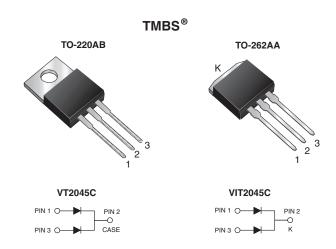


## **Dual Low-Voltage Trench MOS Barrier Schottky Rectifier**

Ultra Low  $V_F = 0.33 \text{ V}$  at  $I_F = 5.0 \text{ A}$ 



| PRIMARY CHARACTERISTICS                 |                    |  |  |  |  |
|-----------------------------------------|--------------------|--|--|--|--|
| I <sub>F(AV)</sub>                      | 2 x 10 A           |  |  |  |  |
| V <sub>RRM</sub>                        | 45 V               |  |  |  |  |
| I <sub>FSM</sub>                        | 160 A              |  |  |  |  |
| V <sub>F</sub> at I <sub>F</sub> = 10 A | 0.41 V             |  |  |  |  |
| T <sub>J</sub> max.                     | 150 °C             |  |  |  |  |
| Package                                 | TO-220AB, TO-262AA |  |  |  |  |
| Diode variations                        | Common cathode     |  |  |  |  |

#### **FEATURES**

- Trench MOS Schottky technology
- · Low forward voltage drop, low power losses

h efficiency operation 60

High efficiency operation
Solder dip 275 °C max. 10 s, per JESD 22-B106

 Material categorization: for definitions of compliance please see <a href="https://www.vishav.com/doc?99912">www.vishav.com/doc?99912</a>

#### 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

Terminals: matte tin plated leads, solderable per

J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

| MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)                             |                  |                                   |             |          |      |  |
|---------------------------------------------------------------------------------------------|------------------|-----------------------------------|-------------|----------|------|--|
| PARAMETER                                                                                   |                  | SYMBOL                            | VT2045C     | VIT2045C | UNIT |  |
| Maximum repetitive peak reverse voltage                                                     |                  | $V_{RRM}$                         | 45          |          | V    |  |
| Maximum average forward rectified current (fig. 1)                                          | per device       | I <sub>F(AV)</sub>                | 20          |          | A    |  |
|                                                                                             | per diode        |                                   | 10          |          |      |  |
| Peak forward surge current 8.3 ms single half sine-was superimposed on rated load per diode | I <sub>FSM</sub> | 160                               |             | А        |      |  |
| Operating junction and storage temperature range                                            |                  | T <sub>J</sub> , T <sub>STG</sub> | -40 to +150 |          | °C   |  |



| <b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted) |                       |                         |                               |      |      |      |  |
|-----------------------------------------------------------------------------------|-----------------------|-------------------------|-------------------------------|------|------|------|--|
| PARAMETER                                                                         | TEST CONDITIONS       |                         | SYMBOL                        | TYP. | MAX. | UNIT |  |
| Instantaneous forward voltage per diode                                           | I <sub>F</sub> = 5 A  | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.44 | -    | V    |  |
|                                                                                   | I <sub>F</sub> = 10 A |                         |                               | 0.49 | 0.58 |      |  |
|                                                                                   | I <sub>F</sub> = 5 A  | T <sub>A</sub> = 125 °C |                               | 0.33 | -    |      |  |
|                                                                                   | I <sub>F</sub> = 10 A |                         |                               | 0.41 | 0.52 |      |  |
| Reverse current per diode                                                         |                       | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | -    | 2000 | μΑ   |  |
|                                                                                   |                       | T <sub>A</sub> = 125 °C |                               | 10   | 30   | mA   |  |

#### Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |            |               |         |          |      |
|-------------------------------------------------------------------------|------------|---------------|---------|----------|------|
| PARAMETER                                                               |            | SYMBOL        | VT2045C | VIT2045C | UNIT |
| Typical thermal registance                                              | per diode  | D             | 3.0     |          | °C/W |
| Typical thermal resistance                                              | per device | $R_{	hetaJC}$ | 2.0     |          |      |

| ORDERING INFORMATION (Example) |                |                 |              |               |               |  |  |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|--|--|
| PACKAGE                        | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |  |  |
| TO-220AB                       | VT2045C-M3/4W  | 1.88            | 4W           | 50/tube       | Tube          |  |  |
| TO-262AA                       | VIT2045C-M3/4W | 1.45            | 4W           | 50/tube       | Tube          |  |  |

## **RATINGS AND CHARACTERISTICS CURVES** (T<sub>A</sub> = 25 °C unless otherwise noted)

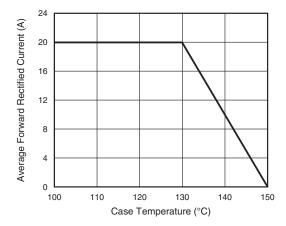
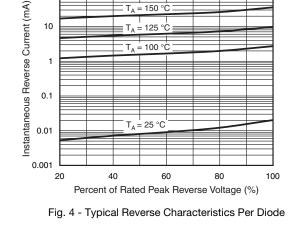


Fig. 1 - Maximum Forward Current Derating Curve



100

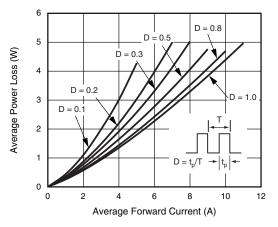


Fig. 2 - Forward Power Loss Characteristics Per Diode

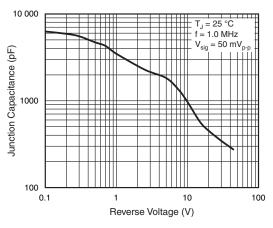


Fig. 5 - Typical Junction Capacitance Per Diode

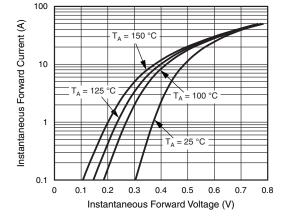


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

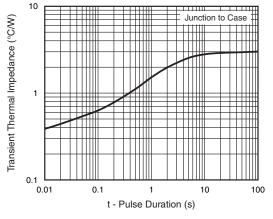
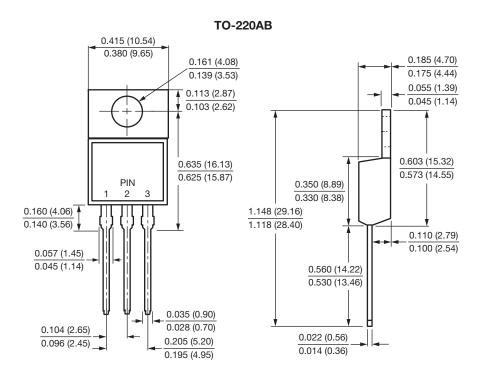


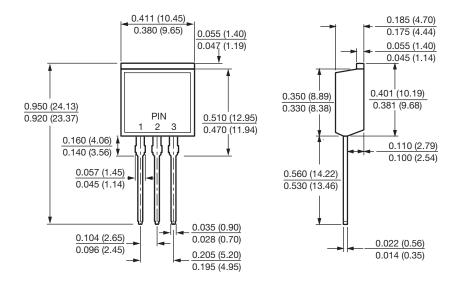
Fig. 6 - Typical Transient Thermal Impedance Per Diode



### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



### **TO-262AA**





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Vishay

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