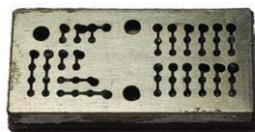




# **ZigBee OEM Module ZBEE\_BOOST**

## **User Manual**



Revision : 1.00

Document : UM\_ZBEE\_BOOST\_20140402\_001\_01\_00.doc

## 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to the warranty if the product or device has been modified without prior written consent, or if original parts have been replaced by parts which it has not manufactured without prior consent.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

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Version	Authors(s)	Version description	Date
0.1	CLEODE	Initial version	02/04/2014
1.0	CLEODE	Validated document	22/04/2014

## REFERENCE DOCUMENTS

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N°	Document	Description
[1]	CC2530 Data Sheet	CC2530 User guide

# I INTRODUCTION

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## I.1 ZBEE PRESENTATION

The module *ZBee Boost* provides an easy hardware solution to quickly implement ZigBee devices with amplified radio. The module is already pre-qualified you will not have you worried about the hardware RF of your product.

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

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

- When the ZBee Boost board is not mounted on its motherboard, always keep it in its anti-static packaging. If the ZBee Boost 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 Boost board by the upper corners



## III ZBEE BOOST Use

### III.1 INTERFACE DEFINITIONS

The physicals interfaces on ZBee Boost provide an access of all CC2530 I/Os. The function of each I/O is defined below (see Figure 2). The Zbee Boost measures 12.7 x 25.4 x 3.55 mm.

#### III.1.1 PIN ASSIGNMENT

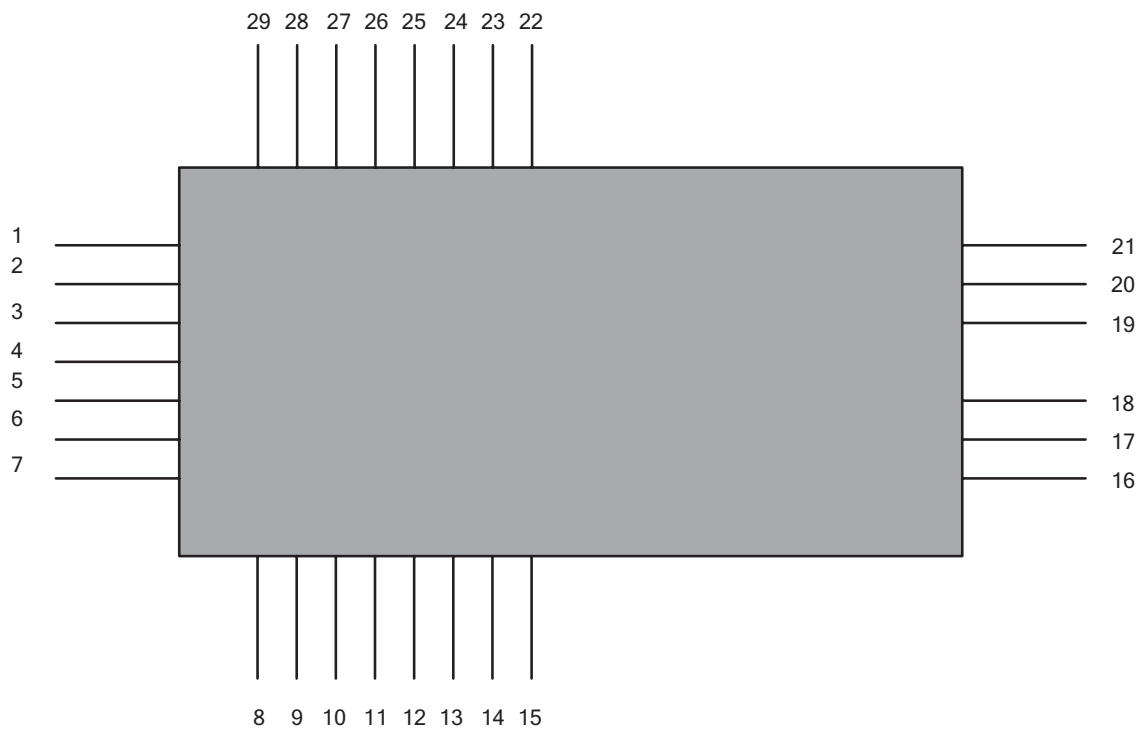


Figure 2: ZBee Boost Pin assignment

### III.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	CC2591 Pin	Description
1	GND	GND	Ground
2	P0_4	X	I/O
3	P0_5	X	I/O
4	P0_1	X	I/O
5	P0_3	X	I/O
6	P0_2	X	I/O
7	GND	GND	Ground
8	P0_7	HGM	I/O – LNA Gain Mode (CC2591)
9	P1_2	X	I/O
10	P0_6	X	I/O
11	P2_0	X	I/O
12	P2_1	X	I/O
13	P2_2	X	I/O
14	P0_0	X	I/O
15	P1_3	EN	I/O – LNA Enable (CC2591)
16	GND	GND	Ground
17	X	RF	External antenna connexion
18	GND	GND	Ground
19	RESET_N	X	Reset
20	+3.3V	+3.3V	VDD
21	GND	GND	Ground
22	P2_4	X	I/O – XTAL 32.768 kHz XOSC
23	P2_3	X	I/O – XTAL 32.768 kHz XOSC
24	P1_7	X	I/O
25	P1_6	X	I/O
26	P1_5	X	I/O
27	P1_4	X	I/O
28	P1_1	PAEN	I/O – PA Enable (CC2591)
29	P1_0	X	I/O

### III.2 BOARD IMPLANTATION

The ZBee Boost module has to be surface mounted on PCB.

### III.2.1 PCB LAYOUT

Follow these following PCB layouts:

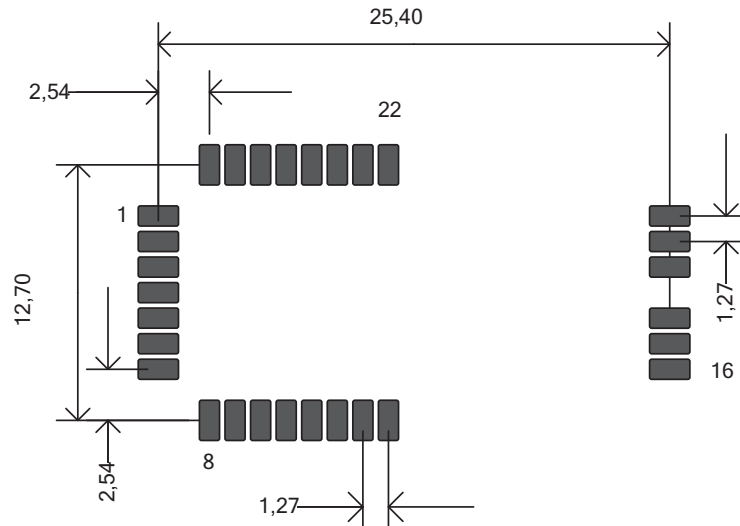


Figure 3: PCB Layout for the standard version

### III.2.2 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 Boost to the CCDebugger connector:

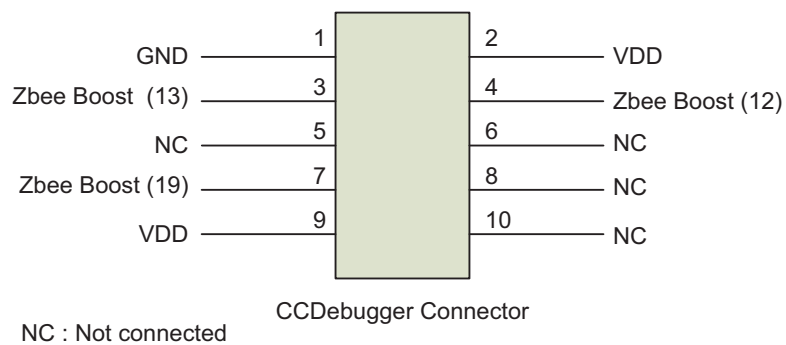


Figure 4: Pinout assignment to CCDebugger connector

Parameter	Min	Typ.	Max	Unit
Power supply	2.7		3.6	V
Frequency band	2405		2480	MHz
Data rate		250		kbps
Current consumption ❖ TX		151		mA
Current consumption ❖ RX		28		mA
Sensitivity		-99		dBm
Dimension ❖ Length ❖ Width ❖ Height		25.4 12.7 3.5		mm mm mm
Storage temperature	-40		85	°C
Operating temperature	-20		70	°C

## REPAIR AND MAINTENANCE

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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](http://www.cleode.com) web site.



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## **Compliance Information**

### **FCC Compliance Statement:**

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

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

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device must accept any interference received, including interference that may cause undesired operation. Product that is a radio transmitter is labeled with FCC ID.

When the module is installed inside another device, the user manual of this device must contain below warning statements;

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

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

B. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

### **FCC Caution:**

(1) Exposure to Radio Frequency Radiation. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

(2) Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

(3) This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

(4) Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

### **RF exposure warning**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment

The equipment must not be co-located or operating in conjunction with any other antenna or transmitter.

**IMPORTANT NOTE:** In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

The antenna gain which being use as below:

Frequency Band(GHz)	Type	M/N	Gain (dBi)
2.405 ~ 2.480	Dipole	N/A	1.2

- (1) The modules FCC ID is not visible when installed in the host, or
- (2) If the host is marketed so that end users do not have straight forward commonly used methods for access to remove the module so that the FCC ID of the module is visible

**OEM integration instructions:**

This device is intended only for OEM integrators under the following conditions:  
The transmitter module may not be co- located with any other transmit or antenna.

The module shall be only used with the provided antenna(s) that has been originally tested and certified with this module.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirement with this module installed(for example, digital device emission, PC peripheral requirements, etc.)

**OEM integration instructions:**

In the event that these conditions cannot be met (for example certain laptop configuration or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these and circumstance, the OEM integrator will be responsible for re-evaluating. The end product (including the transmitter) and obtaining a separate FCC authorization

**End product labeling:**

The final end product must be labeled in a visible area with the following :

“Contains Transmitter Module FCC ID: 2ACL6-ZBEEBOOST or Contains FCC ID: 2ACL6-ZBEEBOOST”

**Information that must be placed in the end user manual:**



The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.