

# FFAF30UA60S

## 30 A, 600 V, Ultrafast II Single Diode

The FFAF30UA60S 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 specifically suited for use in switching power supplies and industrial application as welder and UPS application.

### Features

- Ultrafast Recovery,  $T_{rr} < 90$  ns (@  $I_F = 30$  A)
- Max Forward Voltage,  $V_F = 2.2$  V (@  $T_C = 25^\circ\text{C}$ )
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- These Devices are Pb-Free and are RoHS Compliant

### Typical Applications

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

### ABSOLUTE MAXIMUM RATINGS

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

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	$V_{RRM}$	600	V
Working Peak Reverse Voltage	$V_{RWM}$	600	V
DC Blocking Voltage	$V_R$	600	V
Average Rectified Forward Current (Rated $V_R$ , $T_C = 45^\circ\text{C}$ )	$I_{F(AV)}$	30	A
Non-repetitive Peak Surge Current 60 Hz Single Half-Sine Wave	$I_{FSM}$	180	A
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +175	$^\circ\text{C}$

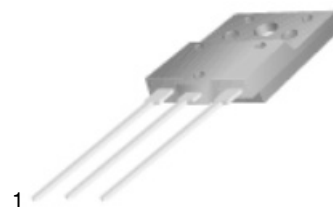
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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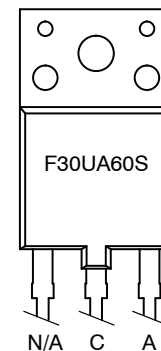
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## 30 A, 600 V ULTRAFAST II RECTIFIER



TO-3PF  
CASE 340AH

### MARKING DIAGRAM



F30UA60S = Specific Device Code

### ORDERING INFORMATION

Device	Package	Shipping
FFAF30UA60S	TO-3PF	30 / Rail

# FFAF30UA60S

## THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Steady State (Assumes 600 mm <sup>2</sup> 1 oz. copper bond pad, on an FR4 board)	2.4	°C/W

## ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{FM1}$	Instantaneous Forward Voltage	$I_F = 30\text{ A}, T_C = 25^\circ\text{C}$ $I_F = 30\text{ A}, T_C = 125^\circ\text{C}$	-	-	2.2 2.0	V
$I_{RM1}$	Instantaneous Reverse Current	$V_R = 600\text{ V}, T_C = 25^\circ\text{C}$ $V_R = 600\text{ V}, T_C = 125^\circ\text{C}$	-	-	100 150	$\mu\text{A}$
$T_{rr}$	Reverse Recovery	$I_F = 30\text{ A}, di_F/dt = 200/\mu\text{s}, T_C = 25^\circ\text{C}$	-	-	90	Ns
$I_{rr}$			-	-	8	A
$Q_{rr}$			-	-	360	nC
$W_{AVL}$	Avalanche Energy	$L = 40\text{ mH}$	20	-	-	mJ

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Pulse: Test Pulse width = 300  $\mu\text{s}$ , Duty Cycle = 2%

## Test Circuit and Waveforms

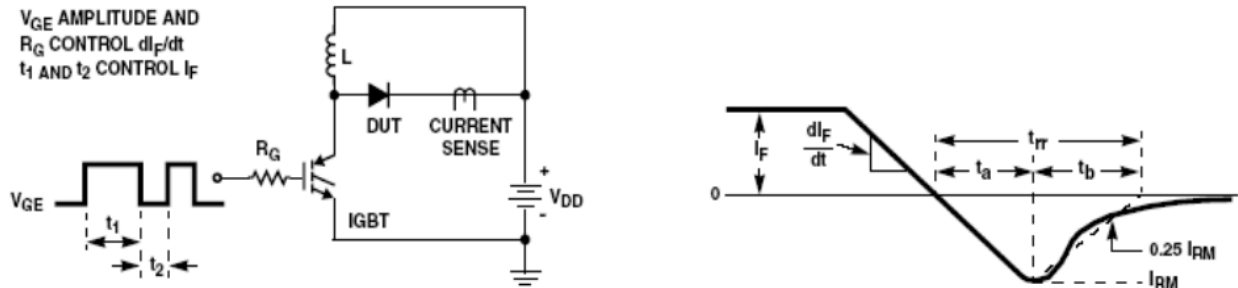


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

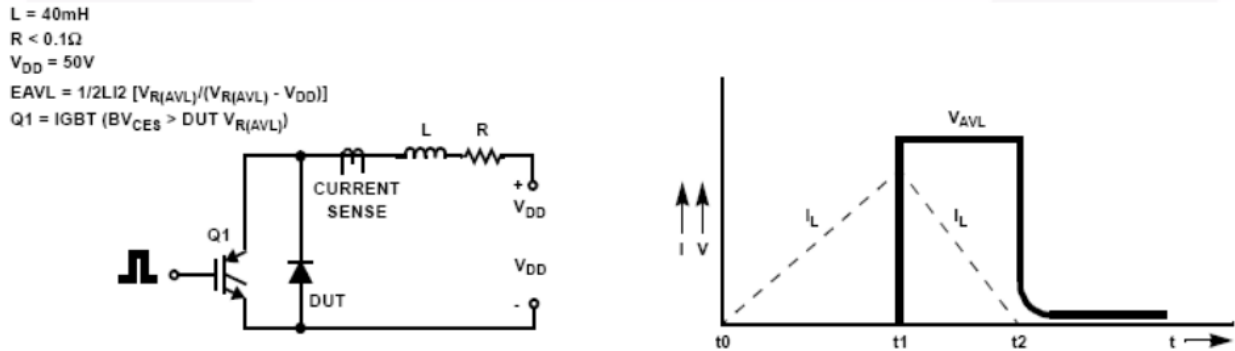


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

# FFAF30UA60S

## TYPICAL CHARACTERISTICS

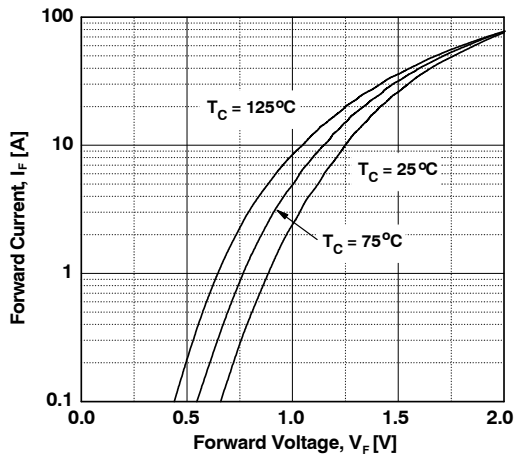


Figure 3. Typical Forward Voltage Drop vs. Forward Current

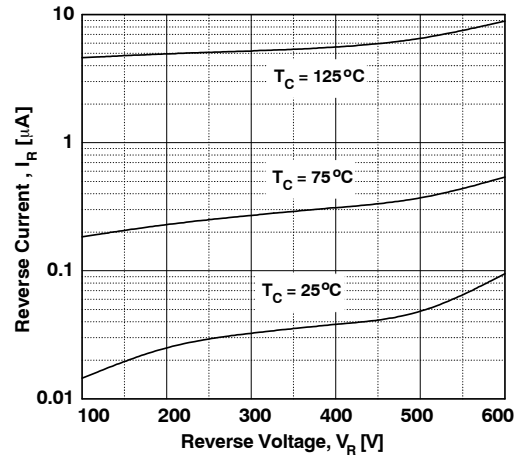


Figure 4. Typical Reverse Current vs. Reverse Voltage

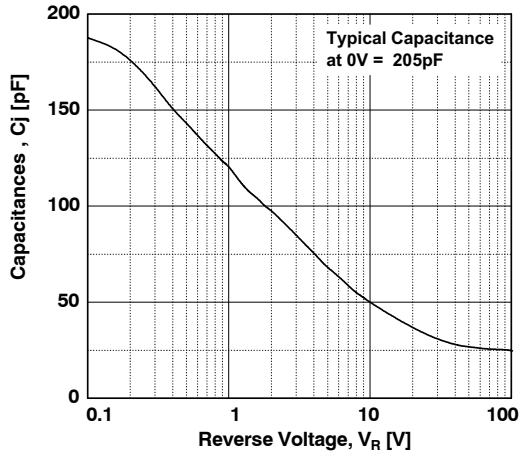


Figure 5. Typical Junction Capacitance

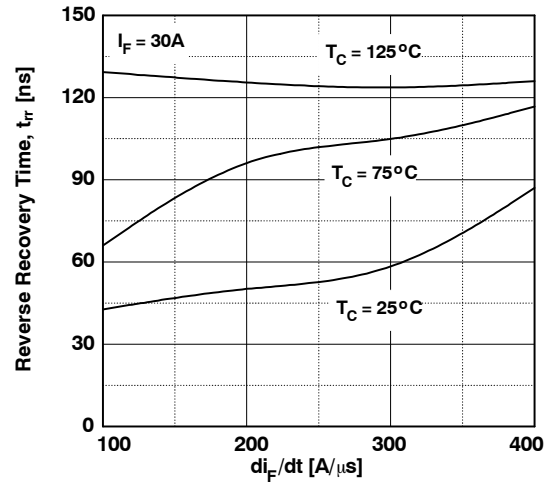


Figure 6. Typical Reverse Recovery Time vs.  $di_F/dt$

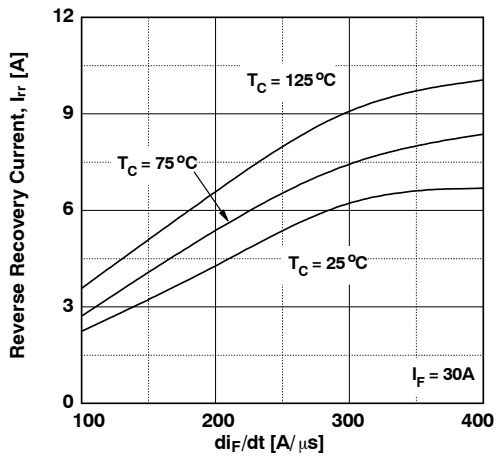


Figure 7. Typical Reverse Recovery Current vs.  $di_F/dt$

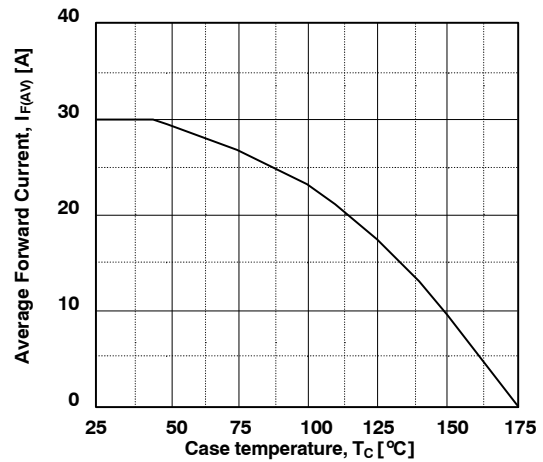


Figure 8. Forward Current Derating Curve

# MECHANICAL CASE OUTLINE

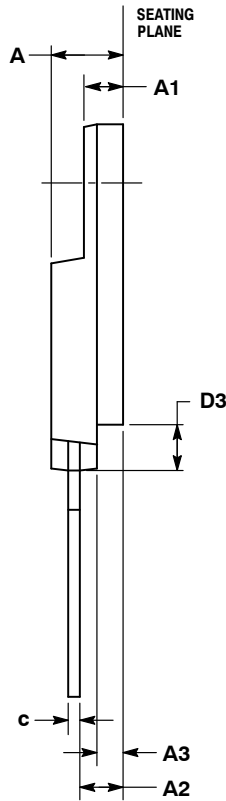
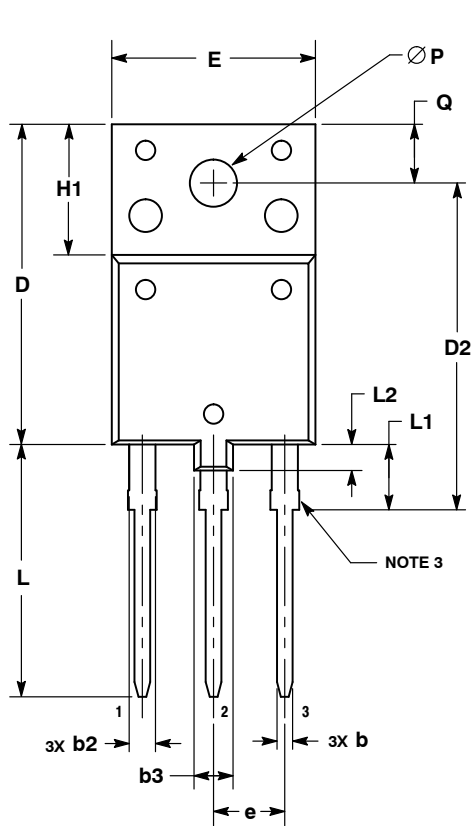
## PACKAGE DIMENSIONS

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### TO-3PF-3L CASE 340AH ISSUE A

DATE 09 JAN 2015



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR UNCONTROLLED IN THIS AREA (6 PLACES).
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE TO BE MEASURED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DIMENSION b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 2.20.

DIM	MILLIMETERS	
	MIN	MAX
A	5.30	5.70
A1	2.80	3.20
A2	3.10	3.50
A3	1.80	2.20
b	0.65	0.95
b2	1.90	2.15
b3	3.80	4.20
c	0.80	1.10
D	24.30	24.70
D2	24.70	25.30
D3	3.30	3.70
E	15.30	15.70
e	5.35	5.55
H1	9.80	10.20
L	19.10	19.50
L1	4.80	5.20
L2	1.90	2.20
P	3.40	3.80
Q	4.30	4.70

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