GESD0501SA

Ultra Low Capacitance TVS/ESD Protection Diode

DESCRIPTION

GESD0501SA is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.25pF only, GESD0501SA is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 (±15kV air, ±8kV contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

GESD0501SA uses ultra-small DFN0603 package. Each GESD0501SA device can protect one high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern. The combined features of low capacitance, ultra-small size and high ESD robustness make GESD0501SA ideal for high-speed data port and high-frequency line (e.g., USB 2.0 & antenna line) applications, such as cellular phones and HD visual devices.

FEATURES

- ✧Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD) ±15kV (Air)
    ±8kV (Contact)
  - IEC 61000-4-4 (EFT) 40A (5/50 ns)
  - Cable Discharge Event (CDE)
- ✧Package optimized for high-speed lines
- ✧Ultra-small package (0.6mm×0.3mm×0.25mm)
- ✧Protects one data, control or power line
- ✧Low capacitance: 0.25pF (Typical)
- ✧Low leakage current
- ✧Low clamping voltage
- ✧Lead finish: NiAu

MACHANICAL DATA

- ✧DFN0603 package
- ✧Flammability Rating: UL 94V-0
- ✧Packaging: Tape and Reel
- ✧High temperature soldering guaranted:260°C /10s
- ✧Reel size: 7 inch

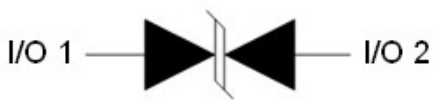
ORDERING INFORMATION

- ✧Device: GESD0501SA
- ✧Package: DFN0603
- ✧Marking: Marking Code + Date Code
- ✧Material: Halogen free
- ✧Packing: Tape & Reel
- ✧Quantity per reel: 10,000pcs

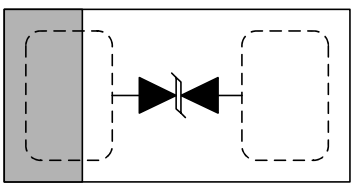
APPLICATIONS

- ✧Serial ATA
- ✧Desktops, Servers and Notebooks
- ✧Cellular Phones
- ✧MDDI Ports
- ✧USB2.0 Power and Data Line Protection
- ✧Display Ports
- ✧Digital Visual Interfaces (DVI)

CIRCUIT DIAGRAM



PIN CONFIGURATION



ABSOLUTE MAXIMUM RATING

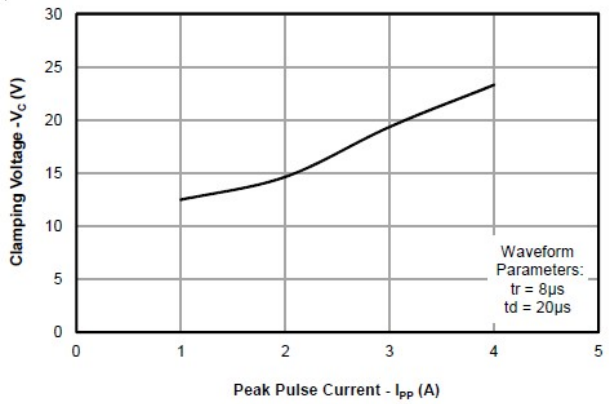
Symbol	Parameter	Value	Units
P_{PP}	Peak Pulse Power (8/20μs)	100	W
I_{PP}	Peak Pulse Current (8/20μs)	4.5	A
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±25 ±22	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

ELECTRICAL CHARACTERISTICS (Tamb=25°C)

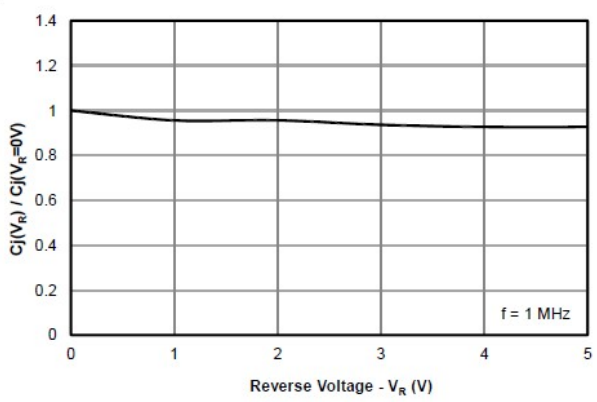
Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage				5.0	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA	7.0		11.0	V
I_R	Reverse Leakage Current	V_{RWM} = 5V		0.01	1.0	μA
V_C	Clamping Voltage	I_{PP} = 1A, t_p = 8/20μs			12	V
V_C	Clamping Voltage	I_{PP} = 4A, t_p = 8/20μs			20	V
C_J	Junction Capacitance	V_R = 0V, f = 1MHz		0.25	0.40	pF

ELECTRICAL CHARACTERISTICS CURVE

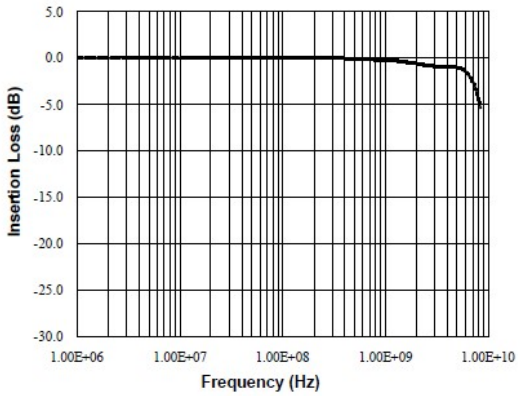
Clamping Voltage vs. Peak Pulse Current



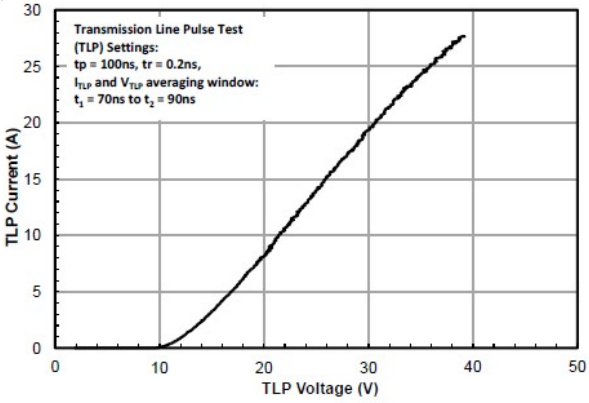
Typical Capacitance vs. Reverse Voltage



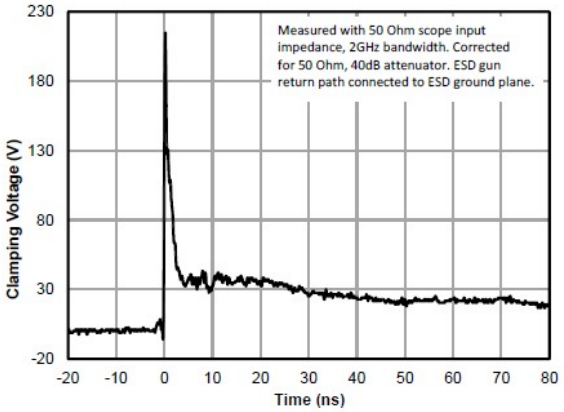
Insertion Loss S21 of I/O to I/O



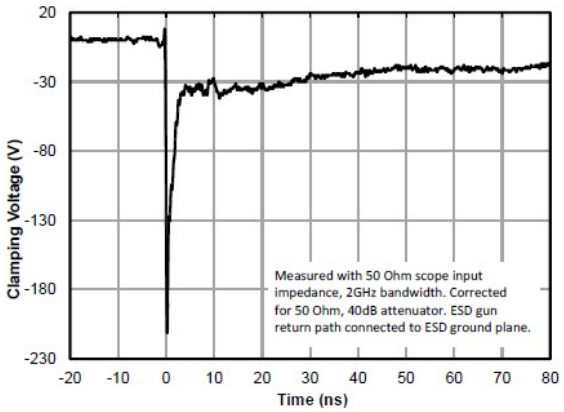
TLP Characteristic



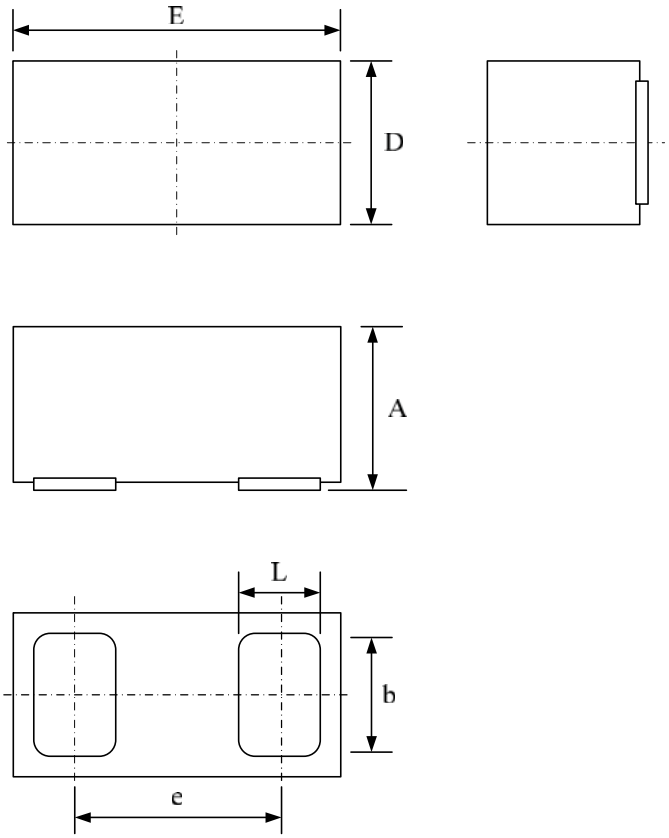
ESD Clamping (+8kV Contact per IEC 61000-4-2)



ESD Clamping (-8kV Contact per IEC 61000-4-2)



DFN0603 PACKAGE OUTLINE DIMENSIONS



Package Dimensions (Controlling dimensions are in millimeters)

Symbol	Dimensions (mm)			Dimensions (Inches)		
	Minimum	Typical	Maximum	Minimum	Typical	Maximum
A	0.280	0.300	0.320	0.011	0.012	0.013
b	0.220	—	0.280	0.009	—	0.011
D	0.275	0.300	0.325	0.011	0.012	0.013
E	0.575	0.600	0.625	0.023	0.024	0.025
e	—	0.380	—	—	0.015	—
L	0.140	—	0.200	0.005	—	0.008