

## 1.5A, 200V - 600V Surface Mount Super Fast Rectifier

### FEATURES

- Glass passivated junction chip
- Ideal for automated placement
- Low profile package
- Low power loss, 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
- On-board DC/DC converter

### MECHANICAL DATA

- Case: SOD-123W
- 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: 16mg (approximately)

| KEY PARAMETERS    |            |      |
|-------------------|------------|------|
| PARAMETER         | VALUE      | UNIT |
| $I_{F(AV)}$       | 1.5        | A    |
| $V_{RRM}$         | 200 - 600  | V    |
| $I_{FSM}$         | 40         | A    |
| $T_J \text{ MAX}$ | 150        | °C   |
| Package           | SOD-123W   |      |
| Configuration     | Single die |      |



**SOD-123W**

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                   |              |             |         |         |      |
|-----------------------------------------------------------------------------------------------|--------------|-------------|---------|---------|------|
| PARAMETER                                                                                     | SYMBOL       | ES15DLW     | ES15GLW | ES15JLW | UNIT |
| Marking code on the device                                                                    |              | ES15D       | ES15G   | ES15J   |      |
| Repetitive peak reverse voltage                                                               | $V_{RRM}$    | 200         | 400     | 600     | V    |
| Reverse voltage, total rms value                                                              | $V_{R(RMS)}$ | 140         | 280     | 420     | V    |
| Forward current                                                                               | $I_{F(AV)}$  | 1.5         |         |         | A    |
| Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$    | 40          |         |         | 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    | $R_{\theta JL}$ | 26    | °C/W |
| Junction-to-ambient thermal resistance per diode | $R_{\theta JA}$ | 76    | °C/W |
| Junction-to-case thermal resistance per diode    | $R_{\theta JC}$ | 27    | °C/W |

**Thermal Performance Note:** Units mounted on recommended PCB (5mm x 5mm Cu pad test board)

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

| PARAMETER                                            |         | CONDITIONS                                                            | SYMBOL          | TYP  | MAX  | UNIT |
|------------------------------------------------------|---------|-----------------------------------------------------------------------|-----------------|------|------|------|
| Forward voltage per diode<br>(1)                     | ES15DLW | I <sub>F</sub> = 0.75A, T <sub>J</sub> = 25°C                         | V <sub>F</sub>  | 0.80 | -    | V    |
|                                                      |         | I <sub>F</sub> = 1.50A, T <sub>J</sub> = 25°C                         |                 | 0.85 | 0.95 | V    |
|                                                      |         | I <sub>F</sub> = 0.75A, T <sub>J</sub> = 125°C                        |                 | 0.66 | -    | V    |
|                                                      |         | I <sub>F</sub> = 1.50A, T <sub>J</sub> = 125°C                        |                 | 0.73 | 0.8  | V    |
|                                                      | ES15GLW | I <sub>F</sub> = 0.75A, T <sub>J</sub> = 25°C                         |                 | 0.87 | -    | V    |
|                                                      |         | I <sub>F</sub> = 1.50A, T <sub>J</sub> = 25°C                         |                 | 0.95 | 1.3  | V    |
|                                                      |         | I <sub>F</sub> = 0.75A, T <sub>J</sub> = 125°C                        |                 | 0.72 | -    | V    |
|                                                      |         | I <sub>F</sub> = 1.50A, T <sub>J</sub> = 125°C                        |                 | 0.80 | 1.05 | V    |
|                                                      | ES15JLW | I <sub>F</sub> = 0.75A, T <sub>J</sub> = 25°C                         |                 | 1.06 | -    | V    |
|                                                      |         | I <sub>F</sub> = 1.50A, T <sub>J</sub> = 25°C                         |                 | 1.18 | 1.7  | V    |
|                                                      |         | I <sub>F</sub> = 0.75A, T <sub>J</sub> = 125°C                        |                 | 0.84 | -    | V    |
|                                                      |         | I <sub>F</sub> = 1.50A, T <sub>J</sub> = 125°C                        |                 | 0.97 | 1.3  | V    |
| Reverse current @ rated V <sub>R</sub> per diode (2) |         | T <sub>J</sub> = 25°C                                                 | I <sub>R</sub>  | -    | 1    | μA   |
|                                                      |         | T <sub>J</sub> = 125°C                                                |                 | -    | 150  | μA   |
| Junction capacitance                                 | ES15DLW | 1 MHz, V <sub>R</sub> =4.0V                                           | C <sub>J</sub>  | 24   | -    | pF   |
|                                                      | ES15GLW |                                                                       |                 | 21   | -    | pF   |
|                                                      | ES15JLW |                                                                       |                 | 20   | -    | pF   |
| Reverse recovery time                                |         | I <sub>F</sub> =0.5A , I <sub>R</sub> =1.0A<br>I <sub>RR</sub> =0.25A | t <sub>rr</sub> | -    | 35   | ns   |

**Notes:**

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

**ORDERING INFORMATION**

| <b>PART NO.</b>       | <b>PART NO.<br/>SUFFIX(*)</b> | <b>PACKING<br/>CODE</b> | <b>PACKING CODE<br/>SUFFIX</b> | <b>PACKAGE</b> | <b>PACKING</b>    |
|-----------------------|-------------------------------|-------------------------|--------------------------------|----------------|-------------------|
| ES15xLW<br>(Note 1,2) | H                             | RV                      | G                              | SOD-123W       | 3,000 / 7" Reel   |
|                       |                               | RQ                      |                                | SOD-123W       | 10,000 / 13" Reel |

**Notes:**

1. "x" defines voltage from 200V (ES15DLW) to 600V (ES15JLW)
2. Whole series with green compound (halogen-free)

\*: Optional available

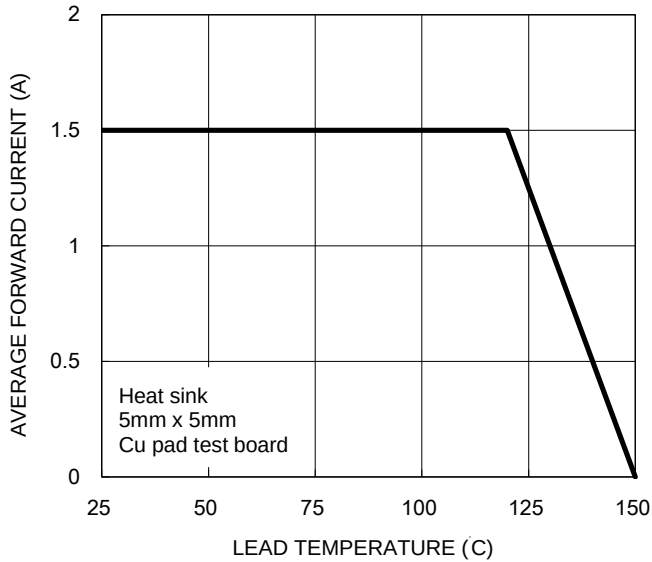
**EXAMPLE P/N**

| <b>EXAMPLE P/N</b> | <b>PART NO.</b> | <b>PART NO.<br/>SUFFIX</b> | <b>PACKING<br/>CODE</b> | <b>PACKING CODE<br/>SUFFIX</b> | <b>DESCRIPTION</b>                   |
|--------------------|-----------------|----------------------------|-------------------------|--------------------------------|--------------------------------------|
| ES15DLWHRVG        | ES15DLW         | H                          | RV                      | G                              | AEC-Q101 qualified<br>Green compound |

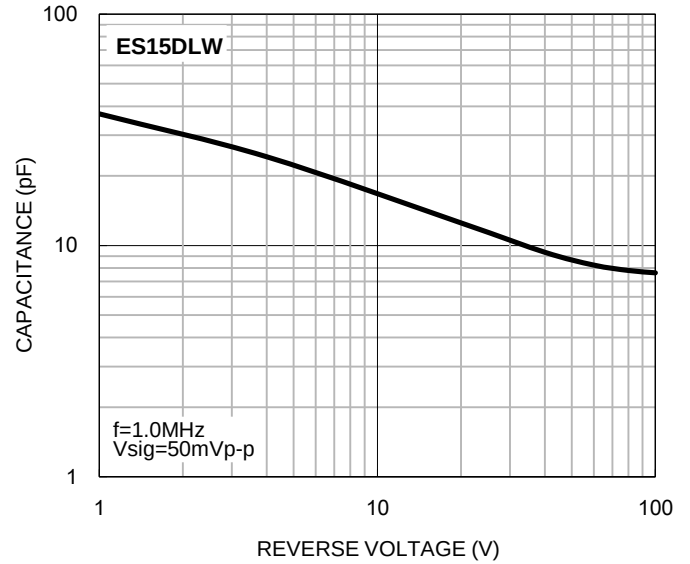
## CHARACTERISTICS CURVES

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

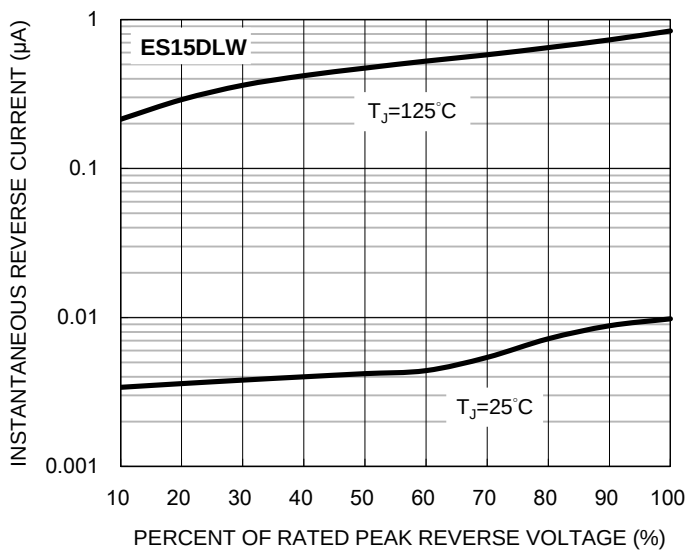
**Fig.1 Forward Current Derating Curve**



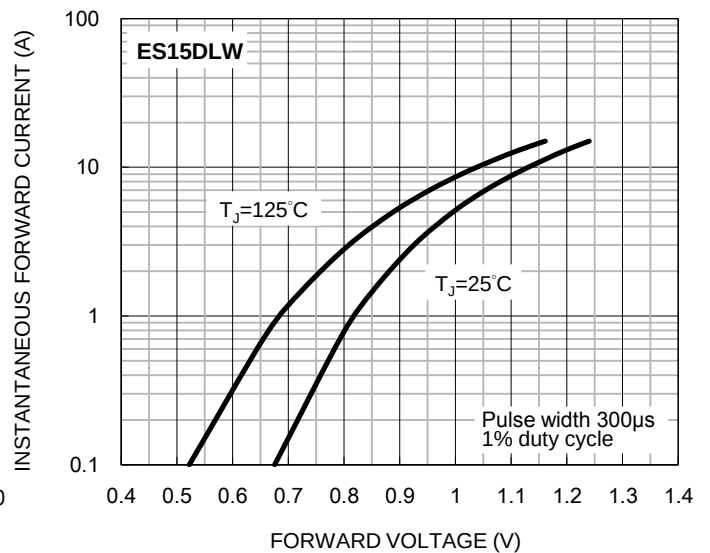
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**



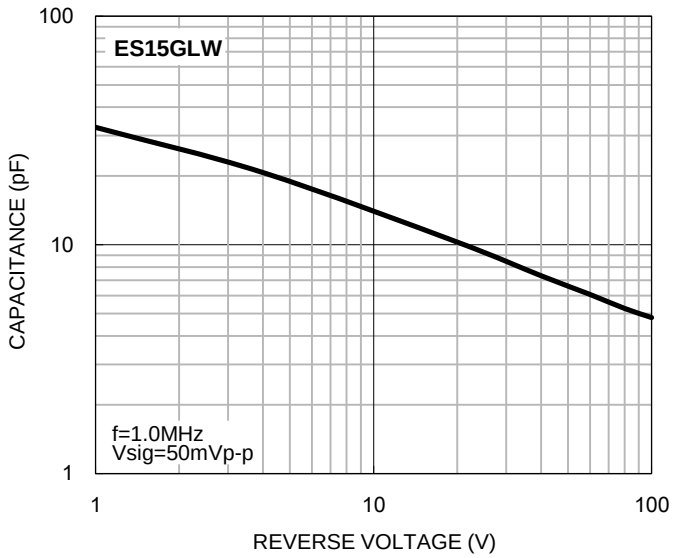
**Fig.4 Typical Forward Characteristics**



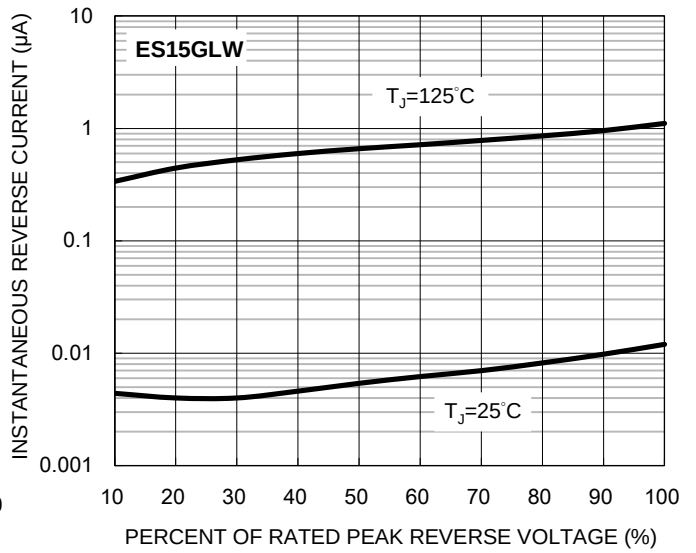
## CHARACTERISTICS CURVES

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

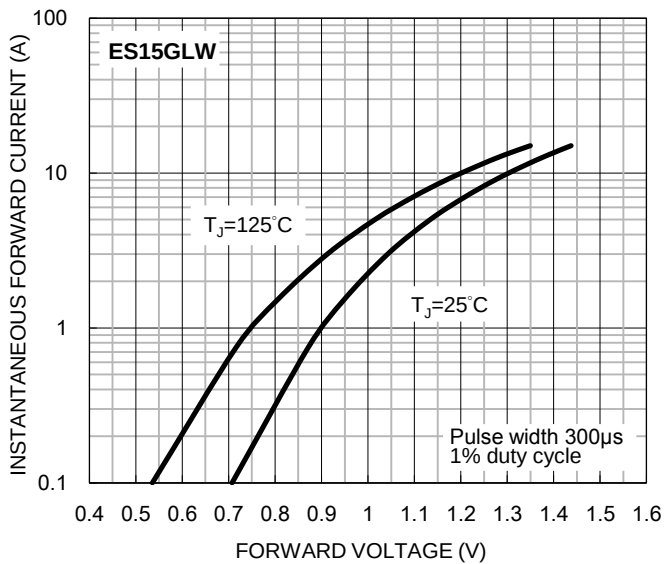
**Fig.5 Typical Junction Capacitance**



**Fig.6 Typical Reverse Characteristics**



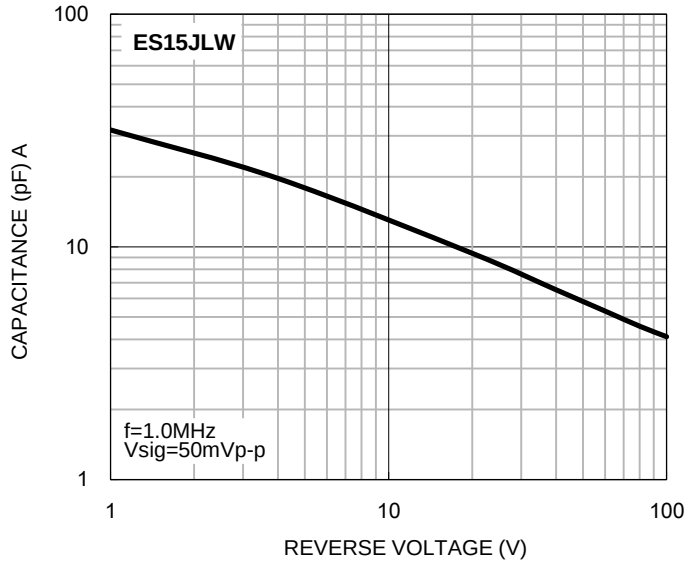
**Fig.7 Typical Forward Characteristics**



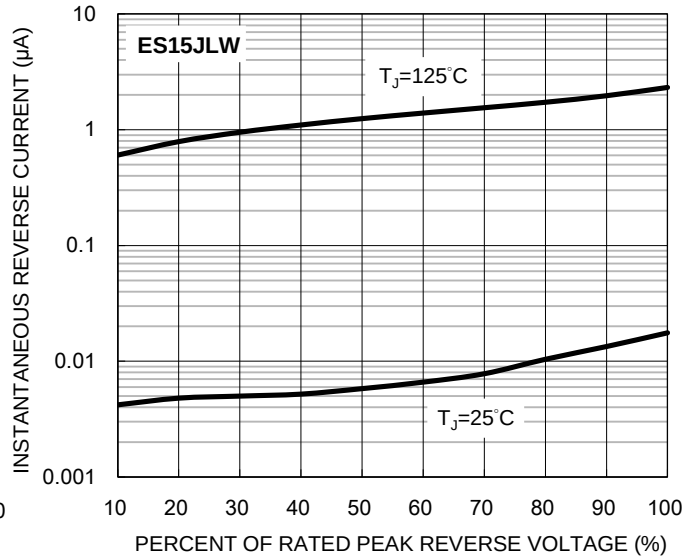
## CHARACTERISTICS CURVES

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

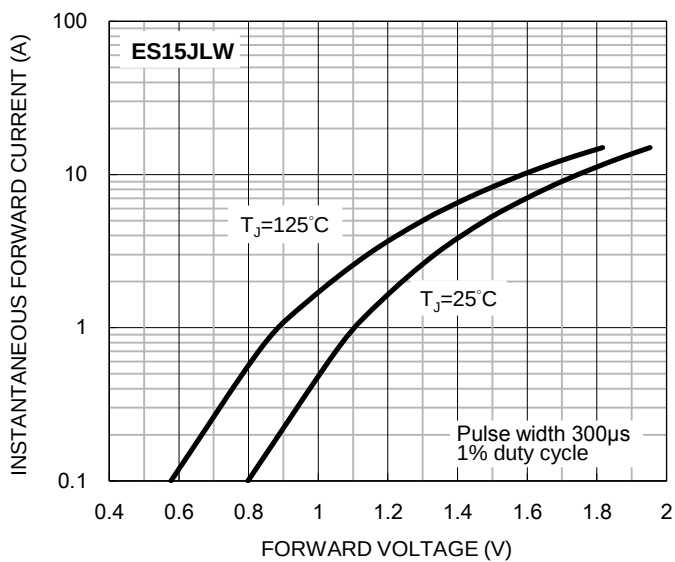
**Fig.8 Typical Junction Capacitance**



**Fig.9 Typical Reverse Characteristics**

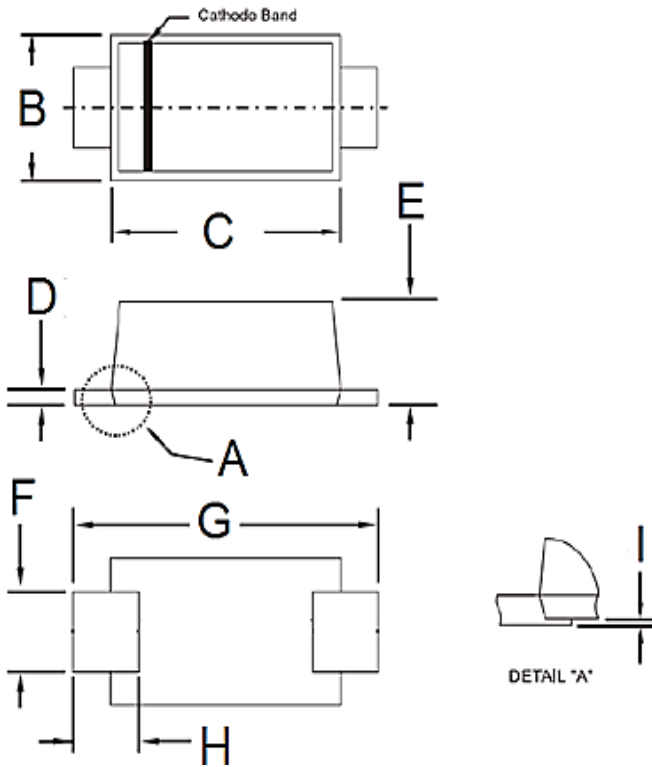


**Fig.10 Typical Forward Characteristics**



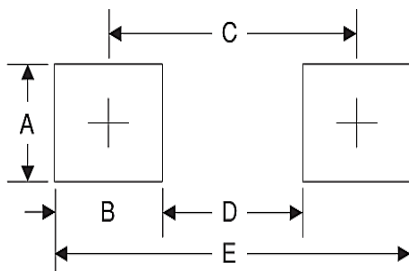
## PACKAGE OUTLINE DIMENSIONS

**SOD-123W**



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| B    | 1.70      | 1.90 | 0.067       | 0.075 |
| C    | 2.60      | 2.90 | 0.102       | 0.114 |
| D    | 0.10      | 0.22 | 0.004       | 0.009 |
| E    | 0.90      | 1.02 | 0.035       | 0.040 |
| F    | 0.90      | 1.05 | 0.035       | 0.041 |
| G    | 3.60      | 3.80 | 0.142       | 0.150 |
| H    | 0.50      | 0.85 | 0.020       | 0.033 |
| I    | 0.00      | 0.10 | 0.000       | 0.004 |

## SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 1.4       | 0.055       |
| B      | 1.2       | 0.047       |
| C      | 3.1       | 0.122       |
| D      | 1.9       | 0.075       |
| E      | 4.3       | 0.169       |

## MARKING DIAGRAM



P/N = Marking Code  
YW = Date Code  
F = Factory Code

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