

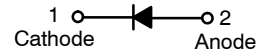
# Rectifiers, Surface Mount

3 A, 50 V-1000 V

S3AB-S3MB

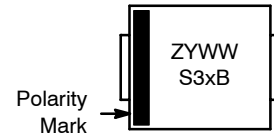
## Features

- Glass Passivated Chip Junction
- High Surge Current Capacity
- Low Forward Voltage: 1.15 V Maximum
- UL Flammability 94V-0 Classification
- MSL 1 per J-STD-020
- RoHS Compliant / Green Molding Compound
- NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb-Free and Halide Free Devices



SMB  
CASE 403AF

## MARKING DIAGRAM



Z  
Y  
WW  
S3xB

= Assembly Plant Code  
= Year  
= Work Week  
= Specific Device Code  
x = A, B, D, G, J, K, M

## ORDERING INFORMATION

See detailed ordering and shipping information on page 3 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 3.

## ABSOLUTE MAXIMUM RATINGS

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol      | Parameter                                                                           | Value      |      |      |      |      |      |      | Unit             |
|-------------|-------------------------------------------------------------------------------------|------------|------|------|------|------|------|------|------------------|
|             |                                                                                     | S3AB       | S3BB | S3DB | S3GB | S3JB | S3KB | S3MB |                  |
| $V_{RRM}$   | Repetitive Peak Reverse Voltage                                                     | 50         | 100  | 200  | 400  | 600  | 800  | 1000 | V                |
| $V_{RMS}$   | RMS Reverse Voltage                                                                 | 35         | 70   | 140  | 280  | 420  | 560  | 700  | V                |
| $V_R$       | DC Blocking Voltage                                                                 | 50         | 100  | 200  | 400  | 600  | 800  | 1000 | V                |
| $I_{F(AV)}$ | Average Forward Rectified Current                                                   | 3          |      |      |      |      |      |      | A                |
| $I_{FSM}$   | Peak Forward Surge Current: 8.3 ms Single Half Sine-Wave Superimposed on Rated Load | 80         |      |      |      |      |      |      | A                |
| $T_J$       | Operating Junction Temperature Range                                                | -55 to 150 |      |      |      |      |      |      | $^\circ\text{C}$ |
| $T_{STG}$   | Storage Temperature Range                                                           | -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.

## THERMAL CHARACTERISTICS

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted. (Note 1)

| Symbol          | Parameter                                         | Value | Unit                      |
|-----------------|---------------------------------------------------|-------|---------------------------|
| $R_{\theta JA}$ | Typical Thermal Resistance, Junction-to-Ambient   | 148   | $^\circ\text{C}/\text{W}$ |
| $\Psi_{JL}$     | Typical Thermal Characteristics, Junction-to-Lead | 14    | $^\circ\text{C}/\text{W}$ |

1. Device mounted on FR-4 PCB, board size = 76.2 mm x 114.3 mm per JESD51-3.

## ELECTRICAL CHARACTERISTICS

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol   | Parameter                              | Test Conditions                                                      | Min | Typ | Max  | Unit          |
|----------|----------------------------------------|----------------------------------------------------------------------|-----|-----|------|---------------|
| $V_F$    | Instantaneous Forward Voltage (Note 2) | $I_F = 3\text{ A}$                                                   | –   | –   | 1.15 | V             |
| $I_R$    | Reverse Current at Rated $V_R$         | $T_J = 25^\circ\text{C}$                                             | –   | –   | 10   | $\mu\text{A}$ |
|          |                                        | $T_J = 125^\circ\text{C}$                                            | –   | –   | 250  |               |
| $t_{rr}$ | Reverse Recovery Time                  | $I_F = 0.5\text{ A}$ , $I_R = 1\text{ A}$ , $I_{rr} = 0.25\text{ A}$ | –   | 1.5 | –    | $\mu\text{s}$ |
| $C_J$    | Junction Capacitance                   | $V_R = 4\text{ V}$ , $f = 1\text{ MHz}$                              | –   | 40  | –    | 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.

2. Pulse test with  $PW = 300\text{ }\mu\text{s}$ , 1% duty cycle.

TYPICAL PERFORMANCE CHARACTERISTICS

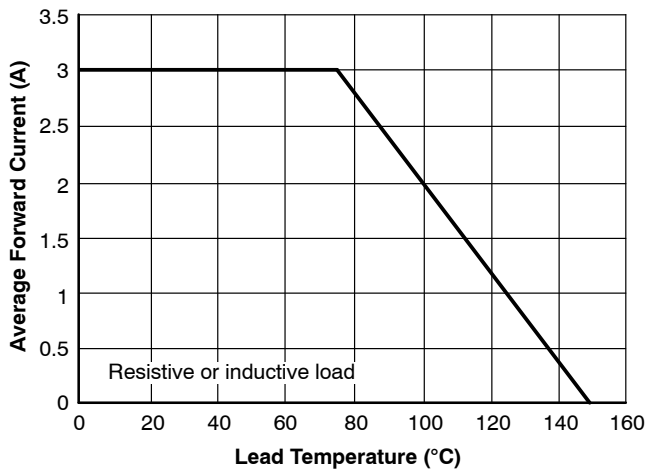


Figure 1. Forward Current Derating Curve

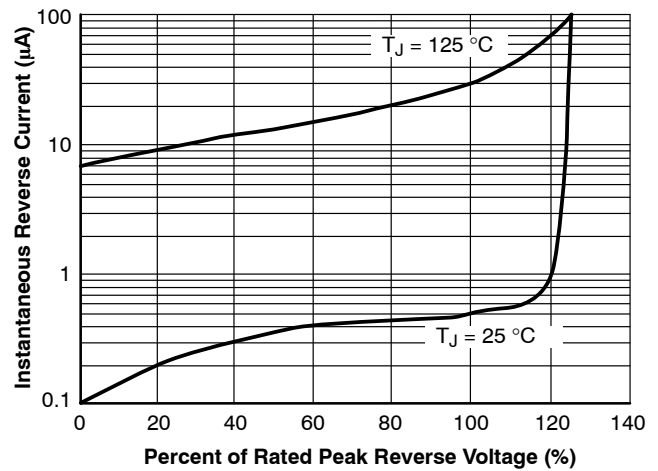


Figure 2. Typical Reverse Characteristics

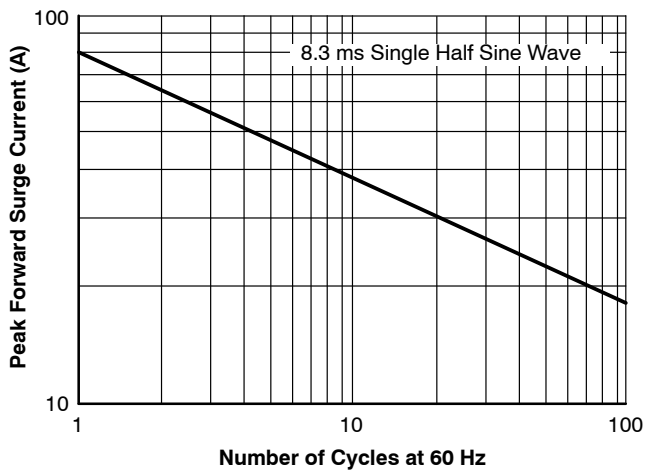


Figure 3. Maximum Non-Repetitive Forward Surge Current

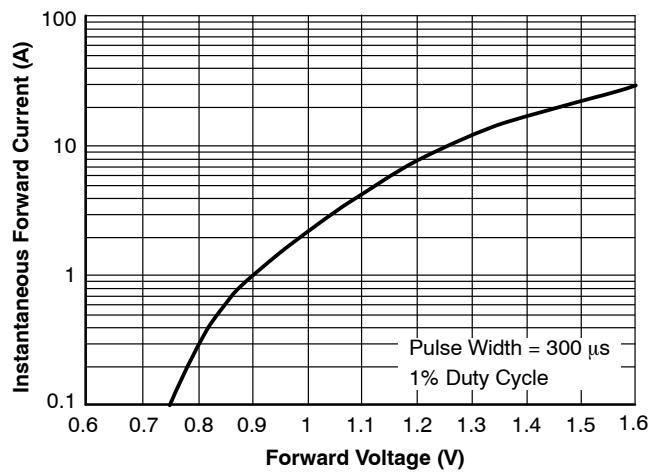


Figure 4. Typical Forward Characteristics

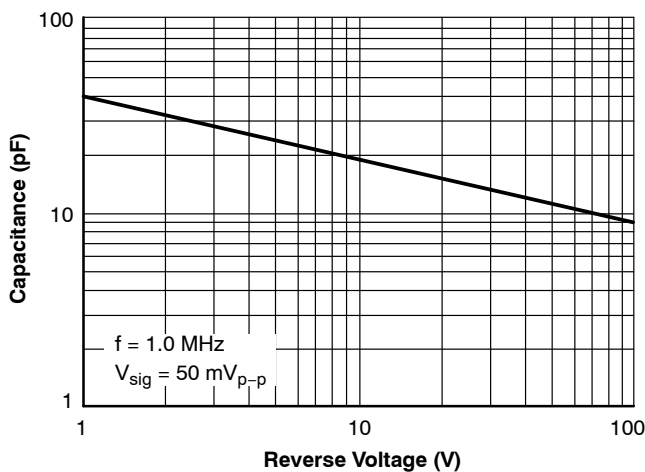


Figure 5. Typical Junction Capacitance

# S3AB-S3MB

## TEST CIRCUIT DIAGRAM

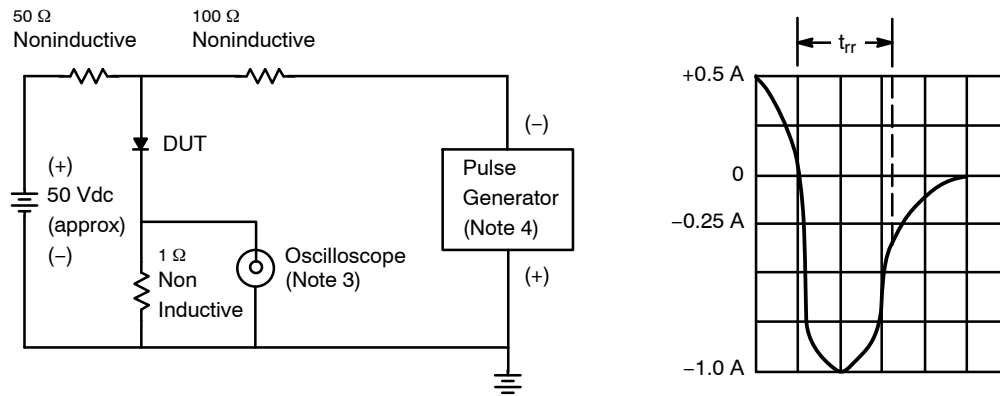


**Figure 6. Reverse Recovery Time Characteristic and Test Circuit Diagram**

### NOTES:

3. Rise Time = 7 ns max. Input Impedance = 1 MΩ, 22 pF
4. Rise Time = 10 ns max. Source Impedance = 50 Ω, 22 pF

### ORDERING INFORMATION

| Part Number    | Device Code Marking | Package                       | Shipping <sup>†</sup> |
|----------------|---------------------|-------------------------------|-----------------------|
| NRVS3BB*       | S3BB                | SMB<br>(Pb-Free, Halide-Free) | 3000 / Tape & Reel    |
| S3DB           | S3DB                |                               |                       |
| S3GB, NRVS3GB* | S3GB                |                               |                       |
| S3JB, NRVS3JB* | S3JB                |                               |                       |
| S3KB           | S3KB                |                               |                       |
| S3MB, NRVS3MB* | S3MB                |                               |                       |

### DISCONTINUED (Note 5)

|                |      |                               |                    |
|----------------|------|-------------------------------|--------------------|
| S3AB, NRVS3AB* | S3AB | SMB<br>(Pb-Free, Halide-Free) | 3000 / Tape & Reel |
| S3BB           | S3BB |                               |                    |
| NRVS3DB*       | S3DB |                               |                    |
| NRVS3KB*       | S3KB |                               |                    |

<sup>†</sup> 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](#).

\* NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable

5. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on [www.onsemi.com](http://www.onsemi.com).

## S3AB-S3MB

### REVISION HISTORY

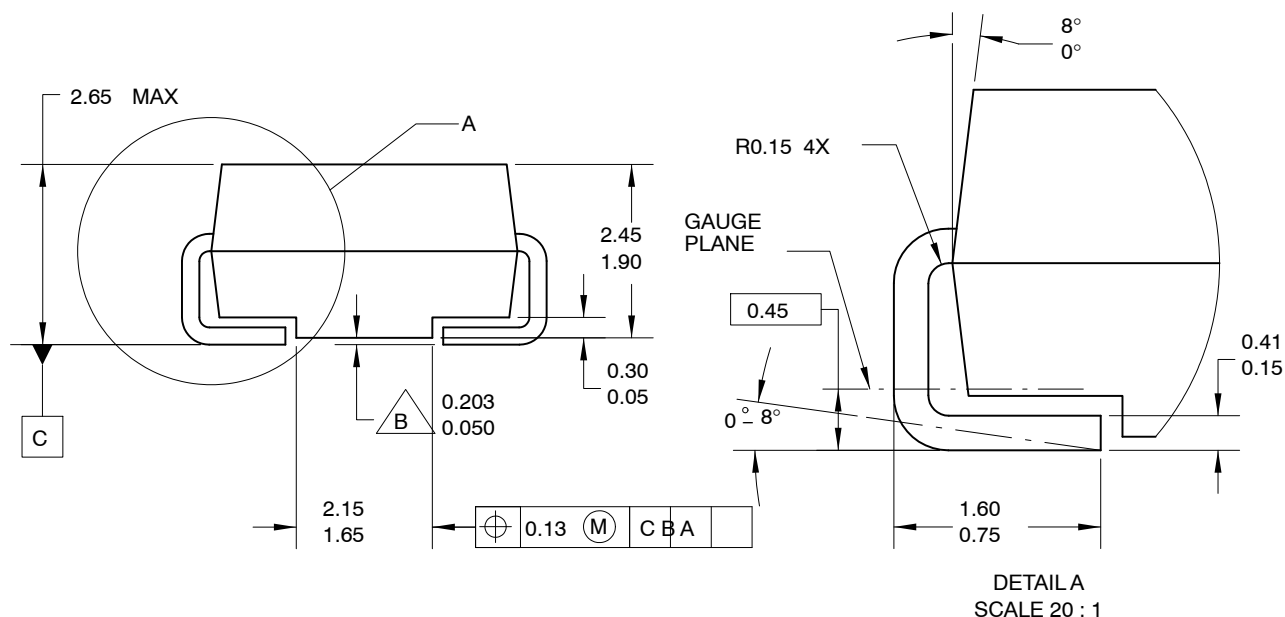
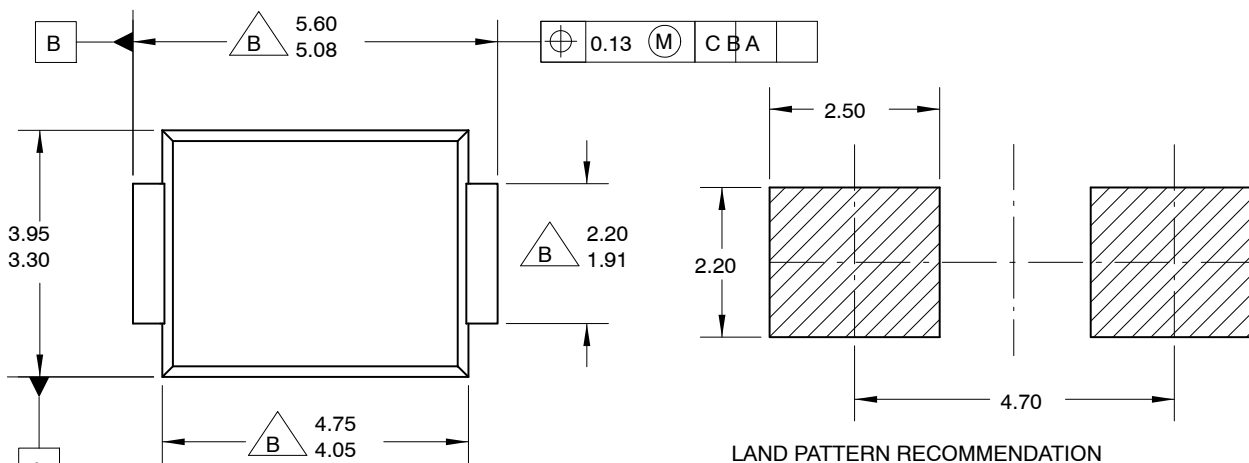
| Revision | Description of Changes                                          | Date     |
|----------|-----------------------------------------------------------------|----------|
| 6        | Corrected DC Blocking Voltage unit from A to V in page 1 table. | 6/8/2026 |

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



**SMB**  
**CASE 403AF**  
**ISSUE O**

DATE 31 AUG 2016



**NOTES:**

- A. EXCEPT WHERE NOTED CONFORMS TO JEDEC DO214 VARIATION AA.
- B. DOES NOT COMPLY JEDEC STD. VALUE.
- C. ALL DIMENSIONS ARE IN MILLIMETERS.
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.
- E. DIMENSION AND TOLERANCE AS PER ASME Y14.5-1994.
- F. LAND PATTERN STD. DIOM5336X240M.

|                         |                    |                                                                                                                                                                                     |
|-------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| <b>DESCRIPTION:</b>     | <b>SMB</b>         | <b>PAGE 1 OF 1</b>                                                                                                                                                                  |

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