

Special Features

- ~ High volume/capacitance ratio
- ~ Self-healing
- ~ Constant capacitance value versus temperature (similar to the obsolete Polycarbonate)
- ~ Low dissipation factor
- ~ According to RoHS 2002/95/EC

Typical Applications

For general DC-applications requiring a high capacitance stability versus temperature e.g.

- ~ Automotive electronics
- ~ Lighting

Construction

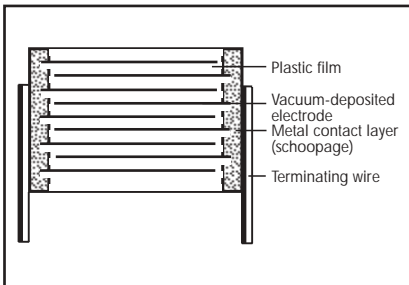
Dielectric:

Mixed film

Capacitor electrodes:

Vacuum-deposited

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: Red

Electrical Data

Capacitance range:

0.01 mF to 22 mF (E12-values on request)

Rated voltages:

63 VDC, 100 VDC, 250 VDC, 400 VDC

Capacitance tolerances:

± 20%, ± 10%, ± 5%

Operating temperature range:

-55+ C to +100+ C

Climatic test category:

55/100/56 in accordance with IEC

Insulation resistance at +20+ C:

C ! 0.33 mF: & 3 x 10⁴ M,
(mean value: 1 x 10⁵ M,)

C) 0.33 mF: & 10 000 sec (M, x mF)
(mean value: 40 000 sec)

Measuring voltage:

U_r = 63 V: U_{test} = 50 V/1 min.

U_r & 100 V: U_{test} = 100 V/1 min.

Test voltage:

1.6 U_r, 2 sec.

Dissipation factors at +20) C: tan d

at f	C ! 0.1 mF	0.1 mF < C ! 1.0 mF	C > 1.0 mF
1 kHz	! 5 x 10 ⁻³	! 5 x 10 ⁻³	! 5 x 10 ⁻³
10 kHz	! 8 x 10 ⁻³	! 9 x 10 ⁻³	-
100 kHz	! 11 x 10 ⁻³	-	-

Maximum pulse rise time:

Capacitance mF	Pulse rise time V/msec max. operating/test			
	63 VDC	100 VDC	250 VDC	400 VDC
0.01 ... 0.022	30/300	30/300	35/350	38/380
0.033 ... 0.068	15/150	15/150	20/200	25/250
0.1 ... 0.22	10/100	12/120	15/150	15/150
0.33 ... 0.68	9/90	9/90	10/100	10/100
1.0 ... 2.2	6/60	5/50	6/60	9/90
3.3 ... 6.8	3/30	3/30	6/60	7/70
10 ... 22	2.5/25	2.5/25	3/30	6/60

for pulses equal to the rated voltage

Mechanical Tests

Pull test on leads:

d ! 0.8 ø: 10 N in direction of leads

d > 0.8 ø: 20 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

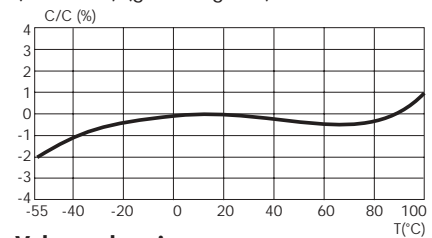
IEC 60068-2-13

Bump test:

4000 bumps at 390 m/sec²

in accordance with IEC 60068-2-29

Capacitance change versus temperature (f = 1 kHz) (general guide)



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 (2 fit (0.5 x U_r and 40) C)

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.

General Data

Capacitance	63 VDC/40 VAC				100 VDC/63 VAC				250 VDC/160 VAC				400 VDC/200 VAC			
	W	H	L	PCM	W	H	L	PCM	W	H	L	PCM	W	H	L	PCM
0.01 nF	3	8.5	10	7.5	3	8.5	10	7.5	3	8.5	10	7.5	3	8.5	10	7.5
	4	9	13	10	4	9	13	10	4	9	13	10	4	9	13	10
0.015 "	3	8.5	10	7.5	3	8.5	10	7.5	3	8.5	10	7.5	3	8.5	10	7.5
	4	9	13	10	4	9	13	10	4	9	13	10	4	9	13	10
0.022 "	3	8.5	10	7.5	3	8.5	10	7.5	3	8.5	10	7.5	4	9	10	7.5
	4	9	13	10	4	9	13	10	4	9	13	10	4	9	13	10
0.033 "	3	8.5	10	7.5	3	8.5	10	7.5	3	8.5	10	7.5	4.5	9.5	10.3	7.5
	4	9	13	10	4	9	13	10	4	9	13	10	4	9	13	10
0.047 "	4	9	10	7.5	4	9	10	7.5	4	9	10	7.5	5	10.5	10.3	7.5
	4	9	13	10	4	9	13	10	4	9	13	10	5	11	13	10
0.068 "	4	9	10	7.5	4	9	10	7.5	4	9	10	7.5	5	11	13	10
	4	9	13	10	4	9	13	10	4	9	13	10	5	11	18	15
0.1 nF	4.5	9.5	10.3	7.5	4.5	9.5	10.3	7.5	4.5	9.5	10.3	7.5	6	12	13	10
	5	11	13	10	5	11	13	10	5	11	13	10	5	11	18	15
0.15 "	5	11	18	15	5	11	18	15	5	11	18	15	6	12.5	18	15
	5	10.5	10.3	7.5	5	10.5	10.3	7.5	5	10.5	10.3	7.5	6	15	26.5	22.5
0.22 "	5	11	13	10	5	11	13	10	5	11	13	10	6	15	26.5	22.5
	5	11	18	15	5	11	18	15	5	11	18	15	6	15	26.5	22.5
0.33 "	6	12	13	10	6	12	13	10	6	12	13	10	7	14	18	15
	5	11	18	15	5	11	18	15	5	11	18	15	6	15	26.5	22.5
0.47 "	6	12.5	18	15	6	12.5	18	15	6	12.5	18	15	8	15	18	15
	6	15	26.5	22.5	6	15	26.5	22.5	6	15	26.5	22.5	6	15	26.5	22.5
0.68 "	7	14	18	15	7	14	18	15	7	14	18	15	7	16.5	26.5	22.5
	6	15	26.5	22.5	6	15	26.5	22.5	6	15	26.5	22.5	6	15	26.5	22.5
1.0 nF	8	15	18	15	8	15	18	15	8	15	18	15	10.5	19	26.5	22.5
	6	15	26.5	22.5	6	15	26.5	22.5	6	15	26.5	22.5	6	15	26.5	22.5
1.5 "	9	16	18	15	9	16	18	15	9	16	18	15	11	21	26.5	22.5
	7	16.5	26.5	22.5	7	16.5	26.5	22.5	7	16.5	26.5	22.5	11	21	31.5	27.5
2.2 "	10.5	19	26.5	22.5	10.5	19	26.5	22.5	10.5	19	26.5	22.5	13	24	31.5	27.5
	9	19	31.5	27.5	9	19	31.5	27.5	9	19	31.5	27.5	15	26	31.5	27.5
3.3 "	11	21	26.5	22.5	11	21	26.5	22.5	11	21	26.5	22.5	15	26	31.5	27.5
	11	21	31.5	27.5	11	21	31.5	27.5	11	21	31.5	27.5	15	26	31.5	27.5
4.7 "	13	24	31.5	27.5	13	24	31.5	27.5	13	24	31.5	27.5	17	29	31.5	27.5
	15	26	31.5	27.5	15	26	31.5	27.5	15	26	31.5	27.5	17	29	41.5	37.5
6.8 "	17	29	31.5	27.5	17	29	31.5	27.5	17	29	31.5	27.5	19	32	41.5	37.5
	15	26	41.5	37.5	15	26	41.5	37.5	15	26	41.5	37.5	19	32	41.5	37.5
10 nF	19	32	41.5	37.5	19	32	41.5	37.5	19	32	41.5	37.5	24	45.5	41.5	37.5
	20	39.5	41.5	37.5	20	39.5	41.5	37.5	20	39.5	41.5	37.5	24	45.5	41.5	37.5
15 "	24	45.5	41.5	37.5	24	45.5	41.5	37.5	24	45.5	41.5	37.5	24	45.5	41.5	37.5
	24	45.5	41.5	37.5	24	45.5	41.5	37.5	24	45.5	41.5	37.5	24	45.5	41.5	37.5

* AC voltagef = 50 Hz; $1.4 \times U_{rms} + U_{DC}$ U_r

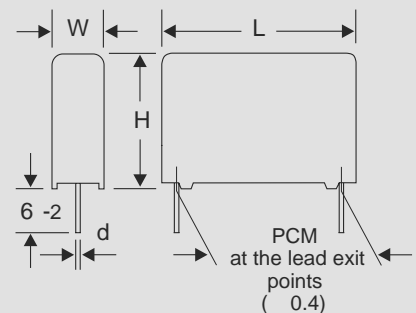
** PCM = Printed circuit module = lead spacing

On ordering please state the required PCM (lead spacing)!
If not specified, smaller PCM will be booked.

Dims. in mm.

Taped version see page 104.

Pd	PCM	W
0.5	7.5	! 3
0.6	7.5	& 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	



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Soldering Process

A preheating of through-hole WIMA capacitors is allowed for temperatures $T_{max} (100^{\circ}C)$.
 In practice a preheating duration of $t (5 \text{ min.})$ has been proven to be best.

Single wave soldering
 Soldering bath temperature: $260^{\circ}C$
 Immersion time: (15 sec)

Double wave soldering
 Soldering bath temperature: $260^{\circ}C$
 Immersion time: $2(x) 8 \text{ sec}$

