



BANNING
PRESSURE SENSOR
BLWP9xxxGD



BANNING

DESCRIPTION

BLWP9xxxGD is a new type of pressure transmitter module, which can provide both temperature and pressure output. The module integrates high performance sensitive pressure sensor and special processing circuit on the same PCB board, with high precision and high reliability. The sensor processing circuit is integrated in the internal noise reduction module to achieve strong anti-interference ability of the sensor performance;

At the same time, the sensor integrates the high precision temperature sensor, and adopts the unique algorithm to realize the temperature compensation of the sensor.

PERFORMANCE

Parameter	Minimum	Typical	Maximum	Unit	Note
Supply voltage	1.68	3.3	3.6	Vdc	
Working current		1		mA	
Current of sleep		20		nA	
ADC		24		bit	
Accuracy (25 °C)		±1	±1.5	%FS	
Accuracy (0 ~50 °C)			±2.5	%FS	
Response time		5	30	ms	
Stability of	-1		1	%FS /yr	
Operating temperature	-40		+125		
Accuracy (1)		1			

- (1) Detection accuracy of ambient temperature when the sensor is in a constant temperature field;

APPLICATION

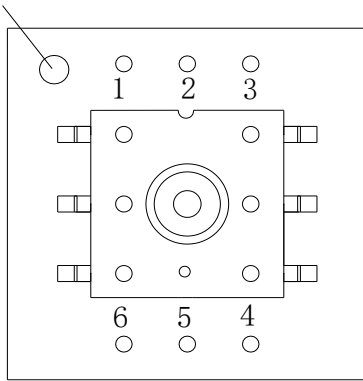
- Industrial control
- Medical monitoring
- Household appliances
- Fitness equipment
- Automotive Applications

CHARACTERISTICS

- Measuring range: -100kPa~0kPa, -40kPa~0kPa, -10kPa~0kPa, 0kPa~10kPa, 0kPa~40kPa, 0kPa~100kPa, 0kPa~500kPa, etc. (gauge pressure, range can be customized)
- High accuracy
- Modular digital output pressure sensor
- High stability
- Good consistency

PIN DEFINITION

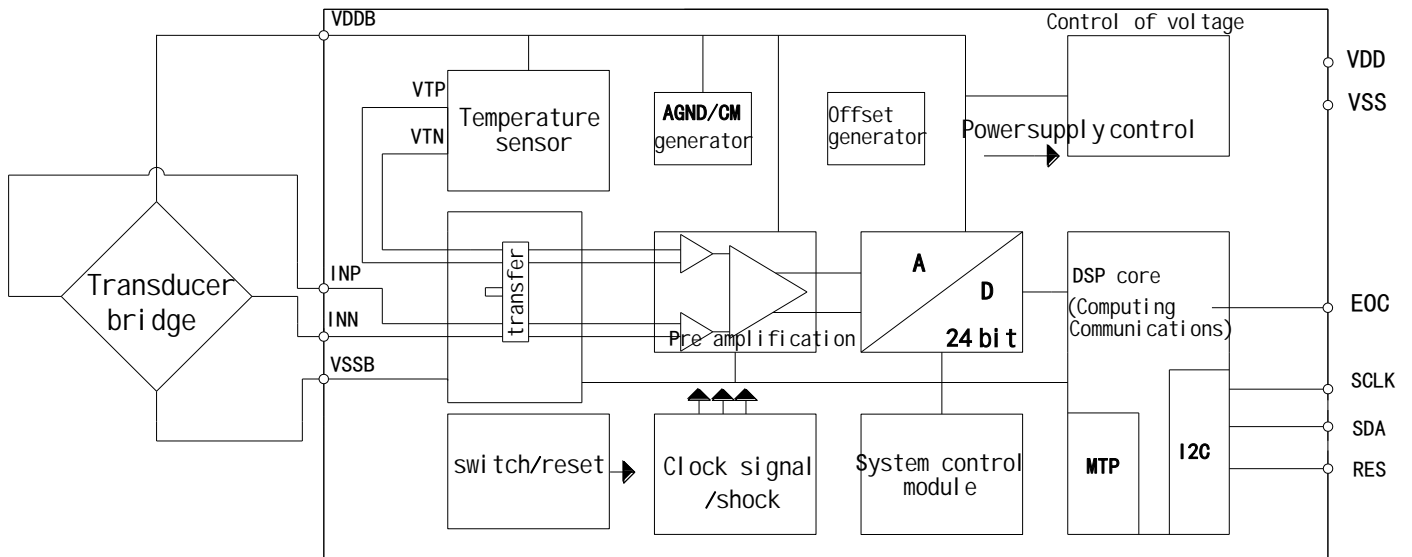
1 pin mark



Pin Definition (face view)

Pin number	Pin definition	Instructions
1	VDD	power supply+
2	NC	-
3	GND	ground
4	NC	-
5	SCL	clock
6	SDA	Output

MODULE CONNECTION



I²C INTERFACE

BLWP9xxxGD chip address description

A7	A6	A5	A4	A3	A2	A1	W/R
0	0	0	0	0	0	0	0/1

The address bit information of BLWP9xxxGD is shown in Table A1~A7 are the address bits and W/R are the direction bits.

- Write register address command: 00000000 (0x00)
- Read register address command: 00000001 (0x01)

I²C COMMUNICATION

Parameter	Symbol	Condition	Minimum	Typical	Maximum	Unit
Frequency of clock	F _{scl}	Pull-up=10k	0		400	KHz
The bus idle time before a new send starts	t _{BUF}		1.5			μs
Initial signal holding time	t _{HD.STA}		0.6			μs
Initial signal establishment time	t _{SU.STA}		0.6			μs
Stop signal establishment time	t _{SU.STO}		0.6			μs
Data entry hold time	t _{HD.DAT}		100			ns
Data entry setup time	t _{SU.DAT}		100			ns
Clock low level period	t _{LOW}		1.5			ns
Clock high level cycle	t _{HIGH}		0.6			ns
SDA and SCL rise time	t _R		30		500	ns
SDA and SCL descent time	t _F		30		500	ns

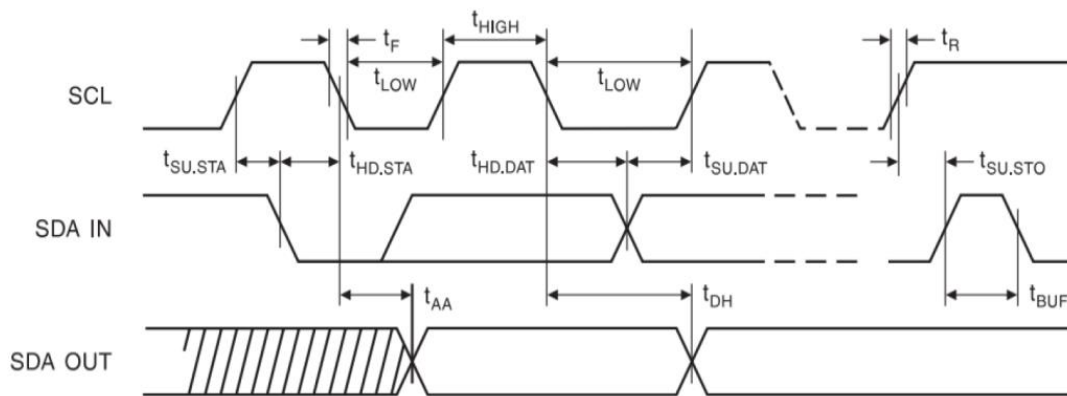


Figure 1. I²C communication sequence diagram

I²C Read and write sequence

The host must first send the address of the chip in order to communicate with it. The slave address byte consists of seven address bits and a direction bit that determines whether the slave is to accept or send. The I²C address of the chip is 0000000, the chip write address is 0x00, and the chip read address is 0x01.

Figure 1. Timing diagram of register configuration for the host write chip. In Figure 3, (a) is the time sequence diagram required for reading the chip, and (b) the time sequence diagram for reading the pressure and temperature data of the chip. SlaveAddr: address of the slave and Command: address of the control command.

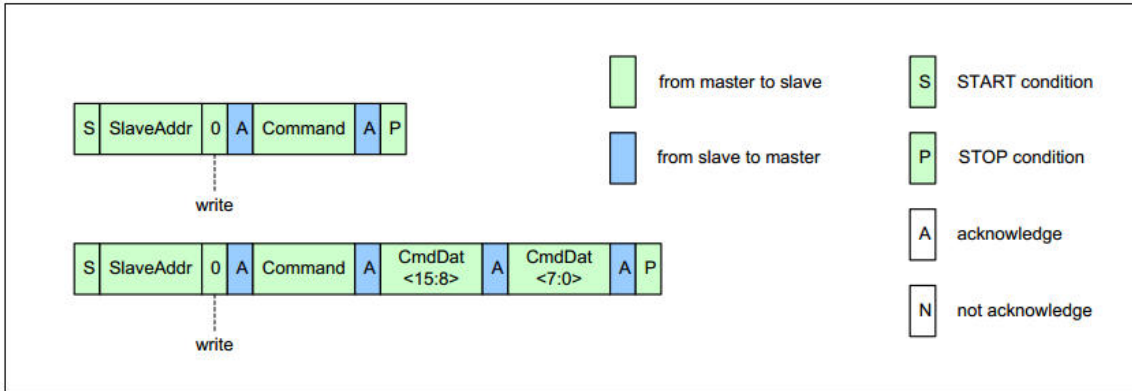


Figure 2. I²C command request

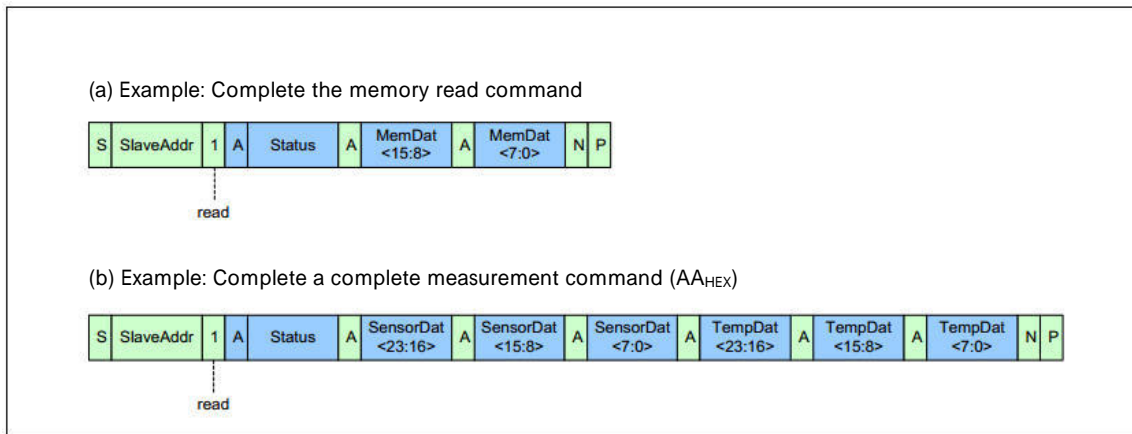


Figure 3. I²C reads data

OUTPUT DESCRIPTION

Pressure register

The pressure register is a 24-bit register stored in binary form, and the pressure result is an 18-bit value. The pressure is calculated by the following formula:

$$P(\text{pa}) = \left(\frac{P_{\text{MAX}} - P_{\text{MIN}}}{2^{18}} \right) * P1 + P_{\text{MIN}}$$

(P -- pressure value collected; P1 - the value of the collected I²C)

Name	Bit	Describe
Pressure	[23:06] pressure	Pressure detection (read only)
	[05:00] reserve	Reserved, always 0 (read only)

Table 1. describes the pressure registers

Type	PMIN(pa)	PMAX(pa)
BLWP9020GD	-1000	21000
BLWP9020GD-N	-21000	1000
BLWP9020DD	-21000	21000
BLWP9040GD	-1000	41000
BLWP9040GD-N	-41000	1000
BLWP9040DD	-41000	41000
BLWP9100GD	-10000	110000
BLWP9500GD	-10000	510000

Table 2. Product model and parameter mapping table

TEMPERATURE REGISTER

The temperature register is a 24-bit register stored in binary form, and the temperature result is a 16-bit value. The temperature is calculated by the following formula

$$T(^{\circ}\text{C}) = \left(\frac{85 + 40}{2^{16}} \right) * T1 - 40$$

(T -- temperature value collected; T1 - The value of the collected I²C)

Name	Bit	Describe
Temperature	[23:08] temperature	temperature detection (read only)
	[07:00] reserve	temperature, always 0 (read only)

Table 3. Description of the temperature register

BLWP9xxxGD chip read and write operations

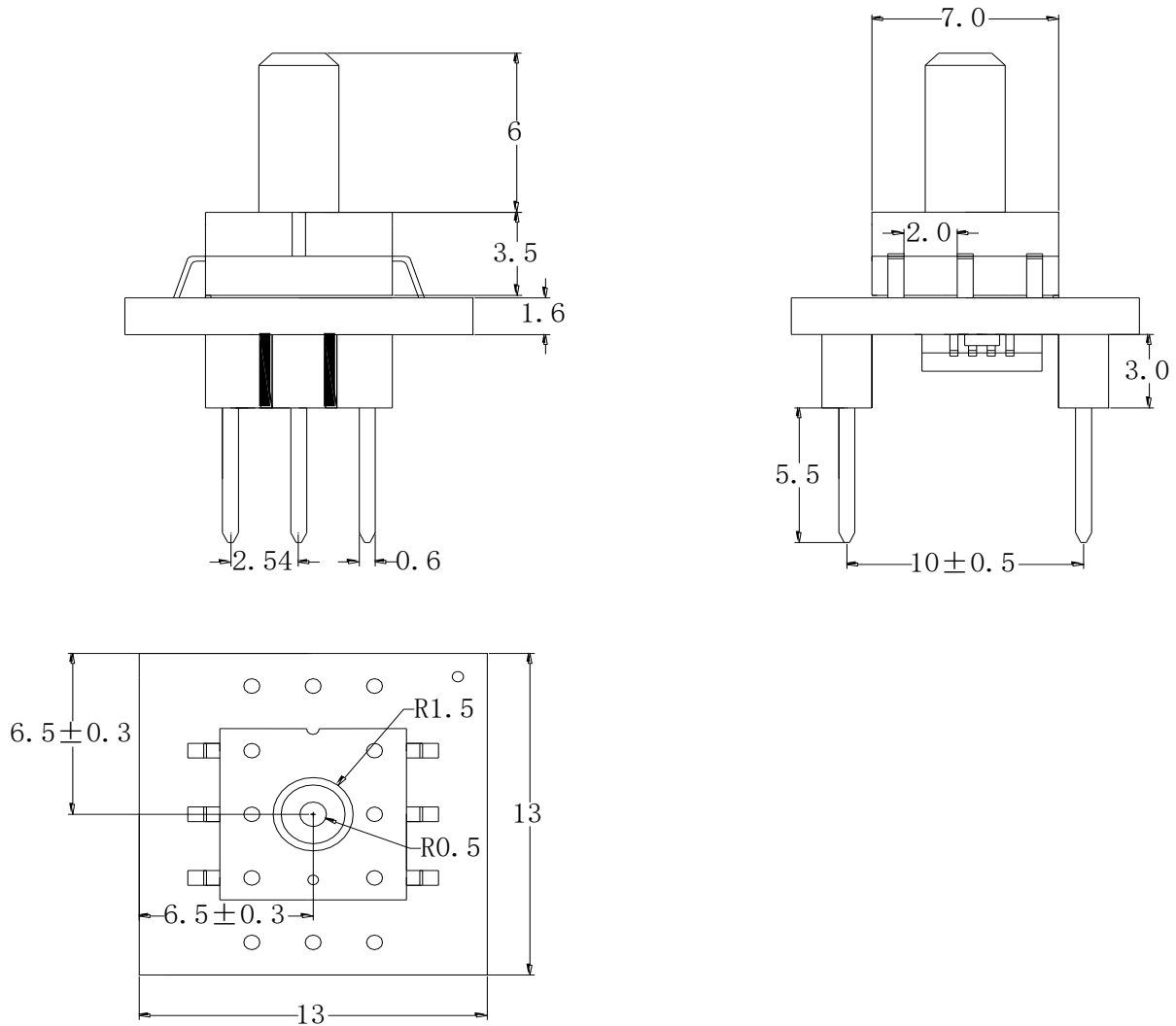
(1) Configuration register

- Start I²C;
- Send write register address command 0x00, wait for a response;
- Write the configuration register address 0XAA to the chip and wait for the response;
- Send the two-byte parameters 0X00 and 0X80 to the chip and wait for a response.
- Turn off I²C communication, delay (5ms), chip acquisition conversion data.

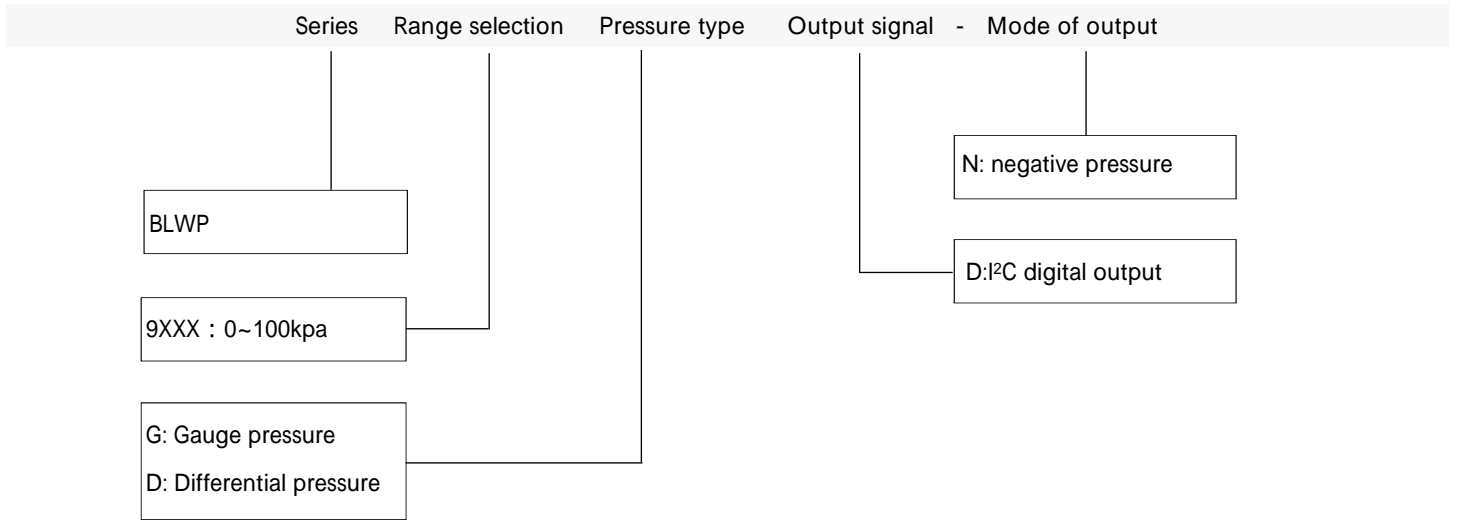
(2) Write the address of the data and ask the chip for data

- Start I²C;
- Send the read register address command 0x01 and wait for the response.
- Receiving chip output data state, read three bytes of pressure data, three bytes of temperature data;
- Disable I²C communication.
- Save and process data.

DIMENSIONS (mm)



SELECTION



FOR EXAMPLE : BLWP9040GD-N

The series is BLWP, range is 0 ~ 40kPa, pressure type is gauge pressure, output signal is I²C digital output mode of output is negative pressure.

DISCLAIMER

Warning

LIFE OR PROPERTY RISK

- Please ensure that this product has been designed as part of whole system and already considered related risks, make sure the product has the correct ratings and is designed based on the entire system. It must not be used when applications related to serious life or property damage risks.

Failure to follow this instruction can result in death or serious injury.

Warning

PERSONAL INJURY

- DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to follow this instruction can result in death or serious injury.

Warning

MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to follow this instruction can result in death or serious injury.

Warranty/Remedy

Banning warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Banning's standard product warranty applies unless agreed to otherwise by Banning in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Banning during the period of coverage, Banning will repair or replace, at its option, without charge those items that Banning, in its sole discretion, finds defective. The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Banning be liable for consequential special, or indirect damages.

While Banning may provide application assistance personally, through our literature and the Banning web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Banning assumes no responsibility for its use.

SALES & SERVICE

Banning serves its clients through a worldwide network of sales offices, agents and distributors. For application assistance specifications, prices or names with the nearest authorized dealer, please contact your sales specialist or contact us directly:

Banning (Nanjing) Sensing Technology Co., Ltd.

Nanjing, Pukou District, Longtai Road, No. 16
Building C2, 3rd Floor

TEL : 400-7181-886

TEL : 025-5829 5589



WeChat



Invoice

Official Website : www.bnsens.com

Service Hotline : 400-7181-886

Official mailbox : sales@banningsensor.com

© 2021 Banning (Nanjing) Sensing Technology Co., Ltd.

INTEGRITY
INTERNATIONAL
INNOVATION

BANNING