



# FFD04H60S

## Features

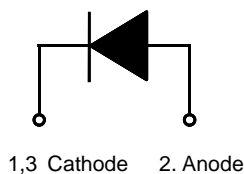
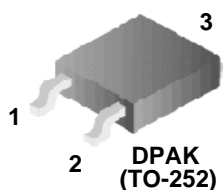
- Hyperfast Recovery,  $t_{rr} = 60 \text{ ns}$  (@  $I_F = 4 \text{ A}$ )
- Max Forward Voltage,  $V_F = 2.1 \text{ V}$  (@  $T_C = 25^\circ\text{C}$ )
- 600V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

## 4 A, 600 V, Hyperfast II Diode

The FFD04H60S is a hyperfast II diode and silicon nitride passivated ion-implanted epitaxial planar construction. This device is intended for use as freewheeling/clamping diodes in a variety of switching power supplies and other power switching applications. Its 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
- Switching Mode Power Supply
- Free-Wheeling Diode for Motor Application
- Power Switching Circuits



## 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 @ $T_C = 130^\circ\text{C}$	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	$^\circ\text{C}$

## Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	4.0	$^\circ\text{C/W}$

## Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F04H60S	FFD04H60S	D-PAK	13" Dia	-	2500

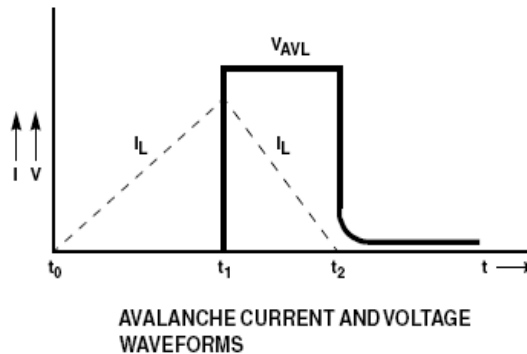
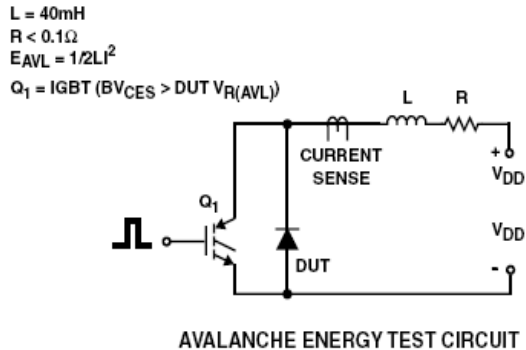
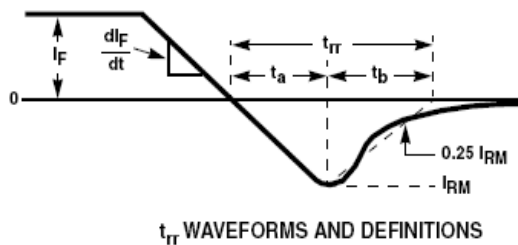
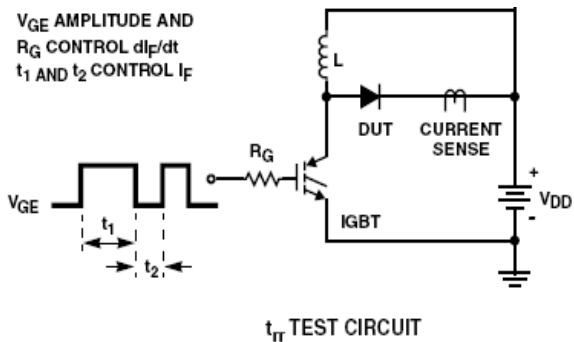
**Electrical Characteristics**  $T_C = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{F1}$	$I_F = 4\text{ A}$ $I_F = 4\text{ A}$	-	-	2.1 1.7	V
$I_{R1}$	$V_R = 600\text{ V}$ $V_R = 600\text{ V}$	-	-	100 200	$\mu\text{A}$
$T_{rr}$	$I_F = 1\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $V_{CC} = 30\text{ V}$ $I_F = 4\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $V_{CC} = 390\text{ V}$	-	19 25	- 60	ns
$I_{rr}$ $Q_{rr}$	$I_F = 4\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $V_{CC} = 390\text{ V}$	-	1.5 18	-	A nC
$W_{AVL}$	Avalanche Energy ( $L = 40\text{ mH}$ )	4	-	-	mJ

**Notes:**

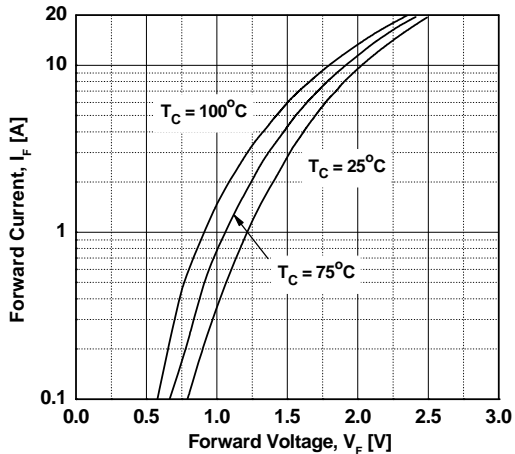
1: Pulse: Test Pulse width = 300  $\mu\text{s}$ , Duty Cycle = 2%

**Test Circuit and Waveforms**

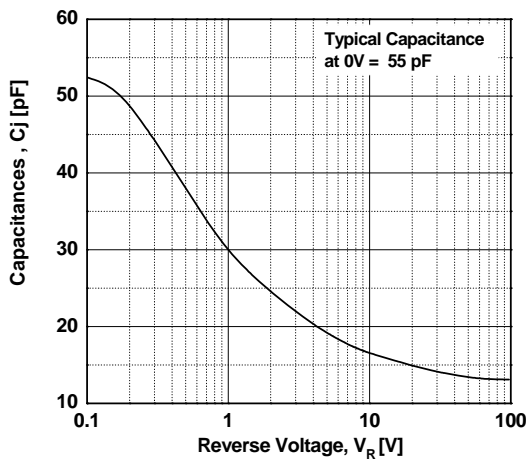


## Typical Performance Characteristics

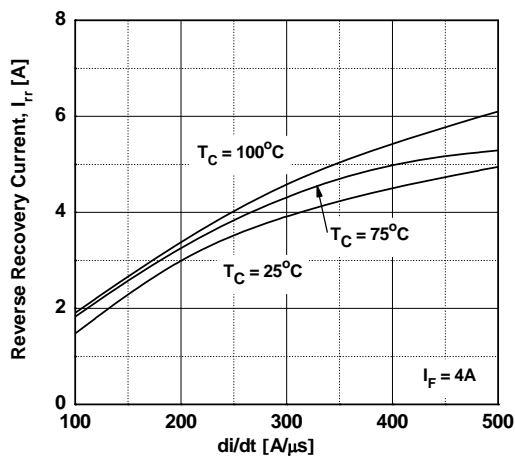
**Figure 1. Typical Forward Voltage Drop vs. Forward Current**



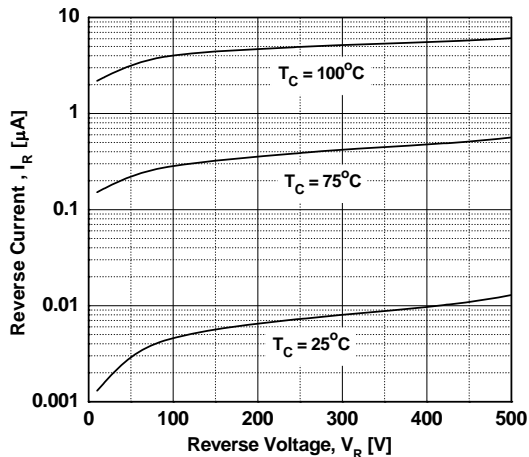
**Figure 3. Typical Junction Capacitance**



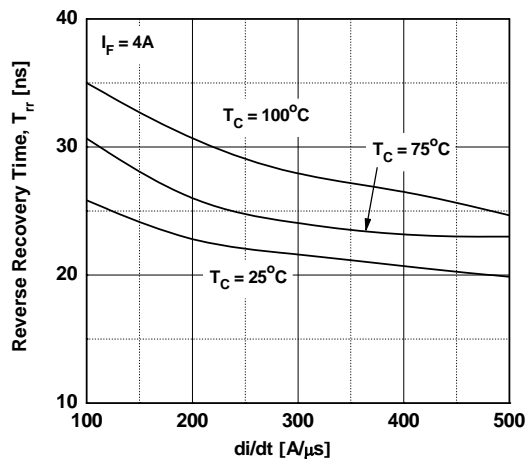
**Figure 5. Typical Reverse Recovery Current vs. di/dt**



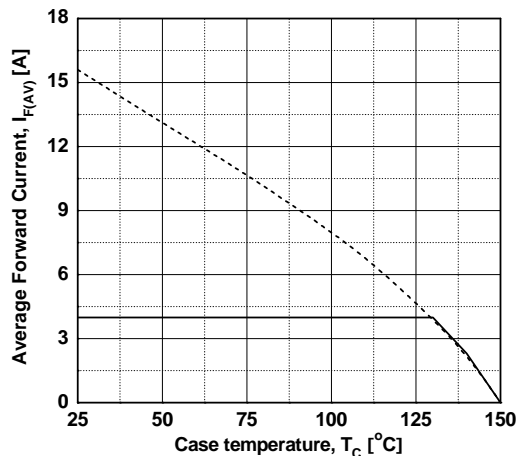
**Figure 2. Typical Reverse Current vs. Reverse Voltage**



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

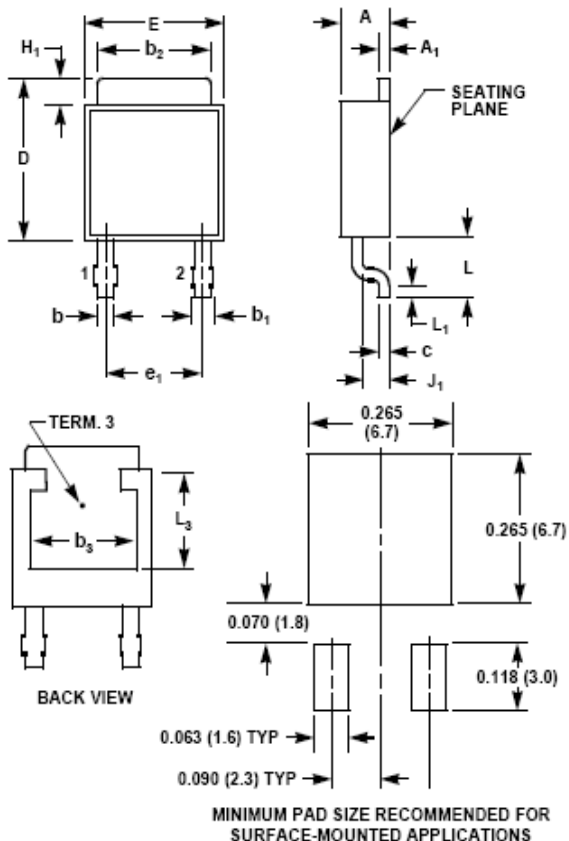


**Figure 6. Forward Current Derating Curve**



## Mechanical Dimensions

### D-PAK



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.086	0.094	2.19	2.38	-
A <sub>1</sub>	0.018	0.022	0.46	0.55	3, 4
b	0.028	0.032	0.72	0.81	3, 4
b <sub>1</sub>	0.033	0.040	0.84	1.01	3
b <sub>2</sub>	0.205	0.215	5.21	5.46	3, 4
b <sub>3</sub>	0.190	-	4.83	-	2
c	0.018	0.022	0.46	0.55	3, 4
D	0.270	0.290	6.86	7.36	-
E	0.250	0.265	6.35	6.73	-
e <sub>1</sub>	0.180 BSC		4.57 BSC		6
H <sub>1</sub>	0.035	0.045	0.89	1.14	-
J <sub>1</sub>	0.040	0.045	1.02	1.14	-
L	0.100	0.115	2.54	2.92	-
L <sub>1</sub>	0.020	-	0.51	-	3, 5
L <sub>3</sub>	0.170	-	4.32	-	2


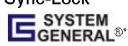



**NOTES:**

1. No current JEDEC outline for this package.
2. L<sub>3</sub> and b<sub>3</sub> dimensions establish a minimum mounting surface for terminal 3.
3. Dimension (without solder).
4. Add typically 0.002 inches (0.05mm) for solder plating.
5. L<sub>1</sub> is the terminal length for soldering.
6. Position of lead to be measured 0.090 inches (2.28mm) from bottom of dimension D.
7. Controlling dimension: Inch.
8. Revision 8 dated 5-99.



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