Type MLSG – Slimpack™, 5000 hr@125 ºC, Aluminum Electrolytic

With a profile of 1.0" by 0.5" type MLSG Slimpack™ capacitors fit into the tightest of spaces and meets a DC test of 5000 hrs at rated voltage, 125 ºC. MLSG SlimpackTM is a perfect fit for military and aerospace applications requiring a low profile, rugged design and long-life. Specify type HRMLSG for high reliability burn-in.

Highlights

- 5000 hrs @ rated voltage, 125 °C
- Stainless steel case
- Withstands more than 80,000 feet altitude
- 80 g vibration
- Type HR, high reliability burn-in

Specifications

Temperature Range	–55 °C to +125 °C
Rated Voltage Range	10 Vdc to 250 Vdc
Capacitance Range	140 µF to 24,000 µF
Capacitance Tolerance	±20%
Leakage Current	≤ 0.002 CV µA, @ 25 °C and 5 mins.
Ripple Current Multipliers	Case Temperature **45 °C** 1.41 / **55 °C** 1.32 / **65 °C** 1.22 / **75 °C** 1.12 / **85 °C** 1.00 / **95 °C** 0.87 / **105 °C** 0.71 / **115 °C** 0.50 / **125 °C** 0.00 Ambient Temperature, No Heatsink **45 °C** 0.63 / **55 °C** 0.58 / **65 °C** 0.54 / **75 °C** 0.49 / **85 °C** 0.44 / **95 °C** 0.38 / **105 °C** 0.31 / **115 °C** 0.22 / **125 °C** 0.00 Frequency **5 to 40 V**: **50 Hz** 0.95 / **60 Hz** 0.96 / **120 Hz** 1.00 / **360 Hz** 1.03 / **1 kHz** 1.04 / **5 kHz** 1.04 / **10 kHz & up** 1.04 **60 to 250 V**: **50 Hz** 0.80 / **60 Hz** 0.84 / **120 Hz** 1.00 / **360 Hz** 1.18 / **1 kHz** 1.25 / **5 kHz** 1.30 / **10 kHz & up** 1.30
Low Temperature Characteristics	Impedance ratio: $Z_{-55\,°C}/Z_{+25\,°C}$ @ 120 Hz ≤ 10 (5 - 20 Vdc) ≤ 2 (25 - 250 Vdc)
DC Life Test	5000 h at rated voltage @ 125 °C Δ Capacitance +/- 15% less than or equal to 60 Vdc Δ Capacitance +/- 10% greater than 60 Vdc ESR 200% of limit DCL 100% of limit
Shelf Life Test	500 h @ 125 °C Capacitance 100% of limit ESR 100% of limit DCL 100% of limit
Vibration *Mounting: Vibration capability is dependent upon mounting restraint.*	MIL-STD-202, Meth. 204, Sine Swept. IEC 60068-2-6 JK Case = 80g All Others = 50g

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Vibration Test	**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. **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. **Frequency Range** The vibration frequency shall be varied logarithmically between the approximate limits of 10 to 2,000 Hz. **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.
High Reliability Test/Burn-in	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.
Thermal Resistance	
ESL	
Typical Weight	Case JK = 30 Case JA = 39 Case JH = 48 Case JB = 57
Terminals	18 AWG copper wire with 60/40 tin-lead electroplate, 20 amps max
Case Material	Stainless Steel
Ripple Current Capability	The ripple current capability is set by the maximum permissible internal core temperature, 125 °C.
Air Cooled	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.
Heatsink Cooled	Temperature rise from the internal hottest spot, the core, to ambient air is $\Delta T = I^2(ESR)(\theta cc + \theta ca)$, recommended max ΔT of 30 °C where θcc is the thermal resistance from core to case and θca 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 θcc.
Example	As an illustration, suppose you operate an insulated MLSG262M060JB0C in 95 °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 2.7 +3. 4 or 6.1° C/W. The power which would heat the core to 125 °C is (125 - 95)/6. 1 or 4.9 W. For an ESR of 47 mΩ, 4.9 W equates to a ripple current of 10.2 A.

Large Sides Heatsinked	Case Length	1.5"	2.0"	2.5″	3.0"
	Insulation	°C/W	°C/W	°C/W	°C/W
one	None	6.6	4.8	3.8	3.1
	Polyester	7.2	5.3	4.2	3.4
both	None	4.4	3.1	2.4	2
	Polyester	4.7	3.3	2.6	2.2

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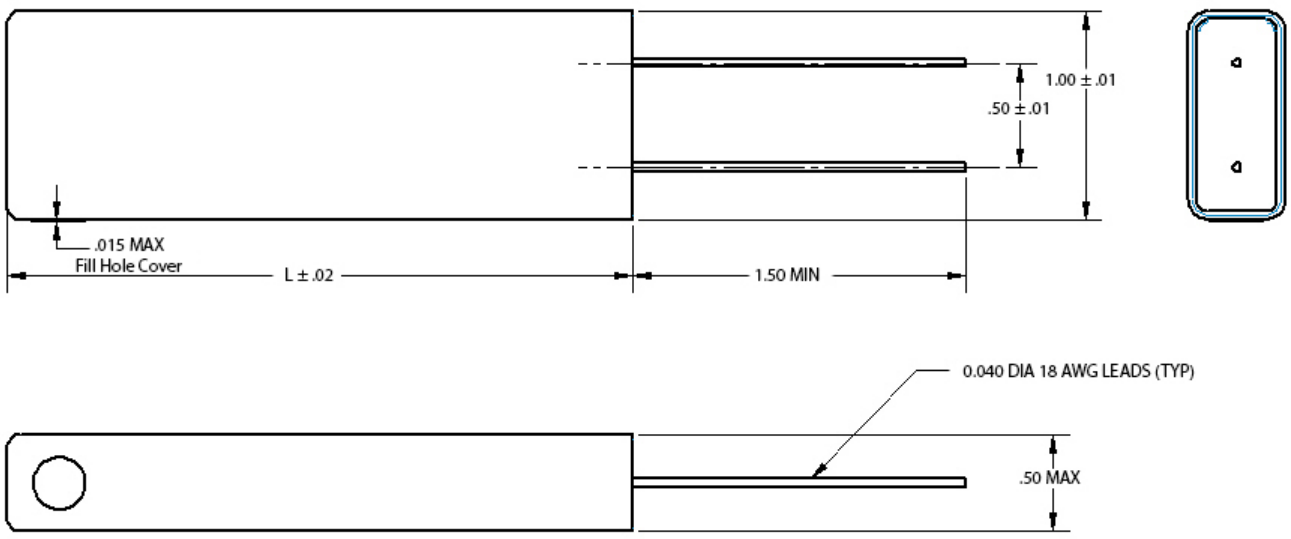
Part Numbering System

HR	MLSG	821	M	200	JB	0	C
Optional	**Type**	**Capacitance**	**Tolerance**	**Rated Voltage**	**Case Code**	**Insulation**	**Mounting Style**
High Reliability	**MLSG**	**191** = 190 µF **102** = 1000 µF	**M=**±20%	005 = 5 Vdc 7R5 = 7.5 Vdc 200 = 200 Vdc	**JK,** L=1.5 in. **JA**, L=2.0 in **JH**, L=2.5 in **JB**, L=3.0 in. * other sizes available	**0** = bare can **1** = polyester	**C** = two leads

Examples:
Standard MLSG: MLSG191M200JK0C
High Reliability: HRMLSG191M200JK0C

Outline Drawing

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



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Ratings

	Cap	Part Number	Ω 120 Hz 25 °C Cat. ESR	Ω 10 KHz 25 °C Cat. ESR	Ripple (A) Case @ 85°C 120Hz	Ripple (A) Case @ 85°C 10kHz	Surge 25 °C Vdc	Case Length	105 °C Vdc
10 Vdc @ 125 °C 12 Vdc @ 105 °C 15 Vdc Surge @ 25 °C	9500	MLSG952M010JK0C	0.096	0.091	6.9	7.1	15	1.5	12
	14000	MLSG143M010JA0C	0.068	0.064	9.8	10	15	2	12
	19000	MLSG193M010JH0C	0.053	0.050	12.6	12.9	15	2.5	12
	24000	MLSG243M010JB0C	0.042	0.040	15.4	15.8	15	3	12
20 Vdc @ 125 °C 24 Vdc @ 105 °C 30 Vdc Surge @ 25 °C	4600	MLSG462M020JK0C	0.102	0.097	6.6	6.8	30	1.5	24
	6800	MLSG682M020JA0C	0.072	0.068	9.4	9.7	30	2	24
	9300	MLSG932M020JH0C	0.054	0.052	12.3	12.6	30	2.5	24
	11000	MLSG113M020JB0C	0.042	0.040	15.2	15.6	30	3	24
30 Vdc @ 125 °C 36 Vdc @ 105 °C 45 Vdc Surge @ 25 °C	3300	MLSG332M030JK0C	0.103	0.098	6.6	6.8	45	1.5	36
	4900	MLSG492M030JA0C	0.072	0.069	9.5	9.7	45	2	36
	6700	MLSG672M030JH0C	0.055	0.053	12.3	12.6	45	2.5	36
	8500	MLSG852M030JB0C	0.043	0.041	14.9	15.3	45	3	36
40 Vdc @ 125 °C 48 Vdc @ 105 °C 60 Vdc Surge @ 25 °C	2300	MLSG232M040JK0C	0.105	0.100	6.6	6.8	60	1.5	48
	3400	MLSG342M040JA0C	0.072	0.068	9.5	9.7	60	2	48
	4600	MLSG462M040JH0C	0.056	0.053	12.3	12.6	60	2.5	48
	5900	MLSG592M040JB0C	0.045	0.043	14.9	15.3	60	3	48
50 Vdc @ 125 °C 60 Vdc @ 105 °C 75 Vdc Surge @ 25 °C	1600	MLSG162M050JK0C	0.108	0.101	6.6	6.8	75	1.5	60
	2500	MLSG252M050JA0C	0.073	0.700	9.5	9.7	75	2	60
	3400	MLSG342M050JH0C	0.056	0.053	12.3	12.6	75	2.5	60
	4300	MLSG432M050JB0C	0.046	0.043	14.9	15.3	75	3	60
60 Vdc @ 125 °C 60 Vdc @ 105 °C 90 Vdc Surge @ 25 °C	1000	MLSG102M060JK0C	0.109	0.103	6.5	6.6	90	1.5	72
	1500	MLSG152M060JA0C	0.074	0.071	9.3	9.6	90	2	72
	2100	MLSG212M060JH0C	0.057	0.054	12.1	12.4	90	2.5	72
	2600	MLSG262M060JB0C	0.047	0.044	14.7	15	90	3	72
75 Vdc @ 125 °C 90 Vdc @ 105 °C 112 Vdc Surge @ 25 °C	790	MLSG791M075JK0C	0.246	0.234	4.0	4.2	112.5	1.5	90
	1100	MLSG112M075JA0C	0.200	0.190	5.0	5.2	112.5	2	90
	1500	MLSG152M075JH0C	0.148	0.141	6.2	6.5	112.5	2.5	90
	2000	MLSG202M075JB0C	0.096	0.091	8.2	8.5	112.5	3	90
100 Vdc @ 125 °C 120 Vdc @ 105 °C 150 Vdc Surge @ 25 °C	400	MLSG401M100JK0C	0.960	0.768	2	2.4	150	1.5	120
	600	MLSG601M100JA0C	0.634	0.507	2.8	3.6	150	2	120
	800	MLSG801M100JH0C	0.484	0.387	3.6	4.6	150	2.5	120
	1000	MLSG102M100JB0C	0.387	0.310	4.4	5.7	150	3	120
150 Vdc @ 125 °C 180 Vdc @ 105 °C 225 Vdc Surge @ 25 °C	200	MLSG201M150JK0C	0.960	0.768	2	2.4	225	1.5	180
	300	MLSG301M150JA0C	0.634	0.507	2.8	3.6	225	2	180
	400	MLSG401M150JH0C	0.484	0.387	3.6	4.6	225	2.5	180
	500	MLSG501M150JB0C	0.387	0.310	4.4	5.7	225	3	180
200 Vdc @ 125 °C 250 Vdc @ 105 °C 300 Vdc Surge @ 25 °C	190	MLSG191M200JK0C	1.274	1.019	1.9	2.1	300	1.5	250
	280	MLSG281M200JA0C	0.845	0.676	2.8	3.1	300	2	250
	380	MLSG381M200JH0C	0.634	0.508	3.6	4.1	300	2.5	250
	490	MLSG491M200JB0C	0.507	0.406	4.4	5	300	3	250
250 Vdc @ 125 °C 275 Vdc @ 105 °C 350 Vdc Surge @ 25 °C	140	MLSG141M250JK0C	1.200	0.960	1.9	2.2	350	1.5	300
	220	MLSG221M250JA0C	0.792	0.634	2.9	3.2	350	2	300
	300	MLSG301M250JH0C	0.605	0.484	3.7	4.2	350	2.5	300
	380	MLSG381M250JB0C	0.484	0.387	4.5	5.1	350	3	300

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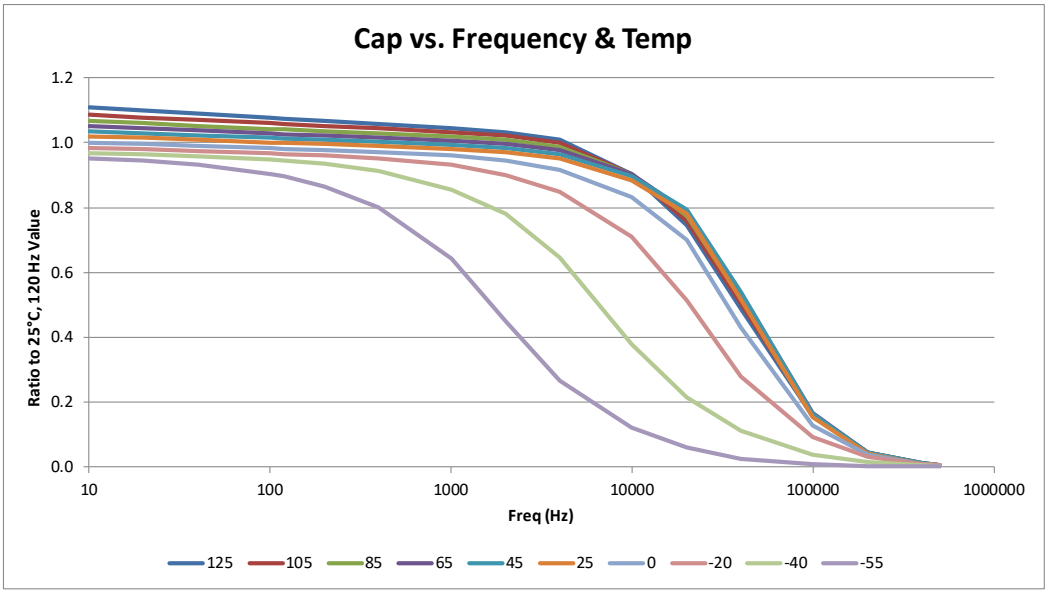
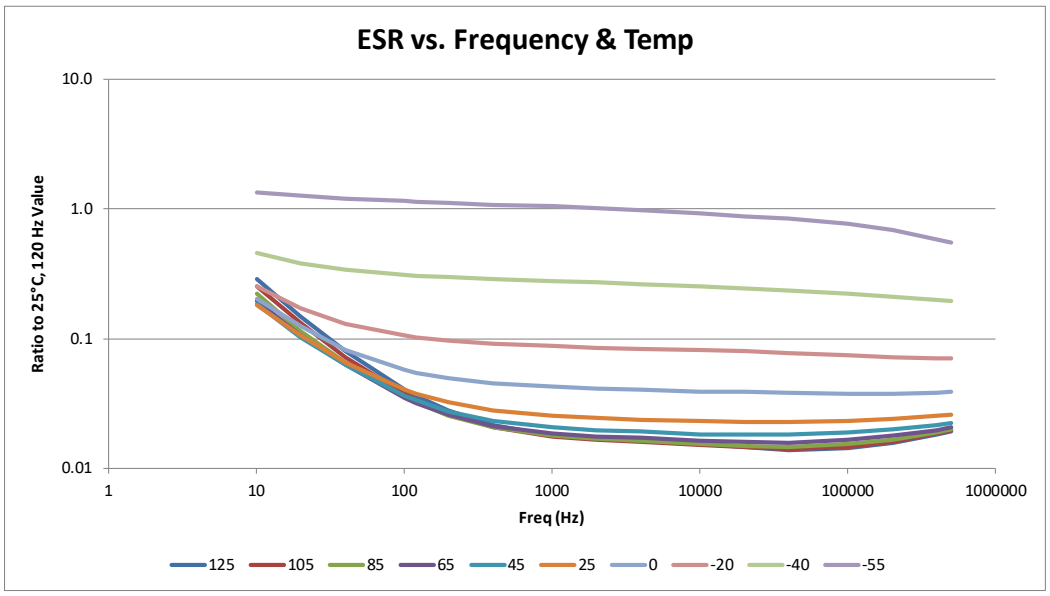
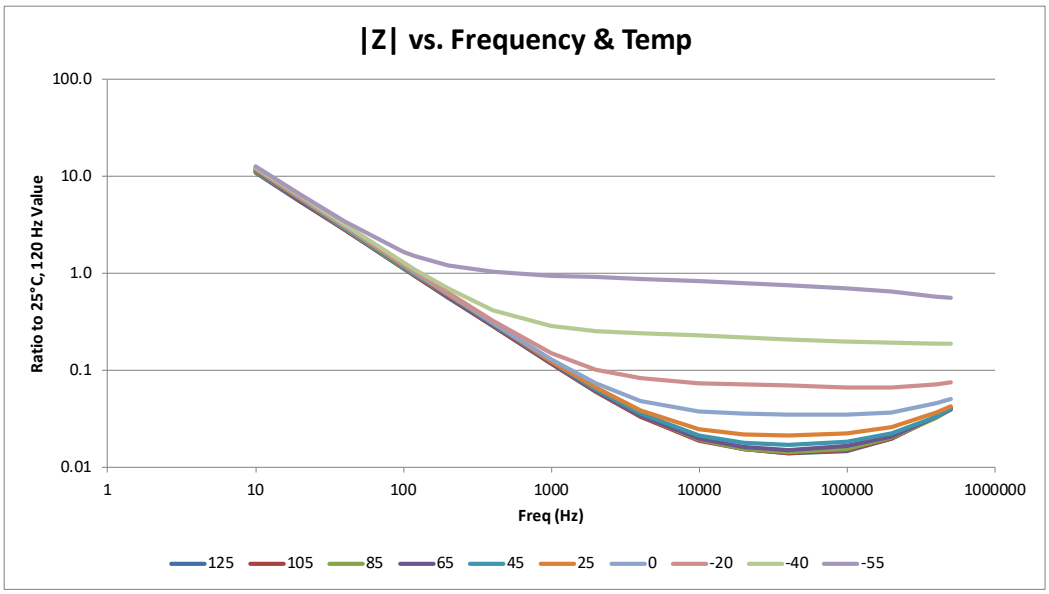
Typical Performance Curves

Part # MLSG122M060JKOC







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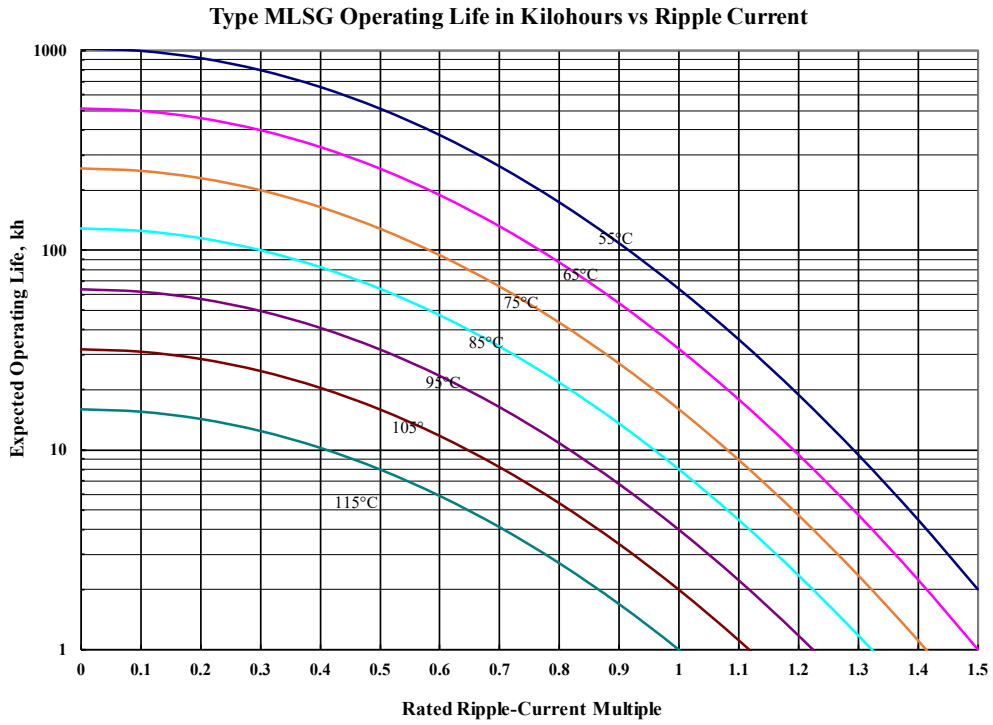

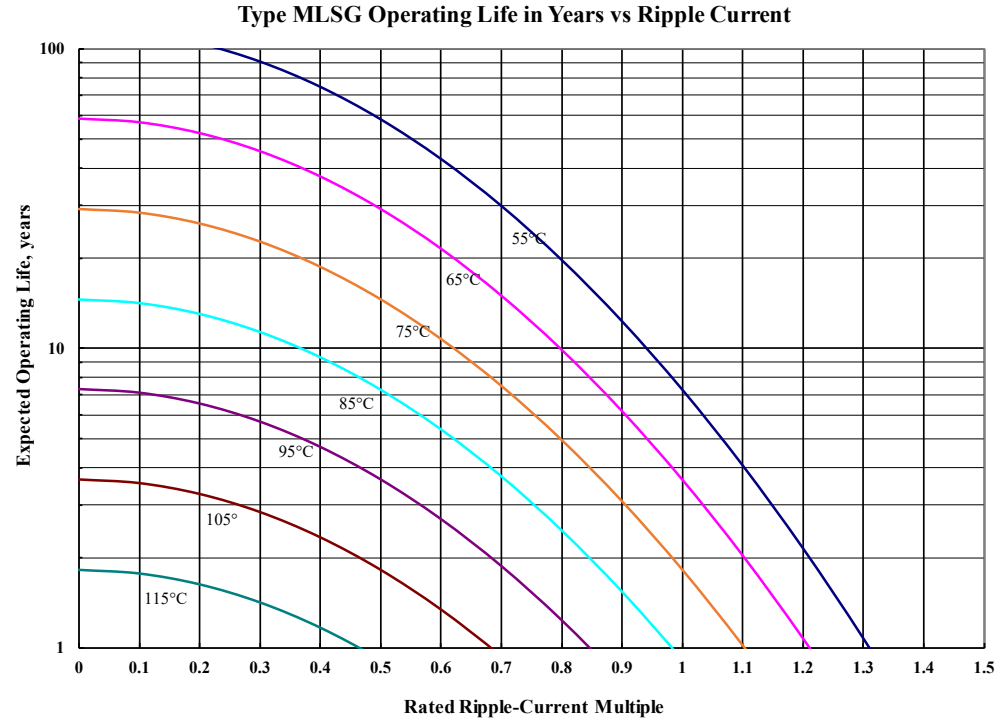

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