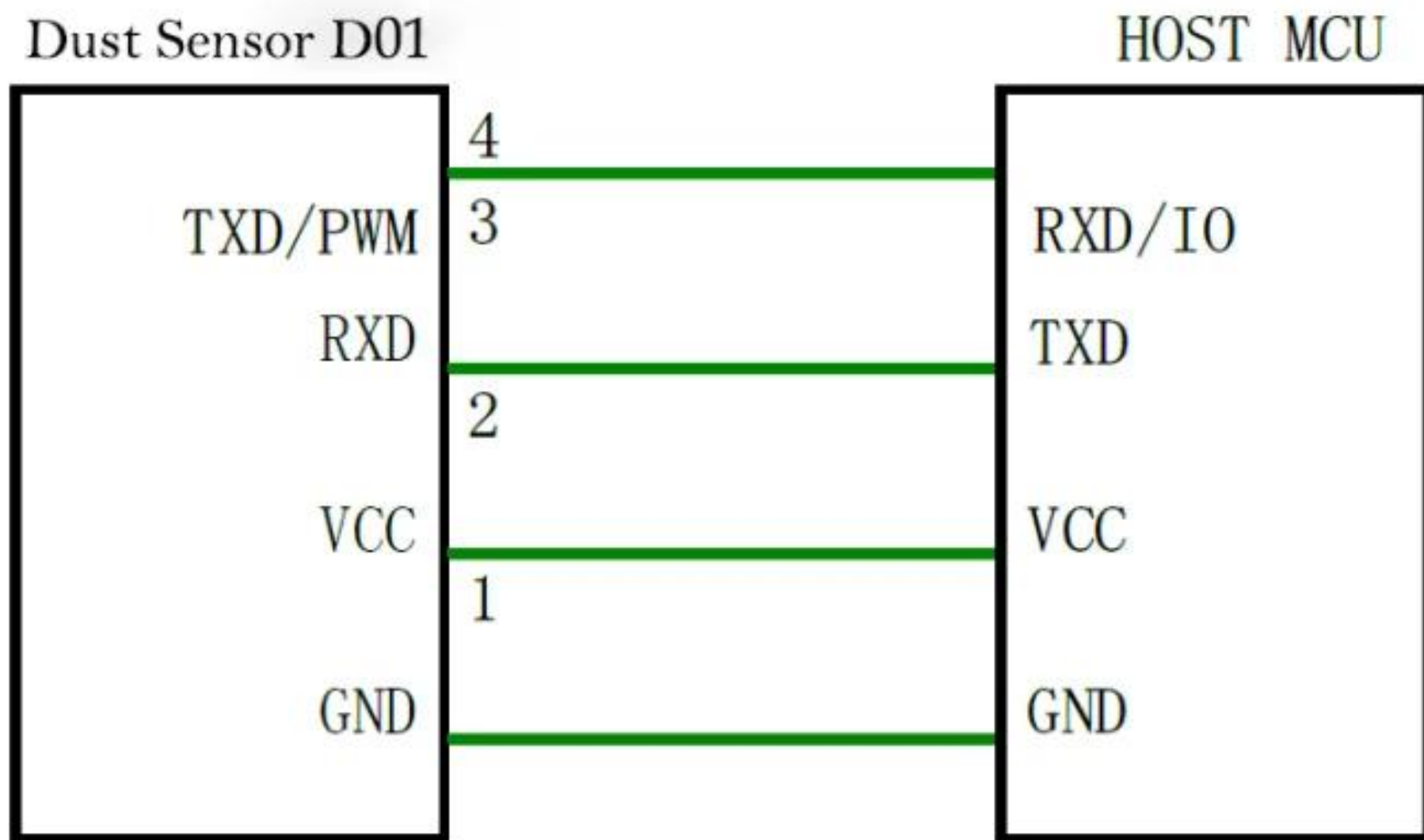
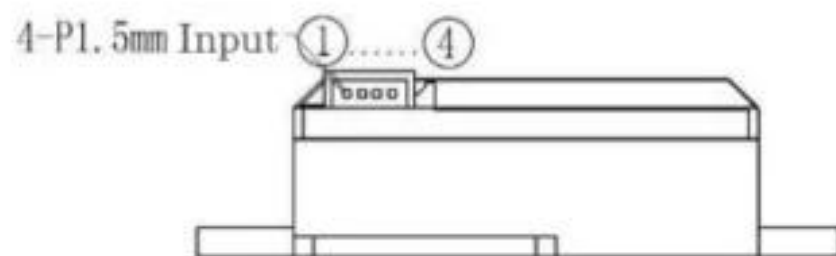
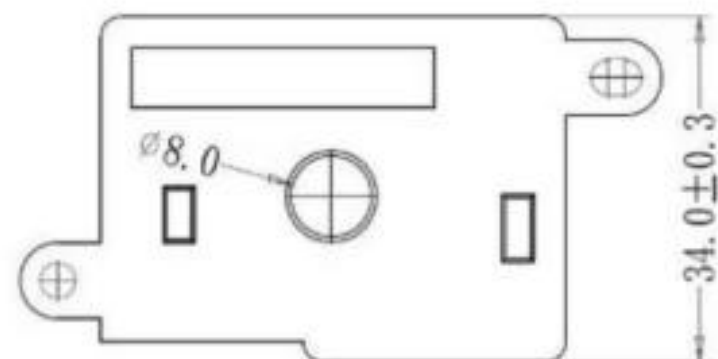
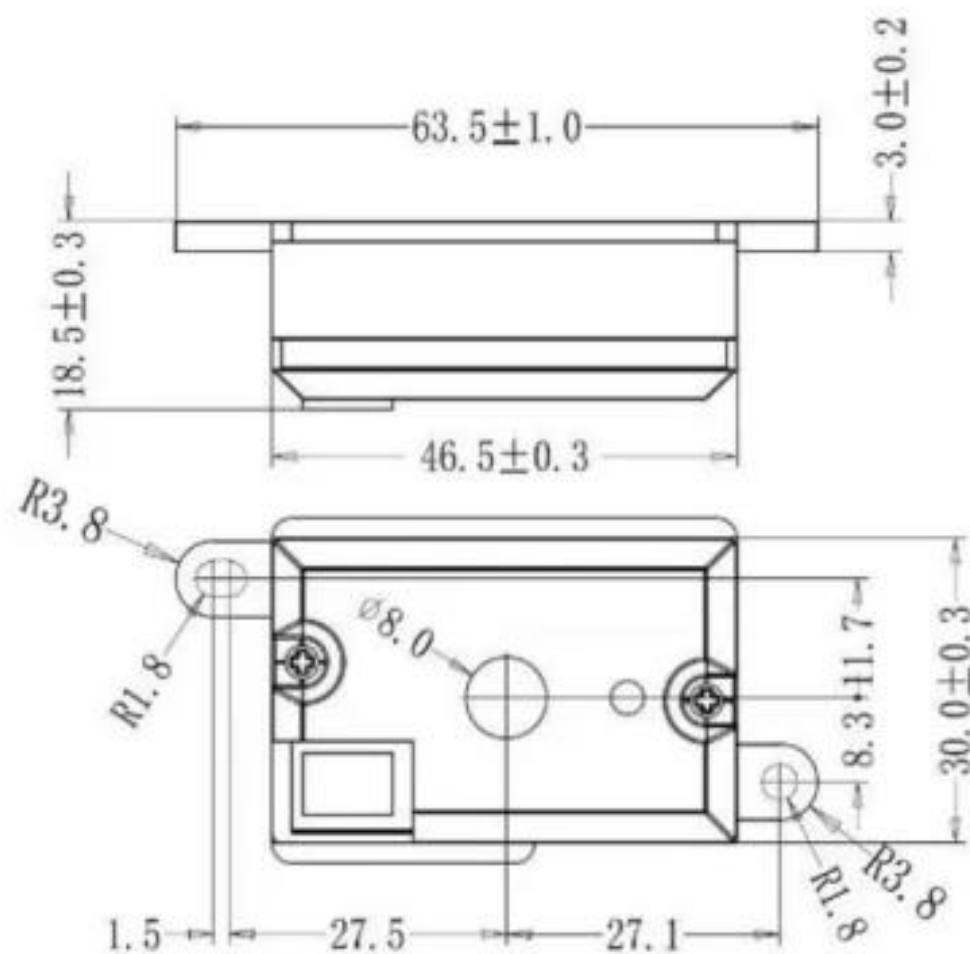


- **Application Circuit**

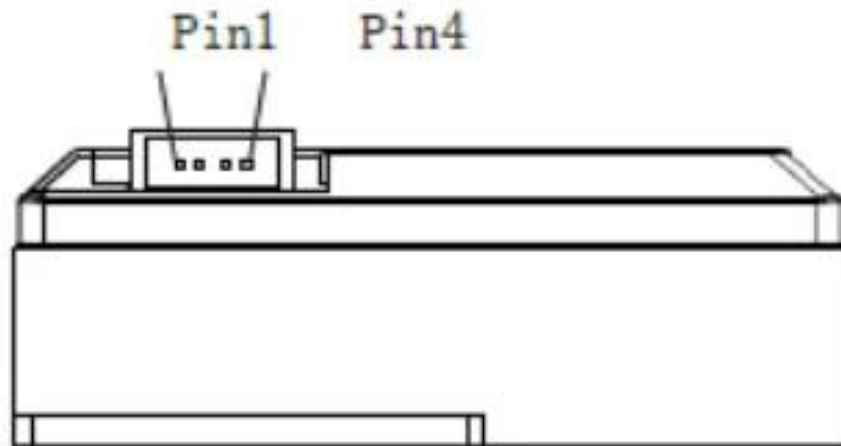


● **Product appearance and size (tolerance:  $\pm 0.5\text{mm}$ )**



Note: No tolerance specified:  $\pm 0.5\text{mm}$ , mounting holes on both ends can be removed

- **Pin diagram**



Pin number	Pin name definition	Pin function description	Pin electrical characteristics
Pin 1	GND	power negative	no reverse protection
Pin 2	VCC	power positive(+5V)	
Pin 3	RXD	RXD pin of the module UART interface	TTL level @ 5V
Pin 4	TXD	TXA pin of the module UART interface	open-circuit output, internal pull-up resistor connected to the power positive

- **PWM output**

The sensor outputs a PWM signal through the PWM pin (pin 4), and the PWM cycle is 1.2 seconds. The dust concentration value is calculated based on the width of the low-level pulse. For example, if the low-level pulse width is 50ms, the corresponding dust concentration is 50ug/m<sup>3</sup>. The concentration output range is from 5ug/m<sup>3</sup> to 1000ug/m<sup>3</sup>. The concentration value has undergone software filtering internally, and the fluctuation range is relatively small. Note: Due to individual differences in products, the maximum output value is within the range of 990-1010ug/m<sup>3</sup>.

## Infrared particle sensor module specifications

Detection type	PM0.3~PM10
Detection range	5~2500 $\mu\text{g}/\text{m}^3$
Detection accuracy	$\pm 20\mu\text{g}/\text{m}^3$ or $\pm 20\text{reading}(@25\pm 2^\circ\text{C}, 50\%\pm 10\%)$
Power-on stability time	$\leq 10\text{s}$
Operating voltage	DC 5V $\pm 5\%$ , Ripple less than 50mV
Stand-by current	$\leq 15\text{mA}$
Output	UART
Input	ZH1.5mm-4P Connector
Operating conditions	$-20^\circ\text{C} \sim +75^\circ\text{C}$ , 0~95%RH(No condensation)
Storage conditions	$-40^\circ\text{C} \sim +85^\circ\text{C}$ , 0~95%RH(No condensation )
Life-time	8 yeaaars since produced
Physical Size	46*34*18.15mm(L*W*H)

- **UART configuration**

Baud rate: 9600bps   Check bit: None   Stop bit: 1 bit   Data bit: 8

A frame of serial output data includes 4 bytes, and the data format is as follows:

Characteristic Byte	Byte 1	Byte 2	Check Byte
0xA5	DATAH	DATAL	SUM

Characteristic byte: fixed value 0xA5.

Data byte: DATAH is the high 7 bits of the concentration value, and DATAL is the low 7 bits of the concentration value.

Check byte: the low 7 bits of the sum of all bytes before the check byte.

Serial data conversion formula: Concentration value = DATAH (bit[6:0])\*128 +DATAL (bit[6:0])

(Note: The PM2.5 dust concentration value obtained from the dust sensor needs to be calibrated with a K value coefficient based on the TSI instrument's photometric method. It is generally recommended to use 0.4.)

For example, if the serial output is 4 bytes of data: 0xA5 0x01 0x2C 0x52,  
then DATAH = 0x01 = 1, DATAL = 0x2C = 44,  
Concentration value =  $1 \times 128 + 44 = 172 \mu\text{g}/\text{m}^3$ .