

1-Line , Bi-directional, Transient Voltage Suppressors

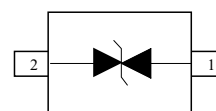
Descriptions

The ESD5B025TA 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), EFT (Electrical Fast Transients) 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 ESD5B025TA is available in SOD-523 package. Standard products are Pb-free and Halogen-free.



SOD-523



Circuit diagram

Features

- Stand-off voltage: $\pm 5V$ Max
- Transient protection for each line according to IEC61000-4-2 (ESD): $\pm 25kV$ air discharge $\pm 25kV$ contact discharge
- Solid-state silicon technology
- Low leakage current

Order information

Applications

- Cell phone handsets and accessories
- Personal Digital Assistants (PDAs)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Digital Cameras
- Car entertainment systems, car dashboard

Device	Package	Shipping	Mark
ESD5B025TA	SOD-523	5000/Tape&Reel	5B

Absolute maximum ratings

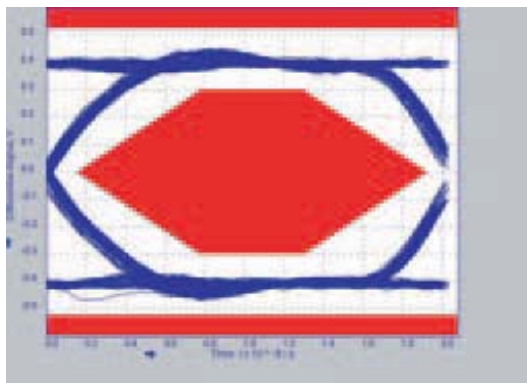
Parameter	Symbol	Rating	Unit
Peak pulse current ($t_p = 8/20\mu s$)	I_{PP}	2.5	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 25	kV
ESD according to IEC61000-4-2 contact discharge		± 25	
Operation junction temperature	T_J	-55~150	$^{\circ}C$
Lead temperature	T_L	260	$^{\circ}C$
Storage temperature	T_{STG}	-55~150	$^{\circ}C$

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

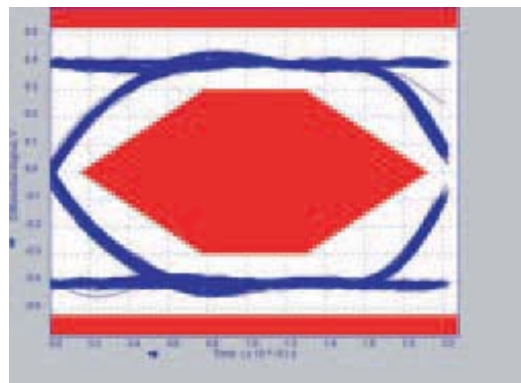
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				± 5.0	V
Reverse leakage current	I_R	$V_{RWM} = 5.0V$			0.5	μA
Reveres breakdown voltage	V_{BR}	$I_T = 1mA$	5.5			V
Clamping voltage	V_C	$I_{PP} = 2.5A$ $t_p = 8/20 \mu s$			13.0	V
Junction capacitance	C_J	$V_R = 0V$, $f = 1MHz$		2.5	3.5	pF

USB eye map

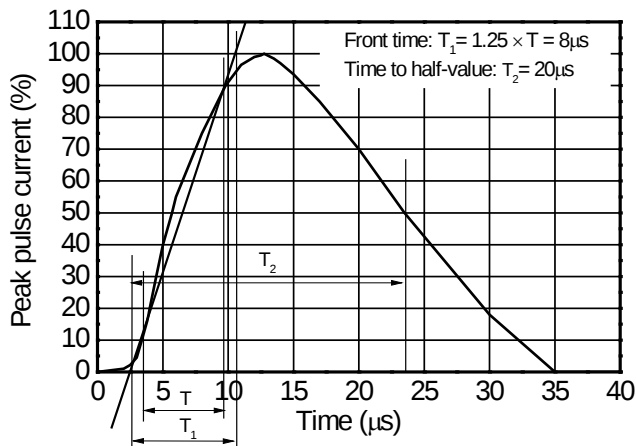
USB 2.0 Eye Diagram



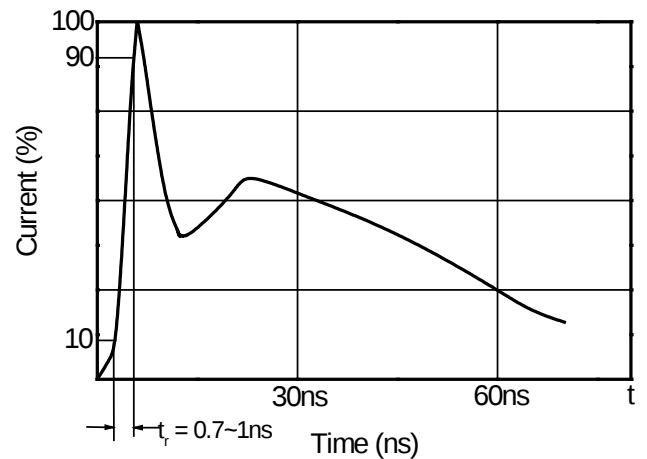
USB 2.0 Eye Diagram ESD5B025TA



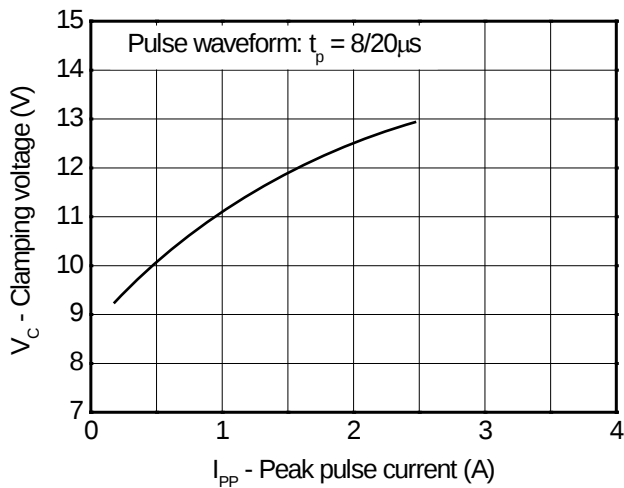
Typical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)



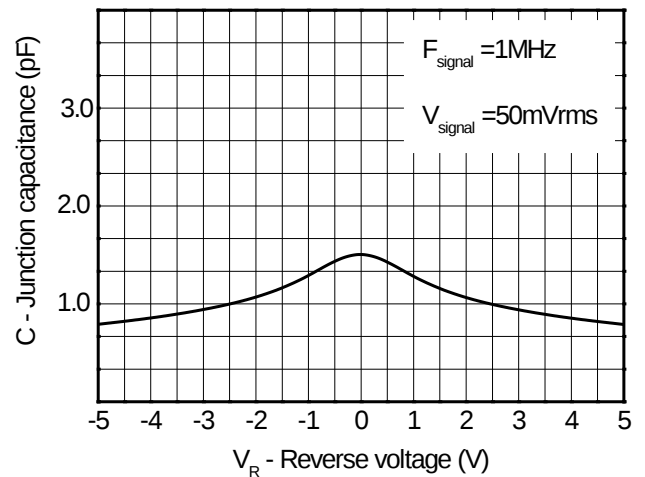
8/20 μs waveform per IEC61000-4-5



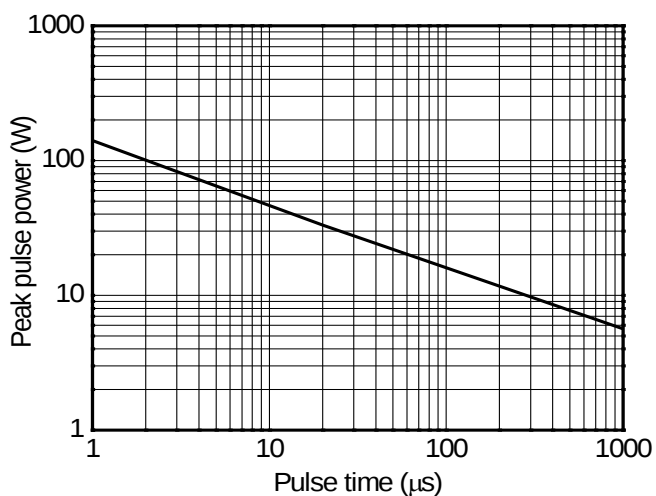
Contact discharge current waveform per IEC61000-4-2



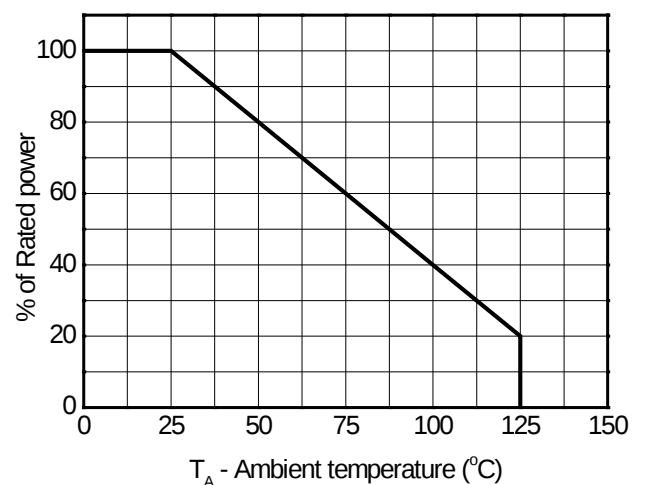
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverses voltage

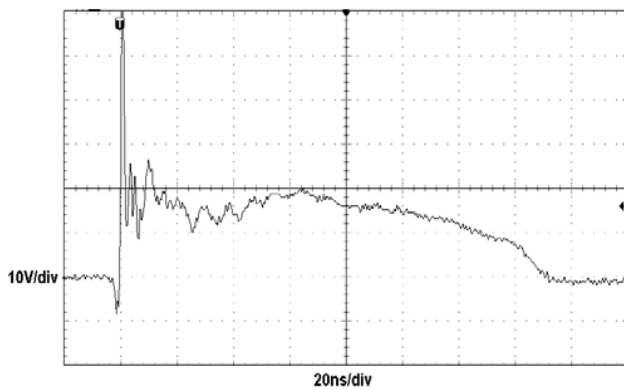
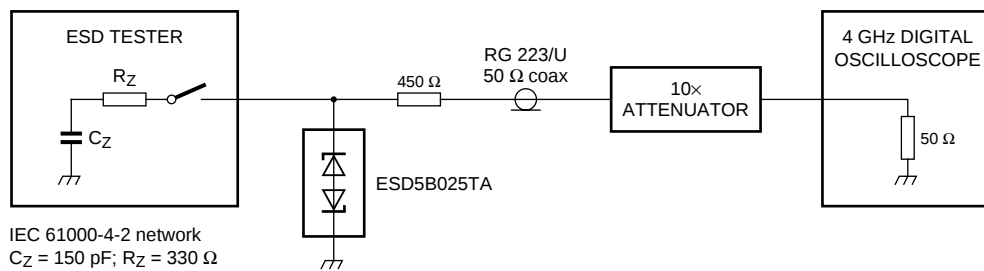


Non-repetitive peak pulse power vs. Pulse time

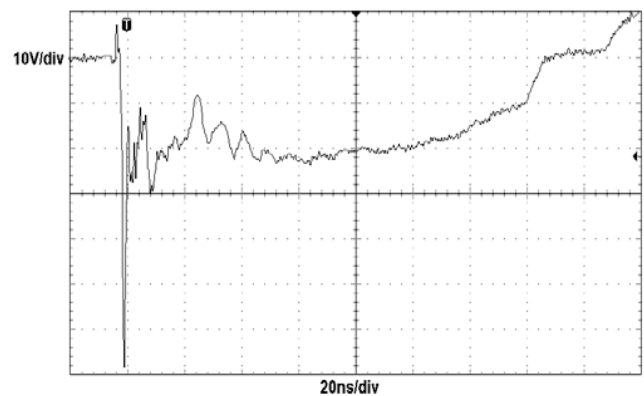


Power derating vs. Ambient temperature

ESD clamping test setup and waveforms



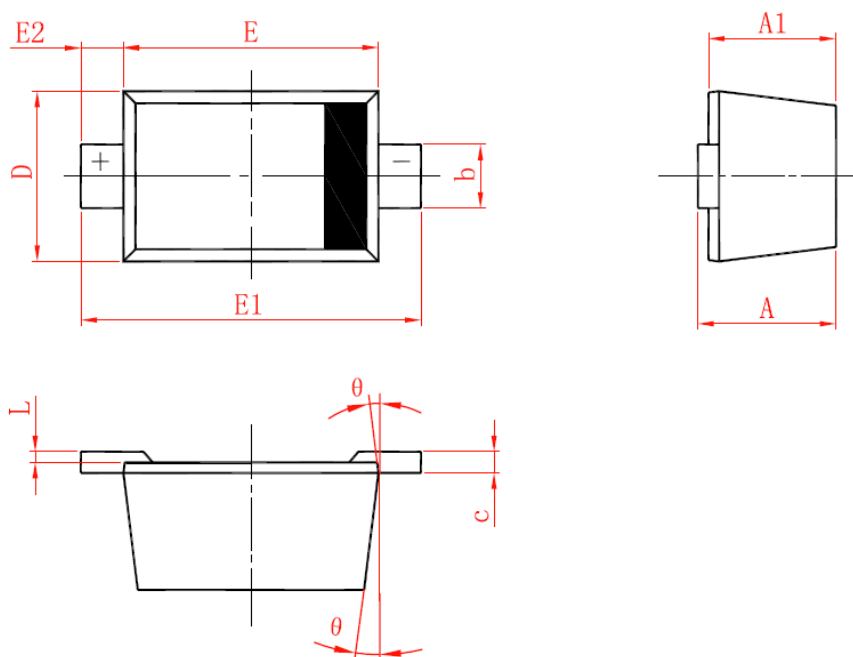
ESD clamping
 (+8kV contact discharge per IEC61000-4-2)



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

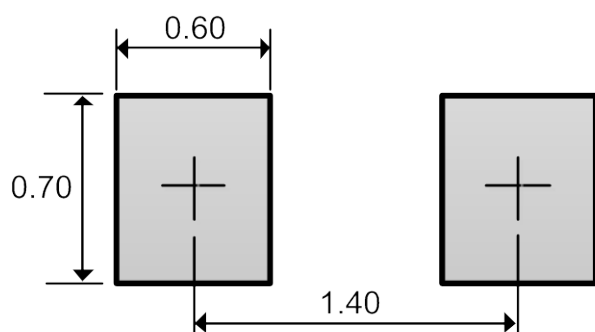
Package outline dimensions

SOD-523



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.510	0.640	0.770
A1	0.500	0.600	0.700
b	0.250	0.300	0.350
c	0.080	0.115	0.150
D	0.750	0.800	0.850
E	1.100	1.200	1.300
E1	1.500	1.600	1.700
E2	0.200 Ref		
L	0.010	0.040	0.070
θ	7° Ref		

Recommend land pattern (Unit: mm)



Note: This land pattern is for your reference only. Actual pad layouts may vary depending on application.