

LL054BT2510E

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

LL054BT2510E

35W 4-Channel Ultra Low Capacitance TVS For ESD Protection Array : 5.0V

Features

- 35Watts peak pulse power ($t_p=8/20\mu s$).
- Solid-state silicon-avalanche technology.
- Protection for high-speed data lines to:
 - IEC 61000-4-2(ESD) $\pm 8kV$ (Contact), $\pm 15kV$ (Air).
 - IEC 61000-4-4(EFT) 40A (5/50ns).
 - IEC 61000-4-5(Lighting) 5A (8/20 μs) .
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.LL054BT2510E-H.

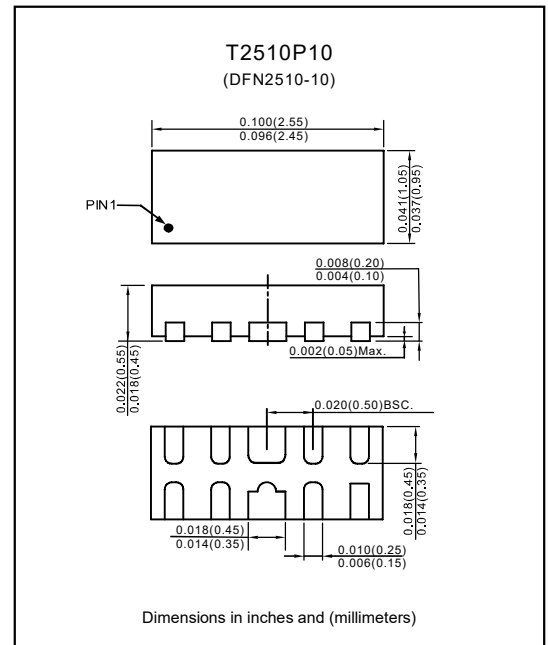
Applications

- USB3.1, USB3.0, MHL, HDMI2.0, Display port 1.3 and eSATA.
- High speed serial interfaces.

Mechanical data

- Epoxy : UL94-V0 rated flame retardant.
- Case : Molded plastic, T2510P10 (DFN2510-10) .
- Terminals : High temperature soldering guaranteed, 260°C/10 seconds at terminals.
- Mounting Position : Any.

Package outline



Maximum ratings (At $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Units
Peak pulse power ($t_p=8/20\mu s$)	P_{PK}	35	W
Peak pulse current ($t_p=8/20\mu s$)	I_{PP}	5	A
ESD per IEC61000-4-2 (Air)	V_{ESD}	± 15	kV
ESD per IEC61000-4-2 (Contact)		± 8	
Operating temperature range	T_J	+125	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

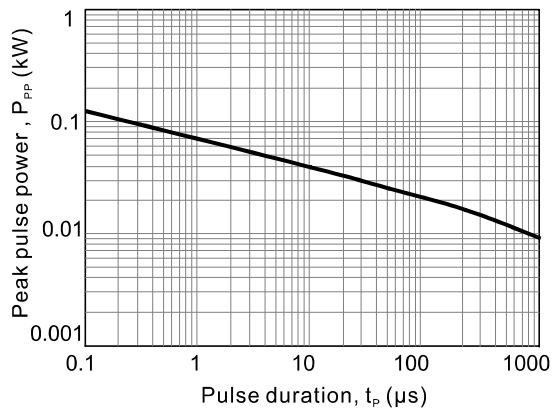
Electrical Characteristics (At $T_A=25^\circ C$ unless otherwise noted)

Parameter	Test condition	Symbol	Min.	Typ.	Max.	Units
Reverse working voltage		V_{RWM}			5	V
Holding voltage	$I_T=I_H$	V_H	2	3		V
Reverse leakage current	$V_{RWM}=5V$	I_R			0.5	μA
Holding current		I_H	30			mA
Clamping voltage	$I_{PP} = 5A, t_p=8/20\mu s$	V_C		7		V
Clamping voltage (TLP)	$I_{PP} = 16A, t_p=100ns$			8		
Dynamic resistance		R_{dyn}		0.248		Ω
Junction capacitance	$V_R=0V, f=1.0MHz, I/O$ to I/O pins	C_J		0.2		pF
	$V_R=0V, f=1.0MHz, I/O$ pin to ground	C_J		0.4		

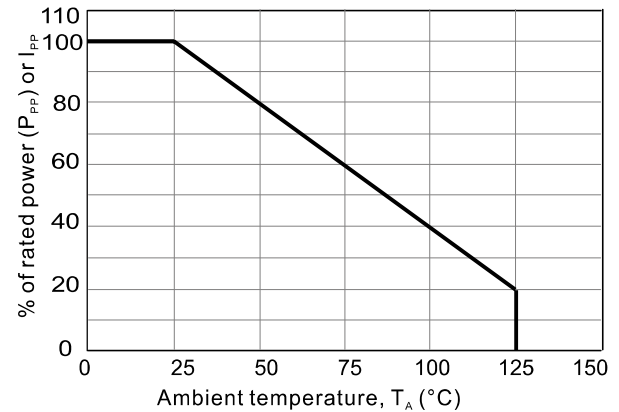
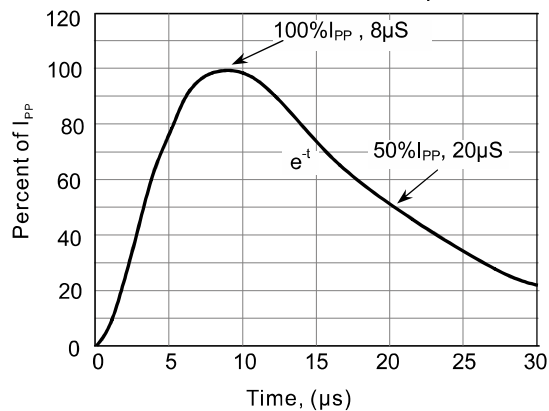
LL054BT2510E

Rating and characteristic curves

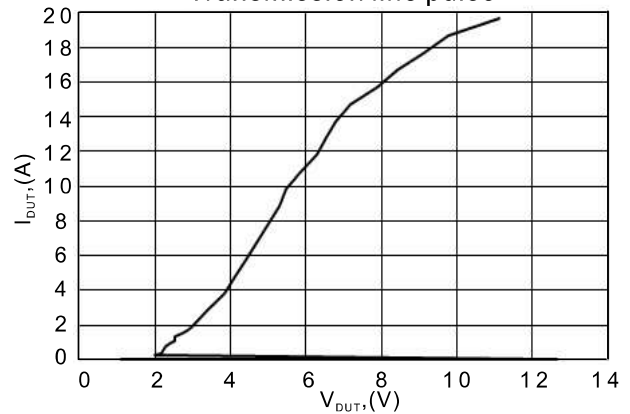
Peak pulse power rating curve



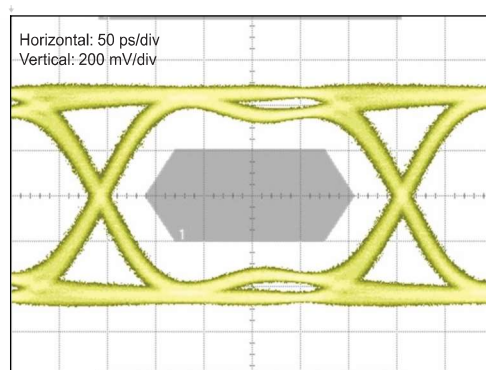
Pulse derating curve

Pulse waveform, 8/20 μ s

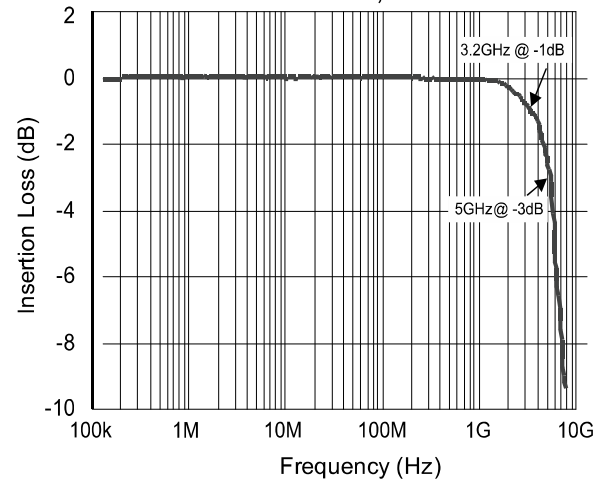
Transmission line pulse



Eye diagram, HDMI mask at 5Gbps per channel

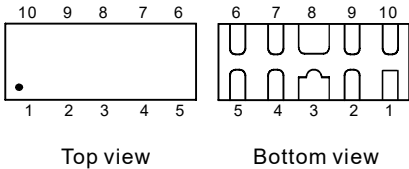
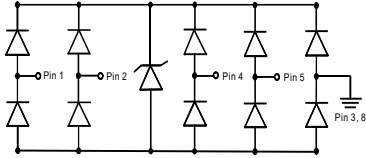


Insertion loss S21, I/O to GND



LL054BT2510E

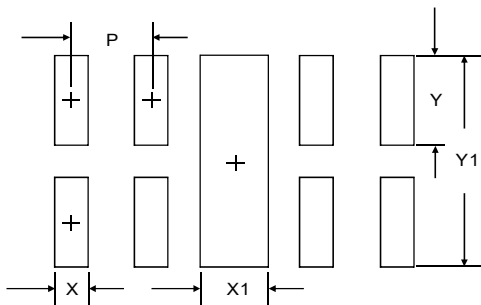
Pinning information

Pin	Simplified outline	Symbol
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
LL054BT2510E	324E

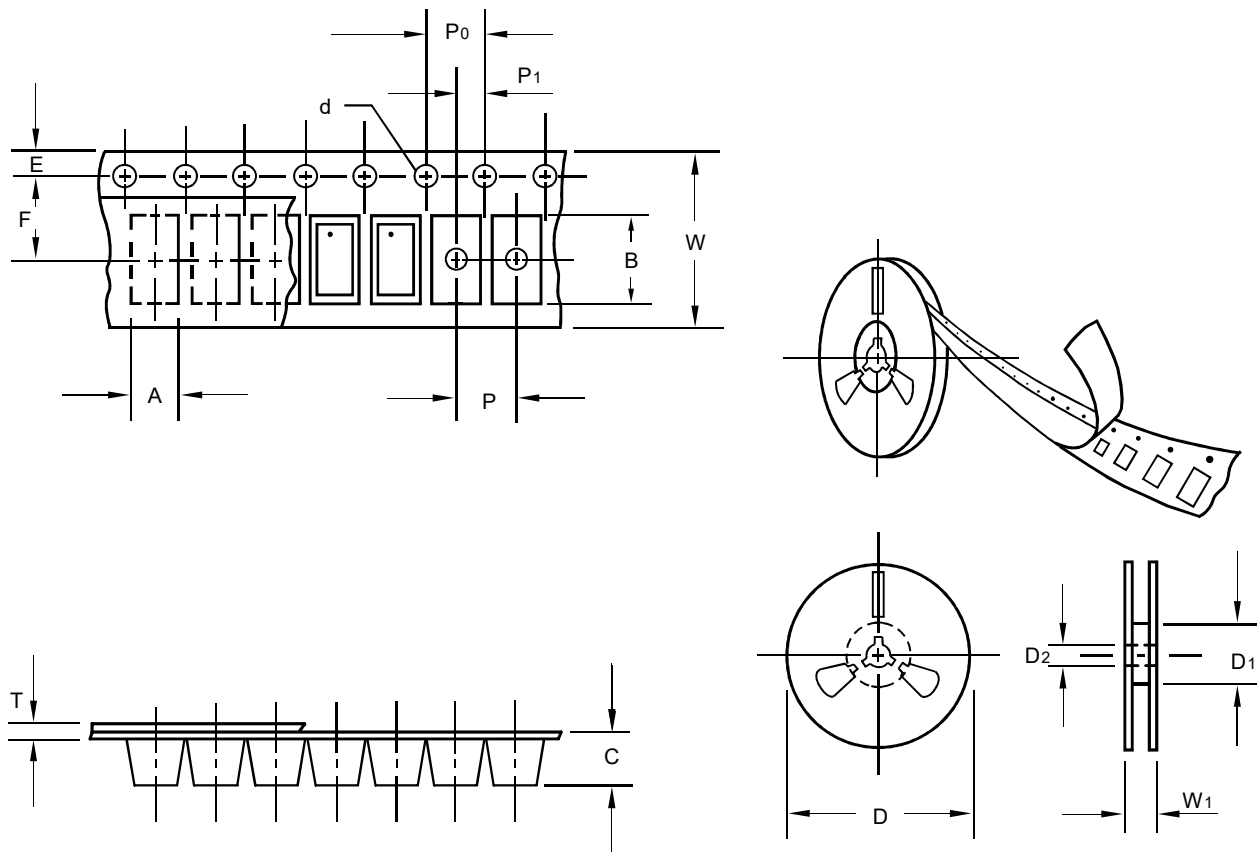
Suggested solder pad layout



DIMENSIONS		
DIM	INCHES	MILLIMETERS
P	0.020	0.50
X	0.010	0.25
X1	0.018	0.45
Y	0.027	0.68
Y1	0.061	1.55

LL054BT2510E

Packing information



unit:mm

Item	Symbol	Tolerance	T2510P10
Carrier width	A	0.05	1.20
Carrier length	B	0.05	2.70
Carrier depth	C	0.05	0.70
Sprocket hole	d	0.1	1.50
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	0.2	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	P ₀	0.1	4.00
Embossment center	P ₁	0.05	2.00
Overall tape thickness	T	0.1	0.20
Tape width	W	0.3	8.00
Reel width	W ₁	1.0	13.1

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

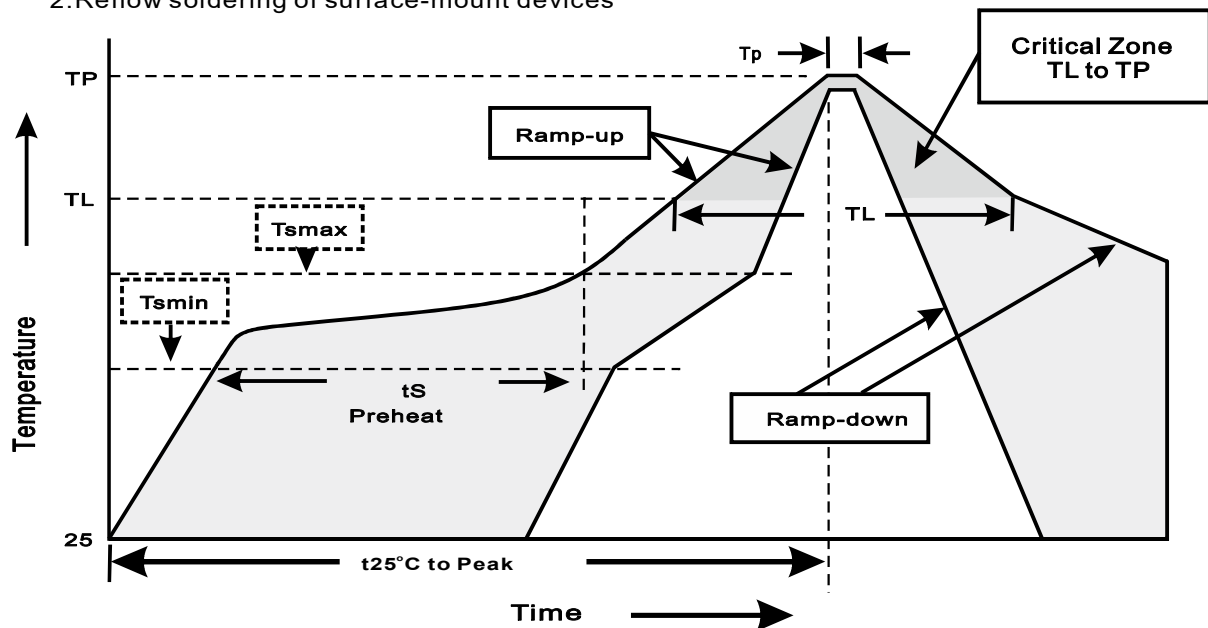
LL054BT2510E

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)	$<3^{\circ}\text{C}/\text{sec}$
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	$<3^{\circ}\text{C}/\text{sec}$
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	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$