

Ø d ±0.05	p ≤ 15*	22.5 ≤ p ≤ 27.5
	0.6	0.8

\*Except for box ≥ 10x16x18 having Ø d = 0.8 ± 0.05 mm. 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, thermosetting 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, EN 132400.

**ELECTRICAL CHARACTERISTICS**

- Rated voltage (V<sub>R</sub>):** 310Vac; 50/60Hz
- Capacitance range:** 0.01µF to 2.2µF
- Capacitance values:** E6 series (IEC 60063 Norm).
- Capacitance tolerances (measured at 1 kHz):** ±10% (K); ±20% (M).
- Dissipation factor (DF):** tgδ × 10<sup>-4</sup> at +25°C ±5°C: ≤ 10 (6)\* at 1kHz

**Insulation resistance:**

- Test conditions**
  - Temperature: +25°C ± 5°C
  - Voltage charge time: 1 min
  - Voltage charge: 100 Vdc
- Performance**
  - ≥ 1 × 10<sup>5</sup> MΩ (5 × 10<sup>5</sup> MΩ)\* for C ≤ 0.33µF
  - ≥ 30000 s (150000 s)\* for C > 0.33µF

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

**X1 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.

Class X1 shall be applied for PERMANENTLY CONNECTED APPARATUS.

**Note: PERMANENTLY CONNECTED APPARATUS:** apparatus which is intended for connection to the mains by a connection which cannot be loosened **BY HAND**.

**BY HAND:** operation that does not require the use of any object such a tool, coin, etc.

**PRODUCT CODE: R49**

**Note:** R.49 series has replaced the 1.58 series (available upon request. For new design we suggest the use of the R.49 series.

Pitch (mm)	Box thickness (B) (mm)	Maximum dimensions (mm)		
		B max	H max	L max
10.0	All	B + 0.2	H + 0.1	L + 0.2
15.0	< 7.5	B + 0.2	H + 0.1	L + 0.3
15.0	≥ 7.5	B + 0.2	H + 0.1	L + 0.5
22.5	All	B + 0.2	H + 0.1	L + 0.3
27.5	All	B + 0.2	H + 0.1	L + 0.3

**TEST METHOD AND PERFORMANCE**

**Damp heat, steady state:**

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

- Performance**
  - Dielectric strength: no dielectric breakdown or flashover at 4.3 x V<sub>R</sub> (d.c.)/1 min
  - Capacitance change |ΔC/C|: ≤ 5%
  - Insulation resistance: ≥ 50% of initial limit.

**Endurance:**

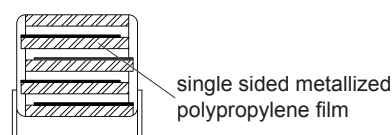
- Test conditions**
  - Temperature: +110°C ± 2°C
  - Test duration: 1000 h
  - Voltage applied: 1.25 x V<sub>R</sub> + 1000Vac 0.1 s/h

- Performance**
  - Dielectric strength: no dielectric breakdown or flashover at 4.3 x V<sub>R</sub> (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**



X1 CLASS (EN132400) - MKP Series  
**METALLIZED POLYPROPYLENE FILM CAPACITOR**  
 SELF-HEALING PROPERTIES  
 PRODUCT CODE: R49

**APPROVALS**

Rated Cap. (*)	310 Vac Std dimensions				Ø d	Max dv/dt at 440Vdc (V/µs)	Part Number
	B	H	L	p			
0.010 µF	5.0	11.0	13.0	10.0	0.6	600	R49AF 2100 -- 01 -
0.015 µF	5.0	11.0	13.0	10.0	0.6	600	R49AF 2150 -- 01 -
0.022 µF	6.0	12.0	13.0	10.0	0.6	600	R49AF 2220 -- 01 -
0.033 µF	6.0	12.0	13.0	10.0	0.6	600	R49AF 2330 -- 01M
0.010 µF	5.0	11.0	18.0	15.0	0.6	500	R49AI 2100 -- 01 -
0.015 µF	5.0	11.0	18.0	15.0	0.6	500	R49AI 2150 -- 01 -
0.022 µF	5.0	11.0	18.0	15.0	0.6	500	R49AI 2220 -- 01 -
0.033 µF	5.0	11.0	18.0	15.0	0.6	500	R49AI 2330 -- 01 -
0.047 µF	6.0	12.0	18.0	15.0	0.6	500	R49AI 2470 -- 01 -
0.068 µF	6.0	12.0	18.0	15.0	0.6	500	R49AI 2680 -- M1M
0.068 µF	7.5	13.5	18.0	15.0	0.6	500	R49AI 2680 -- 01 -
0.10 µF	7.5	13.5	18.0	15.0	0.6	500	R49AI. 3100 -- M1M
0.10 µF	8.5	14.5	18.0	15.0	0.6	500	R49AI 3100 -- 01 -
0.15 µF	10.0	16.0	18.0	15.0	0.8	500	R49AI 3150 -- 01 -
0.10 µF	6.0	15.0	26.5	22.5	0.8	400	R49AN 3100 -- 01 -
0.15 µF	7.0	16.0	26.5	22.5	0.8	400	R49AN 3150 -- 01 -
0.22 µF	8.5	17.0	26.5	22.5	0.8	400	R49AN 3220 -- 01 -
0.33 µF	10.0	18.5	26.5	22.5	0.8	400	R49AN 3330 -- 01 -
0.47 µF	11.0	20.0	26.5	22.5	0.8	400	R49AN 3470 -- 01 -
0.33 µF	9.0	17.0	32.0	27.5	0.8	200	R49AR 3330 -- 01 -
0.47 µF	11.0	20.0	32.0	27.5	0.8	200	R49AR 3470 -- 01 -
0.68 µF	13.0	22.0	32.0	27.5	0.8	200	R49AR 3680 -- 01 -
1.0 µF	14.0	28.0	32.0	27.5	0.8	200	R49AR 4100 -- 01 -
1.5 µF	18.0	33.0	32.0	27.5	0.8	200	R49AR 4150 -- 01 -
2.2 µF	22.0	37.0	32.0	27.5	0.8	200	R49AR 4220 -- 01 -

	IMQ EN 132400	Class X1	File No.CA08.00030
	CSA C22.2 N°1 (up to 1µF)	Across-the-line	File No.LR83890
	UL 1414 (up to 1µF)	Across-the-line	File No.E97797
	UL 1283	Electromagnetic Interference Filters	File No.E85238

CSA and UL 1414 for 250Vac only.  
 Approved according to IEC 60384-14:1993+ A1:1995 (EN132400:1994+A2:1998+A3:1998).  
 According to IEC 60065.

Mechanical version and packaging (Table1) \_\_\_\_\_  
 Tolerance: K (±10%); M (±20%) \_\_\_\_\_

E12 Series available upon request

All dimensions are in mm

Table 1

Standard packaging style	Lead length (mm)	Taping style			Ordering code (Digit 10 to 11)
		P <sub>2</sub> (mm)	Fig. (No.)	Pitch (mm)	
AMMO-PACK		12.70	1	10.0/15.0	DQ
AMMO-PACK		19.05	2	22.5	DQ
REEL Ø500mm		12.70	1	10.0/15.0	CK
REEL Ø500mm		19.05	2	22.5/27.5	CK
Loose, short leads	4 <sup>+2</sup>				00
Loose, long leads	25 <sup>-1/+2</sup>				50
Loose, long leads	30 <sup>+5</sup>				40
Loose, insulated rigid leads	30 <sup>+5</sup>				51
Loose, insulated flexible leads	150 <sup>+5</sup>				52

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