

## PVC1000 Series

### MICRO-PIRANI VACUUM SENSORS

#### DESCRIPTION

Posifa's PVC1000 series of MEMS Micro-Pirani Vacuum Sensors offer a breakthrough vacuum measurement solution that enhances miniaturization while delivering ultra-low power consumption, long lifetime, minimal field maintenance, and low cost.

Based on the principal that the thermal conductivity of gases is proportional to pressure in the low vacuum range, the Posifa sensors measure minute changes in resistance to a heated element resulting from heat transfer to the surrounding gas.

The heated element (i.e. measurement resistor) consists of a platinum thin-film resistor residing on a thermal insulating membrane. The membrane is suspended over a micro-machined cavity that has a bottom surface parallel to the membrane, ensuring precision measurement of heat transfer. Due to the minute volume of the gas measured (i.e. the volume within the cavity), the micro-Pirani sensor delivers ultra-low power consumption and fast response time.

The Posifa sensors also provide a reference resistor of the same Thermal Coefficient of Resistance (TCR) as the measurement resistor for ambient temperature compensation.

Posifa's miniaturization of the Pirani technology using MEMS has established the PVC1000 series as the industry standard due to increased reliability, low cost, ease of use and ultra-low power consumption. Posifa's PVC1000 series sensors help customers leverage this trend to improve their existing products and to develop innovative new products.



#### FEATURES

- Ultra low power consumption < 5 mW
- Fast Response Time < 5 mSec
- Suitable for gas volume as low as 0.1 cm<sup>3</sup>
- Long Term Stability
- Can be cleaned by immersing in solvent, prolonging useful life

#### APPLICATIONS

- Leak detection in any closed system maintained under primary vacuum
- Vacuum packing machines
- Portable digital vacuum gauges

#### ABSOLUTE MAXIMUM RATINGS

- Operating Temperature: -25 to 85 °C
- Storage Temperature: -40 to 90 °C
- Shock: 100 g peak (5 drops, 3 axis)

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## ELECTRICAL CHARACTERISTICS

Test Conditions: Heating Current = 7mA, Ta=25°C					
SPECIFICATIONS	MIN	TYP	MAX	UNIT	CONDITIONS
Range	10 <sup>-3</sup>		30	Torr	
Resolution <sup>1</sup>		0.25		Torr	5-30 Torr
		0.05		Torr	2 to 5 Torr
		0.005		Torr	10 <sup>-3</sup> to 2 Torr
Accuracy <sup>1</sup>		±10		% reading	> 5 Torr
		±5		% reading	< 5 Torr
Measurement Resistor (Class 1)	130	160	180	Ohm	At 25°C
Reference Resistor (Class 1)	250	320	370	Ohm	At 25°C
Measurement Resistor (Class 2)	100	120	140	Ohm	At 25°C
Reference Resistor (Class 2)	190	320	290	Ohm	At 25°C
Resistor TCR		0.0025		/°K	
Humidity	0		100	%	RH, Non-condensing
Heating Current <sup>3</sup>		6.5	7.5	mA	
Operating Temperature Range	-25		85	°C	
Storage Temperature	-40		90	°C	
Power Consumption			5	mW	10 <sup>-3</sup> to 30 Torr
Shock Resistance			1000	g	
Overpressure			27.5	Bar	
Measurable Gas Volumes		0.1		cm <sup>3</sup>	
Response Time		5		mSec	

1 For reference only. Actual resolution/accuracy depends on the associated circuit.

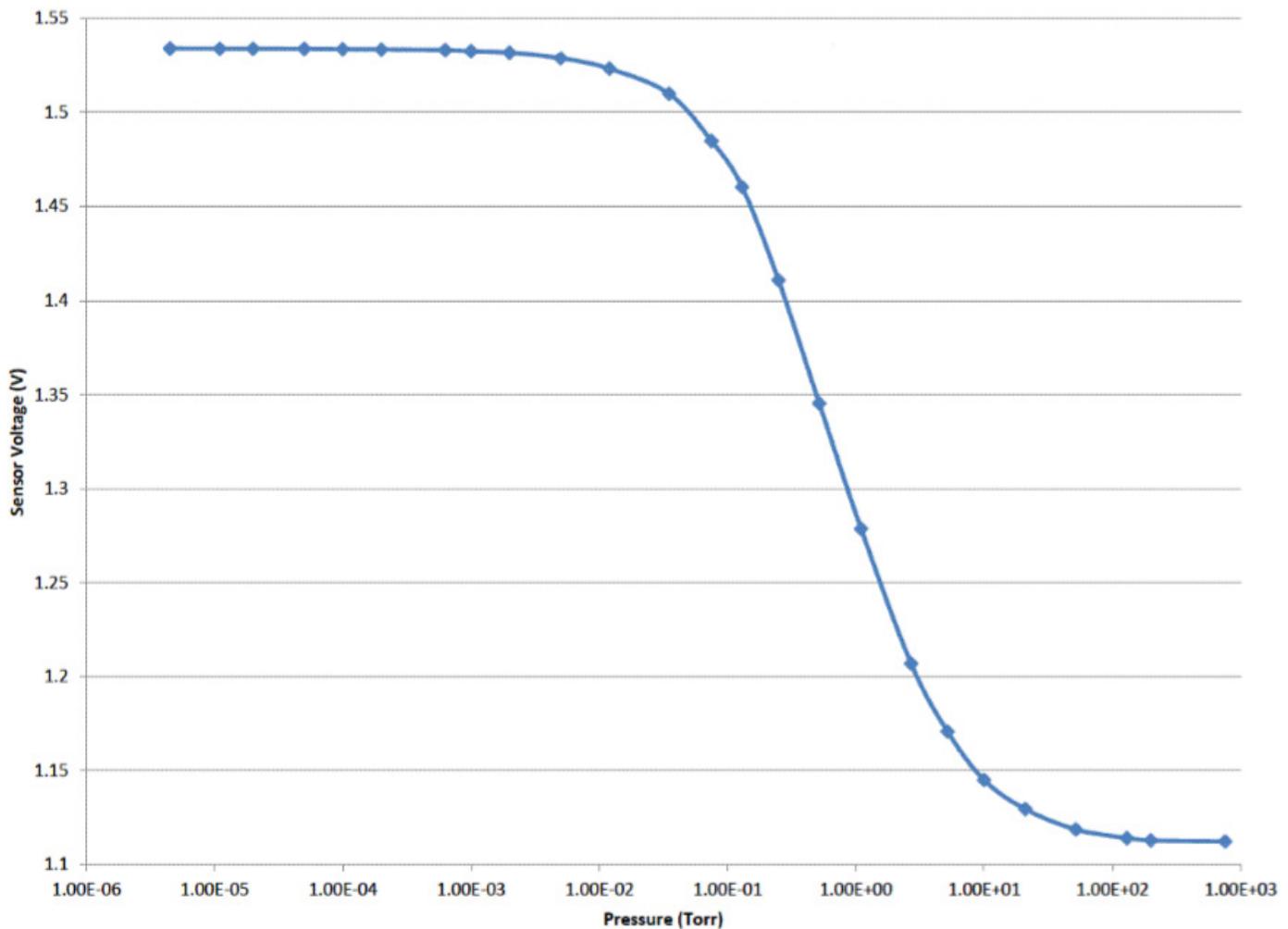
2 For class 1, 6.5mA is recommended. For class 2, 7.3mA,

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**OUTPUT VOLTAGE VS. VACUUM**

Heating Current = 7 mA, Ta = 25 °C, Measurement Resistor = 160 ohm

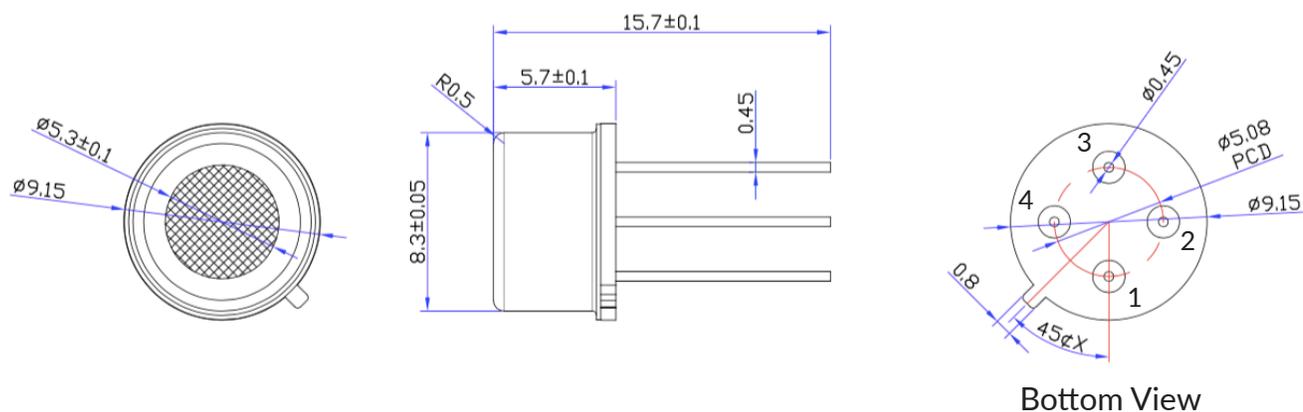


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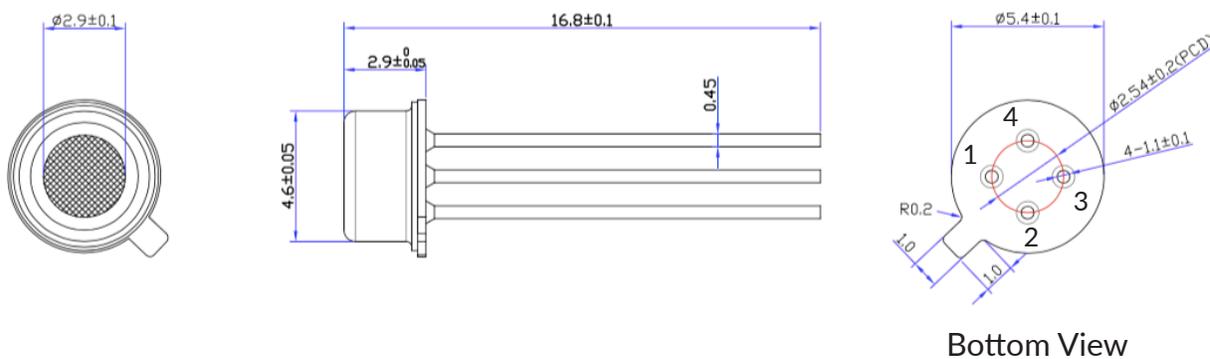
MICRO-PIRANI VACUUM SENSORS

### PACKAGE DIMENSIONS

#### PVC1001



#### PVC1004



Pin#	Description
1	Measurement resistor +
2	Measurement resistor -
3	Reference resistor +
4	Reference resistor -

**PVC1000 Series**

PIRANI VACUUM SENSORS

**ORDERING INFORMATION**

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<b>PART NUMBER</b>	<b>SPECIFICATIONS</b>
PVC1001-1	TO5 package, Class 1
PVC1001-2	TO5 package, Class 2
PVC1004-1	TO46 package, Class 1
PVC1004-2	TO46 package, Class 2

Please contact Posifa or your local distributor to place an order.

**EUROPEAN DISTRIBUTOR**

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