



FFPF12UP20DN

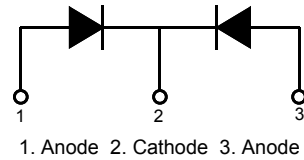
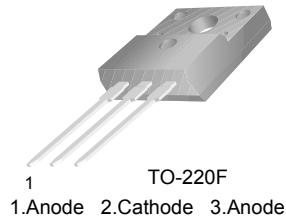
Ultrafast Recovery Power Rectifier

Features

- Ultrafast with Soft Recovery : < 35ns (@ $I_F = 6A$)
- High Reverse Voltage : $V_{RRM} = 200V$
- Enhanced Avalanche Energy Rated
- Planar Construction

Applications

- Output Rectifiers
- Switching Mode Power Supply
- Free-wheeling Diode
- 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 @ $T_C = 120^\circ C$	6	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	60	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	5.0	$^\circ C/W$

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F12UP20DN	FFPF12UP20DNTU	TO-220F	-	-	50

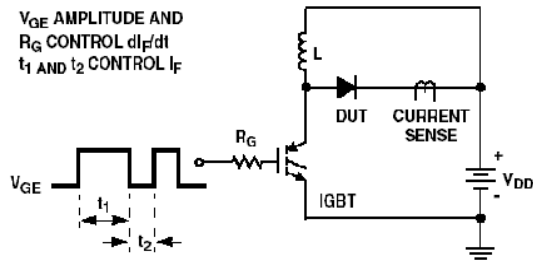
FFPF12UP20DN Ultrafast Recovery Power Rectifier

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

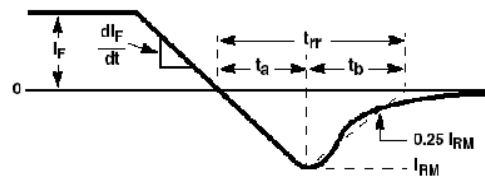
Symbol	Parameter	Min.	Typ.	Max.	Units
V_{FM}^*	$I_F = 6\text{A}$	-	-	1.15	V
	$I_F = 6\text{A}$	-	-	1.0	V
I_{RM}^*	$V_R = 200\text{V}$	-	-	100	μA
	$V_R = 200\text{V}$	-	-	500	μA
t_{rr}	$I_F = 1\text{A}, di/dt = 100\text{A}/\mu\text{s}, V_{CC} = 30\text{V}$	-	-	30	ns
	$I_F = 6\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 130\text{V}$	-	-	35	ns
t_a t_b Q_{rr}	$I_F = 6\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{CC} = 130\text{V}$	$T_C = 25^\circ\text{C}$	-	12	ns
		$T_C = 25^\circ\text{C}$	-	12	ns
		$T_C = 25^\circ\text{C}$	-	24	nC
W_{AVL}	Avalanche Energy ($L = 20\text{mH}$)	10	-	-	mJ

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

Test Circuit and Waveforms

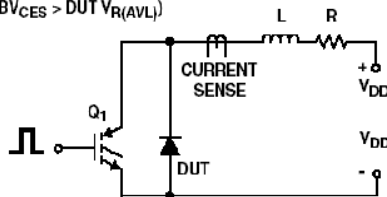


t_{rr} TEST CIRCUIT

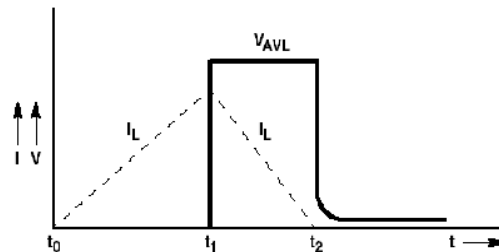


t_{rr} WAVEFORMS AND DEFINITIONS

$I_{MAX} = 1\text{A}$
 $L = 20\text{mH}$
 $R < 0.1\Omega$
 $E_{AVL} = 1/2 L I^2 [V_{R(AVL)} / (V_{R(AVL)} - V_{DD})]$
 $Q_1 = \text{IGBT } (BV_{CES} > \text{DUT } V_{R(AVL)})$



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

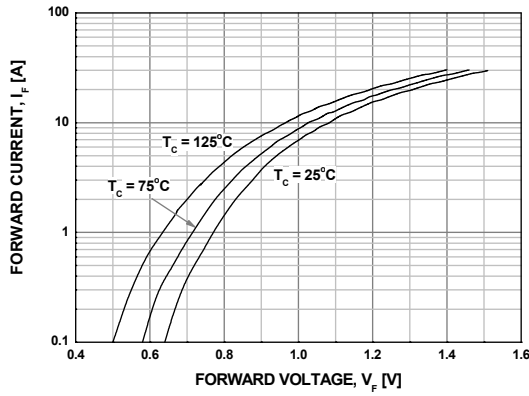


Figure 2. Typical Reverse Current

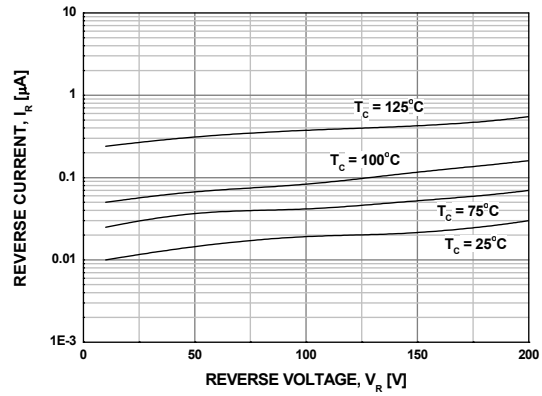


Figure 3. Typical Junction Capacitance

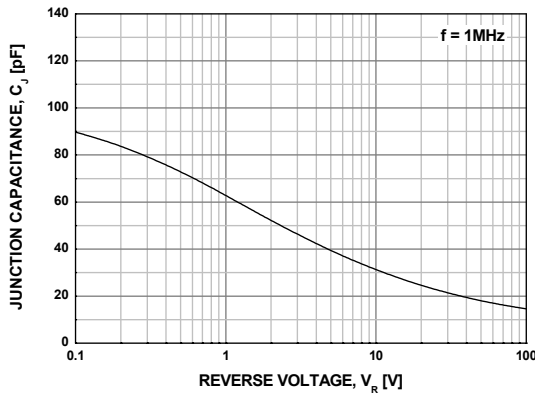


Figure 4. Typical Reverse Recovery Time

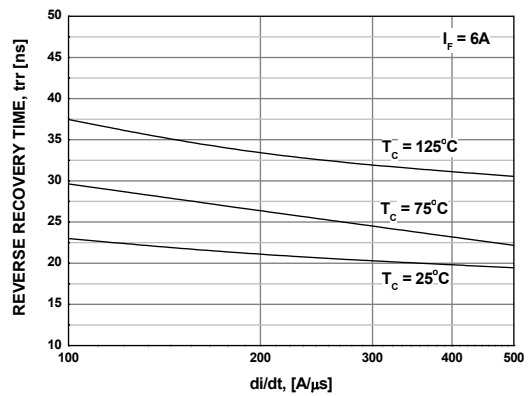


Figure 5. Typical Reverse Recovery Current

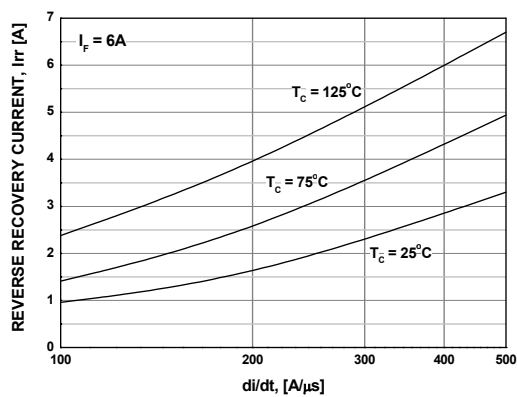
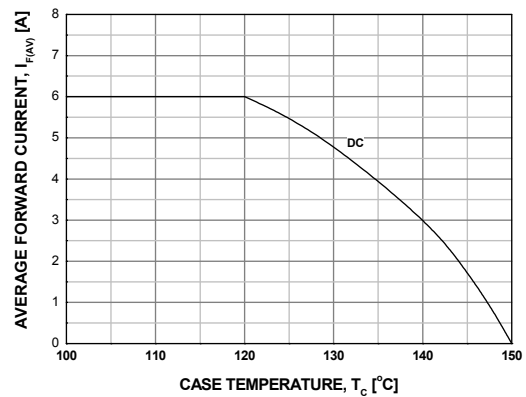


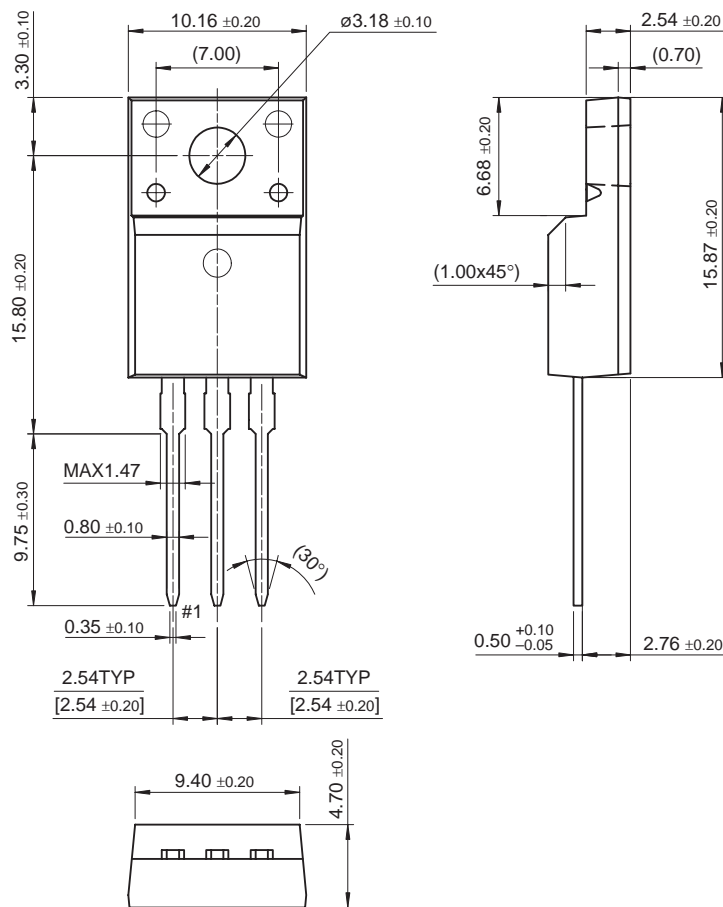
Figure 6. Forward Current Deration Curve



Package Demensions

FFPF12UP20DN Ultrafast Recovery Power Rectifier

TO-220F



Dimensions in Millimeters

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CoolFET TM	GlobalOptoisolator TM	MicroPak TM	QS TM	SyncFET TM
CROSSVOLT TM	GTO TM	MICROWIRE TM	QT Optoelectronics TM	TCM TM
DOMET TM	HiSeC TM	MSX TM	Quiet Series TM	TinyLogic [®]
EcoSPARK TM	I ² C TM	MSXPro TM	RapidConfigure TM	TINYOPTO TM
E ² CMOS TM	<i>i-Lo</i> TM	OCX TM	RapidConnect TM	TruTranslation TM
EnSigna TM	ImpliedDisconnect TM	OCXPro TM	μ SerDes TM	UHC TM
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