佳邦科技股份有限公司
INPAQ TECHNOLOGY CO., LTD.

MLVS1206LAM Series
Data Sheet

Product Name	MLVS1206LAM Series
Series	Multilayer Varistor
Size	EIA 1206
Version	A1

1. Scope

(1) Qualified based on AEC-Q200
(2) RoHS compliant
(3) Meet IEC 61000-4-5 standard
(4) SMD type zinc oxide based ceramic chip
(5) Insulator over coat keeps excellent low and stable leakage current
(6) Quick response time (<0.5ns)
(7) High transient current capability
(8) High reliability
(9) Compact size for EIA1206

Applications

Protection against automotive related transient overvoltage

2. Explanation of Part Number

MLV	S	1206	L	AM	04	202	F
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1. Multilayer varistor
2. Type: S=single
3. Size
4. Lead free series
5. Automotive series
6. Max. AC voltage
7. Typical Capacitance: “202” means 20×10^{2}
8. Control Code

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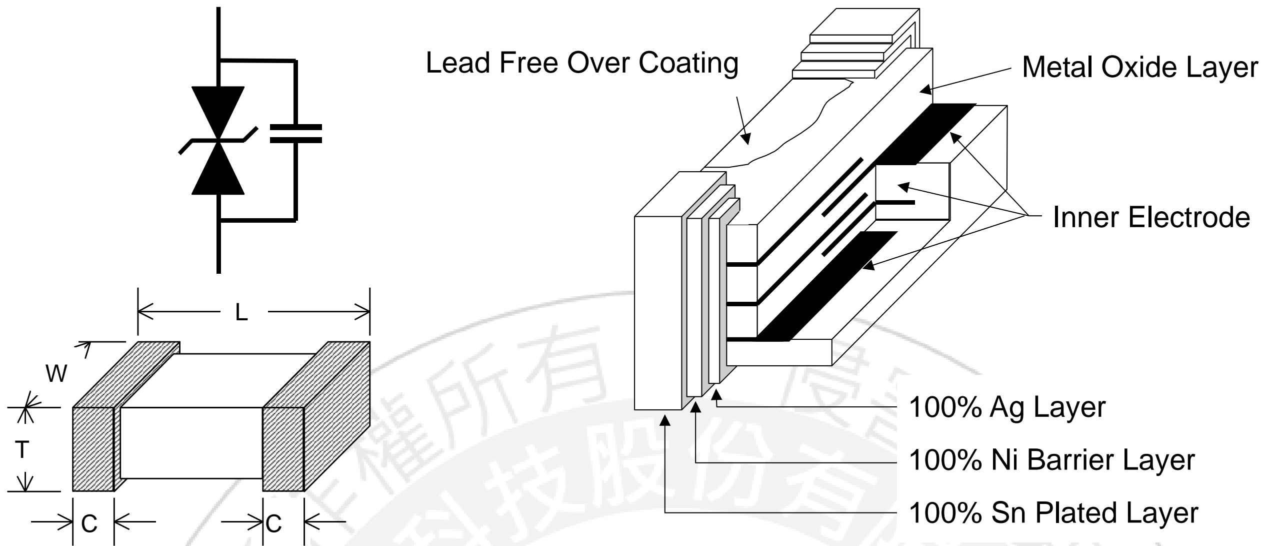
3. Construction & Dimension



Unit: mm	1206
L	3.20±0.3
W	1.60±0.2
T	0.80±0.1
C	0.50±0.25

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4. Part ratings and characteristics

4.1. Ratings (25 °C for characteristics, 125 °C for maximum ratings)

	Working voltage		Varistor voltage	Clamping Voltage	Capacitance	Peak current	Transient energy
Symbol	V_{RMS}	V_{DC}	V_V	V_C	C_P	i_{max}	W_{max}
Units	Volts (Max.)	Volts (Max.)	Volts	Volts (Max.)	pF (Typical)	Amps (Max.)	Joules (Max.)
Test Condition		< 10 μA	1mA DC	1 A 8/20μs	1KHz	8/20μs	10/1000μs
MLVS1206LAM04202F	4	5.5	8~14	25	2000	200	0.3
MLVS1206LAM11661F	11	14	18~22	38	660	100	0.5
MLVS1206LAM11841F	11	14	18~22	36	840	200	0.5
MLVS1206LAM14901F	14	16	22~28	42	900	200	0.6
MLVS1206LAM17781F	17	22	25~32	48	780	200	0.3
MLVS1206LAM20601F	20	26	29.7~37.3	58	600	200	0.7
MLVS1206LAM25651F	25	31	36~44	69	650	200	1
MLVS1206LAM30601F	30	38	45~55	81	600	200	1.1
MLVS1206LAM35231F	35	45	54~62	108	230	200	1.1
MLVS1206LAM40221F	40	56	66~82	110	220	200	1
MLVS1206LAM50251F	50	65	77~93	138	250	100	0.5
MLVS1206LAM60121F	60	85	104~126	168	120	100	0.7

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".

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

W_{max} – Maximum energy that may be dissipated with the 10/1000us waveform without device failure

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, 3 +0/-0.5sec
Solder leach resistance	260±5ºC,10 ±1sec

5.2. Environmental Specifications

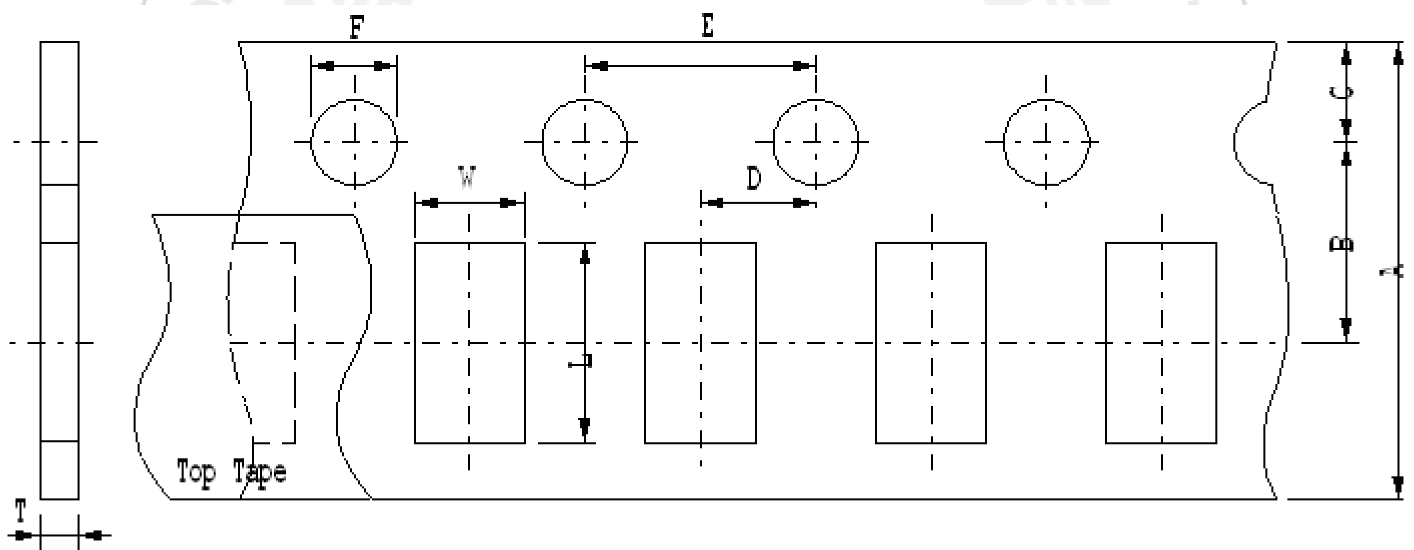
Storage Time: 12 months max.

Storage Temperature: 5 to 40ºC

Relative Humidity: 65% max.

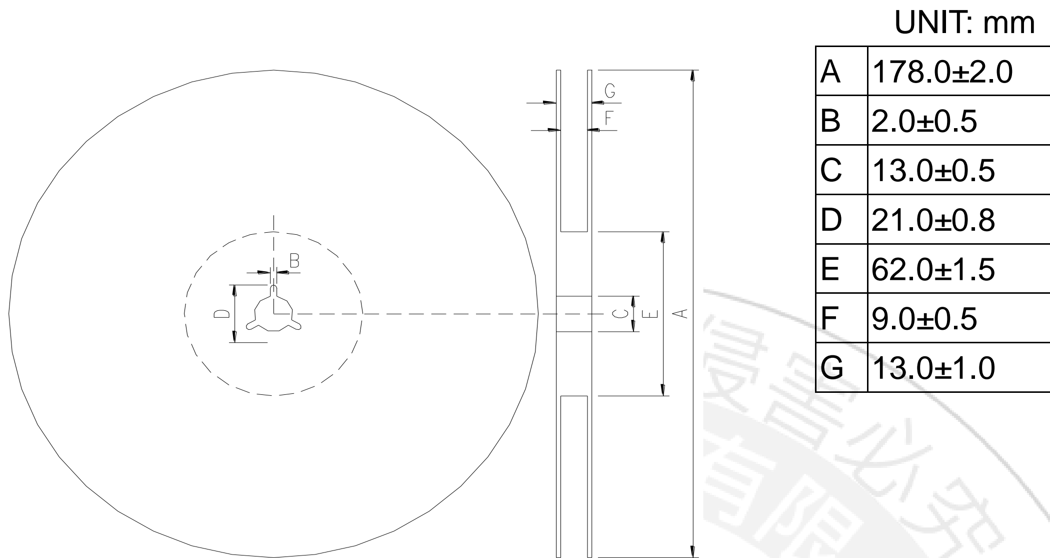
6. Taping Package and Label Marking

6.1. Carrier tape dimensions



A	B	C	D	E	F	L	T	W
8.00± 0.30	3.50± 0.05	1.75± 0.10	2.00± 0.05	4.00± 0.10	1.50± 0.10	3.50± 0.15	0.95± 0.05	1.90± 0.15

6.2. Taping reel dimensions



UNIT: mm

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

(1) Standard quantity: 4000pcs/Reel for MLVS1206LAMF series

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

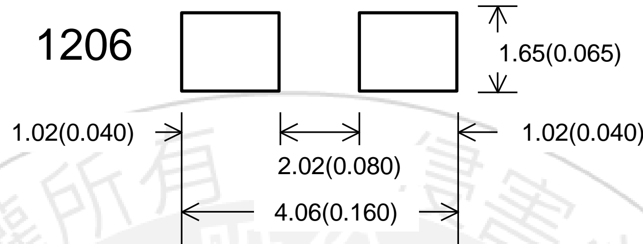
7. Precautions for Handling

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.

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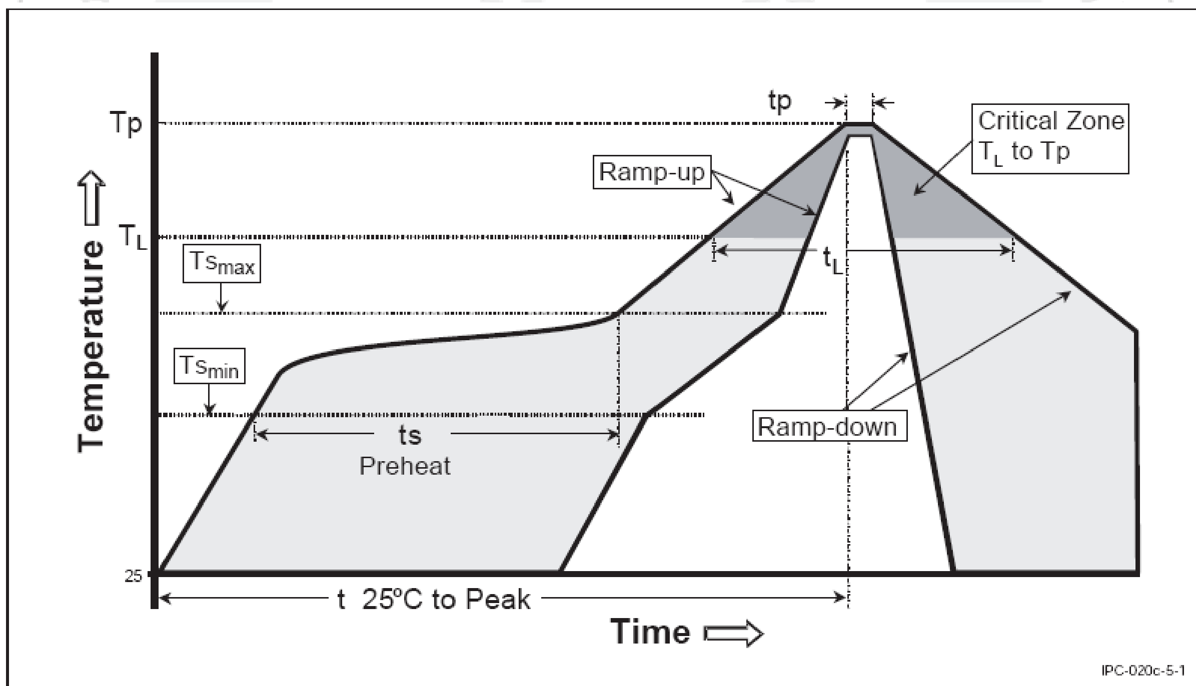
7.4. Recommendable reflow soldering

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

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.