

RC2300/01/02/04

ZigBee™ / IEEE 802.15.4 RF Modules

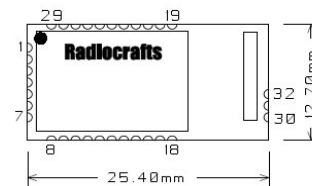
The RC2300/2301/2302/2304 RF Transceiver Modules are a series of compact surface-mounted modules specially designed for ZigBee™ systems, IEEE 802.15.4, and general DSSS systems in the 2.45 GHz world-wide license-free ISM band. The completely shielded module is only 12.7 x 25.4 x 2.5 mm, including the integrated antenna. The RC2301 provides a Location Engine. The module is surface mounted and tape & reel delivery enables low cost pick & place manufacturing.

Features

- Low cost
- Small size: 12.7 x 25.4 x 2.5 mm
- Very low power consumption
- Compact shielded module
- Integrated antenna
- 2.0 – 3.6 V supply voltage
- Ultra low power modes
- SMD mounting
- Conforms with EN 300 440 and EN 300 328 (Europe), FCC CFR 47 part 15 (US), ARIB STD-T66 (Japan)

Applications

- ZigBee systems
- IEEE 802.15.4 and 2.45 GHz DSSS systems
- Home and building automation
- Industrial control
- Wireless positioning



Resources / application interface

- TI/Chipcon CC2430 / CC2431
- RC2300: 128 kB Flash, 8 kB SRAM
- RC2301: Location Engine
- RC2304: 64 kB Flash, 8 kB SRAM
- RC2302: 32 kB Flash, 8 kB SRAM
- 4 kB non-volatile EEPROM
- 32 kHz real-time clock (RTC)
- Dual USART / SPI interface
- 19 digital and analogue I/O
- 8 channel 14 bit ADC
- Ultra low power modes
- Debug interface

ZigBee system support

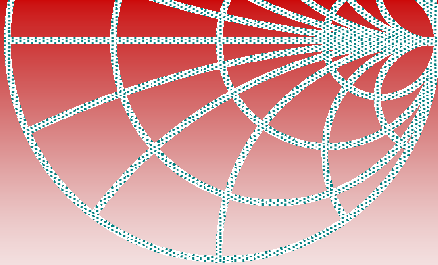
- Supports any ZigBee protocol stack
- IEEE 802.15.4 compliant PHY
- Can be used for all logic devices:
 - Coordinator and Router (FFD)
 - End device (RFD)

Wireless positioning support

- Hardware Location Engine
 - 0.5 meter resolution
 - Location range 64 x 64 meters
 - 3 meter accuracy
 - < 40 μs estimation time

RF parameters

- 16 channels
- 2.45 GHz World-wide ISM band
- Excellent sensitivity (-94 dBm)
- 250 kbit/s
- High performance direct sequence spread spectrum (DSSS) RF transceiver
- Very low power (27 mA in RX)
- Up to 0 dBm output power (25 mA)
- Power down mode (0.6 μA)
- 50 Ohm antenna interface
- CE certified under R&TTE

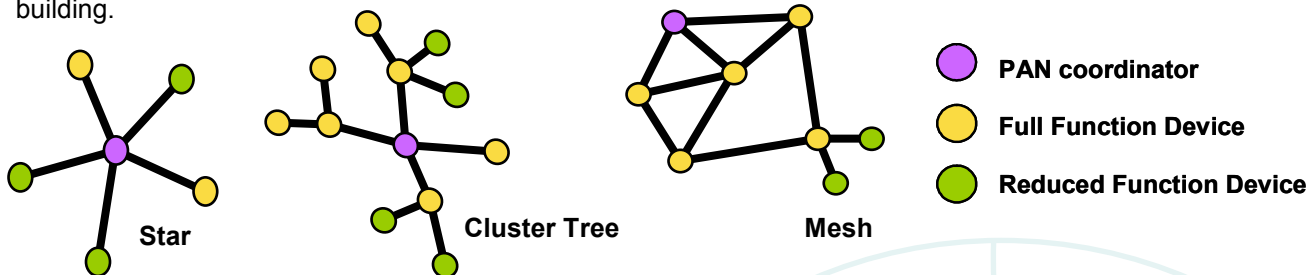


What is IEEE 802.15.4?

It is a standard for low data rate wireless Personal Area Networks (PAN) focusing on low power, low cost and robustness. It defines a Physical layer (PHY) and a Medium Access Control layer (MAC) and is the basis for the open ZigBee protocol or proprietary protocols.

What is ZigBee?

ZigBee is an open global standard aimed for wireless network communication between devices in home control, industrial and building automation applications. It provides star, cluster tree and mesh topologies (see illustration). The multi-hop and ad-hoc routing properties is ideal for non-static networks covering a house or building.



How do I implement my application?

Your application and protocol can be proprietary, or based on IEEE 802.15.4, or implemented on top of a ZigBee stack sharing the resources in the embedded microcontroller. An extensive number of digital and analogue I/Os can be used to directly interface sensors, switches and actuators. Timing applications can use the on-board 32 kHz real-time clock. Ultra low power modes are ideal for battery operation.

Radiocrafts - Embedded Wireless Solutions

Radiocrafts offers standard RF modules for operation in the license-free ISM bands at 315 / 419 / 429 / 433 / 447 / 868 / 915 / 2450 MHz. We provide compact modules that are easy to integrate and easy to use, for shortest possible time-to-market. Radiocrafts also makes customer specific solutions, from specification to turn-key delivery. Based on our experience in a wide variety of products and applications we find the best solution to take your idea to the market at a minimum of time and cost.

What about the ZigBee stack?

In principle any third-party ZigBee stack can be used with the module. But in particular the module can be used with the Figure 8 Wireless Z-stack and MAC, as the royalty fee is included in the module cost. The stack license is available from TI/Chipcon.

What development tools do I need?

The following development tools for the embedded MCU (8051) are recommended:

IAR Embedded Workbench

TI/Chipcon flash programmer

The TI/Chipcon SmartRF04EB can be used to download the program into the embedded controller.

What is the Location Engine?

The Location Engine (RC2301) implements a distributed calculation algorithm used to estimate the position of nodes in an ad-hoc wireless network. Reference nodes are placed with known coordinates, typically being part of an installed infrastructure. Other blind nodes, whose coordinates need to be estimated are often mobile and attached to assets that need to be tracked.

Distributor/rep: