

## 15A, 45V Low $V_F$ Trench Schottky Surface Mount Rectifier

### FEATURES

- Patented Trench Schottky technology
- Excellent high temperature stability
- Low forward voltage
- Lower power loss/ high efficiency
- High forward surge capability
- Ideal for automated placement
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- DC to DC converter

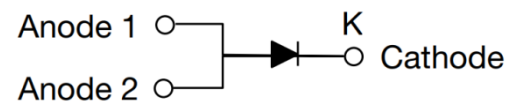
### MECHANICAL DATA

- Case: SMPC4.0
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.095g (approximately)

| KEY PARAMETERS |            |      |
|----------------|------------|------|
| PARAMETER      | VALUE      | UNIT |
| $I_F$          | 15         | A    |
| $V_{RRM}$      | 45         | V    |
| $I_{FSM}$      | 200        | A    |
| $T_{JMAX}$     | 150        | °C   |
| Package        | SMPC4.0    |      |
| Configuration  | Single die |      |



**SMPC4.0**



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)        |              |              |      |
|--|--------------|--------------|------|
| PARAMETER  | SYMBOL       | TSPB15U45S   | UNIT |
| Marking code on the device   |              | B15U45       |      |
| Repetitive peak reverse voltage  | $V_{RRM}$    | 45           | V    |
| Reverse voltage, total rms value   | $V_{R(RMS)}$ | 31           | V    |
| Forward current  | $I_F$        | 15           | A    |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load | $I_{FSM}$    | 200          | A    |
| Junction temperature   | $T_J$        | - 55 to +150 | °C   |
| Storage temperature  | $T_{STG}$    | - 55 to +150 | °C   |

| <b>THERMAL PERFORMANCE</b>          |                 |            |                      |
|-------------------------------------|-----------------|------------|----------------------|
| <b>PARAMETER</b>                    | <b>SYMBOL</b>   | <b>TYP</b> | <b>UNIT</b>          |
| Junction-to-lead thermal resistance | $R_{\theta JL}$ | 8          | $^{\circ}\text{C/W}$ |

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^{\circ}\text{C}$ unless otherwise noted) |   |               |            |            |               |
|---|---|---------------|------------|------------|---------------|
| <b>PARAMETER</b>  | <b>CONDITIONS</b>                             | <b>SYMBOL</b> | <b>TYP</b> | <b>MAX</b> | <b>UNIT</b>   |
| Forward voltage <sup>(1)</sup>  | $I_F = 15\text{A}, T_J = 25^{\circ}\text{C}$  | $V_F$         | 0.48       | 0.56       | V             |
|   | $I_F = 15\text{A}, T_J = 125^{\circ}\text{C}$ |               | 0.39       | 0.45       | V             |
| Reverse current @ rated $V_R$ <sup>(2)</sup>  | $T_J = 25^{\circ}\text{C}$                    | $I_R$         | -          | 300        | $\mu\text{A}$ |
|   | $T_J = 125^{\circ}\text{C}$                   |               | -          | 150        | mA            |

**Notes:**

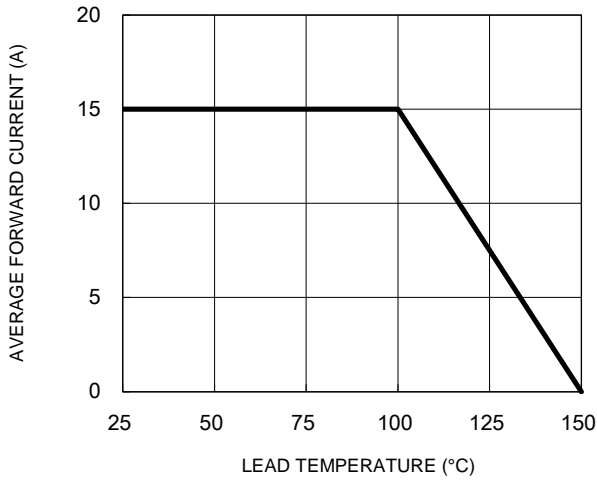
1. Pulse test with  $PW = 0.3\text{ms}$
2. Pulse test with  $PW = 30\text{ms}$

| <b>ORDERING INFORMATION</b> |                |                     |
|-----------------------------|----------------|---------------------|
| <b>ORDERING CODE</b>        | <b>PACKAGE</b> | <b>PACKING</b>      |
| TSPB15U45S                  | SMPC4.0        | 6,000 / Tape & Reel |

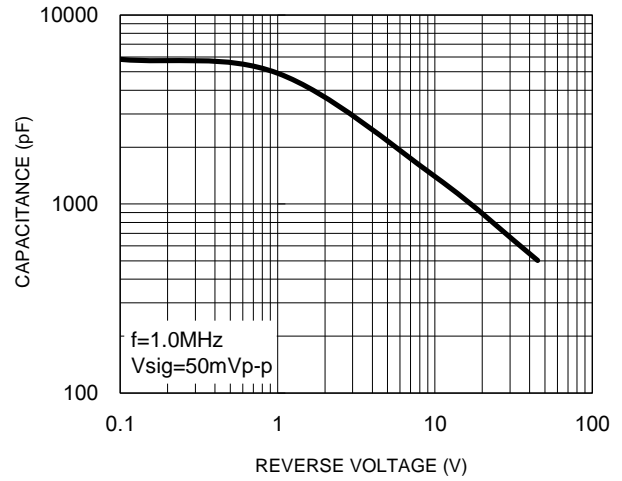
**CHARACTERISTICS CURVES**

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

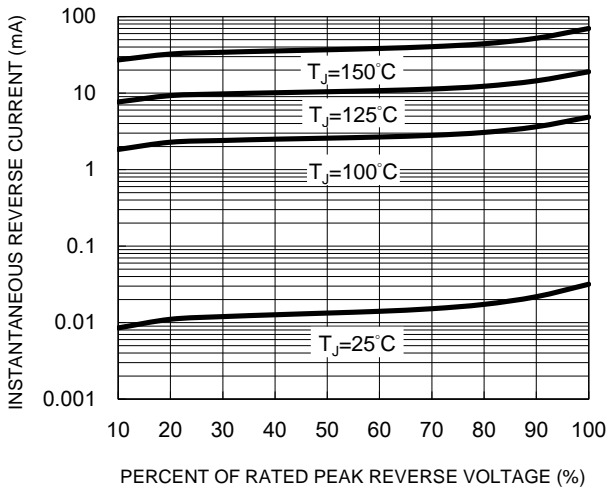
**Fig.1 Forward Current Derating Curve**



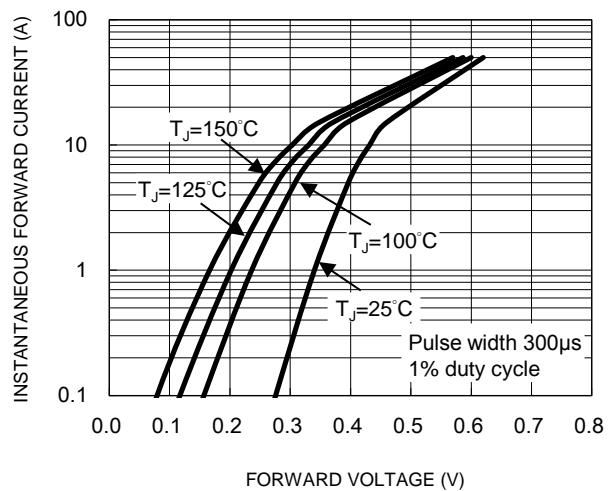
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**

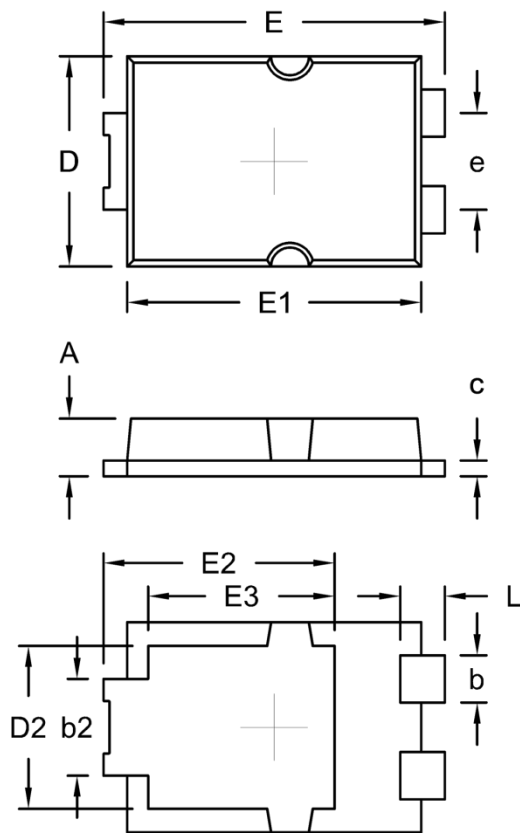


**Fig.4 Typical Forward Characteristics**



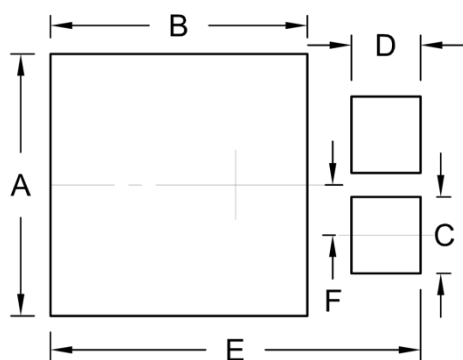
**PACKAGE OUTLINE DIMENSIONS**

SMPC4.0



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 1.00      | 1.20 | 0.039       | 0.047 |
| b    | 0.75      | 1.05 | 0.030       | 0.041 |
| b2   | 1.69      | 1.99 | 0.067       | 0.078 |
| c    | 0.20      | 0.40 | 0.008       | 0.016 |
| D    | 3.95      | 4.05 | 0.156       | 0.159 |
| D2   | 2.95      | 3.25 | 0.116       | 0.128 |
| E    | 6.35      | 6.65 | 0.250       | 0.262 |
| E1   | 5.55      | 5.65 | 0.219       | 0.222 |
| E2   | 4.25      | 4.55 | 0.167       | 0.179 |
| E3   | 3.40      | 3.70 | 0.134       | 0.146 |
| e    | 1.69      | 1.99 | 0.067       | 0.078 |
| L    | 0.70      | 1.00 | 0.028       | 0.039 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 4.80      | 0.189       |
| B      | 4.72      | 0.186       |
| C      | 1.40      | 0.055       |
| D      | 1.27      | 0.050       |
| E      | 6.80      | 0.268       |
| F      | 0.92      | 0.036       |

**MARKING DIAGRAM**



P/N = Marking Code  
YW = Date Code  
F = Factory Code

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