FAIRCHILD SEMICONDUCTOR®

November 2007

FFPF20UP60DN

Features

- High Speed Switching, t_{rr} < 70ns @ I_F = 10A
- High Reverse Voltage and High Reliability
- RoHS compliant

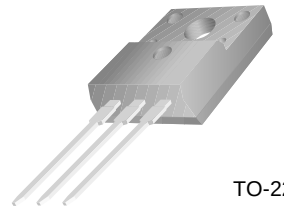
Applications

- General Purpose
- Switching Mode Power Supply
- Boost Diode in continuous mode power factor corrections
- Power switching circuits

20A, 600V Ultrafast Rectifier

The FFPF20UP60DN is a ultrafast rectifier with soft recovery characteristics. It is silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as freewheeling of boost diode in switching power supplies and other power swithching applications. It's low stored charge and ultrarfast soft recovery with soft recovery characteristics minimize ringing and electrical noise in many power switching, thus reducing power loss in the switching transistors.



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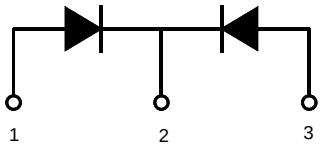


1. Anode 2. Cathode 3. Anode

Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{RRM}	Peak Repetitive Reverse Voltage	600	V
V_{RWM}	Working Peak Reverse Voltage	600	V
V_R	DC Blocking Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 103°C	10	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	50	A
T_J, T_{STG}	Operating and Storage Temperature Range	-65 to +150	°C

Thermal Characteristics

Symbol	Parameter	Ratings	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	7	°C/W

Package Marking and Ordering Information

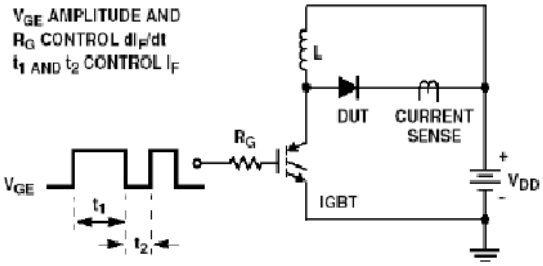
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F20UP60DN	FFPF20UP60DNTU	TO-220F	-	-	50

Electrical Characteristics $T_C = 25^oC$ unless otherwise noted

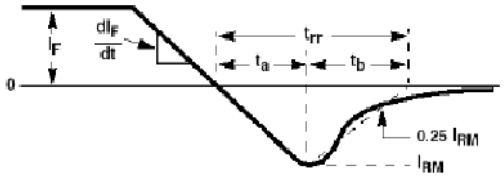
Symbol	Parameter		Min.	Typ.	Max.	Units
V_{FM}1	I_F = 10A I_F = 10A	$T_C = 25^oC$ $T_C = 100^oC$	- -	- -	2.2 2.0	V
I_{RM}1	V_R = 600V V_R = 600V	$T_C = 25^oC$ $T_C = 100^oC$	- -	- -	100 500	μA
t_{rr}	I_F = 10A, di/dt = 200A/μs, V_R = 390V	$T_C = 25^oC$	-	53	70	ns
t_{rr} I_{rr} Q_{rr}	I_F = 1A, di/dt = 100A/μs, V_R = 30V	$T_C = 25^oC$	- - -	30 1.5 20	40 2 30	ns A nC
W_{AVL}	Avalanche Energy (L = 40mH)		10	-	-	mJ

Notes:
1: Pulse: Test Pulse width = 300μs, Duty Cycle = 2%

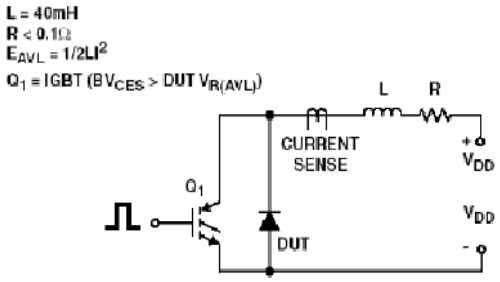
Test Circuit and Waveforms



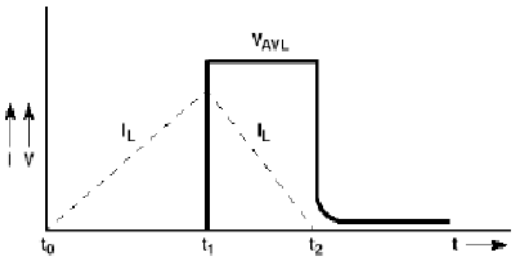
t_{rr} TEST CIRCUIT



t_{rr} WAVEFORMS AND DEFINITIONS



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop vs. Forward Current

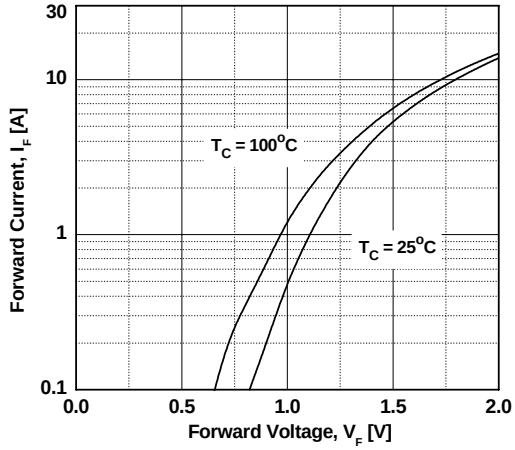


Figure 2. Typical Reverse Current vs. Reverse Voltage

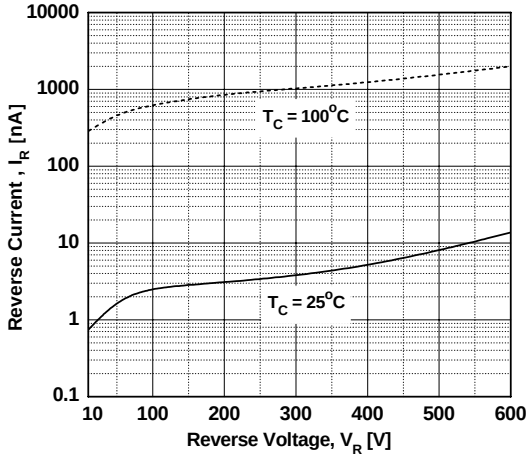


Figure 3. Typical Junction Capacitance

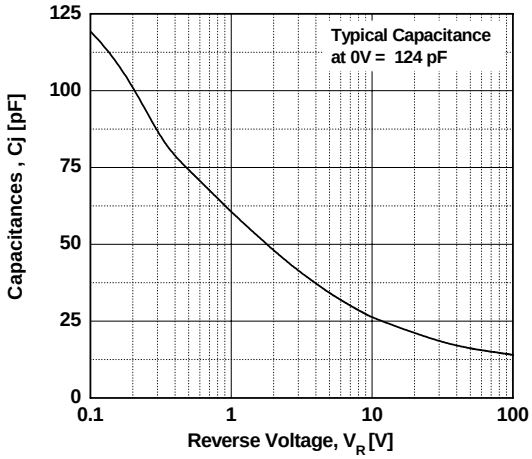


Figure 4. Typical Reverse Recovery Time vs. di/dt

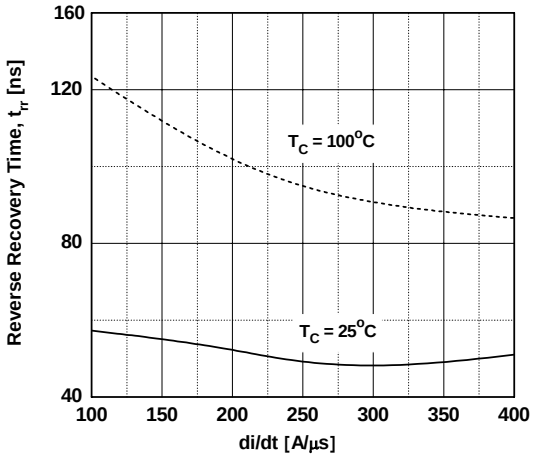


Figure 5. Typical Reverse Recovery Current vs. di/dt

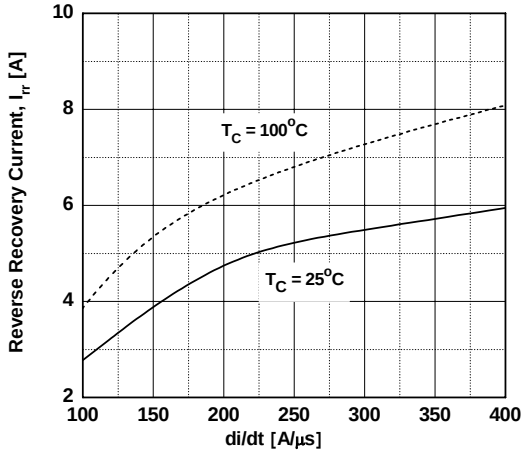
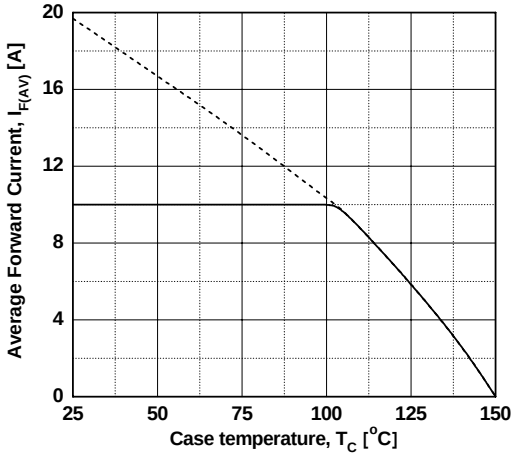


Figure 6. Forward Current Derating Curve



Mechanical Dimensions

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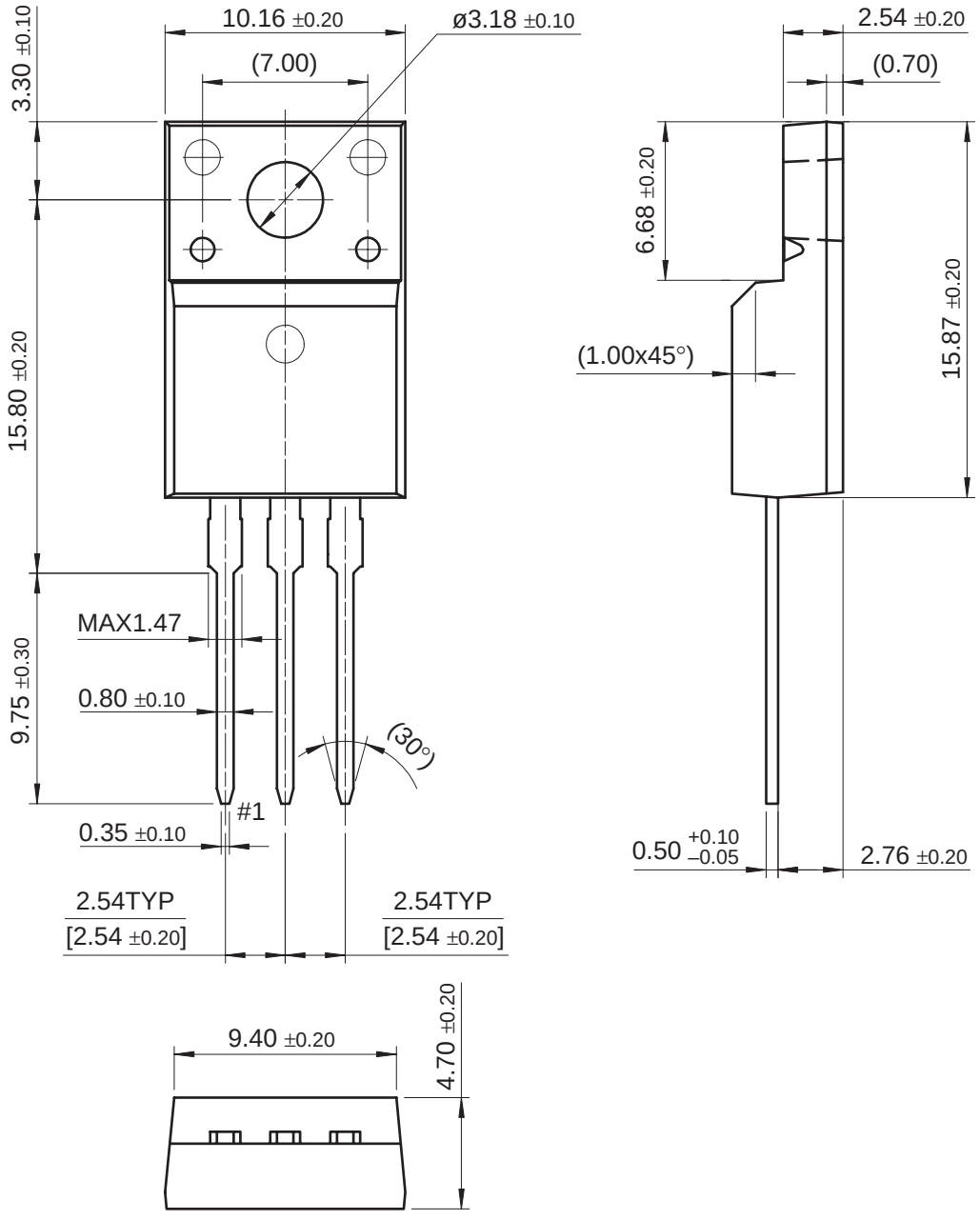

Dimensions in Millimeters

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