

NSR10F40QNXT5G

Schottky Diode Optimized for High Frequency Switching Power Supplies

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

- Very Low Forward Voltage Drop – 490 mV @ 1.0 A
- Low Reverse Current – 10 μ A @ 10 V VR
- 1.0 A of Continuous Forward Current
- ESD Rating – Human Body Model: Class 3B
– Machine Model: Class C
- Very 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	40	V
Forward Current (DC)	I_F	1.0	A
Forward Surge Current (60 Hz @ 1 cycle)	I_{FSM}	18	A
ESD Rating:	Human Body Model Machine Model	ESD > 8 > 400	kV V

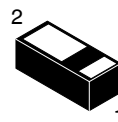
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



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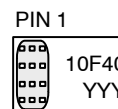
<http://onsemi.com>

40 V SCHOTTKY BARRIER DIODE



DSN2
(0502)
CASE 152AD

MARKING DIAGRAM



10F40 = Specific Device Code
YYY = Year Code

ORDERING INFORMATION

Device	Package	Shipping†
NSR10F40QNXT5G	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.

NSR10F40QNXT5G

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			228 548	$^\circ\text{C/W}$ mW
Thermal Resistance Junction-to-Ambient (Note 2) Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$ P_D			85 1.47	$^\circ\text{C/W}$ 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 ($V_R = 10\text{ V}$) ($V_R = 40\text{ V}$)	I_R			10 100	μA
Forward Voltage ($I_F = 0.5\text{ A}$) ($I_F = 1.0\text{ A}$)	V_F			0.42 0.49	V
Reverse Recovery (Special) Switch from Forward Current to Reverse Voltage Time taken from 1 ns Transition Time to Fully Stabilized ($I_F = 750\text{ mA}$ to $V_R = 36\text{ V}$, 25°C) ($I_F = 750\text{ mA}$ to $V_R = 36\text{ V}$, 85°C)	T_{RR}		28.7 27.4		ns

NSR10F40QNXT5G

TYPICAL CHARACTERISTICS

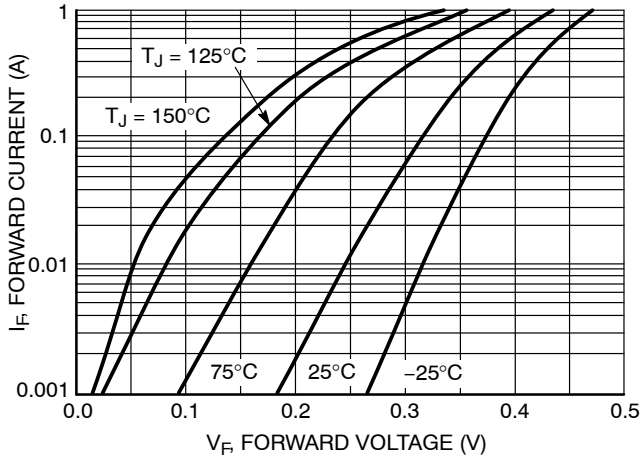


Figure 1. Forward Voltage

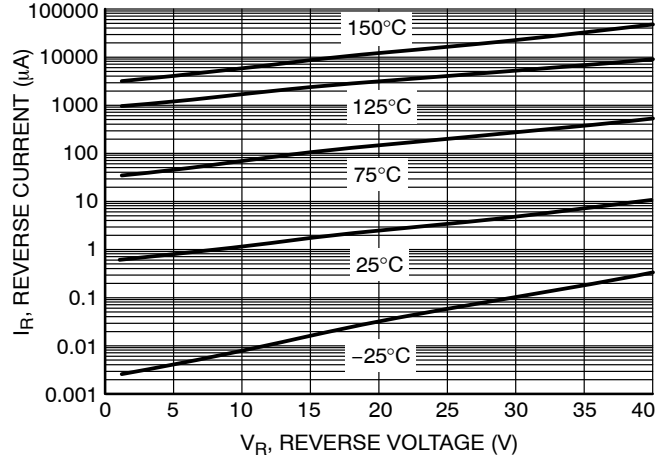


Figure 2. Typical Reverse Current

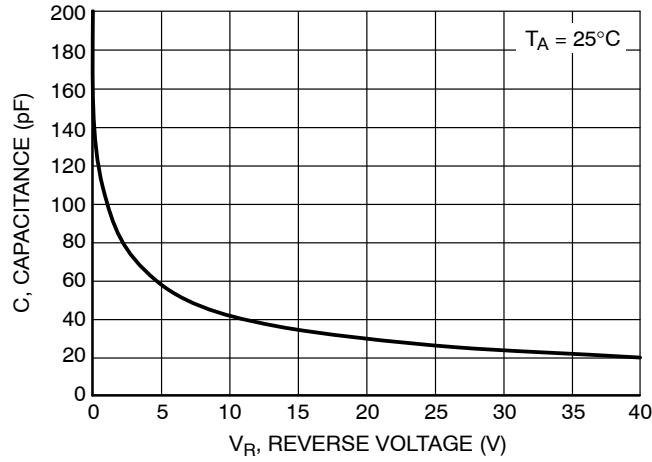


Figure 3. Typical Capacitance

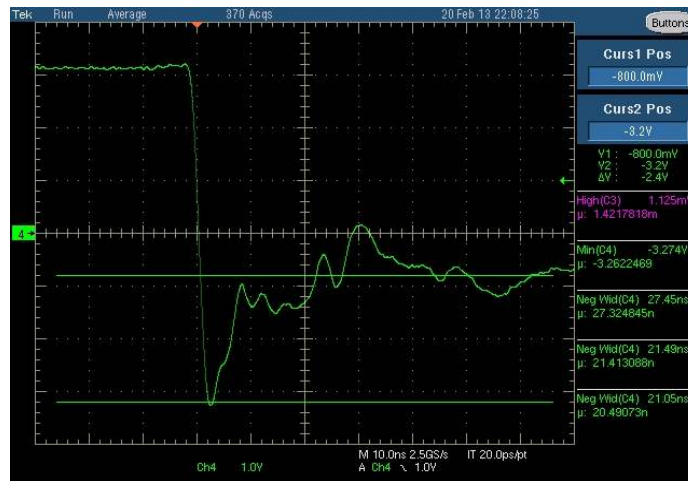


Figure 4. Typical Reverse Recovery
 $I_F = 750 \text{ mA}$ to $V_R = 36 \text{ V}$

NSR10F40QNXT5G

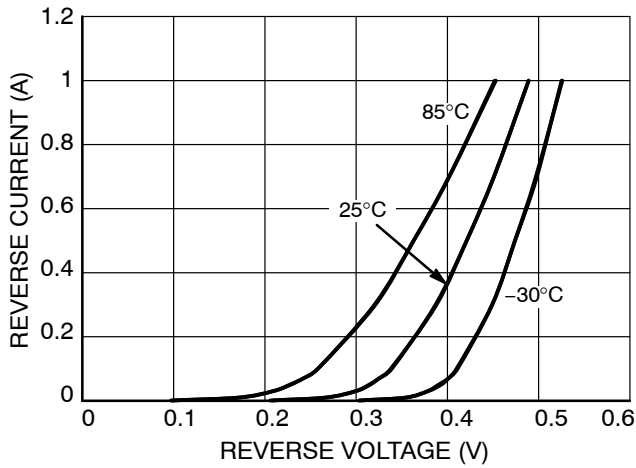


Figure 6. Reverse Leakage Characteristics

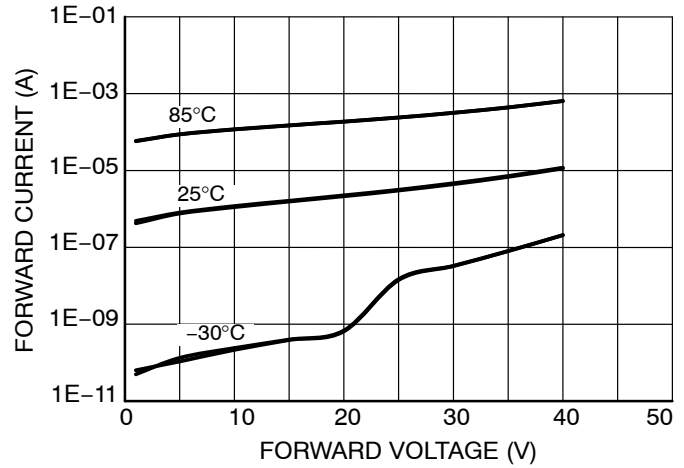


Figure 7. Forward Current Characterization

Finally these diodes were placed in the same circuit at 25°C for 1 week of continuous operation. The screen shots below in Figures 8 and 9 show the operation on the first day of continuous operation and five days respectively.

heavy load operation and 25°C. As seen in Figure 10 the case only got to 29.2°C. This translates to less than 20mW of total power dissipation.

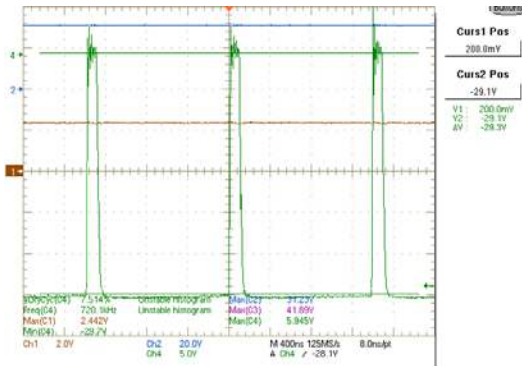


Figure 8. NSR10F40QNXT5G on Day 1 at 25°C

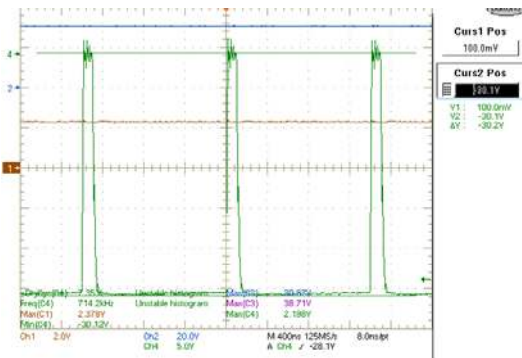


Figure 9. NSR10F40QNXT5G on Day 5 at 25°C

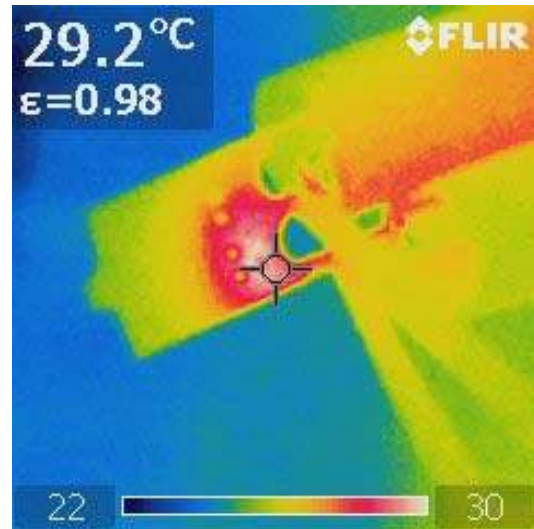


Figure 10. Case Temperature of NSR10F40QNXT5G in Operation at 25°C, 150 mA 34 V Output

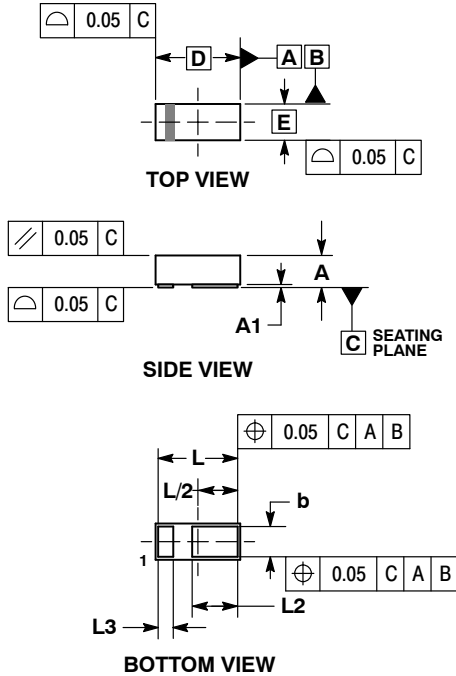
With a heavy load condition (up to 1.2 A) through the NSR10F40QNXT5G on a minimum pad size the ambient temperature can rise up to 145°C and not degrade the performance. Using ON Semiconductor’s new ultra low profile Wireless Boost Application Optimized Schottky diodes will increase the overall efficiency and battery life while reducing board size and cost associated with thermal pads.

To further evaluate the performance, a thermal camera was used to take pictures of the NSR10F40QNXT5G during

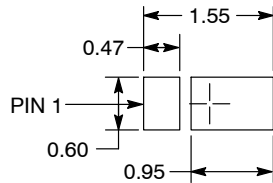
NSR10F40QNXT5G

PACKAGE DIMENSIONS

DSN2, 1.4x0.6, 0.75P
CASE 152AD-01
ISSUE A



MOUNTING FOOTPRINT*



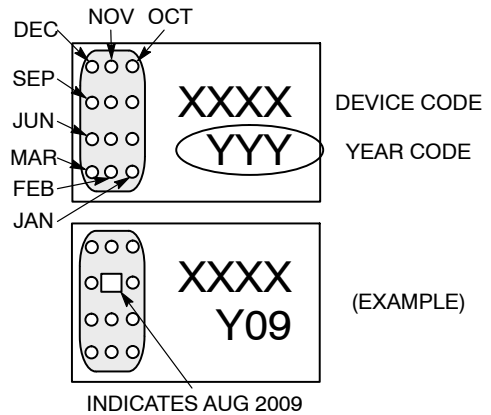
DIMENSIONS: MILLIMETERS

NOTES:

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

MILLIMETERS		
DIM	MIN	MAX
A	0.25	0.31
A1	---	0.05
b	0.45	0.55
D	1.40	BSC
E	0.60	BSC
L	1.20	1.30
L2	0.70	0.80
L3	0.20	0.30

CATHODE BAND MONTH CODING



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.

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