

All dimensions are in mm.

B	≤6	>6
Ød ±0.05	0.5	0.6

METALLIZED POLYESTER FILM CAPACITOR D.C. MULTIPURPOSE APPLICATIONS

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

For inverter applications please refer to RSB Series.

PRODUCT CODE: **R82**

p = 5mm

Pitch	Box thickness (B)	Maximum dimensions (mm)		
(mm)	(mm)	B max	H max	L max
5.0	<4.5	B +0.1	H +0.1	L +0.2
5.0	≥4.5	B +0.1	H +0.1	L +0.3

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		C								-	

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 = 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 (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.

Marking: Capacitance, tolerance, D.C. rated voltage.

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

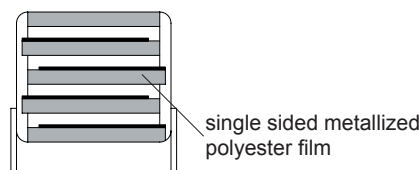
Operating temperature range: -55 to +105°C

Related documents: IEC 60384-2

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

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

Winding scheme



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

p = 5 mm

PRODUCT CODE: R82

- a) STACKED version
b) WOUND version

Rated Cap.	50Vdc/30Vac Std dimensions				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
a) 2.2 μF	6.0	11.0	7.2	5.0	100	10.0 E3	R82CC4220--7--
b) 3.3 μF	7.2	13.0	7.2	5.0	25	2.5 E3	R82CC4330--3--
b) 4.7 μF	7.2	13.0	7.2	5.0	25	2.5 E3	R82CC4470--3--

Mechanical version and packaging (Table1)

Internal use

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

STACKED version

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

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

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.

Rated Cap.	250Vdc/140Vac REDUCED SIZES Std dimensions				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
0.022 μF	2.5	6.5	7.2	5.0	130	65 E3	R82IC2220--6--
0.047 μF	3.5	7.5	7.2	5.0	130	65 E3	R82IC2470--6--
0.068 μF	3.5	7.5	7.2	5.0	130	65 E3	R82IC2680--6--
0.10 μF	4.5	9.5	7.2	5.0	130	65 E3	R82IC3100--6--
0.15 μF	5.0	10.0	7.2	5.0	130	65 E3	R82IC3150--6--
0.22 μF	6.0	11.0	7.2	5.0	130	65 E3	R82IC3220--6--

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

Rated Cap.	400Vdc/160Vac REDUCED SIZES Std dimensions				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
6800 pF	2.5	6.5	7.2	5.0	200	160 E3	R82MC1680--6--
0.015 μF	3.5	7.5	7.2	5.0	200	160 E3	R82MC2150--6--
0.033 μF	4.5	9.5	7.2	5.0	200	160 E3	R82MC2330--6--
0.047 μF	5.0	10.0	7.2	5.0	200	160 E3	R82MC2470--6--
0.068 μF	6.0	11.0	7.2	5.0	200	160 E3	R82MC2680--6--

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

Mechanical version and packaging (Table1)

Internal use

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

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

p = 5 mm

PRODUCT CODE: R82

ELECTRICAL CHARACTERISTICS

Rated voltage (V_R):

50 Vdc 63 Vdc 100 Vdc
250 Vdc 400 Vdc

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 (d.c. and a.c.) 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

max 1 nH per 1 mm lead and capacitor length.

Dissipation factor (DF):

tgδ 10⁻⁴ at +25°C ±5°C

kHz	C ≤ 0.1μF	C > 0.1μF
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

≥ 15000 MΩ for C ≤ 0.33μF

≥ 5000 s for C > 0.33μF and ≤ 1μF

≥ 1000 s for C > 1μF

For $V_R > 100$ Vdc

≥ 30000 MΩ

*Typical value

Test voltage between terminations:

1.4x 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 ($\Delta \text{tg}\delta$): ≤ 50x10⁻⁴ at 1kHz

Insulation resistance: ≥ 50% of initial limit.

Endurance:

Test conditions

Temperature: +105°C ±2°C

Test duration: 2000 h

Voltage applied: 1.25x V_C

Performance

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

DF change ($\Delta \text{tg}\delta$): ≤ 30x10⁻⁴ at 10kHz for C≤1μF
≤ 20x10⁻⁴ at 1kHz for C>1μF

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 ($\Delta \text{tg}\delta$): ≤ 30x10⁻⁴ at 10kHz for C≤ 1μF
≤ 20x10⁻⁴ at 1kHz for C> 1μF

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

RELIABILITY:

Reference MIL HDB 217

Application conditions:

Temperature: +40°C±2°C

Voltage: 0.5x V_R

Failure rate: ≤ 1 FIT

(1 FIT = 1x10⁻⁹ failures/components x h)

Failure criteria:

(according to DIN 44122)

Short or open circuit

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

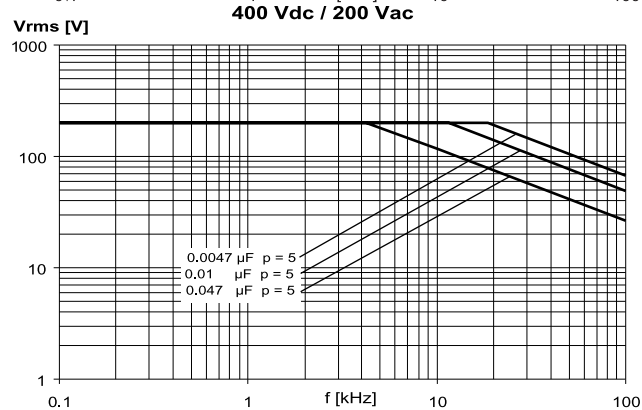
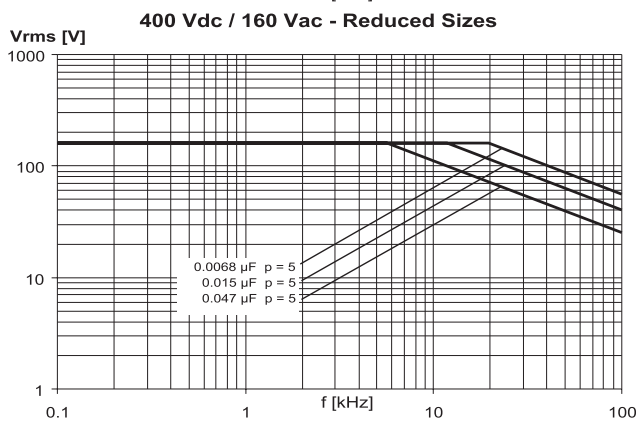
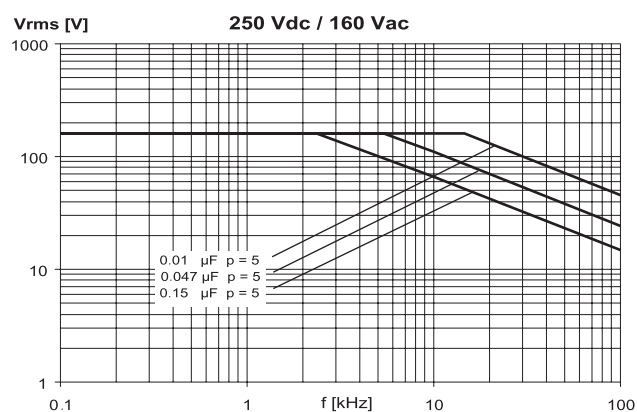
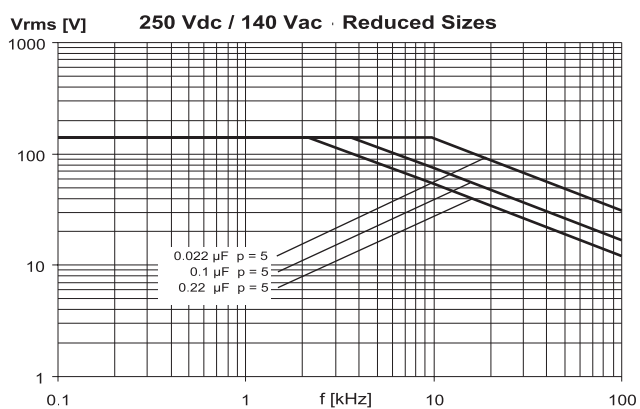
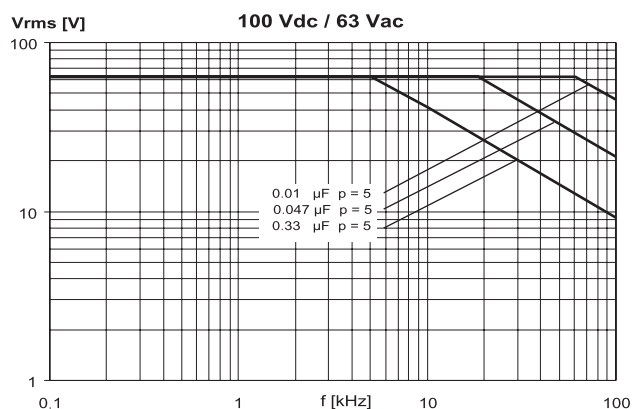
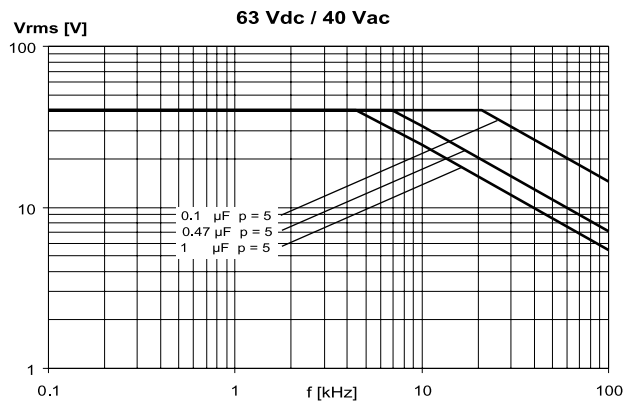
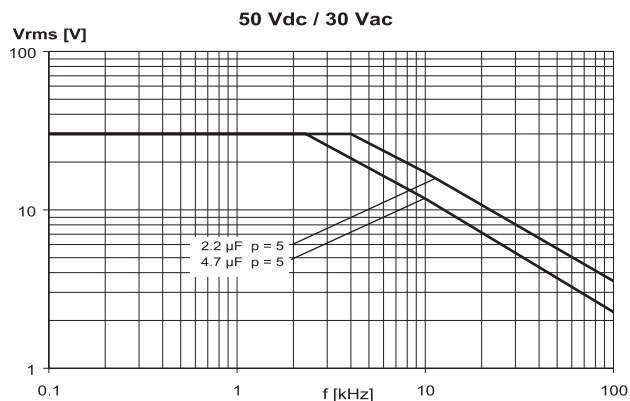
DF change ($\Delta \text{tg}\delta$): > 2 x initial limit.

Insulation resistance: < 0.005 x initial limit.

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

p = 5 mm

PRODUCT CODE: R82

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


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

p = 5 mm

PRODUCT CODE: **R82**

MAX. CURRENT (I_{r.m.s.}) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)

