

# MURF820



ON Semiconductor®

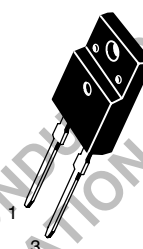
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## Advance Information SWITCHMODE™ Power Rectifier

Designed for use in switching power supplies, inverters and as free wheeling diodes, these state-of-the-art devices have the following features:

- Ultrafast 35 ns Recovery Times
- 150°C Operating Junction Temperature
- Epoxy Meets UL94, V<sub>O</sub> @ 1/8"
- High Temperature Glass Passivated Junction
- Low Leakage Specified @ 150°C Case Temperature
- Current Derating @ Both Case and Ambient Temperatures
- Electrically Isolated. No Isolation Hardware Required.
- UL Recognized File #E69369(1)

**ULTRAFAST RECTIFIER  
8 AMPERES, 200 VOLTS**



CASE 221E-01  
ISOLATED TO-220

### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 1.9 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	200	Volts
Average Rectified Forward Current (Rated V <sub>R</sub> ), T <sub>C</sub> = 150°C	I <sub>F(AV)</sub>	8	Amps
Peak Repetitive Forward Current (Rated V <sub>R</sub> , Square Wave, 20 kHz), T <sub>C</sub> = 150°C	I <sub>FM</sub>	16	Amps
Non-repetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I <sub>FSM</sub>	100	Amps
Operating Junction and Storage Temperature	T <sub>J</sub> , T <sub>stg</sub>	- 65 to +150	°C
RMS Isolation Voltage (t = 1 second, R.H. ≤ 30%, T <sub>A</sub> = 25°C) (2)	Per Figure 3 V <sub>iso1</sub>	4500	Volts
	Per Figure 4 (1) V <sub>iso2</sub>	3500	
	Per Figure 5 V <sub>iso3</sub>	1500	



### THERMAL CHARACTERISTICS

Maximum Thermal Resistance, Junction to Case	R <sub>θJC</sub>	4.2	°C/W
Lead Temperature for Soldering Purposes: 1/8" from Case for 5 seconds	T <sub>L</sub>	260	°C

(1) UL Recognized mounting method is per Figure 4.

(2) Proper strike and creepage distance must be provided.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

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## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Maximum Instantaneous Forward Voltage (3) ( $i_F = 8.0$ Amp, $T_C = 150^\circ\text{C}$ ) ( $i_F = 8.0$ Amp, $T_C = 25^\circ\text{C}$ )	$v_F$	0.895 0.975	Volts
Maximum Instantaneous Reverse Current (3) (Rated dc Voltage, $T_C = 150^\circ\text{C}$ ) (Rated dc Voltage, $T_C = 25^\circ\text{C}$ )	$i_R$	250 5.0	$\mu\text{A}$
Maximum Reverse Recovery Time ( $I_F = 1.0$ Amp, $di/dt = 50$ Amp/ $\mu\text{s}$ ) ( $I_F = 0.5$ Amp, $i_R = 1.0$ Amp, $I_{\text{REC}} = 0.25$ Amp)	$t_{\text{rr}}$	35 25	ns

(3) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

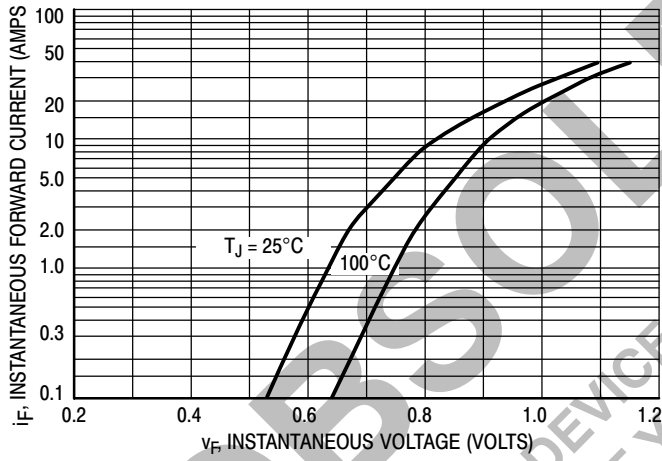


Figure 1. Typical Forward Voltage

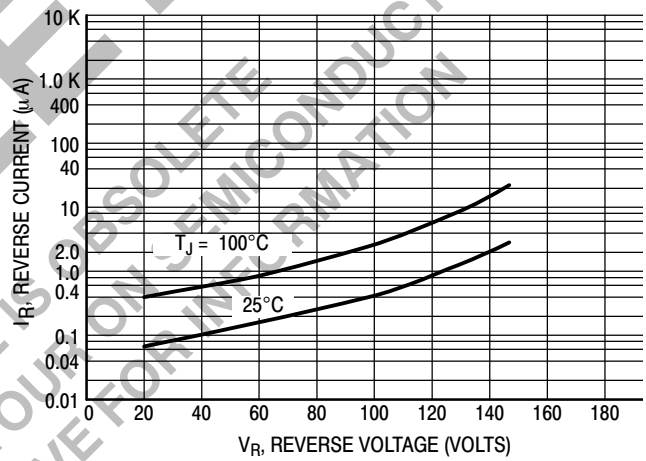
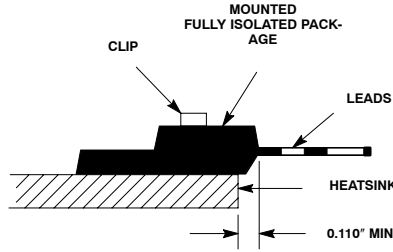


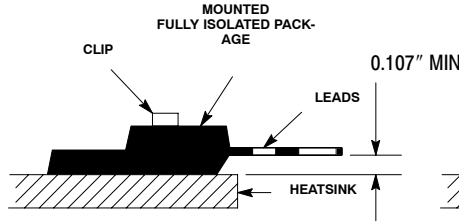
Figure 2. Typical Reverse Leakage Current\*

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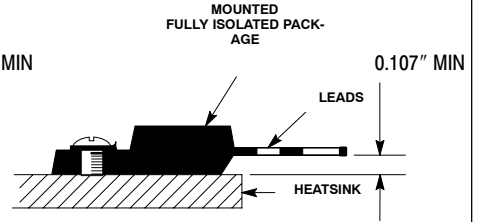
## TEST CONDITIONS FOR ISOLATION TESTS\*



**Figure 3. Clip Mounting Position for Isolation Test Number 1**



**Figure 4. Clip Mounting Position for Isolation Test Number 2**



**Figure 5. Screw Mounting Position for Isolation Test Number 3**

\* Measurement made between leads and heatsink with all leads shorted together.

## MOUNTING INFORMATION\*\*



**Figure 6. Typical Mounting Techniques**

Laboratory tests on a limited number of samples indicate, when using the screw and compression washer mounting technique, a screw torque of 6 to 8 in · lbs is sufficient to provide maximum power dissipation capability. The compression washer helps to maintain a constant pressure on the package over time and during large temperature excursions.

Destructive laboratory tests show that using a hex head 4-40 screw, without washers, and applying a torque in excess of 20 in · lbs will cause the plastic to crack around the mounting hole, resulting in a loss of isolation capability.

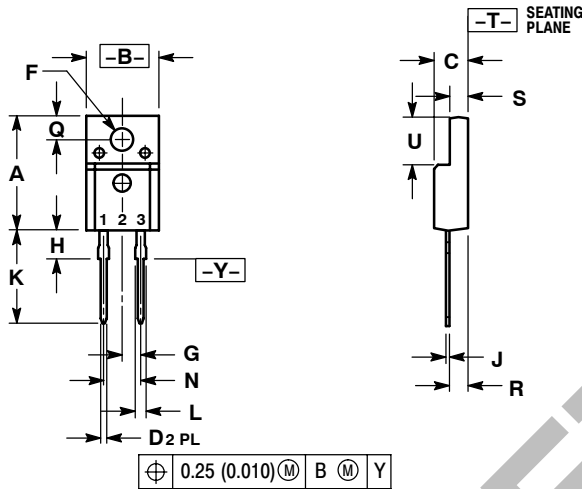
Additional tests on slotted 4-40 screws indicate that the screw slot fails between 15 to 20 in · lbs without adversely affecting the package. However, in order to positively ensure the package integrity of the fully isolated device, Motorola does not recommend exceeding 10 in · lbs of mounting torque under any mounting conditions.

\*\*For more information about mounting power semiconductors see Application Note AN1040.

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## PACKAGE DIMENSIONS

### CASE 221E-01 ISSUE O



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.621	0.629	15.78	15.97
B	0.394	0.402	10.01	10.21
C	0.181	0.189	4.60	4.80
D	0.026	0.034	0.67	0.86
F	0.121	0.129	3.08	3.27
G	0.100 BSC		2.54 BSC	
H	0.123	0.129	3.13	3.27
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
N	0.200 BSC		5.08 BSC	
Q	0.126	0.134	3.21	3.40
R	0.107	0.111	2.72	2.81
S	0.096	0.104	2.44	2.64
U	0.259	0.267	6.58	6.78

- STYLE 1:  
 PIN 1. CATHODE  
 2. N/A  
 3. ANODE

OBSOLETE

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