

RHRP3060

30A, 600V Hyperfast Diodes

Features

- Hyperfast with Soft Recovery <40ns
- Operating Temperature 175°C
- Reverse Voltage Up To 600V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Description

The RHRP3060 are hypersast diodes with soft recovery characteristics ($t_{rr} < 40ns$). They have half the recovery time of ultrafast diodes and are of silicon nitride passivated ion-implanted epitaxial planar construction.

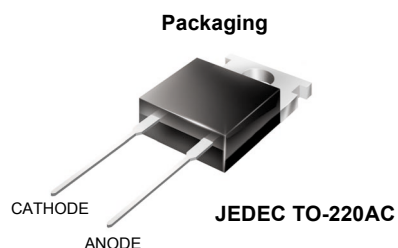
These devices are intended for use as freewheeling/clamping diodes and rectifiers in a variety of switching power supplies and other power switching applications. Their low stored charge and hyperfast soft recovery minimize ringing and electrical noise in many power switching circuits, thus reducing power loss in the switching transistors.

Formerly developmental type TA49063.

Ordering Informations

Part Number	Package	Brand
RHRP3060	TO-220AC	RHRP3060

Note: When ordering, use the entire part number.



Symbol



Absolute Maximum Ratings

Symbol	Parameter	RHRP3060	Units
V_{RRM}	Peak Repetitive Reverse Voltage	600	V
V_{RWM}	Working Peak Reverse Voltage	600	V
V_R	DC Blocking Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current ($T_C = 120^\circ C$)	30	A
I_{FRM}	Repetitive Peak Surge Current (Square Wave, 20KHz)	70	A
I_{FSM}	Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60Hz)	325	A
P_D	Maximum Power Dissipation	125	W
E_{AVL}	Avalanche Energy (See Figures 10 and 11)	20	mJ
T_J, T_{STG}	Operating and Storage Temperature	-65 to 175	°C

Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Test Conditions	RHRP3060			Units
		Min.	Typ.	Max.	
V _F	I _F = 30A	-	-	2.1	V
	I _F = 30A, T _C = 150°C	-	-	1.7	V
I _R	V _R = 400V	-	-	-	μA
	V _R = 600V	-	-	250	μA
	V _R = 400V, T _C = 150°C	-	-	-	mA
	V _R = 600V, T _C = 150°C	-	-	1.0	mA
t _{rr}	I _F = 1A, di _F /dt = 200A/μs	-	-	40	ns
	I _F = 30A, di _F /dt = 200A/μs	-	-	45	ns
t _a	I _F = 30A, di _F /dt = 200A/μs	-	22	-	ns
t _b	I _F = 30A, di _F /dt = 200A/μs	-	18	-	ns
Q _{RR}	I _F = 30A, di _F /dt = 200A/μs	-	100	-	nC
C _J	V _R = 600V, I _F = 0A	-	85	-	pF
R _{θJC}		-	-	1.2	°C/W

DEFINITIONS

V_F = Instantaneous forward voltage (pw = 300μs, 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_{θJC} = Thermal resistance junction to case.

pw = pulse width.

D = Duty cycle.

Typical Performance Characteristics

Figure 1. Forward Current vs Forward Voltage

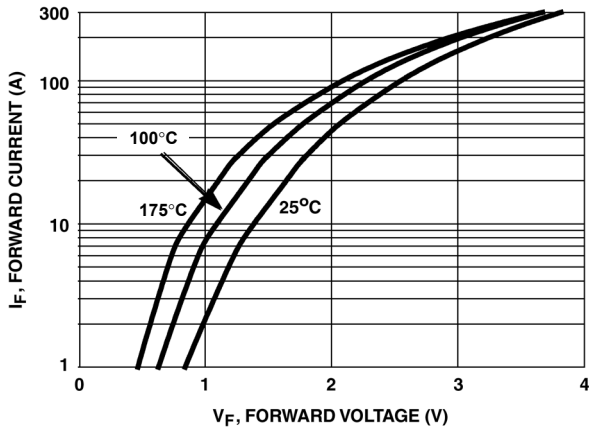


Figure 2. Reverse Current vs Reverse Voltage

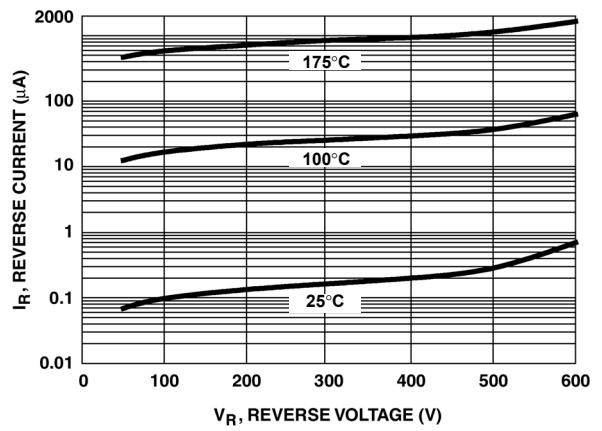


Figure 3. t_{rr} , t_a and t_b Curves vs Forward Current

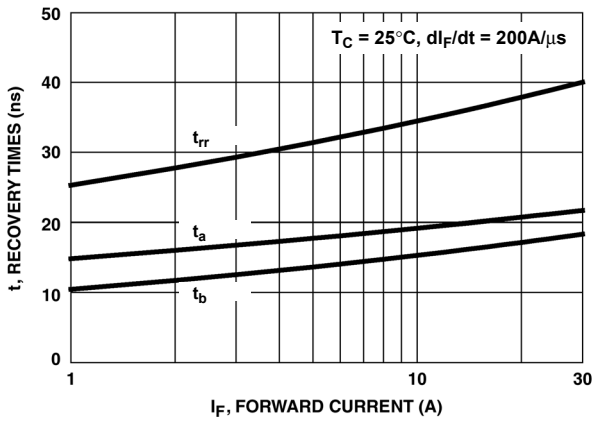


Figure 4. t_{rr} , t_a and t_b Curves vs Forward Current

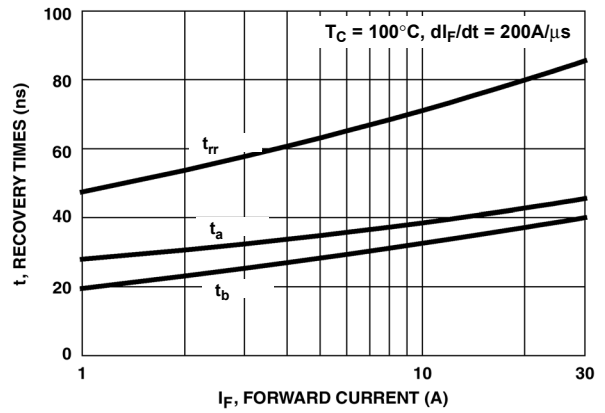


Figure 5. t_{rr} , t_a and t_b Curves vs Forward Current

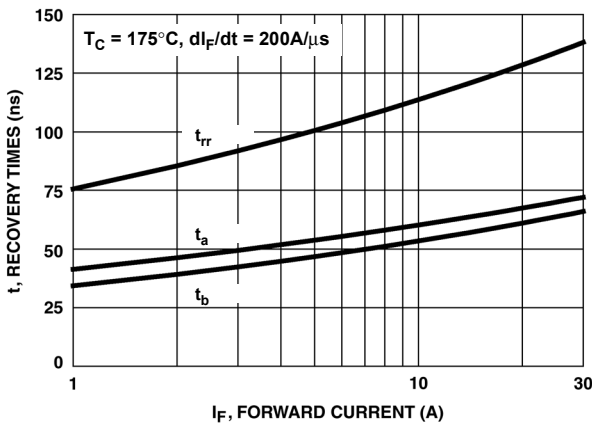
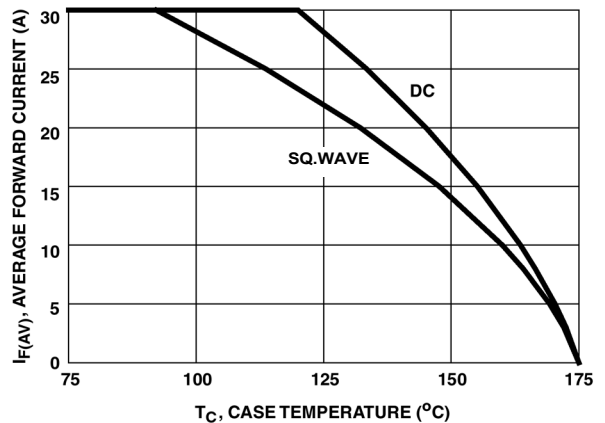
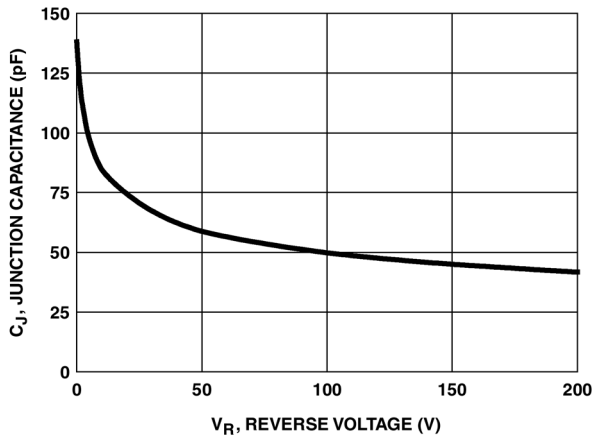


Figure 6. Current Derating Curve



Typical Performance Characteristics (Continued)

Figure 7. Junction Capacitance vs Reverse Voltage



Test Circuit and Waveforms

Figure 8. t_{rr} Test Circuit

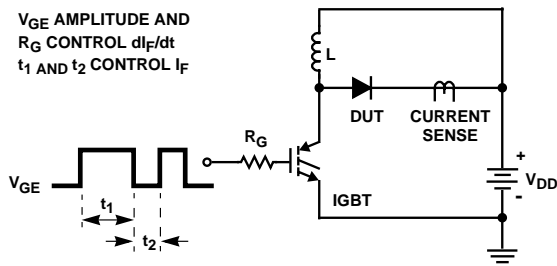


Figure 9. t_{rr} Waveforms and Definitions

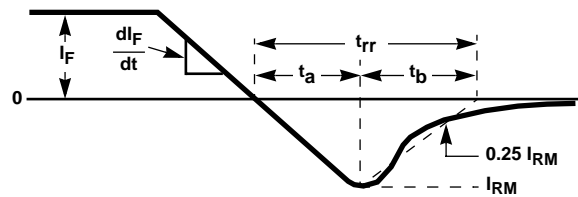


Figure 10. Avalanche Energy Test Circuit

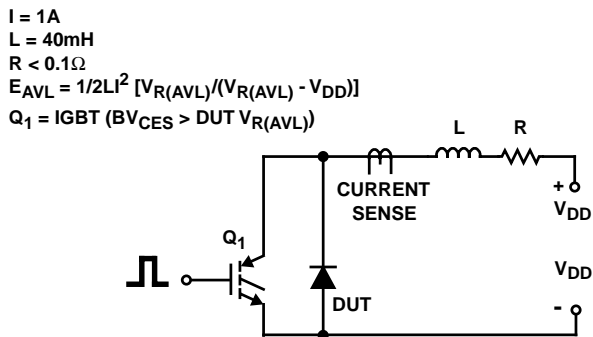
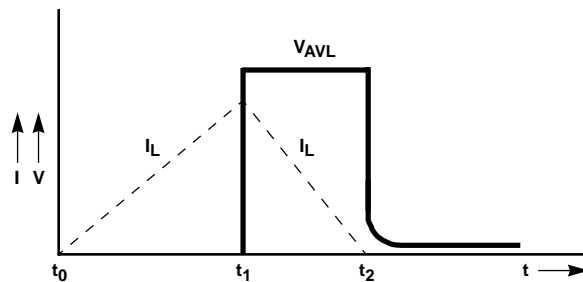


Figure 11. Avalanche Current and Voltage Waveforms



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PRODUCT STATUS DEFINITIONS

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