

## 10A, 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

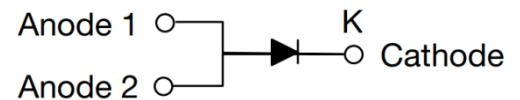
- Switching mode power supply (SMPS)
- Adapters
- DC to DC converter

### 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 |
| $I_F$          | 10         | A    |
| $V_{RRM}$      | 45         | V    |
| $I_{FSM}$      | 275        | A    |
| $T_{J\ MAX}$   | 150        | °C   |
| Package        | SMPC4.0    |      |
| Configuration  | Single die |      |


**HALOGEN  
FREE**

**SMPC4.0**


| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)        |              |              |      |
|------------------------------------------------------------------------------------|--------------|--------------|------|
| PARAMETER                                                                          | SYMBOL       | TSPB10U45S   | UNIT |
| Marking code on the device                                                         |              | B10U45       |      |
| Repetitive peak reverse voltage                                                    | $V_{RRM}$    | 45           | V    |
| Reverse voltage, total rms value                                                   | $V_{R(RMS)}$ | 31           | V    |
| Forward current                                                                    | $I_F$        | 10           | A    |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load | $I_{FSM}$    | 275          | A    |
| Junction temperature                                                               | $T_J$        | - 55 to +150 | °C   |
| Storage temperature                                                                | $T_{STG}$    | - 55 to +150 | °C   |

**THERMAL PERFORMANCE**

| PARAMETER                           | SYMBOL          | TYP | UNIT |
|-------------------------------------|-----------------|-----|------|
| Junction-to-lead thermal resistance | $R_{\theta JL}$ | 25  | °C/W |

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

| PARAMETER                                    | CONDITIONS                                  | SYMBOL | TYP  | MAX  | UNIT          |
|----------------------------------------------|---------------------------------------------|--------|------|------|---------------|
| Forward voltage <sup>(1)</sup>               | $I_F = 5\text{A}, T_J = 25^\circ\text{C}$   | $V_F$  | 0.37 | -    | V             |
|                                              | $I_F = 10\text{A}, T_J = 25^\circ\text{C}$  |        | 0.42 | 0.46 | V             |
|                                              | $I_F = 5\text{A}, T_J = 125^\circ\text{C}$  |        | 0.28 | -    | V             |
|                                              | $I_F = 10\text{A}, T_J = 125^\circ\text{C}$ |        | 0.37 | 0.41 | V             |
| Reverse current @ rated $V_R$ <sup>(2)</sup> | $T_J = 25^\circ\text{C}$                    | $I_R$  | -    | 300  | $\mu\text{A}$ |
|                                              | $T_J = 125^\circ\text{C}$                   |        | -    | 140  | mA            |

**Notes:**

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

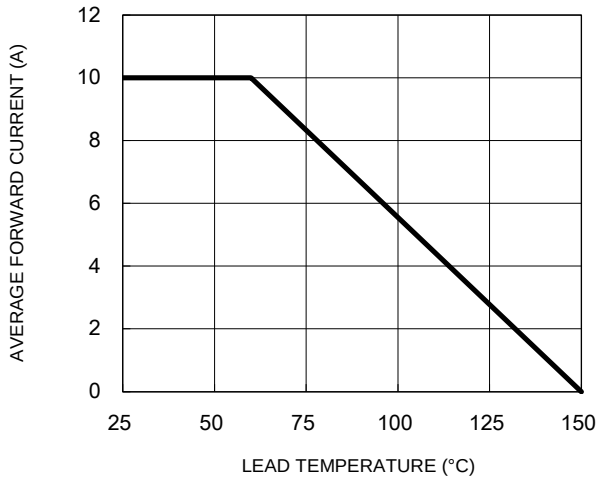
**ORDERING INFORMATION**

| ORDERING CODE | PACKAGE | PACKING             |
|---------------|---------|---------------------|
| TSPB10U45S    | SMPC4.0 | 6,000 / Tape & Reel |

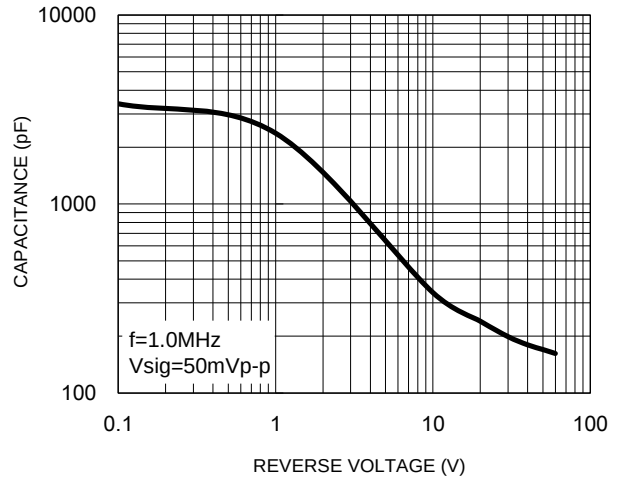
## CHARACTERISTICS CURVES

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

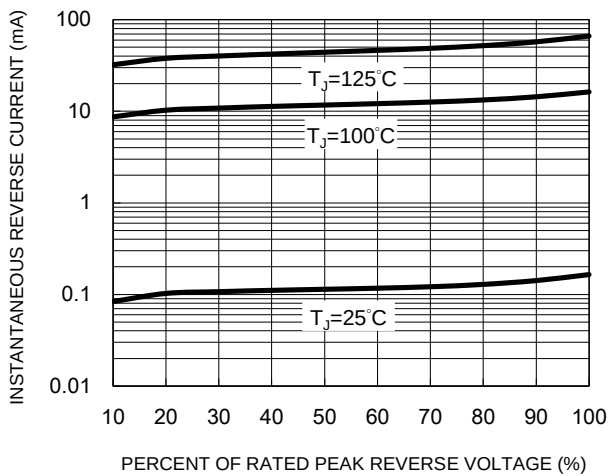
**Fig.1 Forward Current Derating Curve**



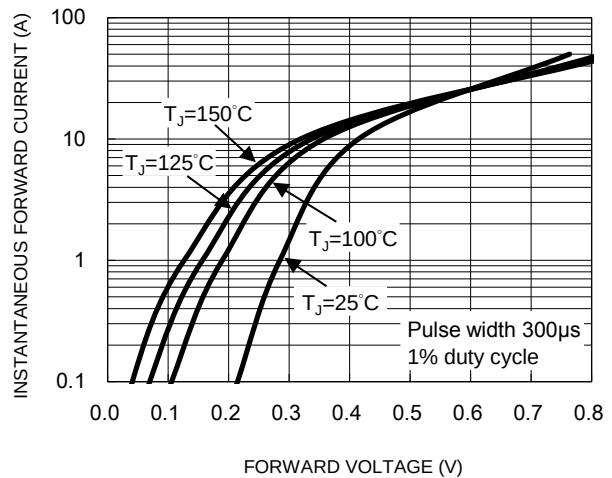
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**

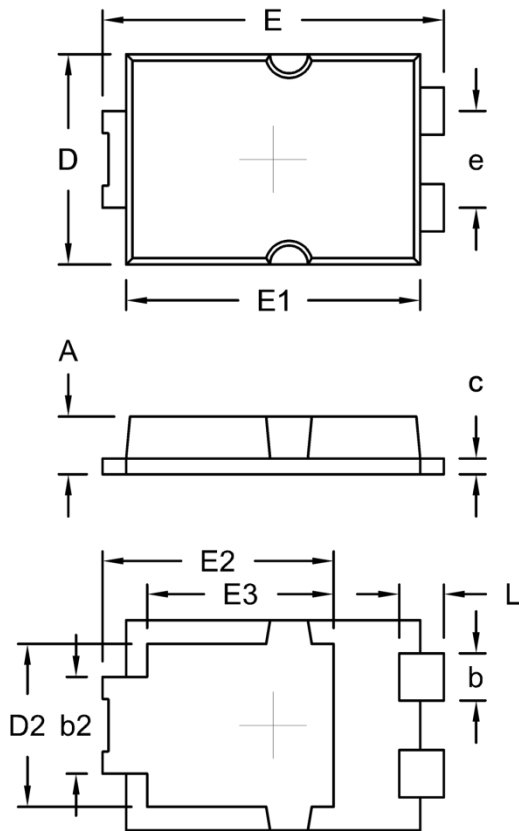


**Fig.4 Typical Forward Characteristics**



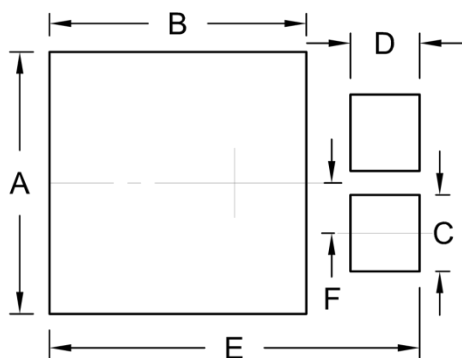
## PACKAGE OUTLINE DIMENSIONS

SMPC4.0



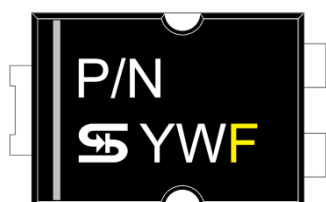
| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 1.00      | 1.20 | 0.039       | 0.047 |
| b    | 0.75      | 1.05 | 0.030       | 0.041 |
| b2   | 1.69      | 1.99 | 0.067       | 0.078 |
| 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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