



THE DATASHEET OF F12UP20DN



FFPF12UP20DN

Features

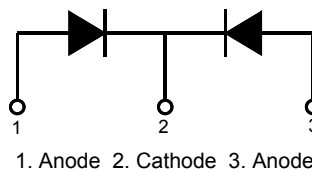
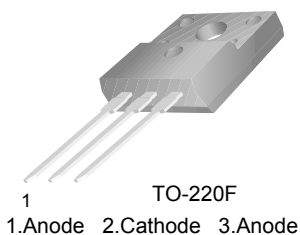
- Ultrafast Recovery $t_{rr} = 35 \text{ ns}$ (@ $I_F = 6 \text{ A}$)
- Max Forward Voltage, $V_F = 2.2 \text{ V}$ (@ $T_C = 25^\circ\text{C}$)
- Reverse Voltage, $V_{RRM} = 200 \text{ V}$
- Avalanche Energy Rated
- RoHS Compliant

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.

Applications

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



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	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information

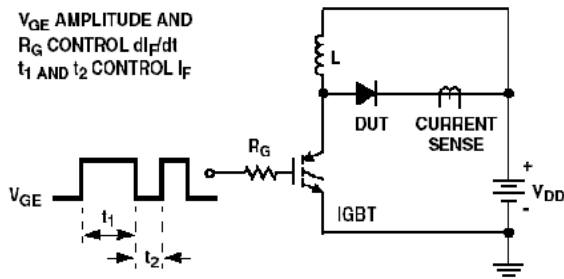
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F12UP20DN	FFPF12UP20DNTU	TO-220F	-	-	50

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

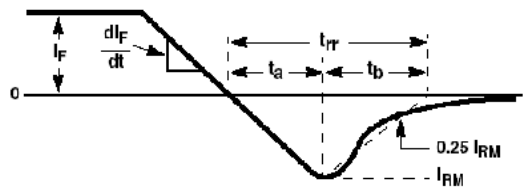
Symbol	Parameter	Min.	Typ.	Max.	Unit
V_F^*	$I_F = 6\text{ A}$	-	-	1.15	V
	$I_F = 6\text{ A}$	-	-	1.0	V
I_R^*	$V_R = 200\text{ V}$	-	-	100	μA
	$V_R = 200\text{ V}$	-	-	500	μA
t_{rr}	$I_F = 1\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, V_{CC} = 30\text{ V}$	-	-	30	ns
	$I_F = 6\text{ A}, di/dt = 200\text{ A}/\mu\text{s}, V_{CC} = 130\text{ V}$	-	-	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 μs , Duty Cycle=2%

Test Circuit and Waveforms

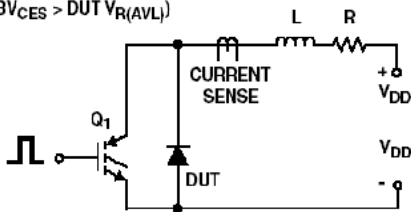


t_{rr} TEST CIRCUIT

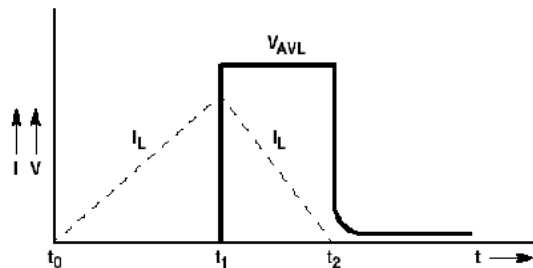


t_{rr} WAVEFORMS AND DEFINITIONS

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



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

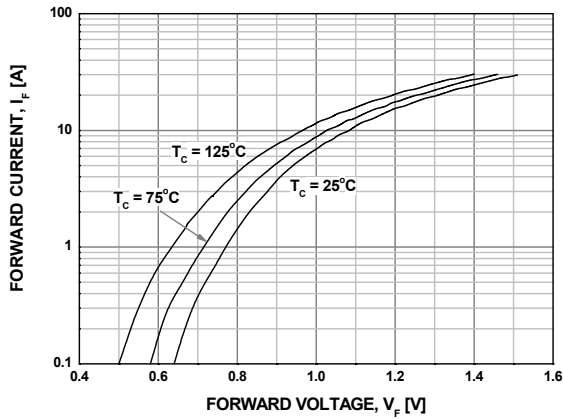


Figure 2. Typical Reverse Current

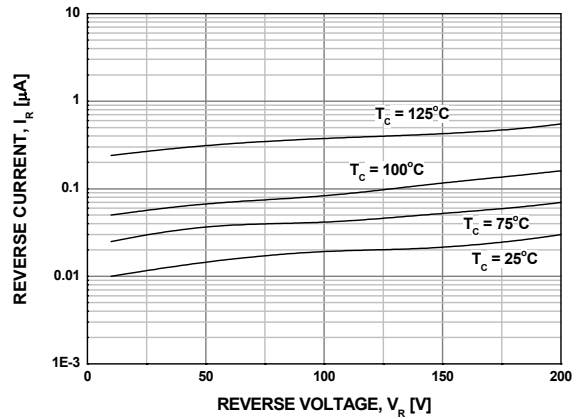


Figure 3. Typical Junction Capacitance

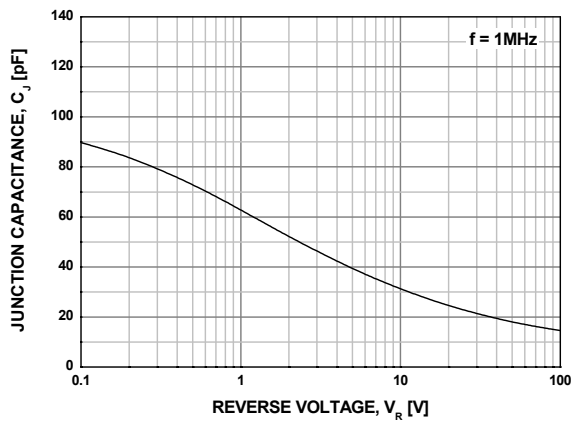


Figure 4. Typical Reverse Recovery Time

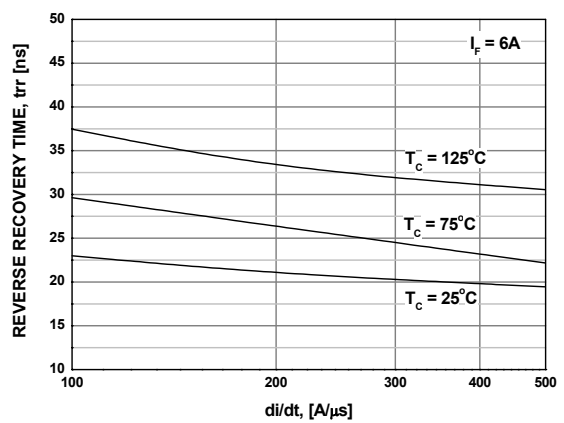


Figure 5. Typical Reverse Recovery Current

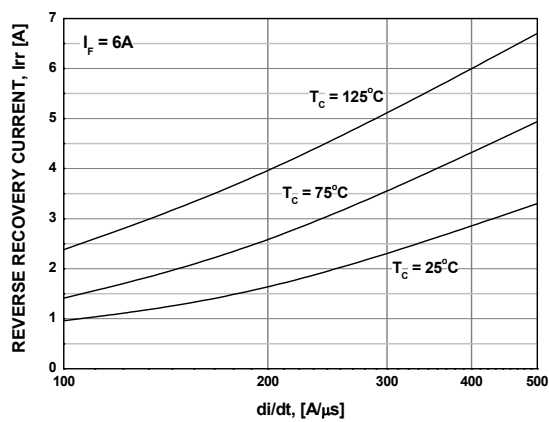
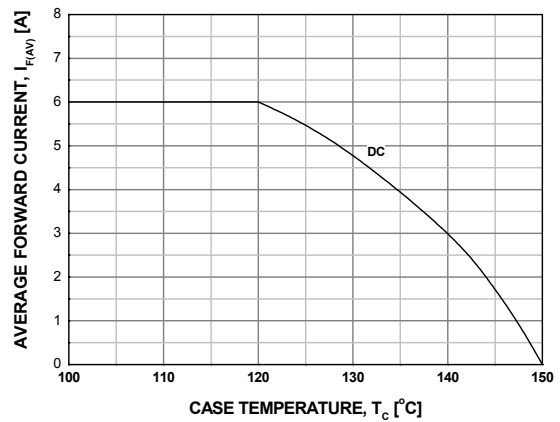
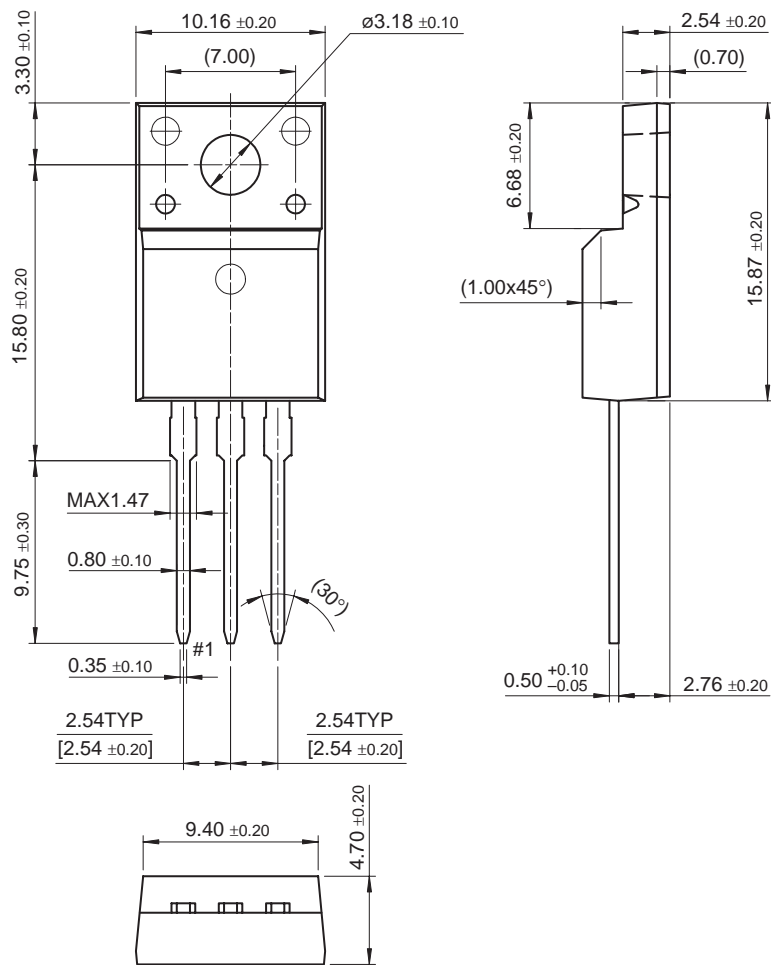


Figure 6. Forward Current Deration Curve



Package Demensions

TO-220F



Dimensions in Millimeters



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Rev. 164

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