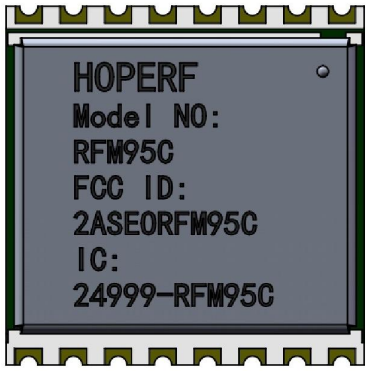
915MHz LoRa Transceiver Module

General Description of RFM95CW

RFM95CW is an ultra-low-power, high-performance LoRa transceiver for various frequency of 137-1020 MHz wireless applications.It is part of the SEMTECH RF product line, which includes complete transmitters, receivers and transceivers.The high integration of RFM95CW simplifies the peripheral materials needed in the system design. The sensitivity up to - 138 dBm which can optimize the link performance of applications.In addition, RFM95CW also supports Duty-Cycle operation mode, channel interception, high-precision RSSI, power-on reset, noise output and other more functions, which makes the application design more flexible thus to achieve product differentiation design. The working voltage of RFM95CW is 1.8V~3.7V. When the sensitivity is reaching -138 dBm, it only consumes 9.9 mA current. Thisultra-low power mode can further reduce the power consumption of the chip.



RFM95CW

Ordering Information

Model No.	Working Frequency
RFM95CW-915S2	915MHz

Features

- Frequency Range: 137~1020MHz
- Modulation: LoRa
- Data Rate: 0.018~37.5 kbps
- Sensitivity: -138 dBm , BW=125KHz, SF=12
- Voltage Range: 1.8~3.7 V
- Receiving Current: 12.5 mA @ BW=125KHz
- Supports Ultra Low Power Receiving Mode
- Sleeping Current
  *160 nA, Duty Cycle = OFF
  *600 nA, Duty Cycle = ON
- 4-wire SPI Interface
- Supports Full-automatic Independent Working Mode

Applications

- Automatic meter Reading
- Home Security&Building automation
- ISM Band Data Communication
- Industrial Monitoring & C ntrolling
- Security System
- Remote Control Application
- Intelligent Instrument
- Supply Chain & Logistics
- Intelligent Agriculture
- Smart City
- Retailing
- Asset Following
- Smart Lighting System
- Smart Parking
- Environmental Monitoring
- Health Monitoring
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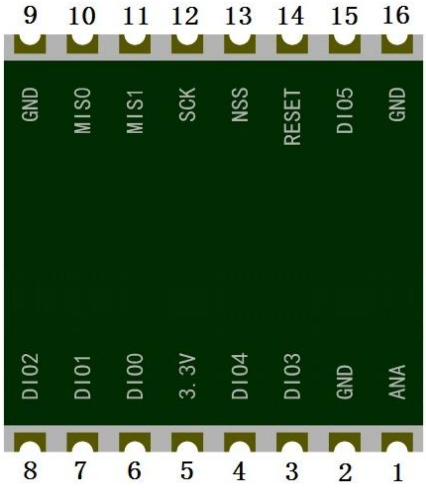
Product Pin



Pic1. Bottom View of RFM95CW

Table1. Module Pin Definition of RFM95CW

Pin No.	Pin Name	Description
1	ANT	Antenna Input &Output
2	GND	Digital Ground
3	DIO3	Data Input & Output, Software Configuration
4	DIO4	Data Input & Output, Software Configuration
5	3.3V	Voltage 3.3V
6	DIO0	Data Input & Output, Software Configuration
7	DIO1	Data Input & Output, Software Configuration
8	DIO2	Data Input & Output,Receiving Data Output
9	GND	Digital Ground
10	MISO	SPI Data Output
11	MOSI	SPI Data Input
12	SCK	SPI clock Input
13	NSS	SPI slave Input
14	RESET	Reset, Active Low
15	DIO5	Data Input & Output, Software Configuration
16	GND	Digital Ground

Electrical parameters

Testing conditions: Power supply 3.3V, temperature 25℃

Table2. Recommended Operating Conditions

Parameter	Symbol	Conditions	Minimum	Typical Value	Maximum	Unit
Supply Voltage	VDD		1.8	3.3	3.7	V
Operating Temperature	T		-40		85	℃
Power Supply Voltage Slope			1			mV/us

Table3. Absolute Maximum Rating

Parameter	Symbol	Conditions	Minimum	Maximum	Unit
Supply Voltage	VDD		-0.5	3.9	V
Interface Voltage	VIN		-0.3	3.3	V
JunctionTemperature	TJ		-40	125	℃
Storage Temperature	TSTG		-50	150	℃
Soldering Temperature	TSDR	Last for at least 30s		255	℃
ESD Level[2]	HBM		-2	2	kV
Latch Current	@ 85 ℃		-100	100	mA

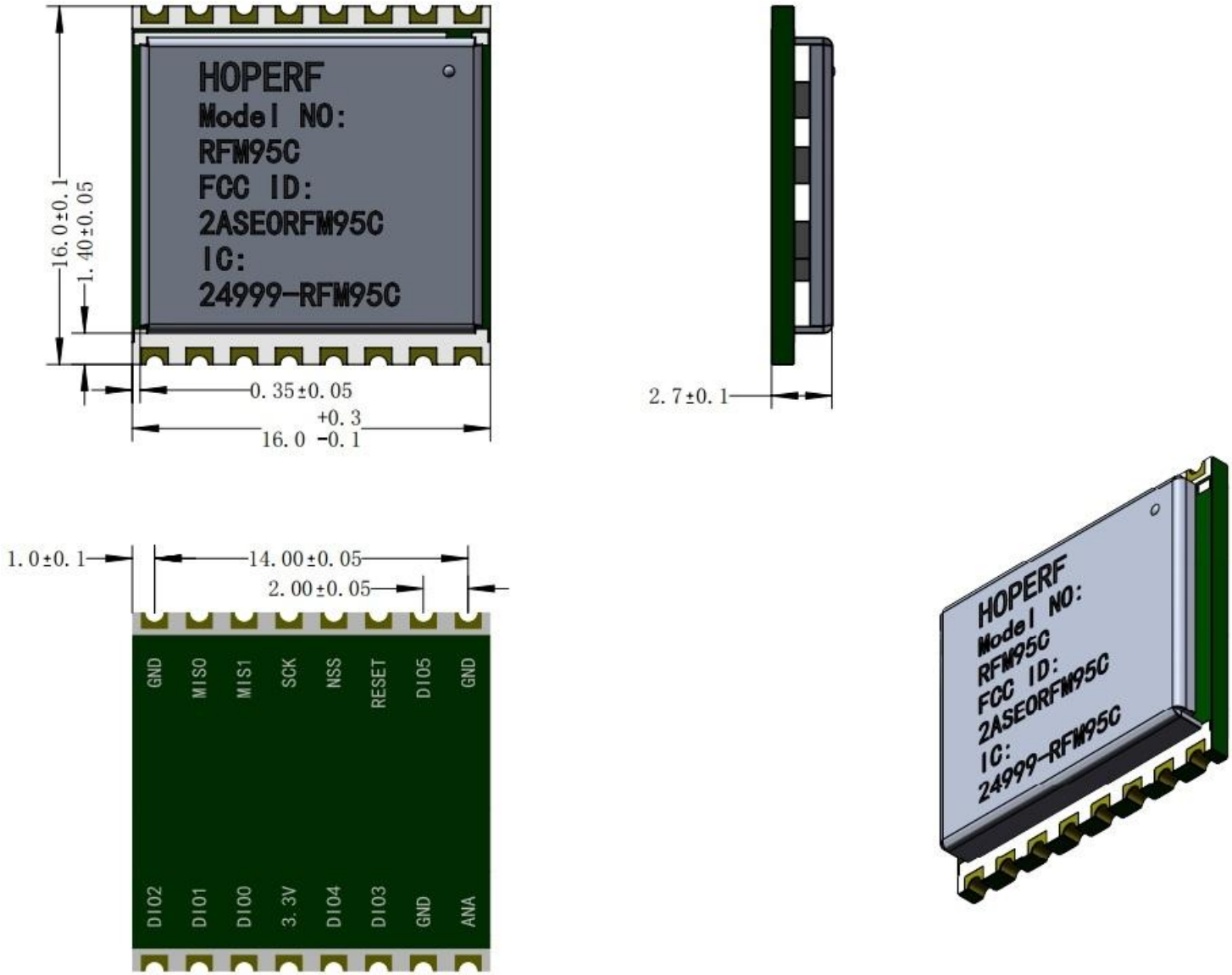
Table4. Receiving Parameters

Parameter	Conditions	Minimum	Typical Value	Maximum	Unit
Frequency Tolerance	915 MHz	914.988	915	915.012	MHz
Transmitting Power	915MHz band	-	18.3	--	dBm
Power Reduction	16.3dBm Vbat=2.7V 15.3dBm Vbat=2.4V 12.3dBm Vbat=1.8V	- - -	2 3 6	- - -	dBm
Transmitting Current	915MHz		134	140	mA

Table5. Receiving Parameters

Receiving Sensitivity (Lora) SF12, BW 125KHz CR4/5	915MHz	-	-138	-	dBm

Module Size



Pic2. Module Size(Unit:mm)

Revision History

Version	Update date	Update content
V1.0		Initial release
V1.1	2024.10.31	Update module picture