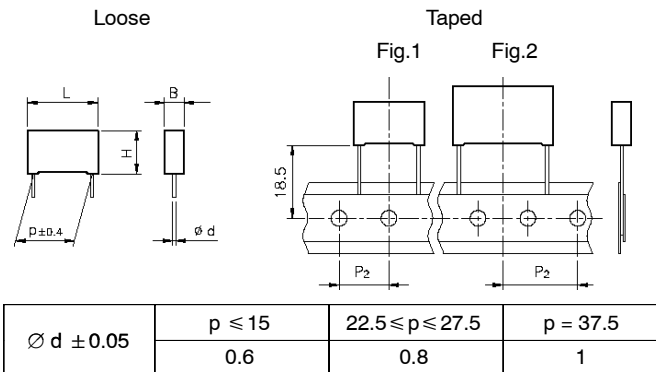


X2 CLASS (EN132400) - MKP Series
METALLIZED POLYPROPYLENE FILM CAPACITOR
 SELF-HEALING PROPERTIES

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



All dimensions are in mm.

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:

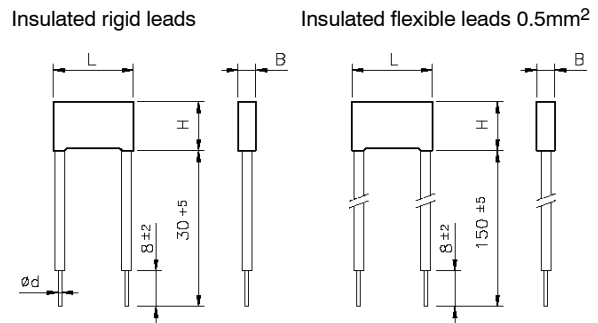
Test conditions

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

Performance

≥ 1 × 10⁵ MΩ (5 × 10⁵ 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:

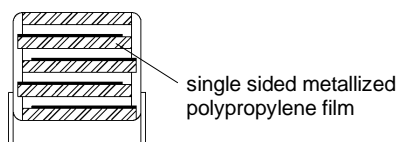
Test conditions

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 (V/μs)	Part Number
	B	H	L	p		
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			Ordering code (Digit 10 to 11)
		P ₂ (mm)	Fig. (No.)	Pitch (mm)	
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 ±5				52

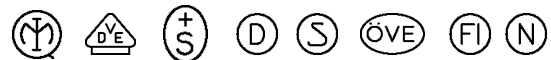
Note: Ammo-pack is the preferred packaging for taped version.

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.

