FAIRCHILD SEMICONDUCTOR®

November 2013

FFPF10UP60S
10 A, 600 V Ultrafast Diode

Features

- Ultrafast Recovery t_{rr} = 40 ns (@ I_F = 1 A)
- Max Forward Voltage, V_F = 2.2 V (@ T_C = 25°C)
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

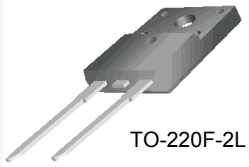
Applications

- General Purpose
- SMPS, Power Switching Circuits
- Free-Wheeling Diode for Motor Application
- Welder, UPS

Description

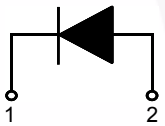
The FFPF10UP60S is an ultrafast diode with low forward voltage drop and rugged UIS capability. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power switching applications. It is specially suited for use in switching power supplies and industrial applicationa as welder and UPS application.

Pin Assignments



TO-220F-2L

1. Cathode 2. Anode



1. Cathode 2. Anode

Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	Rating	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	600	V
V_{RWM}	Working Peak Reverse Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 60 °C	10	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	50	A
T_J, T_{STG}	Operating Junction and Storage Temperature	- 65 to +150	°C

Thermal Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter	Max.	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	4.5	°C/W

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFPF10UP60STU	FFPF10UP60S	TO-220F-2L	Tube	N/A	N/A	30

Electrical Characteristics T_C = 25°C unless otherwise noted

Parameter	Conditions		Min.	Typ.	Max.	Unit
V_F[1]	Maximum Instantaneous Forward Voltage I_F = 10 A I_F = 10 A	 T_C = 25 °C T_C = 100 °C	 - -	 - -	 2.2 2.0	 V
I_R[1]	Maximum Instantaneous Reverse Current @ rated V_R	 T_C = 25 °C T_C = 100 °C	 - -	 - -	 100 500	 μA
t_{rr}	I_F =1 A, di_F/dt = 100 A/μs, V_R= 30 V	T_C = 25 °C	-	-	25	ns
t_{rr} I_{rr} Q_{rr}	Reverse Recovery Time Reverse Recovery Current Reverse Recovery Charge (I_F =8 A, di_F/dt = 200 A/μs, V_R = 390 V)		- - -	34 1.0 17	40 1.5 30	ns A nC
t_{rr}	Maximum Reverse Recovery Time (I_F =10 A, di_F/dt = 200 A/μs, V_R =390 V)		-	58	-	ns
W_{AVL}	Avalanche Energy (L = 40 mH)		20	-	-	mJ

Notes:

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

Test Circuit and Waveforms

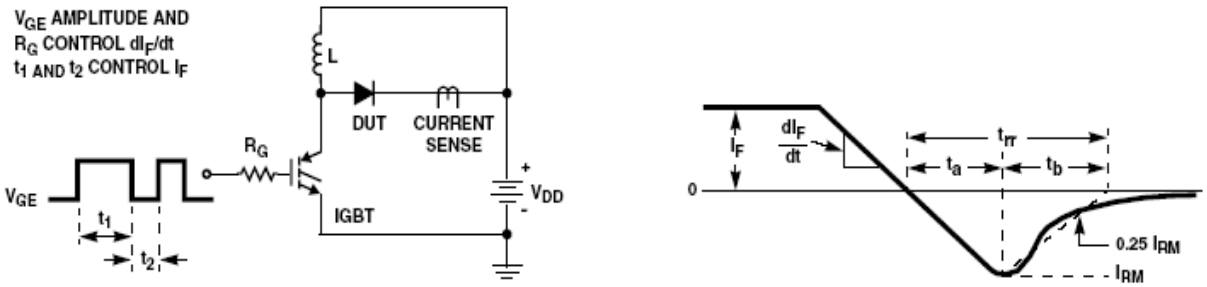


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

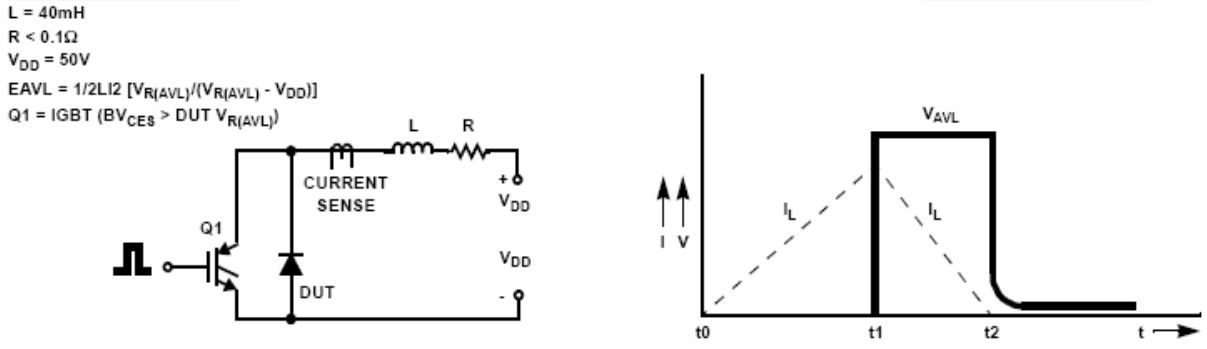


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics $T_C = 25°C$ unless otherwise noted

Figure 3. Typical Forward Voltage Drop

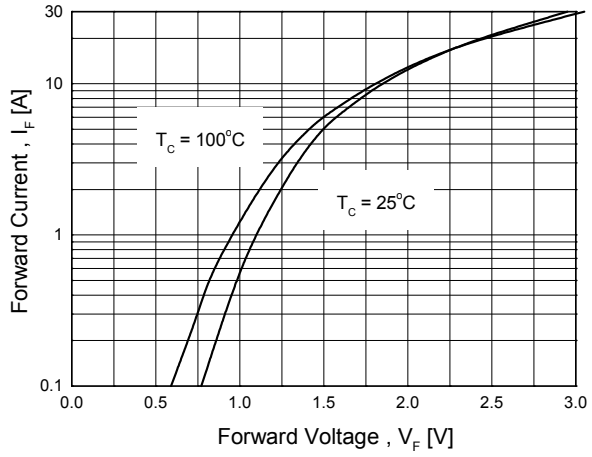


Figure 4. Typical Reverse Current

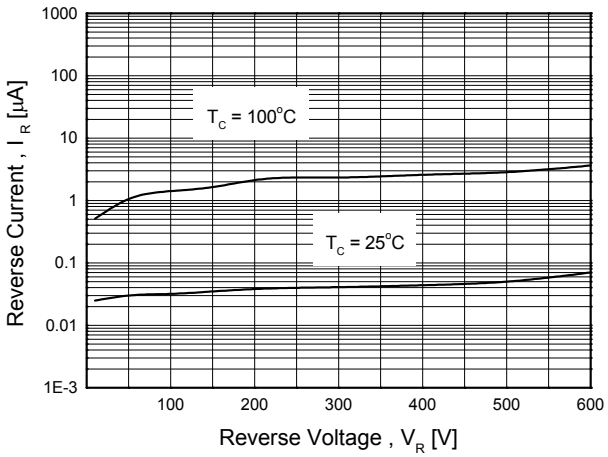


Figure 5. Typical Junction Capacitance

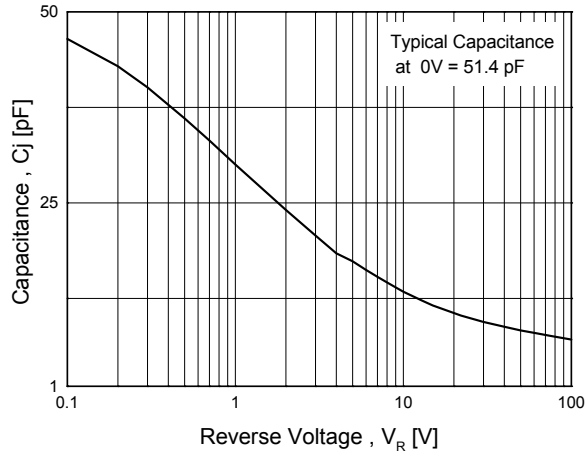


Figure 6. Typical Reverse Recovery Time

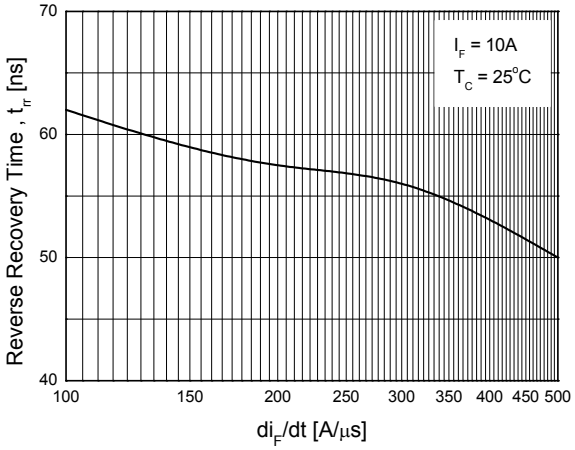


Figure 7. Typical Reverse Recovery Current

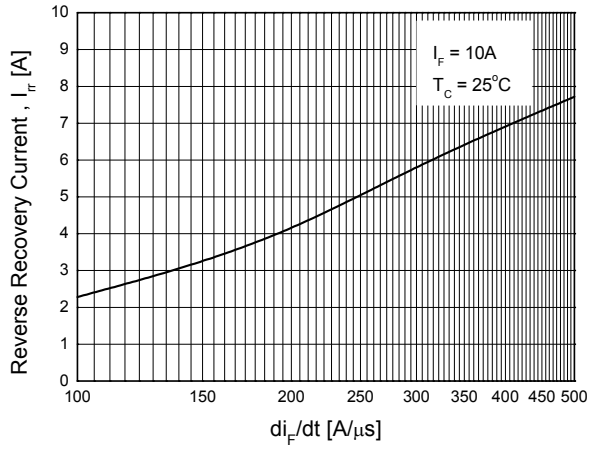
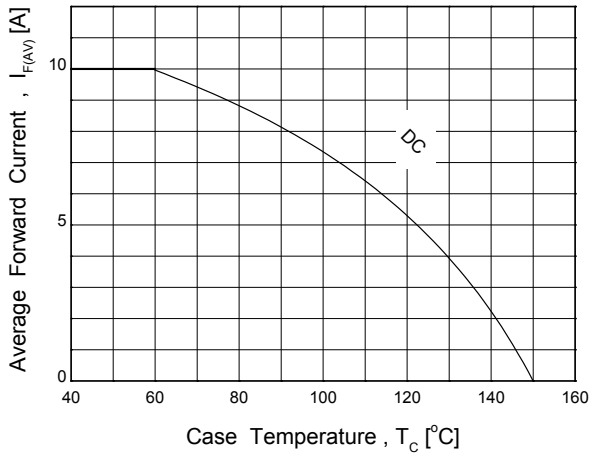


Figure 8. Forward Current Deration Curve



Mechanical Dimensions

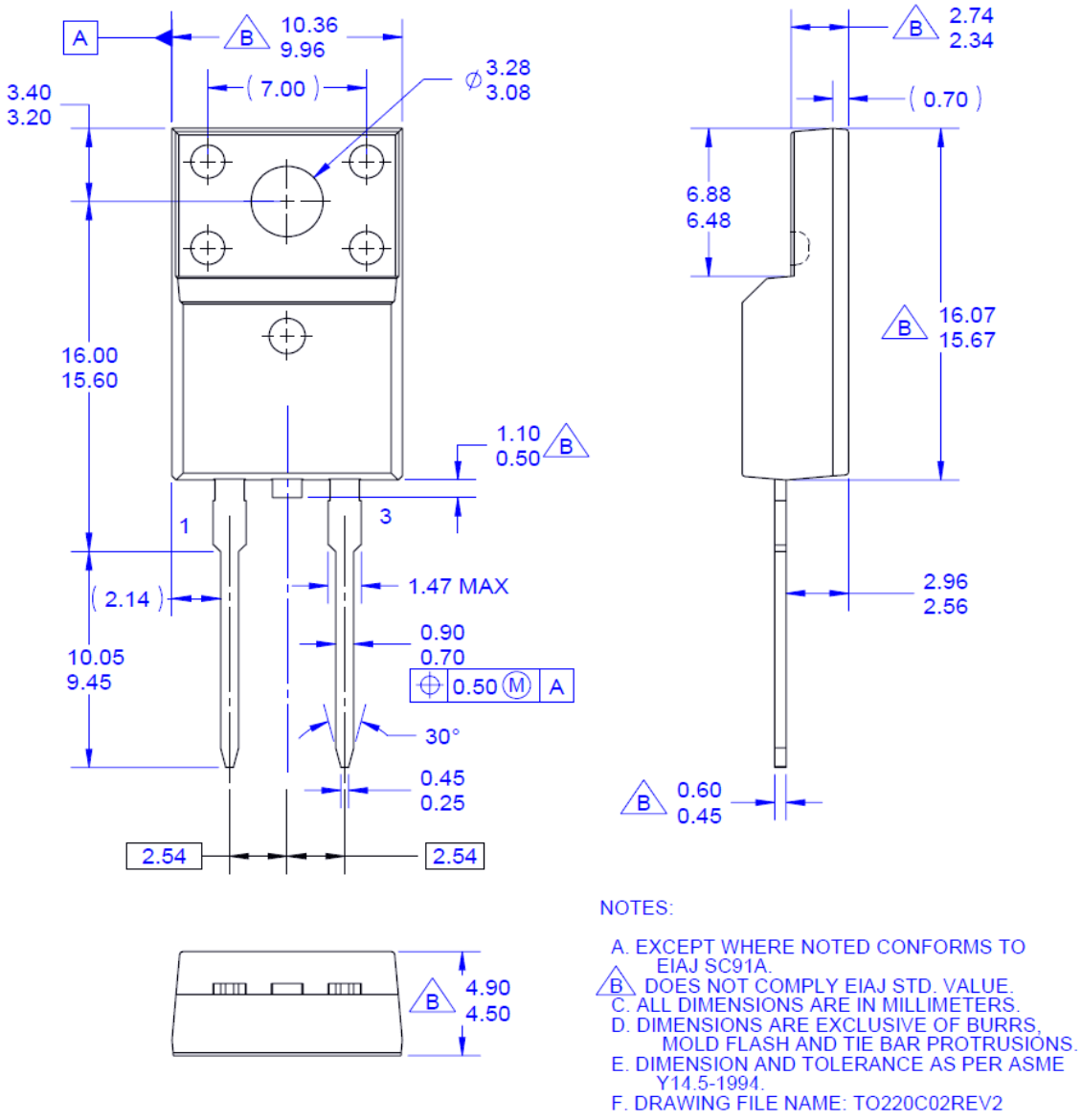


Figure 9. TO-220F 2L - 2LD; TO220; MOLDED; FULL PACK

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