

LL054BT2510H

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

LL054BT2510H

4-Channel Ultra Low Capacitance TVS For ESD Protection Array 5.0V

Features

- Package optimized for high-speed lines.
- Protects four data lines.
- Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ (Contact discharge).
- Transient protection for high-speed data lines
 - IEC61000 -4-2 (ESD) $\pm 16\text{kV}$ (Air), $\pm 12\text{kV}$ (Contact).
 - IEC 61000-4-4 (EFT) 40A (5/50ns) .
 - Cable discharge event (CDE).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates halogen-free parts, ex.LL054BT2510H-H.

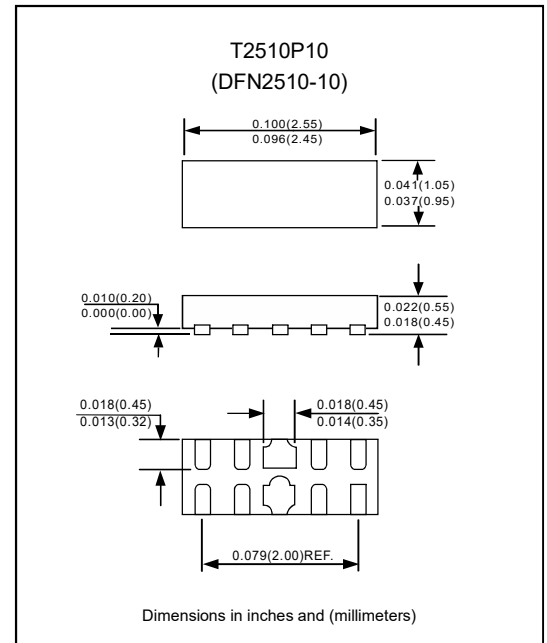
Applications

- Digital video interface (DVI), desktops, servers and notebook .
- USB 2.0/3.0/3.1 power and data line protection.
- HDMI, MDDI ports , Serual ATA , PCI express and display ports.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, T2510P10 (DFN2510-10).
- Mounting Position : Any.

Package outline



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

Parameter	Symbol	Value	Units
Peak pulse current (8/20 μs)	I_{PP}	6	A
ESD per IEC61000-4-2 (Air)	V_{ESD}	± 16	KV
ESD per IEC61000-4-2 (Contact)		± 12	
Operating temperature	T_J	+125	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$

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

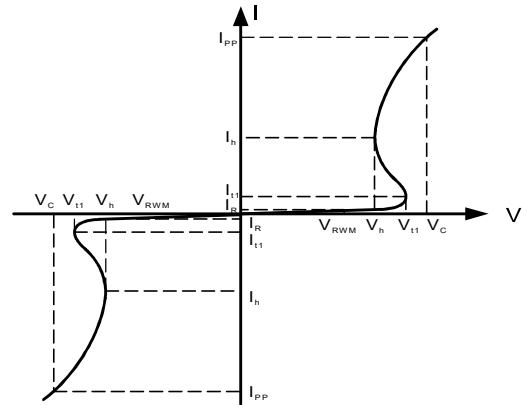
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse working voltage		V_{RWM}			5	V
Reverse leakage current	$V_{RWM} = 5\text{V}$, $T = 25^\circ\text{C}$	I_R		0.1	1	μA
Reverse breakdown voltage	$I_T = 1\text{mA}$	V_{BR}	6		10	V
Clamping voltage	$I_{PP} = 6\text{A}$, $t_p = 8/20\mu\text{s}$	V_C		3.2	5	V
Clamping voltage	$I_{PP} = 12\text{A}$, $t_p = 100\text{ns}$	V_C		4.9		V
	$I_{PP} = 16\text{A}$, $t_p = 100\text{ns}$ (Note1)			6		
Parasitic Capacitance	$V_R = 0\text{V}$, $f = 1.0\text{MHz}$, between I/O and GND	C_{ESD}		0.7		pF
	$V_R = 0\text{V}$, $f = 1.0\text{MHz}$, between I/O and I/O			0.35		

Notes : 1. Measurements performed using a 100ns transmission line pulse(TLP) system.

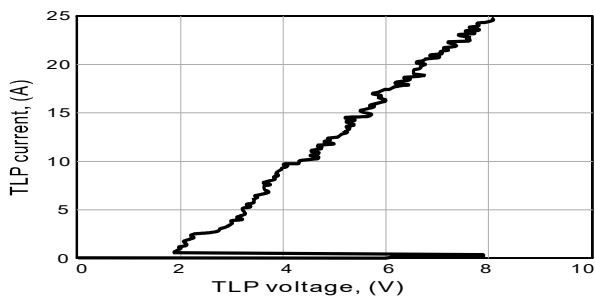
LL054BT2510H

Rating and characteristic curves

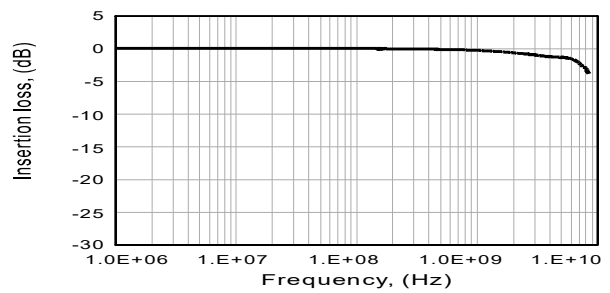
Symbol	Parameter
V_{RWM}	Nominal reverse working voltage
I_R	Reverse leakage current@ V_{RWM}
V_{t1}	Trigger voltage
I_{t1}	Trigger current@ V_{t1}
V_h	Holding voltage
I_h	Holding current@ V_h
V_C	Clamping voltage@ I_{PP}
C_{ESD}	Parasitic capacitance
I_{PP}	Maximum peak pulse current
C_A	Variation in C_{ESD} with reverse bias



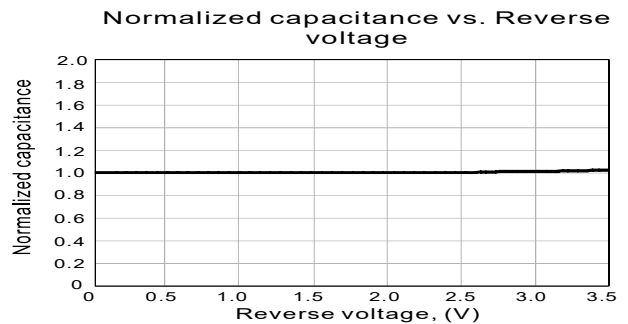
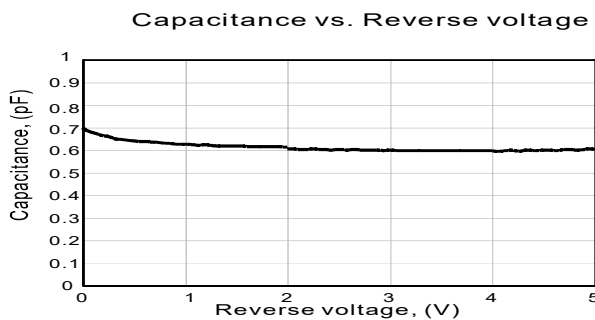
TLP measurement of I/O to GND



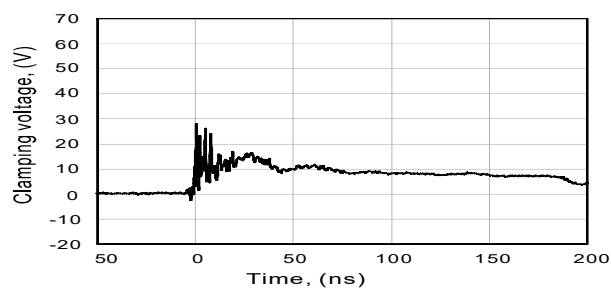
Insertion loss S21 of I/O to GND



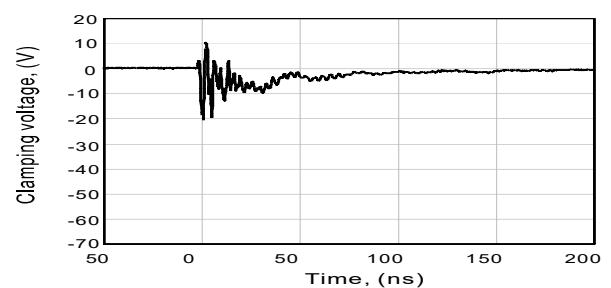
Capacitance vs. voltage of I/O to GND (f=1.0MHz)



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

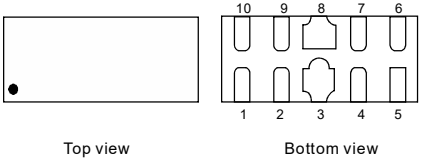
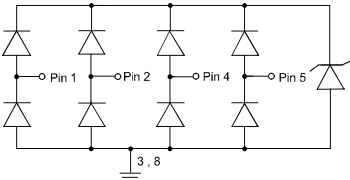


ESD Clamping of I/O to GND
(-8kV Contact per IEC 61000-4-2)



LL054BT2510H

Pinning information

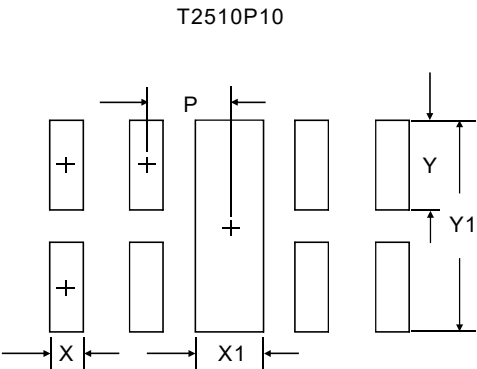
Pin	Simplified outline	Circuit Diagram
Pin 1, 2, 4, 5 I/O Pin 3, 8 GND Pin 6, 7, 9, 10 NC	 Top view Bottom view	

Marking

Type number	Marking code
LL054BT2510H	334XXX

* "334" is part number, fixed.
"XXX" is the wafer lot code.

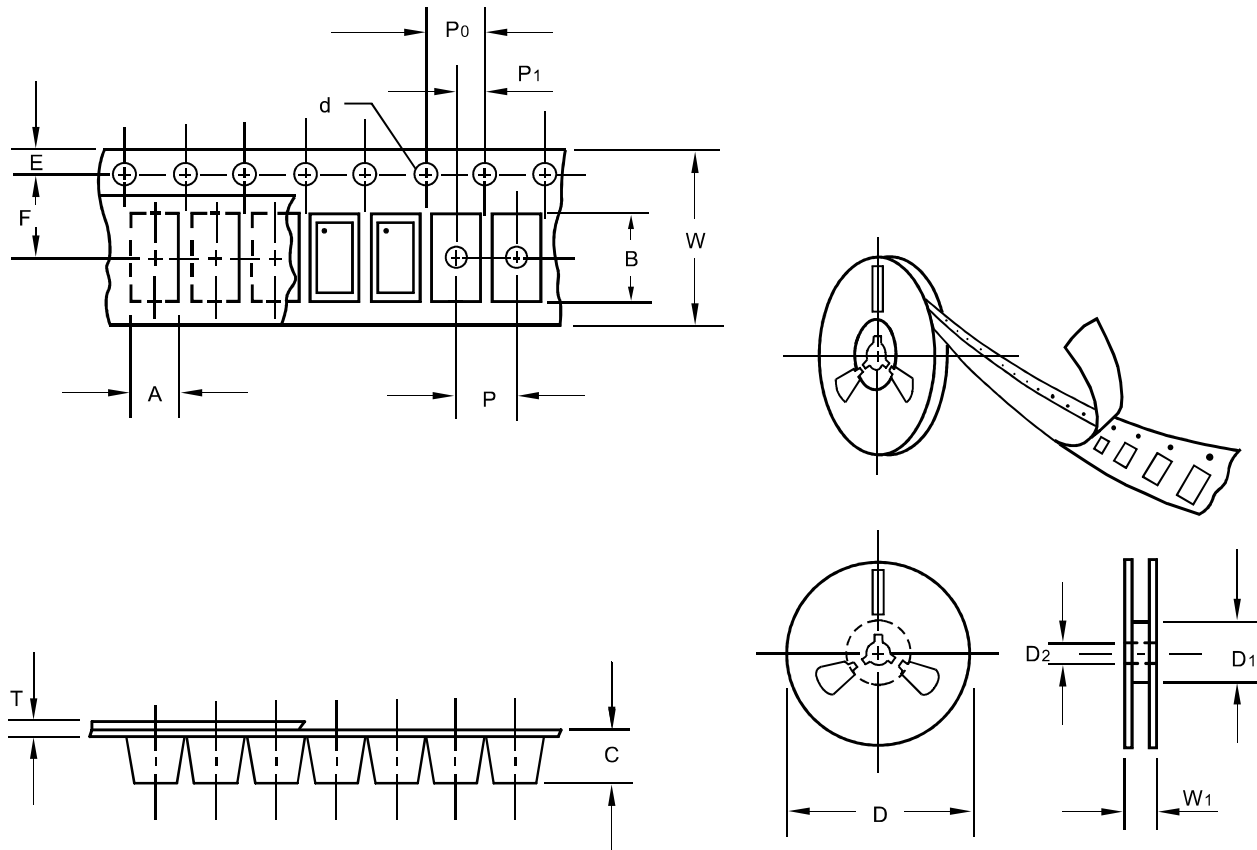
Suggested solder pad layout



DIMENSIONS		
DIM	INCHES	MILLIMETERS
P	0.020	0.50
X	0.012	0.30
X1	0.016	0.40
Y	0.019	0.48
Y1	0.047	1.20

LL054BT2510H

Packing information



unit:mm

Item	Symbol	Tolerance	T2510P10
Carrier width	A	0.1	1.23
Carrier length	B	0.1	2.70
Carrier depth	C	0.1	0.70
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D2	2.0	178.00
7" Reel inner diameter	D1	min	60.00
Feed hole diameter	D2	0.2	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	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.25
Tape width	W	0.3	8.00

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

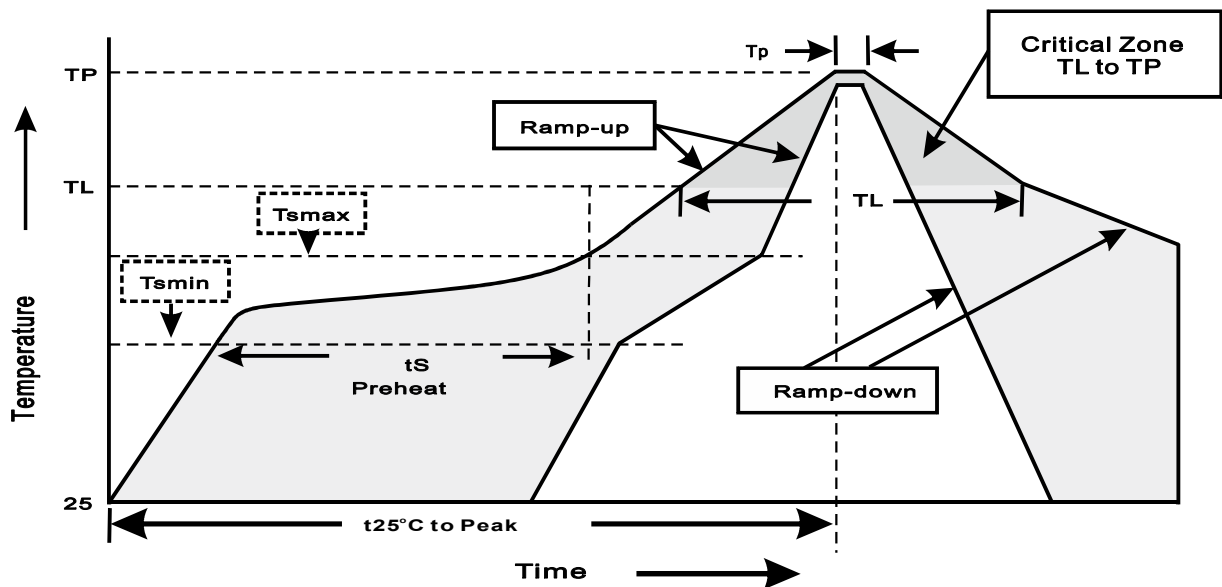
LL054BT2510H

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)
T2510P10	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000

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(T _{Smin}) -Temperature Max(T _{Smax}) -Time(min to max)(t _S)	150°C 200°C 60~120sec
T _{Smax} 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