MLVA-R

Multilayer varistor ESD suppressor

Applications

- ESD port protection for mobile/smart phones
- Game console ESD port protection
- Set-top-boxes
- Tablets, notebooks, netbooks, laptops
- Media players
- Digital cameras
- Medical equipment
- Computers and peripherals ESD port protection
- Consumer electronics

Product description

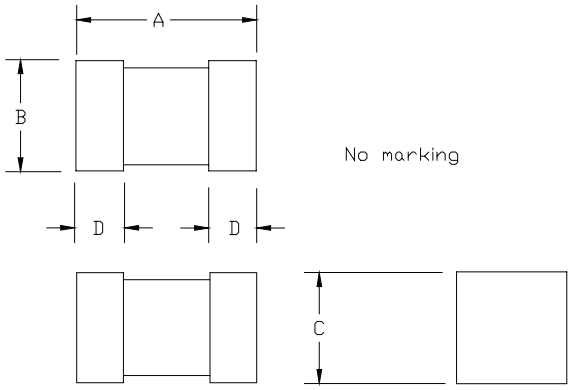
- Three compact footprint options 0201 (0603 metric), 0402 (1005 metric), and 0603 (1608 metric)
- Zinc oxide ceramic chip
- Provides Electro Static Discharge (ESD) protection with fast response time (<1 ns) allowing equipment to pass IEC 61000-4-2 Level 4 test
- 0402 and 0603 meet IEC 61000-4-4 and 61000-4-5
- Compact footprint utilizes less board space
- Low and stable leakage current reduces power consumption
- Low clamping voltage
- Wide operating voltage range: 5.5 Vdc to 26 Vdc
- Halogen free, lead free, RoHS compliant

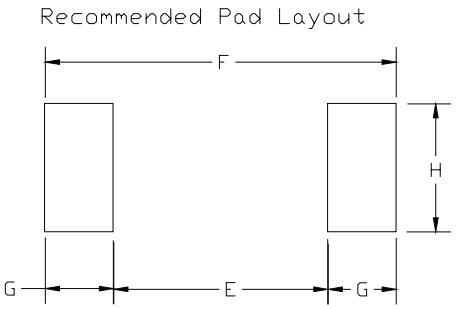
Product specifications

Part number[8]	Package size	Working voltage[1, 2] (V_{rms})	Working voltage[1, 2] (V_{DC})	Varistor voltage[3] (V)	Clamping voltage[4] (V)	Capacitance[5] (pF) typical	Peak current[6] (A)	Transient energy[7] (J)
MLVA02V05C033-R	0201 (0603 metric)	–	5.5	8–14	30	33	–	–
MLVA02V05C047-R	0201 (0603 metric)	–	5.5	8–14	26	47	–	–
MLVA02V05C064-R	0201 (0603 metric)	–	5.5	8–14	26	64	–	–
MLVA04V05C270-R	0402 (1005 metric)	4	5.5	8–18	28	270	20	0.05
MLVA04V09C130-R	0402 (1005 metric)	7	9	11.5–21.5	41	130	20	0.05
MLVA04V18C085-R	0402 (1005 metric)	14	18	23–33	54	85	20	0.05
MLVA06V05C270-R	0603 (1608 metric)	4	5.5	8–18	31	270	30	0.1
MLVA06V09C210-R	0603 (1608 metric)	7	9	11.5–21.5	41	210	30	0.1
MLVA06V18C150-R	0603 (1608 metric)	14	18	23–33	54	150	30	0.1
MLVA06V26C100-R	0603 (1608 metric)	20	26	32–42	70	100	30	0.1

1. Working voltage V_{rms}: Maximum AC operating voltage the device can maintain and not exceed 10 µA leakage current.
2. Working voltage V_{DC}: Maximum DC operating voltage the device can maintain and not exceed 10 µA leakage current
3. Varistor voltage: Voltage across the device measured at 1 mA DC current
4. Clamping voltage: Maximum peak voltage across the device with 8/20 µs waveform and 1 A pulse current
5. Capacitance test parameters: Zero volt bias, 1.0 MHz, 1.0 Vrms
6. Peak current: Maximum peak current which may be applied with 8/20 µs waveform without device failure.
7. Transient energy: Maximum energy which may be dissipated with 10/1000 µs waveform without device failure.
8. Part Number Definition: MLVAxxVxxCxxx
   MLVA xx= Product code and size
   Vxx= Working DC voltage
   Cxxx= Capacitance value
   -R suffix= RoHS compliant.

Dimensions—mm





Part number	A	B	C	D	E	F	G	H
MLVA02V05C033-R	0.60 ±0.05	0.30 ±0.05	0.30 ±0.05	0.20± 0.10	0.30	0.80	0.25	0.30
MLVA02V05C047-R	0.60 ±0.05	0.30 ±0.05	0.30 ±0.05	0.20± 0.10	0.30	0.80	0.25	0.30
MLVA02V05C064-R	0.60 ±0.05	0.30 ±0.05	0.30 ±0.05	0.20± 0.10	0.30	0.80	0.25	0.30
MLVA04V05C270-R	0.95 ±0.15	0.50 ±0.10	0.50 ±0.10	0.25± 0.15	0.51	1.73	0.61	0.51
MLVA04V09C130-R	0.95 ±0.15	0.50 ±0.10	0.50 ±0.10	0.25± 0.15	0.51	1.73	0.61	0.51
MLVA04V18C085-R	0.95 ±0.15	0.50 ±0.10	0.50 ±0.10	0.25± 0.15	0.51	1.73	0.61	0.51
MLVA06V05C270-R	1.60 ±0.15	0.80 ±0.10	0.80 ±0.10	0.30± 0.20	0.50	2.54	1.02	0.76
MLVA06V09C210-R	1.60 ±0.15	0.80 ±0.10	0.80 ±0.10	0.30± 0.20	0.50	2.54	1.02	0.76
MLVA06V18C150-R	1.60 ±0.15	0.80 ±0.10	0.80 ±0.10	0.30± 0.20	0.50	2.54	1.02	0.76
MLVA06V26C100-R	1.60 ±0.15	0.80 ±0.10	0.80 ±0.10	0.30± 0.20	0.50	2.54	1.02	0.76

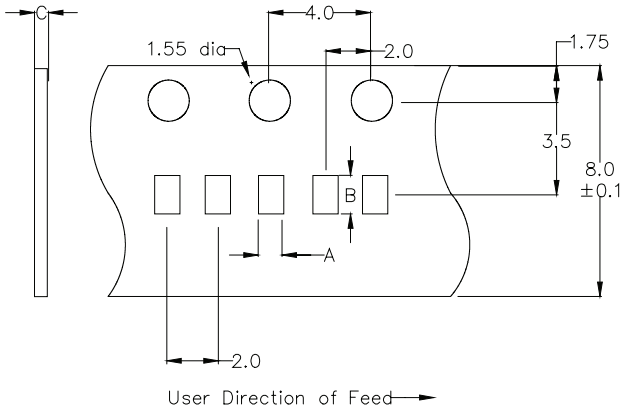
Environmental data

Operating temperature: - 40 °C to +85 °C
Storage temperature (component): +5 °C to +40 °C
Full load volatge: +85 °C at working voltage for 1000 hours Varistor voltage typical < 10% change
Thermal shock: 5 cycles, - 40 °C to +85 °C, 30 minute dwell time Varistor voltage typical < 10% change
Humidity bias: +40 °C, 90% relative humidity, at working voltage for 1000 hours Varistor voltage typical < 10% change
Resistance to solder heat: 260 °C ± 5 °C for 10 seconds ± 1 second

Packaging information—mm

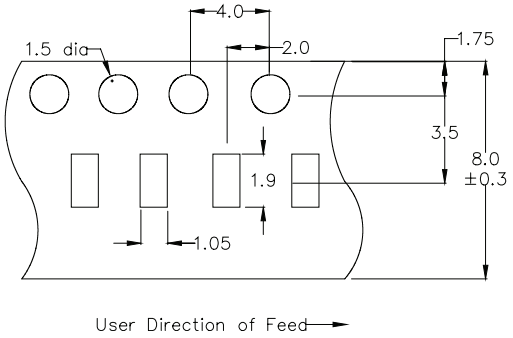
(Drawing not to scale)

Supplied in tape and reel packaging
15 000 parts per 7.0" diameter reel: MLVA02V05C033-R, MLVA02V05C047-R, MLVA02V05C064-R
10 000 parts per 7.0" diameter reel: MLVA04V05C270-R, MLVA04V09C130-R, MLVA04V18C085-R



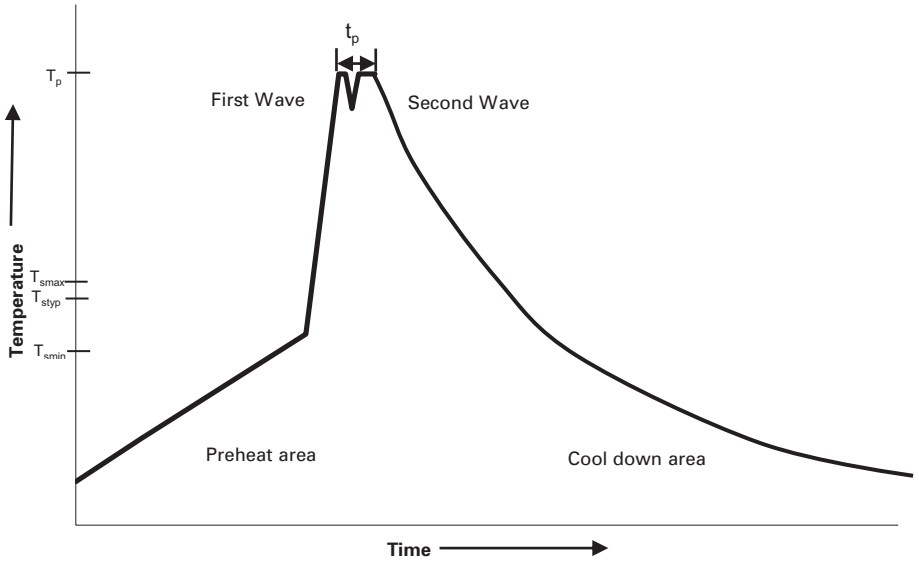
Part number	A	B	C
MLVA02V05C033-R	0.37	0.69	0.42
MLVA02V05C047-R	0.37	0.69	0.42
MLVA02V05C064-R	0.37	0.69	0.42
MLVA04V05C270-R	0.58	1.20	0.60
MLVA04V09C130-R	0.58	1.20	0.60
MLVA04V18C085-R	0.58	1.20	0.60

Supplied in tape and reel packaging
4 000 parts per 7.0" diameter reel
MLVA06V05C270-R, MLVA06V09C210-R, MLVA06V18C150-R, MLVA06V26C100-R



Wave solder profile

Reflow soldering not recommended



Reference EN 61760-1:2006

Profile Feature		Standard SnPb Solder	Lead (Pb) Free Solder
Preheat	• Temperature min. (T_{smin})	100°C	100°C
	• Temperature typ. (T_{styp})	120°C	120°C
	• Temperature max. (T_{smax})	130°C	130°C
	• Time (T_{smin} to T_{smax}) (t_s)	70 seconds	70 seconds
Δ preheat to max Temperature		150°C max.	150°C max.
Peak temperature (T_P)*		235°C – 260°C	250°C – 260°C
Time at peak temperature (t_p)		10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate		~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25°C to 25°C		4 minutes	4 minutes

Manual solder

350°C, 4-5 seconds (by soldering iron), generally manual hand soldering is not recommended.