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# FFH30S60S

## 30 A, 600 V STEALTH™ II Diode

### Features

- Stealth Recovery,  $t_{rr} = 40 \text{ ns}$  (@  $I_F = 30 \text{ A}$ )
- Max. Forward Voltage,  $V_F = 2.6 \text{ V}$  (@  $T_C = 25^\circ\text{C}$ )
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

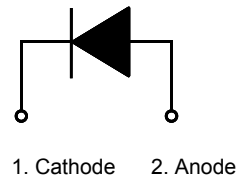
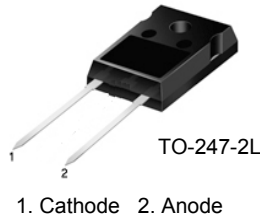
### Applications

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

### Description

The FFH30S60S is STEALTH™ II diode with soft recovery characteristics using silicon nitride passivated ion-implanted epitaxial planar construction. This device is intended for use as a freewheeling 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 power switching circuits, reducing power loss in switching transistors.

### Pin Assignments



### Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted.

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 @ $T_C = 102^\circ\text{C}$	30	A
$I_{FSM}$	Non-Repetitive Peak Surge Current 60 Hz Single Half-Sine Wave	300	A
$T_J, T_{STG}$	Operating and Storage Temperature Range	-65 to +175	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	1.1	$^\circ\text{C}/\text{W}$

### Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFH30H60STU	F30H60S	TO-247	Tube	N/A	N/A	30

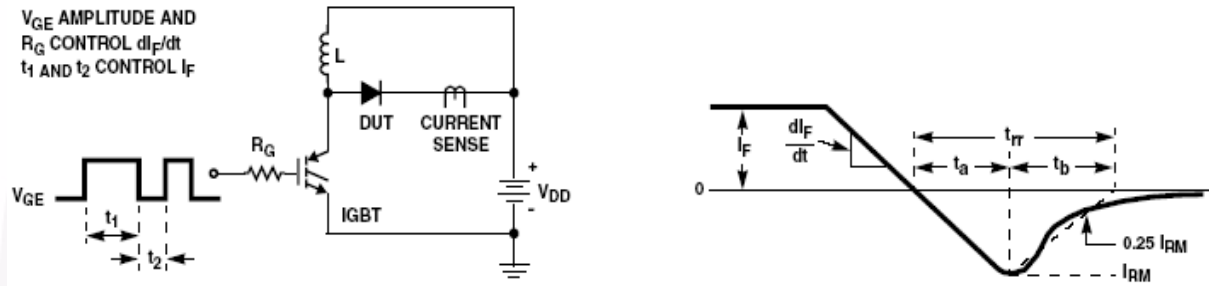
**Electrical Characteristics**  $T_C = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{F1}$	$I_F = 30\text{ A}$ $I_F = 30\text{ A}$	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	2.1 1.6	2.6 -	V
$I_{R1}$	$V_R = 600\text{ V}$ $V_R = 600\text{ V}$	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	- -	100 500	$\mu\text{A}$
$t_{rr}$	$I_F = 1\text{ A}$ , $di_F/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$	$T_C = 25^\circ\text{C}$	-	25 35	ns
$t_{rr}$ $I_{rr}$ S factor $Q_{rr}$	$I_F = 30\text{ A}$ , $di_F/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 390\text{ V}$	$T_C = 25^\circ\text{C}$	- - - -	28 2.4 0.9 34	ns A - nC
$t_{rr}$ $I_{rr}$ S factor $Q_{rr}$	$I_F = 30\text{ A}$ , $di_F/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 390\text{ V}$	$T_C = 125^\circ\text{C}$	- - - -	75 6.3 0.9 236	ns A - nC
$W_{AVL}$	Avalanche Energy ( $L = 40\text{ mH}$ )	20	-	-	mJ

**Notes:**

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

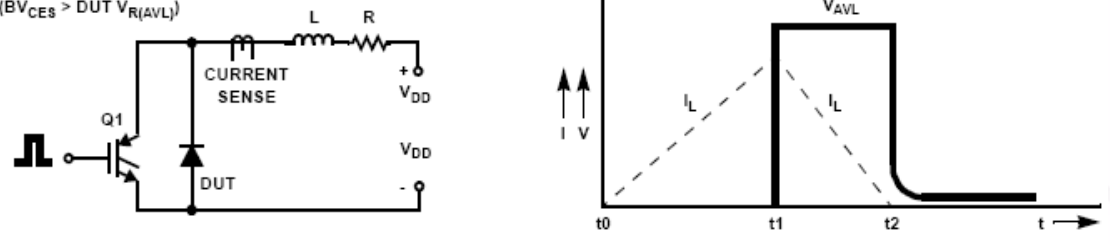
**Test Circuit and Waveforms**



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

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

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



**Figure 2. Unclamped Inductive Switching Test Circuit & Waveform**

### Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop vs. Forward Current

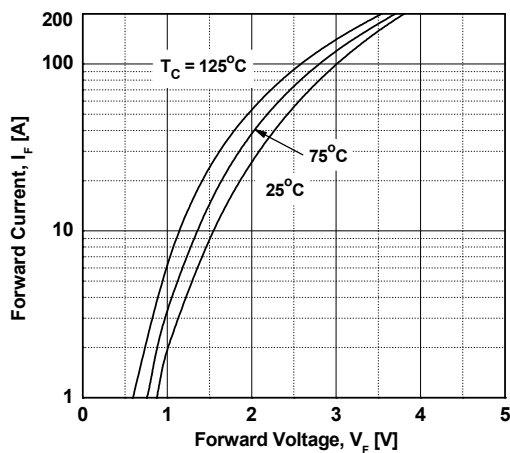


Figure 4. Typical Reverse Current vs. Reverse Voltage

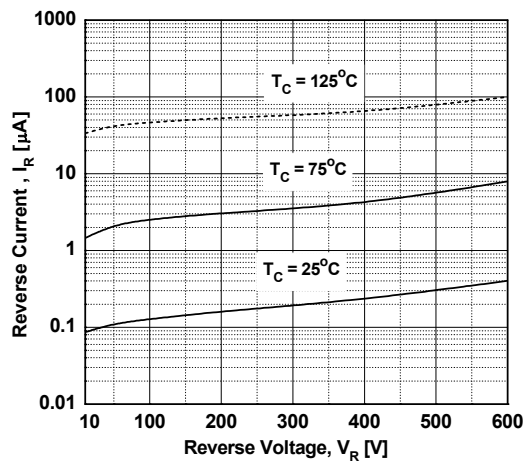


Figure 5. Typical Junction Capacitance

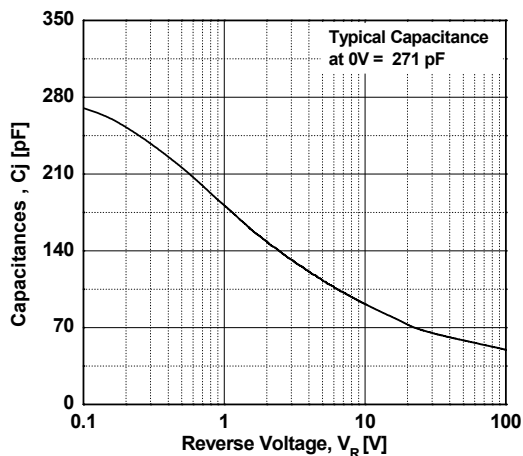


Figure 6. Typical Reverse Recovery Time vs.  $di_F/dt$

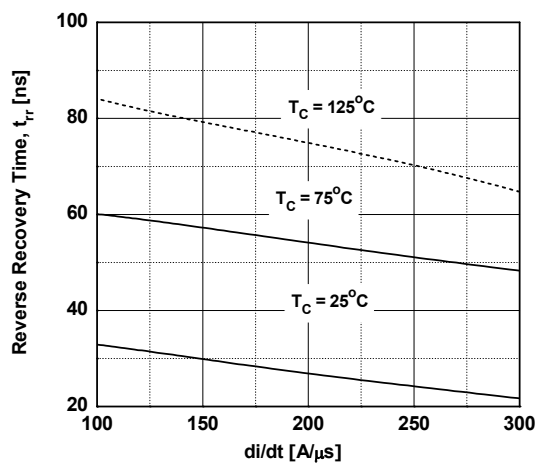


Figure 7. Typical Reverse Recovery Current vs.  $di_F/dt$

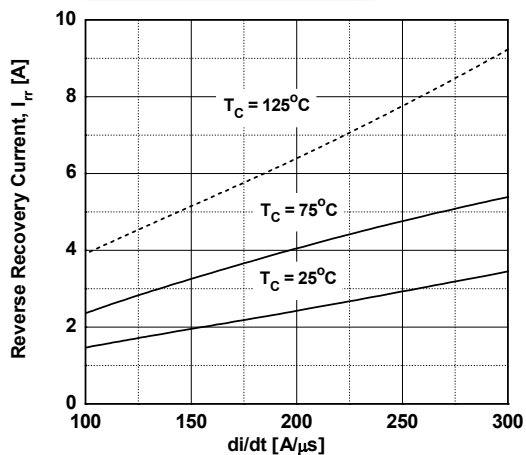
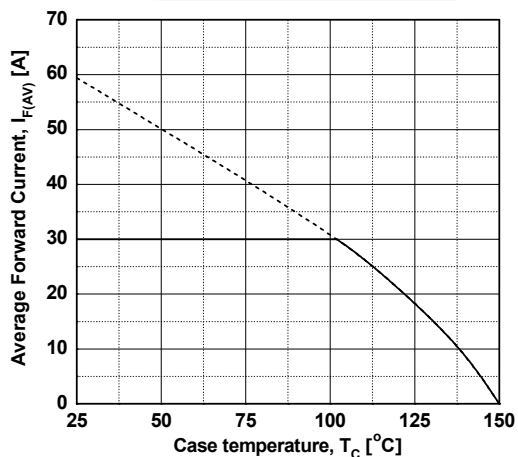
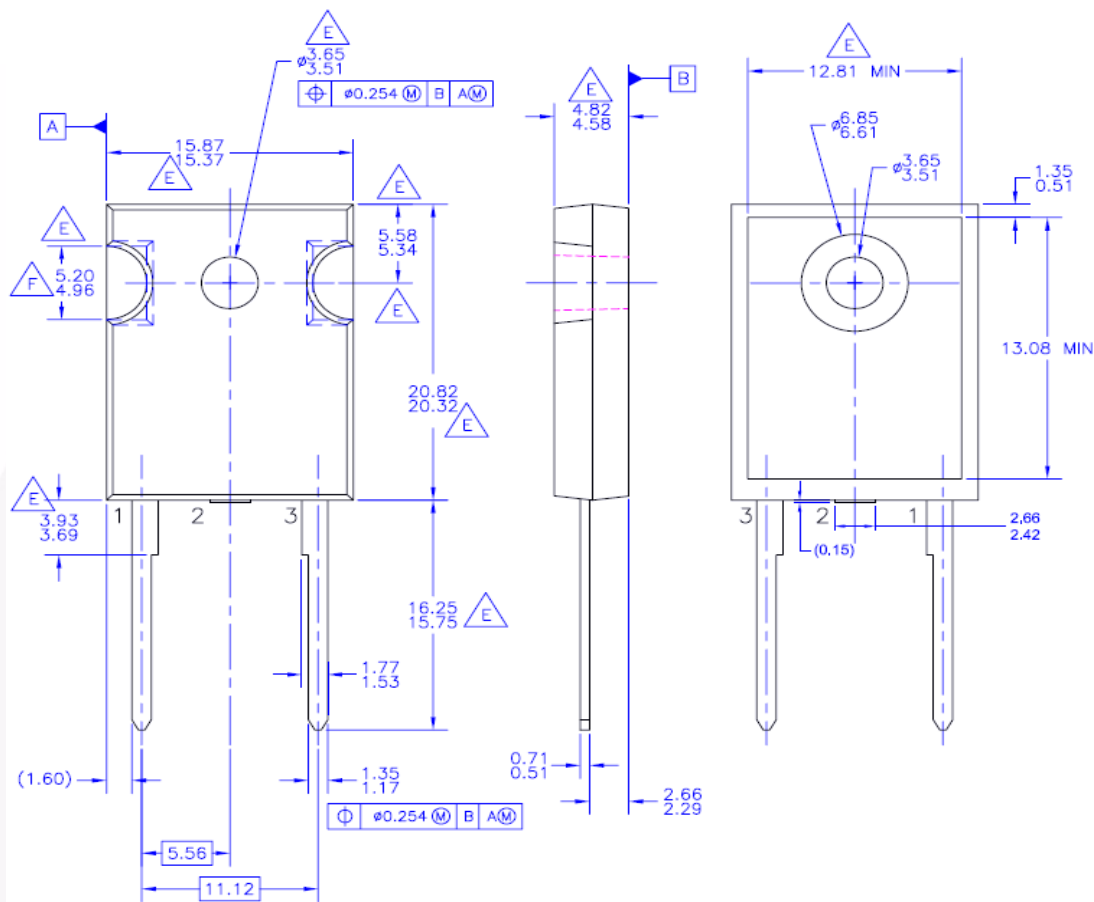


Figure 8. Forward Current Derating Curve



Mechanical Dimensions

TO-247 2L



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- A. PACKAGE REFERENCE: JEDEC TO-247, ISSUE E, VARIATION AB, DATED JUNE, 2004.
  - B. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
  - C. ALL DIMENSIONS ARE IN MILLIMETERS.
  - D. DRAWING CONFORMS TO ASME Y14.5 - 1994
  - E. DOES NOT COMPLY JEDEC STANDARD VALUE
  - F. NOTCH MAY BE SQUARE
  - G. DRAWING FILENAME: MKT-TO247B02\_REV02

Figure 9. TO-247, Molded, 2LD, Jeduc Option AB

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| Awinda®                  | FRFET®  | PowerXS™                    |                  |
| AX-CAP®*                 | Global Power ResourceSM                         | Programmable Active Droop™  |                  |
| BitSiC™                  | GreenBridge™                                    | QFET®                       |                  |
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|                          |   |                             | TRUECURRENT®*    |
|                          |   |                             | μSerDes™         |
|                          |   |                             |                  |
|                          |   |                             | UHC®             |
|                          |   |                             | Ultra FRFET™     |
|                          |   |                             | UniFET™          |
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