**Green**

## 1.0A SURFACE MOUNT FAST RECOVERY RECTIFIER

## Features

- Glass Passivated Die Construction
- Fast Recovery Time for High Efficiency
- Surge Overload Rating to 30A Peak
- Ideally Suited for Automated Assembly
- **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.
  UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Alloy
  Leadframe; Solderable per MIL-STD-202, Method 208 (e3)
- Polarity: Cathode Band or Cathode Notch
- Weight: SMA - 0.064 grams (Approximate)
  SMB - 0.093 grams (Approximate)

**SMA/SMB**
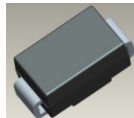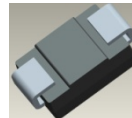
Top View          Bottom View

## Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---|---|---|
| RS1x-13-F | SMA | 5000/Tape & Reel |
| RS1xB-13-F | SMB | 3000/Tape & Reel |

\* x = Device type, e.g. RS1D-13-F (SMA package); RS1JB-13-F (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/SMB**

ᗡᕼ **YWW**
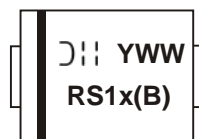
**RS1x(B)**

RS1x = Product Type Marking Code, ex: RS1G (SMA Package)
RS1xB = Product Type Marking Code, ex: RS1GB (SMB Package)
ᗡᕼ = Manufacturer's Code Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 9 for 2019)
WW = Week Code (01 to 53)

RS1A/B - RS1M/B
Document number: DS15002 Rev. 15 - 2

1 of 6
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February 2019
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## Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

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

| Characteristic | Symbol | RS1 A/AB | RS1 B/BB | RS1 D/DB | RS1 G/GB | RS1 J/JB | RS1 K/KB | RS1 M/MB | Unit |
|---|---|---|---|---|---|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage (Note 5) | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 35 | 70 | 140 | 280 | 420 | 560 | 700 | V |
| Average Rectified Output Current          @ $T_T$ = +120°C | $I_O$ | | | | 1.0 | | | | 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 Terminal (Note 6) | $R_{\Theta JT}$ | 20 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -65 to +150 | °C |

## Electrical Characteristics (@$T_A$ = +25°C unless otherwise specified.)

| Characteristic | Symbol | RS1 A/AB | RS1 B/BB | RS1 D/DB | RS1 G/GB | RS1 J/JB | RS1 K/KB | RS1 M/MB | Unit |
|---|---|---|---|---|---|---|---|---|---|
| Minimum Reverse Breakdown Voltage (Note 5)          @ $I_R$ = 5µA | $V_{(BR)R}$ | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum Forward Voltage Drop          @ $I_F$ = 1.0A | $V_{FM}$ | | | | 1.3 | | | | V |
| Peak Reverse Current          @ $T_A$ = +25°C<br>at Rated DC Blocking Voltage (Note 5)          @ $T_A$ = +125°C | $I_{RM}$ | | | | 5.0<br>200 | | | | µA |
| Maximum Reverse Recovery Time (Note 7) | $t_{RR}$ | | 150 | | | | 250 | 500 | ns |
| Typical Total Capacitance (Note 8) | $C_T$ | | | | 15 | | | | pF |

Notes:     5. Short duration pulse test used to minimize self-heating effect.
             6. Valid provided that terminals are kept at ambient temperature.
             7. Reverse recovery test conditions: $I_F$ = 0.5A, $I_R$ = 1.0A, $I_{RR}$ = 0.25A. See Figure 5.
             8. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.

RS1A/B - RS1M/B
Document number: DS15002 Rev. 15 - 2

2 of 6
**www.diodes.com**

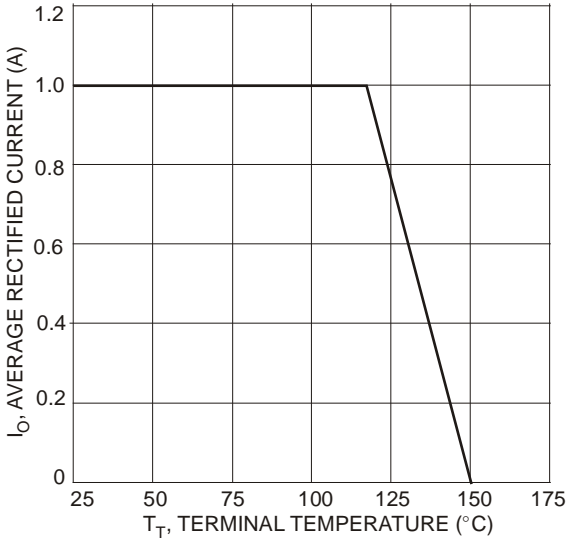February 2019
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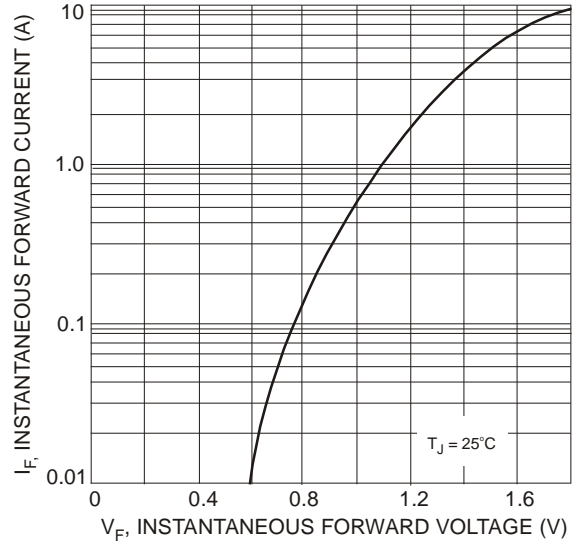
Fig. 1  Forward Current Derating Curve



Fig. 2  Typical Forward Characteristics

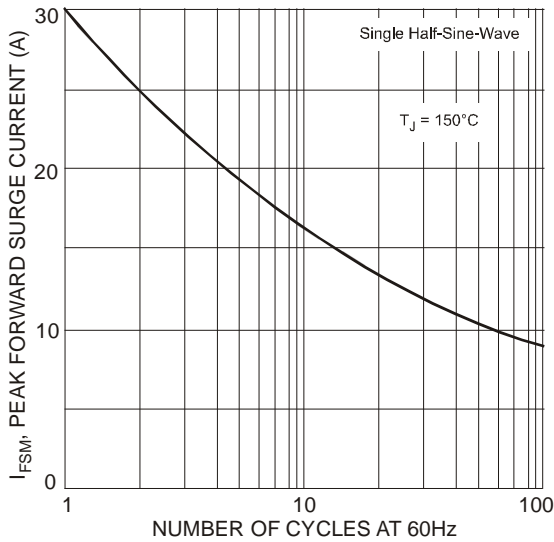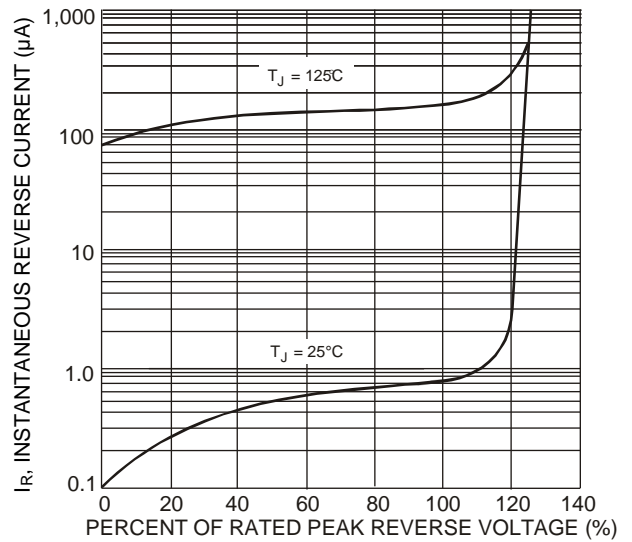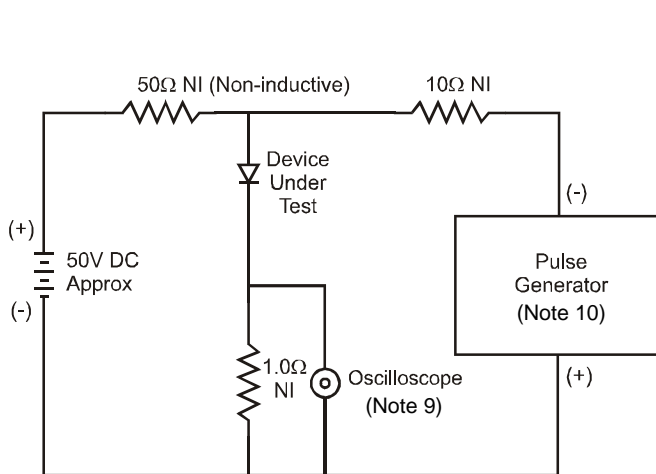

Fig. 3  Forward Surge Current Derating Curve



Fig. 4 Typical Reverse Characteristics



Notes:
9. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
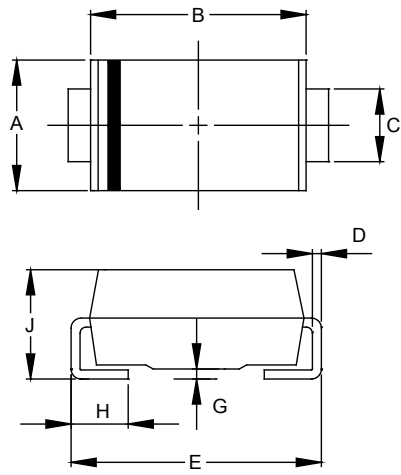10. Rise Time = 10ns max. Input Impedance = 50Ω.

Set time base for 50/100 ns/cm

Fig. 5  Reverse Recovery Time Characteristic and Test Circuit

RS1A/B - RS1M/B
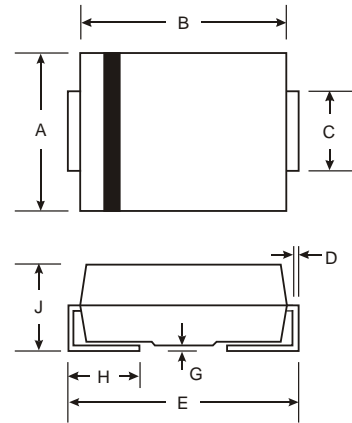Document number: DS15002 Rev. 15 - 2

3 of 6
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February 2019
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## 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** | | |

RS1A/B - RS1M/B
Document number: DS15002 Rev. 15 - 2

4 of 6
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## Suggested Pad Layout

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

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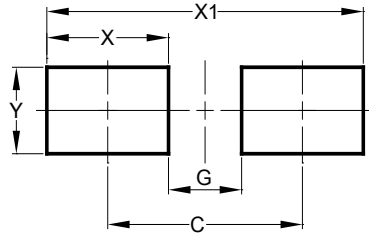
| Dimensions | Value (in mm) |
|------------|---------------|
| C | 4.00 |
| G | 1.50 |
| X | 2.50 |
| X1 | 6.50 |
| Y | 1.70 |

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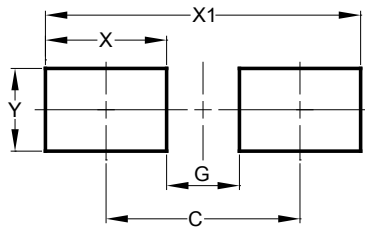
| Dimensions | Value (in mm) |
|------------|---------------|
| C | 4.30 |
| G | 1.80 |
| X | 2.50 |
| X1 | 6.80 |
| Y | 2.30 |

RS1A/B - RS1M/B
Document number: DS15002 Rev. 15 - 2

5 of 6
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February 2019
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RS1A/B - RS1M/B
Document number: DS15002 Rev. 15 - 2

6 of 6
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