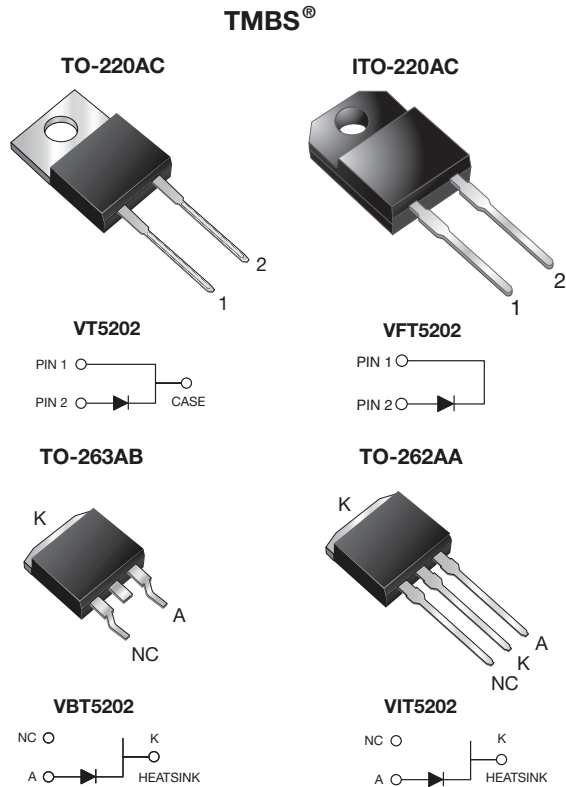


Trench MOS Barrier Schottky Rectifier

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


FEATURES

- Trench MOS Schottky technology Gen 2
- 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 bath temperature 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



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-220AC, ITO-220AC, TO-263AB, 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 max.

PRIMARY CHARACTERISTICS

| | |
|---|--|
| $I_{F(AV)}$ | 5.0 A |
| V_{RRM} | 200 V |
| I_{FSM} | 100 A |
| V_F at $I_F = 5.0 \text{ A}$ ($T_J = 125 \text{ °C}$) | 0.65 V |
| T_J max. | 175 °C |
| Package | TO-220AC, ITO-220AC, TO-263AB, TO-262AA |
| Diode variation | Single die |

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

| PARAMETER | SYMBOL | VT5202 | VFT5202 | VBT5202 | VIT5202 | UNIT |
|--|----------------|-------------|---------|---------|---------|------------|
| Maximum repetitive peak reverse voltage | V_{RRM} | 200 | | | | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 5.0 | | | | A |
| Maximum DC reverse voltage | V_{DC} | 160 | | | | V |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 100 | | | | A |
| Voltage rate of change (rated V_R) | dV/dt | 10 000 | | | | V/ μ 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 +175 | | | | °C |



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|----------------------|-----------------------------------|--------|------|------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode ⁽¹⁾ | $I_F = 2.5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | V_F | 0.74 | - | V |
| | $I_F = 5.0\text{ A}$ | | | 0.80 | 0.88 | |
| | $I_F = 2.5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.58 | - | |
| | $I_F = 5.0\text{ A}$ | | | 0.65 | 0.73 | |
| Reverse current ⁽²⁾ | $V_R = 160\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | I_R | 0.2 | - | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 0.4 | - | mA |
| | $V_R = 200\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 150 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 1.0 | 5 | mA |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width $\leq 5\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|---|--------|---------|---------|---------|--------------------|
| PARAMETER | SYMBOL | VT5202 | VFT5202 | VBT5202 | VIT5202 | UNIT |
| Typical thermal resistance | $R_{\theta\text{JC}}$ | 3.4 | 6.8 | 3.4 | | $^\circ\text{C/W}$ |
| | $R_{\theta\text{JA}}$ ⁽¹⁾⁽²⁾ | 52 | 60 | 52 | | |

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta\text{JA}}$
(2) Free air, without heatsink

| ORDERING INFORMATION (Example) | | | | | |
|---------------------------------------|---------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC | VT5202-M3/4W | 1.89 | 4W | 50/tube | Tube |
| ITO-220AC | VFT5202-M3/4W | 1.65 | 4W | 50/tube | Tube |
| TO-263AB | VBT5202-M3/4W | 1.38 | 4W | 50/tube | Tube |
| TO-263AB | VBT5202-M3/8W | 1.38 | 8W | 800/reel | Tape and reel |
| TO-262AA | VIT5202-M3/4W | 1.46 | 4W | 50/tube | Tube |



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

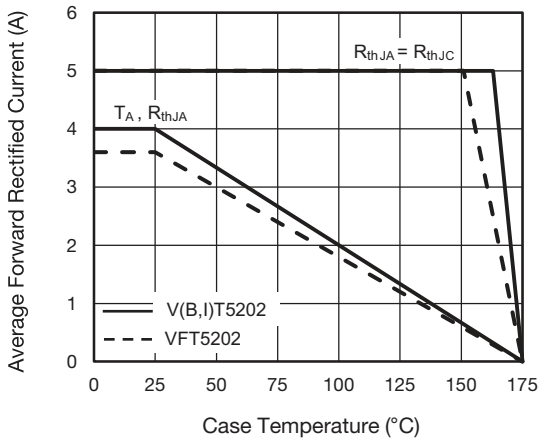


Fig. 1 - Maximum Forward Current Derating Curve

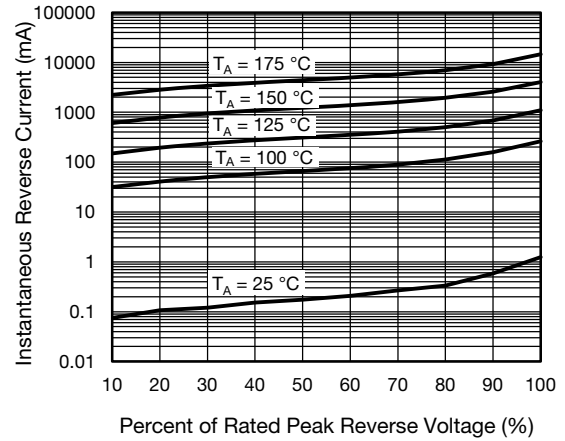


Fig. 4 - Typical Reverse Characteristics

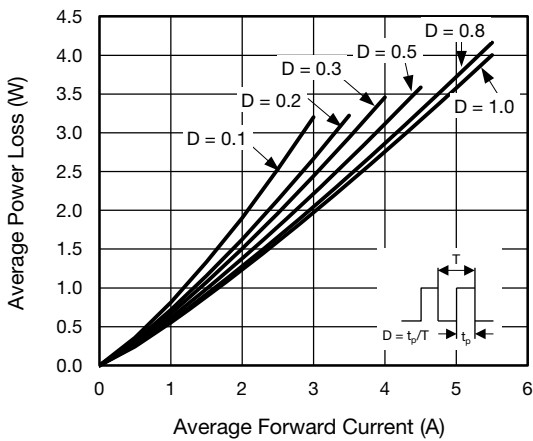


Fig. 2 - Forward Power Dissipation Characteristics

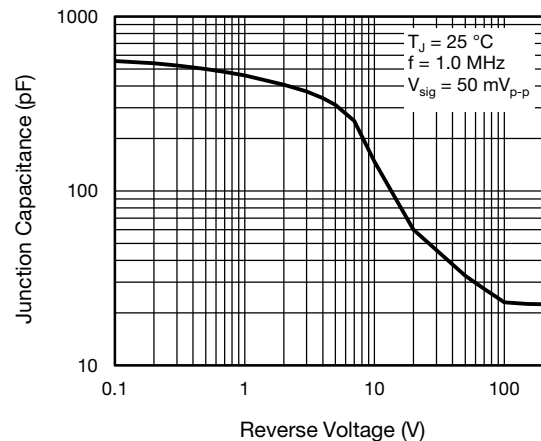


Fig. 5 - Typical Junction Capacitance

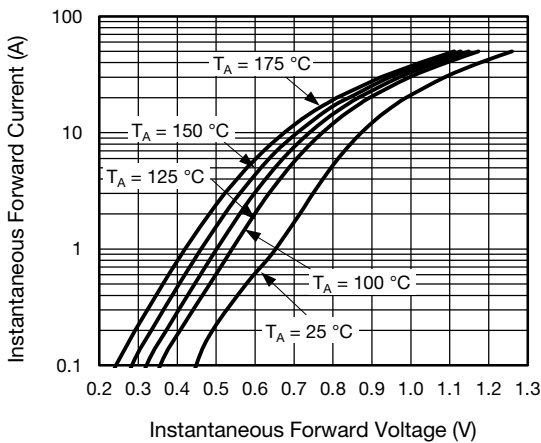


Fig. 3 - Typical Instantaneous Forward Characteristics

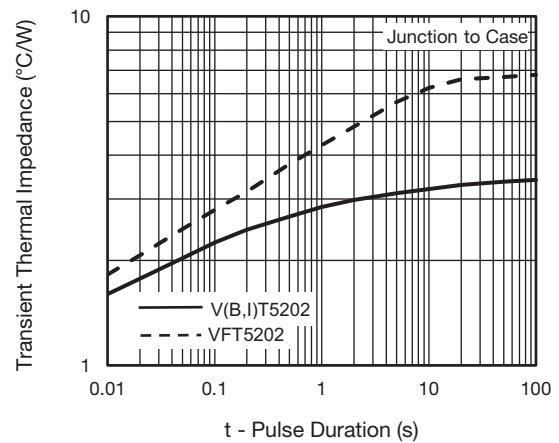
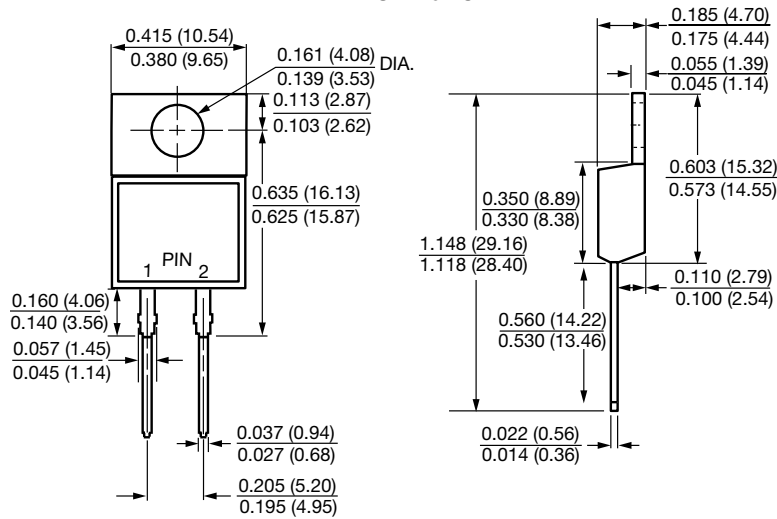


Fig. 6 - Typical Transient Thermal Impedance

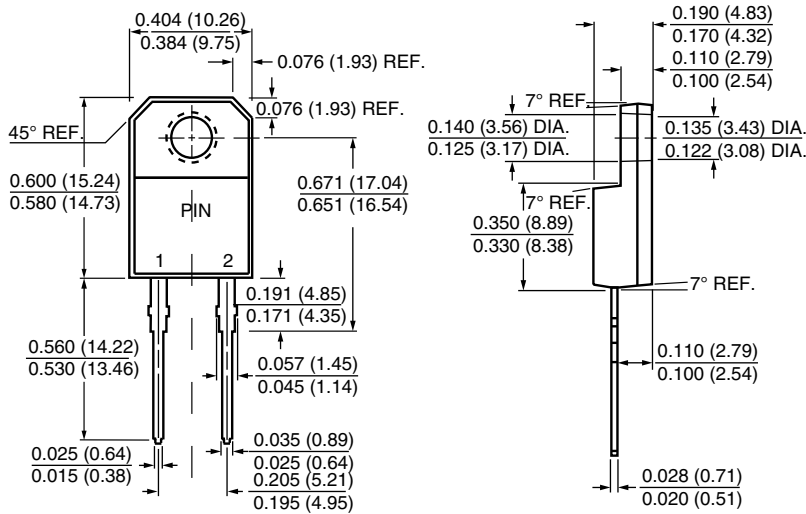


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

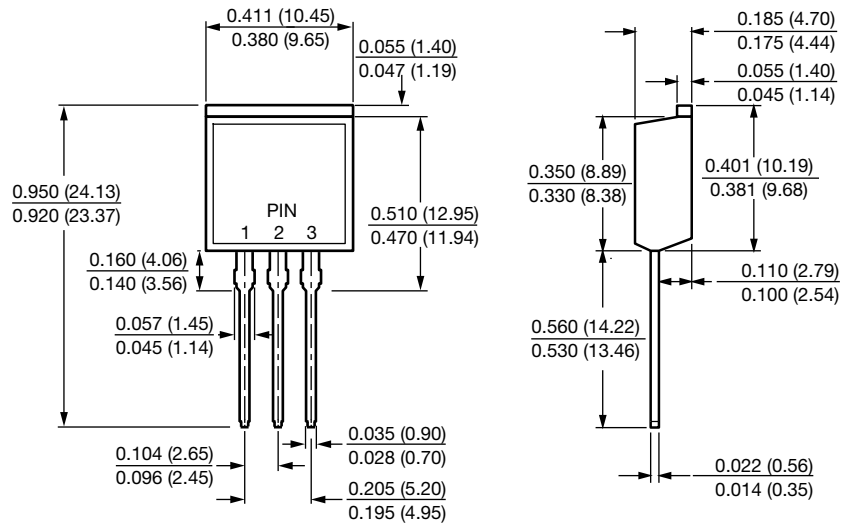
TO-220AC



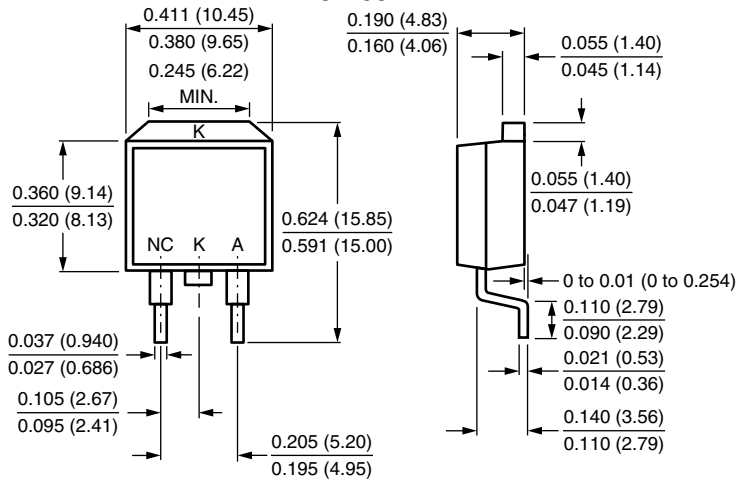
ITO-220AC



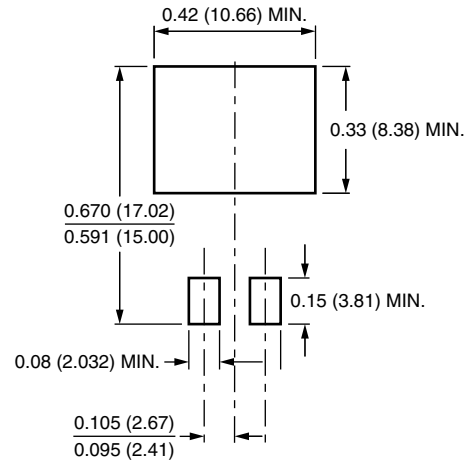
TO-262AA



TO-263AB



Mounting Pad Layout





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