February 2016

RURD620CCS9A

6A, 200V Ultrafast Dual Diode

Features

- Ultrafast with soft Recovery <25ns
- 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 reconvery characteristics (t_{rr}<25ns). This has low forward voltage drop and is silicon nitride passivated ion-implanted epitaxial planar construction.

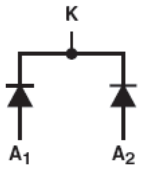
This device is intended for use as freewheeling/clamping diodes and rectifiers in a variety of switching power supplies and other power switching applications. This low stored charge and ultrafast soft recovery minimize ringing and electrical noise in many power swiching circuits, thus reducing power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

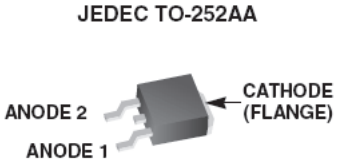
Ordering Information

Part Number	Package	Device Marking
RURD620CCS9A	TO-252AA	UR620C

NOTE: Tape and Reel Packing.

Pin Assignments





Absolute Maximum Ratings (Per Leg) T_C = 25°C Unless Otherwise Specified

Symbol	Parameter	Value	Units
V_{RRM}	Peak Repetitve 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°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	°C

Electrical Characteristics (Per Leg) T_C = 25°C unless otherwise Specified

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

Notes:

DEFINITIONS

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

I_R = Instantaneous reverse current.

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

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

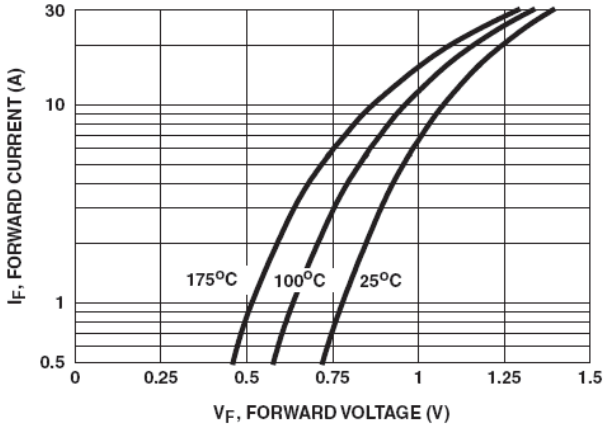


Figure 1. Forward Current vs Forward Voltage

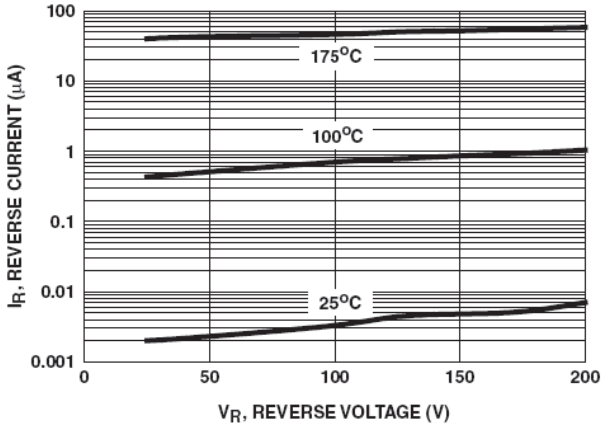


Figure 2. Reverse Current vs Reverse Voltage

Typical Performance Characteristics (Continued)

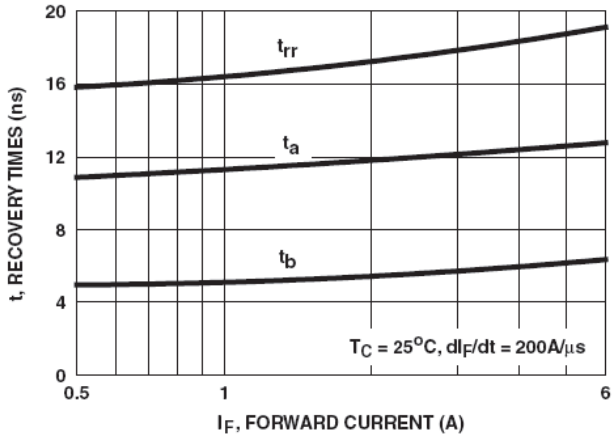


Figure 3. t_{rr}, t_a and t_b Curves vs Forward Current

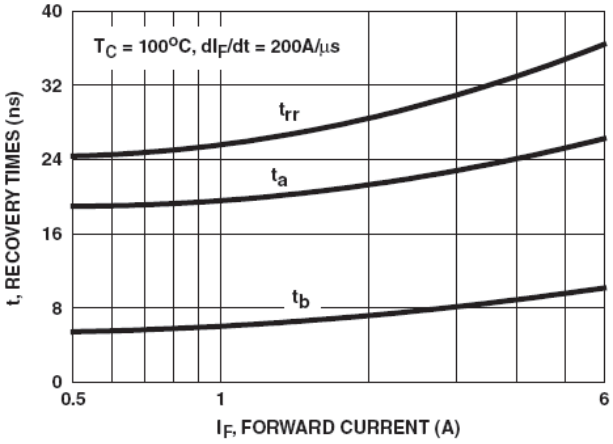


Figure 4. t_{rr}, t_a and t_b Curves vs Forward Current

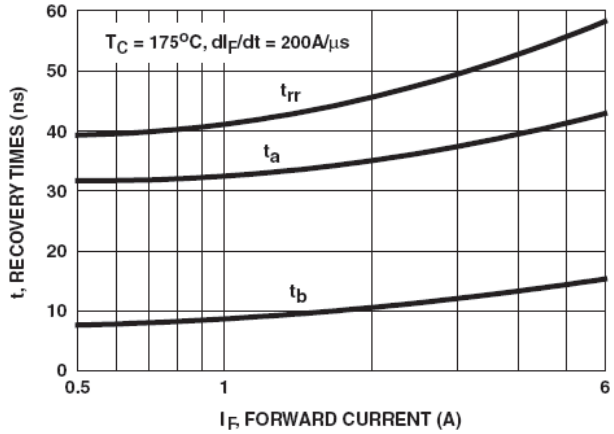


Figure 5. t_{rr}, t_a and t_b Curves vs Forward Current

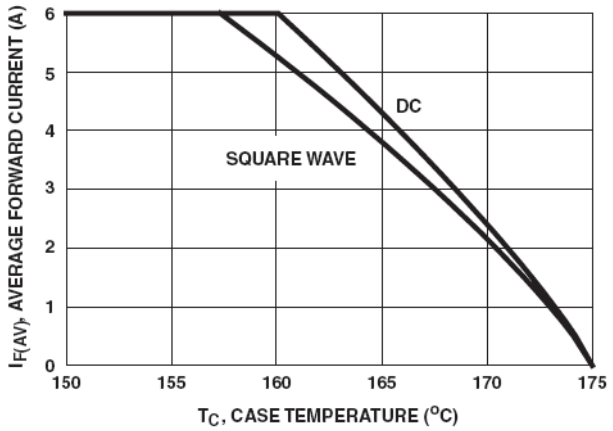


Figure 6. Current Derating Curve

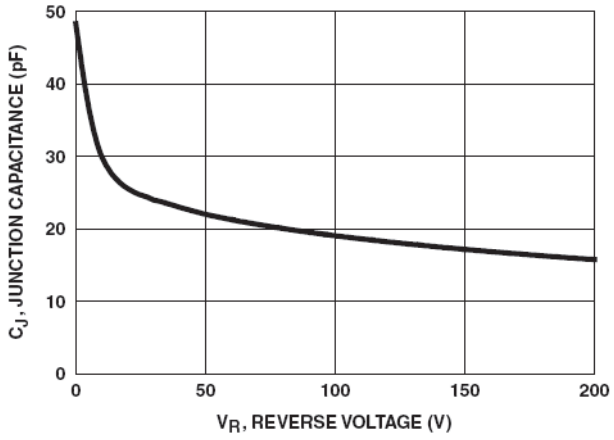


Figure 7. Junction Capacitance vs Reverse Voltage

Test Circuits and Waveforms

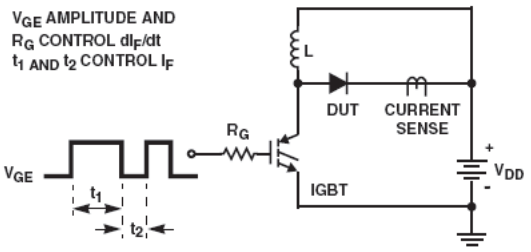


FIGURE 8. t_{rr} TEST CIRCUIT

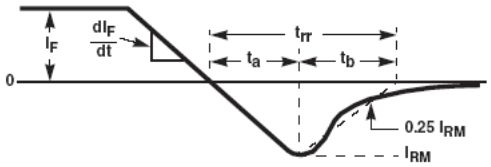


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

I = 1A
L = 20mH
R < 0.1Ω
$E_{AVL} = 1/2LI^2 [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
Q_1 = IGBT (BV_{CES} > DUT $V_{R(AVL)}$)

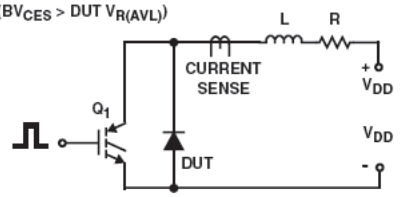


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

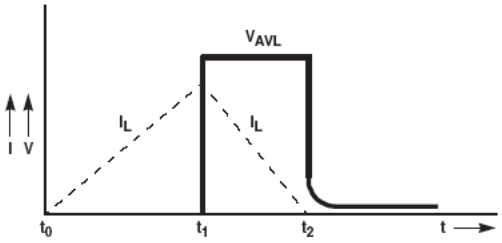
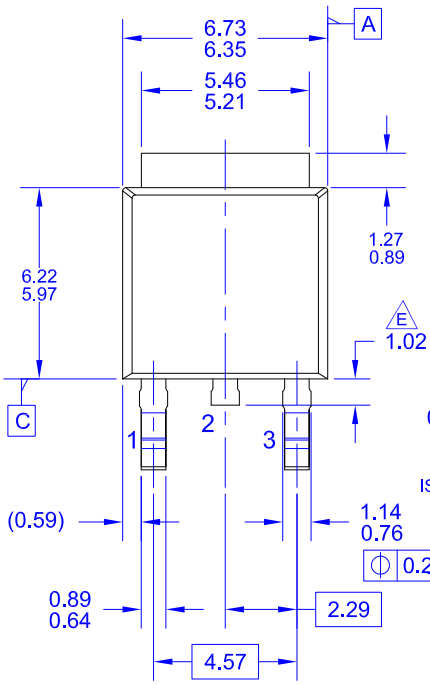
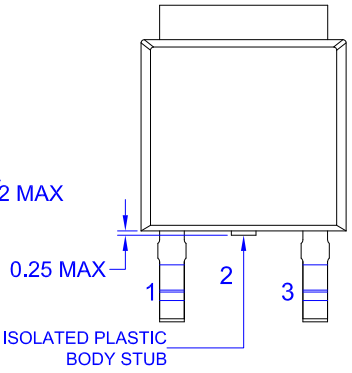


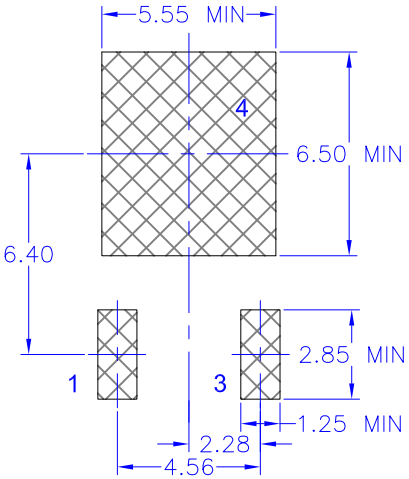
FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS



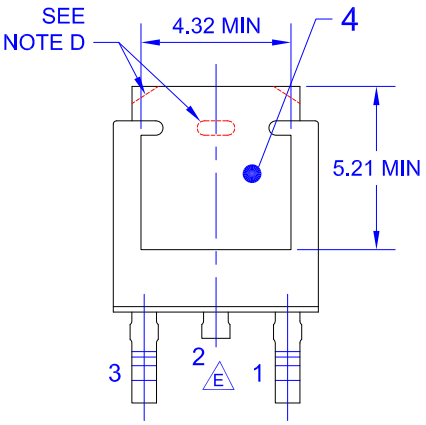
NON-DIODE PRODUCTS VERSION



DIODE PRODUCTS VERSION



LAND PATTERN RECOMMENDATION



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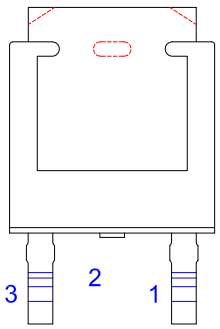
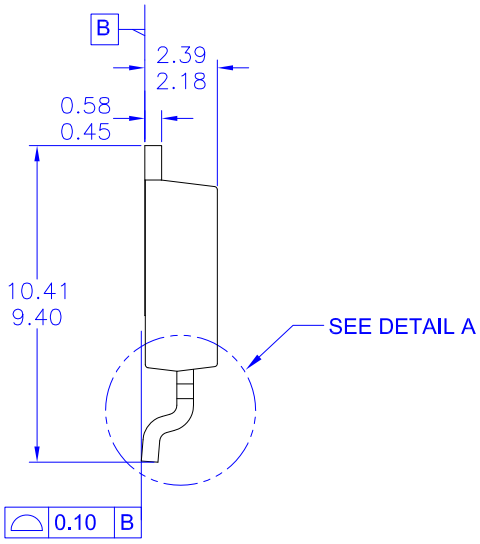


DIODE PRODUCTS VERSION



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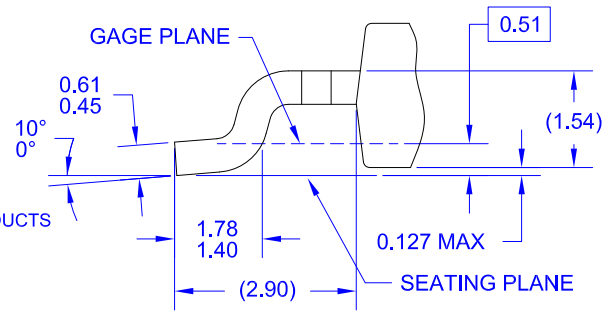
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
D) SUPPLIER DEPENDENT MOLD LOCKING HOLES OR CHAMFERED CORNERS OR EDGE PROTRUSION.
E) TRIMMED METAL CENTER LEAD IS PRESENT ON FOR NON-DIODE PRODUCTS
F) DIMENSIONS ARE EXCLUSIVE OF BURS, MOLD FLASH AND TIE BAR EXTRUSIONS.
G) LAND PATTERN RECOMMENDATION IS BASED ON IPC7351A STD TO228P991X239-3N.
H) DRAWING NUMBER AND REVISION: MKT-TO252A03REV11



DETAIL A
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