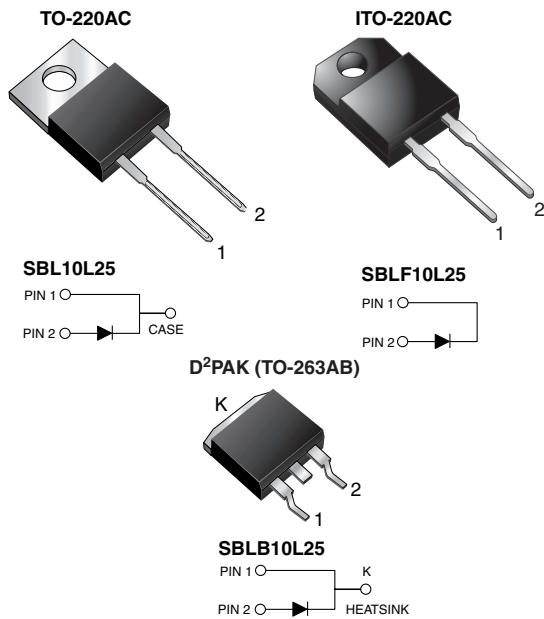


## Low $V_F$ Schottky Barrier Rectifier



### FEATURES

- Power pack
- Guardring for overvoltage protection
- Low power loss, high efficiency
- Very low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C for D<sup>2</sup>PAK (TO-263AB) package
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AC and ITO-220AC package)
- AEC-Q101 qualified available
  - Automotive ordering code:
    - Base P/NHE3 (for ITO-220AC)
    - Base P/NHM3 (for D<sup>2</sup>PAK (TO-263AB) package)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS |  |
|-------------------------|--|
| $I_{F(AV)}$             | 10 A   |
| $V_{RRM}$               | 25 V   |
| $I_{FSM}$               | 240 A  |
| $V_F$                   | 0.35 V   |
| $T_J \text{ max.}$      | 150 °C   |
| Package                 | TO-220AC, ITO-220AC, D <sup>2</sup> PAK (TO-263AB) |
| Circuit configuration   | Single   |

### TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, and polarity protection application.

### MECHANICAL DATA

**Case:** TO-220AC, ITO-220AC, D<sup>2</sup>PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Molding compound meets UL 94 V-0 flammability rating

Base P/NHE3\_X - RoHS-compliant, AEC-Q101 qualified

("\_X" denotes revision code, e.g. A, B, ...)

Base P/N-M3 - RoHS-compliant, halogen-free, commercial grade

Base P/NHM3 - RoHS-compliant, halogen-free, AEC-Q101 qualified

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** as marked

**Mounting Torque:** 10 in-lbs maximum



| <b>MAXIMUM RATINGS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)  |                |                                    |                  |
|--|----------------|------------------------------------|------------------|
| PARAMETER  | SYMBOL         | SBL10L25<br>SBLB10L25<br>SBLF10L25 | UNIT             |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$      | 25                                 | V                |
| Working peak reverse voltage   | $V_{RWM}$      | 18                                 |                  |
| Maximum DC blocking voltage  | $V_{DC}$       | 25                                 |                  |
| Maximum average forward rectified current at $T_C = 135\text{ }^\circ\text{C}$     | $I_{F(AV)}$    | 10                                 | A                |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 240                                |                  |
| Peak repetitive reverse surge current at $t_p = 2.0\text{ }\mu\text{s}$ , 1 kHz    | $I_{RRM}$      | 1.0                                |                  |
| Voltage rate of change (rated $V_R$ )  | $dV/dt$        | 10 000                             | V/ $\mu\text{s}$ |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -65 to +150                        | $^\circ\text{C}$ |
| Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1\text{ min}$    | $V_{AC}$       | 1500                               | V                |

| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) |             |                     |                                   |       |      |
|--|-------------|---------------------|-----------------------------------|-------|------|
| PARAMETER  | SYMBOL      | TEST CONDITIONS     |                                   | VALUE | UNIT |
| Maximum instantaneous forward voltage  | $V_F^{(1)}$ | $I_F = 10\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$  | 0.46  | V    |
|  |             | $I_F = 10\text{ A}$ | $T_J = 125\text{ }^\circ\text{C}$ | 0.35  |      |
|  |             | $I_F = 20\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$  | 0.55  |      |
|  |             | $I_F = 20\text{ A}$ | $T_J = 125\text{ }^\circ\text{C}$ | 0.48  |      |
| Maximum instantaneous reverse current at DC blocking voltage                                 | $I_R^{(2)}$ | Rated $V_R$         | $T_J = 25\text{ }^\circ\text{C}$  | 0.80  | mA   |
|  |             |                     | $T_J = 125\text{ }^\circ\text{C}$ | 260   |      |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: pulse width  $\leq 40\text{ ms}$ 

| <b>THERMAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                 |          |           |           |                    |
|---|-----------------|----------|-----------|-----------|--------------------|
| PARAMETER   | SYMBOL          | SBL10L25 | SBLF10L25 | SBLB10L25 | UNIT               |
| Typical thermal resistance from junction to case per leg                                  | $R_{\theta JC}$ | 1.5      | 4.0       | 1.5       | $^\circ\text{C/W}$ |

| <b>ORDERING INFORMATION</b>   |                                 |                 |              |               |               |
|-------------------------------|---------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                       | PREFERRED P/N                   | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC                      | SBL10L25-E3/45                  | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                     | SBLF10L25-E3/45                 | 1.94            | 45           | 50/tube       | Tube          |
| D <sup>2</sup> PAK (TO-263AB) | SBLB10L25-M3/I                  | 1.33            | I            | 800/reel      | Tape and reel |
| ITO-220AC                     | SBLF10L25HE3_A/P <sup>(1)</sup> | 1.94            | P            | 50/tube       | Tube          |
| D <sup>2</sup> PAK (TO-263AB) | SBLB10L25HM3/I <sup>(1)</sup>   | 1.33            | I            | 800/reel      | Tape and reel |

**Note**(1) AEC-Q101 qualified, available in ITO-220AC and D<sup>2</sup>PAK (TO-263AB)



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

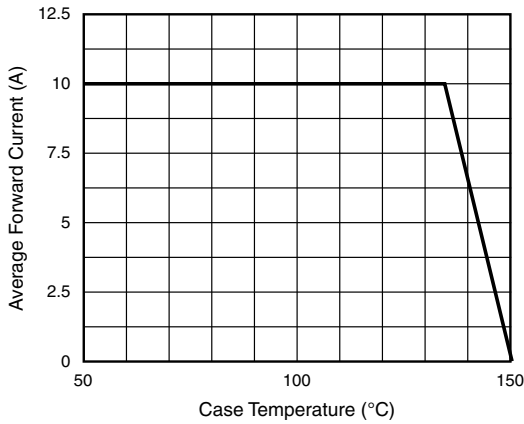


Fig. 1 - Forward Current Derating Curve

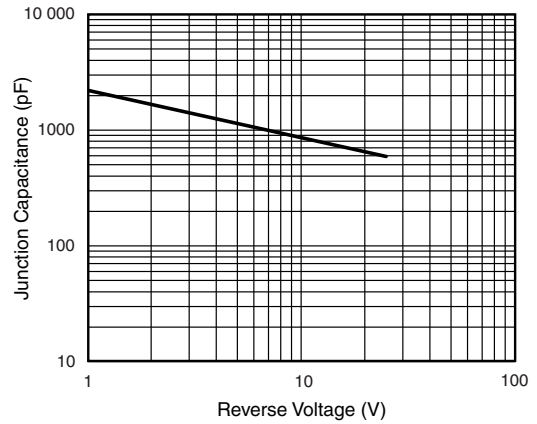


Fig. 4 - Typical Junction Capacitance

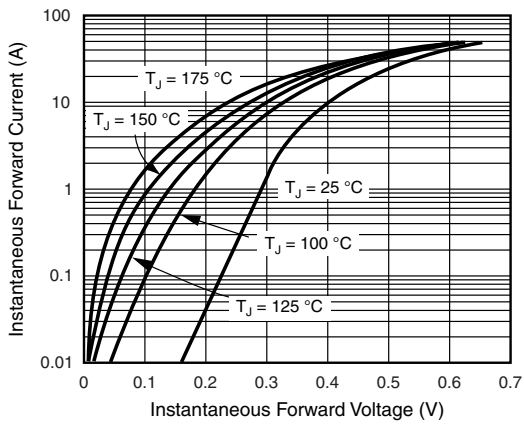


Fig. 2 - Typical Instantaneous Forward Characteristics

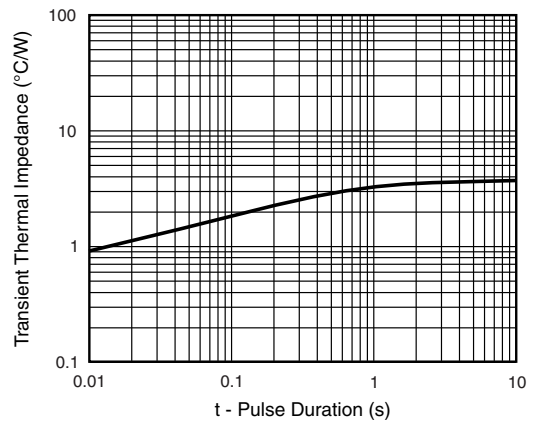


Fig. 5 - Typical Transient Thermal Impedance

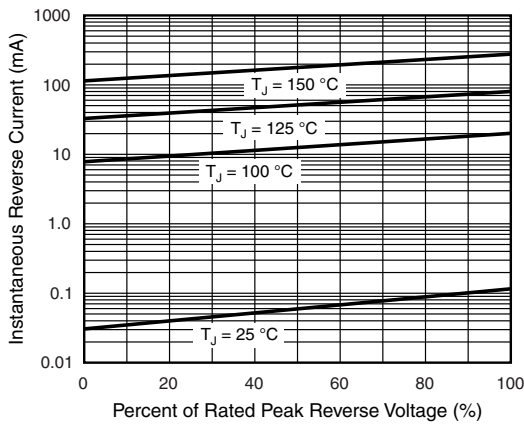
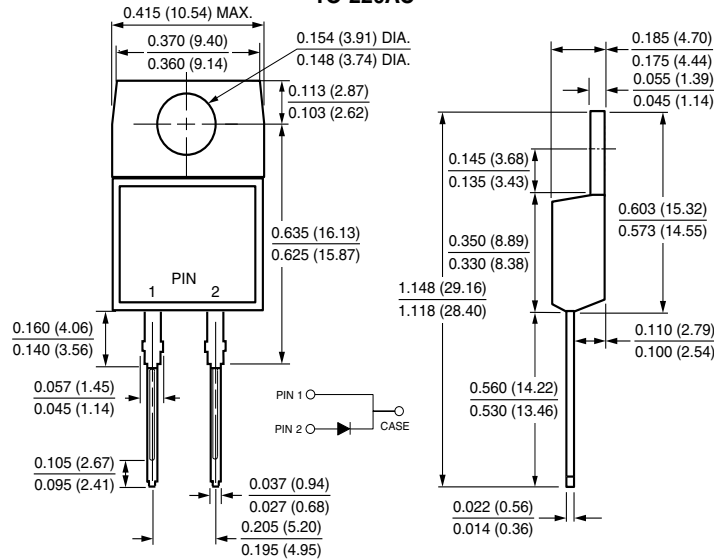


Fig. 3 - Typical Reverse Characteristics

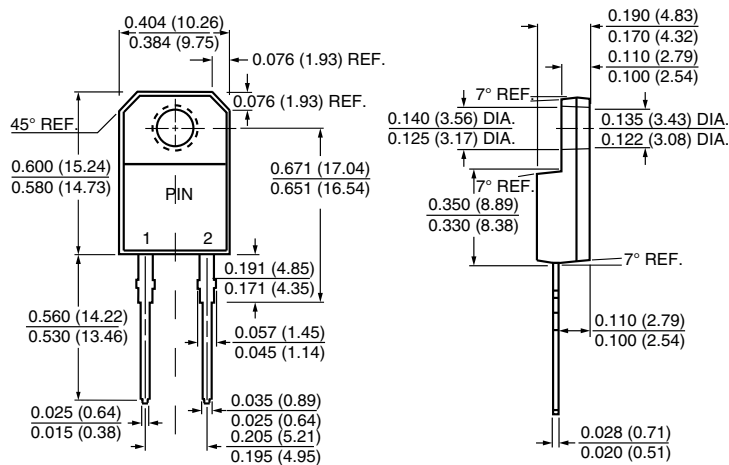


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

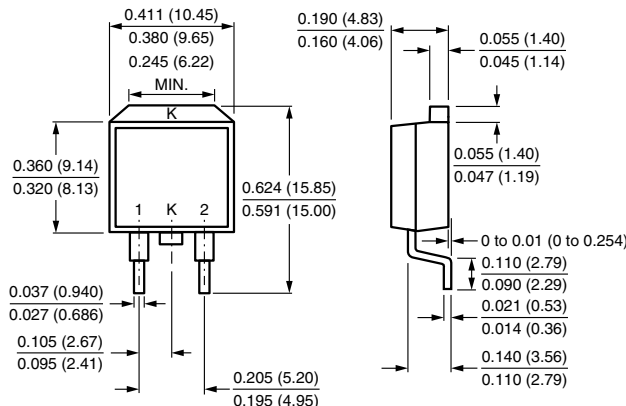
### TO-220AC



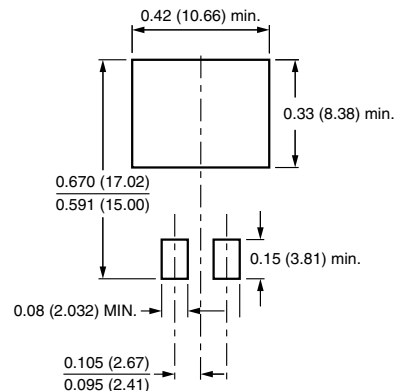
### ITO-220AC



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



### Mounting Pad Layout





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