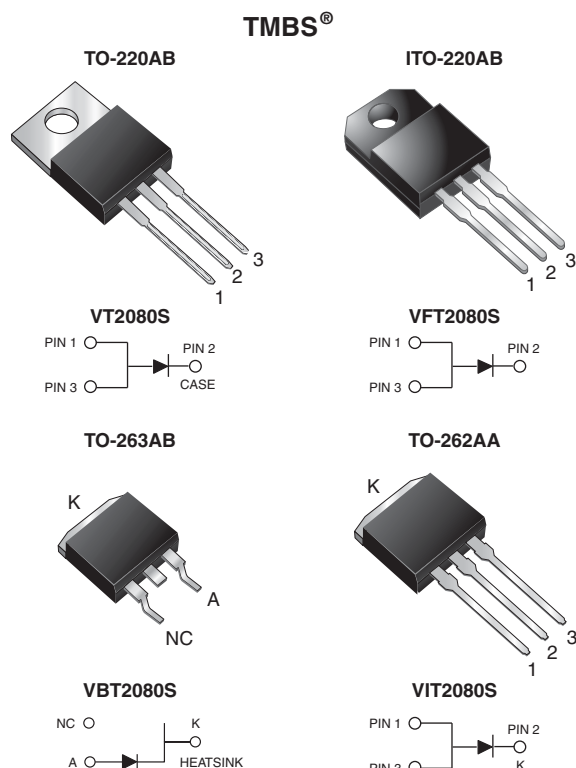


## Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.46\text{ V}$  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](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, 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

### PRIMARY CHARACTERISTICS

|                              |                                         |
|------------------------------|-----------------------------------------|
| $I_{F(AV)}$                  | 20 A                                    |
| $V_{RRM}$                    | 80 V                                    |
| $I_{FSM}$                    | 150 A                                   |
| $V_F$ at $I_F = 20\text{ A}$ | 0.70 V                                  |
| $T_J$ max.                   | 150 °C                                  |
| Package                      | TO-220AB, ITO-220AB, TO-263AB, TO-262AA |
| Diode variations             | Single die                              |

### MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER                                                                                                     | SYMBOL         | VT2080S     | VFT2080S | VBT2080S | VIT2080S | UNIT |
|---------------------------------------------------------------------------------------------------------------|----------------|-------------|----------|----------|----------|------|
| Maximum repetitive peak reverse voltage                                                                       | $V_{RRM}$      | 80          |          |          |          | V    |
| Maximum 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 per diode                  | $I_{FSM}$      | 150         |          |          |          | A    |
| Non-repetitive avalanche energy at $T_J = 25\text{ °C}$ , $L = 60\text{ mH}$                                  | $E_{AS}$       | 160         |          |          |          | 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    |
| Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1\text{ min}$                               | $V_{AC}$       | 1500        |          |          |          | V    |
| Operating junction and storage temperature range                                                              | $T_J, T_{STG}$ | -55 to +150 |          |          |          | °C   |



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                       |                         |                               |                        |                               |      |
|----------------------------------------------------------------------------|-----------------------|-------------------------|-------------------------------|------------------------|-------------------------------|------|
| PARAMETER                                                                  | TEST CONDITIONS       |                         | SYMBOL                        | TYP.                   | MAX.                          | UNIT |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 5 A  | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.52                   | -                             | V    |
|                                                                            | I <sub>F</sub> = 10 A |                         |                               | 0.61                   | -                             |      |
|                                                                            | I <sub>F</sub> = 20 A |                         |                               | 0.80                   | 0.92                          |      |
|                                                                            | I <sub>F</sub> = 5 A  | T <sub>A</sub> = 125 °C |                               | 0.46                   | -                             |      |
|                                                                            | I <sub>F</sub> = 10 A |                         |                               | 0.54                   | -                             |      |
|                                                                            | I <sub>F</sub> = 20 A |                         |                               | 0.70                   | 0.78                          |      |
|                                                                            | Reverse current       | V <sub>R</sub> = 80 V   |                               | T <sub>A</sub> = 25 °C | I <sub>R</sub> <sup>(2)</sup> |      |
| T <sub>A</sub> = 125 °C                                                    |                       |                         | 20                            | 35                     |                               | mA   |

Notes

(1) Pulse test: 300  $\mu\text{s}$  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          | VT2080S | VFT2080S | VBT2080S | VIT2080S | UNIT                 |
| Typical thermal resistance                                                           | $R_{\theta JC}$ | 1.8     | 5.0      | 1.8      | 1.8      | $^{\circ}\text{C/W}$ |

| ORDERING INFORMATION (Example) |                |                 |              |               |               |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                       | VT2080S-E3/4W  | 1.88            | 4W           | 50/tube       | Tube          |
| ITO-220AB                      | VFT2080S-E3/4W | 1.75            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VBT2080S-E3/4W | 1.38            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VBT2080S-E3/8W | 1.38            | 8W           | 800/reel      | Tape and reel |
| TO-262AA                       | VIT2080S-E3/4W | 1.45            | 4W           | 50/tube       | Tube          |

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

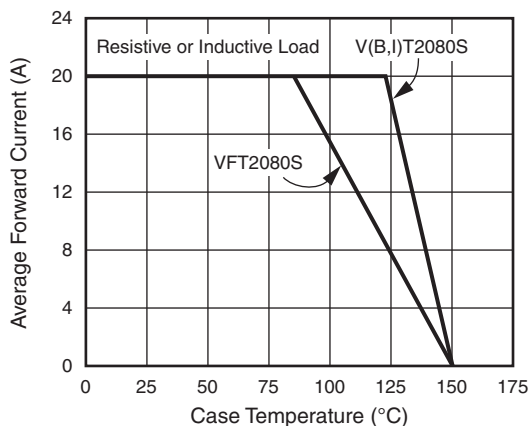


Fig. 1 - Maximum Forward Current Derating Curve

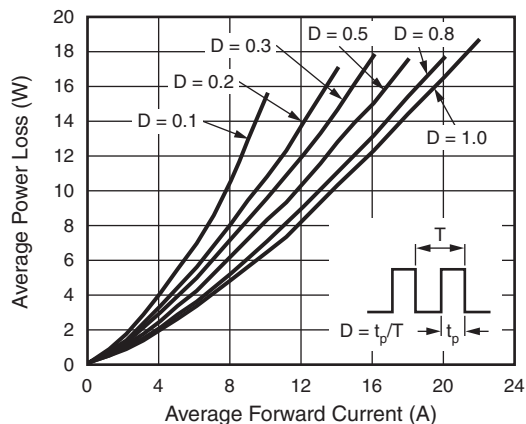


Fig. 2 - Forward Power Loss Characteristics

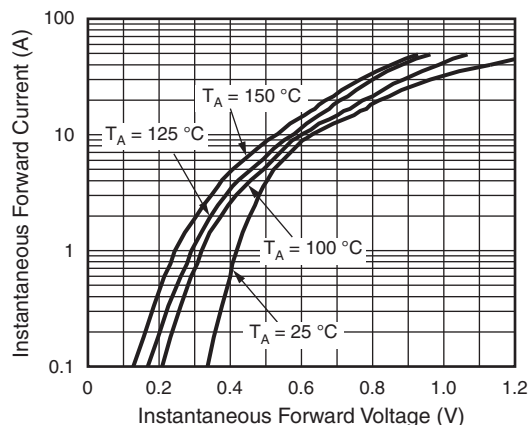


Fig. 3 - Typical Instantaneous Forward Characteristics

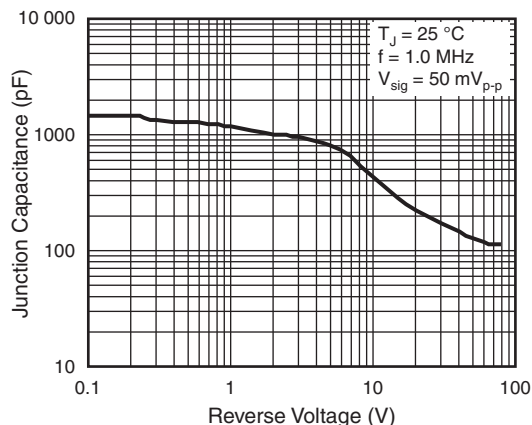


Fig. 5 - Typical Junction Capacitance

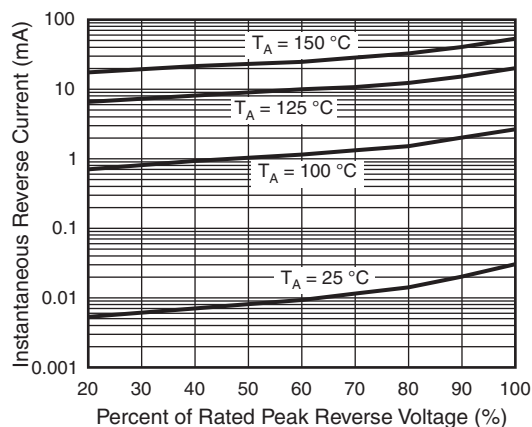


Fig. 4 - Typical Reverse Characteristics

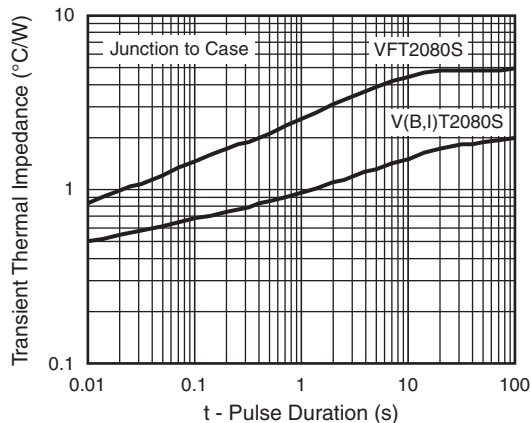
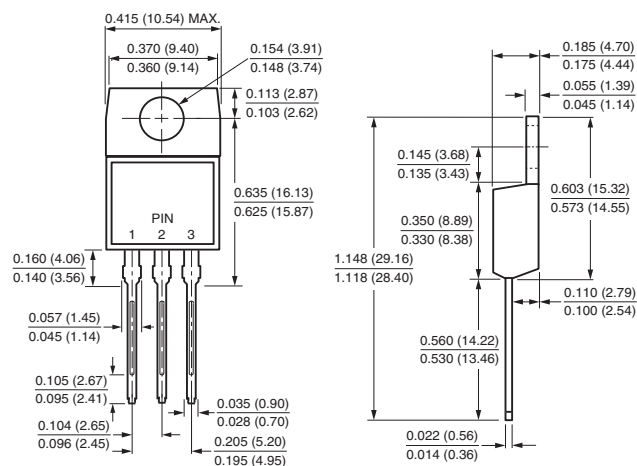


Fig. 6 - Typical Transient Thermal Impedance

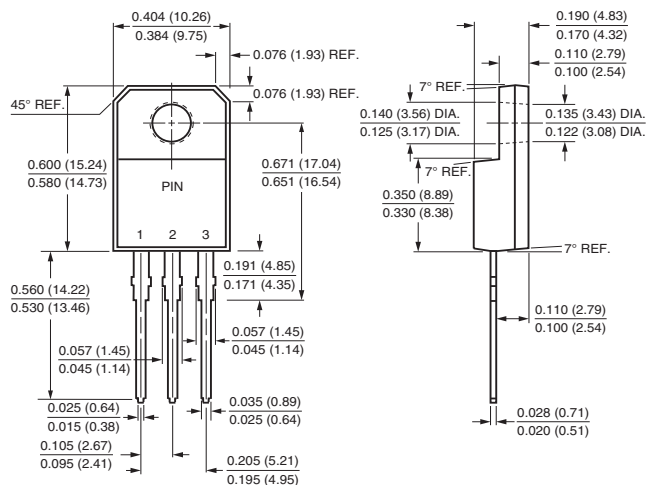


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

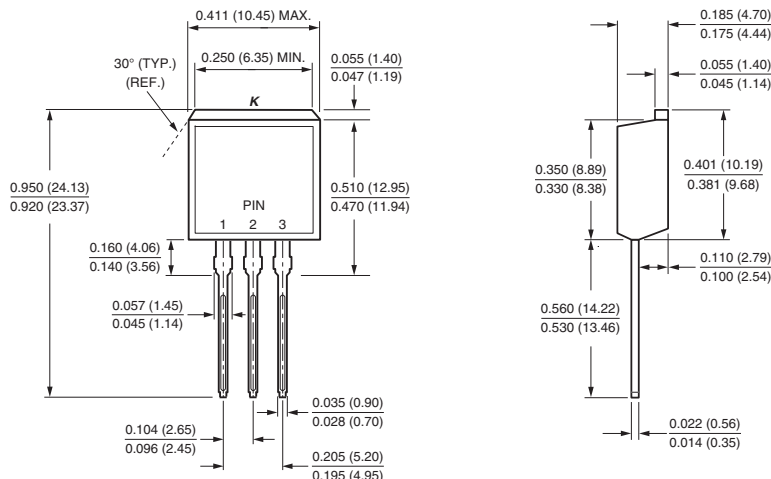
TO-220AB



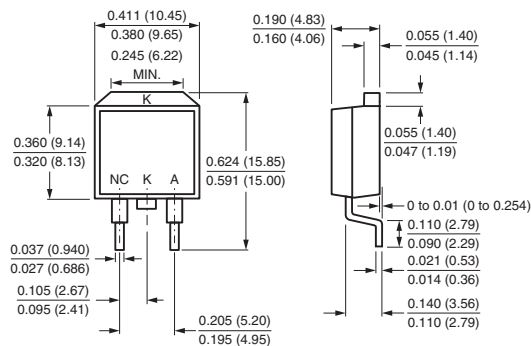
ITO-220AB



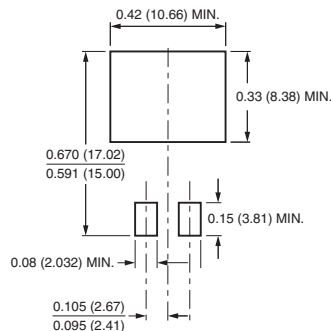
TO-262AA



TO-263AB



Mounting Pad Layout





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