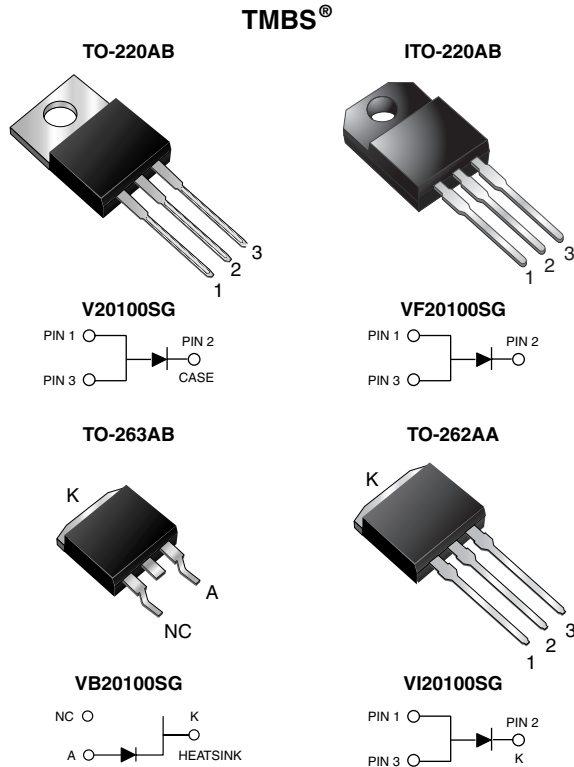


## High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.50\text{ V}$  at  $I_F = 5\text{ A}$



### 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 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

$I_{F(AV)}$	20 A
$V_{RRM}$	100 V
$I_{FSM}$	150 A
$V_F$ at $I_F = 20\text{ A}$	0.75 V
$T_J$ max.	150 °C

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

PARAMETER	SYMBOL	V20100SG	VF20100SG	VB20100SG	VI20100SG	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$			100		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
Non-repetitive avalanche energy at $T_J = 25\text{ °C}$ , $L = 60\text{ mH}$	$E_{AS}$		150			mJ
Peak repetitive reverse current at $t_p = 2\text{ }\mu\text{s}$ , 1 kHz, $T_J = 38\text{ °C} \pm 2\text{ °C}$	$I_{RRM}$		1.0			A
Voltage rate of change (rated $V_R$ )	$dV/dt$		10 000			V/ $\mu\text{s}$
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 <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	I <sub>R</sub> = 10 mA	T <sub>A</sub> = 25 °C	V <sub>BR</sub>	105 (minimum)	-	V
Instantaneous forward voltage	I <sub>F</sub> = 5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.55	-	V
	I <sub>F</sub> = 10 A			0.66	-	
	I <sub>F</sub> = 20 A			0.91	1.07	
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.50	-	
	I <sub>F</sub> = 10 A			0.59	-	
	I <sub>F</sub> = 20 A			0.75	0.82	
Reverse current	V <sub>R</sub> = 70 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	15	-	μA
		T <sub>A</sub> = 125 °C		6	-	mA
	V <sub>R</sub> = 100 V	T <sub>A</sub> = 25 °C		60	350	μA
		T <sub>A</sub> = 125 °C		13	25	mA

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	V20100SG	VF20100SG	VB20100SG	VI20100SG	UNIT
Typical thermal resistance	R <sub>θJC</sub>	2.2	4.0	2.2	2.2	°C/W

ORDERING INFORMATION (Example)						
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
TO-220AB	V20100SG-E3/4W	1.88	4W	50/tube	Tube	
ITO-220AB	VF20100SG-E3/4W	1.74	4W	50/tube	Tube	
TO-263AB	VB20100SG-E3/4W	1.37	4W	50/tube	Tube	
TO-263AB	VB20100SG-E3/8W	1.37	8W	800/reel	Tape and reel	
TO-262AA	VI20100SG-E3/4W	1.45	4W	50/tube	Tube	

RATINGS AND CHARACTERISTICS CURVES

(T<sub>A</sub> = 25 °C unless otherwise noted)

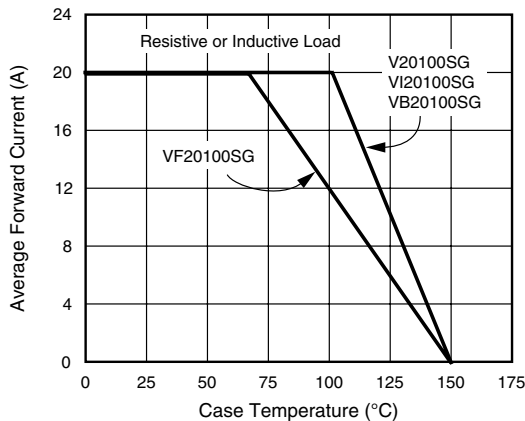


Fig. 1 - Maximum Forward Current Derating Curve

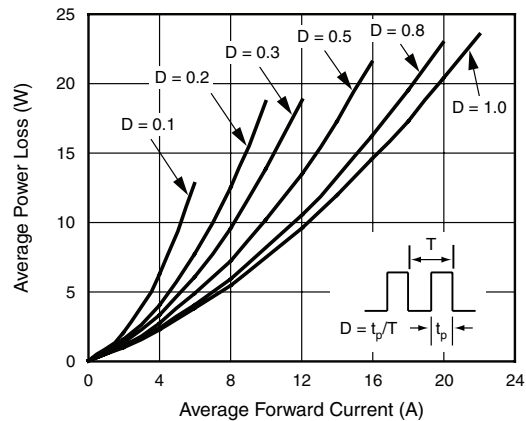


Fig. 2 - Forward Power Loss Characteristics

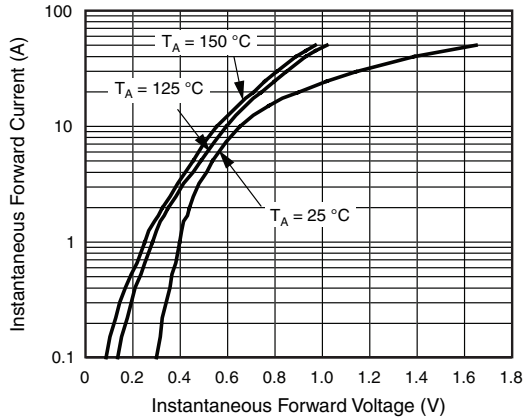


Fig. 3 - Typical Instantaneous Forward Characteristics

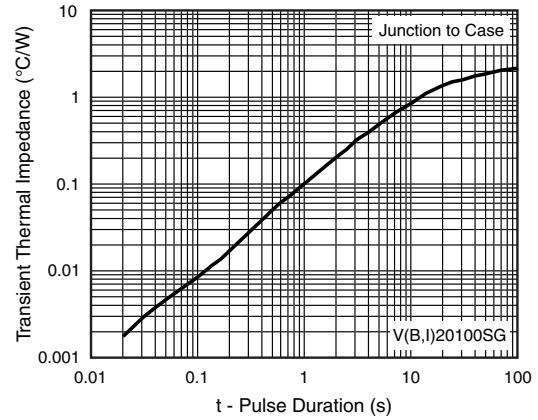


Fig. 6 - Typical Transient Thermal Impedance

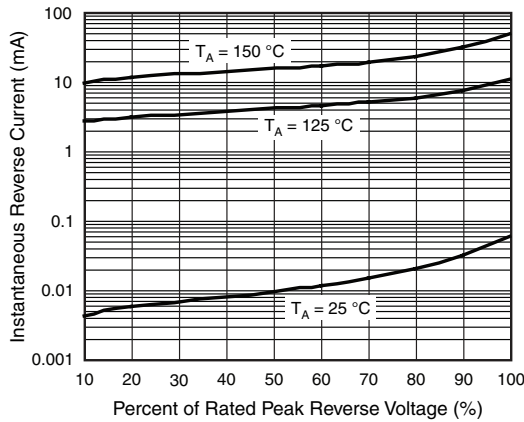


Fig. 4 - Typical Reverse Characteristics

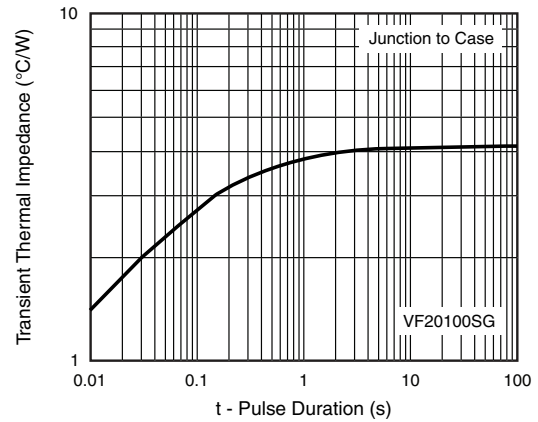


Fig. 7 - Typical Transient Thermal Impedance

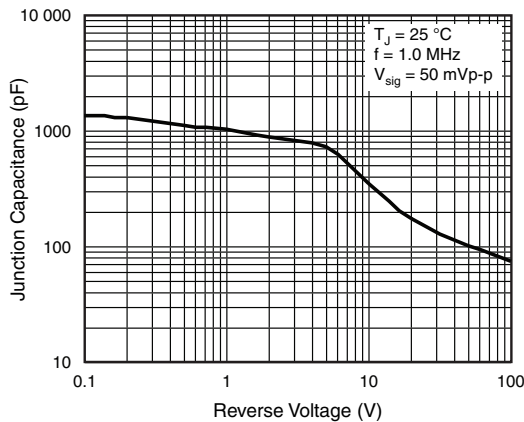


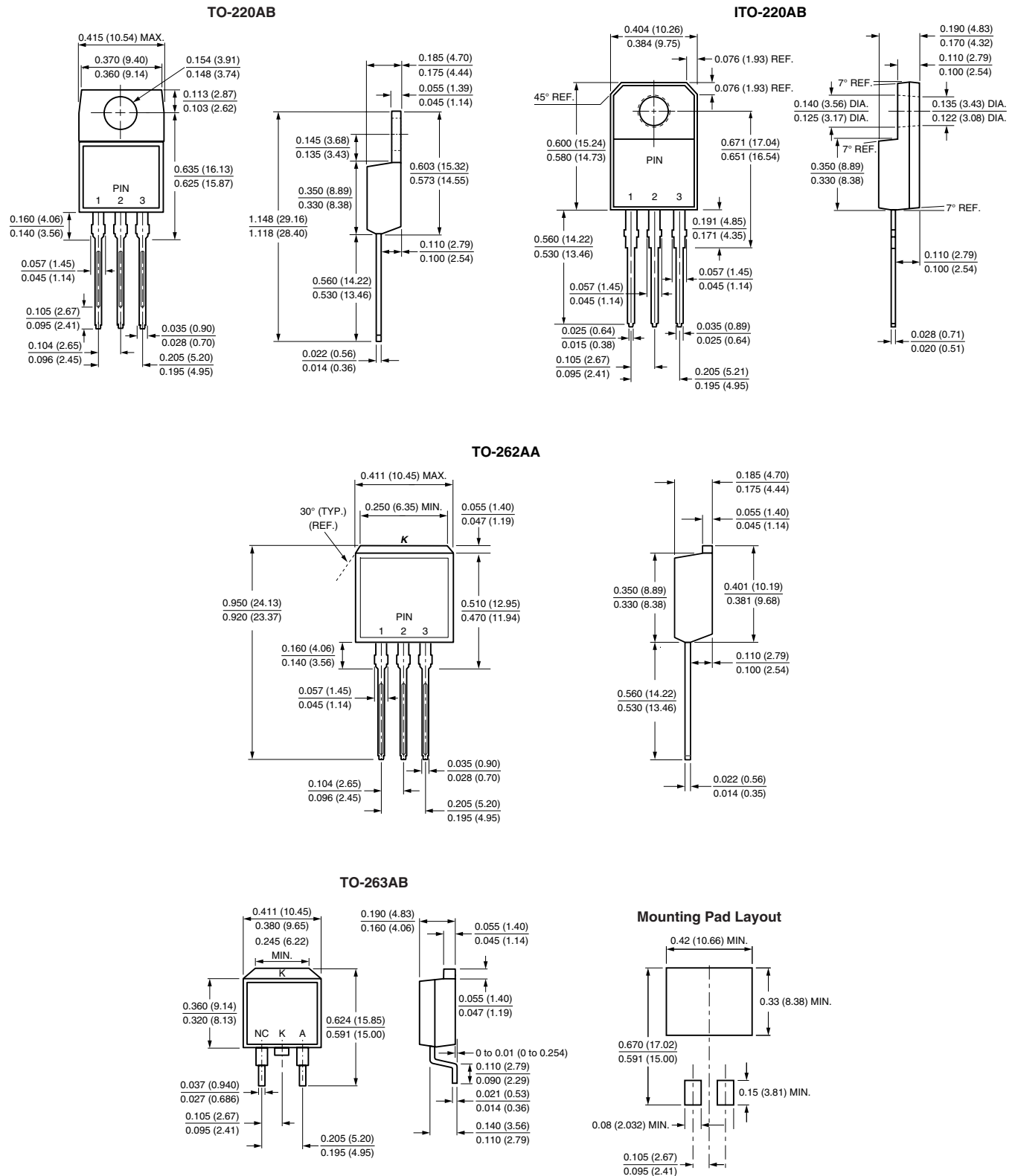
Fig. 5 - Typical Junction Capacitance

# V20100SG, VF20100SG, VB20100SG, VI20100SG

Vishay General Semiconductor



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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