

UWB RADAR MODULE for Short Range detection [SR-RUG0-083M-01 Datasheet]

Application

- Motion Detection
- Presence Detection
- Parking Sensor
- Security Sensor
- Collision Avoidance
- People Counting

Key Features

- Fully Integrated Impulse UWB Radar sensor module with embedded antenna
- 7 - 9 GHz UWB high-band operating frequency
- Tunable Bandwidth 500MHz ~ 1.4GHz
- Detection Range : 15 m (max.), 3~4m (human)
- Power down(save) mode
- Operating Temperature: -20 to +65°C
- RF CMOS technology with ESD protection
- UART Interface control
- Low cost UWB sensor solution with minimum external components
- Module size : 50mm X 55mm (21g)

General Description

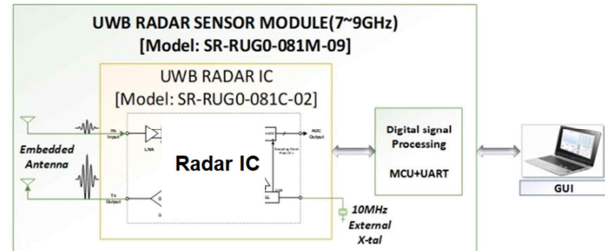
The SR-RUG0-083M-01 is a UWB radar module that detects short range objects (~4 m for human) using an Impulse UWB radar sensor IC with a 6bit ADC and a built-in 1x1 patch antenna.

This module can be used for applications such as parking lot detection, collision prevention, and human recognition.

The frequency is 7.0 ~ 9.0GHz high-band operating frequency, and the 10dB bandwidth is variable from 0.5 ~ 1.4GHz.

In order to implement the low power module, the power down (save) mode is selectively applied and ESD protection technology is applied. The package used was a 48 lead 7x7 mm QFN package.

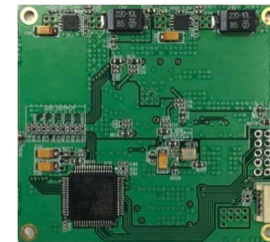
Functional Diagram



UWB Radar Module View



[Top view]



[Bottom view]

UWB Radar Module Specifications

Recommended Operating Conditions

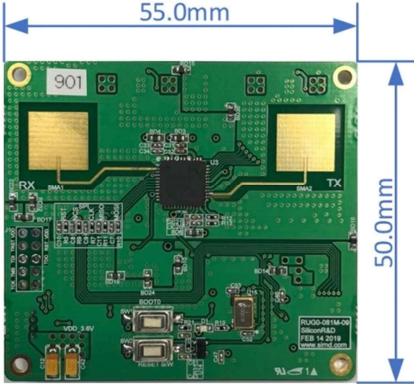
Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature	T _{ST}	- 20	-	+ 65	°C
Supply Voltage	V _{DD}		5.0		V

Electrical Specifications

Parameter	Min	Typ	Max	Unit	Descript.
Frequency Range (carrier)	7.0		9.0	GHz	Carrier tunable
Bandwidth	0.5		1.4	GHz	BW tunable
EIRP (Effective Isotropic Radiated Power)		-43.3	-41.3	dBm	Average power @ 1MHz RBW
		-37.0	-24.4		Peak power @3MHz RBW
Sampling Rate		2		Gbps	
Detection Range ¹⁾	0.5		5	m	~ 4m for human
Detection Resolution		7.5		cm	
Rx Gain Control Dynamic Range	20		66	dB	
PRF (Pulse Repetition Rate) ²⁾		10		MHz	
ADC resolution ³⁾		6		Bits	
Operating voltage(V _{DD})	3.3		5.0	V	
Operating current ⁴⁾ (@ V _{DD} =5.0V)		-		mA	
Embedded Antenna type	1x1 Patch			-	
Embedded Antenna Gain		3.0		dBi	
Interface	UART(Default)				12512WR-04B(Yeonho electronics)
Certification	KC for Korea				

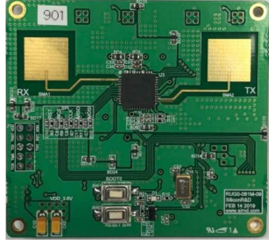


- ¹⁾ Detection range may vary depending on the object being measured. It can be up to 1m for people and up to 2m for metal plates (at RCS 30).
- ²⁾ This module has an embedded 10MHz crystal.
- ³⁾ To be extended to 8 bits in next version.
- ⁴⁾ When power save mode is used, the operating current is reduced down to 1~10%

Physical Specification

Dimension (W x L x H)	Weight
 <p>55.0mm X 50.0mm X 1.6mm</p>	<p>21.0 [g]</p>

Measurement configuration information

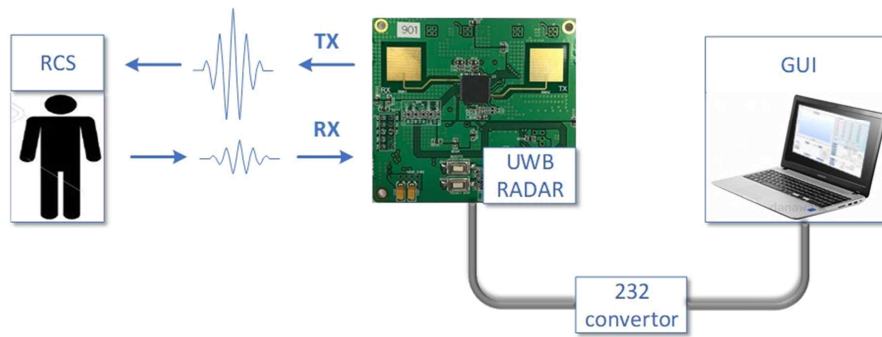
▪ Configuration items

<p>UWB RADAR MODULE (SR-RUG0-083M-01)</p>	
<p>GUI (operated by PC)</p>	
<p>12512WR-04B cable [Connector Manuf.: YeonHo Electronics] (Purchase separately)</p>	<p>(232 Converter is required for interworking with PC.)</p> 

▪ Test set-up

1) Hardware connection

Connect the UWB RADAR MODULE and the PC running the GUI with the "USB to mini-USB" cable as shown below.



2) GUI operation

Test F/W and GUI for PC operation can be provided to the customer.

Packing information

The packaging for the product can be processed in accordance with the customer's request and in a way that satisfies the customer's satisfaction.