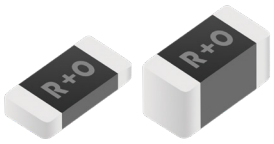
Multilayer Chip Varistor (MLV) Datasheet

Features

- Leadless , Size 0402
- Inherent Bi-directional Clamping
- High surge suppress capability, Low Leakage Current
- Low Inductance, Fast Response (Response time<1.0ns)
- Excellent Temperature Coefficient
- Operating temperature：-55℃ to +125℃
- RoHS compliant & Lead-Free & Halogen Free

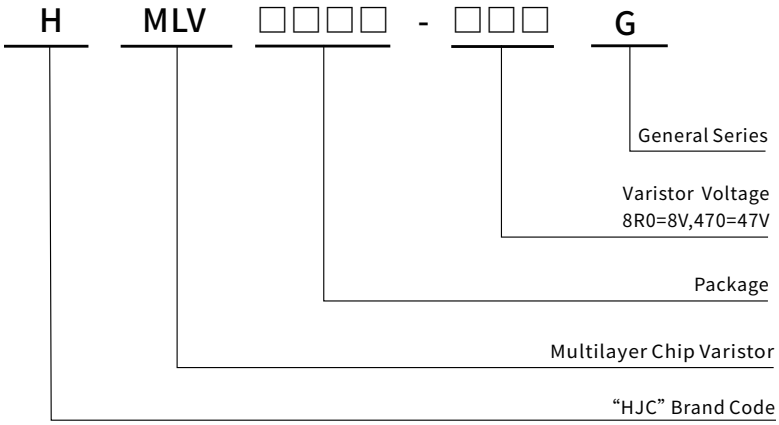
HMLV0402 Series

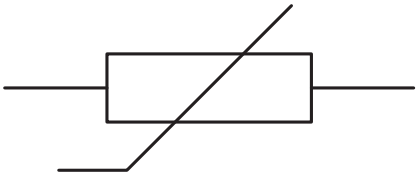


Applications

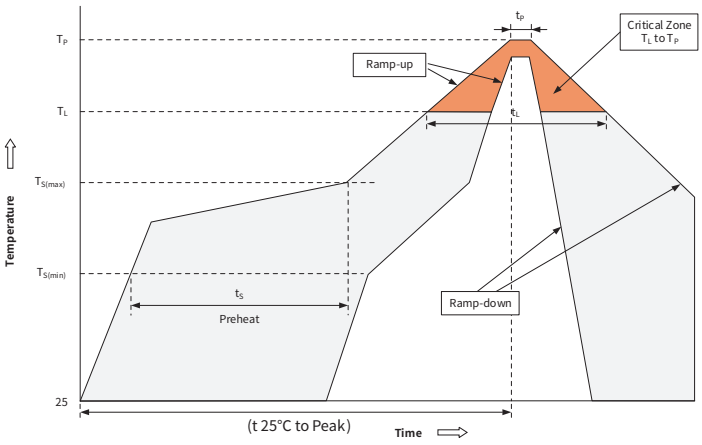
- Suppression of Inductive Switching or Other Transient Events
- Provides On-Board Transient Voltage Protection for ICs, CMOS and MOSFET
- Used to Help Achieve Electromagnetic Compliance of End Products
- Portable equipment protection, such as mobile phone, TV, etc.

Part Number Code





Recommended Soldering Conditions



Profile Feature		Pb-Free Assembly
Pre-heat	Temperature Min ($T_{S(min)}$)	+150°C
	Temperature Max($T_{S(max)}$)	+200°C
	Time (Min to Max) (t_S)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C /sec. Max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C /sec. Max
Reflow	Temperature(T_L)(Liquid us)	+217°C
	Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+240°C to +260°C
Time within 5°C of actual Peak Temp (t_P)		15-30secs
Ramp-down Rate		6°C /sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

Note 1: All temperature refer to topside of the package, measured on the package body surface.
Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Electrical Characteristics (Ta=25°C Unless otherwise specified)

Part Number	Varistor Voltage	Max. Allowable Voltage		Leakage Current @ V_{DC}	Max. Clamping Voltage @8/20μs		Peak Single Pulse Transient Current @8/20μs	Max. Energy @10/1000μs	Typical Capacitance (Reference) @1MHZ	Response Time
	V1mA (V)	V_{AC}(V)	V_{DC}(V)	(μA)	IP(A)	V_C(V)	I(A)	(J)	(pF)	(ns)
HMLV0402-240E0R2	300	-	24	1.0	1.0	30	1.0	0.01	0.25	1.0

Note 1: Typical capacitance value tolerance 40%

Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

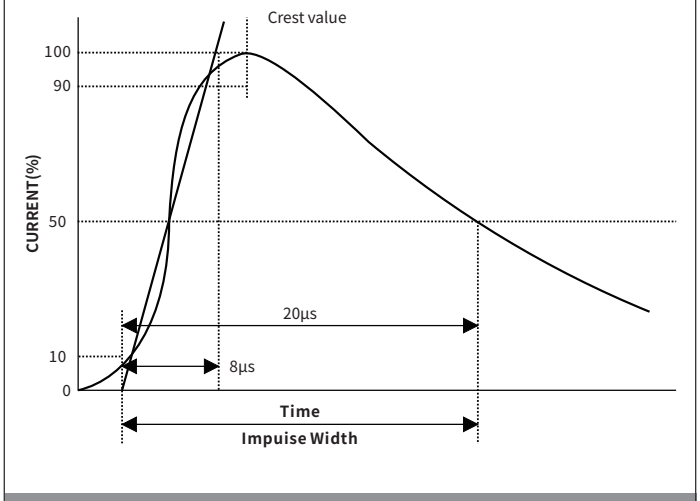


Fig.1 8/20μs Impluse Waveform

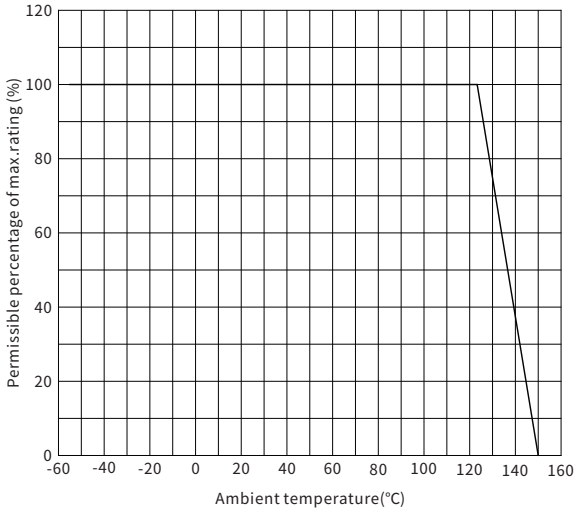


Fig.2 Temperature Derating Curve

Reliability Test

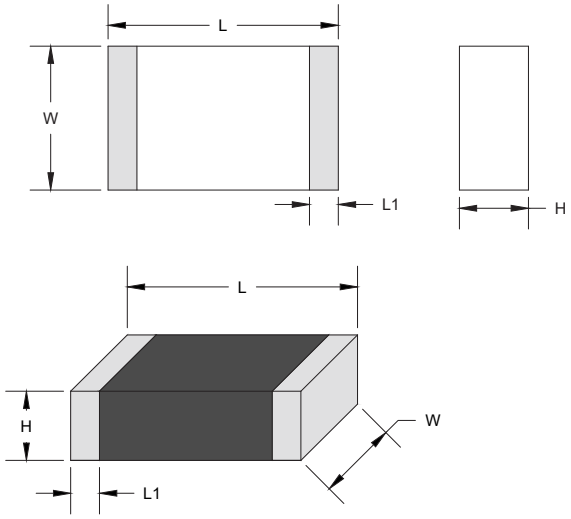
Characteristic	Test method and description
High Temperature Storage	The specimen shall be subjected to 125 °C for 1000 hours in a thermostatic bath without load and then stored at room temperature and humidity for 1 to 2 hours. The change of varistor voltage shall be within 10%.
Temperature Cycle	The 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.
High Temperature Load	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
Damp Heat Load/Humidity Load	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%
Low Temperature Storage	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%.

Step	Temperature	Period
1	-40±3°C	30min±3
2	Room Temperature	1~2hours
3	125±2°C	30min±3
4	Room Temperature	1~2hours

Environmental Specification

Storage temperature:	-25°C to +45°C
Storage Conditions:	Light-proof, Hermetically Sealed, Moisture-proof; The components should be left in their original packing to avoid soldering problems due to oxidized contacts.
Relative humidity:	< 75 % annual average, < 95 % on max. 30 days in a year.
Storage period	The components should be employed within 24 months after delivery

Physical Dimensions

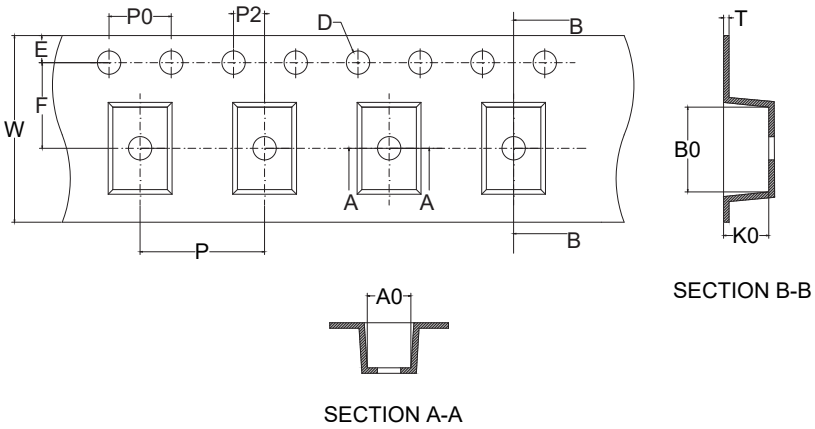


Part Number	L	W	H	L1
	(mm)	(mm)	(mm)	(mm)
HMLV0402-240E0R2	1.00±0.10	0.50±0.10	0.60(max)	0.25±0.10

Ordering Information

PACKAGE	Part Number	DELIVERY MODE	MPQ(PCS)
0402	HMLV0402-240E0R2	7''REEL	10,000

Packaging Information



Symbol	Dimensions
	(mm)
W	8±0.1
A0	1.08±0.1
B0	1.88±0.1
K0	1.04±0.1
P	4.0±0.1
F	3.5±0.1
E	1.75±0.1
D	1.5±0.1
P0	4.0±0.1
P2	2.0±0.1
T	0.22±0.05