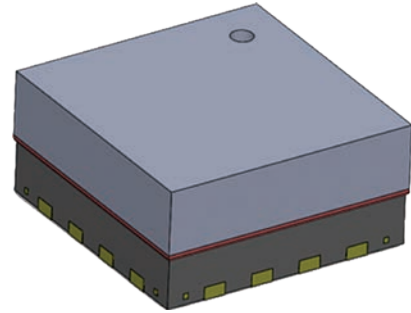


NPB 102

Digital Output Absolute Pressure Sensor



Applications

- Automobile Applications - Thermal Runaway Detection, Infotainment, and Enhanced GPS Navigation
- Mobile Devices - Smart Phones, Smart Watches, and Tablets
- Indoor and Outdoor Navigation
- Altimeter and Barometer for Portable Devices
- Weather Station Equipment
- Leisure and Sports
- Hard Disk Drive (HDD)
- Weather Forecast
- Consumer Drones

Features

- Absolute Pressure Range: 260 mBar to 1260 mBar and 50kPa to 200kPa (Other pressure ranges available upon request)
- Pressure Resolution: 18-bit, Temperature Resolution: 16-bit
- Operating Temperature: -40°C to +125°C
- Absolute Accuracy: ± 0.2 mbar / Relative Accuracy: ± 0.1 mbar Typical
- Interface: I²C (SPI available upon request)
- Operating Range: 1.7V ~ 3.6V
- Small size package
- Package: 4x4mm QFN
- Fully-calibrated and compensated
- Digital compensation via 26-bit internal digital signal processor (DSP) running a correction algorithm



Overview

- The NPB 102 is an absolute pressure sensor with digital output for low cost applications.
- With a standard 4x4 mm QFN package, it is ideally suited for automobile, portable electronics and space-constrained applications.
- A wide operating temperature range from -40°C to +125°C fits well with demanding environmental requirements.
- NPB 102 employs a MEMS pressure sensor with a signal-conditioning IC to provide accurate pressure measurement from 50kPa to 200kPa.
- The NPB 102 not only compensates and calibrates the pressure element, but also provides a corrected temperature output using an internal sensor.
- The measured and corrected bridge values are provided at the digital output pins through an I²C interface.
- Digital compensation of the signal offset, sensitivity, temperature and non-linearity is accomplished via 26-bit internal digital signal processor (DSP) running a correction algorithm.
- Calibration coefficients are stored on-chip in highly reliable, nonvolatile, multiple-time programmable (MTP) memory.

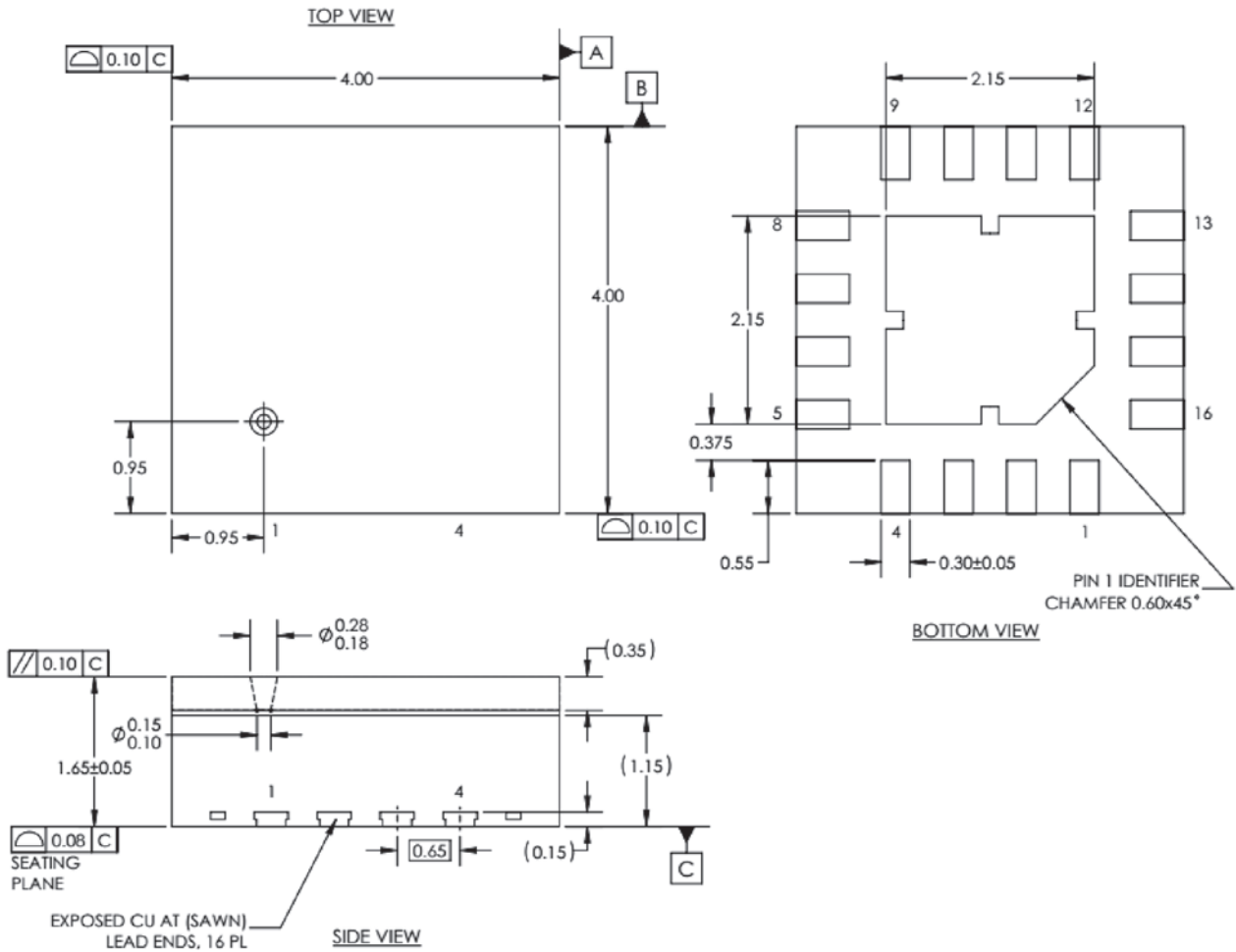
Electrical Specifications

Symbol	Parameter	Limits			Unit	Remark
		Min	Typ	Max		
V _{DD}	Supply Voltage	1.7	-	3.6	V	
T _{op}	Operating Temperature	-40	-	125	°C	
T _{acc}	Full Accuracy Temperature	-40	-	125	°C	
I _{VDD}	Current Consumption	-	0.05	0.75	μA	Sleep Mode
		-	1050	1500	m	Active State
P _{op}	Operating Pressure Range	50	-	200	kPa	
P _{bit}	Pressure Output Data Bits	-	-	24	bit	
P _{res}	Pressure Resolution	-	-	18	bit	
T _{bit}	Temperature Output Data	-	-	24	bit	
T _{abs}	Temperature Accuracy	-	± 4	-	°C	T= -40 to 125°C
T _{res}	Response Time	-	3.5	-	ms	
P _{TEB}	Pressure Accuracy	-2.0		+2.0	%FSO	T= 0 to 85°C
		-3.0		+3.0	%FSO	T=-40 to 0°C and 85 to 125°C
POWER UP						
T _{STA1}	Start-up Time			1	ms	VDD ramp up to interface communication
T _{STA2}				2.5	ms	VDD ramp up to analog operation
T _{WUP1}	Wake-up Time			0.5	ms	Sleep to Active State interface communication
T _{WUP2}				2	ms	Sleep to Active State analog operation
INTERFACE						
	I ² C Slave Address			0x27H		

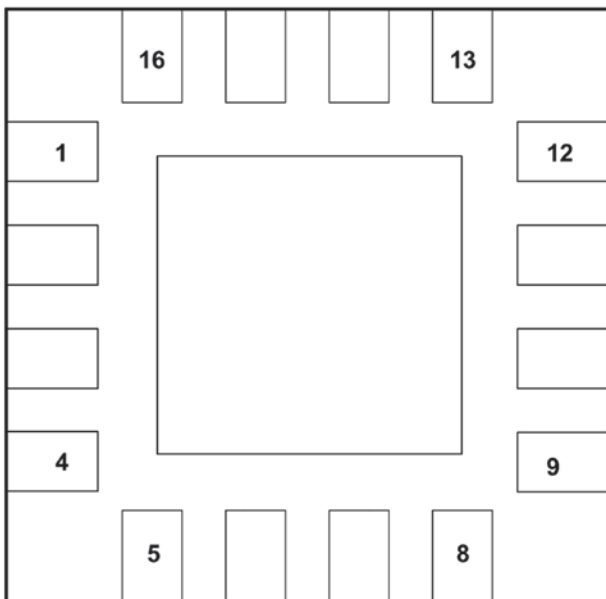
Absolute Maximum Ratings

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
V _{dd}	Supply Voltage	-0.4	-	3.63	V
P	Overpressure (Pressure element only, Non-hermetic package)	-	-	600	kPa
V _{HBM1}	Electrostatic Discharge Tolerance – Human Body Model	4	-	-	kV
T _{STOR}	Storage Temperature	-40	-	125	°C

Package Information



Pin Description



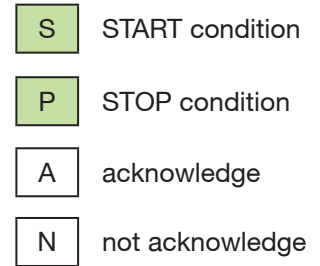
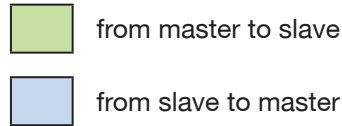
Pin No.	Name
1	VSS
2	RES
3	EOC
4	MISO
5	
6	
7	
8	
9	SCL/SCLK
10	SDA/MOSI
11	SS
12	
13	
14	
15	
16	VDD

I²C Communications Interface

Command Request (I²C Write)



write



write

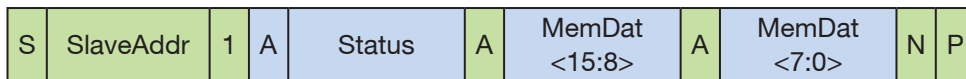
Read Status (I²C Read)



read

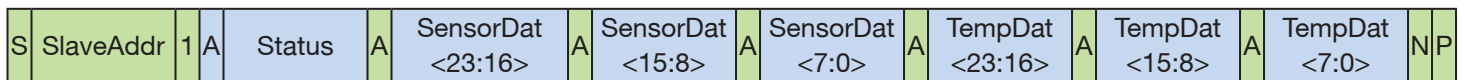
Read Data (I²C Read)

(a) Example: after the completion of a Memory Read command



read

(b) Example: after the completion of a Measure command (AA_{HEX})



read

Measure Command:

IW_xx003AA0000

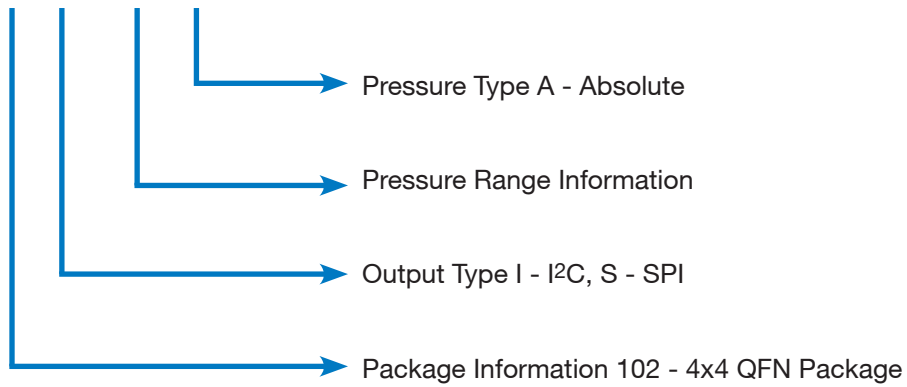
IR_xx004

Where xx is I²C address

The response string is 8 characters long, the rightmost 6 characters is the measurement value.

Ordering Information

NPB-102X-XXXX



Part Number	Description
NPB-102I-0126A	26-126kPa, I ² C output
NPB- 102I - 0200A	50-200kPa, I ² C output