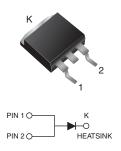


Vishay General Semiconductor

Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low $V_F = 0.33 \text{ V}$ at $I_F = 5 \text{ A}$

TMBS[®] TO-263AB



PRIMARY CHARACTERISTCS			
Package	TO-263AB		
I _{F(DC)}	20 A		
V _{RRM}	45 V		
I _{FSM}	160 A		
V _F at I _F = 20 A	0.51 V		
T _{OP} max. (AC mode)	150 °C		
T _J max. (DC forward current)	200 °C		
Diode variation	Single die		

FEATURES

- 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 245 °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: TO-263AB

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

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VBT2045BP	UNIT	
Maximum repetitive peak reverse voltage	V _{RRM}	45	V	
Maximum DC forward bypassing current (fig. 1)	I _{F(DC)} ⁽¹⁾	20	А	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	160	А	
Operating junction temperature range (AC mode)	T _{OP}	- 40 to + 150	°C	
Junction temperature in DC forward current without reverse bias, $t \le 1 \ h$	T _J ⁽²⁾	≤ 200	°C	

Notes

⁽¹⁾ With heatsink

⁽²⁾ 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 CO	TEST CONDITIONS		TYP.	MAX.	UNIT	
Instantaneous forward voltage	I _F = 5 A		V _F (1)	0.44	-	V	
	I _F = 10 A	T _A = 25 °C		0.49	-		
	I _F = 20 A			0.57	0.66		
	I _F = 5 A	T _A = 125 °C		0.33	-		
	I _F = 10 A			0.41	-		
	I _F = 20 A			0.51	0.63		
Reverse current	V _R = 45 V	T _A = 25 °C	I _R ⁽²⁾	-	2000	μΑ	
	v _R = 45 v	T _A = 125 °C		10	30	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	VBT2045BP	UNIT	
Typical thermal resistance	$R_{ heta JC}$	1.5	°C/W	

ORDERING INFORMATION (Example)						
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
TO-263AB	VBT2045BP-M3/4W	1.37	4W	50/tube	Tube	
TO-263AB	VBT2045BP-M3/8W	1.37	8W	800/reel	Tape and reel	

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

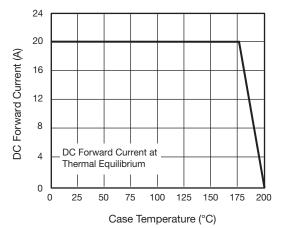


Fig. 1 - Maximum Forward Current Derating Curve

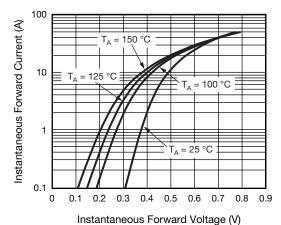
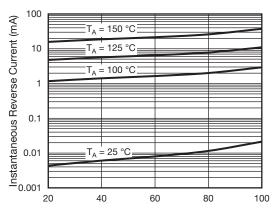


Fig. 2 - Typical Instantaneous Forward Characteristics



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Percent of Rated Peak Reverse Voltage (%)

Fig. 3 - Typical Reverse Characteristics

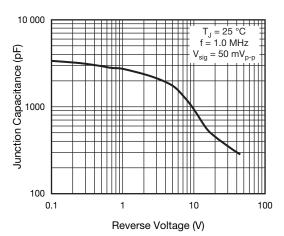


Fig. 4 - Typical Junction Capacitance

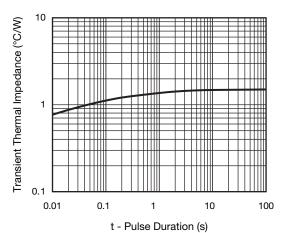
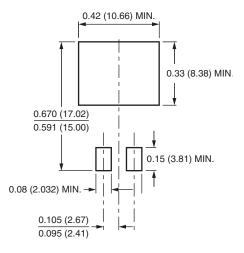


Fig. 5 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AB 0.411 (10.45) 0.190 (4.83) 0.380 (9.65) 0.055 (1.40) 0.160 (4.06) 0.045 (1.14) 0.245 (6.22) MIN. 0.055 (1.40) 0.360 (9.14) 0.047 (1.19) 0.320 (8.13) 0.624 (15.85) 0.591 (15.00) -0 to 0.01 (0 to 0.254) 0.110 (2.79) 0.090 (2.29) 0.037 (0.940) 0.021 (0.53) 0.027 (0.686) 0.014 (0.36) 0.105 (2.67) 0.140 (3.56) 0.095 (2.41) 0.205 (5.20) 0.110 (2.79) 0.195 (4.95)

Mounting Pad Layout





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