Microwave Motion Sensor Module

General Description

The PS5000 is a 5.8GHz microwave motion sensor module. It detects moving objects in a short sensing coverage by consuming very low power. It is the very compact module which integrates RF components, antenna, signal processing circuit and MCU as well.

The false-detection algorithm of this module provides a stable sensing result under the harsh interference due to other wireless devices that use adjacent frequency.

The PS5000 highly simplifies design of non-contact detection applications like smart lighting, surveillance, and automation system.

Features

● 5.8GHz microwave motion sensor module

● Integrates Tx & Rx transceiver antenna, microwave circuit, IF amp and MCU

● A small size : 22.6 x 25.1 x 4.6 mm^3

● Low power consumption: typ. 6mA

● Robust anti-interference with frequency locking algorithm

● Very good detecting performance

● KC certificated (R-R-PYT-PS5000)

Applications

● Lighting Equipment

● Safety and Security Sensor

● Housing electric equipment

● Energy saving management

● Entrance and exit management

Typical Application Circuit
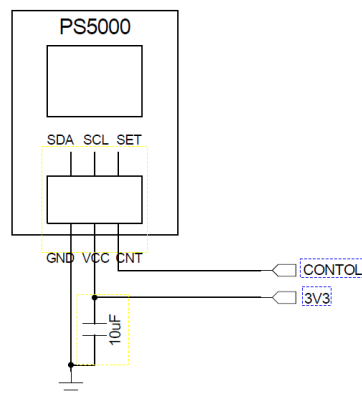
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1. Ordering Information

Part No.	Package & Connector	Packing method
PS5000 TYPE-A	22.6 x 25.1 x 4.6mm^3 JKUN L041A-2X3	Tray
PS5000 TYPE-B	22.6 x 25.1 x 4.6mm^3 2.54mm 2x3 pin header	Tray

NOTE: Type-A is main product.

2. Absolute Maximum Ratings

Parameter	Min	Typ	Max	Unit	Remark
Supply Voltage	0		3.6	V	
Operating Temperature	-20		80	°C	
Storage Temperature	-40		100	°C	

NOTE: The above table represents stress ratings only. Stress beyond those listed in this table may cause permanent damages to the device. Functional operation of the device at these or any other conditions beyond those indicated in the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

3. Electrical Characteristics

| Parameter		Min	Typ	Max	Unit	Remark
Operating Frequency		5.847		5.850	GHz	
Antenna Gain			3.75		dBi	
Output Power [EIRP]				10	dBm	
Maximum Detection Distance			7		m	
Output Power				10	mW	
3dB Antenna Beam Width	E axis		86		Deg	
	H axis		99		Deg	
Current Consumption			6		mA	
Peak Current			80		mA	
Supply Voltage		3.0	3.3	3.6	V	
Control Pin Voltage		3.0	3.3	3.6	V	

Installation Guide

The module antenna should be oriented towards the target sensing area for proper working.

ESD Caution

Integrated circuits can be damaged by ESD. So it is recommended that this device is treated with appropriate precautions.
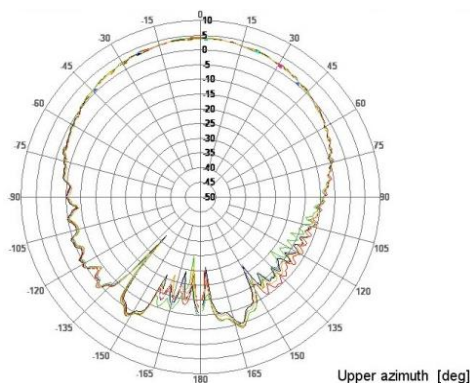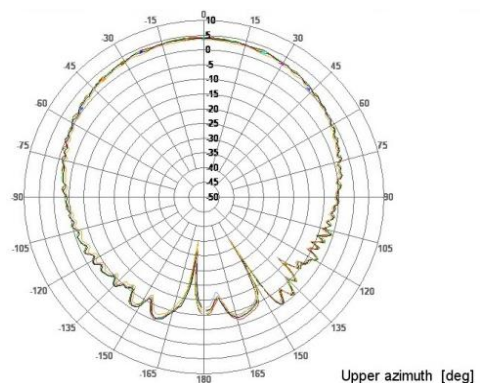
4. Block Diagram
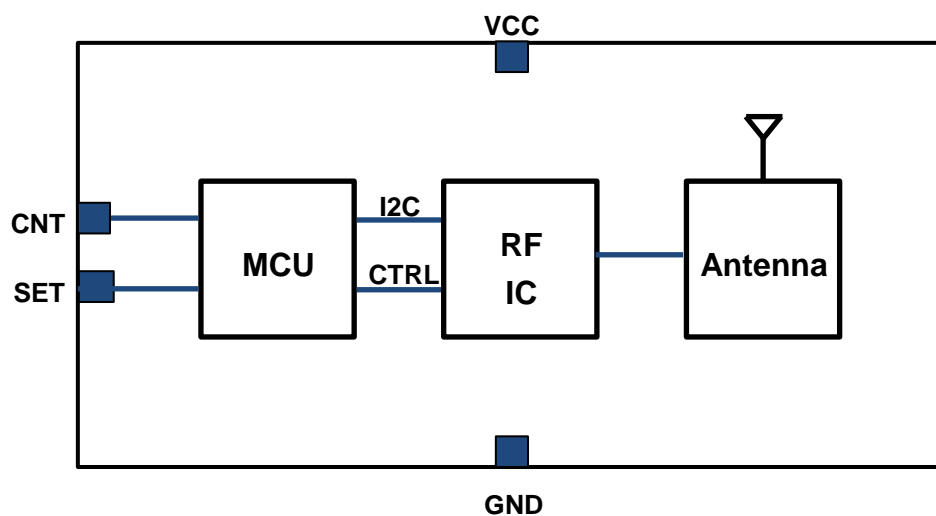
5. Interface

<Backside Pin Assignment>

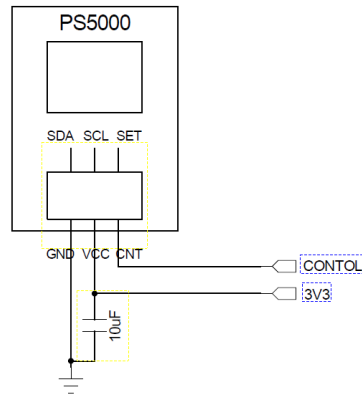| Pin No	Name	I/O	Description
1	SDA	I/O	Control pin setting
2	SCL	I	CDS pin
3	SET	I	Detection range setting
4	GND	G	Ground
5	VCC	P	3.3V voltage input
6	CNT	O	Control signal (Motion: High, without motion: Low) / Auto trigger

6. Antenna Pattern

**<E Pattern>**

<H Pattern>

7. Reference Design

7-1. Basic application

CONTROL : The signal is held at 0V (Low) without a motion detection and 3.3V (High) for 30 seconds if a motion is detected. If another motion is detected at 3.3V, it is held at 3.3V for 30 seconds from the moment.

3V3 : DC 3.3V should be supplied to the pin input pin. If the VCC is supplied by a switching type power, it is recommended to insert a voltage regulator between the power supply and the input pin.
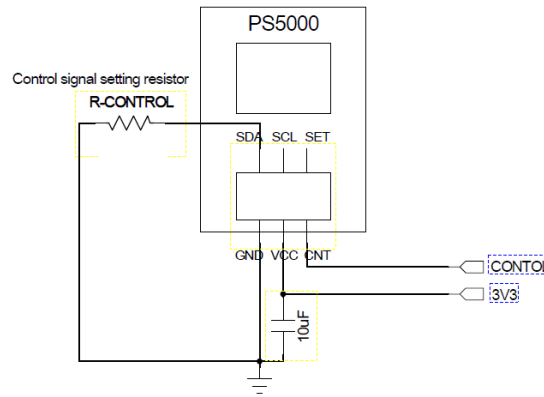
7-2. Detection range setting
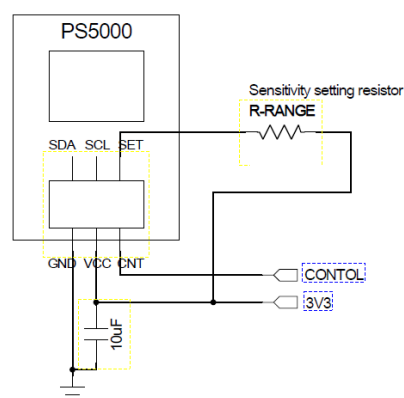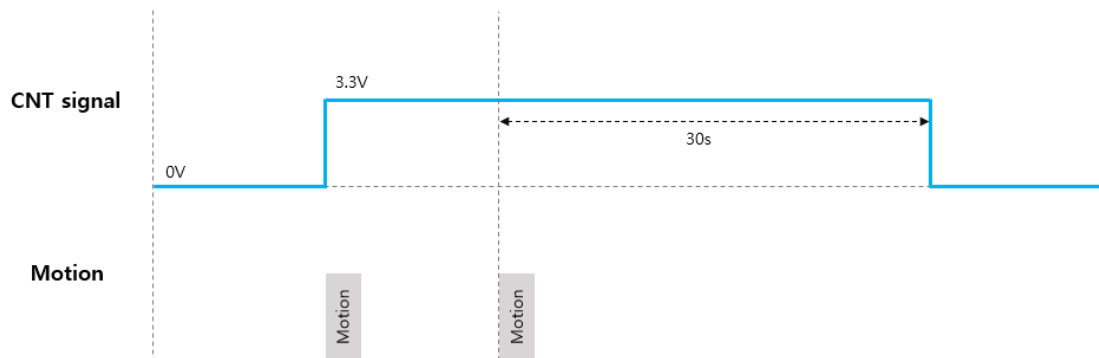

R-RANGE → NC : Max detection range.

R-RANGE → 4.7KΩ : Half detection range.

※ It can be adjusted to 5 steps from max to half range later.
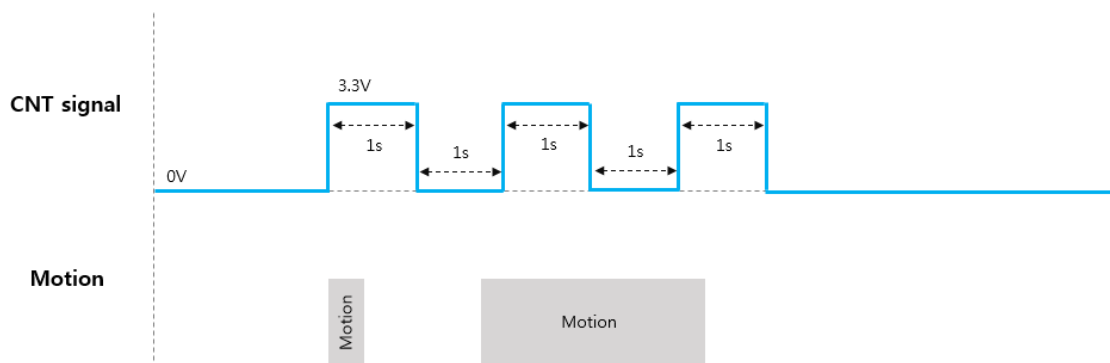
7-3. Control pin signal setting

R-CONTROL → NC : If a motion is dectected, the control pin is held at 3.3 V for 30 seconds with auto-trigger.
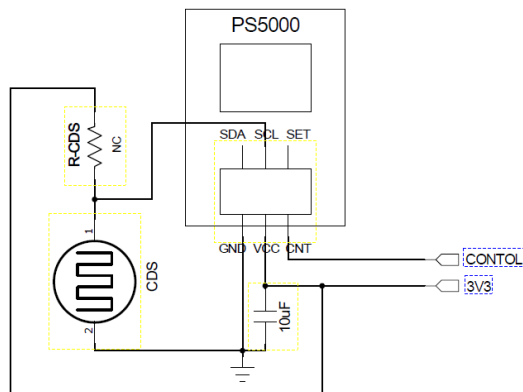

※ Auto-trigger : If a motion is detected while the control pin is high, the control pin is extended by an additional 30 seconds.

R-CONTROL → 1K ohm : If a motion is dectected, the control pin is held at 3.3 V for 1 sec without auto-trigger.
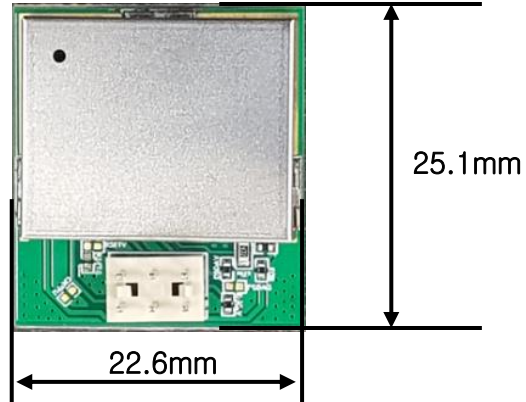
7-2. CDS pin

CDS : If CDS is below 4.7Kohm, the control signal is always "Low" regardless of motion detection.
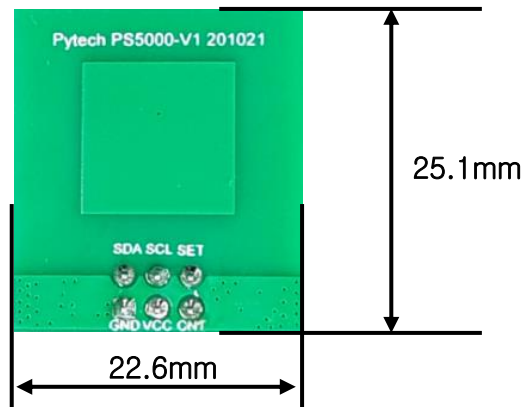
R-CDS : Tunning registor

8. Module Outline

Front Drawing

25.1mm

22.6mm

Backside Drawing

Pytech PS5000-V1 201021

SDA SCL SET

GND VCC CNT

25.1mm

22.6mm

9. Connector Information

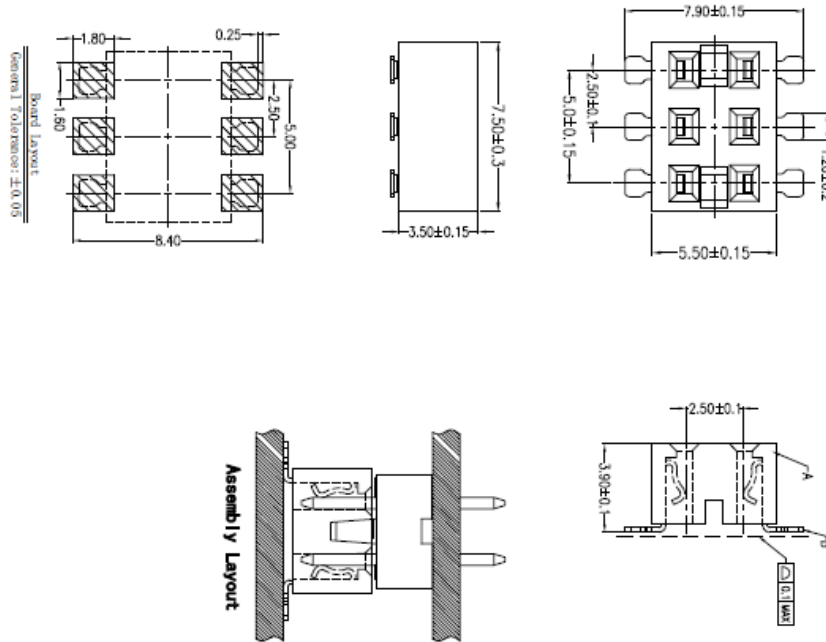TYPE-A : JKUN L041A-2X3

TYPE-B : 2.54mm Pin header

TYPE-A Female Connector : JKUN L041AWV-203-B1MB-R

ORDER INFORMATION:

L041AWV-203-B1MB-R

PART No.
No.FOR CIRCUITS:
203
PLASTIC MATERIAL:
B1M=PA46(BEIGE)

PACKAGING:
R=RELL
PLATING:
B=MATTE Sn

10. Packing Information

TBD

[Unit: mm]

Symbol	A	N	C	D	w1	w2	T
Size							

11. Revision History

Revision No	Date	Description
Ver0.1	Jan. 8, 2021	Format release
Ver0.2	Mar. 15, 2021	1st Release
Ver0.3	May. 04, 2021	2nd Release
Ver0.4	July. 07, 2021	3rd Release
Ver0.5	Aug. 24, 2021	4th Release
Ver0.6	Sep. 30, 2021	5th Release for Connector B type
Ver0.7	Dec. 15, 2021	6th Release for Connector B type
Ver0.8	Dec. 15, 2021	7th Release
Ver0.9	Sep. 08, 2022	8th Release
Ver1.0	Nov. 03, 2022	9th Release

PYTECH Inc.

A Smart Human Detection Solution

102-1306, 166, Gosan-ro,
Gunpo-si, Gyeonggi-do, Korea 15850
TEL: +82-70-4099-0384
FAX: +82-70-4009-0269
sales@pytech.co.kr
http://www.pytech.co.kr

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