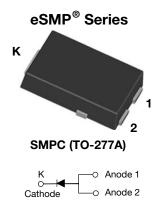
V15P45S-M3

Vishay General Semiconductor

# SMD Photovoltaic Solar Cell Protection TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifiers

Ultra Low  $V_F = 0.31$  V at  $I_F = 5$  A



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## LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	15 A		
V <sub>RRM</sub>	45 V		
I <sub>FSM</sub>	210 A		
V <sub>F</sub> at I <sub>F</sub> = 15 A	0.42 V		
T <sub>J</sub> 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 <u>www.vishay.com/doc?99912</u>

### **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

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V15P45S	UNIT	
Device marking code		1545S		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	45	V	
Maximum DO familiari	I <sub>F</sub> <sup>(1)</sup>	15	— A	
Maximum DC forward current	I <sub>F</sub> <sup>(2)</sup>	4.8		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	210	A	
Junction temperature in DC forward current without reverse bias, t $\leq$ 1 h	$T_{\rm J}^{(3)} \leq 200$		°C	
Operating junction temperature range	T <sub>OP</sub>	-40 to +150	°C	
Storage temperature range	T <sub>STG</sub>	-40 to +175	°C	

#### Notes

<sup>(1)</sup> Mounted on 30 mm x 30 mm aluminum PCB

<sup>(2)</sup> Free air, mounted on recommended copper pad area

<sup>(3)</sup> Meets the requirements of IEC 61215 ed. 2 bypass diode thermal test

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COMPLIAN<sup>®</sup>

HALOGEN

FREE

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<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	TEST CO	NDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 5.0 A	A T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.40	-	- V
	I <sub>F</sub> = 7.5 A			0.45	-	
	I <sub>F</sub> = 15 A			0.49	0.58	
	I <sub>F</sub> = 5.0 A	T <sub>A</sub> = 125 °C		0.31	-	
	I <sub>F</sub> = 7.5 A			0.34	-	
	I <sub>F</sub> = 15 A			0.42	0.51	
Reverse current	V - 45 V	T <sub>A</sub> = 25 °C	1 (2)	-	1500	μA
	$V_{\rm R} = 45 \text{ V}$ $T_{\rm A} = 125 \text{ °C}$	I <sub>R</sub> <sup>(2)</sup>	15	50	mA	

Notes

 $^{(1)}\,$  Pulse test: 300  $\mu s$  pulse width, 1 % duty cycle

<sup>(2)</sup> Pulse test: Pulse width  $\leq$  40 ms

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	V15P45S	UNIT	
Typical thermal resistance	R <sub>0JA</sub> <sup>(1)</sup>	75	- °C/W	
	R <sub>0JM</sub> <sup>(2)</sup>	4		

#### Notes

 $^{(1)}$  Free air, mounted on recommended copper pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient

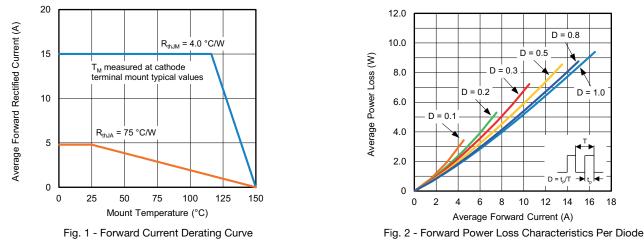
<sup>(2)</sup> Mounted on 30 mm x 30 mm aluminum PCB; thermal resistance  $R_{\theta JM}$  - junction to mount

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<sub>A</sub> = 25 °C unless otherwise noted)



#### Notes

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

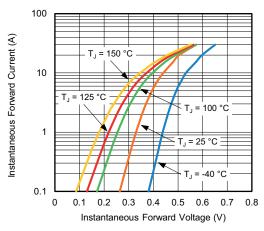


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

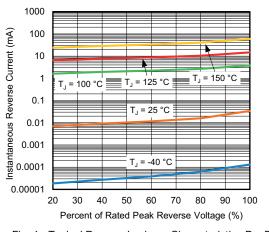


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

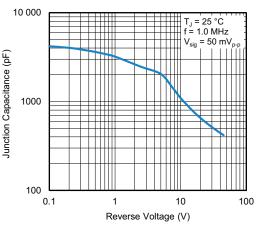


Fig. 5 - Typical Junction Capacitance

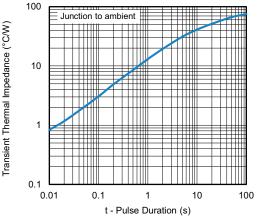


Fig. 6 - Typical Transient Thermal Impedance Per Diode

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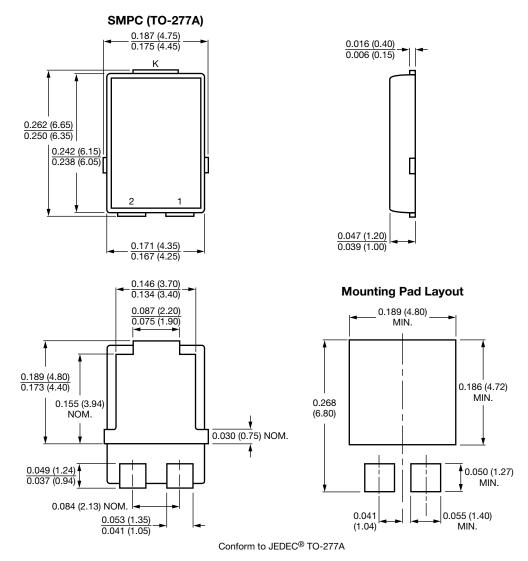
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# PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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