GESD0501MA

Low Capacitance TVS Protection

DESCRIPTION

GESD0501MA is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 6pF only, GESD0501MA 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.

GESD0501MA uses ultra-small DFN0603 package. Each GESD0501MA device can protect one high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern..

FEATURES

- ✧Transient protection for high-speed data lines
  IEC 61000-4-2 (ESD) ±30kV (Air)
  ±30kV (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×0.3mm)
- ✧Protects one data, control or power line
- ✧Low capacitance: 6pF (Typical)
- ✧Low leakage current: 0.1uA@ VRWM (Typical)
- ✧Low clamping voltage
- ✧Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge

MACHANICAL DATA

- ✧DFN0603 package
- ✧Flammability Rating: UL 94V-0
- ✧Packaging: Tape and Reel
- ✧Reel size: 7 inch

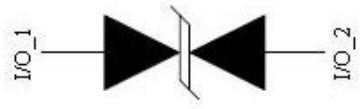
ORDERING INFORMATION

- ✧Device: GESD0501MA
- ✧Package: DFN0603
- ✧Marking: Part number
- ✧Material: Halogen free
- ✧Packing: Tape & Reel
- ✧Quantity per reel: 10,000pcs

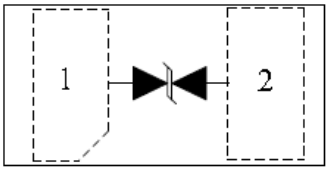
APPLICATIONS

- ✧Portable Electronics
- ✧Desktops, Servers and Notebooks
- ✧Cellular Phones
- ✧MP3 Ports
- ✧Digital Camera Ports

CIRCUIT DIAGRAM



PIN CONFIGURATION

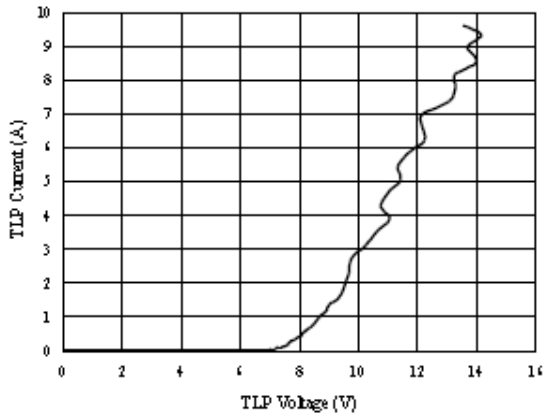


ABSOLUTE MAXIMUM RATING			
Symbol	**Parameter**	**Value**	**Units**
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±30 ±30	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

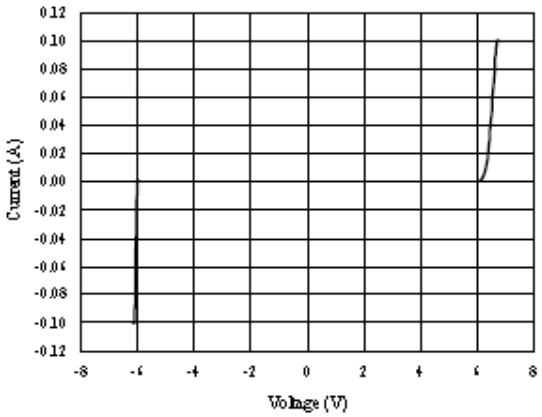
ELECTRICAL CHARACTERISTICS (Tamb=25°C)						
Symbol	**Parameter**	**Test Condition**	**Min**	**Typ**	**Max**	**Units**
V_{RWM}	Reverse Working Voltage				5.0	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA	5.5	6.0	8.0	V
I_R	Reverse Leakage Current	V_{RWM} = 5V		0.1	1.0	μA
V_{C1}	Clamping Voltage 1	I_{PP} = 1A, t_p = 8/20μs			10	V
V_{C2}	Clamping Voltage 2	I_{PP} = 4A, t_p = 8/20μs			15	V
C_J	Junction Capacitance	V_R = 0V, f = 1MHz	4	6	9	pF

ELECTRICAL CHARACTERISTICS CURVE

TLP Measurement of I/O_1 to I/O_2

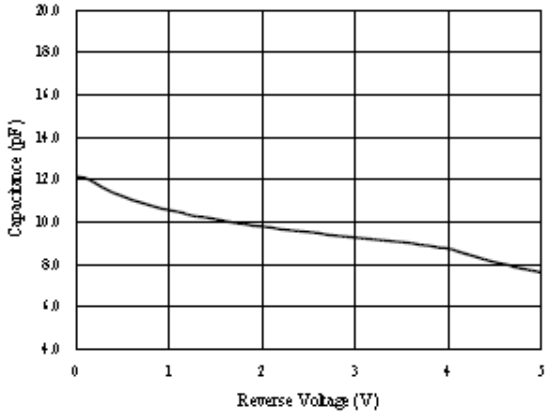


Voltage Sweeping of I/O_1 to I/O_2

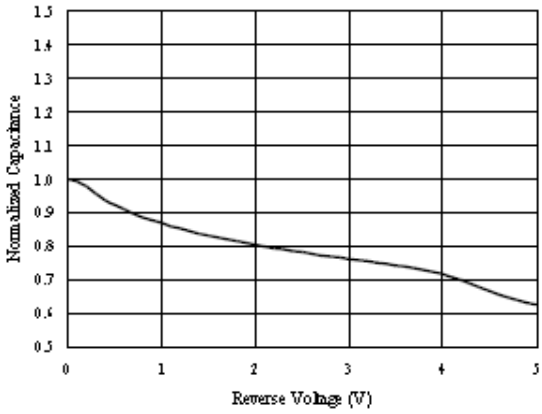


Capacitance vs. Voltage of I/O_1 to I/O_2 (f = 1MHz)

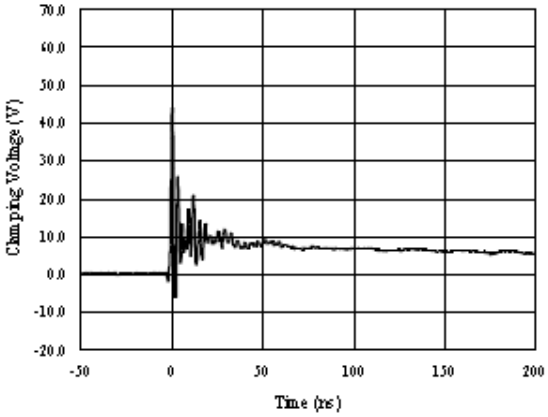
Capacitance *vs.* Reverse Voltage



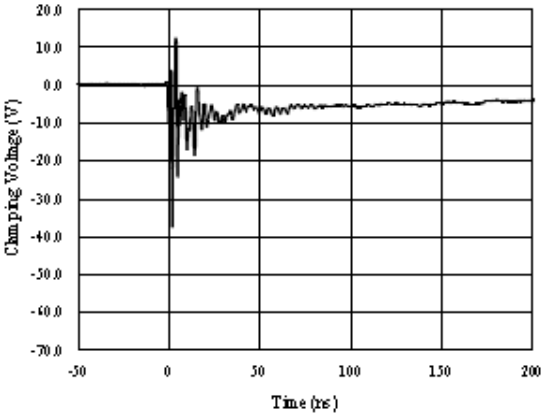
Normalized Capacitance *vs.* Reverse Voltage



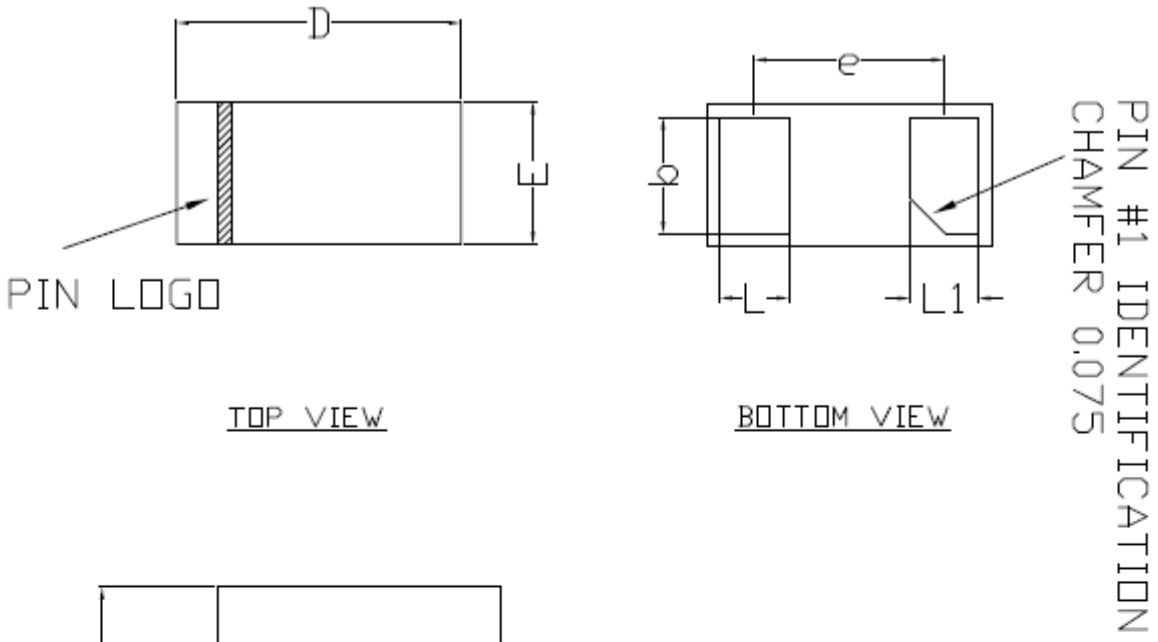
ESD Clamping of I/O_1 to I/O_2 (+8kV Contact per IEC 61000-4-2)



ESD Clamping of I/O_1 to I/O_2 (-8kV Contact per IEC 61000-4-2)

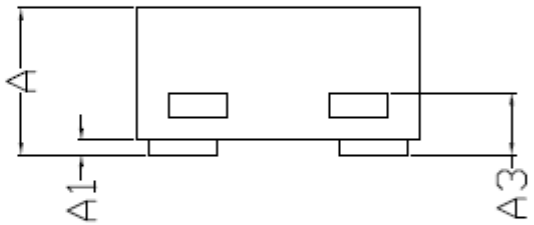


DFN1006 PACKAGE OUTLINE DIMENSIONS



TOP VIEW

BOTTOM VIEW



SIDE VIEW

COMMON DIMENSIONS(MM)			
PKG.	X3-EXTREME THIN		
REF.	MIN.	NOM.	MAX
A	>0.23	–	0.33
A1	0.00	–	0.05
A3	0.102REF.		
D	0.55	0.60	0.65
E	0.25	0.30	0.35
b	0.215	0.245	0.275
L	0.115	0.145	0.175
L1	0.115	0.145	0.175
e	0.40BSC		