

## 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 60 Nanosecond 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

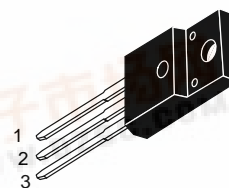
- Case: Epoxy, Molded
- Weight: 1.9 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped 50 units per plastic tube
- Marking: U1660



## MURF1660CT

Motorola Preferred Device

**ULTRAFAST RECTIFIER**  
**16 AMPERES**  
**600 VOLTS**



**CASE 221D-02**  
**ISOLATED TO-220**

### MAXIMUM RATINGS, PER LEG

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	600	Volts
Average Rectified Forward Current Total Device, (Rated $V_R$ ), $T_C = 150^\circ\text{C}$	$I_F(AV)$	8 16	Amps
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20 kHz), $T_C = 150^\circ\text{C}$	$I_{FM}$	16	Amps
Non-repetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	100	Amps
Operating Junction and Storage Temperature	$T_J, T_{stg}$	- 65 to +150	°C
RMS Isolation Voltage (t = 1 second, R.H. ≤ 30%, $T_A = 25^\circ\text{C}$ ) (2)	$V_{iso1}$ $V_{iso2}$ $V_{iso3}$	4500 3500 1500	Volts

### THERMAL CHARACTERISTICS, PER LEG

Maximum Thermal Resistance, Junction to Case	$R_{\theta JC}$	3.0	°C/W
Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	$T_L$	260	°C

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

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

SWITCHMODE is a trademark of Motorola, Inc.

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.



# MURF1660CT

## ELECTRICAL CHARACTERISTICS, PER LEG

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (3) ( $i_F = 8.0$ Amp, $T_C = 150^\circ\text{C}$ ) ( $i_F = 8.0$ Amp, $T_C = 25^\circ\text{C}$ )	$v_F$	1.20 1.50	Volts
Maximum Instantaneous Reverse Current (3) (Rated dc Voltage, $T_C = 150^\circ\text{C}$ ) (Rated dc Voltage, $T_C = 25^\circ\text{C}$ )	$i_R$	500 10	$\mu\text{A}$
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)	$t_{rr}$	60 50	ns

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

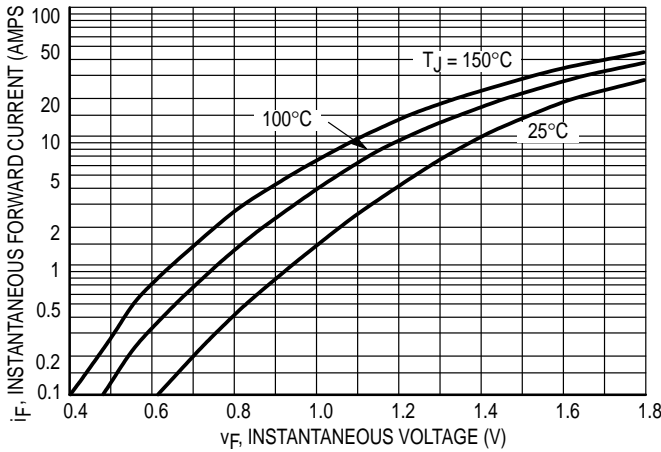


Figure 1. Typical Forward Voltage, Per Leg

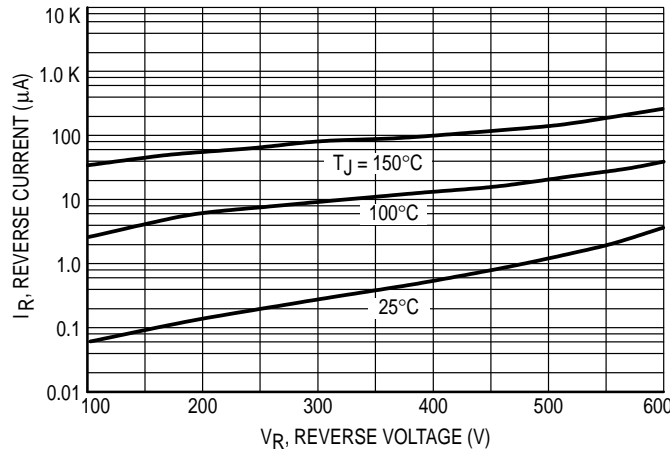
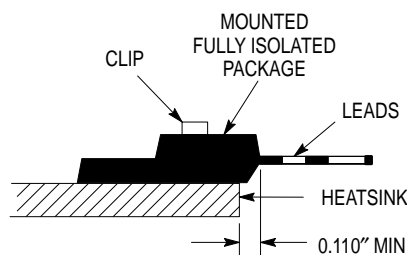
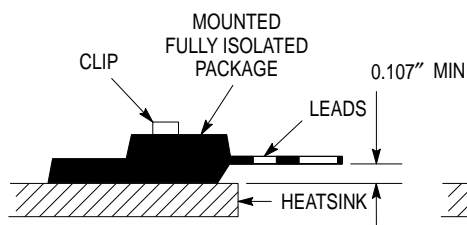


Figure 2. Typical Reverse Current, Per Leg\*

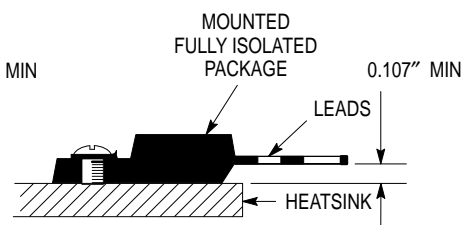
## TEST CONDITIONS FOR ISOLATION TESTS\*



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



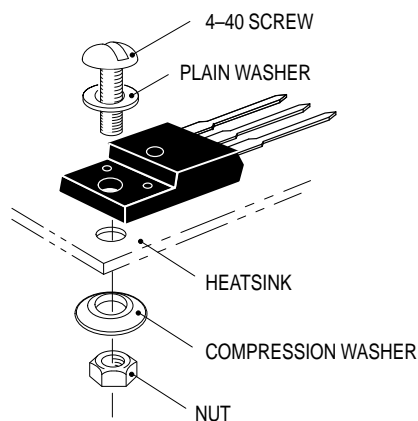
**Figure 4. Clip Mounting Position  
for Isolation Test Number 2**



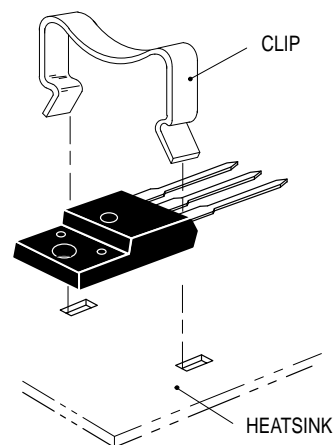
**Figure 5. Screw Mounting Position  
for Isolation Test Number 3**

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

## MOUNTING INFORMATION\*\*



**6a. Screw-Mounted**



**6b. Clip-Mounted**

**Figure 6. Typical Mounting Techniques**

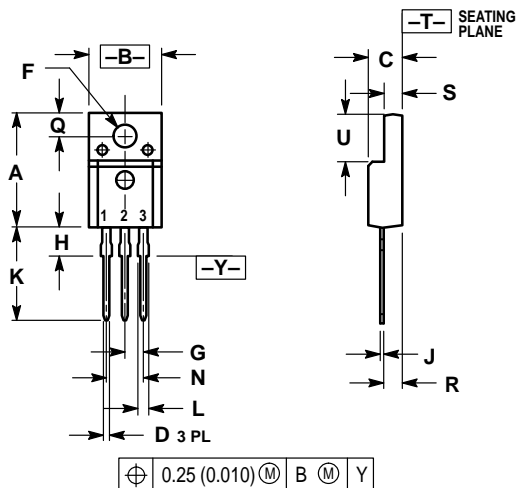
Laboratory tests on a limited number of samples indicate, when using the screw and compression washer mounting technique, a screw torque of 6 to 8 in · lbs is sufficient to provide maximum power dissipation capability. The compression washer helps to maintain a constant pressure on the package over time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

# MURF1660CT

## PACKAGE DIMENSIONS




- 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 3:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE

**CASE 221D-02  
(ISOLATED TO-220)  
ISSUE D**

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