Dual High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.46 V at I_F = 5 A

TMBS®

D²PAK (TO-263AB)

K

2

1

VB40M120C

PIN 1 ○ ──▷|── K
○
PIN 2 ○ ──▷|── HEATSINK
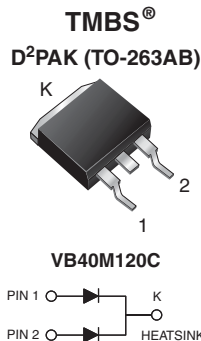
DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

RoHS COMPLIANT

HALOGEN FREE Available

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

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

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2 x 20 A
V_{RRM}	120 V
I_{FSM}	250 A
V_F at I_F = 20 A	0.64 V
T_J max.	150 °C
Package	D²PAK (TO-263AB)
Circuit configuration	Common cathode

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

PARAMETER		SYMBOL	VB40M120C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	120	V
Maximum average forward rectified current (fig. 1)	per 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	
Voltage rate of change (rated V_R)		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
Instantaneous forward voltage per diode	I_F = 5 A	T_A = 25 °C	V_F [1]	0.54	-	V
	I_F = 10 A			0.64	-	
	I_F = 20 A			0.79	0.89	
	I_F = 5 A	T_A = 125 °C		0.46	-	
	I_F = 10 A			0.54	-	
	I_F = 20 A			0.64	0.72	
Reverse current per diode	V_R = 90 V	T_A = 25 °C	I_R [2]	4	-	µA
		T_A = 125 °C		3	-	mA
	V_R = 120 V	T_A = 25 °C		-	500	µA
		T_A = 125 °C		6	32	mA

Notes

[1] Pulse test: 300 µs pulse width, 1 % duty cycle

[2] Pulse test: Pulse width ≤ 20 ms

THERMAL CHARACTERISTICS (T$_A$ = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VB40M120C	UNIT
Typical thermal resistance per diode	R$_{\theta JC}$	1.8	°C/W

ORDERING INFORMATION (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

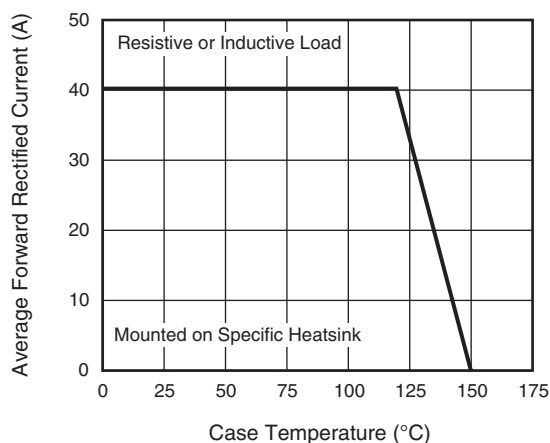## RATINGS AND CHARACTERISTICS CURVES (T$_A$ = 25 °C unless otherwise noted)

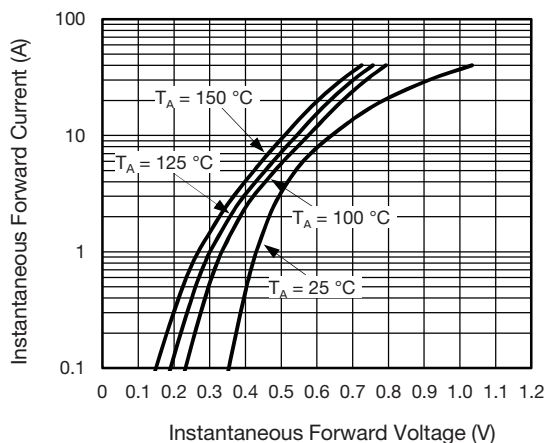Fig. 1 - Maximum Forward Current Derating Curve

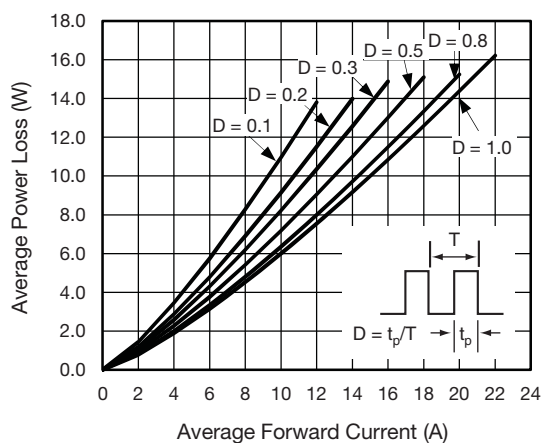Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

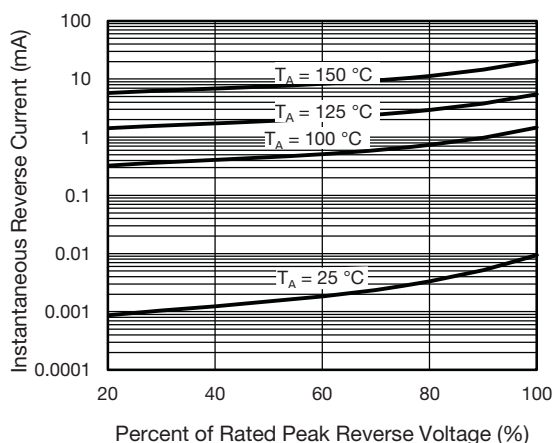Fig. 2 - Forward Power Loss Characteristics Per Diode

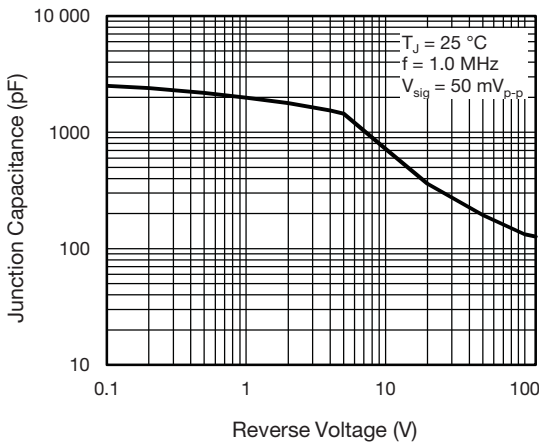Fig. 4 - Typical Reverse Characteristics Per Diode
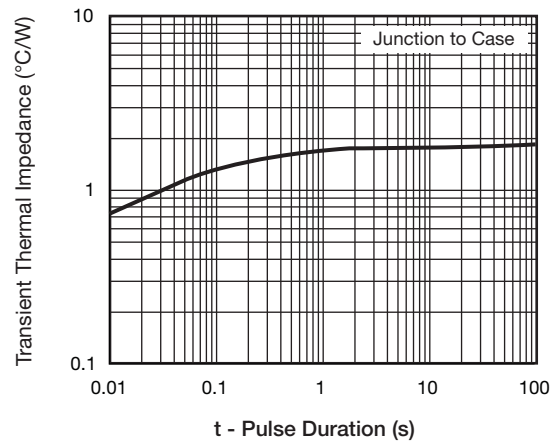
Fig. 5 - Typical Junction Capacitance Per Diode
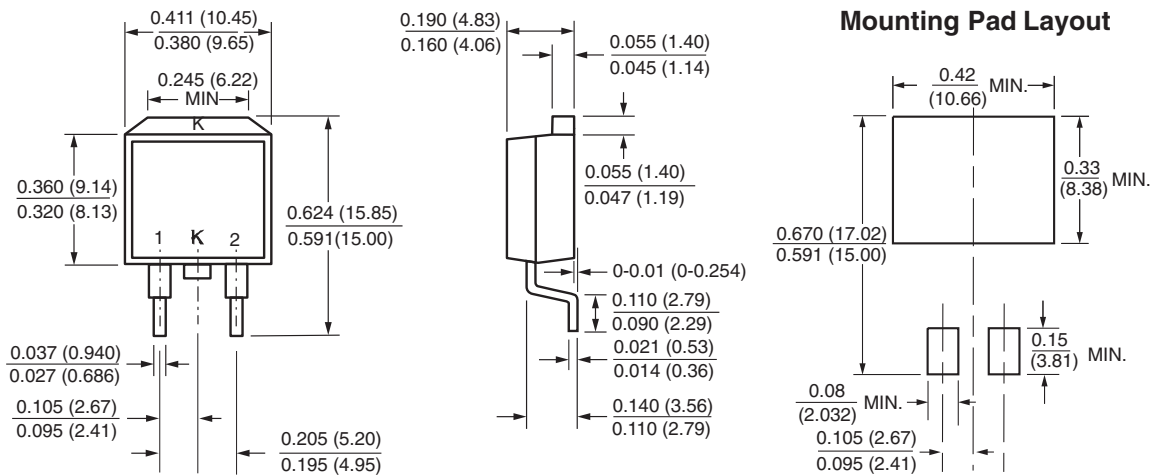

Fig. 6 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

D^{2}PAK (TO-263AB)

Mounting Pad Layout

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