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# RURD620CCS9A

## 6A, 200V Ultrafast Dual Diode

### Features

- Ultrafast with soft Recovery <math><25\text{ns}</math>
- Operating Temperature <math>175^\circ\text{C}</math>
- 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.

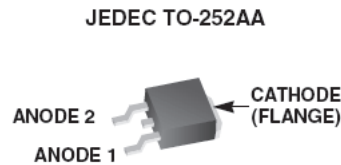
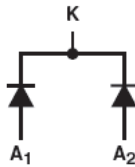
This device is intended for use as freewheeling/clamping diodes and rectifiers in a variety of switching power supplies and other power switching applications. This low stored charge and ultrafast soft recovery minimize ringing and electrical noise in many power switching circuits, thus reducing power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

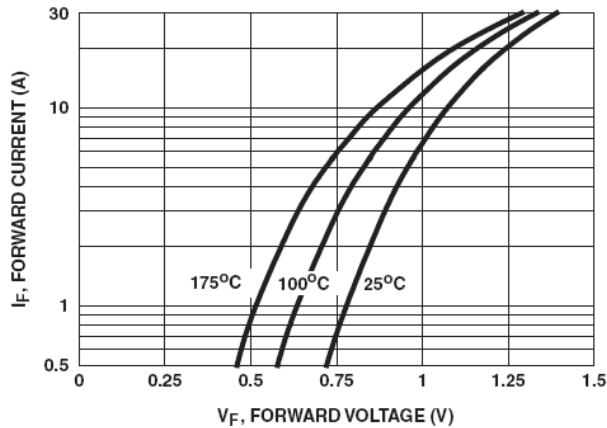
Parameter	Conditions	Min.	Typ.	Max.	Units
$V_F$	$I_F = 6\text{A}$	-	-	1.0	V
	$I_F = 6\text{A}, T_C = 150^\circ\text{C}$	-	-	0.83	V
$I_R$	$V_R = 200\text{V}$	-	-	100	$\mu\text{A}$
	$V_R = 200\text{V}, T_C = 150^\circ\text{C}$	-	-	500	$\mu\text{A}$
$t_{rr}$	$I_F = 1\text{A}, di/dt = 200\text{A}/\mu\text{s}$	-	-	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:**

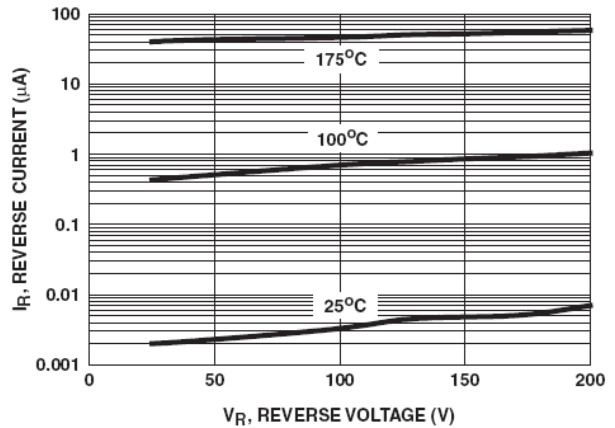
**DEFINITIONS**

- $V_F$  = Instantaneous forward voltage (pw = 300 $\mu\text{s}$ , 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)

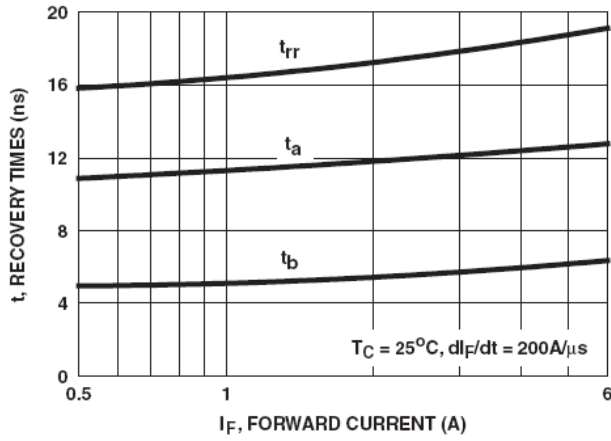


Figure 3.  $t_{rr}$ ,  $t_a$  and  $t_b$  Curves vs Forward Current

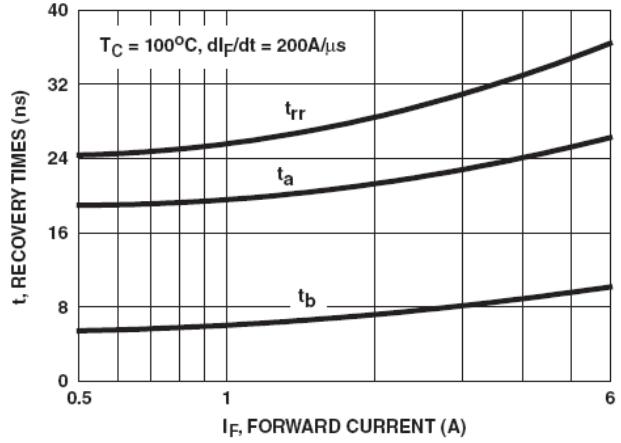


Figure 4.  $t_{rr}$ ,  $t_a$  and  $t_b$  Curves vs Forward Current

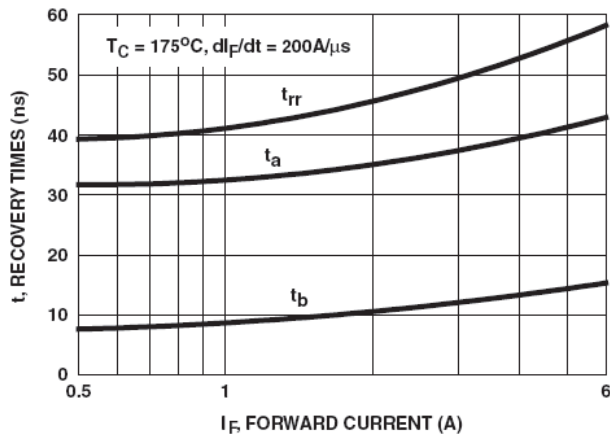


Figure 5.  $t_{rr}$ ,  $t_a$  and  $t_b$  Curves vs Forward Current

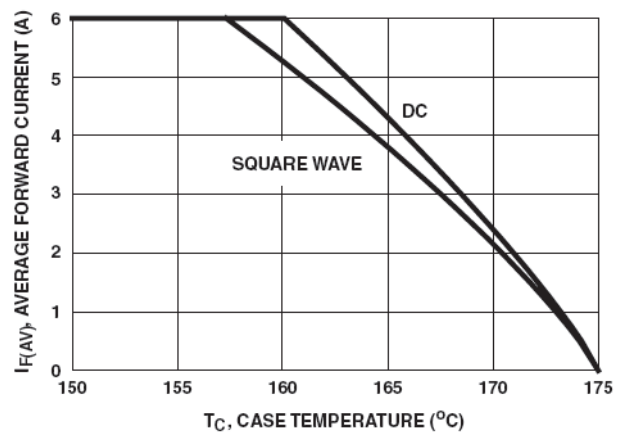


Figure 6. Current Derating Curve

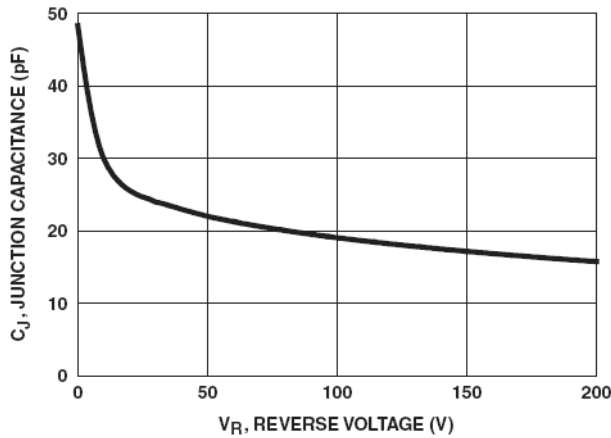


Figure 7. Junction Capacitance vs Reverse Voltage

### Test Circuits and Waveforms

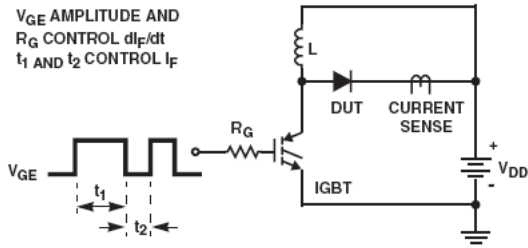


FIGURE 8.  $t_{rr}$  TEST CIRCUIT

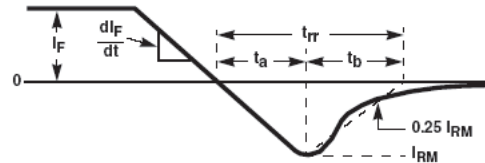


FIGURE 9.  $t_{rr}$  WAVEFORMS AND DEFINITIONS

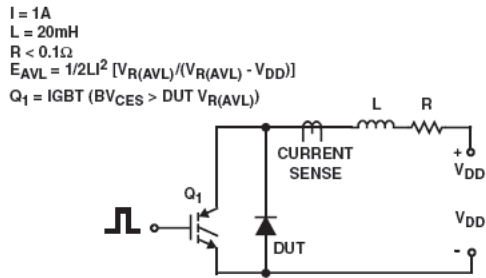


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

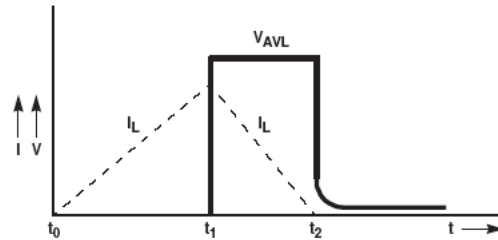
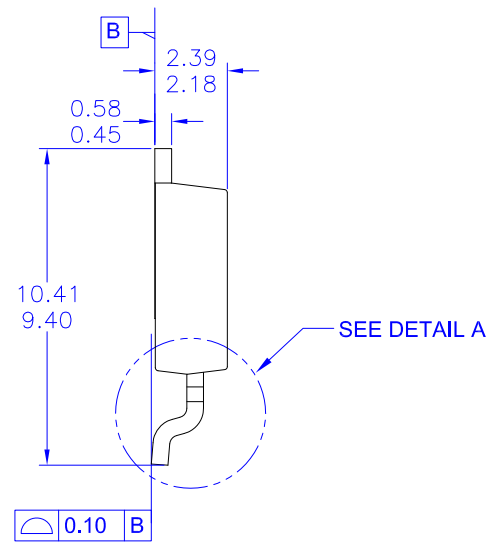
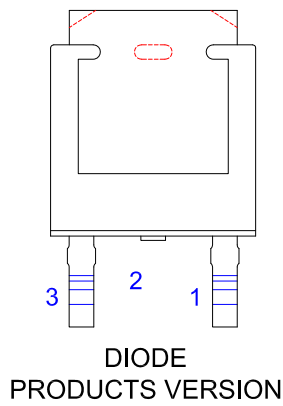
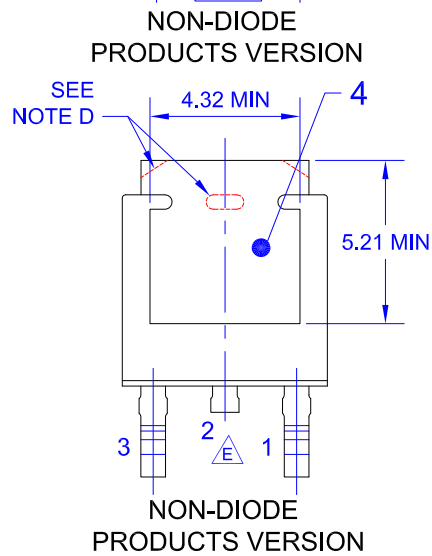
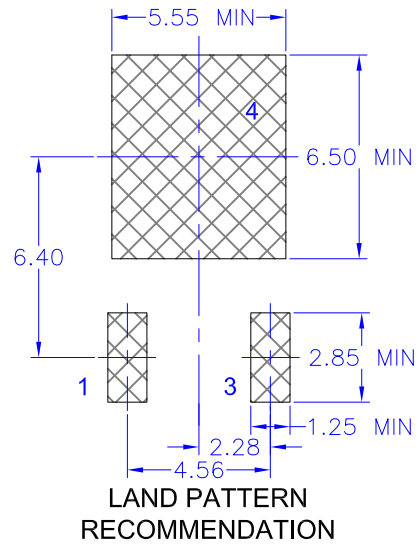
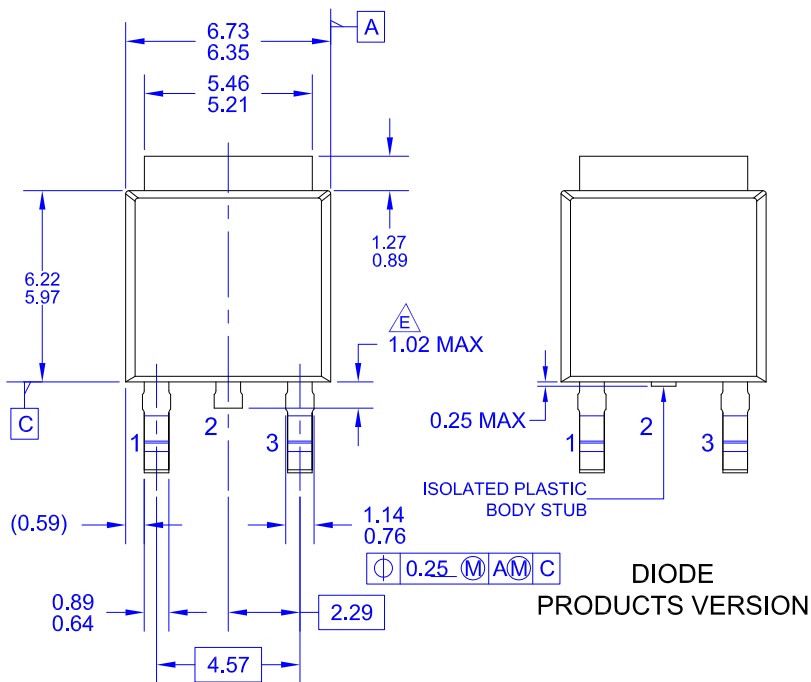
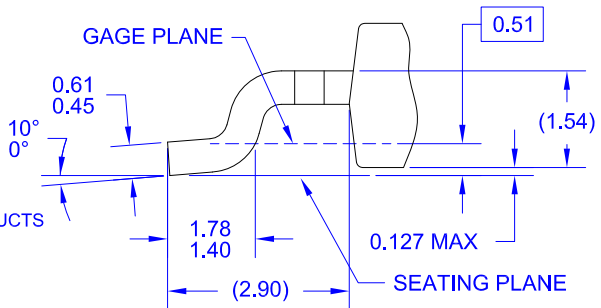


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS



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



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