Photovoltaic Solar Cell Protection Schottky Rectifier

Ultra Low V_F = 0.30 V at I_F = 5 A

TMBS®

DO-201AD

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

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: DO-201AD
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - 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

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	45 V
I_{FSM}	200 A
V_F at I_F = 15 A	0.38 V
T_{OP} max. (AC mode)	150 °C
T_J max. (DC forward current)	200 °C
Package	DO-201AD
Diode variations	Single die

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VSB1545S	UNIT
Device marking code		V1545S	
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum DC forward current (fig. 1, 2)	$I_{F(DC)}$ (1)	15	A
	$I_{F(DC)}$ (2)	7.0	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200	A
Operating junction temperature range (AC mode)	T_{OP}	-40 to +150	°C
Junction temperature in DC forward current without reverse bias, t ≤ 1 h	T_J (3)	≤ 200	

Notes

(1) With heatsink
(2) Without heatsink, free air
(3) Meets the requirements of IEC 61215 ed. 2 bypass diode thermal test

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)	0.42	-	V
	I_F = 7.5 A			0.44	-	
	I_F = 15 A			0.48	0.59	
	I_F = 5.0 A	T_A = 125 °C		0.30	-	
	I_F = 7.5 A			0.33	-	
	I_F = 15 A			0.38	0.46	
Reverse current	V_R = 45 V	T_A = 25 °C	I_R (2)	-	1000	µA
		T_A = 125 °C		13.8	30	mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	1995	-	pF

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

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VSB1545S**	**UNIT**
Thermal resistance	$R_{\theta JA}$ (1)	45	°C/W
	$R_{\theta JL}$ (1)	9	
Typical thermal resistance	$R_{\theta JL}$ (2)	4	°C/W

Notes
(1) Without heatsink, free air; units mounted on PCB with 2 mm x 2 mm copper pad areas at 9.5 mm lead length
(2) Leads clipped at 3 mm lead length from plastic body on 7.0 cm x 2.2 cm x 1.9 cm x 2 heatsink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSB1545S-E3/54	1.20	54	1400	13" diameter paper tape and reel
VSB1545S-E3/73	1.20	73	1000	Ammo pack packaging

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

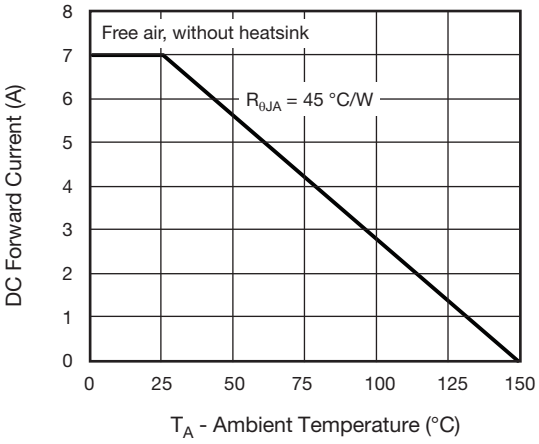


Fig. 1 - Forward Current Derating Curve

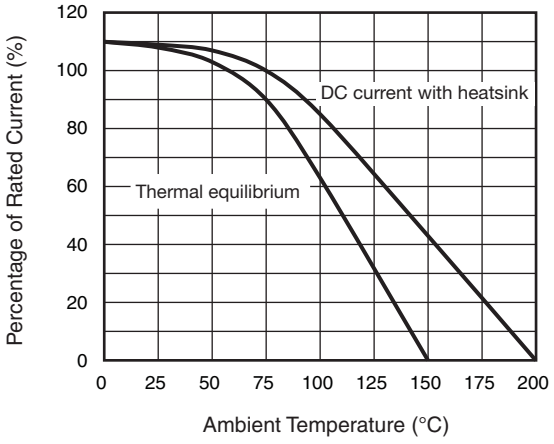


Fig. 2 - Rated Forward Current vs. Ambient Temperature

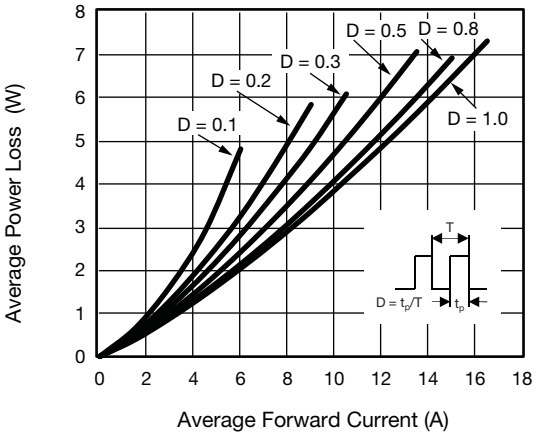


Fig. 3 - Forward Power Loss Characteristics

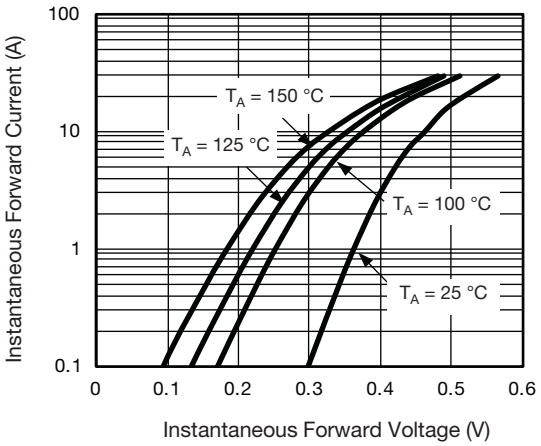


Fig. 4 - Typical Instantaneous Forward Characteristics

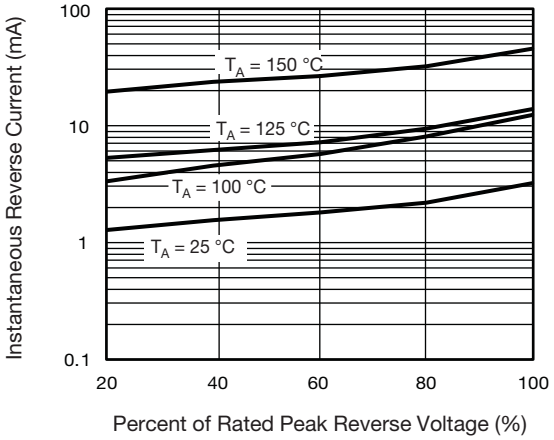


Fig. 5 - Typical Reverse Leakage Characteristics

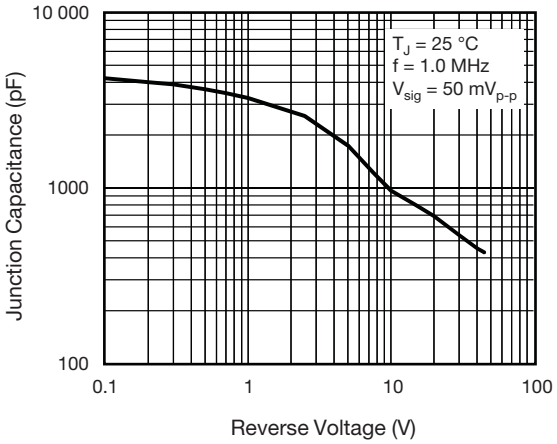
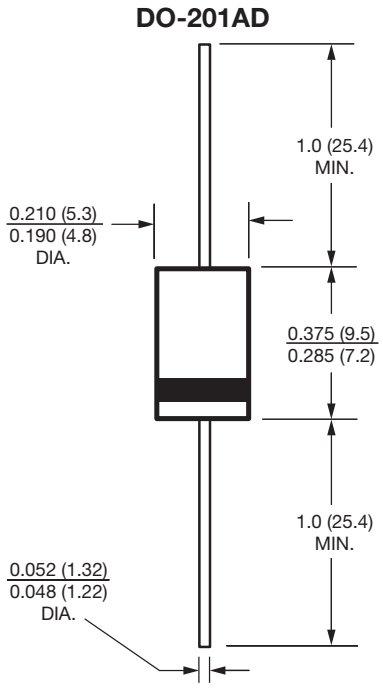


Fig. 6 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



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