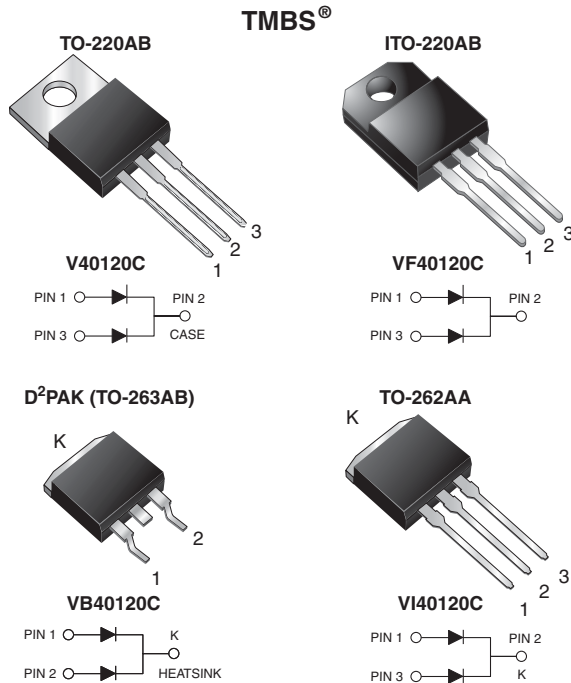


Dual High Voltage Trench MOS Barrier Schottky Rectifier

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

DESIGN SUPPORT TOOLS
[click logo to get started](#)


| PRIMARY CHARACTERISTICS | |
|-------------------------------|--|
| $I_{F(AV)}$ | 2 x 20 A |
| V_{RRM} | 120 V |
| I_{FSM} | 250 A |
| V_F at $I_F = 20 \text{ A}$ | 0.63 V |
| T_J max. | 150 °C |
| Package | TO-220AB, ITO-220AB, D ² PAK (TO-263AB), TO-262AA |
| Circuit configuration | Common cathode |

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
 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

E3 and M3 suffix meet JESD 201 class 1A whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

| MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | | | | |
|---|----------------|-------------|----------|----------|----------|------------------|
| PARAMETER | SYMBOL | V40120C | VF40120C | VB40120C | VI40120C | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 120 | | | | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | per device | 40 | | | A |
| | | per diode | 20 | | | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | I_{FSM} | 250 | | | | A |
| Non-repetitive avalanche energy at $T_J = 25 \text{ °C}$, $L = 100 \text{ mH}$ per diode | E_{AS} | 180 | | | | mJ |
| Peak repetitive reverse current at $t_p = 2 \text{ } \mu\text{s}$, 1 kHz, $T_J = 38 \text{ °C} \pm 2 \text{ °C}$ per diode | I_{RRM} | 0.5 | | | | A |
| Voltage rate of change (rated V_F) | dV/dt | 10 000 | | | | V/ μs |
| 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 |
| Breakdown voltage | $I_R = 1.0\text{ mA}$ | $T_A = 25\text{ }^\circ\text{C}$ | V_{BR} | 120 (minimum) | - | V |
| Instantaneous forward voltage per diode | $I_F = 5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.50 | - | V |
| | $I_F = 10\text{ A}$ | | | 0.60 | - | |
| | $I_F = 20\text{ A}$ | | | 0.78 | 0.88 | |
| | $I_F = 5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.43 | - | |
| | $I_F = 10\text{ A}$ | | | 0.53 | - | |
| | $I_F = 20\text{ A}$ | | | 0.63 | 0.71 | |
| Reverse current per diode | $V_R = 90\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 19 | - | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 10 | - | mA |
| | $V_R = 120\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 500 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 22 | 45 | mA |

Notes

- (1) Pulse test: 300 μs 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 | V40120C | VF40120C | VB40120C | VI40120C | UNIT |
| Typical thermal resistance per diode | $R_{\theta JC}$ | 1.8 | 4.0 | 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 | V40120C-E3/4W | 1.88 | 4W | 50/tube | Tube |
| ITO-220AB | VF40120C-E3/4W | 1.76 | 4W | 50/tube | Tube |
| TO-263AB | VB40120C-E3/4W | 1.39 | 4W | 50/tube | Tube |
| TO-263AB | VB40120C-E3/8W | 1.39 | 8W | 800/reel | Tape and reel |
| TO-262AA | VI40120C-E3/4W | 1.46 | 4W | 50/tube | Tube |
| TO-220AB | V40120C-M3/4W | 1.88 | 4W | 50/tube | Tube |
| ITO-220AB | VF40120C-M3/4W | 1.76 | 4W | 50/tube | Tube |
| TO-263AB | VB40120C-M3/4W | 1.39 | 4W | 50/tube | Tube |
| TO-263AB | VB40120C-M3/8W | 1.39 | 8W | 800/reel | Tape and reel |
| TO-262AA | VI40120C-M3/4W | 1.46 | 4W | 50/tube | Tube |

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

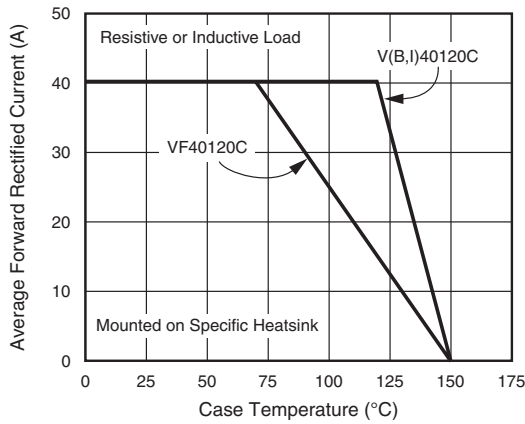


Fig. 1 - Maximum Forward Current Derating Curve

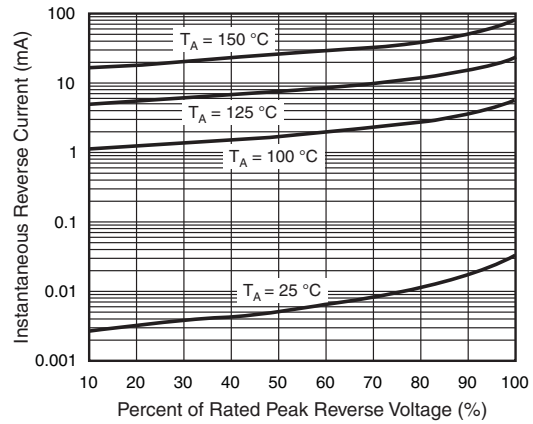


Fig. 4 - Typical Reverse Characteristics Per Diode

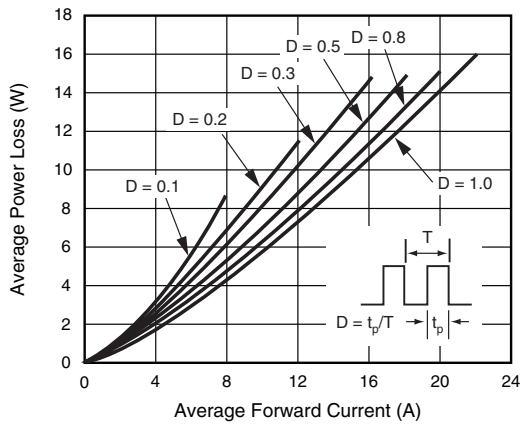


Fig. 2 - Forward Power Loss Characteristics Per Diode

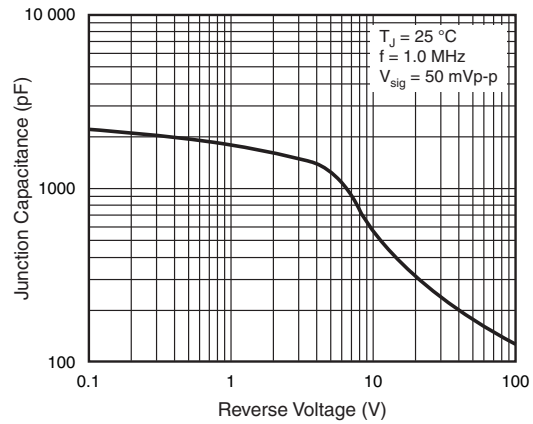


Fig. 5 - Typical Junction Capacitance Per Diode

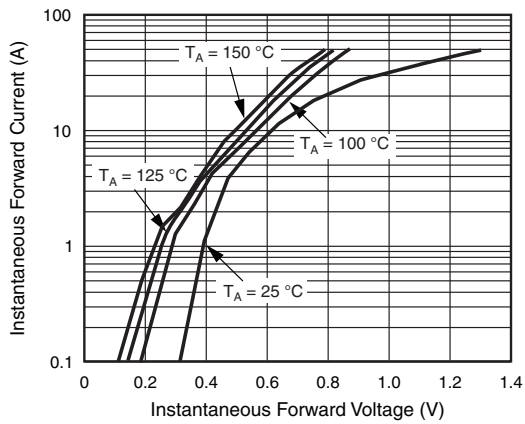


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

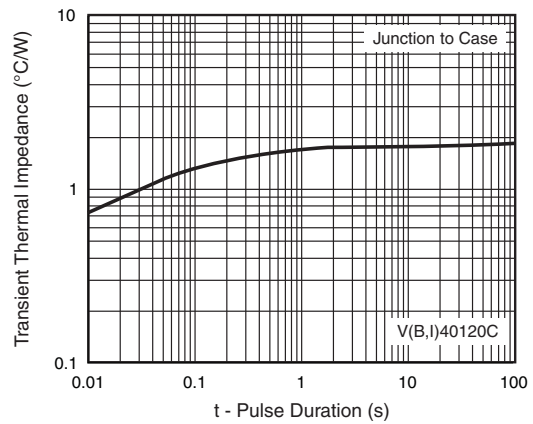


Fig. 6 - Typical Transient Thermal Impedance Per Diode

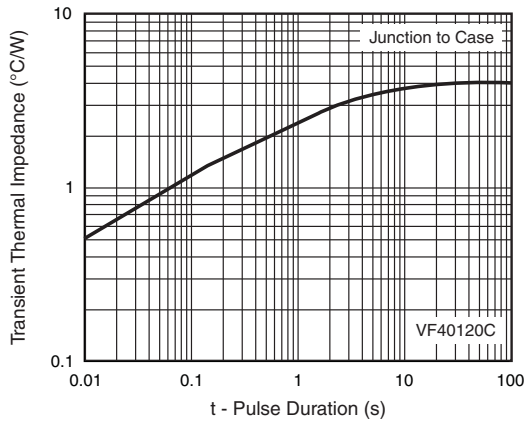
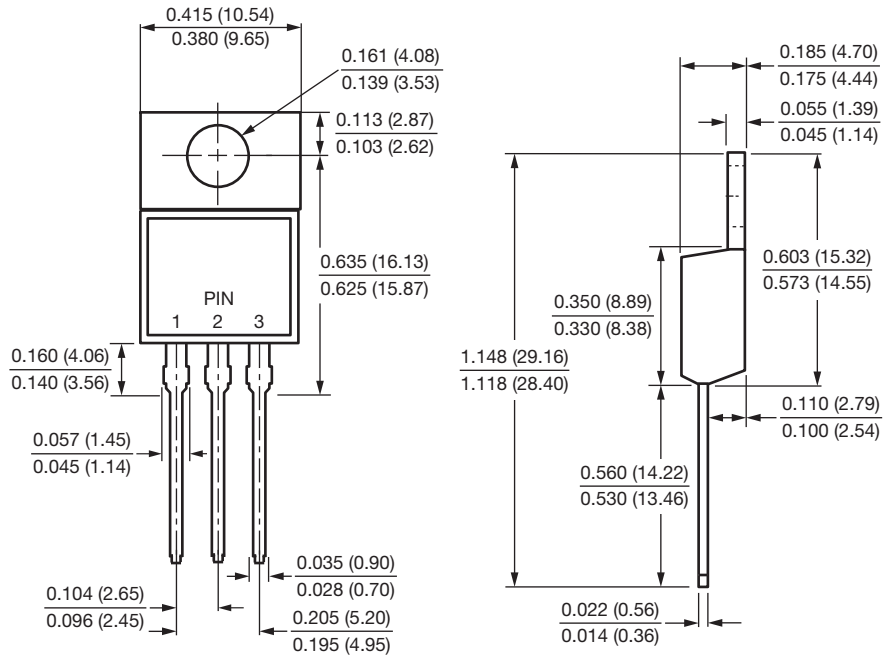


Fig. 7 - Typical Transient Thermal Impedance Per Diode

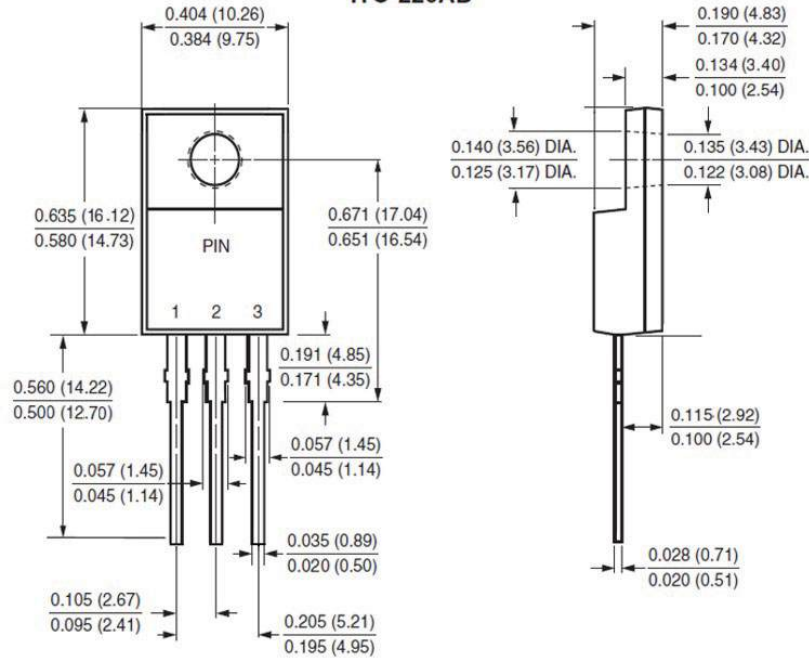
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB

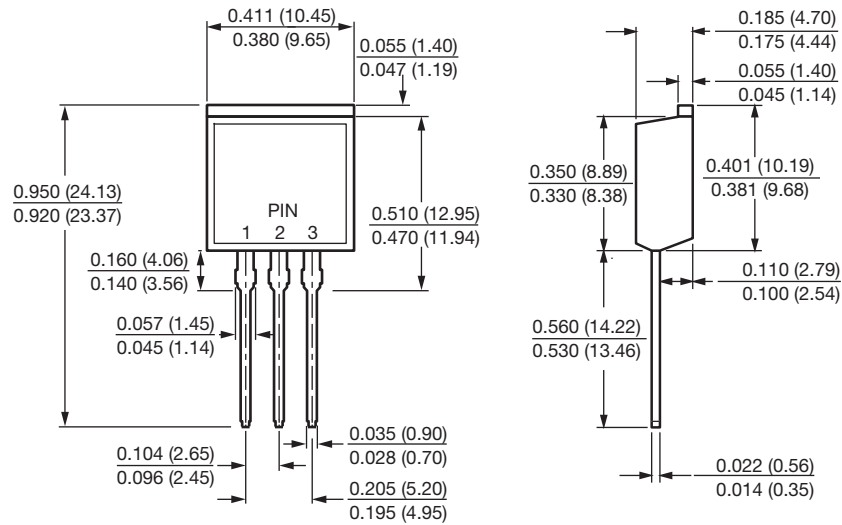




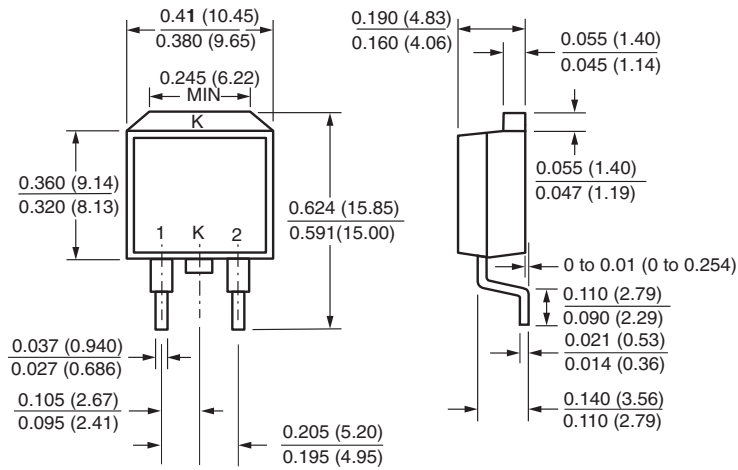
ITO-220AB



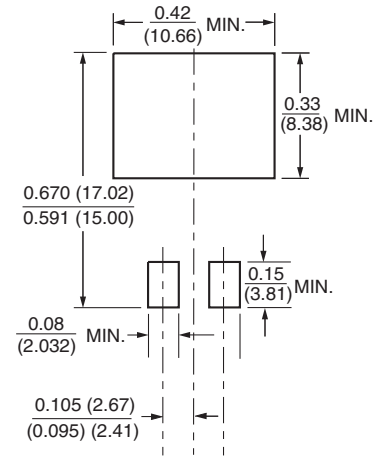
TO-262AA



D²PAK (TO-263AB)



Mounting Pad Layout





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