



# Ultra Low Capacitance TVS/ESD Protection Diode



## DESCRIPTION

GESD0502TL 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 0.2pF (I/O to I/O) only, GESD0502TL 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), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

GESD0502TL uses small SOT-23 package. Each GESD0502TL device can protect two high-speed data lines. The combined features of low capacitance, small size and high ESD robustness make GESD0502TL ideal for high-speed data port and high-frequency line applications. The low clamping voltage of the GESD0502TL guarantees a minimum stress on the protected IC.

## FEATURES

- ◇ Transient protection for high-speed data lines  
IEC 61000-4-2 (ESD)  $\pm 15\text{kV}$  (Air)  
 $\pm 8\text{kV}$  (Contact)
- IEC 61000-4-4 (EFT) 40A (5/50 ns)  
Cable Discharge Event (CDE)
- ◇ Small package (2.9mm $\times$ 2.4mm $\times$ 1.0mm)
- ◇ Protects two data lines
- ◇ Low capacitance: 0.2pF Typical (I/O-I/O)
- ◇ Low leakage current
- ◇ Low clamping voltage

## MACHANICAL DATA

- ◇ SOT-23 package
- ◇ Flammability Rating: UL 94V-0
- ◇ Packaging: Tape and Reel
- ◇ High temperature soldering guaranteed: 260/10s
- ◇ Reel size: 7 inch

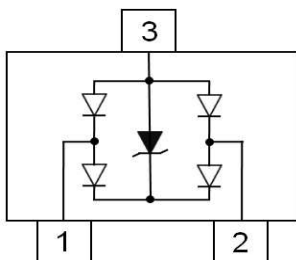
## ORDERING INFORMATION

- ◇ Device: GESD0502TL
- ◇ Package: SOT-23
- ◇ Marking: 52L
- ◇ Material: Halogen free
- ◇ Packing: Tape & Reel
- ◇ Quantity per reel: 3,000pcs

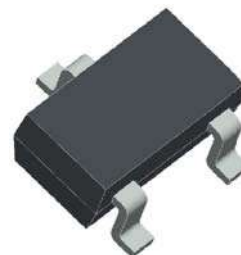
## APPLICATIONS

- ◇ Serial ATA
- ◇ Desktops, Servers and Notebooks
- ◇ PCI Express
- ◇ MDDI Ports
- ◇ USB Data Line Protection
- ◇ Display Ports
- ◇ Digital Visual Interfaces (DVI)

## PIN CONFIGURATION



## PACKAGE OUTLINE



# YSESD0502TL

## ABSOLUTE MAXIMUM RATING

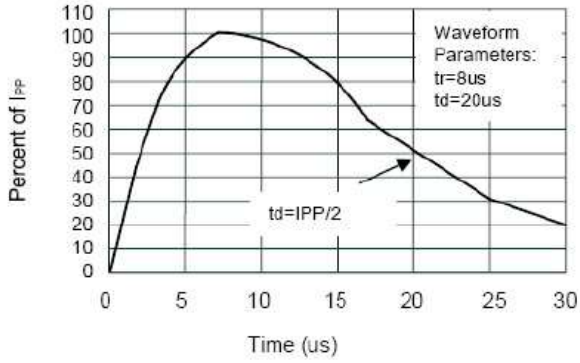
Symbol	Parameter	Value	Units
P <sub>PP</sub>	Peak Pulse Power (8/20μs)	60	W
V <sub>ESD</sub>	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±20 ±20	kV
T <sub>OPT</sub>	Operating Temperature	-55/+125	°C
T <sub>STG</sub>	Storage Temperature	-55/+150	°C

## ELECTRICAL CHARACTERISTICS (T<sub>amb</sub>=25°C)

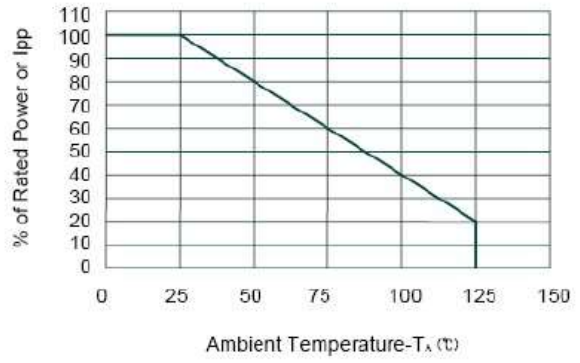
Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V <sub>RWM</sub>	Reverse Working Voltage	I/O to GND			5.0	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> = 1mA Between I/O and GND	6.0			V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> = 5V Between I/O and GND			100	nA
V <sub>C</sub>	Clamping Voltage	I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μs Between I/O and GND			10	V
		I <sub>PP</sub> = 4A, t <sub>p</sub> = 8/20μs Between I/O and GND			15	V
V <sub>F</sub>	Forward Voltage	I <sub>T</sub> = 10mA Between I/O and GND			1.2	V
C <sub>T</sub>	Total Capacitance	V <sub>R</sub> = 0V, f = 1MHz Between I/O and GND		0.4		pF
		V <sub>R</sub> = 0V, f = 1MHz Between I/O and I/O		0.2		pF

# YSESD0502TL

## ELECTRICAL CHARACTERISTICS CURVE

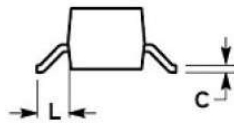
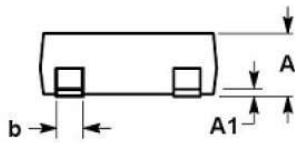
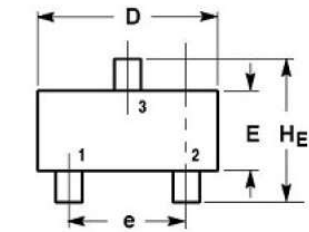


Pulse Waveform



Power Derating Curve

## SOT-23 PACKAGE OUTLINE DIMENSIONS



DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104