

HPSD 1000 Pressure Transducer

General description

Pressure transducer HPSD 1000 is a pressure sensing device. High performance and accuracy enables use of this transducer in many applications. Transducer is packaged in compact SMD package. Programmable temperature compensation provides 1% total error over 0 to 70°C temperature range. Operating from single 5 V supply, wide compensated temperature range and standard, ratiometric 0,5 to 4,5 V output provides OEM users maximum freedom for any type of application with dry air or non-corrosive gases.

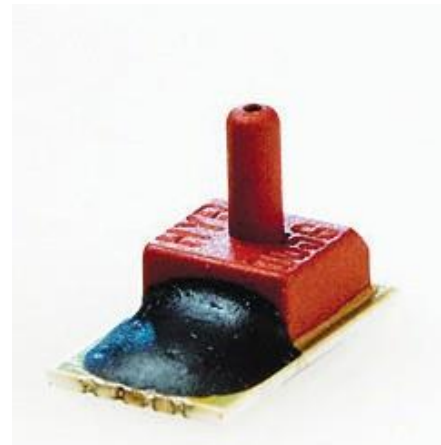
The model HPSD 1000 is designed for surface mount assembly with one pressure tube. Whole family includes 10 mbar up to 7 bar pressure range.

Features

- Single 5 V supply voltage
- Easy to use package
- Wide compensated range (0 to 70°C)
- Up to 15 bits I2C output (pressure + temperature)
- Standard 0,5 to 4,5 V voltage output
- **Total accuracy** down to **0,5%FS** over 0 to 70°C, all effects included (maximum)
- High performance OEM applications
- Gage and absolute configuration

Applications

- Industrial process control
- Pressure transducer
- Air flow monitoring
- Process control
- Leak detection



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HPSD 1000 Pressure Transducer

Types overview

$T_{AMB} = 25^{\circ}C$

$V_{CC} = 5 V$, unless otherwise noted

Low pressure range

Pressure range	10 mbar (0,15 psi)	20 mbar (0,3 psi)	50 mbar (0,8psi)	100 mbar (1,5psi)
ID group	HPSD 1000-010M	HPSD 1000-020M	HPSD 1000-050M	HPSD 1000-100M
Pressure types	gage/ bidirectional	gage/ bidirectional	gage/ bidirectional	gage/ bidirectional
V_{OUT}	0,5 to 4,5 V	0,5 to 4,5 V	0,5 to 4,5 V	0,5 to 4,5 V
Temperature ranges	Operating: -25 to 85°C Compensated: 0 to 70°C Storage: -40 to 125°C			
Over pressure ¹⁾	100 mbar	200 mbar	500 mbar	1000 mbar
Burst pressure ²⁾	150 mbar	300 mbar	750 mbar	1500 mbar

High pressure range

Pressure range	350 mbar (5psi)	1 bar (15psi)	2 bar (30psi)	4 bar (60psi)	7 bar (100psi)
ID group	HPSD 1000-350M	HPSD 1000-001B	HPSD 1000-002B	HPSD 1000-004B	HPSD 1000-007B
Pressure types	gage / bidirectional	gage / bidirectional / absolute	gage / absolute	gage / absolute	gage / absolute
V_{OUT}	0,5 to 4,5 V	0,5 to 4,5 V	0,5 to 4,5 V	0,5 to 4,5 V	0,5 to 4,5 V
Temperature ranges	Operating: -25 to 85°C Compensated: 0 to 70°C Storage : -40 to 125°C				
Over pressure ¹⁾	1 bar	3 bar	6 bar	8 bar	14 bar
Burst pressure ²⁾	1,7 bar	5 bar	10 bar	12 bar	21 bar

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Performance characteristics

$$T_{AMB} = 25^{\circ}\text{C}$$

$$V_{CC} = 5\text{ V, unless otherwise noted}$$

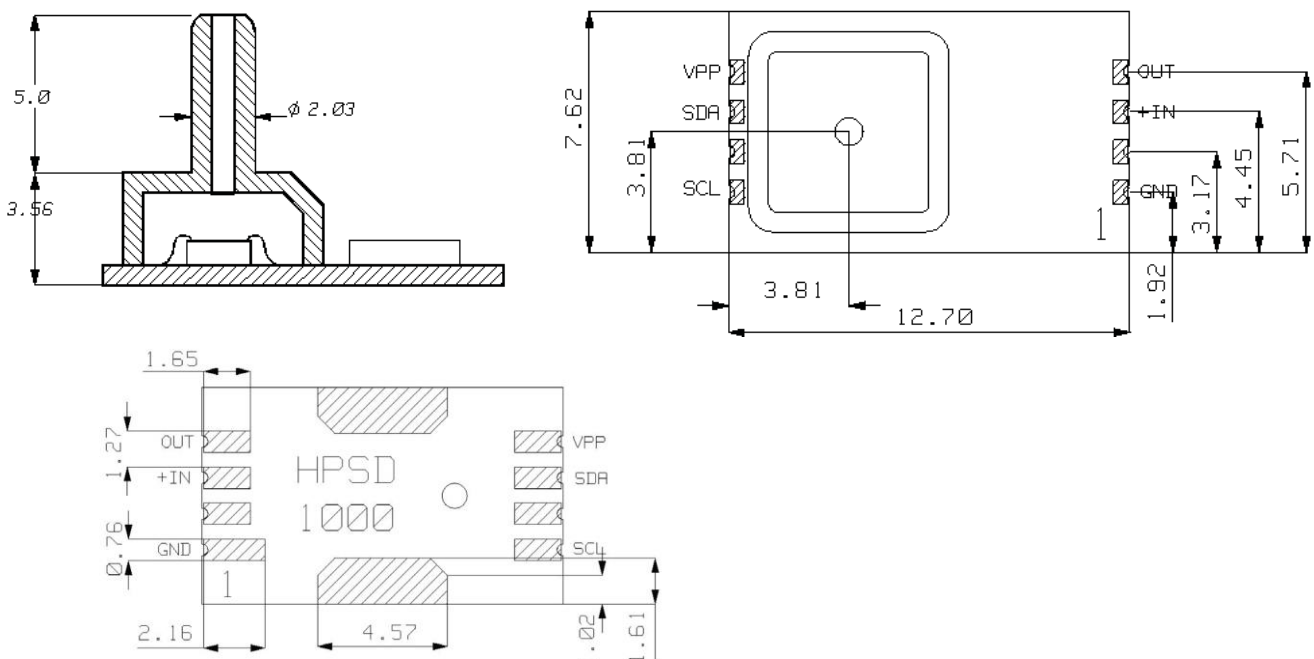
Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply					
Supply voltage	V_{CC}	4,75		5,25	V
Current consumption	I_{CC}		4	6,5	mA
Analog output (pressure)³⁾					
Offset voltage ⁴⁾	V_O		0,50		V
Full scale output (FSO) ⁵⁾	V_{FS}		4,50		V
Full scale span (FSS) ⁶⁾	V_{FSO}		4,00		V
Offset voltage (bidirectional devices)	V_O		2,50		V
Digital output (pressure), 15 bits³⁾					
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
Offset voltage (bidirectional devices)	V_O		16384		counts
Digital output (temperature), 15 bits⁷⁾					
Temperature output @ 0°C	T_o		8192		counts
Temperature output @ 70°C	T_s		24576		counts
Accuracy (pressure) @ 25°C⁸⁾					
Low pressure (10 to 100 mbar devices)	E_a		0,3	±0,5	%FSO
Standard pressure	E_a		0,2	±0,4	%FSO
Total accuracy (pressure) @ 0 to 70°C⁹⁾					
Low pressure (50 to 100 mbar FS devices)	E_{ta}		0,5	±1	%FSO
Standard pressure (all other devices)	E_{ta}		0,3	±0,5	%FSO
Resolution					
A/D converter	D_i			15	bit
D/A converter	D_o		11		bit
Response time	E_{rt}		1,5		ms
Reflow error (offset, span) ¹⁰⁾	E_{rf}		0,1		% FSO
Repeatability ¹¹⁾	E_r		±0,05		% FSO
Nonlinearity & pressure hysteresis (BFSL) ¹²⁾	E_l		±0,1	±0,3	% FSO
Load resistance	R_L	2		∞	k
Media compatibility			See spec. note ¹³⁾		
Weight	W		9		g

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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 V_{cc} , 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 V_{cc} . 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 maximum deviation of transducer signal from ideal characteristic.
- 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) Repeatability is defined as typical deviation of the output signal after 10 pressure cycles.
- 12) Nonlinearity is defined as the BFSL (best fit straight line) across entire pressure range.
- 13) Media compatibility: clean, dry and noncorrosive gases to silicon, RTV, gold, ceramics Al_2O_3 , epoxy, polymer.

Outline dimensions and pinout



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Ordering guide

Transducer type	Pressure range	Pressure type	Direction	Port type
HPSD 1000	010M	G	0	T
	020M	A	B	H
	050M			
	100M			
	350M			
	001B			
	002B			
	004B			
	007B			

Pressure range	
010M	10 mbar
020M	20 mbar
050M	50 mbar
100M	100 mbar
350M	350 mbar
001B	1 bar
002B	2 bar
004B	4 bar
007B	7 bar

Pressure type	
G	Gage
A	Absolute (for p≥1 bar)

Pressure direction	
0	0 to press. range
B	-press. range to +press. range (bidirectional)

Port type	
T	Pressure port
H	Hole (without pressure port)

Other configurations possible on special request.

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