

Data Sheet January 2000 File Number 2091.4

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



Absolute Maximum Ratings T_C = 25°C. Unless Otherwise Specified

Features

•	Ultrafast with Soft Recovery	ns
•	Operating Temperature	οС
•	Reverse Voltage	0V

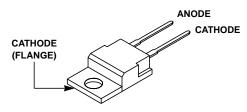
- Avalanche Energy Rated
- Planar Construction

Applications

- · Switching Power Supplies
- · Power Switching Circuits
- · General Purpose

Packaging

JEDEC TO-220AC



About Maximum Ratings 10 - 25 6, oness cultivise opening			
	MUR840 RURP840	MUR860 RURP860	UNITS
Peak Repetitive Reverse VoltageVRRM	400	600	V
Working Peak Reverse Voltage	400	600	V
DC Blocking VoltageV _R	400	600	V
Average Rectified Forward Current $I_{F(AV)}$ ($T_{C} = 155^{\circ}C$)	8	8	Α
Repetitive Peak Surge Current I _{FRM} (Square Wave, 20kHz)	16	16	Α
Nonrepetitive Peak Surge Current	100	100	Α
Maximum Power Dissipation	75	75	W
Avalanche Energy (See Figures 10 and 11)	20	20	mJ
Operating and Storage Temperature	-65 to 175	-65 to 175	oC
Maximum Lead Temperature for Soldering			
Leads at 0.063 in. (1.6mm) from case for 10s	300	300	oC
Package Body for 10s, see Tech Brief 334T _{PKG}	260	260	oC

MUR840, MUR860, RURP840, RURP860

Electrical Specifications $T_C = 25^{\circ}C$, Unless Otherwise Specified

	TEST CONDITION	М	MUR840, RURP840		MUR860, RURP860			
SYMBOL		MIN	TYP	MAX	MIN	TYP	MAX	UNITS
V _F	I _F = 8A	-	-	1.3	-	-	1.5	V
	$I_F = 8A, T_C = 150^{\circ}C$	-	-	1.0	-	-	1.2	V
I _R	V _R = 400V	-	-	100	-	-	-	μΑ
	V _R = 600V	-	-	-	-	-	100	μΑ
	V _R = 400V, T _C = 150°C	-	-	500	-	-	-	μΑ
	$V_R = 600V, T_C = 150^{\circ}C$	-	-	-	-	-	500	μΑ
t _{rr}	$I_F = 1A$, $dI_F/dt = 200A/\mu s$	-	-	60	-	-	60	ns
	$I_F = 8A$, $dI_F/dt = 200A/\mu s$	-	-	70	-	-	70	ns
t _a	$I_F = 8A$, $dI_F/dt = 200A/\mu s$	-	32	-	-	32	-	ns
t _b	$I_F = 8A$, $dI_F/dt = 200A/\mu s$	-	21	-	-	21	-	ns
Q _{RR}	$I_F = 8A$, $dI_F/dt = 200A/\mu s$	-	195	-	-	195	-	nC
СЈ	V _R = 10V, I _F = 0A	-	25	-	-	25	-	pF
$R_{\theta JC}$		-	-	2	-	-	2	oC/M

DEFINITIONS

 V_F = Instantaneous forward voltage (pw = 300 μ s, 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

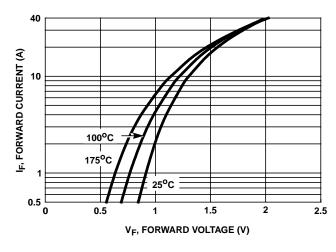


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

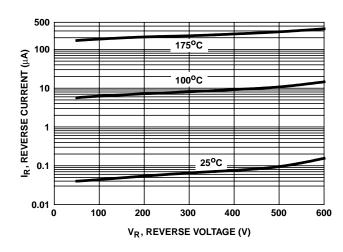


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

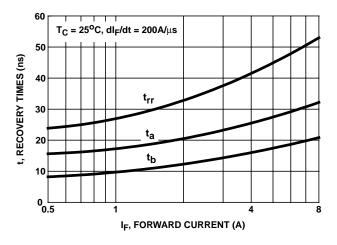


FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

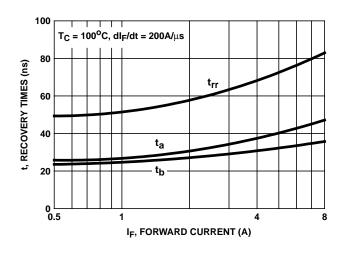


FIGURE 4. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

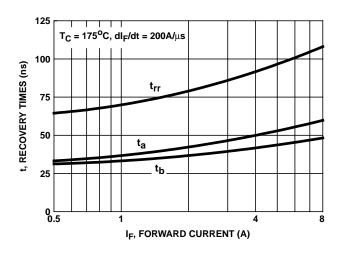


FIGURE 5. t_{rr} , t_a and t_b curves vs forward current

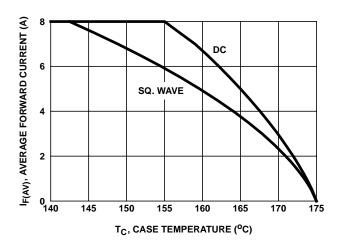


FIGURE 6. CURRENT DERATING CURVE

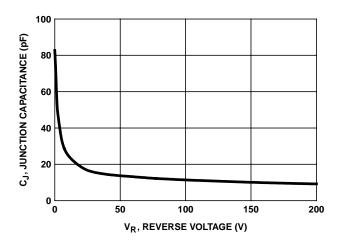


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

Test Circuits and Waveforms

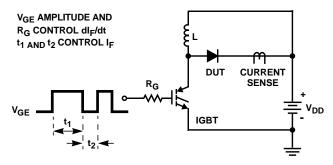


FIGURE 8. t_{rr} TEST CIRCUIT

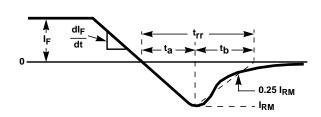


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

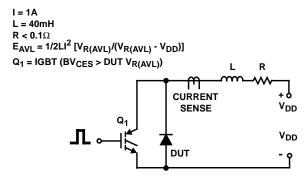


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

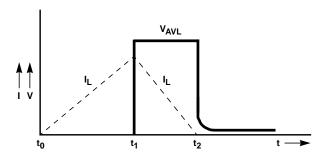


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

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