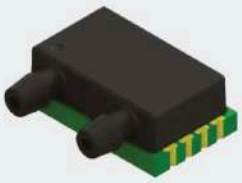
HPSD 8100 MINIATURE PRESSURE TRANSDUCER



- **Pressure ranges from 0-1 mbar to 0-10 bar**
- **Single 3 V or 5 V supply voltage**
- **Digital I²C or SPI output**
- **Resolution up to 19bits (ENOB)**
- **Extremely low power consumption (<1uA)**
- **Outstanding offset stability**
- **Low profile - only 9 mm in height**
- **RoHS compliant**

The Pressure Transducer model HPSD 8100 is a pressure and temperature sensing device specifically developed for low-power apps with ultra-low pressure ranges and demanding space constrictions. High performance and accuracy combined with a special digital signal interface including 24 bit ΔΣ ADC and an extremely low power consumption enables use of this transducer in many pressure measurement applications with dry air or non-corrosive gases or liquids. Calibration coefficients are stored into internal EEPROM for signal calculation which is then performed using external microcontroller through I²C or SPI interface.

This Transducer can for example be used in the following applications:

Sleep Apnea/CPAP	**Medical instruments**	**Process control**
Ventilators/ Respirators	**Air/Gas flow monitoring**	**Leak detection**
HVAC	**Sport equipment**	**Customer devices**

Ultra low pressure range

Pressure range	1 mbar (100 Pa)	2.5 mbar (250 Pa)	5 mbar (500 Pa)	10 mbar (1000 Pa)
Pressure types	differential / bidirectional differential			
Operating Temp	-25 to 85° C			
Compensated Temp.	0 to 70° C			
Storage Temp	-40 to 125° C			
Over pressure	100 mbar	100 mbar	150 mbar	150 mbar
Burst pressure	150 mbar	150 mbar	200 mbar	200 mbar

Low pressure range

Pressure range	20 mbar (0,3 psi)	50 mbar (0,8 psi)	100 mbar (1,5 psi)	350 mbar (5 psi)
Pressure types	differential / bidirectional differential			
Operating Temp	-25 to 85° C			
Compensated Temp.	0 to 70° C			
Storage Temp	-40 to 125° C			
Over pressure	200 mbar	500 mbar	1000 mbar	1 bar

High pressure range

Pressure range	1 bar (15 psi)	2 bar (30 psi)	5 bar (70 psi)	10 bar (150 psi)
Pressure types	differential /bidirectional differential / absolute			
Operating Temp	-25 to 85° C			
Compensated Temp.	0 to 70° C			
Storage Temp	-40 to 125° C			
Over pressure	3 bar	6 bar	15 bar	25 bar
Burst pressure	5 bar	10 bar	25 bar	25 bar

Parameter	Unit	Min.	Typ.	Max.
Power supply Supply voltage 5 V	 V	 1.71	 3 (5)	 5.55
Accuracy (pressure) @ 25°C Ultra low pressure (1 to 5 mbar) Low pressure (10 to 100 mbar) Standard pressure (all other)	 %FSO %FSO %FSO		 ±1 ±0.5 ±0.1	 ±2.5 ±1 ±0.5
Total accuracy (pressure) @ 0 to 70° C Ultra low pressure (1 to 5 mbar) Low pressure (10 to 100 mbar) Standard pressure (all other)	 %FSO %FSO %FSO		 ±1.5 ±0.75 ±0.25	 ±4 ±1.5 ±0.75
Accuracy (temperature)@ 0 to 70° C	°C		±1	±2
Resolution @ OSR setting (pressure) OSRx = 1/4 OSRx = 1 OSRx = 4 OSRx = 16	 bit bit bit bit		 TBD TBD TBD 16.5	
Single A/D conversion time @OSR setting (x = p/T) OSRx = 1/4 OSRx = 1 OSRx = 4 OSRx = 16	 ms ms ms ms		 1.04 2.58 8.72 33.30	
Current consumption @OSR setting (x = p or T) OSRx = 1/4 OSRx = 1 OSRx = 4 OSRx = 16	 uA uA uA uA		 TBD TBD TBD 20	
Repeatability	%FSO		±0.5	
Nonlinearity	%FSO		±0.1	±0.3
Media compatibility		see spec note		
Position sensitivity	%FSO		±0.05	
Weight	g		0.6	

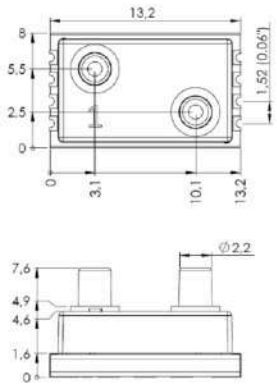
Specification notes

1) Over pressure is the maximum pressure which may be applied without causing damage to the sensing element.
2) Burst pressure is the maximum pressure which may be applied without causing leakage damage to the sensing element.
3) Accuracy includes all effects (offset, span, nonlinearity, pressure hysteresis and repeatability) at room temperature and represents the maximum deviation of the transducer signal from ideal characteristics.
4) Total accuracy includes all effects (offset, span, nonlinearity, pressure hysteresis and repeatability) included with all temperature effects of offset and span. It describes overall error and represents maximum deviation of transducer signal from ideal characteristic in compensated temperature range from 0 to 70°C.
5) Pressure resolution @ 24bit ΔΣ ADC OSR setting, calculated ENOB based on measured RMS noise voltage at the input.
6) Response time @ 24 bit ΔΣ ADC OSR setting, single temperature and single pressure conversion time (no averaging).
7) Average ADC current consumption for pressure & temperature measurement (incl. sensor) @ 24bit ΔΣ ADC OSR setting.
8) Repeatability is defined as typical deviation of the output signal after 10 pressure cycles.
9) Nonlinearity is defined as the BFSL (best fit straight line) across entire pressure range
10) Media compatibility on pressure port P1: noncorrosive gases to silicone, RTV, ceramics Al2O3, Pyrex, LCP plastics.
11) Media compatibility on pressure port P2: noncorrosive gases to silicone, Pyrex, RTV, ceramics Al2O3, epoxy, FR4.
12) Position sensitivity: typ. ±0.25%FS for 0-1 mbar devices.

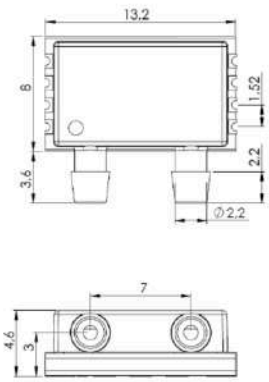
Dimensions

Outline dimensions

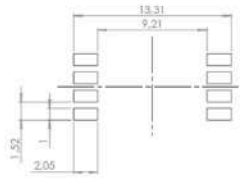
Straight vertical (manifold) pressure port
(HPSD 8100-xxxx-x-x-x-S):



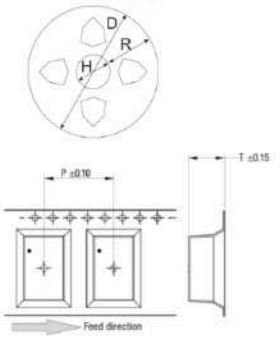
Horizontal pressure port
(HPSD 8100-xxxx-x-x-x-H):



Recommended soldering footprint



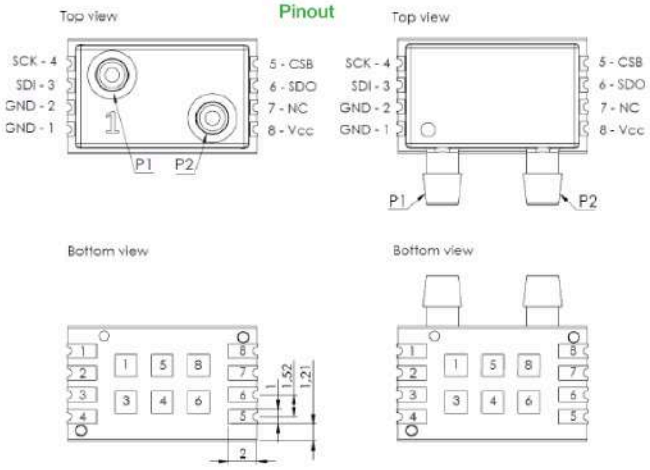
Tape and reel packaging

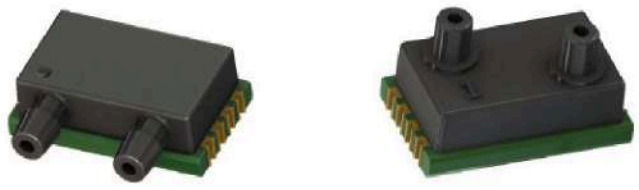


Reel	7"	13"
H (mm)	60	100
R(mm)	59	110
D (mm)	179	330
Pcs / reel	**125**	**500**

Measure	Vertical port	Horizontal port
P (mm)	16	20
T (mm)	8,35	5,35

Pinout





Pin assignment with alternate functions		
Pin	**Name**	**Function**
1	GND	Ground
2	GND	Ground
3	SDI	Data input/output in I²C Data input in 4-wire SPI / Data input/output in 3-wire SPI
4	SCK	Serial bus clock input in I²C and SPI
5	CSB	Bus mode select / chip select with pull-up CSB=VDDIO: I2C mode / chip not selected CSB=GND: SPI mode / chip selected
6	SDO	Data output in 4-wire SPI mode Test input/output in test mode
7	NC	Not connected
8	Vcc	Positive power supply

Ordering information

(Please use the characters in the chart below to create your product code)

Sample Code HPSD8100 - 020M - U - S - H

Pressure range

See table below*

Pressure Type / direction

U	Unidirectional differential (positive pressure on P1)
B	Bidirectional differential (positive pressure on P1)
A	Absolute (pressure on P1)

Package type

S	Straight vertical (manifold)
E	Horizontal (barbed)

Output configuration

H	I²C, 5 V
J	I²C, 3 V
P	SPI, 5 V
Q	SPI, 3V

Pressure Range												
Unit	1 mbar	2.5 mbar	5 mbar	10 mbar	20 mbar	50 mbar	100 mbar	350 mbar	1 bar	2 bar	5 bar	10 bar
Order Code	001M	2P5M	005M	010M	020M	050M	100M	350M	001B	002B	005B	010B

If you require a customized solution for your program contact our sales team.