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January 2016

# FFB20UP30DN

## 20 A, 300 V, Ultrafast Dual Diode

### Features

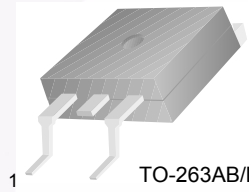
- Ultrafast Recovery, $t_{rr}$ = 45 ns (@ $I_F$ = 10 A)
- Max Forward Voltage, $V_F$ = 1.3 V (@ $T_C$ = 25°C)
- Reverse Voltage : $V_{RRM}$ = 300 V
- Avalanche Energy Rated
- RoHS Compliant

### Applications

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

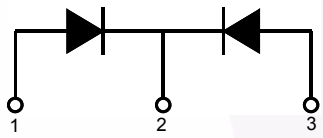
### Description

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 |

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

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

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

## Test Circuit and Waveforms

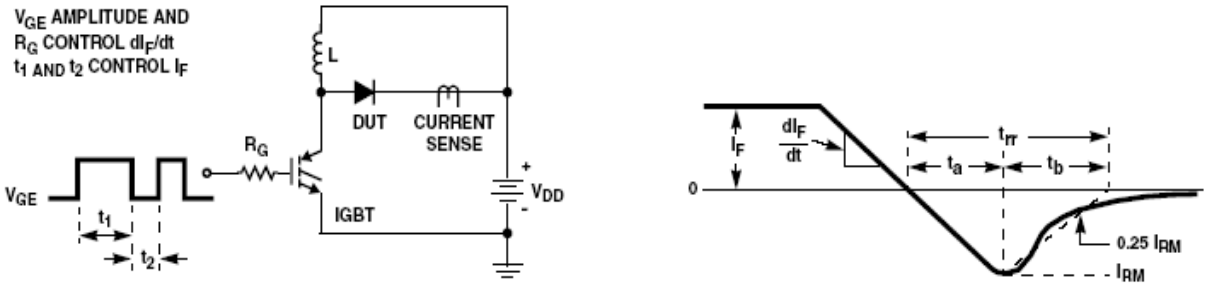



**Figure 1. Diode Reverse Recovery Test Circuit & Waveform**

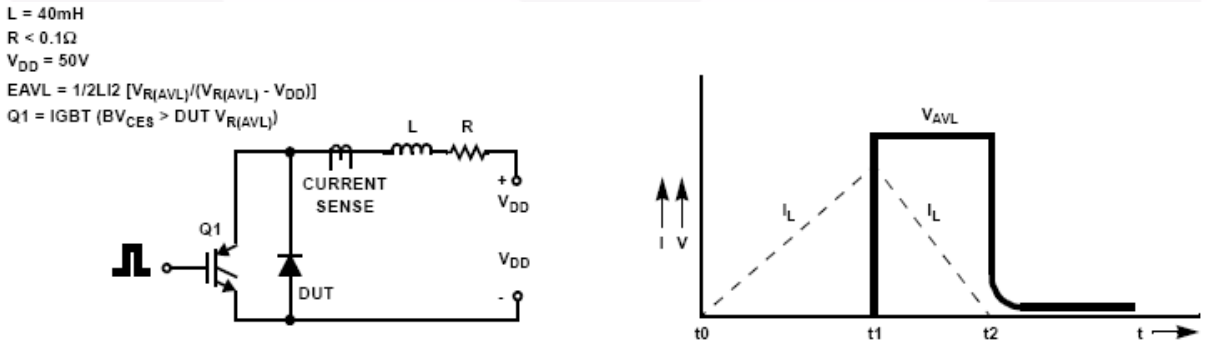



**Figure 2. Unclamped Inductive Switching Test Circuit & Waveform**

## Typical Performance Characteristics

**Figure 3. Typical Forward Voltage Drop**

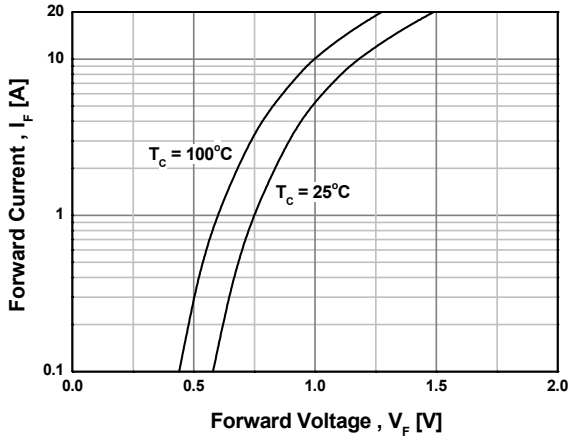



**Figure 4. Typical Reverse Current**

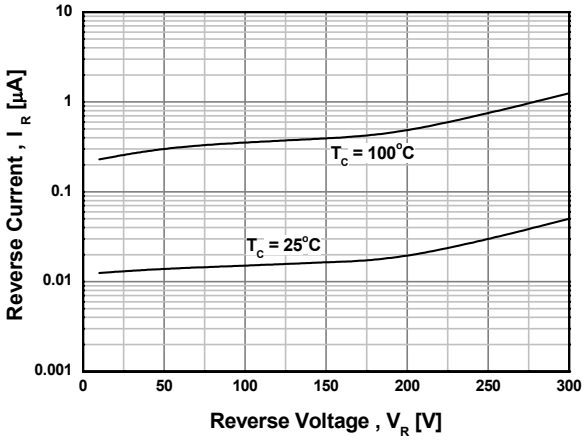



**Figure 5. Typical Junction Capacitance**

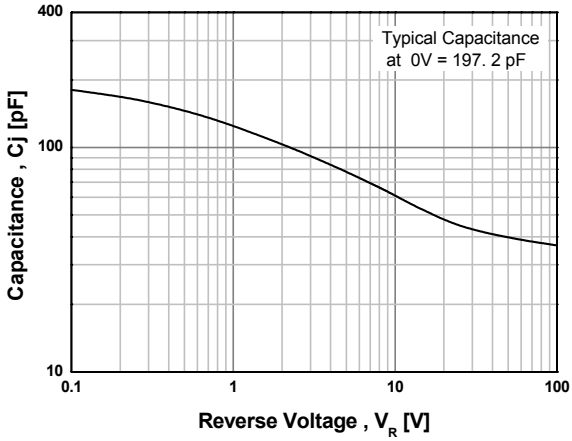



**Figure 6. Typical Reverse Recovery Time**

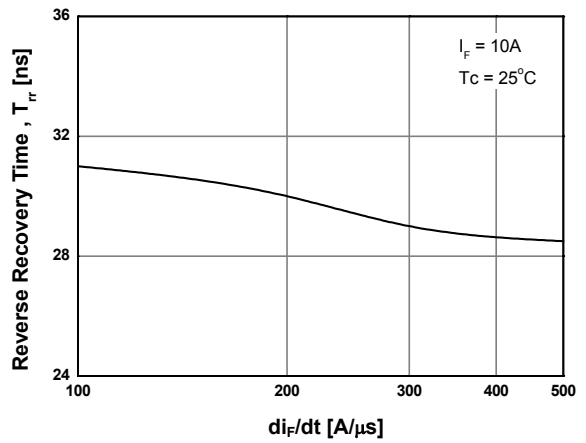



**Figure 7. Typical Reverse Recovery Current**

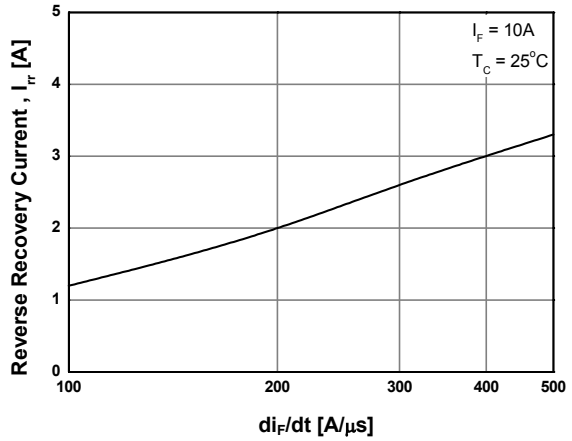
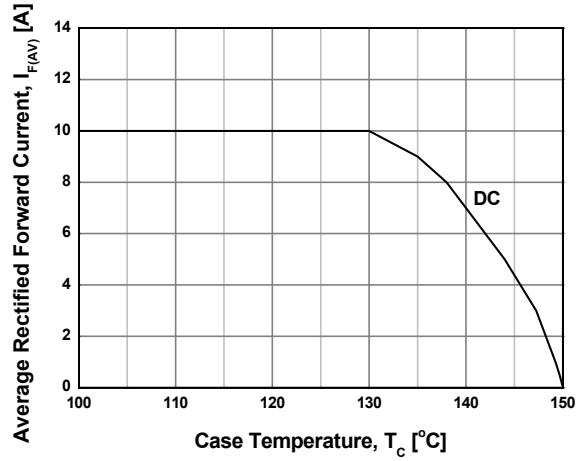
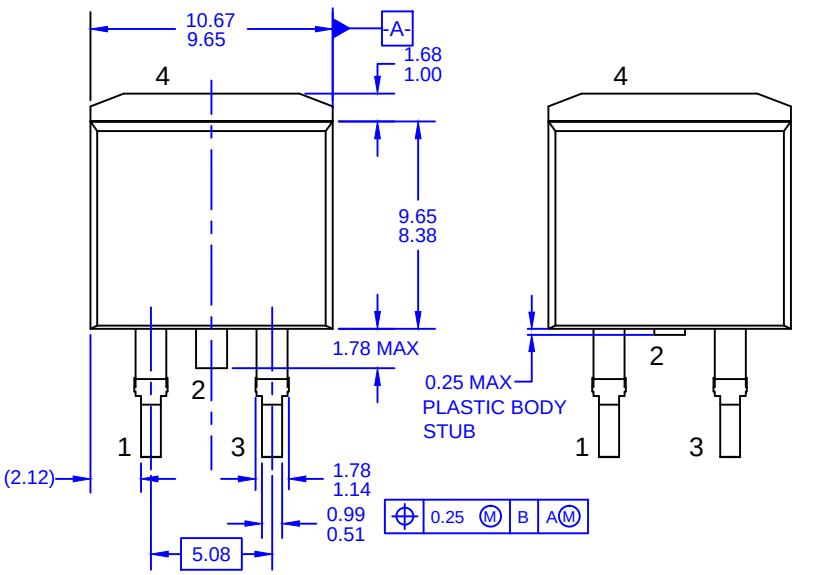
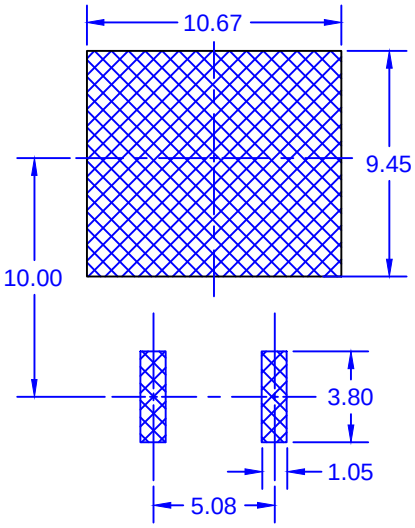



**Figure 8. Forward Current Deration Curve**

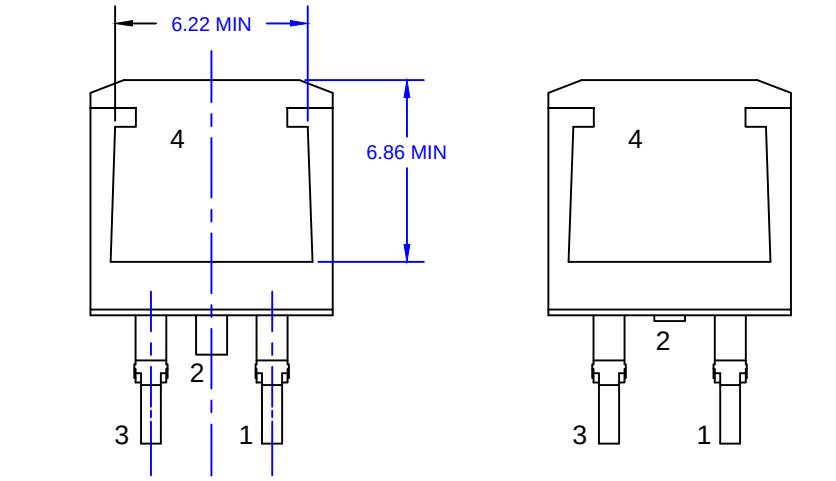




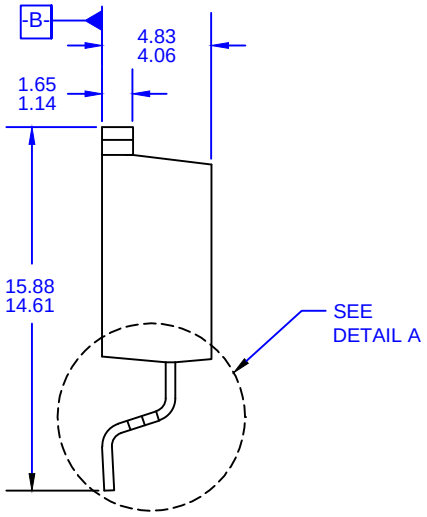

FRONT VIEW - DIODE PRODUCTS VERSION
ALTERNATIVE SUPPLIER DETAIL




LAND PATTERN RECOMMENDATION
UNLESS NOTED, ALL DIMS TYPICAL

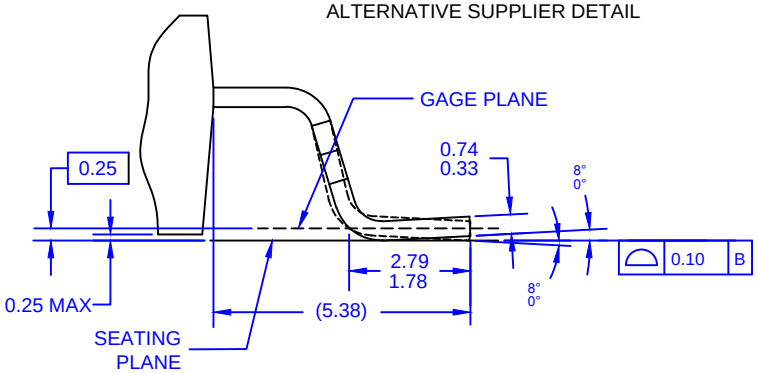



BACK VIEW - DIODE PRODUCTS VERSION
ALTERNATIVE SUPPLIER DETAIL




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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