

# NSR05402

## 500 mA, 40 V 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 – 570 mV (Typ.) @  $I_F = 500$  mA
- Low Reverse Current – 3.0  $\mu$ A (Typ.) @  $V_R = 40$  V
- 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 and Protection

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit	
Reverse Voltage	$V_R$	40	V	
Forward Current (DC)	$I_F$	500	mA	
Forward Surge Current (60 Hz @ 1 cycle)	$I_{FSM}$	8.0	A	
Repetitive Peak Forward Current (Pulse Wave = 1 sec, Duty Cycle = 66%)	$I_{FRM}$	1.8	A	
ESD Rating:	Human Body Model Machine Model	ESD	>8.0 >400	kV V

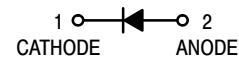
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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### 40 V SCHOTTKY BARRIER DIODE



DSN2  
(0201)  
CASE 152AA

### MARKING DIAGRAM

PIN 1



P = Specific Device Code  
M = Date Code

### ORDERING INFORMATION

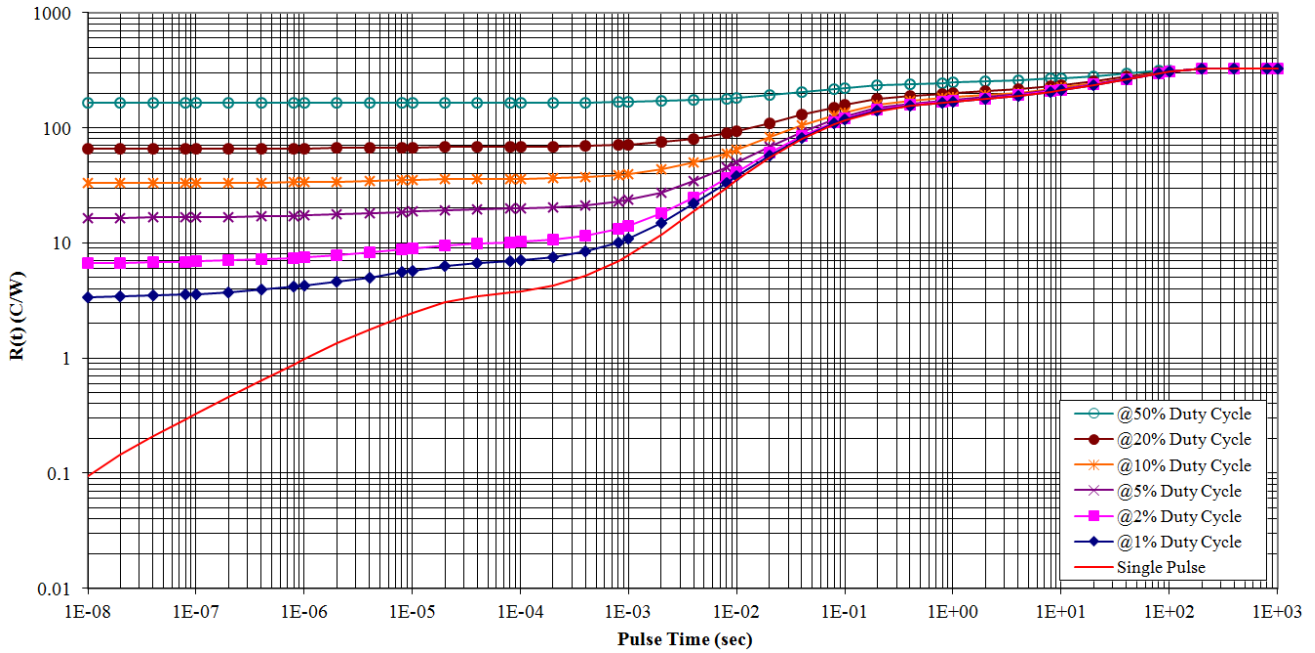
Device	Package	Shipping†
NSR05402NXT5G	DSN2 (Pb-Free)	5000 / Tape & Reel

†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.

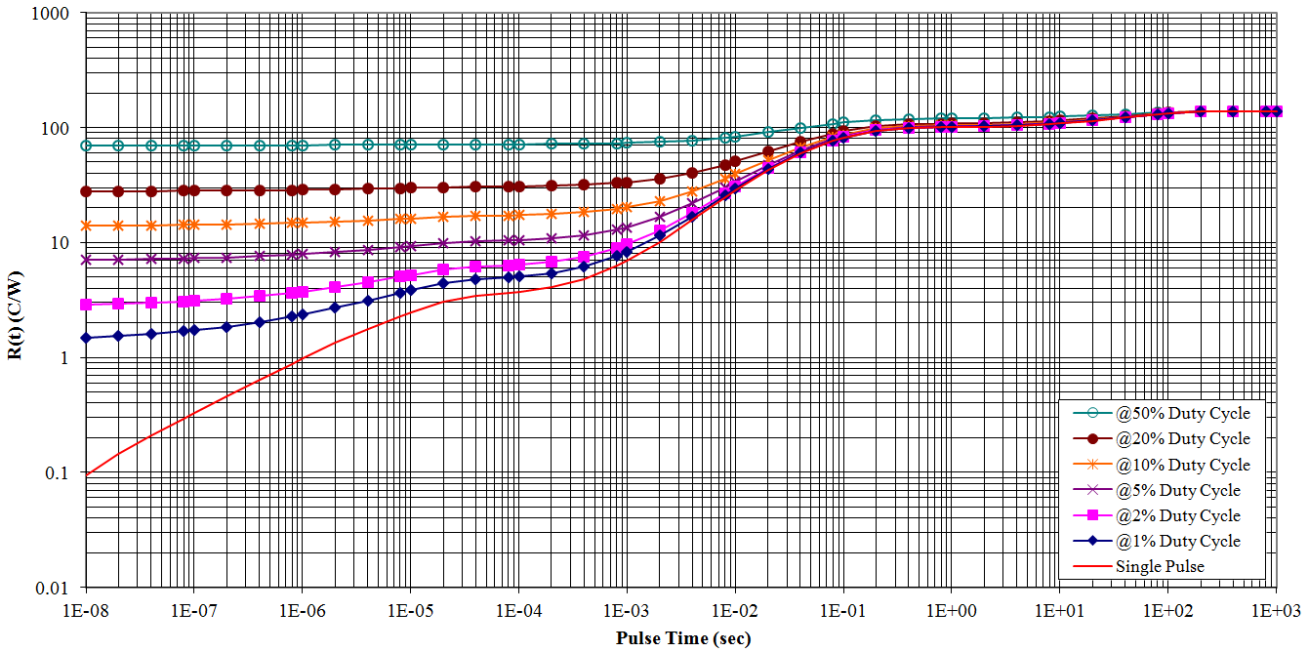
**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Min	Typ	Max	Unit
Thermal Resistance Junction-to-Ambient (Note 1) Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$ $P_D$			329 380	$^\circ\text{C}/\text{W}$ $\text{mW}$
Thermal Resistance Junction-to-Ambient (Note 2) Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$ $P_D$			140 895	$^\circ\text{C}/\text{W}$ $\text{mW}$
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 650 mm sq. 1 oz. Cu 0.06" thick single sided. Operating to steady state.



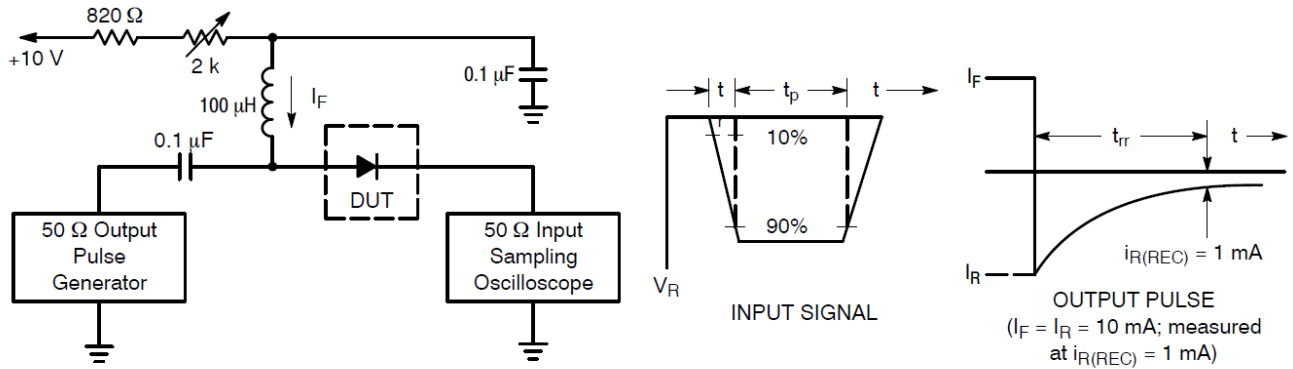
**Figure 1. Thermal Response (Note 1)**



**Figure 2. Thermal Response (Note 2)**

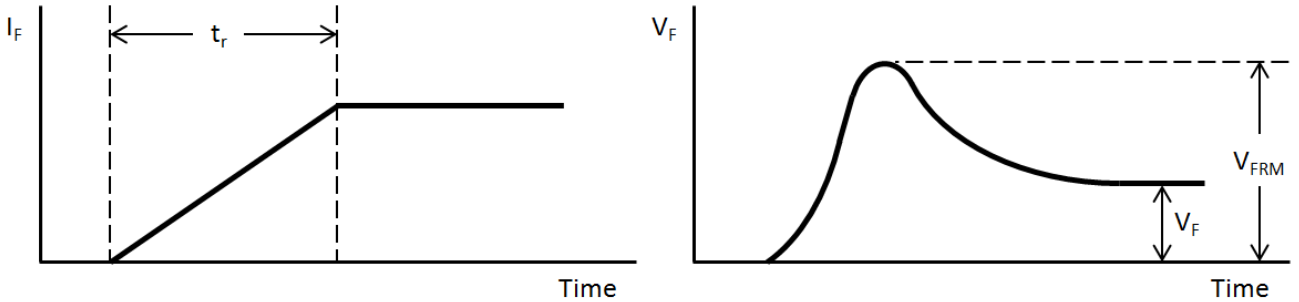
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Leakage ( $V_R = 10\text{ V}$ ) ( $V_R = 40\text{ V}$ )	$I_R$		0.3 3.0	4.0 20	$\mu\text{A}$
Forward Voltage ( $I_F = 0.1\text{ mA}$ ) ( $I_F = 1\text{ mA}$ ) ( $I_F = 10\text{ mA}$ ) ( $I_F = 100\text{ mA}$ ) ( $I_F = 200\text{ mA}$ ) ( $I_F = 500\text{ mA}$ )	$V_F$		180 230 310 400 450 570	220 255 350 440 480 620	mV
Total Capacitance ( $V_R = 5.0\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_T$		9.5		pF
Reverse Recovery Time ( $I_F = I_R = 10\text{ mA}$ , $I_{R(\text{REC})} = 1.0\text{ mA}$ ), Figure 3	$t_{rr}$		5.9		ns
Peak Forward Recover Voltage ( $V_R = 1.0\text{ V}$ , $f = 1.0\text{ MHz}$ ), Figure 4	$V_{\text{FRM}}$		558		mV



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

**Figure 3. Recovery Time Equivalent Test Circuit**



**Figure 4. Peak Forward Recover Voltage Definition**

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

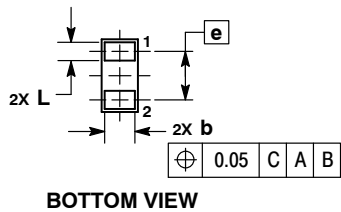
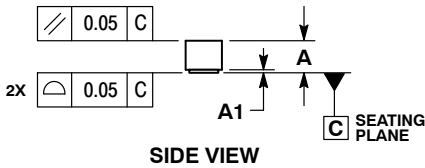
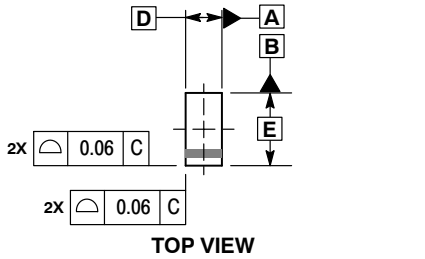
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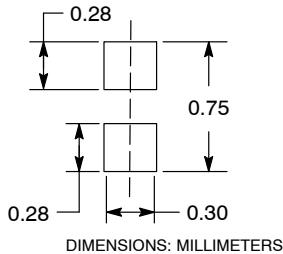
**DSN2, 0.6x0.3, 0.4P, (0201)**  
**CASE 152AA**  
**ISSUE B**

  
**SCALE 8:1**

DATE 30 APR 2017



**MOUNTING FOOTPRINT\***



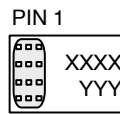
See Application Note AND8398/D for more mounting details

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

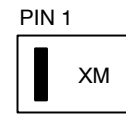
- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.  
 2. CONTROLLING DIMENSION: MILLIMETERS.

MILLIMETERS		
DIM	MIN	MAX
A	0.24	0.30
A1	0.00	0.01
b	0.20	0.22
D	0.30	BSC
E	0.60	BSC
e	0.40	BSC
L	0.10	0.12

**GENERIC MARKING DIAGRAM1\***



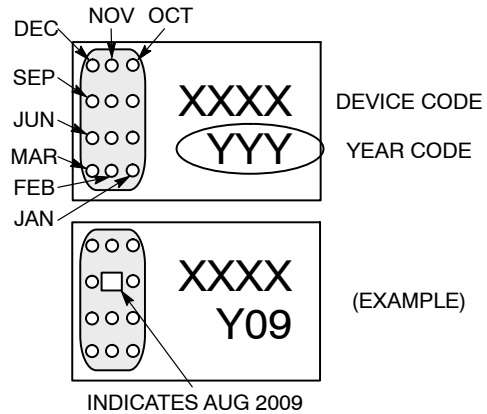
**GENERIC MARKING DIAGRAM2\***




XXXX = Specific Device Code    X = Specific Device Code  
 YYY = Year Code                    M = Date Code

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

**CATHODE BAND MONTH CODING**



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<b>DESCRIPTION:</b>	<b>DSN2, 0.6X0.3, 0.4P, (0201)</b>	<b>PAGE 1 OF 1</b>

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