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 Appearance

➢ KEY PRODUCT FEATURES

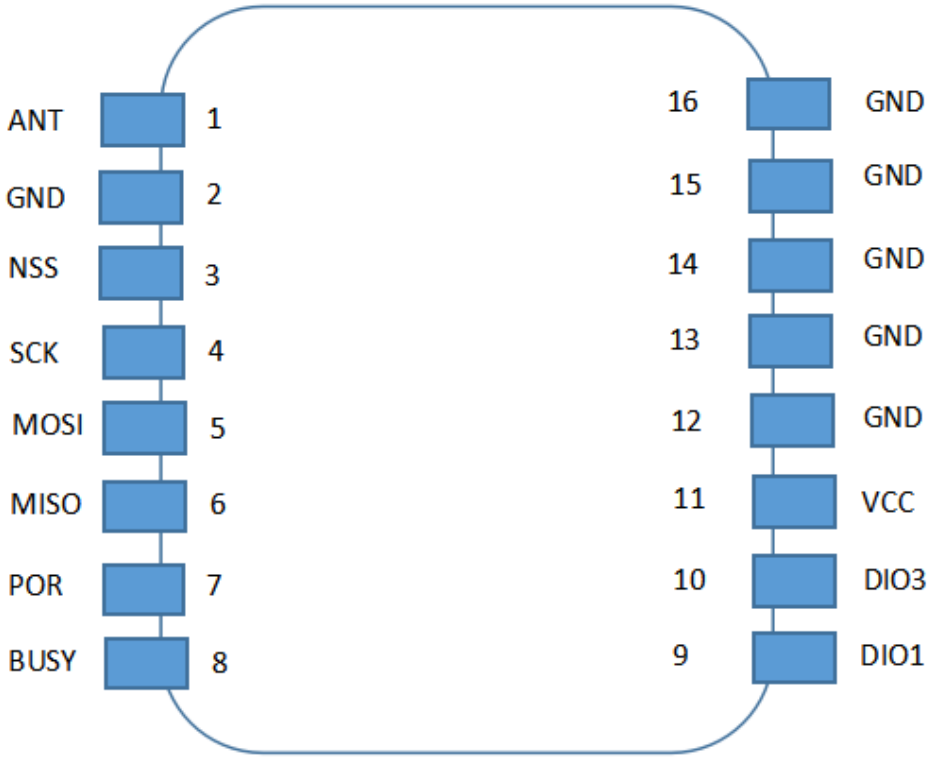
- LoRa™ Modem.
- +22dBm RF output .
- Programmable bit rate up to 300kbps(FSK)/62.5K(LORA).
- High sensitivity: down to -137dBm@LoRa BW 125KHz , SF12; -106dBm @FSK, 38.4kbps.
- Excellent blocking immunity.
- Low RX current of 8mA, 600 nA register retention.
- Fully integrated synthesizer with step 0.95 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 (Bottom View)

➢ Pin Description

NO.	Name	Description
1	ANT	RF signal output/input
2	GND	Ground
3	NSS	SPI slave Select
4	SCK	SPI clock
5	MOSI	SPI slave input
6	MISO	SPI slave output
7	POR	Reset
8	BUSY	Busy indicator
9	DIO1	Interrupt Signal output
10	DIO3	Interrupt Signal output/External XO power supply
11	VCC	Power supply
12	GND	Ground
13	GND	Ground
14	GND	Ground
15	GND	Ground
16	GND	Ground

➢ Electrical Characteristics

- **Absolute Maximum Ratings**

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

- **Operating Range**

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

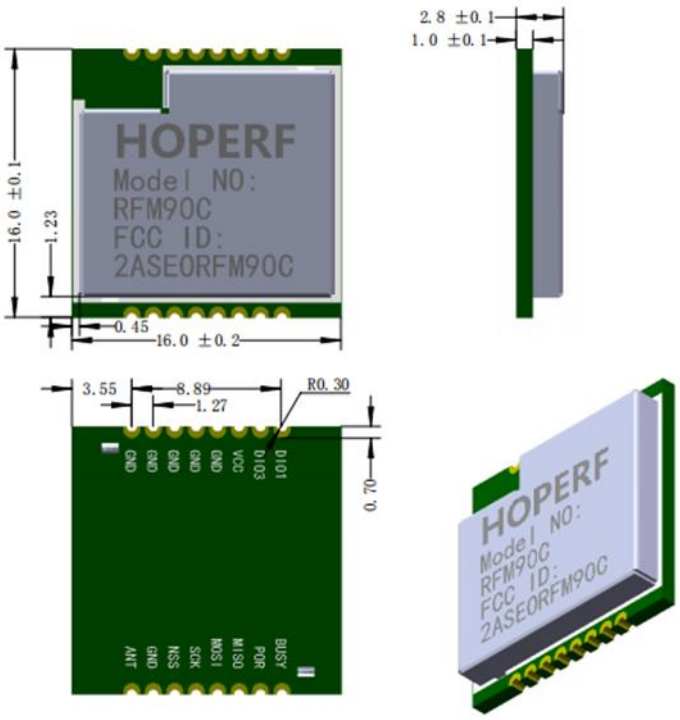
- **Transmit Mode Specifications**

Specification	Condition	Min	Typical	Max	Unit
Frequency Range	915 MHz	-	915	-	MHz
Tx Power	915MHz	-	22	-	dBm
Tx Drop	22dBm Vbat=2.7V 22dBm Vbat=2.4V 22dBm Vbat=1.8V	- - -	2 3 6	- - -	dB
IDDTX	915MHz	-	145	-	mA

- **Receive Mode Specifications**

Specification	Condition	Min	Typical	Max	Unit
Sensitivity	FSK: Rate=38.4kbps,FDA=50KHz 915MHz	-	-106	-	dBm
	LoRa: SF=12,BW=125KHz 915MHz band	-	-137	-	dBm
IDDRX	FSK: Rate=38.4kbps LoRa: SF=12, BW=125KHz	- -	9.1 8.8	- -	mA

➢ Module Dimension



Unit：mm

Picture 3: RFM90CW Module Configuration

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