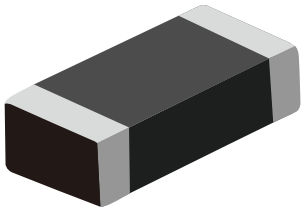
SME0402B24LA

Multilayer Chip Varistor For ESD Protection

FEATURES

- Fast response, instantly clamping the transient over voltage.
- High surge current handling capability.
- High energy absorption capability.
- Low clamping voltages, providing better surge protection.
- Low capacitance values, providing digital switching circuitry protection.
- High insulation resistance, preventing electric arcing to the adjacent devices or circuits.



APPLICATIONS

- Universal Serial Bus (USB).
- Mobile communication.
- Computer/DSP product.
- Video and audio ports.
- Portable/Hand-Held Products.
- Data, Diagnostic I/O ports.

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ELECTRICAL SPECIFICATION

Technical Data	Symbol	Value	Unit
Maximum allowable continuous AC voltage at 50-60Hz	V_{RMS}	NIL	V
Maximum allowable continuous DC voltage	V_{DC}	24	V
Varistor breakdown voltage	V_v	100-150	V
Typical capacitance value measured at 1MHz	C	2.5	pF
Typical capacitance value tolerance	t	±40	%
Maximum allowable clamping voltage	V_C	200	V
Leakage current at VDC (at initial state)	I_{LDC}	<1	μA
Leakage current at VDC (after ESD test)	I_{LDCA}	<2	μA
Response time	T_{rise}	<1	ns
Rated peak single pulse transient current at	I_P	1	A
Maximum Energy Absorption 10/1000μs	E	0.01	J
ESD Per IEC 61000-4-2 (Air)	V_{ESD}	±15	kV
ESD Per IEC 61000-4-2 (Contact)	V_{ESD}	±8	kV
Operation ambient temperature	T_{OPT}	-55~+125	°C
Storage temperature range	T_{STG}	-55~+125	°C

Notes : *1 The varistor breakdown voltage was measured at 1mA. .*2 The clamping voltage was measured at 8/20μs standard current.
*3 The leakage current was measured at working voltage *4 Insulation resistance greater than 10MΩ

RELIABILITY TESTING PROCEDURES

<table>
<tr><th>Characteristic</th><th colspan="4">Test method and description</th></tr>
<tr><td>High Temperature Storage</td><td colspan="4">The specimen shall be subjected to 125°C for 1000 hours in a thermostatic bath without load and then stored at room temperature and humidity for 1 to 2 hours. The change of varistor voltage shall be within 10%.</td></tr>
<tr><td rowspan="5">Temperature Cycle</td><td rowspan="5">The temperature cycle of specified temperature shall be repeated five times and then stored at room temperature and humidity for one two hours. The change of varistor voltage shall be within 10%and mechanical damage shall be examined.</td><td>Step</td><td>Temperature</td><td>Period</td></tr>
<tr><td>1</td><td>-40±3°C</td><td>30min±3</td></tr>
<tr><td>2</td><td>Room Temperature</td><td>1~2hours</td></tr>
<tr><td>3</td><td>125±2°C</td><td>30min±3</td></tr>
<tr><td>4</td><td>Room Temperature</td><td>1~2hours</td></tr>
<tr><td>High Temperature Load</td><td colspan="4">After being continuously applied the maximum allowable voltage at 125°C for 1000hours, the specimen shall be stored at room temperature and humidity for one or hours, the change of varistor voltage shall be within 10%</td></tr>
<tr><td>Damp Heat Load/ Humidity Load</td><td colspan="4">The specimen should be subjected to 40°C,90 to 95%RH environment, and the maximum allowable voltage applied for 1000 hours, then stored at room temperature and humidity for one or two hours. The change of varistor voltage shall be within 10%.</td></tr>
<tr><td>Low Temperature Storage</td><td colspan="4">The specimen should be subjected to -40°C, without load for 1000 hours and then stored at room temperature for one two hours. The change of varistor voltage shall be within 10%.</td></tr>
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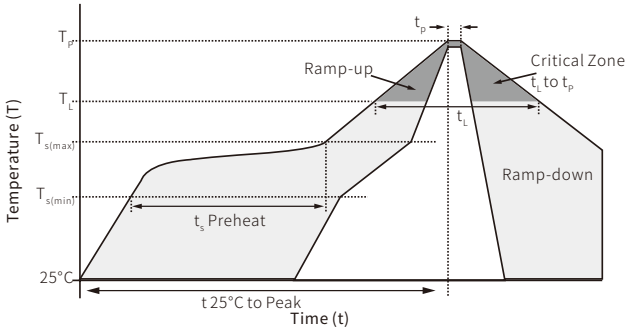
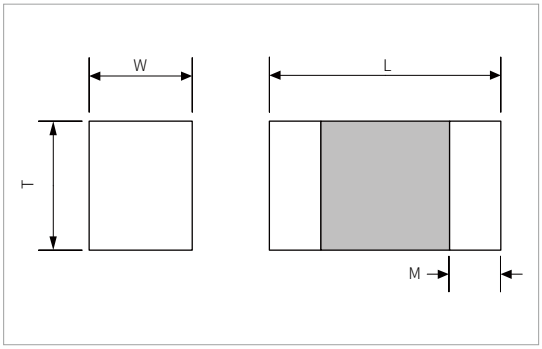
SOLDERING RECOMMENDATIONS

Reflow Condition		Lead–free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
	$T_{S(max)}$ to T_L - Ramp-up Rate	3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes max.
Do not exceed		260°C



DIMENSION SPECIFICATION



Size	L(mm)	W(mm)	T(mm)	M(mm)
0402	1.0±0.10	0.5±0.10	⩽ 0.6	0.20±0.10

ORDERING INFORMATION

Part Number	Package&Size	QTY/Reel	Reel Size
SME0402B24LA	0402 (1.0 x 0.5 mm)	10000PCS	7”

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