

SMD Photovoltaic Solar Cell Protection Rectifier



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- High forward surge capability
- Low thermal resistance
- 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
- **Halogen-free according to IEC 61249-2-21 definition**



TYPICAL APPLICATIONS

For use in solar cell panel blocking diode for protection, using DC forward current without reverse bias.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free and 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

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	S5PMS	UNIT
Device marking code		5PMS	
Maximum repetitive peak reverse voltage	V_{RRM}	1000	V
Maximum DC forward current (fig. 1)	I_F	$T_M = 130$ °C	5.0 ⁽¹⁾
		$T_A = 25$ °C	1.8 ⁽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 °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		55	100	
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	30	-	pF

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	S5PMS	UNIT
Typical thermal resistance	R _{θJA} ⁽¹⁾	90	°C/W
	R _{θJM} ⁽²⁾	3	

Notes

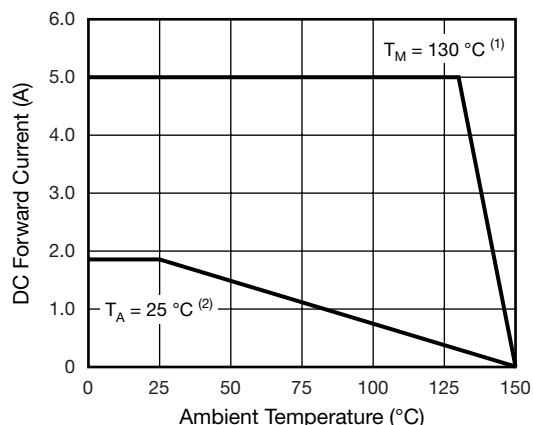
- (1) Free air, mounted on recommended copper pad area. Thermal resistance R_{θJA} - junction to ambient
- (2) Mounted on 30 mm x 30 mm Al P.C.B. Thermal resistance R_{θJM} - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
S5PMS-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
S5PMS-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

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 P.C.B. T_M measured at the terminal (R_{θJM} = 3.0 °C/W)
- (2) Free air, mounted on recommended copper pad area (R_{θJA} = 90 °C/W)

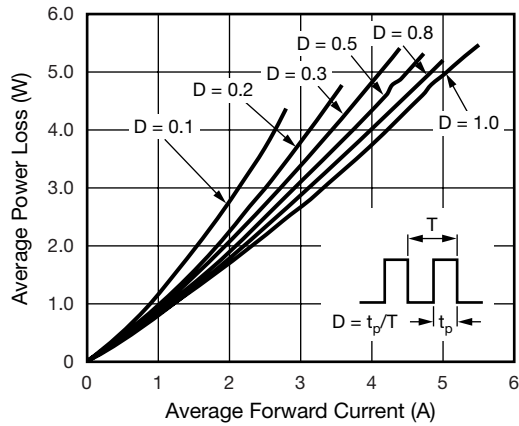


Fig. 2 - Forward Power Loss Characteristics

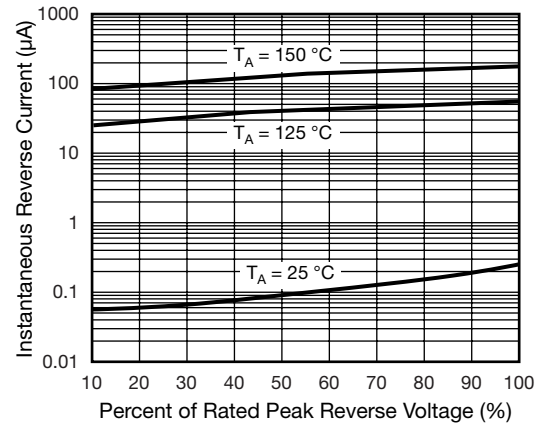


Fig. 4 - Typical Reverse Leakage Characteristics

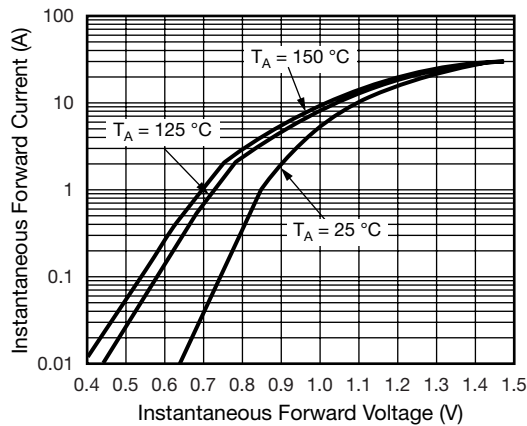


Fig. 3 - Typical Instantaneous Forward Characteristics

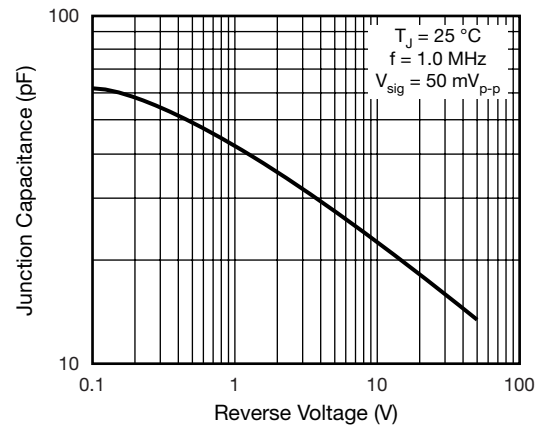
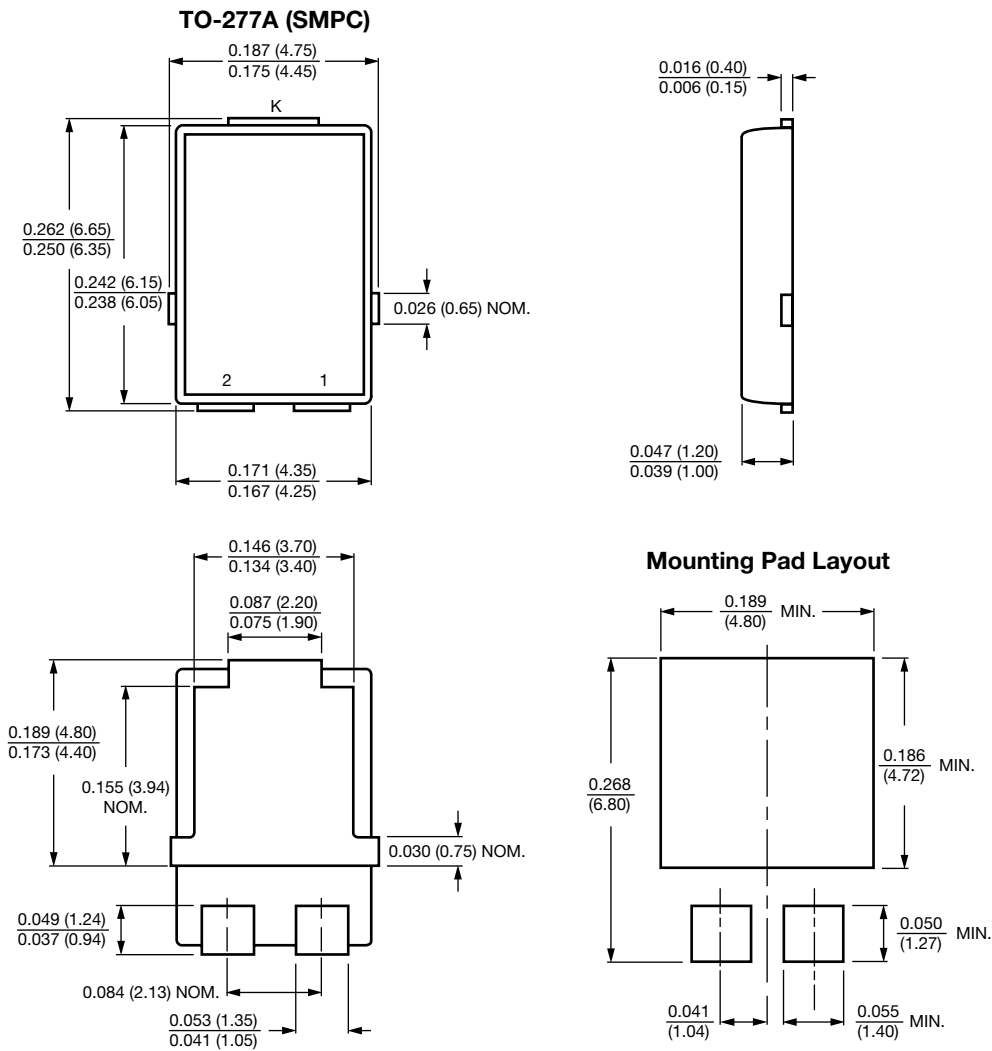


Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A



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