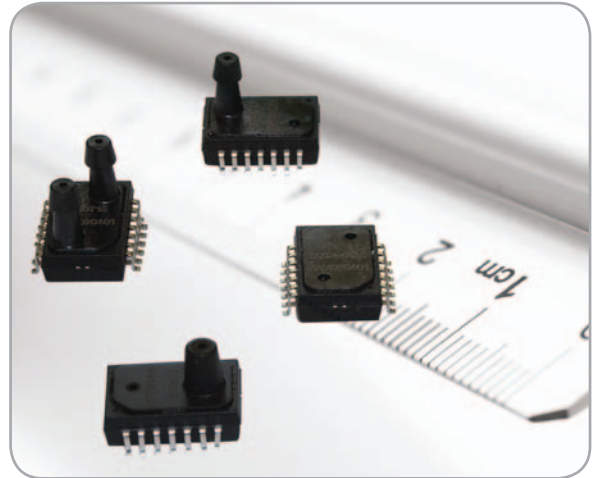


NPA Low Pressure Surface-Mount Pressure Sensor Series



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-Low Pressure Series is available in Gauge or Differential pressure ranges with either 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.

Features

- Surface Mountable
- Differential, Gauge, Low Pressure
- 2" and 5" H₂O Full Scale
- Output Options: Amplified Analog, Digital Serial (14bit), Digital I²C
- On chip temperature sensor in digital mode
- Operating temperature range of -40 to 125°C
- Total Error Band:
 - +/-1.5% Span at 5"H₂O full scale
 - +/-2.5% Span at 2"H₂O full scale

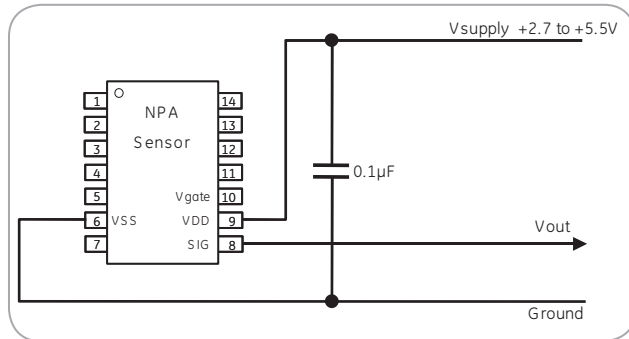
Low Pressure NPA Specifications

Parameter	Value	Units	Notes	
Pressure Range	2 or 5	In H ₂ O	498 or 1245 Pa	
Maximum Overpressure	5X	Rated Pressure	400 in H ₂ O Package Overpressure	
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 +140°F	
Storage	-40 to +125	°C	-40 to +257°F	
Mechanical/Package				
Weight	~1	grams		
Media Compatibility				
Positive differential and gage ports	Media compatible with thermoset plastic, silicon, epoxy, RTV, Pyrex, and UV silicone gel			
Negative differential ports	Dry gasses only			
Performance Parameters	Units	Minimum	Maximum	Notes
Accuracy (Total Error Band)	% Span	-1.5	1.5	5"H ₂ O Full Scale
		-2.5	2.5	2"H ₂ O Full Scale
Response Time	ms		2	0.5 ms Typical
Current Consumption	mA	1.2		Typical

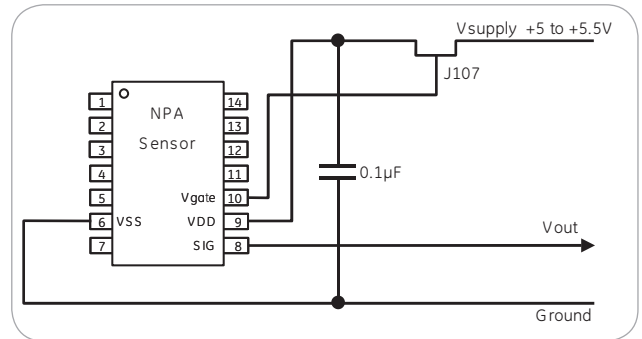
Output Option: Amplified Analog

Parameter	Units	Min	Max
Analog Performance Parameters 5 volt Excitation			
Offset	Volts	0.44	0.56
Span (Absolute/Gauge)	Volts		4
Analog Performance Parameters 3.3 volt Excitation			
Offset	Volts	0.46	0.54
Span (Absolute/Gauge)	Volts		2.5

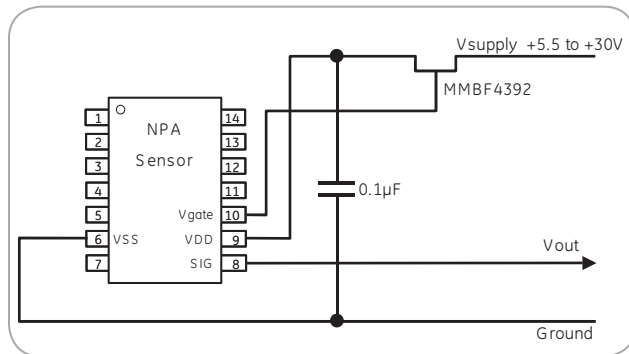
Typical Analog Circuits - Circuit layout same as “Ratiometric Voltage Output”



Ratiometric Voltage Output - Standard NPA



Ratiometric Voltage Output with Over-Voltage Protection - Request Required



Absolute Voltage Output - Request Required

NPA Amplified Output Pinout

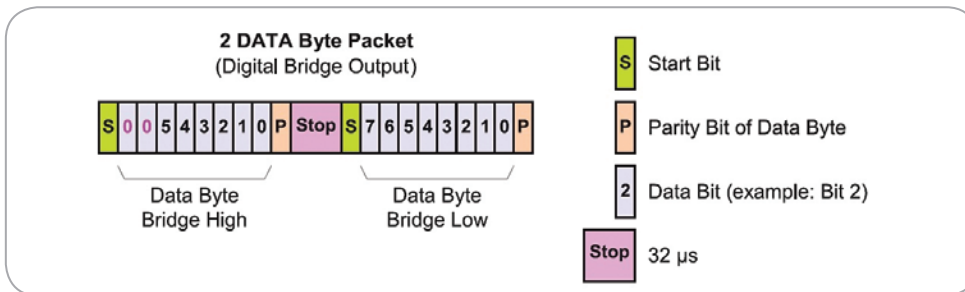
Pin #	Amplified Analog	Function Notes
1	--	
2	--	
3	NC	Do Not Connect
4	NC	Do Not Connect
5	--	
6	VSS	Ground Supply
7	--	
8	SIG	Analog Out, Calibration Interface
9	VDD	Supply Voltage
10	--	
11	NC	Do Not Connect
12	NC	Do Not Connect
13	--	
14	--	

Output Option: Digital Serial (14 bit)

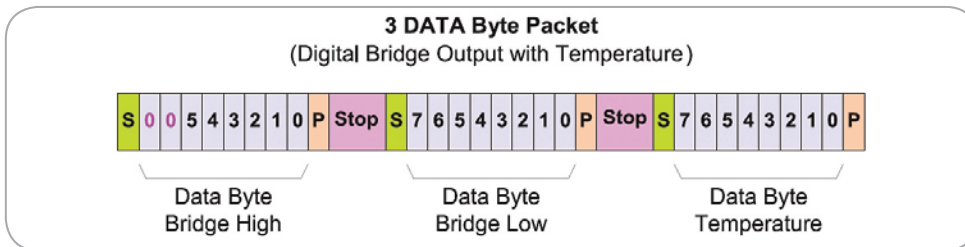
Parameter	Units	Min	Typ	Max	Notes
Digital Performance					
Resolution	ADC		14bit		16383 steps
Sampling Rate	kHz		1		

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 Digital Serial Pinout

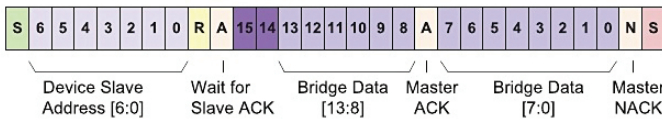
Pin #	Amplified Digital Serial	Function Notes
1	--	
2	--	
3	NC	Do Not Connect
4	NC	Do Not Connect
5	--	
6	VSS	Ground Supply
7	--	
8	SIG	Digital Out, Calibration Interface
9	VDD	Supply Voltage
10	--	
11	NC	Do Not Connect
12	NC	Do Not Connect
13	--	
14	--	

Output Option: Digital I²C

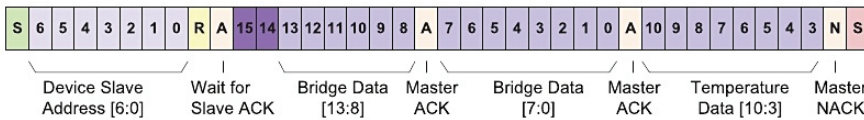
Parameter	Units	Min	Typ	Max	Notes
Digital Performance					
Resolution (ADC)	bit		14		16383 steps
I ² C Slave Address			0x28		
Sampling Rate	kHz		2		
I ² C Bit Rate	kbits/s	100		400	
I ² C Mode			Update		

Digital I²C Update Mode Output Options

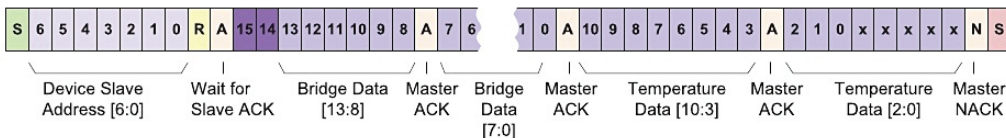
Read_DF2: Data Fetch 2 Bytes



Read_DF3: Data Fetch 3 Bytes



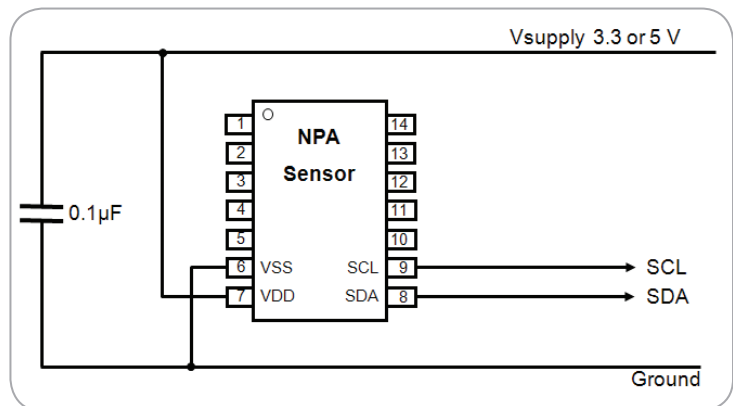
Read_DF4: Data Fetch 4 Bytes



- S** Start Condition
- 5** Device Slave Address (example: Bit 5)
- 2** Data Bit (example: Bit 2)
- R** Read/Write Bit (example: Read=1)
- A** Acknowledge (ACK)
- N** No Acknowledge (NACK)
- S** Stop Condition
- Status Bit**

NPA I²C Pinout

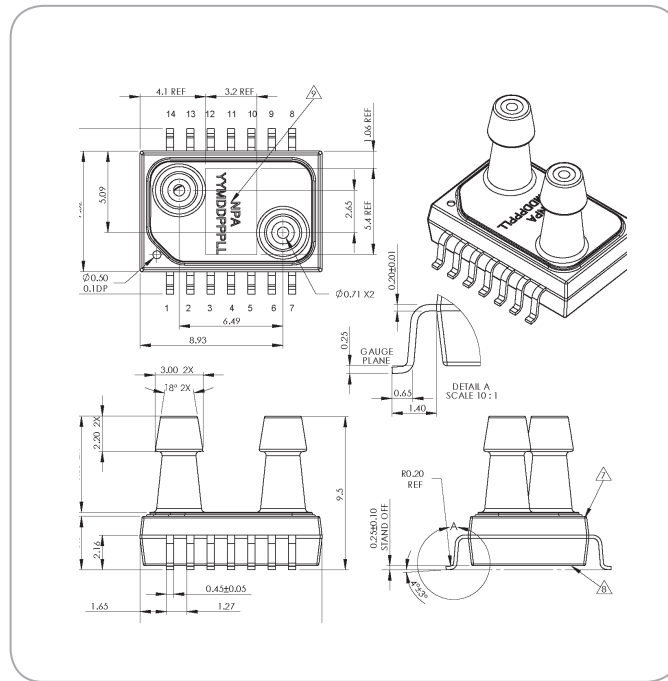
Pin #	Digital I ² C	Function Notes
1	--	
2	--	
3	NC	Do Not Connect
4	NC	Do Not Connect
5	--	
6	VSS	Ground Supply
7	VDD	Supply Voltage
8	SDA	Serial Data, Calibration Interface
9	SCL	Serial Clock, Calibration Interface
10	--	
11	NC	Do Not Connect
12	NC	Do Not Connect
13	--	
14	--	



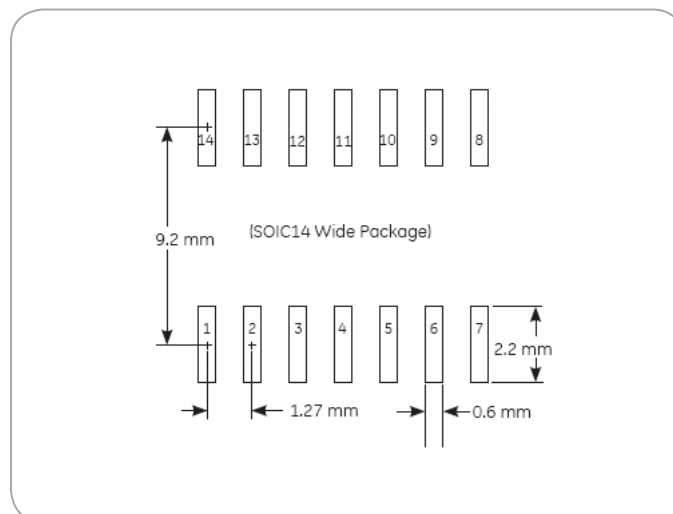
I²C Circuit NPA Pinout

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



Package Leadframe Material: Alloy 194, NiPdAu

Ordering Information

Model NPA	Code	Description
	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
	B	2 barbed ports for Gauge, Absolute and Differential pressure types**
		Code Pressure Range
	02W	2"H2O (0.5 KPa)
	05W	5"H2O (1.24 KPa)
		Code Pressure Type
	G	Gauge
	D	Differential
NPA	-	700
	B	-
	02W	D
EXAMPLE		

- Contact NovaSensor for custom port options.
- Refer to application guide 910-289 for more information.
- Product is RoHS:2010 compliant.

Warranty

NovaSensor warrants its products against defects in material and workmanship for 12 months from the date of shipment. Products not subjected to misuse will be repaired or replaced. NovaSensor reserves the right to make changes without further notice to any products herein. NovaSensor makes no warranty, representation or guarantee regarding the suitability of its products for any particular application. NovaSensor does not assume any liability arising out of the application or use of any product or circuit and specifically disclaims, and all liability, without limitation consequential or incidental damages. The foregoing warranties are exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. No implied statutory warranty or merchantability or fitness for particular purpose shall apply.

