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**30 A, 400 V - 600 V,
Hyperfast Dual Diode**

Description

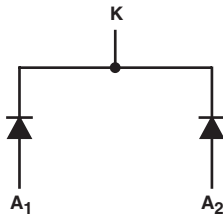
The RHRG1540CC, RHRG1560CC is a hyperfast dual diode with soft recovery characteristics. It has the half recovery time of ultrafast diodes and is silicon nitride passivated ionimplanted epitaxial planar construction. These devices are intended to be used as freewheeling/clamping diodes and diodes in 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.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RHRG1540CC	TO-247-2L	RHRG1540C
RHRG1560CC	TO-247-2L	RHRG1560C

NOTE: When ordering, use the entire part number.

Symbol



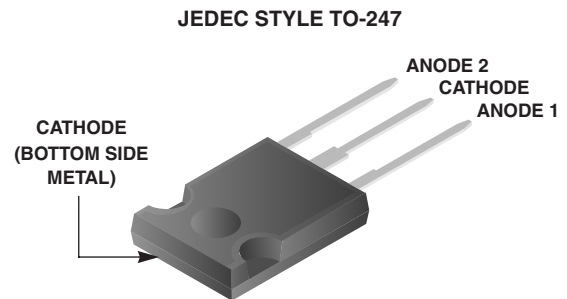
Features

- Hyperfast Recovery $t_{rr} = 40$ ns (@ $I_F = 15$ A)
- Max Forward Voltage, $V_F = 2.1$ V (@ $T_C = 25^\circ\text{C}$)
- 400 V, 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging



Absolute Maximum Rating (Per Leg) $T_C = 25^\circ\text{C}$, Unless Otherwise Specified

	RHRG1540CC	RHRG1560CC	UNITS
Peak Repetitive Reverse Voltage	V_{RRM} 400	600	V
Working Peak Reverse Voltage	V_{RWM} 400	600	V
DC Blocking Voltage	V_R 400	600	V
Average Rectified Forward Current ($T_C = 140^\circ\text{C}$)	$I_{F(AV)}$ 15	15	A
Repetitive Peak Surge Current (Square Wave, 20 kHz)	I_{FRM} 30	30	A
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60 Hz)	I_{FSM} 200	200	A
Maximum Power Dissipation	P_D 100	100	W
Avalanche Energy (See Figure 10 and 11)	E_{AVL} 20	20	mJ
Operating and Storage Temperature	T_{STG}, T_J -65 to 175	-65 to 175	$^\circ\text{C}$

RHRG1540CC, RHRG1560CC

Electrical Specifications (Per Leg) $T_C = 25^\circ\text{C}$, Unless Otherwise Specified

SYMBOL	TEST CONDITION	RHRG1540CC			RHRG1560CC			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
V_F	$I_F = 15\text{ A}$	-	-	2.1	-	-	2.1	V
	$I_F = 15\text{ A}, T_C = 150^\circ\text{C}$	-	-	1.7	-	-	1.7	V
I_R	$V_R = 400\text{ V}$	-	-	100	-	-	-	μA
	$V_R = 600\text{ V}$	-	-	-	-	-	100	μA
	$V_R = 400\text{ V}, T_C = 150^\circ\text{C}$	-	-	500	-	-	-	μA
	$V_R = 600\text{ V}, T_C = 150^\circ\text{C}$	-	-	-	-	-	500	μA
t_{rr}	$I_F = 1\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$	-	-	35	-	-	35	ns
	$I_F = 15\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$	-	-	40	-	-	40	ns
t_a	$I_F = 15\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$	-	20	-	-	20	-	ns
t_b	$I_F = 15\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$	-	15	-	-	15	-	ns
Q_{rr}	$I_F = 15\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$	-	40	-	-	40	-	nC
C_J	$V_R = 10\text{ V}, I_F = 0\text{ A}$	-	60	-	-	60	-	pF
$R_{\theta JC}$		-	-	1.5	-	-	1.5	$^\circ\text{C}/\text{W}$

DEFINITIONS

V_F = Instantaneous forward voltage (pw = 300 μs , 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

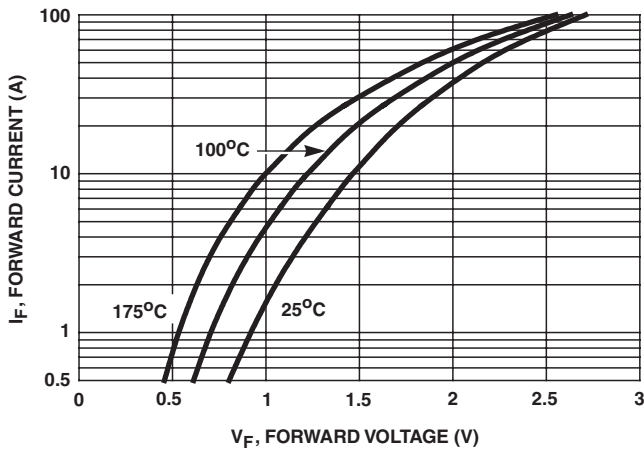


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

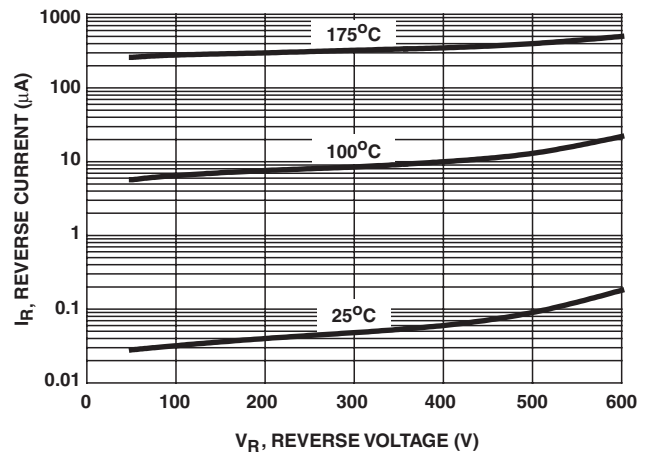


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

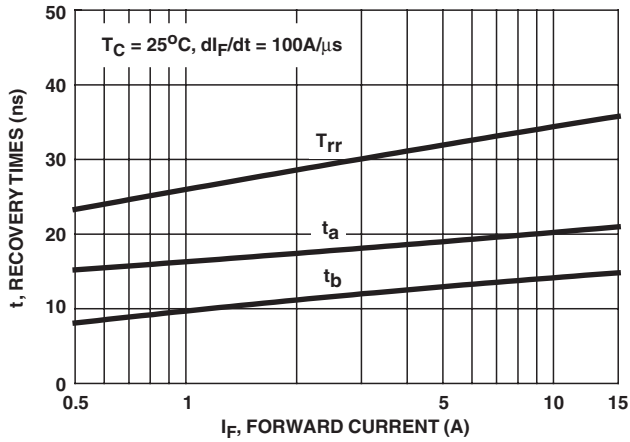


FIGURE 3. T_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

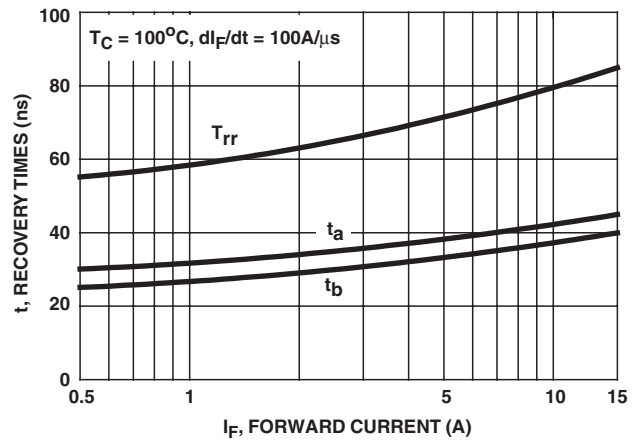


FIGURE 4. T_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

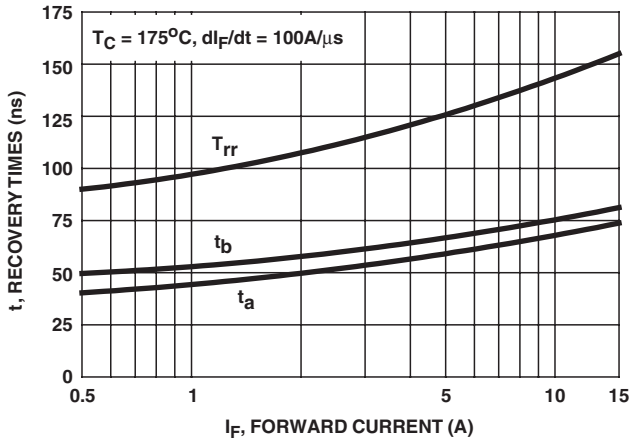


FIGURE 5. T_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

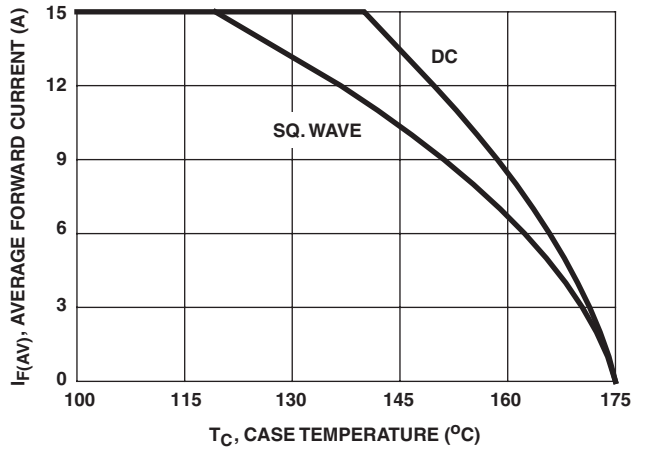


FIGURE 6. CURRENT DERATING CURVE

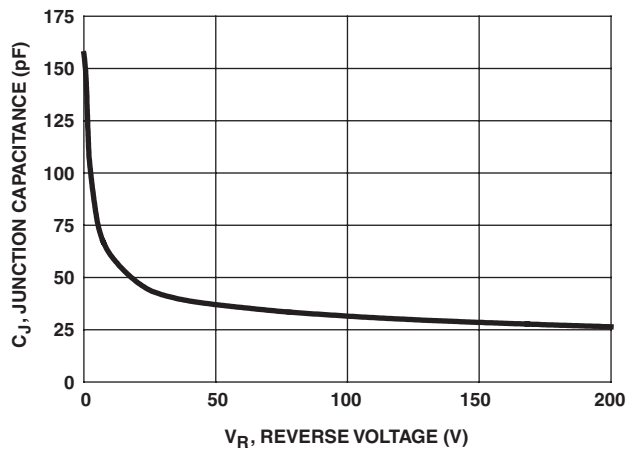


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

Test Circuits and Waveforms

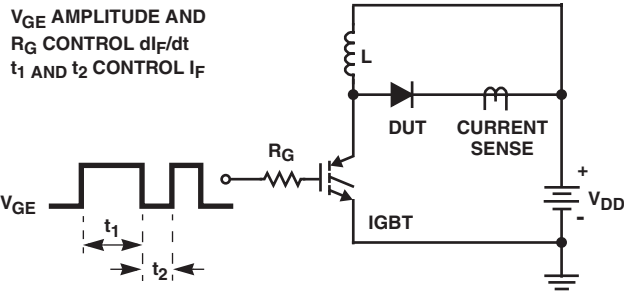


FIGURE 8. T_{rr} TEST CIRCUIT

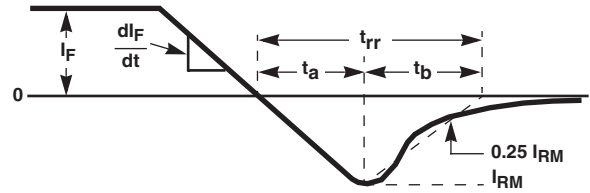


FIGURE 9. T_{rr} WAVEFORMS AND DEFINITIONS

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

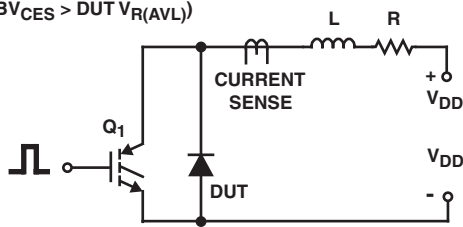


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

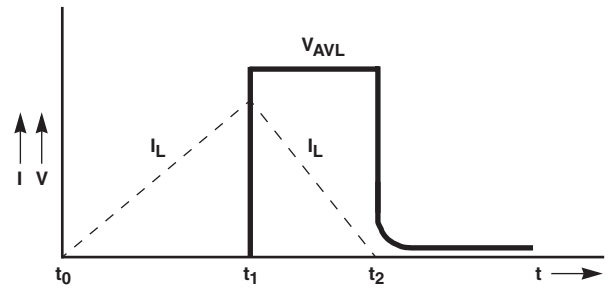
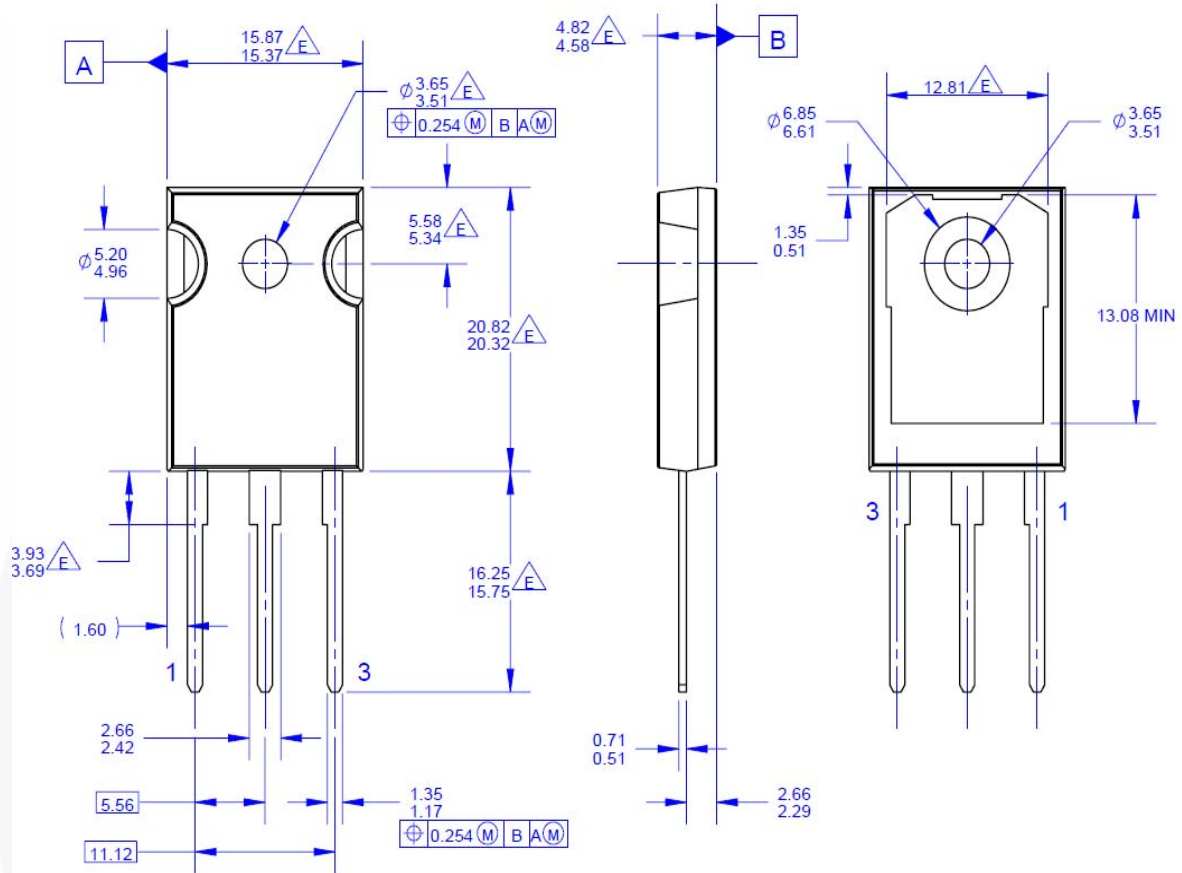


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

TO247-3L



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- D. DRAWING CONFORMS TO ASME Y14.5 - 1994

$\triangle E$ DOES NOT COMPLY JEDEC STANDARD VALUE
 F. DRAWING FILENAME: MKT-TO247A03_REV03

Figure 12. TO-247, Molded, 3LD, Jecdec Option AB

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