



ON Semiconductor®

RHRP30120**Data Sheet****November 2013**

30 A, 1200 V, Hyperfast Diode

The RHRP30120 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
RHRP30120	TO-220AC	RHRP30120

NOTE: When ordering, use the entire part number.

Symbol



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$

		RHRP30120	UNIT
Peak Repetitive Reverse Voltage	.....V	RRM	1200
Working Peak Reverse Voltage	.....V	RWM	1200
DC Blocking Voltage	.....V	R	1200
Average Rectified Forward Current ($T_C = 78^\circ\text{C}$)	.....A	F(AV)	30
Repetitive Peak Surge Current (Square Wave, 20 kHz)	.....A	FRM	60
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60 Hz)	.....A	FSM	300
Maximum Power Dissipation	.....W	D	125
Avalanche Energy (See Figures 7 and 8)	.....mJ	AVL	30
Operating and Storage Temperature	.....°C	STG, T _J	-65 to 175

Features

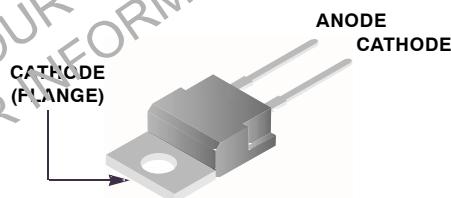
- ☐ Hyperfast Recovery $t_{rr} = 85$ ns (@ $I = 30$ A)
- ☐ Max Forward Voltage, $V = 3.2$ V (@ $T_C = 25^\circ\text{C}$)
- ☐ 1200 V Reverse Voltage and High Reliability
- ☐ Avalanche Energy Rated
- ☐ RoHS Compliant

Applications

- ☐ Switching Power Supplies
- ☐ Power Switching Circuits
- ☐ General Purpose

Packaging

JEDEC TO-220AC



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

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
V_F	$I_F = 30 \text{ A}$	-	-	3.2	V
	$I_F = 30 \text{ A}, T_C = 150^\circ\text{C}$	-	-	.2	V
I_R	$V_R = 1200 \text{ V}$	-	-	250	mA
	$V_R = 1200 \text{ V}, T_C = 150^\circ\text{C}$	-	-	1	mA
t_{rr}	$I_F = 1 \text{ A}, dI_F/dt = 100 \text{ A}/\mu\text{s}$	-	-	55	ns
	$I_F = 30 \text{ A}, dI_F/dt = 100 \text{ A}/\mu\text{s}$	-	-	55	ns
t_a	$I_F = 30 \text{ A}, dI_F/dt = 100 \text{ A}/\mu\text{s}$	-	4	-	ns
t_b	$I_F = 30 \text{ A}, dI_F/dt = 100 \text{ A}/\mu\text{s}$	-	2	-	ns
R_{JJC}		-	-	.2	$^\circ\text{C}/\text{W}$

DEFINITIONS

V_F = Instantaneous forward voltage (pw=300 μs , 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 first point to projected zero crossing of I_R at a steady-state current of 25% of I_{RM} (See Figure 6). g h t l

R_{JJC} = Thermal resistance junction to case.

pw = pulsed width.

D = duty cycle.

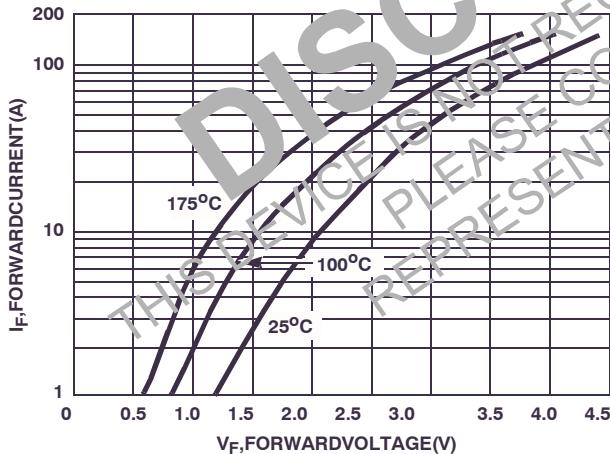
Typical Performance Curves

FIGURE1. FORWARDCURRENTvsFORWARDVOLTAGE

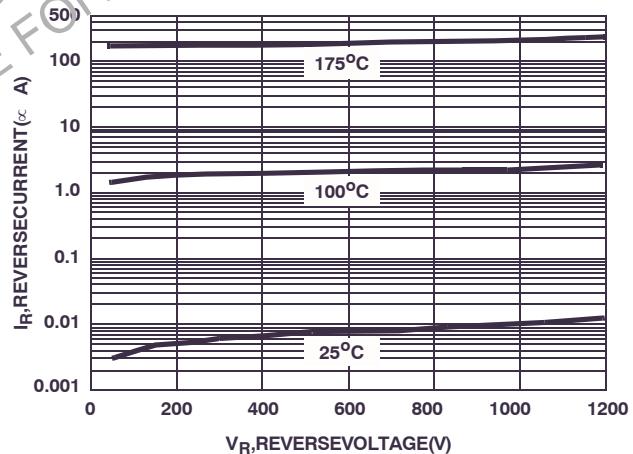


FIGURE2. REVERSECURRENTvsREVERSEVOLTAGE

Typical Performance Curves (Continued)

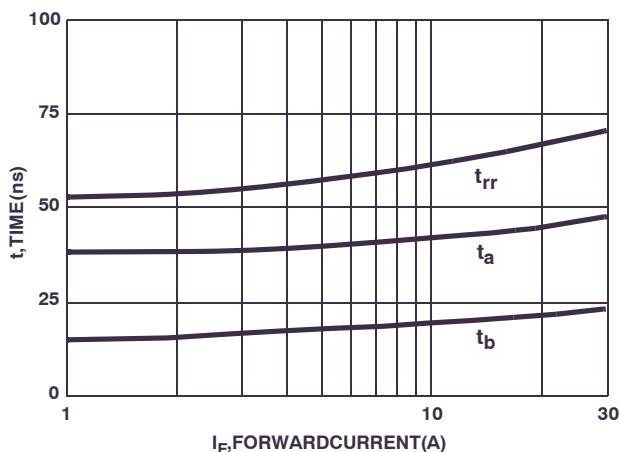
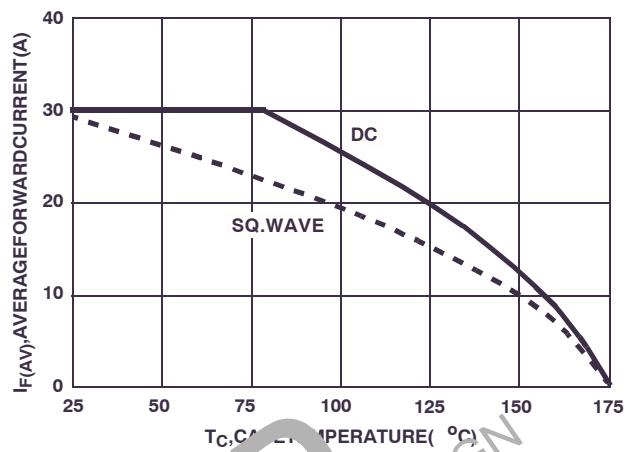
FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

FIGURE 4. CURRENT vs OPERATING CURVE

Test Circuits and Waveforms

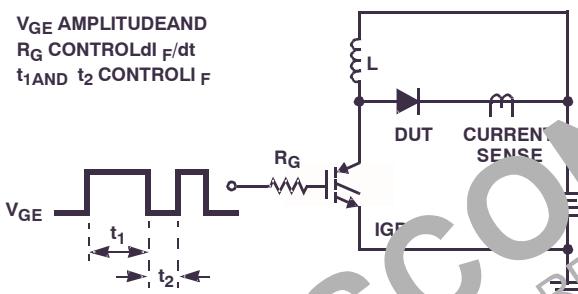
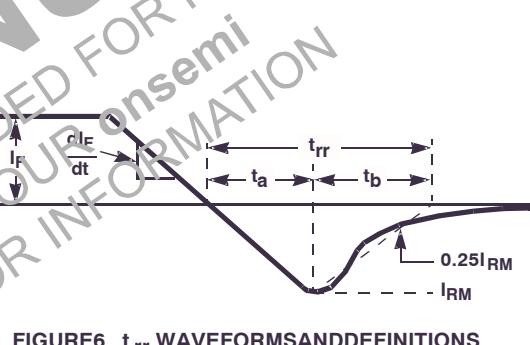
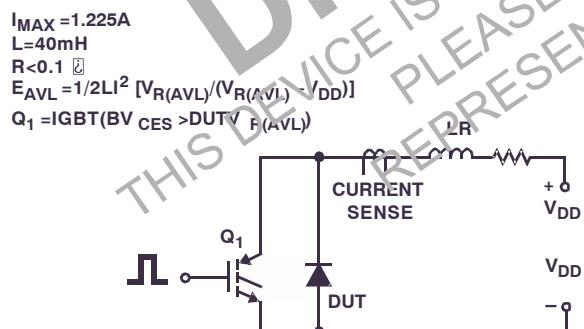
FIGURE 5. t_{rr} TEST CIRCUITFIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

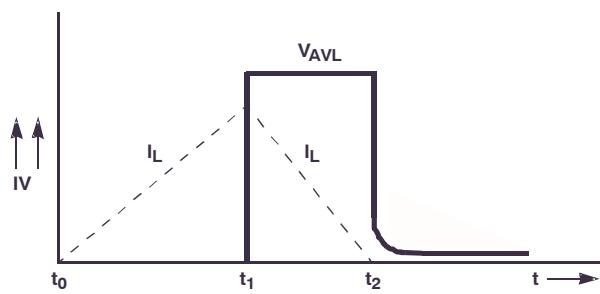


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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