

Loose

Taped

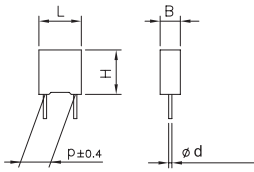
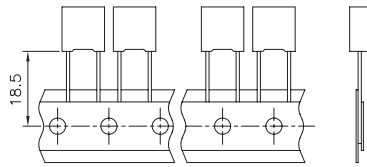


Fig.1 Fig.2



**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

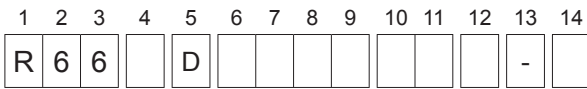
B	<3.5	≥4.0
Ød ±0.05	0.5	0.6

All dimensions are in mm.

Pitch (mm)	Box thickness (B) (mm)	Maximum dimensions (mm)		
		B max	H max	L max
7.5	All	B +0.1	H +0.1	L +0.2

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:

C = 50V D = 63V E = 100V

I = 250V M = 400V P = 630V

Digit 5 Pitch: D = 7.5 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 (table1)

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).

Standard packaging style	Lead length (mm)	Taping style	Ordering code (Digit 10 to 11)
		Figure No.	
AMMO-PACK		1	DQ
AMMO-PACK		2	Z8
Reel Ø 355 mm		1	CK
Loose, short leads	4 ⁺²		AA
Loose, long leads	17 ^{+1/-2}		Z3

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.

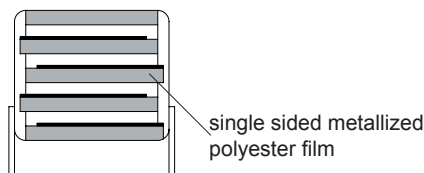
Climatic category: 55/105/56 IEC 60068-1

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



**METALLIZED POLYESTER FILM CAPACITOR
D.C. MULTIPURPOSE APPLICATIONS**

p = 7.5 mm

PRODUCT CODE: R66

STACKED VERSION

Rated Cap.	50Vdc/30Vac Std dimensions				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.68 μF	3.0	8.0	10.0	7.5	100	10 E3	R66CD3680--6--
1.0 μF	3.0	8.0	10.0	7.5	100	10 E3	R66CD4100--6--
1.5 μF	4.0	9.0	10.0	7.5	100	10 E3	R66CD4150--6--
2.2 μF	5.0	10.5	10.0	7.5	100	10 E3	R66CD4220--6--
4.7 μF	6.0	12.0	10.5	7.5	100	10 E3	R66CD4470--6--

Rated Cap.	63Vdc/40Vac Std dimensions				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.33 μF	3.0	8.0	10.0	7.5	120	15 E3	R66DD3330--7--
0.47 μF	3.0	8.0	10.0	7.5	120	15 E3	R66DD3470--6--
0.68 μF	4.0	9.0	10.0	7.5	120	15 E3	R66DD3680--7--
1.0 μF	4.0	9.0	10.0	7.5	120	15 E3	R66DD4100--7--
1.5 μF	5.0	10.5	10.0	7.5	120	15 E3	R66DD4150--7--
2.2 μF	6.0	12.0	10.5	7.5	120	15 E3	R66DD4220--6--
3.3 μF	6.0	12.0	10.5	7.5	120	15 E3	R66DD4330--6--

Rated Cap.	100Vdc/63Vac Std dimensions				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.068 μF	3.0	8.0	10.0	7.5	150	30 E3	R66ED2680--7--
0.10 μF	3.0	8.0	10.0	7.5	150	30 E3	R66ED3100--7--
0.15 μF	3.0	8.0	10.0	7.5	150	30 E3	R66ED3150--7--
0.22 μF	3.0	8.0	10.0	7.5	150	30 E3	R66ED3220--7--
0.33 μF	4.0	9.0	10.0	7.5	150	30 E3	R66ED3330--7--
0.47 μF	4.0	9.0	10.0	7.5	150	30 E3	R66ED3470--7--
0.68 μF	4.0	9.0	10.0	7.5	150	30 E3	R66ED3680--7--
1.0 μF	5.0	10.5	10.0	7.5	150	30 E3	R66ED4100--7--
1.5 μF	6.0	12.0	10.5	7.5	150	30 E3	R66ED4150--6--

Mechanical version and packaging (Table1) _____
 Internal use _____
 Tolerance: J (±5%); K (±10%); M (±20%) _____

Rated Cap.	250Vdc/160Vac Std dimensions				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.022 μF	3.0	8.0	10.0	7.5	200	100 E3	R66ID 2220--7--
0.033 μF	3.0	8.0	10.0	7.5	200	100 E3	R66ID 2330--7--
0.047 μF	3.0	8.0	10.0	7.5	200	100 E3	R66ID 2470--7--
0.068 μF	3.0	8.0	10.0	7.5	200	100 E3	R66ID 2680--6--
0.10 μF	4.0	9.0	10.0	7.5	200	100 E3	R66ID 3100--7--
0.15 μF	4.0	9.0	10.0	7.5	200	100 E3	R66ID 3150--7--
0.22 μF	5.0	10.5	10.0	7.5	200	100 E3	R66ID 3220--7--
0.33 μF	6.0	12.0	10.5	7.5	200	100 E3	R66ID 3330--6--

Rated Cap.	400Vdc/200Vac Std dimensions				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
6800 pF	3.0	8.0	10.0	7.5	275	220 E3	R66MD1680--7--
0.010 μF	3.0	8.0	10.0	7.5	275	220 E3	R66MD2100--7--
0.015 μF	3.0	8.0	10.0	7.5	275	220 E3	R66MD2150--7--
0.022 μF	3.0	8.0	10.0	7.5	275	220 E3	R66MD2220--6--
0.033 μF	4.0	9.0	10.0	7.5	275	220 E3	R66MD2330--7--
0.047 μF	4.0	9.0	10.0	7.5	275	220 E3	R66MD2470--7--
0.068 μF	5.0	10.5	10.0	7.5	275	220 E3	R66MD2680--7--
0.10 μF	6.0	12.0	10.5	7.5	275	220 E3	R66MD3100--6--
0.15 μF	6.0	12.0	10.5	7.5	275	220 E3	R66MD3150--6--

Mechanical version and packaging (Table1) _____
 Internal use _____
 Tolerance: J (±5%); K (±10%); M (±20%) _____

a) WOUND version

b) STACKED version

Rated Cap.	630Vdc/220Vac* Std dimensions				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
a) 1000 pF	3.0	8.0	10.0	7.5	40	50 E3	R66PD 1100--1--
a) 1500 pF	3.0	8.0	10.0	7.5	40	50 E3	R66PD1150--1--
a) 2200 pF	3.0	8.0	10.0	7.5	40	50 E3	R66PD 1220--1--
a) 3300 pF	3.0	8.0	10.0	7.5	40	50 E3	R66PD 1330--1--
a) 4700 pF	3.0	8.0	10.0	7.5	40	50 E3	R66PD 1470--1--
a) 6800 pF	4.0	9.0	10.0	7.5	40	50 E3	R66PD 1680--1--
b) 0.010 μF	4.0	9.0	10.0	7.5	300	378 E3	R66PD2100--7--
b) 0.015 μF	4.0	9.0	10.0	7.5	300	378 E3	R66PD2150--7--
b) 0.022 μF	5.0	10.5	10.0	7.5	300	378 E3	R66PD 2220--7--
b) 0.033 μF	6.0	12.0	10.5	7.5	300	378 E3	R66PD2330--6--
b) 0.047 μF	6.0	12.0	10.5	7.5	300	378 E3	R66PD 2470--6--

Mechanical version and packaging (Table1) _____
 Internal use _____
 Tolerance: J (±5%); K (±10%); M (±20%) _____

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_R/V.

The pulse characteristic K₀ depends on the voltage wave-form and in any case it cannot overcome the value given in the above table.

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

**METALLIZED POLYESTER FILM CAPACITOR
D.C. MULTIPURPOSE APPLICATIONS**

$p = 7.5 \text{ mm}$

PRODUCT CODE: R66

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):

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

Total self-inductance (L): $\approx 8\text{nH}$

(lead length $\sim 2\text{mm}$)

Dissipation factor (DF):

$\text{tg}\delta 10^{-4}$ at +25°C $\pm 5^\circ\text{C}$

kHz	$\text{tg}\delta \times 10^{-4}$
1	≤ 100
10	≤ 150

Insulation resistance:

Test conditions

Temperature: +25°C $\pm 5^\circ\text{C}$
Voltage charge time: 1 min
Voltage charge: 50 Vdc for $V_R < 100 \text{ Vdc}$
100 Vdc for $V_R \geq 100 \text{ Vdc}$

Performance

For $V_R \leq 100 \text{ Vdc}$

$\geq 3750 \text{ M}\Omega$ for $C \leq 0.33\mu\text{F}$ (5000 $\text{M}\Omega$)*
 $\geq 1250 \text{ s}$ for $C > 0.33\mu\text{F}$ (5000 s)*

For $V_R > 100 \text{ Vdc}$

$\geq 30000 \text{ M}\Omega$ (50000 $\text{M}\Omega$)*

*Typical value

Test voltage between terminals:

$1.6 \times V_R$ applied for 2 s at +25°C $\pm 5^\circ\text{C}$

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

Test conditions

Temperature: +40°C $\pm 2^\circ\text{C}$
Relative humidity (RH): 93% $\pm 2\%$
Test duration: 56 days

Performance

Capacitance change $|\Delta C/C|$: $\leq 5\%$
DF change ($\Delta \text{tg}\delta$): $\leq 50 \times 10^{-4}$ at 1kHz
Insulation resistance: $\geq 50\%$ of initial limit.

Endurance:

Test conditions

Temperature: +105°C $\pm 2^\circ\text{C}$
Test duration: 2000 h
Voltage applied: $1.25 \times V_C$

Performance

Capacitance change $|\Delta C/C|$: $\leq 5\%$
DF change ($\Delta \text{tg}\delta$): $\leq 50 \times 10^{-4}$ at 10kHz
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 $\pm 1 \text{ s}$

Performance

Capacitance change $|\Delta C/C|$: $\leq 2\%$
DF change ($\Delta \text{tg}\delta$): $\leq 50 \times 10^{-4}$ at 10kHz
Insulation resistance: \geq initial limit.

Long term stability (after two years):

Storage

standard environmental conditions (see page 12).

Performance

Capacitance change $|\Delta C/C|$: $\leq 3\%$ for $C \leq 0.1\mu\text{F}$
 $\leq 2\%$ for $C > 0.1\mu\text{F}$

RELIABILITY

Reference MIL HDB 217

Application conditions:

Temperature: +40°C $\pm 2^\circ\text{C}$
Voltage: $0.5 \times V_R$
Failure rate: $\leq 2 \text{ FIT}$
(1 FIT = 1×10^{-9} failures/components h)

Failure criteria:

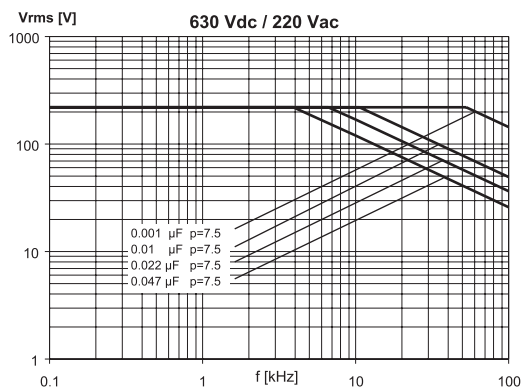
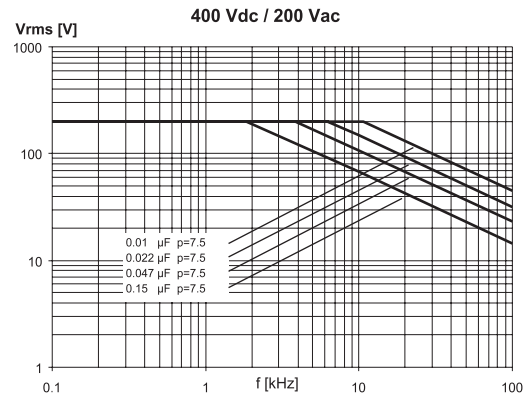
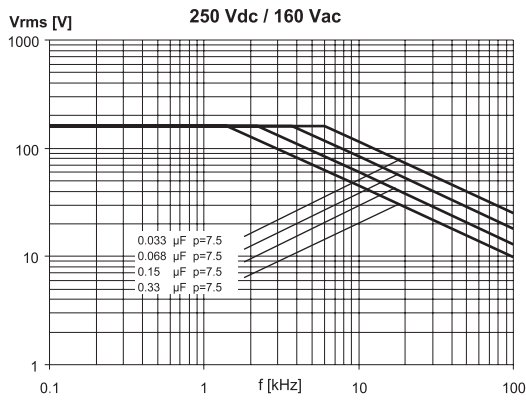
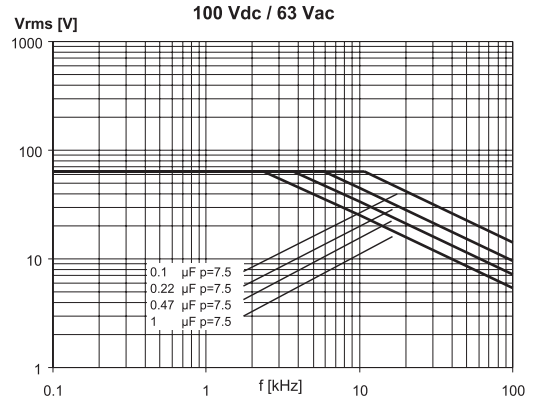
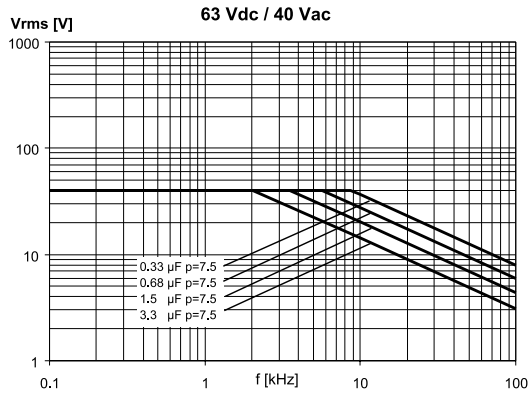
(according to DIN 44122)

Short or open circuit
Capacitance change $|\Delta C/C|$: $> 10\%$
DF change ($\Delta \text{tg}\delta$): $> 2 \times$ initial limit.
Insulation resistance: $< 0.005 \times$ initial limit.

**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)



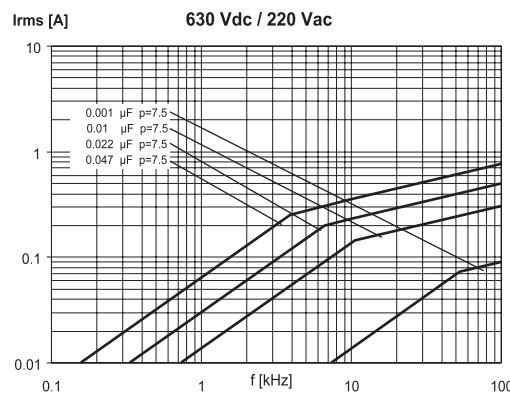
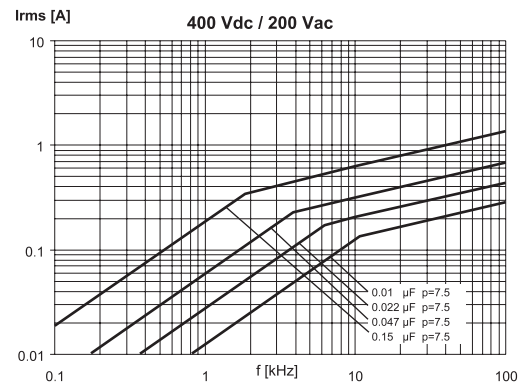
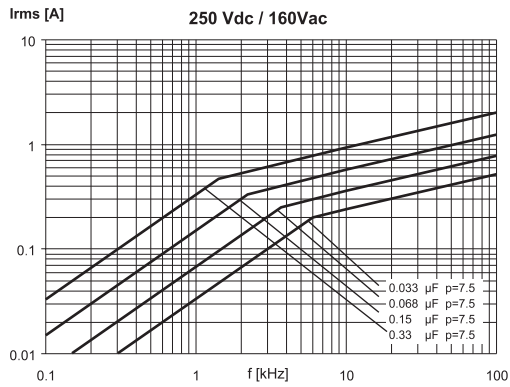
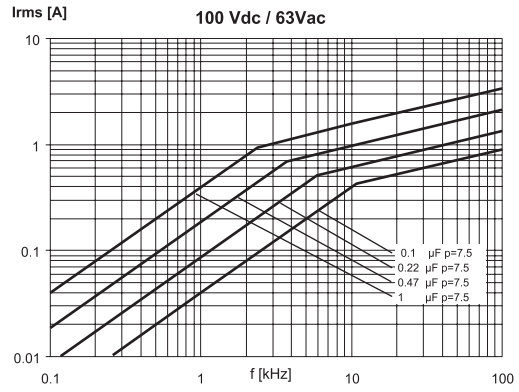
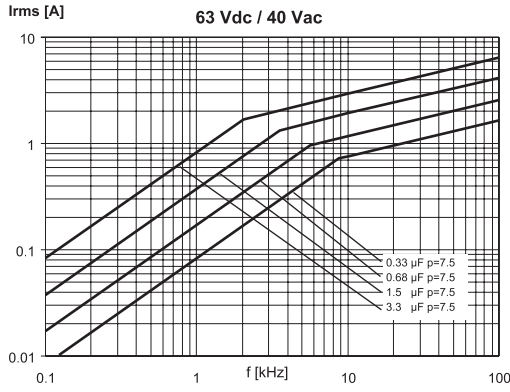
Note: p (pitch) in mm.

**METALLIZED POLYESTER FILM CAPACITOR
D.C. MULTIPURPOSE APPLICATIONS**

$p = 7.5 \text{ mm}$

PRODUCT CODE: **R66**

MAX. CURRENT ($I_{r.m.s.}$) VERSUS FREQUENCY (sinusoidal wave-form / $T_h \leq 40^\circ\text{C}$)



Note: p (pitch) in mm.