MLVC

Multilayer varistor general type ESD suppressor

Applications

- ESD port protection for mobile/smart phones
- Game console ESD port protection
- Set-top-boxes
- Tablets, notebooks, netbooks, laptops
- Media players
- Medical equipment
- Computers and peripherals ESD port protection
- Consumer electronics
- Industrial: Measuring devices, instruments, controllers

Product features

- Four compact footprint options 0402 (1005 metric), 0603 (1608 metric), 0805 (2012 metric), 1206 (3216 metric)
- Working voltage: 12 Vdc to 68 Vdc
  8.5 Vac to 48 Vac
- Absorbs high energy transient voltages seen in EFT and inductive load
- Fast response time to protect downstream circuits

Environmental compliance

Pb HALOGEN HF FREE RoHS

Ordering part number

MLVC 04 V012 C150

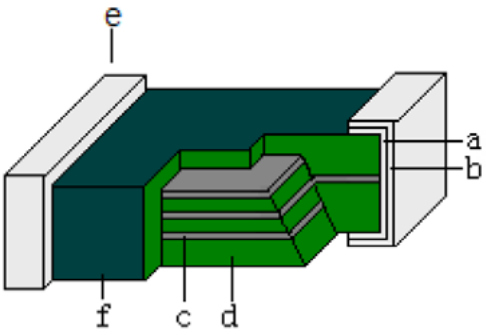
- Family name
- Package size
- Working voltage
- Capacitance code

Powering Business Worldwide

Product specifications

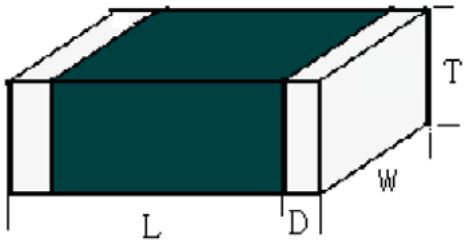
Part number	Working voltage (Vdc)	Working voltage (Vac)	Varistor voltage @ 1 mAdc (V)	Varistor voltage @ 1 mAdc (ΔV_B)	Maximum clamping voltage 8/20 µs (V)	Energy Absorption 10/1000 µs (J)	Peak current 8/20 µs (A)	Typical capacitance @ 1 MHz (pF)
MLVC04V012C150	12	8.5	18	±15%	34 @ 1 A	0.05	20	150
MLVC04V014C120	14	10	20	±10%	35 @ 1 A	0.05	20	120
MLVC04V016C100	16	11.3	22	±10%	39 @ 1 A	0.05	20	100
MLVC04V018C090	18	12.7	25	±10%	44 @ 1 A	0.05	20	90
MLVC06V012C210	12	8.5	18	±15%	34 @1 A	0.1	30	210
MLVC06V014C190	14	10	20	±10%	35 @ 1 A	0.1	30	190
MLVC06V016C180	16	11.3	22	±10%	39 @ 1 A	0.1	30	180
MLVC06V018C170	18	12.7	25	±10%	44 @ 1 A	0.1	30	170
MLVC06V022C150	22	15.6	30	±10%	53 @ 1 A	0.1	30	150
MLVC06V024C140	24	17	33	±10%	58 @ 1 A	0.1	30	140
MLVC06V026C120	26	18.4	36	±10%	63 @ 1 A	0.1	30	120
MLVC06V030C100	30	21.2	42	±10%	74 @ 1 A	0.1	30	100
MLVC06V033C080	33	23.3	45	±10%	79 @ 1 A	0.1	35	80
MLVC08V012C220	12	8.5	18	±15%	34 @ 1 A	0.1	35	220
MLVC08V014C200	14	10	20	±10%	35 @ 1 A	0.1	35	200
MLVC08V016C190	16	11.3	22	±10%	39 @ 1 A	0.1	35	190
MLVC08V018C180	18	12.7	25	±10%	44 @ 1 A	0.1	35	180
MLVC08V022C175	22	15.6	30	±10%	53 @ 1 A	0.1	35	175
MLVC08V024C170	24	17	33	±10%	58 @ 1 A	0.1	35	170
MLVC08V026C165	26	18.4	36	±10%	63 @ 1 A	0.1	35	165
MLVC08V030C150	30	21.2	42	±10%	74 @ 1 A	0.1	35	150
MLVC08V033C120	33	23.3	45	±10%	79 @ 1 A	0.1	35	120
MLVC08V038C110	38	27	51	±10%	90 @ 1 A	0.1	35	110
MLVC08V042C100	42	30	56	±10%	99 @ 1 A	0.1	35	100
MLVC08V048C080	48	34	62	±10%	110 @ 1 A	0.1	35	80
MLVC12V012C450	12	8.5	18	±15%	34 @ 1 A	0.1	35	450
MLVC12V014C350	14	10	20	±10%	35 @ 1 A	0.1	35	350
MLVC12V016C300	16	11.3	22	±10%	39 @ 1 A	0.1	35	300
MLVC12V018C270	18	12.7	25	±10%	44 @ 1 A	0.1	35	270
MLVC12V022C250	22	15.6	30	±10%	53 @ 1 A	0.1	35	250
MLVC12V024C230	24	17	33	±10%	58 @ 1 A	0.1	35	230
MLVC12V026C220	26	18.4	36	±10%	63 @ 1 A	0.1	35	220
MLVC12V030C200	30	21.2	42	±10%	74 @ 1 A	0.1	35	200
MLVC12V033C180	33	23.3	45	±10%	79 @ 1 A	0.1	35	180
MLVC12V038C170	38	27	51	±10%	90 @ 1 A	0.1	35	170
MLVC12V042C160	42	30	56	±10%	99 @ 1 A	0.1	35	160
MLVC12V048C150	48	34	62	±10%	110 @ 1 A	0.1	35	150
MLVC12V056C140	56	40	72	±10%	127 @ 1 A	0.1	35	140
MLVC12V060C120	60	45	76	±10%	134 @ 1 A	0.1	35	120
MLVC12V065C100	65	46	82	±10%	144 @ 1 A	0.1	35	100
MLVC12V068C090	68	48	86	±10%	151 @ 1 A	0.1	35	90

Construction



Component	Material
a. Ag layer	Ag
b. Ni/Sn plating	Ni-Sn
c. Inner electrode	Pd/Ag
d. Body	ZnO
e. Terminal electrode	Ag layer and Ni/Sn plating
f. Glass layer	Si-Bi

Dimensions—mm (in)

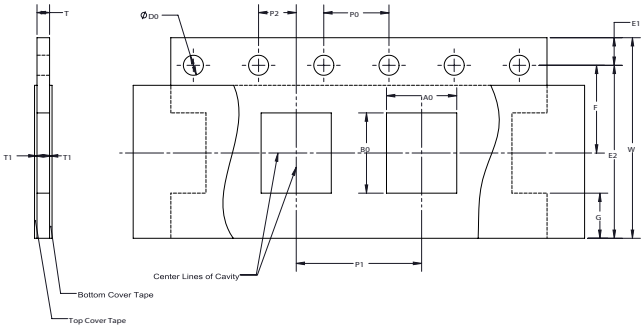


Part size	L	W	T	D
MLVC04	1.0 ± 0.15 (0.04 ± 0.006)	0.5 ± 0.15 (0.02 ± 0.006)	0.5 ± 0.15 (0.02 ± 0.006)	0.25 ± 0.1 (0.01 ± 0.004)
MLVC06	1.6 ± 0.2 (0.063 ± 0.008)	0.8 ± 0.2 (0.031 ± 0.008)	0.8 ± 0.2 (0.031 ± 0.008)	0.3 ± 0.2 (0.01 ± 0.008)
MLVC08	2.0 ± 0.2 (0.079 ± 0.008)	1.2 ± 0.2 (0.047 ± 0.008)	0.9 ± 0.2 (0.035 ± 0.008)	0.5 ± 0.3 (0.02 ± 0.012)
MLVC12	3.2 ± 0.2 (0.126 ± 0.008)	1.6 ± 0.2 (0.063 ± 0.008)	1.1 ± 0.2 (0.043 ± 0.008)	0.5 ± 0.3 (0.02 ± 0.012)

General specifications

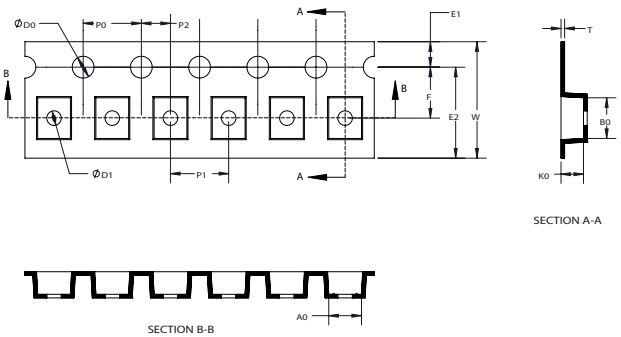
Operating temperature: - 55 °C to +125 °C
Solderability: +245 ± 5 °C, 5 ± 1 s
Resistance to soldering: +260 ± 5 °C, 10 ± 1 s
Low temperature resistance: -55 ± 2 °C, 1000 hours
Vibration: 1.5 mm, A period of 2 hours in each of 3 mutually perpendicular directions, 10 Hz to 55 Hz to 10 Hz for 1 minute
High temperature resistance: 1000 hours, +125 ± 2 °C.
High temperature load: Applied voltage: Working voltage, Testing time: 1000 hours, +85 ± 2 °C.
Static humidity: 90% to 95% RH, +60 °C ± 2 °C, 1000 hours
Thermal shock: -55 °C, 30 ± 3 minutes, +125 °C, 30 ± 3 minutes, 32 cycles

Paper tape: MLVC04, MLVC06, MLVC08



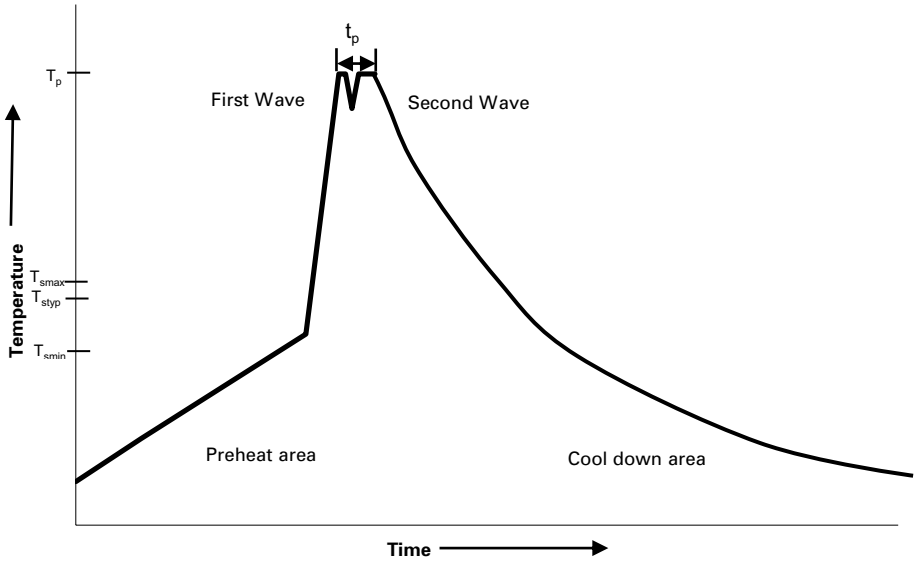
Dimension	MLVC04	MLVC06	MLVC08
W	8 ± 0.3	8 ± 0.3	8 ± 0.3
F	3.5 ± 0.05	3.5 ± 0.05	3.5 ± 0.05
E1	1.75 ± 0.1	1.75 ± 0.1	1.75 ± 0.1
P0	4 ± 0.1	4 ± 0.1	4 ± 0.1
P1	2.0 ± 0.05	4.0 ± 0.2	4.0 ± 0.2
P2	2.0 ± 0.1	2.0 ± 0.1	2.0 ± 0.1
D0	1.5 + 0.1/-0	1.5 + 0.1/-0	1.5 + 0.1/-0
A0	0.65 ± 0.1	1.1 ± 0.2	1.5 ± 0.2
B0	1.15 ± 0.1	1.9 ± 0.2	2.3 ± 0.2
T	0.8 max	1.1 max	1.1 max
Qty	10,000 parts per 7″ reel	4000 parts per 7″ reel	4000 parts per 7″ reel

Embossed tape: MLVC12



Dimension	MLVC12
W	8.1 +/- 0.2
P1	4.0 +/- 0.10
E1	1.75 +/- 0.10
E2	6.25 min
F	3.50 +/- 0.10
D0	1.55 +/- 0.05
D1	1.00 +/- 0.10
P_0	4.0 +/- 0.10
P2	2.0 +/- 0.05
A_0	1.90 +/- 0.10
B_0	3.51 +/- 0.10
T	0.23 +/- 0.10
K_0	1.27 +/- 0.10
Qty	3000 parts per 7″ reel

Wave solder profile



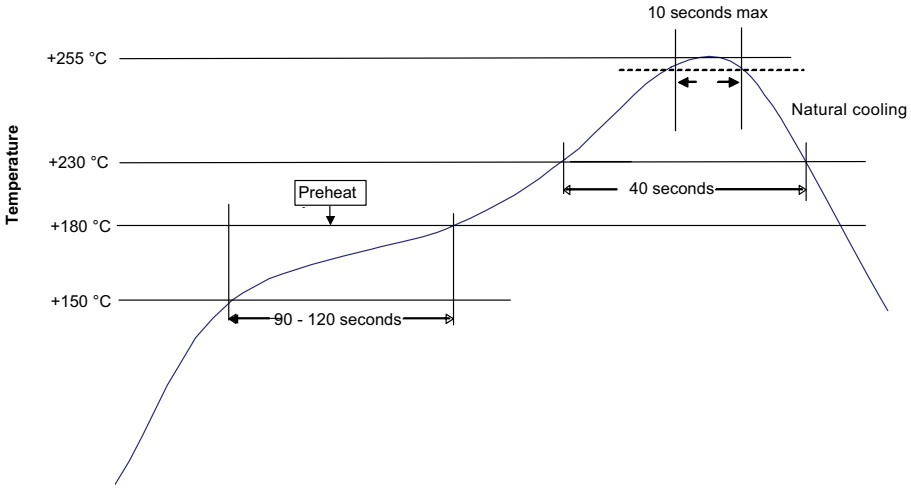
Reference EN 61760-1:2006

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
Δpreheat to max Temperature		150 °C max.	150 °C max.
Peak temperature (Tp)*		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 peak temperature		4 minutes	4 minutes

Manual solder

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

Solder reflow profile



Profile feature		Parameters
Preheat and soak	• Temperature min.	+150 °C
	• Temperature max.	+180 °C
	• Time	60-120 seconds
Liquidous temperature Time at liquidous		+230 °C 40 seconds
Peak package body temperature Time		+255 °C 10 seconds max

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