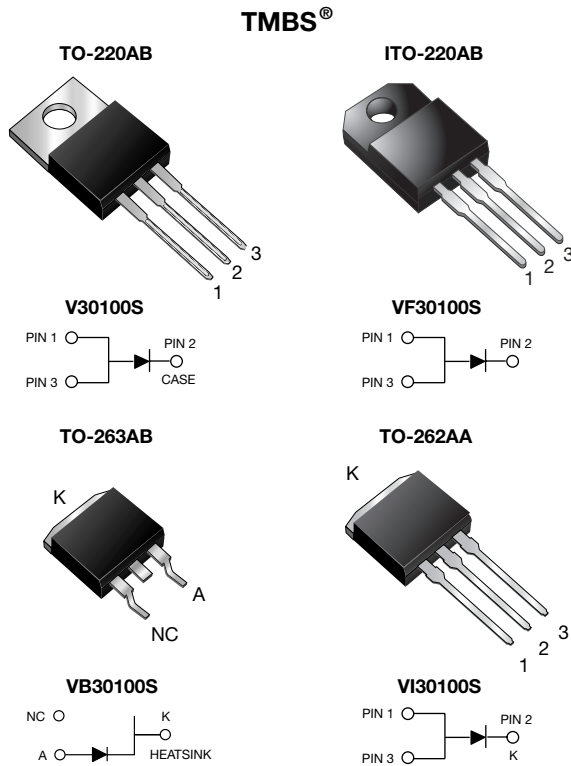


High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.39\text{ V}$ at $I_F = 5\text{ A}$



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)
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency converters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-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

| | |
|------------------------------|--------|
| $I_{F(AV)}$ | 30 A |
| V_{RRM} | 100 V |
| I_{FSM} | 250 A |
| V_F at $I_F = 30\text{ A}$ | 0.69 V |
| T_J max. | 150 °C |

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

| PARAMETER | SYMBOL | V30100S | VF30100S | VB30100S | VI30100S | UNIT |
|---|----------------|---------|----------|---------------|----------|------------------|
| Maximum repetitive peak reverse voltage | V_{RRM} | | | 100 | | 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 | I_{FSM} | | | 250 | | A |
| Non-repetitive avalanche energy at $T_J = 25\text{ °C}$, $L = 90\text{ mH}$ | E_{AS} | | | 230 | | 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_R) | dV/dt | | | 10 000 | | V/ μs |
| 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 |
| Breakdown voltage | I _R = 10 mA | T _A = 25 °C | V _{BR} | 105 (minimum) | - | V |
| Instantaneous forward voltage | I _F = 5 A | T _A = 25 °C | V _F ⁽¹⁾ | 0.47 | - | V |
| | I _F = 10 A | | | 0.55 | - | |
| | I _F = 30 A | | | 0.80 | 0.91 | |
| | I _F = 5 A | T _A = 125 °C | | 0.39 | - | |
| | I _F = 10 A | | | 0.49 | - | |
| | I _F = 30 A | | | 0.69 | 0.78 | |
| Reverse current | V _R = 70 V | T _A = 25 °C | I _R ⁽²⁾ | 27 | - | μA |
| | | T _A = 125 °C | | 11 | - | mA |
| | V _R = 100 V | T _A = 25 °C | | 70 | 1000 | μA |
| | | T _A = 125 °C | | 23 | 45 | 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 | V30100S | VF30100S | VB30100S | VI30100S | UNIT |
| Typical thermal resistance | R _{θJC} | 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 | V30100S-E3/4W | 1.875 | 4W | 50/tube | Tube |
| ITO-220AB | VF30100S-E3/4W | 1.805 | 4W | 50/tube | Tube |
| TO-263AB | VB30100S-E3/4W | 1.380 | 4W | 50/tube | Tube |
| TO-263AB | VB30100S-E3/8W | 1.380 | 8W | 800/reel | Tape and reel |
| TO-262AA | VI30100S-E3/4W | 1.455 | 4W | 50/tube | Tube |

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

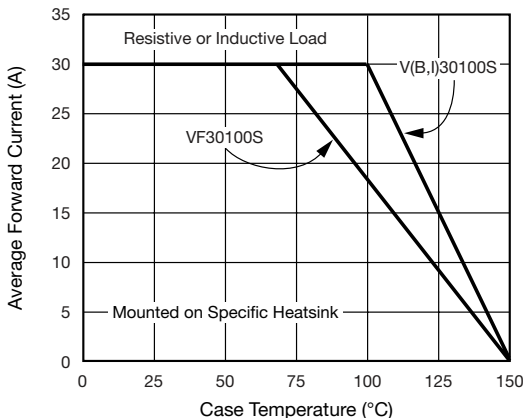


Fig. 1 - Forward Current Derating Curve

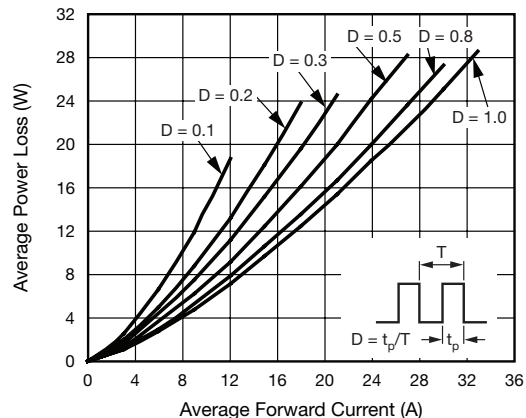


Fig. 2 - Forward Power Loss Characteristics

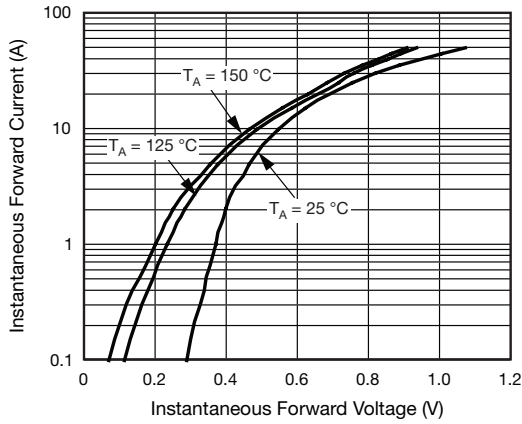


Fig. 3 - Typical Instantaneous Forward Characteristics

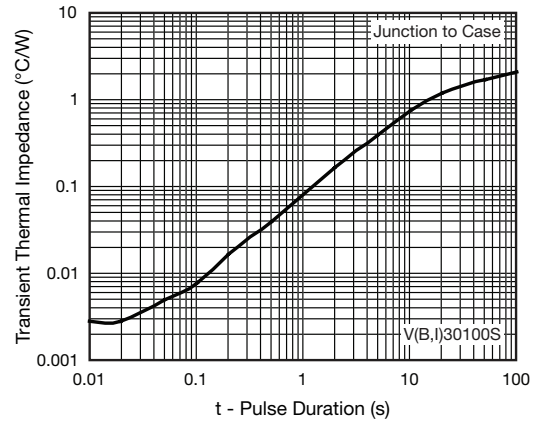


Fig. 6 - Typical Transient Thermal Impedance

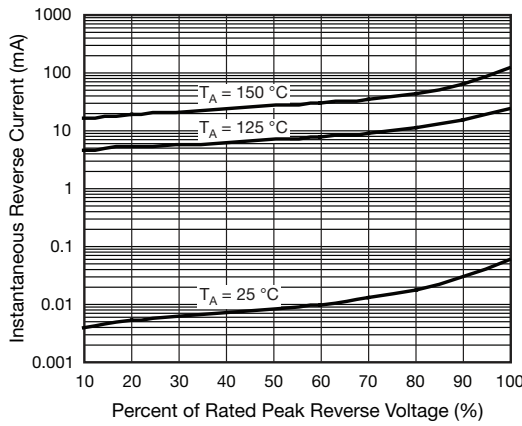


Fig. 4 - Typical Reverse Characteristics

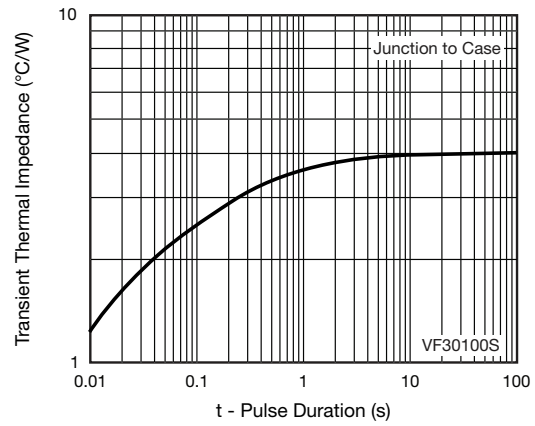


Fig. 7 - Typical Transient Thermal Impedance

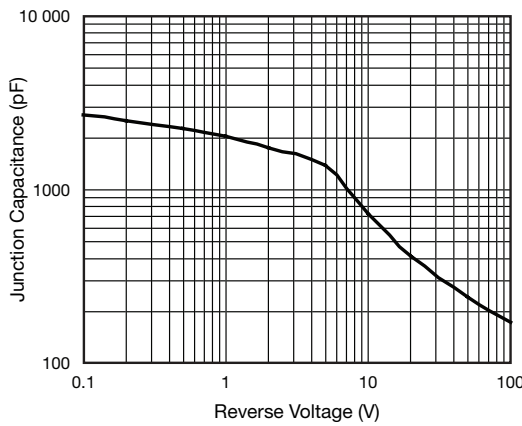


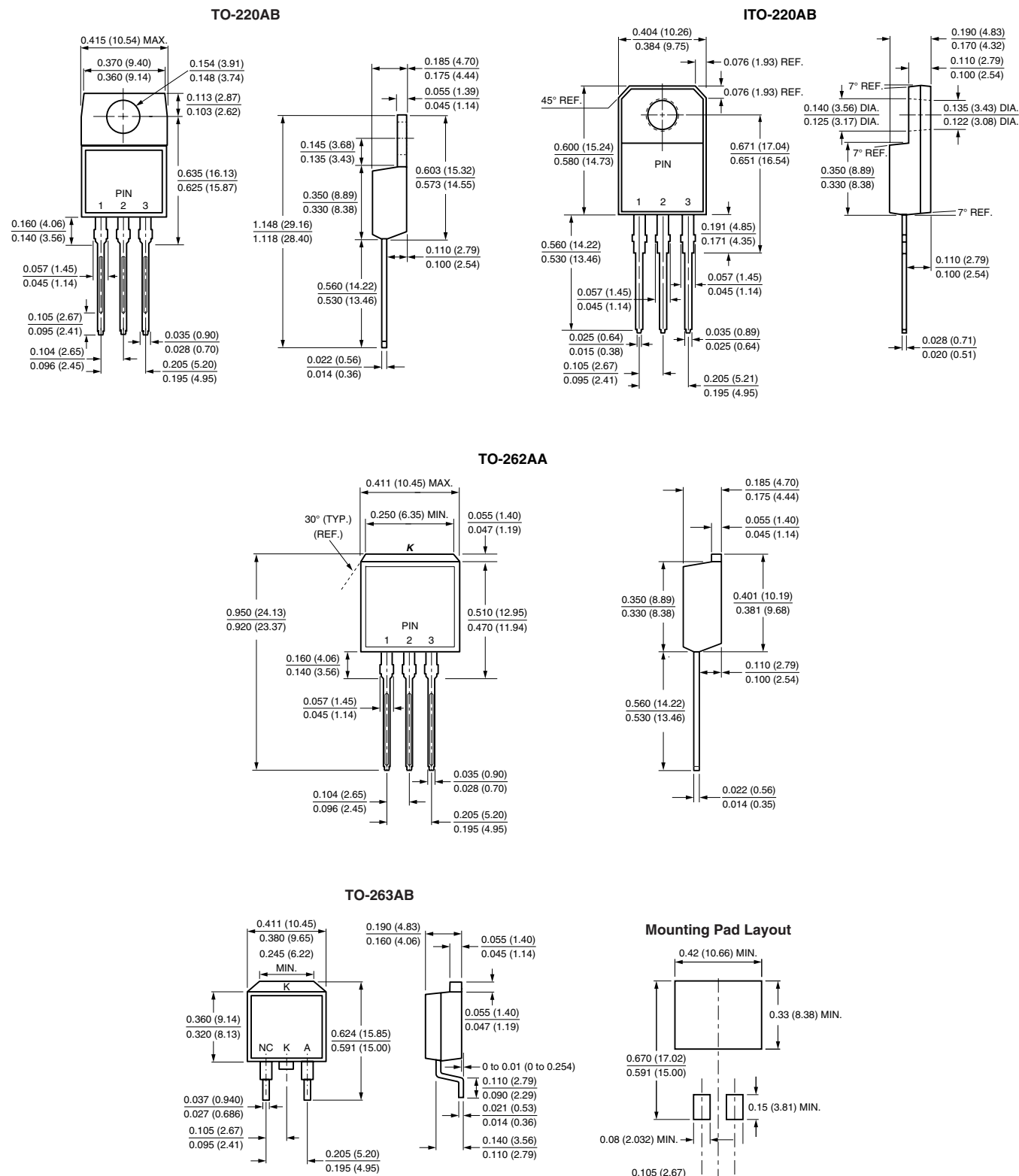
Fig. 5 - Typical Junction Capacitance

V30100S, VF30100S, VB30100S, VI30100S



Vishay General Semiconductor

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru