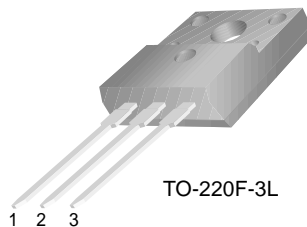


FFPF60SA60DS

Features

- Soft Recovery ($t_b / t_a > 1.2$)
- Fast Recovery ($t_{rr} < 25\text{ns}$)
- Reverse Voltage, 600V
- Forward Voltage (@ $T_C = 125^\circ\text{C}$), $< 2.0\text{ V}$
- Enhanced Avalanche Energy



Applications

- Switch Mode Power Supplies
- Hard Switched PFC Boost Diode
- UPS Free wheeling Diode
- Motor Drive FWD
- SMPS FWD
- Snubber Diode

Absolute Maximum Ratings (per leg) $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Value | Units |
|----------------|---|--------------|------------------|
| 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 @ $T_C = 95^\circ\text{C}$ | 8 | A |
| I_{FSM} | Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave | 80 | A |
| P_D | Power Dissipation | 26 | W |
| W_{AVL} | Avalanche Energy (1A, 40mH) | 20 | mJ |
| T_J, T_{STG} | Operating Junction and Storage Temperature | - 65 to +150 | $^\circ\text{C}$ |

Thermal Characteristics

| Symbol | Parameter | Value | Units |
|-----------------|---|-------|---------------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 3.125 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Maximum Thermal Resistance, Junction to Ambient | 62.5 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics (per leg) $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Min. | Typ. | Max. | Units |
|------------|--|------|------|-------------|---------------|
| V_{FM}^* | Maximum Instantaneous Forward Voltage $I_F = 8\text{A}$ $T_C = 25^\circ\text{C}$ $I_F = 8\text{A}$ $T_C = 125^\circ\text{C}$ | - | 2.0 | 2.4 | V |
| I_{RM}^* | Maximum Instantaneous Reverse Current @ rated V_R $T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ | - | - | 100 1000 | μA |
| t_{rr} | Maximum Reverse Recovery Time ($I_F = 1\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, $V_R = 30\text{V}$) | - | - | 25 | ns |
| t_{rr} | Maximum Reverse Recovery Time ($I_F = 8\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, $V_R = 30\text{V}$) | - | - | 30 | ns |
| t_{rr} | Reverse Recovery Time | - | 39 | - | ns |
| I_{rr} | Reverse Recovery Current | - | 2 | - | A |
| Q_{rr} | Reverse Recovery Charge ($I_F = 8\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_R = 390\text{V}$) | - | 39 | - | nC |

* Pulse Test: Pulse Width=300 μs , Duty Cycle=2%

Typical Characteristics

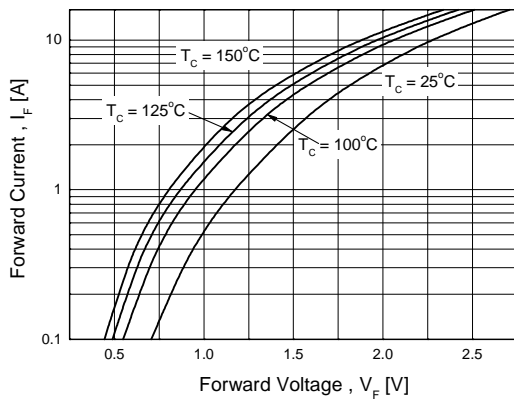


Figure 1. Typical Forward Voltage Drop vs. Forward Current

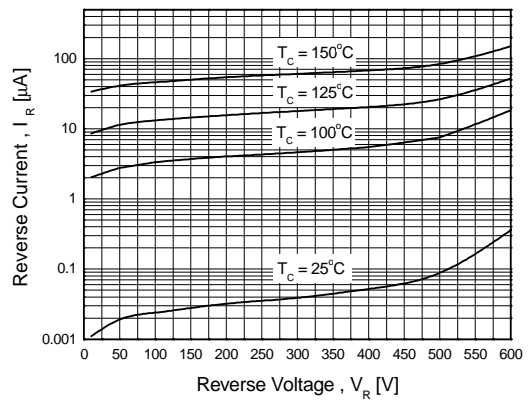


Figure 2. Typical Reverse Current vs. Reverse Voltage

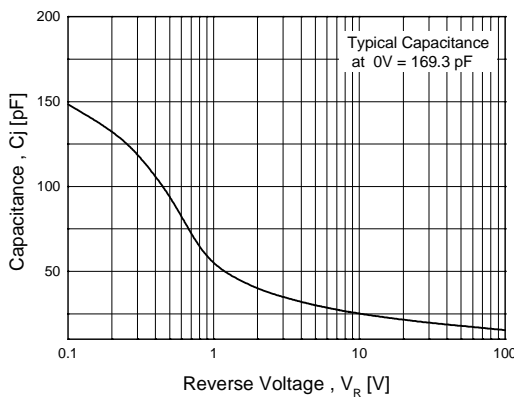


Figure 3. Typical Junction Capacitance

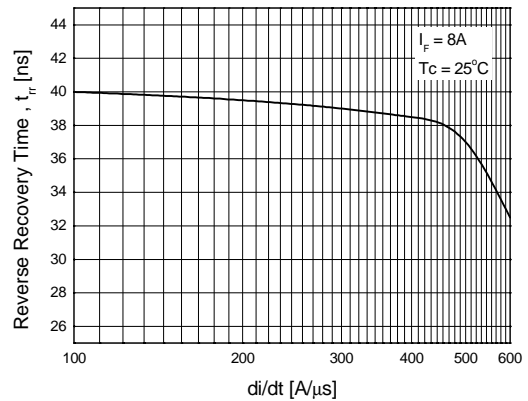


Figure 4. Typical Reverse Recovery Time vs. di/dt

Typical Characteristics (Continued)

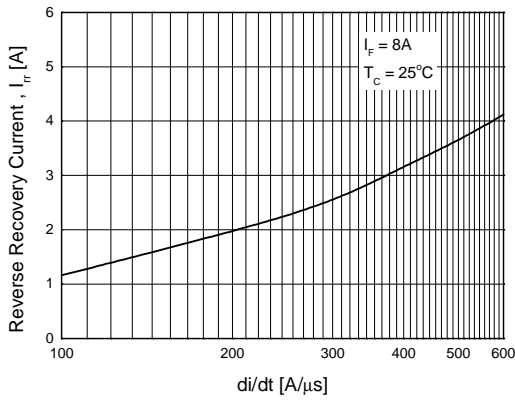


Figure 5. Typical Reverse Recovery Current vs. di/dt

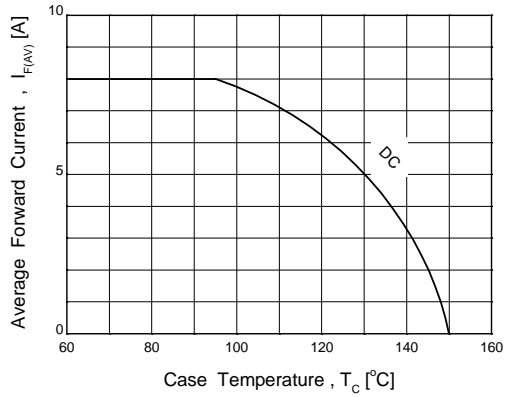


Figure 6. Forward Current Derating Curve

Test Circuits and Waveforms

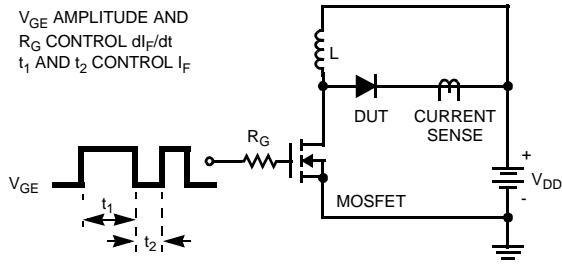


Figure 7. t_{rr} Test Circuit

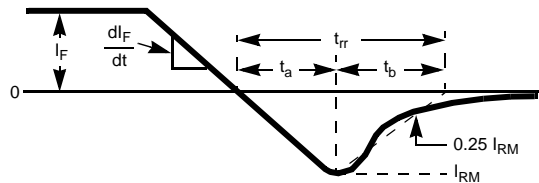


Figure 8. t_{rr} Waveforms and Definitions

$I = 1A$
 $L = 40mH$
 $R < 0.1\Omega$
 $V_{DD} = 50V$
 $E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
 $Q_1 = IGBT (BV_{CES} > DUT V_{R(AVL)})$

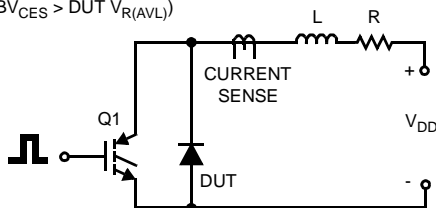


Figure 9. Avalanche Energy Test Circuit

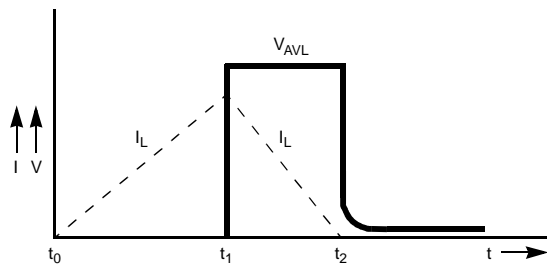
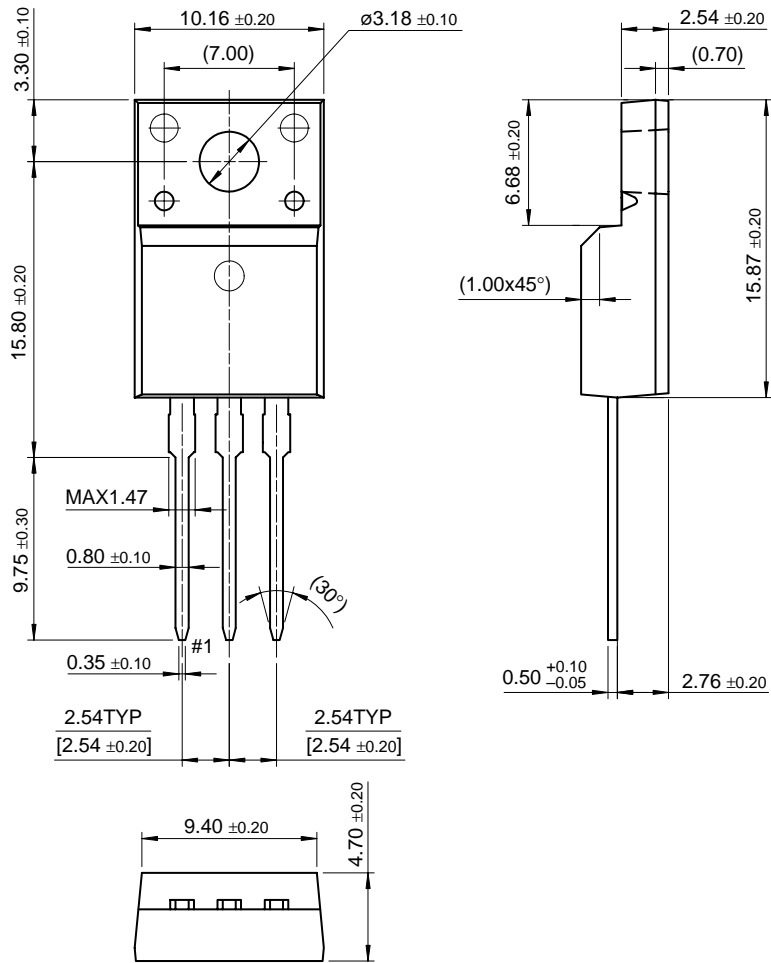


Figure 10. Avalanche Current and Voltage Waveforms

Package Dimensions

TO-220F

FFPF60SA60DS



Dimensions in Millimeters

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