

Ulter Low Capacitance ESD Protection Array

Description

ESD0504TL is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to protection for high-speed data interfaces. With typical capacitance of 0.20pF (I/O to I/O) only, ESD0504TL 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), IEC61000-4-4 (electrical fast transient-EFT) (40A, 5/50ns),very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

ESD0504TL uses small SOT-26 package. Each ESD0504TL device can protect four high-speed data lines one Vcc line. The combined features of ultra-low capacitance, small size and high ESD robustness make ESD0504TL ideal for high-speed data ports and high-frequency lines (e.g., HDMI &DVI) applications. The low clamping voltage of the ESD0504TL guarantees a minimum stress on the protected IC.

Ordering Information

Device: ESD0504TL
Package:SOT-23-6
Marking: V05
Material: Halogen free
Packing: Tape & Reel
Quantity per reel: 3,000pcs

Features

Transient protection for high-speed data lines
IEC 61000-4-2(ESD) ±25KV(Air)
±17KV(Contact)
IEC 61000-4-4(EFT)40A(5/50ns)
Cable Discharge Event(CDE)
Package optimized for high-speed lines
Small package(2.9mm*2.8mm*1.1mm)
Protects four data lines and one Vcc line
Low capacitance: 0.20pF (I/O to I/O)
Low leakage current
Low clamping voltage
Each I/O pin can withstand over 1000 ESD strikes for ±8KV contact discharge

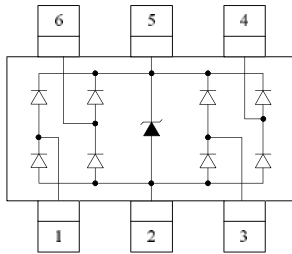
Machanical Data

SOT-23-6 Package
Flammability Rating: UL 94V-0
Terminal: Matte tin plated.
Packaging: Tape and Reel
High temperature soldering guaranteed:260°C/10s
Reel size: 7 inch

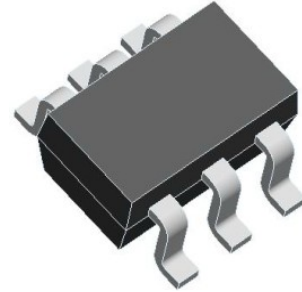
Applications

Serial ATA
MDDI Ports
USB 2.0/3.0 Power and Data Line Protection
Display Ports
High Definition Multi-Media Interface (HDMI)
Digital Visual Interface (DVI)

Pin Configuration



Package Outline



Absolute Maximum Rating

Symbol	Parameter	Value	Units
P_{PP}	Peak Pulse Power (8/20 μ s)	60	W
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	± 25 ± 20	kV
T_{OPT}	Operating Temperature	-55/+125	$^{\circ}$ C
T_{STG}	Storage Temperature	-55/+150	$^{\circ}$ C

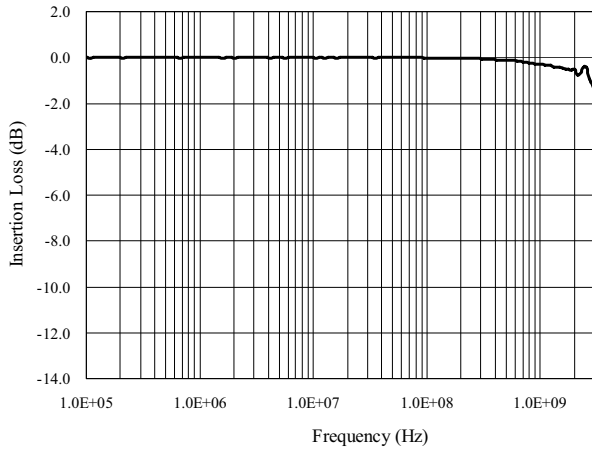
Electrical Characteristics($T_{amb}=25^{\circ}$ C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage	Any I/O pin to GND			5.0	V
V_{BR}	Reverse Breakdown Voltage	$I_T = 1\text{mA}$ Any I/O pin to GND	6.0		9.0	V
I_R	Reverse Leakage Current	$V_{RWM} = 5\text{V}$ Any I/O pin to GND			1.0	μ A
V_C	Clamping Voltage	$I_{PP} = 1\text{A}$, $t_p = 8/20\mu\text{s}$ Any I/O pin to GND			10	V
		$I_{PP} = 4\text{A}$, $t_p = 8/20\mu\text{s}$ Any I/O pin to GND			15	V
		$I_{PP} = 8\text{A}$, $t_p = 8/20\mu\text{s}$ Vcc pin to GND			15	V
C_{ESD}	Parasitic Capacitance	$V_R = 0\text{V}$, $f = 1\text{MHz}$ Between I/O and I/O		0.20	0.30	pF
		$V_R = 0\text{V}$, $f = 1\text{MHz}$ Between I/O and GND		0.45	0.50	pF
		$V_R = 0\text{V}$, $f = 1\text{MHz}$ Between Vcc and GND		0.80		pF

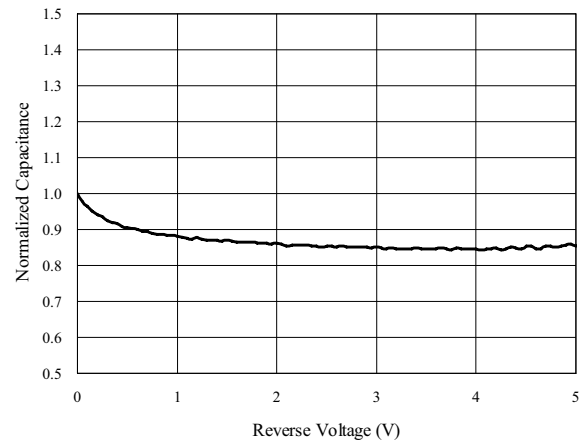
Note: I/O Pins are pin 1,3,4,6. Pin 5 is Vcc. Pin 2 is GND.

Electrical Characteristics Curve

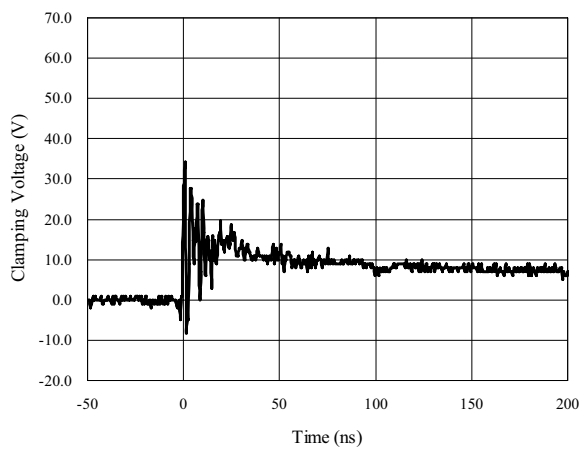
Insertion Loss S21 of I/O to GND



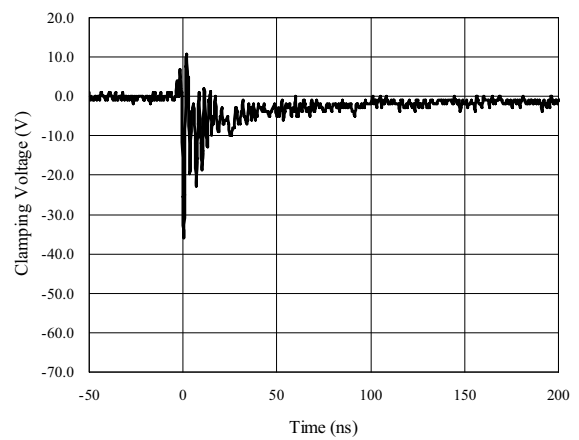
Normalized Capacitance vs. Reverse Voltage



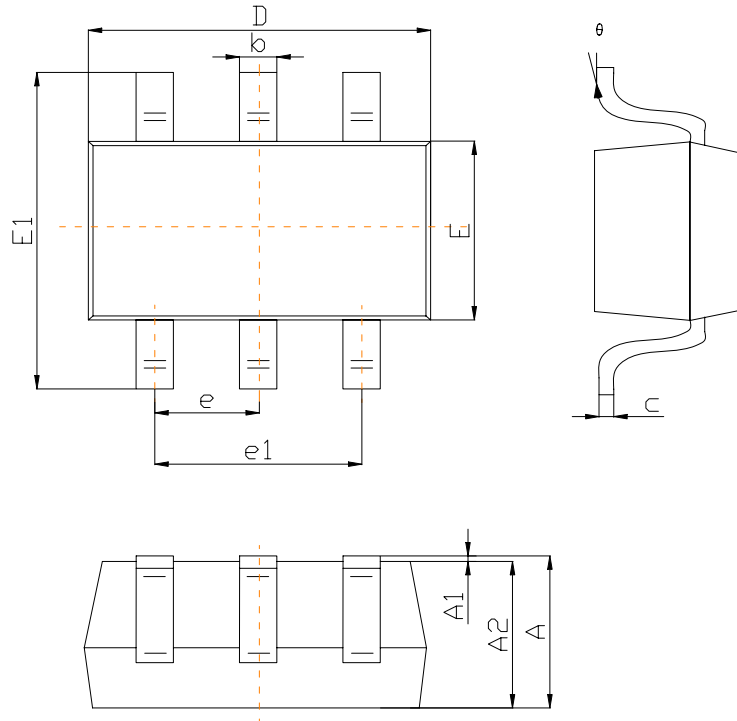
ESD Clamping
(+8kV Contact per IEC 61000-4-2)



ESD Clamping
(-8kV Contact per IEC 61000-4-2)



SOT-23-6 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100		0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0,950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
	0°	8°	0°	8°