

50A, 600V Ultrafast Diode

The RURG5060 is an ultrafast diode with soft recovery characteristics ($t_{rr} < 65\text{ns}$). It has low forward voltage drop and is of silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as a freewheeling/clamping diode and rectifier in a variety of switching power supplies and other power switching applications. Its low stored charge and ultrafast recovery with soft recovery characteristic minimizes ringing and electrical noise in many power switching circuits, thus reducing power loss in the switching transistors.

Formerly developmental type TA09909.

Ordering Information

| PART NUMBER | PACKAGE | BRAND |
|-------------|---------|----------|
| RURG5060 | TO-247 | RURG5060 |

NOTE: When ordering, use the entire part number.

Symbol



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, Unless Otherwise Specified

| | RURG5060 | UNITS |
|--|----------------|------------------|
| Peak Repetitive Reverse Voltage | V_{RRM} | V |
| Working Peak Reverse Voltage | V_{RWM} | V |
| DC Blocking Voltage | V_R | V |
| Average Rectified Forward Current | $I_{F(AV)}$ | A |
| ($T_C = 102^\circ\text{C}$) | | |
| Repetitive Peak Surge Current | I_{FRM} | A |
| (Square Wave, 20kHz) | | |
| Nonrepetitive Peak Surge Current | I_{FSM} | A |
| (Halfwave, 1 Phase, 60Hz) | | |
| Maximum Power Dissipation | P_D | W |
| Avalanche Energy (See Figures 7 and 8) | E_{AVL} | mJ |
| Operating and Storage Temperature | T_{STG}, T_J | $^\circ\text{C}$ |
| | -65 to 175 | |

Features

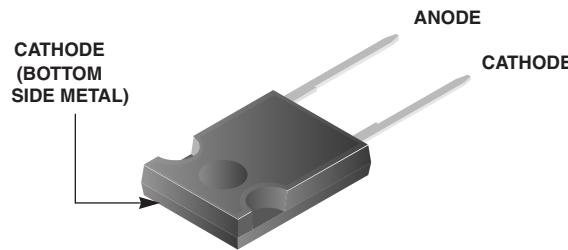
- Ultrafast with Soft Recovery <65ns
- Operating Temperature 175°C
- Reverse Voltage 600V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC STYLE 2 LEAD TO-247



Electrical Specifications $T_C = 25^\circ\text{C}$, Unless Otherwise Specified

| SYMBOL | TEST CONDITION | MIN | TYP | MAX | UNITS |
|-----------------------|---|-----|-----|-----|---------------------------|
| V_F | $I_F = 50\text{A}$ | - | - | 1.6 | V |
| | $I_F = 50\text{A}, T_C = 150^\circ\text{C}$ | - | - | 1.4 | V |
| I_R | $V_R = 600\text{V}$ | - | - | 250 | μA |
| | $V_R = 600\text{V}, T_C = 150^\circ\text{C}$ | - | - | 1.5 | mA |
| t_{rr} | $I_F = 1\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$ | - | - | 65 | ns |
| | $I_F = 50\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$ | - | - | 75 | ns |
| t_a | $I_F = 50\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$ | - | 30 | - | ns |
| t_b | $I_F = 50\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$ | - | 20 | - | ns |
| $R_{\theta\text{JC}}$ | | - | - | 1 | $^\circ\text{C}/\text{W}$ |

DEFINITIONS

V_F = Instantaneous forward voltage ($pw = 300\mu\text{s}$, $D = 2\%$).

I_R = Instantaneous reverse current.

t_{rr} = Reverse recovery time at $dI_F/dt = 100\text{A}/\mu\text{s}$ (See Figure 6), summation of $t_a + t_b$.

t_a = Time to reach peak reverse current at $dI_F/dt = 100\text{A}/\mu\text{s}$ (See Figure 6).

t_b = Time from peak I_{RM} to projected zero crossing of I_{RM} based on a straight line from peak I_{RM} through 25% of I_{RM} (See Figure 6).

$R_{\theta\text{JC}}$ = Thermal resistance junction to case.

pw = Pulse width.

D = Duty cycle.

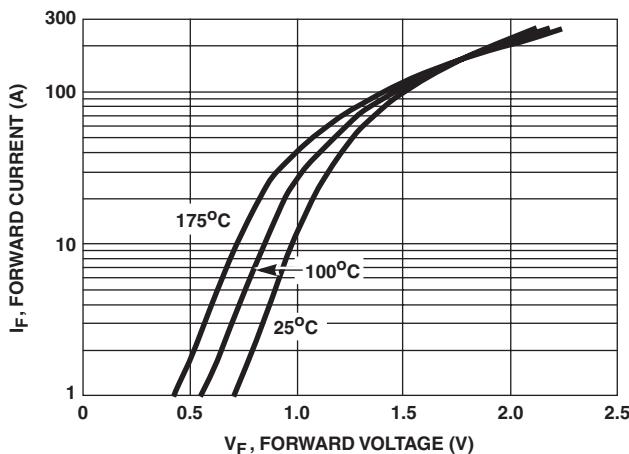
Typical Performance Curves

FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

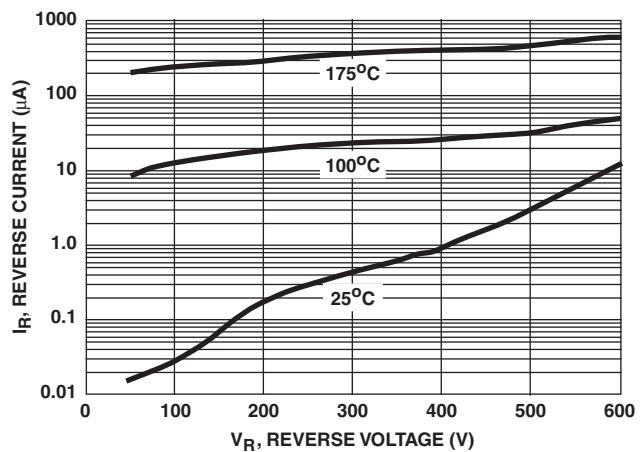


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

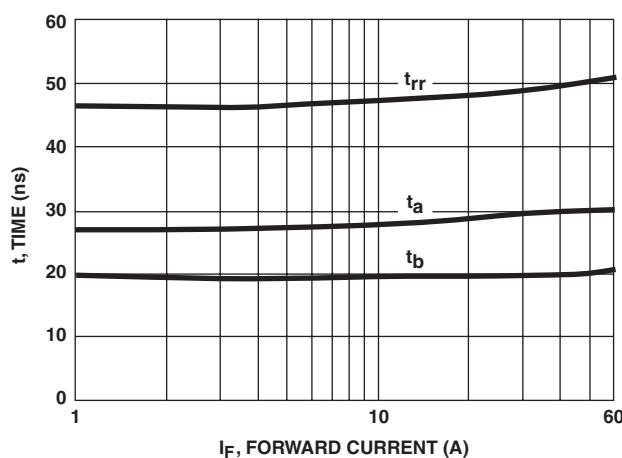
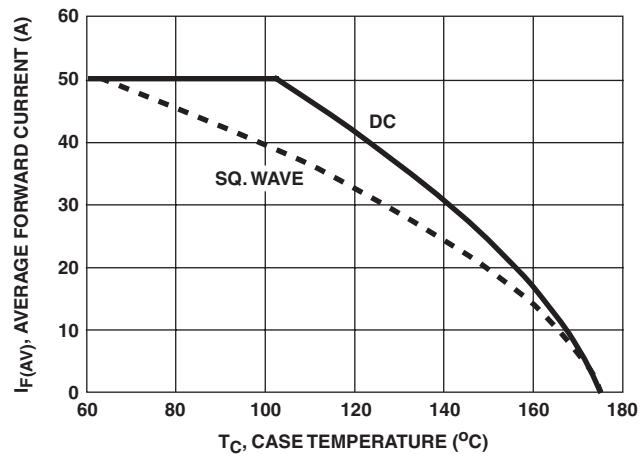
Typical Performance Curves (Continued)FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

FIGURE 4. CURRENT DERATING CURVE

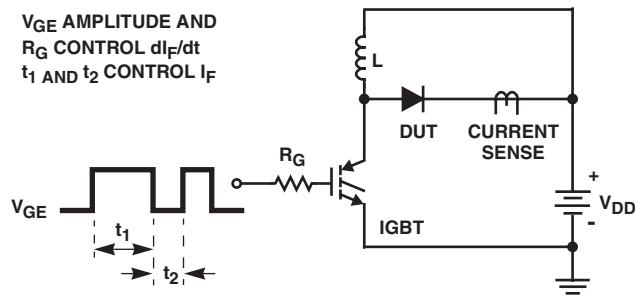
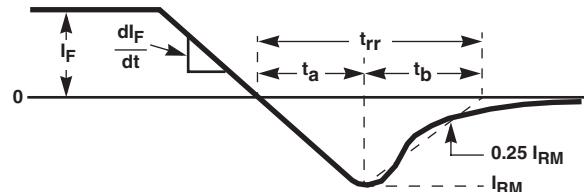
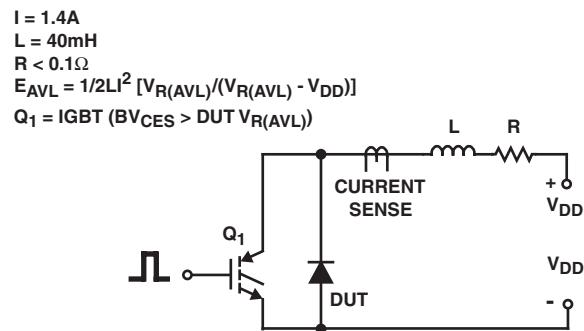
Test Circuits and WaveformsFIGURE 5. t_{rr} TEST CIRCUITFIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

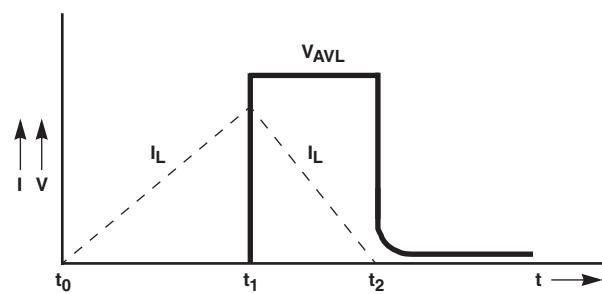


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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