

Product Specification & User's Manual: Radar Sensor Module RSMV2



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Revision Sheet (history)

Release No.	Date	Revision Description
Rev. 0.1	09/30/2023	Initial draft
Rev. 1.0	07/04/2024	A few minor changes

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1. Overview

1.1. Introduction

The radar module “RSMV2” from LG Electronics is a compact millimeter wave detection sensor optimized for detecting minute movements of objects at close area. Its main use is a presence detection sensor that checks the presence of people in various indoor and outdoor environments and has the advantage of being easy to install while minimizing sensor exposure. It also has an embedded program to enable configuration in response to various application requirements.

By adopting Infineon's radar sensor BGT60UTR11AiP, it supports an easy-to-use FMCW (Frequency Modulated Continuous Wave) radar platform. In particular, the AIP (Antenna In Package) structure, which has an antenna built into the radar chip, makes it possible to provide stable RF characteristics even if the size is small.

1.2. Features

- 61-61.5GHz radar sensor for presence detection.
- 1Tx – 1Rx Antenna
- Synthesized FMCW frequency source
- Back-channel UART through USB-to-PC for logging purposes
- Antenna in package (AIP)
- 12V power input.

2. Hardware Description

2.1. Product Appearance

The top and bottom views of the RSMV2 module are shown as follows.

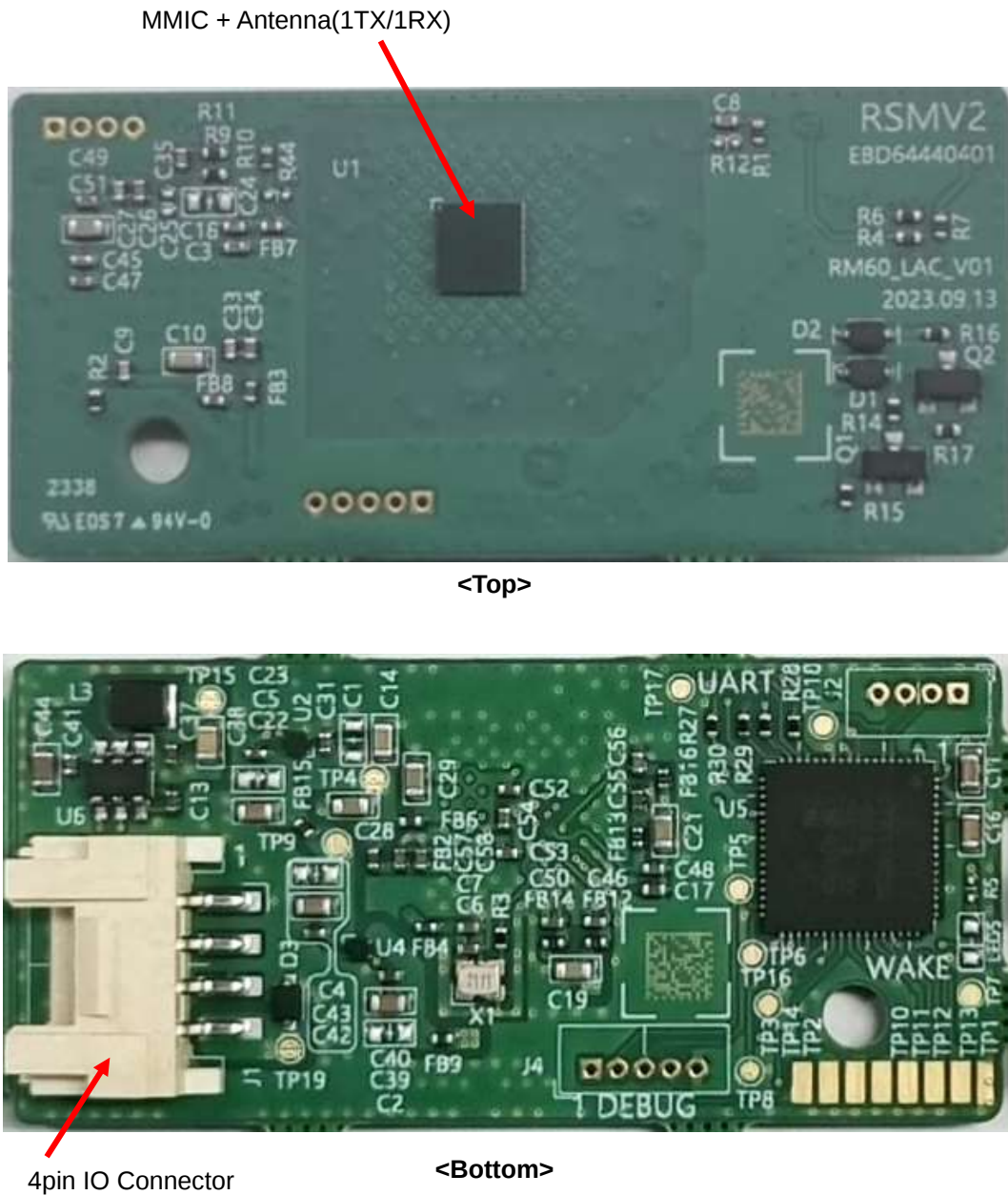
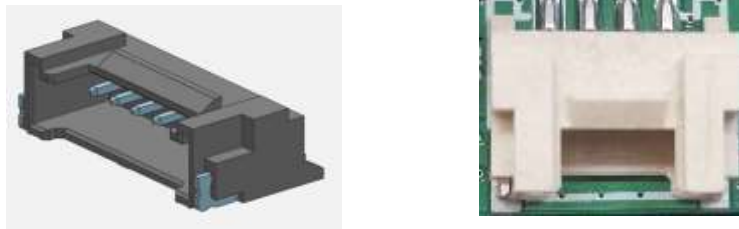


Figure 1. Radar Module Photos

2.2. Connector Interface



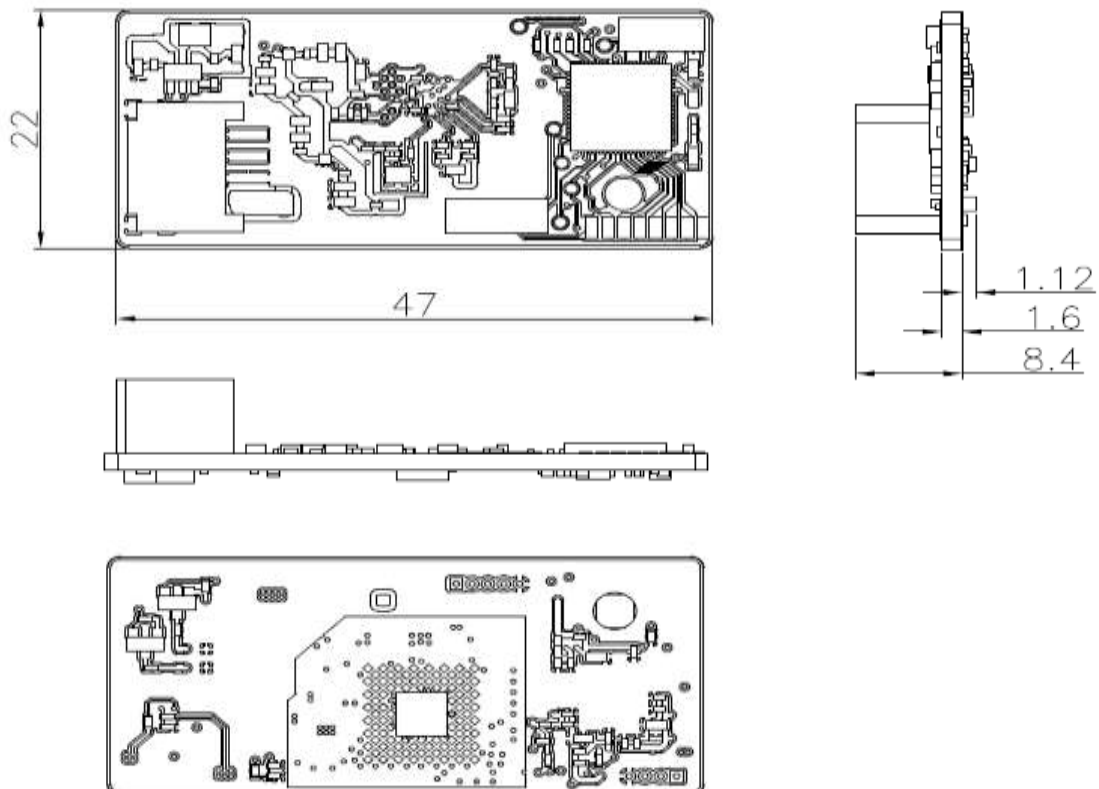
Connector Part No. : 20037WR-H04 (Maker : Yeonho Electronics)

Table 1. 4-Pin IO Connector's Pin

Pin No.	Signal Name	Function
1	HOST_UART_TX	UART TX
2	HOST_UART_RX	UART RX
3	GND	Ground
4	+VDD_12V	+12V DC Input

2.3. Board Dimensions

- Size (W x L x H) : 22.0mm x 47.0mm x 9.52mm (± 0.5 mm)



3. Specifications

3.1. Absolute Maximum Ratings

Parameters	Conditions	Spec.			Notes
		Min	Max	Unit	
Operating Temperature	Module Only	-20	+70	°C	
Storage Temperature	Module Only	-40	+100	°C	
Supply Voltage		11.4	12.6	V	

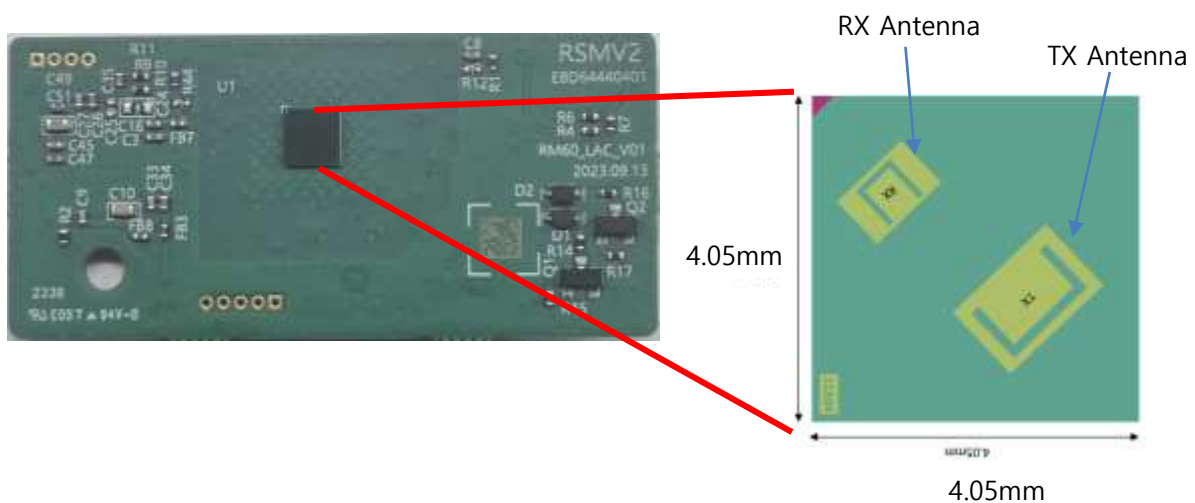
3.2. Radar Performance Specifications

(@ 25°C unless otherwise noted)

Parameters	Spec.	Notes
Frequency	61 ~ 61.5GHz	Max. 480MHz band
Modulation Method	FMCW	Frequency Modulation Continuous Wave
Max Detection Range	≥ 5m	Adult people target
Azimuth FOV	90° (±45°)	
Number of Tx & Rx	1Tx, 1Rx	
Antenna Gain	3dBi	Typical (Max. 4dBi)
Antenna 1Tx Output Power (EIRP)	6.2dBm (±2dBm)	Max. Average EIRP

3.3. Antenna Shape

- Single patch Antenna in Package



<FCC Statement>

FCC Part 15.19 Statements:

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.

FCC Part 15.21 statement

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Regulatory notice to host manufacturer according to KDB 996369 D03 OEM Manual v01>

List of applicable FCC rules

This module has been granted modular approval as below listed FCC rule parts.

-FCC Rule parts **15.255**

Summarize the specific operational use conditions

-The OEM integrator should use equivalent antennas which is the same type and equal or less gain than an antenna listed below in this instruction manual.

Limited module procedures (Only limited modular approval)

N/A

Trace antenna designs (Only trace antenna module) **N/A**

This device is not using trace antenna.

RF exposure considerations

The module has been certified for integration into products only by OEM integrators under the following condition:

- The antenna(s) must be installed such that a minimum separation distance of at least **20** cm is maintained between the radiator (antenna) and all persons at all times.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.
- Mobile use**

As long as the three conditions above are met, further transmitter testing will not be required. OEM integrators should provide the minimum separation distance to end users in their end-product manuals.

Antennas

This module is certified with the following integrated antenna.

-Type: **Single patch Antenna in Package / Peak Gain: 3 dBi**

Any new antenna type, higher gain than listed antennas should be met the requirements of FCC rule 15.203 and 2.1043 as permissive change procedure.

Label and compliance information

End Product Labeling (FCC)

The module is labeled with its own FCC ID. If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains FCC ID: **BEJ-RSMV2**

Information on test modes and additional testing requirements

-OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral

requirements, additional transmitter in the host, etc.).

Additional testing, Part 15 Subpart B disclaimer

-The final host product also requires Part 15 subpart B compliance testing with the modular transmitter installed to be properly authorized for operation as a Part 15 digital device.

Note EMI Considerations

Note that a host manufacture is recommended to use D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties

For standalone mode, reference the guidance in D04 Module Integration Guide and for simultaneous mode; see D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.

How to make changes

Since only Grantees are permitted to make permissive changes, when the module will be used differently than granted, please contact the module manufacture on below contact information.

- **Contact information:** jaecheol.song@lge.com / Tel: 82-10-2485-3739

<ISED Statement>

RSS-GEN, Sec. 7.1.3—(licence-exempt radio apparatus)

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure

The antenna (or antennas) must be installed so as to maintain at all times a distance minimum of at least **20 cm** between the radiation source (antenna) and any individual. This device may not be installed or used in conjunction with any other antenna or transmitter.

l'exposition aux RF

L'antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance minimum de au moins **20 cm** entre la source de radiation (l'antenne) et toute personne physique. Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment. Attention:

Les changements ou modifications de cet appareil non expressément approuvé par le fabricant peuvent annuler votre droit à utiliser cet équipement.

End Product Labeling (ISED)

The module is labeled with its own IC Certification Number. If the IC Certification Number are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains IC: **2703N-RSMV2**

Étiquetage du produit final

Le module est étiqueté avec son propre numéro de certification IC. Si le numéro de certification IC n'est pas visible lorsque le module est installé à l'intérieur d'un autre appareil, alors l'extérieur de l'appareil dans lequel le module est installé doit également afficher une étiquette faisant référence au

module inclus. Dans ce cas, le produit final doit être étiqueté dans une zone visible avec les éléments suivants :

"Contient IC : 2703N-RSMV2