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# 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

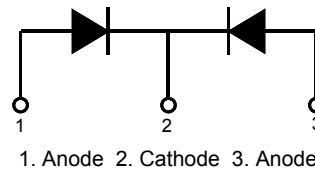
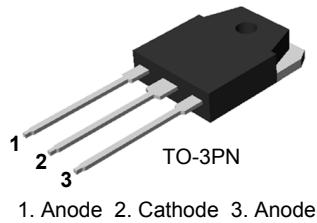
## Applications

- 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

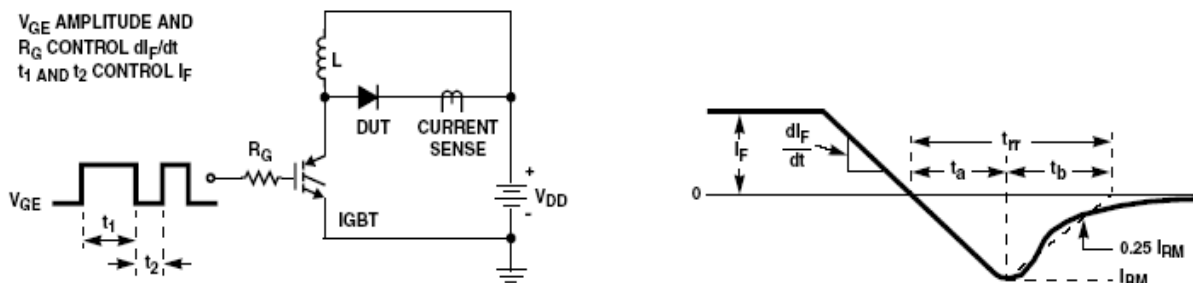
**Electrical Characteristics** Per leg at  $T_C = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{FM1}$	$I_F = 30\text{ A}$ $I_F = 30\text{ A}$	-	-	2.2 2.0	V
$I_{RM1}$	$V_R = 600\text{ V}$ $V_R = 600\text{ V}$	-	-	100 150	$\mu\text{A}$
$t_{rr}$	$I_F = 30\text{ A}, di_F/dt = 200\text{ A}/\mu\text{s}$ $T_C = 25^\circ\text{C}$	-	-	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 $\mu\text{s}$ , Duty Cycle = 2%

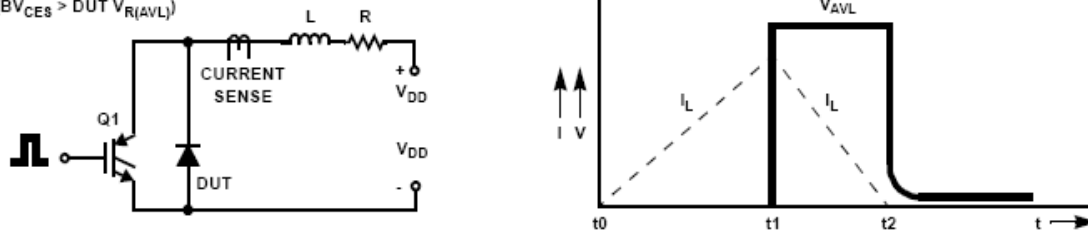
**Test Circuit and Waveforms**



**Figure 1. Diode Reverse Recovery Test Circuit & Waveform**

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

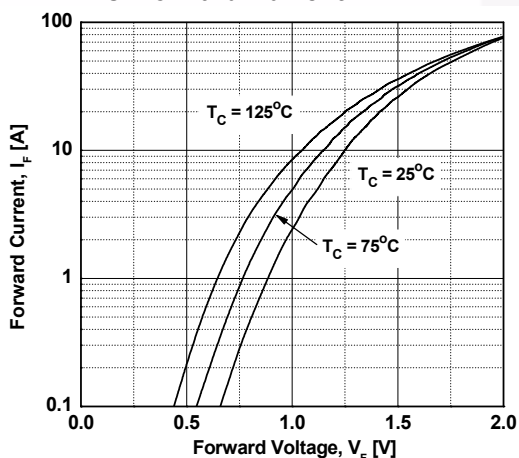
$E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$   
 $Q1 = \text{IGBT } (BV_{CES} > \text{DUT } V_{R(AVL)})$



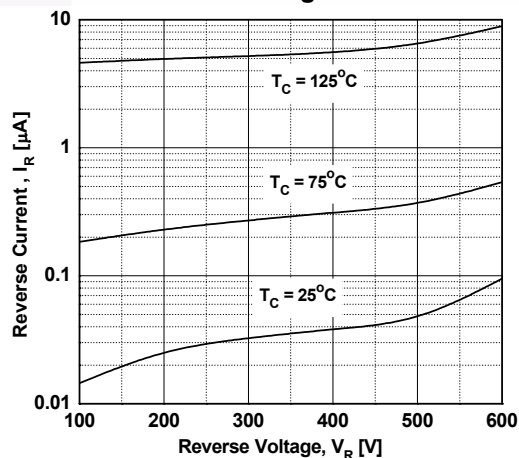
**Figure 2. Unclamped Inductive Switching Test Circuit & Waveform**

## Typical Performance Characteristics

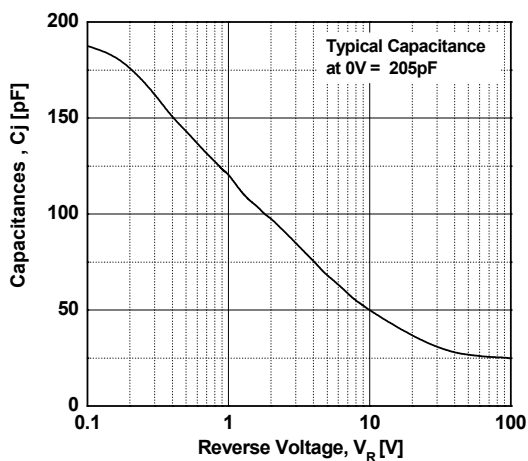
**Figure 3. Typical Forward Voltage Drop vs. Forward Current**



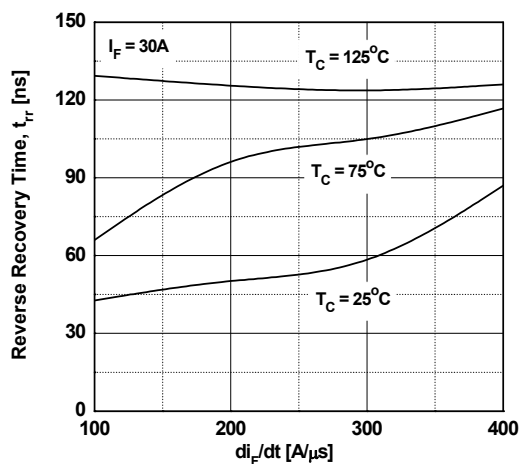
**Figure 4. Typical Reverse Current vs. Reverse Voltage**



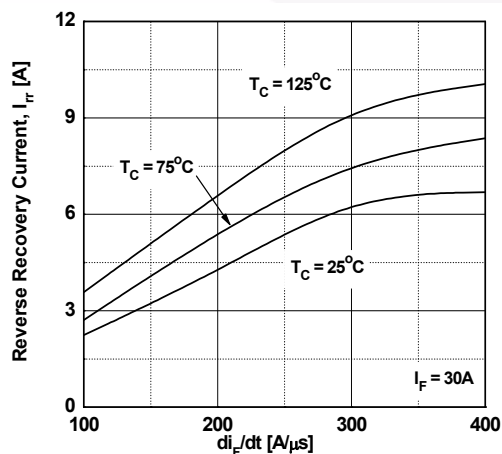
**Figure 5. Typical Junction Capacitance**



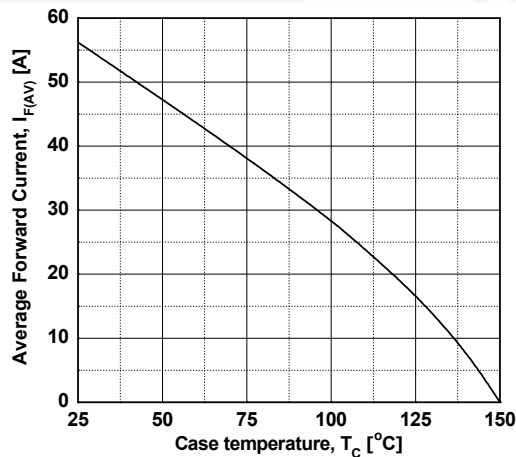
**Figure 6. Typical Reverse Recovery Time vs.  $di_F/dt$**



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



**Figure 8. Forward Current Derating Curve**








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