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FFB10UP20S

10 A, 200 V, Ultrafast Diode

Features

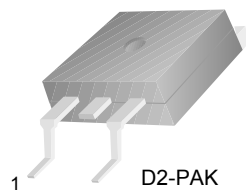
- Ultrafast with Soft Recovery : < 45 ns
- High Reverse Voltage : $V_{RRM} = 200\text{ V}$
- Avalanche Energy Rated
- Planar Construction
- RoHS Compliant

Applications

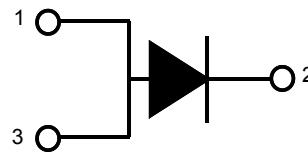
- Output Rectifiers
- SMPS
- Free-Wheeling Diode for Motor Application
- Power Switching Circuits

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) $T_a = 25^\circ\text{C}$ 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 @ $T_C = 120^\circ\text{C}$ | 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 | $^\circ\text{C}$ |

Thermal Characteristics $T_a = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Max | Unit |
|-----------------|--|-----|---------------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 3.0 | $^\circ\text{C}/\text{W}$ |

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 |

Electrical Characteristics (per diode) $T_a = 25^\circ\text{C}$ unless otherwise noted

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

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

Test Circuit and Waveforms

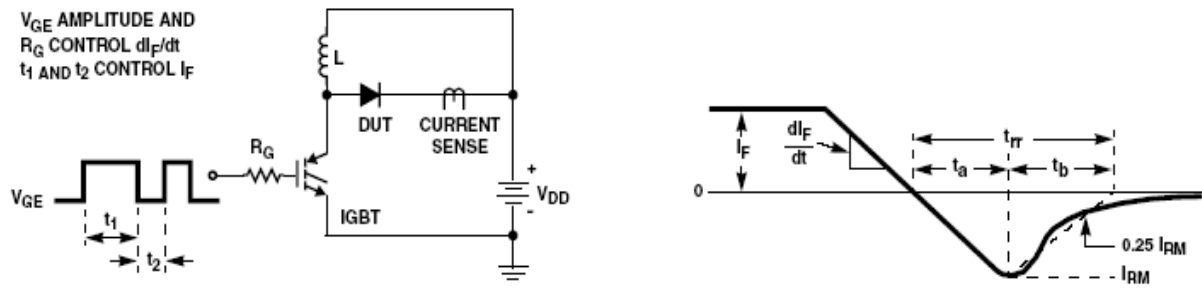


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

L = 40mH
R < 0.1 Ω
VDD = 50V

$$E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$$

Q1 = IGBT ($BV_{CES} > V_{R(AVL)}$)

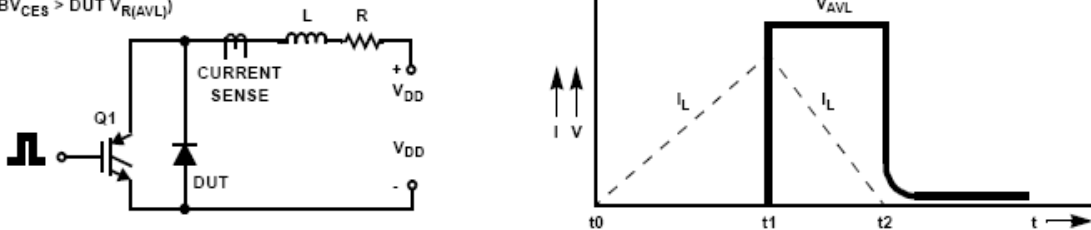


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop

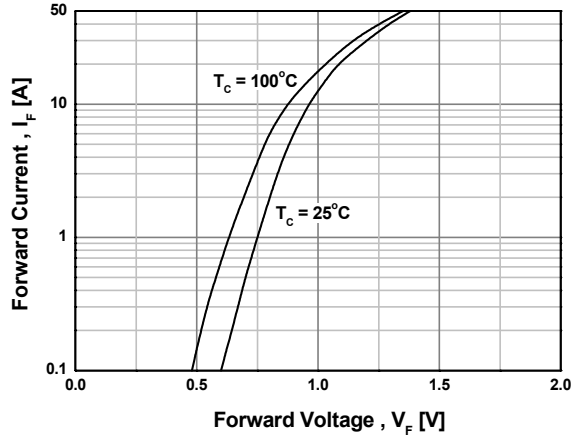


Figure 4. Typical Reverse Current

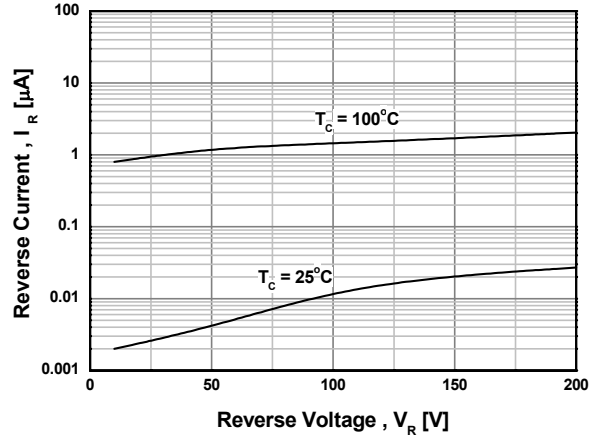


Figure 5. Typical Junction Capacitance

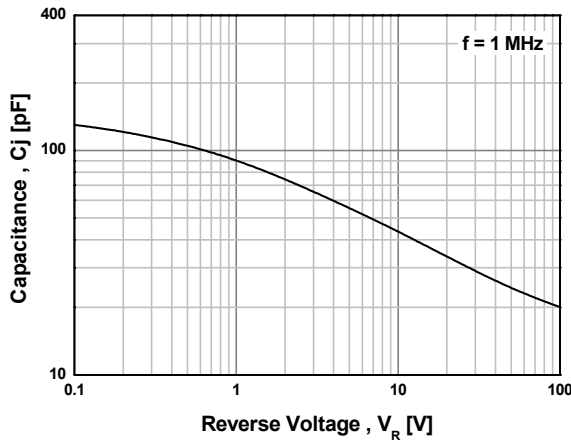


Figure 6. Typical Reverse Recovery Time

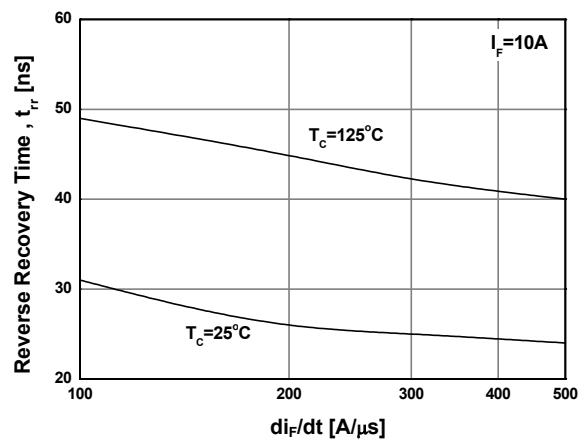


Figure 7. Typical Reverse Recovery Current

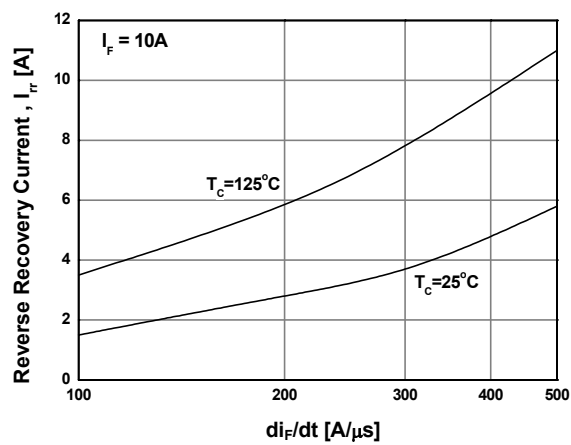
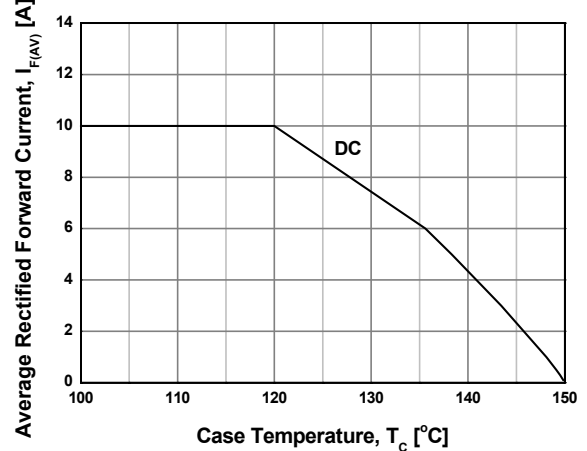


Figure 8. Forward Current Deration Curve



Mechanical Dimensions

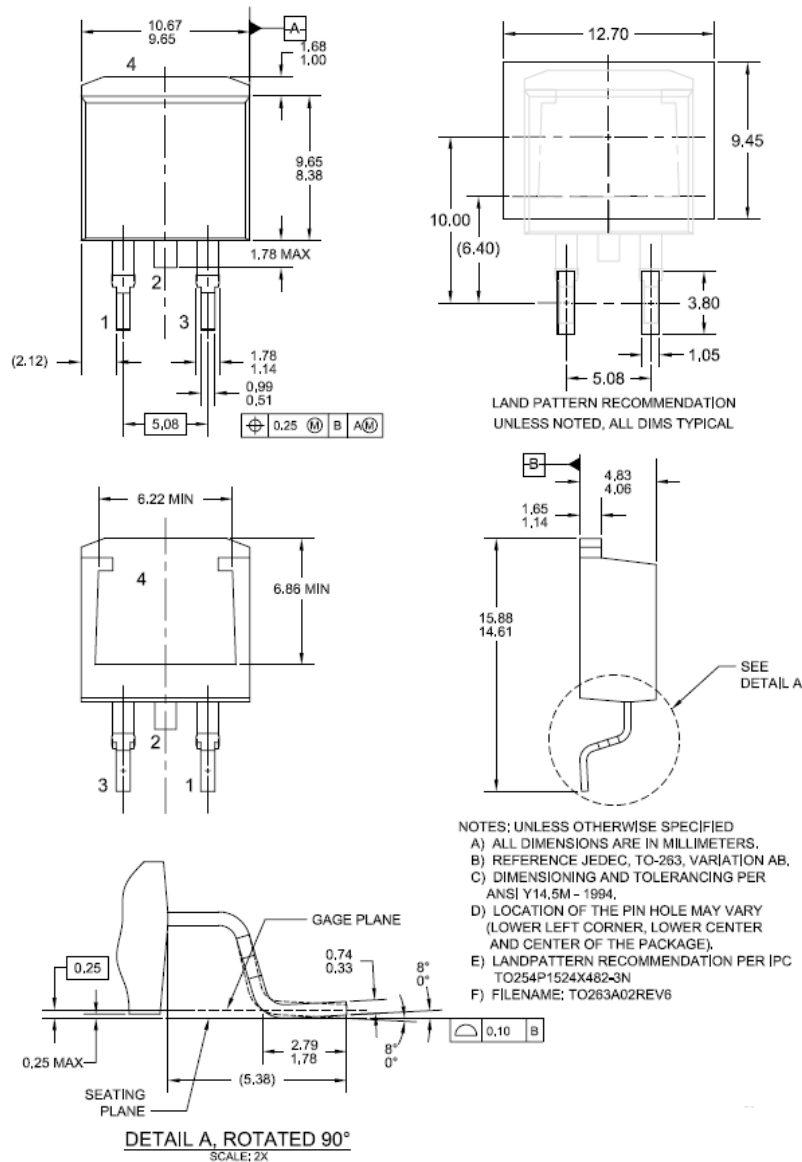


Figure 9. TO-263 2L (D²-PAK) - 2LD, TO263, SURFACE MOUNT

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

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