

LL054BT56B

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LL054BT56B

4-Channel Ultra Low Capacitance ESD Protection Diodes Array: 5.0V

Features

- Up to 4 data lines and one power line protects.
- IEC61000-4-2 (ESD) $\pm 25\text{KV}$ (Air), $\pm 20\text{KV}$ (Contact).
- IEC61000-4-5 (lightning) 5A (8/20 μs).
- RoHS Compliant.
- Suffix "-H" indicates Halogen-free part, ex.LL054BT56B-H.

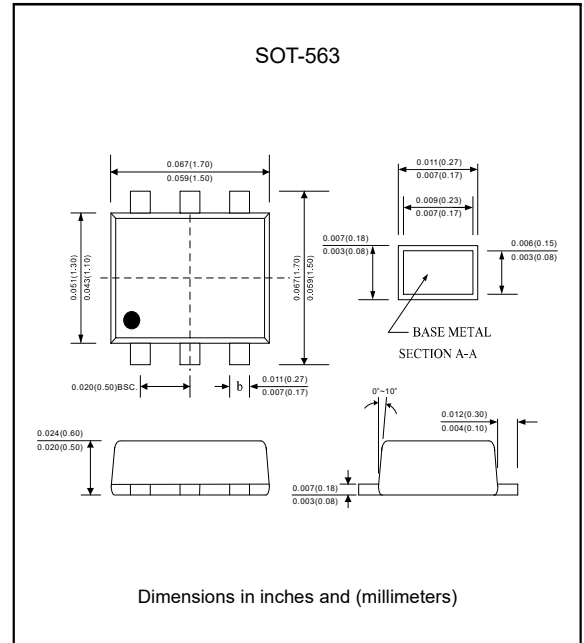
Applications

- USB 2.0 and USB 3.0 Ports.
- USB OTG.
- Digital visual interface (DVI).
- Monitor and flat panel displays.
- PCI Express and serial SATA ports.

Mechanical data

- SOT-563 package.
- Flammability rating : UL 94V-0.
- Marking : Part number, Date.
- Packaging : Tape and reel.
- Weight : Approximated 0.006 gram.

Package outline



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

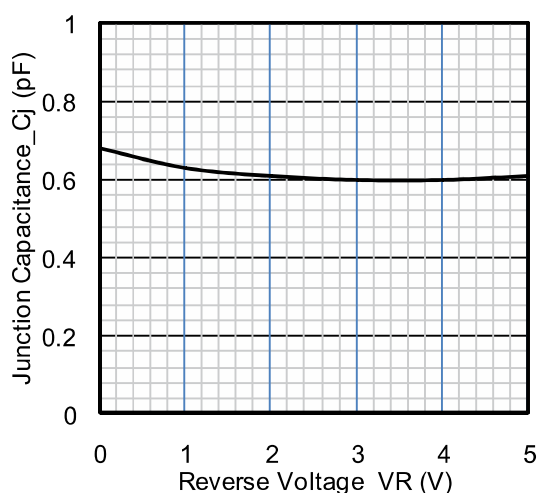
Parameter	Symbol	Value	Unit
Peak pulse power ($t_p=8/20\mu\text{s}$)	P_{PP}	100	W
Peak pulse current ($t_p=8/20\mu\text{s}$)	I_{PP}	5	A
ESD per IEC 61000-4-2 (Contact)	V_{ESD}	± 25	KV
ESD per IEC 61000-4-2 (Air)		± 20	
Operating temperature	T_J	+125	$^\circ\text{C}$
Storage temperature	T_{STG}	-55 to +150	$^\circ\text{C}$

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

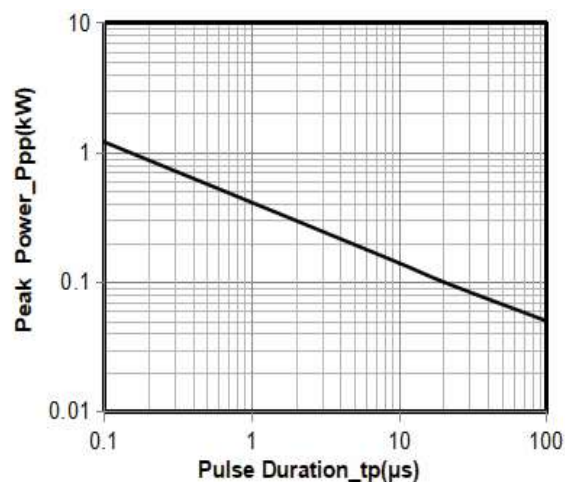
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	(IO pin to ground)	V_{RWM}			5.0	V
Reverse Breakdown voltage	$I_T=1\text{mA}$ (IO pin to ground)	V_{BR}	6.0			V
Reverse leakage current	$V_{RWM}=5.0\text{V}$ (IO pin to ground)	I_R			0.5	μA
Clamping voltage	$I_{PP}=1\text{A}$, $t_p=8/20\mu\text{s}$ (IO pin to ground)	V_C			15	V
	$I_{PP}=5\text{A}$, $t_p=8/20\mu\text{s}$ (IO pin to ground)				20	V
Junction capacitance	$V_R=0\text{V}$, $f=1\text{MHz}$, (Between I/O pins)	C_{ESD}		0.3	0.4	pF
	$V_R=0\text{V}$, $f=1\text{MHz}$, (I/O and ground)				0.8	

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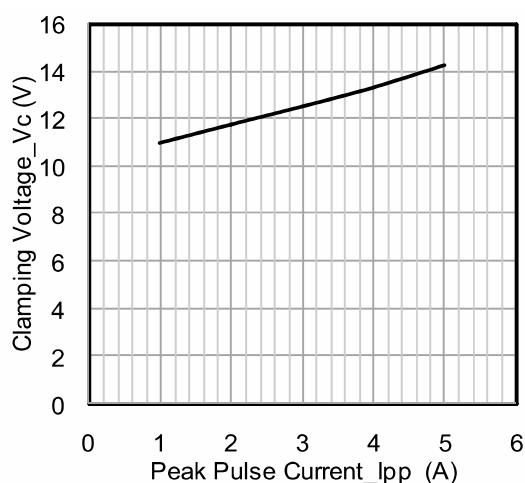
Rating and characteristic curves



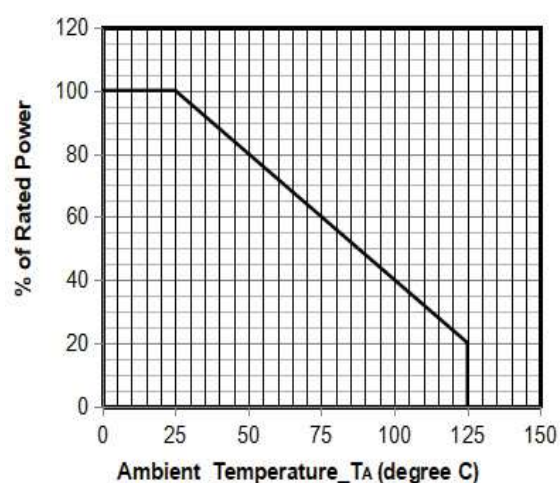
Junction Capacitance vs. Reverse Voltage



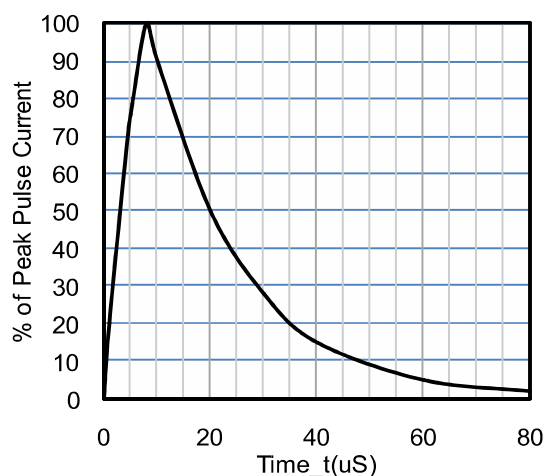
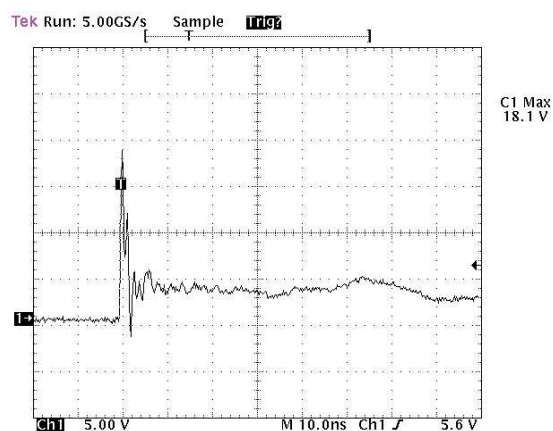
Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current



Power Derating Curve

8 X 20 μ s Pulse Waveform

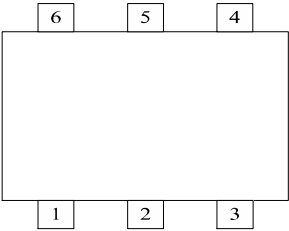
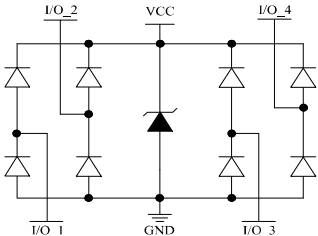
Note : Data is taken with a 10x attenuator

ESD Clamping Voltage

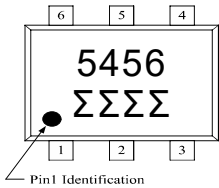
8 kV Contact per IEC61000-4-2

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Pinning information

Pin Configuration	Simplified outline	Circuit Diagram
Pin : 1, 3, 4, 6 I/O Pin : 5 V_{CC} Pin : 2 GND		

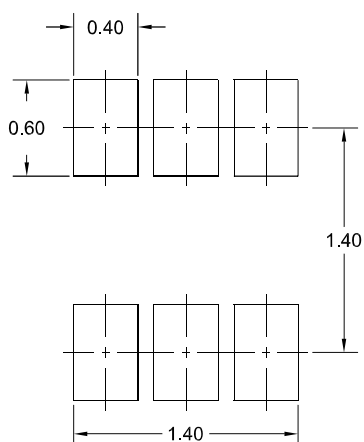
Marking

Type number	Marking code
LL054BT56A	

ΣΣΣΣ:Date Code

Suggested solder pad layout

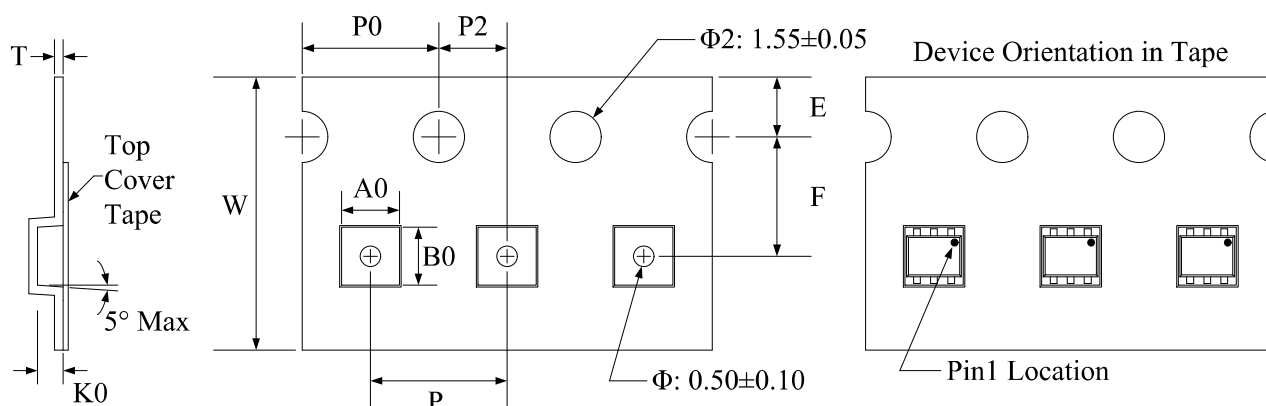
SOT-563



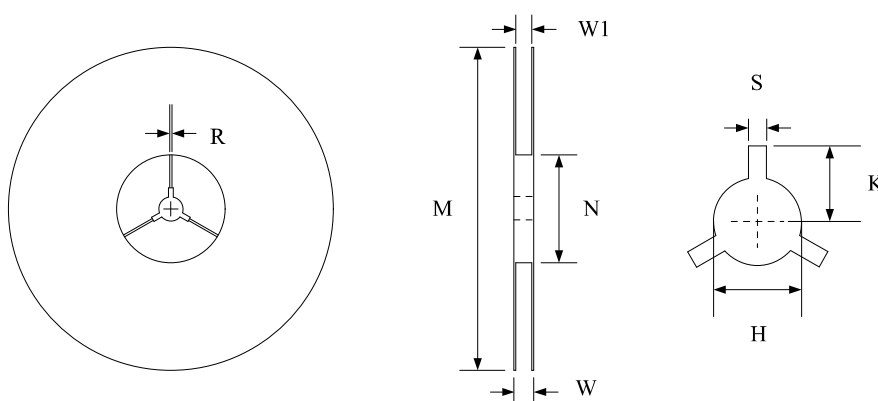
Dimensions in millimeters

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Packing information



Symbol	W	A0	B0	K0	E	F	P	P0	P2	T
Dimensions (mm)	8.00+0.3 -0.1	1.83±0.05	1.83±0.05	0.75±0.05	1.75±0.1	3.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	0.25±0.02



Symbol	Reel Size	M	N	W	W1	H	S	K	R
Dimensions (mm)	Φ178	178.0±1.0	60.0±1.0	11.5±0.5	9.0±0.5	13.0±0.5	2.0±0.1	11.0±0.2	1.0±0.05

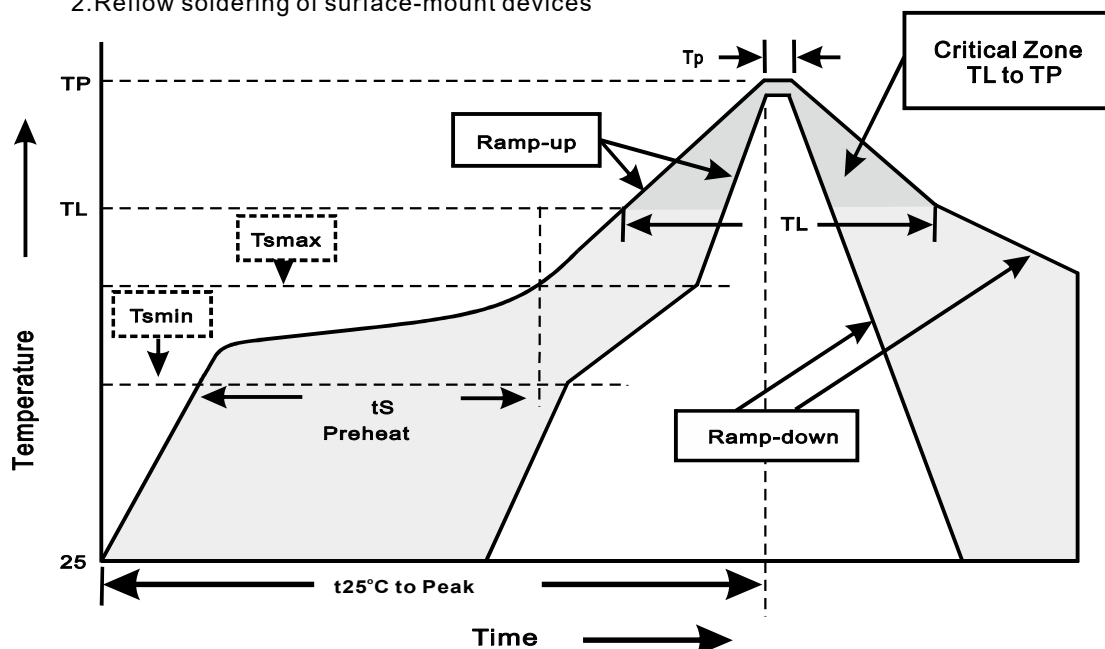
Ordering information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
LL054BT56A	5V	4,000	7 Inch

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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(TL to TP)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(ts)	150°C 200°C 60~120sec
Tsmax to TL -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(TL) -Time(tL)	217°C 60~260sec
Peak Temperature(TP)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(tp)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes