

## Surface-Mount Glass Passivated Rectifier



**SMC (DO-214AB)**



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### 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/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### TYPICAL APPLICATIONS

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

### MECHANICAL DATA

**Case:** SMC (DO-214AB)

Molding compound meets UL 94 V-0 flammability rating

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

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

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

M3 and HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** color band denotes cathode end

| PRIMARY CHARACTERISTICS                 |                             |
|-----------------------------------------|-----------------------------|
| $I_{F(AV)}$                             | 10 A                        |
| $V_{RRM}$                               | 400 V, 600 V, 800 V, 1000 V |
| $I_{FSM}$                               | 240 A                       |
| $I_R$                                   | 10 $\mu$ A                  |
| $V_F$ at $I_F = 10$ A ( $T_A = 125$ °C) | 0.87 V                      |
| $T_J$ max.                              | 150 °C                      |
| Package                                 | SMC (DO-214AB)              |
| Diode variations                        | Single                      |

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                            |                   |             |       |       |       |      |
|------------------------------------------------------------------------------------|-------------------|-------------|-------|-------|-------|------|
| PARAMETER                                                                          | SYMBOL            | S10CG       | S10CJ | S10CK | S10CM | UNIT |
| Device marking code                                                                |                   | 10G         | 10J   | 10K   | 10M   |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$         | 400         | 600   | 800   | 1000  | V    |
| Maximum RMS voltage                                                                | $V_{RMS}$         | 280         | 420   | 560   | 700   | V    |
| Maximum DC blocking voltage                                                        | $V_{DC}$          | 400         | 600   | 800   | 1000  | V    |
| Maximum average forward rectified current                                          | $I_{F(AV)}^{(1)}$ | 10          |       |       |       | A    |
|                                                                                    | $I_{F(AV)}^{(2)}$ | 2           |       |       |       | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$         | 240         |       |       |       | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$    | -55 to +150 |       |       |       | °C   |

#### Notes

(1) Mounted on aluminum PCB 30 mm x 30 mm with aluminum heatsink

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

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

| PARAMETER                     | TEST CONDITIONS                                                        | SYMBOL      | TYP. | MAX. | UNIT          |
|-------------------------------|------------------------------------------------------------------------|-------------|------|------|---------------|
| Instantaneous forward voltage | $I_F = 5.0\text{ A}$                                                   | $V_F^{(1)}$ | 0.9  | -    | V             |
|                               | $I_F = 10.0\text{ A}$                                                  |             | 0.96 | 1.0  |               |
|                               | $I_F = 5.0\text{ A}$                                                   |             | 0.8  | -    |               |
|                               | $I_F = 10.0\text{ A}$                                                  |             | 0.87 | 0.95 |               |
| Reverse current               | Rated $V_R$                                                            | $I_R^{(2)}$ | -    | 10   | $\mu\text{A}$ |
|                               |                                                                        |             | -    | 350  |               |
| Typical reverse recovery time | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$ | $t_{rr}$    | 5    | -    | $\mu\text{s}$ |
| Typical junction capacitance  | 4.0 V, 1 MHz                                                           | $C_J$       | 79   | -    | pF            |

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width; 1 % duty cycle  
 (2) Pulse test: pulse width  $\leq 40\text{ ms}$

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

| PARAMETER                  | SYMBOL                          | S10CG | S10CJ | S10CK | S10CM | UNIT |
|----------------------------|---------------------------------|-------|-------|-------|-------|------|
| Typical thermal resistance | R <sub>θJA</sub> <sup>(1)</sup> | 75    |       |       |       | °C/W |
|                            | R <sub>θJM</sub> <sup>(2)</sup> | 9.3   |       |       |       |      |

**Notes**

- (1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient  
 (2) Mounted on 30 mm x 30 mm Aluminum 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                      |
|---------------------------|-----------------|------------------------|---------------|------------------------------------|
| S10CJ-M3/I                | 0.257           | I                      | 3500          | 13" diameter plastic tape and reel |
| S10CJHM3/I <sup>(1)</sup> | 0.257           | I                      | 3500          | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

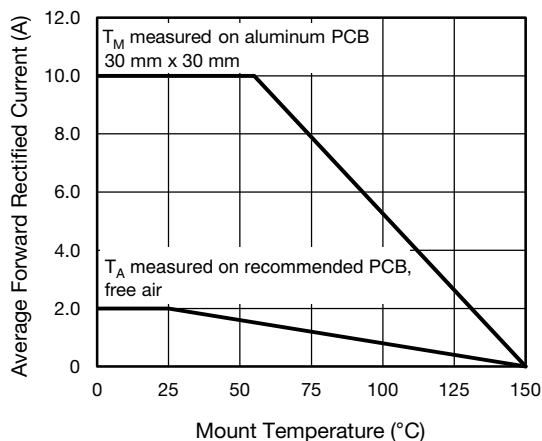
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

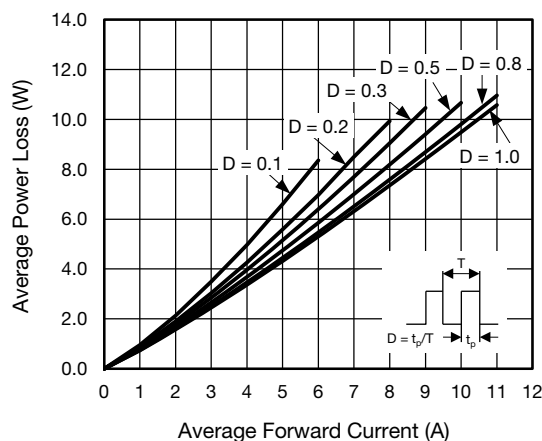


Fig. 2 - Average Power Loss Characteristics

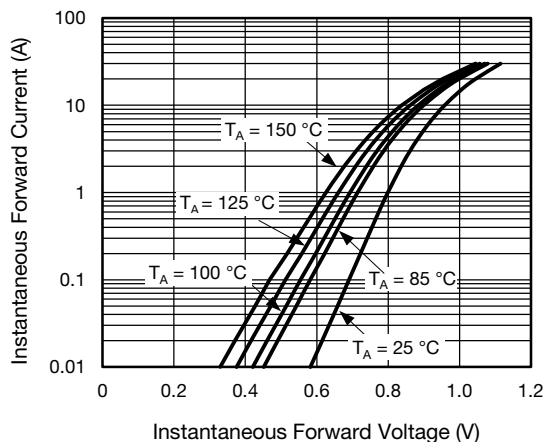


Fig. 3 - Typical Instantaneous Forward Characteristics

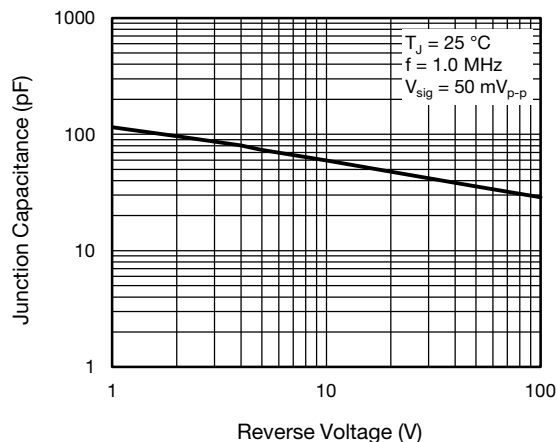


Fig. 5 - Typical Junction Capacitance

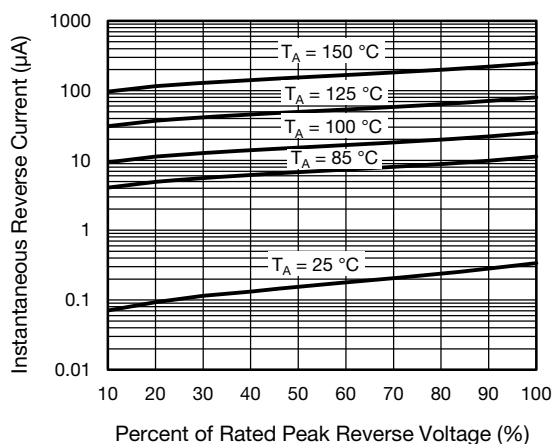


Fig. 4 - Typical Reverse Characteristics

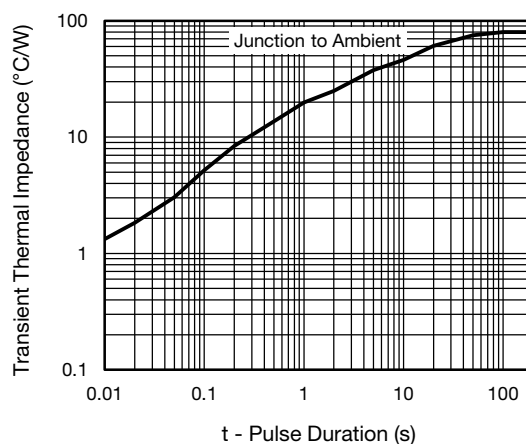
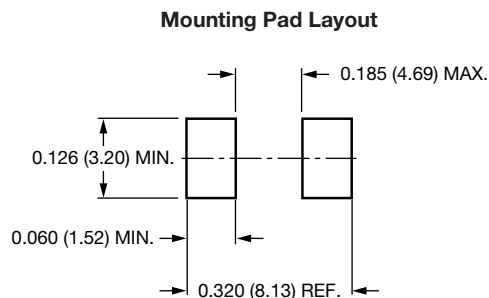
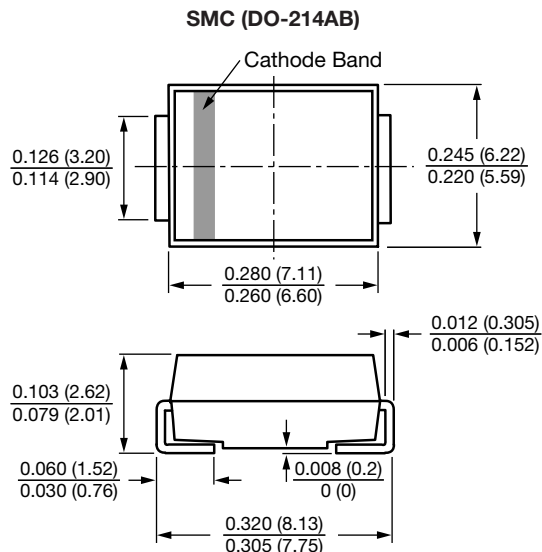


Fig. 6 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)




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