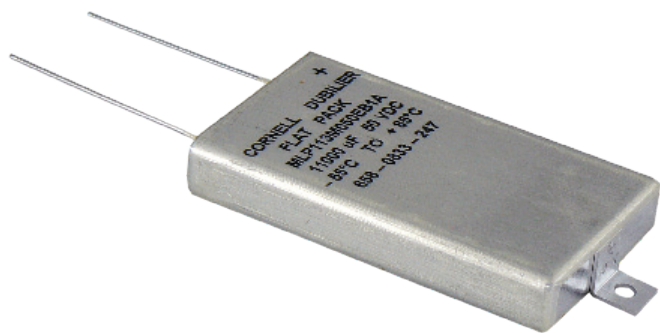


# Type MLP 85 °C Flatpack, Ultra Long Life, Aluminum Electrolytic

## 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 &amp; 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
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Low Temperature Characteristics	Impedance ratio: $Z_{-55°C}/Z_{+25°C}$ ≤ 4 (7.5 Vdc) ≤ 2 (10–250 Vdc) Impedance ratio: $Z_{-20°C}/Z_{+25°C}$ ≤ 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

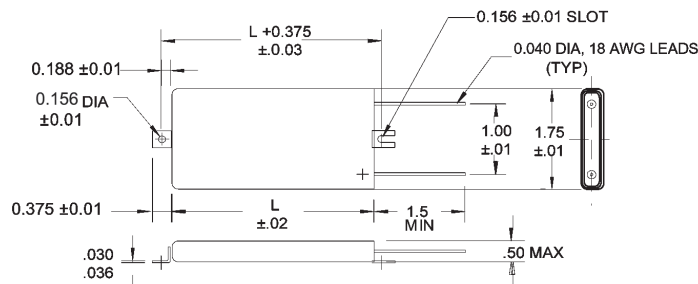
Case Code  
EK, L=1.5 in.  
EA, L=2.0 in.  
EB, L=3.0 in.

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

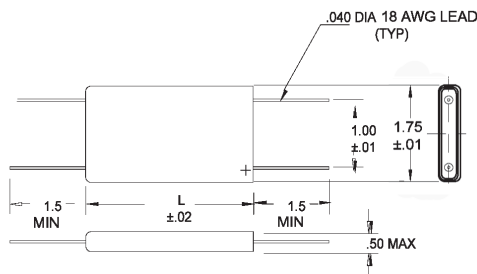
### Outline Drawing

Style A: Mounting Tabs



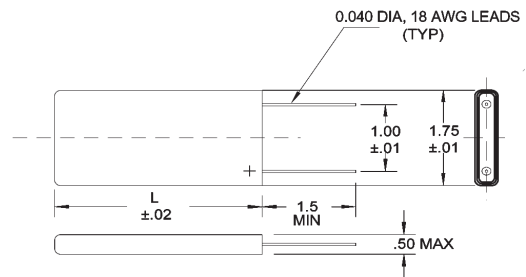
Mounting tabs and negative lead are welded to the case.

Style B: Four Leads



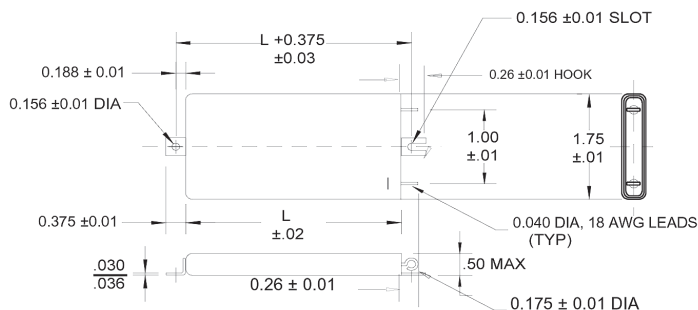
Three negative leads are welded to the case.

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	
<b>7.5 Vdc (10 Vdc Surge)</b>						
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
<b>10 Vdc (13 Vdc Surge)</b>						
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
<b>16 Vdc (20 Vdc Surge)</b>						
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
<b>20 Vdc (25 Vdc Surge)</b>						
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
<b>25 Vdc (30 Vdc Surge)</b>						
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
<b>35 Vdc (50 Vdc Surge)</b>						
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
<b>50 Vdc (63 Vdc Surge)</b>						
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
<b>63 Vdc (75 Vdc Surge)</b>						
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
<b>80 Vdc (100 Vdc Surge)</b>						
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

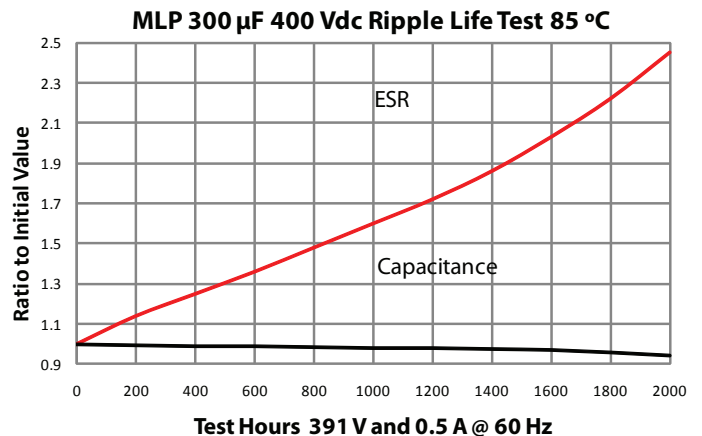
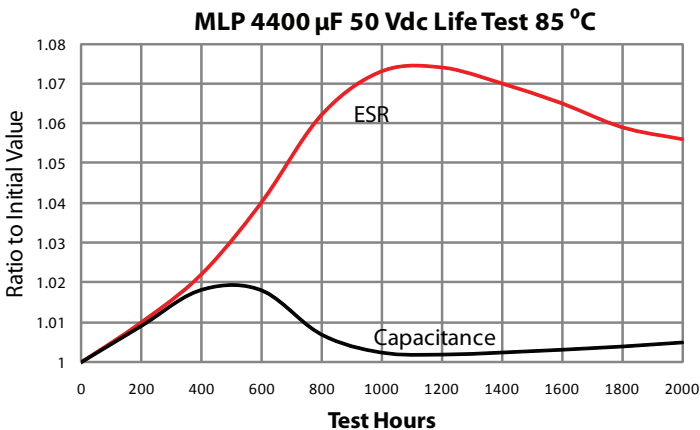
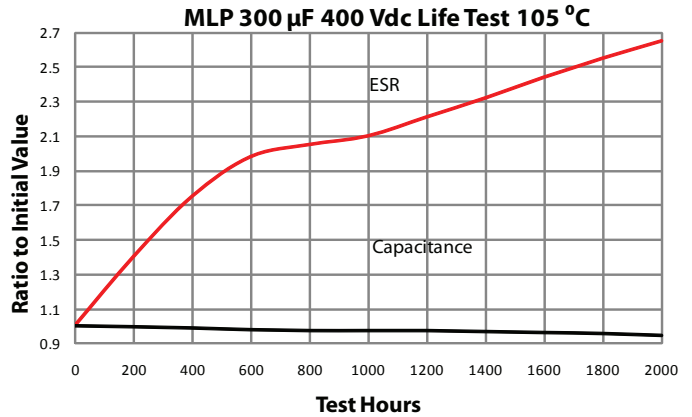
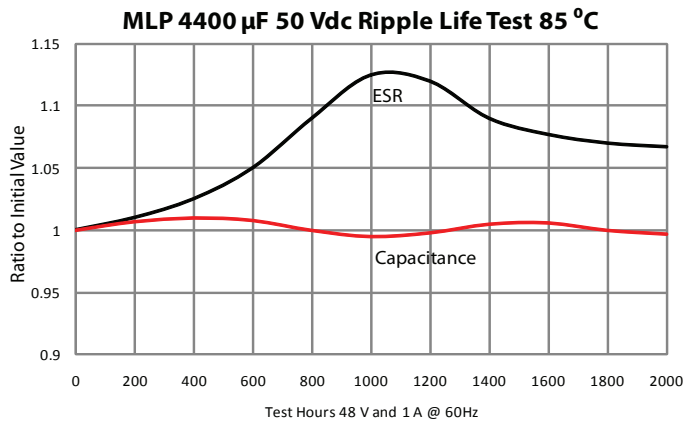
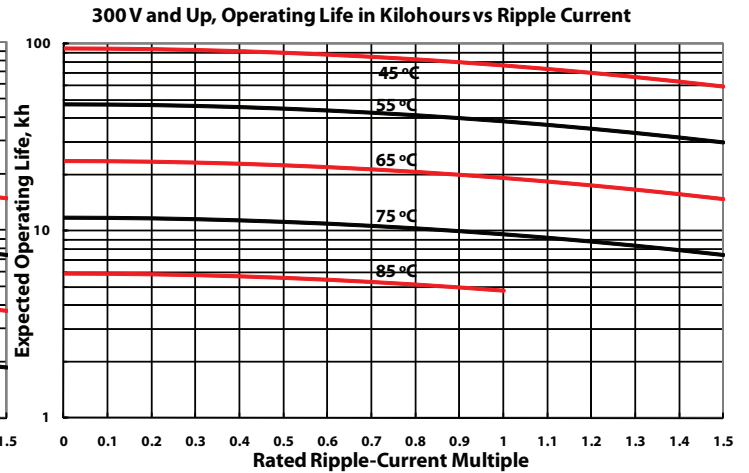
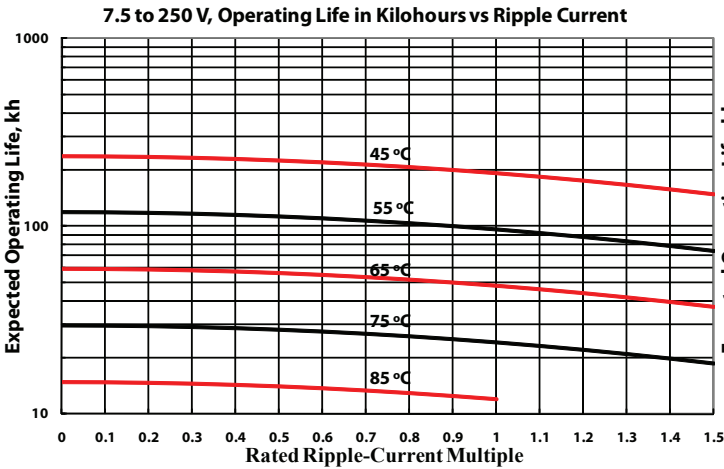
Cap. (µF)	Catalog Part Number	ESR max 25 °C (mΩ)		Ripple (A) Case @ 85 °C		Length (Inches)
		120 Hz	20 kHz	120 Hz	20 kHz	
<b>100 Vdc (125 Vdc Surge)</b>						
1100	MLP112M100EK0A	112	78	3.5	4.2	1.5
1600	MLP162M100EA0A	76	54	4.7	5.6	2.0
2700	MLP272M100EB0A	46	33	7.4	8.7	3.0
<b>150 Vdc (180 Vdc Surge)</b>						
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
<b>200 Vdc (250 Vdc Surge)</b>						
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
<b>250 Vdc (300 Vdc Surge)</b>						
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
<b>300 Vdc (350 Vdc Surge)</b>						
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
<b>350 Vdc (400 Vdc Surge)</b>						
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
<b>400 Vdc (450 Vdc Surge)</b>						
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
<b>420 Vdc (475 Vdc Surge)</b>						
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
<b>450 Vdc (500 Vdc Surge)</b>						
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

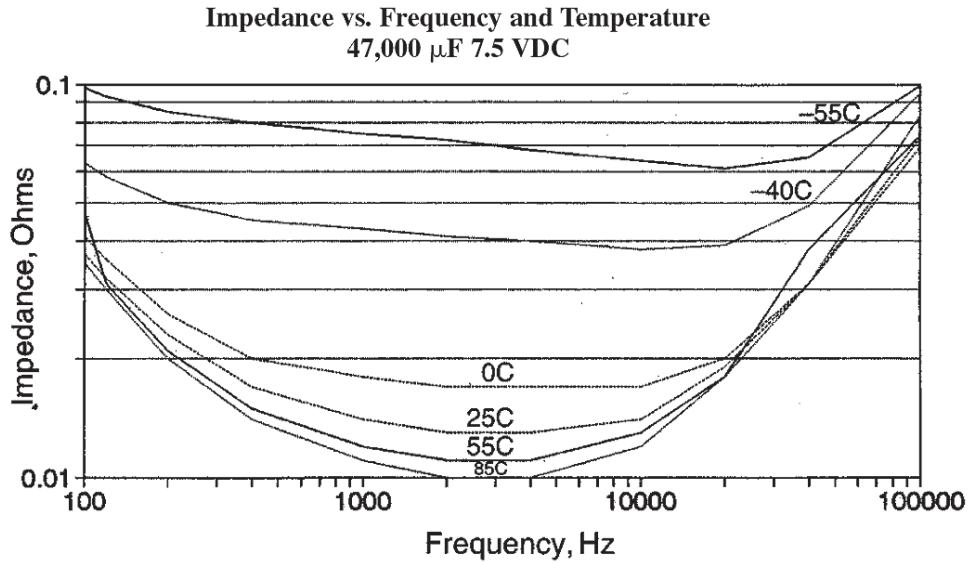




# Type MLP 85 °C Flatpack, Ultra Long Life, Aluminum Electrolytic

## Very Low Profile

### Typical Performance Curves



Note: Impedance measured at ends of leads.

