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DATA SHEET
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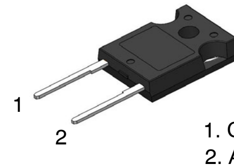
Ultrafast Rectifier

30 A, 600 V

RURG3060-F085



1. Cathode
2. Anode

TO−247−2LD
CASE 340CL

Description

The RURG3060−F085 is an ultrafast diode with soft recovery characteristics (trr< 80 ns). It has low forward voltage drop and is silicon nitride passivated ion−implanted epitaxial planar construction.

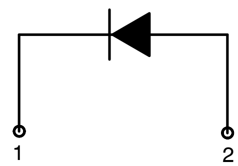
This device is intended for use as a freewheeling/clamping diode and rectifier in a variety of switching power supplies and other power switching applications. Its low stored charge and ultrafast recovery with soft recovery characteristic minimizes ringing and electrical noise in many power switching circuits, thus reducing power loss in the switching transistors.

Features

- High Speed Switching (t_{rr} = 60 ns(Typ.) @ I_F = 30 A)
- Low Forward Voltage (V_F = 1.5 V(Max.) @ I_F = 30 A)
- Avalanche Energy Rated
- AEC−Q101 Qualified and PPAP Capable
- This Device is Pb−Free

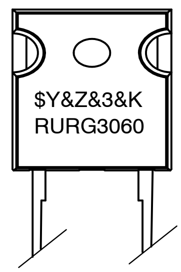
Applications

- Automotive DC/DC Converter
- Automotive On Board Charger
- Switching Power Supply
- Power Switching Circuits



1. Cathode 2. Anode

MARKING DIAGRAM



$Y	= **onsemi** Logo
&Z	= Assembly Plant Code
&3	= Numeric Date Code
&K	= Lot Code
RURG3060	= Specific Device Code

ORDERING INFORMATION

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

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	600	V
Working Peak Reverse Voltage	V_{RWM}	600	V
DC Blocking Voltage	V_R	600	V
Average Rectified Forward Current (T_C = 25°C)	$I_{F(AV)}$	30	A
Non−repetitive Peak Surge Current (Halfwave 1 Phase 50 Hz)	I_{FSM}	90	A
Avalanche Energy (1 A, 40 mH)	E_{AVL}	20	mJ
Operating Junction and Storage Temperature	T_J, T_{STG}	−55 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	Tube	Quantity
RURG3060−F085	RURG3060	TO−247−2LD	−	30

THERMAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Maximum Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	0.7	°C/W
Maximum Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	45	°C/W

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

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Instantaneous Reverse Current	I_R	V_R = 600 V	T_C = 25°C	−	−	250	μA
			T_C = 175°C	−	−	1	mA
Instantaneous Forward Voltage (Note 1)	V_{FM}	I_F = 30 A	T_C = 25°C	−	1.26	1.5	V
			T_C = 175°C	−	1.06	1.3	V
Reverse Recovery Time (Note 2)	t_{rr}	I_F = 1 A, di/dt =100 A/μs, V_{CC} = 390 V	T_C = 25°C	−	35	55	ns
		I_F = 30 A, di/dt = 100 A/μs, V_{CC} = 390 V	T_C = 25°C	−	60	80	ns
			T_C = 175°C	−	231	−	ns
Reverse Recovery Time	t_a	I_F = 30 A, di/dt = 100 A/μs, V_{CC} = 390 V	T_C = 25°C	−	31	−	ns
	t_b			−	29	−	ns
Reverse Recovery Charge	Q_{rr}			−	92	−	nC
Avalanche Energy	E_{AVL}	I_{AV} = 1.0 A, L = 40 mH		20	−	−	mJ

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.

1. Pulse: Test Pulse Width = 300 μs, Duty Cycle = 2%
2. Guaranteed by design.

TYPICAL PERFORMANCE CHARACTERISTICS

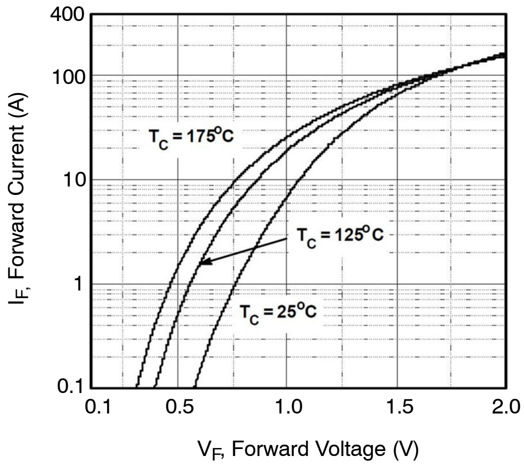


Figure 1. Typical Forward Voltage Drop vs. Forward Current

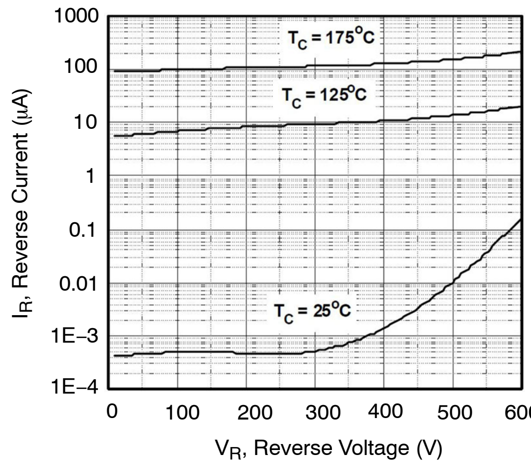


Figure 2. Typical Reverse Current vs. Reverse Voltage

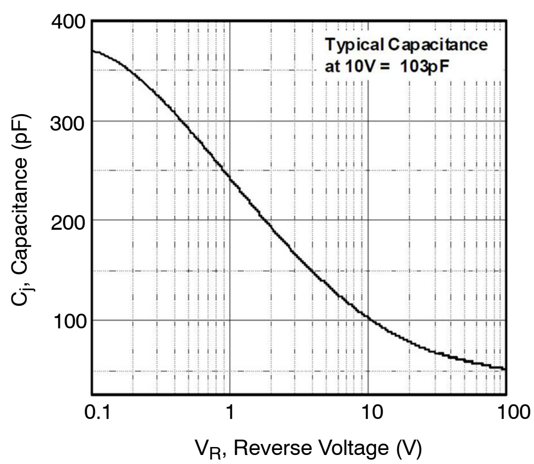


Figure 3. Typical Junction Capacitance

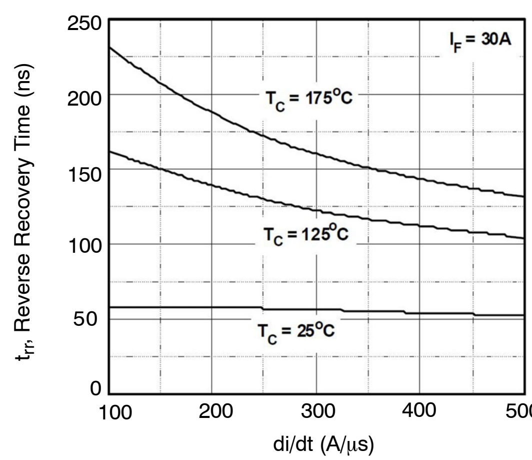


Figure 4. Typical Reverse Recovery Time vs. di/dt

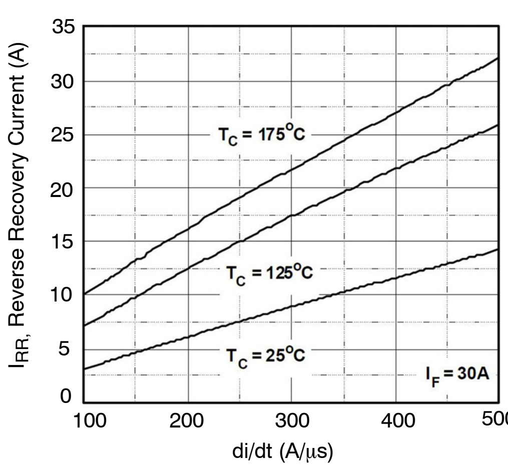


Figure 5. Typical Reverse Recovery Current vs. di/dt

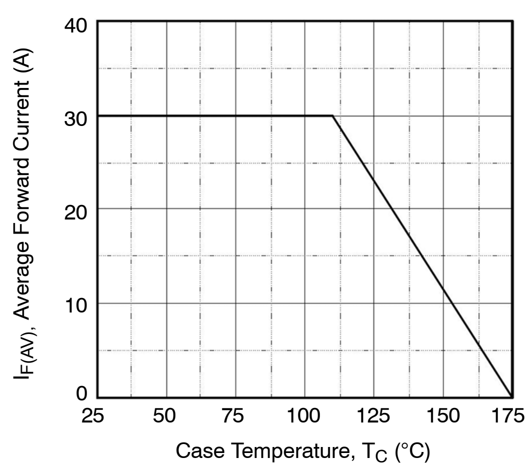


Figure 6. Forward Current Derating Curve

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

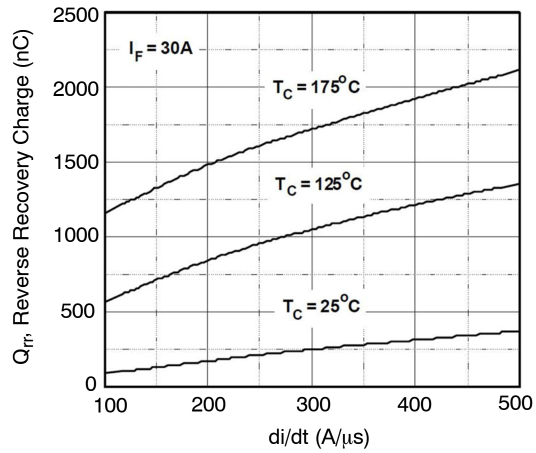


Figure 7. Reverse Recovery Charge

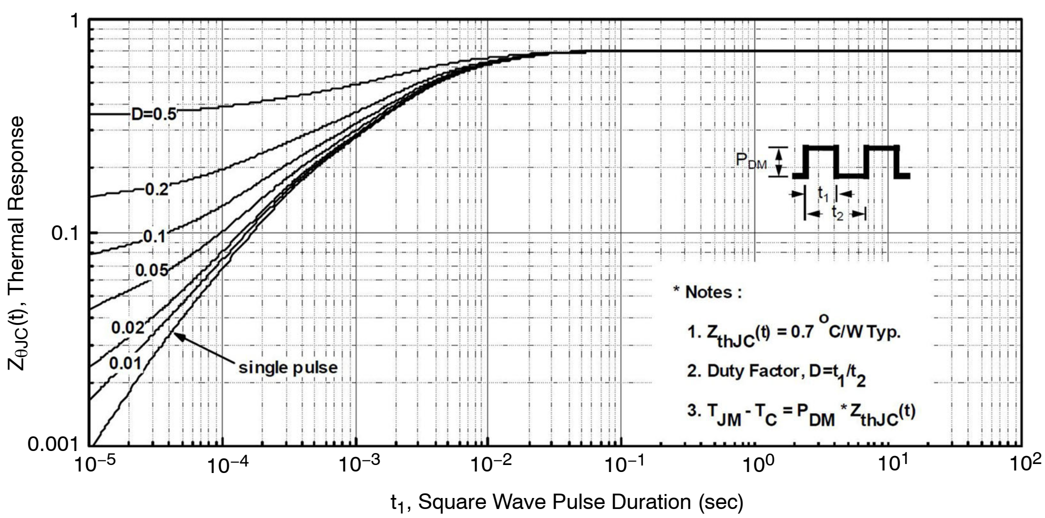


Figure 8. Transient Thermal Response Curve

TEST CIRCUIT AND WAVEFORMS

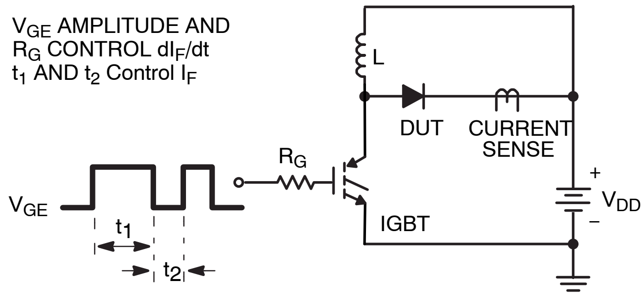


Figure 9. t_{rr} Test Circuit

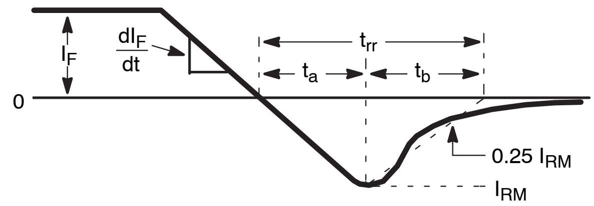


Figure 10. t_{rr} Waveforms and Definitions

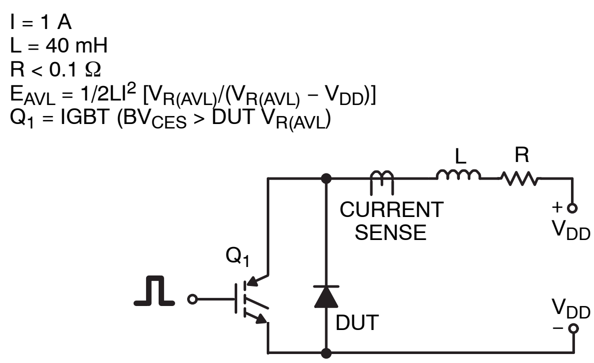


Figure 11. Avalanche Energy Test Circuit

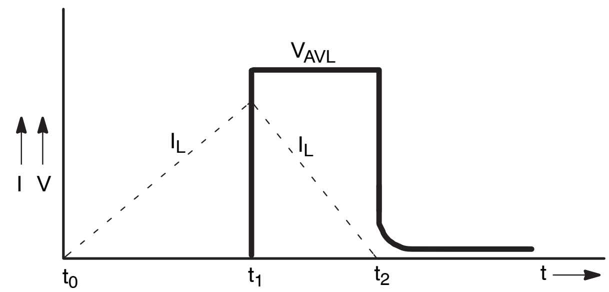


Figure 12. Avalanche Current and Voltage Waveforms

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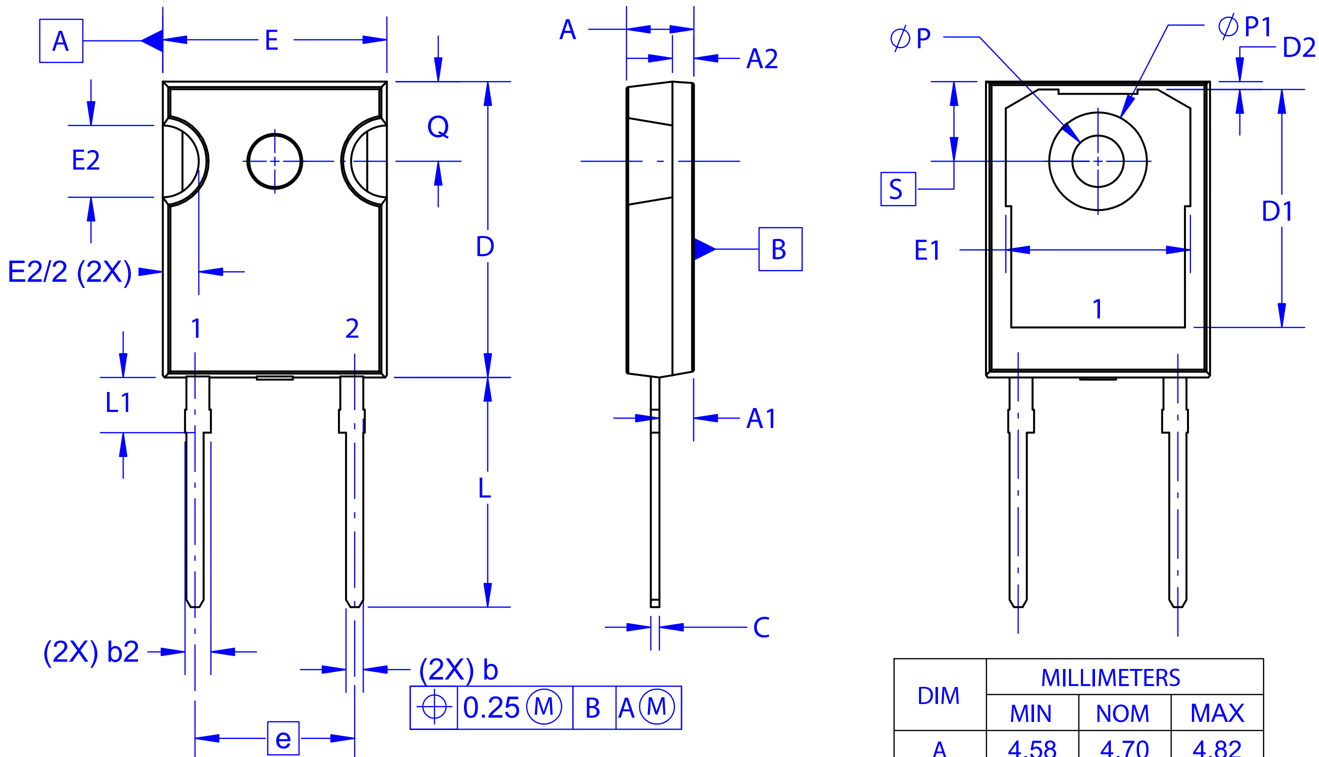
CASE 340CL
ISSUE A

DATE 03 DEC 2019

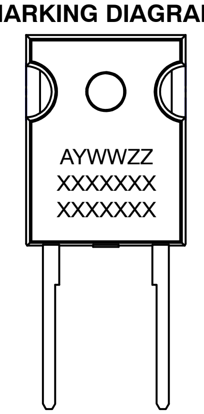


NOTES: UNLESS OTHERWISE SPECIFIED.

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.

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	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
c	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
E	15.37	15.62	15.87
E1	12.81	~	~
E2	4.96	5.08	5.20
e	~	11.12	~
L	15.75	16.00	16.25
L1	3.69	3.81	3.93
ØP	3.51	3.58	3.65
ØP1	6.61	6.73	6.85
Q	5.34	5.46	5.58
S	5.34	5.46	5.58

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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DESCRIPTION:	TO−247−2LD	PAGE 1 OF 1

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