

## 8A, 100V - 200V Ultrafast Dual Diodes

The BYW51 series devices are low forward voltage drop, ultra-fast-recovery rectifiers ( $t_{RR} < 35\text{ns}$ ). They use a planar ion-implanted epitaxial construction.

These devices are intended for use as output rectifiers and fly-wheel diodes in a variety of high-frequency pulse-width-modulated and switching regulators. Their low stored charge and attendant fast reverse-recovery behavior minimize electrical noise generation and in many circuits markedly reduce the turn-on dissipation of the associated power switching transistors.

## Ordering Information

### PACKAGING AVAILABILITY

| PART NUMBER | PACKAGE  | BRAND    |
|-------------|----------|----------|
| BYW51-100   | TO-220AB | BYW51100 |
| BYW51-150   | TO-220AB | BYW51150 |
| BYW51-200   | TO-220AB | BYW51200 |

NOTE: When ordering, use the entire part number.

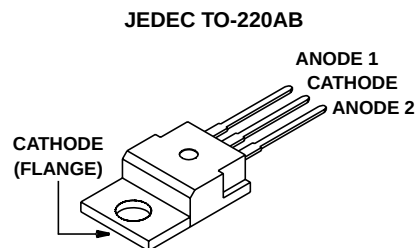
## Features

- Ultra Fast Recovery Time ( $<35\text{ns}$ )
- Low Forward Voltage
- Low Thermal Resistance
- Planar Design
- Wire-Bonded Construction

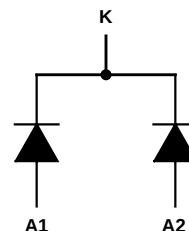
## Applications

- General Purpose
- Power Switching Circuits to 100kHz
- Full-Wave Rectification

## Package



## Symbol



## Absolute Maximum Ratings Per Junction

|                                                                                                                          | BYW51-100 | BYW51-150 | BYW51-200 | UNITS            |
|--------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|------------------|
| Maximum Peak Repetitive Reverse Voltage . . . . . $V_{RRM}$                                                              | 100       | 150       | 200       | V                |
| Maximum Peak Surge Voltage . . . . . $V_{RSM}$                                                                           | 110       | 165       | 220       | V                |
| Repetitive Peak Surge Current . . . . . $I_{FRM}$ , $t_P < 10\mu\text{s}$                                                | 100       | 100       | 100       | A                |
| Nonrepetitive Peak Surge Current . . . . . $I_F(\text{RMS})$ , Total                                                     | 20        | 20        | 20        | A                |
| Average Rectified forward Current . . . . . $I_F(\text{AV})$ , Total<br>$T_C = +125^\circ\text{C}$ , $a = 0.5$ . . . . . | 8         | 8         | 8         | A                |
| Repetitive Peak Surge Current . . . . . $I_{FSM}$<br>$t_P = 10\text{ms}$ , Sinusoidal                                    | 100       | 100       | 100       | A                |
| Maximum Power Dissipation . . . . . $P_D$ , $T_C = +125^\circ\text{C}$                                                   | 20        | 20        | 20        | W                |
| Operating and Storage Temperature . . . . . $T_J$                                                                        | -40 + 150 | -40 + 150 | -40 + 150 | $^\circ\text{C}$ |
| $T_L$ (Lead Temperature During Soldering) . . . . .<br>At Distance $> 1/8$ in. (3.17mm) From Case For 10s max.           | 260       | 260       | 260       | $^\circ\text{C}$ |

# **BYW51-100, BYW51-150, BYW51-200**

## **Electrical Specifications**    Per Junction

| SYMBOL                     | TEST CONDITIONS      |                                |                                | LIMITS              |      |           |      |           |      | UNITS |
|----------------------------|----------------------|--------------------------------|--------------------------------|---------------------|------|-----------|------|-----------|------|-------|
|                            | T <sub>J</sub><br>°C | VOLTAGE<br>V <sub>R</sub><br>V | CURRENT<br>i <sub>F</sub><br>A | BYW51-100           |      | BYW51-150 |      | BYW51-200 |      |       |
|                            |                      |                                |                                | MIN                 | MAX  | MIN       | MAX  | MIN       | MAX  |       |
| I <sub>R</sub>             | 25                   | 100                            | -                              | -                   | 5    | -         | -    | -         | -    | μA    |
|                            |                      | 150                            | -                              | -                   | -    | -         | 5    | -         | -    | μA    |
|                            |                      | 200                            | -                              | -                   | -    | -         | -    | -         | 5    | μA    |
|                            | 100                  | 100                            | -                              | -                   | 1    | -         | -    | -         | -    | mA    |
|                            |                      | 150                            | -                              | -                   | -    | -         | 1    | -         | -    | mA    |
|                            |                      | 200                            | -                              | -                   | -    | -         | -    | -         | 1    | mA    |
| V <sub>F</sub>             | 25                   | -                              | 8                              | -                   | 0.95 | -         | 0.95 | -         | 0.95 | V     |
|                            | 100                  | -                              | 8                              | -                   | 0.89 | -         | 0.89 | -         | 0.89 | V     |
| t <sub>RR</sub>            | 25                   | -                              | 1 (Note 1)                     | -                   | 35   | -         | 35   | -         | 35   | ns    |
| R <sub>θJC</sub> , Per Leg |                      | -                              | -                              | -                   | 2.5  | -         | 2.5  | -         | 2.5  | °C/W  |
| R <sub>θJC</sub> , Total   |                      | -                              | -                              | -                   | 1.3  | -         | 1.3  | -         | 1.3  | °C/W  |
| R <sub>θJA</sub>           |                      | -                              | -                              | -                   | 60   | -         | 60   | -         | 60   | °C/W  |
| C <sub>J</sub>             | 25                   | 10                             | 0                              | All types (typ.) 40 |      |           |      |           |      | pF    |

NOTE:

1. dI<sub>F</sub>/dt > 50A/μs, I<sub>RM</sub>(rec) <1A, I<sub>RR</sub> = 0.25A.

## Typical Performance Curves

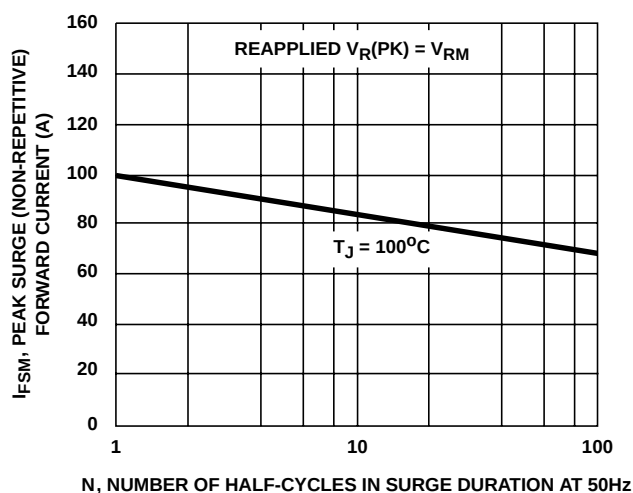


FIGURE 1. PEAK SURGE FORWARD CURRENT vs SURGE DURATION

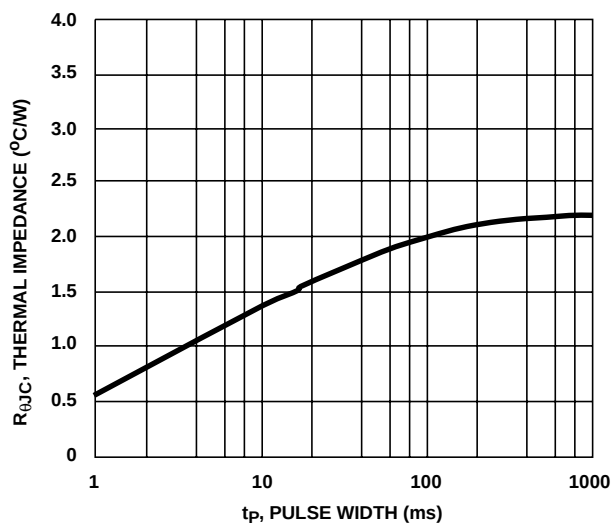


FIGURE 2. THERMAL IMPEDANCE vs PULSE WIDTH (PER JUNCTION)

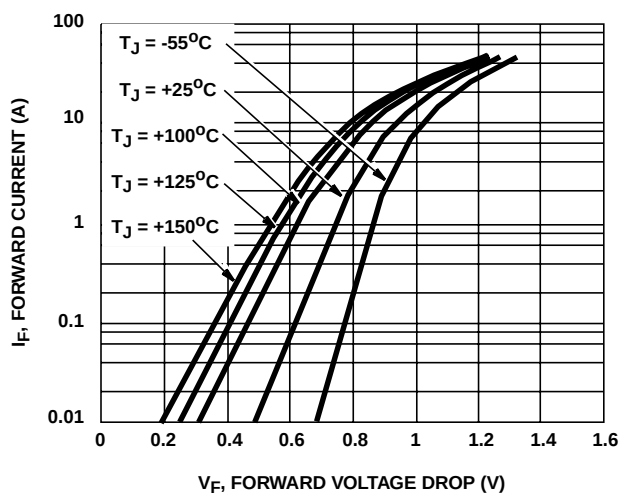


FIGURE 3. TYPICAL FORWARD CURRENT vs FORWARD VOLTAGE DROP

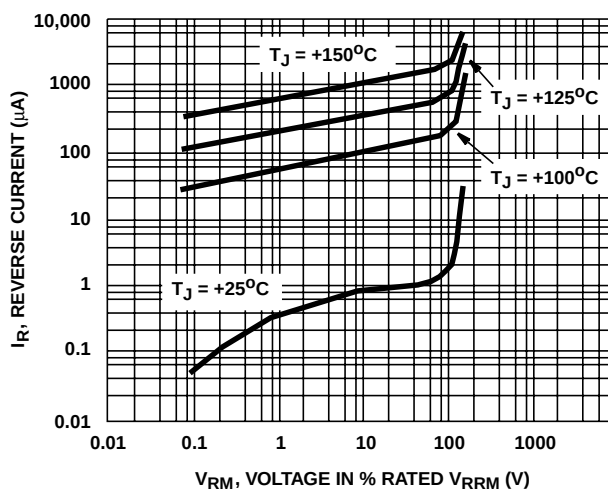


FIGURE 4. TYPICAL REVERSE CURRENT vs VOLTAGE

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