VFT1045BP

Vishay General Semiconductor

Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low $V_F = 0.41$ V at $I_F = 5$ A



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PRIMARY CHARACTERISTICS					
I _{F(DC)}	10 A				
V _{RRM}	45 V				
I _{FSM}	100 A				
V_F at $I_F = 10$ A	0.52 V				
T _{OP} max. (AC mode)	150 °C				
T _J max. (DC forward current)	200 °C				
Package	ITO-220AC				
Circuit configuration	Single				

FEATURES

- Trench MOS Schottky technology
- · Low forward voltage drop, low power losses
- High efficiency operation



HALOGEN

FREE

- Solder bath temperature 275 °C max. 10 s, per JESD 22-B106
- 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: ITO-220AC

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 ($T_A = 25 \text{ °C}$ unless otherwise noted)					
PARAMETER	SYMBOL	VFT1045BP	UNIT		
Maximum repetitive peak reverse voltage	V _{RRM}	45	V		
Maximum DC forward bypassing current (fig. 1)	I _{F(DC)} ⁽¹⁾	10	А		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	100	А		
Operating junction temperature range (AC mode)	T _{OP}	-40 to +150	°C		
Isolation voltage from termal to heatsink t = 1 min	V _{AC}	1500	V		
Junction temperature in DC forward current without reverse bias, $t \leq 1 \ h$	T _J ⁽²⁾	≤ 200	°C		

Notes

(1) With heatsink

⁽²⁾ Meets the requirements of IEC 61215 ed. 2 bypass diode thermal test

ELECTRICAL CHARACTERISTICS ($T_A = 25$ °C unless otherwise noted)							
PARAMETER	TEST CO	TEST CONDITIONS		TYP.	MAX.	UNIT	
Instantaneous forward voltage	I _F = 5 A	T _A = 25 °C	VF ⁽¹⁾	0.50	-	V	
	I _F = 10 A			0.57	0.68		
	I _F = 5 A	T _A = 125 °C		0.41	-		
	I _F = 10 A			0.52	0.64		
Reverse current	V _B = 45 V	T _A = 25 °C	I _R ⁽²⁾	-	500	μA	
	v _R = 45 V	T _A = 125 °C		5	15	mA	

Notes

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

⁽²⁾ Pulse test: Pulse width \leq 40 ms

Revision: 19-Mar-18

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For technical questions within your region: <u>DiodesAmericas@vishay.com</u>, <u>DiodesAsia@vishay.com</u>, <u>DiodesEurope@vishay.com</u> THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT <u>www.vishay.com/doc?91000</u>

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THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL VFT1045BP			
Typical thermal resistance	$R_{ ext{ heta}JC}$	5.5	°C/W	

ORDERING INFORMATION (Example)						
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
ITO-220AC	VFT1045BP-M3/4W	1.75	4W	50/tube	Tube	

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

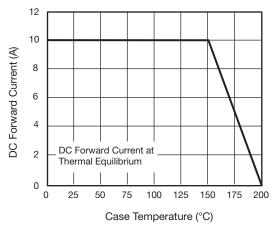
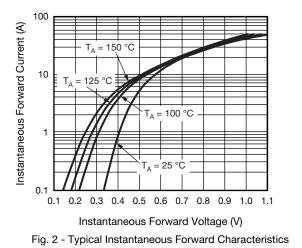
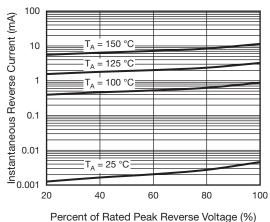
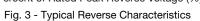
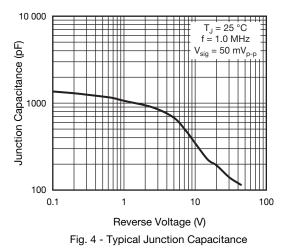


Fig. 1 - Maximum Forward Current Derating Curve













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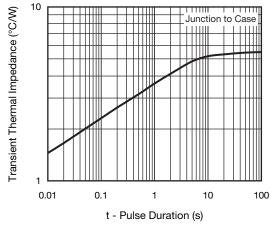
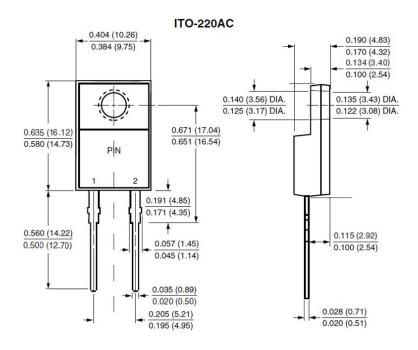


Fig. 5 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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Revision: 01-Jan-2025

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