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**Wireless Module**  
**MIMO 802.11abgn & *Bluetooth*<sup>®</sup>**  
**WYSBCVJXM & WBSBCVJXM**  
**Overview**

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March 20, 2014 Version 1.0

# WYSBCVJXM Wireless Module: MIMO 802.11abgn & Bluetooth

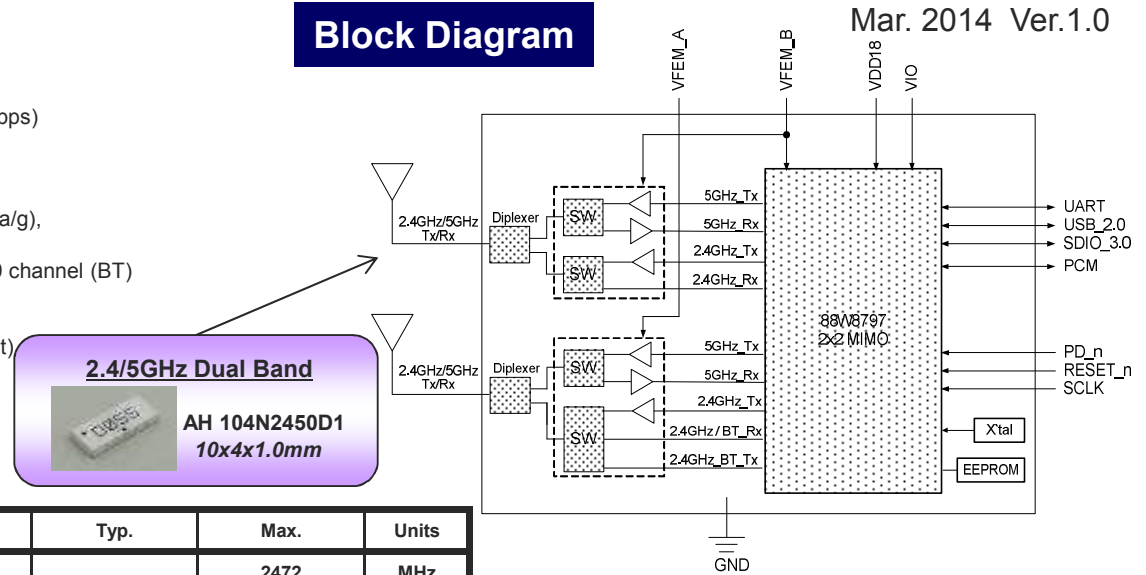
## Features

- SMD type module.
- IEEE802.11a/b/g/n 2x2 MIMO conformity. Data rates up to MCS15 (300Mbps)
- BT4.0 (supports Bluetooth Low Energy). Class2 supports.
- Support 802.11n Beamformer and Beamformee functions.
- Low standby current (with low power operation)
- Transmit data rate : 11/5.5/2/1 Mbps(11b), 54/48/36/24/18/12/9/6 Mbps(11a/g), 300 to 6.5 Mbps (11n, MCS15 to 0, HT20/40)
- Channel Number : 1 to 13 channel (11bgn), W52/W53/W56/W58(11an), 79 channel (BT)
- Interface : SDIO, USB, PCM
- Built-in Diplexer, 2G-PA, 5G-PA, 5G-LNA, EEPROM, Xtal
- Security: WEP, CCMP, TKIP, AES, WAPI, CMPC, WPA/WPA2(64bit/128bit)
- Outline: 12.5 x 16.8 x 1.65(Max) mm
- Package: Metal case package
- RoHS Conformity

## General Electrical Specification

Parameter	Description	Min.	Typ.	Max.	Units
Frequency Range	11b/ g/ n	2412		2472	MHz
	11a	5180		5825	MHz
	BT	2402		2480	MHz
Operation Voltage	VDD18		1.8		V
	VFEM_A/B		3.3		V
	VIO		1.8/2.6/ 3.3		V
TX Output Power (11b/g/n) (11a) (BT)	11b/11g/11n-2G (HT20/40)	13 / 10 / 10	15 / 12 / 12	17 / 14 / 14	dBm
	11a/11n-5G (HT20/40)	10 / 10 / 8	12 / 12 / 10	14 / 14 / 12	
	BT	-6	0	4	
RX Sensitivity (11b/g/n) (11a) (BT)	11b/11g/11n (HT20)		-88 / -73 / -69	-76 / -65 / -64	dBm
	11a/11n-5G (HT20)		-73 / -69	-65 / -64	
	BT (BR)		-86	-70	
TX Power Consumption (MIMO)	11n, MCS15, 5GHz, Tx:10dBm, HT40		1670		mW
RX Power Consumption (MIMO)	11n, MCS15, 5GHz, HT40		1010		mW
Power Consumption	Sleep Mode		145		mW
General Operation Temperature Range)		-30	25	85	deg-C

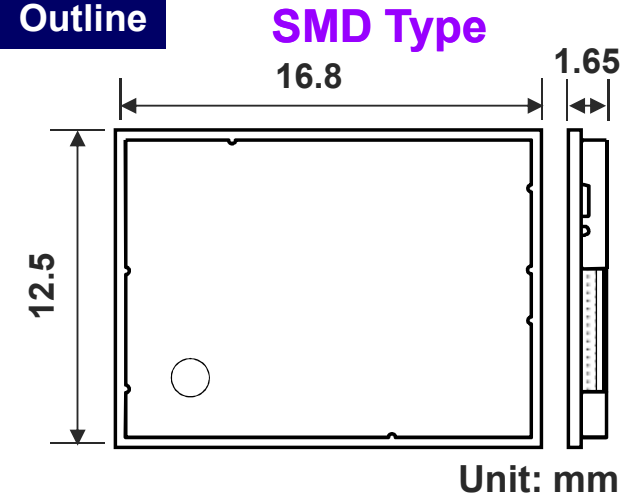
## Block Diagram



## Application

- Portable audio/video device and accessories
- Personal computing system including pad and tablet
- Wireless home audio and video entertainment
- Handy Terminal

## Outline



# WBSBCVJXM: Wireless Module Evaluation Kit

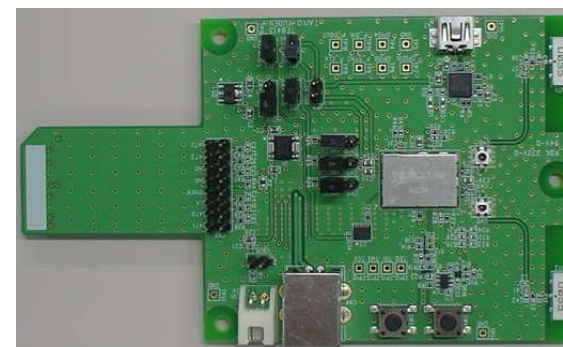
**To Evaluate Wireless Module WYSBCVJXM,  
You Will Need WBSBCVJXM**

**WBSBCVJXM** is the evaluation kit for Wireless Module WYSBCVJXM. This kit has everything you need to evaluate the performance of this module.

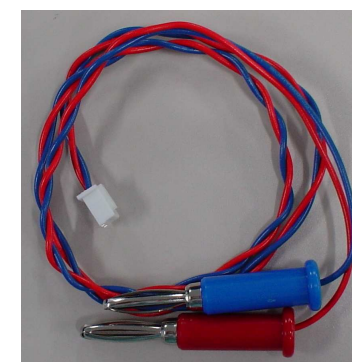
## WBSBCVJXM Kit includes:

No.	Item	Description	Qty
1	WBSBCVJXM	Evaluation Board for Wireless module WYSBCVJXM with SDIO/USB interface	1
2	Red & Blue Cable	Power Supply Cable	1

1 WBSBCVJXM



2 Red & Blue Cable



# Supplemental Product Information

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## WLAN Module Operating Environment

- PC with Linux Fedora13 with software development option and SDIO interface

***Attention: PC with SDIO is required. Although SDIO and SD Memory Card have the same slot shape, they are not compatible. WLAN Module and Evaluation Board will not work if they are connected to SD memory card slot.***

## What will be provided if the Evaluation Board is purchased

- Data Report: Detail Module information
- Application Note: Peripheral design guide
- Evaluation Board Manual: Manual on how to evaluate the Module with the Evaluation Board
- Lab-tool User Guide: RF Control Tool Guide
- Lab-tool: RF Control Tool
- WLAN Device Driver Software for Linux PC, Fedora13

***Attention: There is a possibility that export control could limit customer's access WLAN Device Driver and the API Specification depending on the customer's country or application.***

# Software Structure

## Sample Application

- uaputl , mlanutl (Configuration tools)

## WLAN Device driver

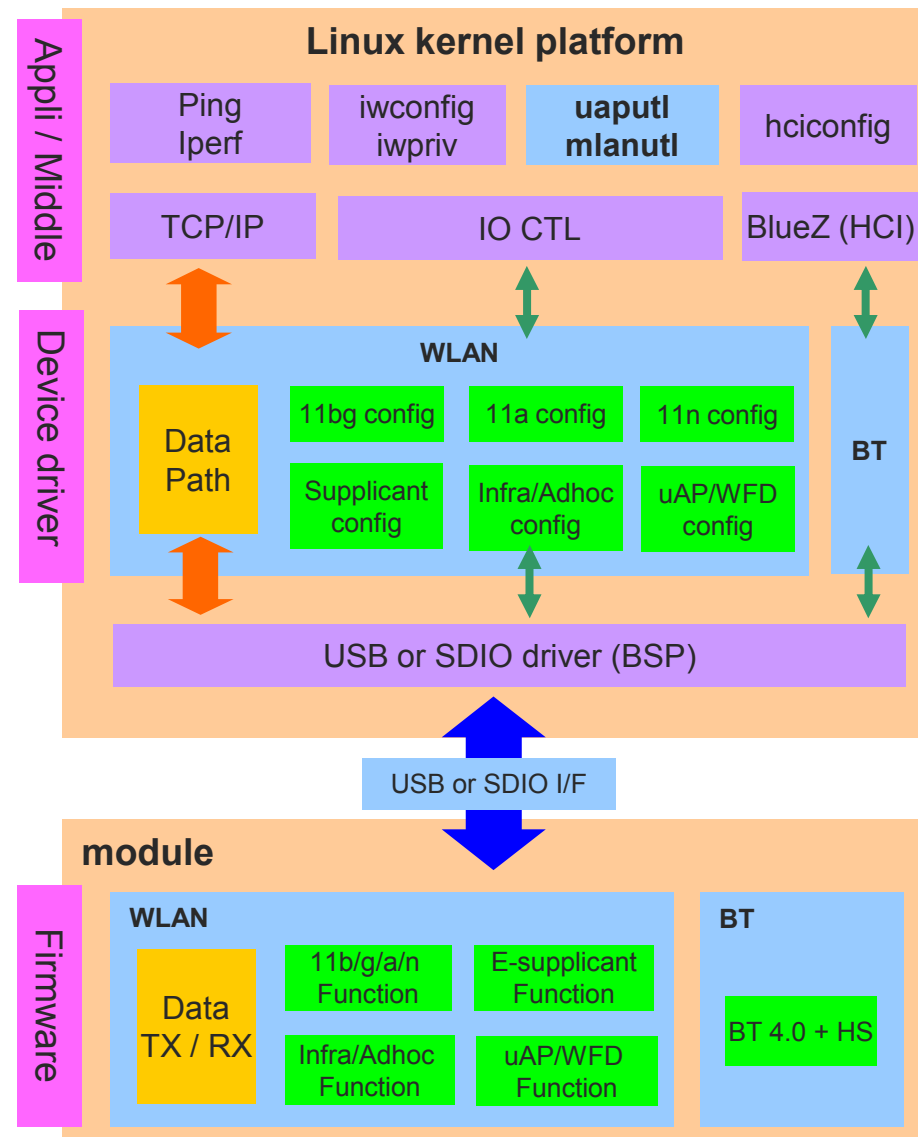
- Data path:  
Communicate data such as TCP or UDP
- 11bg config/11a config/11n config:  
Configure the such as Ch/Rate/band/mode
- Supplicant config:  
Configure the generated key by supplicant of middleware
- Infra/Adhoc config:  
Configure the Infa or Adhoc mode
- uAP/WFD config:  
Configure the uAP or WFD mode

## Bluetooth Device driver

- Bluetooth driver

## Firmware

- Data TX/RX:  
Transmit and receive data on the air, such as TCP or UDP
- 11b/g/a/n function:  
Execute the function of such as Ch/Rate/Band/Mode
- E-supplicant function:  
Generate the key of WPA/WPA2
- Infra/Adhoc function:  
Execute the function of Infra or Adhoc mode
- uAP/WFD function:  
Execute the function of uAP or WFD mode
- Bluetooth 4.0 + High Speed



\*WFD : Wi-Fi Direct , E-supplicant : Embedded supplicant

# Software Feature Set

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## General

- 2 Spatial stream ( 2x2 )
- 802.11b Data rates of 1,2 ,5.5 and 11 Mbps
- 802.11a/g Data rates 6 - 48, and 54 Mbps
- 802.11n Data rates up to 300 Mbps ( MCS0 to 15 )
- 802.11d International roaming
- 802.11e QoS block ack
- 802.11h Transmit power control, DFS
- 802.11i WPA / WPA2 and 802.11X
- Infrastructure and Ad-hoc mode
- Security WEP 64 and 128-bit, TKIP and AES CCMP for WPA / WPA2
- WMM Support, WMM PS ( UAPSD )
- IEEE Power Save, Auto Deep Sleep / Host Sleep
- Embedded Supplicant
- Support for TX and RX of AMPDU and AMSDU-4k packets
- Support for Only TX of AMSDU-8k packets
- Background Scan, Vendor specific IE

## Access point

- Multi-BSS support ( 2 BSS )
- Association support up to 10 stations
- Automatic channel selection ( ACS )

## Simultaneous AP-STA Operation

- AP-STA functionality
- Independent security configurations on different interfaces
- Enhanced power save ( AP-STA simultaneous power save )

## Wi-Fi Direct/P2P

- Autonomous Group Owner mode ( GO )
- P2P Client mode
- P2P Client association with WLAN AP
- P2P Client power save
- P2P Client WMM PS ( UAPSD )
- GO WMM PS / IEEE PS for associated P2P clients
- 8 client support, Provision discovery

## Bluetooth

- BT 4.0 + HS , BT class 1.5 and class 2
- Adaptive frequency hopping ( AFH )
- Multi slot ACL with eSCO
- WLAN + BT / BLE Coexistence

# Driver Package

Driver package (Platform)	Software	CPU / OS Type	Content
Object package for PC	Device driver	CPU: x86 (PC) OS: Fedora 13 (Linux 2.6.33)	Driver object - Linux configuration tools - Linux WLAN and BT driver, Firmware
			Document - Install guide - Demonstration guide
	RF control tool (Lab-tool)	CPU: x86 (PC) OS: Windows XP and Linux	Driver object - Windows XP Lab-tool - Linux bridge tool, Linux driver, Firmware
			Document - User guide



**TAIYO YUDEN**