佳邦科技股份有限公司
INPAQ TECHNOLOGY CO., LTD.

MLVS 1812 Lead Free Series
Specification

Product Name	**Multilayer Varistor**
Series	**MLVS Lead Free Series**
Size	**EIA 1812**

MLVS1812 P Series Engineering Specification

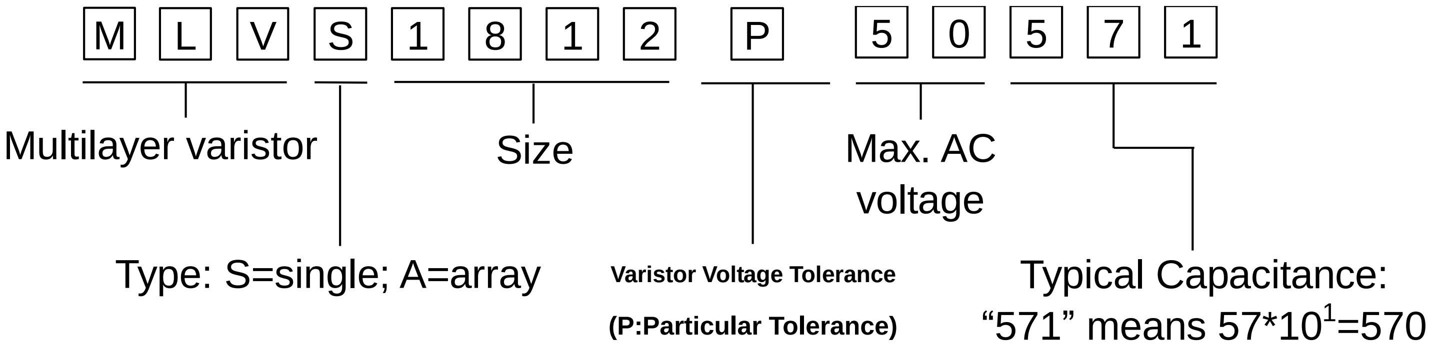
1. Scope

(1) RoHS compliant
(2) Meet IEC61000-4-5 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 EIA1812

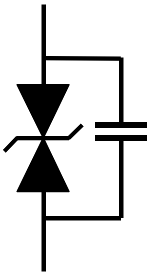
Applications

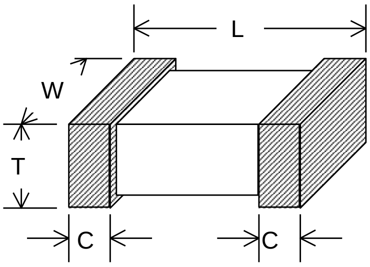
Protection against high working voltage applications related transient overvoltage

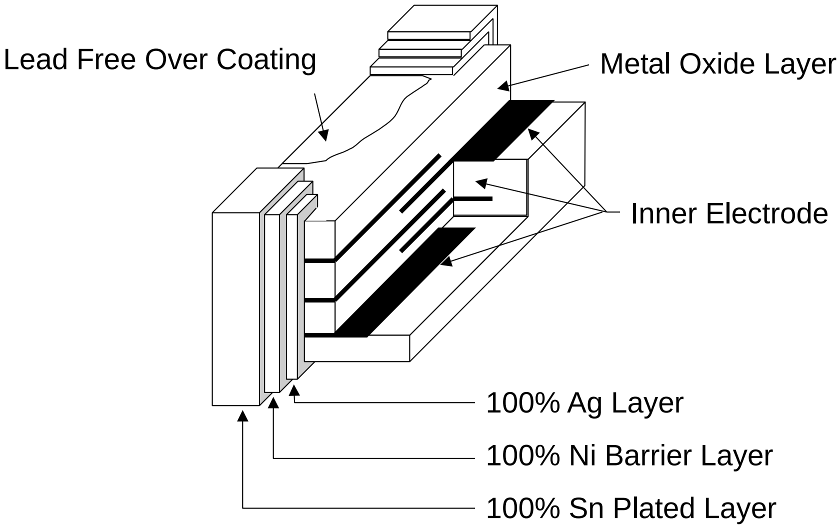
2. Explanation of Part Number



3. Construction & Dimension







Unit: mm	1812
L	4.5±0.40
W	3.2±0.30
T	2.5 max.
C	0.60±0.3

4. Part ratings and characteristics

4.1. Ratings (25^{o}C for characteristics)

	Working voltage		**Varistor voltage**	**Clamping Voltage**	**Capacitance**	**Peak current**
Symbol	V_{RMS}	V_{DC}	V_V	Vc	Cp	i_{max} *
Units	Volts	Volts	Volts	Volts	pF	Amps
	(Max.)	(Max.)		(Max.)	(Typical)	(Max.)
Test Condition			1mA DC	5A 8/20μs	1KHz	8/20μs
MLVS1812P04542	4	5.5	9~14	30	5400	800
MLVS1812P10382	10	14	16~22	42	3800	800
MLVS1812P18232	18	26	31~38	62	2300	800
MLVS1812P21192	21	30	37~46	70	1900	800
MLVS1812P30172	30	38	46~54	78	1700	800
MLVS1812P35112	35	45	50~62	90	1100	500
MLVS1812P50102	50	65	77~95	140	1000	800
MLVS1812P50571	50	65	77~95	140	570	500
MLVS1812P50721	50	65	77~95	140	720	600
MLVS1812P75541	75	100	108~132	200	540	500

V_{RMS} – Maximum AC operating voltage the varistor can maintain and not exceed 10µA leakage current

V_{DC} – Maximum DC operating voltage the varistor can maintain and not exceed 10µA leakage current

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 5A pulse current

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.

5. General electrical specifications

5.1. General technical data

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

5.2. Taping Package Storage Condition

Storage Time: 12 months max.

Storage Temperature: 5 to 40°C

Relative Humidity: 65% max.

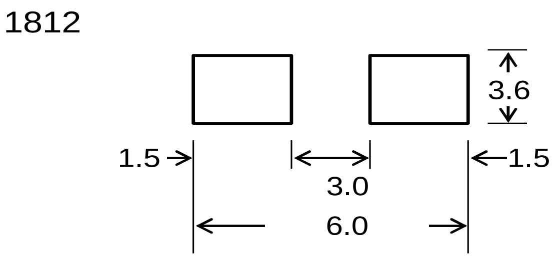
6. Precautions for Handling

6.1. 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)



6.2. 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.

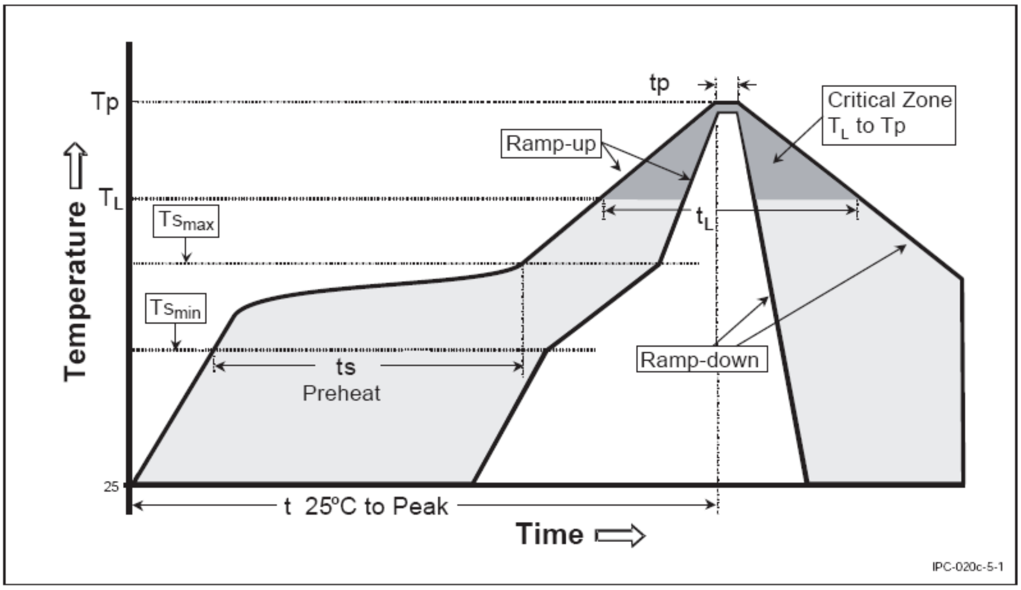
6.3. Precaution for soldering

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.

6.4. Recommendable reflow soldering

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



*According to J-STD-020C

6.5. 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.

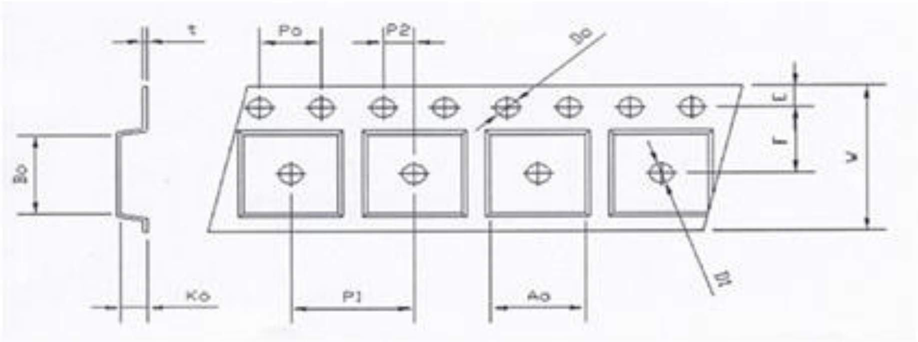
(2) Soldering gun tip shall not touch component directly.

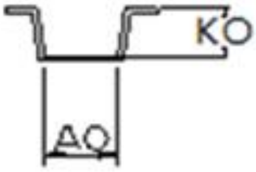
6.6. Soldering volume

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

7. Taping Package and Label Marking

7.1. Carrier tape dimensions

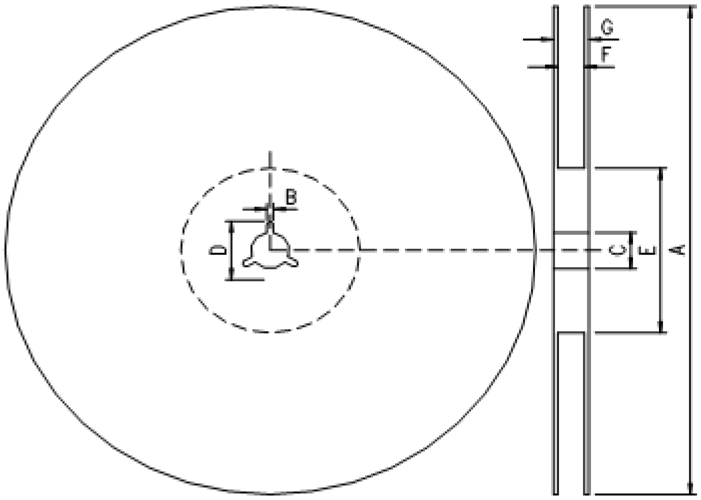




Type	W	E	F	D0	D1	P0	P1	P2	10Po
1812	12.00 ±0.15	1.75 ±0.10	5.5 ±0.10	1.55 ±0.10	1.55 ±0.10	4.00 ±0.10	8.00 ±0.10	2.00 ±0.10	40.00 ±0.20
	Bo	Ao	Ko	t					
	4.90 ±0.10	3.50 ±0.10	2.2 ±0.10	0.25 ±0.5					

Unit : mm

7.2. Taping reel dimensions



UNT:mm

A	178.0 ±1.0
B	2.5±0.5
C	13.0±0.5
D	25.0±1.0
E	60.2±0.5
F	13.0±0.5
G	16.0±0.5

7.3. 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.

7.4. 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.

7.5. Quantity of products in the taping package

(1) Standard quantity: 1,000pcs/Reel

(2) Shipping quantity is a multiple of standard quantity.