

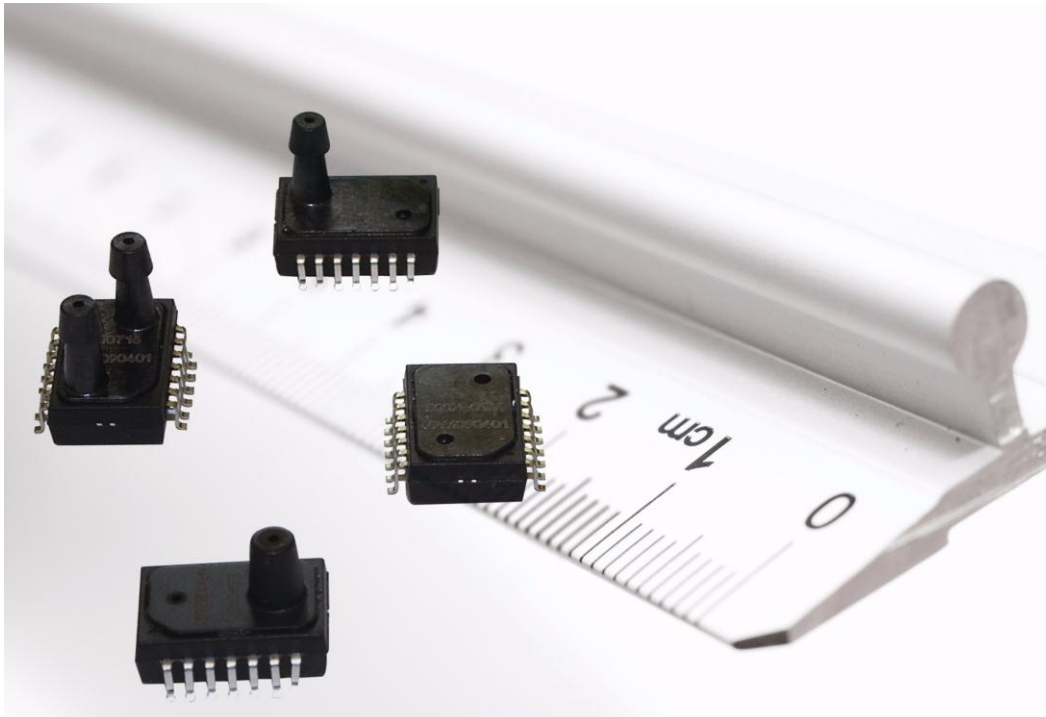
NPA

The NPA product series is provided in a miniature size as a cost effective solution for applications those require calibrated performance. Packaged in a SOIC14 pin surface mount, the NPA Series is available in Gauge or Differential pressure ranges with either mV, amplified analog or digital outputs. The sensor is intended for printed circuit board mounting and delivered in tape and reel form to simplify manufacturing handling.

NPA
Low Pressure Sensors

2" -& 5" H₂O
Preliminary Engineering
Data Sheet

GE Advanced Sensors - NPA Product Line



NPA Low Pressure Preliminary Data Sheet – This data sheet is strictly a preliminary engineering datasheet for our low pressure NPA parts. Our preliminary datasheet for 2" and 5" H₂O reflects a wider total error band specification to ~2.5%.

Features

- Surface Mountable
- Differential and Gauge Low Pressure
- 2" - 5" H₂O
- Output Options: Amplified Analog, Digital Serial (14bit), Digital I2C, Un-calibrated mV
- On chip temperature sensor in digital mode
- Operating temperature range of -40 to 125°C
- Total Error Band < ±2.5% FSO
- 60 psi proof pressure on all ranges

General NPA Specification

Pressure Parameters	Value	Units	Notes
Pressure Range	2 to 5	in H ₂ O	498 to 1245 Pa
Maximum Overpressure **	400	in H ₂ O	101.60 kPa / 15 psi
Electrical @ 25°C (77°F) unless otherwise stated			
Input Excitation	3.3 to 5.0	VDC	3.1 to 5.25 VDC
Environmental			
Temperature Range			
Operating	-40 to +125	°C	-40 to +257°F
Compensated	0 to +60	°C	+32 to +157°F
Storage	-40 to +125	°C	-40 to +257°F
Mechanical/Package/Shipping			
Outline Mechanical Drawing			
Weight	~1	grams	
Media Compatibility	Media compatible with thermoset plastic, silicon, epoxy, RTV, Pyrex, and UV silicone gel		
Negative differential and vent ports	Pyrex, and UV silicone gel		
Positive differential and gage ports	Dry gases only		
Marking per mechanical drawing	E-build as required		
Performance Parameters			
	Units	Minimum	Maximum
Zero Pressure Output Signal	Volts	0.44	0.56
Span (Absolute / Gauge)	Volts	4.0	
Span (Differential)	Volts	1.75	2.50
Accuracy (Total Error Band)	%FSO	-2.5	2.5
Response Time	ms		2
Current Consumption	mA	1.2	
			0.5 ms Typical
			Typical
Analog Output Performance Parameter			
	Units	Minimum	Maximum
Over Voltage Protection*	V	5.5*	

** Sensor can withstand 5X pressure without effecting parameters.

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Reference Conditions for Sensor

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
Vouta	Voltage at Analog I/O - Out Pin	-0.3		VDD+.3	Volts	
RL out	Output load Resistance to Vss or Vdd	2.5	10		K ohms	
CL out	Output Load Capacitance		10	15	Nano Farad	
t-pon	Power ON Rise Time			100	millisecond	
TC-reg	Temp Coefficient - Regulator			35	ppm/K	-10 to 120 C
POR	Power-On Reset Level	1.4		2.6	Volts	
T-WRI_EEP	Data Retention			10	years	at 100 C
T-res ADC	Response Time		1		millisecond	
Iout	Max Output current	2.2			milliamp	
rout	Resolution			11	bit	
EABS	Absolute Error	-10		10	millivolt	DAC input / Output
DNL	Differential Nonlinearity	-0.9		1.5	LSB (11 bit)	No missing codes
Vout	Upper Output Voltage Limit	95%			VDD	RL =2.5 K ohms
Vout	Lower Output Voltage Limit			16.5	mV	

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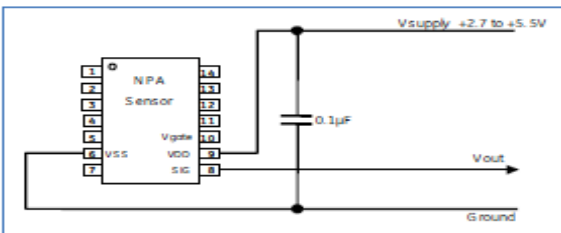
NPA Output Options

Output Option: Amplified Analog

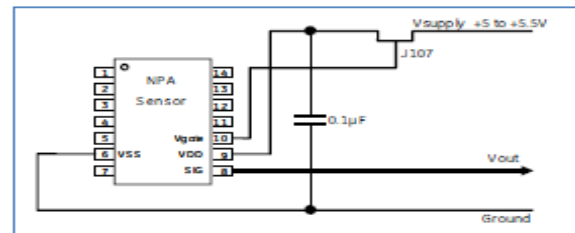
Parameter	Units	Min	Typ	Max
Analog Performance Parameters 5 volt Excitation				
Offset	Volts	0.44	0.5	0.56
Span	Volts		4	
Analog Performance Parameters 3.3 volt Excitation				
Offset	Volts	0.46	0.5	0.54
Span	Volts		2.5	

Typical Analog Circuits

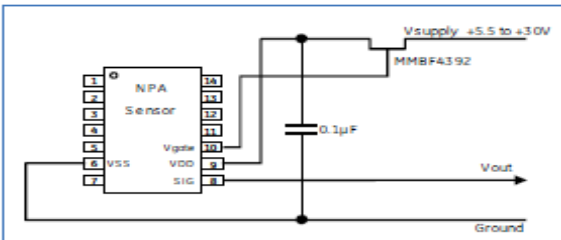
Circuit layout same as "Ratiometric Voltage Output"



Ratiometric Voltage Output - Standard NPA



Ratiometric Voltage Output with Over-Voltage Protection - Request Required



Absolute Voltage Output - Request Required

NPA Pinout

Pin #	Amplified Analog	Function Notes
1	--	
2	--	
3	--	
4	--	
5	--	
6	VSS	Ground Supply
7	--	
8	SIG	Analog Out, Calibration Interface
9	VDD	Supply Voltage
10	--	
11	--	
12	--	
13	--	
14	--	

Diagram 3: NPA Output Options

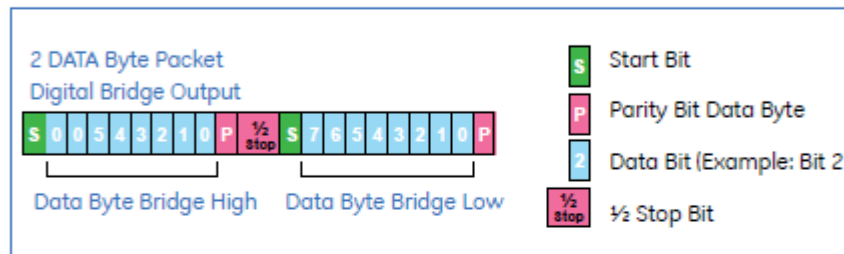
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Output Option: Digital Serial (14 bit)

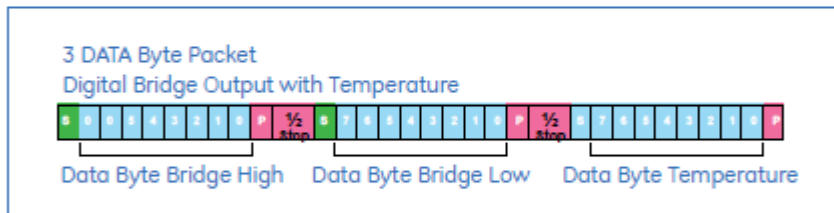
Parameter	Units	Min	Typ	Max	Notes
Digital Performance					
Resolution	ADC		14bit		16383 steps
Sampling Rate	kHz		1		
Digital Serial Output					
Temperature Sensor Accuracy			4°C		8bit

Digital Output Options

Streaming serial output is a 14 bit number proportional to the full scale.



Zacwire—Digital Output (NOM) Bridge Readings



Zacwire—Digital Output (NOM) Bridge Readings with Temperature Option

NPA Pinout

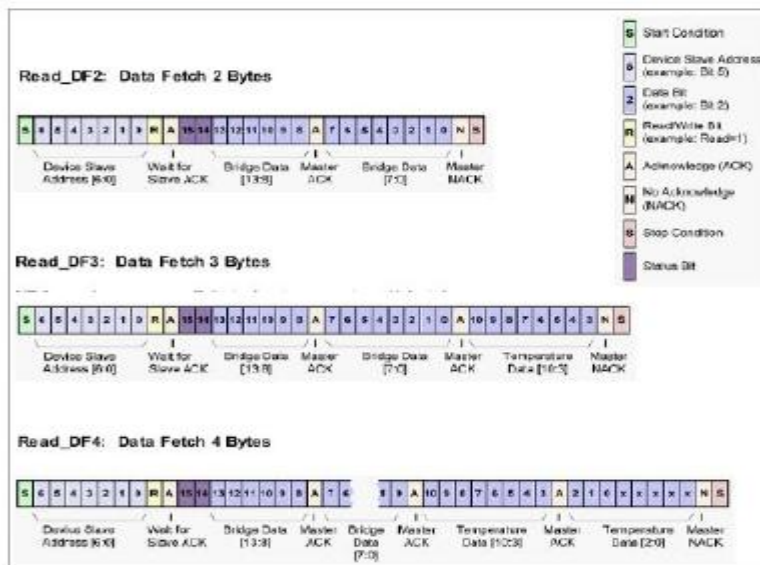
Pin #	Amplified Digital Serial	Function Notes
1	--	
2	--	
3	--	
4	--	
5	--	
6	VSS	Ground Supply
7	--	
8	SIG	Digital Out, Calibration Interface
9	VDD	Supply Voltage
10	--	Not Connected
11	--	
12	--	
13	--	
14	--	

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Output Option: Digital I²C

Parameter	Units	Min	Typ	Max	Notes
Digital Performance					
Resolution (ADC)	bit		14		16383 steps
I ² C Slave Address			0x28		
Sampling Rate	kHz		2		
I ² C Bit Rate	kbits/s	100		400	
I ² C Mode			Update		
Temperature Accuracy (0 to 60°C)	°C		2		11 bit

Digital I²C Update Mode Output Options



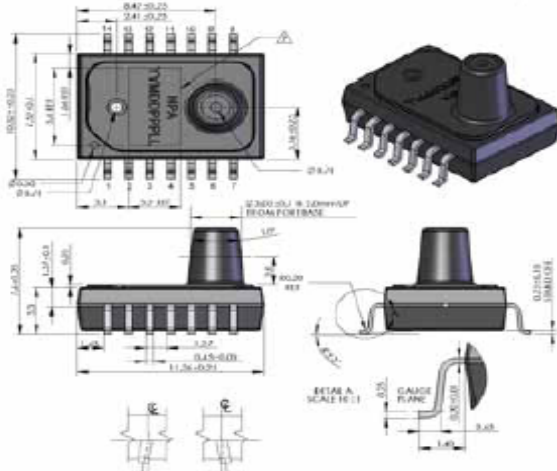
NPA Pinout

Pin #	Digital I ² C	Function Notes
1	--	
2	--	
3	--	
4	--	
5	--	
6	VSS	Ground Supply
7	VDD	Supply Voltage
8	SDA	Serial Data, Calibration Interface
9	SCL	Serial Clock, Calibration Interface
10	--	
11	--	
12	--	
13	--	
14	--	

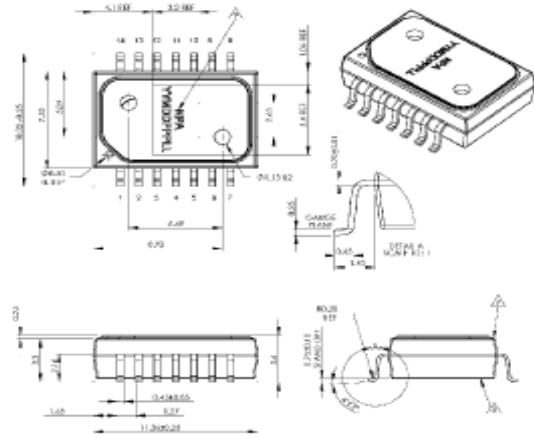
Diagram 4: NPA Pinout

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Manifold Design (All measurements given in mm)

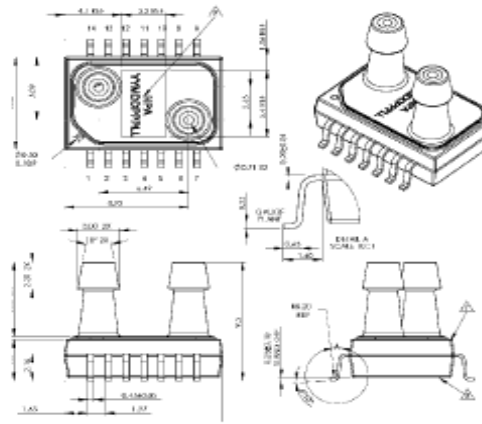
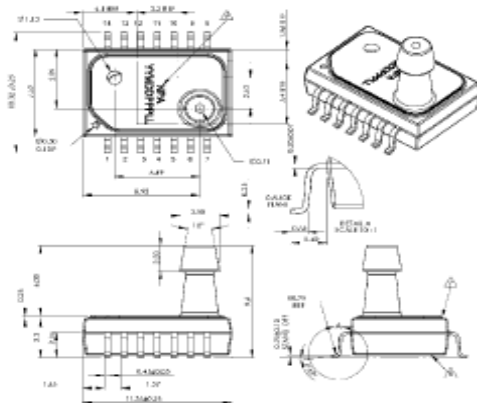


No Port Design (All measurements given in mm)



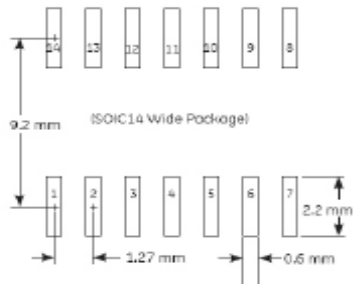
Barbed Design

Recommended tubing size of 3/32" ID, 7/32" OD, 1/16" wall thickness (All measurements given in mm)



1 Barb Port – Request Required

Suggested PCB Land Pattern



Package Leadframe Material: Alloy 194, NiPdAu Plated

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