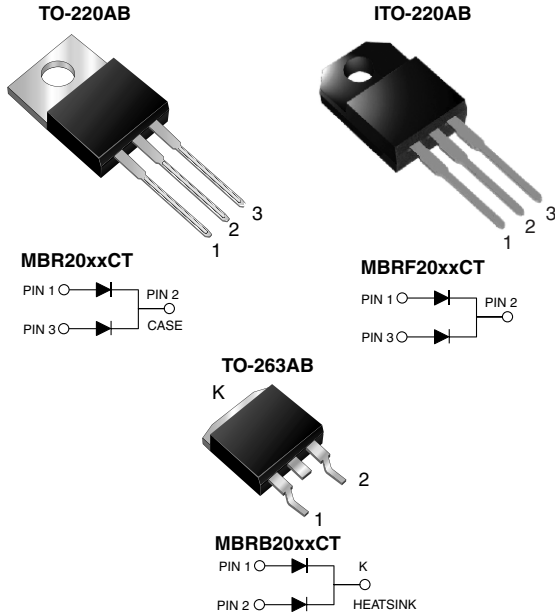


## Dual Common-Cathode Schottky Rectifier



### FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- 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 low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or 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-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

|                    |                |
|--------------------|----------------|
| $I_{F(AV)}$        | 10 A x 2       |
| $V_{RRM}$          | 35 V to 60 V   |
| $I_{FSM}$          | 150 A          |
| $V_F$              | 0.57 V, 0.70 V |
| $T_J \text{ max.}$ | 150 °C         |

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

| PARAMETER                                                                                      | SYMBOL             | MBR2035CT     | MBR2045CT | MBR2050CT | MBR2060CT | UNIT |
|------------------------------------------------------------------------------------------------|--------------------|---------------|-----------|-----------|-----------|------|
| Maximum repetitive peak reverse voltage                                                        | V <sub>RRM</sub>   | 35            | 45        | 50        | 60        | V    |
| Working peak reverse voltage                                                                   | V <sub>RWM</sub>   | 35            | 45        | 50        | 60        | V    |
| Maximum DC blocking voltage                                                                    | V <sub>DC</sub>    | 35            | 45        | 50        | 60        | V    |
| Maximum average forward rectified current at T <sub>C</sub> = 135 °C<br>total device per diode | I <sub>F(AV)</sub> | 20<br>10      |           |           |           | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode   | I <sub>FSM</sub>   | 150           |           |           |           | A    |
| Peak repetitive reverse surge current per diode at t <sub>p</sub> = 2 μs, 1 kHz                | I <sub>RRM</sub>   | 1.0           |           | 0.5       |           | A    |
| Voltage rate of change (rated V <sub>R</sub> )                                                 | dV/dt              | 10000         |           |           |           | V/μs |
| Operating junction temperature range                                                           | T <sub>J</sub>     | - 65 to + 150 |           |           |           | °C   |
| Storage temperature range                                                                      | T <sub>STG</sub>   | - 65 to + 175 |           |           |           | °C   |
| Isolation voltage (ITO-220AB only)<br>from terminal to heatsink t = 1 min                      | V <sub>AC</sub>    | 1500          |           |           |           | V    |

| ELECTRICAL CHARACTERISTICS ( $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                     |                                                                           |        |           |            |      |
|-----------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------|--------|-----------|------------|------|
| PARAMETER                                                                               | TEST CONDITIONS     |                                                                           | SYMBOL | MBR2035CT | MBR2045CT  | UNIT |
| Maximum instantaneous forward voltage per diode <sup>(1)</sup>                          | $I_F = 10\text{ A}$ | $T_C = 25\text{ }^{\circ}\text{C}$                                        | $V_F$  | 0.65      | 0.80       | V    |
|                                                                                         | $I_F = 10\text{ A}$ | $T_C = 125\text{ }^{\circ}\text{C}$                                       |        | 0.57      | 0.70       |      |
|                                                                                         | $I_F = 20\text{ A}$ | $T_C = 25\text{ }^{\circ}\text{C}$                                        |        | 0.84      | 0.95       |      |
|                                                                                         | $I_F = 20\text{ A}$ | $T_C = 125\text{ }^{\circ}\text{C}$                                       |        | 0.72      | 0.85       |      |
| Maximum reverse current per diode at rated DC blocking voltage per diode <sup>(1)</sup> |                     | $T_C = 25\text{ }^{\circ}\text{C}$<br>$T_C = 125\text{ }^{\circ}\text{C}$ | $I_R$  | 0.1<br>15 | 0.15<br>15 | mA   |

**Note:**

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

| THERMAL CHARACTERISTICS ( $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |     |      |      |                      |
|--------------------------------------------------------------------------------------|-----------------|-----|------|------|----------------------|
| PARAMETER                                                                            | SYMBOL          | MBR | MBRF | MBRB | UNIT                 |
| Typical resistance from junction to case per diode                                   | $R_{\theta JC}$ | 2.0 | 5.0  | 2.0  | $^{\circ}\text{C/W}$ |

| ORDERING INFORMATION (Example) |                                 |                 |              |               |               |
|--------------------------------|---------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N                   | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                       | MBR2045CT-E3/45                 | 1.85            | 45           | 50/tube       | Tube          |
| ITO-220AB                      | MBRF2045CT-E3/45                | 1.99            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB2045CT-E3/45                | 1.35            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB2045CT-E3/81                | 1.35            | 81           | 800/reel      | Tape reel     |
| TO-220AB                       | MBR2045CTHE3/45 <sup>(1)</sup>  | 1.85            | 45           | 50/tube       | Tube          |
| ITO-220AB                      | MBRF2045CTHE3/45 <sup>(1)</sup> | 1.99            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB2045CTHE3/45 <sup>(1)</sup> | 1.35            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB2045CTHE3/81 <sup>(1)</sup> | 1.35            | 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)

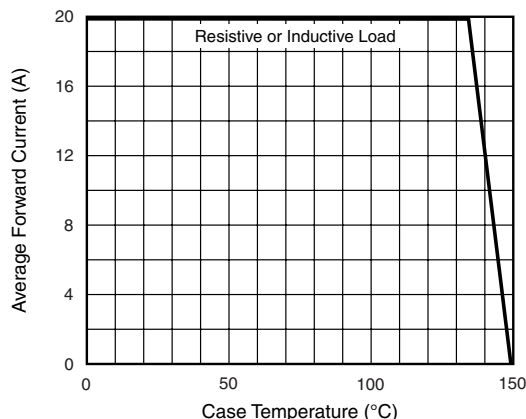


Figure 1. Forward Derating Curve (Total)

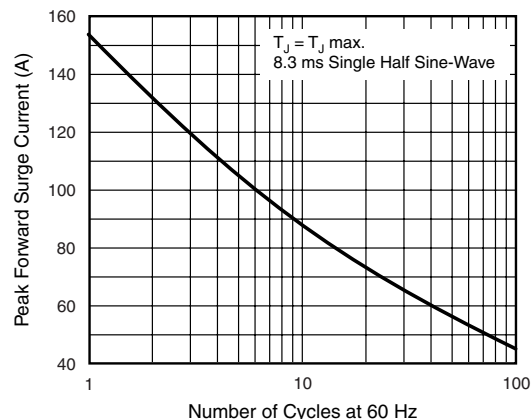


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

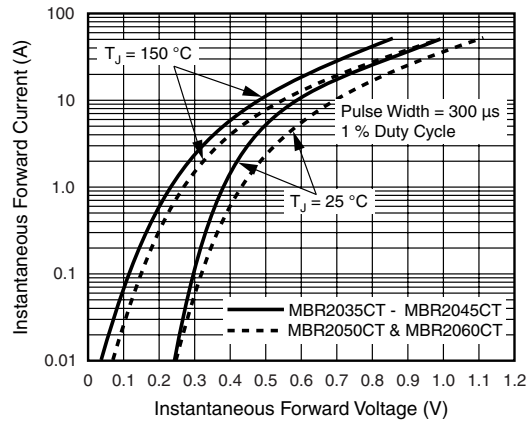


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

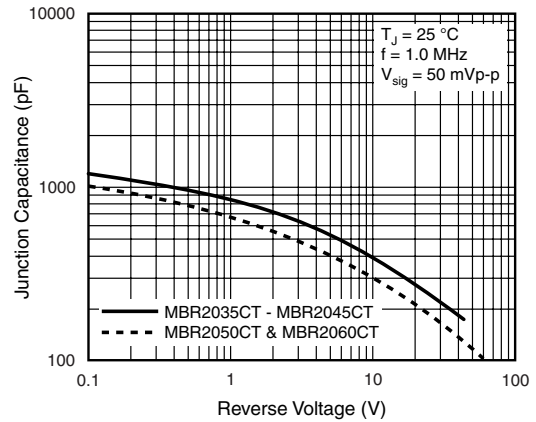


Figure 5. Typical Junction Capacitance Per Diode

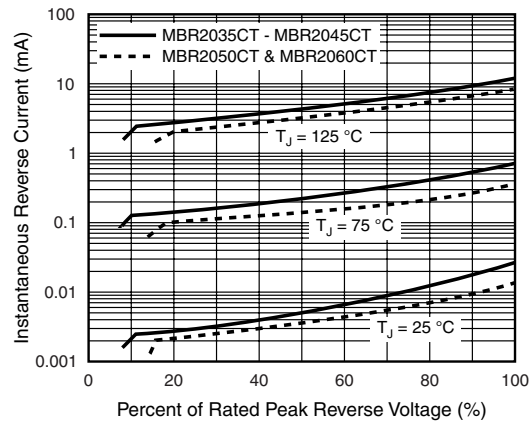


Figure 4. Typical Reverse Characteristics Per Diode

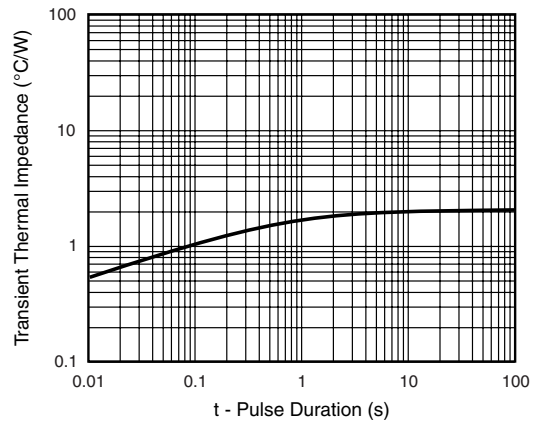
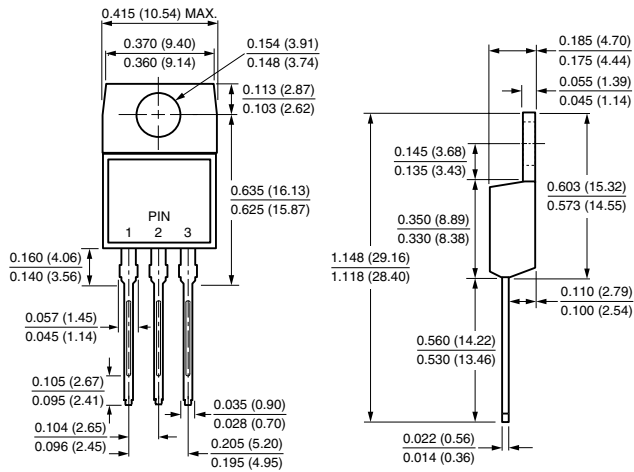


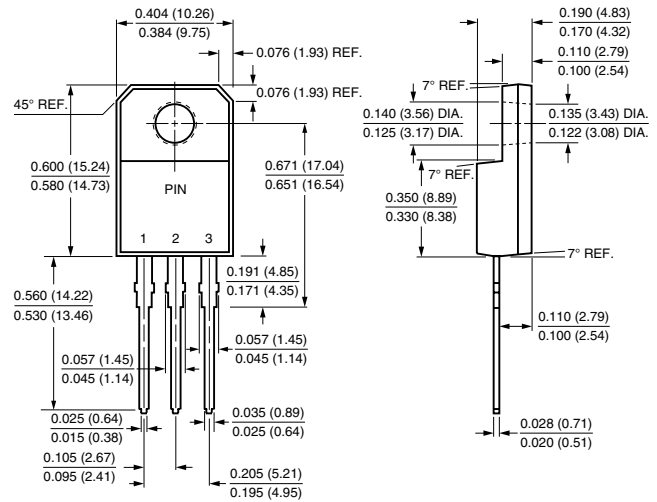
Figure 6. Typical Transient Thermal Impedance Per Diode

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

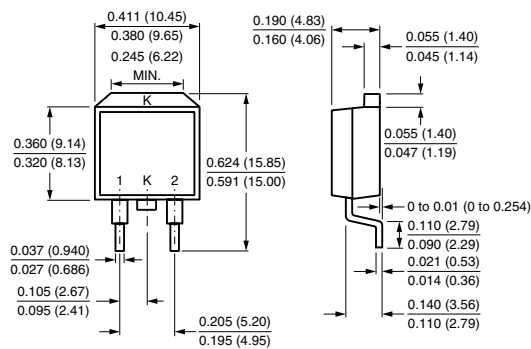
TO-220AB



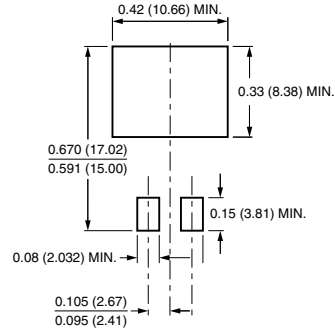
ITO-220AB



TO-263AB



Mounting Pad Layout





### Notice

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