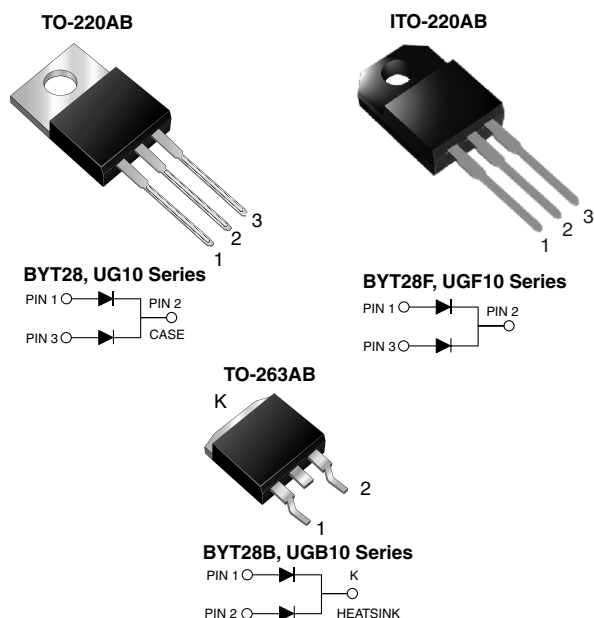


## Dual Common-Cathode Ultrafast Soft Recovery Rectifier



### 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-020C, 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



### 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.

### 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-002B and JESD22-B102D

E3 suffix for commercial 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      |
| $V_{RRM}$          | 300 V, 400 V |
| $I_{FSM}$          | 60 A         |
| $t_{rr}$           | 35 ns        |
| $V_F$              | 1.05 V       |
| $T_J \text{ max.}$ | 150 °C       |

### MAXIMUM RATINGS ( $T_C = 25 \text{ °C}$ unless otherwise noted)

| PARAMETER                                                                                    | SYMBOL         | BYT28-300<br>UG10FCT | BYT28-400<br>UG10GCT | 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                  |      |
| Maximum DC blocking voltage                                                                  | $V_{DC}$       | 300                  | 400                  | V    |
| Maximum average forward rectified current at $T_C = 100 \text{ °C}$ total device per diode   | $I_{F(AV)}$    | 10<br>5.0            |                      | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$      | 60                   |                      | A    |
| Operating junction and storage temperature range                                             | $T_J, T_{STG}$ | - 40 to + 150        |                      | °C   |
| Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1 \text{ min}$             | $V_{AC}$       | 1500                 |                      | V    |

| <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>                                 | $I_F = 5\text{ A}$ ,<br>$I_F = 10\text{ A}$<br>$I_F = 5\text{ A}$                                                     | $T_J = 25\text{ }^{\circ}\text{C}$<br>$T_J = 25\text{ }^{\circ}\text{C}$<br>$T_J = 150\text{ }^{\circ}\text{C}$ | $V_F$    | 1.30<br>1.40<br>1.05 | V             |
| Maximum reverse current per diode at $V_{RRM}$                                                 |                                                                                                                       | $T_J = 25\text{ }^{\circ}\text{C}$<br>$T_J = 100\text{ }^{\circ}\text{C}$                                       | $I_R$    | 10<br>200            | $\mu\text{A}$ |
| Maximum reverse recovery time per diode                                                        | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$                                                |                                                                                                                 | $t_{rr}$ | 35                   | ns            |
| Maximum reverse recovery time per diode                                                        | $I_F = 1.0\text{ A}$ , $dI/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ ,<br>$I_{rr} = 0.1\text{ }I_{RM}$     |                                                                                                                 | $t_{rr}$ | 50                   | ns            |
| Maximum reverse recovery current per diode                                                     | $I_F = 5\text{ A}$ , $dI/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ ,<br>$T_C = 100\text{ }^{\circ}\text{C}$ |                                                                                                                 | $I_{RM}$ | 3.0                  | A             |
| Maximum stored charge per diode                                                                | $I_F = 2\text{ A}$ , $dI/dt = 20\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ ,<br>$I_{rr} = 0.1\text{ }I_{RM}$        |                                                                                                                 | $Q_{rr}$ | 50                   | 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          | BYT28 UG10 | BYT28F UGF10 | BYT28B UGB10 | UNIT                        |
| Typical thermal resistance junction to case per diode                                       | $R_{\theta JC}$ | 4.5        | 6.7          | 4.5          | $^{\circ}\text{C}/\text{W}$ |

| <b>ORDERING INFORMATION</b> (Example) |                                 |                 |              |               |               |
|---------------------------------------|---------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N                   | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                              | BYT28-400-E3/45                 | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AB                             | BYT28F-400-E3/45                | 1.95            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYT28B-400-E3/45                | 1.77            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYT28B-400-E3/81                | 1.77            | 81           | 800/reel      | Tape reel     |
| TO-220AB                              | BYT28-400HE3/45 <sup>(1)</sup>  | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AB                             | BYT28F-400HE3/45 <sup>(1)</sup> | 1.95            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYT28B-400HE3/45 <sup>(1)</sup> | 1.77            | 45           | 50/tube       | Tube          |
| TO-263AB                              | BYT28B-400HE3/81 <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)

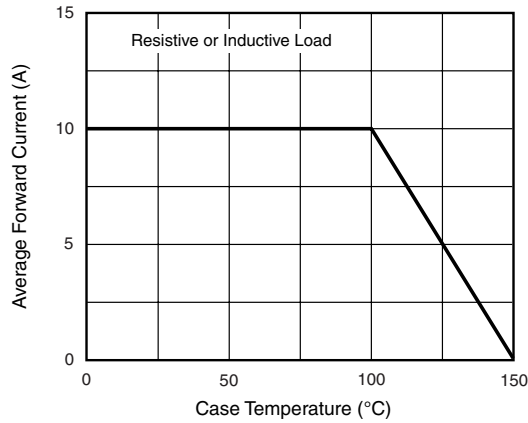


Figure 1. Forward Current Derating Curve

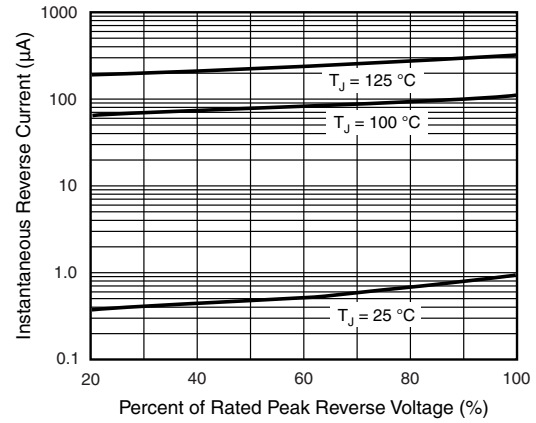


Figure 4. Typical Reverse Characteristics Per Diode

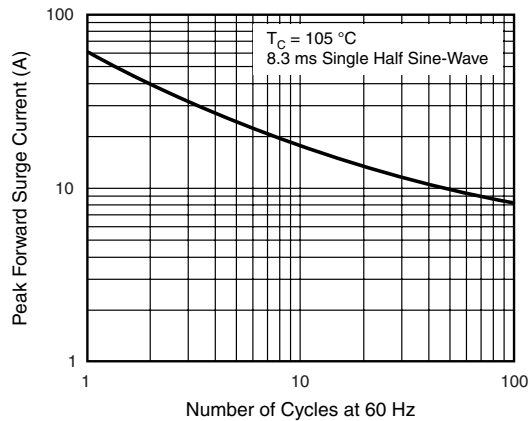


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

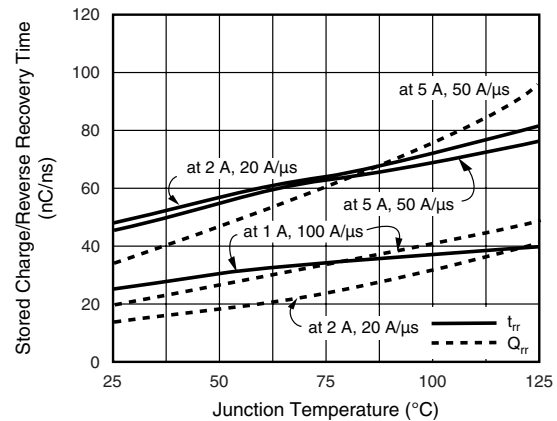


Figure 5. Reverse Switching Characteristics Per Diode

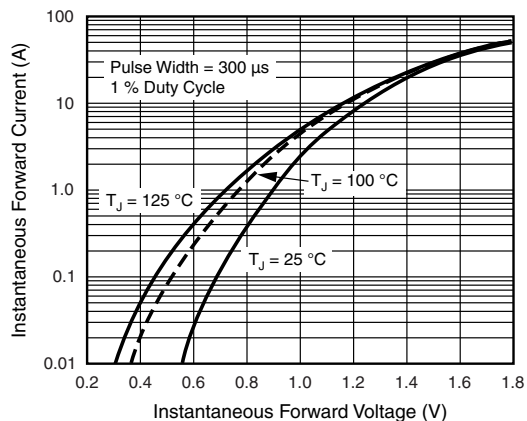


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

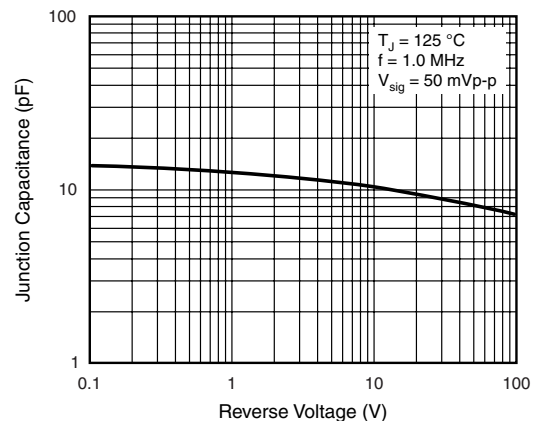
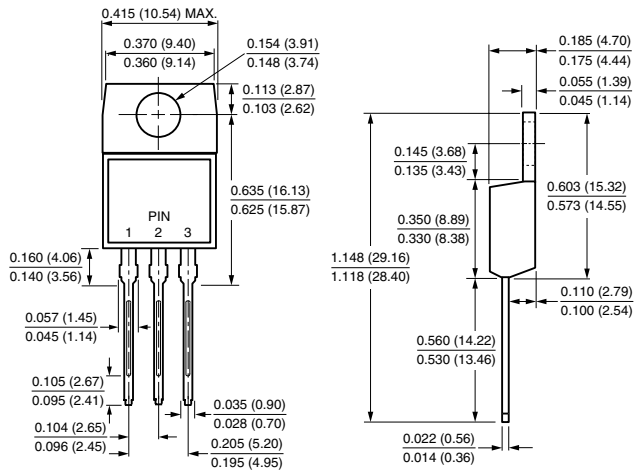


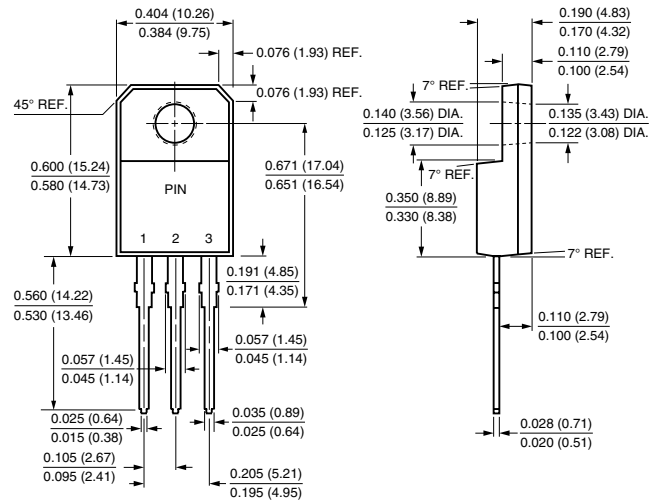
Figure 6. Typical Junction Capacitance Per Diode

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

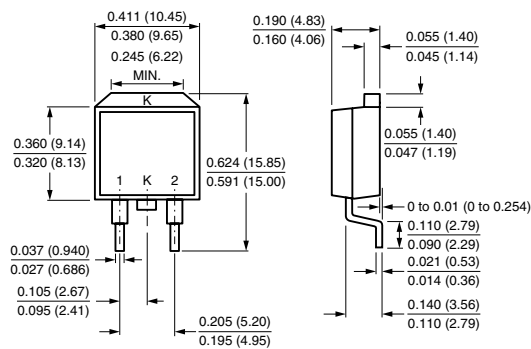
TO-220AB



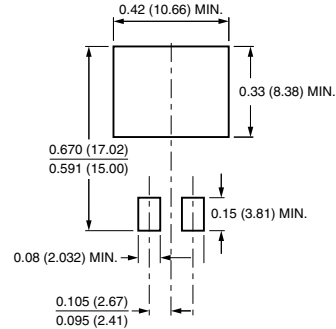
ITO-220AB



TO-263AB



Mounting Pad Layout





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