Data Sheet | January 2000 | File Number 2877.4

30A, 1000V Ultrafast Diode

The RURP30100 is an ultrafast diode with soft recovery characteristics (t_{rr} < 110ns). It has a low forward voltage drop and is of silicon nitride passivated, ion-implanted, epitaxial construction.

This device is intended for use as a flywheel/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 characteristics minimizes ringing and electrical noise in many power switching circuits, thus reducing power loss in the switching transistor.

Formerly developmental type TA09904.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RURP30100	TO-220AC	RUR30100

NOTE: When ordering, use the entire part number.

Symbol

Features

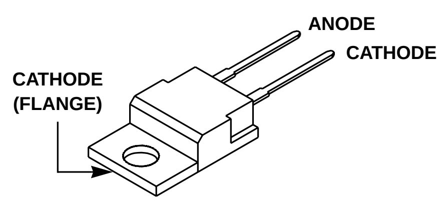
- Ultrafast with Soft Recovery . . . . <110ns
- Operating Temperature. . . . . .175^{o}C
- Reverse Voltage 1000V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supply
- Power Switching Circuits
- General Purpose

Packaging

JEDEC TO-220AC



Absolute Maximum Ratings T_C = 25^{o}C, Unless Otherwise Specified

		RURP30100	UNITS
Peak Repetitive Reverse Voltage	V_{RRM}	1000	V
Working Peak Reverse Voltage	V_{RWM}	1000	V
DC Blocking Voltage	V_R	1000	V
Average Rectified Forward Current (T_C = 120^{o}C)	$I_{F(AV)}$	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	^{o}C

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

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V_F	$I_F = 30A$	-	-	1.8	V
	$I_F = 30A$, $T_C = 150^oC$	-	-	1.6	V
I_R	$V_R = 1000V$	-	-	250	µA
	$V_R = 1000V$, $T_C = 150^oC$	-	-	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	$^oC/W$

DEFINITIONS

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

I_R = Instantaneous reverse current.

t_{rr} = Reverse recovery time at $dI_F/dt = 100A/\mu s$ (See Figure 6), summation of $t_a + t_b$.

t_a = Time to reach peak reverse current at $dI_F/dt = 100A/\mu s$ (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

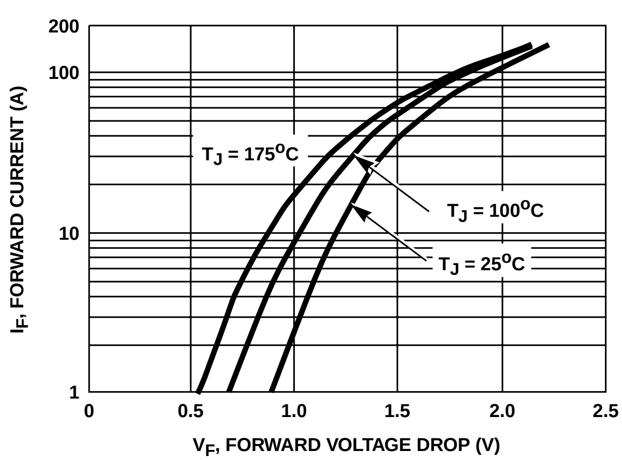


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

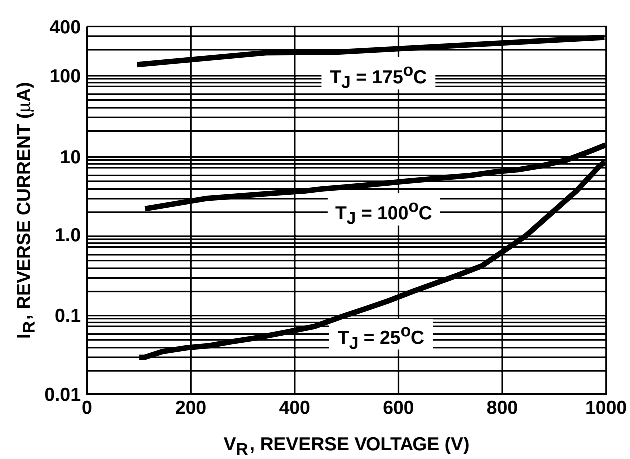


FIGURE 2. REVERSE VOLTAGE vs REVERSE CURRENT

Typical Performance Curves (Continued)

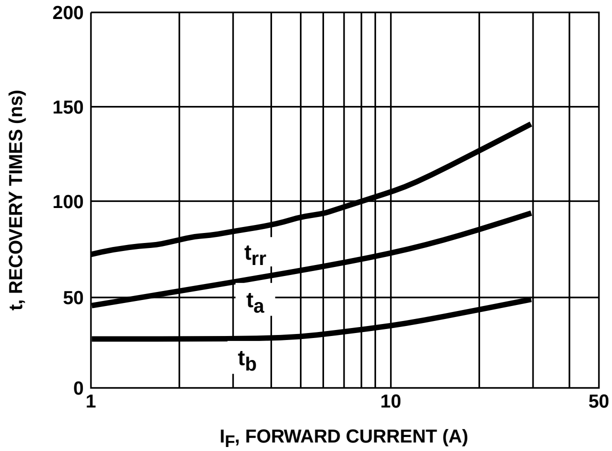


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

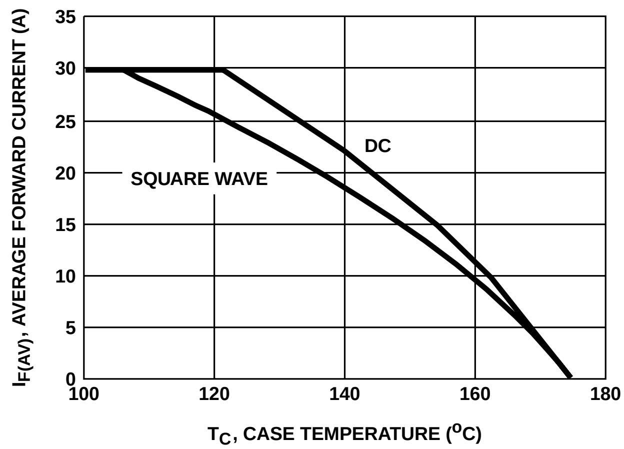


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

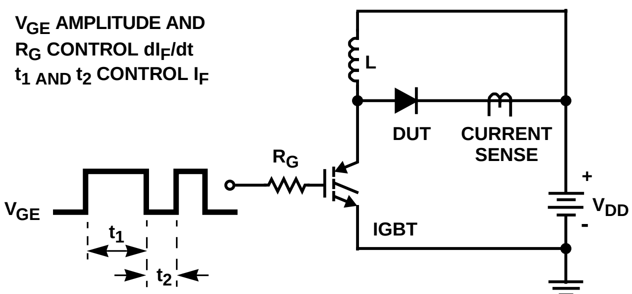


FIGURE 5. t_{rr} TEST CIRCUIT

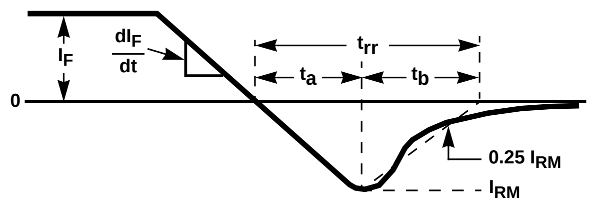


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

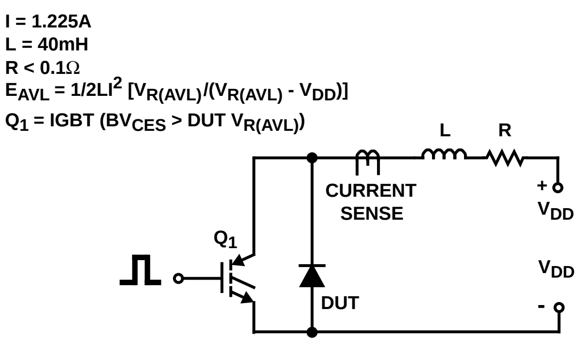


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

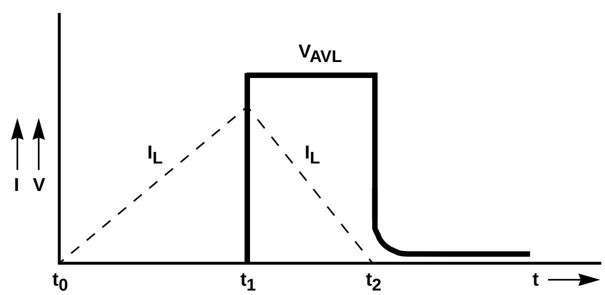


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS