

Vishay General Semiconductor

Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low $V_F = 0.30 \text{ V}$ at $I_F = 5 \text{ A}$



FEATURES	5
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- Trench MOS Schottky technology
- · Low forward voltage drop, low power losses

· High efficiency operation

• Solder bath temperature 275 °C max. 10 s, per JESD 22-B106

- Compliant to RoHS Directive 2011/65/EU
- Halogen-free according to IEC 61249-2-21 definition

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

PRIMARY CHARACTERISTICS			
I _{F(DC)}	30 A		
V_{RRM}	45 V		
I _{FSM}	200 A		
V_F at $I_F = 30 \text{ A}$	0.51 V		
T _{OP} max. (AC mode)	150 °C		
T _J max. (DC forward current)	200 °C		

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VFT3045BP	UNIT	
Maximum repetitive peak reverse voltage	V _{RRM}	45	V	
Maximum DC forward bypassing current (fig. 1)	I _{F(DC)} (1)	30	А	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	200	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, $t \le 1\ h$	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	ONDITIONS	SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	I _F = 5 A	T _A = 25 °C		0.42	-		
	I _F = 15 A		T _A = 25 °C		0.49	-	1
	I _F = 30 A		V _E (1)	0.58	0.70	V	
	I _F = 5 A	T _A = 125 °C	V _F ('')	0.30	-	ľ	
	I _F = 15 A		T _A = 125 °C		0.40	-	I
	I _F = 30 A			0.51	0.60	ļ	
Reverse current	V _R = 45 V	T _A = 25 °C	I _R ⁽²⁾	=	2000	μΑ	
	v _R = 45 v	T _A = 125 °C	IR (=)	19	60	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 VFT3045BP			
Typical thermal resistance	$R_{\theta JC}$	4.2	°C/W	

ORDERING INFORMATION (Example)						
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
ITO-220AC	VFT3045BP-M3/4W	1.75	4W	50/tube	Tube	

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

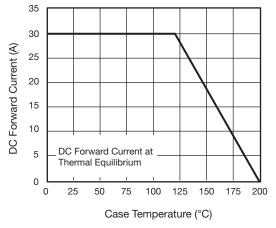


Fig. 1 - Maximum Forward Current Derating Curve

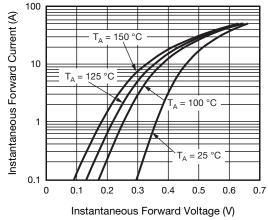
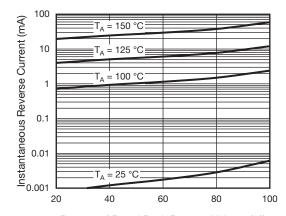


Fig. 2 - Typical Instantaneous Forward Characteristics



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Percent of Rated Peak Reverse Voltage (%) Fig. 3 - Typical Reverse Characteristics

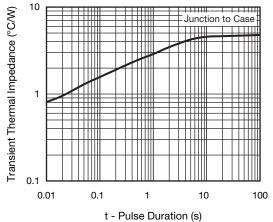


Fig. 5 - Typical Transient Thermal Impedance

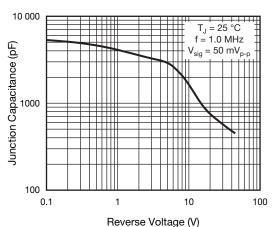
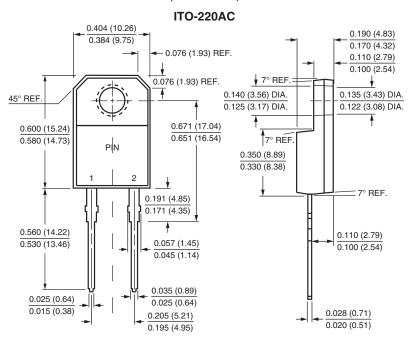


Fig. 4 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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