

# BYW29-200

## SWITCHMODE™ Power Rectifiers

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

### Features

- 175°C Operating Junction Temperature
- Popular TO-220 Package
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Low Forward Voltage
- Low Leakage Current
- High Temperature Glass Passivated Junction
- Pb-Free Package is Available\*

### Mechanical Characteristics

- Case: Epoxy, Molded, Epoxy Meets UL 94 V-0
- 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
- Device Meets MSL1 Requirements
- ESD Ratings: Machine Model, C (> 400 V)  
Human Body Model, 3B (> 8000 V)

### MAXIMUM RATINGS

| Rating                                                                                                         | Symbol                          | Value       | Unit |
|----------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                         | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 200         | V    |
| Average Rectified Forward Current<br>Total Device, (Rated $V_R$ ),<br>$T_C = 150^\circ\text{C}$                | $I_{F(AV)}$                     | 8.0         | A    |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz),<br>$T_C = 150^\circ\text{C}$           | $I_{FM}$                        | 16          | A    |
| Nonrepetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions<br>Half-wave, Single Phase, 60 Hz) | $I_{FSM}$                       | 100         | A    |
| Operating Junction Temperature and<br>Storage Temperature Range                                                | $T_J, T_{stg}$                  | -65 to +175 | °C   |

### THERMAL CHARACTERISTICS

|                                                 |                 |     |      |
|-------------------------------------------------|-----------------|-----|------|
| Maximum Thermal Resistance,<br>Junction-to-Case | $R_{\theta JC}$ | 3.0 | °C/W |
|-------------------------------------------------|-----------------|-----|------|

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.

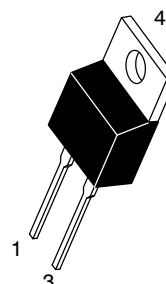
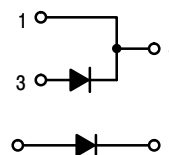
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

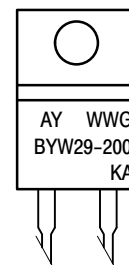
<http://onsemi.com>

**ULTRAFAST  
RECTIFIERS  
8.0 AMPERES  
200 VOLTS**



**CASE 221B  
TO-220B  
PLASTIC**

### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
BYW80-200 = Device Code  
G = Pb-Free Package  
KA = Diode Polarity

### ORDERING INFORMATION

| Device     | Package             | Shipping      |
|------------|---------------------|---------------|
| BYW29-200  | TO-220              | 50 Units/Rail |
| BYW29-200G | TO-220<br>(Pb-Free) | 50 Units/Rail |

# ELECTRICAL CHARACTERISTICS

| Rating                                                                                                                                            | Symbol   | Value       | Unit          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $i_F = 5.0$ A, $T_C = 100^\circ\text{C}$ )<br>( $i_F = 20$ A, $T_C = 25^\circ\text{C}$ )      | $V_F$    | 0.85<br>1.3 | V             |
| Maximum Instantaneous Reverse Current (Note 1)<br>(Rated Dc Voltage, $T_J = 100^\circ\text{C}$ )<br>(Rated Dc Voltage, $T_J = 25^\circ\text{C}$ ) | $i_R$    | 600<br>5.0  | $\mu\text{A}$ |
| Maximum Reverse Recovery Time<br>( $I_F = 1.0$ A, $di/dt = 50$ A/ $\mu\text{s}$ )<br>( $I_F = 0.5$ A, $i_R = 1.0$ A, $I_{REC} = 0.25$ A)          | $t_{rr}$ | 35<br>25    | ns            |

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

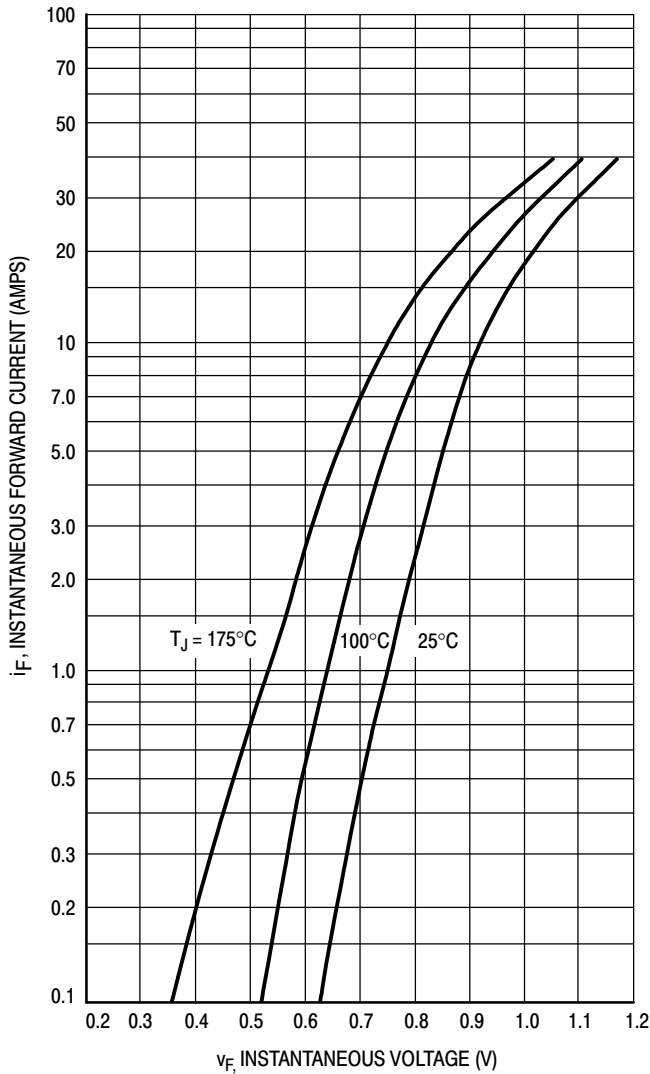


Figure 1. Typical Forward Voltage

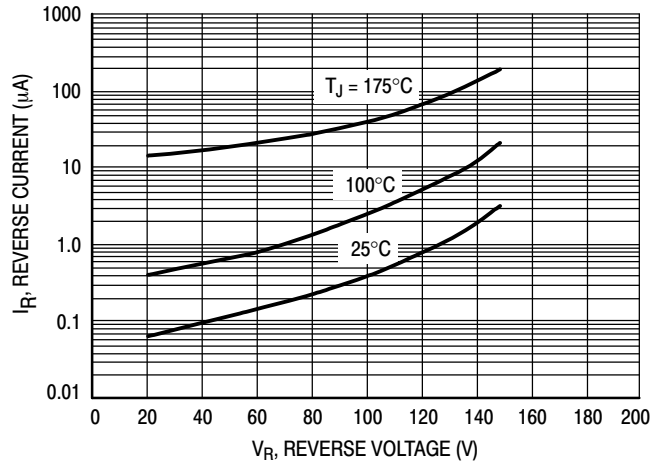


Figure 2. Typical Reverse Current\*

\* 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  $V_R$ .

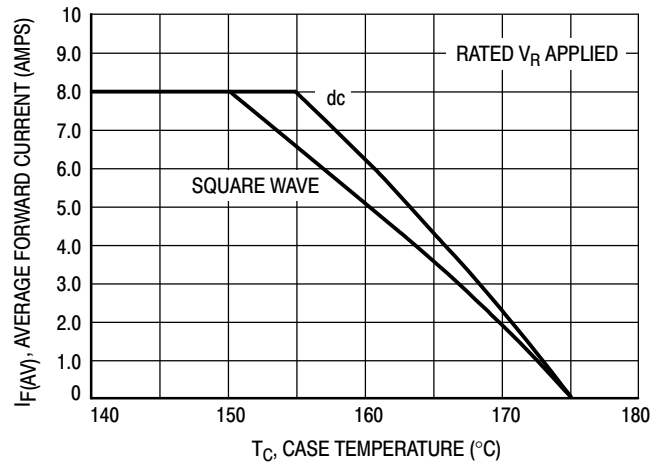


Figure 3. Current Derating, Case

# BYW29-200

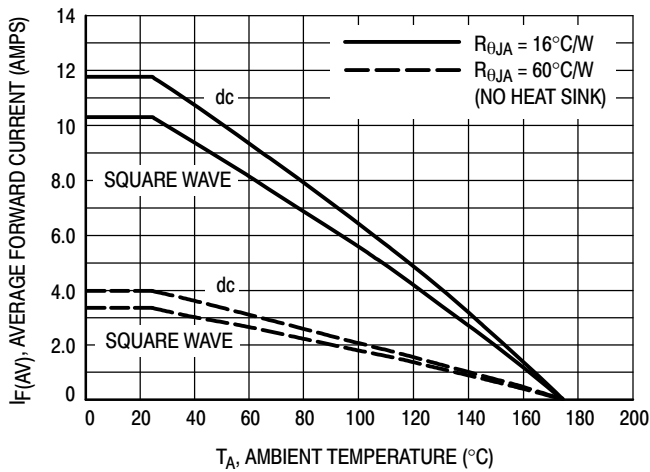


Figure 4. Current Derating, Ambient

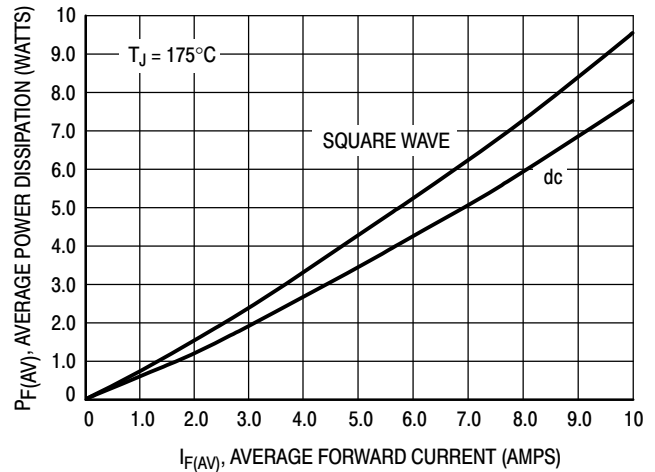


Figure 5. Power Dissipation

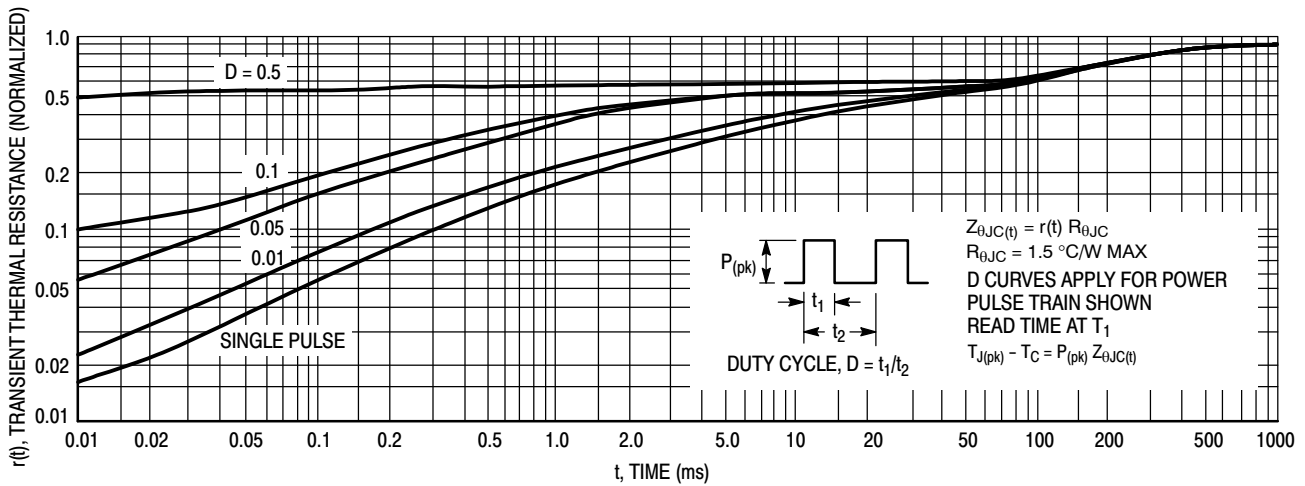


Figure 6. Thermal Response

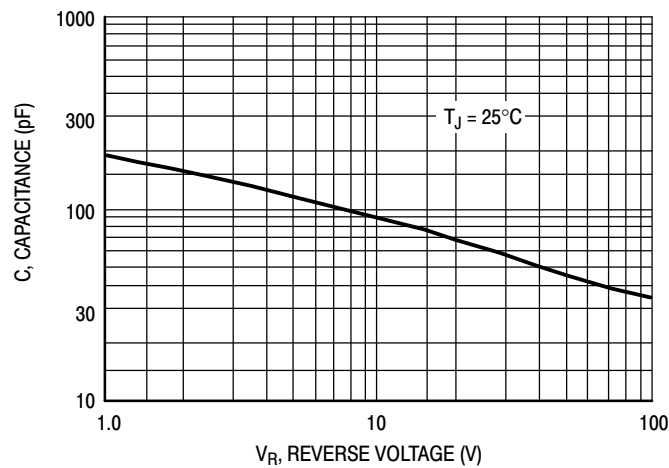
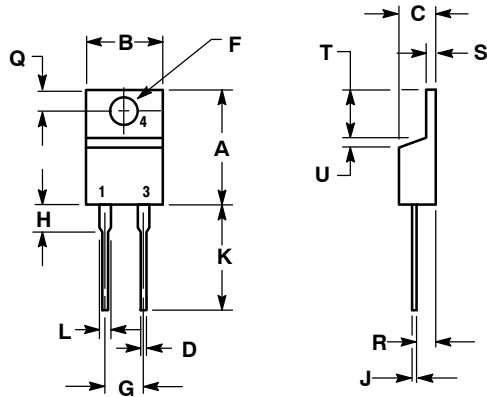


Figure 7. Typical Capacitance

# BYW29-200

## PACKAGE DIMENSIONS

TO-220  
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  |

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
Email: [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

N. American Technical Support: 800-282-9855 Toll Free  
USA/Canada  
Europe, Middle East and Africa Technical Support:  
Phone: 421 33 790 2910  
Japan Customer Focus Center  
Phone: 81-3-5773-3850

ON Semiconductor Website: [www.onsemi.com](http://www.onsemi.com)

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative