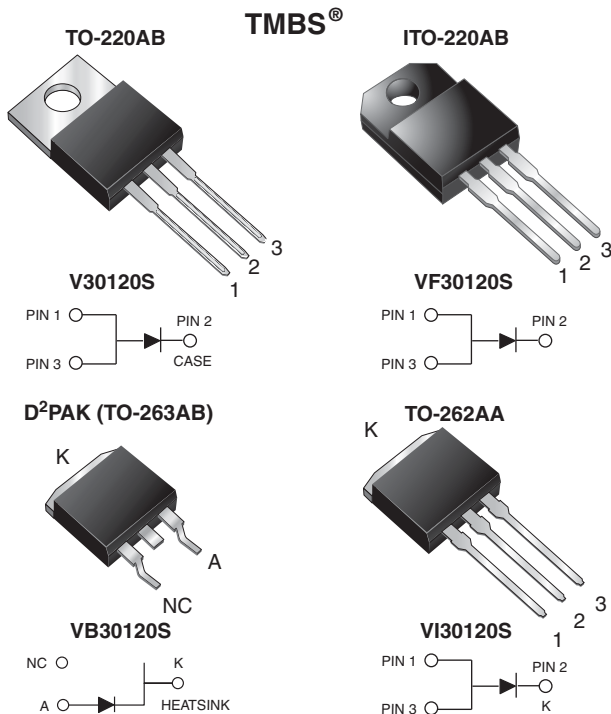


**High Voltage Trench MOS Barrier Schottky Rectifier**Ultra Low  $V_F = 0.43\text{ V}$  at  $I_F = 5\text{ A}$ **DESIGN SUPPORT TOOLS**

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                                                       |
| $T_J$ max.                   | 150 °C                                                       |
| Package                      | TO-220AB, ITO-220AB, D <sup>2</sup> PAK (TO-263AB), TO-262AA |
| Circuit configuration        | Single                                                       |

**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](http://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, D<sup>2</sup>PAK (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

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

| PARAMETER                                              | TEST CONDITIONS        |                         | SYMBOL         | TYP. | MAX. | UNIT |
|--------------------------------------------------------|------------------------|-------------------------|----------------|------|------|------|
| Instantaneous forward voltage per diode <sup>(1)</sup> | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> | 0.50 | -    | V    |
|                                                        | I <sub>F</sub> = 15 A  |                         |                | 0.70 | -    |      |
|                                                        | I <sub>F</sub> = 30 A  |                         |                | 0.99 | 1.10 |      |
|                                                        | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                | 0.43 | -    |      |
|                                                        | I <sub>F</sub> = 15 A  |                         |                | 0.60 | -    |      |
|                                                        | I <sub>F</sub> = 30 A  |                         |                | 0.74 | 0.82 |      |
| Reverse current per diode <sup>(2)</sup>               | V <sub>R</sub> = 90 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> | 18   | -    | μA   |
|                                                        |                        | T <sub>A</sub> = 125 °C |                | 12   | -    | mA   |
|                                                        | V <sub>R</sub> = 120 V | T <sub>A</sub> = 25 °C  |                | -    | 500  | μA   |
|                                                        |                        | T <sub>A</sub> = 125 °C |                | 22   | 35   | mA   |

**Notes**<sup>(1)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle<sup>(2)</sup> Pulse test: Pulse width  $\leq 40\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                            | SYMBOL          | V30120S | VF30120S | VB30120S | VI30120S | UNIT                 |
|--------------------------------------|-----------------|---------|----------|----------|----------|----------------------|
| Typical thermal resistance per diode | $R_{\theta JC}$ | 1.6     | 4.0      | 1.6      | 1.6      | $^{\circ}\text{C/W}$ |

**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          |

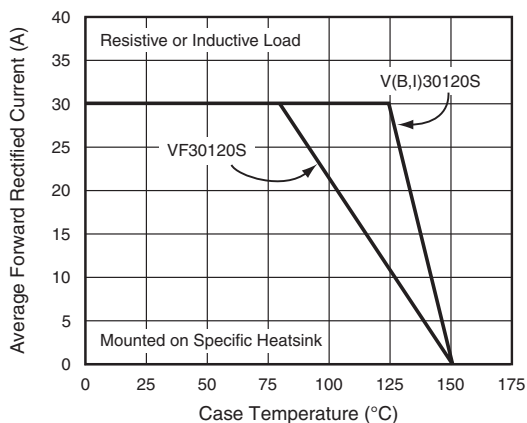
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

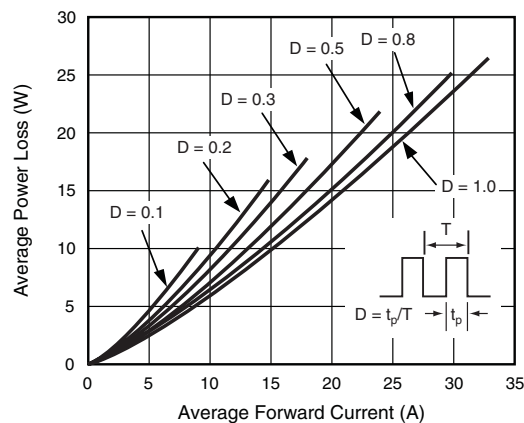


Fig. 2 - Forward Power Loss Characteristics Per Diode

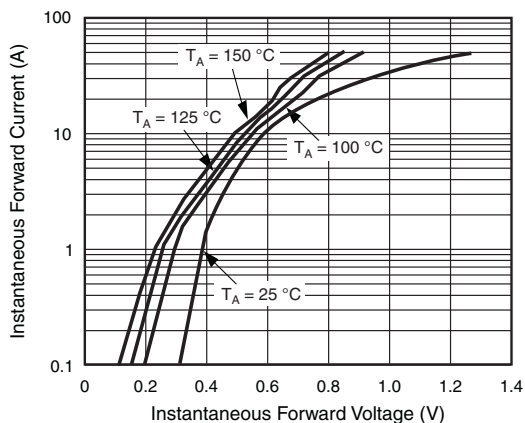


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

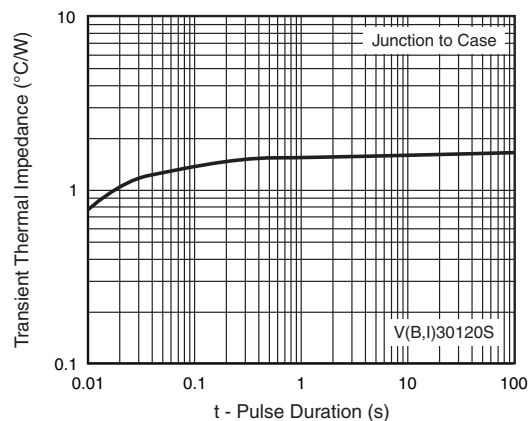


Fig. 6 - Typical Transient Thermal Impedance Per Diode

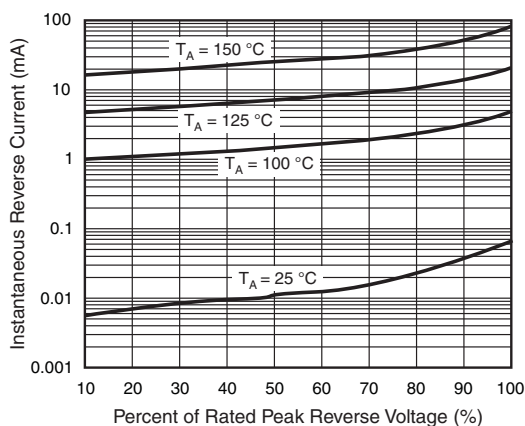


Fig. 4 - Typical Reverse Characteristics Per Diode

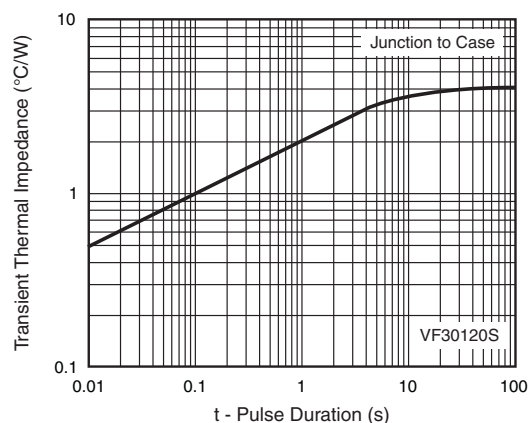


Fig. 7 - Typical Transient Thermal Impedance Per Diode

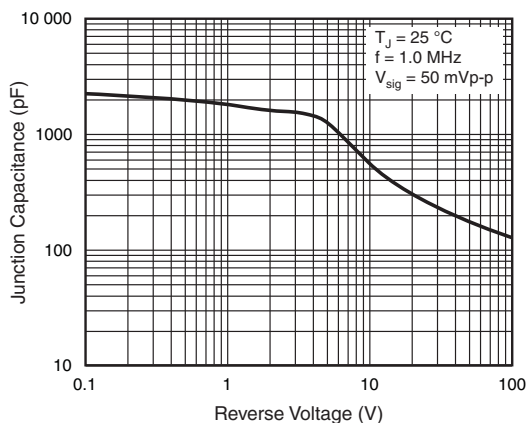
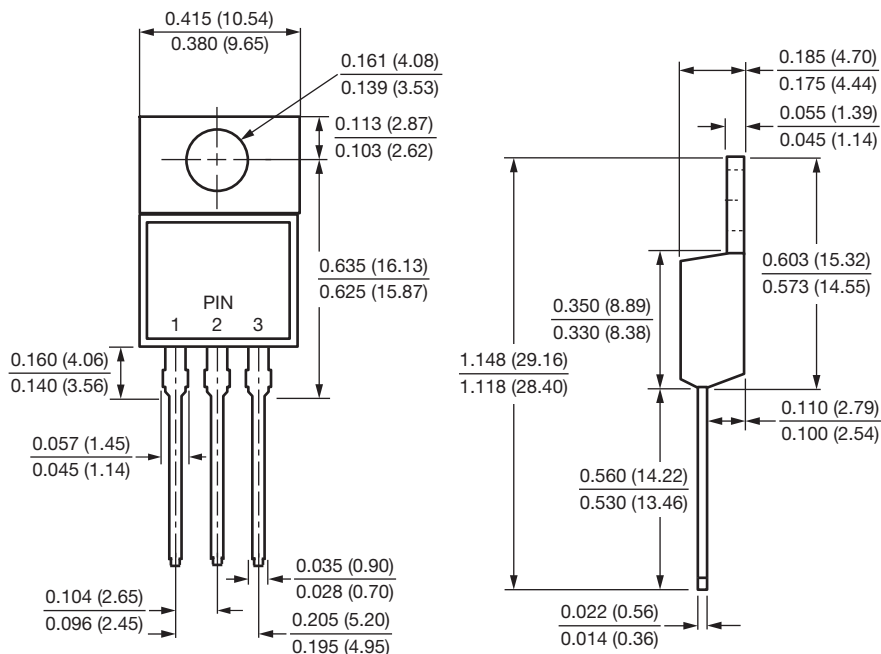


Fig. 5 - Typical Junction Capacitance Per Diode

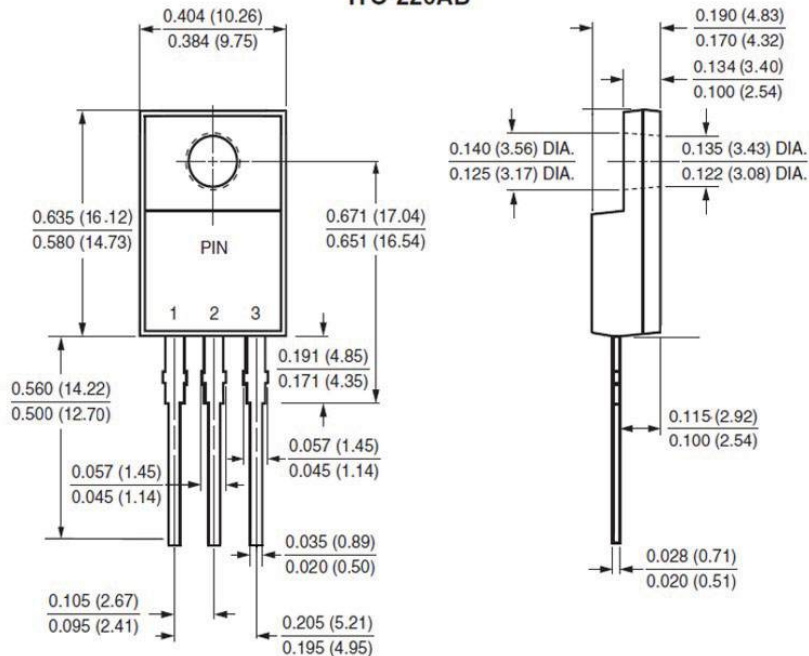


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-220AB

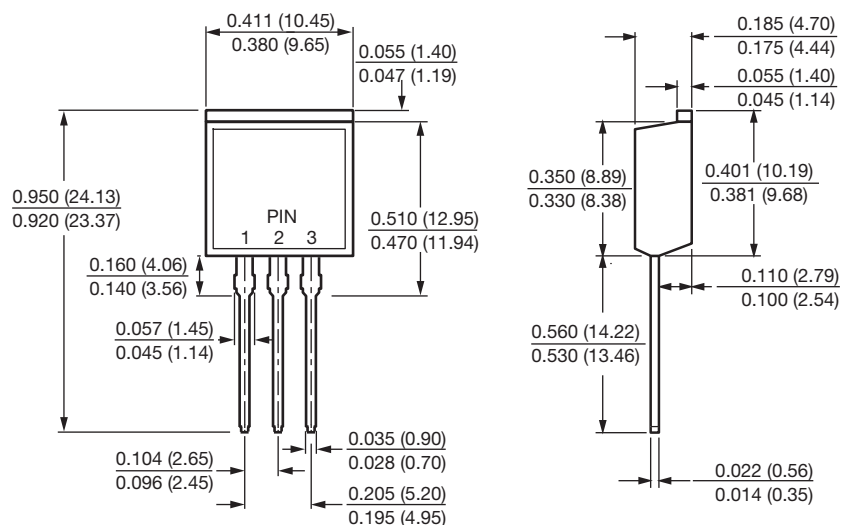


### ITO-220AB

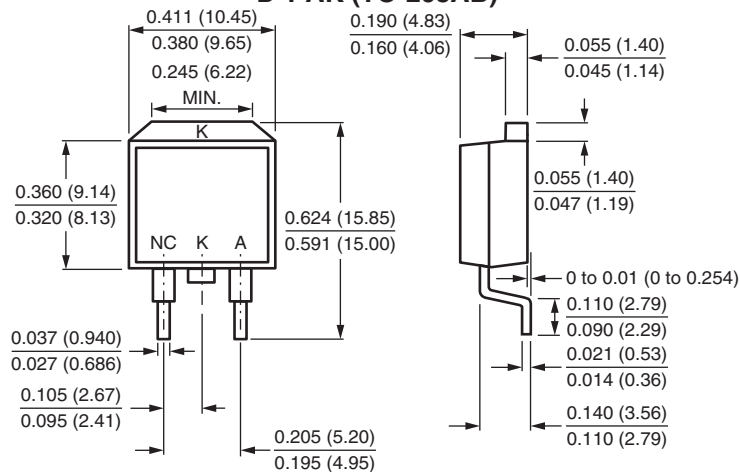




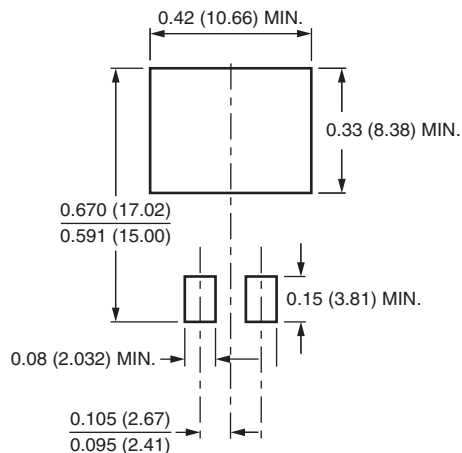
## TO-262AA



## D<sup>2</sup>PAK (TO-263AB)



## Mounting Pad Layout





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