

## Surface-Mount Glass Passivated Rectifier



**SMC (DO-214AB)**

Cathode  Anode

### LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
$V_{RRM}$	400 V, 600 V, 800 V, 1000 V
$I_{FSM}$	300 A
$I_R$	10 $\mu$ A
$V_F$ at $I_F = 12$ A ( $T_J = 125$ °C)	0.90 V
$T_J$ max.	150 °C
Package	SMC (DO-214AB)
Circuit configurations	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/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://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:** 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

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)						
PARAMETER	SYMBOL	S12CG	S12CJ	S12CK	S12CM	UNIT
Device marking code		12G	12J	12K	12M	
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	$I_{F(AV)}^{(1)}$	12				A
	$I_{F(AV)}^{(2)}$	2				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	300				A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150				°C

#### Notes

(1) Mounted on aluminum PCB 10 mm x 10 mm with aluminum heatsink

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



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 6 A	T <sub>J</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.92	-	V
	I <sub>F</sub> = 12 A			1.0	1.1	
	I <sub>F</sub> = 6 A	T <sub>J</sub> = 125 °C		0.81	-	
	I <sub>F</sub> = 12 A			0.90	-	
Reverse current	Rated V <sub>R</sub>	T <sub>J</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	10	μA
		T <sub>J</sub> = 125 °C		-	350	
Typical reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A		t <sub>rr</sub>	5	-	μs
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	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 <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	S12CG	S12CJ	S12CK	S12CM	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)(2)</sup>	87				°C/W
	R <sub>θJM</sub> <sup>(3)</sup>	4				

**Notes**

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$   
(2) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz.  
(3) Thermal resistance junction-to-mount to follow JEDEC® 51-14 transient dual interface test method (TDIM)

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
S12CJ-M3/I	0.257	I	3500	13" diameter plastic tape and reel
S12CJHM3/I <sup>(1)</sup>	0.257	I	3500	13" diameter plastic tape and reel

**Note**

- (1) AEC-Q101 qualified



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

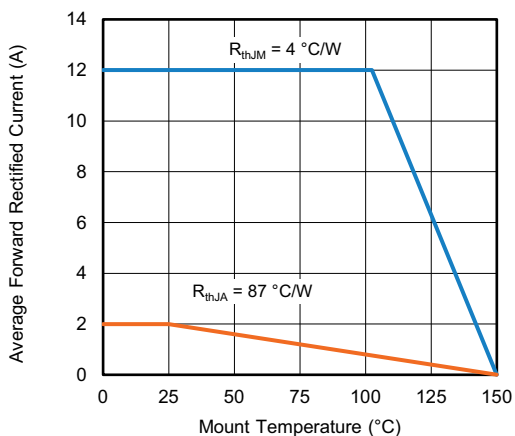


Fig. 1 - Forward Current Derating Curve

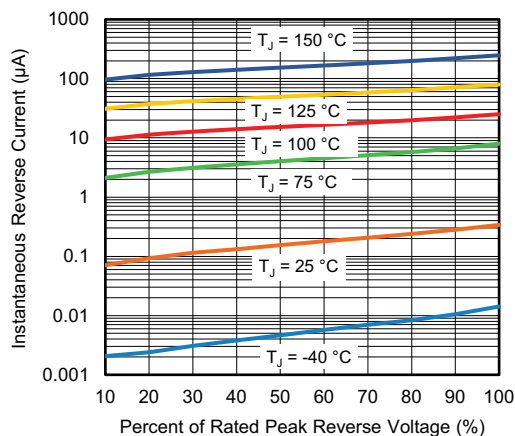


Fig. 4 - Typical Reverse Characteristics

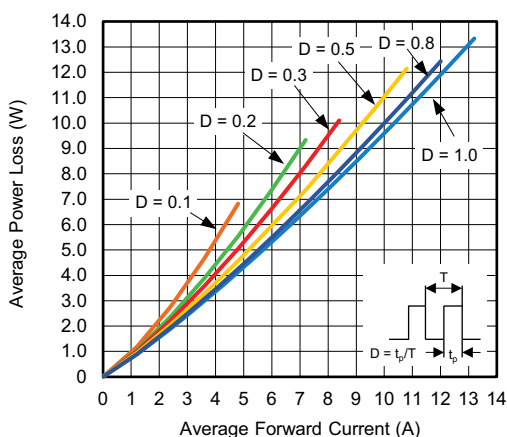


Fig. 2 - Average Power Loss Characteristics

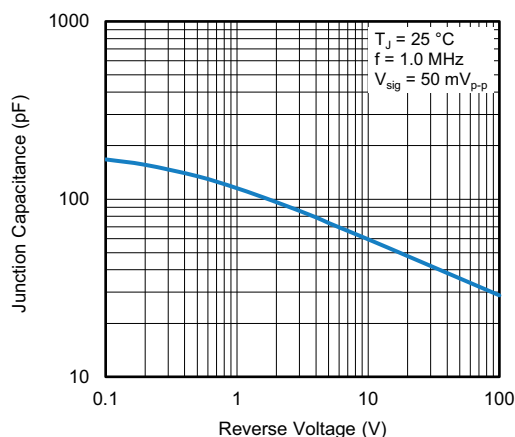


Fig. 5 - Typical Junction Capacitance

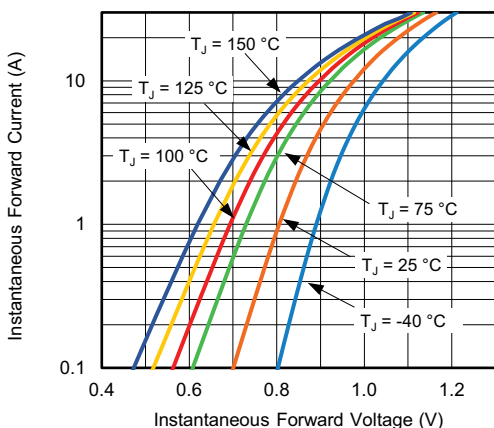


Fig. 3 - Typical Instantaneous Forward Characteristics

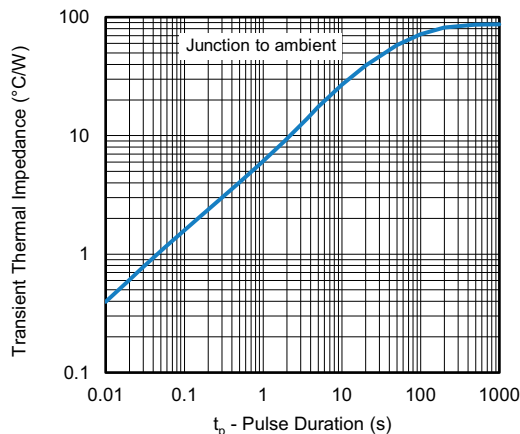
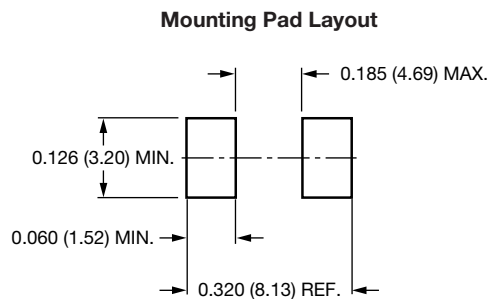
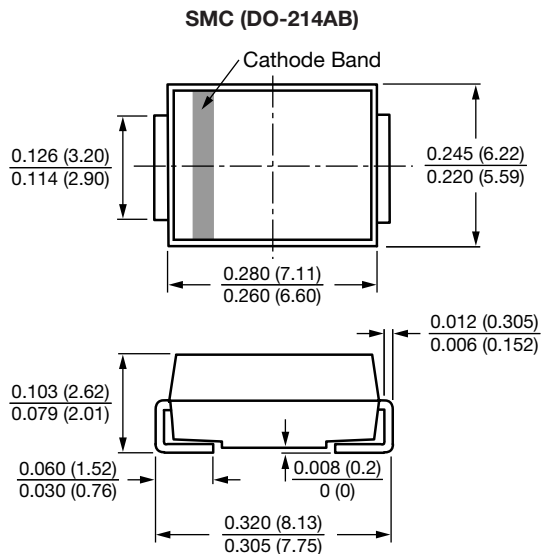


Fig. 6 - Typical Transient Thermal Impedance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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