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Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

January 2016

FFB20UP30DN

20 A, 300 V, Ultrafast Dual Diode

Features

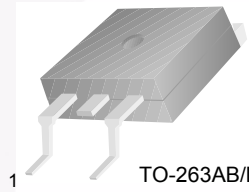
- Ultrafast Recovery, t_{rr} = 45 ns (@ I_F = 10 A)
- Max Forward Voltage, V_F = 1.3 V (@ T_C = 25°C)
- Reverse Voltage : V_{RRM} = 300 V
- Avalanche Energy Rated
- RoHS Compliant

Applications

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

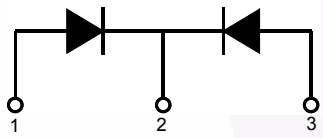
Description

The FFB20UP30DN is an ultrafast dual 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 application.



TO-263AB/D2-PAK

1.Anode 2.Cathode 3.Anode



1. Anode 2. Cathode 3. Anode

Absolute Maximum Ratings

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

Symbol	Parameter	Ratings	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	300	V
V_{RWM}	Working Peak Reverse Voltage	300	V
V_R	DC Blocking Voltage	300	V
$I_{F(AV)}$	Average Rectified Forward Current (per Diode) @T_C = 130°C	10	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	180	A
T_J, T_{STG}	Operating Junction and Storage Temperature	- 65 to +175	°C

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	2.0	°C/W

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFB20UP30DNTM	F20UP30DN	D^2-PAK	Reel	13" Dia	N/A	800

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

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_F *	I_F = 10 A I_F = 10 A	T_C = 25 °C T_C = 150 °C	- -	- -	1.3 1.2	V V
I_R *	V_R = 300 V V_R = 300 V	T_C = 25 °C T_C = 150 °C	- -	- -	1 500	μA μA
T_{rr}	I_F =0.5 A, I_{rr}=1 A, V_{CC} = 30 V 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 = 195 V	T_C = 25 °C T_C = 25 °C T_C = 25 °C	- - -	- - -	30 35 45	ns ns ns
t_a t_b Q_{rr}	I_F =10 A, di_F/dt = 200 A/μs, V_R = 195V	T_C = 25 °C T_C = 25 °C T_C = 25 °C	- - -	11 13 20	- - -	ns ns nC
W_{AVL}	Avalanche Energy (L = 20 mH)		20	-	-	mJ

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

Test Circuit and Waveforms

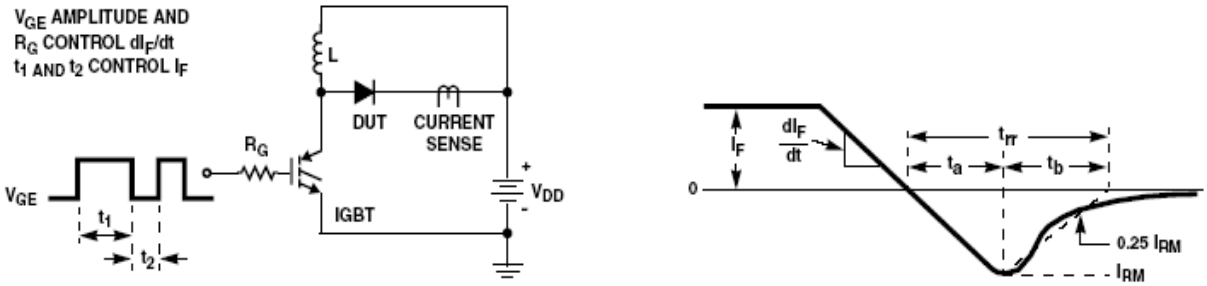


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

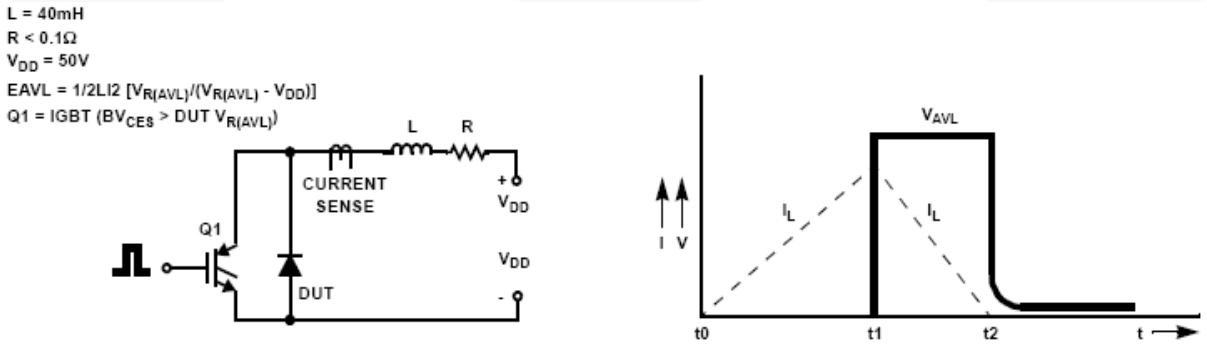


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop

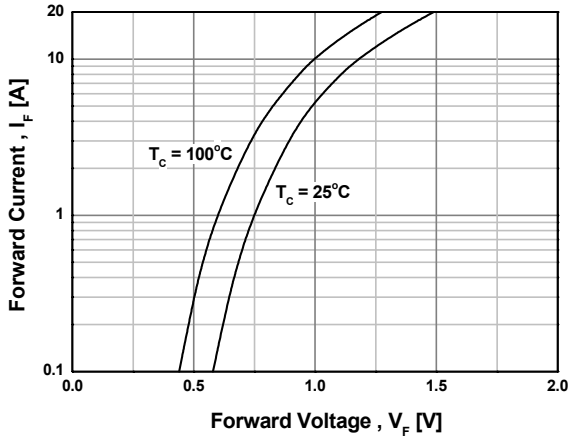


Figure 4. Typical Reverse Current

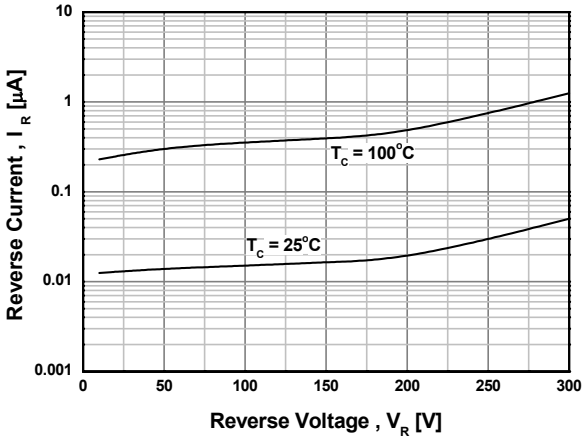


Figure 5. Typical Junction Capacitance

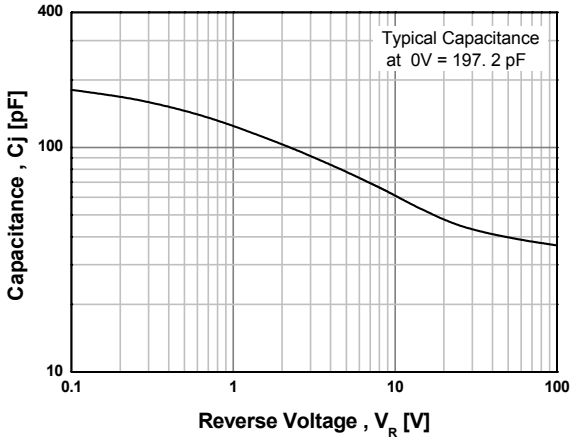


Figure 6. Typical Reverse Recovery Time

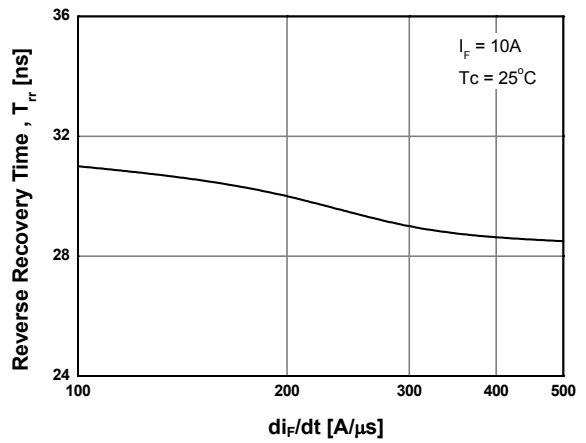


Figure 7. Typical Reverse Recovery Current

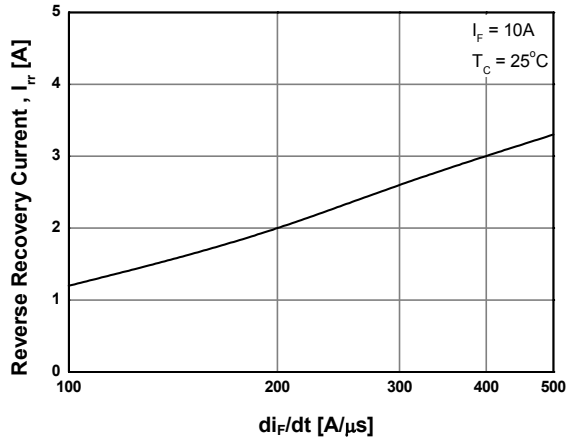
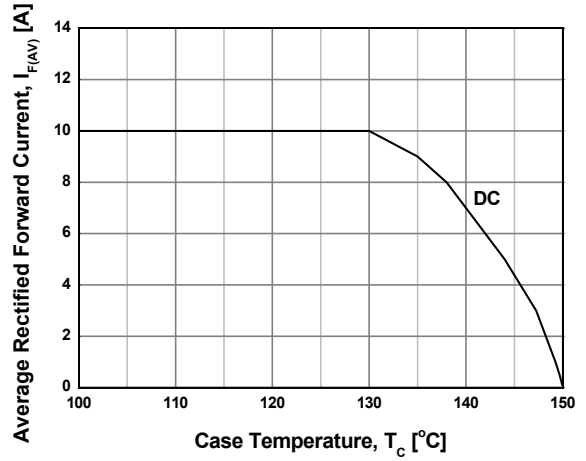
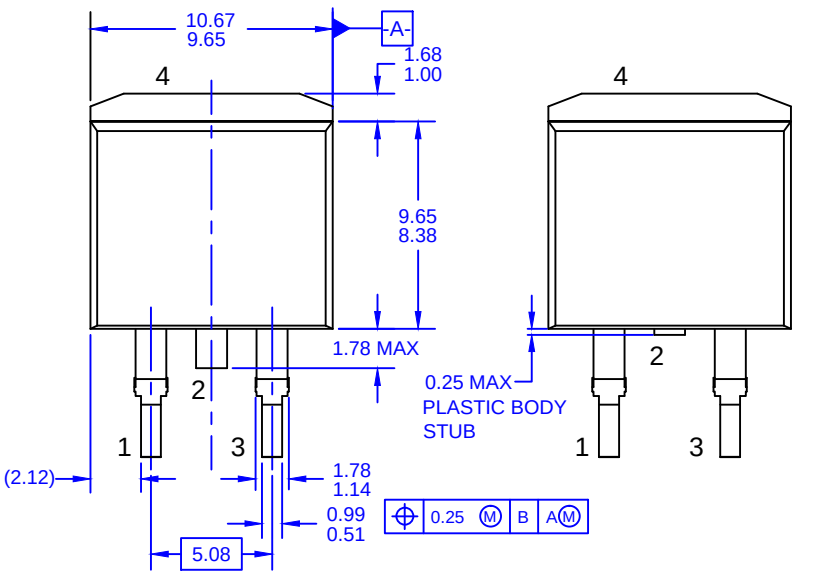
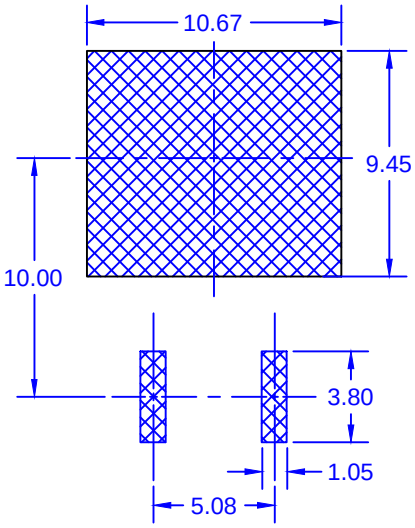


Figure 8. Forward Current Deration Curve

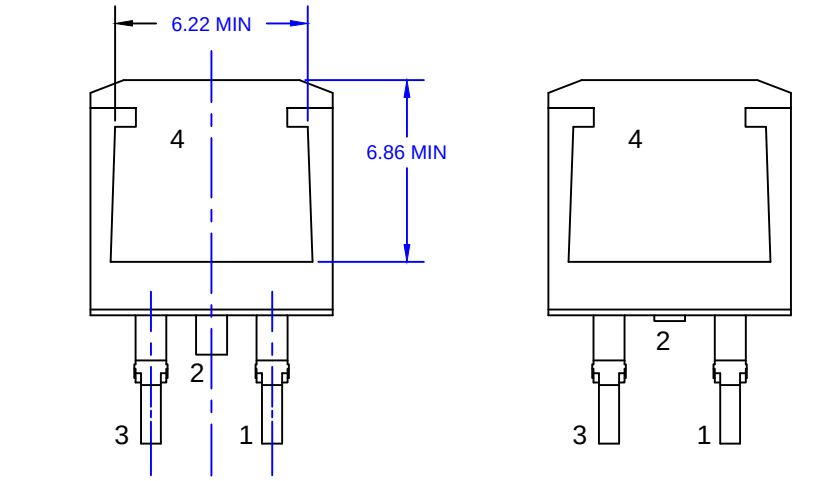




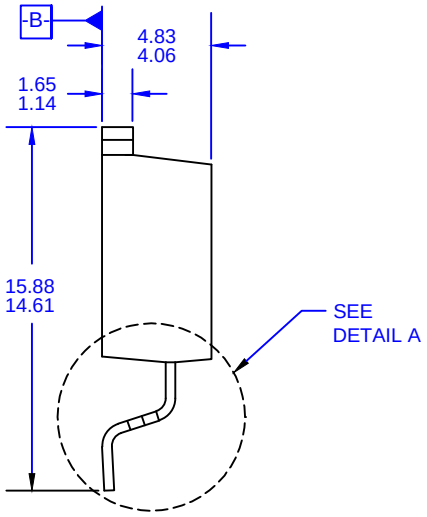
FRONT VIEW - DIODE PRODUCTS VERSION
ALTERNATIVE SUPPLIER DETAIL



LAND PATTERN RECOMMENDATION
UNLESS NOTED, ALL DIMS TYPICAL

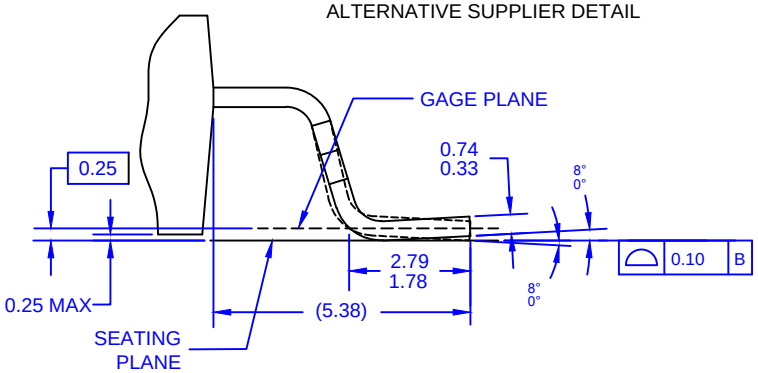


BACK VIEW - DIODE PRODUCTS VERSION
ALTERNATIVE SUPPLIER DETAIL



NOTES: UNLESS OTHERWISE SPECIFIED

A) ALL DIMENSIONS ARE IN MILLIMETERS.
B) REFERENCE JEDEC, TO-263, VARIATION AB.
C) DIMENSIONING AND TOLERANCING PER DIMENSIONING AND TOLERANCING PER ASME Y14.5 - 2009.
D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE).
E) LANDPATTERN RECOMMENDATION PER IPC TO254P1524X482-3N
F) FILENAME: TO263A02REV8



DETAIL A, ROTATED 90°
SCALE: 2X

FAIRCHILD.

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