

RF Module

Technical Reference Information

DESCRIPTION

The CRMX-100 RF module is a 2.4GHz IEEE 802.15.4 transceiver designed for proprietary, Zigbee or RF4CE application. The module is based on Texas Instruments CC2530 that combines the excellent performance of a RF transceiver with industry-standard enhanced 8051 microcontroller unit, 128 KB in-system programmable flash memory, 8-KB RAM, and many other features. The RF module incorporates Texas Instrument CC2590 RF Front End power amplifier (PA) and low-noise amplifier (LNA) for increased output power, and improved receiver sensitivity respectively. The module has an option to either be populated with a chip antenna or reverse-polarity SMA connector to be used with an external antenna. The RF module has various operating modes, making it highly suited for systems where ultralow power consumption is required.

FEATURES

- 2.4GHz IEEE 802.15.4 Compliant RF Transceiver
- High Performance and Low-Power 8051 Microcontroller
- Two Serial Unart Interface
- 2.4GHz Front End Amplifier
- Supports RemoTI stack from Texas Instruments
- 16 General Purpose I/O ports
- Chip antenna or RP-SMA connector for external antenna
- Miniature Footprint 35.80 x 23.11 mm
- Long Range up to 225 meter
- Max 10 mW output power
- RoHS compliant

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

Rating		MIN	MAX	UNIT
Supply voltage	All supply pins must have the same voltage	-0.3	3.9	V _{DC}
Voltage on any digital pin		-0.3	V _{DD} + 0.3, Max 3.9	V _{DC}
Input RF level		+10		dBm
Storage Temperature Range		-40	125	°C
Reflow soldering temperature	According to IPC/JEDEC J-STD-020C		260	°C
ESD ⁽²⁾	All pads, according to human-body model, JEDEC STD 22, method A114		2	kV
	According to charged-device model JEDEC STD 22, method C101		500	V

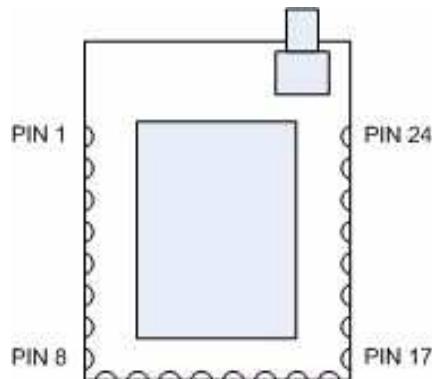
- 1) Stress beyond those listed under the *Absolute Maximum Ratings* may cause permanent damage to device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- 2) **CAUTION! ESD sensitive device. Precaution should be used when handling the device in order to prevent permanent damage.**

RECOMMENDED OPERATING CONDITIONS

Rating	Min	Max	Unit
Power Supply Voltage (V _{DD})	2	3.6	V _{DC}
Input Frequency	2405	2480	MHz
Ambient Temperature Range	-40	85	°C

PIN DESCRIPTIONS

The RF module has 24 edge I/O pins for connecting to a host board. The following table enumerates and defines the RF module pinout.



PIN	PIN NAME	PIN TYPE	PIN DESCRIPTION
1	GROUND	GND	Ground
2	P2_2	DI/DO/AI	General Purpose Digital I/O Port 2_2
3	P2_1	DI/DO/AI	General Purpose Digital I/O Port 2_1
4	P2_0	DI/DO/AI	General Purpose Digital I/O Port 2_0
5	P1_7	DI/DO/AI	General Purpose Digital I/O Port 1_7
6	P1_6	DI/DO/AI	General Purpose Digital I/O Port 1_6
7	P1_5	DI/DO/AI	General Purpose Digital I/O Port 1_5
8	GROUND	GND	Ground
9			Not Connected
10	P1_3	DI/DO	General Purpose Digital I/O Port 1_3
11	P1_2	DI/DO	General Purpose Digital I/O Port 1_2
12			Not Connected
13	P1_0	DI/DO	General Purpose Digital I/O Port 1_0
14	P0_6	DI/DO	General Purpose Digital I/O Port 0_6
15	P0_5	DI/DO	General Purpose Digital I/O Port 0_5
16	P0_4	DI/DO	General Purpose Digital I/O Port 0_4
17	GROUND	GND	Ground
18	P0_3	DI/DO	General Purpose Digital I/O Port 0_3
19	P0_2	DI/DO	General Purpose Digital I/O Port 0_2
20	RESET	DI	Reset, active low
21	P0_1	DI/DO	General Purpose Digital I/O Port 0_1
22	P0_0	DI/DO	General Purpose Digital I/O Port 0_0
23	VDD	PI	Power Supply Input
24	GROUND	GND	Ground

DI= Digital Input

DO= Digital Output

AI= Analog Input

AO=Analog Output

PI = Power Input

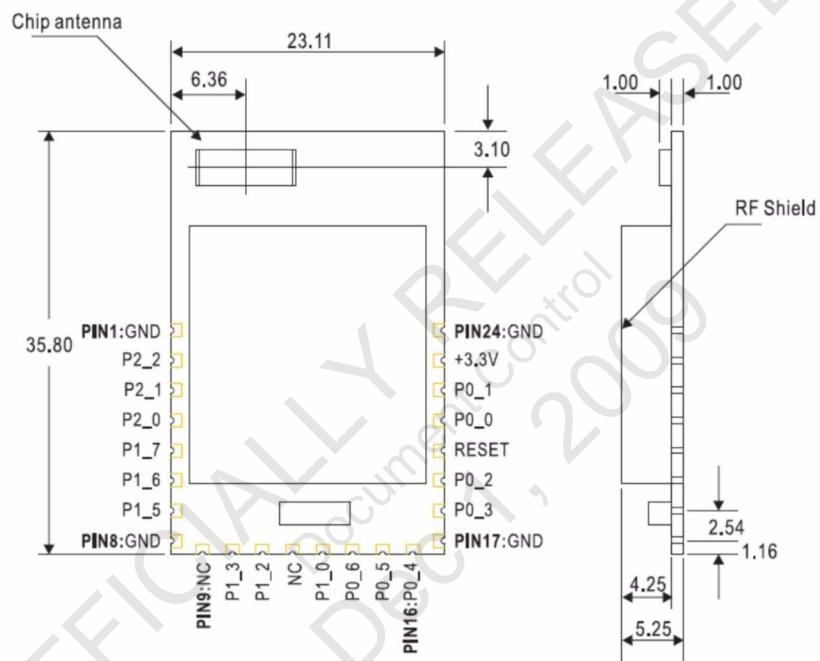
GND = Ground

ANTENNA

The RF module can either be populated with a chip antenna or Reverse-Polarity SMA connector for an external whip antenna. The regulatory certification will be completed with Yageo Corporation's 5320 ceramic chip antenna (part# CAN4311153002501K) and also with the PRO-CELL CO., LTD's dipole antenna (part# RA-A01) with Reverse-Polarity SMA connector.

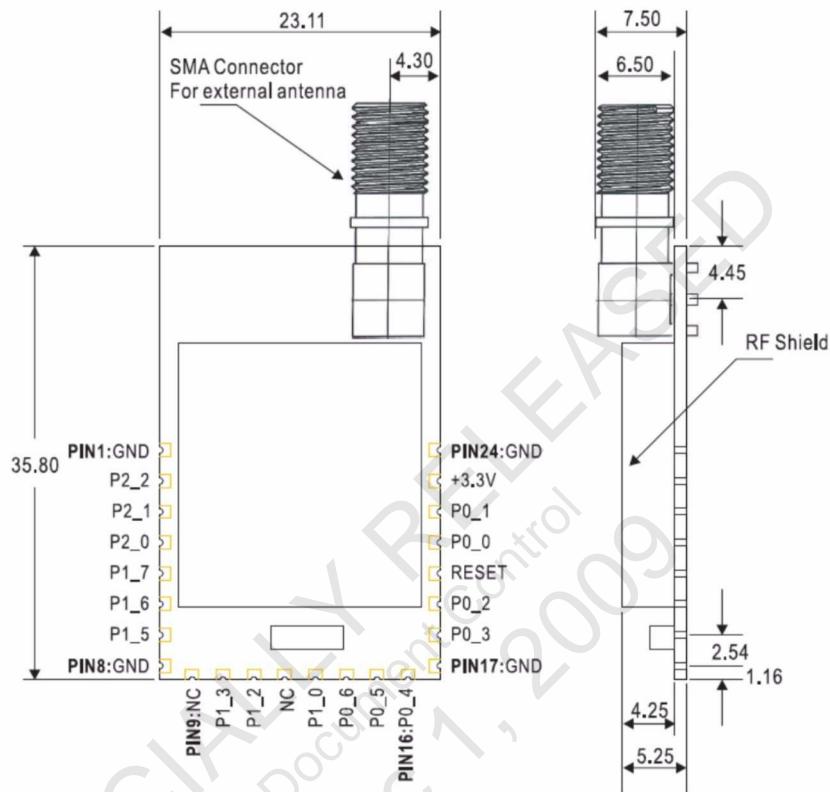
DIMENSIONS: CRMX-100 RF MODULE WITH CHIP ANTENNA

All dimensions are in millimeters, unless otherwise noted.

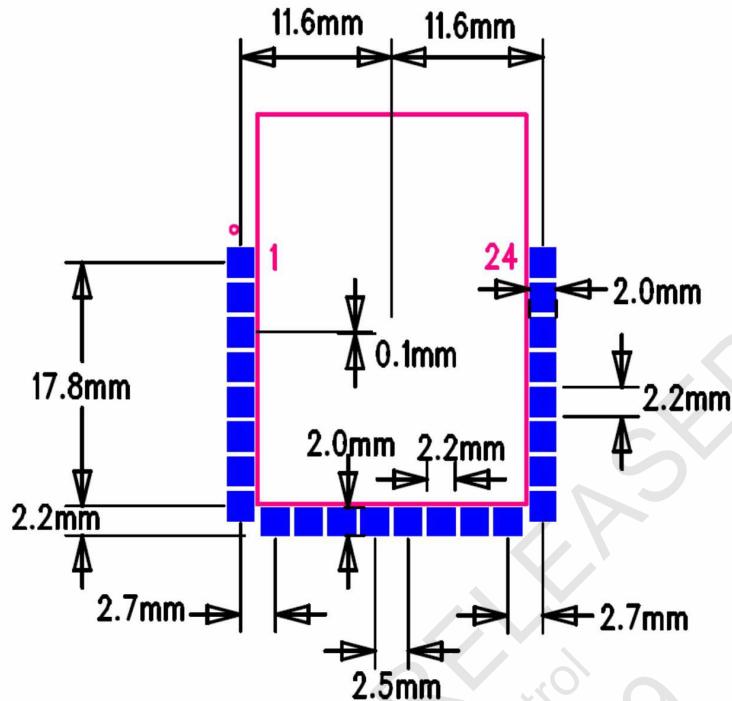


DIMENSIONS: CRMX-100 RF MODULE WITH RP-SMA CONNECTOR

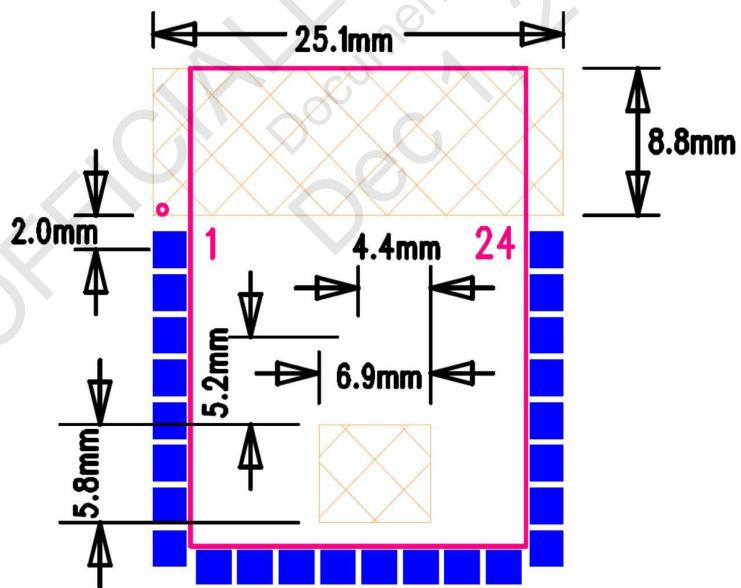
All dimensions are in millimeters, unless otherwise noted.



PCB PAD LAYOUT



PCB KEEP-OUT AREAS



NOTICE

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC/IC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC/IC Rules. Operation is subject to the following two conditions:

- 1) this device may not cause interference and
- 2) this device must accept any interference received, including interference that may cause undesired operation of the device.

FCC/IC RF Radiation Exposure Statement:

This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Contains FCC ID: XU6-CRMX100

Contains IC: 8691A-CRMX100

OFFICIALLY RELEASED
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