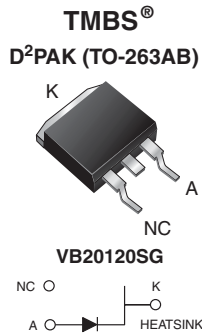


# High-Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.54 \text{ V}$  at  $I_F = 5 \text{ A}$ 

**DESIGN SUPPORT TOOLS**
[click logo to get started](#)

**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:** D²PAK (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	
$I_{F(AV)}$	20 A
$V_{RRM}$	120 V
$I_{FSM}$	150 A
$V_F$ at $I_F = 20 \text{ A}$	0.78 V
$T_J$ max.	150 °C
Package	D²PAK (TO-263AB)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VB20120SG	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	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	$I_{FSM}$	150	A
Voltage rate of change (rated $V_R$ )	dV/dt	10 000	
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 <sup>(1)</sup>	$I_F = 5 \text{ A}$	$T_A = 25 \text{ °C}$	$V_F$	0.62	-	V	
				$I_F = 10 \text{ A}$	0.81		-
				$I_F = 20 \text{ A}$	1.20		1.33
	$T_A = 125 \text{ °C}$	$I_F = 5 \text{ A}$		0.54	-		
		$I_F = 10 \text{ A}$		0.65	-		
		$I_F = 20 \text{ A}$		0.78	0.88		
Reverse current <sup>(2)</sup>	$V_R = 60 \text{ V}$	$T_A = 25 \text{ °C}$	$I_R$	10	-	μA	
		$T_A = 125 \text{ °C}$		7	-	mA	
	$V_R = 120 \text{ V}$	$T_A = 25 \text{ °C}$		-	250	μA	
		$T_A = 125 \text{ °C}$		12	25	mA	

**Notes**
<sup>(1)</sup> Pulse test: 300 μs pulse width, 1 % duty cycle

<sup>(2)</sup> Pulse test: Pulse width ≤ 40 ms



<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VB20120G	UNIT
Typical thermal resistance	$R_{\theta JC}$	2.2	$^\circ\text{C/W}$

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-263AB	VB20120SG-M3/4W	1.38	4W	50/tube	Tube
TO-263AB	VB20120SG-M3/8W	1.38	8W	800/reel	Tape and reel

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

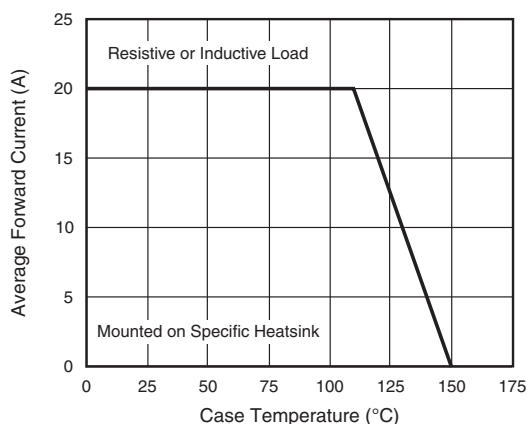


Fig. 1 - Forward Current Derating Curve

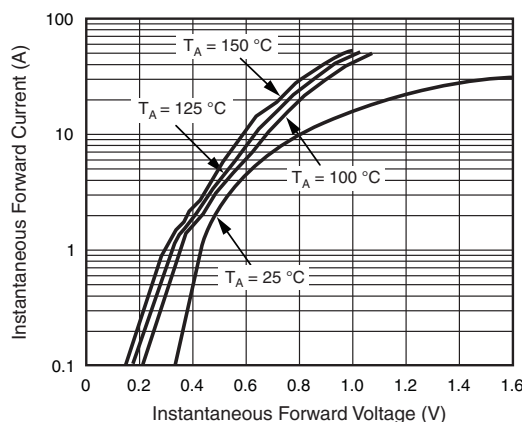


Fig. 3 - Typical Instantaneous Forward Characteristics

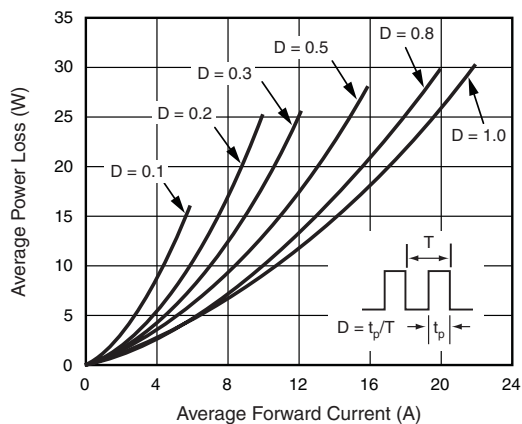


Fig. 2 - Forward Power Loss Characteristics

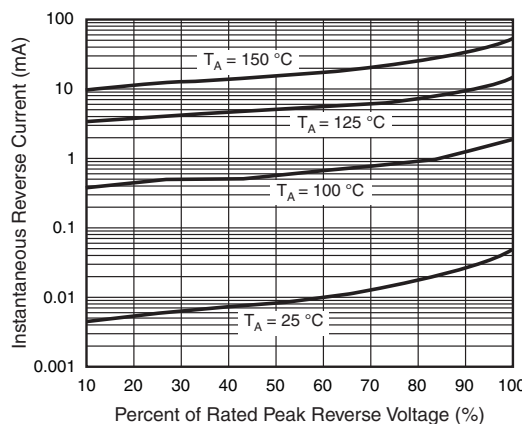


Fig. 4 - Typical Reverse Characteristics

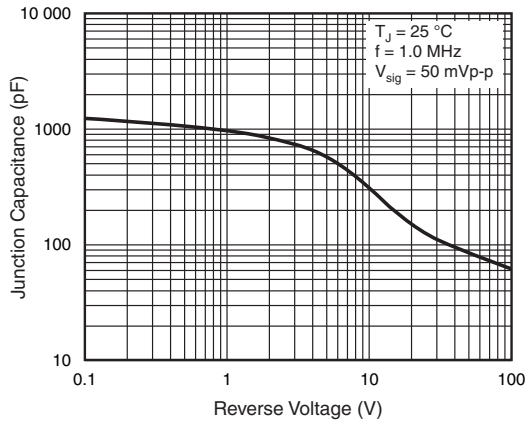


Fig. 5 - Typical Junction Capacitance

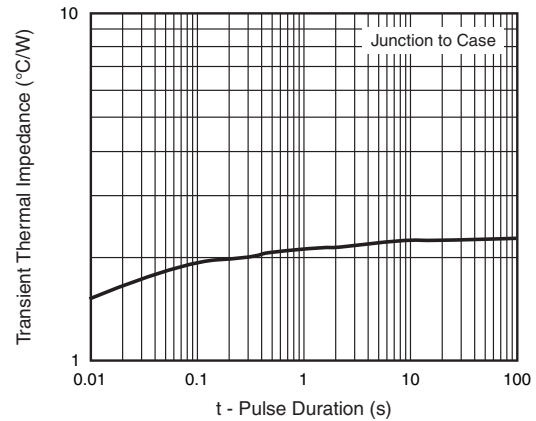
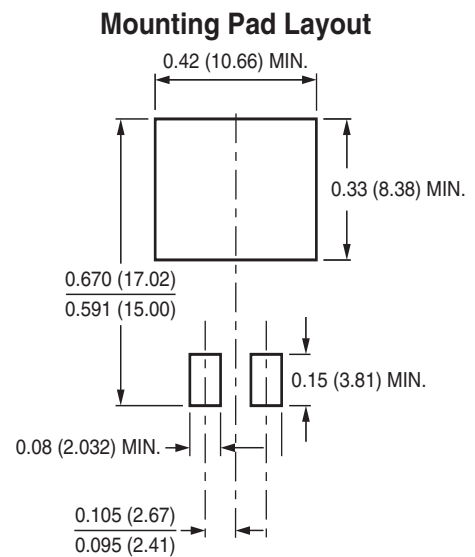
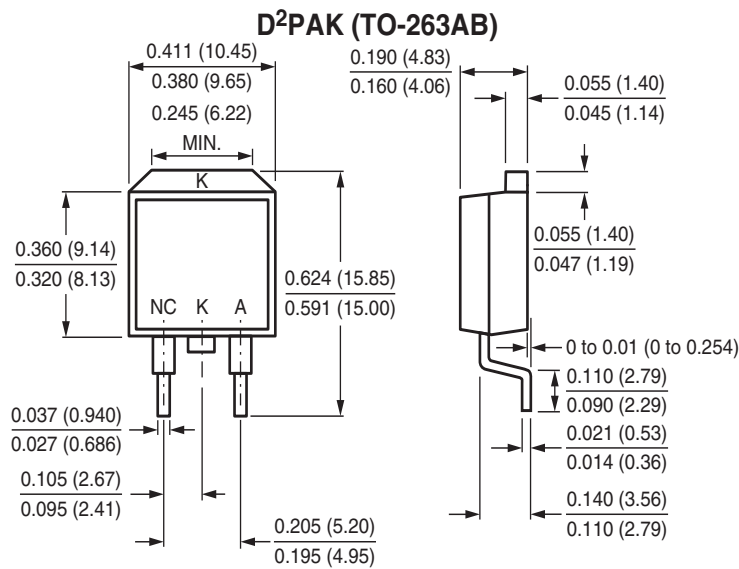


Fig. 6 - Typical Transient Thermal Impedance

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





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