ESD Protection Diodes with Ultra–Low Capacitance

1-Line, Bi-directional, Transient Voltage Suppressors

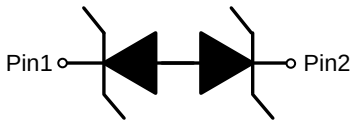
Descriptions

The ESD5D003SA 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 ESD5D003SA may be used to provide ESD protection up to ±20KV Air, ±15KV contact compliance to IEC61000-4-2 , and withstand peak pulse current up to 4 A (8/20μs) according to IEC61000-4-5.

The ESD5D003SA is available in DFN1006-2L package. Standard products are Pb-free and Halogen-free.

DFN1006-2L



Circuit diagram

Features

- Stand-off voltage: ±5V Max
- Transient protection for each line according to
  IEC61000-4-2 (ESD): ±20KV Air, ±15KV contact
  IEC61000-4-5 (Surge): 4 A (8/20μs)
- Solid-state silicon technology
- Low leakage current

Order information

Device	Marking	Package	Shipping
ESD5D003SA	5U	DFN1006-2L	10000/Tape&Reel

Applications

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

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse current (t_p = 8/20μs)	I_{PP}	4	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}	-40~85	°C
Operation junction temperature	T_J	125	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55~150	°C

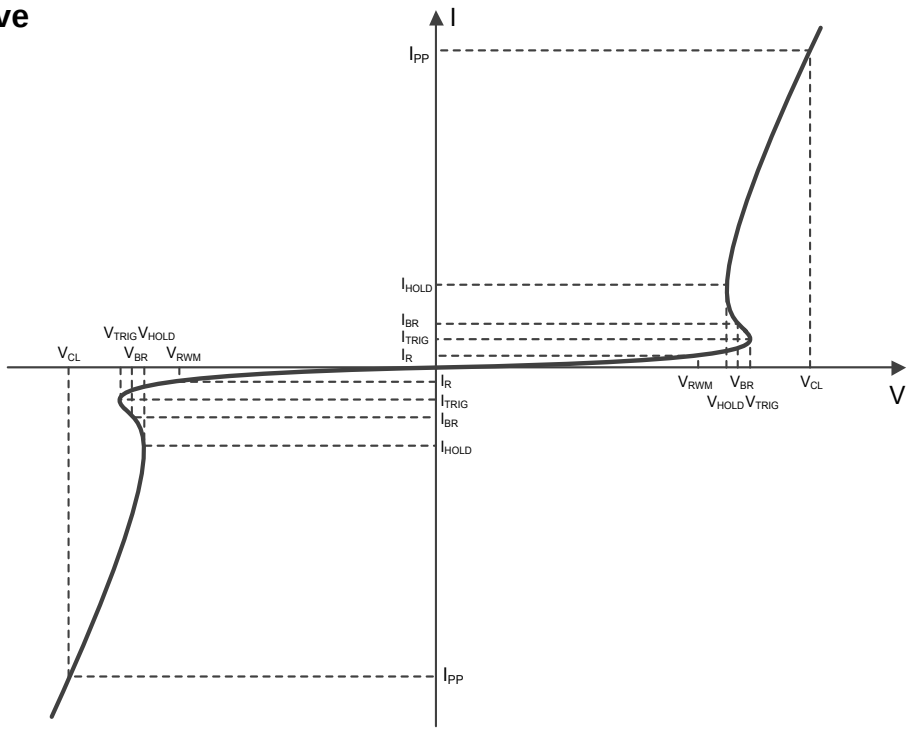
Electrical characteristics (TA=25 °C ,unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				±5	V
Reverse leakage current	I_R	V_{RWM} = 5V			100	nA
Reveres breakdown voltage	V_{BR}	I_T=1mA	6.5	8.5		V
Clamping voltage	V_C	Ipp=1A tp=8/20us		9.3	10	V
Clamping voltage	V_C	Ipp=4A tp=8/20us			12	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz		0.4	0.6	pF

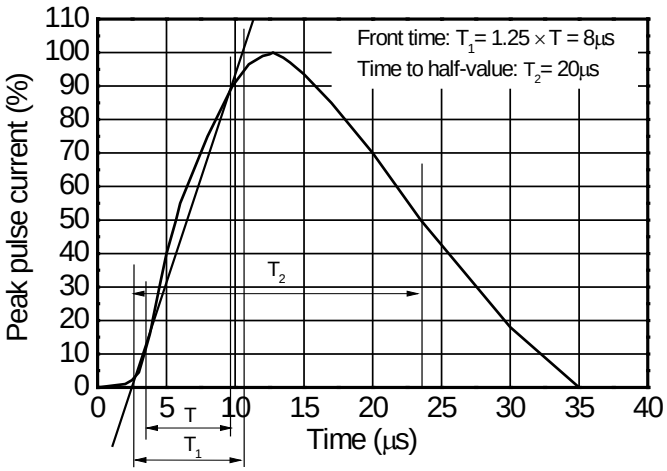
Electrical performance curve

V_{RWM} Reverse stand-off voltage
I_R Reverse leakage current
V_{CL} Clamping voltage
I_{PP} Peak pulse current

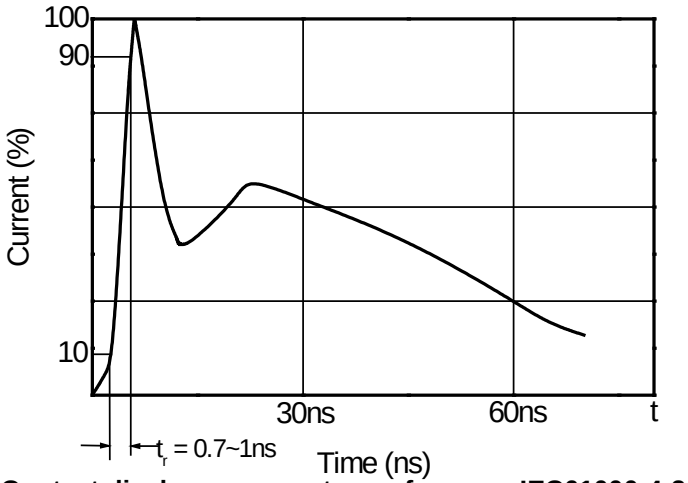
V_{TRIG} Reverse trigger voltage
I_{TRIG} Reverse trigger current
V_{BR} Reverse breakdown voltage
I_{BR} Reverse breakdown current
V_{HOLD} Reverse holding voltage
I_{HOLD} Reverse holding current



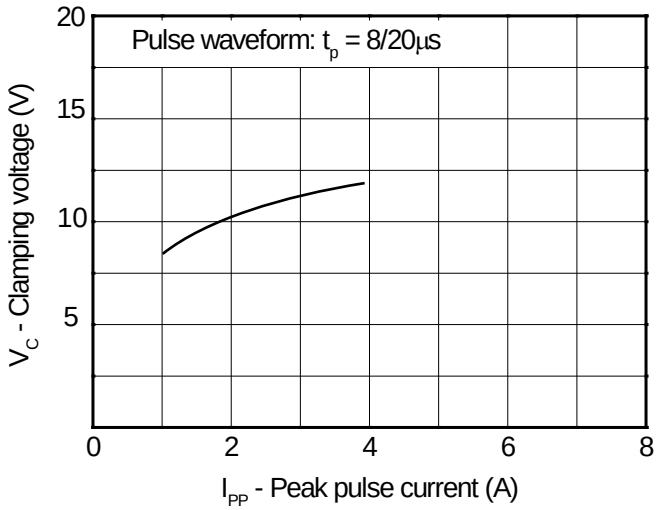
Typical characteristics (T_A=25°C, unless otherwise noted)



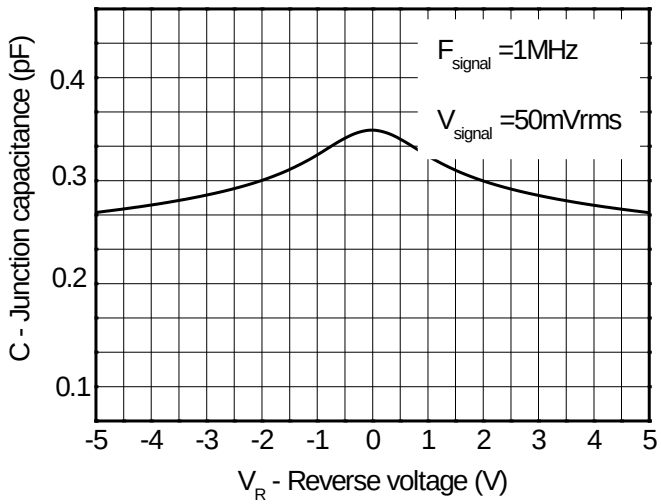
8/20μs waveform per IEC61000-4-5



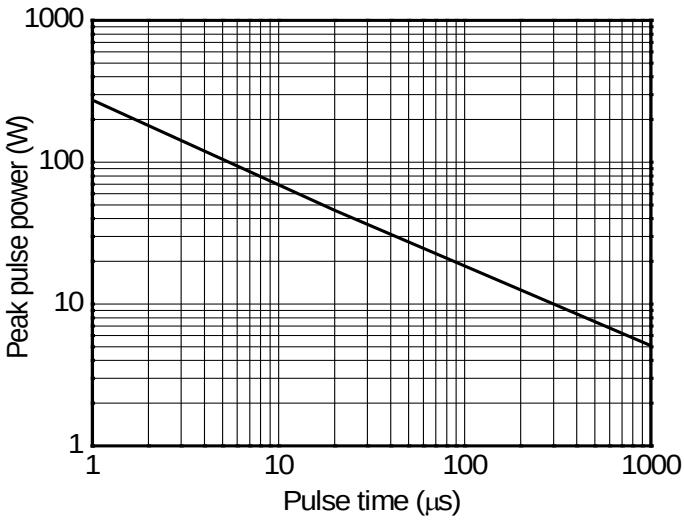
Contact discharge current waveform per IEC61000-4-2



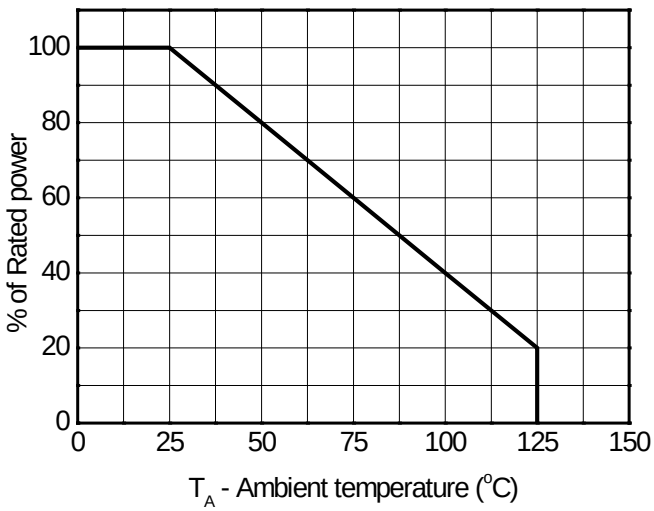
Clamping voltage vs. Peak pulse current



Capacitance vs. Reveres voltage

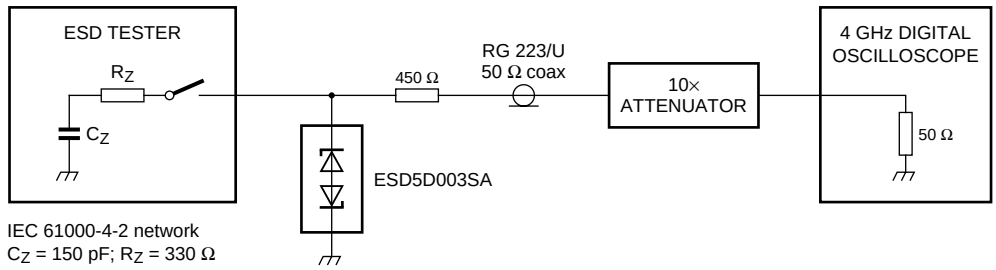


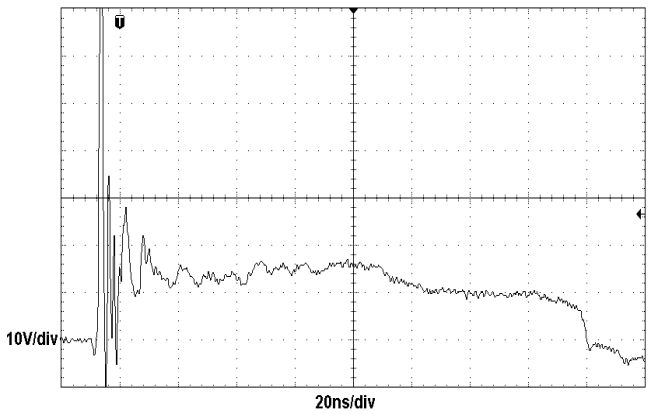
Non-repetitive peak pulse power vs. Pulse time



Power derating vs. Ambient temperature

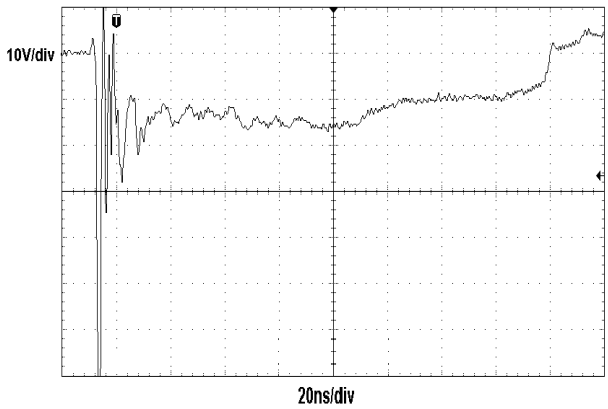
ESD clamping test setup and waveforms





ESD clamping

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



ESD clamping

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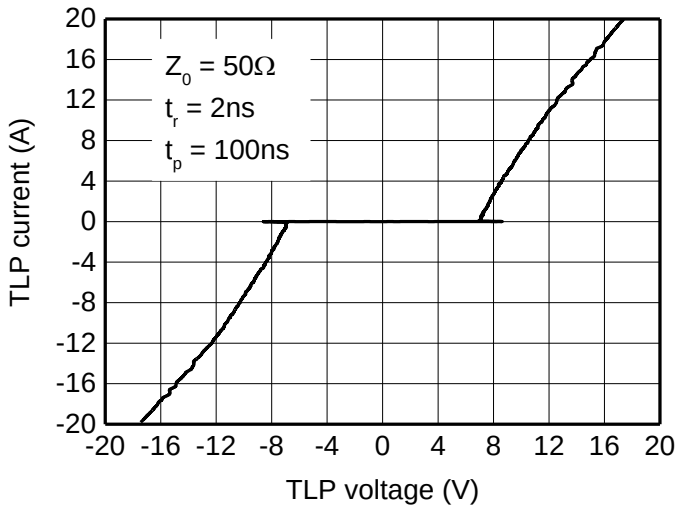
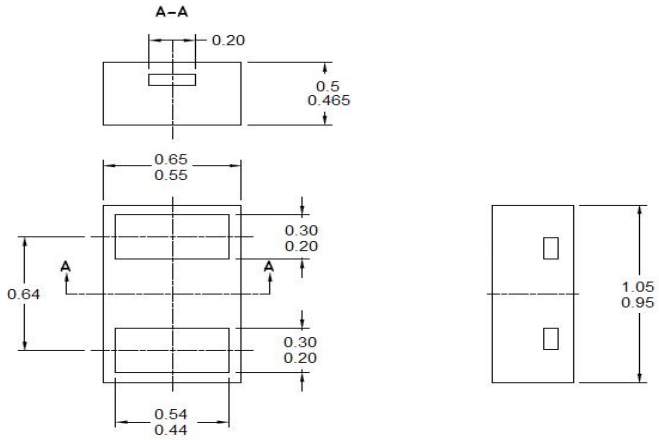


TLP Measurement

Package outline dimensions



DIMENSION OUTLINE: Unit:mm

Recommened Mounting Pad Layout Unit:mm