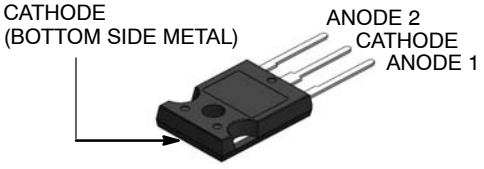
Hyperfast Dual Diode
60 A, 400 V - 600 V

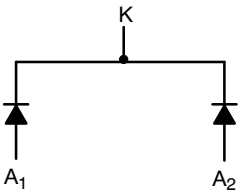
RHRG3060CC, RHRG3040CC

ON Semiconductor®

www.onsemi.com



TO−247−3LD
CASE 340CK



Description

The RHRG3060CC, RHRG3040CC is a hyperfast dual 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.

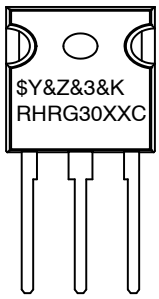
Features

- Hyperfast Recovery t_{rr} = 45 ns (@ I_F = 30 A)
- Max Forward Voltage, V_F = 2.1 V (@ T_C = 25°C)
- High Reverse Voltage and High Reliability
- Avalanche Energy Rated
- These Devices are Pb−Free and are RoHS Compliant

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

MARKING DIAGRAM



$Y	= ON Semiconductor Logo
&Z	= Assembly Plant Code
&3	= Numeric Date Code
&K	= Lot Code
RHRG30XXC	= Specific Device Code
XX	= 60, 40

ORDERING INFORMATION

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

ABSOLUTE MAXIMUM RATING (Per Leg) (T_J = 25°C, unless otherwise specified)

Description	Symbol	RHRG3060CC	RHRG3040CC	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	600	400	V
Working Peak Reverse Voltage	V_{RWM}	600	400	V
DC Blocking Voltage	V_R	600	400	V
Average Rectified Forward Current (T_C = 120°C)	$I_{F(AV)}$	30	30	A
Repetitive Peak Surge Current (Square Wave, 20 kHz)	I_{FRM}	70	70	A
Non−repetitive Peak Surge Current (Halfwave, 1 Phase, 60 Hz)	I_{FSM}	325	325	A
Maximum Power Dissipation	P_D	125	125	W
Avalanche Energy (See Figures 10 and 11)	E_{AVL}	20	20	mJ
Operating and Storage Temperature	T_{STG}, T_J	−65 to 175	−65 to 175	°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.

PACKAGE MARKING AND ORDERING INFORMATION

Part Number	Top Mark	Package	Shipping
RHRG3060CC	RHRG3060C	TO−247−3L	450 / Tube
RHRG3040CC	RHRG3040C	TO−247−3L	450 / Tube

ELECTRICAL SPECIFICATIONS (Per Leg) (T_J = 25°C, unless otherwise specified)

Characteristic	Symbol	Test Conditions	RHRG3060CC			RHRG3040CC			Unit
			Min	Typ	Max	Min	Typ	Max	Unit
Instantaneous Forward Voltage (Pulse Width = 300 μs, Duty Cycle = 2%)	V_F	I_F = 30 A	–	–	2.1	–	–	2.1	V
		I_F = 30 A, T_C = 150°C	–	–	1.7	–	–	1.7	V
Instantaneous Reverse Current	I_R	V_R = 400 V	–	–	–	–	–	250	μA
		V_R = 600 V	–	–	250	–	–	–	μA
		V_R = 400 V, T_C = 150°C	–	–	–	–	–	1.0	mA
		V_R = 600 V, T_C = 150°C	–	–	1.0	–	–	–	mA
Reverse Recovery Time (See Figure 9), Summation of ta + tb.	T_{rr}	I_F = 1 A, dI_F/dt = 200 A/μs	–	–	40	–	–	40	ns
		I_F = 30 A, dI_F/dt = 200 A/μs	–	–	45	–	–	45	ns
Time to Reach Peak Reverse Current (See Figure 9).	t_a	I_F = 30 A, dI_F/dt = 200 A/μs	–	22	–	–	22	–	ns
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).	t_b	I_F = 30 A, dI_F/dt = 200 A/μs	–	18	–	–	18	–	ns
Reverse Recovery Charge	Q_{rr}	I_F = 30 A, dI_F/dt = 200 A/μs	–	100	–	–	100	–	nC
Junction Capacitance	C_J	V_R = 10 V, I_F = 0 A	–	85	–	–	85	–	pF
Thermal Resistance Junction to Case	$R_{\theta JC}$		–	–	1.2	–	–	1.2	°C/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.

TYPICAL PERFORMANCE CURVES

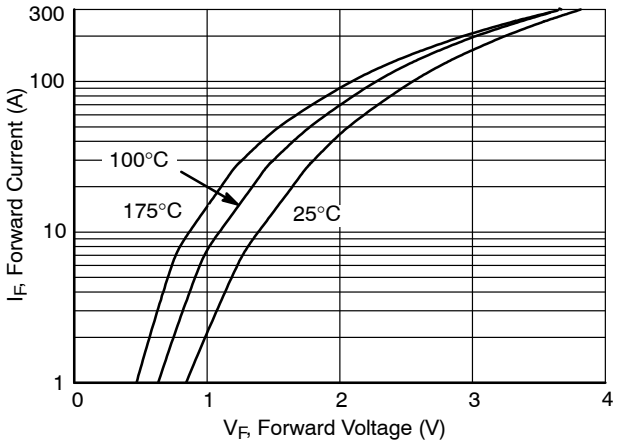


Figure 1. Forward Current vs. Forward Voltage

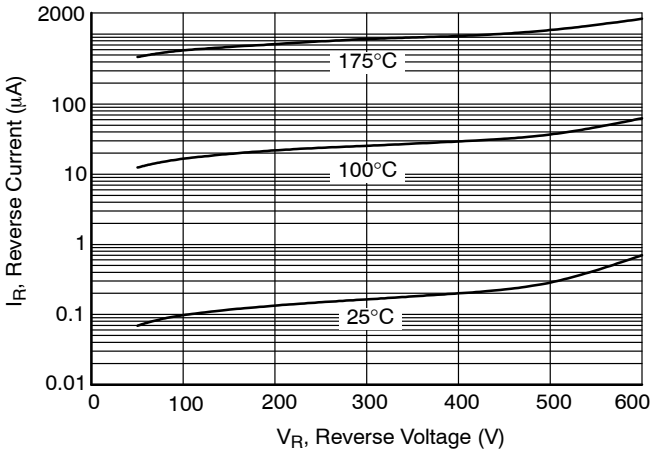


Figure 2. Reverse Current vs. Reverse Voltage

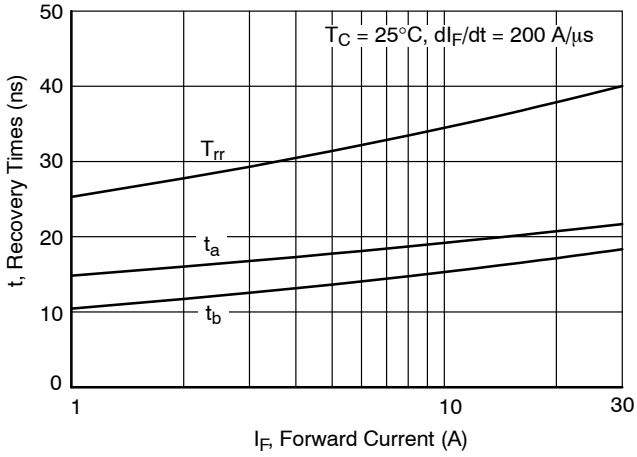


Figure 3. T_{rr}, t_a and t_b Curves vs. Forward Current

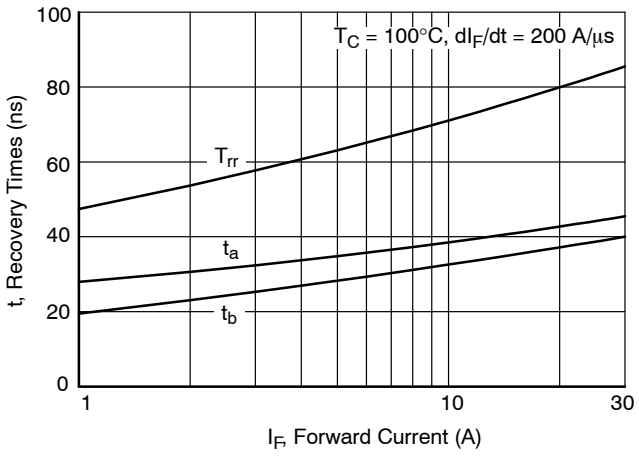


Figure 4. T_{rr}, t_a and t_b Curves vs. Forward Current

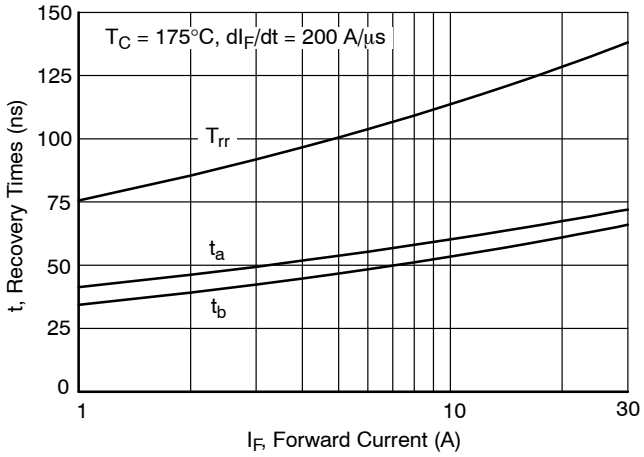


Figure 5. T_{rr}, t_a and t_b Curves vs. Forward Current

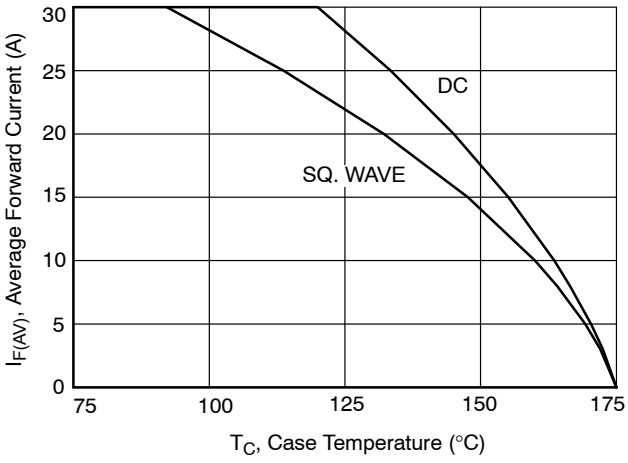


Figure 6. Current Derating Curve

TYPICAL PERFORMANCE CURVES (continued)

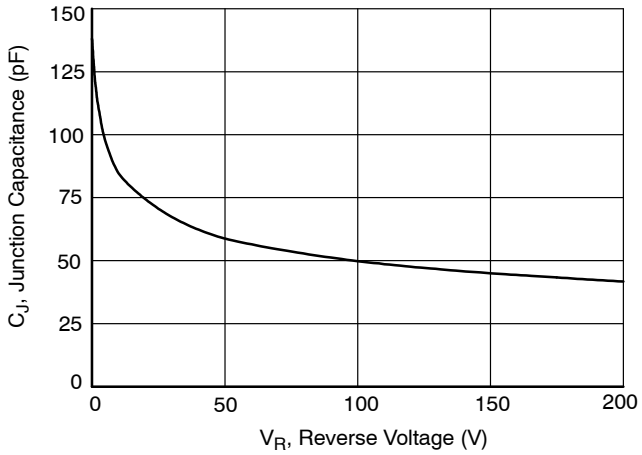


Figure 7. Junction Capacitance vs. Reverse Voltage

TEST CIRCUITS AND WAVEFORMS

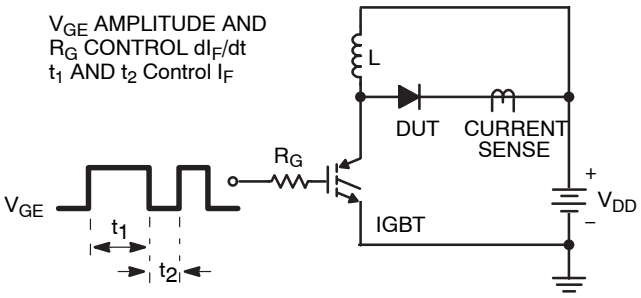


Figure 8. T_{rr} Test Circuit

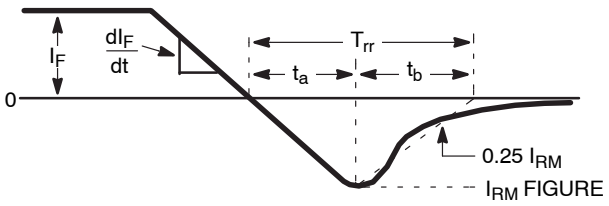


Figure 9. T_{rr} Waveforms and Definitions

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

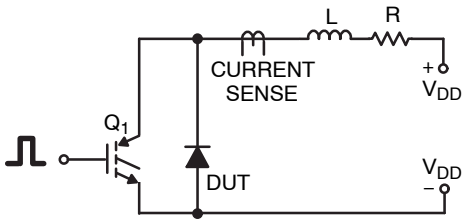


Figure 10. Avalanche Energy Test Circuit

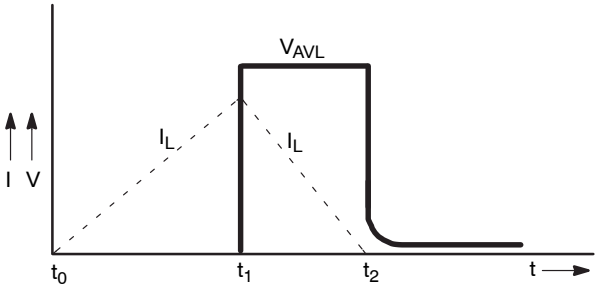
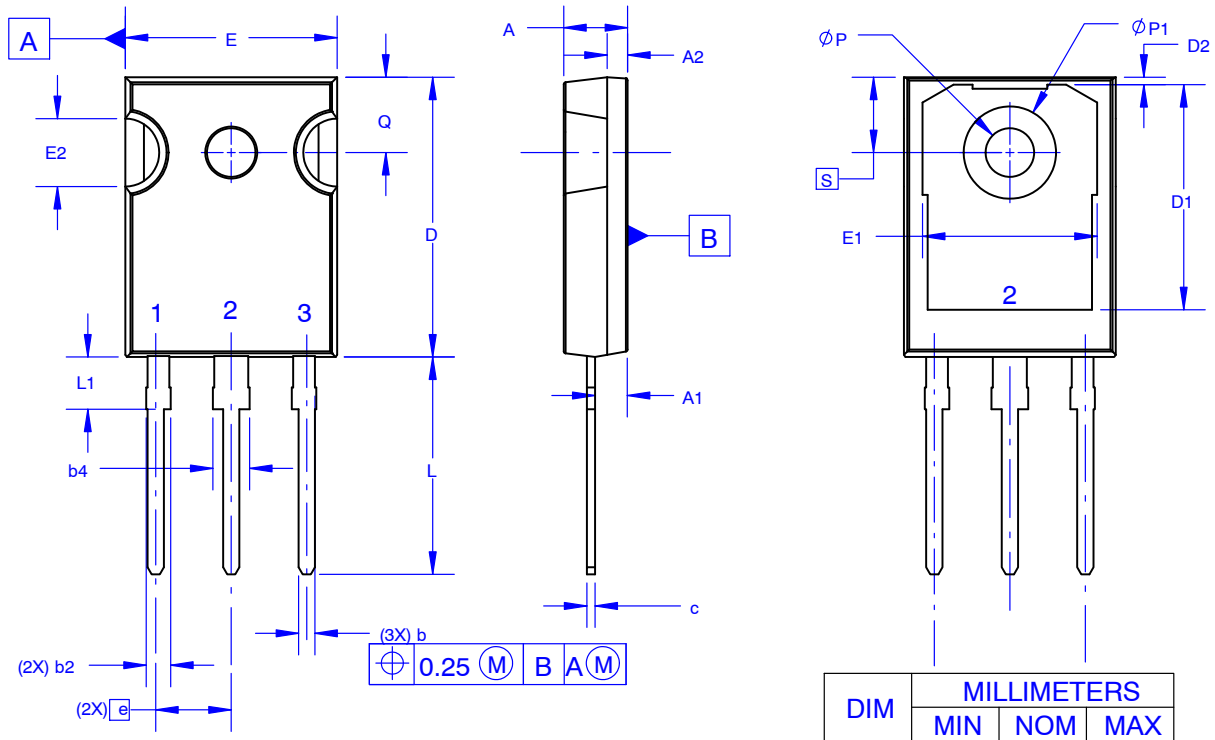


Figure 11. Avalanche Current and Voltage Waveforms

TO−247−3LD SHORT LEAD
CASE 340CK
ISSUE A

DATE 31 JAN 2019

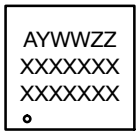


DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.58	4.70	4.82
A1	2.20	2.40	2.60
A2	1.40	1.50	1.60
b	1.17	1.26	1.35
b2	1.53	1.65	1.77
b4	2.42	2.54	2.66
c	0.51	0.61	0.71
D	20.32	20.57	20.82
D1	13.08	~	~
D2	0.51	0.93	1.35
E	15.37	15.62	15.87
E1	12.81	~	~
E2	4.96	5.08	5.20
e	~	5.56	~
L	15.75	16.00	16.25
L1	3.69	3.81	3.93
ØP	3.51	3.58	3.65
ØP1	6.60	6.80	7.00
Q	5.34	5.46	5.58
S	5.34	5.46	5.58

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.

DOCUMENT NUMBER:	**98AON13851G**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.
DESCRIPTION:	**TO−247−3LD SHORT LEAD**	**PAGE 1 OF 1**

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales