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Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

September 2016

FFH60UP60S, FFH60UP60S3

60 A, 600 V Ultrafast Rectifier

Features

- Ultrafast Recovery, t_{rr} = 80 ns (@ I_F = 60 A)
- Max Forward Voltage, V_F = 1.7 V (@ T_C = 25°C)
- Avalanche Energy Rated
- RoHS compliant

Applications

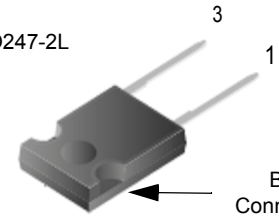
- General Purpose
- SMPS, Welder, UPS
- Free-wheeling diode for motor application
- Power switching circuits

Description

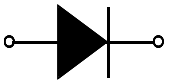
The FFH60UP60S, FFH60UP60S3 is an ultrafast diode with low forward voltage drop and rugged UIS capability. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power switching applications. It is specially suited for use in switching power supplies and industrial applicationa as welder and UPS application.

Pin Assignments

TO247-2L

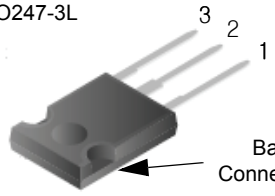


3. Anode 1. Cathode

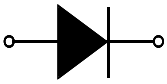


Backside Metal
Connected to Cathode

TO247-3L



1.3 Anode 2. Cathode



Backside Metal
Connected to Cathode

Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	Rating	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 = 93°C	60	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	600	A
T_J, T_{STG}	Operating and Storage Temperature Range	-65 to +175	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	0.7	°C/W

Package Marking and Ordering Information

Device Marking	Device	Package	Packing Methode	Reel Size	Tape Width	Quantity
FFH60UP60S	FFH60UP60S	TO247-2L	Tube	N/A	N/A	30
FFH60UP60S3	FFH60UP60S3	TO247-3L	Tube	N/A	N/A	30

Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_F1	I_F = 60 A	T_C = 25°C T_C = 125°C	- -	1.4 1.3	1.7 -	V
I_R1	V_R=600V	T_C = 25°C T_C = 125°C	- -	- -	100 500	μA
t_{rr}	I_F = 60 A, di_F/dt = 200 A/μs, V_R = 390 V	T_C = 25°C T_C = 125°C	- -	60 138	80 -	ns
W_{AVL}	Avalanche Energy (L = 40 mH)		50	-	-	mJ

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

Test circuit and waveform

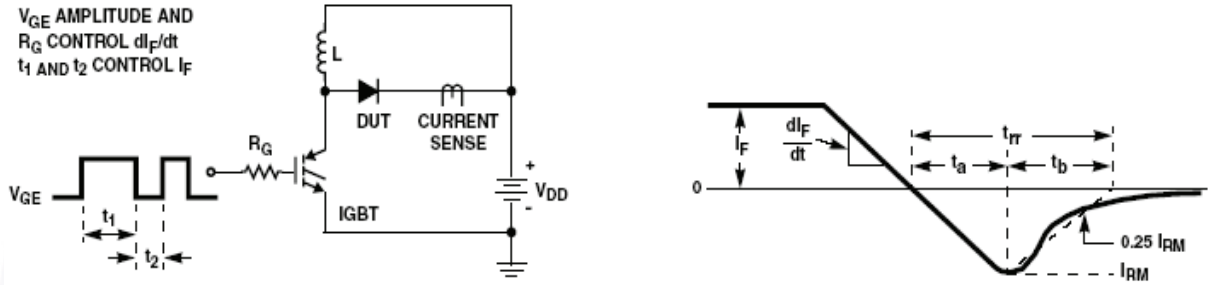


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

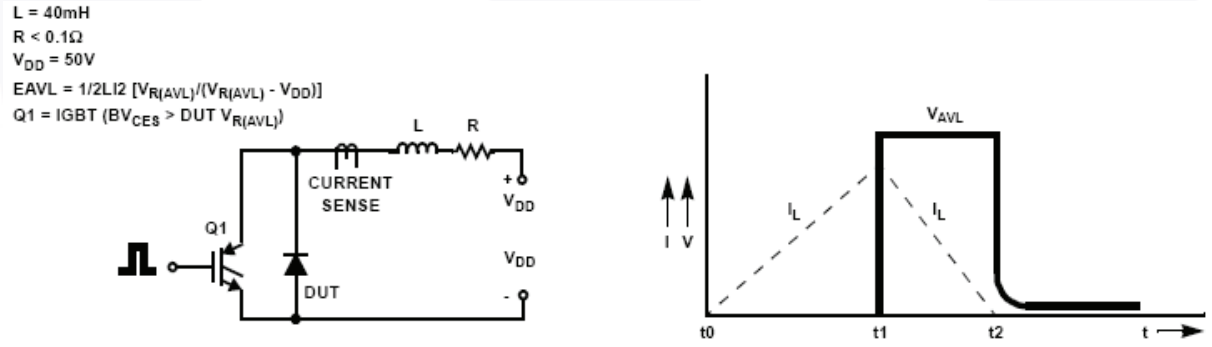


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop vs. Forward Current

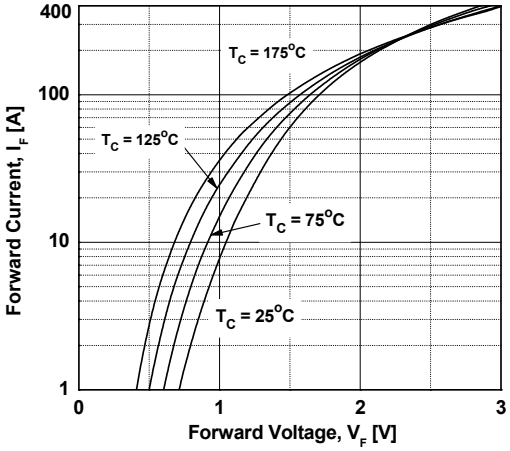


Figure 4. Typical Reverse Current vs. Reverse Voltage

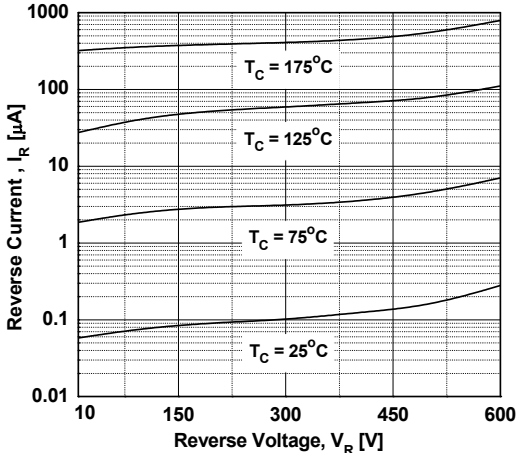


Figure 5.Typical Junction Capacitance

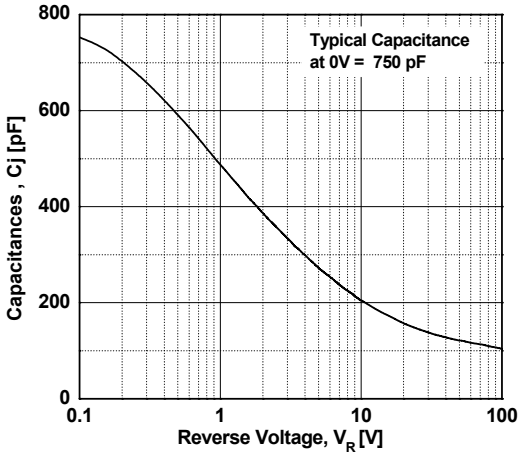


Figure 6. Typical Reverse Recovery Time vs. di_F/dt

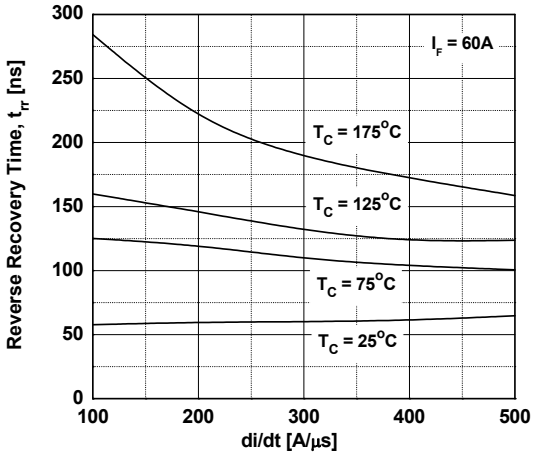


Figure 7. Typical Reverse Recovery Current vs. di_F/dt

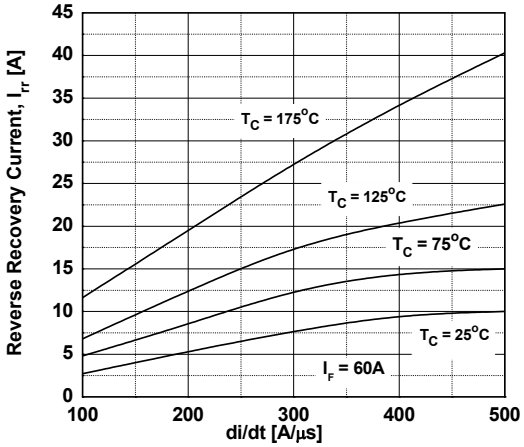
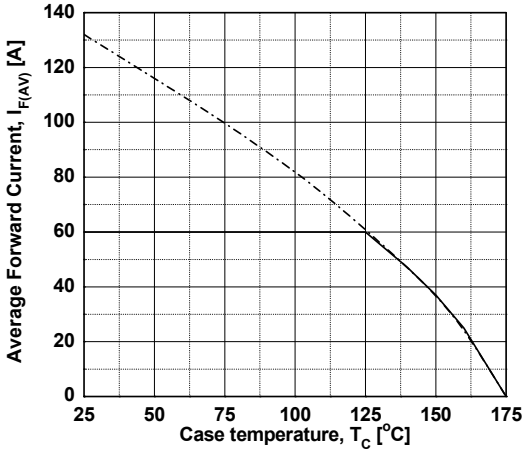
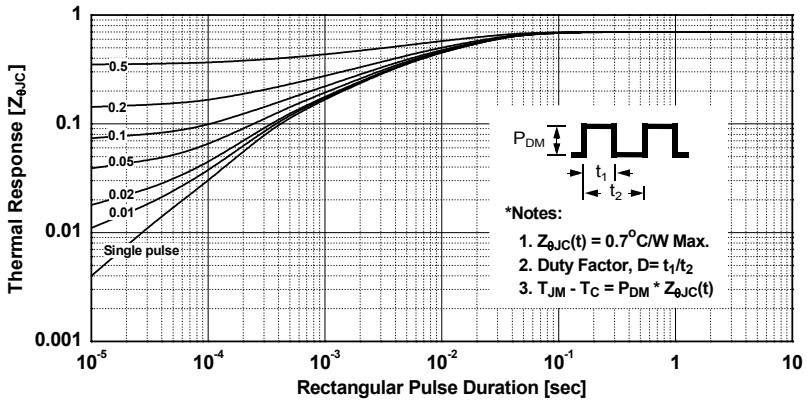


Figure 8. Forward Current Derating Curve



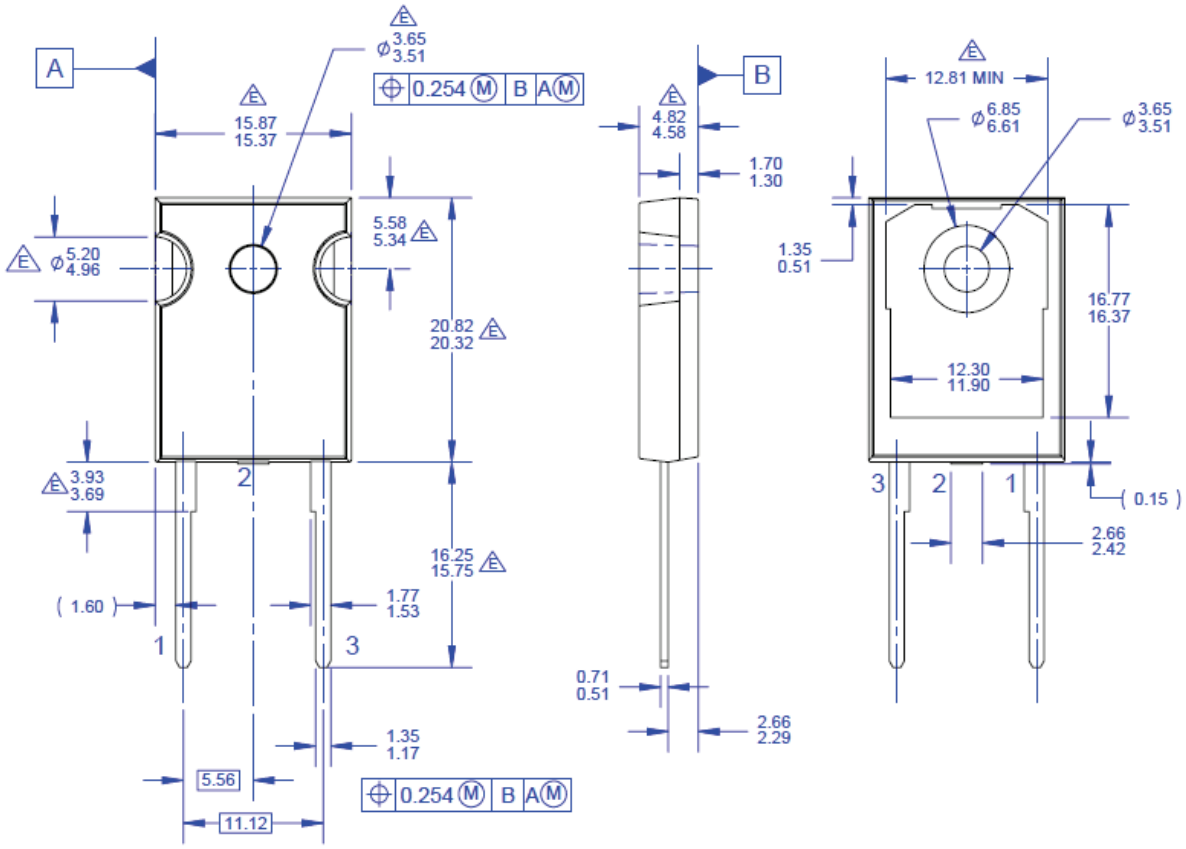
Typical Performance Characteristics (Continued)

Figure 9. Transient Thermal Response Curve



Mechanical Dimensions

TO247-2L



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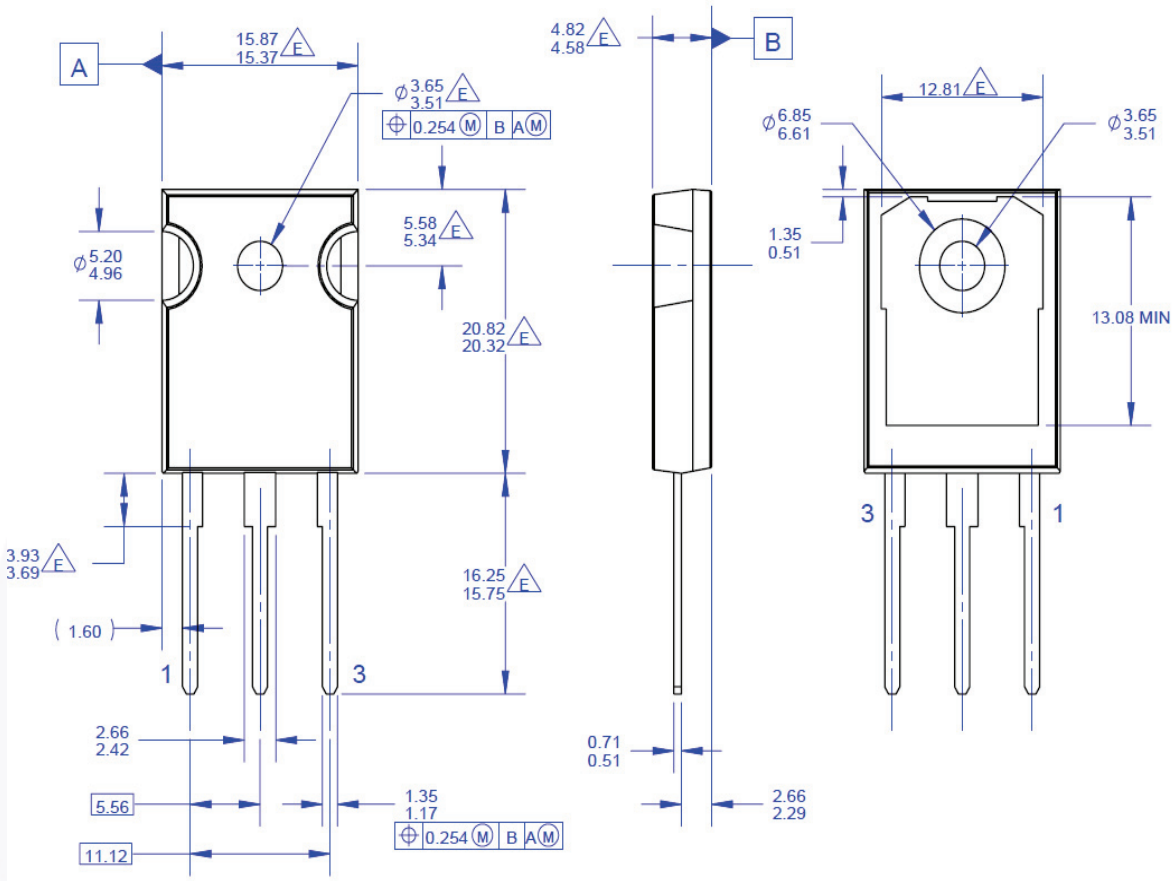
Mechanical Dimensions

TO247-3L



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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
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Rev. I77

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