

DESCRIPTION

ESD0502TCU 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 1.5pF (I/O to I/O) only, ESD0502TCU 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.

ESD0502TCU uses small SOT-23 package. Each ESD0502TCU device can protect two high-speed data lines. The combined features of low capacitance, small size and high ESD robustness make ESD0502TCU ideal for high-speed data port and high-frequency line applications. The low clamping voltage of the ESD0502TCU guarantees a minimum stress on the protected IC.

ORDERING INFORMATION

- ✧ Device: ESD0502TCU
- ✧ Package: SOT-23
- ✧ Marking: 1UW
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 3,000pcs

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 (1.6mm×0.8mm×0.75mm)
- ✧ Protects two data lines
- ✧ Low capacitance: 1.5pF Typical (I/O-I/O)
- ✧ Low leakage current
- ✧ Low clamping voltage

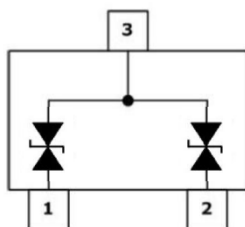
MACHANICAL DATA

- ✧ SOT-23 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranteed: 260/10s
- ✧ Reel size: 7 inch
- ✧ MSL1

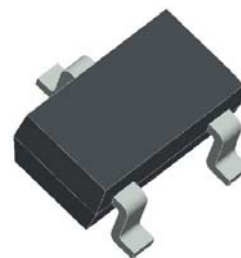
APPLICATIONS

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

PIN CONFIGURATION



PACKAGE OUTLINE



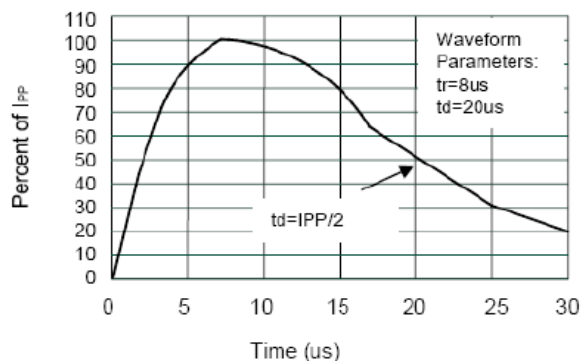
ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Units
P_{PP}	Peak Pulse Power (8/20 μ s)	28	W
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	± 15 ± 8	kV
T_{OPT}	Operating Temperature	-55/+150	°C
T_{STG}	Storage Temperature	-55/+150	°C

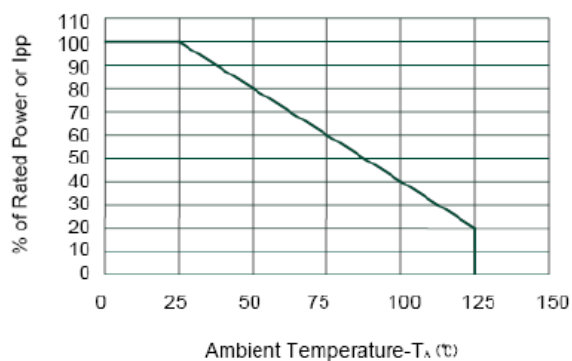
ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}C$)

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	5.6		9.4	V
I_R	Reverse Leakage Current	$V_{RWM} = 5V$ Between I/O and GND			1	μA
V_C	Clamping Voltage	$I_{PP} = 1A, t_p = 8/20\mu s$ Between I/O and GND			10.5	V
		$I_{PP} = 2A, t_p = 8/20\mu s$ Between I/O and GND			14	V
C_T	Total Capacitance	$V_R = 0V, f = 1MHz$ Between I/O and GND		3.0	4.0	pF
		$V_R = 0V, f = 1MHz$ Between I/O and I/O		1.5	2.5	pF

ELECTRICAL CHARACTERISTICS CURVE

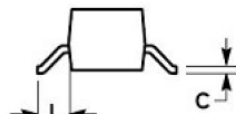
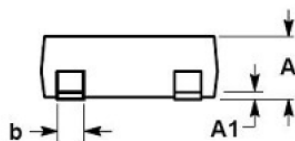
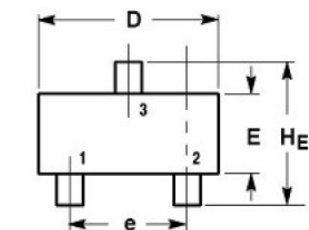


Pulse Waveform



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