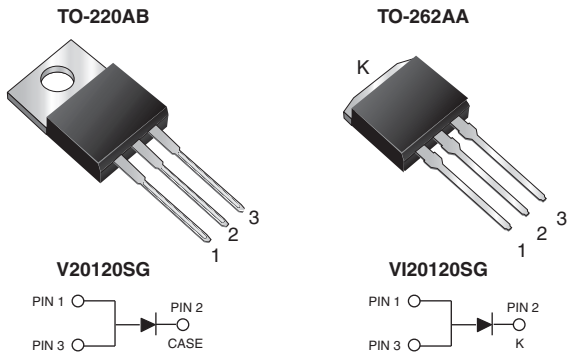
V20120SG, VI20120SG

Vishay General Semiconductor

High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.54 V at I_F = 5 A

TMBS®



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder bath temperature 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**

RoHS COMPLIANT
HALOGEN FREE

TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	120 V
I_{FSM}	150 A
V_F at I_F = 20 A	0.78 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB and TO-262AA
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS compliant, and commercial grade
Base P/NHM3 - halogen-free, RoHS compliant, and commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

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

PARAMETER	SYMBOL	V20120SG	VI20120SG	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	120		V
Maximum 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}	150		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150		°C

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 5 A	T_A = 25 °C	V_F (1)	0.62	-	V
	I_F = 10 A			0.81	-	
	I_F = 20 A			1.20	1.33	
	I_F = 5 A	T_A = 125 °C		0.54	-	
	I_F = 10 A			0.65	-	
	I_F = 20 A			0.78	0.88	
Reverse current	V_R = 90 V	T_A = 25 °C	I_R (2)	10	-	µA
		T_A = 125 °C		7	-	mA
	V_R = 120 V	T_A = 25 °C		-	250	µA
		T_A = 125 °C		12	25	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**	**V20120SG**	**VI20120SG**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.2		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20120SG-M3/4W	1.88	4W	50/tube	Tube
TO-262AA	VI20120SG-M3/4W	1.45	4W	50/tube	Tube
TO-220AB	V20120SGHM3/4W (1)	1.88	4W	50/tube	Tube
TO-262AA	VI20120SGHM3/4W (1)	1.45	4W	50/tube	Tube

Note

(1) AEC-Q101 qualified

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RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

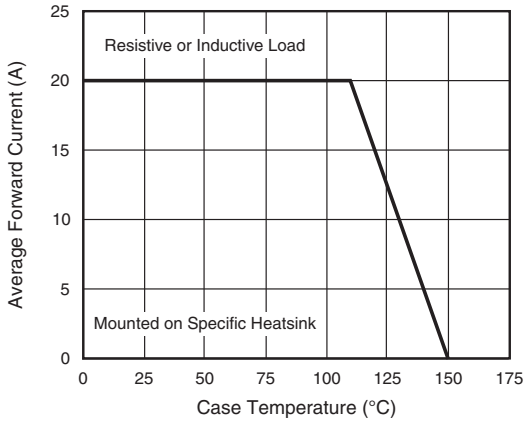

Fig. 1 - Maximum Forward Current Derating Curve

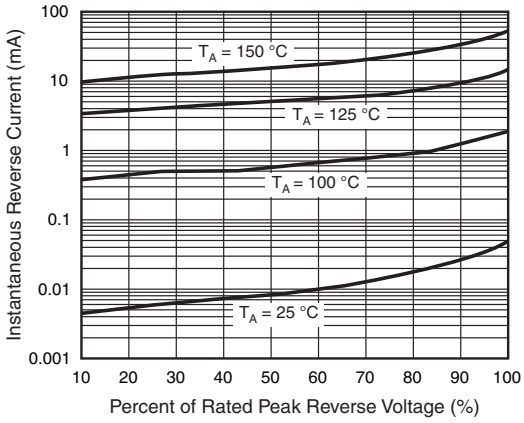

Fig. 4 - Typical Reverse Characteristics

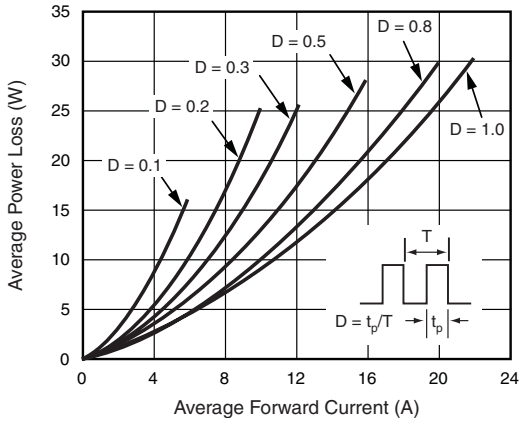

Fig. 2 - Forward Power Dissipation Characteristics

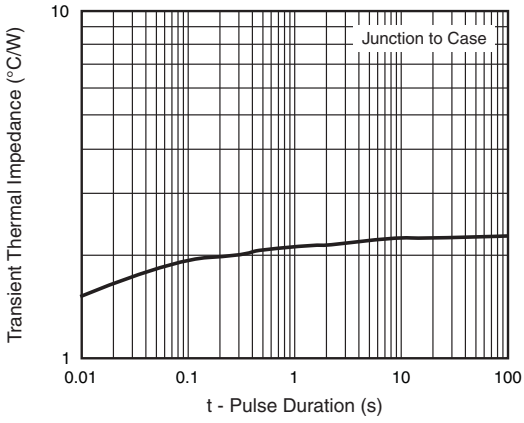

Fig. 5 - Typical Transient Thermal Impedance

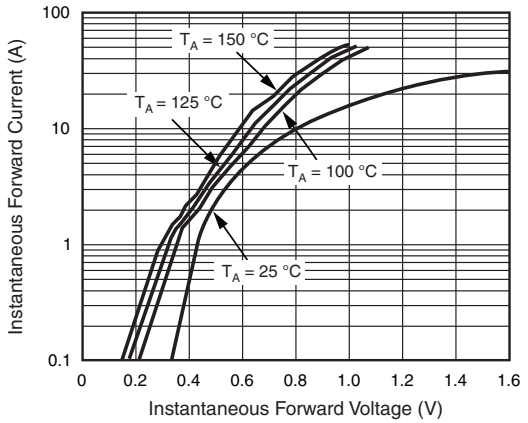

Fig. 3 - Typical Instantaneous Forward Characteristics

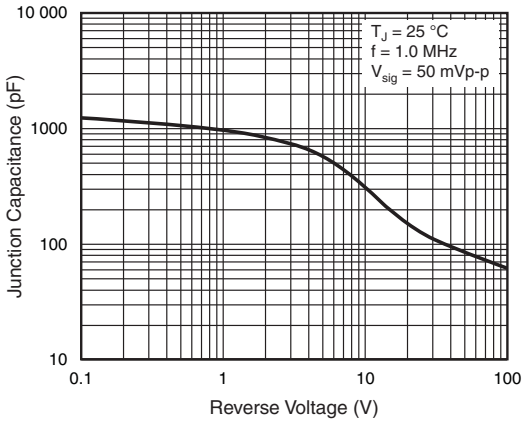

Fig. 6 - Typical Junction Capacitance

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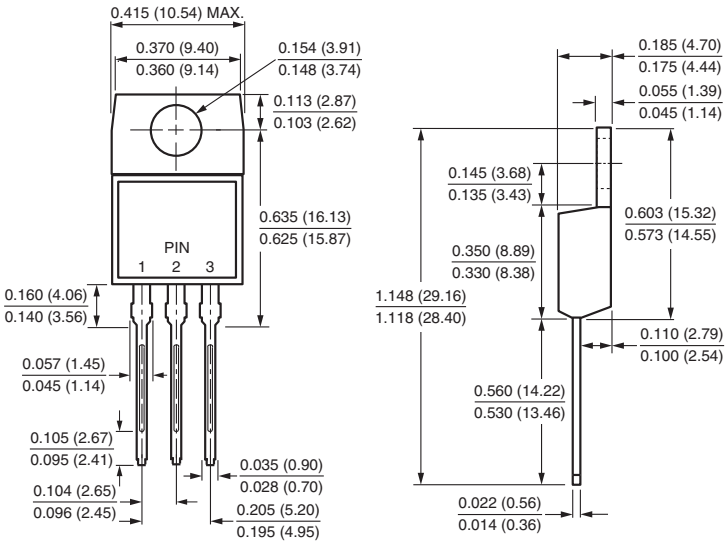
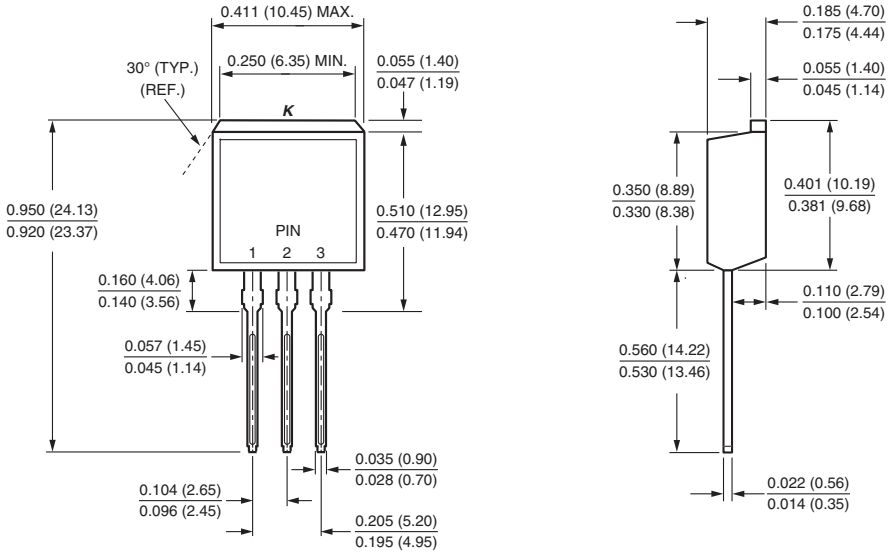
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



TO-262AA



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