

# MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G, SUR8820G, SUR8840G

Preferred Devices

## SWITCHMODE Power Rectifiers

This series are state-of-the-art devices designed for use in switching power supplies, inverters and as free wheeling diodes.

### Features

- Ultrafast 25 and 50 Nanosecond Recovery Time
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Low Forward Voltage
- Low Leakage Current
- Reverse Voltage to 600 V
- ESD Ratings:
  - ◆ Machine Model = C (> 400 V)
  - ◆ Human Body Model = 3B (> 16,000 V)
- AEC-Q101 Qualified and PPAP Capable
- SUR8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb-Free\*

### 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

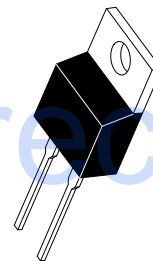
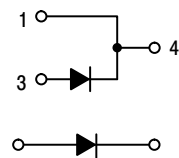
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



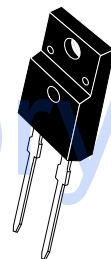
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## ULTRAFAST RECTIFIERS 8.0 AMPERES, 50-600 VOLTS



TO-220AC  
CASE 221B  
PLASTIC



TO-220 FULLPAK  
CASE 221E  
STYLE 1

### MARKING DIAGRAMS



- A = Assembly Location
- Y = Year
- WW = Work Week
- U8XX = Device Code  
xx = 05, 10, 15, 20, 40, or 60
- G = Pb-Free Package
- KA = Diode Polarity

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

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

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## MAXIMUM RATINGS

Rating	Symbol	MUR/SUR8						Unit
		805	810	815	820	840	860	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	50	100	150	200	400	600	V
Average Rectified Forward Current Total Device, (Rated $V_R$ ), $T_C = 150^\circ\text{C}$	$I_{F(AV)}$	8.0						A
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20 kHz), $T_C = 150^\circ\text{C}$	$I_{FM}$	16						A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	100						A
Operating Junction Temperature and Storage Temperature Range	$T_J, T_{stg}$	-65 to +175						$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

## THERMAL CHARACTERISTICS

Characteristic	Symbol	MUR/SUR8						Unit
		805	810	815	820	840	860	
Maximum Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.0			2.0			$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case MURF860	$R_{\theta JC}$	4.75						$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	73						$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient MURF860	$R_{\theta JA}$	75						$^\circ\text{C/W}$

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	MUR/SUR8						Unit
		805	810	815	820	840	860	
Maximum Instantaneous Forward Voltage (Note 1) ( $i_F = 8.0\text{ A}$ , $T_C = 150^\circ\text{C}$ ) ( $i_F = 8.0\text{ A}$ , $T_C = 25^\circ\text{C}$ )	$V_F$	0.895 0.975			1.00 1.30	1.20 1.50	V	
Maximum Instantaneous Reverse Current (Note 1) (Rated DC Voltage, $T_J = 150^\circ\text{C}$ ) (Rated DC Voltage, $T_J = 25^\circ\text{C}$ )	$i_R$	250 5.0			500 10		$\mu\text{A}$	
Maximum Reverse Recovery Time ( $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ ) ( $I_F = 0.5\text{ A}$ , $i_R = 1.0\text{ A}$ , $I_{REC} = 0.25\text{ A}$ )	$t_{rr}$	35 25			60 50		ns	

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

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SUR8820G, SUR8840G

MUR805G, MUR810G, MUR815G, MUR820G, SUR8820G

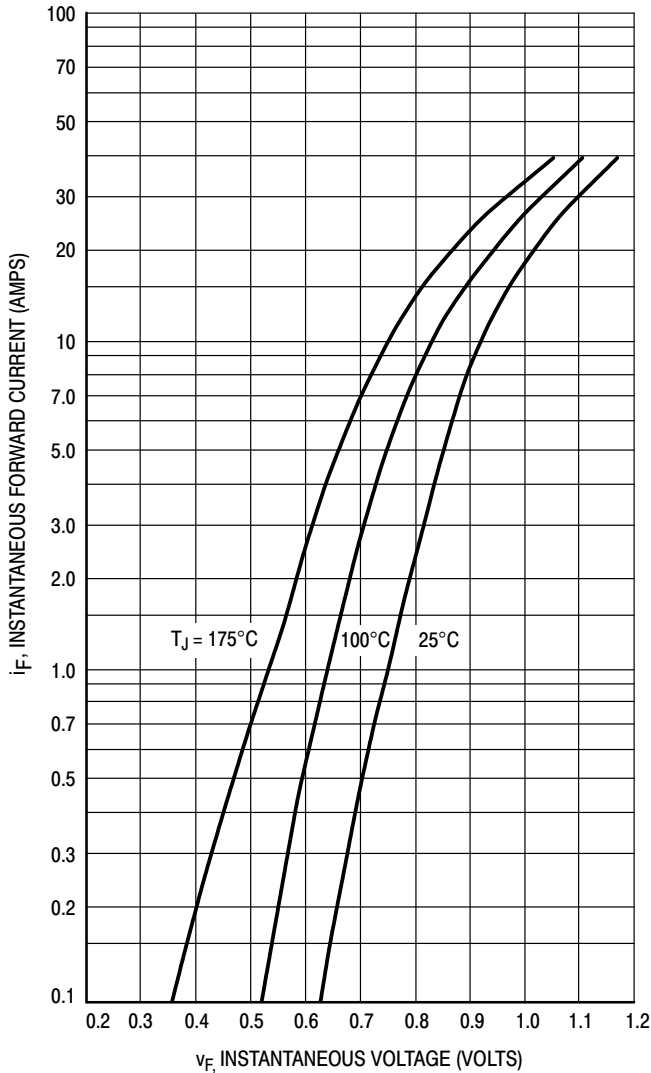


Figure 1. Typical Forward Voltage

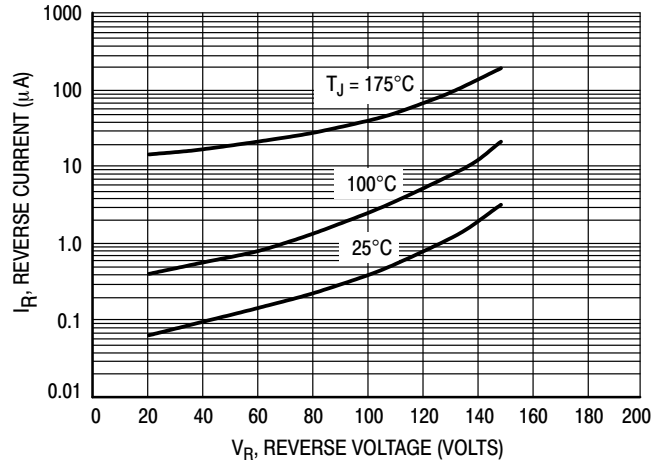


Figure 2. Typical Reverse Current\*

\* The curves shown are typical for the highest voltage device in the grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if  $V_R$  is sufficiently below rated  $V_R$ .

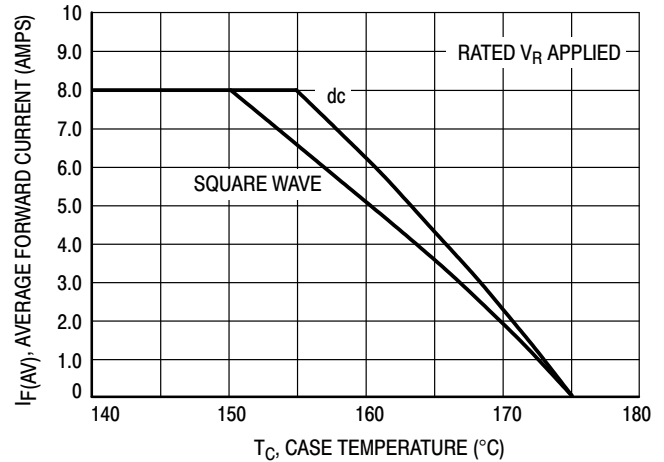


Figure 3. Current Derating, Case

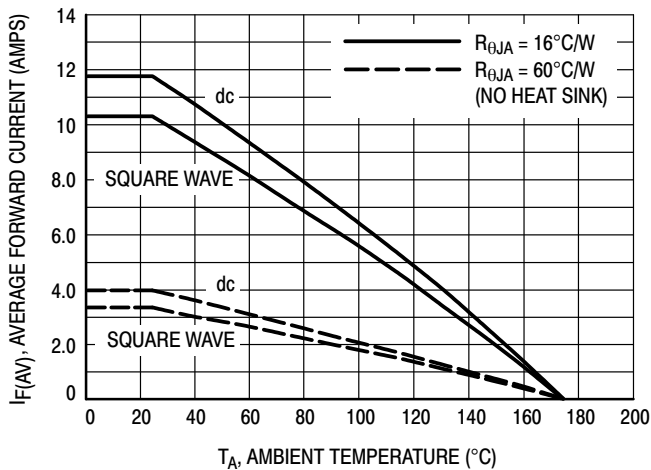


Figure 4. Current Derating, Ambient

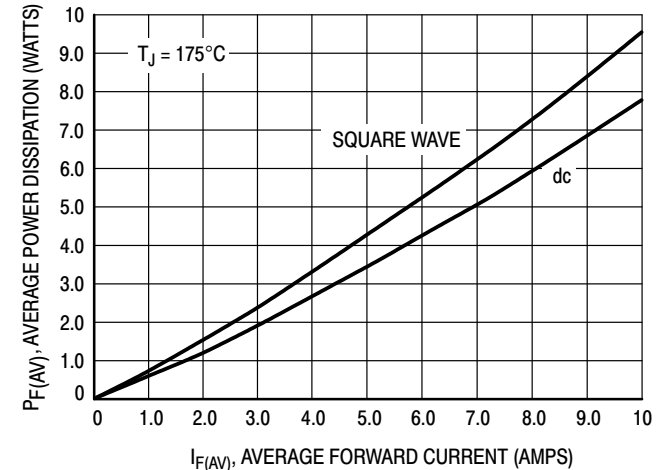


Figure 5. Power Dissipation

MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G,  
SUR8820G, SUR8840G

MUR840G, SUR8840G

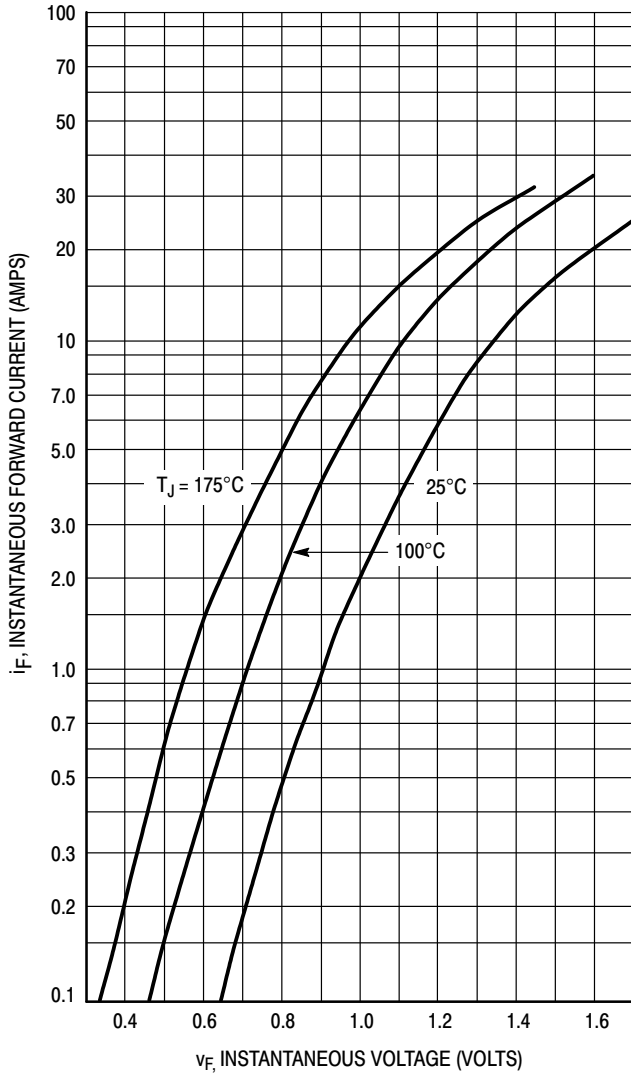


Figure 6. Typical Forward Voltage

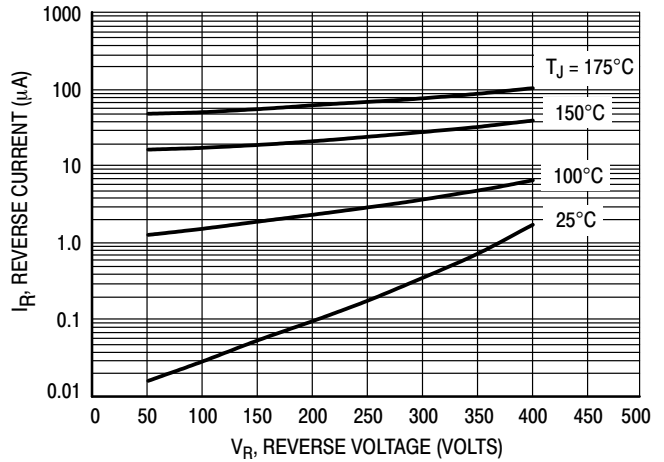


Figure 7. Typical Reverse Current\*

\* The curves shown are typical for the highest voltage device in the grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if  $V_R$  is sufficiently below rated  $V_R$ .

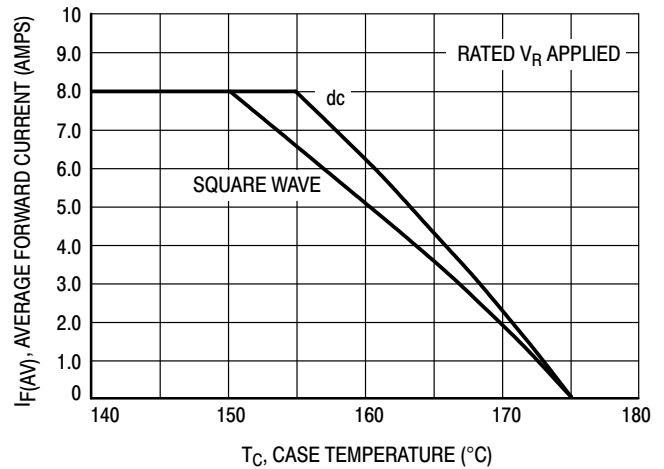


Figure 8. Current Derating, Case

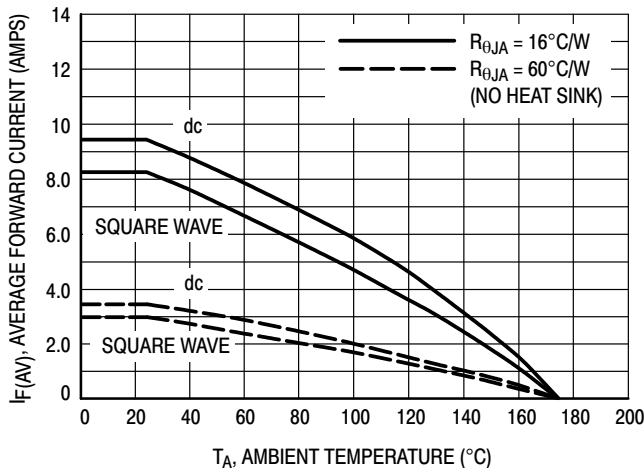


Figure 9. Current Derating, Ambient

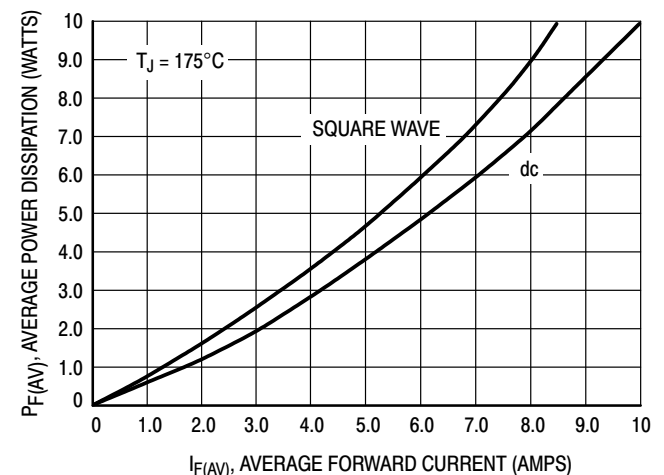


Figure 10. Power Dissipation

MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G,  
SUR8820G, SUR8840G

MUR860G, MURF860G

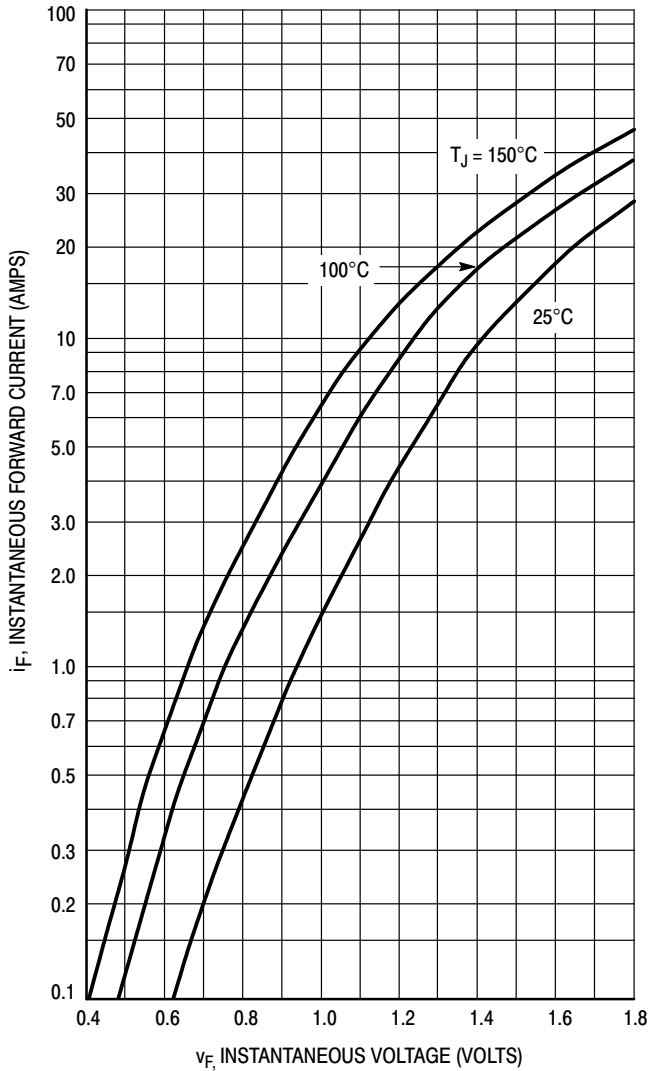


Figure 11. Typical Forward Voltage

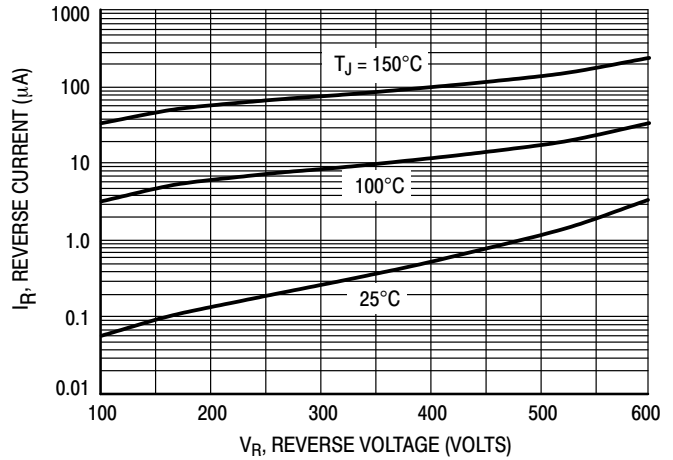


Figure 12. Typical Reverse Current\*

\* The curves shown are typical for the highest voltage device in the grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if  $V_R$  is sufficiently below rated  $V_R$ .

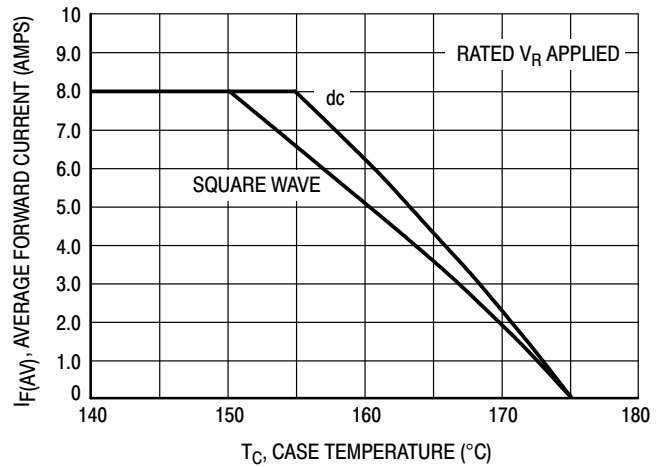


Figure 13. Current Derating, Case

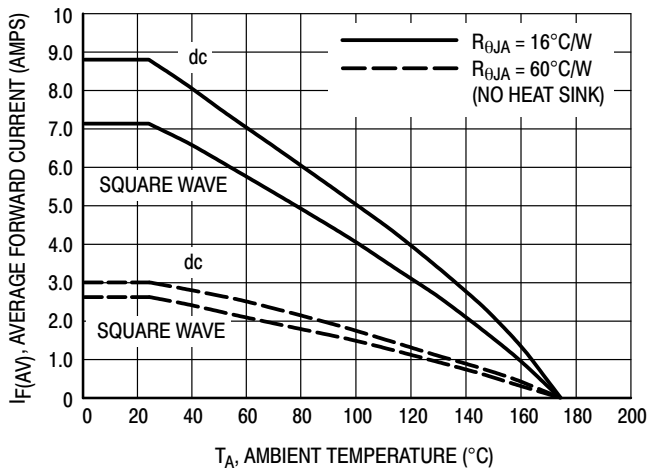


Figure 14. Current Derating, Ambient

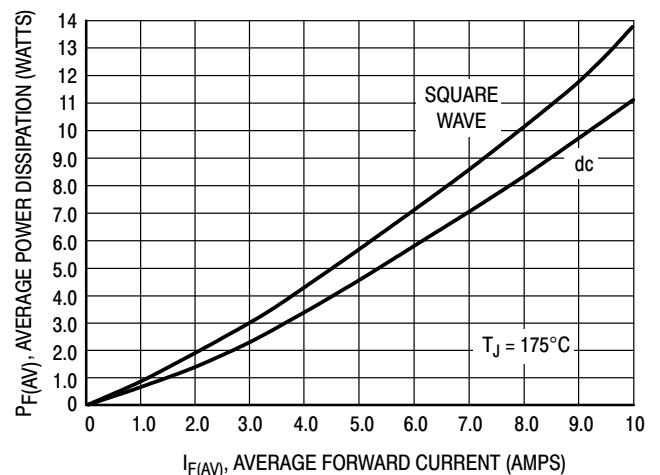


Figure 15. Power Dissipation

MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G,  
SUR8820G, SUR8840G

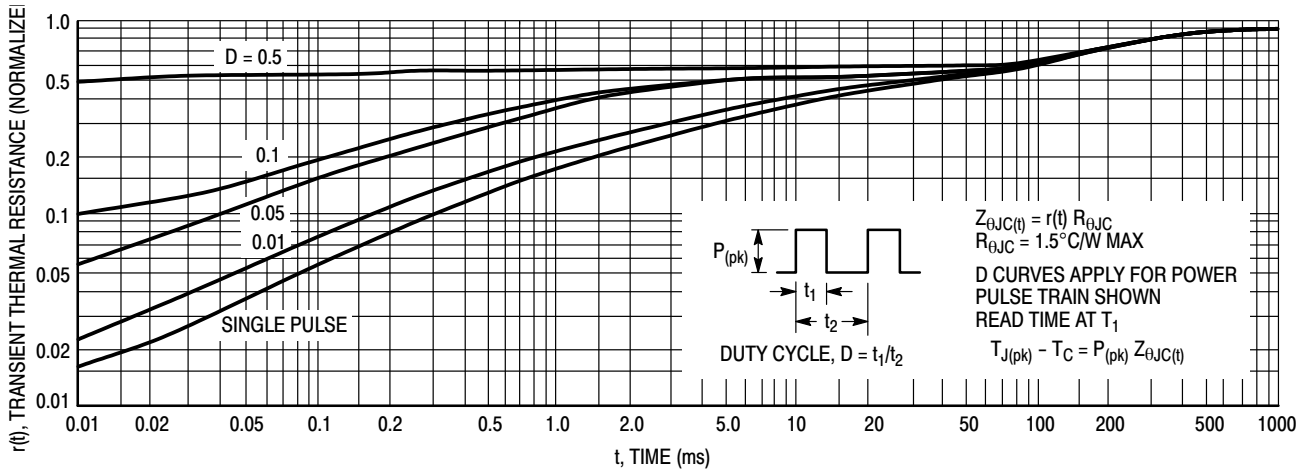


Figure 16. Thermal Response

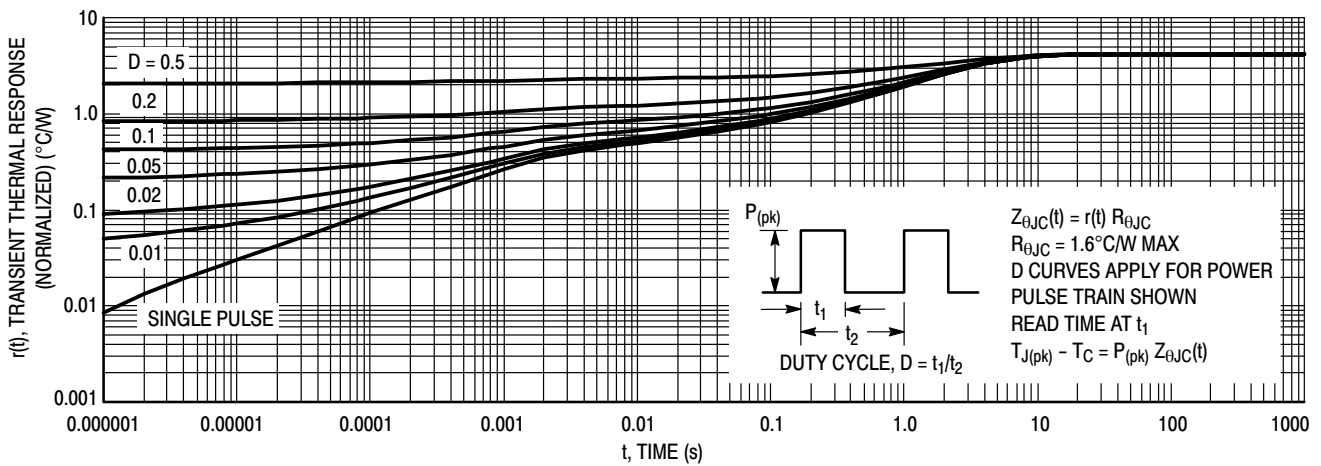


Figure 17. Thermal Response, (MURF860G) Junction-to-Case ( $R_{\theta JC}$ )

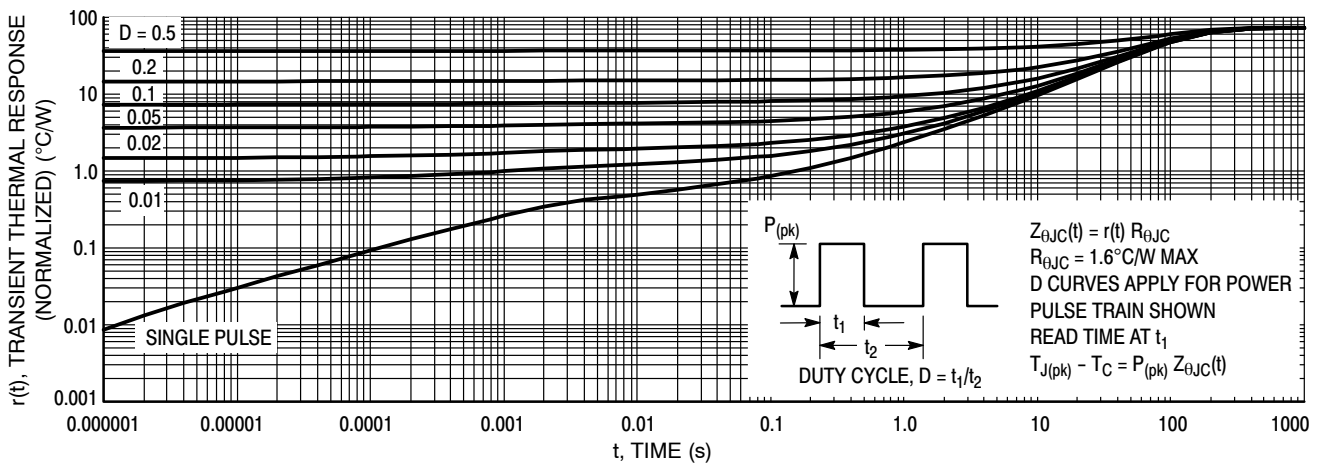
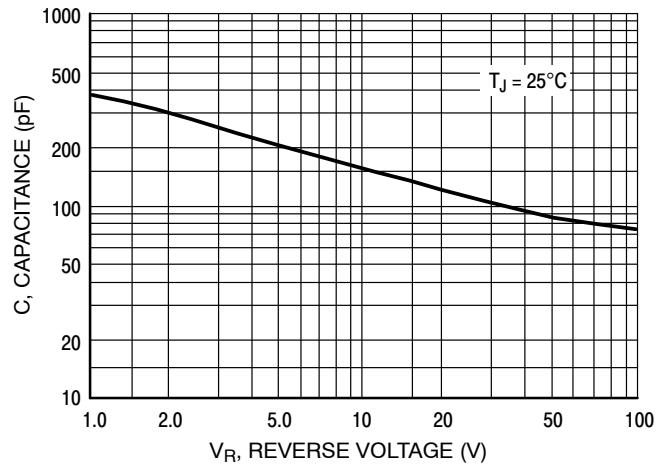


Figure 18. Thermal Response, (MURF860G) Junction-to-Ambient ( $R_{\theta JA}$ )

**MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G,  
SUR8820G, SUR8840G**



**Figure 19. Typical Capacitance**

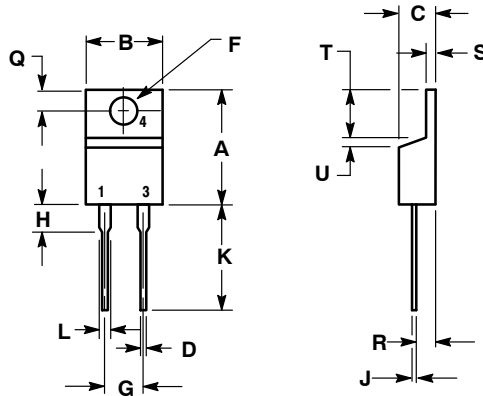
**ORDERING INFORMATION**

Device	Package	Shipping
MUR805G	TO-220AC (Pb-Free)	50 Units / Rail
MUR810G	TO-220AC (Pb-Free)	50 Units / Rail
MUR815G	TO-220AC (Pb-Free)	50 Units / Rail
MUR820G	TO-220AC (Pb-Free)	50 Units / Rail
SUR8820G	TO-220AC (Pb-Free)	50 Units / Rail
MUR840G	TO-220AC (Pb-Free)	50 Units / Rail
SUR8840G	TO-220AC (Pb-Free)	50 Units / Rail
MUR860G	TO-220AC (Pb-Free)	50 Units / Rail
MURF860G	TO-220FP (Pb-Free)	50 Units / Rail

# MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G, SUR8820G, SUR8840G

## PACKAGE DIMENSIONS

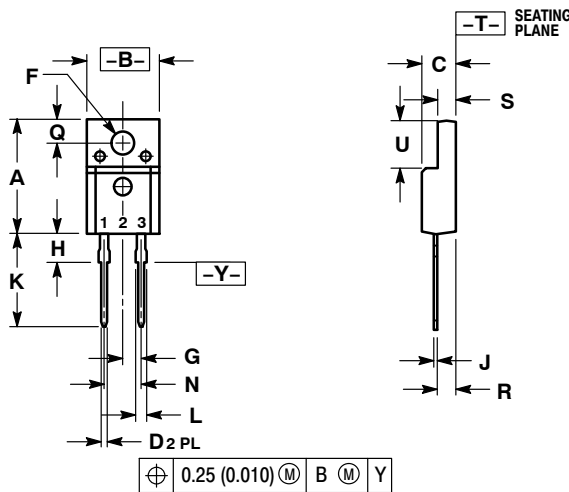
### TO-220AC TWO-LEAD CASE 221B-04 ISSUE E



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.595	0.620	15.11	15.75
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.82
D	0.025	0.035	0.64	0.89
F	0.142	0.161	3.61	4.09
G	0.190	0.210	4.83	5.33
H	0.110	0.130	2.79	3.30
J	0.014	0.025	0.36	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.14	1.39
T	0.235	0.255	5.97	6.48
U	0.000	0.050	0.000	1.27

### TO-220 FULLPAK, 2-LEAD CASE 221E-01 ISSUE A



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.617	0.633	15.67	16.07
B	0.392	0.408	9.96	10.36
C	0.177	0.193	4.50	4.90
D	0.024	0.039	0.60	1.00
F	0.121	0.129	3.08	3.28
G	0.100 BSC		2.54 BSC	
H	0.117	0.133	2.98	3.38
J	0.018	0.025	0.45	0.64
K	0.499	0.562	12.68	14.27
L	0.045	0.060	1.14	1.52
N	0.200 BSC		5.08 BSC	
Q	0.122	0.138	3.10	3.50
R	0.101	0.117	2.56	2.96
S	0.092	0.108	2.34	2.74
U	0.255	0.271	6.48	6.88

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

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