

1A, 50V - 1000V High Efficient 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 1A 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} | 150 | °C |
| Package | Sub SMA | |
| Configuration | Single die | |



Sub SMA



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | | | | | |
|--|--------------|--------------|--------|--------|--------|--------|--------|--------|--------|------|
| PARAMETER | SYMBOL | HS 1AL | HS 1BL | HS 1DL | HS 1FL | HS 1GL | HS 1JL | HS 1KL | HS 1ML | UNIT |
| Marking code on the device | | HAL | HBL | HDL | HFL | HGL | HJL | HKL | HML | |
| Repetitive peak reverse voltage | V_{RRM} | 50 | 100 | 200 | 300 | 400 | 600 | 800 | 1000 | V |
| Reverse voltage, total rms value | $V_{R(RMS)}$ | 35 | 70 | 140 | 210 | 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 +150 | | | | | | | | °C |
| Storage temperature | T_{STG} | - 55 to +150 | | | | | | | | °C |

| THERMAL PERFORMANCE | | | |
|--|-----------------|-----|----------------------|
| PARAMETER | SYMBOL | TYP | UNIT |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 100 | $^{\circ}\text{C/W}$ |

| ELECTRICAL SPECIFICATIONS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted) | | | | | | |
|---|---|--|----------|-----|------|---------------|
| PARAMETER | | CONDITIONS | SYMBOL | TYP | MAX | UNIT |
| Forward voltage ⁽¹⁾ | HS1AL HS1BL HS1DL HS1FL | $I_F = 1\text{A}, T_J = 25^{\circ}\text{C}$ | V_F | - | 0.95 | V |
| | HS1GL | | | - | 1.30 | V |
| | HS1JL HS1KL HS1ML | | | - | 1.70 | V |
| Reverse current @ rated V_R ⁽²⁾ | | $T_J = 25^{\circ}\text{C}$ | I_R | - | 5 | μA |
| | | $T_J = 125^{\circ}\text{C}$ | | - | 150 | μA |
| Junction capacitance | HS1AL HS1BL HS1DL HS1FL HS1GL | $1\text{MHz}, V_R = 4.0\text{V}$ | C_J | 20 | - | pF |
| | HS1JL HS1KL HS1ML | | | 15 | - | pF |
| Reverse recovery time | HS1AL HS1BL HS1DL HS1FL HS1GL | $I_F = 0.5\text{A}, I_R = 1.0\text{A},$ $I_{rr} = 0.25\text{A}$ | t_{rr} | - | 50 | ns |
| | HS1JL HS1KL HS1ML | | | - | 75 | ns |

Notes:

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

| ORDERING INFORMATION | | |
|------------------------------|---------|----------------------|
| ORDERING CODE ⁽¹⁾ | PACKAGE | PACKING |
| HS1xL | Sub SMA | 10,000 / Tape & Reel |

Notes:

1. "x" defines voltage from 50V(HS1AL) to 1000V(HS1ML)

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

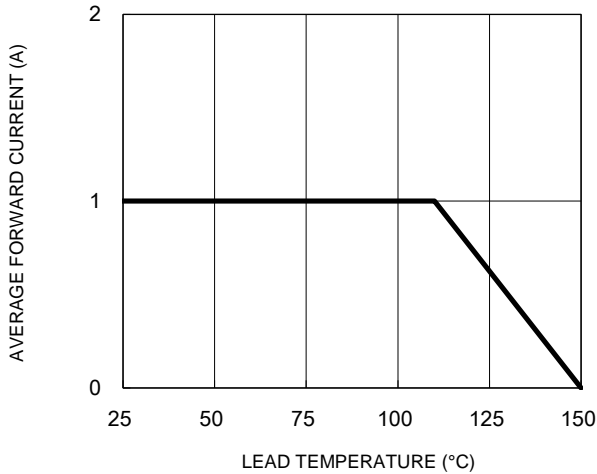


Fig.2 Typical Junction Capacitance

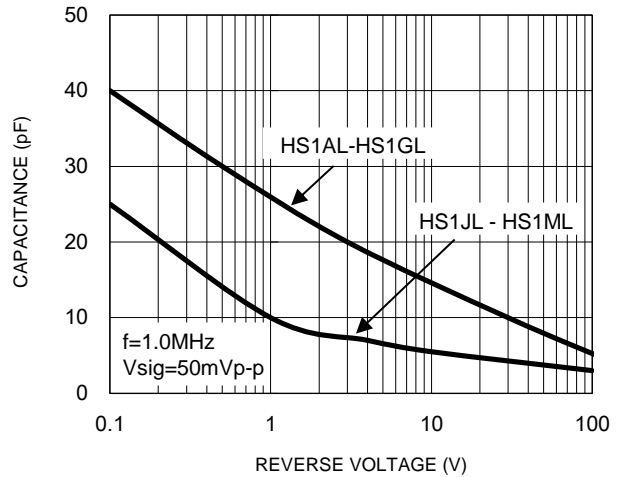


Fig.3 Typical Reverse Characteristics

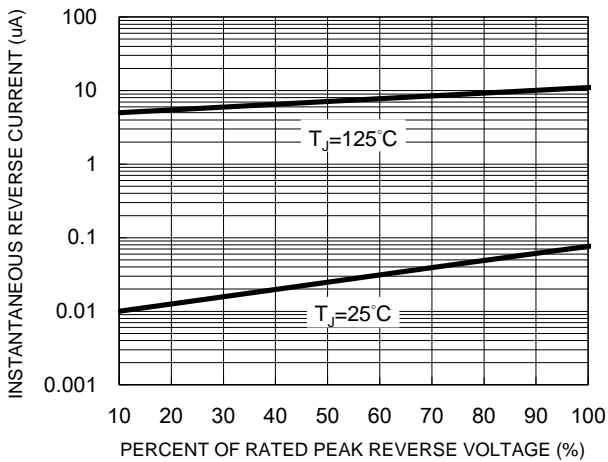


Fig.4 Typical Forward Characteristics

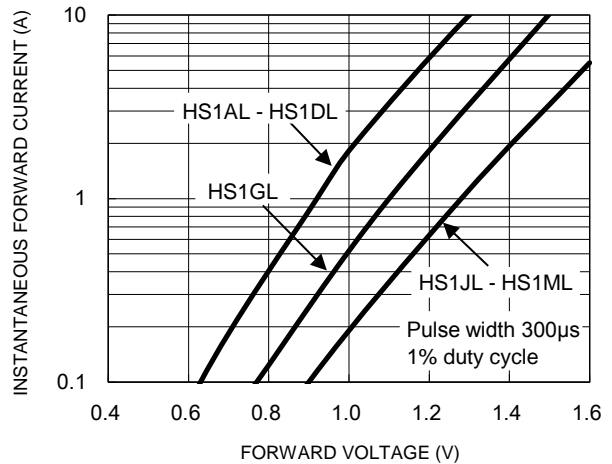
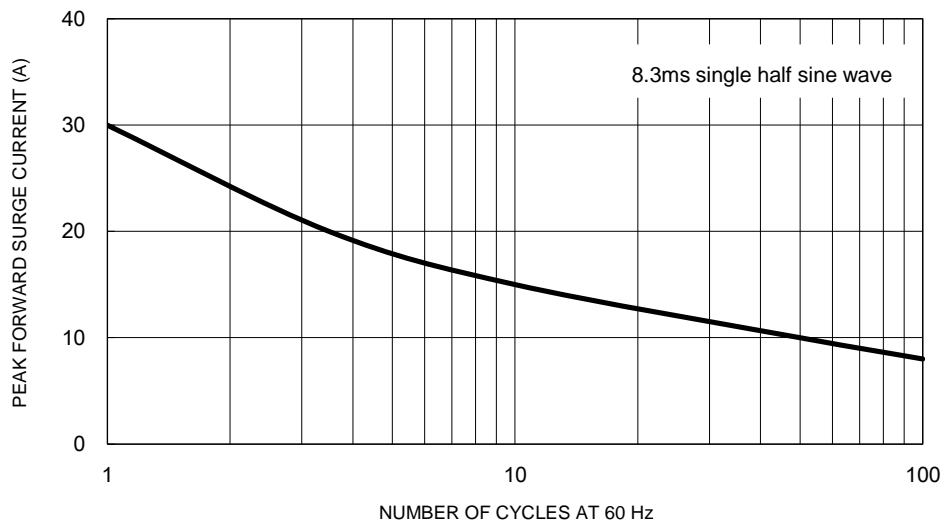


Fig.5 Maximum Non-Repetitive Forward Surge Current



CHARACTERISTICS CURVES

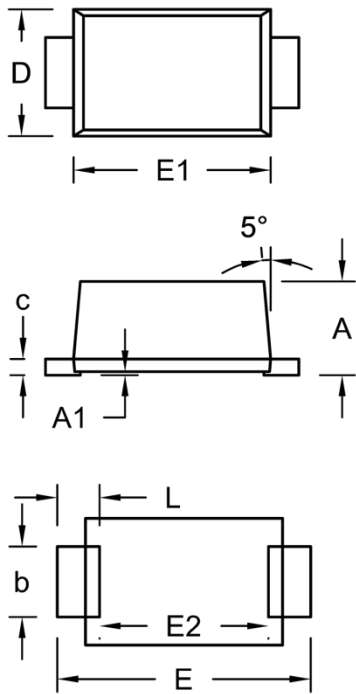
($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.6 Reverse Recovery Time Characteristic and Test Circuit Diagram



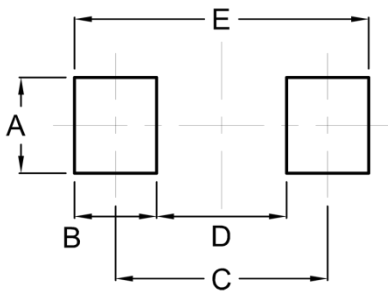
PACKAGE OUTLINE DIMENSIONS

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

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