



FFPF30UP20DN

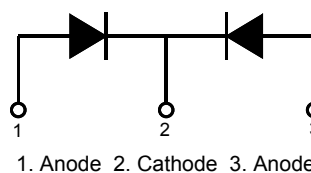
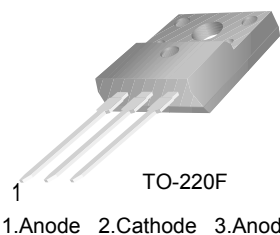
Ultrafast Recovery Power Rectifier

Features

- Ultrafast with Soft Recovery : < 45ns (@ $I_F = 15A$)
- 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



Absolute Maximum Ratings (per diode) $T_C = 25^\circ C$ 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 @ $T_C = 105^\circ C$	15	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	150	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	3.8	$^\circ C/W$

Package Marking and Ordering Information

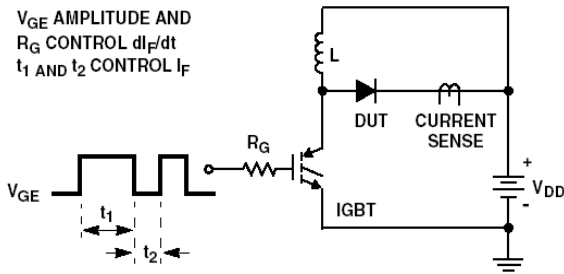
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F30UP20DN	FFPF30UP20DNTU	TO-220F	-	-	50

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

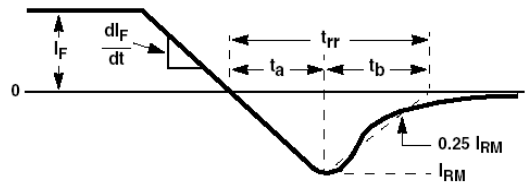
Symbol	Parameter	Min.	Typ.	Max.	Units	
V_{FM}^*	$I_F = 15\text{A}$ $I_F = 15\text{A}$	$T_C = 25^\circ\text{C}$	-	-	1.15	V
		$T_C = 100^\circ\text{C}$	-	-	1.0	V
I_{RM}^*	$V_R = 200\text{V}$ $V_R = 200\text{V}$	$T_C = 25^\circ\text{C}$	-	-	100	μA
		$T_C = 100^\circ\text{C}$	-	-	500	μA
t_{rr}	$I_F = 1\text{A}, di/dt = 100\text{A}/\mu\text{s}, V_{CC} = 30\text{V}$ $I_F = 15\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 130\text{V}$	$T_C = 25^\circ\text{C}$	-	-	35	ns
		$T_C = 25^\circ\text{C}$	-	-	45	ns
t_a t_b Q_{rr}	$I_F = 15\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 130\text{V}$	$T_C = 25^\circ\text{C}$	-	13	-	ns
		$T_C = 25^\circ\text{C}$	-	11	-	ns
		$T_C = 25^\circ\text{C}$	-	24	-	nC
W_{AVL}	Avalanche Energy (L = 40mH)	20	-	-	mJ	

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

Test Circuit and Waveforms



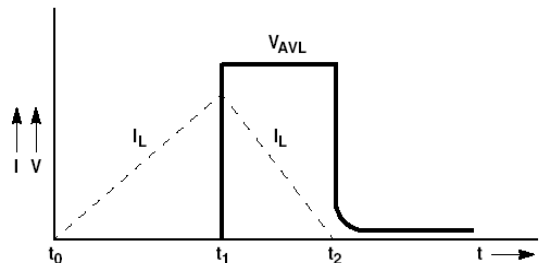
t_{rr} TEST CIRCUIT



t_{rr} WAVEFORMS AND DEFINITIONS



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

$I_{MAX} = 1\text{A}$
 $L = 40\text{mH}$
 $R < 0.1\Omega$
 $E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
 $Q_1 = \text{IGBT } (BV_{CES} > \text{DUT } V_{R(AVL)})$

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

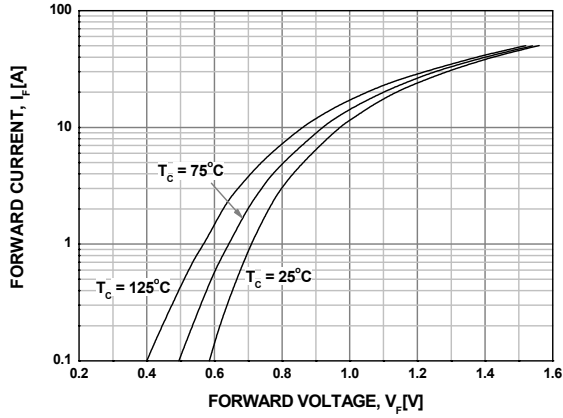


Figure 2. Typical Reverse Current

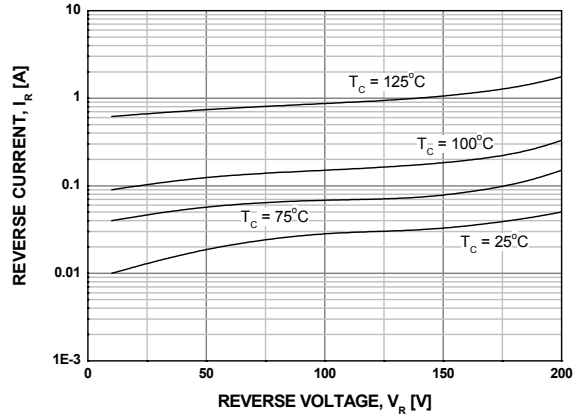


Figure 3. Typical Junction Capacitance

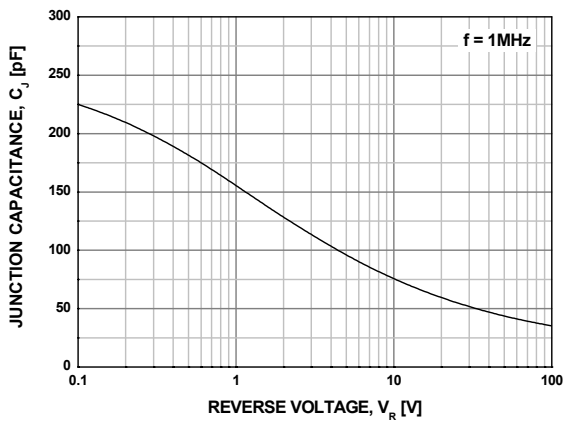


Figure 4. Typical Reverse Recovery Time

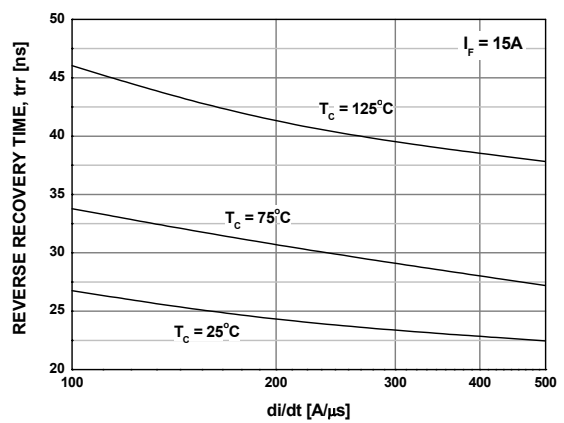


Figure 5. Typical Reverse Recovery Current

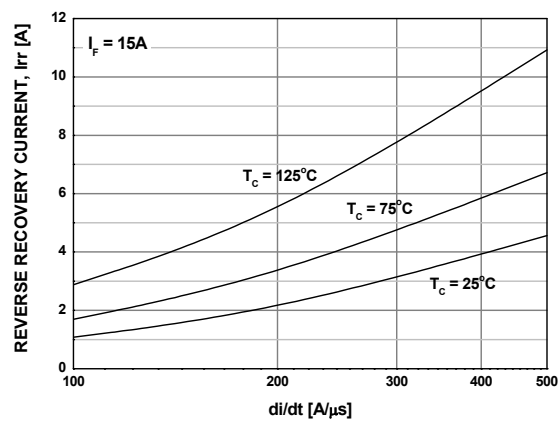
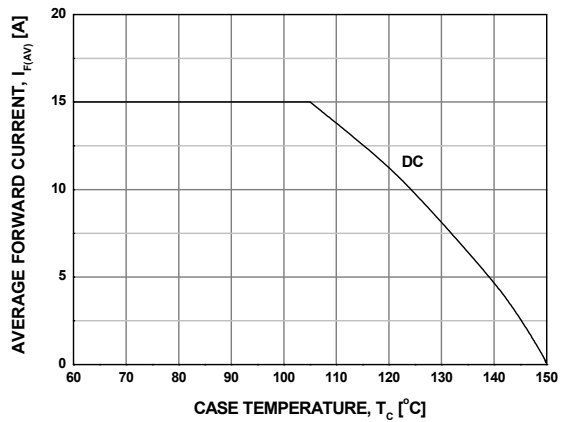
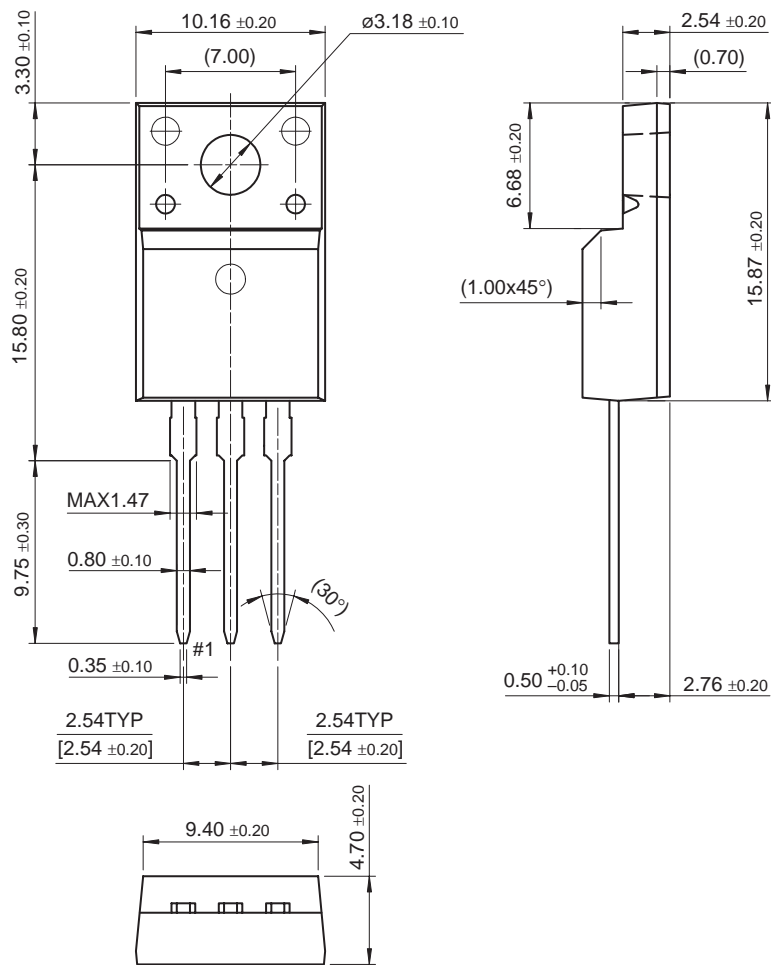


Figure 6. Forward Current Deration Curve



Package Demensions

TO-220F



Dimensions in Millimeters

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