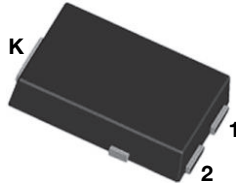
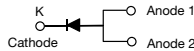


## SMD Photovoltaic Solar Cell Protection Rectifier

### eSMP® Series



### TO-277A (SMPC)



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

### 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**



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:** TO-277A (SMPC)

Molding compound meets UL 94 V-0 flammability rating 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 suffix meets JESD 201 class 1A whisker test

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 <sup>(1)</sup>
		$T_A = 25$ °C	1.8 <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		55	100	
Maximum 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>	30	-	pF

**Notes**

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

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	S5PMS	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	90	°C/W
	R <sub>θJM</sub> <sup>(2)</sup>	3	

**Notes**

- (1) Free air, mounted on recommended copper pad area. Thermal resistance R<sub>θJA</sub> - junction to ambient
- (2) Mounted on 30 mm x 30 mm Al PCB Thermal resistance R<sub>θJM</sub> - 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<sub>A</sub> = 25 °C unless otherwise noted)

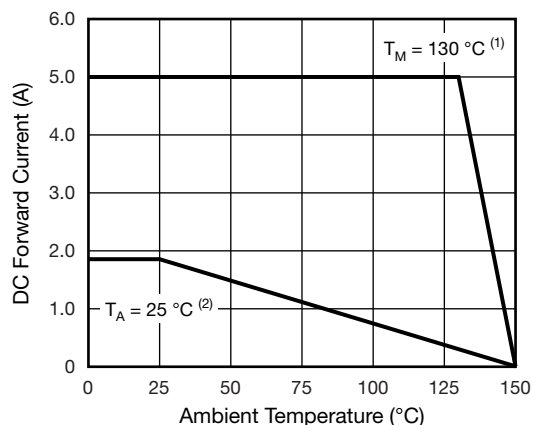


Fig. 1 - Forward Current Derating Curve

**Notes**

- (1) Mounted on 30 mm x 30 mm Al PCB T<sub>M</sub> measured at the terminal (R<sub>θJM</sub> = 3.0 °C/W)
- (2) Free air, mounted on recommended copper pad area (R<sub>θJA</sub> = 90 °C/W)

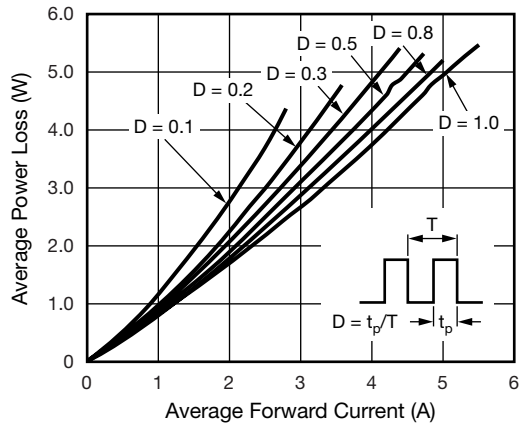


Fig. 2 - Forward Power Loss Characteristics

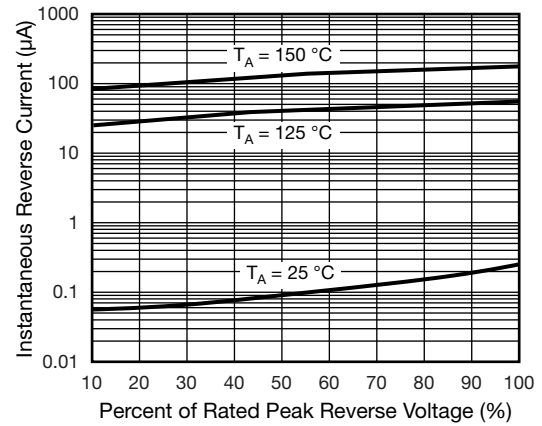


Fig. 4 - Typical Reverse Leakage Characteristics

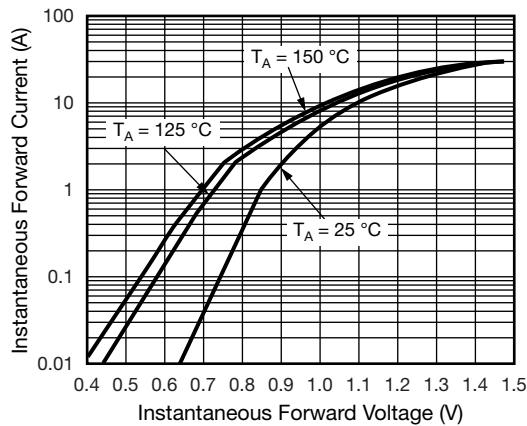


Fig. 3 - Typical Instantaneous Forward Characteristics

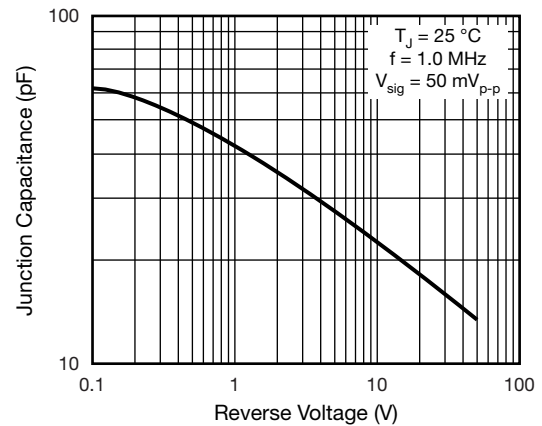
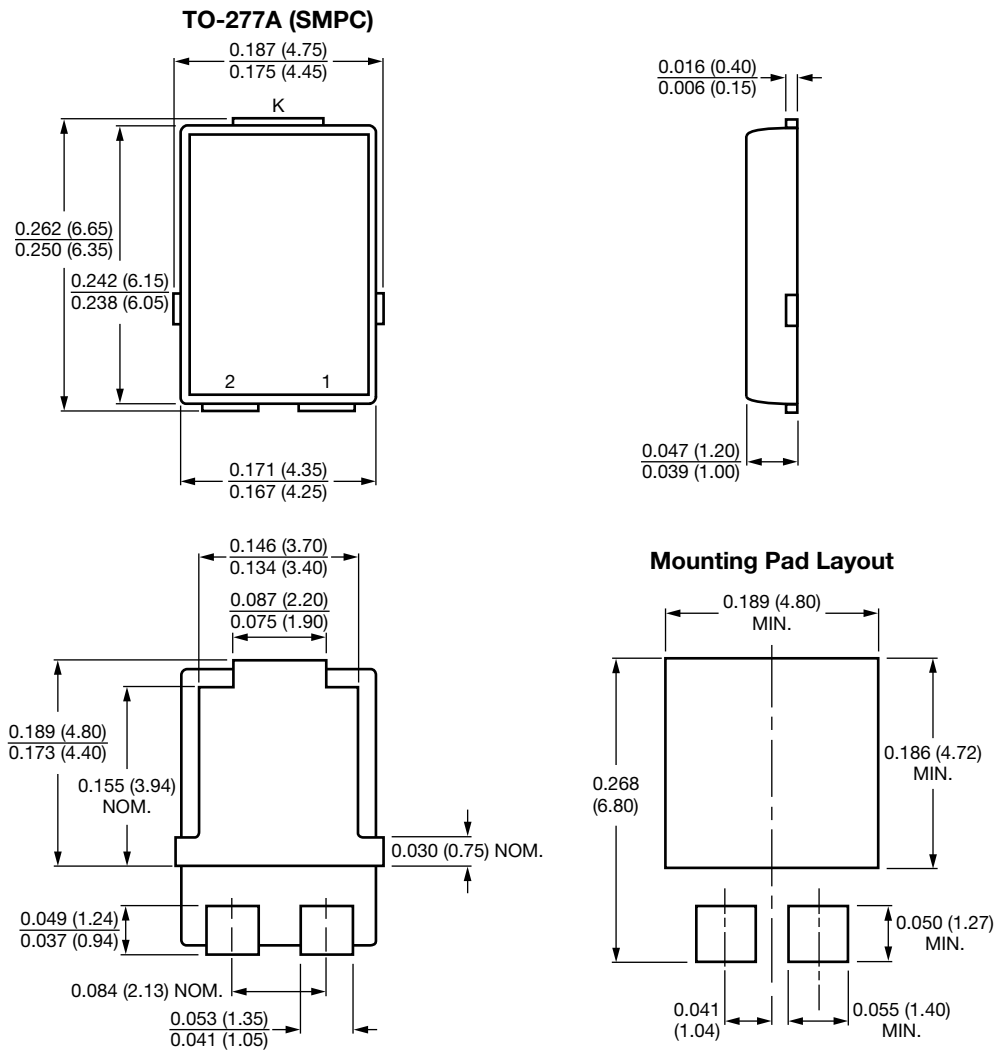


Fig. 5 - Typical Junction Capacitance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)



Conform to JEDEC TO-277A



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