



Electrochemical Ozone Detection Module

(Model: ZE25-O3)

User's Manual

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Zhengzhou Winsen Electronics Technology Co., Ltd

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Zhengzhou Winsen Electronics Technology CO., LTD.

Electrochemical Ozone Detection Module ZE25-O3

Product Description

ZE25-O3 is a general-purpose and miniaturization electrochemical Ozone detection module. It utilizes electrochemical principle to detect ozone in air which makes the module with high selectivity and stability. It is a combination of mature electrochemical detection principle and sophisticated circuit design.

Features

- *High sensitivity & resolution& low power consumption& long lifespan
- *Two output ways: UART/Analog Voltage
- *Good stability, good anti-interference,
- *Temperature compensation, excellent linearity



Application

Portable detector, air-quality monitor device, Ozone disinfection cabinet, smart home device &etc.

Parameter

Table1.

Model No.	ZE25-O3
Target Gas	O3
Interference Gas	NO2, Cl2 etc.
Output Data	DAC(0.4~2V is corresponding to 0.02~10ppm)
	UART Output (3V Electrical Level)
Working Voltage	3.7V~5.5V(No reverse voltage protection)
Warm up time	≤3min
Response time	≤90s
Resume time	≤90s
Detection Range	0~10ppm
Resolution	0.01ppm
Operating Temp.	-10 °C ~ 55 °C
Operating Hum.	15%RH-90%RH (No condensation)
Storage Temp.	-20 °C ~ 55 °C
Working life	2 years (in air)

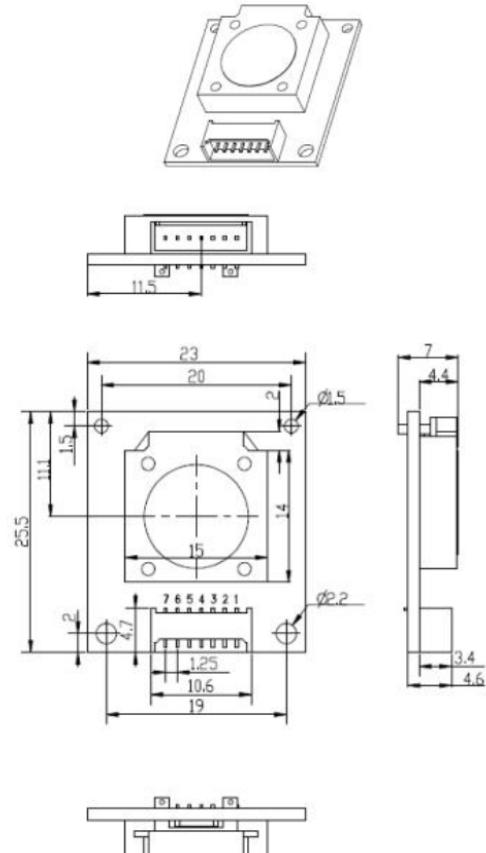
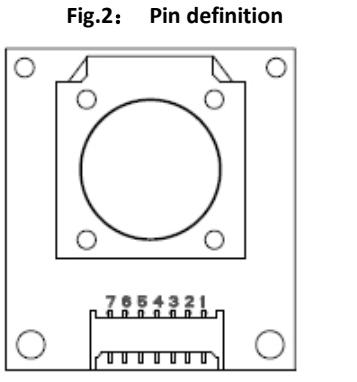


Fig. 1: structure

Pin definition
Table 2

PIN4	Vin (input 3.7V~5.5V)	 Fig.2: Pin definition
PIN3	GND	
PIN2	DAC (0.4-2.0V is corresponding to 0-10ppm)	
PIN7	Reserved	
PIN1	Reserved	
PIN5	UART (RXD) 0~3.0V Data input	
PIN6	UART (TXD) 0~3.0V Data output	

Communication Protocol
1 General Settings
Table 3

Baud Rate	9600
Data Byte	8 bytes
Stop Byte	1 byte
check bits	Null

2 Communication Commands

There are two communication type: active upload type and Question & Answer type. The default type for this module is active upload and it sends gas concentration every other second. If it is Q&A mode and you want to switch it to active upload mode again, please send following command:

Command to switch Q&A mode to active upload mode: Table 4

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Reserved	Switch command	Active upload	Reserved	Reserved	Reserved	Reserved	Checksum
0xFF	0x01	0x78	0x40	0x00	0x00	0x00	0x00	0x47

Data of active upload show as follow:
Table 5

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Gas name	unit	Number of Digital 0	Concentration High Byte	Concentration Low Byte	Full scale High Byte	Full scale Low Byte	Checksum
0xFF	O3	ppb=0x04	0x00	0x00	0x25	0x27	0x10	0x75

NOTE: Gas concentration(PPB)=(Concentration high byte*256+Concentration low byte). PPM=PPB/1000. When users need Q&A mode, send the following command to turn off active upload mode, and then send command to read concentration. The command to turn off active upload mode as follow:

Command to turn off active upload mode:

Table 6

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Reserved	Switch command	Q&A mode	Reserved	Reserved	Reserved	Reserved	Checksum
0xFF	0x01	0x78	0x41	0x00	0x00	0x00	0x00	0x46

Read concentration under Q&A mode:

Table 7

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Reserved	Command	Reserved	Reserved	Reserved	Reserved	Reserved	Checksum
0xFF	0x01	0x86	0x00	0x00	0x00	0x00	0x00	0x79

Return gas concentration as follow:

Table 8

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Command	Concentration High Byte(ppb)	Concentration Low Byte (ppb)	Reserved	Reserved	Concentration High Byte (ppb)	Concentration Low Byte (ppb)	Checksum
0xFF	0x86	0x00	0x20	0x00	0x00	0x00	0x20	0x30

NOTE: Gas concentration(PPB)=(Concentration high byte*256+Concentration low byte).

If users would like to change the unit into PPM: PPM=PPB/1000.

3 Checksum calculation method

Checksum = (Negative (Byte1+Byte2+Byte3+Byte4+Byte5+Byte6+Byte7)) +1

```
unsigned char FucCheckSum(unsigned char *i,unsigned char ln)
{
    unsigned char j,tempq=0;
    i+=1;
    for(j=0;j<(ln-2);j++)
    {
        tempq+=*i;
        i++;
    }
    tempq=(~tempq)+1;
    return(tempq);
}
```

Cautions

1. Prohibit plug and pull the sensor on the module.
2. Prohibit change and shift the installation of electronic components.
3. Do not use this module for systems involving personal safety.
4. Please do not use the modules in strong air convection environment.
5. Sensor shall avoid organic solvent (including silicone and other adhesives), coatings, medicine, oil and high concentration gases.

6. The module cannot be completely encapsulated with resin material, nor can it be immersed in an oxygen-free environment, otherwise the performance of the sensor will be damaged.
7. The module can not be used in the environment containing corrosive gas for long time because corrosive gas will damage the sensor.
8. The module should not withstand excessive shock or vibration.
9. The module needs to be warmed up for 24-48 hours at the first power-on, so that the module is fully stabilized and tested normally.
10. The white waterproof and breathable membrane of the sensor on the module is forbidden to be moved away and damaged by man-made.
11. Do not leave the module in a high concentration of organic gas for long time which will cause the sensor zero point to drift and recover slowly.
12. It is forbidden to encapsulate modules with hot melt adhesive or sealant with curing temperature higher than 80 °C.
13. Prohibit long-term storage and use in high concentration alkaline gas