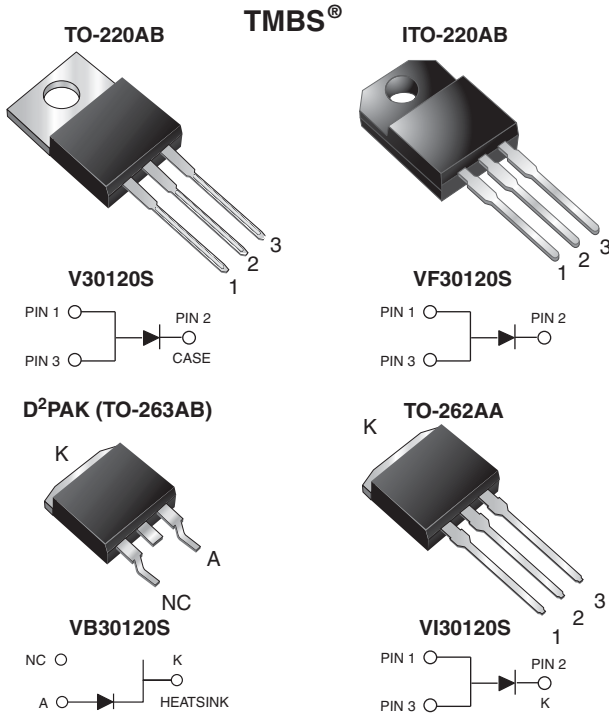


High Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low $V_F = 0.43 \text{ V}$ at $I_F = 5 \text{ A}$


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 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
 HALOGEN
 FREE

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-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 (for TO-220AB, ITO-220AB and TO-262AA package) and class 2 whisker test (for TO-263AB package)

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} | 120 V |
| I_{FSM} | 300 A |
| V_F at $I_F = 30 \text{ A}$ | 0.74 V |
| $T_J \text{ max.}$ | 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 | V30120S | VF30120S | VB30120S | VI30120S | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 120 | | | | 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 per diode | I_{FSM} | 300 | | | | A |
| 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 | |
| Instantaneous forward voltage per diode ⁽¹⁾ | I _F = 5 A | T _A = 25 °C | V _F | 0.50 | - | V |
| | I _F = 15 A | | | 0.70 | - | |
| | I _F = 30 A | | | 0.99 | 1.10 | |
| | I _F = 5 A | T _A = 125 °C | | 0.43 | - | |
| | I _F = 15 A | | | 0.60 | - | |
| | I _F = 30 A | | | 0.74 | 0.82 | |
| Reverse current per diode ⁽²⁾ | V _R = 90 V | T _A = 25 °C | I _R | 18 | - | μA |
| | | T _A = 125 °C | | 12 | - | mA |
| | V _R = 120 V | T _A = 25 °C | | - | 500 | μA |
| | | T _A = 125 °C | | 22 | 35 | 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 | V30120S | VF30120S | VB30120S | VI30120S | UNIT |
| Typical thermal resistance per diode | 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 | V30120S-M3/4W | 1.88 | 4W | 50/tube | Tube |
| ITO-220AB | VF30120S-M3/4W | 1.75 | 4W | 50/tube | Tube |
| TO-263AB | VB30120S-M3/4W | 1.39 | 4W | 50/tube | Tube |
| TO-263AB | VB30120S-M3/8W | 1.39 | 8W | 800/reel | Tape and reel |
| TO-262AA | VI30120S-M3/4W | 1.46 | 4W | 50/tube | Tube |

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

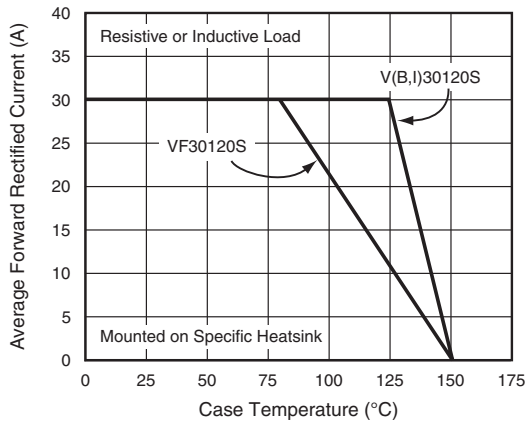


Fig. 1 - Forward Current Derating Curve

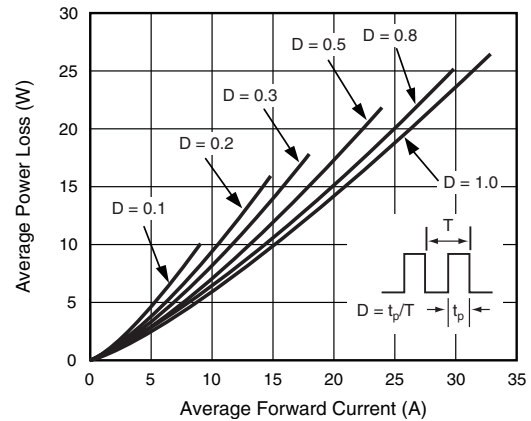


Fig. 2 - Forward Power Loss Characteristics Per Diode

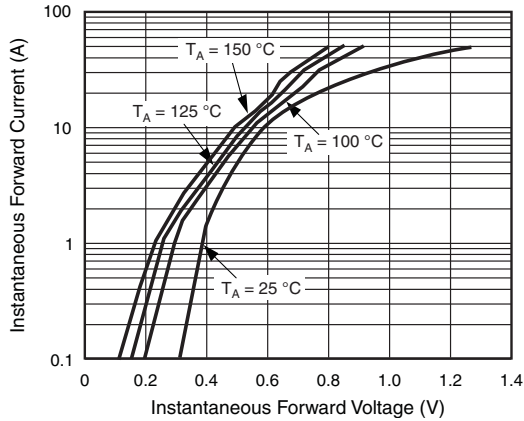


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

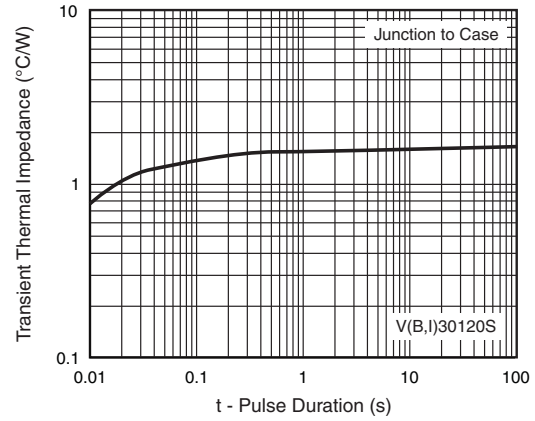


Fig. 6 - Typical Transient Thermal Impedance Per Diode

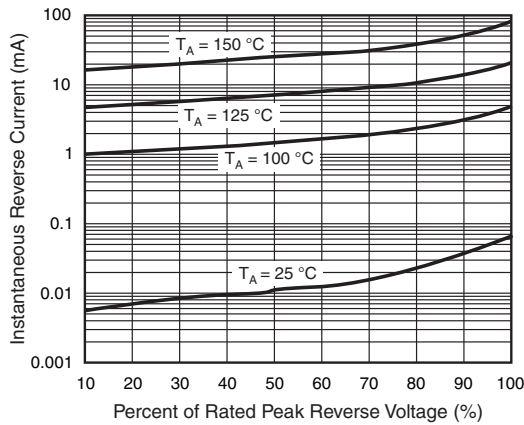


Fig. 4 - Typical Reverse Characteristics Per Diode

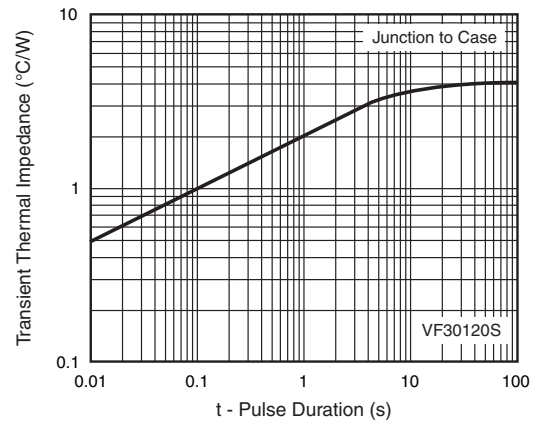


Fig. 7 - Typical Transient Thermal Impedance Per Diode

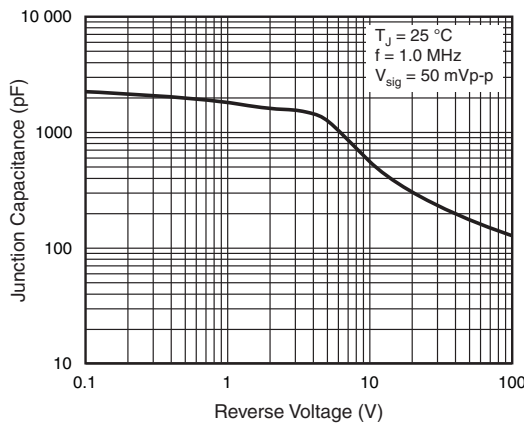
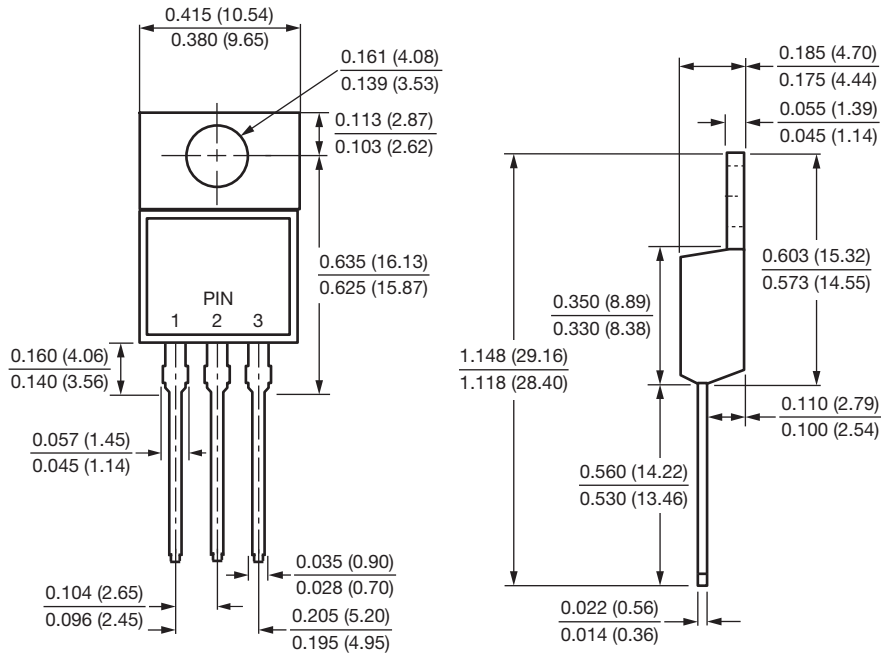


Fig. 5 - Typical Junction Capacitance Per Diode

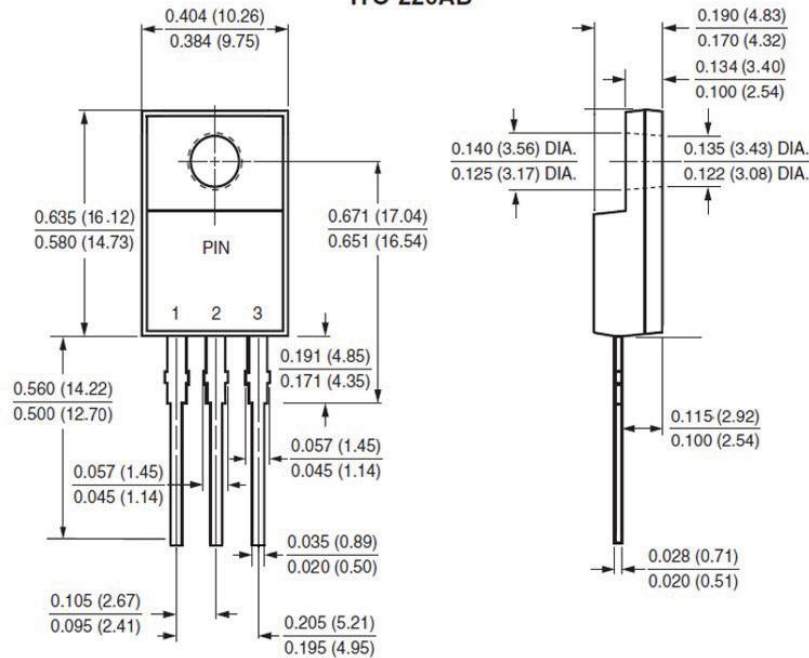


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB

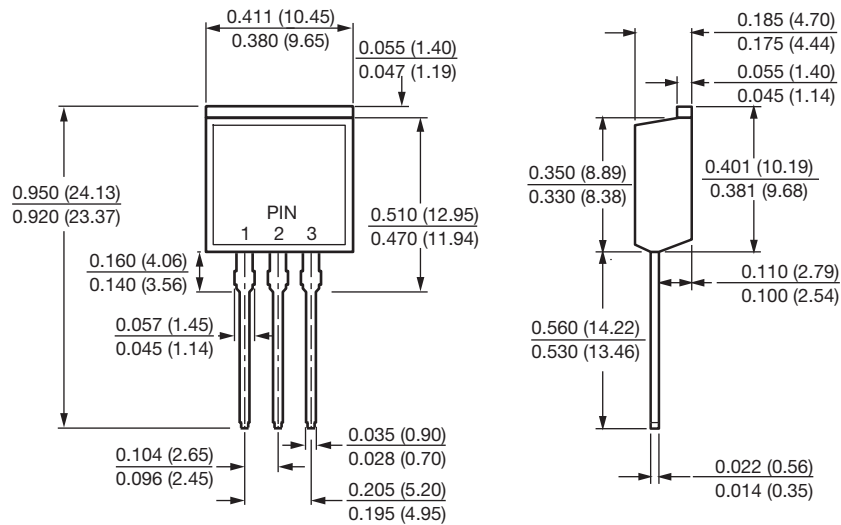


ITO-220AB

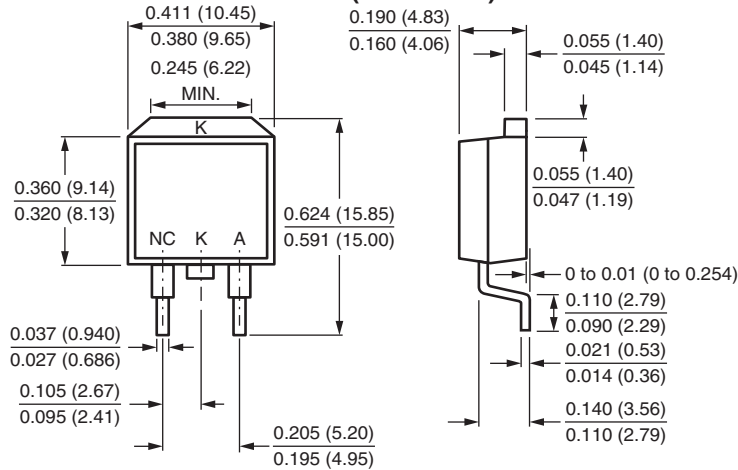




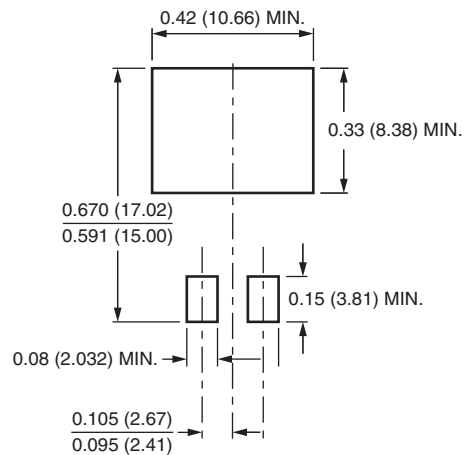
TO-262AA



D²PAK (TO-263AB)



Mounting Pad Layout





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