

Metallized Polypropylene (PP) RFI-Capacitors Class Y2 in PCM 10 mm to 37.5 mm. Capacitances from 1000 pF to 1.0 μF. Rated Voltage 300 VAC.

Special Features

- Reliable self-healing
- High degree of interference suppression due to good attenuation and low ESR
- 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

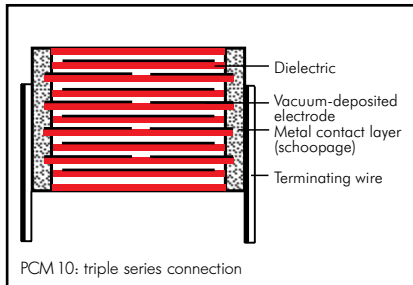
Dielectric:

Polypropylene (PP) film

Capacitor electrodes:

Vacuum-deposited

Internal construction:



Encapsulation:

Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0

Terminations:

Tinned wire.

Marking:

Colour: Red. Marking: Black.

Electrical Data

Capacitance range: 1000 pF to 1.0 μF

Rated voltage: 300 VAC

Continuous DC voltage* (general guide): ≤ 1000 V

Capacitance tolerances: $\pm 20\%$, $\pm 10\%$, $\pm 5\%$

Operating temperature range: -55°C to $+105^\circ\text{C}$

Climatic test category:

55/105/56 in accordance with IEC

Passive flammability class:

B for capacitors with $V > 1750$ mm³

C for capacitors with $V \leq 1750$ mm³

Dissipation factors at $+20^\circ\text{C}$: $\tan \delta$

at f	$C \leq 0.1 \mu\text{F}$	$0.1 \mu\text{F} < C \leq 1.0 \mu\text{F}$
1 kHz	$\leq 18 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
10 kHz	$\leq 20 \times 10^{-4}$	$\leq 60 \times 10^{-4}$
100 kHz	$\leq 100 \times 10^{-4}$	-

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

$C \leq 0.33 \mu\text{F}$: $\geq 1.5 \times 10^4 \text{ M}\Omega$

$C > 0.33 \mu\text{F}$: $\geq 5000 \text{ sec (M}\Omega \times \mu\text{F)}$

Measuring voltage: 100 V/1 min.

Test specifications:

In accordance with IEC 60384-14

Maximum pulse rise time:

100 V/μsec for pulses equal to a voltage

amplitude with $\sqrt{2} \times 300 \text{ VAC} = 425 \text{ V}$

according to IEC 60384-14

Test voltage: 2700 VDC, 2 sec.

Reliability:

Operational life > 300000 hours

Failure rate < 2 fit ($0.5 \times U_r$ and 40°C)

Approvals:

Country	Authority	Specification	Symbol	Approval-No.
Germany	VDE	IEC 60384-14/4		40008997
USA/Canada	UL	UL 60384-14 CAN/CSA-E60384-14		E 134915

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/sec^2 in accordance with IEC 60068-2-29

Packing

Available taped and reeled.

Detailed taping information and graphs at the end of the catalogue.

* 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 $du/dt (I_{F_{max}})$ 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 $\sqrt{2} \times UAC$

For further details and graphs please refer to Technical Information.

Continuation

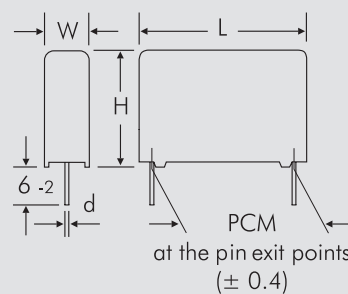
General Data

Capacitance	300 VAC*				PCM**	Part number
	W	H	L			
1000 pF	4	9.5	13		10	MKY22W11003D00_____
1200 "	4	9.5	13		10	MKY22W11203D00_____
1500 "	4	9.5	13		10	MKY22W11503D00_____
1800 "	4	9.5	13		10	MKY22W11803D00_____
2200 "	4	9.5	13		10	MKY22W12203D00_____
2700 "	4	9.5	13		10	MKY22W12703D00_____
3300 "	4	9.5	13		10	MKY22W13303D00_____
3900 "	4	9.5	13		10	MKY22W13903D00_____
4700 "	5	11	13		10	MKY22W14703F00_____
5600 "	5	11	13		10	MKY22W15603F00_____
6800 "	6	12.5	13		10	MKY22W16803H00_____
	5	11	18		15	MKY22W16804B00_____
8200 "	6	12.5	13		10	MKY22W18203H00_____
	5	11	18		15	MKY22W18204B00_____
0.01 µF	8	12	13		10	MKY22W21003I00_____
	5	11	18		15	MKY22W21004B00_____
0.012 "	5	11	18		15	MKY22W21204B00_____
0.015 "	5	11	18		15	MKY22W21504B00_____
0.018 "	5	11	18		15	MKY22W21804B00_____
0.022 "	6	12.5	18		15	MKY22W22204C00_____
0.027 "	6	12.5	18		15	MKY22W22704C00_____
0.033 "	8	15	18		15	MKY22W23304F00_____
0.039 "	8	15	18		15	MKY22W23904F00_____
0.047 "	8	15	18		15	MKY22W24704F00_____
0.056 "	8	15	18		15	MKY22W25604F00_____
0.068 "	9	16	18		15	MKY22W26804J00_____
	6	15	26.5		22.5	MKY22W26805B00_____
0.082 "	7	16.5	26.5		22.5	MKY22W28205D00_____

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.



d = 0.6 ϕ if PCM = 10
d = 0.8 ϕ if PCM = 15 - 22.5

Part number completion:	
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 89

Continuation

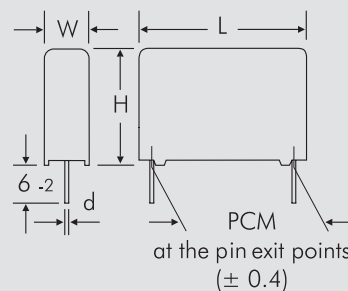
General Data

Capacitance	300 VAC*				PCM**	Part number
	W	H	L			
0.1 μ F	7	16.5	26.5		22.5	MKY22W31005D00_____
0.12 "	8.5	18.5	26.5		22.5	MKY22W31205F00_____
0.15 "	8.5	18.5	26.5		22.5	MKY22W31505F00_____
	9	19	31.5		27.5	MKY22W31506A00_____
0.18 "	10.5	19	26.5		22.5	MKY22W31805G00_____
	9	19	31.5		27.5	MKY22W31806A00_____
0.22 "	11	21	26.5		22.5	MKY22W32205I00_____
	9	19	31.5		27.5	MKY22W32206A00_____
0.27 "	11	21	31.5		27.5	MKY22W32706B00_____
0.33 "	11	21	31.5		27.5	MKY22W33306B00_____
	13	24	41.5		37.5	MKY22W33307C00_____
0.39 "	13	24	31.5		27.5	MKY22W33906D00_____
	13	24	41.5		37.5	MKY22W33907C00_____
0.47 "	15	26	31.5		27.5	MKY22W34706F00_____
	13	24	41.5		37.5	MKY22W34707C00_____
0.56 "	15	26	31.5		27.5	MKY22W35606F00_____
	13	24	41.5		37.5	MKY22W35607C00_____
	15	26	41.5		37.5	MKY22W35607D00_____
0.68 "	17	29	31.5		27.5	MKY22W36806G00_____
	15	26	41.5		37.5	MKY22W36807D00_____
	17	29	41.5		37.5	MKY22W36807E00_____
0.82 "	17	34.5	31.5		27.5	MKY22W38206I00_____
	17	29	41.5		37.5	MKY22W38207E00_____
	19	32	41.5		37.5	MKY22W38207F00_____
1.0 μ F	20	39.5	31.5		27.5	MKY22W41006J00_____
	17	29	41.5		37.5	MKY22W41007E00_____
	20	39.5	41.5		37.5	MKY22W41007G00_____

* f = 50/60 Hz

** PCM = Printed circuit module = pin spacing

Dims. in mm.



d = 0.8 ϕ if PCM \leq 27.5
d = 1.0 ϕ if PCM = 37.5

Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 148.	

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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

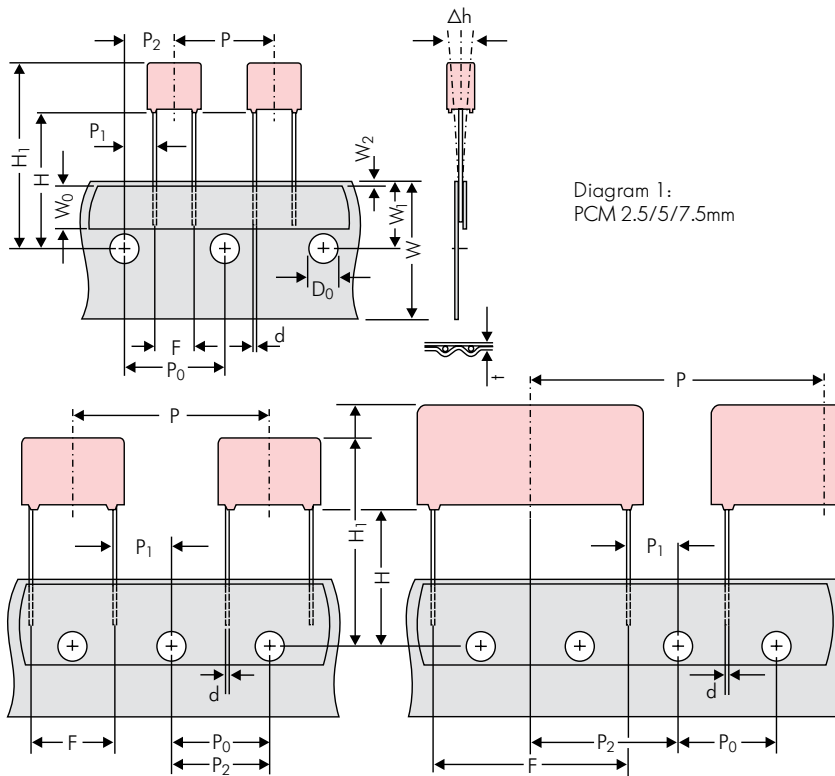


Diagram 2: PCM 10/15 mm

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 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 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.

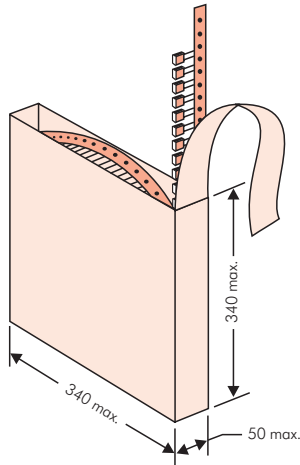
* PCM 10 and PCM 15 can be crimped to PCM 7.5.

Position of components according to PCM 7.5 (sketch 1). P₀ = 12.7 or 15.0 is possible

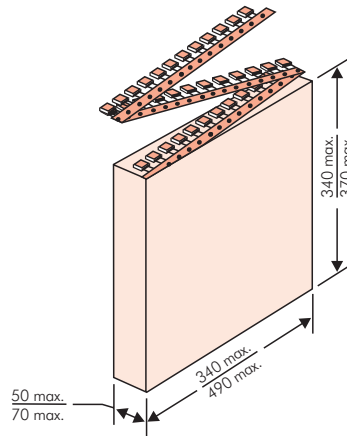
Please clarify customer-specific deviations with the manufacturer.

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

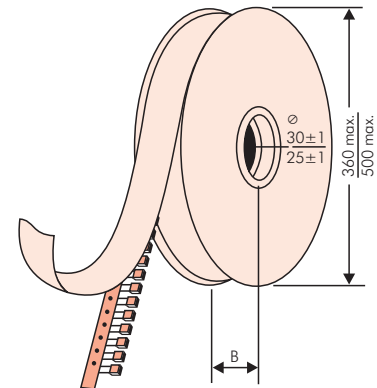
■ ROLL Packaging



■ 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.: MKS2C034701C00K88D		
Handling Unit: MKS 2	QTY: 5.000	COO: DE	
	MKS 2 0.47 µF 63 VDC 3.5x8.5x7.2 RMS		
1000067326	Standard 10% Loss - Standard	Drühte 6-2	Week 03/2011
	Vorlage Debitor Inland		

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			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.

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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 × 340		490 × 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.

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