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High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.39$ V at $I_F = 5$ A



DESIGN SUPPORT TOOLS



PRIMARY CHARACTERISTICS			
I _{F(AV)}	30 A		
V _{RRM}	100 V		
I _{FSM}	250 A		
V_F at $I_F = 30$ A	0.69 V		
T _J max.	150 °C		
Package	D ² PAK (TO-263AB)		
Circuit configuration	Common cathode		

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in high frequency converters, switching power supplies, freewheeling diodes, OR-ing diode, DC/DC converters, and reverse battery protection.

MECHANICAL DATA

Case: D²PAK (TO-263AB)

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

MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	VB30100S	UNIT	
Maximum repetitive peak reverse voltage	V _{RRM}	100	V	
Maximum average forward rectified current (fig. 1)	I _{F(AV)}	30	А	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	250	А	
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 ⁽¹⁾	I _F = 5 A	T _A = 25 °C	V _F	0.47	-	V	
	I _F = 10 A			0.55	-		
	I _F = 30 A			0.80	0.91		
	I _F = 5 A	T _A = 125 °C		0.39	-		
	I _F = 10 A			0.49	-		
	I _F = 30 A			0.69	0.78		
Reverse current ⁽²⁾	V _R = 70 V	T _A = 25 °C	I _R	27	-	μA	
		T _A = 125 °C		11	-	mA	
	V _B = 100 V	T _A = 25 °C		70	1000	μA	
	$v_{\rm R} = 100 V$	T _A = 125 °C		23	45	mA	

Notes

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

⁽²⁾ Pulse test: Pulse width \leq 40 ms

 Revision: 20-Jun-2018
 1
 Document Number: 87985

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RoHS COMPLIANT HALOGEN



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THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)			
PARAMETER	VB30100S	UNIT	
Typical thermal resistance	$R_{\theta JC}$	2.0	°C/W

ORDERING INFORMATION (Example)							
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
TO-263AB	VB30100S-M3/4W	1.380	4W	50/tube	Tube		
TO-263AB	VB30100S-M3/8W	1.380	8W	800/reel	Tape and reel		

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

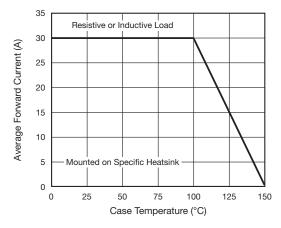


Fig. 1 - Forward Current Derating Curve

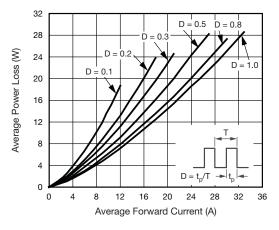


Fig. 2 - Forward Power Loss Characteristics

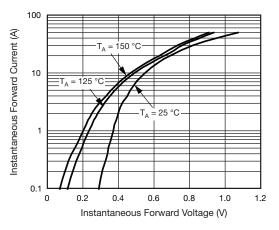


Fig. 3 - Typical Instantaneous Forward Characteristics

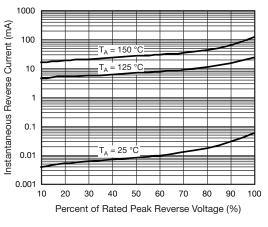
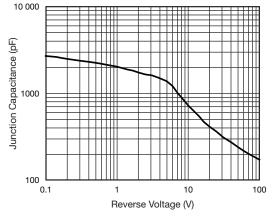


Fig. 4 - Typical Reverse Characteristics



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Fig. 5 - Typical Junction Capacitance

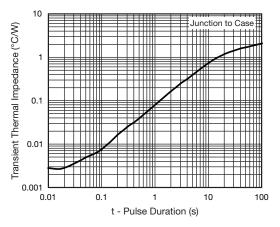
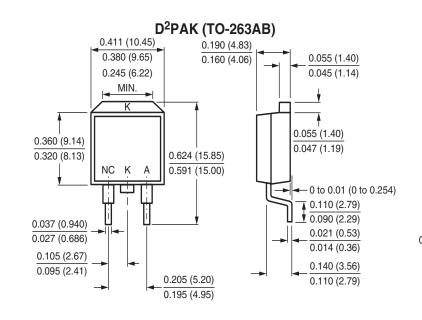
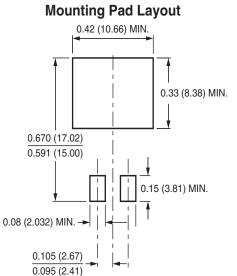


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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