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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



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

	RURG80100	UNIT
Peak Repetitive Reverse Voltage	V_{RRM}	V
Working Peak Reverse Voltage	V_{RWM}	V
DC Blocking Voltage	V_R	V
Average Rectified Forward Current ($T_C = 53^\circ\text{C}$)	$I_{F(AV)}$	A
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	

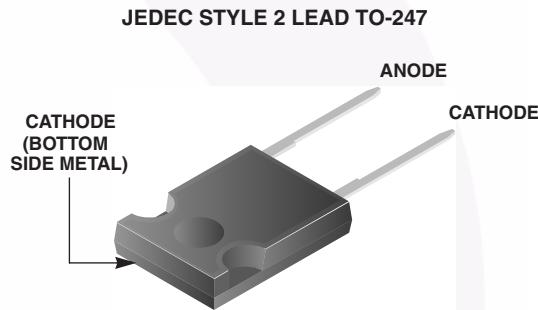
Features

- Ultrafast 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



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
$R_{\theta\text{JC}}$		-	-	0.83	$^\circ\text{C}/\text{W}$

DEFINITIONS

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

I_R = Instantaneous reverse current.

T_{rr} = Reverse recovery time (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).

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

pw = Pulse width.

D = Duty cycle.

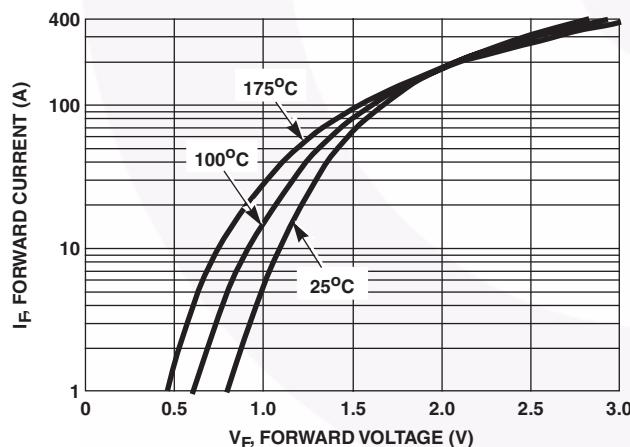
Typical Performance Curves

FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

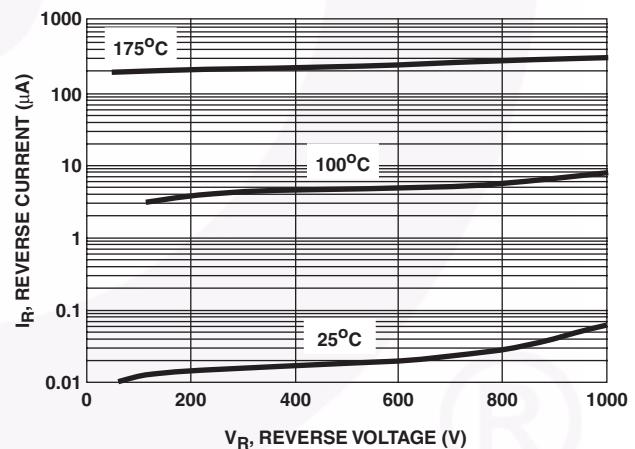


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

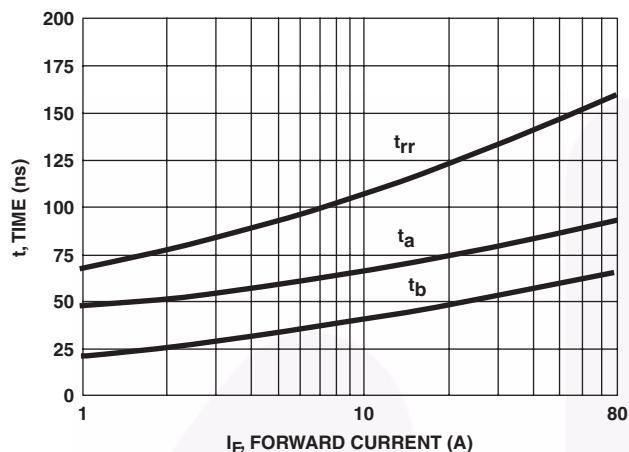
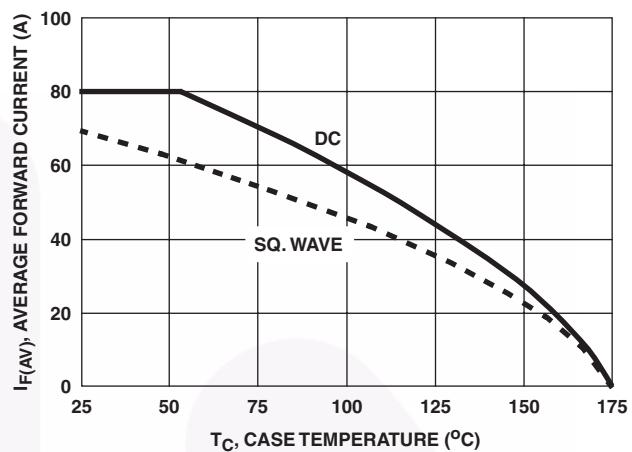
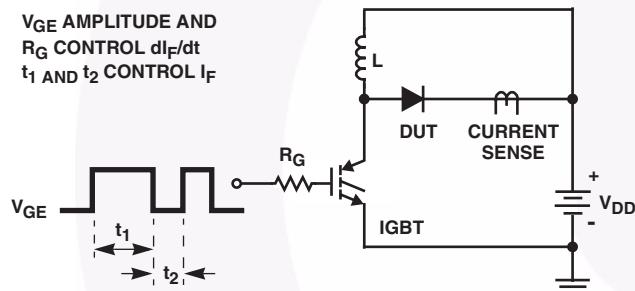
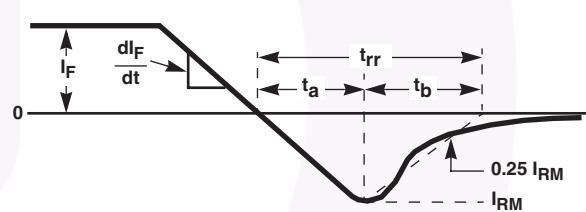
FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

FIGURE 5. t_{rr} TEST CIRCUITFIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

I = 1.6A
L = 40mH
R < 0.1Ω
E_{AVL} = 1/2L² [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]
Q₁ = IGBT (BV_{CES} > DUT V_{R(AVL)})

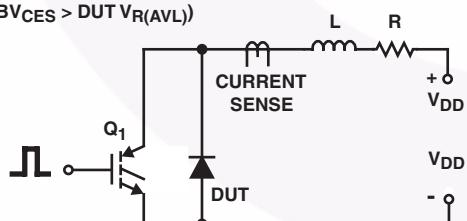


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

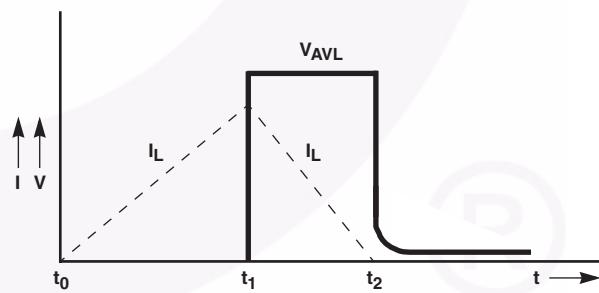
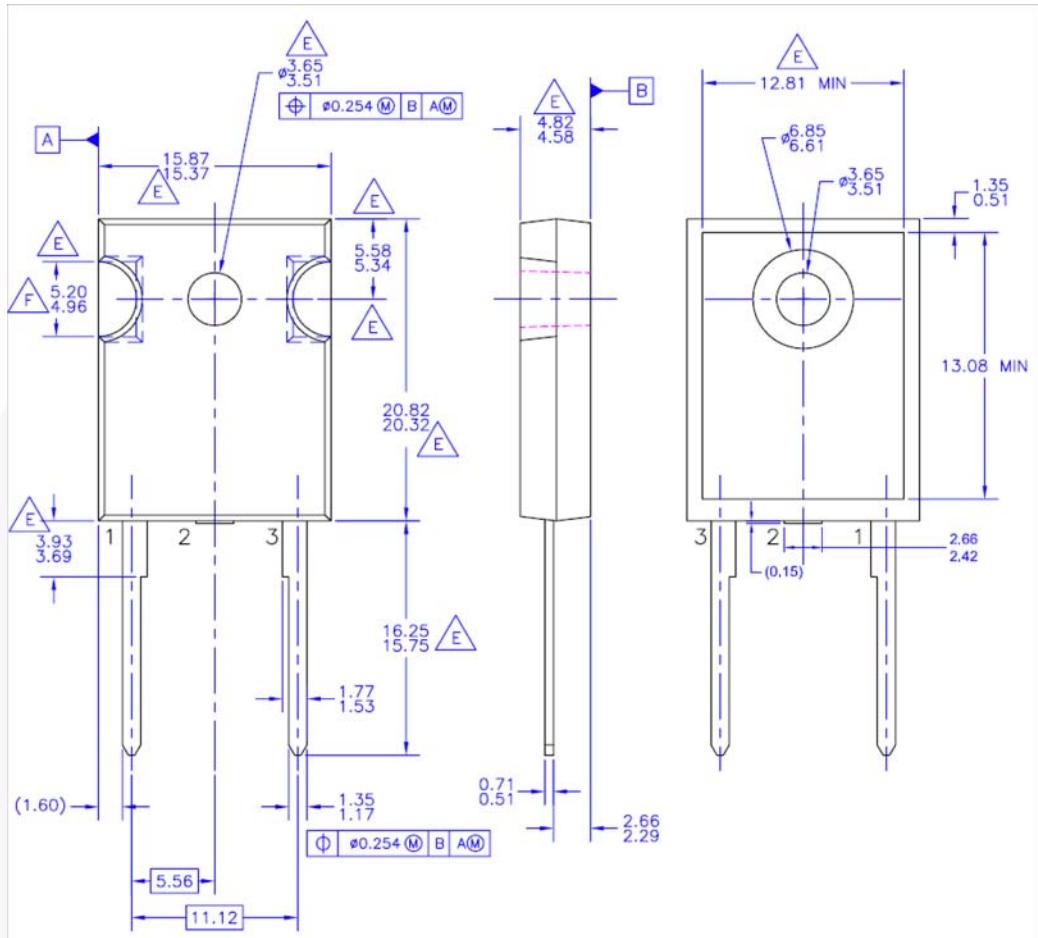


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Mechanical Dimensions

TO247-2L



NOTES: UNLESS OTHERWISE SPECIFIED

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- B. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD
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- C. ALL DIMENSIONS ARE IN MILLIMETERS.

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

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