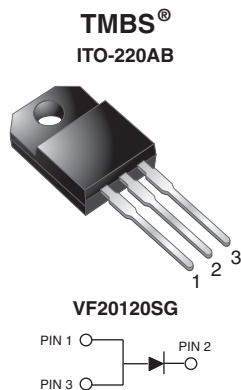


# High-Voltage Trench MOS Barrier Schottky Rectifier

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
- Solder bath temperature 275 °C max. 10 s, per JESD 22-B106
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**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 $I_F = 20 \text{ A}$	0.78 V
$T_J \text{ max.}$	150 °C
Package	ITO-220AB
Diode variation	Single

## MECHANICAL DATA

**Case:** ITO-220AB

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - 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

**Polarity:** as marked

**Mounting Torque:** 10 in-lbs maximum

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

PARAMETER	SYMBOL	VF20120SG	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/ $\mu$ s
Isolation voltage 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

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 5\text{ A}$	$V_F^{(1)}$	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	-	
	$I_F = 10\text{ A}$		0.65	-	
	$I_F = 20\text{ A}$		0.78	0.88	
Reverse current	$V_R = 90\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$	10	-	$\mu\text{A}$
		$T_A = 125\text{ }^{\circ}\text{C}$	7	-	mA
	$V_R = 120\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$	-	250	$\mu\text{A}$
		$T_A = 125\text{ }^{\circ}\text{C}$	12	25	mA

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VF20120SG	UNIT
Typical thermal resistance	$R_{\theta JC}$	4.2	$^{\circ}\text{C/W}$

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ITO-220AB	VF20120SG-M3/4W	1.75	4W	50/tube	Tube

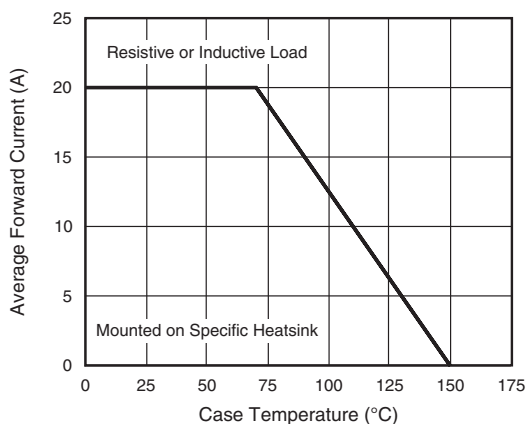
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

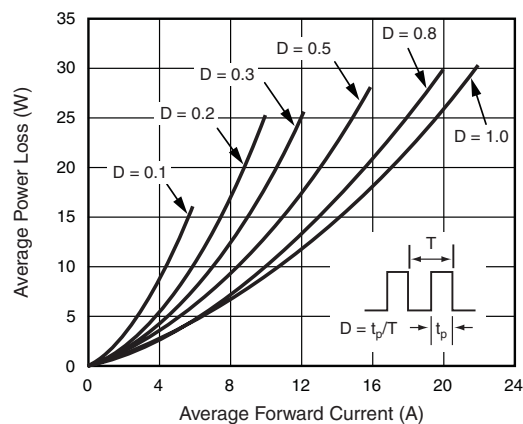


Fig. 2 - Forward Power Dissipation Characteristics

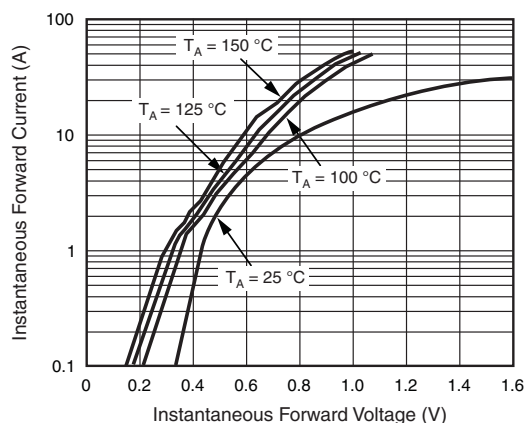


Fig. 3 - Typical Instantaneous Forward Characteristics

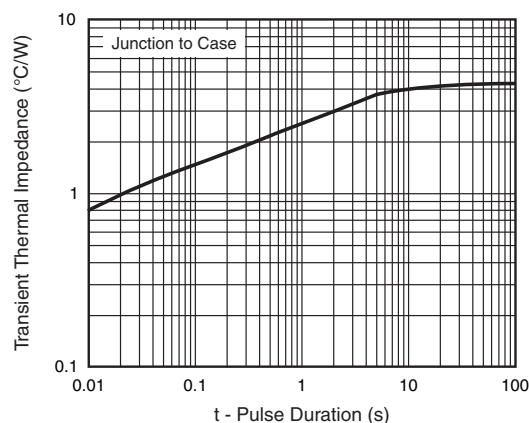


Fig. 5 - Typical Transient Thermal Impedance

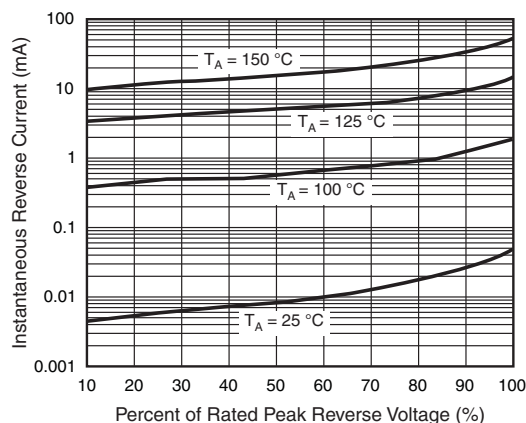


Fig. 4 - Typical Reverse Characteristics

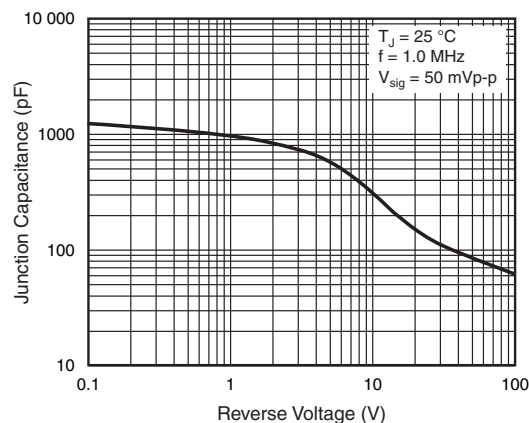
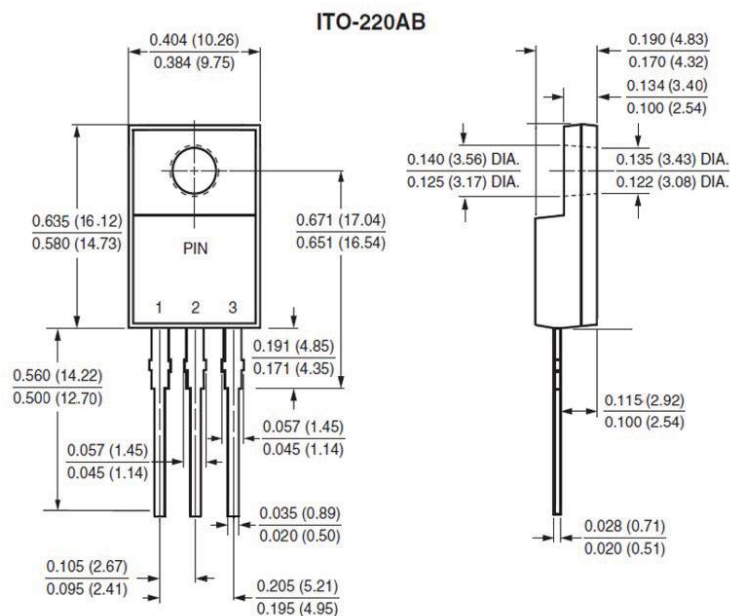


Fig. 6 - Typical Junction Capacitance

# **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)





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