



# THE DATASHEET OF ES1JL R3G



## 1A, 50V - 600V Super Fast Surface Mount Rectifier

### FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Low profile Package
- Low power loss, high efficiency
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- DC to DC converter
- Switching mode converters and inverters
- Freewheeling application

### MECHANICAL DATA

- Case: Sub 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: 0.019g (approximately)

| KEY PARAMETERS |            |      |
|----------------|------------|------|
| PARAMETER      | VALUE      | UNIT |
| $I_F$          | 1          | A    |
| $V_{RRM}$      | 50 - 600   | V    |
| $I_{FSM}$      | 30         | A    |
| $T_{JMAX}$     | 150        | °C   |
| Package        | Sub SMA    |      |
| Configuration  | Single die |      |



Sub SMA



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)        |              |              |        |        |        |        |        |        |        |      |
|------------------------------------------------------------------------------------|--------------|--------------|--------|--------|--------|--------|--------|--------|--------|------|
| PARAMETER                                                                          | SYMBOL       | ES 1AL       | ES 1BL | ES 1CL | ES 1DL | ES 1FL | ES 1GL | ES 1HL | ES 1JL | UNIT |
| Marking code on the device                                                         |              | EAL          | EBL    | ECL    | EDL    | EFL    | EGL    | EHL    | EJL    |      |
| Repetitive peak reverse voltage                                                    | $V_{RRM}$    | 50           | 100    | 150    | 200    | 300    | 400    | 500    | 600    | V    |
| Reverse voltage, total rms value                                                   | $V_{R(RMS)}$ | 35           | 70     | 105    | 140    | 210    | 280    | 350    | 420    | V    |
| Forward current                                                                    | $I_F$        | 1            |        |        |        |        |        |        |        | A    |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load | $I_{FSM}$    | 30           |        |        |        |        |        |        |        | A    |
| Junction temperature                                                               | $T_J$        | - 55 to +150 |        |        |        |        |        |        |        | °C   |
| Storage temperature                                                                | $T_{STG}$    | - 55 to +150 |        |        |        |        |        |        |        | °C   |

**THERMAL PERFORMANCE**

| PARAMETER                              | SYMBOL          | TYP | UNIT |
|----------------------------------------|-----------------|-----|------|
| Junction-to-lead thermal resistance    | $R_{\theta JL}$ | 35  | °C/W |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 85  | °C/W |

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

| PARAMETER                                    | CONDITIONS                                                    | SYMBOL   | TYP | MAX  | UNIT          |
|----------------------------------------------|---------------------------------------------------------------|----------|-----|------|---------------|
| Forward voltage <sup>(1)</sup>               | $I_F = 1\text{A}, T_J = 25^\circ\text{C}$                     | $V_F$    | -   | 0.95 | V             |
|                                              |                                                               |          | -   | 1.30 | V             |
|                                              |                                                               |          | -   | 1.70 | V             |
|                                              |                                                               |          | -   | -    | -             |
| Reverse current @ rated $V_R$ <sup>(2)</sup> | $T_J = 25^\circ\text{C}$                                      | $I_R$    | -   | 5    | $\mu\text{A}$ |
|                                              | $T_J = 125^\circ\text{C}$                                     |          | -   | 100  | $\mu\text{A}$ |
| Junction capacitance                         | 1MHz, $V_R = 4.0\text{V}$                                     | $C_J$    | 10  | -    | pF            |
|                                              |                                                               |          | 8   | -    | pF            |
| Reverse recovery time                        | $I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$ | $t_{rr}$ | -   | 35   | ns            |

**Notes:**

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

**ORDERING INFORMATION**

| ORDERING CODE <sup>(1)</sup> | PACKAGE | PACKING              |
|------------------------------|---------|----------------------|
| ES1xL                        | Sub SMA | 10,000 / Tape & Reel |

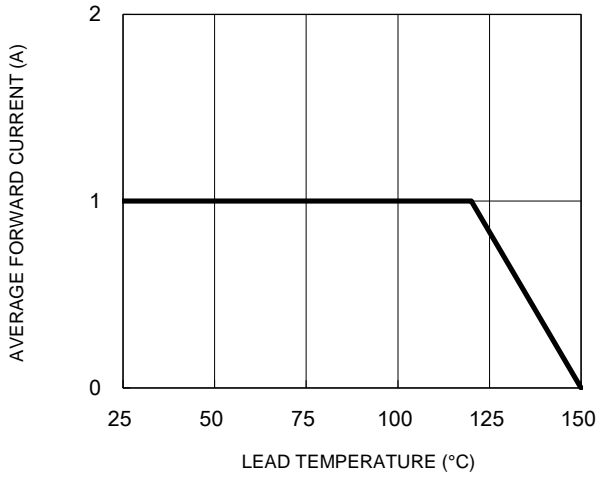
**Notes:**

1. "x" defines voltage from 50V(ES1AL) to 600V(ES1JL)

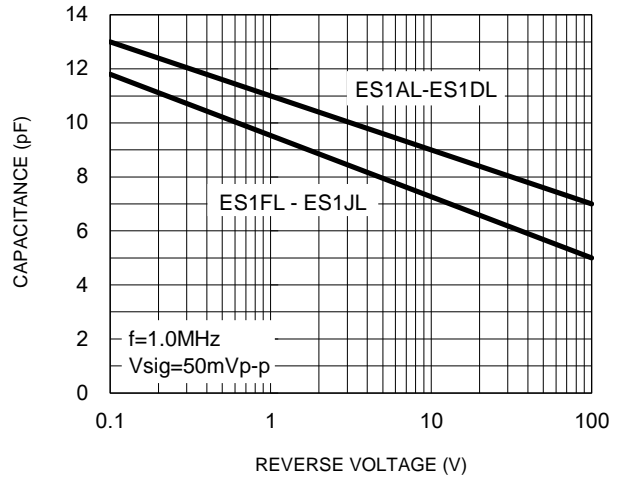
**CHARACTERISTICS CURVES**

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

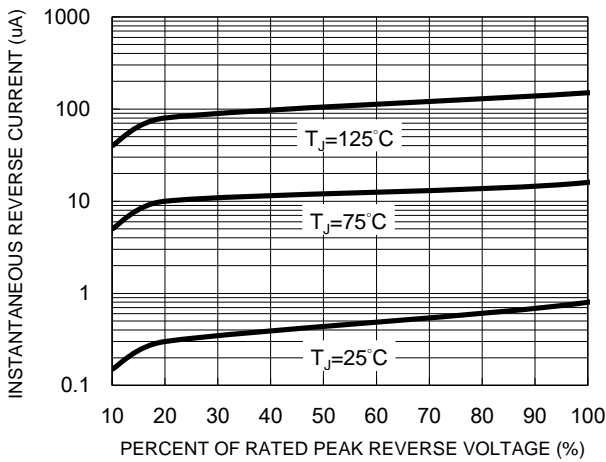
**Fig.1 Forward Current Derating Curve**



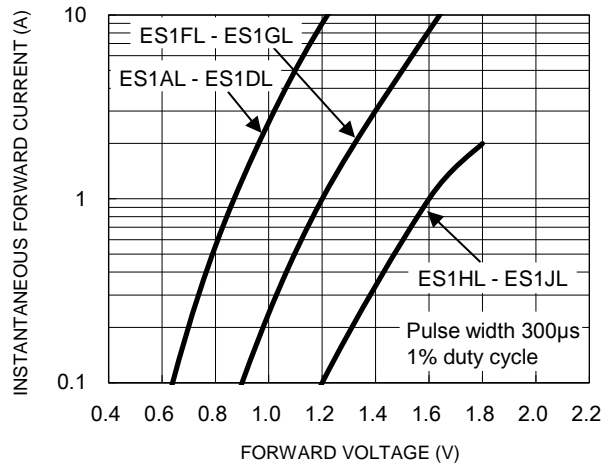
**Fig.2 Typical Junction Capacitance**



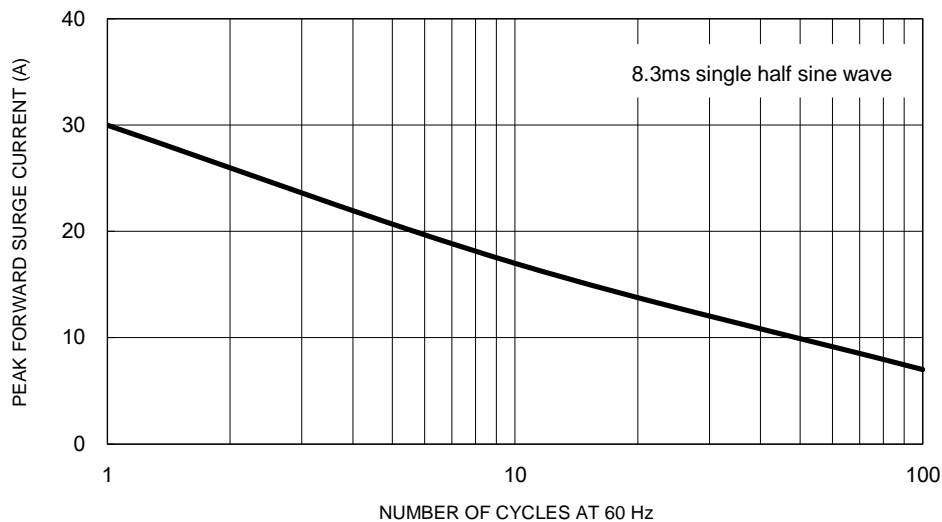
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



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



**CHARACTERISTICS CURVES**

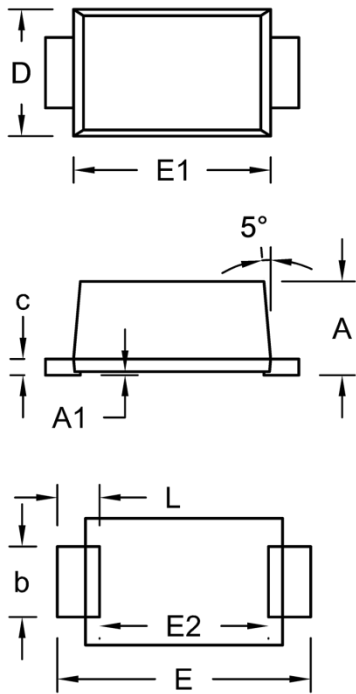
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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



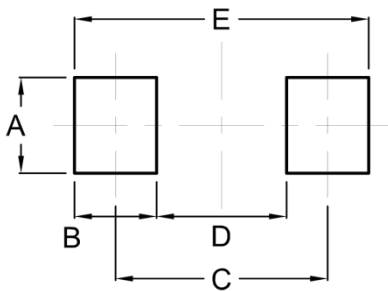
**PACKAGE OUTLINE DIMENSIONS**

Sub SMA



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 1.23      | 1.43 | 0.048       | 0.056 |
| A1   | 0.00      | 0.10 | 0.000       | 0.004 |
| b    | 0.80      | 1.20 | 0.031       | 0.047 |
| c    | 0.16      | 0.30 | 0.006       | 0.012 |
| D    | 1.70      | 1.90 | 0.067       | 0.075 |
| E    | 3.40      | 3.80 | 0.134       | 0.150 |
| E1   | 2.70      | 2.90 | 0.106       | 0.114 |
| E2   | 2.45      | 2.60 | 0.096       | 0.102 |
| L    | 0.35      | 0.85 | 0.014       | 0.033 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 1.40      | 0.055       |
| B      | 1.20      | 0.047       |
| C      | 3.10      | 0.122       |
| D      | 1.90      | 0.075       |
| E      | 4.30      | 0.169       |

**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.



Purchasers are solely responsible for the choice, selection, and use of TSC products and TSC assumes no liability for application assistance or the design of Purchasers' products.

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.

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View ES1JL R3G on WIN SOURCE](#)
-  [Taiwan Semiconductor](#) Information

## Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management