

Type LP 105 °C Snap-In Aluminum Electrolytic Capacitors

Stable ESR, Long Life, Snap-In



Type LP radial snap-in aluminum electrolytic capacitors are small in size and are rated for low voltage applications. Their durable construction guarantees a long life while operating up to 105 °C with a stable ESR. These features make the Type LP ideal for use in switch-mode power supplies.

Highlights

- High Reliability
- 105 °C
- 22 to 35 mm diameter with 10 mm lead spacing

Specifications

| | |
|-------------------------------------|-----------------------|
| Capacitance Range: | 100 to 47,000 μ F |
| Voltage Range: | 16 to 250 Vdc |
| Capacitance tolerance: | \pm 20% |
| Operating Temperature Range: | -40 °C to +105 °C |
| Dissipation Factor: | |

| DF at 120 Hz, +25 °C | | | | |
|----------------------|----|---------|---------|----------|
| Vdc | 16 | 25 - 35 | 50 - 63 | 100- 250 |
| DF % | 30 | 25 | 20 | 15 |

For values that are >1000 μ F, the DF (%) increases 2% for every additional 1000 μ F

DC Leakage Test:

$I = .02CV$
 C = capacitance in μ F
 V = rated voltage
 I = leakage current in μ A

Voltage/Frequency Ripple Multipliers:

| Rated Vdc | Ripple Multipliers | | | | | |
|------------|--------------------|--------|--------|---------|--------|---------|
| | 60 Hz | 100 Hz | 300 Hz | 1000 Hz | 10 kHz | 100 kHz |
| 10 to 50 | 0.90 | 1.00 | 1.03 | 1.05 | 1.10 | 1.10 |
| 63 to 100 | 0.85 | 1.00 | 1.07 | 1.13 | 1.19 | 1.20 |
| 160 to 250 | 0.80 | 1.00 | 1.15 | 1.25 | 1.35 | 1.40 |

Temperature Ripple Multipliers:

| Temperature | Ripple Multiplier |
|-------------|-------------------|
| +85 °C | 1.65 |
| +65 °C | 2.25 |
| +45 °C | 2.55 |

The maximum ripple current at 105 °C and 120 Hz are the Ratings Table. Adjust to other temperature and frequencies using the tables here.

Load Life Test:

1,000 h @ full load at +105 °C per EIA IS-749
 Δ Capacitance \pm 20%
 ESR 200% of limit
 DCL 100% of limit

Shelf Life:

500 h @ 105 °C, capacitance, \leq 200% ESR and DC \pm 20%, initial requirements

Vibration:

10 to 55 Hz, 0.06" and 10 g max, 2 h in each plane



Complies with the EU Directive 2002/95/EC requirement restricting the use of Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr(VI)), PolyBrominated Biphenyls (PBB) and PolyBrominated Diphenyl Ethers (PBDE).

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Part Numbering System



| Diameter | Length | | | | | | |
|----------|--------|------|-----------|-----------|-----------|-----------|-----------|
| | mm | (in) | 25 (1.00) | 30 (1.18) | 35 (1.38) | 40 (1.57) | 45 (1.77) |
| 22 | (0.87) | A1 | A3 | A5 | A7 | A4 | A9 |
| 25 | (1.00) | C1 | C3 | C5 | C7 | C4 | C9 |
| 30 | (1.18) | E1 | E3 | E5 | E7 | E4 | E9 |
| 35 | (1.38) | H1 | H3 | H5 | H7 | H4 | H9 |

Outline Drawing



Ratings

| Cap (μF) | Catalog Part Number | Max ESR @ 120 Hz +25 °C (Ω) | Max Ripple @ 120 Hz +105 °C (A) | Size (Inches) | | Size (mm) | |
|-----------------------------|---------------------|-----------------------------|---------------------------------|---------------|-------|-----------|----|
| | | | | D | L | D | L |
| 16 Vdc; 20 Vdc Surge | | | | | | | |
| 4,700 | LP472M016A1P3 | 0.141 | 1.20 | 0.866 | 0.984 | 22 | 25 |
| 5,600 | LP562M016C1P3 | 0.120 | 1.43 | 0.984 | 0.984 | 25 | 25 |
| 8,200 | LP822M016A5P3 | 0.081 | 1.82 | 0.866 | 1.378 | 22 | 35 |
| 12,000 | LP123M016E3P3 | 0.055 | 2.38 | 1.181 | 1.181 | 30 | 30 |
| 15,000 | LP153M016H3P3 | 0.046 | 3.00 | 1.378 | 1.181 | 35 | 30 |
| 22,000 | LP223M016E7P3 | 0.030 | 3.53 | 1.181 | 1.575 | 30 | 40 |
| 27,000 | LP273M016H7P3 | 0.025 | 4.27 | 1.378 | 1.575 | 35 | 40 |
| 33,000 | LP333M016H9P3 | 0.020 | 5.00 | 1.378 | 1.969 | 35 | 50 |
| 47,000 | LP473M016E9P3 | 0.020 | 6.80 | 1.181 | 1.969 | 30 | 50 |
| 25 Vdc; 32 Vdc Surge | | | | | | | |
| 2,700 | LP272M025C1P3 | 0.180 | 1.000 | 0.984 | 0.984 | 25 | 25 |
| 3,300 | LP332M025A1P3 | 0.151 | 1.160 | 0.866 | 0.984 | 22 | 25 |
| 3,300 | LP332M025C1P3 | 0.150 | 1.143 | 0.984 | 0.984 | 25 | 25 |
| 4,700 | LP472M025C1P3 | 0.106 | 1.480 | 0.984 | 0.984 | 25 | 25 |
| 5,600 | LP562M025E1P3 | 0.090 | 1.857 | 1.181 | 0.984 | 30 | 25 |
| 5,600 | LP562M025C3P3 | 0.089 | 1.730 | 0.984 | 1.181 | 25 | 30 |
| 6,800 | LP682M025C5P3 | 0.073 | 1.940 | 0.984 | 1.378 | 25 | 35 |
| 10,000 | LP103M025H3P3 | 0.050 | 3.333 | 1.378 | 1.181 | 35 | 30 |
| 12,000 | LP123M025H3P3 | 0.041 | 2.970 | 1.378 | 1.181 | 35 | 30 |
| 15,000 | LP153M025E7P3 | 0.033 | 3.360 | 1.181 | 1.575 | 30 | 40 |
| 22,000 | LP223M025H9P3 | 0.023 | 4.857 | 1.378 | 1.969 | 35 | 50 |

| Cap (μF) | Catalog Part Number | Max ESR @ 120 Hz +25 °C (Ω) | Max Ripple @ 120 Hz +105 °C (A) | Size (Inches) | | Size (mm) | |
|-----------------------------|---------------------|-----------------------------|---------------------------------|---------------|-------|-----------|----|
| | | | | D | L | D | L |
| 35 Vdc; 44 Vdc Surge | | | | | | | |
| 1,800 | LP182M035A1P3 | 0.188 | 1.040 | 0.866 | 0.984 | 22 | 25 |
| 2,700 | LP272M035C1P3 | 0.155 | 1.257 | 0.984 | 0.984 | 25 | 25 |
| 3,900 | LP392M035E1P3 | 0.108 | 1.571 | 1.181 | 0.984 | 30 | 25 |
| 5,600 | LP562M035E3P3 | 0.074 | 2.050 | 1.181 | 1.181 | 30 | 30 |
| 6,800 | LP682M035E5P3 | 0.060 | 2.286 | 1.181 | 1.378 | 30 | 35 |
| 6,800 | LP682M035C7P3 | 0.061 | 2.320 | 0.984 | 1.575 | 25 | 40 |
| 8,200 | LP822M035H3P3 | 0.051 | 2.690 | 1.378 | 1.181 | 35 | 30 |
| 10,000 | LP103M035E7P3 | 0.041 | 3.000 | 1.181 | 1.575 | 30 | 40 |
| 12,000 | LP123M035H7P3 | 0.035 | 3.590 | 1.378 | 1.575 | 35 | 40 |
| 15,000 | LP153M035H9P3 | 0.028 | 4.000 | 1.378 | 1.969 | 35 | 50 |
| 50 Vdc; 63 Vdc Surge | | | | | | | |
| 1,200 | LP122M050A1P3 | 0.280 | 0.860 | 0.866 | 0.984 | 22 | 25 |
| 1,500 | LP152M050A1P3 | 0.225 | 0.983 | 0.866 | 0.984 | 22 | 25 |
| 2,200 | LP222M050A5P3 | 0.151 | 1.330 | 0.866 | 1.378 | 22 | 35 |
| 2,200 | LP222M050E1P3 | 0.150 | 1.429 | 1.181 | 0.984 | 30 | 25 |
| 3,300 | LP332M050E3P3 | 0.101 | 0.176 | 1.181 | 1.181 | 30 | 30 |
| 3,300 | LP332M050C5P3 | 0.101 | 1.710 | 0.984 | 1.378 | 25 | 35 |
| 3,300 | LP332M050C3P3 | 0.101 | 1.710 | 0.984 | 1.181 | 25 | 30 |
| 3,900 | LP392M050C7P3 | 0.085 | 1.970 | 0.984 | 1.575 | 25 | 40 |
| 4,700 | LP472M050H3P3 | 0.071 | 2.270 | 1.378 | 1.181 | 35 | 30 |

Type LP 105 °C Snap-In Aluminum Electrolytic Capacitors

| Cap (μ F) | Catalog Part Number | Max ESR @ 120 Hz +25 °C (Ω) | Max Ripple @ 120 Hz +105 °C (A) | Size (Inches) | | Size (mm) | |
|-------------------------------|------------------------|---|--|-----------------------------|-------|--------------|----|
| | | | | D | L | D | L |
| | | | | 50 Vdc; 63 Vdc Surge | | | |
| 5,600 | LP562M050H5P3 | 0.059 | 2.60 | 1.378 | 1.378 | 35 | 35 |
| 6,800 | LP682M050E7P3 | 0.049 | 3.16 | 1.181 | 1.575 | 30 | 40 |
| 6,800 | LP682M050E9P3 | 0.049 | 3.16 | 1.181 | 1.969 | 30 | 50 |
| 8,200 | LP822M050H9P3 | 0.040 | 3.43 | 1.378 | 1.969 | 35 | 50 |
| 63 Vdc; 75 Vdc Surge | | | | | | | |
| 820 | LP821M063A1P3 | 0.300 | 0.77 | 0.866 | 0.984 | 22 | 25 |
| 1,200 | LP122M063C1P3 | 0.210 | 0.99 | 0.984 | 0.984 | 25 | 25 |
| 1,800 | LP182M063A7P3 | 0.138 | 1.34 | 0.866 | 1.575 | 22 | 40 |
| 1,800 | LP182M063E1P3 | 0.140 | 1.37 | 1.181 | 0.984 | 30 | 25 |
| 2,200 | LP222M063E3P3 | 0.113 | 1.55 | 1.181 | 1.181 | 30 | 30 |
| 3,300 | LP332M063H3P3 | 0.076 | 1.20 | 1.378 | 1.181 | 35 | 30 |
| 4,700 | LP472M063E9P3 | 0.053 | 2.84 | 1.181 | 1.969 | 30 | 50 |
| 6,800 | LP682M063H9P3 | 0.037 | 3.36 | 1.378 | 1.969 | 35 | 50 |
| 100 Vdc; 125 Vdc Surge | | | | | | | |
| 820 | LP821M100E1P3 | 0.3 | 0.98 | 1.181 | 0.984 | 30 | 25 |
| 2,200 | LP222M100H7P3 | 0.113 | 2.03 | 1.378 | 1.575 | 35 | 40 |
| 2,700 | LP272M100H9P3 | 0.092 | 2.32 | 1.378 | 1.969 | 35 | 50 |
| 2,700 | LP272M100H7P3 | 0.092 | 2.32 | 1.378 | 1.575 | 35 | 40 |
| 200 Vdc; 250 Vdc Surge | | | | | | | |
| 150 | LP151M200C1P3 | 1.650 | 0.509 | 0.984 | 0.984 | 25 | 25 |
| 150 | LP151M200A1P3 | 1.650 | 0.509 | 0.866 | 0.984 | 22 | 25 |
| 180 | LP181M200C1P3 | 1.400 | 0.571 | 0.984 | 0.984 | 25 | 25 |
| 220 | LP221M200C1P3 | 1.100 | 0.646 | 0.984 | 0.984 | 25 | 25 |
| 220 | LP221M200E1P3 | 1.100 | 0.646 | 1.181 | 0.984 | 30 | 25 |
| 220 | LP221M200A3P3 | 1.130 | 0.660 | 0.866 | 1.181 | 22 | 30 |
| 270 | LP271M200E1P3 | 0.920 | 0.790 | 1.181 | 0.984 | 30 | 25 |
| 270 | LP271M200C3P3 | 0.920 | 0.790 | 0.984 | 1.181 | 25 | 30 |
| 330 | LP331M200E3P3 | 0.750 | 0.886 | 1.181 | 1.181 | 30 | 30 |
| 390 | LP391M200C5P3 | 0.640 | 0.980 | 0.984 | 1.378 | 25 | 35 |
| 470 | LP471M200E5P3 | 0.540 | 1.143 | 1.181 | 1.378 | 30 | 35 |

| Cap (μ F) | Catalog Part Number | Max ESR @ 120 Hz +25 °C (Ω) | Max Ripple @ 120 Hz +105 °C (A) | Size (Inches) | | Size (mm) | |
|-------------------------------|------------------------|---|--|-------------------------------|-------|--------------|----|
| | | | | D | L | D | L |
| | | | | 200 Vdc; 250 Vdc Surge | | | |
| 470 | LP471M200E1P3 | 0.540 | 1.140 | 1.181 | 0.984 | 30 | 25 |
| 470 | LP471M200H3P3 | 0.540 | 1.143 | 1.378 | 1.181 | 35 | 30 |
| 560 | LP561M200H3P3 | 0.440 | 1.310 | 1.378 | 1.181 | 35 | 30 |
| 680 | LP681M200E3P3 | 0.370 | 1.520 | 1.181 | 1.181 | 30 | 30 |
| 680 | LP681M200E5P3 | 0.370 | 1.510 | 1.181 | 1.378 | 30 | 35 |
| 680 | LP681M200H1P3 | 0.370 | 1.510 | 1.378 | 0.984 | 35 | 25 |
| 820 | LP821M200H7P3 | 0.300 | 1.750 | 1.378 | 1.575 | 35 | 40 |
| 820 | LP821M200H3P3 | 0.300 | 1.750 | 1.378 | 1.181 | 35 | 30 |
| 1,000 | LP102M200H9P3 | 0.250 | 2.114 | 1.378 | 1.969 | 35 | 50 |
| 1,000 | LP102M200H5P3 | 0.250 | 2.114 | 1.378 | 1.378 | 35 | 35 |
| 1,200 | LP122M200E9P3 | 0.165 | 2.810 | 1.181 | 1.969 | 30 | 50 |
| 1,200 | LP122M200H5P3 | 0.165 | 2.740 | 1.378 | 1.378 | 35 | 35 |
| 1,500 | LP152M200H4P3 | 0.134 | 3.330 | 1.378 | 1.772 | 35 | 45 |
| 1,800 | LP182M200H9P3 | 0.112 | 3.800 | 1.378 | 1.969 | 35 | 50 |
| 250 Vdc; 300 Vdc Surge | | | | | | | |
| 100 | LP101M250A1P3 | 2.500 | 0.410 | 0.866 | 0.984 | 22 | 25 |
| 150 | LP151M250C1P3 | 1.660 | 0.540 | 0.984 | 0.984 | 25 | 25 |
| 180 | LP181M250C3P3 | 1.400 | 0.686 | 0.984 | 1.181 | 25 | 30 |
| 220 | LP221M250E1P3 | 1.130 | 0.710 | 1.181 | 0.984 | 30 | 25 |
| 270 | LP271M250C3P3 | 0.922 | 0.840 | 0.984 | 1.181 | 25 | 30 |
| 330 | LP331M250E3P3 | 0.750 | 0.914 | 1.181 | 1.181 | 30 | 30 |
| 390 | LP391M250H3P3 | 0.640 | 1.090 | 1.378 | 1.181 | 35 | 30 |
| 470 | LP471M250E7P3 | 0.530 | 1.260 | 1.181 | 1.575 | 30 | 40 |
| 470 | LP471M250H1P3 | 0.530 | 1.260 | 1.378 | 0.984 | 35 | 25 |
| 560 | LP561M250H3P3 | 0.347 | 1.800 | 1.378 | 1.181 | 35 | 30 |
| 680 | LP681M250E9P3 | 0.370 | 1.920 | 1.181 | 1.969 | 30 | 50 |
| 680 | LP681M250H5P3 | 0.370 | 2.070 | 1.378 | 1.378 | 35 | 35 |
| 820 | LP821M250H7P3 | 0.243 | 2.400 | 1.378 | 1.575 | 35 | 40 |
| 1,000 | LP102M250H4P3 | 0.200 | 2.720 | 1.378 | 1.772 | 35 | 45 |
| 1,200 | LP122M250H9P3 | 0.165 | 3.100 | 1.378 | 1.969 | 35 | 50 |

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