RURU8060

Data Sheet **October 2001** **File Number 3380.3**

80A, 600V Ultrafast Diode

The RURU8060 is an ultrafast diode with soft recovery characteristics ($t_{rr} < 75$ns). It has low forward voltage drop and is of 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, thus reducing power loss in the switching transistors.

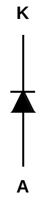
Formerly developmental type TA9886.

Ordering Information

PART NUMBER	PACKAGE	BRAND
RURU8060	TO-218	RURU8060

NOTE: When ordering, use the entire part number.

Symbol



Features

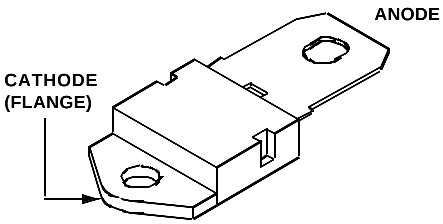
- Ultrafast with Soft Recovery. . . . . <75ns
- Operating Temperature . . . . .175°C
- Reverse Voltage. 600V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC STYLE SINGLE LEAD TO-218



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

		RURU8060	UNITS
Peak Repetitive Reverse Voltage	V_{RRM}	600	V
Working Peak Reverse Voltage	V_{RWM}	600	V
DC Blocking Voltage	V_R	600	V
Average Rectified Forward Current ($T_C = 72^oC$)	$I_{F(AV)}$	80	A
Repetitive Peak Surge Current (Square Wave, 20kHz)	I_{FRM}	160	A
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60Hz)	I_{FSM}	800	A
Maximum Power Dissipation	P_D	180	W
Avalanche Energy (See Figures 7 and 8)	E_{AVL}	50	mJ
Operating and Storage Temperature	T_{STG}, T_J	-65 to 175	°C

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

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
V_F	$I_F = 80A$	-	-	1.6	V
	$I_F = 80A$, $T_C = 150^oC$	-	-	1.4	V
I_R	$V_R = 600V$	-	-	250	μA
	$V_R = 600V$, $T_C = 150^oC$	-	-	2.0	mA
t_{rr}	$I_F = 1A$, $dI_F/dt = 100A/\mu s$	-	-	75	ns
	$I_F = 80A$, $dI_F/dt = 100A/\mu s$	-	-	85	ns
t_a	$I_F = 80A$, $dI_F/dt = 100A/\mu s$	-	40	-	ns
t_b	$I_F = 80A$, $dI_F/dt = 100A/\mu s$	-	25	-	ns
$R_{\theta JC}$		-	-	0.83	$^oC/W$

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

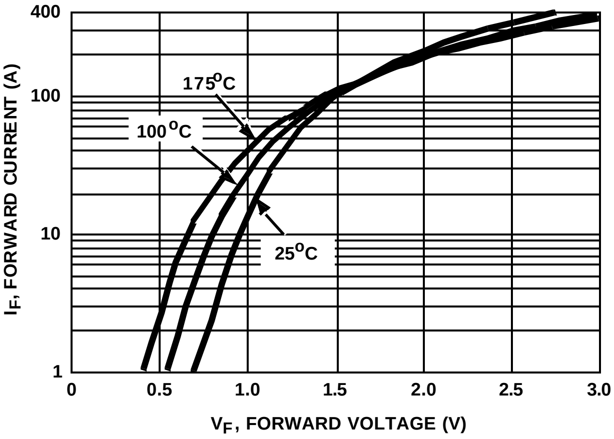


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

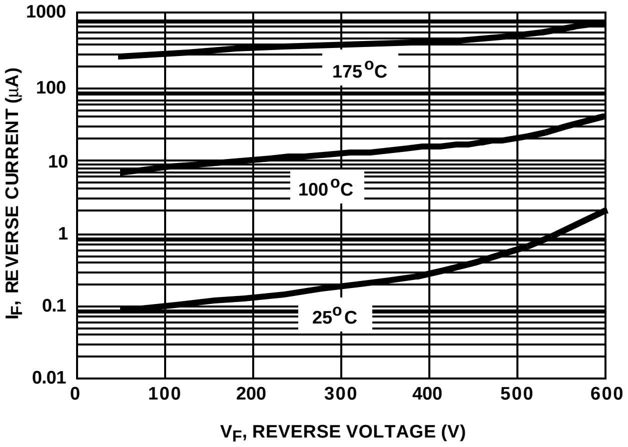


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

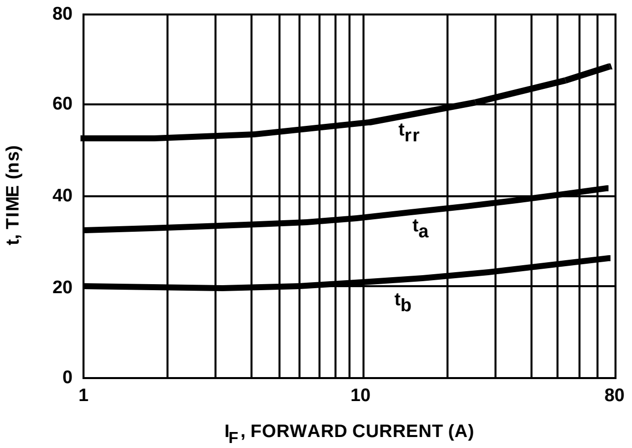


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

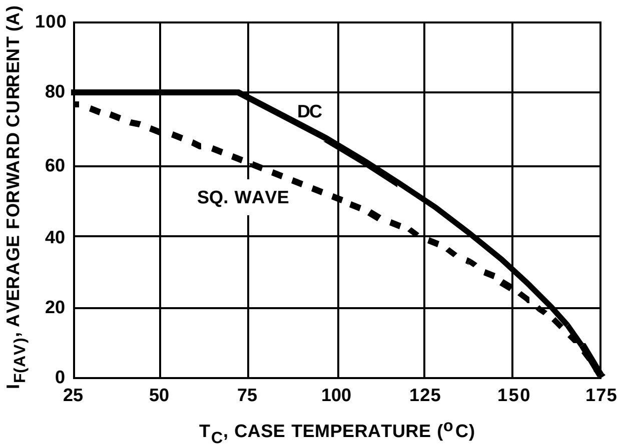


FIGURE 4. CURRENT DERATING CURVE

Test Circuits and Waveforms

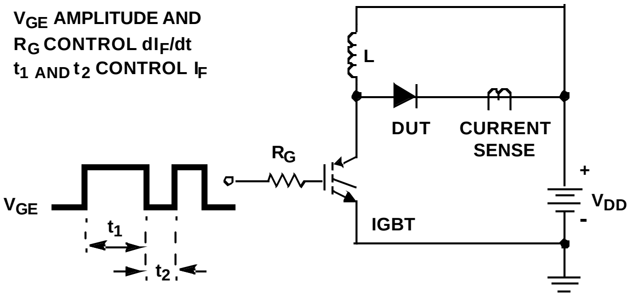


FIGURE 5. t_{rr} TEST CIRCUIT

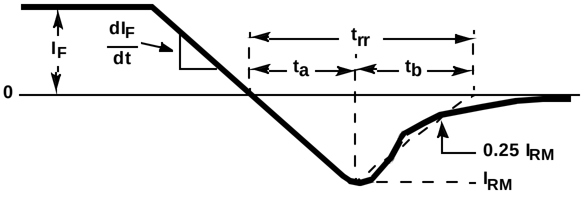


FIGURE 6. t_{rr} WAVEFORMS AND DEFINITIONS

$I = 1.6A$
$L = 40mH$
$R < 0.1\Omega$
$E_{AVL} = 1/2LI^2\ [V_{R(AVL)}/(V_{R(AVL)} - V_{DD})]$
Q_1 = IGBT (BV_{CES} > DUT $V_{R(AVL)}$)

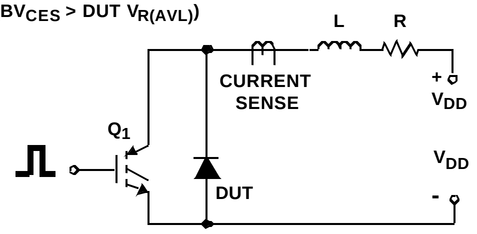


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

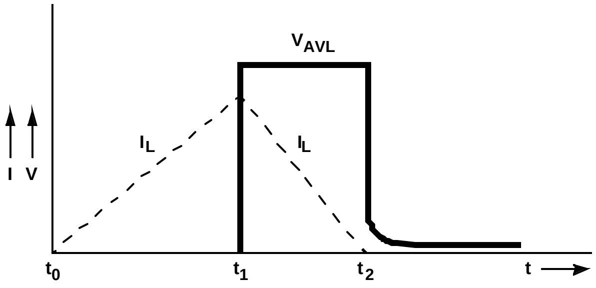
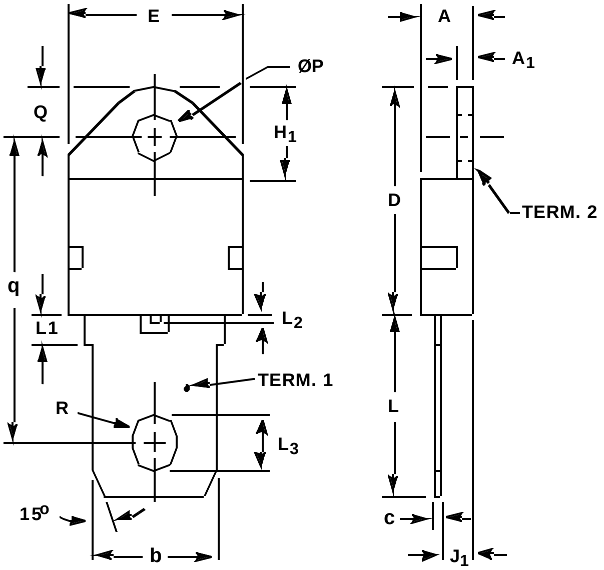


FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

TO-218

SINGLE LEAD JEDEC STYLE TO-218 PLASTIC PACKAGE



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.185	0.195	4.70	4.95	-
A_1	0.058	0.062	1.48	1.57	-
b	0.433	0.443	11.00	11.25	-
c	0.018	0.022	0.46	0.55	-
D	0.800	0.820	20.32	20.82	-
E	0.615	0.625	15.63	15.87	2
H_1	-	0.330	-	8.38	-
J_1	0.115	0.125	2.93	3.17	4
L	0.635	0.655	16.13	16.63	-
L_1	-	0.130	-	3.30	-
L_2	-	0.034	-	0.86	-
L_3	0.195	0.205	4.96	5.20	-
ØP	0.159	0.163	4.04	4.14	-
Q	0.176	0.186	4.48	4.72	2
q	1.080	1.088	27.44	27.63	-
R	0.078	0.082	1.99	2.08	-

NOTES:

1. No current JEDEC outline for this package.
2. Tab outline optional within boundaries of dimensions E and Q.
3. Maximum radius of 0.050 inches (1.27mm) on all body edges and corners.
4. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
5. Controlling dimension: Inch.
6. Revision 1 dated 1-93.

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