

Advance Information

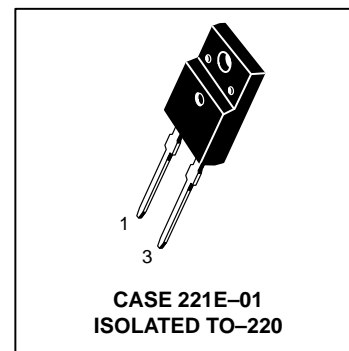
**SWITCHMODE**™  
**Power Rectifier**

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)

**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
- Shipped 50 units per plastic tube
- Marking: U820



**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>R</sub> RM V <sub>R</sub> WM V <sub>R</sub>	200	Volts	
Average Rectified Forward Current (Rated V <sub>R</sub> ), T <sub>C</sub> = 150°C	I <sub>F</sub> (AV)	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 Per Figure 4 (1) Per Figure 5	V <sub>iso1</sub> V <sub>iso2</sub> V <sub>iso3</sub>	4500 3500 1500	Volts

**THERMAL CHARACTERISTICS**

Maximum Thermal Resistance, Junction to Case	R <sub>θ</sub> JC	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.

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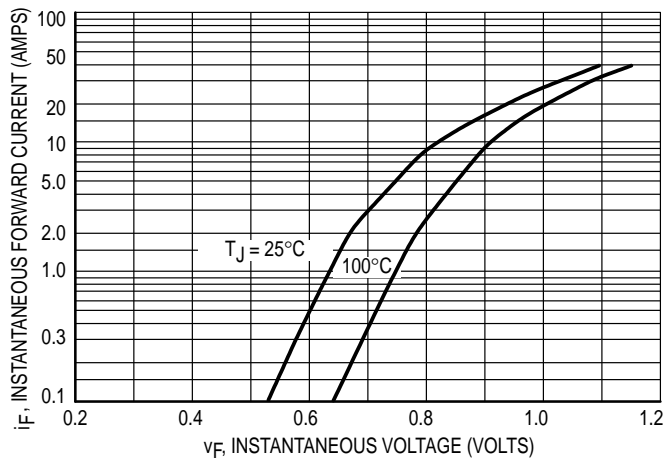
This document contains information on a new product. Specifications and information herein are subject to change without notice.

**Preferred** devices are Motorola recommended choices for future use and best overall value.

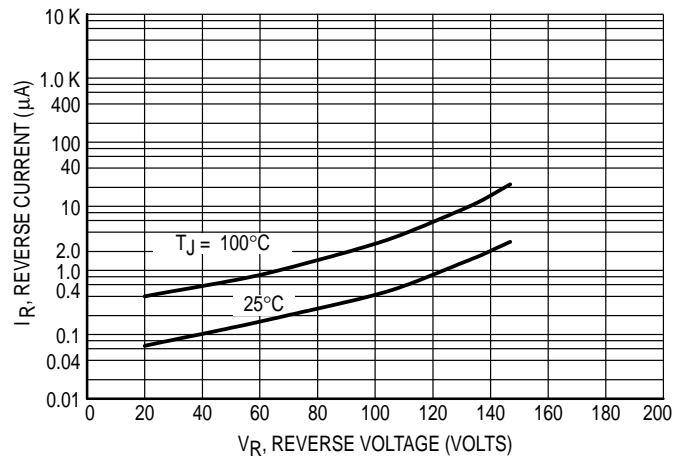
**ELECTRICAL CHARACTERISTICS**

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, $I_{REC} = 0.25$ Amp)	$t_{rr}$	35 25	ns

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

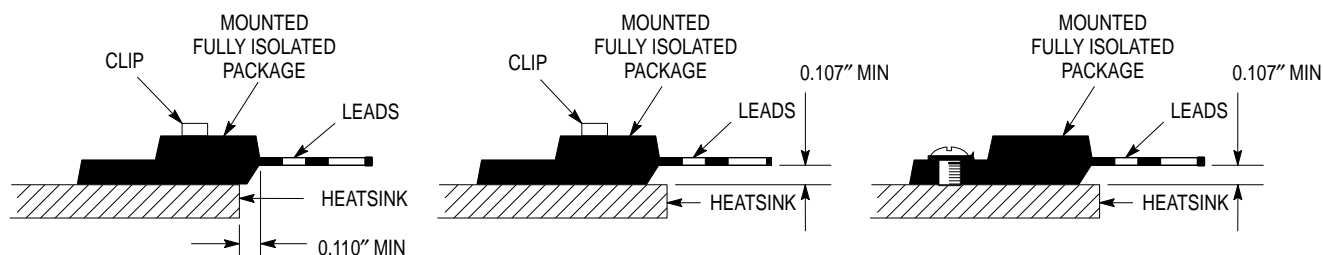


**Figure 1. Typical Forward Voltage**



**Figure 2. Typical Reverse Leakage Current\***

## TEST CONDITIONS FOR ISOLATION TESTS\*



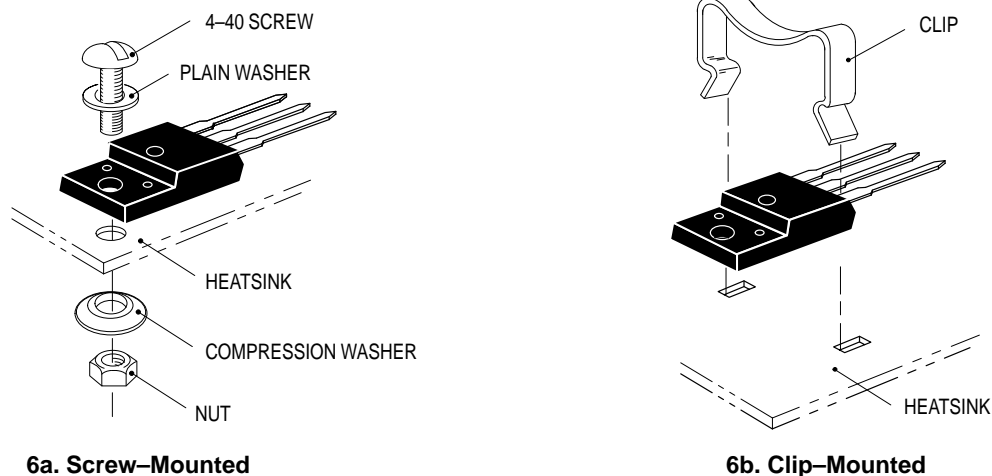
**Figure 3. Clip Mounting Position for Isolation Test Number 1**

**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\*\*



**6a. Screw-Mounted**

**6b. Clip-Mounted**

**Figure 6. Typical Mounting Techniques**

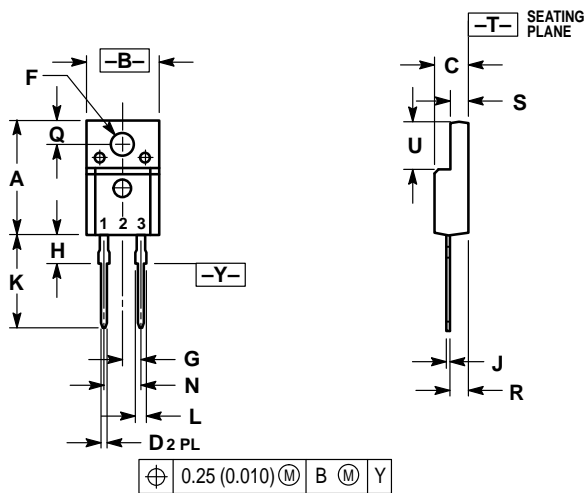
Laboratory tests on a limited number of samples indicate, when using the screw and compression washer mounting technique, a screw torque of 6 to 8 in · lbs is sufficient to provide maximum power dissipation capability. The compression washer helps to maintain a constant pressure on the package over time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

## PACKAGE DIMENSIONS



## NOTES:


- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- 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
- N/A
- ANODE

CASE 221E-01  
ISSUE O

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