



Aluminum Electrolytic Capacitors

LP Series

Features

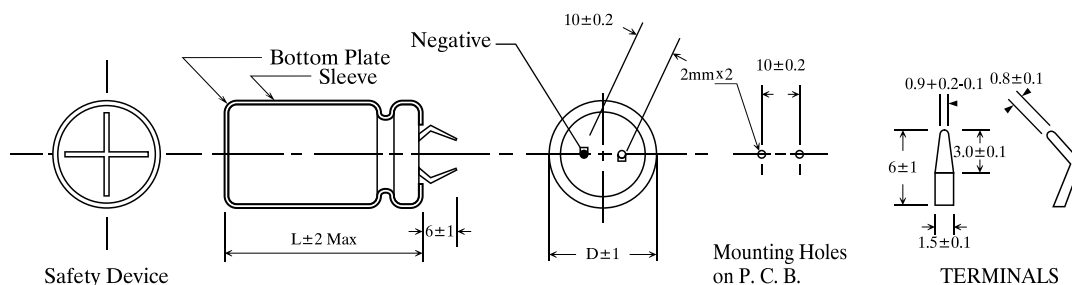
- PCB Snap-In type 85°C
- Directly mountable on printed circuit board without holders.
- Terminal spacing fixed at 10mm for pc board plug in.
- RoHS Compliance



Specification

| Items | Performance | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------|------|------------|------|-----------|----------------|------|------|--------|------|------|------|--------------------|---|----------------------------------|--------------------|---|-----------------------------------------|-----------------|---|--------------------------------|
| Capacitance Tolerance | ±20% (at 120Hz, 25°C) | | | | | | | | | | | | | | | | | | | | | | |
| Rated Voltage Range | 10 to 100 VDC | | | | | | | 160 to 450 VDC | | | | | | | | | | | | | | | |
| Capacitance Range | 1000 to 47000 μF | | | | | | | 47 to 2200 μF | | | | | | | | | | | | | | | |
| Operating Temperature Range | -40 to + 85°C | | | | | | | -25 to 85°C | | | | | | | | | | | | | | | |
| Leakage Current (at 20°C) | $I \leq 0.02 CV$ After 5 minutes application of working voltage. I = Leakage current (μA), C = Rated capacitance (μF), V = Rated voltage (V) | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor (Tan δ at 120Hz, 20°C) | Rated Voltage | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 350 | 400 | 450 | | | | | | | | | |
| | Tan δ (max) | 0.50 | 0.50 | 0.40 | 0.40 | 0.30 | 0.30 | 0.25 | 0.15 | 0.15 | 0.15 | 0.20 | 0.20 | 0.20 | | | | | | | | | |
| Low Temperature Characteristics (at 120Hz) | Impedance ratio shall not exceed the values given in the table below. | | | | | | | | | | | | | | | | | | | | | | |
| | Rated Voltage | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 350 | 400 | 450 | | | | | | | | | |
| | Z-25°C / Z+20°C | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 8 | | | | | | | | | |
| | Z-40°C / Z+20°C | 15 | 15 | 15 | 12 | 12 | 12 | 12 | - | - | - | - | - | - | | | | | | | | | |
| Load Life | After 2000 hours application of W.V. at 85°C, the capacitor shall meet the following limits. <table style="margin-left: 20px;"> <tr> <td>Capacitance change</td> <td>:</td> <td>$\leq \pm 25\%$ of initial value</td> </tr> <tr> <td>Dissipation factor</td> <td>:</td> <td>$\leq 200\%$ of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>:</td> <td>\leq Initial specified value</td> </tr> </table> | | | | | | | | | | | | | | Capacitance change | : | $\leq \pm 25\%$ of initial value | Dissipation factor | : | $\leq 200\%$ of initial specified value | Leakage Current | : | \leq Initial specified value |
| Capacitance change | : | $\leq \pm 25\%$ of initial value | | | | | | | | | | | | | | | | | | | | | |
| Dissipation factor | : | $\leq 200\%$ of initial specified value | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | : | \leq Initial specified value | | | | | | | | | | | | | | | | | | | | | |
| Shelf Life | After storage for 1000 hours at 85°C, with no voltage applied and being stabilized at + 20°C, Capacitor shall meet the limit specified in load life. | | | | | | | | | | | | | | | | | | | | | | |
| Ripple Current & Frequency Multiplier | Freq.(Hz) | | 60 (50) | | 120 | | 500 | | 1K | | 10K up | | | | | | | | | | | | |
| | W.V. (V) | | Under 100 | | 160 to 250 | | 350 to up | | | | | | | | | | | | | | | | |
| | | | 0.90 | | 1.00 | | 1.13 | | 1.19 | | 1.20 | | | | | | | | | | | | |
| | | | 0.81 | | 1.00 | | 1.17 | | 1.32 | | 1.45 | | | | | | | | | | | | |
| Ripple Current & Temperature Multiplier | Temperature(°C) | | 70 | | 85 | | | | | | | | | | | | | | | | | | |
| | Multiplier | | 1.50 | | 1.00 | | | | | | | | | | | | | | | | | | |

DIAGRAM OF DIMENSIONS



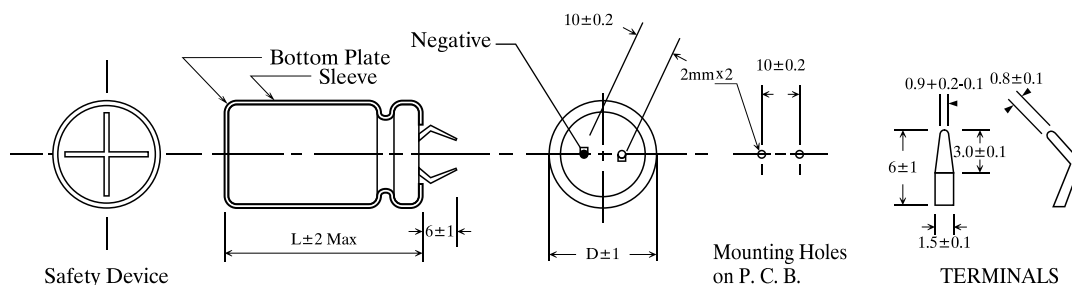
DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension : $\phi D \times L$ (mm)

Ripple Current : A/rms at 120Hz, 85°C

| VDC μF | 10V | | 16V | | 25V | | 35V | | 50V | | 63V | | 100V | |
|----------------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|
| | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple |
| 1000 | | | | | | | | | | | | | 22x32 | 1.58 |
| | | | | | | | | | | | | | 25x26 | 2.58 |
| 1500 | | | | | | | | | | | 22x26 | 1.59 | 22x41 | 1.75 |
| | | | | | | | | | | | | | 25x36 | 1.75 |
| | | | | | | | | | | | | | 30x32 | 1.75 |
| 2200 | | | | | | | 22x26 | 2.08 | 22x26 | 1.98 | 22x32 | 2.48 | 22x51 | 2.52 |
| | | | | | | | | | | | 25x26 | 2.48 | 25x41 | 2.52 |
| | | | | | | | | | | | | | 30x32 | 2.52 |
| 3300 | | | | | | | 22x26 | 2.24 | 22x32 | 2.52 | 22x41 | 3.06 | 25x51 | 3.34 |
| | | | | | | | | | 25x36 | 2.52 | 25x32 | 3.06 | 30x41 | 3.34 |
| 4700 | | | | | 22x26 | 2.52 | 22x32 | 2.46 | 22x36 | 2.72 | 22x51 | 3.12 | 30x51 | 3.62 |
| | | | | | | | 25x26 | 2.46 | 25x36 | 2.72 | 25x41 | 3.12 | 35x46 | 3.62 |
| | | | | | | | | | | | 30x32 | 3.12 | | |
| 6800 | | | | | 22x32 | 2.78 | 22x36 | 2.85 | 22x51 | 3.12 | 25x51 | 4.19 | | |
| | | | | | 25x26 | 2.78 | 25x32 | 2.85 | 25x41 | 3.12 | 25x50 | 4.19 | 35x52 | 3.95 |
| | | | | | | | | | 30x32 | 3.12 | 30x50 | 4.19 | | |
| 10000 | | | 22x26 | 2.85 | 22x36 | 3.36 | 22x46 | 3.42 | | | | | | |
| | | | 25x26 | 2.85 | 25x32 | 3.36 | 25x41 | 3.42 | 25x51 | 3.88 | | | | |
| | | | | | | | 30x32 | 3.42 | 30x41 | 3.88 | 30x50 | 4.67 | | |
| | | | | | | | | | | | 35x45 | 4.67 | | |
| 15000 | 22x36 | 3.68 | 22x36 | 3.68 | 22x51 | 4.18 | | | | | | | | |
| | 25x32 | 3.68 | 25x32 | 3.68 | 25x41 | 4.18 | 25x51 | 3.78 | | | | | | |
| | | | | | 30x32 | 4.18 | 30x35 | 3.78 | | | | | | |
| | | | | | | | | | 30x51 | 4.57 | | | | |
| | | | | | | | | | 35x48 | 4.57 | 35x58 | 4.98 | | |
| 22000 | 22x46 | 4.6 | 22x46 | 4.6 | | | | | | | | | | |
| | 25x36 | 4.6 | 25x36 | 4.6 | 25x51 | 5.24 | | | | | | | | |
| | 30x32 | 4.6 | 30x32 | 4.6 | 30x41 | 5.24 | 30x51 | 5.35 | | | | | | |
| | | | | | | | 35x42 | 5.35 | 35x58 | 5.74 | | | | |
| 33000 | 25x51 | 7.95 | 25x51 | 7.95 | | | | | | | | | | |
| | 30x41 | 7.95 | 30x41 | 7.95 | 30x51 | 6.12 | | | | | | | | |
| | | | | | 35x42 | 6.12 | 35x52 | 6.28 | | | | | | |
| 47000 | 30x51 | 8.78 | 30x51 | 8.78 | | | | | | | | | | |
| | 35x42 | 8.78 | 35x42 | 8.78 | 35x52 | 7.55 | | | | | | | | |

DIAGRAM OF DIMENSIONS



DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension : $\phi D \times L$ (mm)

Ripple Current : A/rms at 120Hz, 85°C

| VDC μF | 160V | | 200V | | 250V | | 350V | | 400V | | 450V | |
|----------------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|
| | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple | $\phi D \times L$ | Ripple |
| 47 | | | | | | | | | | | 22x26 | 032 |
| 68 | | | | | | | | | 22x26 | 0.48 | 22x26 | 0.38 |
| 100 | | | | | | | 22x32 | 0.72 | 22x32 | 0.95 | 22x36 | 0.98 |
| 150 | | | | | 22x26 | 0.86 | 22x36 | 1.02 | 22x36 | 1.08 | 22x51 | 1.13 |
| | | | | | 25x32 | 1.02 | 25x32 | 1.08 | 25x32 | 1.08 | 25x41 | 1.13 |
| 220 | | | 22x26 | 1.28 | 22x32 | 1.28 | 22x46 | 1.32 | 22x51 | 1.68 | 25x51 | 1.55 |
| | | | | | 25x26 | 1.28 | 25x41 | 1.32 | 25x41 | 1.68 | 30x41 | 1.55 |
| | | | | | 30x32 | 1.32 | 30x36 | 1.68 | 30x36 | 1.68 | 35x37 | 1.55 |
| 330 | 22x26 | 1.38 | 22x32 | 1.79 | 22x36 | 1.79 | | | 22x51 | 1.89 | | |
| | | | 25x26 | 1.79 | 25x32 | 1.79 | 25x51 | 1.76 | 25x51 | 2.18 | | |
| | | | | | | | 30x41 | 1.76 | 30x46 | 2.18 | 30x51 | 2.18 |
| 470 | 22x32 | 1.67 | 22x36 | 2.12 | 22x26 | 2.22 | | | | | | |
| | 25x26 | 1.67 | 25x32 | 2.12 | 25x41 | 2.22 | | | 25x56 | 2.39 | | |
| | | | | | 30x32 | 2.22 | 30x51 | 2.32 | 30x46 | 2.39 | | |
| 680 | | | | | | | 35x42 | 2.32 | 35x41 | 2.71 | 35x50 | 2.60 |
| | 22x41 | 2.29 | 22x46 | 2.84 | | | | | | | | |
| | 25x36 | 2.29 | 25x40 | 2.84 | 25x51 | 3.02 | | | | | | |
| | 30x32 | 2.29 | 30x41 | 2.84 | 30x41 | 3.02 | | | 30x56 | 2.98 | | |
| 1000 | | | | | 35x32 | 3.02 | 35x52 | 3.10 | 35x51 | 3.05 | 35x57 | 2.89 |
| | 25x48 | 2.98 | 25x51 | 3.82 | | | | | | | | |
| | 30x41 | 2.98 | 30x41 | 3.82 | 30x51 | 3.80 | | | | | | |
| 1500 | | | | | 35x46 | 3.80 | 35x63 | 3.40 | | | | |
| | 30x46 | 3.84 | 30x51 | 4.87 | | | | | | | | |
| 2200 | 35x36 | 3.84 | 35x46 | 4.87 | 35x52 | 5.28 | | | | | | |
| | 35x47 | 4.58 | 35x56 | 5.89 | | | | | | | | |