WIMA FKP 2



Polypropylene (PP) Film and Foil **Capacitors for Pulse Applications** in PCM 5 mm

Special Features

- Pulse duty construction
- Close tolerances up to ±2.5 % (±1 % on request)
- Very low dissipation factor
- Negative capacitance change versus temperature
- Very low dielectric absorption
- According to RoHS 2002/95/EC

Typical Applications

For high frequency applications e.g.

- Sample and hold
- Timing
- LC-Filtering
- Oscillating circuits
- Audio equipment

Construction

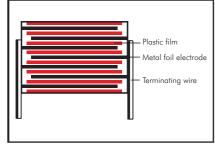
Dielectric:

Polypropylene (PP) film

Capacitor electrodes:

Metal foil

Internal construction:



Encapsulation:

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

Terminations:

Tinned wire.

Marking:

Colour: Red. Marking: Black. Epoxy resin seal: Yellow

Electrical Data

Capacitance range:

33 pF to 0.033 μ F (E12-values on request)

Rated voltages:

63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 800 VDC, 1000 VDC

Capacitance tolerances:

 $\pm 10\%$, $\pm 5\%$, $\pm 2.5\%$ ($\pm 1\%$ available subject to special enquiry)

Operating temperature range:

-55° C to +100° C

Test specifications:

In accordance with IEC 60384-13 and EN 131800

Climatic test category:

55/100/56 in accordance with IEC

Insulation resistance at +20° C:

 $\geq 5 \times 10^5 M\Omega$

(mean value: $1 \times 10^6 M\Omega$)

Measuring voltage:

 $\begin{array}{lll} U_r \! = & 63 \text{ V: } U_{test} \! = & 50 \text{ V/1 min.} \\ U_r \! \geqslant & 100 \text{ V: } U_{test} \! = & 100 \text{ V/1 min.} \end{array}$

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

Test voltage: 2 U_r, 2 sec. Maximum pulse rise time:

1000 V/µsec for pulses equal to the

rated voltage

Dielectric absorption:

0.05%

Temperature coefficient:

-200 x 10⁻⁶/° C (typical)

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 < 5 fit (0.5 x U, and 40° C)

at f	C ≤ 1000 pF	1000 pF < C ≤ 4700 pF	C > 4700 pF
1 kHz	≤ 3 x 10-4	≤ 4 x 10-4	≤ 4 x 10-4
10 kHz 100 kHz	≤ 3 x 10 ⁻⁴ ≤ 4 x 10 ⁻⁴	≤ 4 x 10 ⁻⁴ ≤ 5 x 10 ⁻⁴	≤ 4 x 10 ⁻⁴
1 MHz	≤ 10 x 10 ⁻⁴	- ~ 5 × 10	_

Mechanical Tests

Pull test on leads:

10 N in direction of leads 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:

 $4000 \text{ bumps at } 390 \text{ m/sec}^2 \text{ in}$ accordance with IEC 60068-2-29

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.

WIMA FKP 2



Continuation

General Data

Сарас-	63	VDC/		**) VDC	:/63 V	**		VDC.		VAC*			/220 \	**		VDC/	′250 \	**		VDC.	/250 \	**		VDC		VAC*
itance	W	Н	L	PCM	W	Н	L	PCM	W	Н	L	PCM	W	Н	L	PCM	W	Н	L	PCM	W	H	L	PCM	W	Н	L	PCM
33 pF	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5
47 "	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5		5	2.5	6.5	7.2	5	2.5	6.5	7.2	5
68 "	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5
100 pF	2.5	6.5	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5
					2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5	2.5	6.5	7.2	5								
150 "	2.5	6.5	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5
220 "	2.5	6.5		5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5
330 "	2.5	6.5		5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5
470 "	2.5	6.5		5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	5.5	7	7.2	5	5.5	7	7.2	5
680 "	2.5	6.5	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	5.5	7	7.2	5	5.5	7	7.2	5
1000 pF	2.5	6.5	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	5.5	7	7.2	5	6.5	8	7.2	5
1500 "	2.5	6.5		5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	5.5	7	7.2	5	7.2	8.5		5
2200 "	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	4.5	6	7.2	5	5.5	7	7.2	5	6.5	8	7.2	5	8.5	10	7.2	5
3300 "	4.5	6	7.2	5	5.5	7	7.2	5	5.5	7	7.2	5	5.5	7	7.2	5	6.5	8	7.2	5	7.2	8.5		5				
4700 "	4.5	6	7.2	5	5.5	_	7.2	5	6.5	8	7.2	5	6.5	8	7.2	5	6.5	8	7.2	5	8.5	10	7.2	5				
6800 "	4.5	6	7.2	5	5.5	/	7.2	5	6.5	8	7.2	5	7.2	8.5	7.2	5	7.2	8.5	7.2	5								
0.01 µ F	5.5	7	7.2	5	6.5	8	7.2	5	7.2	8.5	1	5	8.5	10	7.2	5	8.5	10	7.2	5								
0.015 "	6.5	8	7.2	5	7.2	8.5		5	8.5	10	7.2	5																
0.022 "	7.2	8.5	7.2	5	8.5	110	7.2	5										1	0 ==	\equiv	ш			111111		ш	H	

* AC voltage: $f \le 1000 \text{ Hz}$; 1.4 x $U_{rms} + UDC \le U_{r}$

** PCM = Printed circuit module = lead spacing.

New values and box sizes.

8.5 10 7.2

E12 values and individual values available from 27 pF up on request.

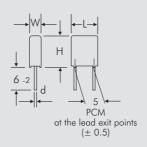
Dims. in mm.

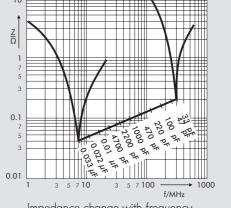
0.033 "

Taped version see page 100.

 $d = 0.5 \ \emptyset$

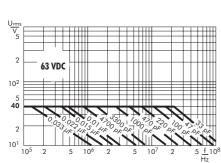
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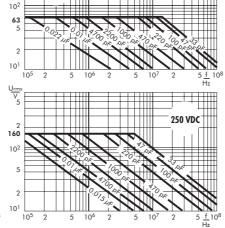


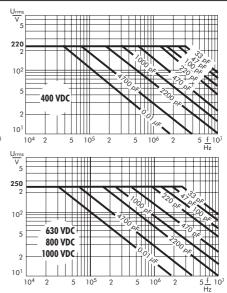


Impedance change with frequency (general guide).

Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general data).







Recommendation for Processing and Application of Through-Hole Capacitors



Soldering Process

A preheating of through-hole WIMA capacitors is allowed for temperatures $T_{\rm max} < 100\,^{\circ}\,\rm C.$

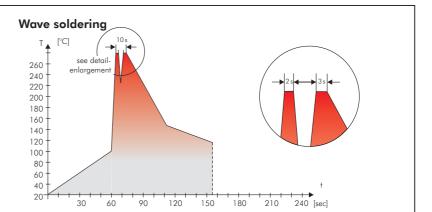
In practice a preheating duration of t < 5 min. has been proven to be best.

Single wave soldering

Soldering bath temperature: T < 260 ° C Immersion time: t < 5 sec

Double wave soldring

Soldering bath temperature: $T < 260^{\circ}$ C Immersion time: $2 \times t < 3$ sec



Temperature/time graph for the maximum permissible solder bath temperature for the wave soldering of through-hole WIMA capacitors

·WIMA Quality and Environmental Philosophy

ISO 9001:2000 Certification

ISO 9001:2000 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2000 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 WPCSI 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
- lead attachment
- cast resin preparation/ encapsulation
- 100% final inspection
- AQL check

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 2002/95/EC 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 refraind from using such substances since years already.



Tape for lead-free WIMA capacitors

ISO 14001:2005

WIMA's environmental management has been established in accordance with the guidelines of ISO 14001. The certification is under preparation and is expected to be accomplished by June 2006.

Typical Dimensions for Taping Configuration



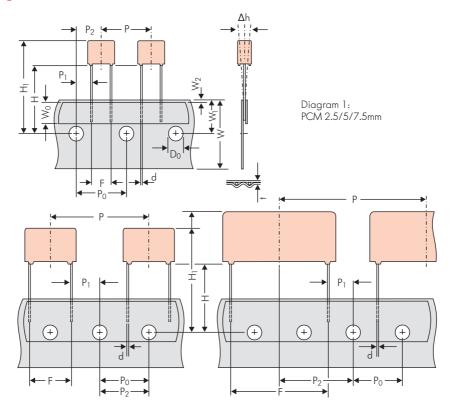


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5*mm
*PCM 27.5 taping possible with two feed holes between components

		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								
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.							
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	Р	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 pit error max. 1.0 mm/20 pi						
Feed hole centre to lead	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	Н▲	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						
edge of the component	''-	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						
Lead 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						
Lead diameter	d	0.4 ±0.05	0.5 ±0.05	*0.5 ±0.05 or 0.7 ^{+0.07} _{-0.05}	*0.5 ±0.05 or 0.7 ^{+0.07} _{-0.05}	0.8 +0.08 -0.05	0.8 +0.08 -0.05	*0.8 +0.08 or 1.0 +0.1 -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						
		ROLL//	AMMO			AMMO								
Package (see also page 101)	A	REEL Ø 360 max. Ø 30 ±1	B $\begin{array}{c} 52\pm2\\ 58\pm2 \end{array} \Biggr\}$ depending on comp. dimensions		REEL \$\tilde{g}\$ 360 max. B 52 \pm 2 8 58 \pm 2 66 \pm 2									
Unit			see details page 103.											

 $^{{\}color{red} \blacktriangle}$ Please give "H" dimensions and desired packaging type when ordering.

 $^\circ$ PCM 10 and PCM 15 can be crimped to PCM 7.5. Position of components according to PCM 7.5 (sketch 1). $P_0=12.7$ or 15.0 is possible

Dims in mm.

Please clarify customer-specific deviations with the manufacturer.

Diameter of leads see General Data.