RFM90CW

RFM90CW Low-Power Long-Range Transceiver Module

➢ General Description

RFM90CW Sub-GHz radio transceivers are ideal for long range wireless applications. It is designed for long battery life with just 8mA of active receive current consumption. It can transmit up to +22dBm with highly efficient integrated power amplifiers. These devices support LoRa® modulation for LPWAN use cases and (G)FSK modulation for legacy use cases. The devices are highly configurable to meet different application requirements utilizing the global LoRaWAN™ standard or proprietary protocols. The devices are designed to comply with the physical layer requirements of the LoRaWAN™ specification released by the LoRa Alliance™. The radio is suitable for systems targeting compliance with radio regulations including but not limited to ETSI EN 300 220, FCC CFR 47 Part 15, China regulatory requirements and the Japanese ARIB T-108. Continuous frequency coverage from 150 MHz to 960 MHz allows the support of all major sub-GHz ISM bands around the world.

Picture1: RFM90CW

➢ KEY PRODUCT FEATURES

◆ LoRa™ Modem.

◆ +22dBm RF output .

◆ Programmable bit rate up to 300kbps(FSK)/62.5K(LORA).

◆ High sensitivity: down to -137dBm@LoRa BW 125KHz ; SF12. -118dBm @FSK, 4.8kbps.

◆ Excellent blocking immunity.

◆ Low RX current of 8mA, 600 nA register retention.

◆ Fully integrated synthesizer with step 0.95 Hz.

◆ (G)FSK, (G)MSK, LoRa™ modulation.

◆ Built-in bit synchronizer for clock recovery.

◆ Preamble detection.

◆ 127dB Dynamic Range instantaneous/Packet RSSI.

◆ Automatic CAD .

◆ Module Size：16*16mm

➢ Applications

The level of integration and the low consumption within RFM90CW enable a new generation of Internet of Things applications.

- Smart meters
- Supply chain and logistics
- Building automation
- Agricultural sensors
- Smart cities
- Retail store sensors
- Asset tracking
- Street lights
- Parking sensors
- Environmental sensors
- Healthcare
- Safety and security sensors
- Remote control applications

➢ Pin Diagram
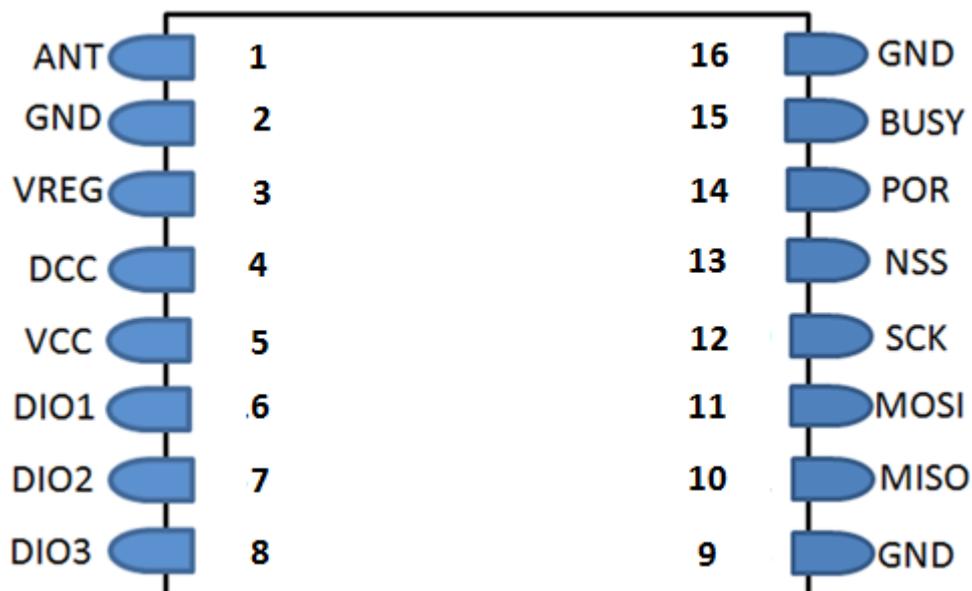
Picture 2: RFM90CW Pin Diagram (Top View)

➢ Pin Description

NO.	Name	Description
1	ANT	RF signal output/input
2	GND	Ground
3	VREG	Regulated output voltage from the internal regulator
4	DCC	DC-DC output
5	VCC	Power supply
6	DIO1	Interrupt Signal output
7	DIO2	Interrupt Signal output/RF switch control
8	DIO3	Interrupt Signal output/External XO power supply
9	GND	Ground
10	MISO	SPI slave output
11	MOSI	SPI slave input
12	SCK	SPI clock
13	NSS	SPI slave Select
14	POR	Reset
15	BUSY	Busy indicator
16	GND	Ground

➢ ElectricalCharacteristics

● AbsoluteMaximumRatings

Symbol	Descriptio	Min	Max	Unit
VDDmr	SupplyVoltage	-0.5	3.9	V
Tmr	Temperature	-55	+125	°C

● OperatingRange

Symbol	Descriptio	Min	Max	Unit
VDD	Supply voltage	1.8	3.7	V
Temperature	Operational temperaturerange	-20	+70	°C
CL	Load capacitance on digital ports	-	20	pF

- **Transmit Mode Specifications**

Specification	Condition	Min	Typical	Max	Unit
Frequency Range	433 MHz band,	-	433.92	-	
	868 MHz band,	-	868	-	MHz
	915 MHz band,	-	915	-	
Tx Power	433MHz	-	22	-	
	868MHz	-	22	-	dBm
	915MHz	-	22	-	
Tx Drop	22dBm Vbat=2.7V	-	2	-	
	22dBm Vbat=2.4V	-	3	-	dB
	22dBm Vbat=1.8V	-	6	-	
IDDTX	433MHz	-	107	-	
	868MHz	-	118	-	mA
	915MHz	-	118	-	

- **Receive Mode Specifications**

Specification	Condition	Min	Typical	Max	Unit
Sensitivity	FSK:				
	Rate=38.4kbps,FDA=50KHz	-	-108	-	dBm
	433MHz band	-	-107	-	
	868MHz band	-	-106	-	
	915MHz band				
	LoRa: SF=12,BW=125KHz				
	433MHz band	-	-137	-	dBm
	868MHz band	-	-137	-	
	915MHz band	-	-137	-	
IDDRX	FSK: Rate=4.8kbps	-	8	-	mA
	LoRa: SF=12, BW=125KHz	-	8.8	-	

➢ **Module Dimension**

Unit：mm
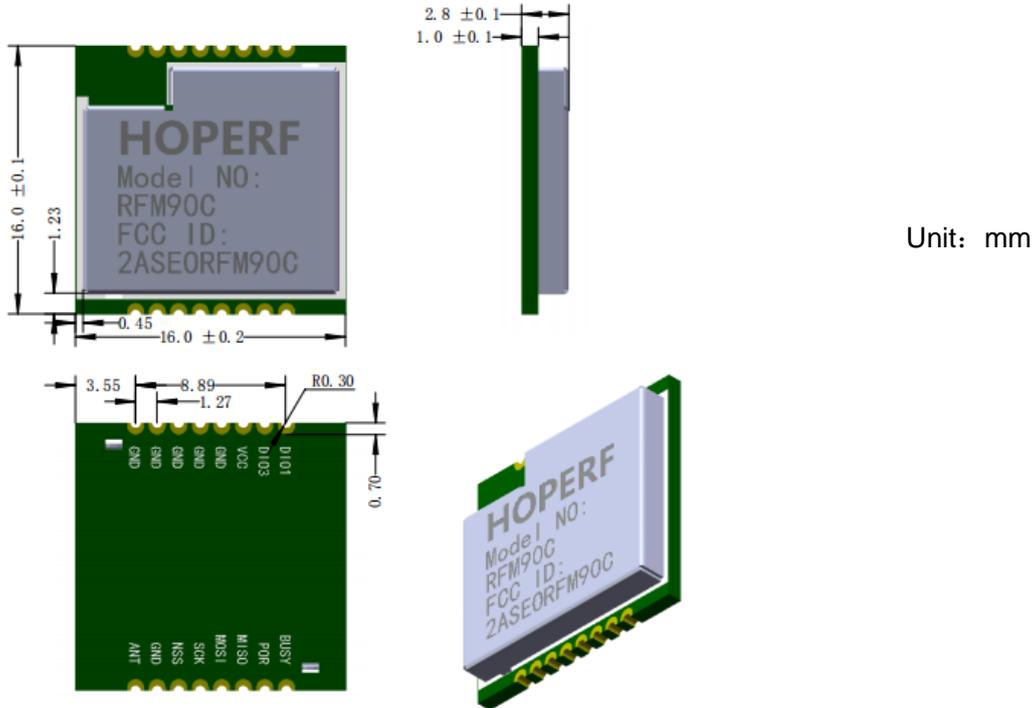
Picture 3: RFM90CW Module Dimensions

HOPE MICROELECTRONICS CO.,LTD Add:2/F,Building3,Pingshan Minqi Park, XiliTown, Nanshan District, Shenzhen, GD, China. Tel: 86-755-82973805 Fax: 86-755-82973550 Email: sales@hoperf.com Website: http://www.hoperf.com http://www.hoperf.cn	This document may contain preliminary information and is subject to change by Hope Microelectronics without notice. Hope Microelectronics assumes no responsibility or liability for any use of the information contained herein. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Hope Microelectronics or third parties. The products described in this document are not intended for use in implantation or other direct life support applications where malfunction may result in the direct physical harm or injury to persons. NO WARRANTIES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIESOF MECHANTABILITYORFITNESSFORAARTICULARPURPOSE,A REOFFEREDIN THISDOCUMENT.