



**THE DATASHEET OF
S1B-E3/5AT**



Surface-Mount Glass Passivated Rectifier


SMA (DO-214AC)

 Cathode  Anode

LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS | |
|-------------------------|---|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 50 V, 100 V, 200 V, 400 V, 600 V, 800 V, 1000 V |
| I_{FSM} | 40 A, 30 A |
| E_{AS} | 5 mJ |
| I_R | 1.0 μ A, 5.0 μ A |
| V_F | 1.1 V |
| T_J max. | 175 °C |
| Package | SMA (DO-214AC) |
| Circuit configuration | Single |

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
 - Automotive ordering code: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive, and telecommunication.

MECHANICAL DATA

Case: SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified

Base P/NHM3_X - halogen-free, RoHS-compliant and AEC-Q101 qualified (“_X” denotes revision code e.g. A, B,.....)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3, M3, HE3, and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

| MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted) | | | | | | | | | |
|---|----------------|-------------|-----|-----|-----|-----|-----|------|------|
| PARAMETER | SYMBOL | S1A | S1B | S1D | S1G | S1J | S1K | S1M | UNIT |
| Device marking code | | SA | SB | SD | SG | SJ | SK | SM | |
| Maximum recurrent peak reverse voltage | V_{RRM} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum RMS voltage | V_{RMS} | 35 | 70 | 140 | 280 | 420 | 560 | 700 | V |
| Maximum DC blocking voltage | V_{DC} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 1.0 | | | | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 40 | | | | | 30 | | A |
| Non-repetitive peak reverse avalanche energy at 25 °C, $I_{AS} = 1\text{ A}$, $L = 10\text{ mH}$ | E_{AS} | 5 | | | | | | | mJ |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +175 | | | | | | | °C |



| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | | | | | |
|--|--|-----------------|-----|-----|-----|-----|-----|-----|-----|------|
| PARAMETER | TEST CONDITIONS | SYMBOL | S1A | S1B | S1D | S1G | S1J | S1K | S1M | UNIT |
| Maximum instantaneous forward voltage | 1.0 A | V _F | 1.1 | | | | | | | V |
| Maximum DC reverse current at rated DC blocking voltage | T _J = 25 °C | I _R | 1.0 | | | | | 5.0 | | μA |
| | T _J = 125 °C | | 50 | | | | | | | |
| Typical reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | t _{rr} | 1.8 | | | | μs | | | |
| Typical junction capacitance | 4.0 V, 1 MHz | C _J | 12 | | | | pF | | | |

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | | | | | |
|---|------------------|-----|-----|-----|-----|-----|-----|-----|------|--|
| PARAMETER | SYMBOL | S1A | S1B | S1D | S1G | S1J | S1K | S1M | UNIT | |
| Typical thermal resistance ⁽¹⁾ | R _{θJA} | 75 | | | | | 85 | | °C/W | |
| | R _{θJL} | 27 | | | | | 30 | | | |

Note

⁽¹⁾ Thermal resistance from junction to ambient and from junction to lead mounted on PCB with 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| S1J-E3/61T | 0.064 | 61T | 1800 | 7" diameter plastic tape and reel |
| S1J-E3/5AT | 0.064 | 5AT | 7500 | 13" diameter plastic tape and reel |
| S1JHE3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| S1JHE3_A/I ⁽¹⁾ | 0.064 | I | 7500 | 13" diameter plastic tape and reel |
| S1J-M3/61T | 0.064 | 61T | 1800 | 7" diameter plastic tape and reel |
| S1J-M3/5AT | 0.064 | 5AT | 7500 | 13" diameter plastic tape and reel |
| S1JHM3_A/H ⁽¹⁾ | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| S1JHM3_A/I ⁽¹⁾ | 0.064 | I | 7500 | 13" diameter plastic tape and reel |

Note

⁽¹⁾ AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)



Fig. 1 - Forward Current Derating Curve



Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

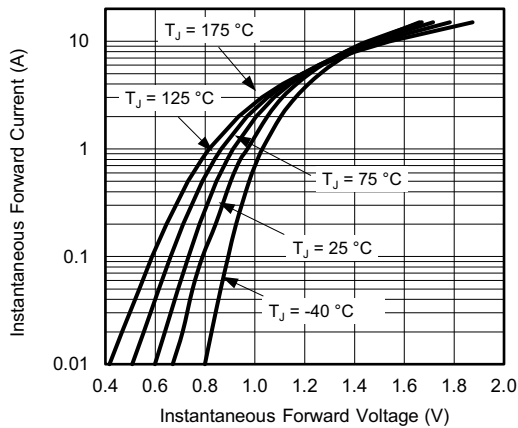


Fig. 3 - Typical Instantaneous Forward Characteristics



Fig. 5 - Typical Junction Capacitance

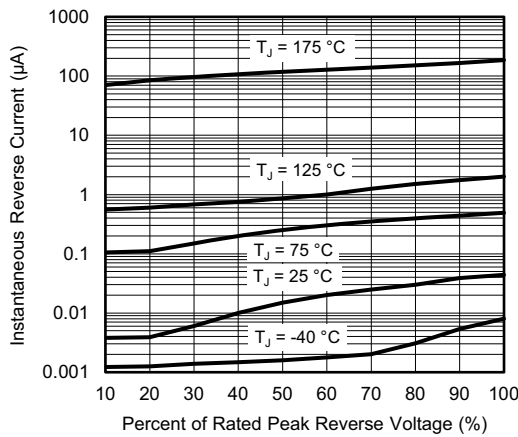


Fig. 4 - Typical Reverse Leakage Characteristics

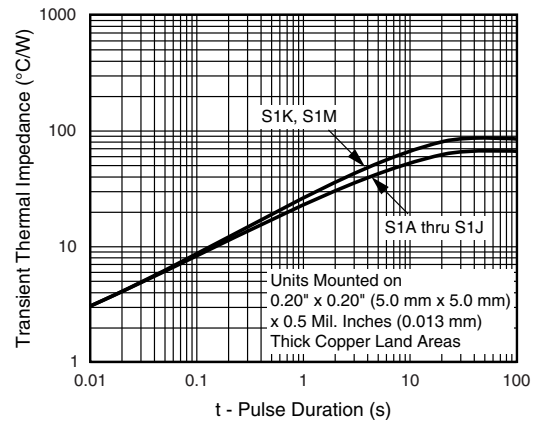
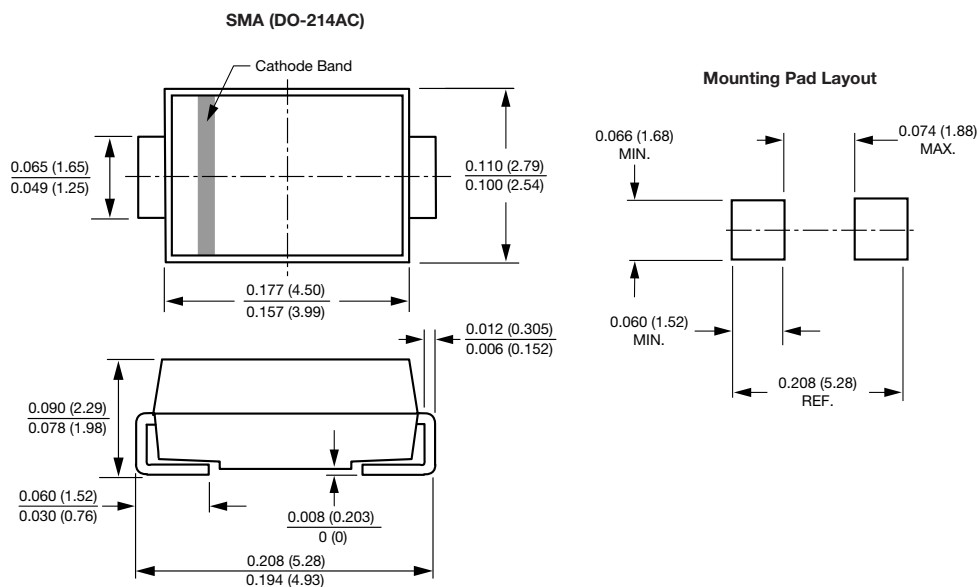


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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