ESD5L5.0C-Q1

List

List.....1

Package outline.....2

Features.....2

Applications.....2

Mechanical data.....2

Maximum ratings 2

Electrical characteristics.....2

Rating and characteristic curves.....3

Pinning information.....4

Marking.....4

Suggested solder pad layout.....4

Packing information.....5

Reel packing.....6

Suggested thermal profiles for soldering processes.....6

High reliability test capabilities.....7

ESD5L5.0C-Q1

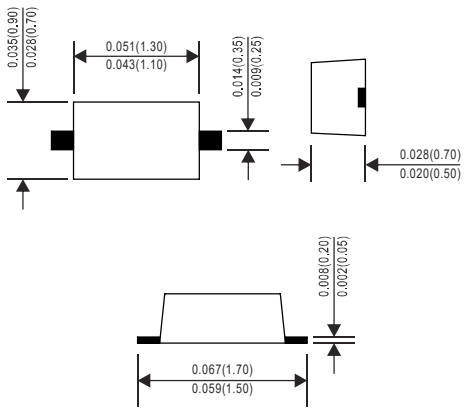
Surface Mount Bi-Directional TVS For ESD Protection Diode 5.0V

Features

- Package optimized for high-speed lines.
- Protects one data, control or power line.
- Low capacitance, low leakage current, and low clamping voltage.
- Provide transient protection :
  IEC 61000-4-2 (ESD) ±25kV (Air)
  ±20KV (Contact)
  IEC 61000-4-4 (EFT) 40A (5/50μs)
  Cable discharge event (CDE)
- Each I/O pin can withstand over 1K ESD strikes for ±8kV contact discharge.
- Qualified to AEC-Q 101 grade 1 .
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.ESD5L5.0C-Q1-H.

Package outline

SOD-523FL



Dimensions in inches and (millimeters)

Applications

- Serial ATA .
- PCI express .
- Desktops, servers and notebooks.
- Digital visual interface (DVI).
- USB 2.0/3.0 power and data line protection.
- Others : MDDI ports,Display ports,Cellular phones, and HDMI 1.4/2.0 .

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOD-523FL.
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Maximum ratings (At T_A=25°C, unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Peak pulse current (t_P=8/20μs)	I_{PP}	5	A
ESD per IEC 61000-4-2 (Air discharge)	ESD	±25	KV
ESD per IEC 61000-4-2 (Contact discharge)		±20	KV
Operating junction temperature range	T_J	-55 ~ 125	°C
Storage temperature range	T_{STG}	-55 ~ 150	°C

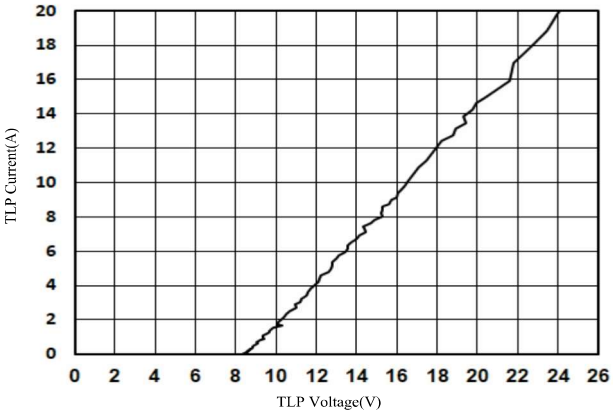
Electrical characteristics (At T_A=25°C, unless otherwise noted)

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Nominal reverse working voltage	V_{RWM}				5	V
Breakdown voltage	V_{BR}	I_T=1mA, Between I/O and I/O	7	8	9	V
Reverse leakage current	I_R	V_{RWM}=5V, Between I/O and I/O		0.01	1.0	μA
Clamping voltage	V_C	I_{PP}=5A, t_P=8/20μs, Between I/O and I/O			14	V
Junction capacitance	C_J	V_R=0V, f=1MHz, Between I/O and I/O		0.3	0.4	pF

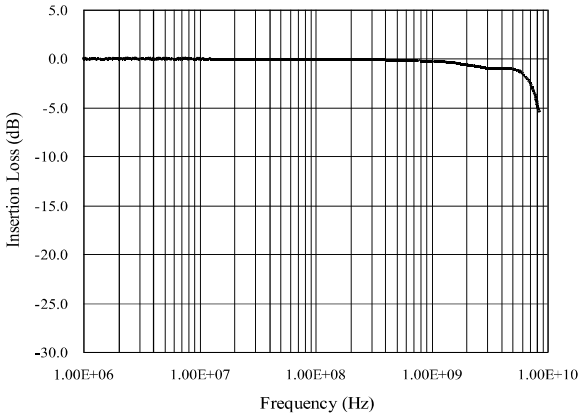
ESD5L5.0C-Q1

Rating and characteristic curves

TLP Measurement of I/O to I/O

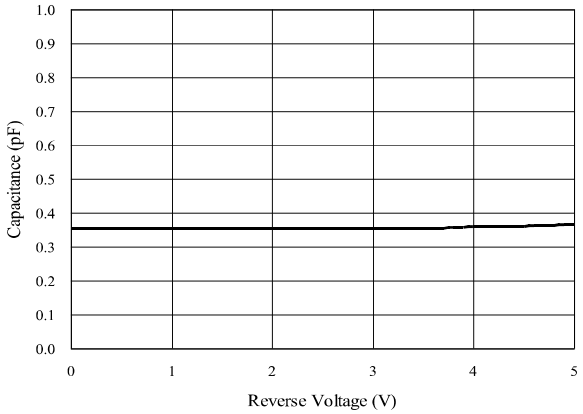


Insertion Loss S21 of I/O to I/O

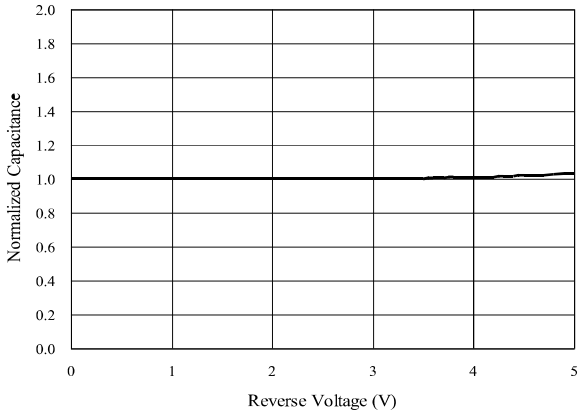


Capacitance vs. Voltage of I/O to I/O (f = 1MHz)

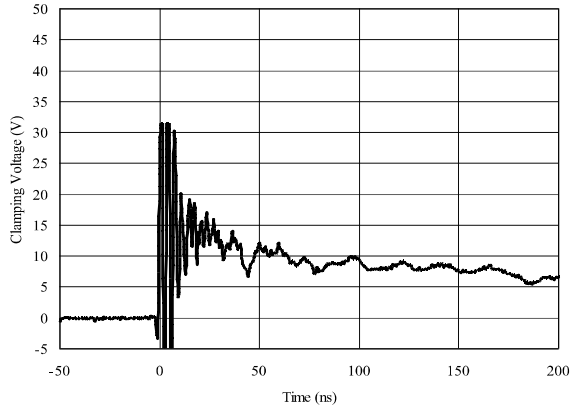
Capacitance vs. Reverse Voltage



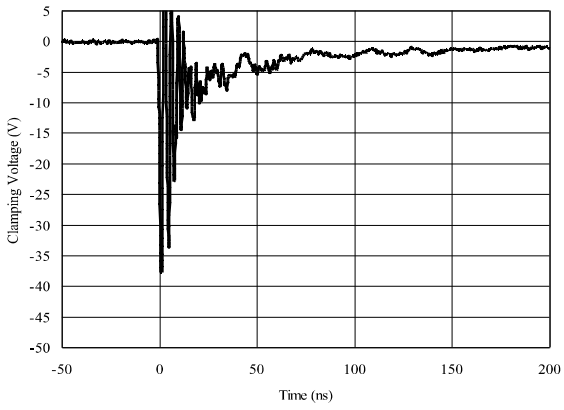
Normalized Capacitance vs. Reverse Voltage



ESD Clamping of I/O to G ND
(+8kV Contact per IEC 61000-4-2)

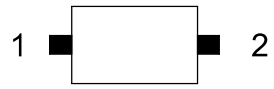


ESD Clamping of I/O to G ND
(-8kV Contact per IEC 61000-4-2)



ESD5L5.0C-Q1

Pinning information

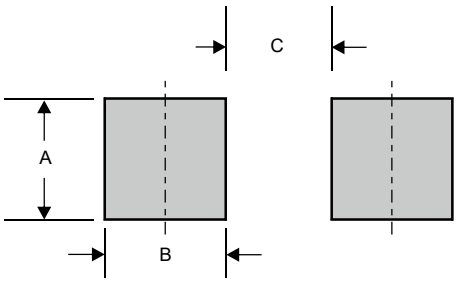
Pin	Simplified outline	Symbol
Bi-Directional		

Marking

Type number	Marking code
ESD5L5.0C-Q1	ASX

Note: 1."AS" is part number,fixed.
2. "X" is the identification number.

Suggested solder pad layout

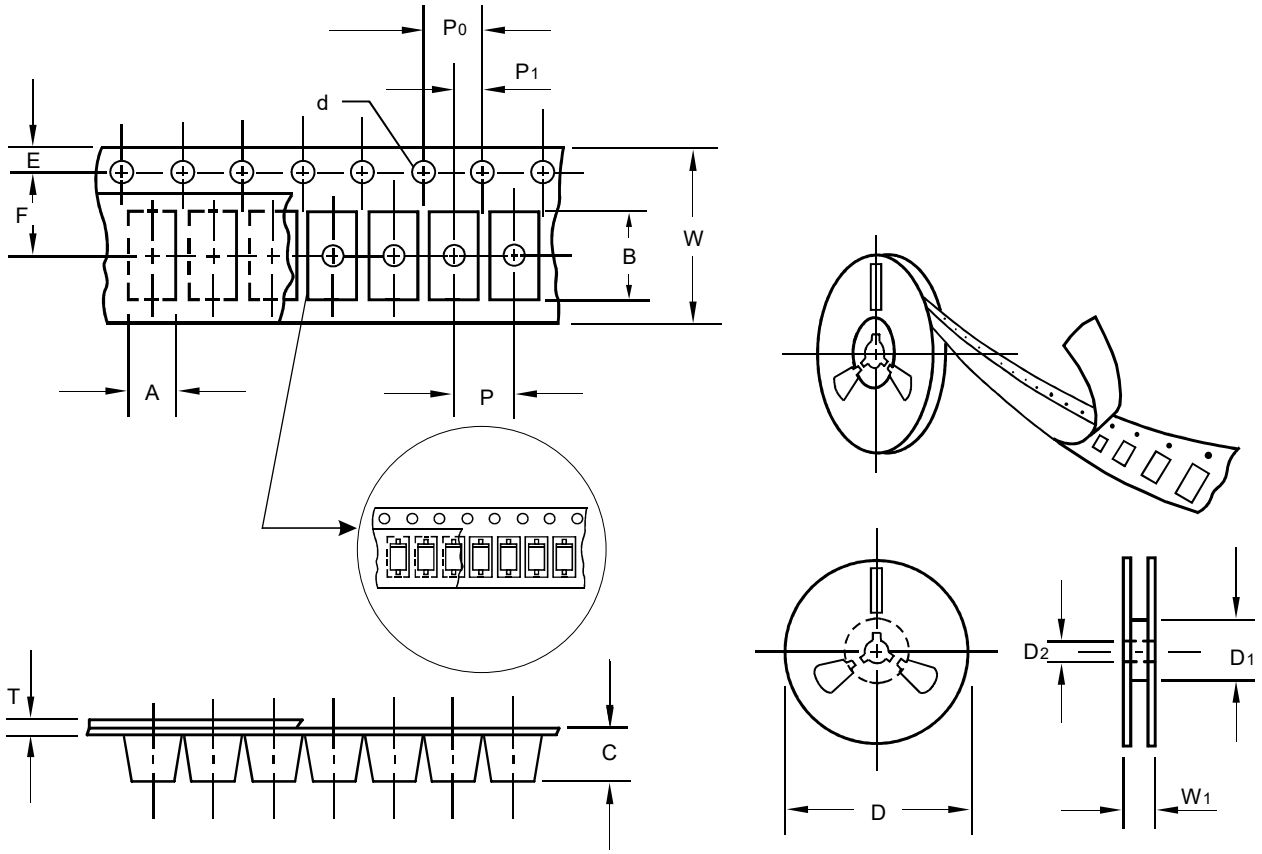


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-523FL	0.032 (0.80)	0.024 (0.60)	0.044 (1.10)

ESD5L5.0C-Q1

Packing information



unit:mm

Item	Symbol	Tolerance	SOD-523FL
Carrier width	A	0.1	0.90
Carrier length	B	0.1	1.95
Carrier depth	C	0.1	0.73
Sprocket hole	d	0.1	1.50
7" Reel outside diameter	D	1.0	178.00
7" Reel inner diameter	D_1	0.4	54.40
Feed hole diameter	D_2	0.05	13.0
Sprocket hole position	E	0.01	1.75
Punch hole position	F	0.05	3.50
Punch hole pitch	P	0.05	2.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.05	2.00
Overall tape thickness	T	0.02	0.18
Tape width	W	0.4	8.00
Reel width	W_1	0.2	12.30

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

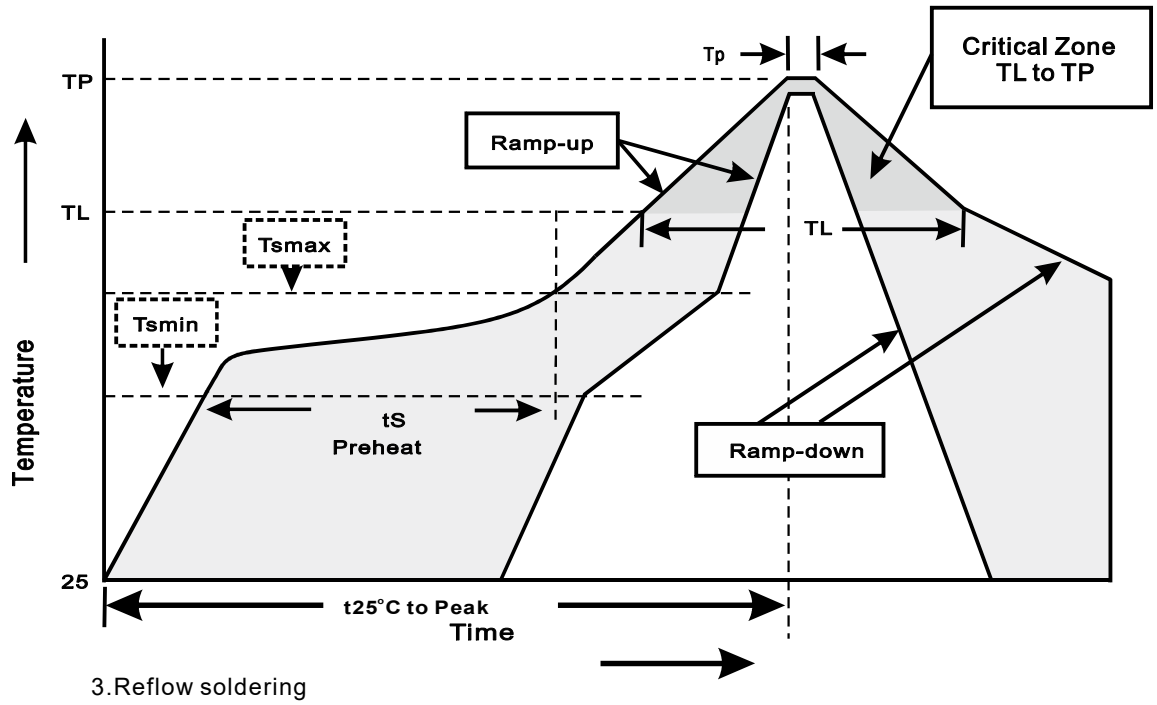
ESD5L5.0C-Q1

Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOD-523FL	7"	3,000	2.0	30,000	183*123*183	178	382*257*387	240,000	9.5

Suggested thermal profiles for soldering processes

1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax to T_L -Ramp-upRate	 <3°C/sec
Time maintained above: -Temperature(T_L) -Time(t_L)	 217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

ESD5L5.0C-Q1

High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec.	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	V_{BR}= V_{BR} Min * 80% at T_J=125°C for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	15P_{SIG} at T_A=121°C for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at T_A=85°C, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
7. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031