



RURDG30120

February 1993

30A, 1200V Ultrafast Dual Diode

Features

- Ultrafast with Soft Recovery <110ns
- Operating Temperature 175°C
- Reverse Voltage Up To 1200V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

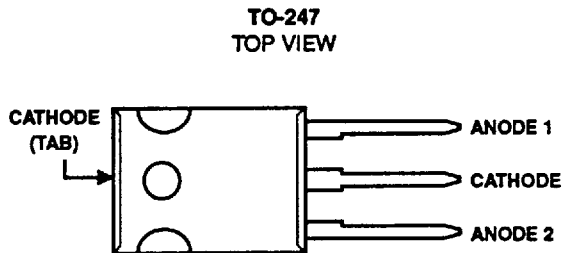
Description

The RURDG30120 (49031) is an ultrafast dual diode with soft recovery characteristic ($t_{RR} < 110ns$). It has low forward voltage drop and is silicon nitride passivated ion-implanted epitaxial planar construction.

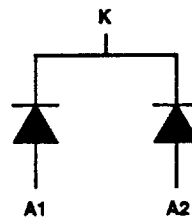
This device is intended for use as a freewheeling/ clamping diode and rectifier in a variety of switching power supplies and other power switching applications. Its low stored charge and ultrafast recovery with soft recovery characteristic minimize ringing and electrical noise in many power switching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

The RURDG30120 is supplied in the TO-247 style plastic package.

Package



Symbol



Absolute Maximum Ratings ($T_C = +25^\circ C$), Unless Otherwise Specified

	RURDG30120	UNITS
Peak Repetitive Reverse Voltage	V_{RRM} 1200	V
Working Peak Reverse Voltage	V_{RWM} 1200	V
DC Blocking Voltage	V_R 1200	V
Average Rectified Forward Current (Per Leg)	$I_{F(AV)}$ 30	A
($T_C = +110^\circ C$)		
Repetitive Peak Surge Current	I_{FSM} 60	A
(Square Wave, 20kHz)		
Nonrepetitive Peak Surge Current	I_{FSM} 300	A
(Halfwave, 1 phase, 60Hz)		
Maximum Power Dissipation	P_D 125	W
Avalanche Energy ($L = 40mH$)	W_{AVL} 30	mj
Operating and Storage Temperature	T_{STG}, T_J -65 to +175	°C

Electrical Characteristics Case Temperature (T_C) = +25°C, Unless Otherwise Specified

SYMBOL	TEST CONDITION	LIMITS			UNITS
		MIN	TYP	MAX	
V_F	$I_F = 30A$	-	-	2.1	V
V_F	$I_F = 30A, T_C = 150^\circ C$	-	-	1.9	V
I_R	$V_R = 1200V$	-	-	100	μA
I_R	$V_R = 1200V, T_C = 150^\circ C$	-	-	1	mA
t_{RR}	$I_F = 1A, dI_F/dt = 100A/\mu s$	-	-	110	ns
	$I_F = 30A, dI_F/dt = 100A/\mu s$	-	-	150	ns
t_A	$I_F = 30A, dI_F/dt = 100A/\mu s$	-	90	-	ns
t_B	$I_F = 30A, dI_F/dt = 100A/\mu s$	-	45	-	ns
$R_{\theta JC}$		-	-	1.2	$^\circ C/W$

DEFINITIONS

V_F = Instantaneous forward voltage (pw = 300 μ s, D = 2%).

I_R = Instantaneous reverse current (pw = 300 μ s, D = 2%).

t_{RR} = Reverse recovery time (See Figure 2), summation of $t_A + t_B$.

t_A = Time to reach peak reverse current (See Figure 2).

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 2).

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

pw = pulse width.

D = duty cycle.

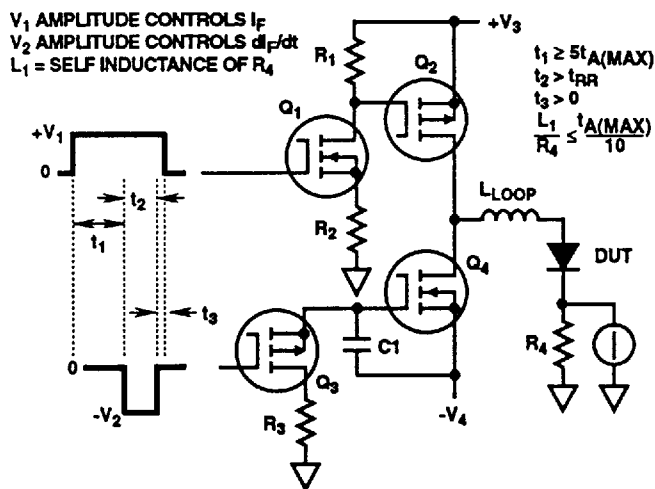


FIGURE 1. t_{RR} TEST CIRCUIT

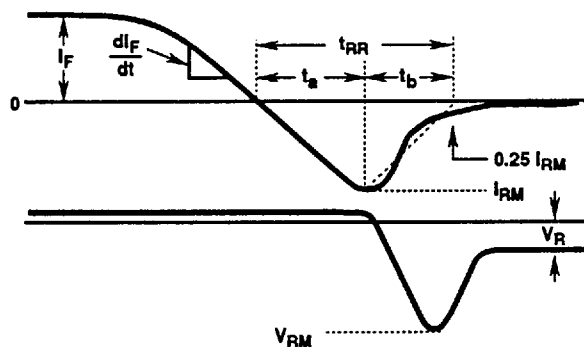


FIGURE 2. t_{RR} WAVEFORMS AND DEFINITIONS

RURDG30120

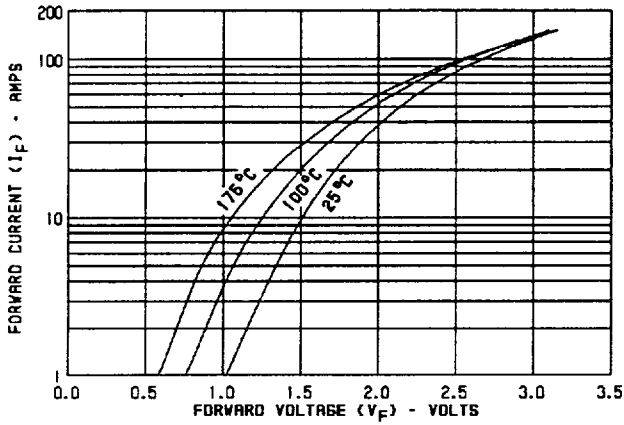


FIGURE 3. TYPICAL FORWARD CURRENT vs FORWARD VOLTAGE DROP

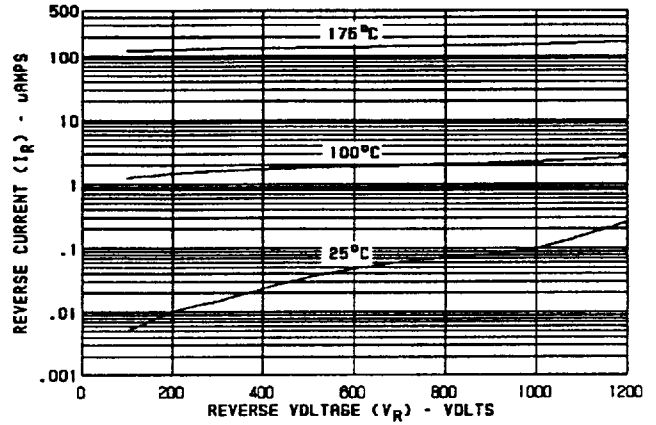


FIGURE 4. TYPICAL REVERSE CURRENT vs VOLTAGE

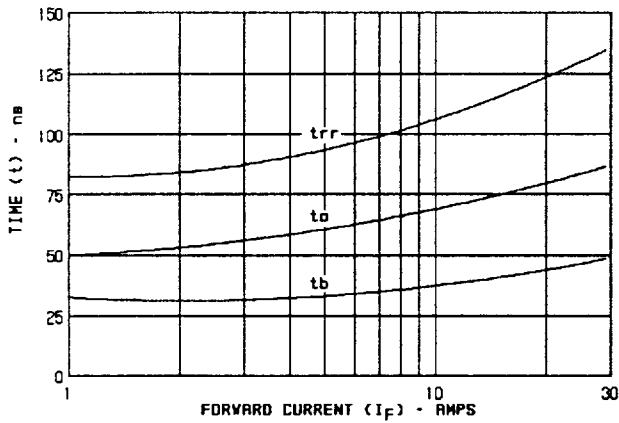


FIGURE 5. TYPICAL t_{RR} , t_A AND t_B CURVES vs FORWARD CURRENT

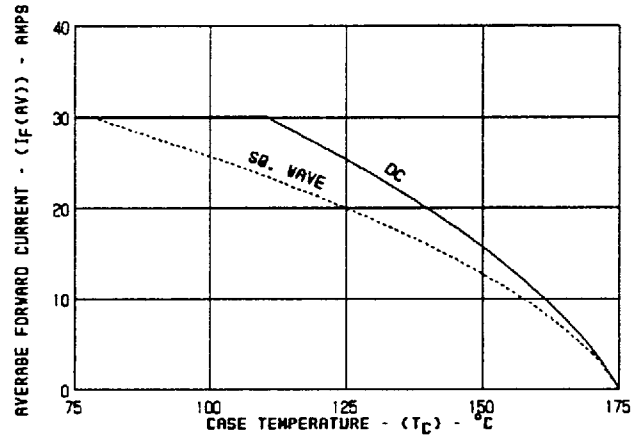


FIGURE 6. CURRENT DERATING CURVE FOR ALL TYPES

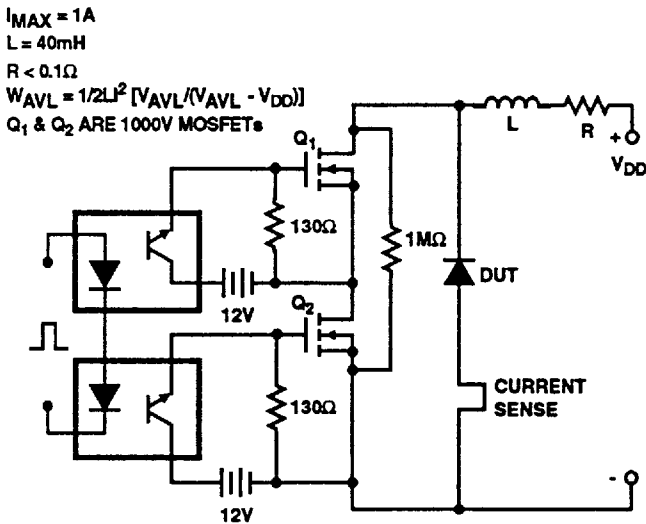


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

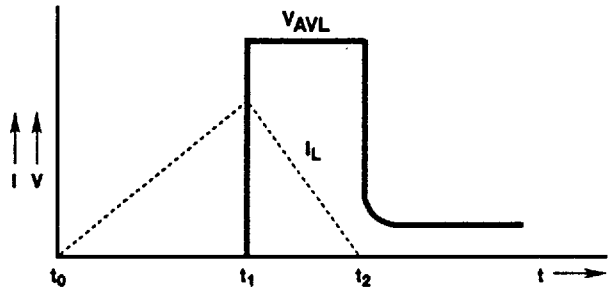
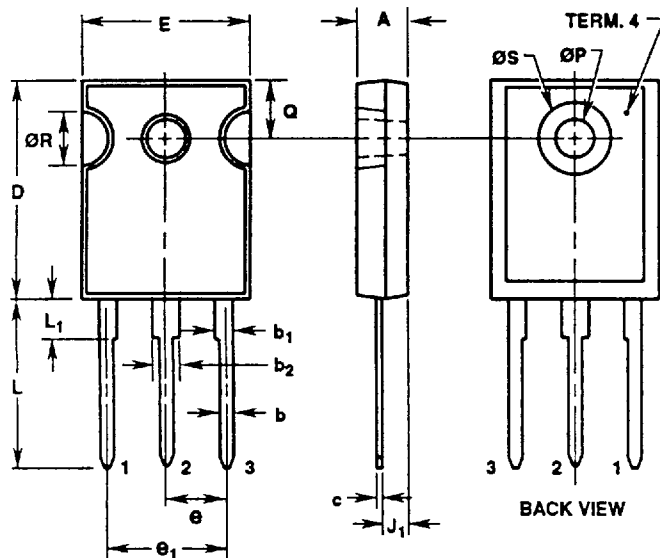


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

RURDG30120

Packaging

JEDEC STYLE TO-247 PLASTIC PACKAGE



**TO-247
3 LEAD JEDEC STYLE PLASTIC PACKAGE**

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.180	0.190	4.58	4.82	-
b	0.046	0.051	1.17	1.29	2, 3
b ₁	0.060	0.070	1.53	1.77	1, 2
b ₂	0.095	0.105	2.42	2.66	1, 2
c	0.020	0.026	0.51	0.66	1, 2, 3
D	0.800	0.820	20.32	20.82	-
E	0.605	0.625	15.37	15.87	-
e	0.219 TYP		5.56 TYP		4
e ₁	0.438 BSC		11.12 BSC		4
J ₁	0.090	0.105	2.29	2.66	5
L	0.620	0.640	15.75	16.25	-
L ₁	0.145	0.155	3.69	3.93	1
ØP	0.138	0.144	3.51	3.65	-
Q	0.210	0.220	5.34	5.58	-
ØR	0.195	0.205	4.96	5.20	-
ØS	0.260	0.270	6.61	6.85	-

NOTES:

1. Lead dimension and finish uncontrolled in L₁.
2. Lead dimension (without solder).
3. Add typically 0.002 inch (0.05mm) for solder coating.
4. Position of lead to be measured 0.250 inch (6.35mm) from bottom of dimension D.
5. Position of lead to be measured 0.100 inch (2.54mm) from bottom of dimension D.
6. Controlling dimension: Inch.
7. Revision 1 dated 1-93.

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