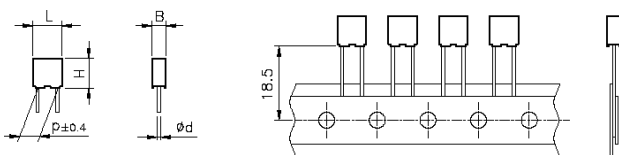


Loose

Taped



METALLIZED POLYESTER FILM CAPACITOR HIGH PERFORMANCES - DIN 44122 MULTIPURPOSE APPLICATIONS

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

PRODUCT CODE: R82

p = 5 mm

Note: R82 series has replaced the R85 series (available only upon request). For new design we suggest the use of the R82 series.

Construction:

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

B	≤ 3.5	> 3.5
∅ d ± 0.05	0.5	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	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, 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

Related documents: IEC 60384-2; CECC 30400

Detail specifications: CECC 30401-011

Winding scheme

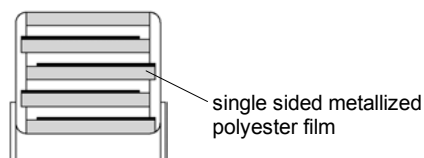


Table 1 (for more detailed information, please refer to page 14).

Standard packaging style	Lead length (mm)	Ordering code (Digit 10 to 11)
AMMO-PACK		DQ
REEL ∅ 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
	B	H	L	p			
a) 2.2μF	6.0	11.0	7.2	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
	B	H	L	p			
0.10μF	2.5	6.5	7.2	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
	B	H	L	p			
1000pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1100--5--
1500pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1150--5--
2200pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1220--5--
3300pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1330--5--
4700pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1470--5--
6800pF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 1680--5--
0.010μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2100--5--
0.015μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2150--5--
0.022μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2220--5--
0.033μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2330--5--
0.047μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2470--6--
0.068μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2680--6--
0.10μF	2.5	6.5	7.2	5.0	200	40 E3	R82EC 3100--7--
0.15μF	3.5	7.5	7.2	5.0	200	40 E3	R82EC 3150--7--
0.22μF	3.5	7.5	7.2	5.0	200	40 E3	R82EC 3220--7--
0.33μF	4.5	9.5	7.2	5.0	200	40 E3	R82EC 3330--7--
0.47μF	4.5	9.5	7.2	5.0	200	40 E3	R82EC 3470--7--
0.68μF	5.0	10.0	7.2	5.0	200	40 E3	R82EC 3680--7--
1.0μF	6.0	11.0	7.2	5.0	200	40 E3	R82EC 4100--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
	B	H	L	p			
6800pF	2.5	6.5	7.2	5.0	250	125 E3	R82IC 1680--5--
0.010μF	2.5	6.5	7.2	5.0	250	125 E3	R82IC 2100--5--
0.015μF	2.5	6.5	7.2	5.0	250	125 E3	R82IC 2150--5--
0.022μF	3.5	7.5	7.2	5.0	250	125 E3	R82IC 2220--5--
0.033μF	3.5	7.5	7.2	5.0	250	125 E3	R82IC 2330--5--
0.047μF	4.5	9.5	7.2	5.0	250	125 E3	R82IC 2470--5--
0.068μF	4.5	9.5	7.2	5.0	250	125 E3	R82IC 2680--5--
0.10μF	5.0	10.0	7.2	5.0	250	125 E3	R82IC 3100--5--
0.15μF	6.0	11.0	7.2	5.0	250	125 E3	R82IC 3150--5--
0.22μF	6.0	11.0	7.2	5.0	250	125 E3	R82IC 3220--6--

Rated Cap.	400Vdc/200Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	p			
1000pF	2.5	6.5	7.2	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.

Note 2: Special version for high temperature applications (125°C / RM2 series) is available upon request.

Typical application: Engine control in AUTOMOTIVE FIELD.

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):

$tg\delta \times 10^{-4}$ 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

≥ 15000MΩ for C ≤ 0.33µF

≥ 5000 s for C > 0.33µF and ≤ 1µF

≥ 1000 s for C > 1µF

For $V_R > 100$ Vdc

≥ 30000MΩ

Test voltage between terminals:

1.4 × 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 ($\Delta tg\delta$): ≤ 30 × 10⁻⁴ at 10kHz for C ≤ 1 µF
≤ 20 × 10⁻⁴ at 1kHz for C > 1 µF

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

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 ≤ 0.1µF
≤ 2% for C > 0.1µF

RELIABILITY

Reference MIL HDB 217

Application conditions:

Temperature: +40°C ± 2°C

Voltage: 0.5 × V_R

Failure rate: ≤ 1 FIT

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

Failure criteria:

(according to DIN 44122)

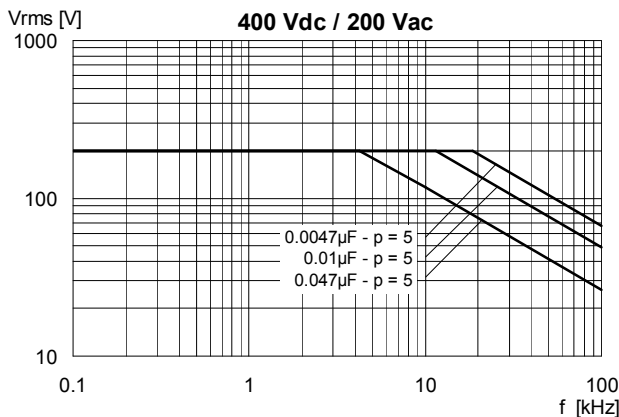
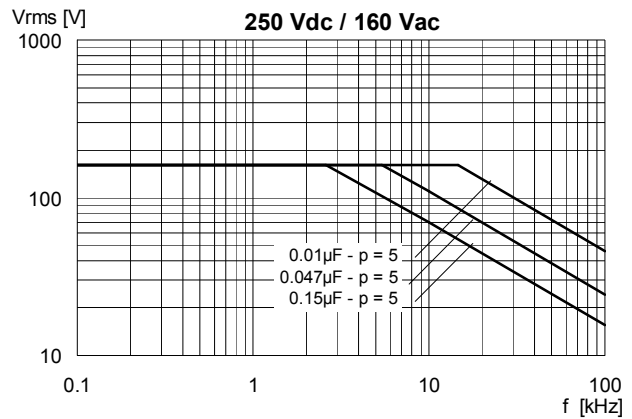
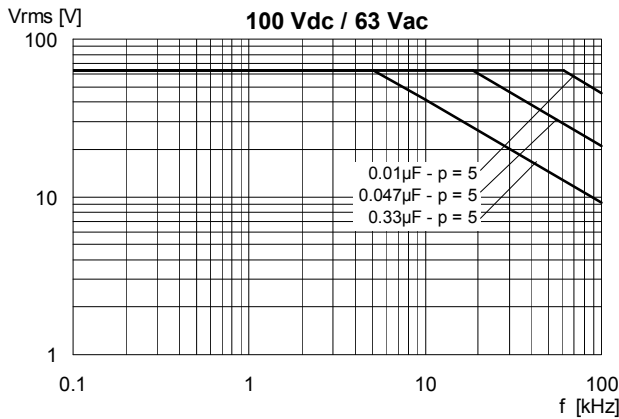
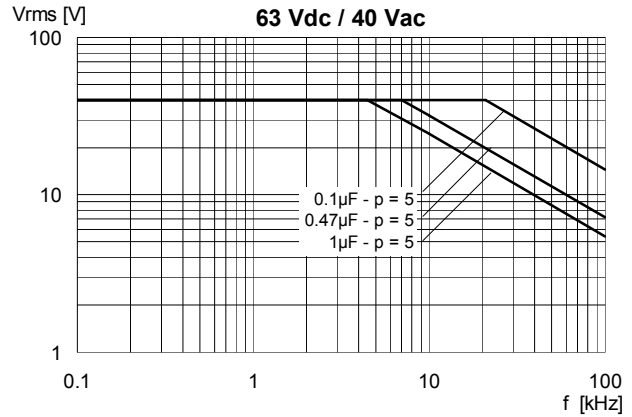
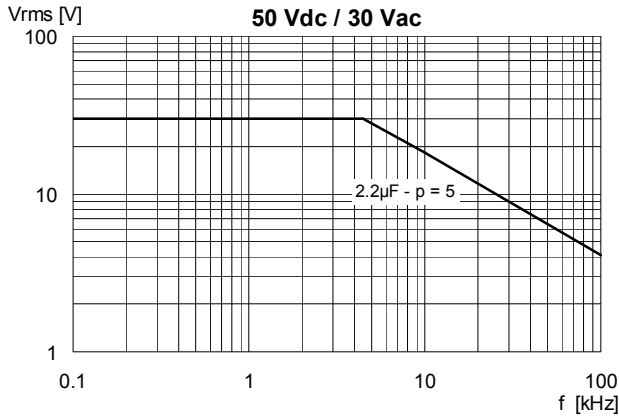
Short or open circuit

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

DF change ($\Delta tg\delta$): > 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.