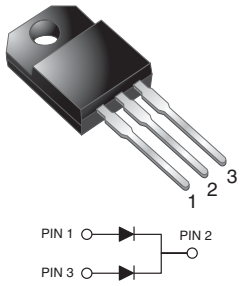
Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low V_F = 0.33 V at I_F = 5.0 A

TMBS®

ITO-220AB



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- T_J 200 °C max. in solar bypass mode application
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT HALOGEN FREE

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-220AB
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	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	45 V
I_{FSM}	160 A
V_F at I_F = 10 A	0.41 V
T_{OP} max. (AC mode)	150 °C
T_J max. (DC forward current)	200 °C
Package	ITO-220AB
Circuit configuration	Common cathode

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

PARAMETER		SYMBOL	VFT2045CBP	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	45	V
Maximum average forward rectified current (fig. 1)	per device	$I_{F(AV)}$ (1)	20	A
	per diode		10	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	160	A
Isolation voltage from terminal to heatsink, t = 1 min		V_{AC}	1500	V
Operating junction and storage temperature range (AC mode)		T_{OP}, T_{STG}	-40 to +150	°C
Junction temperature in DC forward current without reverse bias, t ≤ 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 per diode	I_F = 5 A	T_A = 25 °C	V_F (1)	0.44	-	V
	I_F = 10 A			0.49	0.58	
	I_F = 5 A	T_A = 125 °C		0.33	-	
	I_F = 10 A			0.41	0.52	
Reverse current per diode	V_R = 45 V	T_A = 25 °C	I_R (2)	-	2000	µA
		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

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THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER		SYMBOL	VFT2045CBP	UNIT
Typical thermal resistance	per diode	$R_{\theta JC}$	6.0	°C/W
	per device		4.5	

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ITO-220AB	VFT2045CBP-M3/4W	1.76	4W	50/tube	Tube

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

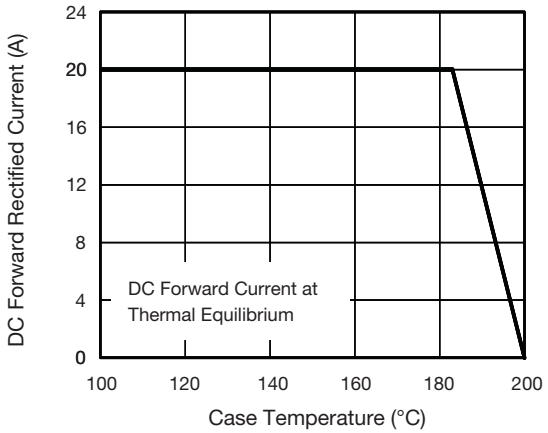

Fig. 1 - Maximum Forward Current Derating Curve

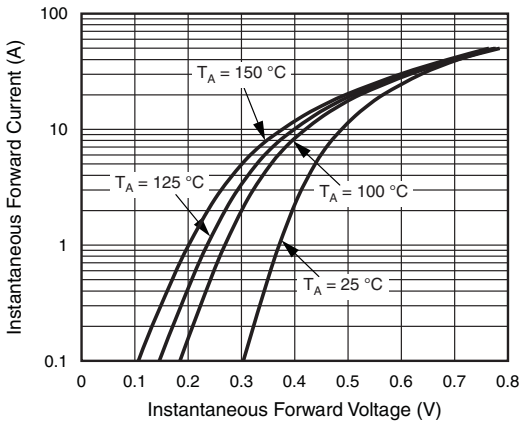

Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

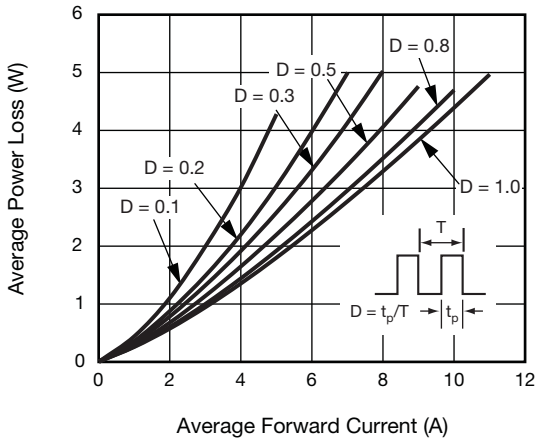

Fig. 2 - Forward Power Loss Characteristics Per Diode

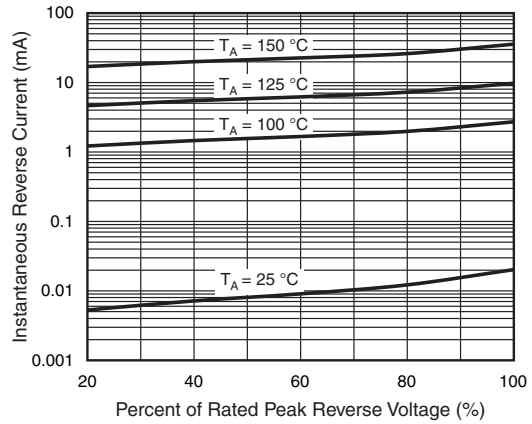

Fig. 4 - Typical Reverse Characteristics Per Diode

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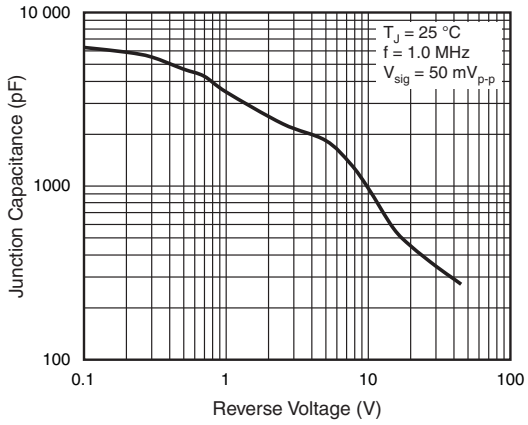


Fig. 5 - Typical Junction Capacitance Per Diode

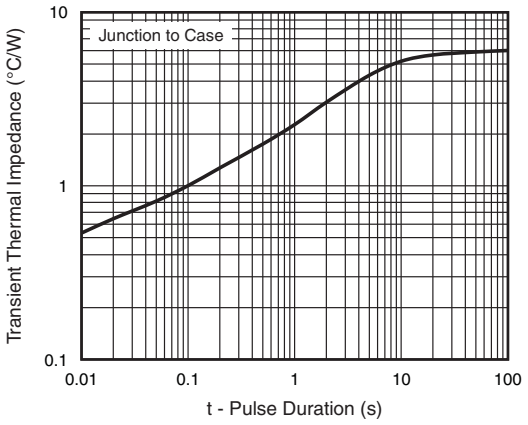
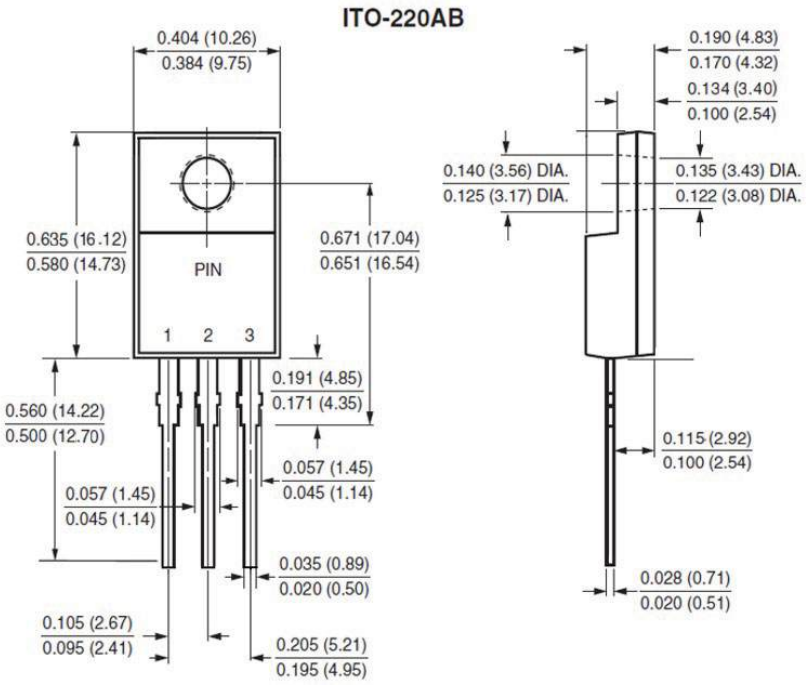


Fig. 6 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



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