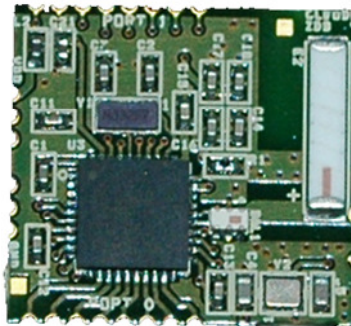




ZigBee OEM Module ZBEE

User Manual



Revision : 3.00
Document : UM_ZBEE_20091002_001_04_00

WARRANTY

The device supplied to the buyer and/or the recipient is guaranteed by CLEODE against any malfunctions originating from a design and/or manufacturing flaw, for a period of twelve (12) months following delivery. The buyer and/or recipient is (are) responsible for proving the existence of the said defects or flaws. This warranty is applicable in accordance with articles 1641 to 1648 of the French Civil Code and in compliance with the French statutory warranty. The warranty covers the replacement free of charge of devices and parts affected by a design and/or manufacturing flaw excluding conspicuous defects in the device that are covered by the buyer and/or the recipient.

In order to invoke the warranty, the buyer must immediately send written notice to CLEODE of the flaws that it attributes to the device. It must enable CLEODE to have access to the device to observe these defects and repair them. The warranty provided by CLEODE is strictly limited to the equipment provided and shall only have for effect the replacement or repair, at CLEODE's expense, on its own premises, of all devices or parts that are not functioning as a result of defects or flaws. CLEODE reserves the right to modify the devices in order to comply with the warranty.

The warranty does not apply to replacement or repairs that may result from normal wear and tear of devices, systems or products, damage or accidents resulting from negligence, failure to supervise or maintain, or incorrect use of the devices, systems and/or products.

The maintenance service is provided by CLEODE with all reasonable care possible and in compliance with the current state of the arts.

The exchange of parts or repairs performed under the warranty cannot result in extending the length of the warranty. In no event can the unavailability of the device due to servicing give rise to compensation for any reason whatsoever. The seller is released from all obligations relating to the warranty if the product or device has been modified without prior written consent, or if original parts have been replaced by parts which it has not manufactured without prior consent. If unforeseen damage is caused by the device, it is expressly agreed that the seller can only be liable for the reimbursement of monies received for the purchase of the device if it has been destroyed. Under no circumstances can the seller be held liable for indirect or contingent damage. The seller is released from any liability and the buyer waives any rights against it if an accident or direct or indirect damage is caused to the buyer following a defect, incorrect usage, incorrect maintenance or normal wear of the device sold.

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TABLE OF REVISIONS

| Version | Authors(s) | Version description | Date |
|---------|------------|----------------------------|------------|
| 0.1 | CLEODE | Initial version | 07/09/2009 |
| 1.0 | CLEODE | Validated document | 07/09/2009 |
| 1.1 | CLEODE | Pinout corrections | 24/09/2009 |
| 2.0 | CLEODE | Validated document | 24/09/2009 |
| 2.1 | CLEODE | Specifications corrections | 07/04/2011 |
| 3.0 | CLEODE | Validated document | 07/04/2011 |
| 3.1 | CLEODE | Specifications corrections | 07/09/2012 |
| 4.0 | CLEODE | Validated document | 07/09/2012 |

REFERENCE DOCUMENTS

| N° | Document | Description |
|-----|------------------|-------------------|
| [1] | CC2530 DataSheet | CC2530 User guide |

I INTRODUCTION

I.1 ZBEE PRESENTATION

The OEM module ZBee provides an easy hardware solution, for developers, to quickly implement ZigBee devices.

On a small surface area, ZBee provides all the access to the I/Os of the Texas Instrument CC2530 chipset.

This module is provided in two versions:

- Standard version : Max TX power = 3,3 dBm
- Boost version : Max TX power = 18 dBm

I.2 COPYRIGHT

The CLEODE trademark and the CLEODE logo are properties of CLEODE SA, France. This document also refers to trademarks and other product names that are registered trademarks of their respective owners.

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II HANDLING INSTRUCTIONS

II.1 ELECTROSTATIC DISCHARGES

The ZBee™ board is an ESD-sensitive device. To protect the components from ESD damage, it is important to take the following precautions:

- When the ZBee™ board is not mounted on its motherboard, always keep it in its anti-static packaging. If the ZBee™ board is delivered with a motherboard, the packaging bears the following logo



Figure 1: ESD Logo

- As far as possible, handle the board on an ESD-safe workstation taking care to follow the instructions relevant to that kind of workstation.
- When an ESD-safe workstation is not available:
 - Discharge yourself and your tools by making a contact with the housing
 - Hold the ZBee™ board by the upper corners

III ZBEE USE

III.1 INTERFACE DEFINITIONS

The physical interfaces on ZBee provide an access of all CC2530 I/Os. The function of each I/O is defined below (see Figure 2).

I.1.1 PIN ASSIGNMENT

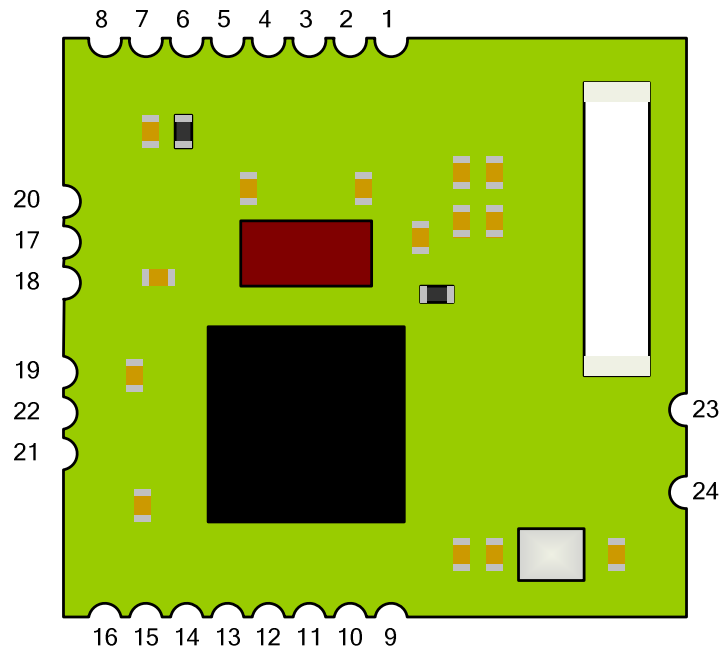


Figure 2: ZBee Pin assignment

I.1.2 MAPPING

The following table lists the I/O pins description.

For a more precise description of each CC2530 I/O function see the CC2530 User Guide :

Document: → <http://focus.ti.com/lit/ds/symlink/cc2530.pdf>

| Pin | CC2530 Pin | Description |
|-----|------------|----------------------------|
| 1 | P1_0 | I/O |
| 2 | P1_1 | I/O |
| 3 | P1_2 | I/O |
| 4 | P1_3 | I/O |
| 5 | P1_4 | I/O |
| 6 | P1_5 | I/O |
| 7 | P1_6 | I/O |
| 8 | P1_7 | I/O |
| 9 | P0_0 | I/O |
| 10 | P0_1 | I/O |
| 11 | P0_2 | I/O |
| 12 | P0_3 | I/O |
| 13 | P0_4 | I/O |
| 14 | P0_5 | I/O |
| 15 | P0_6 | I/O |
| 16 | P0_7 | I/O |
| 17 | P2_0 | I/O |
| 18 | P2_1 | I/O |
| 19 | P2_2 | I/O |
| 20 | +3V | VDD |
| 21 | GND | Ground |
| 22 | RESET_N | Reset |
| 23 | RF | External antenna connexion |
| 24 | GND | Ground |

III.2 BOARD IMPLANTATION

The ZBee module has to be surface mounted on PCB.

I.1.3 PCB LAYOUT

Follow these following PCB layouts:

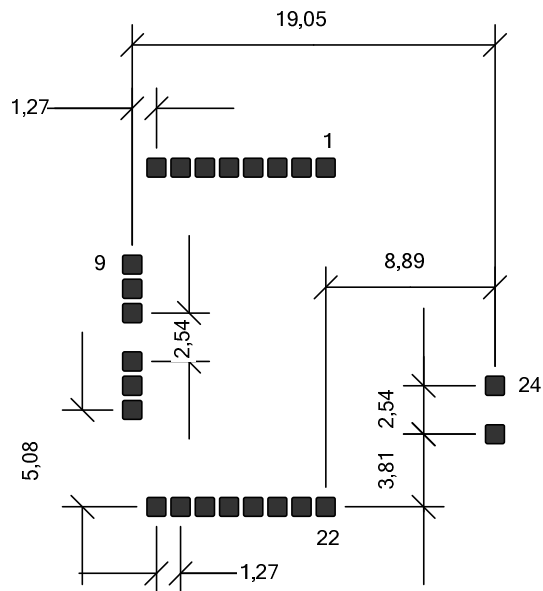


Figure 3: PCB Layout for the standard version

I.1.4 JTAG PINOUT

The ZBee module must be connected to a debug connector to be programmed or debugged via JTAG.

This connector can be a 5x2 pins connector with a 1,27 mm pitch (example : Ref. 623310235321 from Wurth Electronic) to use directly the CCDebugger from Texas Instrument.

The following pinout assignment shows how to connect the ZBee to the CCDebugger connector:

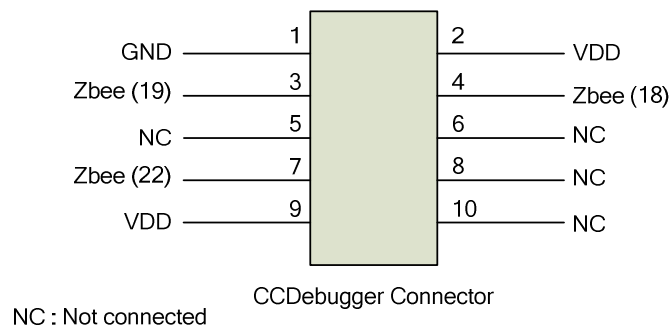


Figure 4: Pinout assignment to CCDebugger connector

I.1.5 USING EXTERNAL ANTENNA

An external antenna can be directly connected to ZBee on the pins 23 and 24. In this case, the ceramic antenna would not populate on the ZBee. The PCB Layout must ensure the 50 Ω impedance between the pin 23 and the antenna.

The following layout shows the connecting between ZBee and antenna:

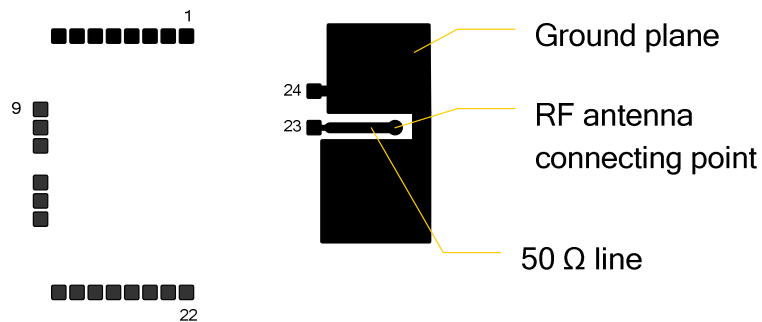


Figure 5: Antenna connexion

IV TECHNICAL CHARACTERISTICS

| Parameter | Value |
|----------------------|----------------------|
| Frequency band | 2394 – 2507 Mhz |
| Data rate RF | 250 kbps |
| Max output power | + 3,3 dbm |
| Power supply | 2,1 à 3,6 V |
| Consumption | |
| ▪ TX (+3,3 dbm) | 34 mA |
| ▪ RX | 24 mA |
| ▪ Sleep Mode | > 1µA |
| Sensitivity (PER 1%) | -97 dbm |
| Range (outdoor) | 150 m à +3,3 dbm |
| Dimension (L/P/H) | 36,83 * 17,78 * 3 mm |
| Security | 128 bit AES |
| Temperature | -40 ° to + 85° C |

REPAIR AND MAINTENANCE

Defective equipments shall be first reported to the CLEODE support team in order to be assigned an RMA number. Be prepared to state your name, company and the serial number of the defective item to the support personnel.

The item shall then be returned to CLEODE with the following documents:

- The RMA number
- A copy of the delivery slip
- A detailed description of the default and the test context

The maintenance period is typically four (4) weeks starting from the date of reception of the equipment at the CLEODE headquarters.

Remark : A FAQ (Frequently Asked Questions) is available on the www.cleode.com web site.



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