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# FFP08S60S

## 8 A, 600 V, STEALTH™ II Diode

### Features

- Stealth Recovery  $t_{rr} = 30$  ns (@  $I_F = 8$  A)
- Max Forward Voltage,  $V_F = 2.6$  V (@  $T_C = 25^\circ\text{C}$ )
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

### Applications

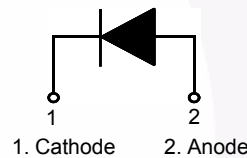
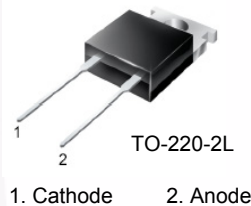
- General Purpose
- SMPS, Power Switching Circuits
- Boost Diode in Continuous Mode Power Factor Corrections

### Description

The FFP08S60S 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 or 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.

### Pin Assignments



### Absolute Maximum Ratings

| Symbol         | Parameter   | Rating       | 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 @ $T_C = 115^\circ\text{C}$   | 8            | A                |
| $I_{FSM}$      | Non-repetitive Peak Surge Current<br>60Hz Single Half-Sine Wave | 80           | A                |
| $T_J, T_{STG}$ | Operating Junction and Storage Temperature                      | - 65 to +175 | $^\circ\text{C}$ |

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

| Symbol          | Parameter                                    | Max. | Unit               |
|-----------------|--|------|--------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 2.5  | $^\circ\text{C/W}$ |

### Package Marking and Ordering Information

| Part Number | Top Mark | Package   | Packing Method | Reel Size | Tape Width | Quantity |
|-------------|----------|-----------|----------------|-----------|------------|----------|
| FFP08S60STU | F08S60S  | TO-220-2L | Tube           | N/A       | N/A        | 50       |

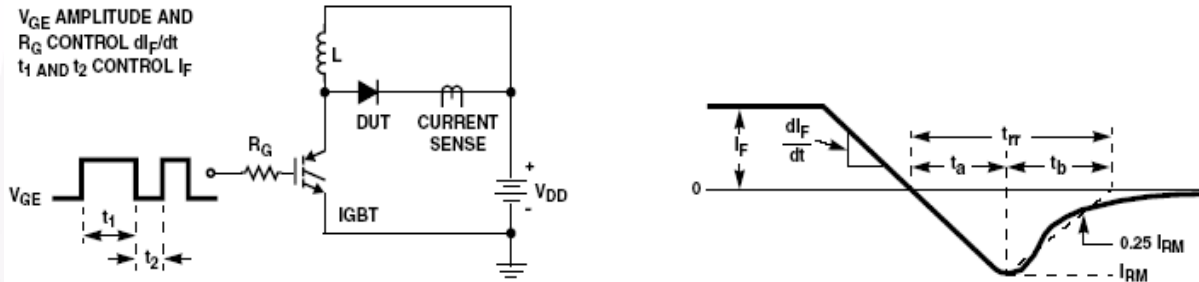
**Electrical Characteristics**  $T_C = 25^\circ\text{C}$  unless otherwise noted

| Parameter                     | Conditions   |                           | Min.                      | Typ. | Max. | Unit          |    |    |
|-------------------------------|--|---------------------------|---------------------------|------|------|---------------|----|----|
| $V_F^1$                       | $I_F = 8\text{ A}$   | $T_C = 25^\circ\text{C}$  | -                         | 2.1  | 2.6  | V             |    |    |
|                               | $I_F = 8\text{ A}$   | $T_C = 125^\circ\text{C}$ | -                         | 1.6  | -    | V             |    |    |
| $I_R^1$                       | $V_R = 600\text{ V}$   | $T_C = 25^\circ\text{C}$  | -                         | -    | 100  | $\mu\text{A}$ |    |    |
|                               | $V_R = 600\text{ V}$   | $T_C = 125^\circ\text{C}$ | -                         | -    | 500  | $\mu\text{A}$ |    |    |
| $t_{rr}$                      | $I_F = 1\text{ A}, di_F/dt = 100\text{ A}/\mu\text{s}, V_R = 30\text{ V}$  |                           | -                         | -    | 25   | ns            |    |    |
| trr<br>Irr<br>S factor<br>Qrr | $I_F = 8\text{ A}, di_F/dt = 200\text{ A}/\mu\text{s}, V_R = 390\text{ V}$ |                           | $T_C = 25^\circ\text{C}$  |      | -    | 19            | ns |    |
|                               |  |                           |                           |      | -    | 2.2           | -  | A  |
|                               |  |                           |                           |      | -    | 0.6           | -  | -  |
|                               |  |                           |                           |      | -    | 21            | -  | nC |
| trr<br>Irr<br>S factor<br>Qrr | $I_F = 8\text{ A}, di_F/dt = 200\text{ A}/\mu\text{s}, V_R = 390\text{ V}$ |                           | $T_C = 125^\circ\text{C}$ |      | -    | 58            | ns |    |
|                               |  |                           |                           |      | -    | 4.3           | -  | A  |
|                               |  |                           |                           |      | -    | 1.3           | -  | -  |
|                               |  |                           |                           |      | -    | 125           | -  | nC |
| $W_{AVL}$                     | Avalanche Energy ( $L = 40\text{ mH}$ )                                    |                           | 20                        | -    | -    | mJ            |    |    |

**Notes:**

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

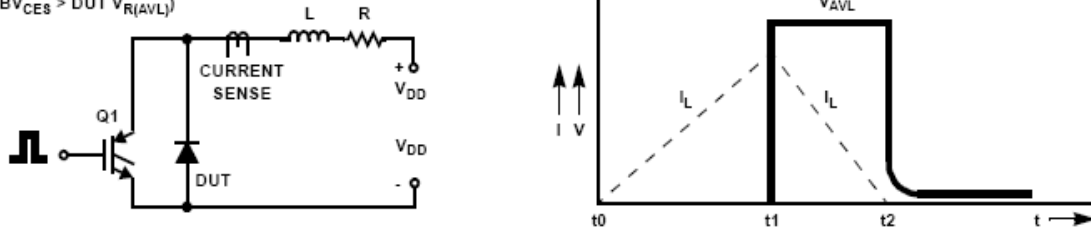
**Test Circuit and Waveforms**



**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  $T_c = 25^\circ\text{C}$  unless otherwise noted

Figure 3. Typical Forward Voltage Drop

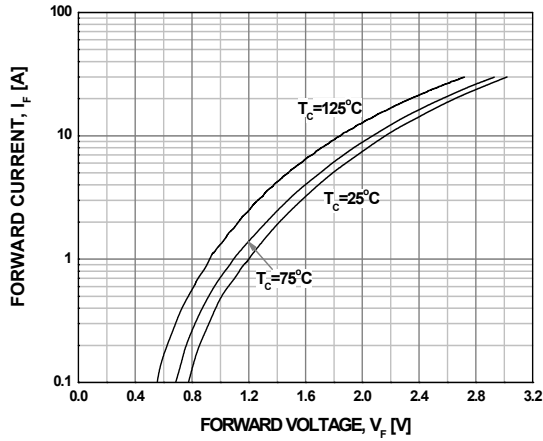


Figure 4. Typical Reverse Current

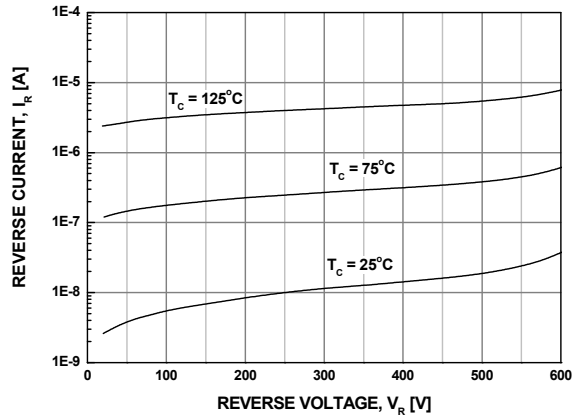


Figure 5. Typical Junction Capacitance

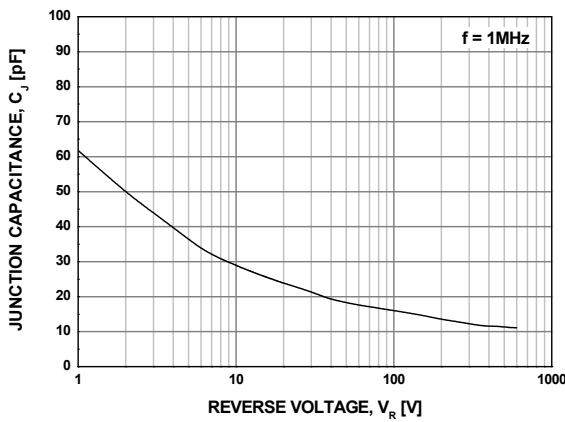


Figure 6. Typical Reverse Recovery Time

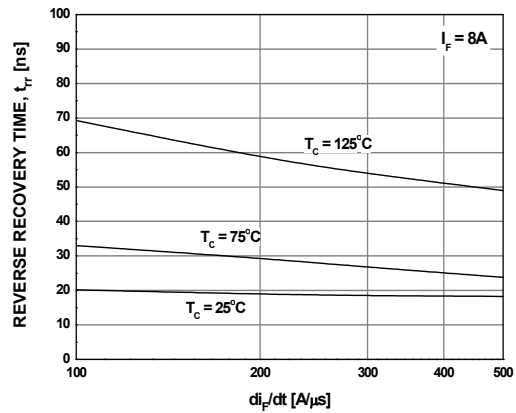


Figure 7. Typical Reverse Recovery Current

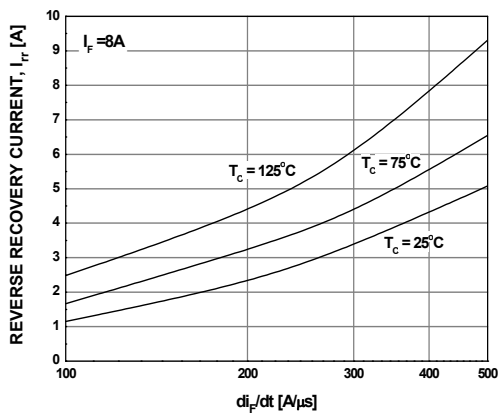
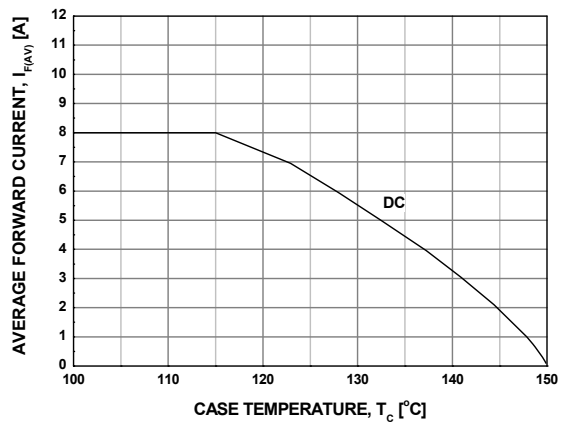
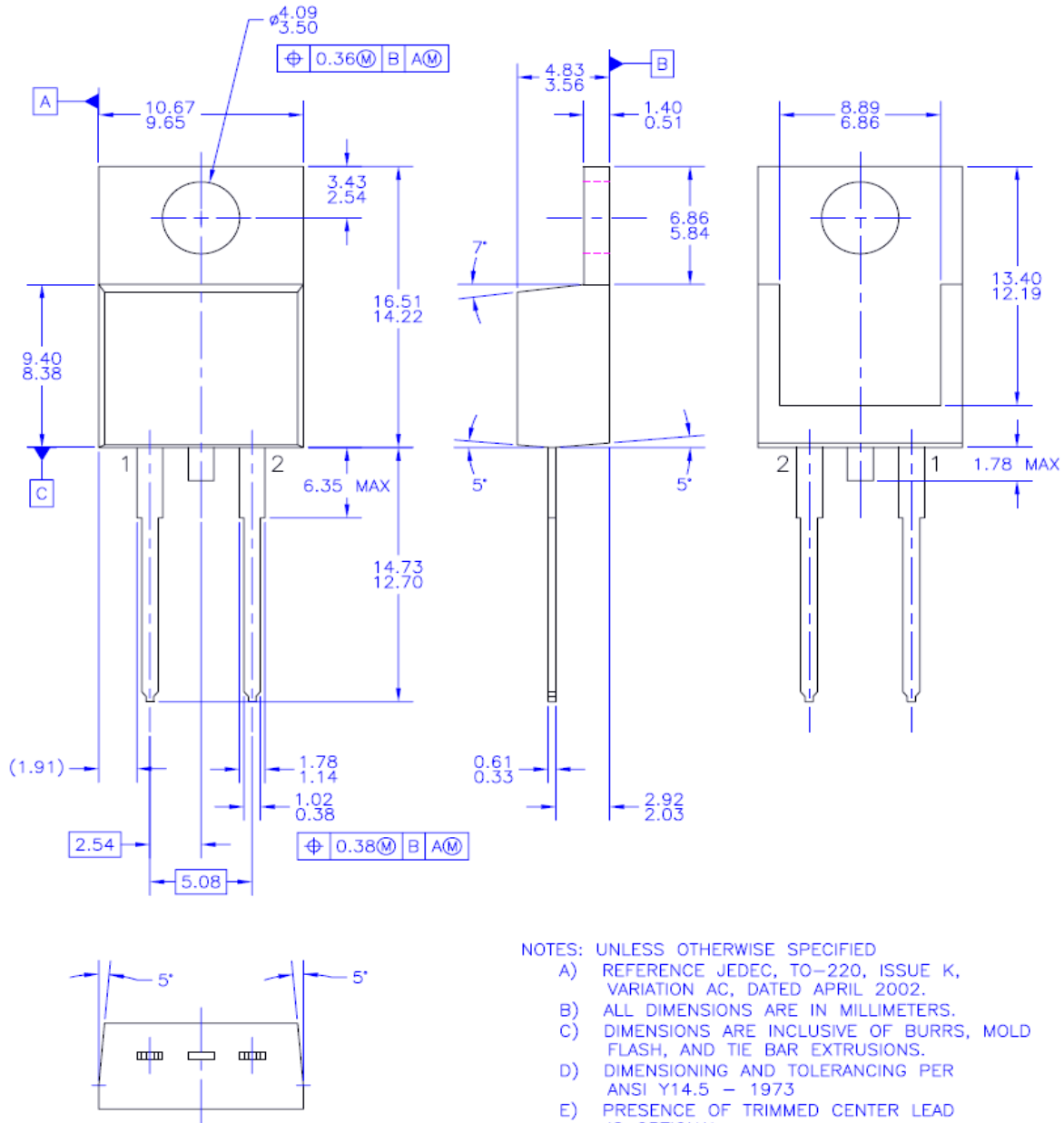


Figure 8. Forward Current Deration Curve



**Mechanical Dimensions**



**Figure 9. TO-220 2L - 2LD, TO220, JEDEC TO-220 VARIATION AC**

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

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Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А