

DC Filter Capacitors



TYPE ER

Capacitors offer unusually good electrical characteristics, coupled with very small size. The ER range of capacitors are manufactured using a mixed dielectric material that consists of polyester / polypropylene. The container is a rolled seamed tinplate case that is hermetically sealed. The construction is designed to prevent internal movement when subjected to shock and vibration.

Note

- The impregnant used is a non toxic highly refined, purified, and inhibited mineral oil

APPLICATIONS

The ER range of capacitors are specifically designed for DC applications.

- Audio coupling
- Pulse forming networks
- Oscillator circuits
- Arc and spark suppression
- RF by-pass
- Tuned filters
- Energy storage
- Integrating circuits
- Low and high pass filters
- High voltage smoothing

Capacitors required for AC applications and high discharge rates can also be designed from the ER range.

TEMPERATURE RANGE

Temperature range is -55 °C to +85 °C. The nominal voltage rating is applicable from -55 °C to +85 °C.

Derating is required for higher operating temperatures.

TEMPERATURE COEFFICIENT

Capacitance will increase by 2 % per 100 °C temperature change.

RIPPLE

The sum of the peak ripple voltage and the DC voltage should not exceed the rated voltage. Refer to graph Fig. 1 for permissible peak-to-peak ripple voltage as a percentage of rated voltage for various frequencies.

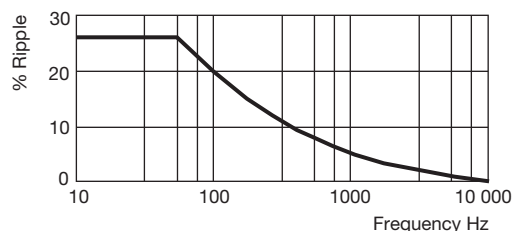


Fig. 1

POWER FACTOR

The power factor is variable, and a function of temperature and frequency. See Fig. 2. Nominal value < 0.5 % at 20 °C.

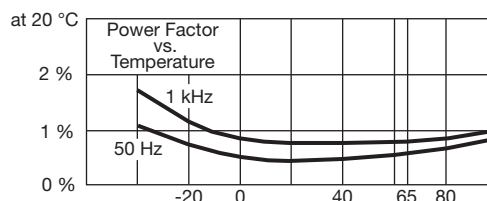


Fig. 2

DIELECTRIC RESISTANCE

(Parallel resistance) is indicated by the graph of insulation ($M\Omega \times \mu F$) vs temperature Fig. 3. The insulation ($M\Omega \times \mu F$) is nominally 10 000 s at +20 °C. (Measurements taken after 1 minute with an applied voltage of 500 V).

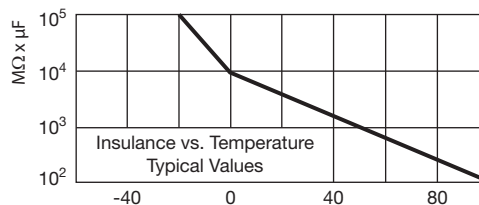


Fig. 3

LIFE EXPECTANCY

ER type capacitors are designed for a life expectancy of 50 000 h at 65 °C. To achieve the same life expectancy at 85 °C derate to 60 % of rated voltage Fig. 4.

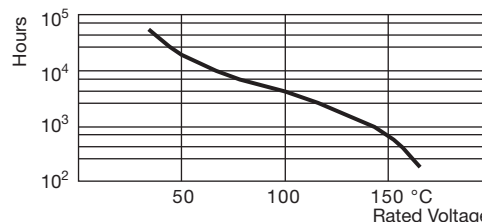


Fig. 4

CAPACITANCE RANGE

0.01 μF to 100 μF . The tolerance is $\pm 10\%$. Other tolerances are available on request. Nominal values measured at 1 kHz.

VOLTAGE RANGE

1000 V_{DC} to 40 000 V_{DC} other values on request.

TEST VOLTAGE

Terminal/terminal (Vt/t)

For DC rating < 20 kV

$V_t/t = 2.0 \times \text{rated voltage } 60 \text{ s}$

For DC rating > 20 kV

$V_t/t = 1.5 \times \text{rated voltage } 60 \text{ s}$

WEIGHT

The approximate weight in kg of capacitors in the ER range can be estimated by multiplying the volume of the capacitor container by $1.45^{(1)} \times 10^{-6}$.

TERMINATIONS

Add suffix W to part number to indicate wire terminations.

CAPACITANCE

Capacitance tolerance of 20 % is standard with those marked ⁽¹⁾.

FLASHOVER

Up to 5000 V rating, the capacitor terminals will withstand 125 % of the rated voltage without flashover at a pressure of 85 mm Hg., equivalent to 50 000 feet altitude. Above 5000 V rating, the capacitor terminals will withstand 125 % of the rated voltage at a pressure of 500 mg Hg, equivalent to 10 000 feet altitude.

LIFE TESTS

Conducted at 85 °C for 500 h. The voltage applied will be 140 % of the rated voltage.

DIMENSIONS in millimeters

Note

- Bracket specifications K, L, M on request

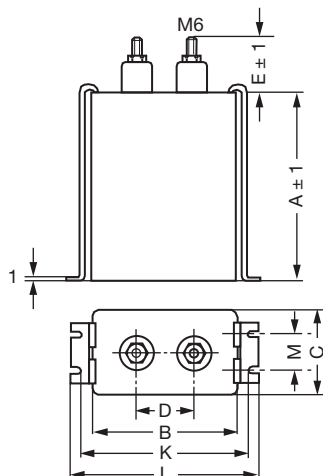


Fig. 5

TYPE DESCRIPTION

PART NUMBER	CAP. (μF)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
1000 V_{DC} WKG						
ER10-104	0.1	50	48	28	20	20
ER10-504	0.5	50	48	28	20	20
ER10-105	1.0	75	48	28	20	20
ER10-405	4.0	75	60	54	25	35
ER10-605	6.0	95	60	54	25	35
ER10-106	10.0	115	80	48	40	35
ER10-256	25.0	155	85	67	40	35
ER10-506	50.0	155	130	100	50	35
1500 V_{DC} WKG						
ER15-104	0.1	60	48	28	20	20
ER15-504	0.5	60	48	28	20	20
ER15-205	2.0	75	54	48	22	35
ER15-405	4.0	115	54	48	22	35
ER15-805	8.0	95	85	67	40	35
ER15-106	10.0	115	85	67	40	35
ER15-126	12.0	135	85	67	40	35
ER15-256	25.0	115	130	100	50	35
ER15-506	50.0	180	130	100	50	35
2000 V_{DC} WKG						
ER20-104	0.1	60	48	28	20	20
ER20-254	0.25	60	48	28	20	20
ER20-504	0.5	60	48	28	20	20
ER20-105	1.0	95	48	28	20	20
ER20-205	2.0	75	54	48	22	35
ER20-405	4.0	115	54	48	22	35
ER20-605	6.0	135	60	54	25	35
ER20-106	10.0	115	85	67	40	35
ER20-126	12.0	135	85	67	40	35
ER20-206	20.0	115	130	100	50	35
3000 V_{DC} WKG						
ER30-104	0.1	60	48	28	20	20
ER30-504	0.5	75	48	28	20	20
ER30-105	1.0	115	48	28	20	20
ER30-105X	1.0	75	54	48	22	35
ER30-205	2.0	115	54	48	22	35
ER30-405	4.0	155	60	54	25	35
ER30-605	6.0	180	80	48	40	35
ER30-805	8.0	155	85	67	40	35
ER30-106	10.0	95	130	100	50	35
ER30-206	20.0	155	130	100	50	35
ER30-256	25.0	180	130	100	50	35
ER30-104	0.1	60	48	28	20	20
4000 V_{DC} WKG						
ER40-104	0.1	60	48	28	20	20
ER40-254	0.25	75	48	28	20	20
ER40-504	0.5	95	48	28	20	20
ER40-105	1.0	95	54	48	22	35
ER40-205	2.0	135	54	48	22	35
ER40-405	4.0	115	85	67	40	35
ER40-805	8.0	115	130	100	50	35
ER40-106	10.0	135	130	100	50	35
ER40-206	20.0	230	130	100	50	35
ER40-306	30.0	320	130	100	50	35



TYPE DESCRIPTION						
PART NUMBER	CAP. [μF]	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
5000 V_{DC} WKG						
ER50-104	0.1	60	48	28	20	20
ER50-254	0.25	75	48	28	20	20
ER50-105	1.0	115	54	48	22	35
ER50-405	4.0	155	85	67	40	35
ER50-805	8.0	135	130	100	50	35
ER50-106	10.0	155	130	100	50	35
ER50-206	20.0	290	130	100	50	35
ER50-506	50.0	295	180	180	75	35
6000 V_{DC} WKG						
ER60-104	0.1	65	54	48	(1)	35
ER60-254	0.25	80	54	48	(1)	35
ER60-504	0.5	100	80	48	40	35
ER60-105	1.0	100	85	67	40	35
ER60-205	2.0	100	130	100	50	35
ER60-405	4.0	135	130	100	50	35
ER60-605	6.0	180	130	100	50	35
ER60-805	8.0	250	130	100	50	35
ER60-106	10.0	290	130	100	50	35
ER60-126	12.0	345	130	100	50	35
ER60-206	20.0	180	220	164	125	60
8000 V_{DC} WKG						
ER80-503	0.05	58	60	54	(1)	60
ER80-104	0.1	65	60	54	(1)	60
ER80-254	0.25	85	60	54	(1)	60
ER80-504	0.5	140	60	54	(1)	60
ER80-105	1.0	120	85	67	40	60
ER80-205	2.0	120	130	100	50	60
ER80-405	4.0	200	130	100	50	60
ER80-605	6.0	270	130	100	50	60
ER80-805	8.0	345	130	100	50	60
ER80-156	15.0	280	180	180	75	60
10 000 V_{DC} WKG						
ER100-503	0.05	58	80	48	40	60
ER100-104	0.1	65	80	48	54	60
ER100-504	0.5	140	80	48	40	60
ER100-105	1.0	160	85	67	40	60
ER100-205	2.0	140	130	100	50	60
ER100-405	4.0	260	130	100	50	60
ER100-605	6.0	350	130	100	50	60
ER100-805	8.0	300	190	120	75	60
ER100-156	15.0	350	180	180	75	60

Note

- (1) These capacitors are fitted with one high voltage terminal and case terminal. An additional terminal for connection to case is available as an optional extra. Add suffix M to part number

TYPE DESCRIPTION						
PART NUMBER	CAP. (μF)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
12 000 V_{DC} WKG						
ER120-503	0.05	75	85	67	40	60
ER120-104	0.10	100	85	67	40	60
ER120-254	0.25	105	85	67	40	60
ER120-105	1.0	145	130	100	75	60
ER120-205	2.0	240	130	100	75	60
ER120-405	4.0	280	190	120	75	60
15 000 V_{DC} WKG						
ER150-103	0.01	60	60	54	(1)	60
ER150-203	0.02	60	60	54	(1)	60
ER150-503	0.05	85	60	54	(1)	60
ER150-104	0.10	105	80	48	(1)	60
ER150-254	0.25	125	85	67	40	60
ER150-504	0.50	190	85	67	40	60
ER150-504X	0.50	105	130	100	75	60
ER150-105	1.0	160	130	100	75	60
ER150-205	2.0	190	159	120	75	60
20 000 V_{DC} WKG						
ER200-103	0.01	70	80	48	(1)	60
ER200-503X	0.05	85	85	67	40	60
ER200-104	0.1	105	85	67	40	60
ER200-254	0.25	190	85	67	40	60
ER200-504	0.5	160	130	100	75	60
ER200-105	1.0	300	130	100	75	60
ER200-205	2.0	250	180	180	90	100
ER200-405	4.0	305	240	180	100	100
25 000 V_{DC} WKG						
ER250-503	0.05	110	85	67	(1)	70
ER250-104X	0.1	95	130	100	65	70
ER250-254	0.25	130	130	100	65	70
ER250-504	0.5	250	130	100	65	70
30 000 V_{DC} WKG						
ER300-303	0.03	120	85	67	(1)	70
ER300-104	0.1	200	85	67	(1)	70
ER300-104X	0.1	120	130	100	65	70
ER300-504	0.5	315	130	100	65	70
ER300-105	1.0	295	180	180	75	100
40 000 V_{DC} WKG						
ER400-303	0.03	160	85	67	(1)	70
ER400-503	0.05	210	85	67	(1)	70
ER400-503X	0.05	125	130	100	65	70



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