

FFB20UP20S

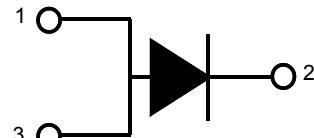
Ultrafast Recovery Power Rectifier

Features

- Ultrafast with Soft Recovery : < 45ns (@ $I_F = 20A$)
- High Reverse Voltage : $V_{RRM} = 200V$
- Avalanche Energy Rated
- Planar Construction
- RoHS Compliant

Applications

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



1. Anode 2. Cathode 3. Anode

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 @ $T_C = 115^\circ C$	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	°C

Thermal Characteristics

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	2.0	°C/W

Package Marking and Ordering Information

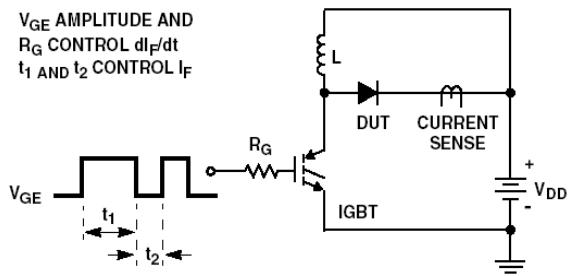
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FF20UP20S	FFB20UP20STM	D2-PAK	13" Dia	-	800

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

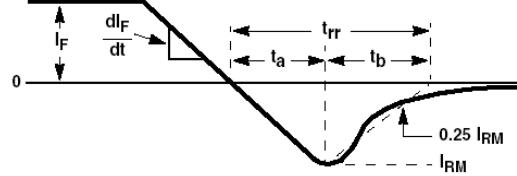
Symbol	Parameter	Min.	Typ.	Max.	Units	
V_{FM}^*	$I_F = 20\text{A}$ $I_F = 20\text{A}$	$T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	-	-	1.15 1.0	V V
I_{RM}^*	$V_R = 200\text{V}$ $V_R = 200\text{V}$	$T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	-	-	100 500	μA μA
t_{rr}	$I_F = 1\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, $V_{CC} = 30\text{V}$ $I_F = 20\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_{CC} = 130\text{V}$	$T_C = 25^\circ\text{C}$ $T_C = 25^\circ\text{C}$	-	-	35 45	ns ns
t_a t_b Q_{rr}	$I_F = 20\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_{CC} = 130\text{V}$	$T_C = 25^\circ\text{C}$ $T_C = 25^\circ\text{C}$ $T_C = 25^\circ\text{C}$	-	11 13 21	-	ns ns nC
W_{AVL}	Avalanche Energy ($L = 40\text{mH}$)	20	-	-	mJ	

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

Test Circuit and Waveforms

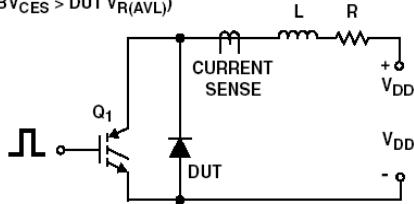


t_{rr} TEST CIRCUIT

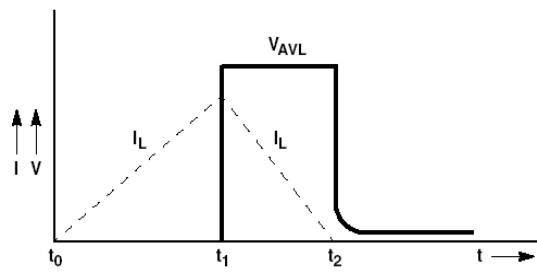


t_{rr} WAVEFORMS AND DEFINITIONS

$I_{MAX} = 1\text{A}$
 $L = 40\text{mH}$
 $R < 0.1\Omega$
 $E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
 $Q_1 = \text{IGBT (BV}_{CES} > \text{DUT } V_{R(AVL)})$



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

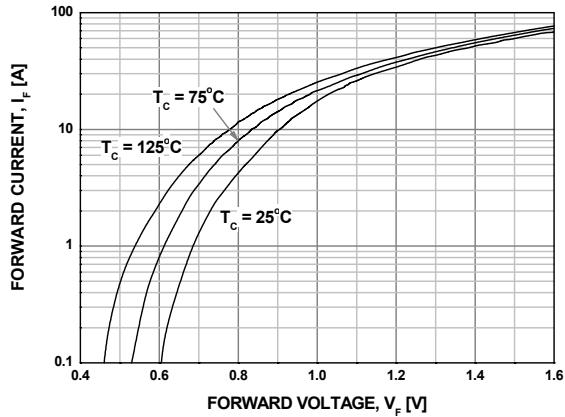


Figure 2. Typical Reverse Current

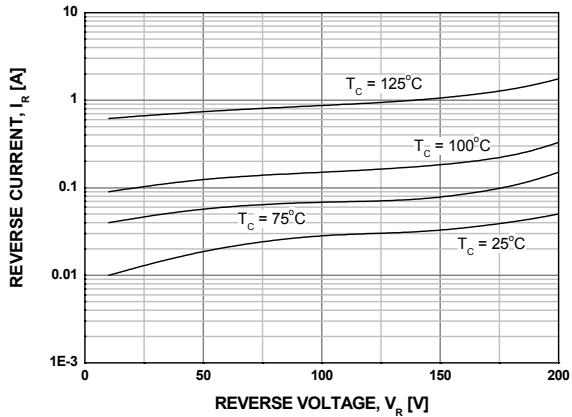


Figure 3. Typical Junction Capacitance

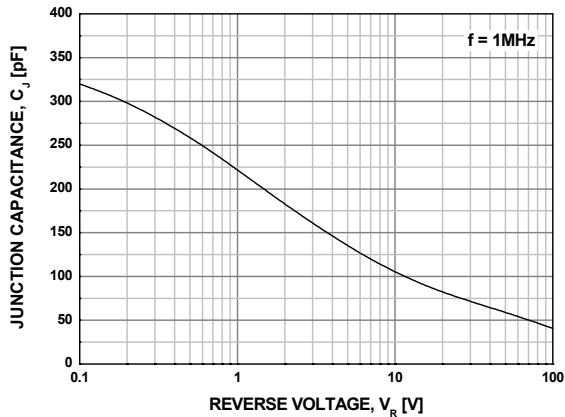


Figure 4. Typical Reverse Recovery Time

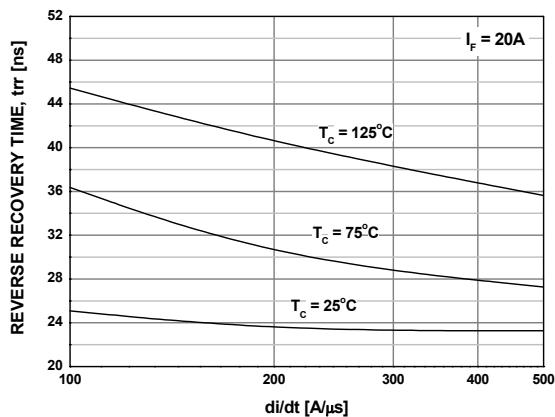


Figure 5. Typical Reverse Recovery Current

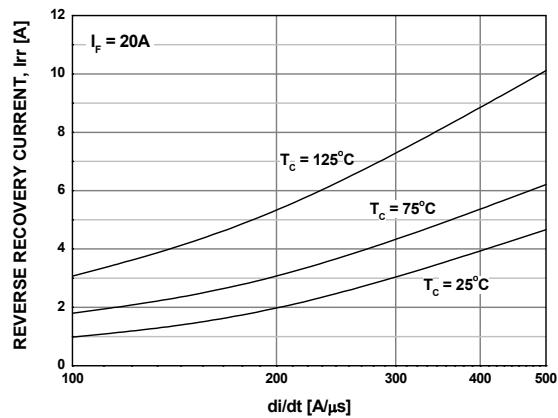
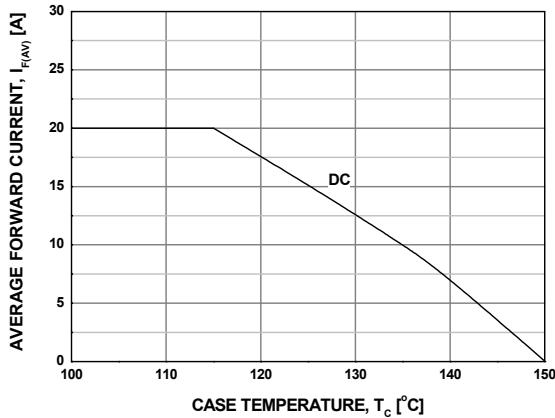
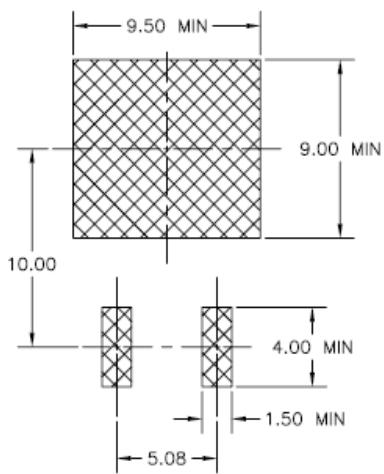
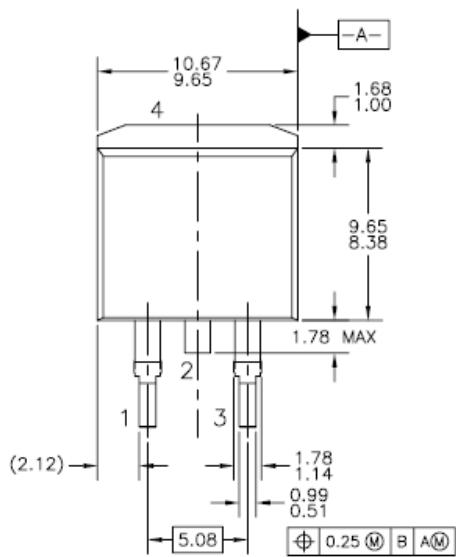


Figure 6. Forward Current Deration Curve

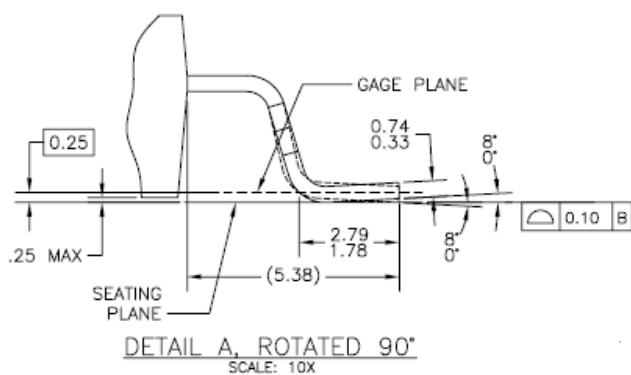
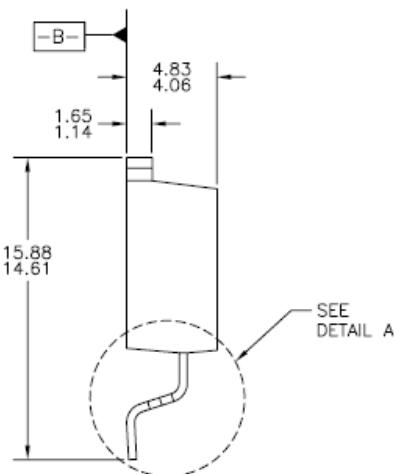
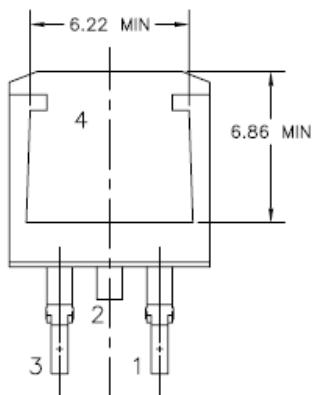


Mechanical Dimensions

D² - PAK



LAND PATTERN RECOMMENDATION



Dimensions in Millimeters



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