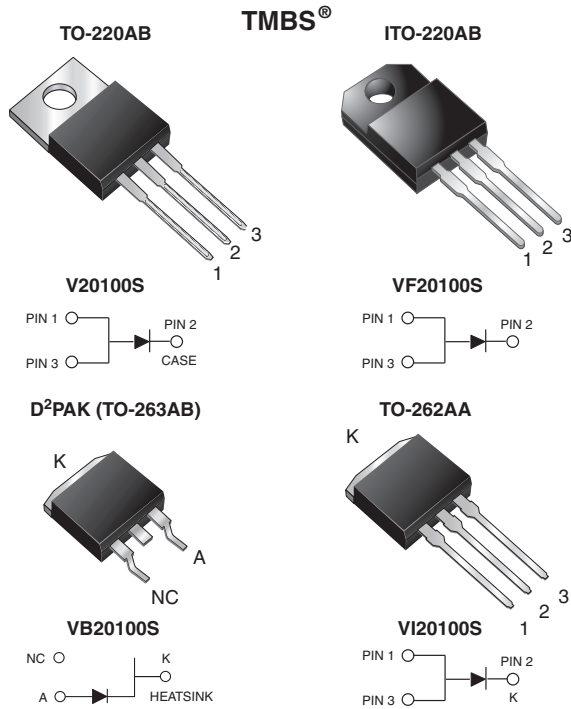


## High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.446\text{ V}$  at  $I_F = 5\text{ A}$



### DESIGN SUPPORT TOOLS



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| PRIMARY CHARACTERISTICS      |  |
|------------------------------|--|
| $I_{F(AV)}$                  | 20 A   |
| $V_{RRM}$                    | 100 V  |
| $I_{FSM}$                    | 250 A  |
| $V_F$ at $I_F = 20\text{ A}$ | 0.69 V   |
| $T_J$ max.                   | 150 °C   |
| Package                      | TO-220AB, ITO-220AB, D <sup>2</sup> PAK (TO-263AB), TO-262AA |
| Circuit configuration        | Single   |

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)  |                |         |             |          |          |                  |
|---|----------------|---------|-------------|----------|----------|------------------|
| PARAMETER   | SYMBOL         | V20100S | VF20100S    | VB20100S | VI20100S | UNIT             |
| Max. repetitive peak reverse voltage  | $V_{RRM}$      |         | 100         |          |          | V                |
| Max. average forward rectified current (fig. 1)   | $I_{F(AV)}$    |         | 20          |          |          | 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 $T_J = 25\text{ °C}$ , $L = 60\text{ mH}$                                  | $E_{AS}$       |         | 210         |          |          | 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 $V_F$ )   | $dV/dt$        |         | 10 000      |          |          | V/ $\mu\text{s}$ |
| 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               |

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



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                    |            |      |      |
|--|------------------------|-------------------------|--------------------|------------|------|------|
| PARAMETER  | TEST CONDITIONS        |                         | SYMBOL             | TYP.       | MAX. | UNIT |
| Breakdown voltage  | I <sub>R</sub> = 10 mA | T <sub>A</sub> = 25 °C  | V <sub>BR</sub>    | 105 (min.) | -    | V    |
| Instantaneous forward voltage  | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> (1) | 0.51       | -    | V    |
|  | I <sub>F</sub> = 10 A  |                         |                    | 0.60       | -    |      |
|  | I <sub>F</sub> = 20 A  |                         |                    | 0.79       | 0.90 |      |
|  | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                    | 0.45       | -    |      |
|  | I <sub>F</sub> = 10 A  |                         |                    | 0.53       | -    |      |
|  | I <sub>F</sub> = 20 A  |                         |                    | 0.69       | 0.76 |      |
| Reverse current  | V <sub>R</sub> = 70 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> (2) | 17         | -    | μA   |
|  |                        | T <sub>A</sub> = 125 °C |                    | 7          | -    | mA   |
|  | V <sub>R</sub> = 100 V | T <sub>A</sub> = 25 °C  |                    | 70         | 500  | μA   |
|  |                        | T <sub>A</sub> = 125 °C |                    | 14         | 30   | mA   |

**Notes**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                  |         |          |          |          |      |
|---|------------------|---------|----------|----------|----------|------|
| PARAMETER   | SYMBOL           | V20100S | VF20100S | VB20100S | VI20100S | UNIT |
| Typical thermal resistance  | R <sub>θJC</sub> | 2.0     | 4.0      | 2.0      | 2.0      | °C/W |

| ORDERING INFORMATION (Example) |                |                 |              |               |               |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                       | V20100S-E3/4W  | 1.88            | 4W           | 50/tube       | Tube          |
| ITO-220AB                      | VF20100S-E3/4W | 1.75            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VB20100S-E3/4W | 1.37            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VB20100S-E3/8W | 1.37            | 8W           | 800/reel      | Tape and reel |
| TO-262AA                       | VI20100S-E3/4W | 1.45            | 4W           | 50/tube       | Tube          |

**RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)**

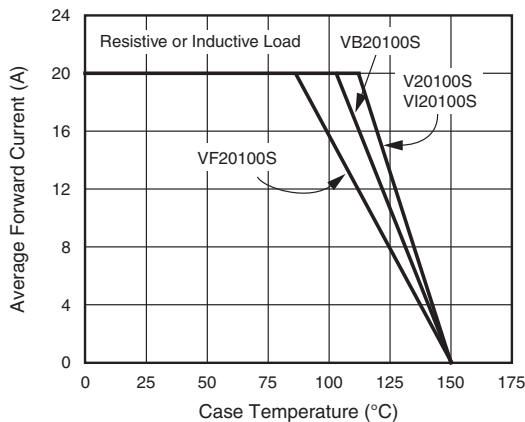


Fig. 1 - Maximum Forward Current Derating Curve

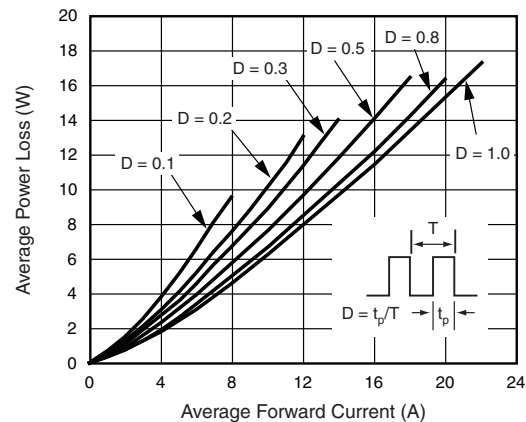


Fig. 2 - Forward Power Loss Characteristics

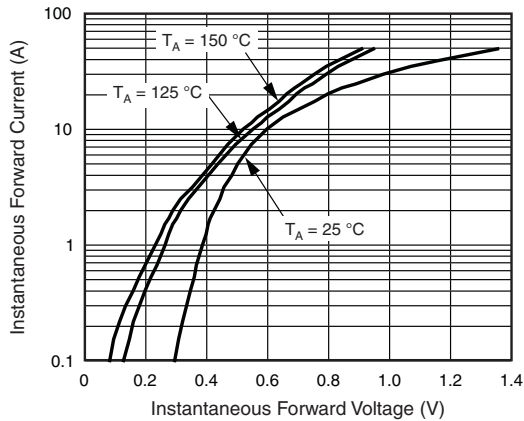


Fig. 3 - Typical Instantaneous Forward Characteristics

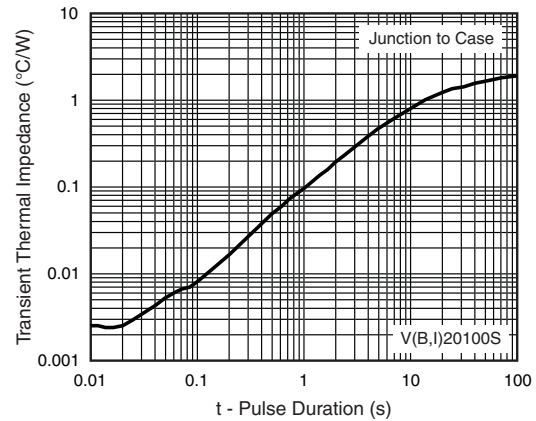


Fig. 6 - Typical Transient Thermal Impedance

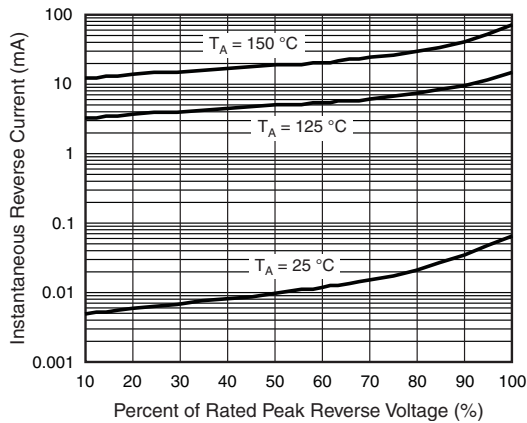


Fig. 4 - Typical Reverse Characteristics

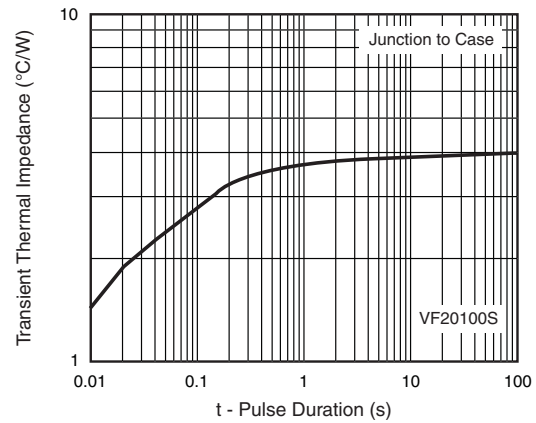


Fig. 7 - Typical Transient Thermal Impedance

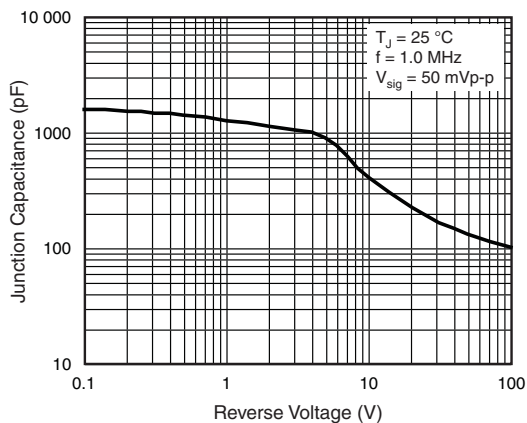
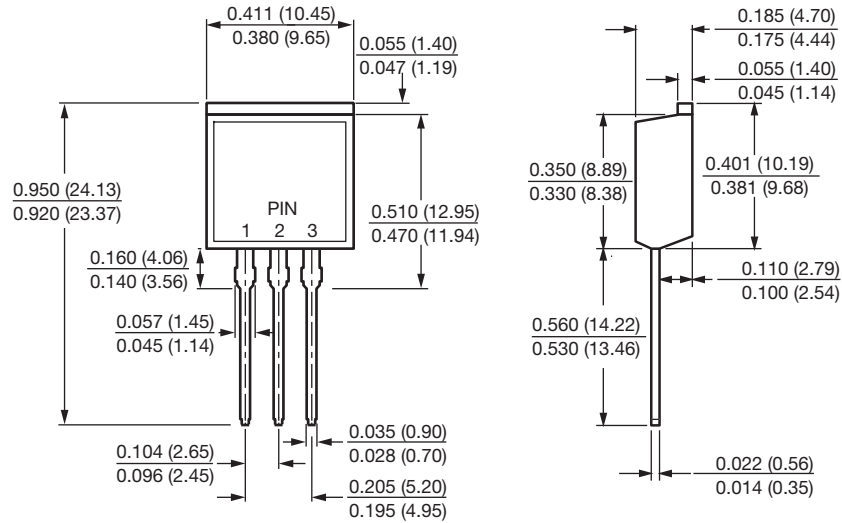


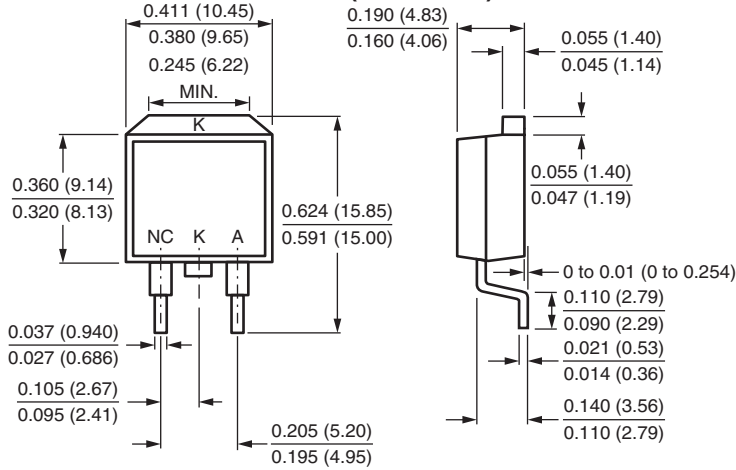
Fig. 5 - Typical Junction Capacitance



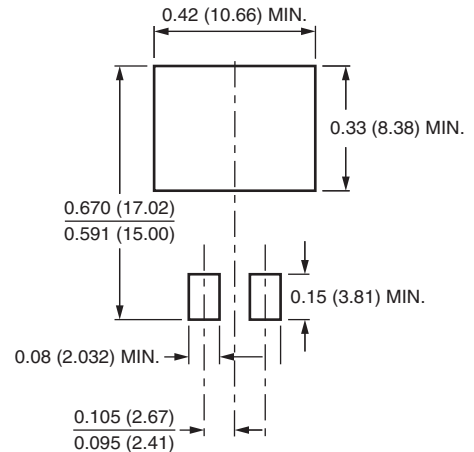
## TO-262AA



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



## Mounting Pad Layout





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