

## Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low  $V_F$  = 0.33 V at  $I_F$  = 10 A



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 30 A
$V_{RRM}$	45 V
$I_{FSM}$	320 A
$V_F$ at $I_F$ = 30 A	0.47 V
$T_{OP}$ max. (AC mode)	150 °C
$T_J$ max. (DC forward current)	200 °C
Package	ITO-220AB
Circuit configuration	Common cathode

### 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](http://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

MAXIMUM RATINGS ( $T_A$ = 25 °C unless otherwise noted)				
PARAMETER		SYMBOL	VFT6045CBP	UNIT
Maximum repetitive peak reverse voltage		$V_{RRM}$	45	V
Maximum average forward rectified current (fig. 1)	per device	$I_{F(AV)}$ (1)	60	A
	per diode		30	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		$I_{FSM}$	320	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, $t \leq 1$ 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 per diode	$I_F$ = 10 A	$T_A$ = 25 °C	0.44	-	V
	$I_F$ = 15 A		0.47	-	
	$I_F$ = 30 A		0.54	0.64	
	$I_F$ = 10 A	$T_A$ = 125 °C	0.33	-	
	$I_F$ = 15 A		0.37	-	
	$I_F$ = 30 A		0.47	0.56	
Reverse current per diode	$V_R$ = 45 V	$T_A$ = 25 °C	-	3000	µA
		$T_A$ = 125 °C	18	50	mA

#### Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

**THERMAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

PARAMETER	SYMBOL	VFT6045CBP	UNIT
Typical thermal resistance	per diode	5.0	°C/W
	per device	3.5	

**ORDERING INFORMATION** (Example)

PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ITO-220AB	VFT6045CBP-M3/4W	1.76	4W	50/tube	Tube

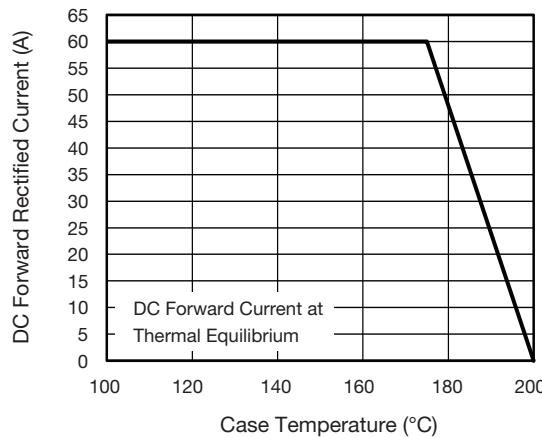
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

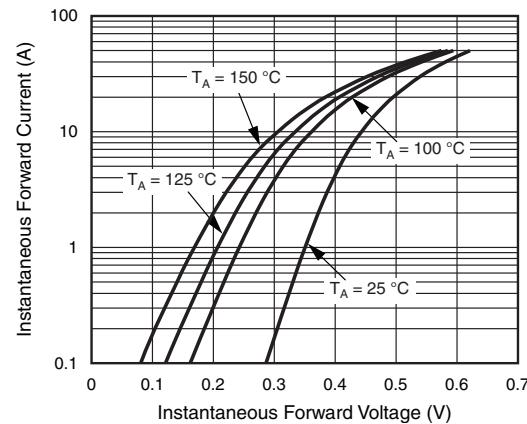


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

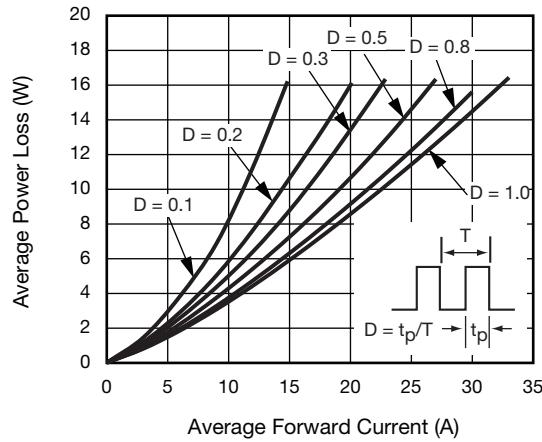


Fig. 2 - Forward Power Loss Characteristics Per Diode

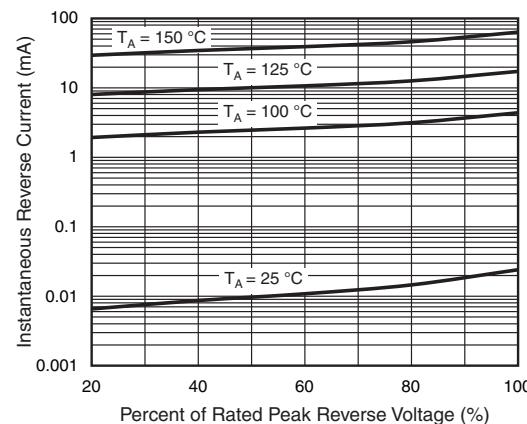


Fig. 4 - Typical Reverse Characteristics Per Diode

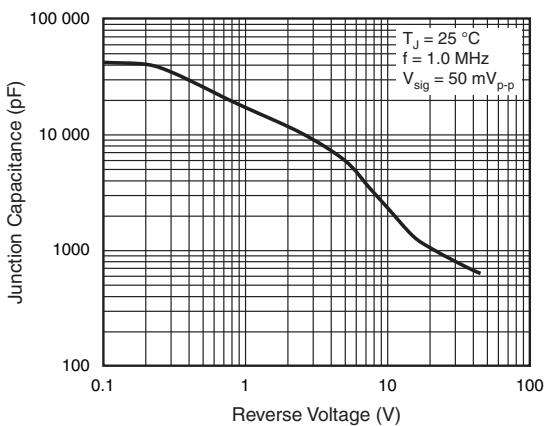


Fig. 5 - Typical Junction Capacitance Per Diode

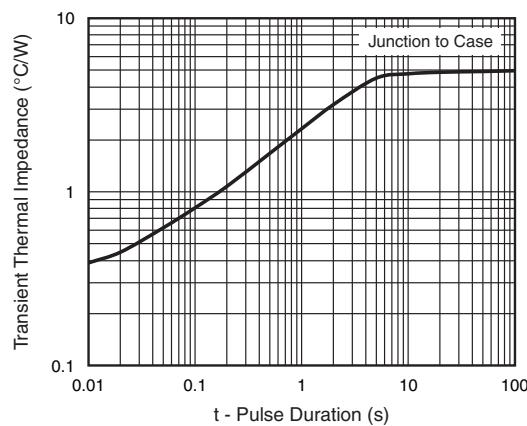
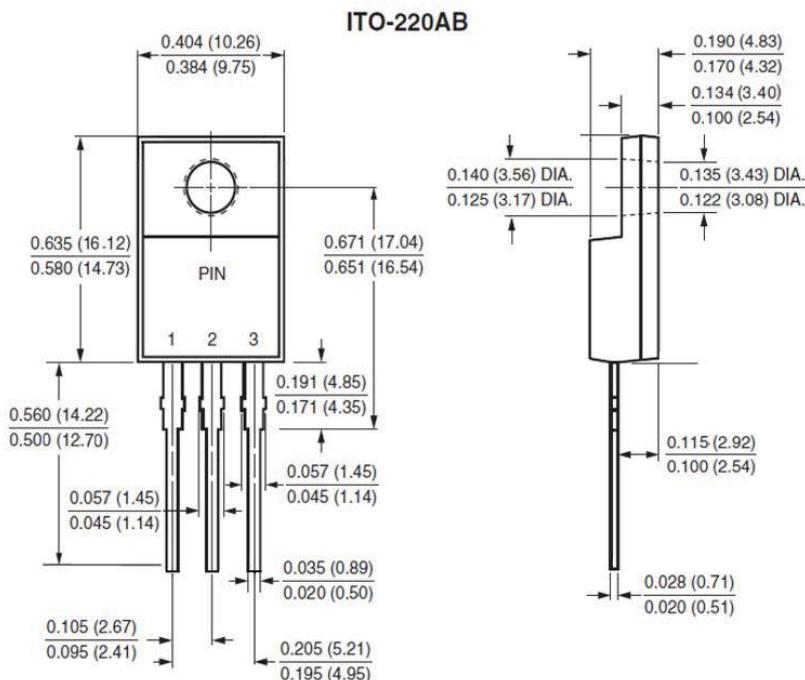


Fig. 6 - Typical Transient Thermal Impedance Per Diode

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)



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