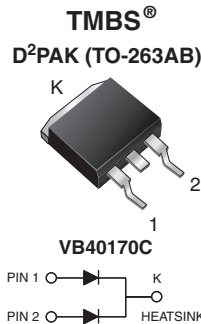


# Dual High Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.52 \text{ V}$  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
$V_{RRM}$	170 V
$I_{FSM}$	200 A
$V_F$ at $I_F = 20 \text{ A}$	0.68 V
$T_J$ max.	175 °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 high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

**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

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

E3 and M3 suffix meet JESD 201 class 2 whisker test

**Polarity:** as marked

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

MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VB40170C	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	170	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	$I_{FSM}$	200	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 +175	°C

ELECTRICAL CHARACTERISTICS ( $T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	$I_F = 5 \text{ A}$	$T_A = 25 \text{ °C}$	$V_F^{(1)}$	0.66	-	V
	$I_F = 10 \text{ A}$			0.75	-	
	$I_F = 20 \text{ A}$			0.86	1.20	
	$I_F = 5 \text{ A}$	$T_A = 125 \text{ °C}$		0.52	-	
	$I_F = 10 \text{ A}$			0.59	-	
	$I_F = 20 \text{ A}$			0.68	0.76	
Reverse current per diode	$V_R = 136 \text{ V}$	$T_A = 25 \text{ °C}$	$I_R^{(2)}$	1.3	-	$\mu$ A
		$T_A = 125 \text{ °C}$		2.2	-	mA
	$V_R = 170 \text{ V}$	$T_A = 25 \text{ °C}$		-	250	$\mu$ A
		$T_A = 125 \text{ °C}$		4.2	50	mA

**Notes**

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

 (2) Pulse test: pulse width  $\leq 5 \text{ ms}$

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)				
PARAMETER		SYMBOL	VB40170C	UNIT
Typical thermal resistance	per diode	$R_{\theta JC}^{(1)}$	1.2	$^\circ\text{C/W}$
	per device		0.85	

**Note**

 (1) Mounted on infinite heat sink; thermal resistance  $R_{\theta JC}$  - junction-to-case

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-263AB	VB40170C-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	VB40170C-E3/8W	1.38	8W	800/reel	Tape and reel
TO-263AB	VB40170C-M3/I	1.38	I	800/reel	13" diameter plastic tape and reel

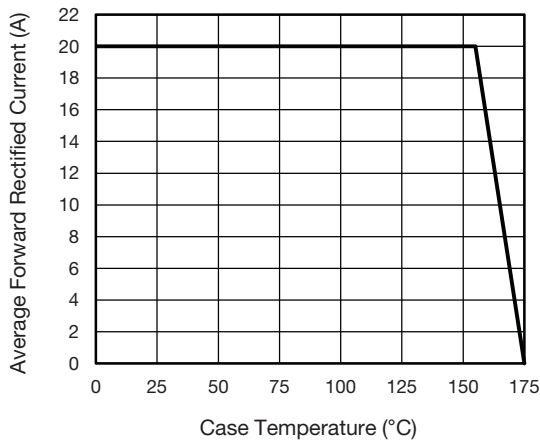
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

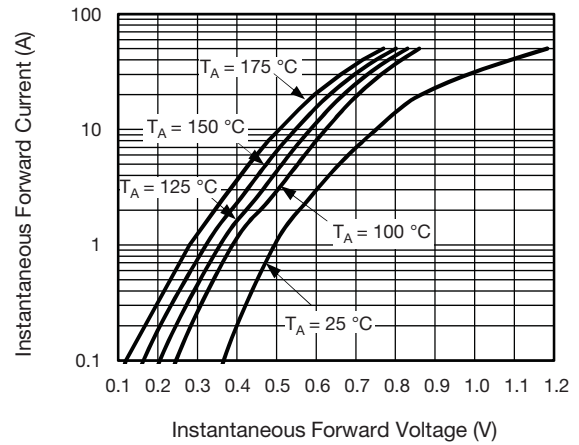


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

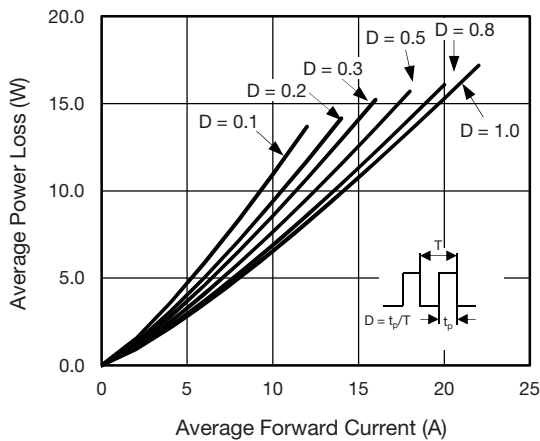


Fig. 2 - Forward Power Loss Characteristics Per Diode

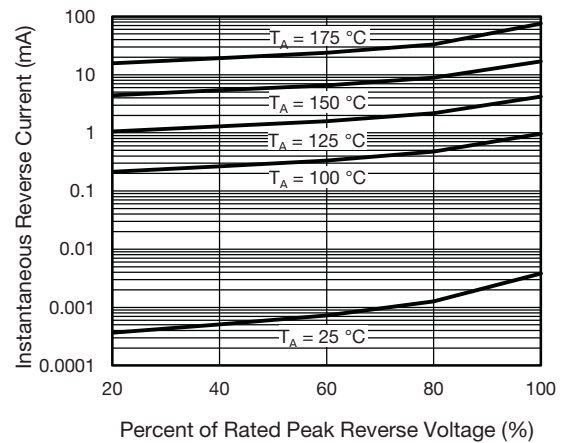


Fig. 4 - Typical Reverse Characteristics Per Diode

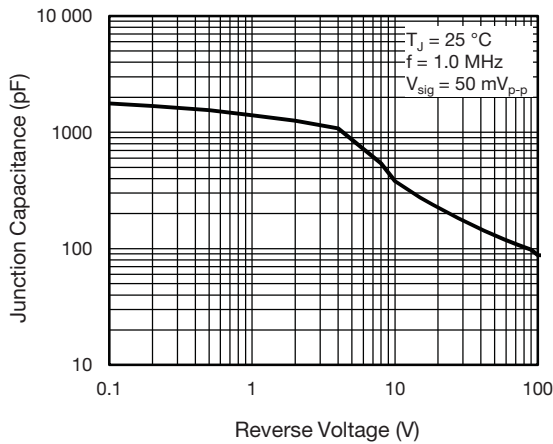


Fig. 5 - Typical Junction Capacitance Per Diode

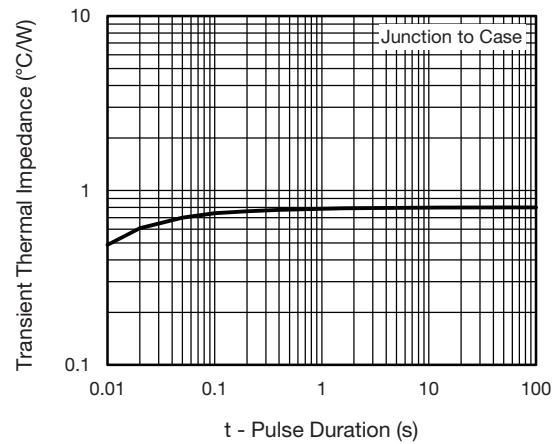
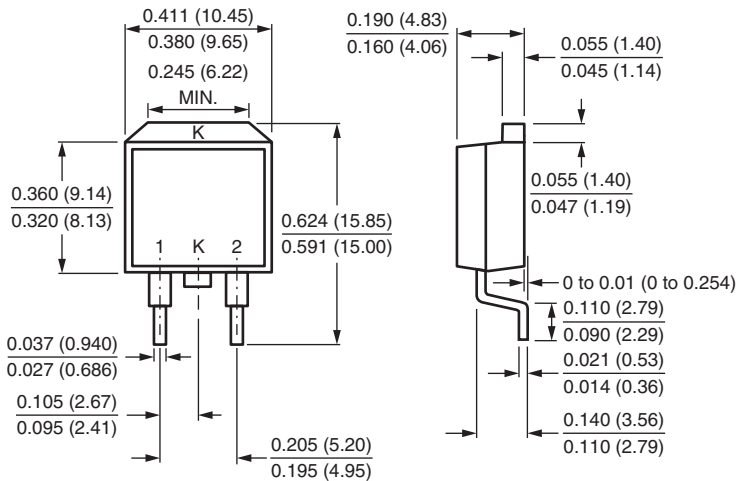


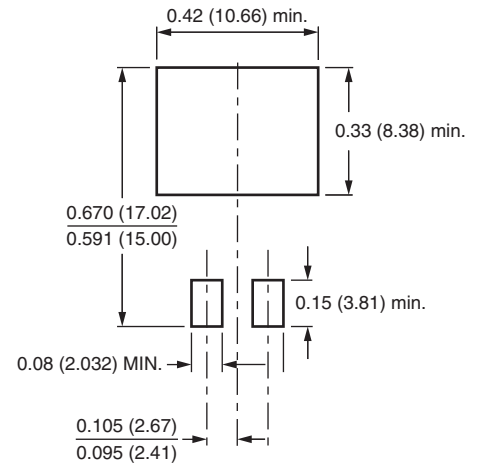
Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

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



**Mounting Pad Layout**





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