SURFACE-MOUNT SCHOTTKY BARRIER DIODE

Product Summary (@T_A = +25°C)

V_{RRM} (V)	I_O (mA)	V_{Fmax} (V)	I_{Rmax} (µA)
30	200	0.8	2

Features and Benefits

- Low Turn-on Voltage
- Fast Switching
- PN Junction Guard Ring for Transient and ESD Protection
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**
- **An automotive-compliant part is available under separate datasheet (BAT54Q /AQ /CQ /SQ)**

Description

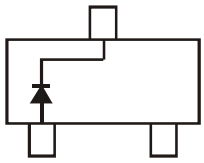
200mA surface-mount Schottky Barrier Diode in SOT23 (Standard) package, offers low turn-on voltage and fast switching capability, designed with PN Junction Guard Ring for Transient and ESD Protection, totally lead-free finish and RoHS compliant, "Green" device.

Mechanical Data

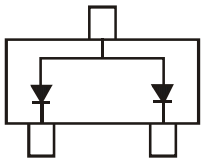
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 e3
- Polarity: See Diagrams Below
- Weight: 0.008 grams (Approximate)

SOT23 (Standard)

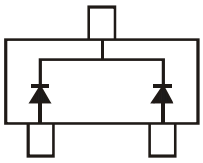
Top View



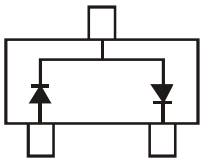
BAT54



BAT54A



BAT54C



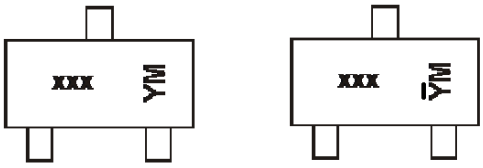
BAT54S

Ordering Information (Note 4)

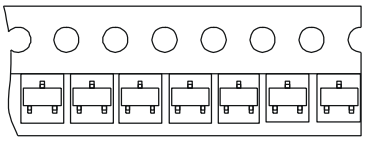
Part Number	Package	Packing	
		Qty.	Carrier
BAT54-7-F	SOT23 (Standard)	3,000	Tape & Reel
BAT54A-7-F	SOT23 (Standard)	3,000	Tape & Reel
BAT54C-7-F	SOT23 (Standard)	3,000	Tape & Reel
BAT54S-7-F	SOT23 (Standard)	3,000	Tape & Reel
BAT54-13-F	SOT23 (Standard)	10,000	Tape & Reel
BAT54A-13-F	SOT23 (Standard)	10,000	Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



xxx = Product Type Marking Code
KL1 = BAT54
KL2 = BAT54A
KL3 = BAT54C
KL4 = BAT54S
YM & $\overline{Y}$M = Date Code Marking
Y or $\overline{Y}$ = Year (ex: K = 2023)
M = Month (ex: D = December)



Date Code Key

Year	2004	-	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	R	-	K	L	M	N	P	R	S	T	U	V

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	30	V
Average Rectified Output Current (Note 5)	I_O	200	mA
Repetitive Peak Forward Current	I_{FRM}	300	mA
Forward Surge Current @ t < 1.0s	I_{FSM}	600	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	200	mW
Typical Thermal Resistance Junction to Ambient Air (Note 5)	$R_{\theta JA}$	500	°C/W
Typical Thermal Resistance Junction to Case (Note 6)	$R_{\theta JC}$	180	°C/W
Operating and Storage Temperature Range (Note 7)	T_J, T_{STG}	-65 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 8)	$V_{(BR)R}$	30	—	—	V	I_{RS} = 100µA
Forward Voltage	V_F	— — — — —	— — — — —	240 320 400 500 800	mV	I_F = 0.1mA I_F = 1mA I_F = 10mA I_F = 30mA I_F = 100mA
Reverse Leakage Current (Note 8)	I_R	—	—	2.0	µA	V_R = 25V
Total Capacitance	C_T	—	—	10	pF	V_R = 1.0V, f = 1.0MHz
Reverse Recovery Time	t_{RR}	—	—	5.0	ns	I_F = 10mA through I_R = 10mA to I_R = 1.0mA, R_L = 100Ω

Notes:
5. Part mounted on FR-4 board with recommended pad layout, which can be found on our website at http://www.diodes.com/package-outlines.html.
6. Device mounted on Polymide substrate PC board. FR-4 2oz 1*MRP layout.
7. The heat generated must be less than the thermal conductivity from Junction-to-Ambient: $dP_D / dT_J < 1 / R_{\theta JA}$.
8. Short duration test pulse used to minimize self-heating effect.

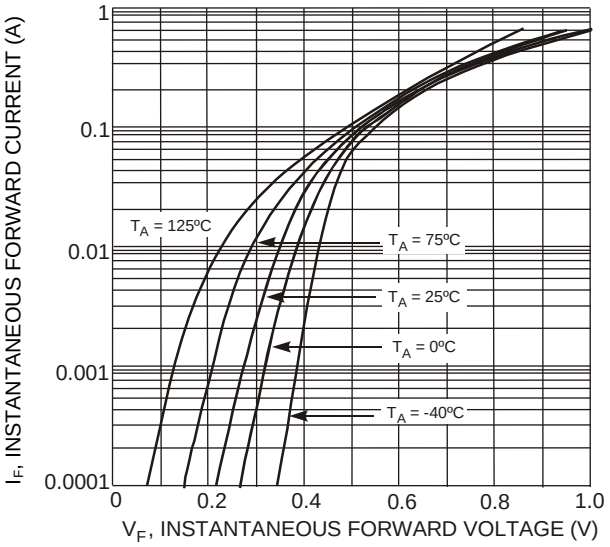


Figure 1 Typical Forward Characteristics

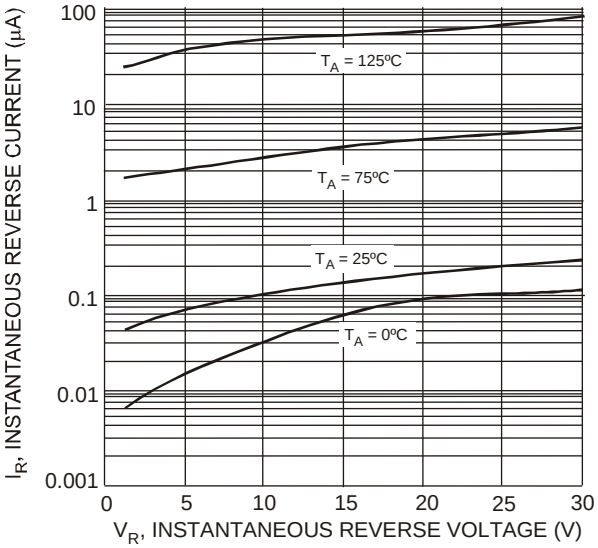


Figure 2 Typical Reverse Characteristics

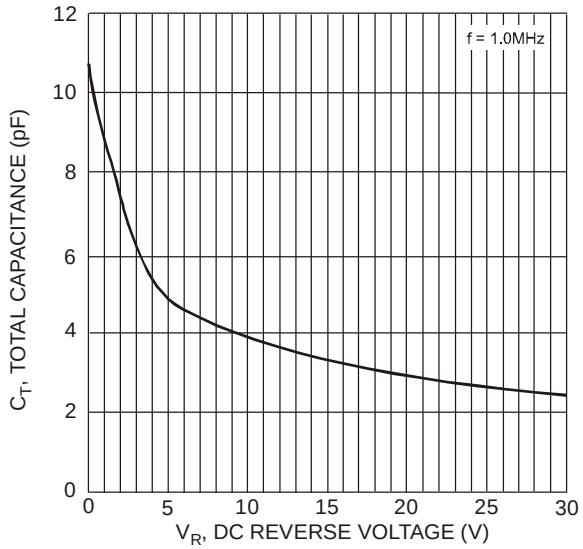


Figure 3 Total Capacitance vs. Reverse Voltage

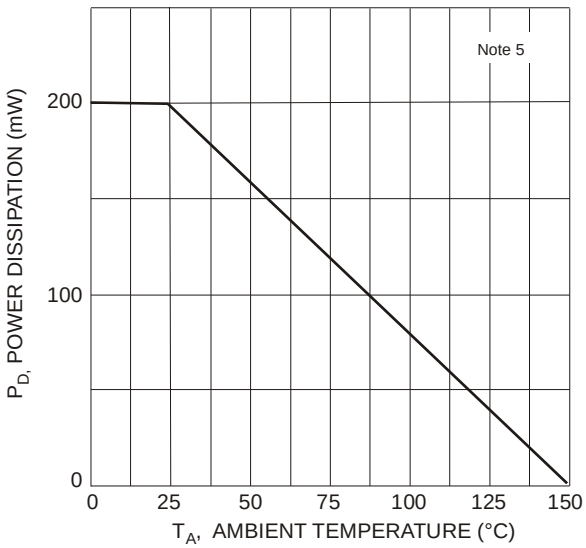
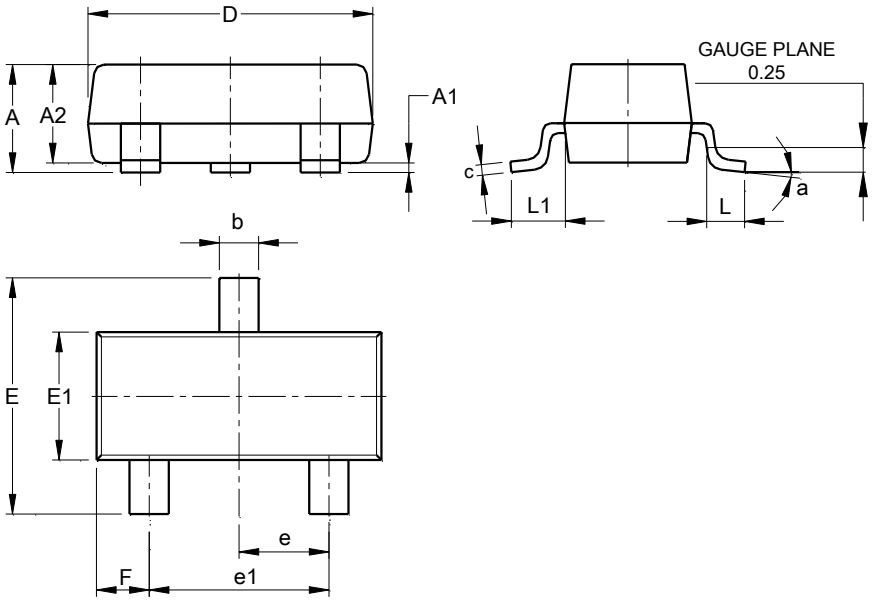


Figure 4 Power Derating Curve

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23 (Standard)

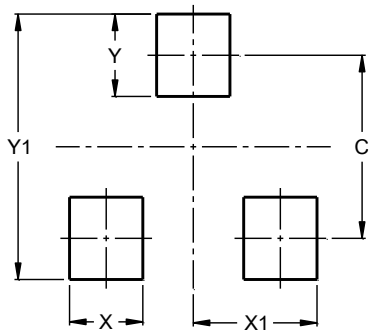


SOT23 (Standard)			
Dim	**Min**	**Max**	**Typ**
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23 (Standard)



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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