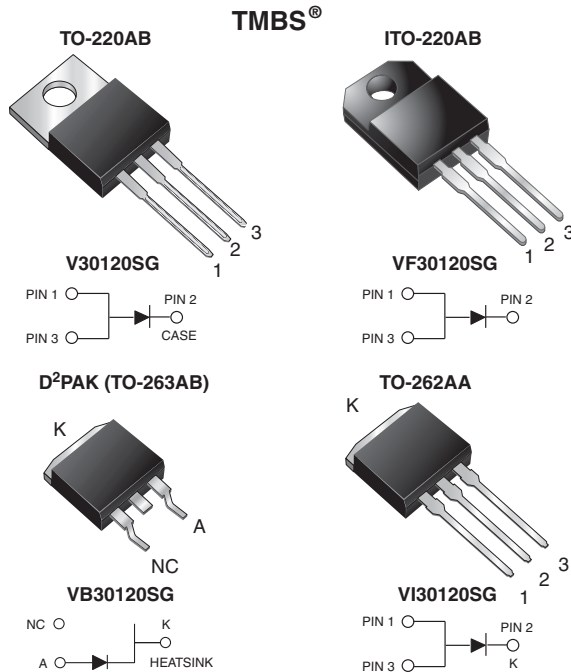




High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.47\text{ V}$ at $I_F = 5\text{ A}$



DESIGN SUPPORT TOOLS

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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 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 max.

| PRIMARY CHARACTERISTICS | |
|------------------------------|---|
| $I_{F(AV)}$ | 30 A |
| V_{RRM} | 120 V |
| I_{FSM} | 220 A |
| V_F at $I_F = 30\text{ A}$ | 0.81 V |
| T_J max. | 150 °C |
| Package | TO-220AB, ITO-220AB, D²PAK (TO-263AB), TO-262AA |
| Circuit configurations | Single |

| MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted) | | | | | | |
|---|----------------|----------|-----------|-------------|-----------|------------------|
| PARAMETER | SYMBOL | V30120SG | VF30120SG | VB30120SG | VI30120SG | UNIT |
| Max. repetitive peak reverse voltage | V_{RRM} | | | 120 | | V |
| Max. 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} | | | 220 | | A |
| Non-repetitive avalanche energy at $T_J = 25\text{ °C}$, $L = 60\text{ mH}$ | E_{AS} | | | 175 | | 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/ 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 °C unless otherwise noted) | | | | | | |
|--|--|-------------------------|-----------------|------------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Breakdown voltage | I _R = 1.0 mA | T _A = 25 °C | V _{BR} | 120 (min.) | - | V |
| Instantaneous forward voltage ⁽¹⁾ | I _F = 5 A I _F = 15 A I _F = 30 A | T _A = 25 °C | V _F | 0.54 | - | V |
| | | | | 0.80 | - | |
| | | | | 1.16 | 1.28 | |
| | I _F = 5 A I _F = 15 A I _F = 30 A | T _A = 125 °C | | 0.47 | - | |
| | | | | 0.66 | - | |
| | | | | 0.81 | 0.90 | |
| Reverse current ⁽²⁾ | V _R = 90 V | T _A = 25 °C | I _R | 13 | - | μA |
| | | T _A = 125 °C | | 13 | - | mA |
| | V _R = 120 V | T _A = 25 °C | | - | 500 | μA |
| | | T _A = 125 °C | | 23 | 55 | 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 | V30120SG | VF30120SG | VB30120SG | VI30120SG | UNIT |
| Typical thermal resistance | R _{θJC} | 1.6 | 4.0 | 1.6 | 1.6 | °C/W |

| ORDERING INFORMATION (Example) | | | | | |
|--------------------------------|-----------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB | V30120SG-E3/4W | 1.88 | 4W | 50/tube | Tube |
| ITO-220AB | VF30120SG-E3/4W | 1.75 | 4W | 50/tube | Tube |
| TO-263AB | VB30120SG-E3/4W | 1.39 | 4W | 50/tube | Tube |
| TO-263AB | VB30120SG-E3/8W | 1.39 | 8W | 800/reel | Tape and reel |
| TO-262AA | VI30120SG-E3/4W | 1.45 | 4W | 50/tube | Tube |

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

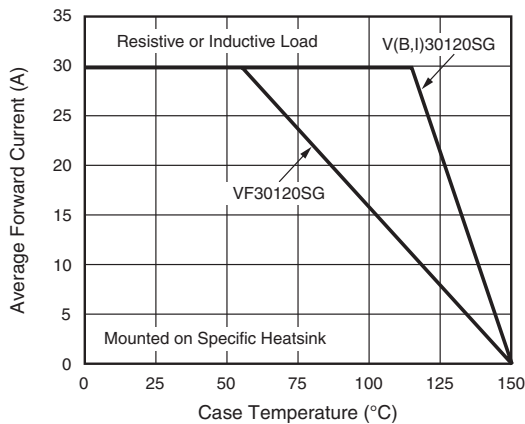


Fig. 1 - Forward Current Derating Curve

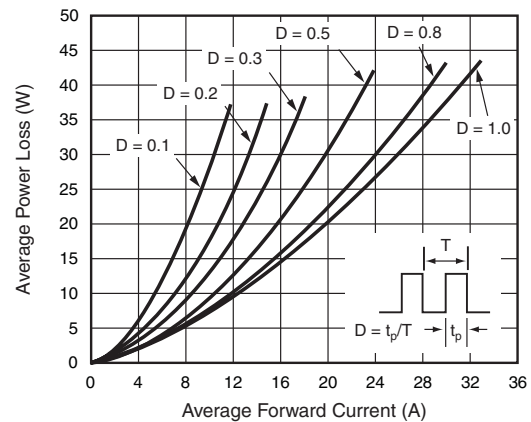


Fig. 2 - Forward Power Loss Characteristics

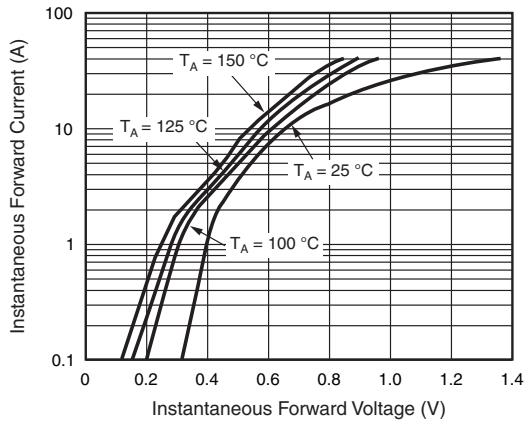


Fig. 3 - Typical Instantaneous Forward Characteristics

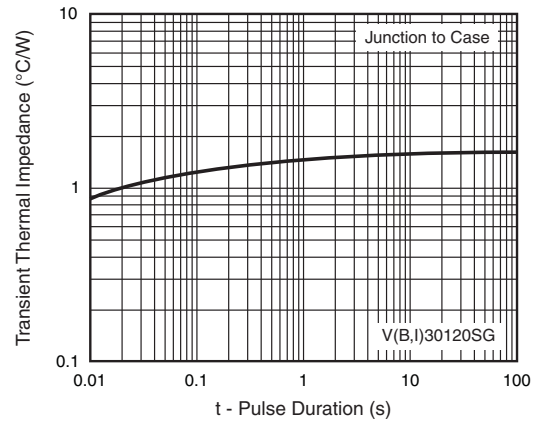


Fig. 6 - Typical Transient Thermal Impedance

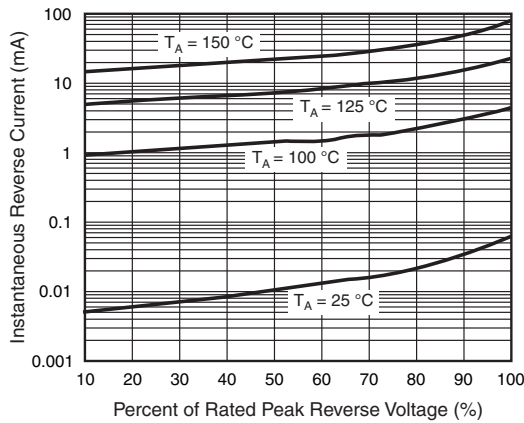


Fig. 4 - Typical Reverse Characteristics

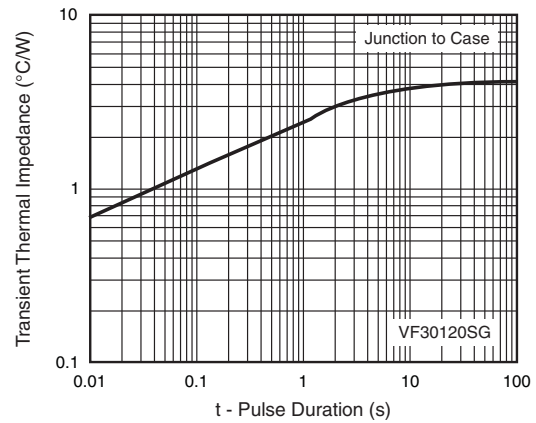


Fig. 7 - Typical Transient Thermal Impedance

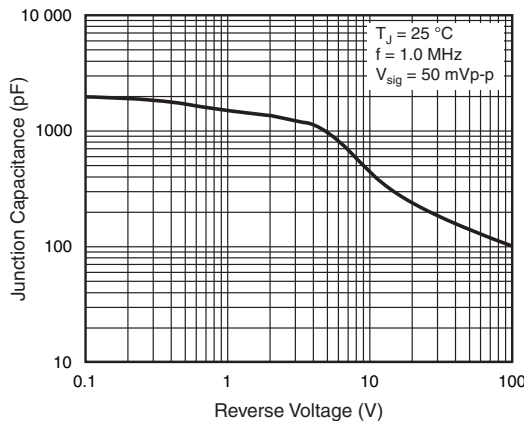
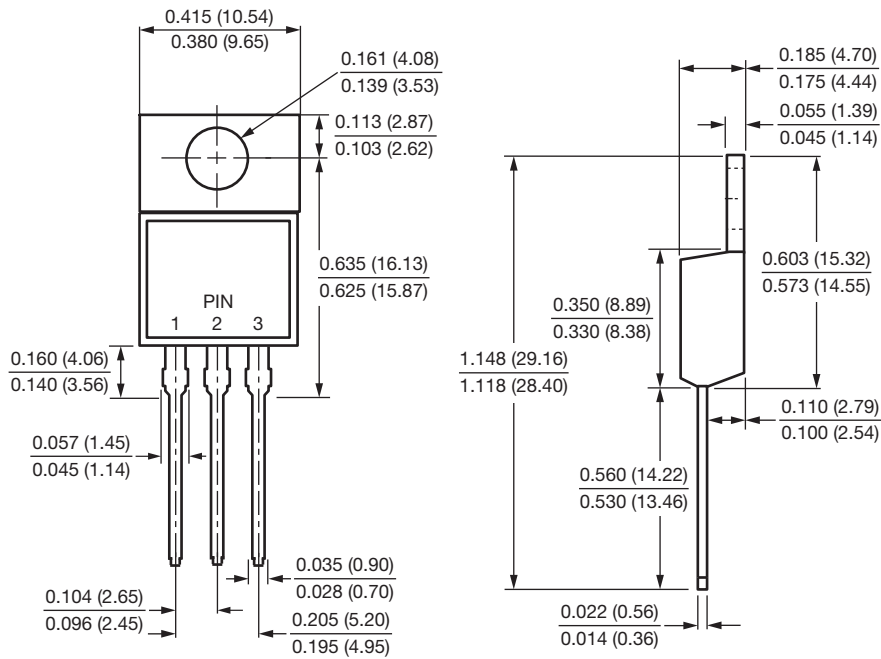


Fig. 5 - Typical Junction Capacitance

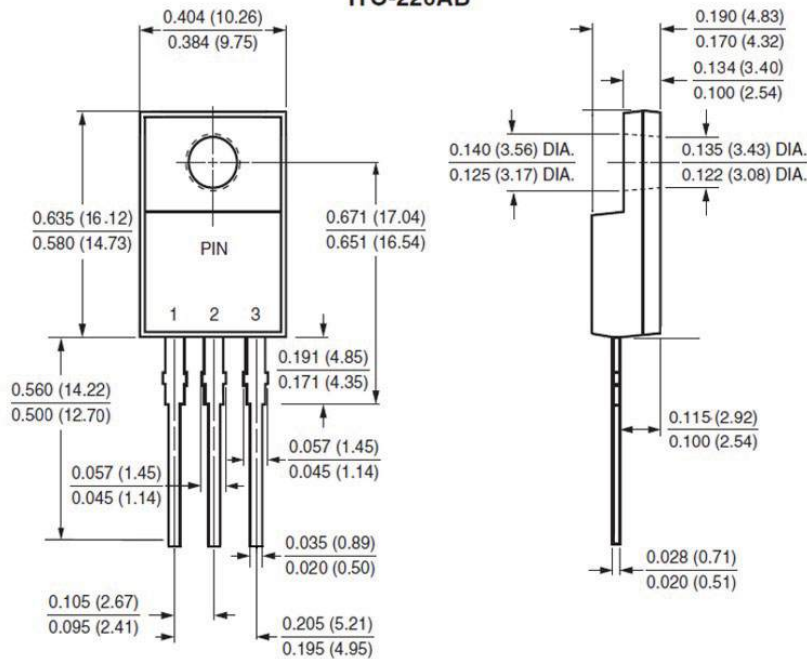


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB

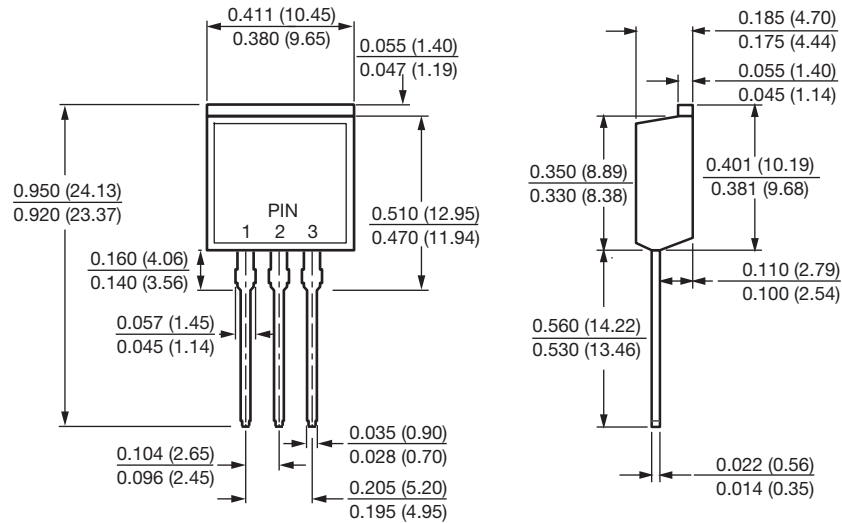


ITO-220AB

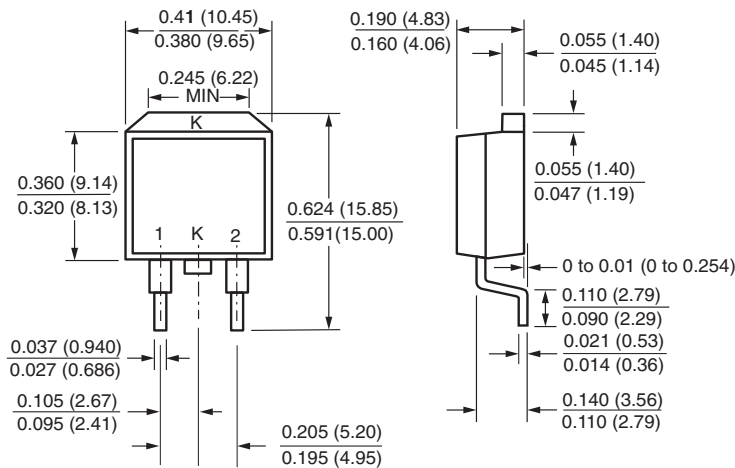




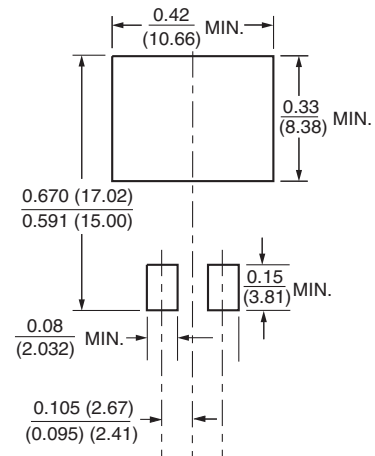
TO-262AA



D²PAK (TO-263AB)



Mounting Pad Layout





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