RCLAMP0502B

Ultra Low Capacitance ESD Protection Diode

Datasheet

DESCRIPTION

The RCLAMP0502B 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, RCLAMP0502B 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.

RCLAMP0502B uses small SOT-523 package.Each RCLAMP0502B device can protect two high-speed data lines. The combined features of low capacitance, small size and high ESD robustness make RCLAMP0502B ideal for high-speed data port and high-frequency line applications. The low clamping voltage of the RCLAMP0502B guarantees a minimum stress on the protected IC.

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)
- ✧Small package (1.6mm×0.8mm×0.75mm)
- ✧Protects two data lines
- ✧Low capacitance: 0.2pF Typical (I/O-I/O)
- ✧Low leakage current
- ✧Low clamping voltage

MACHANICAL DATA

- ✧SOT-523 package
- ✧Flammability Rating: UL 94V-0
- ✧Packaging: Tape and Reel
- ✧High temperature soldering guaranted:260/10s
- ✧Reel size: 7 inch
- ✧MSL1

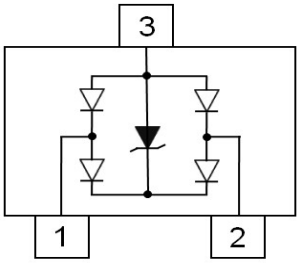
ORDERING INFORMATION

- ✧Package: SOT-523
- ✧Marking: 52L
- ✧Material: Halogen free
- ✧Packing: Tape & Reel
- ✧Quantity per reel: 3,000pcs

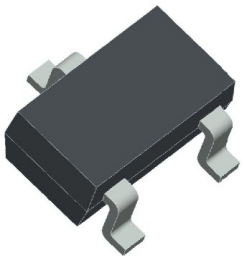
APPLICATIONS

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

PIN CONFIGURATION



PACKAGE OUTLINE



ABSOLUTE MAXIMUM RATING			
Symbol	**Parameter**	**Value**	**Units**
P_{PP}	Peak Pulse Power (8/20μs)	60	W
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±20 ±20	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+125	°C

ELECTRICAL CHARACTERISTICS (Tamb=25°C)						
Symbol	**Parameter**	**Test Condition**	**Min**	**Typ**	**Max**	**Units**
V_{RWM}	Reverse Working Voltage	I/O to GND			5.0	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA Between I/O and GND	6.0			V
I_R	Reverse Leakage Current	V_{RWM} = 5V Between I/O and GND			100	nA
V_F	Forward Voltage	I_T = 10mA Between I/O and GND			1.2	V
V_C	Clamping Voltage	I_{PP} = 1A, t_p = 8/20μs Between I/O and GND			10	V
		I_{PP} = 4A, t_p = 8/20μs Between I/O and GND			15	V
C_T	Total Capacitance	V_R = 0V, f = 1MHz Between I/O and GND		0.4	0.6	pF
		V_R = 0V, f = 1MHz Between I/O and I/O		0.2	0.3	pF

ELECTRICAL CHARACTERISTICS CURVE

Fig 1 Power Derating Curve

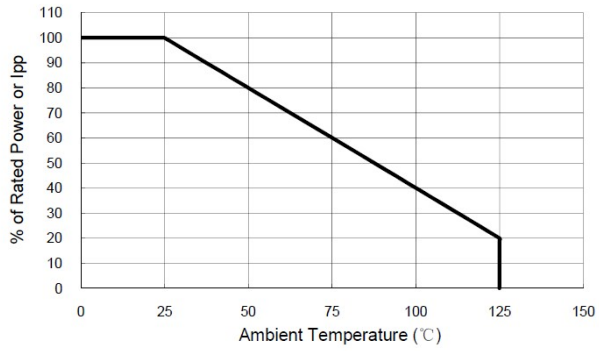


Fig 2 Clamping Voltage vs Peak Pulse Current

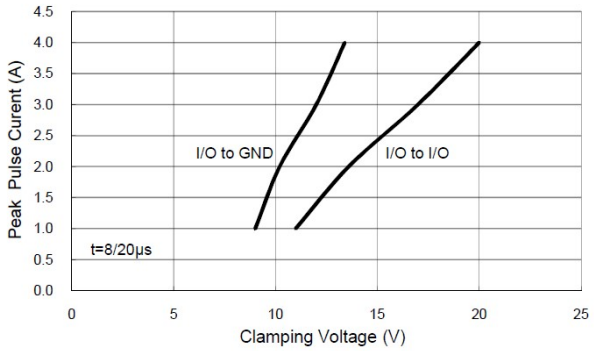


Fig 3 Voltage Sweeping of I/O to I/O

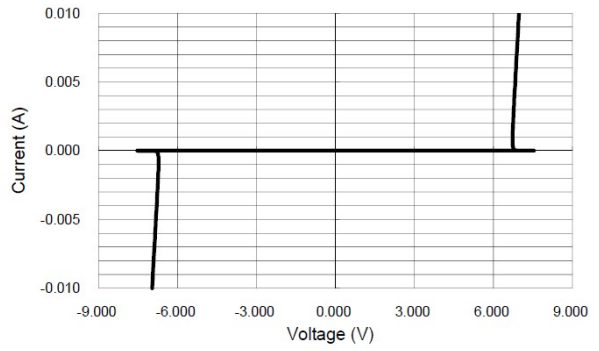


Fig 4 Voltage vs Capacitance

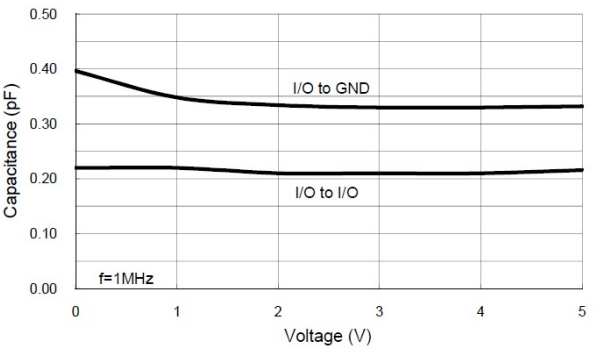


Fig 5 ESD Clamping of I/O to GND (+8kV Contact per IEC 61000-4-2)

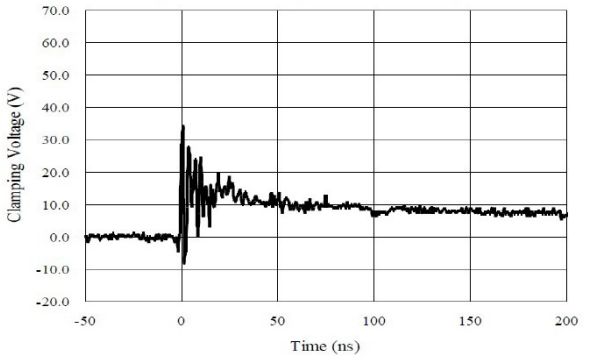
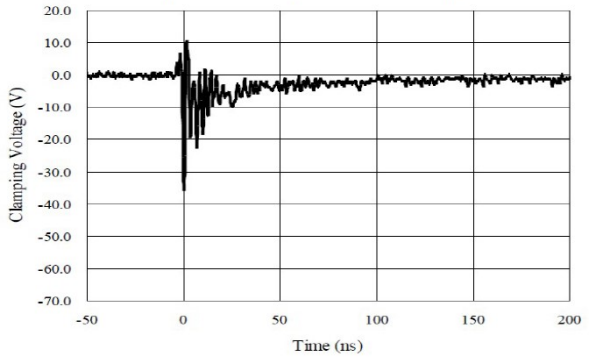
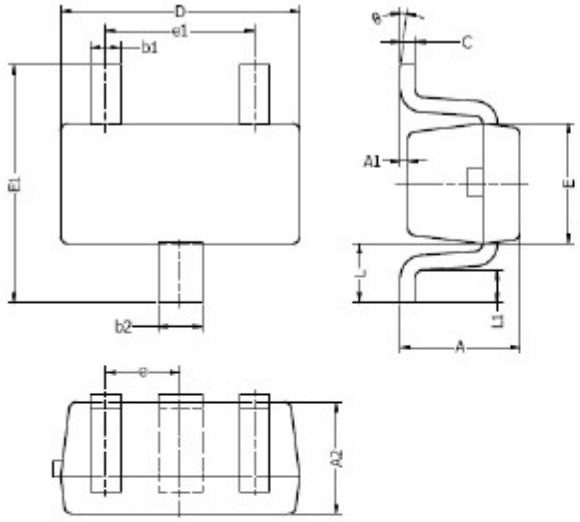


Fig 6 ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)



SOT-523 PACKAGE OUTLINE DIMENSIONS



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.70	0.90	0.028	0.035
A1	0.00	0.10	0.000	0.004
A2	0.70	0.80	0.028	0.031
b1	0.15	0.25	0.006	0.010
b2	0.25	0.35	0.010	0.014
c	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
E1	1.45	1.75	0.057	0.069
e	0.50 TYP.		0.020 TYP.	
e1	0.90	1.10	0.035	0.043
L	0.40 REF.		0.016 REF.	
L1	0.10	0.30	0.004	0.012
θ	0°	8°	0°	8°

Typical Soldering Pattern: