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

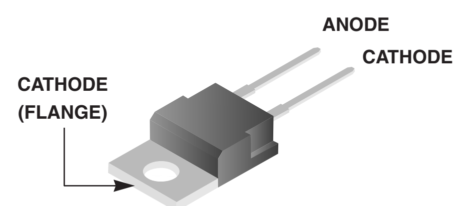
- Hyperfast Recovery t_{rr} = 70 ns (@ I_F= 8 A)
- Max Forward Voltage, V_F = 3.2 V (@ T_C = 25°C)
- 1200 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC TO-220AC



Absolute Maximum Ratings T_C = 25°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	V_R	1200	V
Average Rectified Forward Current (T_C = 140°C)	$I_{F(AV)}$	8	A
Repetitive Peak Surge Current (Square Wave, 20 kHz)	I_{FRM}	16	A
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60 Hz)	I_{FSM}	100	A
Maximum Power Dissipation	P_D	75	W
Avalanche Energy (See Figures 10 and 11)	E_{AVL}	20	mJ
Operating and Storage Temperature	T_{STG}, T_J	-65 to 175	°C

Electrical Specifications $T_C = 25^oC$, Unless Otherwise Specified

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
V_F	I_F = 8 A	-	-	3.2	V
	I_F = 8 A, $T_C = 150^oC$	-	-	2.6	V
I_R	V_R = 1200 V	-	-	100	μA
	V_R = 1200 V, $T_C = 150^oC$	-	-	500	μA
t_{rr}	I_F = 1 A, dI_F/dt = 200 A/μs	-	-	55	ns
	I_F = 8 A, dI_F/dt = 200 A/μs	-	-	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
C_J	V_R = 10 V, I_F = 0 A	-	25	-	pF
$R_{\theta JC}$		-	-	2	$^oC/W$

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

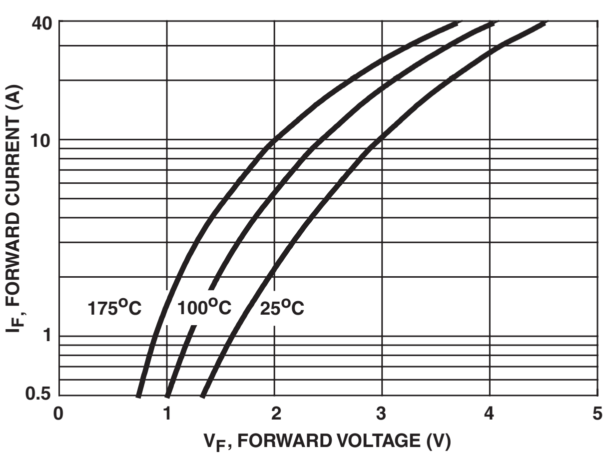


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

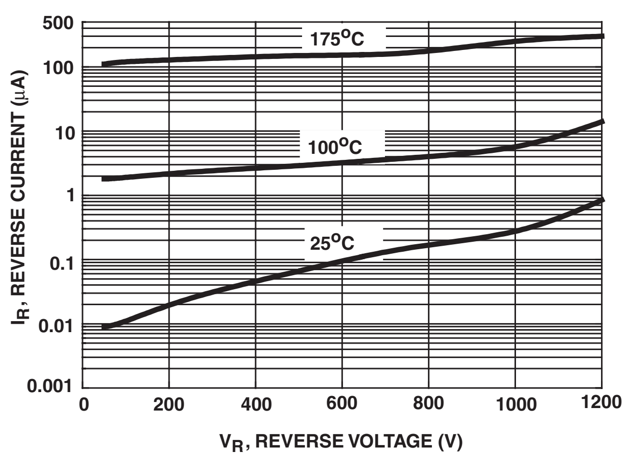


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

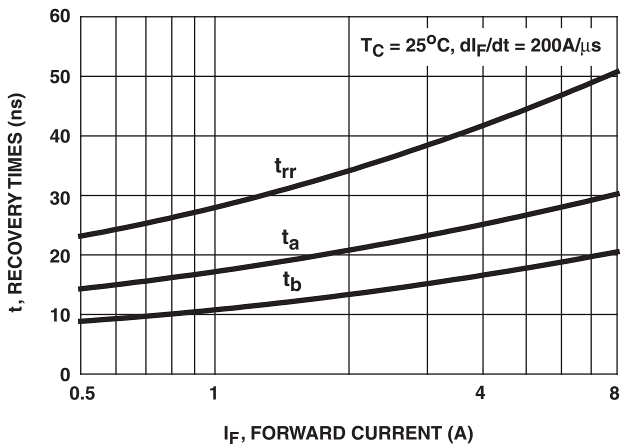


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

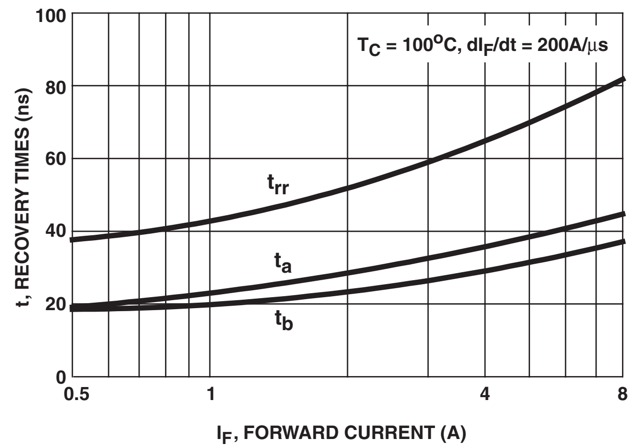


FIGURE 4. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

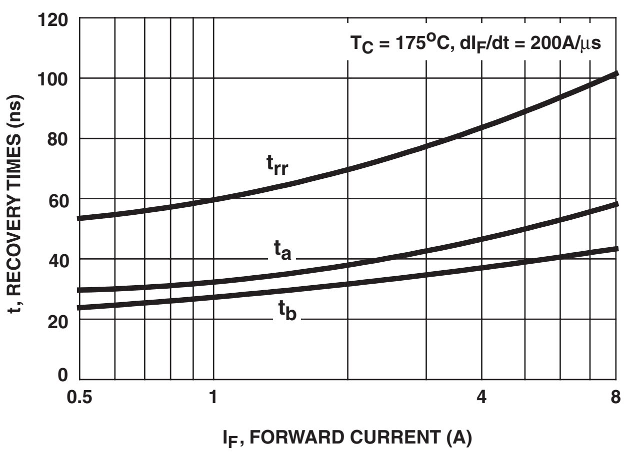


FIGURE 5. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

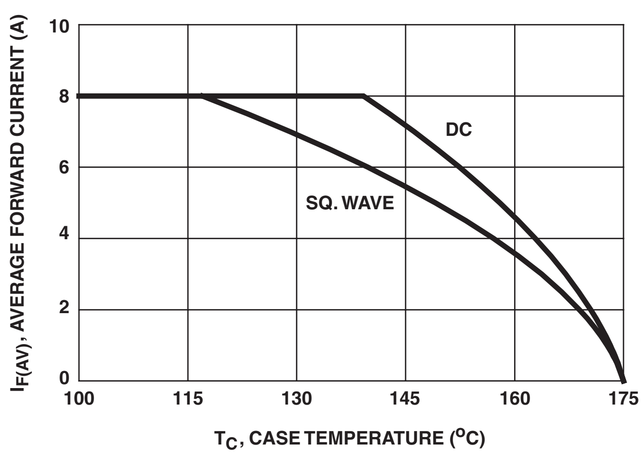


FIGURE 6. CURRENT DERATING CURVE

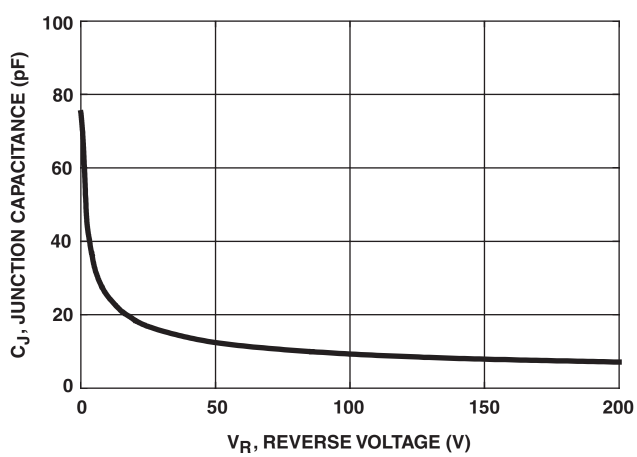


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

Test Circuits and Waveforms

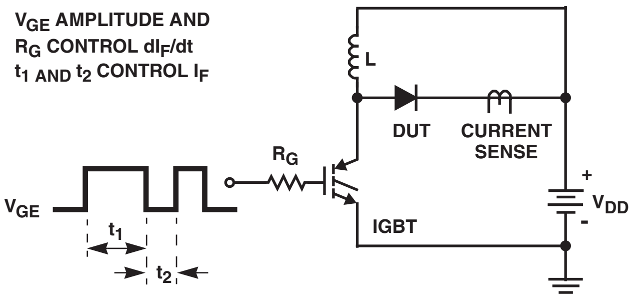


FIGURE 8. t_{rr} TEST CIRCUIT

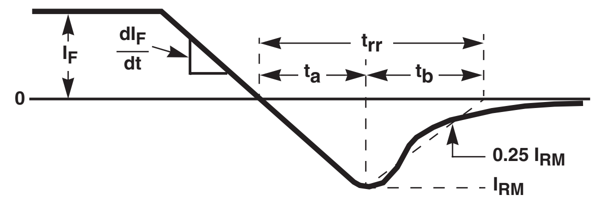


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

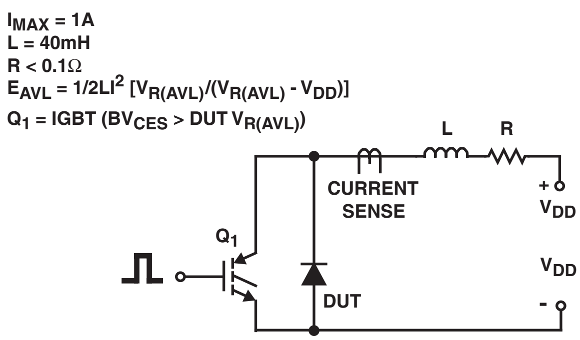


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

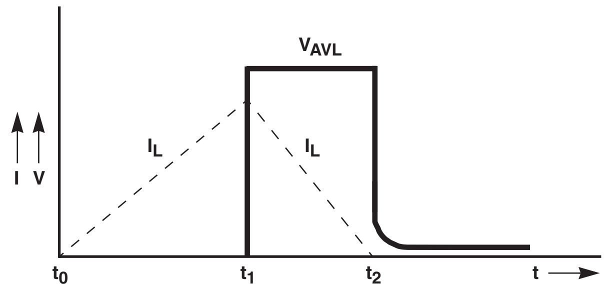


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

PUBLICATION ORDERING INFORMATION

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