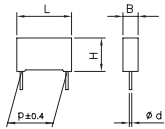
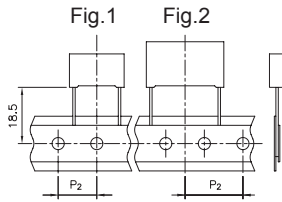


Loose

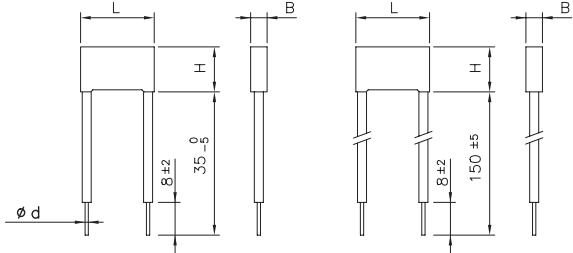


Taped



Insulated rigid leads

Insulated flexible leads 0.5mm²



| | | | |
|-----------|-------------|-----------------|----------|
| 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_R): 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 10⁻⁴ 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

≥1x10⁵ MΩ (5x10⁵ 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

**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_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 x V_R + 1000Vac 0.1 s/h

Performance

Dielectric strength: no dielectric breakdown or flashover at 4.3 x V_R (d.c.)/1 min

Capacitance change |ΔC/C|: ≤10%

Insulation resistance: ≥50% of initial limit.

Resistance to soldering heat:

Test conditions

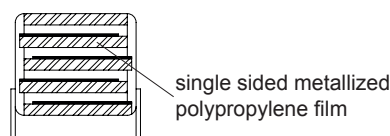
Solder bath temperature: +260°C ± 5°C

Dipping time (with heat screen): 10 s ± 1 s

Performance

Capacitance change |ΔC/C|: ≤2%

Winding scheme



**X2 CLASS (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 | | | | | |
| 0.010 µF | 4.0 | 9.0 | 13.0 | 10.0 | 0.6 | 500 | R46 KF | 2100 - - N0 | - |
| 0.015 µF | 4.0 | 9.0 | 13.0 | 10.0 | 0.6 | 500 | R46 KF | 2150 - - N0 | - |
| 0.022 µF | 4.0 | 9.0 | 13.0 | 10.0 | 0.6 | 500 | R46 KF | 2220 - - N0 | - |
| 0.033 µF | 5.0 | 11.0 | 13.0 | 10.0 | 0.6 | 500 | R46 KF | 2330 - - M1 | - |
| 0.047 µF | 5.0 | 11.0 | 13.0 | 10.0 | 0.6 | 500 | R46 KF | 2470 - - N0 | - |
| 0.068 µF | 6.0 | 12.0 | 13.0 | 10.0 | 0.6 | 500 | R46 KF | 2680 - - M1 | - |
| 0.10 µF | 6.0 | 12.0 | 13.0 | 10.0 | 0.6 | 500 | R46 KF | 3100 - - M1 | M |
| 0.010 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 2100 - - 01 | - |
| 0.015 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 2150 - - 01 | - |
| 0.022 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 2220 - - 01 | - |
| 0.033 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 2330 - - 01 | - |
| 0.047 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 2470 - - 01 | - |
| 0.068 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 2680 - - 01 | - |
| 0.10 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 3100 - - M1 | - |
| 0.15 µF | 6.0 | 12.0 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 3150 - - M2 | - |
| 0.15 µF | 9.0 | 12.5 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 3150 - - L2 | - |
| 0.22 µF | 7.5 | 13.5 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 3220 - - M2 | - |
| 0.22 µF | 9.0 | 12.5 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 3220 - - L2 | - |
| 0.22 µF | 6.0 | 17.5 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 3220 - - 02 | - |
| 0.33 µF | 8.5 | 14.5 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 3330 - - N0 | - |
| 0.33 µF | 10.0 | 16.0 | 18.0 | 15.0 | 0.8 | 400 | R46 KI | 3330 - - M1 | - |
| 0.33 µF | 9.0 | 12.5 | 18.0 | 15.0 | 0.6 | 400 | R46 KI | 3330 - - N1 | M |
| 0.33 µF | 7.5 | 18.5 | 18.0 | 15.0 | 0.8 | 400 | R46 KI | 3330 - - 02 | - |
| 0.33 µF | 13.0 | 12.0 | 18.0 | 15.0 | 0.8 | 400 | R46 KI | 3330 - - 01 | - |
| 0.47 µF | 7.5 | 18.5 | 18.0 | 15.0 | 0.8 | 400 | R46 KI | 3470 - - 02 | M |
| 0.47 µF | 10.0 | 16.0 | 18.0 | 15.0 | 0.8 | 400 | R46 KI | 3470 - - N0 | M |
| 0.47 µF | 11.0 | 19.0 | 18.0 | 15.0 | 0.8 | 400 | R46 KI | 3470 - - M1 | - |
| 0.56 µF | 11.0 | 19.0 | 18.0 | 15.0 | 0.8 | 400 | R46 KI | 3560 - - N0 | - |
| 0.60 µF | 11.0 | 19.0 | 18.0 | 15.0 | 0.8 | 400 | R46 KI | 3600 - - N0 | - |
| 0.15 µF | 6.0 | 15.0 | 26.5 | 22.5 | 0.8 | 200 | R46 KN | 3150 - - 01 | - |
| 0.22 µF | 6.0 | 15.0 | 26.5 | 22.5 | 0.8 | 200 | R46 KN | 3220 - - M1 | - |
| 0.33 µF | 6.0 | 15.0 | 26.5 | 22.5 | 0.8 | 200 | R46 KN | 3330 - - N0 | - |
| 0.47 µF | 7.0 | 16.0 | 26.5 | 22.5 | 0.8 | 200 | R46 KN | 3470 - - N0 | - |
| 0.68 µF | 10.0 | 18.5 | 26.5 | 22.5 | 0.8 | 200 | R46 KN | 3680 - - M2 | - |
| 1.0 µF | 10.0 | 18.5 | 26.5 | 22.5 | 0.8 | 200 | R46 KN | 4100 - - N2 | M |
| 1.0 µF | 11.0 | 20.0 | 26.5 | 22.5 | 0.8 | 200 | R46 KN | 4100 - - N1 | - |
| 0.47 µF | 9.0 | 17.0 | 32.0 | 27.5 | 0.8 | 150 | R46 KR | 3470 - - 01 | - |
| 0.68 µF | 9.0 | 17.0 | 32.0 | 27.5 | 0.8 | 150 | R46 KR | 3680 - - M1 | - |
| 1.0 µF | 11.0 | 20.0 | 32.0 | 27.5 | 0.8 | 150 | R46 KR | 4100 - - M1 | - |
| 1.5 µF | 13.0 | 22.0 | 32.0 | 27.5 | 0.8 | 150 | R46 KR | 4150 - - M1 | - |
| 2.2 µF | 13.0 | 25.0 | 32.0 | 27.5 | 0.8 | 150 | R46 KR | 4220 - - M2 | - |
| 2.2 µF | 14.0 | 28.0 | 32.0 | 27.5 | 0.8 | 150 | R46 KR | 4220 - - M1 | - |
| 3.3 µF | 18.0 | 33.0 | 32.0 | 27.5 | 0.8 | 150 | R46 KR | 4330 - - M2 | - |
| 4.7 µF | 18.0 | 33.0 | 32.0 | 27.5 | 0.8 | 150 | R46 KR | 4470 - - M2 | - |
| 4.7 µF | 22.0 | 37.0 | 32.0 | 27.5 | 0.8 | 150 | R46 KR | 4470 - - M1 | - |
| 1.5 µF | 11.0 | 22.0 | 41.5 | 37.5 | 1.0 | 100 | R46 KW | 4150 - - M1 | - |
| 2.2 µF | 11.0 | 22.0 | 41.5 | 37.5 | 1.0 | 100 | R46 KW | 4220 - - M2 | M |
| 2.2 µF | 13.0 | 24.0 | 41.5 | 37.5 | 1.0 | 100 | R46 KW | 4220 - - M1 | - |
| 3.3 µF | 16.0 | 28.5 | 41.5 | 37.5 | 1.0 | 100 | R46 KW | 4330 - - M1 | - |
| 4.7 µF | 16.0 | 28.5 | 41.5 | 37.5 | 1.0 | 100 | R46 KW | 4470 - - M2 | M |
| 4.7 µF | 19.0 | 32.0 | 41.5 | 37.5 | 1.0 | 100 | R46 KW | 4470 - - M1 | - |
| 6.8 µF | 20.0 | 40.0 | 41.5 | 37.5 | 1.0 | 100 | R46 KW | 4680 - - M2 | - |
| 6.8 µF | 24.0 | 44.0 | 41.5 | 37.5 | 1.0 | 100 | R46 KW | 4680 - - M1 | - |
| 10.0 µF | 30.0 | 45.0 | 41.5 | 37.5 | 1.0 | 100 | R46 KW | 5100 - - M1 | - |

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

(**) 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 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 Ø500mm | | 12.70 | 1 | 10.0/15.0 | CK |
| REEL Ø500mm | | 19.05 | 2 | 22.5/27.5 | CK |
| Loose, short leads | 4 ⁺² | | | | 00 |
| Loose, long leads | 25 ^{-1/+2} | | | | 50 |
| Loose, long leads | 30 ⁺⁵ | | | | 40 |
| Loose, insulated rigid leads | 30 ⁺⁵ | | | | 51 |
| Loose, insulated flexible leads | 150 ^{±5} | | | | 52 |

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

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.

All dimensions are in mm

E12 Series available upon request

**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 | M |
| 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 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 Ø500mm | | 12.70 | 1 | 10.0/15.0 | CK |
| REEL Ø500mm | | 19.05 | 2 | 22.5/27.5 | CK |
| Loose, short leads | 4 ⁺² | | | | 00 |
| Loose, long leads | 25 ^{-1/+2} | | | | 50 |
| Loose, long leads | 30 ⁺⁵ | | | | 40 |
| Loose, insulated rigid leads | 30 ⁺⁵ | | | | 51 |
| Loose, insulated flexible leads | 150 ^{±5} | | | | 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.

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

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

| Rated Cap. | 300 Vac / 630 Vdc Std dimensions | | | | Ø d | Max dv/dt at 390Vdc (V/µs) | Part Number | | |
|------------|-------------------------------------|------|------|------|-----|-------------------------------------|-------------|------------|---|
| | B | H | L | p | | | | | |
| 0.010 µF | 4.0 | 9.0 | 13.0 | 10.0 | 0.6 | 500 | R46 3F | 2100 -- N0 | - |
| 0.015 µF | 4.0 | 9.0 | 13.0 | 10.0 | 0.6 | 500 | R46 3F | 2150 -- N0 | - |
| 0.022 µF | 4.0 | 9.0 | 13.0 | 10.0 | 0.6 | 500 | R46 3F | 2220 -- N0 | - |
| 0.033 µF | 5.0 | 11.0 | 13.0 | 10.0 | 0.6 | 500 | R46 3F | 2330 -- M1 | - |
| 0.047 µF | 5.0 | 11.0 | 13.0 | 10.0 | 0.6 | 500 | R46 3F | 2470 -- N0 | - |
| 0.068 µF | 6.0 | 12.0 | 13.0 | 10.0 | 0.6 | 500 | R46 3F | 2680 -- M1 | - |
| 0.10 µF | 6.0 | 12.0 | 13.0 | 10.0 | 0.6 | 500 | R46 3F | 3100 -- M1 | M |
| 0.010 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 2100 -- 01 | - |
| 0.015 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 2150 -- 01 | - |
| 0.022 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 2220 -- 01 | - |
| 0.033 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 2330 -- 01 | - |
| 0.047 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 2470 -- 01 | - |
| 0.068 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 2680 -- 01 | - |
| 0.10 µF | 5.0 | 11.0 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 3100 -- M1 | - |
| 0.15 µF | 6.0 | 12.0 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 3150 -- M2 | - |
| 0.15 µF | 9.0 | 12.5 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 3150 -- L2 | - |
| 0.22 µF | 7.5 | 13.5 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 3220 -- M2 | - |
| 0.22 µF | 9.0 | 12.5 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 3220 -- L2 | - |
| 0.22 µF | 6.0 | 17.5 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 3220 -- 02 | - |
| 0.33 µF | 8.5 | 14.5 | 18.0 | 15.0 | 0.6 | 400 | R46 3I | 3330 -- N0 | - |
| 0.33 µF | 10.0 | 16.0 | 18.0 | 15.0 | 0.8 | 400 | R46 3I | 3330 -- M1 | - |
| 0.33 µF | 7.5 | 18.5 | 18.0 | 15.0 | 0.8 | 400 | R46 3I | 3330 -- 02 | - |
| 0.33 µF | 13.0 | 12.0 | 18.0 | 15.0 | 0.8 | 400 | R46 3I | 3330 -- 01 | - |
| 0.47 µF | 10.0 | 16.0 | 18.0 | 15.0 | 0.8 | 400 | R46 3I | 3470 -- N0 | M |
| 0.47 µF | 11.0 | 19.0 | 18.0 | 15.0 | 0.8 | 400 | R46 3I | 3470 -- M1 | - |
| 0.56 µF | 11.0 | 19.0 | 18.0 | 15.0 | 0.8 | 400 | R46 3I | 3560 -- N0 | - |
| 0.60 µF | 11.0 | 19.0 | 18.0 | 15.0 | 0.8 | 400 | R46 3I | 3600 -- N0 | - |
| 0.15 µF | 6.0 | 15.0 | 26.5 | 22.5 | 0.8 | 200 | R46 3N | 3150 -- 01 | - |
| 0.22 µF | 6.0 | 15.0 | 26.5 | 22.5 | 0.8 | 200 | R46 3N | 3220 -- M1 | - |
| 0.33 µF | 6.0 | 15.0 | 26.5 | 22.5 | 0.8 | 200 | R46 3N | 3330 -- N0 | - |
| 0.47 µF | 7.0 | 16.0 | 26.5 | 22.5 | 0.8 | 200 | R46 3N | 3470 -- N0 | - |
| 0.68 µF | 10.0 | 18.5 | 26.5 | 22.5 | 0.8 | 200 | R46 3N | 3680 -- M2 | - |
| 1.0 µF | 10.0 | 18.5 | 26.5 | 22.5 | 0.8 | 200 | R46 3N | 4100 -- N2 | M |
| 1.0 µF | 11.0 | 20.0 | 26.5 | 22.5 | 0.8 | 200 | R46 3N | 4100 -- N1 | - |
| 0.47 µF | 9.0 | 17.0 | 32.0 | 27.5 | 0.8 | 150 | R46 3R | 3470 -- 01 | - |
| 0.68 µF | 9.0 | 17.0 | 32.0 | 27.5 | 0.8 | 150 | R46 3R | 3680 -- M1 | - |
| 1.0 µF | 11.0 | 20.0 | 32.0 | 27.5 | 0.8 | 150 | R46 3R | 4100 -- M1 | - |
| 1.5 µF | 13.0 | 22.0 | 32.0 | 27.5 | 0.8 | 150 | R46 3R | 4150 -- M1 | - |
| 2.2 µF | 13.0 | 25.0 | 32.0 | 27.5 | 0.8 | 150 | R46 3R | 4220 -- M2 | - |
| 2.2 µF | 14.0 | 28.0 | 32.0 | 27.5 | 0.8 | 150 | R46 3R | 4220 -- M1 | - |
| 3.3 µF | 18.0 | 33.0 | 32.0 | 27.5 | 0.8 | 150 | R46 3R | 4330 -- M2 | - |
| 4.7 µF | 18.0 | 33.0 | 32.0 | 27.5 | 0.8 | 150 | R46 3R | 4470 -- M2 | - |
| 4.7 µF | 22.0 | 37.0 | 32.0 | 27.5 | 0.8 | 150 | R46 3R | 4470 -- M1 | - |
| 1.5 µF | 11.0 | 22.0 | 41.5 | 37.5 | 1.0 | 100 | R46 3W | 4150 -- M1 | - |
| 2.2 µF | 11.0 | 22.0 | 41.5 | 37.5 | 1.0 | 100 | R46 3W | 4220 -- M2 | M |
| 2.2 µF | 13.0 | 24.0 | 41.5 | 37.5 | 1.0 | 100 | R46 3W | 4220 -- M1 | - |
| 3.3 µF | 16.0 | 28.5 | 41.5 | 37.5 | 1.0 | 100 | R46 3W | 4330 -- M1 | - |
| 4.7 µF | 16.0 | 28.5 | 41.5 | 37.5 | 1.0 | 100 | R46 3W | 4470 -- M2 | M |
| 4.7 µF | 19.0 | 32.0 | 41.5 | 37.5 | 1.0 | 100 | R46 3W | 4470 -- M1 | - |
| 6.8 µF | 20.0 | 40.0 | 41.5 | 37.5 | 1.0 | 100 | R46 3W | 4680 -- M2 | - |
| 6.8 µF | 24.0 | 44.0 | 41.5 | 37.5 | 1.0 | 100 | R46 3W | 4680 -- M1 | - |
| 10.0 µF | 30.0 | 45.0 | 41.5 | 37.5 | 1.0 | 100 | R46 3W | 5100 -- M1 | - |

Rated voltage (3=300Vac) _____
 Mechanical version and packaging (Table 1) _____
 Tolerance: K (±10%); M (±20%) _____

All dimensions are in mm
 E12 Series available upon request

APPROVALS

| | | | |
|--|--|---|--------------------------------------|
| | 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 | FileCQC03001008199 CQC03001008842 |

Approved according to IEC 60384-14
 According to IEC 60065

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

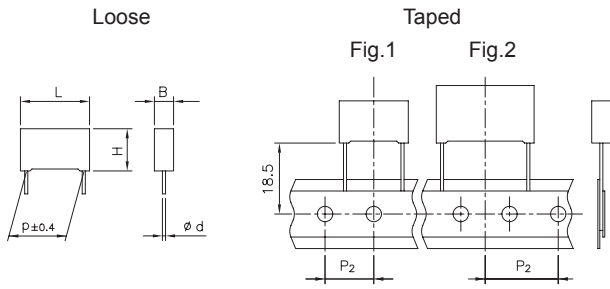


Table 1

| Standard packaging style | Lead length (mm) | Taping style | | | Ordering code (Digit 10 to 11) |
|---------------------------------|---------------------|---------------------|------------|------------|--------------------------------|
| | | P 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 Ø500mm | | 12.70 | 1 | 10.0/15.0 | CK |
| REEL Ø500mm | | 19.05 | 2 | 22.5/27.5 | CK |
| Loose, short leads | 4 ⁺² | | | | 00 |
| Loose, long leads | 25 ^{-1/+2} | | | | 50 |
| Loose, long leads | 30 ⁺⁵ | | | | 40 |
| Loose, insulated rigid leads | 30 ⁺⁵ | | | | 51 |
| Loose, insulated flexible leads | 150 ^{±5} | | | | 52 |

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

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_R):** 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_R +1000Vac 0.1 s/h
- Performance**
- Dielectric strength: no dielectric breakdown or flashover at 4.3 x V_R (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.

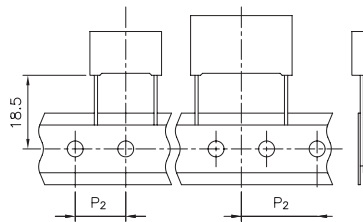
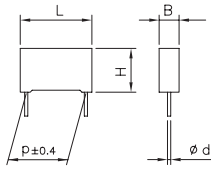
X2 CLASS (IEC 60384-14) - MKP Series
METALLIZED POLYPROPYLENE FILM CAPACITOR
SELF-HEALING PROPERTIES

Loose

Taped

Fig.1

Fig.2



| | | | |
|-----------|-------------|-----------------|----------|
| 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_R): 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 10⁻⁴ 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

≥1x10⁵ MΩ (5x10⁵ 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_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 x V_R + 1000Vac 0.1 s/h

Performance

Dielectric strength: no dielectric breakdown or flashover at 4.3 x 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%

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 | | | | Ø d | Max dv/dt at 390Vdc (V/µs) | Part Number | | |
|-------------------|-------------------------------------|------|------|------|-----|-------------------------------------|-------------|------------|---|
| | B | H | L | p | | | | | |
| 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

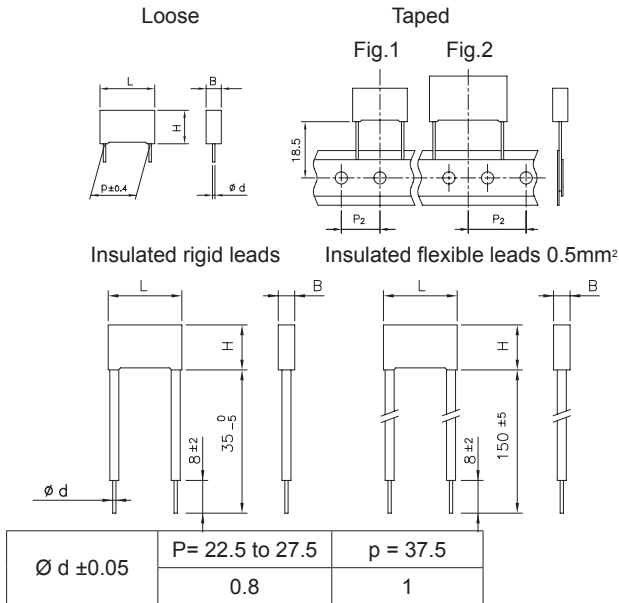
(**) ENEC mark has replaced all the following European
National marks:



Table 1

| Standard packaging style | Lead length (mm) | Taping style | | | Ordering code (Digit 10 to 11) |
|------------------------------------|------------------------|------------------------|---------------|---------------|--------------------------------------|
| | | P 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 Ø500mm | | 12.70 | 1 | 10.0/15.0 | CK |
| REEL Ø500mm | | 19.05 | 2 | 22.5/27.5 | CK |
| Loose, short leads | 4 ⁺² | | | | 00 |
| Loose, long leads | 25 ^{-1/+2} | | | | 50 |
| Loose, long leads | 30 ⁺⁵ | | | | 40 |
| Loose, insulated rigid leads | 30 ⁺⁵ | | | | 51 |
| Loose, insulated flexible leads | 150 ⁺⁵ | | | | 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_R): 275Vac (50/60Hz) / 560 Vdc
300Vac (50/60Hz) / 630 Vdc

Capacitance range: 0.22 μ F to 10 μ F

Capacitance values: E6 series (IEC 60063 Norm).

Capacitance tolerances (measured at 1 kHz):
 $\pm 10\%$ (K); $\pm 20\%$ (M).

Dissipation factor (DF):
 $\text{tg} \delta \cdot 10^{-4}$ at +25°C $\pm 5^\circ\text{C}$: ≤ 10 (6)* at 1kHz *

Insulation resistance:

Test conditions
Temperature: +25°C $\pm 5^\circ\text{C}$
Voltage charge time: 1 min
Voltage charge: 100 Vdc

Performance
 $\geq 1 \times 10^5 M\Omega$ ($5 \times 10^5 M\Omega$)* for $C \leq 0.33 \mu\text{F}$
 $\geq 30000 \text{ s}$ (150000 s)* for $C > 0.33 \mu\text{F}$
* 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 $\pm 2^\circ\text{C}$
Relative humidity (RH): 93% $\pm 2\%$
Test duration: 56 days

Performance

Dielectric strength: no dielectric breakdown or flashover at $4.3 \times V_R$ (d.c.)/1 min
Capacitance change $|\Delta C/C|$: $\leq 5\%$
Insulation resistance: $\geq 50\%$ of initial limit.

Endurance:

Test conditions

Temperature: +110°C $\pm 2^\circ\text{C}$
Test duration: 1000 h
Voltage applied: $1.25 \times V_R + 1000\text{Vac}$ 0.1 s/h

Performance

Dielectric strength: no dielectric breakdown or flashover at $4.3 \times V_R$ (d.c.)/1 min
Capacitance change $|\Delta C/C|$: $\leq 10\%$
Insulation resistance: $\geq 50\%$ of initial limit.

Resistance to soldering heat:

Test conditions

Solder bath temperature: +260°C $\pm 5^\circ\text{C}$
Dipping time (with heat screen): 10 s ± 1 s

Performance

Capacitance change $|\Delta C/C|$: $\leq 2\%$

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 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 ₂ (mm) | Fig. (No.) | Pitch (mm) | |
| REEL Ø500mm | | 19.05 | 2 | 22.5/27.5 | CK |
| Loose, short leads | 4 ⁺² | | | | 00 |
| Loose, long leads | 25 ⁻¹⁺² | | | | 50 |
| Loose, long leads | 30 ⁺⁵ | | | | 40 |
| Loose, insulated rigid leads | 30 ⁺⁵ | | | | 51 |
| Loose, insulated flexible leads | 150 ^{±5} | | | | 52 |

PRODUCT CODE SYSTEM

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



- 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