Data Sheet March 2001

30 A, 400 V - 600 V, Ultrafast Dual Diode

The RURG3040CC, RURG3060CC is an ultrafast dual 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.

Features

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

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

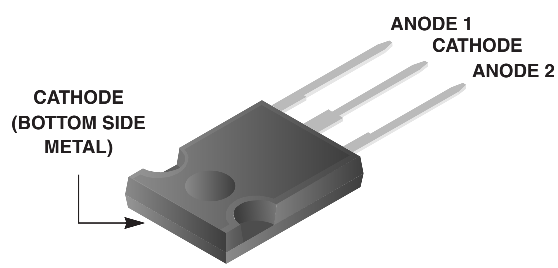
Ordering Information

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

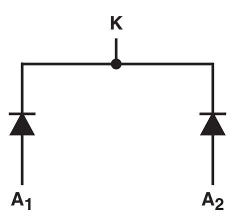
NOTE: When ordering, use the entire part number.

Packaging

JEDEC STYLE TO-247



Symbol



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

		RURG3040CC	RURG3060CC	UNIT
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	^oC

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

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

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

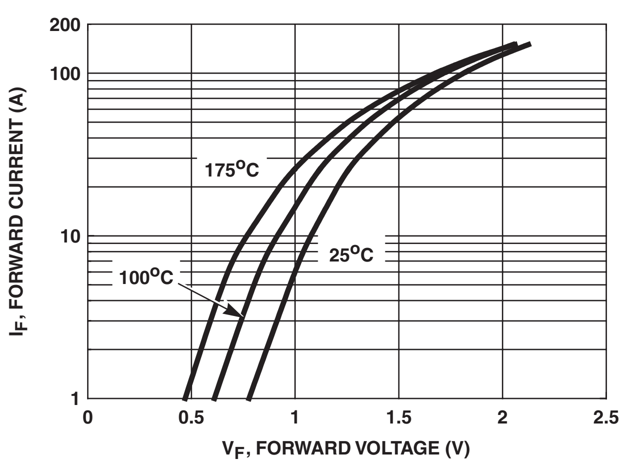


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

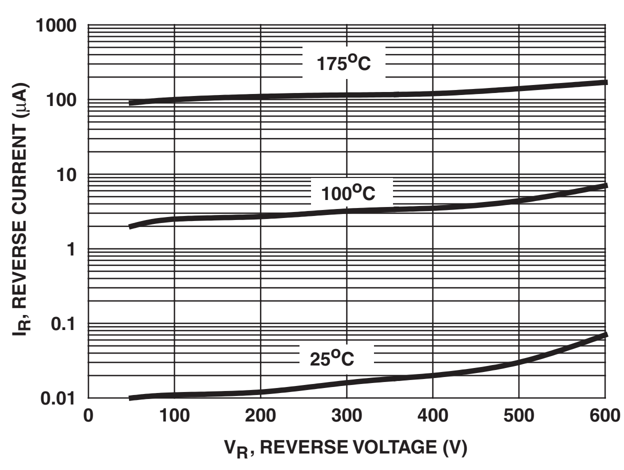


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

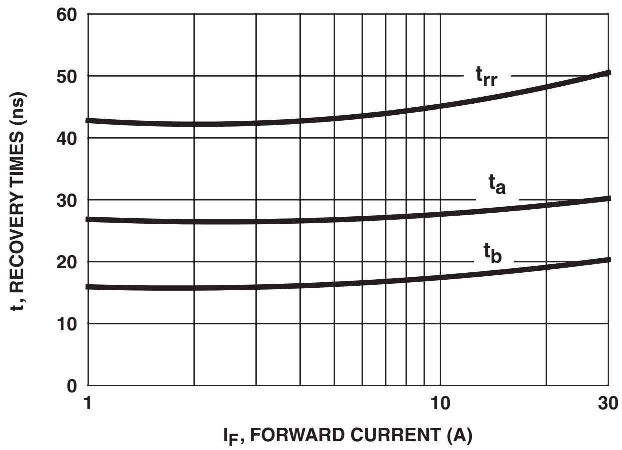


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

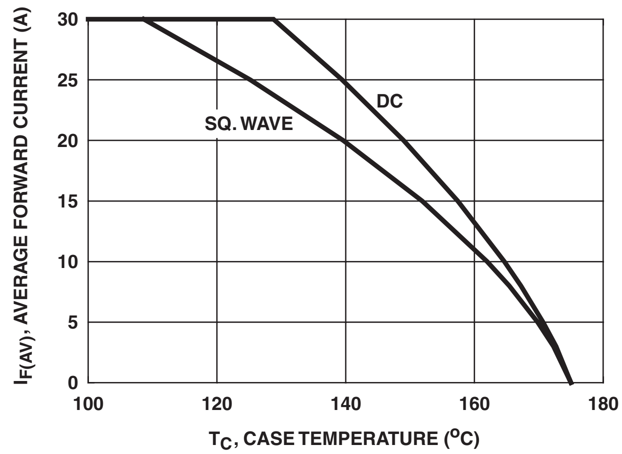


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

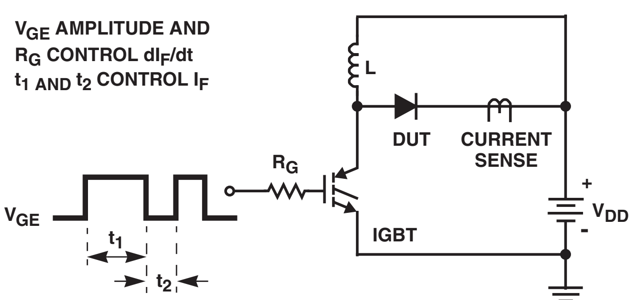


FIGURE 5. t_{rr} TEST CIRCUIT

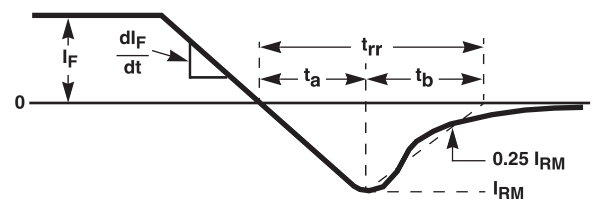


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

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

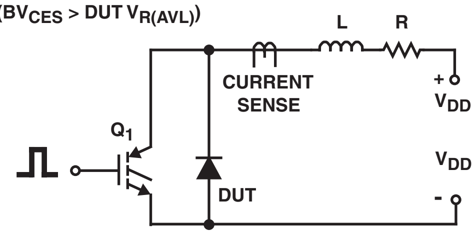


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

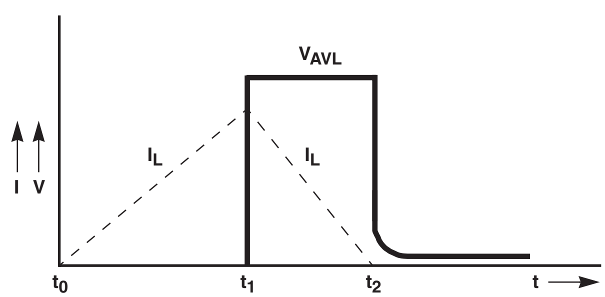


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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