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December 2014

FFPF30UP20S

30 A, 200 V, Ultrafast Diode

Features

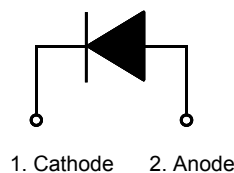
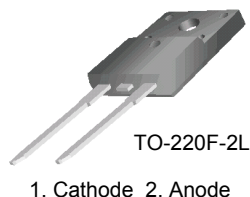
- Ultrafast Recovery $t_{rr} = 50 \text{ ns}$ (@ $I_F = 30 \text{ A}$)
- Max Forward Voltage, $V_F = 1.15 \text{ V}$ (@ $T_C = 25^\circ\text{C}$)
- Reverse Voltage, $V_{RRM} = 200 \text{ V}$
- Avalanche Energy Rated
- RoHS Compliant

Applications

- Output Rectifiers
- SMPS, Power Switching Circuits
- Free-Wheeling Diode for Motor Application

Description

The FFPF30UP20S 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.



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

Symbol	Parameter	Rating	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	200	V
V_{RWM}	Working Peak Reverse Voltage	200	V
V_R	DC Blocking Voltage	200	V
$I_{F(AV)}$	Average Rectified Forward Current @ $T_C = 102^\circ\text{C}$	30	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz 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	Max.	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	3.0	$^\circ\text{C/W}$

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFPF30UP20STU	FFPF30UP20S	TO-220F-2L	Tube	N/A	N/A	50

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

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_F *	$I_F = 30\text{ A}$	-	-	1.15	V
	$I_F = 30\text{ A}$	-	-	1.0	V
I_R *	$V_R = 200\text{ V}$	-	-	100	μA
	$V_R = 200\text{ V}$	-	-	500	μA
t_{rr}	$I_F = 1\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	-	-	40	ns
	$I_F = 30\text{ A}$, $di_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 130\text{ V}$	-	-	50	ns
t_a	$I_F = 30\text{ A}$, $di_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 130\text{ V}$	-	22	-	ns
t_b		-	14	-	ns
Q_{rr}		-	67	-	nC
W_{AVL}	Avalanche Energy ($L = 40\text{ mH}$)	20	-	-	mJ

* Pulse Test: Pulse Width=300 μs , Duty Cycle=2%

Test Circuit and Waveforms

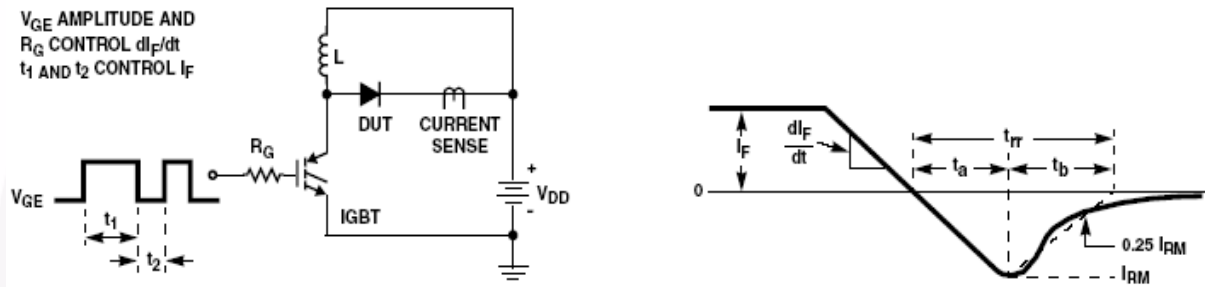


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

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

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

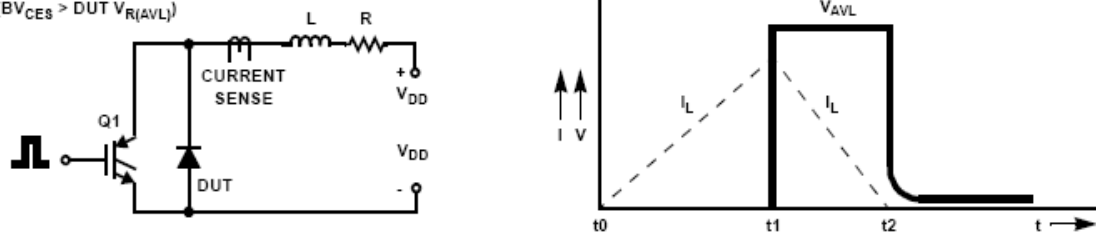


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop

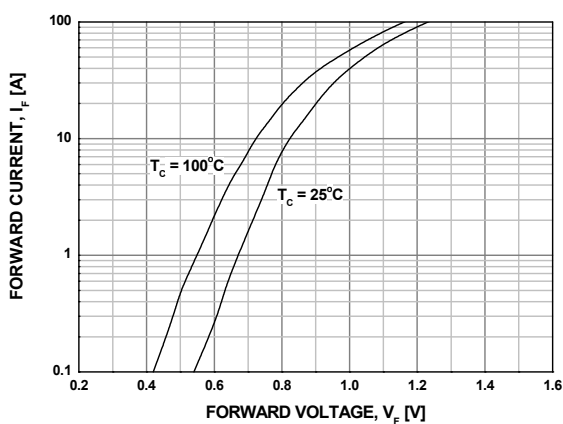


Figure 4. Typical Reverse Current

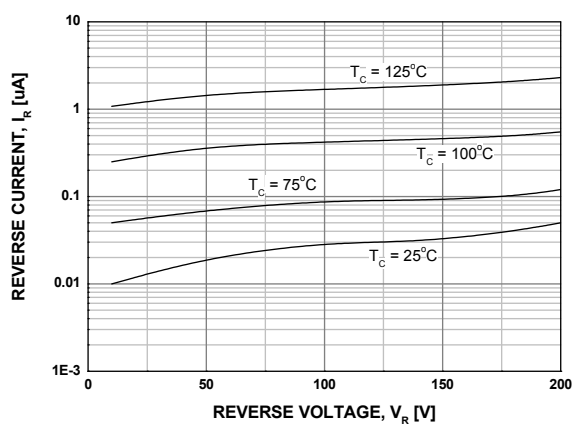


Figure 5. Typical Junction Capacitance

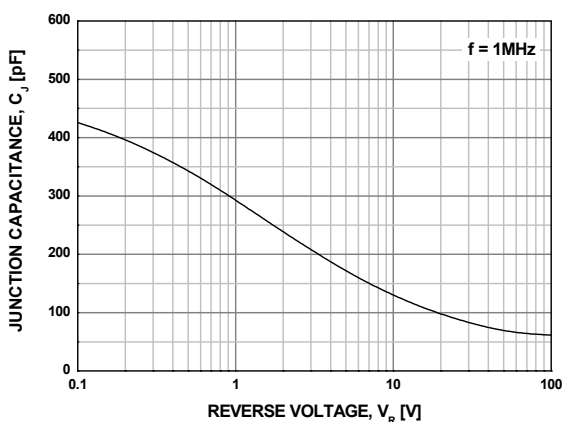


Figure 6. Typical Reverse Recovery Time

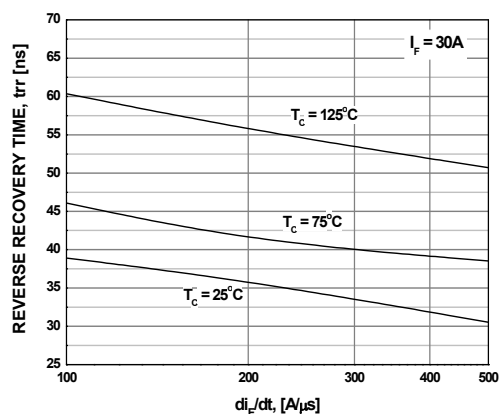


Figure 7. Typical Reverse Recovery Current

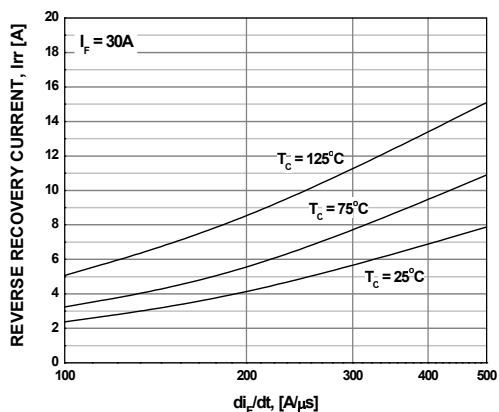
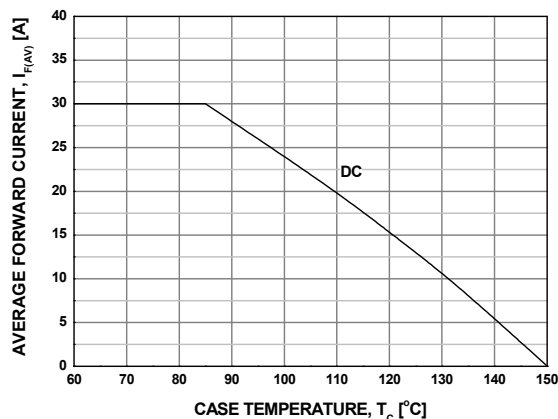


Figure 8. Forward Current Deration Curve



Mechanical Dimensions

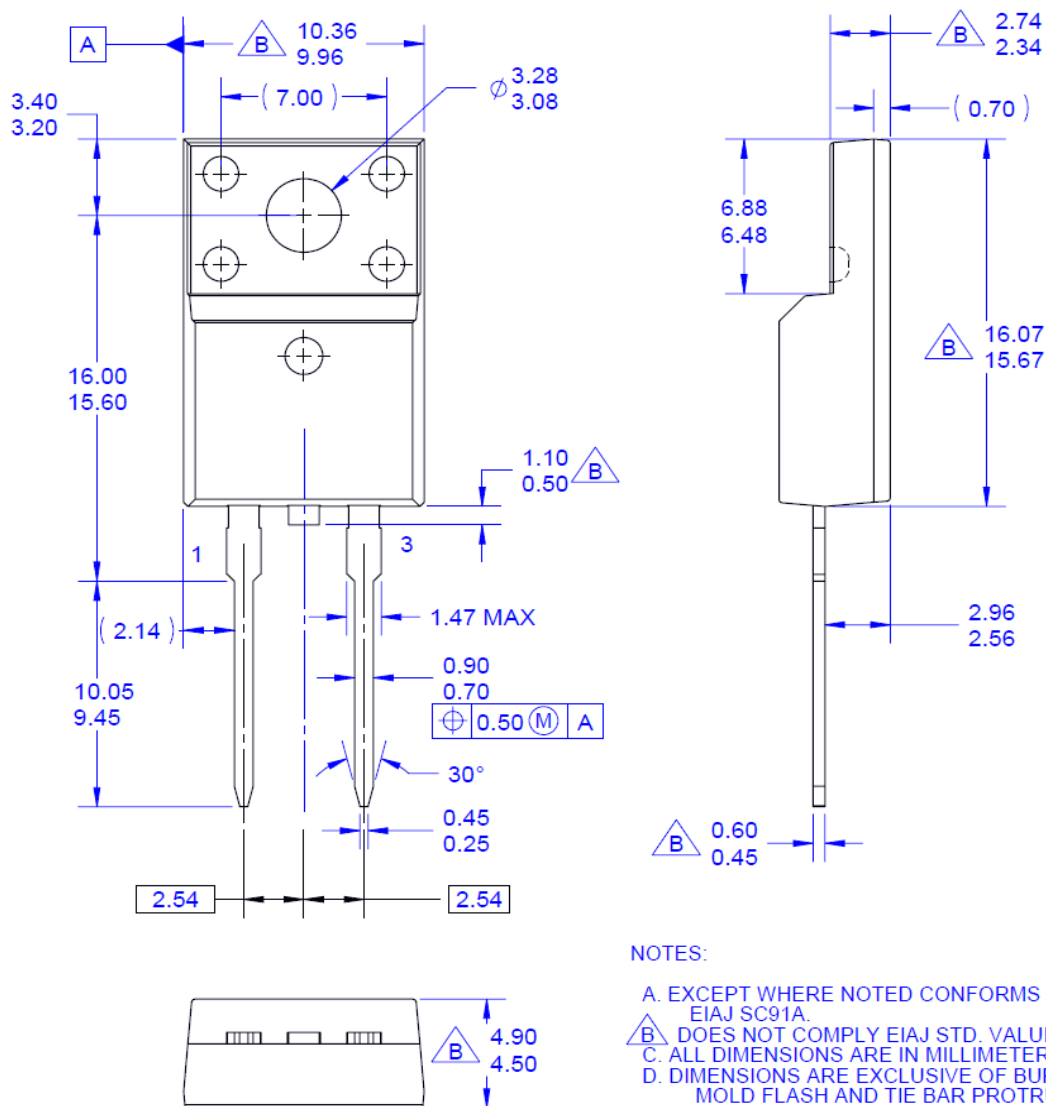


Figure 9. TO-220F 2L - 2LD; TO220; MOLDED; FULL PACK

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