

# General-Purpose Rectifiers

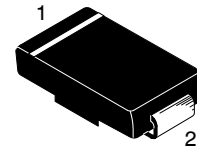
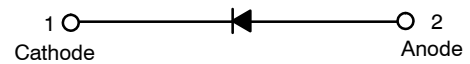
## S1A - S1M

### 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.

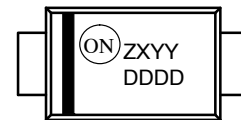
### Features

- 1  $A_{F(AV)}$  Current Rating
- Glass Passivated
- Low Leakage:
  - ◆ 1  $\mu A$  Maximum at 25°C
  - ◆ 50  $\mu A$  Maximum at 125°C
- Fast Response: 1.8  $\mu s$  (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	$^\circ\text{C}/\text{W}$
$\Psi_{JL}$	Junction-Lead Thermal Characteristics (Note 3)	25	$^\circ\text{C}/\text{W}$

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

3. Device mounted on FR-4 PCB, land pattern size: 4.6375 mm<sup>2</sup> (2.65 x 1.75 mm).

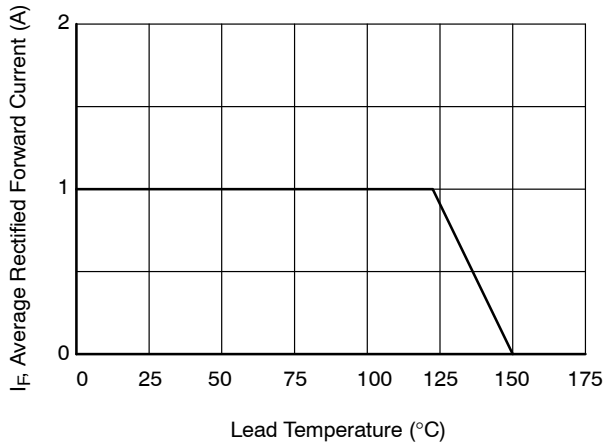
### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

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	-	$\mu\text{s}$
$I_R$	Reverse Current at Rated $V_R$	$T_A = 25^\circ\text{C}$	-	-	1.0	$\mu\text{A}$
		$T_A = 125^\circ\text{C}$	-	-	50	
$C_J$	Junction Capacitance	$V_R = 4.0 \text{ V}$ , $f = 1.0 \text{ MHz}$	-	6.6	-	pF

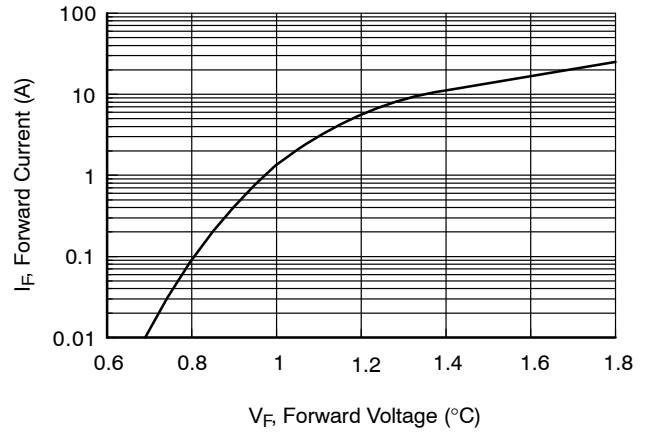
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

# S1A – S1M

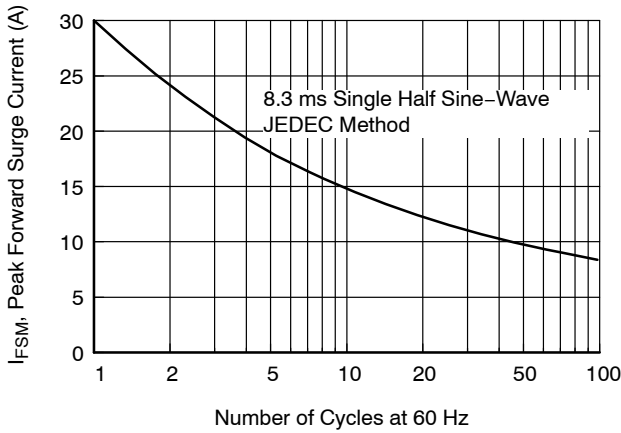
## TYPICAL PERFORMANCE CHARACTERISTICS



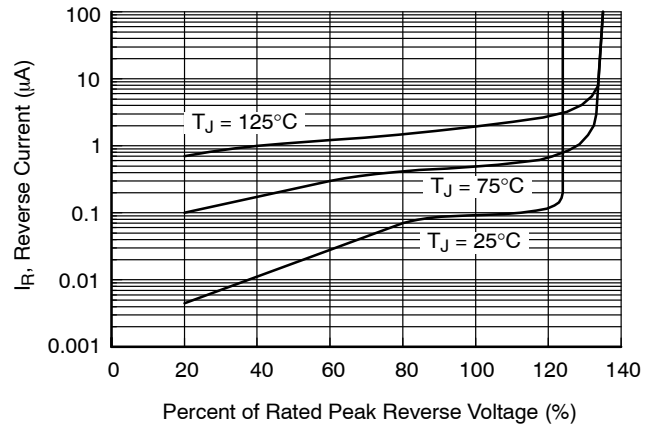
**Figure 1. Forward Current Derating Curve**



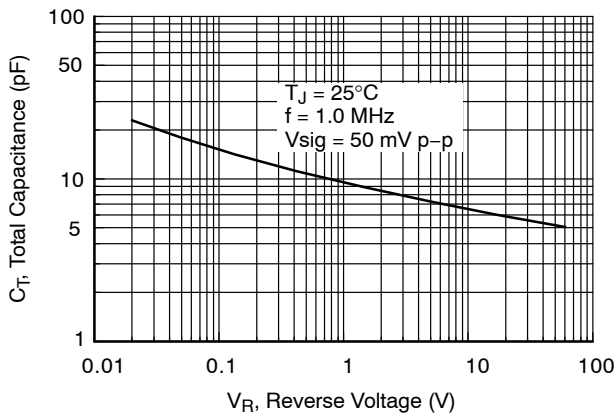
**Figure 2. Forward Voltage Characteristics**



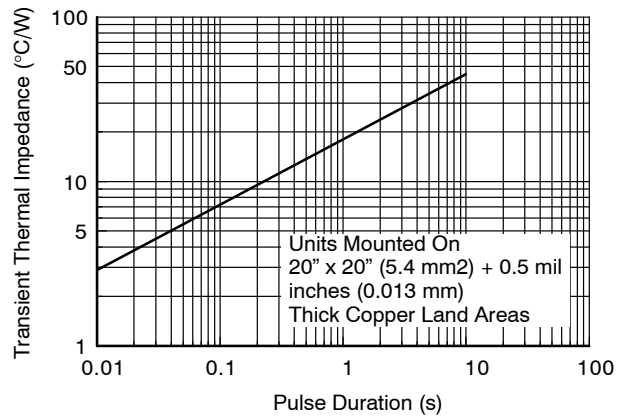
**Figure 3. Non-Repetitive Surge Current**



**Figure 4. Reverse Current vs. Reverse Voltage**



**Figure 5. Total Capacitance**



**Figure 6. Thermal Impedance Characteristics**

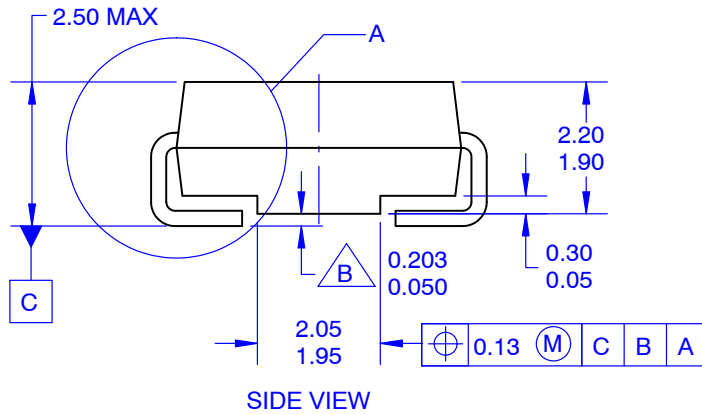
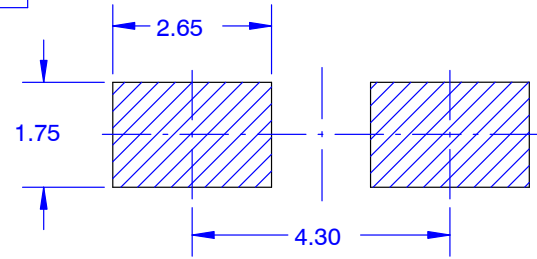
**MECHANICAL CASE OUTLINE**  
**PACKAGE DIMENSIONS**

ON Semiconductor®



**SMA**  
**CASE 403AE**  
**ISSUE O**

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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