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November 2014



FFP08S60S — STEALTH™ II Diode

# FFP08S60S 8 A, 600 V, STEALTH™ II Diode

## Features

- Stealth Recovery  $t_{rr} = 30$  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

## Description

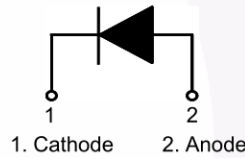
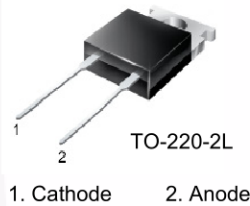
The FFP08S60S is a STEALTH™ II diode with soft recovery characteristics. It is silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as freewheeling 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.

## Applications

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

## Pin Assignments



## Absolute Maximum Ratings

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 @ $T_C = 115^\circ\text{C}$	8	A
$I_{FSM}$	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	80	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	2.5	$^\circ\text{C/W}$

## Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFP08S60STU	F08S60S	TO-220-2L	Tube	N/A	N/A	50

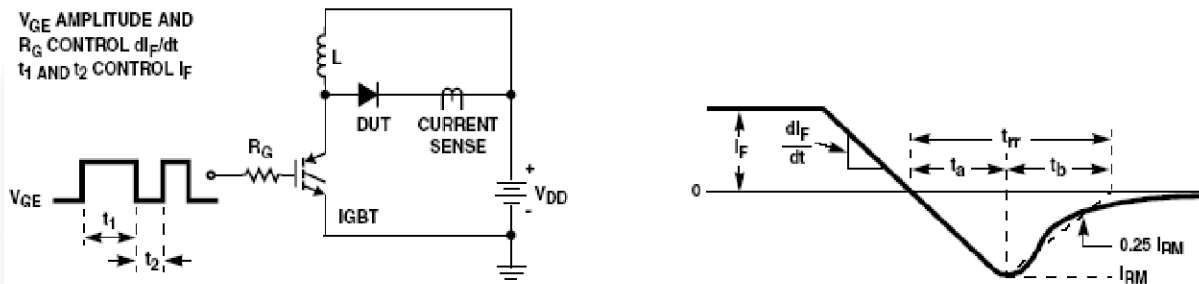
**Electrical Characteristics**  $T_C = 25^\circ\text{C}$  unless otherwise noted

Parameter	Conditions		Min.	Typ.	Max.	Unit
$V_F^1$	$I_F = 8\text{ A}$	$T_C = 25^\circ\text{C}$	-	2.1	2.6	V
	$I_F = 8\text{ A}$	$T_C = 125^\circ\text{C}$	-	1.6	-	V
$I_R^1$	$V_R = 600\text{ V}$	$T_C = 25^\circ\text{C}$	-	-	100	$\mu\text{A}$
	$V_R = 600\text{ V}$	$T_C = 125^\circ\text{C}$	-	-	500	$\mu\text{A}$
$t_{rr}$	$I_F = 1\text{ A}$ , $di_F/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$	$T_C = 25^\circ\text{C}$	-	-	25	ns
$t_{rr}$ $I_{rr}$ S factor $Q_{rr}$	$I_F = 8\text{ A}$ , $di_F/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 390\text{ V}$	$T_C = 25^\circ\text{C}$	-	19	30	ns
			-	2.2	-	A
			-	0.6	-	
			-	21	-	nC
			-	-	-	-
$t_{rr}$ $I_{rr}$ S factor $Q_{rr}$	$I_F = 8\text{ A}$ , $di_F/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 390\text{ V}$	$T_C = 125^\circ\text{C}$	-	58	-	ns
			-	4.3	-	A
			-	1.3	-	
			-	125	-	nC
			-	-	-	-
$W_{AVL}$	Avalanche Energy ( $L = 40\text{ mH}$ )		20	-	-	mJ

**Notes:**

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

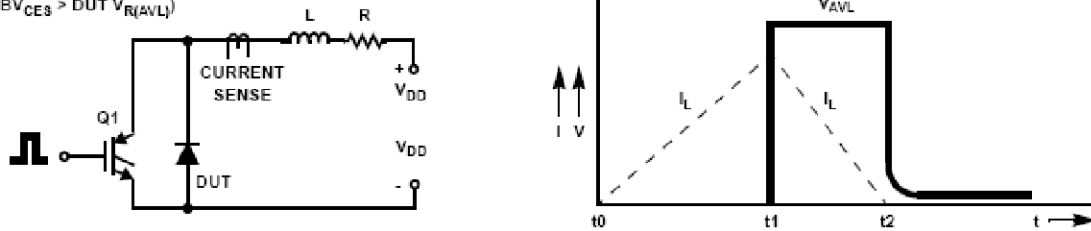
**Test Circuit and Waveforms**



**Figure 1. Diode Reverse Recovery Test Circuit & Waveform**

$L = 40\text{mH}$   
 $R < 0.1\Omega$   
 $V_{DD} = 50\text{V}$

$E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$   
 $Q1 = \text{IGBT } (BV_{CE3} > \text{DUT } V_{R(AVL)})$



**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

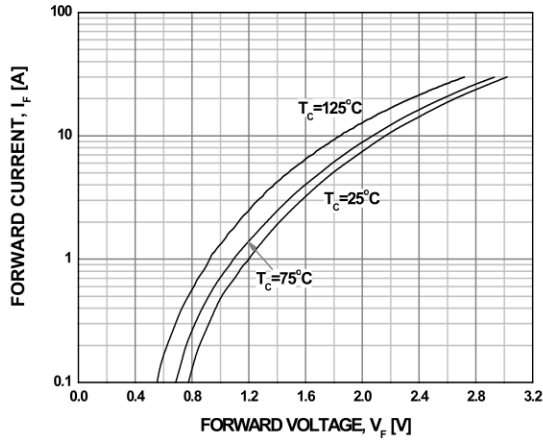


Figure 4. Typical Reverse Current

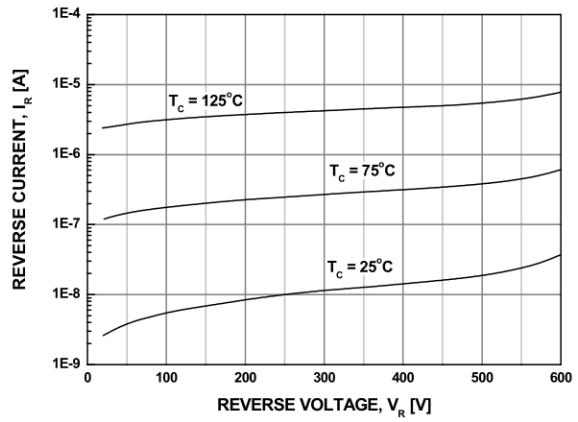


Figure 5. Typical Junction Capacitance

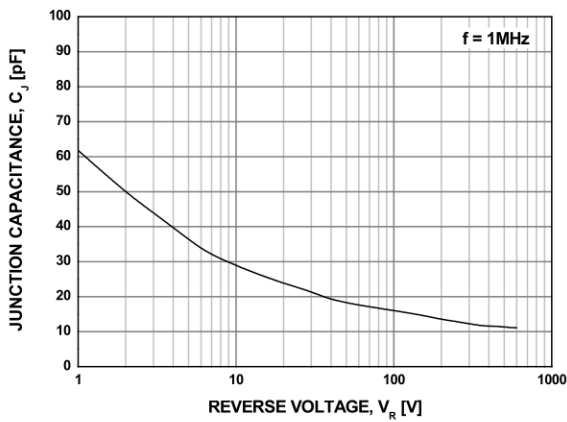


Figure 6. Typical Reverse Recovery Time

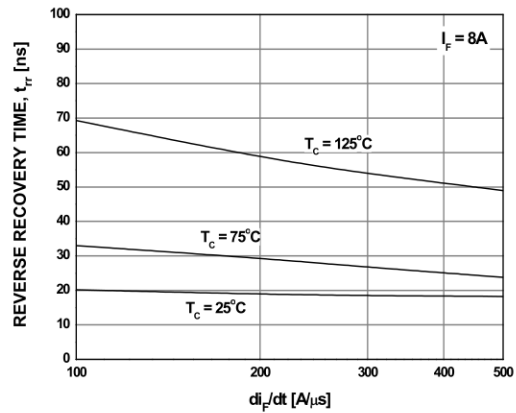


Figure 7. Typical Reverse Recovery Current

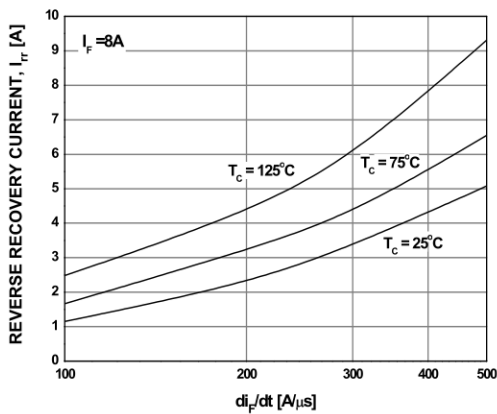
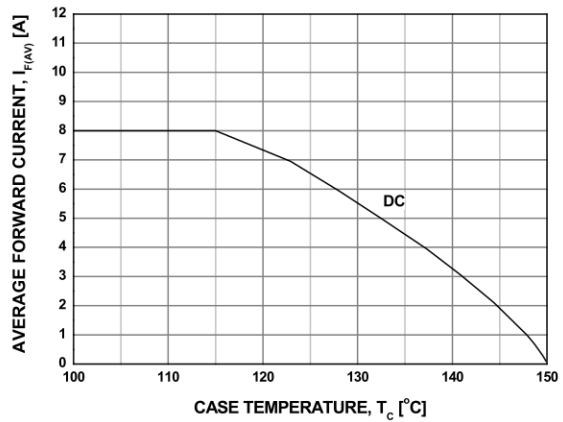
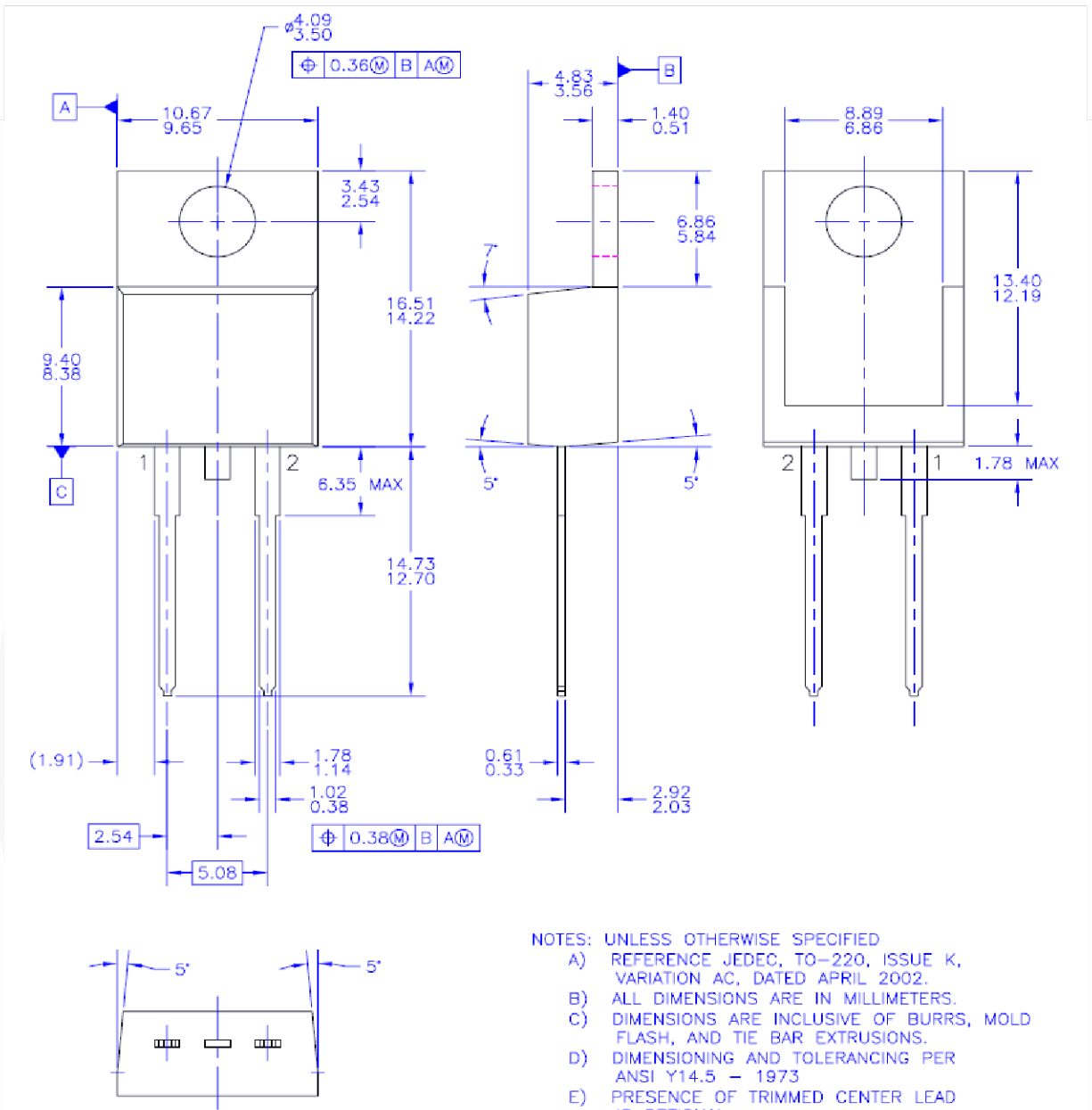


Figure 8. Forward Current Deration Curve



**Mechanical Dimensions**



- NOTES: UNLESS OTHERWISE SPECIFIED
- A) REFERENCE JEDEC, TO-220, ISSUE K, VARIATION AC, DATED APRIL 2002.
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
  - D) DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973
  - E) PRESENCE OF TRIMMED CENTER LEAD IS OPTIONAL

**Figure 9. TO-220 2L - 2LD, TO220, JEDEC TO-220 VARIATION AC**

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