

ESD Protection Diodes with Ultra-Low Capacitance

1-Line, Bi-directional, Transient Voltage Suppressors

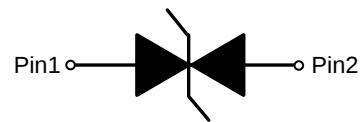
Descriptions

The ESD5D003TAH 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 ESD5D003TAH may be used to provide ESD protection up to $\pm 20\text{KV}$ Air, $\pm 15\text{KV}$ contact compliance to IEC61000-4-2, and withstand peak pulse current up to 4 A (8/20 μs) according to IEC61000-4-5.



DFN1006-2L



Circuit diagram

Features

- Stand-off voltage: $\pm 5\text{V}$ Max
- Transient protection for each line according to IEC61000-4-2 (ESD): $\pm 20\text{KV}$ Air, $\pm 15\text{KV}$ contact
IEC61000-4-4(EFT): 40 A (5/50 ns)
IEC61000-4-5 (Surge): 4 A (8/20 μs)
- Solid-state silicon technology
- Low leakage current

Applications

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

Order information

Device	Marking	Package	Shipping
ESD5D003TAH	N	DFN1006-2L	10000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse current ($t_p = 8/20\mu s$)	I_{PP}	4.0	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 20	kV
ESD according to IEC61000-4-2 contact discharge		± 15	
Operating temperature	T_{OP}	-40~125	$^{\circ}C$
Lead temperature	T_L	260	$^{\circ}C$
Storage temperature	T_{STG}	-65~150	$^{\circ}C$

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
Reverse breakdown voltage	V_{BR}	$I_T = 1mA$	6.0	7.5	9.0	V
Clamping voltage	V_C	$I_{PP} = 1A$ $t_p = 8/20\mu s$			12.0	V
Clamping voltage	V_C	$I_{PP} = 4A$ $t_p = 8/20\mu s$			18.0	V
Junction capacitance	C_J	$V_R = 0V$, $f = 1MHz$		0.3	0.45	pF

Electrical performance curve

V_{RWM} Reverse stand-off voltage

I_R Reverse leakage current

V_{CL} Clamping voltage

I_{PP} Peak pulse current

V_{TRIG} Reverse trigger voltage

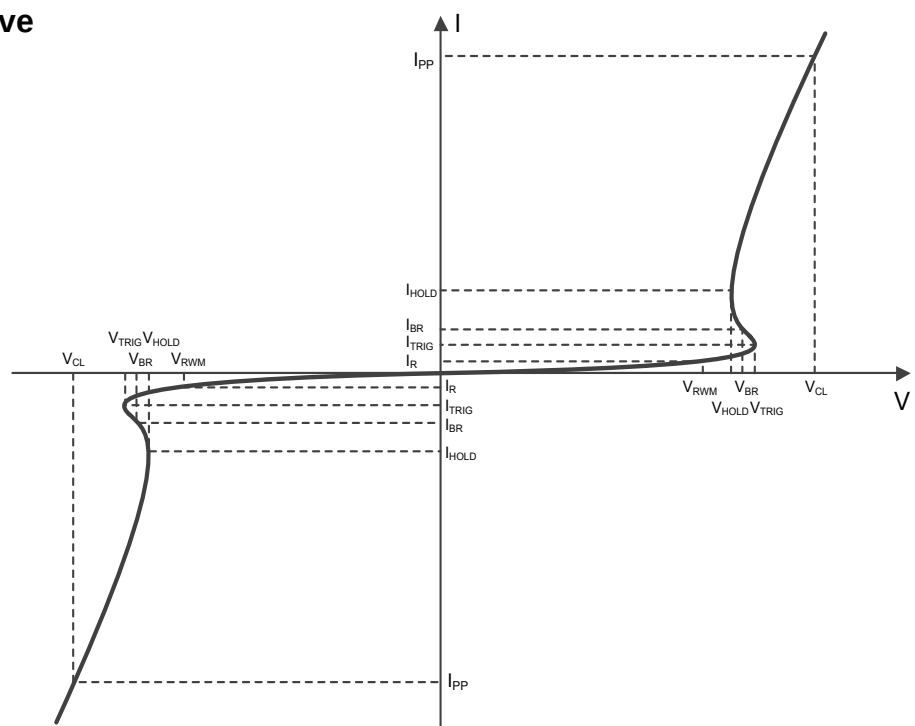
I_{TRIG} Reverse trigger current

V_{BR} Reverse breakdown voltage

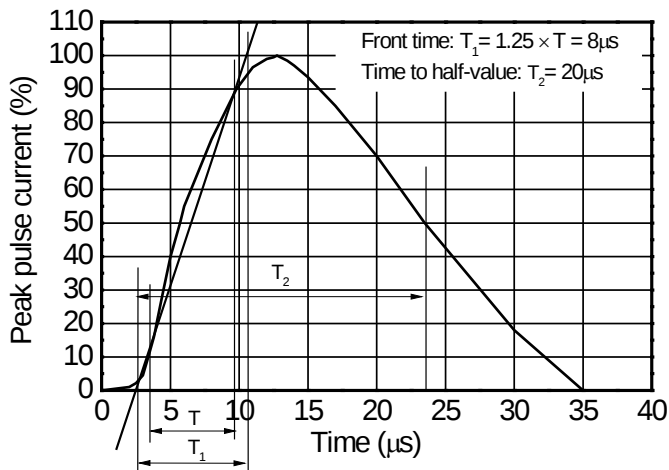
I_{BR} Reverse breakdown current

V_{HOLD} Reverse holding voltage

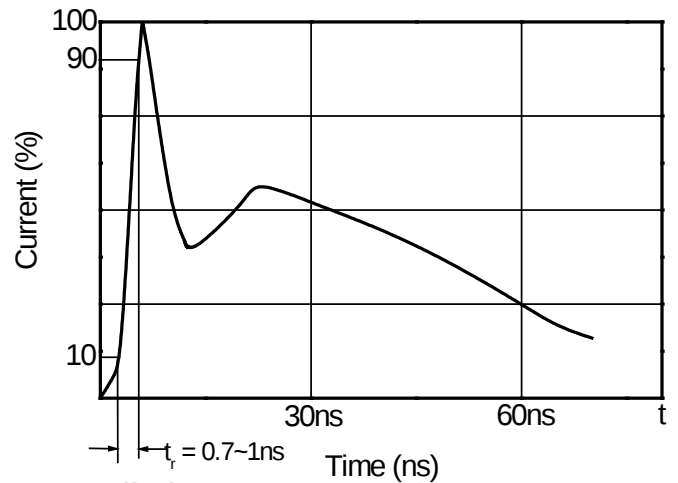
I_{HOLD} Reverse holding current



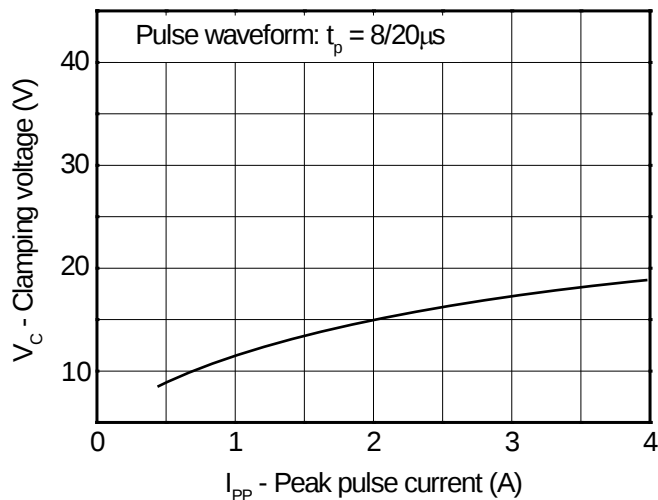
Typical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)



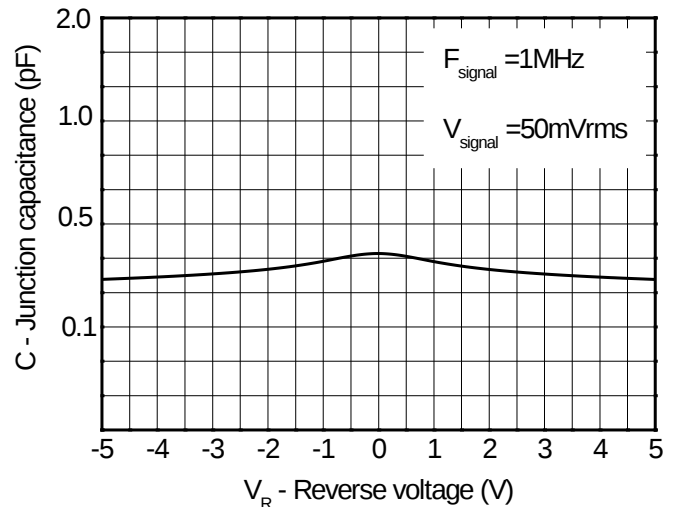
8/20 μs waveform per IEC61000-4-5



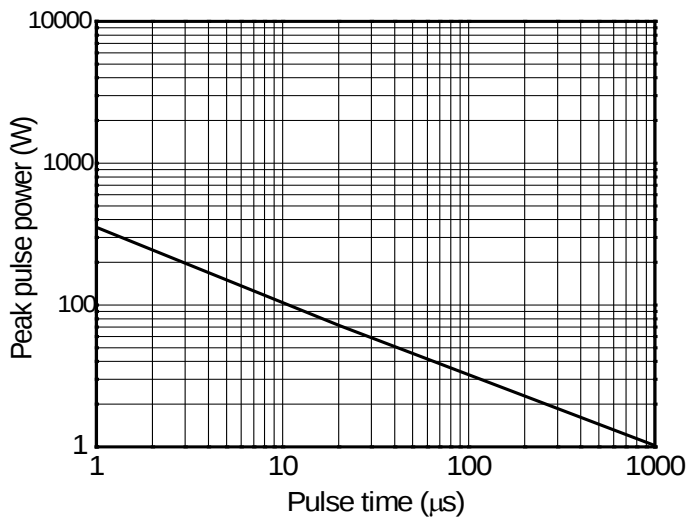
Contact discharge current waveform per IEC61000-4-2



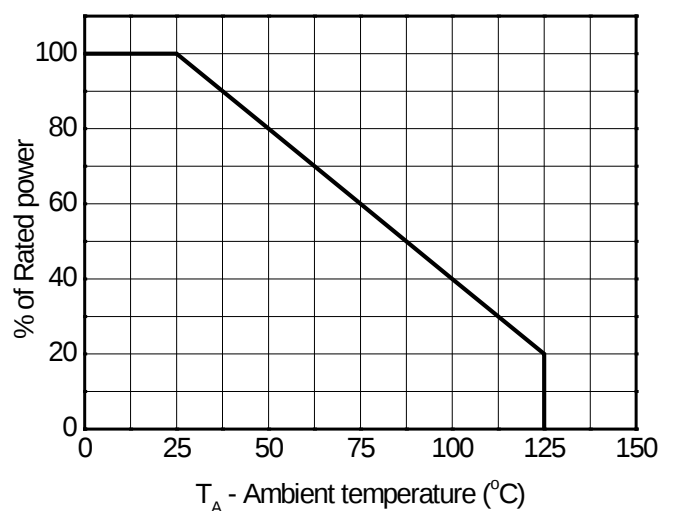
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverses voltage



Non-repetitive peak pulse power vs. Pulse time



Power derating vs. Ambient temperature

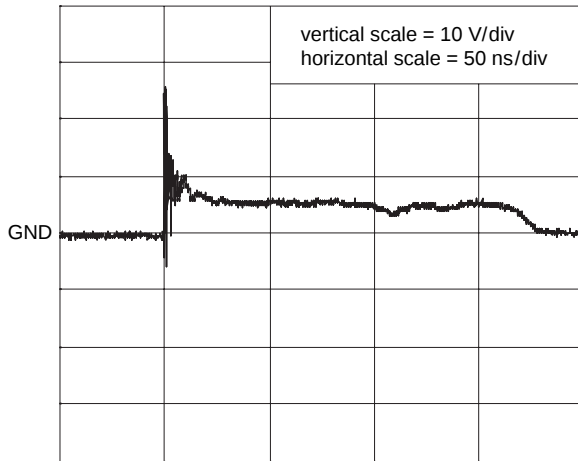


Figure 1. ESD Clamping Voltage Screenshot
Positive 8 kV Contact per IEC61000-4-2

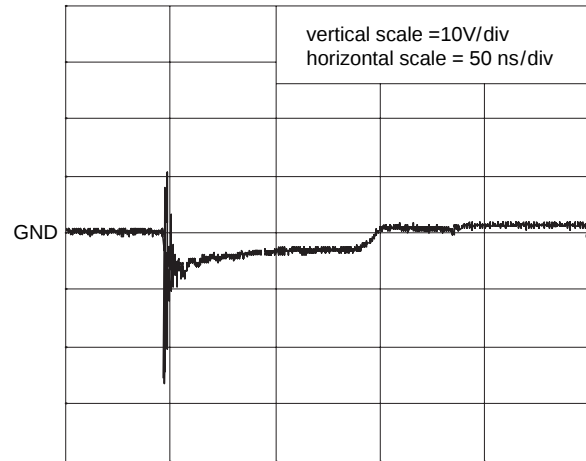
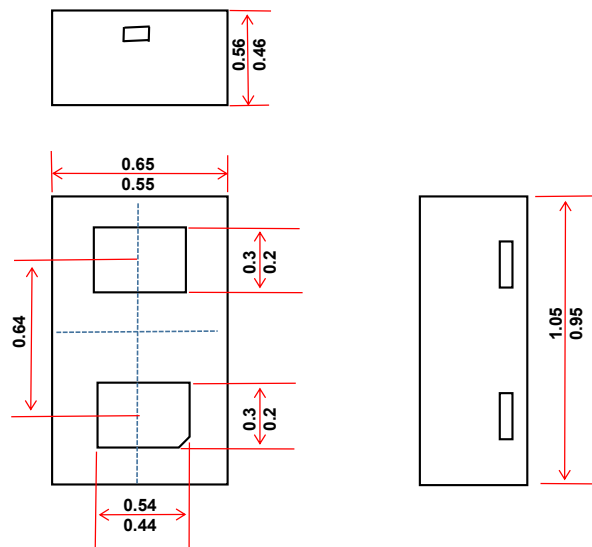


Figure 2. ESD Clamping Voltage Screenshot
Negative 8 kV Contact per IEC61000-4-2

Package outline dimensions



DIMENSION OUTLINE: Unit:mm

Recommended Mounting Pad Layout Unit:mm

