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FAIRCHILD SEMICONDUCTOR®

November 2013

FFB10UP20S

10 A, 200 V, Ultrafast Diode

Features

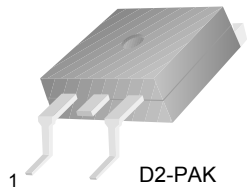
- Ultrafast with Soft Recovery : < 45 ns
- High Reverse Voltage : V_{RRM} = 200 V
- Avalanche Energy Rated
- Planar Construction
- RoHS Compliant

Applications

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

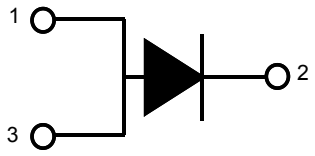
Description

The FFB10UP20S 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 application.



D2-PAK

1.Anode 2.Cathode 3.Anode



1. Anode 2. Cathode 3. Anode

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

Symbol	Parameter	Value	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 = 120°C	10	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	100	A
T_J, T_{STG}	Operating Junction and Storage Temperature	- 65 to +150	°C

Thermal Characteristics T_a = 25°C unless otherwise noted

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	3.0	°C/W

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFB10UP20STM	FFB10UP20S	D^2-PAK	Reel	13" Dia	N/A	800

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

Symbol	Parameter		Min.	Typ.	Max.	Units
V_F *	I_F = 10 A I_F = 10 A	T_C = 25 °C T_C = 150 °C	- -	- -	1.15 1.0	V V
I_R *	V_R = 200 V V_R = 200 V	T_C = 25 °C T_C = 150 °C	- -	- -	100 500	μA μA
t_{rr}	I_F = 1 A, di_F/dt = 100 A/μs, V_R = 30 V I_F = 10 A, di_F/dt = 200 A/μs, V_R = 130 V	T_C = 25 °C T_C = 25 °C	- -	- -	35 45	ns ns
t_a t_b Q_{rr}	I_F = 10 A, di_F/dt = 200 A/μs, V_R = 130 V	T_C = 25 °C T_C = 25 °C T_C = 25 °C	- - -	15 12 36	- - -	ns ns nC
W_{AVL}	Avalanche Energy (L = 20 mH)		10	-	-	mJ

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

Test Circuit and Waveforms

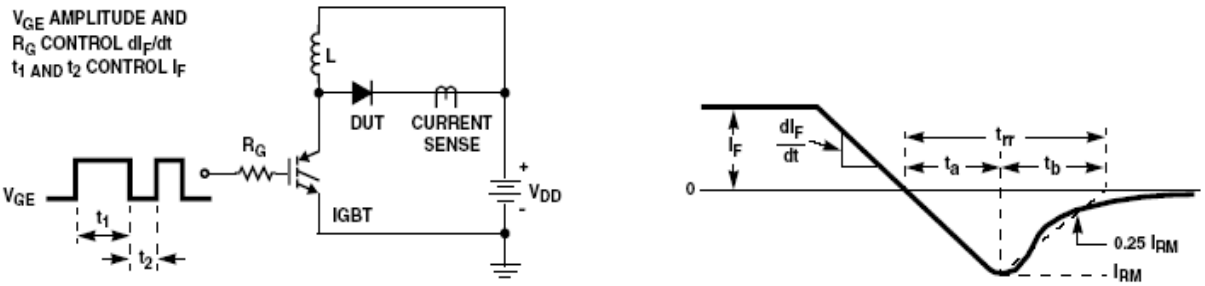


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

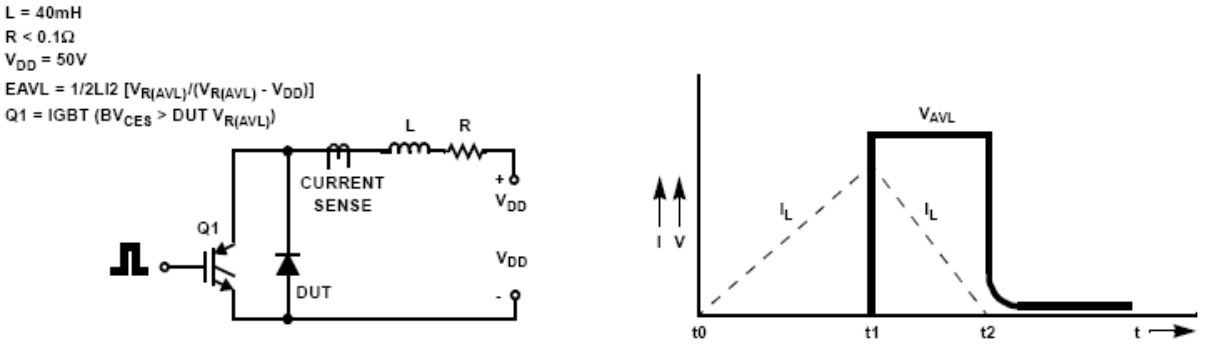


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop

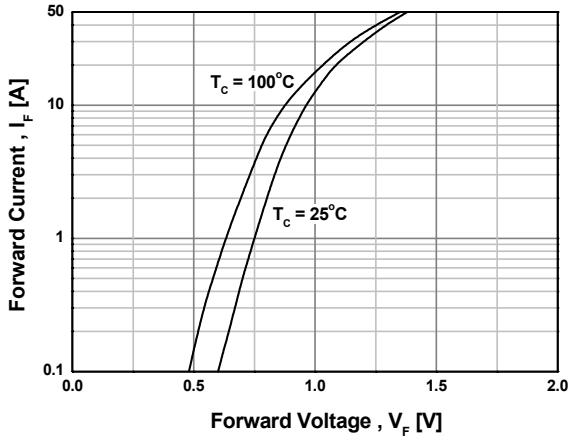


Figure 4. Typical Reverse Current

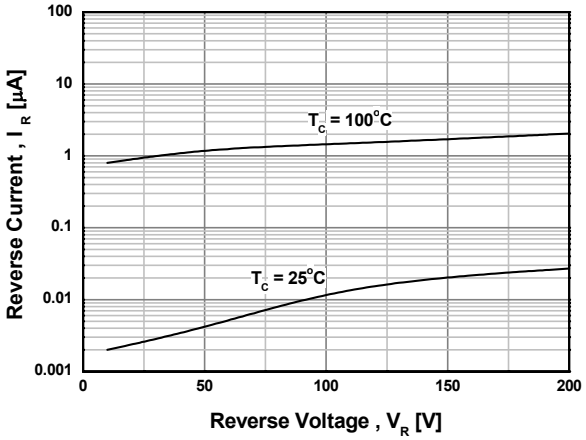


Figure 5. Typical Junction Capacitance

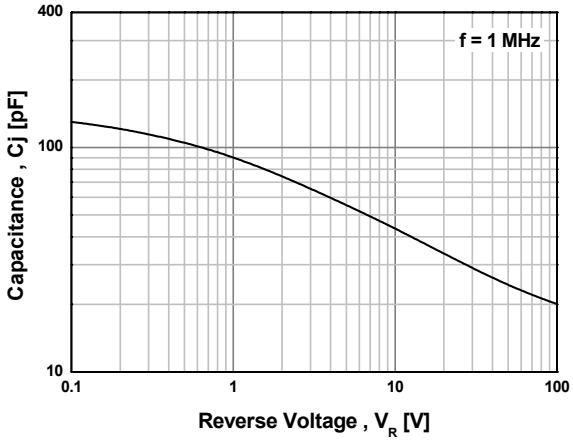


Figure 6. Typical Reverse Recovery Time

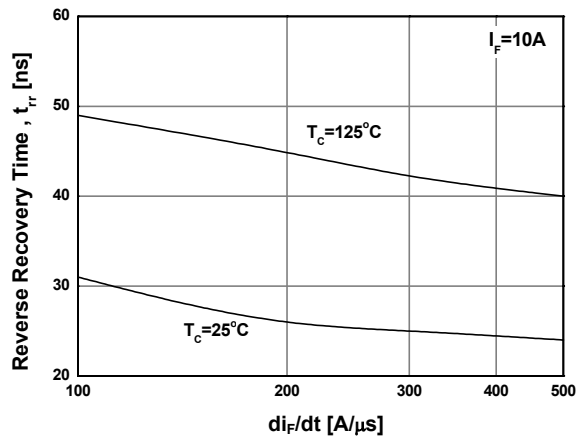


Figure 7. Typical Reverse Recovery Current

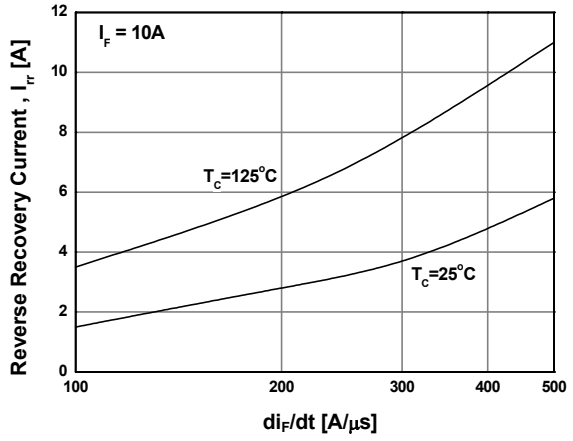
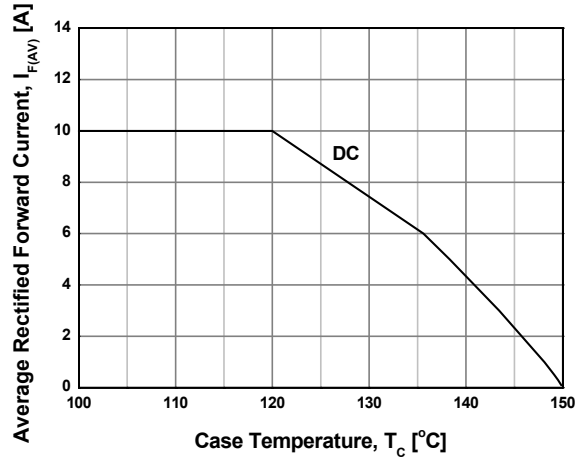


Figure 8. Forward Current Deration Curve



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Mechanical Dimensions

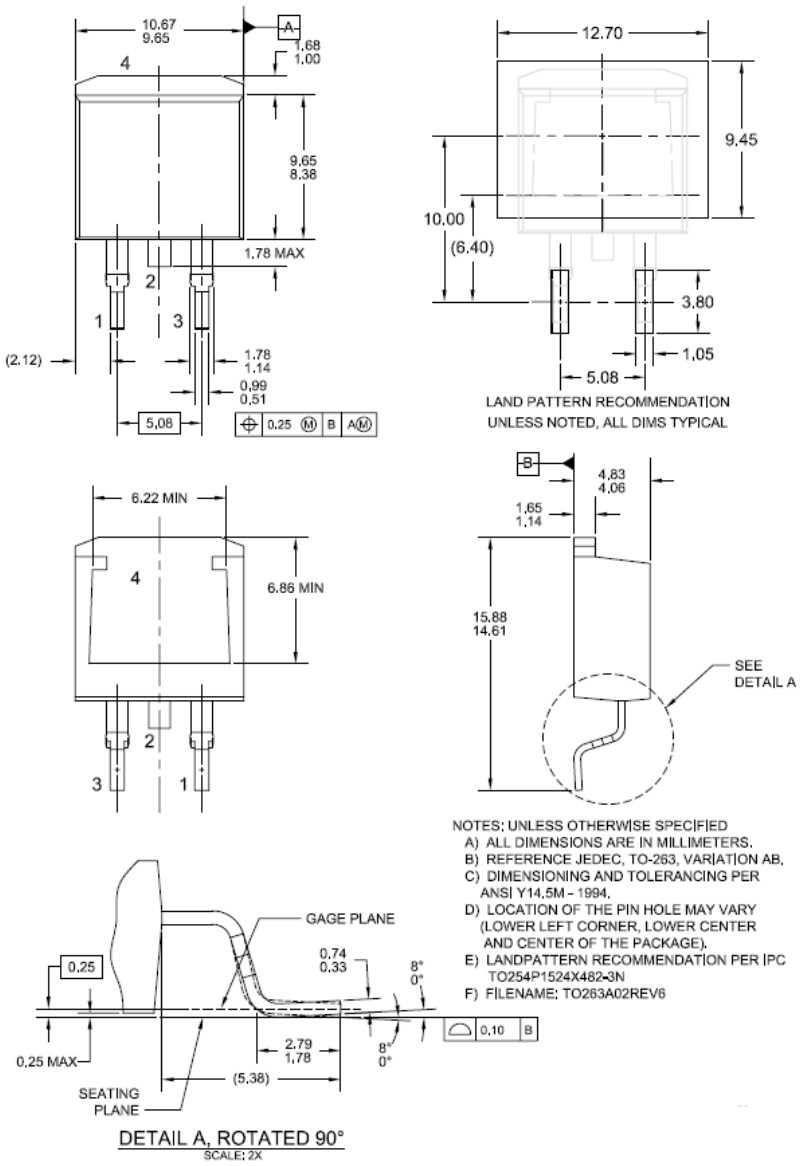


Figure 9. TO-263 2L (D²-PAK) - 2LD,TO263, SURFACE MOUNT

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