

## 5A, 50V - 1000V High Efficient Surface Mount Rectifier

### FEATURES

- Glass passivated junction chip
- Ideal for automated placement
- Low forward voltage drop
- Low profile package
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- High frequency rectification
- Freewheeling application
- Switching mode converters and inverters in computer, automotive and telecommunication.

### 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    |
| $V_{RRM}$      | 50 - 1000      | V    |
| $I_{FSM}$      | 150            | 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       | HS5A         | HS5B | HS5D | HS5F | HS5G | HS5J | HS5K | HS5M | UNIT |
| Marking code on the device                                                                    |              | HS5A         | HS5B | HS5D | HS5F | HS5G | HS5J | HS5K | HS5M |      |
| Repetitive peak reverse voltage                                                               | $V_{RRM}$    | 50           | 100  | 200  | 300  | 400  | 600  | 800  | 1000 | V    |
| Reverse voltage, total rms value                                                              | $V_{R(RMS)}$ | 35           | 70   | 140  | 210  | 280  | 420  | 560  | 700  | V    |
| Maximum DC blocking voltage                                                                   | $V_{DC}$     | 50           | 100  | 200  | 300  | 400  | 600  | 800  | 1000 |      |
| Forward current                                                                               | $I_{F(AV)}$  | 5            |      |      |      |      |      |      |      | A    |
| Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$    | 150          |      |      |      |      |      |      |      | 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-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>               | HS5A<br>HS5B<br>HS5D<br>HS5F         | $I_F = 3\text{A}, T_J = 25^\circ\text{C}$                         | $V_F$    | -    | -    | V             |
|                                                        | HS5G                                 |                                                                   |          | -    | -    | V             |
|                                                        | HS5J<br>HS5K<br>HS5M                 |                                                                   |          | -    | 1.35 | V             |
| Forward voltage per diode <sup>(1)</sup>               | HS5A<br>HS5B<br>HS5D<br>HS5F         | $I_F = 5\text{A}, T_J = 25^\circ\text{C}$                         | $V_F$    | -    | 1.00 | V             |
|                                                        | HS5G                                 |                                                                   |          | -    | 1.30 | V             |
|                                                        | HS5J<br>HS5K<br>HS5M                 |                                                                   |          | -    | 1.70 | V             |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> |                                      | $T_J = 25^\circ\text{C}$                                          | $I_R$    | -    | 10   | $\mu\text{A}$ |
|                                                        |                                      | $T_J = 125^\circ\text{C}$                                         |          | -    | 250  | $\mu\text{A}$ |
| Junction capacitance                                   | HS5A<br>HS5B<br>HS5D<br>HS5F<br>HS5G | 1 MHz, $V_R = 4.0\text{V}$                                        | $C_J$    | 80   | -    | pF            |
|                                                        | HS5J<br>HS5K<br>HS5M                 |                                                                   |          | 50   | -    | pF            |
| Reverse recovery time                                  | HS5A<br>HS5B<br>HS5D<br>HS5F<br>HS5G | $I_F = 0.5\text{A}, I_R = 1.0\text{A}$<br>$I_{RR} = 0.25\text{A}$ | $t_{rr}$ | -    | 50   | ns            |
|                                                        | HS5J<br>HS5K<br>HS5M                 |                                                                   |          | -    | 75   | ns            |

**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                  |
|--------------------|-----------------|--------------|---------------------|------------|--------------------------|
| HS5x<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 :**

- "x" defines voltage from 50V (HS5A) to 1000V (HS5M)
- Only V6 and V7 are all green compound (halogen free)

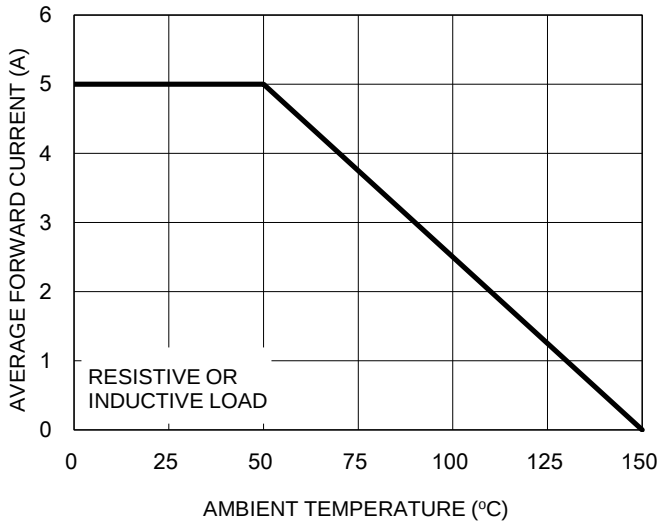
**EXAMPLE**

| EXAMPLE P/N | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION                          |
|-------------|----------|-----------------|--------------|---------------------|--------------------------------------|
| HS5AHR7G    | HS5A     | H               | R7           | G                   | AEC-Q101 qualified<br>Green compound |

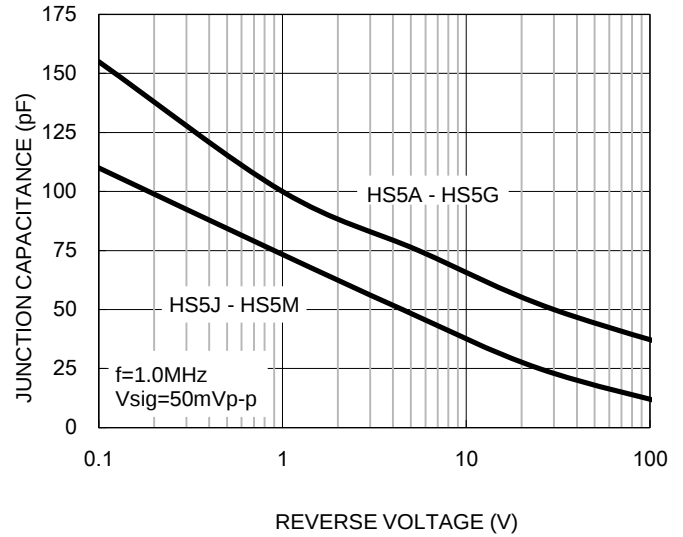
## CHARACTERISTICS CURVES

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

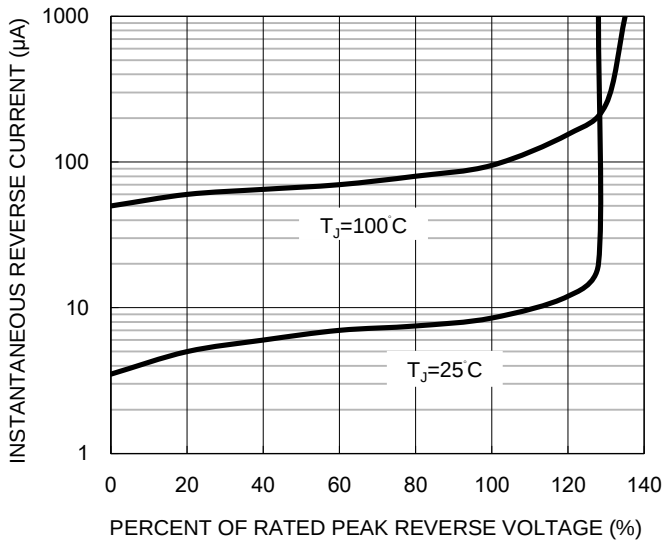
**Fig.1 Forward Current Derating Curve**



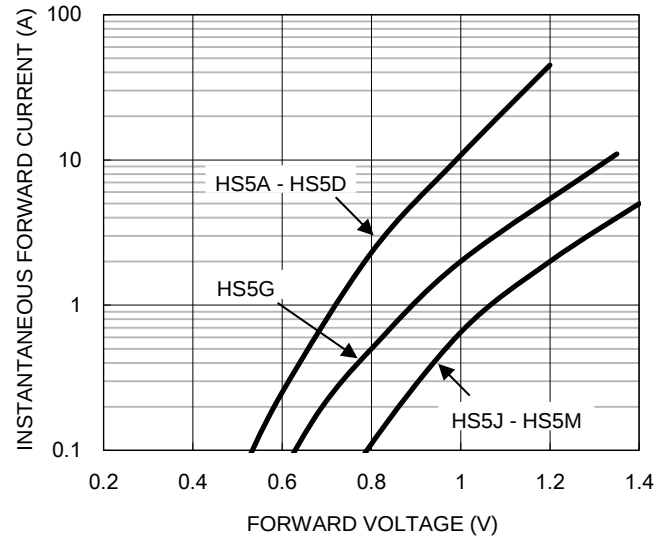
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**



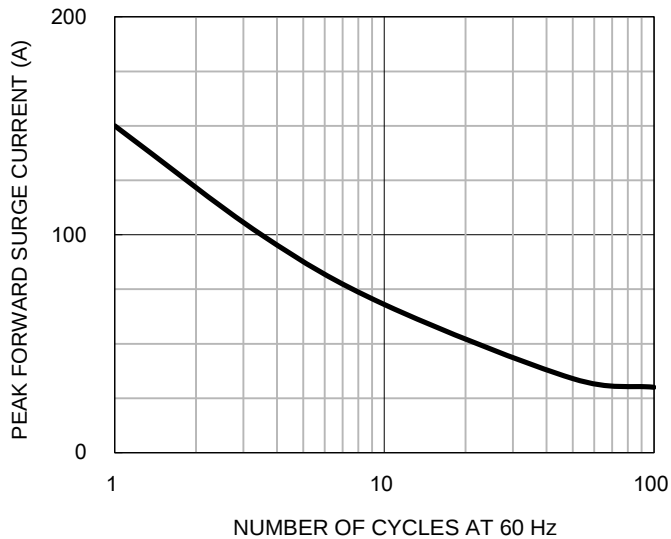
**Fig.4 Typical Forward Characteristics**



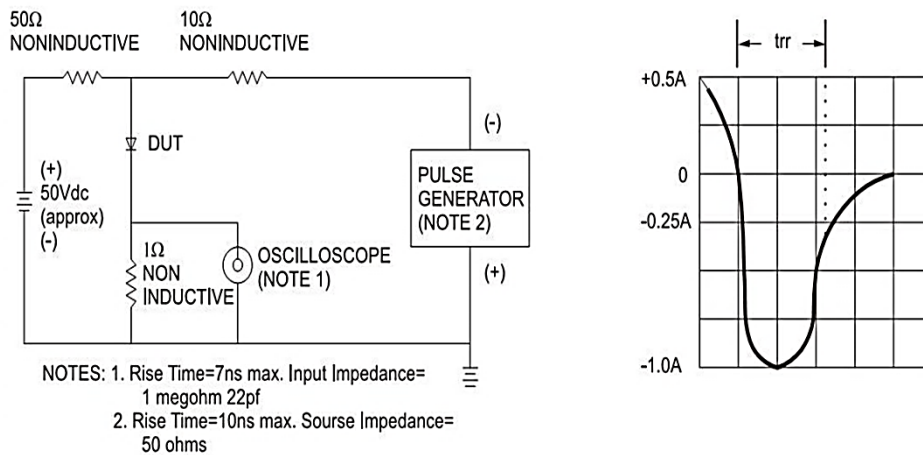
## CHARACTERISTICS CURVES

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

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



**Fig.6 Reverse Recovery Time Characteristic And Test Circuit Diagram**



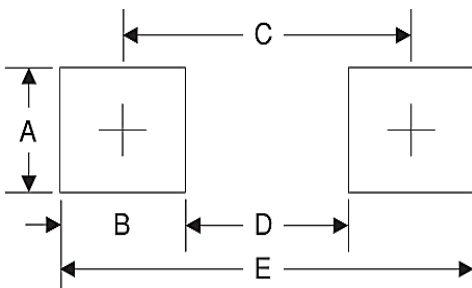
## PACKAGE OUTLINE DIMENSIONS

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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