

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.

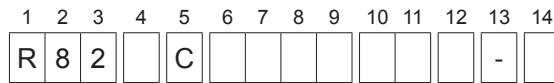
PRODUCT CODE: **R82**

p = 5mm

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



- 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 (table1)
- Digit 12 Identifies the dimensions and electrical characteristics.
- Digit 13 Internal use
- Digit 14 Capacitance tolerance:
J=5%; K=10%; M=20%.

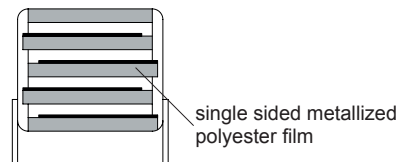
Table 1 (for more detailed information, please refer to page 14).

Standard packaging style	Lead length (mm)	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

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

Winding scheme



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

- a) STACKED version
b) WOUND version

p = 5 mm
PRODUCT CODE: R82

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

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

STACKED version

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

Rated Cap.	100Vdc/63Vac Std dimensions				Max dv/dt (V/ μ s)	Max K ₀ (V ² / μ s)	Part Number
	B	H	L	p			
1000 pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1100--5--
1500 pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1150--5--
2200 pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1220--5--
3300 pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1330--5--
4700 pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1470--5--
6800 pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1680--5--
0.010 μ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2100--5--
0.015 μ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2150--5--
0.022 μ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2220--5--
0.033 μ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2330--5--
0.047 μ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2470--6--
0.068 μ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2680--6--
0.10 μ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 3100--7--
0.15 μ F	3.5	7.5	7.2	5.0	200	40 E3	R82EC 3150--7--
0.22 μ F	3.5	7.5	7.2	5.0	200	40 E3	R82EC 3220--7--
0.33 μ F	4.5	9.5	7.2	5.0	200	40 E3	R82EC 3330--7--
0.47 μ F	4.5	9.5	7.2	5.0	200	40 E3	R82EC 3470--7--
0.68 μ F	5.0	10.0	7.2	5.0	200	40 E3	R82EC 3680--7--
1.0 μ F	6.0	11.0	7.2	5.0	200	40 E3	R82EC 4100--7--

Mechanical version and packaging (Table1) _____
Internal use _____
Tolerance: J (\pm 5%); K (\pm 10%); M (\pm 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/ μ s)	Max K ₀ (V ² / μ s)	Part Number
	B	H	L	p			
0.022 μ F	2.5	6.5	7.2	5.0	130	65 E3	R82IC 2220--6--
0.047 μ F	3.5	7.5	7.2	5.0	130	65 E3	R82IC 2470--6--
0.068 μ F	3.5	7.5	7.2	5.0	130	65 E3	R82IC 2680--6--
0.10 μ F	4.5	9.5	7.2	5.0	130	65 E3	R82IC 3100--6--
0.15 μ F	5.0	10.0	7.2	5.0	130	65 E3	R82IC 3150--6--
0.22 μ F	6.0	11.0	7.2	5.0	130	65 E3	R82IC 3220--6--

Rated Cap.	250Vdc/160Vac Std dimensions				Max dv/dt (V/ μ s)	Max K ₀ (V ² / μ s)	Part Number
	B	H	L	p			
6800 pF	2.5	6.5	7.2	5.0	250	125 E3	R82IC 1680--5--
0.010 μ F	2.5	6.5	7.2	5.0	250	125 E3	R82IC 2100--5--
0.015 μ F	2.5	6.5	7.2	5.0	250	125 E3	R82IC 2150--5--
0.022 μ F	3.5	7.5	7.2	5.0	250	125 E3	R82IC 2220--5--
0.033 μ F	3.5	7.5	7.2	5.0	250	125 E3	R82IC 2330--5--
0.047 μ F	4.5	9.5	7.2	5.0	250	125 E3	R82IC 2470--5--
0.068 μ F	4.5	9.5	7.2	5.0	250	125 E3	R82IC 2680--5--
0.10 μ F	5.0	10.0	7.2	5.0	250	125 E3	R82IC 3100--55--
0.15 μ F	6.0	11.0	7.2	5.0	250	125 E3	R82IC 3150--55--

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

Rated Cap.	400Vdc/200Vac Std dimensions				Max dv/dt (V/ μ s)	Max K ₀ (V ² / μ s)	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 μ F	3.5	7.5	7.2	5.0	400	320 E3	R82MC2100--5--
0.015 μ F	4.5	9.5	7.2	5.0	400	320 E3	R82MC2150--5--
0.022 μ F	4.5	9.5	7.2	5.0	400	320 E3	R82MC2220--5--
0.033 μ F	5.0	10.0	7.2	5.0	400	320 E3	R82MC2330--5--
0.047 μ F	6.0	11.0	7.2	5.0	400	320 E3	R82MC2470--5--

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

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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 $V_R ≥ 100$ Vdc

Performance

For $V_R ≤ 100$ 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.

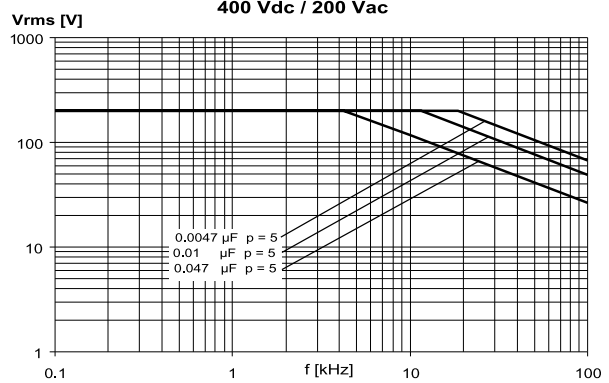
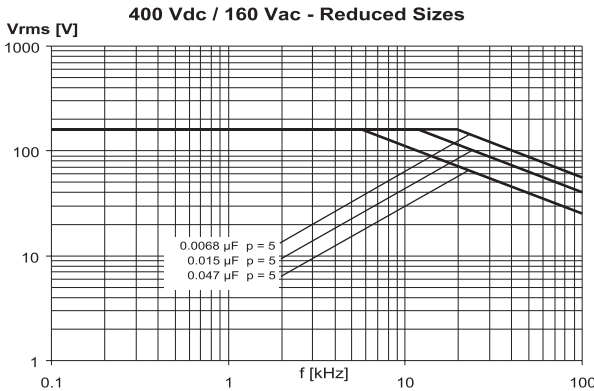
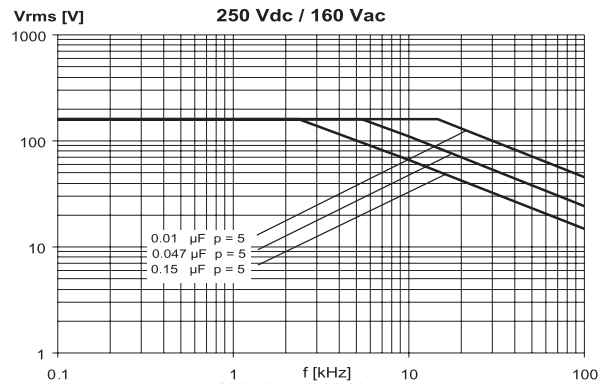
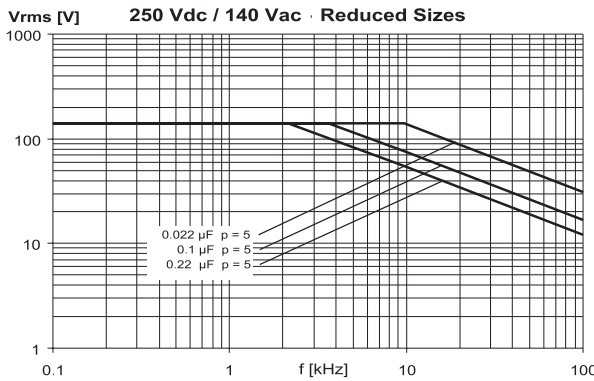
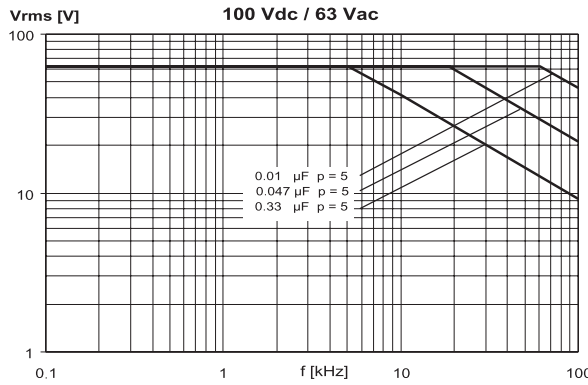
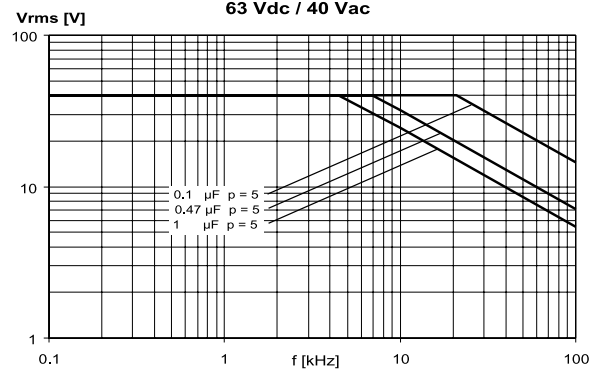
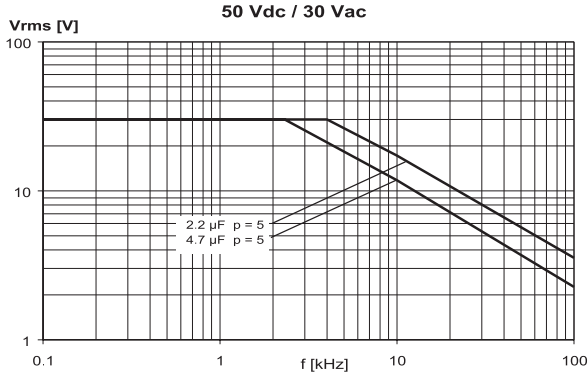
Insulation resistance: < 0.005 x initial limit.

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D.C. MULTIPURPOSE APPLICATIONS**

p = 5 mm

PRODUCT CODE: R82

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

