



October 2007

STEALTH™ II Rectifier

FFPF15S60S

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Features

- High Speed Switching, $t_{rr} < 35\text{ns}$ @ $I_F = 15\text{A}$
- 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



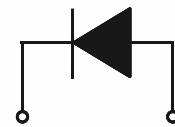
15A, 600V STEALTH™ II Rectifier

The FFPF15S60S 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 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.



1. Cathode 2. Anode



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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 @ $T_C = 52^\circ\text{C}$	15	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz 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	Ratings	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	4.6	$^\circ\text{C/W}$

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F15S60S	FFPF15S60STU	TO-220F-2L	-	-	50

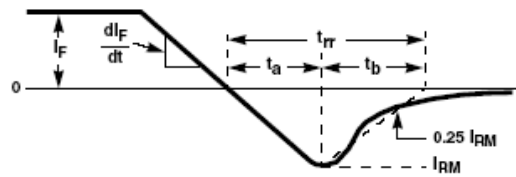
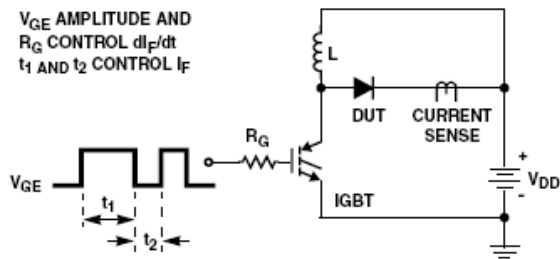
Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Min.	Typ.	Max.	Units
V_{FM1}	$I_F = 15\text{A}$ $I_F = 15\text{A}$	-	2.1 1.6	2.6 -	V
I_{RM1}	$V_R = 600\text{V}$ $V_R = 600\text{V}$	-	-	100 500	μA
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}	$I_F = 15\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_R = 390\text{V}$	-	23	35	ns
I_{rr}		-	2.5	-	A
S factor		-	0.7	-	-
Q_{rr}		-	29	-	nC
t_{rr}	$I_F = 15\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_R = 390\text{V}$	-	55	-	ns
I_{rr}		-	4.3	-	A
S factor		-	1.1	-	-
Q_{rr}		-	118	-	nC
W_{AVL}	Avalanche Energy ($L = 40\text{mH}$)	20	-	-	mJ

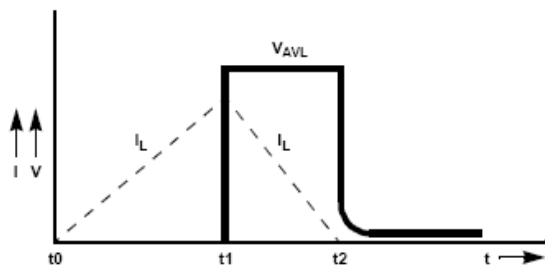
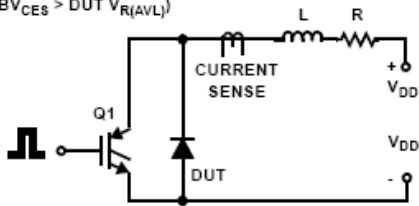
Notes:

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

Test Circuit and Waveforms



$L = 40\text{mH}$
 $R < 0.1\Omega$
 $V_{DD} = 50\text{V}$
 $E_{AVL} = 1/2 L I_2^2 [V_{R(AVL)} / (V_{R(AVL)} - V_{DD})]$
 $Q1 = \text{IGBT } (BV_{CES} > DUT V_{R(AVL)})$



Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop vs. Forward Current

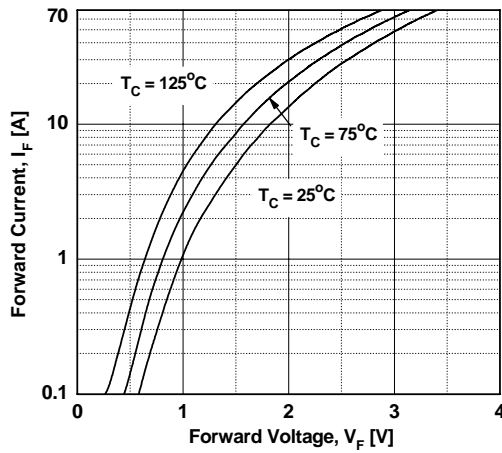


Figure 2. Typical Reverse Current vs. Reverse Voltage

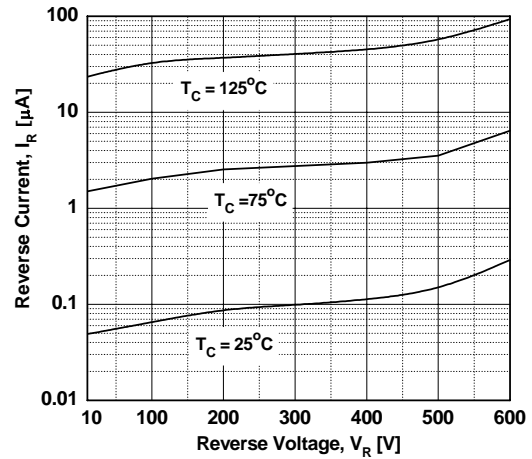


Figure 3. Typical Junction Capacitance

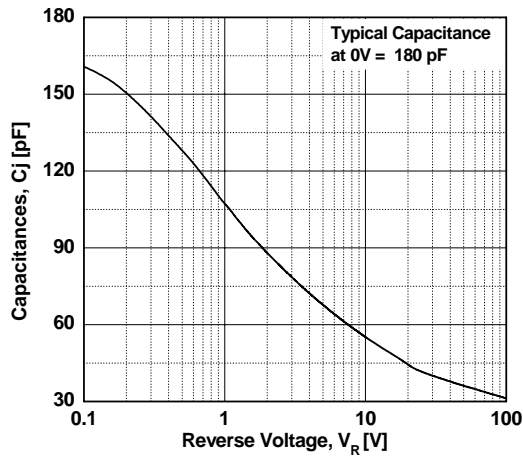


Figure 4. Typical Reverse Recovery Time vs. di/dt

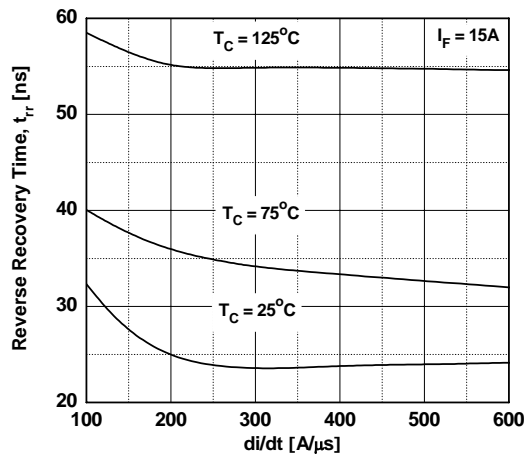


Figure 5. Typical Reverse Recovery Current vs. di/dt

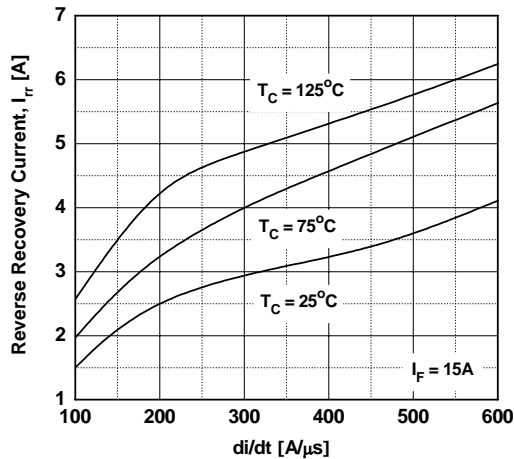
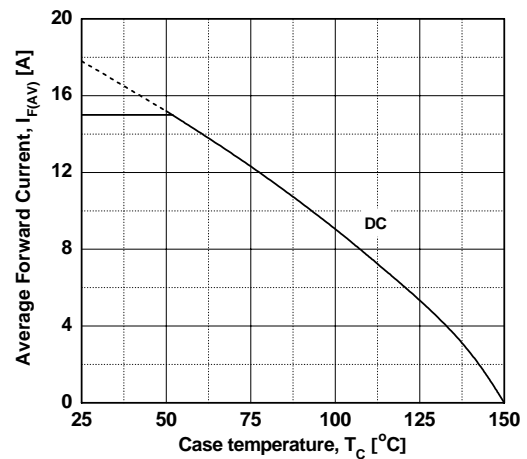
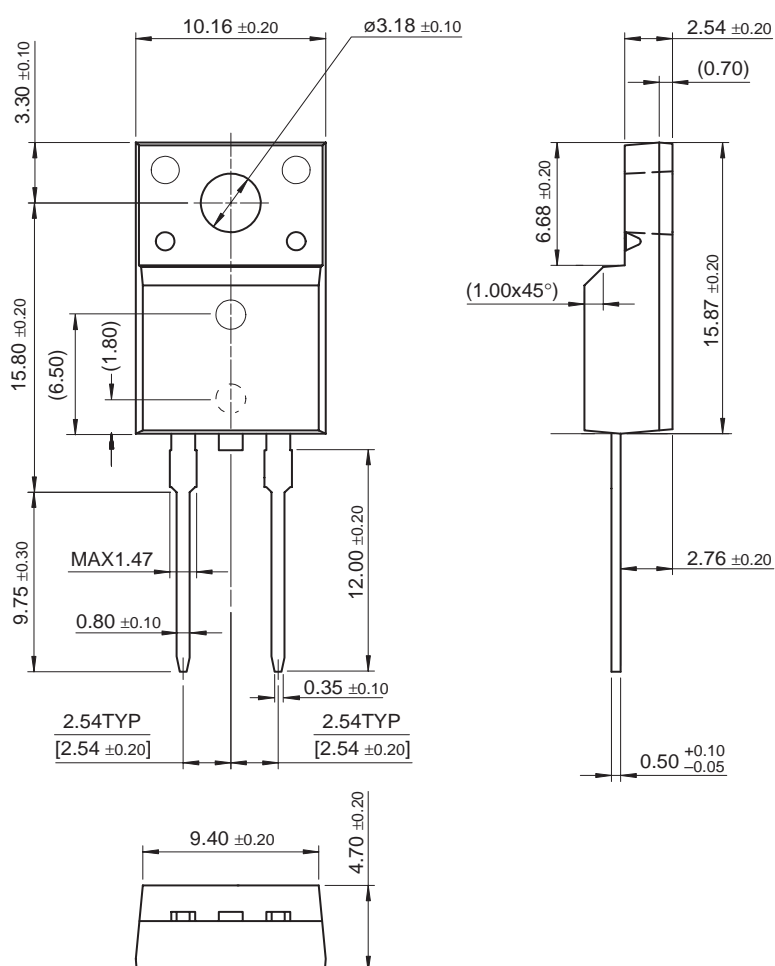


Figure 6. Forward Current Derating Curve




TO-220F 2L



Dimensions in Millimeters

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