

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:

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%.

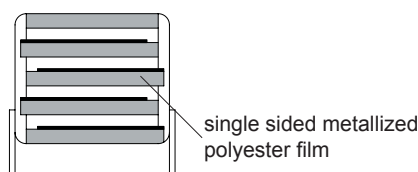
Table 1 (for more detailed information, please refer to page 14).

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

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 <sub>0</sub> (V <sup>2</sup> /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 <sub>0</sub> (V <sup>2</sup> /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 <sub>0</sub> (V <sup>2</sup> /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<sub>R</sub>), 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<sub>R</sub>/V.  
 The pulse characteristic K<sub>0</sub> 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 <sub>0</sub> (V <sup>2</sup> /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 <sub>0</sub> (V <sup>2</sup> /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--5--

Rated Cap.	400Vdc/160Vac REDUCED SIZES Std dimensions				Max dv/dt (V/μs)	Max K <sub>0</sub> (V <sup>2</sup> /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 <sub>0</sub> (V <sup>2</sup> /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<sup>-4</sup> 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<sup>-4</sup> 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<sup>-4</sup> at 10kHz for C≤1µF  
≤ 20x10<sup>-4</sup> 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<sup>-4</sup> at 10kHz for C≤ 1µF  
≤ 20x10<sup>-4</sup> 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<sup>-9</sup> failures/components x h)

**Failure criteria:**

(according to DIN 44122)

Short or open circuit

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

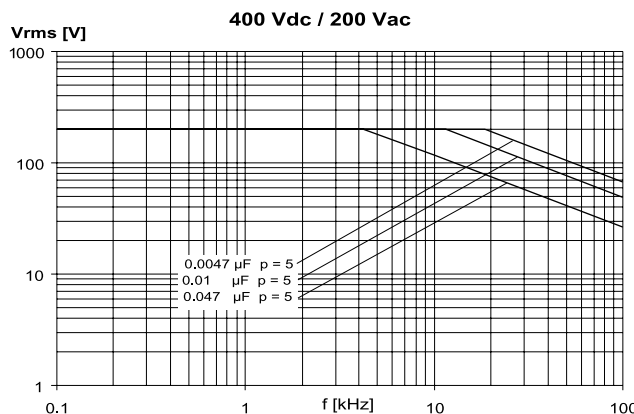
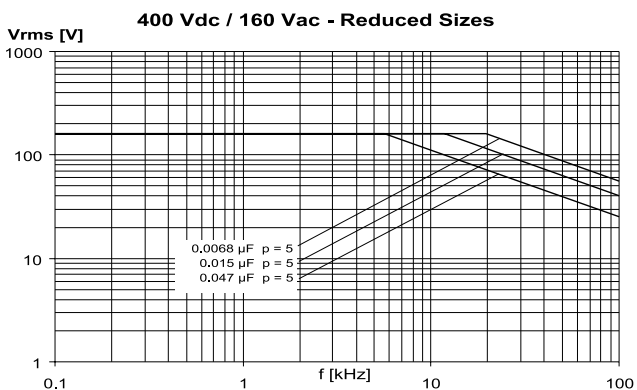
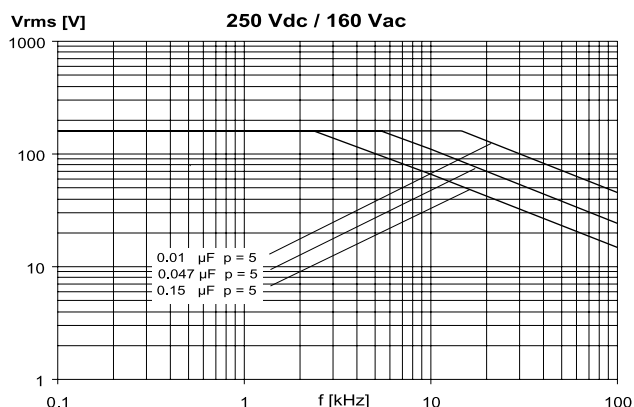
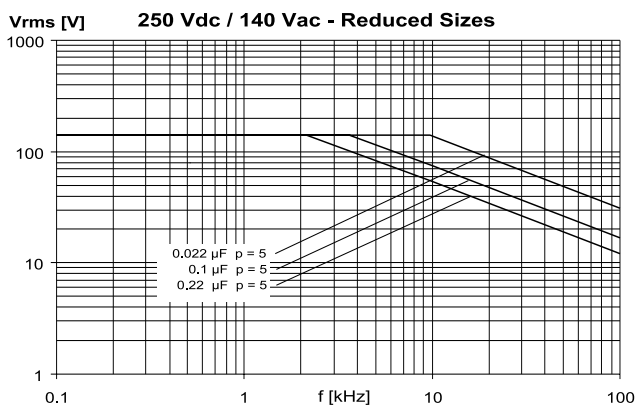
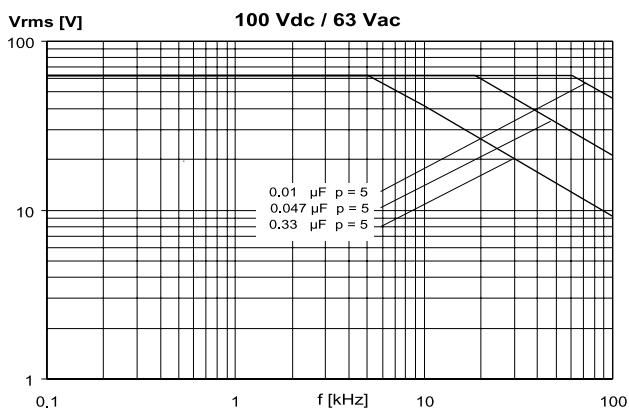
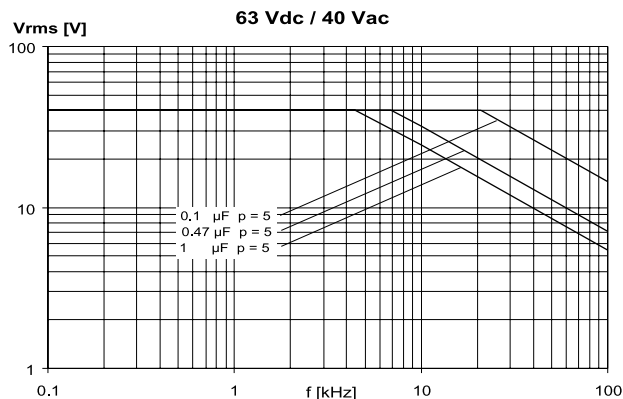
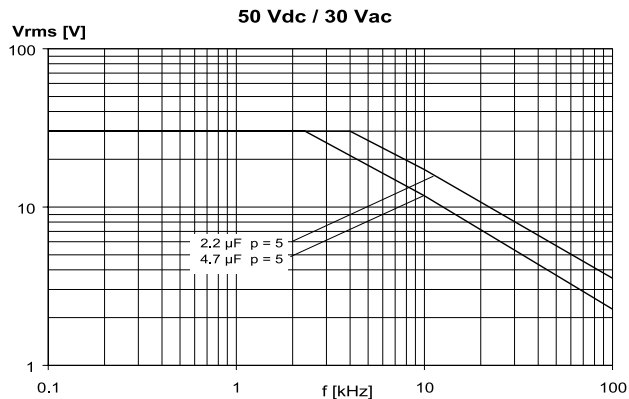
DF change ( $\Delta \text{tg}\delta$ ): > 2 x initial limit.

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 / Th ≤ 40°C)**

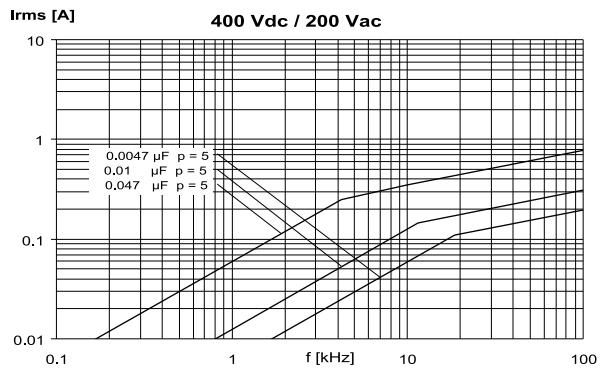
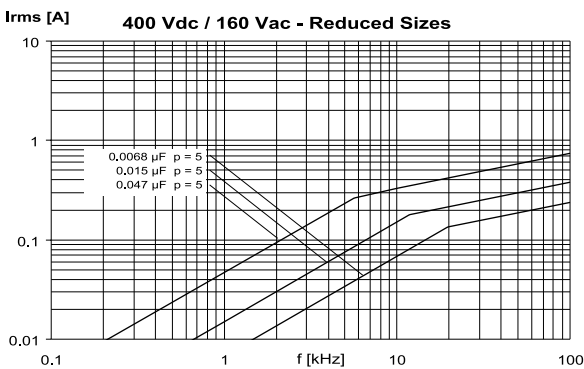
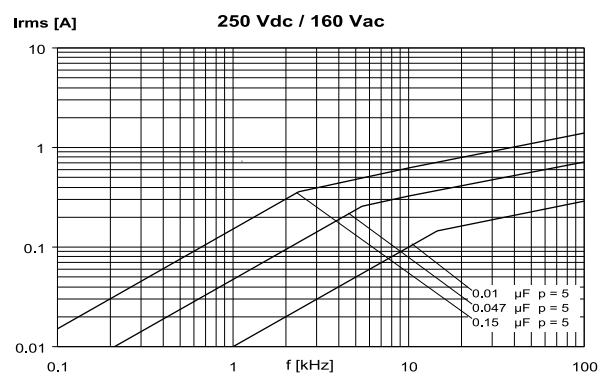
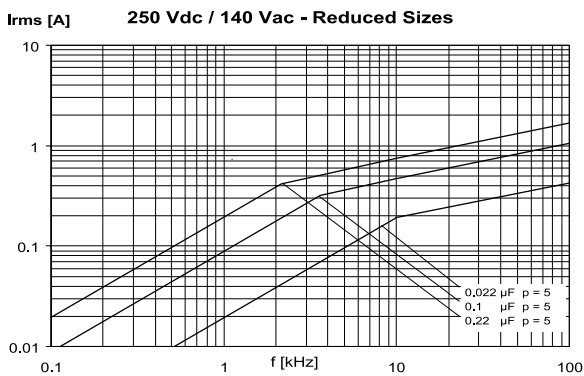
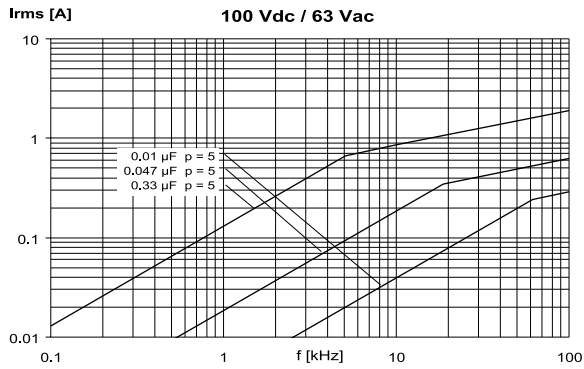
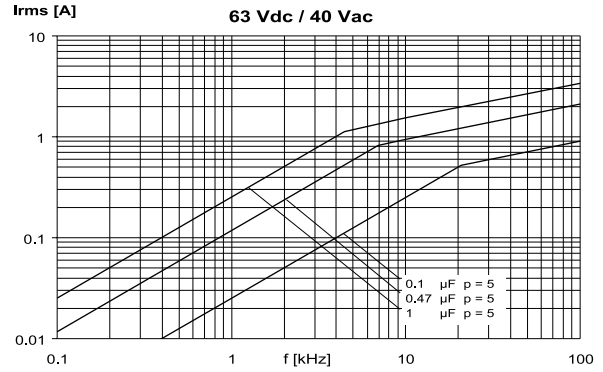
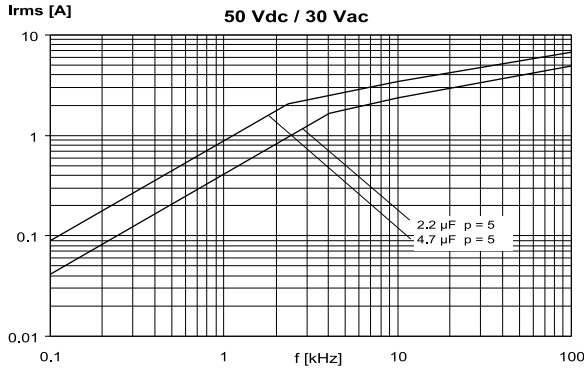


Note: p (pitch) in mm.

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

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

**MAX. CURRENT (I<sub>r.m.s.</sub>) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)**



Note: p (pitch) in mm.