

## 5A, 20V - 150V Surface Mount Schottky Barrier Rectifier

### FEATURES

- Low power loss, high efficiency
- Ideal for automated placement
- Guard ring for over-voltage protection
- High surge current 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

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- Converter

### MECHANICAL DATA

- Case: DO-214AA (SMB)
- Molding compound meets UL 94V-0 flammability rating
- Moisture sensitivity level: level 1, per J-STD-020
- Packing code with suffix "G" means green compound (halogen-free)
- Part no. with suffix "H" means AEC-Q101 qualified
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.1 g (approximately)

| KEY PARAMETERS |                |      |
|----------------|----------------|------|
| PARAMETER      | VALUE          | UNIT |
| $I_{F(AV)}$    | 5              | A    |
| $V_{RRM}$      | 20 - 150       | V    |
| $I_{FSM}$      | 120            | A    |
| Package        | DO-214AA (SMB) |      |
| Configuration  | Single Die     |      |



DO-214AA (SMB)

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                   |              |              |        |        |        |        |        |         |         |                  |
|-----------------------------------------------------------------------------------------------|--------------|--------------|--------|--------|--------|--------|--------|---------|---------|------------------|
| PARAMETER                                                                                     | SYMBOL       | SK 52B       | SK 53B | SK 54B | SK 55B | SK 56B | SK 59B | SK 510B | SK 515B | UNIT             |
| Marking code on the device                                                                    |              | SK 52B       | SK 53B | SK 54B | SK 55B | SK 56B | SK 59B | SK 510B | SK 515B |                  |
| Repetitive peak reverse voltage                                                               | $V_{RRM}$    | 20           | 30     | 40     | 50     | 60     | 90     | 100     | 150     | V                |
| Reverse voltage, total rms value                                                              | $V_{R(RMS)}$ | 14           | 21     | 28     | 35     | 42     | 63     | 70      | 105     | V                |
| Maximum DC blocking voltage                                                                   | $V_{DC}$     | 20           | 30     | 40     | 50     | 60     | 90     | 100     | 150     | V                |
| Forward current                                                                               | $I_{F(AV)}$  | 5            |        |        |        |        |        |         |         | A                |
| Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$    | 120          |        |        |        |        |        |         |         | A                |
| Critical rate of rise of off-state voltage                                                    | $dV/dt$      | 10000        |        |        |        |        |        |         |         | V/ $\mu\text{s}$ |
| Junction temperature                                                                          | $T_J$        | - 55 to +150 |        |        |        |        |        |         |         | $^\circ\text{C}$ |
| Storage temperature                                                                           | $T_{STG}$    | - 55 to +150 |        |        |        |        |        |         |         | $^\circ\text{C}$ |

**THERMAL PERFORMANCE**

| PARAMETER                              | SYMBOL          | LIMIT | UNIT |
|----------------------------------------|-----------------|-------|------|
| Junction-to-lead thermal resistance    | $R_{\theta JL}$ | 19    | °C/W |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 60    | °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>               | SK52B  | $I_F = 5\text{A}, T_J = 25^\circ\text{C}$ | $V_F$  | -   | 0.55 | V    |
|                                                        | SK53B  |                                           |        |     |      | V    |
|                                                        | SK54B  |                                           |        |     |      | V    |
|                                                        | SK55B  |                                           |        | -   | 0.75 | V    |
|                                                        | SK56B  |                                           |        |     |      | V    |
|                                                        | SK59B  |                                           |        | -   | 0.85 | V    |
|                                                        | SK510B |                                           |        | -   | -    | V    |
|                                                        | SK515B |                                           |        | -   | 0.95 | V    |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | SK52B  | $T_J = 25^\circ\text{C}$                  | $I_R$  | -   | 0.5  | mA   |
|                                                        | SK53B  |                                           |        |     |      | mA   |
|                                                        | SK54B  |                                           |        |     |      | mA   |
|                                                        | SK55B  |                                           |        |     |      | mA   |
|                                                        | SK56B  |                                           |        |     |      | mA   |
|                                                        | SK59B  |                                           |        | -   | 0.1  | mA   |
|                                                        | SK510B |                                           |        |     |      | mA   |
|                                                        | SK515B |                                           |        |     |      | mA   |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | SK52B  | $T_J = 100^\circ\text{C}$                 | $I_R$  | -   | 20   | mA   |
|                                                        | SK53B  |                                           |        |     |      | mA   |
|                                                        | SK54B  |                                           |        |     |      | mA   |
|                                                        | SK55B  |                                           |        | -   | 10   | mA   |
|                                                        | SK56B  |                                           |        |     |      | mA   |
|                                                        | SK59B  |                                           |        | -   | -    | mA   |
|                                                        | SK510B |                                           |        |     |      | mA   |
|                                                        | SK515B |                                           |        |     |      | mA   |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | SK52B  | $T_J = 125^\circ\text{C}$                 | $I_R$  | -   | -    | mA   |
|                                                        | SK53B  |                                           |        |     |      | mA   |
|                                                        | SK54B  |                                           |        |     |      | mA   |
|                                                        | SK55B  |                                           |        | -   | -    | mA   |
|                                                        | SK56B  |                                           |        |     |      | mA   |
|                                                        | SK59B  |                                           |        | -   | 2    | mA   |
|                                                        | SK510B |                                           |        |     |      | mA   |
|                                                        | SK515B |                                           |        |     |      | 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.<br>SUFFIX | PACKING<br>CODE | PACKING CODE<br>SUFFIX(*) | PACKAGE | PACKING                  |
|--------------------|--------------------|-----------------|---------------------------|---------|--------------------------|
| SK5xxB<br>(Note 1) | H                  | R5              | G                         | SMB     | 850 / 7" Plastic reel    |
|                    |                    | R4              |                           | SMB     | 3,000 / 13" Paper reel   |
|                    |                    | M4              |                           | SMB     | 3,000 / 13" Plastic reel |

**Note:**

1. "x" defines voltage from 20V (SK52B) to 150V (SK515B)

\*: Optional available

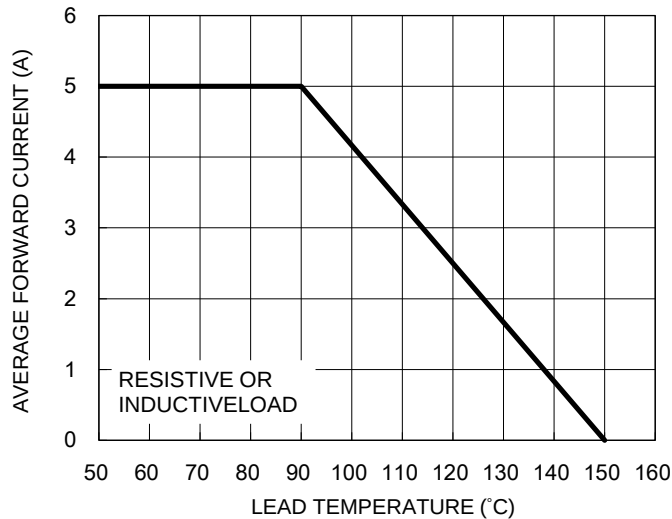
**EXAMPLE P/N**

| EXAMPLE P/N | PART NO. | PART NO.<br>SUFFIX | PACKING<br>CODE | PACKING CODE<br>SUFFIX | DESCRIPTION                          |
|-------------|----------|--------------------|-----------------|------------------------|--------------------------------------|
| SK56BHR5G   | SK56B    | H                  | R5              | G                      | AEC-Q101 qualified<br>Green compound |

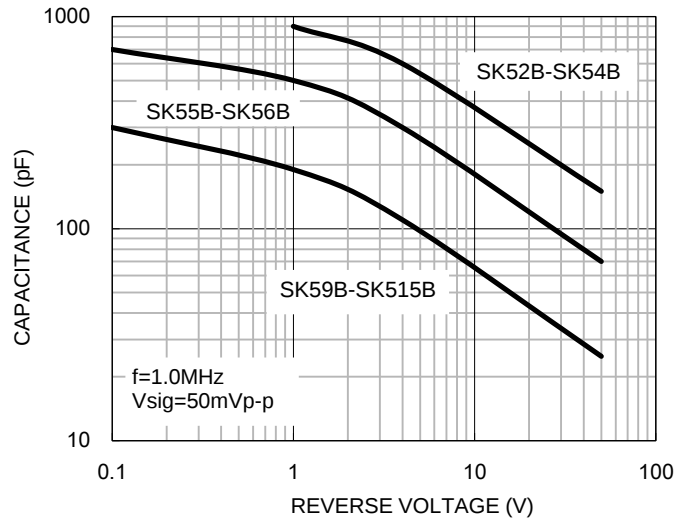
## CHARACTERISTICS CURVES

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

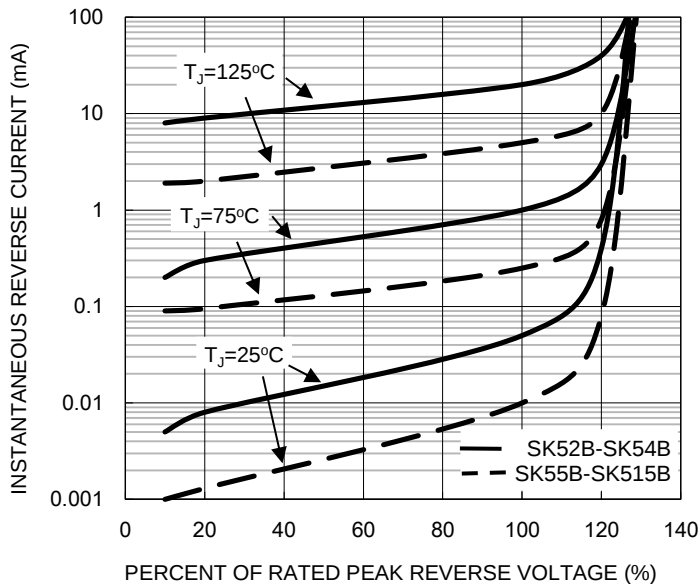
**Fig.1 Forward Current Derating Curve**



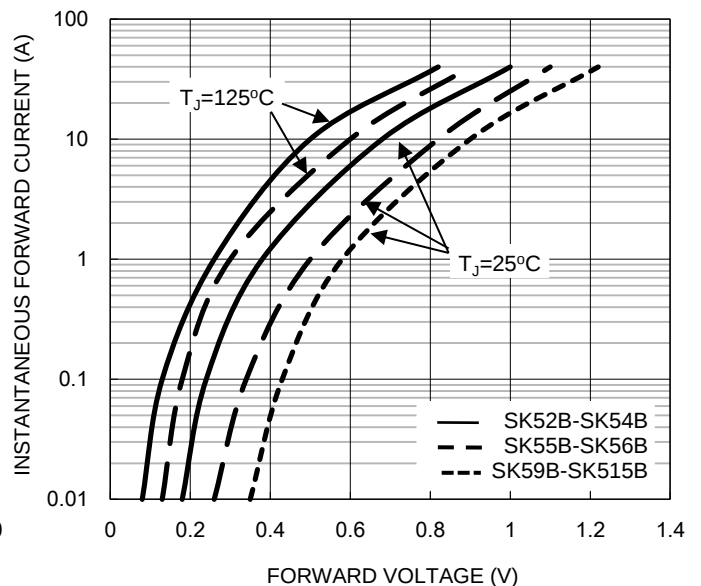
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**



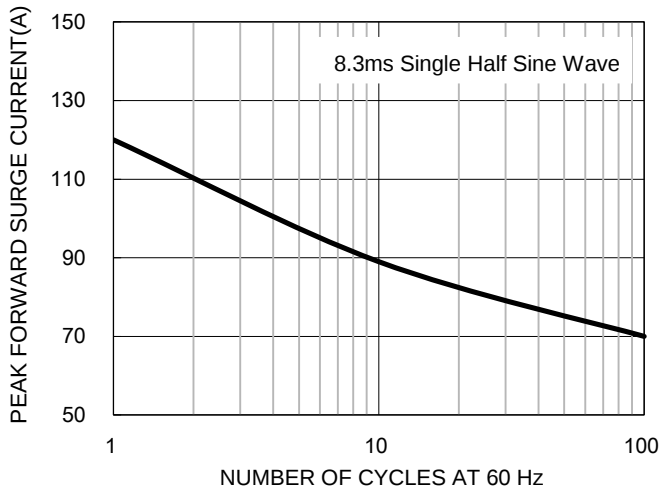
**Fig.4 Typical Forward Characteristics**



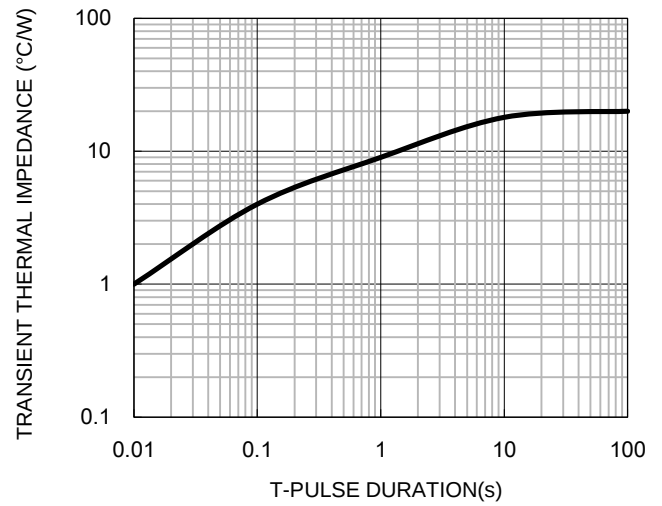
## CHARACTERISTICS CURVES

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

**Fig.5 Maximum Non-repetitive Forward Surge Current**

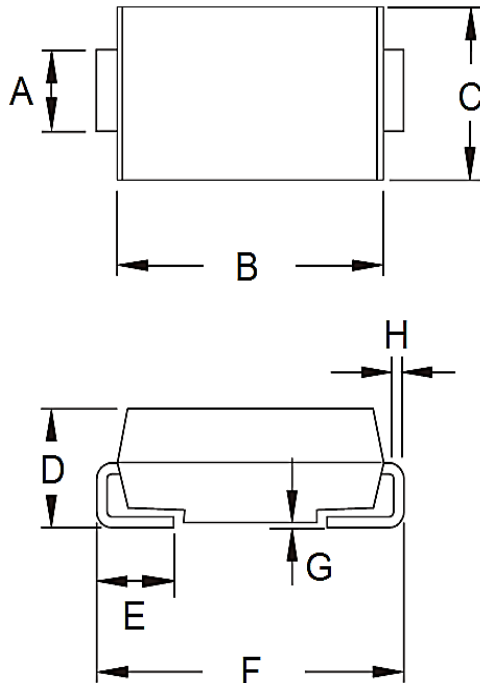


**Fig.6 Typical Transient Thermal Characteristics**



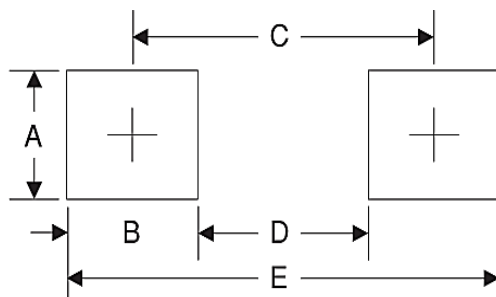
## PACKAGE OUTLINE DIMENSIONS

DO-214AA (SMB)



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 1.95      | 2.20 | 0.077       | 0.087 |
| B    | 4.05      | 4.60 | 0.159       | 0.181 |
| C    | 3.30      | 3.95 | 0.130       | 0.156 |
| D    | 1.95      | 2.65 | 0.077       | 0.104 |
| E    | 0.75      | 1.60 | 0.030       | 0.063 |
| F    | 5.10      | 5.60 | 0.201       | 0.220 |
| G    | 0.05      | 0.20 | 0.002       | 0.008 |
| H    | 0.15      | 0.31 | 0.006       | 0.012 |

## SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 2.3       | 0.091       |
| B      | 2.5       | 0.098       |
| C      | 4.3       | 0.169       |
| D      | 1.8       | 0.071       |
| E      | 6.8       | 0.268       |

## MARKING DIAGRAM



P/N = Marking Code  
G = Green Compound  
YW = Date Code  
F = Factory Code

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