

FFB20UP20S

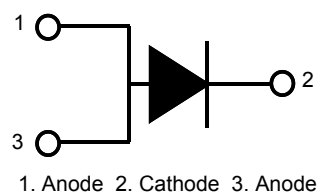
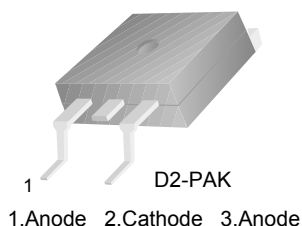
Ultrafast Recovery Power Rectifier

Features

- Ultrafast with Soft Recovery : < 45ns (@ $I_F = 20A$)
- High Reverse Voltage : $V_{RRM} = 200V$
- Avalanche Energy Rated
- Planar Construction
- RoHS Compliant

Applications

- Output Rectifiers
- Switching Mode Power Supply
- Free-wheeling diode for motor application
- Power switching circuits



Absolute Maximum Ratings $T_C = 25^\circ C$ unless otherwise noted

| Symbol | Parameter | Value | Units |
|----------------|---|--------------|------------|
| 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 @ $T_C = 115^\circ C$ | 20 | A |
| I_{FSM} | Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave | 200 | A |
| T_J, T_{STG} | Operating Junction and Storage Temperature | - 65 to +150 | $^\circ C$ |

Thermal Characteristics

| Symbol | Parameter | Max | Units |
|-----------------|--|-----|--------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 2.0 | $^\circ C/W$ |

Package Marking and Ordering Information

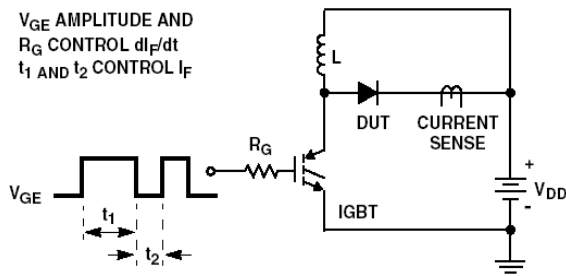
| Device Marking | Device | Package | Reel Size | Tape Width | Quantity |
|----------------|--------------|---------|-----------|------------|----------|
| F20UP20S | FFB20UP20STM | D2-PAK | 13" Dia | - | 800 |

Electrical Characteristics T_C = 25°C unless otherwise noted

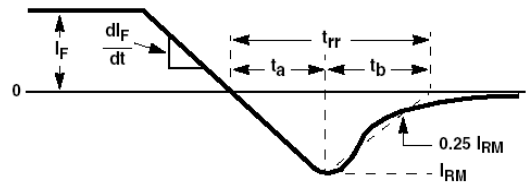
| Symbol | Parameter | | Min. | Typ. | Max. | Units |
|---|---|-------------------------|------|------|------|-------|
| V _{FM} * | I _F = 20A | T _C = 25 °C | - | - | 1.15 | V |
| | I _F = 20A | T _C = 100 °C | - | - | 1.0 | V |
| I _{RM} * | V _R = 200V | T _C = 25 °C | - | - | 100 | μA |
| | V _R = 200V | T _C = 100 °C | - | - | 500 | μA |
| t _{rr} | I _F = 1A, di/dt = 100A/μs, V _{CC} = 30V | T _C = 25 °C | - | - | 35 | ns |
| | I _F = 20A, di/dt = 200A/μs, V _{CC} = 130V | T _C = 25 °C | - | - | 45 | ns |
| t _a t _b Q _{rr} | I _F = 20A, di/dt = 200A/μs, V _{CC} = 130V | T _C = 25 °C | - | 11 | - | ns |
| | | T _C = 25 °C | - | 13 | - | ns |
| | | T _C = 25 °C | - | 21 | - | nC |
| W _{AVL} | Avalanche Energy (L = 40mH) | | 20 | - | - | mJ |

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

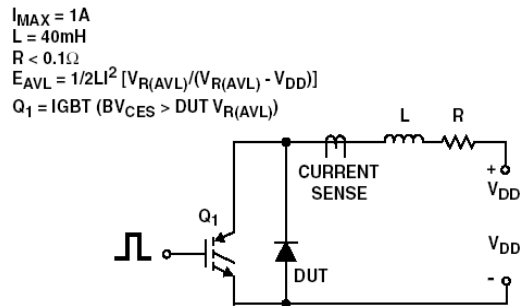
Test Circuit and Waveforms



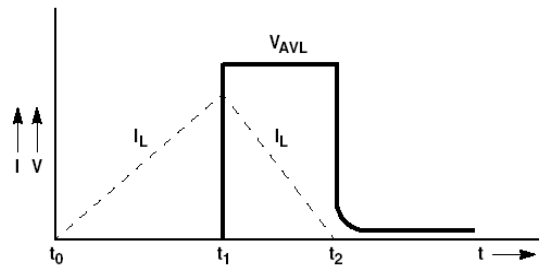
t_{rr} TEST CIRCUIT



t_{rr} WAVEFORMS AND DEFINITIONS



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

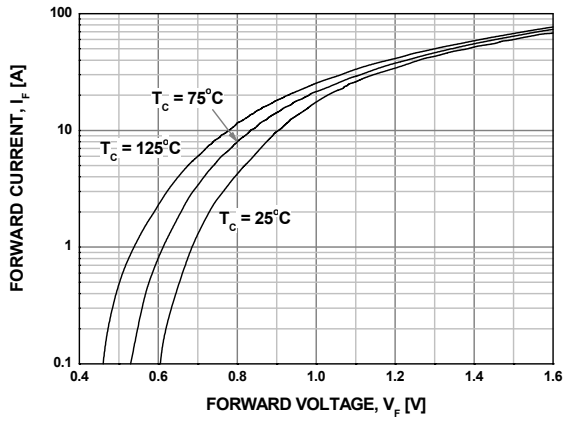


Figure 2. Typical Reverse Current

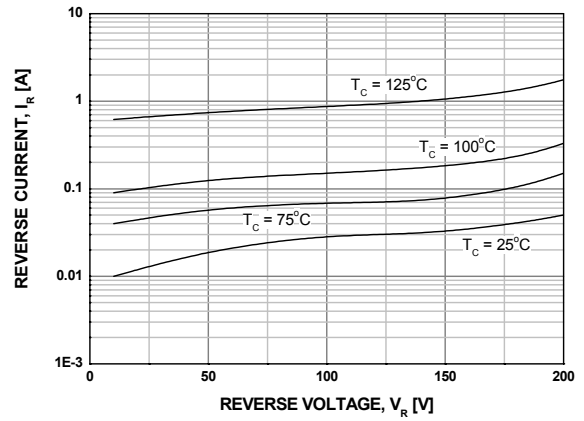


Figure 3. Typical Junction Capacitance

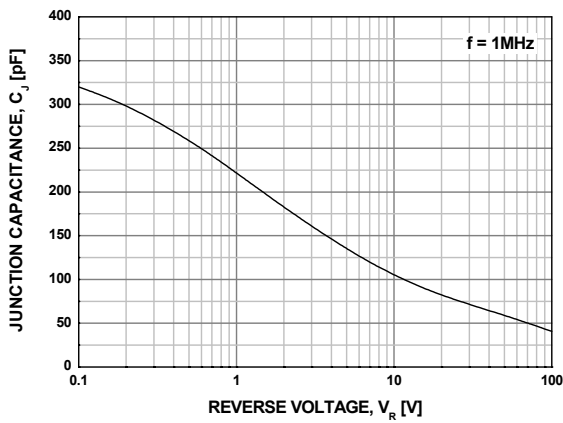


Figure 4. Typical Reverse Recovery Time

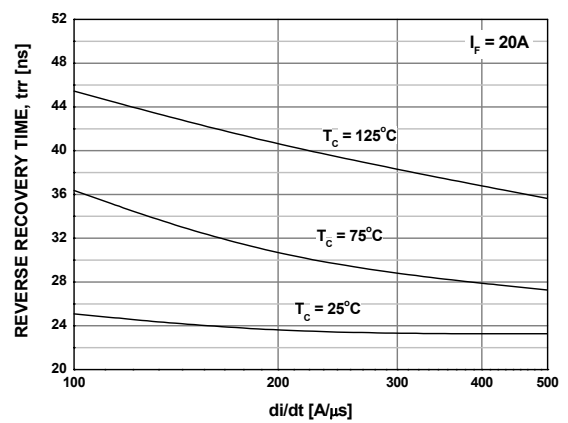


Figure 5. Typical Reverse Recovery Current

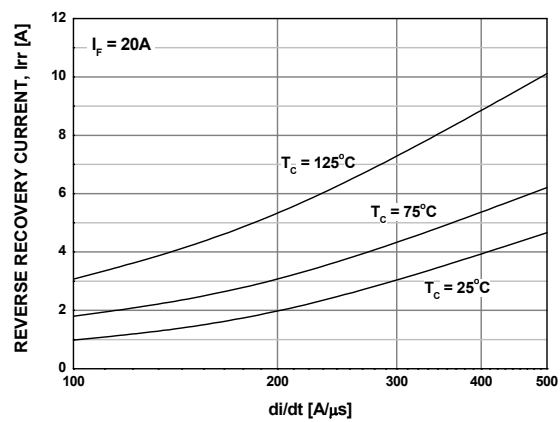
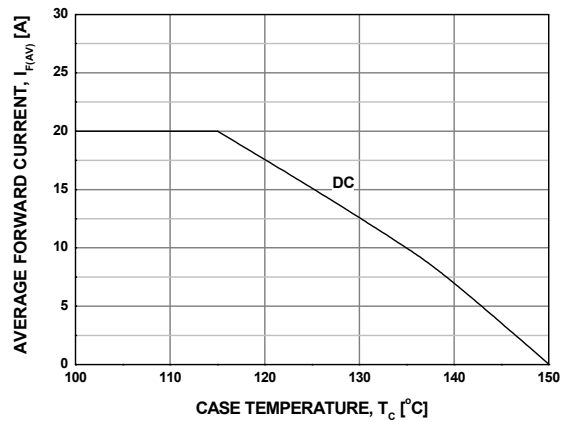
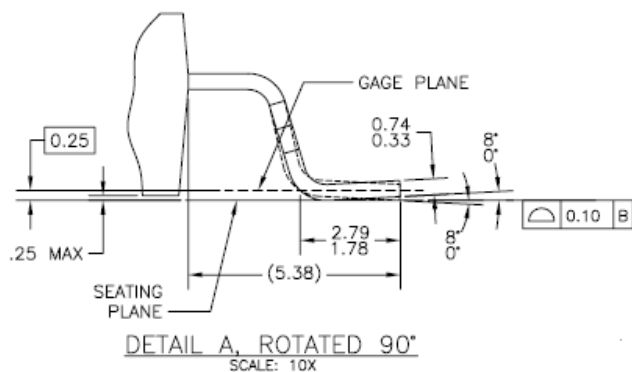
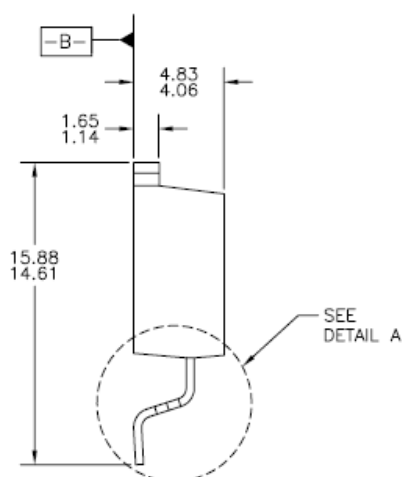
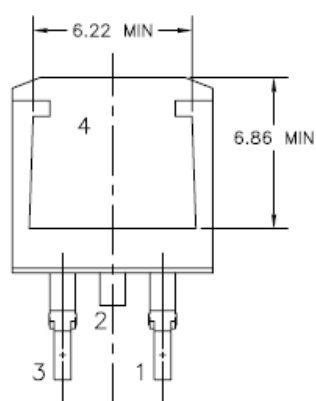
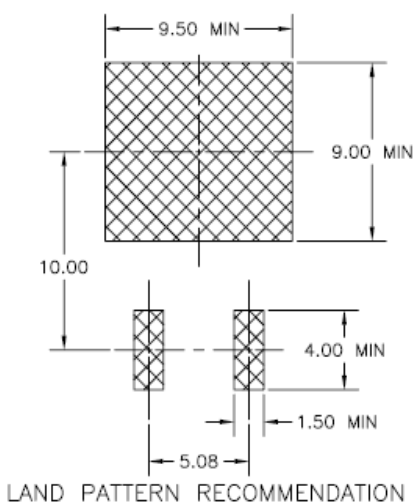
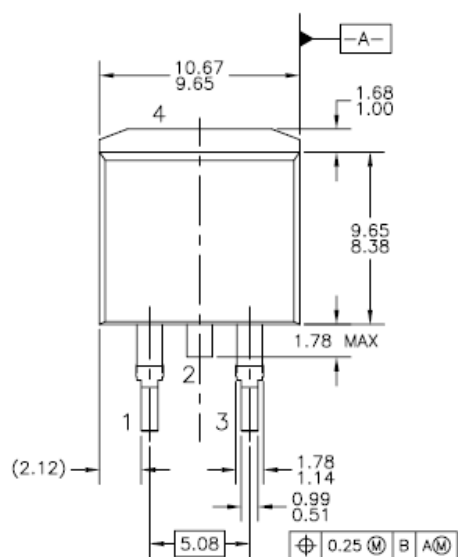


Figure 6. Forward Current Deration Curve



Mechanical Dimensions

D² - PAK



Dimensions in Millimeters

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