MUR840, MUR860, RURP840, RURP860

Data Sheet January 2002

8A, 400V - 600V Ultrafast Diodes

The MUR840, MUR860, RURP840 and RURP860 are low forward voltage drop ultrafast recovery rectifiers (t_{rr} < 60ns). They use a glass-passivated ion-implanted, epitaxial construction.

These devices are intended for use as output rectifiers and flywheel diodes in a variety of high-frequency pulse-width modulated switching regulators. Their low stored charge and attendant fast reverse-recovery behavior minimize electrical noise generation and in many circuits markedly reduce the turn-on dissipation of the associated power switching transistors.

Formerly developmental type TA09616.

Ordering Information

PART NUMBER	PACKAGE	BRAND
MUR840	TO-220AC	MUR840
RURP840	TO-220AC	RURP840
MUR860	TO-220AC	MUR860
RURP860	TO-220AC	RURP860

NOTE: When ordering, use the entire part number.

Symbol

Features

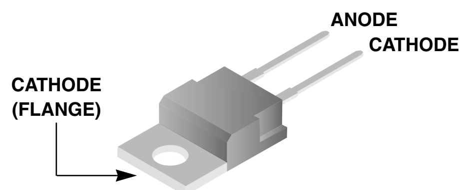
- Ultrafast with Soft Recovery . . . . <60ns
- Operating Temperature. . . . . .175°C
- Reverse Voltage 600V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging

JEDEC TO-220AC



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

		MUR840 RURP840	MUR860 RURP860	UNITS
Peak Repetitive Reverse Voltage	V_{RRM}	400	600	V
Working Peak Reverse Voltage	V_{RWM}	400	600	V
DC Blocking Voltage	V_R	400	600	V
Average Rectified Forward Current ($T_C = 155^oC$)	$I_{F(AV)}$	8	8	A
Repetitive Peak Surge Current (Square Wave, 20kHz)	I_{FRM}	16	16	A
Nonrepetitive Peak Surge Current (Halfwave, 1 Phase, 60Hz)	I_{FSM}	100	100	A
Maximum Power Dissipation	P_D	75	75	W
Avalanche Energy (See Figures 10 and 11)	E_{AVL}	20	20	mJ
Operating and Storage Temperature	T_{STG}, T_J	-65 to 175	-65 to 175	^oC
Maximum Lead Temperature for Soldering				
Leads at 0.063 in. (1.6mm) from case for 10s	T_L	300	300	^oC
Package Body for 10s, see Tech Brief 334	T_{PKG}	260	260	^oC

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

SYMBOL	TEST CONDITION	MUR840, RURP840			MUR860, RURP860			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
V_F	I_F = 8A	-	-	1.3	-	-	1.5	V
	I_F = 8A, T_C = 150°C	-	-	1.0	-	-	1.2	V
I_R	V_R = 400V	-	-	100	-	-	-	μA
	V_R = 600V	-	-	-	-	-	100	μA
	V_R = 400V, T_C = 150°C	-	-	500	-	-	-	μA
	V_R = 600V, T_C = 150°C	-	-	-	-	-	500	μA
t_{rr}	I_F = 1A, dI_F/dt = 200A/μs	-	-	60	-	-	60	ns
	I_F = 8A, dI_F/dt = 200A/μs	-	-	70	-	-	70	ns
t_a	I_F = 8A, dI_F/dt = 200A/μs	-	32	-	-	32	-	ns
t_b	I_F = 8A, dI_F/dt = 200A/μs	-	21	-	-	21	-	ns
Q_{RR}	I_F = 8A, dI_F/dt = 200A/μs	-	195	-	-	195	-	nC
C_J	V_R = 10V, I_F = 0A	-	25	-	-	25	-	pF
$R_{\theta JC}$		-	-	2	-	-	2	°C/W

DEFINITIONS

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

I_R = Instantaneous reverse current.

t_{rr} = Reverse recovery time (See Figure 9), summation of $t_a + t_b$.

t_a = Time to reach peak reverse current (See Figure 9).

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 9).

Q_{RR} = Reverse recovery charge.

C_J = Junction Capacitance.

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

pw = pulse width.

D = duty cycle.

Typical Performance Curves

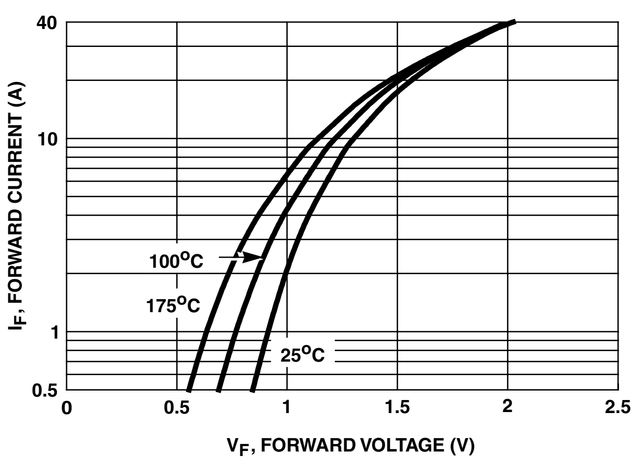


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

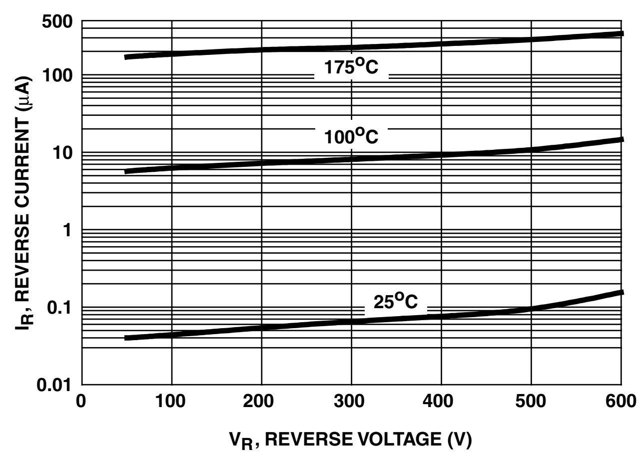


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

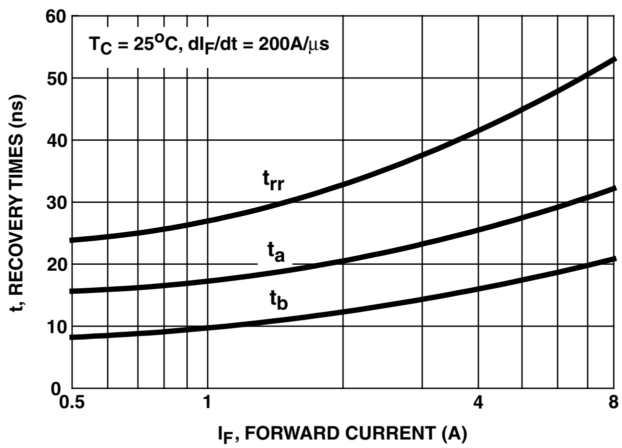


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

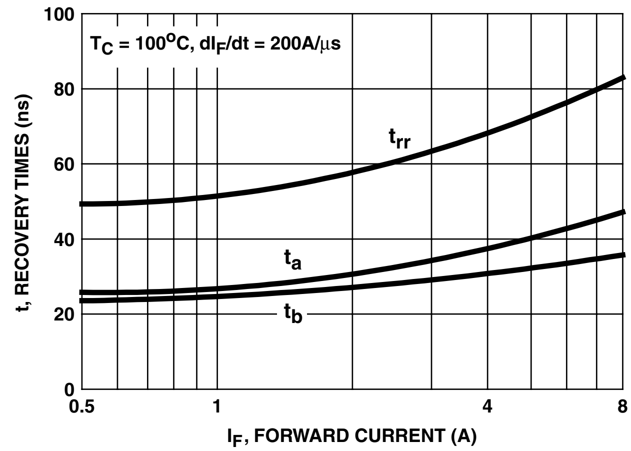


FIGURE 4. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

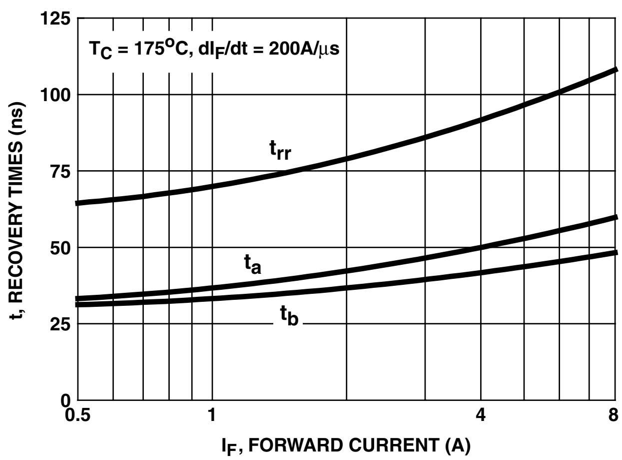


FIGURE 5. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

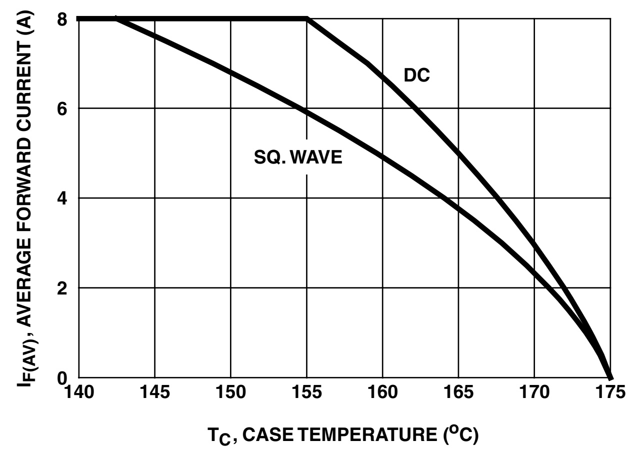


FIGURE 6. CURRENT DERATING CURVE

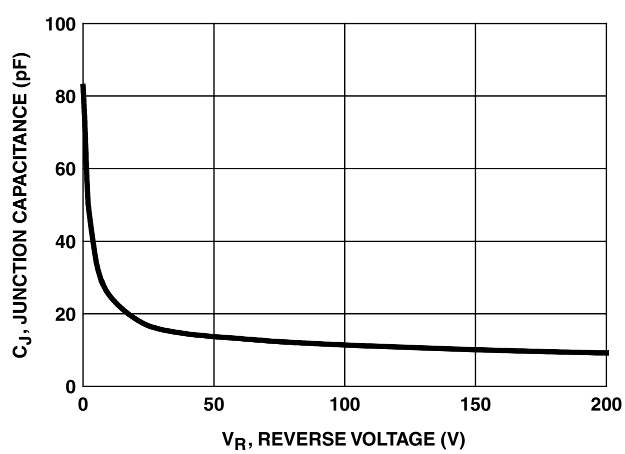


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

Test Circuits and Waveforms

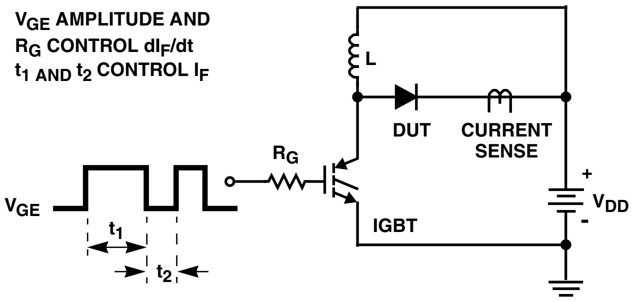


FIGURE 8. t_{rr} TEST CIRCUIT

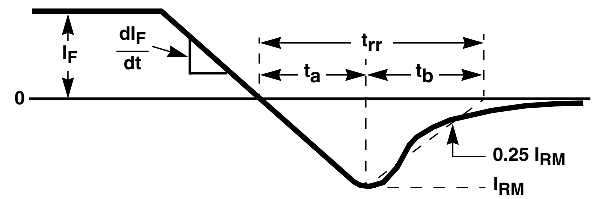


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

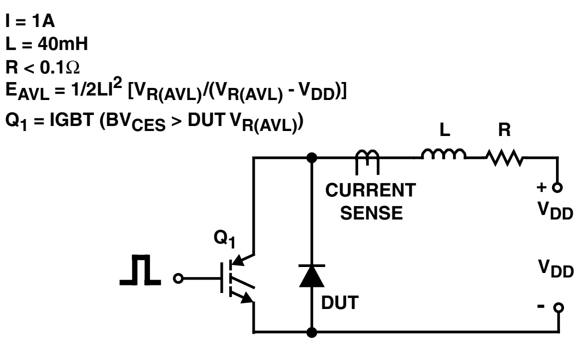


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

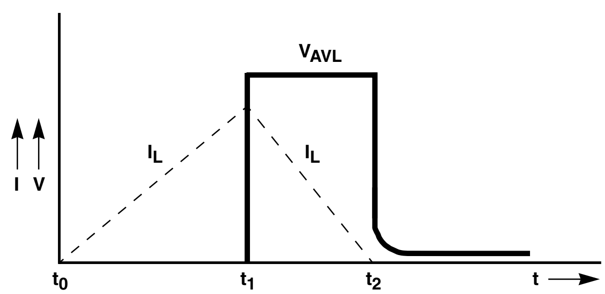


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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