

## 1A, 100V - 200V Ultra Fast Surface Mount Rectifier

### FEATURES

- AEC-Q101 qualified
- Low power loss, high efficiency
- Ideal for automated placement
- Ultra Fast recovery time for high efficiency
- High surge current capability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- DC to DC converter
- Automotive application
- Car lighting
- Snubber
- Freewheeling application

### MECHANICAL DATA

- Case: DO-214AC (SMA)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.070g (approximately)

| KEY PARAMETERS |                |      |
|----------------|----------------|------|
| PARAMETER      | VALUE          | UNIT |
| $I_F$          | 1              | A    |
| $V_{RRM}$      | 100 - 200      | V    |
| $I_{FSM}$      | 50             | A    |
| $T_{JMAX}$     | 175            | °C   |
| Package        | DO-214AC (SMA) |      |
| Configuration  | Single die     |      |



DO-214AC (SMA)



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                    |              |              |         |         |      |
|--|--------------|--------------|---------|---------|------|
| PARAMETER  | SYMBOL       | ESH2BAH      | ESH2CAH | ESH2DAH | UNIT |
| Marking code on the device   |              | ESH2BA       | ESH2CA  | ESH2DA  |      |
| Repetitive peak reverse voltage  | $V_{RRM}$    | 100          | 150     | 200     | V    |
| Reverse voltage, total rms value   | $V_{R(RMS)}$ | 70           | 105     | 140     | V    |
| Forward current  | $I_F$        | 1            |         |         | A    |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load             | $I_{FSM}$    | 50           |         |         | A    |
| Pulse energy in avalanche mode, non-repetitive (inductive load switch off), $L = 120\text{mH}$ | $E_{RSM}$    | 20           |         |         | mJ   |
| Junction temperature   | $T_J$        | - 55 to +175 |         |         | °C   |
| Storage temperature  | $T_{STG}$    | - 55 to +175 |         |         | °C   |

| <b>THERMAL PERFORMANCE</b>             |                 |            |                      |
|--|-----------------|------------|----------------------|
| <b>PARAMETER</b>                       | <b>SYMBOL</b>   | <b>TYP</b> | <b>UNIT</b>          |
| Junction-to-lead thermal resistance    | $R_{\theta JL}$ | 20         | $^{\circ}\text{C/W}$ |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 75         | $^{\circ}\text{C/W}$ |

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^{\circ}\text{C}$ unless otherwise noted) |   |               |            |            |               |
|---|---|---------------|------------|------------|---------------|
| <b>PARAMETER</b>  | <b>CONDITIONS</b>   | <b>SYMBOL</b> | <b>TYP</b> | <b>MAX</b> | <b>UNIT</b>   |
| Forward voltage <sup>(1)</sup>  | $I_F = 1\text{A}, T_J = 25^{\circ}\text{C}$                   | $V_F$         | -          | 0.9        | V             |
| Reverse current @ rated $V_R$ <sup>(2)</sup>  | $T_J = 25^{\circ}\text{C}$                                    | $I_R$         | -          | 1          | $\mu\text{A}$ |
|   | $T_J = 100^{\circ}\text{C}$                                   |               | -          | 10         | $\mu\text{A}$ |
|   | $T_J = 125^{\circ}\text{C}$                                   |               | -          | 50         | $\mu\text{A}$ |
| Junction capacitance  | 1MHz, $V_R = 4.0\text{V}$                                     | $C_J$         | 25         | -          | pF            |
| Reverse recovery time   | $I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$ | $t_{rr}$      | -          | 25         | ns            |

**Notes:**

1. Pulse test with  $PW = 0.3\text{ms}$
2. Pulse test with  $PW = 30\text{ms}$

| <b>ORDERING INFORMATION</b>        |                |                     |
|------------------------------------|----------------|---------------------|
| <b>ORDERING CODE<sup>(1)</sup></b> | <b>PACKAGE</b> | <b>PACKING</b>      |
| ESH2xAH                            | DO-214AC (SMA) | 7,500 / Tape & Reel |

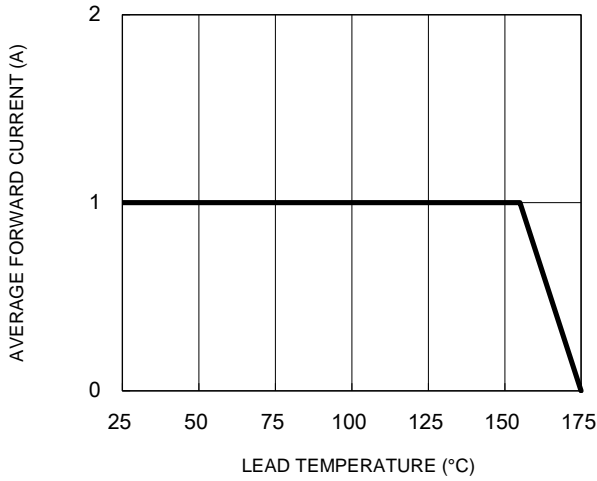
**Notes:**

1. "x" defines voltage from 100V(ESH2BAH) to 200V(ESH2DAH)

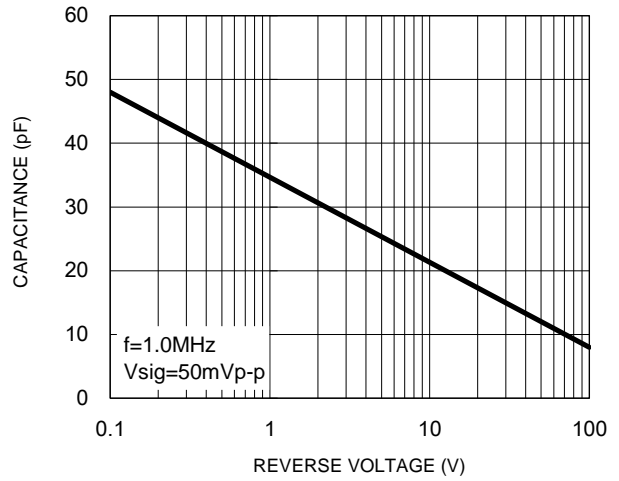
**CHARACTERISTICS CURVES**

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

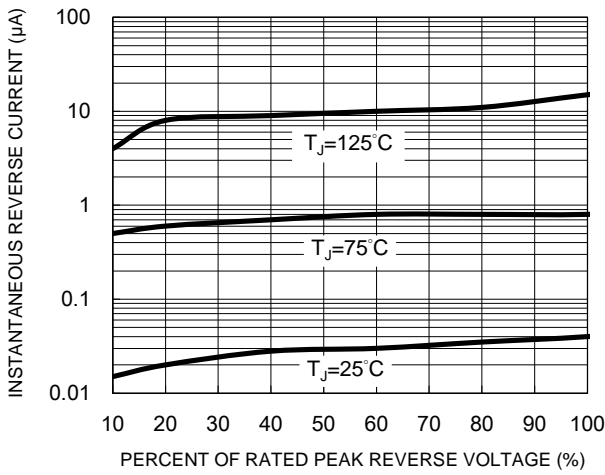
**Fig.1 Forward Current Derating Curve**



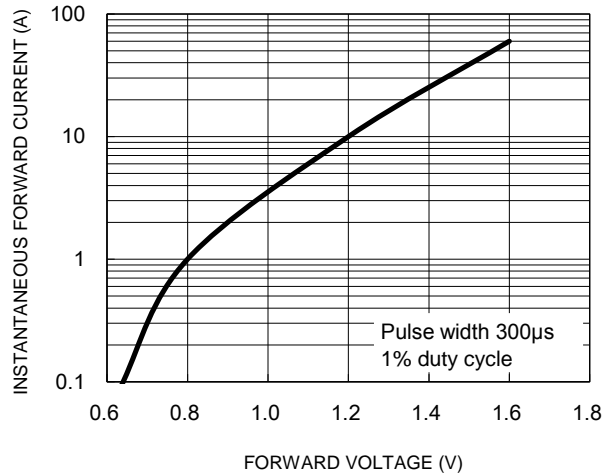
**Fig.2 Typical Junction Capacitance**



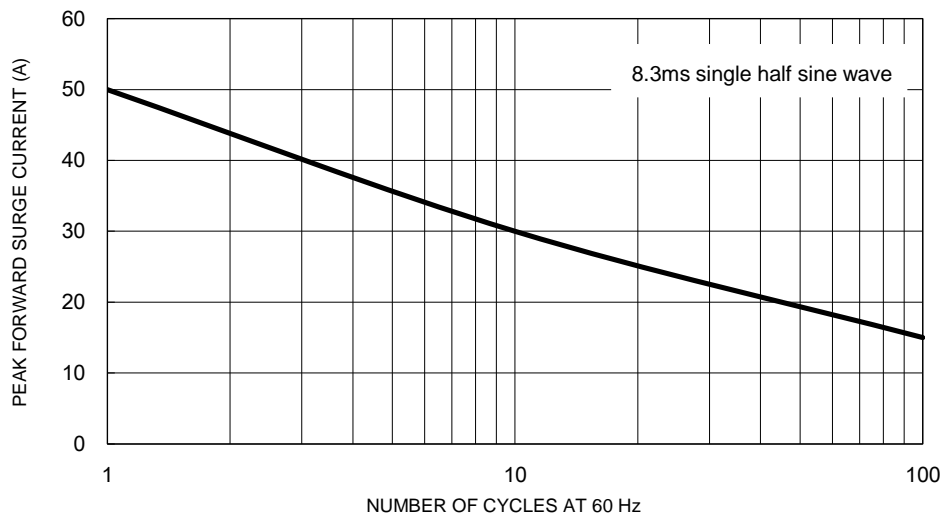
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



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



**CHARACTERISTICS CURVES**

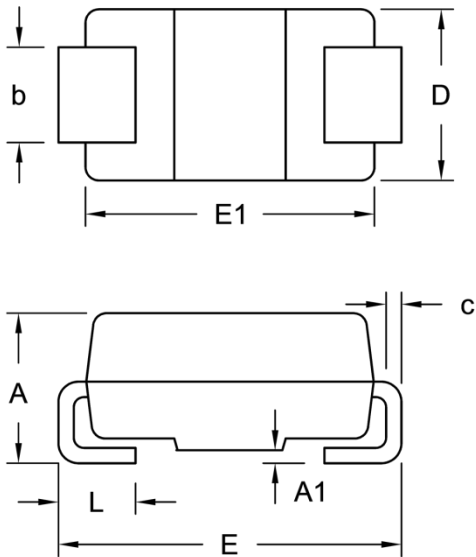
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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



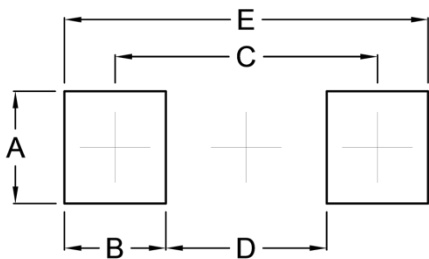
**PACKAGE OUTLINE DIMENSIONS**

DO-214AC (SMA)



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 1.99      | 2.50 | 0.078       | 0.098 |
| A1   | 0.10      | 0.20 | 0.004       | 0.008 |
| b    | 1.27      | 1.58 | 0.050       | 0.062 |
| c    | 0.15      | 0.31 | 0.006       | 0.012 |
| D    | 2.29      | 2.83 | 0.090       | 0.111 |
| E    | 4.95      | 5.33 | 0.195       | 0.210 |
| E1   | 4.06      | 4.60 | 0.160       | 0.181 |
| L    | 0.90      | 1.41 | 0.035       | 0.056 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 1.68      | 0.066       |
| B      | 1.52      | 0.060       |
| C      | 3.93      | 0.155       |
| D      | 2.41      | 0.095       |
| E      | 5.45      | 0.215       |

**MARKING DIAGRAM**



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

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