

# NTST30100SG, NTSB30100S-1G

## Very Low Forward Voltage Trench-based Schottky Rectifier

Exceptionally Low  $V_F = 0.39\text{ V}$  at  $I_F = 5\text{ A}$

### 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
- Low Thermal Resistance
- High Surge Capability
- These are Pb-Free Devices

### Typical Applications

- Switching Power Supplies including Notebook/Netbook Adapters, ATX and Flat Panel Display
- High Frequency and DC-DC Converters
- Freewheeling and OR-ing Diodes
- Reverse Battery Protection
- Instrumentation

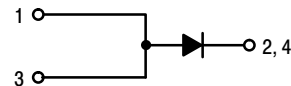
### Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in
- Weight (Approximately): 1.9 Grams
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 sec

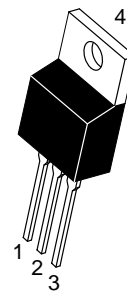


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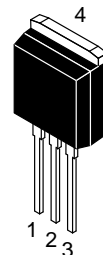
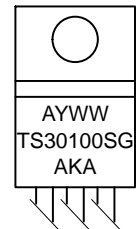
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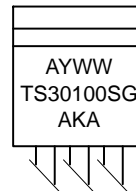
### MARKING DIAGRAMS



TO-220  
CASE 221A  
STYLE 6



i<sup>2</sup>PAK (TO-262)  
CASE 418D  
STYLE 3



A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package  
AKA = Polarity Designator

### ORDERING INFORMATION

| Device        | Package             | Shipping†     |
|---------------|---------------------|---------------|
| NTST30100SG   | TO-220<br>(Pb-Free) | 50 Units/Rail |
| NTSB30100S-1G | TO-262<br>(Pb-Free) | 50 Units/Rail |

†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.

# NTST30100SG, NTSB30100S-1G

## 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>(Rated $V_R$ , $T_C = 105^\circ\text{C}$ )                            | $I_{F(AV)}$                     | 30          | A                |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz, $T_C = 95^\circ\text{C}$ )          | $I_{FRM}$                       | 60          | A                |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 250         | A                |
| Operating Junction Temperature   | $T_J$                           | -40 to +150 | $^\circ\text{C}$ |
| Storage Temperature  | $T_{stg}$                       | -65 to +175 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )  | dv/dt                           | 10,000      | V/ $\mu\text{s}$ |

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

| Rating  | Symbol                             | Value     | Unit                      |
|---|------------------------------------|-----------|---------------------------|
| Maximum Thermal Resistance<br>Junction-to-Case<br>Junction-to-Ambient | $R_{\theta JC}$<br>$R_{\theta JA}$ | 2.0<br>70 | $^\circ\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS

| Rating  | Symbol | Typ   | Max                                  | Unit   |
|---|--------|---|--------------------------------------|--|
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $I_F = 5\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 10\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 30\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br><br>( $I_F = 5\text{ A}$ , $T_J = 125^\circ\text{C}$ )<br>( $I_F = 10\text{ A}$ , $T_J = 125^\circ\text{C}$ )<br>( $I_F = 30\text{ A}$ , $T_J = 125^\circ\text{C}$ ) | $V_F$  | 0.47<br>0.55<br>0.84<br><br>0.39<br>0.51<br>0.7 | -<br>-<br>0.95<br><br>-<br>-<br>0.78 | V  |
| Maximum Instantaneous Reverse Current (Note 1)<br>( $V_R = 70\text{ V}$ , $T_J = 25^\circ\text{C}$ )<br>( $V_R = 70\text{ V}$ , $T_J = 125^\circ\text{C}$ )<br><br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 125^\circ\text{C}$ )  | $I_R$  | 27<br>11<br><br>70<br>23                        | <br><br><br>1000<br>45               | $\mu\text{A}$<br>mA<br><br>$\mu\text{A}$<br>mA |

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  $\leq 2.0\%$

TYPICAL CHARACTERISTICS

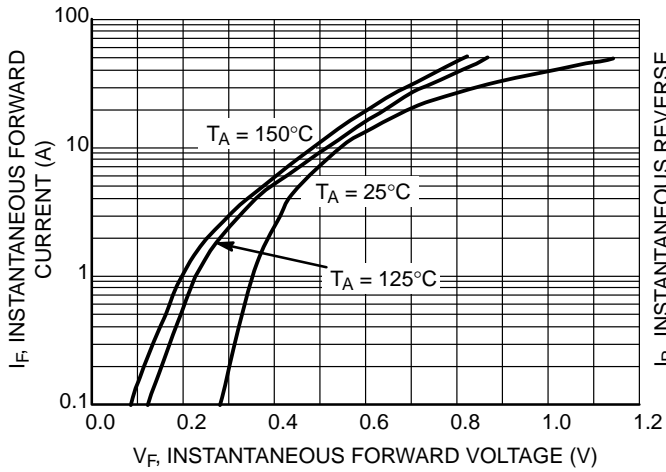


Figure 1. Typical Instantaneous Forward Characteristics

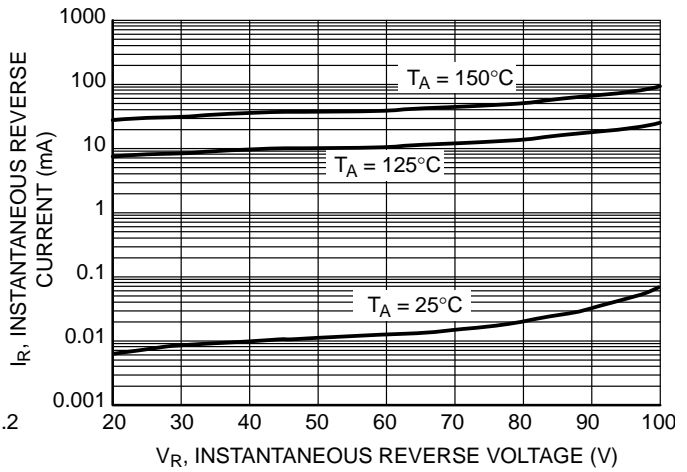


Figure 2. Typical Reverse Characteristics

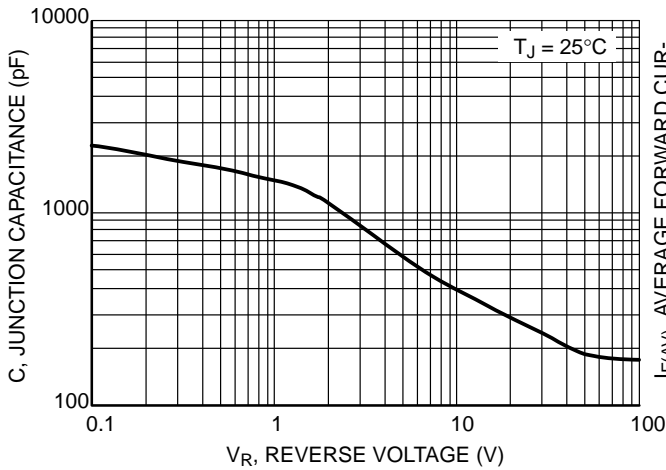


Figure 3. Typical Junction Capacitance

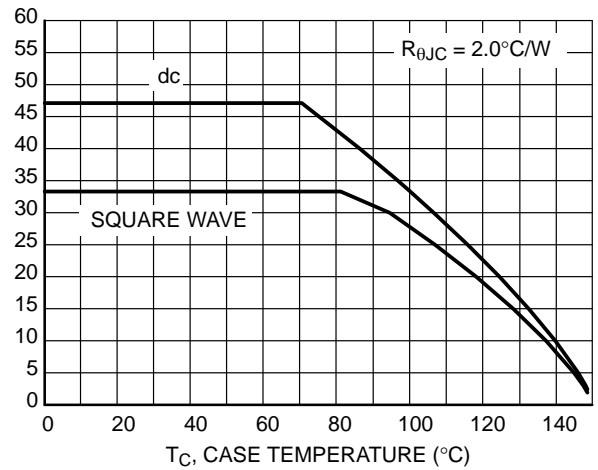


Figure 4. Current Derating, Case

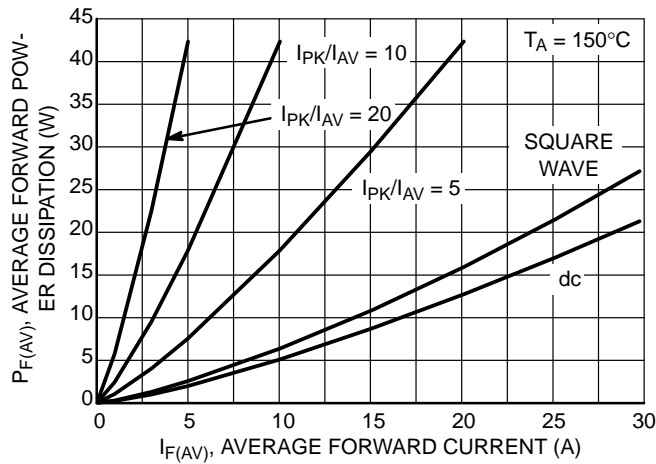


Figure 5. Forward Power Dissipation

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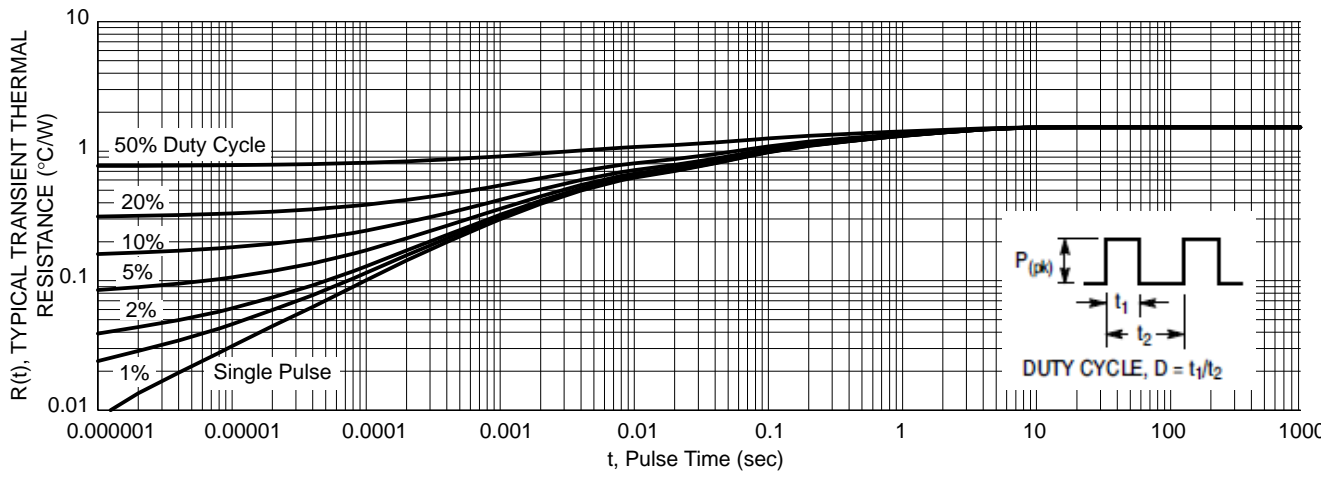
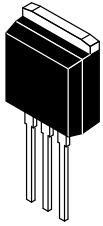


Figure 6. Typical Transient Thermal Response, Junction-to-Case

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

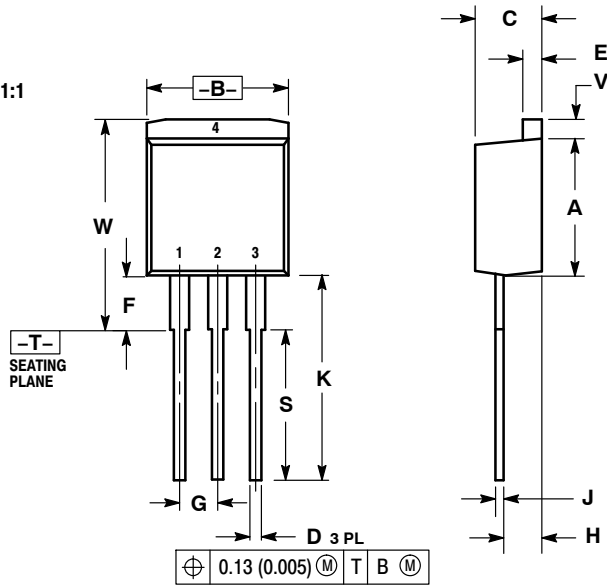
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SCALE 1:1

I<sup>2</sup>PAK (TO-262)  
CASE 418D-01  
ISSUE D

DATE 16 OCT 2007



NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.335     | 0.380 | 8.51        | 9.65  |
| B   | 0.380     | 0.406 | 9.65        | 10.31 |
| C   | 0.160     | 0.185 | 4.06        | 4.70  |
| D   | 0.026     | 0.035 | 0.66        | 0.89  |
| E   | 0.045     | 0.055 | 1.14        | 1.40  |
| F   | 0.122 REF |       | 3.10 REF    |       |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| H   | 0.094     | 0.110 | 2.39        | 2.79  |
| J   | 0.013     | 0.025 | 0.33        | 0.64  |
| K   | 0.500     | 0.562 | 12.70       | 14.27 |
| S   | 0.390 REF |       | 9.90 REF    |       |
| V   | 0.045     | 0.070 | 1.14        | 1.78  |
| W   | 0.522     | 0.551 | 13.25       | 14.00 |

STYLE 1:

- PIN 1. BASE
- 2. COLLECTOR
- 3. EMITTER
- 4. COLLECTOR

STYLE 2:

- PIN 1. GATE
- 2. DRAIN
- 3. SOURCE
- 4. DRAIN

STYLE 3:

- PIN 1. ANODE
- 2. CATHODE
- 3. ANODE
- 4. CATHODE

STYLE 4:

- PIN 1. GATE
- 2. COLLECTOR
- 3. EMITTER
- 4. COLLECTOR

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