ESD Suppressor
SMD Multilayer Varistor Type

ME-V Series

MERITEK

FEATURE

- IEC 61000-4-2 ESD: ±15KV (Air) ±8KV (Contact)
- ESD Protection for one Bidirectional Channel
- Operating Voltage: 5.5VDC ~ 30VDC
- Operating Temperature: -40°C ~ +85°C
- Variable Capacitance

APPLICATION

- Cellular phones
- I/O port for mother board
- LCD module
- Data line
- Bluetooth headset

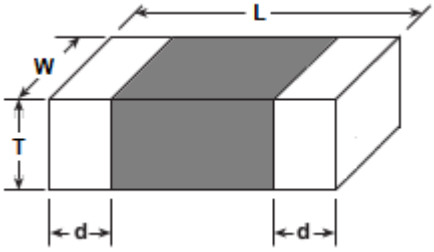
PART NUMBERING SYSTEM

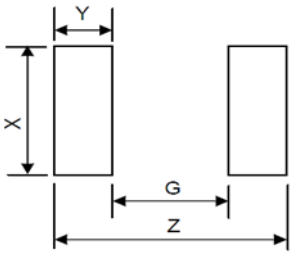
RoHS

ME	5V5	1B	40	V01
(1)	(2)	(3)	(4)	(5)

No	Item	Code	Description	Series Reference
(1)	**Meritek Series**	ME	ESD Suppressor	Surface Mount Chip Type
(2)	**Working Voltage**	5V5	5V5: 5.5VDC	Maximum Continuous Voltage
(3)	**Channel / Direction**	1B	1B: 1 Bidirectional Channel	Symmetrical V/I Characteristics
(4)	**Clamping Voltage**	40	40: 40V	I_{PP}= 1A, tp= 8/20µs
(5)	**Internal Code**	V01	V: Multilayer Varistor Type, 01: 0201	02: 0402, 03: 0603, 05: 0805

DIMENSION AND SOLDERING PAD





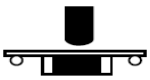
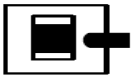
EIA Size	L	W	T Max	d	Z	G	X	Y
0201	0.60±0.05	0.30±0.05	0.35	0.15±0.05	0.8	0.3	0.3	0.25
0402	1.00±0.15	0.50±0.10	0.60	0.20±0.10	1.7	0.5	0.6	0.60
0603	1.60±0.15	0.80±0.15	0.95	0.35±0.15	3.0	1.0	1.0	1.00
0805	2.00±0.20	1.25±0.20	1.00	0.40±0.20	3.4	1.0	1.4	1.20

Unit: mm

ELECTRICAL CHARACTERISTICS

Part Number	EIA Size	Max Continuous Voltage	Varistor Voltage at 1mA V_{1mA}		Max Clamping Voltage 8/20 µs		Max Surge Current 8/20µs	Max Energy 10/1kµs	Typical Capacitance at 1MHz
		V_{DC}	Min	Max	V_P	I_P	I_{max}	W_{max}	C
		(V)	(V)	(V)	(V)	(A)	(A)	(J)	(pF)
ME5V51B40V01	0201	5.5	12.7	17.3	40	1	1	0.01	33
ME5V51B36V01	0201	5.5	12.7	17.3	36	1	1	0.01	47
ME181B135V01	0201	18	46	75	135	1	1	0.01	3
ME5V51B35V02	0402	5.5	8.8	13.2	35	1	1	0.01	10
ME5V51B33V02	0402	5.5	8.8	13.2	33	1	1	0.01	22
ME5V51B31V02	0402	5.5	8.8	13.2	31	1	4	0.02	33
ME5V51B30V02	0402	5.5	8.8	13.2	30	1	4	0.02	40
ME5V51B25V02	0402	5.5	8.8	13.2	25	1	20	0.05	260
ME91B38V02	0402	9	11	16	38	1	2	0.02	22
ME91B35V02	0402	9	11	16	35	1	4	0.02	40
ME91B30V02	0402	9	11	16	30	1	20	0.05	140
ME141B42V02	0402	14	15.9	21.5	42	1	4	0.02	40
ME141B38V02	0402	14	15.9	21.5	38	1	20	0.05	90
ME181B135V02	0402	18	46	75	135	1	1	0.01	3
ME181B55V02	0402	18	22	28	55	1	2	0.03	12
ME181B52V02	0402	18	22	28	52	1	4	0.05	30
ME181B50V02	0402	18	22	28	50	1	20	0.05	50
ME5V51B35V03	0603	5.5	8.8	13.2	35	1	1	0.01	10
ME5V51B34V03	0603	5.5	8.8	13.2	34	1	2	0.02	22
ME5V51B25V03	0603	5.5	8	12	25	1	30	0.1	760
ME91B40V03	0603	9	11	16	40	1	2	0.02	22
ME141B37V03	0603	14	15.9	21.5	37	1	30	0.1	180
ME181B135V03	0603	18	46	75	135	1	1	0.01	3
ME181B55V03	0603	18	22	28	55	1	2	0.03	12
ME181B50V03	0603	18	22	28	50	1	30	0.1	120
ME261B60V03	0603	26	31	38	60	1	30	0.1	110
ME301B74V03	0603	30	37	46	74	1	30	0.1	90
ME5V51B25V05	0805	5.5	8	12	25	1	40	0.1	990
ME91B29V05	0805	9	11	16	29	1	40	0.1	520
ME141B34V05	0805	14	15.9	20.3	34	1	40	0.1	320
ME141B32V05	0805	14	15.9	20.3	32	1	120	0.3	560
ME181B44V05	0805	18	22	28	44	1	40	0.1	290
ME261B60V05	0805	26	29.5	38.5	60	1	40	0.1	140
ME301B72V05	0805	30	37	46	72	1	30	0.1	90

RELIABILITY TEST CONDITON AND REQUIREMENT

<table>
<tr><th>Item</th><th>Standard</th><th>Test conditions / Methods</th><th>Specifications</th></tr>
<tr><td>Bending Strength</td><td>IEC 60068-2-21</td><td>Warp: 2mm; Speed ＜ 0.5mm/sec.
Duration: 10 sec on PCB.
  </td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 5\%$</td></tr>
<tr><td>Adhesion</td><td>IEC 60068-2-21</td><td>Speed ＜ 0.5mm/sec. on PCB
  </td><td>W≧0.5Kgf
the terminal electrode shall be break off not the chip element</td></tr>
<tr><td>Damp Heat Load, Steady State</td><td>IEC 60068-2-78</td><td>Test temp at 40±2°C, 90~95% RH
Duration: 500±24hrs at Working Voltage V_{DC}.</td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 10\%$</td></tr>
<tr><td>High Temp. Exposure (Storage)</td><td>IEC 60068-2-2</td><td>Test temp. at 125±5°C
Duration: 1000±24hrs</td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 5\%$</td></tr>
<tr><td>Rapid Change of Temperature</td><td>IEC 60068-2-14</td><td>The conditions shown below shall be repeated 5 cycles on PCB
Measurement at 24±2 hours after test conclusion.
<table>
<tr><th>Step</th><th>Temp(°C)</th><th>Period (Minutes)</th></tr>
<tr><td>1</td><td>-40±5</td><td>30±3</td></tr>
<tr><td>2</td><td>Room temperature</td><td>5±3</td></tr>
<tr><td>3</td><td>125±5</td><td>30±3</td></tr>
<tr><td>4</td><td>Room temperature</td><td>5±3</td></tr>
</table></td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 5\%$</td></tr>
<tr><td>High Temp Load Life</td><td>MIL-STD-202 Method 108</td><td>Test temp. at 85±2°C, duration: 1000±24 hrs. Bias at Working Voltage Vdc. Measurement at 24±2 hours after test conclusion.</td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 5\%$</td></tr>
<tr><td>Low Temp Load Life</td><td>IEC 60068-2-1</td><td>Test temp. at -40±5°C, duration: 1000 ±24 hrs. Bias at Working Voltage Vdc. Measurement at 24±2 hours after test conclusion.</td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 5\%$</td></tr>
<tr><td>Max Energy</td><td>IEC 61051-14.6</td><td>10/1000μS Waveform, Wmax, 1 surge current</td><td>No visible damage
$|\Delta V1mA/V1mA| \leq 10\%$</td></tr>
<tr><td>Vibration</td><td>IEC 60068-2-6</td><td>Frequency range : 10~55Hz. Amplitude : 0.75mm or $98m/s^2$
Direction : 3 mutually perpendicular directions, 2hrs each</td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 5\%$</td></tr>
<tr><td>Varistor Voltage Temp. Coefficient</td><td>Specification Standard</td><td>Measure V1mA at -40°C, 25°C, 125°C</td><td>$|T_C| \leq 0.05\%/°C$</td></tr>
<tr><td>Climatic Sequence</td><td>IEC 61051-14.18</td><td>Measurement at 24±2 hours after test conclusion.
<table>
<tr><th rowspan="2">Step</th><th>Temp</th><th>Humidity</th><th>Period</th><th>Cycle</th></tr>
<tr><th>(°C)</th><th>(%)</th><th>(hr/cycle)</th><th>Times</th></tr>
<tr><td>1</td><td>125</td><td>-</td><td>16</td><td>-</td></tr>
<tr><td>2</td><td>55</td><td>93</td><td>24</td><td>-</td></tr>
<tr><td>3</td><td>-40</td><td>-</td><td>2</td><td>-</td></tr>
<tr><td>4</td><td>55</td><td>93</td><td>24</td><td>1</td></tr>
</table></td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 10\%$</td></tr>
<tr><td>Max. Surge Current</td><td>IEC 61051-14.6</td><td>8/20μS waveform , Imax, 1 surge current</td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 10\%$</td></tr>
<tr><td>Solderability</td><td>IEC 60068-2-58</td><td>Dip at 245±5°C 3±0.3sec</td><td>95% of termination covered by solder</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>IEC 60068-2-58</td><td>Condition B No pre-heat of samples. Temperature: 260±5°C, Time: 10±1s.</td><td>No visible damage
$|\Delta V_{1mA}/V_{1mA}| \leq 5\%$</td></tr>
</table>

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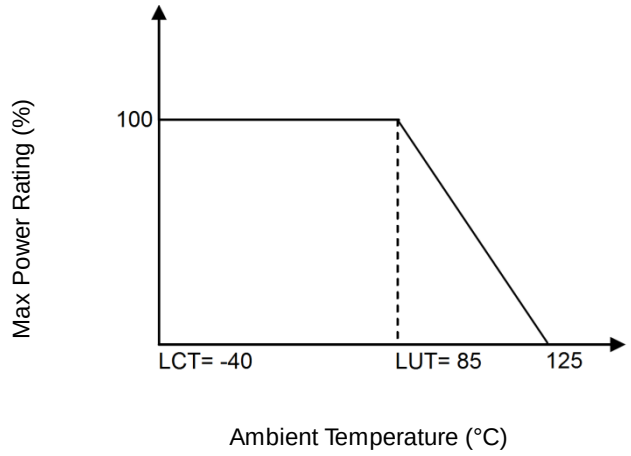
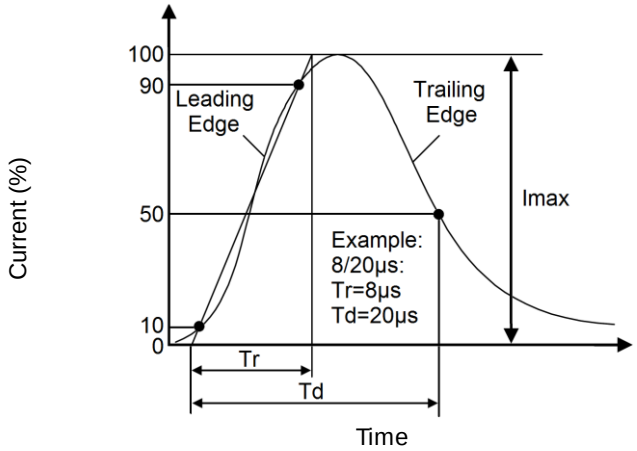
Power Derating Curve

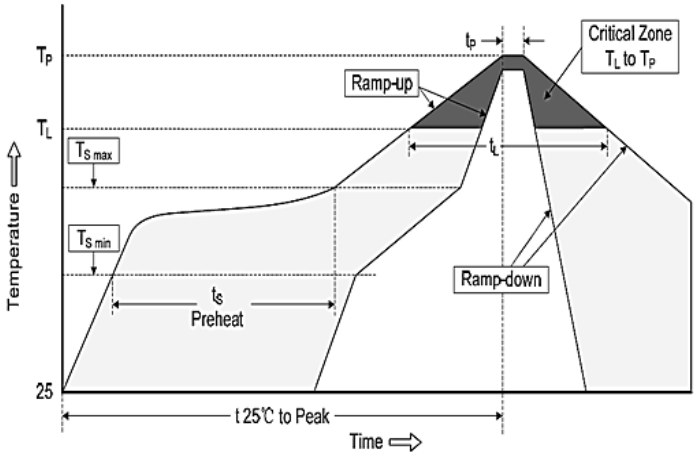


Surge Current Standard Waveform



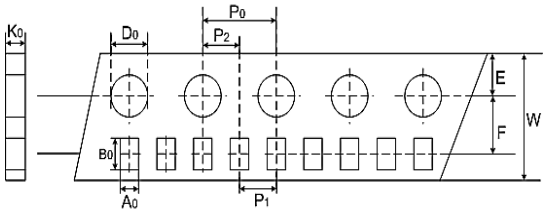
SOLDERING RECOMMENDATION

Reflow Condition		
Pre Heat	Temp. Min $T_{s(min)}$	150°C
	Temp. Max $T_{s(max)}$	200°C
	Time (min. to max.) (t_s)	60~180 seconds
Average ramp up rate (Liquidus Temperature) (T_L) to peak		3°C/second Max
$T_{s(max)}$ to T_L (Ramp-up rate)		3°C/second Max
Reflow	Temp. (T_L)	217°C
	Time (t_L) (min. to max.)	60~150 seconds
Peak 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

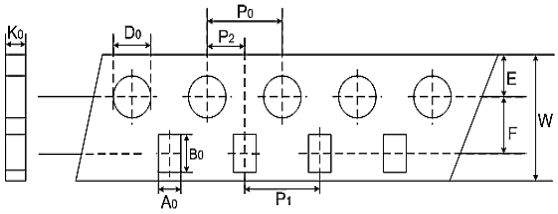


TAPING SPECIFICATON

Taping Specification (0201, 0402)



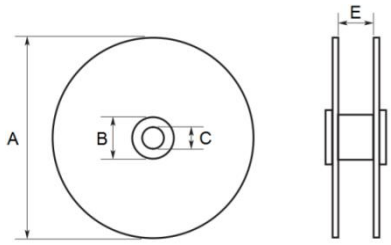
Taping Specification (0603, 0805)



Size	A_0 ±0.05	B_0 ±0.12	W ±0.2	E ±0.1	F ±0.05	P_1 ±0.1	P_2 ±0.05	P_0 ±0.1	D_0 ±0.1	K_0 ±0.1
0201	0.38	0.68	8	1.75	3.5	2	2	4	1.55	0.38
0402	0.62	1.12	8	1.75	3.5	2	2	4	1.55	0.60
0603	1.10	1.90	8	1.75	3.5	4	2	4	1.55	0.95
0805	1.50	2.30	8	1.75	3.5	4	2	4	1.55	1.00

Unit: mm

Size	A ±1	B ±0.5	C ±0.2	E ±0.5	Pcs/ Reel
0201	178	60	13.0	9.0	15000
0402	178	60	13.0	9.0	10000
0603	178	60	13.0	9.0	4000
0805	178	60	13.0	9.0	3500



*Specifications subject to change without notice.