

## 1A, 50V - 1000V Standard 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
- General purpose

### 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 - 1000  | V    |
| $I_{FSM}$      | 30         | A    |
| $T_{JMAX}$     | 175        | °C   |
| Package        | Sub SMA    |      |
| Configuration  | Single die |      |



**Sub SMA**



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)        |              |              |      |      |      |      |      |      |      |
|--|--------------|--------------|------|------|------|------|------|------|------|
| PARAMETER  | SYMBOL       | S1AL         | S1BL | S1DL | S1GL | S1JL | S1KL | S1ML | UNIT |
| Marking code on the device   |              | 1AL          | 1BL  | 1DL  | 1GL  | 1JL  | 1KL  | 1ML  |      |
| 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    |
| 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 +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 <sup>(1)</sup> | $R_{\theta JL}$ | 25         | °C/W        |
| Junction-to-lead thermal resistance <sup>(2)</sup> | $R_{\theta JL}$ | 30         | °C/W        |
| Junction-to-ambient thermal resistance             | $R_{\theta JA}$ | 85         | °C/W        |

**Notes:**

1. Part number: S1AL - S1JL
2. Part number: S1KL - S1ML

| <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>  | $I_F = 1\text{A}, T_J = 25^\circ\text{C}$                     | $V_F$         | -          | 1.1        | V             |
| Reverse current @ rated $V_R$ <sup>(2)</sup>  | $T_J = 25^\circ\text{C}$                                      | $I_R$         | -          | 5          | $\mu\text{A}$ |
|   | $T_J = 125^\circ\text{C}$                                     |               | -          | 50         | $\mu\text{A}$ |
| Junction capacitance  | 1MHz, $V_R = 4.0\text{V}$                                     | $C_J$         | 9          | -          | pF            |
| Reverse recovery time   | $I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$ | $t_{rr}$      | 1800       | -          | 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>       |
| S1xL                               | Sub SMA        | 10,000 / Tape & Reel |

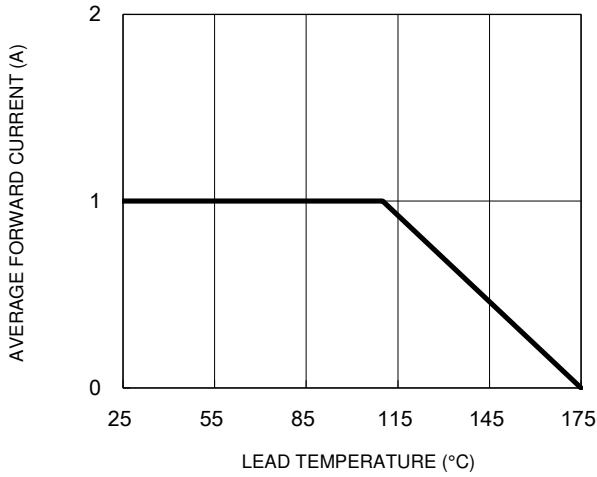
**Notes:**

1. "x" defines voltage from 50V(S1AL) to 1000V(S1ML)

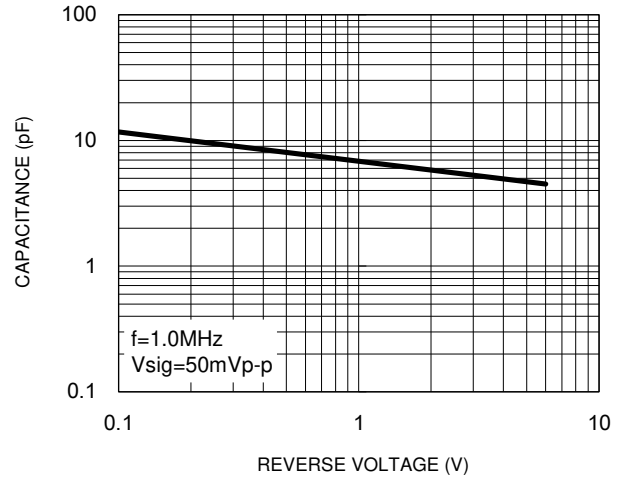
**CHARACTERISTICS CURVES**

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

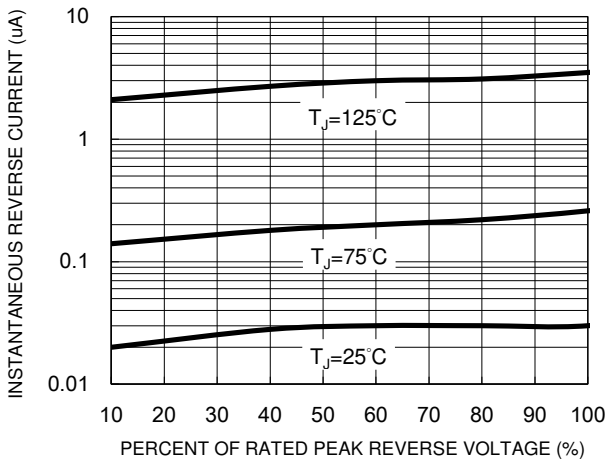
**Fig.1 Forward Current Derating Curve**



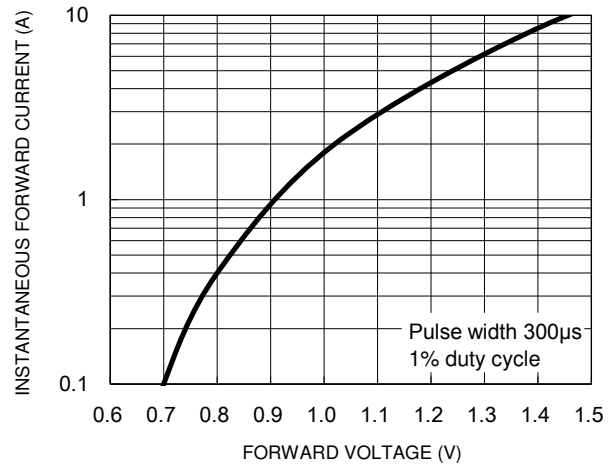
**Fig.2 Typical Junction Capacitance**



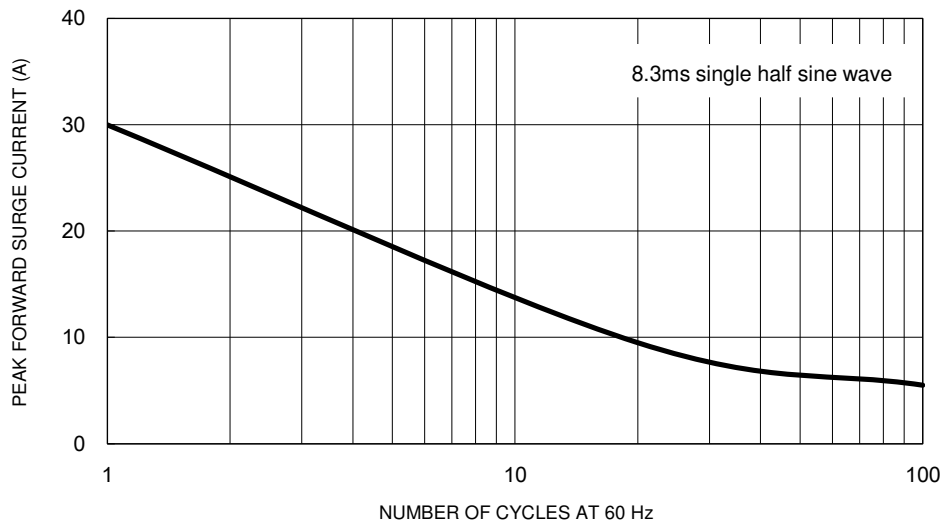
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**

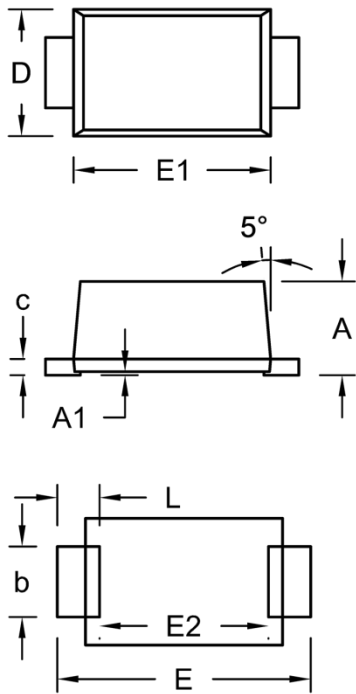


**Fig.5 Maximum Non-Repetitive Forward Surge Current**



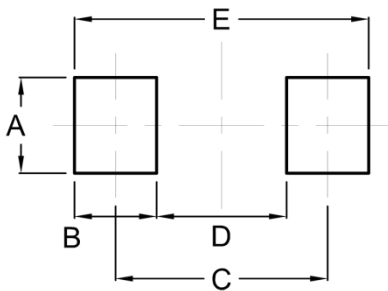
**PACKAGE OUTLINE DIMENSIONS**

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

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