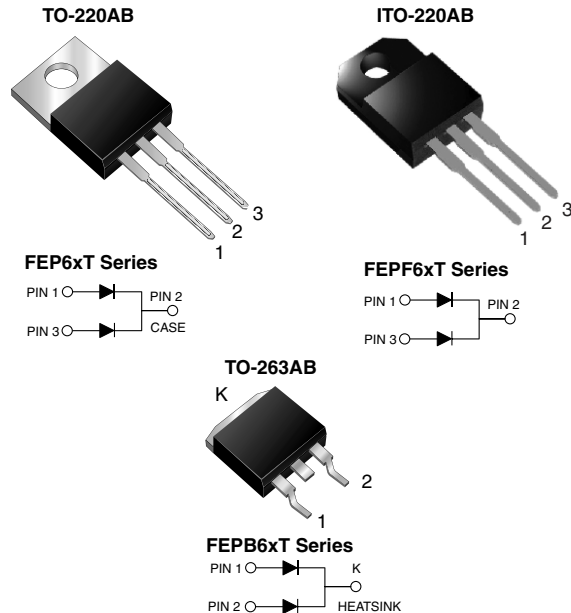


## Dual Common-Cathode Ultrafast Rectifier



### FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low leakage current
- 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 |               |
|-------------------------|---------------|
| $I_{F(AV)}$             | 6.0 A         |
| $V_{RRM}$               | 50 V to 200 V |
| $I_{FSM}$               | 75 A          |
| $t_{rr}$                | 35 ns         |
| $V_F$                   | 0.975 V       |
| $T_J \text{ max.}$      | 150 °C        |

| MAXIMUM RATINGS ( $T_C = 25\text{ °C}$ unless otherwise noted)                               |                |               |        |        |        |      |
|----------------------------------------------------------------------------------------------|----------------|---------------|--------|--------|--------|------|
| PARAMETER                                                                                    | SYMBOL         | FEP6AT        | FEP6BT | FEP6CT | FEP6DT | UNIT |
| Maximum repetitive peak reverse voltage                                                      | $V_{RRM}$      | 50            | 100    | 150    | 200    | V    |
| Maximum RMS voltage                                                                          | $V_{RMS}$      | 35            | 70     | 105    | 140    | V    |
| Maximum DC blocking voltage                                                                  | $V_{DC}$       | 50            | 100    | 150    | 200    | V    |
| Maximum average forward rectified current at $T_C = 105\text{ °C}$                           | $I_{F(AV)}$    | 6.0           |        |        |        | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$      | 75            |        |        |        | A    |
| Operating storage and temperature range                                                      | $T_J, T_{STG}$ | - 55 to + 150 |        |        |        | °C   |
| Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1\text{ min}$              | $V_{AC}$       | 1500          |        |        |        | V    |

| ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted) |                                                                             |                                                   |                 |           |        |        |        |      |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------|-----------------|-----------|--------|--------|--------|------|
| PARAMETER                                                                  | TEST CONDITIONS                                                             |                                                   | SYMBOL          | FEP6AT    | FEP6BT | FEP6CT | FEP6DT | UNIT |
| Maximum instantaneous forward voltage per diode <sup>(1)</sup>             | 3.0 A                                                                       |                                                   | V <sub>F</sub>  | 0.975     |        |        |        | V    |
| Maximum DC reverse current at rated DC blocking voltage per diode          |                                                                             | T <sub>C</sub> = 25 °C<br>T <sub>C</sub> = 100 °C | I <sub>R</sub>  | 5.0<br>50 |        |        |        | μA   |
| Maximum reverse recovery time per diode                                    | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A,<br>I <sub>rr</sub> = 0.25 A |                                                   | t <sub>rr</sub> | 35        |        |        |        | ns   |
| Typical junction capacitance per diode                                     | 4.0 V, 1 MHz                                                                |                                                   | C <sub>J</sub>  | 28        |        |        |        | pF   |

**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          | FEP6 | FEPF6 | FEPB6 | UNIT                 |
| Typical thermal resistance from junction to case per diode                                  | $R_{\theta JC}$ | 3.6  | 5.1   | 3.6   | $^{\circ}\text{C/W}$ |

| <b>ORDERING INFORMATION</b> (Example) |                              |                 |              |               |               |
|---------------------------------------|------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N                | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                              | FEP6DT-E3/45                 | 1.81            | 45           | 50/tube       | Tube          |
| ITO-220AB                             | FEPF6DT-E3/45                | 1.97            | 45           | 50/tube       | Tube          |
| TO-263AB                              | FEPB6DT-E3/45                | 1.33            | 45           | 50/tube       | Tube          |
| TO-263AB                              | FEPB6DT-E3/81                | 1.33            | 81           | 800/reel      | Tape reel     |
| TO-220AB                              | FEP6DTHE3/45 <sup>(1)</sup>  | 1.81            | 45           | 50/tube       | Tube          |
| ITO-220AB                             | FEPF6DTHE3/45 <sup>(1)</sup> | 1.97            | 45           | 50/tube       | Tube          |
| TO-263AB                              | FEPB6DTHE3/45 <sup>(1)</sup> | 1.33            | 45           | 50/tube       | Tube          |
| TO-263AB                              | FEPB6DTHE3/81 <sup>(1)</sup> | 1.33            | 81           | 800/reel      | Tape reel     |

**Note:**

(1) Automotive grade AEC Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

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

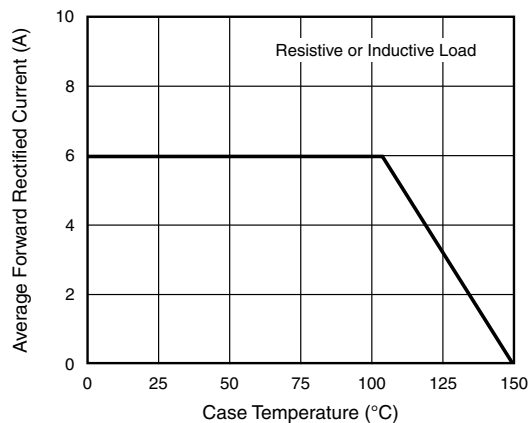


Figure 1. Maximum Forward Current Derating Curve

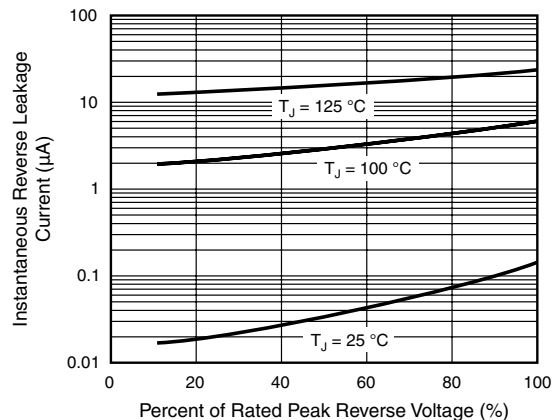


Figure 4. Typical Reverse Leakage Characteristics Per Diode

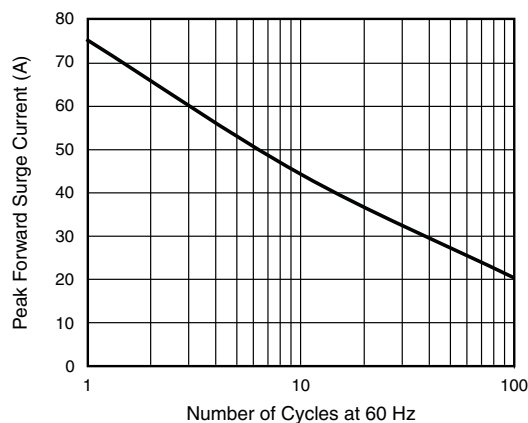


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

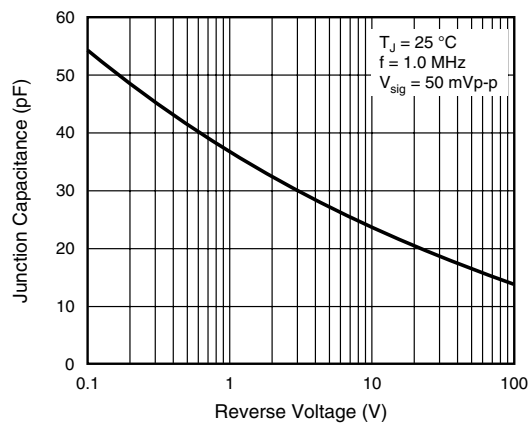


Figure 5. Typical Junction Capacitance Per Diode

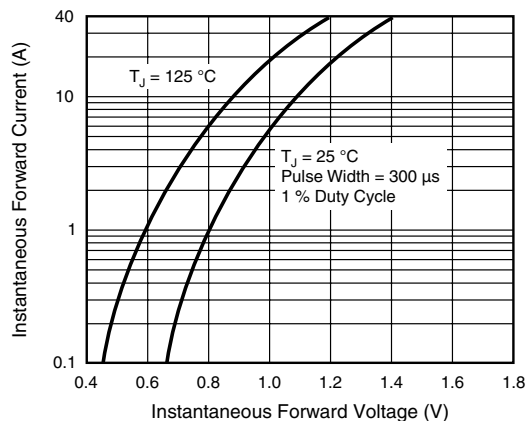
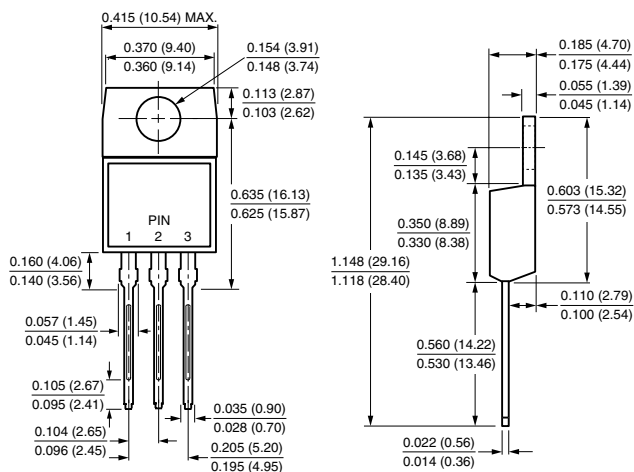
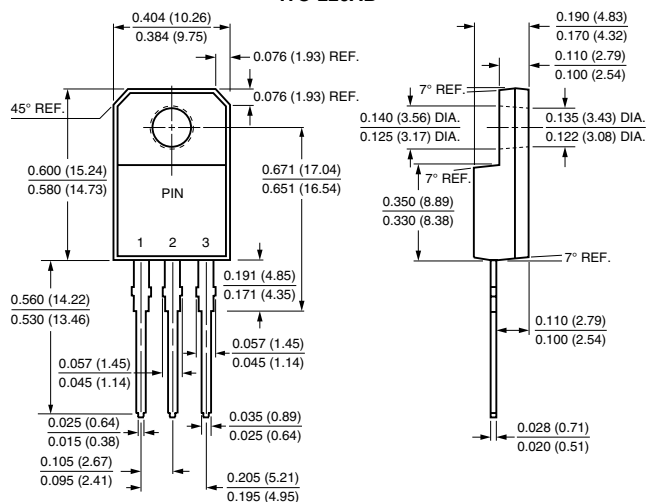
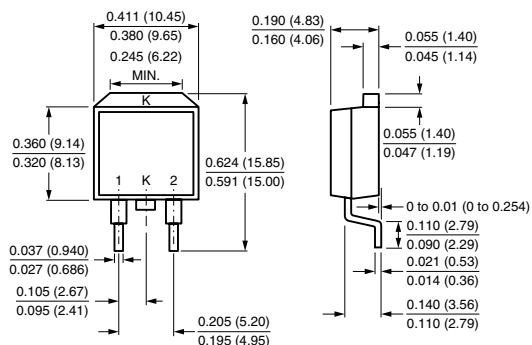
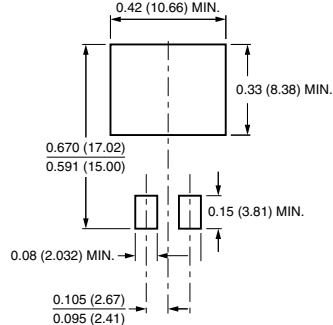


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)**TO-220AB****ITO-220AB****TO-263AB****Mounting Pad Layout**



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