

BAT54T-Q1 / BAT54AT-Q1 / BAT54CT-Q1 / BAT54ST-Q1

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BAT54T-Q1 / BAT54AT-Q1 / BAT54CT-Q1 / BAT54ST-Q1

200mA Surface Mount Small Signal Schottky Diodes 30V

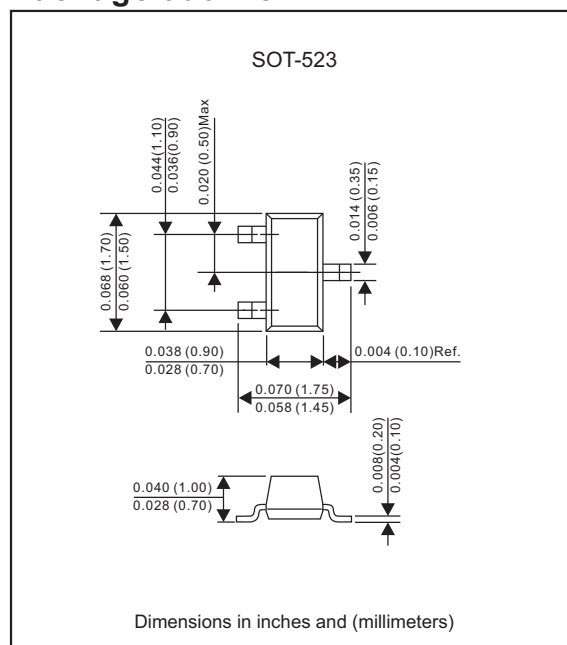
Features

- Low current rectification and high speed switching.
- Up to 200mA current capability.
- Low forward voltage drop
- Silicon epitaxial planar chip, metal silicon junction.
- High speed ($t_{rr} < 5 \text{ ns}$)
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen free parts, ex. BAT54T-Q1-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 (AT $T_A=25^\circ\text{C}$ unless otherwise noted)

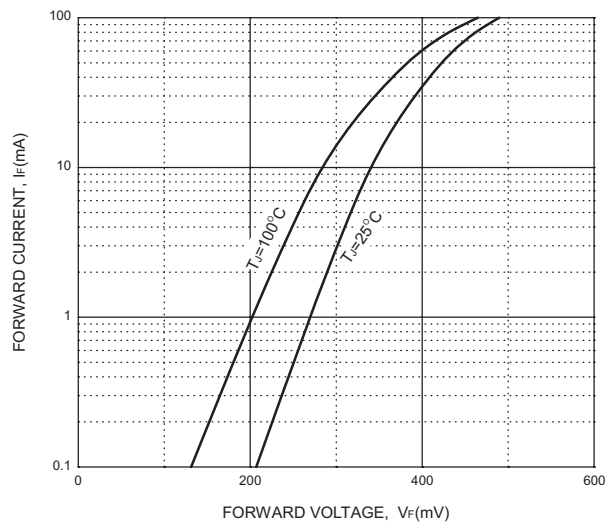
PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
DC reverse voltage		V_R			30	V
Forward current(DC)		I_F			200	mA
Non-repetitive peak forward current	$t_p < 1\text{s}$	I_{FSM}			600	mA
Power dissipation	$T_A=25^\circ\text{C}$	P_D			150	mW
Operating junction temperature range		T_J	-55		+125	$^\circ\text{C}$
Storage temperature range		T_{STG}	-55		+125	$^\circ\text{C}$

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

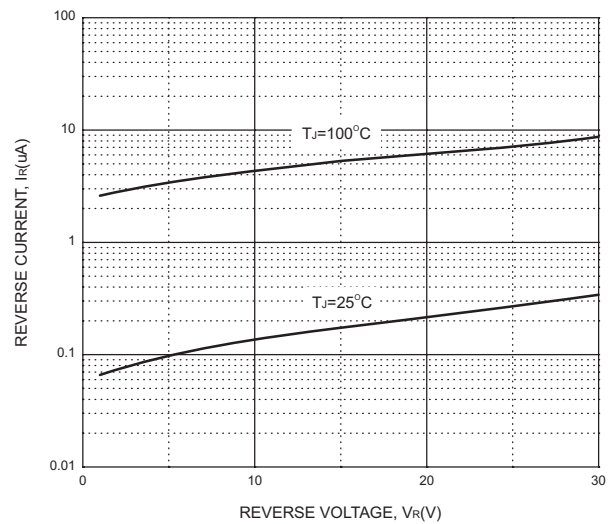
PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Reverse breakdown voltage	$I_R=10\mu\text{A}$	$V_{(BR)R}$	30			V
Forward voltage	$I_F = 0.1 \text{ mA}$	V_F			0.24	V
	$I_F = 1 \text{ mA}$	V_F			0.32	V
	$I_F = 10 \text{ mA}$	V_F			0.40	V
	$I_F = 30 \text{ mA}$	V_F			0.50	V
	$I_F = 100 \text{ mA}$	V_F			1.00	V
Reverse leakage current	$V_R = 25 \text{ V}$	I_R			2.0	μA
Total capacitance	$V_R = 1 \text{ V}, f = 1\text{MHz}$	C_T			10.0	pF
Reverse recovery time	$I_F=I_R=10\text{mA}, I_{R(Rec)}=1.0\text{mA}, R_L=10\text{mA},$	t_{rr}			5	ns

**Rating and characteristic curves for each diode
(BAT54T-Q1 / BAT54AT-Q1 / BAT54CT-Q1 / BAT54ST-Q1)**

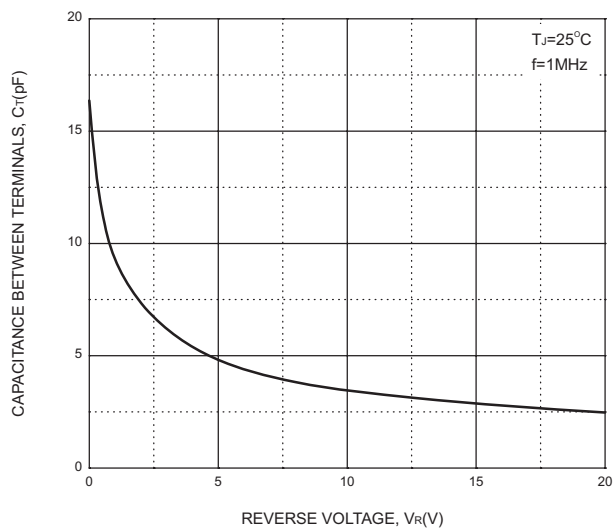
Forward Characteristics



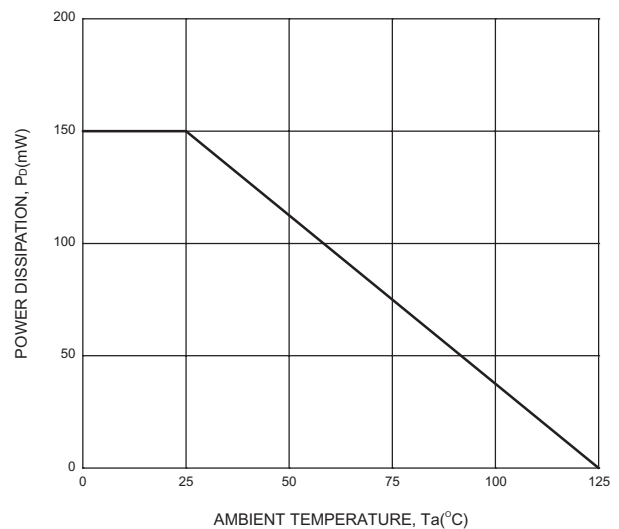
Reverse Characteristics



Capacitance Characteristics

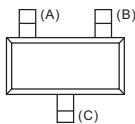
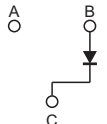
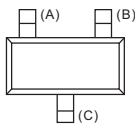
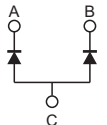
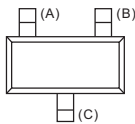
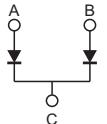
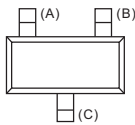
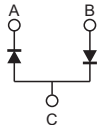


Power Derating Curve



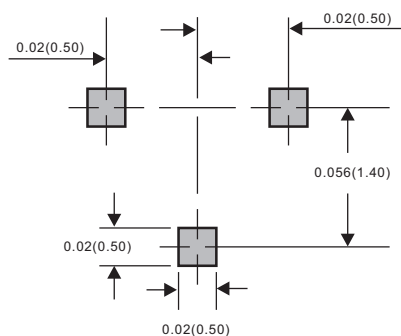
BAT54T-Q1 / BAT54AT-Q1 / BAT54CT-Q1 / BAT54ST-Q1

Pinning information

Type number	Marking code	Simplified outline	Symbol
BAT54T-Q1	KL1		
BAT54AT-Q1	KL2		
BAT54CT-Q1	KL3		
BAT54ST-Q1	KL4		

Suggested solder pad layout

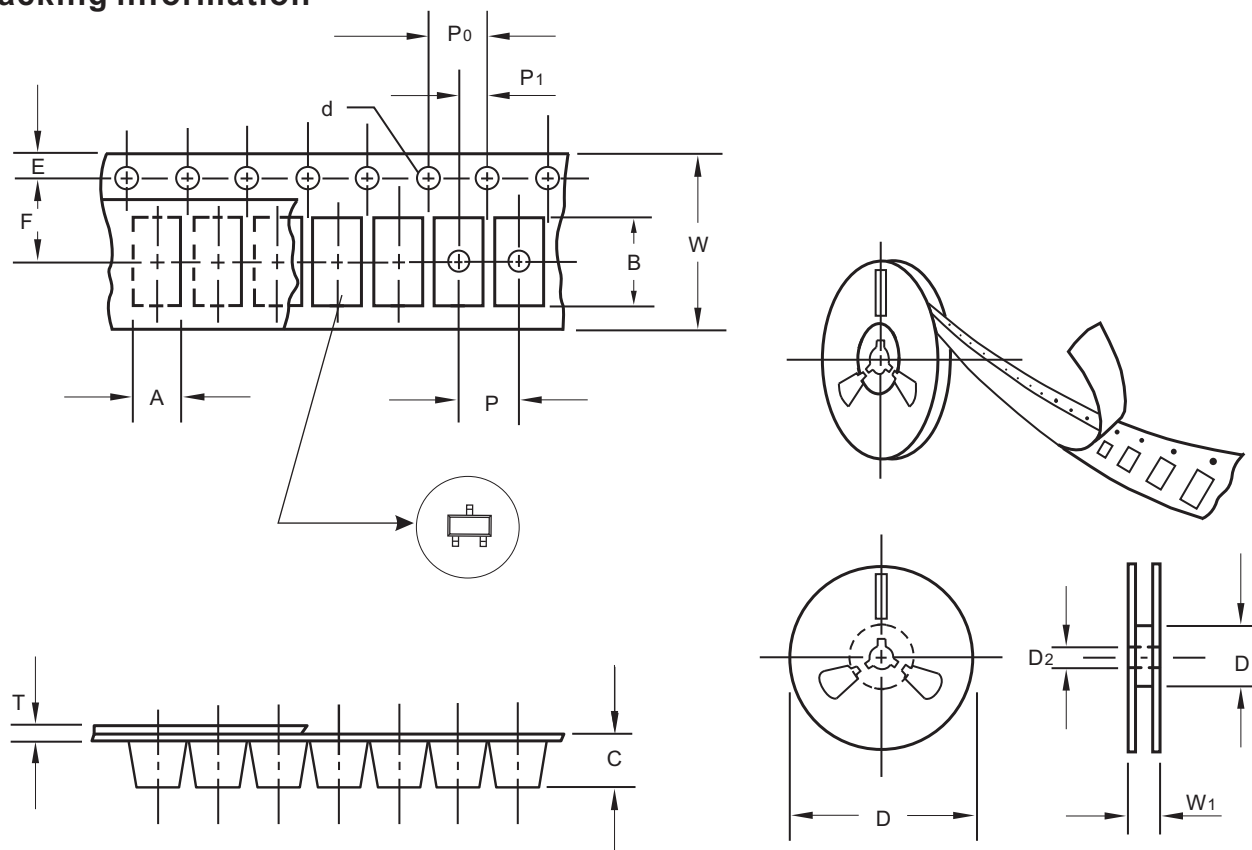
SOT-523



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.

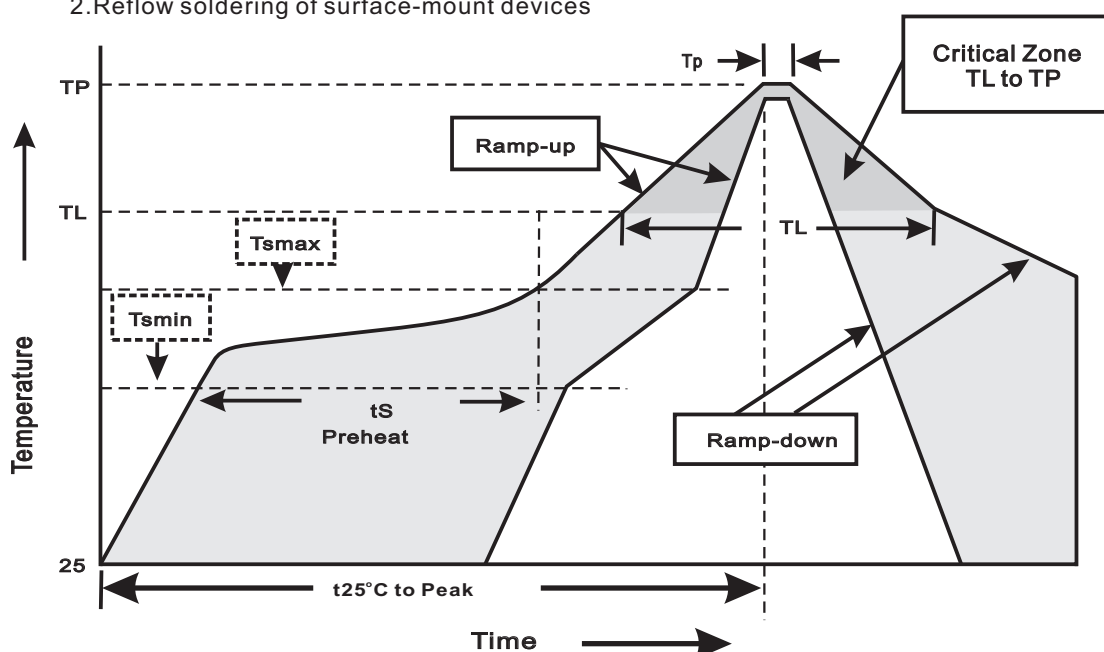
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Reel packing

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 _{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. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. Operation Life	Ta=25°C, Rated Current (Io=Io max.) Test Duration:1000hrs	MIL-STD-750E METHOD 1027.3
3. High Temperature Reverse Bias	80% Rated VR (Tj=Tj max.) Test Duration:1000hrs	JESD22-A108
4. High Temperature Storage Life	Ta=125°C Test Duration: 1000hrs	JESD22 A-103
5. Temperature Cycle	-55°C (15min) to 150°C (15min) Test Cycles: 1000cycles	JESD22 A-104
6. Autoclave	P=2atm Ta=121°C RH=100% Test Duration:96hrs	JESD22 A-102
7. Intermittent Operational Life	Ta=25°C, On/Io Max. 2min, Off/2min, Test Cycles:15000cycles	MIL-STD-750E METHOD 1037
8. Solderability	245±5°C for 5sec	J-STD-002
9. Moisture Resistance	Ta=85°C/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
10. Resistance To Solder Heat	260±5°C for 10sec	JESD22 B-106
11. 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