



# FFPF20UP30S

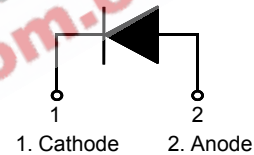
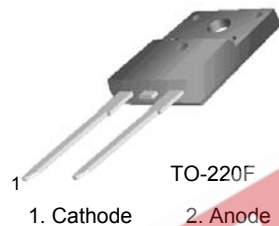
## Ultrafast Recovery Power Rectifier

### Features

- Ultrafast Switching Speed :  $t_{rr} < 35\text{ns}$  (@ $I_F=20\text{A}$ )
- High Reverse Voltage :  $V_{RRM} = 300\text{V}$
- Avalanche Energy Rated
- Planar Construction

### Applications

- General purpose
- Switching Mode Power Supply
- Free-wheeling diode for motor application
- Power switching circuits



### Absolute Maximum Ratings (per diode) $T_a = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{RRM}$	Peak Repetitive Reverse Voltage	300	V
$V_{RWM}$	Working Peak Reverse Voltage	300	V
$V_R$	DC Blocking Voltage	300	V
$I_{F(AV)}$	Average Rectified Forward Current @ $T_C = 85^\circ\text{C}$	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	$^\circ\text{C}$

### Thermal Characteristics $T_a = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	3.7	$^\circ\text{C}/\text{W}$

### Package Marking and Ordering Information

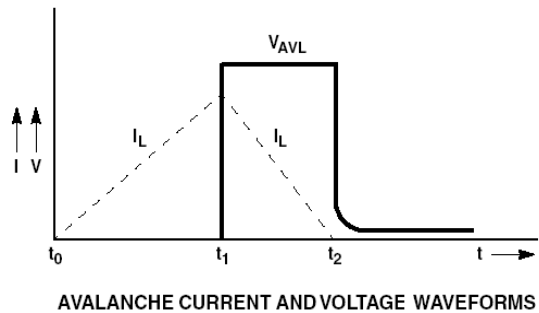
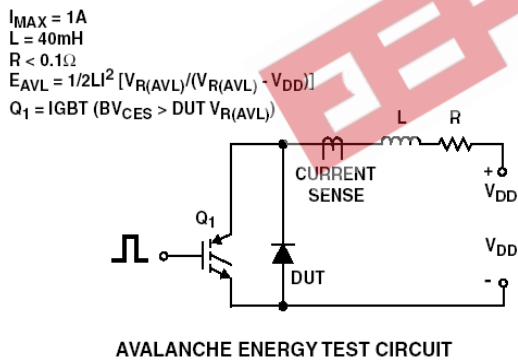
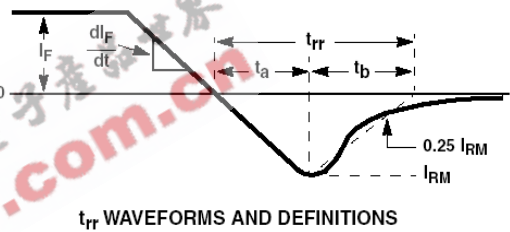
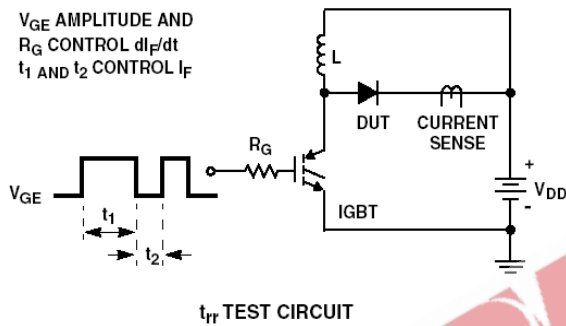
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F20UP30S	FFPF20UP30STU	TO-220F	-	-	50

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

Symbol	Parameter	Min.	Typ.	Max.	Units	
$V_{FM}^*$	$I_F = 20\text{A}$ $I_F = 20\text{A}$	$T_C = 25^\circ\text{C}$	-	-	1.5	V
		$T_C = 150^\circ\text{C}$	-	-	1.3	V
$I_{RM}^*$	$V_R = 300\text{V}$ $V_R = 300\text{V}$	$T_C = 25^\circ\text{C}$	-	-	100	$\mu\text{A}$
		$T_C = 150^\circ\text{C}$	-	-	500	$\mu\text{A}$
$t_{rr}$	$I_F = 1\text{A}, di/dt = 100\text{A}/\mu\text{s}, V_{CC} = 30\text{V}$ $I_F = 20\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 195\text{V}$ $I_F = 20\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 195\text{V}$	$T_C = 25^\circ\text{C}$	-	-	30	ns
		$T_C = 25^\circ\text{C}$	-	-	35	ns
		$T_C = 125^\circ\text{C}$	-	-	60	ns
$t_a$	$I_F = 20\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 195\text{V}$	$T_C = 25^\circ\text{C}$	-	13	-	ns
$t_b$		$T_C = 25^\circ\text{C}$	-	12	-	ns
$Q_{rr}$		$T_C = 25^\circ\text{C}$	-	25	-	nC
$W_{AVL}$	Avalanche Energy ( $L = 40\text{mH}$ )	20	-	-	mJ	

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

### Test Circuit and Waveforms



## Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

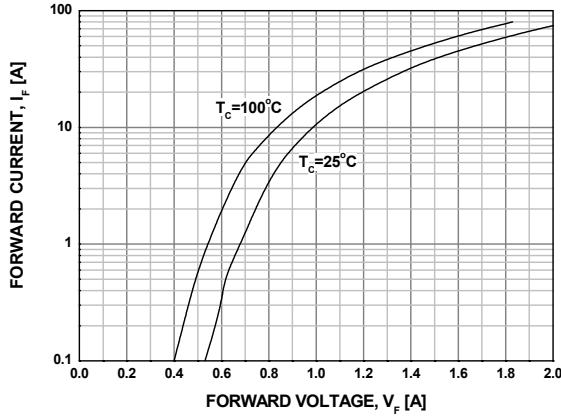


Figure 2. Typical Reverse Current

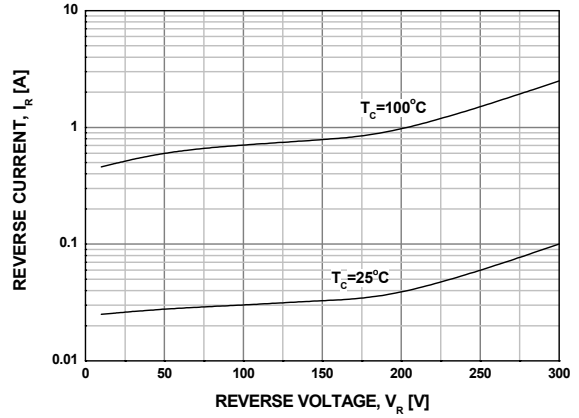


Figure 3. Typical Junction Capacitance

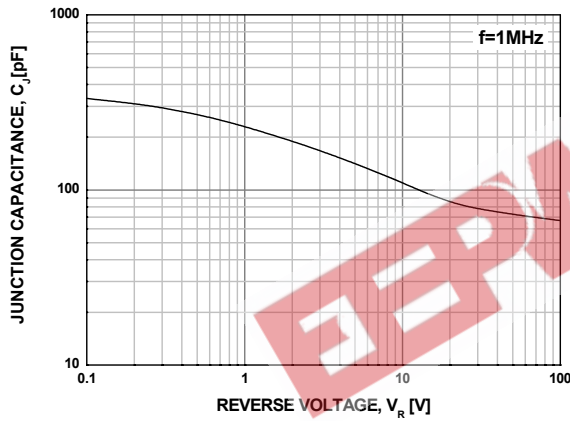


Figure 4. Typical Reverse Recovery Time

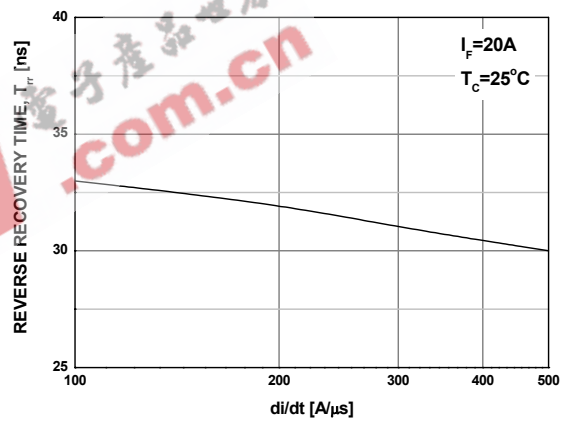


Figure 5. Typical Reverse Recovery Current

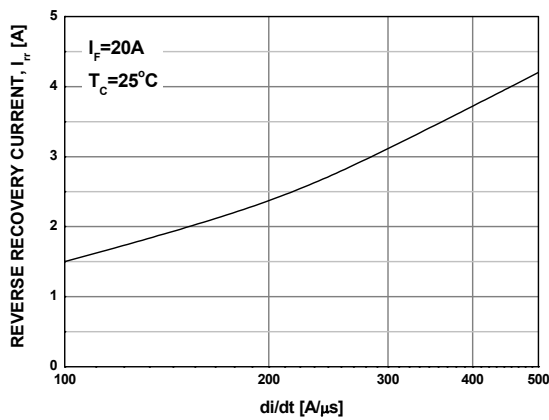
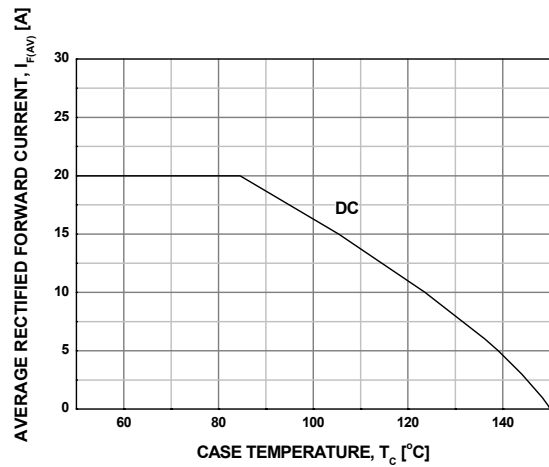
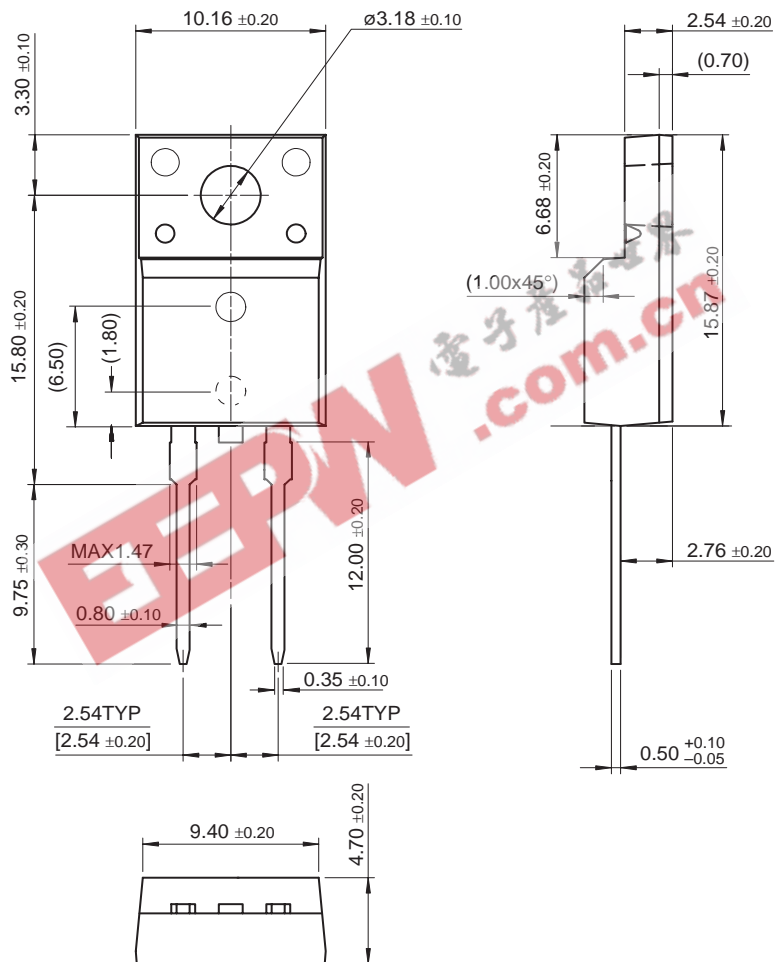


Figure 6. Forward Current Deration Curve



# Package Demensions

## TO-220F 2L



Dimensions in Millimeters

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CROSSVOLT™	GTO™	MICROWIRE™	Quiet Series™	TruTranslation™
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EcoSPARK™	I <sup>2</sup> C™	MSXPro™	RapidConnect™	UltraFET®
E <sup>2</sup> CMOS™	i-Lo™	OCX™	μSerDes™	UniFET™
EnSigna™	ImpliedDisconnect™	OCXPro™	Scalar Pump™	VCX™
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Rev. I17