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8 A, 400 V - 600 V, Ultrafast Diodes

Description

The MUR840, MUR860, RURP840, RURP860 is an ultrafast diode with low forward voltage drop. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power switching applications. It is specially suited for use in switching power supplies and industrial application.

Features

- Ultrafast Recovery t_{rr} = 70 ns (@ I_F = 8 A)
- Max Forward Voltage, V_F = 1.5 V (@ T_C = 25°C)
- 400 V, 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

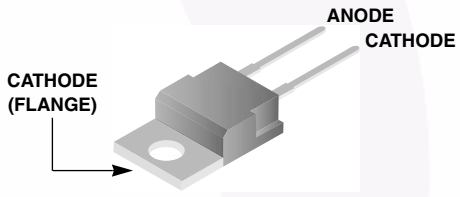
Ordering Information

PART NUMBER	PACKAGE	BRAND
MUR840	TO-220AC-2L	MUR840
RURP840	TO-220AC-2L	RURP840
MUR860	TO-220AC-2L	MUR860
RURP860	TO-220AC-2L	RURP860

NOTE: When ordering, use the entire part number.

Packaging

JEDEC TO-220AC



Symbol



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

		MUR840 RURP840	MUR860 RURP860	UNIT
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°C)	$I_{F(AV)}$	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	°C
Maximum Lead Temperature for Soldering				
Leads at 0.063 in. (1.6mm) from case for 10s	T_L	300	300	°C
Package Body for 10s, see Tech Brief 334	T_{PKG}	260	260	°C

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

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

DEFINITIONS

V_F = Instantaneous forward voltage (pw = 300 µs, 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

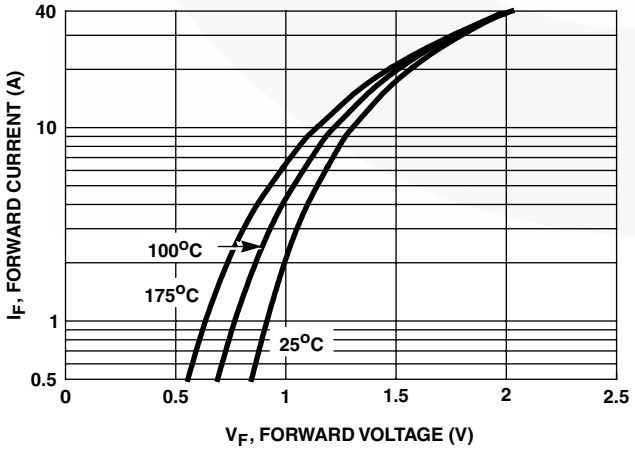


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

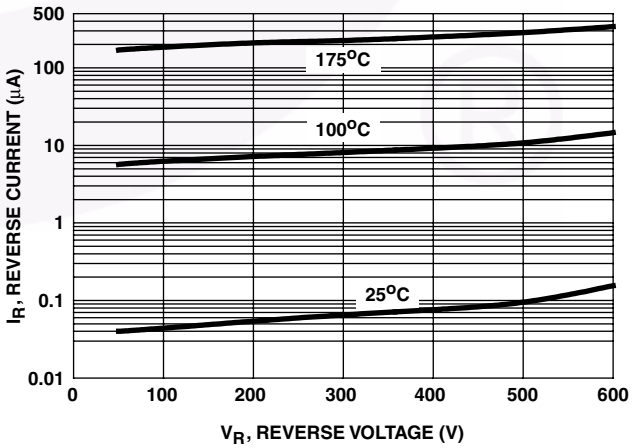


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

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Typical Performance Curves (Continued)

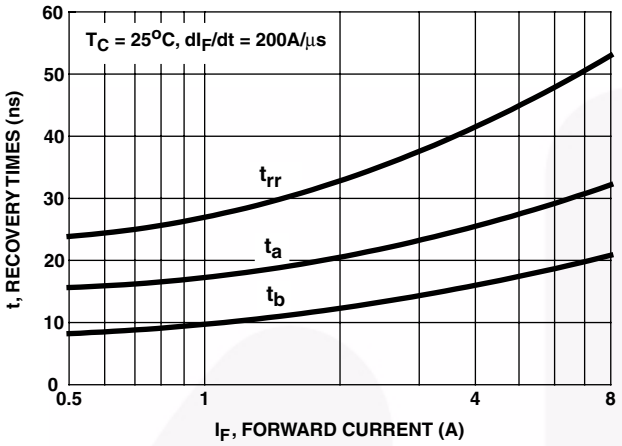


FIGURE 3. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

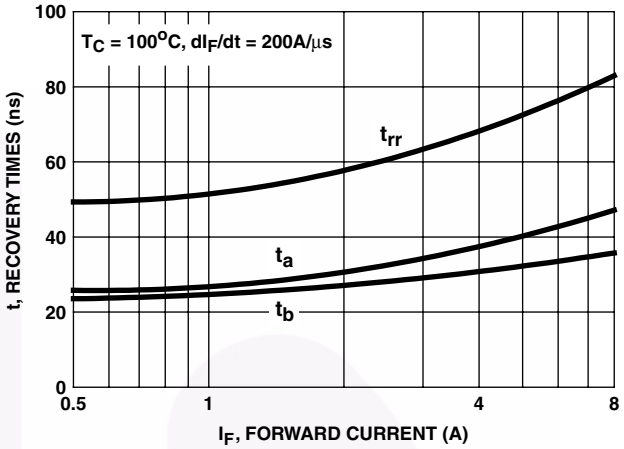


FIGURE 4. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

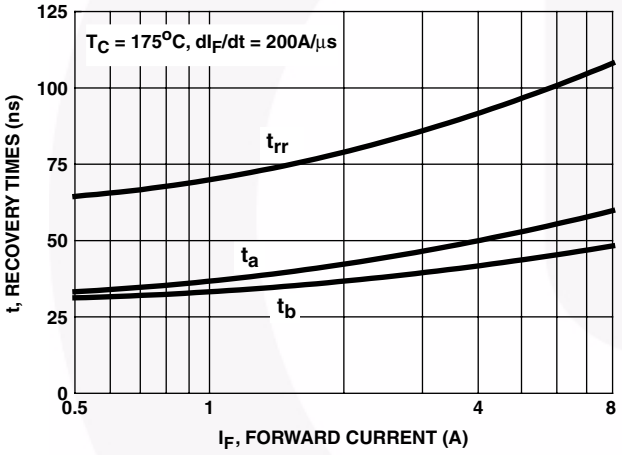


FIGURE 5. t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT

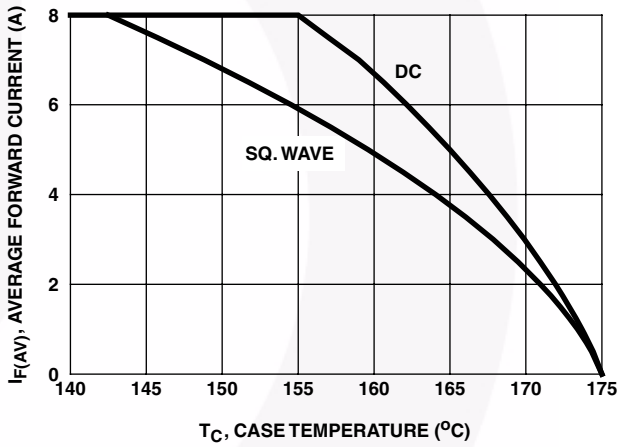


FIGURE 6. CURRENT DERATING CURVE

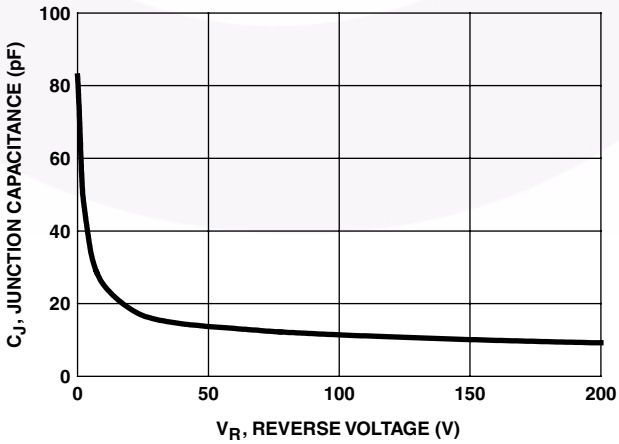


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

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Test Circuits and Waveforms

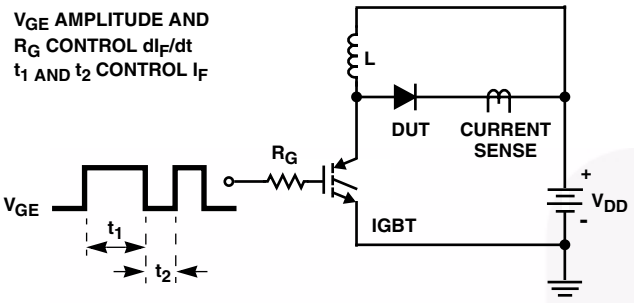


FIGURE 8. t_{rr} TEST CIRCUIT

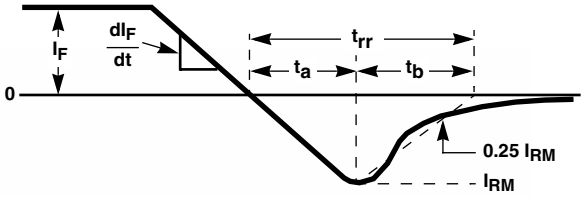


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

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

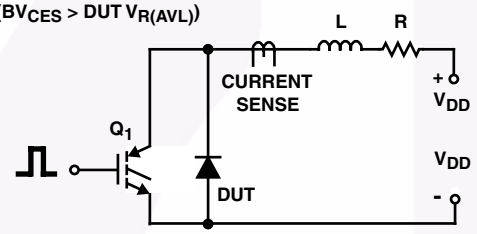


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

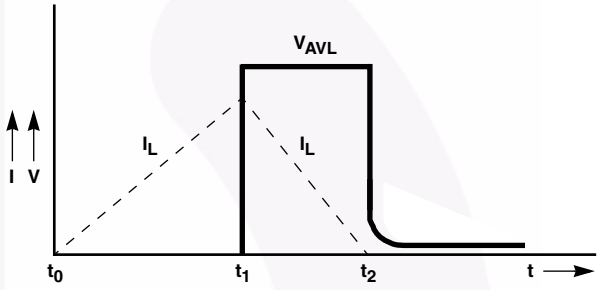


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Mechanical Dimensions

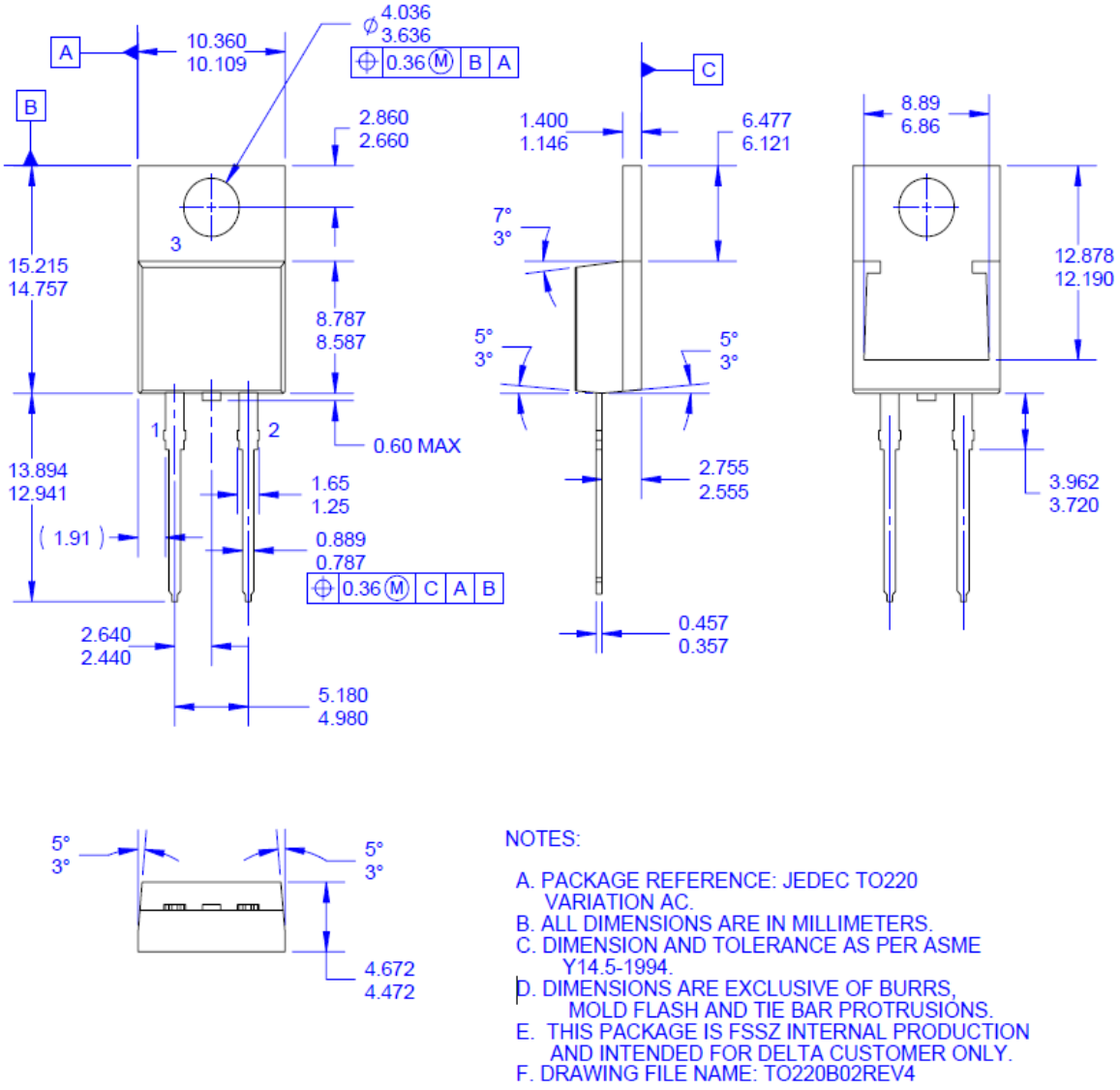


Figure 12. TO-220 2L - TO-220, MOLDED, 2LD

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