Data Sheet | January 2000 | File Number 3145.3

100A, 1200V Hyperfast Diode

The RHRU100120 is a hyperfast diode with soft recovery characteristics (t_{rr} < 90ns). 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 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 TA49070.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RHRU100120	TO-218	RHR100120

NOTE: When ordering, use the entire part number.

Symbol



Features

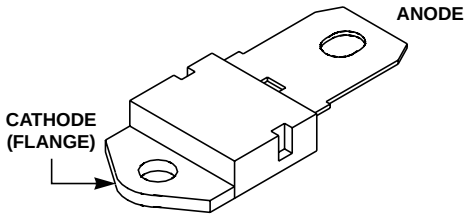
- Hyperfast with Soft Recovery . . . . . <90ns
- Operating Temperature. . . . . 175^{o}C
- Reverse Voltage 1200V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC STYLE TO-218



Absolute Maximum Ratings T_C = 25^{o}C, Unless Otherwise Specified

		RHRU100120	UNITS
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 = 62.5^{o}C)	$I_{F(AV)}$	100	A
Repetitive Peak Surge Current (Square Wave, 20kHz)	I_{FRM}	200	A
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60Hz)	I_{FSM}	1000	A
Maximum Power Dissipation	P_D	300	W
Avalanche Energy (See Figures 7 and 8)	E_{AVL}	50	mJ
Operating and Storage Temperature	T_{STG}, T_J	-65 to 175	^{o}C

1-888-INTERSIL or 321-724-7143 | Copyright © Intersil Corporation 2000

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

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V_F	I_F = 100A	-	-	3.2	V
	I_F = 100A, $T_C = 150^oC$	-	-	2.6	V
I_R	V_R = 1200V	-	-	250	µA
	V_R = 1200V, $T_C = 150^oC$	-	-	2	mA
t_{rr}	I_F = 1A, dI_F/dt = 100A/µs	-	-	90	ns
	I_F = 100A, dI_F/dt = 100A/µs	-	-	100	ns
t_a	I_F = 100A, dI_F/dt = 100A/µs	-	60	-	ns
t_b	I_F = 100A, dI_F/dt = 100A/µs	-	25	-	ns
$R_{\theta JC}$		-	-	0.5	$^oC/W$

DEFINITIONS

V_F = Instantaneous forward voltage (pw = 300µs, 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

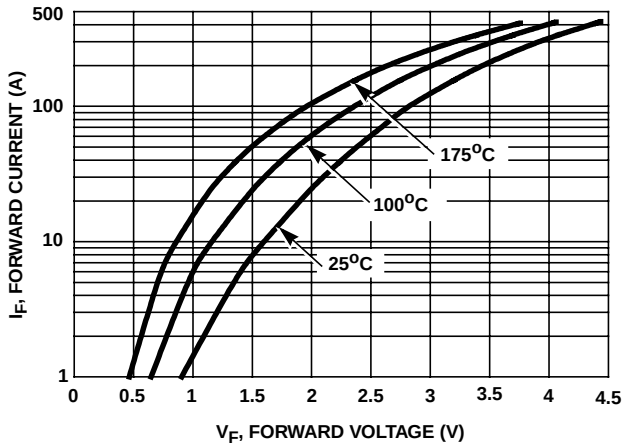


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

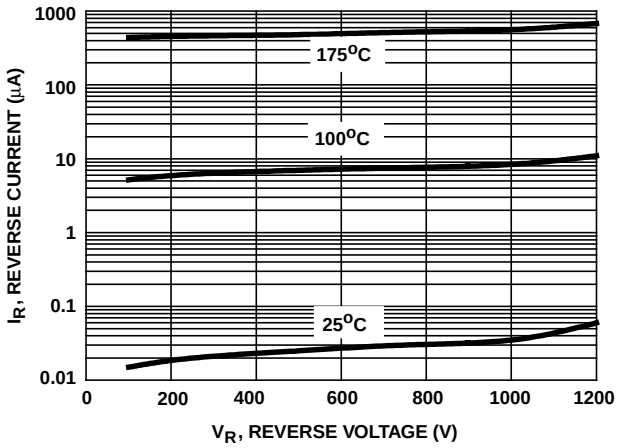


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

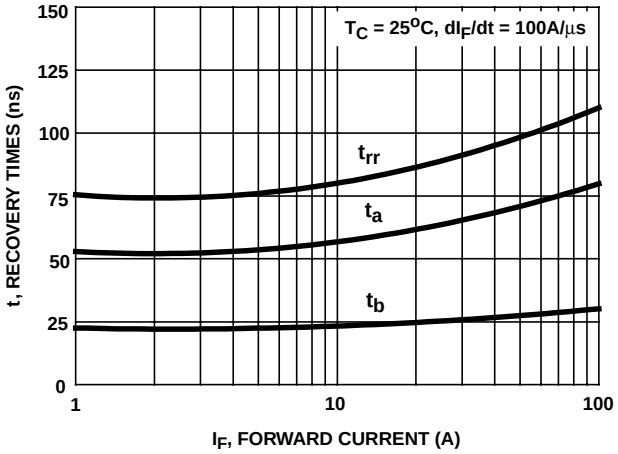


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

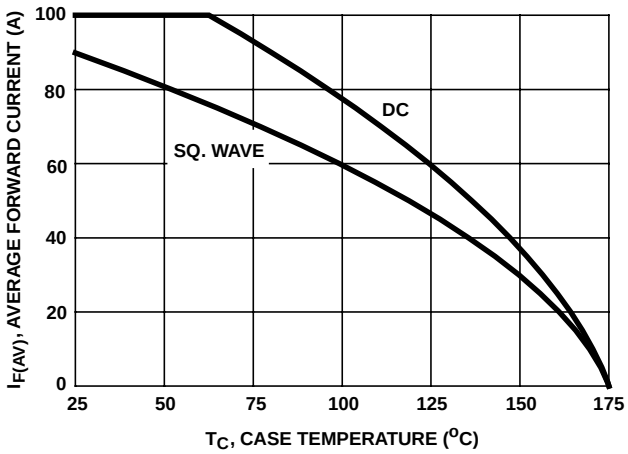


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

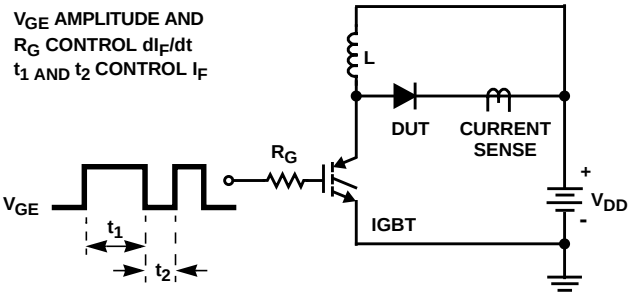


FIGURE 5. t_{rr} TEST CIRCUIT

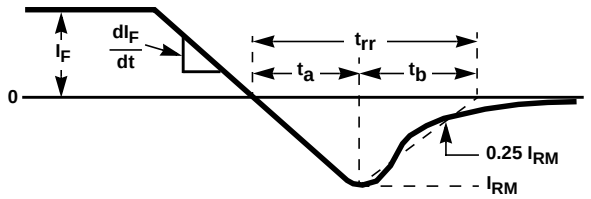


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

I_{MAX} = 1.6A
L = 40mH
R < 0.1Ω
$E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
Q_1 = IGBT (BV_{CES} > DUT $V_{R(AVL)}$)

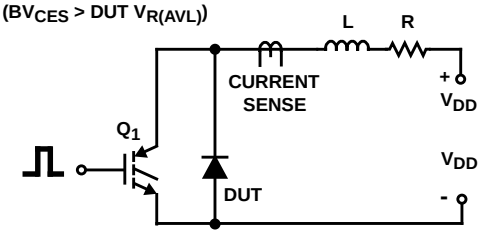


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

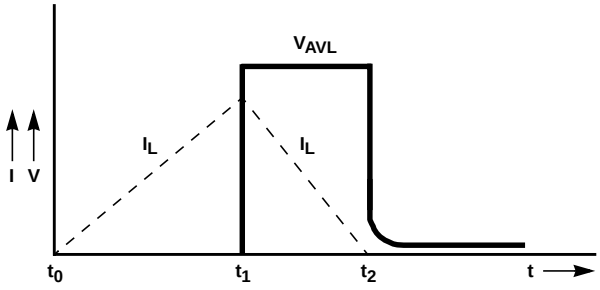


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

All Intersil semiconductor products are manufactured, assembled and tested under **ISO9000** quality systems certification.

Intersil semiconductor products are sold by description only. Intersil Corporation reserves the right to make changes in circuit design and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that data sheets are current before placing orders. Information furnished by Intersil is believed to be accurate and reliable. However, no responsibility is assumed by Intersil or its subsidiaries for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Intersil or its subsidiaries.

For information regarding Intersil Corporation and its products, see web site **www.intersil.com**