

L054BT26A

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L054BT26A

4-Line SMD Low Capacitance TVS for ESD Protection 5.0V

Features

- Up to 4 data lines and one power line protects.
- IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (Air).
- $\pm 30\text{kV}$ (Contact).
- IEC 61000-4-4 (EFT) 40A (5/50ns).
- IEC 61000-4-5 (Lightning) 15A (8/20 μs).
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen-free parts, ex. L054BT26A-H

Applications

- USB 2.0.
- Video graphics cards.
- Digital video interface (DVI).
- Monitor and flat panel displays.
- Notebooks..
- IEEE 1394 fire wire ports
- 10/100 Ethernet

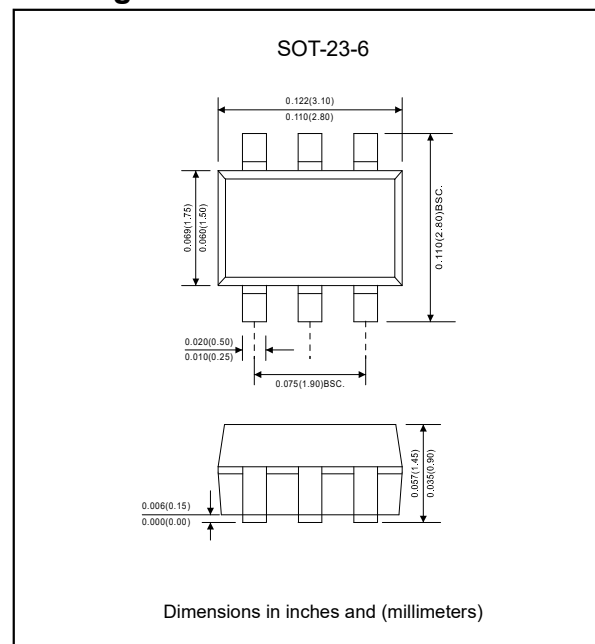
Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23-6
- Terminals : Plated terminals, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.013 gram

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

Parameter	Symbol	Ratings	Unit
Peak pulse power $(t_p=8/20\mu\text{s})$ (Any I/O Pin)	P_{PK}	240	W
		900	
Peak pulse current $(t_p=8/20\mu\text{s})$ (Any I/O Pin)	I_{PP}	15	A
		50	
ESD per IEC 61000-4-2 (Air discharge)	ESD	± 30	KV
		± 30	KV
(Contact discharge)			
Operating junction temperature range	T_J	-55 ~ 125	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 ~ 150	$^\circ\text{C}$
Lead temperature	T_L	260	$^\circ\text{C}$

Package outline



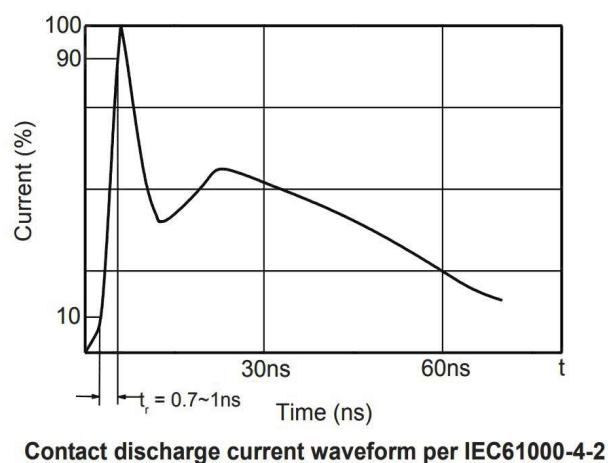
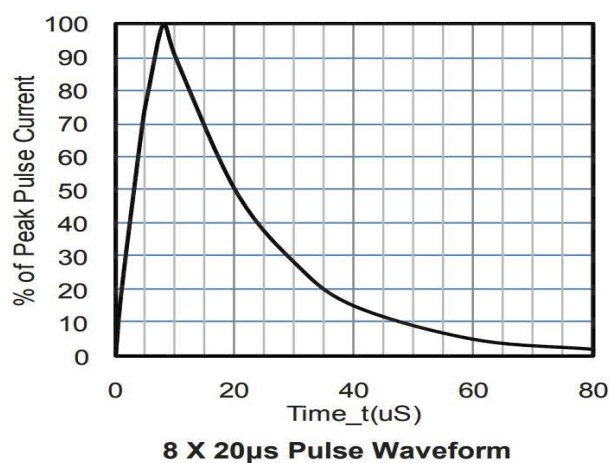
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Electrical characteristics (At $T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Reverse stand-off working voltage	V_{RWM}				5.0	V
Breakdown voltage	V_{BR}	$I_T=1\text{mA}$ (Any I/O pin)	7.0	8.5	10.0	V
		$I_T=1\text{mA}$ (V_{DD} pin)	6.5	8.0	9.5	
Reverse leakage current	I_R	$V_{RWM}=5.0\text{V}$			100	nA
Forward voltage	V_F	$I_F=10\text{mA}$ (Any I/O pin)	0.6	0.9	1.2	V
		$I_F=10\text{mA}$ (V_{DD} pin)	0.5	0.8	1.1	
Clamping voltage (Note 1)	V_{CL}	$I_{PP}=16\text{A}$, $t_p=100\text{ns}$ (Any I/O pin)		13		V
Dynamic resistance (Note 1)	R_{DYN}	$t_p=100\text{ns}$ (Any I/O pin)		0.2		Ω
ESD clamping voltage (Note 2)	V_{CL}	$V_{ESD}=8\text{KV}$ (Any I/O pin)		14		V
Clamping voltage (Note 3)	V_{CL}	$I_{PP}=1\text{A}$, $t_p=8/20\mu\text{s}$ (Any I/O pin)			9.5	V
		$I_{PP}=15\text{A}$, $t_p=8/20\mu\text{s}$ (Any I/O pin)			15.0	
		$I_{PP}=1\text{A}$, $t_p=8/20\mu\text{s}$ (V_{DD} pin)			10	V
		$I_{PP}=50\text{A}$, $t_p=8/20\mu\text{s}$ (V_{DD} pin)			18	
Junction capacitance	C_J	$V_R=0\text{V}$, $f=1\text{MHz}$ ($V_{DD}=\text{Floated}$, Any I/O to GND)		1.8	3.0	pF
		$V_R=0\text{V}$, $f=1\text{MHz}$ (Any I/O to I/O)		0.9	1.8	
		$V_R=0\text{V}$, $f=1\text{MHz}$ (V_{DD} to GND)		300	450	

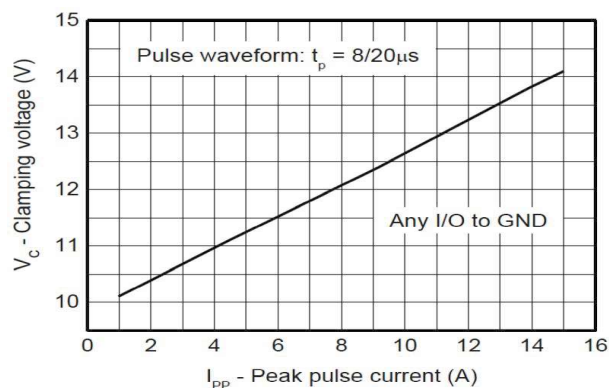
Notes:

1. TLP parameter : $Z_0 = 50\Omega$, $t_p = 100\text{ns}$, $t_r = 2\text{ns}$, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.
2. Contact discharge mode, according to IEC61000-4-2.
3. Non-repetitive current pulse, according to IEC61000-4-5.

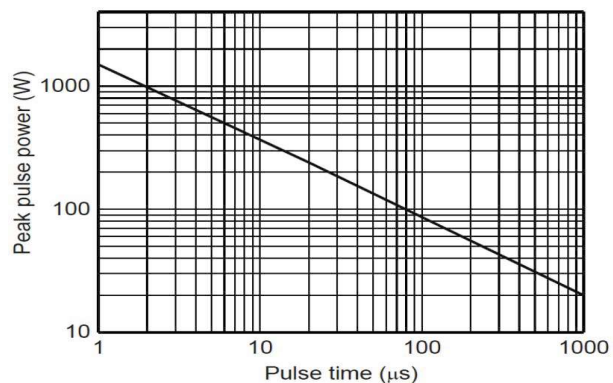
Rating and characteristic curves

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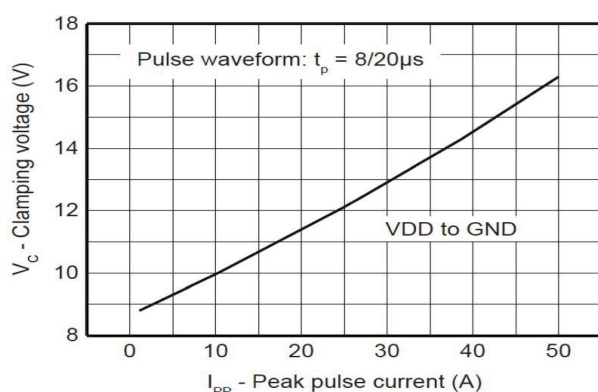
Rating and characteristic curves



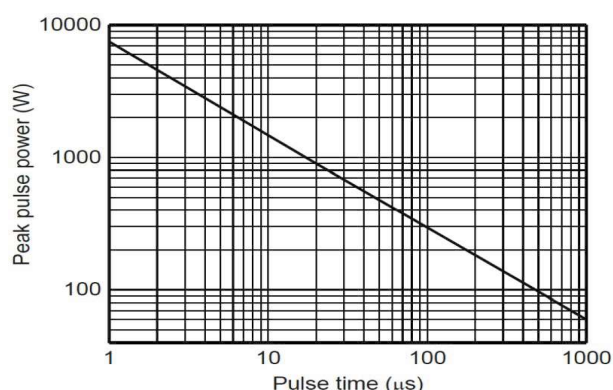
Clamping voltage vs. Peak pulse current
(Any IO Pin)



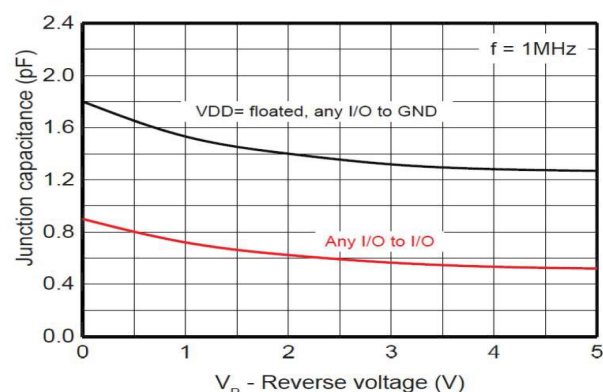
Non-repetitive peak pulse power vs. Pulse time
(Any IO Pin)



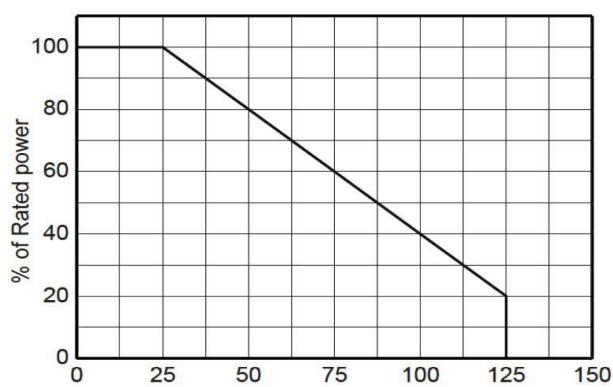
Clamping voltage vs. Peak pulse current
(VDD Pin)



Non-repetitive peak pulse power vs. Pulse time
(VDD Pin)



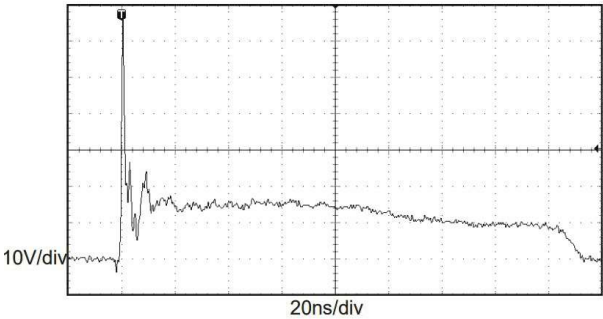
Capacitance vs. Reverse voltage
(Any IO Pin)



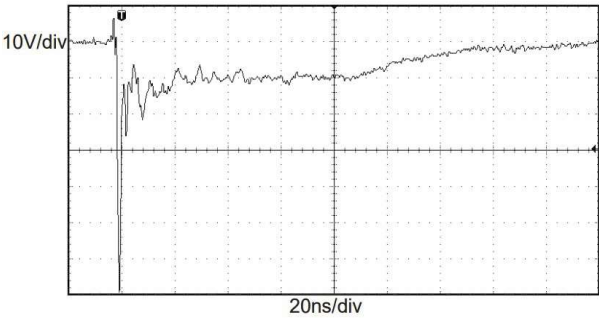
Power derating vs. Ambient temperature

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Rating and characteristic curves



ESD clamping
(+8kV contact discharge per IEC61000-4-2)
(Any IO Pin)



ESD clamping
(-8kV contact discharge per IEC61000-4-2)
(Any IO Pin)

Pinning information

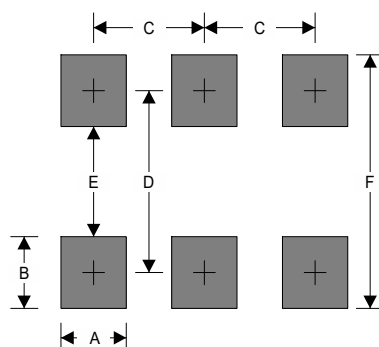
Pin Configuration	Simplified outline	Circuit Diagram
I/O : 1, 3, 4, 6 VCC : 5 GND : 2		

Marking

Type number	Marking code
L054BT26A	SRV05
	05U

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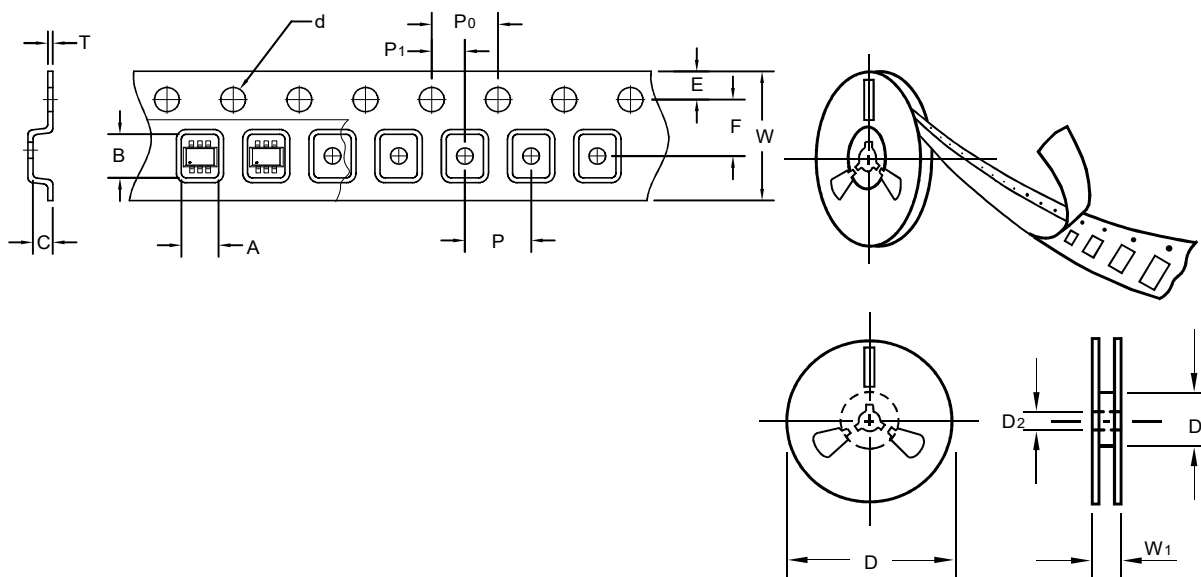
Suggested solder pad layout



Dimensions in inches and (millimeters)

PACKAGE	A	B	C	D	E	F
SOT-23-6	0.024 (0.60)	0.043 (1.10)	0.037 (0.95)	0.098 (2.50)	0.055 (1.40)	0.142 (3.60)

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23-6
Carrier width	A	0.1	3.23
Carrier length	B	0.1	3.17
Carrier depth	C	0.1	1.37
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	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.05	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	0.25
Tape width	W	0.3	8.00
Reel width	W ₁	max	14.40

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

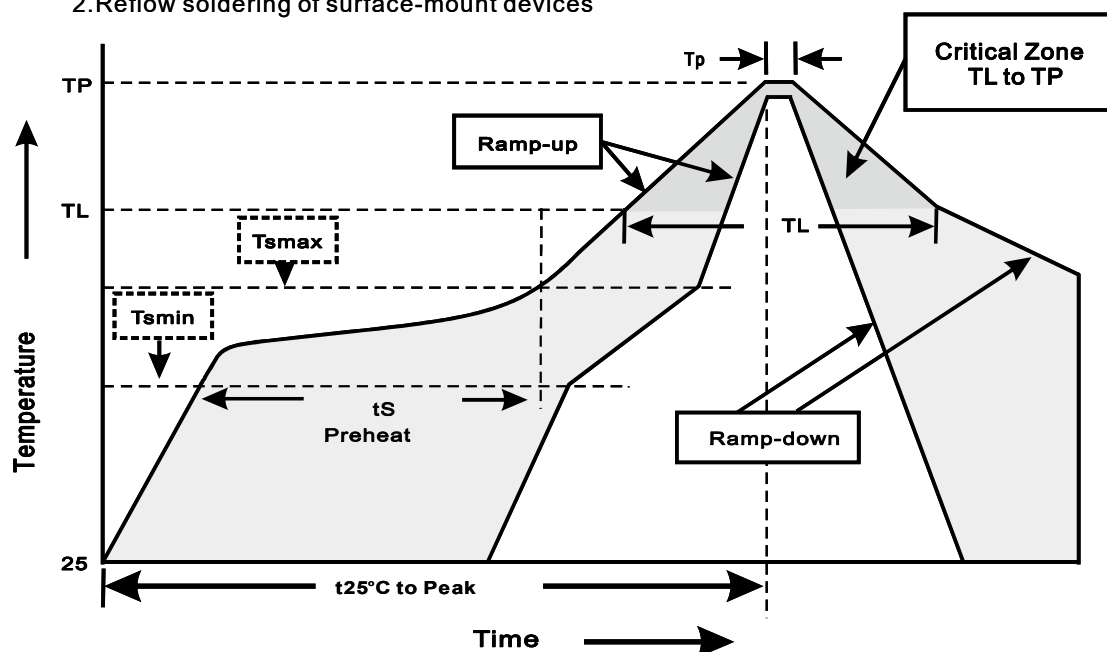
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Reel packing

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)
SOT-23-6	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	9.50

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

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High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^{\circ}\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_{\text{BR}} = V_{\text{BR Min}} * 80\%$ at $T_{\text{J}} = 125^{\circ}\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{\text{SIG}}$ at $T_{\text{A}} = 121^{\circ}\text{C}$ for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to $+125^{\circ}\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at $T_{\text{A}} = 85^{\circ}\text{C}$, 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