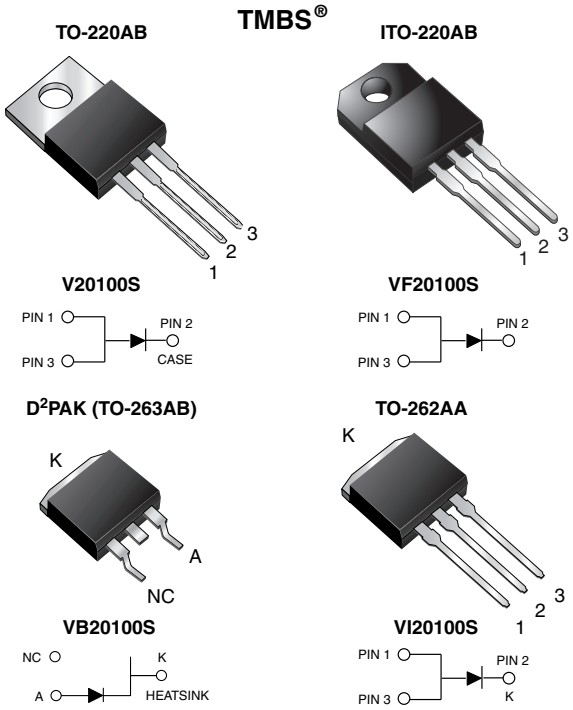
V20100S-E3, VF20100S-E3, VB20100S-E3, VI20100S-E3

High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.446 V at I_F = 5 A

TMBS®



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

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	100 V
I_{FSM}	250 A
V_F at I_F = 20 A	0.69 V
T_J max.	150 °C
Package	TO-220AB, ITO-220AB, D²PAK (TO-263AB), TO-262AA
Circuit configuration	Single

MAXIMUM RATINGS (T_A = 25 °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 °C, L = 60 mH	E_{AS}	210				mJ
Peak repetitive reverse current at t_p = 2 µs, 1 kHz, T_J = 38 °C ± 2 °C	I_{RRM}	1.0				A
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 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	$R_{\theta JC}$	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	V20100S-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20100S-E3/4W	1.75	4W	50/tube	Tube
D^2PAK (TO-263AB)	VB20100S-E3/4W	1.37	4W	50/tube	Tube
D^2PAK (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)

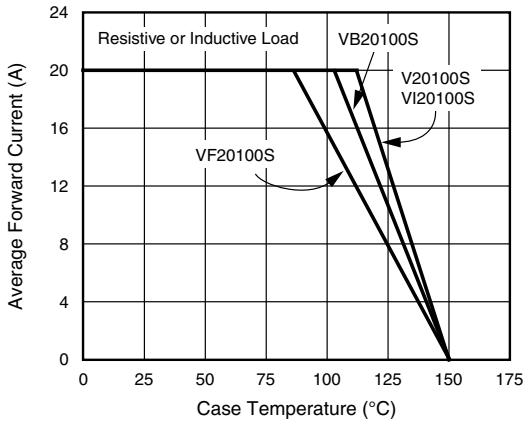


Fig. 1 - Maximum Forward Current Derating Curve

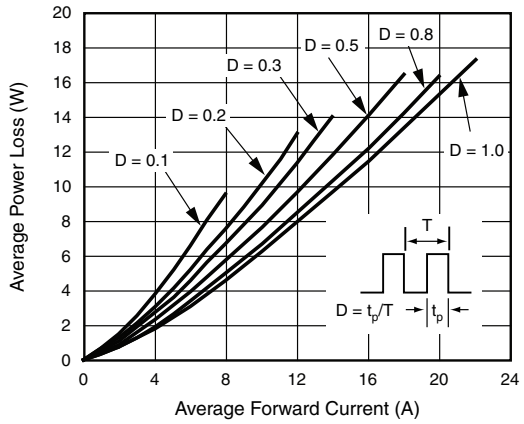


Fig. 2 - Forward Power Loss Characteristics

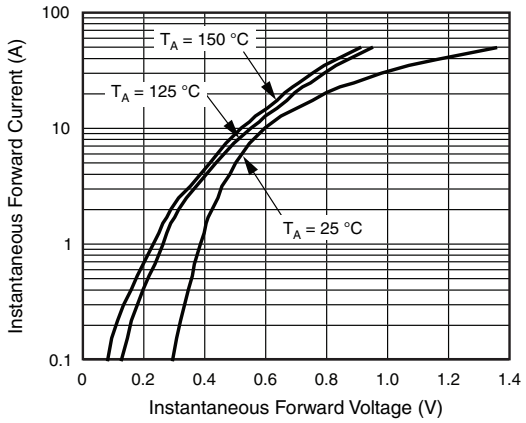


Fig. 3 - Typical Instantaneous Forward Characteristics

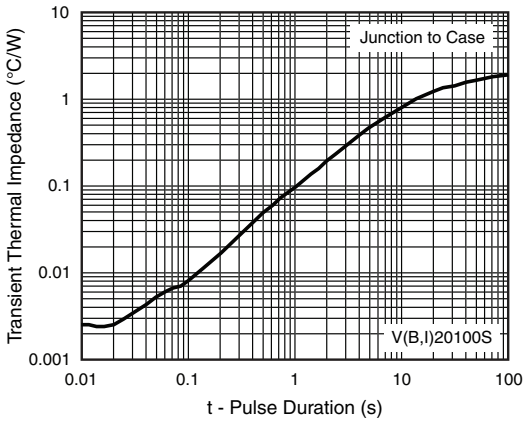


Fig. 6 - Typical Transient Thermal Impedance

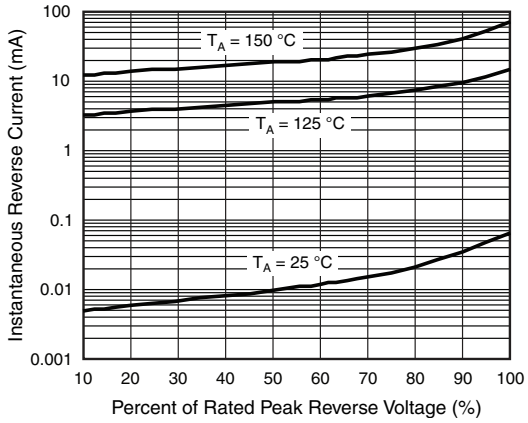


Fig. 4 - Typical Reverse Characteristics

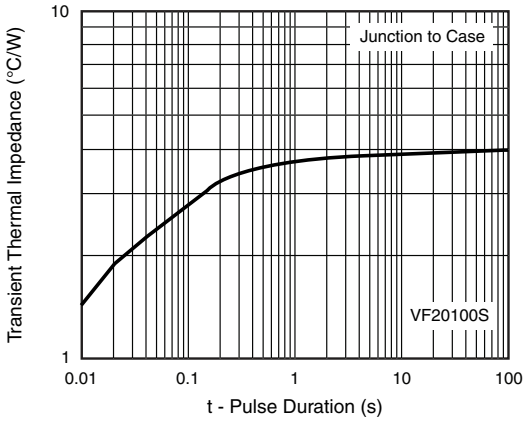


Fig. 7 - Typical Transient Thermal Impedance

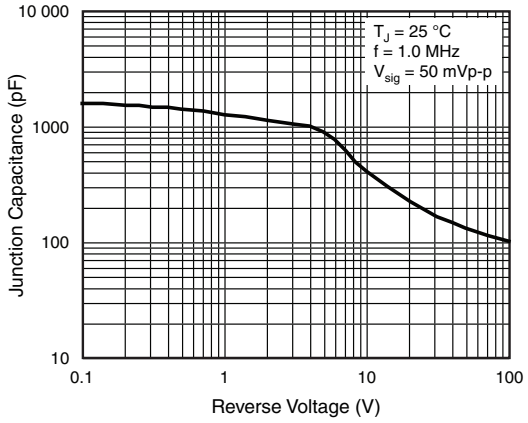
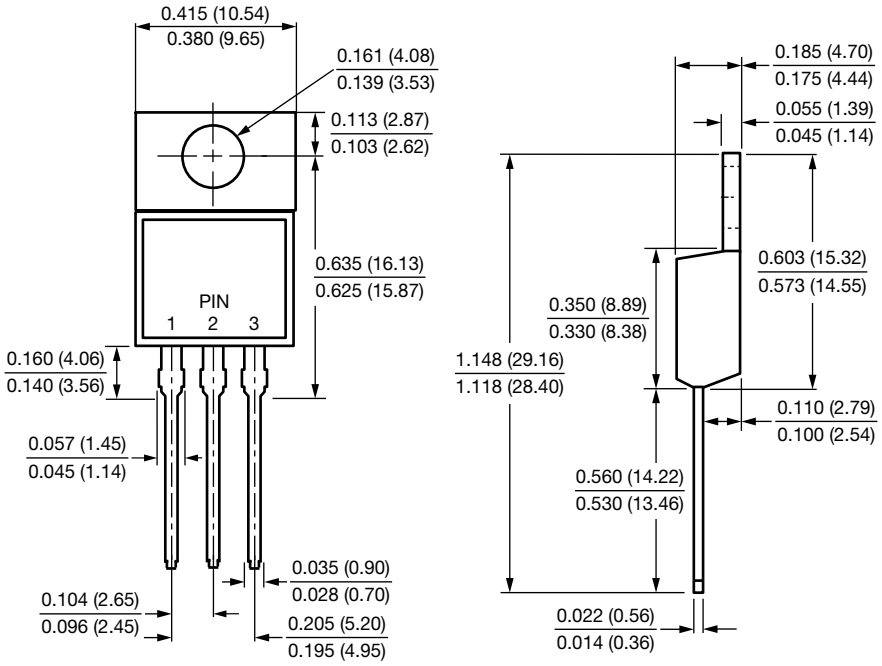


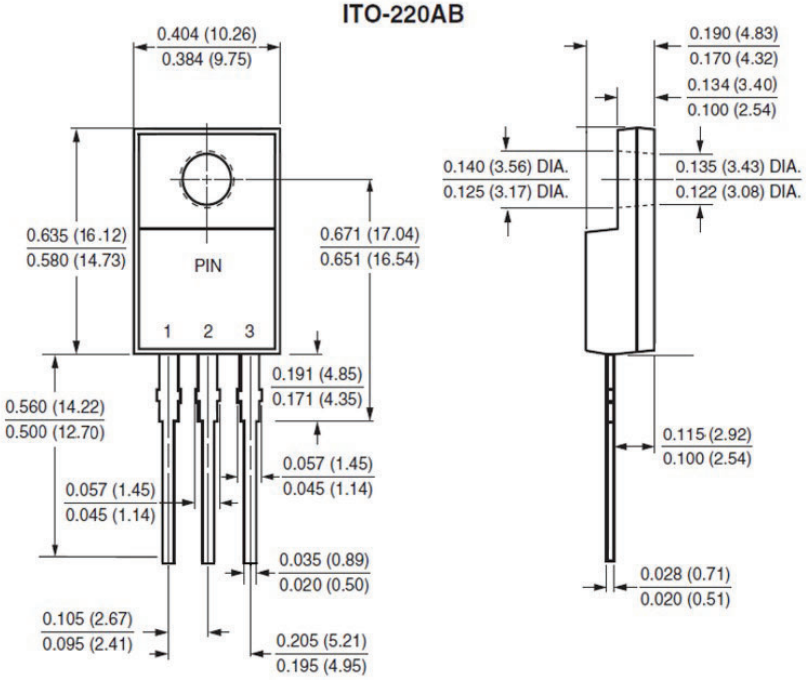
Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

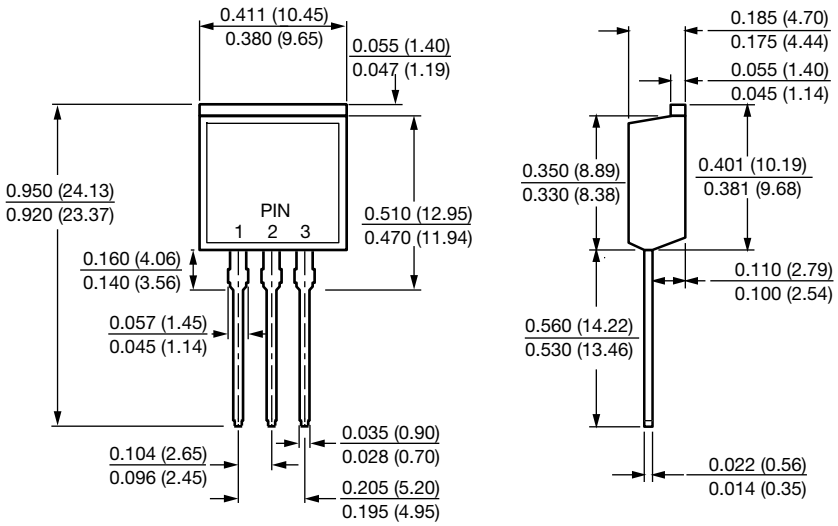
TO-220AB



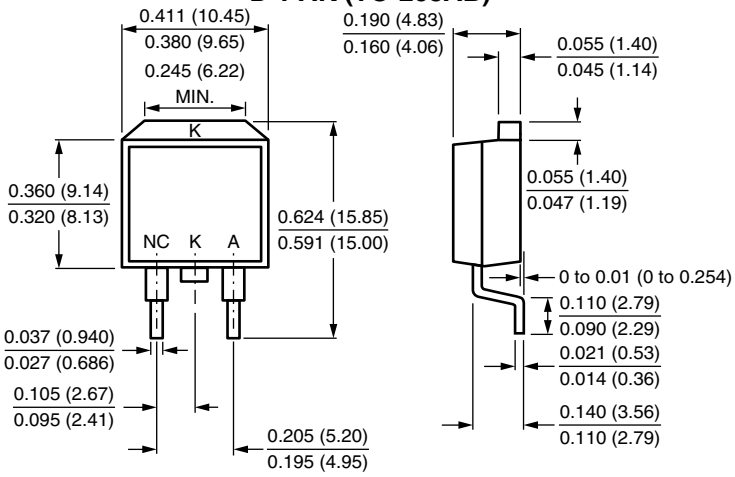
ITO-220AB



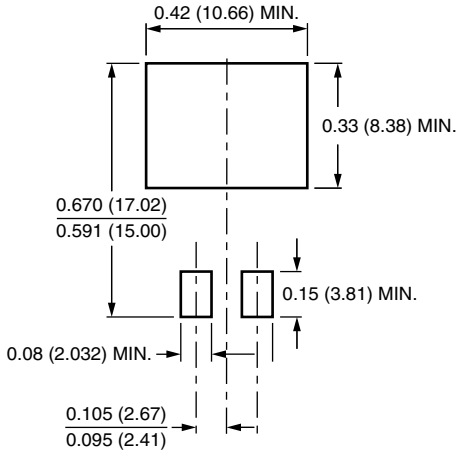
TO-262AA



D²PAK (TO-263AB)



Mounting Pad Layout



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