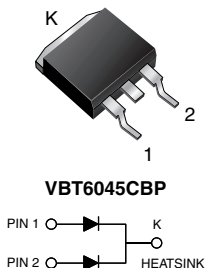


# Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

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

TMBS®  
D<sup>2</sup>PAK (TO-263AB)



VBT6045CBP

PIN 1  
PIN 2  
K  
HEATSINK

## LINKS TO ADDITIONAL RESOURCES



3D Models

## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2 x 30 A
$V_{RRM}$	45 V
$I_{FSM}$	320 A
$V_F$ at $I_F = 30\text{ A}$	0.47 V
$T_{OP\text{ max.}}$ (AC mode)	150 °C
$T_J\text{ max.}$ (DC forward current)	200 °C
Package	D <sup>2</sup> PAK (TO-263AB)
Circuit configuration	Common cathode

## FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- $T_J$  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

## 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:** D<sup>2</sup>PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS-compliant, commercial grade

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test

**Polarity:** as marked

**Mounting Torque:** 10 in-lbs maximum

## MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)

PARAMETER	SYMBOL	VB T6045CBP	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	45	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$ <sup>(1)</sup>	60	A
		30	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	320	A
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, $t \leq 1\text{ h}$	$T_J$ <sup>(2)</sup>	$\leq 200$	°C

### Notes

<sup>(1)</sup> With heatsink

<sup>(2)</sup> Meets the requirements of IEC 61215 ed. 2 bypass diode thermal test

ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I <sub>F</sub> = 10 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.44	-	V
	I <sub>F</sub> = 15 A			0.47	-	
	I <sub>F</sub> = 30 A			0.54	0.64	
	I <sub>F</sub> = 10 A	T <sub>A</sub> = 125 °C		0.33	-	
	I <sub>F</sub> = 15 A			0.37	-	
	I <sub>F</sub> = 30 A			0.47	0.56	
	Reverse current per diode	V <sub>R</sub> = 45 V		T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	
T <sub>A</sub> = 125 °C			18	50		mA

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER		SYMBOL	VB T6045CBP	UNIT
Typical thermal resistance	per diode	R <sub>θJC</sub>	1.5	°C/W
	per device		0.8	

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
D <sup>2</sup> PAK (TO-263AB)	VB T6045CBP-E3/4W	1.38	4W	50/tube	Tube
D <sup>2</sup> PAK (TO-263AB)	VB T6045CBP-E3/8W	1.38	8W	800/reel	Tape and reel

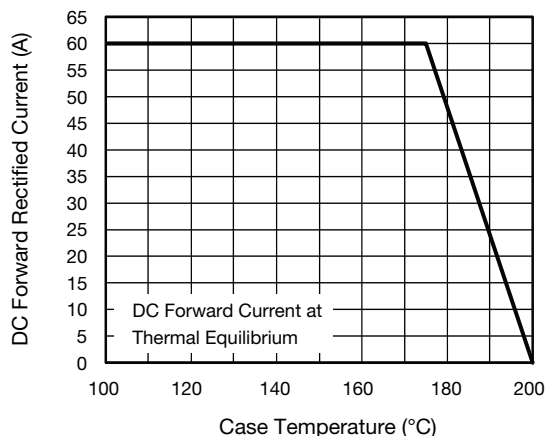
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

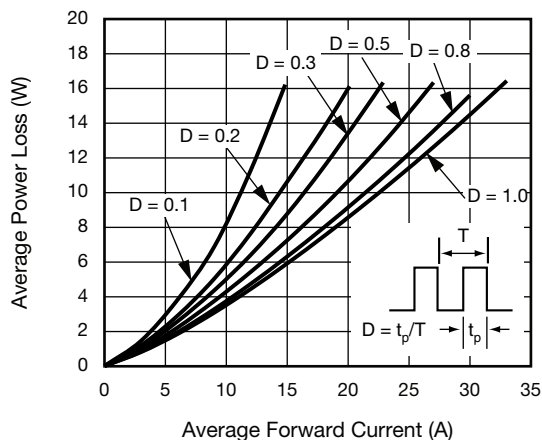


Fig. 2 - Forward Power Loss Characteristics Per Diode

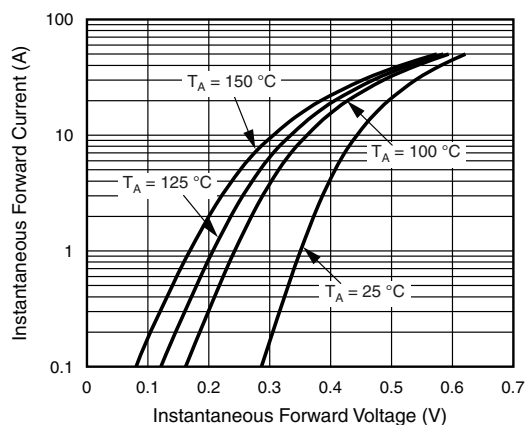


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

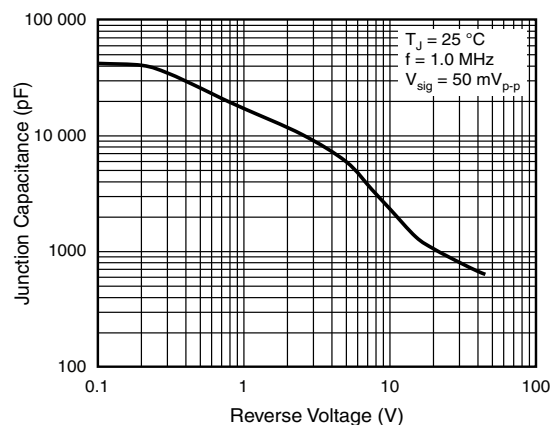


Fig. 5 - Typical Junction Capacitance Per Diode

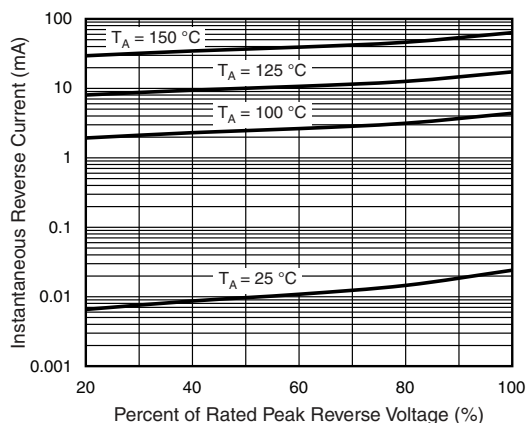


Fig. 4 - Typical Reverse Characteristics Per Diode

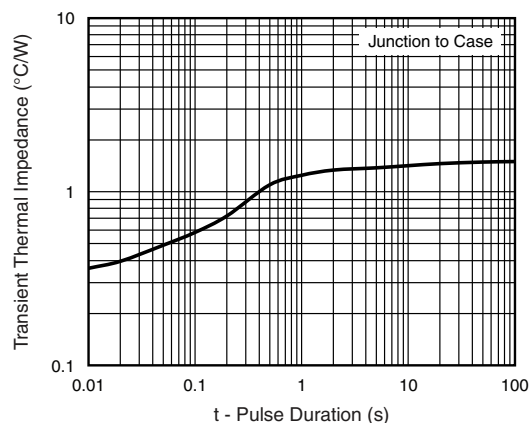
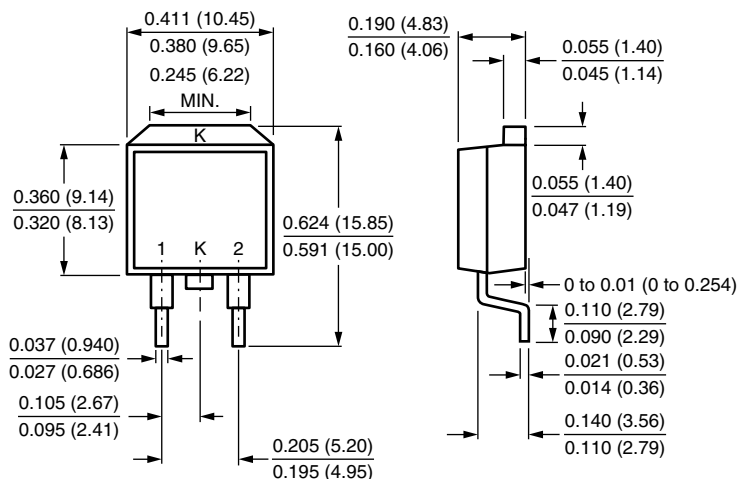


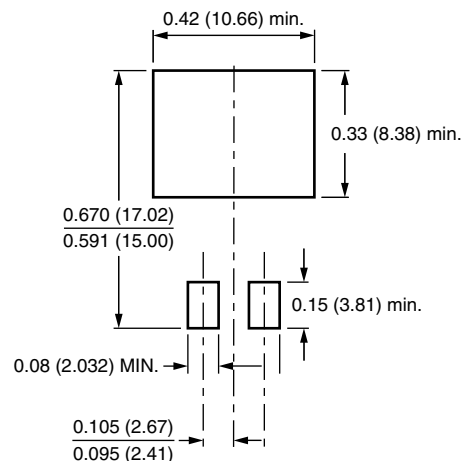
Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

## D<sup>2</sup>PAK (TO-263AB)



## Mounting Pad Layout





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