posifa TECHNOLOGIES

PVC3000 Series

MEMS THERMOPILE VACUUM SENSORS

131 E. Brokaw Road | San Jose CA 95112 | +1 (408) 392-0989 | info@posifatech.com | www.posifatech.com

DESCRIPTION

Posifa's PVC3000 series of MEMS Thermopile Vacuum Sensors bring a breakthrough to vacuum measurement by offering an effective range from below 1 millitorr (0.13 Pascal) all the way to atmophere (760 torr, or 101K Pascal). By contrast, a Pirani vacuum sensor's upper range is 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 an ultra-fast response time of less than 2 millisecond, and a low power consumption of 45 mW (typical). By using pulse excitation power consumption can be reduced further. For example, with 10 Hz excitation, power can be reduced to below 5 mW.

PVC3000 can be used in a differential configuration whereby one sensor is exposed to vacuum (measurement) and another to atmosphere (reference). Such a configuration allows for automatic, internal temperation compensation, and elimination of other environmental factors that cause sensor to drift, achieving excellent repeatability and long term stability.

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 two form factors, PVC3001 in a TO5 metal can, and PVC3004 in a TO46 metal can.

FEATURES

- Range: 0.001 to 760 Torr (0.13 to 101K Pa)
- Fast Response Time < 2 mSec
- Low power consumption: < 5 mW using 10 Hz pulse excitation
- Automatic, internal temperature compensation using a differential configuration (refer to "Application Cirtcuit")
- 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)

131 E. Brokaw Road | San Jose CA 95112 | +1 (408) 392-0989 | info@posifatech.com | www.posifatech.com

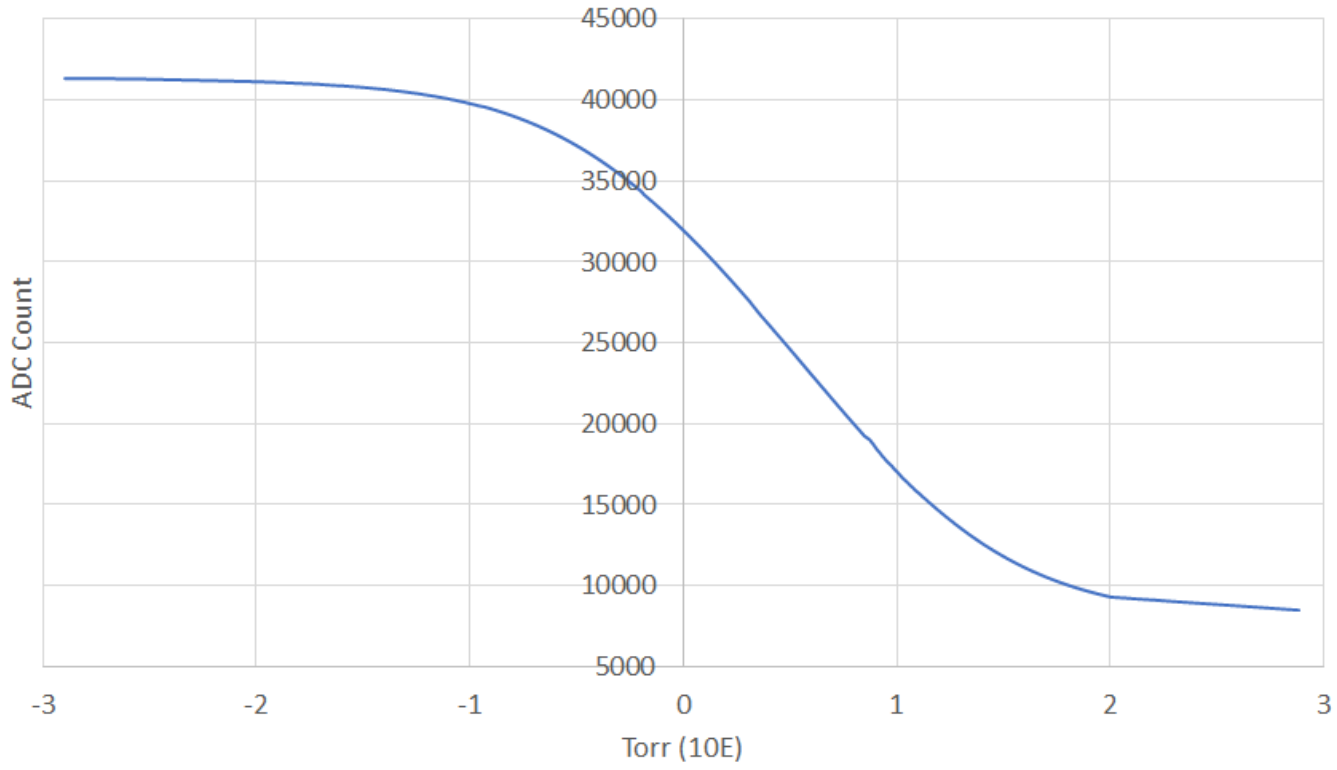
ELECTRICAL CHARACTERISTICS

Test Conditions: Excitation Voltage = 1.5 Vdc, Ta=25°C					
SPECIFICATIONS	**MIN**	**TYP**	**MAX**	**UNIT**	**CONDITIONS**
Range	10^{-3}		760	Torr	
Heater Resistance		110		Ohm	At 25°C
Thermopile Resistance		210		Kohm	At 25°C
Excitation Voltage	1	1.5	2	Vdc	
Response Time		2		mSec	
Operating Temperature Range	-25		85	°C	
Storage Temperature	-40		90	°C	
Shock Resistance			1000	g	
Overpressure			27.5	Bar	

131 E. Brokaw Road | San Jose CA 95112 | +1 (408) 392-0989 | info@posifatech.com | www.posifatech.com

OUTPUT VS. VACUUM

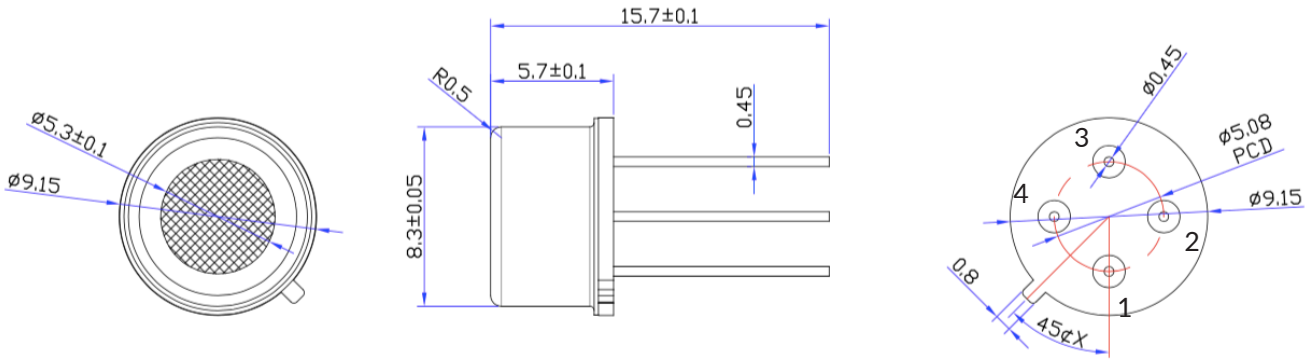
Excitation = 1.5 Vdc, Ta = 25 °C, Gain = 6x, ADC Resolution: 16 bit



131 E. Brokaw Road | San Jose CA 95112 | +1 (408) 392-0989 | info@posifatech.com | www.posifatech.com

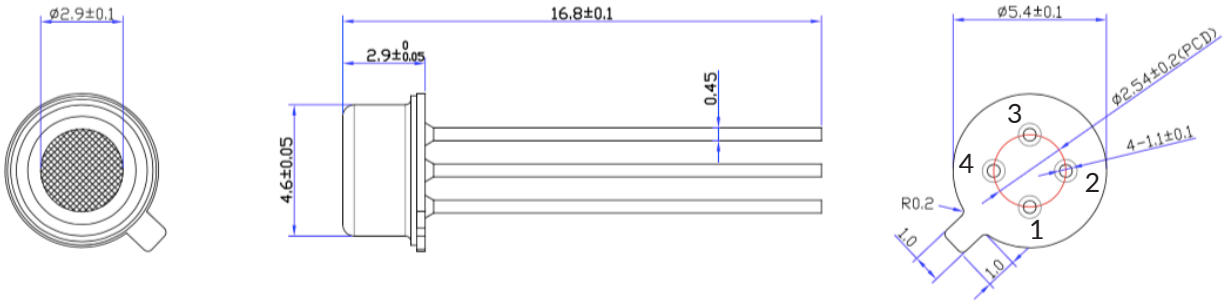
PACKAGE DIMENSIONS

PVC3001



Bottom View

PVC3004

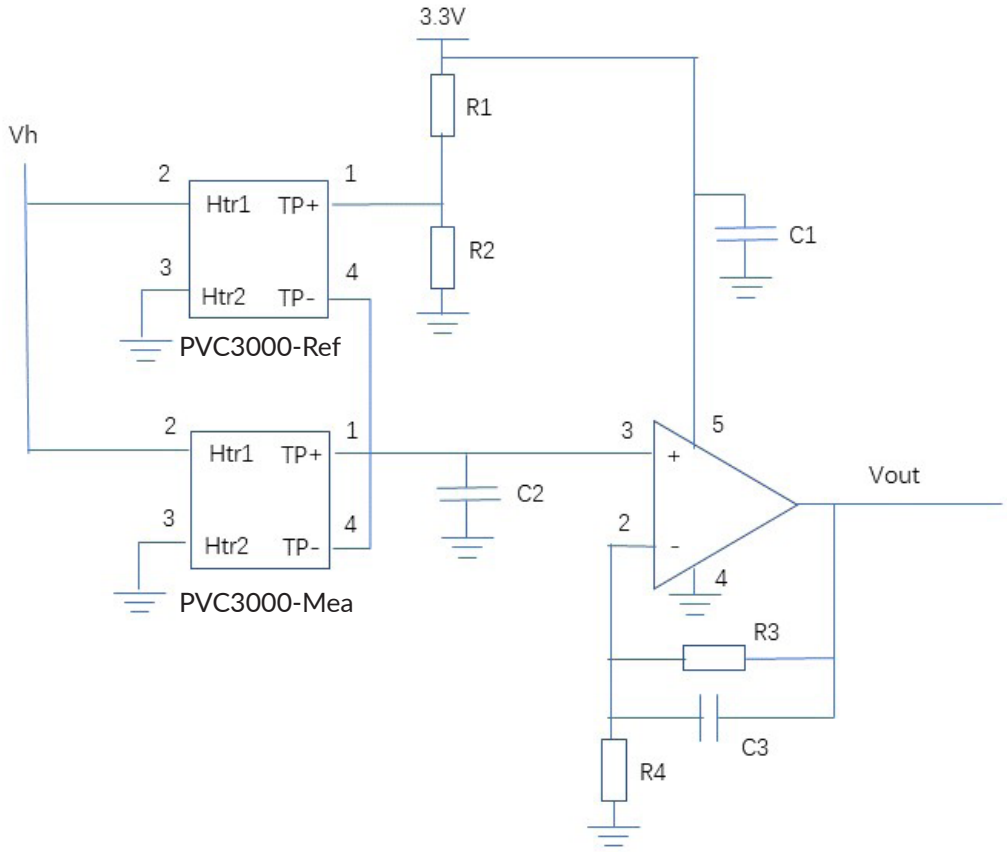


Bottom View

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

131 E. Brokaw Road | San Jose CA 95112 | +1 (408) 392-0989 | info@posifatech.com | www.posifatech.com

APPLICATION CIRCUIT



Note:
1. Recommended Vh = 1.5 V
2. Recommended R1 = 100 kohm, and R2 = 360 ohm
3. Recommended Gain = 6x
4. Vout range: 0 to 250 mV

131 E. Brokaw Road | San Jose CA 95112 | +1 (408) 392-0989 | info@posifatech.com | www.posifatech.com

ORDERING INFORMATION

PART NUMBER	SPECIFICATIONS
PVC3001	TO5 package
PVC3004	TO46 package

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

EUROPEAN DISTRIBUTOR

BS-rep GmbH

Eichertstr. 68, D-56745 Weibern, Germany

Tel: +49 (0) 2655 / 96 26 476

Email: info@sensor-rep.de