

Data Sheet	January 2002	

30A, 1000V Ultrafast Diode

The RURG30100 is an ultrafast diode with soft recovery characteristics (t_{rr} < 110ns). 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 TA09904.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RURG30100	TO-247	RURG30100

NOTE: When ordering, use the entire part number.

Symbol



Features

•	Ultrafast with Soft Recovery <110ns
•	Operating Temperature
•	Reverse Voltage

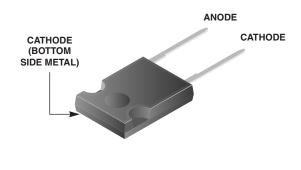
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- · Power Switching Circuits
- General Purpose

Packaging

JEDEC STYLE 2 LEAD TO-247



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

	RURG30100	UNITS
Peak Repetitive Reverse Voltage	1000	V
Working Peak Reverse Voltage	1000	V
DC Blocking VoltageV _R	1000	V
Average Rectified Forward Current $I_{F(AV)}$ ($T_{C} = 120^{\circ}C$)	30	Α
Repetitive Peak Surge Current	60	Α
Nonrepetitive Peak Surge Current	300	Α
Maximum Power Dissipation	125	W
Avalanche Energy (See Figures 7 and 8)	30	mJ
Operating and Storage Temperature	-65 to 175	oC

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

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V _F	I _F = 30A	-	-	1.8	V
	$I_F = 30A, T_C = 150^{\circ}C$	-	-	1.6	V
I _R	V _R = 1000V	-	-	250	μА
	V _R = 1000V, T _C = 150°C	-	-	1	mA
t _{rr}	$I_F = 1A$, $dI_F/dt = 100A/\mu s$	-	-	110	ns
	$I_F = 30A$, $dI_F/dt = 100A/\mu s$	-	-	150	ns
t _a	$I_F = 30A$, $dI_F/dt = 100A/\mu s$	-	90	-	ns
t _b	$I_F = 30A$, $dI_F/dt = 100A/\mu s$	-	45	-	ns
$R_{ heta JC}$		-	-	1.2	°C/W

DEFINITIONS

 V_F = Instantaneous forward voltage (pw = 300 μ 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.

pw = pulse width.

D = duty cycle.

Typical Performance Curves

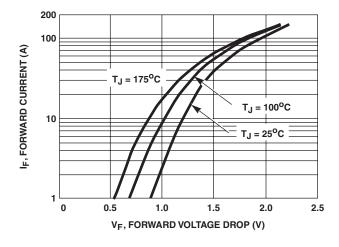


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

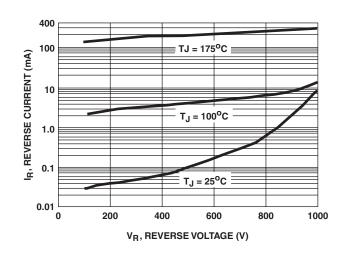


FIGURE 2. REVERSE VOLTAGE vs REVERSE CURRENT

Typical Performance Curves (Continued)

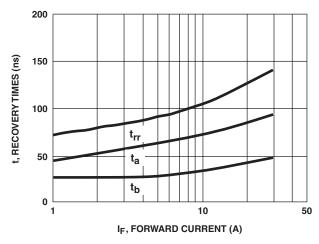


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

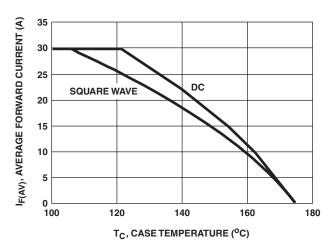
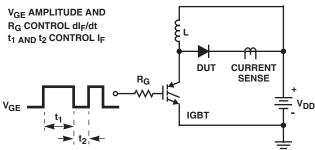
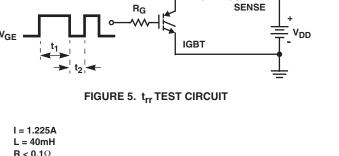


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms





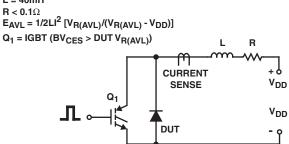


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

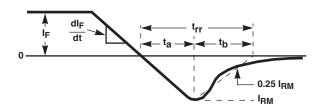


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

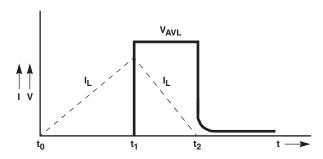


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE **WAVEFORMS**

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