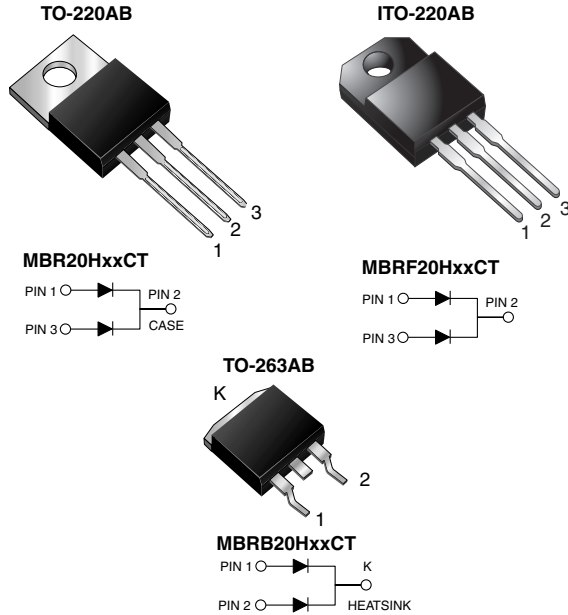


Dual Common Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Power pack
- Guardring for overvoltage protection
- Low power loss, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AB and ITO-220AB package)
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, and polarity protection application.

MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

| PRIMARY CHARACTERISTICS | |
|-------------------------|-------------------------------|
| $I_{F(AV)}$ | 2 x 10 A |
| V_{RRM} | 35 V to 60 V |
| I_{FSM} | 150 A |
| V_F | 0.55 V, 0.61 V |
| I_R | 100 μ A |
| $T_J \text{ max.}$ | 175 °C |
| Package | TO-220AB, ITO-220AB, TO-263AB |
| Diode variations | Common cathode |



| MAXIMUM RATINGS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|----------------|-------------|------------|------------|------------|------------------|
| PARAMETER | SYMBOL | MBR20H35CT | MBR20H45CT | MBR20H50CT | MBR20H60CT | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 35 | 45 | 50 | 60 | V |
| Working peak reverse voltage | V_{RWM} | 35 | 45 | 50 | 60 | |
| Maximum DC blocking voltage | V_{DC} | 35 | 45 | 50 | 60 | |
| Maximum average forward rectified current (fig. 1) total device per diode | $I_{F(AV)}$ | 20 | | | | A |
| | | 10 | | | | |
| Non-repetitive avalanche energy per diode at $25\text{ }^\circ\text{C}$, $I_{AS} = 4\text{ A}$, $L = 10\text{ mH}$ | E_{AS} | 80 | | | | mJ |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | I_{FSM} | 150 | | | | A |
| Peak repetitive reverse surge current per diode at $t_p = 2.0\text{ }\mu\text{s}$, 1 kHz | I_{RRM} | 1.0 | | 0.5 | | |
| Peak non-repetitive reverse energy (8/20 μs waveform) | E_{RSM} | 20 | | 10 | | mJ |
| Electrostatic discharge capacitor voltage Human body model: $C = 100\text{ pF}$, $R = 1.5\text{ k}\Omega$ | V_C | 25 | | | | kV |
| Voltage rate of change (rated V_R) | dV/dt | 10 000 | | | | V/ μs |
| Operating junction and storage temperature range | T_J, T_{STG} | - 65 to 175 | | | | $^\circ\text{C}$ |
| Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1\text{ min}$ | V_{AC} | 1500 | | | | V |

| ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | | | |
|--|-------------|---------------------|-----------------------------------|-----------------------------------|------|--------------------------|------|---------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | MBR20H35CT MBR20H45CT | | MBR20H50CT MBR20H60CT | | UNIT |
| | | | | TYP. | MAX. | TYP. | MAX. | |
| Maximum instantaneous forward voltage per diode | $V_F^{(1)}$ | $I_F = 10\text{ A}$ | $T_C = 25\text{ }^\circ\text{C}$ | - | 0.63 | - | 0.71 | V |
| | | | | $T_C = 125\text{ }^\circ\text{C}$ | 0.49 | 0.55 | 0.57 | |
| | | $I_F = 20\text{ A}$ | $T_C = 25\text{ }^\circ\text{C}$ | - | 0.75 | - | 0.85 | |
| | | | | $T_C = 125\text{ }^\circ\text{C}$ | 0.62 | 0.68 | 0.68 | |
| Maximum reverse current per diode | $I_R^{(2)}$ | Rated V_R | $T_J = 25\text{ }^\circ\text{C}$ | - | 100 | - | 100 | μA |
| | | | $T_J = 125\text{ }^\circ\text{C}$ | 4.0 | 12 | 2.0 | 12 | mA |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | |
|---|-----------------|-----|------|------|--------------------|
| PARAMETER | SYMBOL | MBR | MBRF | MBRB | UNIT |
| Typical resistance, junction to case per diode | $R_{\theta JC}$ | 2.0 | 4.0 | 2.0 | $^\circ\text{C/W}$ |

| ORDERING INFORMATION (Example) | | | | | |
|---------------------------------------|----------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB | MBR20H45CT-E3/45 | 1.85 | 45 | 50/tube | Tube |
| ITO-220AB | MBRF20H45CT-E3/45 | 1.99 | 45 | 50/tube | Tube |
| TO-263AB | MBRB20H45CT-E3/45 | 1.35 | 45 | 50/tube | Tube |
| TO-263AB | MBRB20H45CT-E3/81 | 1.35 | 81 | 800/reel | Tape and reel |
| TO-220AB | MBR20H45CTHE3/45 ⁽¹⁾ | 1.85 | 45 | 50/tube | Tube |
| ITO-220AB | MBRF20H45CTHE3/45 ⁽¹⁾ | 1.99 | 45 | 50/tube | Tube |
| TO-263AB | MBRB20H45CTHE3/45 ⁽¹⁾ | 1.35 | 45 | 50/tube | Tube |
| TO-263AB | MBRB20H45CTHE3/81 ⁽¹⁾ | 1.35 | 81 | 800/reel | Tape and reel |

Note

- (1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES

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

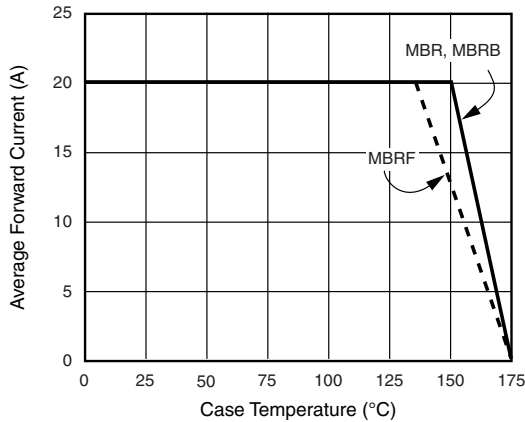


Fig. 1 - Forward Current Derating Curve (Total)

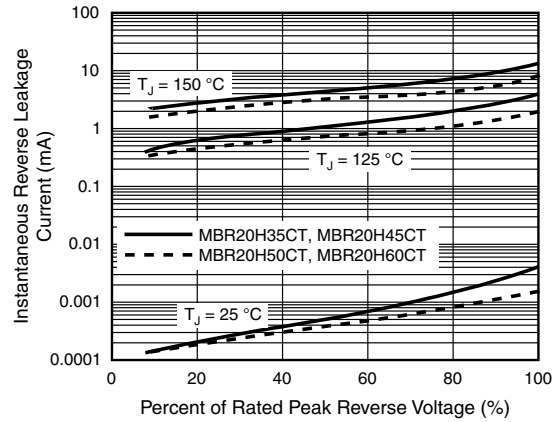


Fig. 4 - Typical Reverse Characteristics Per Diode

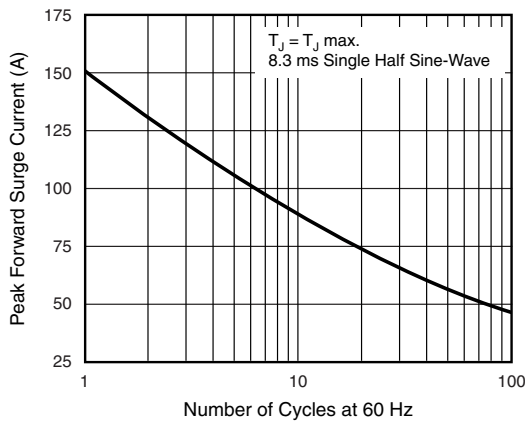


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Diode

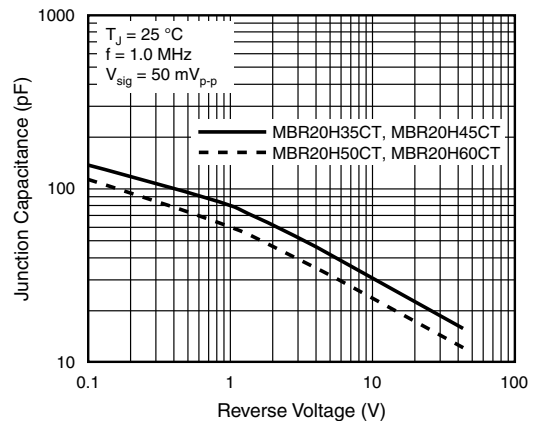


Fig. 5 - Typical Junction Capacitance Per Diode

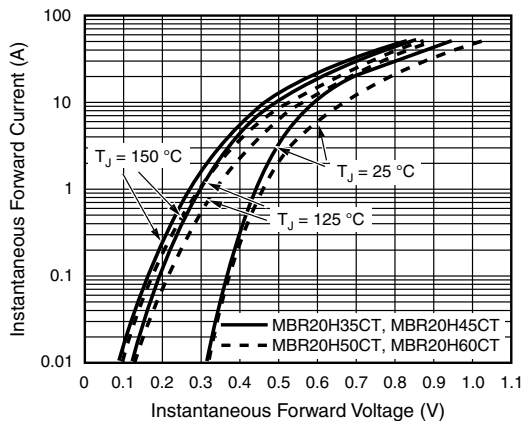


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

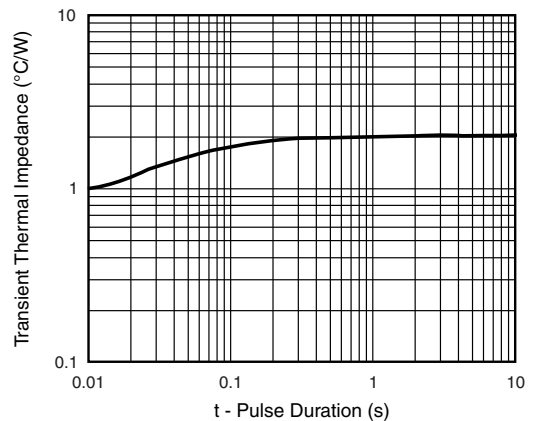
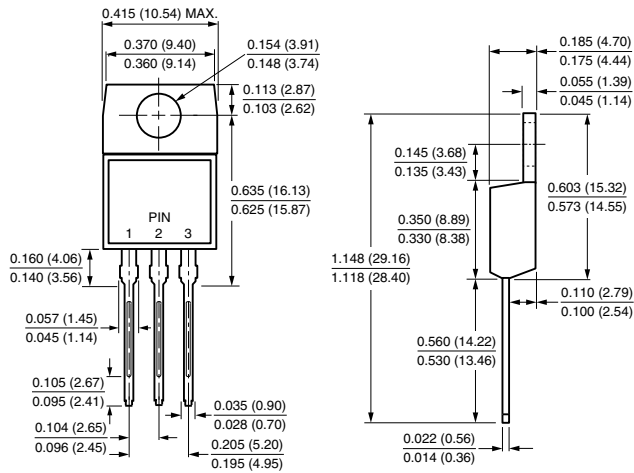


Fig. 6 - Typical Transient Thermal Impedance Per Diode

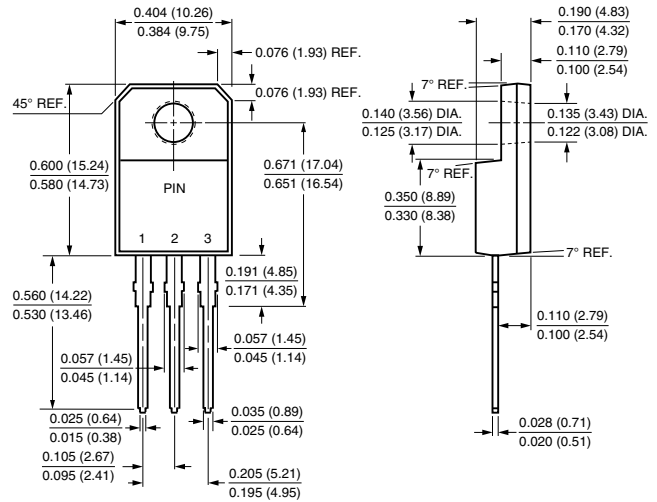


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

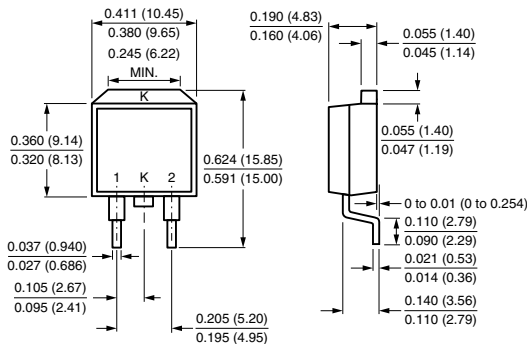
TO-220AB



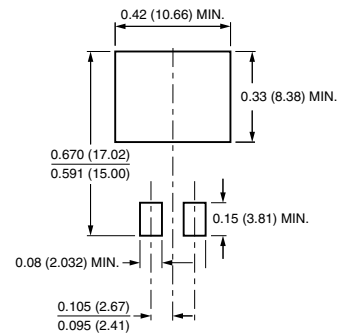
ITO-220AB



TO-263AB



Mounting Pad Layout





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