

## 2A, 50V - 600V Surface Mount Super Fast Rectifier

### FEATURES

- Glass passivated junction chip
- Ideal for automated placement
- Low profile package
- Super fast recovery time 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

### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- Converter

### MECHANICAL DATA

- Case: DO-214AA (SMB)
- Molding compound meets UL 94V-0 flammability rating
- 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: 0.09 g (approximately)

| KEY PARAMETERS |                |      |
|----------------|----------------|------|
| PARAMETER      | VALUE          | UNIT |
| $I_{F(AV)}$    | 2              | A    |
| $V_{RRM}$      | 50 - 600       | V    |
| $I_{FSM}$      | 50             | A    |
| $T_{J\ MAX}$   | 150            | °C   |
| Package        | DO-214AA (SMB) |      |
| Configuration  | Single Die     |      |



**DO-214AA (SMB)**

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

| PARAMETER                                                                                     | SYMBOL       | ES2A         | ES2B | ES2C | ES2D | ES2F | ES2G | ES2H | ES2J | UNIT |
|-----------------------------------------------------------------------------------------------|--------------|--------------|------|------|------|------|------|------|------|------|
| Marking code on the device                                                                    |              | ES2A         | ES2B | ES2C | ES2D | ES2F | ES2G | ES2H | ES2J |      |
| Repetitive peak reverse voltage                                                               | $V_{RRM}$    | 50           | 100  | 150  | 200  | 300  | 400  | 500  | 600  | V    |
| Reverse voltage, total rms value                                                              | $V_{R(RMS)}$ | 30           | 70   | 105  | 140  | 210  | 280  | 350  | 420  | V    |
| Maximum DC blocking voltage                                                                   | $V_{DC}$     | 50           | 100  | 150  | 200  | 300  | 400  | 500  | 600  | V    |
| Forward current                                                                               | $I_{F(AV)}$  | 2            |      |      |      |      |      |      |      | A    |
| Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$    | 50           |      |      |      |      |      |      |      | 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    | $R_{\theta JL}$ | 20    | $^{\circ}\text{C/W}$ |
| Junction to Ambient Thermal Resistance | $R_{\theta JA}$ | 75    | $^{\circ}\text{C/W}$ |

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

| PARAMETER                                              | CONDITIONS                                                  | SYMBOL   | TYP | MAX  | UNIT          |
|--------------------------------------------------------|-------------------------------------------------------------|----------|-----|------|---------------|
| Forward voltage per diode <sup>(1)</sup>               | ES2A                                                        | $V_F$    | -   | 0.95 | V             |
|                                                        | ES2B                                                        |          | -   |      | V             |
|                                                        | ES2C                                                        |          | -   |      | V             |
|                                                        | ES2D                                                        |          | -   |      | V             |
|                                                        | ES2F                                                        |          | -   | 1.30 | V             |
|                                                        | ES2G                                                        |          | -   |      | V             |
|                                                        | ES2H                                                        |          | -   | 1.70 | V             |
|                                                        | ES2J                                                        |          | -   |      | V             |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | $T_J = 25^{\circ}\text{C}$                                  | $I_R$    | -   | 10   | $\mu\text{A}$ |
|                                                        | $T_J = 125^{\circ}\text{C}$                                 |          | -   | 350  | $\mu\text{A}$ |
| Junction capacitance                                   | ES2A                                                        | $C_J$    | 25  | -    | pF            |
|                                                        | ES2B                                                        |          |     | -    | pF            |
|                                                        | ES2C                                                        |          |     | -    | pF            |
|                                                        | ES2D                                                        |          |     | -    | pF            |
|                                                        | ES2F                                                        |          | 20  | -    | pF            |
|                                                        | ES2G                                                        |          |     | -    | pF            |
|                                                        | ES2H                                                        |          |     | -    | pF            |
|                                                        | ES2J                                                        |          |     | -    | pF            |
| Reverse recovery time                                  | $I_F=0.5\text{A}, I_R=1.0\text{A}$<br>$I_{RR}=0.25\text{A}$ | $t_{rr}$ | -   | 35   | 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                  |
|------------------|-----------------|--------------|------------------------|---------|--------------------------|
| ES2x<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 (ES2A) to 600V (ES2J)

\*: Optional available

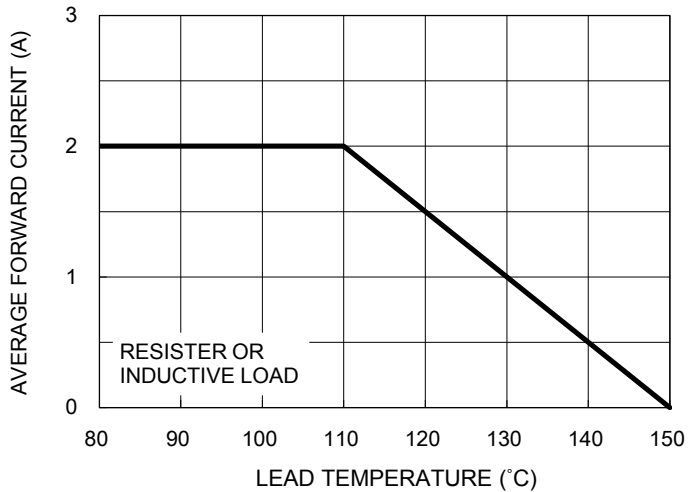
**EXAMPLE P/N**

| EXAMPLE P/N | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION                          |
|-------------|----------|-----------------|--------------|---------------------|--------------------------------------|
| ES2JHR5G    | ES2J     | H               | R5           | G                   | AEC-Q101 qualified<br>Green compound |

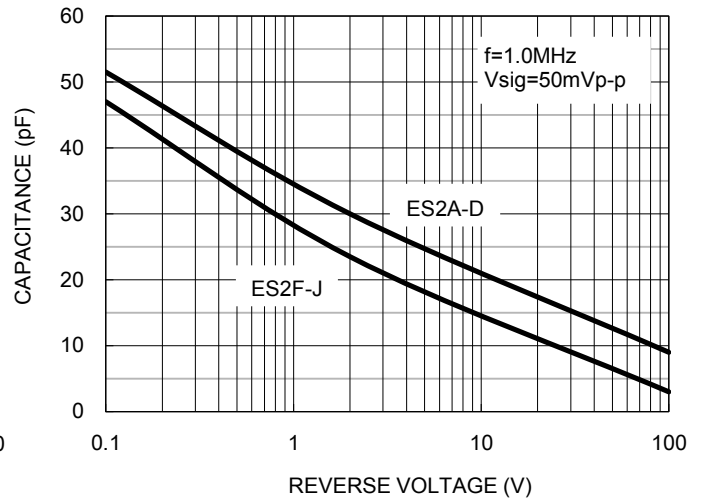
## CHARACTERISTICS CURVES

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

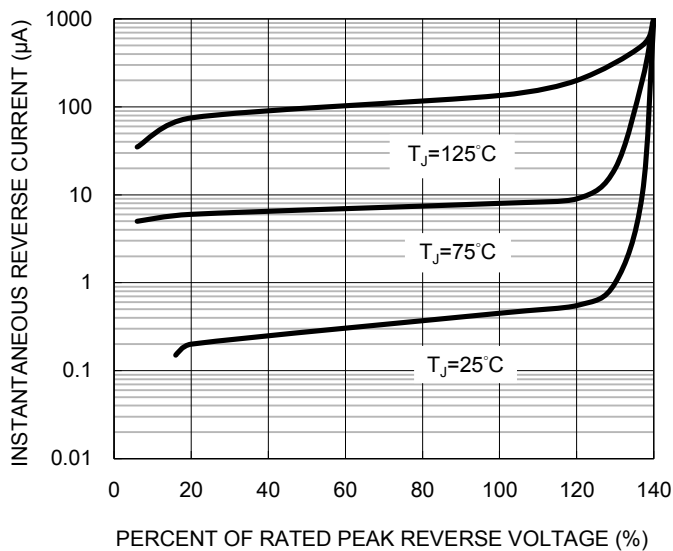
**Fig1. Forward Current Derating Curve**



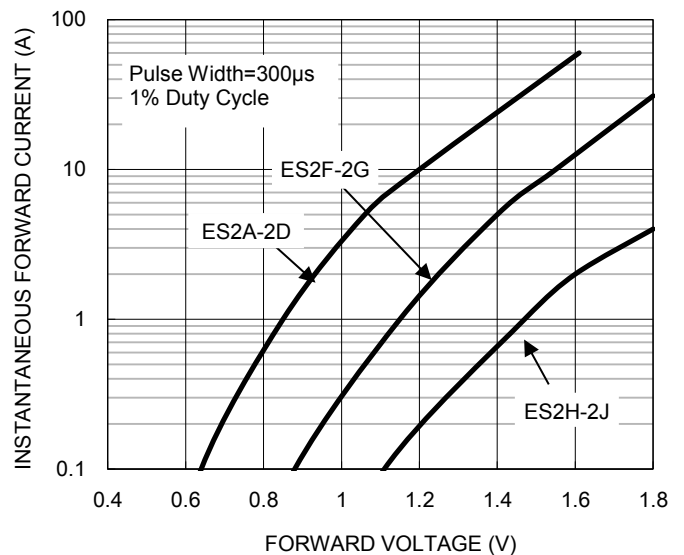
**Fig2. Typical Junction Capacitance**



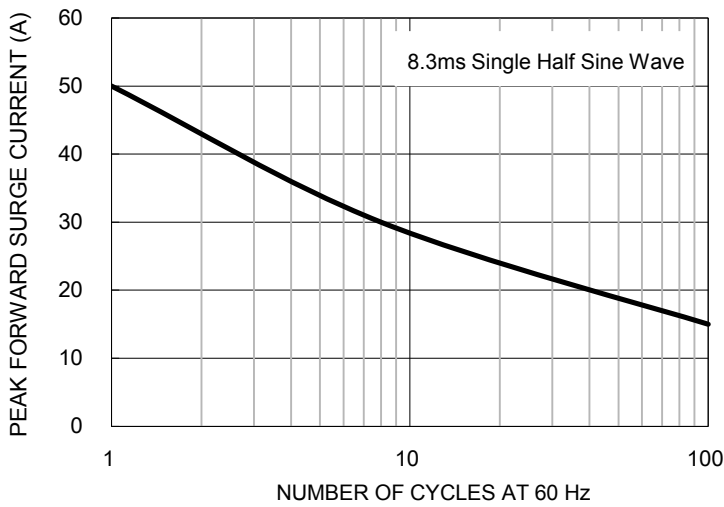
**Fig3. Typical Reverse Characteristics**



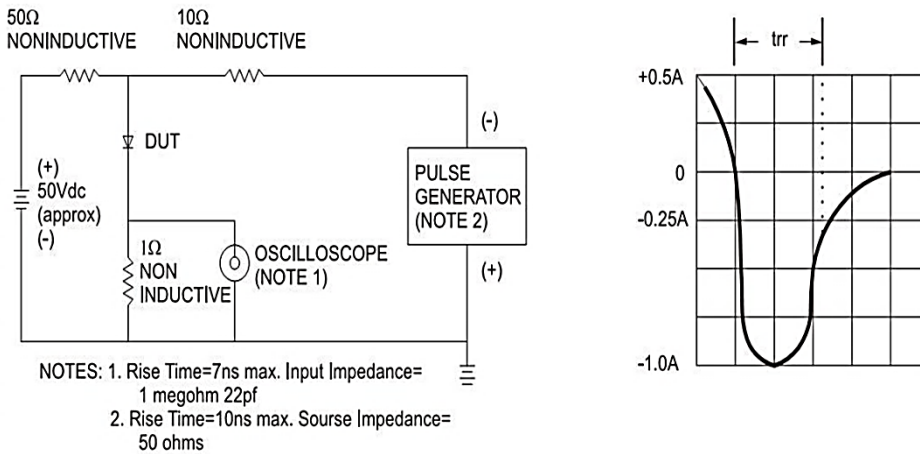
**Fig4. Typical Forward Characteristics**



**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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