

**Y2 / X1 CLASS (IEC 60384-14) 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 could lead to danger of electric shock.
PRODUCT CODE: R41

Not for use in series with the mains.
See www.kemet.com for more information.

Note: R.41 series has replaced the R73 series (available only upon request). For new design we suggest the use of the R.41 series.

Ø d ±0.05	p = 7.5	p = 10	p = 15	15 < p ≤ 27.5	p = 37.5
	0.5	0.6	0.6 or 0.8*	0.8	1

* See size table.
All dimensions are in mm.

Pitch (mm)	Box thickness (B) (mm)	Maximum dimensions (mm)		
		B max	H max	L max
7.5	All	B +0.1	H +0.1	L +0.2
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
37.5	All	B +0.3	H +0.1	L +0.3

GENERAL TECHNICAL DATA

- Dielectric:** polypropylene film.
- Plates:** metal layer deposited by evaporation under vacuum.
- Winding:** non-inductive type.
- Leads:** Ø ≥ 0.6 tinned wire.
Ø = 0.5 tinned wire, low thermal conductivity.
- 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 60384-14.

ELECTRICAL CHARACTERISTICS

- Rated voltage (V_R):** 300Vac / 1000Vdc; 50/60Hz
- Capacitance range:** 1000pF to 1.0µF
- Capacitance values:** E6 series (IEC 60063 Norm).
- Capacitance tolerances** (measured at 1 kHz):
±10% (K); ±20% (M).
- Dissipation factor (DF):**
tgδ × 10⁻⁴ at +25°C ±5°C: ≤30 (20)* 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):
2500Vac for 1 s + 5000Vdc for 1 s at +25°C ±5°C

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

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

Performance

- Dielectric strength: no dielectric breakdown or flashover at 1500Vac/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: 1.7 × V_R + 1000Vac 0.1 s/h

Performance

- Dielectric strength: no dielectric breakdown or flashover at 1500Vac/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%

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Table 1

Rated Cap.	300 Vac/1000Vdc Std dimensions				Ø d	Max dv/dt at 420Vdc (V/µs)	Part Number
	B	H	L	p			
1000 pF	4.0	9.0	10.0	7.5	0.5	800	R413D 1100 -- 00 -
2200 pF	4.0	9.0	10.0	7.5	0.5	800	R413D 1220 -- 00 -
3300 pF	5.0	10.5	10.0	7.5	0.5	800	R413D 1330 -- 00 -
4700 pF	6.0	12.0	10.5	7.5	0.5	800	R413D 1470 -- 00 -
1000 pF	4.0	9.0	13.0	10.0	0.6	800	R413F 1100 -- 00 -
1500 pF	4.0	9.0	13.0	10.0	0.6	800	R413F 1150 -- 00 -
2200 pF	4.0	9.0	13.0	10.0	0.6	800	R413F 1220 -- 00 -
3300 pF	4.0	9.0	13.0	10.0	0.6	800	R413F 1330 -- M1 -
4700 pF	5.0	11.0	13.0	10.0	0.6	800	R413F 1470 -- M1 -
6800 pF	6.0	12.0	13.0	10.0	0.6	800	R413F 1680 -- 00 -M
3300 pF	5.0	11.0	18.0	15.0	0.6	600	R413I 1330 -- 00 -
4700 pF	5.0	11.0	18.0	15.0	0.6	600	R413I 1470 -- 00 -
6800 pF	5.0	11.0	18.0	15.0	0.6	600	R413I 1680 -- 00 -
0.010 µF	5.0	11.0	18.0	15.0	0.6	600	R413I 2100 -- 00 -
0.015 µF	5.0	11.0	18.0	15.0	0.6	600	R413I 2150 -- M1 -
0.022 µF	6.0	12.0	18.0	15.0	0.6	600	R413I 2220 -- M1 -
0.033 µF	7.5	13.5	18.0	15.0	0.6	600	R413I 2330 -- M1 -
0.047 µF	8.5	14.5	18.0	15.0	0.6	600	R413I 2470 -- M1 -
0.068 µF	11.0	19.0	18.0	15.0	0.8	600	R413I 2680 -- 00 -
0.047 µF	6.0	15.0	26.5	22.5	0.8	500	R413N 2470 -- 00 -
0.068 µF	6.0	15.0	26.5	22.5	0.8	500	R413N 2680 -- M1M -
0.068 µF	7.0	16.0	26.5	22.5	0.8	500	R413N 2680 -- 00 -
0.10 µF	8.5	17.0	26.5	22.5	0.8	500	R413N 3100 -- M1 -
0.15 µF	10.0	18.5	26.5	22.5	0.8	500	R413N 3150 -- M1 -
0.22 µF	13.0	22.0	26.5	22.5	0.8	500	R413N 3220 -- 00 -
0.22 µF	13.0	22.0	32.0	27.5	0.8	400	R413R 3220 -- 00 -
0.33 µF	14.0	28.0	32.0	27.5	0.8	400	R413R 3330 -- 00 -
0.47 µF	18.0	33.0	32.0	27.5	0.8	400	R413R 3470 -- 00 -
0.68 µF	18.0	33.0	32.0	27.5	0.8	400	R413R 3680 -- 00 -
0.47 µF	13.0	24.0	41.5	37.5	1.0	300	R413W 3470 -- 00 -
0.68 µF	16.0	28.5	41.5	37.5	1.0	300	R413W 3680 -- 00 -
1.0 µF	20.0	40.0	41.5	37.5	1.0	300	R413W 4100 -- 00 -

Standard packaging style	Lead length (mm)	Taping style			Ordering code (Digit 10 to 11)
		P ₂ (mm)	Fig. (No.)	Pitch (mm)	
AMMO-PACK		6.35	1	7.5	DQ
AMMO-PACK		12.70	1	10.0/15.0	DQ
AMMO-PACK		19.05	2	22.5	DQ
REEL Ø 355mm		6.35	1	7.5	CK
REEL Ø 500mm		12.70	1	10.0/15.0	CK
REEL Ø 500mm		19.05	2	22.5/27.5	CK
Loose, short leads	4 ⁺²				00
Loose, long leads (p<10mm)	17 ^{+1/-2}				Z3
Loose, long leads (p=10mm)	25 ^{±1}				JY
Loose, long leads (p≥15mm)	25 ^{+2/-1} 30 ⁺⁵				50 40

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

APPROVALS

	ENEC IEC 60384-14	Class Y2 / X1	File No. V4160
	UL 1414 (250Vac- 85°C)	Across-the-line	FileNo.E97797
	CSA - C22.2 No.1 (250Vac- 85°C)	Across-the-line certified for Canada	File No. E 97797
	UL 1283 (300 Vac-110°C)	Electromagnetic Interference Filters	File No. E85238
	CSA - C22.2 No.8 (300 Vac-110°C)	Electromagnetic Interference Filters certified for Canada	File No.E85238
	GB IT 14472	Class Y2 / X1	File CQC03001006820 CQC03001006821 (in progress for pitch 7.5 mm)

Approved according to IEC 60384-14

According to IEC 60065.

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



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

E12 Series available upon request

All dimensions are in mm.

Statements of suitability for certain applications are based on our knowledge of typical operating conditions for such applications, but are not intended to constitute – and we specifically disclaim – any warranty concerning suitability for a specific customer application or use. This Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by us with reference to the use of our products is given gratis, and we assume no obligation or liability for the advice given or results obtained.