

Data Sheet January 2000 File Number 3409.3

30A, 1200V Hyperfast Diode

The RHRP30120 is a hyperfast diode with soft recovery characteristics (t_{rr} < 65ns). 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, reducing power loss in the switching transistors.

Formerly developmental type TA49041.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RHRP30120	TO-220AC	RHR30120

NOTE: When ordering, use the entire part number.

Symbol



Features

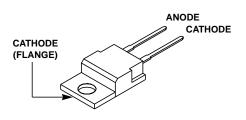
- Hyperfast with Soft Recovery ... <65ns
 Operating Temperature175°C
 Reverse Voltage1200V
- · Avalanche Energy Rated
- · Planar Construction

Applications

- · Switching Power Supplies
- · Power Switching Circuits
- · General Purpose

Packaging

JEDEC TO-220AC



Absolute Maximum Ratings $T_C = 25^{\circ}C$ RHRP30120 **UNITS** 1200 1200 1200 30 $(T_C = 78^{\circ}C)$ 60 Α (Square Wave, 20kHz) 300 Α (Halfwave, 1 Phase, 60Hz) W 125 30 mJ οС -65 to 175

Electrical Specifications $T_C = 25^{\circ}C$, Unless Otherwise Specified

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V _F	I _F = 30A	-	-	3.2	V
	$I_F = 30A, T_C = 150^{\circ}C$	-	-	2.6	V
I _R	V _R = 1200V	-	-	250	μΑ
	$V_R = 1200V, T_C = 150^{\circ}C$	-	-	1	mA
t _{rr}	$I_F = 1A$, $dI_F/dt = 100A/\mu s$	-	-	65	ns
	$I_F = 30A$, $dI_F/dt = 100A/\mu s$	-	-	75	ns
t _a	$I_F = 30A$, $dI_F/dt = 100A/\mu s$	-	48	-	ns
t _b	$I_F = 30A$, $dI_F/dt = 100A/\mu s$	-	22	-	ns
$R_{ heta JC}$		-	-	1.2	°C/W

DEFINITIONS

 V_F = Instantaneous forward voltage (pw = 300 μ 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).

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

pw = pulse width.

D = duty cycle.

Typical Performance Curves

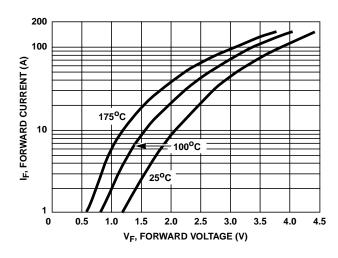


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

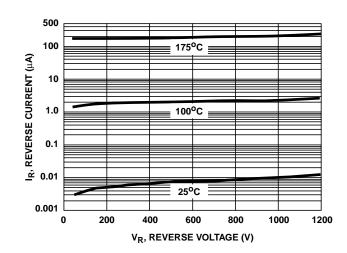


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

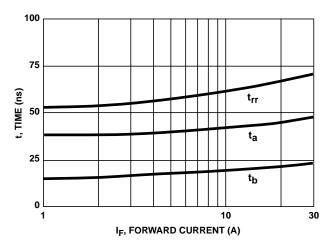


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

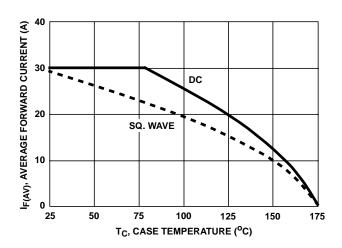


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

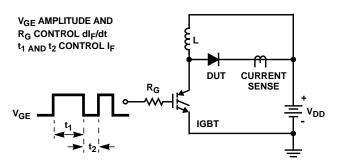


FIGURE 5. t_{rr} TEST CIRCUIT

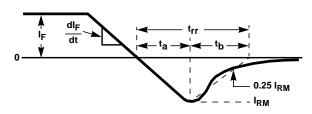


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

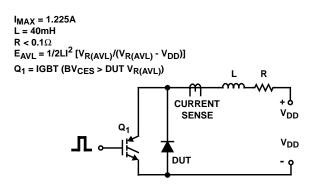


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

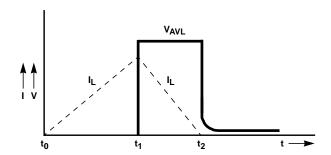


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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