

Product Summary (@ T_A = +25°C)

| V _{RRM} (V) | I _O (mA) | V _{F(MAX)} (mV) | I _{R(MAX)} (μA) |
|----------------------|---------------------|--------------------------|--------------------------|
| 30 | 100 | 1000 | 2 |

Description and Applications

- Reverse polarity protections
- Ultra high-speed switching
- Freewheeling

Features and Benefits

- Fast Switching
- Ultra-Small Surface Mount Package
- 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)**
- **The DIODES™ BAT54WSQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: SOD323
- Package Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Leads: Solderable per MIL-STD-202, Method 208
Also Available in Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe). **e3**
- Polarity: Cathode Band
- Weight: 0.004 grams (Approximate)



Top View

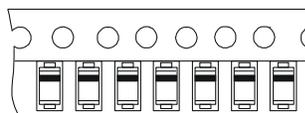
Ordering Information (Note 4)

| Part Number | Package | Packing | |
|--------------|---------|---------|-------------|
| | | Qty. | Carrier |
| BAT54WS-7-F | SOD323 | 3000 | Tape & Reel |
| BAT54WSQ-7-F | SOD323 | 3000 | Tape & Reel |
| BAT54WS-13-F | SOD323 | 10000 | 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


L9 & L̄9 = Product Type Marking Code



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 |
| RMS Reverse Voltage | V _{R(RMS)} | 21 | V |
| Average Rectified Forward Current | I _O | 100 | mA |
| Forward Continuous Current (Note 5) | I _F | 200 | mA |
| Repetitive Peak Forward Current (Note 5) | I _{FRM} | 300 | mA |
| Forward Surge Current (Note 5) @ t < 1.0s | I _{FSM} | 600 | mA |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) | P _D | 200 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 5) | R _{θJA} | 625 | °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 6) | V _{(BR)R} | 30 | — | — | V | I _R = 100μA |
| Forward Voltage | V _{FM} | — | — | 240 320 400 500 1000 | mV | I _F = 0.1mA I _F = 1mA I _F = 10mA I _F = 30mA I _F = 100mA |
| Reverse Leakage Current (Note 6) | I _{RM} | — | — | 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:
- Part mounted on FR-4 PC board with recommended pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
 - Short duration pulse test used to minimize self-heating effect.
 - $\frac{dP_{tot}}{dT_J} > \frac{1}{R_{\theta JA}}$ thermal runaway condition for a diode on its own heatsink.

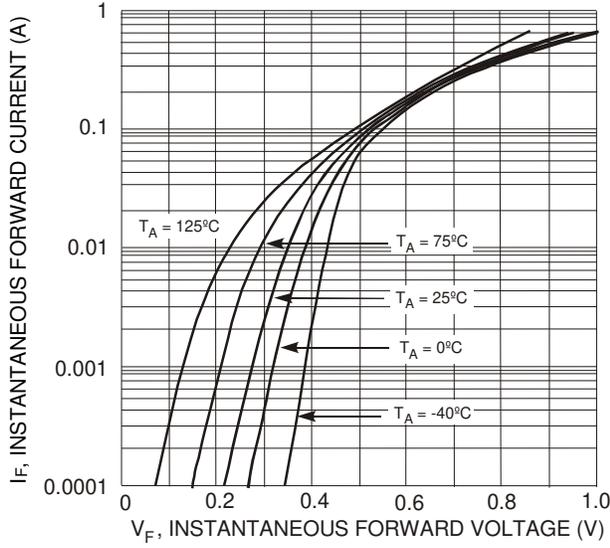


Fig. 1 Typical Forward Characteristics

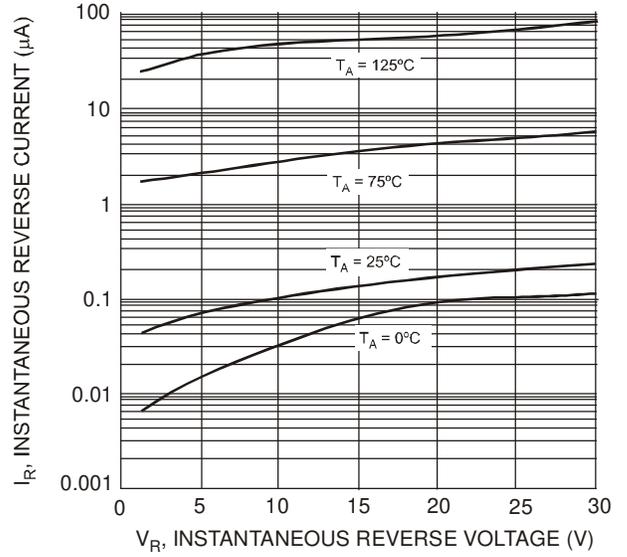


Fig. 2 Typical Reverse Characteristics

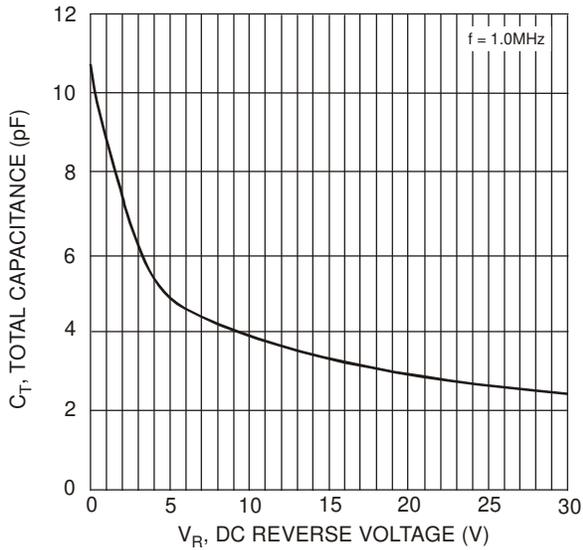


Fig. 3 Total Capacitance vs. Reverse Voltage

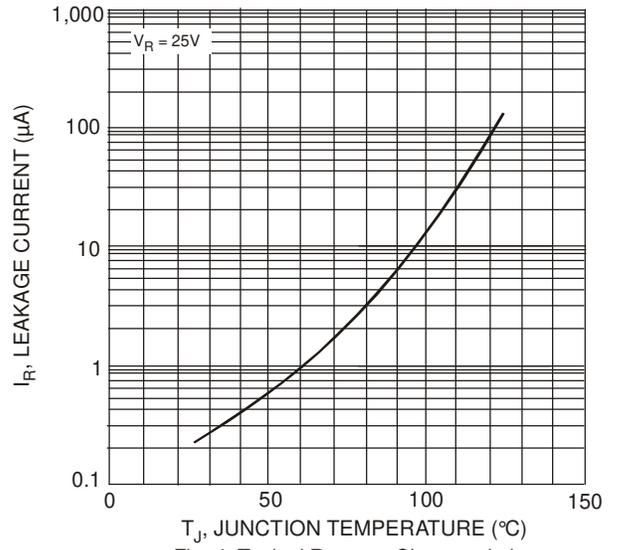


Fig. 4 Typical Reverse Characteristics

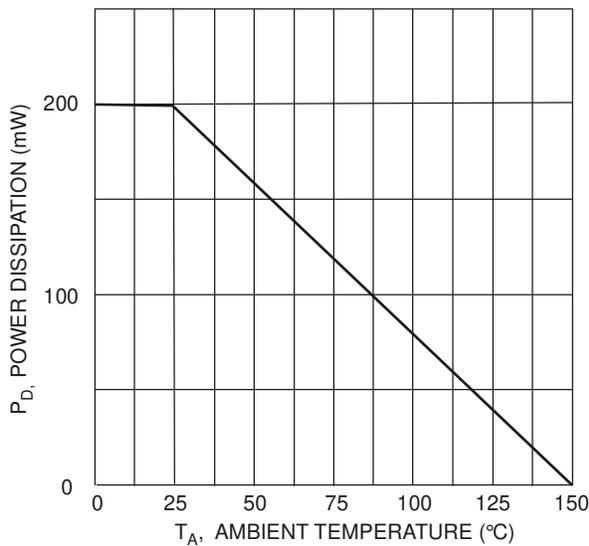
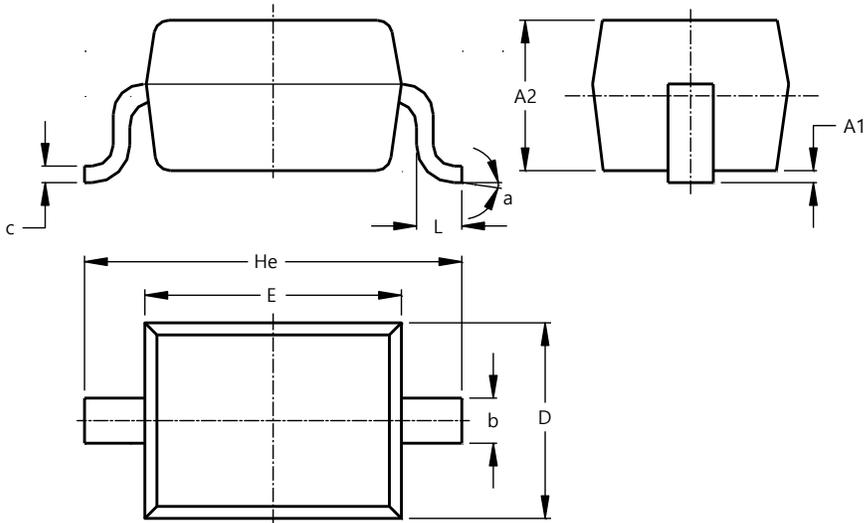


Fig. 5 Power Derating Curve

Package Outline Dimensions

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

SOD323

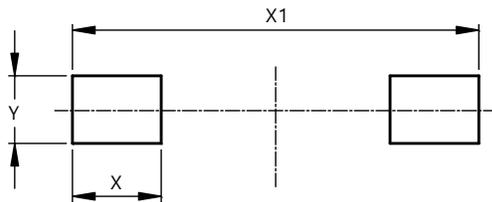


| SOD323 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A1 | -- | 0.10 | 0.05 |
| A2 | 1.00 | 1.10 | 1.05 |
| b | 0.25 | 0.35 | 0.30 |
| c | 0.10 | 0.15 | 0.11 |
| D | 1.20 | 1.40 | 1.30 |
| E | 1.60 | 1.80 | 1.70 |
| He | 2.30 | 2.70 | 2.50 |
| L | 0.20 | 0.40 | 0.30 |
| a | 0° | 8° | -- |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

SOD323



| Dimensions | Value (in mm) |
|------------|---------------|
| X | 0.590 |
| X1 | 2.700 |
| Y | 0.450 |

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