

SMD Photovoltaic Solar Cell Protection Rectifier



DO-214AB (SMC)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated 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
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

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

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	S5MS	UNIT
Device marking code		5MS	
Maximum repetitive peak reverse voltage	V_{RRM}	1000	V
Maximum DC forward current (fig. 1)	$T_M = 110$ °C	5.0 ⁽¹⁾	A
	$T_A = 25$ °C	1.6 ⁽²⁾	
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 ⁽³⁾	T_J	≤ 200	°C

Notes

⁽¹⁾ Mounted on 30 mm x 30 mm Al P.C.B.

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

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

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

PARAMETER	TEST CONDITIONS		SYMBOL	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 _A = 125 °C		0.82	-	
	I _F = 5.0 A			0.90	1.00	
Reverse current	Rated V _R	T _A = 25 °C	I _R ⁽²⁾	-	10	μA
		T _A = 125 °C		50	250	
Maximum reverse recovery time	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 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** ($T = 25\text{ }^{\circ}\text{C}$ 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 P.C.B. 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

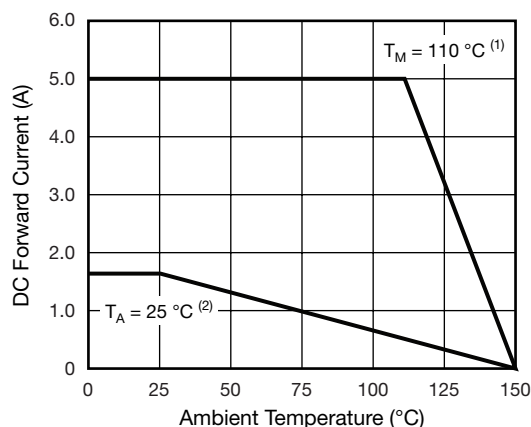
RATINGS AND CHARACTERISTICS CURVES($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

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

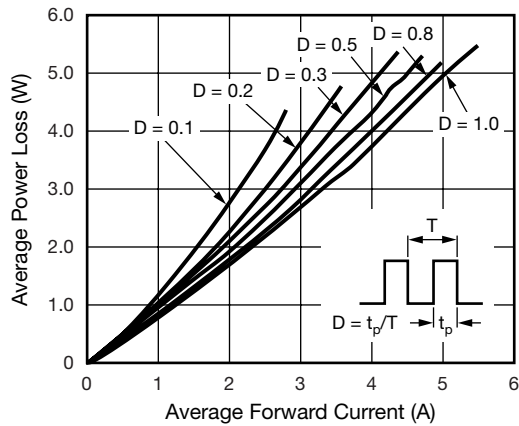


Fig. 2 - Forward Power Loss Characteristics

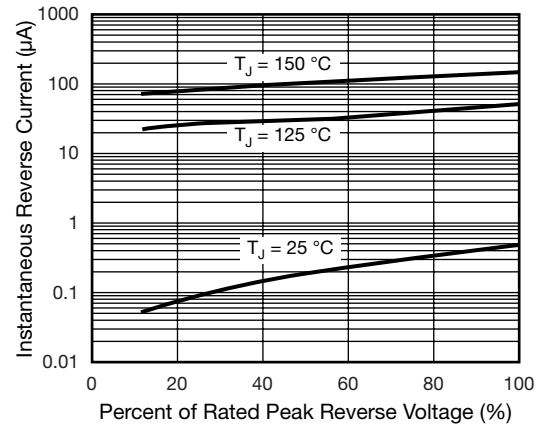


Fig. 4 - Typical Reverse Characteristics

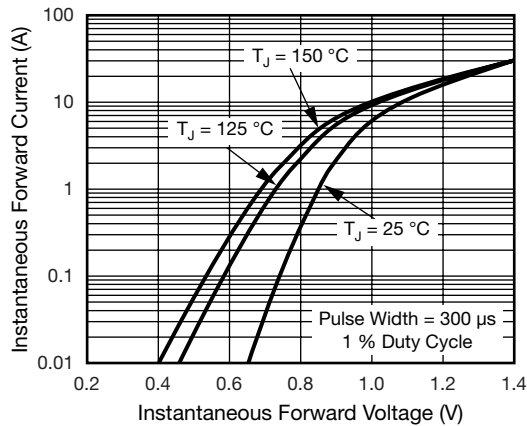


Fig. 3 - Typical Instantaneous Forward Characteristics

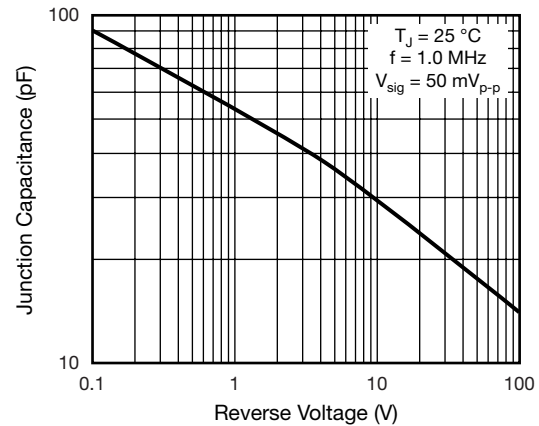
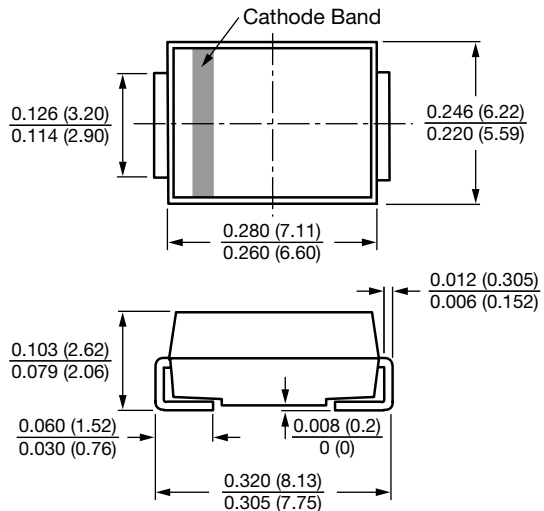
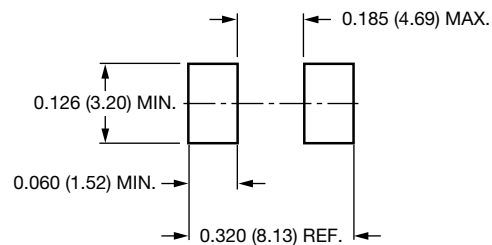


Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)**DO-214AB (SMC)****Mounting Pad Layout**

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