

# 1.0A HIGH VOLTAGE SCHOTTKY BARRIER RECTIFIER

## Product Summary (@ +25°C)

| Device     | V <sub>RRM</sub> (V) | I <sub>O</sub> (A) | V <sub>F</sub> Max (V) | I <sub>R</sub> Max (mA) |
|------------|----------------------|--------------------|------------------------|-------------------------|
| B170AE/BE  | 70                   | 1.0                | 0.79                   | 0.2                     |
| B180AE/BE  | 80                   | 1.0                | 0.79                   | 0.2                     |
| B190AE/BE  | 90                   | 1.0                | 0.79                   | 0.2                     |
| B1100AE/BE | 100                  | 1.0                | 0.79                   | 0.2                     |

## Applications

- Polarity Protection Diode
- Re-Circulating Diode
- Blocking Diode
- DC-DC
- AC-DC

## Features and Benefits

- Guard Ring Die Construction for Transient Protection
- Ideally Suited for Automated Assembly
- Low Power Loss, High Efficiency
- For Use in Low Voltage Drop, High Frequency Inverters, Free Wheeling, and Polarity Protection Application
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

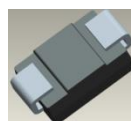
## Mechanical Data

- Case: SMA , SMB
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208 **(e3)**
- Polarity: Cathode Band
- Weight: SMA-0.063 grams (Approximate)  
SMB-0.093 grams (Approximate)

### SMA / SMB



Top View



Bottom View

## Ordering Information (Note 4)

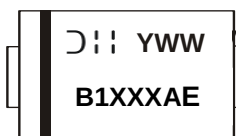
| Part Number | Case | Packaging         |
|-------------|------|-------------------|
| B1XXAE-13   | SMA  | 5,000/Tape & Reel |
| B1XXXAE-13  | SMA  | 5,000/Tape & Reel |
| B1XXBE-13   | SMB  | 3,000/Tape & Reel |
| B1XXXBE-13  | SMB  | 3,000/Tape & Reel |

\*x = Device type, e.g. B180AE-13 (SMA package); B1100BE-13 (SMB package).

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  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

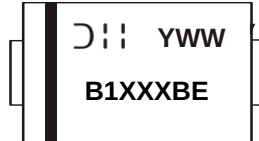
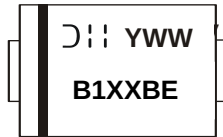
### SMA



B1XXAE or B1XXXAE = Product Type Marking Code, ex: B170AE (SMA Package)  
 ⑈ = Manufacturers' Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 8 for 2018)  
 WW = Week Code (01 to 53)

## Marking Information (Cont.)

### SMB



B1XXBE or B1XXXBE = Product Type Marking Code, ex: B170BE (SMB Package)

DII = Manufacturers' Code Marking

YWW = Date Code Marking

Y = Last Digit of Year (ex: 8 for 2018)

WW = Week Code (01 to 53)

## Maximum Ratings (@T<sub>A</sub> = +25°C unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

| Characteristic                                   | Symbol           | B170AE<br>B170BE | B180AE<br>B180BE | B190AE<br>B190BE | B1100AE<br>B1100BE | Unit |
|--------------------------------------------------|------------------|------------------|------------------|------------------|--------------------|------|
| Peak Repetitive Reverse Voltage                  | V <sub>RRM</sub> | 70               | 80               | 90               | 100                | V    |
| Working Peak Reverse Voltage                     | V <sub>RWM</sub> |                  |                  |                  |                    |      |
| DC Blocking Voltage                              | V <sub>R</sub>   |                  |                  |                  |                    |      |
| Average Rectified Output Current                 | I <sub>O</sub>   | 1.0              |                  |                  |                    | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms  | I <sub>FSM</sub> | 30               |                  |                  |                    | A    |
| Single Half Sine-Wave Superimposed on Rated Load |                  |                  |                  |                  |                    |      |

## Thermal Characteristics

| Characteristic                                          | Symbol                            | Value       | Unit |
|---------------------------------------------------------|-----------------------------------|-------------|------|
| Typical Thermal Resistance Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 110<br>75   | °C/W |
| Typical Thermal Resistance Junction to Case (Note 5)    | R <sub>θJC</sub>                  | 55<br>40    | °C/W |
| Operating and Storage Temperature Range                 | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

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

| Characteristic           | Symbol         | Min | Typ          | Max        | Unit | Test Condition                                                                                      |
|--------------------------|----------------|-----|--------------|------------|------|-----------------------------------------------------------------------------------------------------|
| Forward Voltage Drop     | V <sub>F</sub> | —   | 0.75<br>0.61 | 0.79<br>—  | V    | I <sub>F</sub> = 1.0A, T <sub>A</sub> = +25°C<br>I <sub>F</sub> = 1.0A, T <sub>A</sub> = +125°C     |
| Leakage Current (Note 6) | I <sub>R</sub> | —   | —            | 0.2<br>5.0 | mA   | @ Rated V <sub>R</sub> , T <sub>A</sub> = +25°C<br>@ Rated V <sub>R</sub> , T <sub>A</sub> = +125°C |
| Typical Capacitance      | C <sub>T</sub> | —   | 27           | —          | pF   | V <sub>R</sub> = 4V, f = 1MHz                                                                       |

Notes: 5. Device mounted on FR-4 substrate, 0.4" x 0.5", 2oz, single-sided, PC boards with 0.2" x 0.25" copper pad.  
6. Short duration pulse test used to minimize self-heating effect.

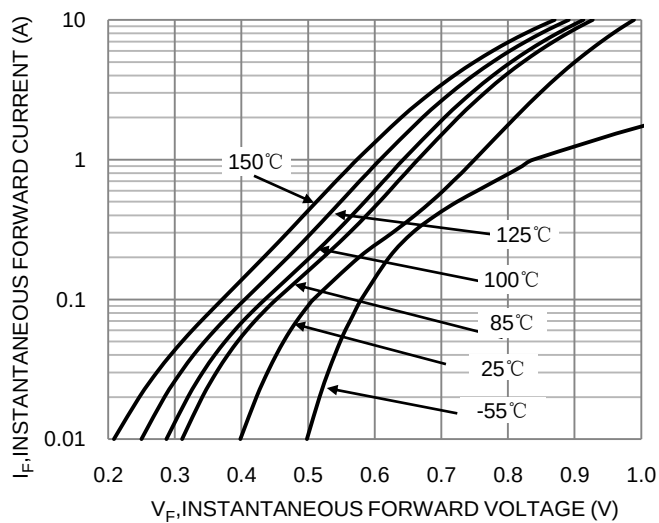


Figure 1. Typical Forward Characteristics

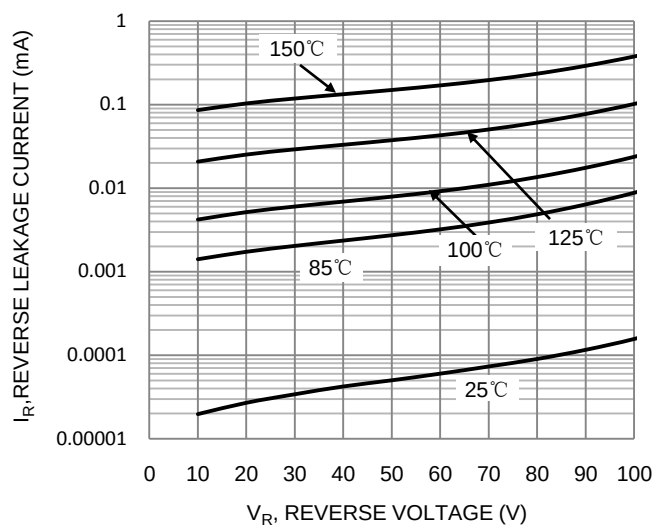


Figure 2. Typical Reverse Characteristics

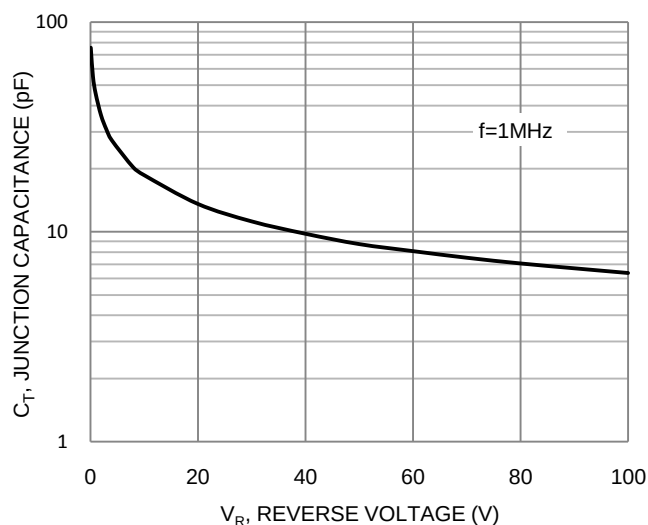


Figure 3. Typical Junction Capacitance

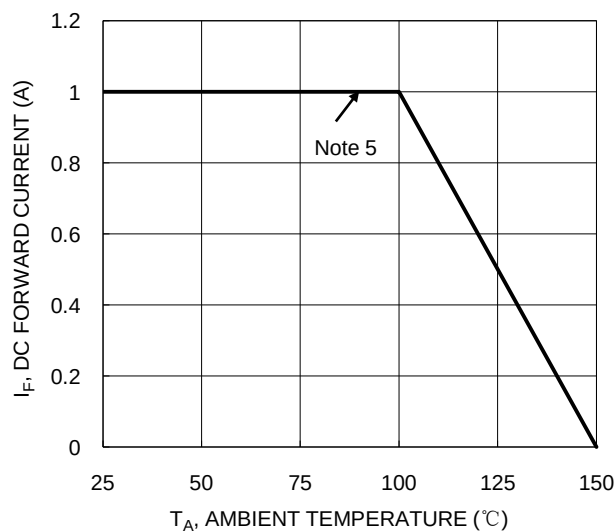
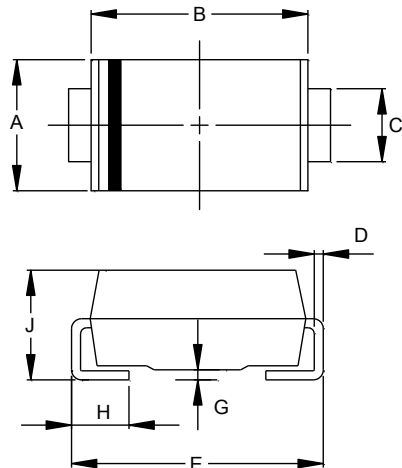


Figure 4. DC Forward Current Derating

## Package Outline Dimensions

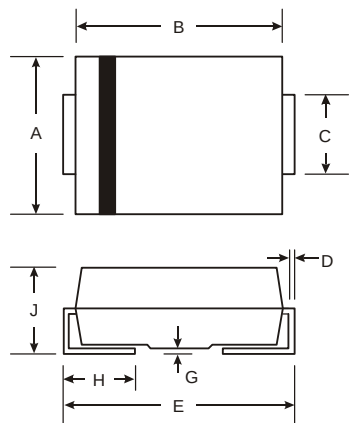
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SMA



| SMA                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.29 | 2.92 |
| B                    | 4.00 | 4.60 |
| C                    | 1.27 | 1.63 |
| D                    | 0.15 | 0.31 |
| E                    | 4.80 | 5.59 |
| G                    | 0.05 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 1.96 | 2.40 |
| All Dimensions in mm |      |      |

### SMB

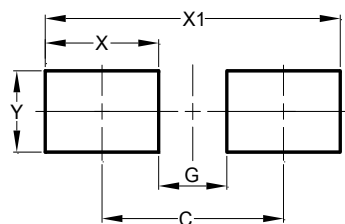


| SMB                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 3.30 | 3.94 |
| B                    | 4.06 | 4.57 |
| C                    | 1.96 | 2.21 |
| D                    | 0.15 | 0.31 |
| E                    | 5.00 | 5.59 |
| G                    | 0.05 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 2.00 | 2.50 |
| All Dimensions in mm |      |      |

## Suggested Pad Layout

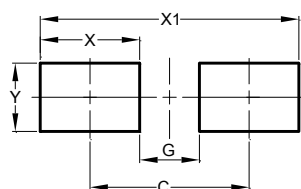
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SMA



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 4.00          |
| G          | 1.50          |
| X          | 2.50          |
| X1         | 6.50          |
| Y          | 1.70          |

### SMB



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 4.30          |
| G          | 1.80          |
| X          | 2.50          |
| X1         | 6.80          |
| Y          | 2.30          |

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