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## Features

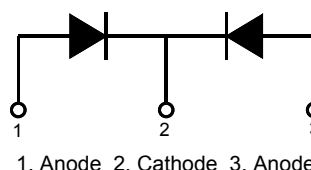
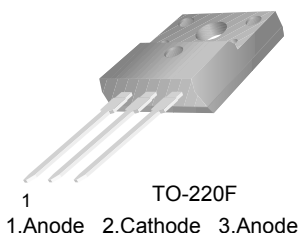
- Ultrafast Recovery  $t_{rr} = 35 \text{ ns}$  (@  $I_F = 6 \text{ A}$ )
- Max Forward Voltage,  $V_F = 2.2 \text{ V}$  (@  $T_C = 25^\circ\text{C}$ )
- Reverse Voltage,  $V_{RRM} = 200 \text{ V}$
- Avalanche Energy Rated
- RoHS Compliant

## Applications

- Output Rectifiers
- Switching Mode Power Supply
- Free-wheeling Diode
- Power Switching Circuits

## 6 A, 200 V, Ultrafast Dual Diode

The FFPF12UP20DN 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 applications as welder and UPS application.



## Absolute Maximum Ratings (per diode) $T_C = 25^\circ\text{C}$ 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 @ $T_C = 120^\circ\text{C}$	6	A
$I_{FSM}$	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	60	A
$T_J, T_{STG}$	Operating Junction and Storage Temperature	- 65 to +150	$^\circ\text{C}$

## Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	5.0	$^\circ\text{C/W}$

## Package Marking and Ordering Information

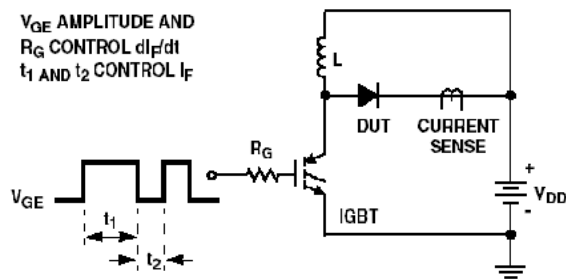
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F12UP20DN	FFPF12UP20DNTU	TO-220F	-	-	50

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

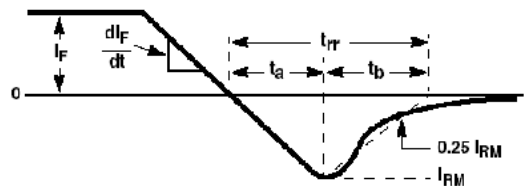
Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_F^*$	$I_F = 6\text{ A}$	-	-	1.15	V
	$T_C = 100^\circ\text{C}$	-	-	1.0	V
$I_R^*$	$V_R = 200\text{ V}$	-	-	100	$\mu\text{A}$
	$T_C = 100^\circ\text{C}$	-	-	500	$\mu\text{A}$
$t_{rr}$	$I_F = 1\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, V_{CC} = 30\text{ V}$	-	-	30	ns
	$I_F = 6\text{ A}, di/dt = 200\text{ A}/\mu\text{s}, V_{CC} = 130\text{ V}$	-	-	35	ns
$t_a$ $t_b$ $Q_{rr}$	$I_F = 6\text{ A}, di/dt = 200\text{ A}/\mu\text{s}, V_{CC} = 130\text{ V}$	$T_C = 25^\circ\text{C}$	12	-	ns
		$T_C = 25^\circ\text{C}$	12	-	ns
		$T_C = 25^\circ\text{C}$	24	-	nC
$W_{AVL}$	Avalanche Energy ( $L = 20\text{mH}$ )	10	-	-	mJ

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

## Test Circuit and Waveforms

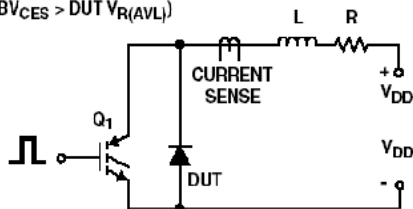


$t_{rr}$  TEST CIRCUIT

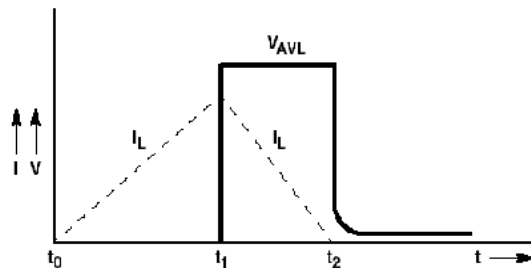


$t_{rr}$  WAVEFORMS AND DEFINITIONS

- $I_{MAX} = 1\text{ A}$
- $L = 20\text{mH}$
- $R < 0.1\Omega$
- $E_{AVL} = 1/2 L I^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
- $Q_1 = \text{IGBT (BV}_{CES} > V_{R(AVL)})$



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

## Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

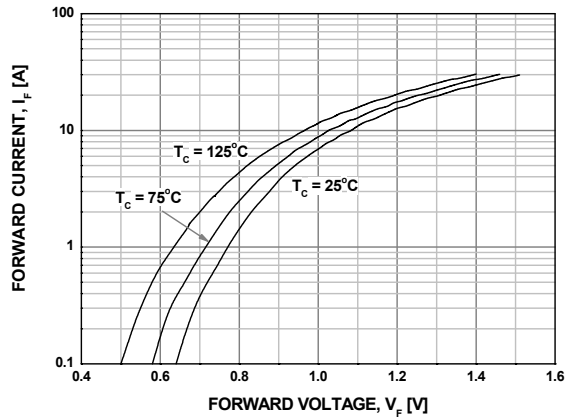


Figure 2. Typical Reverse Current

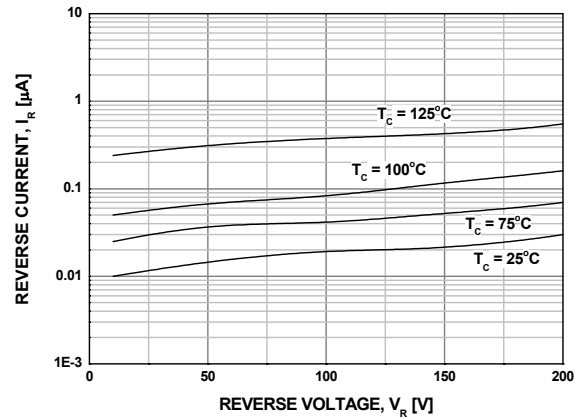


Figure 3. Typical Junction Capacitance

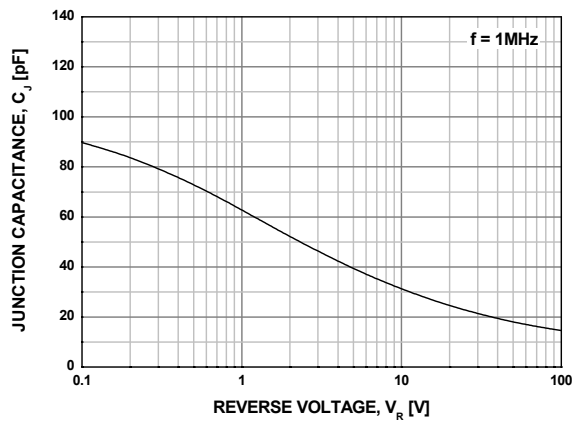


Figure 4. Typical Reverse Recovery Time

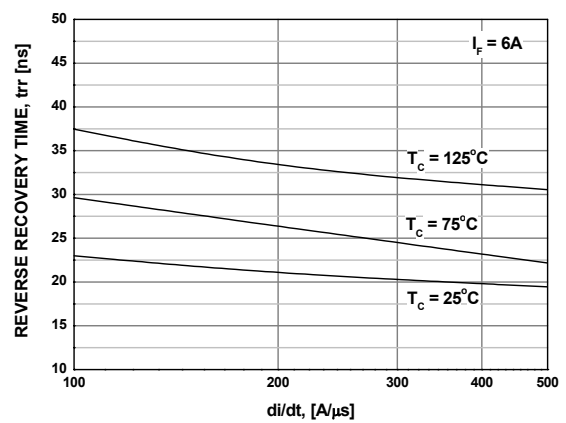


Figure 5. Typical Reverse Recovery Current

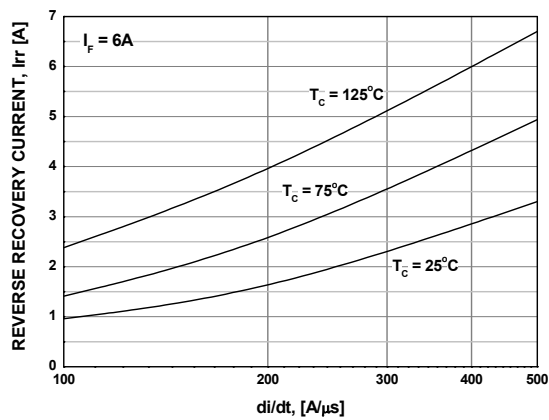
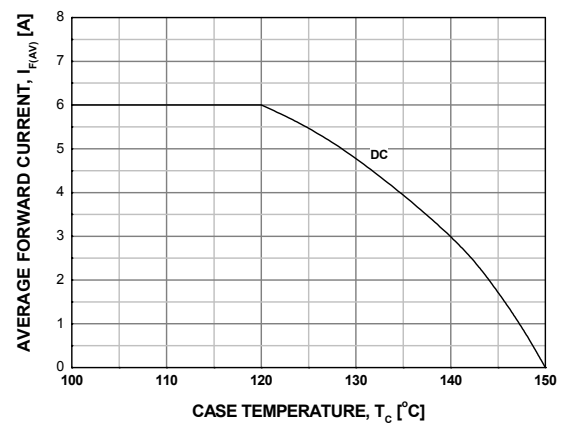
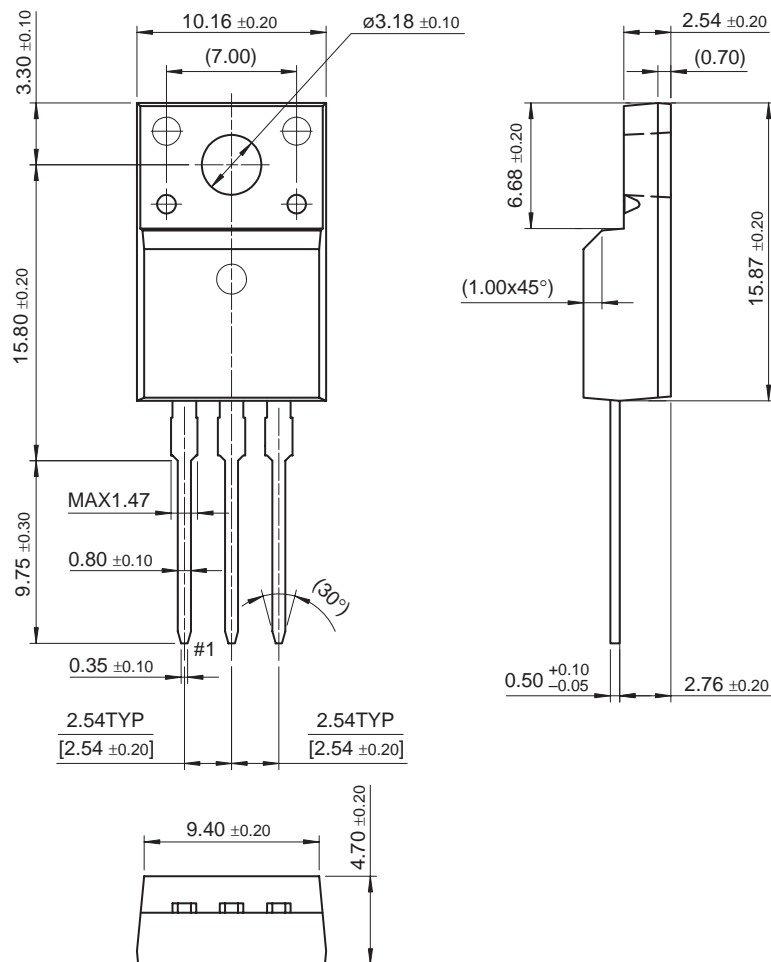


Figure 6. Forward Current Deration Curve



# Package Demensions

## TO-220F



Dimensions in Millimeters



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