HALOGEN

FREE

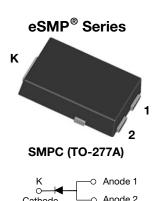


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Vishay General Semiconductor

SMD Photovoltaic Solar Cell Protection TMBS® (Trench MOS Barrier Schottky) Rectifiers

Ultra Low $V_F = 0.31 \text{ V}$ at $I_F = 5 \text{ A}$



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	15 A			
V _{RRM}	45 V			
I _{FSM}	210 A			
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
- Trench MOS Schottky technology
- · Low forward voltage drop, low power losses
- High efficiency operation
- 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 2 whisker test

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V15P45S	UNIT	
Device marking code		1545S		
Maximum repetitive peak reverse voltage	V _{RRM}	45	V	
Maximum DC forward current	I _F ⁽¹⁾	15	Α	
	I _F ⁽²⁾	4.8		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	210	А	
Junction temperature in DC forward current without reverse bias, $t \le 1 \text{ h}$	T _J ⁽³⁾	≤ 200	°C	
Operating junction temperature range	T _{OP}	-40 to +150	°C	
Storage temperature range	T _{STG}	-40 to +175	°C	

Notes

- (1) Mounted on 30 mm x 30 mm aluminum 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 CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	I _F = 5.0 A	T _A = 25 °C	- V _F ⁽¹⁾	0.40	-	V	
	I _F = 7.5 A			0.45	-		
	I _F = 15 A			0.49	0.58		
	I _F = 5.0 A	T _A = 125 °C		0.31	-		
	I _F = 7.5 A		T _A = 125 °C	5°C	0.34	-	
	I _F = 15 A			0.42	0.51		
Reverse current	V - 45 V	T _A = 25 °C	I _R ⁽²⁾	-	1500	μΑ	
	$V_R = 45 \text{ V}$ $T_A = 12$	T _A = 125 °C	IR (=)	15	50	mA	

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 V15P45S				
Typical thermal registence	R _{0JA} (1)	75	°C/W	
Typical thermal resistance	R _{0JM} (2)	4		

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 aluminum 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		
V15P45S-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel	
V15P45S-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)

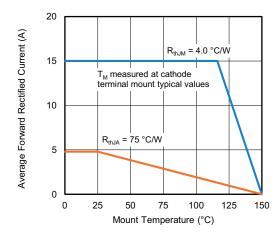


Fig. 1 - Forward Current Derating Curve

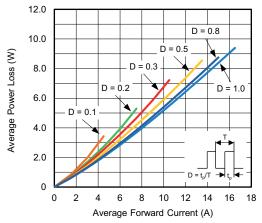


Fig. 2 - Forward Power Loss Characteristics Per Diode

Notes

- (1) Mounted on 30 mm x 30 mm aluminum PCB; T_M measured at the terminal of cathode band ($R_{\theta JM} = 4$ °C/W)
- (2) Free air, mounted on recommended copper pad area ($R_{\theta JA} = 75 \, ^{\circ}\text{C/W}$)

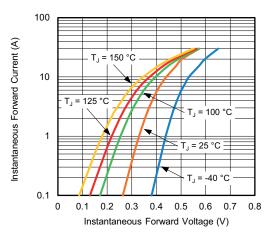


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

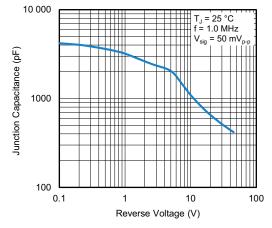


Fig. 5 - Typical Junction Capacitance

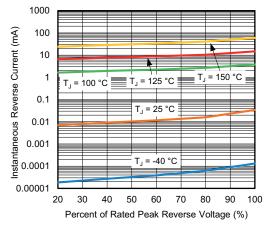


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

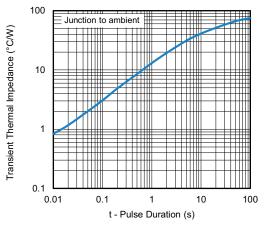
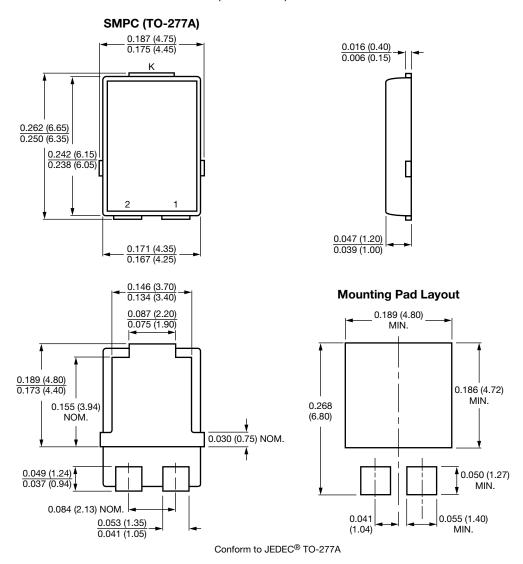


Fig. 6 - Typical Transient Thermal Impedance Per Diode



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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