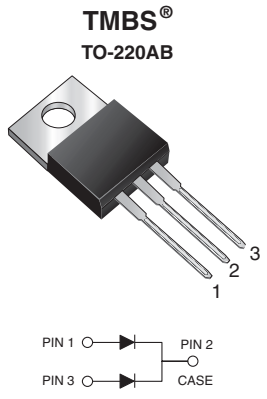
Dual High-Voltage Trench MOS Barrier Schottky Rectifier



FEATURES

- 150 °C high performance Schottky diode
- Very low forward voltage drop
- Optimized V_F vs. I_R trade off for high efficiency
- Increased ruggedness for reverse avalanche capability
- Negligible switching losses
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

TYPICAL APPLICATIONS

For use in high frequency converters, high efficiency SMPS, output rectification, freewheeling, reverse battery protection, DC/DC system and increased power density systems.

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

Marking: V40100K

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_{RRM}	100 V
I_{FSM}	250 A
V_F at I_F = 20 A at T_J = 125 °C	0.63 V
T_J max.	150 °C
Package	TO-220AB
Diode variation	Dual common cathode

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V40100K	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Maximum average forward rectifeid current (fig. 1)	total device	$I_{F(AV)}$	40	A
	per diode		20	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	250	A
Non-repetitive avalanche energy at T_J = 25 °C, I_{AS} = 1.5 A, L = 60 mH per diode		E_{AS}	67.5	mJ
Voltage rate of change		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	-40 to +150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR} (2)	100 (minimum)	-	V
	I_R = 10 mA			105 (minimum)	-	
Instantaneous forward voltage per diode	I_F = 5.0 A	T_A = 25 °C	V_F (1)	0.51	-	V
	I_F = 10 A			0.59	-	
	I_F = 20 A			0.72	0.82	
	I_F = 5.0 A	T_A = 125 °C		0.44	-	
	I_F = 10 A			0.53	-	
	I_F = 20 A			0.63	0.67	
Reverse current at rated V_R per diode	V_R = 70 V	T_A = 25 °C	I_R (2)	9	-	µA
		T_A = 100 °C		10	-	mA
	V_R = 100 V	T_A = 25 °C		-	1000	µA
		T_A = 100 °C		21	45	mA

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**V40100-M3/4W**	**UNIT**
Maximum junction to case	per diode	$R_{\theta JC}$	4	°C/W
	per device		2	
Typical thermal resistance case to heatsink		$R_{\theta JS}$	0.5	

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V40100K-M3/4W	1.85	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

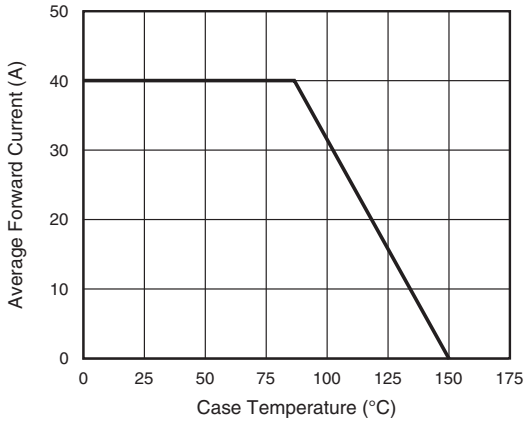


Fig. 1 - Forward Current Derating Curve

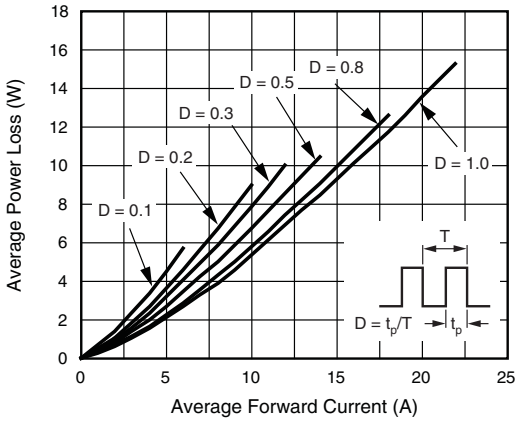


Fig. 2 - Forward Power Loss Characteristics Per Diode

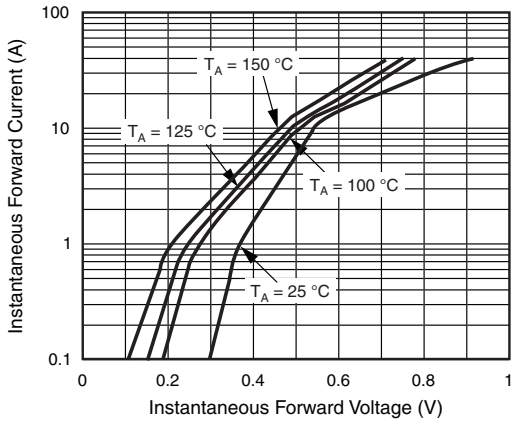


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

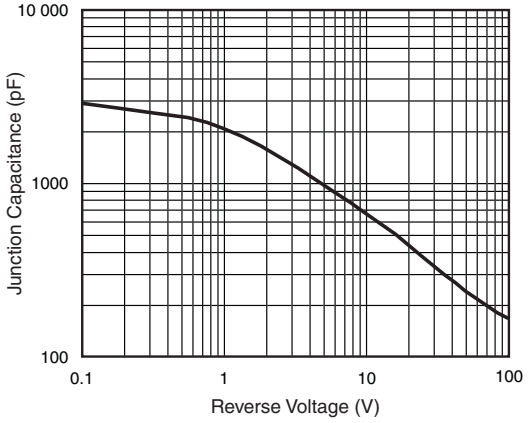


Fig. 5 - Typical Junction Capacitance Per Diode

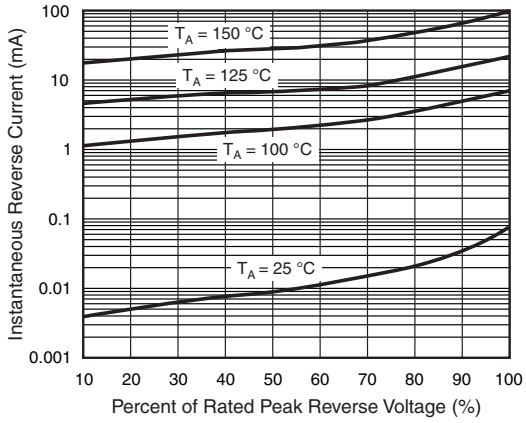


Fig. 4 - Typical Reverse Characteristics Per Diode

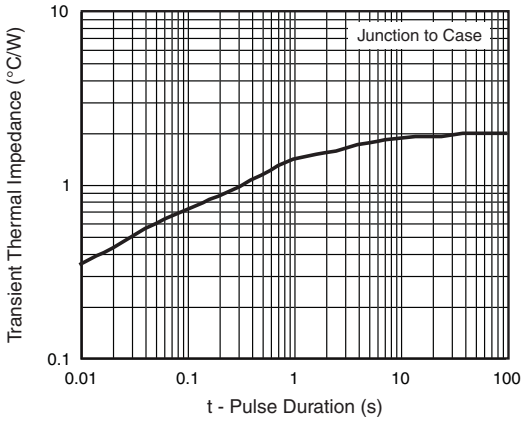
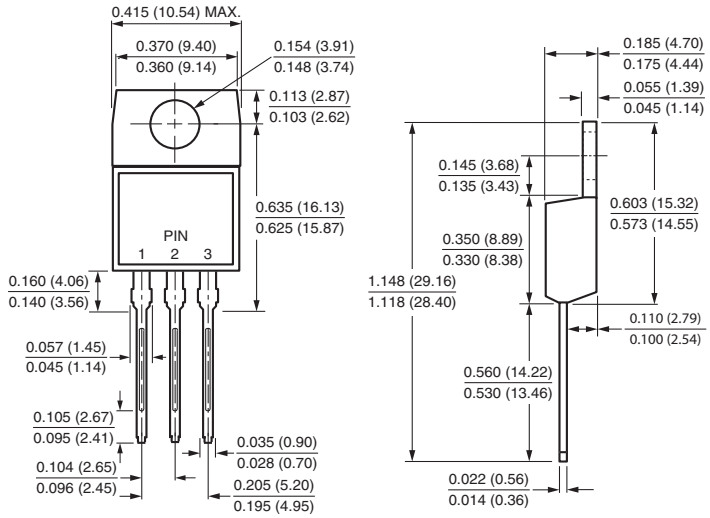


Fig. 6 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



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