HALOGEN

FREE



Vishay General Semiconductor

SMD Photovoltaic Solar Cell Protection Schottky Rectifier



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	15 A			
V _{RRM}	30 V			
I _{FSM}	280 A			
E _{AS}	20 mJ			
V_F at $I_F = 15$ A	0.42 V			
T _J max.	150 °C			
Package	SMPC (TO-277A)			
Circuit configuration	Single			

FEATURES

- Very low profile typical height of 1.1 mm
- · Ideal for automated placement
- · Guardring for overvoltage protection
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- 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

TYPICAL APPLICATIONS

For use in solar cell junction box as a bypass diode for protection, using DC forward current without reverse bias.

MECHANICAL DATA

Case: SMPC (TO-277A)

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

M3 suffix meets JESD 201 class 1A whisker test

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)					
PARAMETER		SS15P3S	UNIT		
Device marking code		153S			
Maximum repetitive peak reverse voltage	V_{RRM}	30	V		
Maying DC family and a sweet fire 1)	IF	15 ⁽¹⁾	Α		
Maximum DC forward current (fig. 1)		4.5 ⁽²⁾			
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	280	Α		
Non-repetitive avalanche energy at I _{AS} = 2.0 A, T _J = 25 °C		20	mJ		
Operating junction and storage temperature range	T_{OP}, T_{STG}	-55 to +150	°C		
Junction temperature in DC forward current without reverse bias, $t \le 1 \ h^{(3)}$	T_J	≤ 200	°C		

Notes

- (1) Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink
- (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 CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 7.5 A	- T _A = 25 °C	V _F ⁽¹⁾	0.43	-	V
	I _F = 15 A			0.50	0.57	
	I _F = 7.5 A	T _A = 125 °C		0.32	-	
	I _F = 15 A			0.42	0.49	
Reverse current	V _R = 30 V	T _A = 25 °C T _A = 125 °C	I _R ⁽²⁾	150	1000	μΑ
	V _R = 30 V			59	120	mA
Typical junction capacitance	4.0 V, 1 MHz		CJ	930	-	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 VALUE		UNIT	
Typical thermal resistance	R _{θJA} ⁽¹⁾	100	°C/W	
	R _{0JM} (2)	3		

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 with 50 mm x 25 mm x 100 mm fin heat sink. Thermal resistance $R_{\theta JM}$ - junction to mount.

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
SS15P3S-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel	
SS15P3S-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel	



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

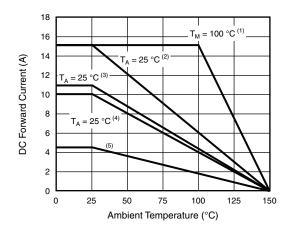


Fig. 1 - Maximum Current Derating Curve

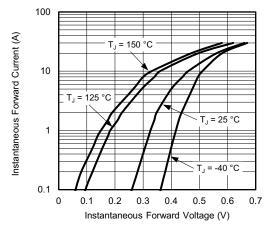


Fig. 3 - Typical Instantaneous Forward Characteristics

Notes

- (1) Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink, T_M measured at the terminal of cathode band
- (2) Mounted on 30 mm x 30 mm Al PCB ($R_{\theta,JA} = 20 \, ^{\circ}\text{C/W}$)
- (3) Mounted on 30 mm x 30 mm x 2 copper pad areas FR4 PCB (R_{θJA} = 30 °C/W)
- (4) Mounted on 25 mm x 25 mm x 2 copper pad areas FR4 PCB (R_{B,IA} = 30 °C/W)
- (5) Free air, mounted on recommended copper pad area $(R_{\theta,JA} = 100 \text{ °C/W})$

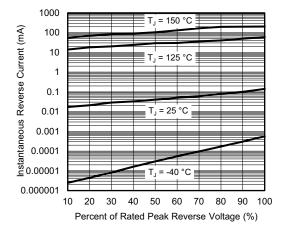


Fig. 4 - Typical Reverse Leakage Characteristics

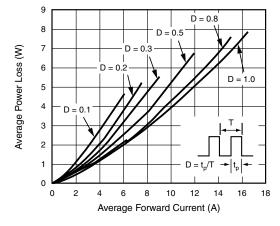


Fig. 2 - Forward Power Loss Characteristics

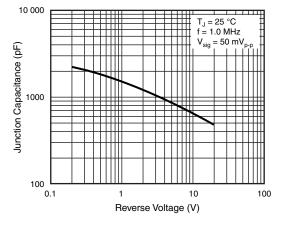
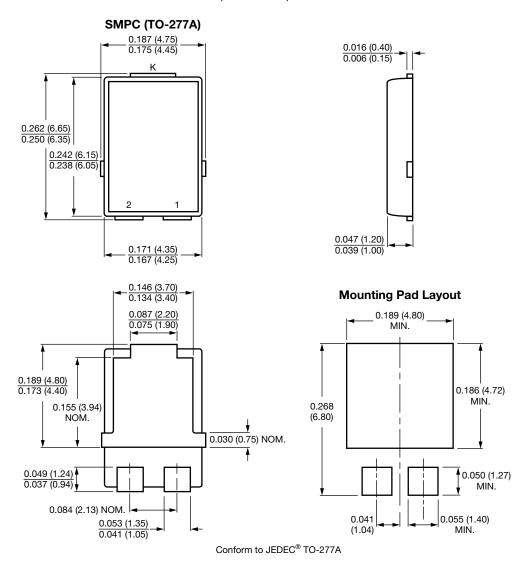


Fig. 5 - Typical Junction Capacitance



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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