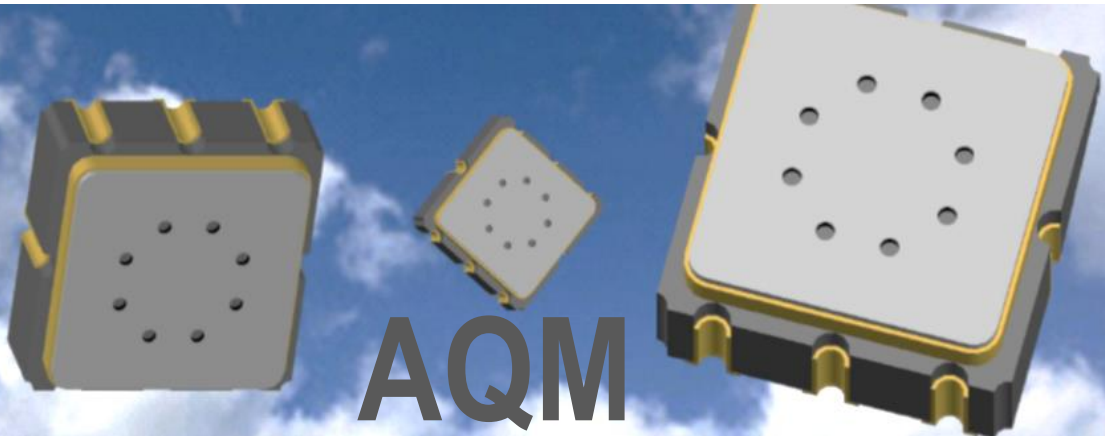


# 5 in 1 Air Quality Sensor Module Datasheet

## PN:RK14Z



### General Description

Based on MEMS gas sensor, the RK14Z sensor module is used to measure VOC levels, temperature and humidity, it also CO<sub>2</sub>, HCHO equivalent predictions. The data is available via I<sup>2</sup>C bus or UART series port.

The MEMS gas sensor can be protected by covering a PTFE filter membrane. The sensor module can be assembled by SMT or removable terminal plug connection.

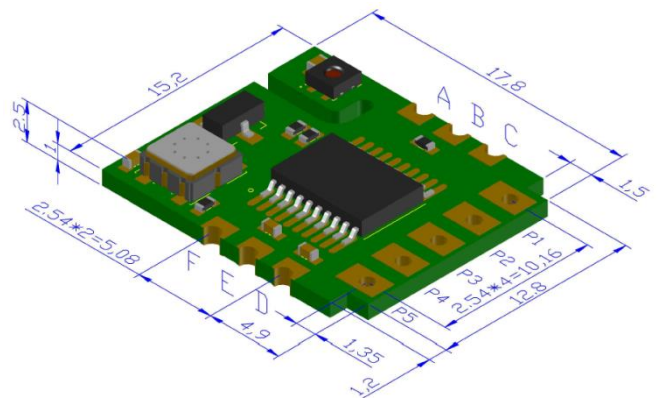
The benefits and features of RK14Z, Indoor Air Quality sensor module are listed below:

- Reliable evaluation of indoor air quality, temperature and humidity
- Built-in Temp. and Humi. Compensation,
- High sensitivity and fast response
- Low power consumption
- Small size for convenient installation
- Automatic baseline correction

### Performance parameter

Item	Remark
Sens. Principle	MEMS metal oxide sensor
Sensing range	400-5000 ppm CO <sub>2</sub> equivalents 0-50000 ug/m <sup>3</sup> TVOC equivalents 0-2000 ug/m <sup>3</sup> HCHO equivalents Temp:-40~125 °C Humi.:0~100%RH
Warm-up time	3 min.
Communication	I2C or UART
Calibration	Automatic baseline correction Baseline resettable

### Product Outline



UNIT: mm

A: +3.3V                      B: NA  
C: SDA                         D: GND  
E: SCL                         F: NA

Pitch: 2.54mm

P1: NC                      P2: RX                      P3:TX

P4:+3.3V                  P5:GND

Pitch: 2.54mm

Remark: IIC interface needs 4.7kΩ pull-up resistors

### Electrical Characteristics

Item	Specification
Voltage	3.3V±0.1V, max. 20mV ripple
Power	Max. 66mW @3.3VDC (20mA)
Interval	1 Sec. / measurement

# Indoor Air Quality Sensor Module

## 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	eCO2(ppm)	Data[1]*2 <sup>8</sup> +Data[2]
3	Status	0x00: OK 0x01: Heating 0x02: Error
4-5	Temperature(°C)	(Data[4]*2 <sup>8</sup> +Data[5]-669)/10
6-7	Humidity(%RH)	(Data[6]*2 <sup>8</sup> +Data[7]-125)/10
8-9	TVOC(ug/m <sup>3</sup> )	Data[8]*2 <sup>8</sup> +Data[9]
10-11	HCHO(ug/m <sup>3</sup> )	Data[10]*2 <sup>8</sup> +Data[11]
12	Check Code	~(Sum(D[1]:D[11]))+1

## 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, The gas sensor must be reflow soldering in neutral atmosphere. The welding furnace should have sufficient flow of clean air to maintain the air clean. The maximum temperature is 260 °C . Manual soldering conditions are recommended for a maximum temperature of 350 °C for 5 seconds.
- 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.
- 3, The sensor resistance will experience a continuous increase after power on. The time span of this process depends on the sensor heat history. 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, Temperature and humidity specification: please refer to Sensirion SHTC3 sensor for detail information.

More information, Please contact:

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