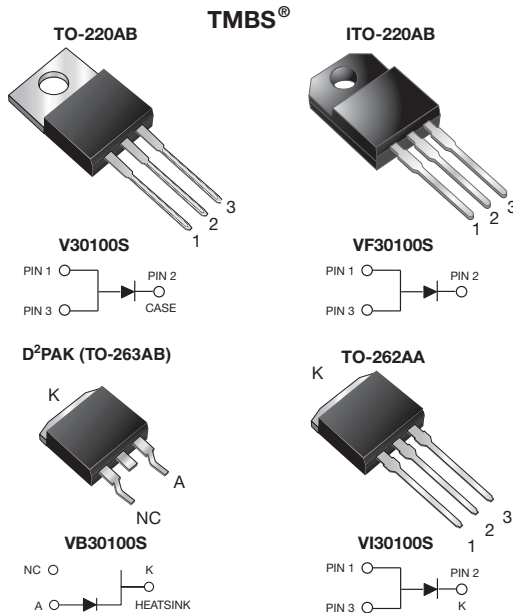




High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.39\text{ V}$ at $I_F = 5\text{ A}$



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- 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, ITO-220AB, and TO-262AA package)
- Material categorization: for definitions of compliance please see 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-220AB, ITO-220AB, D²PAK (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 maximum

DESIGN SUPPORT TOOLS

[click logo to get started](#)



| PRIMARY CHARACTERISTICS | |
|------------------------------|--|
| $I_{F(AV)}$ | 30 A |
| V_{RRM} | 100 V |
| I_{FSM} | 250 A |
| V_F at $I_F = 30\text{ A}$ | 0.69 V |
| T_J max. | 150 °C |
| Package | TO-220AB, ITO-220AB, D ² PAK (TO-263AB), TO-262AA |
| Circuit configuration | Single |

| MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted) | | | | | | |
|---|----------------|---------|----------|-------------|----------|------------------|
| PARAMETER | SYMBOL | V30100S | VF30100S | VB30100S | VI30100S | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | | | 100 | | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | | | 30 | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | | | 250 | | A |
| Non-repetitive avalanche energy at $T_J = 25\text{ °C}$, $L = 90\text{ mH}$ | E_{AS} | | | 230 | | 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} | | | 1.0 | | A |
| Voltage rate of change (rated V_R) | dV/dt | | | 10 000 | | V/ μs |
| Isolation voltage (ITO-220AB 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 ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|----------------------|-----------------------------------|-------------|---------------|------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Breakdown voltage | $I_R = 10\text{ mA}$ | $T_A = 25\text{ }^\circ\text{C}$ | V_{BR} | 105 (minimum) | - | V |
| Instantaneous forward voltage | $I_F = 5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.47 | - | V |
| | $I_F = 10\text{ A}$ | | | 0.55 | - | |
| | $I_F = 30\text{ A}$ | | | 0.80 | 0.91 | |
| | $I_F = 5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.39 | - | |
| | $I_F = 10\text{ A}$ | | | 0.49 | - | |
| | $I_F = 30\text{ A}$ | | | 0.69 | 0.78 | |
| Reverse current | $V_R = 70\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 27 | - | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 11 | - | mA |
| | $V_R = 100\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | 70 | 1000 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 23 | 45 | mA |

Notes

- (1) Pulse test: 300 μs 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 | V30100S | VF30100S | VB30100S | VI30100S | UNIT |
| Typical thermal resistance | $R_{\theta JC}$ | 2.0 | 4.0 | 2.0 | 2.0 | $^\circ\text{C/W}$ |

| ORDERING INFORMATION (Example) | | | | | |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB | V30100S-E3/4W | 1.875 | 4W | 50/tube | Tube |
| ITO-220AB | VF30100S-E3/4W | 1.805 | 4W | 50/tube | Tube |
| TO-263AB | VB30100S-E3/4W | 1.380 | 4W | 50/tube | Tube |
| TO-263AB | VB30100S-E3/8W | 1.380 | 8W | 800/reel | Tape and reel |
| TO-262AA | VI30100S-E3/4W | 1.455 | 4W | 50/tube | Tube |

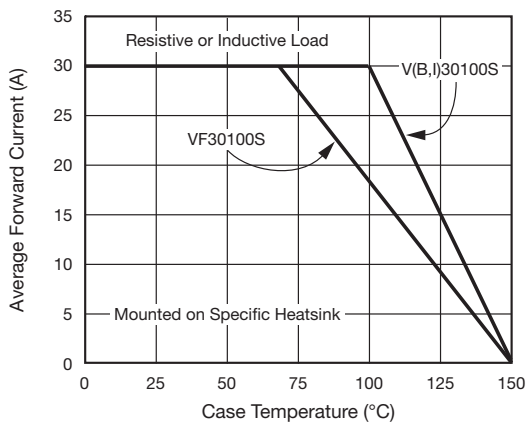
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

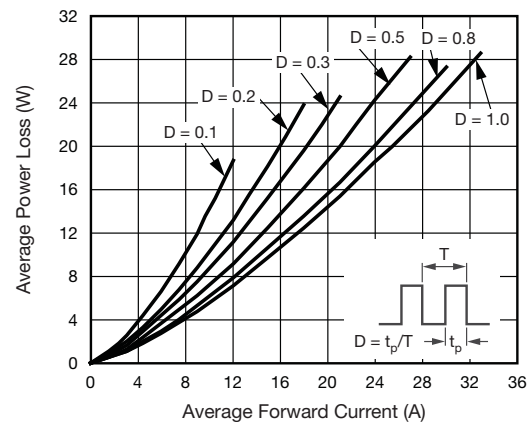


Fig. 2 - Forward Power Loss Characteristics

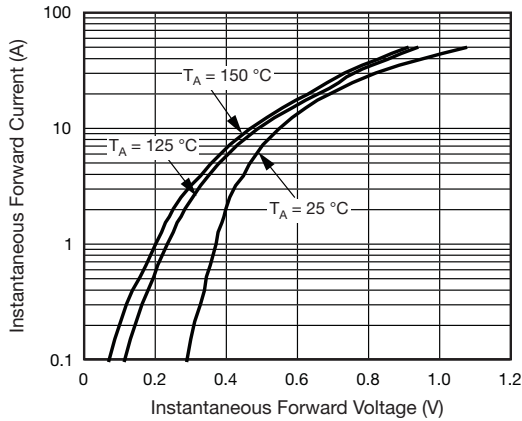


Fig. 3 - Typical Instantaneous Forward Characteristics

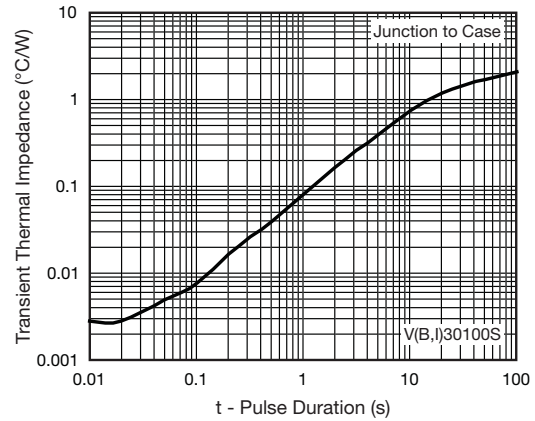


Fig. 6 - Typical Transient Thermal Impedance

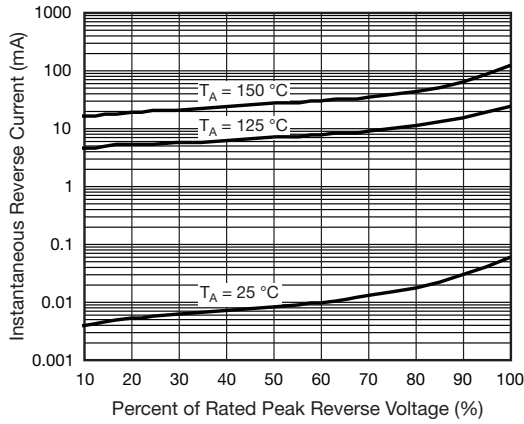


Fig. 4 - Typical Reverse Characteristics

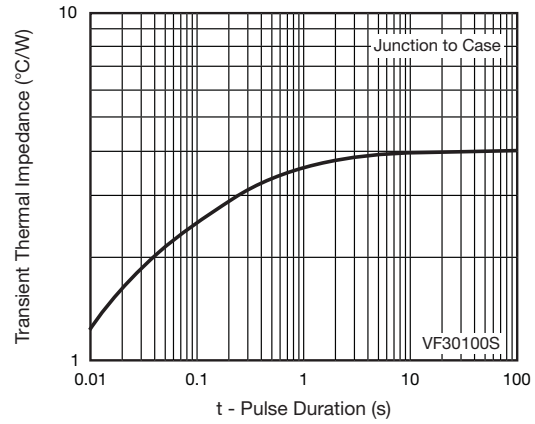


Fig. 7 - Typical Transient Thermal Impedance

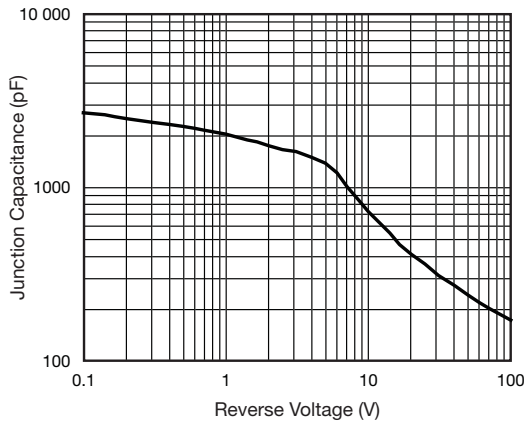
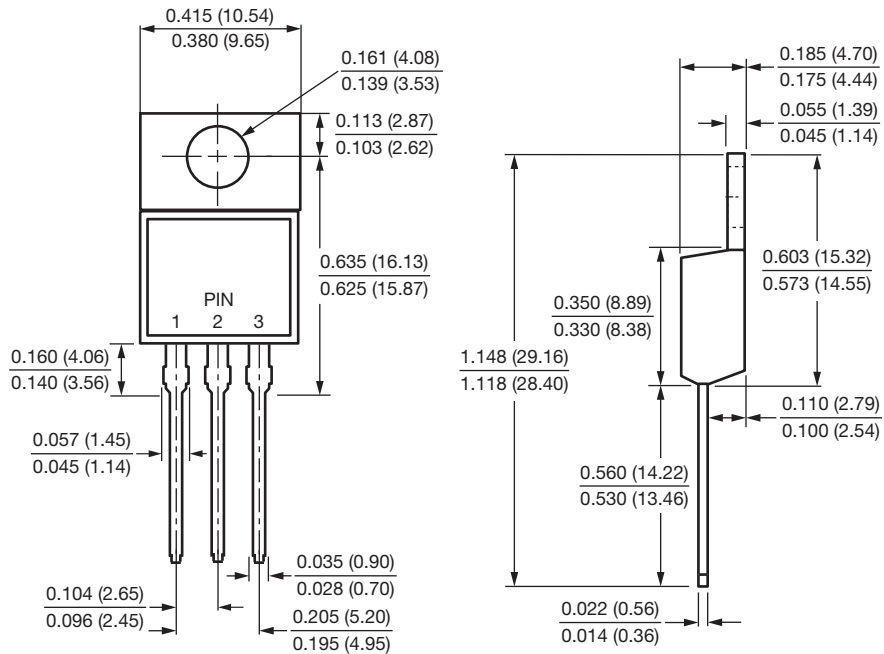


Fig. 5 - Typical Junction Capacitance

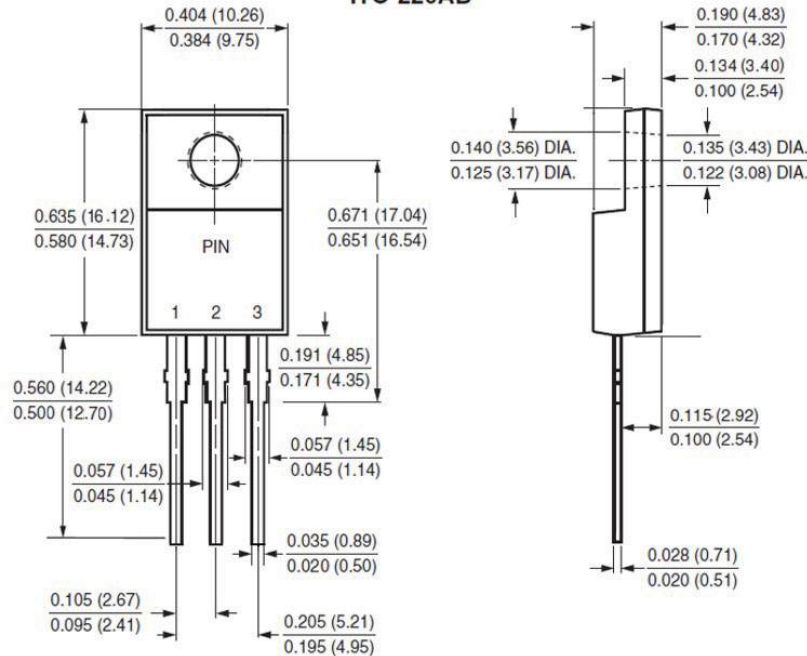


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

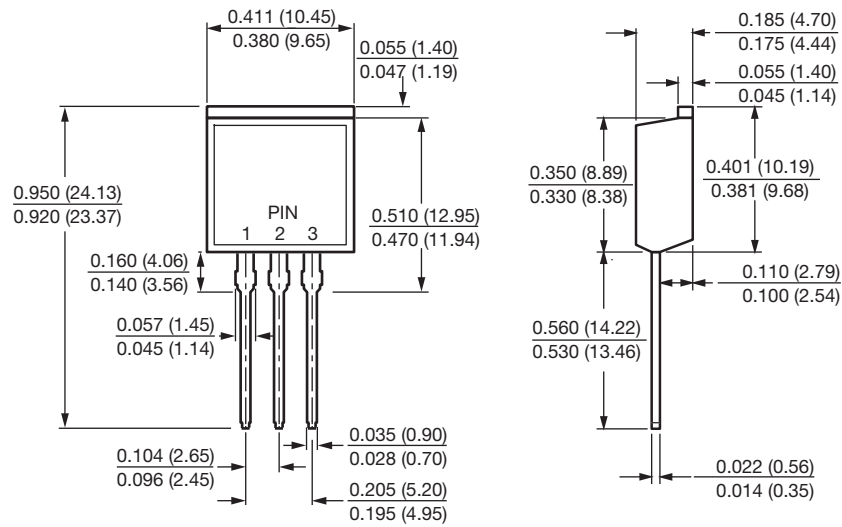
TO-220AB



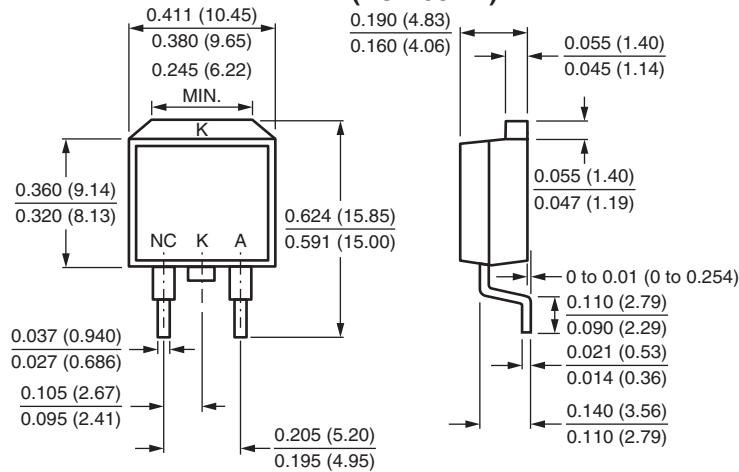
ITO-220AB



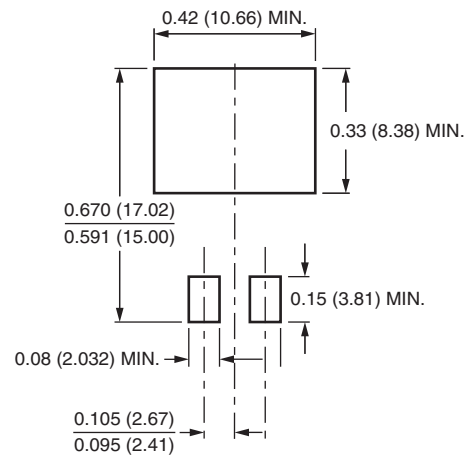
TO-262AA



D²PAK (TO-263AB)



Mounting Pad Layout





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