

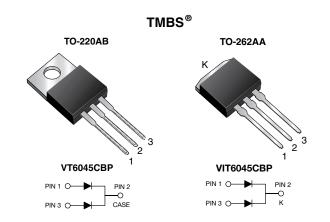
Vishay General Semiconductor

HALOGEN

FREE

Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low $V_F = 0.33 \text{ V}$ at $I_F = 10 \text{ A}$



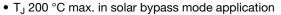
PRIMARY CHARACTERISTICS					
I _{F(AV)}	2 x 30 A				
V _{RRM}	45 V				
I _{FSM} 320 A					
V _F at I _F = 30 A	0.47 V				
T _{OP} max. (AC mode)	150 °C				
T _J max. (DC forward current)	200 °C				
Package	TO-220AB, TO-262AA				
Diode variation	Dual common cathode				

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



 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: TO-220AB, TO-262AA

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	VT6045CBP	VIT6045CBP	UNIT	
Maximum repetitive peak reverse voltage		V_{RRM}	45		V	
Maximum average forward rectified current (fig. 1)	per device	. (1)	60		А	
	per diode	I _{F(AV)} ⁽¹⁾	30			
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I _{FSM}	320		А	
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, $t \le 1$ h		T _J ⁽²⁾	≤ 2	200	°C	

Notes

- (1) With heatsink
- (2) Meets the requirements of IEC 61215 ed. 2 bypass diode thermal test

VT6045CBP, VIT6045CBP

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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	- V _F ⁽¹⁾	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 AF V	T _A = 25 °C	I _R ⁽²⁾	-	3000	μΑ
	$V_R = 45 \text{ V}$ T_A	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 °C unless otherwise noted)					
PARAMETER		SYMBOL	VT6045CBP	VIT6045CBP	UNIT
Typical thermal resistance	per diode	$R_{ heta JC}$	1.5		°C/W
	per device		0.8		

ORDERING INFORMATION (Example)							
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
TO-220AB	VT6045CBP-M3/4W	1.89	4W	50/tube	Tube		
TO-262AA	VIT6045CBP-M3/4W	1.45	4W	50/tube	Tube		

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

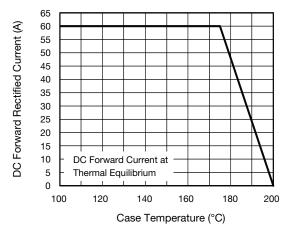


Fig. 1 - Maximum Forward Current Derating Curve

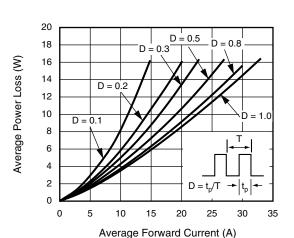


Fig. 2 - Forward Power Loss Characteristics Per Diode

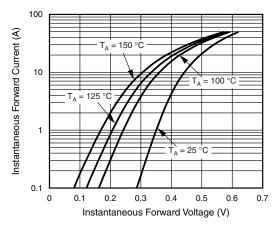


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

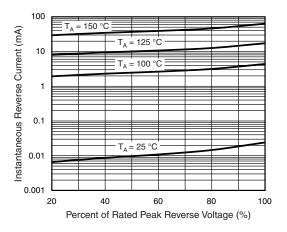


Fig. 4 - Typical Reverse Characteristics Per Diode

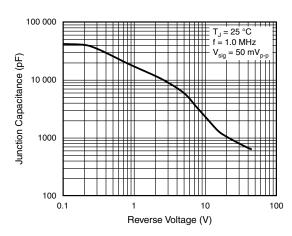


Fig. 5 - Typical Junction Capacitance Per Diode

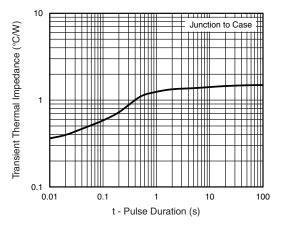


Fig. 6 - Typical Transient Thermal Impedance Per Diode

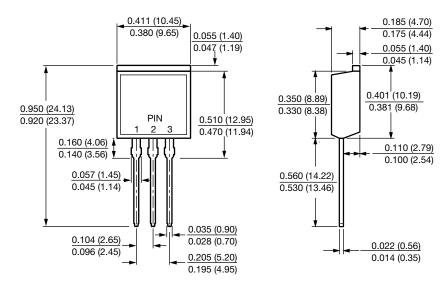


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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB 0.415 (10.54) 0.380 (9.65) 0.185 (4.70) 0.161 (4.08) 0.139 (3.53) 0.175 (4.44) 0.055 (1.39) 0.113 (2.87) 0.045 (1.14) 0.103 (2.62) 0.603 (15.32) 0.635 (16.13) 0.573 (14.55) 0.625 (15.87) PIN 0.350 (8.89) 2 0.330 (8.38) 1.148 (29.16) 0.160 (4.06) 0.140 (3.56) 1.118 (28.40) 0.110 (2.79) 0.100 (2.54) 0.057 (1.45) 0.045 (1.14) 0.560 (14.22) 0.530 (13.46) 0.035 (0.90) 0.028 (0.70) 0.104 (2.65) 0.022 (0.56) 0.096 (2.45) 0.205 (5.20) 0.014 (0.36) 0.195 (4.95)

TO-262AA



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