

SMD Photovoltaic Solar Cell Protection Rectifier


DO-214AB (SMC)

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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in solar cell panel blocking diode for protection, using DC forward current without reverse bias.

MECHANICAL DATA

Case: DO-214AB (SMC)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS-compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

| PRIMARY CHARACTERISTICS | |
|-------------------------|----------------|
| $I_{F(AV)}$ | 5.0 A |
| V_{RRM} | 1000 V |
| I_{FSM} | 100 A |
| I_R | 10 μ A |
| V_F at $I_F = 5.0$ A | 0.90 V |
| T_J max. | 150 °C |
| Package | DO-214AB (SMC) |
| Diode variations | Single die |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | |
|--|-------------------|--------------------|------|
| PARAMETER | SYMBOL | S5MS | UNIT |
| Device marking code | | 5MS | |
| Max. repetitive peak reverse voltage | V_{RRM} | 1000 | V |
| Max. DC forward current (fig. 1) | $T_M = 110$ °C | 5.0 ⁽¹⁾ | A |
| | $T_A = 25$ °C | 1.6 ⁽²⁾ | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 100 | A |
| Operating junction and storage temperature range | T_{OP}, T_{STG} | -55 to +150 | °C |
| Junction temperature in DC forward current without reverse bias, $t \leq 1$ h ⁽³⁾ | T_J | ≤ 200 | °C |

Notes

(1) Mounted on 30 mm x 30 mm Al PCB

(2) Free air, mounted on recommended copper pad area

(3) Meets the requirements of IEC 61215 Ed. 2 bypass diode thermal test

| ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | | |
|---|---|---------------------------|----------------------|------|------|---------------|--|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT | |
| Instantaneous forward voltage | $I_F = 2.5 \text{ A}$ | $T_A = 25^\circ\text{C}$ | V_F ⁽¹⁾ | 0.94 | - | V | |
| | $I_F = 5.0 \text{ A}$ | | | 0.99 | 1.15 | | |
| | $I_F = 2.5 \text{ A}$ | $T_A = 125^\circ\text{C}$ | | 0.82 | - | | |
| | $I_F = 5.0 \text{ A}$ | | | 0.90 | 1.00 | | |
| Reverse current | Rated V_R | $T_A = 25^\circ\text{C}$ | I_R ⁽²⁾ | - | 10 | μA | |
| | | $T_A = 125^\circ\text{C}$ | | 50 | 250 | | |
| Max. reverse recovery time | $I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$ | | t_{rr} | 2.5 | - | μs | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 40 | - | pF | |

Notes

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width $\leq 40 \text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | |
|--|--------------------------------|------|--|--------------------|--|
| PARAMETER | SYMBOL | S5MS | | UNIT | |
| Typical thermal resistance | $R_{\theta JA}$ ⁽¹⁾ | 92 | | $^\circ\text{C/W}$ | |
| | $R_{\theta JM}$ ⁽²⁾ | 8 | | | |

Notes

(1) Free air, mounted on recommended copper pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient

(2) Mounted on 30 mm x 30 mm Al PCB. Thermal resistance $R_{\theta JM}$ - junction to mount

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| S5MS-E3/57T | 0.211 | 57T | 850 | 7" diameter plastic tape and reel |
| S5MS-E3/9AT | 0.211 | 9AT | 3500 | 13" diameter plastic tape and reel |

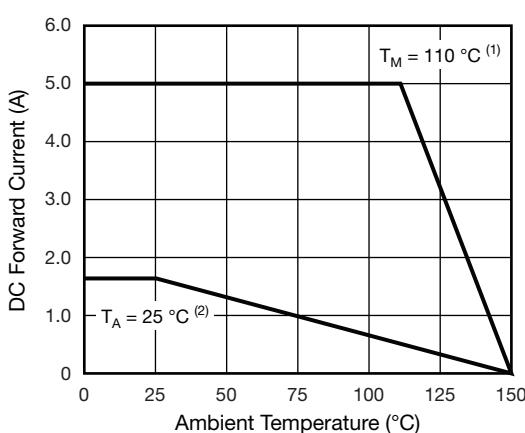
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

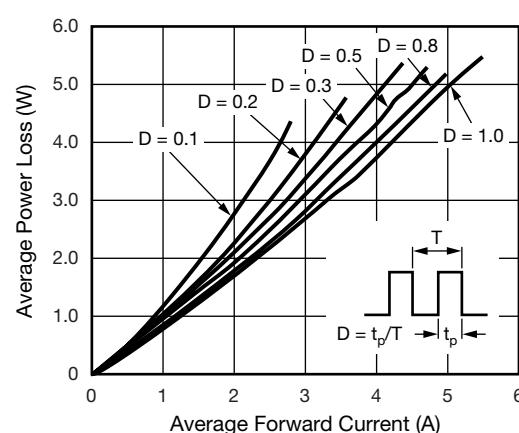


Fig. 2 - Forward Power Loss Characteristics

Notes

(1) Mounted on 30 mm x 30 mm Al PCB T_M measured at the terminal ($R_{\theta JM} = 8 \text{ }^\circ\text{C/W}$)

(2) Free air, mounted on recommended copper pad area ($R_{\theta JA} = 92 \text{ }^\circ\text{C/W}$)

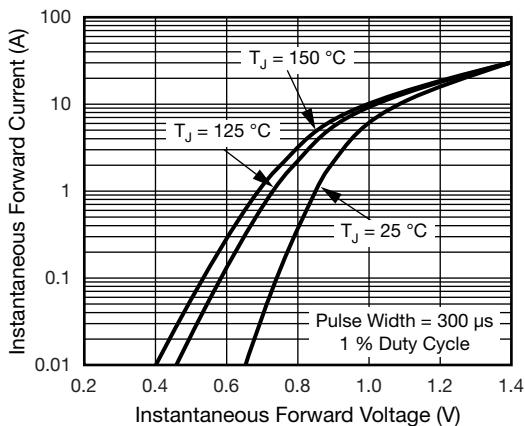


Fig. 3 - Typical Instantaneous Forward Characteristics

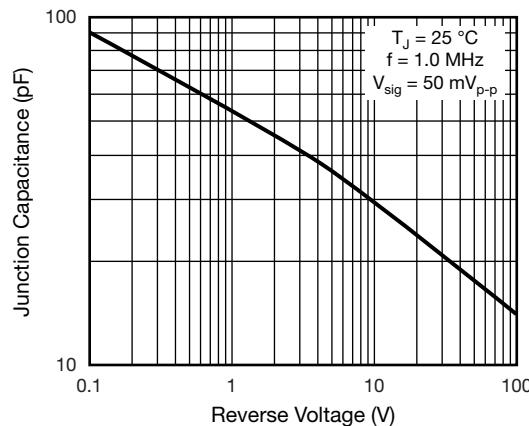


Fig. 5 - Typical Junction Capacitance

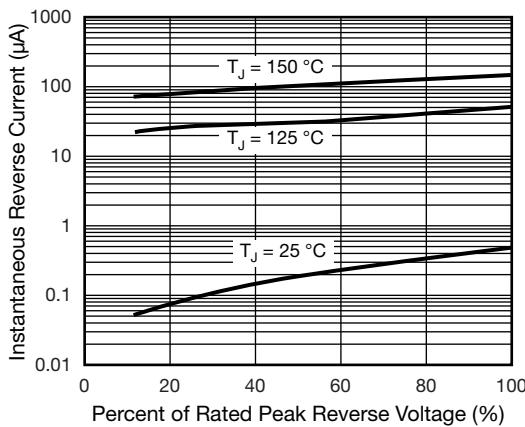
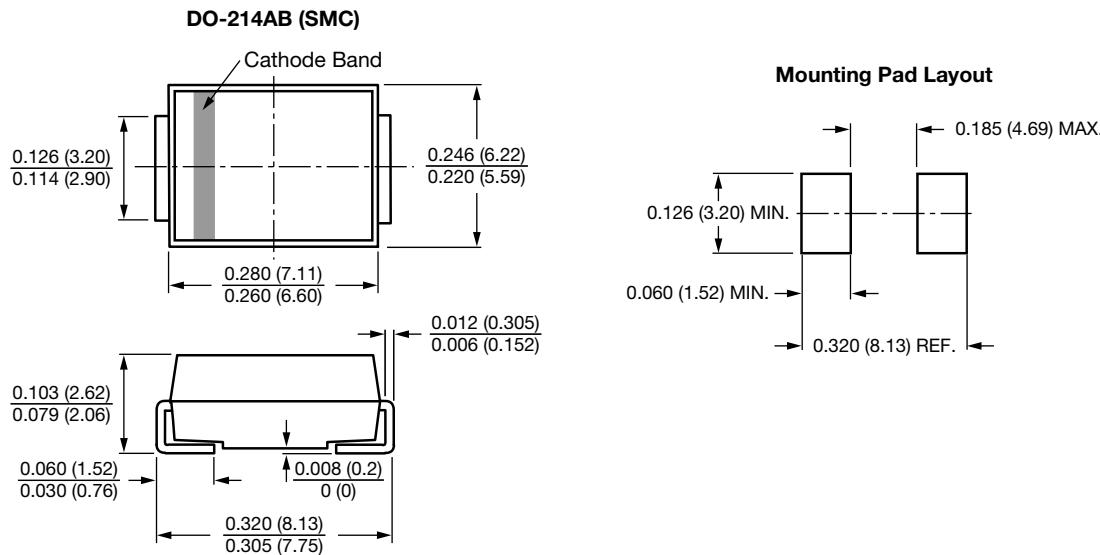


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



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