MUR870E, MUR880E, MUR890E MUR8100E, RUR870, RUR880 RUR890, RUR8100

8A Ultrafast Diode With Soft Recovery Characteristic

May 1991

T-03-17

Features

- Ultrafast with Soft Recovery Characteristic (t_{rr} < 75ns)
- +175°C Rated Junction Temperature
- Reverse Voltage Up to 1000V
- Avalanche Energy Rated

Applications

- Switching Power Supply
- Power Switching Circuits
- General Purpose

Description

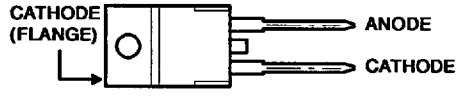
MUR870E, MUR880E, MUR890E, MUR8100E and RUR870, RUR880, RUR890, RUR8100 are ultrafast dual diodes (t_{rr} < 75ns) with soft recovery characteristics ($t_a/t_b \approx 0.5$). They have a low forward voltage drop and are of planar, silicon nitride passivated, ion-implanted, epitaxial construction.

These devices are intended for use as energy steering/ clamping diodes and rectifiers in a variety of switching power supplies and other power switching applications. Their 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.

All are supplied in TO-220AC packages.

Package

TO-220AC
TOP VIEW



Symbol

Absolute Maximum Ratings (T_C = +25°C)

	MUR870E RUR870	MUR880E RUR880	MUR890E RUR890	MUR8100E RUR8100
Peak Repetitive Reverse Voltage ..... V_{RRM}	700V	800V	900V	1000V
Working Peak Reverse Voltage ..... V_{RWM}	700V	800V	900V	1000V
DC Blocking Voltage ..... V_R	700V	800V	900V	1000V
Average Rectified Forward Current ..... $I_{F(AV)}$ (Total device forward current at rated V_R and T_C = 150°C)	8A	8A	8A	8A
Peak Forward Repetitive Current ..... I_{FRM} (Rated V_R, square wave 20kHZ)	16A	16A	16A	16A
Nonrepetitive Peak Surge Current ..... I_{FSM} (Surge applied at rated load condition halfwave 1phase 60Hz)	100A	100A	100A	100A
Operating and Storage Temperature ..... T_{STG}, T_J	-55°C to +175°C	-55°C to +175°C	-55°C to +175°C	-55°C to +175°C

File Number **2780.1**

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

SYMBOL	TEST CONDITION	LIMITS												UNITS
		MUR870E, RUR870			MUR880E, RUR880			MUR890E, RUR890			MUR8100E, RUR8100			
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
V_F	I_F = 8A, T_C = +150°C			1.50			1.50			1.50			1.50	V
	I_F = 8A, T_C = +25°C			1.80			1.80			1.80			1.8	V
IR @ T_C = +150°C	V_R = 700V			500										µA
	V_R = 800V						500							µA
	V_R = 900V									500				µA
	V_R = 1000V												500	µA
IR @ T_C = +25°C	V_R = 700V			25										µA
	V_R = 500V						25							µA
	V_R = 600V									25				µA
	V_R = 1000V												25	µA
t_{rr}	I_F = 1A			100			100			100			100	ns
	I_F = 8A			110			110			110			110	ns
t_a	I_F = 1A		40			40			40			40		ns
	I_F = 8A		45			45			45			45		ns
t_b	I_F = 1A		20			20			20			20		ns
	I_F = 8A		20			20			20			20		ns
$R_{\Theta jc}$				2.0			2.0			2.0			2.0	°C/W
W_{avl}	see Fig. 7&8			20			20			20			20	mj

Definitions

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

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

t_{rr} = Reverse recovery time at dI_F/dt = 100A/µs (See Figure 2), summation of $t_a + t_b$.

t_a = Time to reach peak reverse current at dI_F/dt = 100A/µs (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.

W_{avl} = Controlled avalanche energy (See Figures 7 & 8).

pw = pulse width.

D = duty cycle.

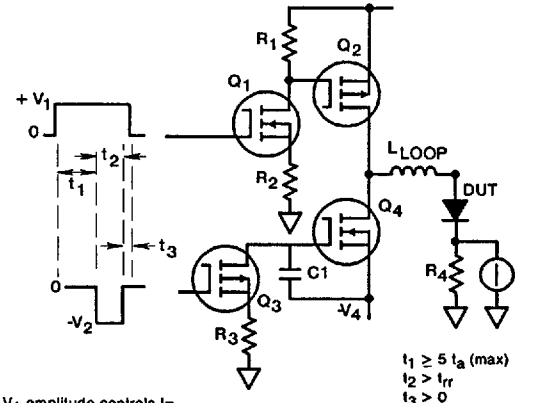


FIGURE 1. t_{rr} TEST CIRCUIT

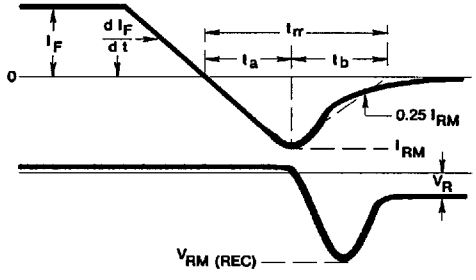


FIGURE 2. DEFINITIONS OF t_{rr}, t_a AND t_b

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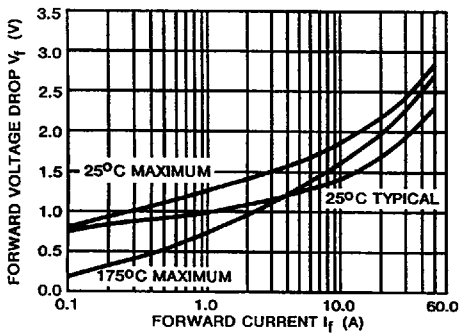

FIGURE 3. FORWARD VOLTAGE vs FORWARD CURRENT CHARACTERISTIC

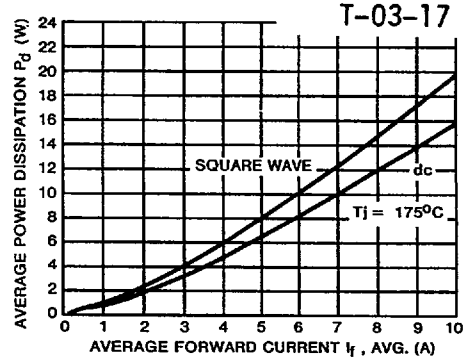

FIGURE 4. AVERAGE FORWARD CURRENT vs AVERAGE POWER DISSIPATION

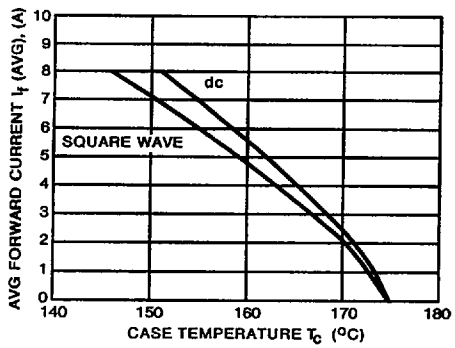

FIGURE 5. AVERAGE FORWARD CURRENT vs CASE TEMPERATURE

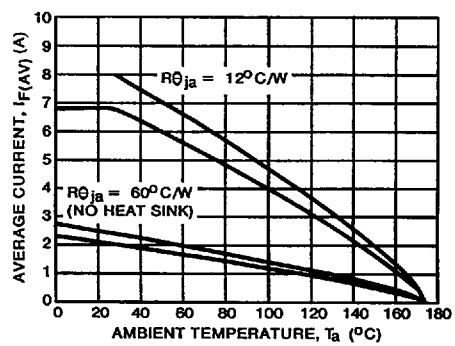

FIGURE 6. AVERAGE FORWARD CURRENT vs AMBIENT TEMPERATURE

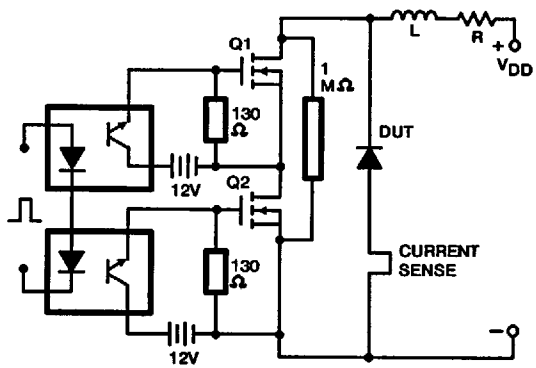

FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT

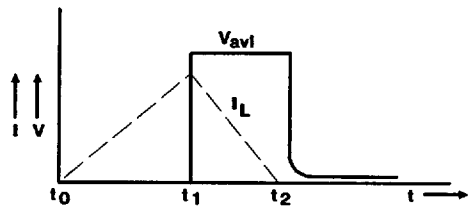

FIGURE 8. CURRENT VOLTAGE WAVEFORM

$I_L$peak = 1A, L = 40mH, R < 0.1Ω, W_{avl} = (1/2) $LI^2[V_{avl}/(V_{avl}-V_{dd})]$