# 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,  $T_{rr} < 90 \text{ ns } (@I_F = 30 \text{ A})$
- Max Forward Voltage,  $V_F = 2.2 \text{ V}$  (@  $T_C = 25^{\circ}\text{C}$ )
- 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  $T_C = 25^{\circ}C$  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 <sub>R</sub> , T <sub>C</sub> = 45°C)	I <sub>F(AV)</sub>	30	Α
Non-repetitive Peak Surge Current 60 Hz Single Half-Sine Wave	I <sub>FSM</sub>	180	Α
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +175	°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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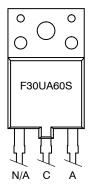
www.onsemi.com

## 30 A, 600 V ULTRAFAST II RECTIFIER





#### **MARKING DIAGRAM**



F30UA60S = Specific Device Code

### **ORDERING INFORMATION**

Device	Package	Shipping
FFAF30UA60S	TO-3PF	30 / Rail

### FFAF30UA60S

#### THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Unit
$R_{ heta JC}$	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	Тур	Max	Unit
V <sub>FM</sub> 1	Instantaneous Forward Voltage	I <sub>F</sub> = 30 A, T <sub>C</sub> = 25°C I <sub>F</sub> = 30 A, T <sub>C</sub> = 125°C	- -	- -	2.2 2.0	V
I <sub>RM</sub> 1	Instantaneous Reverse Current	V <sub>R</sub> = 600 V, T <sub>C</sub> = 25°C V <sub>R</sub> = 600 V, T <sub>C</sub> = 125°C	-	-	100 150	μΑ
Trr	Reverse Recovery	$I_F = 30 \text{ A}, \text{ di}_F/\text{dt} = 200/\mu\text{s}, \text{ T}_C = 25^{\circ}\text{C}$	-	-	90	Ns
Irr			-	-	8	Α
Qrr			-	-	360	nC
W <sub>AVL</sub>	Avalanche Energy	L = 40 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.

#### **Test Circuit and Waveforms**

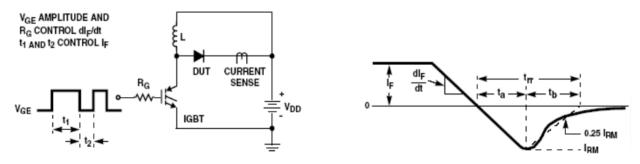


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

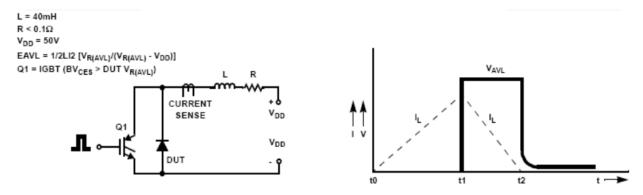


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

<sup>1.</sup> Pulse: Test Pulse width = 300 μs, Duty Cycle = 2%

### FFAF30UA60S

#### **TYPICAL CHARACTERISTICS**

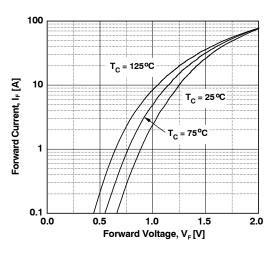


Figure 3. Typical Forward Voltage Drop vs. Forward Current

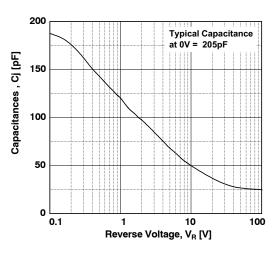


Figure 5. Typical Junction Capacitance

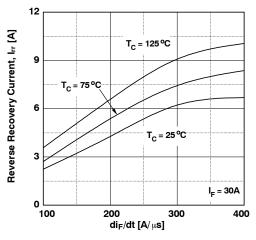


Figure 7. Typical Reverse Recovery Current vs. di<sub>F</sub>/dt

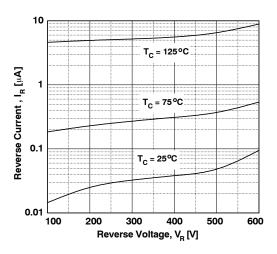


Figure 4. Typical Reverse Current vs. Reverse Voltage

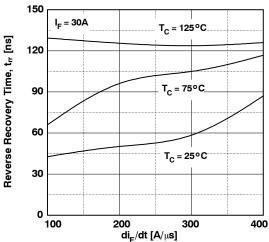
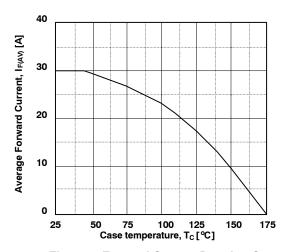


Figure 6. Typical Reverse Recovery Time vs.  ${\rm di_F/dt}$ 

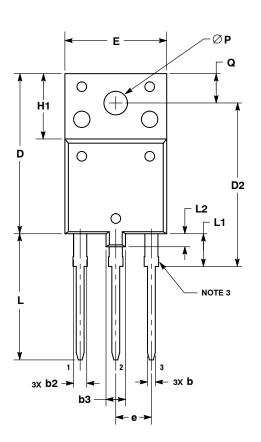


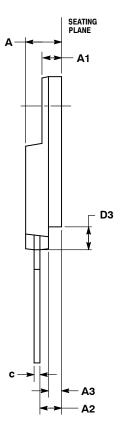
**Figure 8. Forward Current Derating Curve** 



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 OUTERNOST EXTREME OF THE PLASTIC BODY.
  5. DIMENSION DE DOES NOT INCLUDE DAMBAR PROTRUSION.
- LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 2.20.

	MILLIMETERS		
DIM	MIN MAX		
Α	5.30	5.70	
A1	2.80	3.20	
A2	3.10	3.50	
А3	1.80	2.20	
p	0.65	0.95	
b2	1.90	2.15	
b3	3.80	4.20	
С	0.80	1.10	
D	24.30	24.70	
D2	24.70	25.30	
D3	3.30	3.70	
Ε	15.30	15.70	
е	5.35	5.55	
H1	9.80	10.20	
٦	19.10	19.50	
L1	4.80	5.20	
L2	1.90	2.20	
Р	3.40	3.80	
Q	4.30	4.70	

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