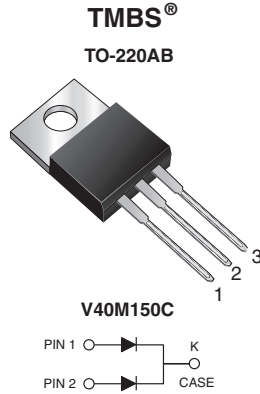


# Dual High-Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.55 \text{ V}$  at  $I_F = 5 \text{ A}$ 


## FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- 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 DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

## MECHANICAL DATA

**Case:** TO-220AB

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	
$I_{F(AV)}$	2 x 20 A
$V_{RRM}$	150 V
$I_{FSM}$	160 A
$V_F$ at $I_F = 20 \text{ A}$ ( $T_A = 125 \text{ °C}$ )	0.75 V
$T_J$ max.	175 °C
Package	TO-220AB
Diode variations	Common cathode

MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V40M150C	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	150	V
Maximum average forward rectified current (fig. 1)		per device	40
		per diode	20
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	160	A
Operating junction and storage temperature range	$T_J, T_{STG}$	-40 to +175	°C

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	$I_F = 5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.69	-	V
	$I_F = 10\text{ A}$			0.84	-	
	$I_F = 20\text{ A}$			1.15	1.43	
	$I_F = 5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.55	-	
	$I_F = 10\text{ A}$			0.64	-	
	$I_F = 20\text{ A}$			0.75	0.82	
Reverse current per diode	$V_R = 100\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	2	-	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		2.5	-	mA
	$V_R = 150\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$		-	250	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		5	25	mA

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  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	V40M150C	UNIT
Typical thermal resistance (1)	per diode	$R_{\theta JC}$	1.8	$^\circ\text{C/W}$
	per device		1.2	
	per device	$R_{\theta JA}^{(2)}$	52	

**Notes**

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient  $dP_D/dT_J < 1/R_{\theta JA}$   
 (2) Free air, without heatsink

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	V40M150C-M3/4W	1.89	4W	50/tube	Tube

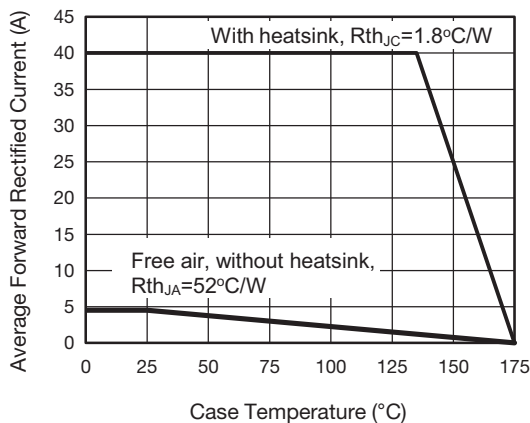
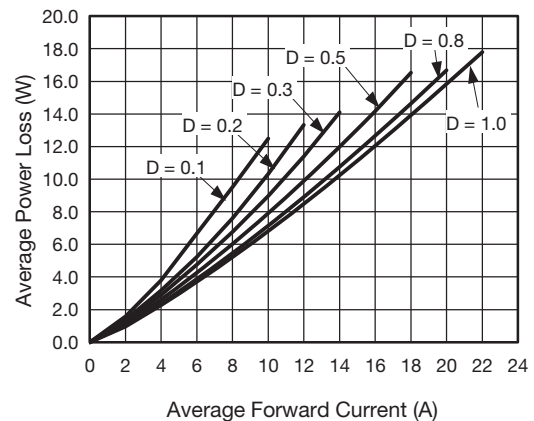
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

 Fig. 1 - Maximum Forward Current Derating Curve  
 ( $D = \text{Duty Cycle} = 0.5$ )


Fig. 2 - Forward Power Loss Characteristics Per Diode

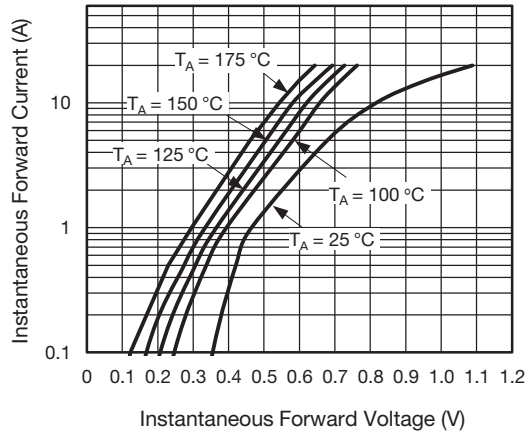


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

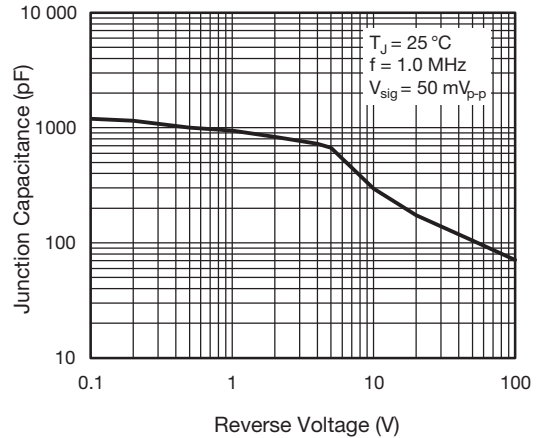


Fig. 5 - Typical Junction Capacitance Per Diode

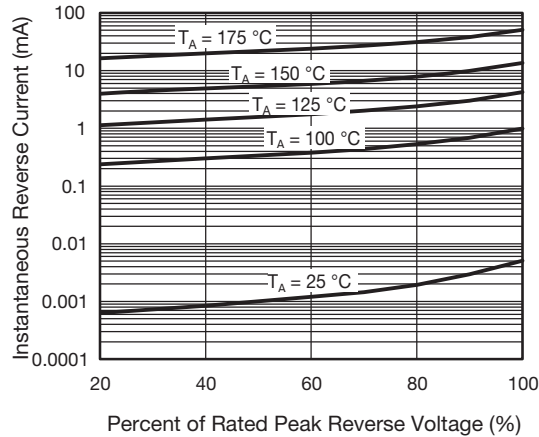


Fig. 4 - Typical Reverse Characteristics Per Diode

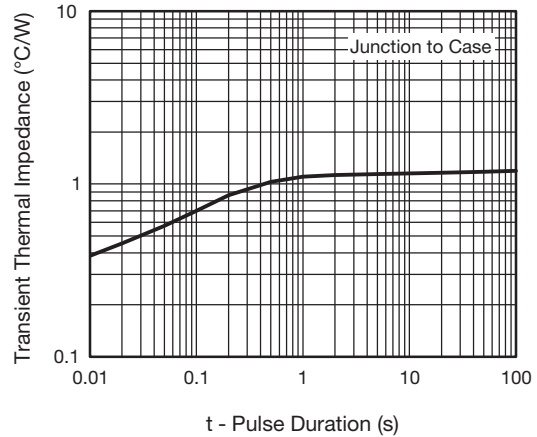
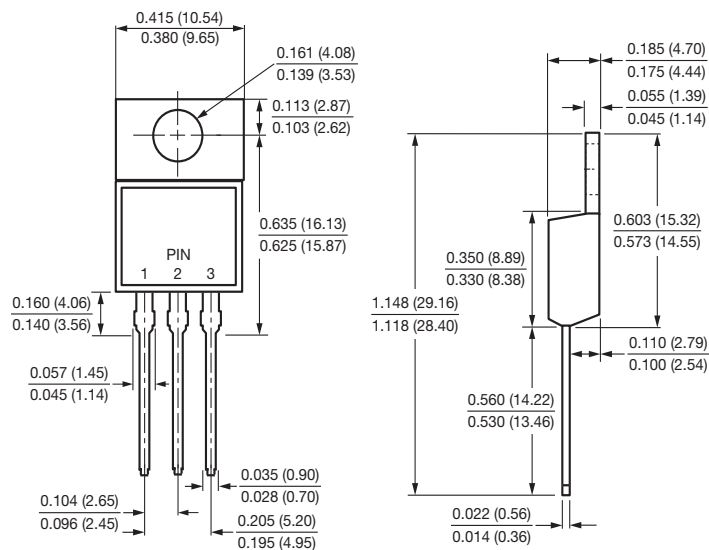


Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

**TO-220AB**





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