

# FFB20UP20S

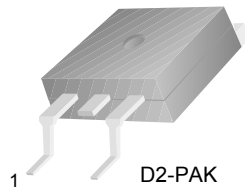
## Ultrafast Recovery Power Rectifier

### Features

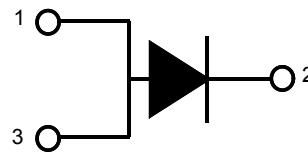
- Ultrafast with Soft Recovery : < 45ns (@ $I_F = 20A$ )
- High Reverse Voltage :  $V_{RRM} = 200V$
- Avalanche Energy Rated
- Planar Construction
- RoHS Compliant

### Applications

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



D2-PAK  
1. Anode 2. Cathode 3. Anode



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	$^\circ C$

### Thermal Characteristics

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

### Package Marking and Ordering Information

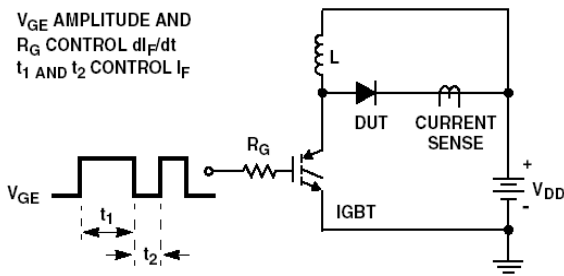
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F20UP20S	FFB20UP20STM	D2-PAK	13" Dia	-	800

### 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> = 20A	-	-	1.15	V
	I <sub>F</sub> = 20A	-	-	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> = 20A, 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> = 20A, di/dt = 200A/μs, V <sub>CC</sub> = 130V	T <sub>C</sub> = 25 °C	-	11	ns
		T <sub>C</sub> = 25 °C	-	13	ns
		T <sub>C</sub> = 25 °C	-	21	nC
W <sub>AVL</sub>	Avalanche Energy (L = 40mH)	20	-	-	mJ

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

### Test Circuit and Waveforms



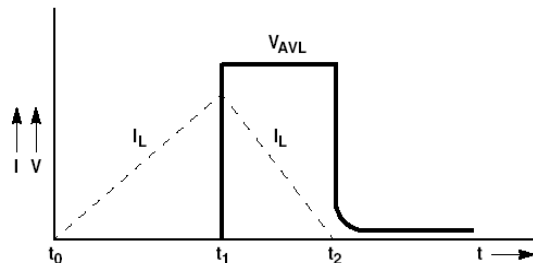
t<sub>rr</sub> TEST CIRCUIT



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



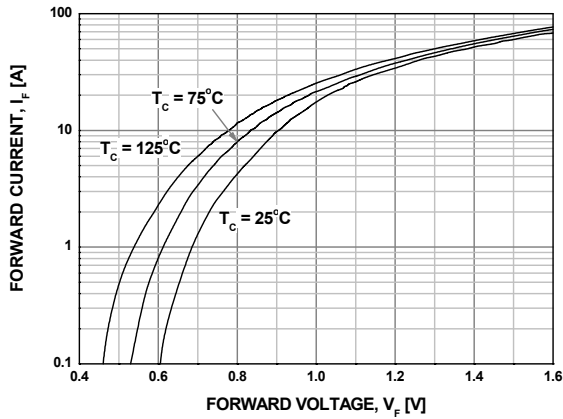
AVALANCHE ENERGY TEST CIRCUIT



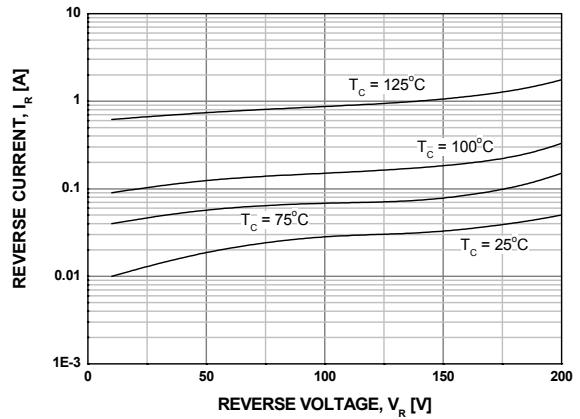
AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

## Typical Performance Characteristics

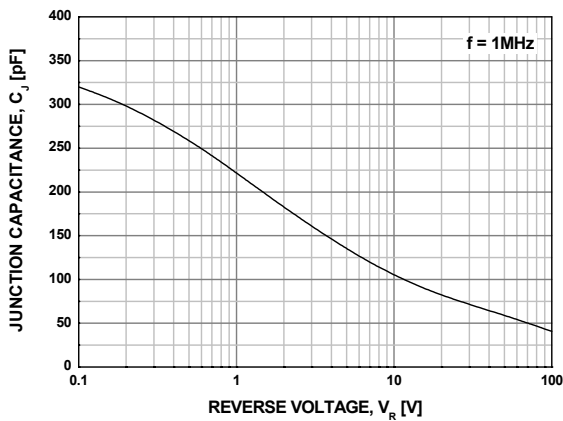
**Figure 1. Typical Forward Voltage Drop**



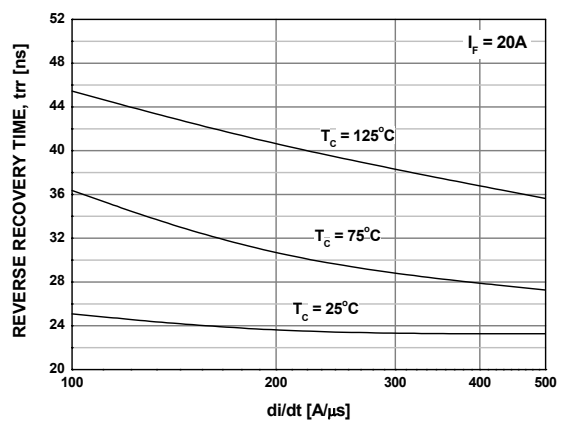
**Figure 2. Typical Reverse Current**



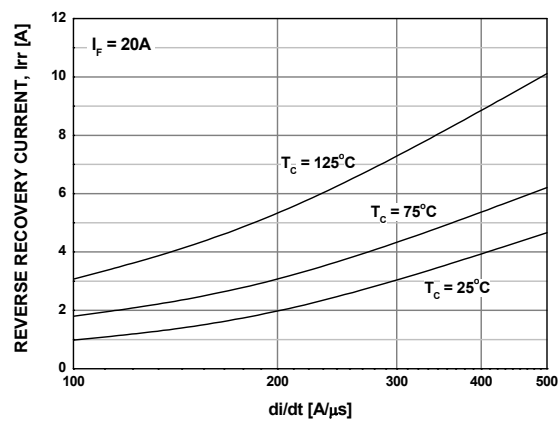
**Figure 3. Typical Junction Capacitance**



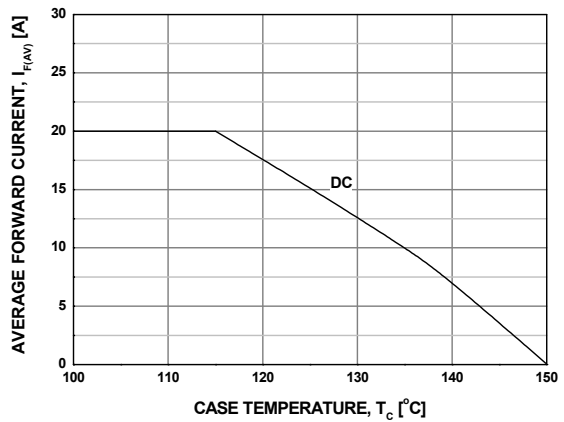
**Figure 4. Typical Reverse Recovery Time**



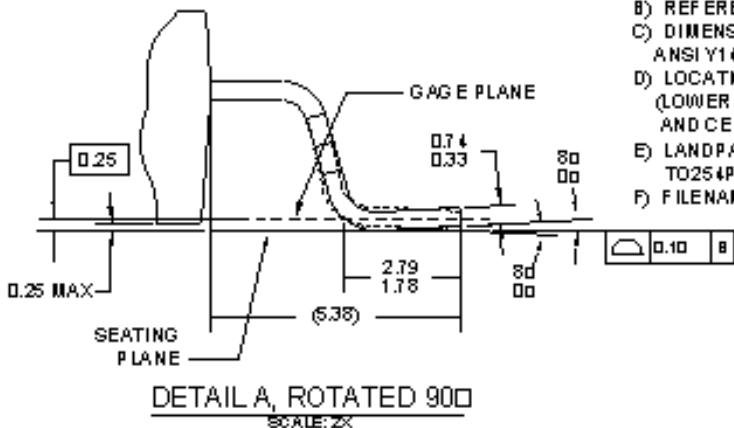
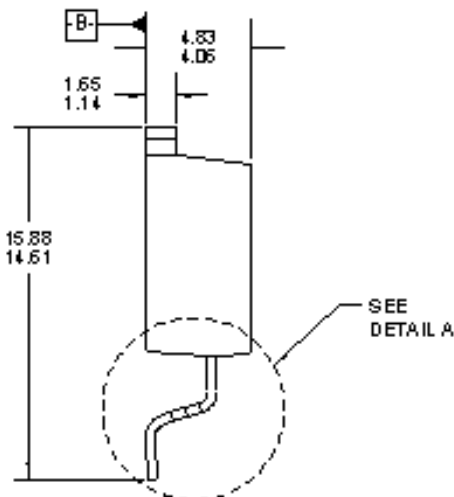
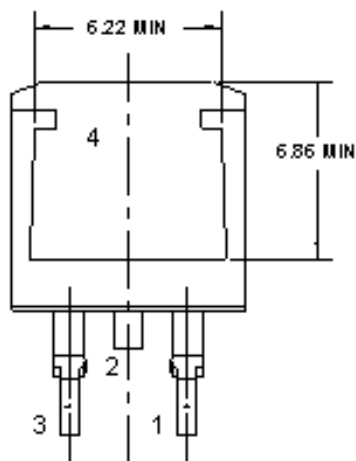
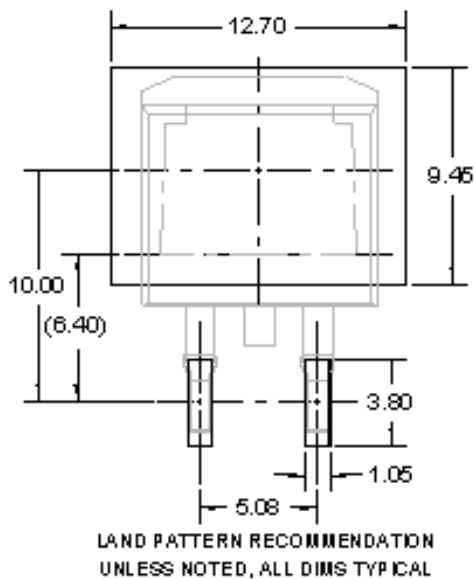
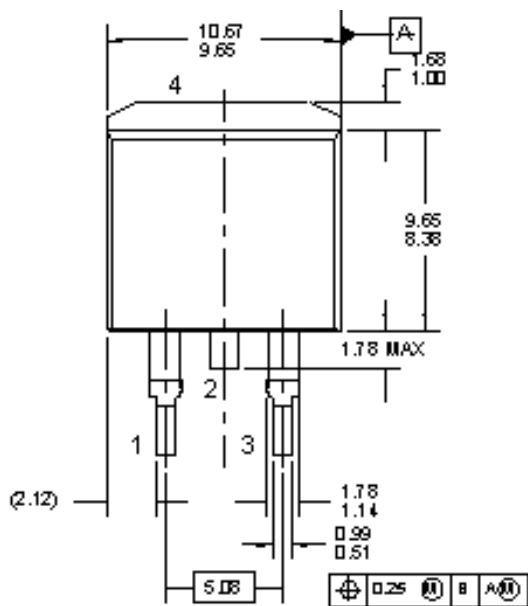
**Figure 5. Typical Reverse Recovery Current**



**Figure 6. Forward Current Deration Curve**



**Mechanical Dimensions**



- NOTES: UNLESS OTHERWISE SPECIFIED  
 A) ALL DIMENSIONS ARE IN MILLIMETERS.  
 B) REFERENCE JEDEC, TO-263, VARIATION AB.  
 C) DIMENSIONING AND TO LERANCING PER ANSI Y14.5M - 1994.  
 D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE).  
 E) LANDPATTERN RECOMMENDATION PER IPC TO254P 1524X482-3N  
 F) FILENAME: TO263AD2REV6

Dimensions in Millimeters



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| Build it Now™            | Global Power Resource <sup>SM</sup> | PowerXS™                              |  |
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| CorePOWER™               | Green FPS™ e-Series™                | QFET®                                 |  |
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| Current Transfer Logic™  | IntelliMAX™                         | RapidConfigure™                       |  |
| DEUXPEED®                | ISOPLANAR™                          | ™                                     |  |
| Dual Cool™               | MegaBuck™                           | Saving our world, 1mW/W/kW at a time™ |  |
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| EfficientMax™            | MicroFET™                           | SmartMax™                             |  |
| ESBC™                    | MicroPak™                           | SMART START™                          |  |
| ®                        | MicroPak2™                          | SPM®                                  |  |
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| FACT®                    | OptiHIT™                            | SuperSOT™-6                           |  |
| FAST®                    | OPTOLOGIC®                          | SuperSOT™-8                           |  |
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| FETBench™                | PDP SPM™                            | Sync-Lock™                            |  |
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