



# FFPF15UP20ST

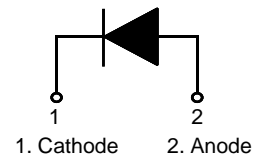
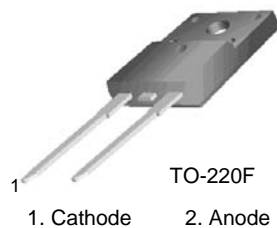
## Ultrafast Recovery Power Rectifier

### Features

- Ultrafast with Soft Recovery :  $< 45\text{ns}$  ( $@ I_F = 15\text{A}$ )
- High Reverse Voltage :  $V_{RRM} = 200\text{V}$
- Avalanche Energy Rated
- Planar Construction

### Applications

- Output Rectifiers
- Switching Mode Power Supply
- Free-wheeling diode for motor application
- Power switching circuits



### Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ 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 @ $T_C = 105^\circ\text{C}$	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	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	3.8	$^\circ\text{C}/\text{W}$

### Package Marking and Ordering Information

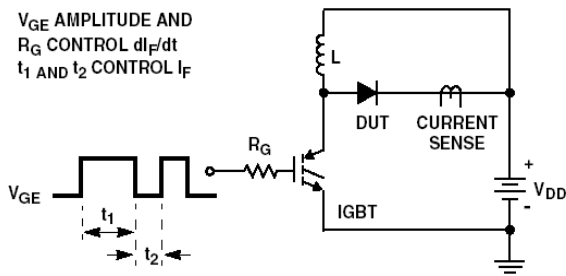
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F15UP20ST	FFPF15UP20STTU	TO-220F	-	-	50

### Electrical Characteristics T<sub>C</sub> = 25°C unless otherwise noted

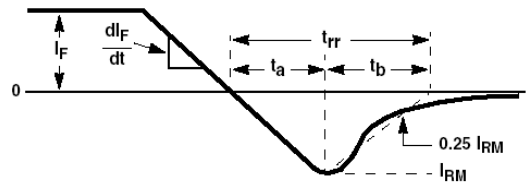
Symbol	Parameter	Min.	Typ.	Max.	Units
V <sub>FM</sub> *	I <sub>F</sub> = 15A	-	-	1.15	V
	I <sub>F</sub> = 15A	-	-	1.0	V
I <sub>RM</sub> *	V <sub>R</sub> = 200V	-	-	100	μA
	V <sub>R</sub> = 200V	-	-	500	μA
t <sub>rr</sub>	I <sub>F</sub> = 1A, di/dt = 100A/μs, V <sub>CC</sub> = 30V	-	-	35	ns
	I <sub>F</sub> = 15A, di/dt = 200A/μs, V <sub>CC</sub> = 130V	-	-	45	ns
t <sub>a</sub> t <sub>b</sub> Q <sub>rr</sub>	I <sub>F</sub> = 15A, di/dt = 200A/μs, V <sub>CC</sub> = 130V	T <sub>C</sub> = 25 °C	-	13	ns
		T <sub>C</sub> = 25 °C	-	11	ns
		T <sub>C</sub> = 25 °C	-	24	nC
W <sub>AVL</sub>	Avalanche Energy (L = 40mH)	20	-	-	mJ

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

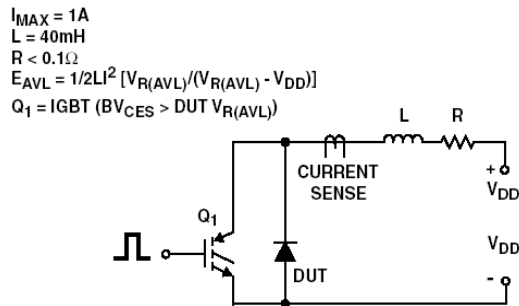
### Test Circuit and Waveforms



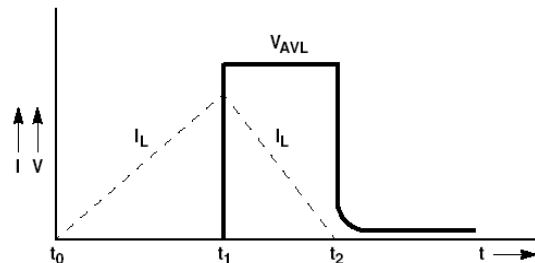
t<sub>rr</sub> TEST CIRCUIT



t<sub>rr</sub> WAVEFORMS AND DEFINITIONS



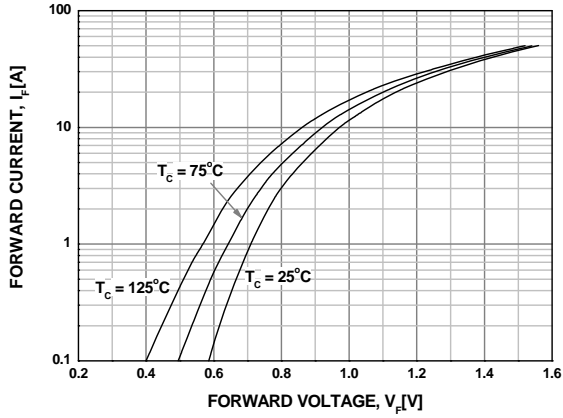
AVALANCHE ENERGY TEST CIRCUIT



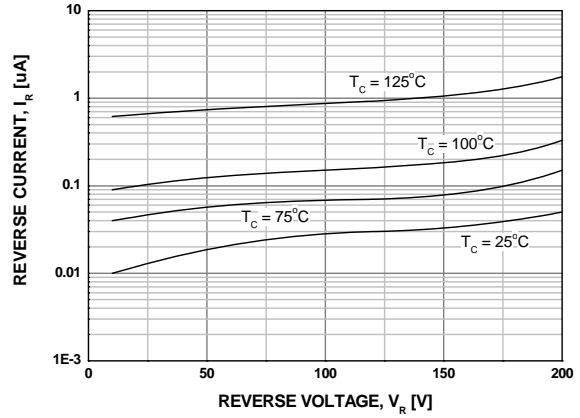
AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

## Typical Performance Characteristics

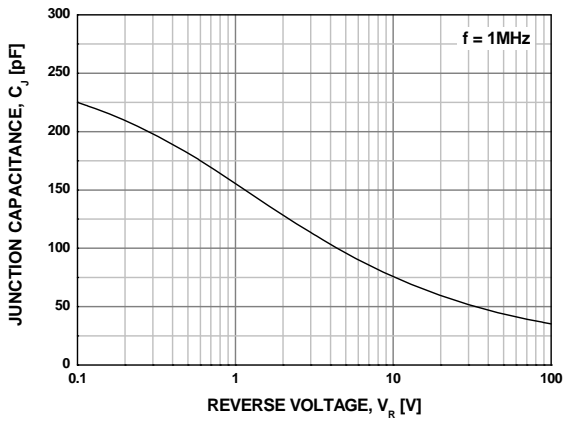
**Figure 1. Typical Forward Voltage Drop**



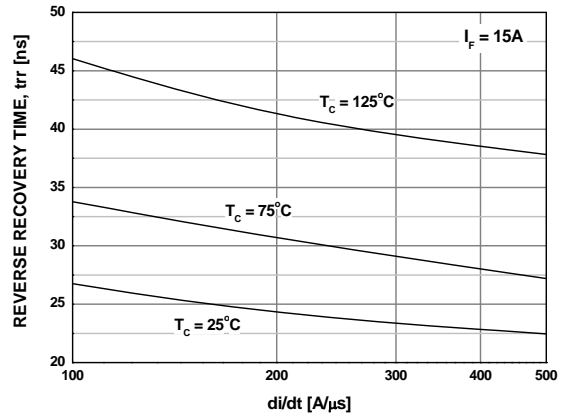
**Figure 2. Typical Reverse Current**



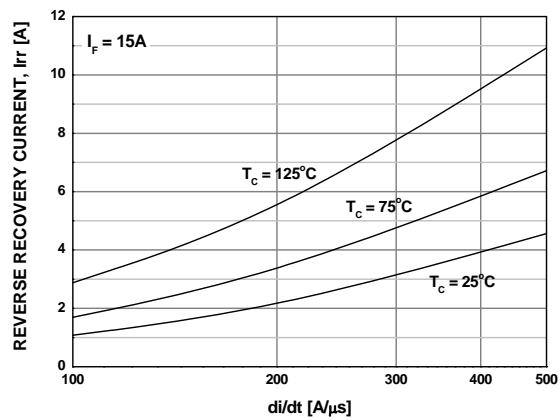
**Figure 3. Typical Junction Capacitance**



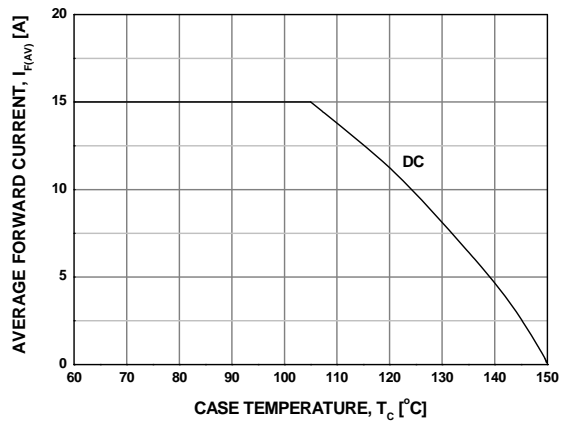
**Figure 4. Typical Reverse Recovery Time**



**Figure 5. Typical Reverse Recovery Current**



**Figure 6. Forward Current Deration Curve**








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