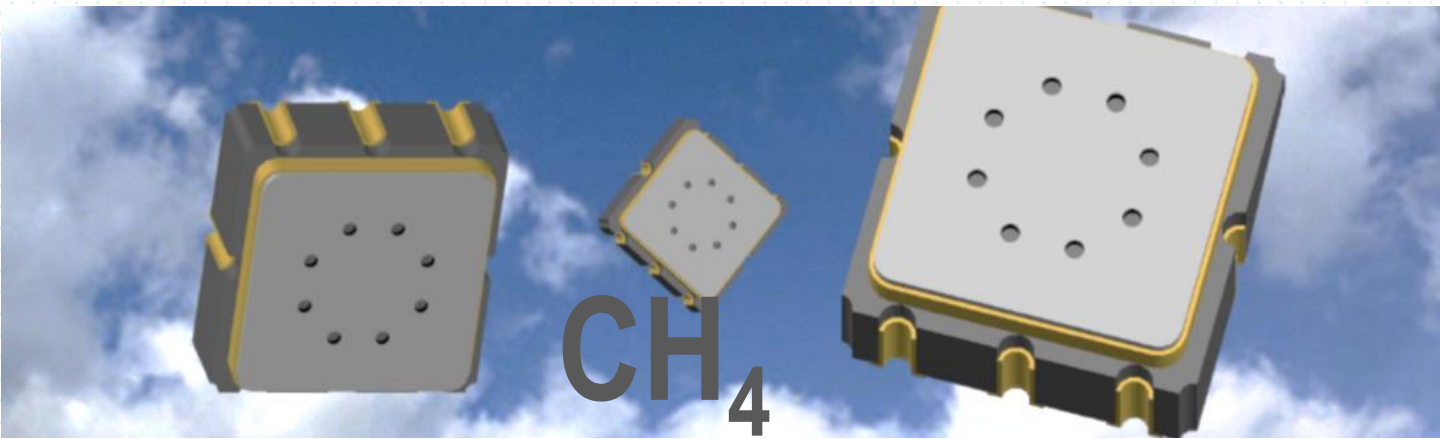


# iS-NGM-G11L CH<sub>4</sub> Sensor Module Datasheet



## General Description

Based on MEMS gas sensor, the iS-NGM-G11L sensor module is used to measure nature gas leakage and provide the relative equivalent concentration of methane gas in the air. The data is available via I<sup>2</sup>C bus, UART series port, or A/B levels.

The MEMS gas sensor can be protected by covering a PTFE filter membrane. The sensor module can be assembled with pin or socket as required.

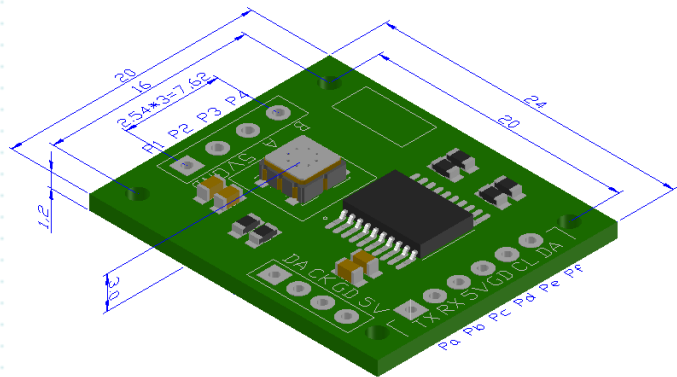
The benefits and features of the module are listed below:

- High sensitivity and fast response to CH<sub>4</sub> gas
- Built-in Temp. compensation and external Humidity compensation available
- Low power consumption
- Automatic baseline correction
- The baseline resettable, the storage status settable
- Robust design, excellent long-term stability
- Highly flexible communication interface
- Optional filter cover, anti-VOCs gas interference

## Performance parameter

Item	Remark
Sens. Principle	MEMS metal oxide sensor
Sensing range	0-50000 ppm CH <sub>4</sub> equivalents
Warm-up time	3 min.
Communication	I <sup>2</sup> C, UART, A/B Levels
Calibration	Automatic baseline correction Baseline resettable, the storage status settable(stored by default)

## Product Outline



UNIT: mm

Pa: UART\_TX      Pb: UART-RX  
Pc: +5.0V      Pd: GND  
Pe: SCL      Pf: SDA  
Pitch: 2.00mm

P1: GND      P2: +5.0V  
P3: A Port      P4: B Port  
Pitch: 2.54mm

Remark:

- 1, I<sup>2</sup>C interface needs 4.7-10kΩ pull-up res.
- 2, Locating hole Φ1.5mm

## Electrical Characteristics

Item	Specification
Voltage	5.0V ± 0.2V, max. 20mV ripple
Power	Max. 100mW @5.0VDC (20mA)
Interval	1 Sec. / measurement

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## Communication

### UART Series port

Item	Specification
Baud rate	9600 bits/s
Data bit	8
Parity bit	None
Stop bit	1
Protocol	1, Master send 0xFF 52 01 01 AC to reset baseline to current value. 2, Master send 0xFF 67 01 01 97 to automatic upload data packet once per Sec.. Send 0xFF 67 00 00 99 to restore to query mode. 3, Master send 0xFF 61 02 01 9C in query mode to acquire 13 bytes data packet.

### I<sup>2</sup>C bus

Item	Specification
Frequency	Standard Mode:100kbts/s
Slave Addr.	0xA2 (7 bit addr. mode, shift left by 0x51)
Do Read	Acquire 13 bytes data packet by do read operation
Do Write	Reset baseline to current value by do write 0xFF 52 01 01 AC operation

## Data Packet

Byte	Name	Description
0	Packet Head	0xFF
1-2	CH <sub>4</sub> Conc. [ppm]	Data[1]*2 <sup>8</sup> +Data[2]
3	Status	0x00: OK 0x01: Heating 0x02: Error
4	Temp. return [°C]	(Data[4]*8-669)/10
5	Humi. Return [%RH]	(Data[5]*8-125)/10
6	Cal. Res. [kΩ]	Data[6]*2 <sup>10</sup>
7	Cal. Conc. [ppm]	Data[7]*2 <sup>10</sup>
8-11	Sens. Res. [Ω]	Data[8]*2 <sup>24</sup> +Data[9]*2 <sup>16</sup> +Data[10]*2 <sup>8</sup> +Data[11]
12	Check Code	~(Sum(D[1]:D[11]))+1

Remarks: Data [4] and Data [5] are used for external humidity compensation

## Environmental Specifications

Item	Specification
Operating Temp.	-10 ~ +60 °C
Operating Humidity	5 ~95 % RH, non-condensing
Storage Temp.	-40 ~ 85 °C
Storage Humidity	5 ~95 % RH, non-condensing

## Attentions

Please read the following terms carefully to avoid product data errors and prevent product damage.

- 1, Manual soldering conditions are recommended for a maximum temperature of 350 °C for 5 seconds. . it is recommended that it should be aged for more than 2 hours to eliminate the influence of welding process on the gas sensor.
- 2, The products should not be exposed to high concentrations of organic solvent vapor, silicone vapor, in order to prevent sensitive material poisoning. The products should be placed in the filter protected space to prevent water and dust. The installation direction can be used to prevent dust deposition.
- 3, The sensor resistance will experience a continuous increase after power on. The time span of this process depends on the sensor heat history and storage environment. The longer time is needed when off time is long. It is recommended to preheat at least 60 min. to get a reliable results.
- 4, It is recommended to use ESD protection equipment when handling the products.
- 5, When a specific kind of gas needs to be measured, the chip operating temperature can be set to achieve better selectivity. Please consult for more information.
- 6, Port A and B level output are defined as follows:  
CH<sub>4</sub>: < 3000ppm      A: Low    B: Low  
3000~ 5000ppm    A: Low    B: High  
5000~10000ppm    A: High    B: Low  
>10000ppm        A: High    B: High

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