



# PRODUCT SPECIFICATION

DOCUMENT NO. ENS000162220

DESCRIPTION	DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY
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# MLVS0805LAMFDG Series Engineering Specification

## 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 EIA0805

## Applications

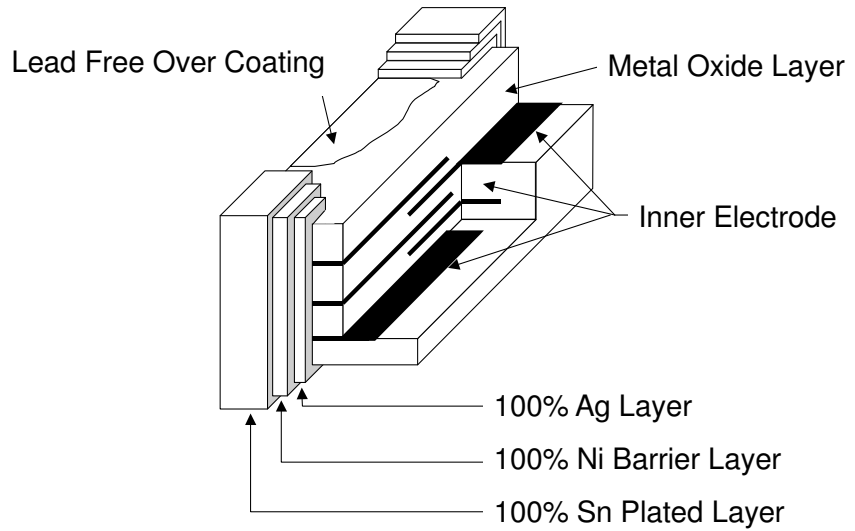
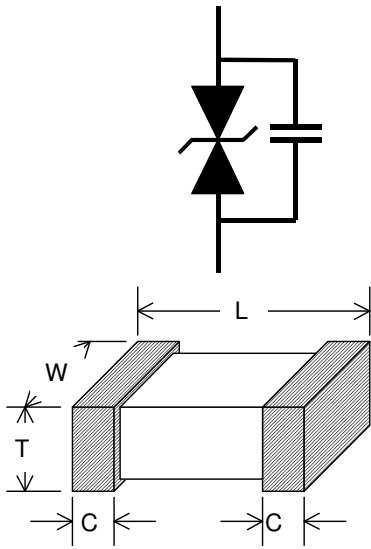
Protection against automotive related transient overvoltage

## 2. Explanation of Part Number

<u>MLV</u>	<u>S</u>	<u>0805</u>	<u>L</u>	<u>AM</u>	<u>14</u>	<u>351</u>	<u>F</u>	<u>DG</u>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

1. Multilayer varistor
2. Type: S=single
3. Size
4. Lead free series
5. Automotive series
6. Max. AC voltage
7. Typical Capacitance: "351" means  $35 \times 10^1$
8. Control Code
9. Inpaq Control Code

### 3. Construction & Dimension



Unit: mm	0805
L	2.0±0.20
W	1.25±0.2
t	0.9±0.10
c	0.5±0.25

#### 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	Volts	Volts	Volts	pF	Amps	Joules
	(Max.)	(Max.)		(Max.)			
Test Condition		< 10 $\mu$ A	1mA DC	1 A 8/20 $\mu$ s	1KHz	8/20 $\mu$ s	10/1000 $\mu$ s
MLVS0805LAM04601FDG	4	5.5	7.8~12	22	600	80	0.1
MLVS0805LAM06651FDG	6	9	11~18	30	650	80	0.2
MLVS0805LAM08441FDG	8	11	14~20	45	440	100	0.3
MLVS0805LAM11501FDG	11	14	17~21	38	500	100	0.1
MLVS0805LAM14351FDG	14	18	20~26	44	350	120	0.3
MLVS0805LAM17161FDG	17	22	25~34	54	160	30	0.1
MLVS0805LAM20251FDG	20	26	30~38	56	250	100	0.4
MLVS0805LAM25221FDG	25	31	36~44	71	220	100	0.3
MLVS0805LAM30201FDG	30	38	45~55	81	200	100	0.3
MLVS0805LAM35131FDG	35	45	54~66	93	130	80	0.1

$V_{RMS}$  – Maximum AC operating voltage the varistor can maintain and not exceed 10 $\mu$ A leakage current

$V_{DC}$  – Maximum DC operating voltage the varistor can maintain and not exceed 10 $\mu$ A leakage current

$V_V$  –Voltage across the device measured at 1mA DC current.  
EquiValent to  $V_b$ , “Breakdown Voltage”.

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

$C_p$  – 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 ... +125°C
Storage temperature (on board)	-40... +125°C
Response time	<1 ns
Solderability	245±5°C, 3 ±1sec
Solder leach resistance	260±5°C, 10 ±1sec

### 5.2. Storage Condition with package

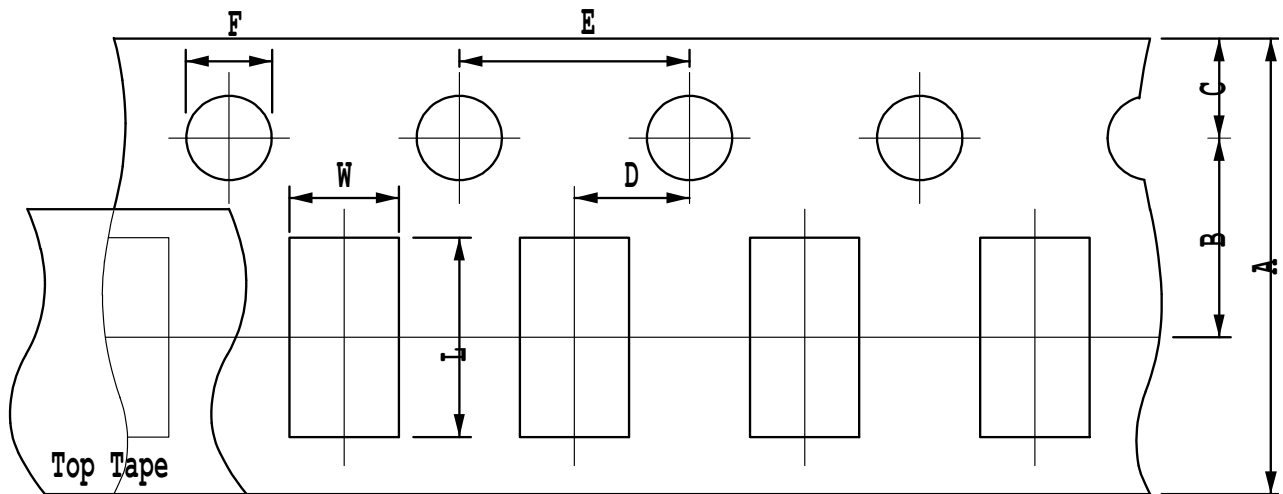
Storage Time: 12 months max

Storage Temperature: 5 to 40°C

Relative Humidity: to 65 %

## 6. Taping Package and Label Marking

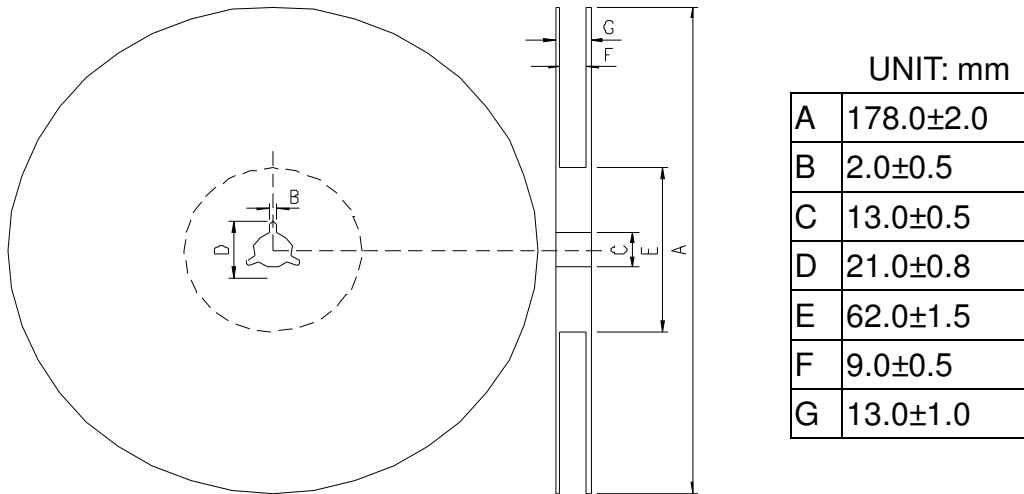
### 6.1. Carrier tape dimensions



UNIT: mm

A	B	C	D	E	F	L	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	2.30± 0.15	1.55± 0.15

**6.2. Taping reel dimensions**



**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**

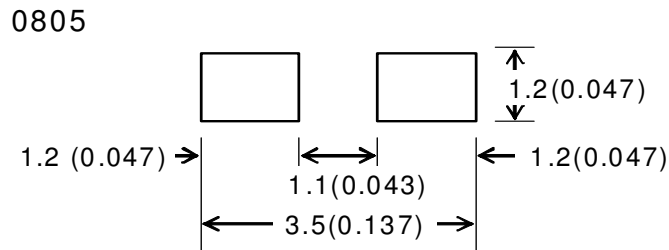
- (1) Standard quantity : 4000pcs/Reel for MLVS0805LAMF series
- (2) Shipping quantity is a multiple of standard quantity.

## 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  $\mu\text{m}$ .
- (2) 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 components.  
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.

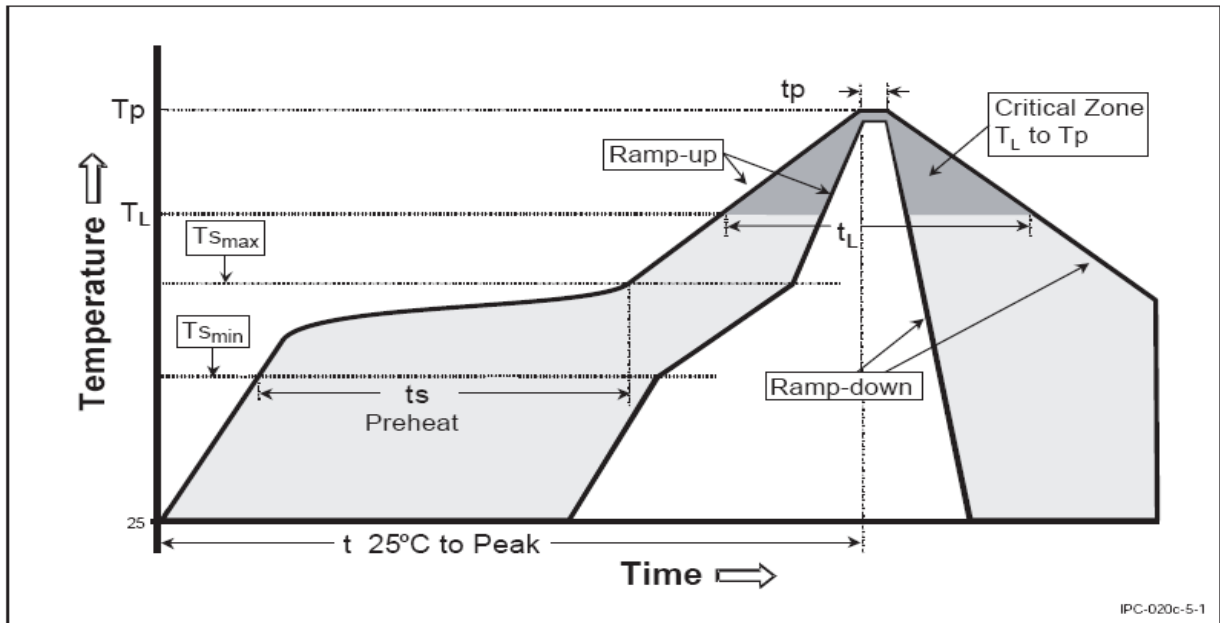
### 7.3. Precaution for soldering

Note that rapid heating, rapid cooling or local heating will easily damage this product.

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 (T <sub>smax</sub> to T <sub>p</sub> )	3° C/second max.
<b>Preheat</b> – Temperature Min (T <sub>smin</sub> ) – Temperature Max (T <sub>smax</sub> ) – Time (t <sub>smin</sub> to t <sub>smax</sub> )	150 °C 200 °C 60-180 seconds
Time maintained above: – Temperature (T <sub>L</sub> ) – Time (t <sub>L</sub> )	217 °C 60-150 seconds
Peak/Classification Temperature (T <sub>p</sub> )	260 °C
Time within 5 °C of actual Peak Temperature (t <sub>p</sub> )	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. Soldering gun procedure

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

- (1) The tip temperature must be less than 280°C for the period within 3 seconds by using soldering gun less than 30 W.
- (2) The soldering gun tip shall not touch this product directly.

### 7.6. Soldering volume

Note that excess of soldering volume will easily get crack the body of this product.