

## Ultra Low Power sub 1GHz Radio Transceiver + Serial Flash Memory



The **RC-CC1310F-XXX** module is based on Texas Instruments CC1310F128 component more a 16M-bit of serial flash memory. This device combines a flexible, very low power RF transceiver with a powerful 48 MHz Cortex M3 microcontroller in a platform supporting multiple physical layers and RF standard.

Compared to the standard module (RC-CC1310-XXX) the "F" version has on board a 16M-bite serial flash memory (GD25Q16CEIG), programmable through SPI interface already cabled inside.

Module Information :	<b>RC-CC1310F</b> - <b>XXX</b>	<i>Frequency</i>
		<b>868=868MHz</b> <b>915=915MHz</b>

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 range & 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 M3
- Supported by the open platform Contiki 6LoWPAN.
- Very Small size

## Technical Characteristics

Characteristics	MIN	TYP	MAX	UNIT
Supply Voltage	2.7	3	3.8	VDC
Supply Current RX mode		5.5		mA
Supply Current TX mode ---> +10dBm		13.4		mA
Supply Current TX mode ---> +14dBm		23.5		mA
Supply Current Standby Mode		0.7		µA
Supply Current Shut Down Mode		185		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 625bps		- 124		
Data Rate (*)	0,01		4	Mbit/s
Operative Temperature	-30		+75	°C

(\*) Programmable parameter.

### MICROCONTROLLER:

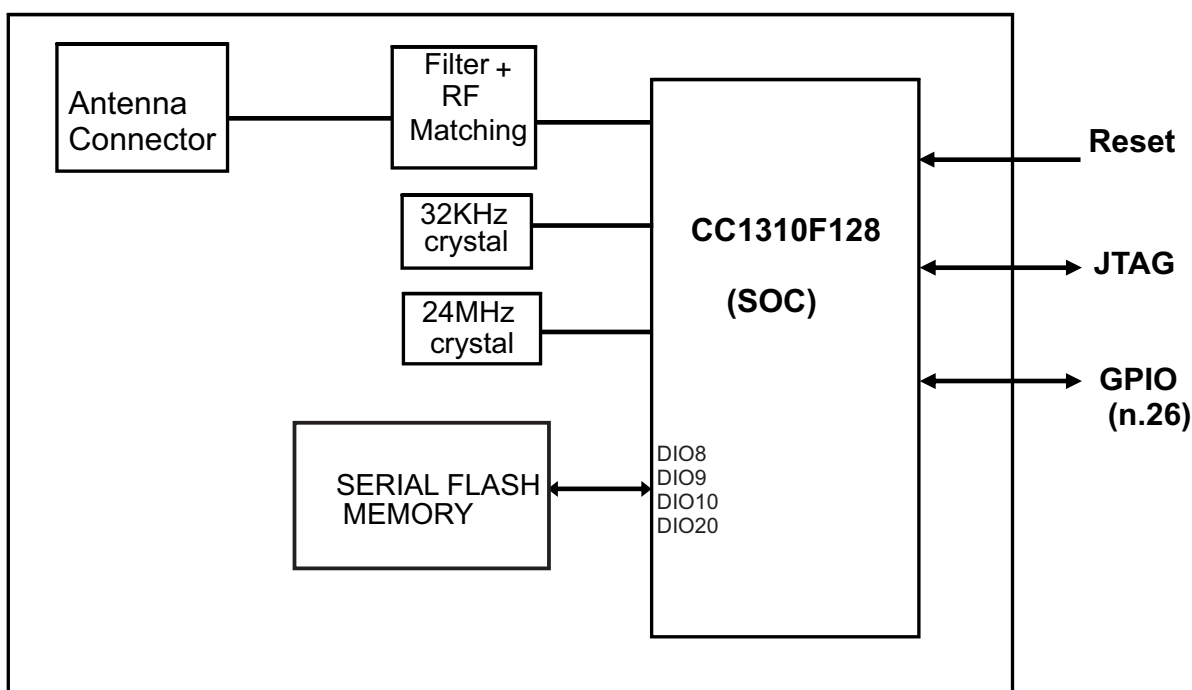
- Power ARM Cortex - M3
- Up to 48MHz Clock Speed
- 128KB of On-System Programming Flash
- 8KB of SRAM for Cache General-Purpose RAM
- 20KB of Ultralow Leakege SRAM
- Support Over-the-Air Upgrade (OTA)

### SERIAL FLASH MEMORY

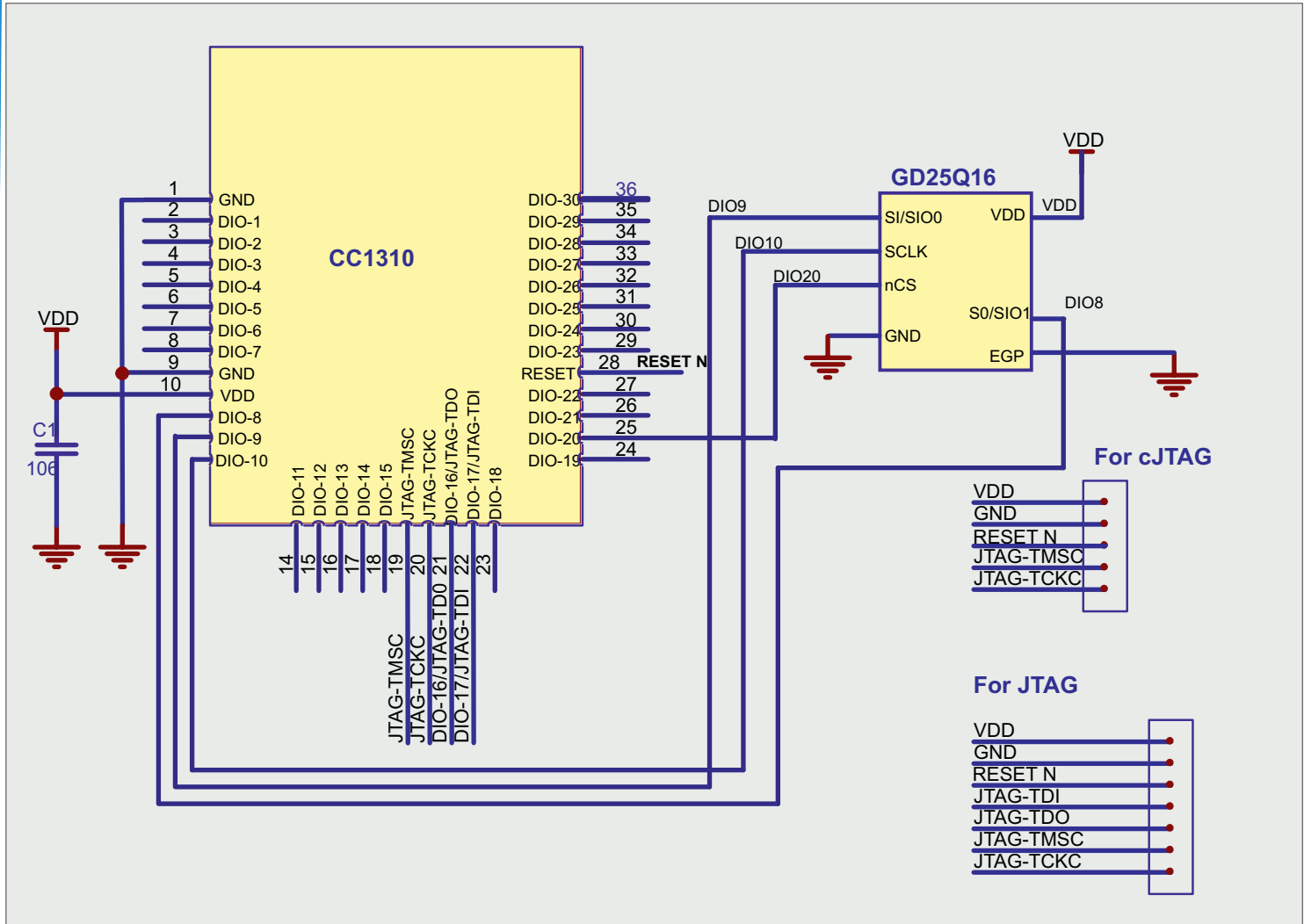
- Dual on Quad seral flash memory GD25Q16
- 16M-bite serial flash
- 2048 k-byte
- 256 bytes per programmable pages

For more information and details, please refer to the CC1310 Texas Instruments datasheet.

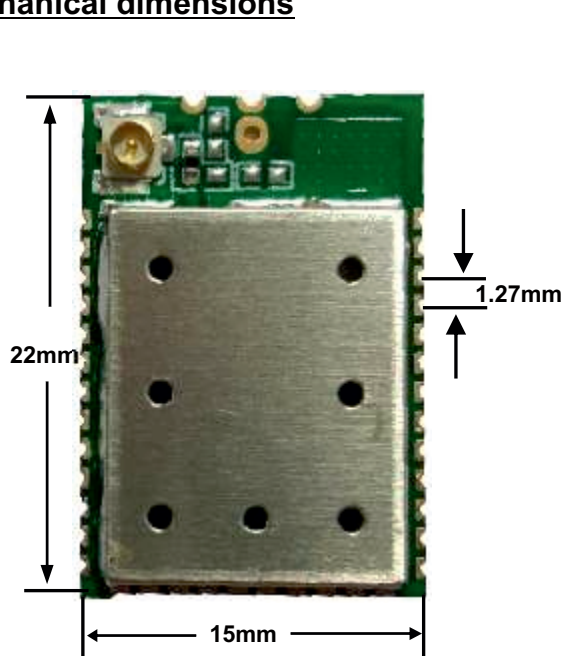
## Block Diagram



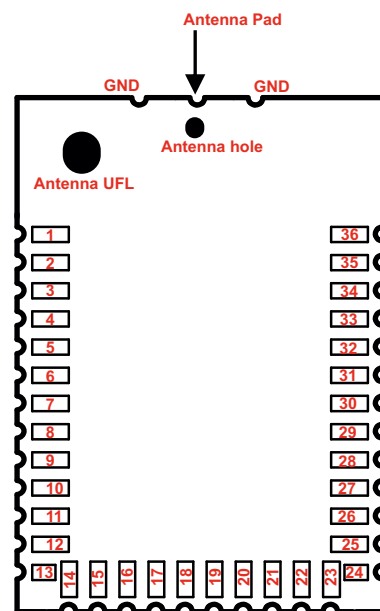
## Reference Schematics



## Mechanical dimensions



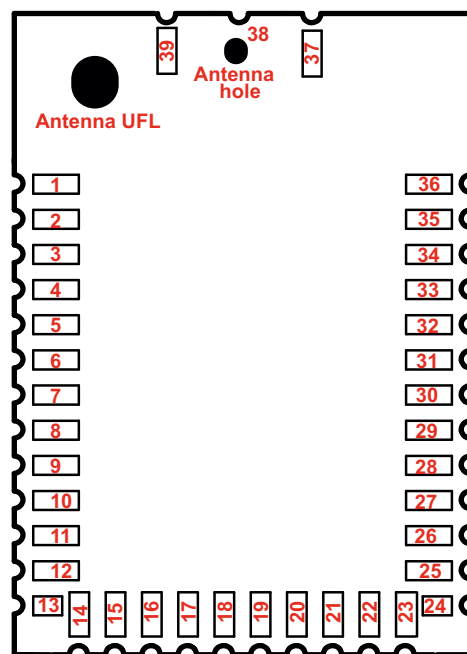
**Thickness = 2,5mm**



*Pin out device*

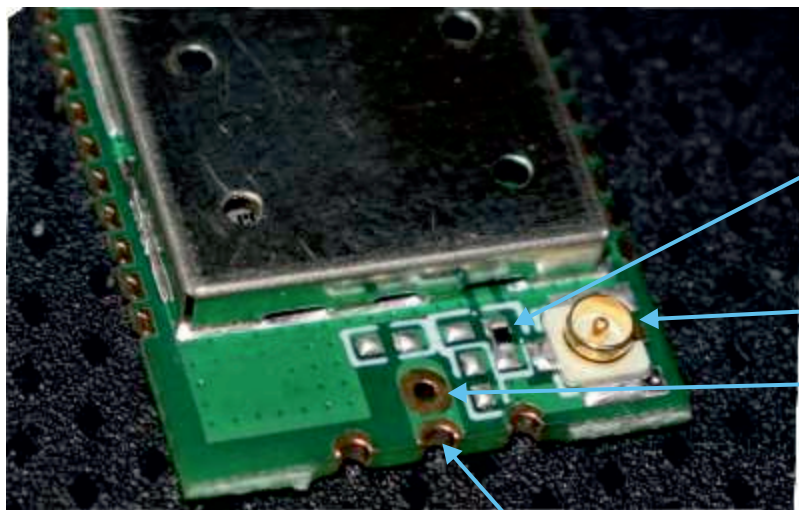
## Terminal description RC-CC1310F-XXX

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	N.U.	Not used
12	N.U.	Not Used
13	N.U.	Not Used
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	N.U.	Not Used
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



0 ohm chip selector

HiRose connector

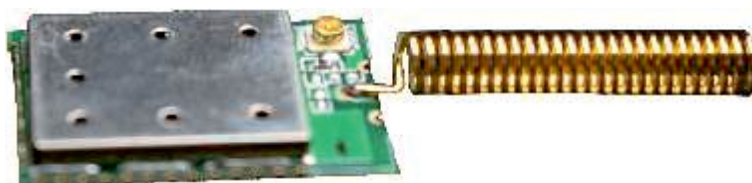
Antenna hole connector

Antenna pad connector

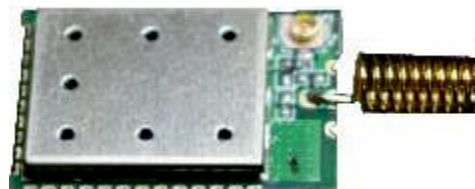
## Type of Antenna connection



Connection using a SMT connector



Connection using hole  
(433.92MHz spiral Antenna)



Connection using hole  
(868.35MHz spiral Antenna)

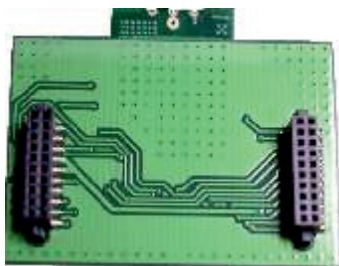
You can use the “Antenna Pad Connector” if you want connect this device to a pcb antenna.

## RC-CC1310F-XXX Adapter board

To make immediate usable the RC-CC1310F-XXX module with TI development systems has been realized the following board adapter.



*Adapter board front*



*Adapter board rear*

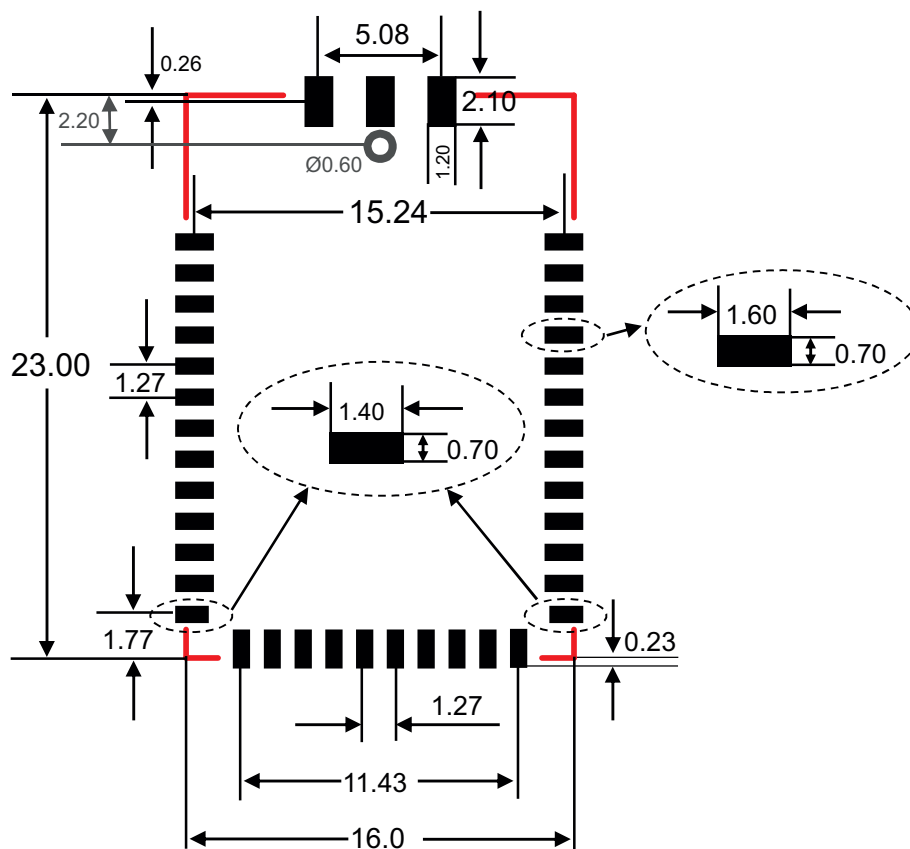


*SMART RF06 Evaluation board (TI)*



*RC-CC1310-DK Evaluation kit*

## Recommended PCB Layout



## Recommended Reflow Profile for Lead Free Solder

