**PRODUCT CODE SYSTEM**

The part number, comprising 14 digits, is formed as follows:

| Digit 1 to 3 | Series code. |
| Digit 4 | d.c. rated voltage: |
| Digit 5 | Pitch: |
| 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: |

- J=5%  
- K=10%  
- M=20%

Table 1 (for more detailed information, please refer to page 14).

<table>
<thead>
<tr>
<th>Standard packaging style</th>
<th>Lead length (mm)</th>
<th>Ordering code (Digit 10 to 11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMO-PACK</td>
<td></td>
<td>DQ</td>
</tr>
<tr>
<td>Reel Ø 355 mm</td>
<td></td>
<td>CK</td>
</tr>
<tr>
<td>Loose, short leads</td>
<td>4 ±1.5</td>
<td>AA</td>
</tr>
<tr>
<td>Loose, long leads</td>
<td>17 ±1/2</td>
<td>Z3</td>
</tr>
</tbody>
</table>

**GENERAL TECHNICAL DATA**

**Dielectric:** polyester film (polyethylene terephthalate).

**Plates:** aluminium 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.

**Marking:** Capacitance, tolerance, D.C. rated voltage.

**Climatic category:** 55/105/56 IEC 60068-1

**Operating temperature range:** -55 to +105°C

**Related documents:** IEC 60384-2

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**R82**

**MKT Series**

**D.C. MULTIPURPOSE APPLICATIONS**

Typical applications: by-passing, blocking, coupling, decoupling, timing, oscillator circuits.

For inverter applications please refer to RSB Series.

**PRODUCT CODE: R82**

p = 5mm

<table>
<thead>
<tr>
<th>Pitch (mm)</th>
<th>Box thickness (B)</th>
<th>Maximum dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0 &lt;4.5</td>
<td>B +0.1</td>
<td>H +0.1 L +0.2</td>
</tr>
<tr>
<td>5.0 ≥4.5</td>
<td>B +0.1</td>
<td>H +0.1 L +0.3</td>
</tr>
</tbody>
</table>

**Winding scheme**

- single sided metallized polyester film

---

**Table 1**

<table>
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</tr>
<tr>
<td>Loose, long leads</td>
<td>17 ±1/2</td>
<td>Z3</td>
</tr>
</tbody>
</table>
## WOUND version

The pulse characteristic $K_0$ depends on the voltage.

## STACKED version

### Mechanical version and packaging (Table 1)

Tolerance: J ($\pm 5\%$); K ($\pm 10\%$); M ($\pm 20\%$)

<table>
<thead>
<tr>
<th>Rated Cap.</th>
<th>50Vdc/30Vac Std dimensions</th>
<th>Max $dv/dt$ (V/µs)</th>
<th>Max $K_0$ (V/µs)</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 µF</td>
<td>2.5 6.5 7.2 5.0</td>
<td>160</td>
<td>20 E3</td>
<td>R82EC1100--5--</td>
</tr>
<tr>
<td>0.15 µF</td>
<td>2.5 6.5 7.2 5.0</td>
<td>160</td>
<td>20 E3</td>
<td>R82EC1150--5--</td>
</tr>
<tr>
<td>0.22 µF</td>
<td>2.5 6.5 7.2 5.0</td>
<td>160</td>
<td>20 E3</td>
<td>R82EC1220--5--</td>
</tr>
<tr>
<td>0.33 µF</td>
<td>3.5 7.5 7.2 5.0</td>
<td>160</td>
<td>20 E3</td>
<td>R82EC1330--5--</td>
</tr>
<tr>
<td>0.47 µF</td>
<td>3.5 7.5 7.2 5.0</td>
<td>160</td>
<td>20 E3</td>
<td>R82EC1470--5--</td>
</tr>
<tr>
<td>0.68 µF</td>
<td>4.5 9.5 7.2 5.0</td>
<td>160</td>
<td>20 E3</td>
<td>R82EC1680--5--</td>
</tr>
<tr>
<td>1.0 µF</td>
<td>5.0 10.0 7.2 5.0</td>
<td>160</td>
<td>20 E3</td>
<td>R82EC1800--5--</td>
</tr>
<tr>
<td>1.5 µF</td>
<td>6.0 11.0 7.2 5.0</td>
<td>160</td>
<td>20 E3</td>
<td>R82EC2100--5--</td>
</tr>
</tbody>
</table>

### Reduced Sizes

<table>
<thead>
<tr>
<th>Rated Cap.</th>
<th>250Vdc/140Vac Std dimensions</th>
<th>Max $dv/dt$ (V/µs)</th>
<th>Max $K_0$ (V/µs)</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.022 µF</td>
<td>2.5 6.5 7.2 5.0</td>
<td>130</td>
<td>65 E3</td>
<td>R82IC2220--6--</td>
</tr>
<tr>
<td>0.047 µF</td>
<td>3.5 7.5 7.2 5.0</td>
<td>130</td>
<td>65 E3</td>
<td>R82IC2470--6--</td>
</tr>
<tr>
<td>0.068 µF</td>
<td>4.5 9.5 7.2 5.0</td>
<td>130</td>
<td>65 E3</td>
<td>R82IC2680--6--</td>
</tr>
<tr>
<td>0.10 µF</td>
<td>5.0 10.0 7.2 5.0</td>
<td>130</td>
<td>65 E3</td>
<td>R82IC3100--6--</td>
</tr>
<tr>
<td>0.15 µF</td>
<td>6.0 11.0 7.2 5.0</td>
<td>130</td>
<td>65 E3</td>
<td>R82IC3150--6--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rated Cap.</th>
<th>400Vdc/200Vac Std dimensions</th>
<th>Max $dv/dt$ (V/µs)</th>
<th>Max $K_0$ (V/µs)</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.015 µF</td>
<td>2.5 6.5 7.2 5.0</td>
<td>200</td>
<td>160 E3</td>
<td>R82MC1680--6--</td>
</tr>
<tr>
<td>0.010 µF</td>
<td>2.5 6.5 7.2 5.0</td>
<td>200</td>
<td>160 E3</td>
<td>R82MC1700--5--</td>
</tr>
<tr>
<td>0.015 µF</td>
<td>2.5 6.5 7.2 5.0</td>
<td>200</td>
<td>160 E3</td>
<td>R82MC2150--6--</td>
</tr>
<tr>
<td>0.033 µF</td>
<td>3.5 7.5 7.2 5.0</td>
<td>200</td>
<td>160 E3</td>
<td>R82MC2330--6--</td>
</tr>
<tr>
<td>0.047 µF</td>
<td>4.5 9.5 7.2 5.0</td>
<td>200</td>
<td>160 E3</td>
<td>R82MC2470--6--</td>
</tr>
<tr>
<td>0.068 µF</td>
<td>6.0 11.0 7.2 5.0</td>
<td>200</td>
<td>160 E3</td>
<td>R82MC2680--6--</td>
</tr>
</tbody>
</table>

### All dimensions in mm.

Note: If the working voltage (V) is lower than the rated voltage ($V_R$), the capacitor may work at higher $dv/dt$. In this case the maximum value allowed is obtained multiplying the above value (see table $dv/dt$) with the ratio $V/V_R$.

The pulse characteristic $K_0$ depends on the voltage waveform and in any case it cannot overcome the value given in the above table.
METALLIZED POLYESTER FILM CAPACITOR
D.C. MULTIPURPOSE APPLICATIONS

p = 5 mm
PRODUCT CODE: R82

ELECTRICAL CHARACTERISTICS

Rated voltage ($V_{R}$):
- 50 Vdc
- 63 Vdc
- 100 Vdc
- 250 Vdc
- 400 Vdc

Rated temperature ($T_{R}$): +85°C

Temperature derated voltage:
For temperatures between +85°C and +105°C a decreasing factor of 1.25% per degree °C on the rated voltage $V_{R}$ (d.c. and a.c.) has to be applied.

Capacitance range: 1000pF to 4.7µF

Capacitance values: E6 series (IEC 60063 Norm).

Capacitance tolerances (measured at 1 kHz):
- ±5% (J); ±10% (K); ±20% (M).

Total self-inductance (L):
≈7nH max 1 nH per 1 mm lead and capacitor length.

Dissipation factor (DF):
tgδ $10^{-4}$ at +25°C ±5°C

<table>
<thead>
<tr>
<th>kHz</th>
<th>C ≤ 0.1µF</th>
<th>C &gt; 0.1µF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>≤ 80</td>
<td>≤ 80</td>
</tr>
<tr>
<td>10</td>
<td>≤ 120</td>
<td>≤ 120</td>
</tr>
<tr>
<td>100</td>
<td>≤ 250</td>
<td>≥ 100</td>
</tr>
</tbody>
</table>

Insulation resistance:

Test conditions
- Temperature: +25°C±5°C
- Voltage charge time: 1 min

Voltage charge:
- 50 Vdc for $V_{R}$ < 100 Vdc
- 100 Vdc for $V_{R}$ ≥ 100 Vdc

Performance

For $V_{R}$ ≤ 100 Vdc
- ≥15000 MΩ for C ≤ 0.33µF
- ≥ 5000 s for C > 0.33µF and ≤1µF
- ≥ 1000 s for C > 1µF

For $V_{R}$ > 100 Vdc
- ≥30000 MΩ

*Typical value

Test voltage between terminations:
1.4$xV_{R}$ applied for 2 s at +25°C±5°C.

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

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

Performance
- Capacitance change |$\Delta C/C$|: ≤ 5%
- DF change ($\Delta \text{tgδ}$):
  - ≤ 50$x10^{-4}$ at 1kHz
  - ≤ 20$x10^{-4}$ at 1kHz
- Insulation resistance:
  - ≥ 50% of initial limit.

Endurance:

Test conditions
- Temperature: +105°C ±2°C
- Voltage applied: 1.25$xV_{c}$

Performance
- Capacitance change |$\Delta C/C$|: ≤ 5%
- DF change ($\Delta \text{tgδ}$):
  - ≤ 30$x10^{-4}$ at 10kHz for C ≤ 1µF
  - ≤ 20$x10^{-4}$ at 1kHz for C > 1µF
- 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 |$\Delta C/C$|: ≤ 2%
- DF change ($\Delta \text{tgδ}$):
  - ≤ 20$x10^{-4}$ at 1kHz for C > 1µF
- Insulation resistance:
  - ≥ initial limit.

Long term stability (after two years):

Storage: standard environmental conditions (see page 12).

Performance
- Capacitance change |$\Delta C/C$|: ≤ 3% for C ≤ 0.1µF
  - ≤ 2% for C > 0.1µF

RELIABILITY:

Reference MIL HDB 217

Application conditions:
- Temperature: +40°C±2°C
- Voltage: 0.5$xV_{R}$
- Failure rate: ≤ 1 FIT

(1 FIT = 1x10^8 failures/components x h)

Failure criteria:
(according to DIN 44122)
- Short or open circuit
- Capacitance change |$\Delta C/C$|: ≥ 10%
- DF change ($\Delta \text{tgδ}$):
  - > 2 x initial limit.
- Insulation resistance:
  - < 0.005 x initial limit.
MAX. VOLTAGE (V_{r.m.s.}) VERSUS FREQUENCY (sinusoidal wave-form / \text{Th} \leq 40^\circ\text{C})
MAX. CURRENT (Ir.m.s.) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)

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