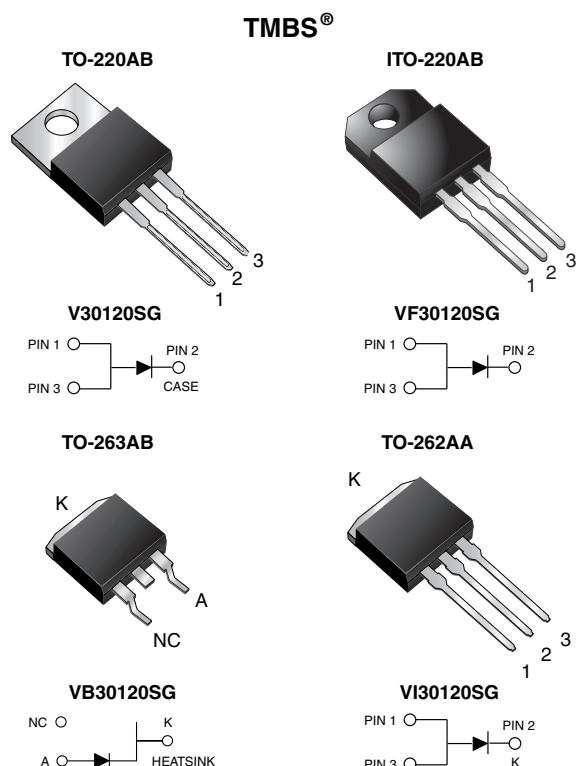




High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.47\text{ V}$ at $I_F = 5\text{ A}$



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- 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

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-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.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	30 A
V_{RRM}	120 V
I_{FSM}	220 A
V_F at $I_F = 30\text{ A}$	0.81 V
T_J max.	150 °C
Package	TO-220AB, ITO-220AB, TO-263AB, TO-262AA
Diode variations	Single die

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)

PARAMETER	SYMBOL	V30120SG	VF30120SG	VB30120SG	VI30120SG	UNIT
Max. repetitive peak reverse voltage	V_{RRM}	120				V
Max. average forward rectified current (fig. 1)	$I_{F(AV)}$	30				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	220				A
Non-repetitive avalanche energy at $T_J = 25\text{ °C}$, $L = 60\text{ mH}$	E_{AS}	175				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}	0.5				A
Voltage rate of change (rated V_R)	dV/dt	10 000				V/ μs
Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1\text{ min}$	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 = 1.0 mA	T _A = 25 °C	V _{BR}	120 (min.)	-	V
Instantaneous forward voltage ⁽¹⁾	I _F = 5 A	T _A = 25 °C	V _F	0.54	-	V
	I _F = 15 A			0.80	-	
	I _F = 30 A			1.16	1.28	
	I _F = 5 A	T _A = 125 °C		0.47	-	
	I _F = 15 A			0.66	-	
	I _F = 30 A			0.81	0.90	
Reverse current ⁽²⁾	V _R = 90 V	T _A = 25 °C	I _R	13	-	μA
		T _A = 125 °C		13	-	mA
	V _R = 120 V	T _A = 25 °C		-	500	μA
		T _A = 125 °C		23	55	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	V30120SG	VF30120SG	VB30120SG	VI30120SG	UNIT
Typical thermal resistance	$R_{\theta JC}$	1.6	4.0	1.6	1.6	$^{\circ}\text{C/W}$

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	V30120SG-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF30120SG-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB30120SG-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB30120SG-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI30120SG-E3/4W	1.45	4W	50/tube	Tube

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

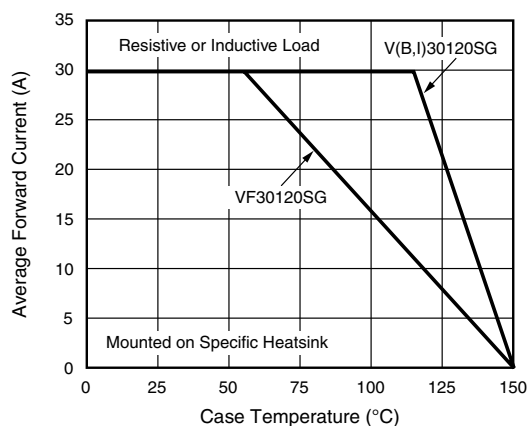


Fig. 1 - Forward Current Derating Curve

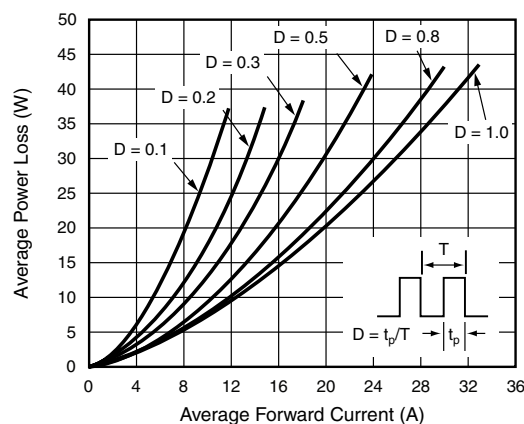


Fig. 2 - Forward Power Loss Characteristics

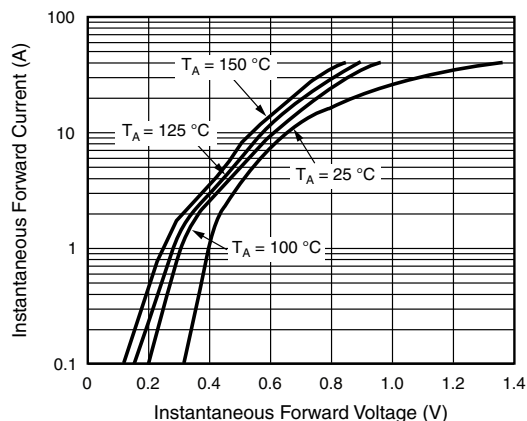


Fig. 3 - Typical Instantaneous Forward Characteristics

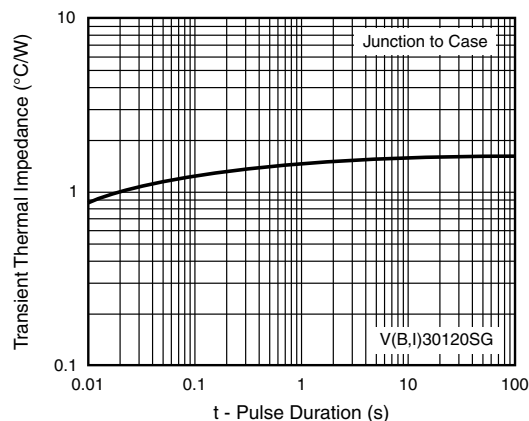


Fig. 6 - Typical Transient Thermal Impedance

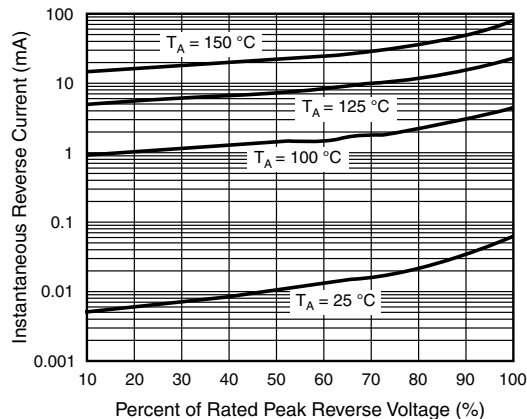


Fig. 4 - Typical Reverse Characteristics

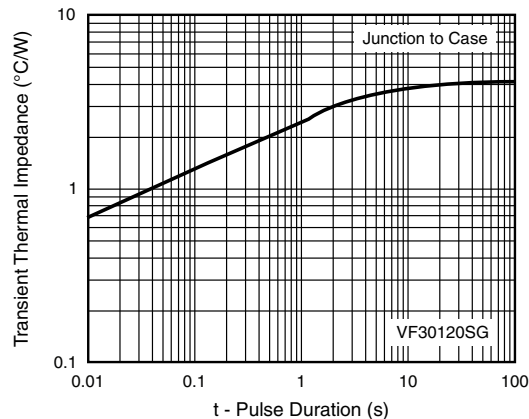


Fig. 7 - Typical Transient Thermal Impedance

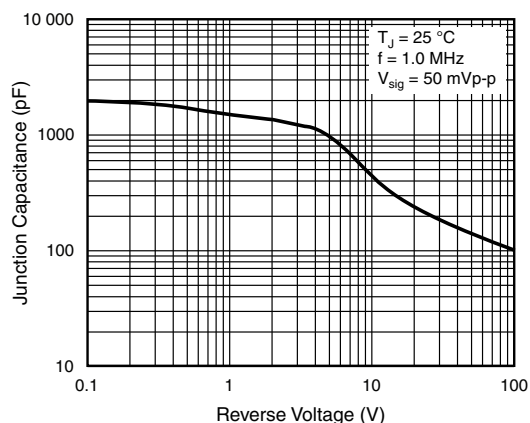
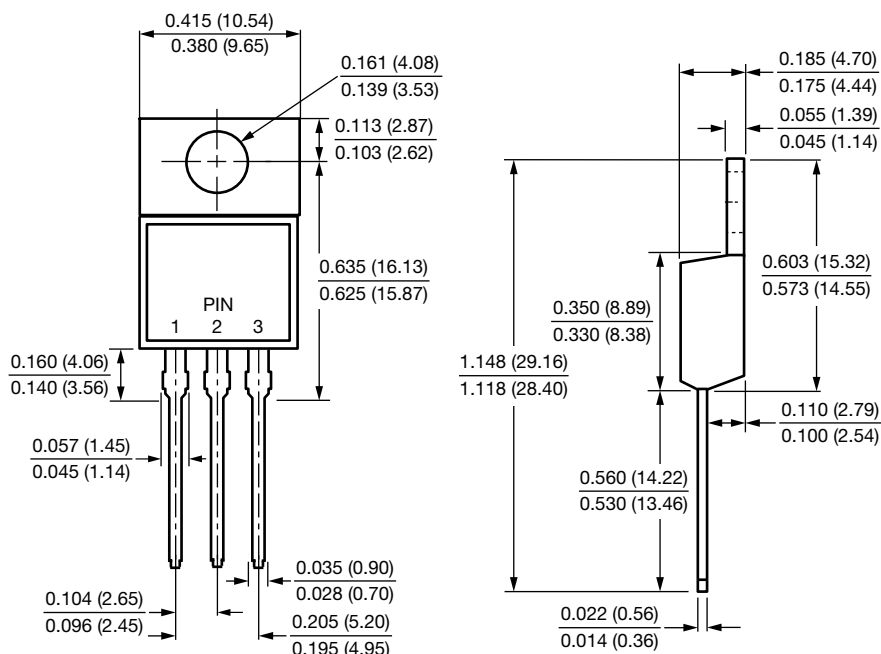


Fig. 5 - Typical Junction Capacitance

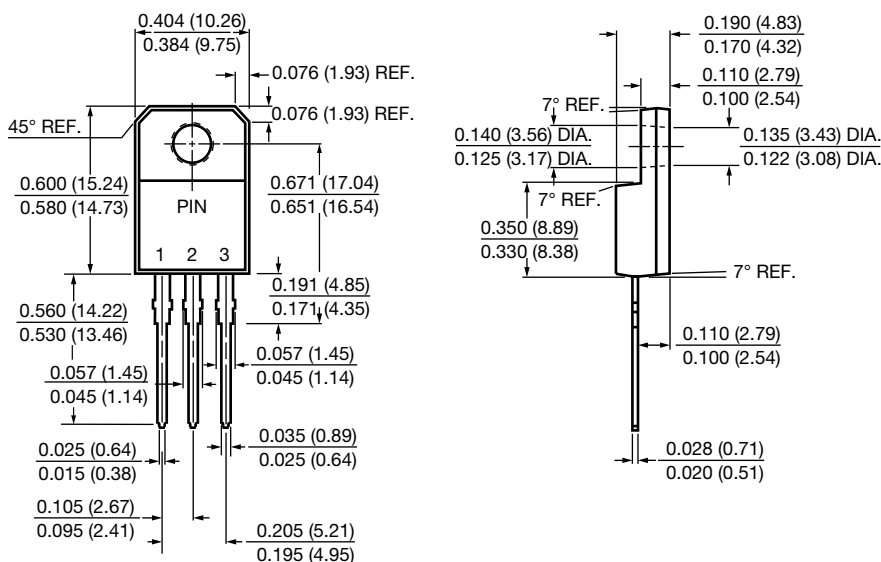


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB

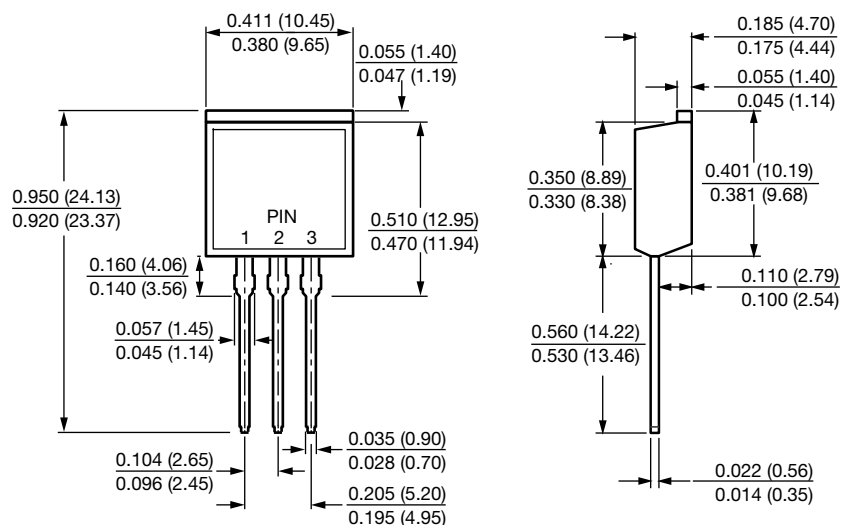


ITO-220AB

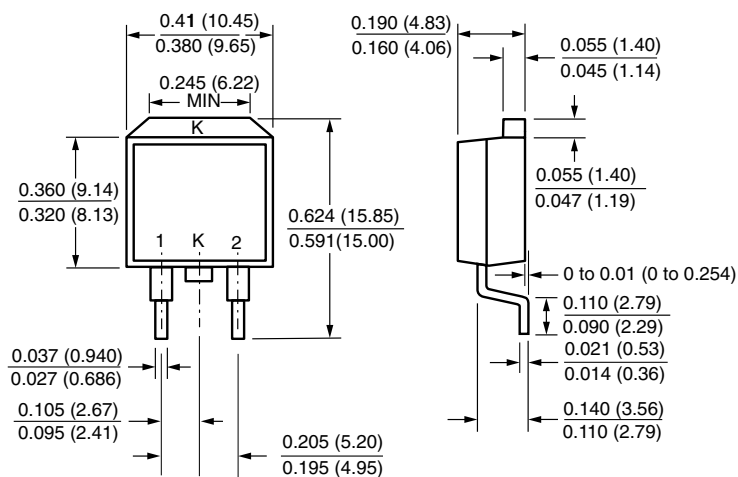




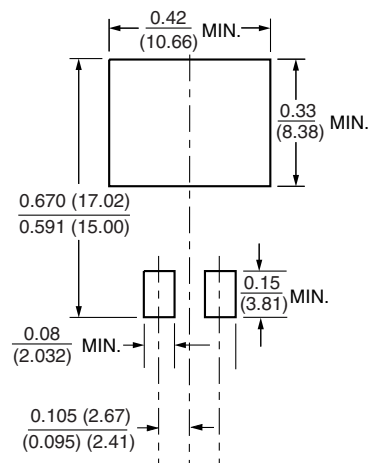
TO-262AA



TO-263AB



Mounting Pad Layout





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