

RHRG5060 Datasheet



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DiGi Electronics Part Number	RHRG5060-DG
Manufacturer	onsemi
Manufacturer Product Number	RHRG5060
Description	DIODE GEN PURP 600V 50A TO247-2
Detailed Description	Diode 600 V 50A Through Hole TO-247-2

This model RHRG5060 is available at DiGi Electronics.

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Purchase and inquiry

Manufacturer Product Number:

RHRG5060

Series:

-

Technology:

Avalanche

Current - Average Rectified (Io):

50A

Speed:

Fast Recovery =< 500ns, > 200mA (Io)

Current - Reverse Leakage @ Vr:

250 μ A @ 600 V

Mounting Type:

Through Hole

Supplier Device Package:

TO-247-2

Base Product Number:

RHRG50

Manufacturer:

onsemi

Product Status:

Active

Voltage - DC Reverse (Vr) (Max):

600 V

Voltage - Forward (Vf) (Max) @ If:

2.1 V @ 50 A

Reverse Recovery Time (trr):

50 ns

Capacitance @ Vr, F:

-

Package / Case:

TO-247-2

Operating Temperature - Junction:

-65°C ~ 175°C

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.10.0080

Moisture Sensitivity Level (MSL):

Not Applicable

ECCN:

EAR99

Hyperfast Diode

50 A, 600 V

RHRG5060

Description

The RHRG5060 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.

Features

- Hyperfast Recovery ($t_{rr} = 50 \text{ ns}$ (@ $I_F = 50 \text{ A}$)
- Max Forward Voltage($V_F = 2.1 \text{ V}$ (@ $T_C = 25 \text{ }^\circ\text{C}$)
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- This Device is Pb-Free and is RoHS Compliant

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

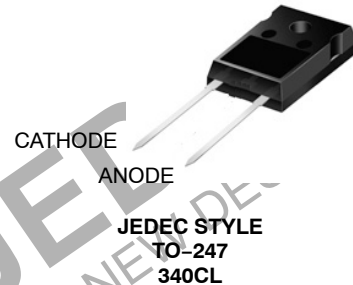
Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	600	V
Working Peak Reverse Voltage	V_{RWM}	600	V
DC Blocking Voltage	V_R	600	V
Average Rectified Forward Current ($T_C = 93 \text{ }^\circ\text{C}$)	$I_{F(AV)}$	50	A
Repetitive Peak Surge Current (Square Wave, 20 kHz)	I_{FRM}	100	A
Nonrepetitive Peak Surge Current (Halfwave 1 Phase, 60 Hz)	I_{FSM}	500	A
Maximum Power Dissipation	P_D	150	W
Avalanche Energy (See Figure 10 and Figure 11)	E_{AVL}	40	mJ
Operating and Storage Temperature	T_{STG}, T_J	-65 to +175	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

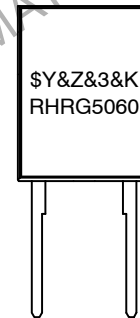


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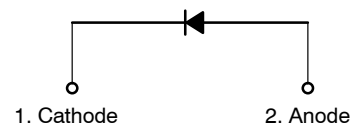
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MARKING DIAGRAM



\$Y = ON Semiconductor Logo
&Z = Assembly Plant Code
&3 = Numeric Date Code
&K = Lot Code
RHRG5060 = Specific Device Code



ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

RHRG5060**PACKAGE MARKING AND ORDERING INFORMATION**

Part Number	Package	Brand
RHRG5060	TO-247-2L	RHRG5060

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_F	Instantaneous Forward Voltage (Pulse Width = 300 μs , Duty Cycle = 2%)	$I_F = 50\text{ A}$			2.1	V
		$I_F = 50\text{ A}$, $T_C = 150^\circ\text{C}$			1.7	V
I_R	Instantaneous Reverse Current	$V_R = 600\text{ V}$			250	μA
		$V_R = 600\text{ V}$ $T_C = 150^\circ\text{C}$			1.5	mA
t_{rr}	Reverse Recovery Time (See Figure 9) Summation of $t_a + t_b$	$I_F = 1\text{ A}$, $dI_F/dt = 100\text{ A}/\mu\text{s}$			45	ns
		$I_F = 50\text{ A}$, $dI_F/dt = 100\text{ A}/\mu\text{s}$			50	ns
t_a	Time to Reach Peak Reverse Current (See Figure 9)	$I_F = 50\text{ A}$, $dI_F/dt = 100\text{ A}/\mu\text{s}$		25		ns
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)	$I_F = 50\text{ A}$, $dI_F/dt = 100\text{ A}/\mu\text{s}$		20		ns
Q_{rr}	Reverse Recovery Charge	$I_F = 50\text{ A}$, $dI_F/dt = 100\text{ A}/\mu\text{s}$		65		nC
C_J	Junction Capacitance	$V_R = 10\text{ V}$, $I_F = 0\text{ A}$		140		pF
$R_{\theta JC}$	Thermal Resistance Junction to Case				1.0	$^\circ\text{C}/\text{W}$

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

DISCONTINUED
 THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
 PLEASE CONTACT YOUR onsemi REPRESENTATIVE FOR INFORMATION

RHRG5060

TYPICAL PERFORMANCE CURVES

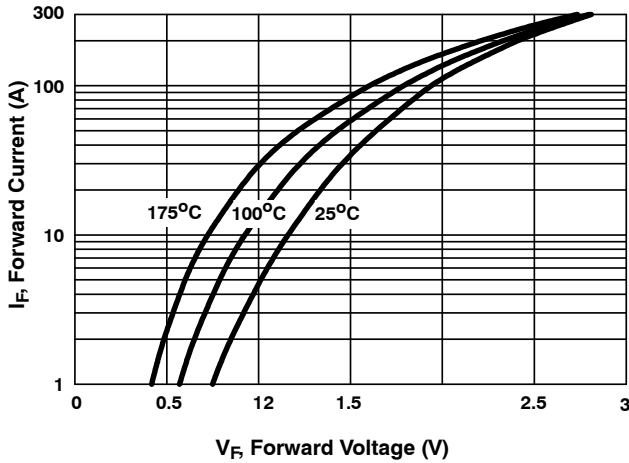


Figure 1. Forward Current vs. Forward Voltage

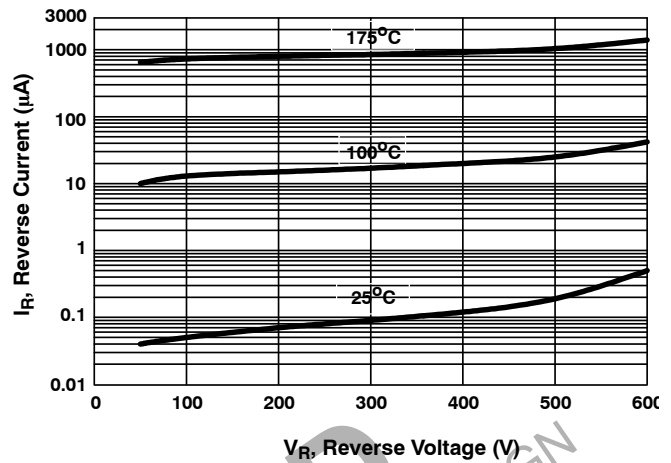


Figure 2. Reverse Current vs. Reverse Voltage

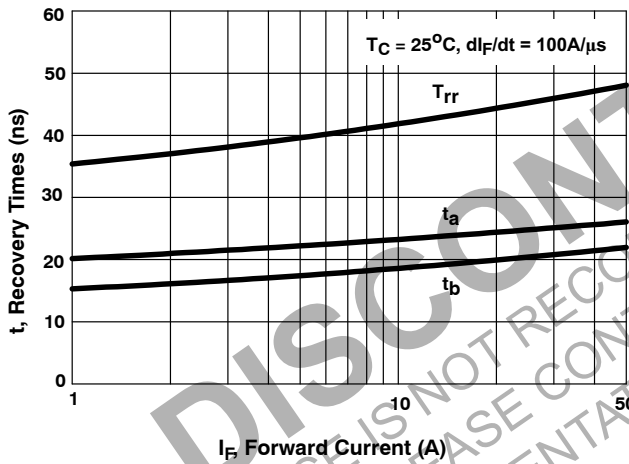


Figure 3. T_{rr} , t_a and t_b Curves vs. Forward Current

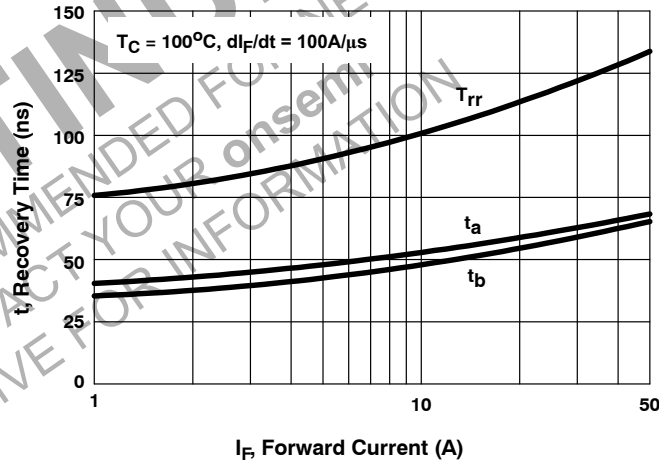


Figure 4. T_{rr} , t_a and t_b Curves vs. Forward Current

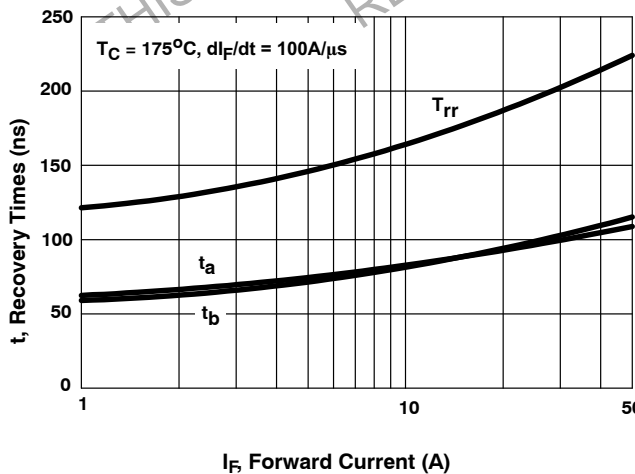


Figure 5. T_{rr} , t_a and t_b Curves vs. Forward Current

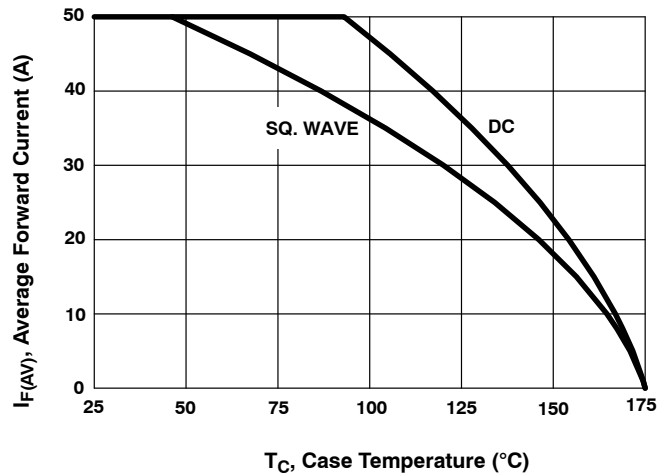


Figure 6. Current Derating Curve

RHRG5060

TYPICAL PERFORMANCE CURVES (continued)

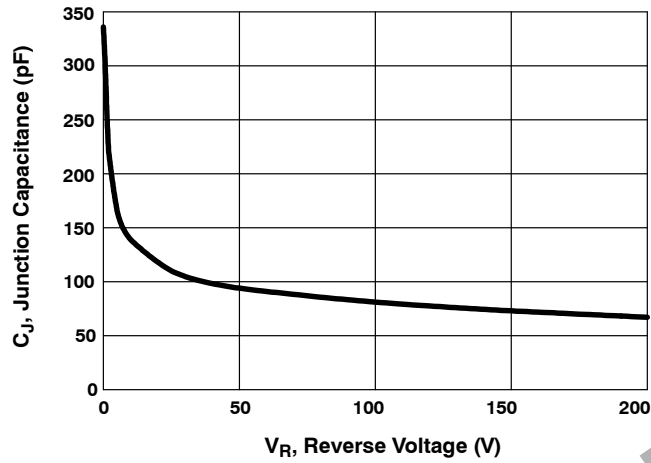


Figure 7. Junction Capacitance vs. Reverse Voltage

TEST CIRCUITS AND WAVEFORMS

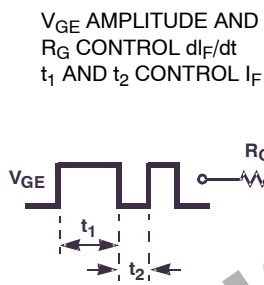


Figure 8. T_{rr} Test Circuit

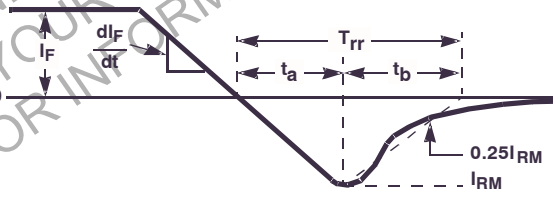


Figure 9. T_{rr} Waveforms and Definitions

$I = 1 \text{ A}$
 $L = 40 \text{ mH}$
 $R < 0.1 \text{ } \Omega$
 $E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
 $Q_1 = \text{IGBT (} BV_{CES} > \text{DUT } V_{R(AVL)})$

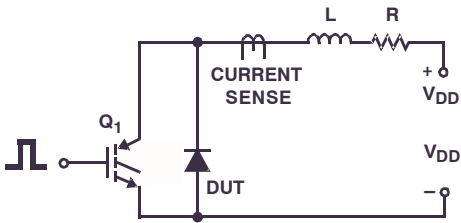


Figure 10. Avalanche Energy Test Circuit

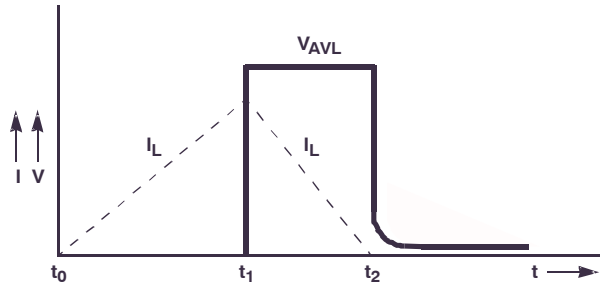
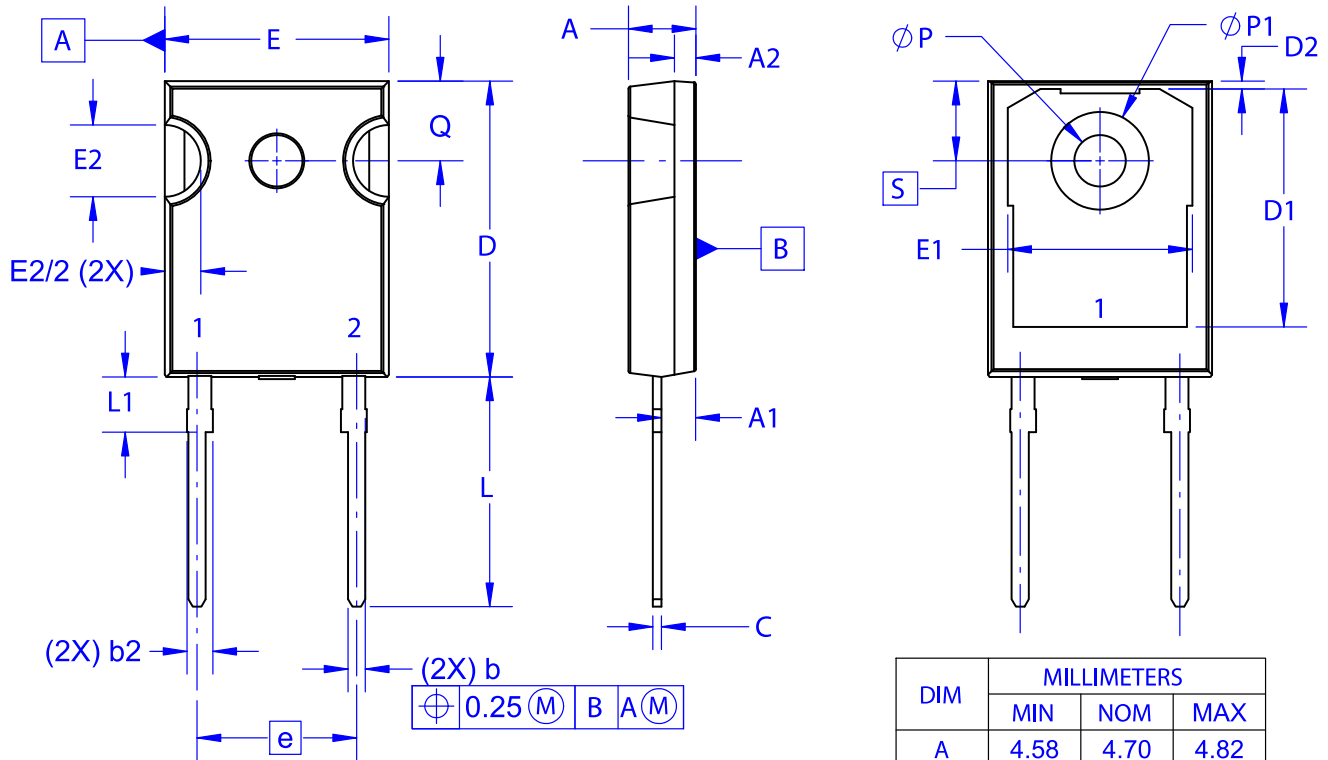


Figure 11. Avalanche Current and Voltage Waveforms

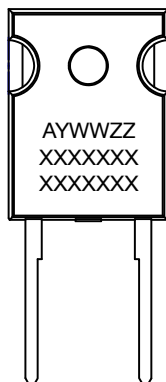
TO-247-2LD
CASE 340CL
ISSUE A

DATE 03 DEC 2019



NOTES: UNLESS OTHERWISE SPECIFIED.

- A. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
 B. ALL DIMENSIONS ARE IN MILLIMETERS.
 C. DRAWING CONFORMS TO ASME Y14.5 - 2009.
 D. DIMENSION A1 TO BE MEASURED IN THE REGION DEFINED BY L1.
 E. LEAD FINISH IS UNCONTROLLED IN THE REGION DEFINED BY L1.

GENERIC
MARKING DIAGRAM*


XXXX = Specific Device Code
 A = Assembly Location
 Y = Year
 WW = Work Week
 ZZ = Assembly Lot Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.58	4.70	4.82
A1	2.29	2.40	2.66
A2	1.30	1.50	1.70
b	1.17	1.26	1.35
b2	1.53	1.65	1.77
c	0.51	0.61	0.71
D	20.32	20.57	20.82
D1	16.37	16.57	16.77
D2	0.51	0.93	1.35
E	15.37	15.62	15.87
E1	12.81	~	~
E2	4.96	5.08	5.20
e	~	11.12	~
L	15.75	16.00	16.25
L1	3.69	3.81	3.93
∅P	3.51	3.58	3.65
∅P1	6.61	6.73	6.85
Q	5.34	5.46	5.58
S	5.34	5.46	5.58

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