



FFPF10H60S Hyperfast Recovery Power Rectifier

Features

- High Speed Switching ($t_{rr}=25\text{ns(Typ.)}$ @ $I_F=10\text{A}$)
- High Reverse Voltage and High Reliability
- Avalanche Energy Rated
- Low Forward Voltage($V_F=2.1\text{V(Typ.)}$ @ $I_F=10\text{A}$)

Applications

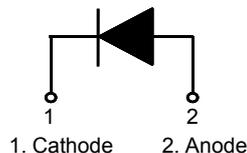
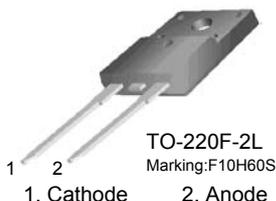
- General Purpose
- Switching Mode Power Supply
- Free-wheeling diode for motor application
- Power switching circuits

General Description

The FFPF10H60S is hyperfast rectifier ($t_{rr}=25\text{ns(Typ.)}$ @ $I_F=10\text{A}$). it has half the recovery time of ultrafast rectifier and is silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as freewheeling/clamping rectifiers in a variety of switching power supplies and other power switching applications. Its 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 | Value | 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 @ $T_C = 85^\circ\text{C}$ | 10 | A |
| I_{FSM} | Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave | 100 | A |
| T_J, T_{STG} | Operating Junction and Storage Temperature | - 65 to +150 | $^\circ\text{C}$ |

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

| Symbol | Parameter | Max | Units |
|-----------------|--|-----|--------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 3.4 | $^\circ\text{C/W}$ |

Package Marking and Ordering Information

| Device Marking | Device | Package | Reel Size | Tape Width | Quantity |
|----------------|--------------|---------|-----------|------------|----------|
| F10H60S | FFPF10H60STU | TO-220F | - | - | 50 |

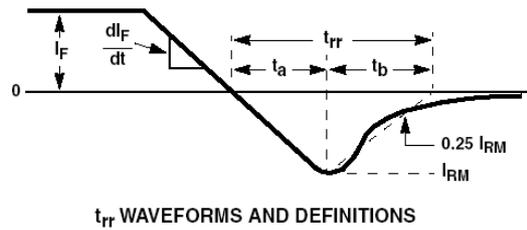
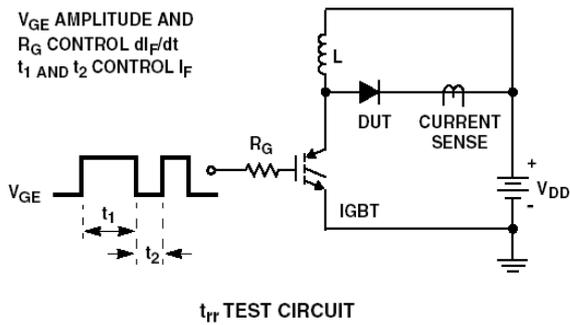
Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

| Parameter | Conditions | Min. | Typ. | Max | Units | |
|----------------------------|---|---------------------------|------|-----|-------|----|
| V_{FM}^1 | $I_F = 10\text{A}$ | $T_C = 25^\circ\text{C}$ | - | 2.1 | 2.5 | V |
| | $I_F = 10\text{A}$ | $T_C = 125^\circ\text{C}$ | - | - | 2.2 | V |
| I_{RM}^1 | $V_R = 600\text{V}$ | $T_C = 25^\circ\text{C}$ | - | - | 1 | mA |
| | $V_R = 600\text{V}$ | $T_C = 125^\circ\text{C}$ | - | - | 2 | mA |
| t_{rr} | $I_F = 1\text{A}, di/dt = 100\text{A}/\mu\text{s}, V_{CC} = 30\text{V}$ | $T_C = 25^\circ\text{C}$ | - | - | 35 | ns |
| | $I_F = 10\text{A}, di/dt = 50\text{A}/\mu\text{s}, V_{CC} = 390\text{V}$ | $T_C = 25^\circ\text{C}$ | - | 25 | 40 | ns |
| | $I_F = 10\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 390\text{V}$ | $T_C = 25^\circ\text{C}$ | - | 21 | - | ns |
| t_a t_b Q_{rr} | $I_F = 10\text{A}, di/dt = 50\text{A}/\mu\text{s}, V_{CC} = 390\text{V}$ | $T_C = 25^\circ\text{C}$ | - | 15 | - | ns |
| | | $T_C = 25^\circ\text{C}$ | - | 10 | - | ns |
| | | $T_C = 25^\circ\text{C}$ | - | 9.0 | - | nC |
| W_{AVL} | Avalanche Energy ($L = 40\text{mH}$) | 20 | - | - | mJ | |

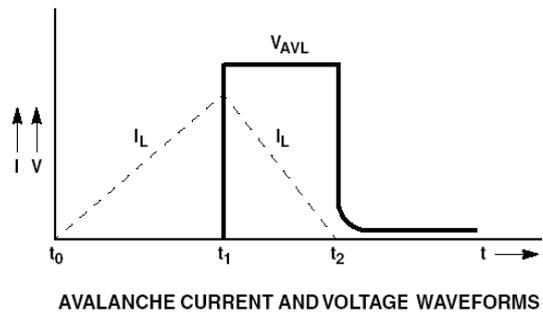
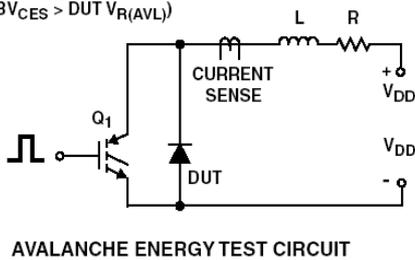
Notes:

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

Test Circuit and Waveforms



$I_{MAX} = 1\text{A}$
 $L = 40\text{mH}$
 $R < 0.1\Omega$
 $E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
 $Q_1 = \text{IGBT (}BV_{CES} > DUT V_{R(AVL)}\text{)}$



Typical Performance Characteristics $T_c = 25^\circ\text{C}$ unless otherwise noted

Figure 1. Typical Forward Voltage Drop

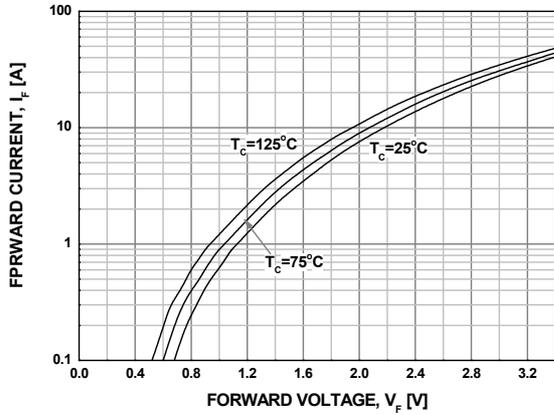


Figure 2. Typical Reverse Current

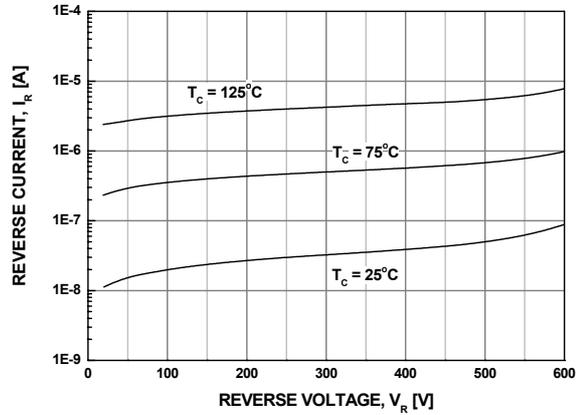


Figure 3. Typical Junction Capacitance

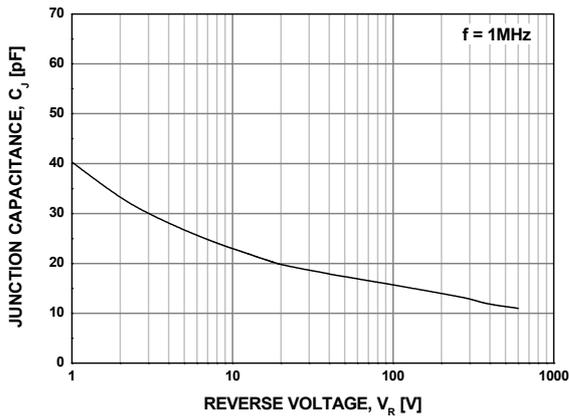


Figure 4. Typical Reverse Recovery Time

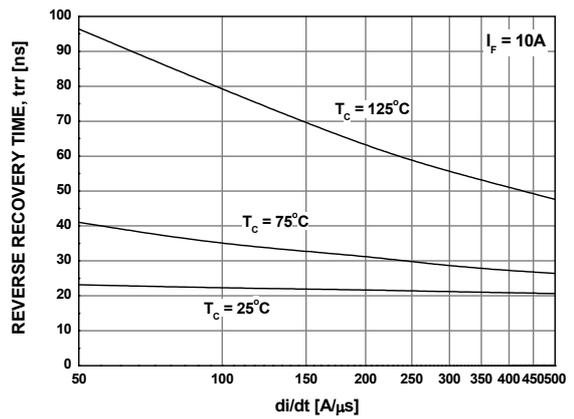


Figure 5. Typical Reverse Recovery Current

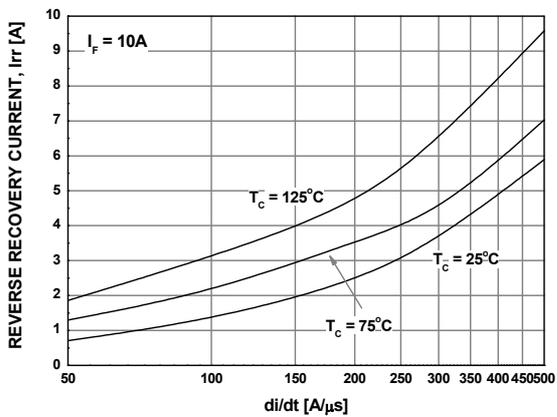
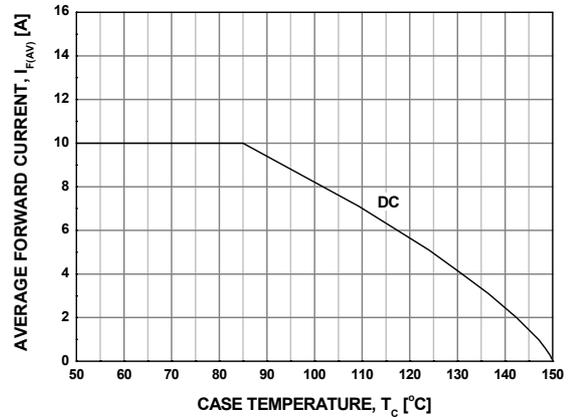
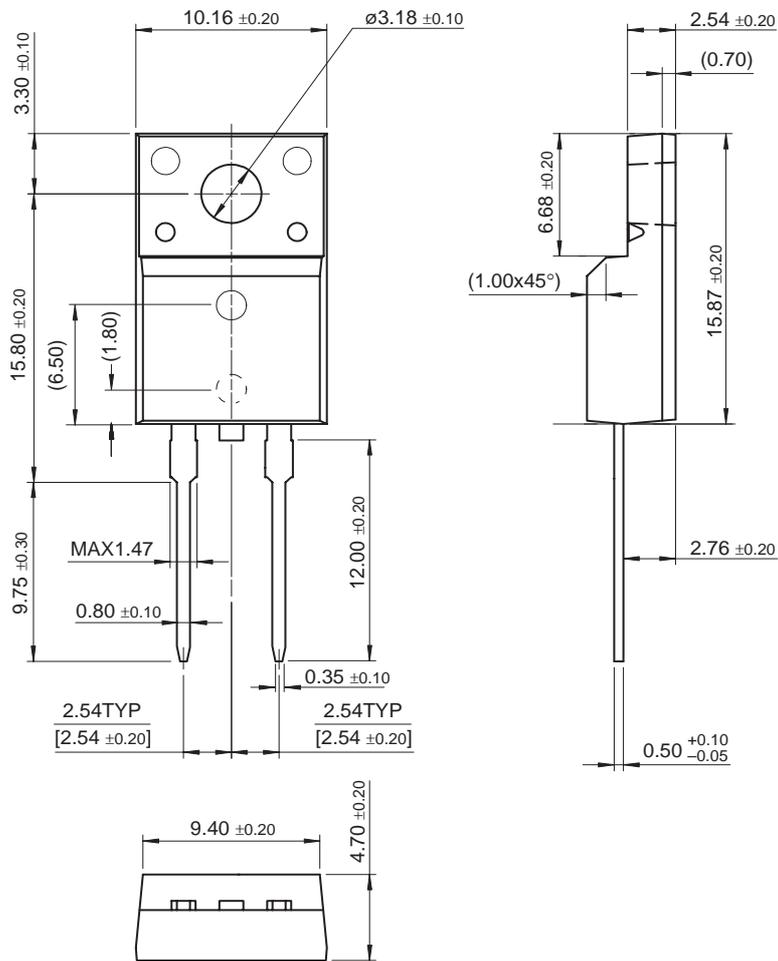


Figure 6. Forward Current Deration Curve



Mechanical Dimensions

TO-220F 2L



Dimensions in Millimeters

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