

Data Sheet January 2000 File Number 3211.3

50A, 600V Ultrafast Diode

The RURG5060 is an ultrafast diode with soft recovery characteristics (t_{rr} < 65ns). 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



Features

•	Ultrafast with Soft Recovery <65n	S
•	Operating Temperature	С
•	Reverse Voltage	V

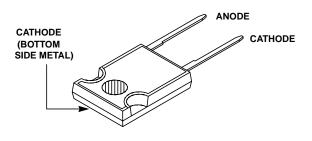
- Avalanche Energy Rated
- Planar Construction

Applications

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

Packaging

JEDEC STYLE 2 LEAD TO-247



Absolute Maximum Ratings T_C = 25°C, Unless Otherwise Specified

	RURG5060	UNITS
Peak Repetitive Reverse VoltageV _{RRM}	600	V
Working Peak Reverse Voltage	600	V
DC Blocking Voltage	600	V
Average Rectified Forward Current $I_{F(AV)}$ ($T_C = 102^{0}C$)	50	Α
Repetitive Peak Surge Current	100	Α
Nonrepetitive Peak Surge Current	500	Α
Maximum Power Dissipation	150	W
Avalanche Energy (See Figures 7 and 8)	40	mJ
Operating and Storage Temperature	-65 to 175	οС

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

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V _F	I _F = 50A	-	-	1.6	V
	$I_F = 50A, T_C = 150^{\circ}C$	-	-	1.4	V
I _R	V _R = 600V	-	-	250	μΑ
	$V_R = 600V, T_C = 150^{\circ}C$	-	-	1.5	mA
t _{rr}	I _F = 1A, dI _F /dt = 100A/μs	-	-	65	ns
	$I_F = 50A$, $dI_F/dt = 100A/\mu s$	-	-	75	ns
t _a	$I_F = 50A$, $dI_F/dt = 100A/\mu s$	-	30	-	ns
t _b	I _F = 50A, dI _F /dt = 100A/μs	-	20	-	ns
$R_{ heta JC}$		-	-	1	°C/W

DEFINITIONS

 V_F = Instantaneous forward voltage (pw = 300 μ s, D = 2%).

 I_R = Instantaneous reverse current.

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

 t_a = Time to reach peak reverse current at dI_F/dt = 100A/ μ 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).

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

pw = Pulse width.

D = Duty cycle.

Typical Performance Curves

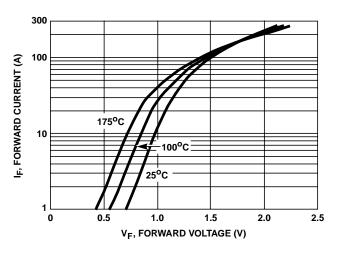


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

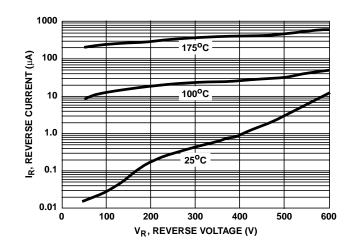


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

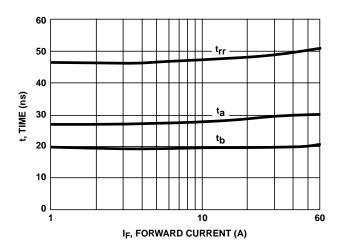


FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

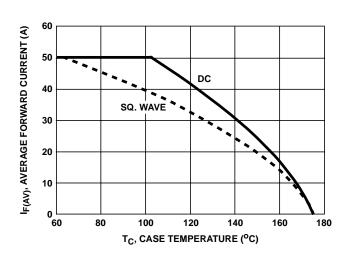


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

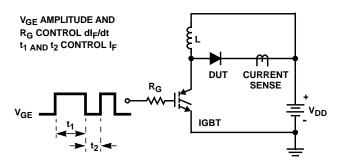


FIGURE 5. t_{rr} TEST CIRCUIT

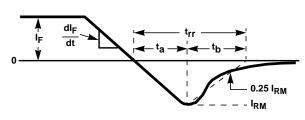


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

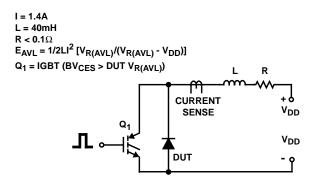


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

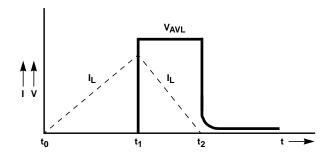


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

All Intersil semiconductor products are manufactured, assembled and tested under ISO9000 quality systems certification.

Intersil semiconductor products are sold by description only. Intersil Corporation reserves the right to make changes in circuit design and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that data sheets are current before placing orders. Information furnished by Intersil is believed to be accurate and reliable. However, no responsibility is assumed by Intersil or its subsidiaries for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Intersil or its subsidiaries.

For information regarding Intersil Corporation and its products, see web site www.intersil.com