

## 5A, 20V - 200V 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-214AB (SMC)
- 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: 0.21 g (approximately)

| KEY PARAMETERS |                |      |
|----------------|----------------|------|
| PARAMETER      | VALUE          | UNIT |
| $I_{F(AV)}$    | 5              | A    |
| $V_{RRM}$      | 20 - 200       | V    |
| $I_{FSM}$      | 120            | A    |
| $T_{J\ MAX}$   | 150            | °C   |
| Package        | DO-214AB (SMC) |      |
| Configuration  | Single die     |      |



DO-214AB (SMC)

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

| PARAMETER                                                                                     | SYMBOL       | SK 52C       | SK 53C | SK 54C | SK 55C | SK 56C | SK 59C | SK 510C | SK 515C | SK 520C | UNIT             |
|-----------------------------------------------------------------------------------------------|--------------|--------------|--------|--------|--------|--------|--------|---------|---------|---------|------------------|
| Marking code on the device                                                                    |              | SK 52C       | SK 53C | SK 54C | SK 55C | SK 56C | SK 59C | SK 510C | SK 515C | SK 520C |                  |
| Repetitive peak reverse voltage                                                               | $V_{RRM}$    | 20           | 30     | 40     | 50     | 60     | 90     | 100     | 150     | 200     | V                |
| Reverse voltage, total rms value                                                              | $V_{R(RMS)}$ | 14           | 21     | 28     | 35     | 42     | 63     | 70      | 105     | 140     | V                |
| Maximum DC blocking voltage                                                                   | $V_{DC}$     | 20           | 30     | 40     | 50     | 60     | 90     | 100     | 150     | 200     | 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                                                    | $dV/dt$      | 10,000       |        |        |        |        |        |         |         |         | V/ $\mu\text{s}$ |
| 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 per diode    | $R_{\theta JL}$ | 17  | °C/W |
| Junction-to-ambient thermal resistance per diode | $R_{\theta JA}$ | 50  | °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>               | SK52C<br>SK53C<br>SK54C                   | $I_F = 5\text{A}, T_J = 25^\circ\text{C}$ | $V_F$  | -    | 0.55 | V    |
|                                                        | SK55C<br>SK56C                            |                                           |        | -    | 0.75 | V    |
|                                                        | SK59C<br>SK510C                           |                                           |        | -    | 0.85 | V    |
|                                                        | SK515C<br>SK520C                          |                                           |        | -    | 0.95 | V    |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | SK52C<br>SK53C<br>SK54C<br>SK55C<br>SK56C | $T_J = 25^\circ\text{C}$                  | $I_R$  | -    | 0.5  | mA   |
|                                                        | SK59C<br>SK510C<br>SK515C<br>SK520C       |                                           |        | -    | 0.3  | mA   |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | SK52C<br>SK53C<br>SK54C                   | $T_J = 100^\circ\text{C}$                 | $I_R$  | -    | 20   | mA   |
|                                                        | SK55C<br>SK56C                            |                                           |        | -    | 10   | mA   |
|                                                        | SK59C<br>SK510C<br>SK515C<br>SK520C       |                                           |        | -    | -    | mA   |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | SK52C<br>SK53C<br>SK54C                   | $T_J = 125^\circ\text{C}$                 | $I_R$  | -    | -    | mA   |
|                                                        | SK55C<br>SK56C                            |                                           |        | -    | -    | mA   |
|                                                        | SK59C<br>SK510C<br>SK515C<br>SK520C       |                                           |        | -    | 5    | 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                  |
|----------------------|-----------------|--------------|---------------------|------------|--------------------------|
| SK5xxC<br>(Note 1,2) | H               | R7           | G                   | SMC        | 850 / 7" Plastic reel    |
|                      |                 | R6           |                     | SMC        | 3,000 / 13" Paper reel   |
|                      |                 | M6           |                     | SMC        | 3,000 / 13" Plastic reel |
|                      |                 | V7           |                     | Matrix SMC | 850 / 7" Plastic reel    |
|                      |                 | V6           |                     | Matrix SMC | 3,000 / 13" Plastic reel |

**Note :**

1. "xx" defines voltage from 20V (SK52C) to 200V (SK520C)
2. Only V6 and V7 are all green compound (halogen free)

**EXAMPLE**

| EXAMPLE P/N | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION                          |
|-------------|----------|-----------------|--------------|---------------------|--------------------------------------|
| SK52CHR7G   | SK52C    | H               | R7           | G                   | AEC-Q101 qualified<br>Green compound |

## CHARACTERISTICS CURVES

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

**Fig.1 Forward Current Derating Curve**

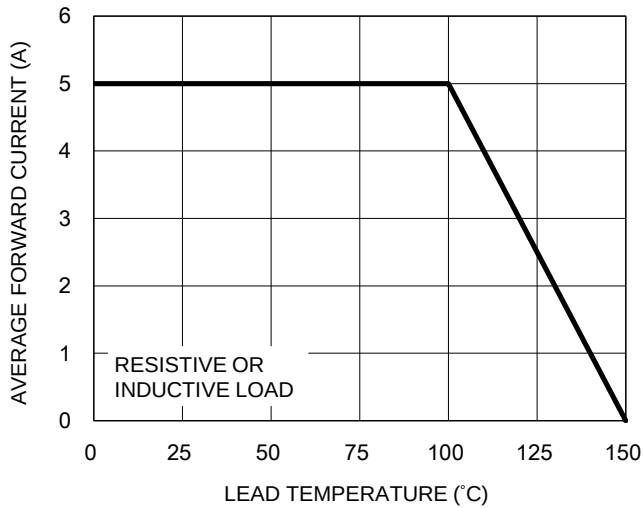


**Fig.2 Typical Junction Capacitance**

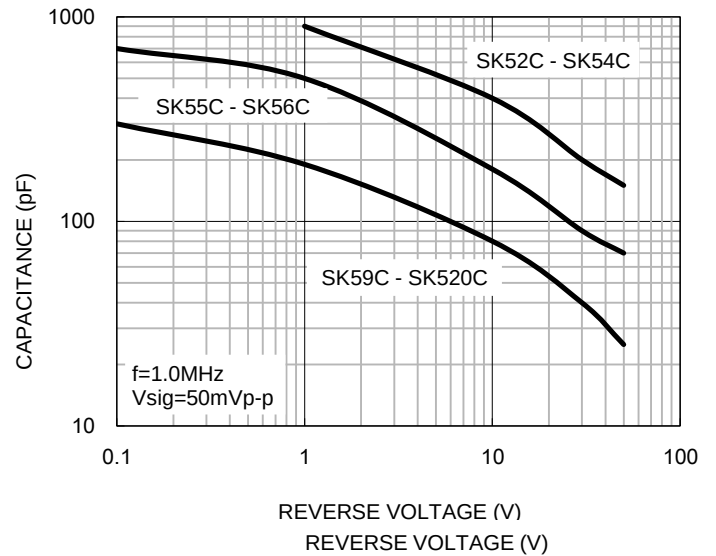


**Fig.3 Typical Reverse Characteristics**

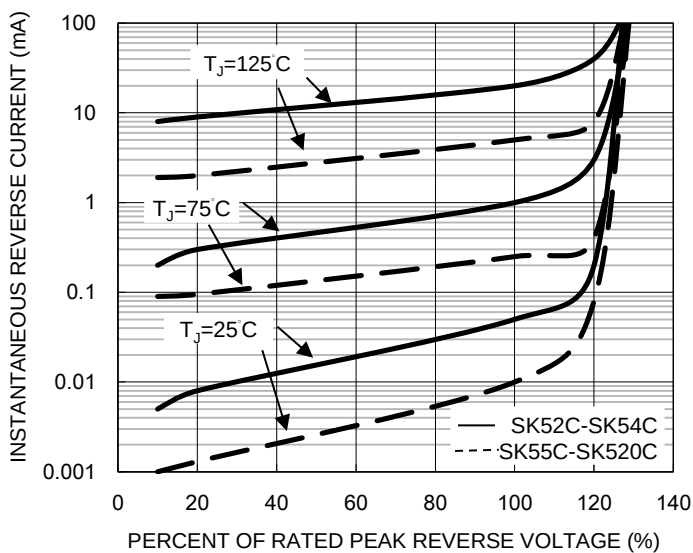
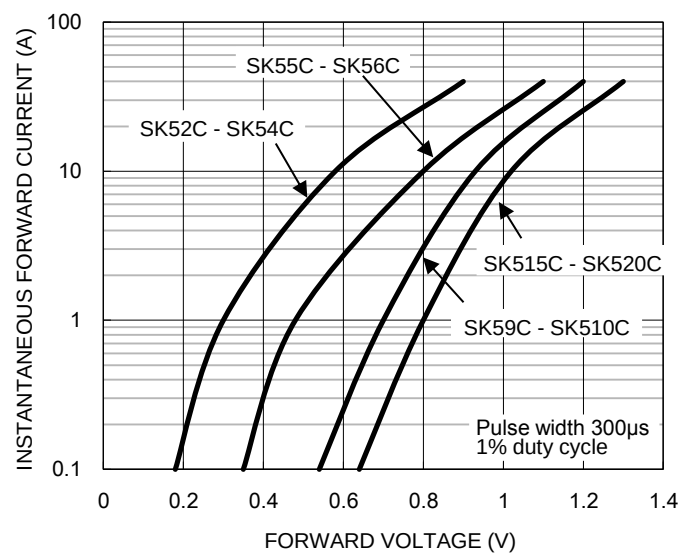


**Fig.4 Typical Forward Characteristics**



## CHARACTERISTICS CURVES

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

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

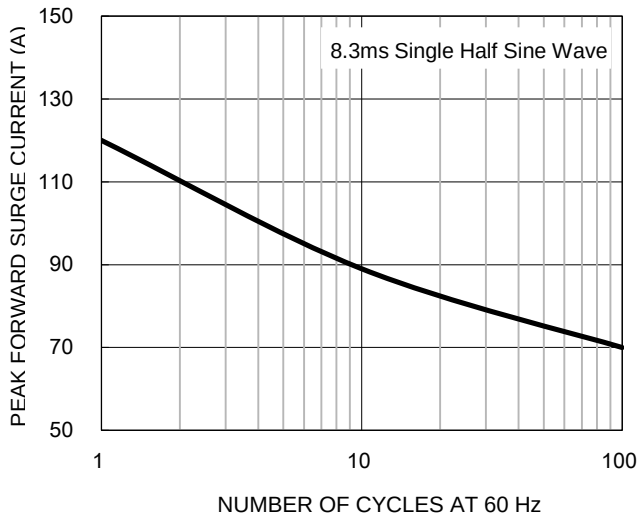
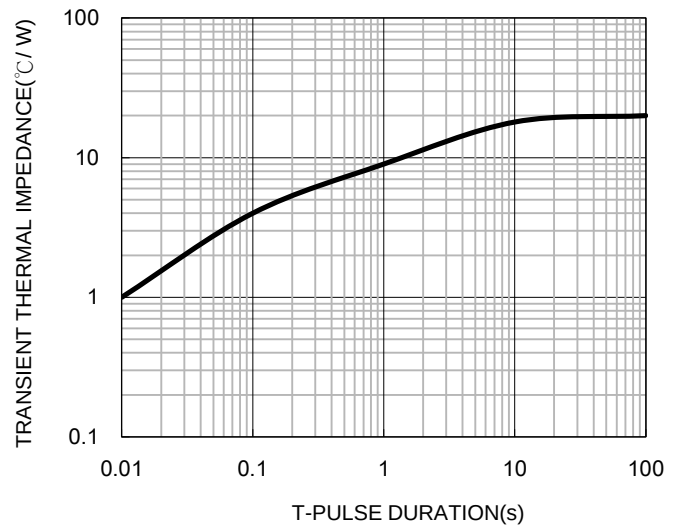
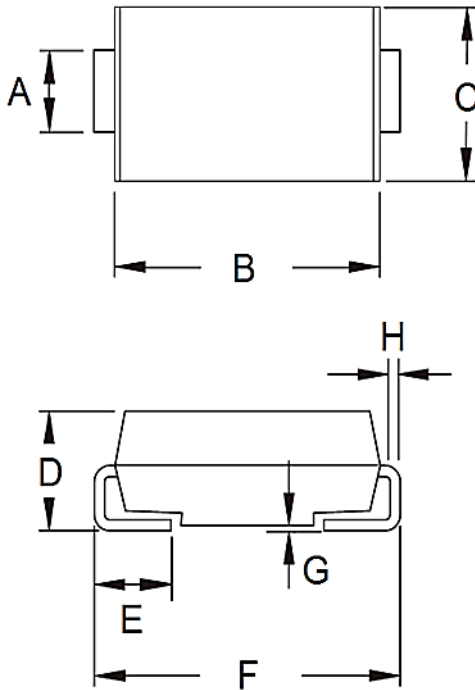


**Fig.6 Typical Transient Thermal Characteristics**



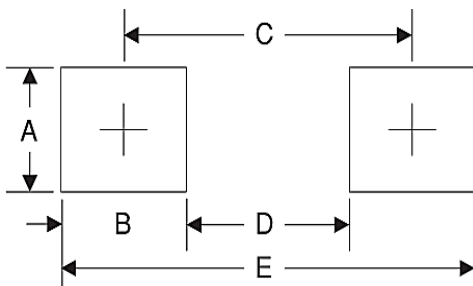
## PACKAGE OUTLINE DIMENSIONS

DO-214AB (SMC)



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 2.90      | 3.20 | 0.114       | 0.126 |
| B    | 6.60      | 7.11 | 0.260       | 0.280 |
| C    | 5.59      | 6.22 | 0.220       | 0.245 |
| D    | 2.00      | 2.62 | 0.079       | 0.103 |
| E    | 1.00      | 1.60 | 0.039       | 0.063 |
| F    | 7.75      | 8.13 | 0.305       | 0.320 |
| G    | 0.10      | 0.20 | 0.004       | 0.008 |
| H    | 0.15      | 0.31 | 0.006       | 0.012 |

## SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 3.30      | 0.130       |
| B      | 2.50      | 0.098       |
| C      | 6.80      | 0.268       |
| D      | 4.40      | 0.173       |
| E      | 9.40      | 0.370       |

## MARKING DIAGRAM

Matrix SMC



SMC



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

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**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331