

General-Purpose Rectifiers

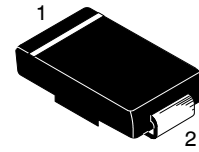
S1A - S1M

Description

In the world of commodity rectifiers, onsemi S1 family of 1 A, P-I-N, SMA rectifiers stand out for their optimized low leakage, low capacitance, and fast response time. This was achieved while maintaining the industry standard V_F max of 1.1 V at 1 A and a 30 A surge rating. In today's world, where system power efficiency is a critical differentiating feature, these advantages can be leveraged to support those higher efficiency goals.

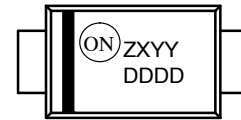
Features

- 1 $A_{I(F(AV))}$ Current Rating
- Glass Passivated
- Low Leakage:
 - ◆ 1 μA Maximum at 25°C
 - ◆ 50 μA Maximum at 125°C
- Fast Response: 1.8 μs (Typical)
- 30 A Surge Rating
- 50 V to 1000 V Reverse Voltage Ratings
- 6.6 pF Typical Capacitance
- UL Certified, UL #E258596
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant



SMA
CASE 403AE

MARKING DIAGRAM



- Z = Assembly Plant Code
- X = Last Digit of Year of Manufacture
- YY = Weekly Code of Manufacture
- DDDD = Specific Device Code

ORDERING INFORMATION

| Part Number | Device Code Marking | Package | Shipping† |
|-------------|---------------------|-----------------------------|--------------------|
| S1A | S1A | DO-214AC (SMA) (Pb-Free) | 7500 / Tape & Reel |
| S1B | S1B | | 7500 / Tape & Reel |
| S1D | S1D | | 7500 / Tape & Reel |
| S1G | S1G | | 7500 / Tape & Reel |
| S1J | S1J | | 7500 / Tape & Reel |
| S1K | S1K | | 7500 / Tape & Reel |
| S1M | S1M | | 7500 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

S1A – S1M

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 1)

| Symbol | Parameter | Value | | | | | | | Unit |
|-------------|--|-------------|-----|-----|-----|-----|-----|------|------------------|
| | | S1A | S1B | S1D | S1G | S1J | S1K | S1M | |
| V_{RRM} | Maximum Repetitive Reverse Voltage | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| $I_{F(AV)}$ | Average Rectified Forward Current at $T_A = 100^\circ\text{C}$ | 1.0 | | | | | | | A |
| I_{FSM} | Non-Repetitive Peak Forward Surge Current 8.3 ms Single Half-Sine-Wave | 30 | | | | | | | A |
| T_{STG} | Storage Temperature Range | -55 to +150 | | | | | | | $^\circ\text{C}$ |
| T_J | Operating Junction Temperature | -55 to +150 | | | | | | | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are limiting values above which the serviceability of any semiconductor device maybe impaired.

THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 1)

| Symbol | Characteristic | Value | Unit |
|-----------------|--|-------|---------------------------|
| P_D | Power Dissipation | 1.4 | W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient (Note 2) | 85 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient (Note 3) | 170 | $^\circ\text{C}/\text{W}$ |
| Ψ_{JL} | Junction-Lead Thermal Characteristics (Note 3) | 25 | $^\circ\text{C}/\text{W}$ |

2. Device mounted on FR-4 PCB, land pattern size: 25 mm² (5 x 5 mm).

3. Device mounted on FR-4 PCB, land pattern size: 4.6375 mm² (2.65 x 1.75 mm).

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------|--------------------------------|--|-----|-----|-----|---------------|
| V_F | Forward Voltage | $I_F = 1.0 \text{ A}$ | - | - | 1.1 | V |
| t_{rr} | Reverse Recovery Time | $I_F = 0.5 \text{ A}$, $I_R = 1.0 \text{ A}$ $I_{rr} = 0.25 \text{ A}$ | - | 1.8 | - | μs |
| I_R | Reverse Current at Rated V_R | $T_A = 25^\circ\text{C}$ | - | - | 1.0 | μA |
| | | $T_A = 125^\circ\text{C}$ | - | - | 50 | |
| C_J | Junction Capacitance | $V_R = 4.0 \text{ V}$, $f = 1.0 \text{ MHz}$ | - | 6.6 | - | pF |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

S1A – S1M

TYPICAL PERFORMANCE CHARACTERISTICS

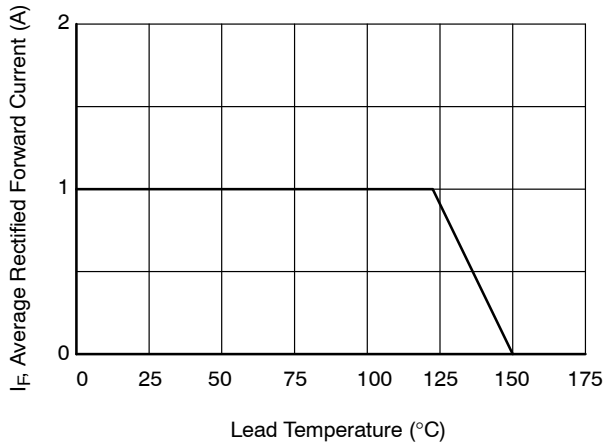


Figure 1. Forward Current Derating Curve

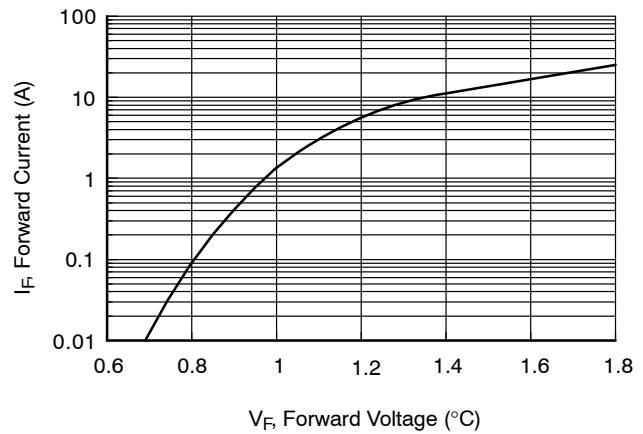


Figure 2. Forward Voltage Characteristics

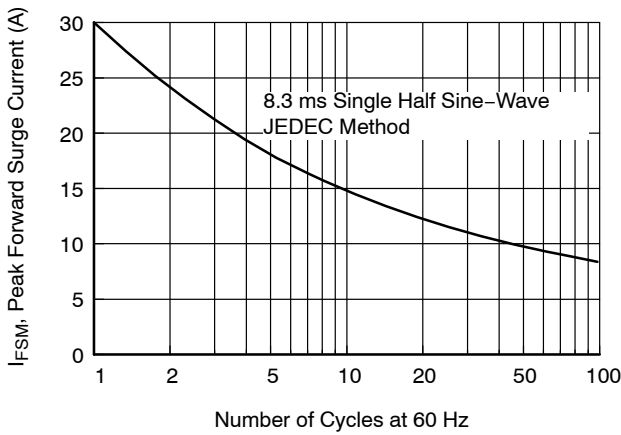


Figure 3. Non-Repetitive Surge Current

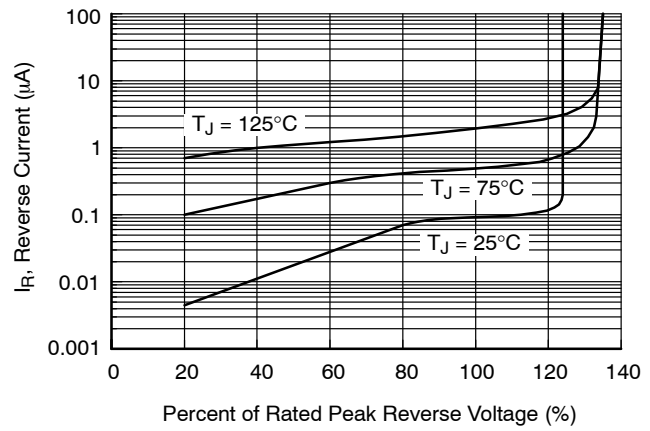


Figure 4. Reverse Current vs. Reverse Voltage

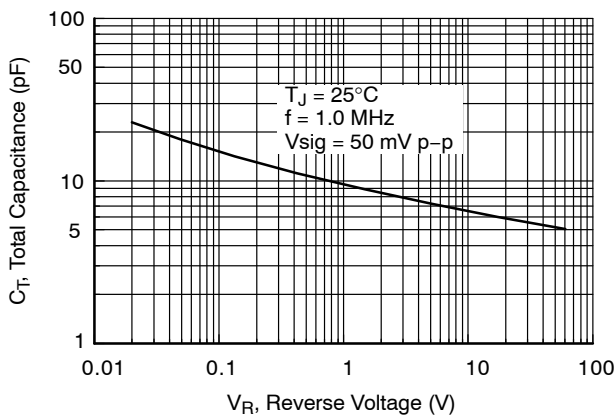


Figure 5. Total Capacitance

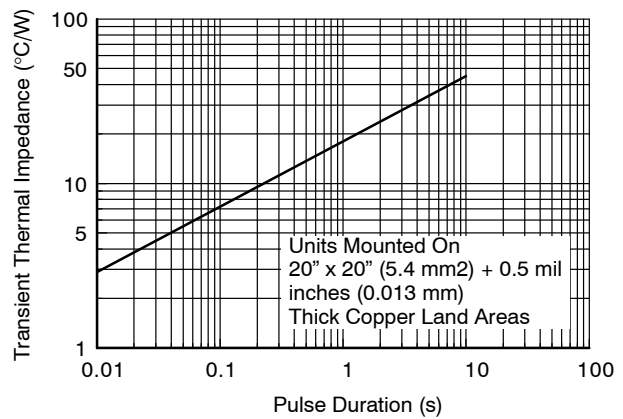


Figure 6. Thermal Impedance Characteristics

MECHANICAL CASE OUTLINE

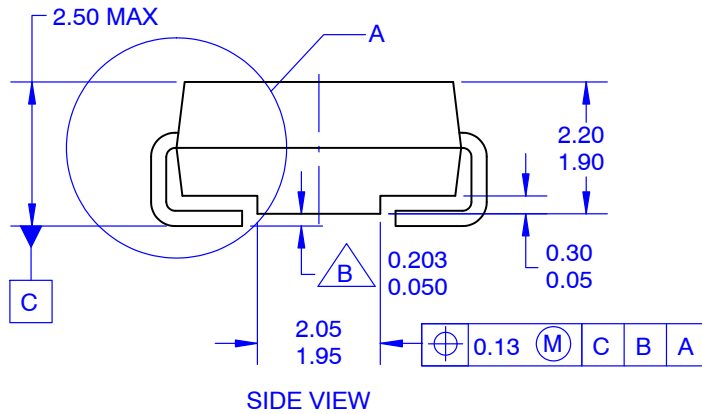
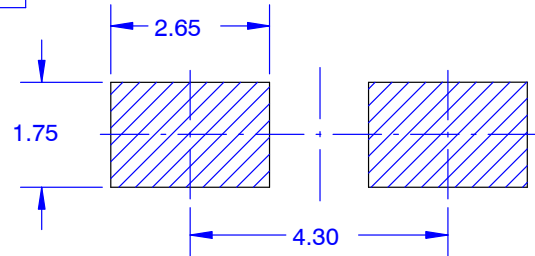
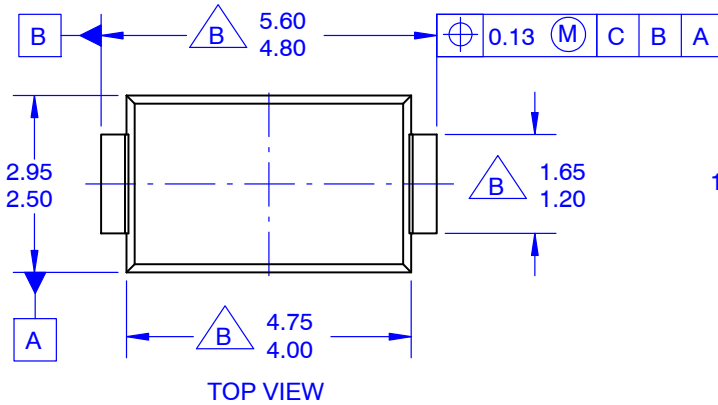
PACKAGE DIMENSIONS

ON Semiconductor®



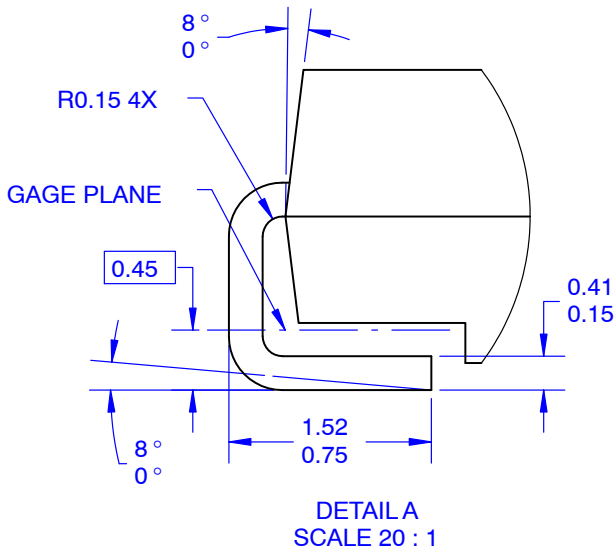
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DATE 31 AUG 2016



NOTES:

- A. EXCEPT WHERE NOTED, CONFORMS TO JEDEC DO214 VARIATION AC.
- B. DOES NOT COMPLY JEDEC STANDARD VALUE.
- C. ALL DIMENSIONS ARE IN MILLIMETERS.
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.
- E. DIMENSIONS AND TOLERANCE AS PER ASME Y14.5-2009.
- E. LAND PATTERN STD. DIOM5025X231M



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