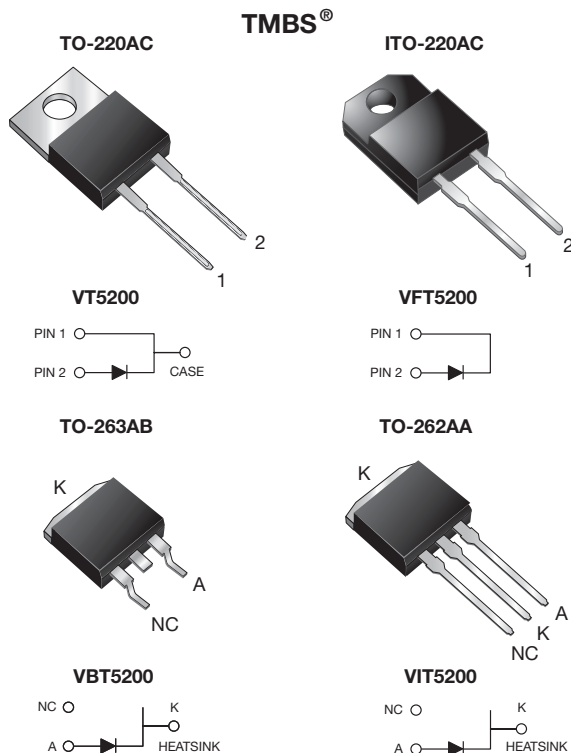


# Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.58 \text{ V}$  at  $I_F = 2.5 \text{ A}$



## FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 275 °C max. 10 s, per JESD 22-B106 (for TO-220AC, ITO-220AC and TO-262AA package)
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

## TYPICAL APPLICATIONS

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

## MECHANICAL DATA

**Case:** TO-220AC, ITO-220AC, TO-263AB and TO-262AA  
Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS compliant, commercial grade

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

E3 suffix meets JESD 201 class 1A whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs max.

## PRIMARY CHARACTERISTICS

|                                |                                         |
|--------------------------------|-----------------------------------------|
| $I_{F(AV)}$                    | 5.0 A                                   |
| $V_{RRM}$                      | 200 V                                   |
| $I_{FSM}$                      | 80 A                                    |
| $V_F$ at $I_F = 5.0 \text{ A}$ | 0.65 V                                  |
| $T_J$ max.                     | 150 °C                                  |
| Package                        | TO-220AC, ITO-220AC, TO-263AB, TO-262AA |
| Diode variation                | Single                                  |

## MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)

| PARAMETER                                                                                                         | SYMBOL         | VT5200        | VFT5200 | VBT5200 | VIT5200 | UNIT             |
|-------------------------------------------------------------------------------------------------------------------|----------------|---------------|---------|---------|---------|------------------|
| Max. repetitive peak reverse voltage                                                                              | $V_{RRM}$      | 200           |         |         |         | V                |
| Max. average forward rectified current (fig. 1)                                                                   | $I_{F(AV)}$    | 5.0           |         |         |         | A                |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load                                | $I_{FSM}$      | 80            |         |         |         | A                |
| Non-repetitive avalanche energy at $T_J = 25 \text{ °C}$ , $L = 60 \text{ mH}$                                    | $E_{AS}$       | 30            |         |         |         | mJ               |
| Peak repetitive reverse current at $t_p = 2 \text{ } \mu\text{s}$ , 1 kHz, $T_J = 38 \text{ °C} \pm 2 \text{ °C}$ | $I_{RRM}$      | 0.5           |         |         |         | A                |
| Voltage rate of change (rated $V_R$ )                                                                             | $dV/dt$        | 10 000        |         |         |         | V/ $\mu\text{s}$ |
| Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1 \text{ min}$                                  | $V_{AC}$       | 1500          |         |         |         | V                |
| Operating junction and storage temperature range                                                                  | $T_J, T_{STG}$ | - 40 to + 150 |         |         |         | °C               |



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                         |                         |                               |            |      |      |
|----------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------------|------------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS         |                         | SYMBOL                        | TYP.       | MAX. | UNIT |
| Breakdown voltage                                                          | I <sub>R</sub> = 1.0 mA | T <sub>A</sub> = 25 °C  | V <sub>BR</sub>               | 200 (min.) | -    | V    |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 2.5 A  | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.81       | -    | V    |
|                                                                            | I <sub>F</sub> = 5.0 A  |                         |                               | 1.10       | 1.60 |      |
|                                                                            | I <sub>F</sub> = 2.5 A  | T <sub>A</sub> = 125 °C |                               | 0.58       | -    |      |
|                                                                            | I <sub>F</sub> = 5.0 A  |                         |                               | 0.65       | 0.73 |      |
| Reverse current                                                            | V <sub>R</sub> = 180 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 1.7        | -    | μA   |
|                                                                            |                         | T <sub>A</sub> = 125 °C |                               | 1.8        | -    | mA   |
|                                                                            | V <sub>R</sub> = 200 V  | T <sub>A</sub> = 25 °C  |                               | -          | 150  | μA   |
|                                                                            |                         | T <sub>A</sub> = 125 °C |                               | 2.5        | 10   | mA   |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

| THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |        |         |         |         |                      |
|--------------------------------------------------------------------------------------|-----------------|--------|---------|---------|---------|----------------------|
| PARAMETER                                                                            | SYMBOL          | VT5200 | VFT5200 | VBT5200 | VIT5200 | UNIT                 |
| Typical thermal resistance                                                           | $R_{\theta JC}$ | 3.5    | 7.0     | 3.5     | 3.5     | $^{\circ}\text{C/W}$ |

| ORDERING INFORMATION (Example) |               |                 |              |               |               |
|--------------------------------|---------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC                       | VT5200-E3/4W  | 1.82            | 4W           | 50/tube       | Tube          |
| ITO-220AC                      | VFT5200-E3/4W | 1.65            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VBT5200-E3/4W | 1.36            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VBT5200-E3/8W | 1.36            | 8W           | 800/reel      | Tape and reel |
| TO-262AA                       | VIT5200-E3/4W | 1.44            | 4W           | 50/tube       | Tube          |

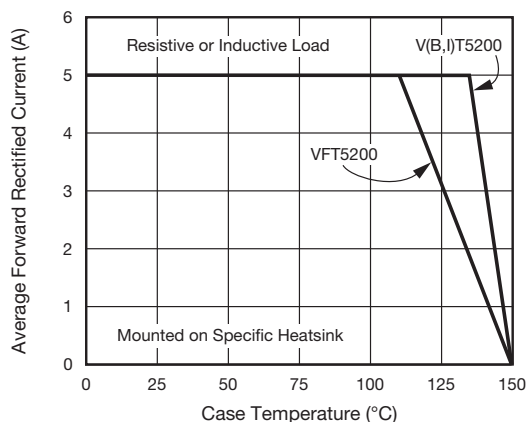
**RATINGS AND CHARACTERISTICS CURVES**( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Maximum Forward Current Derating Curve

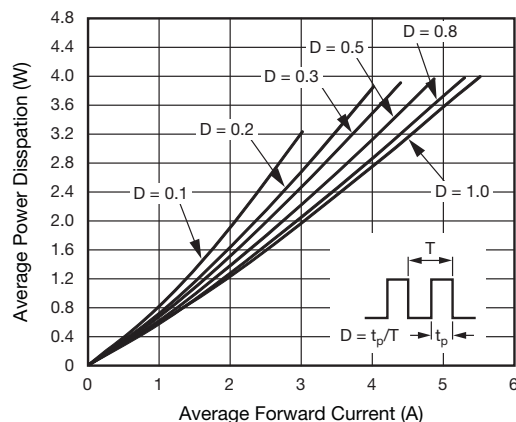


Fig. 2 - Forward Power Dissipation Characteristics

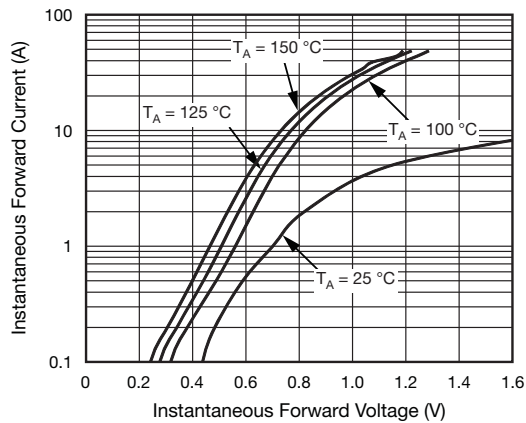


Fig. 3 - Typical Instantaneous Forward Characteristics

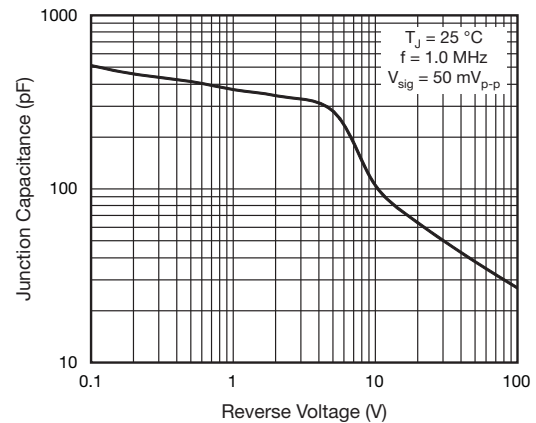


Fig. 5 - Typical Junction Capacitance

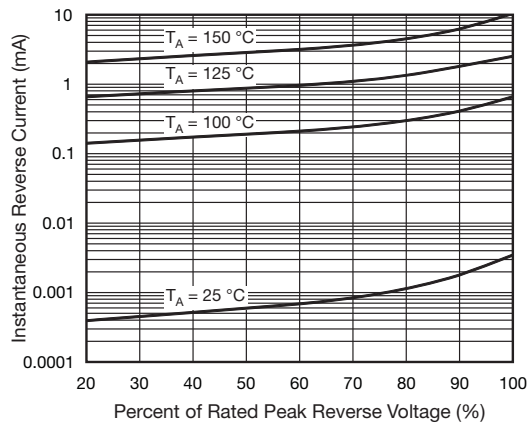


Fig. 4 - Typical Reverse Characteristics

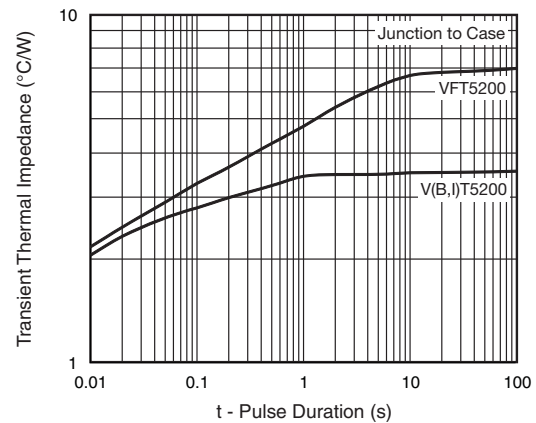
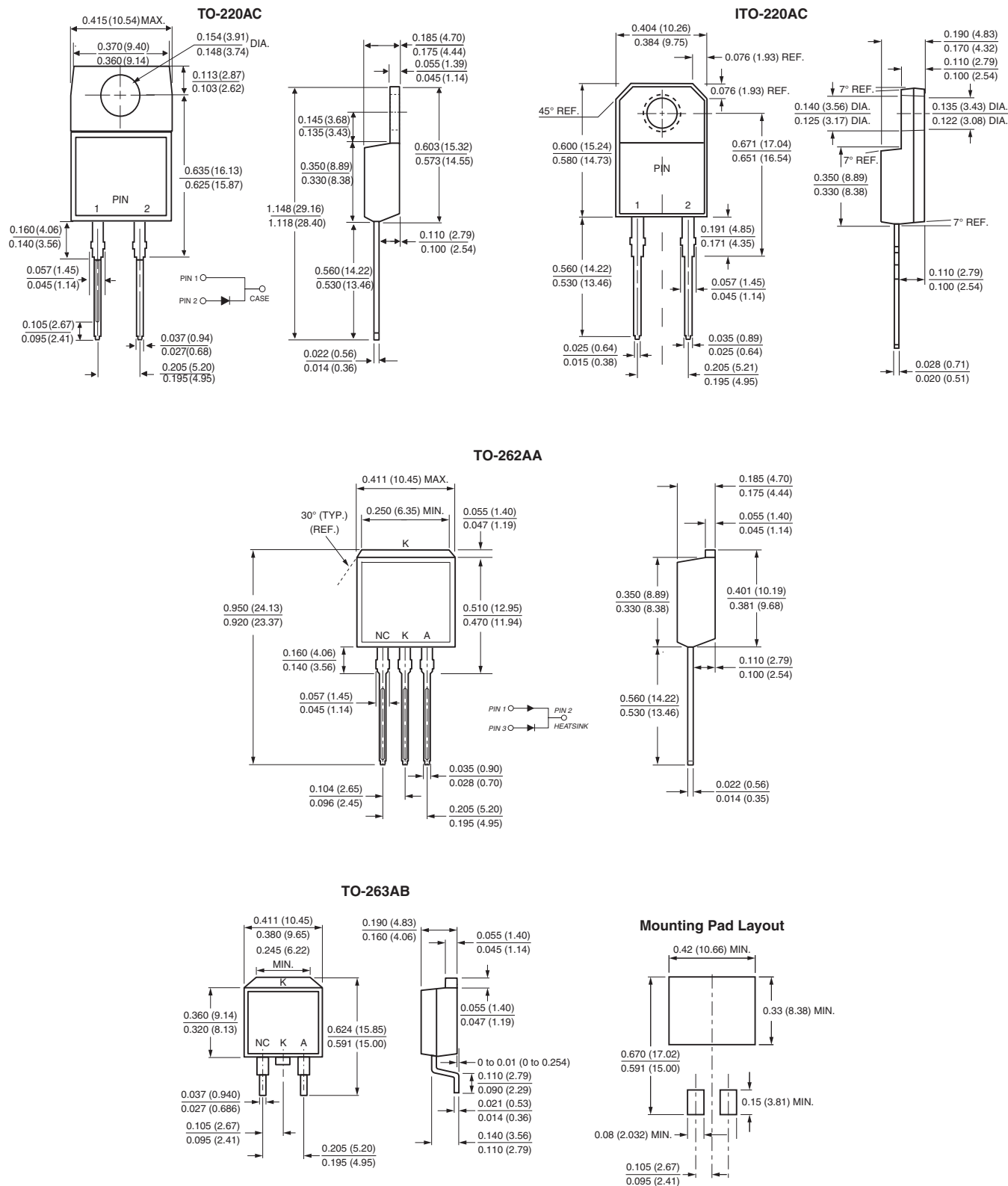


Fig. 6 - Typical Transient Thermal Impedance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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