

## Low-Profile Aluminum Electrolytic



With exceptional 10,000 hr. life and offering high energy density in a low profile, Type CLS allows for compact, high reliability power supply designs. Able to withstand 80,000 feet altitude. Further the reliability of your system by specifying type HRCLS for a MIL-level burn-in. Demand our high vibration (HVCLS) version package that withstands up to 30g's.

### Highlights

- High Energy Density Flatpack™
- Highest Capacitance Flatpack™
- High Ripple Current
- 10,000 hours (at rated load life)
- High Reliability

### Specifications

<b>Temperature Range</b>	-55°C to 105°C																																																																																										
<b>Rated Voltage Range</b>	10 Vdc to 300 Vdc																																																																																										
<b>Capacitance Range</b>	150 µF to 170,000 µF																																																																																										
<b>Capacitance Tolerance</b>	±20%																																																																																										
<b>Leakage Current</b>	≤ 0.004 × C × V microamps for C in microfarads and V in volts																																																																																										
<b>Ripple Current Multipliers</b>	<p><b>Frequency</b></p> <p style="text-align: center;"><b>Ripple Current</b></p> <table border="1"> <thead> <tr> <th>Vdc</th> <th>50</th> <th>60</th> <th>120</th> <th>400</th> <th>1000</th> <th>10000</th> </tr> </thead> <tbody> <tr> <td>0-50</td> <td>0.85</td> <td>0.85</td> <td>1.00</td> <td>1.05</td> <td>1.06</td> <td>1.10</td> </tr> <tr> <td>51-90</td> <td>0.79</td> <td>0.80</td> <td>1.00</td> <td>1.08</td> <td>1.15</td> <td>1.20</td> </tr> <tr> <td>90-249</td> <td>0.75</td> <td>0.76</td> <td>1.00</td> <td>1.13</td> <td>1.30</td> <td>1.35</td> </tr> <tr> <td>250-300</td> <td>0.70</td> <td>0.72</td> <td>1.00</td> <td>1.12</td> <td>1.35</td> <td>1.41</td> </tr> </tbody> </table> <p><b>Ambient Temperature (Natural Convection, No Heatsink)</b></p> <p style="text-align: center;"><b>Ambient Temperature (°C)</b></p> <table border="1"> <thead> <tr> <th>Temp°C</th> <th>45</th> <th>55</th> <th>65</th> <th>75</th> <th>85</th> <th>95</th> <th>105</th> </tr> </thead> <tbody> <tr> <td>0-50</td> <td>2.30</td> <td>2.20</td> <td>2.10</td> <td>1.90</td> <td>1.70</td> <td>1.40</td> <td>1.00</td> </tr> <tr> <td>55-90</td> <td>2.40</td> <td>2.30</td> <td>2.15</td> <td>1.95</td> <td>1.70</td> <td>1.35</td> <td>1.00</td> </tr> <tr> <td>90-249</td> <td>2.55</td> <td>2.40</td> <td>2.20</td> <td>2.00</td> <td>1.74</td> <td>1.40</td> <td>1.00</td> </tr> <tr> <td>250-300</td> <td>2.35</td> <td>2.25</td> <td>2.10</td> <td>1.95</td> <td>1.70</td> <td>1.40</td> <td>1.00</td> </tr> </tbody> </table> <p><b>Airflow Velocity (No Heatsink)</b></p> <table border="1"> <tbody> <tr> <td>Airflow velocity (No heatsink) Natural convection ≈ 0.25 m/s</td> <td>0.25</td> <td>1.00</td> <td>2.50</td> <td>5.00</td> </tr> <tr> <td>Ripple Current Multiplier (Bare Case)</td> <td>1.00</td> <td>1.18</td> <td>1.37</td> <td>1.52</td> </tr> <tr> <td>Ripple Current Multiplier (PE Sleeved)</td> <td>1.00</td> <td>1.16</td> <td>1.35</td> <td>1.50</td> </tr> </tbody> </table>	Vdc	50	60	120	400	1000	10000	0-50	0.85	0.85	1.00	1.05	1.06	1.10	51-90	0.79	0.80	1.00	1.08	1.15	1.20	90-249	0.75	0.76	1.00	1.13	1.30	1.35	250-300	0.70	0.72	1.00	1.12	1.35	1.41	Temp°C	45	55	65	75	85	95	105	0-50	2.30	2.20	2.10	1.90	1.70	1.40	1.00	55-90	2.40	2.30	2.15	1.95	1.70	1.35	1.00	90-249	2.55	2.40	2.20	2.00	1.74	1.40	1.00	250-300	2.35	2.25	2.10	1.95	1.70	1.40	1.00	Airflow velocity (No heatsink) Natural convection ≈ 0.25 m/s	0.25	1.00	2.50	5.00	Ripple Current Multiplier (Bare Case)	1.00	1.18	1.37	1.52	Ripple Current Multiplier (PE Sleeved)	1.00	1.16	1.35	1.50
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<b>Typical Ripple Current Capability</b>	The typical ripple current capability is set by the maximum permissible internal core temperature, maximum lead current capability of 20 Arms, and a maximum 20°C core rise (Not heatsinked), the maximum peak voltage including ripple voltage applied continuously between the terminals is less than the rated voltage of the capacitor. In addition, the user should ensure that the peak-to-peak capacitor voltage divided by the capacitor's rated voltage $V_R$ should not exceed the greater of 10% or $0.01352 \times (VDC \text{ Rated} / 1[VDC])^{1/2}$ .																																																																																										
<b>Terminals - Lead Free Version Available</b>	CLS: Copper wire with 60/40 tin/lead electroplate, 20 amps max CLSR: Copper wire with bright tin electroplate, 20 amps max																																																																																										
<b>Case Material</b>	Stainless Steel: 316L or 304																																																																																										

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<p><b>Low Temperature Characteristics</b></p>	<p>(<math>Z_{-55^{\circ}\text{C}}/Z_{+25^{\circ}\text{C}}</math> @120 Hz)  <math>\leq 50</math> Vdc, <math>Z &lt; 10X</math>, Capacitance loss <math>&lt; 30\%</math>  <math>51 - 300</math> Vdc, <math>Z &lt; 3.6X</math>, Capacitance loss <math>&lt; 30\%</math></p>
<p><b>Endurance Life Test</b></p>	<p>10,000 Hours 105°C At Rated Ripple Load, with rated ripple current applied with rated voltage  <math>\Delta</math> Capacitance <math>\pm 10\%</math>                  ESR <math>&lt; 1.5X</math> Catalog Limit                  DCL <math>\leq 0.004</math> CV <math>\mu\text{A}</math></p>
<p><b>Shelf Life Test</b></p>	<p>Up to 5 years <math>\leq 40^{\circ}\text{C}</math>, 500 hours <math>\leq 105^{\circ}\text{C}</math>                  Capacitance Inside Catalog Tolerance                  ESR <math>&lt;</math> Catalog Limit                  DCL <math>\leq 0.004</math> CV <math>\mu\text{A}</math></p>
<p><b>Vibration</b></p>	<p><b>Amplitude</b>                  The specimens shall be subjected to a simple harmonic motion with the double amplitude or acceleration max levels noted below, whichever is less.</p> <p><b>Acceleration Level</b>                  10 g (peak) - Non HV (High Vibration) part numbers, 30 g (peak) - for HV part numbers, HV may not be available on all sizes.</p> <p><b>Displacement Level</b>                  0.06-inch double amplitude (maximum total excursion).</p> <p><b>Frequency Range</b>                  The vibration frequency shall be varied logarithmically between the approximate limits of 10 to 2,000 Hz.</p> <p><b>Sweep Time &amp; Duration</b>                  The entire frequency range of 10 to 2,000 Hz and return to 10 Hz shall be traversed in 20 minutes. This cycle shall be performed 12 times in each of three mutually perpendicular directions (total of 36 times), so that the motion shall be applied for a total period of approximately 12 hours.</p> <p><b>Mounting</b>                  Vibration capability is dependent upon mounting restraint. The optional mounting pins, alone, are not capable of sustaining the high vibration levels. Additional mounting restraint may be required.</p>
<p><b>High Reliability Test/Burn-In</b></p>	<p>Established reliability HRCLS capacitors shall be subjected to a minimum of 100 percent of the dc rated voltage at 105°C for 48 hours minimum but not to exceed 96 hours. During this test, capacitors shall be adequately protected against temporary voltage surges of 10 percent or more of the test voltage. After burn-in, the capacitors shall be returned to room ambient conditions and the dc leakage, capacitance, and ESR shall be measured with respect to specified limits.</p>

## Low-Profile Aluminum Electrolytic

<p><b>Heatsinked Ripple Current</b></p>	<p>Thermal Resistance <math>\theta_{CHS}</math> Core to Heatsink (°C/W) by Case Length “L”</p> <table border="1"> <thead> <tr> <th rowspan="2">Number of Sides Heatsinked</th> <th rowspan="2">Code</th> <th rowspan="2">Code Length Length (in)</th> <th>_K</th> <th>_A</th> <th>_H</th> <th>_B</th> </tr> <tr> <th>1.5</th> <th>2</th> <th>2.5</th> <th>3</th> </tr> </thead> <tbody> <tr> <td rowspan="2">One Large Side Heat Sinked</td> <td rowspan="2">J_</td> <td>Bare can</td> <td>6.31</td> <td>4.82</td> <td>3.91</td> <td>3.29</td> </tr> <tr> <td>Polyester</td> <td>7.34</td> <td>5.25</td> <td>4.95</td> <td>3.80</td> </tr> <tr> <td rowspan="2">Two Large Sides Heat Sinked</td> <td rowspan="2">J_</td> <td>Bare can</td> <td>4.09</td> <td>3.07</td> <td>2.45</td> <td>2.04</td> </tr> <tr> <td>Polyester</td> <td>4.63</td> <td>3.47</td> <td>2.78</td> <td>2.31</td> </tr> <tr> <td rowspan="2">One Large Side Heat Sinked</td> <td rowspan="2">L_</td> <td>Bare can</td> <td>4.67</td> <td>3.59</td> <td>2.92</td> <td>2.46</td> </tr> <tr> <td>Polyester</td> <td>5.42</td> <td>4.15</td> <td>3.36</td> <td>2.83</td> </tr> <tr> <td rowspan="2">Two Large Sides Heat Sinked</td> <td rowspan="2">L_</td> <td>Bare can</td> <td>3.11</td> <td>2.34</td> <td>1.87</td> <td>1.56</td> </tr> <tr> <td>Polyester</td> <td>3.49</td> <td>2.62</td> <td>2.09</td> <td>1.75</td> </tr> <tr> <td rowspan="2">One Large Side Heat Sinked</td> <td rowspan="2">E_</td> <td>Bare can</td> <td>4.03</td> <td>3.08</td> <td>2.50</td> <td>2.11</td> </tr> <tr> <td>Polyester</td> <td>4.62</td> <td>3.52</td> <td>2.86</td> <td>2.40</td> </tr> <tr> <td rowspan="2">Two Large Sides Heat Sinked</td> <td rowspan="2">E_</td> <td>Bare can</td> <td>2.57</td> <td>1.93</td> <td>1.55</td> <td>1.29</td> </tr> <tr> <td>Polyester</td> <td>2.87</td> <td>2.15</td> <td>1.72</td> <td>1.44</td> </tr> <tr> <td rowspan="2">One Large Side Heat Sinked</td> <td rowspan="2">M_</td> <td>Bare can</td> <td>3.89</td> <td>2.98</td> <td>2.43</td> <td>2.05</td> </tr> <tr> <td>Polyester</td> <td>4.48</td> <td>3.43</td> <td>2.78</td> <td>2.34</td> </tr> <tr> <td rowspan="2">Two Large Sides Heat Sinked</td> <td rowspan="2">M_</td> <td>Bare can</td> <td>2.58</td> <td>1.94</td> <td>1.55</td> <td>1.29</td> </tr> <tr> <td>Polyester</td> <td>2.88</td> <td>2.16</td> <td>1.73</td> <td>1.44</td> </tr> <tr> <td rowspan="2">One Large Side Heat Sinked</td> <td rowspan="2">S_</td> <td>Bare can</td> <td>3.49</td> <td>2.69</td> <td>2.20</td> <td>1.86</td> </tr> <tr> <td>Polyester</td> <td>4.01</td> <td>3.08</td> <td>2.51</td> <td>2.12</td> </tr> <tr> <td rowspan="2">Two Large Sides Heat Sinked</td> <td rowspan="2">S_</td> <td>Bare can</td> <td>2.28</td> <td>1.72</td> <td>1.39</td> <td>1.16</td> </tr> <tr> <td>Polyester</td> <td>2.54</td> <td>1.92</td> <td>1.54</td> <td>1.29</td> </tr> </tbody> </table>	Number of Sides Heatsinked	Code	Code Length Length (in)	_K	_A	_H	_B	1.5	2	2.5	3	One Large Side Heat Sinked	J_	Bare can	6.31	4.82	3.91	3.29	Polyester	7.34	5.25	4.95	3.80	Two Large Sides Heat Sinked	J_	Bare can	4.09	3.07	2.45	2.04	Polyester	4.63	3.47	2.78	2.31	One Large Side Heat Sinked	L_	Bare can	4.67	3.59	2.92	2.46	Polyester	5.42	4.15	3.36	2.83	Two Large Sides Heat Sinked	L_	Bare can	3.11	2.34	1.87	1.56	Polyester	3.49	2.62	2.09	1.75	One Large Side Heat Sinked	E_	Bare can	4.03	3.08	2.50	2.11	Polyester	4.62	3.52	2.86	2.40	Two Large Sides Heat Sinked	E_	Bare can	2.57	1.93	1.55	1.29	Polyester	2.87	2.15	1.72	1.44	One Large Side Heat Sinked	M_	Bare can	3.89	2.98	2.43	2.05	Polyester	4.48	3.43	2.78	2.34	Two Large Sides Heat Sinked	M_	Bare can	2.58	1.94	1.55	1.29	Polyester	2.88	2.16	1.73	1.44	One Large Side Heat Sinked	S_	Bare can	3.49	2.69	2.20	1.86	Polyester	4.01	3.08	2.51	2.12	Two Large Sides Heat Sinked	S_	Bare can	2.28	1.72	1.39	1.16	Polyester	2.54	1.92	1.54	1.29
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<p><b>Heatsink Cooled</b></p>	<p>Temperature rise from the hottest internal spot, the core, to ambient air is <math>\Delta T = I^2(ESR)(\theta_{cc} + \theta_{ca})</math>, recommended max <math>\Delta T</math> of 30°C where <math>\theta_{cc}</math> is the thermal resistance from core to case and <math>\theta_{ca}</math> from case to ambient. To calculate maximum ripple capability with the CLS attached to a heatsink use the maximum core temperature of 105°C, the tabulated values of <math>\theta_{CHS}</math> in lieu of <math>\theta_{cc}</math>, and substitute the heatsink thermal resistance for the case to ambient thermal resistance <math>\theta_{ca}</math>.</p>																																																																																																																																			
<p><b>Example</b></p>	<p>As an illustration, suppose you operate an insulated CLS792M063EB1C in 65°C air and attach it to a commercial heatsink with a free-air thermal resistance of 1.0°C/W for one side. Using a good thermal grease between the CLS and the heatsink, and the total thermal resistance is 1.0 + 2.4 or 3.4°C/W. The CLS is allowed to operate at up to 105°C, which would be a 40°C rise from 65°C, exceeding the recommended 30°C maximum heat rise. The power which would heat the core by 30°C is <math>30/3.4 = 8.82</math> W. For an ESR of 45 mΩ @ 120Hz, 8.82 W equates to a ripple current of 14.00 Arms. In addition, the user should ensure that the peak-to-peak capacitor voltage divided by the capacitor’s rated voltage <math>V_r</math> not exceed the greater of 10% or <math>0.01352 \times (VDC \text{ Rated} / 1[VDC])^{1/2}</math>. The Vpp limit for this capacitor at 120Hz is thereby calculated as 6.76 volts, while the planned 14 amps rms at 120Hz will result in a peak-to-peak voltage of 6.65 volts, just within the AC voltage limit.</p>																																																																																																																																			

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### Part Numbering System

HV	HR	CLS/CLSR	100	M	200	JK	0	A
<b>Optional</b>	<b>Optional</b>	<b>Type</b>	<b>Capacitance</b>	<b>Tolerance</b>	<b>Rated Voltage</b>	<b>Case Code</b>	<b>Insulation</b>	<b>Mounting Style</b>
<b>High Vibration*</b>	<b>High Reliability</b>	<p><b>CLS:</b> Copper wire with 60/40 tin/lead electroplate, 20 amps max</p> <p><b>CLSR:</b> Copper wire with lead free, brite tin electroplate, 20 amps max</p>	<p><b>100</b> = 10 µF</p> <p><b>101</b> = 100 µF</p> <p><b>272</b> = 2700 µF</p>	<b>M</b> =±20%	<b>200</b> = 200 Vdc	<b>See chart below</b>	<p><b>0</b> = bare can</p> <p><b>1</b> = polyester</p>	<p><b>A</b>= mounting tabs*</p> <p><b>C</b>=straight leads/no tabs</p> <p><b>D</b>=hook leads/tabs*</p> <p><b>E</b>=hook leads/no tabs</p>
* May not be available for all sizes, consult Product Manager								<p>*Mounting tabs available only for the drawn cans. Mounting tabs not offered for tubular welded cans.</p>

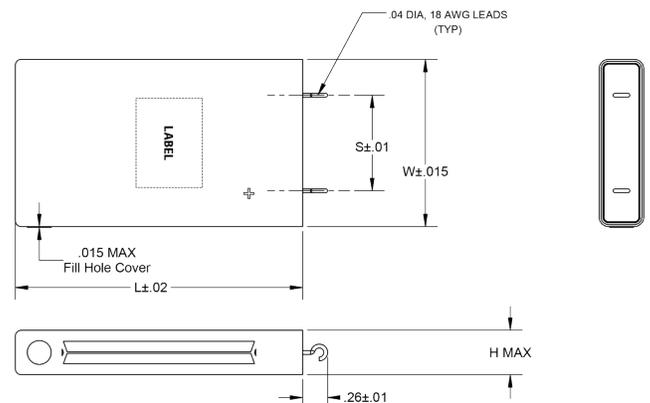
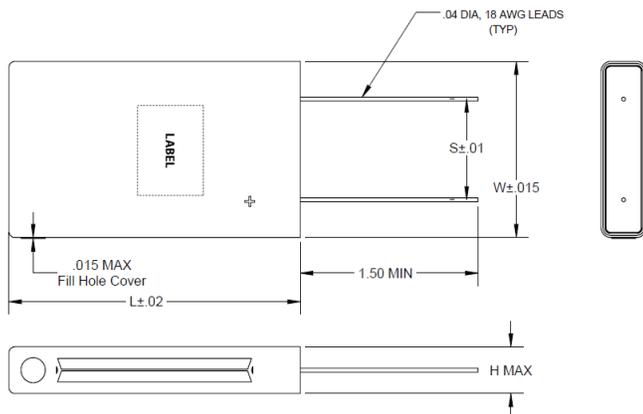
### Case Codes

Case Code	"W"	"H"	"L"	"S"
JK	1.00	0.50	1.50	0.50
JA	1.00	0.50	2.00	0.50
JH	1.00	0.50	2.50	0.50
JB	1.00	0.50	3.00	0.50
LK	1.385	0.64	1.50	0.50
LA	1.385	0.64	2.00	0.50
LH	1.385	0.64	2.50	0.50
LB	1.385	0.64	3.00	0.50
EK	1.75	0.50	1.50	1.00
EA	1.75	0.50	2.00	1.00

Case Code	"W"	"H"	"L"	"S"
EH	1.75	0.50	2.50	1.00
EB	1.75	0.50	3.00	1.00
MK	1.76	0.60	1.50	0.50
MA	1.76	0.60	2.00	0.50
MH	1.76	0.60	2.50	0.50
MB	1.76	0.60	3.00	0.50
SK	2.00	0.80	1.50	0.50
SA	2.00	0.80	2.00	0.50
SH	2.00	0.80	2.50	0.50
SB	2.00	0.80	3.00	0.50

### Outline Drawings

Note: The polyester tape wrap may add up to 0.020 inches to the thickness and width of the capacitor.



Low-Profile Aluminum Electrolytic

Ratings

Voltage Vdc	Cap µF	P/N	120Hz 25°C ESR Max	20KHz 25°C ESR Max	105°C Arms 120Hz	105°C Arms 20KHz	Case			Surge Vdc
							H (in)	W (in)	L (in)	
10	19000	CLS193M010JK1C	76	68	2.74	3.05	0.5	1	1.5	12.5
10	28000	CLS283M010JA1C	53	46	3.64	4.04	0.5	1	2	12.5
10	32000	CLS323M010LK1C	52	46	3.96	4.40	0.637	1.385	1.5	12.5
10	32000	CLS323M010EK1C	53	47	4.02	4.47	0.5	1.75	1.5	12.5
10	39000	CLS393M010JH1C	39	34	4.55	5.06	0.5	1	2.5	12.5
10	48000	CLS483M010LA1C	36	32	5.19	5.77	0.637	1.385	2	12.5
10	48000	CLS483M010EA1C	37	33	5.35	5.95	0.5	1.75	2	12.5
10	48000	CLS483M010MK1C	43	38	4.65	5.17	0.6	1.77	1.5	12.5
10	49000	CLS493M010JB1C	31	28	5.41	6.02	0.5	1	3	12.5
10	65000	CLS653M010LH1C	27	24	6.43	7.15	0.637	1.385	2.5	12.5
10	65000	CLS653M010EH1C	28	25	6.62	7.36	0.5	1.75	2.5	12.5
10	67000	CLS673M010SK1C	40	35	5.31	5.90	0.8	2	1.5	12.5
10	72000	CLS723M010MA1C	30	27	6.15	6.83	0.6	1.77	2	12.5
10	83000	CLS833M010LB1C	22	20	7.59	8.44	0.637	1.385	3	12.5
10	83000	CLS833M010EB1C	23	20	7.80	8.67	0.5	1.75	3	12.5
10	98000	CLS983M010MH1C	23	20	7.56	8.40	0.6	1.77	2.5	12.5
10	99000	CLS993M010SA1C	29	25	7.04	7.83	0.8	2	2	12.5
10	120000	CLS124M010MB1C	19	17	8.86	9.85	0.6	1.77	3	12.5
10	130000	CLS134M010SH1C	22	19	8.59	9.55	0.8	2	2.5	12.5
10	170000	CLS174M010SB1C	18	16	10.02	11.13	0.8	2	3	12.5
25	6200	CLS622M025JK1C	82	72	2.65	2.95	0.5	1	1.5	30
25	9100	CLS912M025JA1C	56	50	3.51	3.91	0.5	1	2	30
25	10000	CLS103M025LK1C	56	49	3.84	4.26	0.637	1.385	1.5	30
25	10000	CLS103M025EK1C	57	50	3.90	4.33	0.5	1.75	1.5	30
25	12000	CLS123M025JH1C	42	37	4.39	4.88	0.5	1	2.5	30
25	15000	CLS153M025JB1C	34	30	5.22	5.81	0.5	1	3	30
25	15000	CLS153M025LA1C	39	34	5.04	5.60	0.637	1.385	2	30
25	15000	CLS153M025EA1C	39	35	5.20	5.78	0.5	1.75	2	30
25	15000	CLS153M025MK1C	45	40	4.53	5.04	0.6	1.77	1.5	30
25	20000	CLS203M025LH1C	29	26	6.24	6.93	0.637	1.385	2.5	30
25	20000	CLS203M025EH1C	30	26	6.43	7.14	0.5	1.75	2.5	30
25	21000	CLS213M025SK1C	42	37	5.21	5.78	0.8	2	1.5	30
25	22000	CLS223M025MA1C	32	28	6.00	6.66	0.6	1.77	2	30
25	26000	CLS263M025LB1C	24	21	7.38	8.20	0.637	1.385	3	30
25	26000	CLS263M025EB1C	24	21	7.59	8.43	0.5	1.75	3	30
25	31000	CLS313M025MH1C	24	21	7.39	8.21	0.6	1.77	2.5	30
25	31000	CLS313M025SA1C	30	26	6.91	7.68	0.8	2	2	30
25	39000	CLS393M025MB1C	20	18	8.67	9.63	0.6	1.77	3	30
25	43000	CLS433M025SH1C	23	20	8.45	9.39	0.8	2	2.5	30
25	54000	CLS543M025SB1C	19	17	9.85	10.95	0.8	2	3	30

Low-Profile Aluminum Electrolytic

Voltage Vdc	Cap µF	P/N	120Hz 25°C ESR Max	20KHz 25°C ESR Max	105°C Arms 120Hz	105°C Arms 20KHz	Case			Surge Vdc
							H (in)	W (in)	L (in)	
40	4000	CLS402M040JK1C	82	72	2.65	2.95	0.5	1	1.5	48
40	5900	CLS592M040JA1C	56	50	3.51	3.91	0.5	1	2	48
40	6700	CLS672M040LK1C	57	50	3.81	4.23	0.637	1.385	1.5	48
40	6700	CLS672M040EK1C	58	51	3.87	4.30	0.5	1.75	1.5	48
40	8100	CLS812M040JH1C	42	37	4.40	4.89	0.5	1	2.5	48
40	9900	CLS992M040LA1C	39	35	5.00	5.55	0.637	1.385	2	48
40	9900	CLS992M040EA1C	40	35	5.15	5.73	0.5	1.75	2	48
40	10000	CLS103M040JB1C	33	30	5.23	5.81	0.5	1	3	48
40	10000	CLS103M040MK1C	47	42	4.45	4.94	0.6	1.77	1.5	48
40	13000	CLS133M040LH1C	30	26	6.18	6.87	0.637	1.385	2.5	48
40	13000	CLS133M040EH1C	30	27	6.37	7.08	0.5	1.75	2.5	48
40	13000	CLS133M040SK1C	44	39	5.05	5.61	0.8	2	1.5	48
40	14000	CLS143M040MA1C	33	29	5.87	6.53	0.6	1.77	2	48
40	17000	CLS173M040LB1C	24	21	7.32	8.13	0.637	1.385	3	48
40	17000	CLS173M040EB1C	25	22	7.53	8.36	0.5	1.75	3	48
40	20000	CLS203M040MH1C	25	22	7.25	8.06	0.6	1.77	2.5	48
40	20000	CLS203M040SA1C	31	28	6.72	7.47	0.8	2	2	48
40	25000	CLS253M040MB1C	21	18	8.51	9.46	0.6	1.77	3	48
40	27000	CLS273M040SH1C	24	21	8.22	9.13	0.8	2	2.5	48
40	35000	CLS353M040SB1C	20	17	9.60	10.67	0.8	2	3	48
50	2600	CLS262M050JK1C	93	82	2.49	2.76	0.5	1	1.5	60
50	4100	CLS412M050JA1C	61	54	3.37	3.74	0.5	1	2	60
50	4400	CLS442M050EK1C	63	56	3.69	4.10	0.5	1.75	1.5	60
50	4600	CLS462M050LK1C	60	53	3.69	4.10	0.637	1.385	1.5	60
50	5600	CLS562M050JH1C	45	40	4.22	4.68	0.5	1	2.5	60
50	6700	CLS672M050LA1C	42	37	4.81	5.35	0.637	1.385	2	60
50	6700	CLS672M050EA1C	43	38	4.97	5.52	0.5	1.75	2	60
50	6700	CLS672M050MK1C	49	44	4.34	4.82	0.6	1.77	1.5	60
50	6800	CLS682M050JB1C	38	33	4.94	5.48	0.5	1	3	60
50	9100	CLS912M050LH1C	32	28	5.97	6.64	0.637	1.385	2.5	60
50	9100	CLS912M050EH1C	33	29	6.16	6.84	0.5	1.75	2.5	60
50	9500	CLS952M050SK1C	45	40	5.02	5.58	0.8	2	1.5	60
50	10000	CLS103M050MA1C	35	31	5.76	6.40	0.6	1.77	2	60
50	11000	CLS113M050LB1C	26	23	7.03	7.82	0.637	1.385	3	60
50	11000	CLS113M050EB1C	27	24	7.24	8.05	0.5	1.75	3	60
50	13000	CLS133M050MH1C	26	23	7.07	7.86	0.6	1.77	2.5	60
50	14000	CLS143M050SA1C	32	28	6.68	7.42	0.8	2	2	60
50	17000	CLS173M050MB1C	22	19	8.33	9.26	0.6	1.77	3	60
50	19000	CLS193M050SH1C	24	21	8.17	9.08	0.8	2	2.5	60
50	24000	CLS243M050SB1C	20	18	9.54	10.60	0.8	2	3	60

Low-Profile Aluminum Electrolytic

Voltage Vdc	Cap µF	P/N	120Hz 25°C ESR Max	20KHz 25°C ESR Max	105°C Arms 120Hz	105°C Arms 20KHz	Case			Surge Vdc
							H (in)	W (in)	L (in)	
63	1900	CLS192M063JK1C	157	126	1.77	2.20	0.5	1	1.5	75
63	2800	CLS282M063JA1C	107	86	2.36	2.93	0.5	1	2	75
63	3100	CLS312M063LK1C	109	87	2.55	3.17	0.637	1.385	1.5	75
63	3100	CLS312M063EK1C	109	88	2.60	3.23	0.5	1.75	1.5	75
63	3800	CLS382M063JH1C	79	64	2.96	3.68	0.5	1	2.5	75
63	4600	CLS462M063LA1C	74	60	3.36	4.18	0.637	1.385	2	75
63	4600	CLS462M063EA1C	75	61	3.49	4.33	0.5	1.75	2	75
63	4600	CLS462M063MK1C	88	71	3.01	3.74	0.6	1.77	1.5	75
63	4900	CLS492M063JB1C	63	50	3.54	4.40	0.5	1	3	75
63	6300	CLS632M063LH1C	55	44	4.20	5.21	0.637	1.385	2.5	75
63	6300	CLS632M063EH1C	56	45	4.35	5.40	0.5	1.75	2.5	75
63	6400	CLS642M063SK1C	81	65	3.46	4.30	0.8	2	1.5	75
63	6800	CLS682M063MA1C	61	49	4.02	5.00	0.6	1.77	2	75
63	7900	CLS792M063LB1C	44	36	4.98	6.19	0.637	1.385	3	75
63	7900	CLS792M063EB1C	45	36	5.16	6.41	0.5	1.75	3	75
63	9300	CLS932M063MH1C	46	37	5.00	6.21	0.6	1.77	2.5	75
63	9500	CLS952M063SA1C	56	45	4.64	5.77	0.8	2	2	75
63	11000	CLS113M063MB1C	37	30	5.89	7.32	0.6	1.77	3	75
63	12000	CLS123M063SH1C	43	34	5.71	7.10	0.8	2	2.5	75
63	16000	CLS163M063SB1C	34	28	6.75	8.38	0.8	2	3	75
100	670	CLS671M100JK1C	367	230	1.10	1.72	0.5	1	1.5	125
100	990	CLS991M100JA1C	249	157	1.46	2.30	0.5	1	2	125
100	990	CLS991M100EK1C	261	164	1.59	2.50	0.5	1.75	1.5	125
100	1100	CLS112M100LK1C	237	149	1.63	2.56	0.637	1.385	1.5	125
100	1300	CLS132M100JH1C	185	116	1.83	2.88	0.5	1	2.5	125
100	1400	CLS142M100EA1C	179	113	2.14	3.35	0.5	1.75	2	125
100	1600	CLS162M100LA1C	162	102	2.15	3.38	0.637	1.385	2	125
100	1600	CLS162M100MK1C	176	111	2.01	3.16	0.6	1.77	1.5	125
100	1700	CLS172M100JB1C	145	91	2.20	3.45	0.5	1	3	125
100	1900	CLS192M100EH1C	133	83	2.67	4.20	0.5	1.75	2.5	125
100	2200	CLS222M100LH1C	119	75	2.70	4.24	0.637	1.385	2.5	125
100	2200	CLS222M100SK1C	146	92	2.44	3.83	0.8	2	1.5	125
100	2400	CLS242M100MA1C	120	76	2.71	4.25	0.6	1.77	2	125
100	2500	CLS252M100EB1C	105	66	3.20	5.03	0.5	1.75	3	125
100	2800	CLS282M100LB1C	95	59	3.22	5.06	0.637	1.385	3	125
100	3200	CLS322M100MH1C	89	56	3.37	5.30	0.6	1.77	2.5	125
100	3300	CLS332M100SA1C	100	63	3.29	5.17	0.8	2	2	125
100	4100	CLS412M100MB1C	71	45	4.02	6.31	0.6	1.77	3	125
100	4500	CLS452M100SH1C	75	47	4.09	6.42	0.8	2	2.5	125
100	5700	CLS572M100SB1C	60	37	4.84	7.61	0.8	2	3	125

Low-Profile Aluminum Electrolytic

Voltage Vdc	Cap $\mu$ F	P/N	120Hz 25°C ESR Max	20KHz 25°C ESR Max	105°C Arms 120Hz	105°C Arms 20KHz	Case			Surge Vdc
							H (in)	W (in)	L (in)	
200	290	CLS291M200JK1C	483	303	0.96	1.50	0.5	1	1.5	250
200	430	CLS431M200JA1C	328	206	1.27	2.00	0.5	1	2	250
200	460	CLS461M200EK1C	318	200	1.44	2.26	0.5	1.75	1.5	250
200	490	CLS491M200LK1C	299	188	1.45	2.28	0.637	1.385	1.5	250
200	590	CLS591M200JH1C	240	151	1.61	2.52	0.5	1	2.5	250
200	680	CLS681M200EA1C	217	136	1.94	3.05	0.5	1.75	2	250
200	720	CLS721M200MK1C	219	137	1.81	2.84	0.6	1.77	1.5	250
200	730	CLS731M200LA1C	203	128	1.92	3.02	0.637	1.385	2	250
200	750	CLS751M200JB1C	190	119	1.92	3.02	0.5	1	3	250
200	930	CLS931M200EH1C	160	100	2.44	3.83	0.5	1.75	2.5	250
200	990	CLS991M200LH1C	150	94	2.41	3.78	0.637	1.385	2.5	250
200	1000	CLS102M200MA1C	152	96	2.40	3.78	0.6	1.77	2	250
200	1000	CLS102M200SK1C	174	110	2.23	3.50	0.8	2	1.5	250
200	1100	CLS112M200EB1C	130	82	2.88	4.52	0.5	1.75	3	250
200	1200	CLS122M200LB1C	121	76	2.85	4.48	0.637	1.385	3	250
200	1400	CLS142M200MH1C	112	70	3.02	4.74	0.6	1.77	2.5	250
200	1500	CLS152M200SA1C	119	75	3.02	4.74	0.8	2	2	250
200	1800	CLS182M200MB1C	88	56	3.60	5.66	0.6	1.77	3	250
200	2000	CLS202M200SH1C	89	56	3.74	5.88	0.8	2	2.5	250
200	2500	CLS252M200SB1C	71	45	4.43	6.96	0.8	2	3	250
250	200	CLS201M250JK1C	776	448	0.84	1.38	0.5	1	1.5	300
250	290	CLS291M250JA1C	530	306	1.12	1.84	0.5	1	2	300
250	330	CLS331M250EK1C	484	279	1.30	2.14	0.5	1.75	1.5	300
250	340	CLS341M250LK1C	464	268	1.30	2.14	0.637	1.385	1.5	300
250	400	CLS401M250JH1C	387	224	1.41	2.32	0.5	1	2.5	300
250	480	CLS481M250LA1C	330	191	1.68	2.77	0.637	1.385	2	300
250	480	CLS481M250EA1C	331	191	1.75	2.88	0.5	1.75	2	300
250	500	CLS501M250MK1C	336	194	1.62	2.67	0.6	1.77	1.5	300
250	510	CLS511M250JB1C	306	177	1.69	2.78	0.5	1	3	300
250	660	CLS661M250LH1C	242	140	2.11	3.48	0.637	1.385	2.5	300
250	660	CLS661M250EH1C	243	140	2.20	3.62	0.5	1.75	2.5	300
250	700	CLS701M250SK1C	257	149	2.05	3.37	0.8	2	1.5	300
250	720	CLS721M250MA1C	231	133	2.17	3.58	0.6	1.77	2	300
250	840	CLS841M250EB1C	189	109	2.65	4.37	0.5	1.75	3	300
250	860	CLS861M250LB1C	184	107	2.57	4.23	0.637	1.385	3	300
250	980	CLS981M250MH1C	170	98	2.72	4.48	0.6	1.77	2.5	300
250	1000	CLS102M250SA1C	177	102	2.75	4.54	0.8	2	2	300
250	1200	CLS122M250MB1C	137	79	3.23	5.31	0.6	1.77	3	300
250	1300	CLS132M250SH1C	133	77	3.41	5.61	0.8	2	2.5	300
250	1800	CLS182M250SB1C	100	58	4.15	6.84	0.8	2	3	300

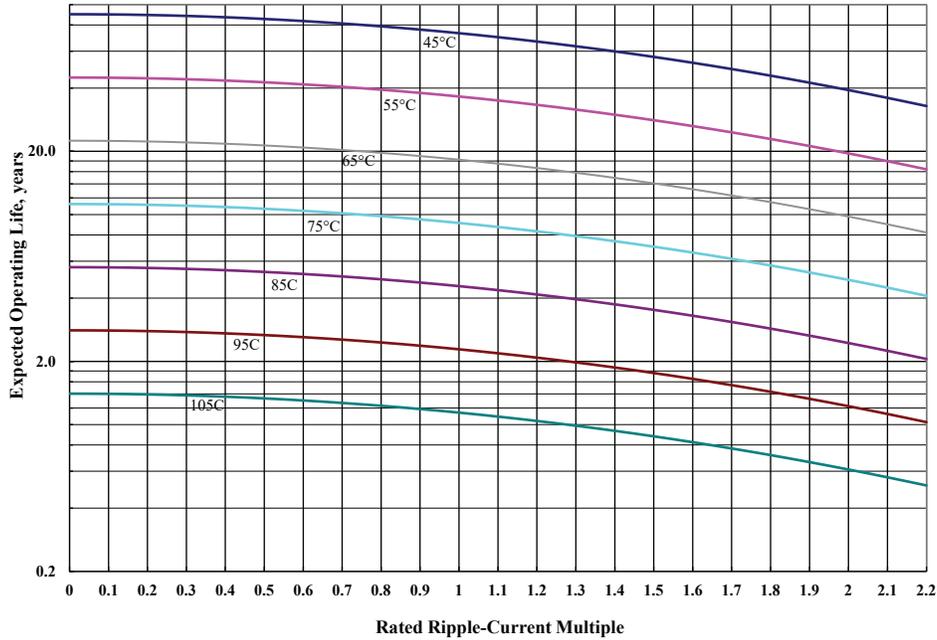
Low-Profile Aluminum Electrolytic

Voltage Vdc	Cap µF	P/N	120Hz 25°C ESR Max	20KHz 25°C ESR Max	105°C Arms 120Hz	105°C Arms 20KHz	Case			Surge Vdc
							H (in)	W (in)	L (in)	
300	150	CLS151M300JK1C	859	496	0.80	1.31	0.5	1	1.5	350
300	230	CLS231M300JA1C	575	332	1.07	1.77	0.5	1	2	350
300	250	CLS251M300LK1C	531	307	1.21	2.00	0.637	1.385	1.5	350
300	250	CLS251M300EK1C	532	307	1.24	2.04	0.5	1.75	1.5	350
300	310	CLS311M300JH1C	424	245	1.35	2.22	0.5	1	2.5	350
300	370	CLS371M300LA1C	361	208	1.61	2.65	0.637	1.385	2	350
300	370	CLS371M300EA1C	362	209	1.67	2.76	0.5	1.75	2	350
300	380	CLS381M300MK1C	368	213	1.55	2.56	0.6	1.77	1.5	350
300	390	CLS391M300JB1C	336	194	1.61	2.65	0.5	1	3	350
300	510	CLS511M300LH1C	264	153	2.02	3.33	0.637	1.385	2.5	350
300	510	CLS511M300EH1C	265	153	2.11	3.47	0.5	1.75	2.5	350
300	520	CLS521M300SK1C	282	163	1.95	3.22	0.8	2	1.5	350
300	550	CLS551M300MA1C	252	146	2.08	3.42	0.6	1.77	2	350
300	640	CLS641M300LB1C	210	121	2.41	3.97	0.637	1.385	3	350
300	640	CLS641M300EB1C	210	122	2.51	4.14	0.5	1.75	3	350
300	760	CLS761M300MH1C	185	107	2.61	4.30	0.6	1.77	2.5	350
300	770	CLS771M300SA1C	192	111	2.65	4.36	0.8	2	2	350
300	960	CLS961M300MB1C	147	85	3.11	5.12	0.6	1.77	3	350
300	1000	CLS102M300SH1C	144	83	3.27	5.39	0.8	2	2.5	350
300	1300	CLS132M300SB1C	114	66	3.90	6.43	0.8	2	3	350

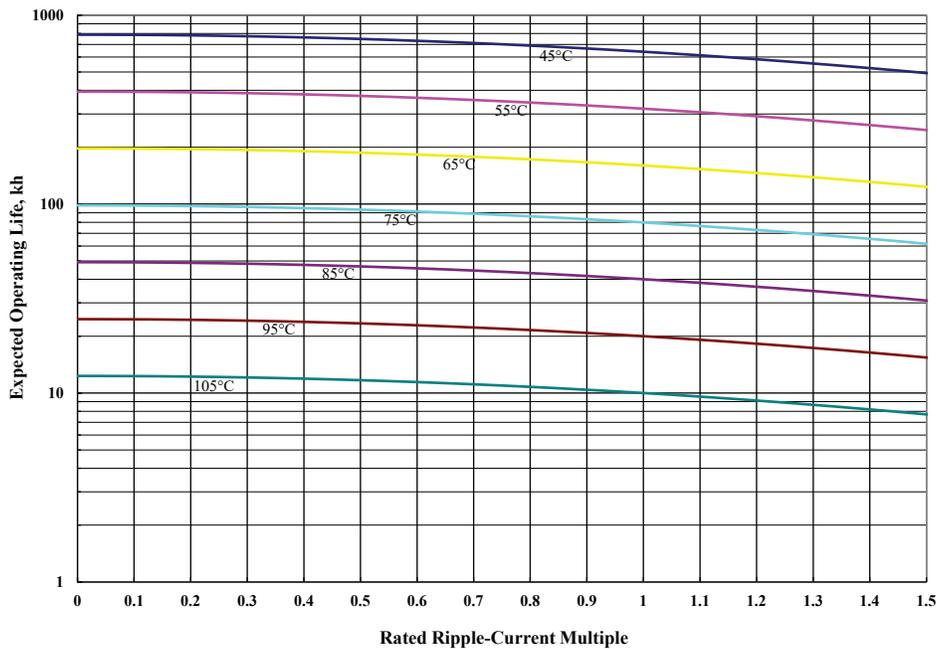
Low-Profile Aluminum Electrolytic

Typical Performance Curves

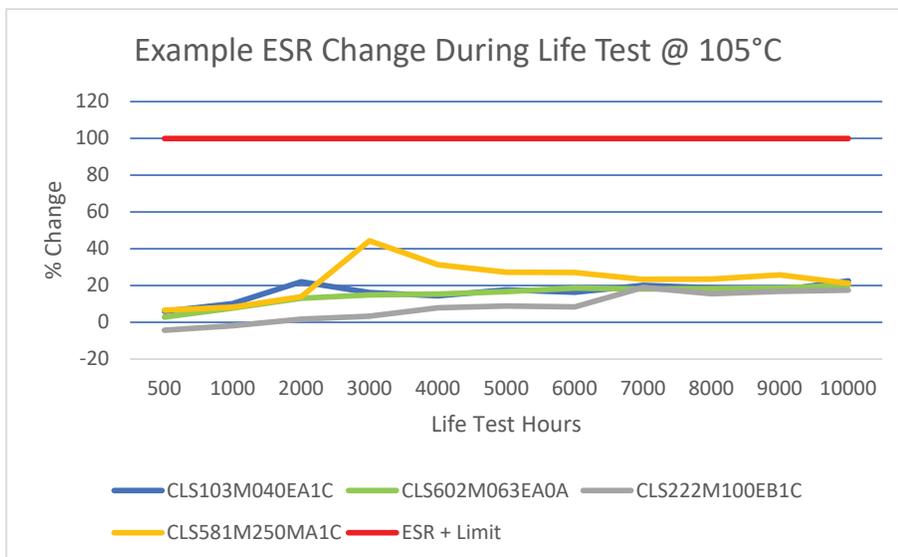
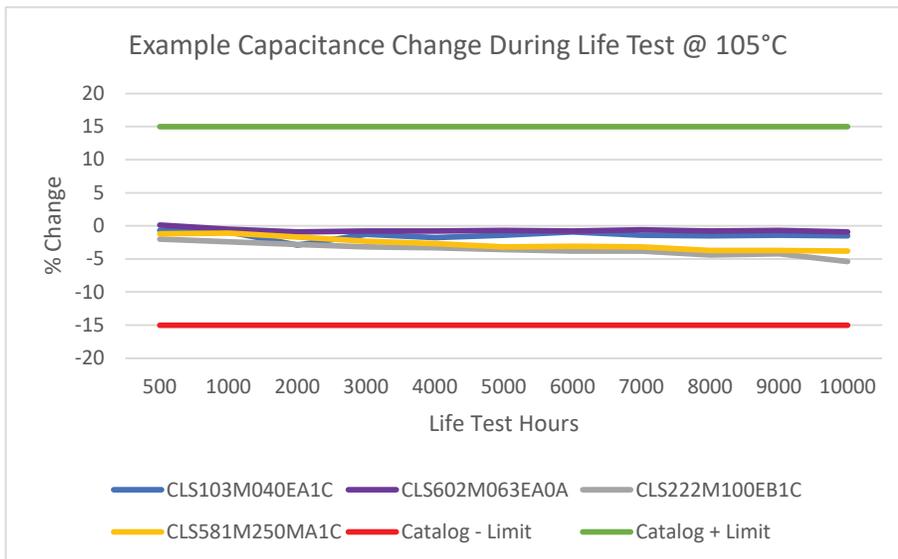
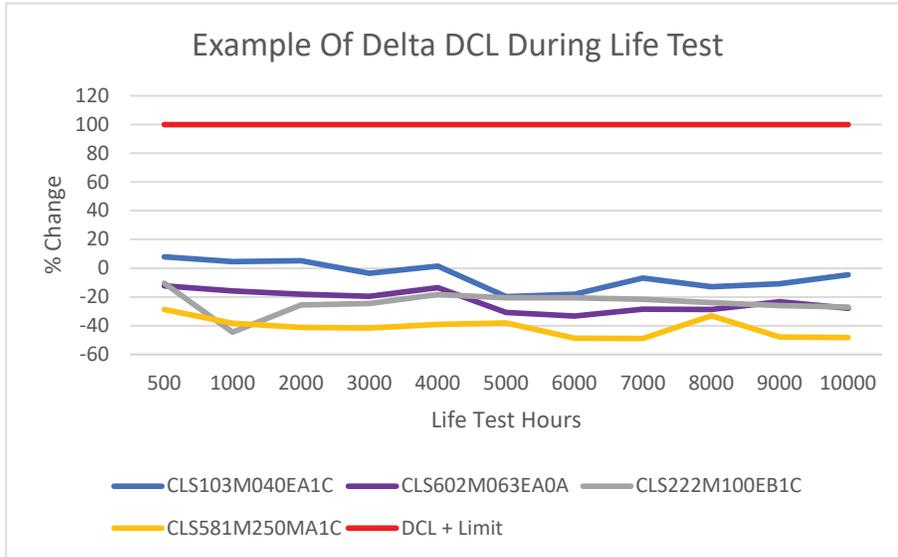
Type CLS Operating Life in Years vs Ripple Current



Type CLS Operating Life in Kilohours vs Ripple Current



Low-Profile Aluminum Electrolytic



## Low-Profile Aluminum Electrolytic

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