

LL034BT2510F

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LL034BT2510F

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

Features

- Protects four I/O lines.
- Array of surge rated diodes with internal TVS diode.
- Each I/O pin can withstand over 1000 ESD strikes for $8\pm kV$ (Contact discharge).
- Transient protection for high-speed data lines
IEC61000 -4-2 (ESD) $\pm 15kV$ (Air), $\pm 15kV$ (Contact).
IEC 61000-4-5 (Lightning) 5.0A (8/20 μs) .
- Cable discharge event (CDE).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates halogen-free parts, ex.LL034BT2510F-H.

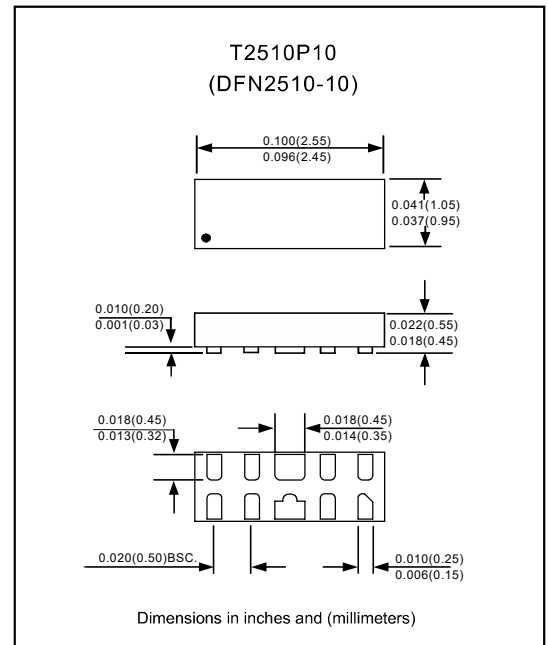
Applications

- Digital video interface (DVI), monitors and flat panel diplays.
- Video graphics cards, set-top box and notebook computers.
- USB 3.0, HDMI 1.4/2.0 , MDDI, SATA ports.

Mechanical data

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

Package outline



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

Parameter	Symbol	Value	Unit
Peak pulse current (8/20 μs)	I_{PP}	5	A
Peak pulse power (8/20 μs)	P_{PK}	20	W
ESD per IEC61000-4-2 (Air)	V_{ESD}	± 15	KV
ESD per IEC61000-4-2 (Contact)		± 15	
Operating temperature	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)

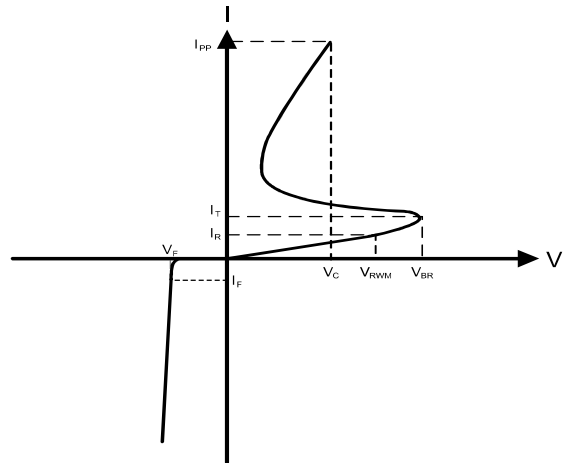
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Reverse working voltage		V_{RWM}			3.3	V
Reverse leakage current	$V_{RWM}=3.3$, $T_A=25^\circ C$ (Between I/O and GND)	I_R		0.1	1	μA
Reverse breakdown voltage	$I_T=1mA$ (Between I/O and GND)	V_{BR}	5	7	9	V
Clamping voltage	$I_{PP}=5A$, $t_p=8/20\mu s$ (Between I/O and GND)	V_C		3.5		V
Clamping voltage	$I_{PP}=8.0A$, $t_p=100ns$ (Note1)	V_C		3.5		V
	$I_{PP}=16.0A$, $t_p=100ns$ (Note1)			5.2		
Inverse dynamic resistance	$I_{PP}=12.0A$, $t_p=100ns$ (Note1)	R_{dyn}		0.22		Ω
Parasitic Capacitance	$V_R=0V$, $f=1.0MHz$ (Between I/O and GND)	C_{ESD}		0.7		pF
	$V_R=0V$, $f=1.0MHz$ (Between I/O and I/O)			0.35		

Notes:1. Measurements performed using a 100ns transmission line pulse (TLP) system, between I/O and GND.

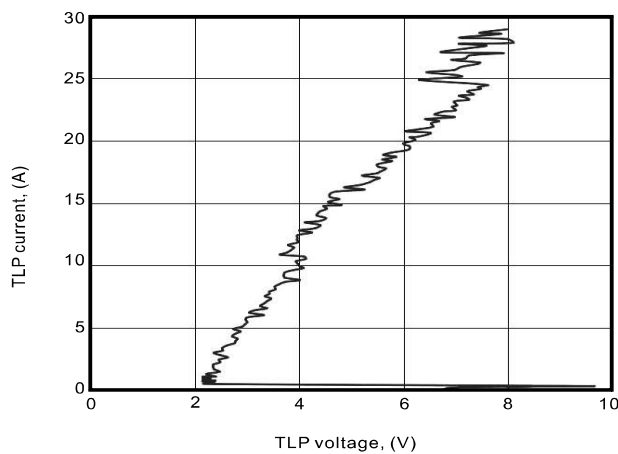
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Rating and characteristic curves

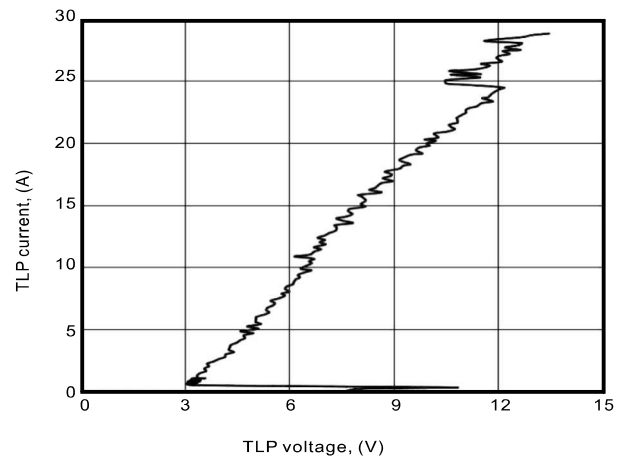
Symbol	Parameter
V_{RWM}	Nominal reverse working voltage
I_R	Reverse leakage current@ V_{RWM}
V_{BR}	Reverse breakdown voltage@ I_T
I_T	Test current for reverse breakdown
V_C	Clamping voltage@ I_{PP}
I_{PP}	Maximum peak pulse current
C_{ESD}	Parasitic capacitance
I_F	Forward current
V_F	Forward voltage @ I_F



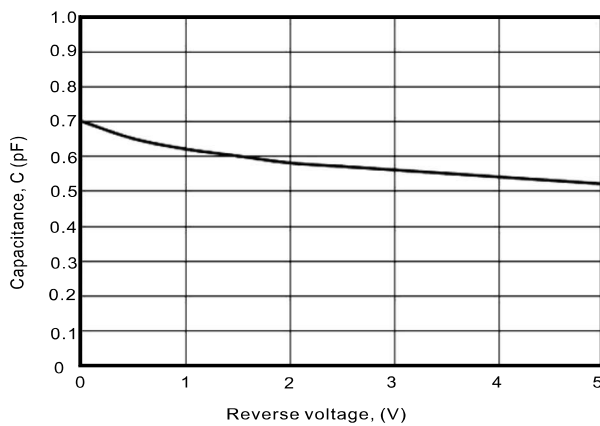
TLP measurement of I/O to GND



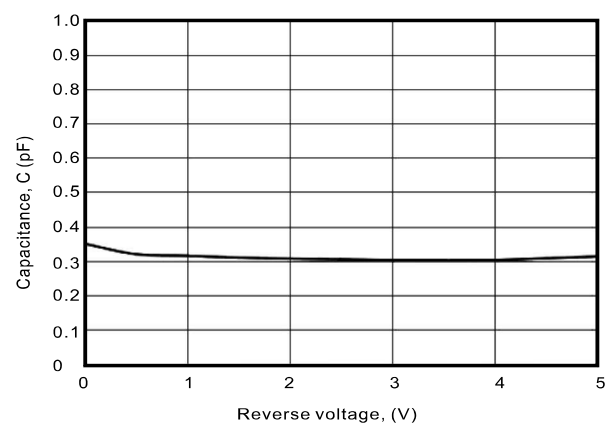
TLP measurement of I/O to I/O



Capacitance vs. Reverse voltage I/O to GND

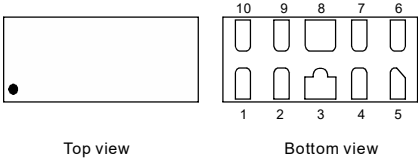
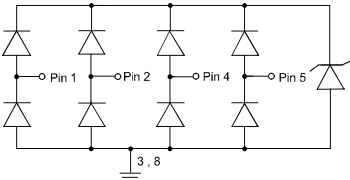


Capacitance vs. Reverse voltage I/O to I/O



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Pinning information

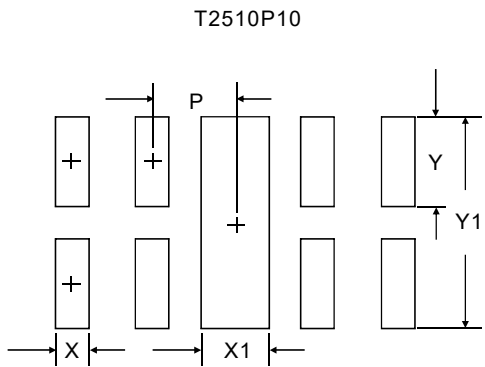
Pin	Simplified outline	Circuit Diagram
Pin 1, 2, 4, 5 I/O Pin 3, 8 GND Pin 6, 7, 9, 10 NC	 Top view Bottom view	

Marking

Type number	Marking code
LL034BT2510F	33XXXX

* "33" is part number, fixed.
* "XXXX" is the identification number.

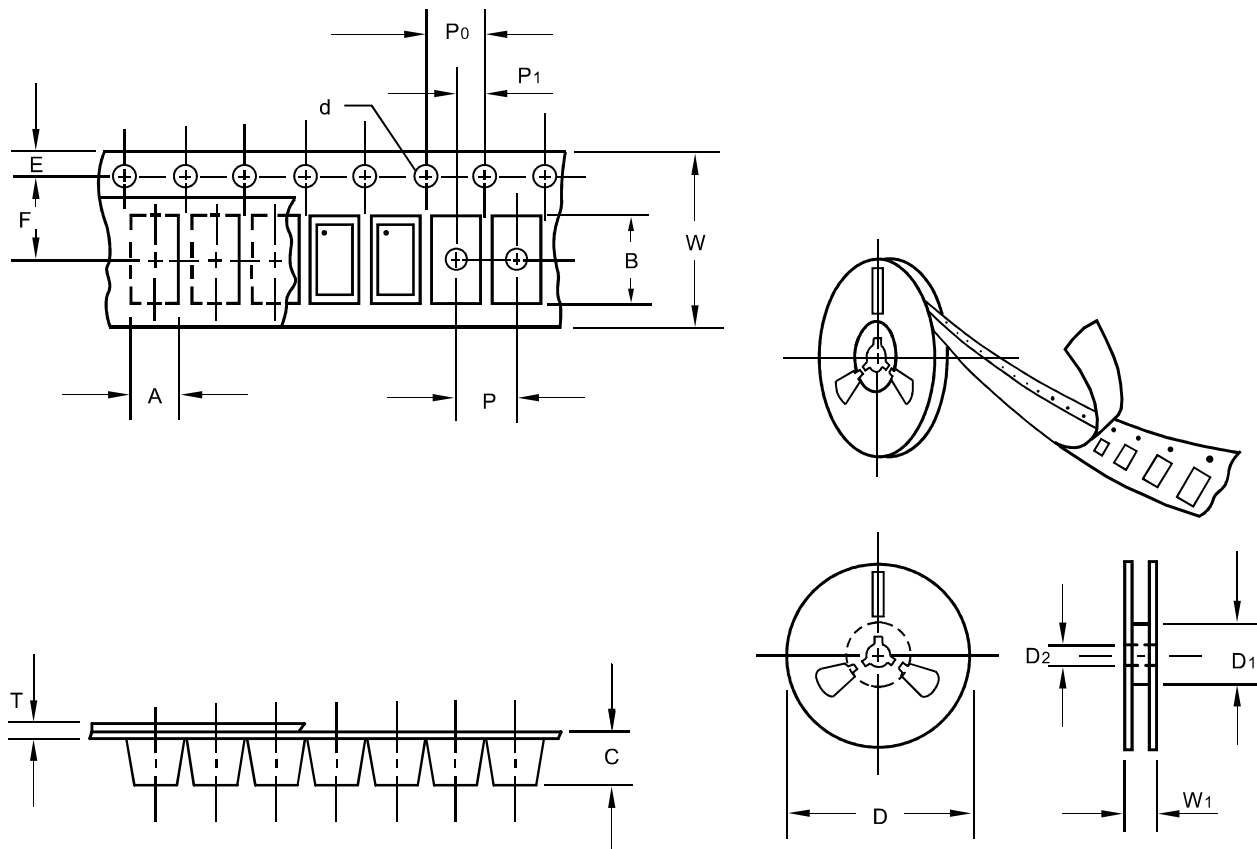
Suggested solder pad layout



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

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Packing information



unit:mm

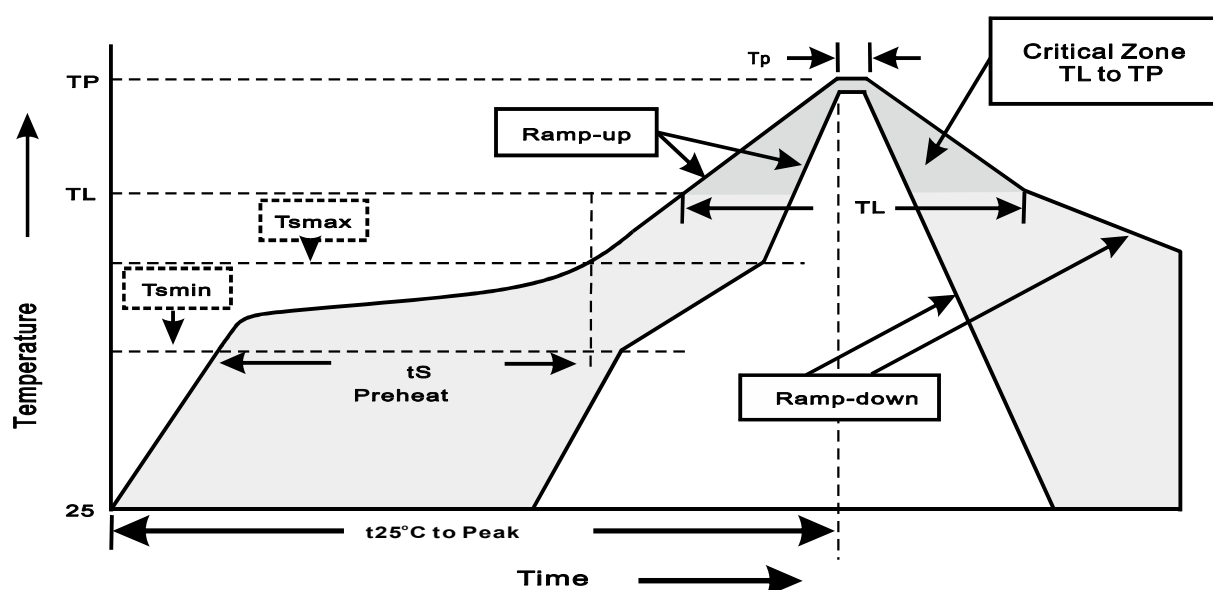
Item	Symbol	Tolerance	T2510P10
Carrier width	A	0.1	1.23
Carrier length	B	0.1	2.70
Carrier depth	C	0.1	0.70
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D2	2.0	178.00
7" Reel inner diameter	D1	min	60.00
Feed hole diameter	D2	0.2	13.00
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.

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

1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
2.Reflow soldering of surface-mount devices



Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min(T_{min}) -Temperature Max(T_{max}) -Time(min to max)(t_s)	150°C 200°C $60\sim 120\text{sec}$
T_{max} to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C $60\sim 260\text{sec}$
Peak Temperature(T_P)	$255^{\circ}\text{C}-0/+5^{\circ}\text{C}$
Time within 5°C of actual Peak Temperature(t_P)	$10\sim 30\text{sec}$
Ramp-down Rate	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$