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**

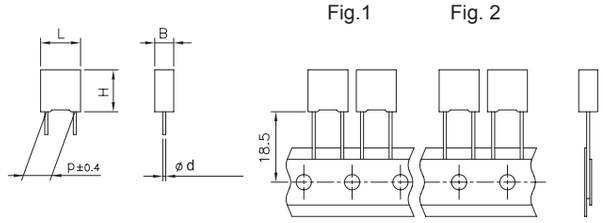
p = 7.5mm

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

For new design we suggest the use of the R66 series

Loose Taped

Fig.1 Fig. 2



B	<3.5	≥4.0
Ød ±0.05	0.5	0.6

All dimensions are in mm.

Pitch	Box thickness (B)	Maximum dimensions (mm)		
(mm)	(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:

1	2	3	4	5	6	7	8	9	10	11	12	13	14
R	6	6		D								-	

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%.

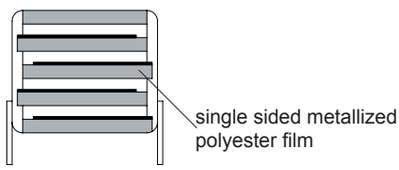
Table 1 (for more detailed information, please refer to page 14).

Standard packaging style	Lead length (mm)	Taping style Figure No.	Ordering code (Digit 10 to 11)
AMMO-PACK		1	DQ
AMMO-PACK		2	28
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



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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	Max K_0	Part Number
	B	H	L	p	(V/ µs)	(V^2/ µs)	
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--
3.3 µF	5.0	10.5	10.0	7.5	100	10 E3	R66CD4330--6--
4.7 µF	6.0	12.0	10.5	7.5	100	10 E3	R66CD4470--6--

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

Rated Cap.	100Vdc/63Vac Std dimensions				Max dv/dt	Max K_0	Part Number
	B	H	L	p	(V/ µs)	(V^2/ µs)	
0.068µF	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.	63Vdc/40Vac Std dimensions				Max dv/dt	Max K_0	Part Number
	B	H	L	p	(V/ µs)	(V^2/ µs)	
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--

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

Rated Cap.	250Vdc/160Vac Std dimensions				Max dv/dt	Max K_0	Part Number
	B	H	L	p	(V/ µs)	(V^2/ µs)	
0.022µF	3.0	8.0	10.0	7.5	200	100 E3	R66ID 2220--7--
0.033µF	3.0	8.0	10.0	7.5	200	100 E3	R66ID 2330--7--
0.047µF	3.0	8.0	10.0	7.5	200	100 E3	R66ID 2470--7--
0.068µF	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--

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

a) WOUND version

b) STACKED version

Rated Cap.	400Vdc/200Vac Std dimensions				Max dv/dt	Max K_0	Part Number
	B	H	L	p	(V/µs)	(V^2/µs)	
6800 pF	3.0	8.0	10.0	7.5	275	220 E3	R66MD1680--7--
0.010µF	3.0	8.0	10.0	7.5	275	220 E3	R66MD2100--7--
0.015µF	3.0	8.0	10.0	7.5	275	220 E3	R66MD2150--7--
0.022µF	3.0	8.0	10.0	7.5	275	220 E3	R66MD2220--6--
0.033µF	4.0	9.0	10.0	7.5	275	220 E3	R66MD2330--7--
0.047µF	4.0	9.0	10.0	7.5	275	220 E3	R66MD2470--7--
0.068µF	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%)

Rated Cap.	630Vdc/220Vac* Std dimensions				Max dv/dt	Max K_0	Part Number
	B	H	L	p	(V/µs)	(V^2/µs)	
a) 1000 pF	3.0	8.0	10.0	7.5	40	50 E3	R66PD1100--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	R66PD1220--1--
a) 3300 pF	3.0	8.0	10.0	7.5	40	50 E3	R66PD1330--1--
a) 4700 pF	3.0	8.0	10.0	7.5	40	50 E3	R66PD1470--1--
a) 6800 pF	4.0	9.0	10.0	7.5	40	50 E3	R66PD1680--1--
b) 0.010µF	4.0	9.0	10.0	7.5	300	378 E3	R66PD2100--7--
b) 0.015µF	4.0	9.0	10.0	7.5	300	378 E3	R66PD2150--7--
b) 0.022µF	5.0	10.5	10.0	7.5	300	378 E3	R66PD2220--7--
b) 0.033µF	6.0	12.0	10.5	7.5	300	378 E3	R66PD2330--6--
b) 0.047µF	6.0	12.0	10.5	7.5	300	378 E3	R66PD2470--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 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 151).

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METALLIZED POLYESTER FILM CAPACITOR D.C. MULTIPURPOSE APPLICATIONS

p = 7.5 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)**:**

± 5% (J); ±10% (K); ±20% (M).

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

Dissipation factor (DF):

tgd 10^{-4} at +25°C ”5°C

kHz	tgδ x 10^{-4}
1	≤ 100
10	≤ 150

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
≥3750 MΩ for C ≤0.33μF (5000 MΩ)*
≥1250 s for C >0.33μF (5000 s)*
For V_R >100 Vdc
≥30000MΩ (50000 MΩ)*
*Typical value

Test voltage between terminals:

1.6xV_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 |ΔC/C|: ≤5%
DF change (Δtgδ): ≤50x10^{-4} at 1kHz
Insulation resistance: ≥50% of initial limit.

Endurance:

Test conditions

Temperature: +105°C ±2°C
Test duration: 2000 h
Voltage applied: 1.25xV_C

Performance

Capacitance change |ΔC/C|: ≤5%
DF change (Δtgδ): ≤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 |ΔC/C|: ≤2%
DF change (Δtg): ≤50x10^{-4} at 10kHz
Insulation resistance: ≥ initial limit.

Long term stability (after two years)**:**

Storage

standard environmental conditions (see page 12).

Performance

Capacitance change |ΔC/C|: ≤3% for C≤0.1μF
≤2% for C>0.1μF

RELIABILITY

Reference MIL HDB 217

Application conditions:

Temperature: +40°C±2°C
Voltage: 0.5xV_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 |ΔC/C|: >10%
DF change (Δtgδ): >2 x initial limit.
Insulation resistance: <0.005 x initial limit.

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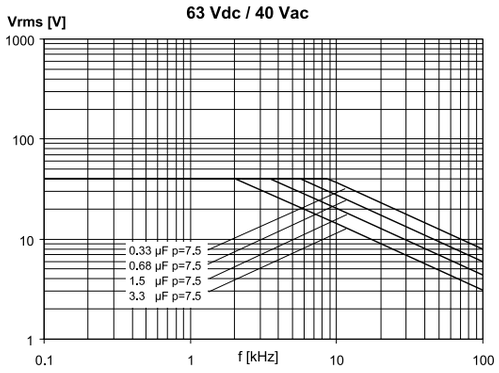
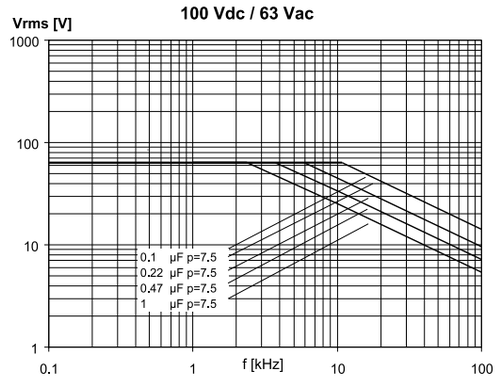
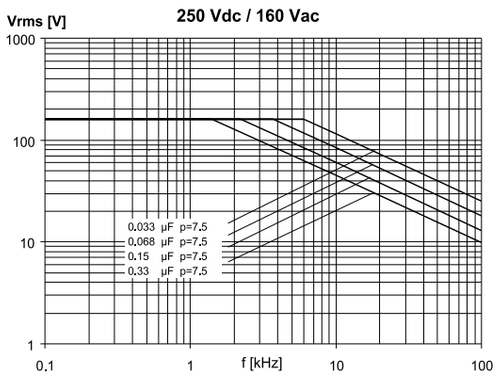
METALLIZED POLYESTER FILM CAPACITOR
D.C. MULTIPURPOSE APPLICATIONS

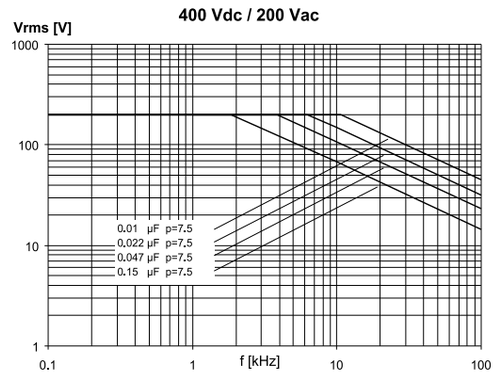
p = 7.5 mm
PRODUCT CODE: **R66**

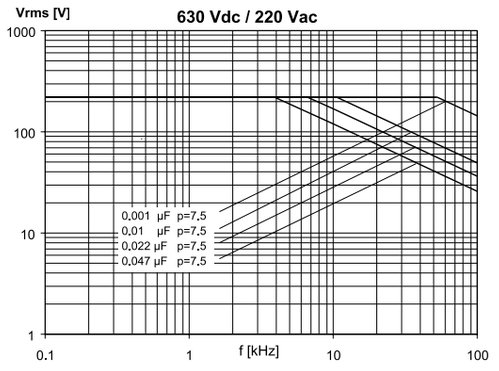
MAX. VOLTAGE (Vr.m.s.) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)











Note: p (pitch) in mm.

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D.C. MULTIPURPOSE APPLICATIONS

p = 7.5 mm
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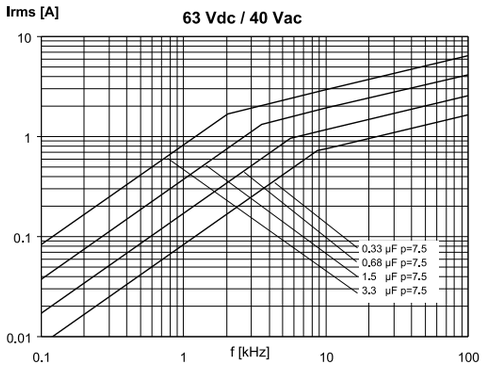
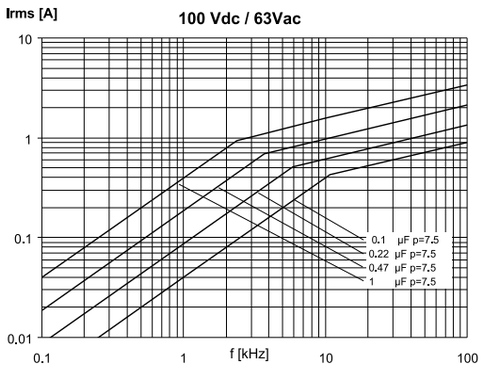
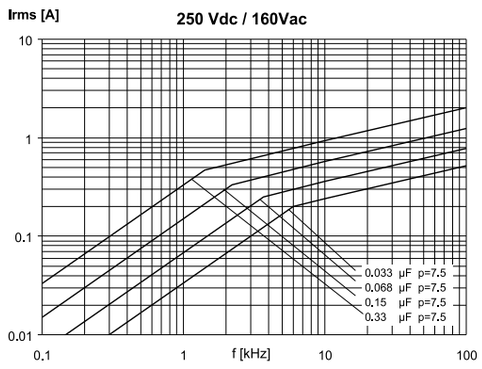
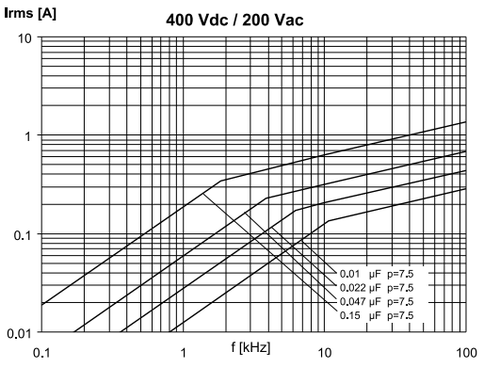
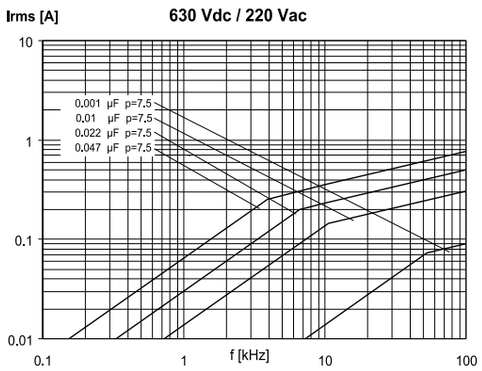
MAX. CURRENT (Ir.m.s.) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)











Note: p (pitch) in mm.