



**THE DATASHEET OF  
B320A-13-F**



## Product Summary

### B320A-B340A:

| V <sub>RRM</sub> (V) | I <sub>O</sub> (A) | V <sub>F(MAX)</sub> @ 3A (V) | I <sub>R(MAX)</sub> @ V <sub>RRM</sub> (mA) |
|----------------------|--------------------|------------------------------|---|
| 20, 30, 40           | 3.0                | 0.50                         | 0.5   |

### B350-B360A:

| V <sub>RRM</sub> (V) | I <sub>O</sub> (A) | V <sub>F(typ)</sub> @ +125°C (V) | I <sub>R(MAX)</sub> @ V <sub>RRM</sub> (mA) |
|----------------------|--------------------|----------------------------------|---|
| 50, 60               | 3.0                | 0.70                             | 0.5   |

## Description and Applications

For use in low-voltage, high-frequency inverters, freewheeling, DC-DC converters, and polarity protection applications.

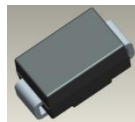
## Features

- Guard Ring Die Construction for Transient Protection
- Ideally Suited for Automated Assembly
- Low Power Loss, High Efficiency
- **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**

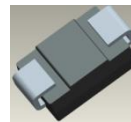
## Mechanical Data

- Case: SMA
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte-Tin Finish). Solderable per MIL-STD-202, Method 208 Ⓜ3
- Polarity: Cathode Band
- Weight: 0.064 grams (Approximate)

### SMA



Top View



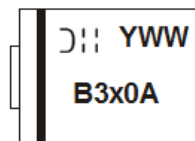
Bottom View

## Ordering Information (Note 5)

| Part Number* | Compliance | Case | Packaging         |
|--------------|------------|------|-------------------|
| B3XXA-13-F   | Standard   | SMA  | 5,000/Tape & Reel |

\* XX = Device Type, e.g. B320A-13-F (SMA Package).

## Marking Information (Note 6)



B3x0A = Product Type Marking Code, ex: B320A  
 ⌋|| = Manufacturers' Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 15 for 2015)  
 WW = Week Code (01 to 53)

- 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. Products 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/products/packages.html>.
  6. Device has a cathode band (as shown above) and may also have a cathode notch.

### Maximum Ratings (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitance load, derate current by 20%.

| Characteristic   | Symbol    | B320A | B330A | B340A | B350A | B360A | Unit |
|--|-----------|-------|-------|-------|-------|-------|------|
| Peak Repetitive Reverse Voltage  | $V_{RRM}$ |       |       |       |       |       |      |
| Working Peak Reverse Voltage   | $V_{RWM}$ | 20    | 30    | 40    | 50    | 60    | V    |
| DC Blocking Voltage  | $V_R$     |       |       |       |       |       |      |
| Average Rectified Output Current @ $T_T = +100^\circ\text{C}$                                    | $I_O$     | 3.0   |       |       |       |       | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 80    |       |       |       |       | A    |

### Thermal Characteristics

| Characteristic   | Symbol          | Value       | Unit                      |
|--|-----------------|-------------|---------------------------|
| Maximum Total Power Dissipation - Steady State, $T_A = +25^\circ\text{C}$ (Note 7) | $P_D$           | 850         | mW                        |
| Typical Thermal Resistance, Junction to Ambient (Note 7)                           | $R_{\theta JA}$ | 140         | $^\circ\text{C}/\text{W}$ |
| Typical Thermal Resistance, Junction to Terminal (Note 8)                          | $R_{\theta JT}$ | 25          | $^\circ\text{C}/\text{W}$ |
| Typical Thermal Resistance, Junction to Ambient (Note 8)                           | $R_{\theta JA}$ | 100         | $^\circ\text{C}/\text{W}$ |
| Operating Temperature Range  | $T_J$           | -55 to +150 | $^\circ\text{C}$          |
| Storage Temperature Range  | $T_{STG}$       | -55 to +150 | $^\circ\text{C}$          |

### Electrical Characteristics (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

| Characteristic           | Symbol | Min | Typ | Max  | Unit | Test Condition                                  |
|--------------------------|--------|-----|-----|------|------|---|
| Forward Voltage Drop     | $V_F$  | —   | —   | 0.50 | V    | $I_F = 3.0\text{A}$ , $T_A = +25^\circ\text{C}$ |
|                          |        |     |     | 0.70 |      |   |
| Leakage Current (Note 9) | $I_R$  | —   | —   | 0.5  | mA   | @ Rated $V_R$ , $T_A = +25^\circ\text{C}$       |
|                          |        |     |     | 20   |      | @ Rated $V_R$ , $T_A = +100^\circ\text{C}$      |
| Total Capacitance        | $C_T$  | —   | 200 | —    | pF   | $V_R = 4\text{V}$ , $f = 1\text{MHz}$           |

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout.
  - Device mounted on glass epoxy substrate with 2x3mm copper pad.
  - Short duration pulse test used to minimize self-heating effect.

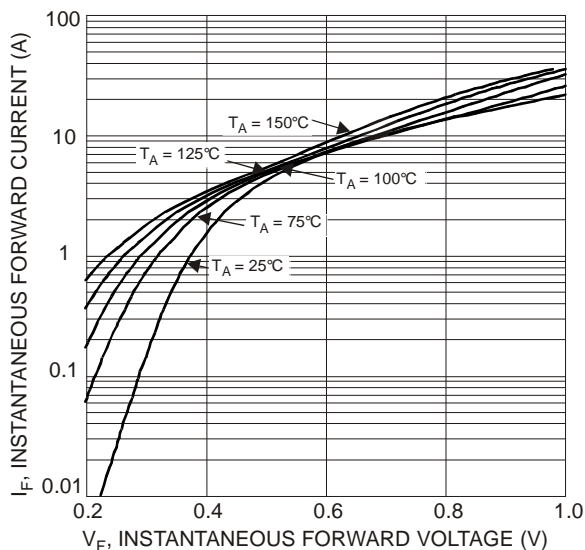


Fig. 1 Typical Forward Characteristics - B320A thru B340A

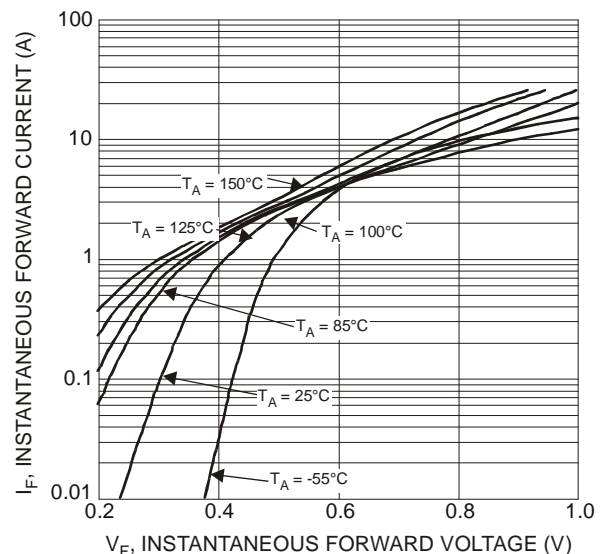


Fig. 2 Typ. Forward Characteristics - B350A thru B360A

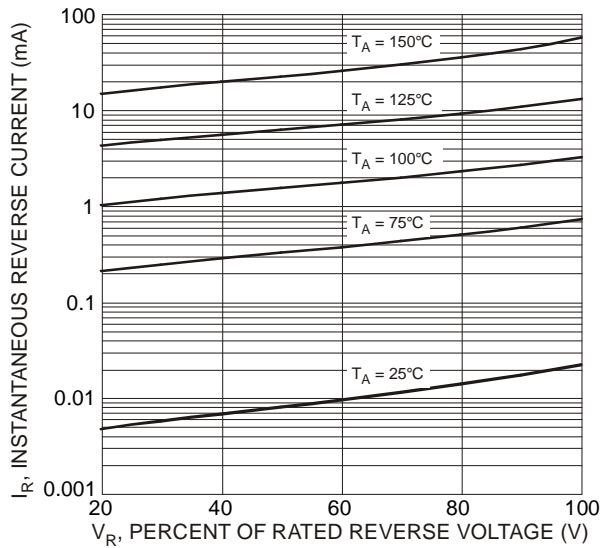


Fig. 3 Typical Reverse Characteristics, B320A thru B340A

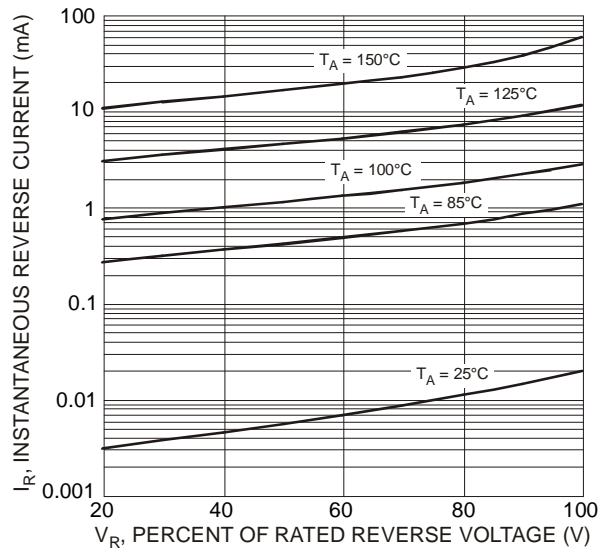


Fig. 4 Typical Reverse Characteristics, B350A thru B360A

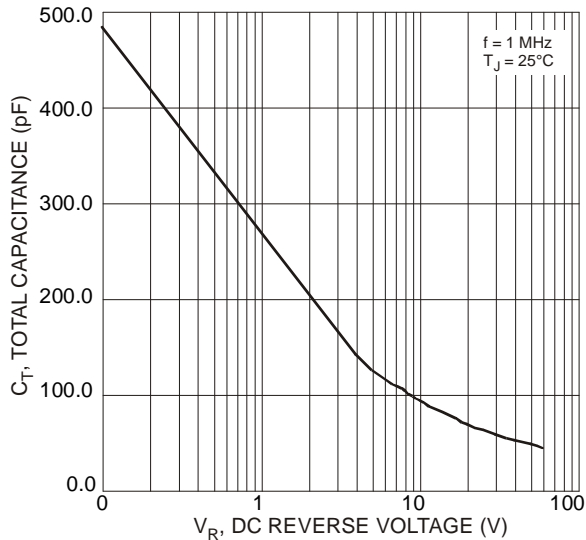


Fig. 5 Total Capacitance vs. Reverse Voltage

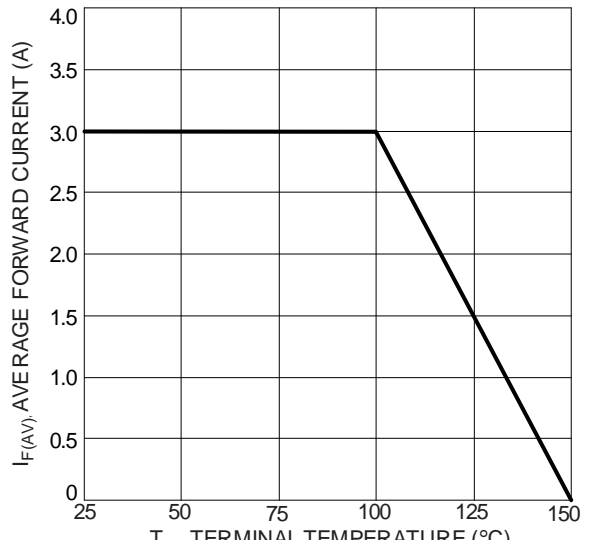


Fig. 6 Forward Current Derating Curve

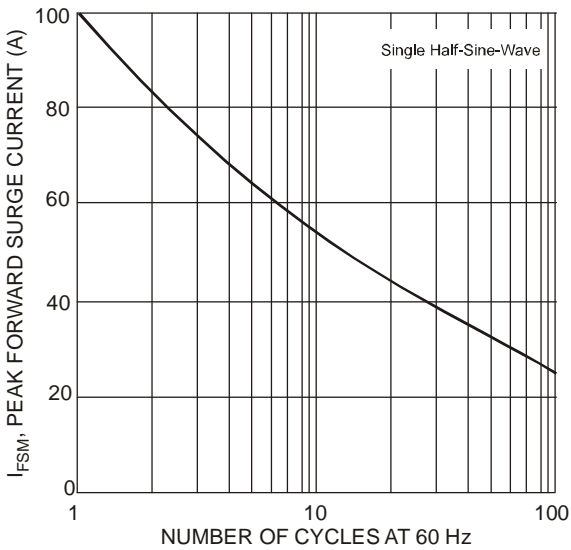


Fig. 7 Max Non-Repetitive Peak Fwd Surge Current

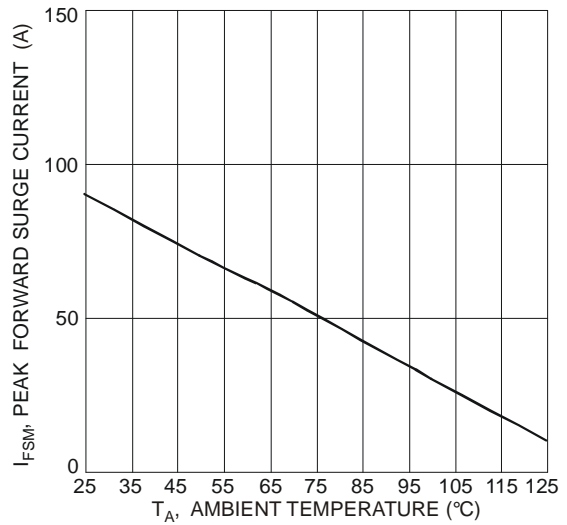


Fig. 8 Non-Repetitive Forward Surge Current Derating Curve

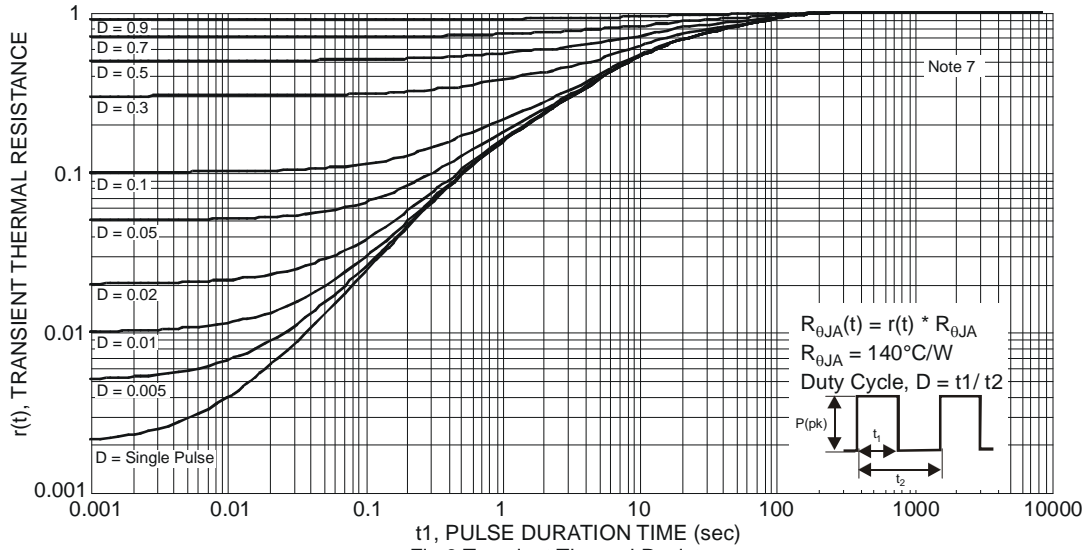


Fig 9 Transient Thermal Resistance  
B320A-B340A

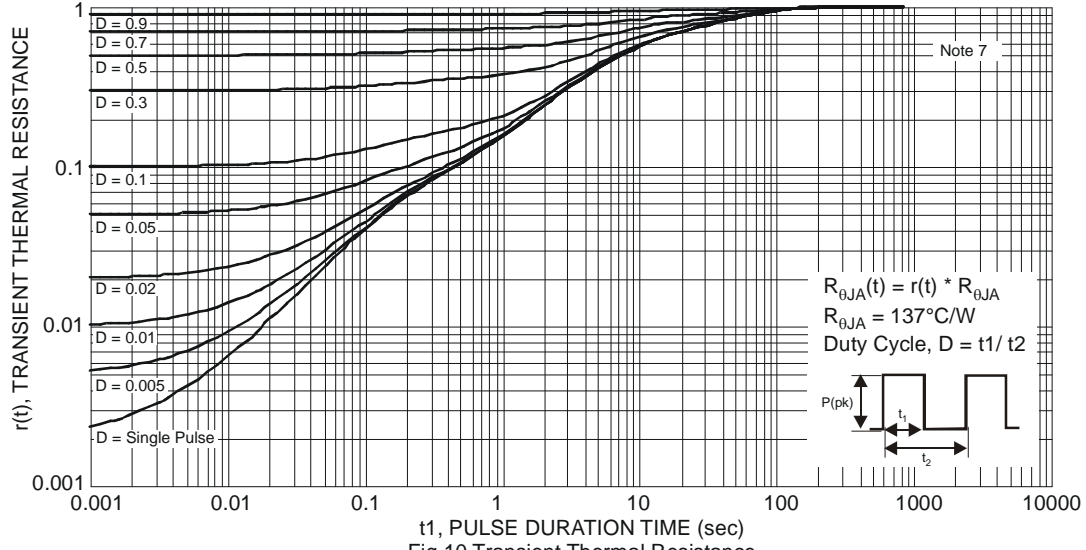


Fig 10 Transient Thermal Resistance  
B350A-B360A

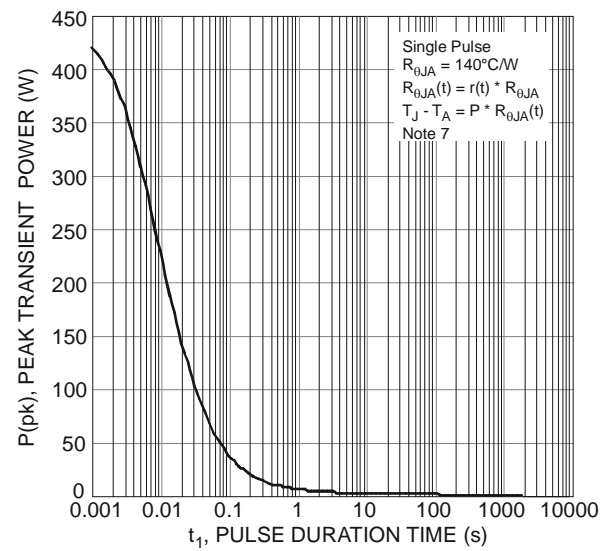


Fig. 11 Single Pulse Maximum Power Dissipation  
(B320A-B340A)

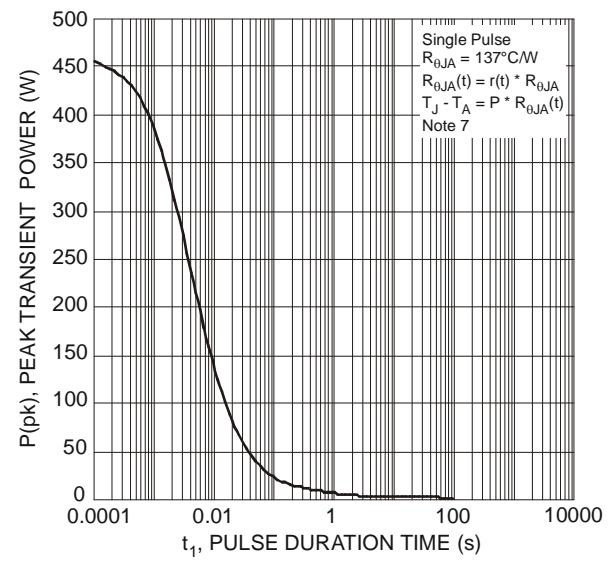
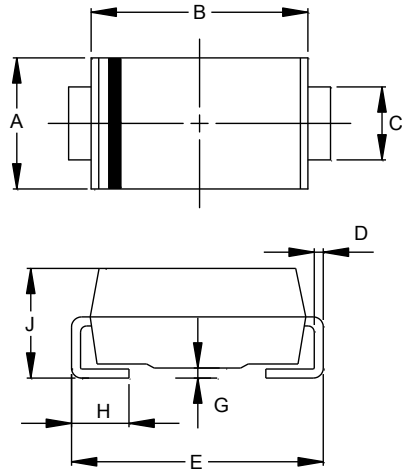


Fig. 12 Single Pulse Maximum Power Dissipation  
(B350A-B360A)

## Package Outline Dimensions

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

### SMA

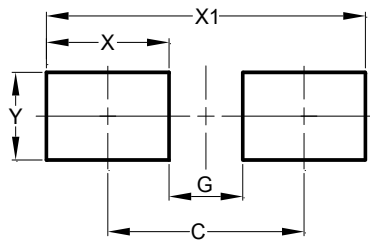


| SMA                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.29 | 2.92 |
| B                    | 4.00 | 4.60 |
| C                    | 1.27 | 1.63 |
| D                    | 0.15 | 0.31 |
| E                    | 4.80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

## 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          |

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