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November 2014



FFPF08S60SN — STEALTH™ II Diode

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

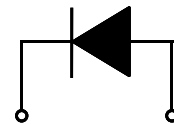
The FFPF08S60SN is a STEALTH™ II diode with soft recovery characteristics. It is silicon nitride passivated ion-implanted epitaxial planar construction. This device is intended for use as freewheeling of boost diode in switching power supplies and other power switching applications. Their low stored 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 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 |

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

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

Notes:

1: Pulse: Test Pulse width = 300 μs , Duty Cycle = 2%

Test Circuit and Waveforms

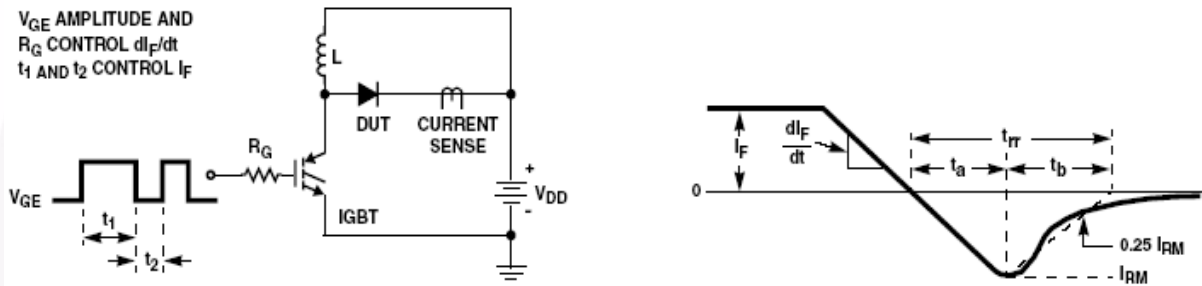


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

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

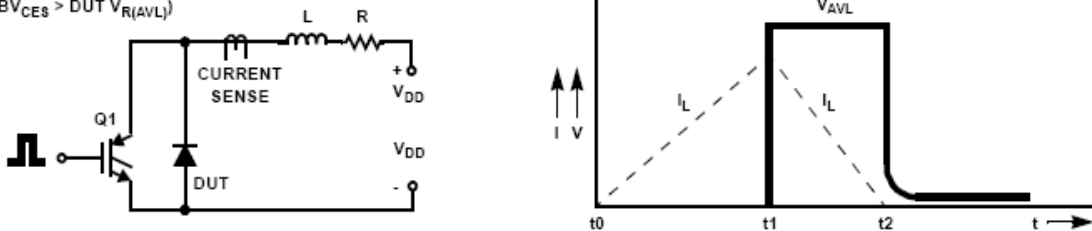


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop vs. Forward Current

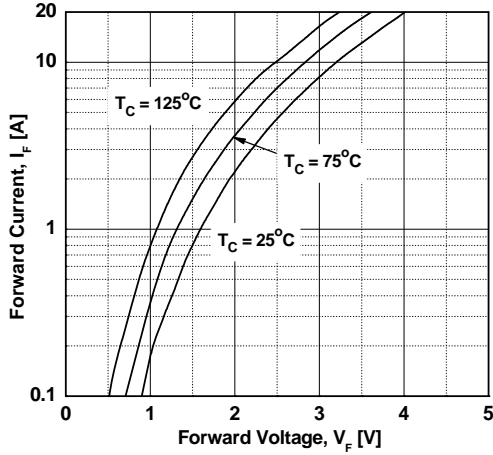


Figure 5. Typical Junction Capacitance

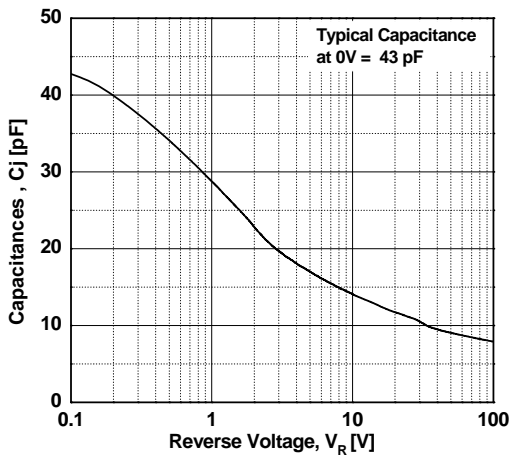


Figure 7. Typical Reverse Recovery Current vs. di/dt

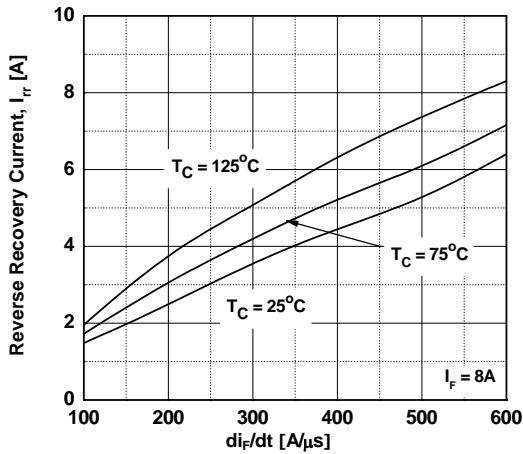


Figure 4. Typical Reverse Current vs. Reverse Voltage

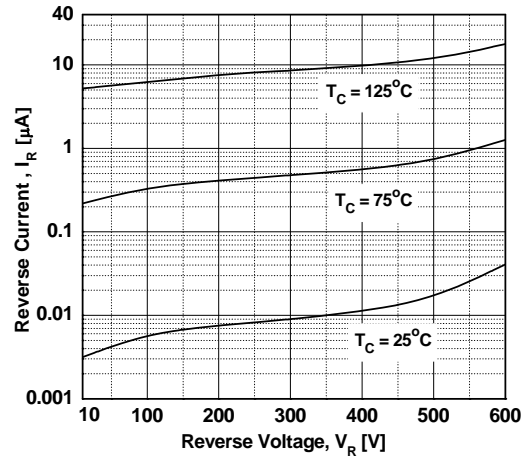


Figure 6. Typical Reverse Recovery Time vs. di/dt

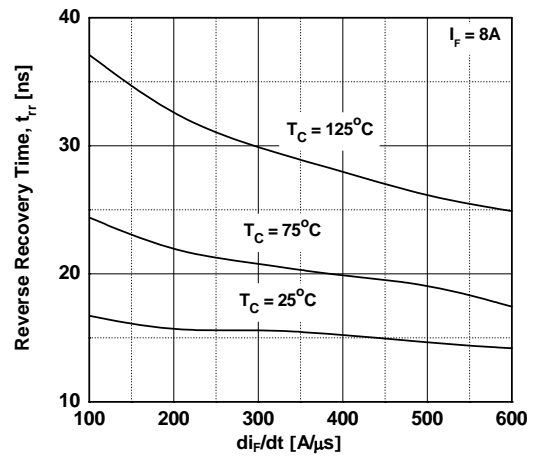
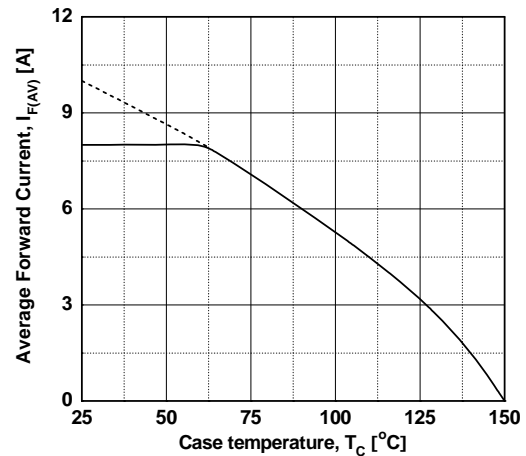
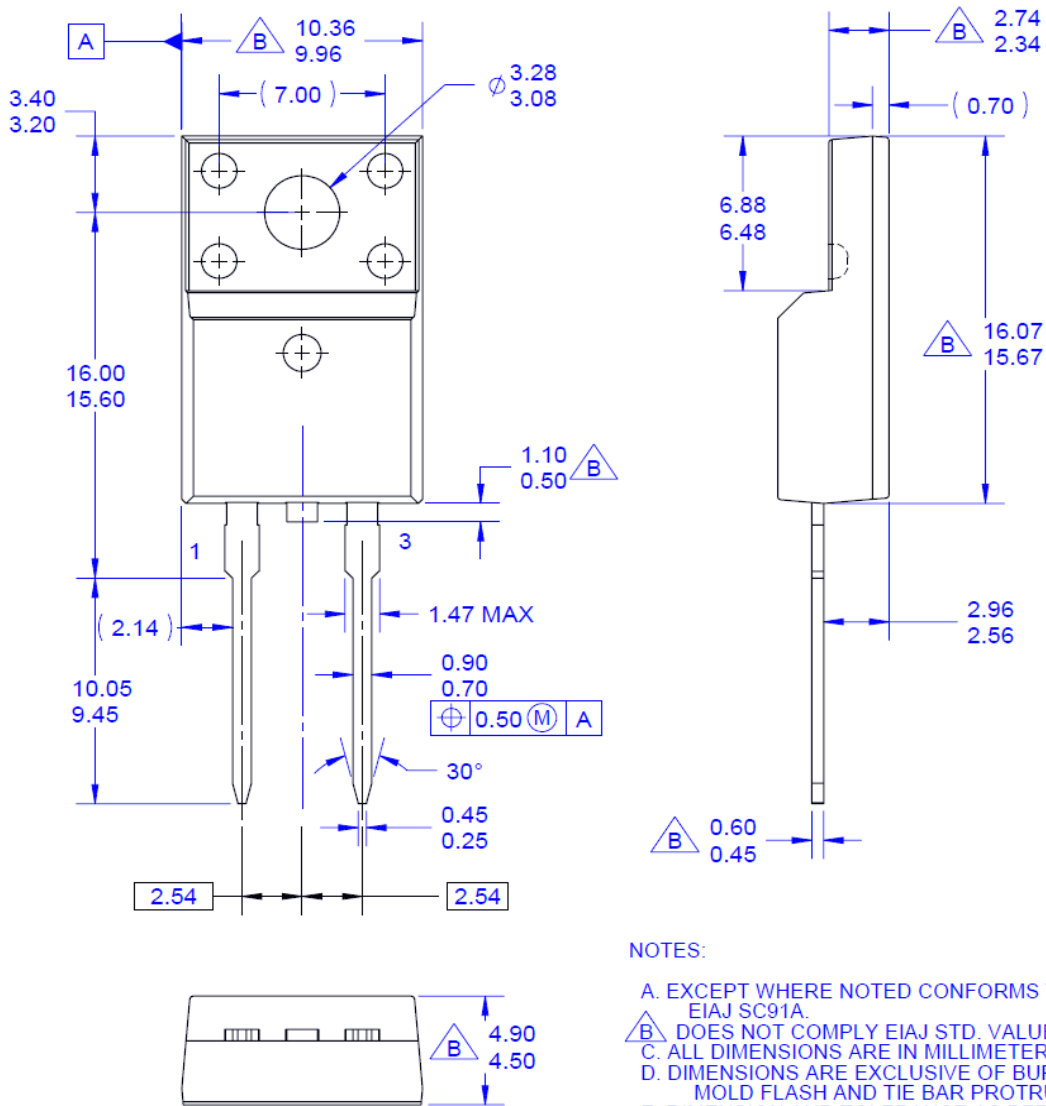


Figure 8. Forward Current Derating Curve



Mechanical Dimensions



NOTES:

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

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

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| Build it Now™ | Green FPS™ | QS™ | TinyCalc™ |
| CorePLUS™ | Green FPS™ e-Series™ | Quiet Series™ | TinyLogic® |
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