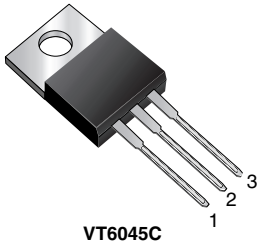
# Dual Low-Voltage Trench MOS Barrier Schottky Rectifier

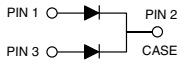
Ultra Low $V_F$ = 0.33 V at $I_F$ = 10 A

TMBS®

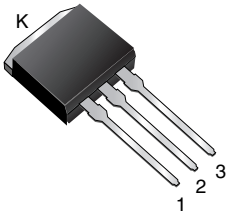
TO-220AB



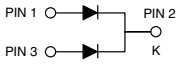

VT6045C




TO-262AA




VIT6045C




## FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

## TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

## MECHANICAL DATA

**Case:** TO-220AB and TO-262AA
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 2 x 30 A |
| $V_{RRM}$ | 45 V |
| $I_{FSM}$ | 320 A |
| $V_F$ at $I_F$ = 30 A | 0.47 V |
| $T_J$ max. | 150 °C |
| Package | TO-220AB, TO-262AA |
| Diode variations | Dual common cathode |

**MAXIMUM RATINGS** ($T_A$ = 25 °C unless otherwise noted)

| PARAMETER | | SYMBOL | VT6045C | VIT6045C | UNIT |
|---|---|---|---|---|---|
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 45 | | V |
| Maximum average forward rectified current (fig. 1) | per device | $I_{F(AV)}$ | 60 | | A |
| | per diode | | 30 | | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | | $I_{FSM}$ | 320 | | A |
| Operating junction and storage temperature range | | $T_J$, $T_{STG}$ | -40 to +150 | | °C |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| **ELECTRICAL CHARACTERISTICS** ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | | **SYMBOL** | **TYP.** | **MAX.** | **UNIT** |
| Instantaneous forward voltage per diode | $I_F$ = 10 A | $T_A$ = 25 °C | $V_F$ (1) | 0.44 | - | V |
| | $I_F$ = 15 A | | | 0.47 | - | |
| | $I_F$ = 30 A | | | 0.54 | 0.64 | |
| | $I_F$ = 10 A | $T_A$ = 125 °C | | 0.33 | - | |
| | $I_F$ = 15 A | | | 0.37 | - | |
| | $I_F$ = 30 A | | | 0.47 | 0.56 | |
| Reverse current per diode | $V_R$ = 45 V | $T_A$ = 25 °C | $I_R$ (2) | - | 3000 | µA |
| | | $T_A$ = 125 °C | | 18 | 50 | mA |

**Notes**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

| **THERMAL CHARACTERISTICS** ($T_A$ = 25 °C unless otherwise noted) | | | | | |
|---|---|---|---|---|---|
| **PARAMETER** | | **SYMBOL** | **VT6045C** | **VIT6045C** | **UNIT** |
| Typical thermal resistance | per diode | $R_{\theta JC}$ | 1.5 | | °C/W |
| | per device | | 0.8 | | |

| **ORDERING INFORMATION** (Example) | | | | | |
|---|---|---|---|---|---|
| **PACKAGE** | **PREFERRED P/N** | **UNIT WEIGHT (g)** | **PACKAGE CODE** | **BASE QUANTITY** | **DELIVERY MODE** |
| TO-220AB | VT6045C-M3/4W | 1.89 | 4W | 50/tube | Tube |
| TO-262AA | VIT6045C-M3/4W | 1.46 | 4W | 50/tube | Tube |
| TO-220AB | VT6045CHM3/4W (1) | 1.89 | 4W | 50/tube | Tube |
| TO-262AA | VIT6045CHM3/4W (1) | 1.46 | 4W | 50/tube | Tube |

**Note**

(1) AEC-Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES ($T_A$ = 25 °C unless otherwise noted)

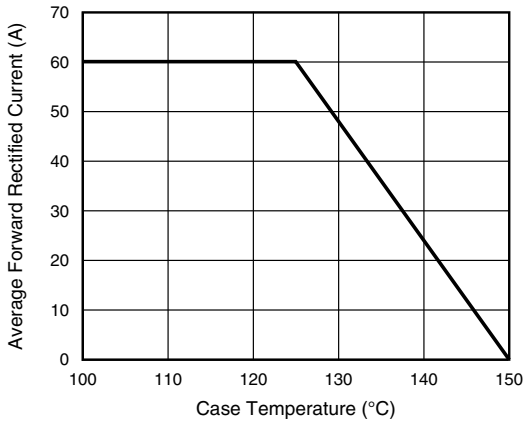


Fig. 1 - Maximum Forward Current Derating Curve

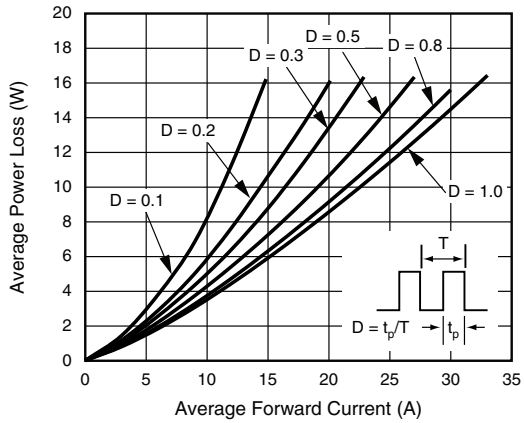


Fig. 2 - Forward Power Loss Characteristics Per Diode


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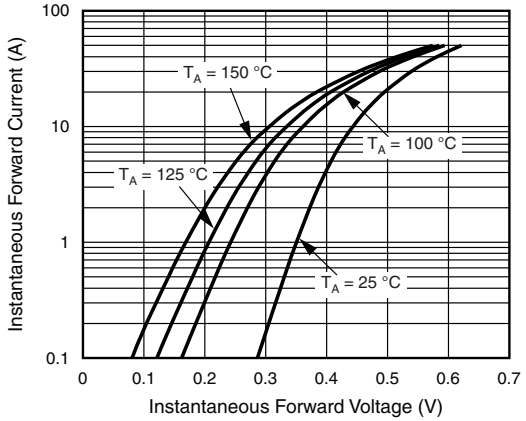


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

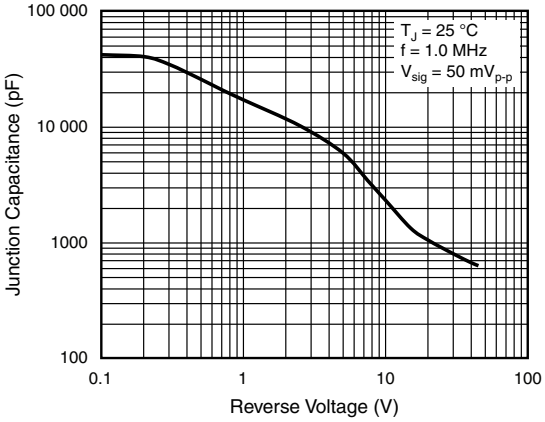


Fig. 5 - Typical Junction Capacitance Per Diode

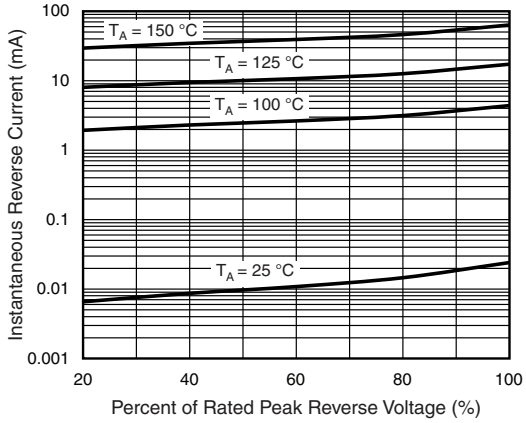


Fig. 4 - Typical Reverse Characteristics Per Diode

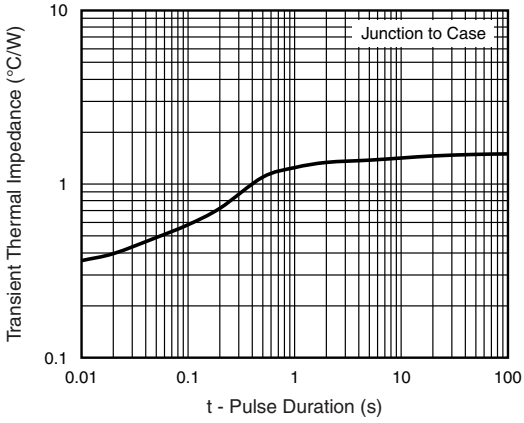


Fig. 6 - Typical Transient Thermal Impedance Per Diode


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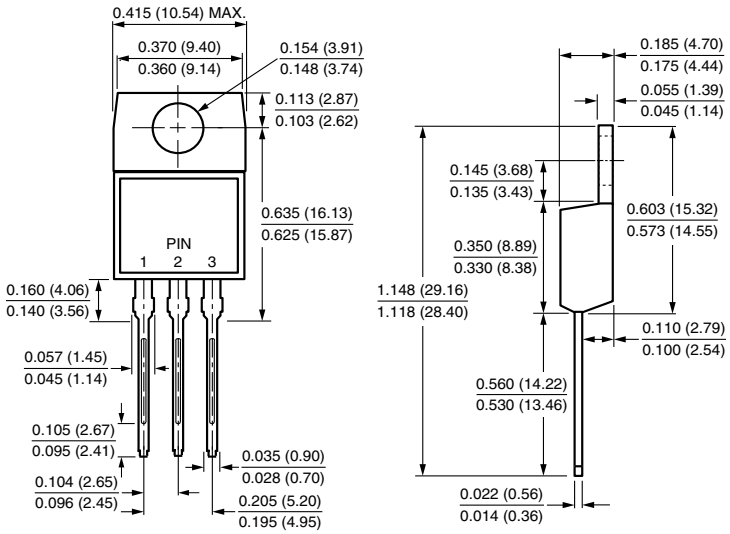
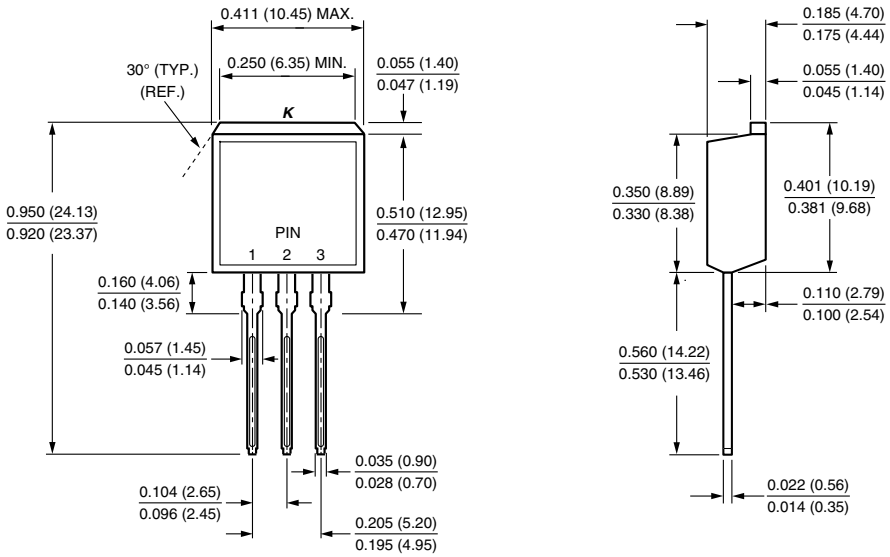
**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**TO-220AB**




**TO-262AA**





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