

Wireless ZigBee® Network Module

ADVANCE INFORMATION

This document contains information on a new product. Specifications and information herein are subject to change without notice.

Product Description

The RC2300xx-ZNM ZigBee Network Module is a compact surface-mounted module with a complete embedded ZigBee® network protocol stack supporting wireless star and mesh topologies based on IEEE 802.15.4 compliant PHY and MAC layers. The network module features an easy-to-use serial interface and API for configuration of the module and for sending ZigBee packets.

The module operates in 16 channels in the 2.45 GHz world-wide license-free ISM band. The complete shielded module is only 12.7 x 25.4 x 2.5 mm with integrated antenna (RC2300AT-ZNM) or pins for external antenna (RC2300-ZNM).

The API gives access to 2 digital and 4 analogue I/Os, 8 channel 14 bit ADC, timers, and non-volatile memory (EEPROM).

Using a ZigBee network module drastically reduces development time and gives a fast-track to a ZigBee compliant product. The ZigBee application can be implemented on any small external MCU (typically 4k Flash) or embedded controller with tools and compilers the developer is already familiar with.

Applications

- · Wireless sensor networks
- Home automation / Building automation
- Smart metering / AMI / AMR
- Asset tracking
- OEM equipment
- Fleet and inventory management

Features

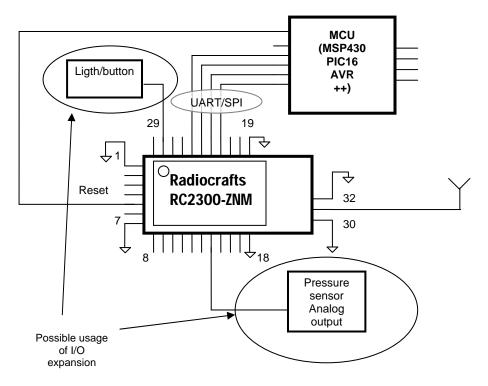
- Compact API command set for ZigBee network configuration and data communication
- API available via UART or SPI serial interface
- Complete shielded module with integrated antenna
- 12.7 x 25.4 x 2.5 mm compact module for SMD mounting
- IEEE 802.15.4 compliant PHY
- Support all devices(Coordinator, Router and End Devices)
- 4 kB EEPROM available for external MCU
- I/O expansion with 2 digital and 4 analogue I/O pins
- On-board 32.768 kHz real time clock (RTC), 4 SW timers available through serial interface
- High performance direct sequence spread spectrum (DSSS) RF transceiver
- 16 channels in the 2.45 GHz ISM band
- 2.0 3.6 V supply voltage, ultra low power modes (only available using SPI)
- Conforms with EN 300 440 and EN 300 328 (Europe), FCC CFR 47 part 15 (US), ARIB STD-T66 (Japan)

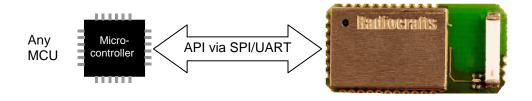




Specifications (3.0V, 25°C)		Min	Тур	Max	Unit	
General:	Frequency Range	2.400		2.4835	GHz	
	Number of channels		16			
	Data Rate		250		kbit/s	
TX mode:	Output Power (programmable)	-24		0	dBm	
	2 nd /3 rd harmonic		-56/-60		dBm	
Rx Mode:	Sensitivity (PER = 1%)		-92		dBm	
	Adjacent Channel Rejection		29		dB	
	Alternate Channel Selectivity		53		dB	
Operating conditions						
Power Supply:	Supply Voltage	2.0		3.6	V	
	Current Consumption, RX		27		mΑ	
	Current Consumption, TX, 0 dBm		25		mΑ	
	Current Consumption, Power Down		0.6		μΑ	
Temperature range:		-40		85	°C	

Application Circuit







Application user example

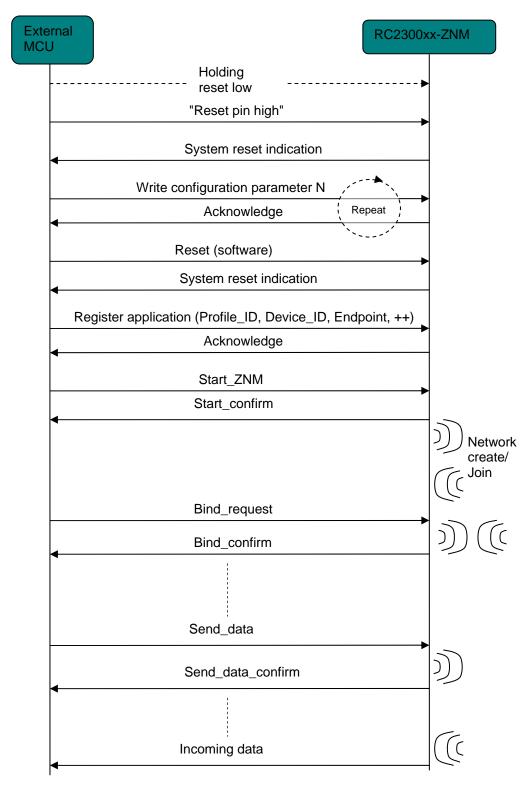


Figure 1. Message Sequence Chart (MSC) between RC2300xx-ZNM and external MCU

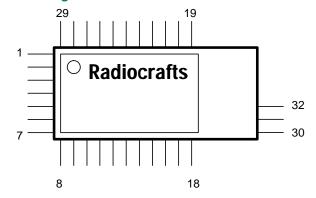


Embedded resources

PHY/MAC: Chipcon CC2430

ZigBee stack: ZNM implementation based on Z-stack from TI

Pin Assignment



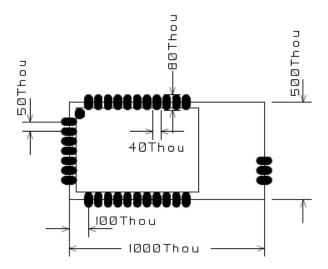
Pin Description

Pin no	Pin name	Description and internal MCU connection	
1	GND	System ground	
2	VCC	Supply voltage input	
3	NC	Not connected	
4	NC	Not connected	
5	NC	Not connected	
6	RESET_N	Reset. Active low with internal pull-up.	
7	GND	System ground	
8	CFG0	Configuration pin 0 (1=use internal 32kHz crystal-default)	
9	CFG1	Configuration pin 1 (1= SPI, 0=UART)	
10	NC	Not connected	
11	NC	Not connected	
12	A3	Analogue input, A3	
13	A4	Analogue input, A4	
14	A1	Analogue input, A1	
15	A2	Analogue input, A2	
16	NC	Not connected	
17	NC	Not connected	
18	GND	System ground	
19	GND	System ground	
20	NC	Not connected	
21	NC	Not connected	
22	RXD/SO	UART/SPI	
23	TXD/SI	UART/SPI	
24	RTS/CS	UART/SPI	
25	CTS/SS	UART/SPI	
26	SRDY	Slave ready, for SPI flow control and power management	
27	MRDY	Master ready, for SPI flow control and power management	
28	GPIO_1	Digital I/O, 20 mA sink/source capability	
29	GPIO_0	Digital I/O, 20 mA sink/source capability	
30	GND	System ground	
31	RF	RF I/O connection to antenna, 50 Ohm. Do not connect for integrated	
		antenna variant (AT).	
32	GND	System ground	



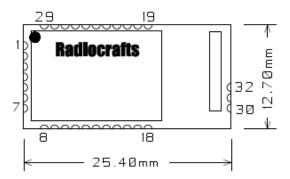
PCB Layout Recommendations

The recommended layout pads for the module are shown in the figure below. All dimensions are in thousands of an inch (mil). The circle in upper left corner is an orientation mark only, and should not be a part of the copper pattern.



The area underneath the module should be covered with solder resist in order to prevent short circuiting the test pads on the back side of the module. A solid ground plane is preferred. Unconnected pins should be soldered to the pads, and the pads should be left floating. For the module version with integrated antenna connector, the RF pad can be soldered, but the pad should not be connected further. The two ground pads (pin 30 and 32 should be grounded for all variants.

Mechanical Drawing



Mechanical Dimensions

The module size is 0.5" x 1.0" x 0.1" (12.7 x 25.4 x 2.5 mm).

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