Preliminary Datasheet

HPSD 7000 OEM Ceramic Pressure Transducer

General description

HPSD 7000 is a new generation of ceramic pressure sensors made with low-temperature co-fired ceramic (LTCC) technology and a patented sensor-construction solution.

The pressure sensor element is made with LTCC technology using piezo-resistive principle to detect the pressure. The LTCC material is compatible with many types of aggressive media like water, hydraulic oils, diesel and others, which makes the sensor suitable for pressure measurements in **harsh environments**. Special protection of the piezo-resistors also makes this sensor suitable for **wet-wet applications**.

High performance and accuracy are achieved with the patented sensor construction, which allows this sensor to be used in many applications, and with its compact and convenient design it is very suitable for OEM users.

The HPSD 7000 pressure sensors are amplified and temperature compensated from 0 to 70°C with special signal conditioning electronics.

The HPSD 7000 family consists of standard 100 mbar, 350 mbar, 1 bar, 2bar, 4bar and 10 bar differential pressure ranges.

Features

- Suitable for **harsh environment** and **wet-wet** applications
- Single 5V supply voltage
- Wide compensated range (0-70°C)
- Total accuracy down to **0.75%FS** (typ.) over 0-70°C, all effects included.
- Standard **0.5 – 4.5V voltage output** and **digital I2C output** available (pressure & temperature)
- High performance OEM

Applications

- Pressure measurements of gases and liquids
- Instrumentation & measuring equipment
- Process control
- Level control systems
- HVAC
- Leak detection

RoHS COMPLIANT

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Available types overview

T_{AMB}=25°C, V_{cc} = 5V unless otherwise noted.

Pressure range	100 mbar	350 mbar	1 bar
ID group	HPSD 7000-100M	HPSD 7000-350M	HPSD 7000-001B
Pressure types	Differential	Differential	Differential
V_{OUT}	0.5 to 4.5V	0.5 to 4.5V	0.5 to 4.5V
Temperature ranges	Operating: -25°C to 85°C Compensated: 0°C to 70°C Storage: -40 to 105°C		
Over pressure [1)]	300 mbar	800 mbar	2 bar
Burst. pressure [2)]	400 mbar	1200 mbar	2.2 bar

Pressure range	2 bar	4 bar	10 bar
ID group	HPSD 7000-002B	HPSD 7000-004B	HPSD 7000-010B
Pressure types	Differential	Differential	Differential
V_{OUT}	0.5 to 4.5V	0.5 to 4.5V	0.5 to 4.5V
Temperature ranges	Operating: -25°C to 85°C Compensated: 0°C to 70°C Storage: -40 to 105°C		
Over pressure [1)]	4 bar	8 bar	20 bar
Burst. pressure [2)]	4.5 bar	9 bar	22 bar

Performance characteristics

T_{AMB}=25°C, V_{cc} = 5V, unless otherwise noted.

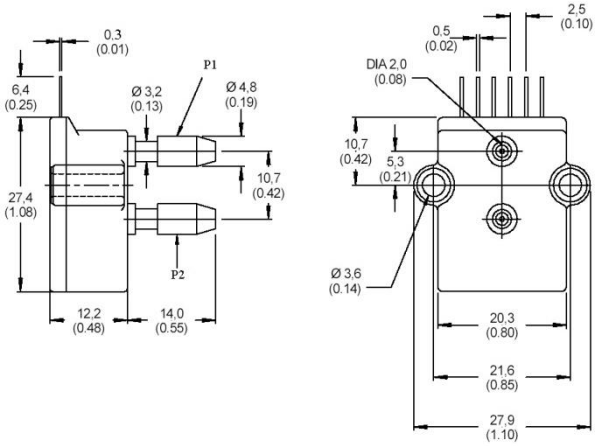
Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply					
Supply voltage	V_{CC}	4.75		5.25	V
Current consumption	I_{CC}		3.5	6.5	mA
Analog output (pressure) [3]					
Offset voltage [4]	V_O		0,50		V
Full scale output (FSO) [5]	V_{FS}		4,50		V
Full scale span (FSS) [6]	V_{FSO}		4,00		V
Digital output (pressure) [3]					
Offset voltage [4]	V_O		3277		counts
Full scale output (FSO) [5]	V_{FS}		29491		counts
Full scale span (FSS) [6]	V_{FSO}		26214		counts
Accuracy (pressure; offset, span) @25°C [7]	E_a		±0.5	±1	%FSO
Total accuracy (pressure) @0-70°C [8]	E_{ta}		±0.75	±2	%FSO
Resolution					
A/D converter	D_i			15	bit
D/A converter	D_O		11		bit
Response time	E_{rt}		1		ms
Repeatability [9]	E_r		±0.1		% FSO
Nonlinearity & pressure hysteresis (BFSL) [10]	E_l		±0.1	±0.3	% FSO
Load resistance	R_L	2		∝	k
Media compatibility		see spec. note [11], [12]			
Weight	W		9		g

Specification notes

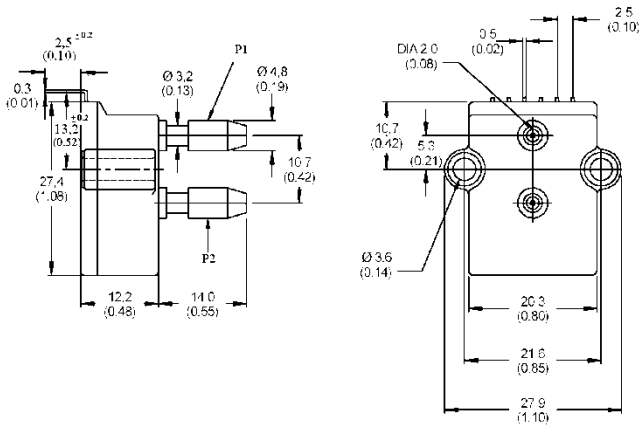
1) Over pressure is the maximum pressure which may be applied without causing damage to the sensing element.
2) Burst pressure is the maximum pressure which may be applied without causing leakage damage to the sensing element.
3) Analog output signal is ratiometric to power supply Vcc digital signal 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) Accuracy of offset and span includes all effects (nonlinearity, pressure hysteresis and repeatability) at room temperature and represents maximum deviation of sensor signal from ideal characteristic.
8) 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 sensor signal from ideal characteristic in compensated temperature range from 0°C to 70°C.
9) Repeatability is defined as typical deviation of the output signal after 10 pressure cycles.
10) Nonlinearity is defined as the BFSL (best fit straight line) across entire pressure range.
11) Media compatibility on pressure port P1,P2 : noncorrosive gases/fluids to epoxy, LTCC ceramics and LCP plastics.

Outline dimensions

1)PINS STRAIGHT:



2)PINS CURVED:



HYB emotional electronics

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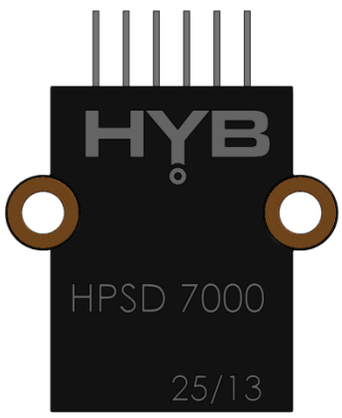
Pinout

6 5 4 3 2 1 **- Pin 1 is marked by #1**



Pin number	OUTPUT
1	GND
2	SDA
3	SCL
4	OUT
5	N/C[1)]
6	Vcc

1)Pin 5 must be left unconnected

Ordering guide

Transducer type	Pressure range	Pressure type	Pressure direction	Pressure port	Contact pins
HPSD 7000	100M	D	0	P	S
	350M		B		C
	001B				
	002B				
	004B				
	010B				

Pressure range	
100M	100 mbar
350M	350 mbar
001B	1 bar
002B	2 bar
004B	4 bar
010B	10 bar

Pressure type	
D	Differential

Pressure direction	
0	0 to press. range
B	-press. range to press. range

Pressure port	
P	Positive pressure on P1 port

Contact pins	
S	Straight
C	Curved

Other configurations possible on special request.

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