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November 2014

# FFPF08S60SN

## 8 A, 600 V, STEALTH™ II Diode



### Features

- Stealth Recovery  $t_{rr} = 25 \text{ ns}$  (@  $I_F = 8 \text{ A}$ )
- Max Forward Voltage,  $V_F = 3.4 \text{ V}$  (@  $T_C = 25^\circ\text{C}$ )
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

### Description

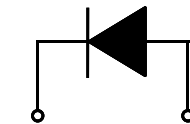
The FFPF08S60SN is a STEALTH™ II diode with soft recovery characteristics. It is silicon nitride passivated ion-implanted epitaxial planar construction. This device is intended for use as freewheeling of boost diode in switching power supplies and other power switching applications. Their low stored charge and hyperfast soft recovery minimize ringing and electrical noise in many power switching circuits reducing power loss in the switching transistors.

### Applications

- General Purpose
- SMPS, Power Switching Circuits
- Boost Diode in Continuous Mode Power Factor Corrections



1. Cathode 2. Anode



1. Cathode 2. Anode

### Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted

| Symbol         | Parameter   | Ratings     | Unit             |
|----------------|---|-------------|------------------|
| $V_{RRM}$      | Peak Repetitive Reverse Voltage                                 | 600         | V                |
| $V_{RWM}$      | Working Peak Reverse Voltage                                    | 600         | V                |
| $V_R$          | DC Blocking Voltage   | 600         | V                |
| $I_{F(AV)}$    | Average Rectified Forward Current @ $T_C = 60^\circ\text{C}$    | 8           | A                |
| $I_{FSM}$      | Non-repetitive Peak Surge Current<br>60Hz Single Half-Sine Wave | 60          | A                |
| $T_J, T_{STG}$ | Operating and Storage Temperature Range                         | -65 to +175 | $^\circ\text{C}$ |

### Thermal Characteristics

| Symbol          | Parameter                                    | Max. | Unit               |
|-----------------|--|------|--------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 6.8  | $^\circ\text{C/W}$ |

### Package Marking and Ordering Information

| Part Number   | Top Mark    | Package    | Packing Method | Reel Size | Tape Width | Quantity |
|---------------|-------------|------------|----------------|-----------|------------|----------|
| FFPF08S60SNTU | FFPF08S60SN | TO-220F-2L | Tube           | N/A       | N/A        | 50       |

FFPF08S60SN — STEALTH™ II Diode

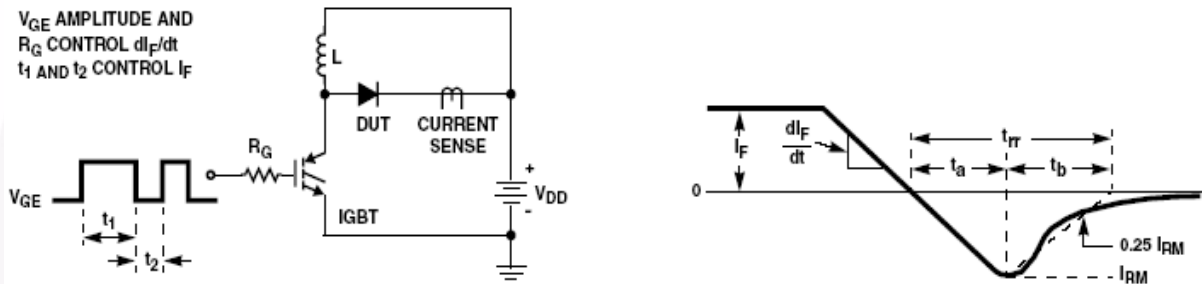
**Electrical Characteristics**  $T_C = 25^\circ\text{C}$  unless otherwise noted

| Symbol                                       | Parameter  | Min. | Typ.                   | Max.              | Unit               |
|--|--|------|------------------------|-------------------|--------------------|
| $V_{F1}$                                     | $I_F = 8\text{ A}$<br>$I_F = 8\text{ A}$   | -    | 2.7<br>2.1             | 3.4<br>-          | V                  |
| $I_{R1}$                                     | $V_R = 600\text{ V}$<br>$V_R = 600\text{ V}$                                     | -    | -                      | 100<br>500        | $\mu\text{A}$      |
| $t_{rr}$                                     | $I_F = 1\text{ A}$ , $di_F/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$  | -    | 13                     | -                 | ns                 |
| $t_{rr}$<br>$I_{rr}$<br>S factor<br>$Q_{rr}$ | $I_F = 8\text{ A}$ , $di_F/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 390\text{ V}$ | -    | 15<br>2.5<br>0.4<br>19 | 25<br>-<br>-<br>- | ns<br>A<br>-<br>nC |
| $t_{rr}$<br>$I_{rr}$<br>S factor<br>$Q_{rr}$ | $I_F = 8\text{ A}$ , $di_F/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 390\text{ V}$ | -    | 32<br>3.8<br>0.7<br>62 | -<br>-<br>-<br>-  | ns<br>A<br>-<br>nC |
| $W_{AVL}$                                    | Avalanche Energy ( $L = 40\text{ mH}$ )  | 10   | -                      | -                 | mJ                 |

**Notes:**

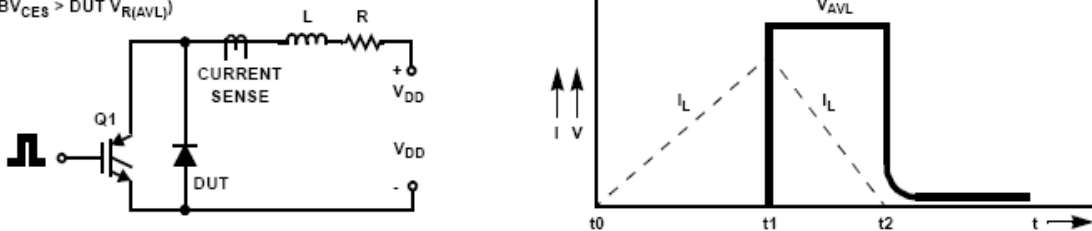
1: Pulse: Test Pulse width = 300  $\mu\text{s}$ , Duty Cycle = 2%

**Test Circuit and Waveforms**



**Figure 1. Diode Reverse Recovery Test Circuit & Waveform**

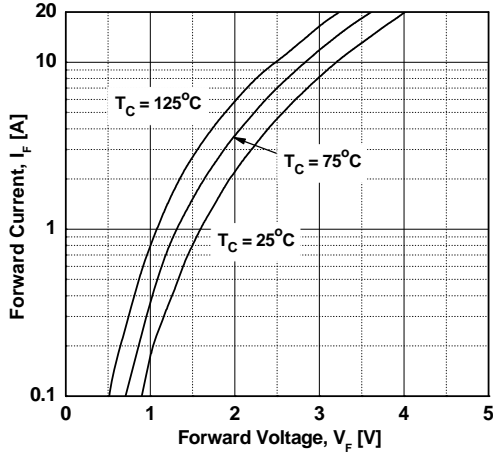
$L = 40\text{ mH}$   
 $R < 0.1\Omega$   
 $V_{DD} = 50\text{ V}$   
 $E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$   
 $Q1 = \text{IGBT (}BV_{CES} > \text{DUT } V_{R(AVL)})$



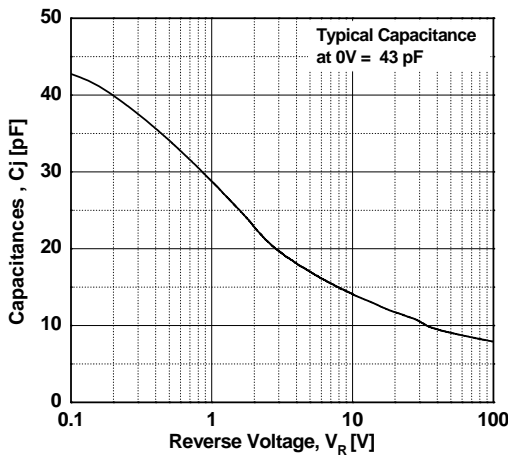
**Figure 2. Unclamped Inductive Switching Test Circuit & Waveform**

### Typical Performance Characteristics

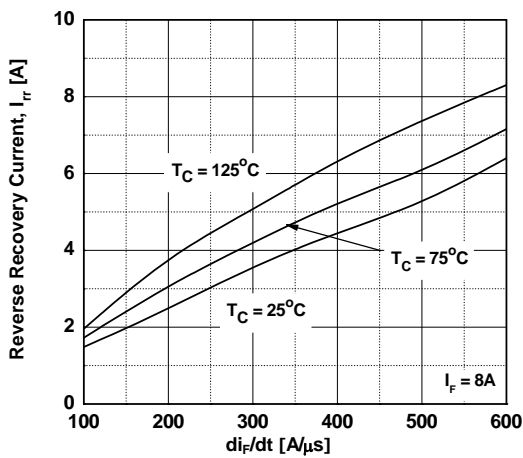
**Figure 3. Typical Forward Voltage Drop vs. Forward Current**



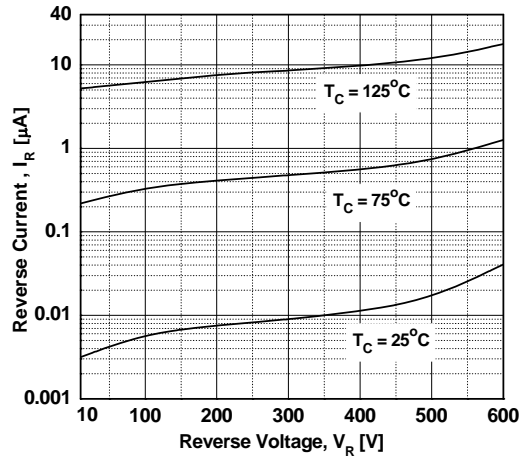
**Figure 5. Typical Junction Capacitance**



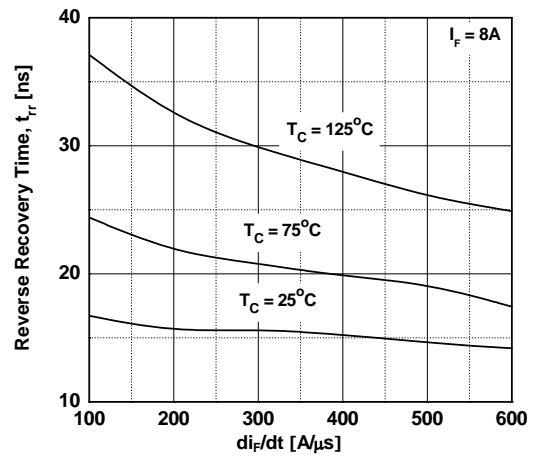
**Figure 7. Typical Reverse Recovery Current vs. di/dt**



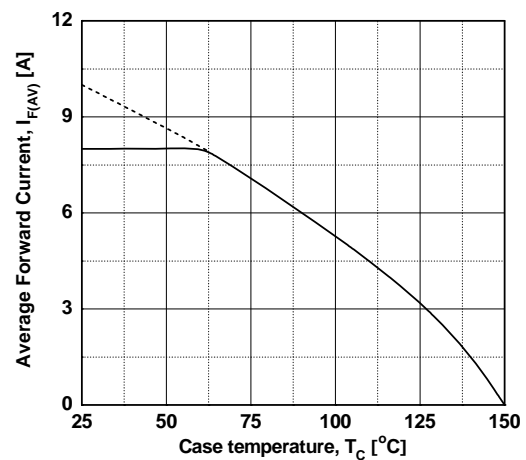
**Figure 4. Typical Reverse Current vs. Reverse Voltage**



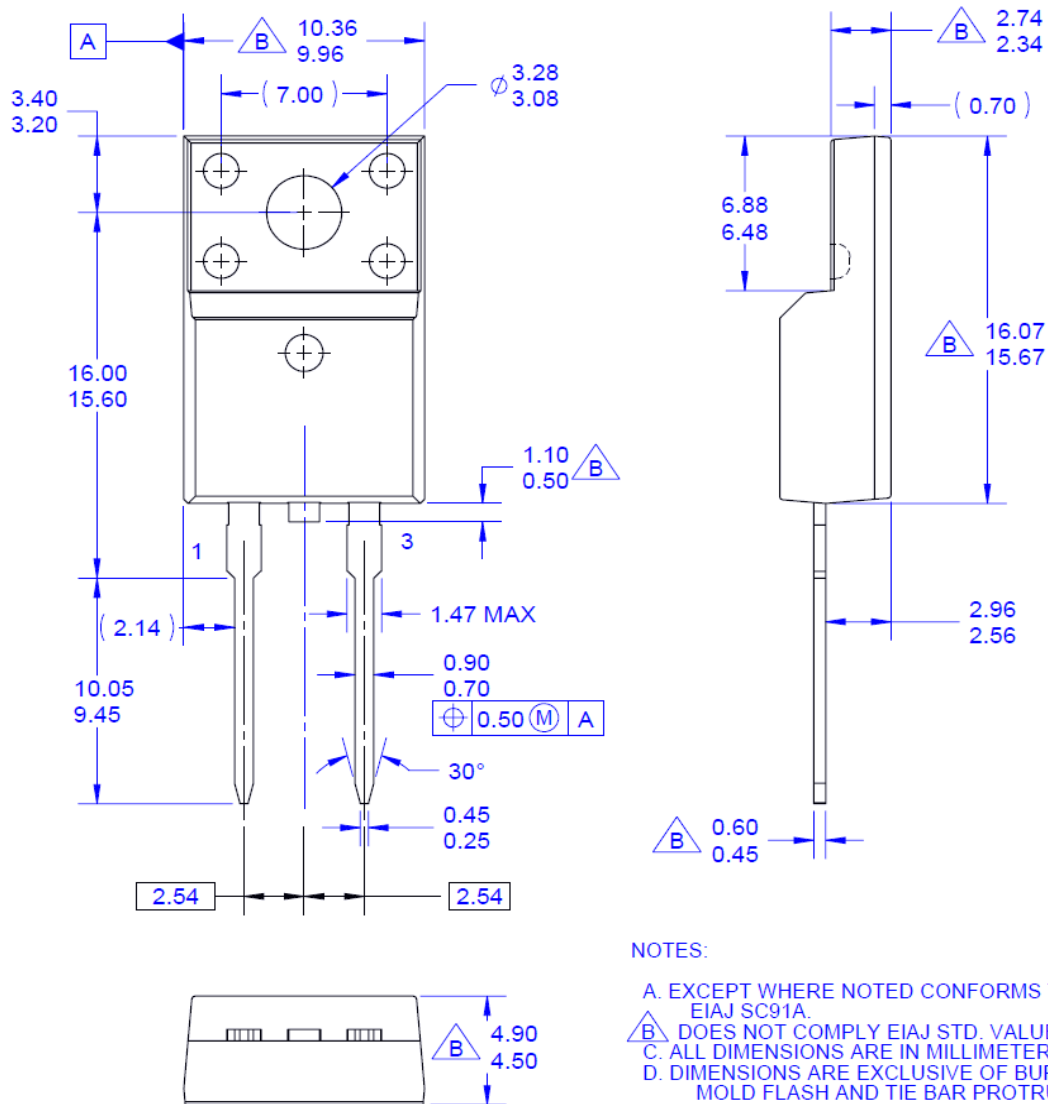
**Figure 6. Typical Reverse Recovery Time vs. di/dt**



**Figure 8. Forward Current Derating Curve**



## Mechanical Dimensions



## NOTES:

- EXCEPT WHERE NOTED CONFORMS TO EIAJ SC91A.
- DOES NOT COMPLY EIAJ STD. VALUE.
- ALL DIMENSIONS ARE IN MILLIMETERS.
- DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.
- DIMENSION AND TOLERANCE AS PER ASME Y14.5-1994.
- DRAWING FILE NAME: TO220C02REV2

Figure 9. TO-220F 2L - 2LD; TO220; MOLDED; FULL PACK

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|  | MicroPak2™                                      | SuperSOT™-3                           | UniFET™          |
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