1. General Description

1.1 Introduction

6223E-UUC is a highly integrated module 802.11n Wireless LAN (WLAN) USB 2.0 Multi-Function network interface controller with integrated Bluetooth 4.1 controller.
It combines a WLAN MAC, a 1T1R capable WLAN baseband, and RF in s single chip.
6223E-UUC provides a complete solution for a high-performance integrated wireless LAN and Bluetooth device.

1.2 Description

Model Name	6223E-UUC
Product Description	Support Wi-Fi/BLE functionalities
Dimension	L x W x H: 12.9 x 12.2 x 2.3 mm
Wi-Fi Interface	Support USB 2.0
BT Interface	USB
OS supported	Android /Linux/ Windows
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 85°C

2. Features

General

- 802.11b/g/n 1T1R WLAN and Bluetooth single chip

PHY Features

- 802.11n OFDM
- One Transmit and one Receive path (1T1R)
- 20MHz and 40MHz bandwidth transmission
- Short Guard Interval (400ns)
- DSSS with DBPSK and DQPSK, CCK modulation with long and short preamble

Host Interface

- Complies with USB2.0 for WLAN and BT controller
- USB Multi-Function for both BT (USB function 0) and WLAN (USB function 1)
- USB LPM and USB Selective Suspend supported

Bluetooth Features

- Supports Bluetooth 4.0/4.1 Low Energy(BLE)

3. General Specification

3.1 WI-FI Specification

Feature	**Description**	
WLAN Standard	IEEE 802.11 b/g/n Wi-Fi compliant	
Frequency Range	2.412 GHz ~ 2.462 GHz	
Number of Channels	2.4GHz：Ch1 ~ Ch11	
Test Items	**Typical Value**	**EVM**
Output Power	802.11b /11Mbps : 17dBm ± 2 dB	EVM ≤ -10dB
	802.11g /54Mbps : 15dBm ± 2 dB	EVM ≤ -25dB
	802.11n /MCS7 : 14dBm ± 2 dB	EVM ≤ -28dB
Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	±20ppm	
SISO Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -91 dBm	≤-83
	- 2Mbps PER @ -89 dBm	≤-80
	- 5.5Mbps PER @ -86 dBm	≤-79
	- 11Mbps PER @ -84 dBm	≤-76

SISO Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps	PER @ -87 dBm	≤-85
	- 9Mbps	PER @ -86 dBm	≤-84
	- 12Mbps	PER @ -84 dBm	≤-82
	- 18Mbps	PER @ -82 dBm	≤-80
	- 24Mbps	PER @ -79 dBm	≤-77
	- 36Mbps	PER @ -75 dBm	≤-73
	- 48Mbps	PER @ -71 dBm	≤-69
	- 54Mbps	PER @ -70 dBm	≤-68
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0	PER @ -87 dBm	≤-85
	- MCS=1	PER @ -84 dBm	≤-82
	- MCS=2	PER @ -82 dBm	≤-80
	- MCS=3	PER @ -79 dBm	≤-77
	- MCS=4	PER @ -75 dBm	≤-73
	- MCS=5	PER @ -71 dBm	≤-69
	- MCS=6	PER @ -70 dBm	≤-68
	- MCS=7	PER @ -69 dBm	≤-67
SISO Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0,	PER @ -84 dBm	≤-82
	- MCS=1,	PER @ -81 dBm	≤-79
	- MCS=2,	PER @ -79 dBm	≤-77
	- MCS=3,	PER @ -76 dBm	≤-74
	- MCS=4,	PER @ -72 dBm	≤-70
	- MCS=5,	PER @ -68 dBm	≤-66
	- MCS=6,	PER @ -67 dBm	≤-65
	- MCS=7,	PER @ -66 dBm	≤-64
Maximum Input Level	802.11b : -8 dBm		
	802.11g/n : -20 dBm		
Antenna Reference	Small antennas with 0~2 dBi peak gain		

3.3 Bluetooth Specification

Feature	Description
General Specification	
Bluetooth Standard	LE(1Mbps)
Host Interface	USB
Frequency Band	2402MHz ~ 2480MHz
Number of Channels	40 channels for BLE
Modulation	GFSK
RF Specification	
Output Power , tolerance ±4 dB	
	CL1(dBm)
BLE Output Power	5
Sensitivity, tolerance : /	
Sensitivity @ BLE=30.8% for LE (1Mbps)	-89
Maximum Input Level	GFSK (1Mbps):-20dBm

4. ID setting information

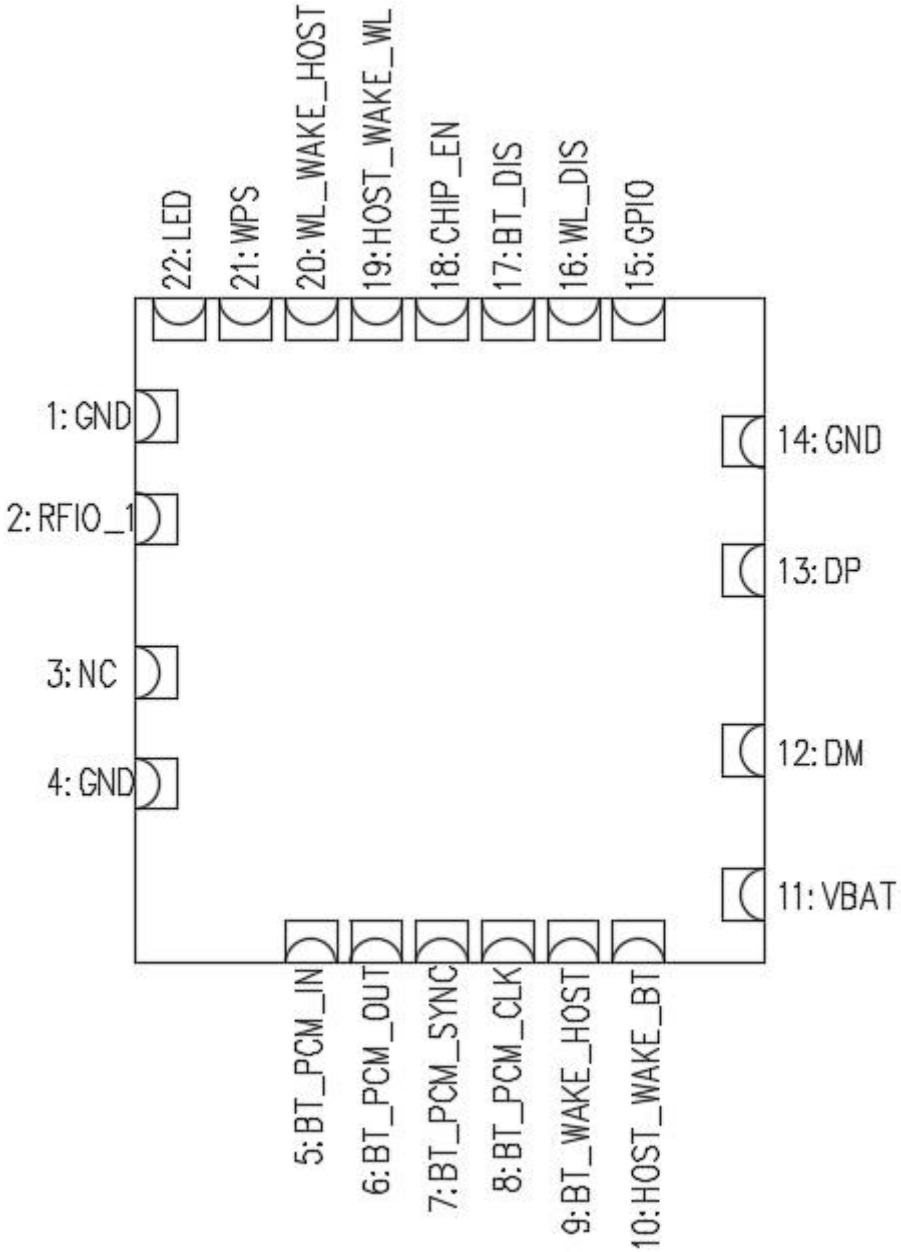
WI-FI

Vendor ID	TBD
Product ID	TBD

5 Pin Definition

5.1 Pin Outline

< TOP VIEW >



5.2 Pin Definition details

NO.	Name	Type	Description	Voltage
1	GND		Ground connections	
2	RFIO_1	I/O	RF I/O port	
3	NC	-	Floating (NC)	
4	GND		Ground connections	
5	PCM_IN	I	PCM Input	VCC
6	PCM_OUT	O	PCM Output	VCC
7	PCM_SYNC	I/O	PCM Sync	VCC
8	PCM_CLK	I/O	PCM Clock	VCC
9	BT_WAKE_HOST	O	WLAN Wakeup Host pin. This pin is also shared with GPIO14	VCC
10	HOST_WAKE_BT	I	Host Wakeup WLAN pin. This pin is also shared with GPIO12	VCC
11	VBAT_IN	P	3.3±10% V Main power voltage source input	VCC
12	DM	I/O	USB DM	VCC
13	DP	I/O	USB DP	VCC
14	GND	-	Ground connections	
15	GPIO	I/O	GPIO13	VCC
16	WL_DIS	I	WLAN disable,low active,GPIO9	VCC
17	BT_DIS	I	BT disable,low active,GPIO11	VCC
18	CHIP_EN	I	Chip Enable,default pull high. Low active	VCC
19	HOST_WAKE_WL	I	Host Wakeup WLAN pin. This pin is also shared with GPIO4	VCC
20	WL_WAKE_HOST	O	WLAN Wakeup Host pin. This pin is also shared with GPIO8	VCC
21	WPS	I	WPS button input. This pin is also shared with GPIO15. It is used to detect the WPS button input.	VCC
22	LED	O	LED Pin (Active Low). This pin is also shared with ANTSEL1	VCC

P:POWER I:INPUT O:OUTPUT VDDIO:3.3V

2.2 List of applicable FCC rules
FCC Part 15.247

2.3 Specific operational use conditions
This product is a Single-modular transmitter policy independent of any host. Not applicable.

2.4 Limited module procedures
This product is a Single-modular transmitter. It is not a limited module. Not applicable.

2.5 Trace antenna designs
This product has a external antennas. Not applicable.

2.6 RF exposure considerations
This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.

2.7 Antennas
This product has two external antennas. The antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

No.	Antenna Type	Frequency Range	Gain	Impedance
1	FPC Antenna	2402-2480MHz 2412-2462MHz	3.39dBi	50ohm

2.8 Label and compliance information
FCC ID label on the final system must be labeled with “Contains FCC ID: 2AATL-6223E-UUC” or “Contains transmitter module FCC ID: 2AATL-6223E-UUC”.

2.9 Information on test modes and additional testing requirements
Contact FN-LINK TECHNOLOGY LIMITED will provide stand-alone modular transmitter test mode. Additional testing and certification may be necessary when multiple modules are used in a host.

2.10 Additional testing, Part 15 Subpart B disclaimer

To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Supplier's Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, FN-LINK TECHNOLOGY LIMITED shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

FCC Warning

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.

Note: 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:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

NOTE 1: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Note 1: This module certified that complies with RF exposure requirement under mobile or fixed condition, this module is to be installed only in mobile or fixed applications.

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fixed device is defined as a device is physically secured at one location and is not able to be easily moved to another location.

Note 2: Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

Note 3: The module may be operated only with the antenna with which it is authorized. Any antenna that is of the same type and of equal or less directional gain as an antenna that is authorized with the intentional radiator may be marketed with, and used with, that intentional radiator.

Note 4: For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.