



# FFPF15S60S

## Features

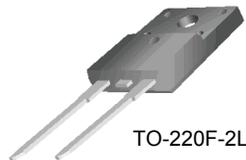
- Stealth Recovery  $t_{rr} = 35 \text{ ns}$  (@  $I_F = 15 \text{ A}$ )
- Max Forward Voltage,  $V_F = 2.6 \text{ V}$  (@  $T_C = 25^\circ\text{C}$ )
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

## 15 A, 600 V, STEALTH™ II Diode

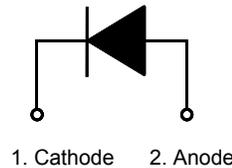
The FFPF15S60S is a STEALTH™ II diode with soft recovery characteristics. It is silicon nitride passivated ion-implanted epitaxial planar construction. This device is intended for use as freewheeling of boost diode in switching power supplies and other power switching applications. Their low stored charge and hyperfast soft recovery minimize ringing and electrical noise in many power switching circuits reducing power loss in the switching transistors.

## Applications

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



1. Cathode 2. Anode



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

| 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 @ $T_C = 52^\circ\text{C}$     | 15          | A                |
| $I_{FSM}$      | Non-repetitive Peak Surge Current<br>60 Hz Single Half-Sine Wave | 150         | A                |
| $T_J, T_{STG}$ | Operating and Storage Temperature Range                          | -65 to +150 | $^\circ\text{C}$ |

## Thermal Characteristics

| Symbol          | Parameter                                    | Rating | Unit               |
|-----------------|--|--------|--------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 4.6    | $^\circ\text{C/W}$ |

## Package Marking and Ordering Information

| Device Marking | Device       | Package    | Eco Status | Packing | Quantity |
|----------------|--------------|------------|------------|---------|----------|
| F15S60S        | FFPF15S60STU | TO-220F-2L | Green/RoHS | Tube    | 50       |

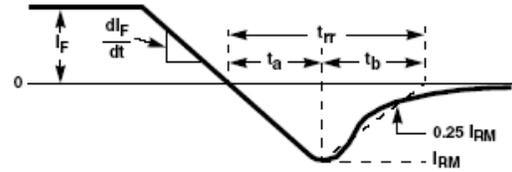
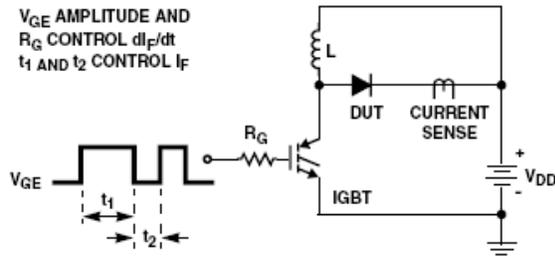
### Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

| Symbol                                       | Parameter   | Min.             | Typ.                    | Max.              | Unit               |
|--|---|------------------|-------------------------|-------------------|--------------------|
| $V_F$  | $I_F = 15\text{ A}$<br>$I_F = 15\text{ A}$                                      | -                | 2.1<br>1.6              | 2.6<br>-          | V                  |
| $I_{R1}$                                     | $V_R = 600\text{ V}$<br>$V_R = 600\text{ V}$                                    | -                | -                       | 100<br>500        | $\mu\text{A}$      |
| $t_{rr}$                                     | $I_F = 1\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$   | -                | 21                      | 30                | ns                 |
| $t_{rr}$<br>$I_{rr}$<br>S factor<br>$Q_{rr}$ | $I_F = 15\text{ A}$ , $di/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 390\text{ V}$ | -<br>-<br>-<br>- | 23<br>2.5<br>0.7<br>29  | 35<br>-<br>-<br>- | ns<br>A<br>-<br>nC |
| $t_{rr}$<br>$I_{rr}$<br>S factor<br>$Q_{rr}$ | $I_F = 15\text{ A}$ , $di/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 390\text{ V}$ | -<br>-<br>-<br>- | 55<br>4.3<br>1.1<br>118 | -<br>-<br>-<br>-  | ns<br>A<br>-<br>nC |
| $W_{AVL}$                                    | Avalanche Energy ( $L = 40\text{ mH}$ )   | 20               | -                       | -                 | mJ                 |

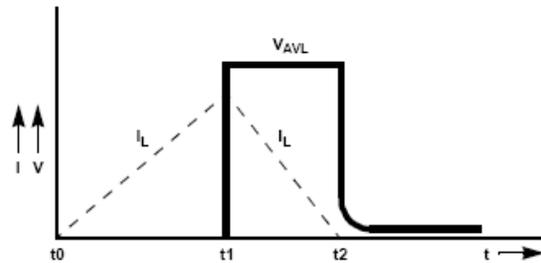
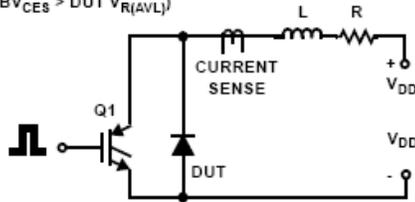
**Notes:**

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

### Test Circuit and Waveforms

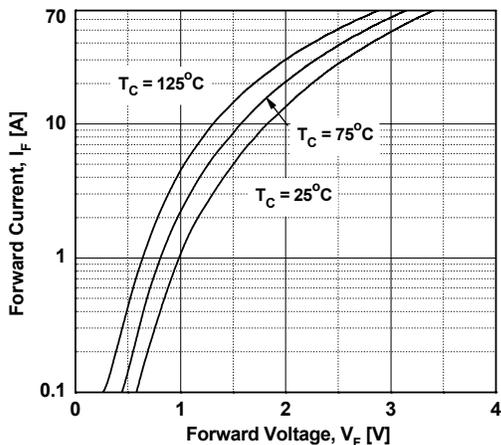


$L = 40\text{ mH}$   
 $R < 0.1\Omega$   
 $V_{DD} = 50\text{ V}$   
 $E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$   
 $Q1 = \text{IGBT } (BV_{CES} > \text{DUT } V_{R(AVL)})$

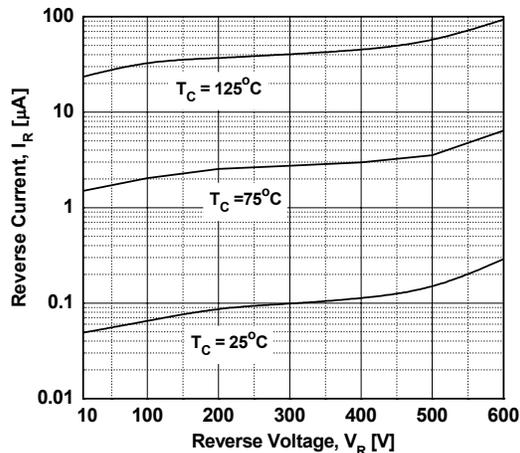


## Typical Performance Characteristics

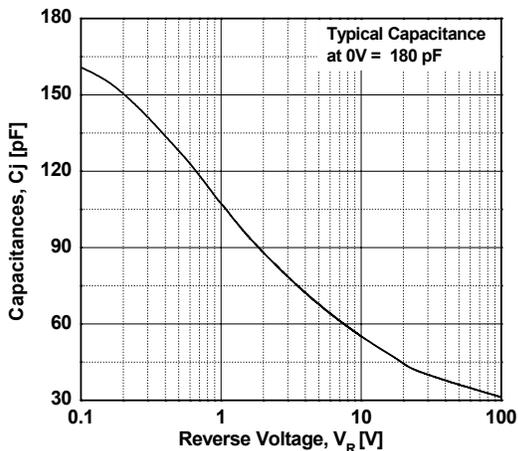
**Figure 1. Typical Forward Voltage Drop vs. Forward Current**



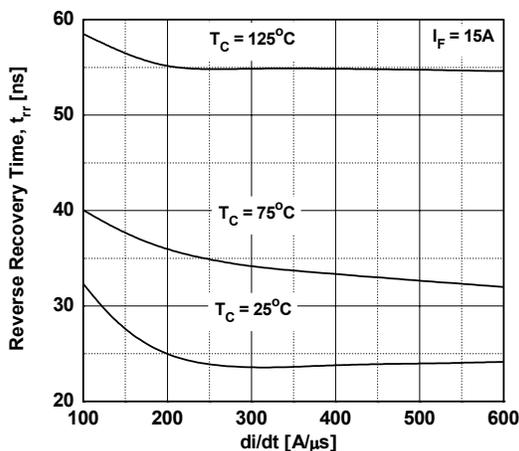
**Figure 2. Typical Reverse Current vs. Reverse Voltage**



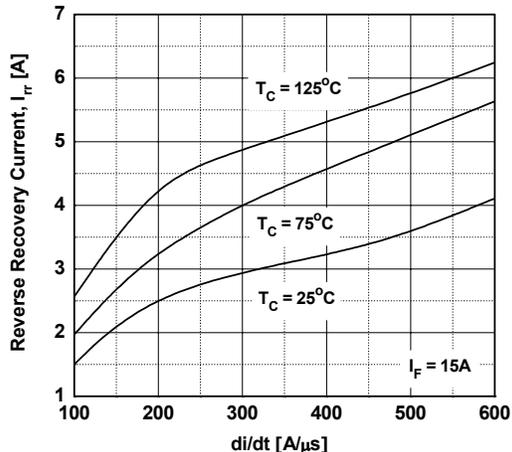
**Figure 3. Typical Junction Capacitance**



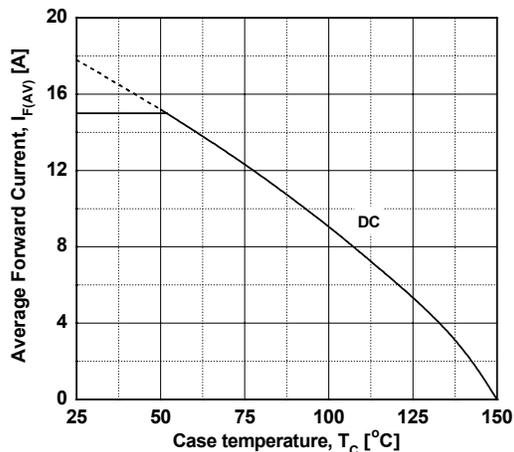
**Figure 4. Typical Reverse Recovery Time vs. di/dt**



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

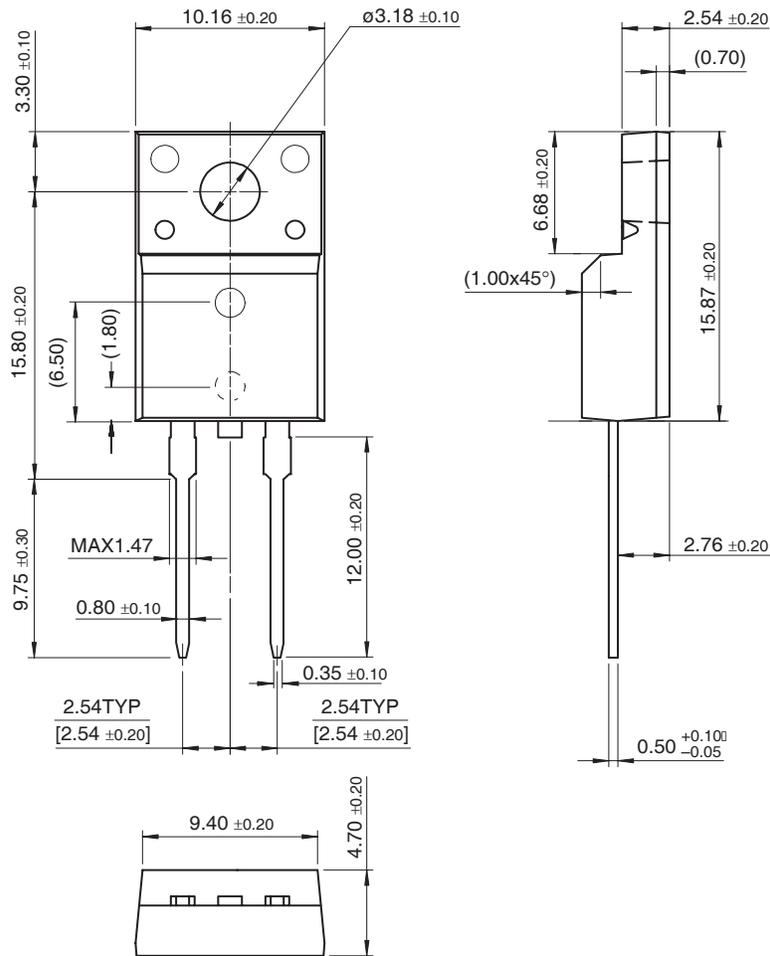


**Figure 6. Forward Current Derating Curve**



Mechanical Dimensions

TO-220F 2L



Dimensions in Millimeters



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| BitSiC™                  | Global Power Resource™                         | Programmable Active Droop™            | TinyBuck™        |
| Build it Now™            | GreenBridge™                                   | QFET®                                 | TinyCalc™        |
| CorePLUS™                | Green FPS™                                     | QS™                                   | TinyLogic®       |
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| CROSSVOLT™               | Gmax™  | RapidConfigure™                       | TinyPower™       |
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| FAST®                    | mWSaver™                                       | SuperSOT™-8                           | VisualMax™       |
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| FETBench™                | OPTOLOGIC®                                     | SyncFET™                              | XS™              |
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