Radiocontrolli
Wireless Modules

Ultra Low Power sub 1GHz Multichannels Radio Transceiver

The **RC-CC1312R-XXX** module is based on Texas Instruments CC1312R1F3RGZ component. This device combines a flexible, very low power RF transceiver with a powerful 48 MHz ARM Cortex M4F CPU in a platform supporting multiple physical layers and RF standard. This device is pin to pi compatible with the module RC-CC1310-XXX.

Module Information :

		Frequency
RC-CC1312R -	**XXX**	**434=434MHz**
		868=868MHz
		915=915MHz

Sub-1Ghz technology is becoming one of the chief driving forces behind the **Internet of Things (Iot)**, in particular this type of module is ideal for this applications basically for the following reasons :

Ultra low power consumption, the consumption of this device is 5.5mA when receiving and 23.5mA when transmitting at +14dBm (13.4mA at +10dBm) in sleep mode the consumption is 0.6µA (microamps).

Long range operations, the sensitivity parameter is -110dBm at data rates of 50 kbps and down to -124dBm when the data rate is 0.625kbps.
Interference from other wireless communications can be overcome with 90dB of blocking.
The RF output power levels can reach up to +14dBm.
All this ensure a robust signaling for long range communications.

SimpleLink-Easylink compatibility,ultra-low power platform designed (from TI) to easily implement the long-range connectivity with low power consumption on the Internet of Things projects (IoT).

TI-15.4 Stack, IEEE802.15.4e/g Standard Based Star Networking Software Designed for long **r**ange & robust star networks

6LoWPAN compatibility with mesh network stack for **Contiki.**

Applications :

- Low-Power Wireless Systems
- Smart Grid and Automatic Meter Reading
- Home and Building Automation
- Wireless Sensor Network
- 6LoWPAN systems

Feature :

- IEEE 802.15.4g mode switch support
- Ultra Low consumption technology
- Powerful ARM Cortex M4
- Supported by the open platform Contiki 6LoWPAN.
- Very Small size

Technical Characteristics

Characteristics	MIN	TYP	MAX	UNIT
Supply Voltage	1.8	3	3.8	VDC
Supply Current RX mode		5.8		mA
Supply Current TX mode ---> +10dBm		13.4		mA
Supply Current TX mode ---> +14dBm		24.9		mA
Supply Current Standby Mode		0.85		µA
Supply Current Shut Down Mode		150		nA
Operative Frequency		434/868/915		MHz
Frequency error		± 10		ppm
RF Power Output 50ohm (*)	-10		+14	dBm
RF Sensitivity 50kbps		- 110		dBm
RF Sensitivity long range mode 5kbps		- 121		
Data Rate (*)	0,01		4	Mbit/s
Operative Temperature	-30		+75	°C

(*) Programmable parameter.

MICROCONTROLLER:

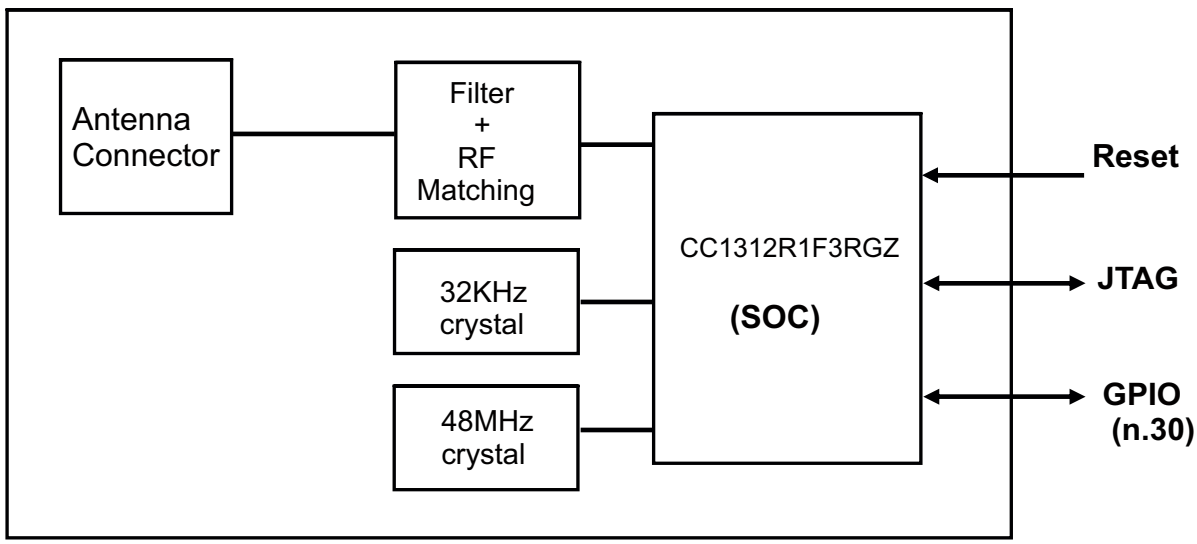
- Powerul 48MHz ARM Cortex - M4F Processor
- 352KB of in-system Programmable Flash
- 256KB of ROM for protocol and library function
- 8KB of SRAM for Cache
- 80KB of Ultralow Leakege SRAM
- Support Over-the-Air Upgrade (OTA)

Development Tools and Software from TI

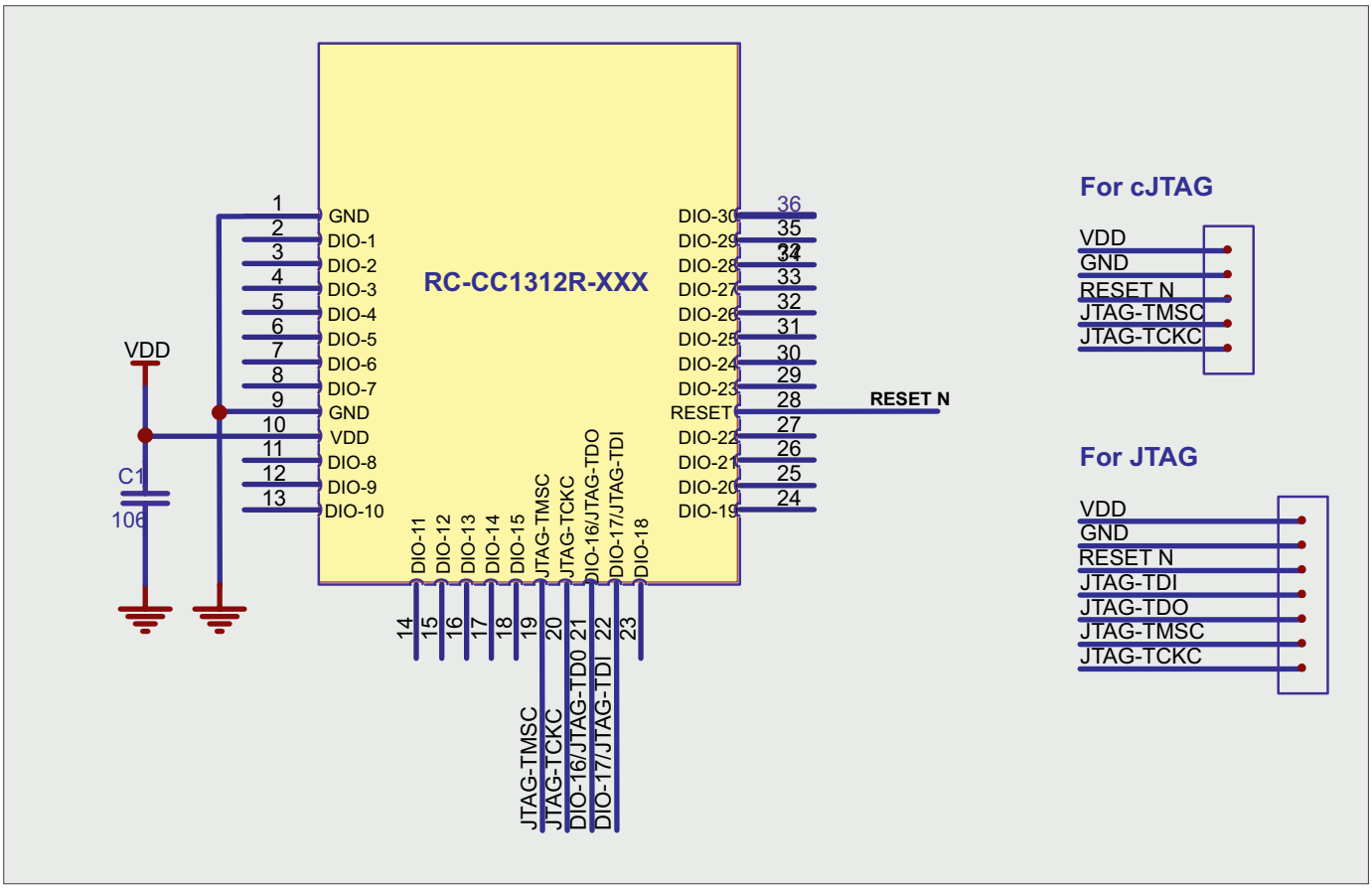
– CC1312R LaunchPad™ Development Kit
– SimpleLink™ CC13X2-CC26X2 Software Development Kit
– SmartRF™ Studio for simple radio configuration
– Sensor Controller Studio for building low-power sensing applications

For more information and details, please refer to the CC1312R Texas Instruments datasheet.

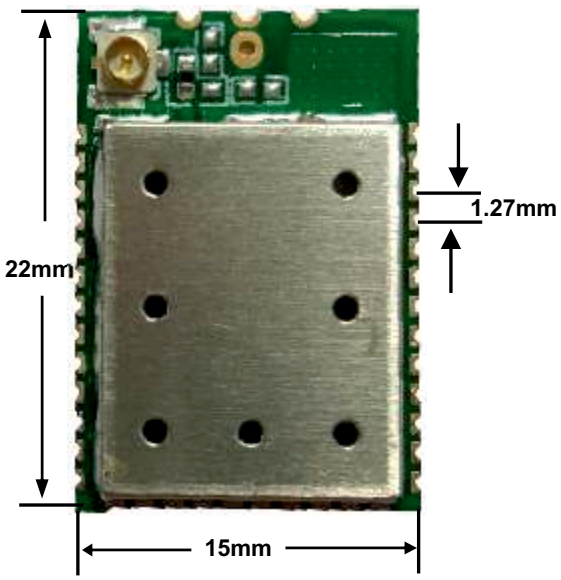
Block Diagram



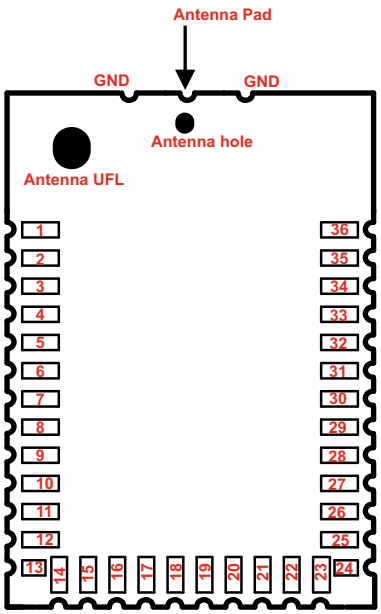
Reference Schematics



Mechanical dimensions



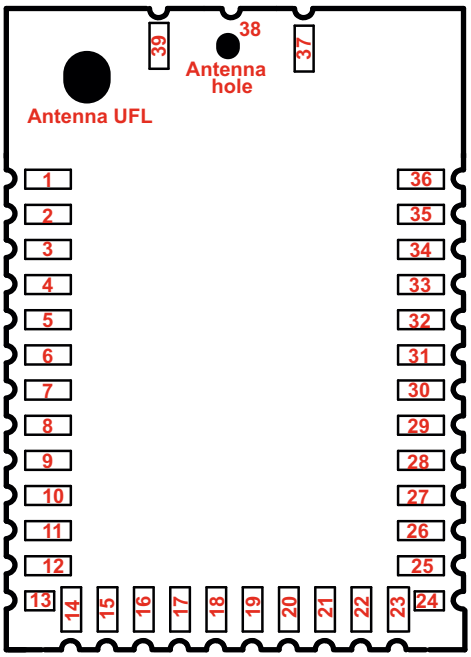
Thickness = 2,5mm



Pin out device

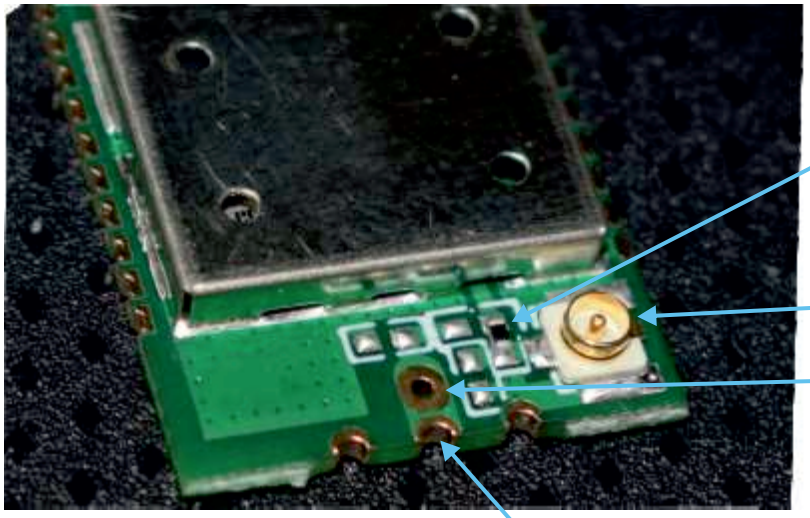
Terminal description RC-CC1312R-XXX

Pads	Name	Description
1	GND	Ground
2	DIO-1	GPIO,Sensor Controller, High drive capability
3	DIO-2	GPIO, Sensor Controller, High drive capability
4	DIO-3	GPIO, Sensor Controller, High drive capability
5	DIO-4	GPIO, Sensor Controller, High drive capability
6	DIO-5	GPIO, Sensor Controller, High drive capability
7	DIO-6	GPIO, Sensor Controller, High drive capability
8	DIO-7	GPIO, Sensor Controller, High drive capability
9	GND	Ground
10	VDD	Power
11	DIO-8	GPIO
12	DIO-9	GPIO
13	DIO-10	GPIO
14	DIO-11	GPIO
15	DIO-12	GPIO
16	DIO-13	GPIO
17	DIO-14	GPIO
18	DIO-15	GPIO
19	JTAG-TMSC	JTAG TMSC, High drive capability
20	JTAG-TCKC	JTAG TCKC
21	DIO-16	GPIO,JTAG -TDO, High drive capability
22	DIO-17	GPIO,JTAG-TDI, High drive capability
23	DIO-18	GPIO
24	DIO-19	GPIO
25	DIO-20	GPIO
26	DIO-21	GPIO
27	DIO-22	GPIO
28	RESET-N	RESET, (Active low ,No internal pull up)
29	DIO-23	GPIO, Sensor Controller, Analog
30	DIO-24	GPIO, Sensor Controller, Analog
31	DIO-25	GPIO, Sensor Controller, Analog
32	DIO-26	GPIO, Sensor Controller, Analog
33	DIO-27	GPIO, Sensor Controller, Analog
34	DIO-28	GPIO, Sensor Controller, Analog
35	DIO-29	GPIO, Sensor Controller, Analog
36	DIO-30	GPIO, Sensor Controller, Analog
37	GND	Ground
38	Antenna	Antenna PAD
39	GND	Ground



Pin out device

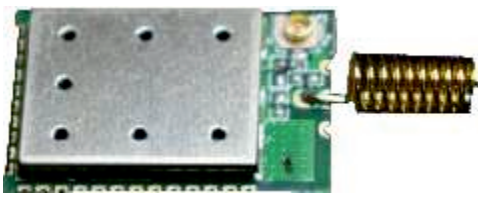
Antenna Connection



Type of Antenna connection

Connection using a SMT connector

Connection using hole (433.92MHz spiral Antenna)



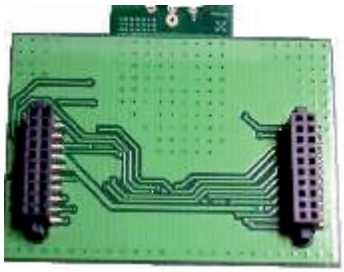
Connection using hole (868.35MHz spiral Antenna)

You can use the “Antenna Pad Connector” if you want connect this device to a pcb antenna.

RC-CC1312R-XXX Adapter board

To make immediate usable the RC-CC1312R-XXX module with TI development systems has been realized the following board adapter.

Adapter board front

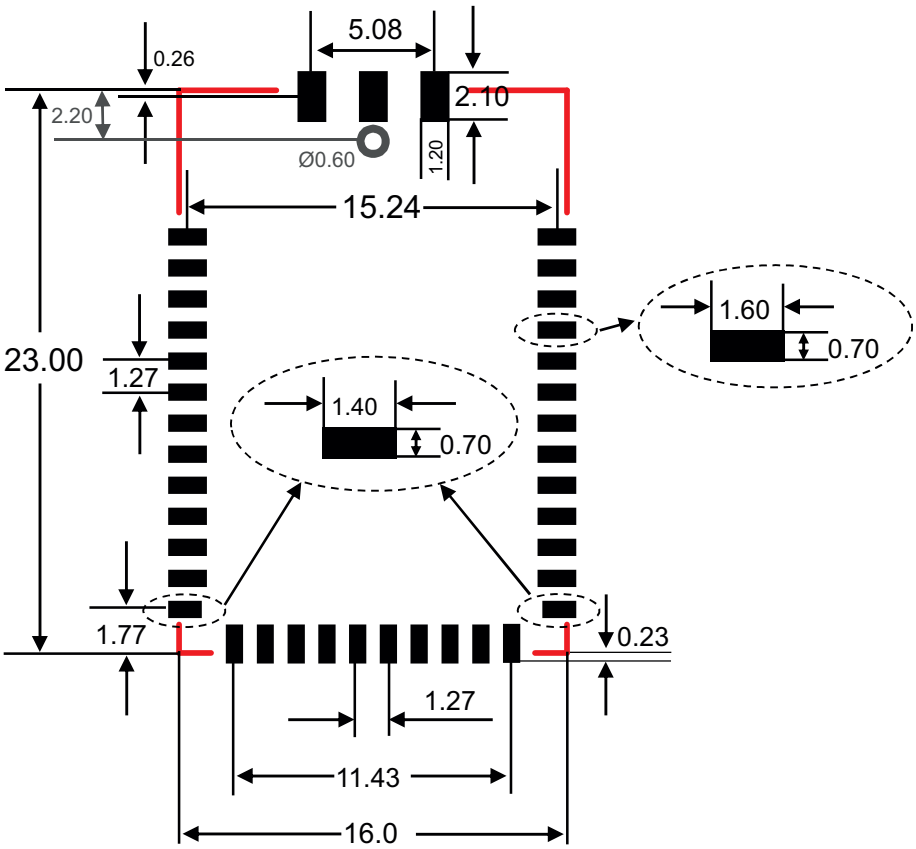


Adapter board rear

SMART RF06 Evaluation board (TI)

RC-CC1310-DK Evaluation kit

Recommended PCB Layout



Recommended Reflow Profile for Lead Free Solder