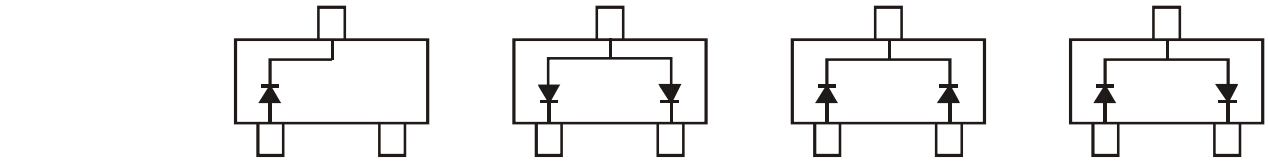
# SURFACE MOUNT SCHOTTKY BARRIER DIODE

## Features

- 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 (Notes 3 & 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SOT23
- Case 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)

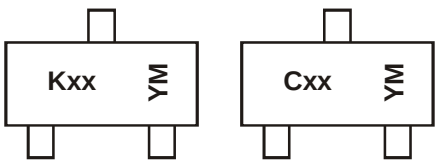



## Ordering Information (Note 5)

| Part Number | Qualification | Case | Packaging |
|---|---|---|---|
| BAT54-7-F | Commercial | SOT23 | 3000/Tape & Reel |
| BAT54A-7-F | Commercial | SOT23 | 3000/Tape & Reel |
| BAT54C-7-F | Commercial | SOT23 | 3000/Tape & Reel |
| BAT54S-7-F | Commercial | SOT23 | 3000/Tape & Reel |
| BAT54Q-7-F | Automotive | SOT23 | 3000/Tape & Reel |
| BAT54AQ-7-F | Automotive | SOT23 | 3000/Tape & Reel |
| BAT54CQ-7-F | Automotive | SOT23 | 3000/Tape & Reel |
| BAT54SQ-7-F | Automotive | SOT23 | 3000/Tape & Reel |
| BAT54-13-F | Commercial | SOT23 | 10,000/Tape & Reel |
| BAT54A-13-F | Commercial | SOT23 | 10,000/Tape & Reel |
| BAT54Q-13 | Automotive | SOT23 | 10,000/Tape & Reel |
| BAT54AQ-13 | Automotive | SOT23 | 10,000/Tape & Reel |
| BAT54SQ-13 | Automotive | SOT23 | 10,000/Tape & Reel |

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com 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. Products manufactured with date code VD (Week 50, 2008) and newer are built with Green Molding Compound. Products manufactured with date code prior to VD are built with Non-Green Molding Compound and may contain Halogens or $Sb_2O_3$ Fire Retardants.
5. For packaging details, go to our website at http://www.diodes.com.

## Marking Information




K = (SAT,Shangbai Assembly / test site)
C = (CAT/DTC , ChengDu Assembly / test site)
xx = Product Type Marking Code
L1 = BAT54
L2 = BAT54A
L3 = BAT54C
L4 = BAT54S
YM = Date Code Marking
Y = Year (ex: T = 2006)
M = Month (ex: 9 = September)

Date Code Key

| Year | 1998 | … | 2002 | 2003 | … | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | J | … | N | P | … | W | X | Y | Z | A | B | C | D | E |

| 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℃ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 30 | V |
| Forward Continuous Current (Note 6) | $I_F$ | 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 6) | $P_D$ | 200 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 6) | $R_{\theta JA}$ | 500 | ℃/W |
| Operating and Storage Temperature Range (Note 7) | $T_J$, $T_{STG}$ | -65 to +150 | ℃ |

## Electrical Characteristics @$T_A$ = 25℃ 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<br>320<br>400<br>500<br>800 | mV | $I_F$ = 0.1mA<br>$I_F$ = 1mA<br>$I_F$ = 10mA<br>$I_F$ = 30mA<br>$I_F$ = 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: 6. Part mounted on FR-4 board with recommended pad layout, which can be found on our website at http://www.diodes.com.
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.

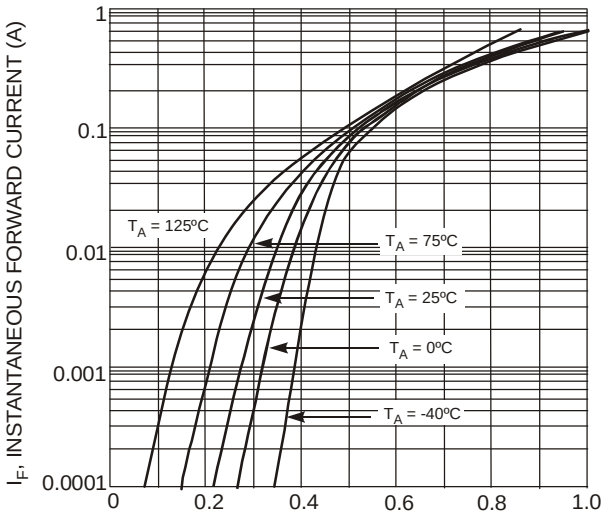


Fig. 1 Typical Forward Characteristics

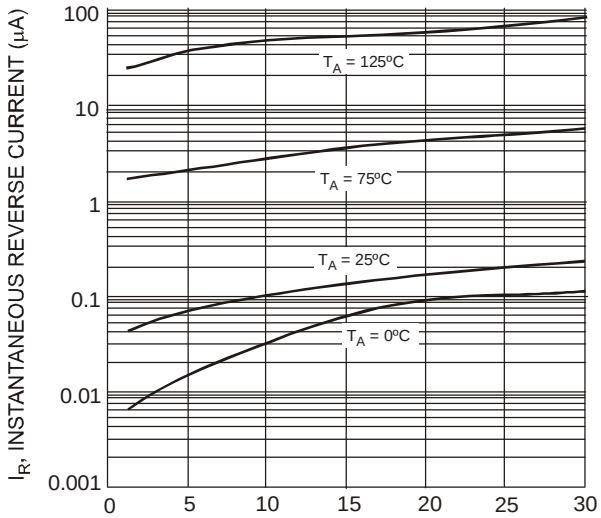


Fig. 2 Typical Reverse Characteristics

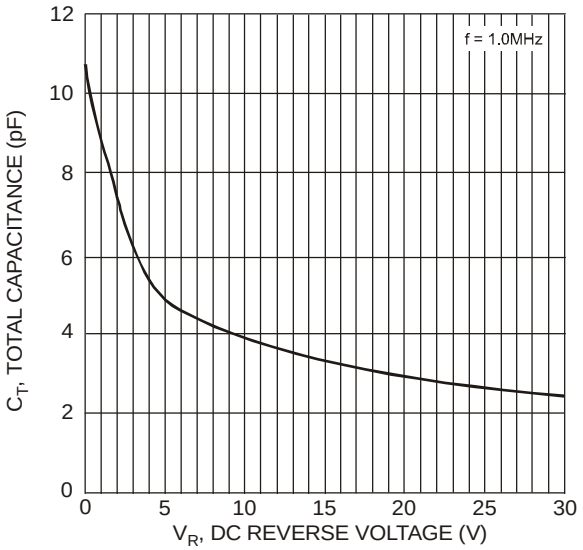



Fig. 3 Total Capacitance vs. Reverse Voltage

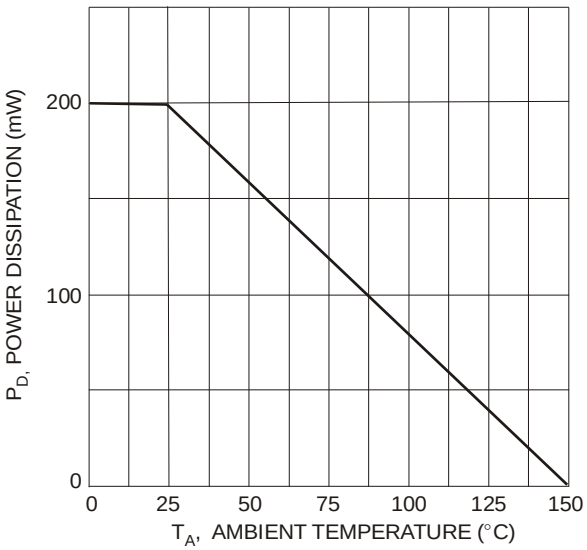
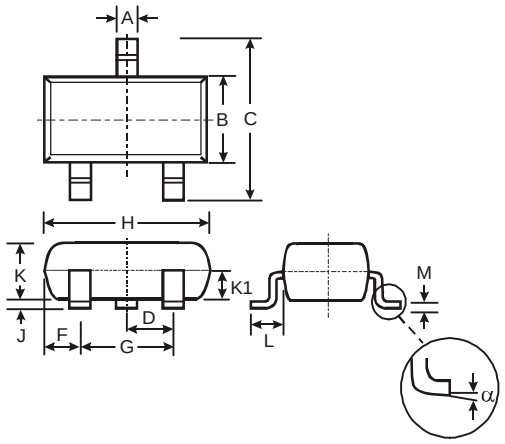


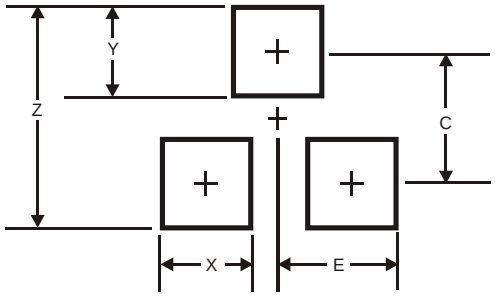

Fig. 4 Power Derating Curve

## Package Outline Dimensions




| SOT23 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.37 | 0.51 | 0.40 |
| **B** | 1.20 | 1.40 | 1.30 |
| **C** | 2.30 | 2.50 | 2.40 |
| **D** | 0.89 | 1.03 | 0.915 |
| **F** | 0.45 | 0.60 | 0.535 |
| **G** | 1.78 | 2.05 | 1.83 |
| **H** | 2.80 | 3.00 | 2.90 |
| **J** | 0.013 | 0.10 | 0.05 |
| **K** | 0.903 | 1.10 | 1.00 |
| **K1** | - | - | 0.400 |
| **L** | 0.45 | 0.61 | 0.55 |
| **M** | 0.085 | 0.18 | 0.11 |
| **α** | 0° | 8° | - |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout




| Dimensions | Value (in mm) |
|---|---|
| **Z** | 2.9 |
| **X** | 0.8 |
| **Y** | 0.9 |
| **C** | 2.0 |
| **E** | 1.35 |

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