



**INPAQ**

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# **PRODUCT SPECIFICATION**

**DOCUMENT NO. ENS000135770**

<b>DESCRIPTION</b>	<b>DRAWN BY</b>	<b>DESIGNED BY</b>	<b>CHECKED BY</b>	<b>APPROVED BY</b>
<b>MLVS0806HVDG Series</b>	<b>Sandy</b>	<b>James</b>	<b>James</b>	<b>Shawn Yeh</b>

RoHS



## MLVS0806HVDG 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 EIA0806
- (9) MSL Level : Level 1

### Applications

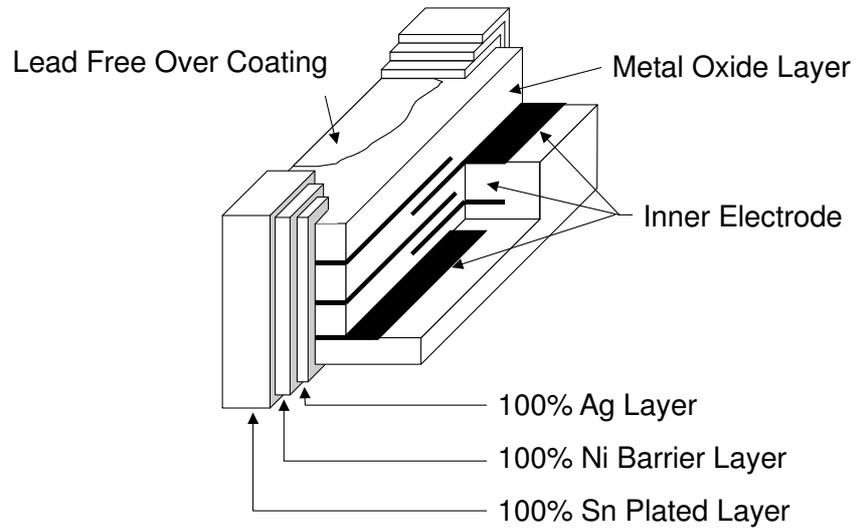
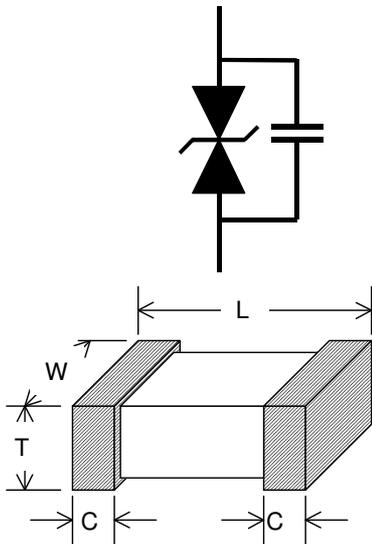
Protection against high working voltage applications related transient overvoltage

### 2. Explanation of Part Number

<b><u>MLV</u></b>	<b><u>S</u></b>	<b><u>0806</u></b>	<b><u>HV</u></b>	<b><u>241</u></b>	<b><u>DG</u></b>
(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: "241" means  $24 \times 10^1 = 241$
6. Inpaq Control Code

### 3. Construction & Dimension



Unit: mm	0806
L	2.2±0.20
W	1.7±0.20
T	1.8 max.
C	0.50±0.25

## 4. Part ratings and characteristics

### 4.1 Ratings (25°C for characteristics)

Symbol	Working voltage		Varistor voltage	Leakage current	Clamping Voltage	Capacitance	Peak current	
	$V_{RMS}$	$V_{DC}$	$V_V$	$I_L$	$V_C$	$C_p$	$i_{max}^*$	$i_{max}^\#$
Units	Volts	Volts	Volts	$\mu A$	Volts	pF	Amps	Amps
	(Max.)	(Max.)		(Max.)	(Max.)	(Typical)	(Max.)	(Max.)
Test Condition			1mA DC	$V_V \times 80\%$ (at initial state)	1A 8/20 $\mu s$	1KHz	8/20 $\mu s$ (1Time)*	8/20 $\mu s$ (15Times) #
MLVS0806HV151DG	95	125	150 $\pm 10\%$	50	175	240	120	80
MLVS0806HV181DG	115	145	180 $\pm 10\%$	50	280	125	120	80
MLVS0806HV241DG	150	200	240 $\pm 10\%$	80	340	140	160	100
MLVS0806HV241A0DG	150	200	240 $\pm 10\%$	50	340	75	100	50
MLVS0806HV271DG	175	225	270 $\pm 10\%$	80	390	100	100	50
MLVS0806HV391DG	250	320	390 $\pm 10\%$	50	570	50	50	30
MLVS0806HV431DG	275	350	430 $\pm 10\%$	50	700	20	20	10
MLVS0806HV471DG	300	385	470 $\pm 10\%$	50	740	15	10	10

$V_V$  – 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

$I_L$  – Leakage current at  $V_V \times 80\%$

$C_p$  – Device capacitance measured with zero volt bias 1Vrms.

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

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 ... +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

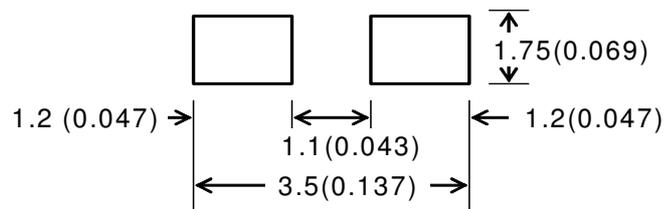
### 6.1 Solder cream in reflow soldering

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)

0806



### 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.

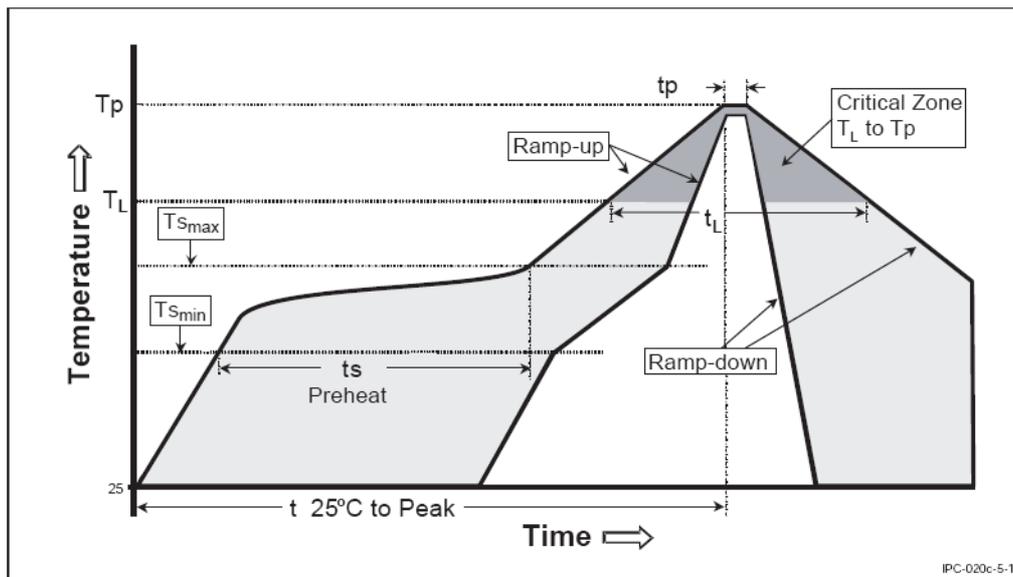
### 6.3 Precaution for soldering

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 ( $T_{smax}$ to $T_p$ )	3°C/second max.
<b>Preheat</b> – Temperature Min ( $T_{smin}$ ) – Temperature Max ( $T_{smax}$ ) – Time ( $t_{smin}$ to $t_{smax}$ )	150°C 200°C 60-180 seconds
Time maintained above: – Temperature ( $T_L$ ) – Time ( $t_L$ )	217°C 60-150 seconds
Peak/Classification Temperature ( $T_p$ )	260°C
Time within 5 °C of actual Peak Temperature ( $t_p$ )	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.

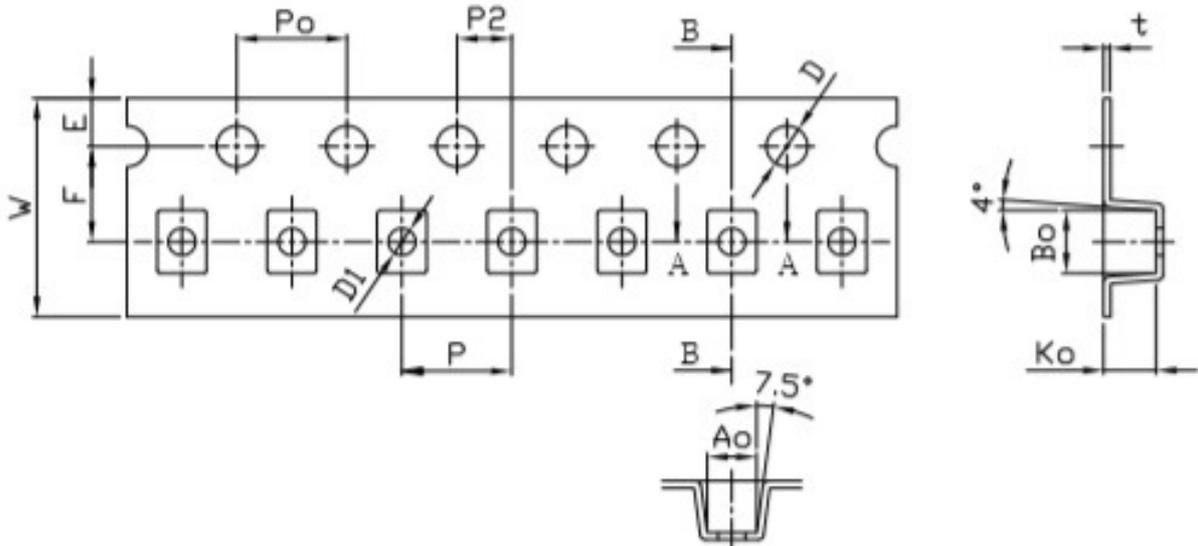
- (1) Use solder tip temperature must be less than 350°C for the period within 3 seconds by using soldering gun under 30W.
- (2) Soldering gun tip shall not touch component directly.

**6.6 Soldering volume**

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

## 7 Taping Package and Label Marking

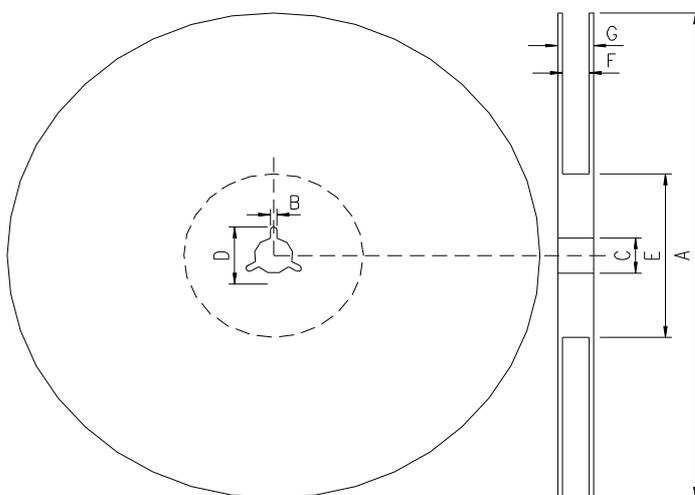
### 7.1 Carrier tape dimensions



UNIT: mm

W	P	E	F	P2	D	D1	Po	10Po	A0	B0	K0	t
8.00	4.0	1.75	3.50	2.00	1.5	1.00	4.00	40.00	1.8	2.3	1.9	0.26
±0.10	±0.10	±0.10	±0.05	±0.05	+0.01 -0.00	±0.10	±0.10	±0.2	±0.10	±0.10	±0.10	±0.05

### 7.2 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

**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: 2,000pcs/Reel

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