

ESD5B5VL

1-Line, Bi-directional, Transient Voltage Suppressors

www.omnivision-group.com

Descriptions

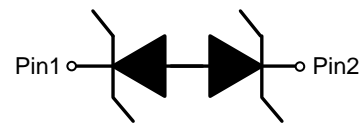
The ESD5B5VL is a bi-directional TVS (Transient Voltage Suppressor). It is specifically designed to protect sensitive electronic components that may be subjected to ESD (Electrostatic Discharge) and Lightning. It is particularly well-suited for cellular phones, portable device, digital cameras, power supplies and many other portable applications because of its small package and low weight.

The ESD5B5VL may be used to provide ESD protection up to $\pm 8\text{kV}$ (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 3 A (8/20 μs) according to IEC61000-4-5.

The ESD5B5VL is available in SOD-523 package. Standard products are Pb-free and Halogen-free.



SOD-523



Circuit diagram

Features

- Stand-off voltage: $\pm 5\text{V}$ Max
- Transient protection for each line according to IEC61000-4-2 (ESD): $\pm 8\text{kV}$ (contact discharge)
IEC61000-4-5 (surge): 3A (8/20 μs)
- Capacitance: $C_J = 5.0\text{pF}$ typ.
- Solid-state silicon technology



B = Device code

* = Date code (A~Z)

Marking (Top View)

Applications

- Cell phone handsets and accessories
- Personal Digital Assistants (PDAs)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Digital Cameras
- MP3/MP4/PMP Players

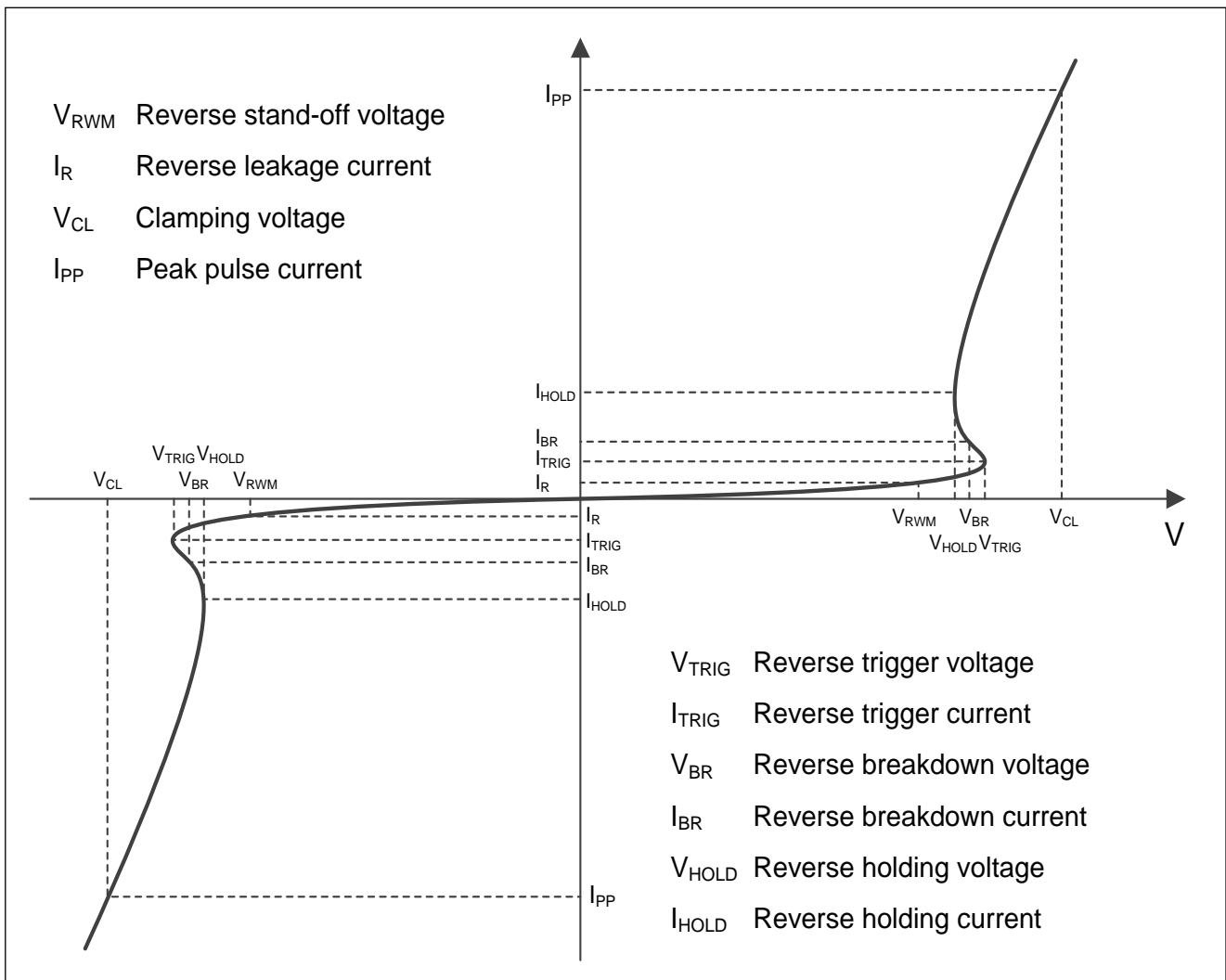
Order information

Device	Package	Shipping
ESD5B5VL-2/TR	SOD-523	3000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power ($t_p = 8/20\mu s$)	P_{pk}	33	W
Peak pulse current ($t_p = 8/20\mu s$)	I_{PP}	3	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 15	kV
ESD according to IEC61000-4-2 contact discharge		± 8	
Junction temperature	T_J	125	$^{\circ}C$
Operating temperature	T_{OP}	-40~85	$^{\circ}C$
Lead temperature	T_L	260	$^{\circ}C$
Storage temperature	T_{STG}	-55~150	$^{\circ}C$

Electrical characteristics ($T_A=25^{\circ}C$, unless otherwise noted)

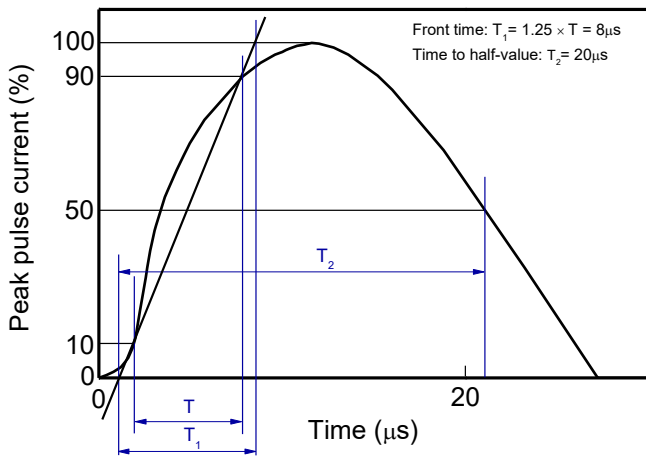


Electrical characteristics ($T_A=25\text{ }^\circ\text{C}$, unless otherwise noted)

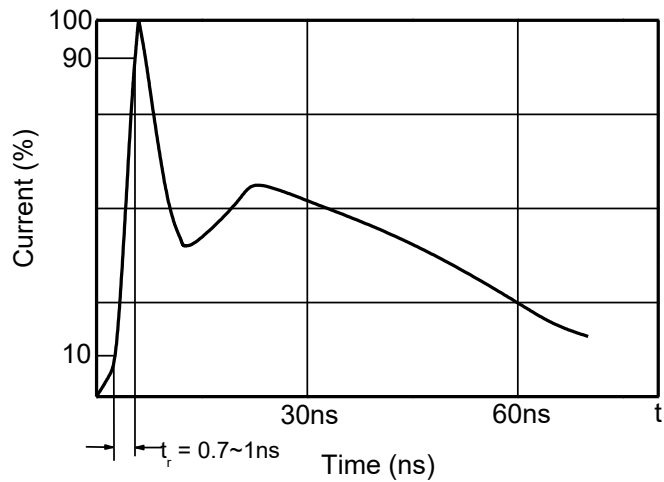
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				± 5	V
Reverse leakage current	I_R	$V_{RWM} = 5V$			1	μA
Reverse breakdown voltage	V_{BR}	$I_T=1mA$	6.2		8.2	V
Clamping voltage ¹⁾	V_{CL}	$I_{PP} = 16A, t_p = 100ns$		13		V
Clamping voltage ²⁾	V_{CL}	$V_{ESD} = 8kV$		13		V
Clamping voltage ³⁾	V_C	$I_{pp}=1A t_p=8/20\mu s$			8.5	V
		$I_{pp}=3A t_p=8/20\mu s$			11	V
Dynamic resistance ¹⁾	R_{DYN}			0.4		Ω
Junction capacitance	C_J	$V_R = 0V, f = 1MHz$		5.0	10	pF
		$V_R = 5V, f = 1MHz$		3.5	5	pF

Notes:

- 1) TLP parameter: $Z_0 = 50\Omega, t_p = 100ns, t_r = 2ns$, averaging window from 70ns to 90ns. R_{DYN} is calculated from 4A to 16A.
- 2) Contact discharge mode, according to IEC61000-4-2.
- 3) Non-repetitive current pulse, according to IEC61000-4-5.

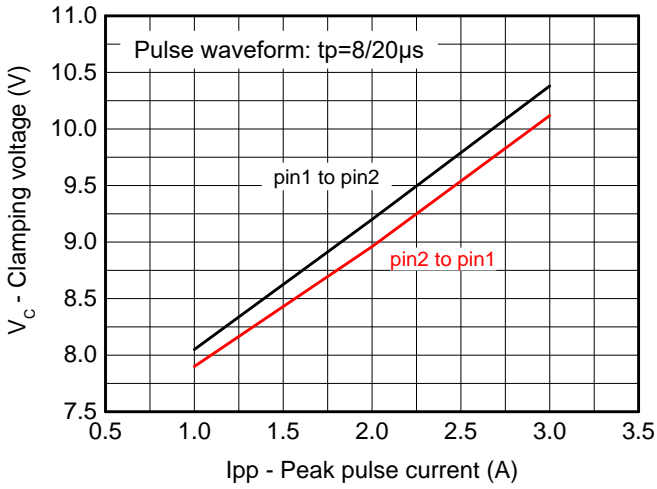


8/20 μs waveform per IEC61000-4-5

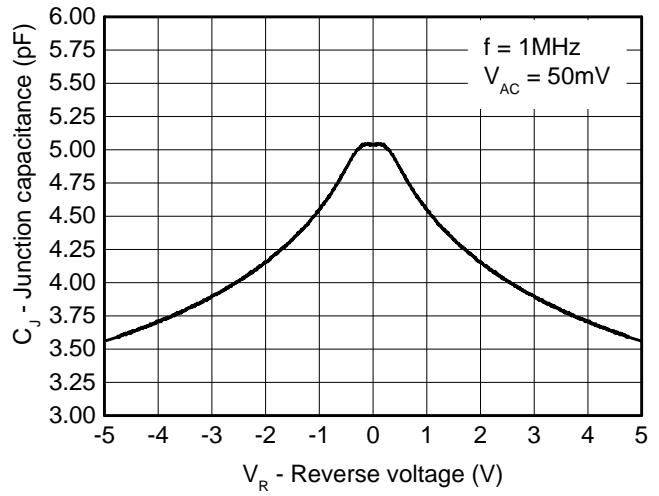


Contact discharge current waveform per IEC61000-4-2

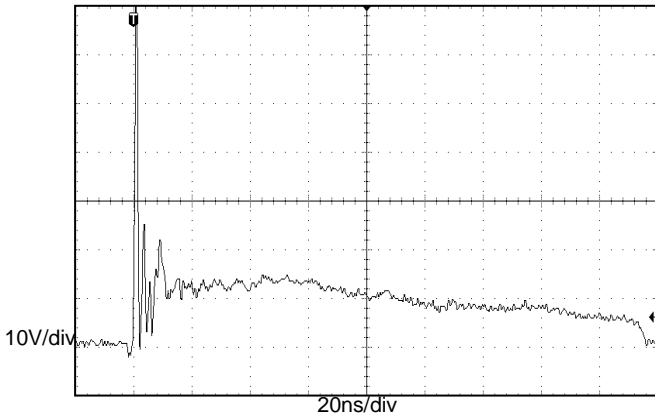
Typical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)



Clamping voltage vs. Peak pulse current

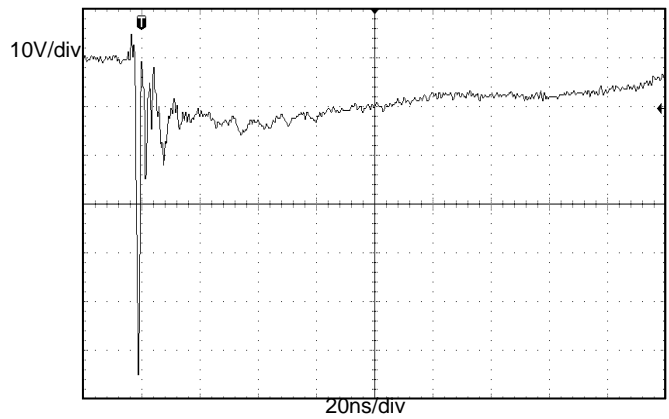


Capacitance vs. Reverse voltage



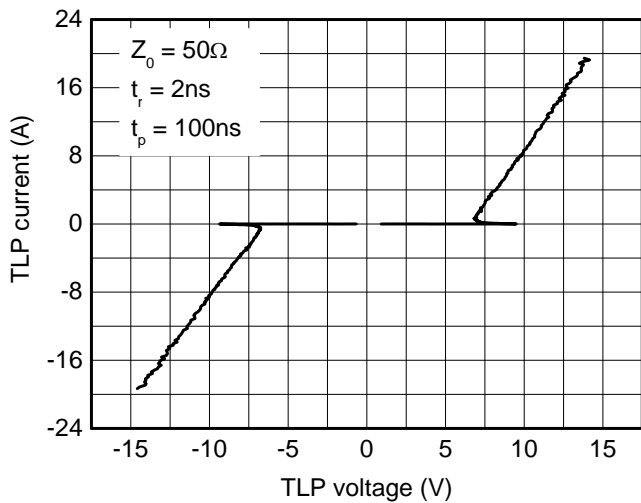
ESD clamping

(+8kV contact discharge per IEC61000-4-2)



ESD clamping

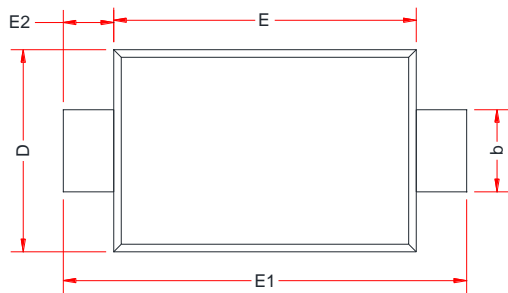
(-8kV contact discharge per IEC61000-4-2)



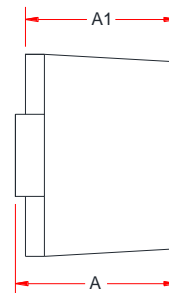
TLP Measurement

Package outline dimensions

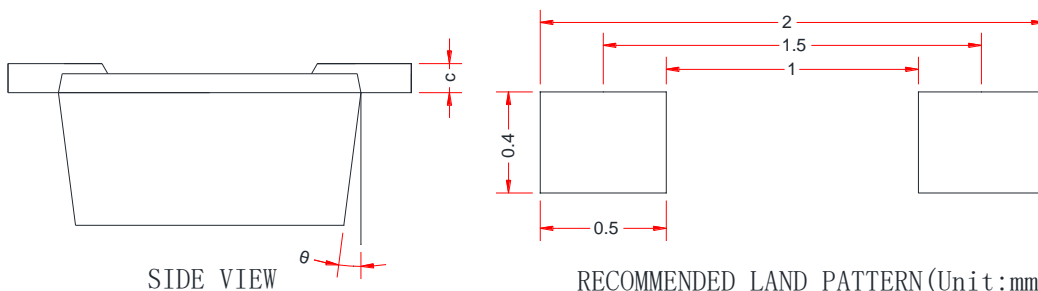
SOD-523



TOP VIEW



SIDE VIEW



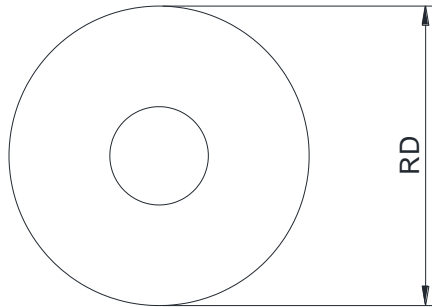
SIDE VIEW

RECOMMENDED LAND PATTERN (Unit:mm)

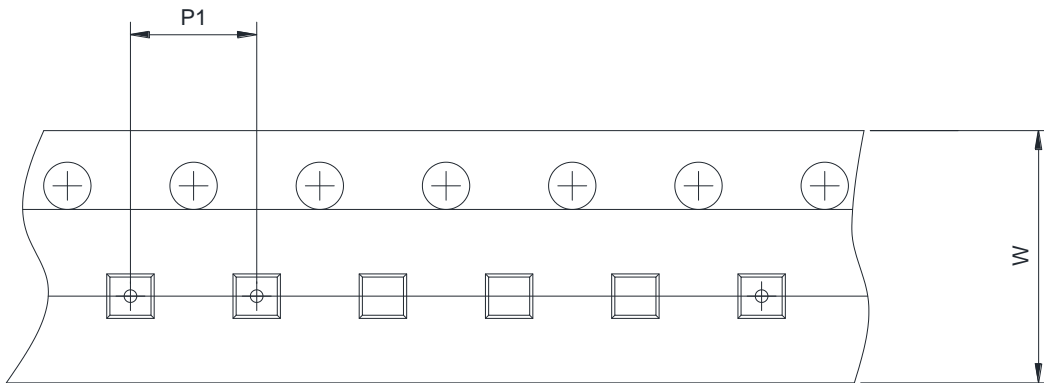
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.51	-	0.77
A1	0.50	0.60	0.70
b	0.25	-	0.40
c	0.08	-	0.15
D	0.75	0.80	0.85
E	1.10	1.20	1.30
E1	1.50	1.60	1.70
E2	0.20 Ref.		
θ	7 °C Ref.		

Tape and reel information

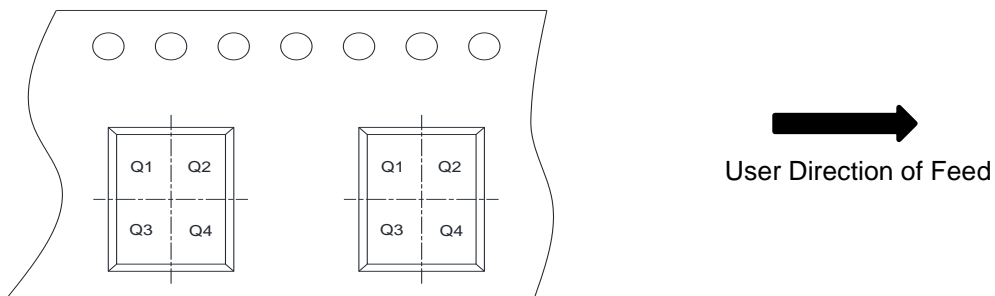
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch	<input type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm	<input type="checkbox"/> 12mm <input type="checkbox"/> 16mm
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2mm	<input checked="" type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input checked="" type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4