

## 3A, 45V - 60V Trench Schottky Rectifier

### FEATURES

- Patented Trench Schottky technology
- Excellent high temperature stability
- Low forward voltage
- Lower power loss/ high efficiency
- High forward surge capability
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- Trench Schottky barrier rectifier is designed for high frequency miniature switched mode power supplies such as adapters, lighting and on-board DC/DC converters

### MECHANICAL DATA

- Case: SOD-123HE
- Molding compound meets UL 94V-0 flammability rating
- Part no. with suffix "H" means AEC-Q101 qualified
- Packing code with suffix "G" means green compound (halogen-free)
- Moisture sensitivity level: level 1, per J-STD-020
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.022g (approximately)

| KEY PARAMETERS    |            |      |
|-------------------|------------|------|
| PARAMETER         | VALUE      | UNIT |
| $I_{F(AV)}$       | 3          | A    |
| $V_{RRM}$         | 45 - 60    | V    |
| $I_{FSM}$         | 60         | A    |
| $T_J \text{ MAX}$ | 150        | °C   |
| Package           | SOD-123HE  |      |
| Configuration     | Single die |      |



**SOD-123HE**

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

| PARAMETER                                                                                     | SYMBOL      | TSSE3H45    | TSSE3H60 | UNIT |
|-----------------------------------------------------------------------------------------------|-------------|-------------|----------|------|
| Marking code on the device                                                                    |             | E3H45       | E3H60    |      |
| Maximum repetitive peak reverse voltage                                                       | $V_{RRM}$   | 45          | 60       | V    |
| Maximum RMS voltage                                                                           | $V_{RMS}$   | 32          | 42       | V    |
| Forward current                                                                               | $I_{F(AV)}$ | 3           |          | A    |
| Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$   | 60          |          | A    |
| Junction temperature                                                                          | $T_J$       | -55 to +150 |          | °C   |
| Storage temperature                                                                           | $T_{STG}$   | -55 to +150 |          | °C   |

**THERMAL PERFORMANCE**

| PARAMETER                                     | SYMBOL          | LIMIT | UNIT |
|-----------------------------------------------|-----------------|-------|------|
| Junction-to-lead thermal resistance per diode | $R_{\theta JL}$ | 20    | °C/W |

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

| PARAMETER                                              | CONDITIONS                                            | SYMBOL | TYP  | MAX  | UNIT          |
|--------------------------------------------------------|-------------------------------------------------------|--------|------|------|---------------|
| Forward voltage per diode <sup>(1)</sup>               | TSSE3H45<br>$I_F = 3\text{A}, T_J = 25^\circ\text{C}$ | $V_F$  | 0.47 | 0.57 | V             |
|                                                        | $I_F = 3\text{A}, T_J = 125^\circ\text{C}$            |        | 0.40 | 0.50 | V             |
|                                                        | TSSE3H60<br>$I_F = 3\text{A}, T_J = 25^\circ\text{C}$ |        | 0.50 | 0.60 | V             |
|                                                        | $I_F = 3\text{A}, T_J = 125^\circ\text{C}$            |        | 0.43 | 0.53 | V             |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | $T_J = 25^\circ\text{C}$                              | $I_R$  | -    | 100  | $\mu\text{A}$ |
|                                                        | $T_J = 125^\circ\text{C}$                             |        | -    | 25   | mA            |

**Notes:**

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

**ORDERING INFORMATION**

| PART NO.                | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | PACKAGE   | PACKING           |
|-------------------------|-----------------|--------------|---------------------|-----------|-------------------|
| TSSE3Hxx<br>(Note 1, 2) | H               | RV           | G                   | SOD-123HE | 3,000 / 7" Reel   |
|                         |                 | RQ           |                     | SOD-123HE | 10,000 / 13" Reel |

**Notes:**

1. "x" defines voltage from 45V (TSSE3H45) to 60V (TSSE3H60)
2. Whole series with green compound (halogen-free)

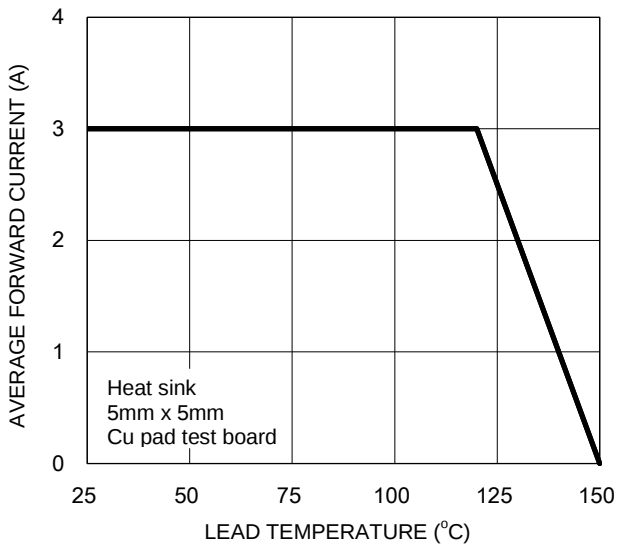
**EXAMPLE P/N**

| EXAMPLE P/N  | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION                          |
|--------------|----------|-----------------|--------------|---------------------|--------------------------------------|
| TSSE3H45HRVG | TSSE3H45 | H               | RV           | G                   | AEC-Q101 qualified<br>Green compound |

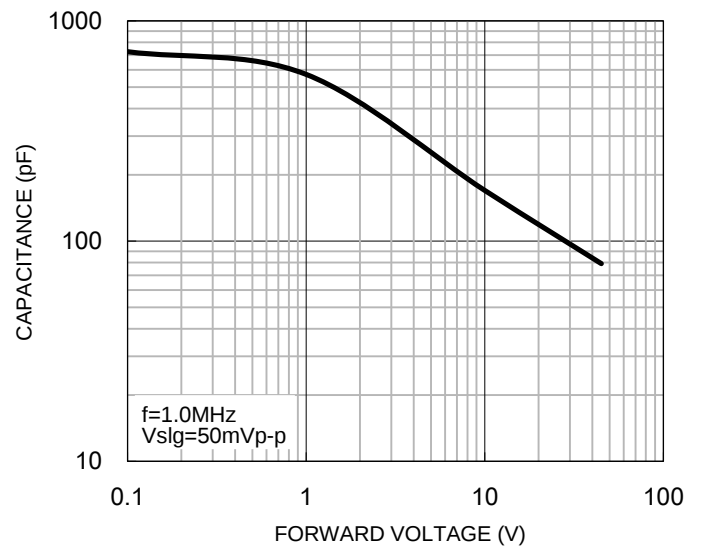
## CHARACTERISTICS CURVES

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

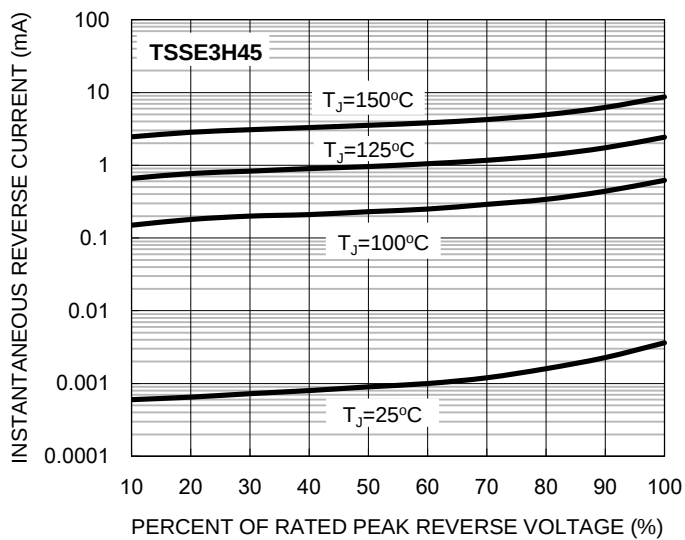
**Fig.1 Forward Current Derating Curve**



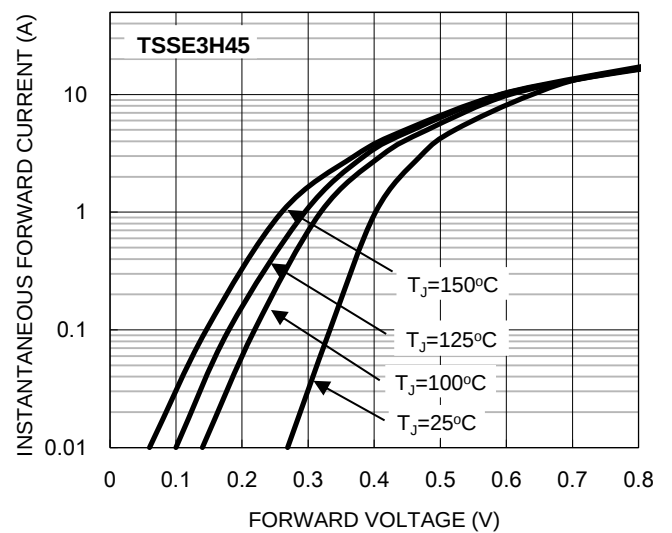
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**



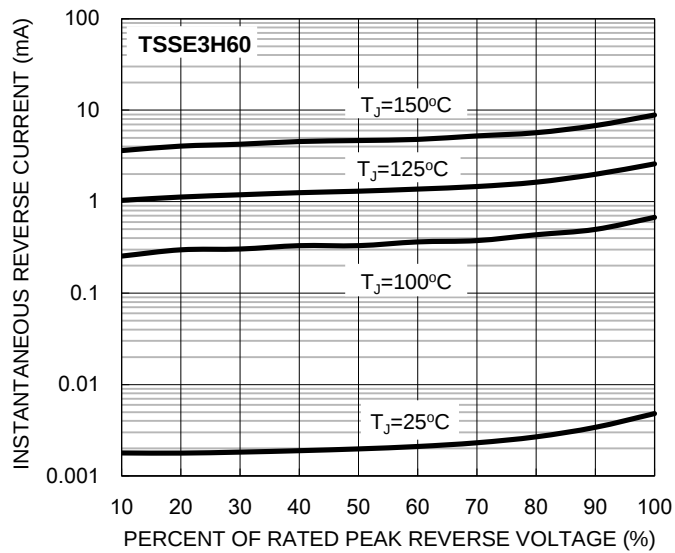
**Fig.4 Typical Forward Characteristics**



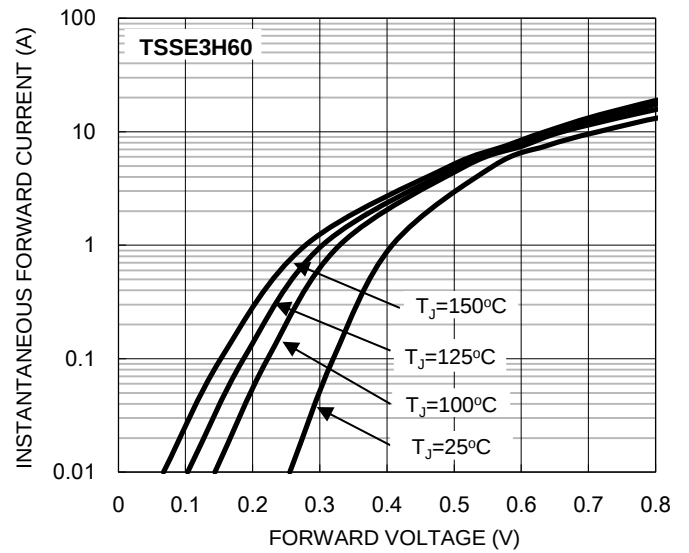
## CHARACTERISTICS CURVES

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

**Fig.5 Typical Reverse Characteristics**

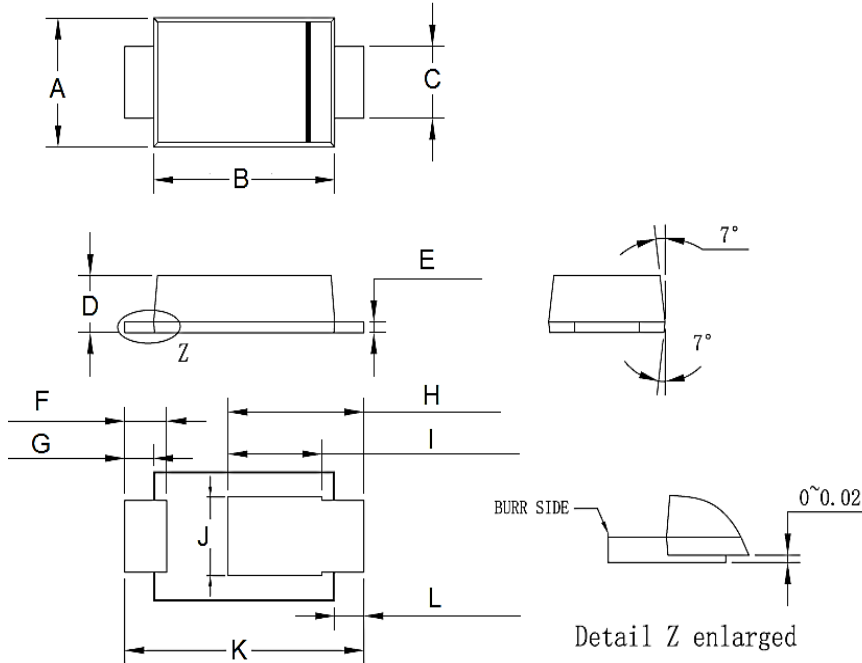


**Fig.6 Typical Forward Characteristics**



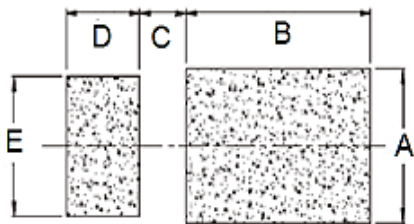
## PACKAGE OUTLINE DIMENSIONS

### SOD-123HE



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 1.65      | 1.95 | 0.065       | 0.077 |
| B    | 2.60      | 3.00 | 0.102       | 0.118 |
| C    | 0.85      | 1.15 | 0.033       | 0.045 |
| D    | 0.75      | 0.85 | 0.030       | 0.033 |
| E    | 0.10      | 0.20 | 0.004       | 0.008 |
| F    | 0.55      | 0.75 | 0.022       | 0.030 |
| G    | 0.35      | 0.55 | 0.014       | 0.022 |
| H    | 1.90      | 2.30 | 0.075       | 0.091 |
| I    | 1.35      | 1.55 | 0.053       | 0.061 |
| J    | 0.95      | 1.25 | 0.037       | 0.049 |
| K    | 3.50      | 3.90 | 0.138       | 0.154 |
| L    | 0.35      | 0.55 | 0.014       | 0.022 |

## SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 1.40      | 0.055       |
| B      | 2.40      | 0.094       |
| C      | 0.70      | 0.028       |
| D      | 0.90      | 0.035       |
| E      | 1.40      | 0.055       |

## MARKING DIAGRAM



P/N = Marking Code

YW = Date Code

F = Factory Code

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