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80 A, 1000 V, Ultrafast Diode

Description

The RURG80100 is an ultrafast diode with low forward voltage drop. 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 application.

Ordering Information

| PART NUMBER | PACKAGE | BRAND |
|-------------|-----------|-----------|
| RURG80100 | TO-247-2L | RURG80100 |

NOTE: When ordering, use the entire part number.

Symbol



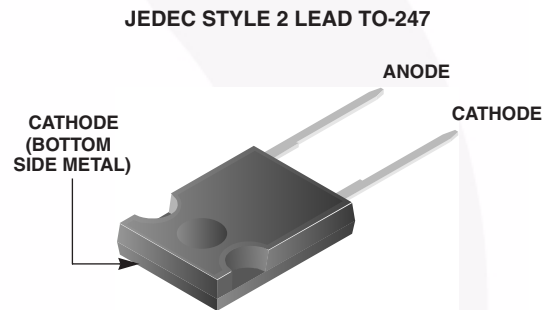
Features

- Ultrafast Recovery $t_{rr} = 200$ ns (@ $I_F = 80$ A)
- Max Forward Voltage, $V_F = 1.9$ V (@ $T_C = 25^\circ\text{C}$)
- 1000 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging



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

| | RURG80100 | UNIT |
|---|------------|------------------|
| Peak Repetitive Reverse Voltage | 1000 | V |
| Working Peak Reverse Voltage | 1000 | V |
| DC Blocking Voltage | 1000 | V |
| Average Rectified Forward Current ($T_C = 53^\circ\text{C}$) | 80 | A |
| Repetitive Peak Surge Current (Square Wave, 20kHz) | 160 | A |
| Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60Hz) | 500 | A |
| Maximum Power Dissipation | 180 | W |
| Avalanche Energy (See Figures 7 and 8) | 50 | mJ |
| Operating and Storage Temperature | -65 to 175 | $^\circ\text{C}$ |

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

| SYMBOL | TEST CONDITION | MIN | TYP | MAX | UNIT |
|-----------------|---|-----|-----|------|---------------------------|
| V_F | $I_F = 80\text{ A}$ | - | - | 1.9 | V |
| | $I_F = 80\text{ A}, T_C = 150^\circ\text{C}$ | - | - | 1.7 | V |
| I_R | $V_R = 1000\text{ V}$ | - | - | 250 | μA |
| | $V_R = 1000\text{ V}, T_C = 150^\circ\text{C}$ | - | - | 2 | mA |
| t_{rr} | $I_F = 1\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$ | - | - | 125 | ns |
| | $I_F = 80\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$ | - | - | 200 | ns |
| t_a | $I_F = 80\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$ | - | 90 | - | ns |
| t_b | $I_F = 80\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$ | - | 65 | - | ns |
| $R_{\theta JC}$ | | - | - | 0.83 | $^\circ\text{C}/\text{W}$ |

DEFINITIONS

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

I_R = Instantaneous reverse current.

T_{rr} = Reverse recovery time (See Figure 6), summation of $t_a + t_b$.

t_a = Time to reach peak reverse current (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).

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

p_w = Pulse width.

D = Duty cycle.

Typical Performance Curves

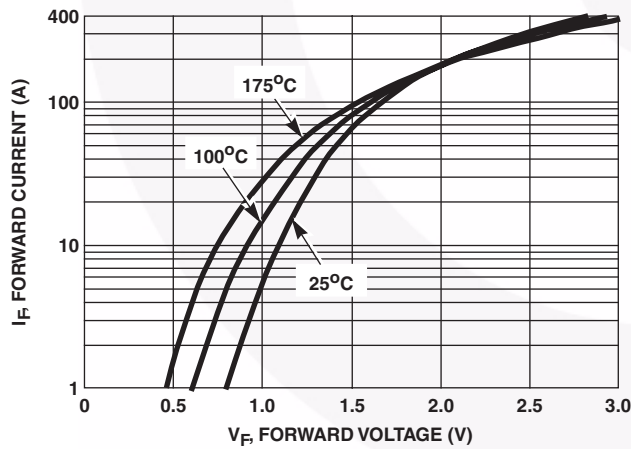


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

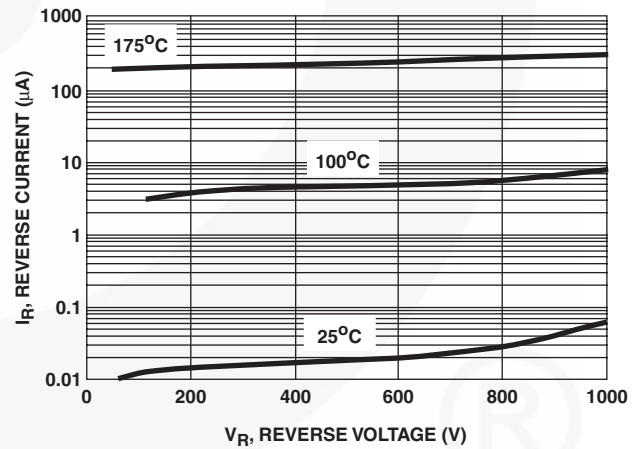


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

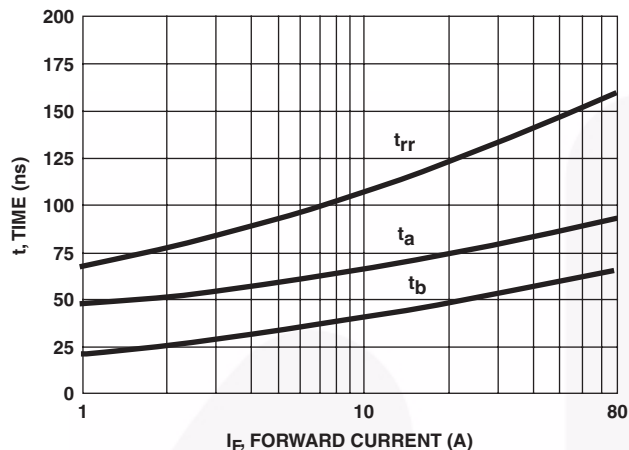


FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

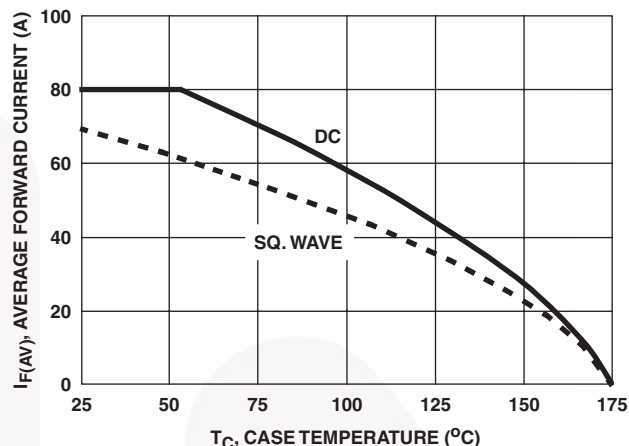


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

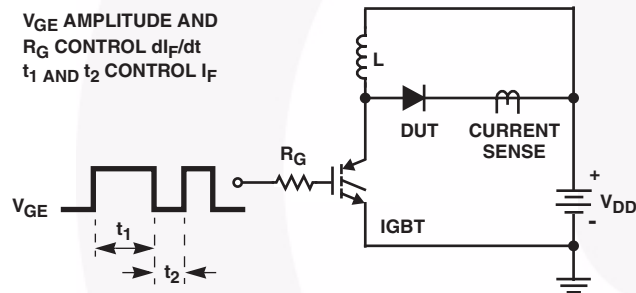


FIGURE 5. t_{rr} TEST CIRCUIT

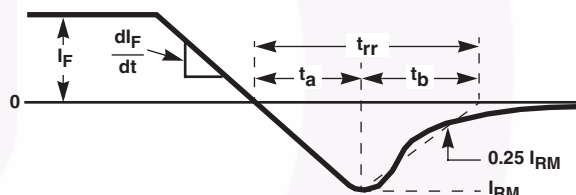


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

$I = 1.6A$
 $L = 40mH$
 $R < 0.1\Omega$
 $E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
 $Q_1 = IGBT (BV_{CES} > DUT V_{R(AVL)})$

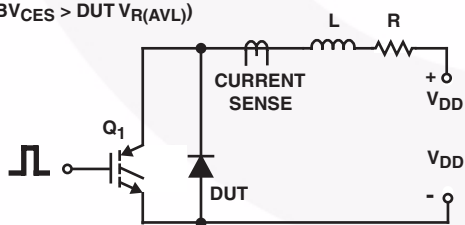


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

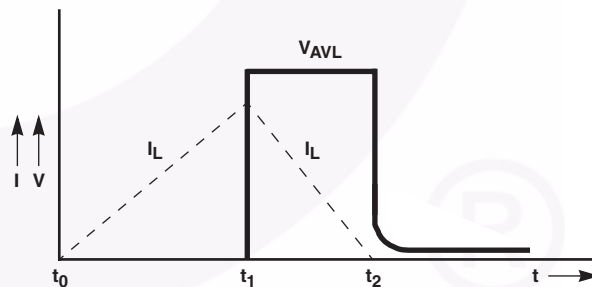


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Mechanical Dimensions

TO247-2L

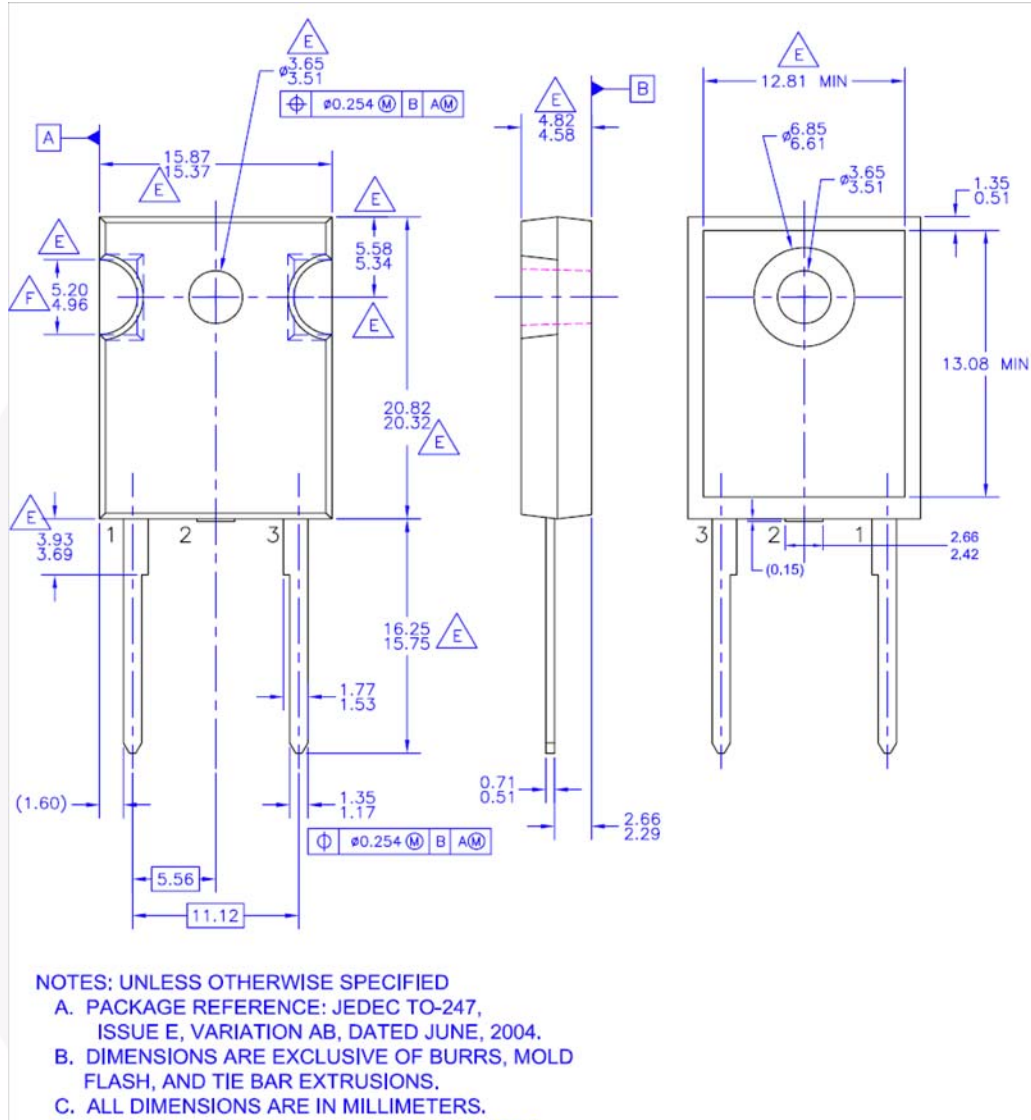


Figure 9. TO-247, Molded, 2LD, Jedec Option AB

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