

# BYW29-200

## Switch-mode 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.

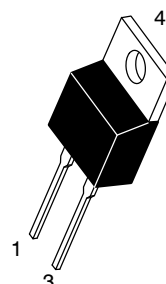
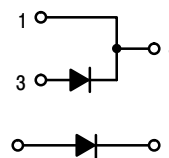
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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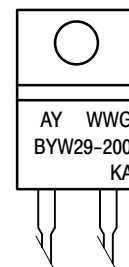
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**ULTRAFAST  
RECTIFIERS  
8.0 AMPERES  
200 VOLTS**



**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  $\leq 2.0\%$ .

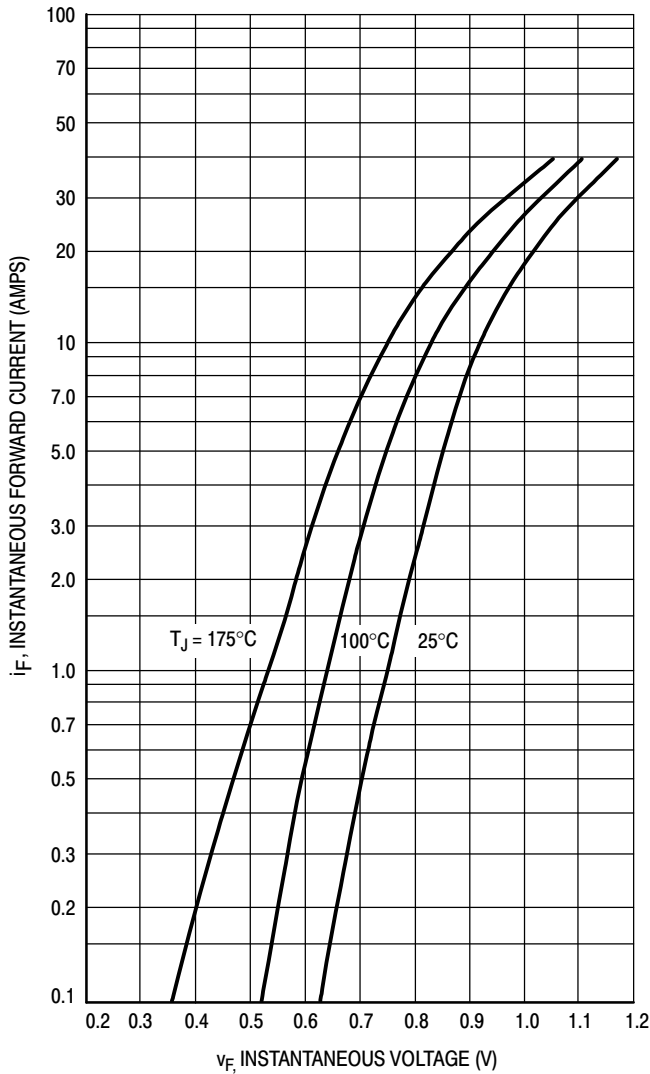


Figure 1. Typical Forward Voltage

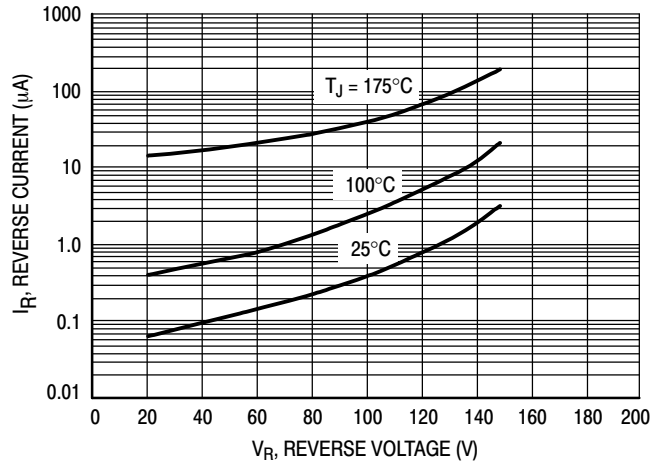


Figure 2. Typical Reverse Current\*

\* 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  $V_R$ .

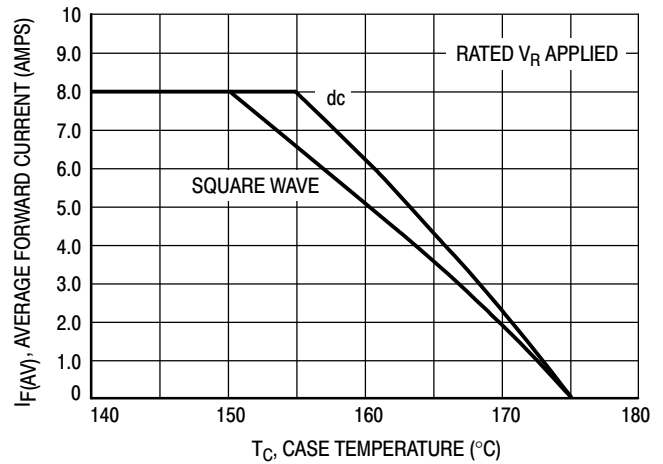


Figure 3. Current Derating, Case

# BYW29-200

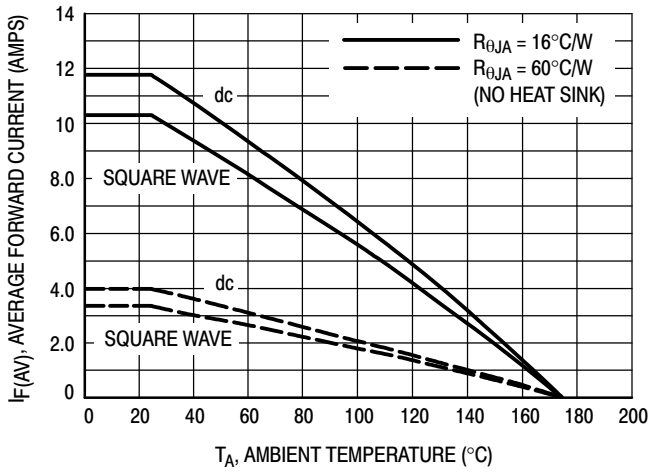


Figure 4. Current Derating, Ambient

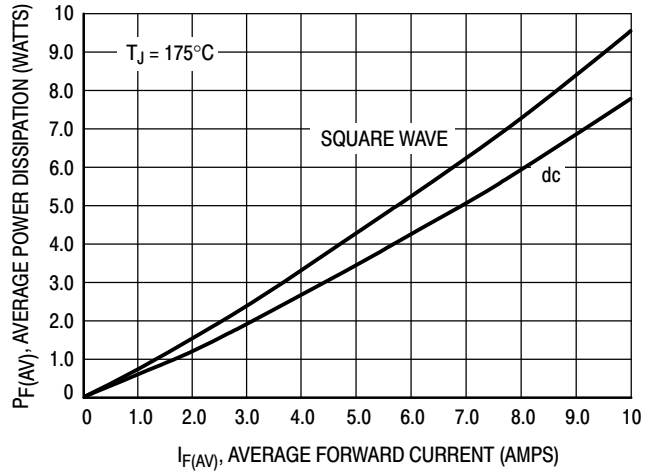


Figure 5. Power Dissipation

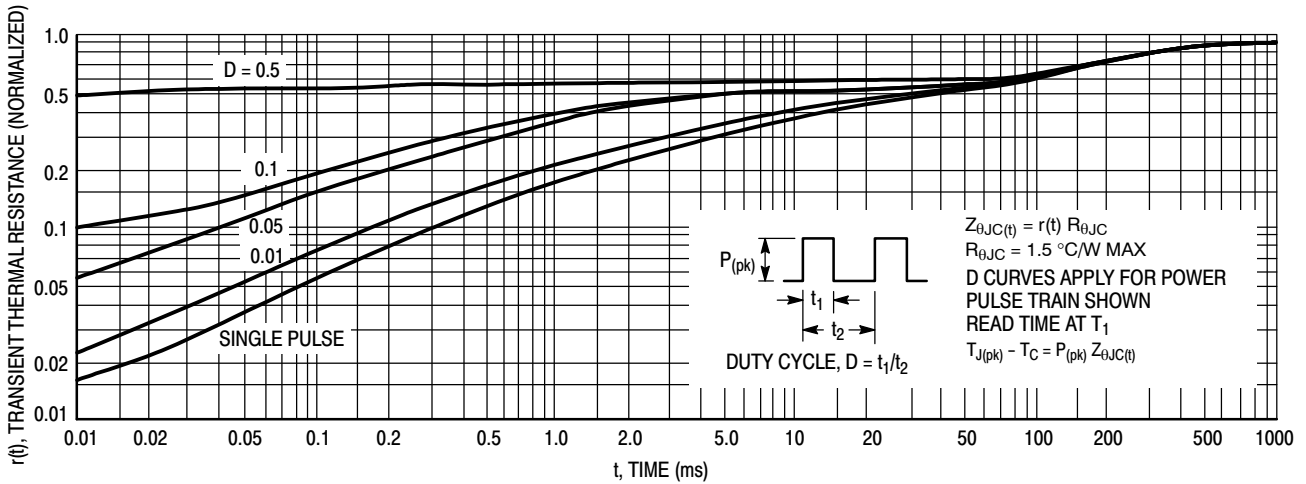


Figure 6. Thermal Response

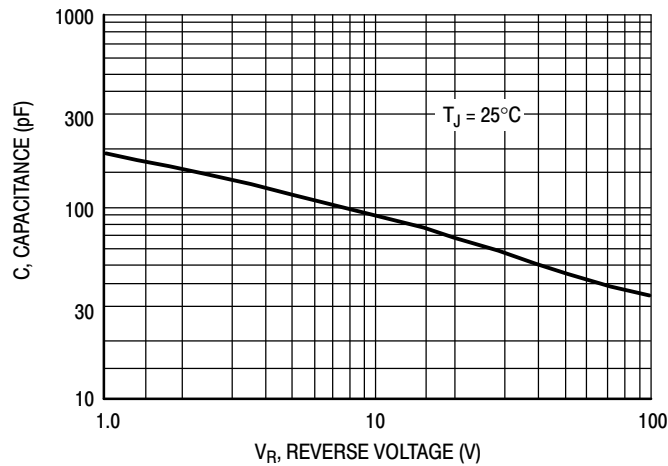


Figure 7. Typical Capacitance

# MECHANICAL CASE OUTLINE

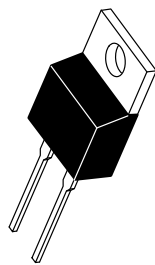
## PACKAGE DIMENSIONS

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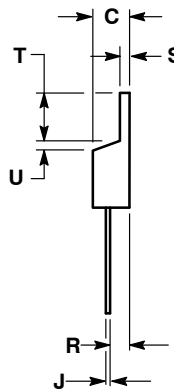
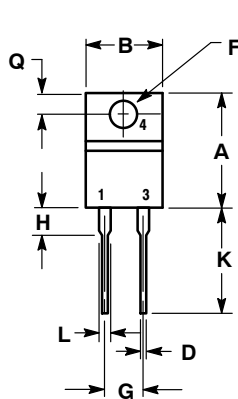


### TO-220, 2-LEAD CASE 221B-04 ISSUE F

DATE 12 APR 2013



SCALE 1:1



#### NOTES:

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

| 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  | 0.039 | 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

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