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December 2014

FFPF20UP40S

20 A, 400 V, Ultrafast Diode

Features

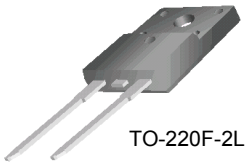
- Ultrafast Recovery t_{rr} = 50 ns (@ I_F = 20 A)
- Max Forward Voltage, V_F = 1.4 V (@ T_C = 25°C)
- Reverse Voltage, V_{RRM} = 400 V
- Avalanche Energy Rated
- RoHS Compliant

Applications

- Boost Diode in PFC and SMPS
- Freewheeling Diodes

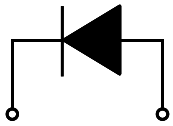
Description

The FFPF20UP40S is a ultrafast diode with low forward voltage drop. 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 application.



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	400	V
V_{RWM}	Working Peak Reverse Voltage	400	V
V_R	DC Blocking Voltage	400	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 102°C	20	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	200	A
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +175	°C

Thermal Characteristics

Symbol	Parameter	Max.	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	2.6	°C/W

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFPF20UP40S	FFPF20UP40S	TO-220F-2L	Tube	N/A	N/A	50

Electrical Characteristics $T_C = 25^oC$ unless otherwise noted

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_F1	I_F = 20 A I_F = 20 A	$T_C = 25^oC$ $T_C = 125^oC$	- -	- -	1.4 1.4	V
I_R1	V_R = 400 V V_R = 400 V	$T_C = 25^oC$ $T_C = 125^oC$	- -	- -	50 50	μA
t_{rr} I_{rr} Q_{rr}	I_F = 20 A, di_F/dt = 200 A/μs	$T_C = 25^oC$	- - -	29 3.3 47	50 5.5 138	ns A nC
W_{AVL}	Avalanche Energy (L = 40 mH)		1	-	-	mJ

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

Test Circuit and Waveforms

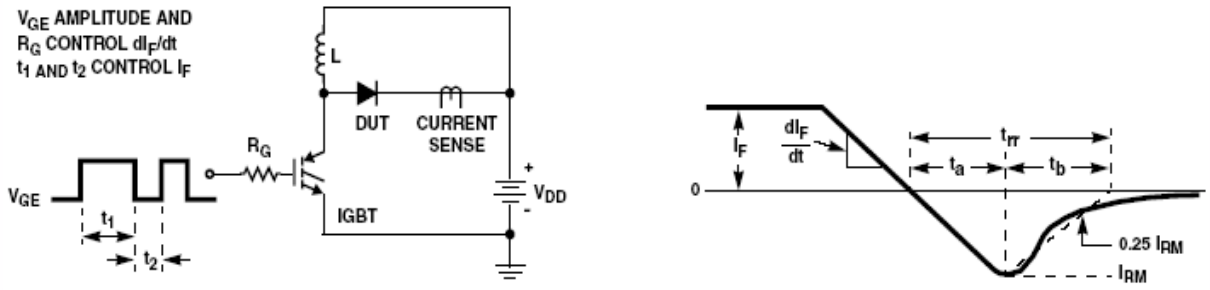


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

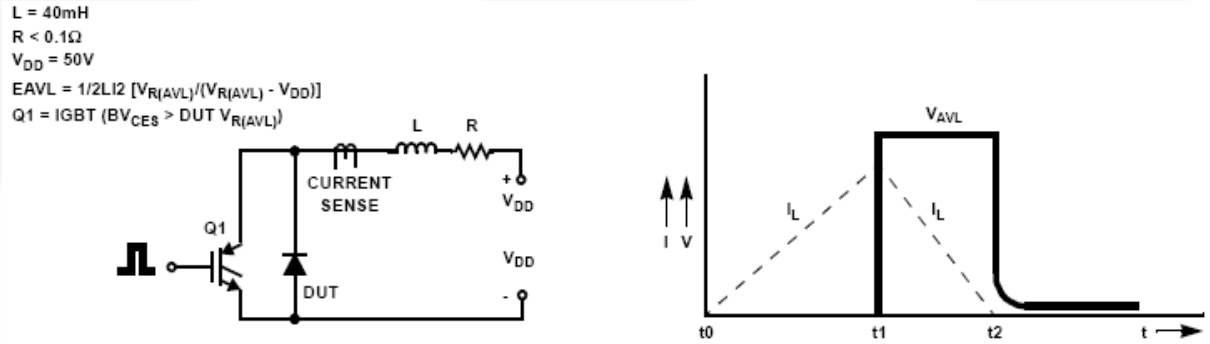


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop vs. Forward Current

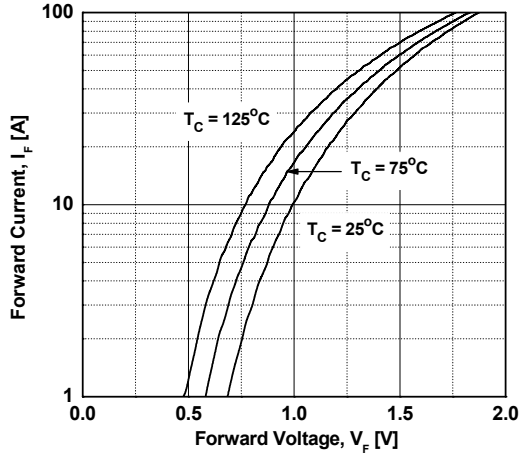


Figure 4. Typical Reverse Current vs. Reverse Voltage

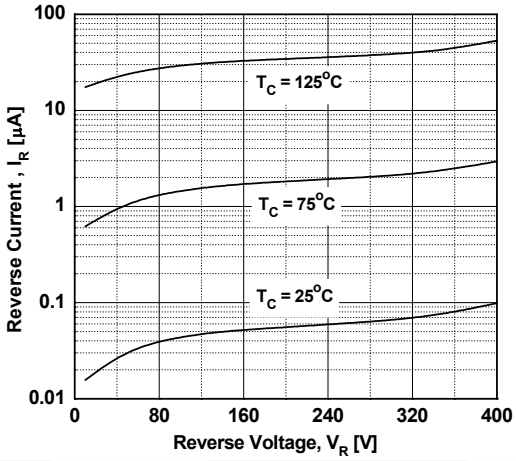


Figure 5. Typical Junction Capacitance

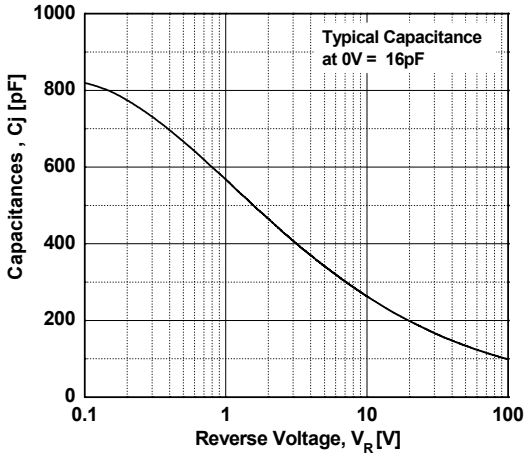


Figure 6. Typical Reverse Recovery Time vs. di_F/dt

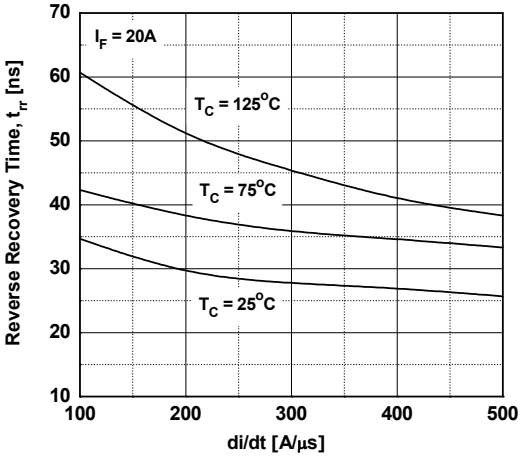


Figure 7. Typical Reverse Recovery Current vs. di_F/dt

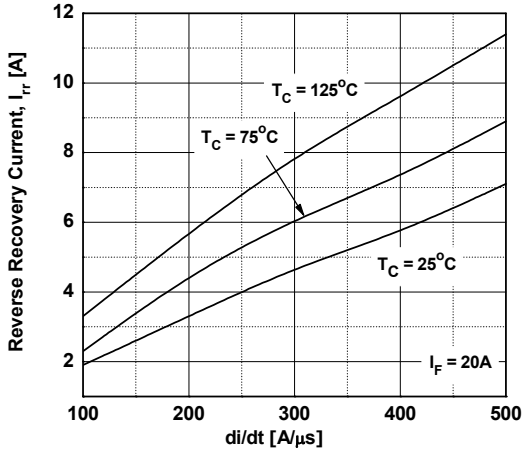
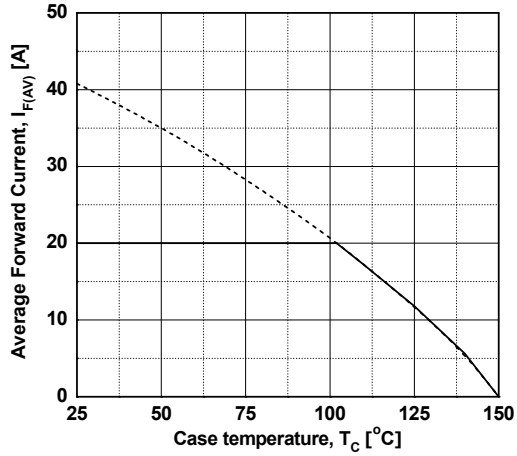


Figure 8. Forward Current Derating Curve



Mechanical Dimensions

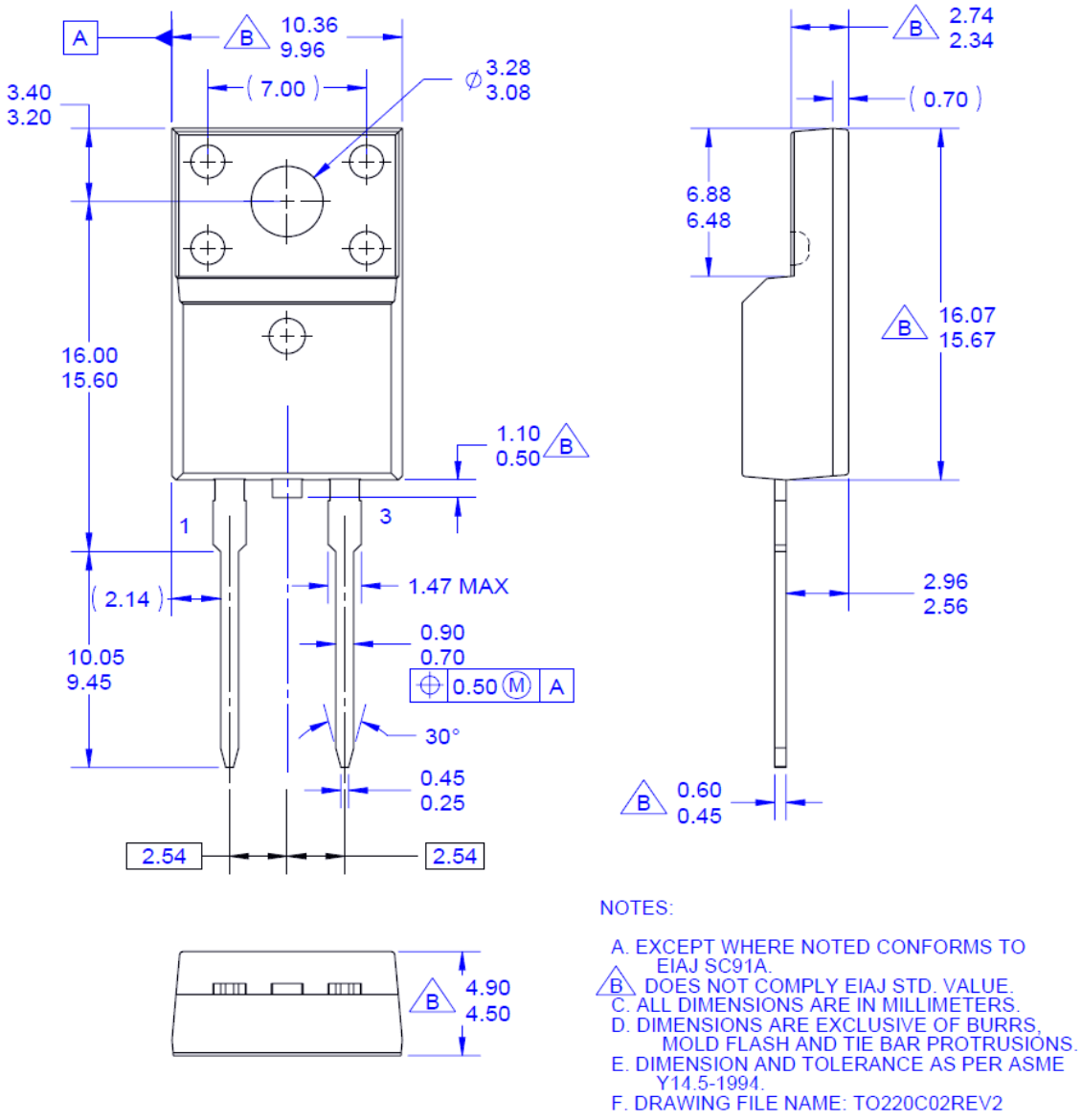


Figure 9. TO-220F 2L - 2LD; TO220; MOLDED; FULL PACK

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