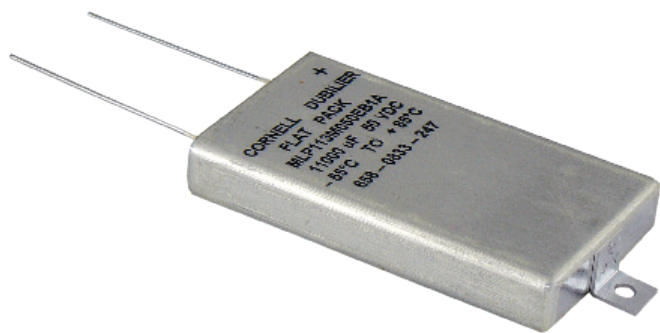


Type MLP 85 °C Flatpack, Ultra Long Life, Aluminum Electrolytic

Very Low Profile



The MLP's high-energy storage and box-shape make it perfect for voltage holdup or filtering in military SEM-E modules, telecom circuit packs and computer cards. The MLP delivers up to 20 joules of energy storage in a 1/2" height with 50 year's life at +45 °C. You can readily heatsink it to double the ripple-current capability. The MLP is the square-peg component that fits the square-holes in electronic assemblies.

Highlights

- Low-profile replacement for snap-ins
- Double the ripple capability with a heatsink
- Nearly hermetic welded seal assures 50-year life
- Withstands more than 80,000 feet altitude

Specifications

| Temperature Range | -55°C to +85°C ≤250 Vdc -40°C to +85°C ≥300 Vdc | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--|-------|--------|--------|-------|-------|-------------|------|------|------|------|-------|-------|-------|-------|-------|------|------|------|------|------|--|-------|-------|--------|--------|-------|-------|-------------|-------------|------|------|------|------|------|------|------|-------------|------|------|------|------|------|------|------|
| Rated Voltage Range | 7.5 Vdc to 450 Vdc | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Range | 110 uF to 47,000 μF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance | ±20% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | ≤ 0.002 CV μA, @ 25°C and 5 mins. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ripple Current Multipliers | <p>Ambient Temperature, No Heatsink</p> <table border="1"> <thead> <tr> <th>45 °C</th> <th>55 °C</th> <th>65 °C</th> <th>75 °C</th> <th>85 °C</th> </tr> </thead> <tbody> <tr> <td>1.00</td> <td>0.90</td> <td>0.75</td> <td>0.56</td> <td>0.27</td> </tr> </tbody> </table> <p>Case Temperature</p> <table border="1"> <thead> <tr> <th>45 °C</th> <th>55 °C</th> <th>65 °C</th> <th>75 °C</th> <th>85 °C</th> </tr> </thead> <tbody> <tr> <td>3.79</td> <td>3.32</td> <td>2.77</td> <td>2.08</td> <td>1.00</td> </tr> </tbody> </table> <p>Frequency</p> <table border="1"> <thead> <tr> <th></th> <th>50 Hz</th> <th>60 Hz</th> <th>120 Hz</th> <th>360 Hz</th> <th>1 kHz</th> <th>5 kHz</th> <th>10 kHz & up</th> </tr> </thead> <tbody> <tr> <th>7.5 to 63 V</th> <td>0.94</td> <td>0.95</td> <td>1.00</td> <td>1.04</td> <td>1.05</td> <td>1.06</td> <td>1.06</td> </tr> <tr> <th>80 to 450 V</th> <td>0.80</td> <td>0.85</td> <td>1.00</td> <td>1.17</td> <td>1.24</td> <td>1.28</td> <td>1.29</td> </tr> </tbody> </table> | 45 °C | 55 °C | 65 °C | 75 °C | 85 °C | 1.00 | 0.90 | 0.75 | 0.56 | 0.27 | 45 °C | 55 °C | 65 °C | 75 °C | 85 °C | 3.79 | 3.32 | 2.77 | 2.08 | 1.00 | | 50 Hz | 60 Hz | 120 Hz | 360 Hz | 1 kHz | 5 kHz | 10 kHz & up | 7.5 to 63 V | 0.94 | 0.95 | 1.00 | 1.04 | 1.05 | 1.06 | 1.06 | 80 to 450 V | 0.80 | 0.85 | 1.00 | 1.17 | 1.24 | 1.28 | 1.29 |
| 45 °C | 55 °C | 65 °C | 75 °C | 85 °C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.00 | 0.90 | 0.75 | 0.56 | 0.27 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 °C | 55 °C | 65 °C | 75 °C | 85 °C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.79 | 3.32 | 2.77 | 2.08 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 Hz | 60 Hz | 120 Hz | 360 Hz | 1 kHz | 5 kHz | 10 kHz & up | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.5 to 63 V | 0.94 | 0.95 | 1.00 | 1.04 | 1.05 | 1.06 | 1.06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 to 450 V | 0.80 | 0.85 | 1.00 | 1.17 | 1.24 | 1.28 | 1.29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low Temperature Characteristics | Impedance ratio: $Z_{-55^{\circ}\text{C}}/Z_{+25^{\circ}\text{C}}$ ≤ 4 (7.5 Vdc) ≤ 2 (10–250 Vdc) Impedance ratio: $Z_{-20^{\circ}\text{C}}/Z_{+25^{\circ}\text{C}}$ ≤ 4 (300–450Vdc) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Endurance Life Test | 2000 h @ full load at +85°C Δ Capacitance ±10% ESR 200% of limit DCL 100% of limit Height .05 in. max | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shelf Life Test | 500 h at 85 °C Capacitance 100% of limit ESR 100% of limit DCL 100% of limit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vibration | 10 Hz to 2 kHz, 0.06" pp max and 10g. MIL-STD-202, Meth. 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RoHS Compliant | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



Type MLP 85 °C Flatpack, Ultra Long Life, Aluminum Electrolytic

Very Low Profile

Part Numbering System

MLP

102

M

200

EB

O

A

Type
MLP

Capacitance
821=820 μF
102 = 1000 μF

Tolerance
M=±20%

Rated Voltage
Vdc

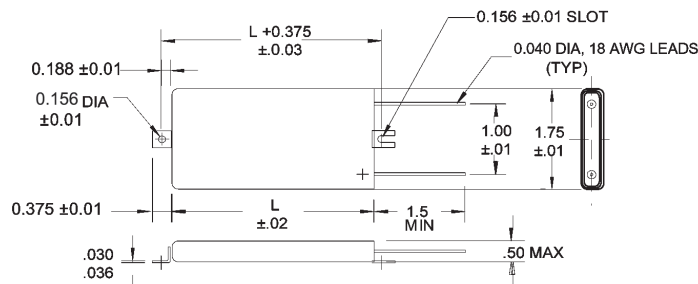
Case Code
EK, L=1.5 in.
EA, L=2.0 in.
EB, L=3.0 in.

Insulation
0 = bare can
1 = polyester

Mounting Style
A = mounting tabs
B = four leads
C = two leads/no tabs
D = hook leads/tabs
E = hook leads/no tabs

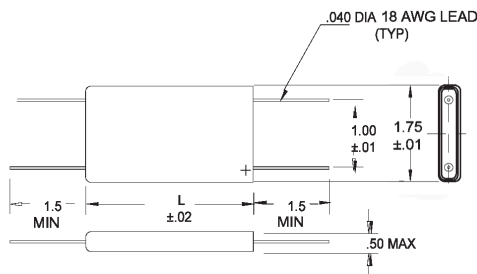
Outline Drawing

Style A: Mounting Tabs



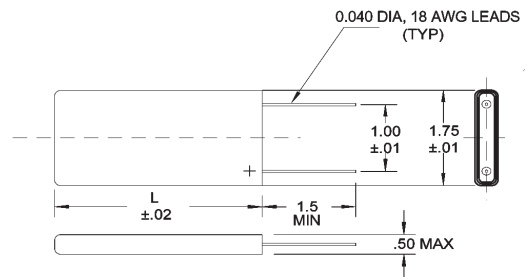
Mounting tabs and negative lead are welded to the case.

Style B: Four Leads



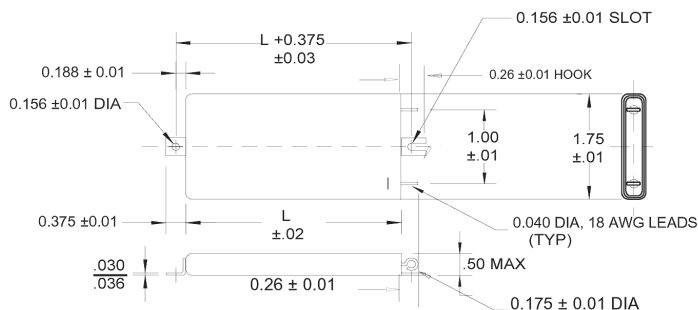
Three negative leads are welded to the case.

Style C: No Tabs



The negative lead is welded to the case.

Style D: Hook Leads



Mounting tabs and negative lead are welded to the case.

| Case Code | Length L (in) | Weight (g) |
|-----------|---------------|------------|
| EK | 1.5 | 30 |
| EA | 2.0 | 42 |
| EB | 3.0 | 66 |

Type MLP 85 °C Flatpack, Ultra Long Life, Aluminum Electrolytic

Very Low Profile

Ratings

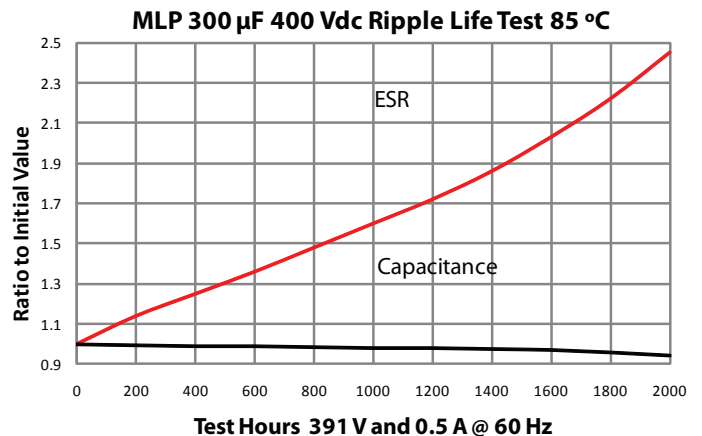
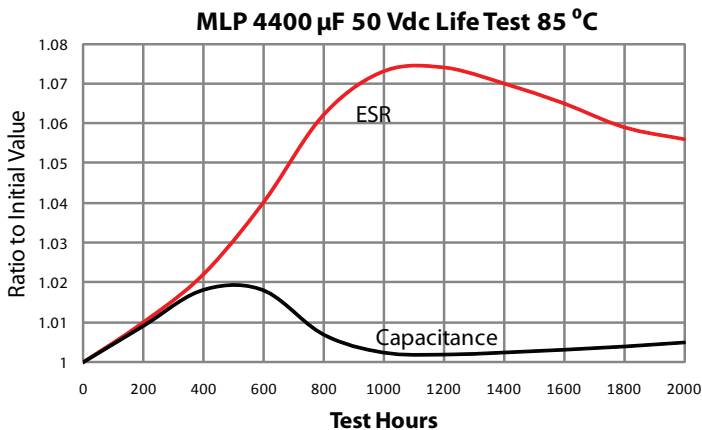
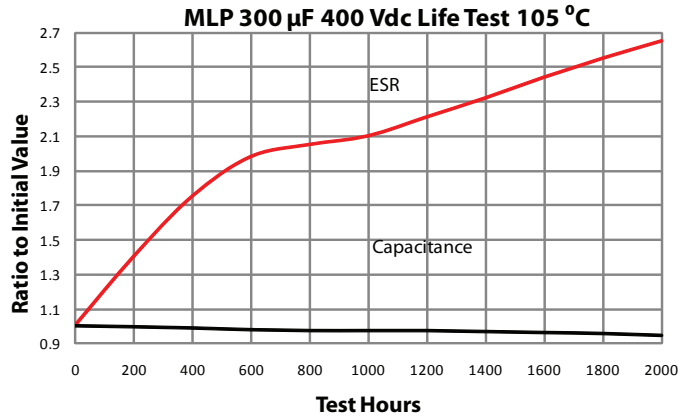
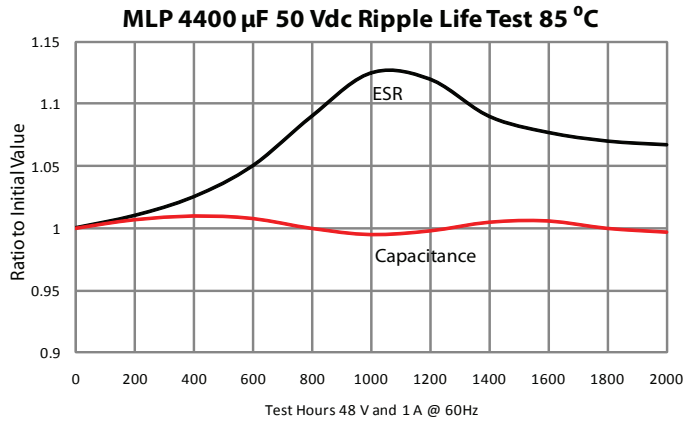
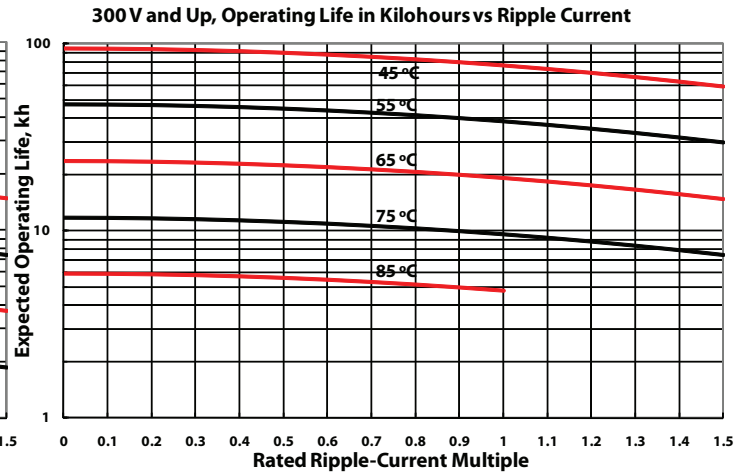
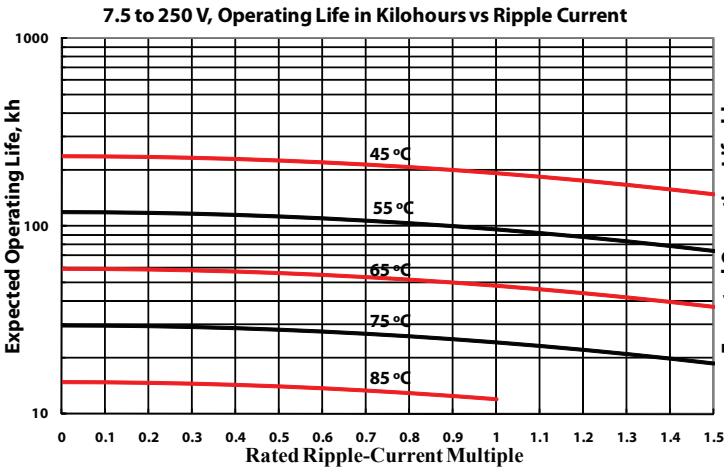
| Cap. (µF) | Catalog Part Number | ESR max 25 °C (mΩ) | | Ripple (A) Case @ 85 °C | | Length (Inches) |
|-------------------------------|------------------------|-----------------------|--------|----------------------------|--------|--------------------|
| | | 120 Hz | 20 kHz | 120 Hz | 20 kHz | |
| 7.5 Vdc (10 Vdc Surge) | | | | | | |
| 19,000 | MLP193M7R5EK0A | 76 | 66 | 4.2 | 4.5 | 1.5 |
| 28,000 | MLP283M7R5EA0A | 50 | 44 | 5.8 | 6.2 | 2.0 |
| 47,000 | MLP473M7R5EB0A | 30 | 26 | 9.1 | 9.8 | 3.0 |
| 10 Vdc (13 Vdc Surge) | | | | | | |
| 17000 | MLP173M010EK0A | 77 | 67 | 4.2 | 4.5 | 1.5 |
| 26000 | MLP263M010EA0A | 51 | 45 | 5.8 | 6.1 | 2.0 |
| 43000 | MLP433M010EB0A | 30 | 27 | 9.0 | 9.6 | 3.0 |
| 16 Vdc (20 Vdc Surge) | | | | | | |
| 13000 | MLP133M016EK0A | 81 | 69 | 4.1 | 4.4 | 1.5 |
| 21000 | MLP213M016EA0A | 53 | 46 | 5.7 | 6.1 | 2.0 |
| 38000 | MLP383M016EB0A | 31 | 27 | 9.0 | 9.6 | 3.0 |
| 20 Vdc (25 Vdc Surge) | | | | | | |
| 9600 | MLP962M020EK0A | 84 | 69 | 4.0 | 4.4 | 1.5 |
| 14000 | MLP143M020EA0A | 56 | 46 | 5.5 | 6.1 | 2.0 |
| 24000 | MLP243M020EB0A | 33 | 27 | 8.7 | 9.6 | 3.0 |
| 25 Vdc (30 Vdc Surge) | | | | | | |
| 8000 | MLP802M025EK0A | 87 | 69 | 3.9 | 4.4 | 1.5 |
| 12000 | MLP123M025EA0A | 57 | 46 | 5.5 | 6.1 | 2.0 |
| 20000 | MLP203M025EB0A | 34 | 27 | 8.6 | 9.6 | 3.0 |
| 35 Vdc (50 Vdc Surge) | | | | | | |
| 5600 | MLP562M035EK0A | 90 | 70 | 3.4 | 4.4 | 1.5 |
| 8400 | MLP842M035EA0A | 59 | 46 | 5.4 | 6.1 | 2.0 |
| 14000 | MLP143M035EB0A | 35 | 27 | 8.4 | 9.6 | 3.0 |
| 50 Vdc (63 Vdc Surge) | | | | | | |
| 4400 | MLP442M050EK0A | 97 | 70 | 3.7 | 4.4 | 1.5 |
| 6600 | MLP662M050EA0A | 62 | 46 | 5.2 | 6.1 | 2.0 |
| 11000 | MLP113M050EB0A | 36 | 27 | 8.3 | 9.6 | 3.0 |
| 63 Vdc (75 Vdc Surge) | | | | | | |
| 2200 | MLP222M063EK0A | 101 | 76 | 3.7 | 4.2 | 1.5 |
| 3300 | MLP332M063EA0A | 64 | 50 | 5.2 | 5.8 | 2.0 |
| 5600 | MLP562M063EB0A | 36 | 29 | 8.3 | 9.3 | 3.0 |
| 80 Vdc (100 Vdc Surge) | | | | | | |
| 1500 | MLP152M080EK0A | 106 | 77 | 3.6 | 4.2 | 1.5 |
| 2100 | MLP212M080EA0A | 72 | 52 | 4.9 | 5.7 | 2.0 |
| 3300 | MLP332M080EB0A | 44 | 31 | 7.5 | 9.0 | 3.0 |

| Cap. (µF) | Catalog Part Number | ESR max 25 °C (mΩ) | | Ripple (A) Case @ 85 °C | | Length (Inches) |
|--------------------------------|------------------------|-----------------------|--------|----------------------------|--------|--------------------|
| | | 120 Hz | 20 kHz | 120 Hz | 20 kHz | |
| 100 Vdc (125 Vdc Surge) | | | | | | |
| 1100 | MLP112M100EK0A | 112 | 78 | 3.5 | 4.2 | 1.5 |
| 1600 | MLP162M100EA0A | 76 | 54 | 4.7 | 5.6 | 2.0 |
| 2700 | MLP272M100EB0A | 46 | 33 | 7.4 | 8.7 | 3.0 |
| 150 Vdc (180 Vdc Surge) | | | | | | |
| 500 | MLP501M150EK0A | 355 | 248 | 1.9 | 2.3 | 1.5 |
| 770 | MLP771M150EA0A | 238 | 166 | 2.7 | 3.2 | 2.0 |
| 1300 | MLP132M150EB0A | 143 | 100 | 4.2 | 5.0 | 3.0 |
| 200 Vdc (250 Vdc Surge) | | | | | | |
| 400 | MLP401M200EK0A | 388 | 253 | 1.9 | 2.3 | 1.5 |
| 600 | MLP601M200EA0A | 261 | 168 | 2.6 | 3.2 | 2.0 |
| 1000 | MLP102M200EB0A | 158 | 100 | 3.8 | 5.0 | 3.0 |
| 250 Vdc (300 Vdc Surge) | | | | | | |
| 330 | MLP331M250EK0A | 426 | 258 | 1.8 | 2.3 | 1.5 |
| 490 | MLP491M250EA0A | 285 | 172 | 2.4 | 3.1 | 2.0 |
| 820 | MLP821M250EB0A | 172 | 103 | 3.8 | 4.9 | 3.0 |
| 300 Vdc (350 Vdc Surge) | | | | | | |
| 220 | MLP221M300EK0A | 597 | 393 | 1.5 | 1.9 | 1.5 |
| 330 | MLP331M300EA0A | 399 | 262 | 2.1 | 2.5 | 2.0 |
| 560 | MLP561M300EB0A | 240 | 157 | 3.2 | 4.0 | 3.0 |
| 350 Vdc (400 Vdc Surge) | | | | | | |
| 150 | MLP151M350EK0A | 1000 | 734 | 1.2 | 1.4 | 1.5 |
| 220 | MLP221M350EA0A | 683 | 503 | 1.6 | 1.8 | 2.0 |
| 370 | MLP371M350EB0A | 420 | 310 | 2.3 | 2.8 | 3.0 |
| 400 Vdc (450 Vdc Surge) | | | | | | |
| 130 | MLP131M400EK0A | 1320 | 970 | 1.0 | 1.2 | 1.5 |
| 200 | MLP201M400EA0A | 882 | 648 | 1.4 | 1.6 | 2.0 |
| 330 | MLP331M400EB0A | 530 | 390 | 2.1 | 2.5 | 3.0 |
| 420 Vdc (475 Vdc Surge) | | | | | | |
| 130 | MLP131M420EK0A | 1320 | 970 | 1.0 | 1.2 | 1.5 |
| 200 | MLP201M420EA0A | 882 | 648 | 1.4 | 1.6 | 2.0 |
| 330 | MLP331M420EB0A | 530 | 390 | 2.1 | 2.5 | 3.0 |
| 450 Vdc (500 Vdc Surge) | | | | | | |
| 110 | MLP111M450EK0A | 1456 | 1190 | 0.96 | 1.1 | 1.5 |
| 170 | MLP171M450EA0A | 973 | 797 | 1.3 | 1.5 | 2.0 |
| 280 | MLP281M450EB0A | 585 | 480 | 2.0 | 2.3 | 3.0 |

Type MLP 85 °C Flatpack, Ultra Long Life, Aluminum Electrolytic

Very Low Profile

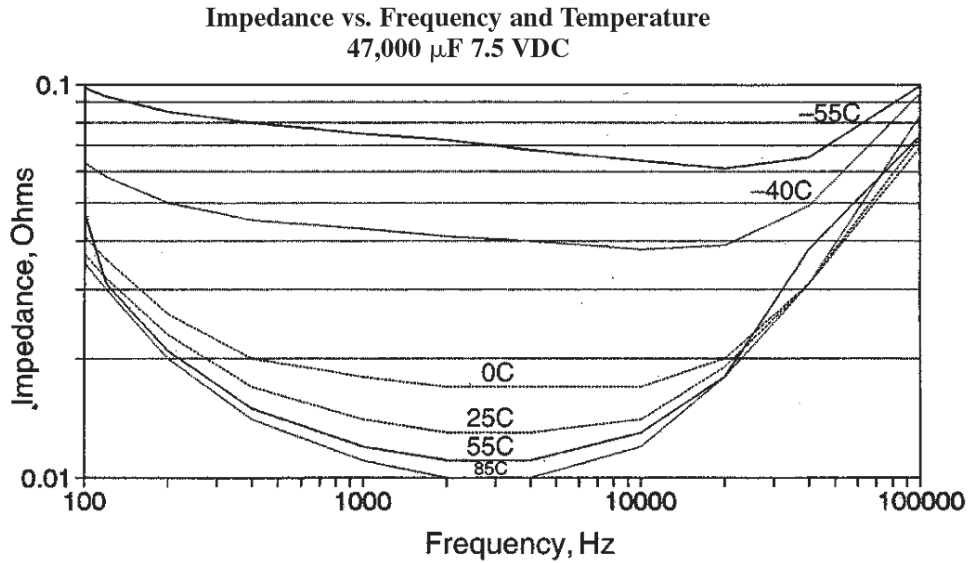
Typical Performance Curves



Type MLP 85 °C Flatpack, Ultra Long Life, Aluminum Electrolytic

Very Low Profile

Typical Performance Curves



Note: Impedance measured at ends of leads.

