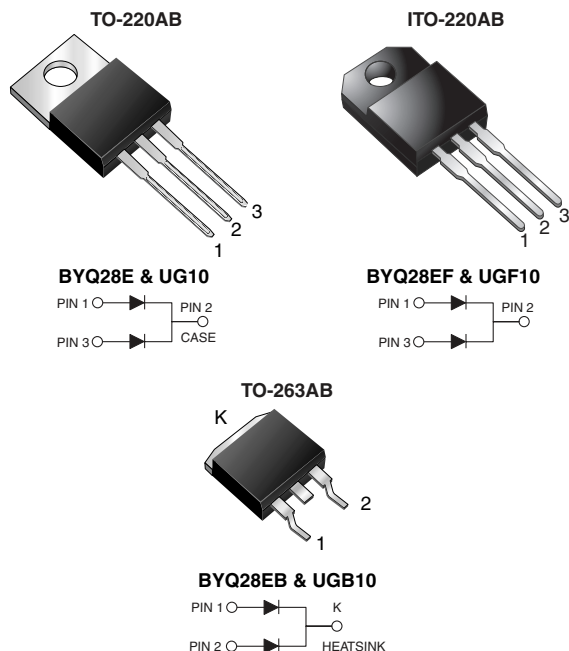




## Dual Common Cathode Ultrafast Rectifier



### FEATURES

- Glass passivated chip junction
- Ultrafast recovery times
- Soft recovery characteristics
- Low switching losses, high efficiency
- 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-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

### MECHANICAL DATA

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

### PRIMARY CHARACTERISTICS

|             |                     |
|-------------|---------------------|
| $I_{F(AV)}$ | 5 A x 2             |
| $V_{RRM}$   | 100 V, 150 V, 200 V |
| $I_{FSM}$   | 55 A                |
| $t_{rr}$    | 25 ns               |
| $V_F$       | 0.895 V             |
| $T_J$ max.  | 150 °C              |

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

| PARAMETER                                                                                    | SYMBOL         | UG10BCT       | UG10CCT    | UG10DCT    | UNIT |
|----------------------------------------------------------------------------------------------|----------------|---------------|------------|------------|------|
|                                                                                              |                | BYQ28E-100    | BYQ28E-150 | BYQ28E-200 |      |
| Maximum repetitive peak reverse voltage                                                      | $V_{RRM}$      | 100           | 150        | 200        | V    |
| Working peak reverse voltage                                                                 | $V_{RWM}$      | 100           | 150        | 200        | V    |
| Maximum DC blocking voltage                                                                  | $V_{DC}$       | 100           | 150        | 200        | V    |
| Maximum average forward rectified current at $T_C = 100$ °C total device per diode           | $I_{F(AV)}$    | 10<br>5       |            |            | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$      | 55            |            |            | A    |
| Non-repetitive peak reverse current per diode at $t_p = 100$ μs                              | $I_{RSM}$      | 0.2           |            |            | A    |
| Electrostatic discharge capacitor voltage, human body model: C = 250 pF, R = 1.5 kΩ          | $V_C$          | 8             |            |            | kV   |
| Operating junction and storage temperature range                                             | $T_J, T_{STG}$ | - 40 to + 150 |            |            | °C   |
| Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1$ min                     | $V_{AC}$       | 1500          |            |            | V    |

# BYQ28E(F,B)-100 thru BYQ28E(F,B)-200, UG(F,B)10BCT

Vishay General Semiconductor



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                                                                                                         |                                                                                                                 |          |                       |               |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------|-----------------------|---------------|
| PARAMETER                                                                                      | TEST CONDITIONS                                                                                         |                                                                                                                 | SYMBOL   | VALUE                 | UNIT          |
| Maximum instantaneous forward voltage per diode <sup>(1)</sup>                                 | $I_F = 10\text{ A}$<br>$I_F = 5\text{ A}$<br>$I_F = 5\text{ A}$                                         | $T_J = 25\text{ }^{\circ}\text{C}$<br>$T_J = 25\text{ }^{\circ}\text{C}$<br>$T_J = 150\text{ }^{\circ}\text{C}$ | $V_F$    | 1.25<br>1.10<br>0.895 | V             |
| Maximum reverse current per diode at working peak reverse voltage                              |                                                                                                         | $T_J = 25\text{ }^{\circ}\text{C}$<br>$T_J = 100\text{ }^{\circ}\text{C}$                                       | $I_R$    | 10<br>200             | $\mu\text{A}$ |
| Maximum reverse recovery time per diode                                                        | $I_F = 1.0\text{ A}$ , $dI/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1 I_{RM}$ |                                                                                                                 | $t_{rr}$ | 25                    | ns            |
| Maximum reverse recovery time per diode                                                        | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$                                  |                                                                                                                 | $t_{rr}$ | 20                    | ns            |
| Maximum stored charge per diode                                                                | $I_F = 2\text{ A}$ , $dI/dt = 20\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1 I_{RM}$    |                                                                                                                 | $Q_{rr}$ | 9                     | 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          | UG10   | UGF10   | UGB10   | UNIT                        |
|                                                                                             |                 | BYQ28E | BYQ28EF | BYQ28EB |                             |
| Typical thermal resistance per diode, junction to ambient                                   | $R_{\theta JA}$ | 50     | 55      | 50      | $^{\circ}\text{C}/\text{W}$ |
| Typical thermal resistance per diode, junction to case                                      | $R_{\theta JC}$ | 4.5    | 6.7     | 4.8     |                             |

| <b>ORDERING INFORMATION</b> (Example) |                                  |                 |              |               |               |
|---------------------------------------|----------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N                    | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                              | BYQ28E-200-E3/45                 | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AB                             | BYQ28EF-200-E3/45                | 1.95            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYQ28EB-200-E3/45                | 1.77            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYQ28EB-200-E3/81                | 1.77            | 81           | 800/reel      | Tape reel     |
| TO-220AB                              | BYQ28E-200HE3/45 <sup>(1)</sup>  | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AB                             | BYQ28EF-200HE3/45 <sup>(1)</sup> | 1.95            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYQ28EB-200HE3/45 <sup>(1)</sup> | 1.77            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYQ28EB-200HE3/81 <sup>(1)</sup> | 1.77            | 81           | 800/reel      | Tape reel     |

**Note:**

(1) Automotive grade AEC Q101 qualified



## RATINGS AND CHARACTERISTICS CURVES

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

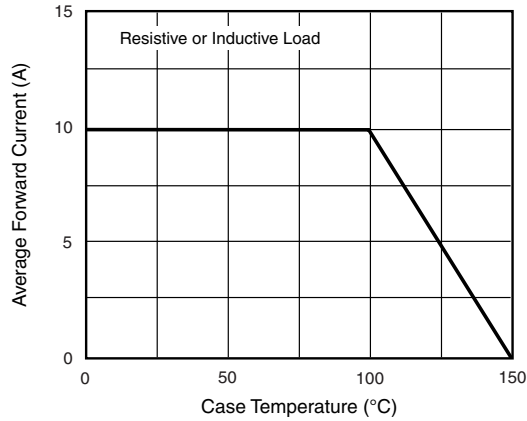


Figure 1. Forward Current Derating Curve

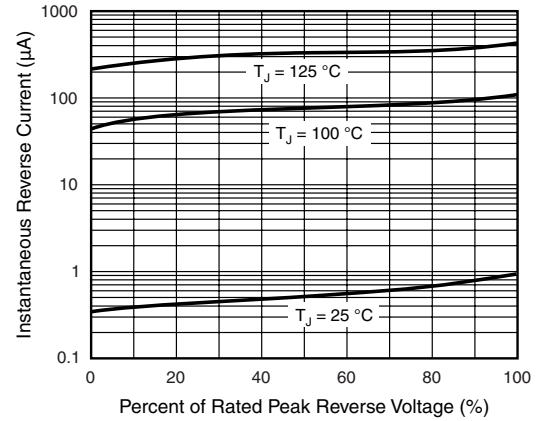


Figure 4. Typical Reverse Characteristics Per Diode

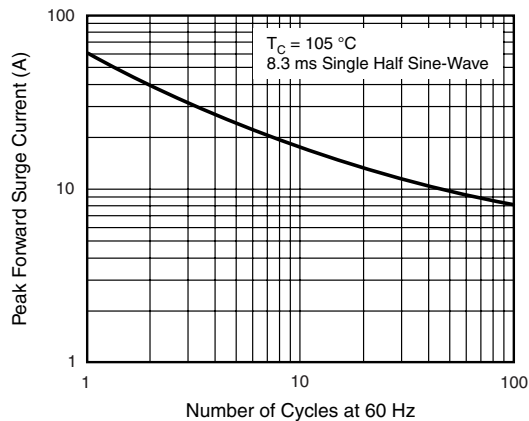


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

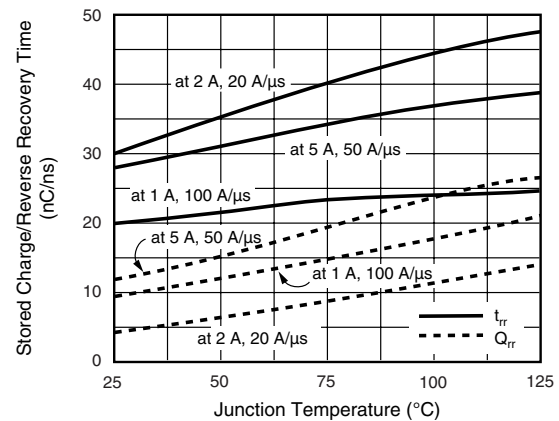


Figure 5. Reverse Switching Characteristics Per Diode

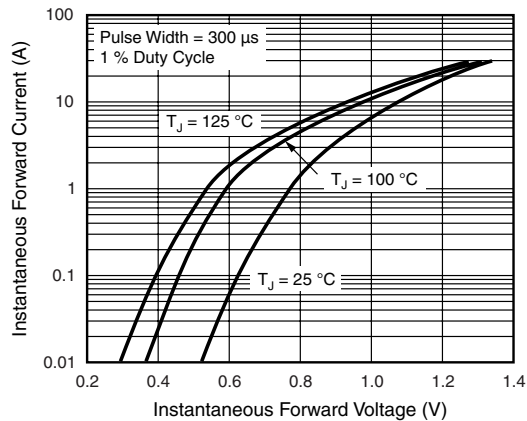


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

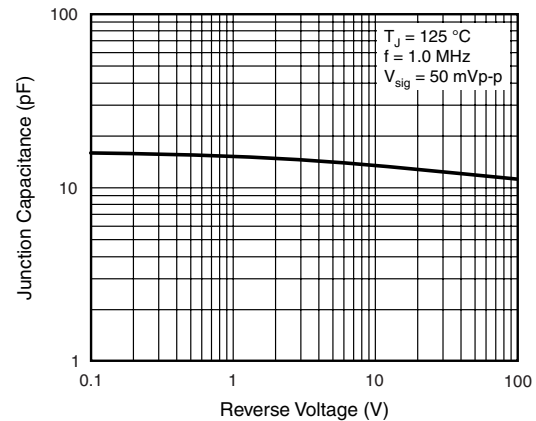
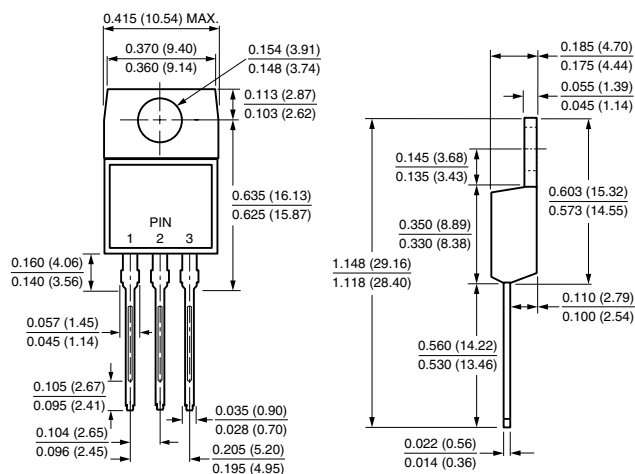


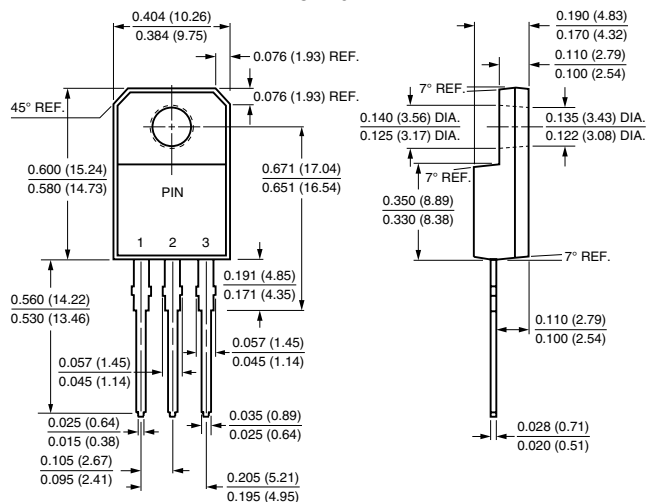
Figure 6. Typical Junction Capacitance Per Diode

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

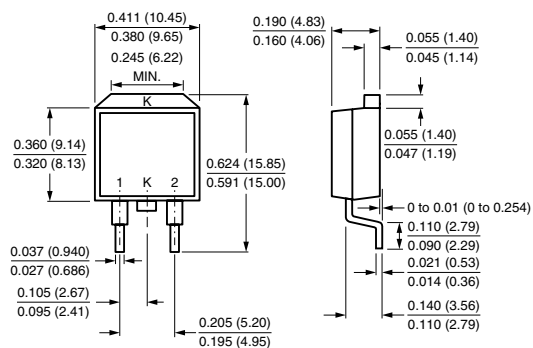
TO-220AB



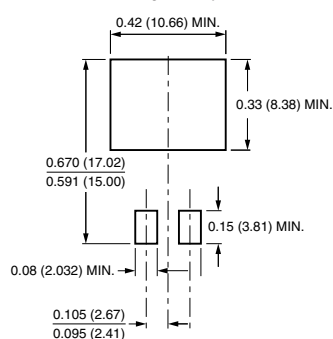
ITO-220AB



TO-263AB



Mounting Pad Layout





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