R.46

X2 CLASS (EN132400) - MKP Series

METALLIZED POLYPROPYLENE FILM CAPACITOR

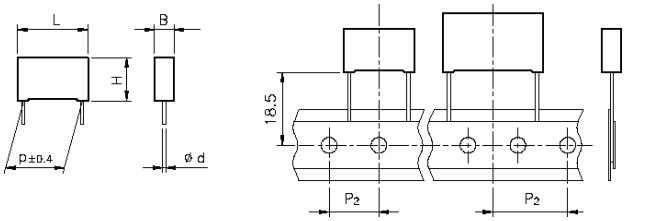
SELF-HEALING PROPERTIES

Typical applications: interference suppression and «across-the-line» applications. Suitable for use in situations where failure of the capacitor would not lead to danger of electric shock.

PRODUCT CODE: **R46**

Loose Taped

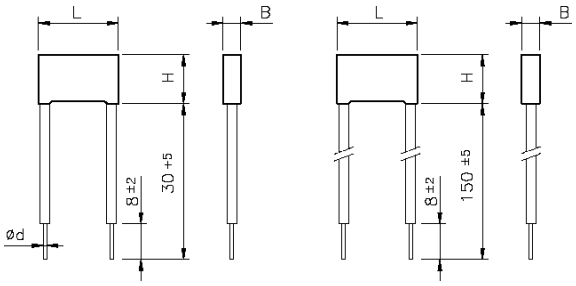
Fig.1 Fig.2



∅ d ±0.05	p ≤ 15	22.5 ≤ p ≤ 27.5	p = 37.5
	0.6	0.8	1

All dimensions are in mm.

Insulated rigid leads Insulated flexible leads 0.5mm²



GENERAL TECHNICAL DATA

Dielectric: polypropylene film.

Plates: metal layer deposited by evaporation under vacuum.

Winding: non-inductive type.

Leads: tinned wire.

Protection: plastic case, epoxy resin filled. Box material is solvent resistant and flame retardant according to UL94 V0.

Marking : Manufacturer's logo, series, capacitance, tolerance, rated voltage, capacitor class, dielectric code, climatic category, passive flammability category, manufacturing date code, approvals, manufacturing plant.

Climatic category: 40/110/56 IEC 60068-1

Operating temperature range: -40 to +110°C

Related documents: IEC 60384-14 2nd edition '93; EN 132400.

ELECTRICAL CHARACTERISTICS

Rated voltage (V_R): 275Vac; 50/60Hz

Capacitance range: 0.01µF to 4.7µF

Capacitance values: E6 series (IEC 60063 Norm).

Capacitance tolerances (measured at 1 kHz)**:**
±10% (K); ±20% (M).

Dissipation factor (DF):
$tg\delta \times 10^{-4}$ at +25°C ±5°C: ≤10 (6)* at 1kHz
* Typical value

Insulation resistance:

Test conditions

Temperature: +25°C±5°C
Voltage charge time: 1 min
Voltage charge: 100 Vdc

Performance

≥ 1×10^5 MΩ (5×10^5 MΩ)* for C ≤ 0.33µF
≥ 30000 s (150000 s)* for C > 0.33µF
* Typical value

Test voltage between terminations (on all pieces)**:**
1500Vac for 1 s + 2200Vdc for 1 s at +25°C±5°C

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

Test conditions 1st

Temperature: +40°C±2°C
Relative humidity (RH): 93% ±2%
Test duration: 56 days

Test conditions 2nd

Temperature: +60°C±2°C
Relative humidity (RH): 95% ±2%
Test duration: 500 hours

Performance

Dielectric strength: no dielectric breakdown or flashover at 4.3 × V_R (d.c.)/1 min
Capacitance change |ΔC/C|: ≤5%
Insulation resistance: ≥50% of initial limit.

Endurance:

Test conditions

Temperature: +110°C±2°C
Test duration: 1000 h
Voltage applied: 1.25 × V_R +1000Vac 0.1 s/h

Performance

Dielectric strength: no dielectric breakdown or flashover at 4.3 × V_R (d.c.)/1 min
Capacitance change |ΔC/C|: ≤10%
Insulation resistance: ≥50% of initial limit.

Resistance to soldering heat:

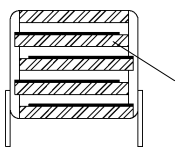
Test conditions

Solder bath temperature: +260°C±5°C
Dipping time (with heat screen):10 s±1 s

Performance

Capacitance change |ΔC/C|: ≤2%

Winding scheme



X2 CLASS (EN132400) - MKP Series

METALLIZED POLYPROPYLENE FILM CAPACITOR

SELF-HEALING PROPERTIES

(All dimensions are in mm)

Rated Cap. (*)	275 Vac				Max dv/dt at 390Vdc	Part Number
	B	H	L	p	(V/ µs)	
0.010 µF	5.0	11.0	13.0	10.0	500	R46.KF. 2100.- -.M1. -
0.015 µF	5.0	11.0	13.0	10.0	500	R46.KF. 2150.- -.M1. -
0.022 µF	5.0	11.0	13.0	10.0	500	R46.KF. 2220.- -.M1. -
0.033 µF	5.0	11.0	13.0	10.0	500	R46.KF. 2330.- -.M1. -
0.047 µF	6.0	12.0	13.0	10.0	500	R46.KF. 2470.- -.M1. -
0.010 µF	5.0	11.0	18.0	15.0	400	R46.KI. 2100.- -.01. -
0.015 µF	5.0	11.0	18.0	15.0	400	R46.KI. 2150.- -.01. -
0.022 µF	5.0	11.0	18.0	15.0	400	R46.KI. 2220.- -.01. -
0.033 µF	5.0	11.0	18.0	15.0	400	R46.KI. 2330.- -.01. -
0.047 µF	5.0	11.0	18.0	15.0	400	R46.KI. 2470.- -.01. -
0.068 µF	5.0	11.0	18.0	15.0	400	R46.KI. 2680.- -.01. -
0.10 µF	5.0	11.0	18.0	15.0	400	R46.KI. 3100.- -.M1.M
0.10 µF	6.0	12.0	18.0	15.0	400	R46.KI. 3100.- -.01. -
0.15 µF	6.0	12.0	18.0	15.0	400	R46.KI. 3150.- -.M2.M
0.15 µF	7.5	13.5	18.0	15.0	400	R46.KI. 3150.- -.M1. -
0.22 µF	7.5	13.5	18.0	15.0	400	R46.KI. 3220.- -.M2.M
0.22 µF	8.5	14.5	18.0	15.0	400	R46.KI. 3220.- -.M1. -
0.33 µF	10.0	16.0	18.0	15.0	400	R46.KI. 3330.- -.M1. -
0.47 µF	11.0	19.0	18.0	15.0	400	R46.KI. 3470.- -.M1. -
0.15 µF	6.0	15.0	26.5	22.5	200	R46.KN. 3150.- -.01. -
0.22 µF	6.0	15.0	26.5	22.5	200	R46.KN. 3220.- -.M1. -
0.33 µF	7.0	16.0	26.5	22.5	200	R46.KN. 3330.- -.M1. -
0.47 µF	8.5	17.0	26.5	22.5	200	R46.KN. 3470.- -.M1. -
0.47 µF	10.0	18.5	26.5	22.5	200	R46.KN. 3470.- -.01. -
0.68 µF	10.0	18.5	26.5	22.5	200	R46.KN. 3680.- -.M2. -
0.68 µF	11.0	20.0	26.5	22.5	200	R46.KN. 3680.- -.M1. -
1.0 µF	13.0	22.0	26.5	22.5	200	R46.KN. 4100.- -.M1. -
0.47 µF	9.0	17.0	32.0	27.5	150	R46.KR. 3470.- -.01. -
0.68 µF	9.0	17.0	32.0	27.5	150	R46.KR. 3680.- -.M1. -
0.68 µF	10.0	20.0	32.0	27.5	150	R46.KR. 3680.- -.01. -
1.0 µF	11.0	20.0	32.0	27.5	150	R46.KR. 4100.- -.M1. -
1.5 µF	13.0	22.0	32.0	27.5	150	R46.KR. 4150.- -.M1. -
1.5 µF	15.0	24.5	32.0	27.5	150	R46.KR. 4150.- -.01. -
2.2 µF	14.0	28.0	32.0	27.5	150	R46.KR. 4220.- -.M1. -
2.2 µF	18.0	33.0	32.0	27.5	150	R46.KR. 4220.- -.01. -
3.3 µF	18.0	33.0	32.0	27.5	150	R46.KR. 4330.- -.M2. -
3.3 µF	22.0	37.0	32.0	27.5	150	R46.KR. 4330.- -.M1. -
4.7 µF	22.0	37.0	32.0	27.5	150	R46.KR. 4470.- -.M1. -
2.2 µF	13.0	24.0	41.5	37.5	100	R46.KW.4220.- -.M1. -
3.3 µF	16.0	28.5	41.5	37.5	100	R46.KW.4330.- -.M1. -
4.7 µF	19.0	32.0	41.5	37.5	100	R46.KW.4470.- -.M1. -

Mechanical version and packaging (Table 1)

Tolerance: K (±10%); M (±20%)

(*) E12 series available up to 5.6µF upon request

Table 1

Standard packaging style	Lead length (mm)	Taping style: P_2 (mm)	Taping style: Fig. (No.)	Taping style: Pitch (mm)	Ordering code (Digit 10 to 11)
AMMO-PACK		12.70	1	10.0/15.0	DQ
AMMO-PACK		19.05	2	22.5	DQ
REEL ⌀355mm		12.70	1	10.0/15.0	CK
REEL ⌀500mm		19.05	2	22.5/27.5	CK
Loose, short leads	4^{+2}				00
Loose, long leads	30^{+5}				50
Loose, insulated rigid leads	30^{+5}				51
Loose, insulated flexible leads	$150^{\pm5}$				52

Note: Ammo-pack is the preferred packaging for taped version.

APPROVALS

(*)	ENEC-IMQ EN132400 CB	Class X2	File No. V4413 File No. IT-1524
	CSA C22.2 N°1 (up to 1µF)	Across-the-line	File No. LR 83890
	UL 1414 (up to 1µF)	Across-the-line	File No.E97797
	UL 1283 (310 Vac)	Electromagnetic Interference Filters	File No.E85238
	CCEE IEC60384-14	Class X2	File No.CH0045034-2000

CSA and UL 1414 for 250Vac only.
Approved according to EN 132400 (IEC 60384-14 2nd edition 1993 plus Amendment A1: 1995).
According to IEC 60065.

(*) ENEC mark has replaced all the following European National marks:

TYPICAL GRAPHS

Z = f (f) (lead length 2 mm). Typical values.