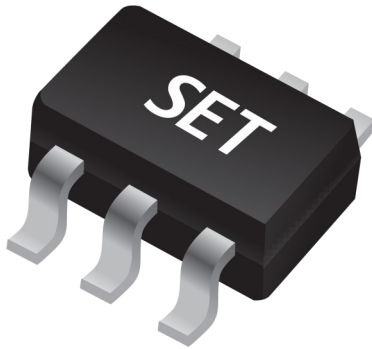


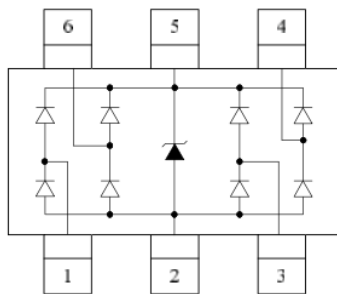
ESD Protection Diodes

Ultra-Low Capacitance ESD and Transient Voltage Protection

SD0520T26L1 SOT26



Pinout and Functional Block Diagram



Applications

- USB Power and Data Line Protection
- 10/100 Ethernet
- Video Graphics Cards
- SIM Ports
- ATM Interfaces
- Monitors and Flat Panel Displays
- Digital Video Interface (DVI)
- IEEE 1394 Fire wire Ports

Order Information

Type	Package	Marking Code	Delivery Form	Delivery Quantity
SD0520T26L1	SOT26	04A or V54	7" T&R	3000 PCS

Description

The SD0520T26L1 has ultra low capacitance rail-to-rail diodes with an additional zener diode fabricated in a proprietary silicon avalanche technology to protect each I/O pin providing a high level of protection for electronic equipment that may experience destructive electrostatic discharges (ESD). These robust diodes can safely absorb repetitive ESD strikes at the maximum level (level 4) specified in the IEC 61000-4-2 international standard without performance degradation. Their very low loading capacitance also makes them ideal for protecting high speed signal pins such as DVI, USB2.0, and IEEE 1394.

Features

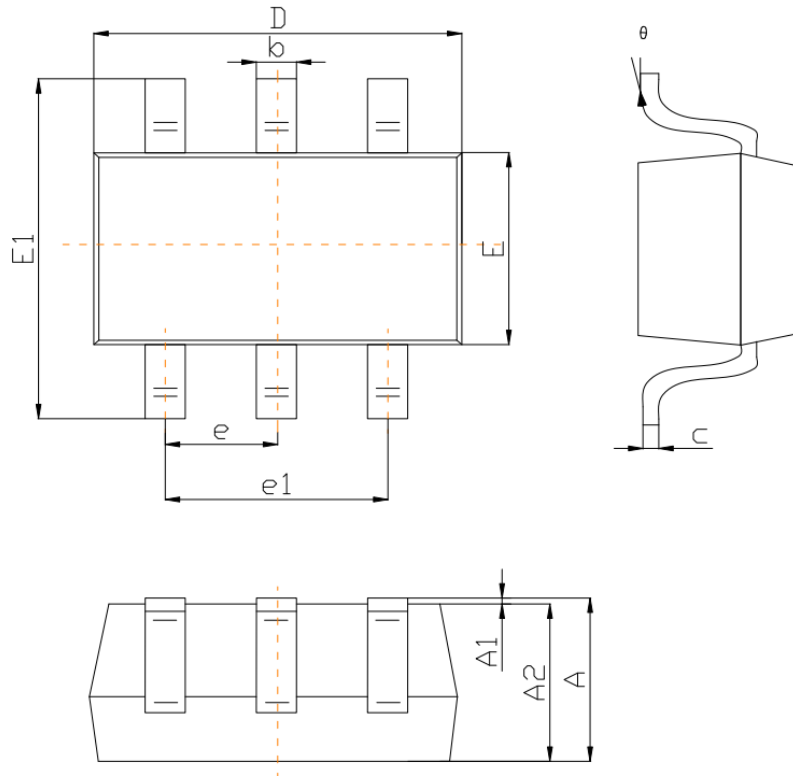
- IEC61000-4-2 (ESD) ± 30 kV (Air), ± 30 kV (Contact)
- IEC61000-4-5 (Surge) :30 A @ 8 / 20 μ s
- IEC61000-4-4 (EFT) :40 A @ 5 / 50 ns
- Protects Four Lines
- Low Capacitance :0.5 pF typical between I/O pins
- Low Clamping Voltage
- Low Leakage Current
- High Temperature to Reflow Soldering Guaranteed: 260 °C / 10 sec
- Flammability Rating: UL 94 V-0
- Halogen Free and RoHS Compliant

ESD Protection Diodes

Ultra-Low Capacitance ESD and Transient Voltage Protection

SD0520T26L1 SOT26

Package Dimensions - SOT26



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.05	1.25	0.041	0.049
A1	0.00	0.10	0.000	0.004
A2	1.05	1.15	0.041	0.045
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.82	3.02	0.111	0.119
E	1.50	1.70	0.059	0.067
E1	2.65	2.95	0.104	0.116
e	0.95 BSC		0.037 BSC	
e1	1.80	2.00	0.071	0.079
L	0.30	0.60	0.012	0.024
	0°	8°	0°	8°

ESD Protection Diodes

Ultra-Low Capacitance ESD and Transient Voltage Protection

SD0520T26L1 SOT26

Limiting Values

($T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Max	Unit
V_{ESD}	Electrostatic Discharge Voltage	IEC 61000-4-2; Contact Discharge	-	30	kV
		IEC 61000-4-2; Air Discharge	-	30	kV
P_{PP}	Peak Pulse Power (8 / 20 μs)	-	-	625	W
T_A	Operating Temperature Range	-	-55	125	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-	-55	150	$^\circ\text{C}$

Electrical Characteristics

($T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ.	Max	Unit
V_{RWM}	Reverse Working Voltage	Any I/O pin to ground	-	-	5	V
V_{BR}	Reverse Breakdown Voltage	$I_T = 1\text{ mA}$ Any I/O pin to ground	6	-	-	V
I_R	Reverse Leakage Current	$V_{RWM} = 5\text{ V}$ Any I/O pin to ground	-	-	1	μA
V_{C1}	Clamping Voltage	$I_{PP} = 1\text{ A}$, $t_p = 8 / 20\text{ }\mu\text{s}$ Any I/O pin to ground	-	-	9.8	V
V_{C2}	Clamping Voltage	$I_{PP} = 25\text{ A}$, $t_p = 8 / 20\text{ }\mu\text{s}$ Any I/O pin to ground	-	-	25	V
C_{J1}	Junction Capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$ Between I/O pins	-	0.5	1	pF
C_{J2}	Junction Capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$ Any I/O pin to ground	-	1.2	2	pF

ESD Protection Diodes

Ultra-Low Capacitance ESD and Transient Voltage Protection

SD0520T26L1 SOT26

Performance Curve for Reference

($T_A=25\text{ }^\circ\text{C}$ unless otherwise noted)

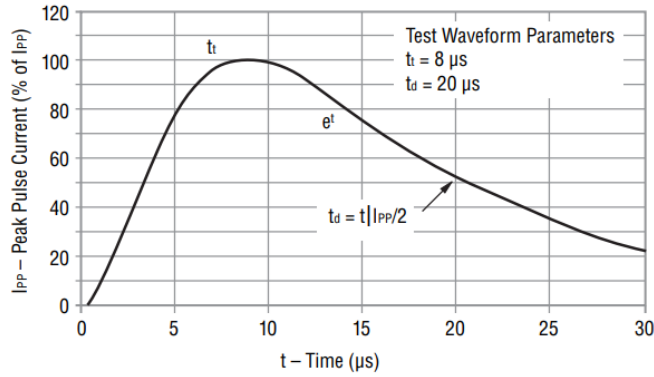


FIGURE 1
Pulse Waveform

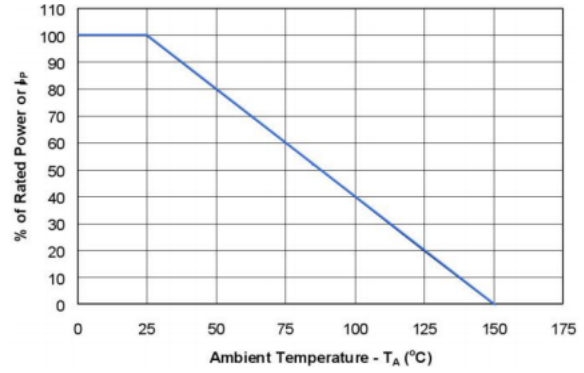


FIGURE 2
Peak Pulse Power Derating Curve

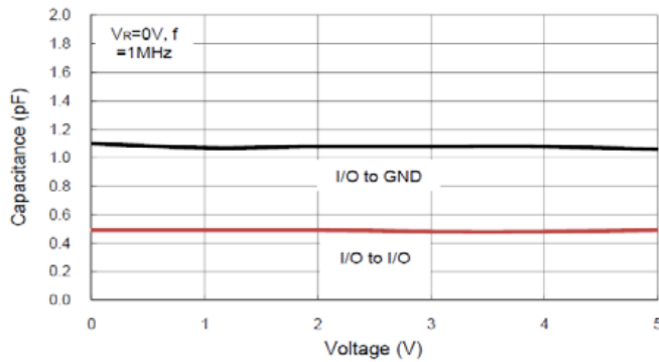


FIGURE 3
Voltage vs. Capacitance

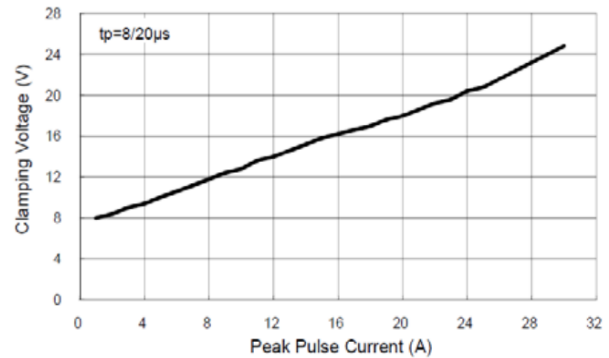


FIGURE 4
Peak Pulse Current vs. Clamping Voltage

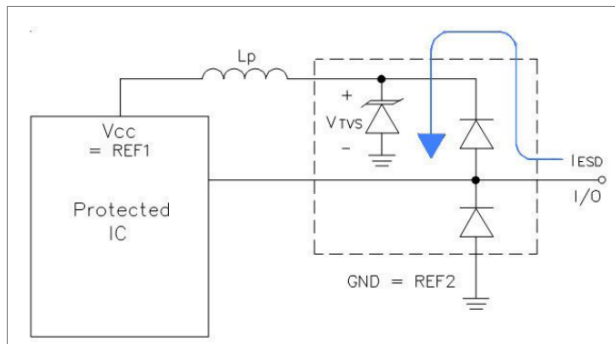


FIGURE 5
Rail-to-Rail Protection

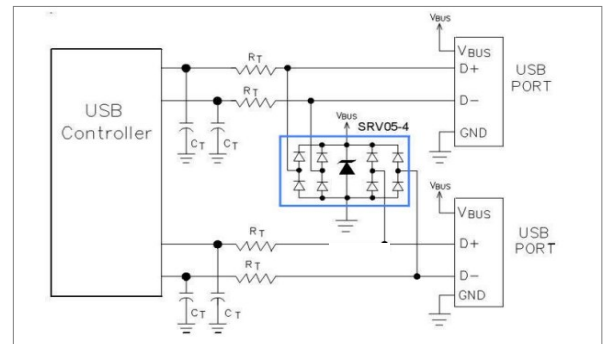


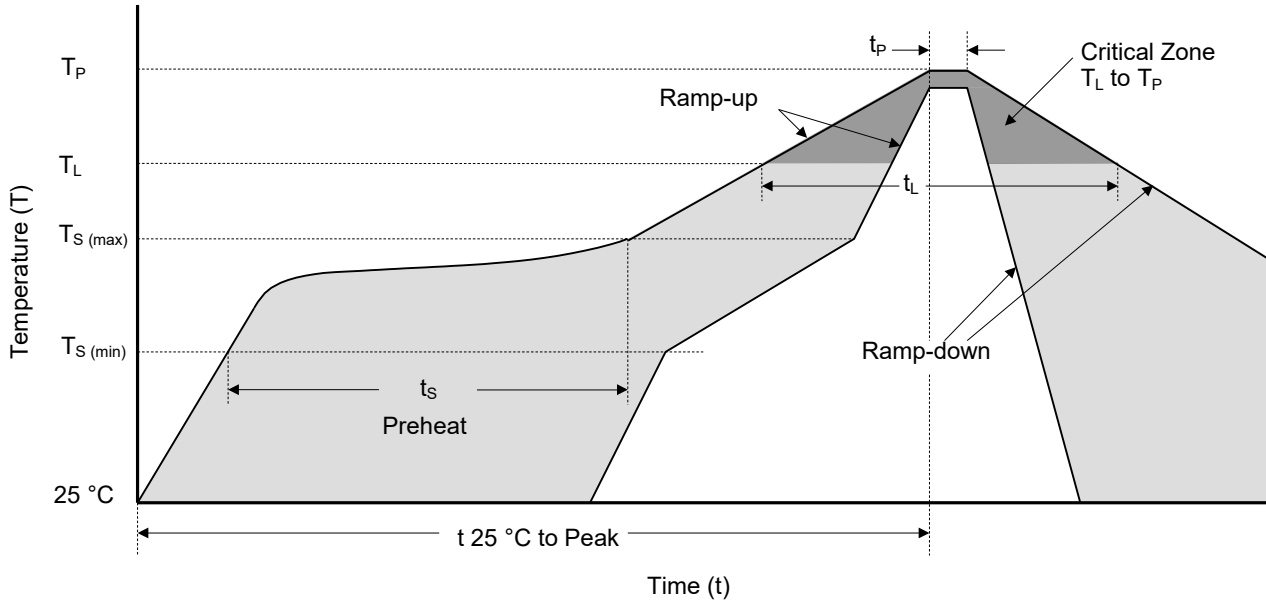
FIGURE 6
Dual USB Port Protection

ESD Protection Diodes

Ultra-Low Capacitance ESD and Transient Voltage Protection

SD0520T26L1 SOT26

Soldering Parameters



Reflowing Condition

Reflow Soldering Parameters		Lead-Free Assembly
Pre-heat	Temperature Min ($T_{S(min)}$)	150 °C
	Temperature Max ($T_{S(max)}$)	200 °C
	Time (min to max) (t_s)	60 ~ 120 seconds
Average Ramp Up Rate (Liquidus Temp (T_L) to Peak)		3 °C / second max.
$T_{S(max)}$ to T_L Ramp-up Rate		3 °C / second max.
Reflow	Temperature (T_L) (Liquidus)	217 °C
	Time (min to max) (t_L)	60 ~ 150 seconds
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time of within 5 °C of Actual Peak Temperature (t_p)		20 ~ 40 seconds
Ramp-down Rate		6 °C / second max.
Time from 25 °C to Peak Temperature		8 Minutes max.
Do Not Exceed		260 °C



ATTENTION

Usage

1. TVS must be operated in the specified ambient temp.
2. Do not clean the TVS with strong polar solvent such as ketone, esters, benzene and halogenated hydrocarbon, to avoid damaging the encapsulating layer.
3. Please do not apply severe vibration, shock or pressure to TVS, to avoid element cracking.

Replacement

1. If TVS is visually damaged, please replace it.
2. TVS is a non-repairable product. For safety sake, please use equivalent TVS for replacement.

Storage

1. Storage Temp. Range: (-55 to 150) °C.
2. Do not store the TVS at the high temp., high humidity or corrosive gas environment, to avoid influencing the solder-ability of the lead wires. The product shall be used up within 1 year after receiving the goods.

Environmental Conditions













































1. TVS should not be exposed to the open air, nor direct sunshine.
2. TVS should avoid rain, water vapor or other condition of high temp. and high humidity.
3. TVS should avoid sand dust, salt mist, or other harmful gases.

Max. Typical Capacitance of TVS

The typical capacitance of TVS is listed in the specifications. Designers may refer to it when designing TVS in High frequency circuit.

Installation Mechanical Stress

1. Do not knock TVS when installing, to avoid mechanical damage.
2. Please do not apply severe vibration, shock or pressure to TVS, to avoid surface resin or element cracking.

Package Outline					Circuit Diagram					
										
DFN0603	DFN1006	DFN1006-3L	DFN1610	DFN2020-3L	1CH/UNI	1CH/BI	2CH/UNI	2CH/BI	1CH/BI	1CH/UNI
										
DFN1610-6L	DFN2010-8L	DFN2510	DFN2626-10L	DFN3810-9L	1CH/UNI	1CH/BI	1CH/UNI	1CH/BI	2CH/UNI	2CH/BI
										
SOD-923	SOD-523	SOD-323	SOD-123	SOT-143	1CH/UNI	2CH/UNI	2CH/UNI	4CH/UNI	5CH/UNI	4CH/UNI
										
SOT-523	SOT-323	SOT-23	SOT-363	SOT-23-6L	2CH/BI	4CH/UNI	4CH/UNI	8CH/UNI	8CH/UNI	8CH/UNI