Data Sheet | January 2000 | File Number 3549.3

30A, 400V - 600V Ultrafast Dual Diodes

RURG3040CC and RURG3060CC are ultrafast dual diodes with soft recovery characteristics (t_{rr} < 55ns). They have low forward voltage drop and are silicon nitride passivated ion-implanted epitaxial planar construction.

These devices are intended for use as freewheeling/clamping diodes and rectifiers in a variety of switching power supplies and other power switching applications. Their low stored charge and ultrafast recovery with soft recovery characteristics minimize ringing and electrical noise in many power switching circuits reducing power loss in the switching transistors.

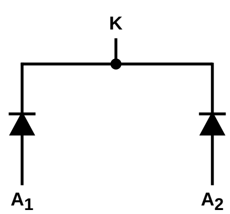
Formerly developmental type TA09903.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RURG3040CC	TO-247	RURG3040C
RURG3060CC	TO-247	RURG3060C

NOTE: When ordering, use the entire part number.

Symbol



Features

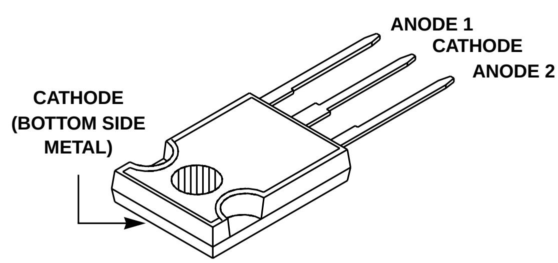
- Ultrafast with Soft Recovery . . . . <55ns
- Operating Temperature. . . . . .175°C
- Reverse Voltage Up to 600V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC STYLE TO-247



Absolute Maximum Ratings (Per Leg) $T_C = 25^oC$

		RURG3040CC	RURG3060CC	UNITS
Peak Repetitive Reverse Voltage	V_{RRM}	400	600	V
Working Peak Reverse Voltage	V_{RWM}	400	600	V
DC Blocking Voltage	V_R	400	600	V
Average Rectified Forward Current ($T_C = 130^oC$)	$I_{F(AV)}$	30	30	A
Repetitive Peak Surge Current (Square Wave, 20kHz)	I_{FRM}	70	70	A
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60Hz)	I_{FSM}	325	325	A
Maximum Power Dissipation	P_D	125	125	W
Avalanche Energy (See Figures 7 and 8)	E_{AVL}	20	20	mJ
Operating and Storage Temperature	T_{STG}, T_J	-65 to 175	-65 to 175	°C

Electrical Specifications (Per Leg) $T_C = 25^oC$, Unless Otherwise Specified

SYMBOL	TEST CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	UNITS
V_F	I_F = 30A	-	-	1.5	-	-	1.5	V
	I_F = 30A, TC = 150^oC	-	-	1.3	-	-	1.3	V
I_R	V_R = 400V	-	-	250	-	-	-	µA
	V_R = 600V	-	-	-	-	-	250	µA
	V_R = 400V, T_C = 150^oC	-	-	1.0	-	-	-	mA
	V_R = 600V, TC = 150^oC	-	-	-	-	-	1.0	mA
t_{rr}	I_F = 1A, dI_F/dt = 100A/µs	-	-	55	-	-	55	ns
t_{rr}	I_F = 30A, dI_F/dt = 100A/µs	-	-	60	-	-	60	ns
t_a	I_F = 30A, dI_F/dt = 100A/µs	-	30	-	-	30	-	ns
t_b	I_F = 30A, dI_F/dt = 100A/µs	-	20	-	-	20	-	ns
$R_{\theta JC}$		-	-	1.2	-	-	1.2	$^oC/W$

DEFINITIONS

V_F = Instantaneous forward voltage (pw = 300µs, 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

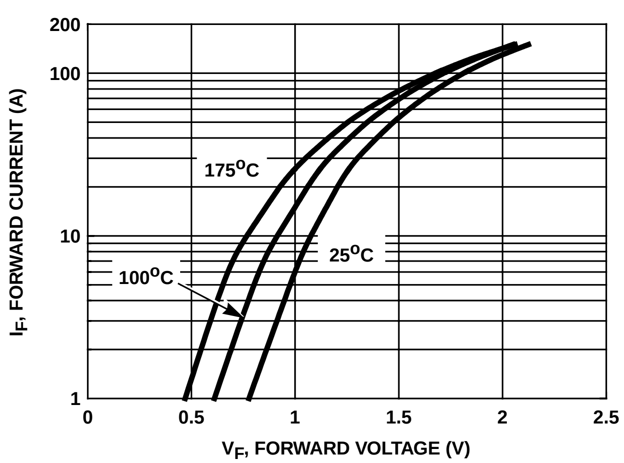


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

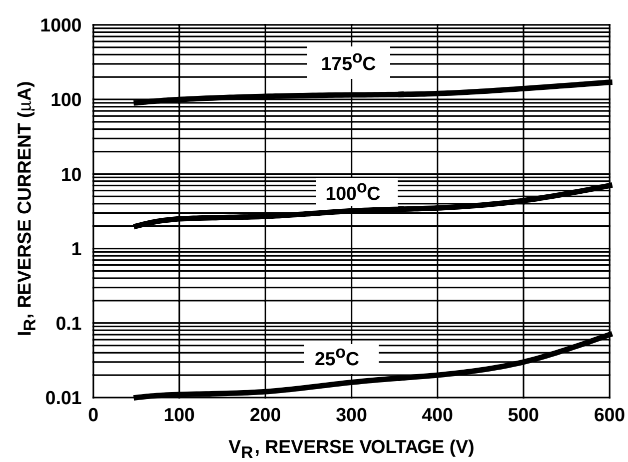


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

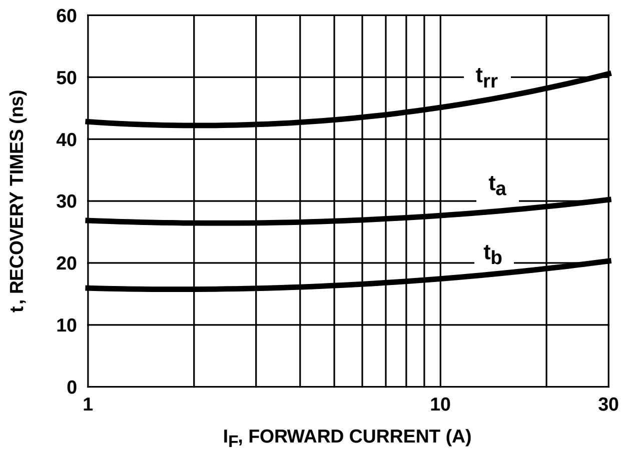


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

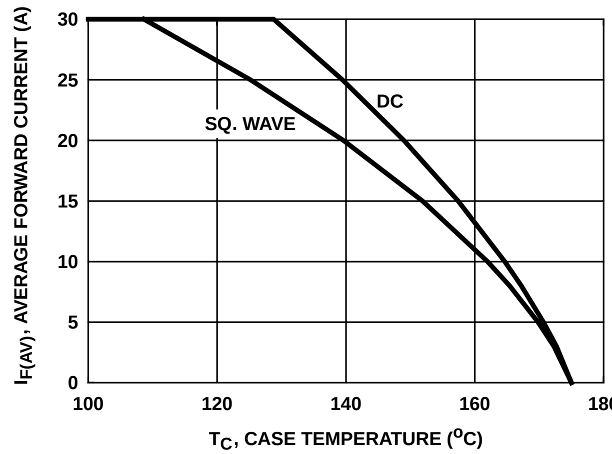


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

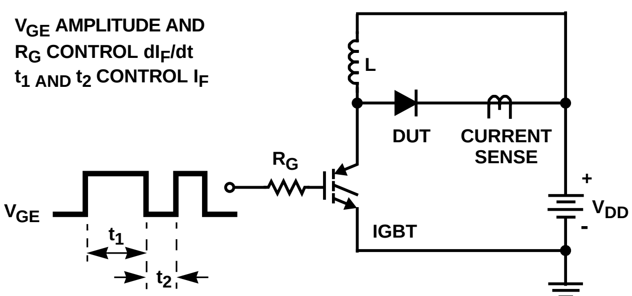


FIGURE 5. t_{rr} TEST CIRCUIT

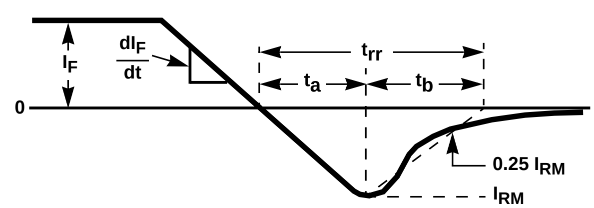


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

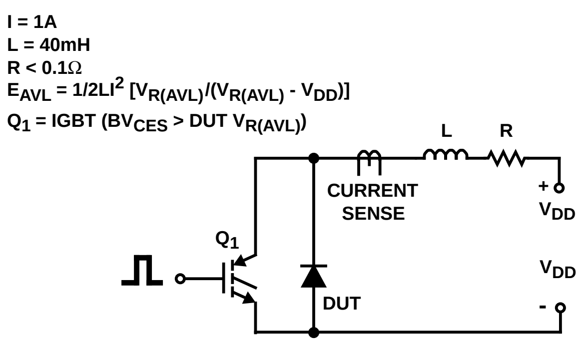


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

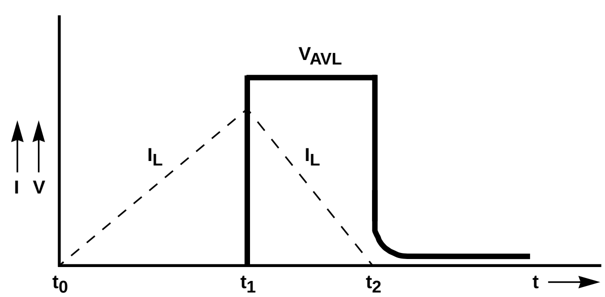


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS