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February 2006



FFPF20UP20S

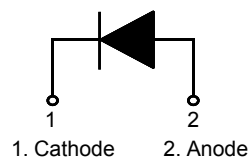
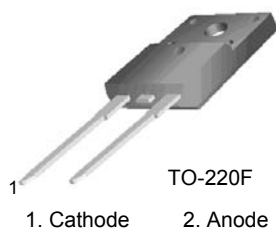
Ultrafast Recovery Power Rectifier

Features

- Ultrafast with Soft Recovery : < 45ns (@ $I_F = 20A$)
- 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 $T_C = 25^\circ C$ 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 @ $T_C = 95^\circ C$	20	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	200	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	3.5	$^\circ C/W$

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F20UP20S	FFPF20UP20STU	TO-220F	-	-	50

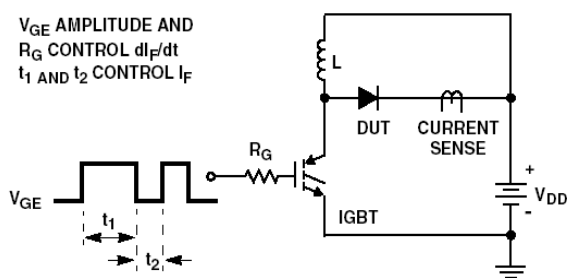
FFPF20UP20S Ultrafast Recovery Power Rectifier

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

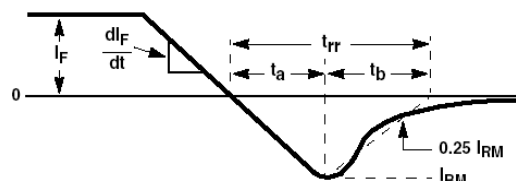
Symbol	Parameter	Min.	Typ.	Max.	Units
V_{FM}^*	$I_F = 20\text{A}$	-	-	1.15	V
	$I_F = 20\text{A}$	-	-	1.0	V
I_{RM}^*	$V_R = 200\text{V}$	-	-	100	μA
	$V_R = 200\text{V}$	-	-	500	μA
t_{rr}	$I_F = 1\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, $V_{CC} = 30\text{V}$	-	-	35	ns
	$I_F = 20\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_{CC} = 130\text{V}$	-	-	45	ns
t_a	$I_F = 20\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_{CC} = 130\text{V}$	-	11	-	ns
t_b	$I_F = 20\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_{CC} = 130\text{V}$	-	13	-	ns
Q_{rr}	$I_F = 20\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_{CC} = 130\text{V}$	-	21	-	nC
W_{AVL}	Avalanche Energy ($L = 40\text{mH}$)	20	-	-	mJ

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

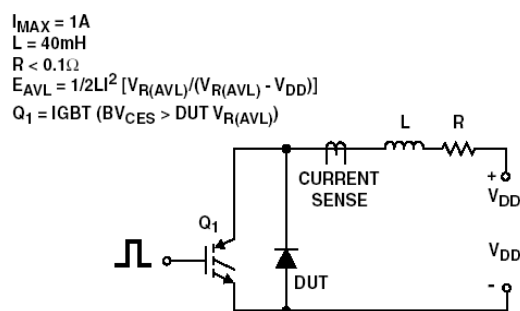
Test Circuit and Waveforms



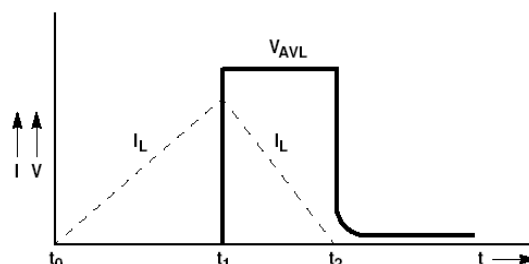
t_{rr} TEST CIRCUIT



t_{rr} WAVEFORMS AND DEFINITIONS



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

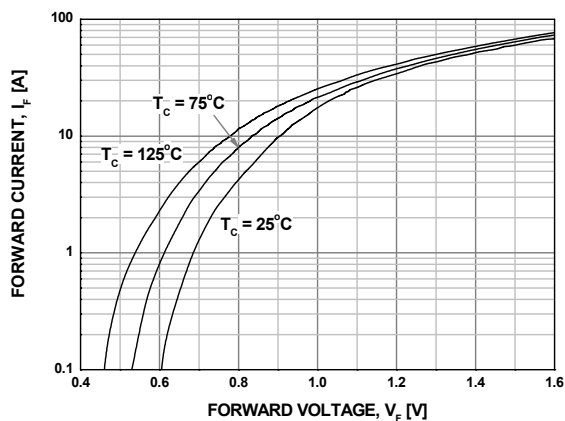


Figure 2. Typical Reverse Current

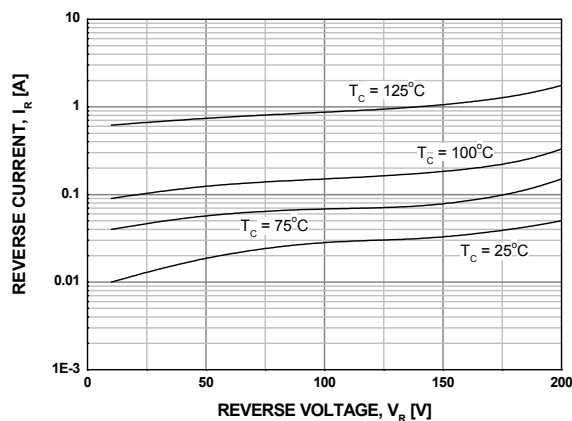


Figure 3. Typical Junction Capacitance

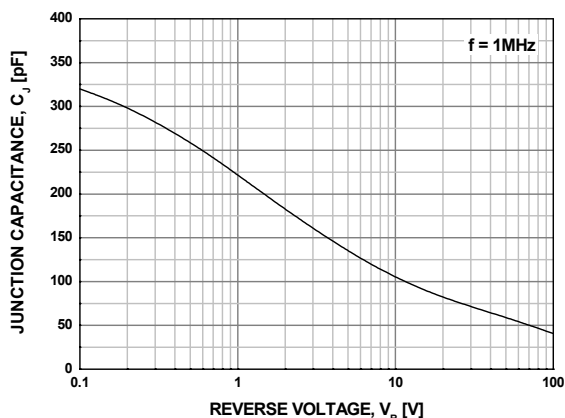


Figure 4. Typical Reverse Recovery Time

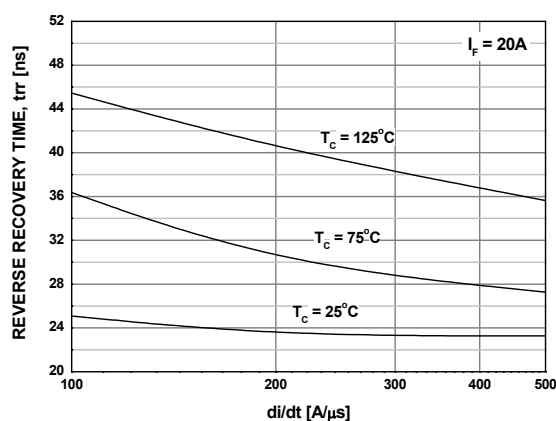


Figure 5. Typical Reverse Recovery Current

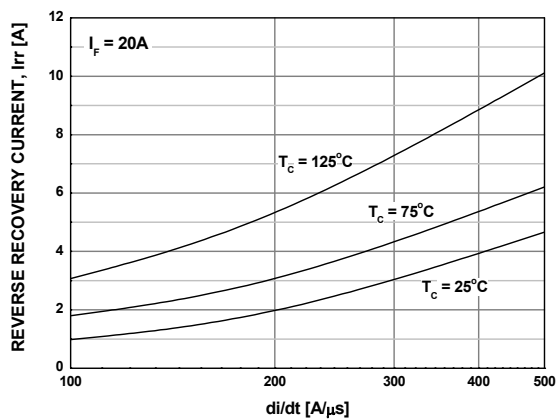
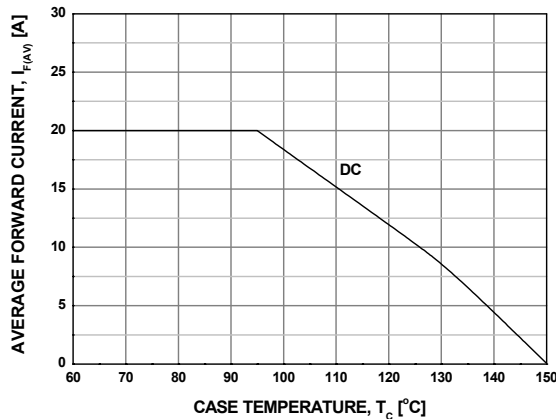
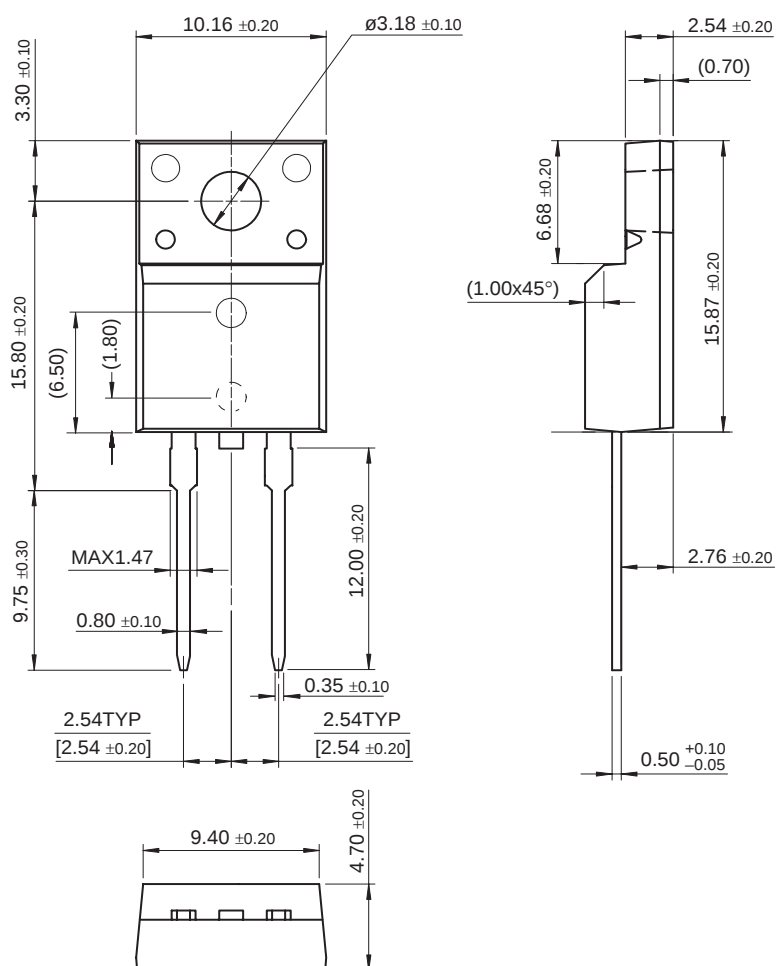


Figure 6. Forward Current Deration Curve



Package Demensions

TO-220F 2L



Dimensions in Millimeters

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CoolFET [™]	GlobalOptoisolator [™]	MicroPak [™]	QT Optoelectronics [™]	TinyLogic [®]
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EcoSPARK [™]	I ² C [™]	MSXPro [™]	RapidConnect [™]	UHC [™]
E ² CMOS [™]	i-Lo [™]	OCX [™]	μSerDes [™]	UltraFET [®]
EnSigna [™]	ImpliedDisconnect [™]	OCXPro [™]	Scalar Pump [™]	UniFET [™]
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		PowerEdge [™]	SuperSOT [™] -3	

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