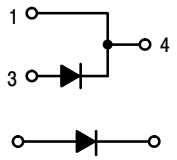
Switch-mode Power Rectifiers

MUR1510G, MUR1515G, MUR1520G, MUR1540G, MUR1560G, MURF1560G, SUR81520G, SUR81560G

ULTRAFAST RECTIFIERS
15 AMPERES, 100−600 VOLTS



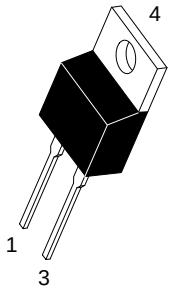
These state-of-the-art devices are a series designed for use in switching power supplies, inverters and as free wheeling diodes.

Features

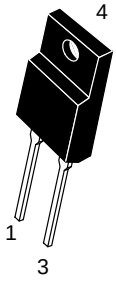
- Ultrafast 35 and 60 Nanosecond Recovery Time
- 175 °C Operating Junction Temperature
- High Voltage Capability to 600 V
- ESD Ratings:
  - Machine Model = C
  - Human Body Model = 3B
- Low Forward Drop
- Low Leakage Specified @ 150 °C Case Temperature
- Current Derating Specified @ Both Case and Ambient Temperatures
- SUR8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- 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

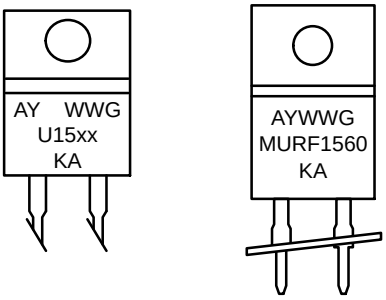


TO-220AC
CASE 221B
STYLE 1



TO-220 FULLPAK
CASE 221AG
STYLE 1

MARKING DIAGRAMS



A = Assembly Location
Y = Year
WW = Work Week
G = Pb-Free Package
U15xx = Device Code
xx = 10, 15, 20, 40 or 60
KA = Diode Polarity

ORDERING INFORMATION

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

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 7.

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

MAXIMUM RATINGS

Rating	Symbol	MUR/SUR8					Unit
		1510	1515	1520	1540	1560	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	100	150	200	400	600	V
Average Rectified Forward Current (Rated V_R)	$I_{F(AV)}$	15 @ T_C = 150 °C				15 @ T_C = 145 °C	A
Peak Rectified Forward Current (Rated V_R, Square Wave, 20 kHz)	I_{FRM}	30 @ T_C = 150 °C				30 @ T_C = 145 °C	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	200			150		A
Operating Junction Temperature and Storage Temperature Range	T_J, T_{stg}	−65 to +175					°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
MUR1510 Series: Thermal Resistance Junction-to-Case Junction-to-Ambient	 $R_{\theta JC}$ $R_{\theta JA}$	 1.5 73	°C/W
MURF1560: Thermal Resistance Junction-to-Case Junction-to-Ambient	 $R_{\theta JC}$ $R_{\theta JA}$	 4.25 75	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	1510	1515	1520	1540	1560	Unit
Maximum Instantaneous Forward Voltage (Note 1) (i_F = 15 A, T_C = 150 °C) (i_F = 15 A, T_C = 25 °C)	v_F		0.85 1.05		1.12 1.25	1.20 1.50	V
Maximum Instantaneous Reverse Current (Note 1) (Rated DC Voltage, T_C = 150 °C) (Rated DC Voltage, T_C = 25 °C)	i_R		500 10		500 10	1000 10	μA
Maximum Reverse Recovery Time (I_F = 1.0 A, di/dt = 50 A/μs)	t_{rr}		35			60	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

MUR1510G, MUR1515G, MUR1520G, SUR81520G

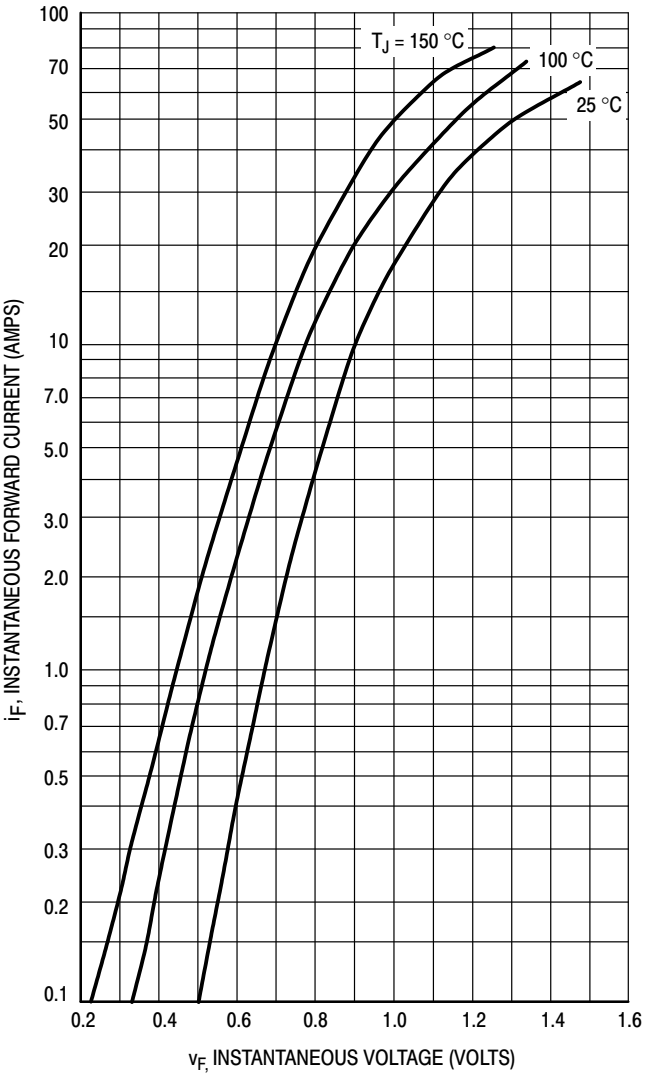


Figure 1. Typical Forward Voltage

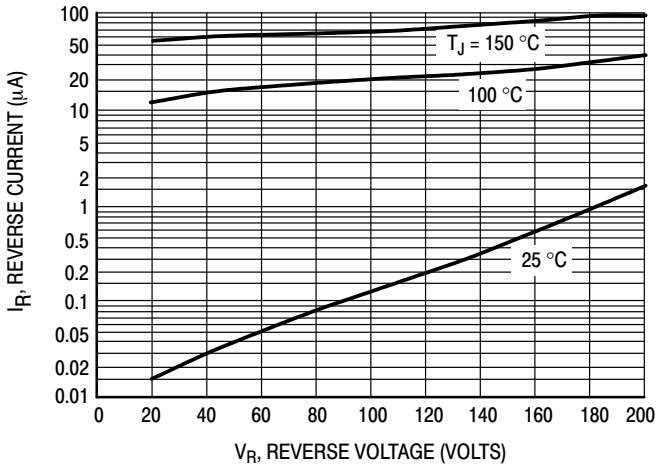


Figure 2. Typical Reverse Current

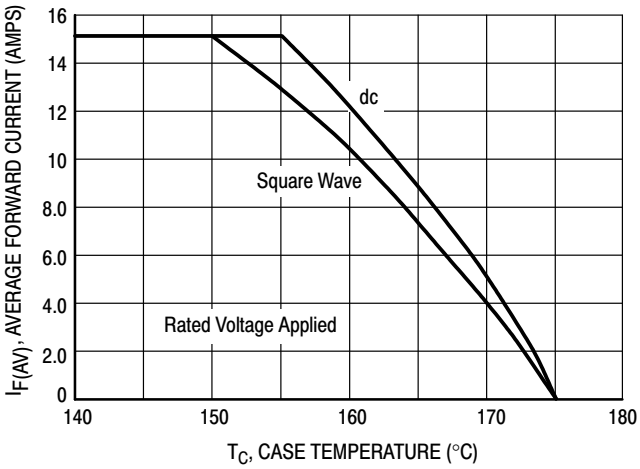


Figure 3. Current Derating, Case

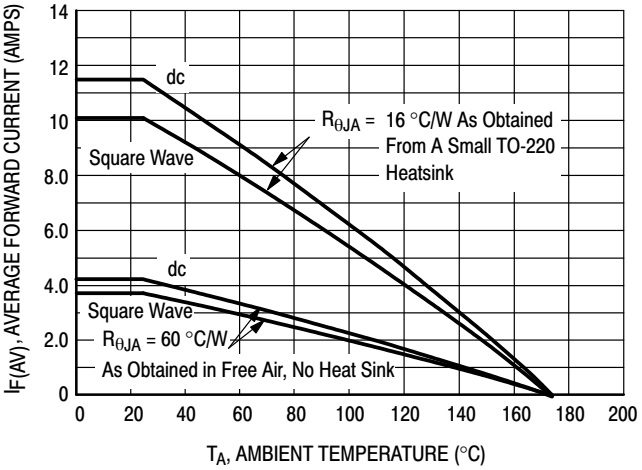


Figure 4. Current Derating, Ambient

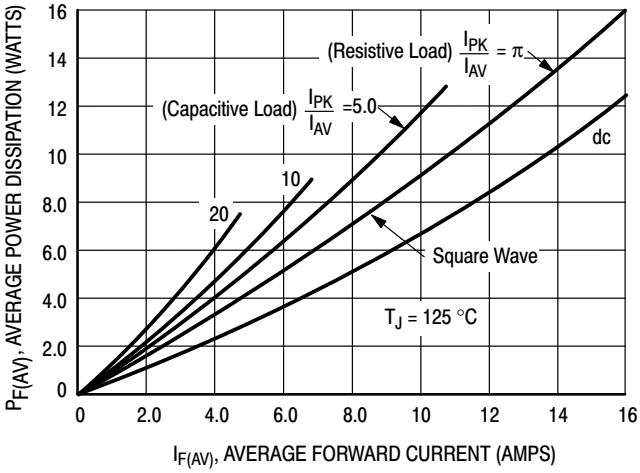


Figure 5. Power Dissipation

MUR1540G

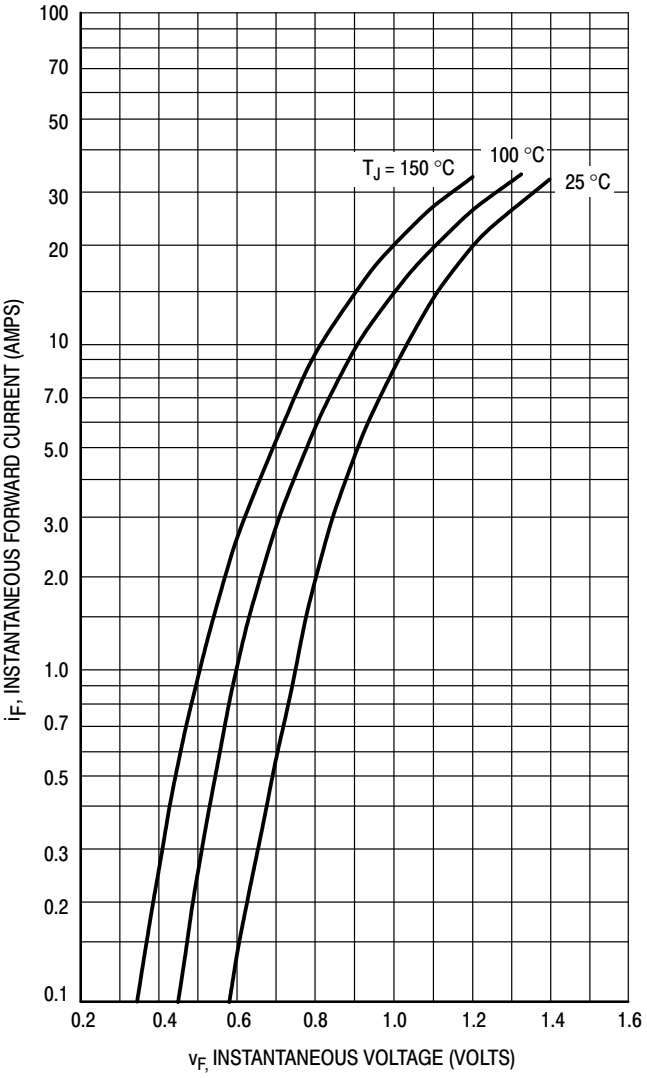


Figure 6. Typical Forward Voltage

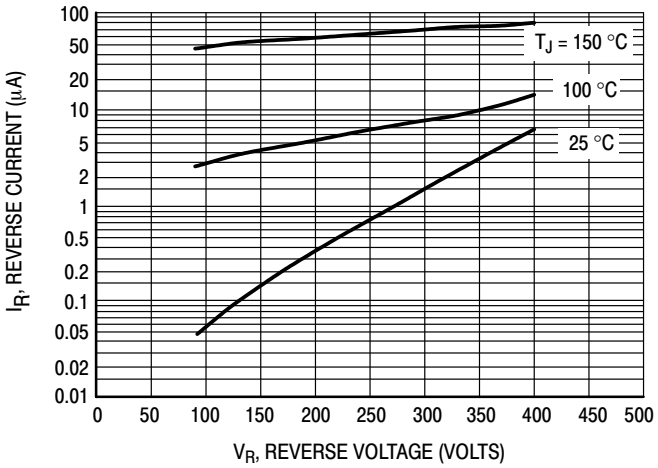


Figure 7. Typical Reverse Current

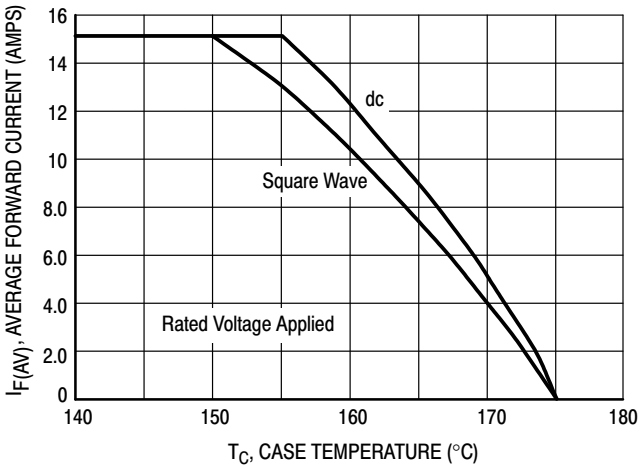


Figure 8. Current Derating, Case

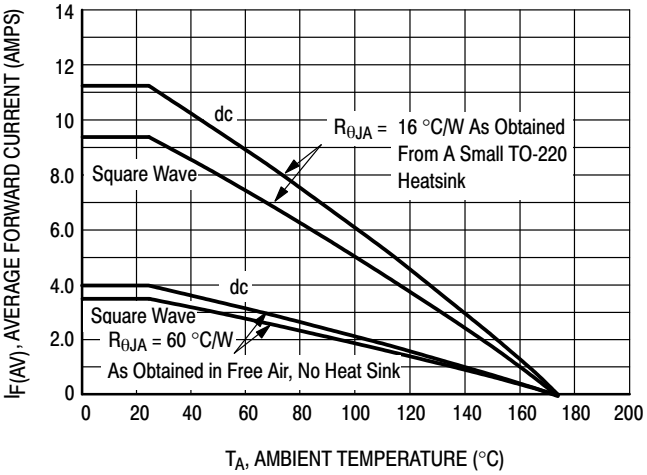


Figure 9. Current Derating, Ambient

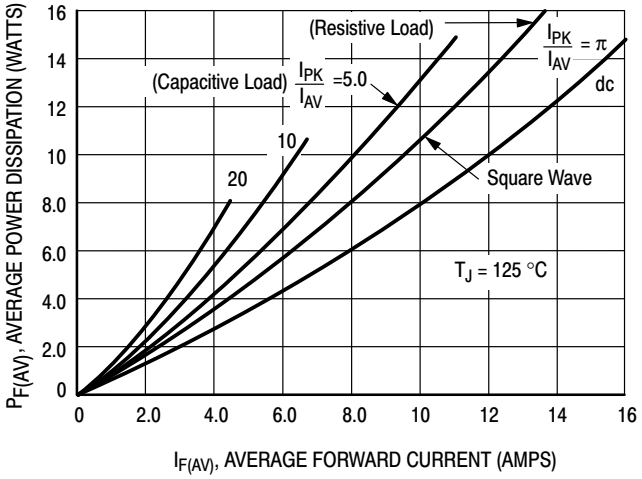


Figure 10. Power Dissipation

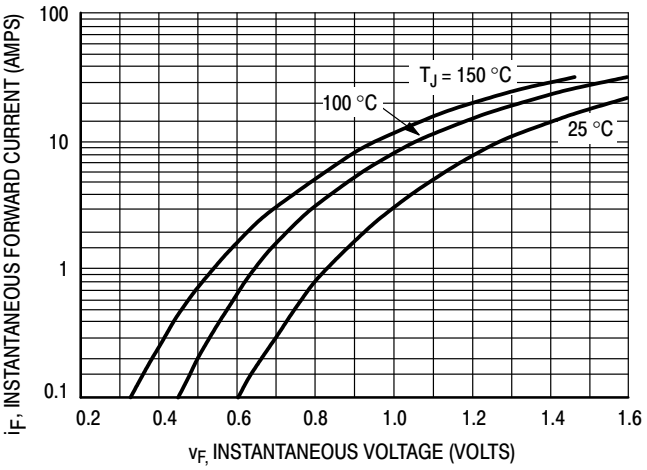


Figure 11. Typical Forward Voltage

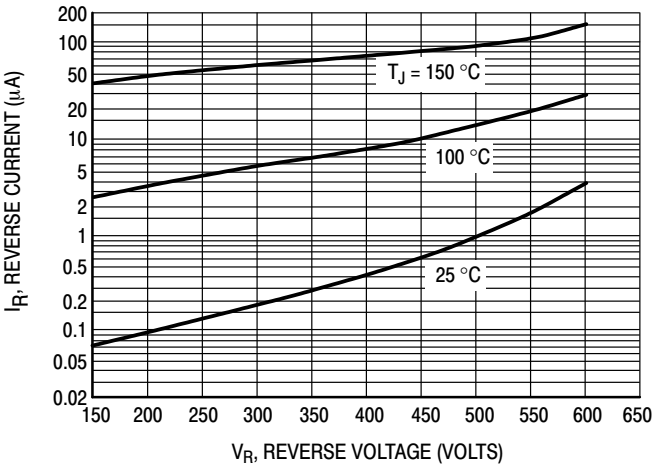


Figure 12. Typical Reverse Current

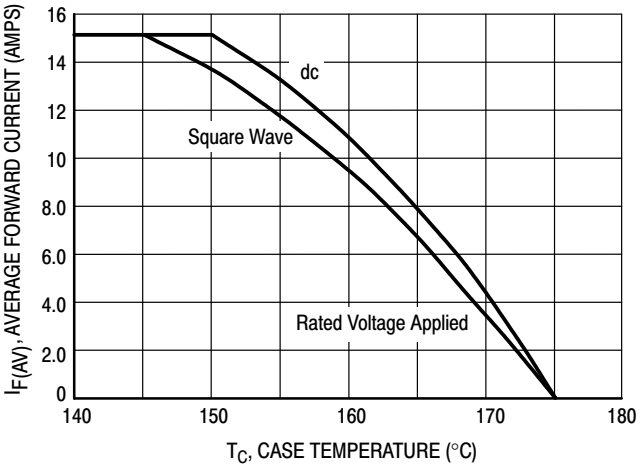


Figure 13. Current Derating, Case

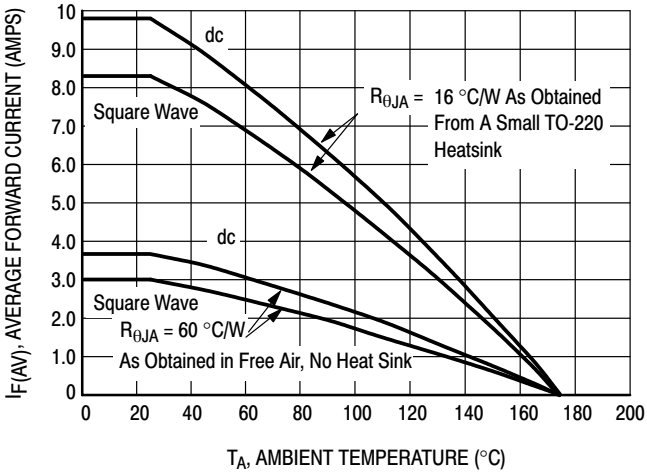


Figure 14. Current Derating, Ambient

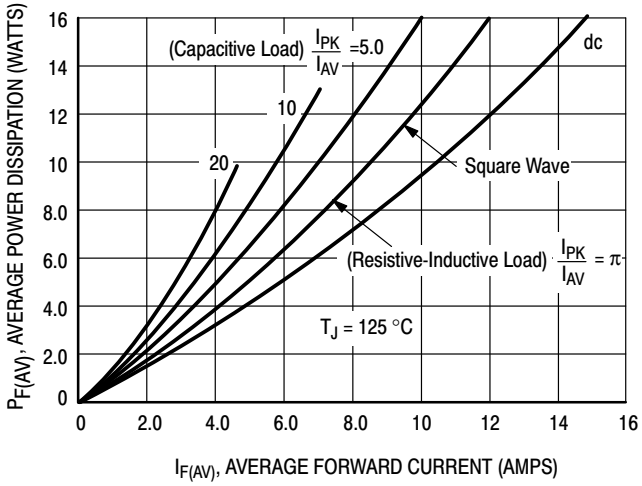


Figure 15. Power Dissipation

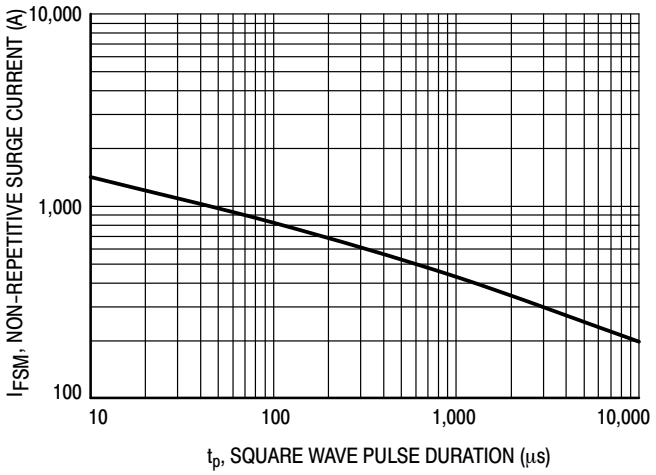


Figure 16. Typical Non-Repetitive Surge Current

* Typical performance based on a limited sample size. **onsemi** does not guarantee ratings not listed in the Maximum Ratings table.

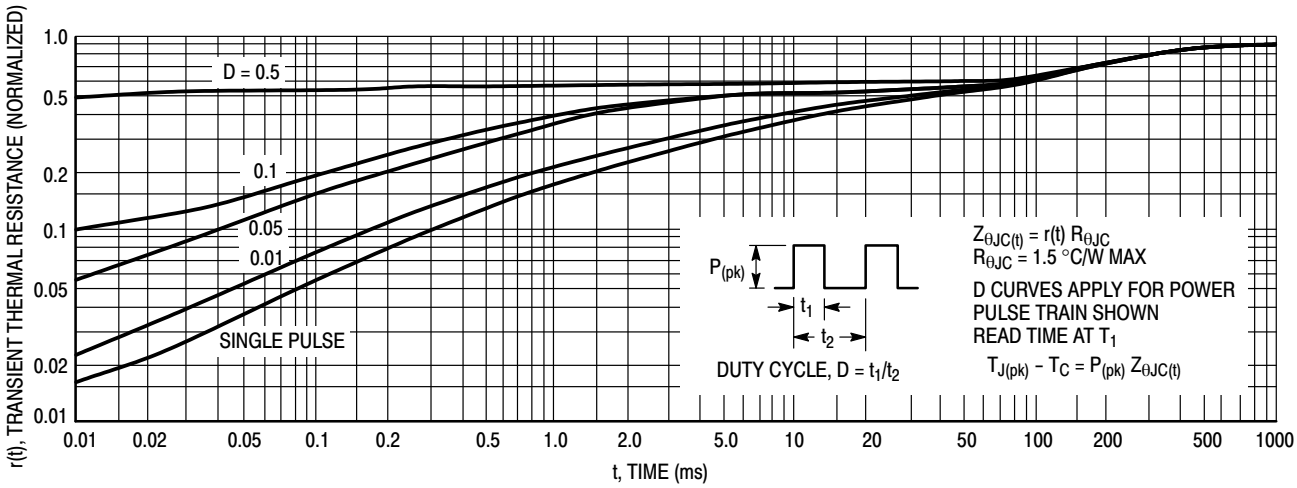


Figure 17. Thermal Response

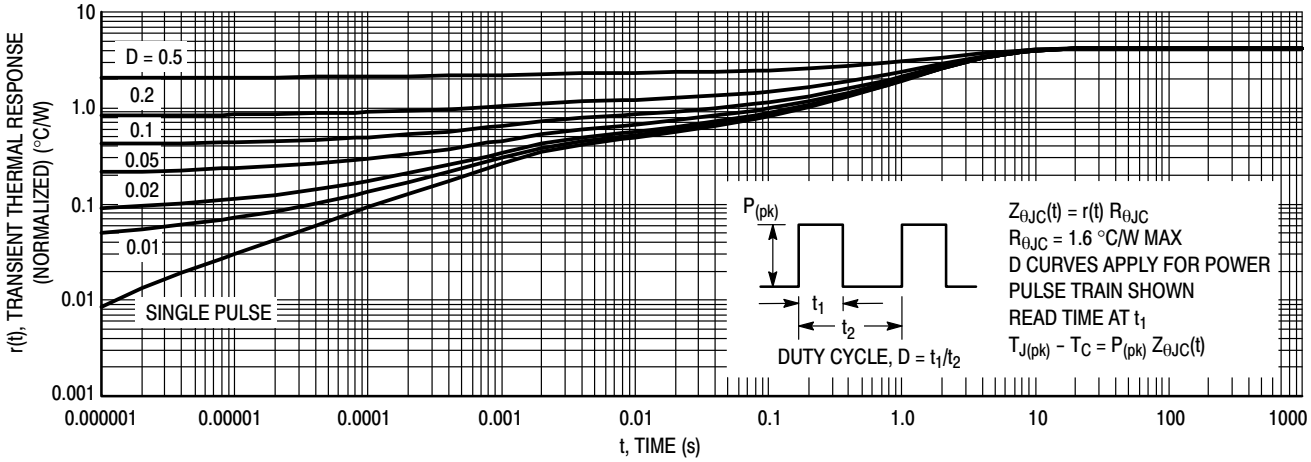


Figure 18. Thermal Response, (MURF1560G) Junction-to-Case ($R_{\theta JC}$)

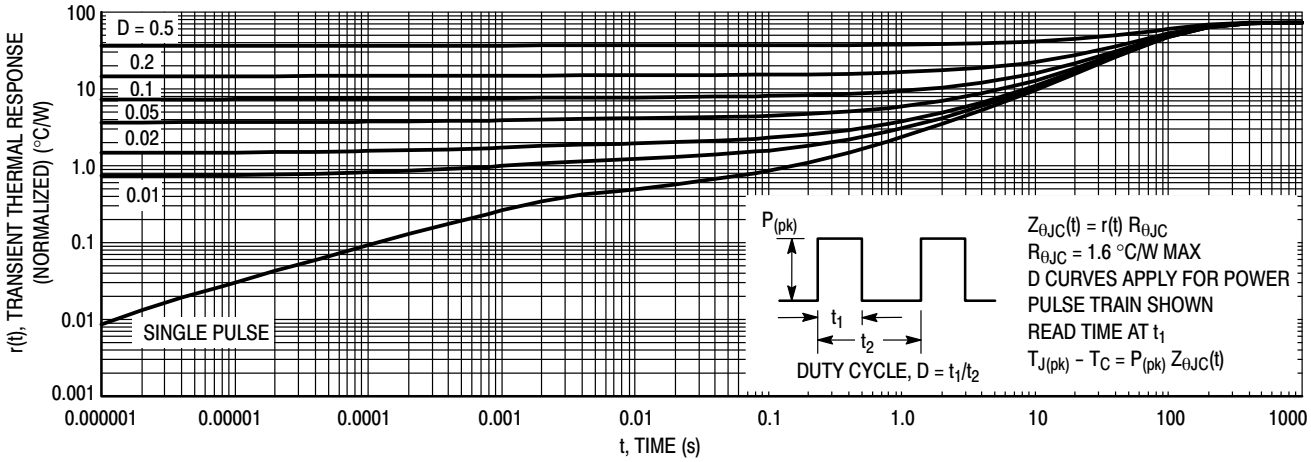


Figure 19. Thermal Response, (MURF1560G) Junction-to-Ambient ($R_{\theta JA}$)

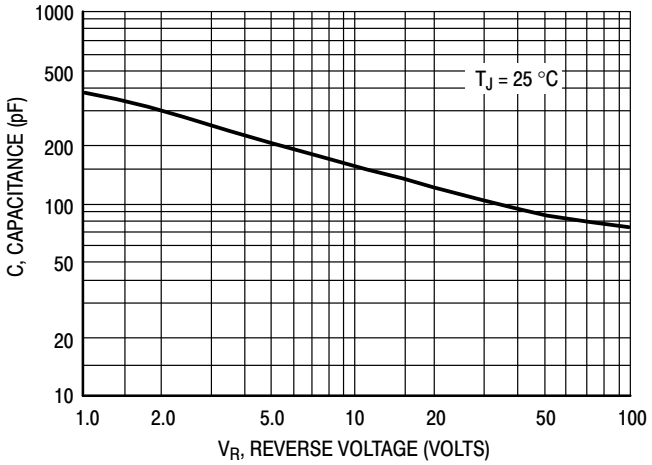


Figure 20. Typical Capacitance

ORDERING INFORMATION

Device	Package	Shipping†
MUR1520G	TO-220AC (Pb-Free)	50 Units / Rail
MUR1540G	TO-220AC (Pb-Free)	50 Units / Rail
MUR1560G	TO-220AC (Pb-Free)	50 Units / Rail
SUR81560G	TO-220AC (Pb-Free)	50 Units / Rail
MURF1560G	TO-220FP (Pb-Free)	50 Units / Rail

DISCONTINUED (Note 2)

MUR1510G	TO-220AC (Pb-Free)	50 Units / Rail
MUR1515G	TO-220AC (Pb-Free)	50 Units / Rail
SUR81520G	TO-220AC (Pb-Free)	50 Units / Rail

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

2. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on www.onsemi.com.

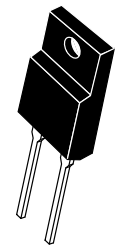
REVISION HISTORY

Revision	Description of Changes	Date
11	Rebranded the Data Sheet to **onsemi** format. MUR1510G, MUR1515G, SUR81520G OPNs marked as Discontinued.	10/8/2025

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

TO−220 FULLPACK, 2−LEAD
CASE 221AG
ISSUE B

DATE 27 AUG 2015



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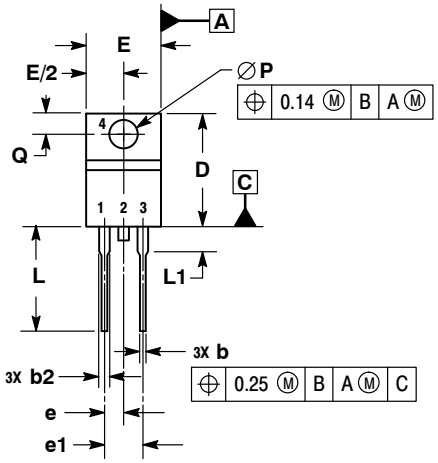
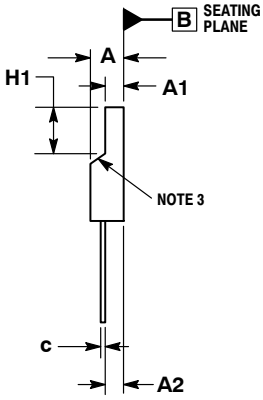


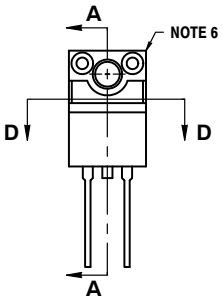
TOP VIEW



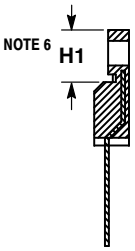
SIDE VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR UNCONTROLLED IN THIS AREA.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH AND GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE TO BE MEASURED AT OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DIMENSION b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 2.00.

	MILLIMETERS	
DIM	MIN	MAX
A	4.30	4.70
A1	2.50	2.90
A2	2.50	2.90
b	0.54	0.84
b2	1.10	1.40
c	0.49	0.79
D	14.22	15.88
E	9.65	10.67
e	2.54 BSC	
e1	5.08 BSC	
H1	6.40	6.90
L	12.70	14.73
L1	---	2.80
P	3.00	3.40
Q	2.80	3.20



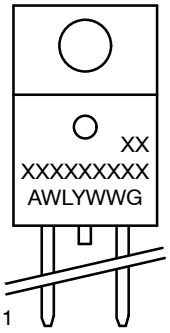
ALTERNATE CONSTRUCTION



SECTION A−A

SECTION D−D

GENERIC MARKING DIAGRAM*



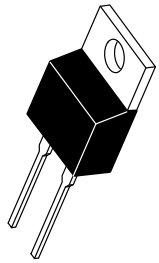
A = Assembly Location
WL = Wafer Lot
Y = Year
WW = Work Week
G = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present.

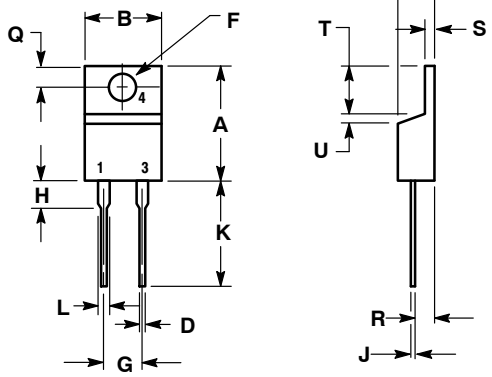
DOCUMENT NUMBER:	**98AON52563E**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.
DESCRIPTION:	**TO−220 FULLPACK, 2−LEAD**	**PAGE 1 OF 1**

TO−220, 2−LEAD
CASE 221B−04
ISSUE F

DATE 12 APR 2013



SCALE 1:1



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

	INCHES		MILLIMETERS	
DIM	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	0.039	0.64	1.00
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

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

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

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DESCRIPTION:	**TO−220, 2−LEAD**		**PAGE 1 OF 1**

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales