

# 3A, 50V - 1000V Surface Mount Fast Recovery Rectifier

#### **FEATURES**

- Glass passivated chip junction
- Ideal for automated placement
- Fast switching for high efficiency
- 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 <sub>F(AV)</sub> | 3             | Α    |  |  |  |  |
| $V_{RRM}$          | 50 - 1000     | V    |  |  |  |  |
| I <sub>FSM</sub>   | 100           | Α    |  |  |  |  |
| T <sub>J MAX</sub> | 150           | °C   |  |  |  |  |
| Package            | DO-214AB (SMC |      |  |  |  |  |
| Configuration      | Single        | die  |  |  |  |  |





**DO-214AB (SMC)** 

| PARAMETER   | SYMBOL             | RS3A         | RS3B | RS3D | RS3G | RS3J | RS3K | RS3M | UNIT |
|---|--------------------|--------------|------|------|------|------|------|------|------|
| Marking code on the device  |                    | RS3A         | RS3B | RS3D | RS3G | RS3J | RS3K | RS3M |      |
| Repetitive peak reverse voltage   | $V_{RRM}$          | 50           | 100  | 200  | 400  | 600  | 800  | 1000 | V    |
| Reverse voltage, total rms value  | $V_{R(RMS)}$       | 35           | 70   | 140  | 280  | 420  | 560  | 700  | V    |
| Maximum DC blocking voltage   | $V_{DC}$           | 50           | 100  | 200  | 400  | 600  | 800  | 1000 | V    |
| Forward current   | I <sub>F(AV)</sub> |              |      |      | 3    |      |      |      | Α    |
| Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode | I <sub>FSM</sub>   | 100          |      |      | А    |      |      |      |      |
| Junction temperature  | T <sub>J</sub>     | - 55 to +150 |      |      |      | °C   |      |      |      |
| Storage temperature   | T <sub>STG</sub>   | - 55 to +150 |      |      |      | °C   |      |      |      |



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| THERMAL PERFORMANCE                              |                  |     |      |  |  |  |
|--|------------------|-----|------|--|--|--|
| PARAMETER  | SYMBOL           | TYP | UNIT |  |  |  |
| Junction-to-lead thermal resistance per diode    | $R_{\Theta JL}$  | 15  | °C/W |  |  |  |
| Junction-to-ambient thermal resistance per diode | R <sub>⊖JA</sub> | 50  | °C/W |  |  |  |

| ELECTRICAL SPECIFICATIONS (T <sub>A</sub> = 25°C unless otherwise noted) |  |   |                  |      |      |      |
|--|--|---|------------------|------|------|------|
| PARAMETER  |  | CONDITIONS                                  | SYMBOL           | TYP. | MAX. | UNIT |
| Forward voltage per diode (1   |  | I <sub>F</sub> = 3A, T <sub>J</sub> = 25°C  | $V_{F}$          | -    | 1.3  | V    |
| Doverse surrent @ reted //   | nor diada <sup>(2)</sup>                         | T <sub>J</sub> = 25°C                       | ,                | -    | 10   | μA   |
| Reverse current @ rated v <sub>R</sub>                                   | current @ rated $V_R$ per diode $^{(2)}$ $T_J =$ |   | - I <sub>R</sub> | -    | 250  | μΑ   |
| Reverse recovery time  | RS3A<br>RS3B<br>RS3D<br>RS3G                     | I <sub>F</sub> =0.5A , I <sub>R</sub> =1.0A | t <sub>rr</sub>  | -    | 150  | ns   |
| Treveled receivery time  | RS3J   | I <sub>RR</sub> =0.25A                      | ·rr              | -    | 250  | ns   |
|  | RS3K<br>RS3M                                     |   |                  | -    | 500  | ns   |

### Notes:

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

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| ORDERING INFORMATION |                       |                 |                           |            |                           |  |
|----------------------|-----------------------|-----------------|---------------------------|------------|---------------------------|--|
| PART NO.             | PART<br>NO.<br>SUFFIX | PACKING<br>CODE | PACKING<br>CODE<br>SUFFIX | PACKAGE    | PACKING                   |  |
|                      |                       | R7              |                           | SMC        | 850 / 7" Plastic reel     |  |
|                      |                       | R6              |                           | SMC        | 3,000 / 13" Paper reel    |  |
| RS3x<br>(Note 1,2)   | Н                     | M6              | G                         | SMC        | 3,000 / 13" Plastic reel  |  |
| (Note 1,2)           |                       | V7              |                           | Matrix SMC | 850 / 7" Plastic reel     |  |
|                      |                       | V6              |                           | Matrix SMC | `3,000 / 13" Plastic reel |  |

### Note:

- "x" defines voltage from 50V (RS3A) to 1000V (RS3M)
  Only V6 and V7 are all green compound (halogen free)

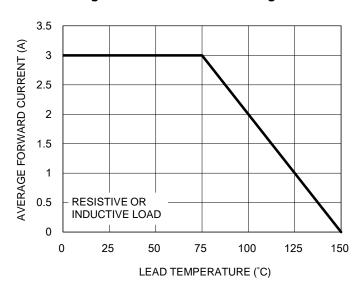
| EXAMPLE     |          |                    |                 |                        |                                      |  |
|-------------|----------|--------------------|-----------------|------------------------|--------------------------------------|--|
| EXAMPLE P/N | PART NO. | PART NO.<br>SUFFIX | PACKING<br>CODE | PACKING CODE<br>SUFFIX | DESCRIPTION                          |  |
| RS3AHR7G    | RS3A     | Н                  | R7              | G                      | AEC-Q101 qualified<br>Green compound |  |



### **CHARACTERISTICS CURVES**

(T<sub>A</sub> = 25°C unless otherwise noted)

**Fig.1 Forward Current Derating Curve** 



**Fig.2 Typical Junction Capacitance** 

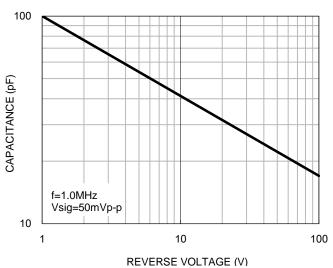


Fig.3 Typical Reverse Characteristics

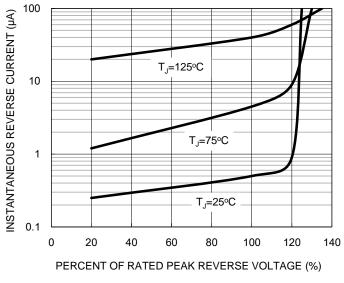
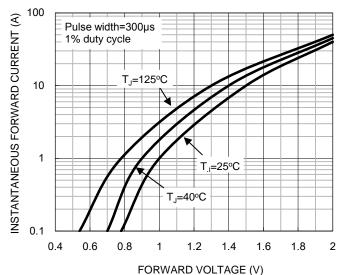


Fig.4 Typical Forward Characteristics





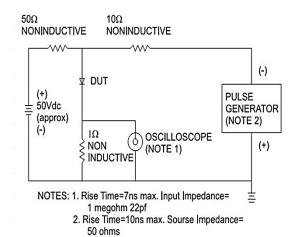
### **CHARACTERISTICS CURVES**

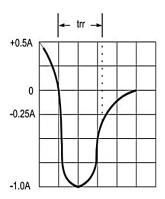
(T<sub>A</sub> = 25°C unless otherwise noted)

Fig.5 Maximum Non-repetitive Forward Surge Current



Fig.6 Reverse Recovery Time Characteristic And Test Circuit Diagram

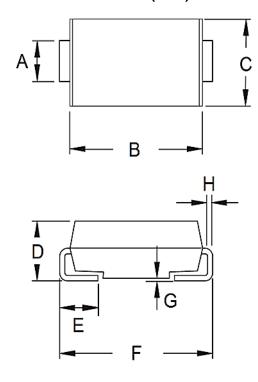






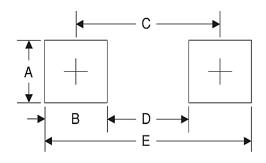
# **PACKAGE OUTLINE DIMENSIONS**

# DO-214AB (SMC)



| DIM.   | Unit | (mm) | Unit (inch) |       |
|--------|------|------|-------------|-------|
| DIIVI. | Min. | Max. | Min.        | Max.  |
| Α      | 2.90 | 3.20 | 0.114       | 0.126 |
| В      | 6.60 | 7.11 | 0.260       | 0.280 |
| С      | 5.59 | 6.22 | 0.220       | 0.245 |
| D      | 2.00 | 2.62 | 0.079       | 0.103 |
| Е      | 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 |
| Н      | 0.15 | 0.31 | 0.006       | 0.012 |

# **SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| А      | 3.30      | 0.130       |
| В      | 2.50      | 0.098       |
| С      | 6.80      | 0.268       |
| D      | 4.40      | 0.173       |
| Е      | 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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