



SPECIFICATION

<Tentative>

Product Name: NDIR CO₂ Sensor

Model No. : POC2021-3

(Customer:)

Date : 2023. 01. 03.

Approval

Writer	Audit	Approved
JS Choi		JS Choi
2023/01/03		2023/01/03



POC2021-3

Smart NDIR CO₂ Sensor for Indoor Air Quality

1. Description

POC2021-3 is a NDIR(Non-Dispersive Infrared) CO₂(carbon dioxide) gas sensor. It uses infrared wave length of 4.26 micrometer to detect a CO₂ concentration. A single IR lamp and single thermopile sensor are optically arranged by precision optical design. It has high accuracy and long lifetime and optional temperature compensation. It is widely used in Indoor Air Quality monitor, air purifier and building management, automotive, Agricultural HVAC application.

2. Features

Advanced NDIR design

Low cost version for popular application

Lead free and ROHS directive compliant

The detection range of CO₂ 400~5000 ppm

Compact size and Light weight 26.1(W)x 10.1(T)x 19.8(D) mm, 5.7 gram.

3. Interface (Calibration of CO₂ Concentration)

3_1. UART, 9600 Baud Rate

3_2. Change the ABC Cycle (Days)

3_3. i2C, Read measured result of CO₂



Parameter	Index	unit
Measurment Range	400~5000	ppm
Resolution	1	ppm
Maximum Consistency Error	$\pm (50\text{ppm}+3\%\text{Reading})$	
Time to first reading	≤ 30	Second (s)
DC Power Supply	Typ:5.0 Min:4.5 Max: 5.5	Volt (V)
Active Current	200mA peak , 25mA average	Milliampere (mA)
Interface Level	L <0.8 @3.3 H >2.7@3.3	Volt (V)
Working Temperature Range	-5~50	°C
Working Humidity Range	0~85% non condensed	
Storage Temperature Range	-40~+85	°C
Life Time	≥ 7	Year (Y)
Physical Size *	33×20×10.5	mm
Pin Gap	2.54	mm

4. Specification

Note1: The physical size is not including the length of Pin



5. UART Interface

5_1. UART, Read measured result of CO2

9,600BPS, 8bit, No parity, 1 stop bit, TTL Level

Request Format

Byte	1	2	3	4
Value	0xF1	0xF2	0x01	0x1C
Description	Start Byte		Command	Check Sum

Response Format

Byte	1	2	3	4	5	6	7	8
Value	0xF1	0xF2	0x02	MSB	LSB	0x00	0x00	CS
Description	Start Byte		Command	CO2 Value		Reserved		Check Sum

ex) 451ppm → 0xF1 - 0xF2 - 0x02 - **0x01** - **0xC3** - 0x00 - 0x00 - 0x57
Hex, 0x1C3 = Decimal, 451



6. Change the ABC Cycle (Days)

Request Format

Byte	1	2	3	4	5
Value	0xFF	0xAB	0xC3	days	0xC4
Description	Start Byte		Command	ABC cycle	—

Response : 0xFF - 0xAB - 0xC3 - days - C4
(ABC depfault:15days(Hex : 0F), 3~30days, 0: ABC Close)

6_1. ABC Cycle confirm

Request Format : 0xFF - 0xAB - 0xC2 - 0xAB - 0xC3

Response Format : 0xFF - 0xAB - 0xC2 - days - C0
(ABC depfault:15days, 0: ABC Close)



7. i2C, Read measured result of CO2

- * Caution : Although there is a pull-up resistor inside the sensor,
If necessary, 3.3V should be applied to the pull-up resistor.

센서 내부에 풀업 저항이 있지만,
필요한 경우 풀업 저항에 3.3V를 인가해야 합니다.

Slave Address = 0x12(7bit), 0x24(8bit)

Bit	7	6	5	4	3	2	1	0
Value	0	0	1	0	0	1	0	R/W Bit

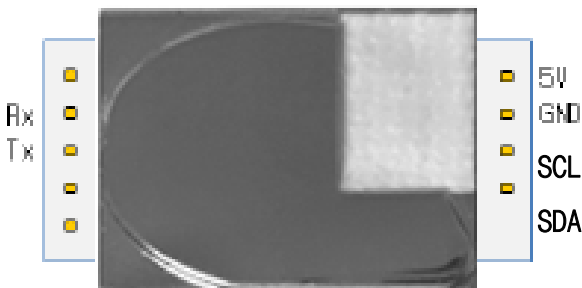
R/W Bit: Read = 1, Write = 0

When reading the data, Slave Address byte is 0x25,
When writing the data, Slave Address byte is 0x24.

CO2 Concentrations Request Command = 0x01

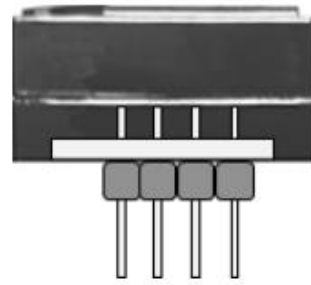
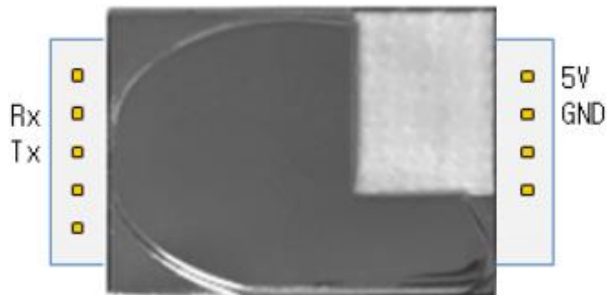
Response Format

Byte	1	2	3	4
Value	0x27	MSB	LSB	CS
Description	Start	CO2 Value		Check Sum





8. I/O Connector Pin Out



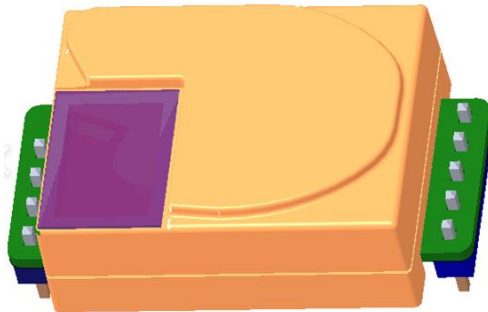
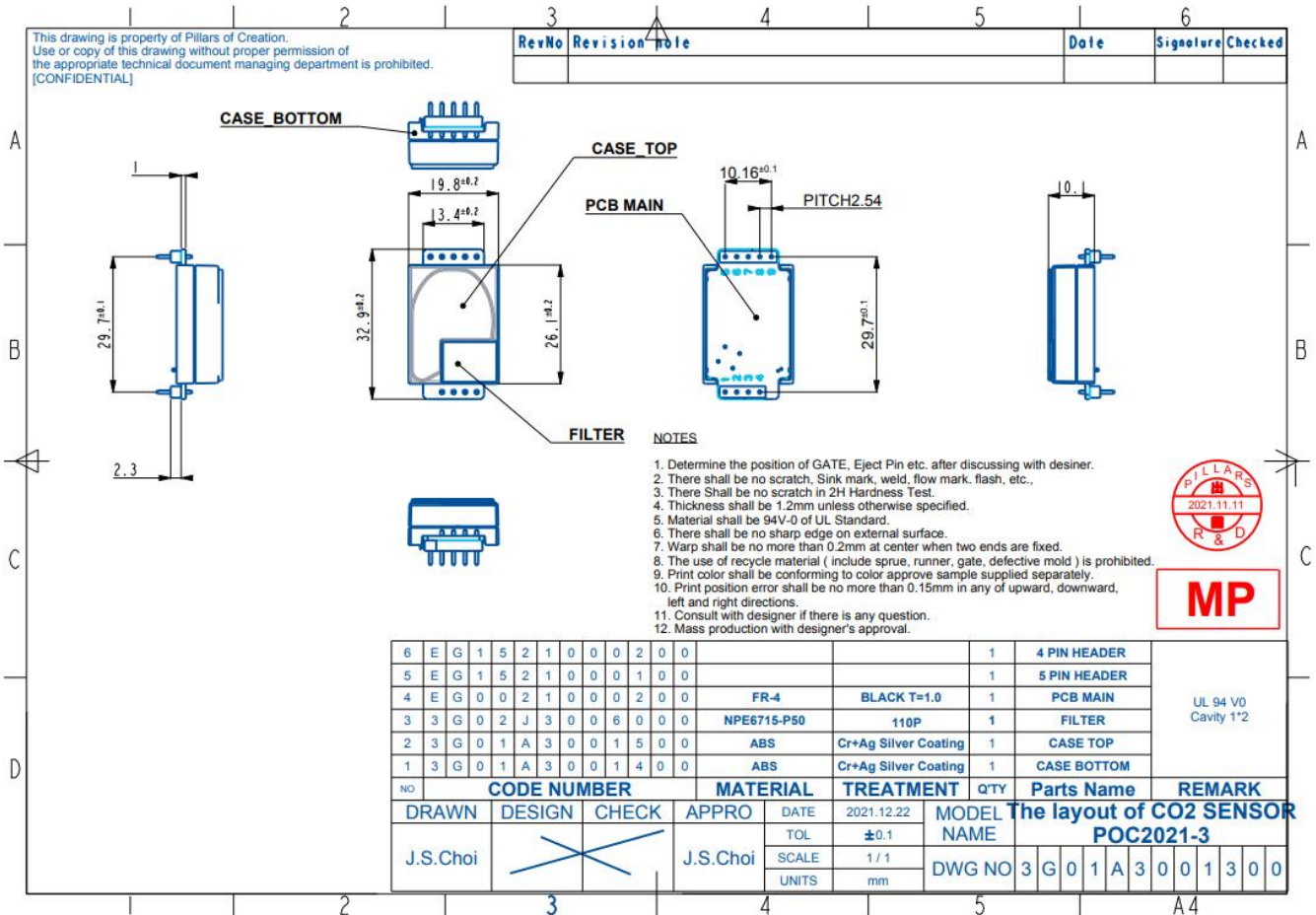
Pins

Pin	Definition
Vin	5V (Power)
GND	GND
Rx	UART(RXD) data input
Tx	UART(TXD) data output



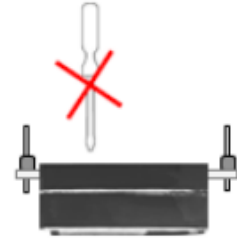
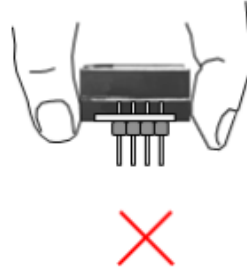
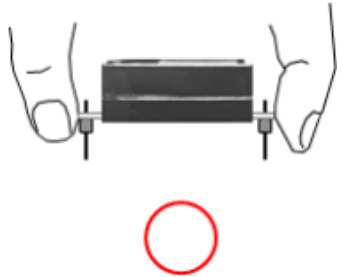
9. Outline Dimension

9_1 Sensor Dimension





10. Handle with care



■ Document Revision Table

Document No	Version	Date	Changed Content	Page
ED-N-DS-211222	Rev 1.0	2022.03.14	Original	
ED-N-DS-221220	Rev 2.0	2022.12.20	Change the ABC Cycle (Days), i2C, Read measured result of CO2	

-This is the end of document. -