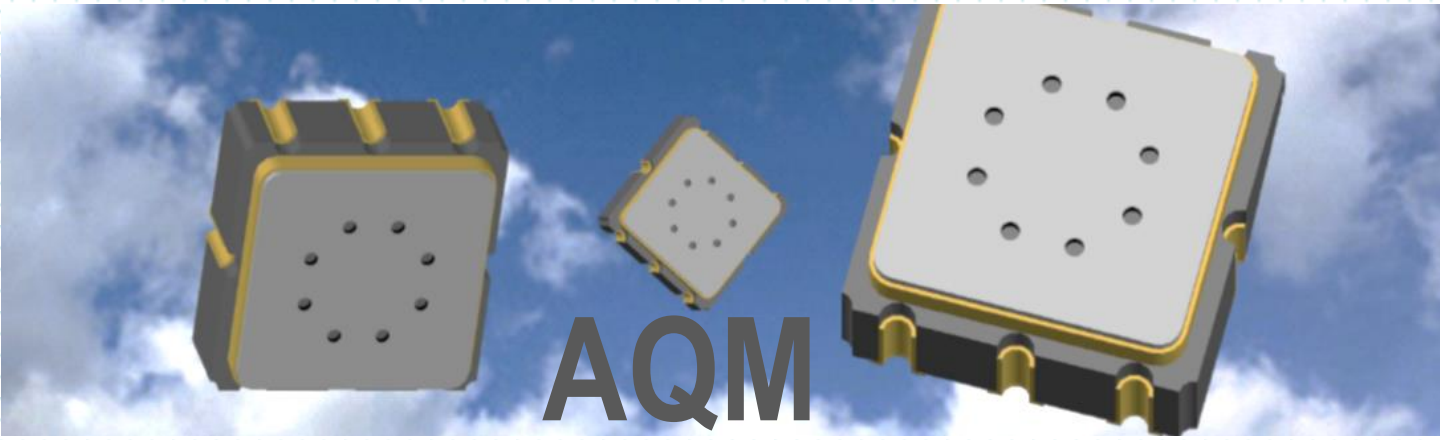
3 in 1 Air Quality Sensor Module Datasheet
PN:RK14



General Description

Based on MEMS gas sensor, the RK14 sensor module is used to measure VOC levels and provide TVOC equivalent and CO_2, HCHO equivalent predictions. The data is available via I^2C 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.

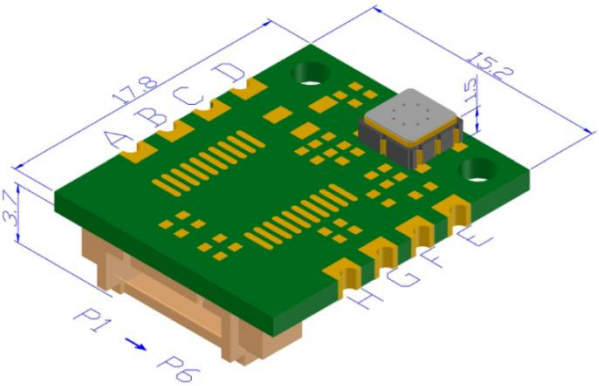
The benefits and features of RK14, Indoor Air Quality sensor module are listed below:

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

Performance parameter

Item	Remark
Sensing tech.	MEMS metal oxide sensor
Sensing range	400-5000 ppm CO_2 equivalents 0–50000 ug/m^3 TVOC equivalents 0-2000 ug/m^3 HCHO equivalents
Warm-up time	3 min.
Communication	I2C or UART
Calibration	Automatic baseline correction Baseline resettable

Product Outline



A: UART_TX B: +3.3V
C: NA D: SDA
E: GND F: SCL
G: NA H:UART-RX
Pitch: 2.54mm

P1: VDD P2: SCL P3:SDA
P4:Rx P5:Tx P6:GND
Pitch:1.25mm

Remarks:

1, The module has built-in pull-up resistor, If you want cancel it, pls. contact us.

2, Locating Holes:Φ2.0mm. Default without socket.

Electrical Characteristics

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

RK14 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 00 99 to restore to query mode. 3, Master send oxFF 61 02 01 9C in query mode to acquire 13 bytes data packet.

I²C bus

Item	Specification
Frequency	Standard Mode:100kbits/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	eCO_2(ppm)	Data[1]*2^8+Data[2]
3	Status	0x00: OK 0x01: Heating 0x02: Error
4	Temp. Return(℃)	(Date[4]*8-669)/10
5	Humi. Return(%RH)	(Date[5]*8-125)/10
6-7	Sensor Rs (kΩ)	Data[6]*2^8+Data[7]
8-9	TVOC(ug/m^3)	Data[8]*2^8+Data[9]
10-11	HCHO(ug/m^3)	Data[10]*2^8+Data[11]
12	Check Code	~(Sum(D[1]:D[11]))+1

Environmental Specifications

Item	Specification
Operating Temp.	-10 ~ +60 ℃
Operating Humidity	5 ~95 % RH, non-condensing
Storage Temp.	-40 ~ 85 ℃
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 ℃ . Manual soldering conditions are recommended for a maximum temperature of 350 ℃ 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, The temperate of micro hot plate can be resettable for better gas selectivity. Please consult us for more information.

More information, Please contact us：
www.rainbowtechnology.cn
www.rainbowtechnology.us