October 2015

RURG80100_F085
80A, 1000V Ultrafast Rectifier

Features

- Ultrafast and soft recovery
- Low Forward Voltage(V_F=1.56V(Typ.) @ I_F=80A)
- High Speed Switching (t_{rr}=242ns(Typ.) @ I_F=80A)
- Avalanche Energy Rated
- AEC-Q101 Qualified

Applications

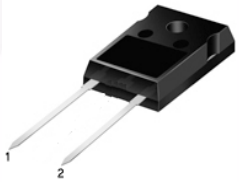
- EV and HEV On-Board Charger
- Stationary Charger
- Other Automotive Applications
- General Power Supply Requiring Higher Reliability

Description

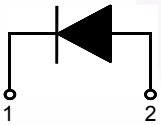
The RURG80100_F085 is an Ultrafast™ diode with low forward voltage drop and soft recovery characteristics. Its low voltage drop and ultrafast soft recovery minimize conduction loss and electrical noise in power switching circuit. Meanwhile, the robust design and high quality manufacture process make it a reliable device for heavy duty automotive applications.

This device is intended to be used in a variety of automotive power-train applications for purposes like freewheeling, clamping, rectification, bootstrap and snubber, etc. It's also an ideal device for non-automotive applications which requires a higher reliability performance.

Pin Assignments



TO-247-2L
1. Cathode 2. Anode



1. Cathode 2. Anode

Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{RRM}	Peak Repetitive Reverse Voltage	1000	V
V_{RWM}	Working Peak Reverse Voltage	1000	V
V_R	DC Blocking Voltage	1000	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 25°C	80	A
I_{FSM}	Non-repetitive Peak Surge Current (Halfwave 1 Phase 50Hz)	240	A
E_{AVL}	Avalanche Energy (1.6A, 40mH)	50	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	0.3	°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
RURG80100	RURG80100_F085	TO-247	-	30

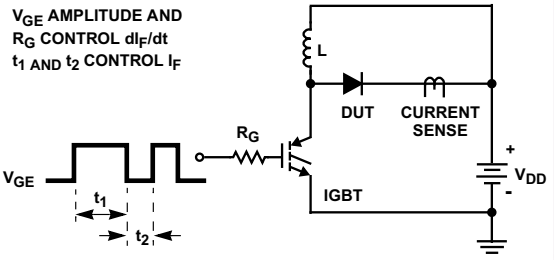
Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter	Conditions		Min.	Typ.	Max	Units
I_R	Instantaneous Reverse Current	V_R = 1000V	T_C = 25 °C	-	-	250	uA
			T_C = 175 °C	-	-	1.5	mA
V_{FM}[1]	Instantaneous Forward Voltage	I_F = 80A	T_C = 25 °C T_C = 175 °C	- -	1.56 1.35	2.0 1.7	V V
t_{rr}[2]	Reverse Recovery Time	I_F =1A, di/dt = 100A/μs, V_{CC}= 650V	T_C = 25 °C	-	122	158	ns
		I_F =80A, di/dt = 100A/μs, V_{CC}= 650V	T_C = 25 °C T_C = 175 °C	- -	242 979	314 -	ns ns
t_a t_b Q_{rr}	Reverse Recovery Time Reverse Recovery Charge	I_F =80A, di/dt = 100A/μs, V_{CC}= 650V	T_C = 25 °C	- - -	74 168 751	- - -	ns ns nC

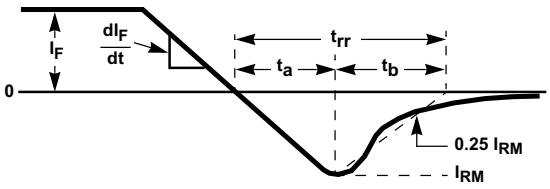
Notes:

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

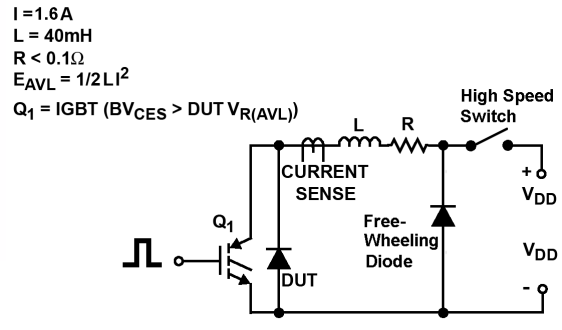
Test Circuit and Waveforms



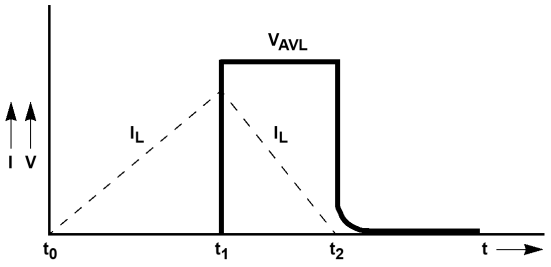
t_{rr} Test Circuit



t_{rr} Waveforms and Definitions



Avalanche Energy Test Circuit



Avalanche Current and Voltage Waveforms

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop vs. Forward Current

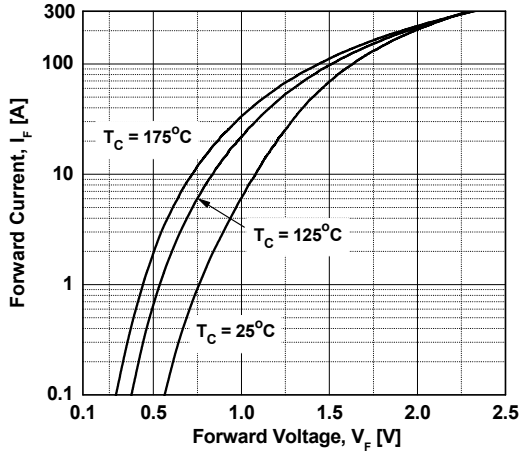


Figure 2. Typical Reverse Current vs. Reverse Voltage

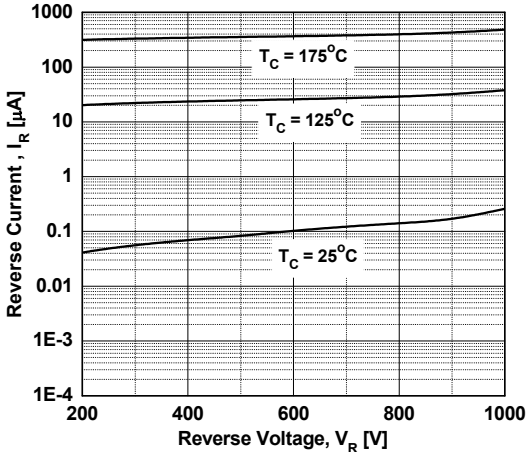


Figure 3.Typical Junction Capacitance

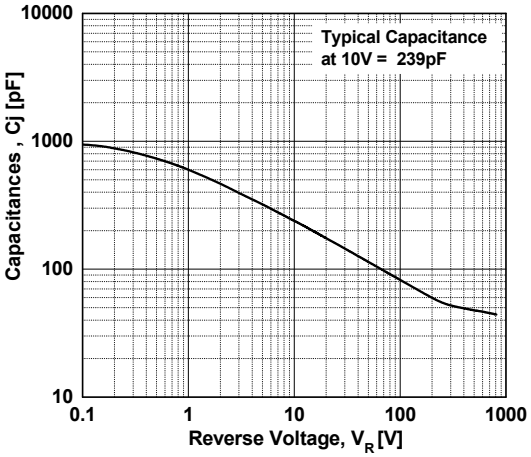


Figure 4. Typical Reverse Recovery Time vs. di/dt

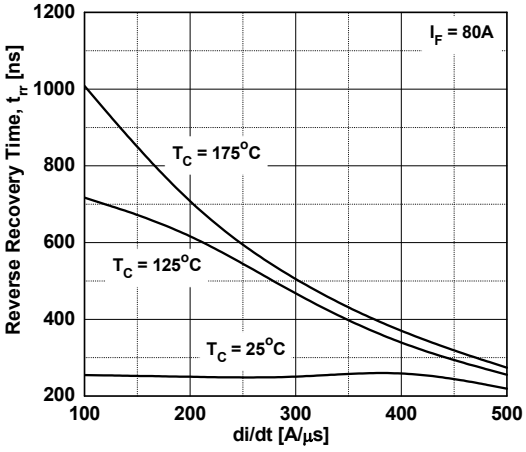


Figure 5. Typical Reverse Recovery Current vs. di/dt

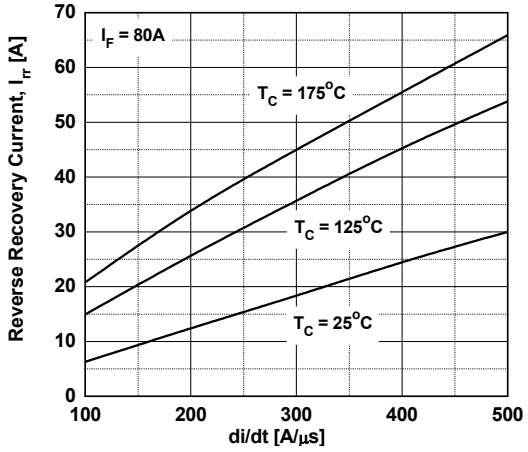
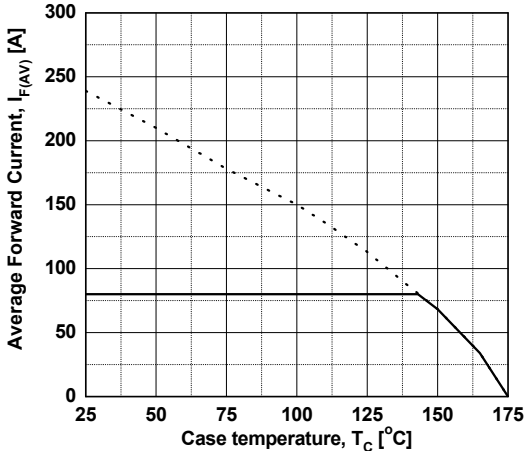


Figure 6. Forward Current Derating Curve



Typical Performance Characteristics (Continued)

Figure 7. Reverse Recovery Charge

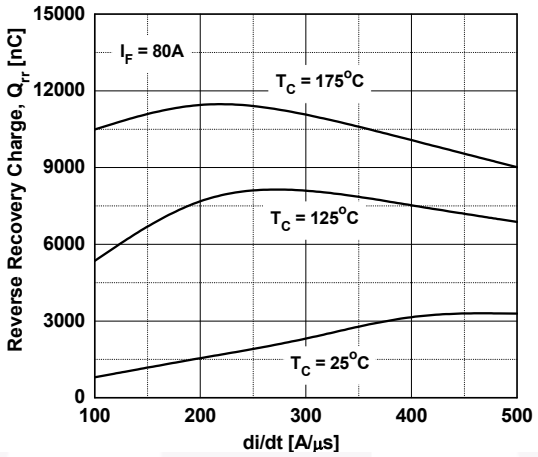
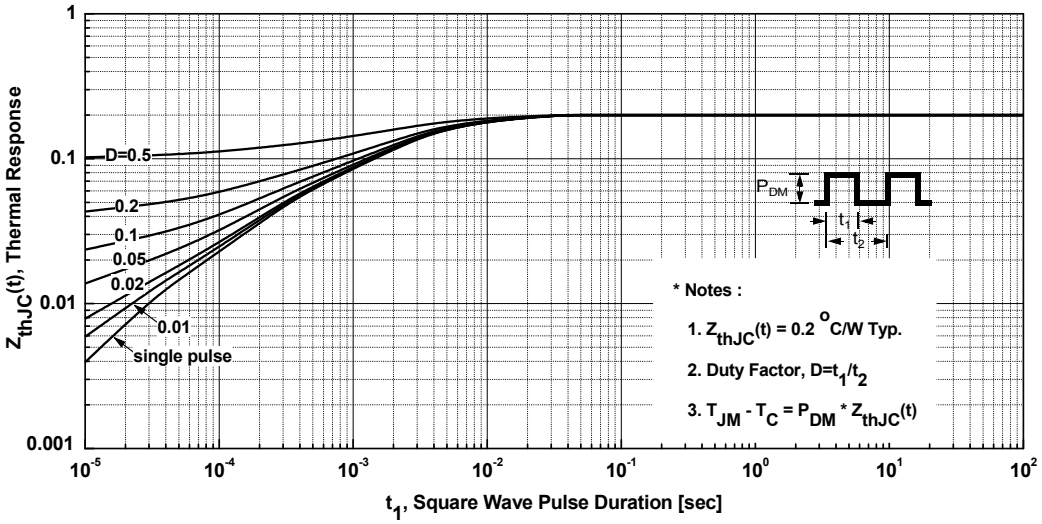
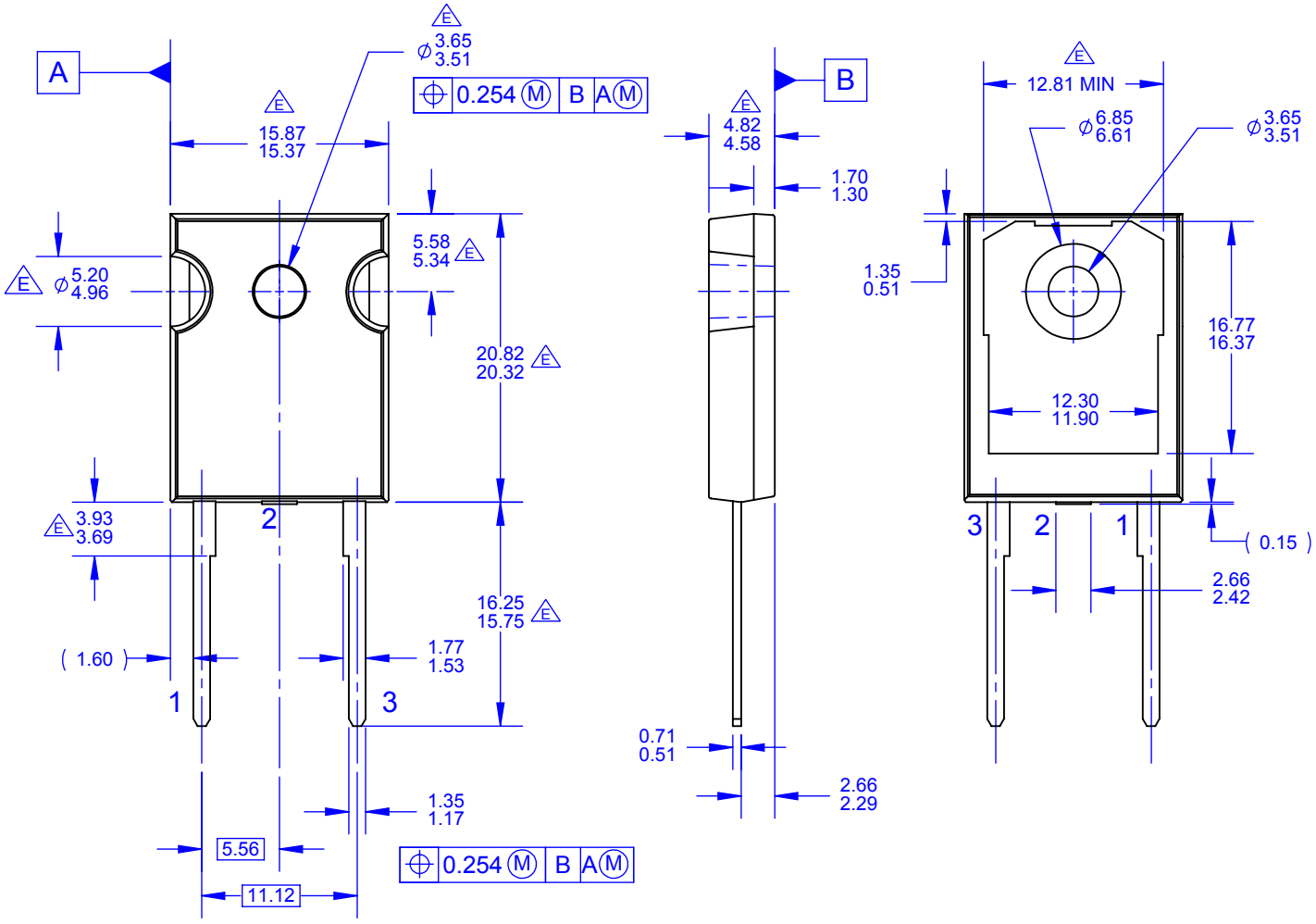


Figure 8. Transient Thermal Response Curve





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