

WIMA MP 3-Y2 / 3R-Y2



**Metallized Paper (MP) RFI-Capacitors Class Y2
in PCM 10 mm to 27.5 mm. Capacitances from 1000 pF to 0.1 µF.
Rated Voltages 250 VAC and 300 VAC.**

Special Features

- Particularly high reliability against active and passive flammability
- Excellent self-healing as well as high voltage strength
- Twice the safety by internal series connection (300 VAC)
- 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

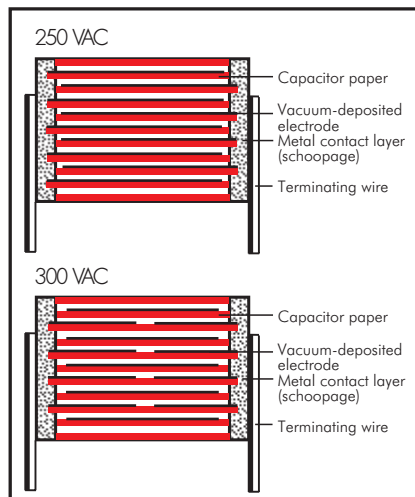
Dielectric:

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 µF (E12-values on request)

Rated voltages:

250 VAC, 300 VAC

Continuous DC voltage* (general guide):

250 VAC: ≤ 1000 V

300 VAC: ≤ 1250 V

Capacitance tolerances: ±20%

Operating temperature range:

-40° C to +110° C

Climatic test category:

250 VAC: 40/110/56/C

300 VAC: 40/110/56/B

in accordance with IEC

Insulation resistance at +20° C:

≥ 12 x 10³ MΩ

Measuring voltage: 100 V/1 min.

Dissipation factors:

tan δ ≤ 13 x 10⁻³ at 1 kHz and +20° C

Test specifications:

in accordance with IEC 60384-14

Approvals:

Authority	Specification	Symbol	Approval-No.
UL/Demko	EN 60384-14		ENEC-02833 (250 VAC) ENEC-02399 (300 VAC)
UL	UL 60384-14 CAN/CSA-E60384-14		E 100438

Maximum pulse rise time 250 VAC:

Capacitance pF/µF	Pulse rise time V/µsec max. operation
1000 ... 4700	2500
6800 ... 0.022	1750

Maximum pulse rise time 300 VAC:

Capacitance pF/µF	Pulse rise time V/µsec max. operation
1000 ... 4700	2500
6800 ... 0.015	1850
0.022 ... 0.1	600

for pulses equal to a voltage amplitude with $\sqrt{2} \times 250 \text{ VAC} = 355 \text{ V}$
with $\sqrt{2} \times 300 \text{ VAC} = 425 \text{ V}$
according to IEC 60384-14

Test voltage: 2400 VDC, 2sec.

Reliability:

Operational life > 300 000 hours

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

Mechanical Tests

Pull test on pins: 10 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

* 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

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

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

Packing

Available taped and reeled.

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	250 VAC*					300 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	8.5	13.5	10	MPY20W1100FA00_____	5	13	19	15	MPLY2W1100FC00_____
1500 „	4	8.5	13.5	10	MPY20W1150FA00_____	5	13	19	15	MPLY2W1150FC00_____
2200 „	4	8.5	13.5	10	MPY20W1220FA00_____	5	13	19	15	MPLY2W1220FC00_____
3300 „	4	8.5	13.5	10	MPY20W1330FA00_____	5	13	19	15	MPLY2W1330FC00_____
4700 „	5	10	13.5	10	MPY20W1470FB00_____	6	14	19	15	MPLY2W1470FD00_____
6800 „	5	13	19	15	MPY20W1680FC00_____	7	15	19	15	MPLY2W1680FE00_____
0.01 µF	5	13	19	15	MPY20W2100FC00_____	8	17	19	15	MPLY2W2100FF00_____
0.015 „	6	14	19	15	MPY20W2150FD00_____	10	18	19	15	MPLY2W2150FG00_____
0.022 „	7	15	19	15	MPY20W2220FE00_____	8	20	28	22.5	MPLY2W2220FH00_____
0.033 „						8	20	28	22.5	MPLY2W2330FH00_____
0.047 „						10	22	28	22.5	MPLY2W2470FI00_____
0.068 „						12	24	28	22.5	MPLY2W2680FJ00_____
0.1 µF						13	25	33	27.5	MPLY2W3100FK00_____

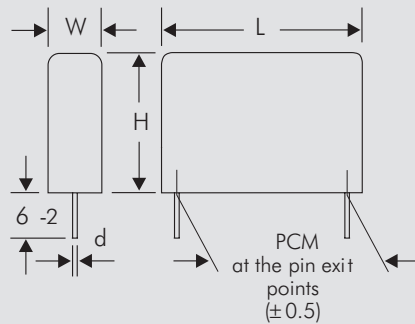
* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Upon request with long pins 35-2 mm max.

Dims. in mm.

d = 0.6 ø if PCM 10
d = 0.8 ø if PCM ≥ 15



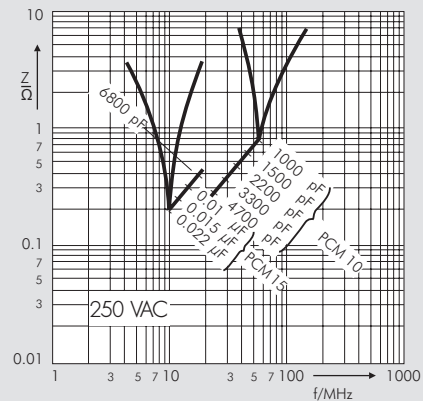
Part number completion:

Tolerance: 20 % = M

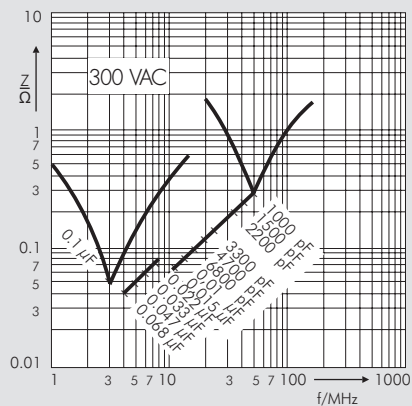
Packing: bulk = S

Pin length: 6-2 = SD

Taped version see page 149.



Impedance change with frequency (general guide)



Impedance change with frequency (general guide)

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

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

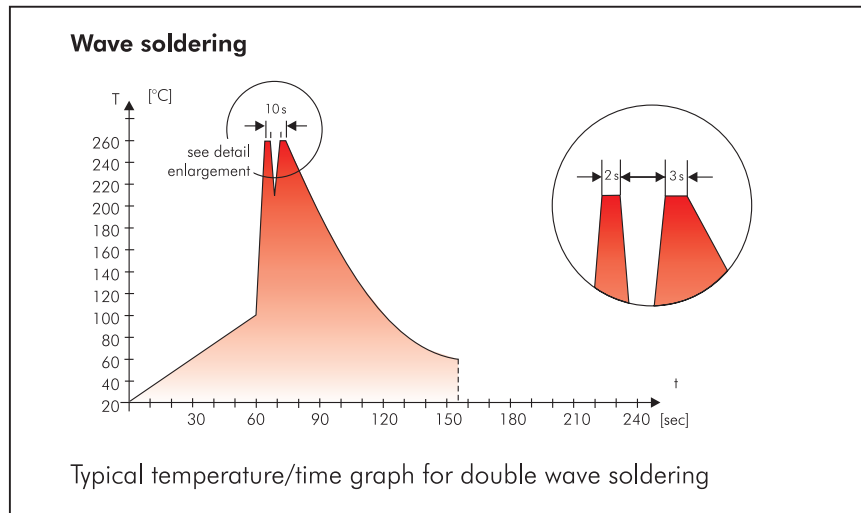
Single wave soldering

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 9001:2015 Certification

ISO 9001:2015 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2015 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:

- adhesive tapes made of plastic
- metal clips

RoHS Compliance

According to the RoHS Directive 2011/65/EU as amended from time to time 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

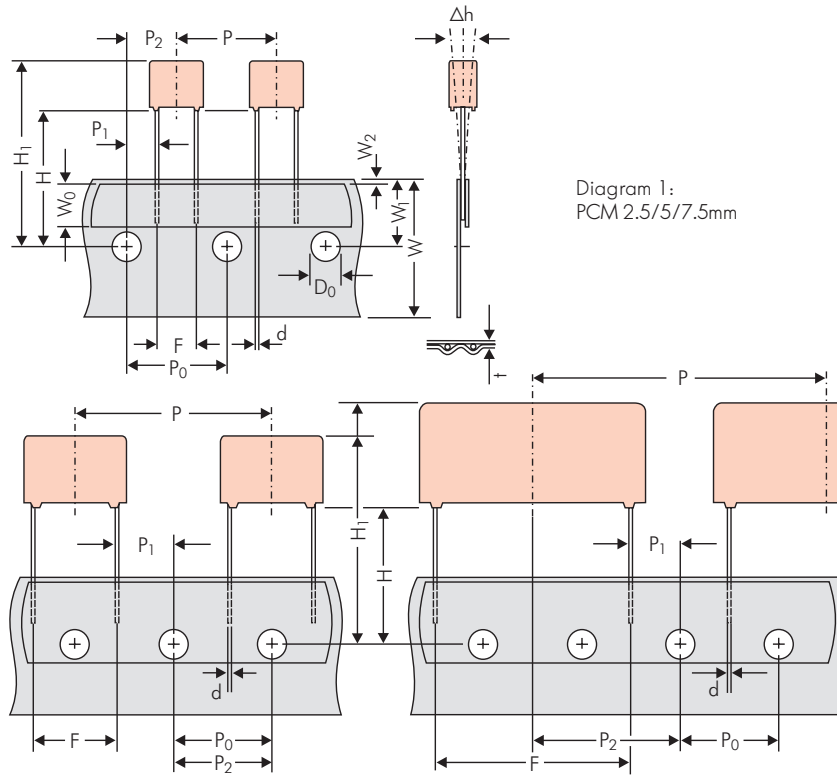


Diagram 1:
PCM 2.5/5/7.5mm

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	0.6 ±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 150)	ROLL/AMMO			AMMO				
	REEL	ϕ 360 max. ϕ 30 ±1	B 52 ±2 B 58 ±2 } depending on comp. dimensions	REEL ϕ 360 max. ϕ 30 ±1	B 52 ±2 B 58 ±2 or B 66 ±2	REEL ϕ 500 max. ϕ 25 ±1	B 54 ±2 B 60 ±2 B 68 ±2 } depending on PCM and component dimensions	
Unit	see details page 151.							

Dims in mm.

* Diameter of pins see General Data.

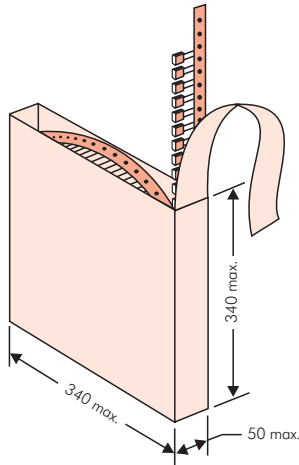
* PCM 10 and PCM 15 can be crimped to PCM 7.5.

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

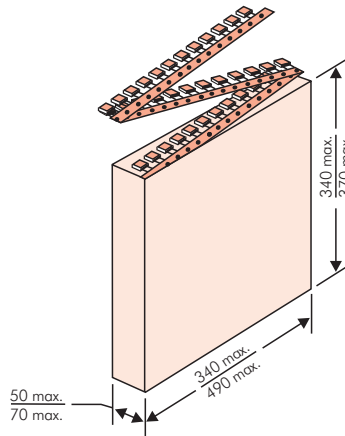
Please clarify customer-specific deviations with the manufacturer.

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

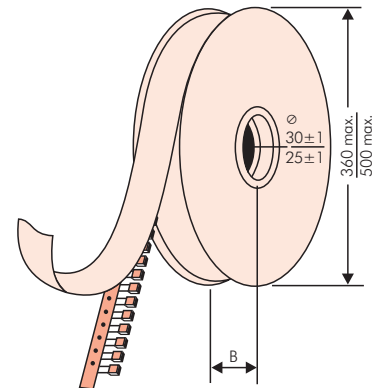
■ ROLL Packaging



■ 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	
	Standard 10% Loss - Standard Dichte 6-2	
1000067326	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	H16.5	H18.5	ø 500	H16.5	H18.5	340 x 340
					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		–		640		–	
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	FK	405*	-	-	-	-	-	-	-	-				
	15	26	31.5	6F	324*	-	-	-	-	270	-	-	250				
	15	26	33	FL	324*	-	-	-	-	-	-	-	-				
	17	29	31.5	6G	198*	-	-	-	-	-	-	-	-				
	17	34.5	31.5	6I	198*	-	-	-	-	-	-	-	-				
	20	32	33	FM	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

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

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ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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