R66
MKT Series

**METALLIZED POLYESTER FILM CAPACITOR**

**D.C. MULTIPURPOSE APPLICATIONS**

Typical applications: this series combines small size, good performances in by-passing, blocking and interference suppression in low voltage applications (i.e.: AUTOMOTIVE).

**PRODUCT CODE: R66**

**p = 7.5mm**

Note: R66 series has replaced the R84 series (available only upon request).

For new design we suggest the use of the R66 series

<table>
<thead>
<tr>
<th>Pitch</th>
<th>Box thickness (B)</th>
<th>Maximum dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(mm)</td>
<td>(mm)</td>
<td>B max</td>
</tr>
<tr>
<td>7.5</td>
<td>All</td>
<td>B +0.1</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, thermosetting 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 For stacked technology an upper operating temperature of +125°C is allowed for a max operating time of 1000 h.

Related documents: IEC 60384-2

**Winding scheme**

(single sided metallized polyester film)

**PRODUCT CODE SYSTEM**

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

<table>
<thead>
<tr>
<th>Digit 1 to 3</th>
<th>Series code.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit 4</td>
<td>d.c. rated voltage:</td>
</tr>
<tr>
<td></td>
<td>C = 50V D = 63V E = 100V</td>
</tr>
<tr>
<td></td>
<td>I = 250V M = 400V P = 630V</td>
</tr>
<tr>
<td>Digit 5</td>
<td>Pitch: D = 7.5 mm</td>
</tr>
<tr>
<td>Digit 6 to 9</td>
<td>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.</td>
</tr>
<tr>
<td>Digit 10 to 11</td>
<td>Mechanical version and/or packaging (table1)</td>
</tr>
<tr>
<td>Digit 12</td>
<td>Identifies the dimensions and electrical characteristics.</td>
</tr>
<tr>
<td>Digit 13</td>
<td>Internal use</td>
</tr>
<tr>
<td>Digit 14</td>
<td>Capacitance tolerance: J=5%; K=10%; M=20%.</td>
</tr>
</tbody>
</table>

**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>Taping style</th>
<th>Ordering code (Digit 10 to 11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMO-PACK</td>
<td></td>
<td>1</td>
<td>DQ</td>
</tr>
<tr>
<td>AMMO-PACK</td>
<td></td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>Reel Ø 355 mm</td>
<td></td>
<td>1</td>
<td>CK</td>
</tr>
<tr>
<td>Loose, short leads</td>
<td>4</td>
<td>1</td>
<td>AA</td>
</tr>
<tr>
<td>Loose, long leads</td>
<td>17</td>
<td>2</td>
<td>Z3</td>
</tr>
</tbody>
</table>

All dimensions are in mm.
R66
MKT Series
METALLIZED POLYESTER FILM CAPACITOR
D.C. MULTIPURPOSE APPLICATIONS
p = 7.5 mm
PRODUCT CODE: R66

STACKED VERSION

<table>
<thead>
<tr>
<th>Rated Cap.</th>
<th>50Vdc/30Vac Std dimensions</th>
<th>Max dv/dt</th>
<th>Max K0</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.68 µF</td>
<td>3.0 8.0 10.0 7.5</td>
<td>100</td>
<td>10 E3</td>
<td>R66CD3680--6--</td>
</tr>
<tr>
<td>1.0 µF</td>
<td>3.0 8.0 10.0 7.5</td>
<td>100</td>
<td>10 E3</td>
<td>R66CD4100--6--</td>
</tr>
<tr>
<td>1.5 µF</td>
<td>4.0 9.0 10.0 7.5</td>
<td>100</td>
<td>10 E3</td>
<td>R66CD4150--6--</td>
</tr>
<tr>
<td>2.2 µF</td>
<td>5.0 10.5 10.0 7.5</td>
<td>100</td>
<td>10 E3</td>
<td>R66CD4220--6--</td>
</tr>
<tr>
<td>4.7 µF</td>
<td>6.0 12.0 10.5 7.5</td>
<td>100</td>
<td>10 E3</td>
<td>R66CD4470--6--</td>
</tr>
</tbody>
</table>

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 pulse characteristic K_0 depends on the voltage wave-form and in any case it cannot overcome the value given in the above table.

<table>
<thead>
<tr>
<th>Rated Cap.</th>
<th>63Vdc/40Vac Std dimensions</th>
<th>Max dv/dt</th>
<th>Max K0</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.33 µF</td>
<td>3.0 8.0 10.0 7.5</td>
<td>120</td>
<td>15 E3</td>
<td>R66DD3330--6--</td>
</tr>
<tr>
<td>0.47 µF</td>
<td>3.0 8.0 10.0 7.5</td>
<td>120</td>
<td>15 E3</td>
<td>R66DD3470--6--</td>
</tr>
<tr>
<td>0.68 µF</td>
<td>4.0 9.0 10.0 7.5</td>
<td>120</td>
<td>15 E3</td>
<td>R66DD3680--6--</td>
</tr>
<tr>
<td>1.0 µF</td>
<td>4.0 9.0 10.0 7.5</td>
<td>120</td>
<td>15 E3</td>
<td>R66DD4100--7--</td>
</tr>
<tr>
<td>1.5 µF</td>
<td>5.0 10.5 10.0 7.5</td>
<td>120</td>
<td>15 E3</td>
<td>R66DD4150--7--</td>
</tr>
<tr>
<td>2.2 µF</td>
<td>6.0 12.0 10.5 7.5</td>
<td>120</td>
<td>15 E3</td>
<td>R66DD4220--6--</td>
</tr>
<tr>
<td>3.3 µF</td>
<td>6.0 12.0 10.5 7.5</td>
<td>120</td>
<td>15 E3</td>
<td>R66DD4330--6--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rated Cap.</th>
<th>100Vdc/63Vac Std dimensions</th>
<th>Max dv/dt</th>
<th>Max K0</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.068 µF</td>
<td>3.0 8.0 10.0 7.5</td>
<td>150</td>
<td>30 E3</td>
<td>R66ED2680--7--</td>
</tr>
<tr>
<td>0.1 µF</td>
<td>3.0 8.0 10.0 7.5</td>
<td>150</td>
<td>30 E3</td>
<td>R66ED3100--7--</td>
</tr>
<tr>
<td>0.15 µF</td>
<td>3.0 8.0 10.0 7.5</td>
<td>150</td>
<td>30 E3</td>
<td>R66ED3150--7--</td>
</tr>
<tr>
<td>0.22 µF</td>
<td>4.0 9.0 10.0 7.5</td>
<td>150</td>
<td>30 E3</td>
<td>R66ED3220--7--</td>
</tr>
<tr>
<td>0.33 µF</td>
<td>4.0 9.0 10.0 7.5</td>
<td>150</td>
<td>30 E3</td>
<td>R66ED3330--7--</td>
</tr>
<tr>
<td>0.47 µF</td>
<td>4.0 9.0 10.0 7.5</td>
<td>150</td>
<td>30 E3</td>
<td>R66ED3470--7--</td>
</tr>
<tr>
<td>0.68 µF</td>
<td>4.0 9.0 10.0 7.5</td>
<td>150</td>
<td>30 E3</td>
<td>R66ED3680--7--</td>
</tr>
<tr>
<td>1.0 µF</td>
<td>5.0 10.5 10.0 7.5</td>
<td>150</td>
<td>30 E3</td>
<td>R66ED4100--7--</td>
</tr>
<tr>
<td>1.5 µF</td>
<td>6.0 12.0 10.5 7.5</td>
<td>150</td>
<td>30 E3</td>
<td>R66ED4150--6--</td>
</tr>
</tbody>
</table>

All dimensions are 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 wave-form and in any case it cannot overcome the value given in the above table.

*Not suitable for across-the-line applications. Please refer to Interference Suppression Capacitors (page 145).
ELECTRICAL CHARACTERISTICS

Rated voltage ($V_R$):
- 50 Vdc
- 63 Vdc
- 100 Vdc
- 250 Vdc
- 400 Vdc
- 630 Vdc

Rated temperature ($T_R$): +85 °C

Temperature derated voltage:
for temperatures between +85°C and the upper operating temperature (+105°C for wound technology and +125°C for stacked technology) 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: 1000 pF to 4.7 µF

Capacitance values:
E6 series (IEC 60063 Norm).

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

Total self-inductance (L): ≈8nH
(lead length ~2mm)

Dissipation factor (DF):
$tgδ$ 10⁻⁴ at +25°C *5°C

<table>
<thead>
<tr>
<th>kHz</th>
<th>$tgδ \times 10^4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>≤ 100</td>
</tr>
<tr>
<td>10</td>
<td>≤ 150</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 $V_R \geq 100$ Vdc

Performance
- For $V_R \leq 100$ Vdc
  - $\geq 3750$ MΩ for C ≤0.33µF (5000 MΩ)*
  - $\geq 1250$ S for C >0.33µF (5000 S)*
- For $V_R >100$ Vdc
  - $\geq 30000$ MΩ (50000 MΩ)*
  - *Typical value

Test voltage between terminals:
1.6$xV_R$ 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 ($\Delta tgδ$): ≤50x10⁻⁴ at 1kHz
- Insulation resistance: ≥50% of initial limit.

Endurance:

Test conditions
- Temperature: +105°C ±2°C
- Test duration: 2000 h
- Voltage applied: 1.25$xV_R$

Performance
- Capacitance change ($\Delta C/C$): ≤5%
- DF change ($\Delta tgδ$): ≤50 10⁻⁴ at 10kHz
- 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 ($\Delta tgδ$): ≤50x10⁻⁴ at 10kHz
- 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

RELIABILTY

Reference MIL HDB 217

Application conditions:
- Temperature: +40°C ±2°C
- Voltage: 0.5$xV_R$
- Failure rate: ≤2 FIT
  - (1 FIT = 1 10⁻⁹ failures/components h)
- Failure criteria:
  - (according to DIN 44122)
  - Short or open circuit
- Capacitance change ($\Delta C/C$): >10%
- DF change ($\Delta tgδ$): >2 x initial limit.
- Insulation resistance: <0.005 x initial limit.

09/2008
R66

MKT Series

MeTAllIZeD POlyeSTeR FIlM CAPACITOR

D.C. MulTIPuRPOSe APPlICATIONS

p = 7.5 mm

PRoDUCT CoDe: R66

MAX. VOLTAGE (Vr.m.s.) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)

Note: p (pitch) in mm.

Not for new design. Use new F611-F612 Series.
MAX. CURRENT (Ir.m.s.) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)

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Note: p (pitch) in mm.

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