



Ozone module

**(Model: ZE27-O3)**

# user's Guide

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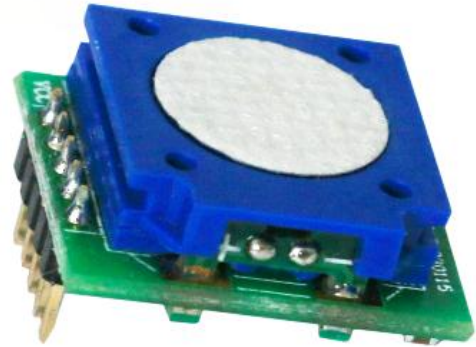
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## Electrochemical ozone module ZE27-O3

### Product Description

The ZE27-O3 electrochemical ozone module is a general-purpose, miniaturized model Group. Using electrochemical principles to detect the presence of ozone gas in the air, Has good selectivity and stability. Built-in temperature sensor, can be temperature Degree compensation; with digital output, easy to use. ZE27-O3 will mature The electrochemical detection technology is closely combined with sophisticated circuit design to design and manufacture The universal gas module.



### Module features

- High sensitivity, high resolution, low power consumption, long service life
- supply UART output method
- High stability, excellent anti-interference ability, temperature compensation, excellent linear output

### main application

Portable instruments and meters, air quality monitoring equipment, disinfection cabinets, smart homes and other equipment places.

Technical index Table 1

Product number	ZE27-O3
Detection gas	O3
Interference gas	alcohol Waitbody
output signal	UART output (3V-TTL level)
Operating Voltage	3.7V~5.5V (no voltage reverse connection protection)
Preheat time	≤3 minutes
Response time	≤90 seconds
Recovery Time	≤90 seconds
Range	0~10ppm
Resolution	0.01ppm
Operating temperature	-20°C~50°C
Working humidity	15%RH-90%RH (no condensation)
storage temperature	-20°C~50°C
Service life	2 years (in air)

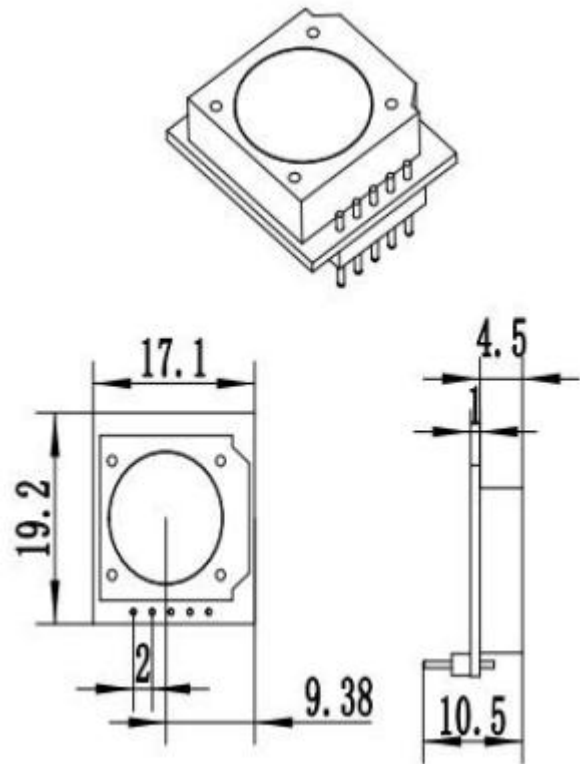


Figure 1: Module structure diagram (tolerance ±0.2mm)

Pin definition

Table 2

管脚名称	管脚说明
Pin1	Vin (电压输入 3.7V~5.5V)
Pin2	UART (TXD) 0~3V 数据输出
Pin3	UART (RXD) 0~3V 数据输入
Pin4	GND
Pin5	预留

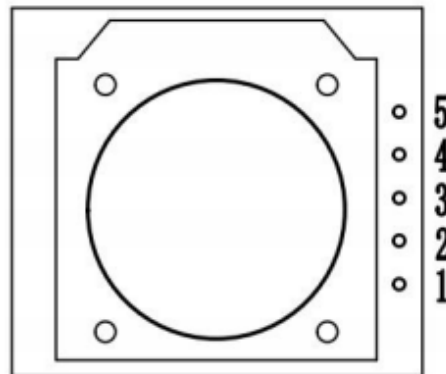


Figure 2: Module pin diagram

Protocol

1 General settings

table 3

Baud rate	9600
Data bit	8-bit
Stop bit	1 person
Check Digit	none

2 Communication commands

Communication is divided into active upload type and question and answer type. The factory defaults to active upload, and the concentration value is sent every

1S. If the user switches to Q&A mode and needs to switch to active upload again, just send the following command line format:

Table 4

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start bit	Reserve	Switch command	Active upload	Reserve	Reserve	Reserve	Reserve	Check value
0xFF	0x01	0x78	0x40	0x00	0x00	0x00	0x00	0x47

The display format of actively uploaded data is as follows:

table 5

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start bit	Gas name	unit	Decimal places	Rich gas	Rich gas	full range	full range	Check value
	O3		0Bit	High degree	Low	High position	Low	
0xFF	O3=0x2A	ppb=0x04	0x00	0x00	0x25	0x27	0x10	0x75

**Notes:**Gas concentration value (PPB) = (high gas concentration \* 256 + low gas concentration). When converting to PPM: PPM= PPB/1000.

When users need question and answer mode, You can close the actively uploaded data by sending the following command format, and then send the command to read the concentration. The command line format for closing active upload is as follows:

Table 6

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start bit	Reserve	Switch command	Question-and-answer	Reserve	Reserve	Reserve	Reserve	Check value
0xFF	0x01	0x78	0x41	0x00	0x00	0x00	0x00	0x46

In the question and answer mode, the command format for reading the concentration is as follows:

Table 7

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start bit	Reserve	Order	Reserve	Reserve	Reserve	Reserve	Reserve	Check value
0xFF	0x01	0x86	0x00	0x00	0x00	0x00	0x00	0x79

The returned concentration display format is as follows:

Table 8

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start bit	Order	Gas concentration High (ppb)	Gas concentration Low (ppb)	Reserve	Reserve	High gas concentration Bit (ppb)	Gas concentration Low (ppb)	Check value
0xFF	0x86	0x00	0x20	0x00	0x00	0x00	0x20	0x30

Notes: Gas concentration value (PPB) = (high gas concentration \* 256 + low gas concentration). When converting to PPM: PPM= PPB/1000.3 **Checksum**

**calculation**

Check = (invert (byte 1+byte 2+……+byte 7)) + 1 The reference

routine is as follows:

```

/*****
* Function name: unsigned char FucChecksum(unsigned char *i,unsigned char ln)
* Function description: Sum check (take the sending and receiving protocol1\2\3\4\5\6\7And negated+1)
* Function description: The elements of the array1-Add the penultimate element and negate it+1(The number of elements must be greater than2)
*****/
* / 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);
}

```

## Precautions

- 1, It is forbidden to plug and unplug the sensor on the module.
- 2, It is forbidden to change or shift the installation status of electronic components.
- 3, Modules should avoid contact with organic solvents (including silica gel and other adhesives) Coatings, medicaments, oils and high-concentration gases.
- 4, The module can not 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.
- 5, The module can not be used for a long time in the environment containing corrosive gas, corrosive gas will damage the sensor;
- 6, The module should not be subjected to excessive shock or vibration.
- 7, The module needs to be warmed up when it is first powered on 24-48 After about hours, make the module fully stable and test normally.
- 8, The white waterproof and breathable membrane of the sensor on the module is strictly prohibited to be opened or damaged by humans;
- 9, Do not install the module in a strong convection air environment.
- 10, Do not place the module in high-concentration organic gas for a long time. Long-term placement will cause the sensor zero point to drift and slow recovery.
- 11, It is forbidden to use hot melt adhesive or the curing temperature is higher than 80°CThe above sealant package module;
- 12, It is forbidden to store and use in high-concentration alkaline gas for a long time.

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