

Data Sheet January 2000 File Number 3746.3

6A, 600V Hyperfast Diodes

The RHRD660 and RHRD660S are hyperfast diodes with soft recovery characteristics (t_{rr} < 30ns). They have half the recovery time of ultrafast diodes and are silicon nitride passivated ion-implanted epitaxial planar construction.

These devices are intended for use as freewheeling/ clamping diodes and rectifiers 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.

Formerly developmental type TA49057.

Ordering Information

PART NUMBER	PACKAGE	BRAND	
RHRD660	TO-251	RHR660	
RHRD660S	TO-252	RHR660	

NOTE: When ordering, use the entire part number. Add the suffix 9A to obtain the TO-252 variant in tape and reel, e.g. RHRD660S9A.

Symbol



Absolute Maximum Ratings T_C = 25°C, Unless Otherwise Specified

Features

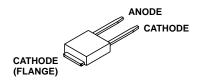
- Avalanche Energy Rated
- Planar Construction

Applications

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

Packaging

JEDEC STYLE TO-251



JEDEC STYLE TO-252



RHRD660, RHRD660S UNITS Peak Repetitive Reverse Voltage......VRRM 600 V Working Peak Reverse VoltageV_{RWM} 600 ٧ DC Blocking VoltageV_R 600 V 6 Α $(T_C = 152^{\circ}C)$ 12 Α (Square Wave, 20kHz) Nonrepetitive Peak Surge Current IFSM 60 Α (Halfwave, 1 Phase, 60Hz) 50 W 10 mJ -65 to 175 οС Maximum Lead Temperature for Soldering

Package Body for 10s, see Tech Brief 334.

300

260

οС

οС

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

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V _F	I _F = 6A	-	-	2.1	V
	I _F = 6A, T _C = 150°C	-	-	1.7	V
I _R	V _R = 600V	-	-	100	μΑ
	$V_R = 600V, T_C = 150^{\circ}C$	-	-	500	μΑ
t _{rr}	$I_F = 1A$, $dI_F/dt = 200A/\mu s$	-	-	30	ns
	$I_F = 6A$, $dI_F/dt = 200A/\mu s$	-	-	35	ns
t _a	$I_F = 6A$, $dI_F/dt = 200A/\mu s$	-	16	-	ns
t _b	$I_F = 6A$, $dI_F/dt = 200A/\mu s$	-	8.5	-	ns
Q _{RR}	$I_F = 6A$, $dI_F/dt = 200A/\mu s$	-	45	-	nC
СЈ	V _R = 10V, I _F = 0A	-	20	-	pF
$R_{ heta JC}$		-	-	3	°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 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

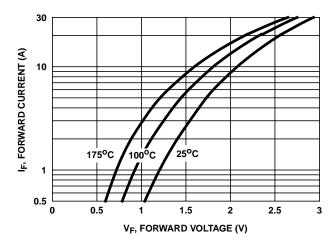


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

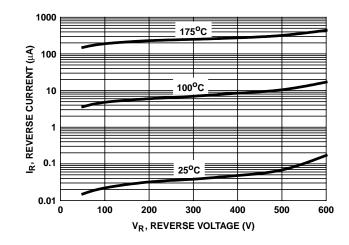


FIGURE 2. REVERSE CURRENT vs REVERSE

Typical Performance Curves (Continued)

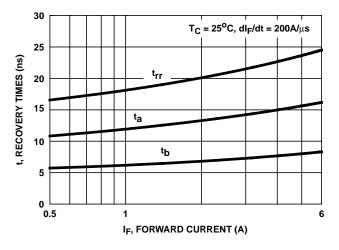


FIGURE 3. $t_{\rm rr}$, $t_{\rm a}$ and $t_{\rm b}$ curves vs forward current

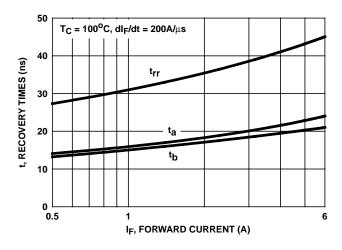


FIGURE 4. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

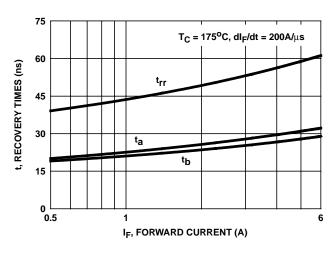


FIGURE 5. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

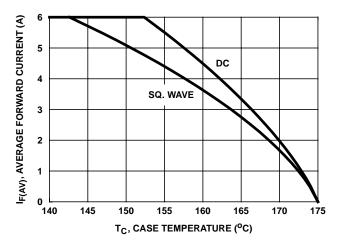


FIGURE 6. CURRENT DERATING CURVE

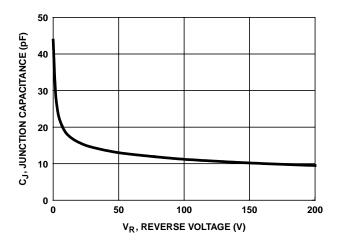


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

Test Circuits and Waveforms

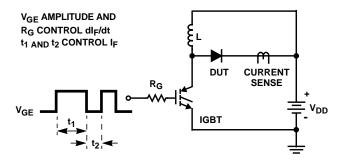


FIGURE 8. t_{rr} TEST CIRCUIT

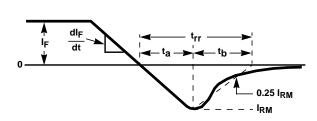


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

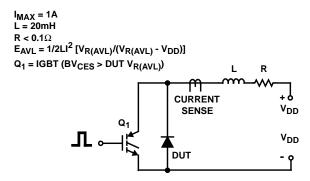


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

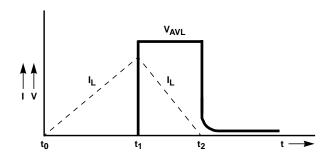


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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