STEALTH™ Rectifier

30 A, 600 V

ISL9R3060G2-F085

Description

The ISL9R3060G2−F085 is STEALTH diode optimized for low loss performance in high frequency hard switched applications. The STEALTH family exhibits low reverse recovery current (I_{RRM}) and exceptionally soft recovery under typical operating conditions.

This device is intended for use as a free wheeling or boost diode in power supplies and other power switching applications. The low I_{RRM} and short t_a phase reduce loss in switching transistors. The soft recovery minimizes ringing, expanding the range of conditions under which the diode may be operated without the use of additional snubber circuitry. Consider using the STEALTH diode with an SMPS IGBT to provide the most efficient and highest power density design at lower cost.

Features

- High Speed Switching (t_{rr} = 31 ns(Typ.) @ I_F = 30 A)
- Low Forward Voltage (V_F = 2.4 V(Max.) @ I_F = 30 A)
- Avalanche Energy Rated
- AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- Automotive DCDC converter
- Automotive On Board Charger
- Switching Power Supply
- Power Switching Circuits

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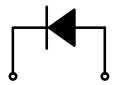
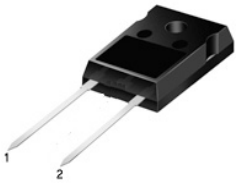
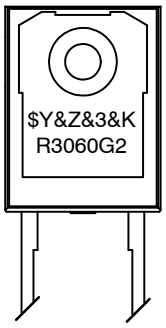


1. Cathode 2. Anode



TO−247−2LD
CASE 340CL

MARKING DIAGRAM



$Y	= ON Semiconductor Logo
&Z	= Assembly Plant Code
&3	= Date Code (Year & Week)
&K	= Lot Traceability Code
R3060G2	= 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

Symbol	Parameter	Ratings	Units
V_{RRM}	Peak Repetitive Reverse Voltage	600	V
V_{RWM}	Working Peak Reverse Voltage	600	V
V_R	DC Blocking Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 125°C	30	A
I_{FSM}	Non−repetitive Peak Surge Current (Halfwave 1 Phase 60 Hz)	325	A
E_{AVL}	Avalanche Energy (1 A, 40 mH)	20	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature	−55 to +175	°C

THERMAL CHARACTERISTICS T_C = 25°C unless otherwise noted

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	0.58	°C/W
$R_{\theta JA}$	Maximum Thermal Resistance, Junction to Ambient	45	°C/W

PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Package	Tube	Quantity
R3060G2	ISL9R3060G2−F085	TO−247	−	30

ELECTRICAL CHARACTERISTICS T_C = 25°C unless otherwise noted

Symbol	Parameter	Conditions		Min.	Typ.	Max	Units
I_R	Instantaneous Reverse Current	V_R = 600 V	T_C = 25°C	−	−	100	μA
			T_C = 175°C	−	−	2	mA
V_{FM}[1]	Instantaneous Forward Voltage	I_F = 30 A	T_C = 25°C	−	2.0	2.4	V
			T_C = 175°C	−	1.5	2.2	V
t_{rr}[2]	Reverse Recovery Time	I_F = 1 A, di/dt = 200 A/μs, V_{CC} = 390 V	T_C = 25°C	−	23	35	ns
		I_F = 30 A, di/dt = 200 A/μs, V_{CC} = 390 V	T_C = 25°C T_C = 175°C	−	31 135	45 −	ns ns
t_a t_b Q_{rr}	Reverse Recovery Time Reverse Recovery Charge	I_F = 30 A, di/dt = 200 A/μs, V_{CC} = 390 V	T_C = 25°C	− − −	18 13 48	− − −	ns ns nC
E_{AVL}	Avalanche Energy	I_{AV} =1.0 A, L = 40 mH		20	−	−	mJ

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

TEST CIRCUIT WAVEFORMS

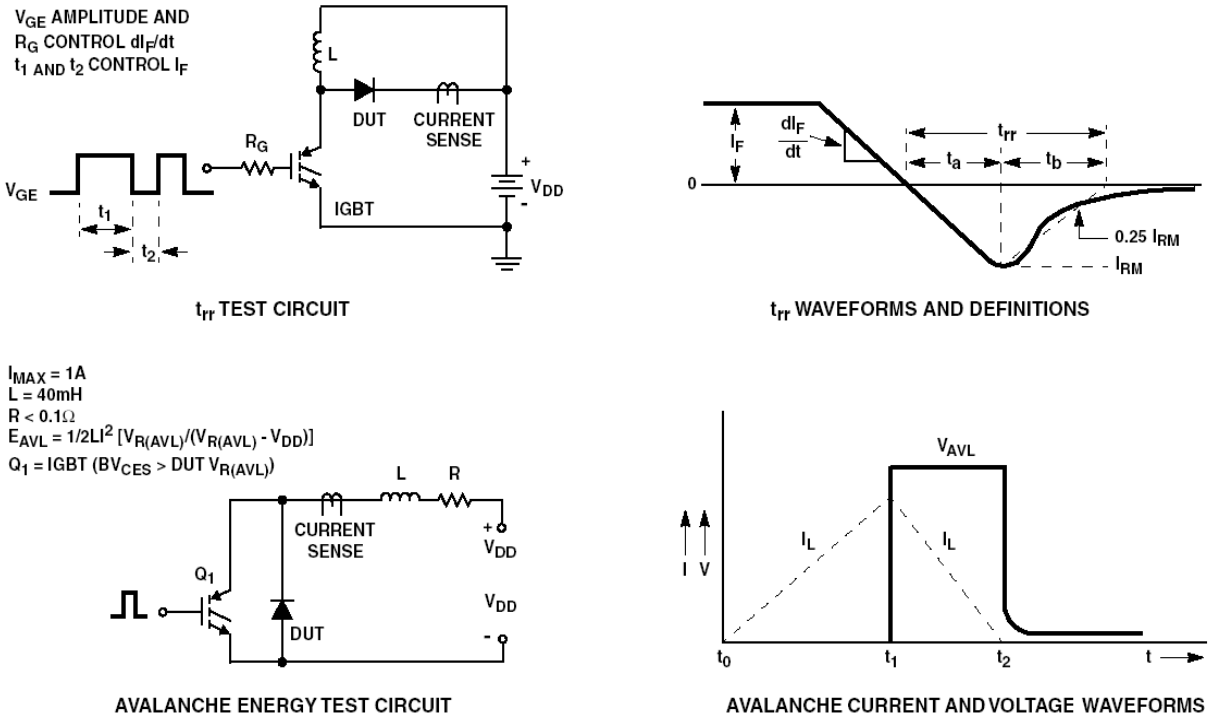


Figure 1. Test Circuit Waveforms

TYPICAL PERFORMANCE CHARACTERISTICS

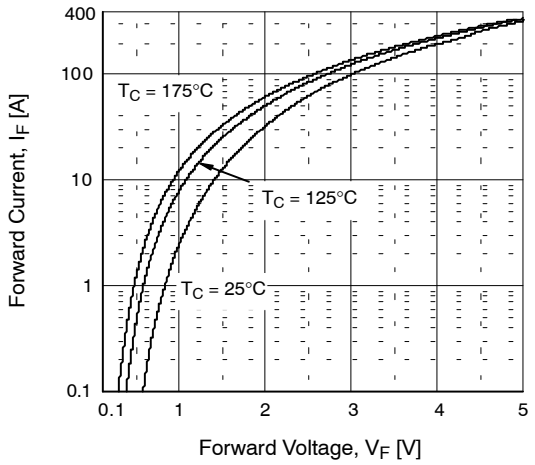


Figure 2. Typical Forward Voltage Drop vs. Forward Current

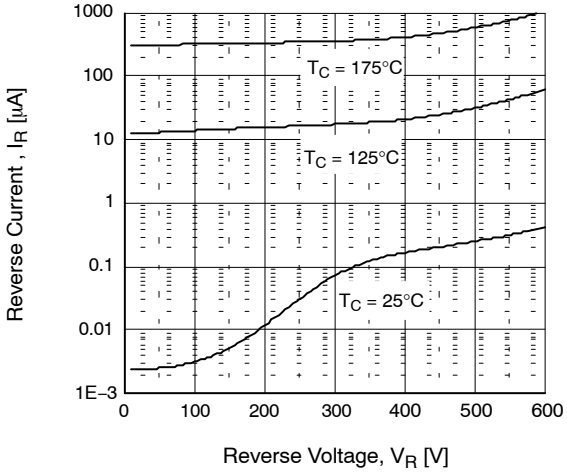


Figure 3. Typical Reverse Current vs. Reverse Voltage

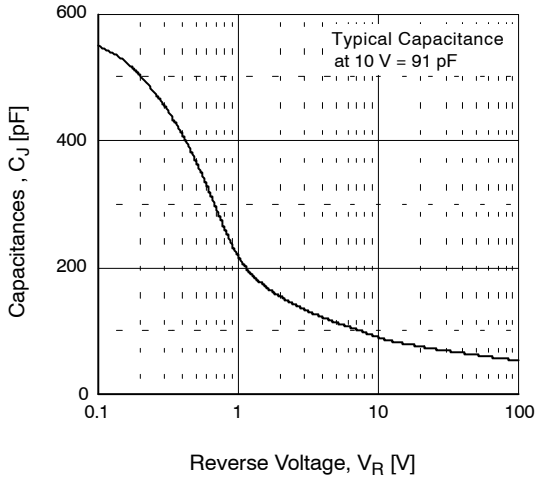


Figure 4. Typical Junction Capacitance

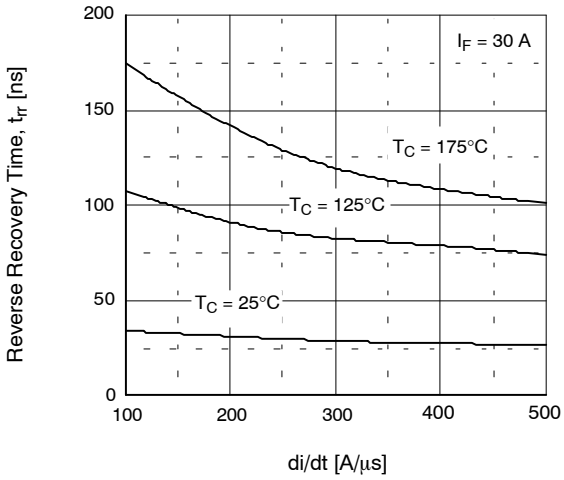


Figure 5. Typical Reverse Recovery Time vs. di/dt

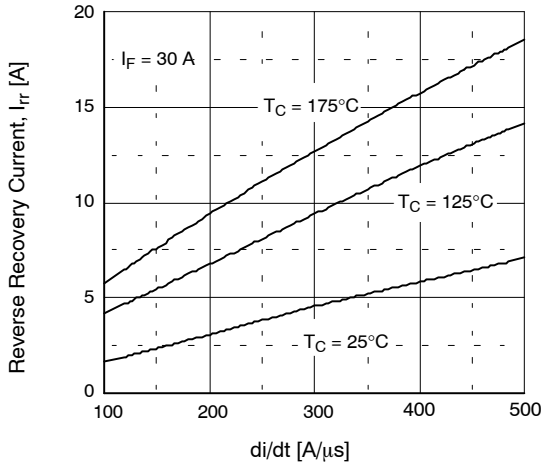


Figure 6. Typical Reverse Recovery Current vs. di/dt

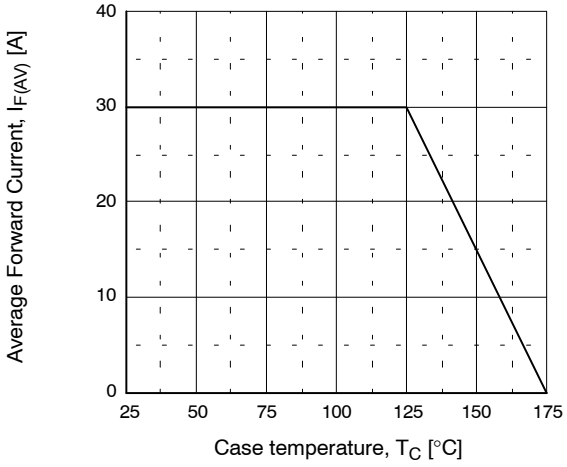


Figure 7. Forward Current Derating Curve

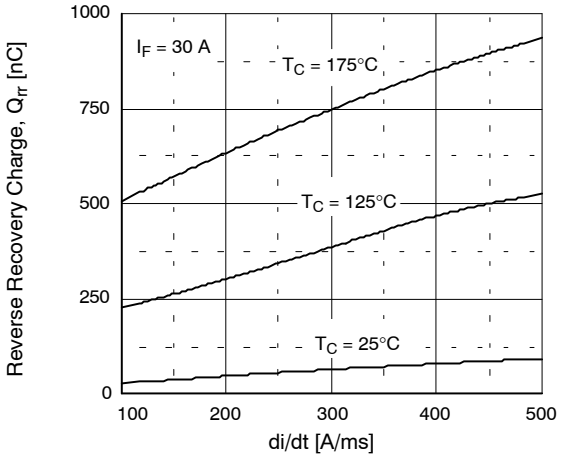


Figure 8. Reverse Recovery Charge

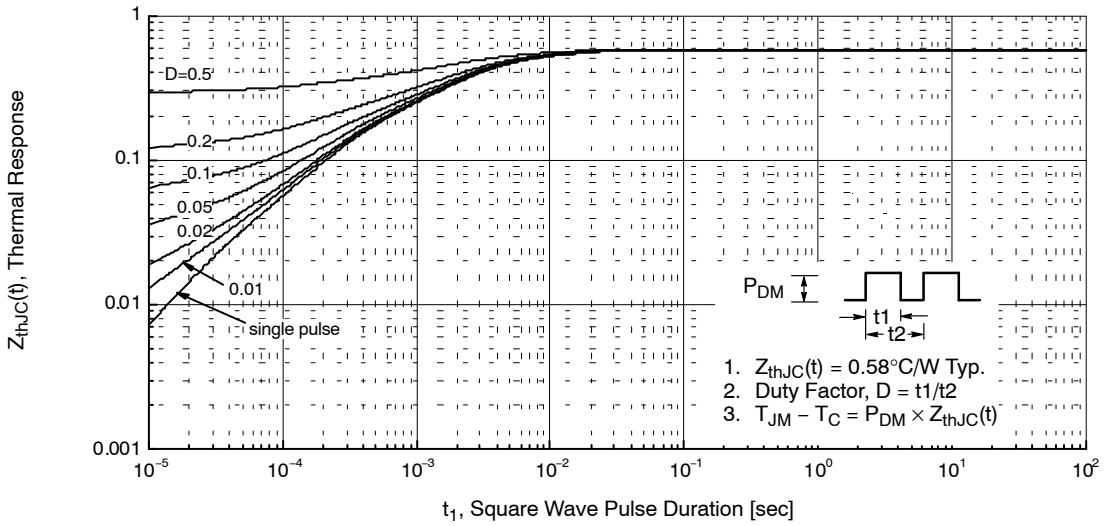


Figure 9. Transient Thermal Response Curve

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

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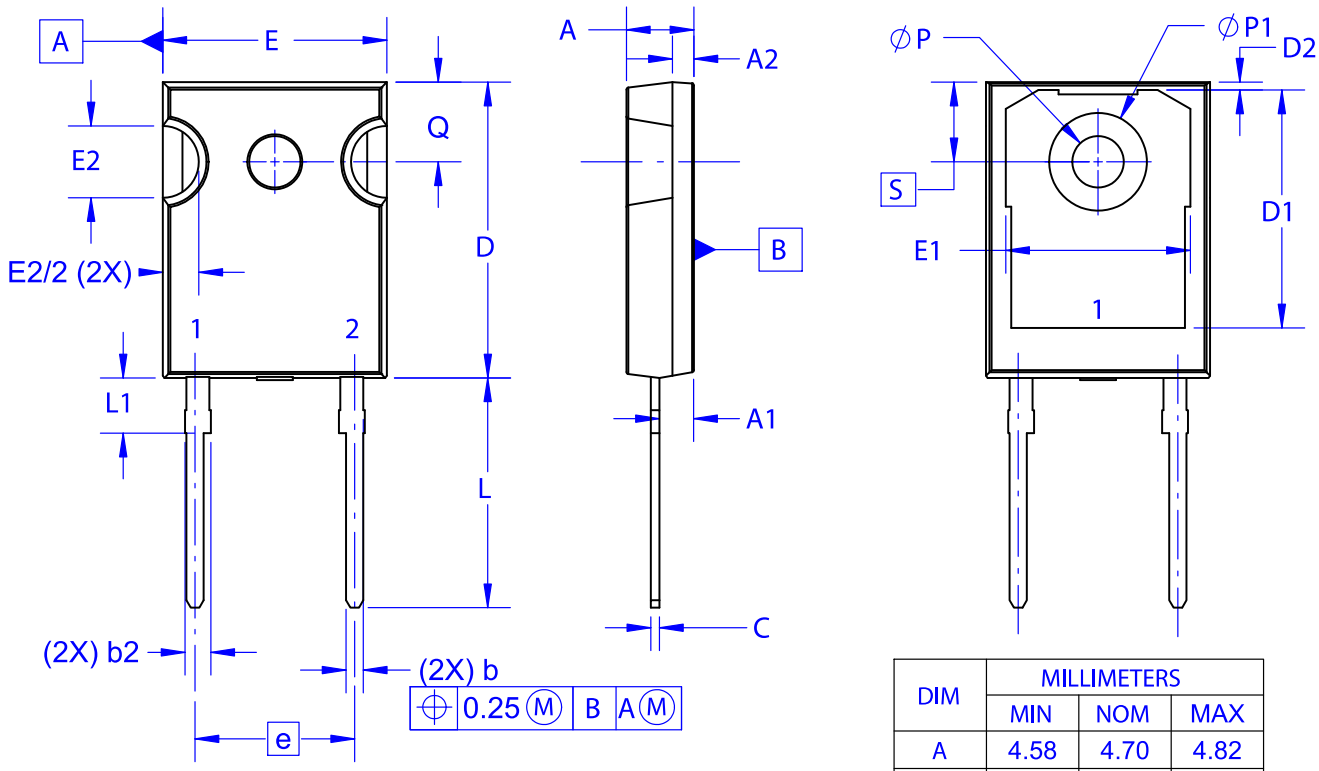
TO−247−2LD
CASE 340CL
ISSUE A

DATE 03 DEC 2019

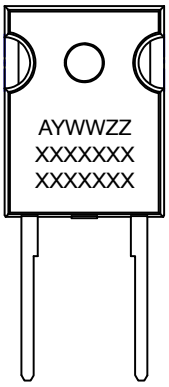


DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.58	4.70	4.82
A1	2.29	2.40	2.66
A2	1.30	1.50	1.70
b	1.17	1.26	1.35
b2	1.53	1.65	1.77
c	0.51	0.61	0.71
D	20.32	20.57	20.82
D1	16.37	16.57	16.77
D2	0.51	0.93	1.35
E	15.37	15.62	15.87
E1	12.81	~	~
E2	4.96	5.08	5.20
e	~	11.12	~
L	15.75	16.00	16.25
L1	3.69	3.81	3.93
ØP	3.51	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

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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