

**Product Summary (@ +25°C)**

| $V_{RRM}$ (V) | $I_F$ (mA) | $V_F$ Max (mV) @ 1mA | $I_R$ Max (μA) @ 25V |
|---------------|------------|----------------------|----------------------|
| 30            | 200        | 320                  | 2                    |

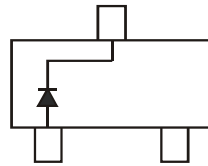
**Applications**

- SMPS
- DC-DC Converter
- Freewheeling Diodes
- Reverse Polarity Protection
- Blocking Diodes

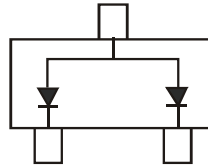
SOT323



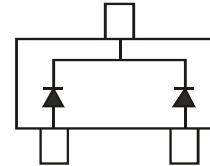
Top View



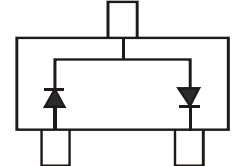
BAT54W



BAT54AW



BAT54CW



BAT54SW

**Features and Benefits**

- Low Forward Voltage Drop
- 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)**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([BAT54WQ /AWQ /CWQ /SWQ](#))**

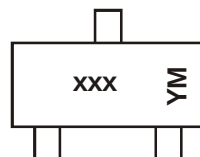
**Mechanical Data**

- Case: SOT323
- 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(Ⓔ)
- Polarity: See Diagrams Below
- Weight: 0.006 grams (Approximate)

**Ordering Information (Note 4)**

| Part Number  | Compliance | Case   | Packaging         |
|--------------|------------|--------|-------------------|
| BAT54W-7-F   | Standard   | SOT323 | 3000/Tape & Reel  |
| BAT54W-13-F  | Standard   | SOT323 | 10000/Tape & Reel |
| BAT54AW-7-F  | Standard   | SOT323 | 3000/Tape & Reel  |
| BAT54AW-13-F | Standard   | SOT323 | 10000/Tape & Reel |
| BAT54CW-7-F  | Standard   | SOT323 | 3000/Tape & Reel  |
| BAT54CW-13-F | Standard   | SOT323 | 10000/Tape & Reel |
| BAT54SW-7-F  | Standard   | SOT323 | 3000/Tape & Reel  |
| BAT54SW-13-F | Standard   | SOT323 | 10000/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/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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  
 KL5 = BAT54W  
 KL6 = BAT54AW  
 KL7 = BAT54CW  
 KL8 = BAT54SW  
 YM = Date Code Marking  
 Y = Year (ex: E = 2017)  
 M = Month (ex: 9 = September)

**Date Code Key**

| Year  | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code  | X    | Y    | Z    | A    | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    |
| 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<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                                                         | Symbol                                                 | Value | Unit |
|----------------------------------------------------------------------------------------|--------------------------------------------------------|-------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | V <sub>RRM</sub><br>V <sub>RWM</sub><br>V <sub>R</sub> | 30    | V    |
| Forward Continuous Current (Note 5)                                                    | I <sub>F</sub>                                         | 200   | mA   |
| Repetitive Peak Forward Current (Note 5)                                               | I <sub>FRM</sub>                                       | 300   | mA   |
| Forward Surge Current (Note 5) @ t < 1.0s                                              | I <sub>FSM</sub>                                       | 600   | mA   |

**Thermal Characteristics**

| Characteristic                                      | Symbol                            | Value       | Unit |
|-----------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)                          | P <sub>D</sub>                    | 200         | mW   |
| Thermal Resistance Junction to Ambient Air (Note 5) | R <sub>θJA</sub>                  | 625         | °C/W |
| Operating and Storage Temperature Range             | T <sub>J</sub> , T <sub>STG</sub> | -65 to +125 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                     | Symbol             | Min | Typ | Max                              | Unit | Test Condition                                                                                                             |
|------------------------------------|--------------------|-----|-----|----------------------------------|------|----------------------------------------------------------------------------------------------------------------------------|
| Reverse Breakdown Voltage (Note 6) | V <sub>(BR)R</sub> | 30  | —   | —                                | V    | I <sub>R</sub> = 100μA                                                                                                     |
| Forward Voltage                    | V <sub>F</sub>     | —   | —   | 240<br>320<br>400<br>500<br>1000 | mV   | I <sub>F</sub> = 0.1mA<br>I <sub>F</sub> = 1mA<br>I <sub>F</sub> = 10mA<br>I <sub>F</sub> = 30mA<br>I <sub>F</sub> = 100mA |
| Reverse Leakage Current (Note 6)   | I <sub>R</sub>     | —   | —   | 2.0                              | μA   | V <sub>R</sub> = 25V                                                                                                       |
| Total Capacitance                  | C <sub>T</sub>     | —   | —   | 10                               | pF   | V <sub>R</sub> = 1.0V, f = 1.0MHz                                                                                          |
| Reverse Recovery Time              | t <sub>RR</sub>    | —   | —   | 5.0                              | ns   | I <sub>F</sub> = 10mA through I <sub>R</sub> = 10mA<br>to I <sub>R</sub> = 1.0mA, R <sub>L</sub> = 100Ω                    |

- Notes:
5. 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>.
  6. Short duration pulse test used to minimize self-heating effect.

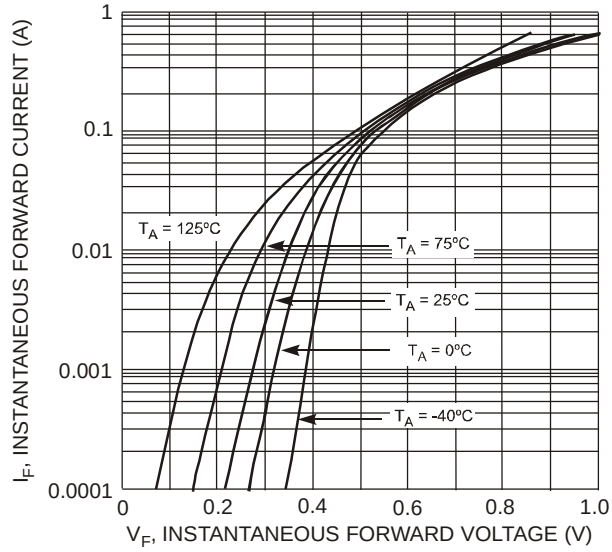


Fig. 1 Typical Forward Characteristics

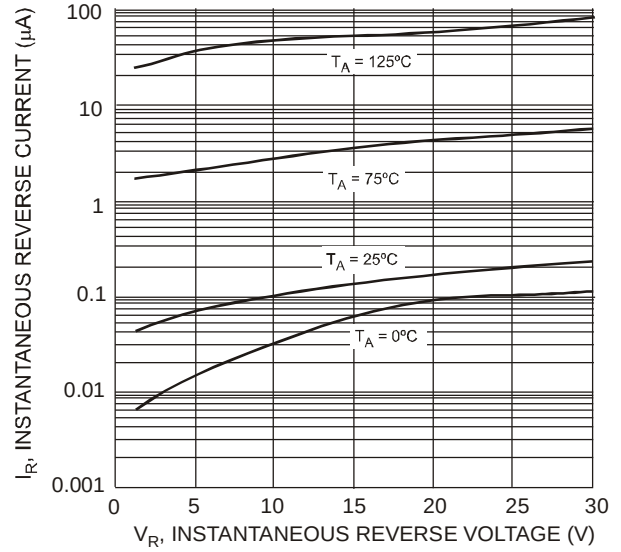


Fig. 2 Typical Reverse Characteristics

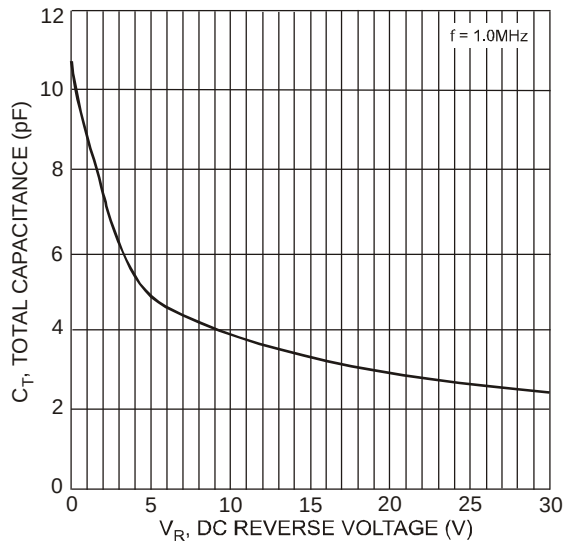


Fig. 3 Total Capacitance vs. Reverse Voltage

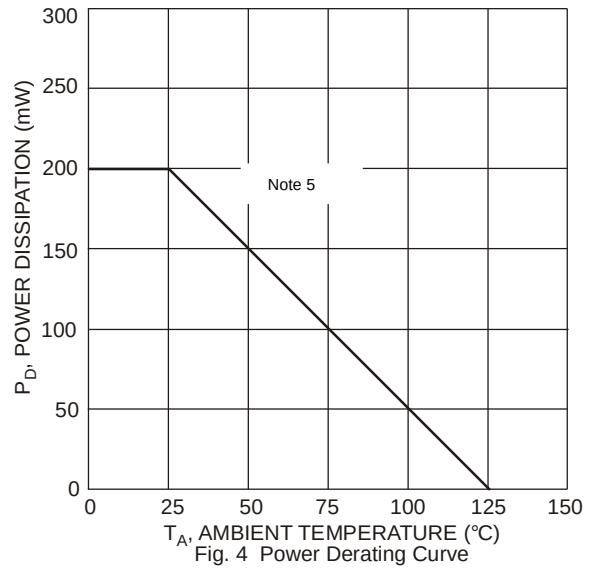
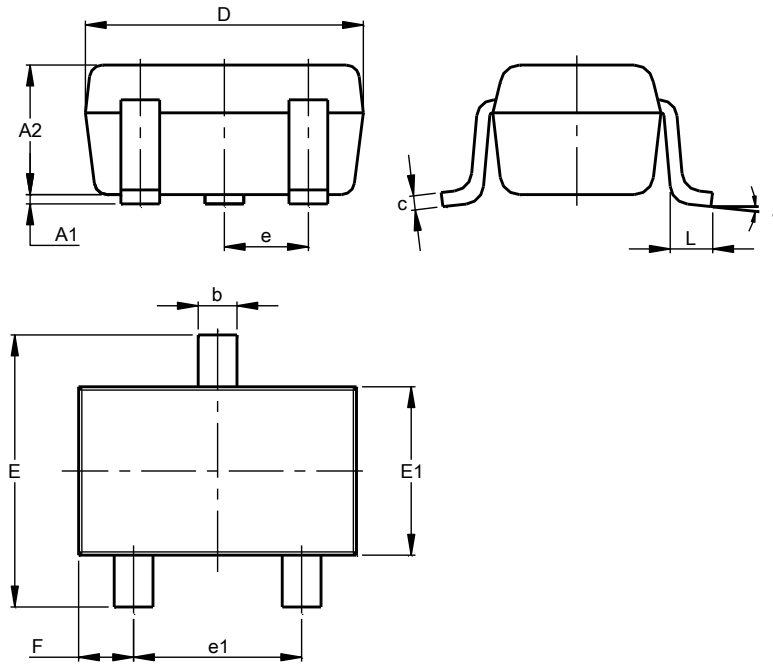


Fig. 4 Power Derating Curve

## Package Outline Dimensions

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

**SOT323**

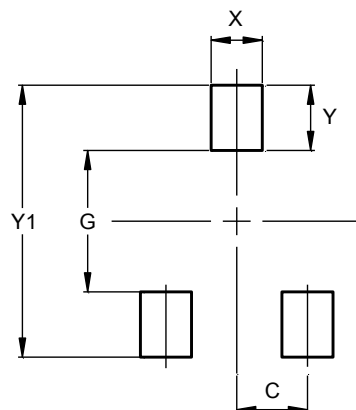


| SOT323               |           |       |       |
|----------------------|-----------|-------|-------|
| Dim                  | Min       | Max   | Typ   |
| A1                   | 0.00      | 0.10  | 0.05  |
| A2                   | 0.90      | 1.00  | 0.95  |
| b                    | 0.25      | 0.40  | 0.30  |
| c                    | 0.10      | 0.18  | 0.11  |
| D                    | 1.80      | 2.20  | 2.15  |
| E                    | 2.00      | 2.20  | 2.10  |
| E1                   | 1.15      | 1.35  | 1.30  |
| e                    | 0.650 BSC |       |       |
| e1                   | 1.20      | 1.40  | 1.30  |
| F                    | 0.375     | 0.475 | 0.425 |
| L                    | 0.25      | 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.

**SOT323**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.650         |
| G          | 1.300         |
| X          | 0.470         |
| Y          | 0.600         |
| Y1         | 2.500         |

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