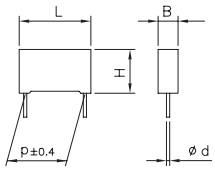
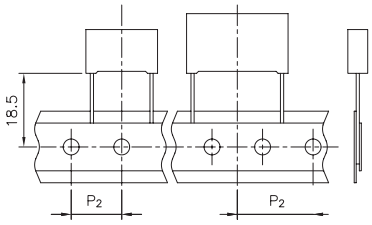
R82
MKT Series

Loose



Taped



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 (table1)

Digit 12 Identifies the dimensions and electrical characteristics.

Digit 13 Internal use

Digit 14 Capacitance tolerance:
J=5%; K=10%; M=20%.

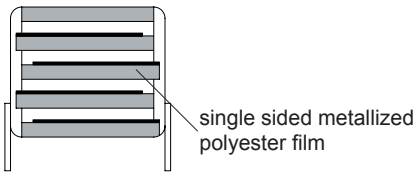
Table 1 (for more detailed information, please refer to page 14).

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



R82
MKT Series

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	Max K_0	Part Number
	B	H	L	p	(V/µs)	(V^2/µs)	
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	Max K_0	Part Number
	B	H	L	p	(V/µs)	(V^2µs)	
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	Max K_0	Part Number
	B	H	L	p	(V/µs)	(V^2/µs)	
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 K_0 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	Max K_0	Part Number
	B	H	L	p	(V/µs)	(V^2/µs)	
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	Max K_0	Part Number
	B	H	L	p	(V/µs)	(V^2/µs)	
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--5--

Rated Cap.	400Vdc/160Vac REDUCED SIZES Std dimensions				Max dv/dt	Max K_0	Part Number
	B	H	L	p	(V/µs)	(V^2µs)	
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	Max K_0	Part Number
	B	H	L	p	(V/µs)	(V^2µs)	
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%)

R82
MKT Series

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 ≥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:
1.4xV_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 |ΔC/C|: ≤ 5%
DF change (Δtgδ): ≤ 50x10^{-4} at 1kHz
Insulation resistance: ≥ 50% of initial limit.

Endurance:

Test conditions
Temperature: +105°C ±2°C
Test duration: 2000 h
Voltage applied: 1.25xV_C
Performance
Capacitance change |ΔC/C|: ≤ 5%
DF change (Δtgδ): ≤ 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 |ΔC/C|: ≤2%
DF change (Δtgδ): ≤ 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 |ΔC/C|: ≤ 3% for C≤ 0.1µF
≤ 2% for C> 0.1µF

RELIABILITY:

Reference MIL HDB 217

Application conditions:
Temperature: +40°C±2°C
Voltage: 0.5xV_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 |ΔC/C|: > 10%
DF change (Δtgδ): > 2 x initial limit.
Insulation resistance: < 0.005 x initial limit.

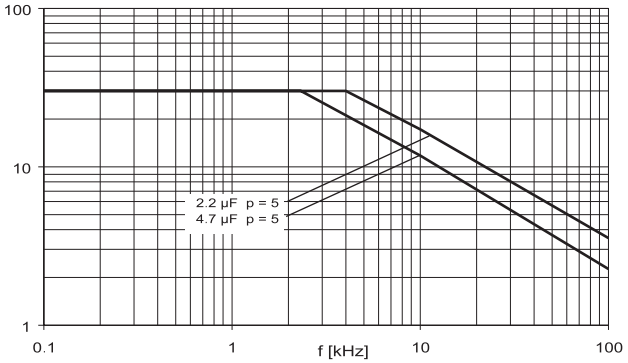
R82
MKT Series

METALLIZED POLYESTER FILM CAPACITOR
D.C. MULTIPURPOSE APPLICATIONS

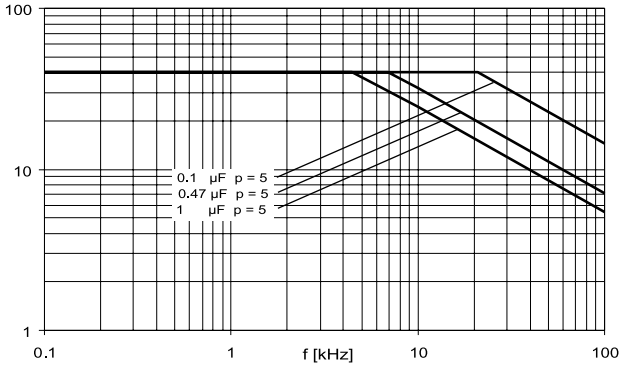
p = 5 mm
PRODUCT CODE: **R82**

MAX. VOLTAGE (Vr.m.s.) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)

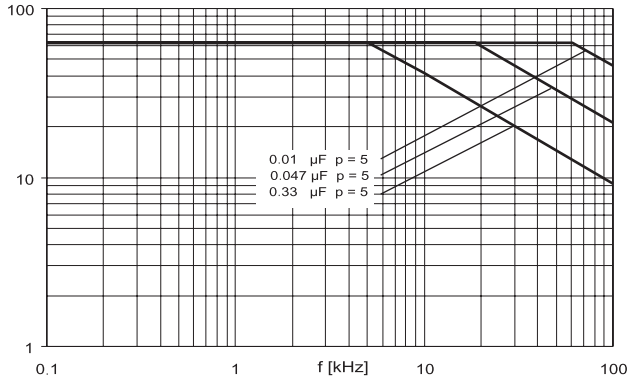
50 Vdc / 30 Vac



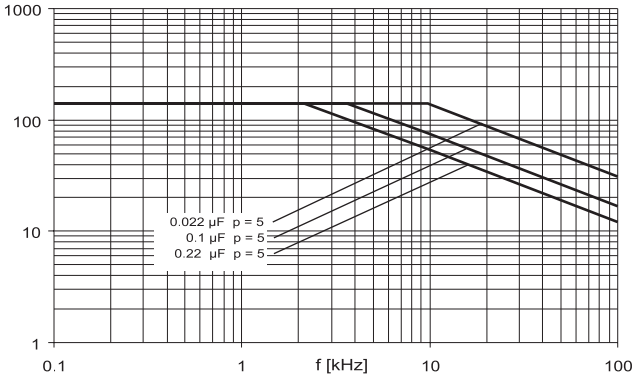
63 Vdc / 40 Vac



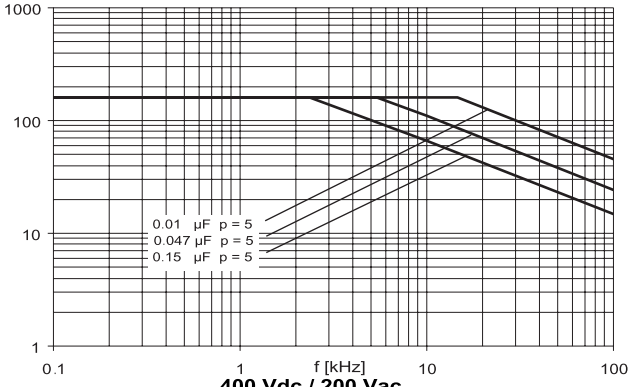
100 Vdc / 63 Vac



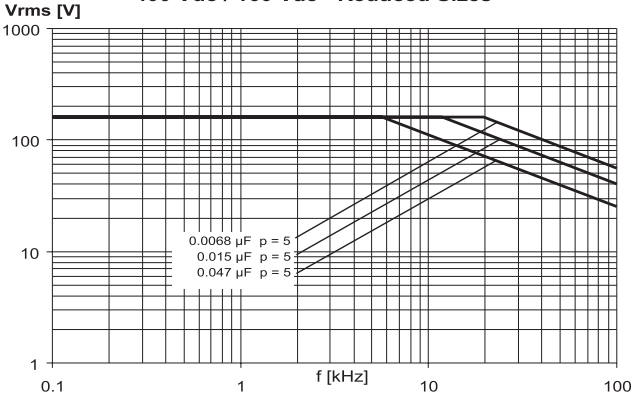
250 Vdc / 140 Vac - Reduced Sizes



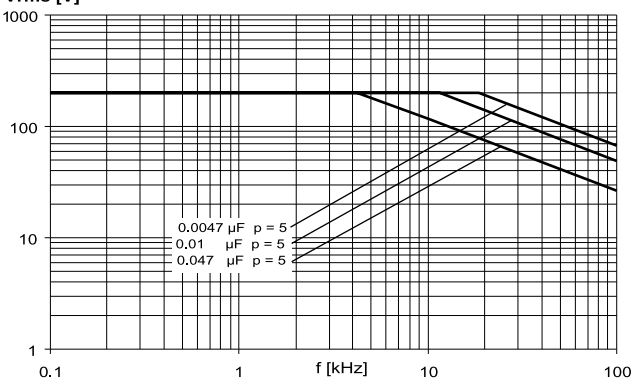
250 Vdc / 160 Vac



400 Vdc / 160 Vac - Reduced Sizes



400 Vdc / 200 Vac



R82
MKT Series

METALLIZED POLYESTER FILM CAPACITOR
D.C. MULTIPURPOSE APPLICATIONS

p = 5 mm
PRODUCT CODE: **R82**

MAX. CURRENT (Ir.m.s.) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)