Data Sheet | January 2000 | File Number 3397.3

30A, 1200V Ultrafast Diode

The RURP30120 is an ultrafast 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.

Formerly developmental type TA49031.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RURP30120	TO-220AC	RUR30120

NOTE: When ordering, use the entire part number.

Symbol

Features

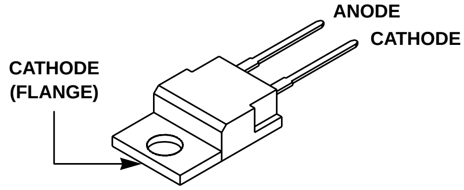
- Ultrafast with Soft Recovery . . . . <110ns
- Operating Temperature. . . . . 175^oC
- Reverse Voltage 1200V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC TO-220AC



Absolute Maximum Ratings $T_C = 25^oC$, Unless Otherwise Specified

		RURP30120	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 ($T_C = 110^oC$)	$I_{F(AV)}$	30	A
Repetitive Peak Surge Current (Square Wave, 20kHz)	I_{FRM}	60	A
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60Hz)	I_{FSM}	300	A
Maximum Power Dissipation	P_D	125	W
Avalanche Energy (See Figures 7 and 8)	E_{AVL}	30	mJ
Operating and Storage Temperature	T_{STG}, T_J	-65 to 175	^oC

Electrical Specifications $T_C = 25^oC$, Unless Otherwise Specified

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V_F	I_F = 30A	-	-	2.1	V
	I_F = 30A, $T_C = 150^oC$	-	-	1.9	V
I_R	V_R = 1200V	-	-	250	μA
	V_R = 1200V, $T_C = 150^oC$	-	-	1	mA
t_{rr}	I_F = 1A, dI_F/dt = 100A/μs	-	-	110	ns
	I_F = 30A, dI_F/dt = 100A/μs	-	-	150	ns
t_a	I_F = 30A, dI_F/dt = 100A/μs	-	90	-	ns
t_b	I_F = 30A, dI_F/dt = 100A/μs	-	45	-	ns
$R_{\theta JC}$		-	-	1.2	$^oC/W$

DEFINITIONS

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

I_R = Instantaneous reverse current.

t_{rr} = Reverse recovery time (See Figure 6), summation of $t_a + t_b$.

t_a = Time to reach peak reverse current (See Figure 6).

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 6).

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

pw = Pulse width.

D = Duty cycle.

Typical Performance Curves

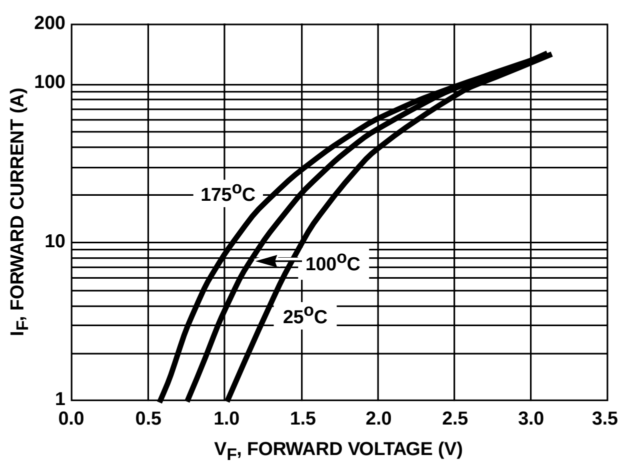


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

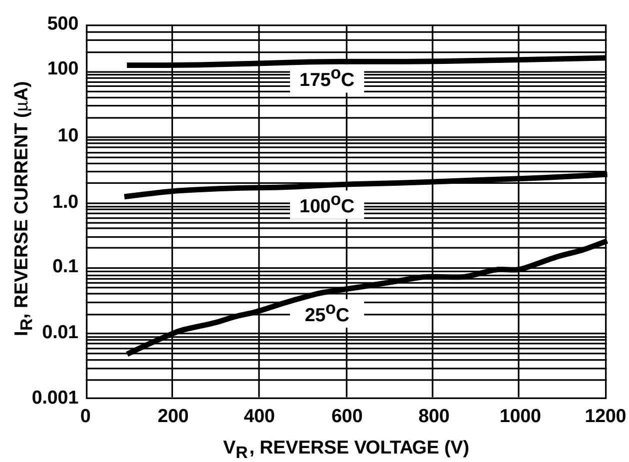


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

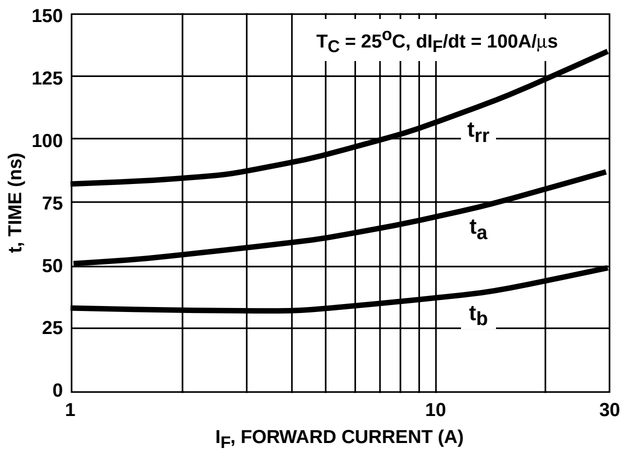


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

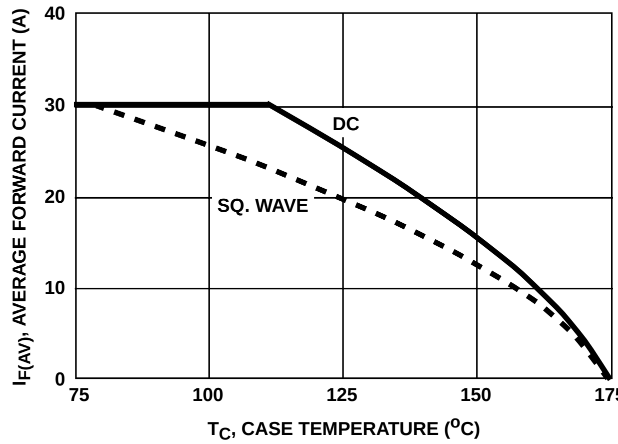


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

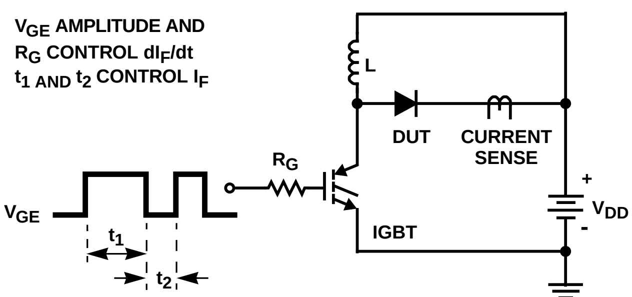


FIGURE 5. t_{rr} TEST CIRCUIT

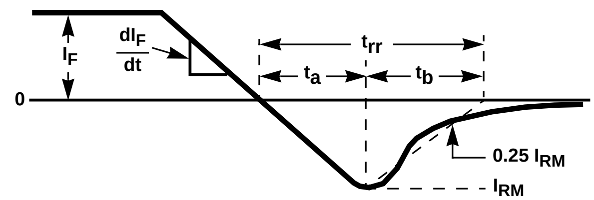


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

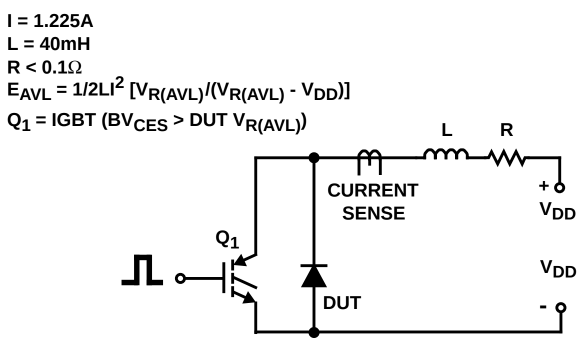


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

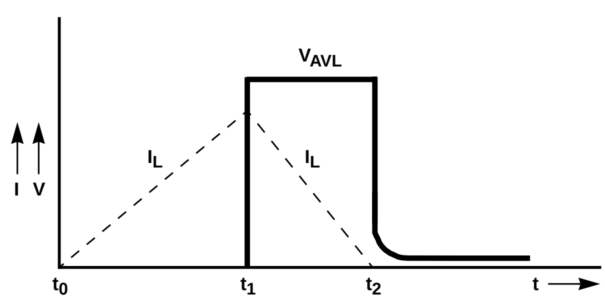


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS