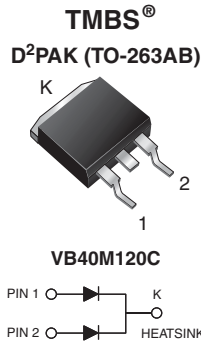


# Dual High Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.46 \text{ V}$  at  $I_F = 5 \text{ A}$ 

**DESIGN SUPPORT TOOLS**
[click logo to get started](#)
**3D**  
Models  
Available

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
$V_{RRM}$	120 V
$I_{FSM}$	250 A
$V_F$ at $I_F = 20 \text{ A}$	0.64 V
$T_J$ max.	150 °C
Package	D²PAK (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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT  
**HALOGEN**  
**FREE**  
Available

**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:** D²PAK (TO-263AB)

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

E3 and M3 suffix meets JESD 201 class 2 whisker test

**Polarity:** as marked

MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VB40M120C	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	per device	40
		per diode	20
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	250	A
Voltage rate of change (rated $V_R$ )	$dV/dt$	10 000	V/ $\mu$ s
Operating junction and storage temperature range	$T_J, T_{STG}$	-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	$I_F = 5 \text{ A}$	$T_A = 25 \text{ °C}$	$V_F^{(1)}$	0.54	-	V	
				$I_F = 10 \text{ A}$	0.64		-
				$I_F = 20 \text{ A}$	0.79		0.89
	$I_F = 5 \text{ A}$	$T_A = 125 \text{ °C}$		0.46	-		
				$I_F = 10 \text{ A}$	0.54		-
				$I_F = 20 \text{ A}$	0.64		0.72
Reverse current per diode	$V_R = 90 \text{ V}$	$T_A = 25 \text{ °C}$	$I_R^{(2)}$	4	-	$\mu$ A	
		$T_A = 125 \text{ °C}$		3	-	mA	
	$V_R = 120 \text{ V}$	$T_A = 25 \text{ °C}$		-	500	$\mu$ A	
		$T_A = 125 \text{ °C}$		6	32	mA	

**Notes**

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

 (2) Pulse test: Pulse width  $\leq 20 \text{ ms}$



<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VB40M120C	UNIT
Typical thermal resistance per diode	$R_{\theta JC}$	1.8	$^\circ\text{C/W}$

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-263AB	VB40M120C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB40M120C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-263AB	VB40M120C-M3/I	1.39	I	800/reel	Tape and reel

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

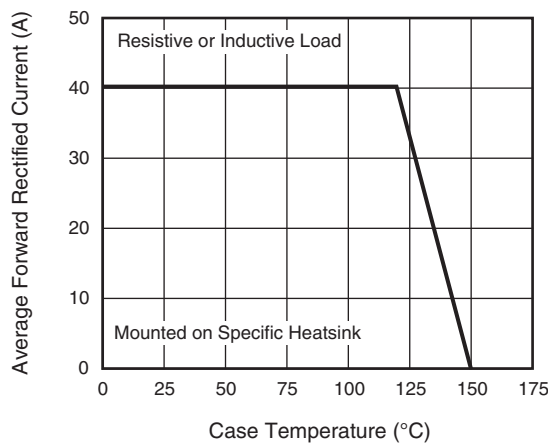


Fig. 1 - Maximum Forward Current Derating Curve

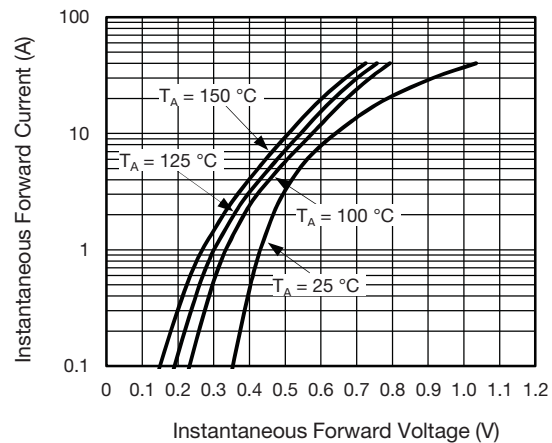


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

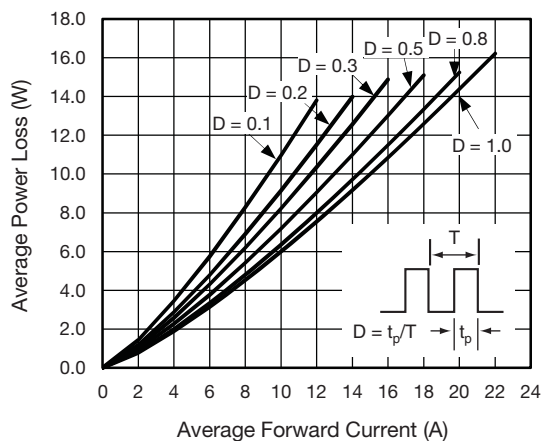


Fig. 2 - Forward Power Loss Characteristics Per Diode

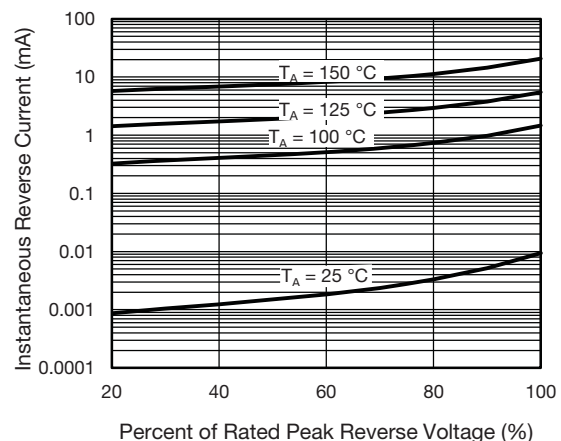


Fig. 4 - Typical Reverse Characteristics Per Diode

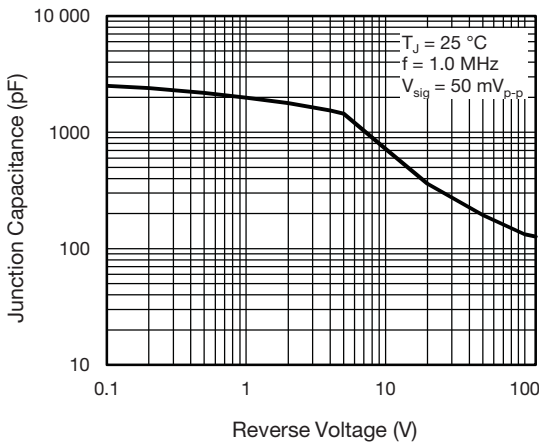


Fig. 5 - Typical Junction Capacitance Per Diode

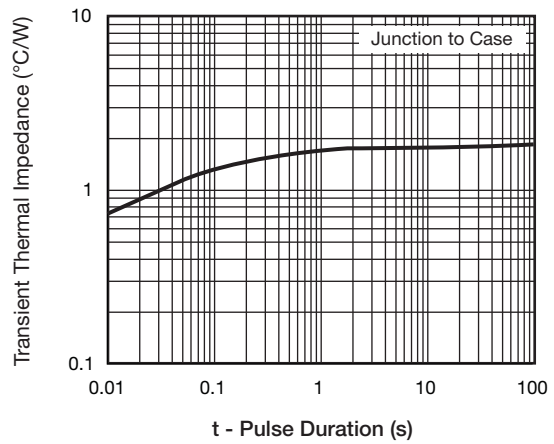
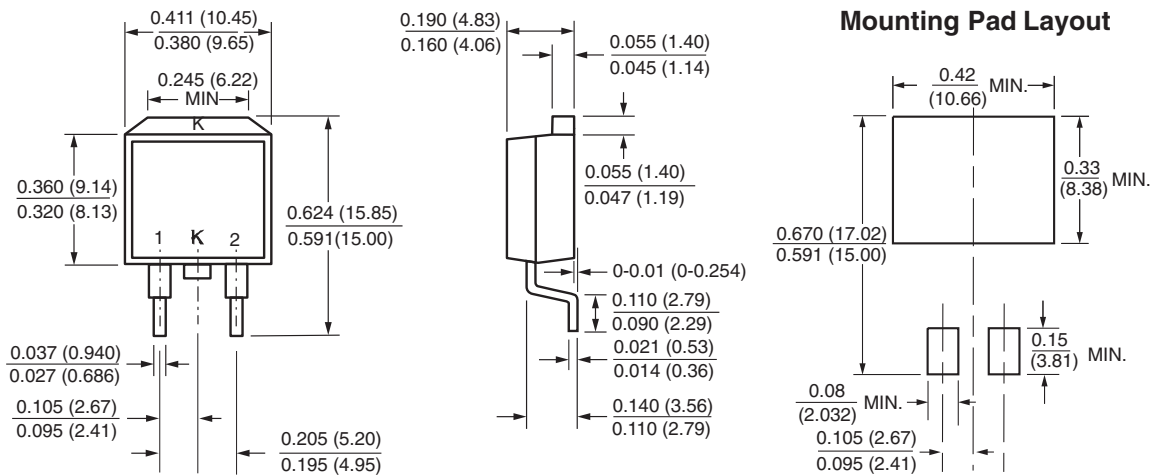


Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

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





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