



Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.



RURD620CCS9A

RURD620CCS9A

6A, 200V Ultrafast Dual Diode

Features

- Ultrafast with soft Recovery <math><25\text{ns}</math>
- Operating Temperature 175°C
- Reverse Voltage 200V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power supplies
- Power Switching Circuits
- General Purpose

Description

The RURD620CCS9A is ultrafast dual diode with soft recovery characteristics ($t_{rr}<25\text{ns}$). This has low forward voltage drop and is silicon nitride passivated ion-implanted epitaxial planar construction.

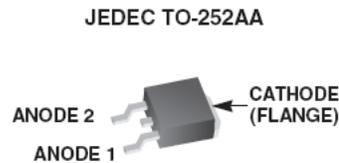
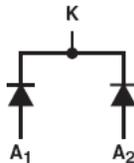
This device is intended for use as freewheeling/clamping diodes and rectifiers in a variety of switching power supplies and other power switching applications. This low stored charge and ultrafast soft recovery minimize ringing and electrical noise in many power switching circuits, thus reducing power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

Ordering Information

Part Number	Package	Device Marking
RURD620CCS9A	TO-252AA	UR620C

NOTE: Tape and Reel Packing.

Pin Assignments



Absolute Maximum Ratings (Per Leg) $T_C = 25^\circ\text{C}$ Unless Otherwise Specified

Symbol	Parameter	Value	Units
V_{RRM}	Peak Repetitive Reverse Voltage	200	V
V_{RWM}	Working Peak Reverse Voltage	200	V
V_R	DC Blocking Voltage	200	V
$I_{F(AV)}$	Average Rectified Forward Current $T_C = 160^\circ\text{C}$	6	A
I_{FRM}	Repetitive Peak Surge Current Square Wave, 20kHz	12	A
I_{FSM}	Non-repetitive Peak Surge Current Halfwave, 1phase, 60Hz	90	A
P_D	Maximum Power Dissipation	45	W
E_{AVL}	Avalanche Energy (See Figures 10 and 11)	10	mJ
T_{STG}, T_J	Operating and Storage Temperature	- 65 to +175	$^\circ\text{C}$

Electrical Characteristics (Per Leg) $T_C = 25^\circ\text{C}$ unless otherwise Specified

Parameter	Conditions	Min.	Typ.	Max.	Units
V_F	$I_F = 6\text{A}$	-	-	1.0	V
	$I_F = 6\text{A}, T_C = 150^\circ\text{C}$	-	-	0.83	V
I_R	$V_R = 200\text{V}$	-	-	100	μA
	$V_R = 200\text{V}, T_C = 150^\circ\text{C}$	-	-	500	μA
t_{rr}	$I_F = 1\text{A}, di/dt = 200\text{A}/\mu\text{s}$	-	-	25	ns
	$I_F = 6\text{A}, di/dt = 200\text{A}/\mu\text{s}$	-	-	30	ns
t_a	$I_F = 6\text{A}, di/dt = 200\text{A}/\mu\text{s}$	-	13	-	ns
t_b	$I_F = 6\text{A}, di/dt = 200\text{A}/\mu\text{s}$	-	6.5	-	ns
Q_{rr}	$I_F = 6\text{A}, di/dt = 200\text{A}/\mu\text{s}$	-	20	-	nC
C_J	$V_R = 10\text{V}, I_F = 0\text{A}$	-	30	-	pF
$R_{\theta JC}$		-	-	3.5	$^\circ\text{C}/\text{W}$

Notes:

DEFINITIONS

V_F = Instantaneous forward voltage (pw = 300 μs , D = 2%)

I_R = Instantaneous reverse current.

t_{rr} = Reverse recovery time (See Figure 9), summation of t_a+t_b .

t_a = Time to reach peak reverse current (See Figure 9).

t_b = Time from peak I_{RM} to projected zero crossing of I_{RM} base on a straight line from peak I_{RM} through 25% of I_{RM} (See Figure 9).

Q_{rr} = Reverse recovery charge.

C_J = Junction Capacitance.

$R_{\theta JC}$ = Thermal resistance junction to case.

pw = Pulse width

D = duty cycle.

Typical Performance Curves

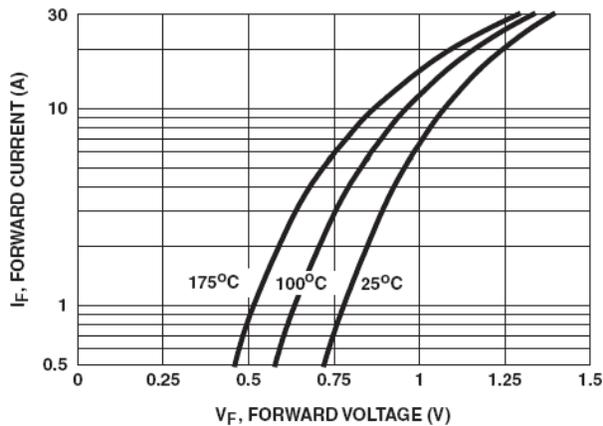


Figure 1. Forward Current vs Forward Voltage

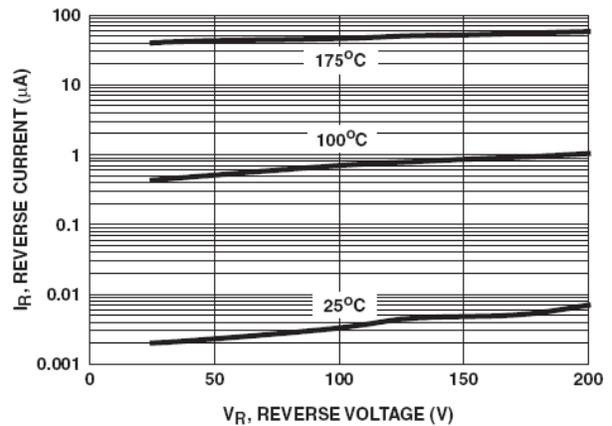


Figure 2. Reverse Current vs Reverse Voltage

Typical Performance Characteristics (Continued)

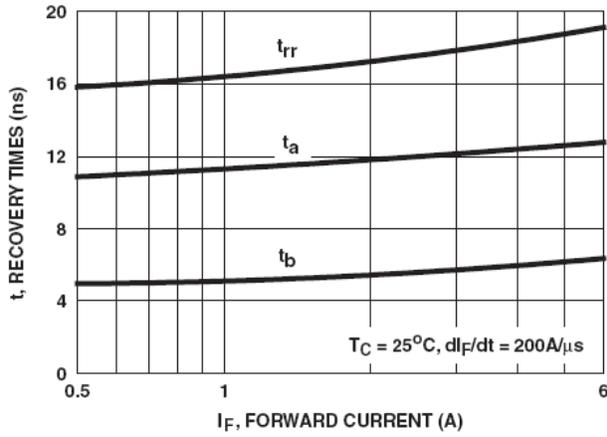


Figure 3. t_{rr} , t_a and t_b Curves vs Forward Current

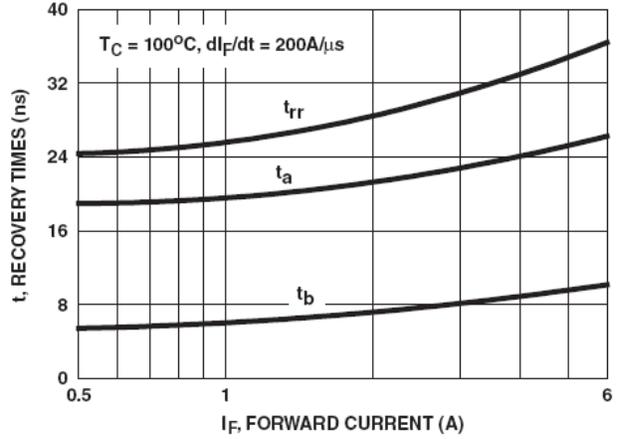


Figure 4. t_{rr} , t_a and t_b Curves vs Forward Current

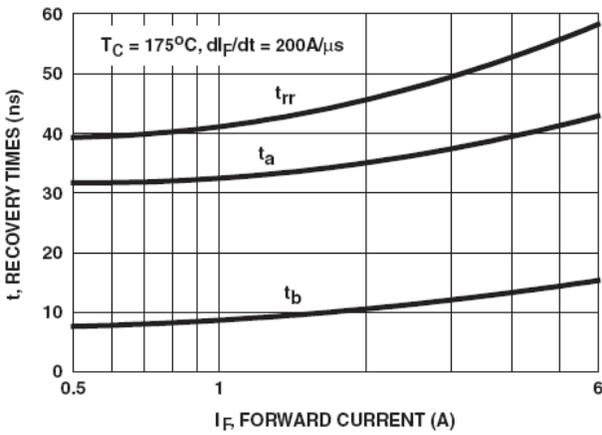


Figure 5. t_{rr} , t_a and t_b Curves vs Forward Current

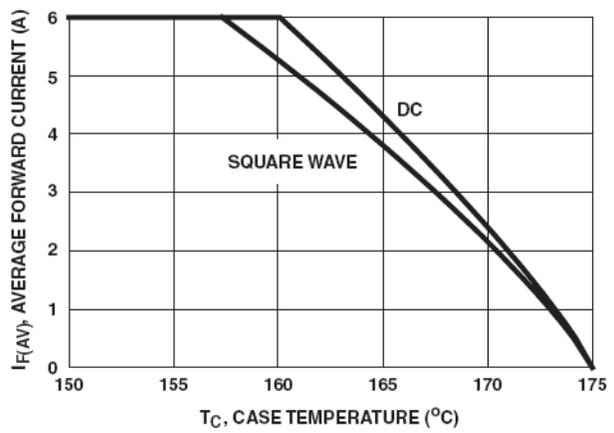


Figure 6. Current Derating Curve

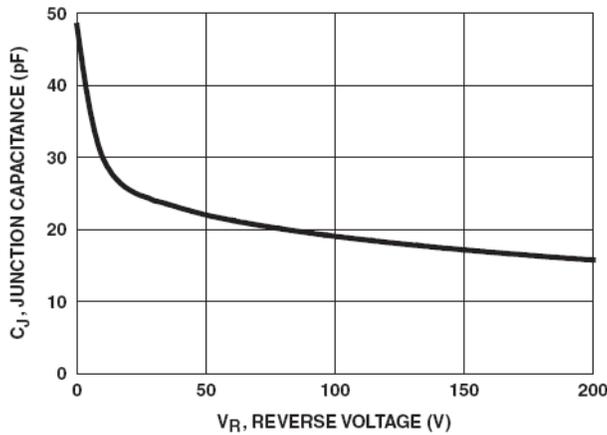


Figure 7. Junction Capacitance vs Reverse Voltage

Test Circuits and Waveforms

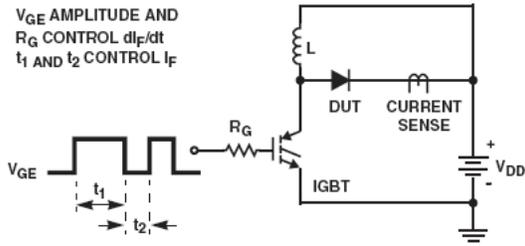


FIGURE 8. t_{rr} TEST CIRCUIT

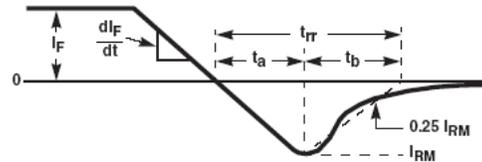


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

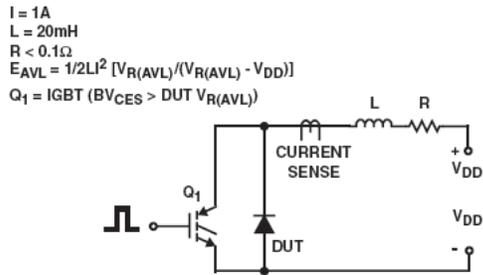


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

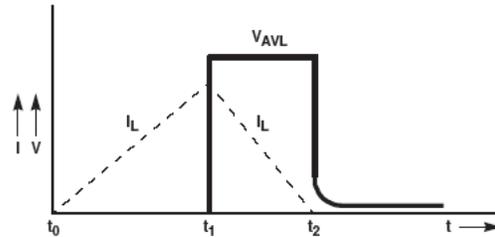
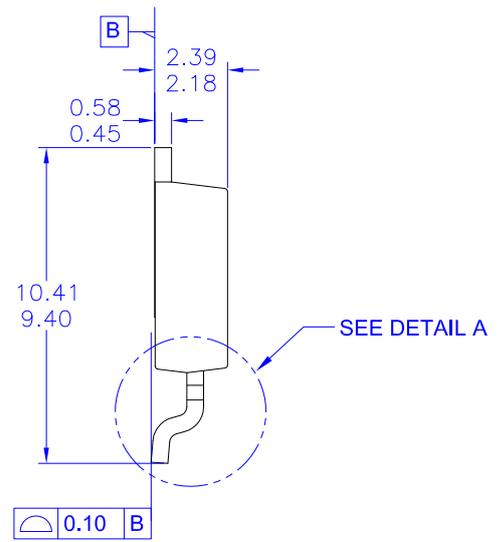
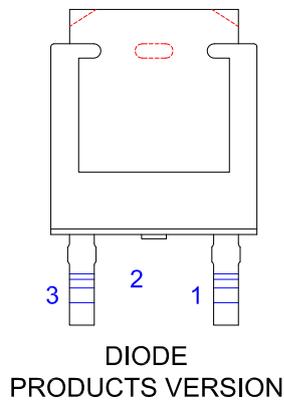
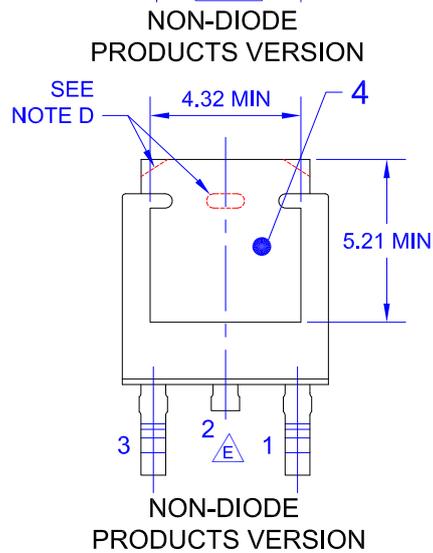
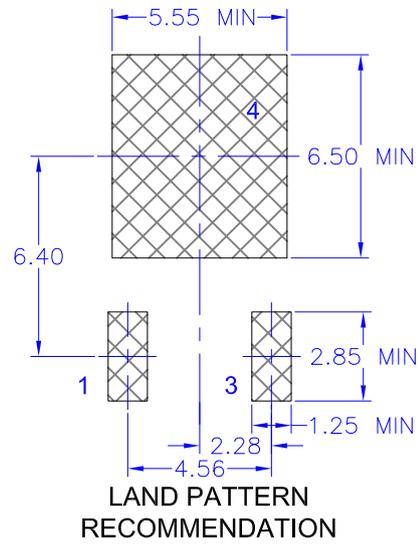
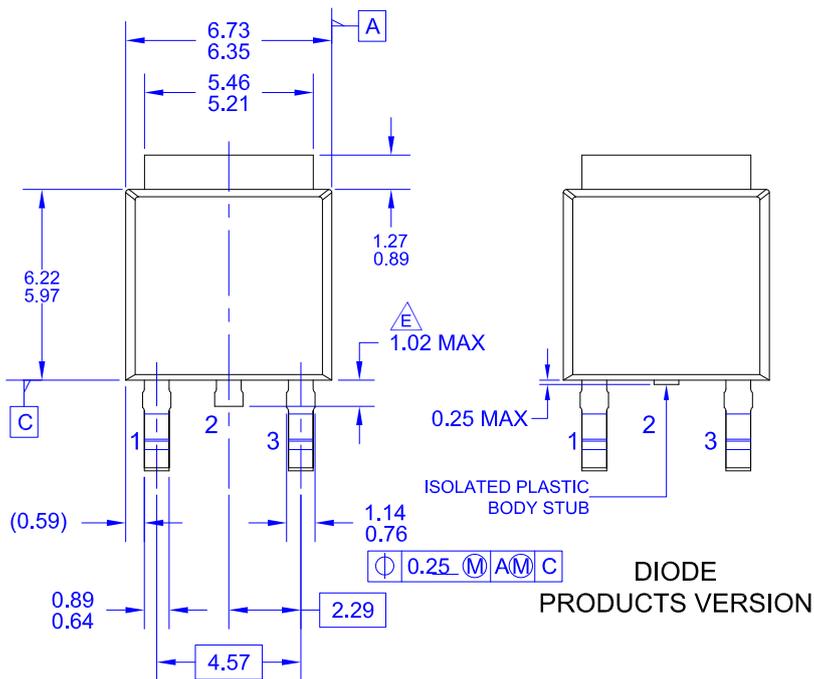
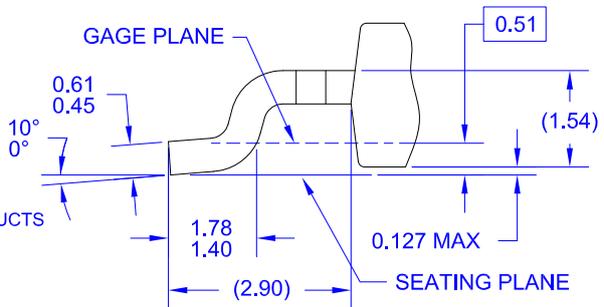


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS



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 METAL CENTER LEAD IS PRESENT ON FOR NON-DIODE PRODUCTS
- F) DIMENSIONS ARE EXCLUSIVE OF BURS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- G) LAND PATTERN RECOMMENDATION IS BASED ON IPC7351A STD TO228P991X239-3N.
- H) DRAWING NUMBER AND REVISION: MKT-TO252A03REV11



DETAIL A
(ROTATED -90°)
SCALE: 12X



ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local
Sales Representative