PRODUCT SPECIFICATION

DOCUMENT NO. ENS000135780				
DESCRIPTION	**DRAWN BY**	**DESIGNED BY**	**CHECKED BY**	**APPROVED BY**
MLVS0604HVDG Series	Sandy	James	James	Shawn Yeh

RoHS MLVS0604HVDG Series Engineering Specification

1. Scope

(1) RoHS compliant
(2) Meet 61000-4-5 standard
(3) SMD type zinc oxide based ceramic chip
(4) Insulator over coat keeps excellent low and stable leakage current
(5) Quick response time (<0.5ns)
(6) High transient current capability
(7) High reliability
(8) Compact size for EIA0604
(9) MSL Level：Level 1

Applications

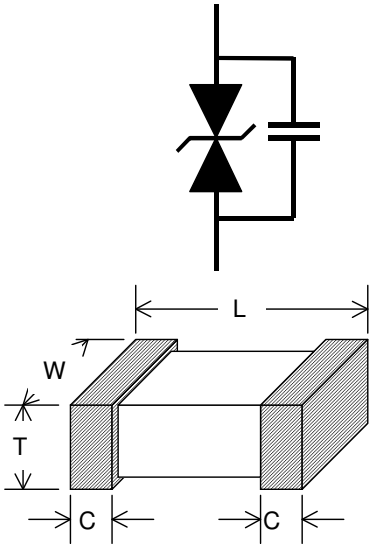
Protection against high working voltage applications related transient overvoltage

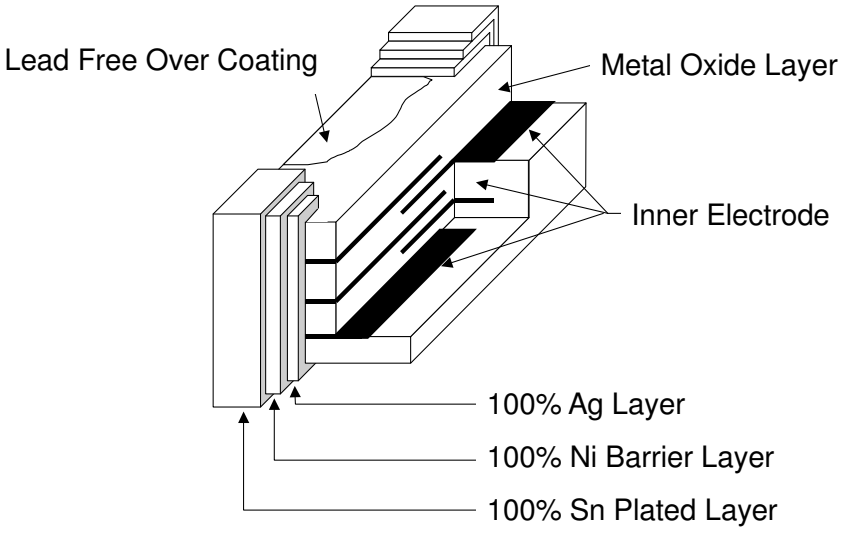
2. Explanation of Part Number

MLV	S	0604	HV	271	DG
(1)	(2)	(3)	(4)	(5)	(6)

1. Multilayer varistor
2. Type: S=single; A=array
3. Size
4. High Varistor voltage
5. Typical Varistor voltage: “271” means $27 \times 10^1 = 270$
6. Inpaq Control Code

3. Construction & Dimension





Unit: mm	0604
L	1.60±0.15
W	1.05±0.10
T	1.15 max.
C	0.25±0.10

4. Part ratings and characteristics

4.1. Ratings (25°C for characteristics)

	Working voltage		Varistor voltage	Leakage current	Clamping Voltage	Capacitance	Peak current	
Symbol	V_{RMS}	V_{DC}	V_V	I_L	Vc	Cp	i_{max} *	i_{max} #
Units	Volts (Max.)	Volts (Max.)	Volts	uA (Max.)	Volts (Max.)	pF (Typical)	Amps (Max.)	Amps (Max.)
Test Condition			1mA DC	Vv*80% (at initial state)	1A 8/20μs	1KHz	8/20μs (1Time)*	8/20μs (15Times)#
MLVS0604HV181DG	115	145	180±10 %	50	225	21	20	10
MLVS0604HV241DG	150	200	240±10 %	50	375	20	20	10
MLVS0604HV271DG	180	225	270±10 %	50	450	20	20	10

V_V –Voltage across the device measured at 1mA DC current.
Equivlent to Vb, “Breakdown Voltage”.

Vc – Maximum peak voltage across the varistor measured at 8/20us waveform and 1A pulse current

I_L – Leakage current at Vv × 80%

Cp – Device capacitance measured with zero volt bias 1Vrms.

i_{max} – Maximum peak current which may be applied with 8/20us waveform without device failure.

8/20us(1 time)*：Calibration method by short circuit

8/20us(15 times)#：Calibration method by UL standard

5. General electrical specifications

5.1. General technical data

Operating temperature	-40 ~+125ºC
Storage temperature (on board)	-40 ~+125ºC
Response time	<1 ns
Solderability	245±5ºC, 5 +0/-0.5sec
Solder leach resistance	260±5ºC,10 ±1sec

5.2. Taping Package Storage Condition

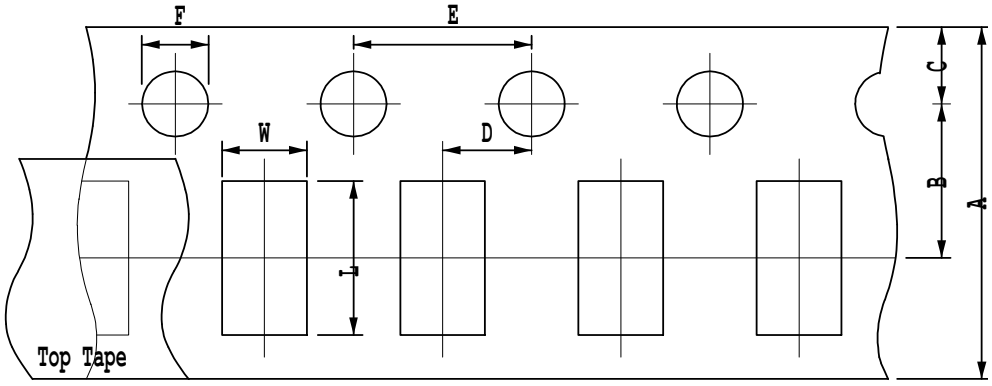
Storage Time: 12 months max.

Storage Temperature: 5 to 40ºC

Relative Humidity: 65% max.

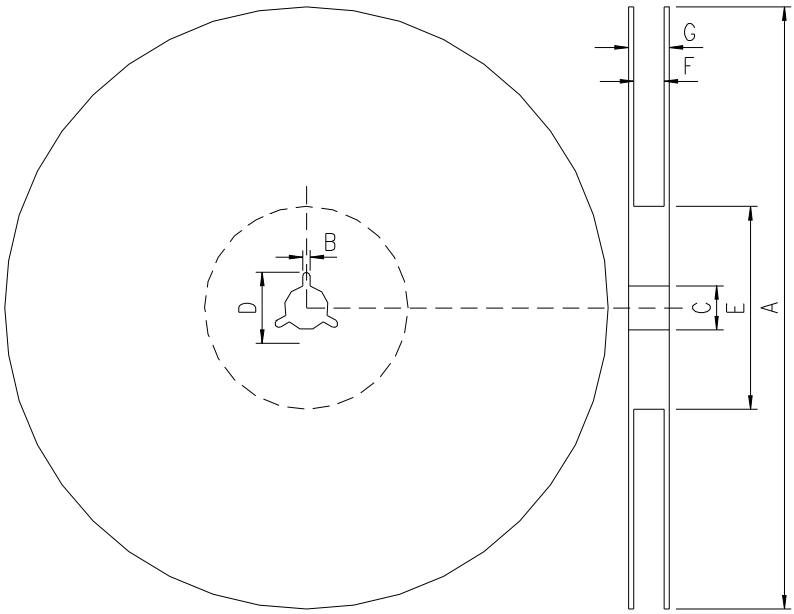
6. Taping Package and Label Marking

6.1 Carrier Tape Dimensions



Type	A	B	C	D	E	F	L	W
0604	8.00 ±0.20	3.50 ±0.10	1.75 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10	1.70 ±0.05	1.20 ±0.05

6.2 Taping Reel Dimensions



A	178.0±2.0
B	2.0±0.5
C	13.0±0.5
D	21.0±0.8
E	62.0±1.5
F	9.0±0.5
G	13.0±1.0

6.3 Taping Specifications

There shall be the portion having no product in both the head and the end of taping, and there shall be the cover tape in the head of taping.

6.4 Label Marking

The label specified as follows shall be put on the side of reel.

(1) Part No.

(2) Quantity

(3) Lot No.

* Part No. And Quantity shall be marked on outer packaging.

6.5 Quantity of Products in the Taping Package

Standard quantity：3000pcs/Reel for MLVS 0604HV series

Shipping quantity is a multiple of standard quantity.

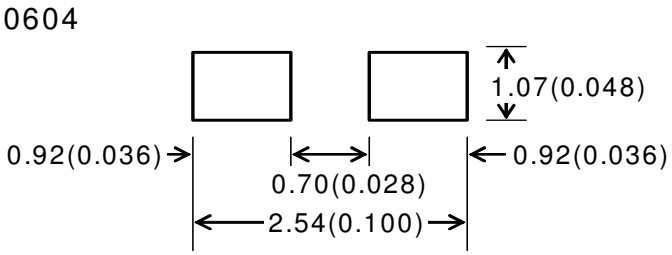
7. Precautions for Handling

7.1. Solder cream in reflow soldering

Refer to the recommendable land pattern as printing mask pattern for solder cream.

(1) Print solder in a thickness of 150 to 200 μm

Dimensions: millimeters (inches)



7.2. Precaution for handling of substrate

Do not exceed to bend the board after soldering this product extremely.

(Reference examples)

- Mounting place must be as far as possible from the position, which is close to the break line of board, or on the line of large holes of board.
- Do not bend extremely the board, in mounting another component.
  If necessary, use back-up pin (support pin) to prevent from bending extremely.
- Do not break the board by hand. We recommend using the machine or the jig to break it.

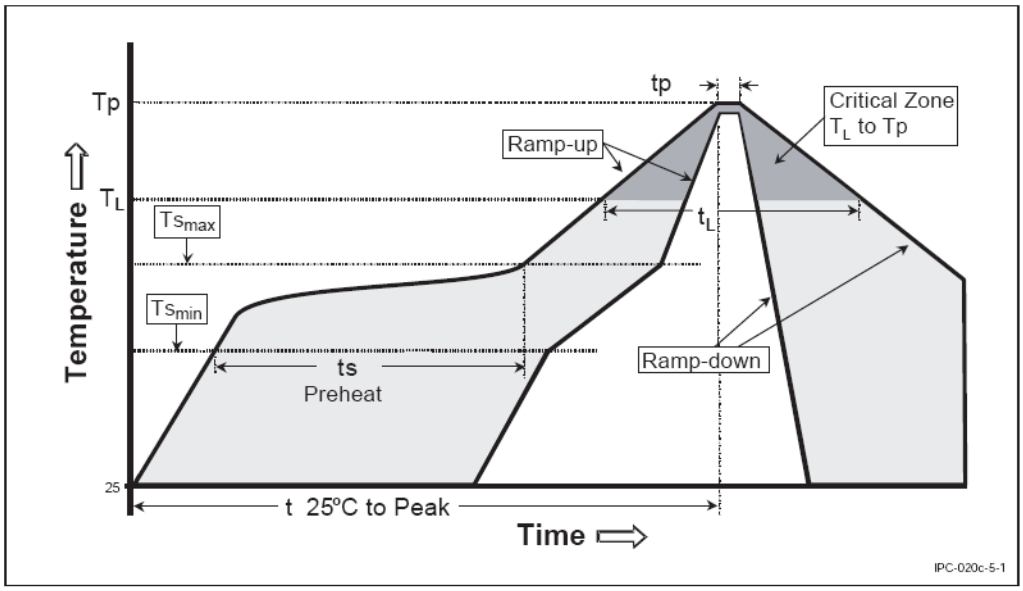
7.3. Precaution for soldering

Note that rapid heating, rapid cooling or local heating will easily damage the component.

Do not give heat shock over 100°C in the process of soldering. We recommend taking preheating and gradual cooling.

7.4. Recommendable reflow soldering

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Tsmax to Tp)	3℃/second max.
Preheat – Temperature Min (Tsmin) – Temperature Max (Tsmax) – Time (tsmin to tsmax)	 150℃ 200℃ 60-180 seconds
Time maintained above: – Temperature (TL) – Time (tL)	 217℃ 60-150 seconds
Peak/Classification Temperature (Tp)	260℃
Time within 5 ℃ of actual Peak Temperature (tp)	20-40 seconds
Ramp-Down Rate	6℃/second max.
Time 25 ℃ to Peak Temperature	8 minutes max.



*According to J-STD-020C

7.5. Solder gun procedure

Note the follows, in case of using solder gun for replacement.

(1) Use solder tip temperature must be less than 350°C for the period within 3 seconds by using soldering gun under 30W.

(2) Soldering gun tip shall not touch component directly.

7.6. Soldering volume

Apply proper volume of solder paste, too much may cause crack of component body.