

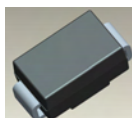
## Features

- Guard Ring Die Construction for Transient Protection
- Ideally Suited for Automated Assembly
- Low Power Loss, High Efficiency
- Surge Overload Rating to 50A Peak
- For Use in Low Voltage, High Frequency Inverters, Free Wheeling, and Polarity Protection Application
- High Temperature Soldering: 260°C/10 Second at Terminal
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3 & 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

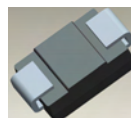
## Mechanical Data

- Case: SMA/SMB
- Case Material: Molded Plastic. 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 
- Polarity: Cathode Band or Cathode Notch
- Weight: SMA 0.064 grams (Approximate)  
SMB 0.093 grams (Approximate)

SMA/SMB



Top View



Bottom View

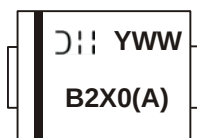
## Ordering Information (Note 5)

| Part Number | Qualification | Case | Packaging        |
|-------------|---------------|------|------------------|
| B2xxA-13-F  | Commercial    | SMA  | 5000/Tape & Reel |
| B2xx-13-F   | Commercial    | SMB  | 3000/Tape & Reel |
| B250Q-13    | Automotive    | SMB  | 3000/Tape & Reel |
| B240AQ-13-F | Automotive    | SMA  | 5000/Tape & Reel |

\* x = Device type, e.g. B260A-13-F (SMA package); B240-13-F (SMB package).

- 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> 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. Product manufactured with Date Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
  5. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



B2X0A = Product type marking code, ex: B220A (SMA package)  
 B2X0 = Product type marking code, ex: B230 (SMB package)  
 311 = Manufacturers' code marking  
 YWW = Date code marking  
 Y = Last digit of year (ex: 2 for 2002)  
 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 capacitance load, derate current by 20%.

| Characteristic                                             | Symbol              | B220/A | B230/A | B240/A | B250/A | B260/A | Unit |
|------------------------------------------------------------|---------------------|--------|--------|--------|--------|--------|------|
| Peak Repetitive Reverse Voltage                            | V <sub>RRM</sub>    |        |        |        |        |        |      |
| Working Peak Reverse Voltage                               | V <sub>RWM</sub>    | 20     | 30     | 40     | 50     | 60     | V    |
| DC Blocking Voltage                                        | V <sub>R</sub>      |        |        |        |        |        |      |
| RMS Reverse Voltage                                        | V <sub>R(RMS)</sub> | 14     | 21     | 28     | 35     | 42     | V    |
| Average Rectified Output Current @ T <sub>L</sub> = +100°C | I <sub>O</sub>      | 2.0    |        |        |        |        | A    |
| Non-Repetitive Peak Forward Surge Current, 8.3ms           | I <sub>FSM</sub>    | 50     |        |        |        |        | A    |
| Single Half Sine-Wave Superimposed on Rated Load           |                     |        |        |        |        |        |      |

## Thermal Characteristics

| Characteristic                               | Symbol                            | Value       | Unit |
|----------------------------------------------|-----------------------------------|-------------|------|
| Typical Thermal Resistance, Junction to Lead | R <sub>θJL</sub>                  | 25<br>20    | °C/W |
| Operating and Storage Temperature Range      | T <sub>J</sub> , T <sub>STG</sub> | -65 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> | -   | -   | 0.50<br>0.70 | V    | I <sub>F</sub> = 2.0A, T <sub>A</sub> = +25°C                                                       |
| Leakage Current (Note 6) | I <sub>R</sub> | -   | -   | 0.5<br>20    | mA   | @ Rated V <sub>R</sub> , T <sub>A</sub> = +25°C<br>@ Rated V <sub>R</sub> , T <sub>A</sub> = +100°C |
| Total Capacitance        | C <sub>T</sub> | -   | -   | 200          | pF   | V <sub>R</sub> = 4V, f = 1MHz                                                                       |

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

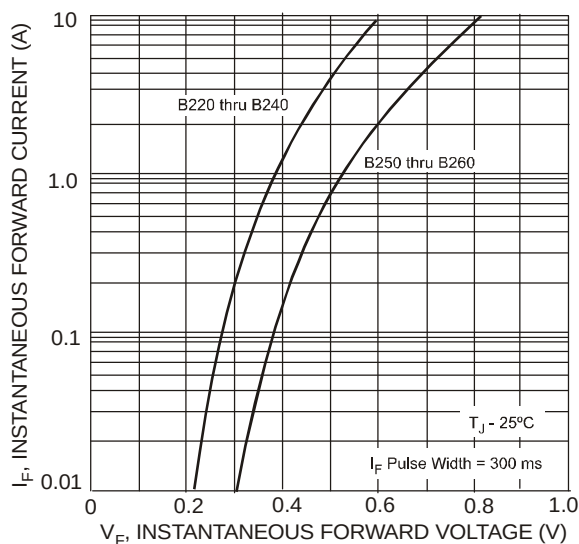


Fig. 1 Typical Forward Characteristics

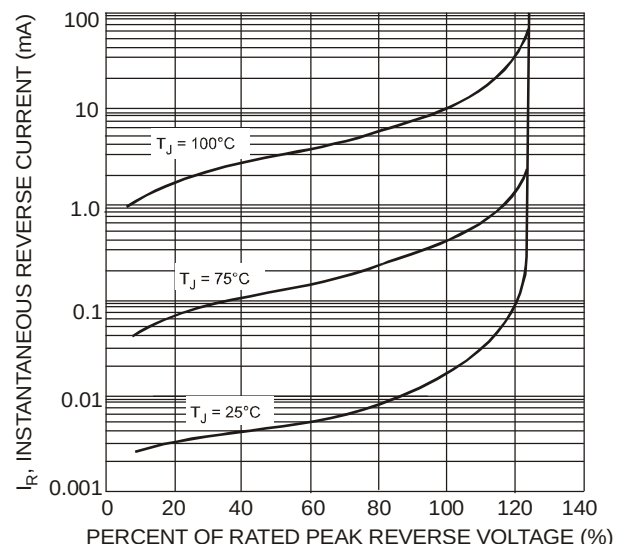
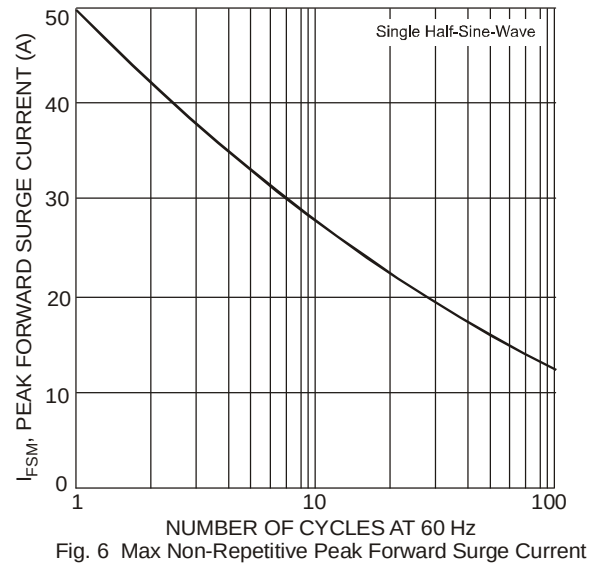
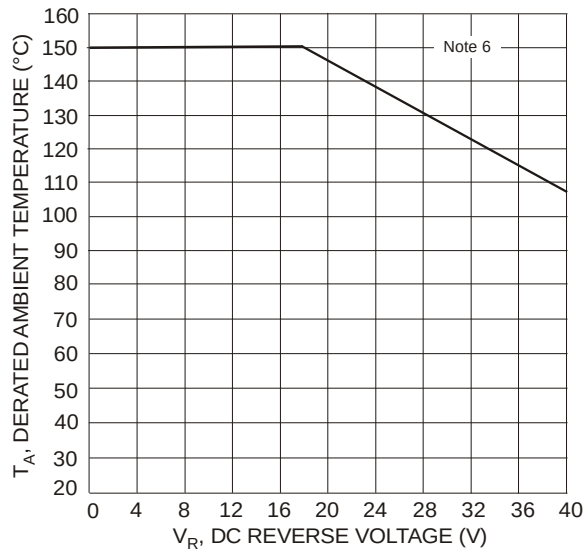
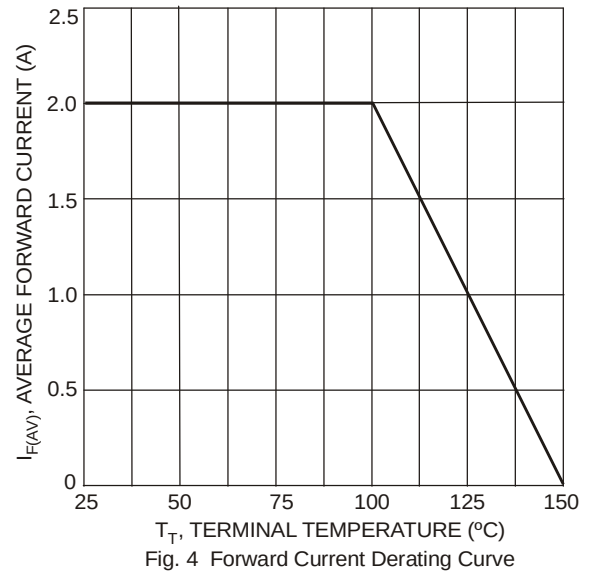
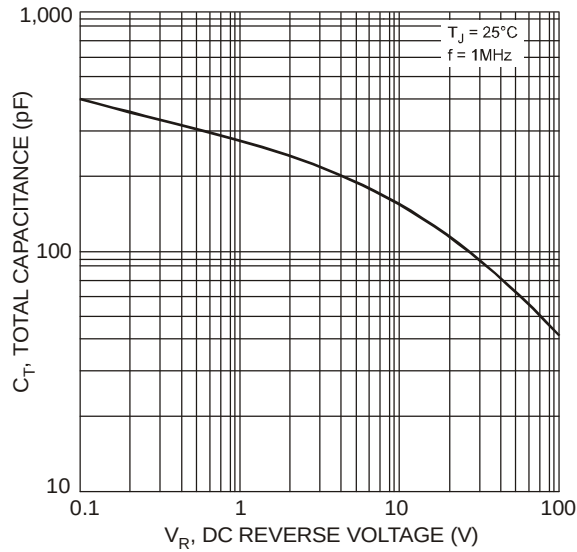


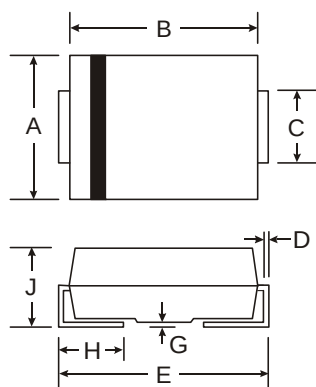
Fig. 2 Typical Reverse Characteristics



6. Device mounted on FR-4 PC board with minimum recommended pad layout pattern as per <http://www.diodes.com>.

## Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

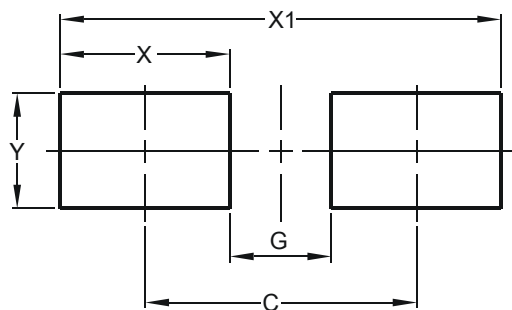


| SMA                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.29 | 2.92 |
| B                    | 4.00 | 4.60 |
| C                    | 1.27 | 1.63 |
| D                    | 0.15 | 0.31 |
| E                    | 4.80 | 5.59 |
| G                    | 0.05 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 2.01 | 2.30 |
| All Dimensions in mm |      |      |

| 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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> 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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### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

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