

Low Capacitance ESD/Surge Protection for Gigabit Ethernet Interfaces

DESCRIPTION

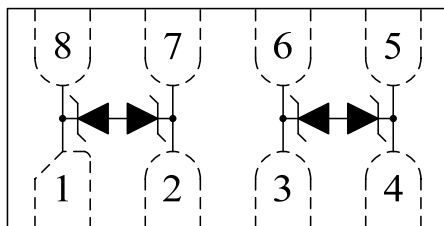
GESD2502CW is a low-capacitance Transient Voltage Suppressor (TVS) array designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.8 pF only, GESD2502CW is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), IEC 61000-4-5 (Surge) (15A, 8/20 μs), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

Each GESD2502CW device can protect two high-speed line pairs. The combined features of low capacitance and high ESD robustness make GESD2502CW ideal for high-speed data port and high-frequency line (e.g., Gigabit Ethernet Ports) applications. The low clamping voltage of the GESD2502CW guarantees a minimum stress on the protected IC.

ORDERING INFORMATION

- ✧ Device: GESD2502CW
- ✧ Package: DFN2010-8L
- ✧ Marking: 2502CW
- ✧ Material: Halogen free and RoHS compliant
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 3,000pcs

PIN CONFIGURATION



FEATURES

- ✧ Transient protection for high-speed data lines
 - IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (Air)
 - $\pm 30\text{kV}$ (Contact)
 - IEC 61000-4-4 (EFT) 40A (5/50 ns)
 - IEC 61000-4-5 (Surge) 15A (8/20 μs)
- ✧ Package optimized for high-speed lines
- ✧ Provides protection for two line pairs
- ✧ Low capacitance: 0.8 pF (Typical)
- ✧ Low leakage current: 100nA @ VRWM (Max)
- ✧ Low operating and clamping voltage
- ✧ Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ contact discharge

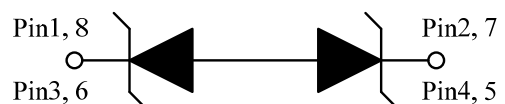
MACHANICAL DATA

- ✧ DFN2010-8L package
- ✧ Flammability Rating: UL 94V-0
- ✧ MSL 1 & Thermally-Enhanced
- ✧ Reel size: 7 inch
- ✧ High temperature soldering guaranteed: 260 $^{\circ}\text{C}$ /10s

APPLICATIONS

- ✧ 10/100/1000M Ethernet Ports
- ✧ WAN/LAN Equipment
- ✧ Desktops, Servers and Notebooks
- ✧ Cellular Phones
- ✧ Switching Systems
- ✧ Audio/Video Inputs

CIRCUIT DIAGRAM



ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Units
P _{PP}	Peak Pulse Power (8/20μs)	270	W
I _{PP}	Peak Pulse Current (8/20μs)	15	A
V _{ESD}	ESD per IEC 61000-4-2 (Contact) ESD per IEC 61000-4-2 (Air)	±30 ±30	kV
T _{OPT}	Operating Temperature	-55~150	°C
T _{STG}	Storage Temperature	-55~150	°C

ELECTRICAL CHARACTERISTICS (T_{amb}=25°C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V _{RWM}	Reverse Working Voltage				2.5	V
I _R	Reverse Leakage Current	V _{RWM} = 2.5V			100	nA
V _B	Reverse Breakdown Voltage	I _R = 1mA	3.5			V
V _{C1}	Clamping Voltage 1	I _{PP} = 1A, t _p = 8/20μs Pin 1, 8 to Pin 2, 7 & Pin 3, 6 to Pin 4, 5			6.5	V
V _{C2}	Clamping Voltage 2	I _{PP} = 10A, t _p = 8/20μs Pin 1, 8 to Pin 2, 7 & Pin 3, 6 to Pin 4, 5			12	V
V _{C3}	Clamping Voltage 3	I _{PP} = 15A, t _p = 8/20μs Pin 1, 8 to Pin 2, 7 & Pin 3, 6 to Pin 4, 5			18	V
C _J	Junction Capacitance	V _R = 0V, f = 1MHz Pin 1, 8 to Pin 2, 7 & Pin 3, 6 to Pin 4, 5		0.8		pF

ELECTRICAL CHARACTERISTICS CURVE

Fig 1 8/20 μ s Waveform per IEC61000-4-5

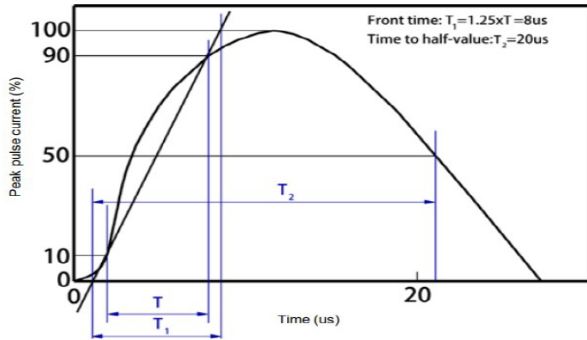


Fig 2 Contact Discharge Current Waveform per IEC 61000-4-2)

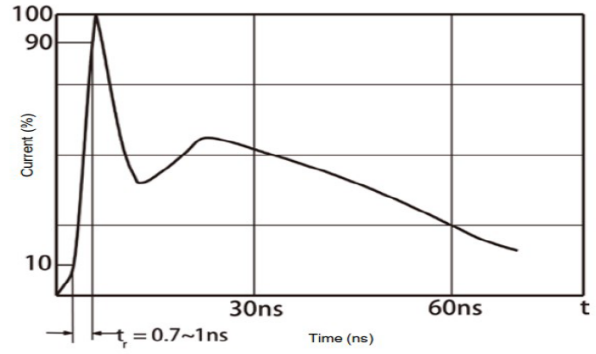


Fig 3 Voltage vs Capacitance

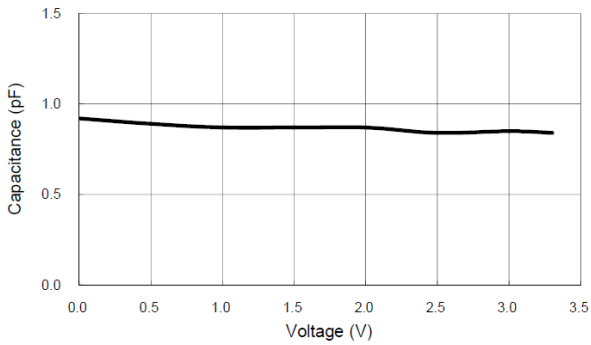
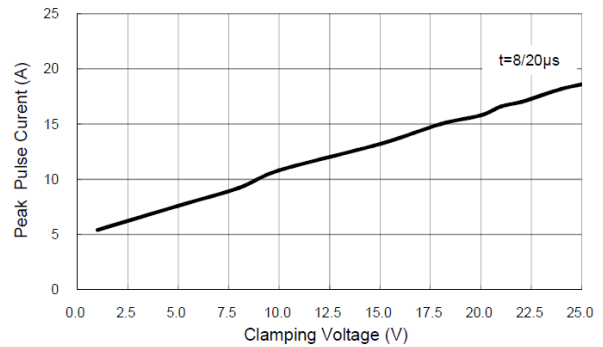
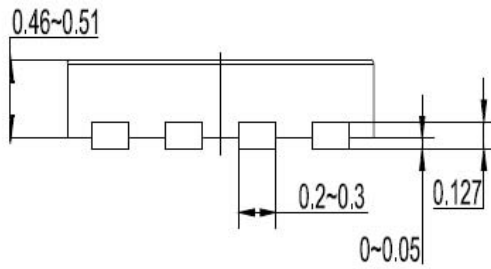
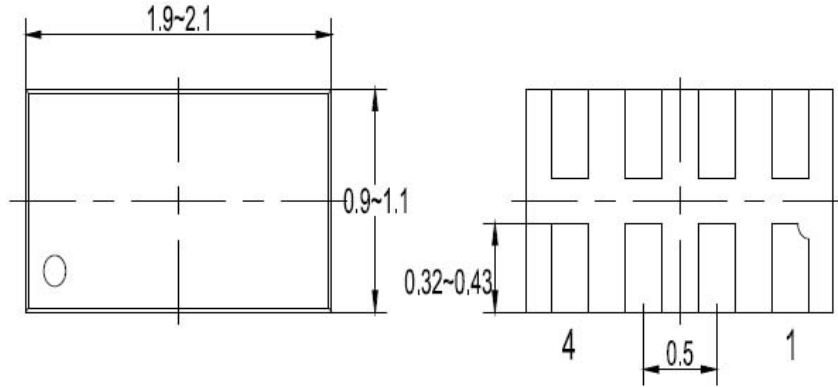


Fig 4 Clamping Voltage vs Peak Pulse Current



DFN2010-8L PACKAGE OUTLINE DIMENSIONS



Recommended Soldering Footprint

