LL052AT523

List

LL052AT523

Surface Mount TVS For ESD Protection Diode

Features

- Protects tow data line.
- Low capacitance : 0.25pF Typical (I/O to I/O).
- Low leakage current : 0.1μA @V_{RWM} (typ.).
- Low clamping voltage.
- Provide transient protection:
  IEC 61000-4-2 (ESD) ±25KV (Air), ±17KV (Contact).
  IEC 61000-4-4 (EFT) 40A (5/50ns).
  Cable discharge event (CDE).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.LL052AT523-H.

Applications

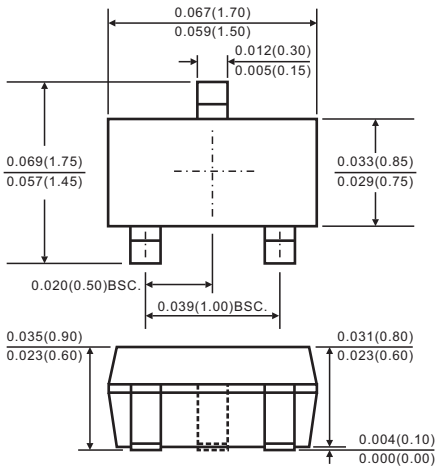
- Serial ATA.
- PCI Express.
- USB 2.0 Power and data line protection.
- Display ports.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-523 .
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Polarity : Indicated by cathode band.
- Mounting Position : Any.
- Weight : Approximated 0.002 gram.

Package outline

SOT-523



Dimensions in inches and (millimeters)

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

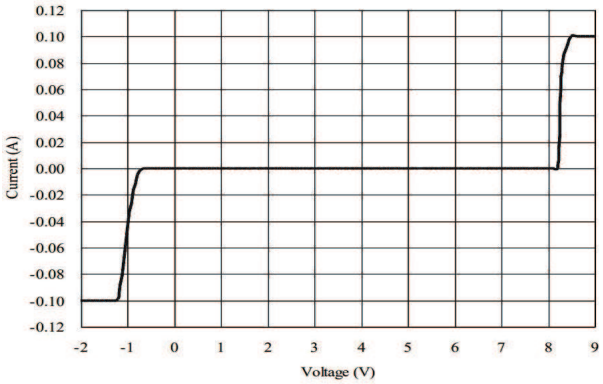
Parameter	Symbol	Value	Unit
Peak pulse power (t_P=8/20μs)	P_{PP}	12	W
Electrostatic discharge voltage (IEC61000-4-2 Contact) (IEC61000-4-2 Air)	V_{ESD}	±17 ±25	KV
Peak pulse current (t_P=8/20μs, IEC61000-4-5)	I_{PP}	1	A
Operating temperature	T_J	+125	℃
Storage temperature	T_{STG}	-55 to +150	℃

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

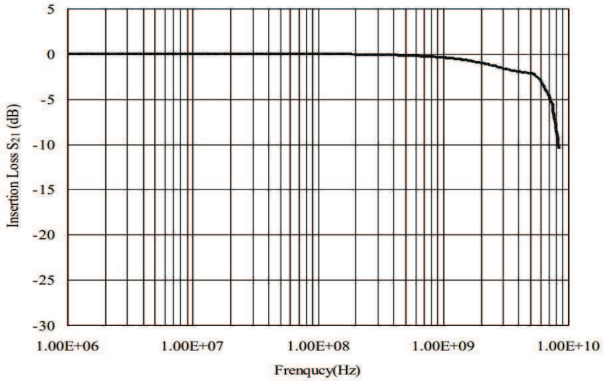
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage		V_{RWM}			5	V
Breakdown voltage	I_T=1mA (Between I/O and GND)	V_{BR}	6.0	8.0	10	V
Reverse leakage current	V_{RWM}=5V (Between I/O and GND)	I_R		0.1	1.0	μA
Clamping voltage	I_{PP}=1A, t_p=8/20μs (Between I/O and GND)	V_C			12	V
Junction capacitance	V_R=0V, f=1MHz (Between I/O and GND)	C_j		0.8	1.2	pF
	V_R=0V, f=1MHz (Between I/O and I/O)			0.25	0.5	

Rating and characteristic curves(LL052AT523)

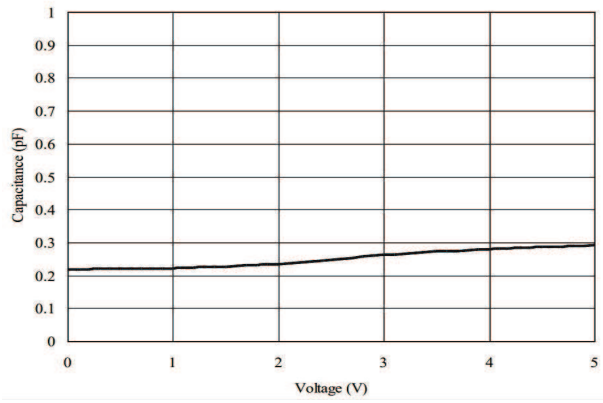
Voltage Sweeping of I/O to I/O



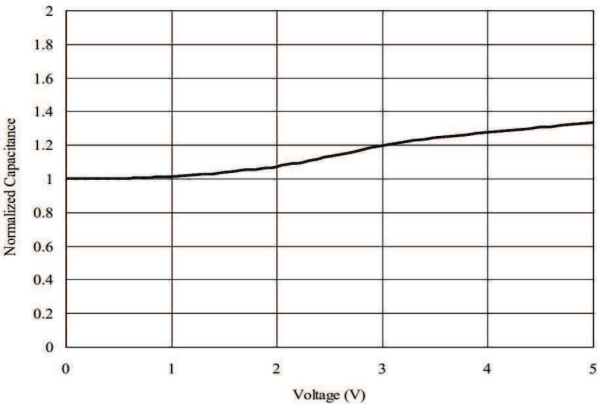
Insertion Loss S21 of I/O to I/O



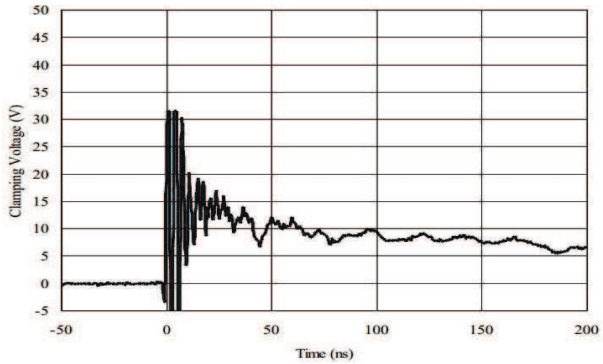
Capacitance *vs.* Reverse Voltage



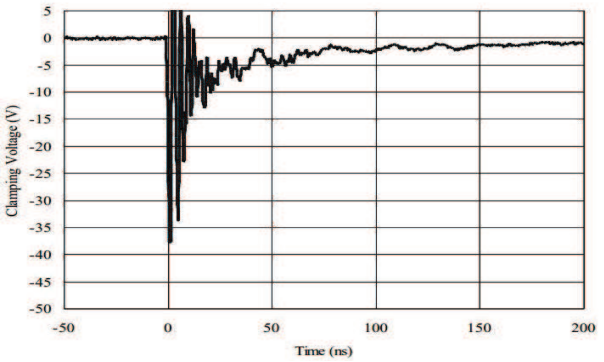
Normalized Capacitance *vs.* Reverse Voltage



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



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



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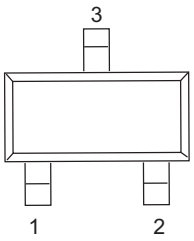
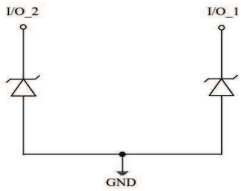
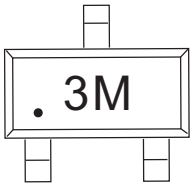
Pinning information

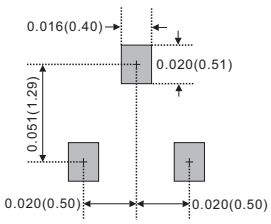
Pin	Simplified outline	Symbol
Pin1 I/O_1 Pin2 I/O_2 Pin3 GND		

Marking

Type number	Marking code
LL052AT523	

Suggested solder pad layout

SOT-523



Dimensions in inches and (millimeters)

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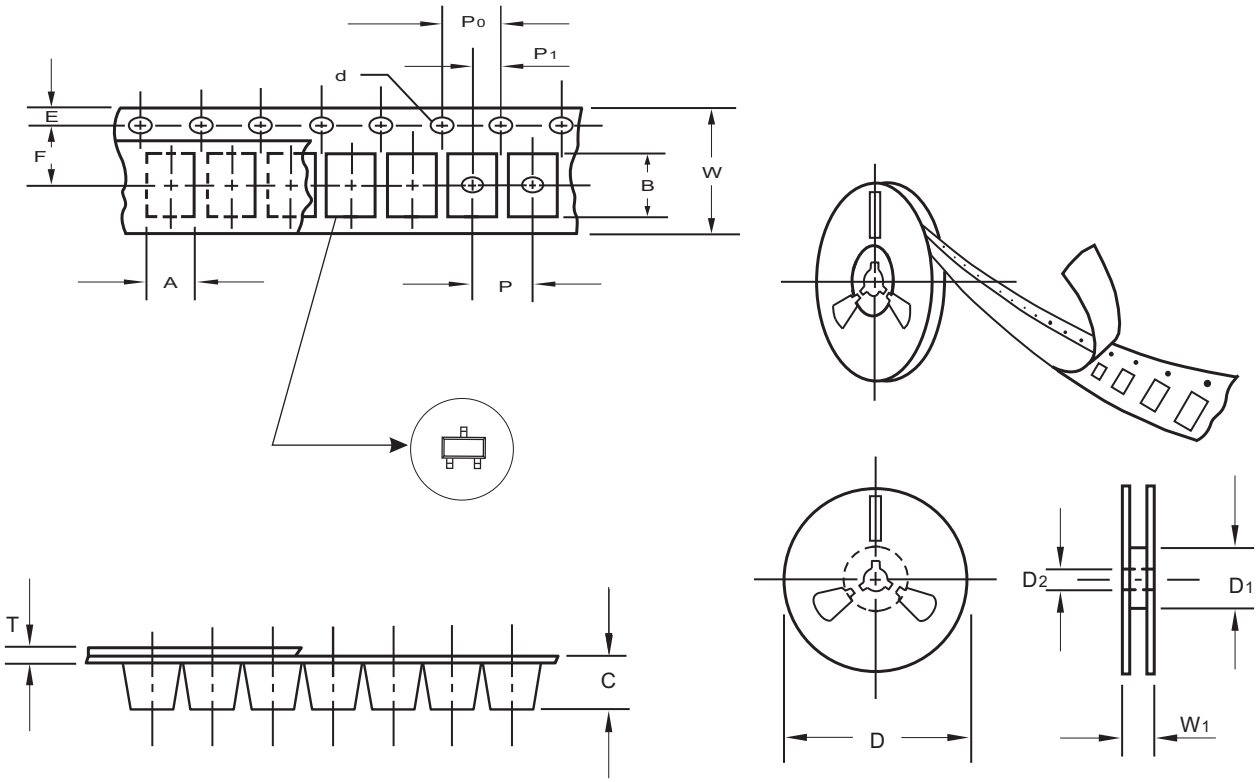
Packing information



unit:mm

Item	Symbol	Tolerance	SOT-523
Carrier width	A	0.1	1.85
Carrier length	B	0.1	1.85
Carrier depth	C	0.1	0.875
Sprocket hole	d	0.1	1.5
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D_1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	60.00
Feed hole diameter	D_2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	9.50

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

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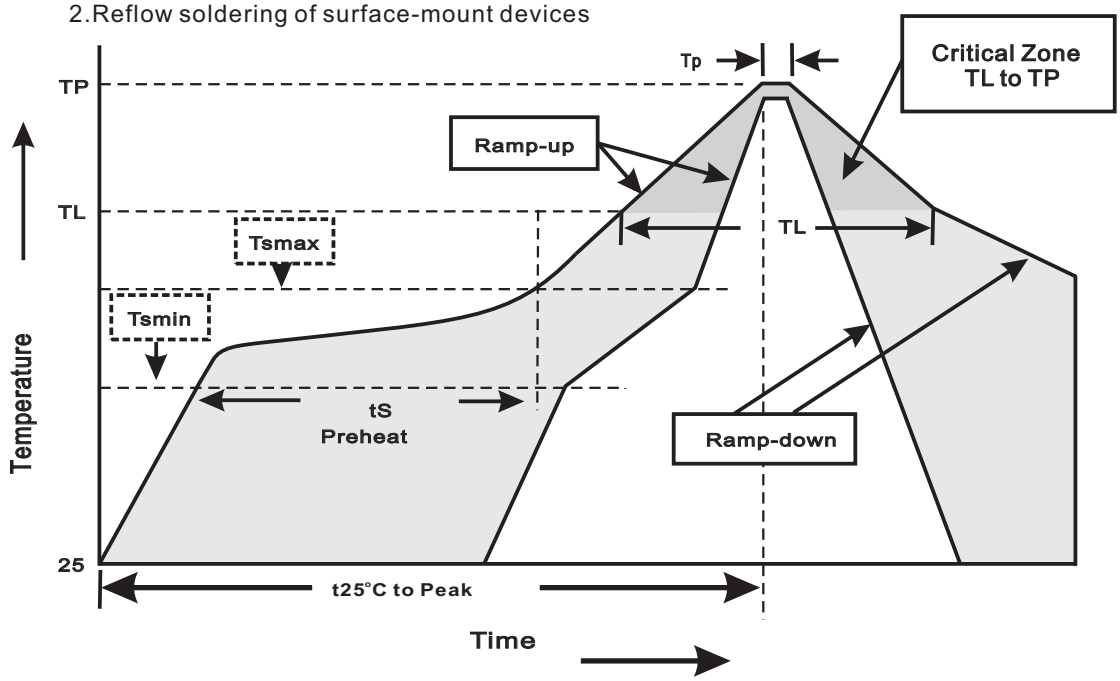
Reel packing

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)
SOT-523	7"	3,000	4.0	30,000	183*183*123	178	382*262*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

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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=150°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 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031