WINSOURCE ELECTRONICS

THE DATASHEET OF

RHRG1560CC

Hyperfast Dual Diode
30 A, 400 V - 600 V

RHRG1560CC, RHRG1540CC

Description

The RHRG1560CC, RHRG1540CC 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} = 40 ns (@ I_F = 15 A)
- Max Forward Voltage, V_F = 2.1 V (@ T_C = 25°C)
- 400 V, 600 V 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

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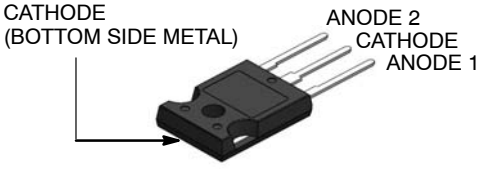
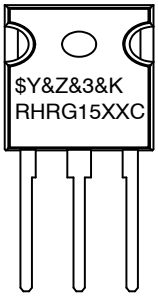
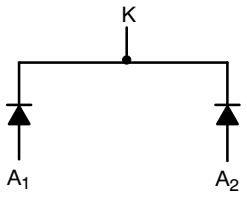


TO−247−3LD
CASE 340CK

MARKING DIAGRAM



$Y	= ON Semiconductor Logo
&Z	= Assembly Plant Code
&3	= Numeric Date Code
&K	= Lot Code
RHRG15XXC	= Specific Device Code
XX	= 60, 40



ORDERING INFORMATION

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

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

Description	Symbol	RHRG1560CC	RHRG1540CC	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 = 140°C)	$I_{F(AV)}$	15	15	A
Repetitive Peak Surge Current (Square Wave, 20 kHz)	I_{FRM}	30	30	A
Non−repetitive Peak Surge Current (Halfwave, 1 Phase, 60 Hz)	I_{FSM}	200	200	A
Maximum Power Dissipation	P_D	100	100	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
RHRG1560CC	RHRG1560C	TO−247−3L	450 / Tube
RHRG1540CC	RHRG1540C	TO−247−3L	450 / Tube

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

Characteristic	Symbol	Test Conditions	RHRG1560CC			RHRG1540CC			Unit
			Min	Typ	Max	Min	Typ	Max	Unit
Instantaneous Forward Voltage (Pulse Width = 300 μs, Duty Cycle = 2%)	V_F	I_F = 15 A	–	–	2.1	–	–	2.1	V
		I_F = 15 A, T_C = 150°C	–	–	1.7	–	–	1.7	V
Instantaneous Reverse Current	I_R	V_R = 400 V	–	–	–	–	–	100	μA
		V_R = 600 V	–	–	100	–	–	–	μA
		V_R = 400 V, T_C = 150°C	–	–	–	–	–	500	μA
		V_R = 600 V, T_C = 150°C	–	–	500	–	–	–	μA
Reverse Recovery Time (See Figure 9), Summation of ta + tb.	T_{rr}	I_F = 1 A, dI_F/dt = 100 A/μs	–	–	35	–	–	35	ns
		I_F = 15 A, dI_F/dt = 100 A/μs	–	–	40	–	–	40	ns
Time to Reach Peak Reverse Current (See Figure 9).	t_a	I_F = 15 A, dI_F/dt = 100 A/μs	–	20	–	–	20	–	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 IRM (See Figure 9).	t_b	I_F = 15 A, dI_F/dt = 100 A/μs	–	15	–	–	15	–	ns
Reverse Recovery Charge	Q_{rr}	I_F = 15 A, dI_F/dt = 100 A/μs	–	40	–	–	40	–	nC
Junction Capacitance	C_J	V_R = 10 V, I_F = 0 A	–	60	–	–	60	–	pF
Thermal Resistance Junction to Case	$R_{\theta JC}$		–	–	1.5	–	–	1.5	°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

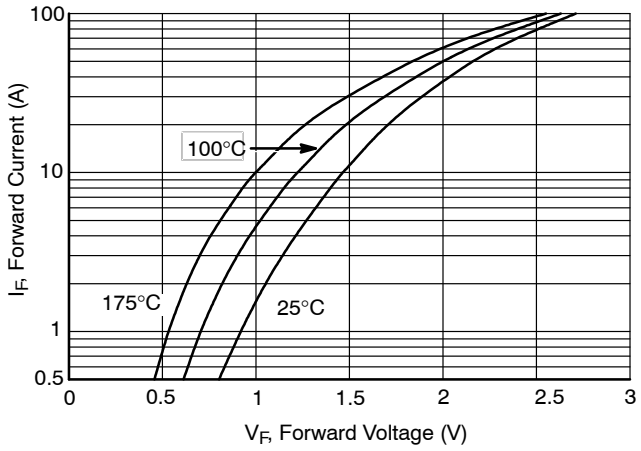

Figure 1. Forward Current vs. Forward Voltage

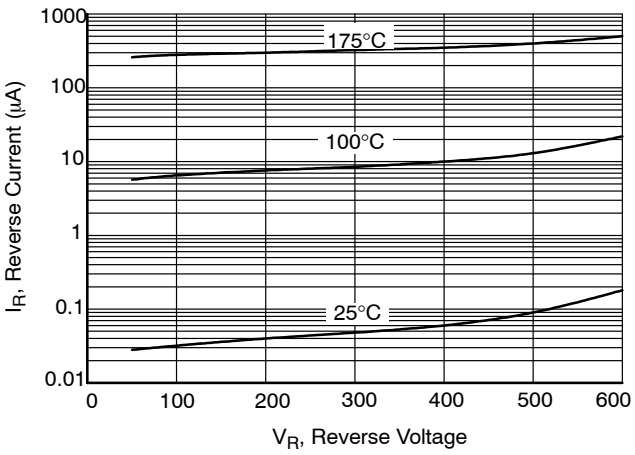

Figure 2. Reverse Current vs. Reverse Voltage

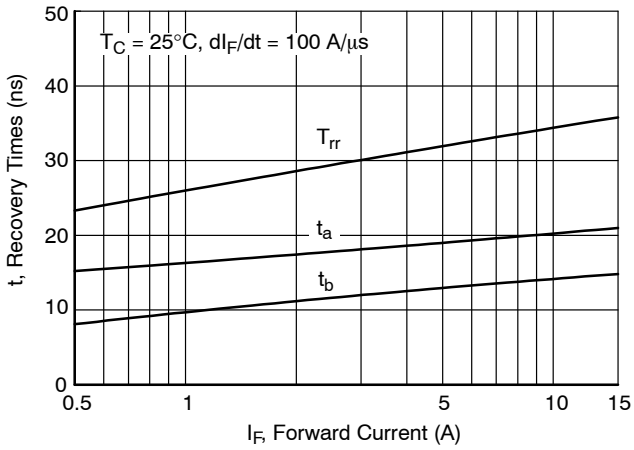

Figure 3. T_{rr}, t_a and t_b Curves vs. Forward Current

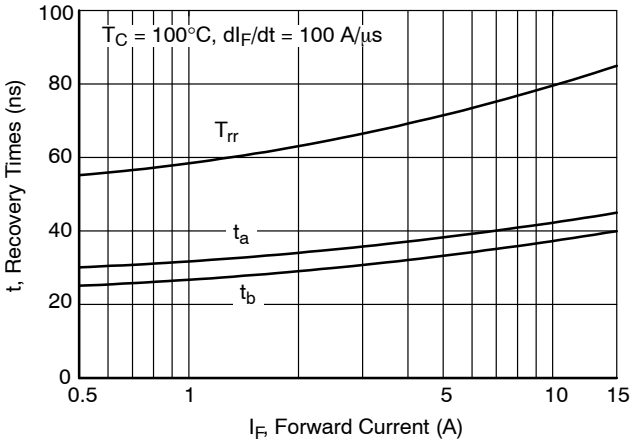

Figure 4. T_{rr}, t_a and t_b Curves vs. Forward Current

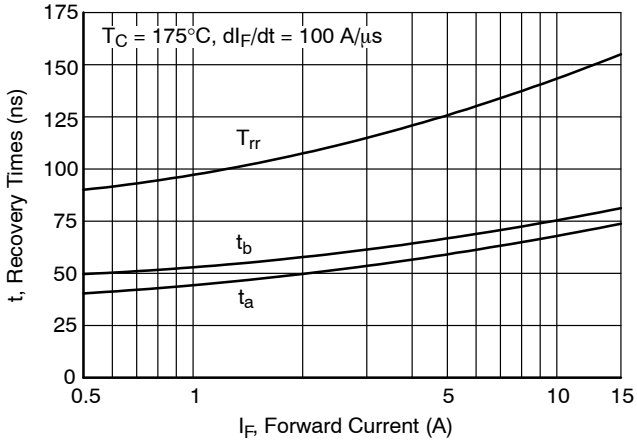

Figure 5. T_{rr}, t_a and t_b Curves vs. Forward Current

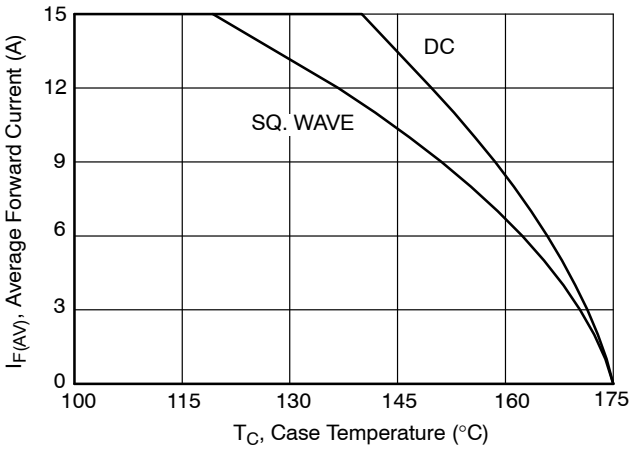

Figure 6. Current Derating Curve

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

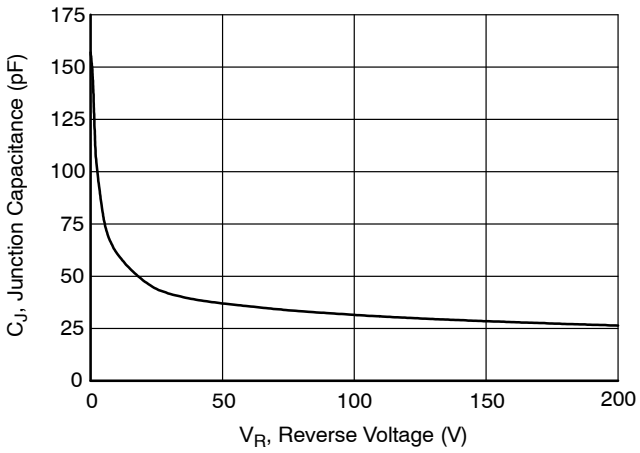

Figure 7. Junction Capacitance vs. Reverse Voltage

TEST CIRCUITS AND WAVEFORMS

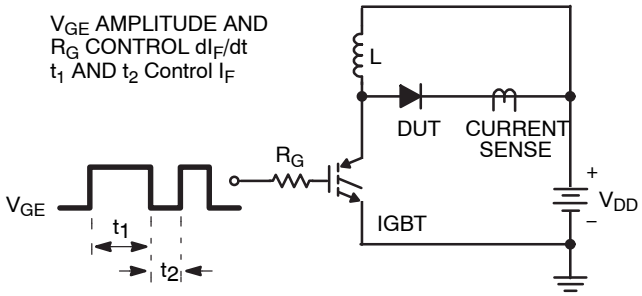

Figure 8. T_{rr} Test Circuit

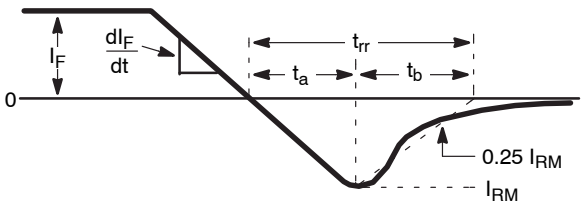

Figure 9. T_{rr} Waveforms and Definitions

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 $V_{R(AVL)}$)

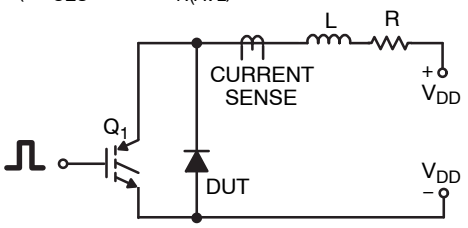

Figure 10. Avalanche Energy Test Circuit

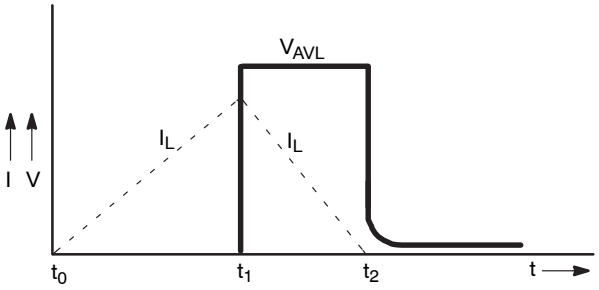

Figure 11. Avalanche Current and Voltage Waveforms

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

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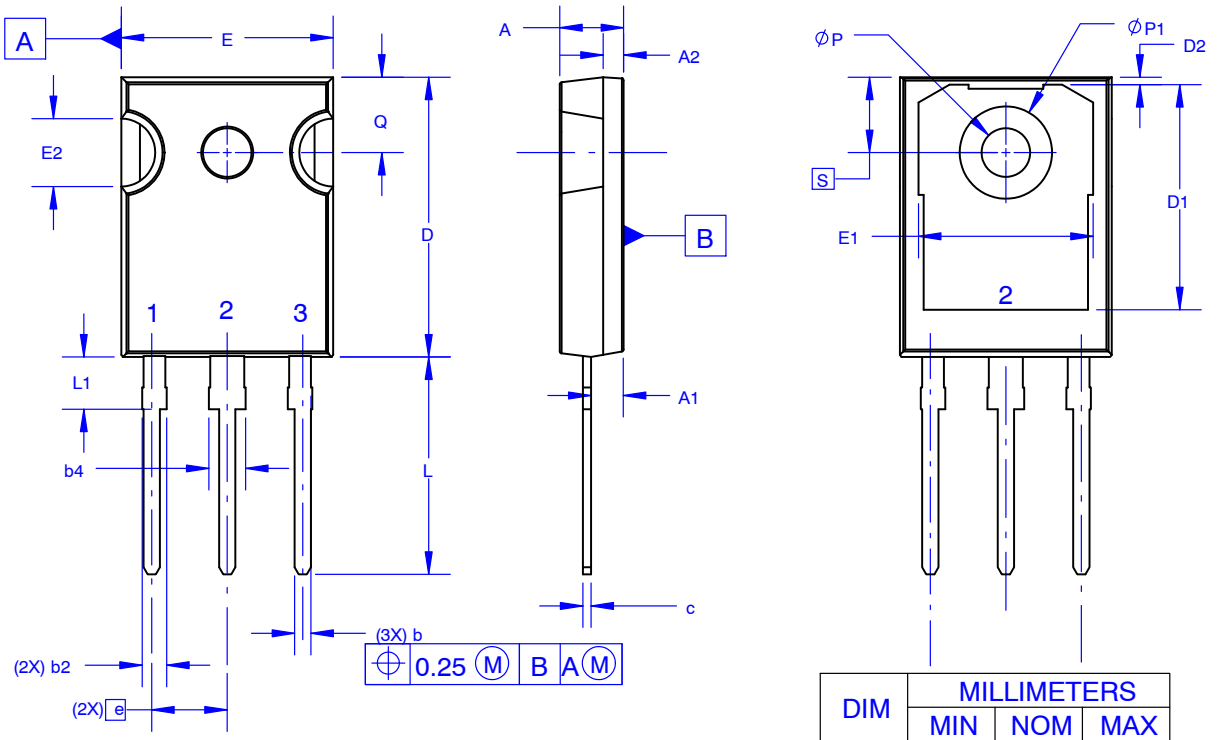
TO−247−3LD SHORT LEAD
CASE 340CK
ISSUE A

DATE 31 JAN 2019

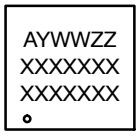


DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.58	4.70	4.82
A1	2.20	2.40	2.60
A2	1.40	1.50	1.60
b	1.17	1.26	1.35
b2	1.53	1.65	1.77
b4	2.42	2.54	2.66
c	0.51	0.61	0.71
D	20.32	20.57	20.82
D1	13.08	~	~
D2	0.51	0.93	1.35
E	15.37	15.62	15.87
E1	12.81	~	~
E2	4.96	5.08	5.20
e	~	5.56	~
L	15.75	16.00	16.25
L1	3.69	3.81	3.93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

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