**GENERAL TECHNICAL DATA**

**Dielectric:** polypropylene film.

**Plates:** metal layer deposited by evaporation under vacuum.

**Winding:** non-inductive type.

**Leads:** tinned wire.

**Protection:** plastic case, thermostetting 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):**

\[ \text{tg} \delta \leq 10^{-4} \text{ at } +25^\circ C \pm 5^\circ C: \leq 10 \times 6^* \text{ at 1kHz} \]

* Typical value

**Insulation resistance:**

**Test conditions**

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

**Performance**

- \( \leq 1 \times 10^8 \text{ M}\Omega \times (5 \times 10^8 \text{ M}\Omega)^* \) 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):

- 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 \( 4.3 \times V_R \) (d.c.)/1 min
- Capacitance change \( |\Delta C/C| < 5\% \)
- Insulation resistance: \( \geq 50\% \) of initial limit.

**Endurance:**

- **Test conditions**
  - Temperature: +110°C ±2°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 \( |\Delta C/C| < 10\% \)
- Insulation resistance: \( \geq 50\% \) 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 \( |\Delta C/C| < 2\% \)

**Winding scheme**

- single sided metallized polypropylene film
**APPROVALS**

<table>
<thead>
<tr>
<th>Standard packaging style</th>
<th>Lead length (mm)</th>
<th>Taping style</th>
<th>Pitch (mm)</th>
<th>Ordering code</th>
<th>File No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMO-PACK</td>
<td>12.70</td>
<td>1</td>
<td>10.0/15.0</td>
<td>DQ</td>
<td>E85238</td>
</tr>
<tr>
<td>REEL Ø500mm</td>
<td>12.70</td>
<td>1</td>
<td>10.0/15.0</td>
<td>CK</td>
<td>E85238</td>
</tr>
<tr>
<td>REEL Ø500mm</td>
<td>19.05</td>
<td>2</td>
<td>22.5/27.5</td>
<td>CK</td>
<td></td>
</tr>
<tr>
<td>Loose, short leads</td>
<td>4 v &lt; 30 µs</td>
<td>2</td>
<td>150</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>Loose, long leads</td>
<td>4 v &lt; 30 µs</td>
<td>2</td>
<td>150</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Loose, insulated rigid leads</td>
<td>30 µs</td>
<td>2</td>
<td>150</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Loose, insulated flexible leads</td>
<td>30 µs</td>
<td>2</td>
<td>150</td>
<td>52</td>
<td></td>
</tr>
</tbody>
</table>

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.

---

**Rated voltage** (K=275 Vac)

<table>
<thead>
<tr>
<th>Mechanical version and packaging (Table 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance: K (±10%); M (±20%)</td>
</tr>
</tbody>
</table>

All dimensions are in mm

**E12 Series available upon request**
**APPROVALS**

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

Approved according to IEC 60384-14 According to IEC 60065

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

![Image](Image.png)

---

### Table 1

<table>
<thead>
<tr>
<th>Standard packaging style</th>
<th>Lead length (mm)</th>
<th>Taping style</th>
<th>Ordering code (Digit 10 to 11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMO-PACK</td>
<td>12.70</td>
<td>10.0/15.0</td>
<td>7</td>
</tr>
<tr>
<td>AMMO-PACK</td>
<td>19.05</td>
<td>22.5</td>
<td>2</td>
</tr>
<tr>
<td>AMMO-PACK</td>
<td>12.70</td>
<td>10.0/15.0</td>
<td>2</td>
</tr>
<tr>
<td>AMMO-PACK</td>
<td>19.05</td>
<td>22.5</td>
<td>2</td>
</tr>
<tr>
<td>REEL Ø500mm</td>
<td>4</td>
<td>30</td>
<td>00</td>
</tr>
<tr>
<td>REEL Ø500mm</td>
<td>25</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Loose, short leads</td>
<td>4</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Loose, long leads</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loose, insulated rigid leads</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loose, insulated flexible leads</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loose, long leads</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loose, insulated rigid leads</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loose, insulated flexible leads</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**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.**
All dimensions are in mm

E12 Series available upon request

<table>
<thead>
<tr>
<th>Rated Cap.</th>
<th>Ø d</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.015µF</td>
<td>9.0</td>
<td>R46 3F 2150 - - N0 -</td>
</tr>
<tr>
<td>0.022µF</td>
<td>9.0</td>
<td>R46 3F 2220 - - N0 -</td>
</tr>
<tr>
<td>0.033µF</td>
<td>11.0</td>
<td>R46 3F 2330 - - N0 -</td>
</tr>
<tr>
<td>0.047µF</td>
<td>11.0</td>
<td>R46 3F 2470 - - N0 -</td>
</tr>
<tr>
<td>0.068µF</td>
<td>12.0</td>
<td>R46 3F 2680 - - M1 -</td>
</tr>
<tr>
<td>0.10µF</td>
<td>12.0</td>
<td>R46 3F 3100 - - M1 M</td>
</tr>
<tr>
<td>0.15µF</td>
<td>12.0</td>
<td>R46 3F 3150 - - M2 -</td>
</tr>
<tr>
<td>0.22µF</td>
<td>13.5</td>
<td>R46 3F 3330 - - M2 M</td>
</tr>
<tr>
<td>0.33µF</td>
<td>14.5</td>
<td>R46 3F 3330 - - N0 -</td>
</tr>
<tr>
<td>0.47µF</td>
<td>16.0</td>
<td>R46 3F 3470 - - N0 M</td>
</tr>
<tr>
<td>0.60µF</td>
<td>18.0</td>
<td>R46 3F 3560 - - N0 -</td>
</tr>
<tr>
<td>0.85µF</td>
<td>21.0</td>
<td>R46 3F 3600 - - N0 -</td>
</tr>
<tr>
<td>1.0µF</td>
<td>22.5</td>
<td>R46 3F 3720 - - M2</td>
</tr>
<tr>
<td>1.5µF</td>
<td>27.5</td>
<td>R46 3F 4220 - - M1 -</td>
</tr>
<tr>
<td>2.2µF</td>
<td>32.0</td>
<td>R46 3F 4470 - - M1 -</td>
</tr>
<tr>
<td>3.3µF</td>
<td>37.5</td>
<td>R46 3F 4470 - - M1 -</td>
</tr>
<tr>
<td>4.7µF</td>
<td>41.5</td>
<td>R46 3F 4470 - - M1 -</td>
</tr>
<tr>
<td>6.8µF</td>
<td>47.0</td>
<td>R46 3F 4470 - - M1 -</td>
</tr>
<tr>
<td>10.0µF</td>
<td>50.0</td>
<td>R46 3F 5100 - - M1 -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lead length (mm)</th>
<th>Taping style (mm)</th>
<th>Ordering code (Digit 10 to 11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.00</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>30</td>
<td>45</td>
<td>50</td>
</tr>
</tbody>
</table>

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.
**R.46**

**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**

**NEW 125°C**

---

**GENERAL TECHNICAL DATA**

- **Dielectric:** polypropylene film.
- **Plates:** metal layer deposited by evaporation under vacuum.
- **Winding:** non-inductive type.
- **Leads:** tinned wire.
- **Protection:** plastic case, thermostetting 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 $V_{r}$ +1000 Vac 0.1 s/h

**Performance**

- **Dielectric strength:** no dielectric breakdown or flashover at 4.3 x $V_{r}$,1 Y1 min
- **Capacitance change ($ΔC/C$):** ≤ 10%
- **Insulation resistance:** ≥ 50% of initial limit.

---

**APPROVALS**

<table>
<thead>
<tr>
<th>Part number</th>
<th><strong>275 Vac / 560 Vdc</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Cap.</strong></td>
<td><strong>Std dimensions</strong></td>
</tr>
<tr>
<td>0.01µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.015µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.022µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.033µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.047µF</td>
<td>6.0</td>
</tr>
<tr>
<td>0.068µF</td>
<td>6.0</td>
</tr>
<tr>
<td>0.15µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.15µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.22µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.33µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.33µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.33µF</td>
<td>5.0</td>
</tr>
<tr>
<td>0.47µF</td>
<td>11.0</td>
</tr>
<tr>
<td>0.15µF</td>
<td>6.0</td>
</tr>
<tr>
<td>0.22µF</td>
<td>6.0</td>
</tr>
<tr>
<td>0.33µF</td>
<td>7.0</td>
</tr>
<tr>
<td>0.47µF</td>
<td>10.0</td>
</tr>
<tr>
<td>0.68µF</td>
<td>11.0</td>
</tr>
<tr>
<td>1.0µF</td>
<td>13.0</td>
</tr>
</tbody>
</table>

**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.

09/2008 154
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: 0.022 µF to 10 µF

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 (B) at 1kHz
* Typical value

Insulation resistance:

Test conditions

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

Performance

≥1 x 10<sup>6</sup> MΩ (5 x 10<sup>5</sup> MΩ)* for Cs0.33 µF
≥30000 s (150000 s)* for C>0.33 µF
* 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

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 |∆C/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 |∆C/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 |∆C/C|: ≤2%
## Approved according to IEC 60384-14

 According to IEC 60065

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

### Table 1

<table>
<thead>
<tr>
<th>Standard packaging style</th>
<th>Lead length (mm)</th>
<th>Taping style</th>
<th>Ordering code (Digit 10 to 11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMO-PACK</td>
<td>12.70 / 19.05</td>
<td>1 / 2</td>
<td>CK</td>
</tr>
<tr>
<td>REEL Ø500mm</td>
<td>12.70 / 19.05</td>
<td>1 / 2</td>
<td>CK</td>
</tr>
<tr>
<td>Loose, short leads</td>
<td>4 / 5²</td>
<td>1 / 2</td>
<td>CK</td>
</tr>
<tr>
<td>Loose, long leads</td>
<td>3 / 4²</td>
<td>1 / 2</td>
<td>CK</td>
</tr>
<tr>
<td>Loose, insulated rigid leads</td>
<td>3 / 5²</td>
<td>1 / 2</td>
<td>CK</td>
</tr>
<tr>
<td>Loose, insulated flexible leads</td>
<td>30 / 5²</td>
<td>1 / 2</td>
<td>CK</td>
</tr>
</tbody>
</table>

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

### Rated voltage (K=275Vac)
- Tolerance: $\pm10\%$; $\pm20\%$

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

---

**APPROVALS**

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

---

**Specifications**

- Rated voltage: 300 Vac available upon request
- All dimensions in mm

---

**R.46 S VERSION**

**X2 CLASS (IEC60384-14) - MKP Series**

**METALLIZED POLYPROPYLENE FILM CAPACITOR**

**SELF-HEALING PROPERTIES**
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

<table>
<thead>
<tr>
<th>Pitch</th>
<th>Box thickness (B)</th>
<th>Maximum dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(mm)</td>
<td>B max</td>
</tr>
<tr>
<td>22.5</td>
<td>All</td>
<td>B +0.2</td>
</tr>
<tr>
<td>27.5</td>
<td>All</td>
<td>B +0.2</td>
</tr>
<tr>
<td>37.5</td>
<td>All</td>
<td>B +0.3</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Approvals</th>
<th>Class</th>
<th>File No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENEC</td>
<td>X2</td>
<td>V4413</td>
</tr>
<tr>
<td>IEC 60384-14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL 1283 (310Vac-105°C)</td>
<td>Electromagnetic Interference Filters</td>
<td>E85238</td>
</tr>
<tr>
<td>CSA - C22.2 No.8 (310Vac-105°C)</td>
<td>Electromagnetic Interference Filters certified for Canada</td>
<td>E85238</td>
</tr>
</tbody>
</table>

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

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):
\[ \tan \delta \times 10^4 \] 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
\[ ≥1x10^9 \text{ MΩ} \] (5x10^9 to MΩ) for C≤0.33μF
\[ ≥30000 \text{ s} \] (150000 s)* for C>0.33μF

Typical value

Test voltage between terminations (on all pieces):

\[ R.46+R \]

Loose

Taped

Fig.1

Fig.2

Insulated rigid leads

Insulated flexible leads 0.5mm

Ø d ±0.05

P= 22.5 to 27.5

p = 37.5

0.8 1

R.46+R 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

<table>
<thead>
<tr>
<th>Pitch</th>
<th>Box thickness (B)</th>
<th>Maximum dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(mm)</td>
<td>B max</td>
</tr>
<tr>
<td>22.5</td>
<td>All</td>
<td>B +0.2</td>
</tr>
<tr>
<td>27.5</td>
<td>All</td>
<td>B +0.2</td>
</tr>
<tr>
<td>37.5</td>
<td>All</td>
<td>B +0.3</td>
</tr>
</tbody>
</table>

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%

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Typical value

Test voltage between terminations (on all pieces):

\[ R.46+R \]
Table 1

<table>
<thead>
<tr>
<th>Standard packaging style</th>
<th>Lead length (mm)</th>
<th>Taping style P2 (mm)</th>
<th>Fig. (No.)</th>
<th>Pitch (mm)</th>
<th>Ordering code (Digit 10 to 11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REEL Ø500mm</td>
<td>19.05</td>
<td>2</td>
<td>22.5/27.5</td>
<td>CK</td>
<td></td>
</tr>
<tr>
<td>Loose, short leads</td>
<td>4.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loose, long leads</td>
<td>25.16</td>
<td></td>
<td></td>
<td></td>
<td>00</td>
</tr>
<tr>
<td>Loose, long leads</td>
<td>30.68</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Loose, insulated rigid leads</td>
<td>30.68</td>
<td></td>
<td></td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Loose, insulated flexible leads</td>
<td>150.76</td>
<td></td>
<td></td>
<td></td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>52</td>
</tr>
</tbody>
</table>

**PRODUCT CODE SYSTEM**

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

1. **Digit 1 to 3** Series code.
2. **Digit 4** a.c. rated voltage:
   - K = 275Vac
   - 3 = 300Vac
3. **Digit 5** Pitch:
   - N = 22.5
   - R = 27.5
   - W = 37.5 mm
4. **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.
5. **Digit 10 to 11** Mechanical version and/or packaging (Table 1).
6. **Digit 12** Identifies the dimensions and electrical characteristics.
7. **Digit 13** Internal use
8. **Digit 14** Capacitance tolerance:
   - K=±10%; M=±20%
9. **Digit 15** Value of the discharge resistor (tolerance±10%) according to the following table:

Table 2

<table>
<thead>
<tr>
<th>R code (x)</th>
<th>470 kΩ</th>
<th>680 kΩ</th>
<th>1 MΩ</th>
<th>1.2 MΩ</th>
<th>1.5 MΩ</th>
<th>2.2 MΩ</th>
<th>3.3 MΩ</th>
<th>4.7 MΩ</th>
<th>6.8 MΩ</th>
<th>10 MΩ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>L</td>
<td>N</td>
<td>P</td>
<td>Q</td>
<td>S</td>
<td>T</td>
<td>V</td>
</tr>
</tbody>
</table>

All dimensions are in mm