

Pb Free Plating Product**FFD04H60S**

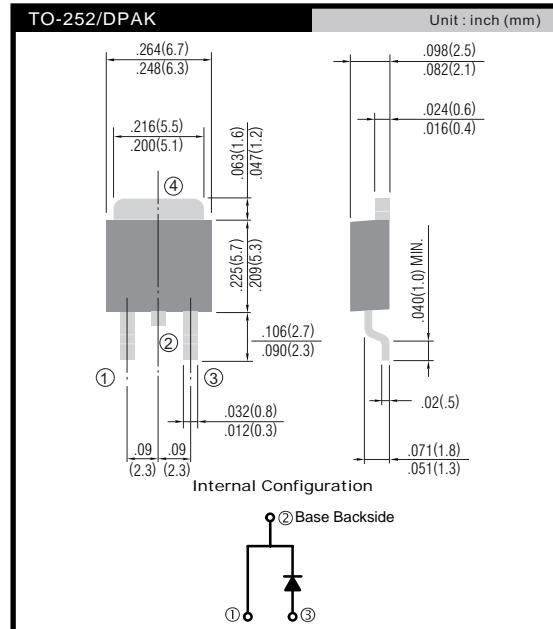
4Ampere,600Volt Single Surface Mount Type Hyperfast Recovery Epitaxial Diode

APPLICATION

- Freewheeling, Snubber, Clamp
- Inversion Welder
- PFC
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Converter & Chopper
- UPS

PRODUCT FEATURE

- Ultrafast Recovery Time
- Soft Recovery Characteristics
- Low Recovery Loss
- Low Forward Voltage
- High Surge Current Capability
- Low Leakage Current

**GENERAL DESCRIPTION**

FFD04H60S using the lastest FRED FAB process(planar passivation pellet) with ultrafast and soft recovery characteristics.

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ 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 @ $T_C = 130^\circ\text{C}$	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	Ratings	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	4.0	$^\circ\text{C/W}$

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

Symbol	Parameter	Min.	Typ.	Max.	Units
V_{FM1}	$I_F = 4\text{A}$ $I_F = 4\text{A}$	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	- -	- 1.7	V
I_{RM1}	$V_R = 600\text{V}$ $V_R = 600\text{V}$	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	- -	- 200	μA
t_{rr}	$I_F = 1\text{A}$, di/dt = 100A/ μs , $V_{CC} = 30\text{V}$ $I_F = 4\text{A}$, di/dt = 100A/ μs , $V_{CC} = 390\text{V}$	$T_C = 25^\circ\text{C}$ $T_C = 25^\circ\text{C}$	- -	19 25 60	ns
I_{rr} Q_{rr}	$I_F = 4\text{A}$, di/dt = 100A/ μs , $V_{CC} = 390\text{V}$	$T_C = 25^\circ\text{C}$	- -	1.5 18	A nC
W_{AVL}	Avalanche Energy ($L = 40\text{mH}$)	4	-	-	mJ

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

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop vs. Forward Current

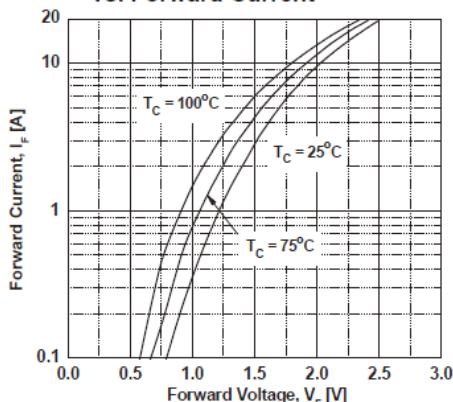


Figure 3. Typical Junction Capacitance

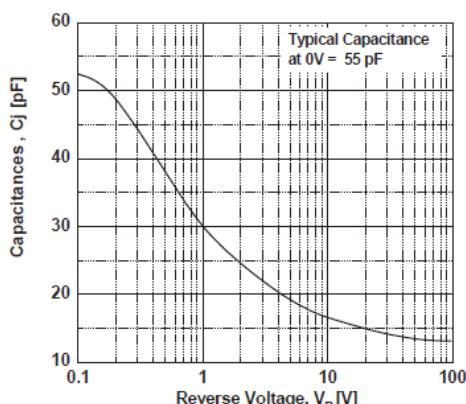


Figure 5. Typical Reverse Recovery Current vs. di/dt

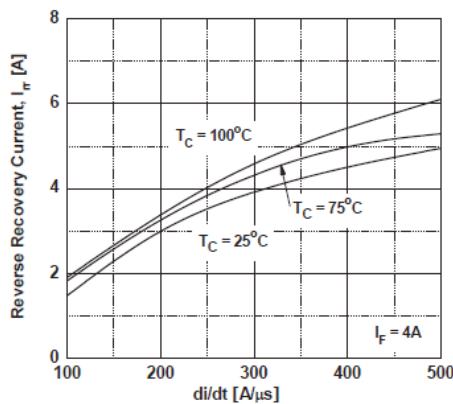


Figure 2. Typical Reverse Current vs. Reverse Voltage

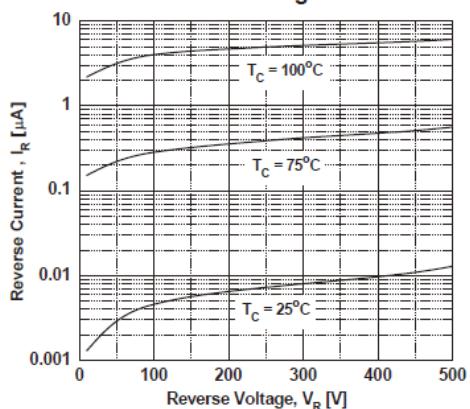


Figure 4. Typical Reverse Recovery Time vs. di/dt

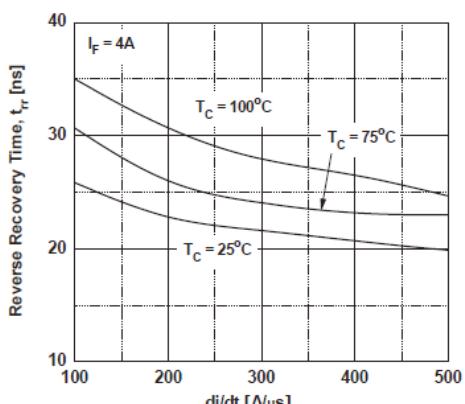
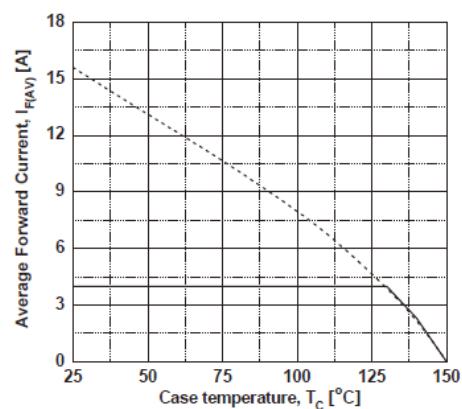
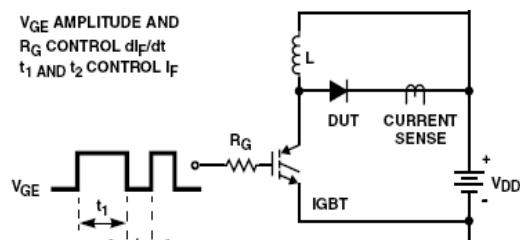
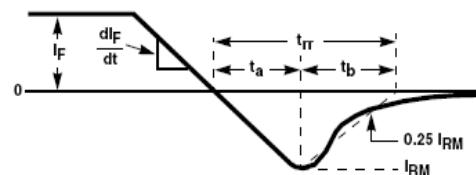
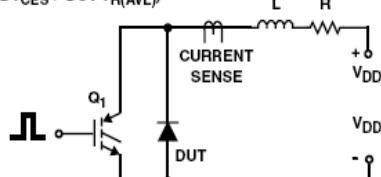


Figure 6. Forward Current Derating Curve

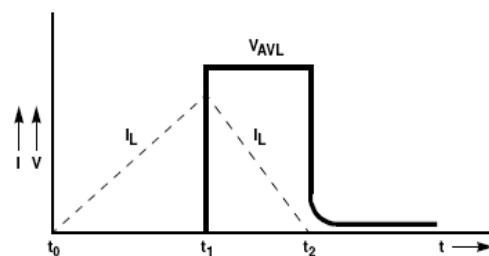


Test Circuit and Waveforms

V_{GE} AMPLITUDE AND
 R_G CONTROL di_F/dt
 t_1 AND t_2 CONTROL I_F

t_{tr} TEST CIRCUITt_{tr} WAVEFORMS AND DEFINITIONS $L = 40mH$ $R < 0.1\Omega$ $E_{AVL} = 1/2 L I^2$ $Q_1 = \text{IGBT } (\text{BV}_{CES} > \text{DUT } V_{R(AVL)})$ 

AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS