V30120SG, VF30120SG, VB30120SG, VI30120SG

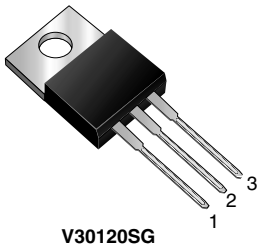
Vishay General Semiconductor

High-Voltage Trench MOS Barrier Schottky Rectifier

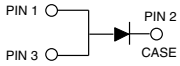
Ultra Low V_F = 0.47 V at I_F = 5 A

TMBS®

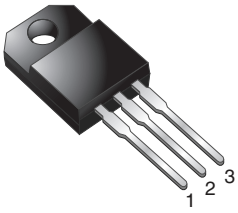
TO-220AB



V30120SG



ITO-220AB



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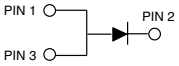
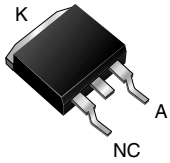
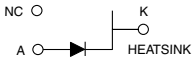


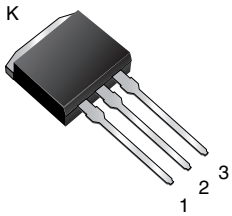
TO-263AB



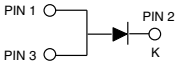
VB30120SG



TO-262AA



VI30120SG



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)
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency converters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-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 maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	120 V
I_{FSM}	220 A
V_F at I_F = 30 A	0.81 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V30120SG	VF30120SG	VB30120SG	VI30120SG	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	120				V
Maximum 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 °C, L = 60 mH	E_{AS}	175				mJ
Peak repetitive reverse current at t_p = 2 µs, 1 kHz, T_J = 38 °C ± 2 °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 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

For technical questions within your region, please contact one of the following:
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V30120SG, VF30120SG, VB30120SG, VI30120SG

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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 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 25 °C	V_F	0.54 0.80 1.16	- - 1.28	V
	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 125 °C		0.47 0.66 0.81	- - 0.90	
Reverse current (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	13 13	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		- 23	500 55	µA 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**	**V30120SG**	**VF30120SG**	**VB30120SG**	**VI30120SG**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	1.6	4.0	1.6	1.6	°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 °C unless otherwise noted)

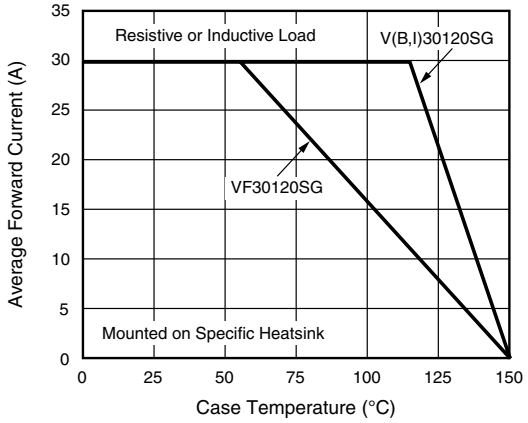

Figure 1. Forward Current Derating Curve

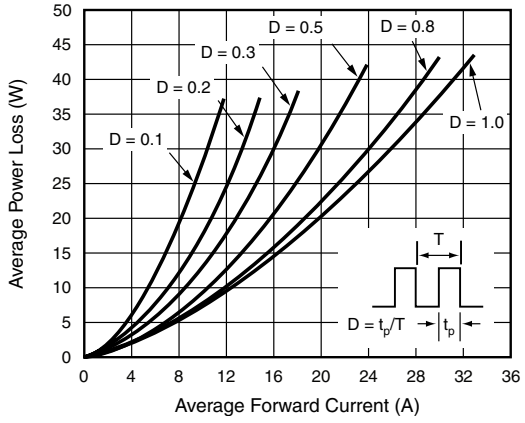

Figure 2. Forward Power Loss Characteristics

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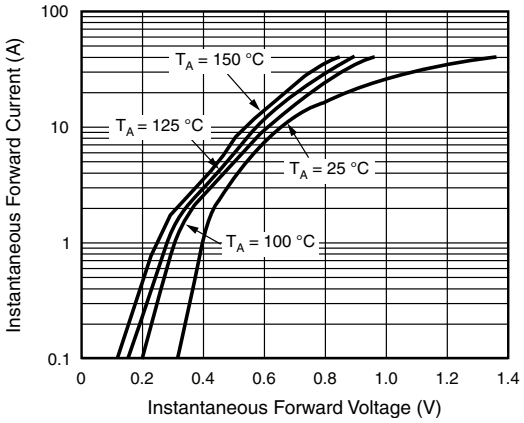


Figure 3. Typical Instantaneous Forward Characteristics

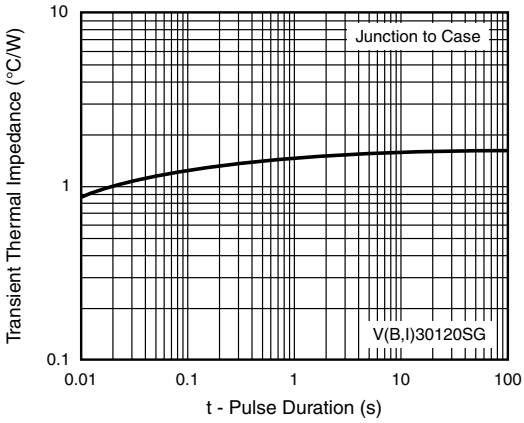


Figure 6. Typical Transient Thermal Impedance

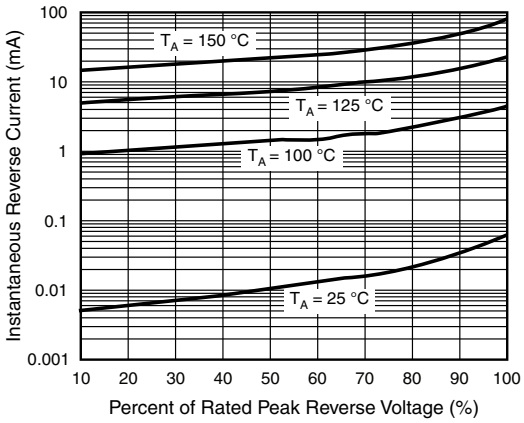


Figure 4. Typical Reverse Characteristics

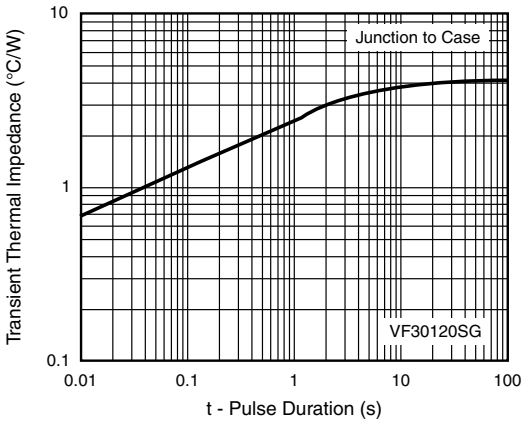


Figure 7. Typical Transient Thermal Impedance

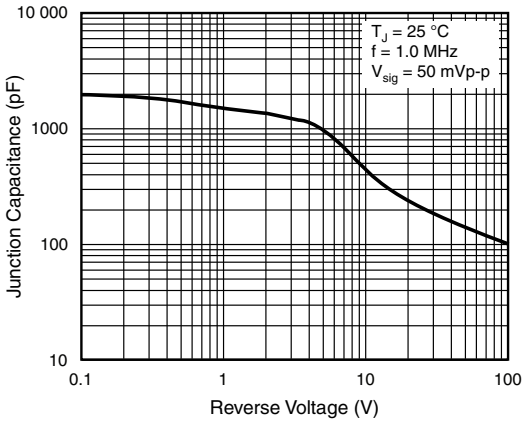
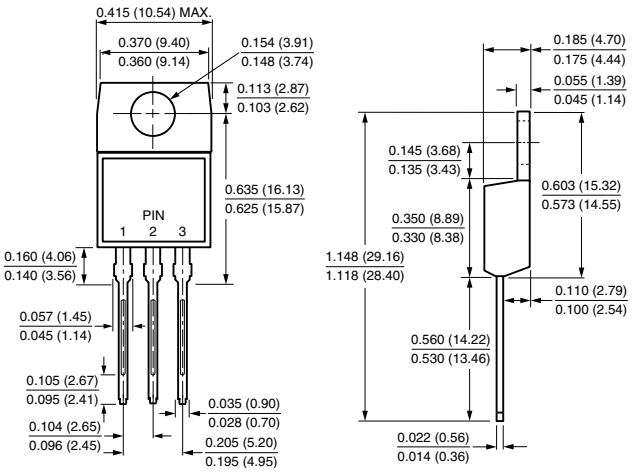


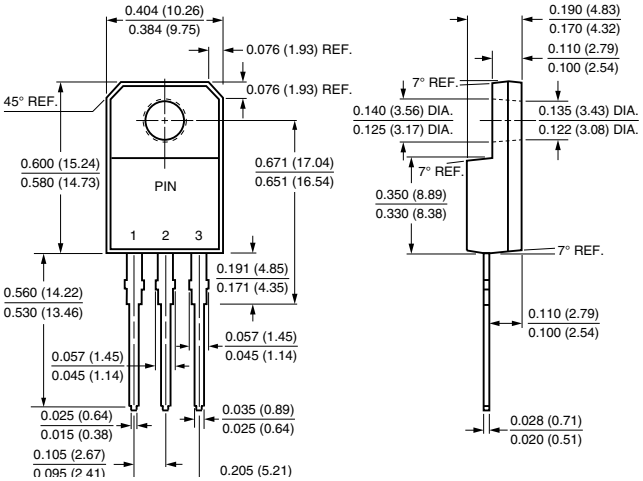
Figure 5. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



ITO-220AB



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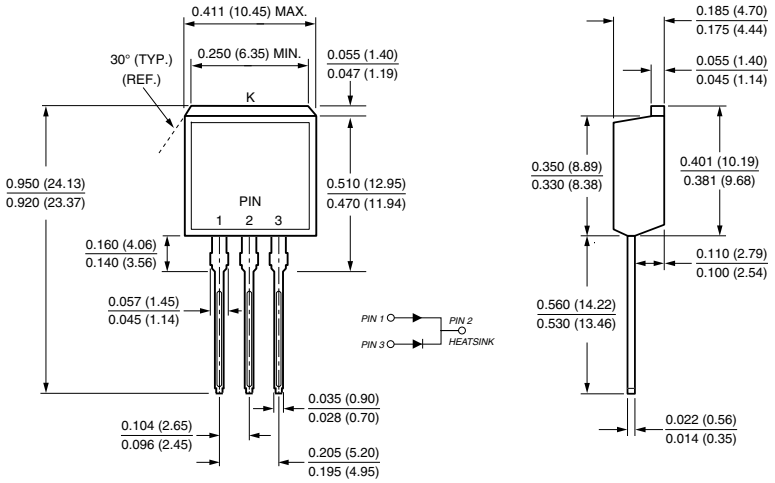
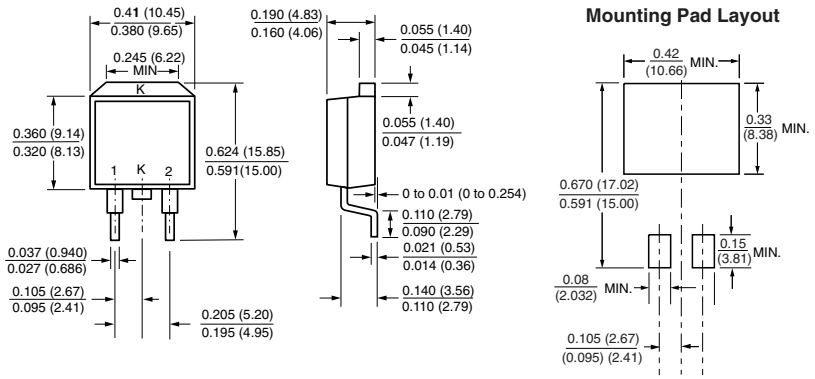


TO-263AB



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