FAIRCHILD SEMICONDUCTOR®

November 2013

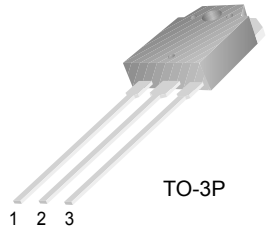
FFA60UP20DN
60 A, 200 V, Ultrafast Dual Diode

Features
- Ultrafast Recovery, T_{rr} = 32 ns (@ I_F = 30 A)
- Max. Forward Voltage, V_F = 1.15 V (@ T_C = 25°C)
- Reverse Voltage: V_{RRM} = 200 V
- Avalanche Energy Rated
- RoHS Compliant

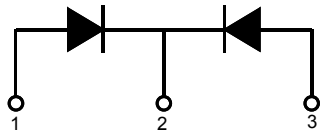
Description
The FFA60UP20DN is an ultrafast diode with low forward voltage drop and rugged UIS capability. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power switching applications. It is specially suited for use in switching power supplies and industrial applications as Welder and UPS application.

Applications
- Power Switching Circuits
- Output Rectifiers
- Free-Wheeling Diodes
- SMPS
- Welder
- UPS

Pin Assignments



TO-3P



1. Anode 2. Cathode 3. Anode

Absolute Maximum Ratings (per diode) T_C=25°C unless otherwise noted

Symbol	Parameter	Ratings	Unit
V_R	DC Blocking Voltage	200	V
V_{RRM}	Peak Repetitive Reverse Voltage	200	V
V_{RWM}	Working Peak Reverse Voltage	200	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 100°C	30	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	300	A
T_J, T_{STG}	Operating Junction and Storage Temperature	- 65 to +150	°C

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	1.4	°C/W

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFA60UP20DNTU	F60UA60DN	TO-3P	Tube	N/A	N/A	30

Electrical Characteristics (per diode) T_C=25 °C unless otherwise noted

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_F *	Maximum Instantaneous Forward Voltage					
	I_F = 30 A	T_C = 25 °C	-	-	1.15	V
	I_F = 30 A	T_C = 100 °C	-	-	1.0	
I_R *	Maximum Instantaneous Reverse Current					
	@ rated V_R	T_C = 25 °C	-	-	10	μA
		T_C = 100 °C	-	-	100	
t_{rr}	Reverse Recovery Time		-	32	-	ns
I_{rr}	Reverse Recovery Current		-	2.4	-	A
Q_{rr}	Reverse Recovery Charge		-	38.4	-	nC
	(I_F =30 A, di_F/dt = 200 A/μs, V_R=130 V)					
t_{rr}	Maximum Reverse Recovery Time		-	-	40	ns
	(I_F =1 A, di_F/dt = 100 A/μs)					
W_{AVL}	Avalanche Energy (L=40 mH)		2	-	-	mJ

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

Test Circuit and Waveforms

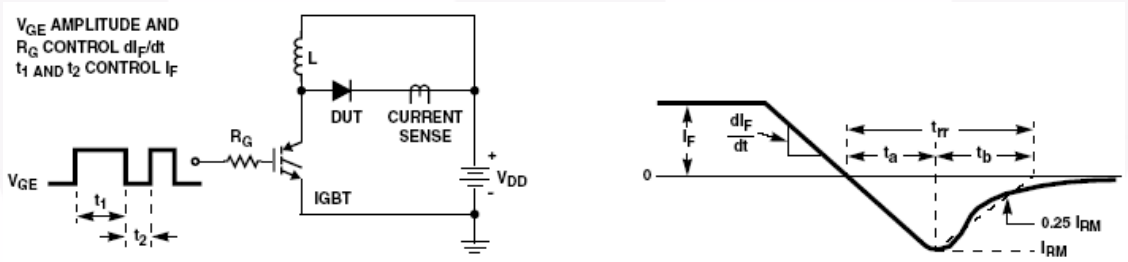


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

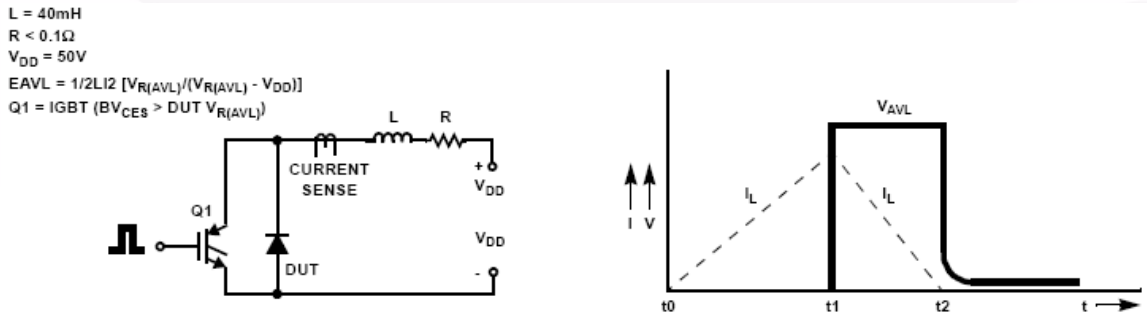


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Characteristics

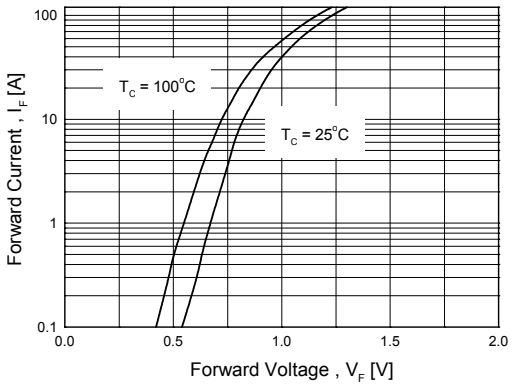


Figure 3. Typical Forward Voltage Drop vs. Forward Current

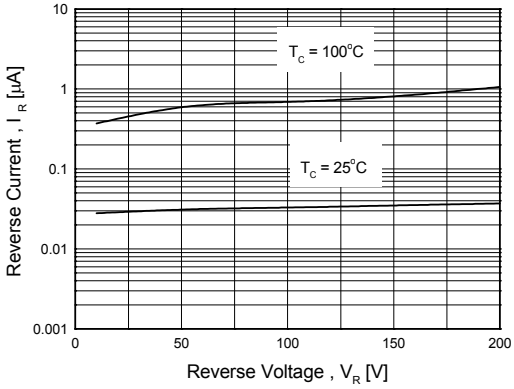


Figure 4. Typical Reverse Current vs. Reverse Voltage

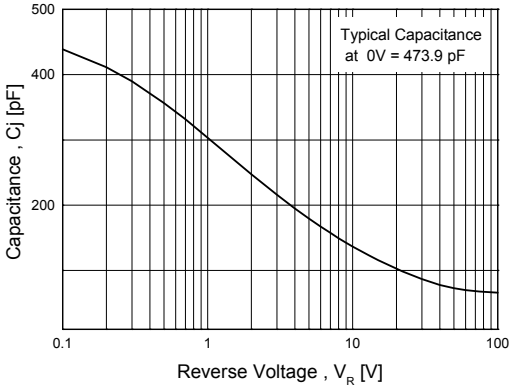


Figure 5. Typical Junction Capacitance

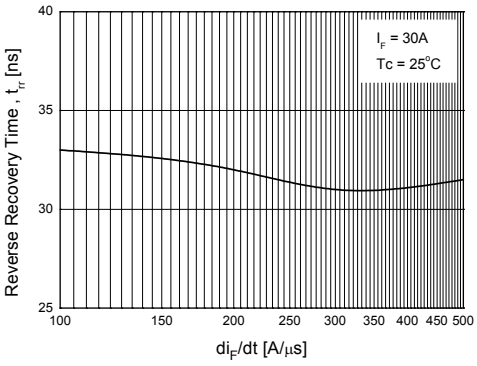


Figure 6. Typical Reverse Recovery Time vs. di_F/dt

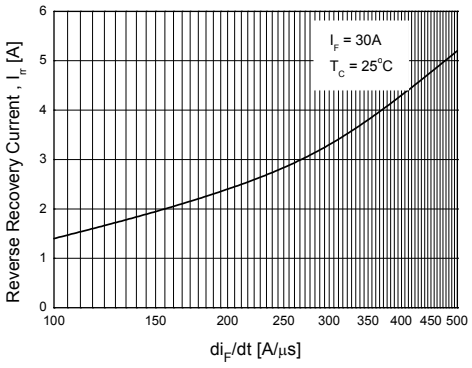


Figure 7. Typical Reverse Recovery Current vs. di_F/dt

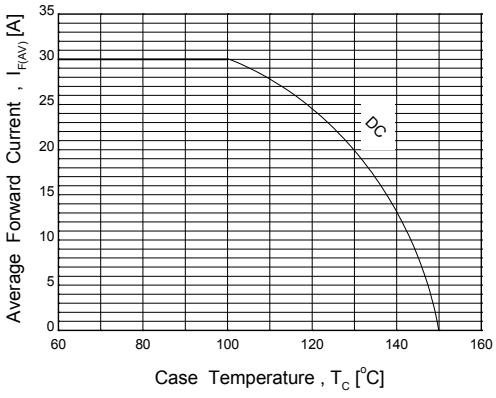


Figure 8. Forward Current Derating Curve

Mechanical Dimensions

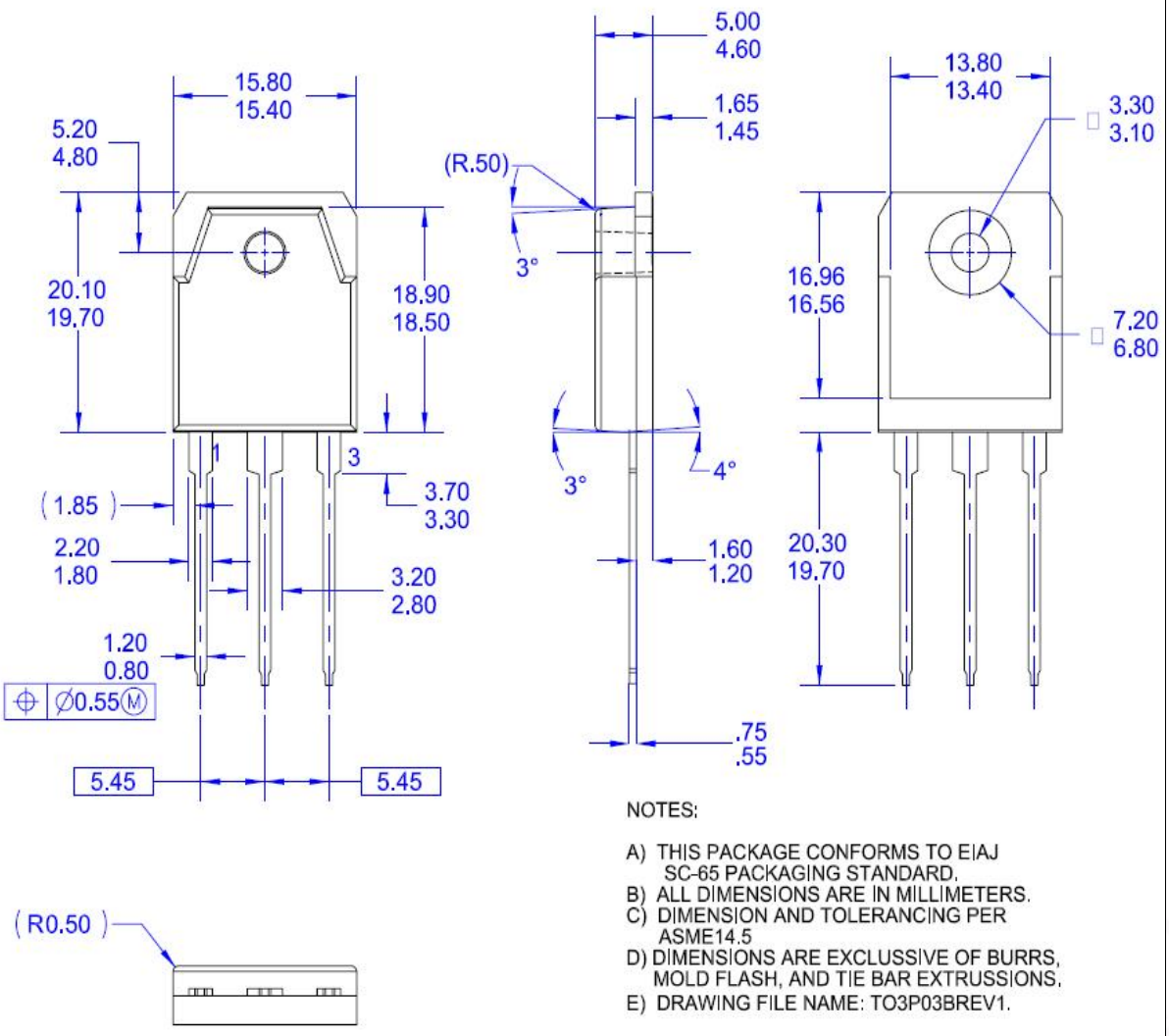


Figure 9. TO-3P 3L - 3LD, T03, PLASTIC, EIAJ SC-65

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