

# S-1

Occupancy detecting Module using a radar principle

## MOD10003

(FCC ID : Q54MOD10003)

### User's Manual

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#### **CAUTION!!**

- The UWB sensor is an ultra-wideband(UWB) module certified under FCC Part 15.519.
- The product would operate following the 15.519 rules outside of this testing mode.



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# INTRODUCTION & INFORMATION

## Introduction

The UWB(Ultra Wide Band) sensors refers to a kind of radar technology that was traditionally used in military applications. When used as a security means, it's low power, wide band characteristics often causes frequent false alarms. Overcoming such limitations with its excellence in technology, S1 showcases the first ever UWB-based security sensor in the world. Its radar-based principle makes it inherently immune to heat source-induced false alarms and enables high level of sensitivity to the movement of heat-insulated intruders. Coverage can be flexibly adjusted to enable its deployment in various environments.

This device is a 7.9 GHz UWB(Ultra-wideband) module. Transmitter of the EUT is powered by the 3.3 Vdc from OEM supplier product(user end equipment). The antenna is Onboard Patch antenna without antenna connector. Please the other instruction have a look at the user's manual.

This document describes the features and the specifications of the UWB sensor, important regulatory information concerning its use, and details on how to diagnose potential problems.

# INTRODUCTION & INFORMATION

## Information to the User

The UWB sensor is an ultra-wideband(UWB) module certified under FCC Part 15.519. It's use is subject to technical requirements for Hand Held UWB systems, in particular the stipulation that the devices should only be used indoors. Users should note carefully the following information:

- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Users should also carefully note the following information:

- **CAUTION:** Any changes or modifications made to the "UWB Sensor" which are not expressly approved by the "S-1" could void the user's authority to operate the equipment.
- **NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.

End Product Labeling:

- This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: Q54MOD10003". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

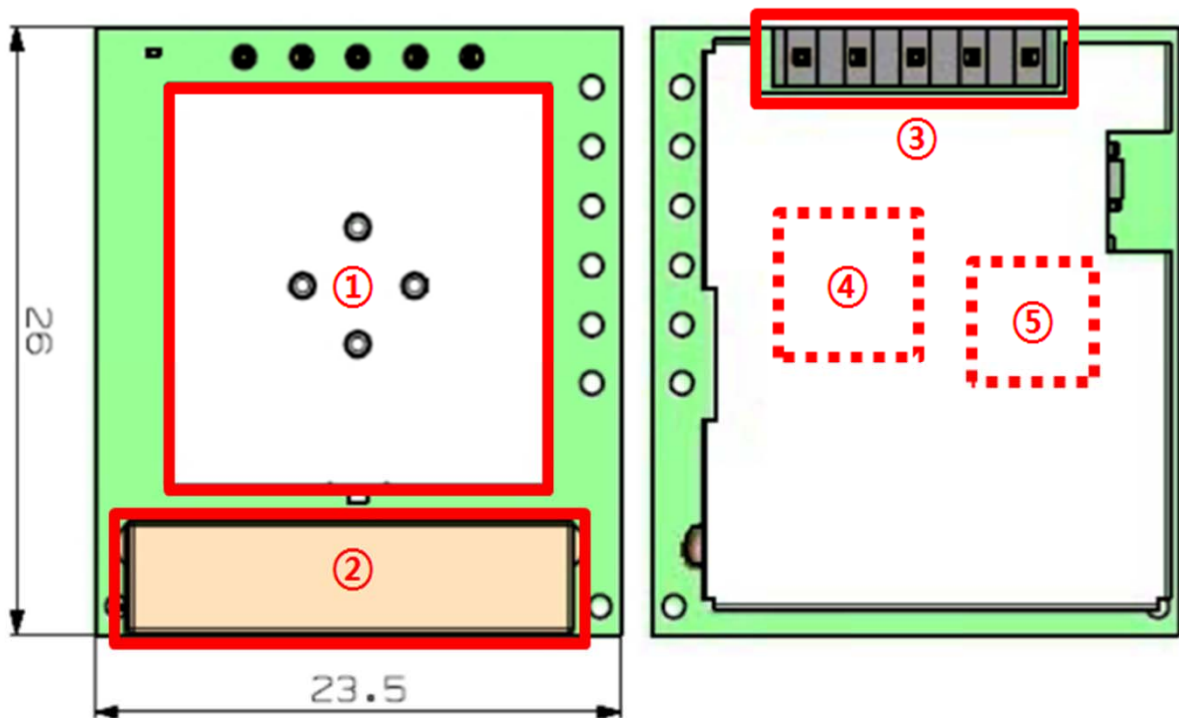
Manual Information to the End User:

- The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

# FEATURES OF THE UWB MODULE

## Features of the UWB Sensor

The diagram below shows several important features of the UWB Module:



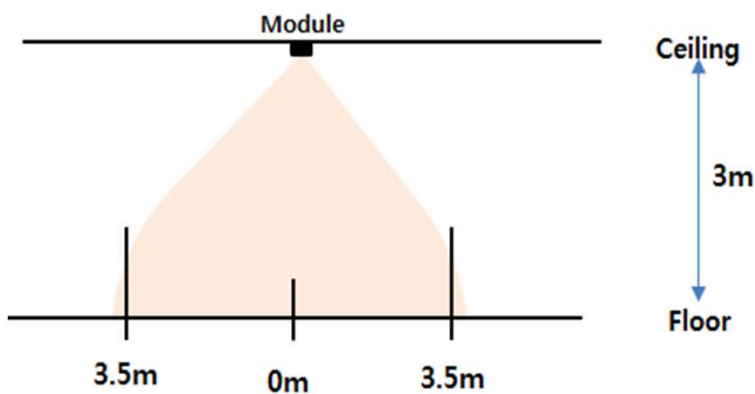
No.	Name
①	Antenna
②	UWB RF(Shielded)
③	LED for UWB operation debugging
④	Main board connector
⑤	Remote download interface
⑥	MCU
⑦	FPGA

# COVERAGE OF THE UWB SENSOR

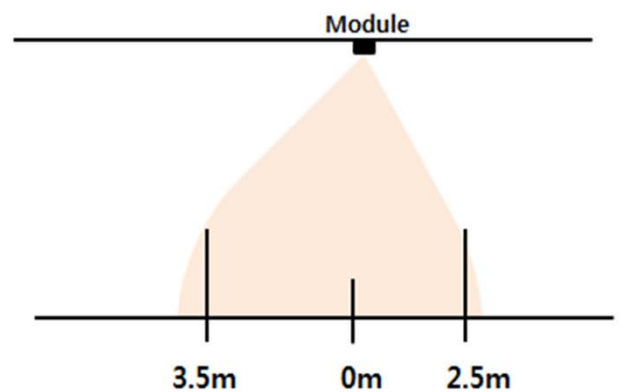
## Coverage of the UWB Sensor

Maximum detection area of the sensor is as follows:

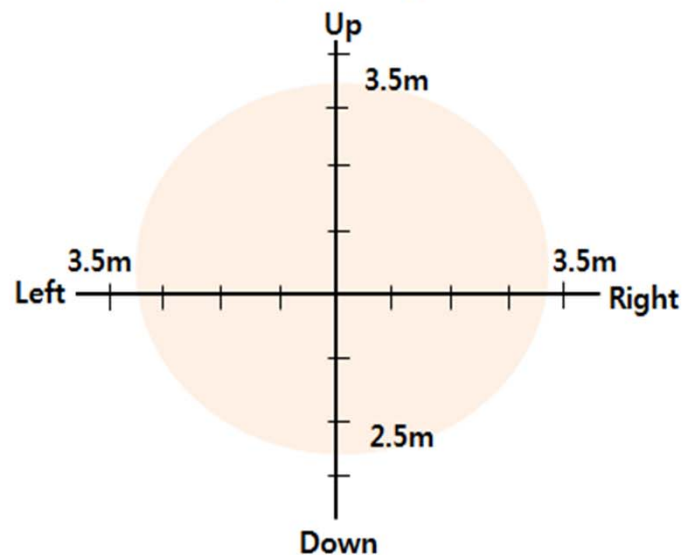
### • Install Height : 3m(Left, Right)



### • Install Height : 3m(Up, Down)



### • Spot Range



### Note

- Installer is to walk into the pattern or may walk perpendicular to the pattern to verify the pattern.

# UWB MODULE SPECIFICATIONS

## UWB Sensor Specifications

The specification of the sensor refer to the following table:

Model code		MOC10003
Sensing Method	Sensing type	Impulse Radio(Ultra Wide Band)
Power	Operating Power	DC 3.3V
	Power consumption	20mA or less
Operation environment	Temperature	-10℃ ~ +50℃ (14°F ~ 122°F)
	Humidity	95 % RH or less
Circuit spec	Interface	UART
	Calibration time	5 seconds (maximum)
	Operation status(LED)	System operation status check
Sensing spec	Maximum sensing distance	7m
	Horizontal sensing angle	90°
	Vertical sensing angle	55° ~ 60°
	Distance resolution	By 1 meter(3.2ft)
	Sensing output time	20 ± 0.5 seconds
RF	Center frequency	7.9GHz ± 1GHz
	Bandwidth	500MHz or wider
	EIRP	Maximum -41.3 dBm
	Pulse repetition frequency	19.6 kHz (Periodic)
	Pulse repetition interval	Approx. 51 us
	Pulse peak power	56.95 dBuV @ 3m distance
	UWB antenna	Onboard Patch