



YW-51GJ dust sensor

Product Features

- High sensitivity, response time 10 ms
- High consistency up to +/- 15%
- Washable
- Small size 46 * 34 mm
- High EMC performance

Functional Description

The products use raw fine particles scatter light

Reason, when the fine particles through the detection aperture, the optical

Form the scattering line. A portion of scattered light by light

Axis, gathered by a lens photosensitive member, the photosensitive member

The optical signal into an electrical signal output.

Applications

- Domestic / commercial air purification
- Domestic / commercial air conditioner
- Household / commercial air system
- Car air purification system
- Civilian air quality monitoring system (air box, the air fruit)
- Industrial dust monitoring system (construction dust, dust factory)

Product Image





1. Extreme working conditions

symbol	project	Min	Typ	Max	unit
VCC	Supply voltage	0	/	5.5	V
V _{IN}	Input voltage	-0.3	/	VCC + 0.3	V
I _O	Input Current	/	/	twenty four	mA
V _{ripple} [1]	Power Supply Ripple	/	/	30	mV
T _S	storage temperature	-20	/	80	°C
T _A	Operating temperature	-10	/	65	°C
RH _s [2]	Storage humidity	/	/	95	%
RH _A [2]	Working humidity	/	/	95	%

Table 1 Operating limits

[1] 0.3KHz to 24KHz [2] No

condensation



2. Optical characteristics

Symbol	Item Conditions	Min	Typ	Max	Units		
U consistency * 1		* 2		- 15%	/	15%	/

Table 2 Optical properties

* 1 : Extraction 4pcs A set of samples, the condition * 2 The test environment, recording the output of a weighted average of a set of samples. Consistency refers to the above-described deviation of the mean.

* 2 :Test Conditions 25 °C 50% RH

Input voltage 5V ± 0.04V

Test dust particles: Lam Ju brand mosquito coils

Standard equipment: TSI 8530

Concentration test environment: 80ug / m³

* 3 : This product is used MCU Respectively, and Panasonic ST Two brands, by the two brands MCU Assembled products can reach the table 1 And Table 2 Performance requirements.

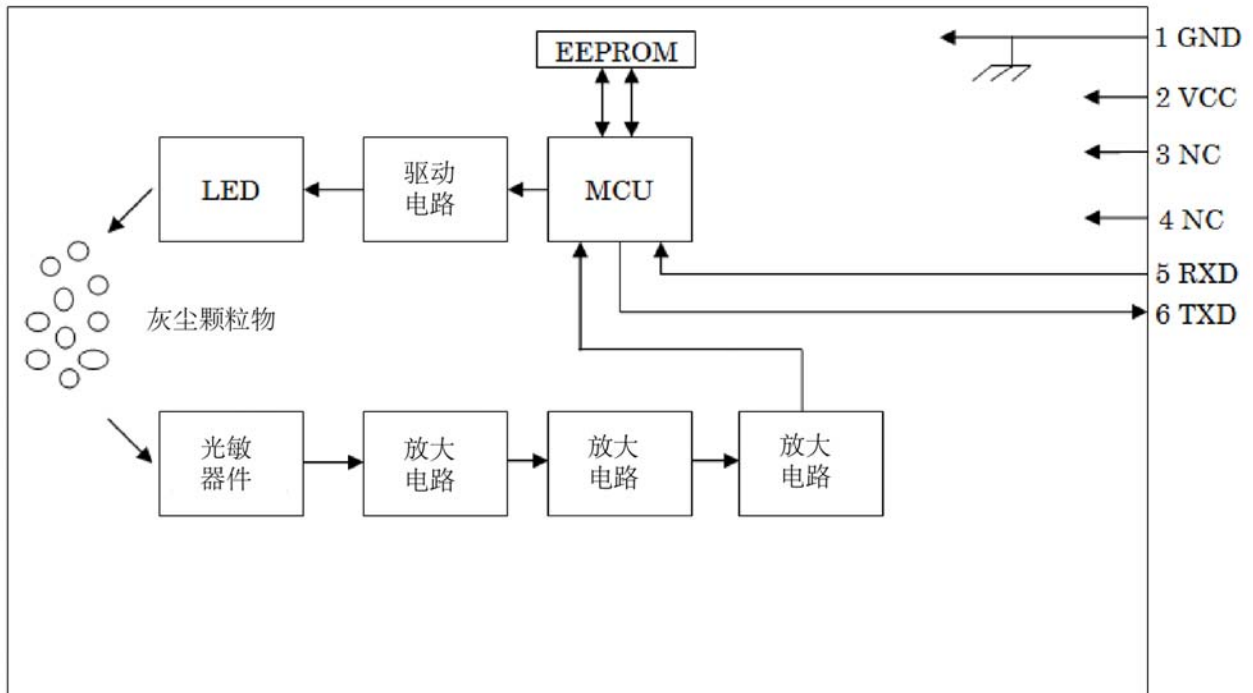
3. Functional Description

The products use light scattering theory of small particles, small particles when tested hole, light

Form the scattering line. A portion of the light scattered by the optical axis by a lens to gather photosensitive member, the photosensitive member

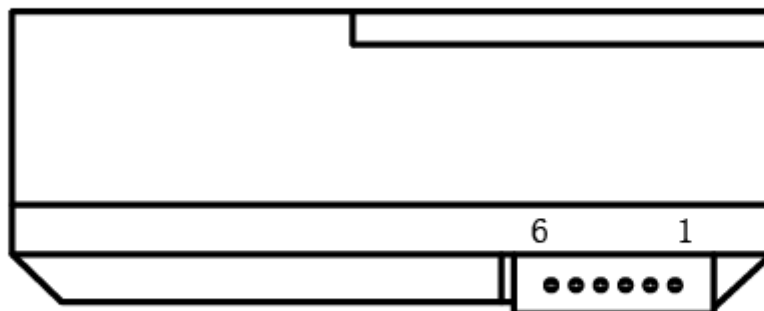
The optical signal into an electrical signal output.

3.1 Functional Block Diagram



1 functional block diagram of FIG.

3.2 Interface Definition



2 a schematic view of the connector of FIG.

Pin Name	Pin Number	Types of	description
GND	1	Power supply negative input pin, and when used note	Good grounding equipment, metal
VCC	2	Power supply pins	Positive power supply input
Reserve	3		
Reserve	4		
RXD	5	Digital I / O	UART data receiving opening
TXD	6	Digital I / O	UART data transmission port

Table 3 Pin Definitions

3.3 a peripheral circuit

A schematic view of sensor applications, the master through the serial port RXD Receiving sensor data, it is recommended VCC with GND increase between 220uF The capacitance. See serial communication parameters 3.4 .

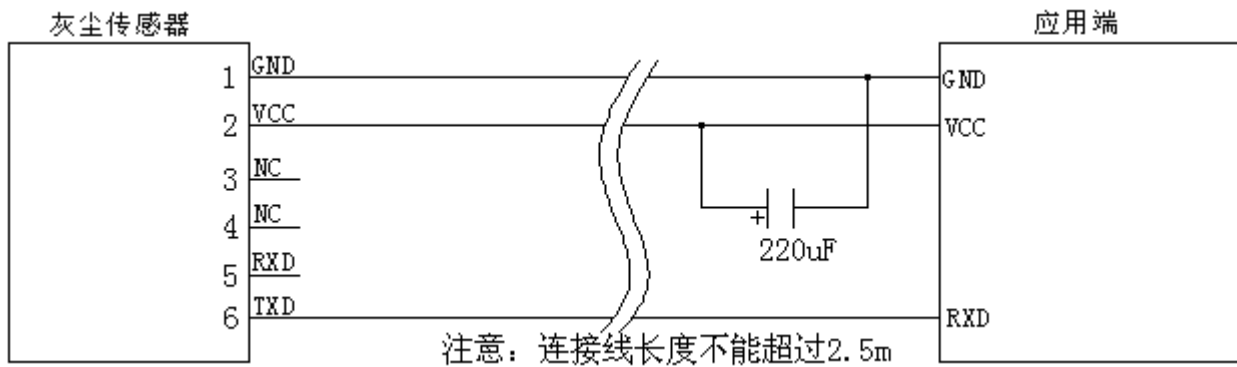


Figure 3 a schematic view of sensor applications



3.4 Communication mode

The default configuration for the UART communication:

parameter	Set up
Baud Rate	2400
Stop bits	1
Parity	no

Table 4 default UART settings

3.5 serial output parameters

- 1) Baud rate: 2400 bit / s;
- 2) Each 10ms frame of data transmitted, a total of seven bytes, parity = Vout (H) + Vout (L) + Vref (H) + Vref (L);
- 3) data transmission formats

Start bit	VoutH	VoutL	VrefH	VrefL	Parity stop bit	
0xaa such as: 0x00	such as: 0x00	such as: 0x3a	such as: 0x00	such as: 0x7a	such as: 0xb4	0xff

Table 5 data transmission formats

3.6 Calculation of dust concentration

Ud = concentration of dust concentration coefficient K × (Vouth × 256 + VoutL) × 2.5 / 1024 where:

High VoutL sensor output voltage value is:: Vouth

lower sensor output voltage values

Concentration coefficient K represents a scale factor value of the sensor output voltage Vouth, VoutL specific kind of dust.

In dusty environments particle size of 2.5um, the concentration value of the coefficient K Refer to FIG.

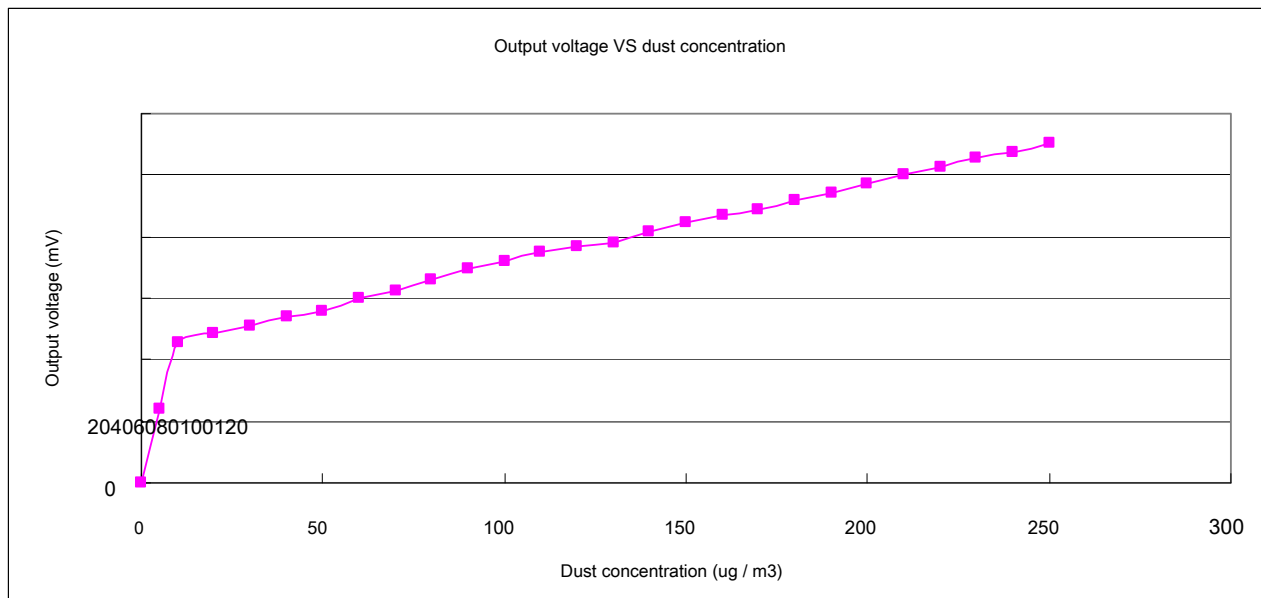


FIG concentration coefficient 4

The output voltage (V) <0.045	0.046-0.048	0.049-0.051	0.052-0.054	0.055-0.058	0.059-0.064	0.065-0.070
Coefficient values	200	400	600	750	900	1000
Output voltage (V)	0.071-0.075	0.076-0.080	0.081-0.085	0.086-0.090	0.091-0.100	0.101-0.110
Coefficient values	1400	1700	1800	1900	2000	2200
						3000

Table 6 Coefficient range

E.g:

Sensor output data shown in Table 5, the dust concentration of the reference values:

$$\text{Dust concentration} = [(0 \times 00 * 256 + 0 \times 3A) * 2.5 / 1024] * 3000 = 424 \text{ ug / m}^3$$

4. Connector

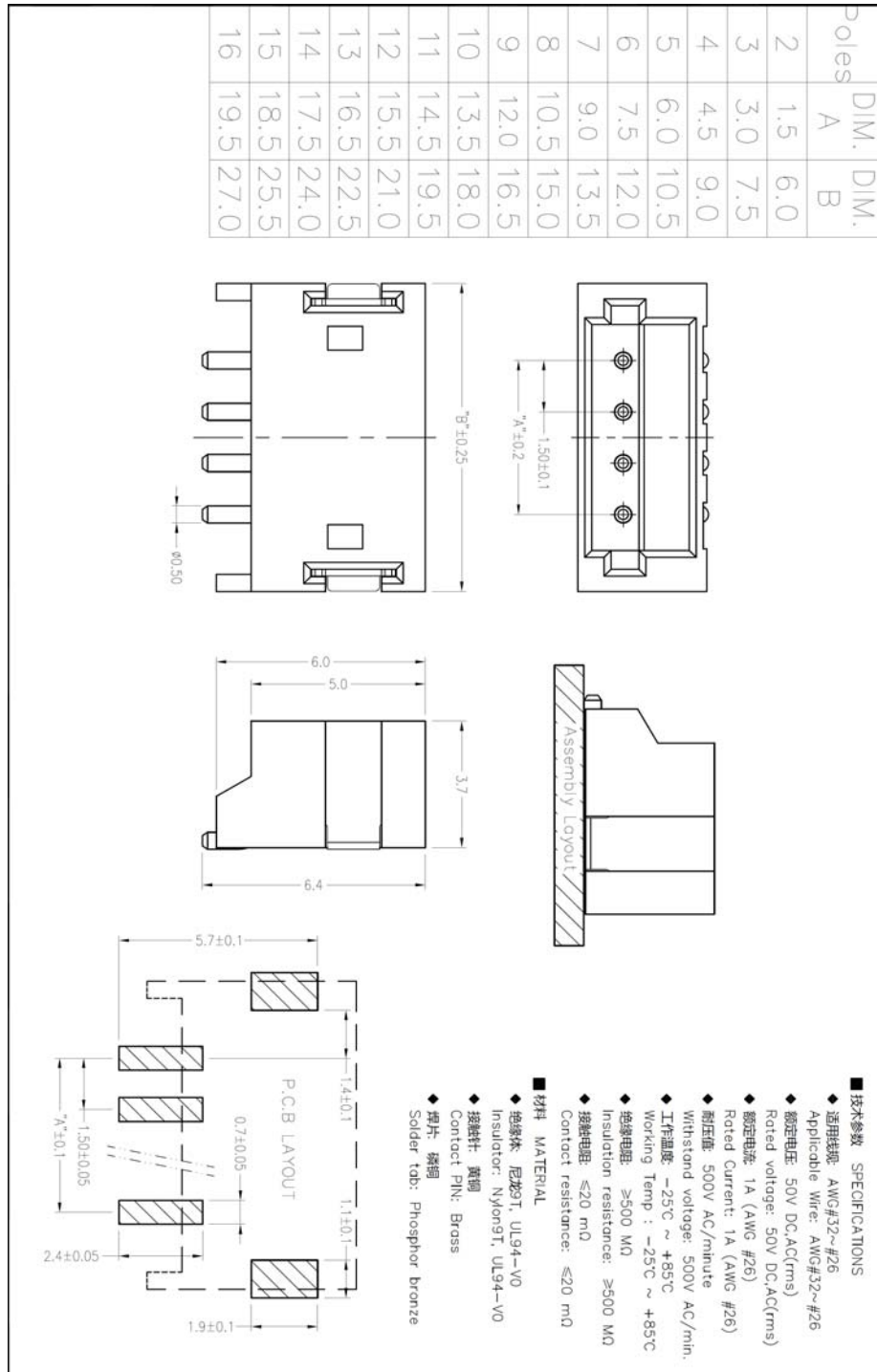
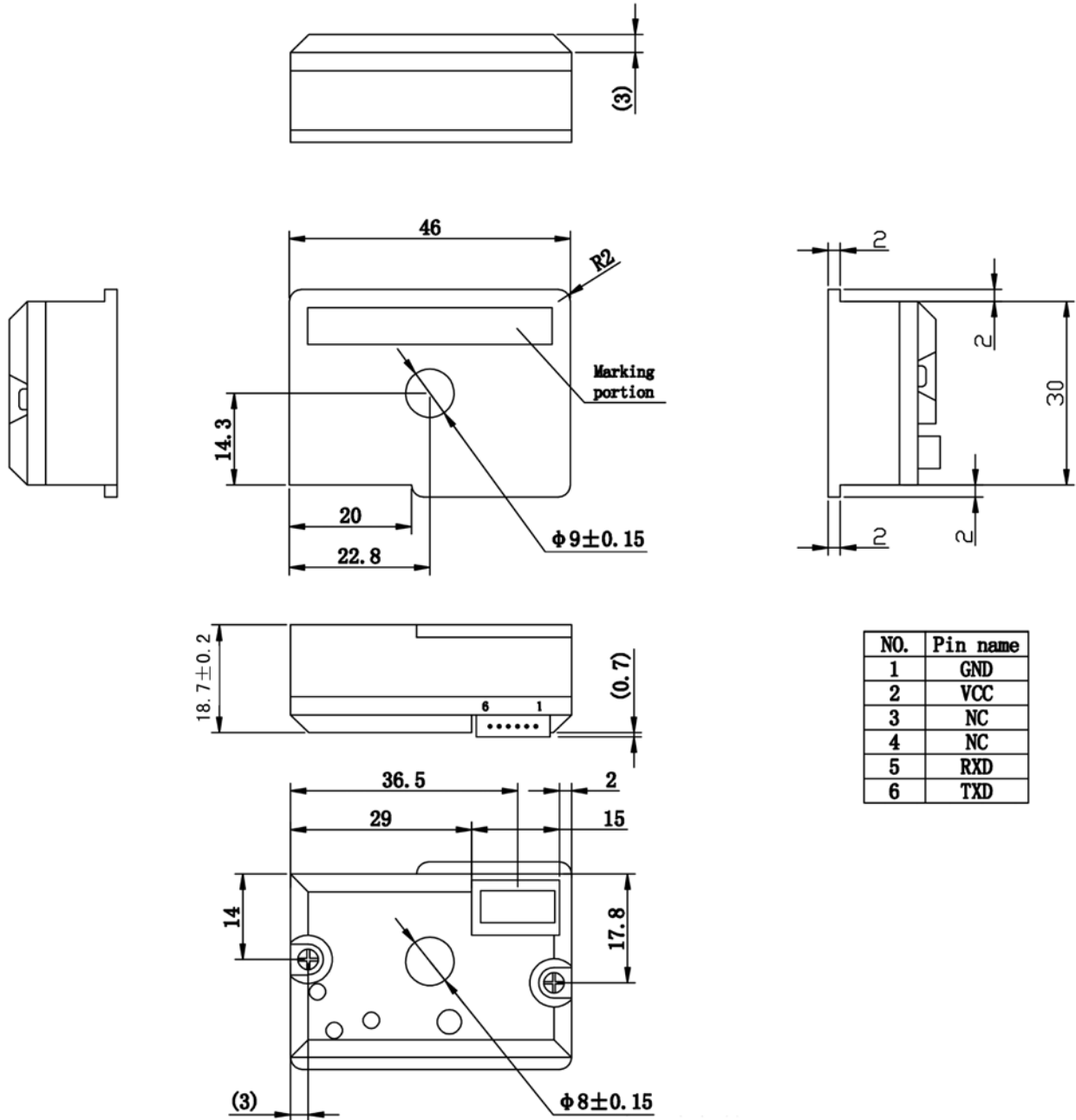


FIG 5 FIG connector size

(Please contact the British Vader for more information on the design of the connector and harness)



5. physical dimensions



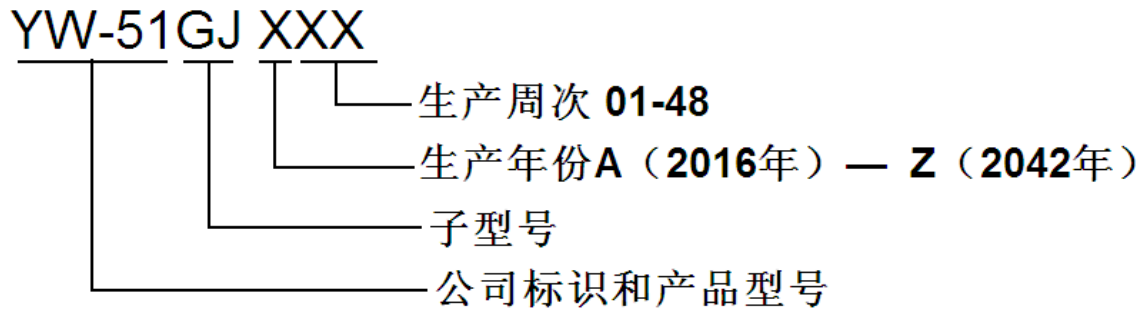
- 1) 未注公差: $\pm 0.3\text{mm}$;
- 2) (): 参考尺寸;
- 3) 单位: mm;

FIG physical dimensions 6

(Please contact the British Vader obtain information about dimensions of detailed design information)



6. Item



例如：

YW-51GJA15 代表该产品是**2016**年第**15**周生产的子型号**GJ**的产品