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June 2016

FFD10UP20S
10 A, 200 V, Ultrafast Diode

Features

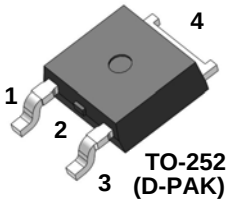
- Ultrafast Recovery, T_{rr} = 20.8 ns (@ I_F = 10 A)
- Max Forward Voltage, V_F = 1.15 V (@ T_C = 25°C)
- Reverse Voltage : V_{RRM} = 200 V
- Avalanche Energy Rated
- RoHS Compliant

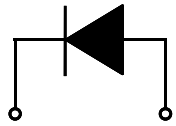
Applications

- SMPS, Power Switching Circuits
- Output Rectifiers
- Freewheeling Diodes

Description

The FFD10UP20S is an ultrafast 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 applicationa as welder and UPS application.





1,4 Cathode 3. Anode

Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	Rating	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	200	V
V_{RWM}	Working Peak Reverse Voltage	200	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 115°C	10	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	100	A
T_J, T_{STG}	Operating and Storage Temperature Range	-65 to +175	°C

Thermal Characteristics

Symbol	Parameter	Max.	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	3.0	°C/W

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFD10UP20S	F10UP20S	TO-252(D-PAK)	Reel	13" Dia	N/A	2500

Electrical Characteristics $T_C = 25^oC$ unless otherwise noted

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_F*	Maximum Instantaneous Forward Voltage I_F = 10 A I_F = 10 A	 $T_C = 25^oC$ $T_C = 100^oC$	 - -	 - -	 1.15 1.10	V
I_R*	Maximum Instantaneous Reverse Current @ rated V_R	 $T_C = 25^oC$ $T_C = 100^oC$	 - -	 - -	 100 500	μA
t_{rr} I_{rr} Q_{rr}	Reverse Recovery Time Reverse Recovery Current Reverse Recovery Charge (I_F = 10 A, di_F/dt = 200 A/μs, V_R=130 V)		 - - -	 20.8 2.8 28.5	 - - -	 ns A nC
t_{rr}	Maximum Reverse Recovery Time (I_F = 1 A, di_F/dt = 100 A/μs)		-	-	35	ns
W_{AVL}	Avalanche Energy (L = 40 mH)		10	-	-	mJ

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

Test Circuit and Waveforms

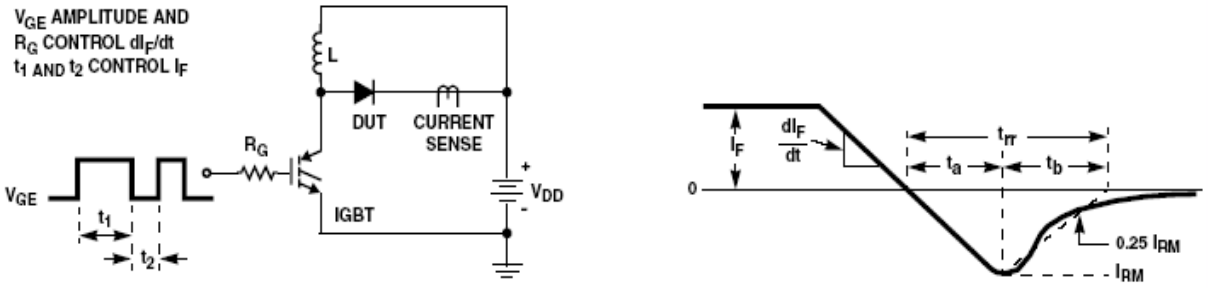


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

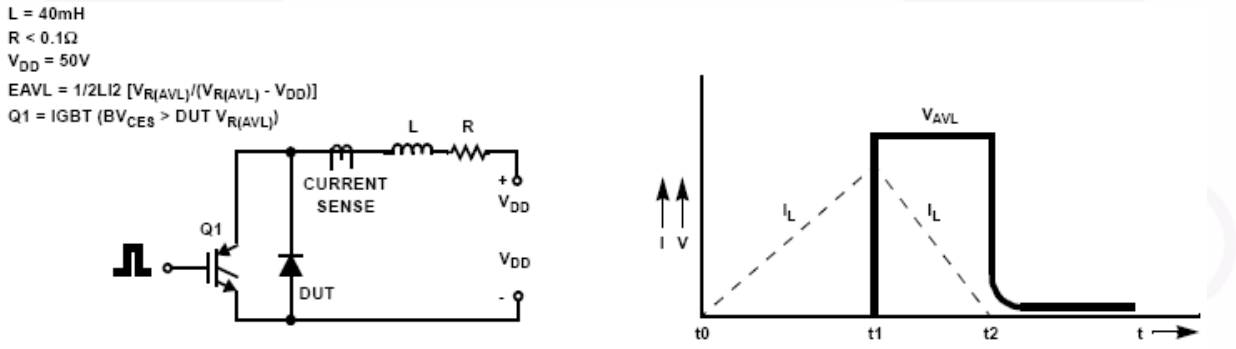


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop vs. Forward Current

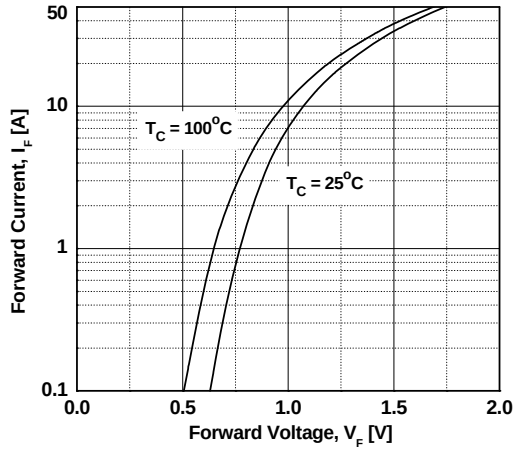


Figure 4. Typical Reverse Current vs. Reverse Voltage

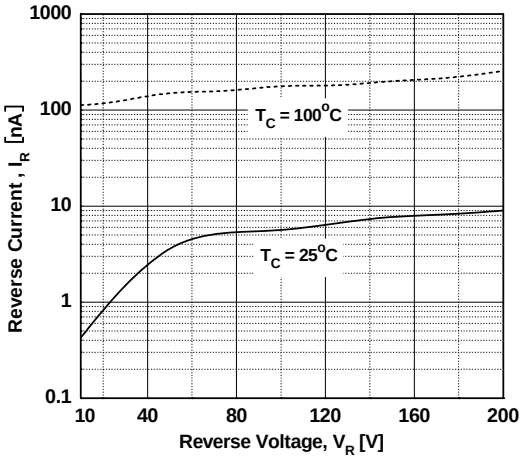


Figure 5. Typical Junction Capacitance

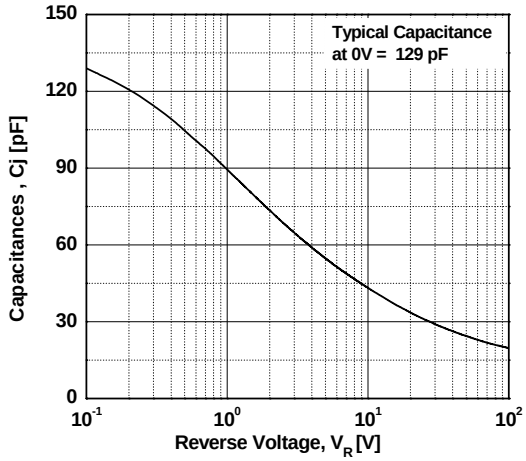


Figure 6. Typical Reverse Recovery Time vs. di_F/dt

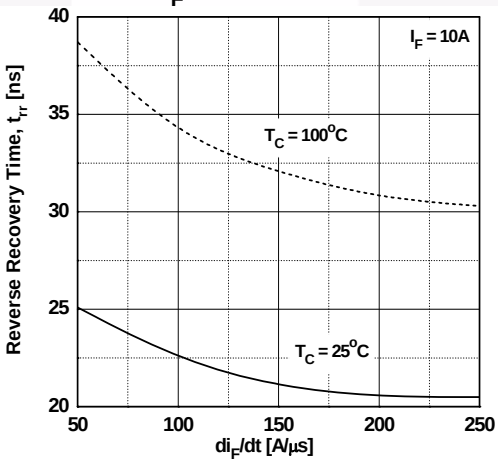


Figure 7. Typical Reverse Recovery Current vs. di_F/dt

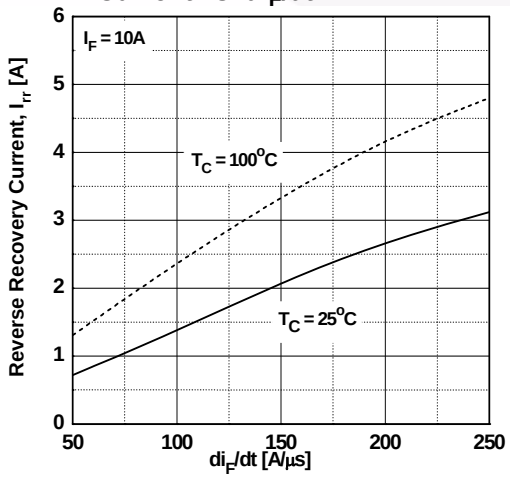
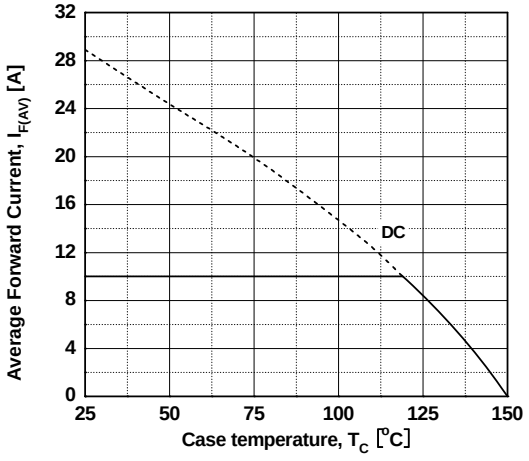
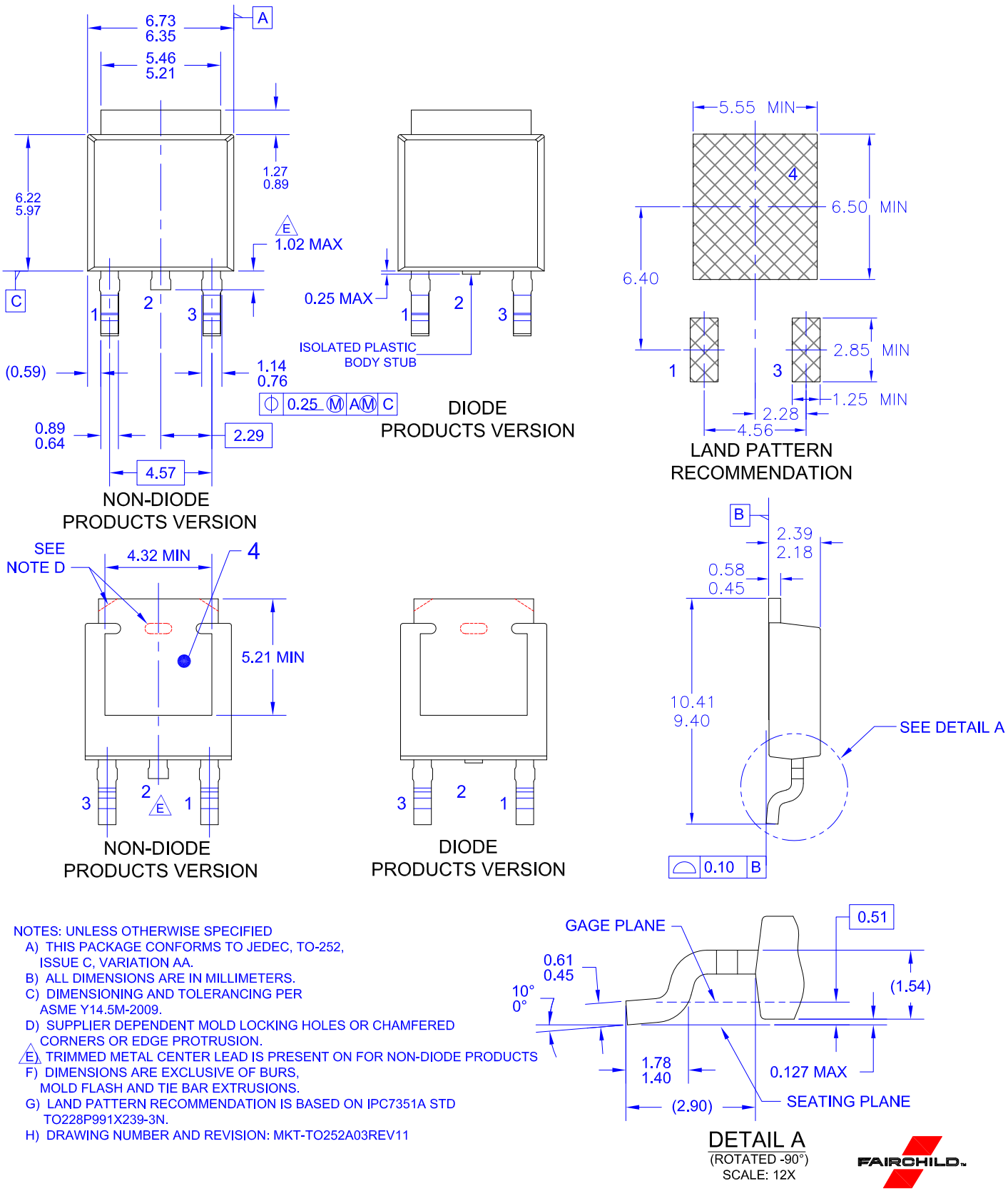


Figure 8. Forward Current Derating Curve





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B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
D) SUPPLIER DEPENDENT MOLD LOCKING HOLES OR CHAMFERED CORNERS OR EDGE PROTRUSION.
E) TRIMMED METAL CENTER LEAD IS PRESENT ON FOR NON-DIODE PRODUCTS
F) DIMENSIONS ARE EXCLUSIVE OF BURS, MOLD FLASH AND TIE BAR EXTRUSIONS.
G) LAND PATTERN RECOMMENDATION IS BASED ON IPC7351A STD TO228P991X239-3N.
H) DRAWING NUMBER AND REVISION: MKT-TO252A03REV11

DETAIL A
(ROTATED -90°)
SCALE: 12X

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