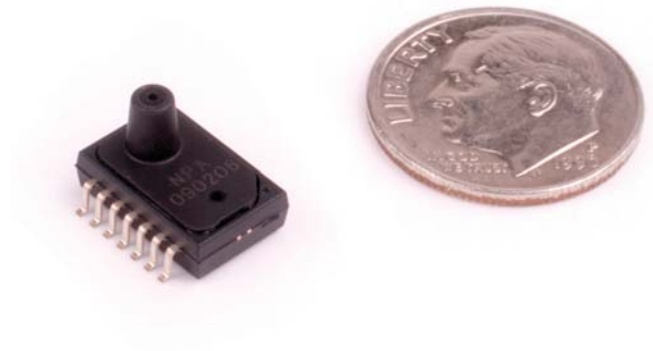


NPA

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
- Analog Amplified Analog or Digital Output
- Uncalibrated mV Output Option
- Digital pressure signal: 14 bit ADC / 11 bit DAC
- On chip temperature sensor in digital mode
- Operating temperature range of -40 to 125°C
- Total Error Band < $\pm 1.5\%$ FSO
- 60X overpressure on ranges <1 PSI



NPA Engineering Specification

| Parameter | Value | Units | Notes |
|--------------------------------------|-----------------------------------|-------|---------------|
| Environmental | | | |
| Temperature Range | | | |
| Operating | -40 to +125 | °C | -40 to +257°F |
| Compensated | 0 to 70 | °C | +32 to +157°F |
| Storage | -40 to +125 | °C | -40 to +257°F |
| Mechanical | | | |
| Weight | ~1 | grams | |
| Media Compatibility | | | |
| Positive differential and gage ports | Compatible with exposed materials | | 1 |
| Negative differential ports | Dry gases only | | |

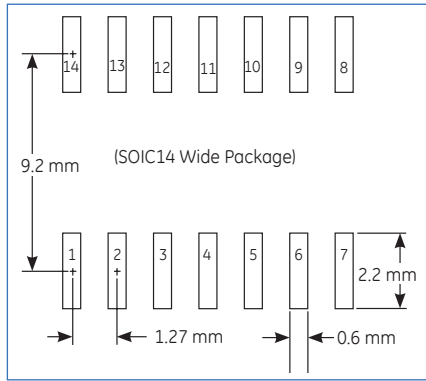
| Parameter | Units | Min | Typ | Max | Notes |
|--|------------|--------|-------|-------|-------------|
| Common Parameters | | | | | |
| Accuracy (Total Error Band) | %FSO | -1.5 | | 1.5 | |
| Response Time | ms | | 1 | 2 | |
| Pressure Overload <1psi FS range | full scale | | 60X | | |
| Pressure Overload 5psi to 30psi | full scale | | 2X | | |
| Resolution | | | 11bit | DAC | |
| Pressure ranges | | 10"H2O | | 30psi | |
| Digital Performance | | | | | |
| Resolution | | | 14bit | ADC | 16383 steps |
| Sampling Rate | kHz | | 1 | | |
| Digital Serial Output | | | | | |
| Temperature Sensor Accuracy | | | 4°C | | 8bit |
| 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 | | |

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

| NPA Uncalibrated Performance | | | |
|--|------------|-------------|-----------------------------|
| Parameter | Value | Units | Notes |
| Pressure Range | 0.36 to 30 | psi | 10"H2O = 0.361psi = 2.49KPa |
| Excitation | 1.5 | mA | 10 VDC Maximum |
| Input Impedance | 5000±20% | Ω | |
| Output Impedance | 5000±20% | Ω | |
| Zero Offset | ± 75 | mV | |
| Full Scale Output (10"H2O) | 40 to 120 | mV | |
| Full Scale Output (1psi) | 75 to 135 | mV | |
| Full Scale Output (5 psi to 30psi) | 100 to 166 | mV | |
| Full Scale Output (15psi & 30psi) | 75 to 135 | mV | |
| Linearity | ±0.25 | %FSO | |
| Pressure Hysteresis | ±0.02 | %FSO | |
| Temperature Coefficient of Zero | +30 | μV / V / °C | |
| Temperature Coefficient of Resistance | 0.29 | % /°C | |
| Temperature Coefficient of Sensitivity | -0.2 | %FSO/°C | |
| Thermal Hysteresis of Zero | 0.2 | %FSO | |
| Position Sensitivity | 0.1 | %FSO | |

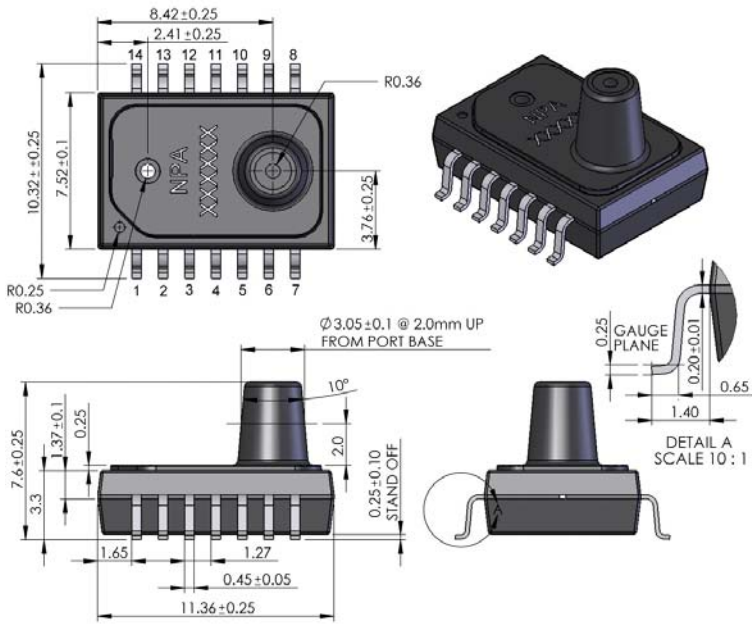
| Pin # | Uncalibrated Analog | Amplified Digital & Analog | Function Notes |
|-------|---------------------|----------------------------|--|
| 3 | VP | -- | Sensor Interface Positive Output |
| 4 | VSSP | -- | Sensor Interface Ground |
| 5 | -- | -- | Not Connected |
| 6 | -- | VSS | Ground Supply |
| 8 | -- | SIG | Analog Out, Digital Out, Calibration Interface |
| 9 | -- | VDD | Supply Voltage |
| 10 | -- | -- | Gate Control for External JFET Regulation / Overvoltage Protection |
| 11 | VN | -- | Sensor Interface Negative Output |
| 12 | VDDP | -- | Sensor Interface Positive Excitation |

Note: Pin numbers, 1, 2, 7, 13, 14 are unused.



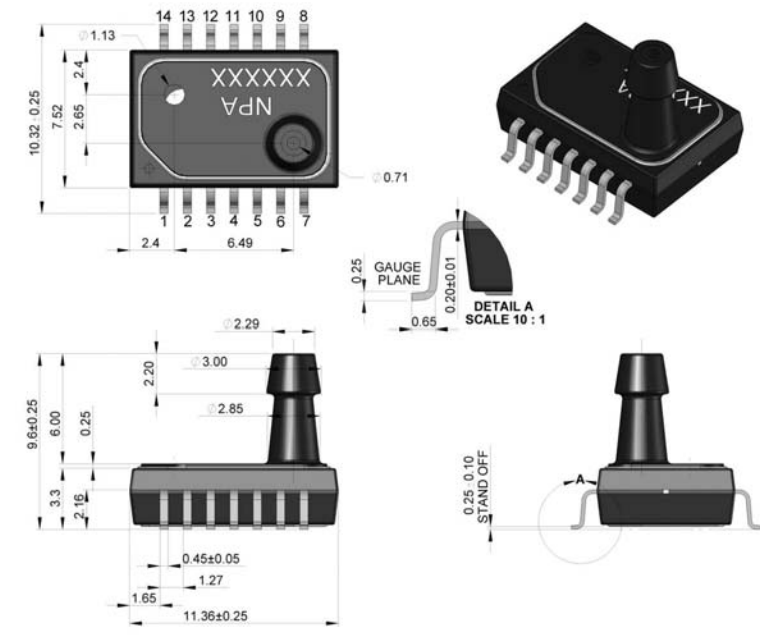
Suggested PCB Land Pattern

Manifold Design (All measurements given in mm)



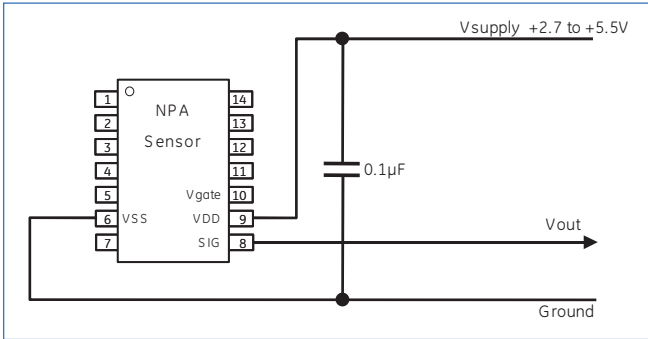
Barbed Fitting Design

Recommended tubing size of 3/32" ID, 7/32" OD, 1/16" wall thickness

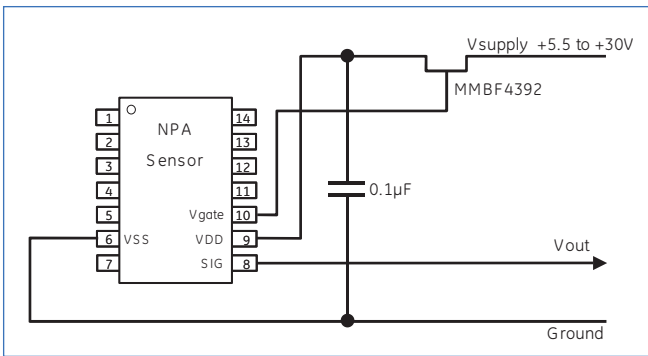


Typical Analog Circuits

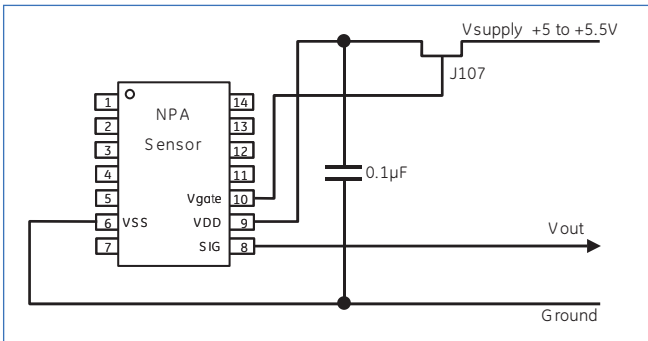
Circuit layout same as "Ratiometric Voltage Output"



Ratiometric Voltage Output



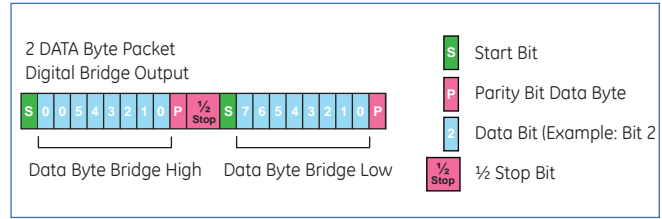
Absolute Voltage Output



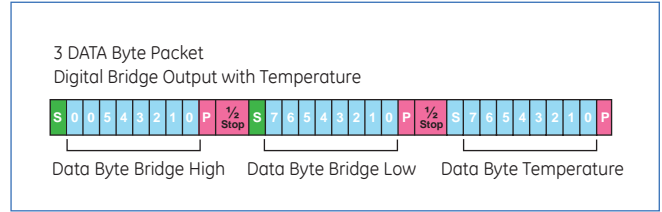
Ratiometric Voltage Output with Over-Voltage Protection

Digital Output Options

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



Digital Output (NOM) Bridge Readings



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

Ordering Information

| 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 | Digital Serial Output, Calibrated Sensor |
| | | Code Port Type |
| | M | Ported Manifold Pressure connection |
| | B | Barbed Pressure Port |
| | N | Non ported Manifold |
| | | Code Pressure Range |
| | 010W | 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 |
| | | Code Description |
| | Blank | Plastic Pack |
| | T | Tape and Reel |

NPA - - - - -

Note: * Absolute pressure ranges are available in 15 PSIA and 30 PSIA only. Contact Factory for custom pressure ranges.



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