

30A, 1200V Hyperfast Dual Diode

The RHRG30120CC is a hyperfast dual diode with soft recovery characteristics ($t_{rr} < 65\text{ns}$). It has half the recovery time of ultrafast diodes 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 high frequency switching power supplies and other power switching applications. Its low stored charge and hyperfast soft recovery minimize ringing and electrical noise in many power switching circuits, thus reducing power loss in the switching transistors.

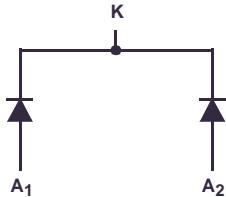
Formerly developmental type TA49041.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RHRG30120CC	TO-247	RHR30120C

NOTE: When ordering, use the entire part number.

Symbol



Absolute Maximum Ratings (Per Leg) $T_C = 25^\circ\text{C}$

	RHRG30120CC	UNITS
Peak Repetitive Reverse Voltage	V_{RRM}	V
Working Peak Reverse Voltage	V_{RWM}	V
DC Blocking Voltage	V_R	V
Average Rectified Forward Current	$I_{F(AV)}$	V
($T_C = 78^\circ\text{C}$)		
Repetitive Peak Surge Current	I_{FRM}	V
(Square Wave, 20kHz)		
Nonrepetitive Peak Surge Current	I_{FSM}	V
(Halfwave, 1 Phase, 60Hz)		
Maximum Power Dissipation	P_D	W
Avalanche Energy (See Figures 7 and 8)	E_{AVL}	mJ
Operating and Storage Temperature	T_{STG}, T_J	$^\circ\text{C}$

Features

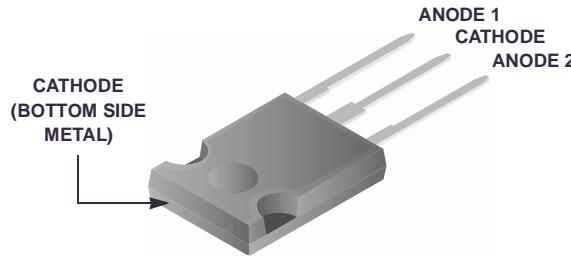
- Hyperfast with Soft Recovery.....<65ns
- Operating Temperature175°C
- Reverse Voltage.....1200V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC STYLE TO-247



Electrical Specifications (Per Leg) $T_C = 25^\circ\text{C}$, Unless Otherwise Specified

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V_F	$I_F = 30\text{A}$	-	-	3.2	V
	$I_F = 30\text{A}, T_C = 150^\circ\text{C}$	-	-	2.6	V
I_R	$V_R = 1200\text{V}$	-	-	250	μA
	$V_R = 1200\text{V}, T_C = 150^\circ\text{C}$	-	-	1	mA
t_{rr}	$I_F = 1\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	-	65	ns
	$I_F = 30\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	-	85	ns
t_a	$I_F = 30\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	48	-	ns
t_b	$I_F = 30\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	22	-	ns
$R_{\theta\text{JC}}$		-	-	1.2	$^\circ\text{C}/\text{W}$

DEFINITIONS

V_F = Instantaneous forward voltage ($pw = 300\mu\text{s}$, $D = 2\%$).

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).

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

pw = Pulse width.

D = Duty cycle.

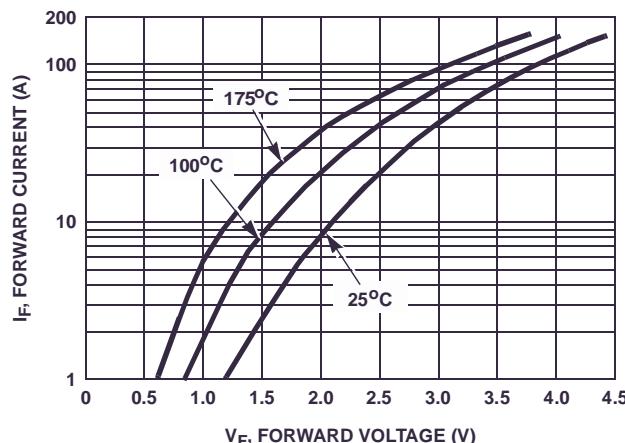
Typical Performance Curves

FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

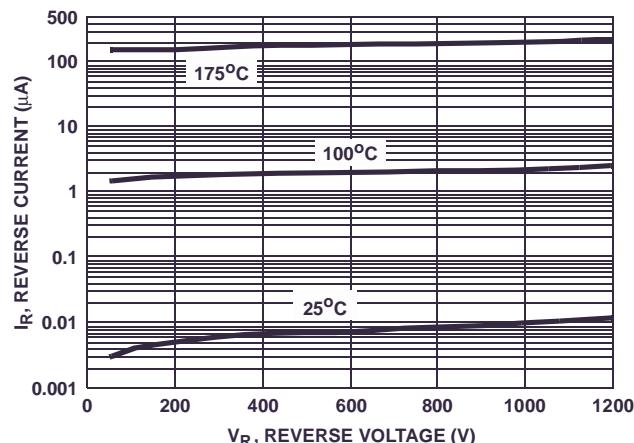


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

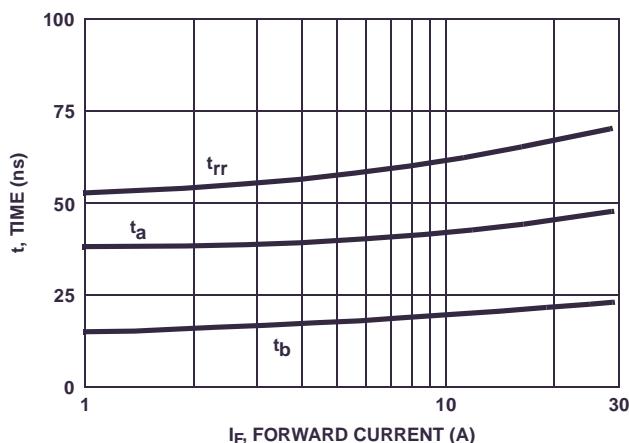
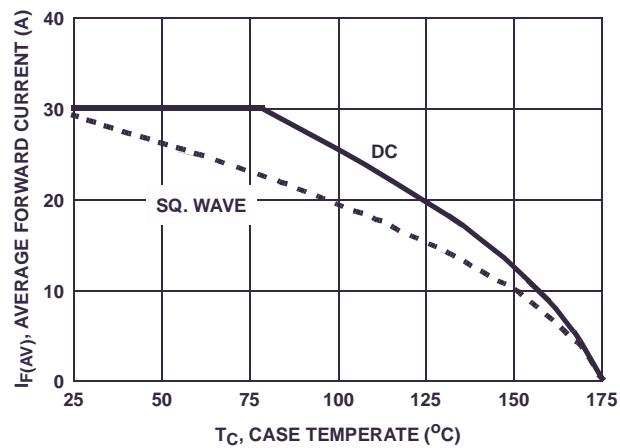
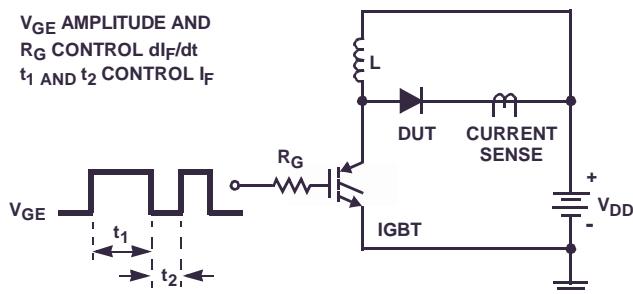
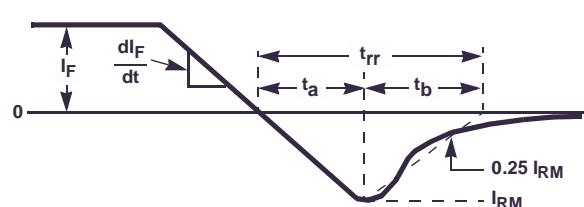
FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

FIGURE 5. t_{rr} TEST CIRCUITFIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

I_{MAX} = 1.225A
L = 40mH
R < 0.1Ω
E_{AVL} = 1/2L² [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]
Q₁ = IGBT (BV_{CES} > DUT V_{R(AVL)})

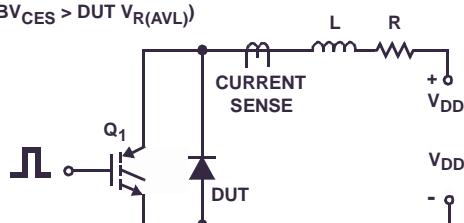


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

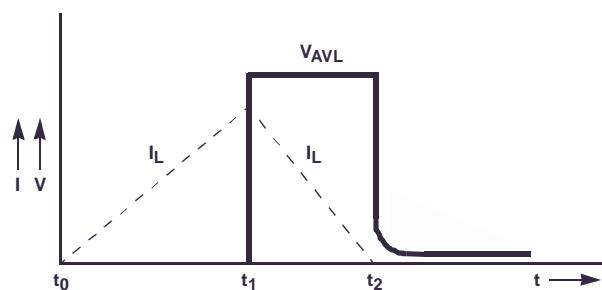


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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