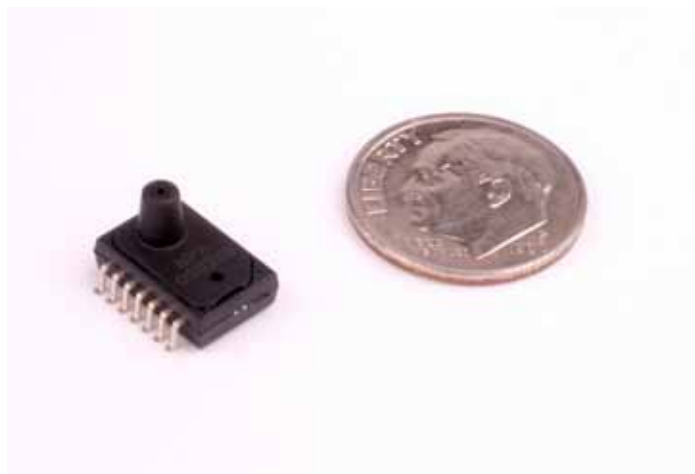


NPA

Surface-Mount Pressure Sensor Series

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



Features

- Surface Mountable
- Differential, Gauge, Absolute & Low Pressure
- 10" H₂O to 30 PSI Full Scale
- Output Options: Amplified Analog, Digital Serial (14bit), Digital I²C, Uncalibrated mV
- On chip temperature sensor in digital mode
- Operating temperature range of -40 to 125°C
- Total Error Band < ±1.5% FSO
- 60 psi proof pressure on all ranges



Parameter	Value	Units	Notes
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			
Weight	~1	grams	
Media Compatibility			
Positive differential and gauge ports	Compatible with exposed materials		1
Negative differential ports	Dry gases only		

Parameter	Units	Min	Typ	Max	Notes
Common Parameters					
Accuracy (Total Error Band)	%FSO	-1.5		1.5	
Proof Pressure	psi		60		
Burst Pressure			TBD		
Pressure ranges		10"H2O		30psi	

Notes: 1. Exposed materials are thermoset plastic, silicon, epoxy, RTV, and pyrex. Series Excitation Voltage Notes

Series	Excitation Voltage	Notes
NPA-100	1.5mA	NPA Uncompensated, mV
NPA-300	3.3V	NPA Compensated, low power amplified analog
NPA-500	5.0V	NPA Compensated, amplified analog
NPA-600	5.0V *	NPA Compensated, digital serial
NPA-700	5.0V *	NPA Compensated, digital I ² C

* 3.3V optional, contact factory for more details

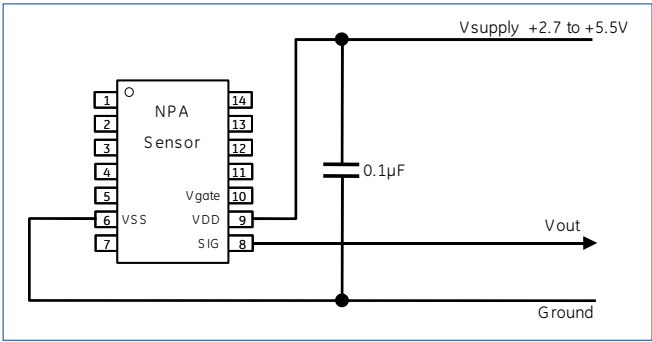
Output Option: Amplified Analog

PRELIMINARY

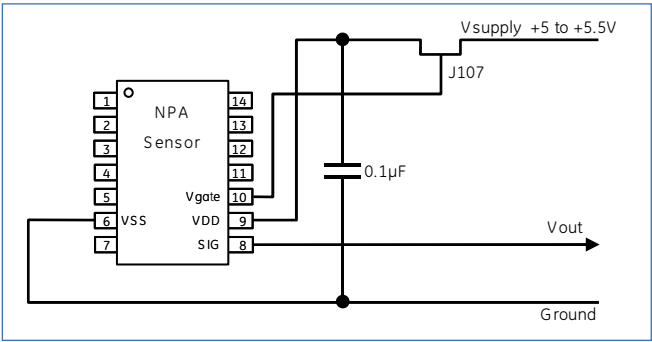
Parameter	Units	Min	Typ	Max
Analog Performance Parameters 5 volt Excitation				
Offset	Volts	0.44	0.5	0.56
Span	Volts		4	
Analog Performance Parameters 3.3 volt Excitation				
Offset	Volts	0.46	0.5	0.54
Span	Volts		2.5	

Typical Analog Circuits

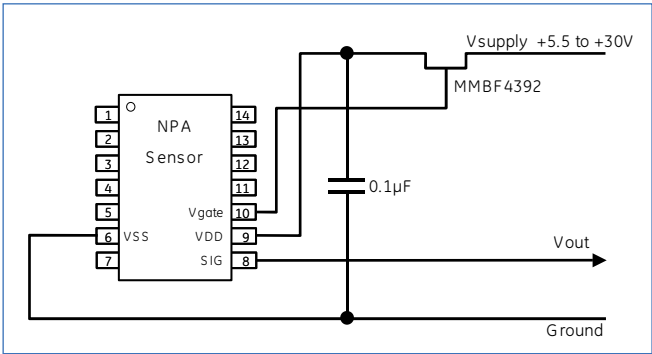
Circuit layout same as “Ratiometric Voltage Output”



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	--	

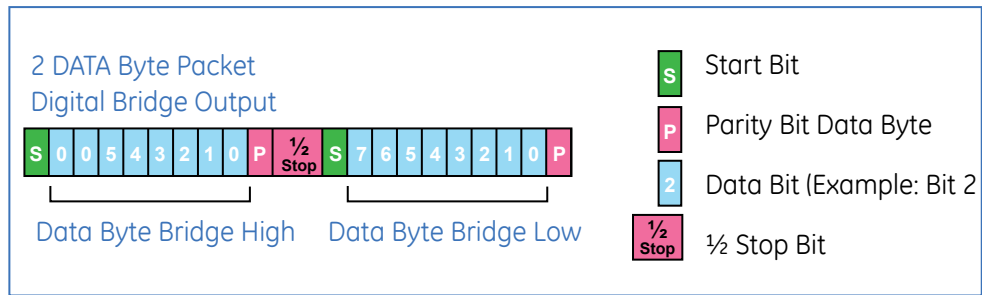
Output Option: Digital Serial (14 bit)

PRELIMINARY

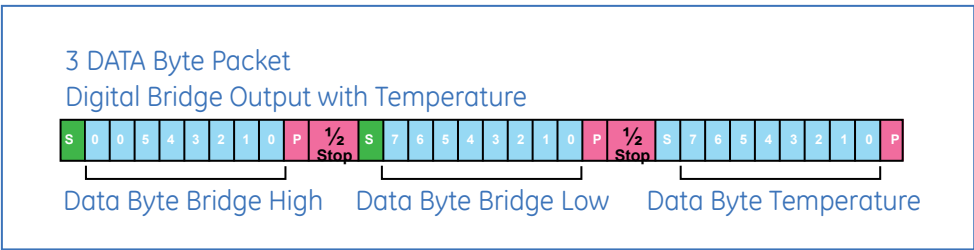
Parameter	Units	Min	Typ	Max	Notes
Digital Performance					
Resolution	ADC		14bit		16383 steps
Sampling Rate	kHz		1		
Digital Serial Output					
Temperature Sensor Accuracy			4°C		8bit

Digital Output Options

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



Zacwire—Digital Output (NOM) Bridge Readings



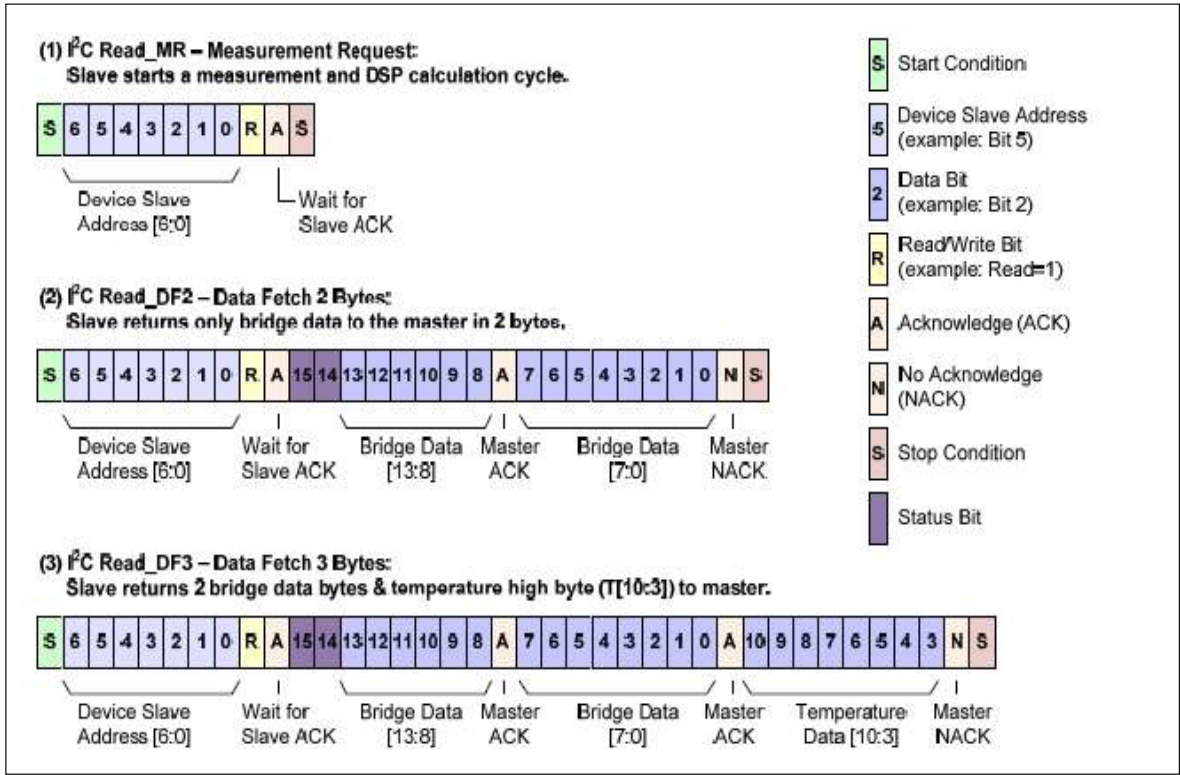
Zacwire—Digital Output (NOM) Bridge Readings with Temperature Option: Ask salesperson to stipulate Temperature need

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	--	

Parameter	Units	Min	Typ	Max	Notes
Digital Performance					
Resolution (ADC)	bit		14		16383 steps
Sampling Rate	kHz		2		
Temperature Accuracy (0 to 60°C)	°C		2		11 bit
I ² C Clock Frequency	MHz		1		4 MHz available, see application notes
I ² C Slave Address			0x28		
I ² C Mode			Update		Sleep mode available, see application notes

Digital I²C Update Mode Output Options



Packet (1) - Sleep Mode Only

NPA Pinout

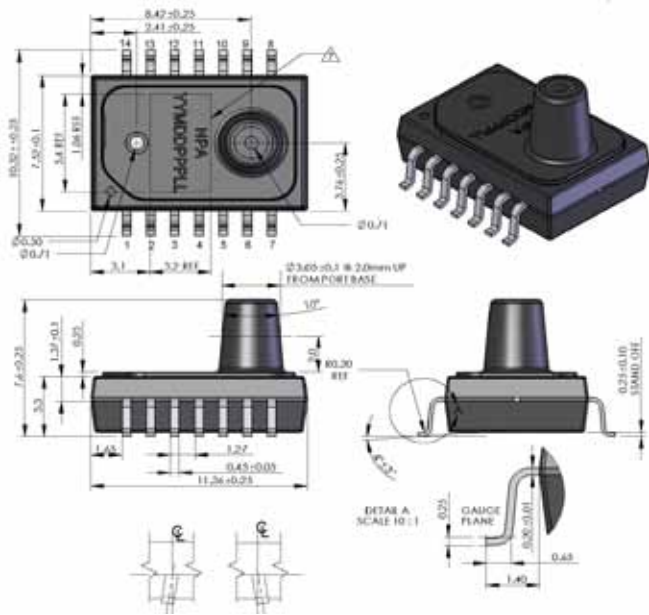
Pin #	Digital I ² C	Function Notes
1	--	
2	--	
3	--	
4	--	
5	--	
6	VSS	Ground Supply
7	VDD	Supply Voltage
8	SDA	Serial Data, Calibration Interface
9	SCL	Serial Clock, Calibration Interface
10	--	
11	--	
12	--	
13	--	
14	--	

NPA Uncalibrated Performance									
10 "H2O to 1 psi						5 psi to 30 psi			
Parameter	Units	Min	Typ	Max	Notes	Min	Typ	Max	Notes
Pressure Range	psi		0.36 to 1		10"H2O = 0.361psi = 2.49KPa		5 to 30		
Excitation	mA		1.5		10 VDC Maximum		1.0		10 VDC Maximum
Input Impedance	Ω		5000±20%				5000 ±20%		
Output Impedance	Ω		5000±20%				5000 ±20%		
Zero Offset	mV		± 75				±10		
Full Scale Output	mV		40 to 120		10 "H2O		100 to 166		5 psi to 30 psi
			75 to 135		1 psi				
Linearity	%FSO		±0.25				±0.25		
Pressure Hysteresis	%FSO		TBD				TBD		
Temperature Coefficient of Zero	µV/ V / °C		+30				+25		
Temperature Coefficient of Resistance	% /°C		0.29				0.38		
Temperature Coefficient of Sensitivity	%FSO/°C		-0.2				-0.19		
Thermal Hysteresis of Zero	%FSO		0.2						
Position Sensitivity	%FSO		0.1						

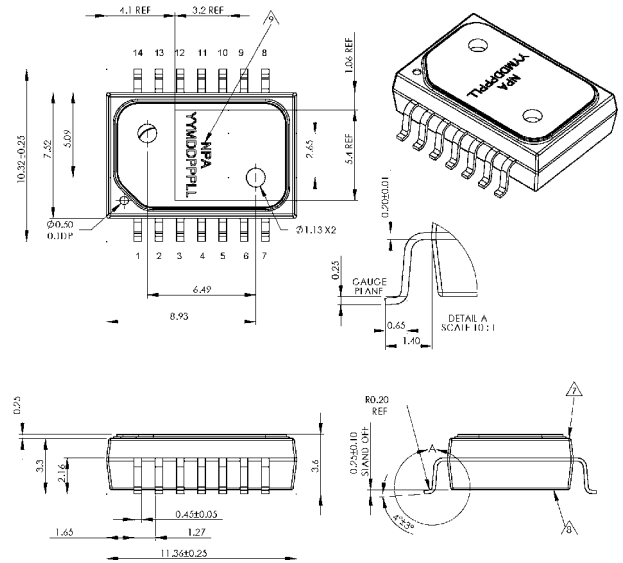
NPA Pinout

Pin #	Uncalibrated mV	Function Notes
1	--	
2	--	
3	VP	Sensor Interface Positive Output
4	VSSP	Sensor Interface Ground
5	--	
6	--	
7	--	
8	--	
9	--	
10	--	
11	VN	Sensor Interface Negative Output
12	VDDP	Sensor Interface Positive Excitation
13	--	
14	--	

Manifold Design (All measurements given in mm)

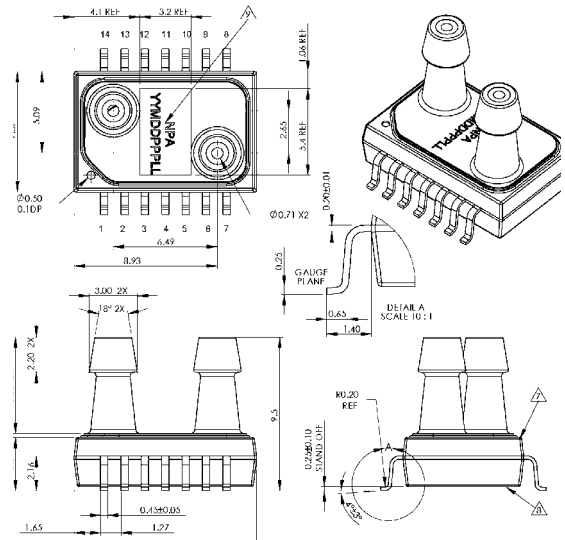
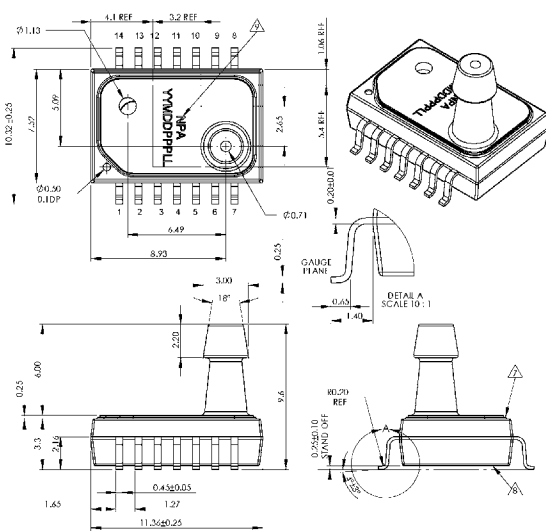


No Port Design (All measurements given in mm)

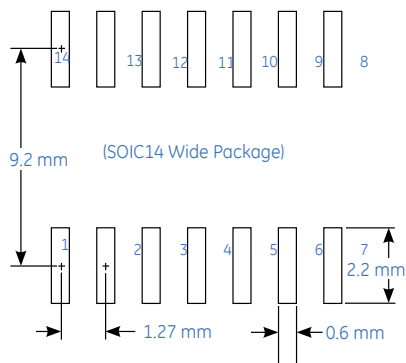


Barbed Design

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



Suggested PCB Land Pattern



Ordering Information

PRELIMINARY

Model

NPA

Code	Description
100	mV Output, Ratiometric Uncalibrated sensor
300	Analog Amplified Output, 3.3Vdc Excitation, Calibrated sensor
500	Analog Amplified Output, 5Vdc Excitation, Calibrated sensor
600	Zacwire —Digital Serial Output, Calibrated Sensor, 2 byte
601	Zacwire —Digital Serial Output, Calibrated Sensor, 3 byte
700	I ² C - Digital output, Calibrated Sensor, 2 byte

Code	Port Type
M	1 manifold port for Gauge and Absolute pressure types
B	1 barbed port for Gauge and Absolute pressure types
B	2 barbed ports for Differential pressure types
N	Non ported

Code	Pressure Range
10W	10"H2O (2.5 KPa)
001	1 PSI (7 KPa)
005	5 PSI (35 KPa)
015	15 PSI (100 KPa)
030	30 PSI (200 KPa)

Code	Pressure Type
G	Gauge
D	Differential
A *	Absolute

NPA - [] [] - [] []

Note: * Absolute pressure ranges are available in 15 PSIA and 30 PSIA only.

Contact factory for custom pressure ranges. 1-800-833-9438

Refer to application guide 910-289 for more information.

Product is RoHS:2010 compliant.

Warranty

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