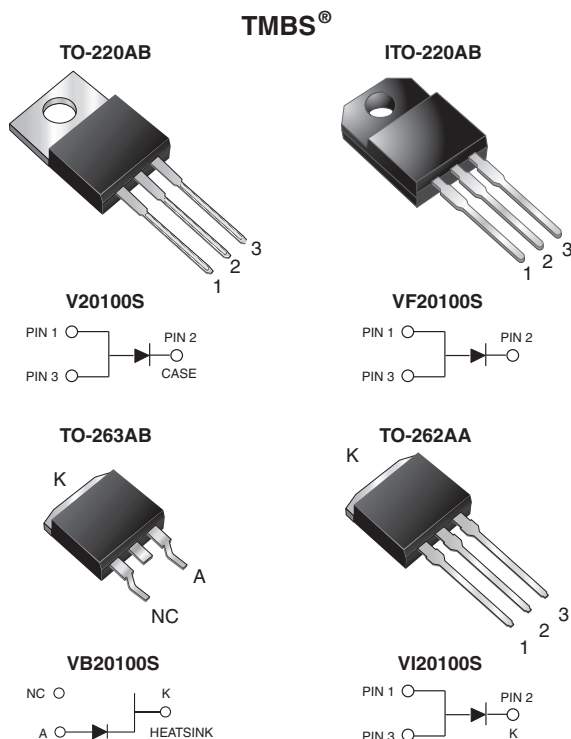




High Voltage Trench MOS Barrier Schottky Rectifier

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 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
HALOGEN
FREE

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, TO-263AB and TO-262AA

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

V20100S-M3 and VF20100-M3 suffix meets JESD 201 class 1A whisker test

VB20100S-M3 and VI20100-M3 suffix meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs max.

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
$T_J \text{ max.}$	150 °C
Package	TO-220AB, ITO-220AB, TO-263AB, TO-262AA
Diode variation	Single die

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 $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	V20100S	VF20100S	VB20100S	VI20100S	UNIT
Typical thermal resistance	$R_{\theta JC}$	2.0	4.0	2.0	2.0	$^{\circ}\text{C/W}$

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	V20100S-M3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20100S-M3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20100S-M3/4W	1.37	4W	50/tube	Tube
TO-263AB	VB20100S-M3/8W	1.37	8W	800/reel	Tape and reel
TO-262AA	VI20100S-M3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

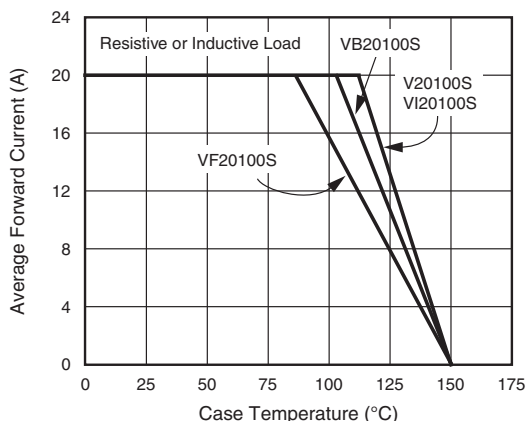


Fig. 1 - Maximum Forward Current Derating Curve

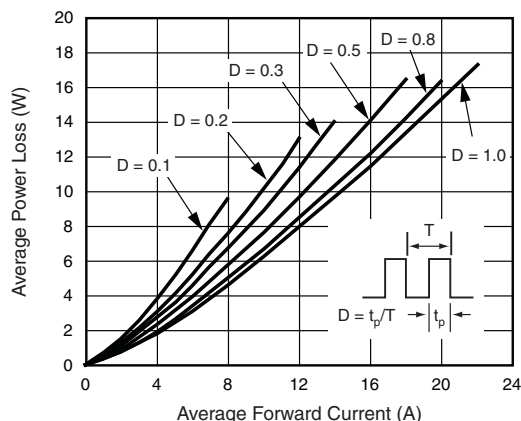


Fig. 2 - Forward Power Loss Characteristics

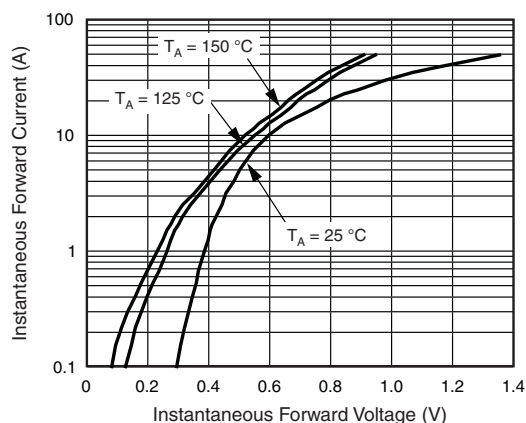


Fig. 3 - Typical Instantaneous Forward Characteristics

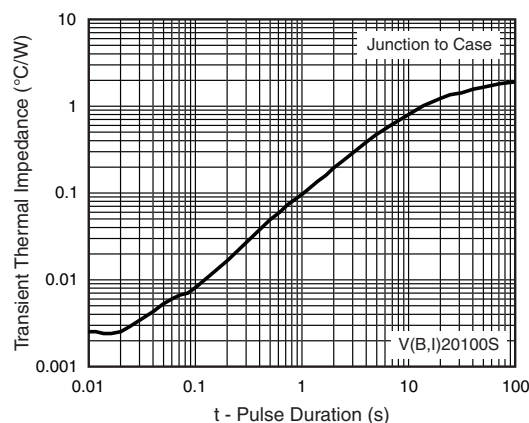


Fig. 6 - Typical Transient Thermal Impedance

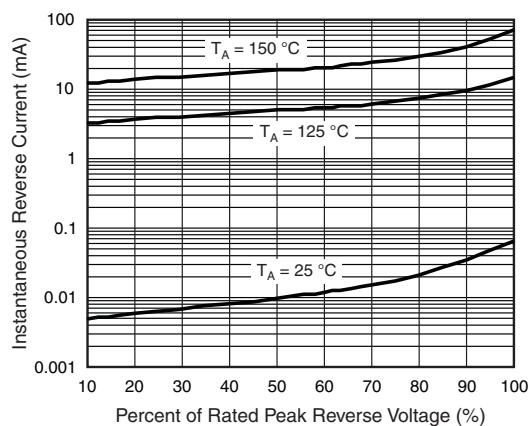


Fig. 4 - Typical Reverse Characteristics

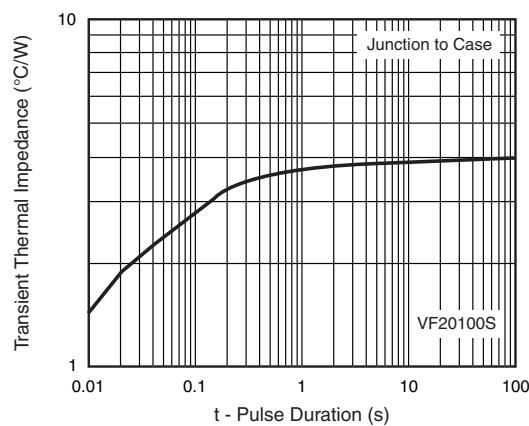


Fig. 7 - Typical Transient Thermal Impedance

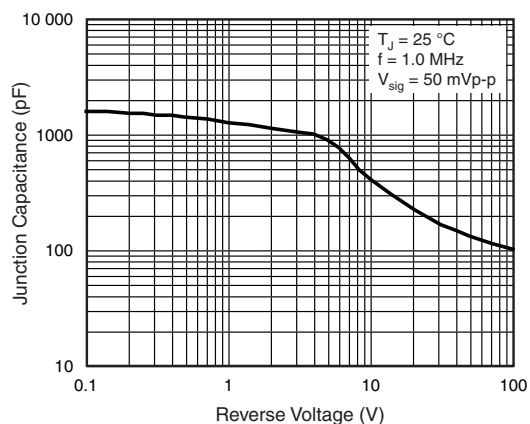
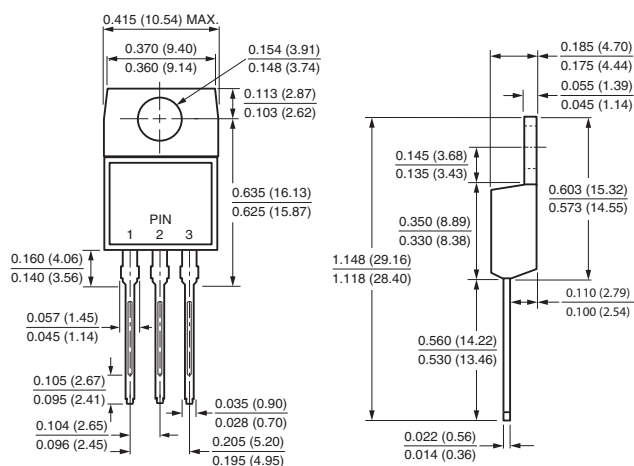


Fig. 5 - Typical Junction Capacitance

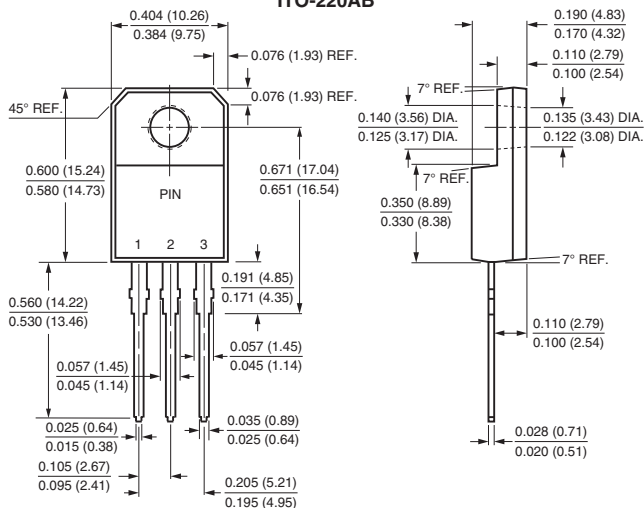


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

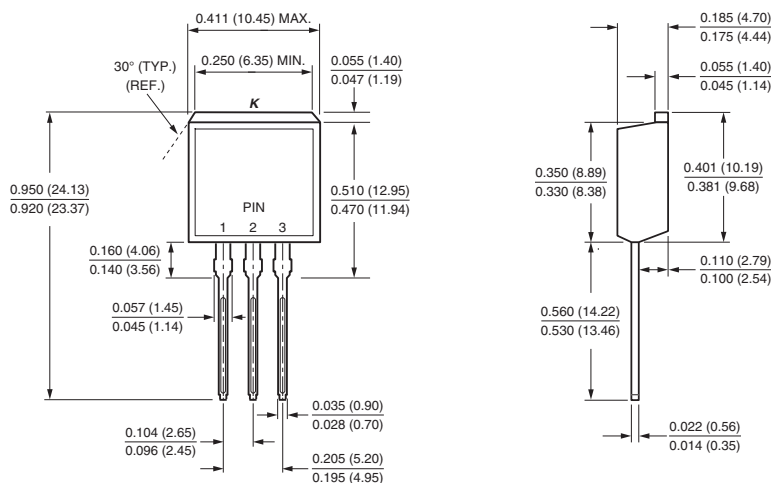
TO-220AB



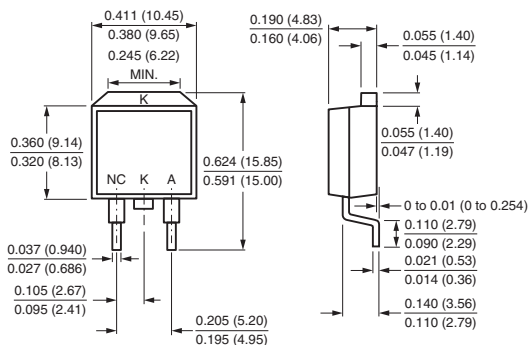
ITO-220AB



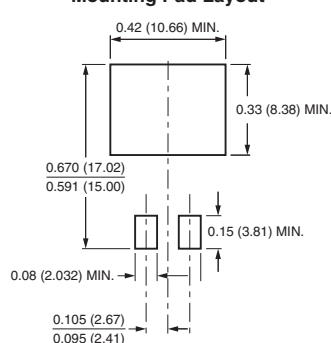
TO-262AA



TO-263AB



Mounting Pad Layout





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