

# SMD Photovoltaic Solar Cell Protection Rectifier



SMC (DO-214AB)

## DESIGN SUPPORT TOOLS

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## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	5.0 A
$V_{RRM}$	1000 V
$I_{FSM}$	100 A
$I_R$	10 $\mu$ A
$V_F$ at $I_F = 5.0$ A	0.90 V
$T_J$ max.	150 °C
Package	SMC (DO-214AB)
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
- 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 solar cell panel blocking diode for protection, using DC forward current without reverse bias.

## MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - RoHS-compliant, commercial grade

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

M3 suffix meets JESD 201 class 1A whisker test

**Polarity:** color band denotes cathode end

## 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)	$I_F$	5.0 <sup>(1)</sup>	A
		1.6 <sup>(2)</sup>	
Peak forward surge current 10 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 <sup>(3)</sup>	$T_J$	$\leq 200$	°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 <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 2.5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.94	-	V
	I <sub>F</sub> = 5.0 A			0.99	1.15	
	I <sub>F</sub> = 2.5 A	T <sub>A</sub> = 125 °C		0.82	-	
	I <sub>F</sub> = 5.0 A			0.90	1.00	
Reverse current	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	10	μA
		T <sub>A</sub> = 125 °C		50	250	
Max. 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>	2.5	-	μs
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	40	-	pF

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ 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

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
S5MS-M3/57T	0.211	57T	850	7" diameter plastic tape and reel
S5MS-M3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel

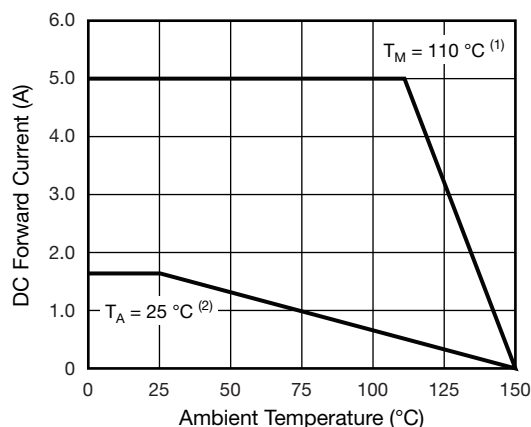
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

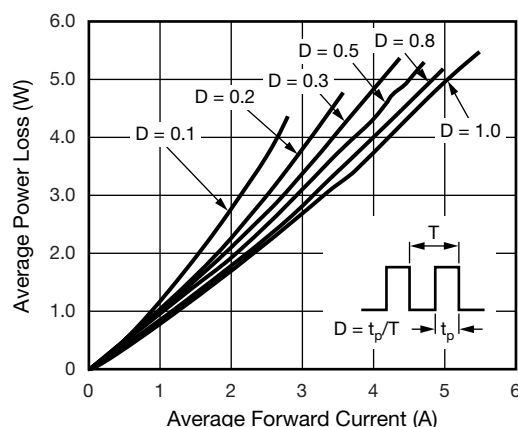


Fig. 2 - Forward Power Loss Characteristics

**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  
( $R_{\theta JA} = 92\text{ }^{\circ}\text{C/W}$ )

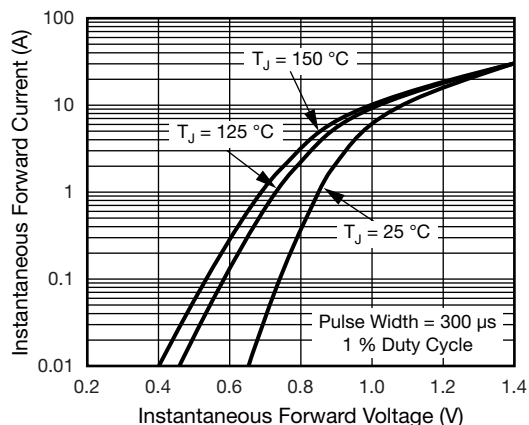


Fig. 3 - Typical Instantaneous Forward Characteristics

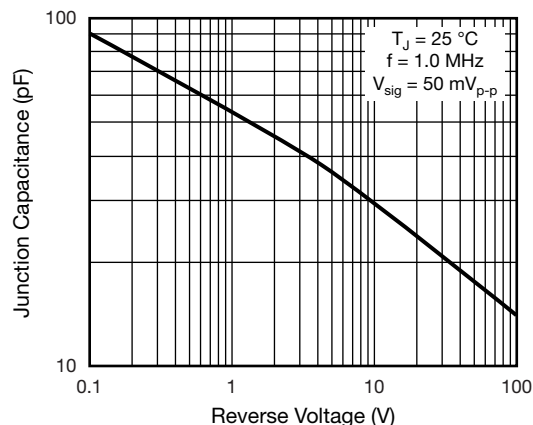


Fig. 5 - Typical Junction Capacitance

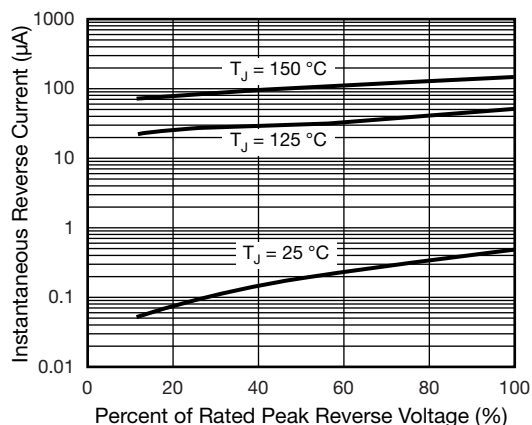
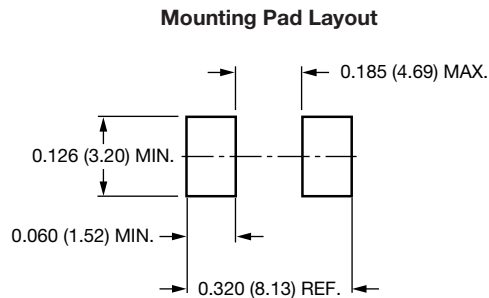
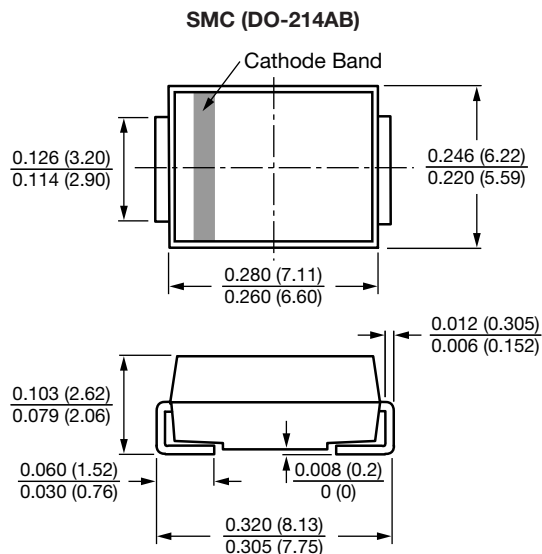


Fig. 4 - Typical Reverse Characteristics

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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