



# THE DATASHEET OF HS3BB R5G



## 3A, 50V - 1000V High Efficient Surface Mount Rectifier

### FEATURES

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

| KEY PARAMETERS |                |      |
|----------------|----------------|------|
| PARAMETER      | VALUE          | UNIT |
| $I_{F(AV)}$    | 3              | A    |
| $V_{RRM}$      | 50 - 1000      | V    |
| $I_{FSM}$      | 100            | A    |
| $T_{J MAX}$    | 150            | °C   |
| Package        | DO-214AA (SMB) |      |
| Configuration  | Signal Die     |      |

### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Monitor
- TV



DO-214AA (SMB)

### 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: 0.093 g (approximately)

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                   |              |              |           |           |           |           |           |           |           |      |
|---|--------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------|
| PARAMETER   | SYMBOL       | HS           | HS        | HS        | HS        | HS        | HS        | HS        | HS        | UNIT |
|   |              | 3AB          | 3BB       | 3DB       | 3FB       | 3GB       | 3JB       | 3KB       | 3MB       |      |
| Marking code on the device  |              | HS<br>3AB    | HS<br>3BB | HS<br>3DB | HS<br>3FB | HS<br>3GB | HS<br>3JB | HS<br>3KB | HS<br>3MB |      |
| 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      | 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 | $I_{FSM}$    | 100          |           |           |           |           |           |           |           | A    |
| Junction temperature  | $T_J$        | - 55 to +150 |           |           |           |           |           |           |           | °C   |
| Storage temperature   | $T_{STG}$    | - 55 to +150 |           |           |           |           |           |           |           | °C   |

| <b>THERMAL PERFORMANCE</b>             |                 |       |               |
|--|-----------------|-------|---------------|
| PARAMETER                              | SYMBOL          | LIMIT | UNIT          |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 60    | $^{\circ}C/W$ |

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^{\circ}C$ unless otherwise noted) |       |  |          |     |     |         |    |     |    |
|--|-------|--|----------|-----|-----|---------|----|-----|----|
| PARAMETER  |       | CONDITIONS                                   | SYMBOL   | TYP | MAX | UNIT    |    |     |    |
| Forward voltage per diode <sup>(1)</sup>                                       | HS3AB | $I_F = 3A, T_J = 25^{\circ}C$                | $V_F$    | -   | 1.0 | V       |    |     |    |
|  | HS3BB |  |          |     |     | V       |    |     |    |
|  | HS3DB |  |          |     |     | V       |    |     |    |
|  | HS3FB |  |          |     |     | V       |    |     |    |
|  | HS3GB |  |          |     |     |         | -  | 1.3 | V  |
|  | HS3JB |  |          |     |     |         | -  | 1.7 | V  |
|  | HS3KB |  |          |     | V   |         |    |     |    |
|  | HS3MB |  |          |     | V   |         |    |     |    |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup>                         |       | $T_J = 25^{\circ}C$                          | $I_R$    | -   | 10  | $\mu A$ |    |     |    |
|  |       | $T_J = 100^{\circ}C$                         | $I_R$    | -   | 250 | $\mu A$ |    |     |    |
| Junction capacitance   | HS3AB | 1 MHz, $V_R = 4V$                            | $C_J$    | 80  | -   | pF      |    |     |    |
|  | HS3BB |  |          |     |     | pF      |    |     |    |
|  | HS3DB |  |          |     |     | pF      |    |     |    |
|  | HS3FB |  |          |     |     | pF      |    |     |    |
|  | HS3GB |  |          |     |     |         | 50 | -   | pF |
|  | HS3JB |  |          |     | pF  |         |    |     |    |
|  | HS3KB |  |          |     | pF  |         |    |     |    |
|  | HS3MB |  |          |     | pF  |         |    |     |    |
| Reverse recovery time  | HS3AB | $I_F = 0.5A, I_R = 1.0A$<br>$I_{RR} = 0.25A$ | $t_{rr}$ | -   | 50  | ns      |    |     |    |
|  | HS3BB |  |          |     |     | ns      |    |     |    |
|  | HS3DB |  |          |     |     | ns      |    |     |    |
|  | HS3FB |  |          |     |     | ns      |    |     |    |
|  | HS3GB |  |          |     |     |         | 75 | -   | ns |
|  | HS3JB |  |          |     | ns  |         |    |     |    |
|  | HS3KB |  |          |     | ns  |         |    |     |    |
|  | HS3MB |  |          |     | ns  |         |    |     |    |

**Notes:**

1. Pulse test with PW=0.3 ms
2. Pulse test with PW=30 ms

**ORDERING INFORMATION**

| PART NO.          | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX(*) | PACKAGE | PACKING                  |
|-------------------|-----------------|--------------|------------------------|---------|--------------------------|
| HS3xB<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 50V (HS3AB) to 1000V (HS3MB)

\*: Optional available

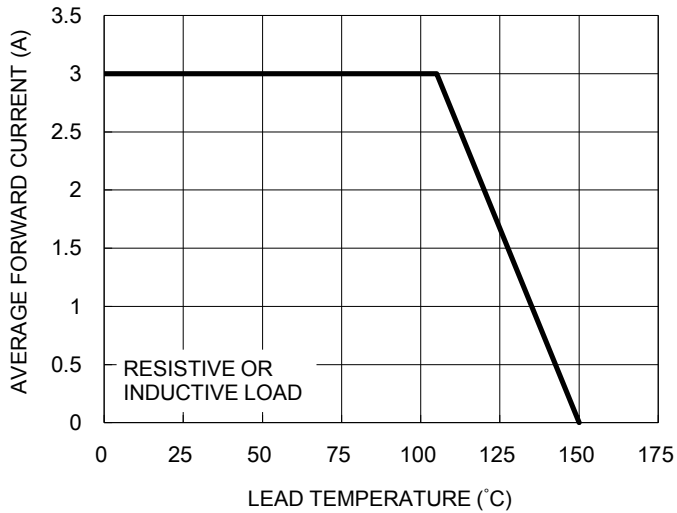
**EXAMPLE P/N**

| EXAMPLE P/N | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION                          |
|-------------|----------|-----------------|--------------|---------------------|--------------------------------------|
| HS3ABHR5G   | HS3AB    | H               | R5           | G                   | AEC-Q101 qualified<br>Green compound |

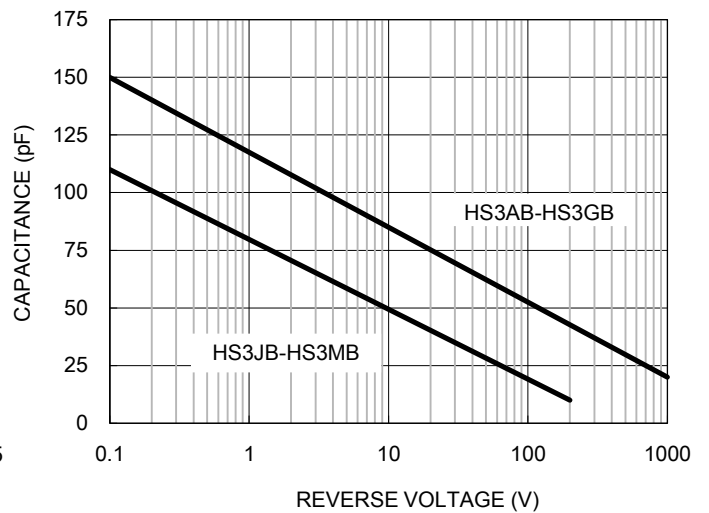
**CHARACTERISTICS CURVES**

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

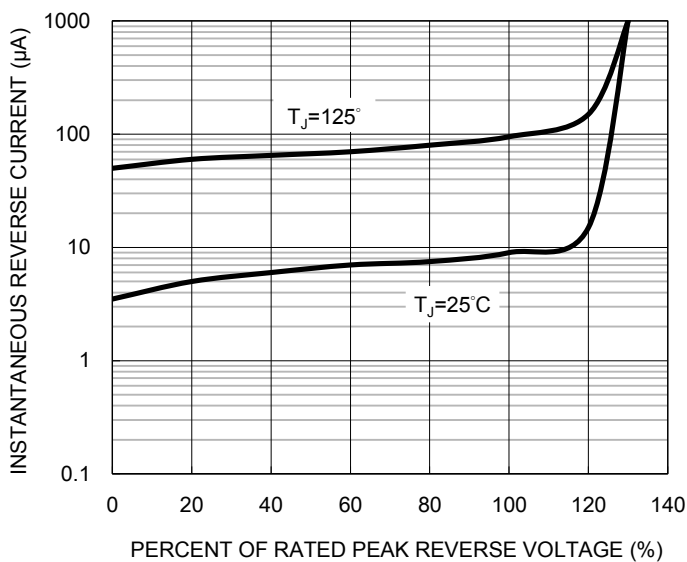
**Fig1. Forward Current Derating Curve**



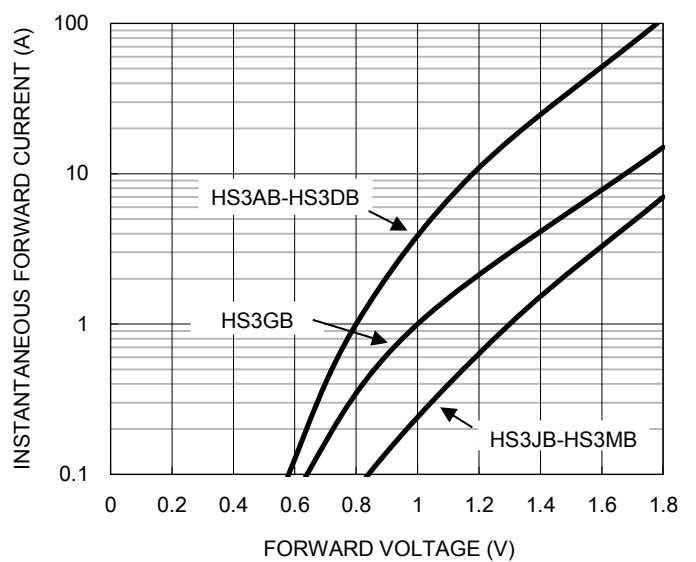
**Fig2. Typical Junction Capacitance**



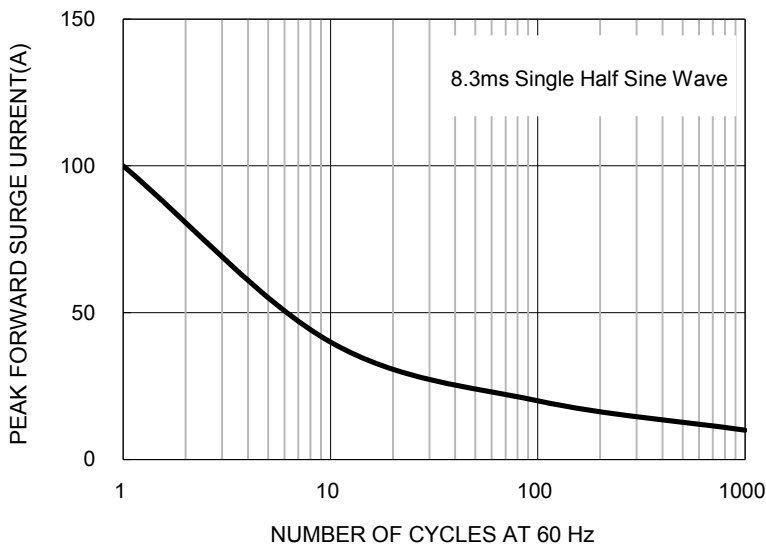
**Fig3. Typical Reverse Characteristics**



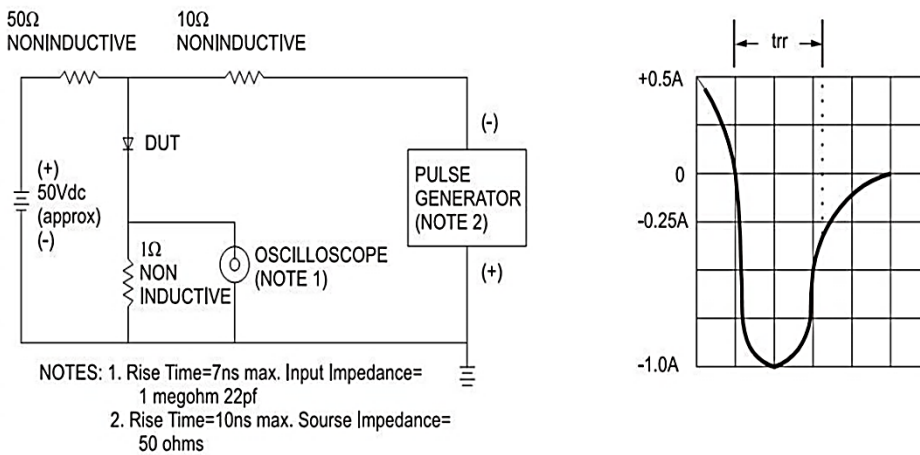
**Fig4. Typical Forward Characteristics**



**Fig5. Maximum Non-repetitive Forward Surge Current**

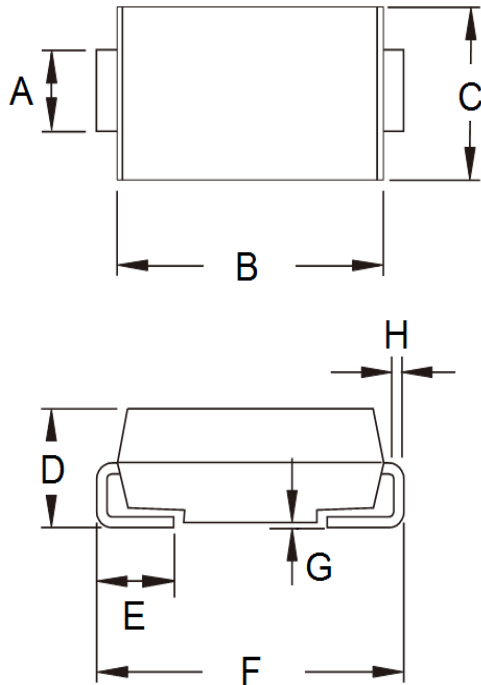


**Fig6. Reverse Recovery Time Characteristic And Test Circuit Diagram**



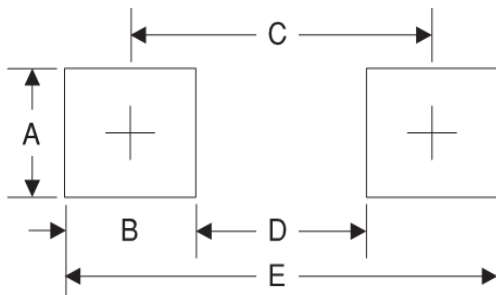
**PACKAGE OUTLINE DIMENSIONS**

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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