Ultrafast Power Rectifier

6 A, 600 V

RURD660S9A-F085

The RURD660S9A−F085 is an ultrafast diode with soft recovery characteristics (trr < 83 ns). It has a low forward voltage drop and is of 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 soft recovery minimize ringing and electrical noise in many power switching circuits, thus reducing powerloss in the switching transistors.

Features

- High Speed Switching (t_{rr} = 63 ns (Typ.) @ I_F = 6 A)
- Low Forward Voltage (V_F = 1.26 V (Typ.) @ I_F = 6 A)
- Avalanche Energy Rated
- AEC−Q101 Qualified and PPAP Capable
- This is a Pb−Free Device

Applications

- General Purpose
- Switching Mode Power Supply
- Power Switching Circuits

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

Symbol	Parameter	Ratings	Unit
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 = 25°C	6	A
I_{FSM}	Non−repetitive Peak Surge Current	60	A
T_J, T_{STG}	Operating Junction and Storage Temperature	− 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.

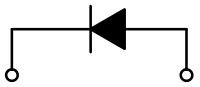
THERMAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	3	°C/W
$R_{\theta JA}$ (Note 1)	Maximum Thermal Resistance, Junction to Ambient	140	°C/W
$R_{\theta JA}$ (Note 2)	Maximum Thermal Resistance, Junction to Ambient	50	°C/W

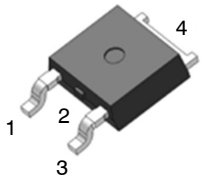
1. Mounted on a minimum pad follow by JEDEC standard.
2. Mounted on a 1 in^2 pad of 2 oz copper follow by JEDEC standard.

ON Semiconductor®

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1, 2, 4. Cathode 3. Anode



DPAK3 (TO−252 3 LD)
CASE 369AS

MARKING DIAGRAM



RUR660 = Specific Device Code
$Y = ON Semiconductor Logo
&Z = Assembly Plant Code
&3 = 3−Digit Date Code
&K = 2−Digits Lot Run Traceability Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 4 of this data sheet.

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

Symbol	Parameter	Condition		Min	Typ	Max	Unit
I_R	Instantaneous Reverse Current	V_R = 600 V	T_C = 25°C	–	–	100	μA
			T_C = 175°	–	–	500	μA
V_{FM} (Note 3)	Instantaneous Forward Voltage	I_F = 6 A	T_C = 25°C T_C = 175°	– –	1.26 1.04	1.5 –	V V
t_{rr} (Note 4)	Reverse Recovery Time	I_F = 1 A, di/dt = 200 A/μs, V_{CC} = 390 V	T_C = 25°C	–	25	33	ns
		I_F = 6 A, di/dt = 200 A/μs, V_{CC} = 390 V	T_C = 25°C T_C = 175°	– –	63 119	83 –	ns ns
t_a t_b Qrr	Reverse Recovery Time Reverse Recovery Charge	I_F = 6 A, di/dt = 200 A/μs, V_{CC} = 390 V	T_C = 25°C	– – –	23 40 151	– – –	ns ns nC
W_{AVL}		Avalanche Energy (L = 20 mH)		10	–	–	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.

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

TEST CIRCUIT AND WAVEFORMS

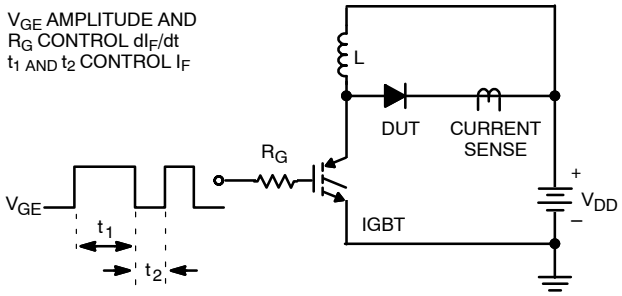


Figure 1. t_{rr} Test Circuit

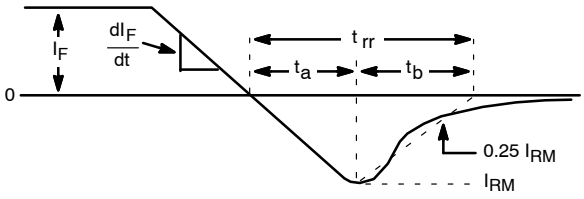


Figure 2. trr Waveforms and Definitions

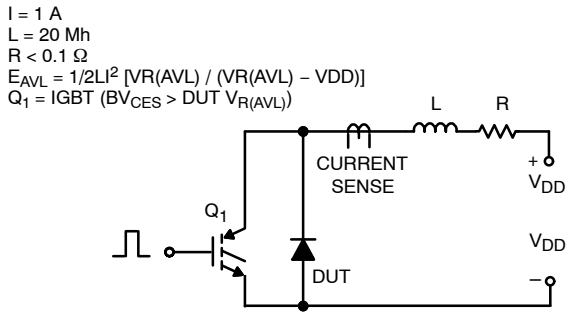


Figure 3. Avalanche Energy Test Circuit

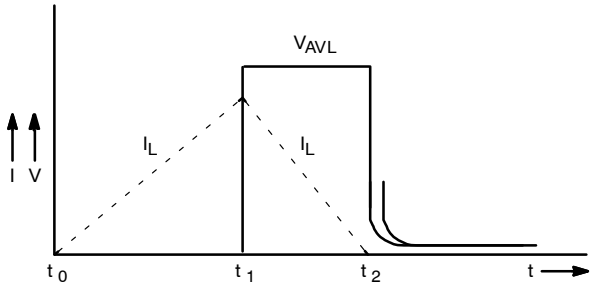


Figure 4. Avalanche Current and Voltage Waveforms

TYPICAL PERFORMANCE CHARACTERISTICS

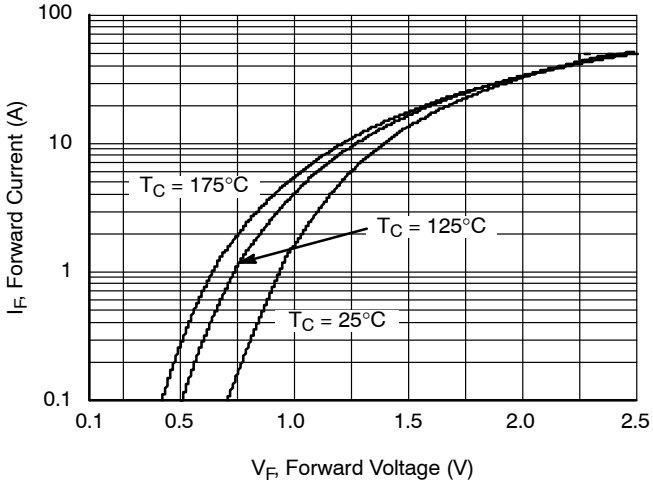


Figure 9. Typical Forward Voltage Drop vs. Forward Current

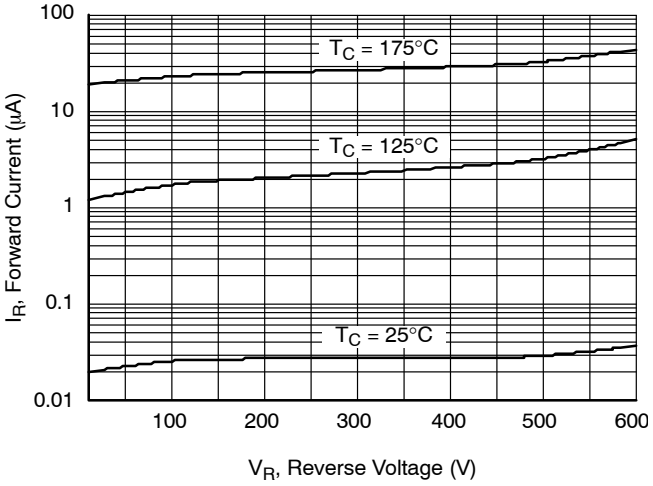


Figure 10. Typical Reverse Current vs. Reverse Voltage

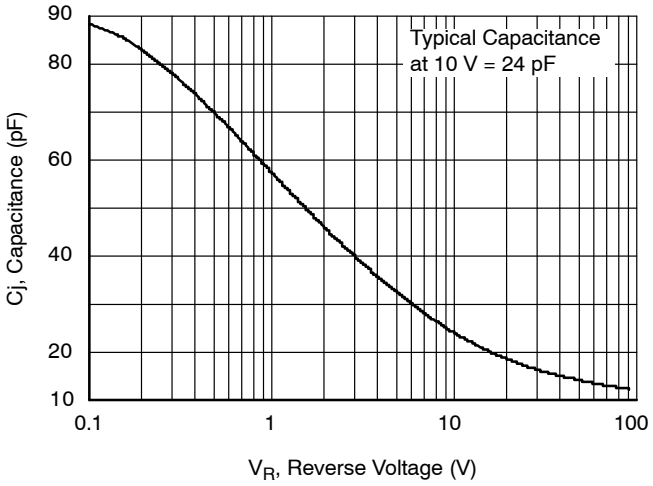


Figure 5. Typical Junction Capacitance

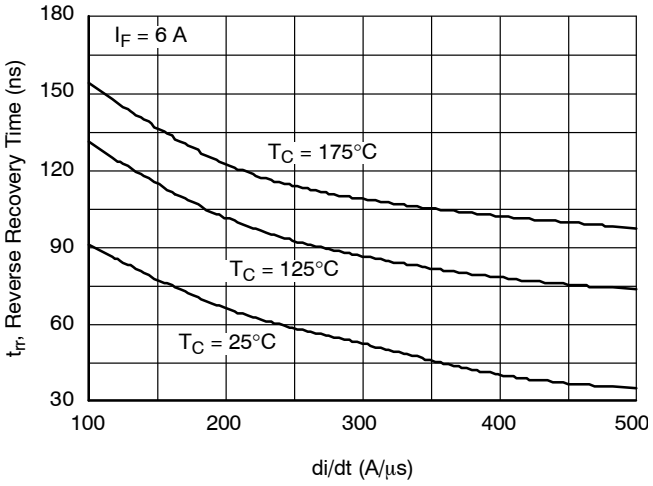


Figure 6. Typical Reverse Recovery Time vs. di/dt

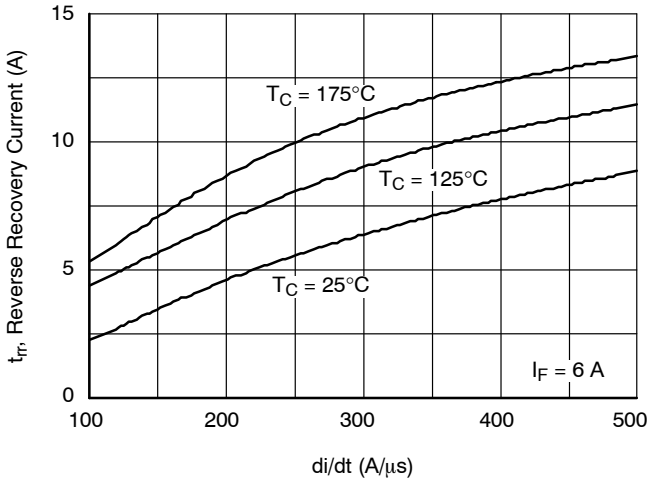


Figure 7. Typical Reverse Recovery Current vs. di/dt

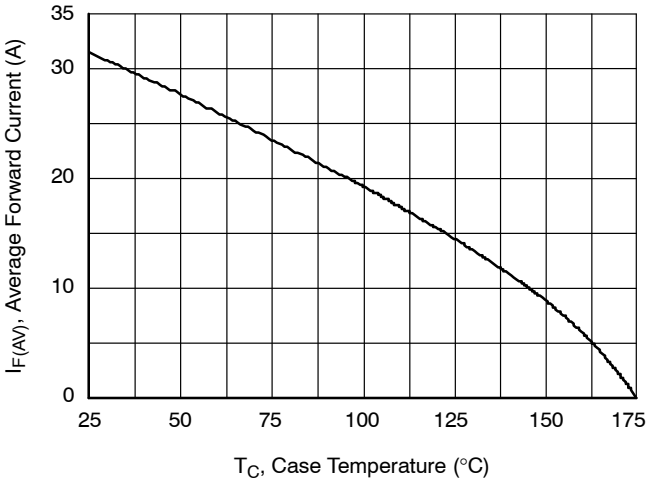


Figure 8. Forward Current Derating Curve

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

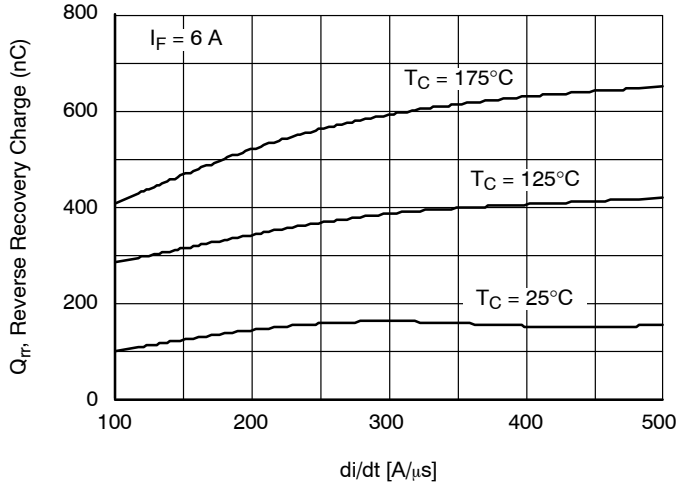


Figure 12. Reverse Recovery Charge

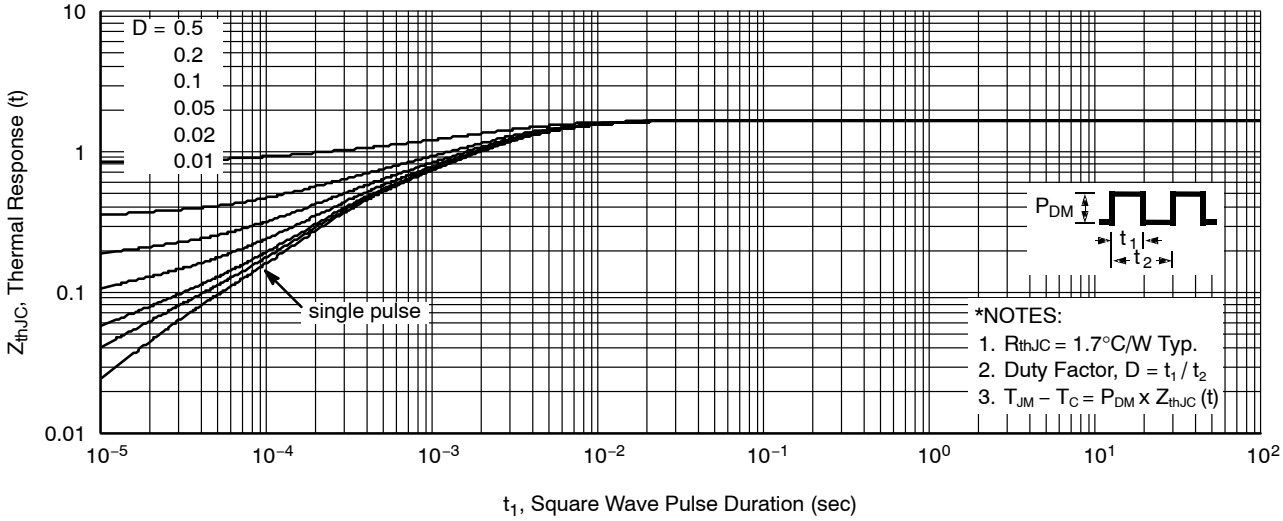


Figure 11. Transient Thermal Response Curve

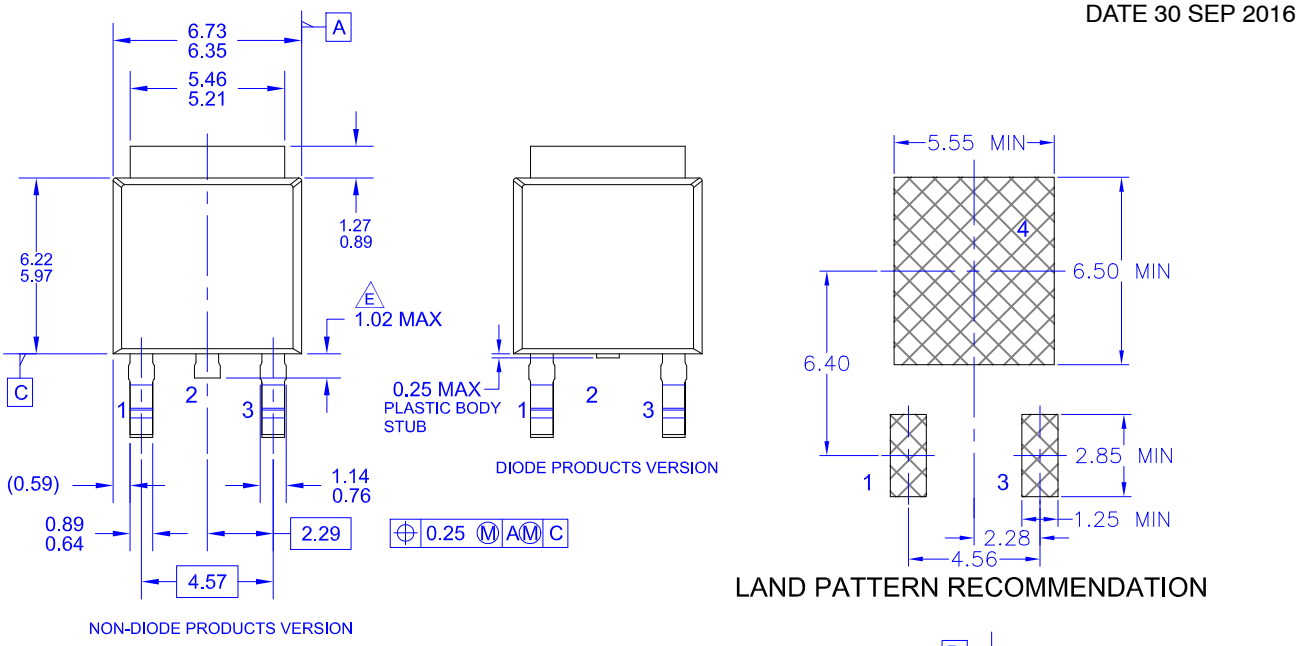
ORDERING INFORMATION

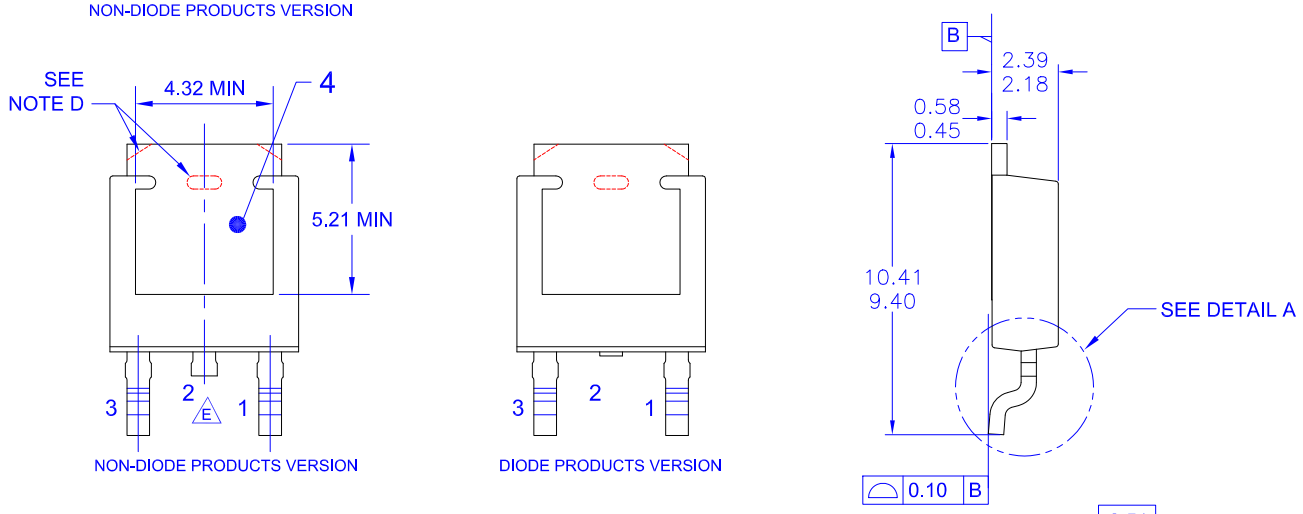
Device	Device Marking	Package	Shipping†
RURD660S9A−F085	RUR660	TO−252 3 LD (Pb−Free)	2500 / Tape & Reel

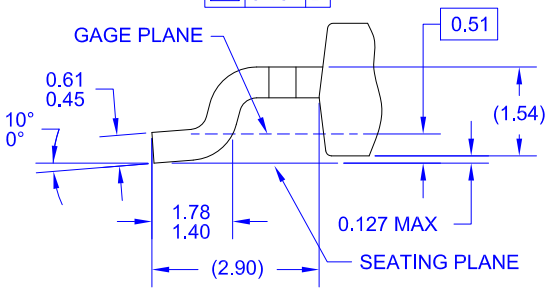
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

DPAK3 (TO−252 3 LD)
CASE 369AS
ISSUE O

DATE 30 SEP 2016







DETAIL A
(ROTATED -90°)
SCALE: 12X

NOTES: UNLESS OTHERWISE SPECIFIED
A) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE C, VARIATION AA.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
D) SUPPLIER DEPENDENT MOLD LOCKING HOLES OR CHAMFERED CORNERS OR EDGE PROTRUSION.
E) TRIMMED CENTER LEAD IS PRESENT ONLY FOR DIODE PRODUCTS
F) DIMENSIONS ARE EXCLUSSIVE OF BURSS, MOLD FLASH AND TIE BAR EXTRUSIONS.
G) LAND PATTERN RECOMENDATION IS BASED ON IPC7351A STD TO228P991X239-3N.

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