

# 80SQ045N

Preferred Device

## Axial Lead Rectifier

These devices employ the Schottky Barrier principle in a large area metal-to-silicon power diode. State-of-the-art geometry features 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

- High Current Capability
- Low Stored Charge, Majority Carrier Conduction
- Low Power Loss/High Efficiency
- Highly Stable Oxide Passivated Junction
- Guard-Ring for Stress Protection
- Low Forward Voltage
- High Surge Capacity
- These are Pb-Free Devices\*

### Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 1.1 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 220°C Max. for 10 Seconds, 1/16" from Case
- Polarity: Cathode indicated by Polarity Band
- ESD Protection: Human Body Model > 4000 V (Class 3)  
Machine Model > 400 V (Class C)

### MAXIMUM RATINGS

| Rating   | Symbol                          | Max         | Unit             |
|--|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage   | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 45          | V                |
| Average Rectified Forward Current $T_L = 75^\circ\text{C}$<br>( $P_{siJL} = 12^\circ\text{C/W}$ , P.C. Board Mounting, Note 2) | $I_O$                           | 8.0         | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions<br>Halfwave, Single Phase, 60 Hz)                 | $I_{FSM}$                       | 140         | A                |
| Operating and Storage Junction Temperature Range<br>(Reverse Voltage Applied)  | $T_J, T_{stg}$                  | -65 to +125 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )  | dv/dt                           | 10          | V/ns             |

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.

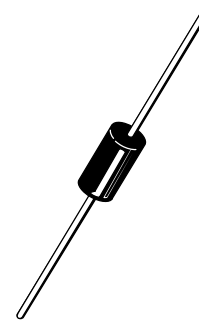
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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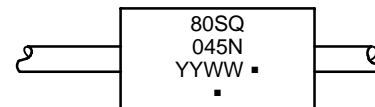
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIER 8.0 AMPERES



AXIAL LEAD  
CASE 267-05  
(DO-201AD)  
STYLE 1

### MARKING DIAGRAM



YY = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device      | Package     | Shipping†        |
|-------------|-------------|------------------|
| 80SQ045N    | Axial Lead* | 500 Units/Box    |
| 80SQ045NG   | Axial Lead* | 500 Units/Box    |
| 80SQ045NRL  | Axial Lead* | 1500/Tape & Reel |
| 80SQ045NRLG | Axial Lead* | 1500/Tape & Reel |

†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.

\*This package is inherently Pb-Free.

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

# 80SQ045N

## THERMAL CHARACTERISTICS

| Characteristic   | Symbol          | 0.9 in x 0.9 in<br>Copper Pad Size | 6.75 in x 6.75 in<br>Copper Pad Size | Unit          |
|--|-----------------|------------------------------------|--------------------------------------|---------------|
| Thermal Resistance, Junction-to-Lead (See Note 2 – Mounting Data)    | $R_{\theta JL}$ | 13                                 | 12                                   | $^{\circ}C/W$ |
| Thermal Resistance, Junction-to-Ambient (See Note 2 – Mounting Data) | $R_{\theta JA}$ | 50                                 | 40                                   |               |

## ELECTRICAL CHARACTERISTICS ( $T_L = 25^{\circ}C$ unless otherwise noted)

| Characteristic   | Symbol | Max       | Unit |
|--|--------|-----------|------|
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $i_F = 8.0 A$ , $T_L = 25^{\circ}C$ )                        | $V_F$  | 0.55      | V    |
| Maximum Instantaneous Reverse Current @ Rated dc Voltage (Note 1)<br>$T_L = 25^{\circ}C$<br>$T_L = 100^{\circ}C$ | $i_R$  | 1.0<br>50 | mA   |

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

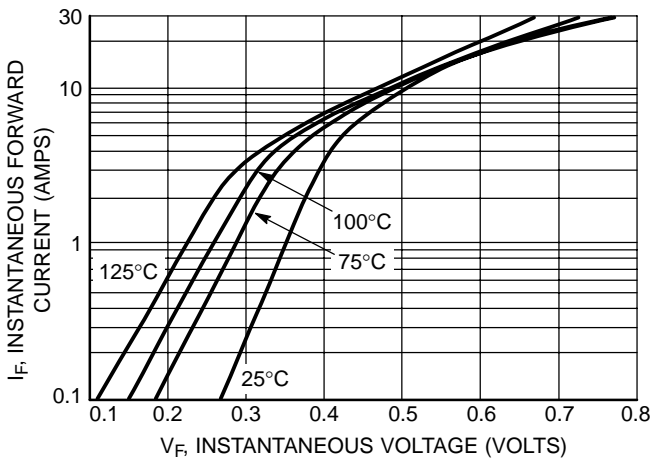


Figure 1. Typical Forward Voltage

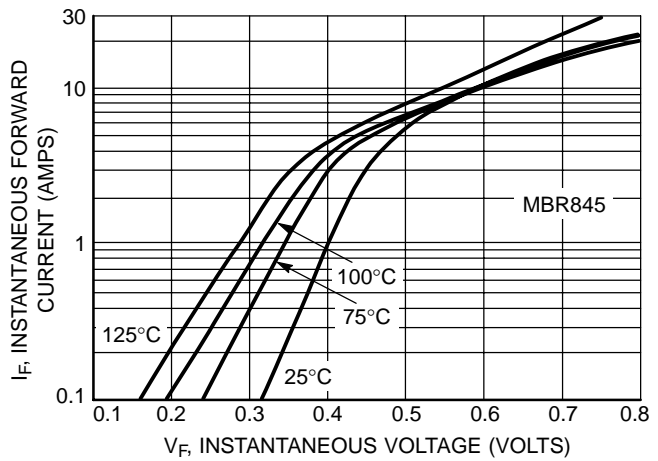


Figure 2. Maximum Forward Voltage

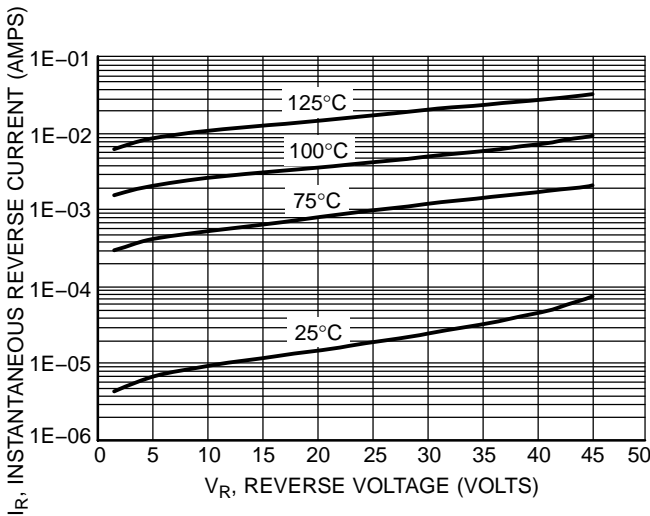


Figure 3. Typical Reverse Current

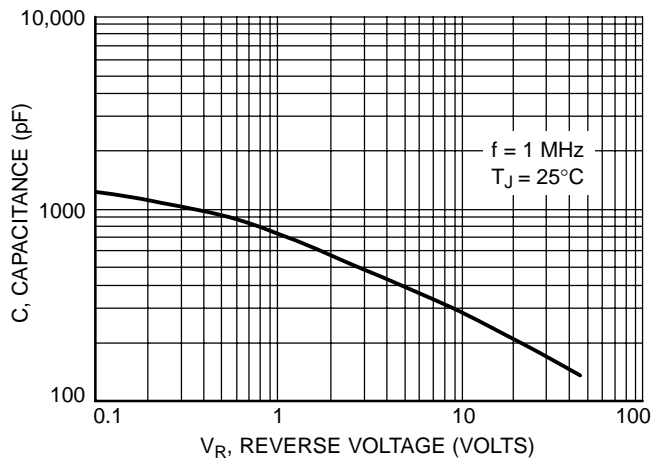


Figure 4. Typical Capacitance

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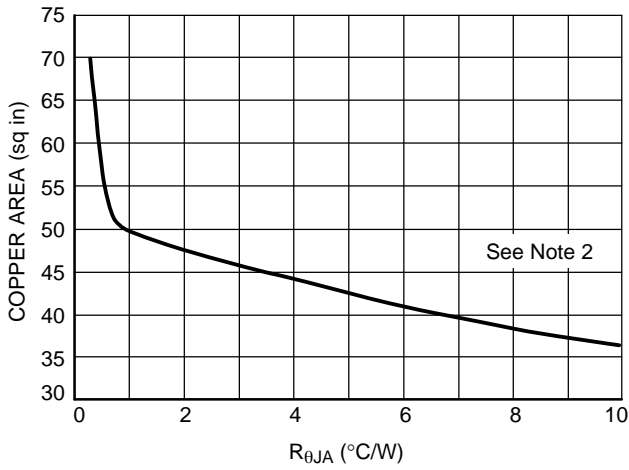


Figure 5.  $R_{\theta JA}$  versus Copper Area

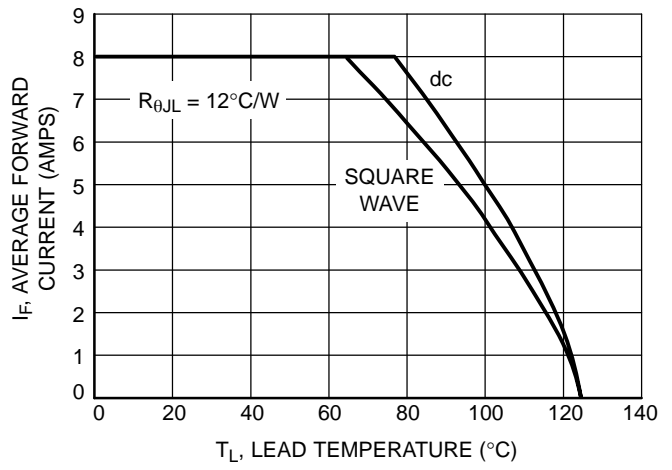


Figure 6. Current Derating - Lead

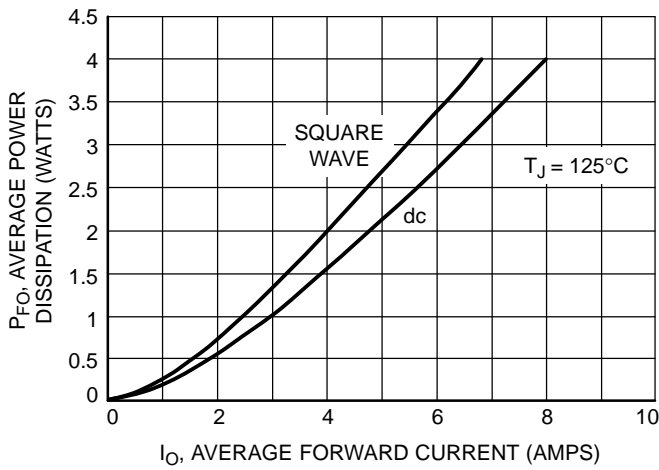


Figure 7. Forward Power Dissipation

## NOTE 2 — MOUNTING DATA

### Mounting Method

P.C. Board with 6.75 sq. in. copper surface.

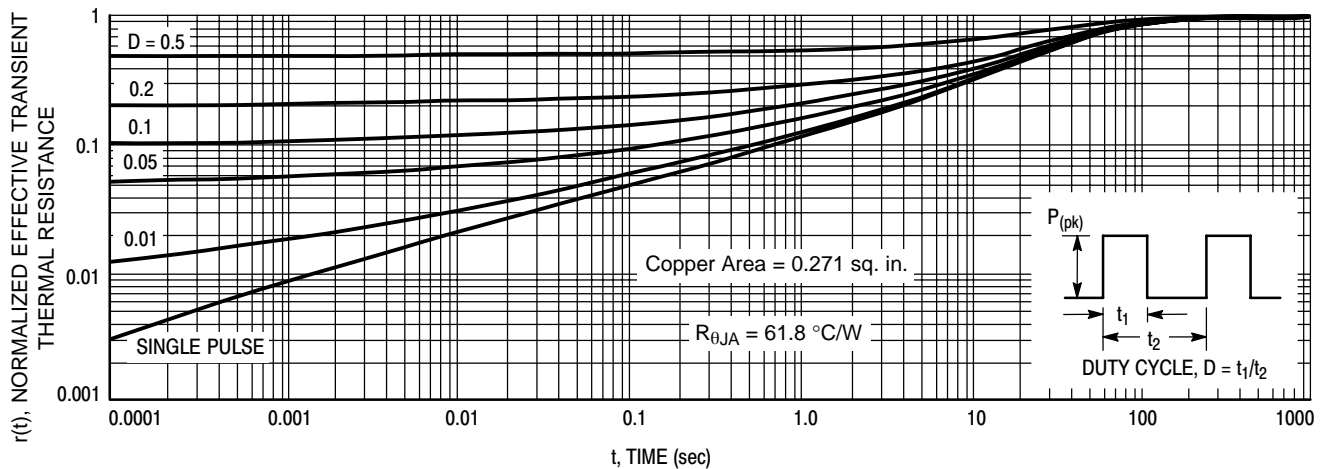
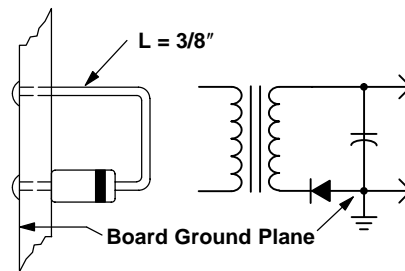
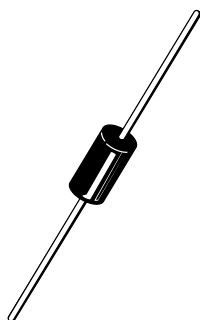


Figure 8. Thermal Response, Junction-to-Ambient

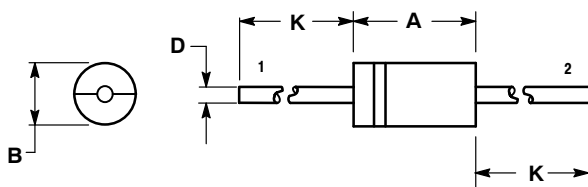


**AXIAL LEAD**  
**CASE 267-05**  
**ISSUE G**

**DATE 06/06/2000**



SCALE 1:1



- NOTES:
1. DIMENSIONS AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. 267-04 OBSOLETE, NEW STANDARD 267-05.

| DIM | INCHES |       | MILLIMETERS |      |
|-----|--------|-------|-------------|------|
|     | MIN    | MAX   | MIN         | MAX  |
| A   | 0.287  | 0.374 | 7.30        | 9.50 |
| B   | 0.189  | 0.209 | 4.80        | 5.30 |
| D   | 0.047  | 0.051 | 1.20        | 1.30 |
| K   | 1.000  | ---   | 25.40       | ---  |

STYLE 1:  
 PIN 1. CATHODE (POLARITY BAND)  
 2. ANODE

STYLE 2:  
 NO POLARITY

|                         |                    |  |
|-------------------------|--------------------|--|
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| <b>DESCRIPTION:</b>     | <b>AXIAL LEAD</b>  | <b>PAGE 1 OF 1</b>   |

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