FAIRCHILD SEMICONDUCTOR®

October 2007

STEALTH™ II Rectifier

FFPF04S60S

Features

- High Speed Switching, t_{rr} < 25ns @ I_F = 4A
- 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

4A, 600V STEALTH™ II Rectifier

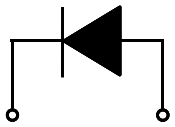
The FFPF04S60S is STEALTH™ II rectifier with soft recovery characteristics. It is silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as freewheeling of boost diode in switching power supplies and other power swithching 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.



TO-220F-2L

1. Cathode 2. Anode



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Absolute Maximum Ratings T_C = 25°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 = 116°C	4	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	40	A
T_J, T_{STG}	Operating and Storage Temperature Range	-65 to +150	°C

Thermal Characteristics

Symbol	Parameter	Ratings	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	6.8	°C/W

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F04S60S	FFPF04S60STU	TO-220F-2L	-	-	50

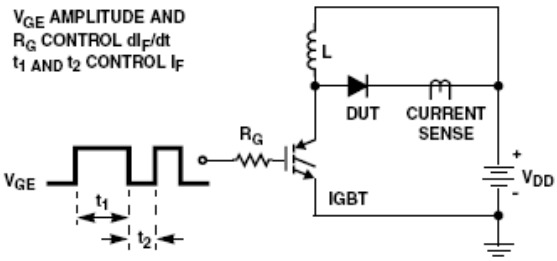
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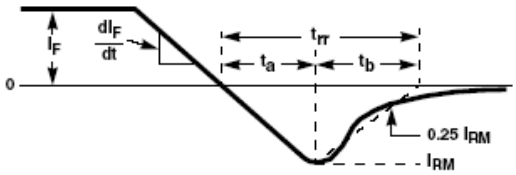
Electrical Characteristics $T_C = 25^oC$ unless otherwise noted

Symbol	Parameter		Min.	Typ.	Max.	Units
V_{FM}1	I_F = 4A I_F = 4A	$T_C = 25^oC$ $T_C = 125^oC$	- -	2.2 1.7	2.6 -	V
I_{RM}1	V_R = 600V V_R = 600V	$T_C = 25^oC$ $T_C = 125^oC$	- -	- -	100 500	μA
t_{rr}	I_F = 1A, di/dt = 100A/μs, V_R = 30V	$T_C = 25^oC$	-	16	23	ns
t_{rr} I_{rr} S factor Q_{rr}	I_F = 4A, di/dt = 200A/μs, V_R = 390V	$T_C = 25^oC$	- - - -	18 2 0.7 18	25 - - -	ns A nC
t_{rr} I_{rr} S factor Q_{rr}	I_F = 4A, di/dt = 200A/μs, V_R = 390V	$T_C = 125^oC$	- - - -	45 2.8 1.8 64	- - - -	ns A nC
W_{AVL}	Avalanche Energy (L = 40mH)		10	-	-	mJ

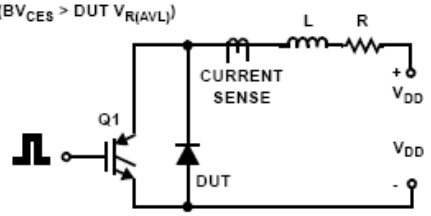
Notes:
1: Pulse: Test Pulse width = 300μs, Duty Cycle = 2%

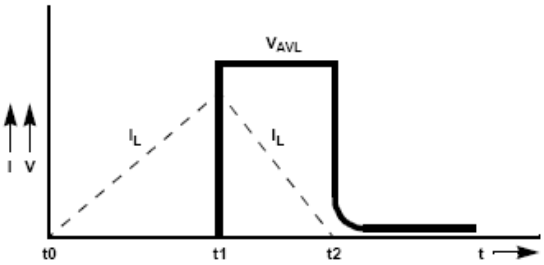
Test Circuit and Waveforms





L = 40mH
R < 0.1Ω
V_{DD} = 50V
EAVL = 1/2LI2 [$V_{R(AVL)}$/($V_{R(AVL)}$ - V_{DD})]
Q1 = IGBT (BV_{CES} > DUT $V_{R(AVL)}$)





Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop vs. Forward Current

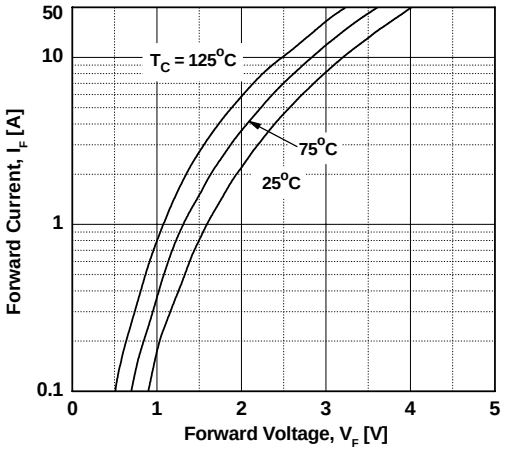


Figure 2. Typical Reverse Current vs. Reverse Voltage

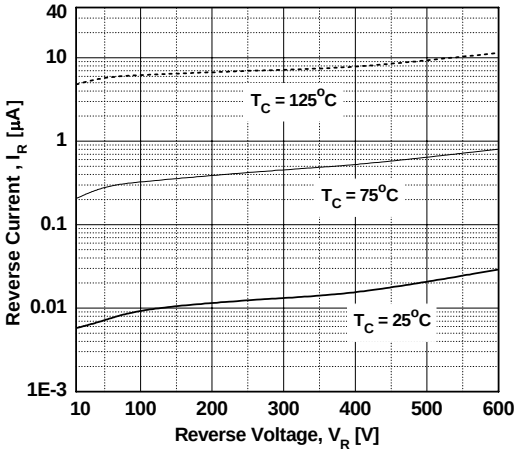


Figure 3. Typical Junction Capacitance

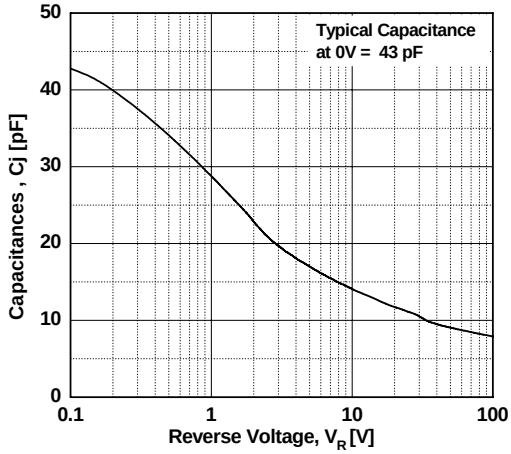


Figure 4. Typical Reverse Recovery Time vs. di/dt

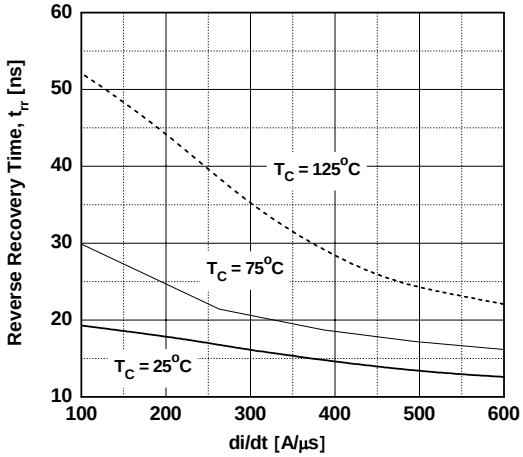


Figure 5. Typical Reverse Recovery Current vs. di/dt

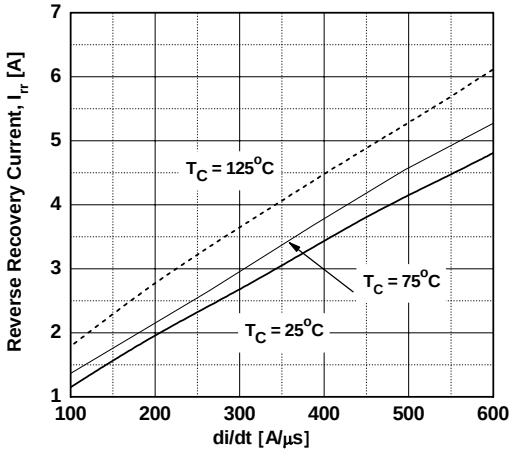
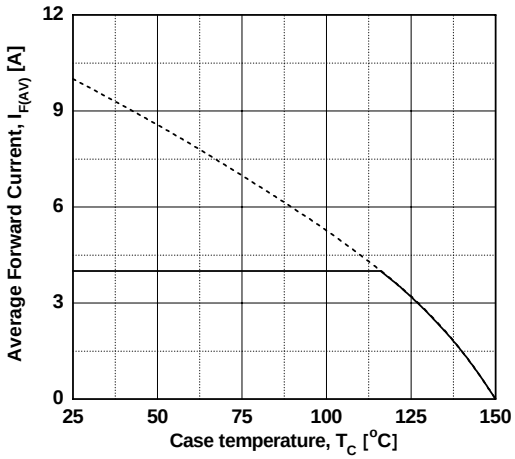
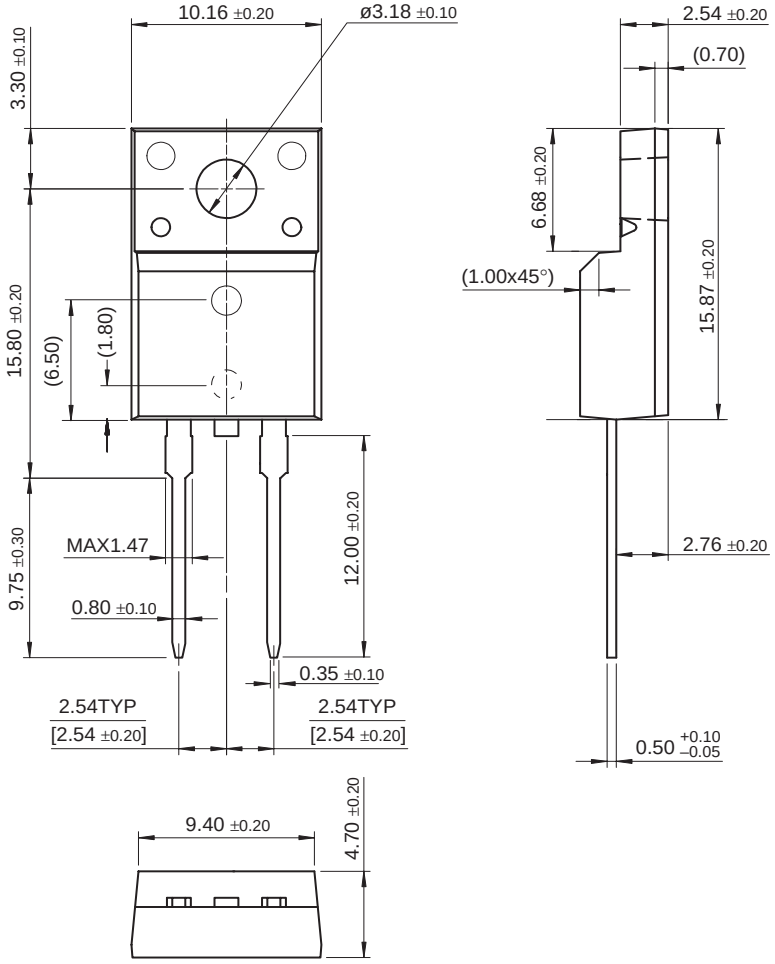


Figure 6. Forward Current Derating Curve



Mechanical Dimensions

TO-220F 2L



Dimensions in Millimeters

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Power220®
Power247®
POWEREDGE®
Power-SPM™
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