

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.

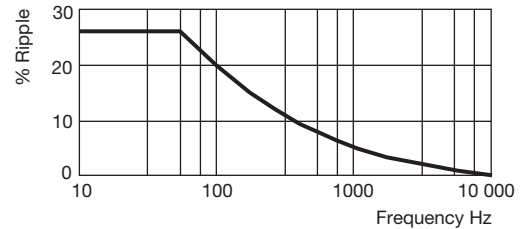


Fig. 1

POWER FACTOR

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

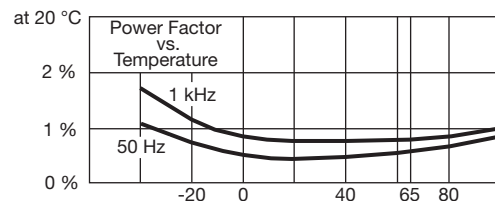


Fig. 2

DIELECTRIC RESISTANCE

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

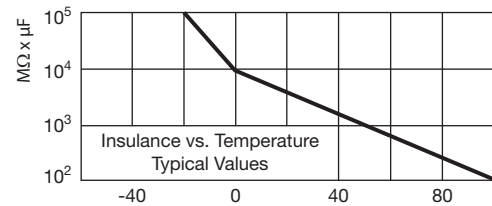


Fig. 3

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.

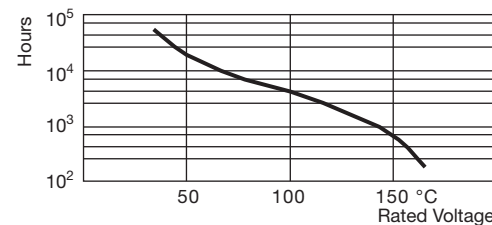


Fig. 4

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

Vt/t = 2.0 x rated voltage 60 s

For DC rating > 20 kV

Vt/t = 1.5 x rated voltage 60 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⁾ x 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

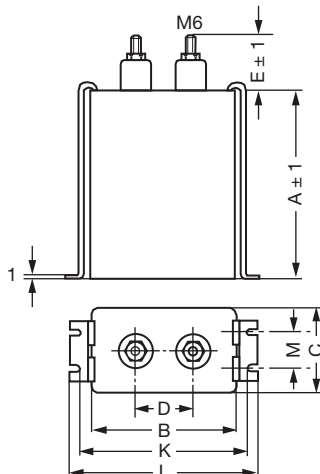


Fig. 5

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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