

## Product Summary

B120AF/B130AF/B140AF

| V <sub>RRM</sub> (V) | I <sub>O</sub> (A) | V <sub>F(MAX)</sub> (V)<br>@ +25°C | I <sub>R(MAX)</sub> (mA)<br>@ +25°C |
|----------------------|--------------------|------------------------------------|-------------------------------------|
| 20                   | 1                  | 0.5                                | 0.1                                 |
| 30                   | 1                  | 0.5                                | 0.1                                 |
| 40                   | 1                  | 0.5                                | 0.2                                 |

## Description and Applications


The Schottky rectifier providing low V<sub>F</sub> and excellent reverse leakage stability at high temperatures, this device is ideal for use in general rectification applications such as:

- Boost Diode
- Blocking Diode
- Recirculating Diode

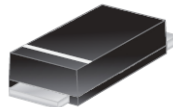
## Features and Benefits

- Reduced Low Forward Voltage Drop (V<sub>F</sub>); Better Efficiency and Cooler Operation
- Reduced High-Temperature Reverse Leakage; Increased Reliability against Thermal Runaway Failure in High Temperature Operation
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SMAF
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Polarity: Cathode Band
- Weight: 0.036 grams (Approximate)

SMAF



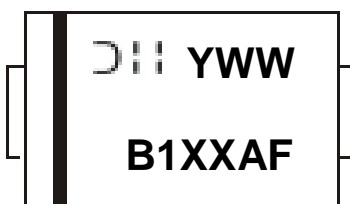
Top View

## Ordering Information (Note 4)

| Part Number | Case | Packaging          |
|-------------|------|--------------------|
| B120AF-13   | SMAF | 10,000/Tape & Reel |
| B130AF-13   | SMAF | 10,000/Tape & Reel |
| B140AF-13   | SMAF | 10,000/Tape & Reel |

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



B1XXAF = Product Type Marking Code, ex: B120AF

311 = Manufacturers' Code Marking

YWW = Date Code Marking

Y = Last Digit of Year (ex: 7 for 2017)

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    | B120AF | B130AF | B140AF | Unit |
|---|-----------|--------|--------|--------|------|
| Peak Repetitive Reverse Voltage   | $V_{RRM}$ | 20     | 30     | 40     | V    |
| Working Peak Reverse Voltage  | $V_{RWM}$ |        |        |        |      |
| DC Blocking Voltage   | $V_{RM}$  |        |        |        |      |
| Average Rectified Output Current  | $I_O$     | 1      |        |        | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 30     |        |        | A    |

## Thermal Characteristics

| Characteristic  | Symbol                            | Value       | Unit |
|---|-----------------------------------|-------------|------|
| Typical Thermal Resistance Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 95          | °C/W |
| Typical Thermal Resistance Junction to Case (Note 5)    | R <sub>θJC</sub>                  | 45          | °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> | —   | 0.455<br>0.40                  | 0.50<br>—                 | V    | I <sub>F</sub> = 1A, T <sub>J</sub> = +25°C<br>I <sub>F</sub> = 1A, T <sub>J</sub> = +125°C   |
| Leakage Current (Note 6) | I <sub>R</sub> | —   | 0.005<br>0.006<br>0.010<br>6.0 | 0.10<br>0.10<br>0.20<br>— | mA   | V <sub>R</sub> = 20V, T <sub>J</sub> = +25°C<br>V <sub>R</sub> = 30V, T <sub>J</sub> = +25°C<br>V <sub>R</sub> = 40V, T <sub>J</sub> = +25°C<br>V <sub>R</sub> = 40V, T <sub>J</sub> = +125°C |
| Typical Capacitance      | C <sub>T</sub> | —   | 50                             | —                         | pF   | V <sub>R</sub> = 4.0V, 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.

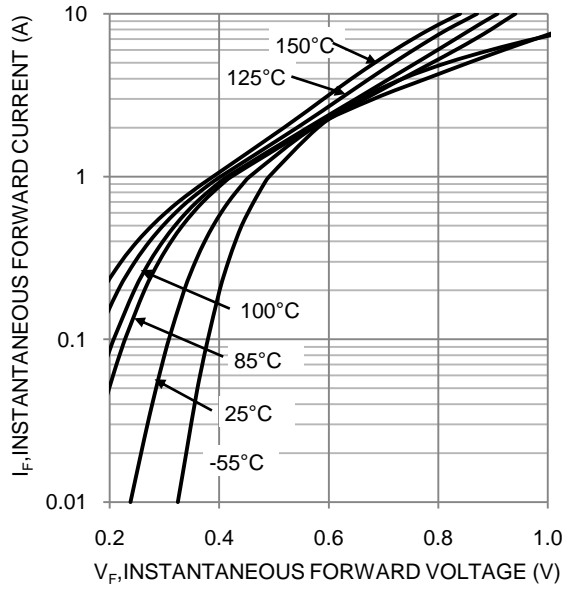


Figure 1. Typical Forward Characteristics

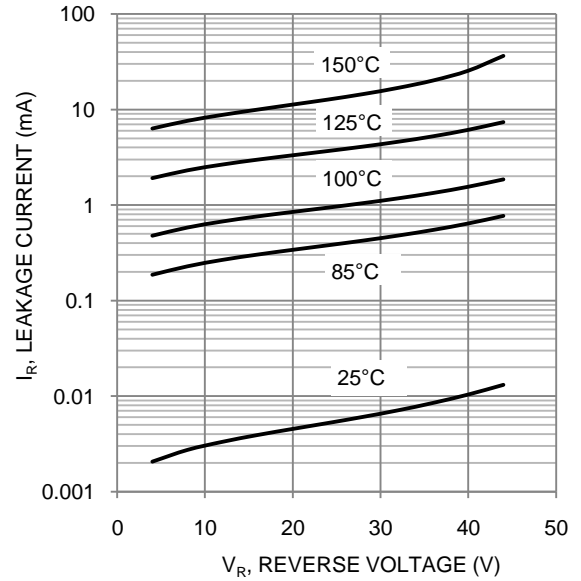


Figure 2. Typical Reverse Characteristics

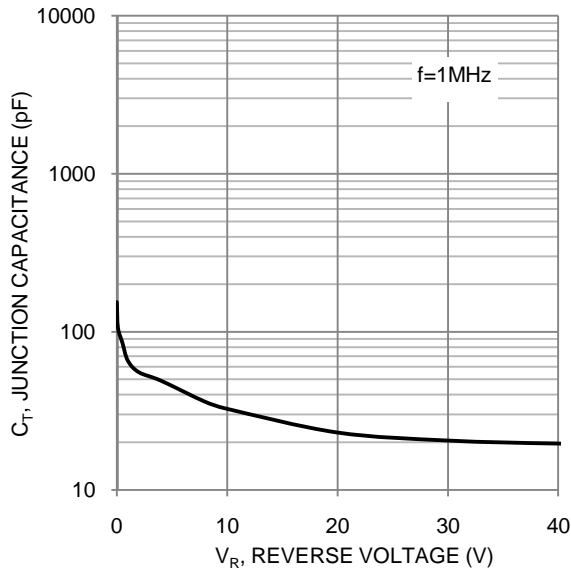


Figure 3. Typical Junction Capacitance

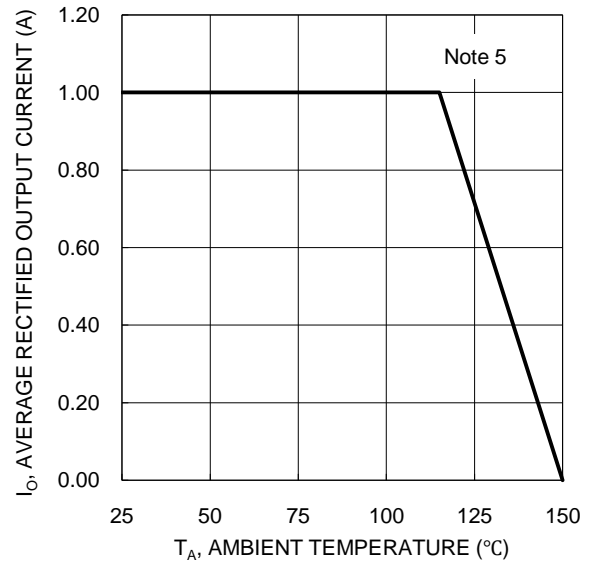
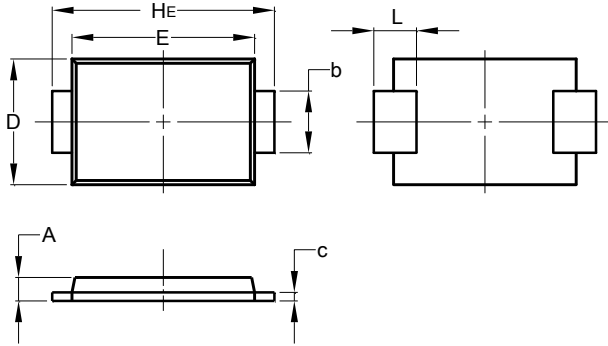


Figure 4. DC Forward Current Derating

## Package Outline Dimensions

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

### SMAF

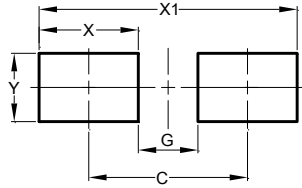


| SMAF                 |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 0.90 | 1.10 |
| b                    | 1.25 | 1.65 |
| c                    | 0.10 | 0.40 |
| D                    | 2.25 | 2.95 |
| E                    | 3.95 | 4.60 |
| HE                   | 4.80 | 5.60 |
| L                    | 0.50 | 1.50 |
| All Dimensions in mm |      |      |

## Suggested Pad Layout

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

### SMAF



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

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