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Vishay General Semiconductor

SMD Photovoltaic Solar Cell Protection Rectifier



SMC (DO-214AB)

Cathode O Anode

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	5.0 A			
V _{RRM}	1000 V			
I _{FSM}	100 A			
I _R	10 μΑ			
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 <u>www.vishay.com/doc?99912</u>

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-E3 - RoHS-compliant, commercial grade Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

E3 and 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		
May DC famuered augment (fig. 1)	T _M = 110 °C	l _F	5.0 ⁽¹⁾	Α		
Max. DC forward current (fig. 1)	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	А		
Operating junction and storage temperature range		T_{OP} , T_{STG}	, T _{STG} -55 to +150			
Junction temperature in DC forward current without reverse bias, $t \le 1 \ h^{(3)}$		TJ	≤ 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



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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)							
PARAMETER	TEST CO	TEST CONDITIONS		TYP.	MAX.	UNIT	
Instantaneous forward voltage	I _F = 2.5 A	T _A = 25 °C	V _F ⁽¹⁾	0.94	-	V	
	I _F = 5.0 A			0.99	1.15		
	I _F = 2.5 A	T 105 °C		0.82	-		
	I _F = 5.0 A	$T_A = 125 ^{\circ}C$		0.90	1.00		
Reverse current	Rated V _R	T _A = 25 °C	I _R ⁽²⁾	-	10	μА	
	nateu v _R	T _A = 125 °C		50	250		
Max. reverse recovery time	I _F = 0.5 A, I _R = I _{rr} = 0.25 A	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A		2.5	-	μs	
Typical junction capacitance	4.0 V, 1 MHz		CJ	40	-	pF	

Notes

 $^{(1)}\,$ Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL S5MS		UNIT	
Typical thermal resistance	R _{θJA} ⁽¹⁾	92	°C/W	
Typical trieffial resistance	R _{0JM} (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	
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	

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

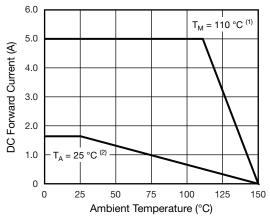


Fig. 1 - Forward Current Derating Curve

Notes

- (1) Mounted on 30 mm x 30 mm Al PCB T_M measured at the terminal ($R_{\theta JM} = 8$ °C/W)
- ⁽²⁾ Free air, mounted on recommended copper pad area ($R_{\theta JA} = 92 \, ^{\circ}\text{C/W}$)

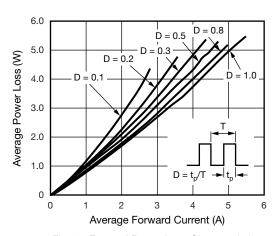


Fig. 2 - Forward Power Loss Characteristics

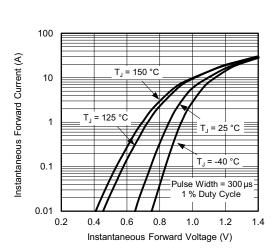


Fig. 3 - Typical Instantaneous Forward Characteristics

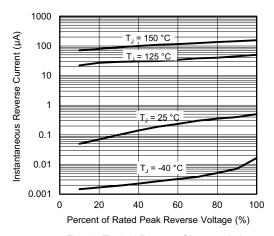


Fig. 4 - Typical Reverse Characteristics

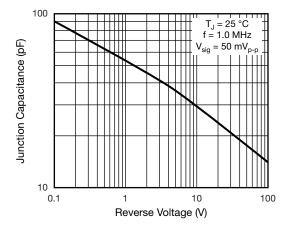


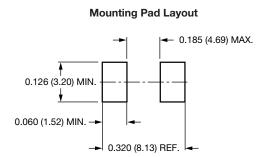
Fig. 5 - Typical Junction Capacitance



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

O.126 (3.20) 0.114 (2.90) 0.280 (7.11) 0.260 (6.60) 0.103 (2.62) 0.079 (2.06) 0.060 (1.52) 0.030 (0.76) 0.320 (8.13) 0.305 (7.75)





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