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November 2014

FFA60UA60DN

Ultrafast II Dual Diode

Features

- Ultrafast Recovery, $T_{rr} = 90\text{ns}$ (@ $I_F = 30\text{ A}$)
- Max Forward Voltage, $V_F < 2.2\text{ V}$
- High Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

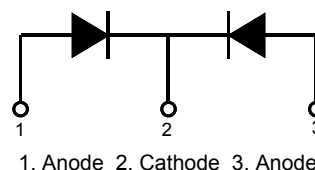
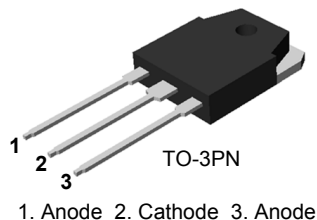
Applications

- Boost Diode in PFC and SMPS
- Welder, UPS and Motor Control Application

Description

The FFA60UA60DN is an ultrafast II 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.

Pin Assignments



Absolute Maximum Ratings

 Per leg at $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	600	V
V_{RWM}	Working Peak Reverse Voltage	600	V
V_R	DC Blocking Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current @ $T_C = 95^\circ\text{C}$	30	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	180	A
T_J, T_{STG}	Operating and Storage Temperature Range	-65 to +175	$^\circ\text{C}$

Thermal Characteristics

 Per leg at $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	1.3	$^\circ\text{C/W}$

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFA60UA60DN	F60UA60DN	TO-3P	Tube	N/A	N/A	30

Electrical Characteristics

Per leg at $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{FM1}	$I_F = 30\text{ A}$ $I_F = 30\text{ A}$	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	- -	2.2 2.0	V
I_{RM1}	$V_R = 600\text{ V}$ $V_R = 600\text{ V}$	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	- -	100 150	μA
t_{rr}	$I_F = 30\text{ A}$, $di_F/dt = 200\text{ A}/\mu\text{s}$	$T_C = 25^\circ\text{C}$	-	90	ns
I_{rr}			-	8	A
Q_{rr}			-	360	nC
W_{AVL}	Avalanche Energy ($L = 40\text{ mH}$)	20	-	-	mJ

Notes:

1: Pulse: Test Pulse width = 300 μs , Duty Cycle = 2%

Test Circuit and Waveforms

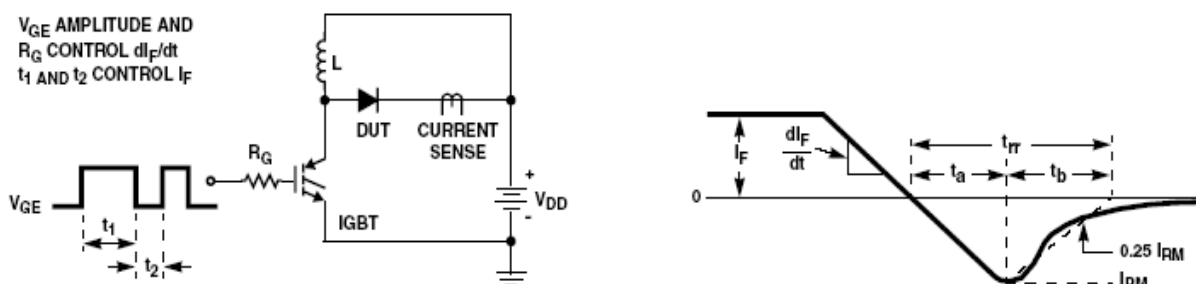


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

$L = 40\text{ mH}$
 $R < 0.1\Omega$
 $V_{DD} = 50\text{ V}$

$$E_{AVL} = 1/2 L I_L^2 [V_{R(AVL)} / (V_{R(AVL)} - V_{DD})]$$

$Q1 = \text{IGBT } (BV_{CES} > \text{DUT } V_{R(AVL)})$

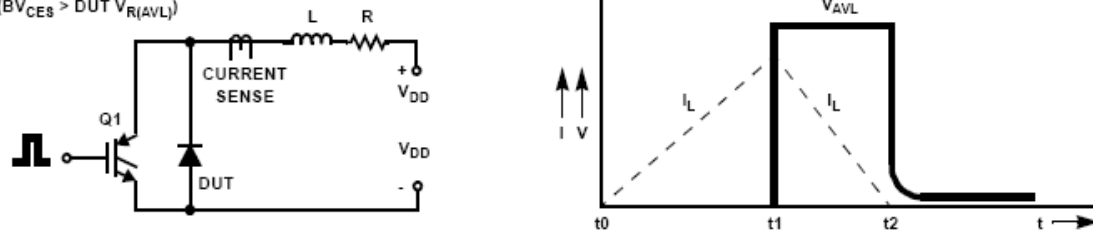


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop vs. Forward Current

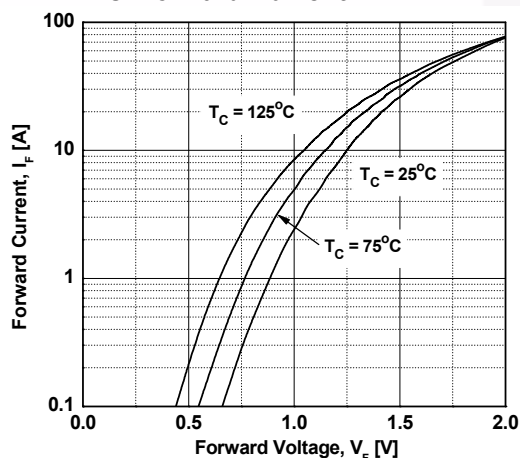


Figure 4. Typical Reverse Current vs. Reverse Voltage

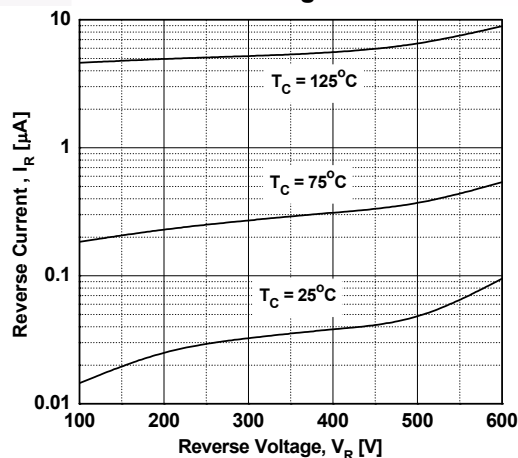


Figure 5. Typical Junction Capacitance

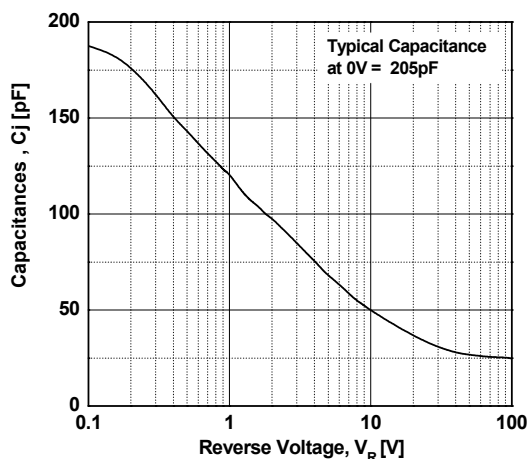


Figure 6. Typical Reverse Recovery Time vs. di_F/dt

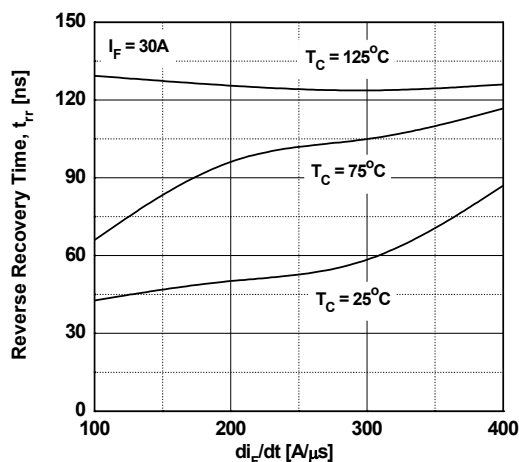


Figure 7. Typical Reverse Recovery Current vs. di_F/dt

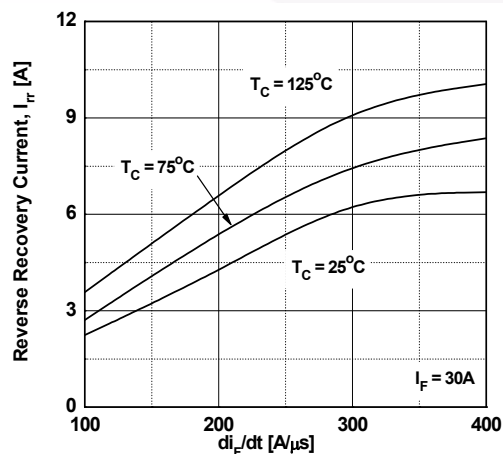
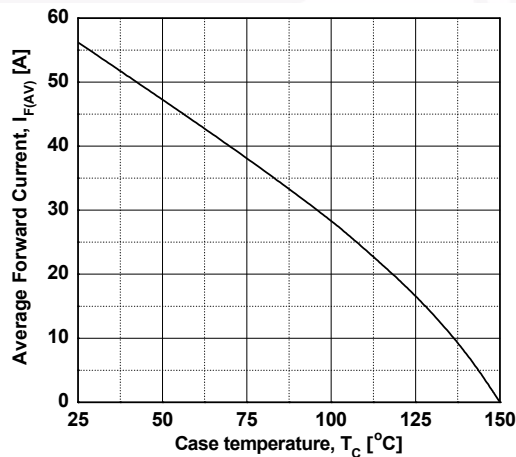
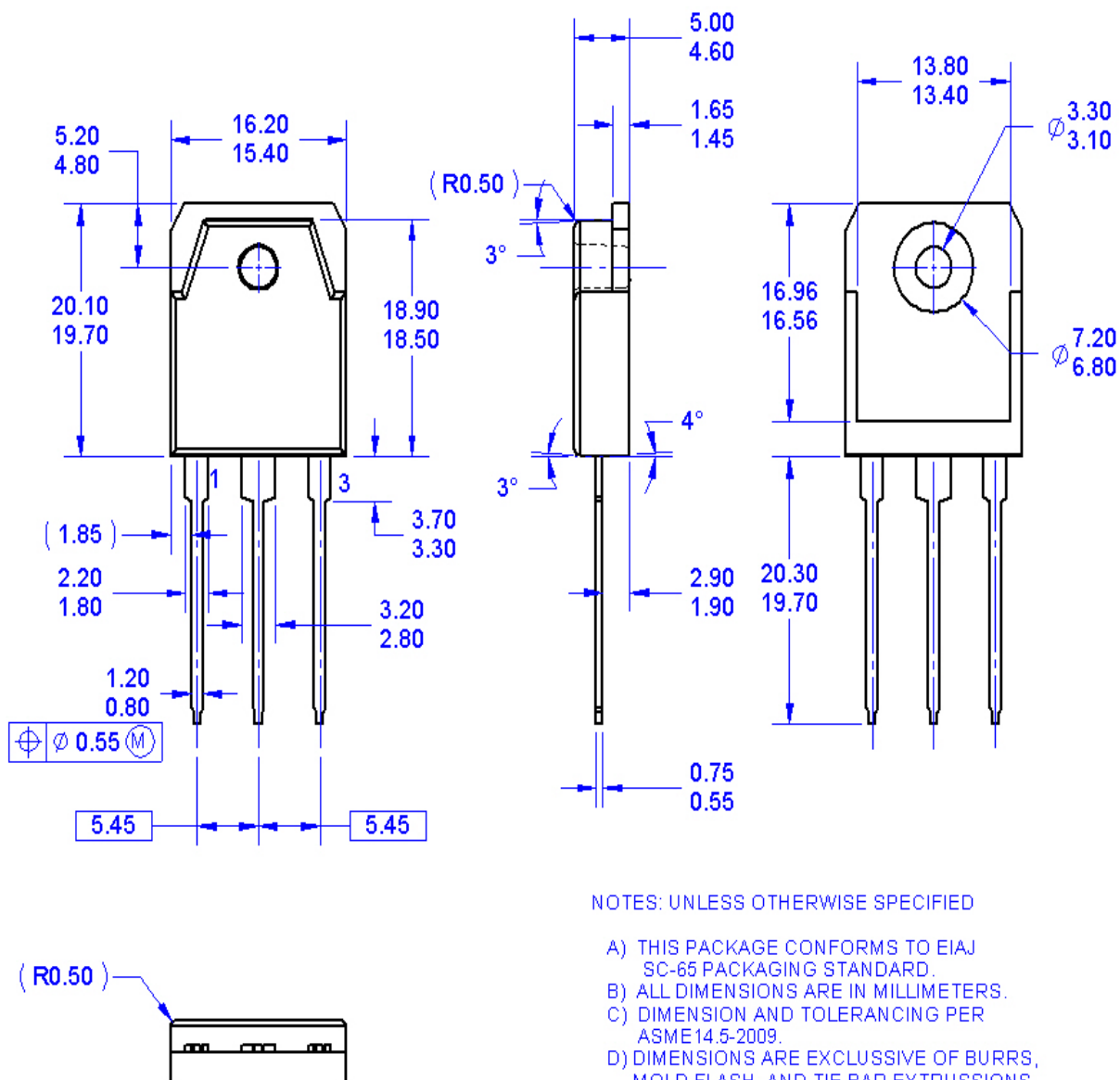


Figure 8. Forward Current Derating Curve



Mechanical Dimensions



NOTES: UNLESS OTHERWISE SPECIFIED

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- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSION AND TOLERANCING PER ASME Y14.5-2009.
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Figure 9. TO-3P 3L - 3LD, T03, PLASTIC, EIAJ SC-65

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