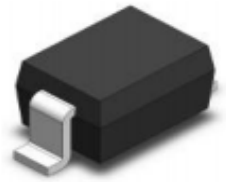
1-Line, Bi-directional, Transient Voltage Suppressors

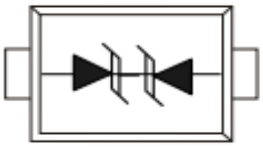
Descriptions

The ESD5A003TA 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 ESD5A003TA may be used to provide ESD protection up to ±30kV air discharge ±30kV contact discharge according to IEC61000-4-2, and withstand peak pulse current up to 18A (8/20μs) according to IEC61000-4-5.



SOD-323



Circuit diagram

Features

- Stand-off voltage: ±5VMax
- Transient protection for each line according to
  IEC61000-4-2 (ESD): ±30kV air discharge ±30kV contact discharge
  IEC61000-4-5 (surge): 18A (8/20μs)
- Solid-state silicon technology

Order information

Device	Package	Shipping	Mark
ESD5A003TA	SOD-323	3000/Tape&Reel	AC

Applications

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

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse current (t_p = 8/20μs)	I_{PP}	18.0	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	
Operation junction temperature	T_J	-55~150	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55~150	°C

Electrical characteristics (TA=25°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} = 5V			0.1	μA
Reveres breakdown voltage	V_{BR}	I_T=1mA	6.0	7.0		V
Clamping voltage	V_C	Ipp= 1A tp=8/20us		9.0	10.0	V
		Ipp=18A tp=8/20us		18.0	20.0	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz		0.5	1.0	pF

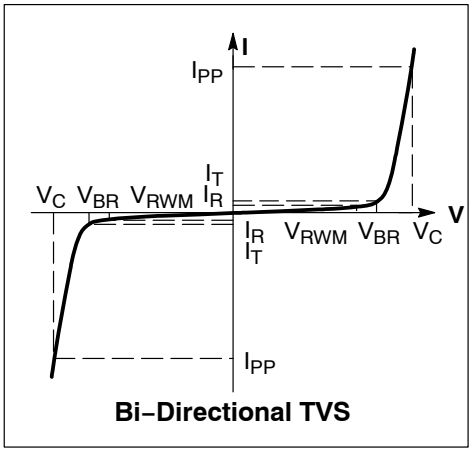
Electrical performance curve

V_C: Maximum clamping voltage

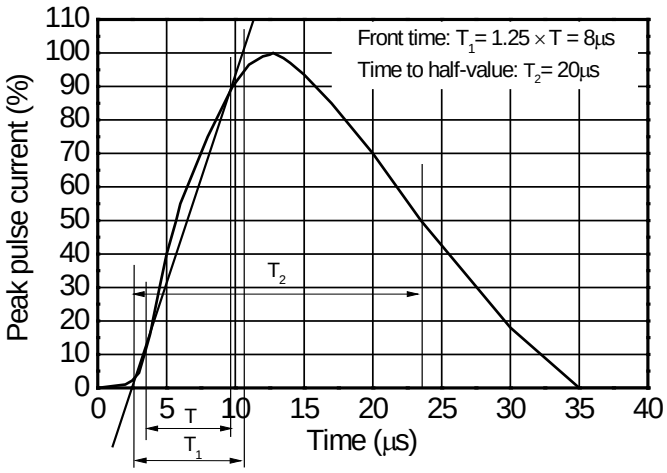
V_{br}: Reverse breakdown voltage

V_{RWM}: Working voltage

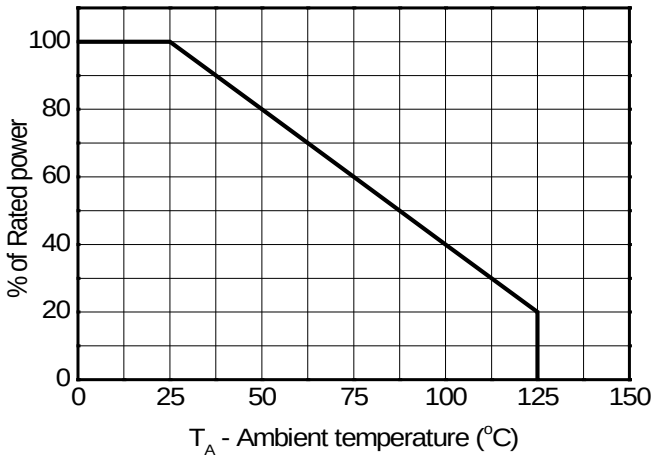
I_{PP}: Maximum peak current



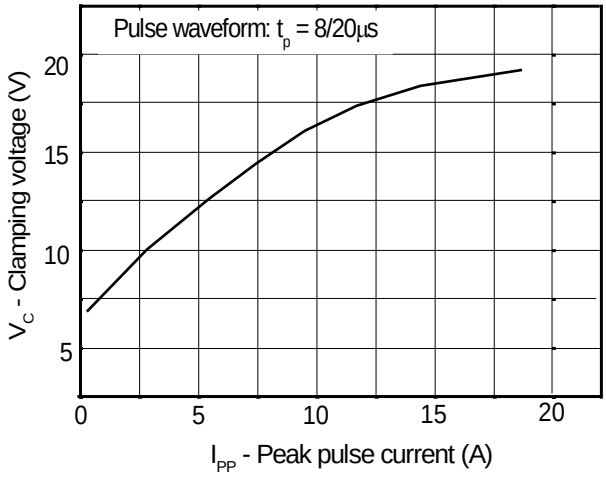
Bi-Directional TVS



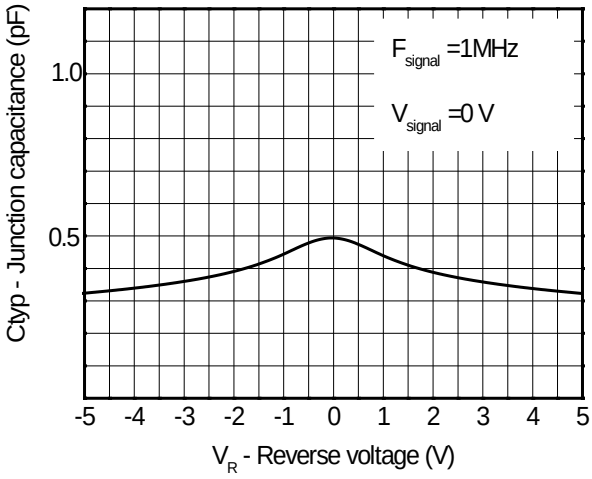
8/20μs waveform per IEC61000-4-5



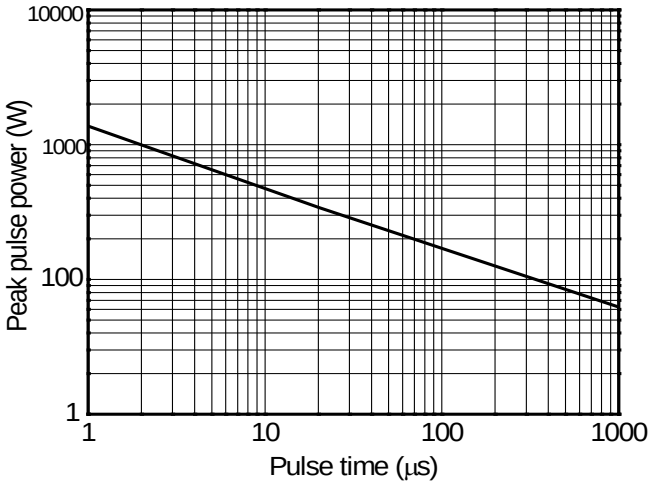
Power derating vs. Ambient temperature



Clamping voltage vs. Peak pulse current

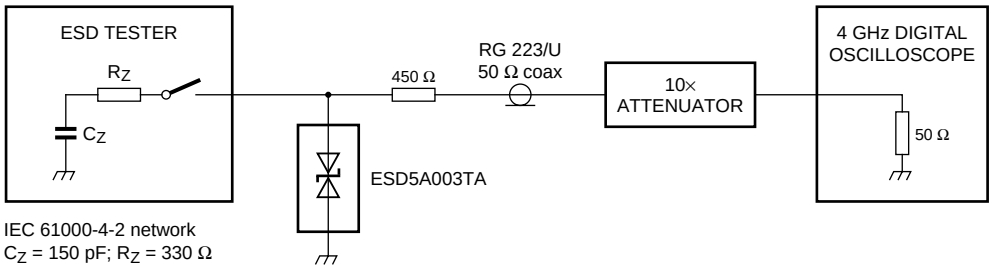


Capacitance vs. Reveres voltage

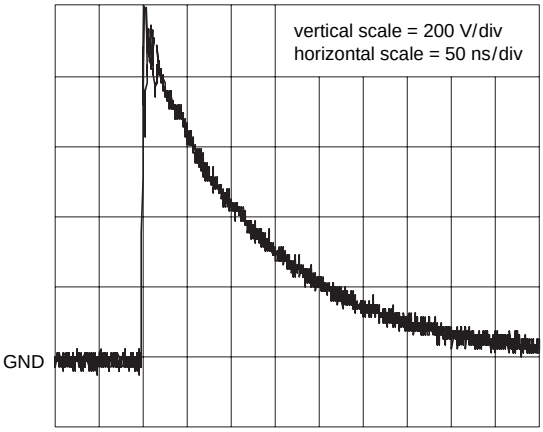


Non-repetitive peak pulse power vs. Pulse time

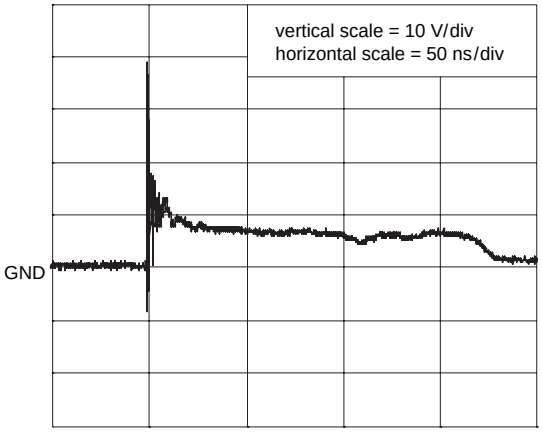
ESD clamping test setup and waveforms



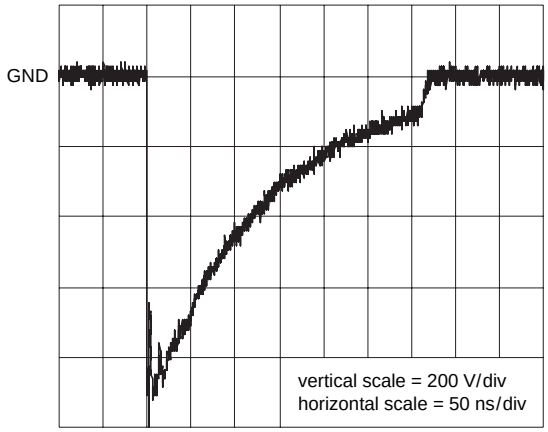
IEC 61000-4-2 network
C_Z = 150 pF; R_Z = 330 Ω



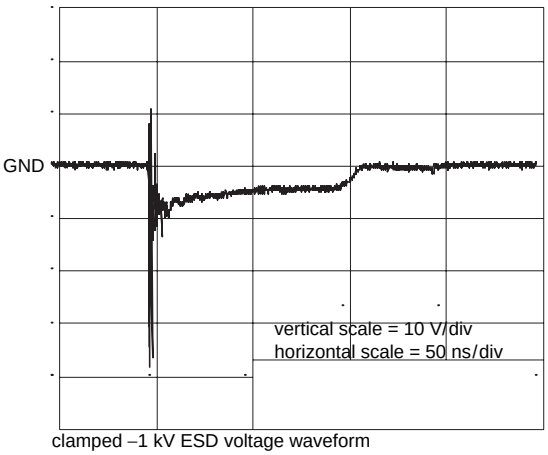
unclamped +1 kV ESD voltage waveform
(IEC61000-4-2 network)



clamped +1 kV ESD voltage waveform
(IEC61000-4-2 network)

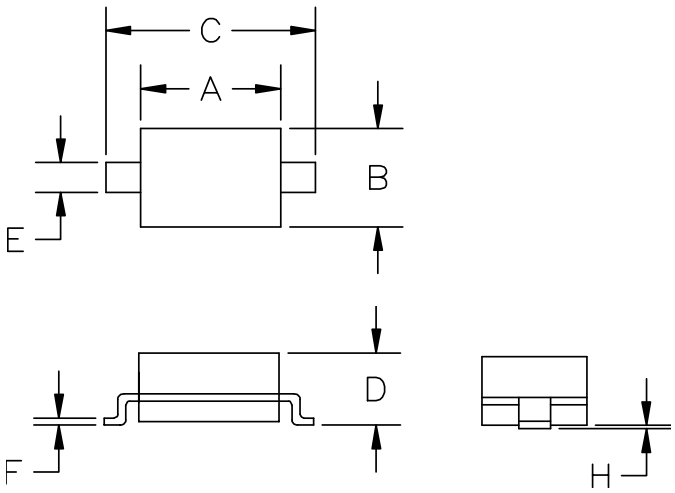


unclamped –1 kV ESD voltage waveform
(IEC61000-4-2 network)



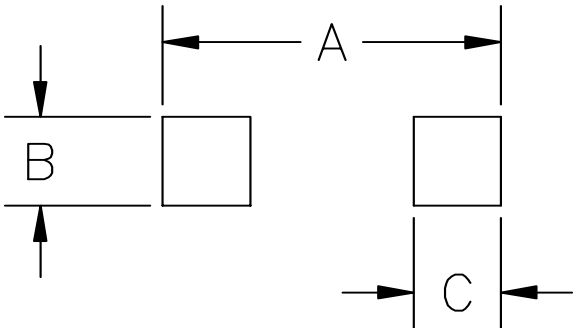
clamped –1 kV ESD voltage waveform
(IEC61000-4-2 network)

Package outline dimensions **SOD-323**



SYM	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.50	1.80	0.060	0.071
B	1.20	1.40	0.045	0.054
C	2.30	2.70	0.090	0.107
D	-	1.10	-	0.043
E	0.30	0.40	0.012	0.016
F	0.10	0.25	0.004	0.010
H	-	0.10	-	0.004

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
A	3.15	0.120
B	0.80	0.031
C	0.80	0.031