

# FFP30UP20DN

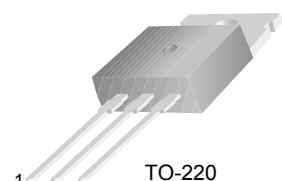
## Ultrafast Recovery Power Rectifier

### Features

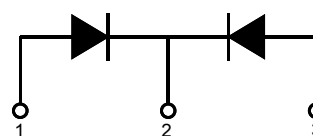
- Ultrafast with Soft Recovery :  $< 45\text{ns}$  ( $@I_F = 15\text{A}$ )
- High Reverse Voltage :  $V_{RRM} = 200\text{V}$
- Avalanche Energy Rated
- Planar Construction

### 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) $T_C = 25^\circ\text{C}$ 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 @ $T_C = 120^\circ\text{C}$   | 15           | A                |
| $I_{FSM}$      | Non-repetitive Peak Surge Current<br>60Hz Single Half-Sine Wave | 150          | A                |
| $T_J, T_{STG}$ | Operating Junction and Storage Temperature                      | - 65 to +150 | $^\circ\text{C}$ |

### Thermal Characteristics

| Symbol          | Parameter                                    | Max | Units              |
|-----------------|----------------------------------------------|-----|--------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 2.2 | $^\circ\text{C/W}$ |

### Package Marking and Ordering Information

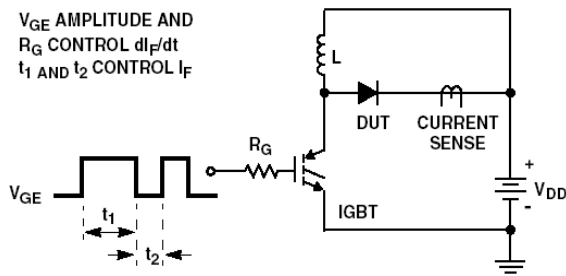
| Device Marking | Device        | Package | Reel Size | Tape Width | Quantity |
|----------------|---------------|---------|-----------|------------|----------|
| F30UP20DN      | FFP30UP20DNTU | TO-220  | -         | -          | 50       |

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

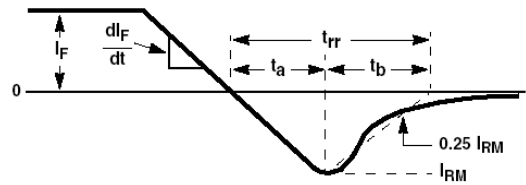
| Symbol                     | Parameter                                                                                                                                                        | Min.        | Typ.           | Max.        | Units                          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------|-------------|--------------------------------|
| $V_{FM}^*$                 | $I_F = 15\text{A}$<br>$I_F = 15\text{A}$                                                                                                                         | -           | -              | 1.15<br>1.0 | V<br>V                         |
| $I_{RM}^*$                 | $V_R = 200\text{V}$<br>$V_R = 200\text{V}$                                                                                                                       | -           | -              | 100<br>500  | $\mu\text{A}$<br>$\mu\text{A}$ |
| $t_{rr}$                   | $I_F = 1\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$ , $V_{CC} = 30\text{V}$<br>$I_F = 15\text{A}$ , $di/dt = 200\text{A}/\mu\text{s}$ , $V_{CC} = 130\text{V}$ | -           | -              | 35<br>45    | ns<br>ns                       |
| $t_a$<br>$t_b$<br>$Q_{rr}$ | $I_F = 15\text{A}$ , $di/dt = 200\text{A}/\mu\text{s}$ , $V_{CC} = 130\text{V}$                                                                                  | -<br>-<br>- | 13<br>11<br>24 | -<br>-<br>- | ns<br>ns<br>nC                 |
| $W_{AVL}$                  | Avalanche Energy ( $L = 40\text{mH}$ )                                                                                                                           | 20          | -              | -           | mJ                             |

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

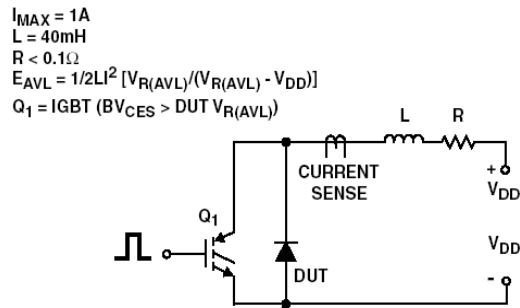
## Test Circuit and Waveforms



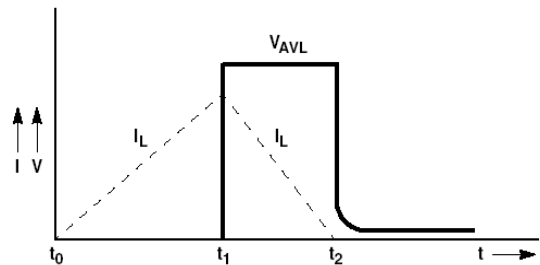
$t_{rr}$  TEST CIRCUIT



$t_{rr}$  WAVEFORMS AND DEFINITIONS



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

# Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

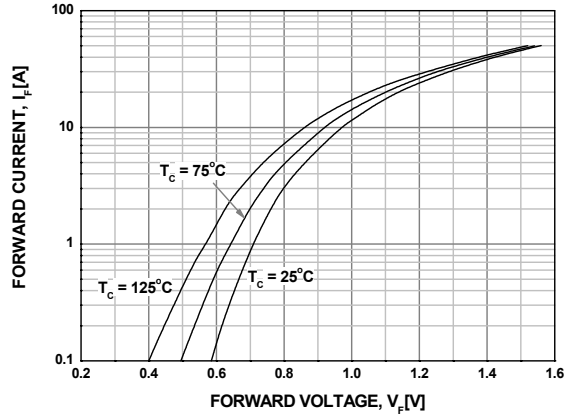


Figure 2. Typical Reverse Current

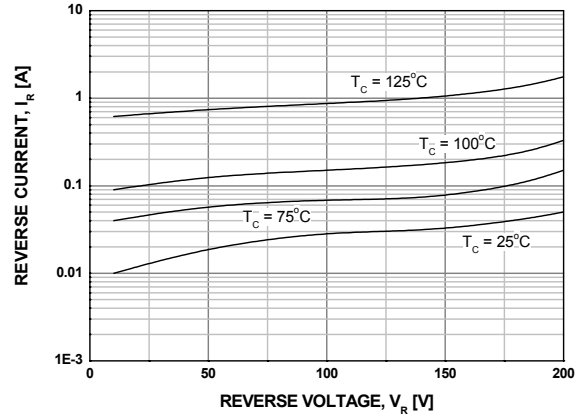


Figure 3. Typical Junction Capacitance

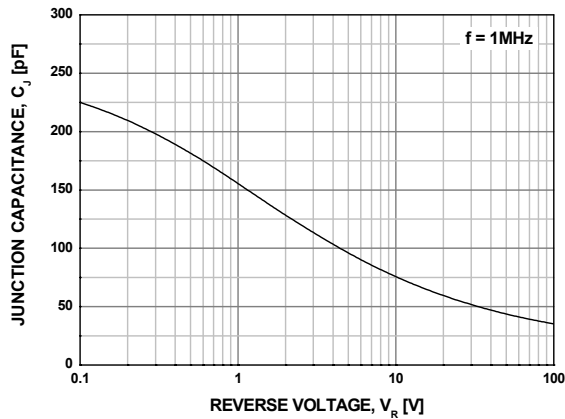


Figure 4. Typical Reverse Recovery Time

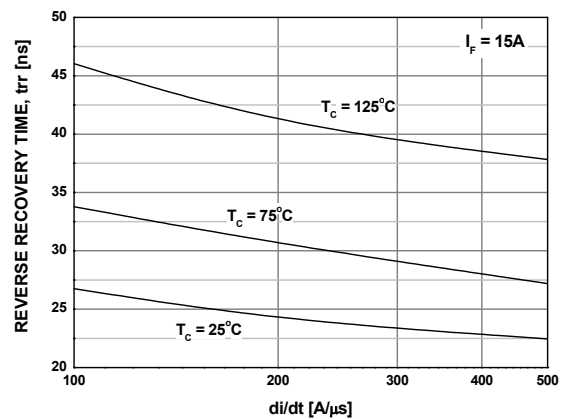


Figure 5. Typical Reverse Recovery Current

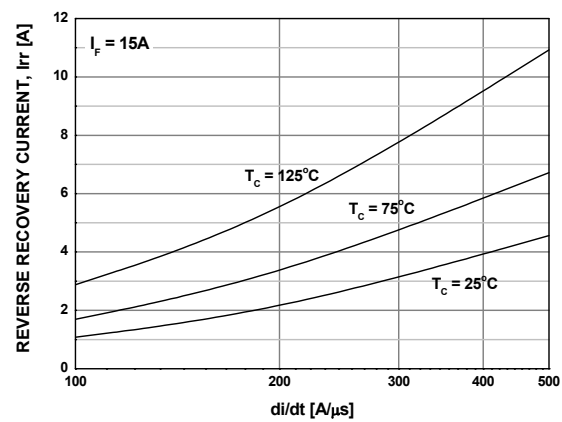


Figure 6. Forward Current Deration Curve

