

# Trench Schottky Rectifier, Low Forward Voltage

## NTSA4100, NRV TSA4100

### 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
- NRV TSA Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### 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

## SCHOTTKY BARRIER RECTIFIERS 4 AMPERES 100 VOLTS



SMA  
 CASE 403D  
 STYLE 1

### MARKING DIAGRAM



- TH41 = Specific Device Code
- A = Assembly Location
- Y = Year
- WW = Work Week
- = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

# NTSA4100, NRV TSA4100

## 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>( $T_L = 118^\circ\text{C}$ )                                          | $I_{F(AV)}$                     | 4.0         | A                |
| Peak Repetitive Forward Current,<br>(Square Wave, 20 kHz, $T_L = 110^\circ\text{C}$ )                       | $I_{FRM}$                       | 8.0         | 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 +150 | $^\circ\text{C}$ |
| Operating Junction Temperature                                                                              | $T_J$                           | -55 to +150 | $^\circ\text{C}$ |
| ESD Rating (Human Body Model)                                                                               |                                 | 1B          |                  |
| ESD Rating (Charged Device Model)                                                                           |                                 | > 1000      | V                |

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

| Characteristic                                                                                                               | Symbol          | Typ | Max  | Unit                      |
|------------------------------------------------------------------------------------------------------------------------------|-----------------|-----|------|---------------------------|
| Thermal Resistance, Junction-to-Lead, Steady State<br>(Assumes 600 mm <sup>2</sup> 1 oz. copper bond pad, on a FR4 board)    | $R_{\theta JL}$ | -   | 16.2 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient, Steady State<br>(Assumes 600 mm <sup>2</sup> 1 oz. copper bond pad, on a FR4 board) | $R_{\theta JA}$ | -   | 90   | $^\circ\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS

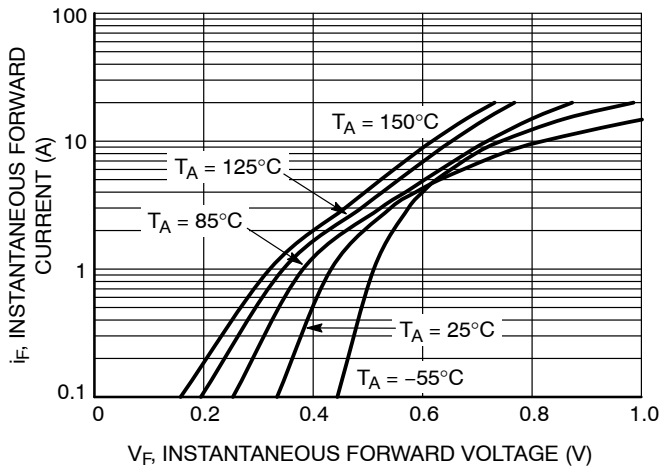
|                                                                                                                                                                                                                                                                          |       |                                  |                            |                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------|----------------------------|---------------------|
| Instantaneous Forward Voltage (Note 1)<br>( $i_F = 1.0\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $i_F = 4.0\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br><br>( $i_F = 1.0\text{ A}$ , $T_J = 125^\circ\text{C}$ )<br>( $i_F = 4.0\text{ A}$ , $T_J = 125^\circ\text{C}$ ) | $v_F$ | 0.43<br>0.59<br><br>0.35<br>0.53 | -<br>0.66<br><br>-<br>0.58 | V                   |
| Reverse Current (Note 1)<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 125^\circ\text{C}$ )                                                                                                                                              | $i_R$ | 1.3<br>0.13                      | 25<br>9                    | $\mu\text{A}$<br>mA |
| Diode Capacitance<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ , $f = 1\text{ MHz}$ )                                                                                                                                                                                  | $C_d$ | 54.7                             |                            | 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.

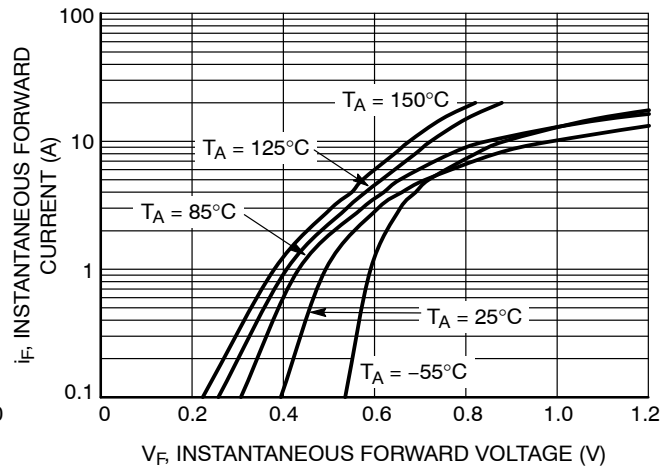
1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

# NTSA4100, NRV TSA4100

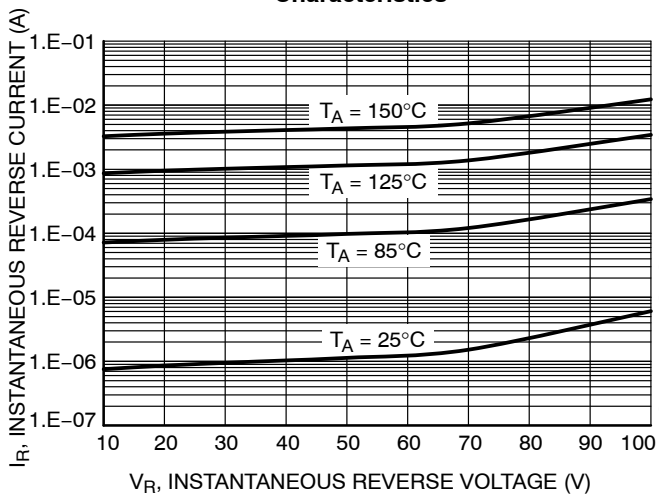
## TYPICAL CHARACTERISTICS



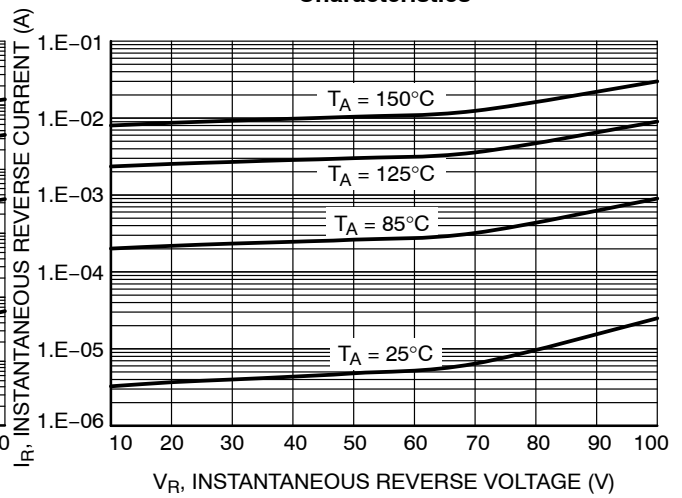
**Figure 1. Typical Instantaneous Forward Characteristics**



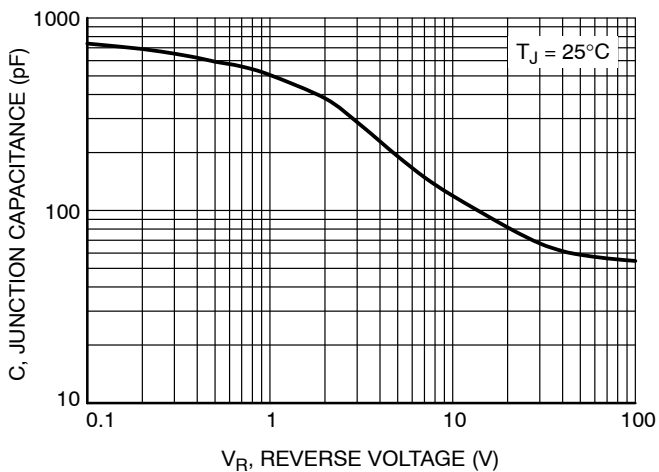
**Figure 2. Maximum Instantaneous Forward Characteristics**



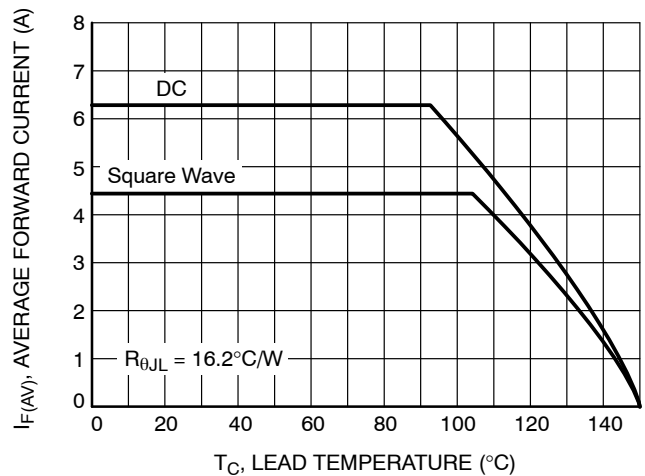
**Figure 3. Typical Reverse Characteristics**



**Figure 4. Maximum Reverse Characteristics**



**Figure 5. Typical Junction Capacitance**



**Figure 6. Current Derating**

# NTSA4100, NRV TSA4100

## TYPICAL CHARACTERISTICS

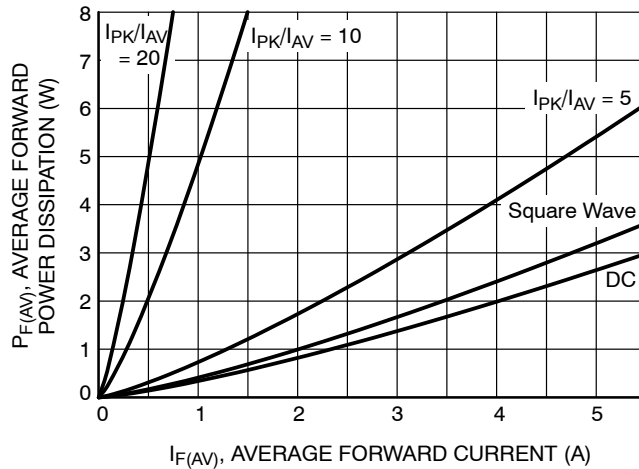


Figure 7. Forward Power Dissipation

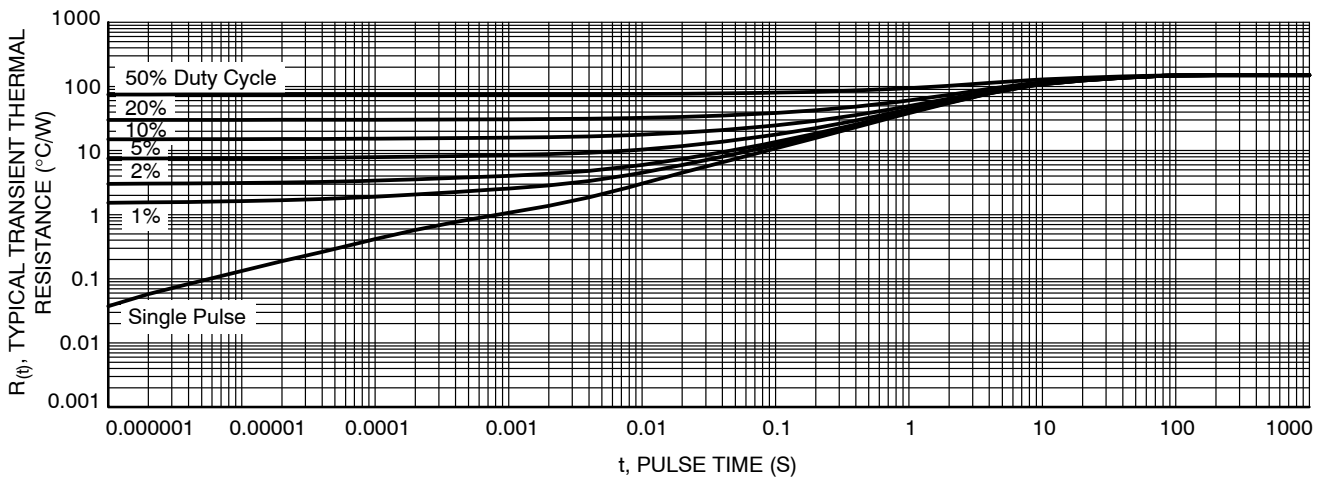


Figure 8. Typical Transient Thermal Response, Junction-to-Ambient

### ORDERING INFORMATION

| Device              | Package          | Shipping <sup>†</sup> |
|---------------------|------------------|-----------------------|
| NTSA4100T3G         | SMA<br>(Pb-Free) | 5000 /<br>Tape & Reel |
| NRV TSA4100T3G      | SMA<br>(Pb-Free) | 5000 /<br>Tape & Reel |
| NRV TSA4100T3G-GA01 | SMA<br>(Pb-Free) | 5000 /<br>Tape & Reel |

<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](#).

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



STYLE 1    STYLE 2

SCALE 1:1

**SMA**  
CASE 403D  
ISSUE J

DATE 22 OCT 2021



POLARITY INDICATOR  
OPTIONAL AS NEEDED

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCHES
3. DIMENSION *b* SHALL BE MEASURED WITHIN DIMENSION L.

| DIM      | MILLIMETERS |      |      | INCHES |       |       |
|----------|-------------|------|------|--------|-------|-------|
|          | MIN.        | NOM. | MAX. | MIN.   | NOM.  | MAX.  |
| A        | 1.97        | 2.10 | 2.20 | 0.078  | 0.083 | 0.087 |
| A1       | 0.05        | 0.10 | 0.20 | 0.002  | 0.004 | 0.008 |
| <i>b</i> | 1.27        | 1.45 | 1.63 | 0.050  | 0.057 | 0.064 |
| <i>c</i> | 0.15        | 0.28 | 0.41 | 0.006  | 0.011 | 0.016 |
| D        | 2.29        | 2.60 | 2.92 | 0.090  | 0.103 | 0.115 |
| E        | 4.06        | 4.32 | 4.57 | 0.160  | 0.170 | 0.180 |
| HE       | 4.83        | 5.21 | 5.59 | 0.190  | 0.205 | 0.220 |
| L        | 0.76        | 1.14 | 1.52 | 0.030  | 0.045 | 0.060 |



STYLE 1:  
PIN 1. CATHODE (POLARITY BAND)  
2. ANODE

STYLE 2:  
NO POLARITY

**GENERIC  
MARKING DIAGRAM\***

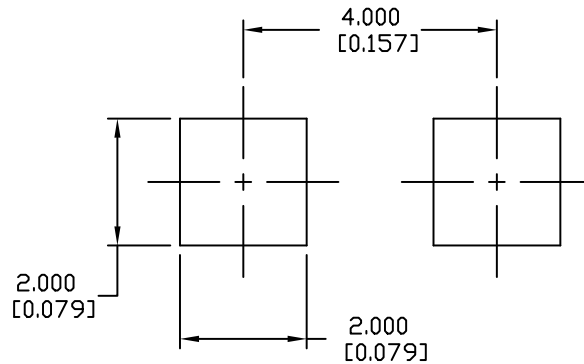


STYLE 1

STYLE 2

- 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.



RECOMMENDED  
MOUNTING FOOTPRINT

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