Hyperfast Diode 30 A, 1200 V

RHRG30120

Description

The RHRG30120 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 $t_{rr} = 85 \text{ ns}$ (@ $I_F = 30 \text{ A}$)
- Max Forward Voltage, $V_F = 3.2 \text{ V}$ (@ $T_C = 25^{\circ}\text{C}$)
- 1200 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°C unless otherwise noted)

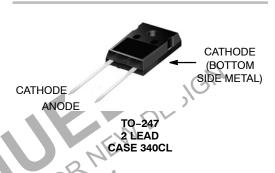
Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	VRRM	1200	V
Working Peak Reverse Voltage	V_{RWM}	1200	V
DC Blocking Voltage	V _R	1200	V
Average Rectified Forward Current (T _C = 80°C)	I _{F(AV)}	30	Α
Repetitive Peak Surge Current (Square Wave, 20 kHz)	I _{FRM}	60	Α
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60 Hz)	I _{FSM}	300	Α
Maximum Power Dissipation	P_{D}	125	W
Avalanche Energy (See Figures 7 and 8)	E _{AVL}	30	mJ
Operating and Storage Temperature	T_{STG}, T_{J}	-65 to 175	°C

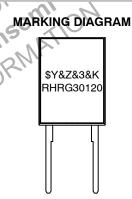
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



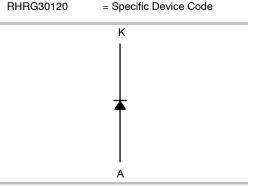
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\$Y = ON Semiconductor Logo = Assembly Plant Code &Z &3 = Numeric Date Code &K = Lot Code RHRG30120



ORDERING INFORMATION

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

RHRG30120

PACKAGE MARKING AND ORDERING INFORMATION

Device	Device Marking	Package	Shipping
RHRG30120	RHRG30120	TO-247-2L	450/Tube

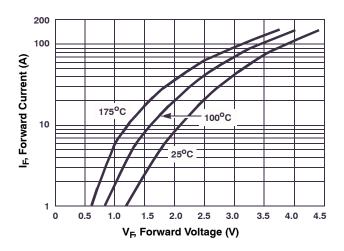
ELECTRICAL CHARACTERISTICS ($T_C = 25$ °C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Тур	Max	Unit
V _F Instantaneous Forward Voltage (Pulse Width = 300 μs, Duty Cycle =		I _F = 30 A			3.2	V
	(Pulse Width = 300 μs, Duty Cycle = 2%)	I _F = 30 A, T _C = 150°C			2.6	٧
I _R	Instantaneous Reverse Current	V _R = 1200 V			250	μΑ
		V _R = 1200 V T _C = 150°C			1	mA
t _{rr}	Reverse Recovery Time (See Figure 6) Summation of t _a + t _b	I _F = 1 A, di _F /dt = 100 A/μs			65	ns
		I _F = 30 A, di _F /dt = 100 A/μs			85	ns
t _a	Time to Reach Peak Reverse Current (See Figure 6)	I _F = 30 A, di _F /dt = 100 A/μs		48	•	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 6)	1 _F = 30 A, di _F /dt = 100 A/μs	NE	22		ns
$R_{ heta JC}$	Thermal Resistance Junction to Case		.61	10/2	1.2	°C/W

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

RHRG30120

TYPICAL PERFORMANCE CURVES



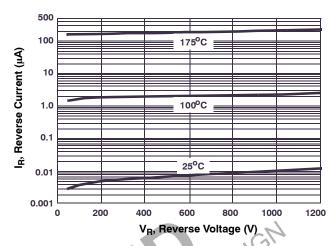
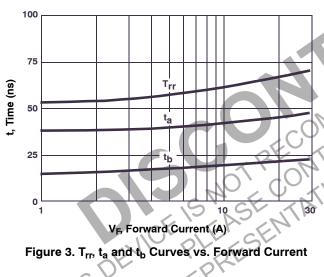


Figure 1. Forward Current vs. Forward Voltage

Figure 2. Reverse Current vs. Reverse Voltage



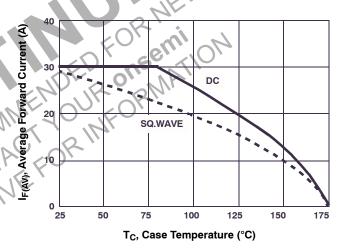
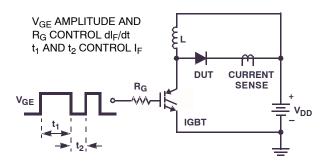


Figure 4. Current Derating Curve

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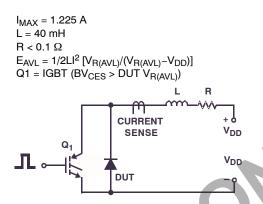
TEST CIRCUITS AND WAVEFORMS



 dI_F dt 0.25I_{RM} I_{RM}

Figure 5. T_{rr} Test Circuit

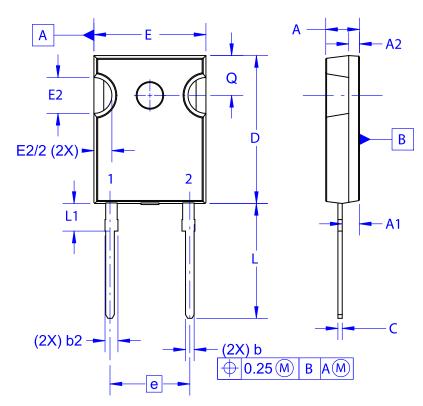
Figure 6. T_{rr} Waveforms and Definitions



TENN DESIGN -iergy Test Circuit Figure 8, Avalanche Current and Voltage Waveforms



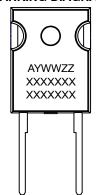






- A. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DRAWING CONFORMS TO ASME Y14.5 2009.
 D. DIMENSION A1 TO BE MEASURED IN THE REGION DEFINED BY L1.
- E. LEAD FINISH IS UNCONTROLLED IN THE REGION DEFINED BY L1.

GENERIC MARKING DIAGRAM*



XXXX = Specific Device Code

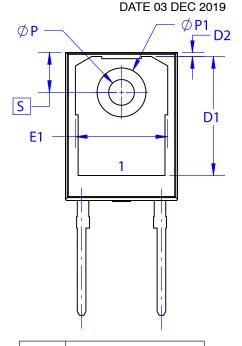
= Assembly Location

= Year

WW = Work Week

= 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			
DIM	MIN	NOM	MAX	
Α	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	
С	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	
Е	15.37	15.62	15.87	
E1	12.81	l	~	
E2	4.96	5.08	5.20	
е	~	11.12	~	
L	15.75	16.00	16.25	
L1	3.69	3.81	3.93	
ØΡ	3.51	3.58	3.65	
Ø P 1	6.61	6.73	6.85	
Q	5.34	5.46	5.58	
S	5.34	5.46	5.58	

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