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November 2014

FFPF08H60S

8 A, 600 V, Hyperfast II Diode

Features

- Hyperfast Recovery $t_{rr} = 45$ ns (@ $I_F = 8$ A)
- Max Forward Voltage, $V_F = 2.6$ V (@ $T_C = 25^\circ\text{C}$)
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

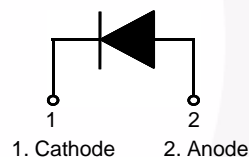
Applications

- General Purpose
- Switching Mode Power Supply
- Free-Wheeling Diode for Motor Application
- Power Switching Circuits

Description

The FFPF08H60S is a hyperfast II diode with soft recovery characteristics. It has the half recovery time of ultrafast diodes and is silicon nitride passivated ionimplanted epitaxial planar construction. These devices are intended to be used as freewheeling/ clamping diodes and diodes in a variety of 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	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 @ $T_C = 105^\circ\text{C}$	8	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	60	A
T_J, T_{STG}	Operating Junction and Storage Temperature	- 65 to +175	$^\circ\text{C}$

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

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

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFPF08H60STU	FFPF08H60S	TO-220F-2L	Tube	N/A	N/A	60

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

Parameter	Conditions		Min.	Typ.	Max	Unit
V _F ¹	I _F = 8 A	T _C = 25 °C	-	-	2.1	V
	I _F = 8 A	T _C = 125 °C	-	-	1.7	V
I _R ¹	V _R = 600 V	T _C = 25 °C	-	-	100	μA
	V _R = 600 V	T _C = 125 °C	-	-	200	μA
t _{rr}	I _F =1 A, di _F /dt = 100 A/μs, V _R = 30 V	T _C = 25 °C	-	-	35	ns
	I _F =8 A, di _F /dt = 100 A/μs, V _R = 390 V	T _C = 25 °C	-	-	45	ns
t _a	I _F =8 A, di _F /dt = 100 A/μs, V _R = 390 V	T _C = 25 °C	-	15	-	ns
t _b		T _C = 25 °C	-	16	-	ns
Q _{rr}		T _C = 25 °C	-	18.6	-	nC
W _{AVL}	Avalanche Energy (L = 40 mH)		20	-	-	mJ

Notes:

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

Test Circuit and Waveforms

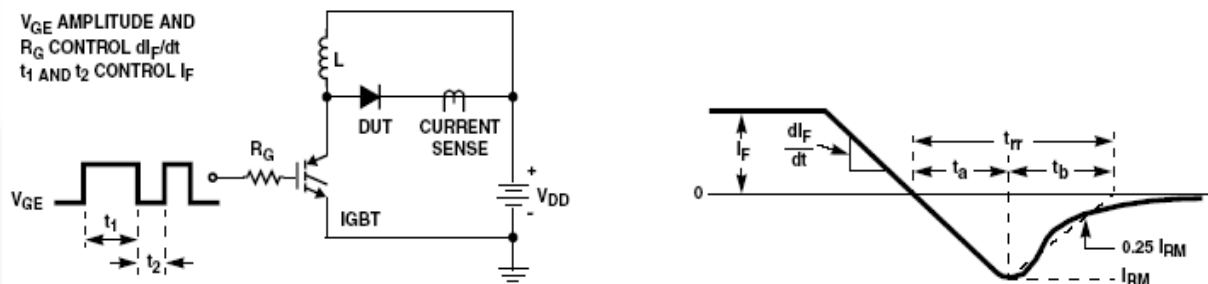


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

$L = 40\text{ mH}$

$R < 0.1\Omega$

$V_{DD} = 50\text{ V}$

$E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$

$Q1 = \text{IGBT } (BV_{CES} > DUT V_{R(AVL)})$

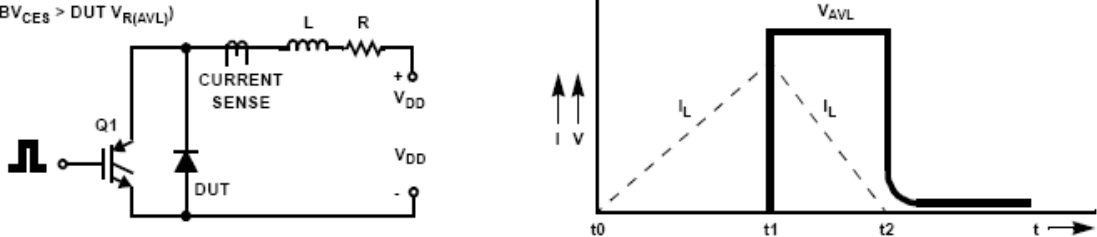


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

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

Figure 3. Typical Forward Voltage Drop

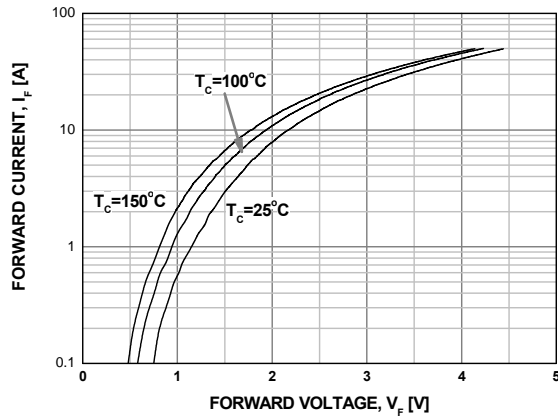


Figure 4. Typical Reverse Current

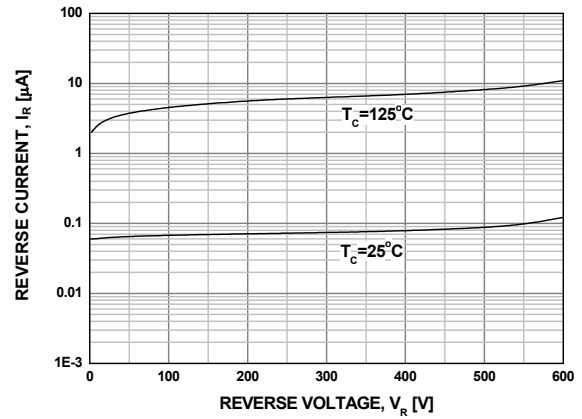


Figure 5. Typical Junction Capacitance

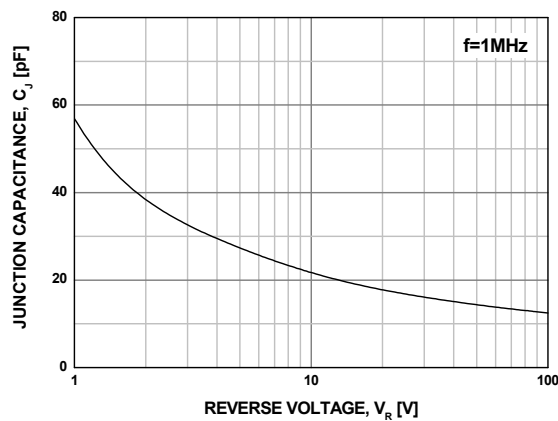


Figure 6. Typical Reverse Recovery Time

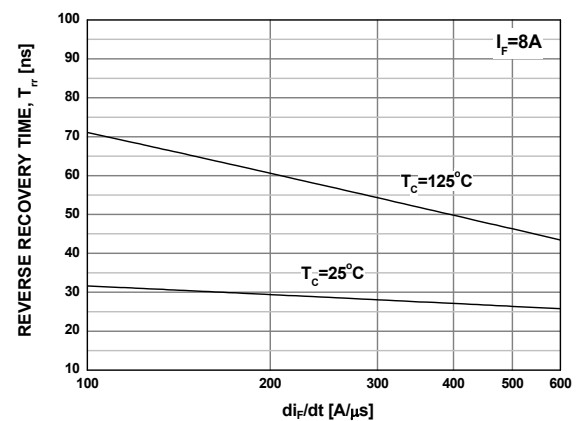


Figure 7. Typical Reverse Recovery Current

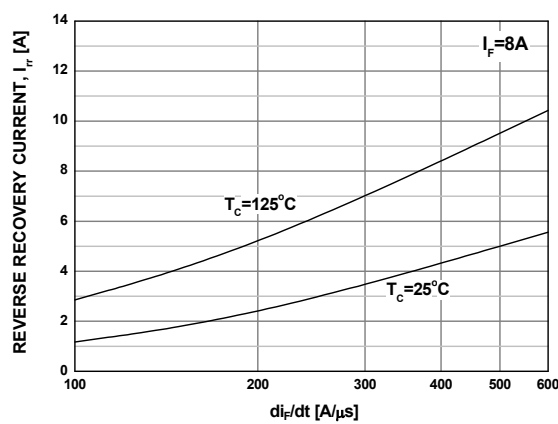
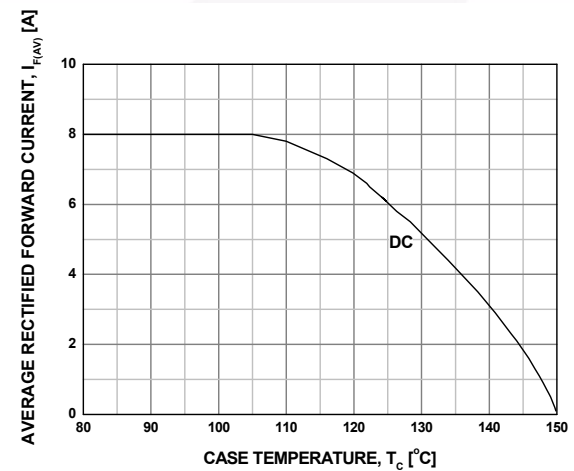
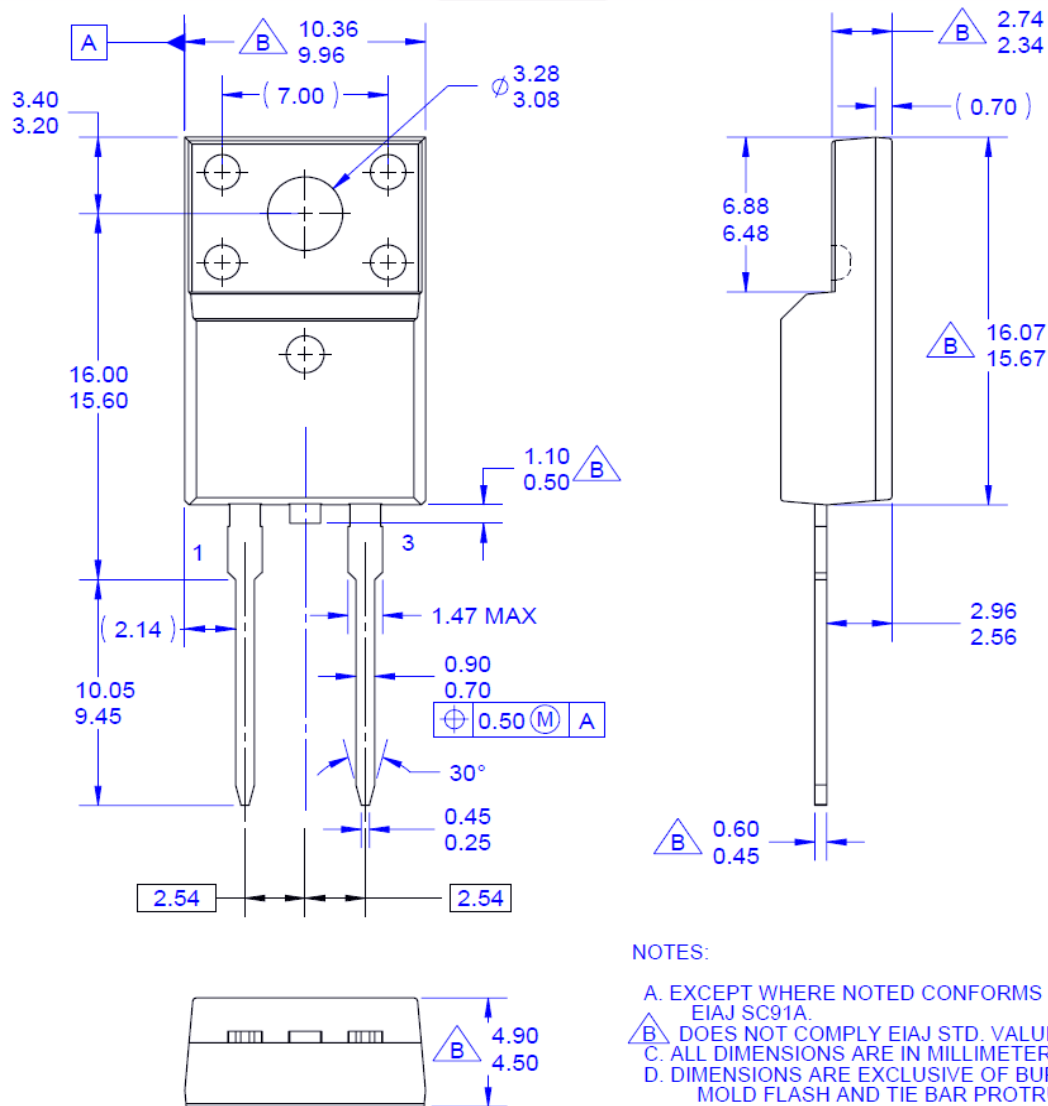


Figure 8. Forward Current Deration Curve



Mechanical Dimensions



NOTES:

- A. EXCEPT WHERE NOTED CONFORMS TO EIAJ SC91A.
- B. DOES NOT COMPLY EIAJ STD. VALUE.
- C. ALL DIMENSIONS ARE IN MILLIMETERS.
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.
- E. DIMENSION AND TOLERANCE AS PER ASME Y14.5-1994.
- F. DRAWING FILE NAME: TO220C02REV2

Figure 9. TO-220F 2L - 2LD; TO220; MOLDED; FULL PACK


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