

BAT54T / BAT54AT / BAT54CT / BAT54ST

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Datasheet.Live

BAT54T / BAT54AT / BAT54CT / BAT54ST

200mA Surface Mount Small Signal Schottky Diodes-30V

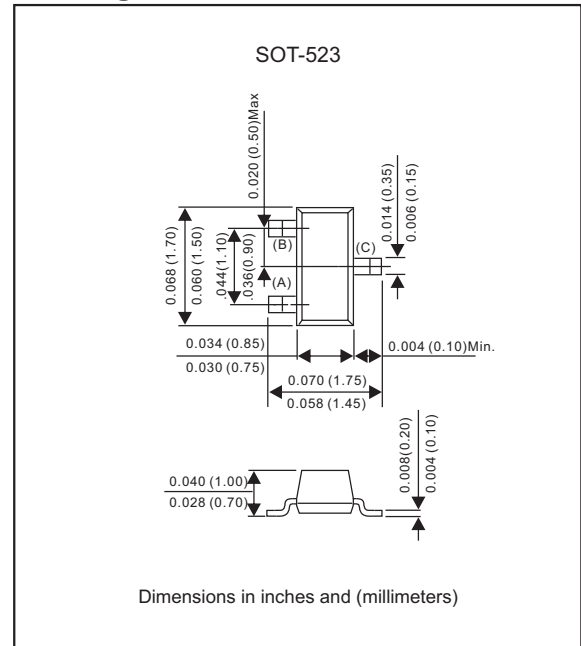
Features

- Low current rectification and high speed switching.
- Tiny surface mount type.
- Up to 200mA current capability.
- Low forward voltage drop ($V_F = 1.00V$ typ. @100mA)
- Silicon epitaxial planar chip, metal silicon junction.
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- High speed ($t_{rr} < 5$ ns)
- Suffix "-H" indicates Halogen free parts, ex. BAT54T-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-523
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.003 gram

Package outline



Maximum ratings and Electrical Characteristics (AT $T_A = 25^\circ C$ unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Repetitive peak reverse voltage		V_{RRM}			30	V
Reverse voltage		V_R			30	V
Peak Repetitive forward current		I_{FRM}			300	mA
Peak Forward Surge Current	at $t < 1.0s$	I_{FSM}			600	mA
Power Dissipation		P_D			150	mW
Forward current		I_F			200	mA
Thermal resistance	Junction to ambient Junction to case	$R_{\theta JA}$ $R_{\theta JC}$		833 630		$^\circ C/W$ $^\circ C/W$
Operating temperature		T_J	-55		+125	$^\circ C$
Storage temperature		T_{STG}	-55		+125	$^\circ C$
Forward voltage	$I_F = 0.1$ mA	V_F			0.240	V
	$I_F = 1$ mA	V_F			0.320	V
	$I_F = 10$ mA	V_F			0.400	V
	$I_F = 30$ mA	V_F			0.500	V
	$I_F = 100$ mA	V_F			1.000	V
Reverse current	$V_R = 25$ V	I_R			2.0	μA
Total Capacitance	$V_R = 1$ V, $f = 1$ MHz	C_T			10.0	pF
Reverse recovery time	$I_F = 10$ mA through $I_R = 10$ mA to $I_R = 1$ mA, $R_L = 100\Omega$	t_{rr}			5	ns

Rating and characteristic curves for each diode (BAT54T / BAT54AT / BAT54CT / BAT54ST)

FIG.1-TYPICAL FORWARD CHARACTERISTICS

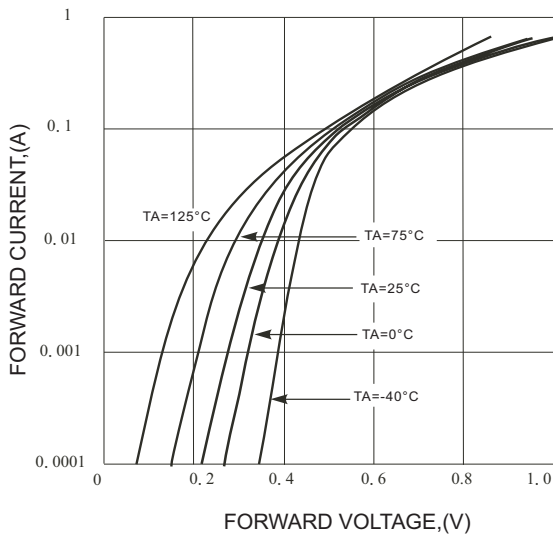


FIG.2 - TYPICAL REVERSE CHARACTERISTICS

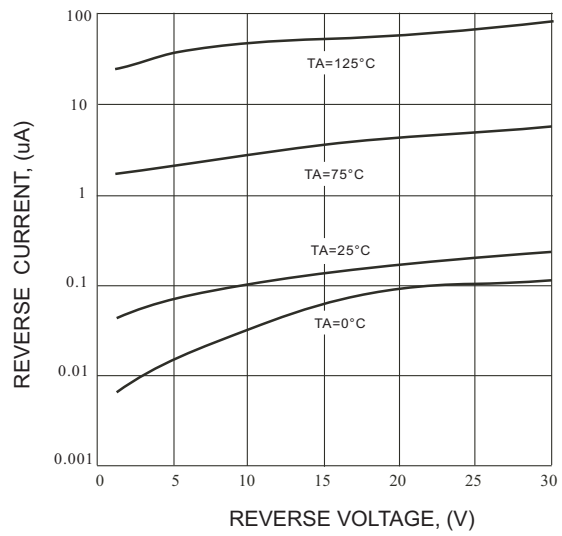


FIG.3-TYPICAL JUNCTION CAPACITANCE

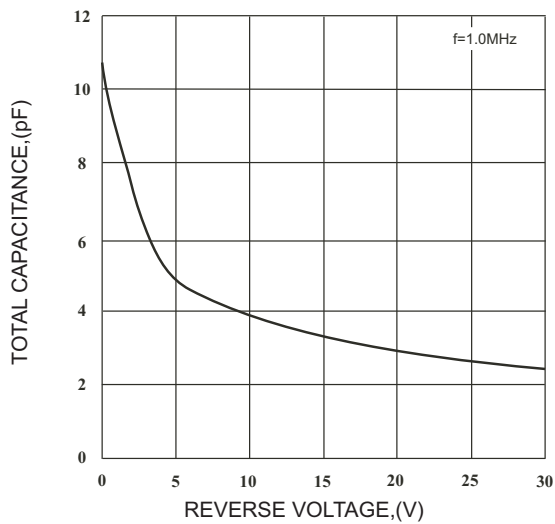
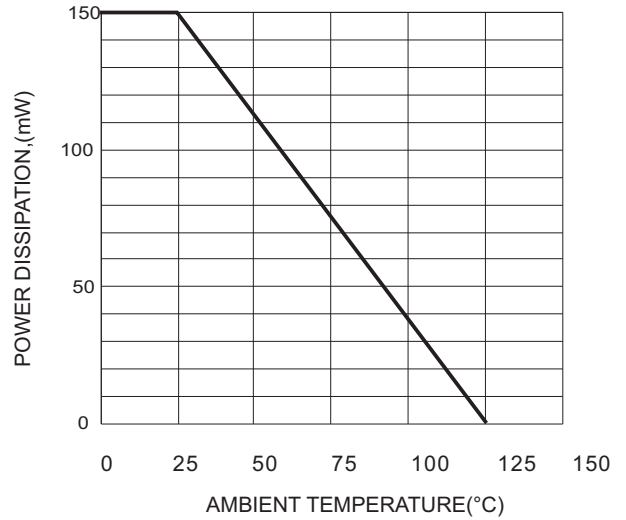
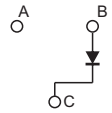
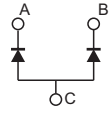
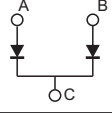
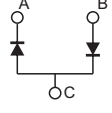


FIG.4-POWER DERATING CURVE



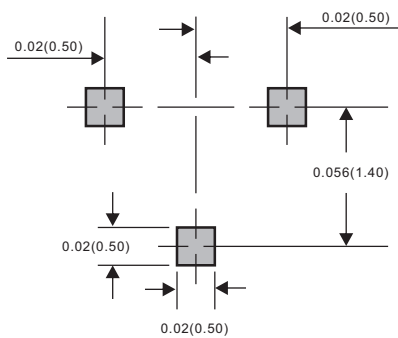
BAT54T / BAT54AT / BAT54CT / BAT54ST

Pinning information

Type number	Marking code	Symbol
BAT54T	L1	
BAT54AT	L2	
BAT54CT	L3	
BAT54ST	L4	

Suggested solder pad layout

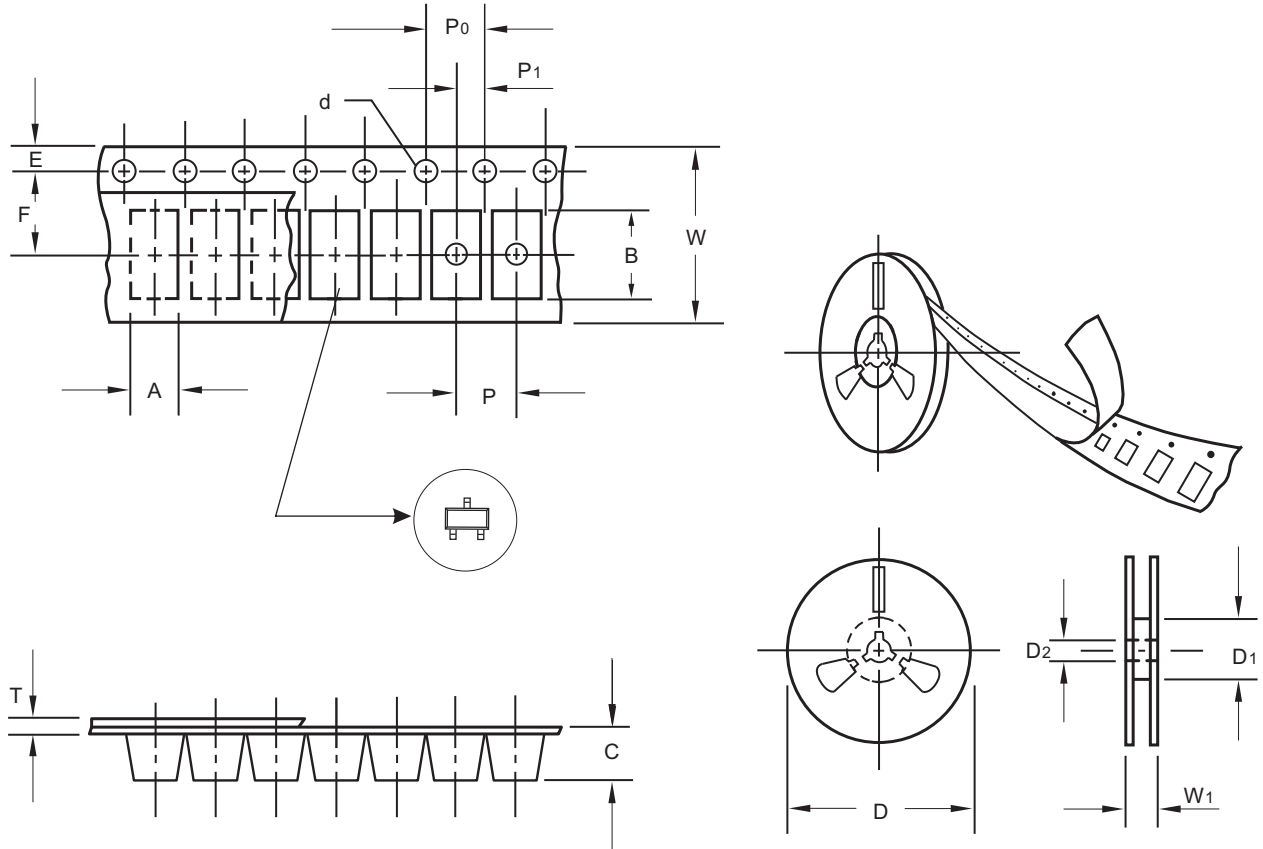
SOT-523



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-523
Carrier width	A	0.1	1.73
Carrier length	B	0.1	1.85
Carrier depth	C	0.1	0.90
Sprocket hole	d	0.1	1.5
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	60.00
Feed hole diameter	D2	0.5	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	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	11.40

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

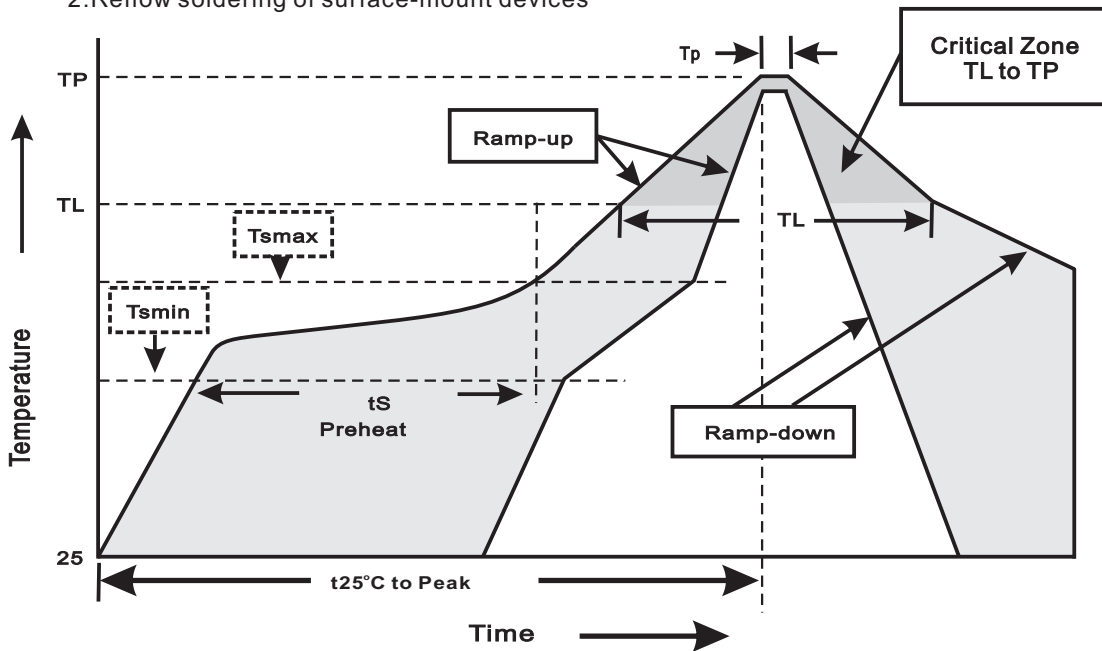
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Reel packing

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-523	7"	3000	4.0	30,000	183*183*123	178	382*262*387	240,000	9.5

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(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} 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

BAT54T / BAT54AT / BAT54CT / BAT54ST**High reliability test capabilities**

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec. immerse body into solder 1/16"±1/32"	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_R=80\%$ rate at $T_J=125^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Forward Operation Life	Rated average rectifier current at $T_A=25^\circ\text{C}$ for 500hrs.	MIL-STD-750D METHOD-1027
5. Intermittent Operation Life	$T_A = 25^\circ\text{C}$, $I_F = I_o$ On state: power on for 5 min. off state: power off for 5 min. on and off for 500 cycles.	MIL-STD-750D METHOD-1036
6. Pressure Cooker	$15P_{SIG}$ at $T_A=121^\circ\text{C}$ for 4 hrs.	JESD22-A102
7. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
8. Thermal Shock	0°C for 5 min. rise to 100°C for 5 min. total 10 cycles.	MIL-STD-750D METHOD-1056
9. Forward Surge	Paek Forward Surge Current at t=1s	MIL-STD-750D METHOD-4066-2
10. Humidity	at $T_A=85^\circ\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
11. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031