

Features

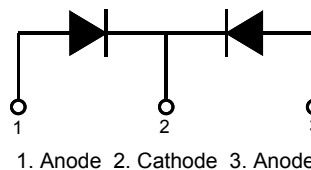
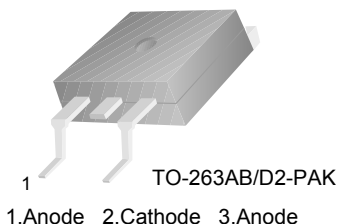
- Ultrafast Recovery, $t_{rr} = 45 \text{ ns}$ (@ $I_F = 10 \text{ A}$)
- Max Forward Voltage, $V_F = 1.3 \text{ V}$ (@ $T_C = 25^\circ\text{C}$)
- Reverse Voltage : $V_{RRM} = 300 \text{ V}$
- Avalanche Energy Rated
- RoHS Compliant

Applications

- General Purpose
- Switching Mode Power Supply
- Free-Wheeling Diode for Motor Application
- Power Switching Circuits

20 A, 300 V, Ultrafast Dual Diode

The FFB20UP30DN is an ultrafast dual diode with low forward voltage drop and rugged UIS capability. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power switching applications. It is specially suited for use in switching power supplies and industrial applications as welder and UPS application.



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Unit
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 Rating for each diode $I_{F(AV)}/2$ @ $T_C = 130^\circ\text{C}$	20	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	180	A
T_J, T_{STG}	Operating Junction and Storage Temperature	- 65 to +150	$^\circ\text{C}$

Thermal Characteristics

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

Package Marking and Ordering Information

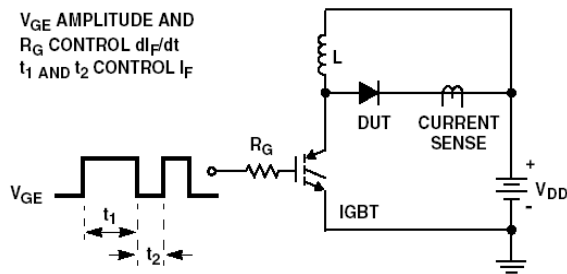
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F20UP30DN	FFB20UP30DNTM	TO-263AB/D2-PAK	13" Dia	-	800

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

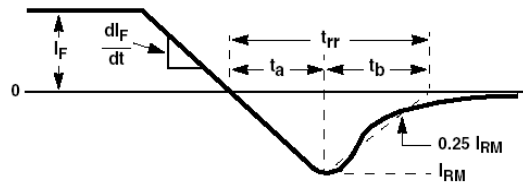
Symbol	Parameter	Min.	Typ.	Max.	Unit
V_F *	$I_F = 10\text{ A}$	-	-	1.3	V
	$I_F = 10\text{ A}$	-	-	1.2	V
I_R *	$V_R = 300\text{ V}$	-	-	1	μA
	$V_R = 300\text{ V}$	-	-	500	μA
T_{rr}	$I_F = 0.5\text{ A}$, $I_{rr} = 1\text{ A}$, $V_{CC} = 30\text{ V}$	-	-	30	ns
	$I_F = 1\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $V_{CC} = 30\text{ V}$	-	-	35	ns
	$I_F = 10\text{ A}$, $di/dt = 200\text{ A}/\mu\text{s}$, $V_{CC} = 195\text{ V}$	-	-	45	ns
t_a	$I_F = 10\text{ A}$, $di/dt = 200\text{ A}/\mu\text{s}$, $V_{CC} = 195\text{ V}$	-	11	-	ns
t_b		-	13	-	ns
Q_{rr}		-	20	-	nC
W_{AVL}	Avalanche Energy ($L = 20\text{ mH}$)	20	-	-	mJ

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

Test Circuit and Waveforms

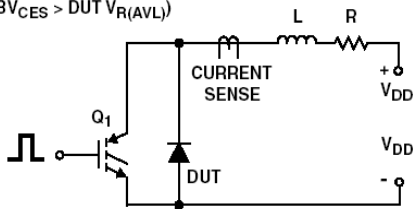


t_{rr} TEST CIRCUIT

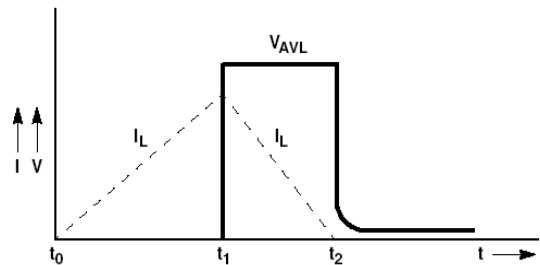


t_{rr} WAVEFORMS AND DEFINITIONS

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



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop

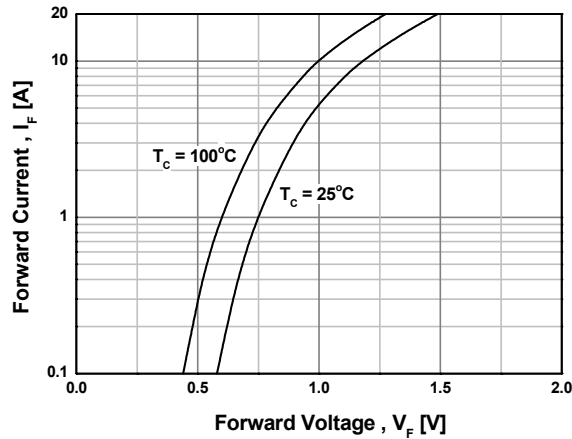


Figure 2. Typical Reverse Current

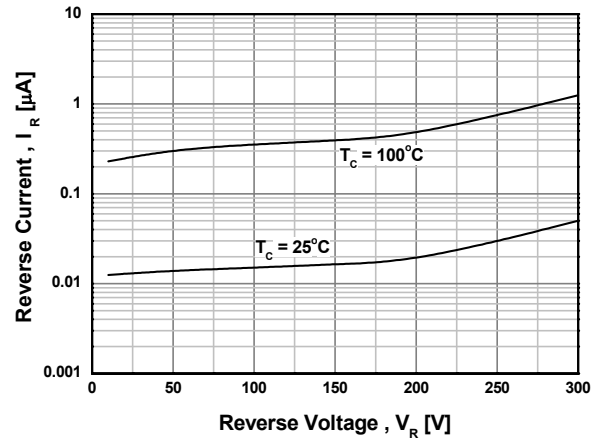


Figure 3. Typical Junction Capacitance

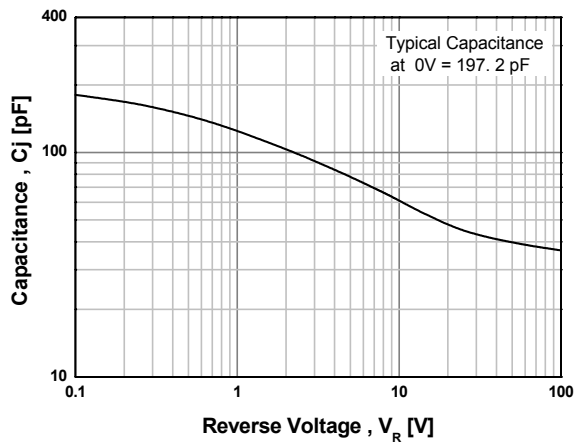


Figure 4. Typical Reverse Recovery Time

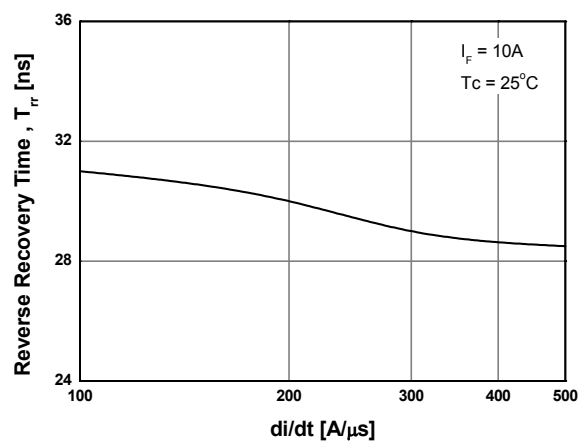


Figure 5. Typical Reverse Recovery Current

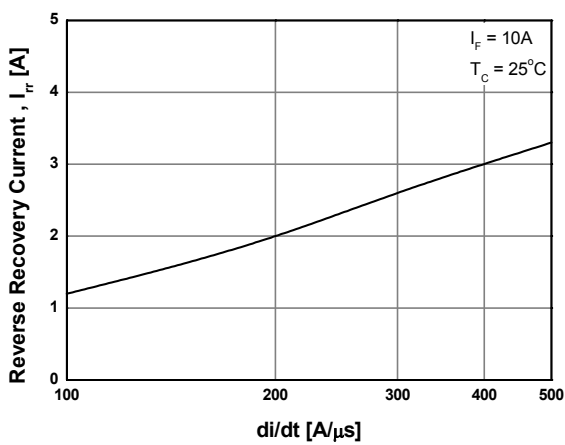
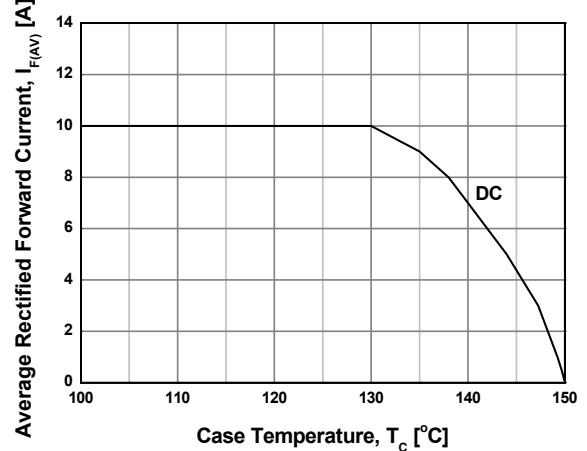
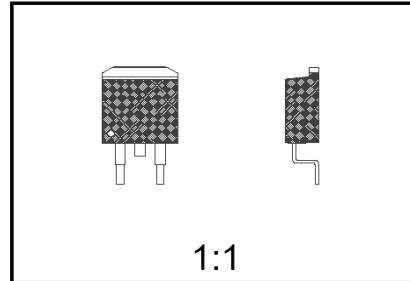
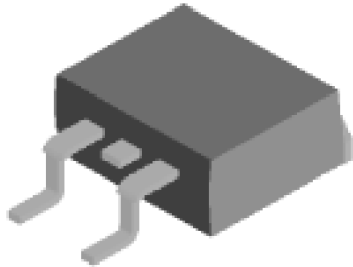


Figure 6. Forward Current Deration Curve



Package Demensions

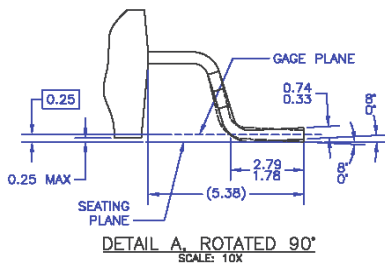
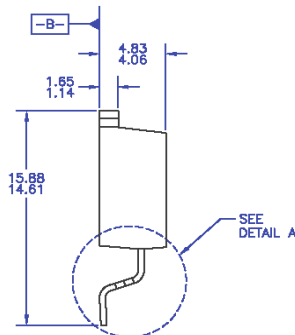
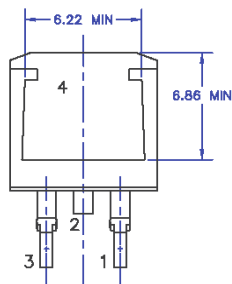
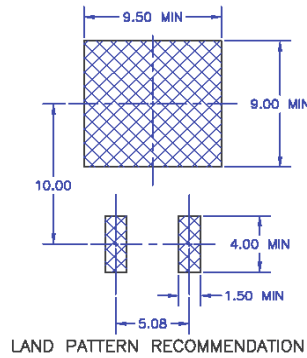
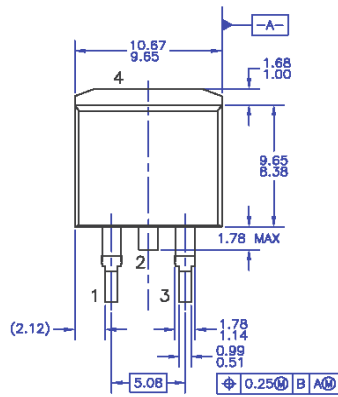
TO-263AB/D²-PAK



Scale 1:1 on letter size paper

Dimensions shown below are in:
millimeters

Part Weight per unit (gram): 1.4378



- NOTES: UNLESS OTHERWISE SPECIFIED
- A) ALL DIMENSIONS ARE IN MILLIMETERS.
 - B) REFERENCE JEDEC, TO-263, ISSUE D, VARIATION AB, DATED JULY 2003.
 - C) DIMENSIONING AND TOLERANCING PER ANSI Y14.5M - 1982.
 - D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE).
 - E) PRESENCE OF TRIMMED CENTER LEAD IS OPTIONAL.

TO263A02REV D

Dimensions in Millimeters



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Rev. I64