

RHRP8120

Data Sheet

November 2013

8 A, 1200 V, Hyperfast Diode

The RHRP8120 is a hyperfast diode with soft recovery characteristics. It has the half recovery time of ultrafast diodes and is silicon nitride passivated ionimplanted epitaxial planar construction. These devices are intended to be used as freewheeling/ clamping diodes and diodes in a variety of switching power supplies and other power switching applications. Their low stored charge and hyperfast soft recovery minimize ringing and electrical noise in many power switching circuits reducing power loss in the switching transistors.

Ordering Information

PART NUMBER	PACKAGE	BRAND	
RHRP8120	TO-220AC-2L	RHRP8120	

NOTE: When ordering, use the entire part number.

Symbol



Features

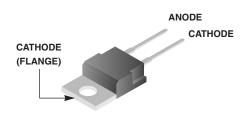
- Hyperfast Recovery t_{rr} = 70 ns (@ I_F= 8 A)
- Max Forward Voltage, $V_F = 3.2 \text{ V}$ (@ $T_C = 25^{\circ}\text{C}$)
- 1200 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC TO-220AC



Absolute Maximum Ratings $T_{C} = 25^{\circ}C$, Unless Otherwise Specified

	RHRP8120	UNIT
Peak Repetitive Reverse Voltage V _{RRM}	1200	V
Working Peak Reverse Voltage V _{RWM}	1200	V
DC Blocking Voltage	1200	V
Average Rectified Forward Current	8	A
Repetitive Peak Surge Current I _{FRM} (Square Wave, 20 kHz)	16	A
Nonrepetitive Peak Surge Current I _{FSM} (Halfwave, 1 Phase, 60 Hz)	100	А
Maximum Power DissipationPD	75	W
Avalanche Energy (See Figures 10 and 11) E _{AVL}	20	mJ
Operating and Storage Temperature	-65 to 175	°C

SYMBOL	TEST CONDITION	MIN	ТҮР	MAX	UNIT
V _F	I _F = 8 A	-	-	3.2	V
	I _F = 8 A, T _C = 150 ^o C	-	-	2.6	V
I _R	V _R = 1200 V	-	-	100	μΑ
	$V_{R} = 1200 \text{ V}, \text{ T}_{C} = 150^{\circ}\text{C}$	-	-	500	μΑ
t _{rr}	I _F = 1 A, dI _F /dt = 200 A/μs	-	-	55	ns
	$I_F = 8 \text{ A}, \text{ d}I_F/\text{d}t = 200 \text{ A}/\mu\text{s}$	-	-	70	ns
t _a	I _F = 8 A, dI _F /dt = 200 A/μs	-	30	-	ns
t _b	I _F = 8 A, dI _F /dt = 200 A/μs	-	20	-	ns
Q _{rr}	I _F = 8 A, dI _F /dt = 200 A/μs	-	165	-	nC
CJ	V _R = 10 V, I _F = 0 A	-	25	-	pF
R _{θJC}		-	-	2	°C/W

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

DEFINITIONS

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

 I_{R} = Instantaneous reverse current.

 T_{rr} = Reverse recovery time (See Figure 9), summation of t_a + t_b

 t_a = Time to reach peak reverse current (See Figure 9).

 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 9).

Q_{rr} = Reverse Recovery Charge.

 C_J = Junction Capacitance.

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

pw = Pulse Width.

D = Duty Cycle.

Typical Performance Curves

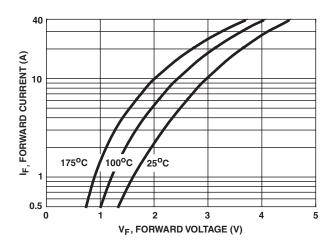


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

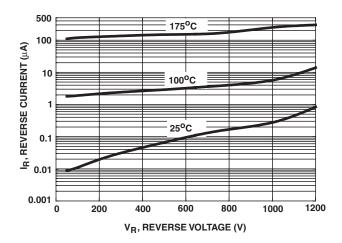


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE



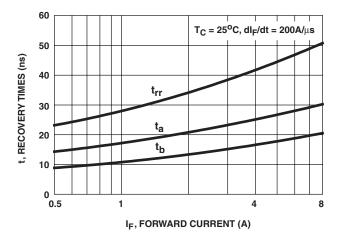
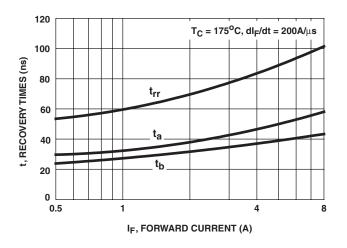


FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT





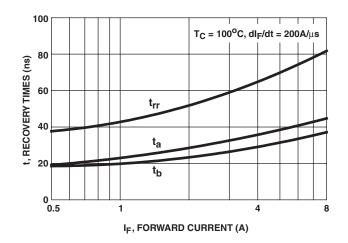


FIGURE 4. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

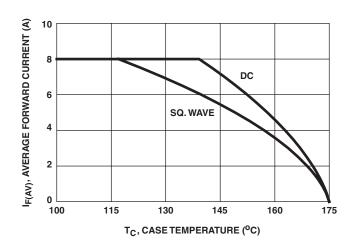


FIGURE 6. CURRENT DERATING CURVE

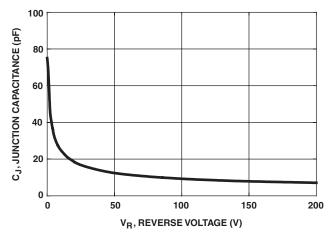
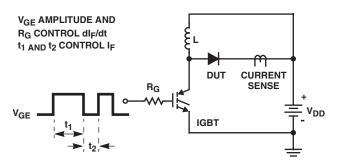


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

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Test Circuits and Waveforms





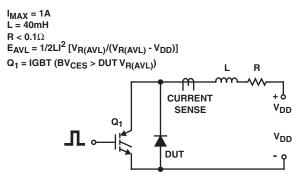


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

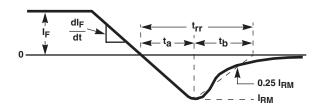


FIGURE 9. trr WAVEFORMS AND DEFINITIONS

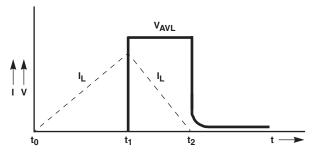


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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