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30 A, 600 V, Ultrafast Diode

Description

The RURG3060 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
RURG3060	TO-247-2L	RURG3060

NOTE: When ordering, use the entire part number.

Symbol



Features

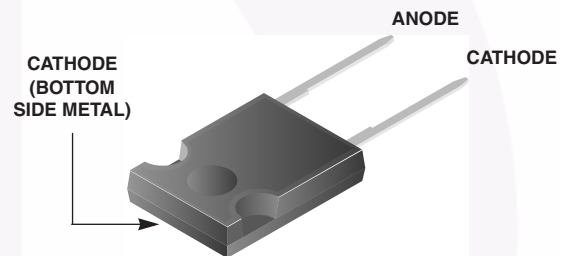
- Ultrafast Recovery $t_{rr} = 60$ ns (@ $I_F = 30$ A)
- Max Forward Voltage, $V_F = 1.5$ V (@ $T_C = 25^\circ\text{C}$)
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC STYLE 2 LEAD TO-247



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

		RURG3060	UNIT
Peak Repetitive Reverse Voltage	V_{RRM}	600	V
Working Peak Reverse Voltage	V_{RWM}	600	V
DC Blocking Voltage	V_R	600	V
Average Rectified Forward Current	$I_{F(AV)}$	30	A
($T_C = 130^\circ\text{C}$)			
Repetitive Peak Surge Current	I_{FRM}	70	A
(Square Wave, 20 kHz)			
Nonrepetitive Peak Surge Current	I_{FSM}	325	A
(Halfwave, 1 Phase, 60 Hz)			
Maximum Power Dissipation	P_D	125	W
Avalanche Energy (See Figures 7 and 8)	E_{AVL}	20	mJ
Operating and Storage Temperature	T_{STG}, T_J	-65 to 175	$^\circ\text{C}$

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

SYMBOL	TEST CONDITION	TYP	MAX	UNIT
V_F	$I_F = 30\text{ A}$	-	1.5	V
	$I_F = 30\text{ A}, T_C = 150^\circ\text{C}$	-	1.3	V
I_R	$V_R = 600\text{ V}$	-	250	μA
	$V_R = 600\text{ V}, T_C = 150^\circ\text{C}$	-	1	mA
t_{rr}	$I_F = 1\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$	-	55	ns
	$I_F = 30\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$	-	60	ns
t_a	$I_F = 30\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$	30	-	ns
t_b	$I_F = 30\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$	20	-	ns
$R_{\theta JC}$		-	1.2	$^\circ\text{C}/\text{W}$

DEFINITIONS

V_F = Instantaneous forward voltage (pw = 300 μs , 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.

pw = Pulse width.

D = Duty cycle.

Typical Performance Curves

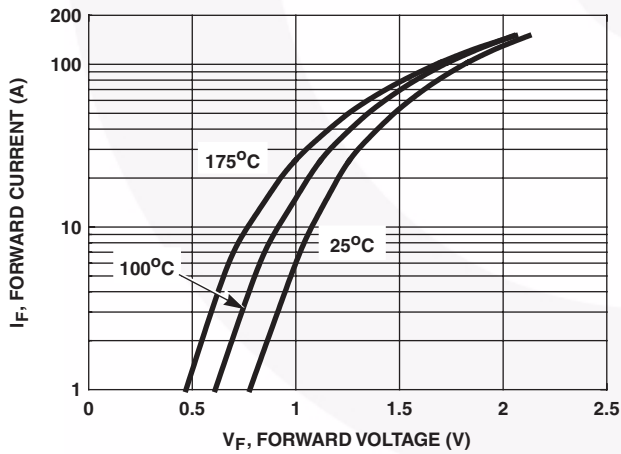


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

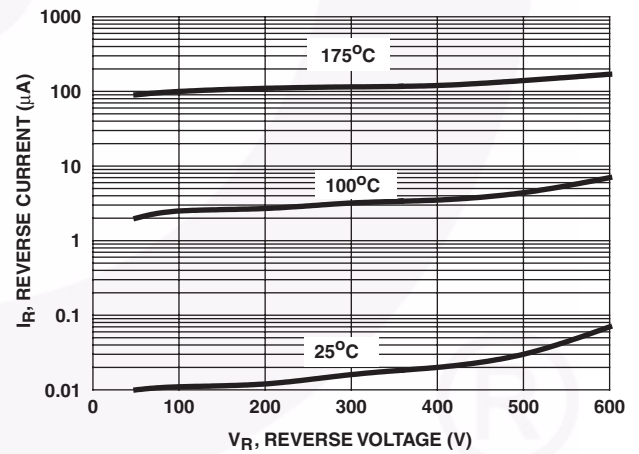


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

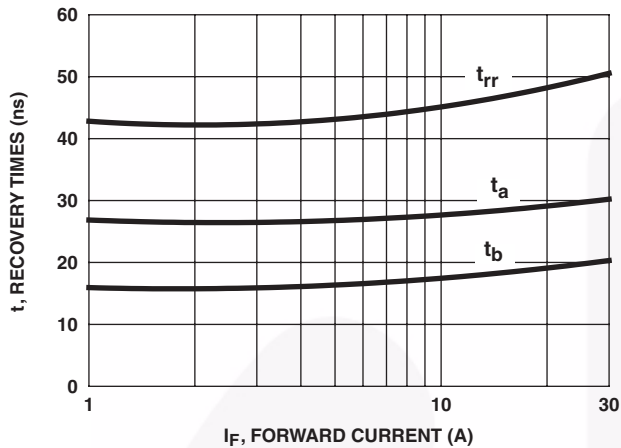


FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

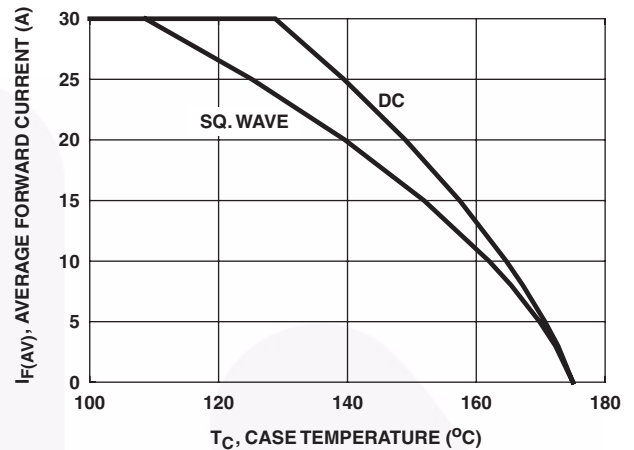


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

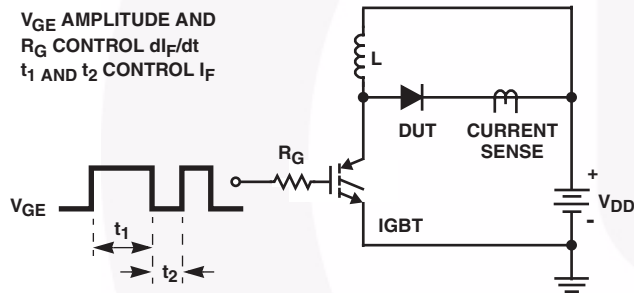


FIGURE 5. t_{rr} TEST CIRCUIT

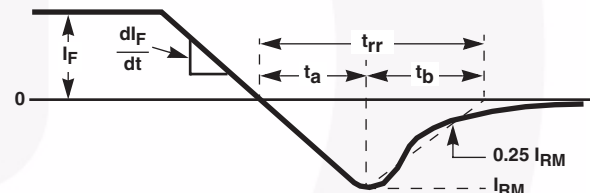


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

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

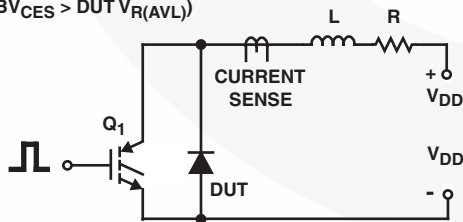


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

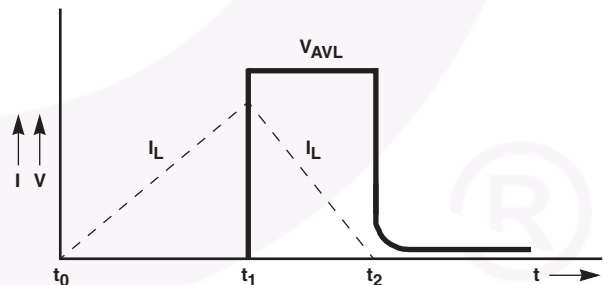


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Technical drawing of a JEDEC TO-247 package showing three views: top, side, and front. The drawing includes dimensions in millimeters and various tolerances. Key dimensions include a top width of 12.81 MIN, a top length of 15.87/15.37, a side height of 13.08 MIN, and a front width of 11.12. Tolerances are specified for various features, including a maximum of 0.254 for a hole diameter and a maximum of 0.015 for a hole position. The drawing also shows a cross-section of the package with a height of 4.82/4.58. The drawing is labeled with 'E' for electrical and 'B' for mechanical features.

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