PM2.5 / PM1.0 Sensor
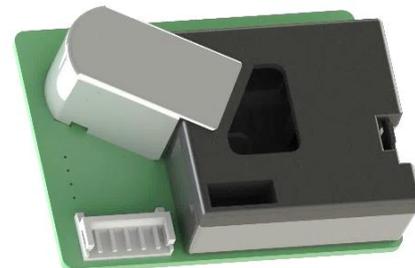
Particulate Matter Sensing Solution

PSMU series

FEATURES

✧ **Detectable Particle Size - ≥0.3μm**

➔ **Real-time PM2.5/PM1.0**

✧ **UART Output - μg/m³**

✧ **Excellent Accuracy[1]**

✧ **High Linearity and Uniformity**

✧ **Market-proven Reliability and Durability**

[1] *see page 2. Specifications*

PRODUCT SUMMARY

PSMU Series is PM2.5/PM1.0 dedicated sensor providing uniform performance and excellent accuracy in weight concentration value by detecting over 0.3μm sized ultra-fine particle through **SAMYOUNG S&C**'s proprietary optical structure with IrED.

APPLICATION

● Air Solution Products

  (Air Purifier, Air Conditioner and etc.)

● HVAC Control System

● Smart IAQ Device

● Outdoor Particle Sensing Device

KEYNOTE

PSMU Series, in which **SAMYOUNG S&C**'s 20years knowledge and technology are concentrated, is a PM2.5/PM1.0 dedicated sensor with a radical improvement for detection capability at ultra-fine particle range – 0.3μm~1.0μm, which assures PM2.5/PM1.0 weight concentration values more accurate than conventional presumptive sensors.

PSMU Series which performs higher accuracy along with improved sensitivity than conventional sensors provides reliable information to users enabling more accurate and sophisticated control in the applications such as air purifiers, air conditioners and air quality measuring devices.

SAMYOUNG S&C has developed a system to reliably mass-produce PSMU Series of uniform performance by a mass calibration technology which also contributes to efficient production. Moreover, the patented aerodynamic optical structure maximizes the performance of the sensor and improved the quality of the product. In addition, it provides real-time PM2.5/PM1.0 weight concentration values in UART output for user convenience.
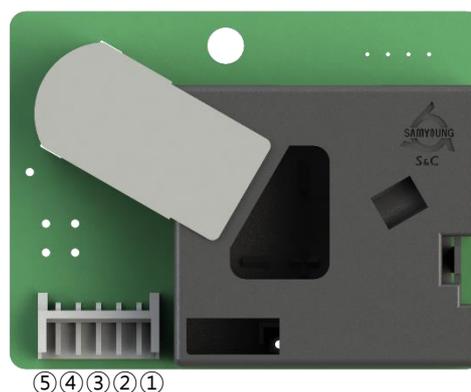
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1. Product Specifications

<div align="right">Ta=25°C</div>

Parameter	Index
Detectable Size	≥0.3μm
Effective Range	0~500μg/㎥
Maximum Range	0~900μg/㎥
Accuracy	±25%@100~500μg/㎥ ±2.5μg@0~100μg/㎥
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℃
Operating Humidity	<95%RH(Non-Condensing)
Storage Temperature	-20~80℃
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)

⑤④③②①

3. Output Characteristics
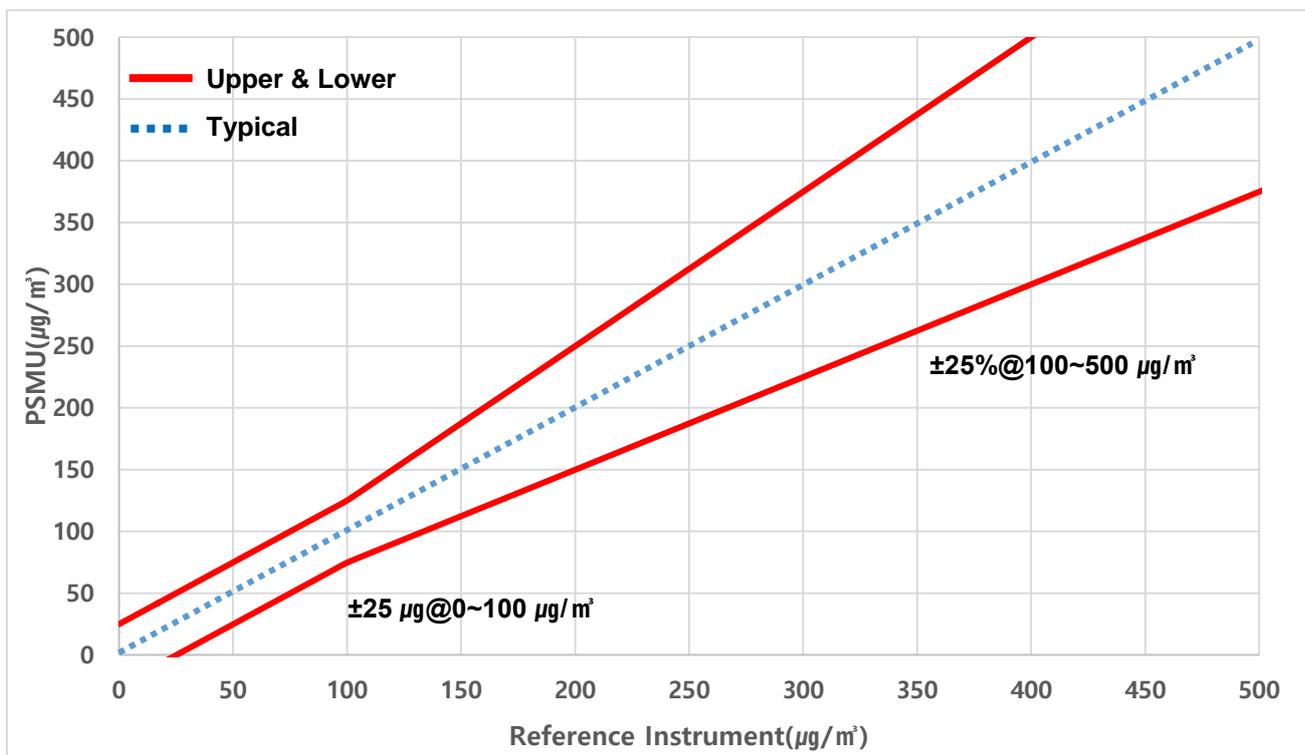

Figure1. Output Characteristics

*see 4. Standard Measurement Method for referential testing method

4. Standard Measurement Method

- ◆ Room Chamber : 27㎥ @23±5℃, 50%RH

- ◆ Particle Source : Cigarette

- ◆ Reference Instrument : GRIMM 11-A

- ◆ Particle Saturation Time : 5mins

- ◆ Measurement Time : 60mins

- ◆ Sensor Placement : Center of Room Chamber

Spray cigarette smoke in room chamber; and measure weight concentration of the airborne particles while slowly purifying the air inside the chamber through HEPA filter.
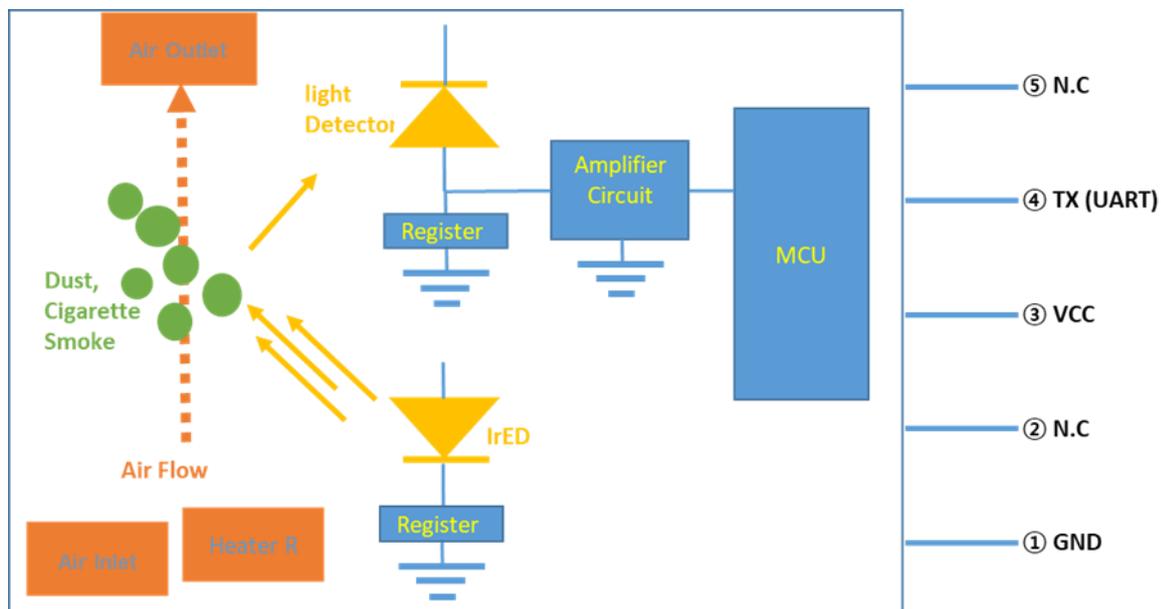
5. Internal Schematic

Figure2. Example of Internal Schematic

6. I/O Connector Specifications

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. Connector Description (Male/Female)

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

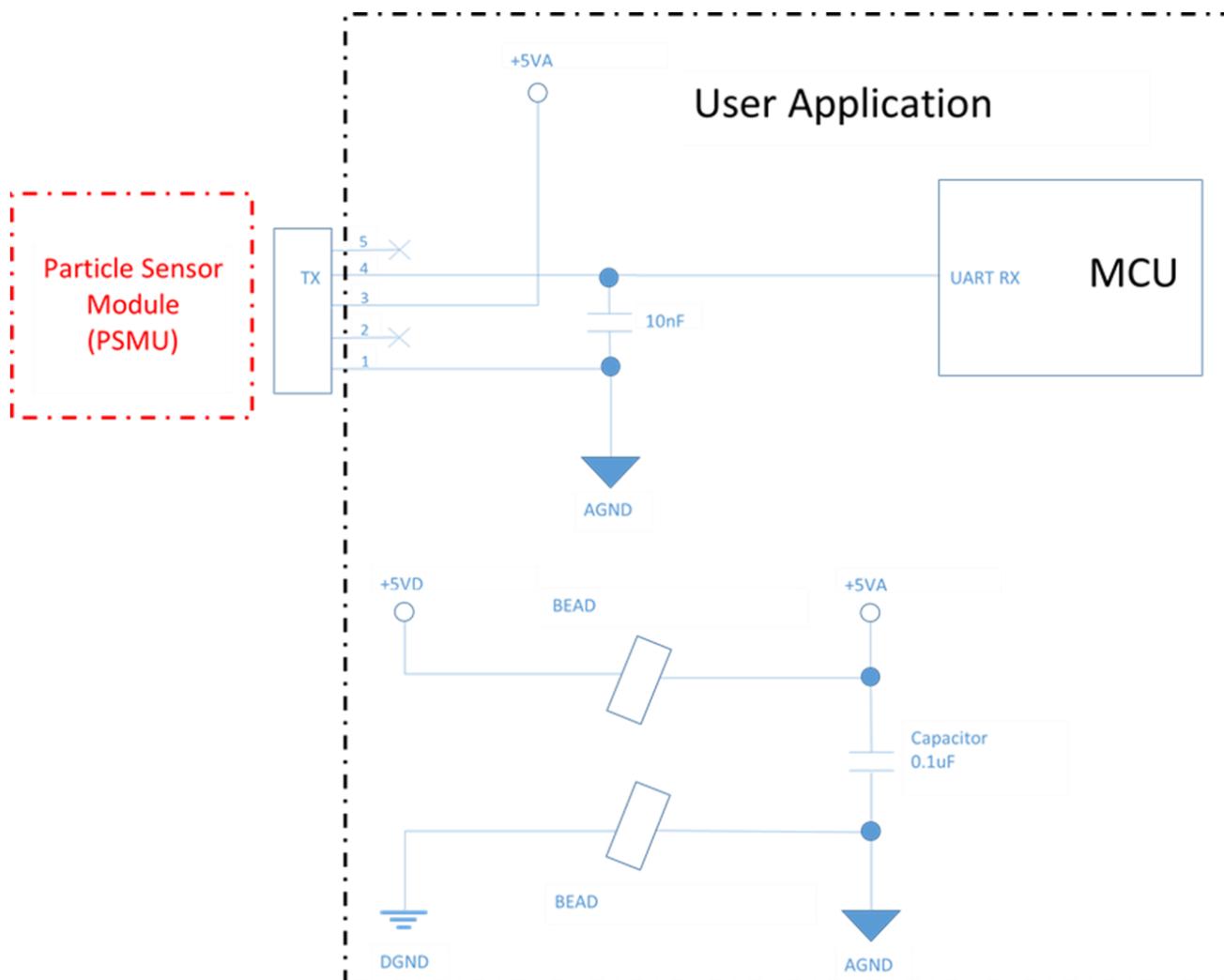October 2018 Preliminary Version

8. Interface Circuit

Figure3. Example of Interface Circuit

*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 50㎝

9. Output Signal (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. Particle Concentration Calculation

Particle Concentration($\mu g/㎥$) = $(D_1+D_2+D_3+…+D_N)/N$

Example :

ug:0,2	D_1
ug:0,0	D_2
ug:0,10	D_3
…	
ug:0,26	D_N

Particle Concentration($\mu g/㎥$) for N sec. = $(2+0+10+…+26)/N$

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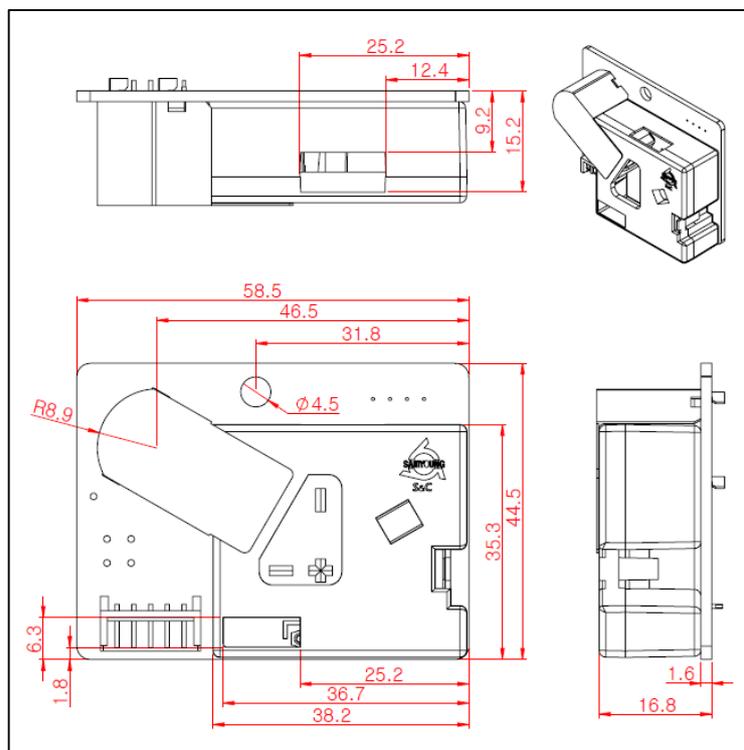
11. Dimensions

Figure4. Dimensions

12. Ordering Information

Type	Part No.	Contact Info.	
PM2.5	PSMU2.5	E-MAIL	sales@samyoungsnc.com
PM1.0	PSMU1.0	PHONE	+ 82 31 780-9900

13. Packaging Information

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

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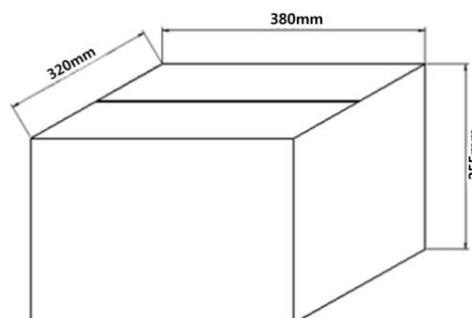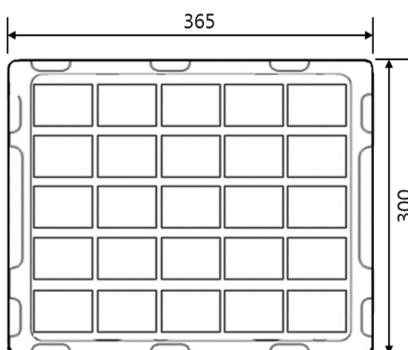
14. Revision History

Date	Version	Page	Change
2018.10.31	Preliminary	All	First Edition