RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

ESD2502CD

Low Capacitance ESD/Surge Protection for Gigabit Ethernet Interfaces

DESCRIPTION

ESD2502CD 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, ESD2502CD 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), IEC 61000-4-5 (Surge) (15A, 8/20μs), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

Each ESD2502CD device can protect two high-speed line pairs. The combined features of low capacitance and high ESD robustness make ESD2502CD ideal for high-speed data port and high-frequency line (e.g., Gigabit Ethernet Ports) applications. The low clamping voltage of the ESD2502CD guarantees a minimum stress on the protected IC.

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)
  - IEC 61000-4-5 (Surge) 15A (8/20μs)
- ✧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 ±8kV 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℃/10s

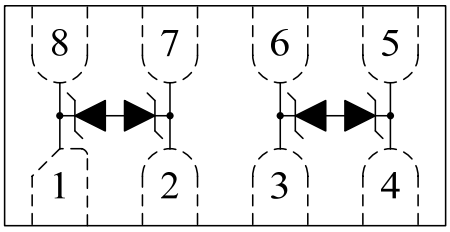
ORDERING INFORMATION

- ✧ Device: ESD2502CD
- ✧Package: DFN2010-8L
- ✧Marking: 2502CW
- ✧Material: Halogen free and RoHS compliant
- ✧Packing: Tape & Reel
- ✧Quantity per reel: 3,000pcs

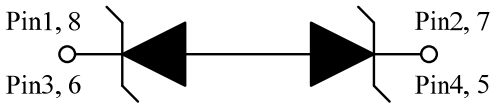
APPLICATIONS

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

PIN CONFIGURATION



CIRCUIT DIAGRAM



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REV:O

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 (Tamb=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

RATING AND CHARACTERISTICS CURVES (ESD2502CD)

Fig 1 8/20μs Waveform per IEC61000-4-5

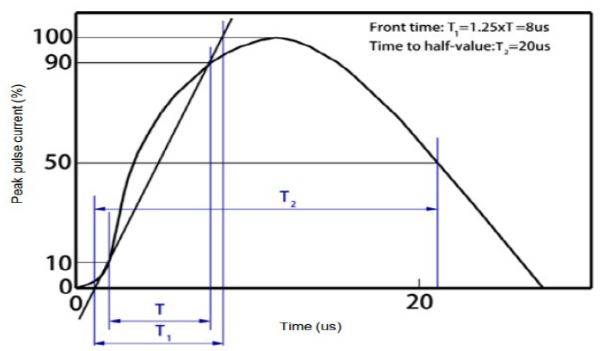


Fig 2 Contact Discharge Current Waveform per IEC 61000-4-2)

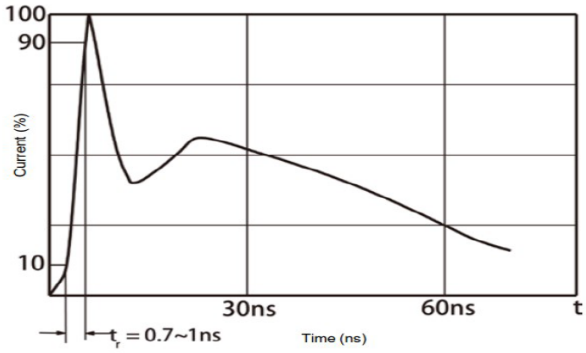


Fig 3 Voltage vs Capacitance

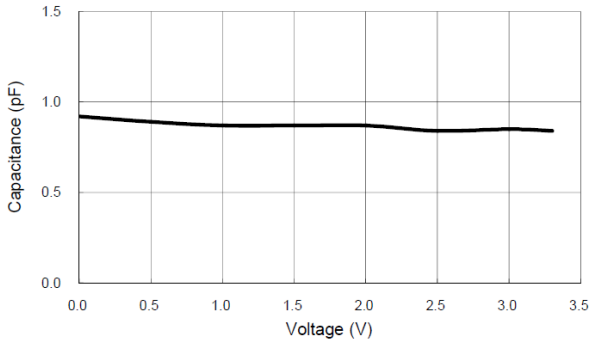
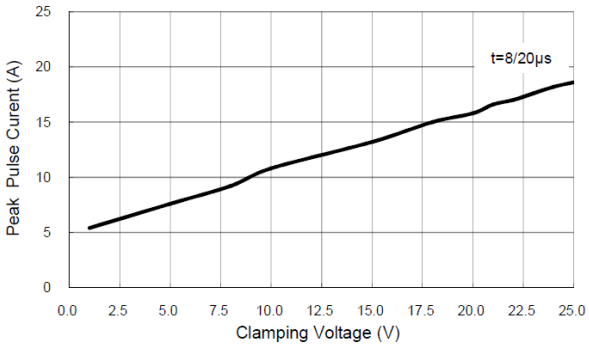
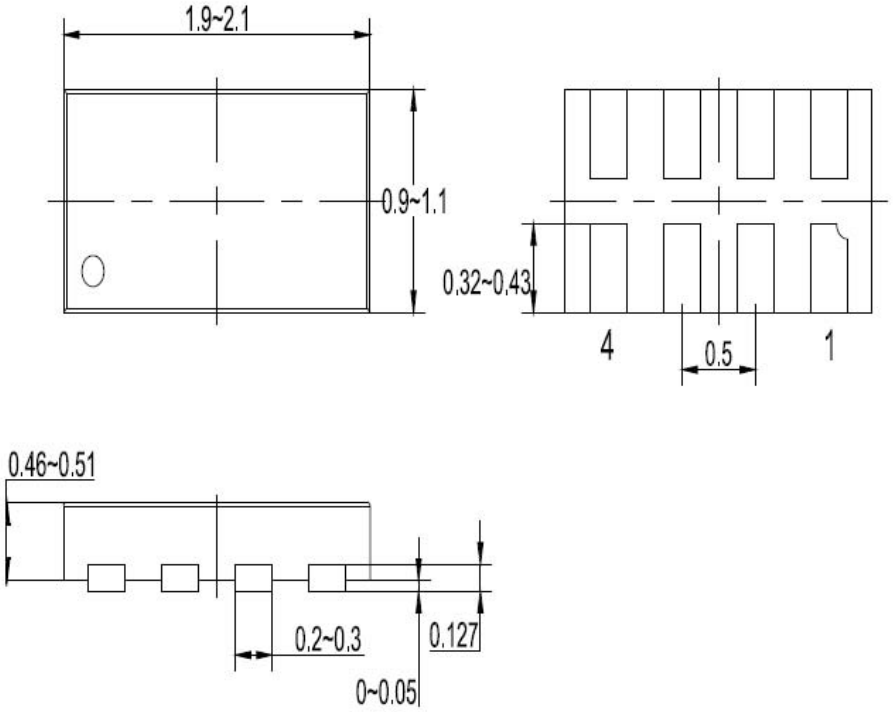


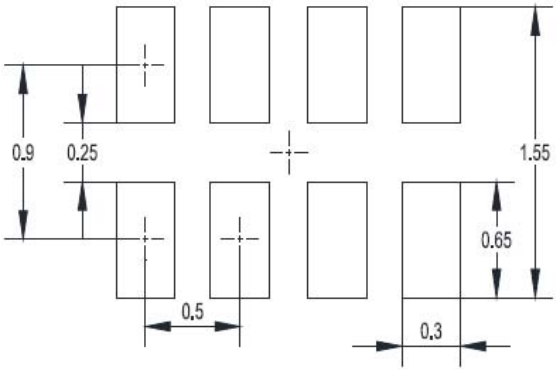
Fig 4 Clamping Voltage vs Peak Pulse Current



DFN2010-8L PACKAGE OUTLINE DIMENSIONS



Recommended Soldering Footprint



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