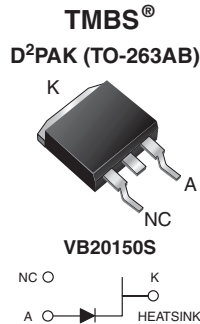


# High-Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.55\text{ V}$  at  $I_F = 5.0\text{ A}$ 


## 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:** D<sup>2</sup>PAK (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

## DESIGN SUPPORT TOOLS

[click logo to get started](#)


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
$V_{RRM}$	150 V
$I_{FSM}$	160 A
$V_F$ at $I_F = 20\text{ A}$	0.75 V
$T_J$ max.	150 °C
Package	D <sup>2</sup> PAK (TO-263AB)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VB20150S	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	150	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	20	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	160	A
Voltage rate of change (rated $V_R$ )	dV/dt	10 000	V/ $\mu$ s
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 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>	$I_F = 5.0\text{ A}$ $I_F = 10\text{ A}$ $I_F = 20\text{ A}$ $T_A = 25\text{ °C}$	$V_F$	0.69	-	V
			0.84	-	
			1.15	1.43	
	$I_F = 5.0\text{ A}$ $I_F = 10\text{ A}$ $I_F = 20\text{ A}$ $T_A = 125\text{ °C}$		0.55	-	
			0.64	-	
			0.75	0.82	
Reverse current per diode <sup>(2)</sup>	$V_R = 100\text{ V}$ $T_A = 25\text{ °C}$ $T_A = 125\text{ °C}$	$I_R$	2	-	$\mu$ A
			2.5	-	mA
	$V_R = 150\text{ V}$ $T_A = 25\text{ °C}$ $T_A = 125\text{ °C}$		-	250	$\mu$ A
			5	25	mA

### Notes

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

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VB20150S	UNIT
Typical thermal resistance	$R_{\theta JC}$	2.0	$^\circ\text{C/W}$

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-263AB	VB20150S-M3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB20150S-M3/8W	1.39	8W	800/reel	Tape and reel

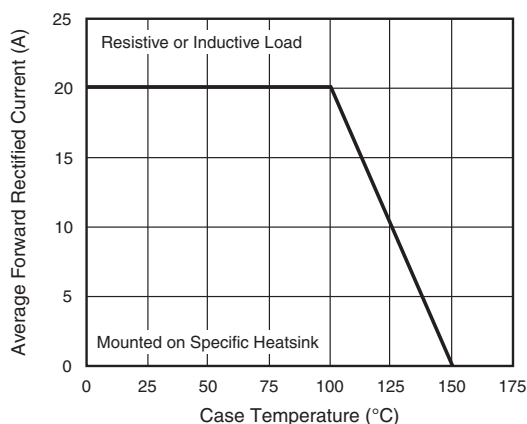
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

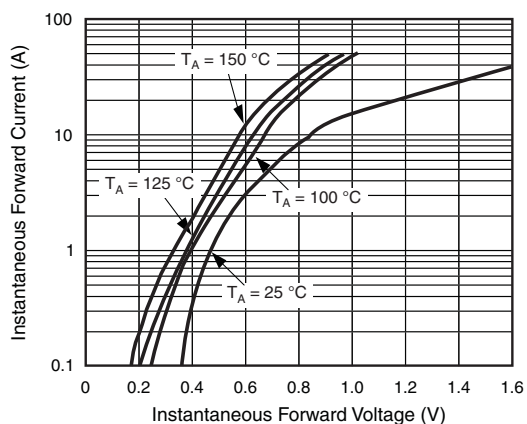


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

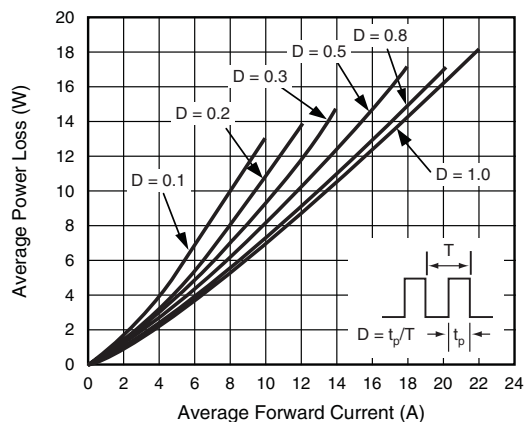


Fig. 2 - Forward Power Dissipation Characteristics Per Diode

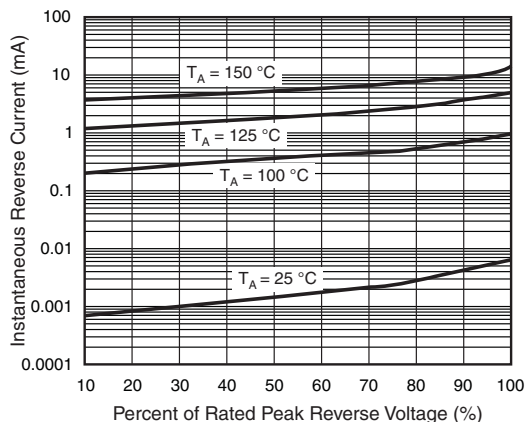


Fig. 4 - Typical Reverse Characteristics Per Diode

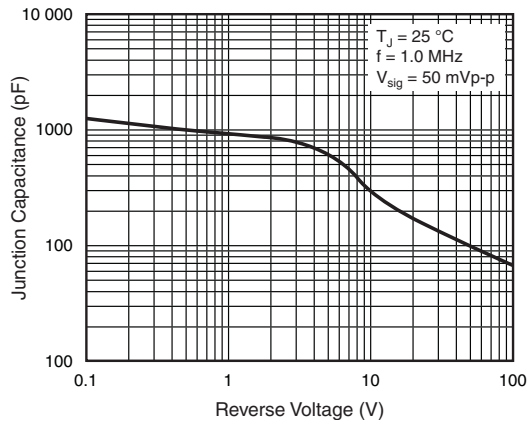


Fig. 5 - Typical Junction Capacitance Per Diode

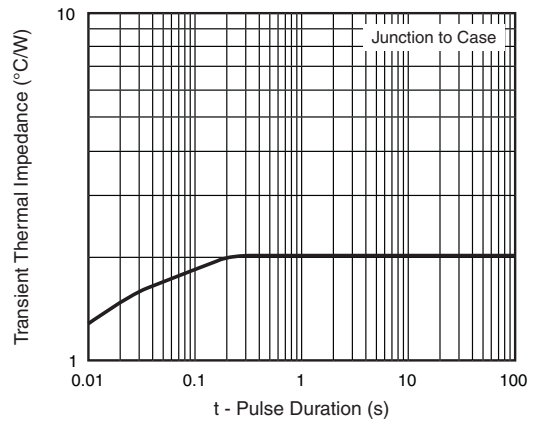
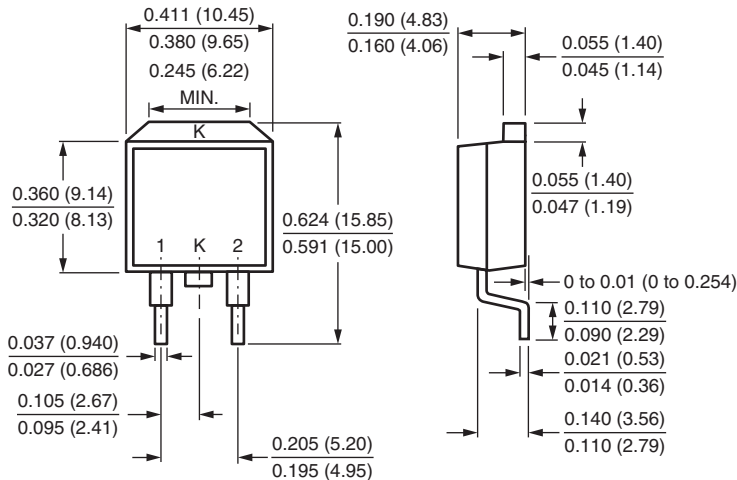


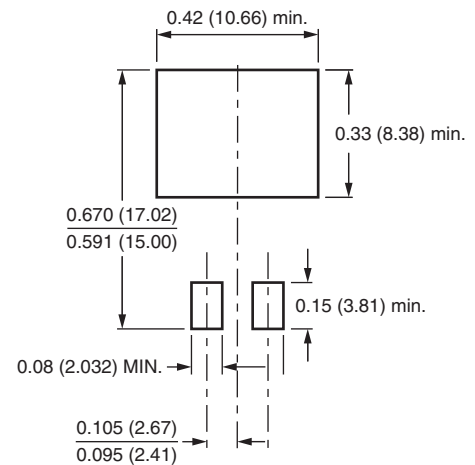
Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

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



**Mounting Pad Layout**





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