

# NSR20F20

## Schottky Barrier Diode

These Schottky barrier diodes are optimized for low forward voltage drop and low leakage current and are offered in a Chip Scale Package (CSP) to reduce board space. The low thermal resistance enables designers to meet the challenging task of achieving higher efficiency and meeting reduced space requirements.

### Features

- Low Forward Voltage Drop – 450 mV @ 2.0 A
- Low Reverse Current – 30  $\mu$ A @ 10 V VR
- 2.0 A of Continuous Forward Current
- Power Dissipation of 665 mW with Minimum Trace
- ESD Rating – Human Body Model: Class 3B  
– Machine Model: Class C
- High Switching Speed
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### Typical Applications

- LCD and Keypad Backlighting
- Camera Photo Flash
- Buck and Boost dc–dc Converters
- Reverse Voltage and Current Protection
- Clamping & Protection

### Markets

- Mobile Handsets
- MP3 Players
- Digital Camera and Camcorders
- Notebook PCs & PDAs
- GPS

### MAXIMUM RATINGS

| Rating   | Symbol    | Value        | Unit    |
|--|-----------|--------------|---------|
| Reverse Voltage  | $V_R$     | 20           | V       |
| Forward Current (DC)   | $I_F$     | 2.0          | A       |
| Forward Surge Current (60 Hz @ 1 cycle)                                | $I_{FSM}$ | 28           | A       |
| Repetitive Peak Forward Current (Pulse Wave = 1 sec, Duty Cycle = 66%) | $I_{FRM}$ | 4.0          | A       |
| ESD Rating: Human Body Model<br>Machine Model                          | ESD       | > 8<br>> 400 | kV<br>V |

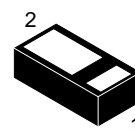
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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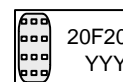
## 20 V SCHOTTKY BARRIER DIODE



DSN2  
(0603)  
CASE 152AB

### MARKING DIAGRAM

PIN 1



20F20 = Specific Device Code  
YYY = Year Code

### ORDERING INFORMATION

| Device        | Package           | Shipping†          |
|---------------|-------------------|--------------------|
| NSR20F20NXT5G | DSN2<br>(Pb-Free) | 5000 / Tape & Reel |

†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.

# NSR20F20

## THERMAL CHARACTERISTICS

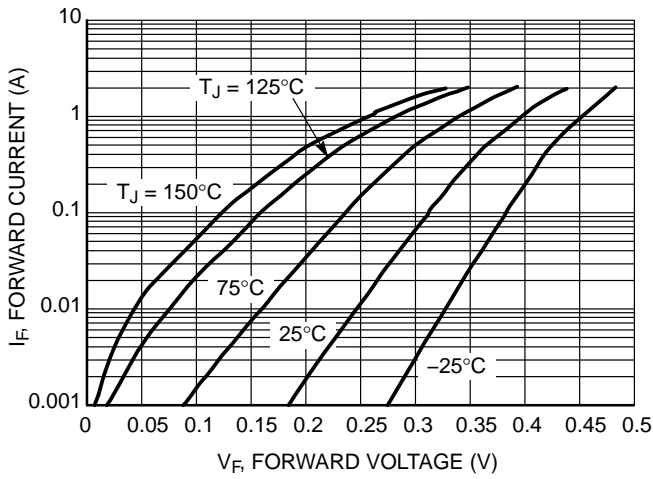
| Characteristic   | Symbol                   | Min | Typ | Max         | Unit                     |
|--|--------------------------|-----|-----|-------------|--------------------------|
| Thermal Resistance<br>Junction-to-Ambient (Note 1)<br>Total Power Dissipation @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$<br>$P_D$ |     |     | 213<br>586  | $^\circ\text{C/W}$<br>mW |
| Thermal Resistance<br>Junction-to-Ambient (Note 2)<br>Total Power Dissipation @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$<br>$P_D$ |     |     | 80<br>1.56  | $^\circ\text{C/W}$<br>W  |
| Storage Temperature Range  | $T_{stg}$                |     |     | -40 to +125 | $^\circ\text{C}$         |
| Junction Temperature   | $T_J$                    |     |     | +150        | $^\circ\text{C}$         |

1. Mounted onto a 4 in square FR-4 board 50 mm sq. 1 oz. Cu 0.06" thick single sided. Operating to steady state.
2. Mounted onto a 4 in square FR-4 board 1 in sq. 1 oz. Cu 0.06" thick single sided. Operating to steady state.

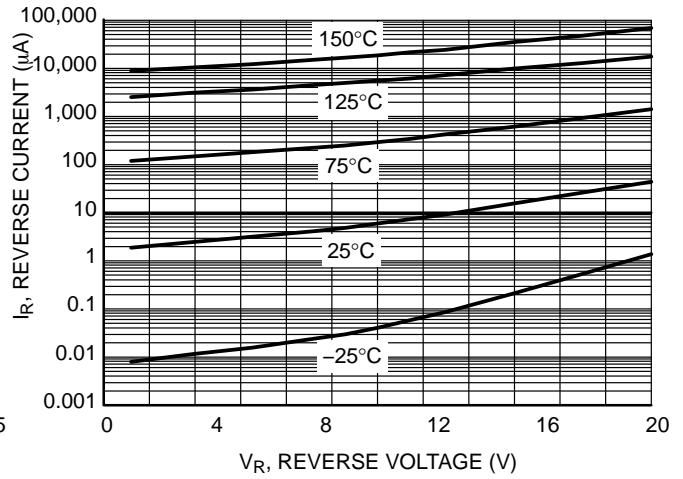
## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic   | Symbol   | Min | Typ            | Max            | Unit          |
|--|----------|-----|----------------|----------------|---------------|
| Reverse Leakage<br>( $V_R = 10\text{ V}$ )<br>( $V_R = 20\text{ V}$ )                            | $I_R$    |     |                | 30<br>150      | $\mu\text{A}$ |
| Forward Voltage<br>( $I_F = 1.0\text{ A}$ )<br>( $I_F = 2.0\text{ A}$ )                          | $V_F$    |     | 0.390<br>0.450 | 0.420<br>0.470 | V             |
| Reverse Recovery Time<br>( $I_F = I_R = 10\text{ mA}$ , $I_{R(REC)} = 1.0\text{ mA}$ , Figure 4) | $t_{rr}$ |     | 80             |                | ns            |

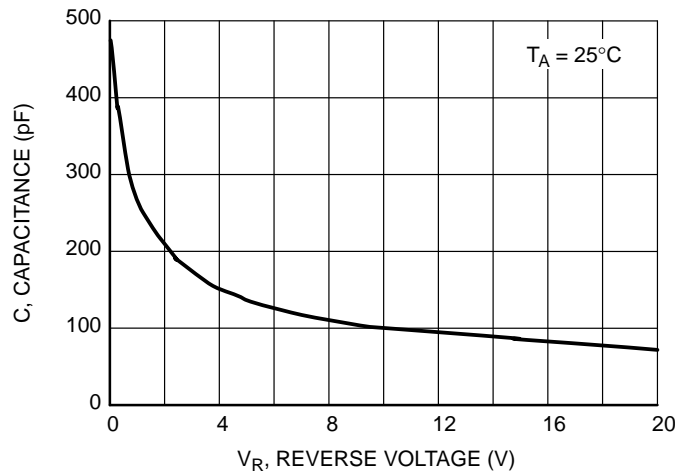
# NSR20F20



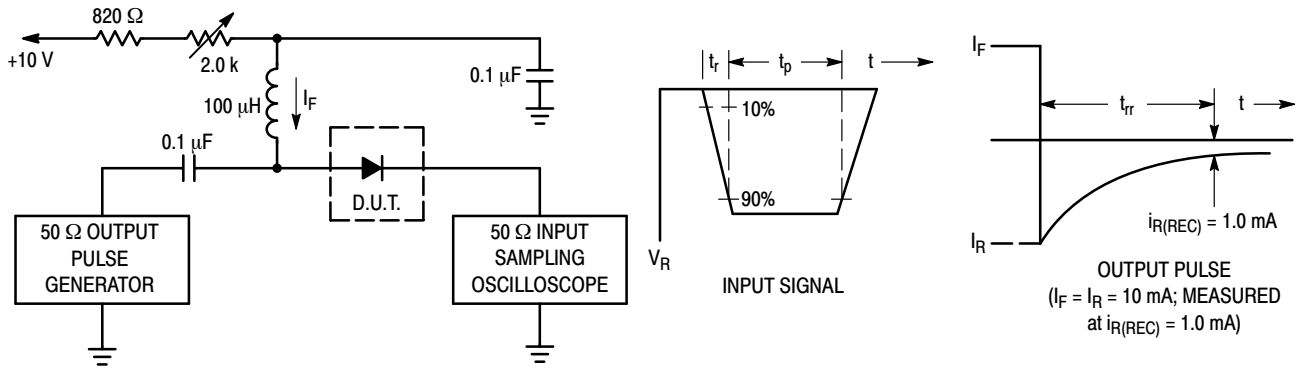
**Figure 1. Forward Voltage**



**Figure 2. Typical Reverse Current**



**Figure 3. Typical Capacitance**



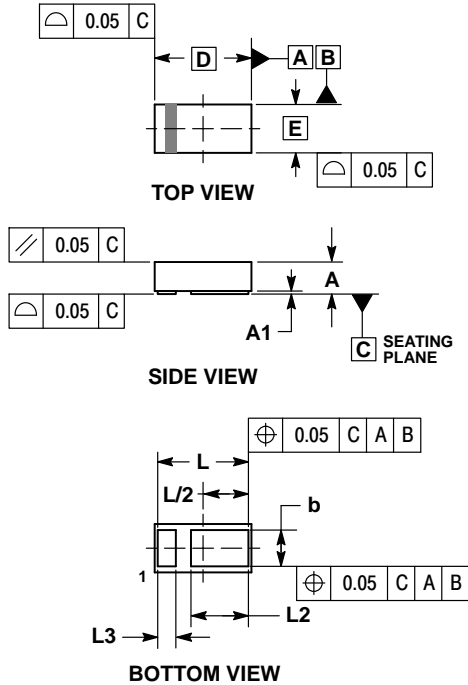
- Notes: 1. A 2.0 kΩ variable resistor adjusted for a Forward Current ( $I_F$ ) of 10 mA.
- 2. Input pulse is adjusted so  $I_{R(peak)}$  is equal to 10 mA.
- 3.  $t_p \gg t_{rr}$

**Figure 4. Recovery Time Equivalent Test Circuit**

# NSR20F20

## PACKAGE DIMENSIONS

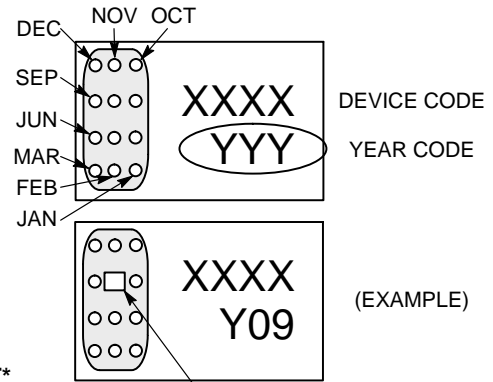
DSN2, 1.6x0.8, 0.9P, (0603)  
CASE 152AB  
ISSUE B



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
  2. CONTROLLING DIMENSION: MILLIMETERS.

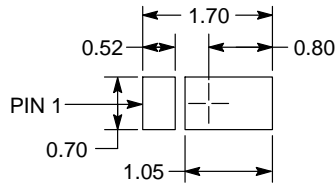
| DIM | MILLIMETERS |      |
|-----|-------------|------|
|     | MIN         | MAX  |
| A   | 0.25        | 0.31 |
| A1  | ---         | 0.05 |
| b   | 0.55        | 0.65 |
| D   | 1.60 BSC    |      |
| E   | 0.80 BSC    |      |
| L   | 1.45        | 1.55 |
| L2  | 0.90        | 1.00 |
| L3  | 0.25        | 0.35 |

### CATHODE BAND MONTH CODING



INDICATES AUG 2009

### MOUNTING FOOTPRINT\*



DIMENSIONS: MILLIMETERS

See Application Note AND8464/D for more mounting details

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

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