ESD0504TL

Ultra Low Capacitance ESD Protection Array

SOT-26 Plastic-Encapsulate ESD Protection Array

DESCRIPTION

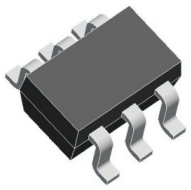
ESD0504TL is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to protection For high-speed data interfaces. With typical capacitance of 0.20pF (I/O to I/O) only, ESD0504TL is designed to protect parasitic-sensitive systems against over-voltage and over-current transsient events. It complies with IEC 61000-4-2 (ESD), Level 4 (±15kV air, ±8kV contact discharge), IEC 61000-4-4 (electrical fast transientt - EFT) (40A, 5/50 ns), very fast charged devicee model (CDM) ESD and cable discharge event (CDE), etc. ESD0504TL uses ultra-small SOT-26 package. Each ESD0504TL device can protect four high-speed data line 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 guarantess a minimum strese on the protected IC.

Features

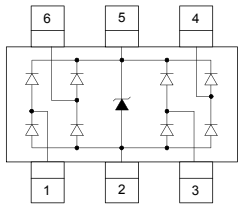
- Transient protection for high speed data lines
- IEC61000-4-2 (ESD) ±25kV (air), ±20kV (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
- Cable Discharge Event (CDE)
- Package optimized for hingh-speed lines
- Protects four data line and one Vcc line
- Low Capacitance :0.20pF(I/O to I/O)
- Low clamping voltage
- Low leakage current
- Each I/O pin can withstand over 1000 ESD strikes for ±8KV coantact discharge

Pin Configuration

RoHS COMPLIANT



Circuit Diagram



Applications

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

Mechanical Characteristics

- Package: SOT-26
- Flammability Rating: UL 94V-0
- Packaging: Tape and Reel
- High temperature soldering guaranted: 260℃/10s
- Marking: V05

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	± 25 ± 20	KV
Peak Pulse Power(8/20us)	P_{PP}	60	W
Operating Temperature	T_{OPT}	−55 to +125	°C
Storage Temperature	T_{STG}	−55 to +150	°C
Lead Solder Temperature – Maximum (10 Second Duration)	T_L	260(10 sec.)	°C

The above data are for reference only.

Electrical Characteristics (T_A=25°C unless otherwise specified)

Symbol	Param	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 = 1mA Any I/O pin to GND	6.0		9.0	V
I_R	Reverse Leakage Current	V_{RWM} = 5V Any I/O pin to GND			1.0	uA
V_C	Clamping Voltage	I_{PP} = 1A, t_p = 8/20μs Any I/O pin to GND			10	V
		I_{PP} = 4A, t_p = 8/20μs Any I/O pin to GND			15	V
		I_{PP} = 8A, t_p = 8/20μs Vcc pin to GND			15	V
C_{ESD}	Parasitic Capacitance	V_R = 0V, f = 1MHz Between I/O and I/O		0.20	0.30	pF
		V_R = 0V, f = 1MHz Between I/O and GND		0.45	0.50	pF
		V_R = 0V, f = 1MHz 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

Fig 1 Power Derating Curve

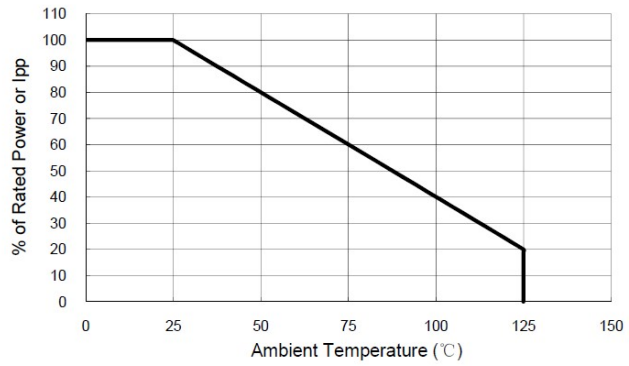


Fig 2 Clamping Voltage vs Peak Pulse Current

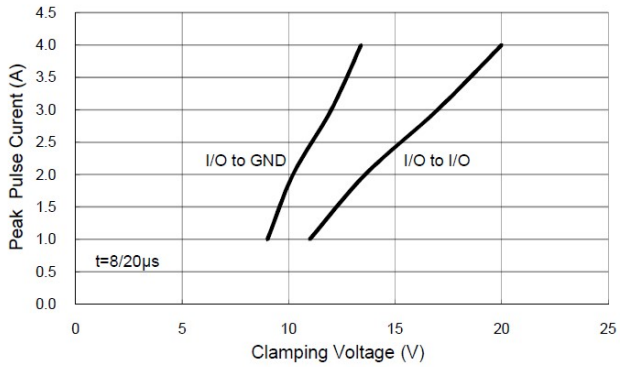


Fig 3 Voltage Sweeping of I/O to I/O

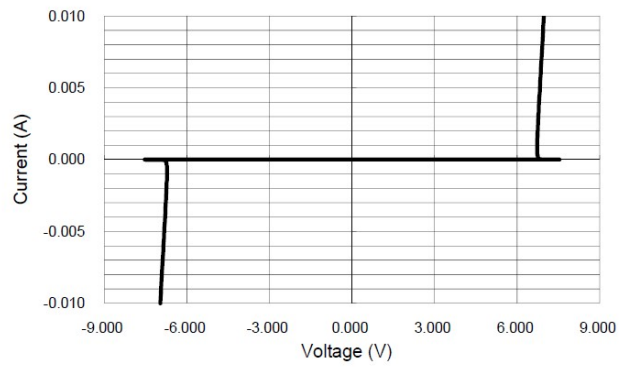


Fig 4 Voltage vs Capacitance

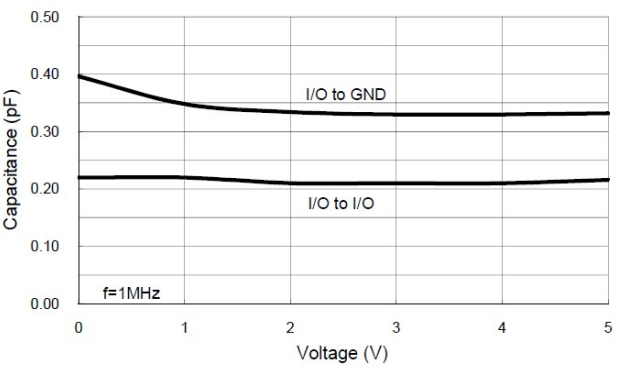


Fig 5 ESD Clamping of I/O to GND
(+8kV Contact per IEC 61000-4-2)

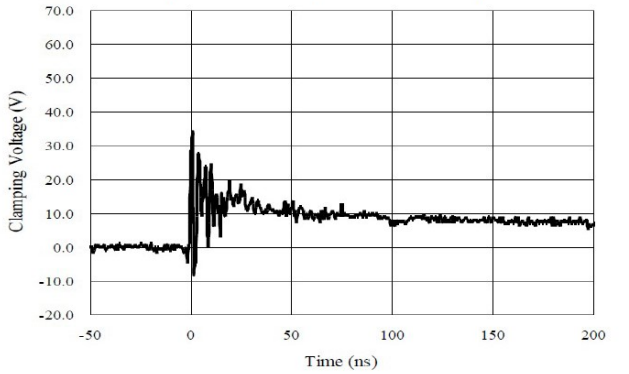
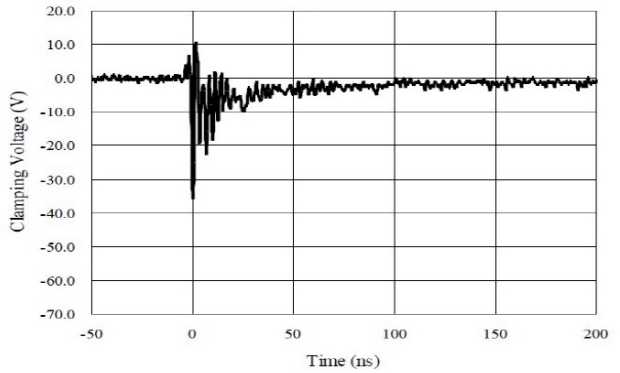


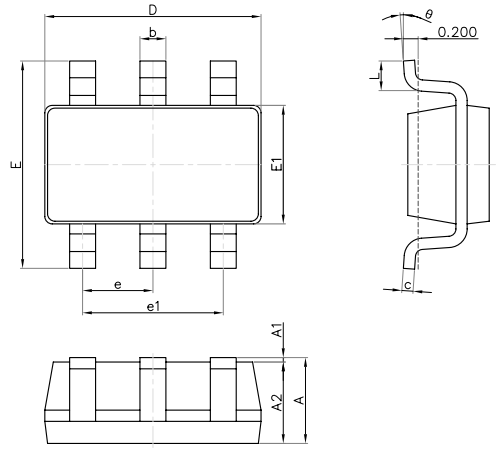
Fig 6 ESD Clamping of I/O to GND
(-8kV Contact per IEC 61000-4-2)



The curve above is for reference only.

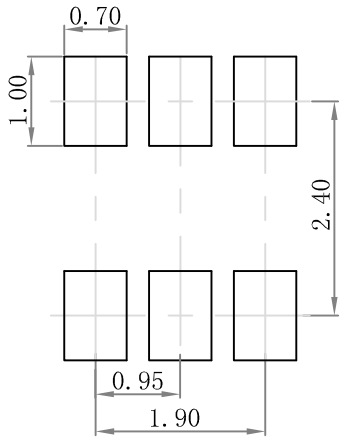
PACKAGE OUTLINE AND PAD LAYOUT INFORMATION

SOT-26 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	0.000	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
E1	1.500	1.700	0.059	0.067
E	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
θ	0°	8°	0°	8°

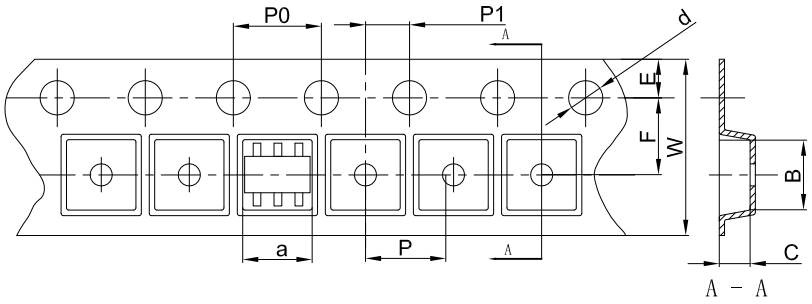
Suggested Pad Layout



Note:
1.Controlling dimension:in/millimeters.
2.General tolerance: ±0.05mm.
3.The pad layout is for reference purposes only.

TAPE AND REEL INFORMATION

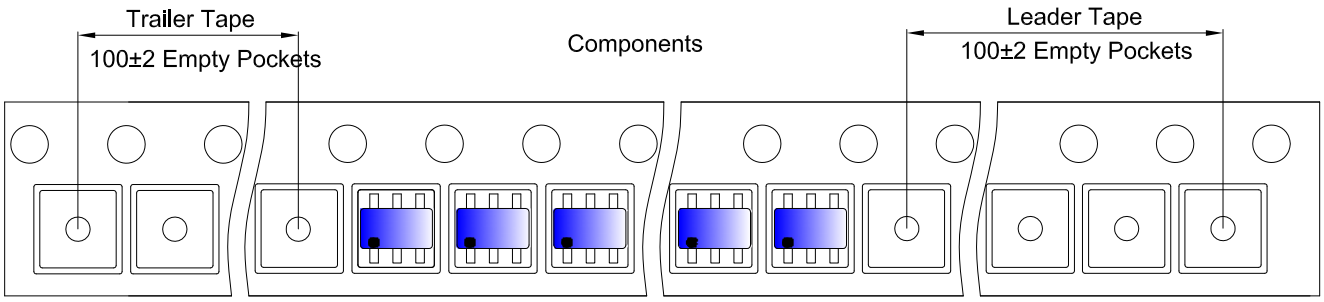
SOT-26 Embossed Carrler Tape



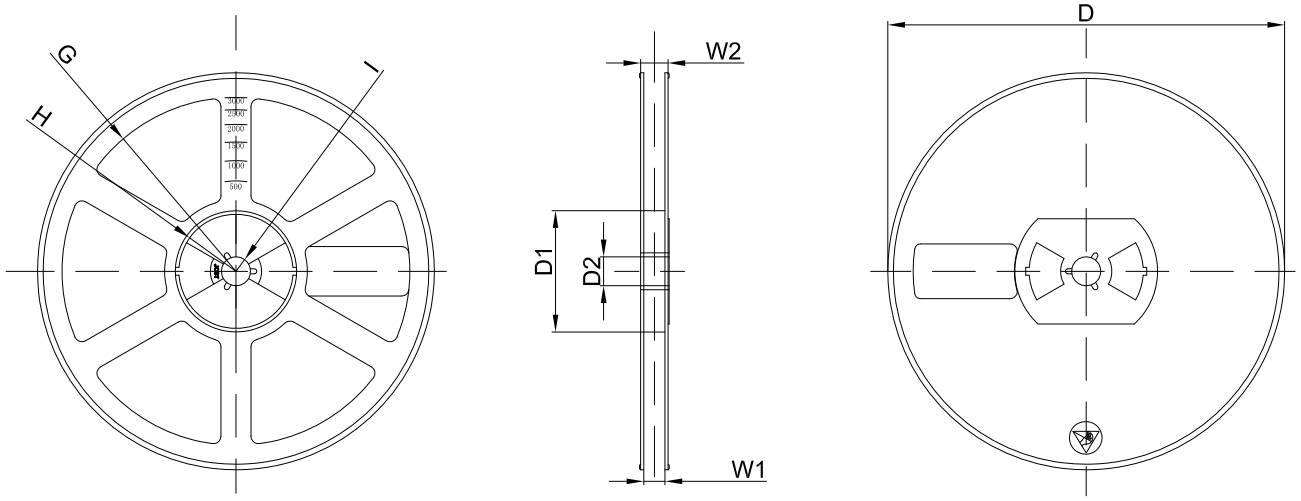
Packaging Description:
SOT-26 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film,adhesive laye,sealant, and anti-static sprayed agent.These reeled parts In standard option are shipped with 3,000 units per 7" or 18cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
SOT-26	3.17	3.23	1.37	Ø1.55	1.75	3.50	4.00	4.00	2.00	8.00

SOT-26 Tape Leader and Trailer



SOT-26 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø180.00	60.00	13.00	R78.00	R25.60	R6.50	9.50	13.10

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 Inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	