HARRIS SEMICONDUCTOR

RURH3010CC, RURH3015CC, RURH3020CC

April 1995

30A, 100V - 200V Ultrafast Dual Diodes

Features

- **Ultrafast with Soft Recovery Characteristic (t_{RR} < 45ns)**
- **+175°C Rated Junction Temperature**
- **Reverse Voltage Up to 200V**
- **Avalanche Energy Rated**

Applications

- **Switching Power Supply**
- **Power Switching Circuits**
- **General Purpose**

Description

RURH3010CC, RURH3015CC, RURH3020CC are ultrafast dual diodes (t_{RR} < 45ns) with soft recovery characteristics. They have a low forward voltage drop and are of planar, silicon nitride passivated, ion-implanted, epitaxial construction.

These devices are intended for use as energy steering/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 minimizes ringing and electrical noise in many power switching circuits thus reducing power loss in the switching transistor.

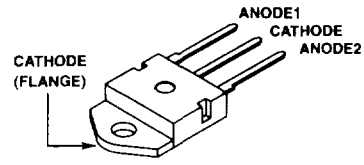
PACKAGING AVAILABILITY

PART NUMBER	PACKAGE	BRAND
RURH3010CC	TO-218AC	RURH3010C
RURH3015CC	TO-218AC	RURH3015C
RURH3020CC	TO-218AC	RURH3020C

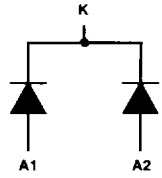
NOTE: When ordering, use the entire part number.

Package

JEDEC TO-218AC



Symbol



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

		RURH3010CC	RURH3015CC	RURH3020CC
Peak Repetitive Reverse Voltage	V_{RRM}	100V	150V	200V
Working Peak Reverse Voltage	V_{RWM}	100V	150V	200V
DC Blocking Voltage	V_R	100V	150V	200V
Average Rectified Forward Current (Per Leg) (Total device forward current at rated V_R and T_C = +150°C)	$I_{F(AV)}$	30A	30A	30A
Peak Forward Repetitive Current (Rated V_R, Square Wave 20kHz)	I_{FRM}	70A	70A	70A
Nonrepetitive Peak Surge Current (Surge applied at rated load condition halfwave 1 phase 60Hz)	I_{FSM}	325A	325A	325A
Operating and Storage Temperature	T_{STG}, T_J	-55°C to +175°C	-55°C to +175°C	-55°C to +175°C

File Number **2773.3**

Electrical Specifications T_C = +25°C, Unless Otherwise Specified

SYMBOL	TEST CONDITION	LIMITS									UNITS
		RURH3010CC			RURH3015CC			RURH3020CC			
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
V_F	I_F = 30A, T_C = +150°C	-	-	0.85	-	-	0.85	-	-	0.85	V
	I_F = 30A, T_C = +25°C	-	-	1.00	-	-	1.00	-	-	1.00	V
I_R at T_C = +150°C	V_R = 100V	-	-	1.00	-	-	-	-	-	-	mA
	V_R = 150V	-	-	-	-	-	1.00	-	-	-	mA
	V_R = 200V	-	-	-	-	-	-	-	-	1.00	mA
I_R at T_C = +25°C	V_R = 100V	-	-	500	-	-	-	-	-	-	µA
	V_R = 150V	-	-	-	-	-	500	-	-	-	µA
	V_R = 200V	-	-	-	-	-	-	-	-	500	µA
t_{RR}	I_F = 1A	-	-	45	-	-	45	-	-	45	ns
	I_F = 30A	-	-	50	-	-	50	-	-	50	ns
t_A	I_F = 1A	-	24	-	-	24	-	-	24	-	ns
	I_F = 30A	-	28	-	-	28	-	-	28	-	ns
t_B	I_F = 1A	-	17	-	-	17	-	-	17	-	ns
	I_F = 30A	-	20	-	-	20	-	-	20	-	ns
$R_{\theta JC}$		-	-	1.2	-	-	1.2	-	-	1.2	°C/W
E_{AVL}	see Fig. 7 and 8	-	-	20	-	-	20	-	-	20	mj

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 2), summation of $t_A + t_B$.

t_A = Time to reach peak reverse current at dI_F/dt = 100A/µs (See Figure 2).

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 2).

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

E_{AVL} = Controlled avalanche energy (See Figures 7 and 8).

pw = pulse width.

D = duty cycle.

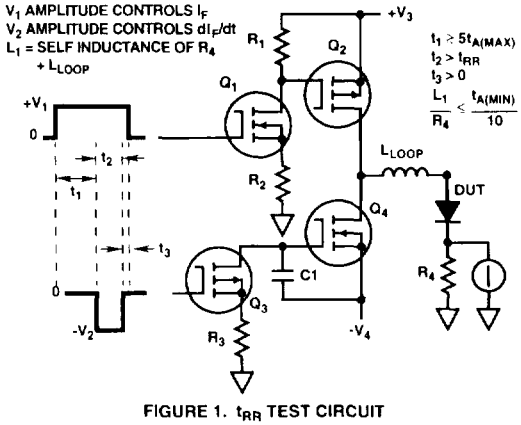


FIGURE 1. t_{RR} TEST CIRCUIT

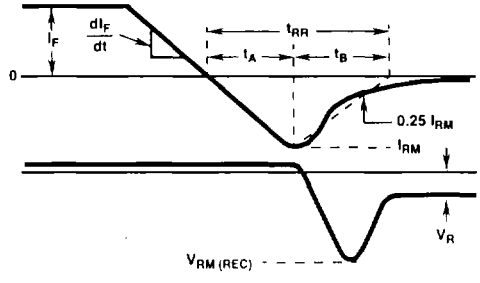


FIGURE 2. DEFINITIONS OF t_{RR}, t_A AND t_B

Typical Performance Curves

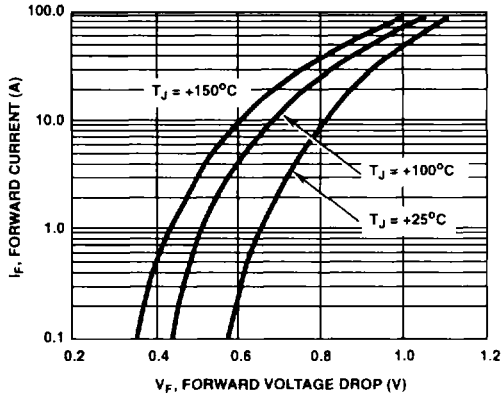


FIGURE 3. FORWARD VOLTAGE vs FORWARD CURRENT CHARACTERISTIC

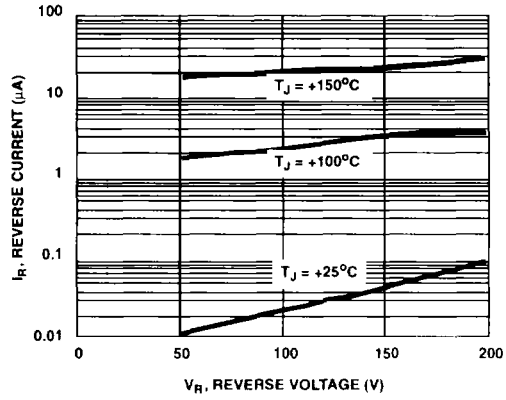


FIGURE 4. REVERSE VOLTAGE vs REVERSE CURRENT CHARACTERISTIC

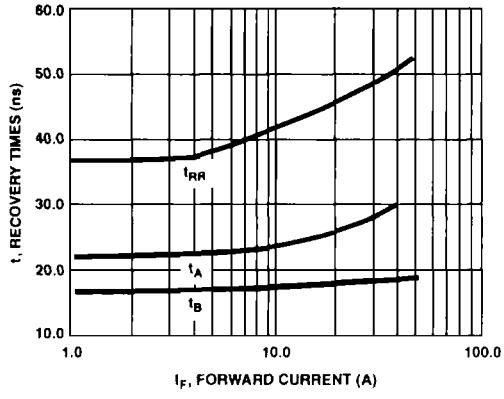


FIGURE 5. TYPICAL t_{RR}, t_A AND t_B CURVES vs FORWARD CURRENT

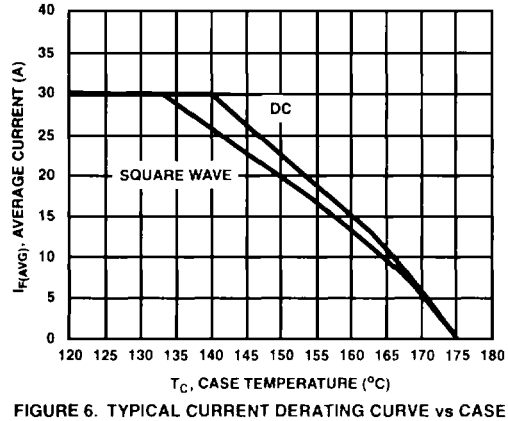


FIGURE 6. TYPICAL CURRENT DERATING CURVE vs CASE TEMPERATURE

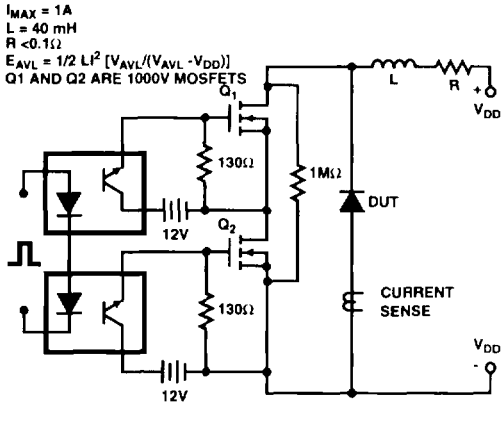


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

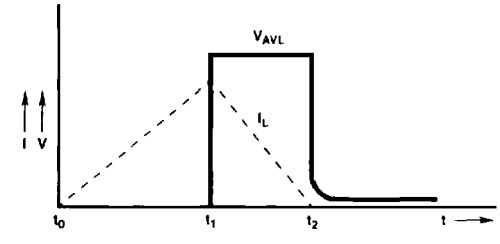


FIGURE 8. CURRENT VOLTAGE WAVEFORM