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8 A, 1000 V Ultrafast Diodes

The MUR8100E, RURP8100 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 $t_{rr} = 100$ ns (@ $I_F = 8$ A)
- Max Forward Voltage, $V_F = 1.8$ V (@ $T_C = 25^\circ\text{C}$)
- 1000 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- RoHS Compliant

Applications

- Switching Power Supply
- Power Switching Circuits
- General Purpose

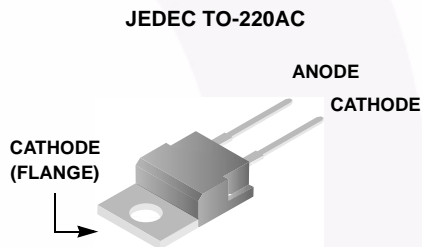
Packaging

Ordering Information

PART NUMBER	PACKAGE	BRAND
MUR8100E	TO-220AC	MU8100
RURP8100	TO-220AC	RURP8100

NOTE: When ordering, use entire part number.

Symbol



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, Unless Otherwise Specified

		MUR8100E RURP8100	UNIT
Peak Repetitive Reverse Voltage	V_{RRM}	1000	V
Working Peak Reverse Voltage	V_{RWM}	1000	V
DC Blocking Voltage	V_R	1000	V
Average Rectified Forward Current ($T_C = 155^\circ\text{C}$)	$I_{F(AV)}$	8	A
Repetitive Peak Surge Current (Square Wave 20kHz)	I_{FRM}	16	A
Nonrepetitive Peak Surge Current (Halfwave 1 Phase 60Hz)	I_{FSM}	100	A
Maximum Power Dissipation	P_D	75	W
Avalanche Energy (See Figures 10 and 11)	E_{AVL}	20	mJ
Operating and Storage Temperature	T_{STG}, T_J	-55 to 175	$^\circ\text{C}$

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

SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
V_F	$I_F = 8\text{ A}$	-	-	1.8	V
	$I_F = 8\text{ A}, T_C = 150^\circ\text{C}$	-	-	1.5	V
I_R	$V_R = 1000\text{ V}$	-	-	100	μA
	$V_R = 1000\text{ V}, T_C = 150^\circ\text{C}$	-	-	500	μA
t_{rr}	$I_F = 1\text{ A}$	-	-	85	ns
	$I_F = 8\text{ A}, dI_F/dt = 200\text{ A}/\mu\text{s}$	-	-	100	ns
t_a	$I_F = 8\text{ A}, dI_F/dt = 200\text{ A}/\mu\text{s}$	-	50	-	ns
t_b	$I_F = 8\text{ A}, dI_F/dt = 200\text{ A}/\mu\text{s}$	-	30	-	ns
Q_{RR}	$I_F = 8\text{ A}, dI_F/dt = 200\text{ A}/\mu\text{s}$	-	500	-	nC
C_J	$V_R = 10\text{ V}, I_F = 0\text{ A}$	-	30	-	pF
$R_{\theta JC}$		-	-	2.0	$^\circ\text{C}/\text{W}$

DEFINITIONS

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

I_R = Instantaneous reverse current.

T_{rr} = Reverse recovery time at $dI_F/dt = 100\text{ A}/\mu\text{s}$ (See Figure 9), summation of $t_a + t_b$.

t_a = Time to reach peak reverse current at $dI_F/dt = 100\text{ A}/\mu\text{s}$ (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

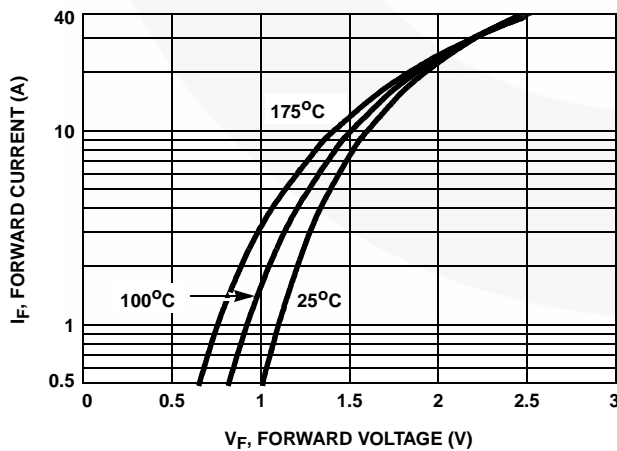


FIGURE 1. FORWARD CURRENT vs FORWARD VOLTAGE

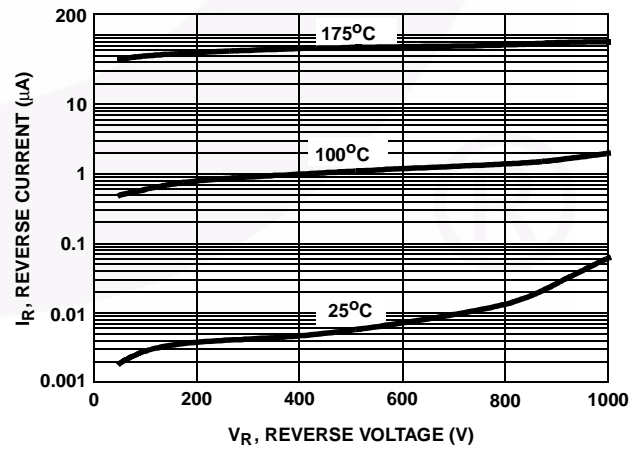


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

Typical Performance Curves (Continued)

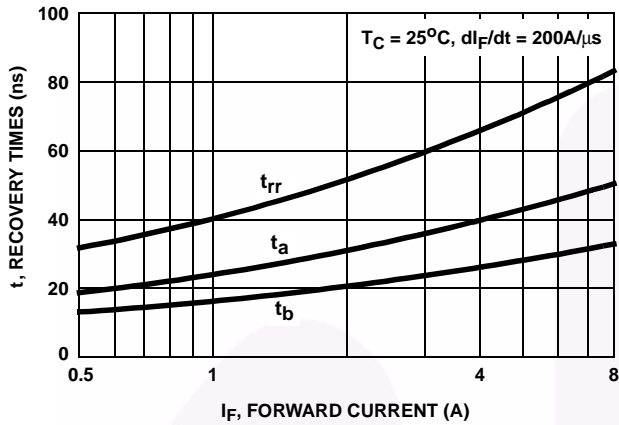


FIGURE 3. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

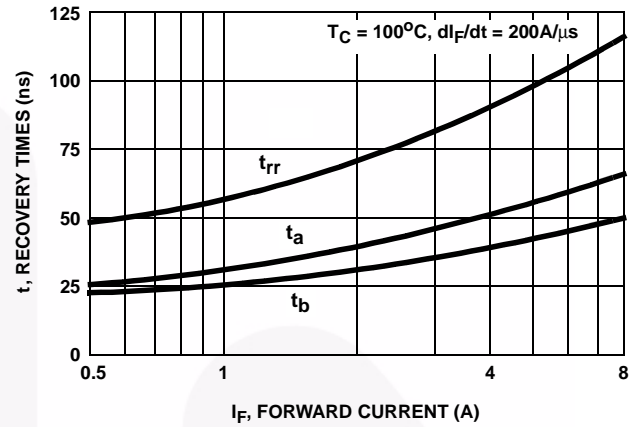


FIGURE 4. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

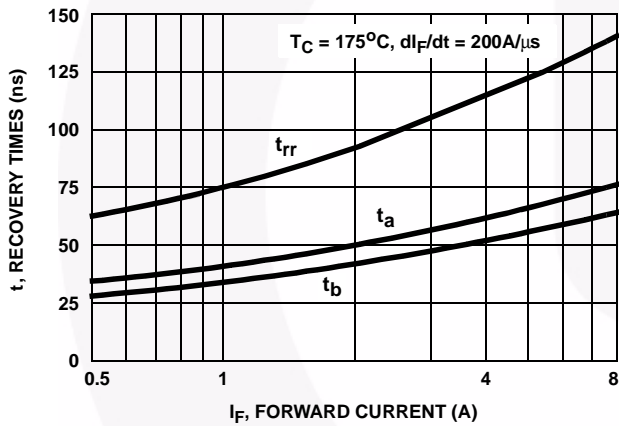


FIGURE 5. t_{rr} , t_a AND t_b CURVES vs FORWARD CURRENT

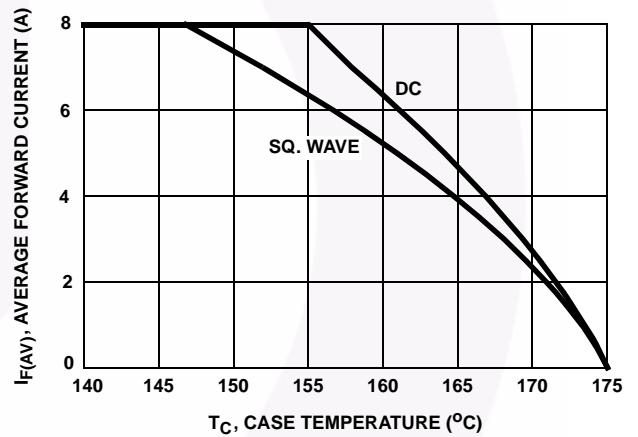


FIGURE 6. CURRENT DERATING CURVE

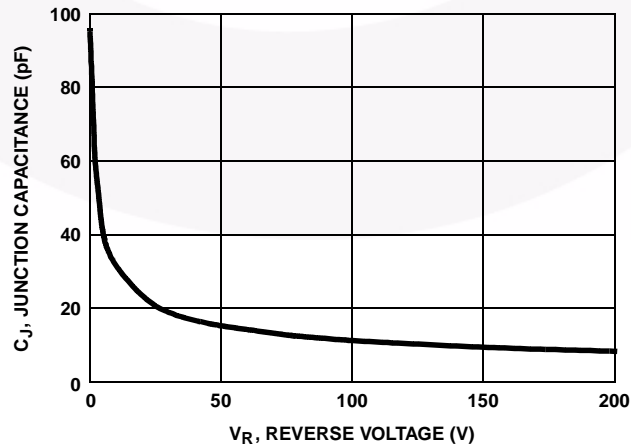


FIGURE 7. JUNCTION CAPACITANCE vs REVERSE VOLTAGE

Test Circuits and Waveforms

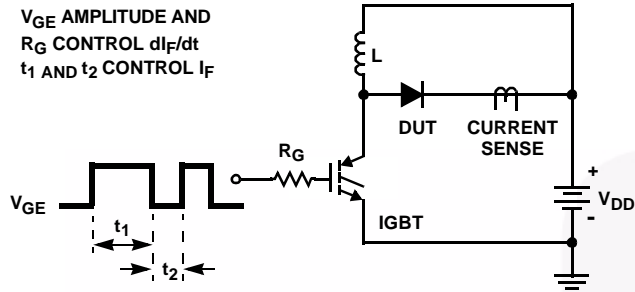


FIGURE 8. t_{rr} TEST CIRCUIT

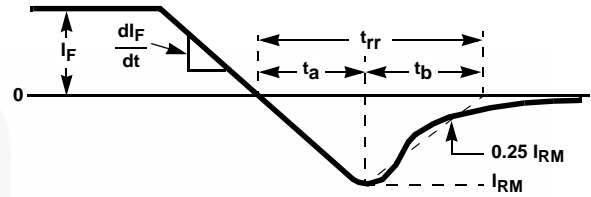


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

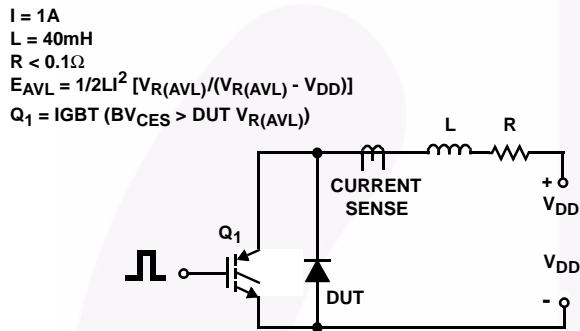


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

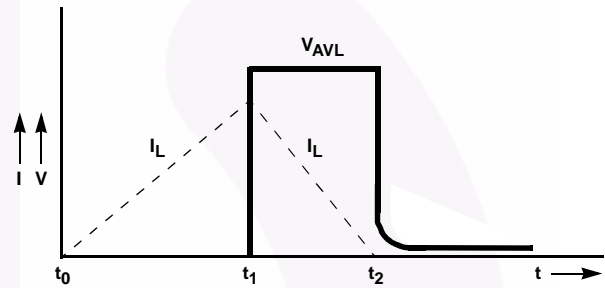


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Mechanical Dimensions

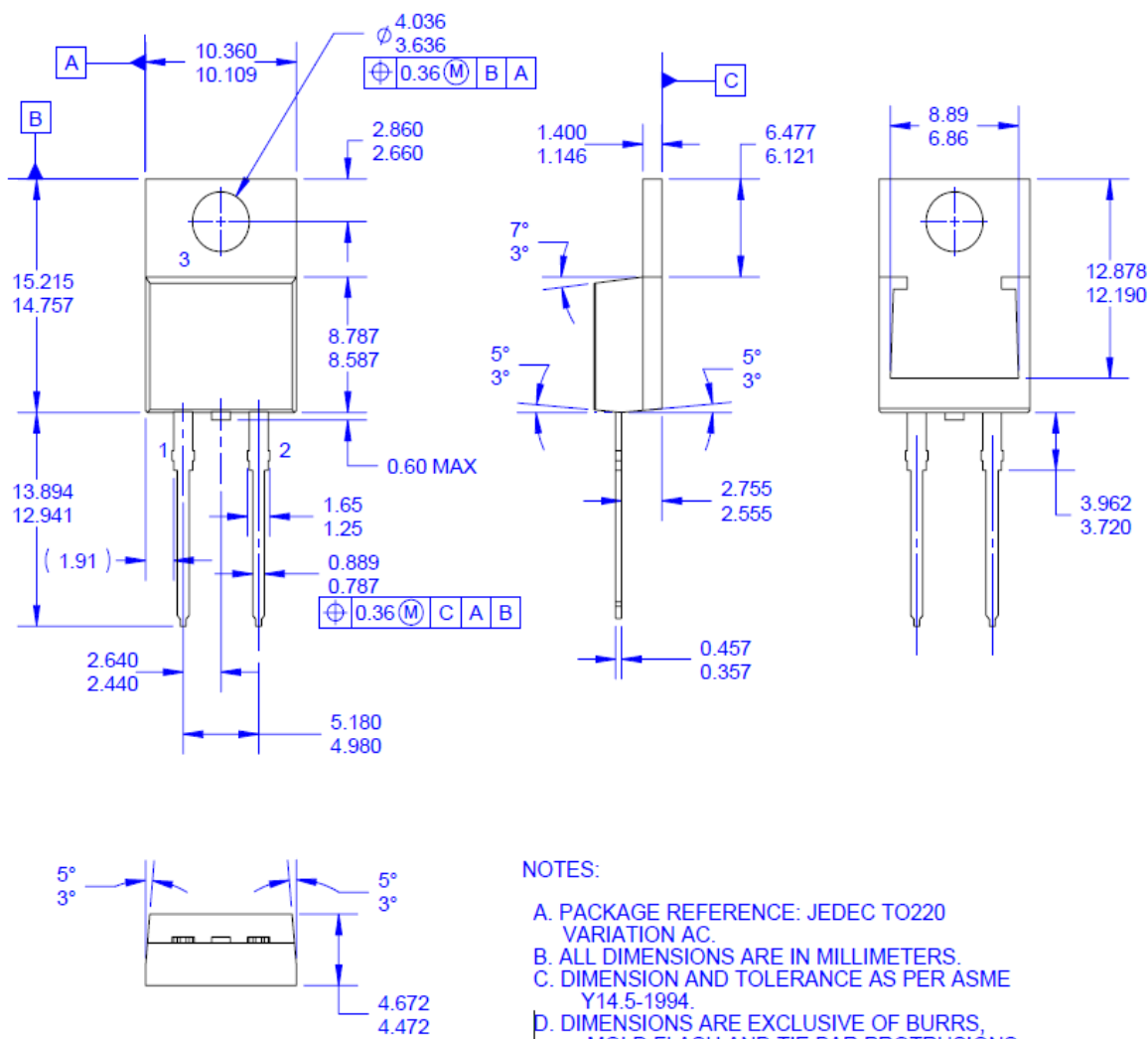


Figure 12. TO-220 2L - TO-220, MOLDED, 2LD

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Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru

www.lifeelectronics.ru