

12 A, 200 V, Ultrafast Dual Diode

The RURD620CCS9A is an ultrafast dual diode with low forward voltage drop. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power switching applications. It is specially suited for use in switching power supplies and industrial application.

Features

- Ultrafast Recovery $t_{rr} = 30$ ns (@ $I_F = 6$ A)
- Max Forward Voltage, $V_F = 1.0$ V (@ $T_C = 25^\circ\text{C}$)
- Reverse Voltage, $V_{RRM} = 200$ V
- Avalanche Energy Rated
- RoHS Compliant

Applications

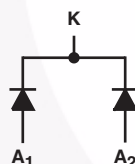
- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Ordering Information

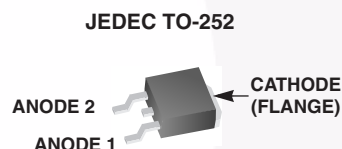
PART NUMBER	PACKAGE	BRAND
RURD620CCS9A	TO-252-3L	UR620C

NOTE: When ordering, use the entire part number. Add the suffix, 9A, to obtain the TO-252 variant in tape and reel, i.e., RURD620CCS9A.

Symbol



Packaging



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

	RURD620CCS9A	UNIT
Peak Repetitive Reverse Voltage	V_{RRM} 200	V
Working Peak Reverse Voltage	V_{RWM} 200	V
DC Blocking Voltage	V_R 200	V
Average Rectified Forward Current $T_C = 160^\circ\text{C}$	$I_{F(AV)}$ 6	A
Repetitive Peak Surge Current Square Wave, 20 kHz	I_{FRM} 12	A
Nonrepetitive Peak Surge Current Halfwave, 1 phase, 60 Hz	I_{FSM} 60	A
Maximum Power Dissipation	P_D 45	W
Avalanche Energy (See Figures 10 and 11)	E_{AVL} 10	mJ
Operating and Storage Temperature	T_{STG}, T_J -65 to 175	$^\circ\text{C}$

Electrical Specifications (Per Leg) $T_C = 25^\circ\text{C}$, Unless Otherwise Specified

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
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}	$I_F = 1\text{ A}, dI_F/dt = 200\text{ A}/\mu\text{s}$	-	-	25	ns
	$I_F = 6\text{ A}, dI_F/dt = 200\text{ A}/\mu\text{s}$	-	-	30	ns
t_a	$I_F = 6\text{ A}, dI_F/dt = 200\text{ A}/\mu\text{s}$	-	13	-	ns
t_b	$I_F = 6\text{ A}, dI_F/dt = 200\text{ A}/\mu\text{s}$	-	6.5	-	ns
Q_{rr}	$I_F = 6\text{ A}, dI_F/dt = 200\text{ A}/\mu\text{s}$	-	20	-	nC
C_J	$V_R = 10\text{ V}, I_F = 0\text{ A}$	-	30	-	pF
$R_{\theta JC}$		-	-	3.5	$^\circ\text{C}/\text{W}$

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} based 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.

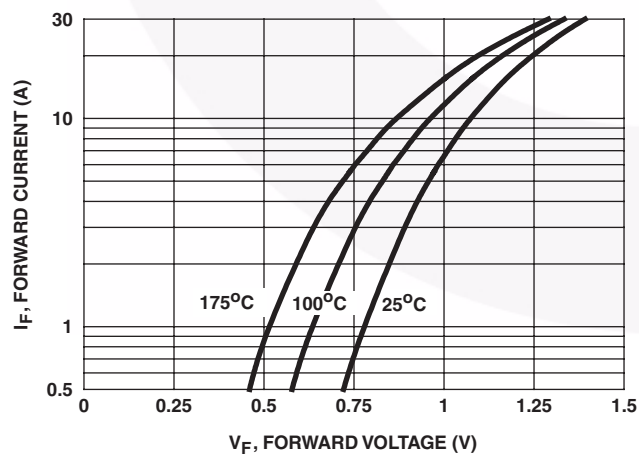
Typical Performance Curves

FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

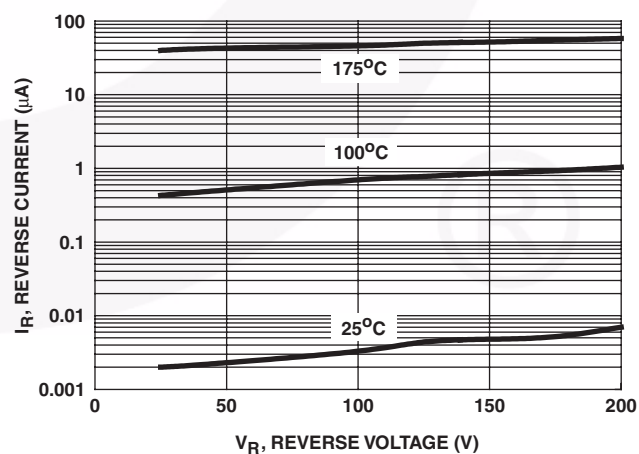


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

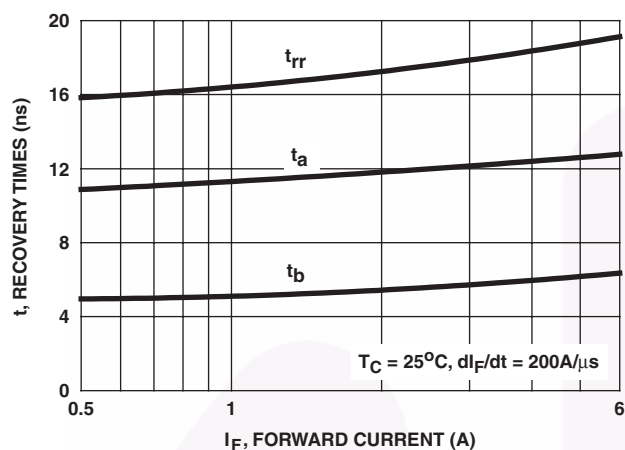


FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

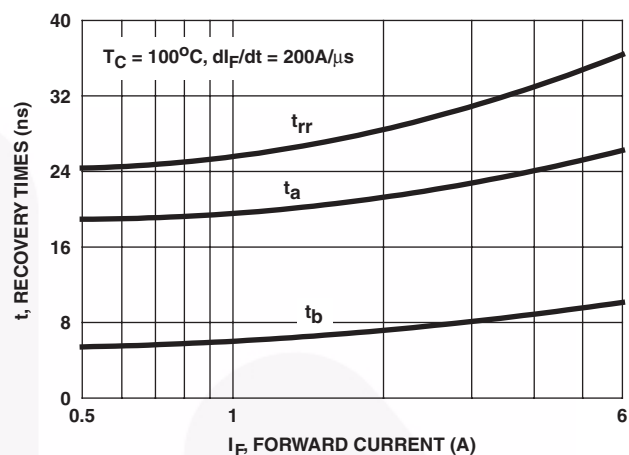


FIGURE 4. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

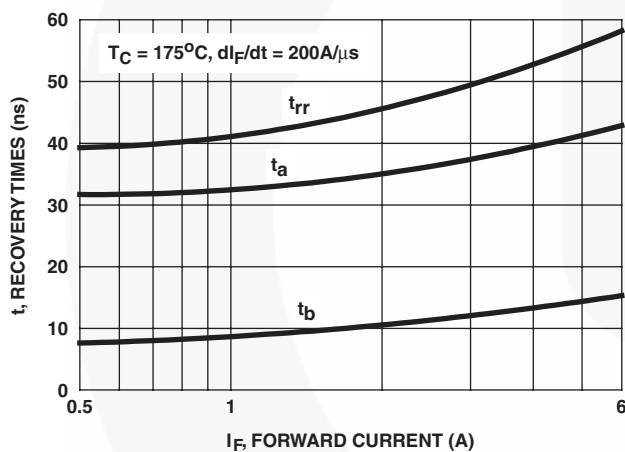


FIGURE 5. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

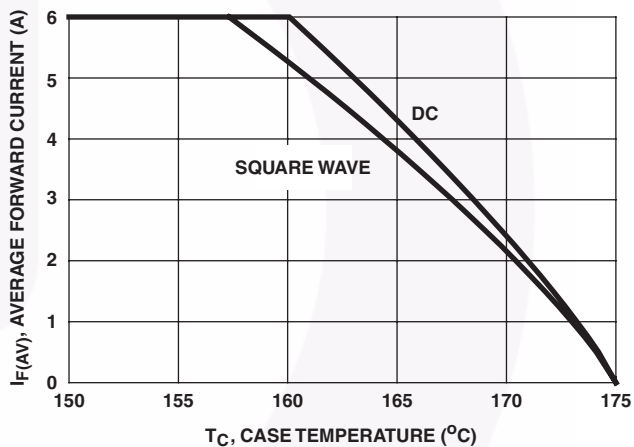


FIGURE 6. CURRENT DERATING CURVE

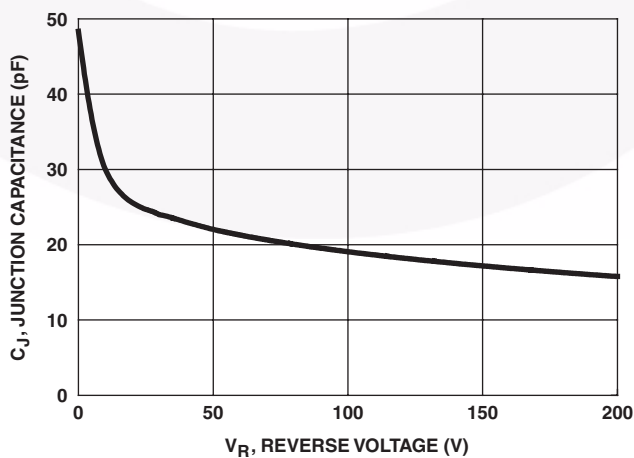


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

Test Circuits and Waveforms

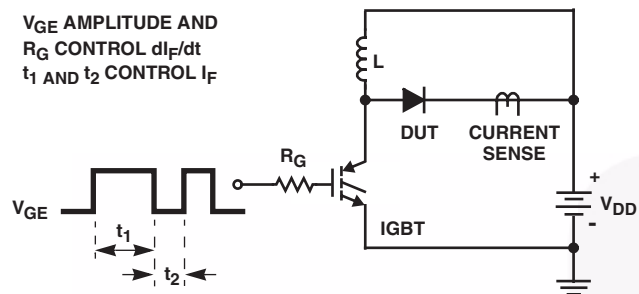


FIGURE 8. t_{rr} TEST CIRCUIT

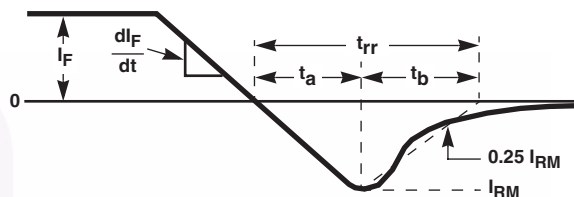


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

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

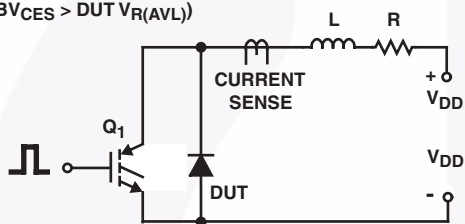


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

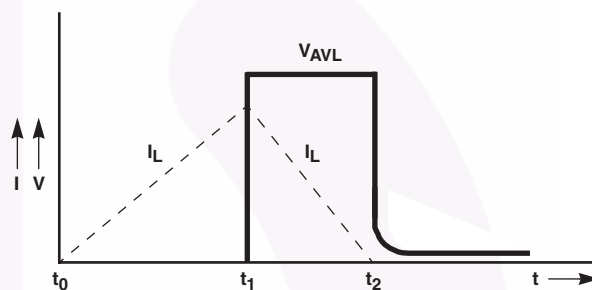


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Mechanical Dimensions

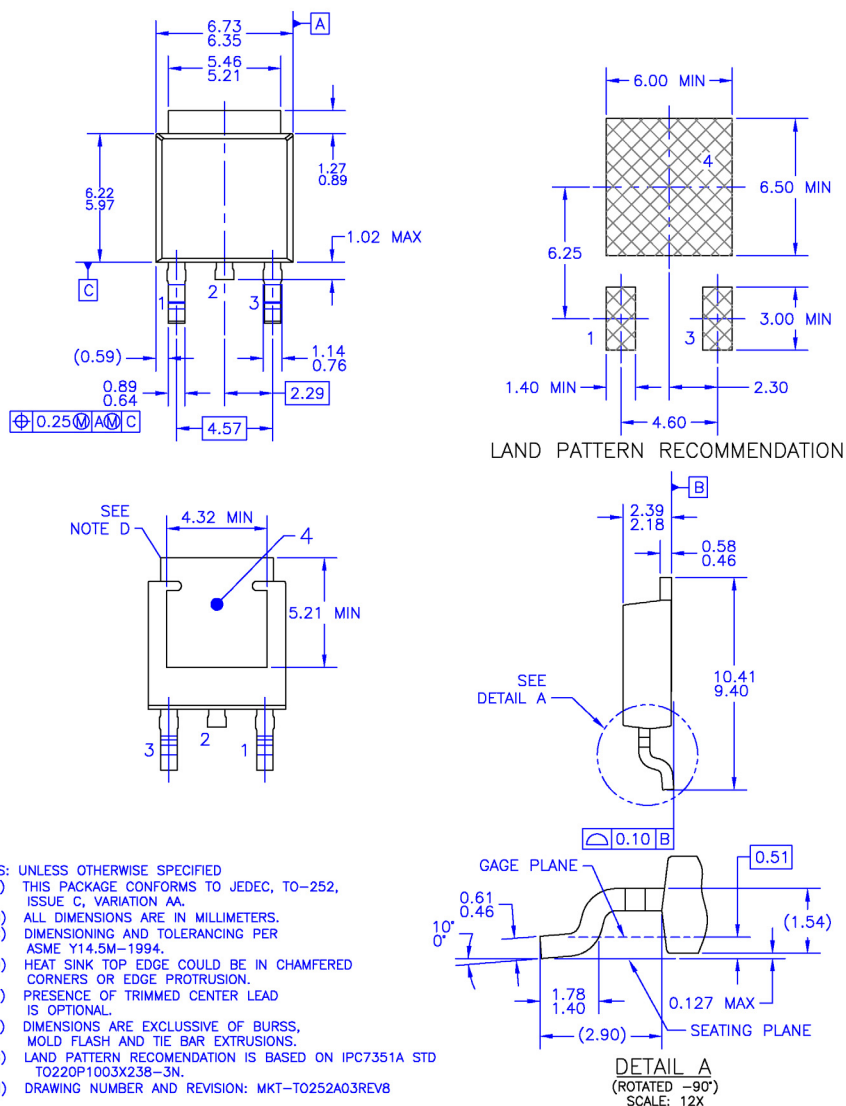


Figure 9. TO-252 3L (DPAK) - TO252 (D-PAK), MOLDED, 3 LEAD, OPTION AA&AB

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Rev. I66



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