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FFH60UP60S, FFH60UP60S3

60 A, 600 V Ultrafast Rectifier

Features

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

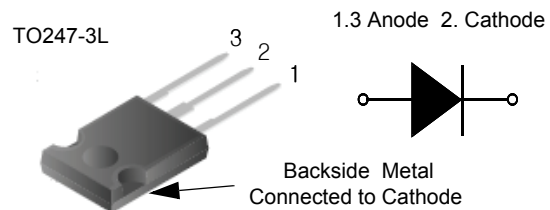
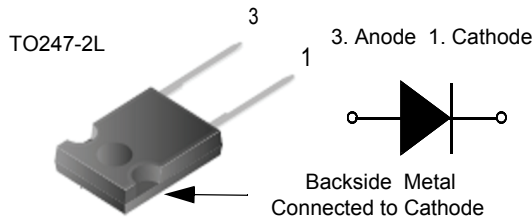
Applications

- 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 applications as welder and UPS application.

Pin Assignments



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ 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 @ $T_C = 93^\circ\text{C}$ | 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 | $^\circ\text{C}$ |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-----------------|--|--------|--------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 0.7 | $^\circ\text{C/W}$ |

Package Marking and Ordering Information

| Device Marking | Device | Package | Packing Method | 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 $T_C = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|-----------|---|------|------------|------------|---------------|
| V_F1 | $I_F = 60\text{ A}$ | - | 1.4 1.3 | 1.7 - | V |
| I_{R1} | $V_R=600\text{ V}$ | - | - | 100 500 | μA |
| t_{rr} | $I_F = 60\text{ A}, di_F/dt = 200\text{ A}/\mu\text{s}, V_R = 390\text{ V}$ | - | 60 138 | 80 - | ns |
| W_{AVL} | Avalanche Energy ($L = 40\text{ mH}$) | 50 | - | - | mJ |

Notes:

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

Test circuit and waveform

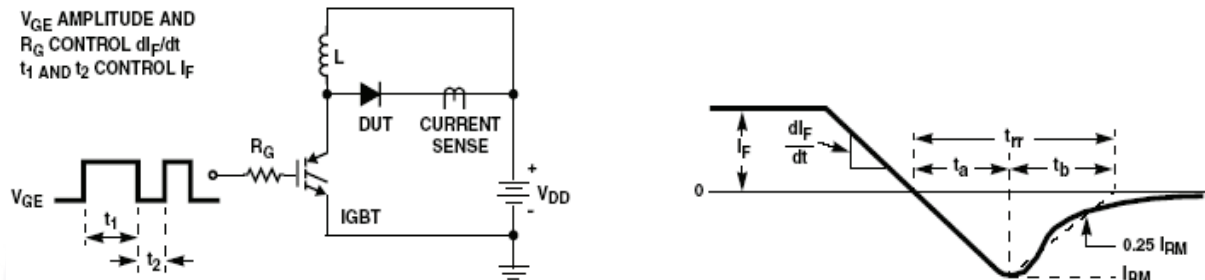


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

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

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

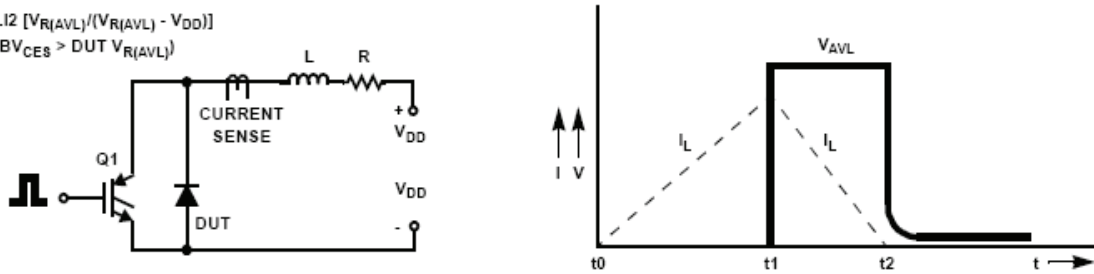


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop vs. Forward Current

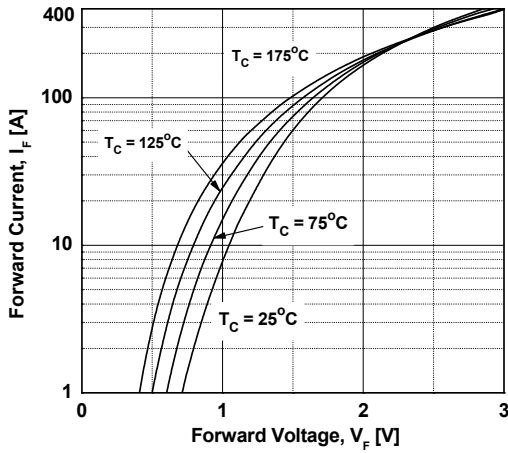


Figure 5. Typical Junction Capacitance

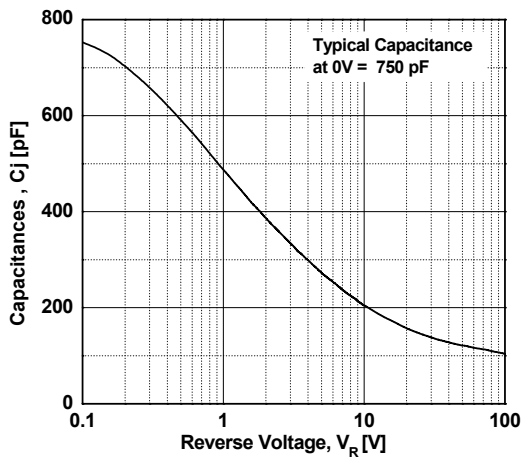


Figure 7. Typical Reverse Recovery Current vs. di_F/dt

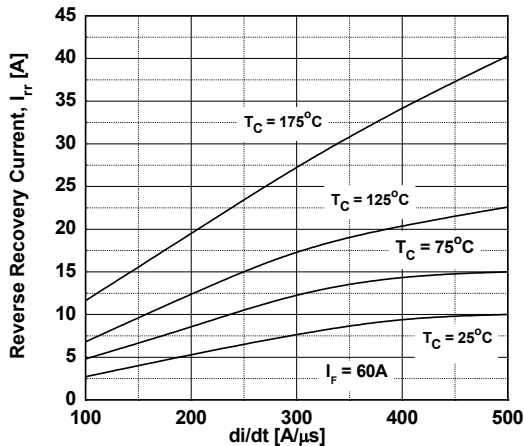


Figure 4. Typical Reverse Current vs. Reverse Voltage

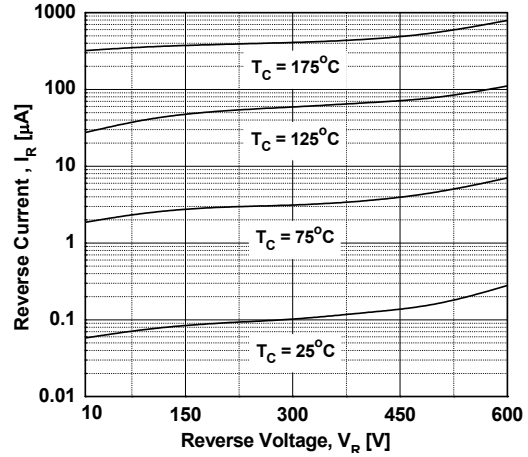


Figure 6. Typical Reverse Recovery Time vs. di_F/dt

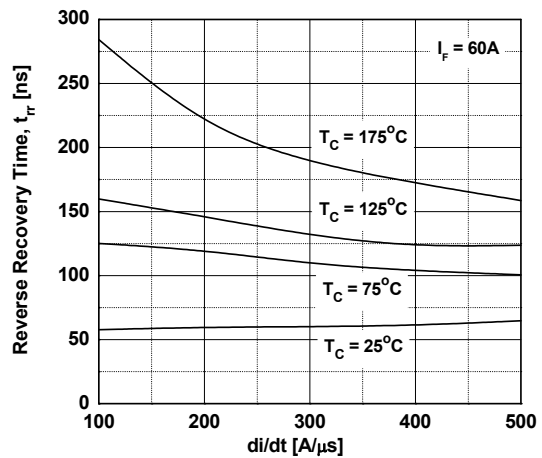
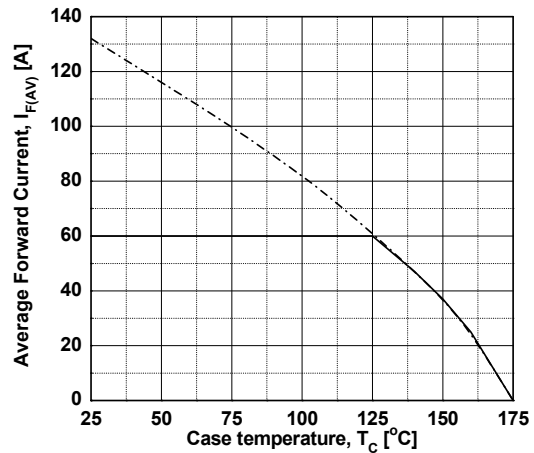
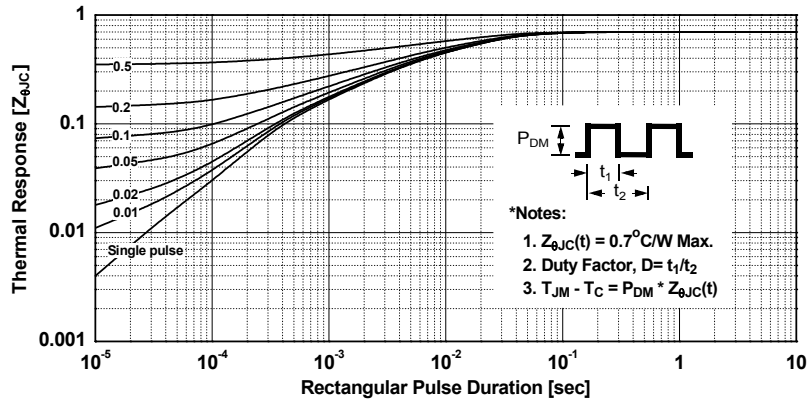


Figure 8. Forward Current Derating Curve



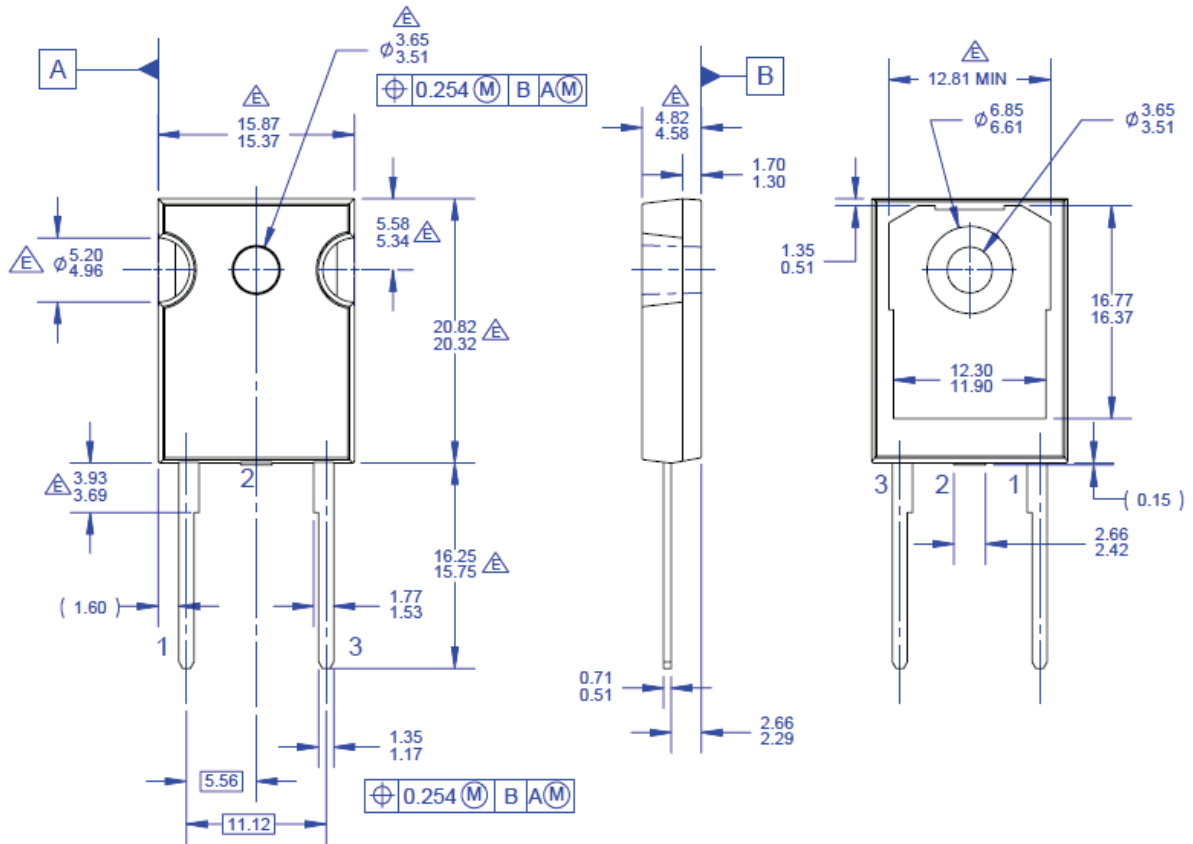
Typical Performance Characteristics (Continued)

Figure 9. Transient Thermal Response Curve



Mechanical Dimensions

TO247-2L



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