

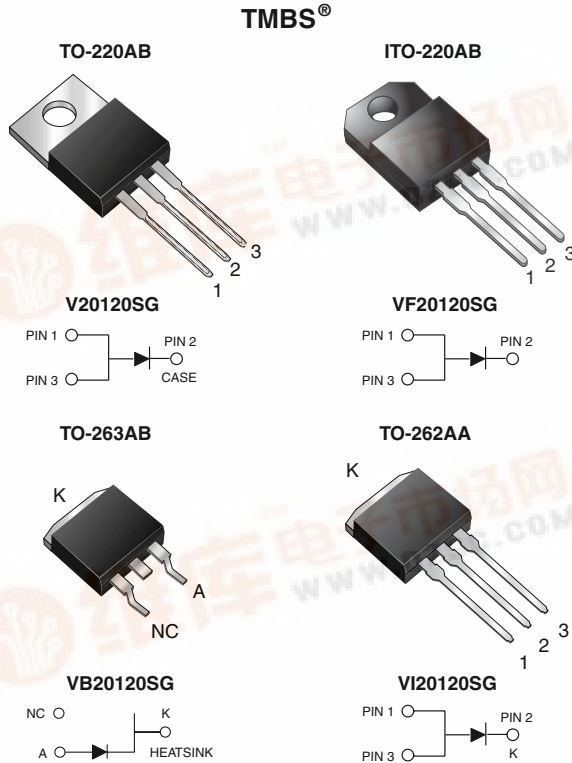


V20120SG, VF20120SG, VB20120SG & VI20120SG

Vishay General Semiconductor

High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.54 \text{ V}$ 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 dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, 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

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS

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

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

PARAMETER	SYMBOL	V20120SG	VF20120SG	VB20120SG	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
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



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ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	$I_R = 1.0\text{ mA}$	$T_A = 25\text{ }^{\circ}\text{C}$	V_{BR}	120 (minimum)	-	
Instantaneous forward voltage ⁽¹⁾	$I_F = 5\text{ A}$	$T_A = 25\text{ }^{\circ}\text{C}$	V_F	0.62	-	V
	$I_F = 10\text{ A}$			0.81	-	
	$I_F = 20\text{ A}$			1.20	1.33	
	$I_F = 5\text{ A}$	$T_A = 125\text{ }^{\circ}\text{C}$		0.54	-	
Reverse current ⁽²⁾	$V_R = 90\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$	I_R	10	-	μA
		$T_A = 125\text{ }^{\circ}\text{C}$		7	-	mA
	$V_R = 120\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$		-	250	μA
		$T_A = 125\text{ }^{\circ}\text{C}$		12	25	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	V20120SG	VF20120SG	VB20120SG	VI20120SG	UNIT
Typical thermal resistance	$R_{\theta JC}$	2.2	4.2	2.2	2.2	$^{\circ}\text{C/W}$

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	V20120SG-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20120SG-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20120SG-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	VB20120SG-E3/8W	1.38	8W	800/reel	Tape and reel
TO-262AA	VI20120SG-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

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

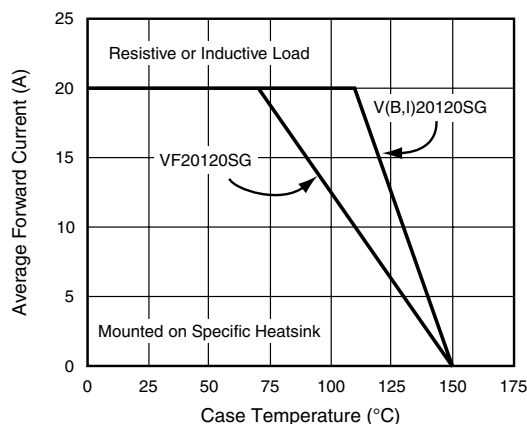


Figure 1. Forward Current Derating Curve

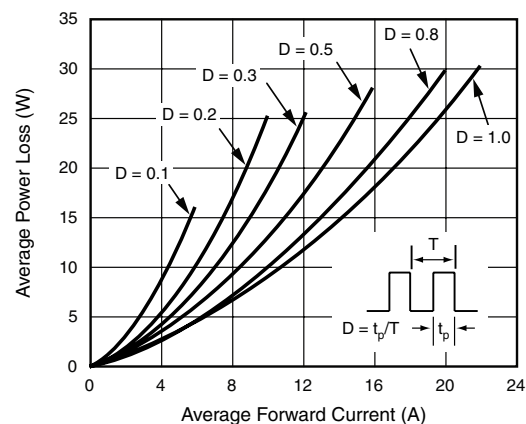


Figure 2. Forward Power Loss Characteristics



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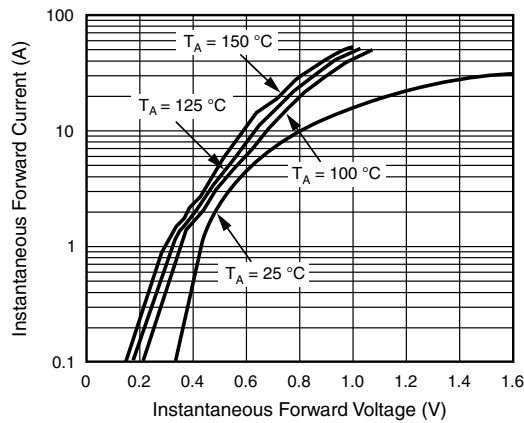


Figure 3. Typical Instantaneous Forward Characteristics

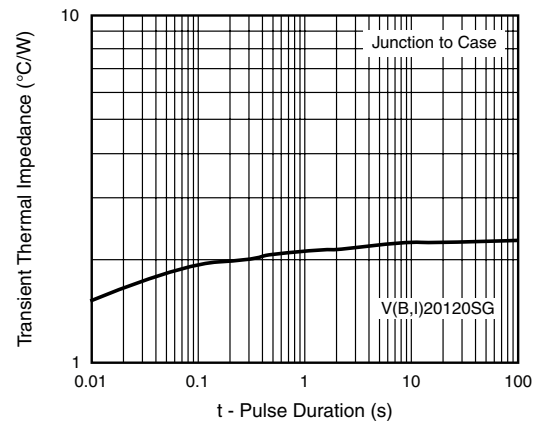


Figure 6. Typical Transient Thermal Impedance

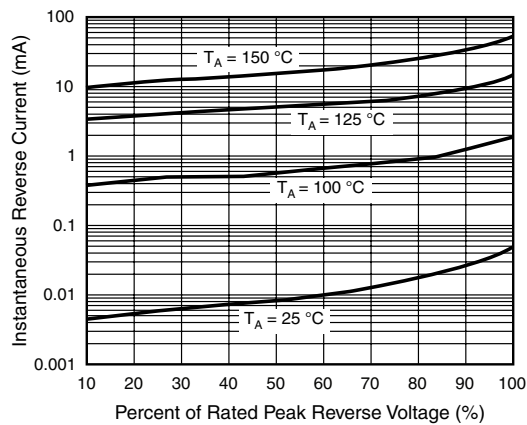


Figure 4. Typical Reverse Characteristics

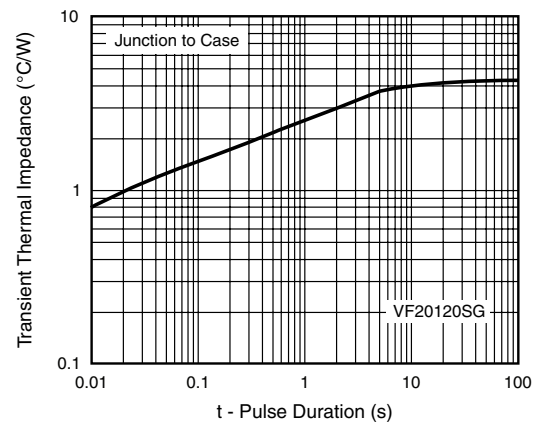


Figure 7. Typical Transient Thermal Impedance

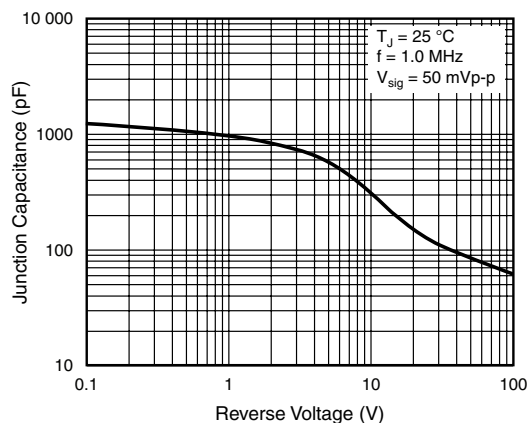


Figure 5. Typical Junction Capacitance

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TO-220AB

0.415 (10.54) MAX.
 0.370 (9.40)
 0.360 (9.14)
 0.154 (3.91)
 0.148 (3.74)
 0.113 (2.87)
 0.103 (2.62)
 0.635 (16.13)
 0.625 (15.87)
 0.160 (4.06)
 0.140 (3.56)
 0.057 (1.45)
 0.045 (1.14)
 0.105 (2.67)
 0.095 (2.41)
 0.104 (2.65)
 0.096 (2.45)
 0.035 (0.90)
 0.028 (0.70)
 0.205 (5.20)
 0.195 (4.95)

ITO-220AB

0.404 (10.26)
 0.384 (9.75)
 0.076 (1.93) REF.
 0.076 (1.93) REF.
 45° REF.
 0.600 (15.24)
 0.580 (14.73)
 0.671 (17.04)
 0.651 (16.54)
 0.191 (4.85)
 0.171 (4.35)
 0.057 (1.45)
 0.045 (1.14)
 0.025 (0.64)
 0.015 (0.38)
 0.105 (2.67)
 0.095 (2.41)
 0.035 (0.89)
 0.025 (0.64)
 0.205 (5.21)
 0.195 (4.95)
 0.190 (4.83)
 0.170 (4.32)
 0.110 (2.79)
 0.100 (2.54)
 0.135 (3.43) DIA.
 0.122 (3.08) DIA.
 0.140 (3.56) DIA.
 0.125 (3.17) DIA.
 7° REF.
 0.350 (8.89)
 0.330 (8.38)
 0.110 (2.79)
 0.100 (2.54)
 0.028 (0.71)
 0.020 (0.51)

TO-262AA

0.411 (10.45) MAX.
 0.250 (6.35) MIN.
 30° (TYP.) (REF.)
 0.055 (1.40)
 0.047 (1.19)
 0.950 (24.13)
 0.920 (23.37)
 0.510 (12.95)
 0.470 (11.94)
 0.160 (4.06)
 0.140 (3.56)
 0.057 (1.45)
 0.045 (1.14)
 0.104 (2.65)
 0.096 (2.45)
 0.035 (0.90)
 0.028 (0.70)
 0.205 (5.20)
 0.195 (4.95)

TO-263AB

0.411 (10.45)
 0.380 (9.65)
 0.245 (6.22)
 MIN.
 0.360 (9.14)
 0.320 (8.13)
 0.624 (15.85)
 0.591 (15.00)
 0.037 (0.940)
 0.027 (0.686)
 0.105 (2.67)
 0.095 (2.41)
 0.205 (5.20)
 0.195 (4.95)
 0.190 (4.83)
 0.160 (4.06)
 0.055 (1.40)
 0.045 (1.14)
 0.055 (1.40)
 0.047 (1.19)
 0.110 (2.79)
 0.090 (2.29)
 0.021 (0.53)
 0.014 (0.36)
 0.140 (3.56)
 0.110 (2.79)

Mounting Pad Layout

0.42 (10.66) MIN.
 0.33 (8.38) MIN.
 0.670 (17.02)
 0.591 (15.00)
 0.15 (3.81) MIN.
 0.08 (2.032) MIN.
 0.105 (2.67)
 0.095 (2.41)



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