

**FFP30S60S**

**Features**

- High Speed Switching,  $t_{rr} < 40\text{ns}$  @  $I_F = 30\text{A}$
- High Reverse Voltage and High Reliability
- RoHS compliant

**Applications**

- General Purpose
- Switching Mode Power Supply
- Boost Diode in continuous mode power factor corrections
- Power switching circuits

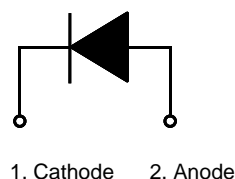
**30A, 600V STEALTH™ II Rectifier**

The FFP30S60S is STEALTH™ II rectifier 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.



**Pin Assignments**



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

| Symbol         | Parameter   | Ratings     | Units            |
|----------------|---|-------------|------------------|
| $V_{RRM}$      | 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 @ $T_C = 103^\circ\text{C}$   | 30          | A                |
| $I_{FSM}$      | Non-repetitive Peak Surge Current<br>60Hz Single Half-Sine Wave | 300         | A                |
| $T_J, T_{STG}$ | Operating and Storage Temperature Range                         | -65 to +150 | $^\circ\text{C}$ |

**Thermal Characteristics**

| Symbol          | Parameter                                    | Ratings | Units              |
|-----------------|--|---------|--------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 1.1     | $^\circ\text{C/W}$ |

**Package Marking and Ordering Information**

| Device Marking | Device      | Package   | Reel Size | Tape Width | Quantity |
|----------------|-------------|-----------|-----------|------------|----------|
| F30S60S        | FFP30S60STU | TO-220-2L | -         | -          | 50       |

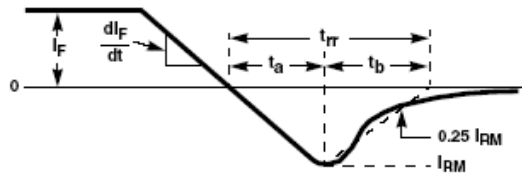
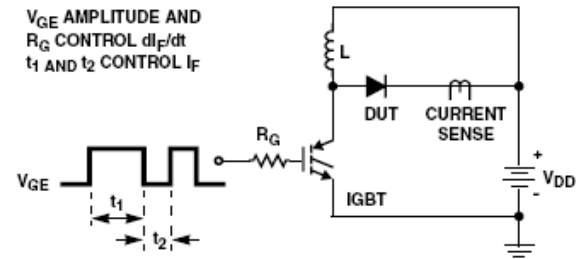
**Electrical Characteristics**  $T_C = 25^\circ\text{C}$  unless otherwise noted

| Symbol                                       | Parameter  | Min.             | Typ.                    | Max.              | Units              |
|--|--|------------------|-------------------------|-------------------|--------------------|
| $V_{FM1}$                                    | $I_F = 30\text{A}$<br>$I_F = 30\text{A}$                                     | -                | 2.1<br>1.6              | 2.6<br>-          | V                  |
| $I_{RM1}$                                    | $V_R = 600\text{V}$<br>$V_R = 600\text{V}$                                   | -                | -                       | 100<br>500        | $\mu\text{A}$      |
| $t_{rr}$                                     | $I_F = 1\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$ , $V_R = 30\text{V}$   | -                | 25                      | 35                | ns                 |
| $t_{rr}$<br>$I_{rr}$<br>S factor<br>$Q_{rr}$ | $I_F = 30\text{A}$ , $di/dt = 200\text{A}/\mu\text{s}$ , $V_R = 390\text{V}$ | -<br>-<br>-<br>- | 28<br>2.4<br>0.9<br>34  | 40<br>-<br>-<br>- | ns<br>A<br>-<br>nC |
| $t_{rr}$<br>$I_{rr}$<br>S factor<br>$Q_{rr}$ | $I_F = 30\text{A}$ , $di/dt = 200\text{A}/\mu\text{s}$ , $V_R = 390\text{V}$ | -<br>-<br>-<br>- | 75<br>6.3<br>0.9<br>236 | -<br>-<br>-<br>-  | ns<br>A<br>-<br>nC |
| $W_{AVL}$                                    | Avalanche Energy ( $L = 40\text{mH}$ )                                       | 20               | -                       | -                 | mJ                 |

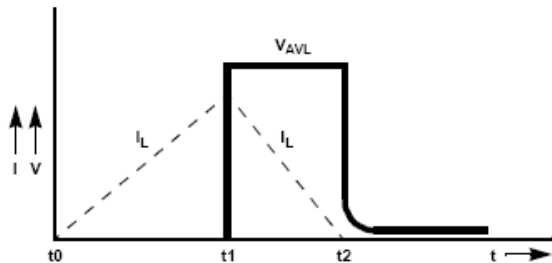
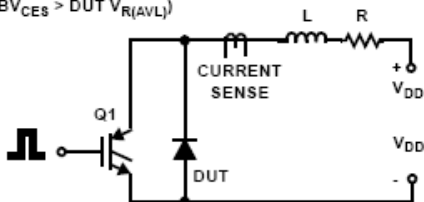
**Notes:**

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

**Test Circuit and Waveforms**



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



### Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop vs. Forward Current

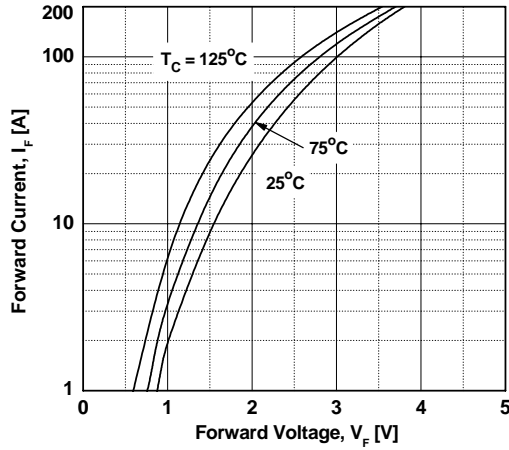


Figure 2. Typical Reverse Current vs. Reverse Voltage

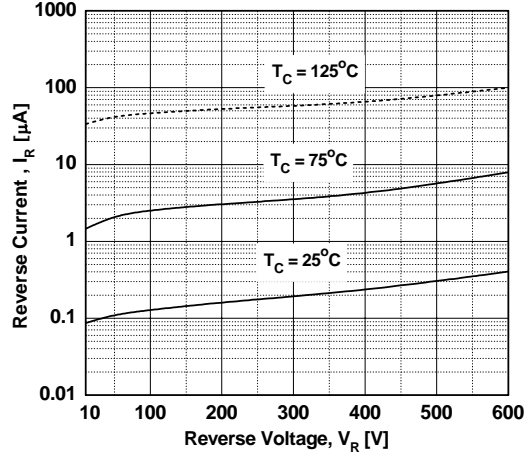


Figure 3. Typical Junction Capacitance

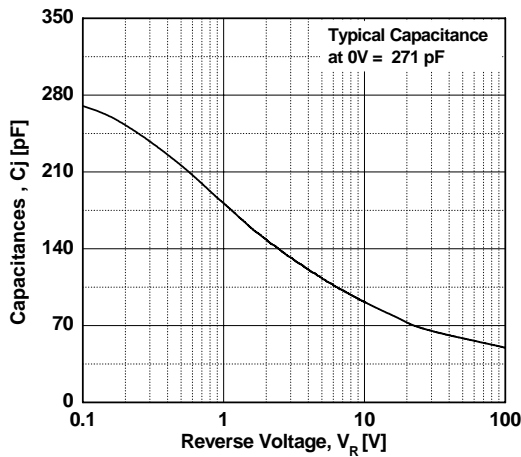


Figure 4. Typical Reverse Recovery Time vs. di/dt

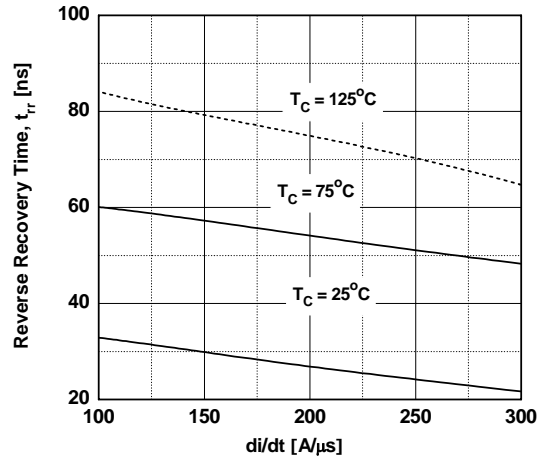


Figure 5. Typical Reverse Recovery Current vs. di/dt

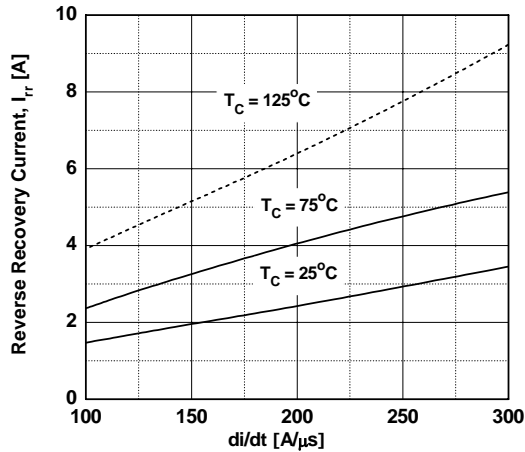
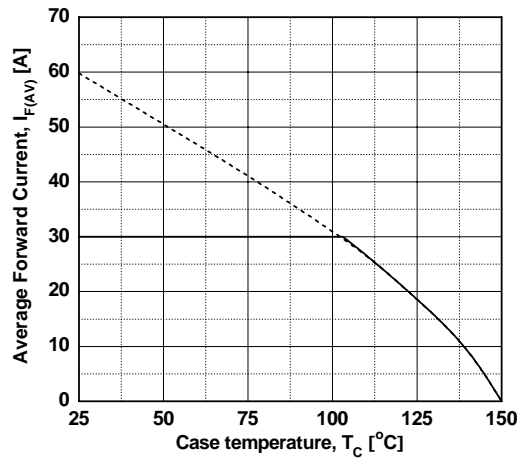
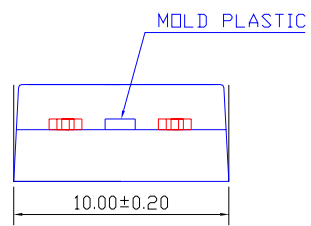
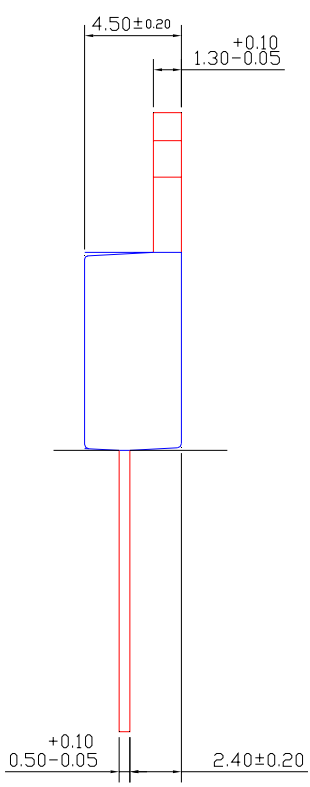
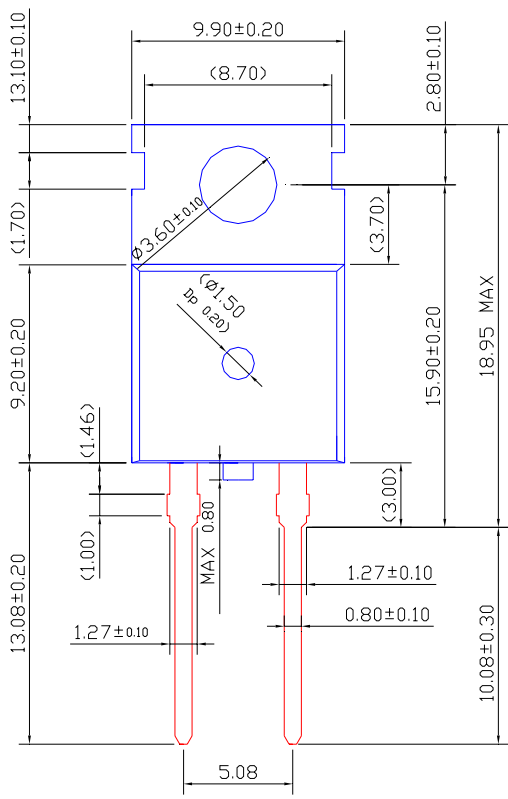


Figure 6. Forward Current Derating Curve



### Mechanical Dimensions

## TO-220-2L



#### NOTE


- 1. THESE DIMENSIONS DO NOT INCLUDE MOLD PROTRUSION.
- 2. ( ) IS REFERENCE
- 3. [ ] IS ASS'Y OUT QUALITY

Dimensions in Millimeters



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