

# FFP20UP20DN

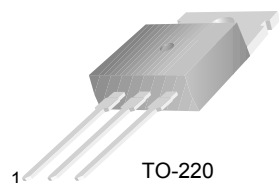
## Ultrafast Recovery Power Rectifier

### Features

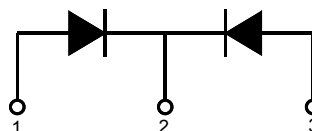
- Ultrafast with Soft Recovery : < 45ns
- High Reverse Voltage :  $V_{RRM} = 200V$
- Avalanche Energy Rated
- Planar Construction

### Applications

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



1. Anode 2. Cathode 3. Anode



1. Anode 2. Cathode 3. Anode

### Absolute Maximum Ratings (per diode) $T_a = 25^\circ C$ 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 @ $T_C = 120^\circ C$         | 10           | A          |
| $I_{FSM}$      | Non-repetitive Peak Surge Current<br>60Hz Single Half-Sine Wave | 100          | A          |
| $T_J, T_{STG}$ | Operating Junction and Storage Temperature                      | - 65 to +150 | $^\circ C$ |

### Thermal Characteristics $T_a = 25^\circ C$ unless otherwise noted

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

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

| Symbol     | Parameter                                                                                                                                                        |                           | Min. | Typ. | Max. | Units         |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------|------|------|---------------|
| $V_{FM}^*$ | $I_F = 10\text{A}$<br>$I_F = 10\text{A}$                                                                                                                         | $T_C = 25^\circ\text{C}$  | -    | -    | 1.15 | V             |
|            |                                                                                                                                                                  | $T_C = 150^\circ\text{C}$ | -    | -    | 1.0  | V             |
| $I_{RM}^*$ | $V_R = 200\text{V}$<br>$V_R = 200\text{V}$                                                                                                                       | $T_C = 25^\circ\text{C}$  | -    | -    | 100  | $\mu\text{A}$ |
|            |                                                                                                                                                                  | $T_C = 150^\circ\text{C}$ | -    | -    | 500  | $\mu\text{A}$ |
| $t_{rr}$   | $I_F = 1\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$ , $V_{CC} = 30\text{V}$<br>$I_F = 10\text{A}$ , $di/dt = 200\text{A}/\mu\text{s}$ , $V_{CC} = 130\text{V}$ | $T_C = 25^\circ\text{C}$  | -    | -    | 35   | ns            |
|            |                                                                                                                                                                  | $T_C = 25^\circ\text{C}$  | -    | -    | 45   | ns            |
| $t_a$      | $I_F = 10\text{A}$ , $di/dt = 200\text{A}/\mu\text{s}$ , $V_{CC} = 130\text{V}$                                                                                  | $T_C = 25^\circ\text{C}$  | -    | 15   | -    | ns            |
| $t_b$      |                                                                                                                                                                  | $T_C = 25^\circ\text{C}$  | -    | 12   | -    | ns            |
| $Q_{rr}$   |                                                                                                                                                                  | $T_C = 25^\circ\text{C}$  | -    | 36   | -    | nC            |
| $W_{AVL}$  | Avalanche Energy ( $L = 20\text{mH}$ )                                                                                                                           |                           | 10   | -    | -    | mJ            |

\* Pulse Test: Pulse Width=300 $\mu\text{s}$ , Duty Cycle=2%

## Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

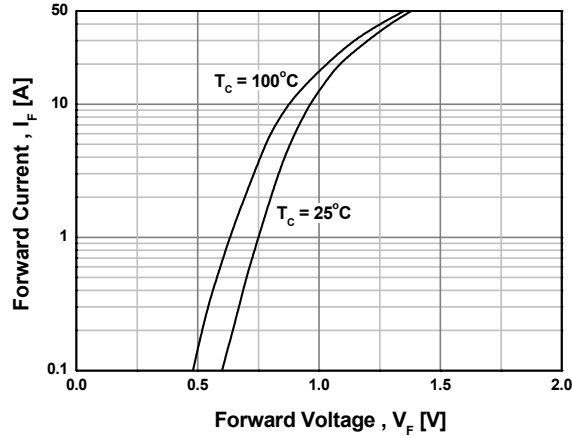


Figure 2. Typical Reverse Current

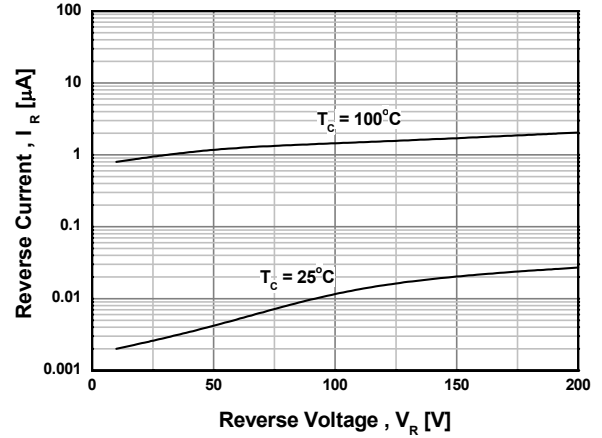


Figure 3. Typical Junction Capacitance

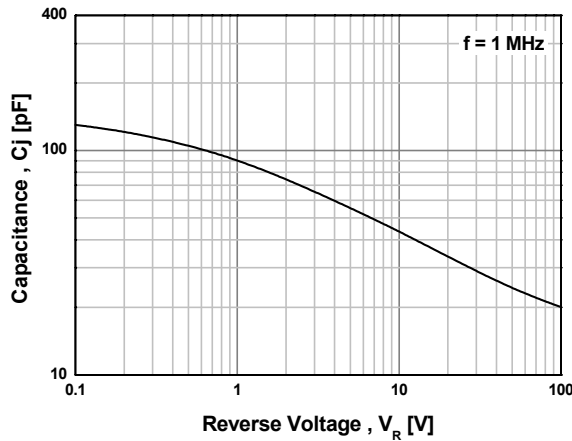


Figure 4. Typical Reverse Recovery Time

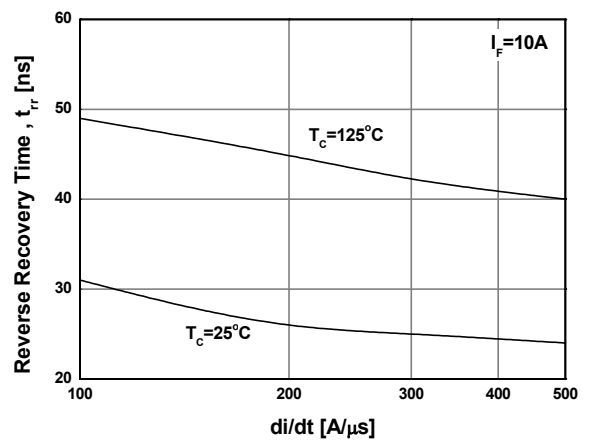


Figure 5. Typical Reverse Recovery Current

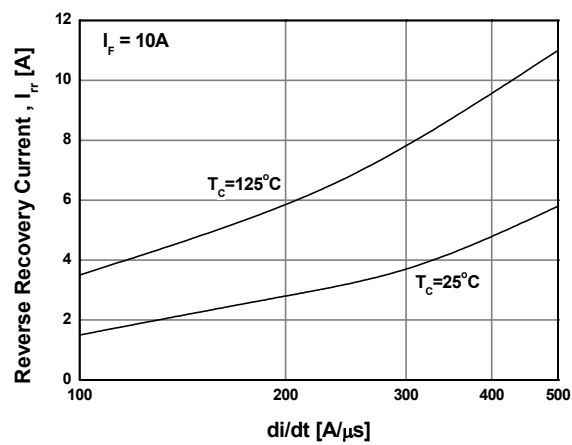
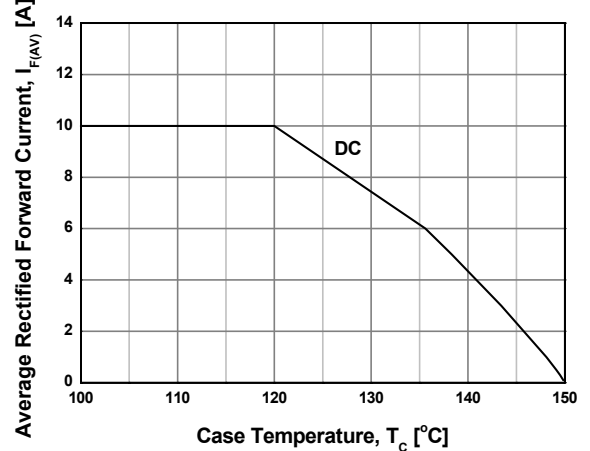
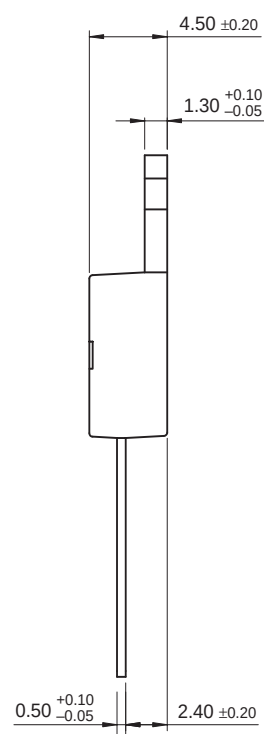


Figure 6. Forward Current Deration Curve



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