intersil

RURH3020CC

Data Sheet | January 2000 | File Number 2773.4

30A, 200V Ultrafast Dual Diode

The RURH3020CC is an ultrafast dual diode (t_{rr} < 45ns) with soft recovery characteristics. It has a low forward voltage drop and is of planar, silicon nitride passivated, ion-implanted, epitaxial construction.

This device is intended for use as an energy steering/ 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 characteristics minimize ringing and electrical noise in many power switching circuits thus reducing power loss in the switching transistor.

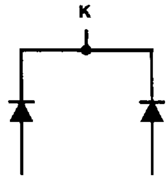
Formerly developmental type TA09645.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RURH3020CC	TO-218AC	RURH3020C

NOTE: When ordering, use the entire part number.

Symbol



Features

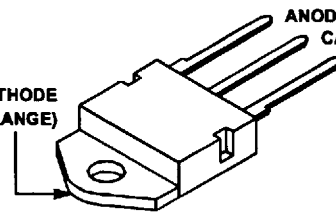
- Ultrafast with Soft Recovery . . . . <45ns
- Operating Temperature. . . . . 175°C
- Reverse Voltage 200V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supply
- Power Switching Circuits
- General Purpose

Packaging

JEDEC TO-218AC



Absolute Maximum Ratings (Per Leg) T_C = 25°C, Unless Otherwise Specified

		RURH3020CC	UNITS
Peak Repetitive Reverse Voltage	V_{RRM}	200	V
Working Peak Reverse Voltage	V_{RWM}	200	V
DC Blocking Voltage	V_R	200	V
Average Rectified Forward Current (T_C = 145°C)	$I_{F(AV)}$	30	A
Repetitive Peak Surge Current (Square Wave 20kHz)	I_{FRM}	70	A
Nonrepetitive Peak Surge Current (Halfwave 1 Phase 60Hz)	I_{FSM}	325	A
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	-55 to 175	°C

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Electrical Specifications (Per Leg) T_C = 25°C, Unless Otherwise Specified

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V_F	I_F = 30A	-	-	1.0	V
	I_F = 30A, T_C = 150°C	-	-	0.85	V
I_R	V_R = 200V	-	-	250	µA
	V_R = 200V, T_C = 150°C	-	-	1.0	mA
t_{rr}	I_F = 1A, dI_F/dt = 100A/µs	-	-	45	ns
	I_F = 30A, dI_F/dt = 100A/µs	-	-	50	ns
t_a	I_F = 30A, dI_F/dt = 100A/µs	-	28	-	ns
t_b	I_F = 30A, dI_F/dt = 100A/µs	-	20	-	ns
$R_{\theta JC}$		-	-	1.2	°C/W

DEFINITIONS

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

I_R = Instantaneous reverse current.

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

t_a = Time to reach peak reverse current at dI_F/dt = 100A/µs (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

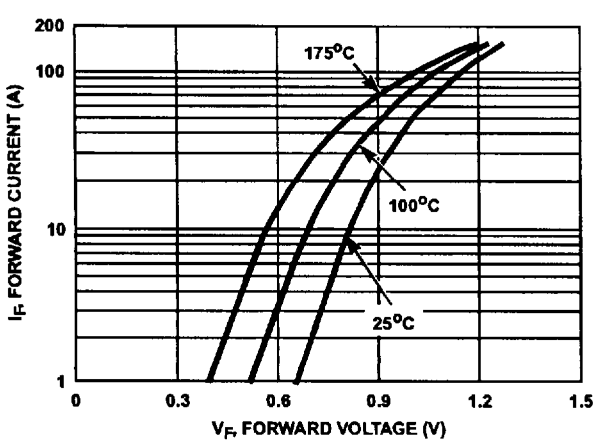

FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

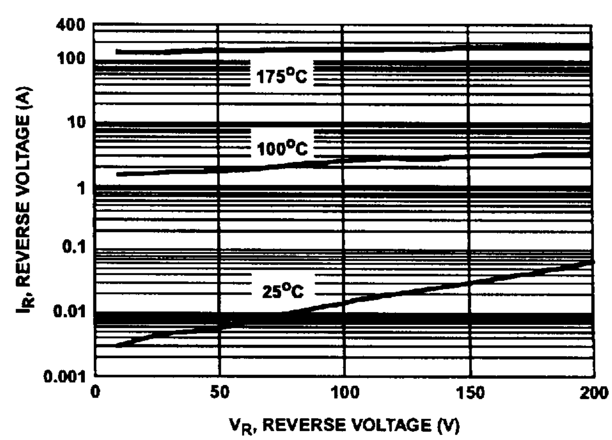

FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves

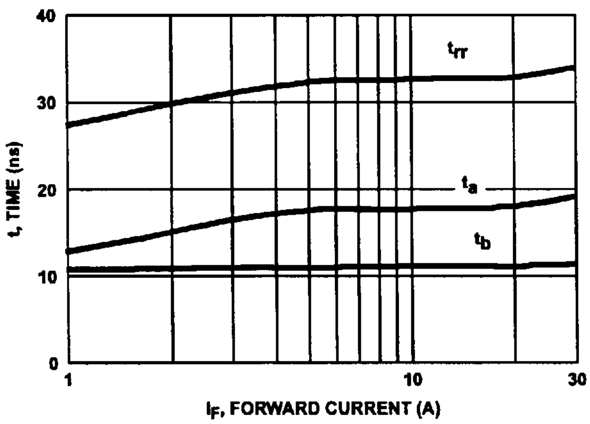

FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

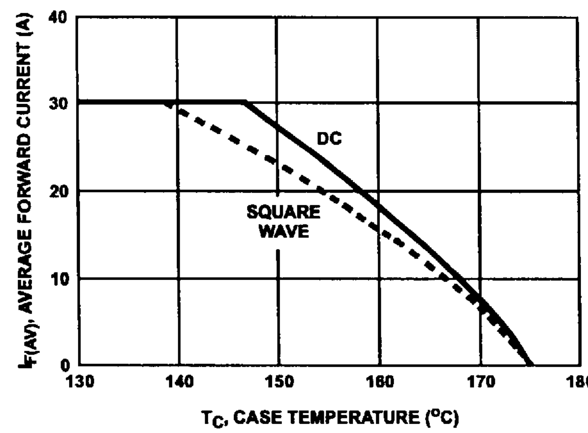

FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

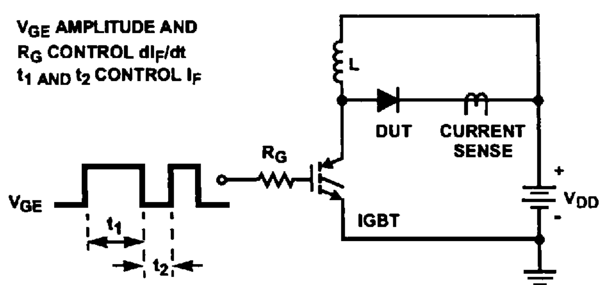

FIGURE 5. t_{rr} TEST CIRCUIT

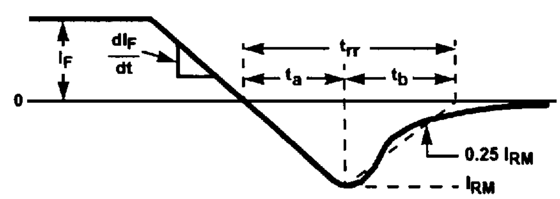

FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

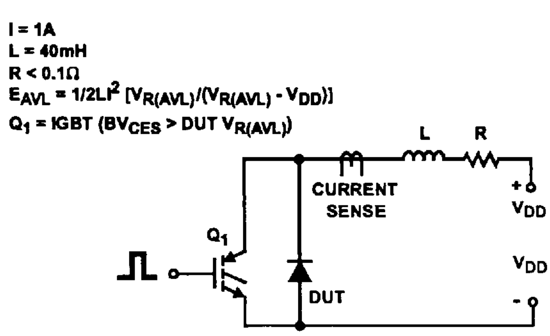

FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

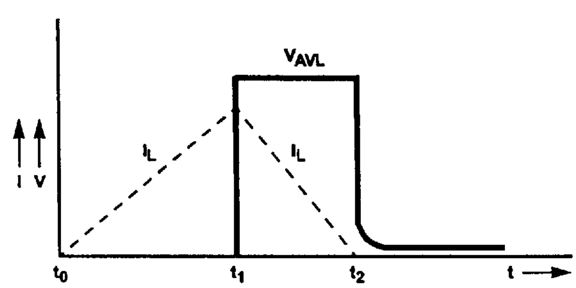

FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS