Ultrafast Dual Diode
30 A, 200 V

RURG3020CC

Description

The RURG3020CC is an ultrafast dual diode with low forward voltage drop. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power switching applications. It is specially suited for use in switching power supplies and industrial application.

Features

- Ultrafast Recovery t_{rr} = 50 ns (@ I_F = 30 A)
- Max Forward Voltage, V_F = 1.0 V (@ T_C = 25°C)
- Reverse Voltage, V_{RRM} = 200 V
- Avalanche Energy Rated
- This Device is Pb−Free and is RoHS Compliant

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

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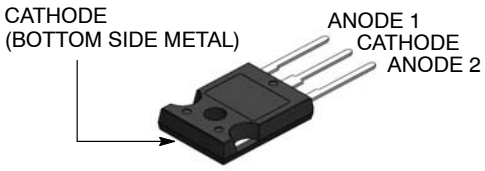
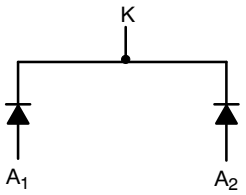
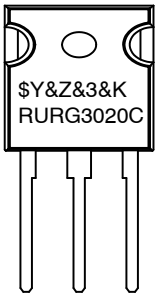


TO−247−3LD
CASE 340CK



MARKING DIAGRAM



$Y	= ON Semiconductor Logo
&Z	= Assembly Plant Code
&3	= Numeric Date Code
&K	= Lot Code
RURG3020C	= Specific Device Code

ORDERING INFORMATION

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

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ABSOLUTE MAXIMUM RATINGS (Per Leg) (T_C = 25°C)

Parameter	Symbol	Ratings	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	200	V
Working Peak Reverse Voltage	V_{RWM}	200	V
DC Blocking Voltage	V_R	200	V
Average Rectified Forward Current (Per Leg) (T_C = 145°C)	$I_{F(AV)}$	30	A
Repetitive Peak Surge Current (Square Wave, 20 kHz)	I_{FRM}	70	A
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60 Hz)	I_{FSM}	325	A
Maximum Power Dissipation	P_D	125	W
Avalanche Energy (See Figures 7 and 8)	E_{AVL}	20	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.

PACKAGE MARKING AND ORDERING INFORMATION

Device	Device Marking	Package	Shipping
RURG3020CC	RURG3020C	TO−247−3LD	450 / Tube

ELECTRICAL SPECIFICATION (Per Leg) (T_C = 25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Instantaneous Forward Voltage (Pulse Width = 300 μs, Duty Cycle = 2%)	V_F	I_F = 30 A	–	–	1.0	V
		I_F = 30 A, T_C = 150°C	–	–	0.85	V
Instantaneous Reverse Current	I_R	V_R = 200 V	–	–	250	μA
		V_R = 200 V, T_C = 150°C	–	–	1	mA
Reverse Recovery Time (See Figure 6) Summation of t_a + t_b	t_{rr}	I_F = 1 A, dI_F/dt = 100 A/μs	–	–	45	ns
		I_F = 30 A, dI_F/dt = 100 A/μs	–	–	50	ns
Time to Reach Peak Reverse Current (See Figure 6)	t_a	I_F = 30 A, dI_F/dt = 100 A/μs	–	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 I_{RM} (See Figure 6)	t_b	I_F = 30 A, dI_F/dt = 100 A/μs	–	15	–	ns
Thermal Resistance Junction to Case	$R_{\theta JC}$		–	–	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

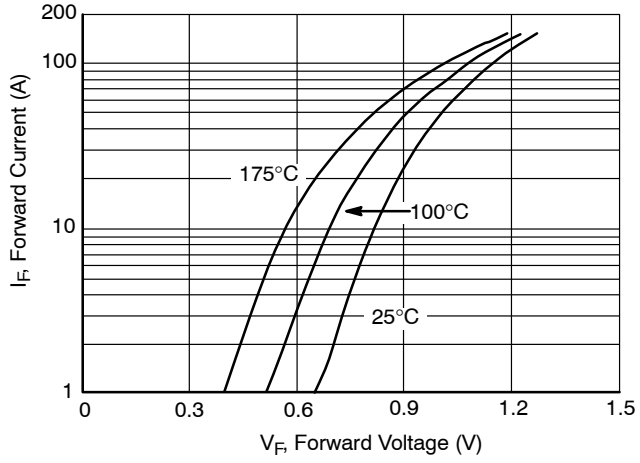

Figure 1. Forward Current vs. Forward Voltage

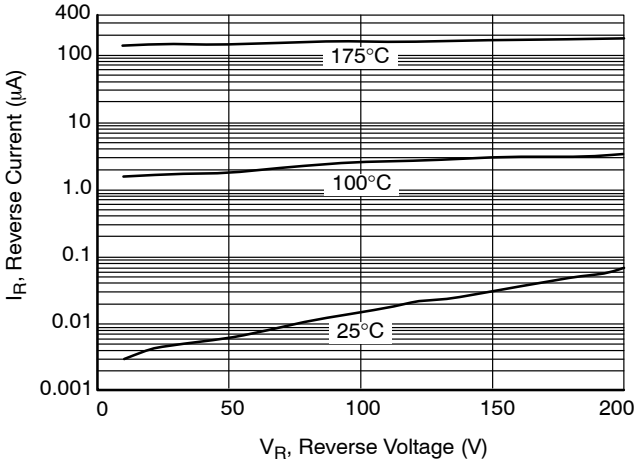

Figure 2. Reverse Current vs. Reverse Voltage

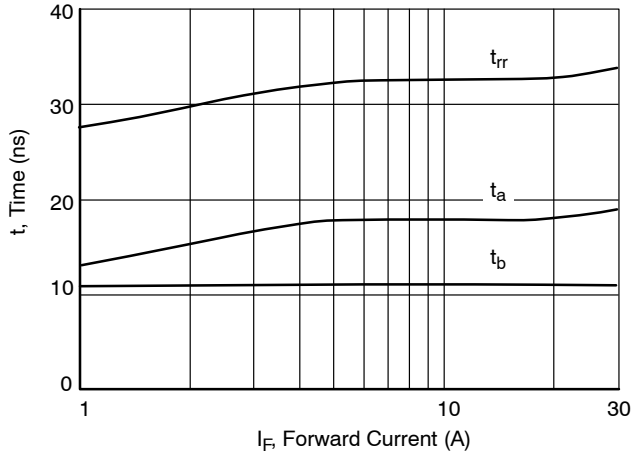

Figure 3. t_{rr}, t_a and t_b Curves vs. Forward Current

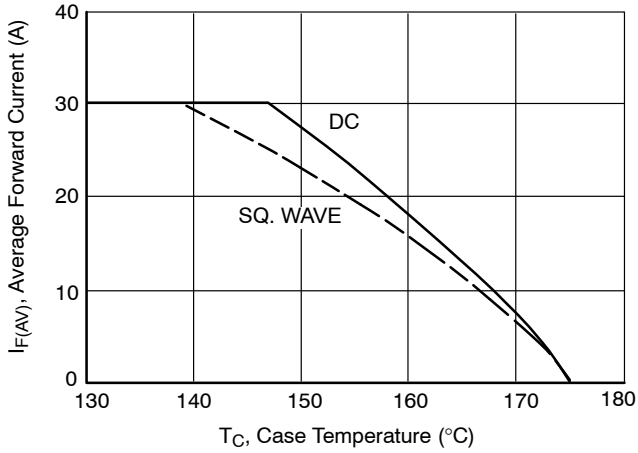

Figure 4. Current Derating Curve

TEST CIRCUITS AND WAVEFORMS

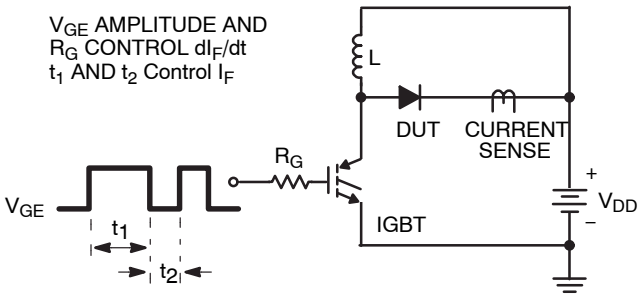

Figure 5. t_{rr} Test Circuit

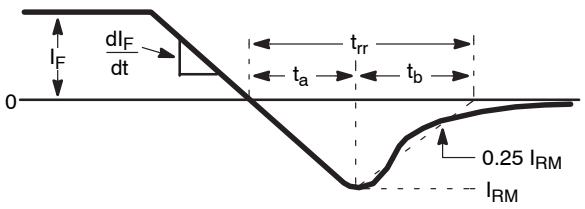

Figure 6. t_{rr} Waveforms and Definitions

I = 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 $V_{R(AVL)}$)

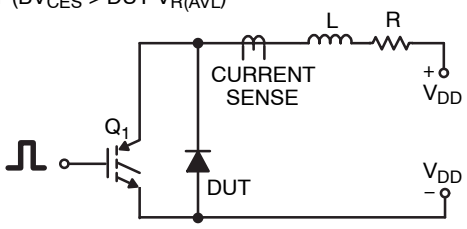

Figure 7. Avalanche Energy Test Circuit

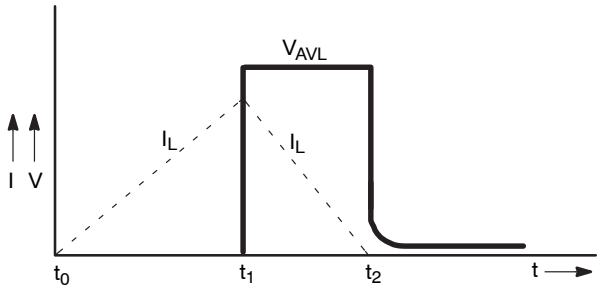

Figure 8. Avalanche Current and Voltage Waveforms

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

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

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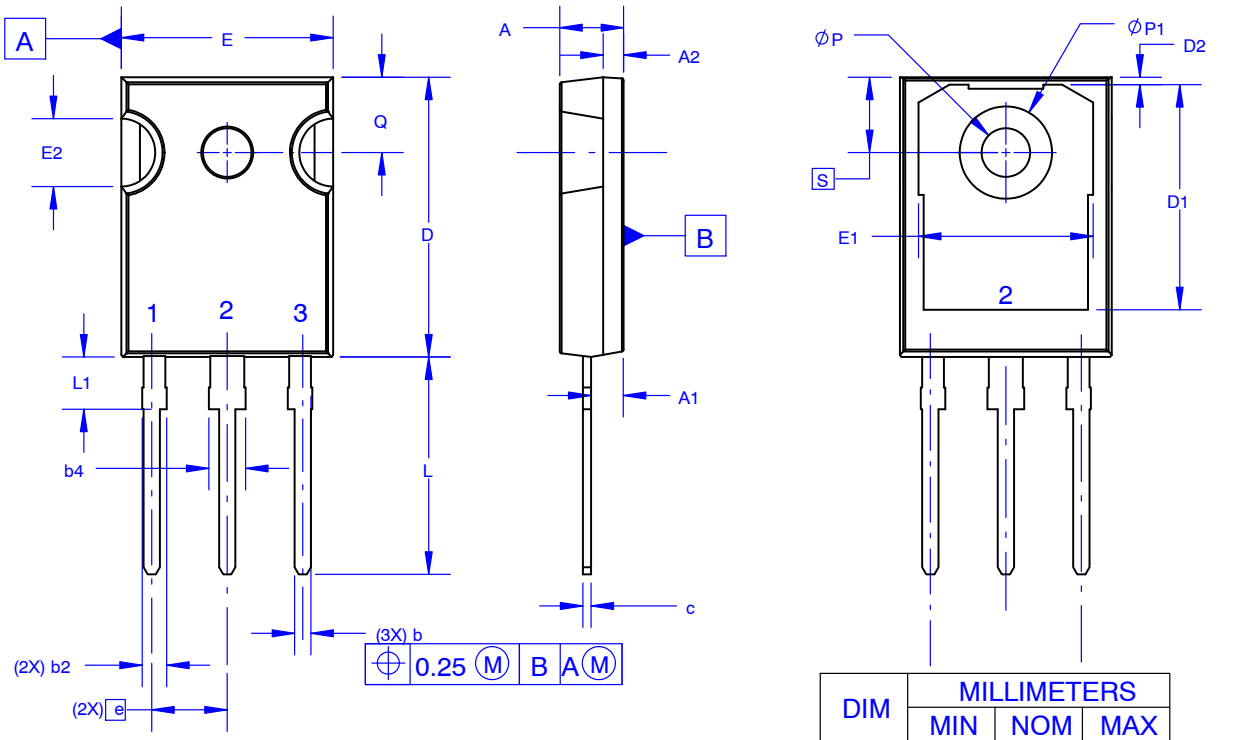
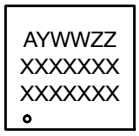


DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.58	4.70	4.82
A1	2.20	2.40	2.60
A2	1.40	1.50	1.60
b	1.17	1.26	1.35
b2	1.53	1.65	1.77
b4	2.42	2.54	2.66
c	0.51	0.61	0.71
D	20.32	20.57	20.82
D1	13.08	~	~
D2	0.51	0.93	1.35
E	15.37	15.62	15.87
E1	12.81	~	~
E2	4.96	5.08	5.20
e	~	5.56	~
L	15.75	16.00	16.25
L1	3.69	3.81	3.93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