



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



Type MLSG – Flatpack, 5000 hr@125 °C, Aluminum Electrolytic

Available with High Vibration and High Reliability Options



With over 5000 hrs of DC life at rated voltage, 125°C, type MLSG is our longest life steel-cased Flatpack capacitor. For systems requiring the highest life expectancy, type MLSG is the best choice. Enhance the reliability of your system even further by specifying type HRMLSG for a MIL-level burn-in. This series is also available in a high vibration package up to 50g's by specifying type HVMLSG.

Highlights

- Longest Life
- Stainless-steel case
- Withstands more than 80,000 feet altitude
- Type HV up to 50g
- Type HR, High Reliability

Specifications

Temperature Range	-55 °C to +125 °C																																																												
Rated Voltage Range	20 Vdc to 250 Vdc																																																												
Capacitance Range	220 µF to 17,000 µF																																																												
Capacitance Tolerance	±20%																																																												
Leakage Current	≤ 0.002 CV µA, @ 25 °C and 5 mins.																																																												
Ripple Current Multipliers	<p>Case Temperature</p> <table border="1"> <tr> <th>45 °C</th> <th>55 °C</th> <th>65 °C</th> <th>75 °C</th> <th>85 °C</th> <th>95 °C</th> <th>105 °C</th> <th>115 °C</th> <th>125 °C</th> </tr> <tr> <td>1.41</td> <td>1.32</td> <td>1.22</td> <td>1.12</td> <td>1.00</td> <td>0.87</td> <td>0.71</td> <td>0.50</td> <td>0.00</td> </tr> </table> <p>Ambient Temperature, No Heatsink</p> <table border="1"> <tr> <th>45 °C</th> <th>55 °C</th> <th>65 °C</th> <th>75 °C</th> <th>85 °C</th> <th>95 °C</th> <th>105 °C</th> <th>115 °C</th> <th>125 °C</th> </tr> <tr> <td>0.63</td> <td>0.58</td> <td>0.54</td> <td>0.49</td> <td>0.44</td> <td>0.38</td> <td>0.31</td> <td>0.22</td> <td>0.00</td> </tr> </table> <p>Frequency</p> <table border="1"> <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> <tr> <th>5 to 40 V</th> <td>0.95</td> <td>0.96</td> <td>1.00</td> <td>1.03</td> <td>1.04</td> <td>1.04</td> <td>1.04</td> </tr> <tr> <th>60 to 250 V</th> <td>0.80</td> <td>0.84</td> <td>1.00</td> <td>1.18</td> <td>1.25</td> <td>1.30</td> <td>1.30</td> </tr> </table>	45 °C	55 °C	65 °C	75 °C	85 °C	95 °C	105 °C	115 °C	125 °C	1.41	1.32	1.22	1.12	1.00	0.87	0.71	0.50	0.00	45 °C	55 °C	65 °C	75 °C	85 °C	95 °C	105 °C	115 °C	125 °C	0.63	0.58	0.54	0.49	0.44	0.38	0.31	0.22	0.00		50 Hz	60 Hz	120 Hz	360 Hz	1 kHz	5 kHz	10 kHz & up	5 to 40 V	0.95	0.96	1.00	1.03	1.04	1.04	1.04	60 to 250 V	0.80	0.84	1.00	1.18	1.25	1.30	1.30
45 °C	55 °C	65 °C	75 °C	85 °C	95 °C	105 °C	115 °C	125 °C																																																					
1.41	1.32	1.22	1.12	1.00	0.87	0.71	0.50	0.00																																																					
45 °C	55 °C	65 °C	75 °C	85 °C	95 °C	105 °C	115 °C	125 °C																																																					
0.63	0.58	0.54	0.49	0.44	0.38	0.31	0.22	0.00																																																					
	50 Hz	60 Hz	120 Hz	360 Hz	1 kHz	5 kHz	10 kHz & up																																																						
5 to 40 V	0.95	0.96	1.00	1.03	1.04	1.04	1.04																																																						
60 to 250 V	0.80	0.84	1.00	1.18	1.25	1.30	1.30																																																						
Low Temperature Characteristics	<p>Impedance ratio: $Z_{-55^{\circ}\text{C}}/Z_{+25^{\circ}\text{C}}$ @ 120 Hz</p> <p>≤ 10 (5 - 60 Vdc)</p> <p>≤ 2 (61 - 250 Vdc)</p>																																																												
DC Life Test	<p>5000 h at rated voltage & 125 °C</p> <p>Δ Capacitance +/- 15% less than or equal to 60 Vdc</p> <p>Δ Capacitance +/- 10% greater than 60 Vdc</p> <p>ESR 200% of limit</p> <p>DCL 100% of limit</p>																																																												
Shelf Life Test	<p>500 h at 125 °C</p> <p>Capacitance 100% of limit</p> <p>ESR 100% of limit</p> <p>DCL 100% of limit</p>																																																												
Vibration	<p>MIL-STD-202, Meth. 204, Sine Swept, IEC 60068-2-6</p> <p>Standard MLSG Flatpack: 10g</p> <p>Type HVMLSG Flatpack 1.5" and 2.0" case length, 50g</p> <p>Type HVMLSG Flatpack 2.5" and 3.0" case length, 30g</p>																																																												

Vibration
Mounting: Vibration capability is dependent upon mounting restraint. The optional welded mounting tabs, alone, are not capable of sustaining the high vibration levels. To achieve the high vibration levels as published on right, additional mounting restraint is required.

Type MLSG – Flatpack, 5000 hr@125 °C, Aluminum Electrolytic

Available with High Vibration and High Reliability Options

<p>Vibration Test</p>	<p>Level The specimens, while deenergized or operating under the load conditions specified, shall be subjected to the vibration amplitude, frequency range, and duration specified for each case size.</p> <p>Amplitude The specimens shall be subjected to a simple harmonic motion having an amplitude of either 0.06-inch double amplitude (maximum total excursion) or peak level specified above (XXg peak), whichever is less. The tolerance on vibration amplitude shall be ±10 percent.</p> <p>Frequency Range The vibration frequency shall be varied logarithmically between the approximate limits of 10 to 2,000 Hz.</p> <p>Sweep Time and Duration 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. Interruptions are permitted provided the requirements for rate of change and test duration are met.</p>																										
<p>High Reliability Test/Burn-in</p>	<p>Established Reliability capacitors shall be subjected to a minimum of 100 percent of the dc rated voltage at 85 °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>																										
<p>Thermal Resistance</p>	<table border="1"> <thead> <tr> <th rowspan="2">Large Sides Heatsinked</th> <th rowspan="2">Case Length Insulation</th> <th>1.5"</th> <th>2.0"</th> <th>3.0"</th> </tr> <tr> <th>°C/W</th> <th>°C/W</th> <th>°C/W</th> </tr> </thead> <tbody> <tr> <td rowspan="2">one</td> <td>None</td> <td>4.3</td> <td>3.1</td> <td>2.0</td> </tr> <tr> <td>Polyester</td> <td>4.7</td> <td>3.4</td> <td>2.2</td> </tr> <tr> <td rowspan="2">both</td> <td>None</td> <td>2.8</td> <td>2.0</td> <td>1.3</td> </tr> <tr> <td>Polyester</td> <td>3.0</td> <td>2.2</td> <td>1.4</td> </tr> </tbody> </table>	Large Sides Heatsinked	Case Length Insulation	1.5"	2.0"	3.0"	°C/W	°C/W	°C/W	one	None	4.3	3.1	2.0	Polyester	4.7	3.4	2.2	both	None	2.8	2.0	1.3	Polyester	3.0	2.2	1.4
Large Sides Heatsinked	Case Length Insulation			1.5"	2.0"	3.0"																					
		°C/W	°C/W	°C/W																							
one	None	4.3	3.1	2.0																							
	Polyester	4.7	3.4	2.2																							
both	None	2.8	2.0	1.3																							
	Polyester	3.0	2.2	1.4																							
<p>ESL</p>	<p>≤30 nH measured 1/4" from case at 1 MHz</p>																										
<p>Weight</p>	<p>Case EK 48g typical Case EA 63g typical Case EH 78g typical Case EB 93g typical</p>																										
<p>Terminals</p>	<p>18 AWG copper wire with 60/40 tin-lead electroplate, 20 amps max</p>																										
<p>Ripple Current Capability</p>	<p>The ripple current capability is set by the maximum permissible internal core temperature, 125 °C.</p>																										
<p>Air Cooled</p>	<p>The ripple currents in the ratings tables are for 85 °C case temperatures. For air temperatures without a heatsink use the multipliers Ambient Temperature, No Heatsink.</p>																										
<p>Heatsink Cooled</p>	<p>Temperature rise from the internal hottest spot, the core, to ambient air is</p> $\Delta T = I^2(ESR)(\theta_{cc} + \theta_{ca}), \text{ recommended max } \Delta T \text{ of } 30 \text{ } ^\circ\text{C}$ <p>where θ_{cc} is the thermal resistance from core to case and θ_{ca} from case to ambient. To calculate maximum ripple capability with the MLS attached to a heatsink use the maximum core temperature and the values for θ_{cc}.</p>																										
<p>Example</p>	<p>As an illustration, suppose you operate an insulated MLSG332M060EB1C in 65 °C air and attach it to a commercial heatsink with a free-air thermal resistance of 2.7 °C/W. Use a good thermal grease between the MLS and the heatsink, and the total thermal resistance is 2.3 + 2.2 or 4.5 °C/W. The power which would heat the core to 125 °C is (125 - 65)/4.5 or 13.3 W. For an ESR of 31 mΩ, 13.3 W equates to a ripple current of 20.7 A, however, the wire leads are rated for only 20 A.</p>																										

Type MLSG – Flatpack, 5000 hr@125 °C, Aluminum Electrolytic

Available with High Vibration and High Reliability Options

Part Numbering System

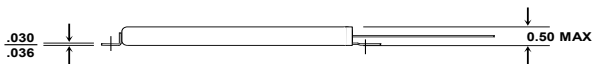
HV	HR	MLSG	821	M	200	EB	0	A
Optional High Vibration	Optional High Reliability	Type MLSG	Capacitance 821=820 μF 102 = 1000 μF	Tolerance M=±20%	Rated Voltage Vdc	Case Code EK, L=1.5 in. EA, L=2.0 in. EH, L=2.5 in. EB, L=3.0 in. * other sizes available	Insulation 0 = bare can 1 = polyester	Mounting Style A = mounting tabs C = two leads/no tabs D = hook leads/tabs * other mounting tab options available

Examples:
 Standard MLSG: MLSG821M200EB0C
 High Reliability: HRMLSG821M200EB0C
 High Vibration: HVMLSG821M200EB0C
 High Reliability, High Vibration: HVHRMLSG821M200EB0C

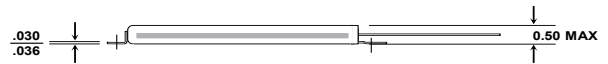
Outline Drawings

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

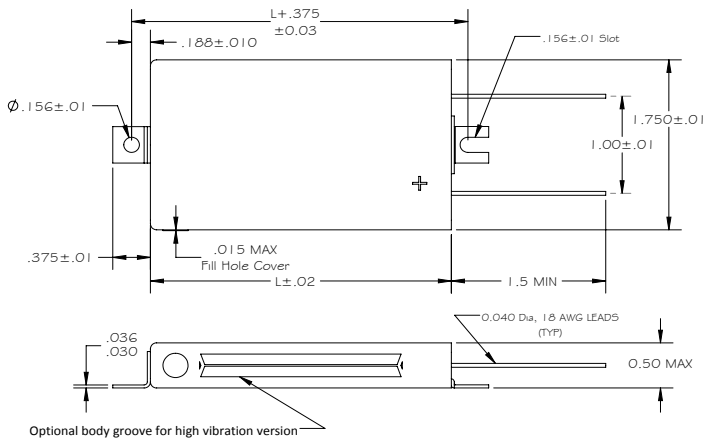
Standard Type MLSG



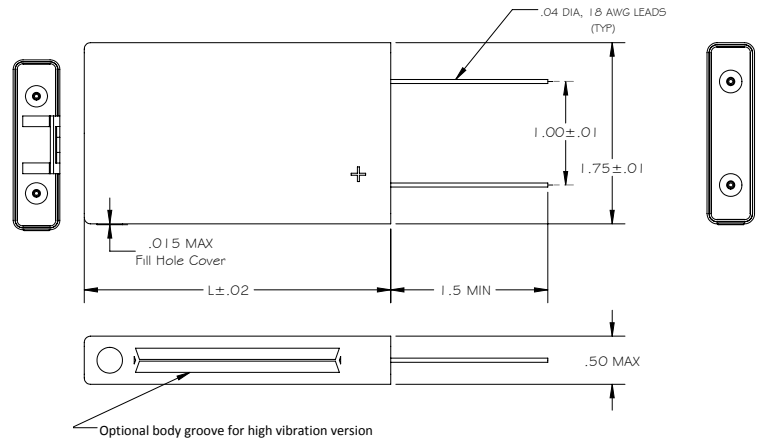
Type HV, Rilled Construction



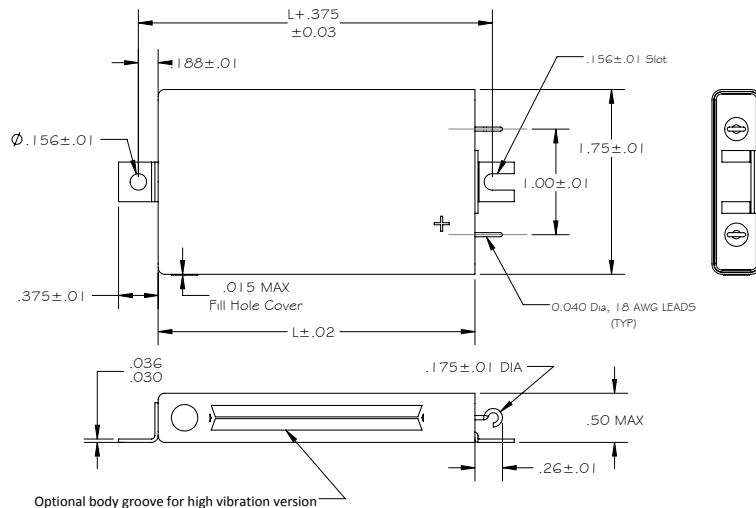
Style A: Mounting Tabs



Style C: No Tabs



Style D: Hook Leads

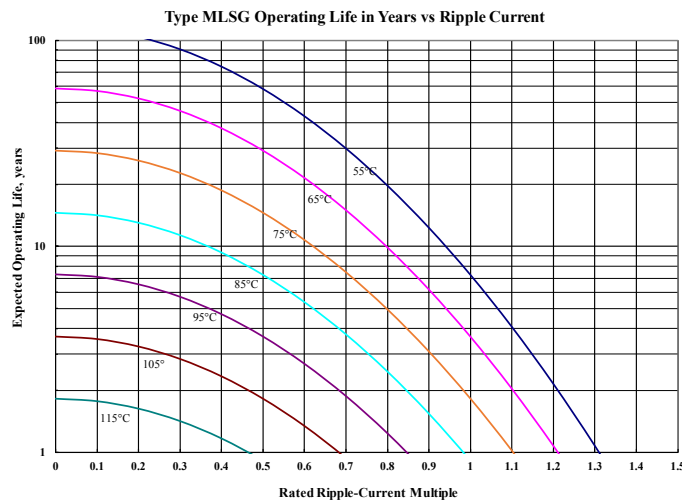
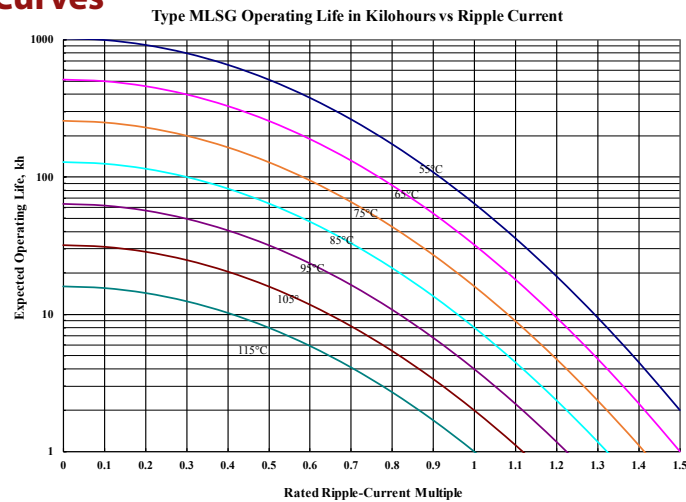


Mounting tabs are welded to the case.

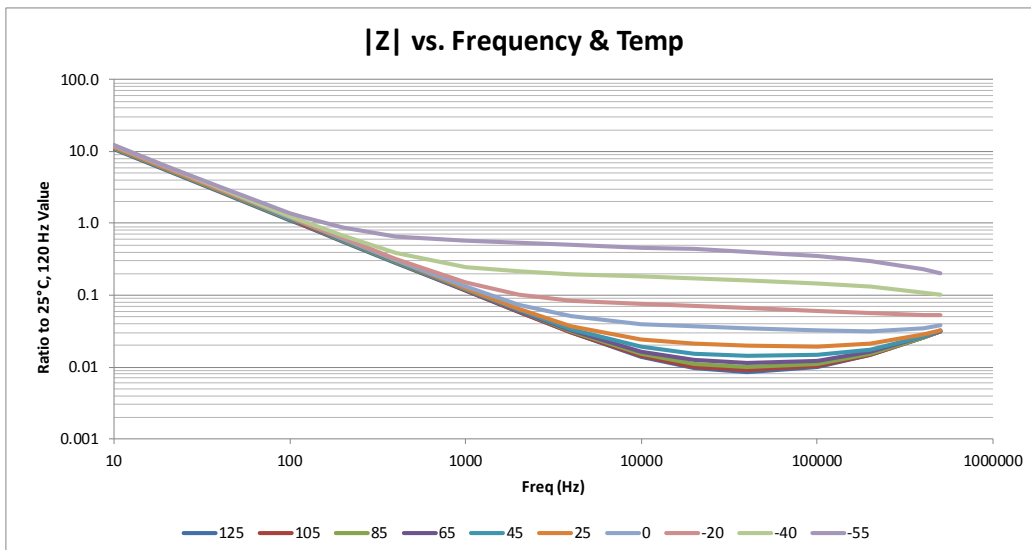
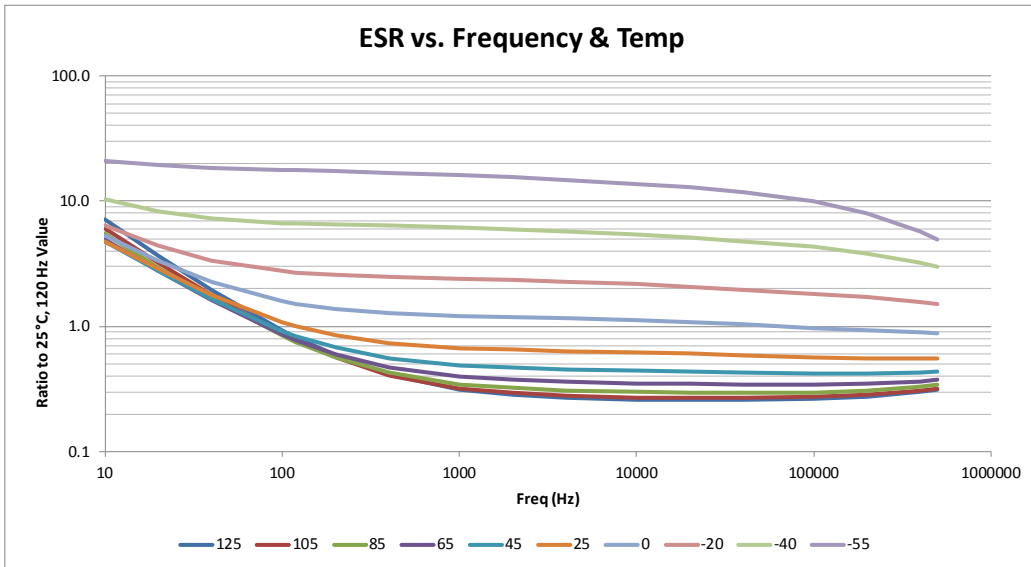
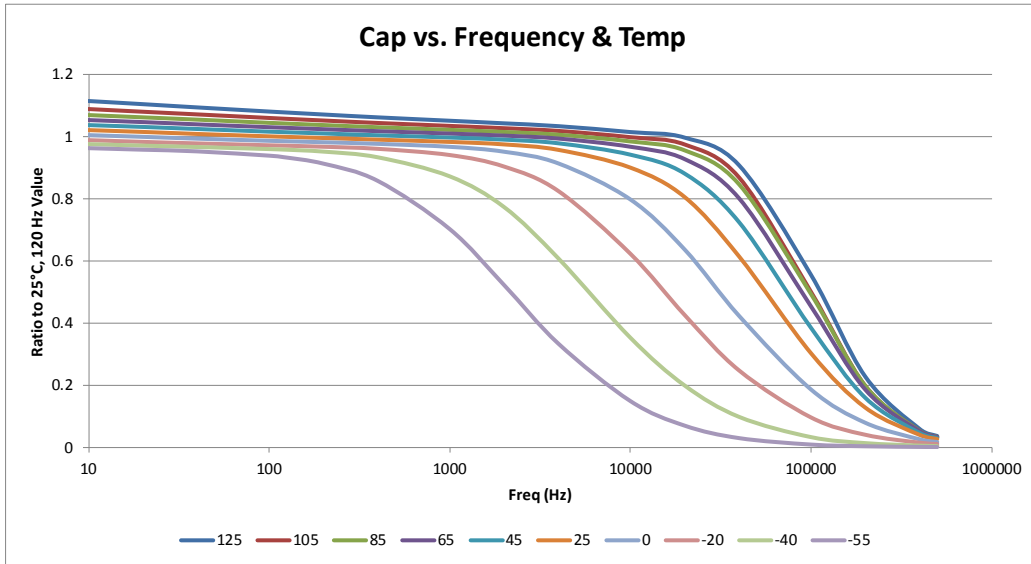
Type MLSG – Flatpack, 5000 hr@125 °C, Aluminum Electrolytic Ratings

Voltage	Cap (μF)	Catalog Part Number	ESR max		Ripple (A)		Length (inches)
			25 °C (mΩ)	20 kHz	Case @ 85°C	20 kHz	
20 Vdc @ 125 °C 24 Vdc @ 105 °C 30 Vdc Surge @ 25 °C	6,800	MLSG682M020EK0C	84	69	11	12.2	1.5
	17,000	MLSG173M020EB0A	33	27	17.6	19.5	3.0
40 Vdc @ 125 °C 48 Vdc @ 105 °C 60 Vdc Surge @ 25 °C	4,400	MLSG442M040EK0C	97	70	10.3	12.1	1.5
	6,300	MLSG632M040EA0A	62	46	12.9	15	2.0
	10,000	MLSG103M040EB0C	36	27	16.9	19.5	3.0
60 Vdc @ 125 °C 65 Vdc @ 105 °C 90 Vdc Surge @ 25 °C	1,500	MLSG152M060EK0A	106	77	9.8	11.5	1.5
	2,100	MLSG212M060EA0A	72	52	11.9	14.1	2.0
	3,300	MLSG332M060EB0C	44	31	15.3	18.2	3.0
100 Vdc @ 125 °C 120 Vdc @ 105 °C 150 Vdc Surge @ 25 °C	500	MLSG501M100EK0A	355	248	5.4	6.4	1.5
	770	MLSG771M100EA0C	238	166	6.6	7.8	2.0
	1,300	MLSG132M100EB0D	143	100	8.5	10.1	3.0
150 Vdc @ 125 °C 180 Vdc @ 105 °C 225 Vdc Surge @ 25 °C	360	MLSG361M150EK1A	388	253	5.1	6.4	1.5
	540	MLSG541M150EA1A	261	168	6.3	7.8	2.0
	900	MLSG901M150EB0C	158	100	8.1	10.1	3.0
200 Vdc @ 125 °C 250 Vdc @ 105 °C 300 Vdc Surge @ 25 °C	280	MLSG281M200EK1A	426	258	4.9	6.2	1.5
	400	MLSG401M200EA0A	285	172	6	7.7	2.0
	720	MLSG721M200EB0C	172	103	7.7	10	3.0
250 Vdc @ 125 °C 275 Vdc @ 105 °C 300 Vdc Surge @ 25 °C	220	MLSG221M250EK0C	597	393	4.1	5.1	1.5
	560	MLSG561M250EB0C	240	157	6.5	8.1	3.0

Typical Performance Curves



Typical Performance Curves



Notice and Disclaimer: All product drawings, descriptions, specifications, statements, information and data (collectively, the "Information") in this datasheet or other publication are subject to change. The customer is responsible for checking, confirming and verifying the extent to which the Information contained in this datasheet or other publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without any guarantee, warranty, representation or responsibility of any kind, expressed or implied. Statements of suitability for certain applications are based on the knowledge that the Cornell Dubilier company providing such statements ("Cornell Dubilier") has of operating conditions that such Cornell Dubilier company regards as typical for such applications, but are not intended to constitute any guarantee, warranty or representation regarding any such matter – and Cornell Dubilier specifically and expressly disclaims any guarantee, warranty or representation concerning the suitability for a specific customer application, use, storage, transportation, or operating environment. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by Cornell Dubilier with reference to the use of any Cornell Dubilier products is given gratis (unless otherwise specified by Cornell Dubilier), and Cornell Dubilier assumes no obligation or liability for the advice given or results obtained. Although Cornell Dubilier strives to apply the most stringent quality and safety standards regarding the design and manufacturing of its products, in light of the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies or other appropriate protective measures) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage. Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated in such warnings, cautions and notes, or that other safety measures may not be required.