

DESCRIPTION

The PVC4000 series is a vacuum transducer designed for cost-effective OEM integration. It consists of a MEMS thermal conduction sensor (Pirani sensor), measuring electronics, and a microprocessor, packaged in a ultra-compact PCB assembly

The sensor element is based on Posifa's proven, second-generation MEMS thermal conduction chip that operates under the principle that the thermal conductivity of gases is proportional to its vacuum pressure.

The electronics and microprocessor amplify and digitize the sensor signal, and provide the output via an I²C interface. Because thermal conductivity of vacuum varies with the ambient temperature, a temperature compensation algorithm is implemented in the microprocessor, taking input from a built-in temperature sensor.

To prevent signal drift due to sensor chip self-heating, the microprocessor includes a pulsed excitation scheme whereby the sensor chip is heated for about 100 ms and then turned off for one second.

Output from PVC4000 is uncalibrated. As an option, users of PVC4000 can choose to input up to ten pairs of calibration points via the I²C interface into the microprocessor. A built-in piecewise linearization algorithm will leverage this data to provide calibrated output.

To further facilitate integration PVC4000 includes connector-terminated wire harness that is soldered onto the PCB assembly.



FEATURES

- Range: 0.001 to 760 Torr (0.13 to 101K Pa)
- Fast Response Time < 1.2 s
- Low power consumption for battery-powered instruments
- Temperature compensation
- Pulsed sensor excitation to prevent signal drift in high vacuum
- Piecewise linearization algorithm and I²C interface for storing calibration data (optional)
- Resistant to contamination

APPLICATIONS

- Leak detection in any closed system maintained under primary vacuum, such as in Vacuum Insulated Panels
- 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)
- Overpressure: 27.5 bar

ELECTRICAL CHARACTERISTICS

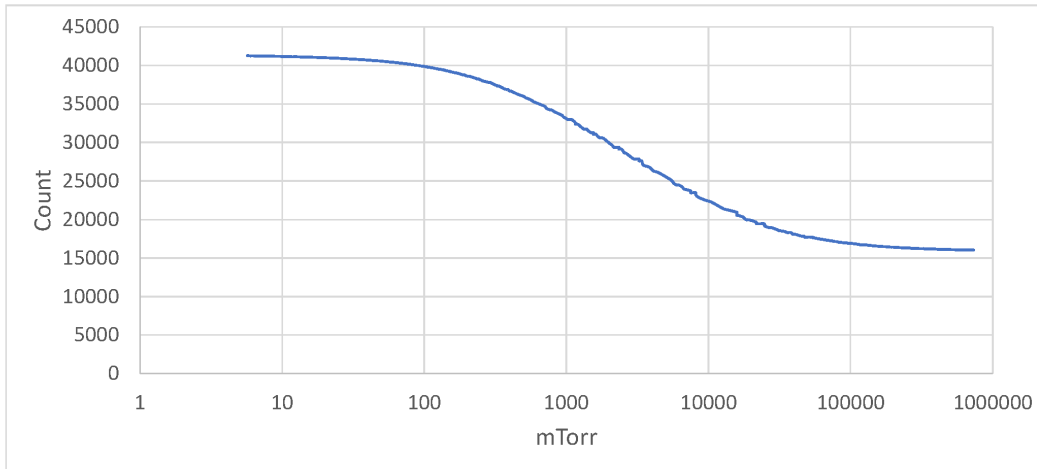
Test Conditions: Vdd = 3.3 Vdc, Ta=21°C					
SPECIFICATIONS	MIN	TYP	MAX	UNIT	CONDITIONS
Range	1		760000	Micron	
Output	13500	17500	20000	Count	At 760000 Micron
	37000	40800	44000	Count	At 30 Micron
Sensitivity		8		Count/Micron	1 to 1000 Micron
		1.6		Count/Micron	1000 to 5000 Micron
		0.5		Count/Micron	5000 to 10000 Micron
		0.15		Count/Micron	10000 to 25000 Micron
Temperature Drift		5		Count/°C	0 to 40°C
Response Time		1.2		s	
Supply Voltage	2.7		5.5	Vdc	
Operating Current		11		mA	When heater is turned on
Operating Temperature Range	-25		85	°C	
Storage Temperature	-40		90	°C	

Note:

1. Sensor output is not calibrated.

TYPICAL OUTPUT CURVE

Vdd = 3.3, Ta = 21°C



Pressure	Output	Pressure	Output	Pressure	Output
760000	17135	5493	24650	83	38630
300000	17280	3017	27350	46	39090
100000	17765	1657	30150	25	39360
24560	19670	910	32750	10	39560
10000	22300	500	35050	8	39595
7411	23450	204	37530	5	39630

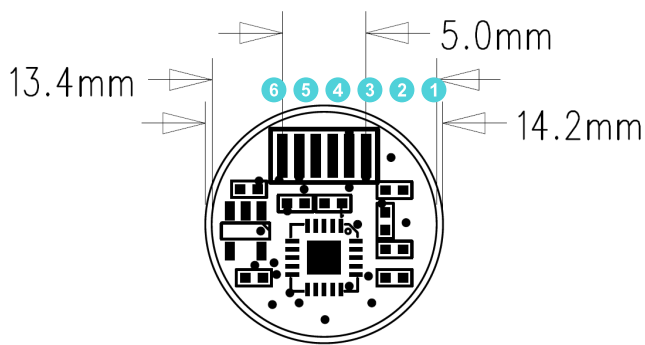
LOW-POWER OPERATION

For battery-powered instruments that require further reduction in power consumption we recommend powering PVC4000 in an intermittent mode:

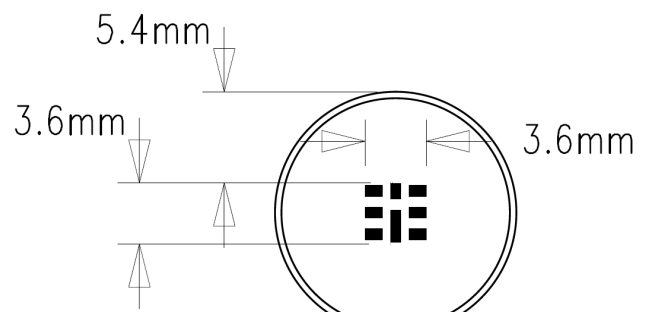
1. turn on PVC4000
2. Wait for 150 millisecond
3. Read from the I²C interface
4. Turn off PVC4000
5. Wait for 1 second, and repeat from Step 1

PACKAGE DIMENSIONS

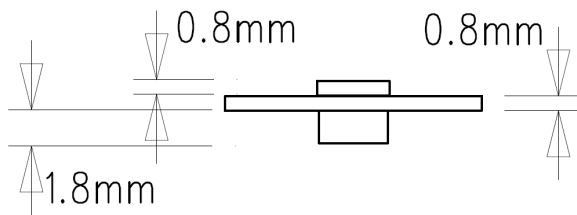
PVC4000



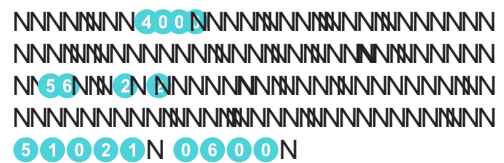
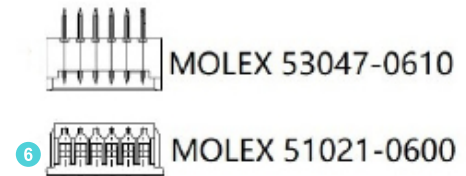
Top



Bottom



Side



Pad/Wire#	Description (Wire Color)
1	Vdd (Red)
2	GND (Black)
3	SDA (Yellow)
4	SCL (Green)
5	ICPCK (for firmware update) (Blue)
6	ICPDA (for firmware update) (White)

ORDERING INFORMATION

PART NUMBER	SPECIFICATIONS
PVC4001	10 ⁻³ to 760 Torr, SMD sensor

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

EUROPEAN DISTRIBUTOR

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