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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

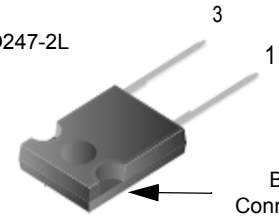
- General Purpose
- SMPS, Welder, UPS
- Free-wheeling diode for motor application
- Power switching circuits

### Description

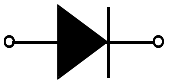
The FFH60UP60S, FFH60UP60S3 is an ultrafast diode with low forward voltage drop and rugged UIS capability. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power switching applications. It is specially suited for use in switching power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

### Pin Assignments

TO247-2L

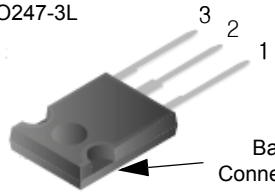



3. Anode 1. Cathode

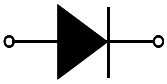


Backside Metal
Connected to Cathode

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_F$1 | $I_F$ = 60 A | $T_C$ = 25°C<br>$T_C$ = 125°C | -<br>- | 1.4<br>1.3 | 1.7<br>- | V |
| $I_R$1 | $V_R$=600V | $T_C$ = 25°C<br>$T_C$ = 125°C | -<br>- | -<br>- | 100<br>500 | μA |
| $t_{rr}$ | $I_F$ = 60 A, $di_F/dt$ = 200 A/μs, $V_R$ = 390 V | $T_C$ = 25°C<br>$T_C$ = 125°C | -<br>- | 60<br>138 | 80<br>- | ns |
| $W_{AVL}$ | Avalanche Energy ( L = 40 mH) | | 50 | - | - | mJ |

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

## Test circuit and waveform

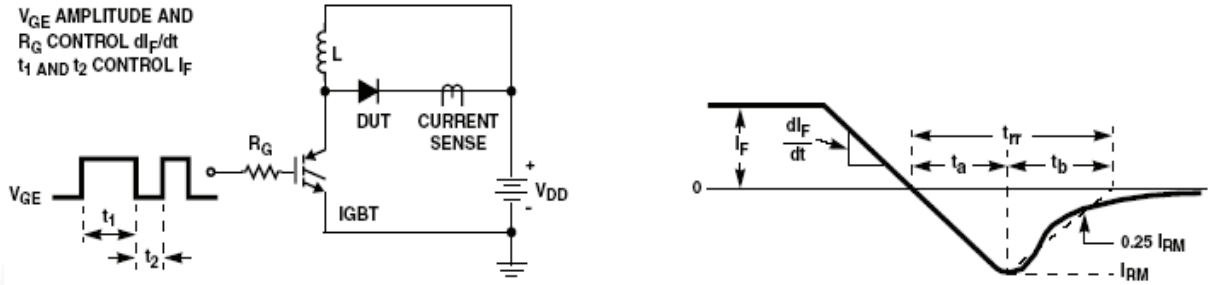



**Figure 1. Diode Reverse Recovery Test Circuit & Waveform**

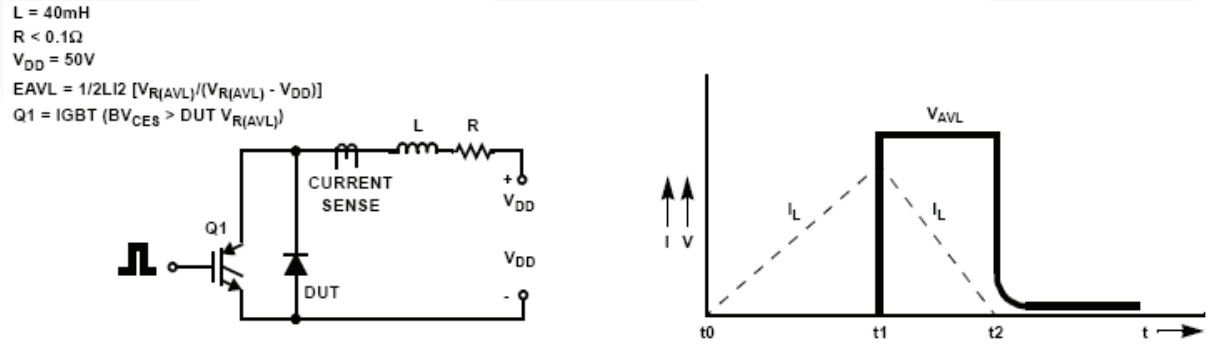



**Figure 2. Unclamped Inductive Switching Test Circuit & Waveform**

## Typical Performance Characteristics

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

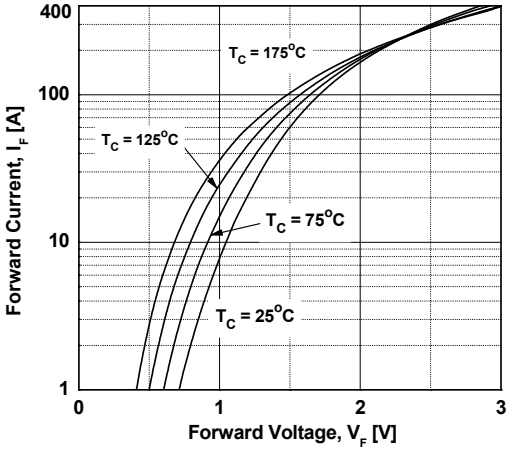



**Figure 4. Typical Reverse Current vs. Reverse Voltage**

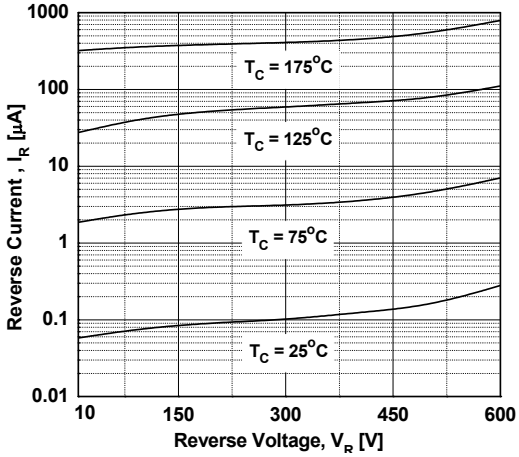



**Figure 5.Typical Junction Capacitance**

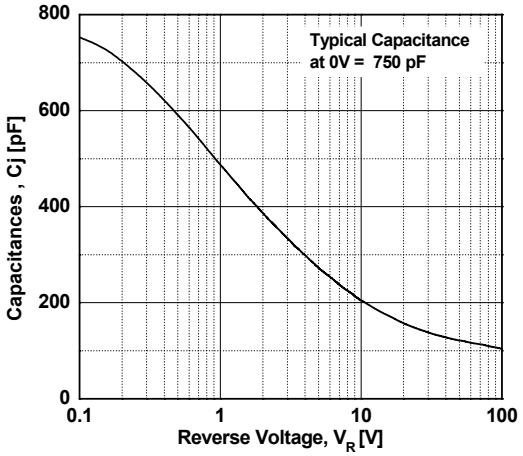



**Figure 6. Typical Reverse Recovery Time vs. $di_F/dt$**

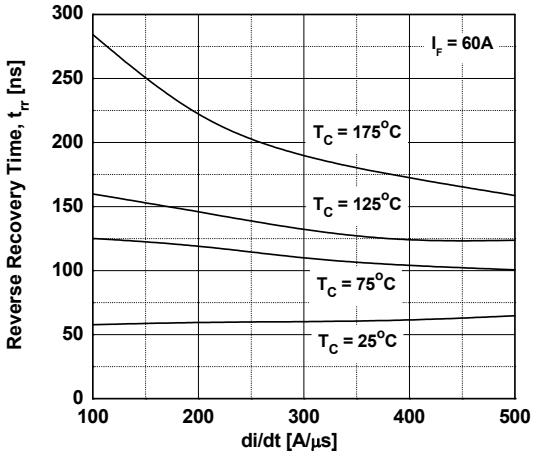



**Figure 7. Typical Reverse Recovery Current vs. $di_F/dt$**

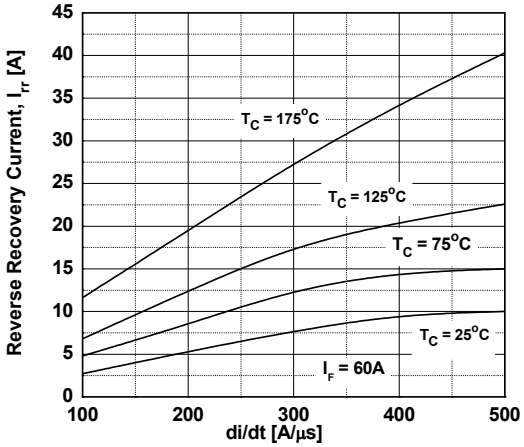
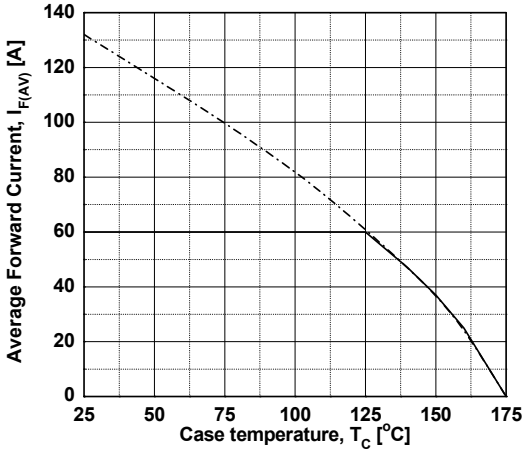
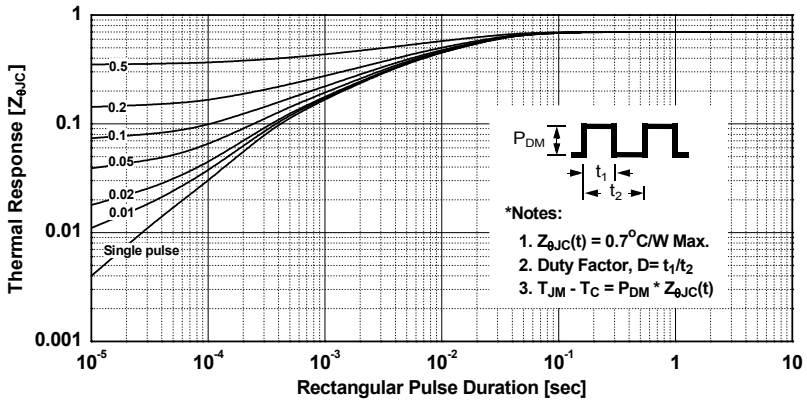



**Figure 8. Forward Current Derating Curve**



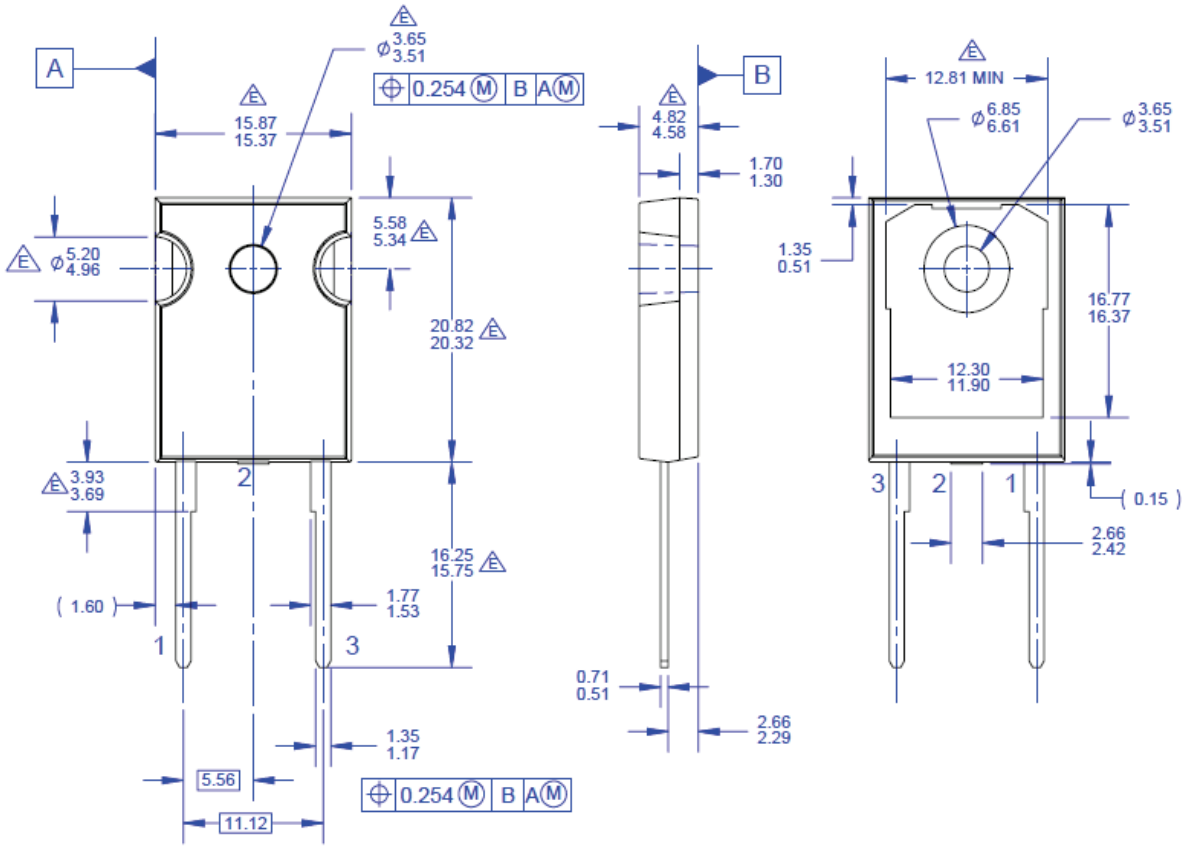
## Typical Performance Characteristics (Continued)

**Figure 9. Transient Thermal Response Curve**



## Mechanical Dimensions

# TO247-2L

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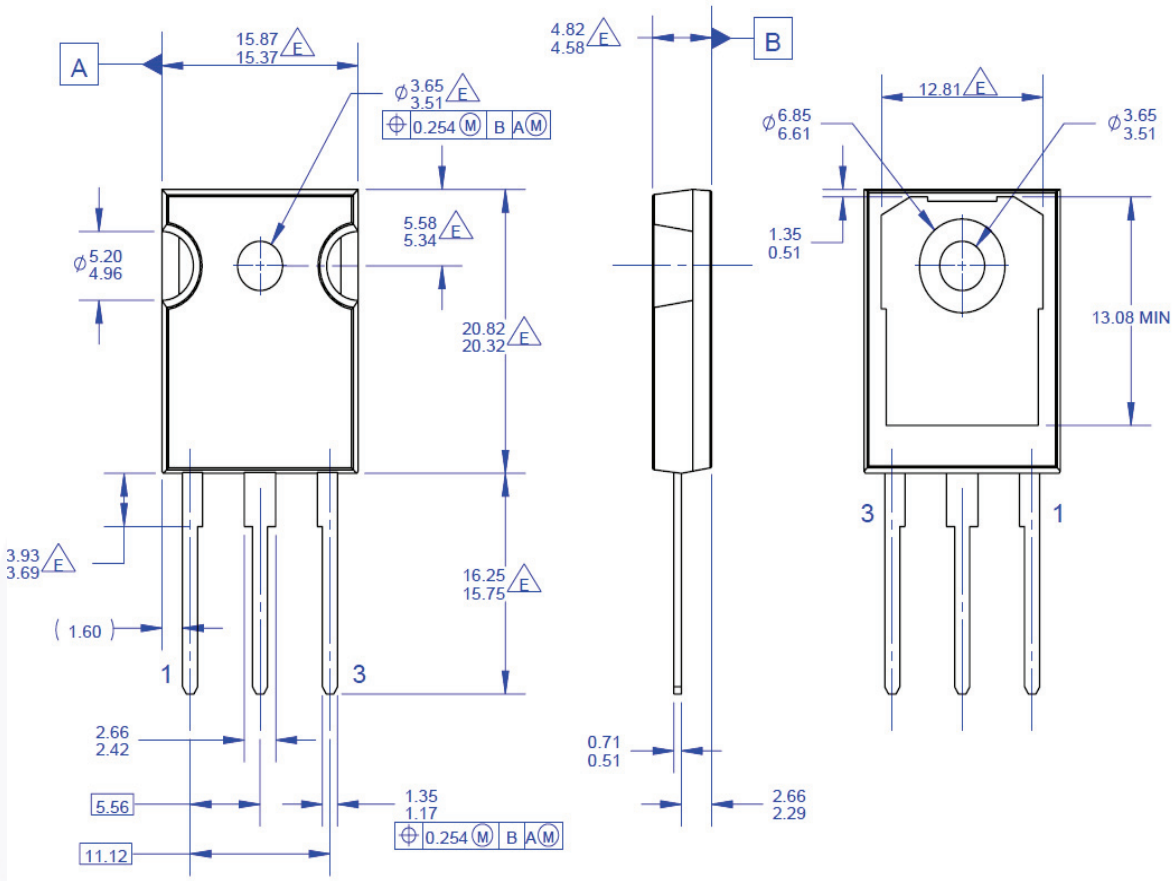


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