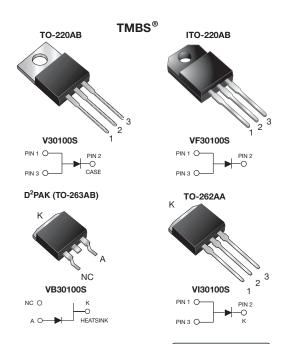
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# **High Voltage Trench MOS Barrier Schottky Rectifier**

Ultra Low  $V_F = 0.39 \text{ V}$  at  $I_F = 5 \text{ A}$ 



#### **DESIGN SUPPORT TOOLS**





PRIMARY CHARACTERISTICS						
I <sub>F(AV)</sub>	30 A					
$V_{RRM}$	100 V					
I <sub>FSM</sub>	250 A					
V <sub>F</sub> at I <sub>F</sub> = 30 A	0.69 V					
T <sub>J</sub> max.	150 °C					
Package	TO-220AB, ITO-220AB, D <sup>2</sup> PAK (TO-263AB),TO-262AA					
Circuit configuration	Single					

### **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 (for TO-263AB package)
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AB, ITO-220AB, and TO-262AA package)
- · Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

### 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: TO-220AB, ITO-220AB, D2PAK (TO-263AB), and TO-262AA

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant, commercial grade

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

E3 suffix meets JESD 201 class 1A whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	V30100S	VF30100S	VB30100S	VI30100S	UNIT		
Maximum repetitive peak reverse voltage	$V_{RRM}$	100			V			
Maximum average forward rectified current (fig. 1)	I <sub>F(AV)</sub>	30			Α			
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	250			Α			
Non-repetitive avalanche energy at T <sub>J</sub> = 25 °C, L = 90 mH	E <sub>AS</sub>	230			mJ			
Peak repetitive reverse current at $t_p = 2 \mu s$ , 1 kHz, $T_J = 38  ^{\circ}C \pm 2  ^{\circ}C$	I <sub>RRM</sub>	1.0			Α			
Voltage rate of change (rated V <sub>R</sub> )	dV/dt	10 000			V/µs			
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V <sub>AC</sub>	1500		V				
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-40 to +150			°C			

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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT		
Breakdown voltage	I <sub>R</sub> = 10 mA	T <sub>A</sub> = 25 °C	$V_{BR}$	105 (minimum)	-	V		
Instantaneous forward voltage	I <sub>F</sub> = 5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.47	-	V		
	I <sub>F</sub> = 10 A			0.55	-			
	I <sub>F</sub> = 30 A	]		0.80	0.91			
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.39	-			
	I <sub>F</sub> = 10 A			0.49	-			
	I <sub>F</sub> = 30 A	]		0.69	0.78			
Reverse current	V <sub>R</sub> = 70 V	T <sub>A</sub> = 25 °C	1 (2)	27	-	μΑ		
		T <sub>A</sub> = 125 °C		11	-	mA		
	V <sub>R</sub> = 100 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	70	1000	μΑ		
		T <sub>A</sub> = 125 °C		23	45	mA		

#### **Notes**

<sup>(2)</sup> Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	V30100S	VF30100S	VB30100S	VI30100S	UNIT	
Typical thermal resistance	$R_{\theta JC}$	2.0	4.0	2.0	2.0	°C/W	

ORDERING INFORMATION (Example)								
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE			
TO-220AB	V30100S-E3/4W	1.875	4W	50/tube	Tube			
ITO-220AB	VF30100S-E3/4W	1.805	4W	50/tube	Tube			
TO-263AB	VB30100S-E3/4W	1.380	4W	50/tube	Tube			
TO-263AB	VB30100S-E3/8W	1.380	8W	800/reel	Tape and reel			
TO-262AA	VI30100S-E3/4W	1.455	4W	50/tube	Tube			

## RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

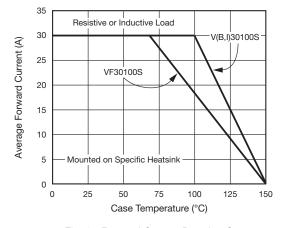


Fig. 1 - Forward Current Derating Curve

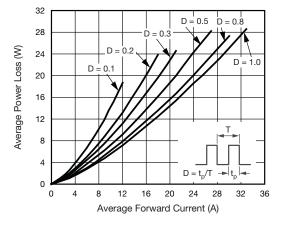


Fig. 2 - Forward Power Loss Characteristics

 $<sup>^{(1)}\,</sup>$  Pulse test: 300  $\mu s$  pulse width, 1 % duty cycle

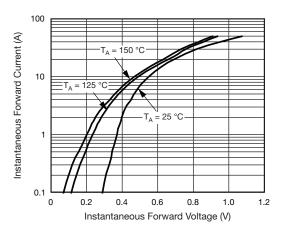


Fig. 3 - Typical Instantaneous Forward Characteristics

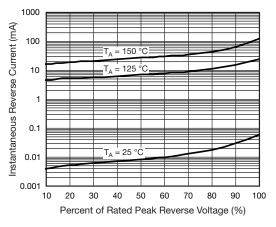


Fig. 4 - Typical Reverse Characteristics

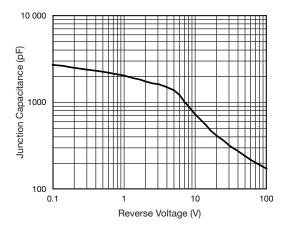


Fig. 5 - Typical Junction Capacitance

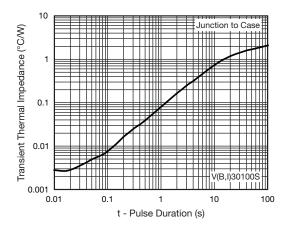


Fig. 6 - Typical Transient Thermal Impedance

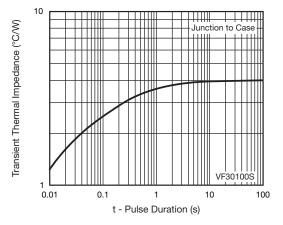
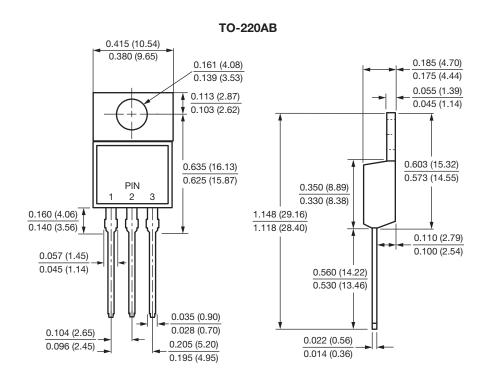


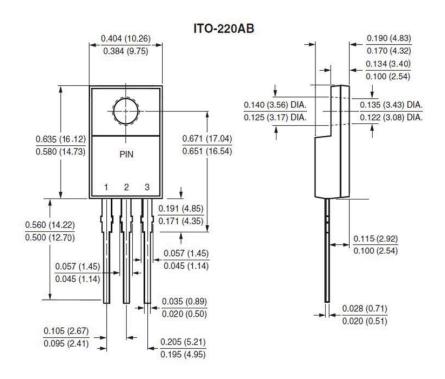
Fig. 7 - Typical Transient Thermal Impedance

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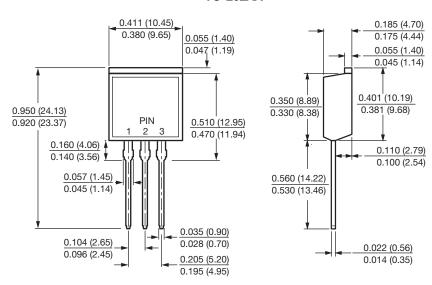
## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

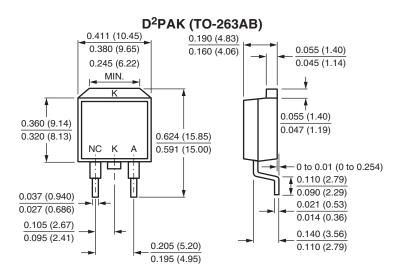




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#### **TO-262AA**





# 0.42 (10.66) MIN. 0.670 (17.02) 0.591 (15.00) 0.08 (2.032) MIN. 0.105 (2.67) 0.095 (2.41)



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