

# Super Fast Surface Mount Rectifiers

## US2AA-US2MA

### Features

- Glass Passivated Chip Junction
- High Surge Capacity
- Low Forward Voltage Drop
- Fast Switching with Reverse Recovery Time: 50~75 ns Maximum
- UL Flammability 94 V – 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\*

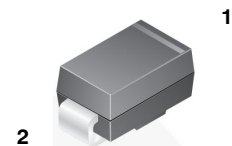
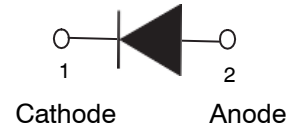
Table 1. ORDERING INFORMATION

| Part Number         | Top Mark | Package        | Packing Method |
|---------------------|----------|----------------|----------------|
| US2AA,<br>NRVUS2AA* | US2AA    | DO-214AC (SMA) | Tape and Reel  |
| US2BA,<br>NRVUS2BA* | US2BA    | DO-214AC (SMA) | Tape and Reel  |
| US2DA,<br>NRVUS2DA* | US2DA    | DO-214AC (SMA) | Tape and Reel  |
| US2FA,<br>NRVUS2FA* | US2FA    | DO-214AC (SMA) | Tape and Reel  |
| US2GA,<br>NRVUS2GA* | US2GA    | DO-214AC (SMA) | Tape and Reel  |
| US2JA,<br>NRVUS2JA* | US2JA    | DO-214AC (SMA) | Tape and Reel  |
| US2KA,<br>NRVUS2KA* | US2KA    | DO-214AC (SMA) | Tape and Reel  |
| US2MA,<br>NRVUS2MA* | US2MA    | DO-214AC (SMA) | Tape and Reel  |



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SMA/DO-214AC

COLOR BAND DENOTES CATHODE

### MARKING DIAGRAM



|       |                           |
|-------|---------------------------|
| \$Y   | = ON Semiconductor Logo   |
| &Z    | = Assembly Plant Code     |
| &3    | = Data Code (Year & Week) |
| US2XA | = Specific Device Code    |
| X     | = A/B/D/F/G/J/K/M         |

# US2AA-US2MA

**Table 2. ABSOLUTE MAXIMUM RATINGS**

| Symbol      | Parameter                                                                            |             |        |        |        |        |        |        |        | Unit |
|-------------|--------------------------------------------------------------------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|------|
|             |                                                                                      | US2 AA      | US2 BA | US2 DA | US2 FA | US2 GA | US2 JA | US2 KA | US2 MA |      |
| $V_{RRM}$   | Repetitive Peak Reverse Voltage                                                      | 50          | 100    | 200    | 300    | 400    | 600    | 800    | 1000   | V    |
| $V_{RMS}$   | RMS Reverse Voltage                                                                  | 35          | 70     | 140    | 210    | 280    | 420    | 560    | 700    | V    |
| $V_{DC}$    | DC Blocking Voltage                                                                  | 50          | 100    | 200    | 300    | 400    | 600    | 800    | 1000   | V    |
| $I_{F(AV)}$ | Average Forward Rectified Current                                                    | 1.5         |        |        |        |        |        |        |        | A    |
| $I_{FSM}$   | Peak Forward Surge Current, 8.3 ms Single Half-Sine Wave, Superimposed on Rated Load | 50          |        |        |        |        |        |        |        | A    |
| $T_J$       | Operating Junction Temperature Range                                                 | -55 to +150 |        |        |        |        |        |        |        | °C   |
| $T_{STG}$   | Storage Temperature Range                                                            | -55 to +150 |        |        |        |        |        |        |        | °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.

**Table 3. THERMAL CHARACTERISTICS (NOTE 1)** (Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Symbol          | Parameter                                                                         | Value | Unit |
|-----------------|-----------------------------------------------------------------------------------|-------|------|
| $R_{\theta JA}$ | Typical Thermal Resistance, Junction-to-Ambient                                   | 189   | °C/W |
| $\Psi_{JL}$     | Typical Thermal Characteristics, Junction-to-Lead (with Reference to Cathode Pin) | 31    | °C/W |

1. Device mounted at minimum pad.

**Table 4. ELECTRICAL CHARACTERISTICS** (Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Symbol          | Parameter                                                                 |            | Value  |        |        |        |        |        |        |        | Unit |
|-----------------|---------------------------------------------------------------------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|------|
|                 |                                                                           |            | US2 AA | US2 BA | US2 DA | US2 FA | US2 GA | US2 JA | US2 KA | US2 MA |      |
| V <sub>F</sub>  | Maximum Instantaneous Forward Voltage (Note2) at Rated I <sub>F(AV)</sub> |            | 1.0    |        |        |        | 1.3    | 1.7    |        | V      |      |
| I <sub>R</sub>  | Maximum Reverse Current at Rated V <sub>R</sub>                           | TJ = 25°C  | 5      |        |        |        |        |        |        | μA     |      |
|                 |                                                                           | TJ = 125°C | 100    |        |        |        |        |        |        |        |      |
| t <sub>rr</sub> | Maximum Reverse Recovery Time (Note 3)                                    |            | 50     |        |        |        | 75     |        |        | ns     |      |
| C <sub>J</sub>  | Typical Junction Capacitance (Note 4)                                     |            | 50     |        |        |        | 30     |        |        | pF     |      |

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

3. Reverse recovery test conditions:  $I_F = 0.5 \text{ A}$ ,  $I_R = 1.0 \text{ A}$ ,  $I_{RR} = 0.25 \text{ A}$

4. Measured at 1 Mhz and applied reverse voltage of 4.0 V D.C.

# US2AA-US2MA

## TYPICAL PERFORMANCE CHARACTERISTICS

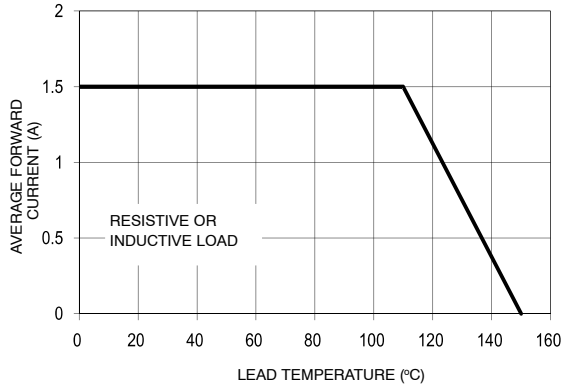


Figure 1. Forward Current Derating Curve

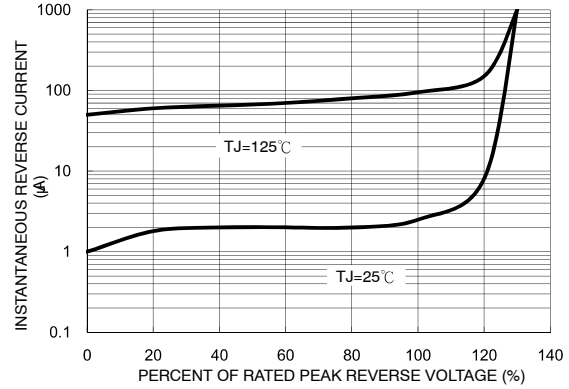


Figure 2. Typical Reverse Characteristics

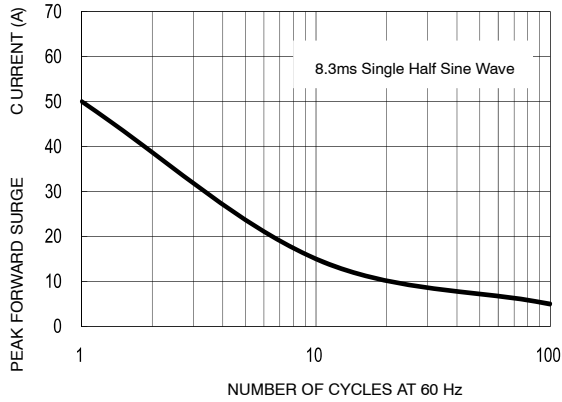


Figure 3. Maximum Non-Repetitive Forward Surge Current

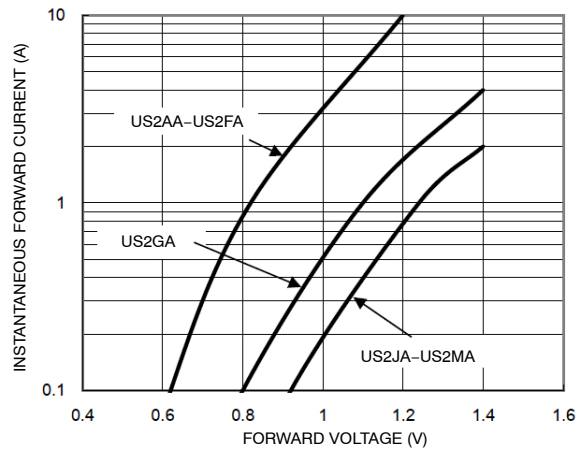


Figure 4. Typical Forward Characteristics

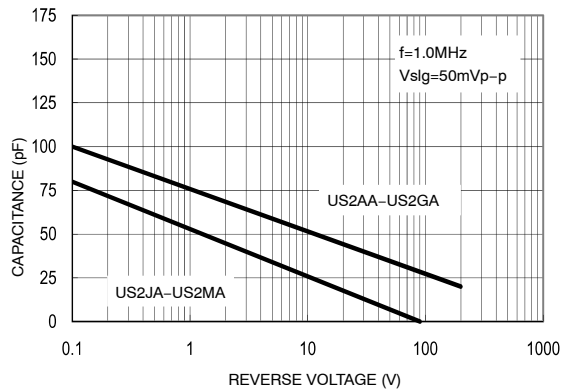


Figure 5. Typical Forward Characteristics

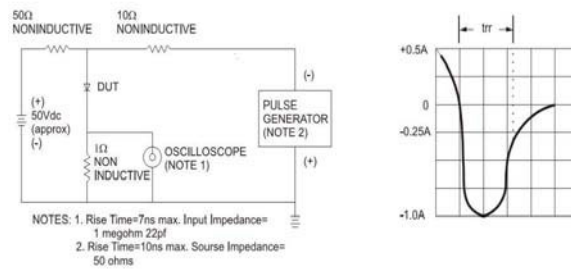
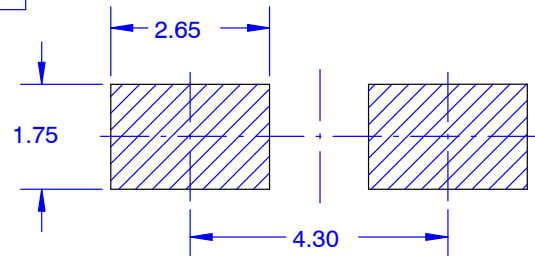
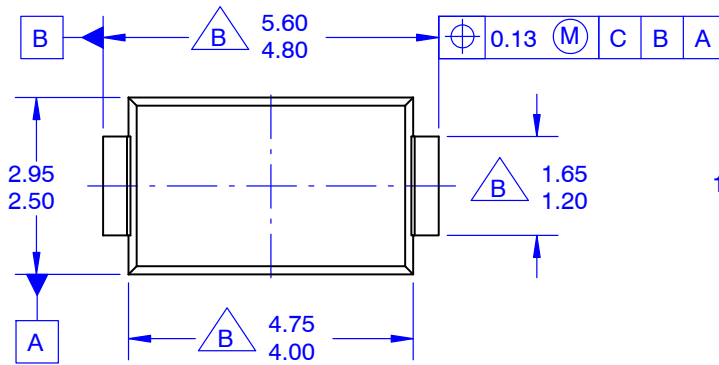


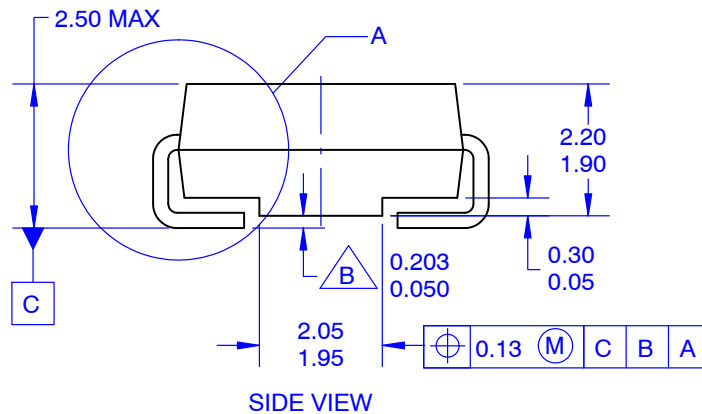
Figure 6. Typical Forward Characteristics

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

DATE 31 AUG 2016

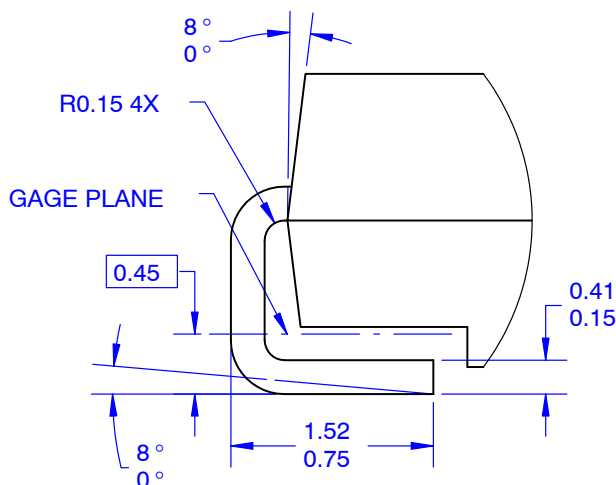


LAND PATTERN RECOMMENDATION



**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



**DETAIL A**  
**SCALE 20 : 1**

|                         |                    |                                                                                                                                                                                  |
|-------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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