ±0.7	7.7 ±0.7	5.2 ±0.7	7.8 ±0.7	5.3 ±0.7
Hole centre to component centre	P ₂	6.35 ±1.3	6.35 ±1.3	6.35 ±1.3	12.7 ±1.3	12.7 ±1.3	19.05 ±1.3	19.05 ±1.3
Feed hole centre to bottom edge of the component	H	16.5 ±0.3	16.5 ±0.3	16.5 ±0.5	16.5 ±0.5	16.5 ±0.5	16.5 ±0.5	16.5 ±0.5
		18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5	18.5 ±0.5
Feed hole centre to top edge of the component	H ₁	H+H _{component} < H ₁ 32.25 max.	H+H _{component} < H ₁ 32.25 max.	H+H _{component} < H ₁ 24.5 to 31.5	H+H _{component} < H ₁ 25.0 to 31.5	H+H _{component} < H ₁ 26.0 to 37.0	H+H _{component} < H ₁ 30.0 to 43.0	H+H _{component} < H ₁ 35.0 to 45.0
Pin spacing at upper edge of carrier tape	F	2.5 ±0.5	5.0 ^{+0.8} _{-0.2}	7.5 ±0.8	10.0 ±0.8	15 ±0.8	22.5 ±0.8	27.5 ±0.8
Pin diameter	d	0.4 ±0.05	0.5 ±0.05	*0.5 ±0.05 or 0.6 ^{+0.06} _{-0.05}	*0.5 ±0.05 or 0.6 ^{+0.06} _{-0.05}	0.8 ^{+0.08} _{-0.05}	0.8 ^{+0.08} _{-0.05}	0.8 ^{+0.08} _{-0.05}
Component alignment	Δh	± 2.0 max.	± 2.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.
Total tape thickness	t	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2
Package (see also page 141)		ROLL/AMMO			AMMO			
		REEL ø 360 max. ø 30 ±1	B 52 ±2 B 58 ±2 } depending on comp. dimensions	REEL ø 360 max. ø 30 ±1 B 58 ±2 or 66 ±2 REEL ø 500 max. ø 25 ±1 B 60 ±2 or 68 ±2 } depending on PCM and component dimensions				
Unit		see details page 142.						

Dims in mm.

* Diameter of pins see General Data.

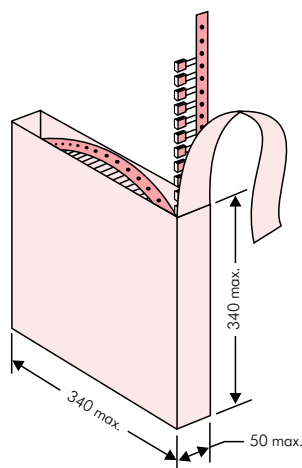
Please clarify customer-specific deviations with the manufacturer.

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

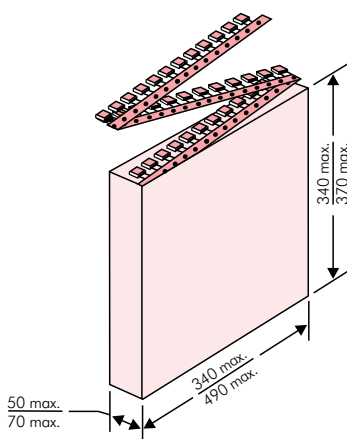
Position of components according to PCM 7.5 (sketch 11). P₀ = 12.7 or 15.0 is possible

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

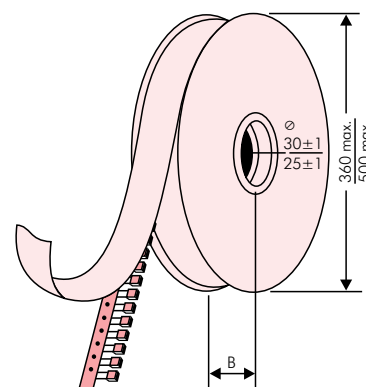
■ ROLL Packaging



■ AMMO Packaging



■ REEL Packaging



BAR CODE (Labelling)

Labelling of package units in plain text and with alphanumerical Bar Code

Scanner decoding of

- WIMA supplier number
- Customer's P/O number
- Customer's part number
- WIMA confirmation number
- WIMA part number
- Lot number
- Date code
- Quantity

In addition part description of

- article
- capacitance value
- rated voltage
- dimensions
- capacitance tolerance
- packing

as well as gross weight and customer's name are indicated in plain text.

WIMA Best Capacitors Made in Germany		Werk Unna	
Supplier-ID: 123456789	RoHS 2011/65/EU	Date Code: 08.10.10	
Purchase Order No. (P/O): Bestellung xyz		Quantity: 5.000	
Customer Part No.: KUNDETEILENUMMER		Customer No.: 0000100002	
WIMA Confirmation No.: 0001004063000100		Gross Weight [g]: 1870	
WIMA Part No.: MKS2C034701C00K88D			
Handling Unit:	MKS 2	QTY: 5.000	COO: DE
MKS 2 0.47 µF 63 VDC 3.5x8.5x7.2 RMS			
Standard 10% Loss - Standard Drähte 6-2			
1000067326 Vorlage Debitur Inland		Week 03/2011	

BARCODE „Code 39“



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

PCM	Size				bulk	pcs. per packing unit									
						ROLL		REEL		AMMO					
	W	H	L	Codes		S	H16.5	H18.5	ø 360	ø 500	340 × 340		490 × 370		
						N	O	F	I	H	J	A	C	B	D
2.5 mm	2.5	7	4.6	0B	5000		2200		2500		–		2800		–
	3	7.5	4.6	0C	5000		2000		2300		–		2300		–
	3.8	8.5	4.6	0D	5000		1500		1800		–		1800		–
	4.6	9	4.6	0E	5000		1200		1500		–		1500		–
	5.5	10	4.6	0F	5000		900		1200		–		1200		–
5 mm	2.5	6.5	7.2	1A	5000		2200		2500		–		2800		–
	3	7.5	7.2	1B	5000		2000		2300		–		2300		–
	3.5	8.5	7.2	1C	5000		1600		2000		–		2000		–
	4.5	6	7.2	1D	6000		1300		1500		–		1500		–
	4.5	9.5	7.2	1E	4000		1300		1500		–		1500		–
	5	10	7.2	1F	3500		1100		1400		–		1400		–
	5.5	7	7.2	1G	4000		1000		1200		–		1200		–
	5.5	11.5	7.2	1H	2500		1000		1200		–		1200		–
	6.5	8	7.2	1I	2500		800		1000		–		1000		–
	7.2	8.5	7.2	1J	2500		700		1000		–		1000		–
	7.2	13	7.2	1K	2000		700		950		–		1000		–
	8.5	10	7.2	1L	2000		600		800		–		800		–
	8.5	14	7.2	1M	1500		600		800		–		800		–
11	16	7.2	1N	1000		500		600		–		400		–	
7.5 mm	2.5	7	10	2A	5000		–		2500		4400		2500		–
	3	8.5	10	2B	5000		–		2200		4300		2300		4150
	4	9	10	2C	4000		–		1700		3200		1700		3100
	4.5	9.5	10.3	2D	3500		–		1500		2900		1400		2800
	5	10.5	10.3	2E	3000		–		1300		2500		1300		–
	5.7	12.5	10.3	2F	2000		–		1000		2200		1100		–
	7.2	12.5	10.3	2G	1500		–		900		1800		1000		–
10 mm	3	9	13	3A	3000		–		1100		2200		–		1900
	4	8.5	13.5	FA	3000		–		900		1600		–		1450
	4	9	13	3C	3000		–		900		1600		–		1450
	4	9.5	13	3D	3000		–		900		1600		–		1400
	5	10	13.5	FB	2000		–		700		1300		–		1200
	5	11	13	3F	3000		–		700		1300		–		1200
	6	12	13	3G	2400		–		550		1100		–		1000
	6	12.5	13	3H	2400		–		550		1100		–		1000
8	12	13	3I	2000		–		400		800		–		740	
15 mm	5	11	18	4B	2400		–		600		1200		–		1150
	5	13	19	FC	1000		–		600		1200		–		1200
	6	12.5	18	4C	2000		–		500		1000		–		1000
	6	14	19	FD	1000		–		500		1000		–		1000
	7	14	18	4D	1600		–		450		900		–		850
	7	15	19	FE	1000		–		450		900		–		850
	8	15	18	4F	1200		–		400		800		–		740
	8	17	19	FF	500		–		400		800		–		740
	9	14	18	4H	1200		–		350		700		–		650
	9	16	18	4J	900		–		350		700		–		650
	10	18	19	FG	500		–		300		650		–		590
11	14	18	4M	1000		–		300		600		–		540	
22.5 mm	5	14	26.5	5A	1200		–		–		800		–		770
	6	15	26.5	5B	1000		–		–		700		–		640
	7	16.5	26.5	5D	760		–		–		600		–		550
	8	20	28	FH	500		–		–		500		–		480
	8.5	18.5	26.5	5F	500		–		–		480		–		450
	10	22	28	FI	540*		–		–		420		–		380
	10.5	19	26.5	5G	680*		–		–		400		–		360
	10.5	20.5	26.5	5H	680*		–		–		400		–		360
	11	21	26.5	5I	680*		–		–		380		–		350
	12	24	28	FJ	450*		–		–		350		–		310

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

■ Moulded versions.

Rights reserved to amend design data without prior notification.

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

PCM	Size				bulk	ROLL		pcs. per packing unit				AMMO			
								REEL							
	W	H	L	Codes	S	N	O	ø 360	ø 500	340 × 340	490 × 370	H16.5	H18.5	H16.5	H18.5
								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*	–	–	–	–	–	–	–	–	–	–
	15	26	31.5	6F	384*	–	–	–	–	270	–	–	–	250	–
	15	26	33	6L	288*	–	–	–	–	–	–	–	–	–	–
	17	29	31.5	6G	176*	–	–	–	–	–	–	–	–	–	–
	17	34.5	31.5	6I	176*	–	–	–	–	–	–	–	–	–	–
	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*	–	–	–	–	–	–	–	–	–	–
	27	15	41.5	7M	100*	–	–	–	–	–	–	–	–	–	–
	31	46	41.5	7I	72*	–	–	–	–	–	–	–	–	–	–
	35	50	41.5	7J	35*	–	–	–	–	–	–	–	–	–	–
	40	55	41.5	7K	28*	–	–	–	–	–	–	–	–	–	–
48.5 mm	19	31	56	8D	50*	–	–	–	–	–	–	–	–	–	–
	23	34	56	8E	72*	–	–	–	–	–	–	–	–	–	–
	27	37.5	56	8H	60*	–	–	–	–	–	–	–	–	–	–
	33	48	56	8J	48*	–	–	–	–	–	–	–	–	–	–
	37	54	56	8L	25*	–	–	–	–	–	–	–	–	–	–
52.5 mm	35	50	57	9F	25*	–	–	–	–	–	–	–	–	–	–
	45	55	57	9H	20*	–	–	–	–	–	–	–	–	–	–
	45	65	57	9J	20*	–	–	–	–	–	–	–	–	–	–

* for 2-inch transport pitches.

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

■ Moulded versions. Rights reserved to amend design data without prior notification.

WIMA Part Number System

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

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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	K	S	2	C	0	2	1	0	0	1	A	0	0	M	S	S	D
MKS 2				63 VDC		0.01 μF				2.5×6.5×7.2		-		20%	bulk	6 -2	
Type description:				Rated voltage:		Capacitance:				Size:				Tolerance:			
SMD-PET = SMDT				50 VDC = B0		22 pF = 0022				4.8×3.3×3 Size 1812 = KA				±20% = M			
SMD-PEN = SMDN				63 VDC = C0		47 pF = 0047				4.8×3.3×4 Size 1812 = KB				±10% = K			
SMD-PPS = SMDI				100 VDC = D0		100 pF = 0100				5.7×5.1×3.5 Size 2220 = QA				±5% = J			
FKP 02 = FKPO				250 VDC = F0		150 pF = 0150				5.7×5.1×4.5 Size 2220 = QB				±2.5% = H			
MKS 02 = MKS0				400 VDC = G0		220 pF = 0220				7.2×6.1×3 Size 2824 = TA				±1% = E			
FKS 2 = FKS2				450 VDC = H0		330 pF = 0330				7.2×6.1×5 Size 2824 = TB				...			
FKP 2 = FKP2				600 VDC = I0		470 pF = 0470				10.2×7.6×5 Size 4030 = VA							
MKS 2 = MKS2				630 VDC = J0		680 pF = 0680				12.7×10.2×6 Size 5040 = XA							
MKP 2 = MKP2				700 VDC = K0		1000 pF = 1100				15.3×13.7×7 Size 6054 = YA							
FKS 3 = FKS3				800 VDC = L0		1500 pF = 1150				2.5×7×4.6 PCM 2.5 = 0B				Packing:			
FKP 3 = FKP3				850 VDC = M0		2200 pF = 1220				3×7.5×4.6 PCM 2.5 = 0C				AMMO H16.5 340×340 = A			
MKS 4 = MKS4				900 VDC = N0		3300 pF = 1330				2.5×6.5×7.2 PCM 5 = 1A				AMMO H16.5 490×370 = B			
MKP 4 = MKP4				1000 VDC = O1		4700 pF = 1470				3×7.5×7.2 PCM 5 = 1B				AMMO H18.5 340×340 = C			
MKP 10 = MKP1				1100 VDC = P0		6800 pF = 1680				2.5×7×10 PCM 7.5 = 2A				AMMO H18.5 490×370 = D			
FKP 4 = FKP4				1200 VDC = Q0		0.01 μF = 2100				3×8.5×10 PCM 7.5 = 2B				REEL H16.5 360 = F			
FKP 1 = FKP1				1250 VDC = R0		0.022 μF = 2220				3×9×13 PCM 10 = 3A				REEL H16.5 500 = H			
MKP-X2 = MKX2				1500 VDC = S0		0.047 μF = 2470				4×9×13 PCM 10 = 3C				REEL H18.5 360 = I			
MKP-X2 R = MKXR				1600 VDC = T0		0.1 μF = 3100				5×11×18 PCM 15 = 4B				REEL H18.5 500 = J			
MKP-X1 R = MKX1				2000 VDC = U0		0.22 μF = 3220				6×12.5×18 PCM 15 = 4C				ROLL H16.5 = N			
MKP-Y2 = MKY2				2500 VDC = V0		0.47 μF = 3470				5×14×26.5 PCM 22.5 = 5A				ROLL H18.5 = O			
MP 3-X2 = MPX2				3000 VDC = W0		1 μF = 4100				6×15×26.5 PCM 22.5 = 5B				BLISTER W12 180 = P			
MP 3-X1 = MPX1				4000 VDC = X0		2.2 μF = 4220				9×19×31.5 PCM 27.5 = 6A				BLISTER W12 330 = Q			
MP 3-Y2 = MPY2				6000 VDC = Y0		4.7 μF = 4470				11×21×31.5 PCM 27.5 = 6B				BLISTER W16 330 = R			
MP 3R-Y2 = MPRY				250 VAC = 0W		10 μF = 5100				9×19×41.5 PCM 37.5 = 7A				BLISTER W24 330 = T			
Snubber MKP = SNMP				275 VAC = 1W		22 μF = 5220				11×22×41.5 PCM 37.5 = 7B				Bulk/TPS Standard = S			
Snubber FKP = SNFP				300 VAC = 2W		47 μF = 5470				19×31×56 PCM 48.5 = 8D				...			
GTO MKP = GTOM				305 VAC = AW		100 μF = 6100				35×50×57 PCM 52.5 = 9F							
DC-LINK MKP 3 = DCP3				400 VAC = 3W		220 μF = 6220				...							
DC-LINK MKP 4 = DCP4				440 VAC = 4W		1000 μF = 7100											
DC-LINK MKP 4S = DCP5				500 VAC = 5W		1500 μF = 7150											
DC-LINK MKP 5 = DCP5				...		...											
DC-LINK MKP 6 = DCP6																	
DC-LINK HC = DCHC																	