



### Features

- SMD type zinc oxide based ceramic chip
- Lead free plating termination provided good solderability characteristic
- Insulator overcoat keeps excellent low and stable leakage current
- Quick response time (<1ns)
- Low clamping voltage
- High transient current capability
- Meet IEC 61000-4-2, 61000-4-4, and 61000-4-5 standard
- Compact size for EIA 0402/0603/1206

### Applications

Applications for Mother Board, Notebook, Cellular Phone, PDA, handheld device, DSC, DV, Scanner, and Set-Top Box etc.

### How to Order

**MLV**   **S**   **1206**   **M**   **04** - **362**

1      2      3      4      5      6

1 Series Type : MLV—Multilayer Varistor

2 Model Code

3 Chip Size (EIA) : 0402 / 0603 / 1206

4 Varistor Voltage Tolerance:

M—±20%, L—±15%, K—±10%

5  $V_{RMS}$  : AC Working Voltage  $V_{RMS}$

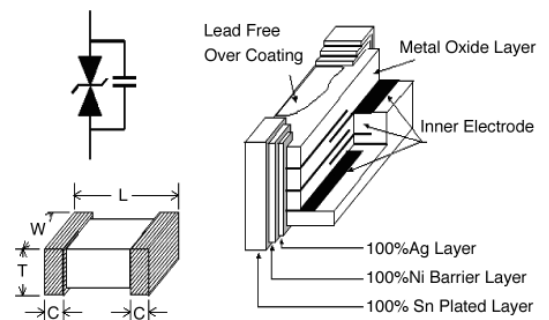
6 Capacitance : Value — XX x  $10^N$  → XXN

ex.220pF= 22x $10^1$  → 221

### Dimensions

Unit: mm

Size EIA (EIAJ)	0402 (1005)	0603 (1608)	1206 (3216)
L	1.00±0.15	1.60±0.20	3.20±0.20
W	0.50±0.10	0.80±0.20	1.60±0.20
T	0.50±0.10	0.80±0.20	1.7 max.
C	0.25±0.15	0.30±0.20	0.50±0.25



### Specifications

Symbol	Working Voltage		Varistor Voltage		Clamping Voltage	Capacitance	Peak Current	Transient Energy
	$V_{RMS}$	$V_{DC}$	$V_V$	$\Delta V_V$	$V_C$	$C_p$	$I_{max}$	$W_{max}$
Units	Volts	Volts (Max.)	Volts	%	Volts (Max.)	pF (typ.)	Amps (Max.)	Joules (Max.)
Test Condition		<10 $\mu$ A	1mA DC		1A 8/20 $\mu$ S	1MHz	8/20 $\mu$ S	10/1000 $\mu$ S
<b>MLVS 0402</b>								
MLVS0402M04	4	5.5	8	$\pm 20$	19	270	20	0.05
MLVS0402M07	7	9	12.5	$\pm 20$	32	130	20	0.05
MLVS0402K11	11	14	18	$\pm 10$	38	90	20	0.05
MLVS0402K14	14	18	22	$\pm 10$	45	85	20	0.05
<b>MLVS 0603</b>								
MLVS0603M04	4	5.5	8	$\pm 20$	19	270	30	0.1
MLVS0603M07	7	9	12.5	$\pm 20$	27	210	30	0.1
MLVS0603K11	11	14	18	$\pm 10$	35	150	30	0.1
MLVS0603K14	14	18	22	$\pm 10$	40	130	30	0.1
MLVS0603K20	20	26	31	$\pm 10$	58	100	30	0.1
<b>MLVS 1206</b>								
MLVS1206M04-362	4	5.5	8	$\pm 20$	19	3600	150	0.4
MLVS1206K14-182	14	18	22	$\pm 10$	40	1800	150	0.4
MLVS1206K14-651	14	18	22	$\pm 10$	40	650	200	0.4
MLVS1206K25-501	25	31	41	$\pm 10$	70	500	200	1.0
MLVS1206K40-181	40	56	70	$\pm 10$	110	180	200	1.0

$V_{RMS}$  —Maximum AC operating voltage the varistor can maintain and not exceed 10 $\mu$ A leakage current for 0402,0603/50 $\mu$ A leakage current for 1206

$V_{DC}$  —Maximum DC operating voltage the varistor can maintain and not exceed 10 $\mu$ A leakage current for 0402,0603/50 $\mu$ A leakage current for 1206

$V_V$  —Voltage across the device measured at 1mA DC current.

Equivalent to  $V_b$ , "break down voltage."

$V_C$  —Maximum peak current across the varistor with 8/20 $\mu$ s 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 8/20 $\mu$ s waveform without device failure

$W_{max}$  —Maximum energy which may be dissipated with the 10/1000 $\mu$ s waveform without device failure

### General Technical Data

Operating Temperature	-40... +85°C 0402, 0603 / -55...+125°C 1206
Storage Condition	-40... +85°C 0402, 0603 / -55...+150°C 1206
Response Time	<1 ns
Solderability	245 $\pm$ 5°C, 3 sec

### Environmental Performance

Item	Specifications	Test Condition
Bias Humidity	$\Delta V_V / V_V \leq \pm 10 \%$	90%RH, 40°C, Working Voltage, 1000 hrs
Thermal Shock		0402 & 0603: -40°C to 85°C, 30 min. cycle, 5 cycles 1206: -55°C to 125°C, 30 min. cycle, 5 cycles
High Temperature Loading		0402 & 0603: Working Voltage, 85°C, 1000 hrs 1206: Working Voltage, 125°C, 1000 hrs
Solder Leach Resistance	(1) $\Delta V_V / V_V \leq \pm 10 \%$ (2) $I_L \leq 10\mu$ A at Working Voltage (3) Solder Wetting Area $\geq 95\%$	260°C, 10 sec.

### Package

Size EIA (EIAJ)	0402 (1005)	0603 (1608)	1206 (3216)
Standard Packing Quantity (pcs / reel)	10,000pcs	4,000pcs	4,000pcs