U054BT2510

List

U054BT2510

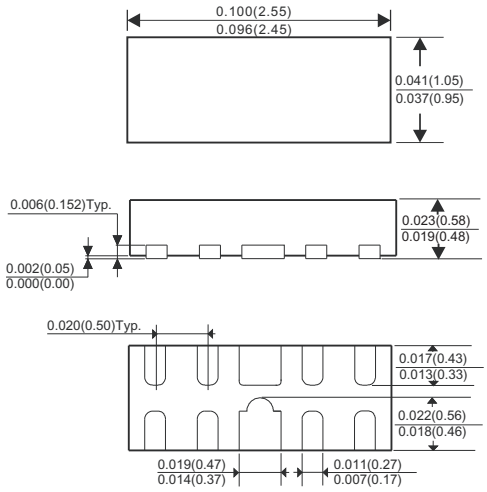
4-Channel Ultra Low Capacitance ESD Protection Diodes Array- 5.0V

Features

- 4 channels of ESD protection
- Provide transient protection:
  IEC 61000-4-2 (ESD) level 4
  IEC 61000-4-4 (EFT) 80A (5/50ns)
  IEC 61000-4-5 (Surge) (8/20us)
- Channel I/O to GND capacitance: 0.6pF(Max.)
- Channel I/O to I/O capacitance: 0.3pF(Max.)
- Low clamping voltage
- Low operating voltage
- Improved zener structure
- Optimized package for easy high speed data lines PCB layout
- RoHS compliant
- Suffix "-H" indicates Halogen-free parts, ex. U054BT2510-H.

Package outline

T2510P10



Dimensions in inches and (millimeters)

Applications

- HDMI / DVI ports
- Display port interface
- 10M / 100M / 1G ethernet
- USB 2.0 interface
- VGA interface
- Set-top box
- Flat panel monitors / TVs
- PC / note book

Mechanical data

- Flammability Rating: UL 94V-0
- Terminal: Matte tin plated
- Case : Molded plastic, T2510P10
- Mounting Position : Any
- Weight : 3.8 Millgrams (Approximate)

Maximum ratings (at T_A=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Peak pulse power (8/20us)	P_{PP}	75	W
Peak pulse current IEC 61000-4-5(8/20us)	I_{PP}	5.0	A
ESD per IEC 61000-4-2(air)	V_{ESD}	±15	kV
ESD per IEC 61000-4-2(contact)	V_{ESD}	±8.0	kV
Operating junction temperature range	T_J	-55 to +125	°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 stand off voltage	any I/O pin to GND	V_{RWM}			5.0	V
Reverse breakdown voltage	I_T=1mA, any I/O pin to GND	V_{BR}	6.0			V
Reverse leakage current	V_{RWM}=5V, any I/O pin to GND	I_R			1.0	uA
Positive clamping voltage	I_{PP}=1A, any I/O pin to GND (8/20us)	V_C		8.5	12.0	V
Negative clamping voltage	I_{PP}=1A, any I/O pin to GND (8/20us)	V_C		1.8		V
Junction capacitance between channel	V_R=0V, f=1MHz ,between I/O pins	C_J		0.25	0.30	pF
Junction capacitance between I/O and GND	V_R=0V, f=1MHz ,any I/O pin to GND	C_J		0.40	0.60	pF

Note: I/O pins are pin 1,2,4,5.

Rating and characteristic curves

Fig.1 - Non-Repetitive Peak Pulse Power

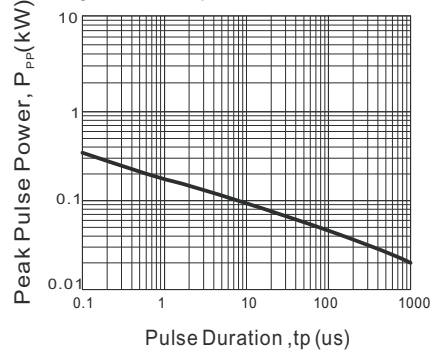


Fig. 2 - Power Derating Curve

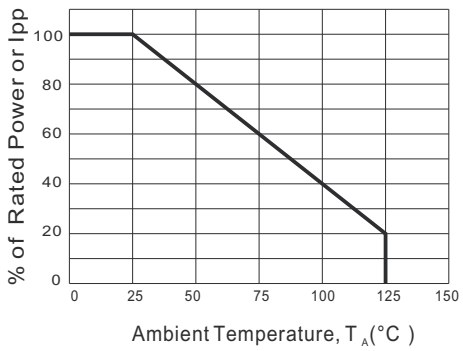


Fig. 3 - Pulse Waveform

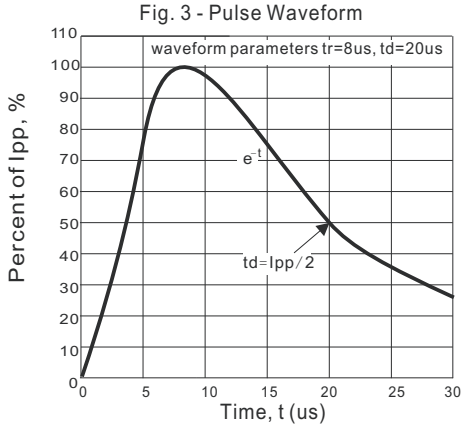


Fig. 4 - I/O-GND Clamping Voltage vs. Peak Pulse Current

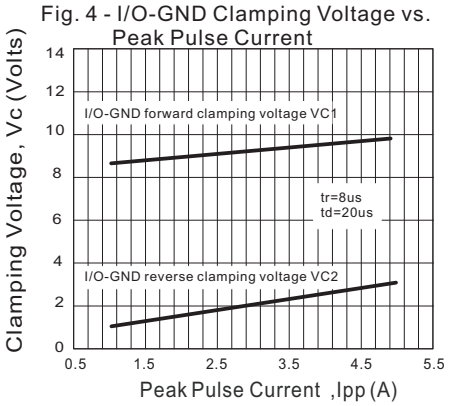
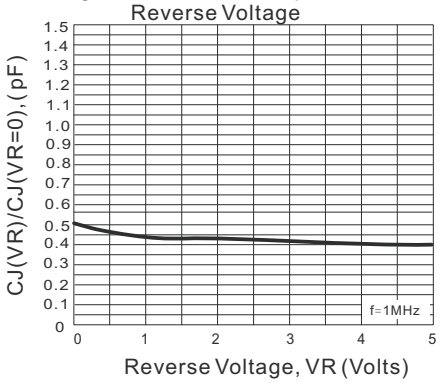
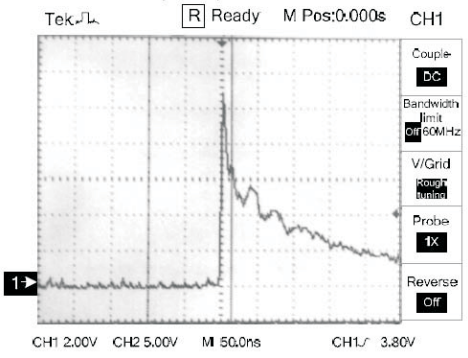


Fig. 5 - Normalized Capacitance vs. Reverse Voltage



ESD Clamping for +8KV pulse per IEC61000-4-2



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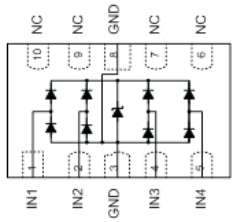
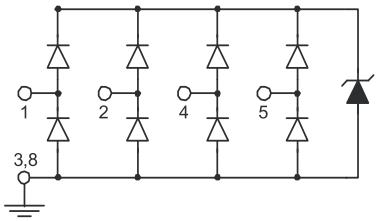
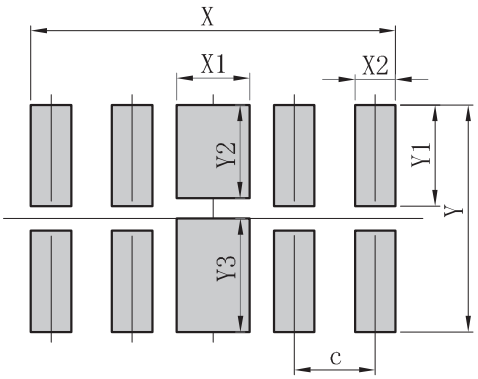
Pinning information

Pin Configuration	Simplified outline	Circuit Diagram
		

Marking

Type number	Marking code
U054BT2510	24B

Suggested solder pad layout



T2510P10	mm
c	0.5
X	2.25
X1	0.45
X2	0.25
Y	1.40
Y1	0.625
Y2	0.575
Y3	0.70

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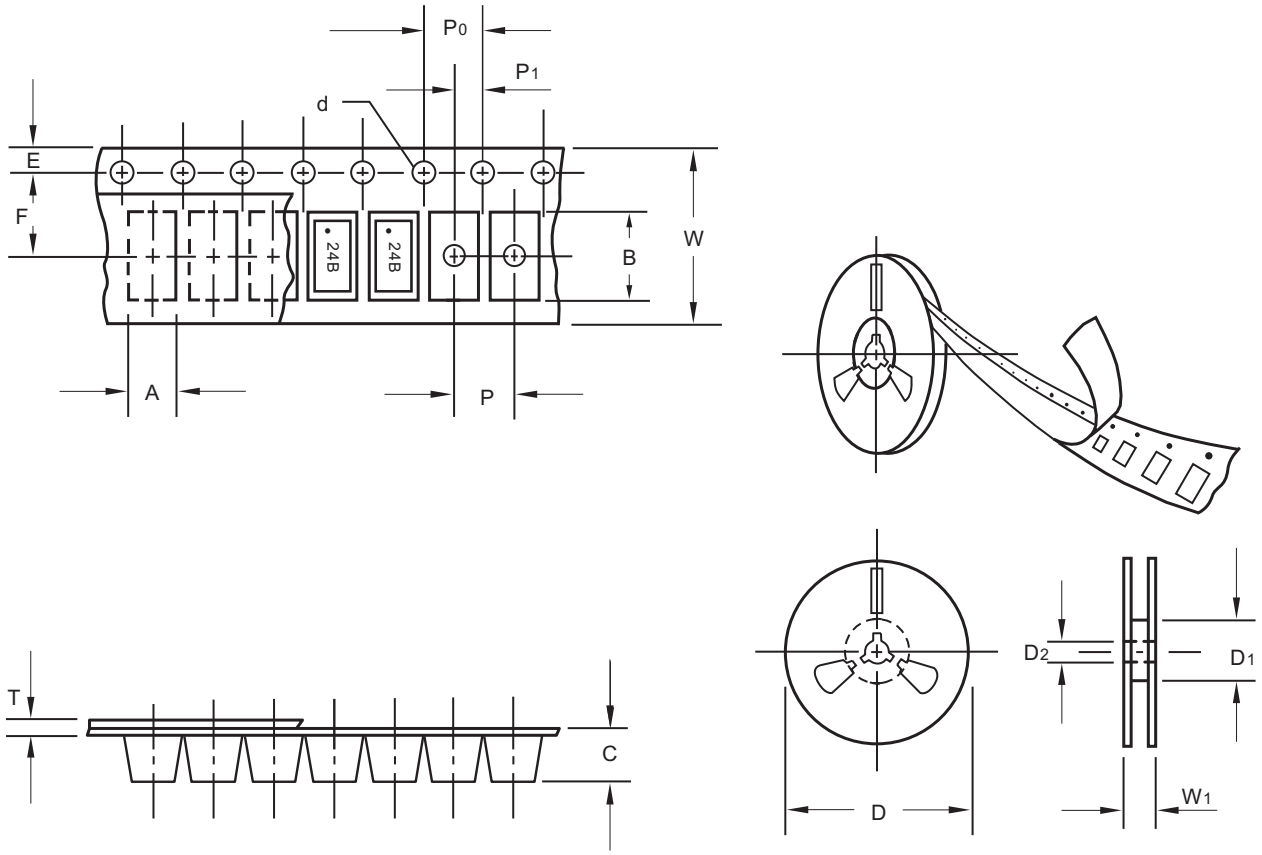
Packing information



unit:mm

Item	Symbol	Tolerance	T2510P10
Carrier width	A	0.05	1.23
Carrier length	B	0.05	2.70
Carrier depth	C	0.05	0.70
Sprocket hole	d	0.1	1.55
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	0.23
Tape width	W	0.3	8.00
Reel width	W_1	max	9.50

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

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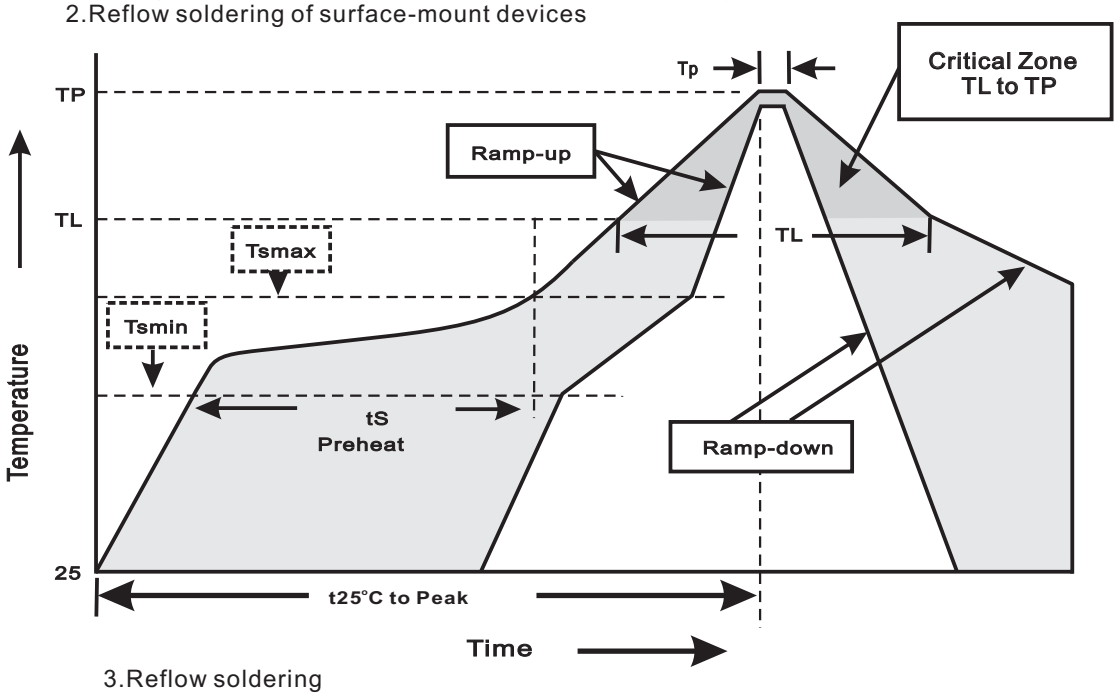
Reel packing

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)	APPROX. GROSS WEIGHT (kg)
T2510P10	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	7.5

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. Solder Resistance	at 260±5°C for 10±2sec.	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	V_{BR}= V_{BR} Min * 80% at T_J=125°C for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	15P_{SIG} at T_A=121°C for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at T_A=85°C, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
7. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031