



- ▶ **Pressure ranges from 0-1 mbar to 0-10 bar**
- ▶ **Single 3 V or 5 V supply voltage**
- ▶ **Digital I²C or SPI output**
- ▶ **Outstanding offset stability**
- ▶ **Low profile - only 9 mm in height**
- ▶ **RoHS compliant**

The Pressure Transducer model HPSP 8000 is a pressure and temperature sensing device specifically developed for ultra-low pressure ranges and demanding space constrictions. High performance and accuracy enables use of this transducer in many applications with dry air or non-corrosive gases or liquids and differential

pressure measurements. The SMD housing is reflow mountable with fast stabilization after the soldering process. The pressure ports are very flexible and can accept standard pneumatic tubes or can be customized for intergration into end customer housings with straight pressure ports.

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

Sleep Apnea/CPAP

Medical instruments

Pneumatic 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			
V _{out}	0.5 to 4.5 V			
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			
V _{out}	0.5 to 4.5 V			
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
Burst pressure	300 mbar	750 mbar	1500 mbar	1.7 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			
V _{out}	0.5 to 4.5 V			
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



Performance characteristics

TAMB = 25° C

Vcc = 5 V, unless otherwise noted

Parameter	Unit	Min.	Typ.	Max.
Power supply				
Supply voltage 5 V	V	4.75	5	5.25
Supply voltage 3 V	V	2.70	3	3.3
Current consumption I _{cc}	mA		4	6.5
Analog output (pressure) @ 5 V				
Offset voltage V _o	V		0.50	
Full scale output (FSO) V _{FS}	V		4.50	
Full scale span (FSS) V _{FSO}	V		4.00	
Offset voltage (bidirectional devices)	V		2.50	
Analog output (pressure) @ 3 V				
Offset voltage	V		0.30	
Full scale output (FSO)	V		2.70	
Full scale span (FSS)	V		2.40	
Offset voltage (bidirectional devices)	V		1.50	
Digital output (pressure), 15 bits				
Offset voltage	counts		3277	
Full scale output (FSO)	counts		29491	
Full scale span (FSS)	counts		26214	
Offset voltage (bidirectional devices)	counts		16384	
Digital output (temperature) 15 bits				
Temperature output @ 0° C	counts		8192	
Temperature output @ 70° C	counts		24576	
Accuracy (pressure) @ 25°C				
Ultra low pressure (1 to 5 mbar)	%FSO		±1	±2.5
Low pressure (10 to 100 mbar)	%FSO		±0.5	±1
Standard pressure (all other)	%FSO		±0.1	±0.5
Total accuracy (pressure)				
@ 0 to 70° C				
Ultra low pressure (1 to 5 mbar)	%FSO		±1.5	±4
Low pressure (10 to 100 mbar)	%FSO		±0.75	±1.5
Standard pressure (all other)	%FSO		±0.25	±0.75



Parameter	Unit	Min.	Typ.	Max.
Resolution A/D converter D/A converter	bit bit		11	15
Response time	ms		1.5	
Repeatability	%FSO		±0.05	
Nonlinearity / pressure hysteresis (BFSL)	%FSO		±0.1	±0.3
Load resistance	k	2		∞
Media compatibility	see spec. note			
Position sensitivity	%FSO		±0.05	
Weight	g		0.6	

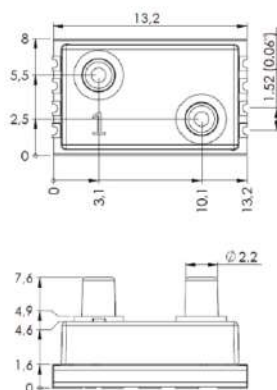
Specification notes

- 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) Analog output signal is ratiometric to power supply Vcc, digital signal is not ratiometric to the power supply.
- 4) Offset voltage is the voltage output at zero pressure.
- 5) Full scale output is the voltage output at full pressure range.
- 6) Full scale span is the algebraic difference between the output at full scale pressure range and offset.
- 7) Digital output signal (temperature) is not ratiometric to power supply Vs. Temperature data are read directly on the sensing element.
- 8) 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.
- 9) 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.
- 10) Repeatability is defined as typical deviation of the output signal after 10 pressure cycles.
- 11) Nonlinearity is defined as the BFSL (best fit straight line) across entire pressure range
- 12) Media compatibility on pressure port P1: noncorrosive gases to silicone, RTV, ceramics Al₂O₃, Pyrex, LCP plastics.
- 13) Media compatibility on pressure port P2: noncorrosive gases to silicone, Pyrex, RTV, ceramics Al₂O₃, epoxy, FR4.
- 14) Position sensitivity: typ. ±0.25%FS for 1 mbar devices.

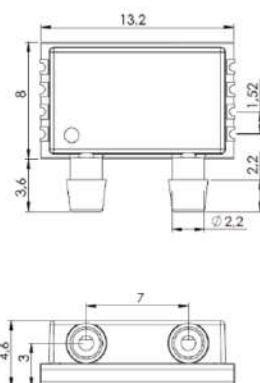


Dimensions

Straight vertical (manifold) pressure port
(HPSD 8000-xxxx-x-x-**S**):

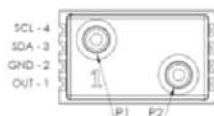


Horizontal pressure port
(HPSD 8000-xxxx-x-x-**H**):



Vertical pressure port:

Top view



Bottom view



Pinout

Horizontal pressure port:

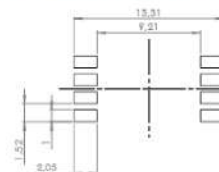
Top view



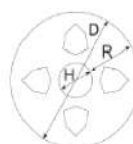
Bottom view



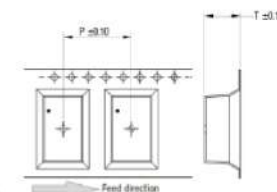
Recommended soldering footprint



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

Pin assignment with alternate functions		
Pin	Name	Function
1	Out	Analog output or PWM2 output or one-wire interface I/O
2	GND	Ground
3	SDA	PC data I/O or SPI data in (MOSI)
4	SCL	PC clock or SPI clock (SCK)
5	IO2	SPI slave select (SS) or ALARM2
6	IO1	SPI data out (MISO) or ALARM1 or PWM1 Output
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 HPSD8000 - 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

R I²C, 3.3 V

J I²C, 3 V

P SPI, 5 V

Y SPI, 3.3V

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.