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Data Sheet October 2018

4A, 1200V Ultrafast Diodes

The RURD4120S9A_F085 are ultrafast diodes with soft recovery characteristics (t_{rr} < 70ns). They have low forward voltage drop and are silicon nitride passivated ion-implanted epitaxial planar construction.

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

Formerly developmental type TA49036.

Ordering Information

PART NUMBER	PACKAGE	BRAND	PACKING TYPE	QUANTITY
RURD4120S9A_F085	TO-252	UR4120	Tape and Reel	2500

Features

•	Ultrafast with Soft Recovery	<70ns
•	Operating Temperature	175°C
•	Reverse Voltage	1200V

- · Avalanche Energy Rated
- Planar Construction
- Qualified to ACE Q101
- · RoHS Compliant

Applications

- Switching Power Supplies
- · Power Switching Circuits
- General Purpose

Packaging

JEDEC STYLE TO-252

Symbol





Absolute Maximum Ratings T_C = 25°C, Unless Otherwise Specified

	RURD4120S9A_F085	UNITS
Peak Repetitive Reverse Voltage	1200	V
Working Peak Reverse Voltage	1200	V
DC Blocking VoltageV _R	1200	V
Average Rectified Forward Current $I_{F(AV)}$ ($T_{C} = 152^{\circ}C$)	4	Α
Repetitive Peak Surge Current	8	Α
Nonrepetitive Peak Surge Current	40	Α
Maximum Power Dissipation	50	W
Avalanche Energy (See Figures 10 and 11)	10	mJ
Operating and Storage Temperature	-65 to 175	°C

Electrical Specifications T_C = 25°C, Unless Otherwise Specified

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V _F	I _F = 4A	-	-	2.1	V
	$I_F = 4A, T_C = 150^{\circ}C$	-	-	1.9	V
I _R	V _R = 1200V	-	-	100	μΑ
	V _R = 1200V, T _C = 150 ^o C	-	-	500	μА
t _{rr}	$I_F = 1A$, $dI_F/dt = 200A/\mu s$	-	-	70	ns
	$I_F = 4A$, $dI_F/dt = 200A/\mu s$	-	-	90	ns
t _a	$I_F = 4A$, $dI_F/dt = 200A/\mu s$	-	40	-	ns
t _b	$I_F = 4A$, $dI_F/dt = 200A/\mu s$	-	28	-	ns
Q _{RR}	$I_F = 4A$, $dI_F/dt = 200A/\mu s$	-	335	-	nC
CJ	$V_{R} = 10V, I_{F} = 0A$	-	15	-	pF
$R_{ heta JC}$		-	-	3	°C/W

DEFINITIONS

 V_F = Instantaneous forward voltage (pw = 300 μ 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} based on a straight line from peak I_{RM} through 25% of I_{RM} (See Figure 9).

Q_{RR} = Reverse recovery time.

 C_J = Junction capacitance.

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

pw = Pulse width.

D = Duty cycle.

Typical Performance Curves

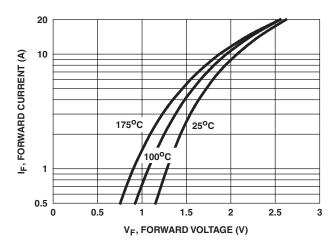


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

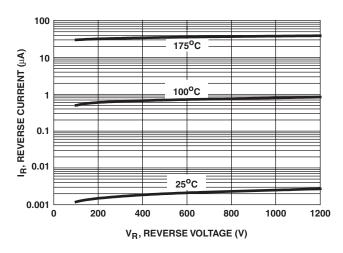


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

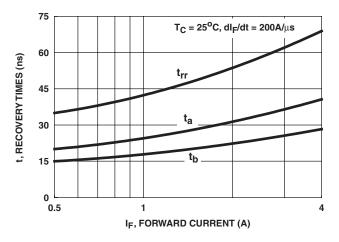


FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

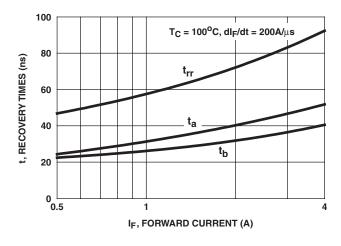


FIGURE 4. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

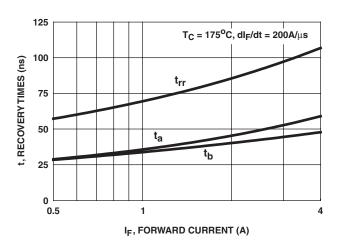


FIGURE 5. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

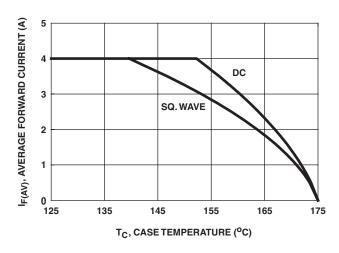


FIGURE 6. CURRENT DERATING CURVE

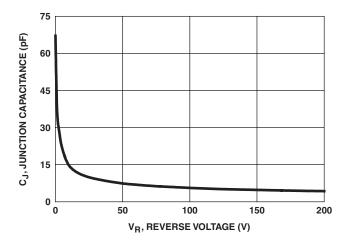


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

Test Circuits and Waveforms

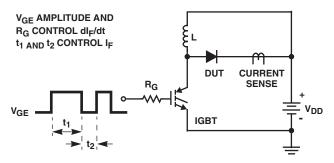


FIGURE 8. t_{rr} TEST CIRCUIT

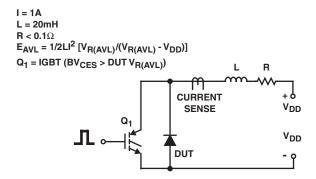


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

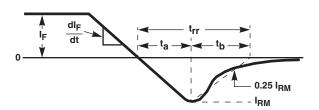


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

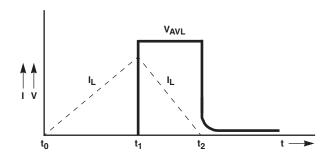


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS





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Datasheet Identification	Product Status	Definition
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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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