

# PM2.5 / PM1.0 Sensor

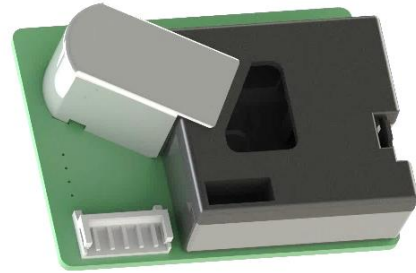
Particulate Matter Sensing Solution

## PSMU series

### 特点

- ◇ 监测超细颗粒物 ( $\geq 0.3\mu\text{m}$ )
  - 实时(Real-time) PM2.5/PM1.0
- ◇ UART输出 ( $\mu\text{g}/\text{m}^3$ )
- ◇ 优秀的准确度 ( $\mu\text{g}/\text{m}^3$ )<sup>1)</sup>
- ◇ 优秀的一致性
- ◇ 在市场验证可靠性及耐久性

1) 参考第2页规格



### 产品概要

PSMU系列通过**SAMYOUNG S&C**自主光学机构，使IrED发光元件，可感知 $0.3\mu\text{m}$ 大小细颗粒物，将监测灰尘通过MCU转换为 $\mu\text{g}$ 数值，以UART输出的PM2.5专用传感器。

### 应用

- Air solution产品 (空气净化器，空调等)
- HVAC控制系统
- 智能空气质量控制机器(IAQ)
- 户外警报灰尘机器

### 基调

PSMU系列以**SAMYOUNG S&C**的20年间技术集中的灰尘传感器，大幅提高了超细颗粒物领域 $0.3\mu\text{m}$ 以上 $1\mu\text{m}$ 以下的感知能力，可实现比现有预测方式传感器更准确的PM2.5/PM1.0的浓度。

与现有的灰尘传感器相比，具有极高的准确度和敏感度，并提供可靠的信息。适用于空气净化器，空调，空气质量监测机器，可更加准确和精巧地检测和控制浓度。

**SAMYOUNG S&C**通过开发大量校准系统，提高了生产效率和一致性，通过申请专利的光学机构，使传感器的品质和性能最大化。

PSMU系列为了提高使用者的便利性，将实时的PM2.5/PM1.0浓度数值有UART输出。

October 2018 Preliminary Version

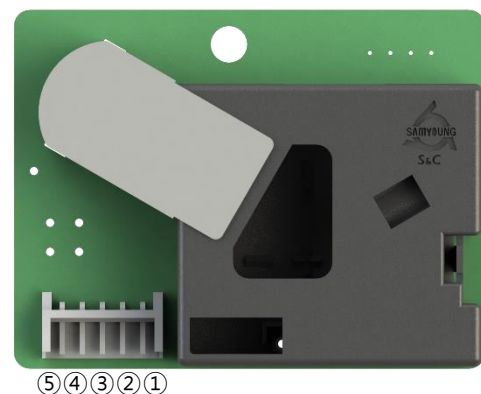
## 1. 规格

Ta=25°C

Parameter	Index
Detectable Size	≥0.3μm
Effective Range	0~500μg/m³
Maximum Range	0~900μg/m³
Accuracy	±25%@100~500μg/m³ ±2.5μg@0~100μg/m³
Time for Initial Stabilization	60sec. after powered on
Response Time	1sec
Supply Voltage	DC5.0V±10% Ripple 30mV or Less
Current Consumption	Typ. 85mA
Output Signal	UART
Operating Temperature	-10~65°C
Operating Humidity	<95%RH(Non-Condensing)
Storage Temperature	-20~80°C
Storage Humidity	<95%RH(Non-Condensing)
Dimensions	59 x 45 x 17mm (W x H x D)
Light Source Life Time	Min. 5years
Weight	25g

## 2. Pin Map

Pin No.	Name	Description
1	GND	Ground
2	RX	Not Used (N.C)
3	VCC	DC 5V
4	TX	UART Tx
5	OPT	Not Used (N.C)



October 2018 Preliminary Version

### 3. 输出特性

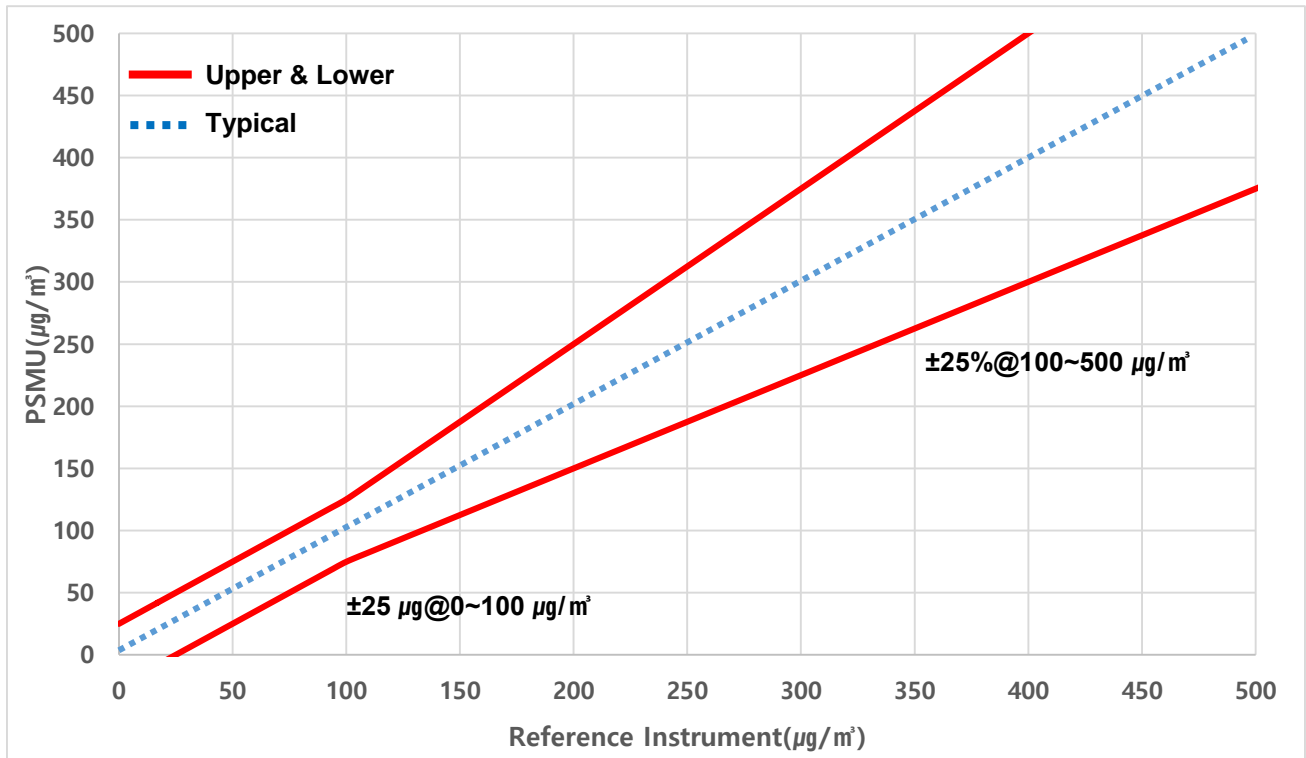


图1. 输出特性

\*请看4. 标准测试方法和测量设备

### 4. 标准测试方法和测量设备

- ◆ Room Chamber : 27 m<sup>3</sup> @23±5°C, 50%RH
- ◆ Particle Source : Cigarette
- ◆ Reference Instrument : GRIMM 11-A
- ◆ Particle Saturation Time : 5mins
- ◆ Measurement Time : 60mins
- ◆ Sensor Placement : Center of Room Chamber

在room chamber内喷烟味,并用气雾剂测量空气中的悬浮颗粒浓度,并通过HEPA过滤空气

## 5. 内部架构

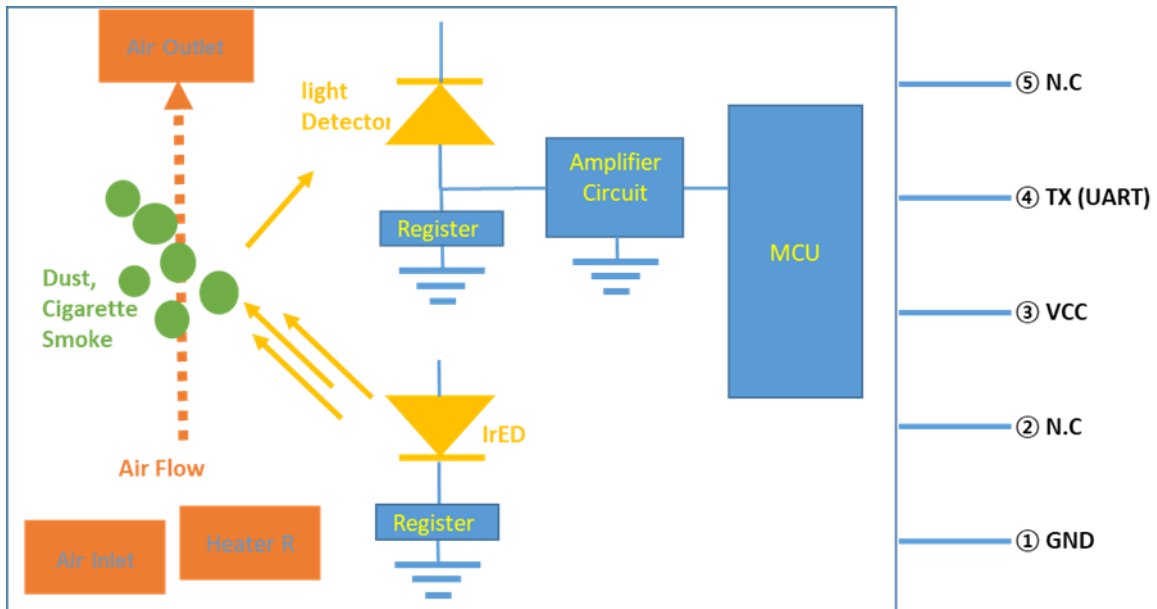


图2. 内部架构模式

## 6. I/O 连接器规格

Pin No.	Name	Description	Remark
1	GND	Ground	Ground
2	RX	Not Used (N.C)	Not Connected
3	VCC	DC 5V	Input Voltage
4	TX	UART Tx	PM2.5 Output
5	OPT	Not Used (N.C)	Not Connected

## 7. 连接器 (Male/Female)

Model Name	Part No.		Description	Connector Maker
PSMU	Wafer	S5B-EH-2.5	2.5mm pitch	JST
	Housing	EHR-5		

October 2018 Preliminary Version

## 8. 电路图

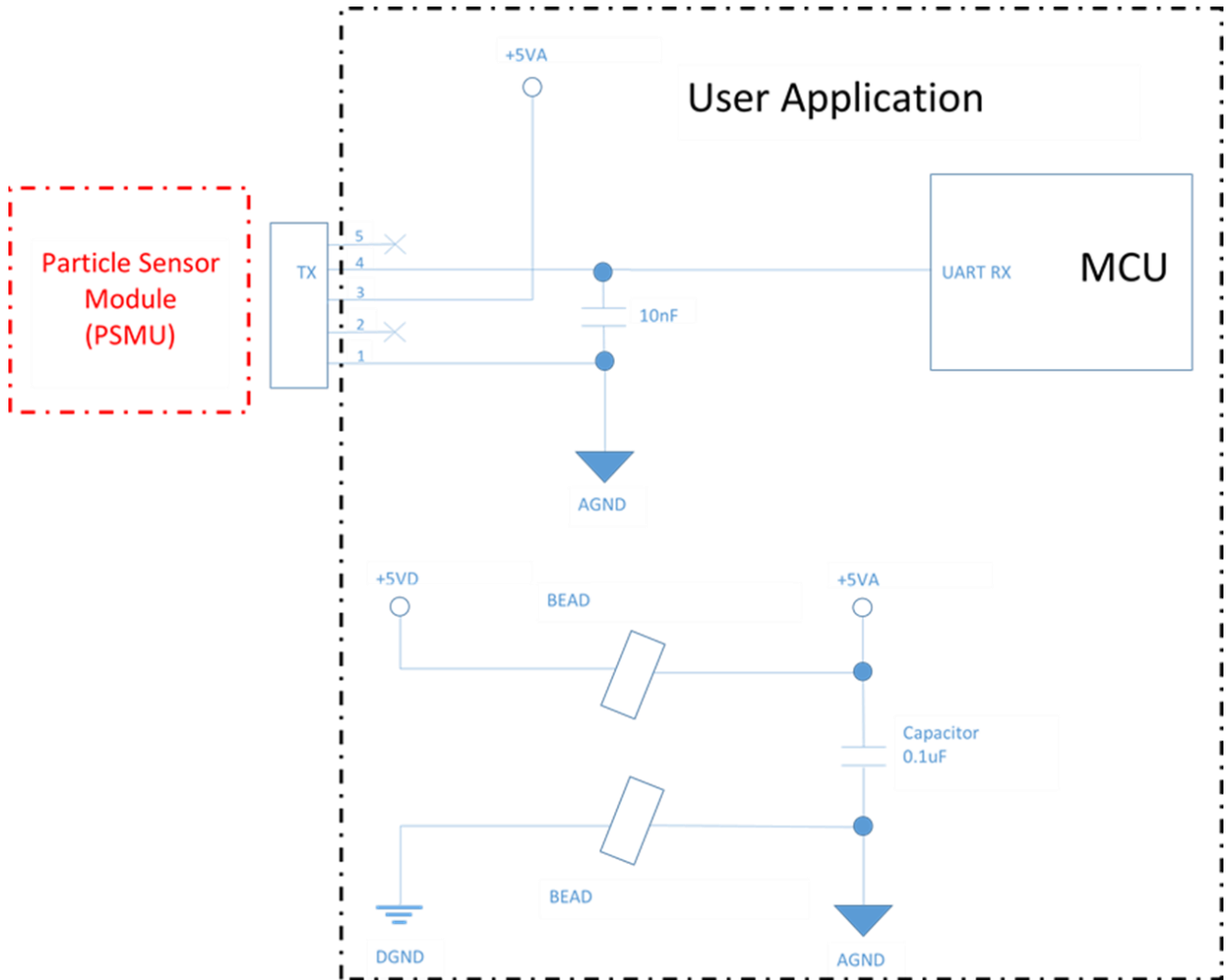


图3. 电路图列

\*Please use an extra power regulator and/or a bypass capacitor(below 10nF) on the signal line in order to compensate noise if there is noise on the signal, or power line and/or signal line are longer than 50cm

## 9. 输出信号 (Tx)

### 9-1. UART Setup

Properties	Value
Baud Rate	9600 bps
Data Bit	8
Parity Bit	None
Stop Bit	1

### 9-2. Message Format

Format	"ug:<Dummy>,<PM2.5>\n"
Example	"ug:0,25\n"

## 10. 颗粒浓度计算

Particle Concentration( $\mu\text{g}/\text{m}^3$ ) =  $(D_1 + D_2 + D_3 + \dots + D_N) / N$

Example :

ug:0,2	$D_1$
ug:0,0	$D_2$
ug:0,10	$D_3$
...	
ug:0,26	$D_N$

Particle Concentration( $\mu\text{g}/\text{m}^3$ ) for N sec. =  $(2+0+10+\dots+26)/N$

### 11. 尺寸

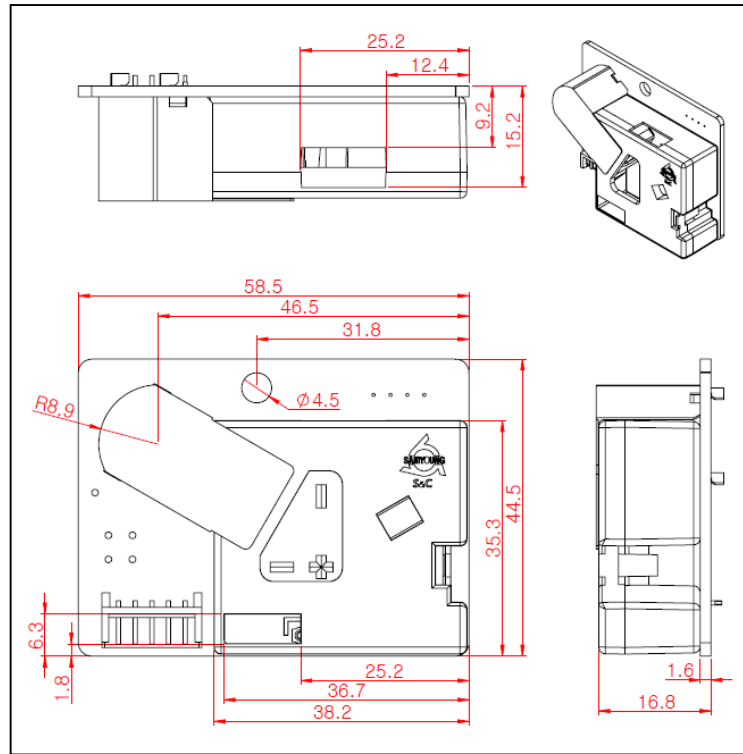


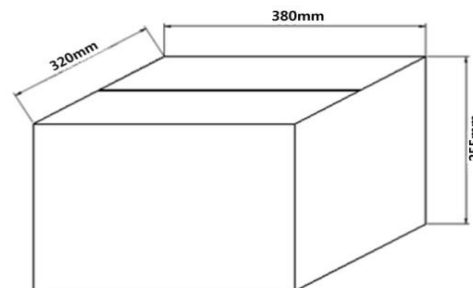
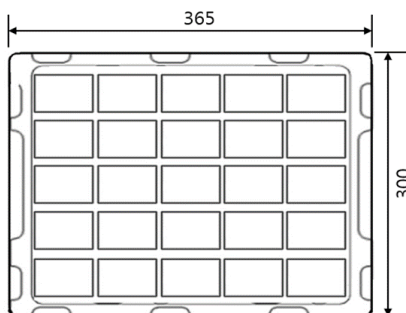
图4. 尺寸

### 12. 订购

Type	Part No.	Contact Info.	
PM2.5	PSMU2.5	E-MAIL	<a href="mailto:sales@samyoungsnc.com">sales@samyoungsnc.com</a>
PM1.0	PSMU1.0	PHONE	+ 82 31 780-9900

### 13. 包装

Tray : 25pcs / 1 Tray (PS, 365×300×25mm ) Out Box (KBL3SK, 380×320×255mm) : 10 Trays (250pcs, 7.85kg)



y Version

## 14. 修正

Date	Version	Page	Change
2018.10.31	Preliminary	All	First Edition