

Ød ± 0.05	p = 10	P > 10
	0.6	0.8

	Fig. 1	Fig. 2
P ₂ (mm)	12.7	19.05

All dimensions are in mm.

PART NUMBERING SYSTEM



- Series code
- Capacitance value in pico farads. First 2 digits are significant and 3rd digit indicates number of zeros.
- Capacitance tolerance
J = 5% K = 10% M = 20%
- D.C. voltage
- Packaging code
B = bulk A = ammo R = reel
- Lead spacing (mm)
F = 10 I = 15 N = 22.5
R = 27.5 W = 37.5
- Lead length (mm) – (Applies to bulk packaging only. Omit for standard lead length 4-6mm.)
L = 15 min. T = 3.5-4.0 V = 2.7-3.3
- Construction
(omit for wound construction)
Q = Stacked version
- Internal code

METALLIZED POLYESTER FILM CAPACITOR MULTIPURPOSE APPLICATIONS

Typical application: blocking, coupling, decoupling, bypassing, interference suppression in low voltage applications (i.e.: AUTOMOTIVE).

SERIES CODE: R60

NOTE: Special version, in compliance with DIN 44122, is available upon request.

Construction:

- STACKED technology for 10 mm lead spacing (Rated Voltage from 63 to 630Vdc)**
- WOUND technology from 10 to 27.5mm lead spacing (Rated Voltage from 63 to 1000Vdc)**

GENERAL TECHNICAL DATA

Dielectric: polyester film (polyethylene terephthalate).

Plates: aluminum 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. voltage

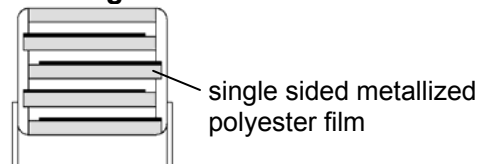
Climatic category: 55/100/56 IEC 60068-1

Operating temperature range: -55 to +105°C

For stacked technology an upper operating temperature of +125°C is allowed for a max. operating time of 1000h.

Related documents: IEC 60384-2; CECC 30400

Winding scheme



METALLIZED POLYESTER FILM CAPACITOR
MULTIPURPOSE APPLICATIONS
 SERIES CODE: R60

STACKED VERSION

Rated Cap.	63Vdc/40Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
1.0μF	4.0	9.0	13.0	10.0	50	6.3 E3	R60105-63-F-Q
1.5μF	5.0	11.0	13.0	10.0	50	6.3 E3	R60155-63-F-Q
2.2μF	5.0	11.0	13.0	10.0	50	6.3 E3	R60225-63-F-Q
3.3μF	6.0	12.0	13.0	10.0	50	6.3 E3	R60335-63-F-Q

Rated Cap.	250Vdc/160Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
0.10μF	4.0	9.0	13.0	10.0	150	75 E3	R60104-250-F-Q
0.15μF	4.0	9.0	13.0	10.0	150	75 E3	R60154-250-F-Q
0.22μF	5.0	11.0	13.0	10.0	150	75 E3	R60224-250-F-Q
0.33μF	5.0	11.0	13.0	10.0	150	75 E3	R60334-250-F-Q
0.47μF	6.0	12.0	13.0	10.0	150	75 E3	R60474-250-F-Q

Rated Cap.	100Vdc/63Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
0.33μF	4.0	9.0	13.0	10.0	75	15 E3	R60334-100-F-Q
0.47μF	4.0	9.0	13.0	10.0	75	15 E3	R60474-100-F-Q
0.68μF	4.0	9.0	13.0	10.0	75	15 E3	R60684-100-F-Q
1.0μF	5.0	11.0	13.0	10.0	75	15 E3	R60105-100-F-Q
1.5μF	5.0	11.0	13.0	10.0	75	15 E3	R60155-100-F-Q

Rated Cap.	400Vdc/200Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
0.033μF	4.0	9.0	13.0	10.0	175	140 E3	R60333-400-F-Q
0.047μF	4.0	9.0	13.0	10.0	175	140 E3	R60473-400-F-Q
0.068μF	4.0	9.0	13.0	10.0	175	140 E3	R60683-400-F-Q
0.10μF	5.0	11.0	13.0	10.0	175	140 E3	R60104-400-F-Q
0.15μF	6.0	12.0	13.0	10.0	175	140 E3	R60154-400-F-Q

Rated Cap.	160Vdc/90Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
0.22μF	4.0	9.0	13.0	10.0	100	32 E3	R60224-160-F-Q
0.33μF	4.0	9.0	13.0	10.0	100	32 E3	R60334-160-F-Q
0.47μF	5.0	11.0	13.0	10.0	100	32 E3	R60474-160-F-Q
0.68μF	6.0	12.0	13.0	10.0	100	32 E3	R60684-160-F-Q

Rated Cap.	630Vdc/220Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
1000pF	4.0	9.0	13.0	10.0	200	250 E3	R60102-630-F-Q
1500pF	4.0	9.0	13.0	10.0	200	250 E3	R60152-630-F-Q
2200pF	4.0	9.0	13.0	10.0	200	250 E3	R60222-630-F-Q
3300pF	4.0	9.0	13.0	10.0	200	250 E3	R60332-630-F-Q
4700pF	4.0	9.0	13.0	10.0	200	250 E3	R60472-630-F-Q
6800pF	4.0	9.0	13.0	10.0	200	250 E3	R60682-630-F-Q
0.010μF	4.0	9.0	13.0	10.0	200	250 E3	R60103-630-F-Q
0.015μF	4.0	9.0	13.0	10.0	200	250 E3	R60153-630-F-Q
0.022μF	4.0	9.0	13.0	10.0	200	250 E3	R60223-630-F-Q
0.033μF	5.0	11.0	13.0	10.0	200	250 E3	R60333-630-F-Q
0.047μF	5.0	11.0	13.0	10.0	200	250 E3	R60473-630-F-Q

Tolerance: J (± 5%); K (±10%); M (±20%)
 Packaging code: B (bulk); A (ammo); R (reel)
 Lead length (mm): L (24-27); T (3.5-4.0); V (2.7-3.3)
 Omit for standard (4-6)

Tolerance: J (± 5%); K (±10%); M (±20%)
 Packaging code: B (bulk); A (ammo); R (reel)
 Lead length (mm): L (24-27); T (3.5-4.0); V (2.7-3.3)
 Omit for standard (4-6)

In progress

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 waveform and in any case it cannot exceed the value given in the above table.

METALLIZED POLYESTER FILM CAPACITOR MULTIPURPOSE APPLICATIONS SERIES CODE: R60

WOUND VERSION

Rated Cap.	63Vdc/40Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
0.47μF	4.0	9.0	13.0	10.0	6.0	0.75 E3	R60474-63-F-
0.68μF	4.0	9.0	13.0	10.0	6.0	0.75 E3	R60684-63-F-
1.0μF	5.0	11.0	13.0	10.0	6.0	0.75 E3	R60105-63-F-
1.5μF	6.0	12.0	13.0	10.0	6.0	0.75 E3	R60155-63-F-
0.68μF	5.0	11.0	18.0	15.0	2.5	0.32 E3	R60684-63-I-
1.0μF	5.0	11.0	18.0	15.0	2.5	0.32 E3	R60105-63-I-
1.5μF	5.0	11.0	18.0	15.0	2.5	0.32 E3	R60155-63-I-
2.2μF	6.0	12.0	18.0	15.0	2.5	0.32 E3	R60225-63-I-
3.3μF	7.5	13.5	18.0	15.0	2.5	0.32 E3	R60335-63-I-
4.7μF	8.5	14.5	18.0	15.0	2.5	0.32 E3	R60475-63-I-
6.8μF	10.0	16.0	18.0	15.0	2.5	0.32 E3	R60685-63-I-
3.3μF	6.0	15.0	26.5	22.5	1.5	0.19 E3	R60335-63-N-
4.7μF	7.0	16.0	26.5	22.5	1.5	0.19 E3	R60475-63-N-
6.8μF	7.0	16.0	26.5	22.5	1.5	0.19 E3	R60685-63-N-
10.0μF	8.5	17.0	26.5	22.5	1.5	0.19 E3	R60106-63-N-
10.0μF	9.0	17.0	32.0	27.5	1.0	0.13 E3	R60106-63-R-
15.0μF	11.0	20.0	32.0	27.5	1.0	0.13 E3	R60156-63-R-
22.0μF	13.0	22.0	32.0	27.5	1.0	0.13 E3	R60226-63-R-
33.0μF	14.0	28.0	32.0	27.5	1.0	0.13 E3	R60336-63-R-
47.0μF	18.0	33.0	32.0	27.5	1.0	0.13 E3	R60476-63-R-
68.0μF	22.0	37.0	32.0	27.5	1.0	0.13 E3	R60686-63-R-
22.0μF	11.0	22.0	41.5	37.5	0.8	0.10 E3	R60226-63-W-
33.0μF	13.0	24.0	41.5	37.5	0.8	0.10 E3	R60336-63-W-
47.0μF	16.0	28.5	41.5	37.5	0.8	0.10 E3	R60476-63-W-
68.0μF	19.0	32.0	41.5	37.5	0.8	0.10 E3	R60-686-63-W-
100.0μF	24.0	44.0	41.5	37.5	0.8	0.10 E3	R60-107-63-W-

Tolerance: J (± 5%); K (±10%); M (±20%)

Packaging code: B (bulk); A (ammo); R (reel)

Lead length (mm): L (24-27); T (3.5-4.0); V (2.7-3.3)

Omit for standard (4-6)

Rated Cap.	100Vdc/63Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
0.33μF	4.0	9.0	13.0	10.0	9.0	1.8 E3	R60334-100-F-
0.47μF	5.0	11.0	13.0	10.0	9.0	1.8 E3	R60474-100-F-
0.68μF	6.0	12.0	13.0	10.0	9.0	1.8 E3	R60684-100-F-
0.33μF	5.0	11.0	18.0	15.0	3.0	0.6 E3	R60334-100-I-
0.47μF	5.0	11.0	18.0	15.0	3.0	0.6 E3	R60474-100-I-
0.68μF	5.0	11.0	18.0	15.0	3.0	0.6 E3	R60684-100-I-
1.0μF	5.0	11.0	18.0	15.0	3.0	0.6 E3	R60105-100-I-
1.5μF	7.5	13.5	18.0	15.0	3.0	0.6 E3	R60155-100-I-
2.2μF	8.5	14.5	18.0	15.0	3.0	0.6 E3	R60225-100-I-
3.3μF	10.0	16.0	18.0	15.0	3.0	0.6 E3	R60335-100-I-
1.5μF	6.0	15.0	26.5	22.5	2.0	0.4 E3	R60155-100-N-
2.2μF	6.0	15.0	26.5	22.5	2.0	0.4 E3	R60225-100-N-
3.3μF	7.0	16.0	26.5	22.5	2.0	0.4 E3	R60335-100-N-
4.7μF	8.5	17.0	26.5	22.5	2.0	0.4 E3	R60475-100-N-
6.8μF	10.0	18.5	26.5	22.5	2.0	0.4 E3	R60685-100-N-
4.7μF	9.0	17.0	32.0	27.5	1.5	0.3 E3	R60475-100-R-
6.8μF	9.0	17.0	32.0	27.5	1.5	0.3 E3	R60685-100-R-
10.0μF	11.0	20.0	32.0	27.5	1.5	0.3 E3	R60106-100-R-
15.0μF	13.0	22.0	32.0	27.5	1.5	0.3 E3	R60156-100-R-
22.0μF	14.0	28.0	32.0	27.5	1.5	0.3 E3	R60226-100-R-
33.0μF	18.0	33.0	32.0	27.5	1.5	0.3 E3	R60336-100-R-
47.0μF	22.0	37.0	32.0	27.5	1.5	0.3 E3	R60476-100-R-
15.0μF	11.0	22.0	41.5	37.5	1.0	0.2 E3	R60156-100-W-
22.0μF	13.0	24.0	41.5	37.5	1.0	0.2 E3	R60226-100-W-
33.0μF	16.0	28.5	41.5	37.5	1.0	0.2 E3	R60336-100-W-
47.0μF	19.0	32.0	41.5	37.5	1.0	0.2 E3	R60476-100-W-
68.0μF	24.0	44.0	41.5	37.5	1.0	0.2 E3	R60686-100-W-

Tolerance: J (± 5%); K (±10%); M (±20%)

Packaging code: B (bulk); A (ammo); R (reel)

Lead length (mm): L (24-27); T (3.5-4.0); V (2.7-3.3)

Omit for standard (4-6)

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 waveform and in any case it cannot exceed the value given in the above table.

METALLIZED POLYESTER FILM CAPACITOR MULTIPURPOSE APPLICATIONS SERIES CODE: R60

WOUND VERSION

Rated Cap.	160Vdc/90Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
0.22μF	4.0	9.0	13.0	10.0	15.0	4.80 E3	R60224-160-F-
0.33μF	5.0	11.0	13.0	10.0	15.0	4.80 E3	R60334-160-F-
0.47μF	6.0	12.0	13.0	10.0	15.0	4.80 E3	R60474-160-F-
0.33μF	5.0	11.0	18.0	15.0	9.0	2.90 E3	R60334-160-I-
0.47μF	5.0	11.0	18.0	15.0	9.0	2.90 E3	R60474-160-I-
0.68μF	5.0	11.0	18.0	15.0	9.0	2.90 E3	R60684-160-I-
1.0μF	7.5	13.5	18.0	15.0	9.0	2.90 E3	R60105-160-I-
1.5μF	8.5	14.5	18.0	15.0	9.0	2.90 E3	R60155-160-I-
2.2μF	10.0	16.0	18.0	15.0	9.0	2.90 E3	R60225-160-I-
1.5μF	6.0	15.0	26.5	22.5	5.5	1.70 E3	R60155-160-N-
2.2μF	7.0	16.0	26.5	22.5	5.5	1.70 E3	R60225-160-N-
3.3μF	8.5	17.0	26.5	22.5	5.5	1.70 E3	R60335-160-N-
4.7μF	11.0	20.0	26.5	22.5	5.5	1.70 E3	R60475-160-N-
3.3μF	9.0	17.0	32.0	27.5	3.0	0.96 E3	R60335-160-R-
4.7μF	9.0	17.0	32.0	27.5	3.0	0.96 E3	R60475-160-R-
6.8μF	11.0	20.0	32.0	27.5	3.0	0.96 E3	R60685-160-R-
10.0μF	15.0	24.5	32.0	27.5	3.0	0.96 E3	R60106-160-R-
15.0μF	18.0	33.0	32.0	27.5	3.0	0.96 E3	R60156-160-R-
22.0μF	22.0	37.0	32.0	27.5	3.0	0.96 E3	R60226-160-R-
10.0μF	11.0	22.0	41.5	37.5	2.0	0.64 E3	R60106-160-W-
15.0μF	13.0	24.0	41.5	37.5	2.0	0.64 E3	R60156-160-W-
22.0μF	16.0	28.5	41.5	37.5	2.0	0.64 E3	R60226-160-W-
33.0μF	19.0	32.0	41.5	37.5	2.0	0.64 E3	R60336-160-W-
47.0μF	24.0	44.0	41.5	37.5	2.0	0.64 E3	R60476-160-W-

Tolerance: J (± 5%); K (±10%); M (±20%)

Packaging code: B (bulk); A (ammo); R (reel)

Lead length (mm): L (24-27); T (3.5-4.0); V (2.7-3.3)

Omit for standard (4-6)

Rated Cap.	250Vdc/160Vac				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
0.068μF	4.0	9.0	13.0	10.0	20	10.0 E3	R60683-250-F-
0.10μF	4.0	9.0	13.0	10.0	20	10.0 E3	R60104-250-F-
0.15μF	4.0	9.0	13.0	10.0	20	10.0 E3	R60154-250-F-
0.22μF	5.0	11.0	13.0	10.0	20	10.0 E3	R60224-250-F-
0.33μF	6.0	12.0	13.0	10.0	20	10.0 E3	R60334-250-F-
0.10μF	5.0	11.0	18.0	15.0	12	6.0 E3	R60104-250-I-
0.15μF	5.0	11.0	18.0	15.0	12	6.0 E3	R60154-250-I-
0.22μF	5.0	11.0	18.0	15.0	12	6.0 E3	R60224-250-I-
0.33μF	5.0	11.0	18.0	15.0	12	6.0 E3	R60334-250-I-
0.47μF	6.0	12.0	18.0	15.0	12	6.0 E3	R60474-250-I-
0.68μF	7.5	13.5	18.0	15.0	12	6.0 E3	R60684-250-I-
1.0μF	8.5	14.5	18.0	15.0	12	6.0 E3	R60105-250-I-
1.5μF	10.0	16.0	18.0	15.0	12	6.0 E3	R60155-250-I-
0.47μF	6.0	15.0	26.5	22.5	8	4.0 E3	R60474-250-N-
0.68μF	6.0	15.0	26.5	22.5	8	4.0 E3	R60684-250-N-
1.0μF	6.0	15.0	26.5	22.5	8	4.0 E3	R60105-250-N-
1.5μF	7.0	16.0	26.5	22.5	8	4.0 E3	R60155-250-N-
2.2μF	10.0	18.5	26.5	22.5	8	4.0 E3	R60225-250-N-
3.3μF	11.0	20.0	26.5	22.5	8	4.0 E3	R60335-250-N-
1.5μF	9.0	17.0	32.0	27.5	5	2.5 E3	R60155-250-R-
2.2μF	9.0	17.0	32.0	27.5	5	2.5 E3	R60225-250-R-
3.3μF	11.0	20.0	32.0	27.5	5	2.5 E3	R60335-250-R-
4.7μF	13.0	22.0	32.0	27.5	5	2.5 E3	R60475-250-R-
6.8μF	14.0	28.0	32.0	27.5	5	2.5 E3	R60685-250-R-
10.0μF	18.0	33.0	32.0	27.5	5	2.5 E3	R60106-250-R-
15.0μF	22.0	37.0	32.0	27.5	5	2.5 E3	R60156-250-R-
4.7μF	11.0	22.0	41.5	37.5	4	2.0 E3	R60475-250-W-
6.8μF	13.0	24.0	41.5	37.5	4	2.0 E3	R60685-250-W-
10.0μF	16.0	28.5	41.5	37.5	4	2.0 E3	R60106-250-W-
15.0μF	19.0	32.0	41.5	37.5	4	2.0 E3	R60156-250-W-
22.0μF	20.0	40.0	41.5	37.5	4	2.0 E3	R60226-250-W-
33.0μF	24.0	44.0	41.5	37.5	4	2.0 E3	R60336-250-W-

Tolerance: J (± 5%); K (±10%); M (±20%)

Packaging code: B (bulk); A (ammo); R (reel)

Lead length (mm): L (24-27); T (3.5-4.0); V (2.7-3.3)

Omit for standard (4-6)

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 waveform and in any case it cannot exceed the value given in the above table.

METALLIZED POLYESTER FILM CAPACITOR MULTIPURPOSE APPLICATIONS SERIES CODE: R60

WOUND VERSION

Rated Cap.	400Vdc/200Vac				Max dv/dt	Max K ₀	Part Number
	B	H	L	P			
0.015μF	4.0	9.0	13.0	10.0	30.0	24.0 E3	R60153-400-F-
0.022μF	4.0	9.0	13.0	10.0	30.0	24.0 E3	R60223-400-F-
0.033μF	4.0	9.0	13.0	10.0	30.0	24.0 E3	R60333-400-F-
0.047μF	4.0	9.0	13.0	10.0	30.0	24.0 E3	R60473-400-F-
0.068μF	5.0	11.0	13.0	10.0	30.0	24.0 E3	R60683-400-F-
0.10μF	6.0	12.0	13.0	10.0	30.0	24.0 E3	R60104-400-F-
0.047μF	5.0	11.0	18.0	15.0	20.0	16.0 E3	R60473-400-I-
0.068μF	5.0	11.0	18.0	15.0	20.0	16.0 E3	R60683-400-I-
0.10μF	5.0	11.0	18.0	15.0	20.0	16.0 E3	R60104-400-I-
0.15μF	5.0	11.0	18.0	15.0	20.0	16.0 E3	R60154-400-I-
0.22μF	6.0	12.0	18.0	15.0	20.0	16.0 E3	R60224-400-I-
0.33μF	7.5	13.5	18.0	15.0	20.0	16.0 E3	R60334-400-I-
0.47μF	8.5	14.5	18.0	15.0	20.0	16.0 E3	R60474-400-I-
0.22μF	6.0	15.0	26.5	22.5	10.0	8.0 E3	R60224-400-N-
0.33μF	6.0	15.0	26.5	22.5	10.0	8.0 E3	R60334-400-N-
0.47μF	6.0	15.0	26.5	22.5	10.0	8.0 E3	R60474-400-N-
0.68μF	7.0	16.0	26.5	22.5	10.0	8.0 E3	R60684-400-N-
1.0μF	10.0	18.5	26.5	22.5	10.0	8.0 E3	R60105-400-N-
1.5μF	11.0	20.0	26.5	22.5	10.0	8.0 E3	R60155-400-N-
0.68μF	9.0	17.0	32.0	27.5	8.5	3.4 E3	R60684-400-R-
1.0μF	9.0	17.0	32.0	27.5	8.5	3.4 E3	R60105-400-R-
1.5μF	10.0	20.0	32.0	27.5	8.5	3.4 E3	R60155-400-R-
2.2μF	13.0	22.0	32.0	27.5	8.5	3.4 E3	R60225-400-R-
3.3μF	14.0	28.0	32.0	27.5	8.5	3.4 E3	R60335-400-R-
4.7μF	18.0	33.0	32.0	27.5	8.5	3.4 E3	R60475-400-R-
6.8μF	22.0	37.0	32.0	27.5	8.5	3.4 E3	R60685-400-R-
3.3μF	11.0	22.0	41.5	37.5	6.0	2.4 E3	R60335-400-W-
4.7μF	13.0	24.0	41.5	37.5	6.0	2.4 E3	R60475-400-W-
6.8μF	16.0	28.5	41.5	37.5	6.0	2.4 E3	R60685-400-W-
10.0μF	19.0	32.0	41.5	37.5	6.0	2.4 E3	R60106-400-W-
15.0μF	24.0	44.0	41.5	37.5	6.0	2.4 E3	R60156-400-W-

Tolerance: J (± 5%); K (±10%); M (±20%)
 Packaging code: B (bulk); A (ammo); R (reel)
 Lead length (mm): L (24-27); T (3.5-4.0); V (2.7-3.3)
 Omit for standard (4-6)

All dimensions are in mm.

Rated Cap.	630Vdc/220Vac*				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
4700pF	4.0	9.0	13.0	10.0	40	50 E3	R60472-630-F-
6800pF	4.0	9.0	13.0	10.0	40	50 E3	R60682-630-F-
0.010μF	4.0	9.0	13.0	10.0	40	50 E3	R60103-630-F-
0.015μF	4.0	9.0	13.0	10.0	40	50 E3	R60153-630-F-
0.022μF	5.0	11.0	13.0	10.0	40	50 E3	R60223-630-F-
0.033μF	6.0	12.0	13.0	10.0	40	50 E3	R60333-630-F-
0.047μF	6.0	12.0	13.0	10.0	40	50 E3	R60473-630-F-
0.033μF	5.0	11.0	18.0	15.0	25	31 E3	R60333-630-I-
0.047μF	5.0	11.0	18.0	15.0	25	31 E3	R60473-630-I-
0.068μF	6.0	12.0	18.0	15.0	25	31 E3	R60683-630-I-
0.10μF	7.5	13.5	18.0	15.0	25	31 E3	R60104-630-I-
0.15μF	8.5	14.5	18.0	15.0	25	31 E3	R60154-630-I-
0.10μF	6.0	15.0	26.5	22.5	12	15 E3	R60104-630-N-
0.15μF	6.0	15.0	26.5	22.5	12	15 E3	R60154-630-N-
0.22μF	7.0	16.0	26.5	22.5	12	15 E3	R60224-630-N-
0.33μF	10.0	18.5	26.5	22.5	12	15 E3	R60334-630-N-
0.33μF	9.0	17.0	32.0	27.5	10	12 E3	R60334-630-R-
0.47μF	11.0	20.0	32.0	27.5	10	12 E3	R60474-630-R-
0.68μF	13.0	22.0	32.0	27.5	10	12 E3	R60684-630-R-
1.0μF	14.0	28.0	32.0	27.5	10	12 E3	R60105-630-R-
1.5μF	18.0	33.0	32.0	27.5	10	12 E3	R60155-630-R-
2.2μF	22.0	37.0	32.0	27.5	10	12 E3	R60225-630-R-
1.0μF	11.0	22.0	41.5	37.5	8	9.6 E3	R60105-630-W-
1.5μF	13.0	24.0	41.5	37.5	8	9.6 E3	R60155-630-W-
2.2μF	16.0	28.5	41.5	37.5	8	9.6 E3	R60225-630-W-
3.3μF	20.0	40.0	41.5	37.5	8	9.6 E3	R60335-630-W-
4.7μF	24.0	44.0	41.5	37.5	8	9.6 E3	R60475-630-W-

Tolerance: J (± 5%); K (±10%); M (±20%)
 Packaging code: B (bulk); A (ammo); R (reel)
 Lead length (mm): L (24-27); T (3.5-4.0); V (2.7-3.3)
 Omit for standard (4-6)

* Not suitable for across-the-line applications. Please refer to Interference Suppression Capacitors.

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 waveform and in any case it cannot exceed the value given in the above table.

Note 2: Rated voltages higher than 1000Vdc are available upon request.

METALLIZED POLYESTER FILM CAPACITOR MULTIPURPOSE APPLICATIONS SERIES CODE: R60

WOUND VERSION

Rated Cap.	1000Vdc/250Vac*				Max dv/dt (V/μs)	Max K ₀ (V ² /μs)	Part Number
	B	H	L	P			
1000pF	4.0	9.0	13.0	10.0	60	120 E3	R60102-1000-F-
1500pF	4.0	9.0	13.0	10.0	60	120 E3	R60152-1000-F-
2200pF	4.0	9.0	13.0	10.0	60	120 E3	R60222-1000-F-
3300pF	4.0	9.0	13.0	10.0	60	120 E3	R60332-1000-F-
4700pF	5.0	11.0	13.0	10.0	60	120 E3	R60472-1000-F-
6800pF	6.0	12.0	13.0	10.0	60	120 E3	R60682-1000-F-
0.010μF	5.0	11.0	18.0	15.0	30	60 E3	R60103-1000-I-
0.015μF	6.0	12.0	18.0	15.0	30	60 E3	R60153-1000-I-
0.022μF	7.5	13.5	18.0	15.0	30	60 E3	R60223-1000-I-
0.033μF	8.5	14.5	18.0	15.0	30	60 E3	R60333-1000-I-
0.047μF	10.0	16.0	18.0	15.0	30	60 E3	R60473-1000-I-
0.033μF	6.0	15.0	26.5	22.5	15	30 E3	R60333-1000-N-
0.047μF	6.0	15.0	26.5	22.5	15	30 E3	R60473-1000-N-
0.068μF	8.5	17.0	26.5	22.5	15	30 E3	R60683-1000-N-
0.10μF	10.0	18.5	26.5	22.5	15	30 E3	R60104-1000-N-
0.15μF	9.0	17.0	32.0	27.5	12	24 E3	R60154-1000-R-
0.22μF	11.0	20.0	32.0	27.5	12	24 E3	R60224-1000-R-
0.33μF	13.0	22.0	32.0	27.5	12	24 E3	R60334-1000-R-
0.47μF	14.0	28.0	32.0	27.5	12	24 E3	R60474-1000-R-
0.68μF	18.0	33.0	32.0	27.5	12	24 E3	R60684-1000-R-
1.0μF	22.0	37.0	32.0	27.5	12	24 E3	R60105-1000-R-
0.47μF	11.0	22.0	41.5	37.5	10	20 E3	R60474-1000-W-
0.68μF	13.0	24.0	41.5	37.5	10	20 E3	R60684-1000-W-
1.0μF	16.0	28.5	41.5	37.5	10	20 E3	R60105-1000-W-
1.5μF	20.0	40.0	41.5	37.5	10	20 E3	R60155-1000-W-
2.2μF	24.0	44.0	41.5	37.5	10	20 E3	R60225-1000-W-

Tolerance: J (± 5%); K (±10%); M (±20%) _____

Packaging code: B (bulk); A (ammo); R (reel) _____

Lead length (mm): L (24-27); T (3.5-4.0); V (2.7-3.3) _____

Omit for standard (4-6) _____

All dimensions are in mm.

* Not suitable for across-the-line applications. Please refer to Interference Suppression Capacitors.

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 waveform and in any case it cannot exceed the value given in the above table.

Note 2: Rated voltages higher than 1000Vdc are available upon request.

METALLIZED POLYESTER FILM CAPACITOR MULTIPURPOSE APPLICATIONS SERIES CODE: R60

ELECTRICAL CHARACTERISTICS

Rated voltage (V_R): 63Vdc - 100Vdc - 160Vdc - 250Vdc
400Vdc - 630Vdc - 1000Vdc

Rated temperature (T_R): +85°C

Voltage derating vs. temperature:

for temperatures between +85°C and the upper operating temperature (+105°C for wound technology and +125°C for stacked technology) a decreasing factor of 1.25% per °C on the rated voltage V_R has to be applied.

Capacitance range:

Stacked: 1000pF to 3.3μF
Wound: 1000pF to 100μF

Capacitance values:

E6 series (IEC 60063 Norm)

Capacitance tolerances (measured at 1 kHz):
5% (J); 10% (K); 20% (M)

Total self-inductance (L): (lead length ~2mm)

Pitch (mm)	10	15	22.5	27.5	37.5
L (nH) ≈	9	10	18	18	22

Dissipation factor (DF):

tgδ×10⁻⁴ at +25°C ± 5°C

KHz	C ≤ 1μF	C > 1μF
1	≤ 100	≤ 100
10	≤ 150	

Insulation resistance:

Test conditions

Temperature: +25°C ± 5°C
Voltage charge time: 1 min
Voltage charge: 50Vdc for V_R < 100Vdc
100Vdc for V_R ≥ 100Vdc

Performance

For V_R ≤ 100Vdc

≥ 3750 MΩ for C ≤ 0.33μF (50000 MΩ)*

≥ 1250 s for C > 0.33μF (5000 s)*

For V_R > 100Vdc

≥ 30000 MΩ for C ≤ 0.33μF (50000 MΩ)*

≥ 10000 s for C > 0.33μF (17000 s)*

*Typical value

Test voltage between terminations:

1.6×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 (ΔC/C): ≤ 5%
DF change (Δtgδ): ≤ 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 (ΔC/C): ≤ 5%
DF change (Δtgδ): ≤ 50×10⁻⁴ at 10kHz for C ≤ 1μF
≤ 30×10⁻⁴ 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): ≤ 50×10⁻⁴ at 10kHz for C ≤ 1μF
≤ 30×10⁻⁴ at 1kHz for C > 1μF
Insulation resistance: ≥ initial limit

Long term stability (after two years):

Storage: standard environmental conditions see general information section.

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: 0.5×V_R
Failure rate: ≤ 5 FIT

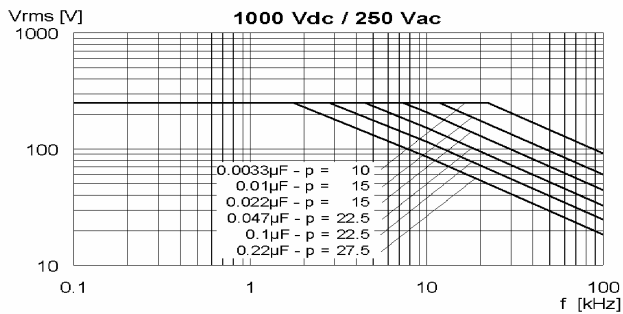
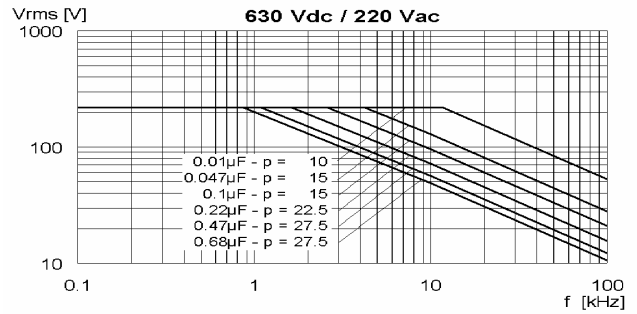
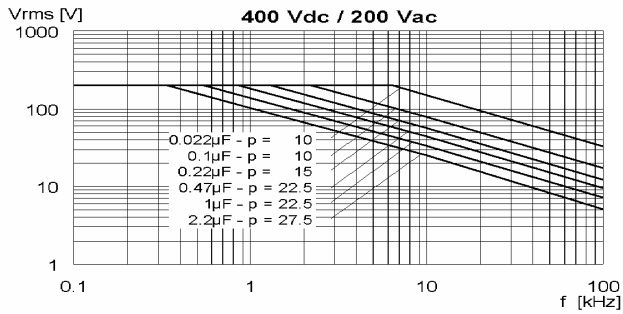
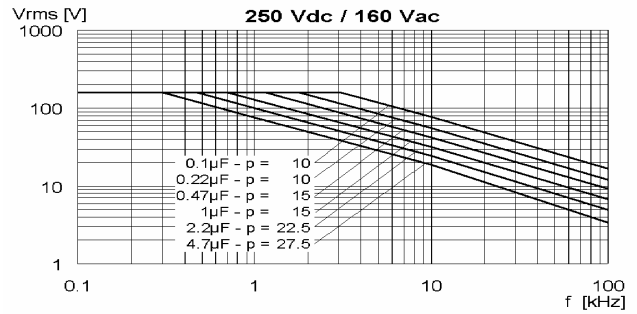
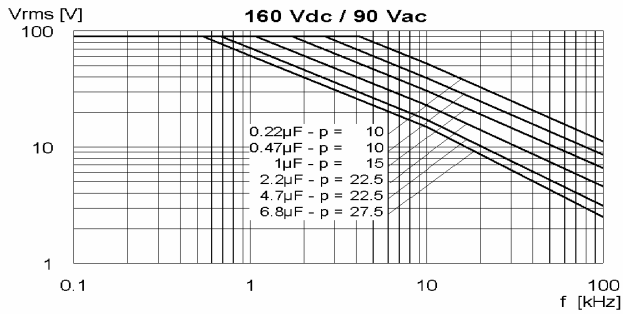
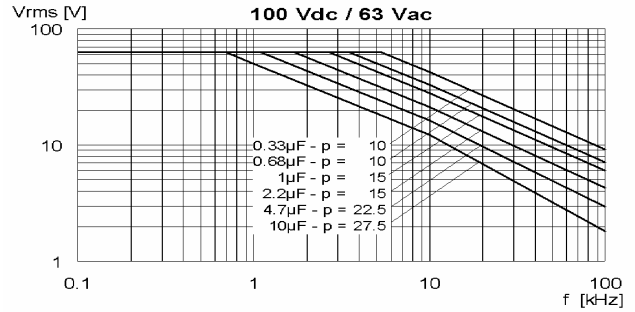
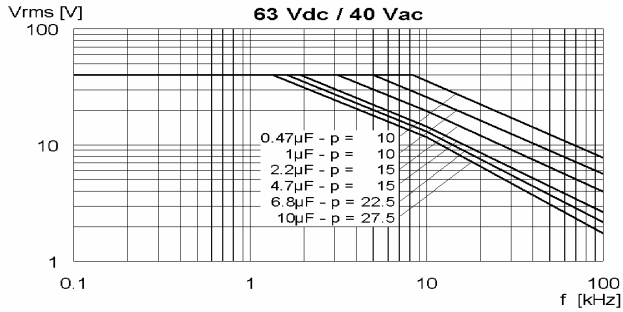
(1 FIT = 1×10⁻⁹ failures/components×h)

Failure criteria:

(according to DIN 44122)
Short or open circuit
Capacitance change |ΔC/C|: > 10%
DF change (Δtgδ): > 2×initial limit
Insulation resistance: < 0.005×initial limit

METALLIZED POLYESTER FILM CAPACITOR MULTIPURPOSE APPLICATIONS SERIES CODE: R60

MAX. VOLTAGE (V_{rms}) VERSUS FREQUENCY (sinusoidal waveform / T_h ≤ 40° C)



Note: p (pitch) in mm