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

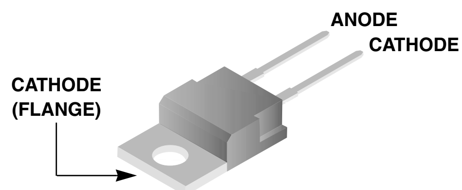
- Ultrafast with Soft Recovery . . . . <60ns
- Operating Temperature. . . . . .175°C
- Reverse Voltage 600V
- Avalanche Energy Rated
- Planar Construction

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 MIN	TYP	MAX	MUR860, RURP860 MIN	TYP	MAX	UNITS
V_F	I_F = 8A	-	-	1.3	-	-	1.5	V
	I_F = 8A, T_C = 150^{o}C	-	-	1.0	-	-	1.2	V
I_R	V_R = 400V	-	-	100	-	-	-	μA
	V_R = 600V	-	-	-	-	-	100	μA
	V_R = 400V, T_C = 150^{o}C	-	-	500	-	-	-	μA
	V_R = 600V, T_C = 150^{o}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	^{o}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

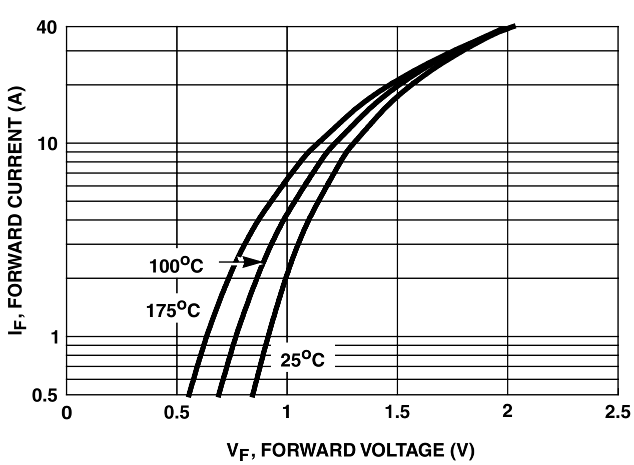


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

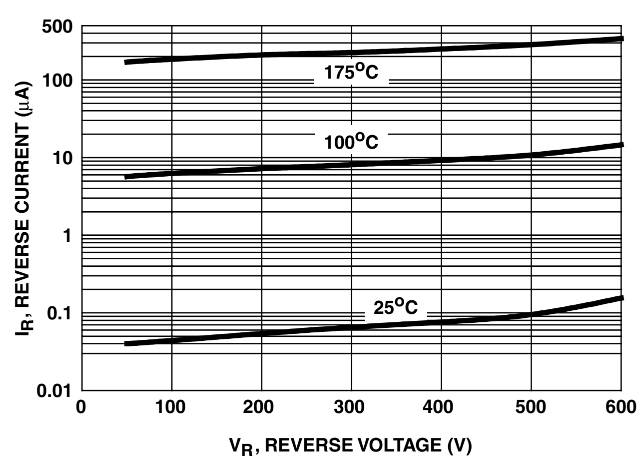


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

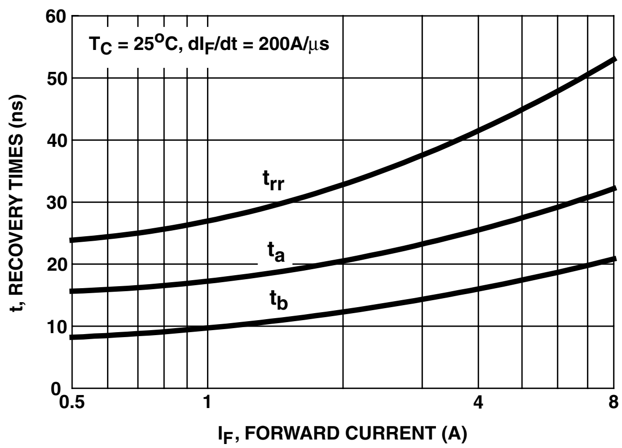


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

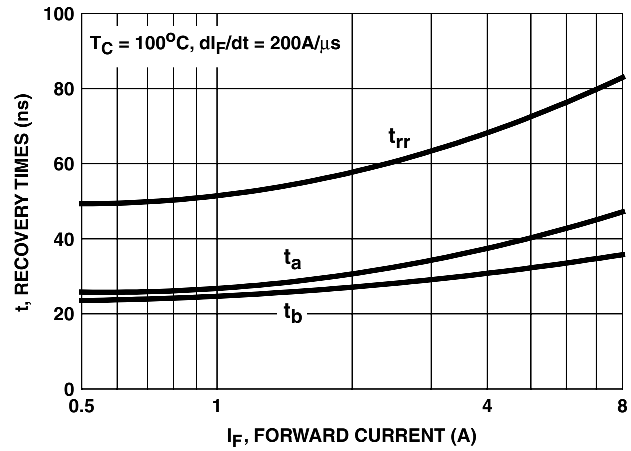


FIGURE 4. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

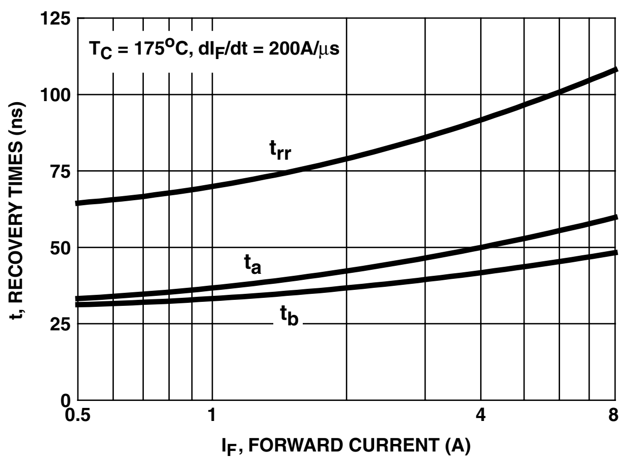


FIGURE 5. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

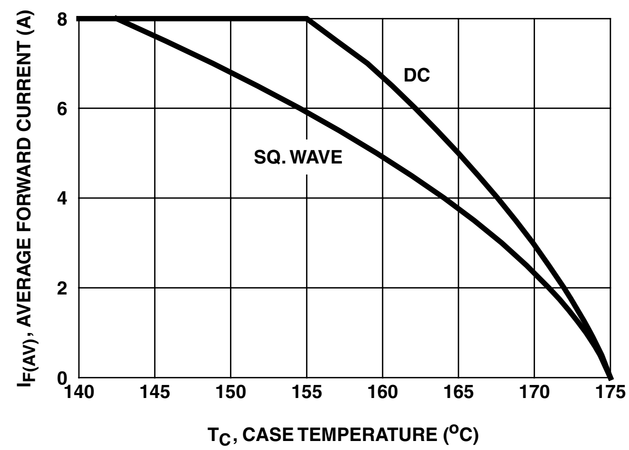


FIGURE 6. CURRENT DERATING CURVE

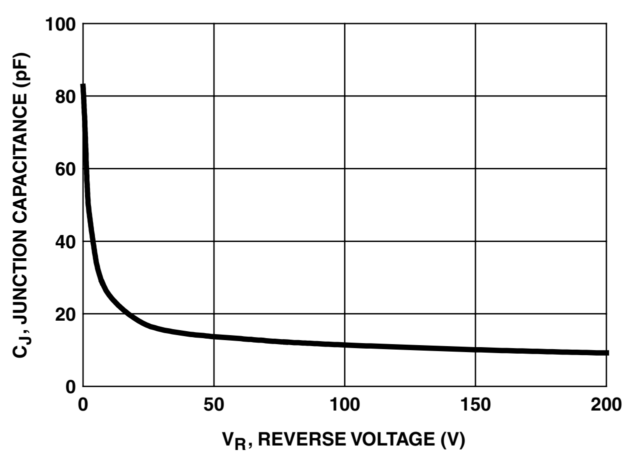


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

Test Circuits and Waveforms

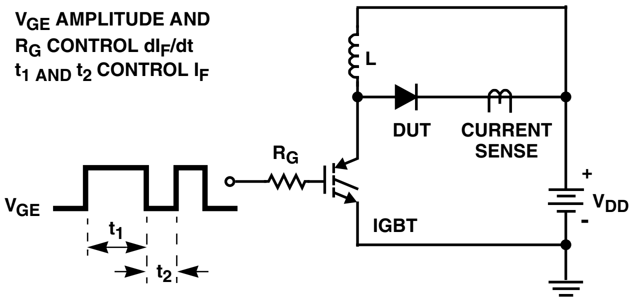


FIGURE 8. t_{rr} TEST CIRCUIT

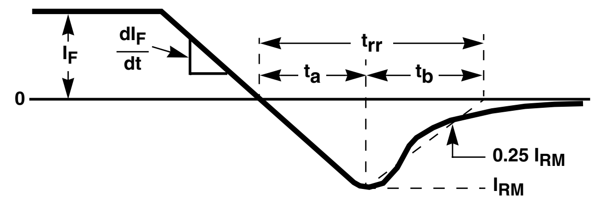


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

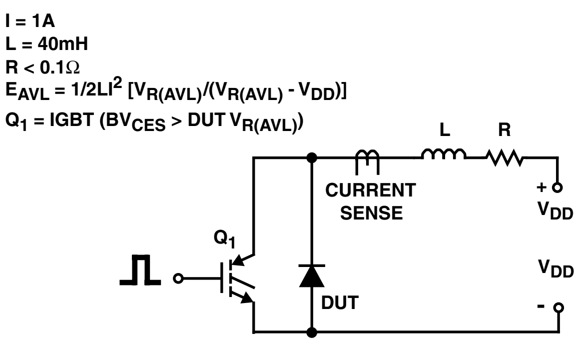


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

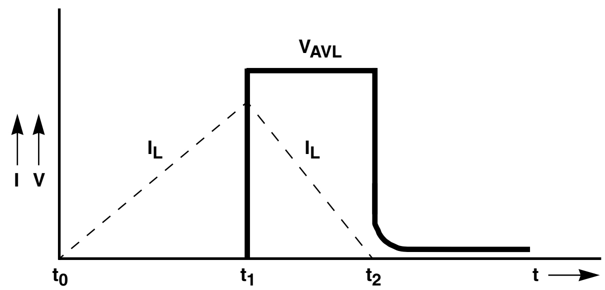


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.

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