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

## FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Low forward voltage drop
- High current capability
- 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

| 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-214AB (SMC) | |
| Configuration | Single die | |

## 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)

**DO-214AB (SMC)**

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise noted)

| PARAMETER | SYMBOL | S3A | S3B | S3D | S3G | S3J | S3K | S3M | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| Marking code on the device | | S3A | S3B | S3D | S3G | S3J | S3K | S3M | |
| 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 | $I_{F(AV)}$ | 3 | | | | | | | A |
| Surge peak forward current, 8.3 ms single half sine-wave uperimposed 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 |

## THERMAL PERFORMANCE

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|---|---|---|
| Junction-to-lead thermal resistance per diode | $R_{\Theta JL}$ | 13 | °C/W |
| Junction-to-ambient thermal resistance per diode | $R_{\Theta JA}$ | 47 | °C/W |

## ELECTRICAL SPECIFICATIONS ($T_A$ = 25°C unless otherwise noted)

| PARAMETER | CONDITIONS | SYMBOL | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| Forward voltage per diode (1) | $I_F$ = 3A, $T_J$ = 25°C | $V_F$ | - | 1.15 | V |
| Reverse current @ rated $V_R$ per diode (2) | $T_J$ = 25°C | $I_R$ | - | 10 | μA |
| | $T_J$ = 125°C | | - | 250 | μA |
| Junction capacitance | 1 MHz, $V_R$=4.0V | $C_J$ | 60 | - | pF |
| Reverse recovery time | $I_F$=0.5A , $I_R$=1.0A $I_{RR}$=0.25A | $t_{rr}$ | 1500 | - | 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 |
|---|---|---|---|---|---|
| S3x (Note 1) | 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. "x" defines voltage from 50V (S3A) to 1000V (S3M)

## EXAMPLE

| EXAMPLE P/N | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION |
|---|---|---|---|---|---|
| S3AHR7G | S3A | H | R7 | G | AEC-Q101 qualified Green compound |

## CHARACTERISTICS CURVES

($T_A$ = 25°C unless otherwise noted)

**Fig.1 Forward Current Derating Curve**

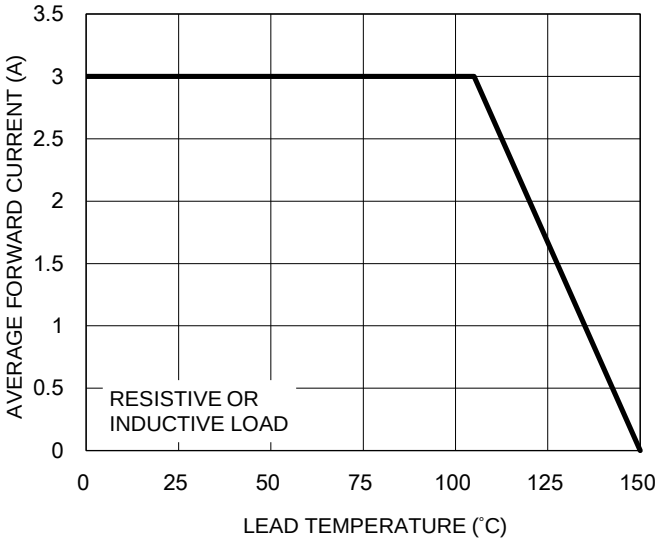



**Fig.2 Typical Junction Capacitance**

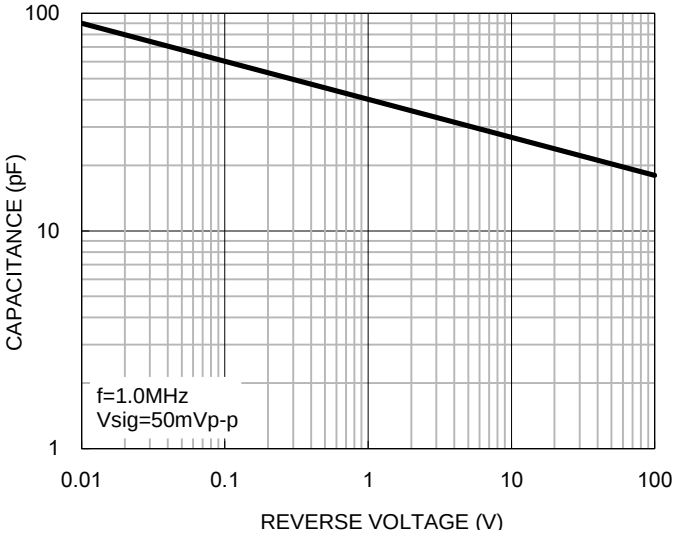



**Fig.3 Typical Reverse Characteristics**

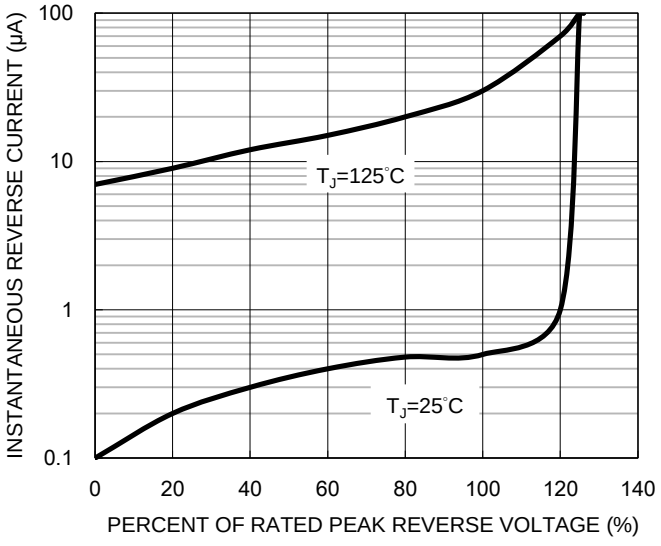
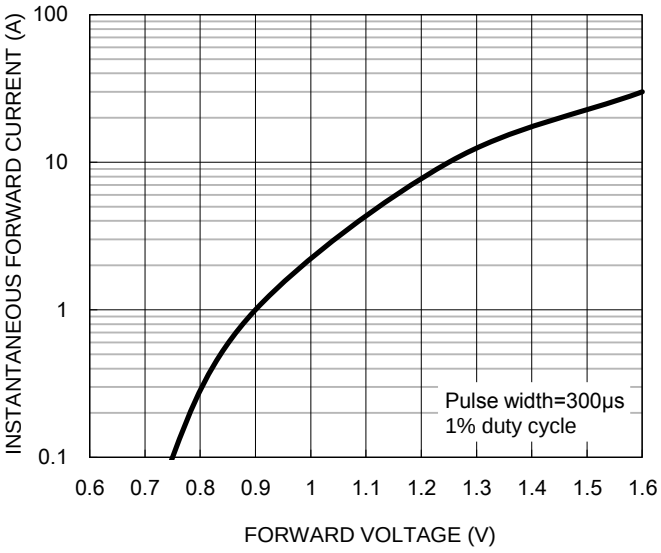



**Fig.4 Typical Forward Characteristics**



## CHARACTERISTICS CURVES

($T_A$ = 25°C unless otherwise noted)

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

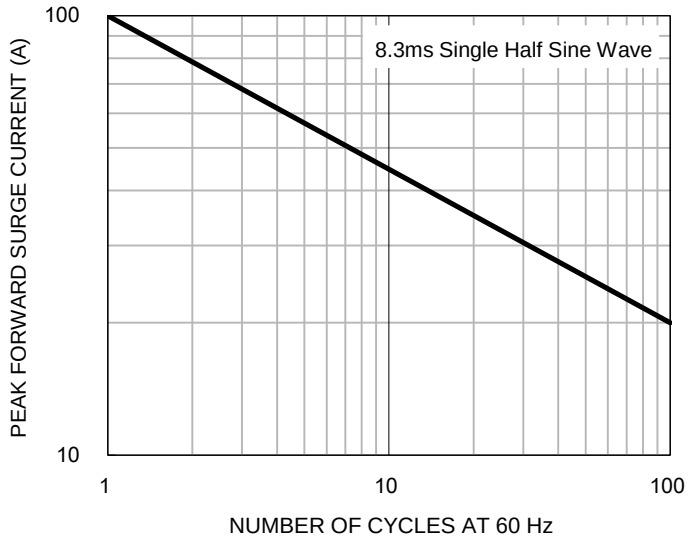
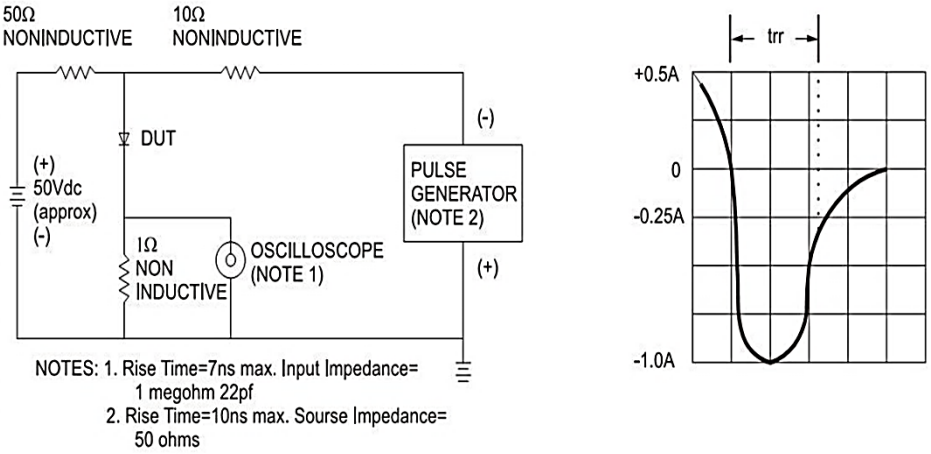
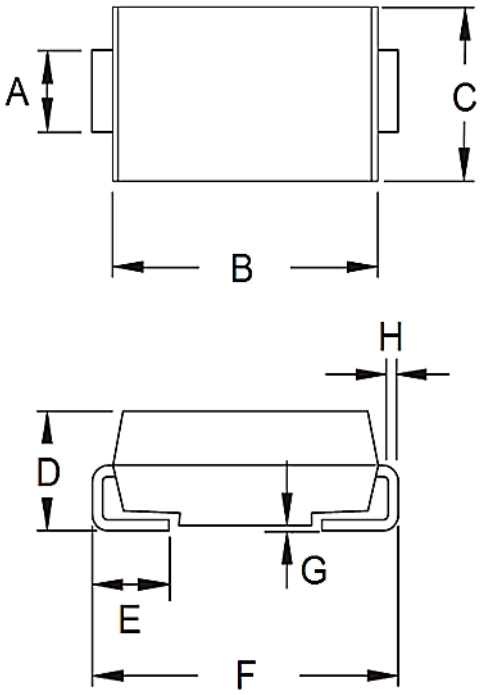



**Fig.6 Reverse Recovery Time Characteristic And Test Circuit Diagram**



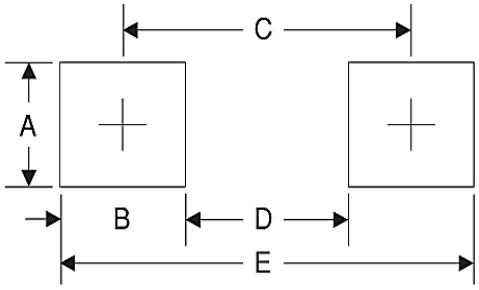
## PACKAGE OUTLINE DIMENSIONS

**DO-214AB (SMC)**




| DIM. | Unit (mm) | | Unit (inch) | |
|---|---|---|---|---|
| | 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


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

## Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.