

# 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

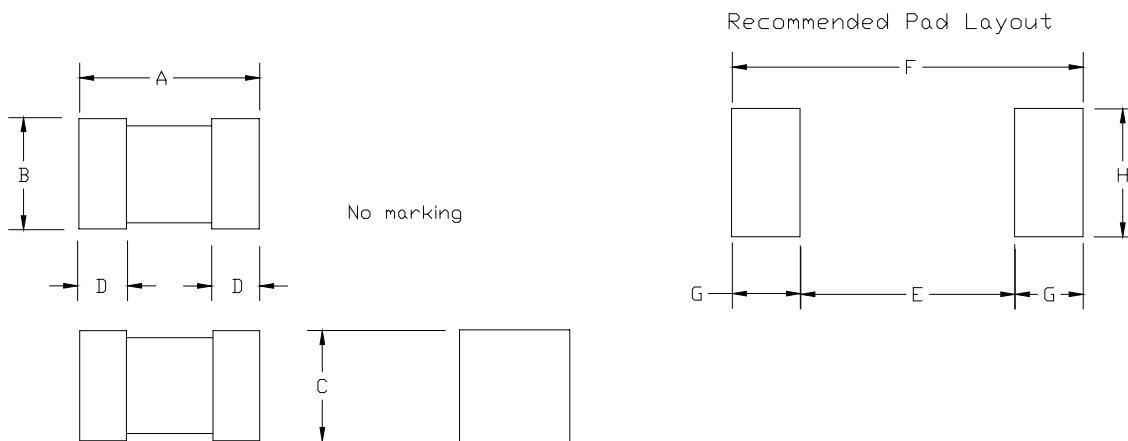
**Product specifications**

Part number <sup>8</sup>	Package size	Working voltage <sup>1,2</sup>		Varistor voltage <sup>3</sup> (V)	Clamping voltage <sup>4</sup> (V)	Capacitance <sup>5</sup> (pF) typical	Peak current <sup>6</sup> (A)	Transient energy <sup>7</sup> (J)
		(V <sub>rms</sub> )	(V <sub>DC</sub> )					
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

- Working voltage V<sub>rms</sub>: Maximum AC operating voltage the device can maintain and not exceed 10 µA leakage current.
- Working voltage V<sub>DC</sub>: Maximum DC operating voltage the device can maintain and not exceed 10 µA leakage current
- Varistor voltage: Voltage across the device measured at 1 mA DC current
- Clamping voltage: Maximum peak voltage across the device with 8/20 µs waveform and 1 A pulse current
- Capacitance test parameters: Zero volt bias, 1.0 MHz, 1.0 Vrms

- Peak current: Maximum peak current which may be applied with 8/20 µs waveform without device failure.
- Transient energy: Maximum energy which may be dissipated with 10/1000 µs waveform without device failure.
- 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**

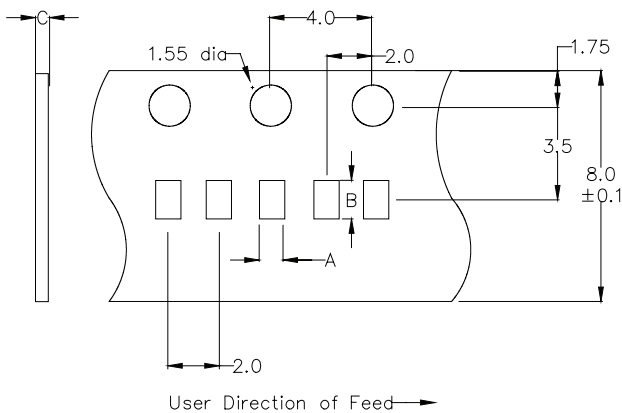
Operating temperature: - 40 °C to +85 °C
Storage temperature (component): +5 °C to +40 °C
Full load voltage: +85 °C at working voltage for 1000 hours Varistor voltage typical < 10% change
Thermal shock: 5 cycles, - 40 °C to +85 °C, 30 minute dwell time Varistor voltage typical < 10% change
Humidity bias: +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

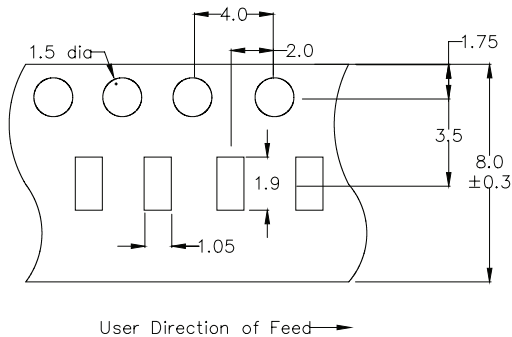


Part number	A	B	C
MLVA02V05C033-R	0.37	0.69	0.42
MLVA02V05C047-R	0.37	0.69	0.42
MLVA02V05C064-R	0.37	0.69	0.42
MLVA04V05C270-R	0.58	1.20	0.60
MLVA04V09C130-R	0.58	1.20	0.60
MLVA04V18C085-R	0.58	1.20	0.60

Supplied in tape and reel packaging

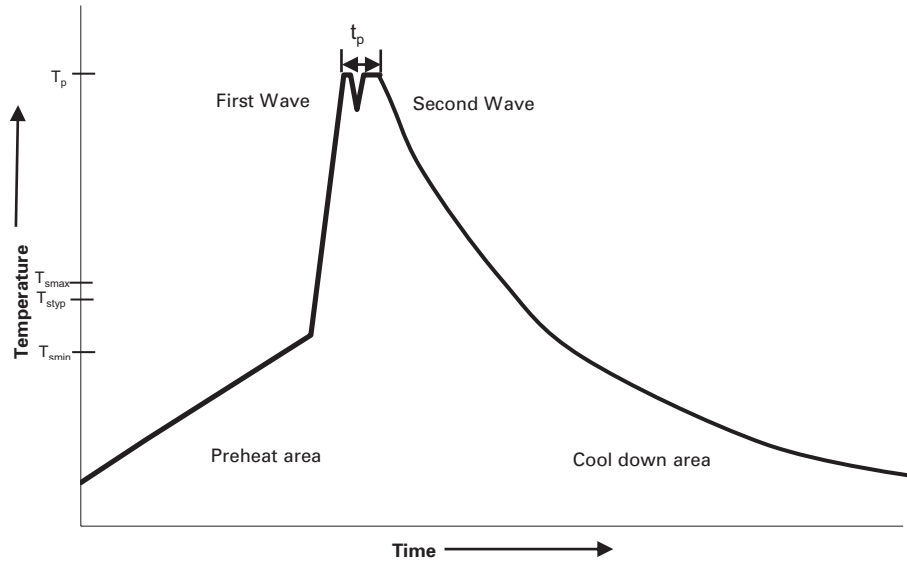
4 000 parts per 7.0" diameter reel

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
	• Temperature typ. ( $T_{styp}$ )	120°C
	• Temperature max. ( $T_{smax}$ )	130°C
	• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	70 seconds
$\Delta$ 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.