



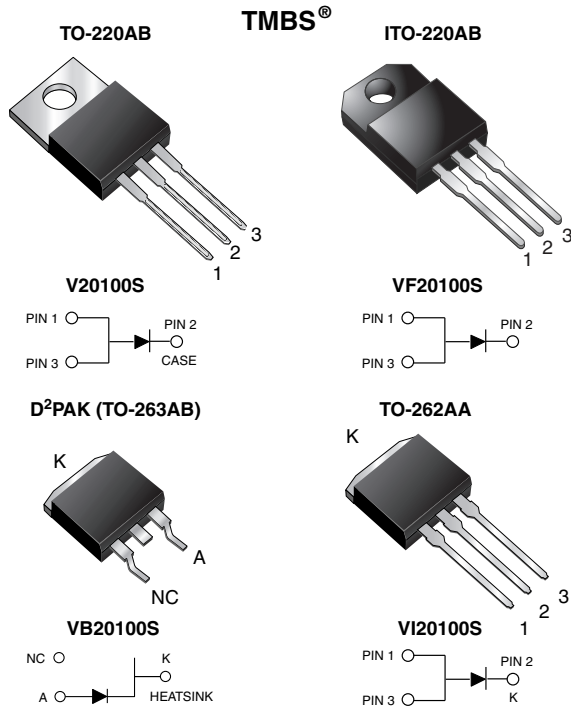
**THE DATASHEET OF
VB20100S-E3/4W**





High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.446\text{ V}$ at $I_F = 5\text{ A}$



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 D²PAK (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



RoHS COMPLIANT

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 max.

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	100 V
I_{FSM}	250 A
V_F at $I_F = 20\text{ A}$	0.69 V
T_J max.	150 °C
Package	TO-220AB, ITO-220AB, D ² PAK (TO-263AB), TO-262AA
Circuit configuration	Single

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	V20100S	VF20100S	VB20100S	VI20100S	UNIT
Max. repetitive peak reverse voltage	V_{RRM}		100			V
Max. average forward rectified current (fig. 1)	$I_{F(AV)}$		20			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}		250			A
Non-repetitive avalanche energy at $T_J = 25\text{ °C}$, $L = 60\text{ mH}$	E_{AS}		210			mJ
Peak repetitive reverse current at $t_p = 2\text{ }\mu\text{s}$, 1 kHz, $T_J = 38\text{ °C} \pm 2\text{ °C}$	I_{RRM}		1.0			A
Voltage rate of change (rated V_F)	dV/dt		10 000			V/ μs
Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1\text{ min}$	V_{AC}		1500			V
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 = 10 mA	T _A = 25 °C	V _{BR}	105 (min.)	-	V
Instantaneous forward voltage	I _F = 5 A	T _A = 25 °C	V _F ⁽¹⁾	0.51	-	V
	I _F = 10 A			0.60	-	
	I _F = 20 A			0.79	0.90	
	I _F = 5 A	T _A = 125 °C		0.45	-	
	I _F = 10 A			0.53	-	
	I _F = 20 A			0.69	0.76	
Reverse current	V _R = 70 V	T _A = 25 °C	I _R ⁽²⁾	17	-	μA
		T _A = 125 °C		7	-	mA
	V _R = 100 V	T _A = 25 °C		70	500	μA
		T _A = 125 °C		14	30	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	V20100S	VF20100S	VB20100S	VI20100S	UNIT
Typical thermal resistance	R _{θJC}	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	V20100S-E3/4W	1.88	4W	50/tube	Tube	
ITO-220AB	VF20100S-E3/4W	1.75	4W	50/tube	Tube	
D ² PAK (TO-263AB)	VB20100S-E3/4W	1.37	4W	50/tube	Tube	
D ² PAK (TO-263AB)	VB20100S-E3/8W	1.37	8W	800/reel	Tape and reel	
TO-262AA	VI20100S-E3/4W	1.45	4W	50/tube	Tube	

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

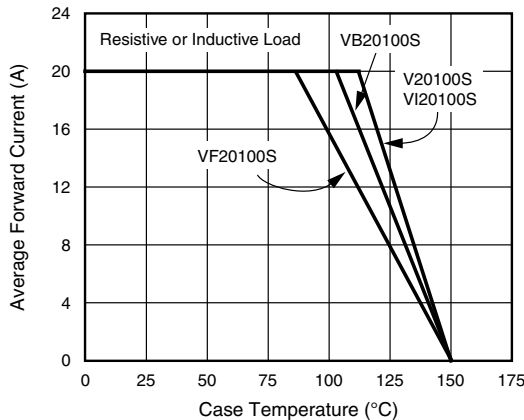


Fig. 1 - Maximum Forward Current Derating Curve

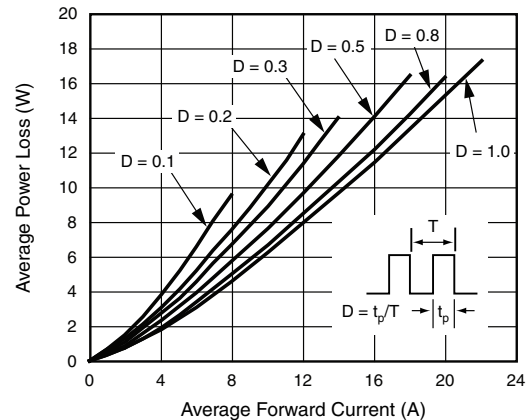


Fig. 2 - Forward Power Loss Characteristics

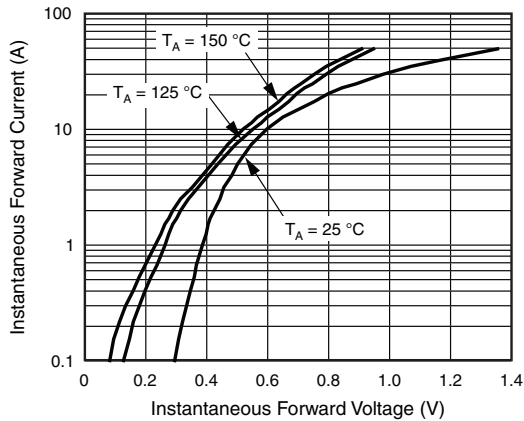


Fig. 3 - Typical Instantaneous Forward Characteristics

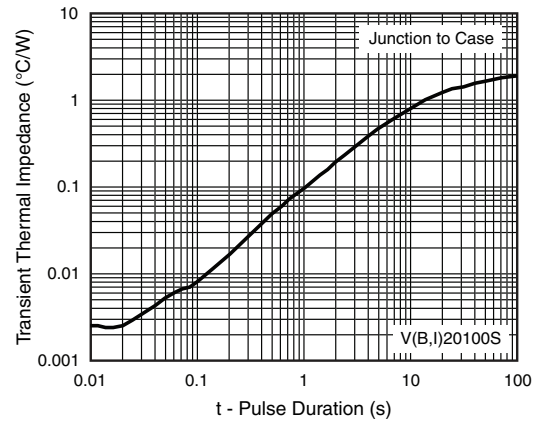


Fig. 6 - Typical Transient Thermal Impedance

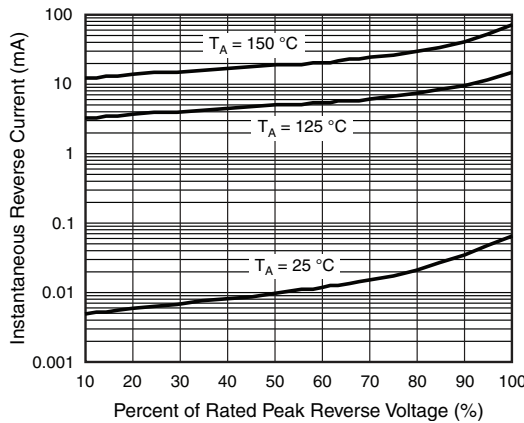


Fig. 4 - Typical Reverse Characteristics

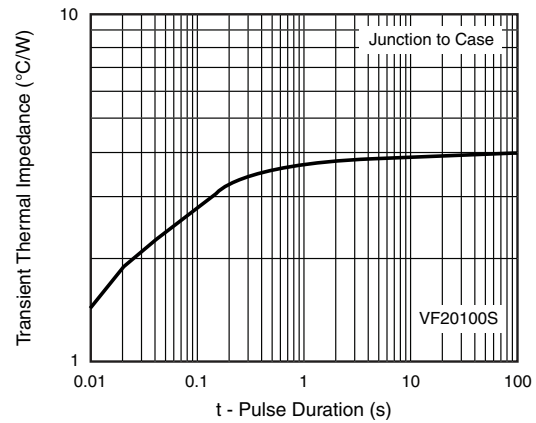


Fig. 7 - Typical Transient Thermal Impedance

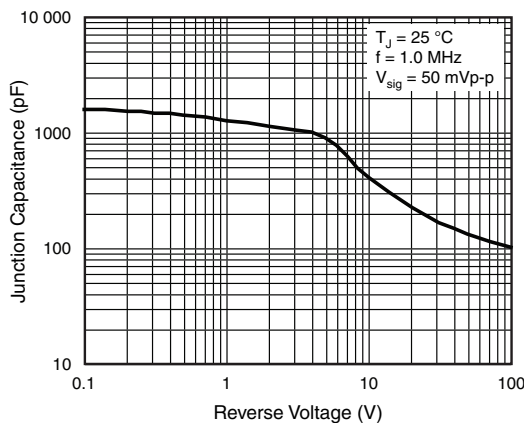
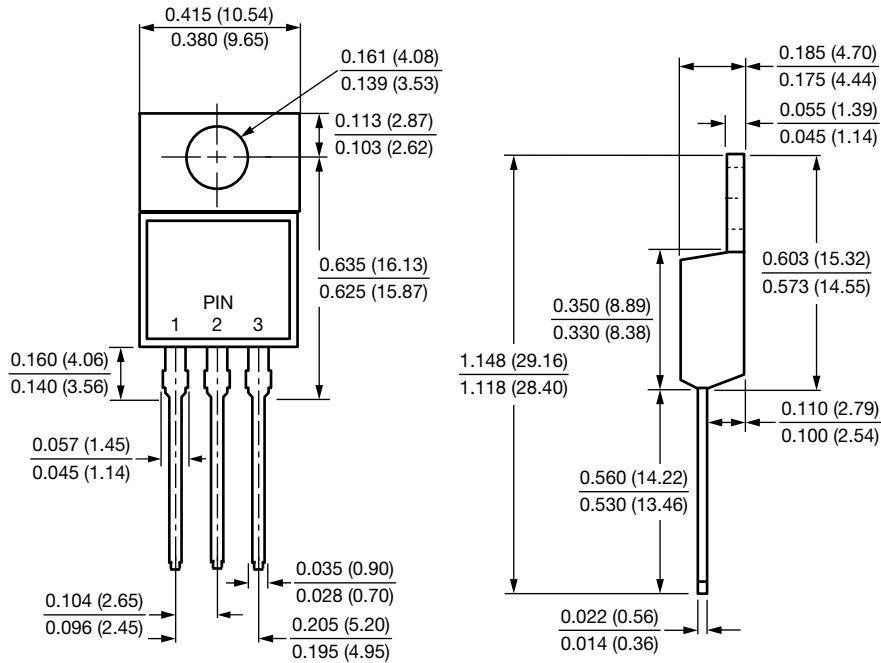


Fig. 5 - Typical Junction Capacitance

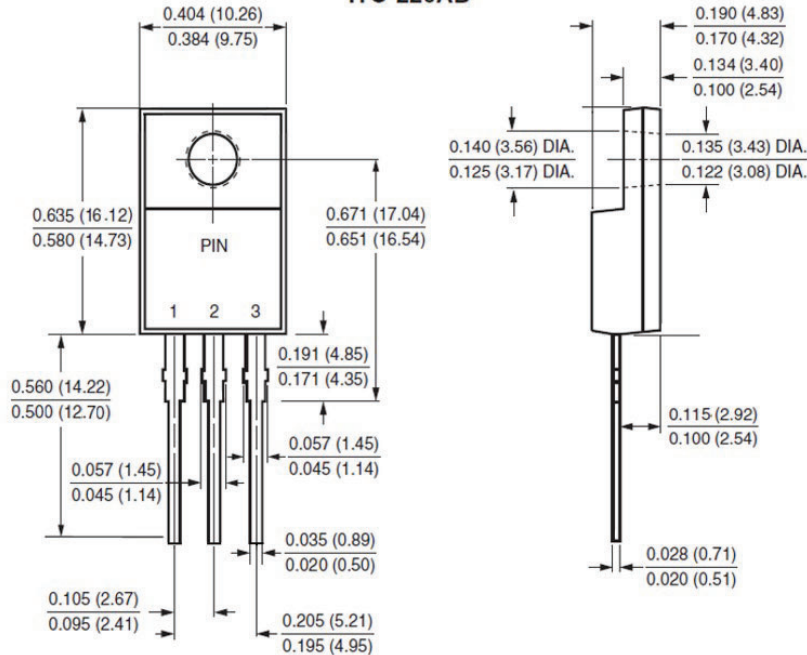


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

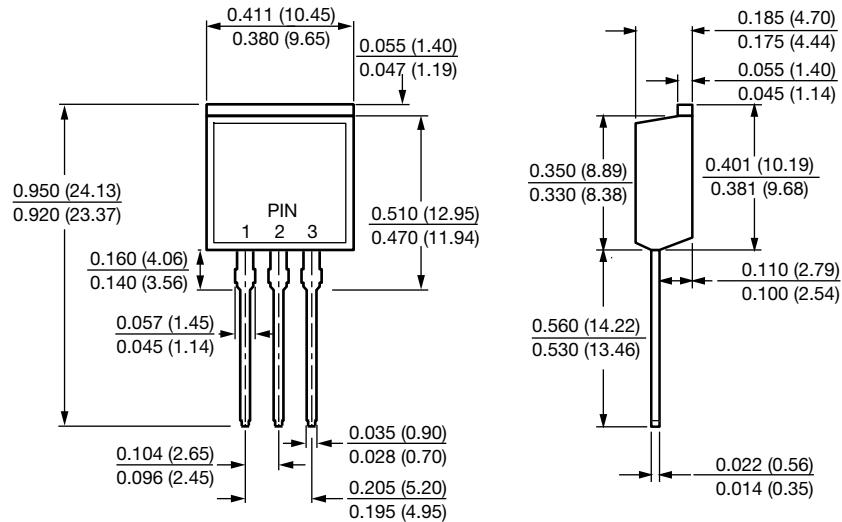
TO-220AB



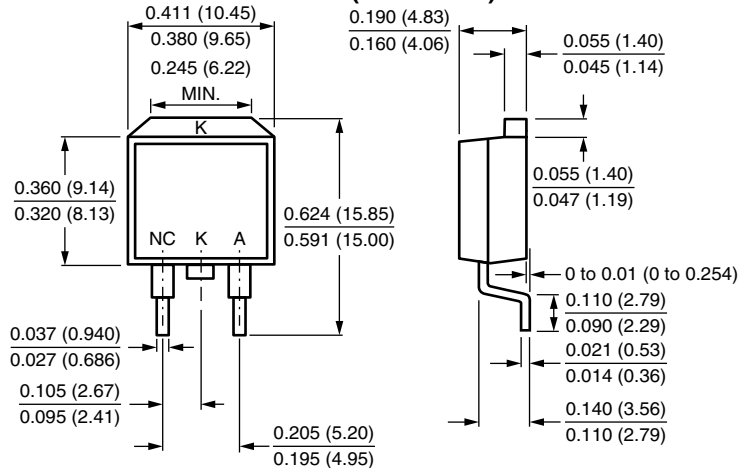
ITO-220AB



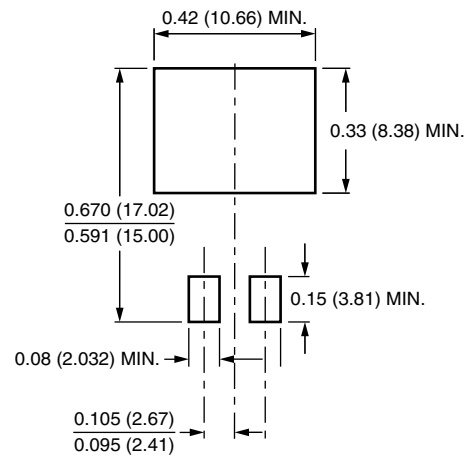
TO-262AA



D²PAK (TO-263AB)



Mounting Pad Layout





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