LL034BT2510G-Q1

List

LL034BT2510G-Q1

4-Channel Ultra Low Capacitance TVS For ESD Protection Array : 3.3V

Features

- Transient protection for high-speed data lines
  - IEC61000 -4-2 (ESD) ±15kV (Air), ±14kV (Contact).
  - IEC 61000-4-4 (EFT) 40A (5/50ns).
  - IEC 61000-4-5 (Surge) 6A (8/20μs) .
- Qualified to AEC-Q101 standard for high reliability.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates halogen-free parts, ex.LL034BT2510G-Q1-H.

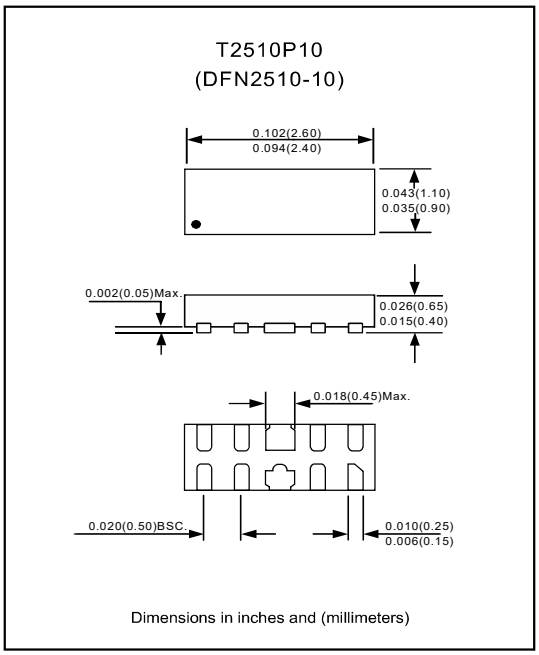
Applications

- V-by-one interface and SATA/eSATA interface.
- USB3.0/3.1 and HDMI 2.0/2.1.
- Thunderblot interface and display ports interface.

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°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse current (8/20μs)	I_{PP}	6	A
ESD per IEC61000-4-2 (Air)	V_{ESD}	±15	kV
ESD per IEC61000-4-2 (Contact)		±14	
Operating temperature	T_J	+105	°C
Storage temperature range	T_{STG}	-55 to +150	°C

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse working voltage	I/O pin to GND	V_{RWM}			3.3	V
Reverse leakage current	V_{RWM}=3.3V, I/O pin to GND	I_R			1	μA
Reverse breakdown voltage	I_T=1mA, I/O pin to GND	V_{BR}	6.5		16	V
Forward voltage	I_T=15mA, I/O pin to GND	V_F		1		V
Surge clamping voltage	I_{PP} = 5A, t_P = 8/20μs, I/O pin to GND	V_C		11.5		V
TLP Clamping voltage	I_{TLP} = 1A, t_P = 100ns, t_r=1ns, I/O pin to GDN	V_C		2.5		V
	I_{TLP} = 16A, t_P = 100ns, t_r=1ns, I/O pin to GDN			5.5		
TLP dynamic resistance	t_P=100ns, t_r=1ns, I/O pin to GND	R_{dyn}		0.2		Ω
Junction capacitance	V_R=1.5V, f=1.0MHz, I/O pin to GND	C_J		0.28	0.33	pF
	V_R=1.5V, f=1.0MHz, between I/O pin			0.05	0.1	

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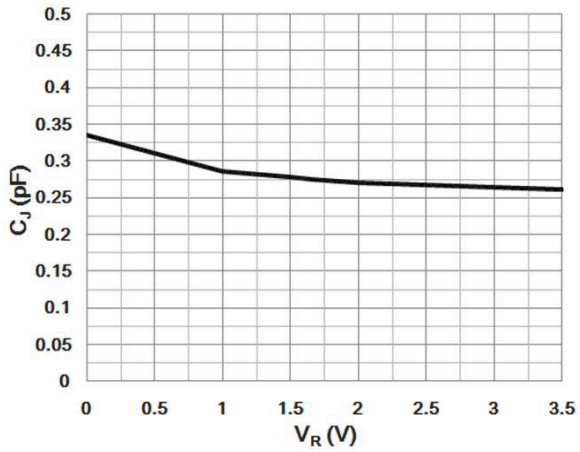
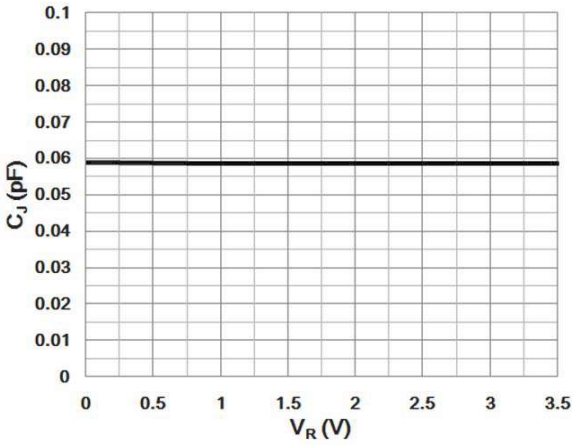
Rating and characteristic curves

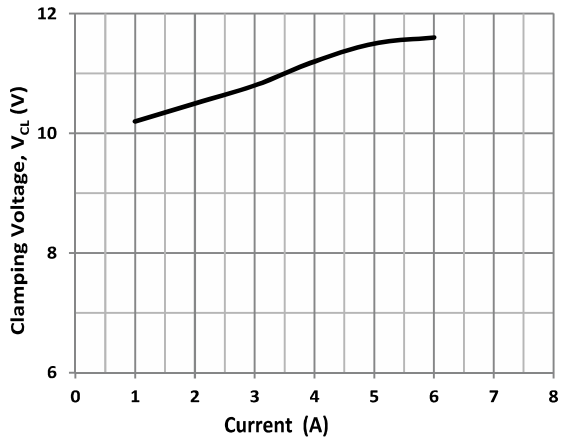
Junction Capacitance (I/O Pin to GND)



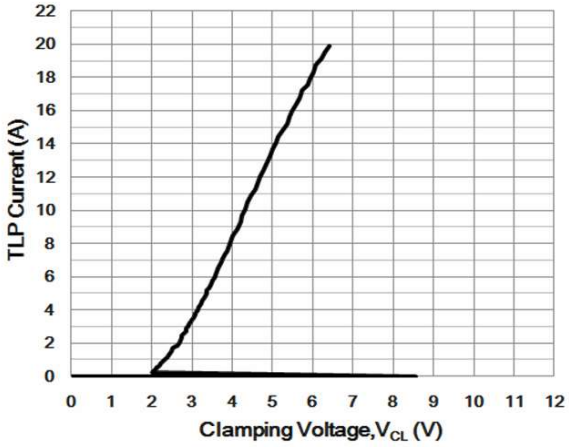
Junction Capacitance (I/O Pin to I/O Pin)



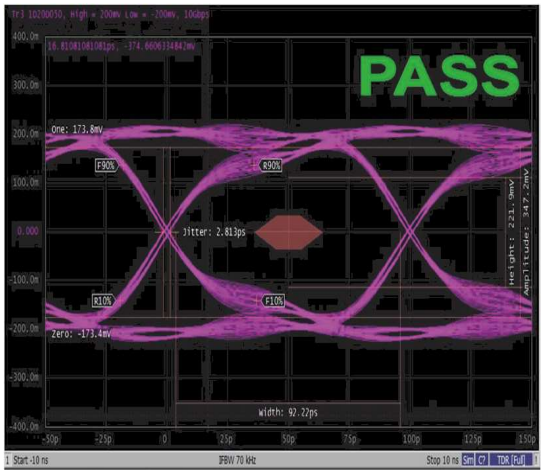
Surge Clamping Voltage



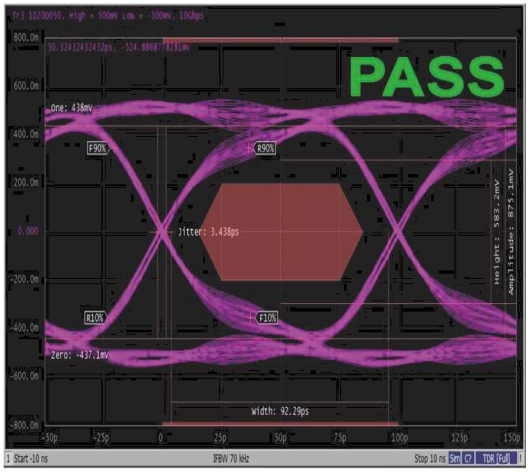
TLP Clamping Voltage (tperiod=100ns,tr=1ns)



10Gb/s USB3.1 Gen2 Eye Diagram with EZ0P33P2NA-A



10Gb/s HDMI Eye Diagram with EZ0P33P2NA-A



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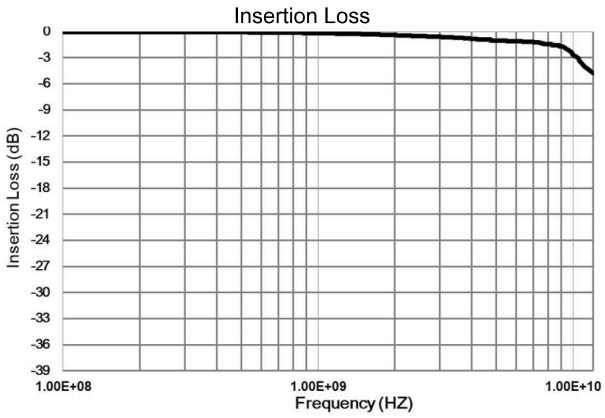
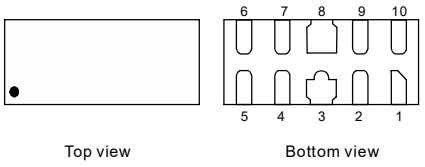
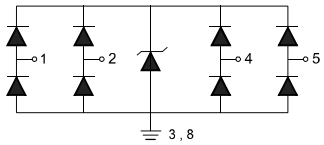
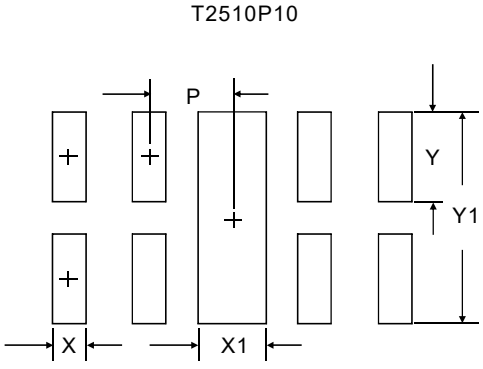
Rating and characteristic curves



Pinning information

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

Suggested solder pad layout



DIMENSIONS		
DIM	INCHES	MILLIMETERS
P	0.022	0.55
X	0.012	0.30
X1	0.018	0.45
Y	0.027	0.68
Y1	0.067	1.70

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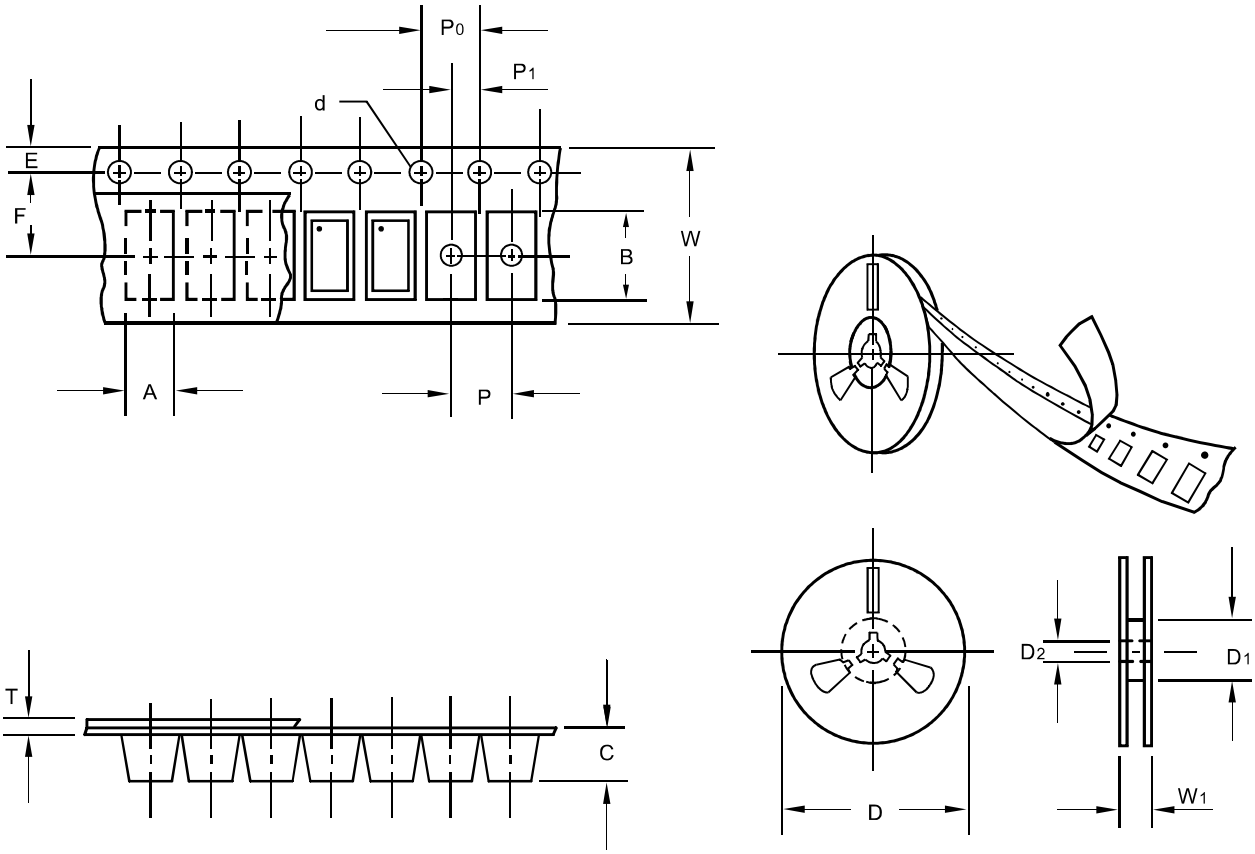
Packing information



unit:mm

Item	Symbol	Tolerance	T2510P10
Carrier width	A	0.1	1.20
Carrier length	B	0.1	2.70
Carrier depth	C	0.1	0.70
Sprocket hole	d	0.3	1.35
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	50.00
Feed hole diameter	D2	2.0	13.10
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	0.22
Tape width	W	0.3	15.10

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

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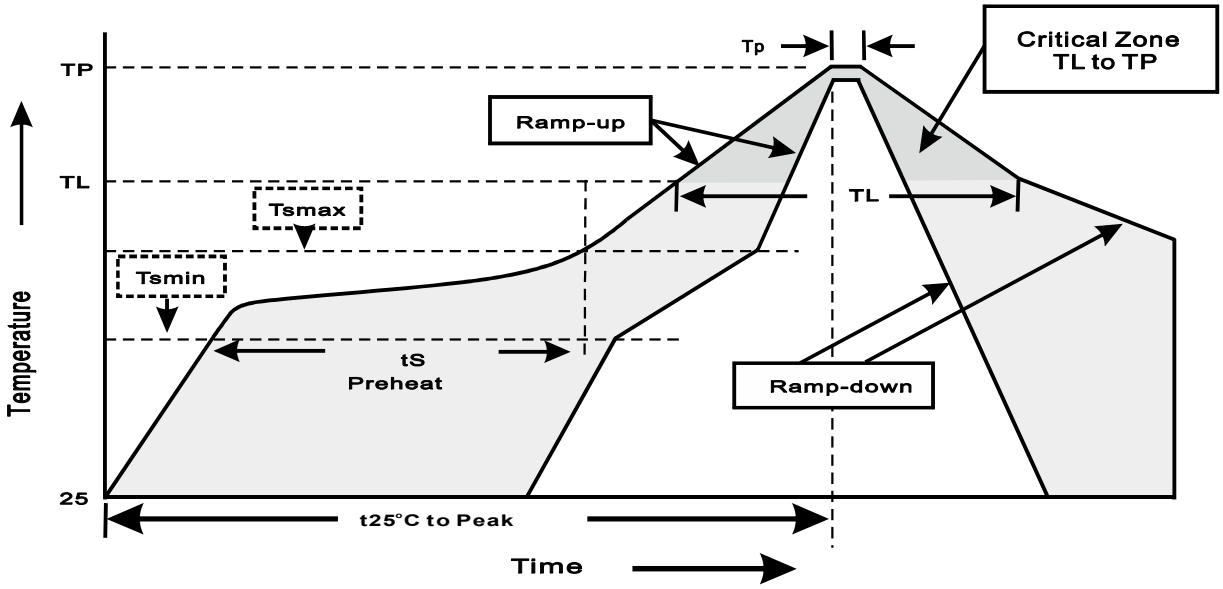
Reel packing

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)
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(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. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. High Temperature Reverse Bias	V_{BR}=$V_{BR\ MIN}$*80% (T_J=T_J max.)Test Duration:1000hrs	JESD22-A108
3. High Temperature Storage Life	Ta=150°C Test Duration:1000hrs	JESD22 A-103
4. Temperature Cycle	-55°C(15min) to 150°C(15min)Test Cycles:1000cycles	JESD22 A-104
5. Autoclave	P=2atm Ta=121°C RH=100% Test Duration:96hrs	JESD22 A-102
6. Solderability	245±5°C for 5sec	J-STD-002
7. Moisture Resistance	Ta=85°C/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
8. Resistance To Solder Heat	260±5°C for 10sec	JESD22 B-106
9. High Temperature High Humidity Reverse Bias	Ta=85°C, 85%RH, with device reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber Test Duration:1000hrs	JESD22-A101