

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%.

### 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

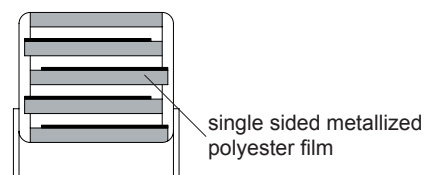
**Operating temperature range:** -55 to +105°C

**Related documents:** IEC 60384-2

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

### 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/ $\mu$ s)	Max K <sub>0</sub> (V <sup>2</sup> / $\mu$ s)	Part Number
	B	H	L	p			
a) 2.2 $\mu$ F	6.0	11.0	7.2	5.0	100	10.0 E3	R82CC4220--7--
b) 3.3 $\mu$ F	7.2	13.0	7.2	5.0	25	2.5 E3	R82CC4330--3--
b) 4.7 $\mu$ 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/ $\mu$ s)	Max K <sub>0</sub> (V <sup>2</sup> / $\mu$ s)	Part Number
	B	H	L	p			
0.10 $\mu$ F	2.5	6.5	7.2	5.0	160	20 E3	R82DC3100--5--
0.15 $\mu$ F	2.5	6.5	7.2	5.0	160	20 E3	R82DC3150--6--
0.22 $\mu$ F	2.5	6.5	7.2	5.0	160	20 E3	R82DC3220--6--
0.33 $\mu$ F	3.5	7.5	7.2	5.0	160	20 E3	R82DC3330--6--
0.47 $\mu$ F	3.5	7.5	7.2	5.0	160	20 E3	R82DC3470--6--
0.68 $\mu$ F	4.5	9.5	7.2	5.0	160	20 E3	R82DC3680--6--
1.0 $\mu$ F	5.0	10.0	7.2	5.0	160	20 E3	R82DC4100--6--
1.5 $\mu$ F	6.0	11.0	7.2	5.0	160	20 E3	R82DC4150--6--

Rated Cap.	100Vdc/63Vac Std dimensions				Max dv/dt (V/ $\mu$ s)	Max K <sub>0</sub> (V <sup>2</sup> / $\mu$ 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 $\mu$ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2100--5--
0.015 $\mu$ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2150--5--
0.022 $\mu$ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2220--5--
0.033 $\mu$ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2330--5--
0.047 $\mu$ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2470--6--
0.068 $\mu$ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 2680--6--
0.10 $\mu$ F	2.5	6.5	7.2	5.0	200	40 E3	R82EC 3100--7--
0.15 $\mu$ F	3.5	7.5	7.2	5.0	200	40 E3	R82EC 3150--7--
0.22 $\mu$ F	3.5	7.5	7.2	5.0	200	40 E3	R82EC 3220--7--
0.33 $\mu$ F	4.5	9.5	7.2	5.0	200	40 E3	R82EC 3330--7--
0.47 $\mu$ F	4.5	9.5	7.2	5.0	200	40 E3	R82EC 3470--7--
0.68 $\mu$ F	5.0	10.0	7.2	5.0	200	40 E3	R82EC 3680--7--
1.0 $\mu$ 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<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/ $\mu$ s)	Max K <sub>0</sub> (V <sup>2</sup> / $\mu$ s)	Part Number
	B	H	L	p			
0.022 $\mu$ F	2.5	6.5	7.2	5.0	130	65 E3	R82IC 2220--6--
0.047 $\mu$ F	3.5	7.5	7.2	5.0	130	65 E3	R82IC 2470--6--
0.068 $\mu$ F	3.5	7.5	7.2	5.0	130	65 E3	R82IC 2680--6--
0.10 $\mu$ F	4.5	9.5	7.2	5.0	130	65 E3	R82IC 3100--6--
0.15 $\mu$ F	5.0	10.0	7.2	5.0	130	65 E3	R82IC 3150--6--
0.22 $\mu$ 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/ $\mu$ s)	Max K <sub>0</sub> (V <sup>2</sup> / $\mu$ 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 $\mu$ F	2.5	6.5	7.2	5.0	250	125 E3	R82IC 2100--5--
0.015 $\mu$ F	2.5	6.5	7.2	5.0	250	125 E3	R82IC 2150--5--
0.022 $\mu$ F	3.5	7.5	7.2	5.0	250	125 E3	R82IC 2220--5--
0.033 $\mu$ F	3.5	7.5	7.2	5.0	250	125 E3	R82IC 2330--5--
0.047 $\mu$ F	4.5	9.5	7.2	5.0	250	125 E3	R82IC 2470--5--
0.068 $\mu$ F	4.5	9.5	7.2	5.0	250	125 E3	R82IC 2680--5--
0.10 $\mu$ F	5.0	10.0	7.2	5.0	250	125 E3	R82IC 3100--55-
0.15 $\mu$ F	6.0	11.0	7.2	5.0	250	125 E3	R82IC 3150--5--

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

Rated Cap.	400Vdc/200Vac Std dimensions				Max dv/dt (V/ $\mu$ s)	Max K <sub>0</sub> (V <sup>2</sup> / $\mu$ 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 $\mu$ F	3.5	7.5	7.2	5.0	400	320 E3	R82MC2100--5--
0.015 $\mu$ F	4.5	9.5	7.2	5.0	400	320 E3	R82MC2150--5--
0.022 $\mu$ F	4.5	9.5	7.2	5.0	400	320 E3	R82MC2220--5--
0.033 $\mu$ F	5.0	10.0	7.2	5.0	400	320 E3	R82MC2330--5--
0.047 $\mu$ 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%) \_\_\_\_\_

**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%

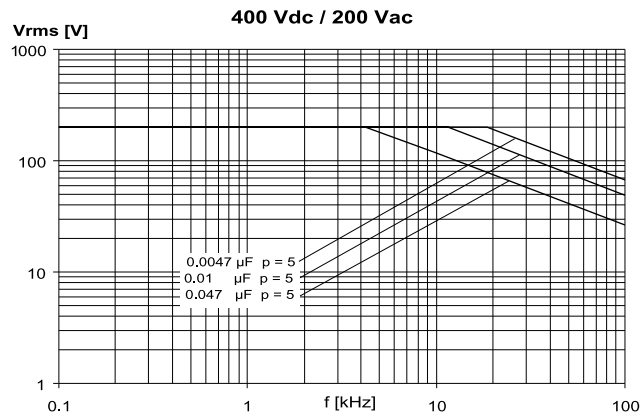
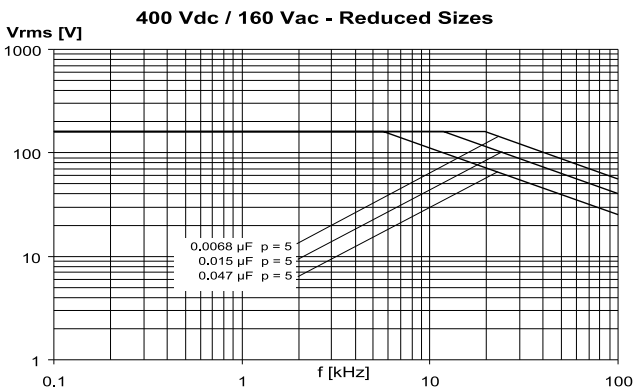
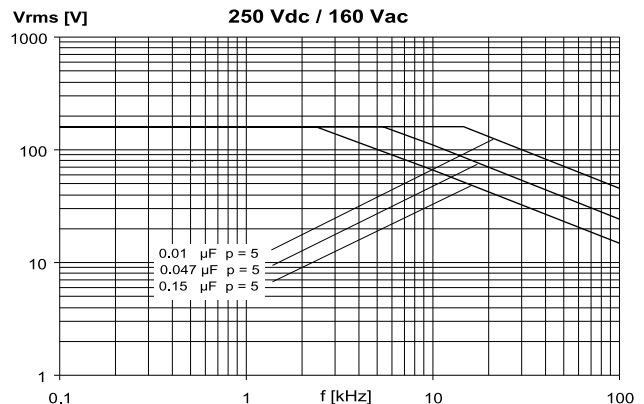
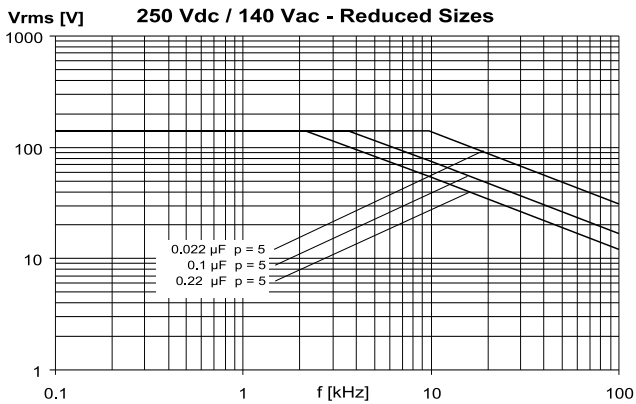
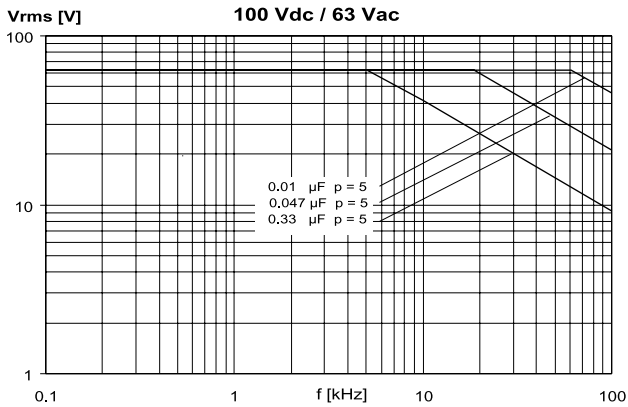
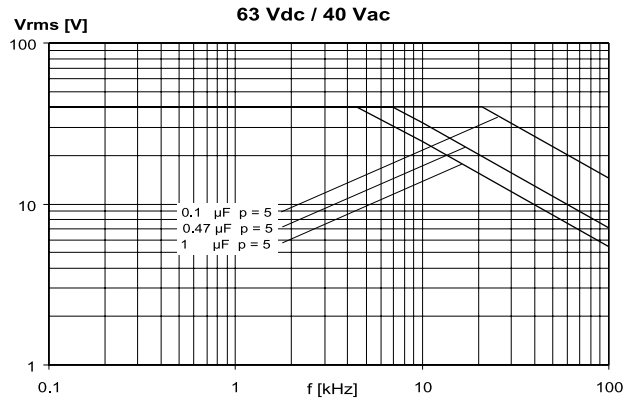
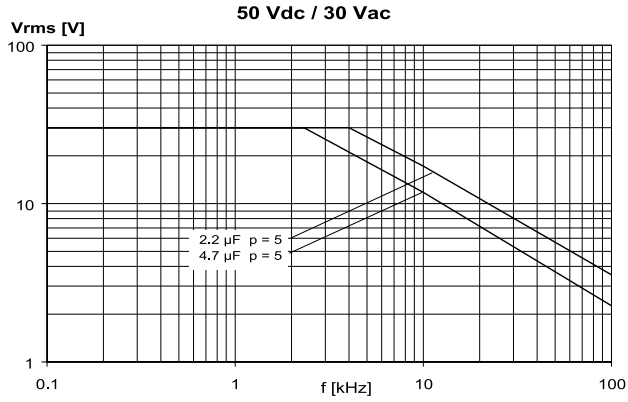
DF change ( $\Delta \text{tg}\delta$ ): > 2 x initial limit.

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)**

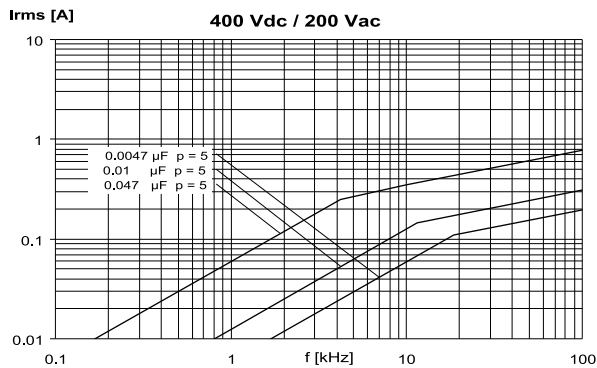
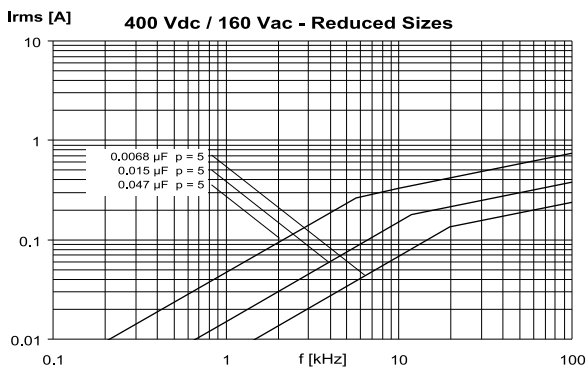
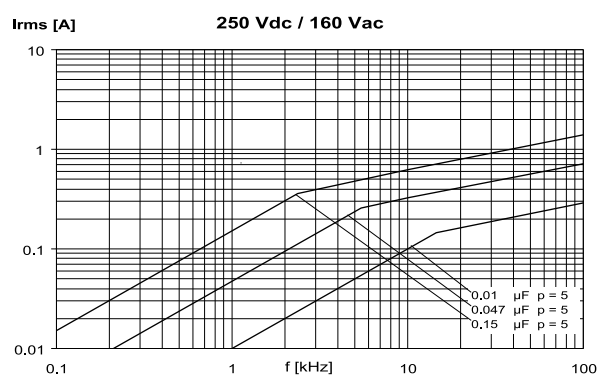
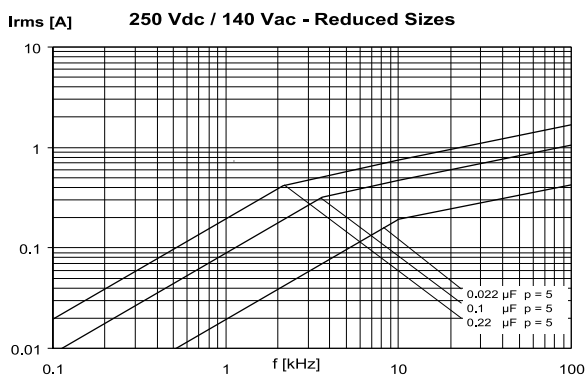
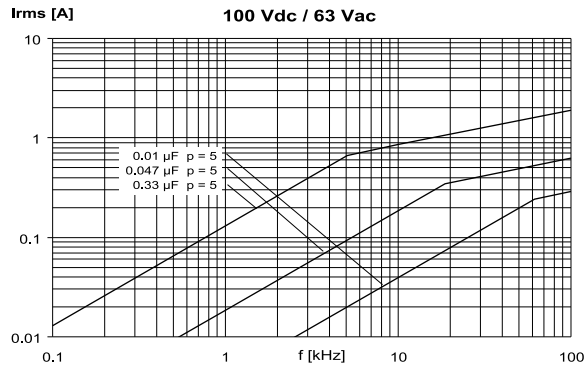
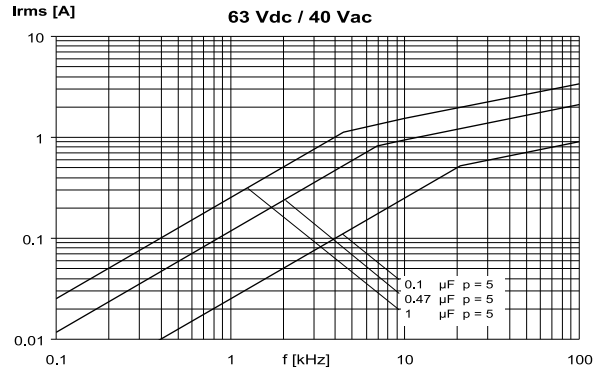
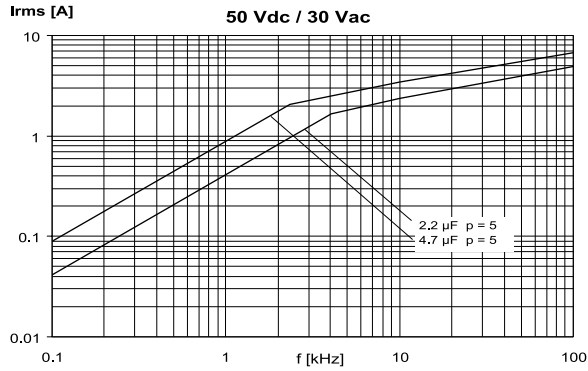


Note: p (pitch) in mm.

**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.  
05/2007