

# 600 V, 1.0 A Ultrafast Rectifier

## MURHS160T3, NRVUHS160V, SURHS8160

### Features and Benefits

- Ultrafast 35 Nanosecond Recovery Times
- 175°C Operating Junction Temperature
- High Temperature Glass Passivated Junction
- High Voltage Capability to 600 V
- NRVUHS and SURHS8 Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

### Applications

- Power Supplies
- Inverters
- Free Wheeling Diodes

### Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: 95 mg (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Cathode Polarity Band

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	600	V
Average Rectified Forward Current (Rated $V_R$ , $T_L = 145^\circ\text{C}$ )	$I_{F(AV)}$	1.0	A
Nonrepetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	15	A
Operating Junction and Storage Temperature Range	$T_J$ , $T_{stg}$	-65 to +175	°C
ESD Ratings: Charged Device Model Human Body Model = 3B		> 1000 > 8000	V

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.

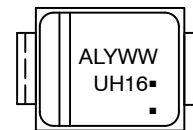
## ULTRAFAST RECTIFIER 1.0 AMPERES 600 VOLTS



SMB  
CASE 403A  
PLASTIC



### MARKING DIAGRAM



UH16 = Specific Device Code  
AL = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
NRVUHS160VT3G	SMB (Pb-Free)	2,500 / Tape & Reel
NRVUHS160VT3G-GA01		
SURHS8160T3G-GA01		

### DISCONTINUED (Note 1)

Device	Package	Shipping <sup>†</sup>
MURHS160T3G	SMB (Pb-Free)	2,500 / Tape & Reel
SURHS8160T3G		

<sup>†</sup>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](#).

1. **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](http://www.onsemi.com).

## MURHS160T3, NRVUHS160V, SURHS8160

### THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Maximum Thermal Resistance, Junction-to-Lead (Note 1)	$R_{\theta JL}$	24	$^{\circ}\text{C/W}$
Maximum Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	80	$^{\circ}\text{C/W}$

1. Mounted with minimum recommended pad size, PC Board FR4.
2. 1 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.

### ELECTRICAL CHARACTERISTICS

Rating	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage (Note 3) ( $I_F = 1.0\text{ A}$ , $T_C = 25^{\circ}\text{C}$ ) ( $I_F = 1.0\text{ A}$ , $T_C = 125^{\circ}\text{C}$ )	$V_F$	1.5 1.2	2.4 1.7	V
Maximum Instantaneous Reverse Current (Note 3) (Rated dc Voltage, $T_C = 25^{\circ}\text{C}$ ) (Rated dc Voltage, $T_C = 125^{\circ}\text{C}$ )	$I_R$	0.18 5.0	20 200	$\mu\text{A}$
Maximum Reverse Recovery Time ( $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ ) ( $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{REC} = 0.25\text{ A}$ )	$t_{rr}$	25 16	35 30	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.

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

TYPICAL CHARACTERISTICS

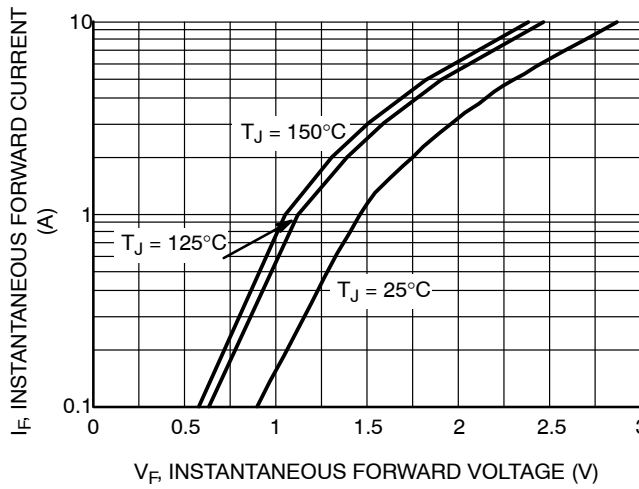


Figure 1. Typical Forward Voltage

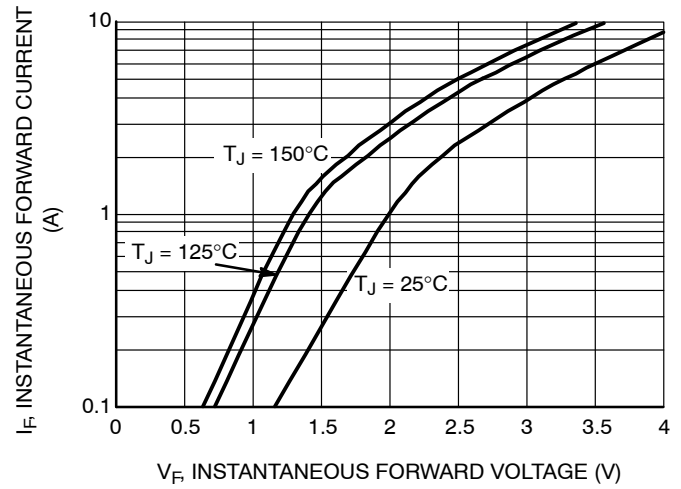


Figure 2. Maximum Forward Voltage

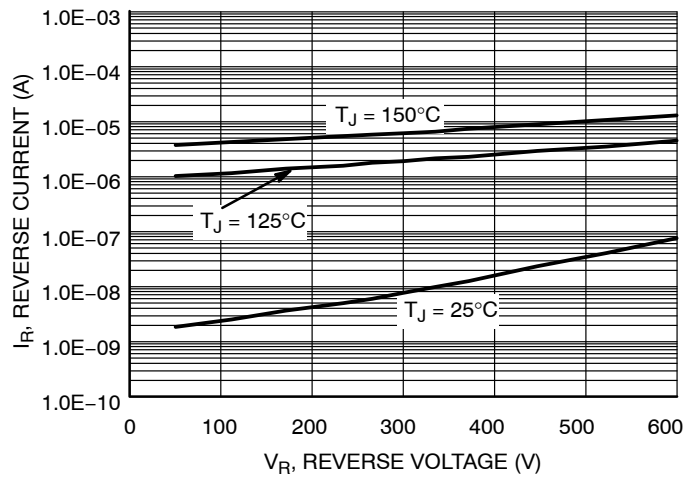


Figure 3. Typical Reverse Current

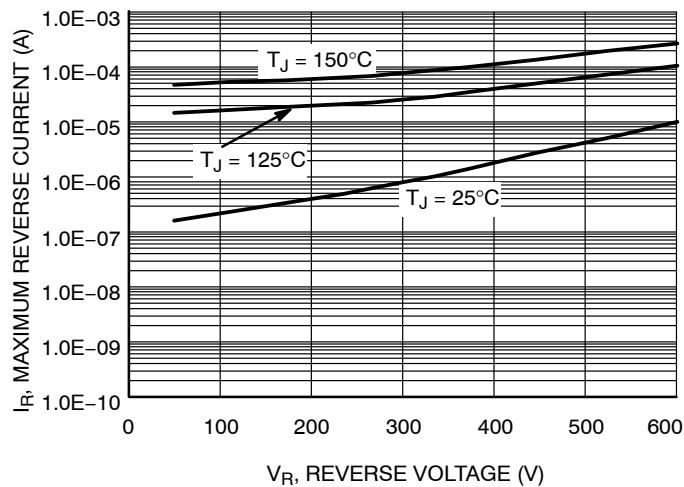


Figure 4. Maximum Reverse Current

TYPICAL CHARACTERISTICS

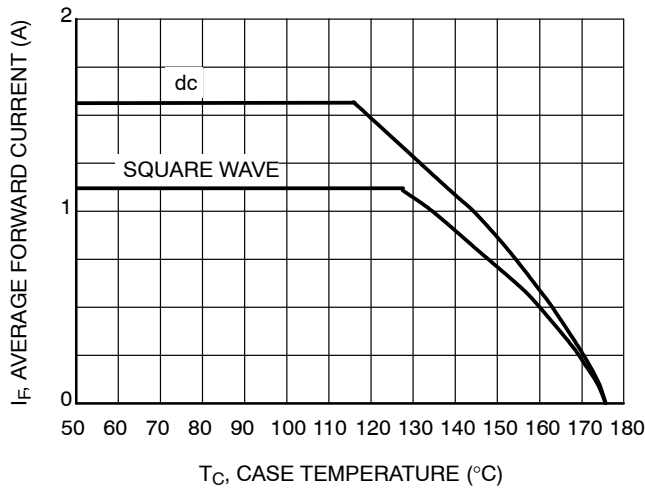


Figure 5. Current Derating

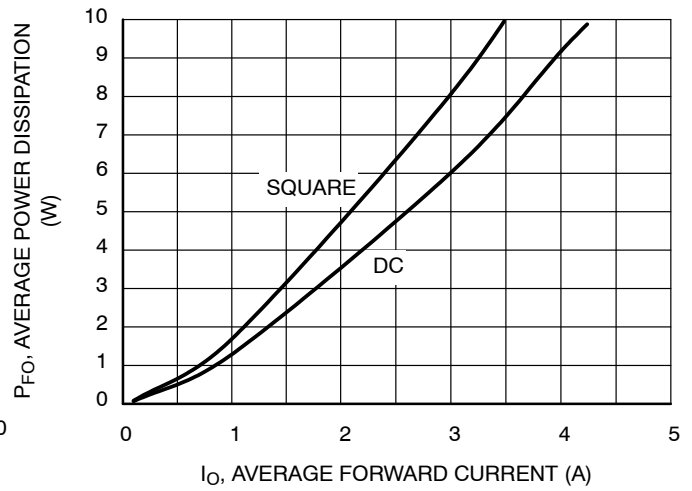


Figure 7. Forward Power Dissipation

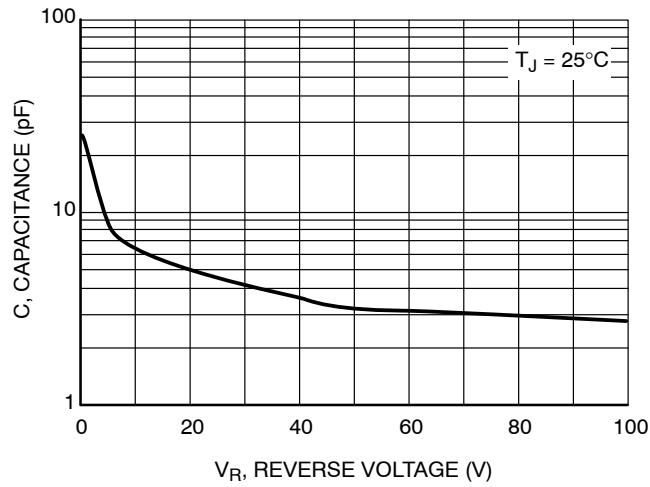


Figure 6. Capacitance

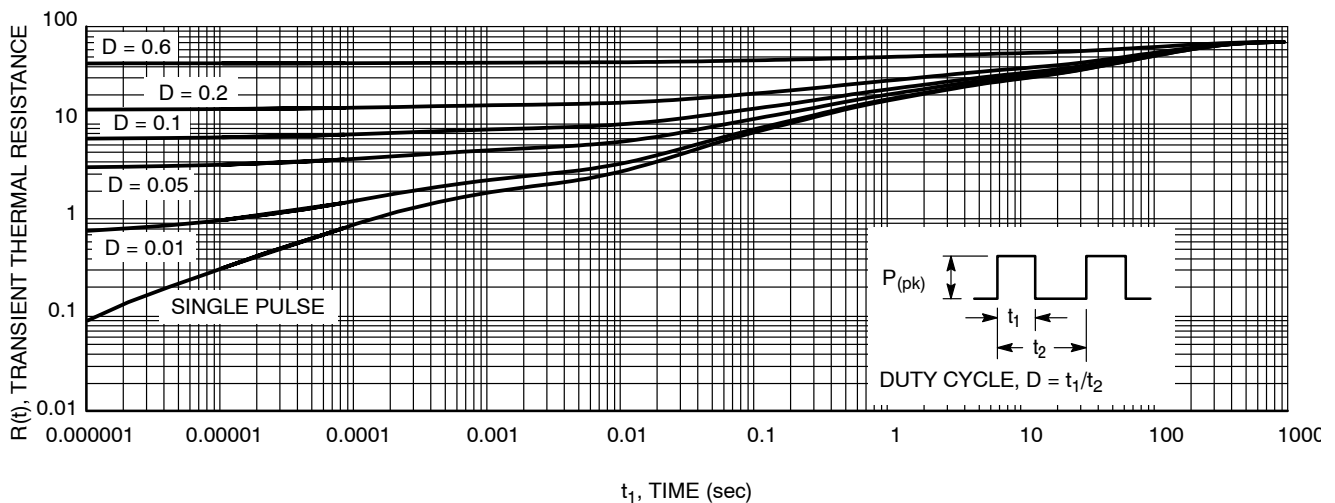


Figure 8. Thermal Response Junction-to-Ambient



SCALE 1:1

Polarity Band

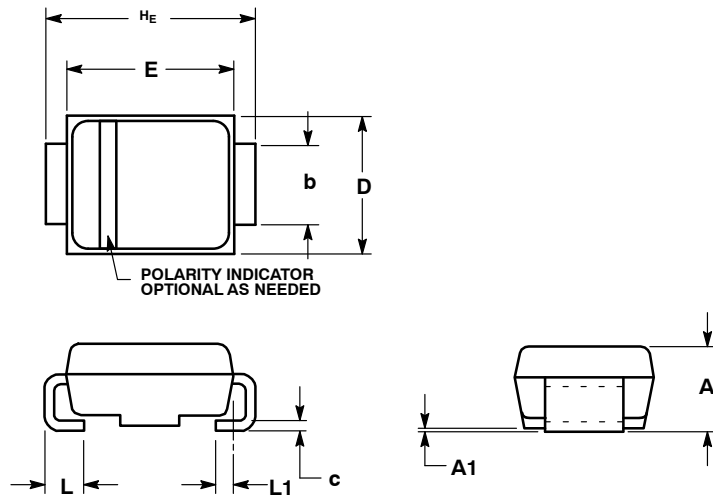
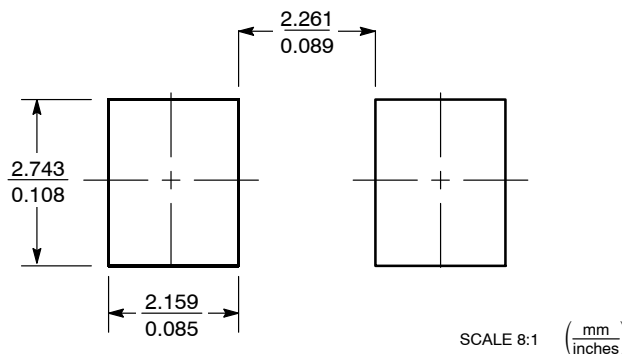


SCALE 1:1

Non-Polarity Band

**SMB**  
**CASE 403A-03**  
**ISSUE J**

DATE 19 JUL 2012

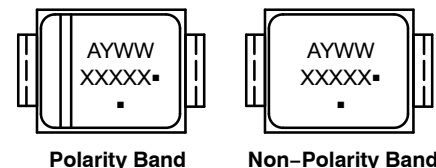

**SOLDERING FOOTPRINT\***


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

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION  $b$  SHALL BE MEASURED WITHIN DIMENSION  $L1$ .

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
<b>A</b>	1.95	2.30	2.47	0.077	0.091	0.097
<b>A1</b>	0.05	0.10	0.20	0.002	0.004	0.008
<b>b</b>	1.96	2.03	2.20	0.077	0.080	0.087
<b>c</b>	0.15	0.23	0.31	0.006	0.009	0.012
<b>D</b>	3.30	3.56	3.95	0.130	0.140	0.156
<b>E</b>	4.06	4.32	4.60	0.160	0.170	0.181
<b>H<sub>E</sub></b>	5.21	5.44	5.60	0.205	0.214	0.220
<b>L</b>	0.76	1.02	1.60	0.030	0.040	0.063
<b>L1</b>	0.51 REF			0.020 REF		

**GENERIC**  
**MARKING DIAGRAM\***


Polarity Band

Non-Polarity Band

XXXXX = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*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. Some products may not follow the Generic Marking.

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