

# Axial Lead Rectifiers

## SCHOTTKY BARRIER RECTIFIERS

1.0 AMPERE 20, 30 and 40 VOLTS

### 1N5817, 1N5818, 1N5819

This series employs the Schottky Barrier principle in a large area metal-to-silicon power diode. State-of-the-art geometry features chrome barrier metal, epitaxial construction with oxide passivation and metal overlap contact. Ideally suited for use as rectifiers in low-voltage, high-frequency inverters, free wheeling diodes, and polarity protection diodes.

#### Features

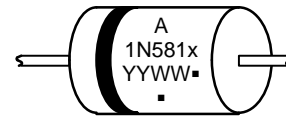
- Extremely Low  $V_F$
- Low Stored Charge, Majority Carrier Conduction
- Low Power Loss/High Efficiency
- These are Pb-Free Devices\*

#### Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:  
260°C Max for 10 Seconds
- Polarity: Cathode Indicated by Polarity Band
- ESD Ratings: Machine Model = C (>400 V)  
Human Body Model = 3B (>8000 V)



#### MARKING DIAGRAM



A =Assembly Location  
1N581x =Device Number  
x= 7, 8, or 9  
YY =Year  
WW =Work Week  
▪ =Pb-Free Package  
(Note: Microdot may be in either location)

#### ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.

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

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## MAXIMUM RATINGS

Rating	Symbol	1N5817	1N5818	1N5819	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	20	30	40	V
Non-Repetitive Peak Reverse Voltage	$V_{RSM}$	24	36	48	V
RMS Reverse Voltage	$V_{R(RMS)}$	14	21	28	V
Average Rectified Forward Current (Note 1), ( $V_{R(equiv)} \leq 0.2 V_R(dc)$ , $T_L = 90^\circ C$ , $R_{\theta JA} = 80^\circ C/W$ , P.C. Board Mounting, see Note 2, $T_A = 55^\circ C$ )	$I_O$	1.0			A
Ambient Temperature (Rated $V_R(dc)$ , $P_{F(AV)} = 0$ , $R_{\theta JA} = 80^\circ C/W$ )	$T_A$	85	80	75	$^\circ C$
Non-Repetitive Peak Surge Current, (Surge applied at rated load conditions, half-wave, single phase 60 Hz, $T_L = 70^\circ C$ )	$I_{FSM}$				

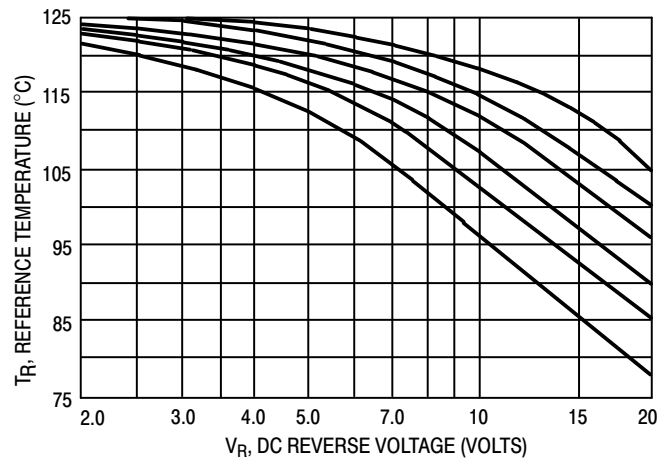


Figure 1. Maximum RefTURE (

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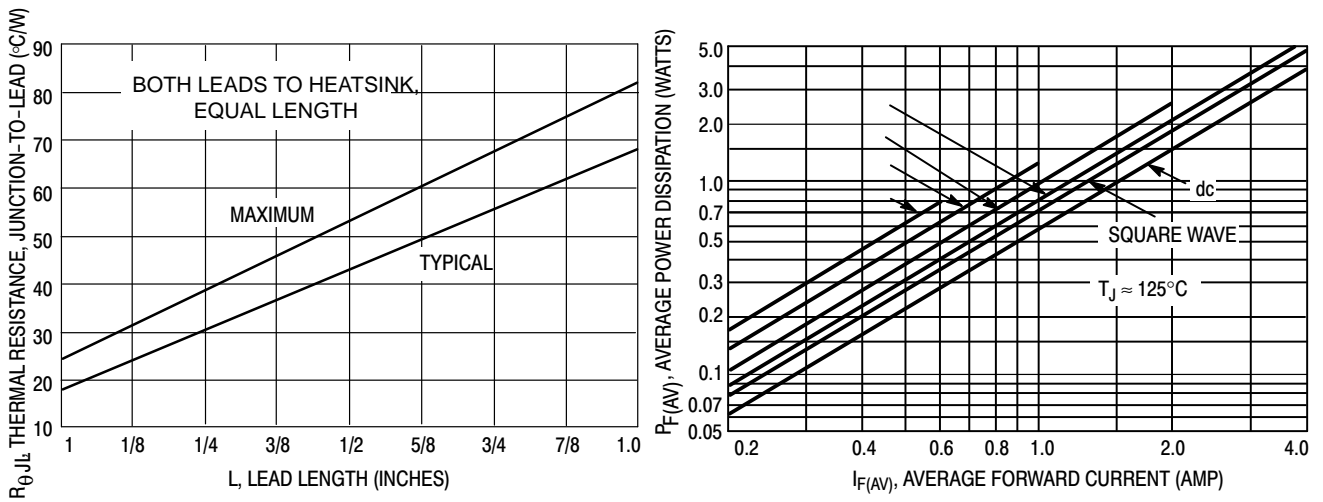
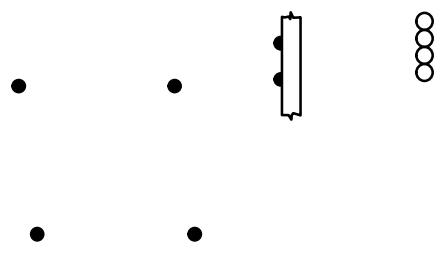
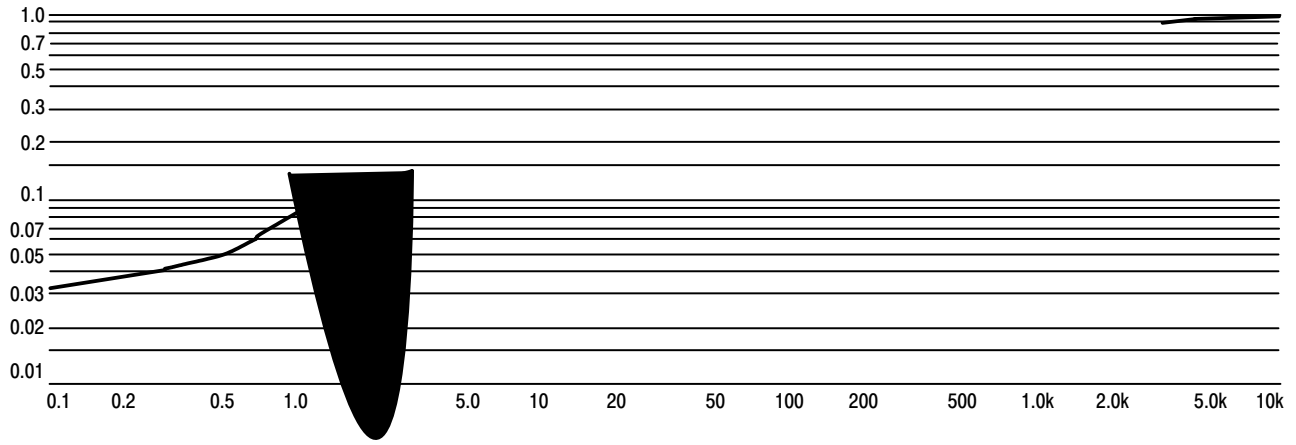
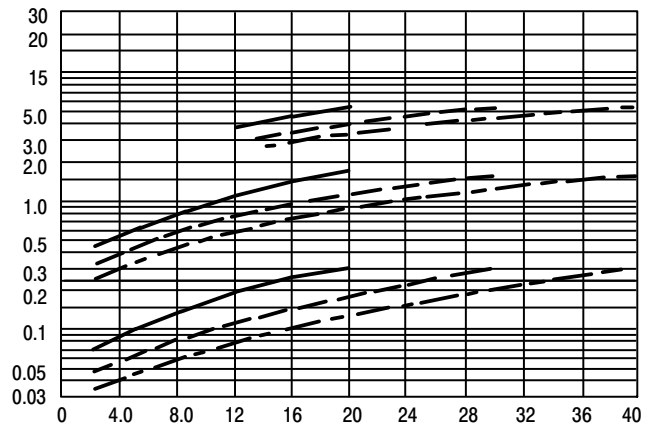
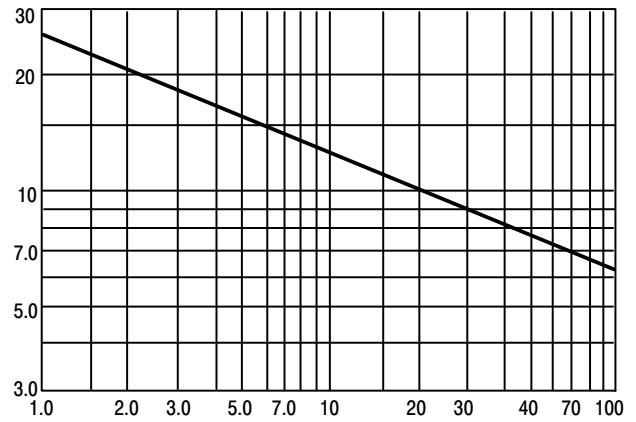
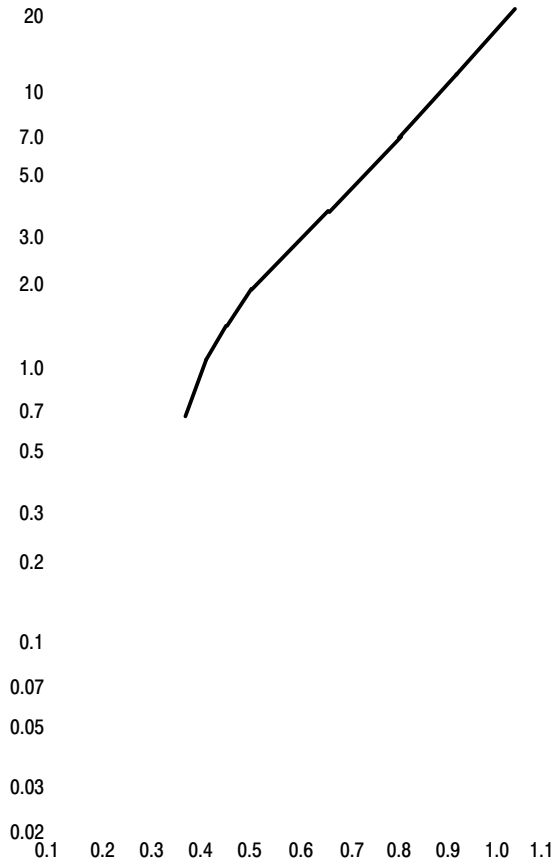
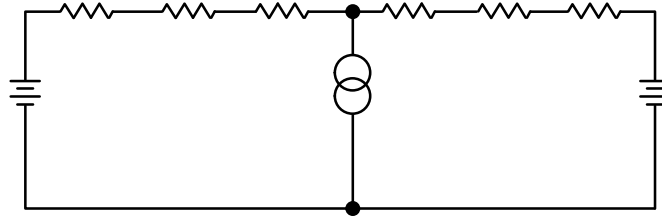


Figure 4. Steady-State Thermal Resistance



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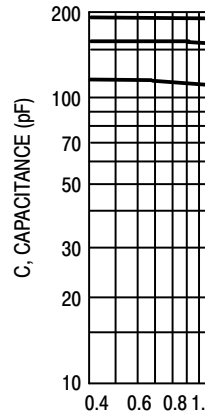


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## NOTE 6. — HIGH FREQUENCY OPERATION

Since current flow in a Schottky rectifier is the result of majority carrier conduction, it is not subject to junction diode forward and reverse recovery transients due to minority carrier injection and stored charge. Satisfactory circuit analysis work may be performed by using a model consisting of an ideal diode in parallel with a variable capacitance. (See Figure 10.)

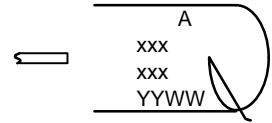
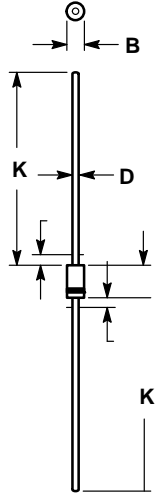
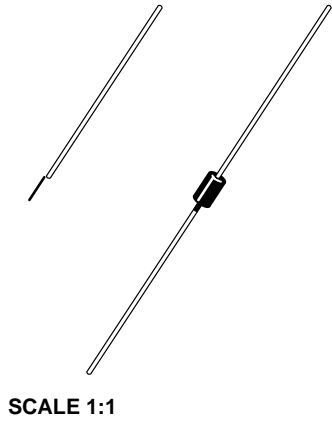
Rectification efficiency measurements show that operation will be satisfactory up to several megahertz. For example, relative waveform rectification efficiency is approximately 70 percent at 2.0 MHz, e.g., the ratio of dc power to RMS power in the load is 0.28 at this frequency, whereas perfect rectification would yield 0.406 for sine wave inputs. However, in contrast to ordinary junction diodes, the loss in waveform efficiency is not indicative of power loss: it is simply a result of reverse current flow through the diode capacitance, which lowers the dc output voltage.



Fig

## ORDERING INFORMATION

Device	Package	
1N5817	Axial Lead*	
1N5817G	Axial Lead*	
1N5817RL	Axial Lead*	
1N5817RLG	Axial Lead*	5000 / Tape & Reel
1N5818		



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