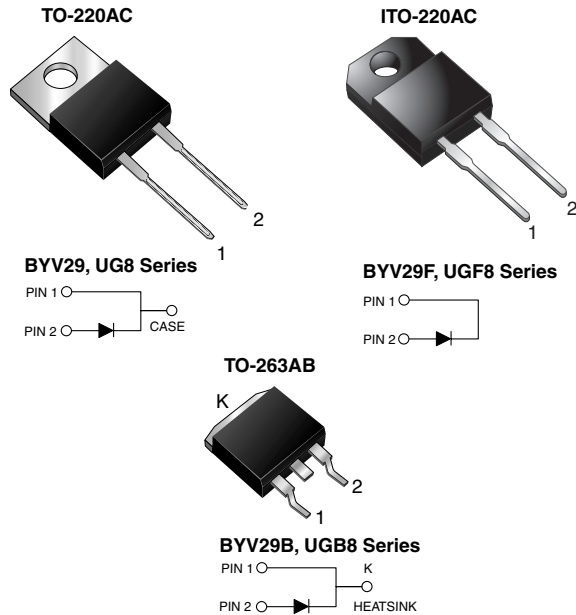


## Ultrafast Rectifier



### FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

### PRIMARY CHARACTERISTICS

|                    |              |
|--------------------|--------------|
| $I_{F(AV)}$        | 8.0 A        |
| $V_{RRM}$          | 300 V, 400 V |
| $I_{FSM}$          | 110 A        |
| $t_{rr}$           | 35 ns        |
| $V_F$              | 1.03 V       |
| $T_J \text{ max.}$ | 150 °C       |

### MECHANICAL DATA

**Case:** TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), meets JESD 201 class 2 whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

### MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)

| PARAMETER                                                                          | SYMBOL         | BYV29-300<br>UG8FT | BYV29-400<br>UG8GT | UNIT |
|------------------------------------------------------------------------------------|----------------|--------------------|--------------------|------|
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 300                | 400                | V    |
| Maximum working reverse voltage                                                    | $V_{RWM}$      | 300                | 400                | V    |
| Maximum RMS voltage                                                                | $V_{RMS}$      | 210                | 280                | V    |
| Maximum DC blocking voltage                                                        | $V_{DC}$       | 300                | 400                | V    |
| Maximum average forward rectified current at $T_C = 100$ °C                        | $I_{F(AV)}$    | 8.0                |                    | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 110                |                    | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | - 40 to + 150      |                    | °C   |
| Isolation voltage (ITO-220AC only)<br>from terminal to heatsink $t = 1$ min        | $V_{AC}$       | 1500               |                    | V    |

| ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted) |                                                                                                           |                                                                             |                 |                      |                    |      |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------|----------------------|--------------------|------|
| PARAMETER                                                                  | TEST CONDITIONS                                                                                           |                                                                             | SYMBOL          | BYV29-300<br>UG8FT   | BYV29-400<br>UG8GT | UNIT |
| Maximum instantaneous forward voltage <sup>(1)</sup>                       | I <sub>F</sub> = 8 A<br>I <sub>F</sub> = 8 A<br>I <sub>F</sub> = 20 A                                     | T <sub>J</sub> = 25 °C<br>T <sub>J</sub> = 150 °C<br>T <sub>J</sub> = 25 °C | V <sub>F</sub>  | 1.25<br>1.03<br>1.40 |                    | V    |
| Maximum DC reverse current at V <sub>RRM</sub>                             |                                                                                                           | T <sub>C</sub> = 25 °C<br>T <sub>C</sub> = 100 °C                           | I <sub>R</sub>  | 10<br>350            |                    | μA   |
| Maximum reverse recovery time                                              | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A                                  |                                                                             | t <sub>rr</sub> | 35                   |                    | ns   |
| Maximum reverse recovery time                                              | I <sub>F</sub> = 1.0 A, dI/dt = 100 A/μs,<br>V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub> |                                                                             | t <sub>rr</sub> | 50                   |                    | ns   |
| Maximum reverse recovery current                                           | I <sub>F</sub> = 10 A, dI/dt = 50 A/μs,<br>V <sub>R</sub> = 30 V, T <sub>C</sub> = 100 °C                 |                                                                             | I <sub>RM</sub> | 5.5                  |                    | A    |
| Maximum recovered stored charged                                           | I <sub>F</sub> = 2 A, dI/dt = 20 A/μs,<br>V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>    |                                                                             | Q <sub>rr</sub> | 55                   |                    | nC   |

**Note:**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

| <b>THERMAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |              |                |                |                             |
|---------------------------------------------------------------------------------------------|-----------------|--------------|----------------|----------------|-----------------------------|
| PARAMETER                                                                                   | SYMBOL          | BYV29<br>UG8 | BYV29F<br>UGF8 | BYV29B<br>UGB8 | UNIT                        |
| Typical thermal resistance from junction to case                                            | $R_{\theta JC}$ | 2.5          | 5.5            | 2.5            | $^{\circ}\text{C}/\text{W}$ |

| <b>ORDERING INFORMATION</b> (Example) |                                 |                 |              |               |               |
|---------------------------------------|---------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N                   | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC                              | BYV29-400-E3/45                 | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                             | BYV29F-400-E3/45                | 1.95            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYV29B-400-E3/45                | 1.77            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYV29B-400-E3/81                | 1.77            | 81           | 800/reel      | Tape and reel |
| TO-220AC                              | BYV29-400HE3/45 <sup>(1)</sup>  | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                             | BYV29F-400HE3/45 <sup>(1)</sup> | 1.95            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYV29B-400HE3/45 <sup>(1)</sup> | 1.77            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYV29B-400HE3/81 <sup>(1)</sup> | 1.77            | 81           | 800/reel      | Tape and reel |

**Note:**

(1) Automotive grade AEC Q101 qualified



## RATINGS AND CHARACTERISTICS CURVES

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

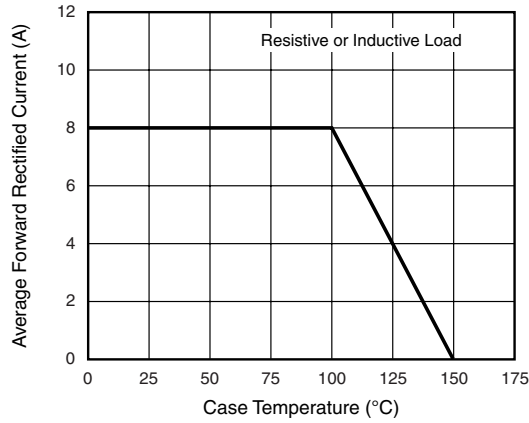


Figure 1. Maximum Forward Current Derating Curve

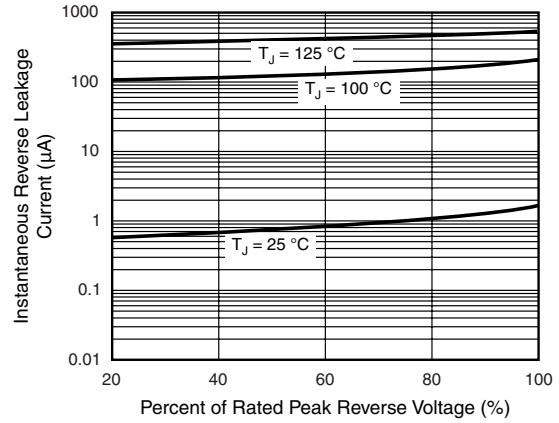


Figure 4. Typical Reverse Leakage Characteristics

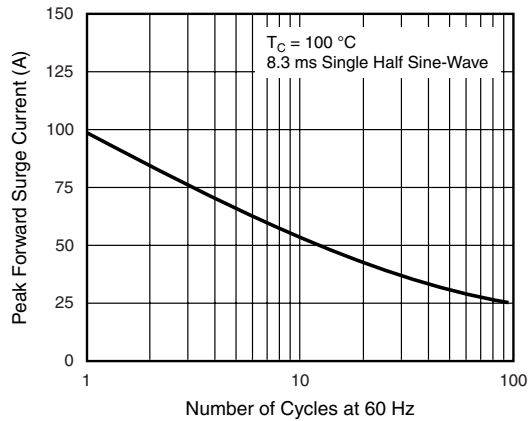


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

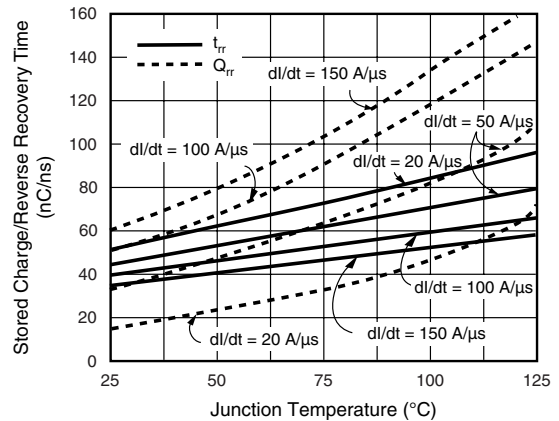


Figure 5. Reverse Switching Characteristics Per Leg

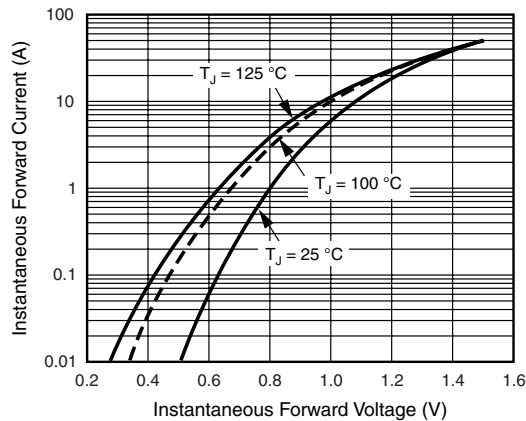


Figure 3. Typical Instantaneous Forward Characteristics

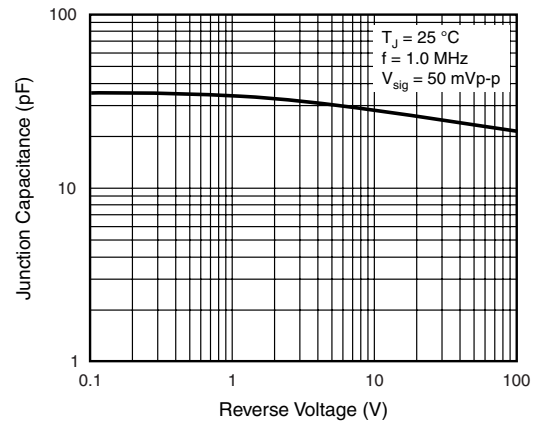
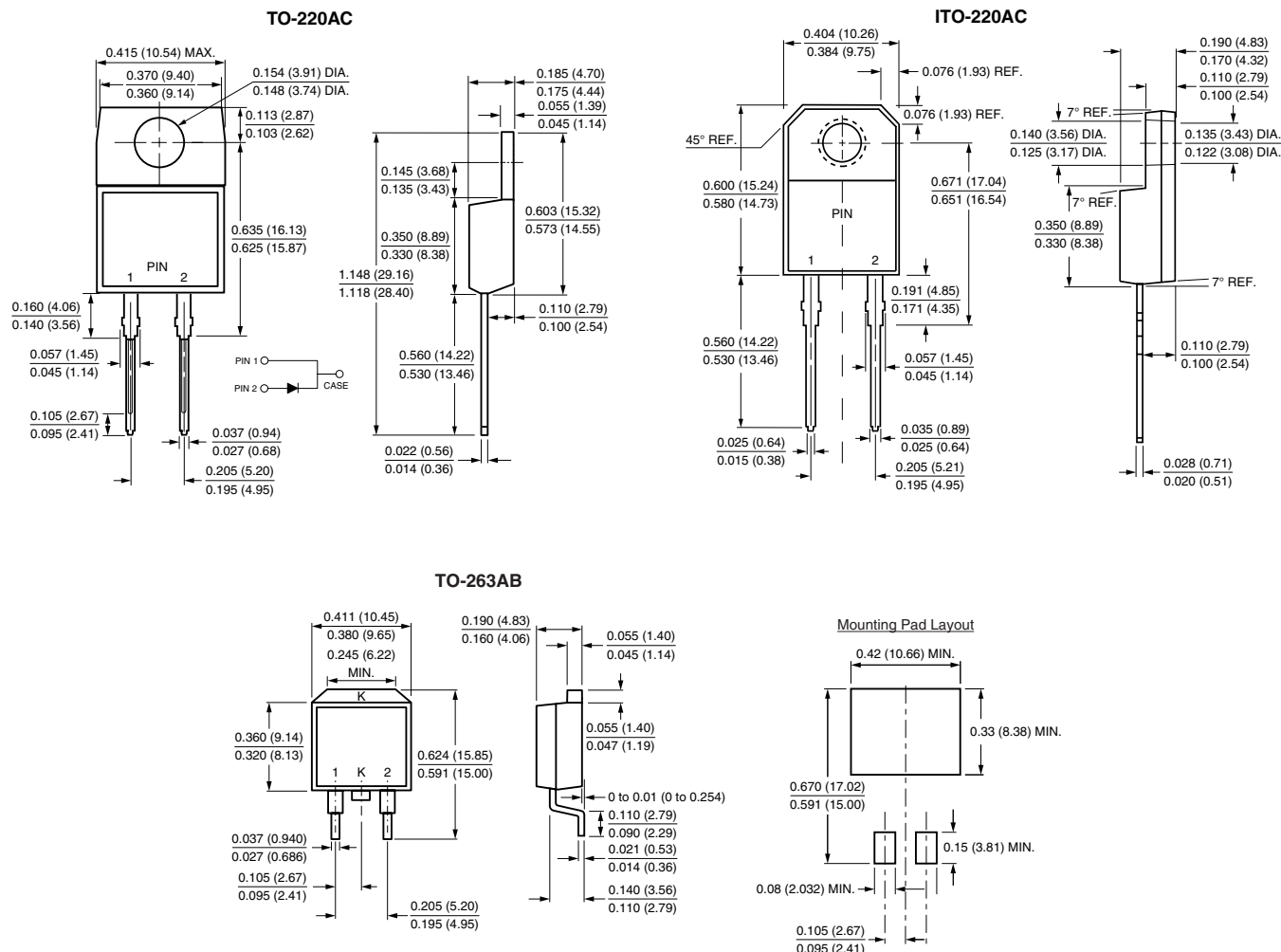


Figure 6. Typical Junction Capacitance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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