

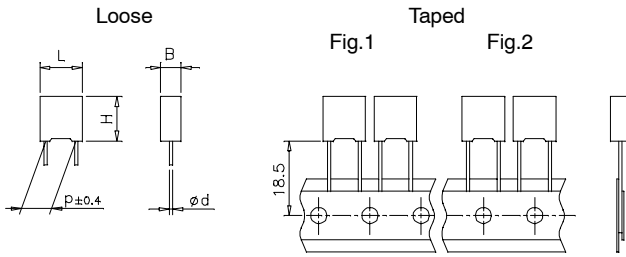
METALLIZED POLYESTER FILM CAPACITOR MINIATURE TYPE

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

PRODUCT CODE: **R66**

p = 7.5 mm

Construction:
STACKED and WOUND technology



B max	2.5	≥ 3.5
∅ d ± 0.05	0.5 to 0.6	0.6

All dimensions are in mm

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										-	

- Digit 1 to 3 Series code.
- Digit 4 d.c. rated voltage:
D = 63V E = 100V I = 250V
M = 400V P = 630V
- Digit 5 Pitch: D = 7.5mm
- 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%

GENERAL TECHNICAL DATA

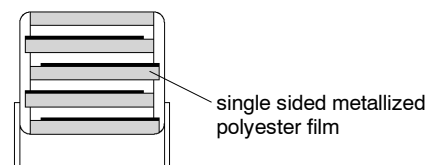
- Dielectric:** polyester film (polyethylene terephthalate).
- Plates:** aluminium layer deposited by evaporation under vacuum.
- Winding:** non-inductive type.
- Leads:** tinned wire.
- Protection:** plastic case, epoxy resin filled.
Box material is solvent resistant and flame retardant according to UL94 V0.
- Marking:** Manufacturer's logo, capacitance, tolerance, D.C. rated voltage.
- Climatic category:** 55/100/56 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 1000h.
- Related documents:** IEC 60384-2; CECC 30400
- Detail specifications:** CECC 30401-009

Table 1

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 ∅ 355mm		1	CK
Loose, short leads	4 +2		AA
Loose, long leads	17 +1/-2		Z3

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

Winding scheme



NEW

STACKED VERSION

Rated Cap.	63Vdc/40Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.33μF	2.5	7.0	10.0	7.5	120	15 E3	R66DD 3330--6--
0.47μF	3.0	8.0	10.0	7.5	120	15 E3	R66DD 3470--6--
0.68μF	3.5	8.5	10.5	7.5	120	15 E3	R66DD 3680--6--
1.0μF	4.0	9.0	10.5	7.5	120	15 E3	R66DD 4100--6--
1.5μF	5.0	11.0	10.5	7.5	120	15 E3	R66DD 4150--6--
2.2μF	6.0	12.0	10.5	7.5	120	15 E3	R66DD 4220--6--
3.3μF	6.0	12.0	10.5	7.5	120	15 E3	R66DD 4330--6--

Rated Cap.	100Vdc/63Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.068μF	2.5	7.0	10.0	7.5	150	30 E3	R66ED 2680--6--
0.10μF	2.5	7.0	10.0	7.5	150	30 E3	R66ED 3100--6--
0.15μF	2.5	7.0	10.0	7.5	150	30 E3	R66ED 3150--6--
0.22μF	2.5	7.0	10.0	7.5	150	30 E3	R66ED 3220--6--
0.33μF	3.5	8.5	10.5	7.5	150	30 E3	R66ED 3330--6--
0.47μF	3.5	8.5	10.5	7.5	150	30 E3	R66ED 3470--6--
0.68μF	4.0	9.0	10.5	7.5	150	30 E3	R66ED 3680--6--
1.0μF	5.0	11.0	10.5	7.5	150	30 E3	R66ED 4100--6--
1.5μF	6.0	12.0	10.5	7.5	150	30 E3	R66ED 4150--6--

Rated Cap.	250Vdc/160Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.022μF	2.5	7.0	10.0	7.5	200	100 E3	R66ID 2220--6--
0.033μF	2.5	7.0	10.0	7.5	200	100 E3	R66ID 2330--6--
0.047μF	2.5	7.0	10.0	7.5	200	100 E3	R66ID 2470--6--
0.068μF	3.0	8.0	10.0	7.5	200	100 E3	R66ID 2680--6--
0.10μF	3.5	8.5	10.5	7.5	200	100 E3	R66ID 3100--6--
0.15μF	4.0	9.0	10.5	7.5	200	100 E3	R66ID 3150--6--
0.22μF	5.0	11.0	10.5	7.5	200	100 E3	R66ID 3220--6--
0.33μF	6.0	12.0	10.5	7.5	200	100 E3	R66ID 3330--6--

Mechanical version and packaging (Table 1)
Internal use
Tolerance: J (± 5%); K (± 10%); M (± 20%)

Rated Cap.	400Vdc/200Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
6800pF	2.5	7.0	10.0	7.5	275	220 E3	R66MD1680--6--
0.010μF	2.5	7.0	10.0	7.5	275	220 E3	R66MD2100--6--
0.015μF	2.5	7.0	10.0	7.5	275	220 E3	R66MD2150--6--
0.022μF	3.0	8.0	10.0	7.5	275	220 E3	R66MD2220--6--
0.033μF	3.5	8.5	10.5	7.5	275	220 E3	R66MD2330--6--
0.047μF	4.0	9.0	10.5	7.5	275	220 E3	R66MD2470--6--
0.068μF	5.0	11.0	10.5	7.5	275	220 E3	R66MD2680--6--
0.10μF	6.0	12.0	10.5	7.5	275	220 E3	R66MD3100--6--
0.15μF	6.0	12.0	10.5	7.5	275	220 E3	R66MD3150--6--

Mechanical version and packaging (Table 1)
Internal use
Tolerance: J (± 5%); K (± 10%); M (± 20%)

Rated Cap.	630Vdc/220Vac*				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
1000pF	2.5	7.0	10.0	7.5	300	378 E3	R66PD 1100--6--
1500pF	2.5	7.0	10.0	7.5	300	378 E3	R66PD 1150--6--
2200pF	2.5	7.0	10.0	7.5	300	378 E3	R66PD 1220--6--
3300pF	2.5	7.0	10.0	7.5	300	378 E3	R66PD 1330--6--
4700pF	2.5	7.0	10.0	7.5	300	378 E3	R66PD 1470--6--
6800pF	3.0	8.0	10.0	7.5	300	378 E3	R66PD 1680--6--
0.010μF	3.5	8.5	10.5	7.5	300	378 E3	R66PD 2100--6--
0.015μF	4.0	9.0	10.5	7.5	300	378 E3	R66PD 2150--6--
0.022μF	5.0	11.0	10.5	7.5	300	378 E3	R66PD 2220--6--
0.033μF	6.0	12.0	10.5	7.5	300	378 E3	R66PD 2330--6--
0.047μF	6.0	12.0	10.5	7.5	300	378 E3	R66PD 2470--6--

Mechanical version and packaging (Table 1)
Internal use
Tolerance: K (± 10%); M (± 20%)

In progress C ≤ 6800pF @ 630Vdc

In progress

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.

**METALLIZED POLYESTER FILM CAPACITOR
MINIATURE TYPE**

p = 7.5 mm

PRODUCT CODE: R66

WOUND VERSION

Rated Cap.	63Vdc/40Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.10μF	2.5	7.0	10.0	7.5	5	0.63 E3	R66DD3100--0--
0.15μF	2.5	7.0	10.0	7.5	5	0.63 E3	R66DD3150--0--
0.22μF	3.5	8.5	10.5	7.5	5	0.63 E3	R66DD3220--0--
0.33μF	3.5	8.5	10.5	7.5	5	0.63 E3	R66DD3330--0--
0.47μF	4.0	9.0	10.5	7.5	5	0.63 E3	R66DD3470--0--
0.68μF	5.0	11.0	10.5	7.5	5	0.63 E3	R66DD3680--0--
1.0μF	6.0	12.0	10.5	7.5	5	0.63 E3	R66DD4100--0--

Rated Cap.	100Vdc/63Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.047μF	2.5	7.0	10.0	7.5	6	1.2 E3	R66ED 2470--0--
0.068μF	2.5	7.0	10.0	7.5	6	1.2 E3	R66ED 2680--0--
0.10μF	3.5	8.5	10.5	7.5	6	1.2 E3	R66ED 3100--0--
0.15μF	3.5	8.5	10.5	7.5	6	1.2 E3	R66ED 3150--0--
0.22μF	3.5	8.5	10.5	7.5	6	1.2 E3	R66ED 3220--0--
0.33μF	5.0	11.0	10.5	7.5	6	1.2 E3	R66ED 3330--0--
0.47μF	6.0	12.0	10.5	7.5	6	1.2 E3	R66ED 3470--0--

Rated Cap.	250Vdc/160Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.015μF	2.5	7.0	10.0	7.5	15	7.5 E3	R66ID 2150--0--
0.022μF	2.5	7.0	10.0	7.5	15	7.5 E3	R66ID 2220--0--
0.033μF	2.5	7.0	10.0	7.5	15	7.5 E3	R66ID 2330--0--
0.047μF	3.5	8.5	10.5	7.5	15	7.5 E3	R66ID 2470--0--
0.068μF	3.5	8.5	10.5	7.5	15	7.5 E3	R66ID 2680--0--
0.10μF	4.0	9.0	10.5	7.5	15	7.5 E3	R66ID 3100--0--
0.15μF	5.0	11.0	10.5	7.5	15	7.5 E3	R66ID 3150--0--
0.22μF	6.0	12.0	10.5	7.5	15	7.5 E3	R66ID 3220--0--

Mechanical version and packaging (Table 1) _____
 Internal use _____
 Tolerance: J (± 5%); K (± 10%); M (± 20%) _____

Rated Cap.	400Vdc/200Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
3300pF	2.5	7.0	10.0	7.5	30	24 E3	R66MD1330--0--
4700pF	2.5	7.0	10.0	7.5	30	24 E3	R66MD1470--0--
6800pF	2.5	7.0	10.0	7.5	30	24 E3	R66MD1680--0--
0.010μF	2.5	7.0	10.0	7.5	30	24 E3	R66MD2100--0--
0.015μF	3.5	8.5	10.5	7.5	30	24 E3	R66MD2150--0--
0.022μF	3.5	8.5	10.5	7.5	30	24 E3	R66MD2220--0--
0.033μF	4.0	9.0	10.5	7.5	30	24 E3	R66MD2330--0--
0.047μF	5.0	11.0	10.5	7.5	30	24 E3	R66MD2470--0--
0.068μF	5.0	11.0	10.5	7.5	30	24 E3	R66MD2680--0--
0.10μF	6.0	12.0	10.5	7.5	30	24 E3	R66MD3100--0--

Rated Cap.	630Vdc/220Vac*				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
1000pF	2.5	7.0	10.0	7.5	40	50 E3	R66PD 1100--0--
1500pF	2.5	7.0	10.0	7.5	40	50 E3	R66PD 1150--0--
2200pF	2.5	7.0	10.0	7.5	40	50 E3	R66PD 1220--0--
3300pF	3.5	8.5	10.5	7.5	40	50 E3	R66PD 1330--0--
4700pF	3.5	8.5	10.5	7.5	40	50 E3	R66PD 1470--0--
6800pF	3.5	8.5	10.5	7.5	40	50 E3	R66PD 1680--0--
0.010μF	4.0	9.0	10.5	7.5	40	50 E3	R66PD 2100--0--
0.015μF	5.0	11.0	10.5	7.5	40	50 E3	R66PD 2150--0--
0.022μF	6.0	12.0	10.5	7.5	40	50 E3	R66PD 2220--0--

Mechanical version and packaging (Table 1) _____
 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 across-the-line applications. Please refer to Interference Suppression Capacitors.

ELECTRICAL CHARACTERISTICS

Rated voltage (V_R): 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 has to be applied.

Capacitance range: 1000pF to 3.3μF

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):
 $tg\delta \times 10^{-4}$ at +25°C ±5°C

kHz	$tg\delta \times 10^{-4}$
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 $V_R \geq 100$ Vdc

Performance

For $V_R \leq 100$ Vdc

≥ 3750 MΩ for $C \leq 0.33\mu F$ (5000 MΩ)*

≥ 1250 s for $C > 0.33\mu F$ (5000 s)*

For $V_R > 100$ Vdc

≥ 30000MΩ (50000 MΩ)*

*Typical value

Test voltage between terminals:

1.6 × V_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 ($\Delta tg\delta$): ≤50 × 10⁻⁴ at 1kHz

Insulation resistance: ≥50% of initial limit.

Endurance:

Test conditions

Temperature: +100°C ±2°C

Test duration: 2000 h

Voltage applied: 1.25 × V_C

Performance

Capacitance change $|\Delta C/C|$: ≤5%

DF change ($\Delta tg\delta$): ≤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 ($\Delta tg\delta$): ≤50 × 10⁻⁴ at 10kHz

Insulation resistance: ≥ initial limit.

Long term stability (after two years):

Storage

standard environmental conditions (see page 10).

Performance

Capacitance change $|\Delta C/C|$: ≤3% for $C \leq 0.1\mu F$

≤2% for $C > 0.1\mu F$

RELIABILITY

Reference MIL HDB 217

Application conditions:

Temperature: +40°C ±2°C

Voltage: 0.5 × V_R

Failure rate: ≤2 FIT

(1 FIT = 1 × 10⁻⁹ failures/components × h)

Failure criteria:

(according to DIN 44122)

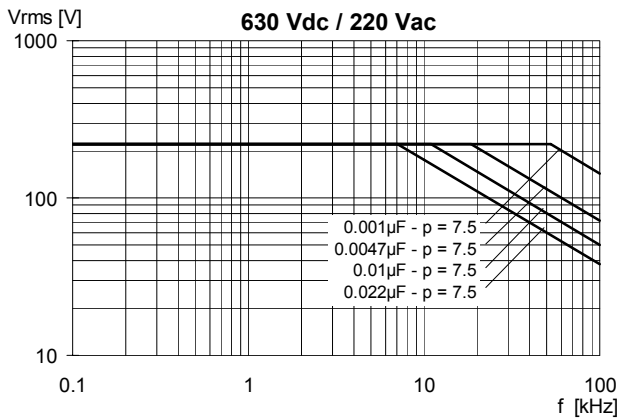
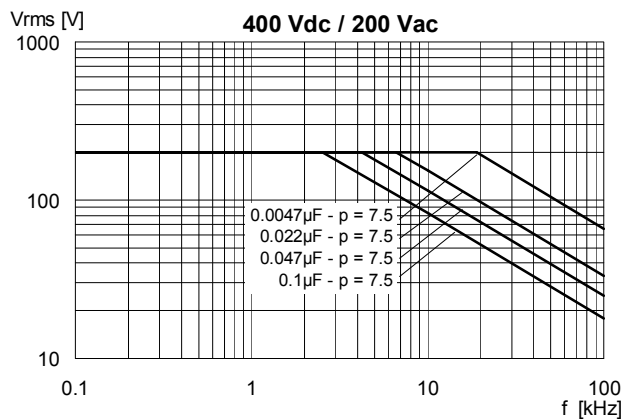
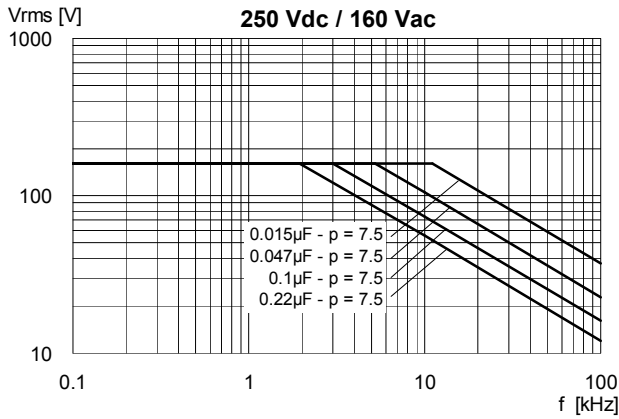
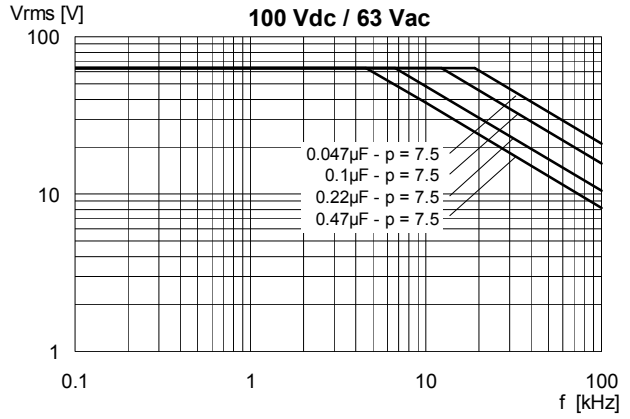
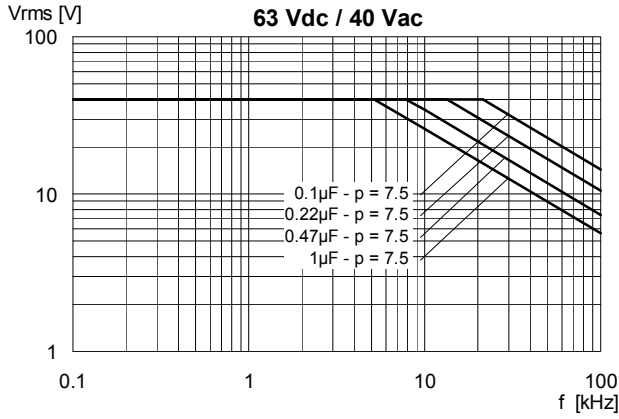
Short or open circuit

Capacitance change $|\Delta C/C|$: >10%

DF change ($\Delta tg\delta$): >2 × initial limit.

Insulation resistance: <0.005 × initial limit.

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



Note: p (pitch) in mm.