

# Schottky Rectifier, Trench-based, Low Forward Voltage, Low Leakage

## NTSS5100, NTSAF5100

### Features

- Fine Lithography Trench-based Schottky Technology for Very Low Forward Voltage and Low Leakage
- Fast Switching with Exceptional Temperature Stability
- Low Power Loss and Lower Operating Temperature
- Higher Efficiency for Achieving Regulatory Compliance
- High Surge Capability
- These are Pb-Free and Halide-Free Devices

### Typical Applications

- Switching Power Supplies including Wireless, Smartphone and Notebook Adapters
- High Frequency and DC-DC Converters
- Freewheeling and OR-ing diodes
- Reverse Battery Protection
- Instrumentation
- LED Lighting

### Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in.
- Lead Finish: 100% Matte Sn (Tin)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements



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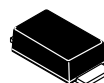
[www.onsemi.com](http://www.onsemi.com)

### SCHOTTKY BARRIER RECTIFIERS 5 AMPERES 100 VOLTS

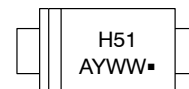
#### MARKING DIAGRAM



**SMB  
CASE 403A**



**SMA-FL  
CASE 403AA  
STYLE 6**



A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device       | Package             | Shipping†             |
|--------------|---------------------|-----------------------|
| NTSS5100T3G  | SMB<br>(Pb-Free)    | 2500 /<br>Tape & Reel |
| NTSAF5100T3G | SMA-FL<br>(Pb-Free) | 5000 /<br>Tape & Reel |

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

# NTSS5100, NTSAF5100

## MAXIMUM RATINGS

| Rating                                                                                                      | Symbol                          | Value       | Unit             |
|-------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                      | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 100         | V                |
| Average Rectified Forward Current<br>( $T_L = 73^\circ\text{C}$ )                                           | $I_{F(AV)}$                     | 5.0         | A                |
| Peak Repetitive Forward Current,<br>(Square Wave, Duty = 0.5, $T_L = 54^\circ\text{C}$ )                    | $I_{FRM}$                       | 10          | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 50          | A                |
| Storage Temperature Range                                                                                   | $T_{stg}$                       | -65 to +175 | $^\circ\text{C}$ |
| Operating Junction Temperature (Note 1)                                                                     | $T_J$                           | -55 to +175 | $^\circ\text{C}$ |
| ESD Rating (Human Body Model)                                                                               |                                 | 1B          |                  |
| ESD Rating (Machine Model)                                                                                  |                                 | M3          |                  |

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. The heat generated must be less than the thermal conductivity from Junction-to-Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .

## THERMAL CHARACTERISTICS

| Characteristic                                    | Symbol          | Max  | Unit               |
|---------------------------------------------------|-----------------|------|--------------------|
| Maximum Thermal Resistance, Steady State (Note 2) |                 |      |                    |
| (NTSAF5100) Junction-to-Lead                      | $R_{\theta JL}$ | 25   | $^\circ\text{C/W}$ |
| Junction-to-Ambient                               | $R_{\theta JA}$ | 90   | $^\circ\text{C/W}$ |
| Junction-to-Case Top                              | $\Psi_{JCT}$    | 33   | $^\circ\text{C/W}$ |
| (NTSS5100) Junction-to-Lead                       | $R_{\theta JL}$ | 13.1 | $^\circ\text{C/W}$ |
| Junction-to-Ambient                               | $R_{\theta JA}$ | 71.1 | $^\circ\text{C/W}$ |
| Junction-to-Case Top                              | $\Psi_{JCT}$    | 2.6  | $^\circ\text{C/W}$ |

2. Assumes 600 mm<sup>2</sup> 1 oz. copper bond pad, on a FR4 board

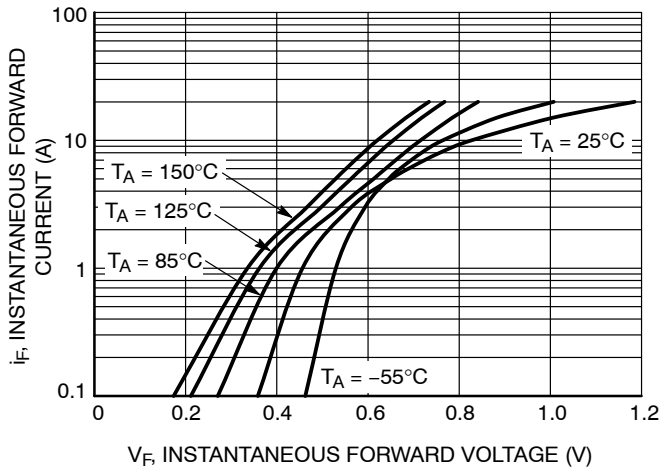
## ELECTRICAL CHARACTERISTICS

| Characteristic                                                                                                                                                                                                                                       | Symbol | Typ                              | Max                        | Unit                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------|----------------------------|---------------------|
| Instantaneous Forward Voltage (Note 3)<br>( $i_F = 3.0$ Amps, $T_J = 25^\circ\text{C}$ )<br>( $i_F = 5.0$ Amps, $T_J = 25^\circ\text{C}$ )<br><br>( $i_F = 3.0$ Amps, $T_J = 125^\circ\text{C}$ )<br>( $i_F = 5.0$ Amps, $T_J = 125^\circ\text{C}$ ) | $V_F$  | 0.56<br>0.65<br><br>0.50<br>0.56 | –<br>0.69<br><br>–<br>0.61 | V                   |
| Reverse Current (Note 3)<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 125^\circ\text{C}$ )                                                                                                                          | $i_R$  | 2.6<br>2.2                       | 25<br>9                    | $\mu\text{A}$<br>mA |
| Diode Capacitance<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ , $f = 1$ MHz)                                                                                                                                                                      | $C_j$  | 54.4                             |                            | pF                  |

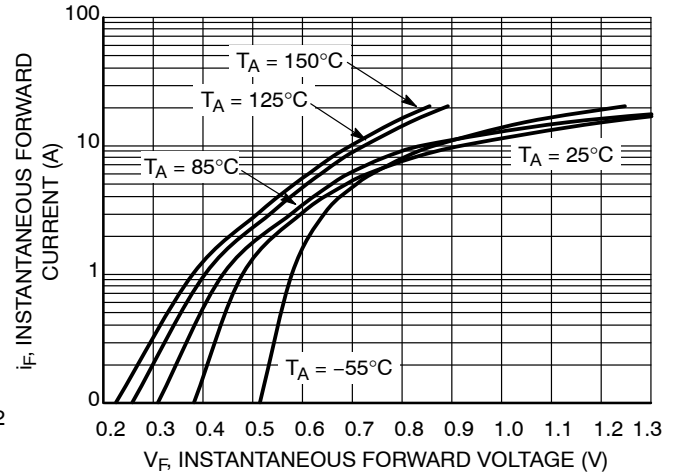
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

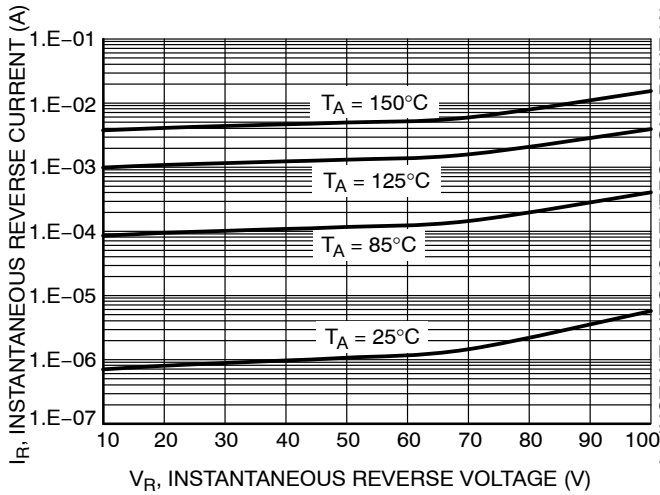
TYPICAL CHARACTERISTICS



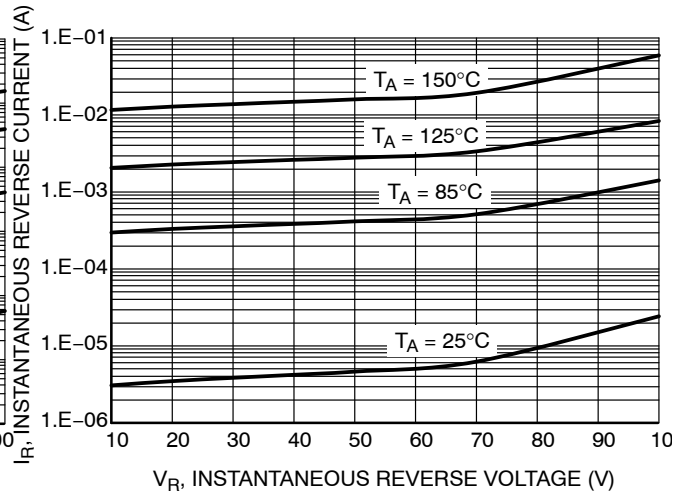
**Figure 1. Typical Instantaneous Forward Characteristics**



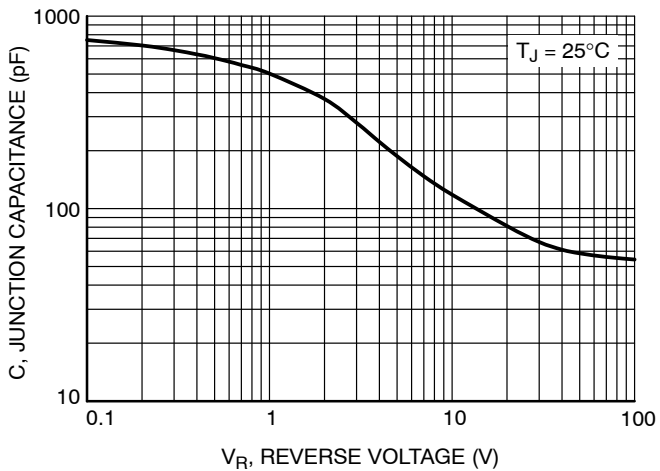
**Figure 2. Maximum Instantaneous Forward Characteristics**



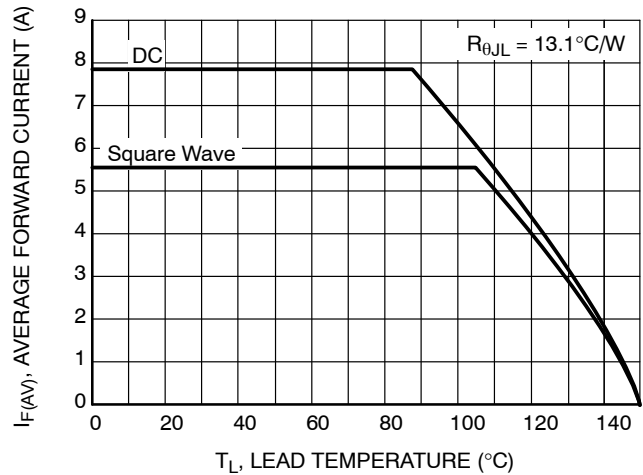
**Figure 3. Typical Reverse Characteristics**



**Figure 4. Maximum Reverse Characteristics**



**Figure 5. Typical Junction Capacitance**



**Figure 6. Current Derating for NTSS5100**

# NTSS5100, NTSAF5100

## TYPICAL CHARACTERISTICS

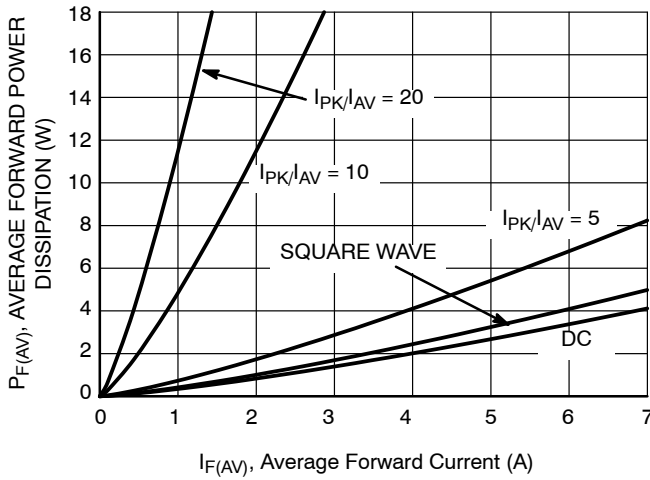


Figure 7. Forward Power Dissipation

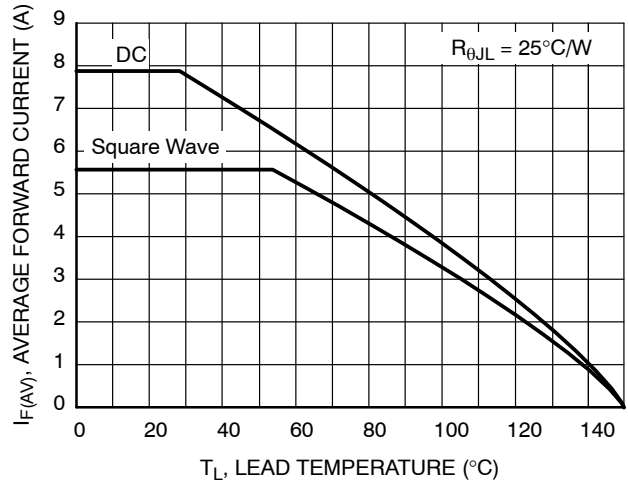


Figure 8. Current Derating for NTSAF5100

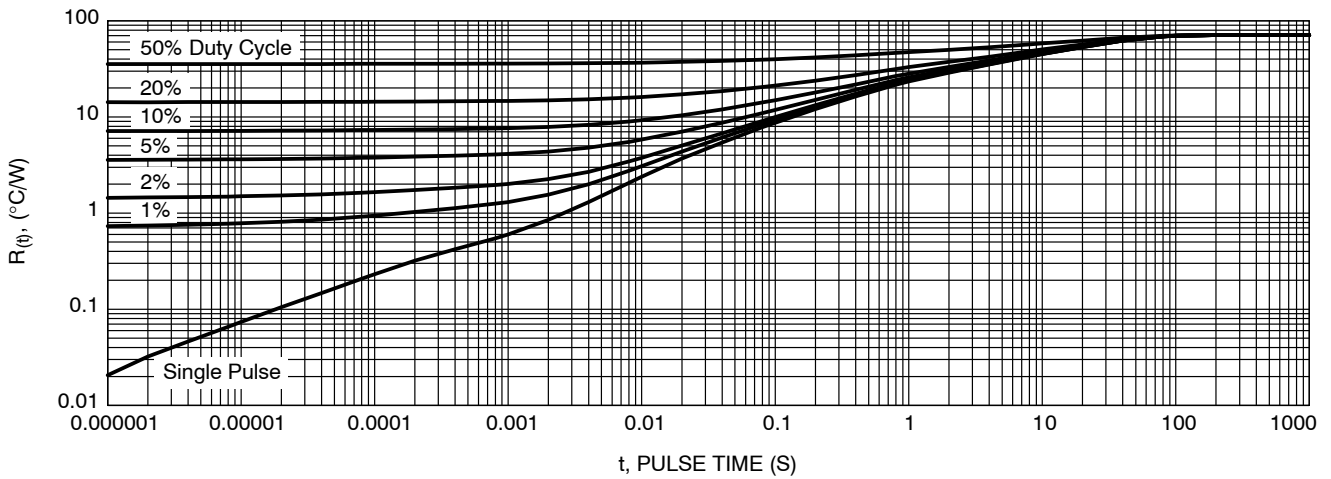


Figure 9. Typical Transient Thermal Response, Junction-to-Ambient for NTSS5100

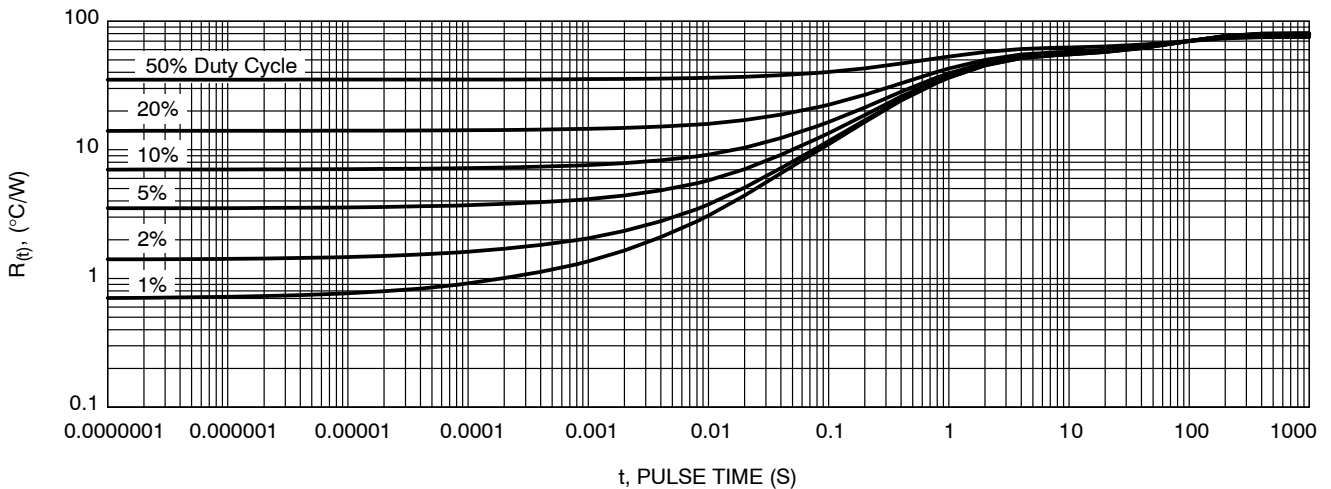


Figure 10. Typical Transient Thermal Response, Junction-to-Ambient for NTSAF5100



SCALE 1:1

Polarity Band

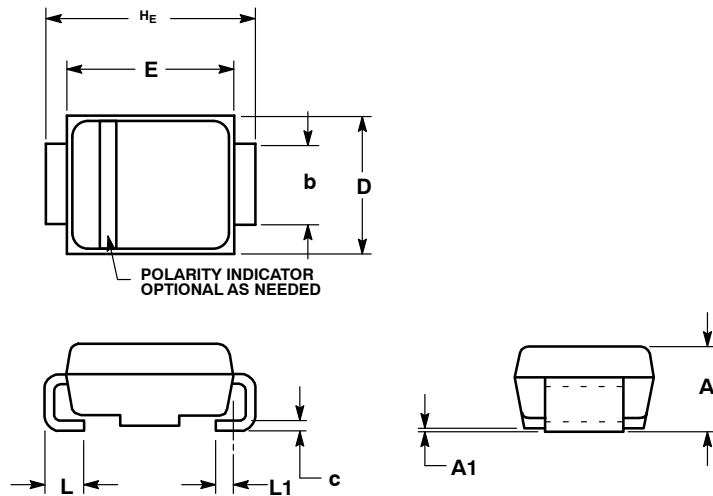
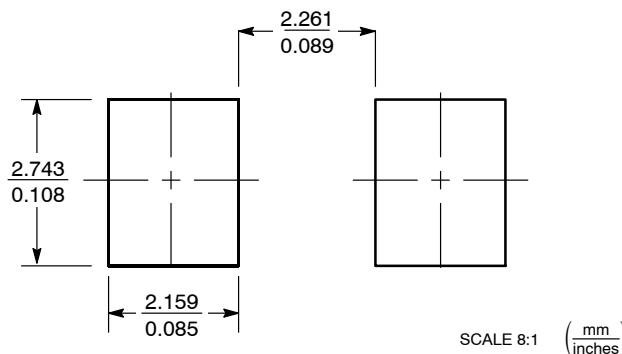


SCALE 1:1

Non-Polarity Band

**SMB**  
**CASE 403A-03**  
**ISSUE J**

DATE 19 JUL 2012

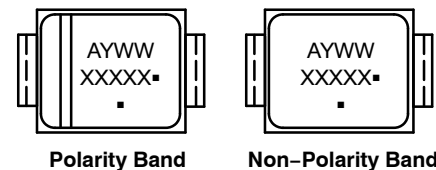

**SOLDERING FOOTPRINT\***


\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERM/D.

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION  $b$  SHALL BE MEASURED WITHIN DIMENSION  $L1$ .

| DIM                  | MILLIMETERS |      |      | INCHES    |       |       |
|----------------------|-------------|------|------|-----------|-------|-------|
|                      | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| <b>A</b>             | 1.95        | 2.30 | 2.47 | 0.077     | 0.091 | 0.097 |
| <b>A1</b>            | 0.05        | 0.10 | 0.20 | 0.002     | 0.004 | 0.008 |
| <b>b</b>             | 1.96        | 2.03 | 2.20 | 0.077     | 0.080 | 0.087 |
| <b>c</b>             | 0.15        | 0.23 | 0.31 | 0.006     | 0.009 | 0.012 |
| <b>D</b>             | 3.30        | 3.56 | 3.95 | 0.130     | 0.140 | 0.156 |
| <b>E</b>             | 4.06        | 4.32 | 4.60 | 0.160     | 0.170 | 0.181 |
| <b>H<sub>E</sub></b> | 5.21        | 5.44 | 5.60 | 0.205     | 0.214 | 0.220 |
| <b>L</b>             | 0.76        | 1.02 | 1.60 | 0.030     | 0.040 | 0.063 |
| <b>L1</b>            | 0.51 REF    |      |      | 0.020 REF |       |       |

**GENERIC**  
**MARKING DIAGRAM\***


Polarity Band

Non-Polarity Band

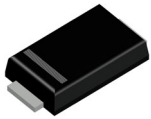
XXXXX = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

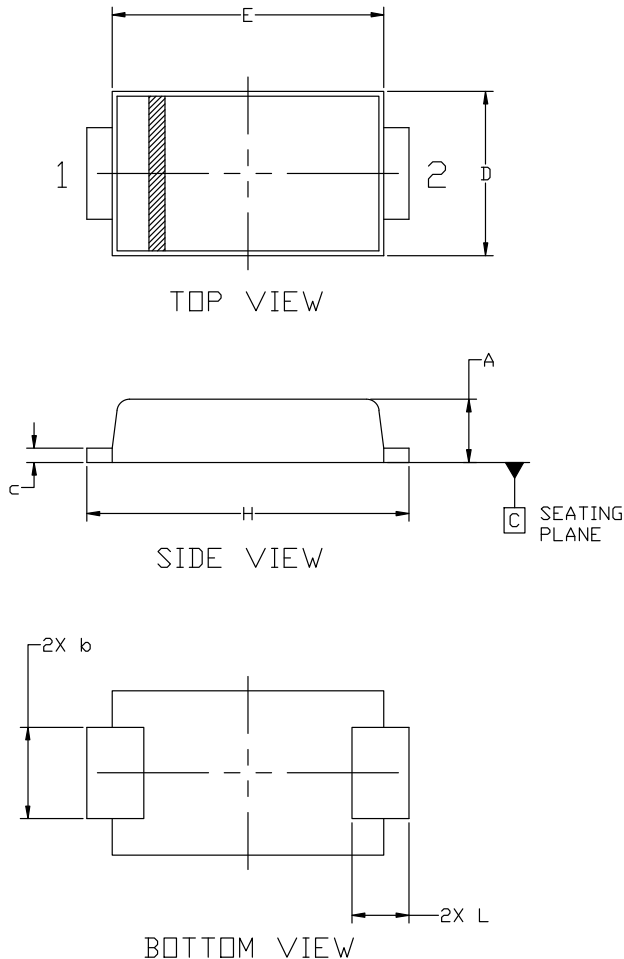
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**SMA 2.60x4.30x1.00**  
**CASE 403AA**  
**ISSUE A**

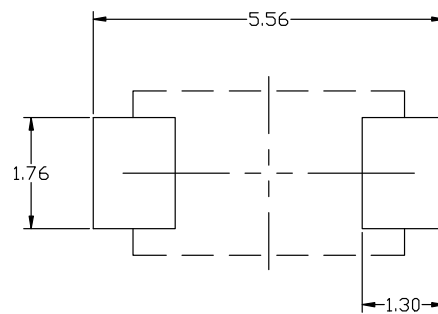
DATE 18 JAN 2024



**NOTES:**

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. FL

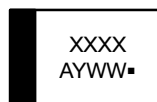
| MILLIMETERS |      |       |      |
|-------------|------|-------|------|
| DIM         | MIN  | NOM   | MAX  |
| A           | 0.90 | 1.00  | 1.10 |
| b           | 1.25 | 1.45  | 1.65 |
| c           | 0.15 | 0.225 | 0.30 |
| D           | 2.40 | 2.60  | 2.80 |
| E           | 4.00 | 4.30  | 4.60 |
| H           | 4.80 | 5.10  | 5.40 |
| L           | 0.70 | 0.90  | 1.10 |



**RECOMMENDED MOUNTING FOOTPRINT**

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference manual, SOLDERM/D.

**GENERIC MARKING DIAGRAM\***



XXXX = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

|                         |                           |                                                                                                                                                                                  |
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