

B	≤ 3.5	> 3.5
Ø d ± 0.05	0.5	0.6

All dimensions are in mm

METALLIZED POLYESTER FILM CAPACITOR MULTIPURPOSE APPLICATIONS

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

For inverter applications please refer to RSB.

PRODUCT CODE: **R82**

p = 5 mm

Construction:

- **STACKED technology** for Rated Voltage from 50 to 400Vdc.
- **WOUND technology** for Rated Voltage @ 50Vdc for size 7.2x13.0x7.2 mm only.

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	8	2										-	

Digit 1 to 3 Series code.

Digit 4 d.c. rated voltage:

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

I = 250V M = 400V

Digit 5 Pitch: C = 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, thermosetting 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

Related documents: IEC 60384-2

Winding scheme

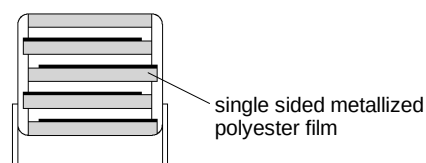


Table1 (for more detailed information please refer to page 15)

Standard packaging style	Lead length (mm)	Ordering code (Digit 10 to 11)
AMMO-PACK		DQ
REEL Ø 355mm		CK
Loose, short leads	4 +1.5	AA
Loose, long leads	17 +1/-2	Z3

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

a) STACKED technology

b) WOUND technology

Rated Cap.	50Vdc/30Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
a) 2.2μF	B 6.0	H 11.0	L 7.2	p 5.0	100	10 E3	R82CC4220--7--
b) 3.3μF	7.2	13.0	7.2	5.0	25	2.5 E3	R82CC4330--3--
b) 4.7μF	7.2	13.0	7.2	5.0	25	2.5 E3	R82CC4470--3--

Mechanical version and packaging (Table 1)

Internal use

Tolerance: J (± 5%); K (± 10%); M (± 20%)

STACKED technology

Rated Cap.	63Vdc/40Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
0.10μF	B 2.5	H 6.5	L 7.2	p 5.0	160	20 E3	R82DC3100--5--
0.15μF	2.5	6.5	7.2	5.0	160	20 E3	R82DC3150--6--
0.22μF	2.5	6.5	7.2	5.0	160	20 E3	R82DC3220--6--
0.33μF	3.5	7.5	7.2	5.0	160	20 E3	R82DC3330--6--
0.47μF	3.5	7.5	7.2	5.0	160	20 E3	R82DC3470--6--
0.68μF	4.5	9.5	7.2	5.0	160	20 E3	R82DC3680--6--
1.0μF	5.0	10.0	7.2	5.0	160	20 E3	R82DC4100--6--
1.5μF	6.0	11.0	7.2	5.0	160	20 E3	R82DC4150--6--

Rated Cap.	100Vdc/63Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
1000pF	B 2.5	H 6.5	L 7.2	p 5.0	200	40 E3	R82EC1100--5--
1500pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC1150--5--
2200pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC1220--5--
3300pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC1330--5--
4700pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC1470--5--
6800pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC1680--5--
0.010μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC2100--5--
0.015μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC2150--5--
0.022μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC2220--5--
0.033μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC2330--5--
0.047μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC2470--6--
0.068μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC2680--6--
0.10μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC3100--7--
0.15μF	3.5	7.5	7.2	5.0	200	40 E3	R82EC3150--7--
0.22μF	3.5	7.5	7.2	5.0	200	40 E3	R82EC3220--7--
0.33μF	4.5	9.5	7.2	5.0	200	40 E3	R82EC3330--7--
0.47μF	4.5	9.5	7.2	5.0	200	40 E3	R82EC3470--7--
0.68μF	5.0	10.0	7.2	5.0	200	40 E3	R82EC3680--7--
1.0μF	6.0	11.0	7.2	5.0	200	40 E3	R82EC4100--7--

Mechanical version and packaging (Table 1)

Internal use

Tolerance: J (± 5%); K (± 10%); M (± 20%)

Rated Cap.	250Vdc/160Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
6800pF	B 2.5	H 6.5	L 7.2	p 5.0	250	125 E3	R82IC1680--5--
0.010μF	2.5	6.5	7.2	5.0	250	125 E3	R82IC2100--5--
0.015μF	2.5	6.5	7.2	5.0	250	125 E3	R82IC2150--5--
0.022μF	3.5	7.5	7.2	5.0	250	125 E3	R82IC2220--5--
0.033μF	3.5	7.5	7.2	5.0	250	125 E3	R82IC2330--5--
0.047μF	4.5	9.5	7.2	5.0	250	125 E3	R82IC2470--5--
0.068μF	4.5	9.5	7.2	5.0	250	125 E3	R82IC2680--5--
0.10μF	5.0	10.0	7.2	5.0	250	125 E3	R82IC3100--55-
0.10μF	6.0	11.0	7.2	5.0	250	125 E3	R82IC3100--5--
0.15μF	6.0	11.0	7.2	5.0	250	125 E3	R82IC3150--5--
0.22μF	6.0	11.0	7.2	5.0	250	125 E3	R82IC3220--6--

Rated Cap.	400Vdc/200Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
1000pF	B 2.5	H 6.5	L 7.2	p 5.0	400	320 E3	R82MC1100--5--
1500pF	2.5	6.5	7.2	5.0	400	320 E3	R82MC1150--5--
2200pF	2.5	6.5	7.2	5.0	400	320 E3	R82MC1220--5--
3300pF	2.5	6.5	7.2	5.0	400	320 E3	R82MC1330--5--
4700pF	2.5	6.5	7.2	5.0	400	320 E3	R82MC1470--5--
6800pF	3.5	7.5	7.2	5.0	400	320 E3	R82MC1680--5--
0.010μF	3.5	7.5	7.2	5.0	400	320 E3	R82MC2100--5--
0.015μF	4.5	9.5	7.2	5.0	400	320 E3	R82MC2150--5--
0.022μF	4.5	9.5	7.2	5.0	400	320 E3	R82MC2220--5--
0.033μF	5.0	10.0	7.2	5.0	400	320 E3	R82MC2330--5--
0.047μF	6.0	11.0	7.2	5.0	400	320 E3	R82MC2470--5--
0.068μF	6.0	11.0	7.2	5.0	400	320 E3	R82MC2680--5--

Mechanical version and packaging (Table 1)

Internal use

Tolerance: J (± 5%); K (± 10%); M (± 20%)

All dimensions are in mm.

Note 1: 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.

ELECTRICAL CHARACTERISTICS

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

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 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

(lead length ~2mm)

Dissipation factor (DF):

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

kHz	$C \leq 0.1\mu\text{F}$	$C > 0.1\mu\text{F}$
1	≤ 80	≤ 80
10	≤ 120	≤ 120
100	≤ 250	

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

≥ 15000MΩ for $C \leq 0.33\mu\text{F}$

≥ 5000 s for $C > 0.33\mu\text{F}$ and $\leq 1\mu\text{F}$

≥ 1000 s for $C > 1\mu\text{F}$

For $V_R > 100$ Vdc

≥ 30000MΩ

Test voltage between terminals:

$1.4 \times V_R$ 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 ($\Delta \text{tg}\delta$): ≤ 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: $1.25 \times V_C$

Performance

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

DF change ($\Delta \text{tg}\delta$): ≤ 30×10^{-4} at 10kHz for $C \leq 1\mu\text{F}$
≤ 20×10^{-4} at 1kHz for $C > 1\mu\text{F}$

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 ($\Delta \text{tg}\delta$): ≤ 30×10^{-4} at 10kHz for $C \leq 1\mu\text{F}$
≤ 20×10^{-4} at 1kHz for $C > 1\mu\text{F}$

Insulation resistance: ≥ initial limit.

Long term stability (after two years):

Storage

standard environmental conditions (see page 11).

Performance

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

RELIABILITY

Reference MIL HDB 217

Application conditions:

Temperature: +40°C ± 2°C

Voltage: $0.5 \times V_R$

Failure rate: ≤ 1 FIT

(1 FIT = 1×10^{-9} failures/components × h)

Failure criteria:

(according to DIN 44122)

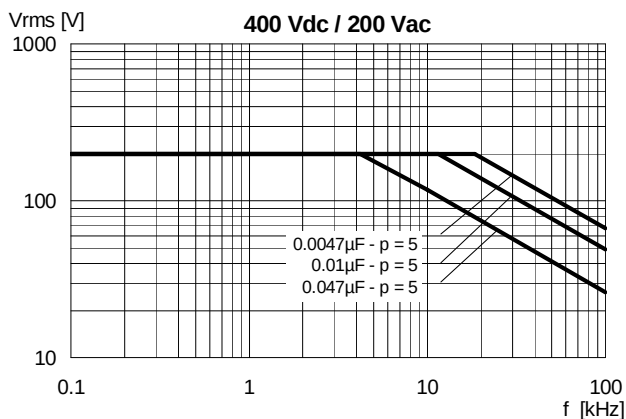
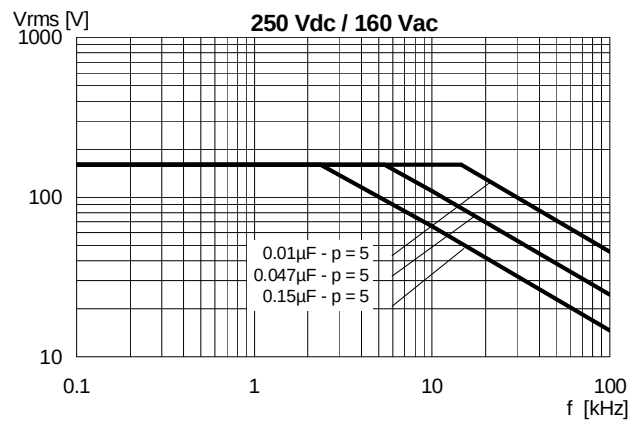
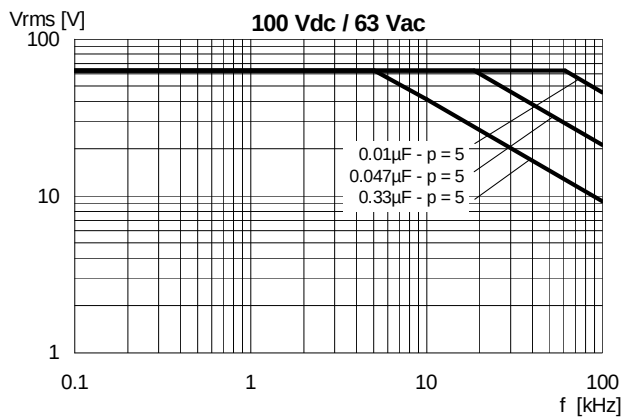
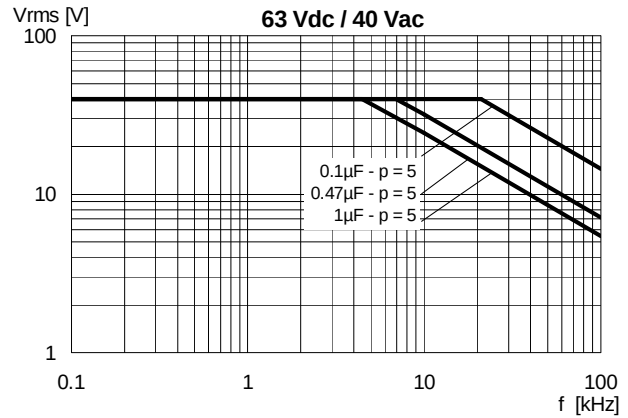
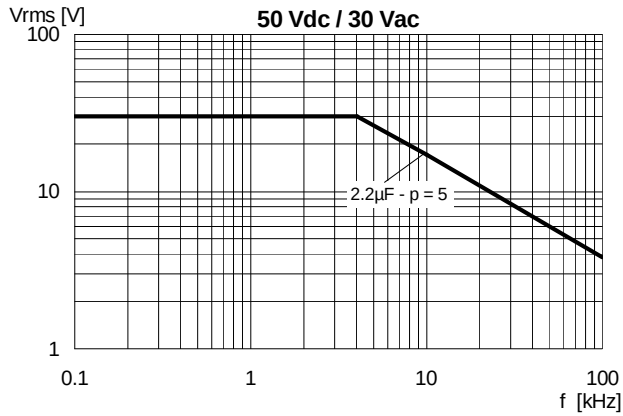
Short or open circuit

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

DF change ($\Delta \text{tg}\delta$): > 2 × 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.