

Ø d ±0.05	p ≤ 15	22.5 ≤ p ≤ 27.5	p = 37.5
	0.6 or 0.8*	0.8	1

\*See size table.  
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 60384-14.

**ELECTRICAL CHARACTERISTICS**

**Rated voltage (V<sub>R</sub>):** 275Vac (50/60Hz) / 560 Vdc  
300Vac (50/60Hz) / 630 Vdc

**Capacitance range:** 0.01µF to 10µF  
**Capacitance values:** E6 series (IEC 60063 Norm).  
**Capacitance tolerances** (measured at 1 kHz):  
±10% (K); ±20% (M);  
tolerance ±5% (J) available upon request

**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**  
≥1x10<sup>5</sup> MΩ (5x10<sup>5</sup> 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

09/2008

**X2 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 would not lead to danger of electric shock.

**PRODUCT CODE: R46**  
Not for use in series with the mains.  
See www.kemet.com for more information.

**Note:** R.46 series has replaced the 1.40 series and 1.47 series.  
For new design we suggest the use of the R.46 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
37.5	All	B +0.3	H +0.1	L +0.3

**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 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

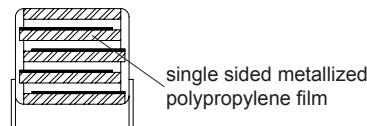
**Performance**  
Dielectric strength: no dielectric breakdown or flashover at 4.3 x V<sub>R</sub> (d.c.)/1 min  
Capacitance change |ΔC/C|: ≤10%  
Insulation resistance: ≥50% of initial limit.

**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**





**X2 CLASS (IEC 60384-14) - MKP Series  
METALLIZED POLYPROPYLENE FILM CAPACITOR  
SELF-HEALING PROPERTIES**

**APPROVALS**

Rated Cap.	275 Vac / 560 Vdc Std dimensions					Ø d	Max dv/dt at 390Vdc (V/µs)	Part Number		
	B	H	L	p						
0.033 µF	4.0	9.0	13.0	10.0	0.6	500	R46 KF	2330 -- P0	-	
0.047 µF	4.0	9.0	13.0	10.0	0.6	500	R46 KF	2470 -- P0	-	
0.068 µF	5.0	11.0	13.0	10.0	0.6	500	R46 KF	2680 -- P0	-	
0.1 µF	5.0	11.0	13.0	10.0	0.6	500	R46 KF	3100 -- P1	M	
0.1 µF	6.0	12.0	13.0	10.0	0.6	500	R46 KF	3100 -- P0	-	
0.15 µF	6.0	12.0	13.0	10.0	0.6	500	R46 KF	3150 -- P0	M	
0.15 µF	5.0	11.0	18.0	15.0	0.6	400	R46 KI	3150 -- P0	-	
0.22 µF	6.0	12.0	18.0	15.0	0.6	400	R46 KI	3220 -- P0	-	
0.33 µF	7.5	13.5	18.0	15.0	0.6	400	R46 KI	3330 -- P0	-	
0.33 µF	9.0	12.5	18.0	15.0	0.6	400	R46 KI	3330 -- P1	-	
0.33 µF	6.0	17.5	18.0	15.0	0.6	400	R46 KI	3330 -- P2	-	
0.47 µF	8.5	14.5	18.0	15.0	0.6	400	R46 KI	3470 -- P0	-	
0.47 µF	9.0	12.5	18.0	15.0	0.6	400	R46 KI	3470 -- P1	M	
0.47 µF	6.0	17.5	18.0	15.0	0.6	400	R46 KI	3470 -- P2	M	
0.47 µF	7.5	18.5	18.0	15.0	0.8	400	R46 KI	3470 -- P3	-	
0.68 µF	10.0	16.0	18.0	15.0	0.8	400	R46 KI	3680 -- P1	M	
0.68 µF	11.0	19.0	18.0	15.0	0.8	400	R46 KI	3680 -- P0	-	
0.82 µF	11.0	19.0	18.0	15.0	0.8	400	R46 KI	3820 -- P0	M	
0.47 µF	6.0	15.0	26.5	22.5	0.8	200	R46 KN	3470 -- P1	-	
0.56 µF	6.0	15.0	26.5	22.5	0.8	200	R46 KN	3560 -- P1	M	
0.56 µF	7.0	16.0	26.5	22.5	0.8	200	R46 KN	3560 -- P0	-	
0.68 µF	7.0	16.0	26.5	22.5	0.8	200	R46 KN	3680 -- P0	-	
1.0 µF	8.5	17.0	26.5	22.5	0.8	200	R46 KN	4100 -- P1	M	
1.0 µF	10.0	18.5	26.5	22.5	0.8	200	R46 KN	4100 -- P0	-	
1.5 µF	10.0	18.5	26.5	22.5	0.8	200	R46 KN	4150 -- P1	M	
1.5 µF	11.0	20.0	26.5	22.5	0.8	200	R46 KN	4150 -- P0	-	
2.2 µF	13.0	22.0	26.5	22.5	0.8	200	R46 KN	4220 -- P0	M	
1.0 µF	9.0	17.0	32.0	27.5	0.8	150	R46 KR	4100 -- P0	-	
1.5 µF	11.0	20.0	32.0	27.5	0.8	150	R46 KR	4150 -- P0	-	
2.2 µF	13.0	22.0	32.0	27.5	0.8	150	R46 KR	4220 -- P0	-	
3.3 µF	14.0	28.0	32.0	27.5	0.8	150	R46 KR	4330 -- P0	-	
4.7 µF	14.0	28.0	32.0	27.5	0.8	150	R46 KR	4470 -- P1	M	
4.7 µF	18.0	33.0	32.0	27.5	0.8	150	R46 KR	4470 -- P0	-	
6.8 µF	22.0	37.0	32.0	27.5	0.8	150	R46 KR	4680 -- P0	-	
2.2 µF	11.0	22.0	41.5	37.5	1.0	100	R46 KW	4220 -- P0	-	
3.3 µF	13.0	24.0	41.5	37.5	1.0	100	R46 KW	4330 -- P0	-	
4.7 µF	16.0	28.5	41.5	37.5	1.0	100	R46 KW	4470 -- P0	-	
6.8 µF	19.0	32.0	41.5	37.5	1.0	100	R46 KW	4680 -- P0	-	
10.0 µF	20.0	40.0	41.5	37.5	1.0	100	R46 KW	5100 -- P0	-	

Rated voltage (K=275Vac)  
Mechanical version and packaging (Table 1)  
Tolerance: K (±10%); M (±20%)

	ENEC IEC 60384-14	Class X2	File No.V4413
	UL 1414 (up to 1µF, 85°C; 250Vac)	Across-the-line	File No.E97797
	CSA - C22.2 No.1 (up to 1µF, 85°C; 250Vac)	Across-the-line certified for Canada	File No.E97797
	UL 1283 (310 Vac)	Electromagnetic Interference Filters	File No.E85238
	CSA - C22.2 No.8 (310 Vac)	Electromagnetic Interference Filters certified for Canada	File No.E85238
		GB/T 14472	Class X2
			File CQC03001008199 CQC03001008842

Approved according to IEC 60384-14  
According to IEC 60065  
Not for use in series with the mains.  
See www.kemet.com for more information.

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



**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

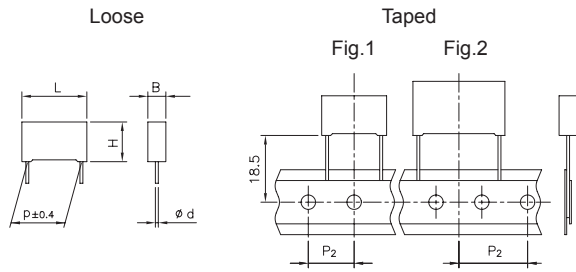
Note: Ammo-pack is the preferred packaging for taped version.

All dimensions are in mm

E12 Series available upon request

For "capacitor connected in serial with main line" (two - phase and three - phase net) application, please read the "SHORT GUIDE TO CHOOSE THE RIGHT FILM CAPACITORS" at pag. 178 and contact our Technical Service for choosing the safest solution.





Ø d ±0.05	p ≤ 15	p = 22.5
	0.6 or 0.8*	0.8

\*See size table.  
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:** 40/125/56 IEC 60068-1  
**Operating temperature range:** -40 to +125°C  
**Related documents:** IEC 60384-14; EN 60384-14

**ELECTRICAL CHARACTERISTICS**

**Rated voltage (V<sub>R</sub>):** 275 Vac (50/60Hz) / 560 Vdc  
**Capacitance range:** 0.01µF to 1µF

**TEST METHOD AND PERFORMANCE**

**Endurance:**  
**Test conditions**  
 Temperature: +125°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.

**APPROVALS**

	 ENEC IEC 60384-14 (**)	Class X2	File No.CA08.00063
	UL 1414 (up to 1µF, 85°C; 250Vac)	Across-the-line	File No.E97797
	CSA - C22.2 No.1 (up to 1µF, 85°C; 250Vac)	Across-the-line certified for Canada	File No.E97797
	UL 1283 (310 Vac)	Electromagnetic Interference Filters	File No.E85238
	CSA - C22.2 No.8 (310 Vac)	Electromagnetic Interference Filters certified for Canada	File No.E85238

Approved according to IEC 60384-14  
 According to IEC 60065  
 (\*\*) ENEC mark has replaced all the following European National marks:



**X2 CLASS (IEC 60384-14) - MKP 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**  
 Not for use in series with the mains.  
 See www.kemet.com for more information.

**NEW 125°C**

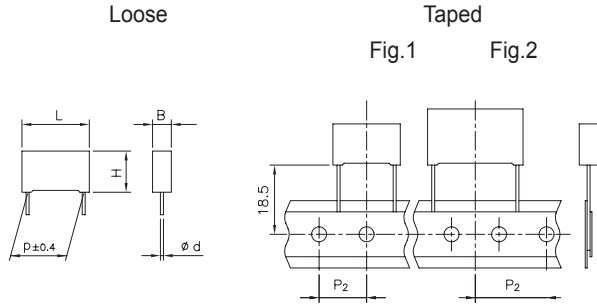
Rated Cap.	275 Vac / 560 Vdc Std dimensions				Ø d	Max dv/dt at 390Vdc (V/µs)	Part Number
	B	H	L	p			
0.010 µF	5.0	11.0	13.0	10.0	0.6	500	R46 K F 2100 - - H1 -
0.015 µF	5.0	11.0	13.0	10.0	0.6	500	R46 K F 2150 - - H1 -
0.022 µF	5.0	11.0	13.0	10.0	0.6	500	R46 K F 2220 - - H1 -
0.033 µF	5.0	11.0	13.0	10.0	0.6	500	R46 K F 2330 - - H1 -
0.047 µF	6.0	12.0	13.0	10.0	0.6	500	R46 K F 2470 - - H1 -
0.068 µF	6.0	12.0	13.0	10.0	0.6	500	R46 K F 2680 - - H1 M
0.010 µF	5.0	11.0	18.0	15.0	0.6	400	R46 K I 2100 - - H1 -
0.015 µF	5.0	11.0	18.0	15.0	0.6	400	R46 K I 2150 - - H1 -
0.022 µF	5.0	11.0	18.0	15.0	0.6	400	R46 K I 2220 - - H1 -
0.033 µF	5.0	11.0	18.0	15.0	0.6	400	R46 K I 2330 - - H1 -
0.047 µF	5.0	11.0	18.0	15.0	0.6	400	R46 K I 2470 - - H1 -
0.068 µF	5.0	11.0	18.0	15.0	0.6	400	R46 K I 2680 - - H1 -
0.10 µF	6.0	12.0	18.0	15.0	0.6	400	R46 K I 3100 - - H1 -
0.15 µF	6.0	17.5	18.0	15.0	0.6	400	R46 K I 3150 - - H2 -
0.15 µF	9.0	12.5	18.0	15.0	0.6	400	R46 K I 3150 - - H3 -
0.15 µF	7.5	13.5	18.0	15.0	0.6	400	R46 K I 3150 - - H1 -
0.22 µF	8.5	14.5	18.0	15.0	0.6	400	R46 K I 3220 - - H1 -
0.22 µF	6.0	17.5	18.0	15.0	0.6	400	R46 K I 3220 - - H2 M
0.22 µF	9.0	12.5	18.0	15.0	0.6	400	R46 K I 3220 - - H3 M
0.22 µF	7.5	18.5	18.0	15.0	0.8	400	R46 K I 3220 - - H4 -
0.33 µF	10.0	16.0	18.0	15.0	0.8	400	R46 K I 3330 - - H1 M
0.33 µF	7.5	18.5	18.0	15.0	0.8	400	R46 K I 3330 - - H2 M
0.33 µF	13.0	12.0	18.0	15.0	0.8	400	R46 K I 3330 - - H3 M
0.47 µF	11.0	19.0	18.0	15.0	0.8	400	R46 K I 3470 - - H1 M
0.15 µF	6.0	15.0	26.5	22.5	0.8	200	R46 K N 3150 - - H1 -
0.22 µF	6.0	15.0	26.5	22.5	0.8	200	R46 K N 3220 - - H1 -
0.33 µF	7.0	16.0	26.5	22.5	0.8	200	R46 K N 3330 - - H1 -
0.47 µF	10.0	18.5	26.5	22.5	0.8	200	R46 K N 3470 - - H1 -
0.68 µF	11.0	20.0	26.5	22.5	0.8	200	R46 K N 3680 - - H1 -
1.0 µF	13.0	22.0	26.5	22.5	0.8	200	R46 K N 4100 - - H1 -

Rated voltage (K=275Vac) \_\_\_\_\_  
 Mechanical version and packaging (Table 1) \_\_\_\_\_  
 Tolerance: K (±10%); M (±20%) \_\_\_\_\_

300Vac available upon request  
 E12 Series available upon request  
 All dimensions are in mm

For "capacitor connected in serial with main line" (two - phase and three - phase net) application, please read the "SHORT GUIDE TO CHOOSE THE RIGHT FILM CAPACITORS" at pag. 178 and contact our Technical Service for choosing the safest solution.

X2 CLASS (IEC 60384-14) - MKP Series  
**METALLIZED POLYPROPYLENE FILM CAPACITOR**  
SELF-HEALING PROPERTIES



Ø d ±0.05	p ≤ 15	22.5 ≤ p ≤ 27.5	p = 37.5
	0.6 or 0.8*	0.8	1.0

\*See size table.  
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 60384-14.

**ELECTRICAL CHARACTERISTICS**

**Rated voltage (V<sub>R</sub>):** 275Vac (50/60Hz) / 560 Vdc

- Capacitance range:** 0.022µF to 10µF
- Capacitance values:** E6 series (IEC 60063 Norm).
- Capacitance tolerances** (measured at 1 kHz):  
±10% (K); ±20% (M).  
tolerance ±5% (J) available upon request

**Dissipation factor (DF):**  
tgδ 10<sup>-4</sup> at +25°C ±5°C: ≤15 (8)\* at 1kHz  
\* Typical value

**Insulation resistance:**

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

**Performance**  
≥1x10<sup>5</sup> MΩ (5x10<sup>5</sup> 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

**Typical applications:** This special R46 release is designed for applications in series with the main .

**PRODUCT CODE: R46**

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

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
37.5	All	B +0.3	H +0.1	L +0.3

**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

**Test conditions 3rd**

Temperature: +40°C ± 2°C  
Relative humidity (RH): 93% ±2%  
Test duration: 500 hours  
Voltage value: 230 Vac, 50 Hz

**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%

X2 CLASS (IEC60384-14) - MKP Series  
**METALLIZED POLYPROPYLENE FILM CAPACITOR**  
**SELF-HEALING PROPERTIES**

**APPROVALS**

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

Rated Cap. (*)	275 Vac / 560 Vdc Std dimensions					Max dv/dt at 390Vdc (V/μs)	Part Number		
	B	H	L	p	∅ d				
0.010 μF	5.0	11.0	18.0	15.0	0.6	400	R46 KI	2100 -- S0	-
0.015 μF	5.0	11.0	18.0	15.0	0.6	400	R46 KI	2150 -- S0	-
0.022 μF	5.0	11.0	18.0	15.0	0.6	400	R46 KI	2220 -- S0	-
0.033 μF	5.0	11.0	18.0	15.0	0.6	400	R46 KI	2330 -- S0	-
0.047 μF	5.0	11.0	18.0	15.0	0.6	400	R46 KI	2470 -- S1	-
0.068 μF	5.0	11.0	18.0	15.0	0.6	400	R46 KI	2680 -- S0	-
0.10 μF	5.0	11.0	18.0	15.0	0.6	400	R46 KI	3100 -- S1	M
0.10 μF	6.0	12.0	18.0	15.0	0.6	400	R46 KI	3100 -- S0	-
0.15 μF	6.0	12.0	18.0	15.0	0.6	400	R46 KI	3150 -- S1	M
0.15 μF	7.5	13.5	18.0	15.0	0.6	400	R46 KI	3150 -- S0	-
0.15 μF	9.0	12.5	18.0	15.0	0.6	400	R46 KI	3150 -- S3	-
0.22 μF	7.5	13.5	18.0	15.0	0.6	400	R46 KI	3220 -- S1	M
0.22 μF	8.5	14.5	18.0	15.0	0.6	400	R46 KI	3220 -- S0	-
0.22 μF	6.0	17.5	18.0	15.0	0.6	400	R46 KI	3220 -- S2	-
0.22 μF	9.0	12.5	18.0	15.0	0.6	400	R46 KI	3220 -- S3	-
0.33 μF	13.0	12.0	18.0	15.0	0.8	400	R46 KI	3330 -- S1	-
0.33 μF	8.5	14.5	18.0	15.0	0.8	400	R46 KI	3330 -- S3	M
0.33 μF	10.0	16.0	18.0	15.0	0.8	400	R46 KI	3330 -- S0	-
0.33 μF	7.5	18.5	18.0	15.0	0.8	400	R46 KI	3330 -- S2	-
0.47 μF	11.0	19.0	18.0	15.0	0.8	400	R46 KI	3470 -- S0	-
0.47 μF	10.0	16.0	18.0	15.0	0.8	400	R46 KI	3470 -- S1	M
0.56 μF	11.0	19.0	18.0	15.0	0.8	400	R46 KI	3560 -- S0	-
0.68 μF	11.0	19.0	18.0	15.0	0.8	400	R46 KI	3680 -- S0	M
0.22 μF	6.0	15.0	26.5	22.5	0.8	200	R46 KN	3220 -- S0	-
0.33 μF	6.0	15.0	26.5	22.5	0.8	200	R46 KN	3330 -- S1	M
0.33 μF	7.0	16.0	26.5	22.5	0.8	200	R46 KN	3330 -- S0	-
0.47 μF	7.0	16.0	26.5	22.5	0.8	200	R46 KN	3470 -- S1	M
0.47 μF	8.5	17.0	26.5	22.5	0.8	200	R46 KN	3470 -- S0	-
0.68 μF	10.0	18.5	26.5	22.5	0.8	200	R46 KN	3680 -- S0	-
1.0 μF	10.0	18.5	26.5	22.5	0.8	200	R46 KN	4100 -- S2	M
1.0 μF	11.0	20.0	26.5	22.5	0.8	200	R46 KN	4100 -- S1	-
1.2 μF	13.0	22.0	26.5	22.5	0.8	200	R46 KN	4120 -- S0	-
0.47 μF	9.0	17.0	32.0	27.5	0.8	150	R46 KR	3470 -- S0	-
0.68 μF	9.0	17.0	32.0	27.5	0.8	150	R46 KR	3680 -- S1	-
1.0 μF	11.0	20.0	32.0	27.5	0.8	150	R46 KR	4100 -- S1	-
1.5 μF	13.0	22.0	32.0	27.5	0.8	150	R46 KR	4150 -- S1	-
2.2 μF	13.0	25.0	32.0	27.5	0.8	150	R46 KR	4220 -- S2	-
3.3 μF	18.0	33.0	32.0	27.5	0.8	150	R46 KR	4330 -- S2	-
4.7 μF	18.0	33.0	32.0	27.5	0.8	150	R46 KR	4470 -- S2	-
1.5 μF	11.0	22.0	41.5	37.5	1.0	100	R46 KW	4150 -- S1	-
2.2 μF	11.0	22.0	41.5	37.5	1.0	100	R46 KW	4220 -- S2	M
2.2 μF	13.0	24.0	41.5	37.5	1.0	100	R46 KW	4220 -- S1	-
3.3 μF	16.0	28.5	41.5	37.5	1.0	100	R46 KW	4330 -- S1	-
4.7 μF	16.0	28.5	41.5	37.5	1.0	100	R46 KW	4470 -- S2	M
4.7 μF	19.0	32.0	41.5	37.5	1.0	100	R46 KW	4470 -- S1	-
6.8 μF	20.0	40.0	41.5	37.5	1.0	100	R46 KW	4680 -- S2	-
10.0 μF	30.0	45.0	41.5	37.5	1.0	100	R46 KW	5100 -- S1	-

Rated voltage (K=275Vac) \_\_\_\_\_  
Mechanical version and packaging (Table 1) \_\_\_\_\_  
Tolerance: K (±10%); M (±20%) \_\_\_\_\_

300Vac Available upon request  
E12 Series available upon request  
All dimensions are in mm

	ENEC IEC 60384-14	Class X2	File No.V4413
	UL 1414 (up to 1μF, 85°C; 250Vac)	Across-the-line	File No.E97797
	CSA - C22.2 No.1 (up to 1μF, 85°C; 250Vac)	Across-the-line certified for Canada	File No.E97797
	UL 1283 (310 Vac)	Electromagnetic Interference Filters	File No.E85238
	CSA - C22.2 No.8 (310 Vac)	Electromagnetic Interference Filters certified for Canada	File No.E85238
	GB/T 14472	Class X2	File CQC03001008199 CQC03001008842

Approved according to IEC 60384-14  
According to IEC 60065

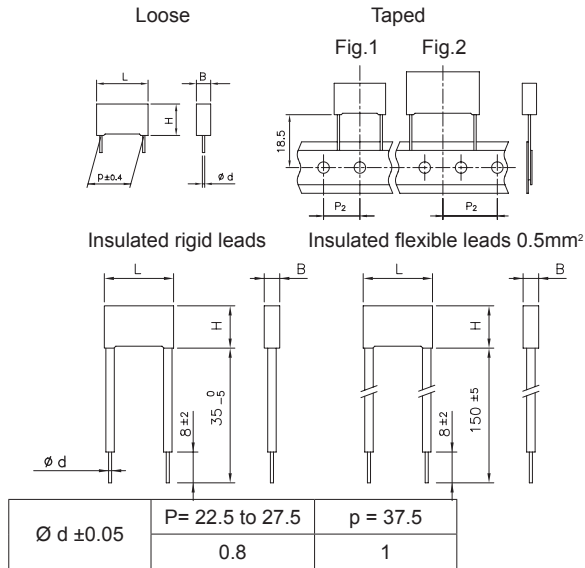
(\*\*) ENEC mark has replaced all the following European National marks:



**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.



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 60384-14.

**ELECTRICAL CHARACTERISTICS**

**Rated voltage (V<sub>R</sub>):** 275Vac (50/60Hz) / 560 Vdc  
300Vac (50/60Hz) / 630 Vdc

**Capacitance range:** 0.22µF to 10µF

**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 \*

Typical value

**Insulation resistance:**

**Test conditions**

Temperature: +25°C±5°C

Voltage charge time: 1 min

Voltage charge: 100 Vdc

**Performance**

≥1x10<sup>5</sup> MΩ (5x10<sup>5</sup> MΩ)\* for C≤0.33µF

≥30000 s (150000 s)\* for C>0.33µF

\* Typical value

**Test voltage between terminations** (on all pieces):

Capacitors with discharge resistor  
X2 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 would not lead to danger of electric shock.

**PRODUCT CODE: R46**

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

Pitch (mm)	Box thickness (B) (mm)	Maximum dimensions (mm)		
		B max	H max	L max
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

**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

**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%

**APPROVALS**

	ENEC IEC 60384-14	Class X2	File No.V4413
	UL 1283 (310Vac-105°C)	Electromagnetic Interference Filters	File No.E85238
	CSA - C22.2 No.8 (310Vac-105°C)	Electromagnetic Interference Filters certified for Canada	File No.E85238

Approved according to IEC 60384-14  
According to IEC 60065.



Capacitors with discharge resistor  
X2 CLASS (IEC 60384-14) - MKP Series  
**METALLIZED POLYPROPYLENE FILM CAPACITOR**  
SELF-HEALING PROPERTIES

PRODUCT CODE: **R46**

Not for use in series with the mains.  
See [www.kemet.com](http://www.kemet.com) for more information.

Rated Cap. (*)	275 Vac / 560 Vdc Std dimensions				Ø d	Max dv/dt at 390Vdc (V/µs)	Part Number	
	B	H	L	p				
0.22 µF	7.0	16.0	26.5	22.5	0.8	200	R46KN	3220 -- 01 - x
0.33 µF	8.5	17.0	26.5	22.5	0.8	200	R46KN	3330 -- 01 - x
0.47 µF	10.0	18.5	26.5	22.5	0.8	200	R46KN	3470 -- 01 - x
0.68 µF	11.0	20.0	26.5	22.5	0.8	200	R46KN	3680 -- 01 - x
0.47 µF	11.0	20.0	32.0	27.5	0.8	150	R46KR	3470 -- 01 - x
0.68 µF	11.0	20.0	32.0	27.5	0.8	150	R46KR	3680 -- M1 - x
1.0 µF	13.0	22.0	32.0	27.5	0.8	150	R46KR	4100 -- M1 - x
1.5 µF	13.0	22.0	32.0	27.5	0.8	150	R46KR	4150 -- M1 - x
2.2 µF	14.0	28.0	32.0	27.5	0.8	150	R46KR	4220 -- M1 - x
3.3 µF	18.0	33.0	32.0	27.5	0.8	150	R46KR	4330 -- M2 - x
4.7 µF	22.0	37.0	32.0	27.5	0.8	150	R46KR	4470 -- M1 - x
1.5 µF	11.0	22.0	41.5	37.5	1.0	100	R46KW	4150 -- M1 - x
2.2 µF	13.0	24.0	41.5	37.5	1.0	100	R46KW	4220 -- M1 - x
3.3 µF	16.0	28.5	41.5	37.5	1.0	100	R46KW	4330 -- M1 - x
4.7 µF	19.0	32.0	41.5	37.5	1.0	100	R46KW	4470 -- M1 - x
6.8 µF	20.0	40.0	41.5	37.5	1.0	100	R46KW	4680 -- M2 - x
10.0 µF	24.0	44.0	41.5	37.5	1.0	100	R46KW	5100 -- M1 - x

Rated voltage (K=275Vac) \_\_\_\_\_  
 Mechanical version and packaging (Table 1) \_\_\_\_\_  
 Tolerance: K (±10%); M (±20%) \_\_\_\_\_  
 Value of discharge resistor (Table 2) \_\_\_\_\_

Rated Cap. (*)	300 Vac / 630 Vdc Std dimensions				Ø d	Max dv/dt at 390Vdc (V/µs)	Part Number	
	B	H	L	p				
0.22 µF	7.0	16.0	26.5	22.5	0.8	200	R463N	3220 -- 01 - x
0.33 µF	8.5	17.0	26.5	22.5	0.8	200	R463N	3330 -- 01 - x
0.47 µF	10.0	18.5	26.5	22.5	0.8	200	R463N	3470 -- 01 - x
0.68 µF	11.0	20.0	26.5	22.5	0.8	200	R463N	3680 -- 01 - x
0.47 µF	11.0	20.0	32.0	27.5	0.8	150	R463R	3470 -- 01 - x
0.68 µF	11.0	20.0	32.0	27.5	0.8	150	R463R	3680 -- M1 - x
1.0 µF	13.0	22.0	32.0	27.5	0.8	150	R463R	4100 -- M1 - x
1.5 µF	13.0	22.0	32.0	27.5	0.8	150	R463R	4150 -- M1 - x
2.2 µF	14.0	28.0	32.0	27.5	0.8	150	R463R	4220 -- M1 - x
3.3 µF	18.0	33.0	32.0	27.5	0.8	150	R463R	4330 -- M2 - x
4.7 µF	22.0	37.0	32.0	27.5	0.8	150	R463R	4470 -- M1 - x
1.5 µF	11.0	22.0	41.5	37.5	1.0	100	R463W	4150 -- M1 - x
2.2 µF	13.0	24.0	41.5	37.5	1.0	100	R463W	4220 -- M1 - x
3.3 µF	16.0	28.5	41.5	37.5	1.0	100	R463W	4330 -- M1 - x
4.7 µF	19.0	32.0	41.5	37.5	1.0	100	R463W	4470 -- M1 - x
6.8 µF	20.0	40.0	41.5	37.5	1.0	100	R463W	4680 -- M2 - x
10.0 µF	24.0	44.0	41.5	37.5	1.0	100	R463W	5100 -- M1 - x

Rated voltage (3=300Vac) \_\_\_\_\_  
 Mechanical version and packaging (Table 1) \_\_\_\_\_  
 Tolerance: K (±10%); M (±20%) \_\_\_\_\_  
 Value of discharge resistor (Table 2) \_\_\_\_\_

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)	
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

**PRODUCT CODE SYSTEM**

The part number, comprising 15 digits, is formed as follows:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
R	4	6										-		-

- Digit 1 to 3 Series code.
- Digit 4 a.c. rated voltage:  
K = 275Vac; 3 = 300Vac
- Digit 5 Pitch:  
N = 22.5; R = 27.5; W = 37.5 mm
- Digit 6 to 9 Digits 7 - 8 - 9 indicate the first three digits of Capacitance value and the 6th digit indicates the number of zeros that must be added to obtain the Rated Capacitance in pF.
- Digit 10 to 11 Mechanical version and/or packaging (table 1)
- Digit 12 Identifies the dimensions and electrical characteristics.
- Digit 13 Internal use
- Digit 14 Capacitance tolerance:  
K=±10%; M=±20%
- Digit 15 Value of the discharge resistor (tolerance±10%) according to the following table\*:

Table 2

R	code (x)
470 kΩ	E
680 kΩ	F
1 MΩ	G
1.2 MΩ	L
1.5 MΩ	N
2.2 MΩ	P
3.3 MΩ	Q
4.7 MΩ	S
6.8 MΩ	T
10 MΩ	V

\*Other resistors are available upon request.

All dimensions are in mm