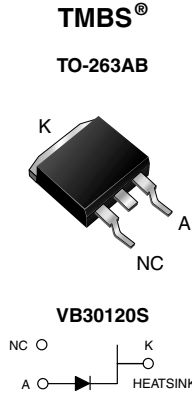


# High-Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.43 \text{ V}$  at  $I_F = 5 \text{ A}$ 


## 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
- 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 high frequency converters, switching power supplies, freewheeling diodes, OR-ing diode, DC/DC converters, and reverse battery protection.

## MECHANICAL DATA

**Case:** TO-263AB

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	
Package	TO-263AB
$I_{F(AV)}$	30 A
$V_{RRM}$	120 V
$I_{FSM}$	300 A
$V_F$ at $I_F = 30 \text{ A}$	0.74 V
$T_J$ max.	150 °C
Diode variation	Single die

MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VB30120S	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	30	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	300	
Voltage rate of change (rated $V_R$ )	$dV/dt$	10 000	
Operating junction and storage temperature range	$T_J, T_{STG}$	- 40 to + 150	°C

ELECTRICAL CHARACTERISTICS ( $T_A = 25 \text{ °C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage per diode <sup>(1)</sup>	$I_F = 5 \text{ A}$	$T_A = 25 \text{ °C}$	$V_F$	0.50	-	V	
				$I_F = 15 \text{ A}$	0.70		-
				$I_F = 30 \text{ A}$	0.99		1.10
	$I_F = 5 \text{ A}$	$T_A = 125 \text{ °C}$		0.43	-		
				$I_F = 15 \text{ A}$	0.60		-
				$I_F = 30 \text{ A}$	0.74		0.82
Reverse current per diode <sup>(2)</sup>	$V_R = 90 \text{ V}$	$T_A = 25 \text{ °C}$	$I_R$	18	-	$\mu\text{A}$	
		$T_A = 125 \text{ °C}$		12	-	$\text{mA}$	
	$V_R = 120 \text{ V}$	$T_A = 25 \text{ °C}$		-	500	$\mu\text{A}$	
		$T_A = 125 \text{ °C}$		22	35	$\text{mA}$	

### Notes

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

<sup>(2)</sup> Pulse test: Pulse width  $\leq 40 \text{ ms}$



<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VB30120S	UNIT
Typical thermal resistance per diode	$R_{\theta JC}$	1.6	$^\circ\text{C/W}$

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-263AB	VB30120S-M3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB30120S-M3/8W	1.39	8W	800/reel	Tape and reel

**RATINGS AND CHARACTERISTICS CURVES**

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

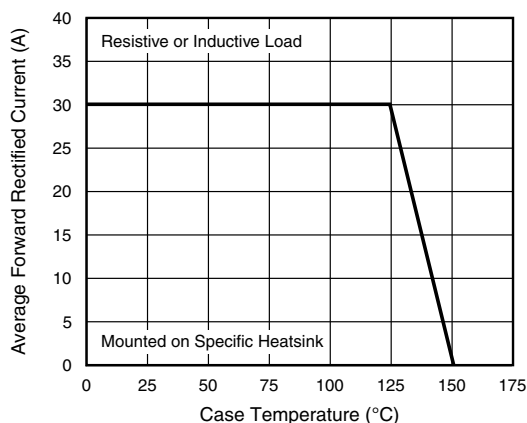


Fig. 1 - Forward Current Derating Curve

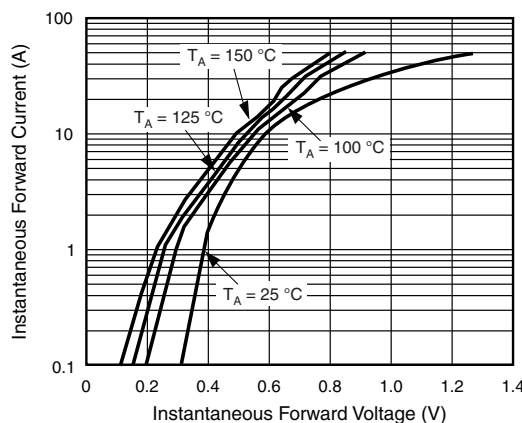


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

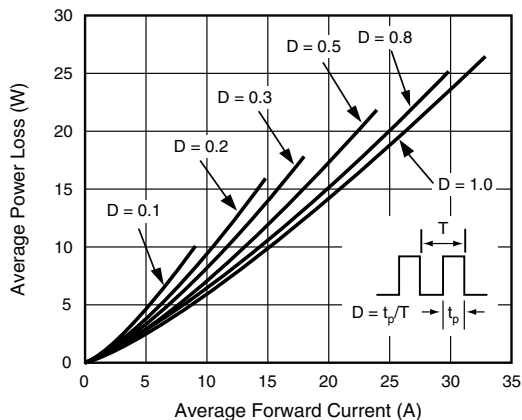


Fig. 2 - Forward Power Loss Characteristics Per Diode

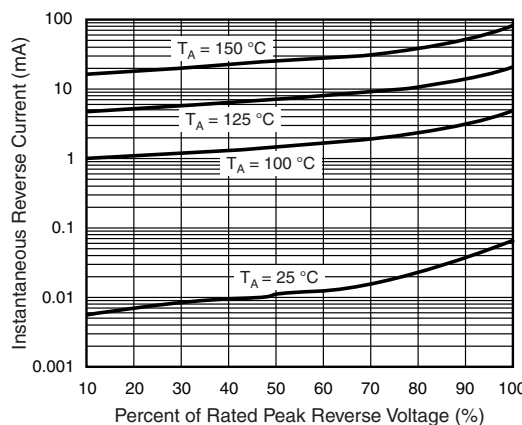


Fig. 4 - Typical Reverse Characteristics Per Diode

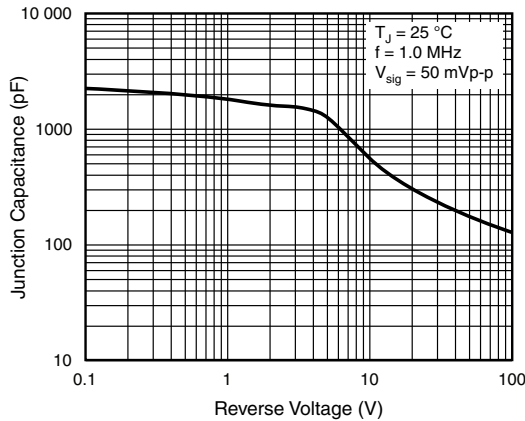


Fig. 5 - Typical Junction Capacitance Per Diode

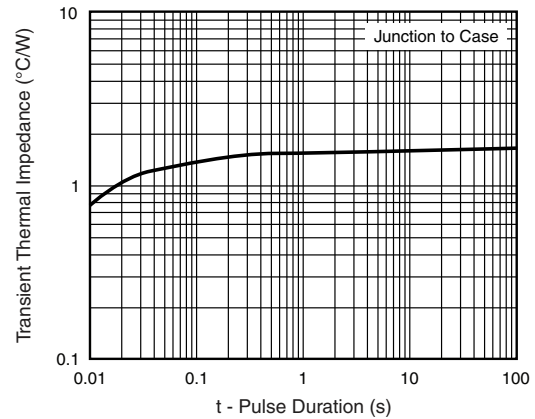
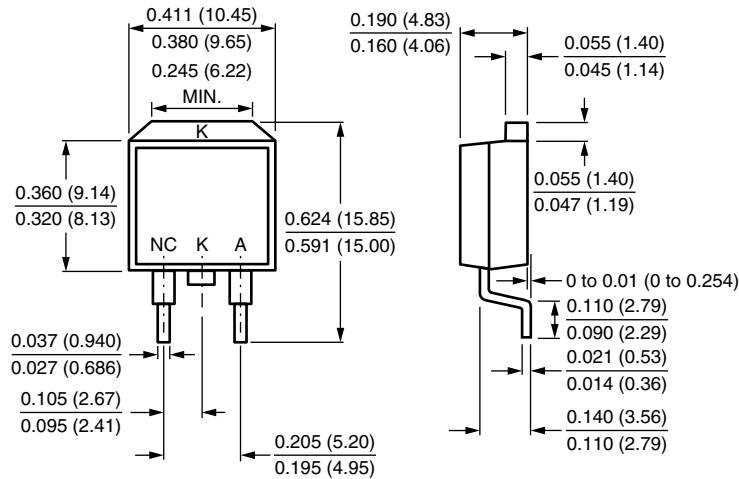


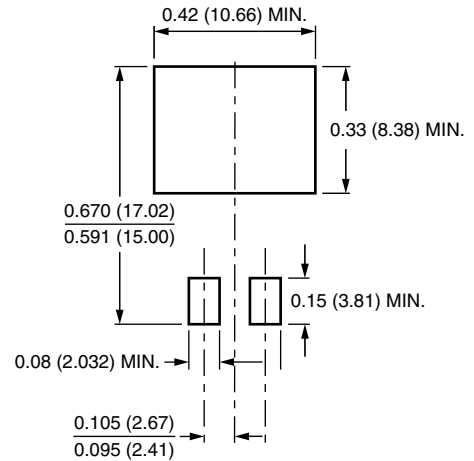
Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

**TO-263AB**



**Mounting Pad Layout**





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