USER MANUAL

K-WLM-01

V1.0

IMPORTANT NOTES

Please read this manual thoroughly before using the equipment to ensure safe and correct usage.

FCC information

FCC notice "Declaration of Conformity Information"

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

FCC Conditions

This equipment has been tested and found to comply 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.

FCC Notice "Equipment Authorization" Information

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.
This device is authorized under Title 47 CFR 15.519 (the FCC Rules and Regulations).
The operation of this device is subject to the following restriction:
The changes or substitutions of the antennas which are furnished with the device is prohibited.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

OEM INTEGRATION INSTRUCTIONS:

This device is intended only for OEM integrators under the following conditions:

The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used "with the following antenna types listed and may not be used with other antenna types or with antennas of higher gain."
List of Antenna Types and gain:

Antenna Type / Antenna Gain	Monopole Antenna	Antenna 1 (Basic)	GW26.0152	1.8 dBi
		Antenna 2 (Additional)	SAT-G01R	1.5 dBi
		Antenna 3 (Additional)	RN-SMA-S-RP	1.7 dBi
		Antenna 4 (Additional)	GW26.0151	1.8 dBi

As long as these 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 requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.). The end-product may need Verification testing, Declaration of Conformity testing, a Permissive Class II Change or new Certification. Please involve a FCC certification specialist in order to determine what will be exactly applicable for the end-product.

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations 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 circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization. In such cases, please involve a FCC certification specialist in order to determine if a Permissive Class II Change or new Certification is required.

Upgrade Firmware:

The software provided for firmware upgrade will not be capable to affect any RF parameters as certified for the FCC for this module, in order to prevent compliance issues.

End product labeling:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains FCC ID: 2ASB7K-WLM-01”.

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.

IC Statement

This ZIGBEE RF apparatus complies with Canadian RSS-GEN.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF exposure

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter. Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

EU Limitations

This device may not be installed into road or rail vehicles.

This product is sold to all CE countries.

BE	**GE**	**CZ**	**DK**	**DE**	**EE**	**IE**
EL	**ES**	**FR**	**HR**	**IT**	**CY**	**LV**
LT	**LU**	**HU**	**MT**	**NL**	**AT**	**PL**
PT	**RO**	**SI**	**SK**	**FI**	**SE**	**UK**

CE

Declaration of Conformity

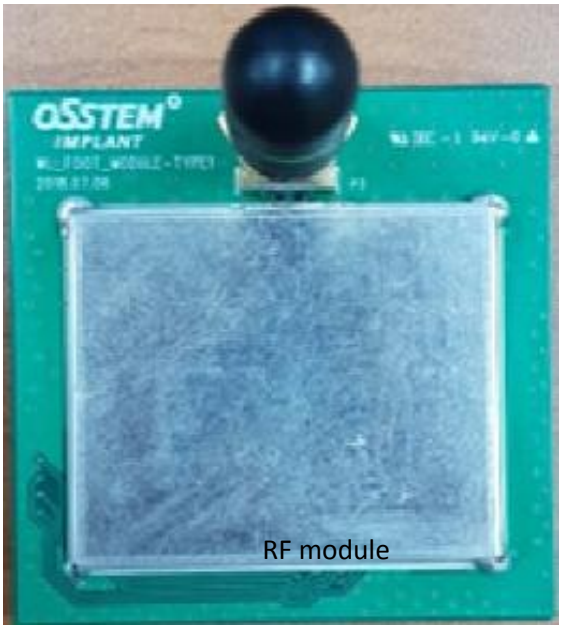
We, OSSTEM IMPLANT Co., Ltd.

1st floor, B-dong, 135, Gasan digital 2-ro, Geumcheon-gu, Seoul, Korea

declare under our sole responsibility that our product meets the essential requirements to be applied.

CONTENT

1. Package Components



RF module

2. Summaries

2.1 ZIGBEE RF Module Applications

This is the ZIGBEE module for OEM usage in the application of wireless data transmission. This module is compact module which can be put on the any PCB board. This module is used primarily inside devices as like ZIGBEE System, Health Care, Industrial Control and Monitoring for wireless connection of digital signal and data line as USART signal.

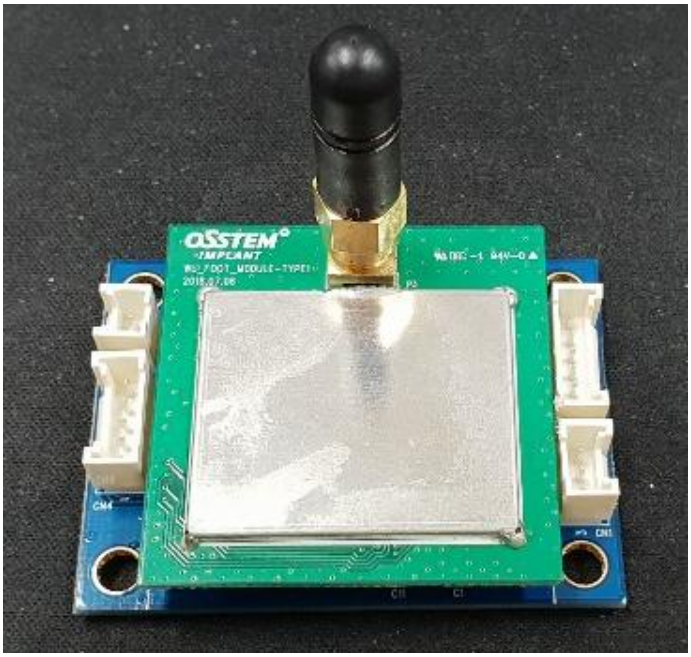
2.2 Interface Signals

This module is based on USART interface. Pins of connector have USART and GPIO signals and power. GPIO signals can be programmed for debug interface line for device control. Power 3.3V is supplied to the module. In the module, 3.3V is used for I/O part. The current consumption is about 30mA in active TX mode.

2.3 Module Installation

. The mother board which is installed with the ZIGBEE module should have 1.25mm pitch (2x10 pins) Connector parts.

The installation procedure is as follows.



Connect the motherboard and ZIGBEE Module using 1.25mm pitch (2x10 pins) Connectors and fix it to the case.

3. Hardware Specifications

3.1 General

Wireless circuit compatible with 2.4GHz-IEEE 802.15.4 standard and provide maximum speeds up to 250 Kbps.

3.2 Product Characteristics

K-WLM-01 is designed for ZIGBEE module product as device side. It provides the reliable data transmission between user and ZIGBEE module device via wireless network. The device is intended for use in a wide range of system types with extensive communication and connectivity requirements.

- Radio technology: Compliance with 802.15.4 standards
- Operating frequency:

- CE, KC, FCC : 2.405GHz ~2.480GHz

Modulation Scheme : IEEE 802.15.4-2006 Modulation Format (O-QPSK)

3.3 ENVIRONMENT

3.3.1 Temperature

Operating Temperature Conditions

The product shall be capable of continuous reliable operation when operating in ambient temperature of -20℃ to +50℃.

Non-Operating Temperature Conditions

Neither subassemblies shall be damaged nor shall the operational performance be degraded when restored to the operating temperature when exposed to storage temperature in the range of -20℃ to +60℃.

3.3.2 Humidity

Operating Humidity Conditions

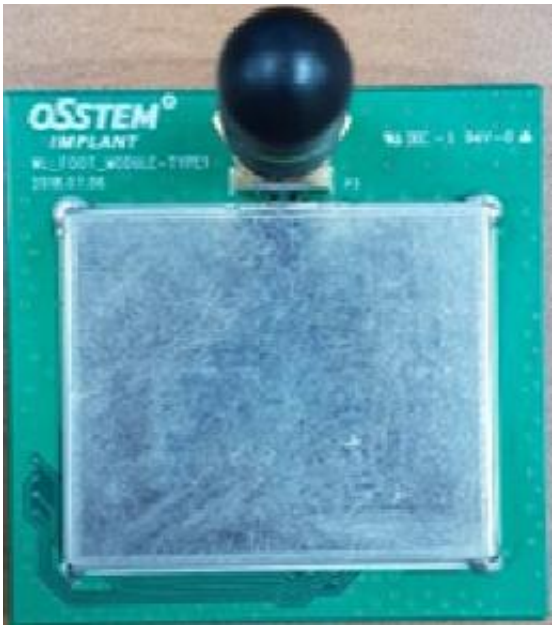
The product shall be capable of continuous reliable operation when subjected to relative humidity in the range of 10% and 85% non-condensing.

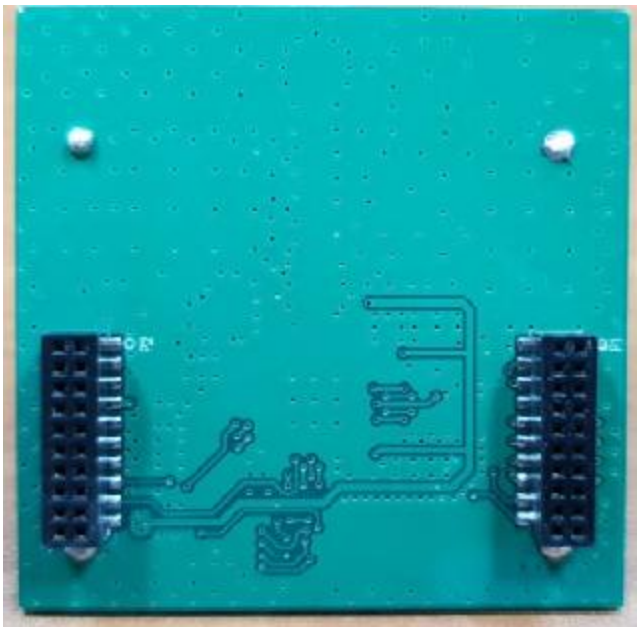
Non-Operating Humidity conditions

The product shall not be damaged nor shall the performance be degraded after exposure to relative humidity ranging from 5% to 90% non-condensing.

3.4 Product Photography

PCB Top and Bottom Side

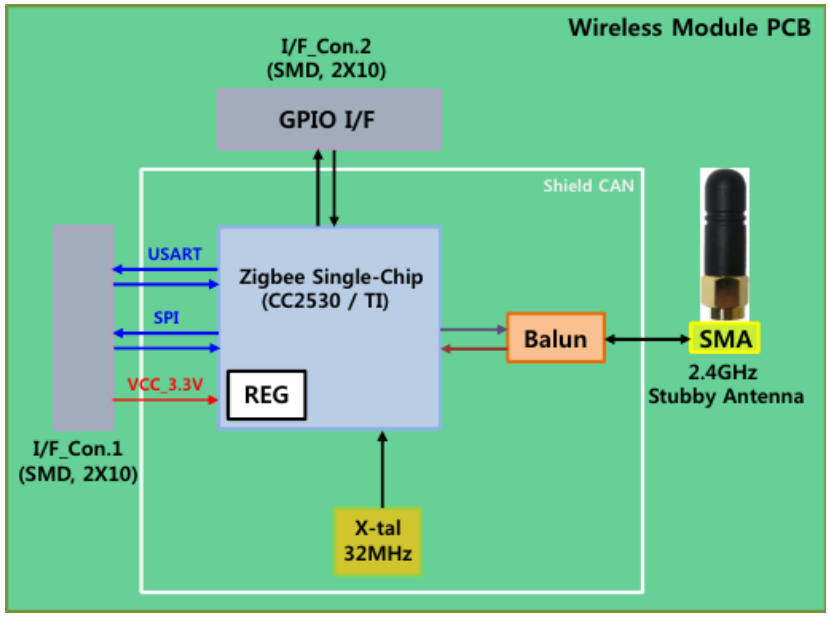




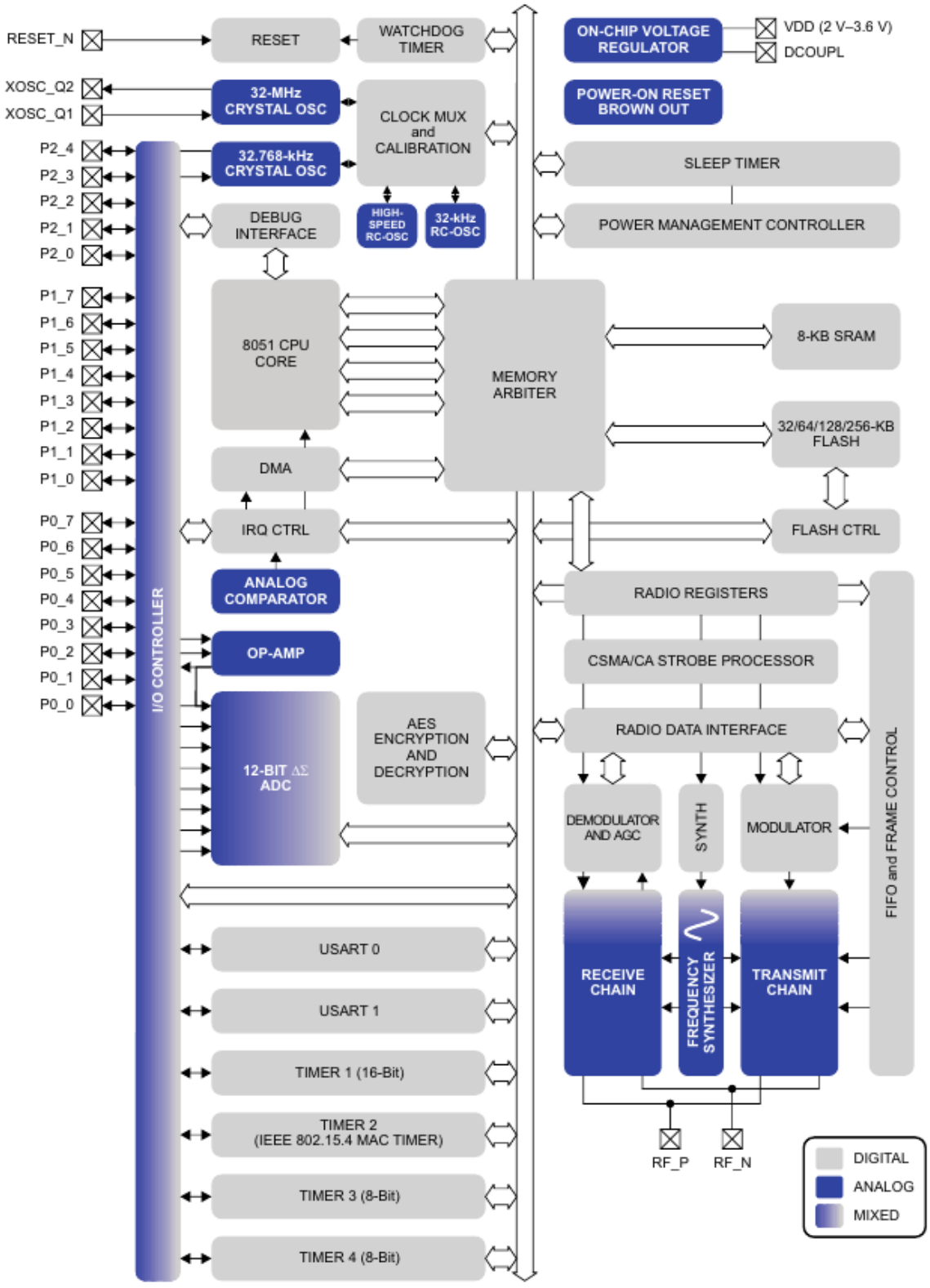
4. Hardware Requirements

4.1 Block Diagram

The hardware design of K-WLM-01 is based on CC2530 reference circuit



4.2 CC2530 Chipset Architecture



4.3 IO Connector PIN Definition

Connector	PIN	FUNCTION	DESCRIPTION
P1	1	GND	Power Ground
P1	2	NC	No Connection
P1	3	Digital I/O	Input / Output signal (P0_4)
P1	4	Digital I/O	Input / Output signal (P1_4)
P1	5	Digital I/O	Input / Output signal (P0_1)
P1	6	Digital I/O	Input / Output signal (P1_0)
P1	7	USART_RX	USART_RX signal (P0_2)
P1	8	NC	No Connection
P1	9	USART_TX	USART_TX signal (P0_3)
P1	10	DEBUG_DATA	Download DATA signal (P2_1)
P1	11	Digital I/O	Input / Output signal (P0_0)
P1	12	DEBUG_CLK	Download Clock signal (P2_2)
P1	13	Digital I/O	Input / Output signal (P1_1)
P1	14	Digital I/O	Input / Output signal (P1_4)
P1	15	Digital I/O	Input / Output signal (P0_6)
P1	16	Digital I/O	Input / Output signal (P1_5)
P1	17	Digital I/O, Analog I/O	Input / Output signal (P0_7)
P1	18	Digital I/O	Input / Output signal (P1_6)
P1	19	GND	Power Ground
P1	20	Digital I/O	Input / Output signal (P1_7)
P2	1	NC	No Connection
P2	2	GND	Power Ground
P2	3	NC	No Connection

P2	4	NC	No Connection
P2	5	NC	No Connection
P2	6	NC	No Connection
P2	7	3.3V	Power VDD
P2	8	NC	No Connection
P2	9	3.3V	Power VDD
P2	10	NC	No Connection
P2	11	NC	No Connection
P2	12	NC	No Connection
P2	13	NC	No Connection
P2	14	NC	No Connection
P2	15	RESET_n	RESET PIN (Active Low)
P2	16	NC	No Connection
P2	17	Digital I/O	Input / Output signal (P1_2)
P2	18	Digital I/O	Input / Output signal (P0_5)
P2	19	Digital I/O	Input / Output signal (P2_0)
P2	20	NC	No Connection

4.4 Current Consumption

	Maximum Current Consumption (mA)		
Mode	**Stand-by**	**Active-Mode**	
		Transmit	**Receive**
Current	<1mA	<30mA	<25mA

5. DIMENSION INFORMATION

5.1 PCB DIMENSION

PCB Dimension (W x L): 39.3 x 39.3mm, Thickness 0.8mm ±0.2mm