VFT4045BP

Vishay General Semiconductor

Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low $V_F = 0.28$ V at $I_F = 5$ A



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FEATURES

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



FREE

- Solder bath temperature 275 °C max. 10 s, per JESD 22-B106
- 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: 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 °C unless otherwise noted)					
PARAMETER		VFT4045BP	UNIT		
Maximum repetitive peak reverse voltage	V _{RRM}	45	V		
Maximum DC forward bypassing current (fig. 1)	I _{F(DC)} ⁽¹⁾	40	A		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	240	A		
Operating junction temperature range (AC mode)	T _{OP}	-40 to +150	°C		
Isolation voltage from thermal 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 CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	I _F = 5 A	T _A = 25 °C	V _F ⁽¹⁾	0.41	-	V	
	I _F = 20 A			0.50	-		
	I _F = 40 A			0.57	0.67		
	I _F = 5 A	T _A = 125 °C		0.28	-		
	I _F = 20 A			0.41	-		
	I _F = 40 A			0.51	0.63		
Reverse current	V _B = 45 V	T _A = 25 °C	I _R ⁽²⁾	-	3000	μA	
	v _R = 45 v	T _A = 125 °C		29	85	mA	

Notes

⁽¹⁾ Pulse test: 300 µs pulse width, 1 % duty cycle

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

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40 A

45 V

240 A

0.51 V

150 °C

200 °C

ITO-220AC

Single

PIN 2 0

PIN 1 O-

PRIMARY CHARACTERISTICS

IF(DC)

V_{RRM}

I_{FSM}

 V_F at $I_F = 40 A$

T_{OP} max. (AC mode)

T_{.1} max. (DC forward current)

Package

Circuit configuration



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THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	OL VFT4045BP		
Typical thermal resistance	$R_{ ext{ heta}JC}$	4.0	°C/W	

ORDERING INFORMATION (Example)						
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
ITO-220AC	VFT4045BP-M3/4W	1.75	4W	50/tube	Tube	

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

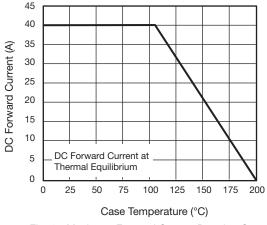


Fig. 1 - Maximum Forward Current Derating Curve

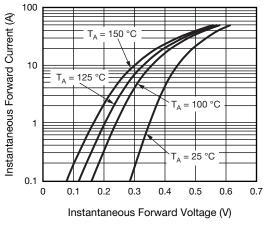
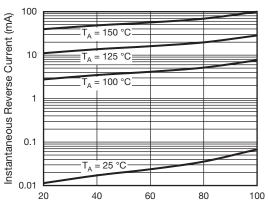


Fig. 2 - Typical Instantaneous Forward Characteristics



Percent of Rated Peak Reverse Voltage (%)



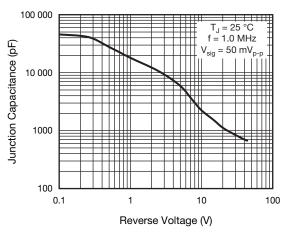
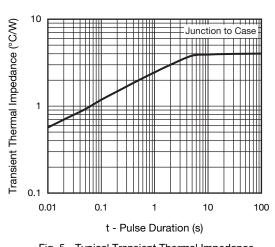


Fig. 4 - Typical Junction Capacitance

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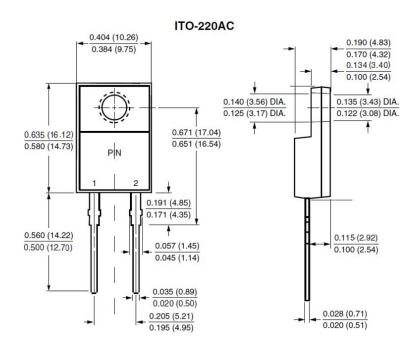


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Fig. 5 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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