PVC3000 Series

MEMS THERMOPILE VACUUM SENSORS

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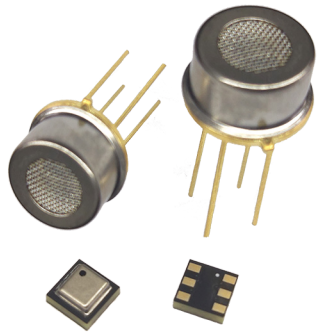
DESCRIPTION

Posifa's PVC3000 series of MEMS Thermopile Vacuum Sensors bring a breakthrough to vacuum measurement by offering an effective range from 0.1 millitorr (0.013 Pascal) all the way to atmophere (760 torr, or 101K Pascal). By contrast, a Pirani vacuum sensor's upper range is usually capped at 30 torr. A piezoresistive pressure sensor cannot measure vacuum below 10 torr. A costly capacitive pressure sensor is limited to 0.1 torr at the lower end of its range. Thus, PVC3000 can do the job of two sensors, i.e. a Pirani sensor and a piezeresistive/capacitive pressure sensor.

In addition, PVC3000 has a low power consumption of 10 mW (assuming pulsed excitation with a 75% duty cycle). By using smaller duty cycles power consumption can be reduced further.

PVC3000 uses Posifa's second generation thermal conductivity sensor die (PTCD20), and operates under the principle that the thermal conductivity of gases is proportional to its vacuum pressure.

PVC3000 is available in either SMD or TO metal can form factors.



FEATURES

- Range: 0.0001 to 760 Torr (0.013 to 101K Pa)
- Low power consumption: <= 10 mW
- Can be cleaned by immersing in solvent, prolonging useful life

APPLICATIONS

- Leak detection in any closed system maintained under primary vacuum, such as in Vacuum Insulated Panels
- Portable and fixed vacuum gauges

ABSOLUTE MAXIMUM RATINGS

- Operating Temperature: -40 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: Excitation Voltage = 1.2 Vdc, Ta=23°C					
SPECIFICATIONS	**MIN**	**TYP**	**MAX**	**UNIT**	**CONDITIONS**
Range	10^{-4}		760	Torr	
Heater Resistance		110		Ohm	
Thermopile Resistance		210		Kohm	
Excitation Voltage[1]		1.2		Vdc	
Thermopile Output	100	120	145	mV	At 1.2V excitation
Response Time[2]		200		ms	
Operating Temperature Range	-40		85	°C	
Storage Temperature	-40		90	°C	
Shock Resistance			1000	g	
Overpressure			27.5	Bar	TO package

Notes:
1. We recommend pulse excitation with OFF time no shorter than 100 ms. The ON time should include a warm-up period of no shorter than 60 ms. Voltage data collected after the warm-up period is considered valid.
2. Assume ON time of 100 ms and OFF time 100 ms

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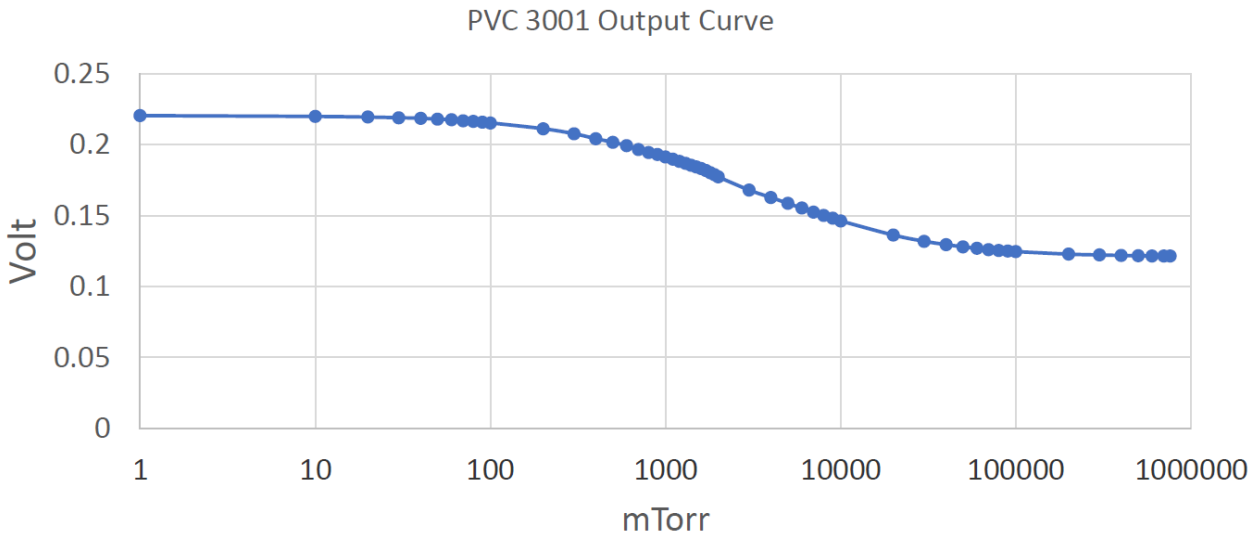
TYPICAL OUTPUT VS. VACUUM

Excitation = 1.2 Vdc, Ta = 23 °C



Pressure (mTorr)	Output (V)		Pressure (mTorr)	Output (V)		Pressure (mTorr)	Output (V)
760000	0.1215		10000	0.1463		200	0.2113
300000	0.1223		5000	0.1587		100	0.2154
200000	0.1229		2000	0.1773		50	0.2180
100000	0.1247		1000	0.1914		10	0.2199
50000	0.1281		700	0.1966		5	0.2102
20000	0.1363		500	0.2017		1	0.2205

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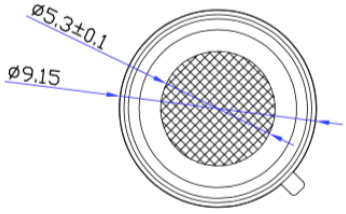
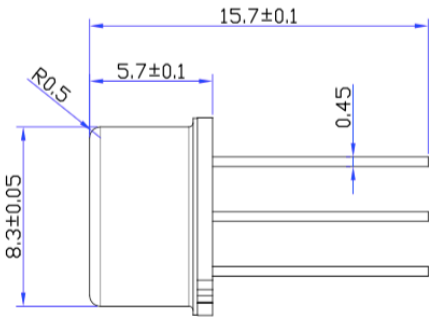
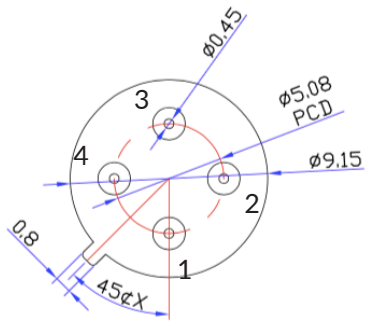
PACKAGE DIMENSIONS

PVC3001



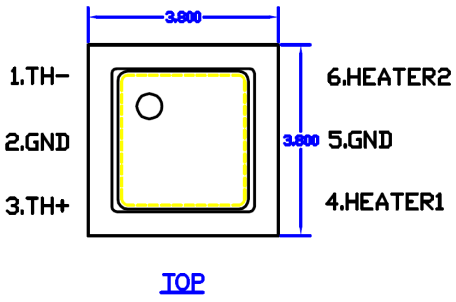


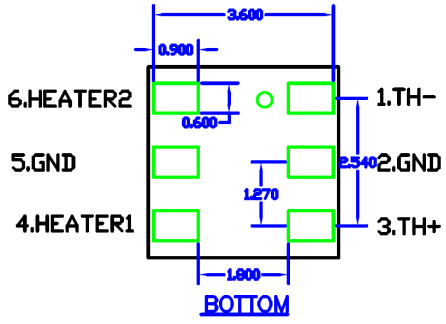


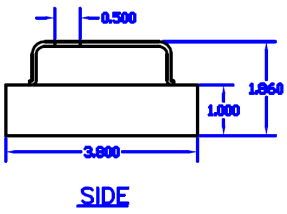
Bottom View

Pin#	Description
1	Thermopile +
2	Heater 1
3	Heater 2
4	Thermopile -

PVC3002







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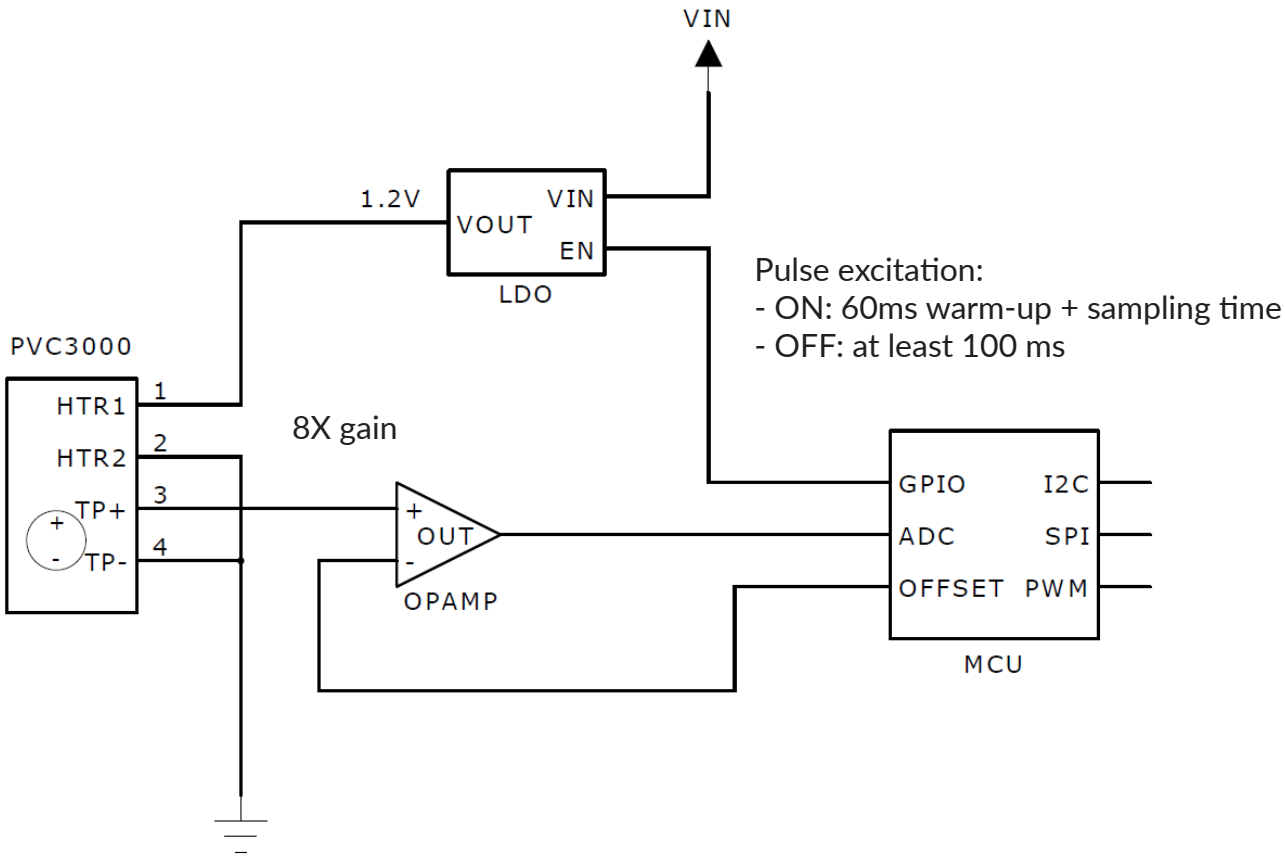
APPLICATION CIRCUIT



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ORDERING INFORMATION

PART NUMBER	SPECIFICATIONS
PVC3001	TO5 package
PVC3002	SMD, FR4 Substrate

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