Ampak

AP6234AL

Evaluation Kits

User manual

Version 1.2

Revision History

Date	Revision Content	Revised By	Version
2012/12/26	Initial released	Dora	1.0
2013/03/07	Modify figure1	Dora	1.1
2013/06/06	Modify figure1	Dora	1.2

Federal Communication Commission Interference Statement

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 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.

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

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.

IMPORTANT NOTE:
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.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

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

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna,
3) 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.

As long as 3 conditions above are met, further <u>transmitter</u> 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

IMPORTANT NOTE: In the event that these conditions <u>can not be met</u> (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID <u>can not</u> 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.

<u>**End Product Labeling**</u>

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: ZQ6-AP6234A".

<u>**Manual Information To the End User**</u>

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.

Industry Canada statement:

This device complies with Industry Canada licence-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.

Radiation Exposure Statement:

This equipment complies with IC 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.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This device is intended only for OEM integrators under the following conditions: (For module device use)

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and

2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 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.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et

2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not 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 Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

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 IC: 11956A-AP6234A ".

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 11956A-AP6234A ".

Manual Information To the End User

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.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

Caution :

(i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(ii) the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall comply with the e.i.r.p. limit; and

(iii) the maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

(iv) Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

(i) les dispositifs fonctionnant dans la bande 5 150-5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

(ii) le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5 250-5 350 MHz et 5 470-5 725 MHz doit se conformer à la limite de p.i.r.e.;

(iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5 725-5 825 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

(iv) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250-5 350 MHz et 5 650-5 850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

This radio transmitter (IC: 11956A-AP6234A) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (IC: 11956A-AP6234A) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Type	Manufacture	Gain	Connector
Dipole	Mag.layers	2dBi	SMA Male RP

KCC

해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음
해당 무선 설비는 5150-5250MHz 대역에서 실내 에서안 사용만 수 있웅.
(Translation: the service related to human safety is not allowed because this device
may have the possibility of the radio interference.)
For RF device using 5150-5250MHz, this device shall be used for indoor only.

802.11b/802.11g/BT 警語：

第十二條→經型式認證合格之低功率射頻電機，非經許可，公司，商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條→低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。 低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

802.11a 警語：

無線傳輸設備 (UNII)

在 5.25-5.35 秭赫頻帶內操作之無線資訊傳輸設備，限於室內使用。 (4.7.5)

無線資訊傳輸設備忍受合法通信之干擾且不得干擾合法通信；如造成干擾，應立即停用，俟無干擾之虞，始得繼續使用。 (4.7.6)

無線資訊傳設備的製造廠商應確保頻率穩定性，如依製造廠商使用手冊上所述正常操作，發射的信號應維持於操作頻帶中。(4.7.7)

模組請加註

1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤

2. 系統廠商應於平台上標示「本產品內含射頻模組: **CCAFXXLPXXXXTX)**」字樣

1. AP6XXX Evaluation Board Introduction

AP6XXX Evaluation board (EVB) likes as figure1. That is designed for IEEE802.11 a/b/g/n/ac WLAN with integrated Bluetooth, FM, NFC and GPS application. It is subject to provide a convenient environment for customer's verification on WiFi or Bluetooth function. There are many controller pins and reserved GPIO on Evaluation board which describes as below.
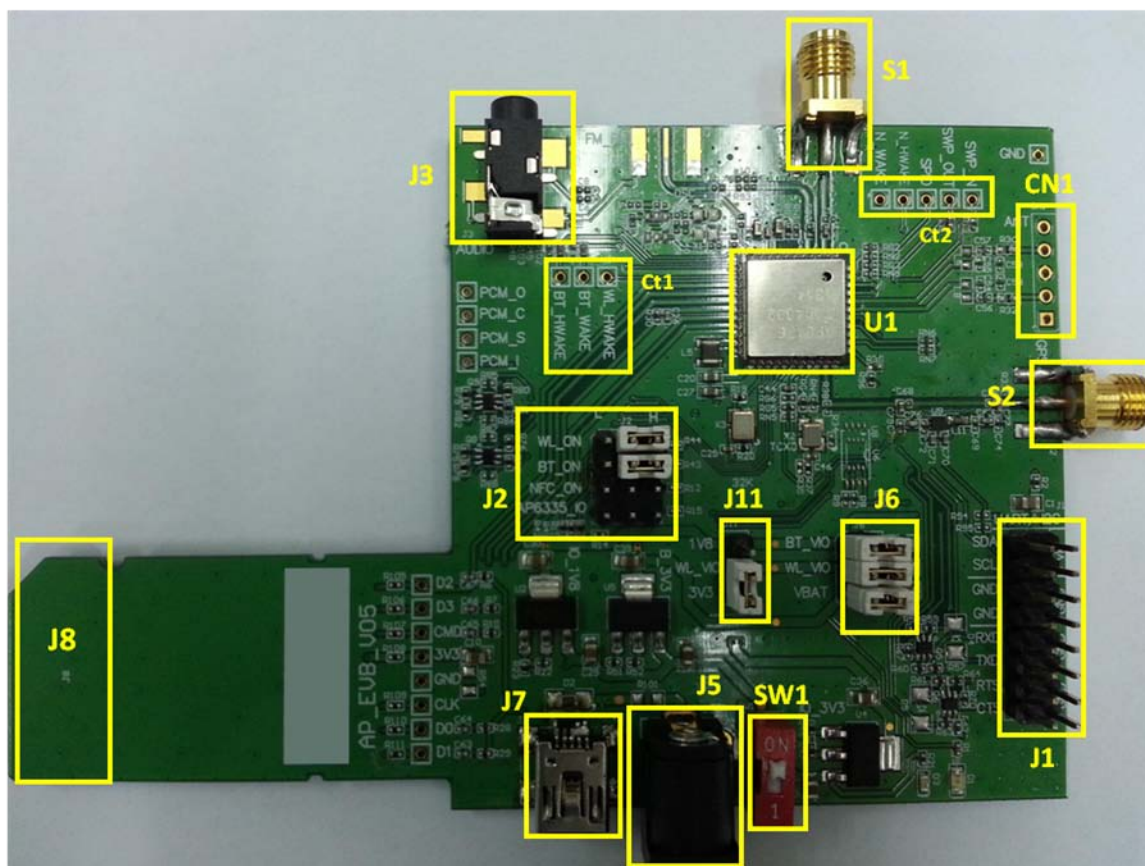

Figure1. Top view of AP6XXX EVB

Interface highlights:

1. U1: AP6XXX SIP module.
2. J1: UART interface connects with UART transport board for BT and GPS measuring, it also provides I2C (SDA/SCL) for NFC measuring.
3. J2: Enable(H) or disable(L) Bluetooth, WiFi, NFC function and AP6335_SDIO I/O voltage selection.(H for SDIO 3.3V, L for SDIO 1.8V)
4. J3: FM audio out interface.
5. J5: 5V DC adaptor input connector.
6. J6: VBAT / WL_VIO / BT_VIO for main system I/O power path.
7. J7: 5V DC mini USB input connector.
8. J8: Standard SDIO interfaces for Wi-Fi performance measured.

9. J11: WL_VIO power path for 1V8 or 3V3 selection.
10. SW1: Power on/off switch.
11. CN1: NFC interface connects with NFC antenna.
12. S1: SMA connector let RF signal in/out path, you could connect with RF cable or Dipole antenna.
13. S2: SMA connector let GPS RF signal input, you could connect with GPS antenna.
14. Ct1: WLAN and BT control pins, strongly recommended WL_HWAKE(IRQ) connected to MCU.
15. Ct2: NFC control pins, strongly recommended N_WAKE and N_H_WAKE connected to MCU.

2. WiFi function verification step

WIFI SDIO: Using external pull up resistors depends on the SDIO supply voltage. For 1.8V, the resistance range is 30KΩ~82KΩ. For 3.3V, its range from 21 KΩ~41 KΩ on the four data lines and the CMD line as the following circuitry.
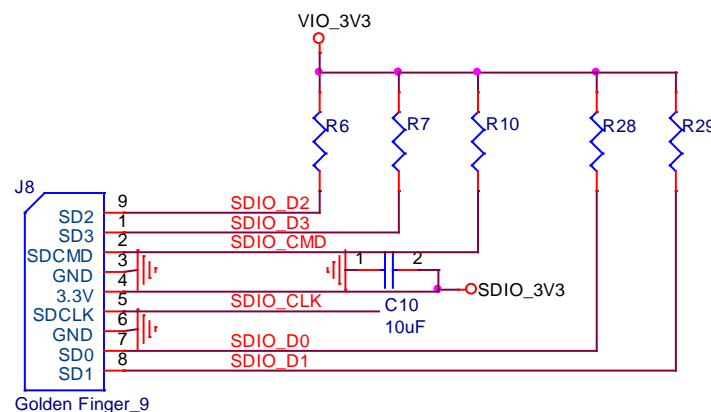

Figure2. WiFi verification connection interface to Host SDIO

Hardware Setup:
- ❖ Refer to Figure2 SDIO pin definition connects the J8 interface of AP6XXX evaluation board to Host SDIO control interface.
- ❖ Using pull high resistors (R6, R7, R10, R28, R29) that resistance is 30Kohm for 1.8V or 3.3V VDDIO pull up voltage. (Pull high resistors are un-necessary if at verification phase.)
- ❖ Connects an external antenna at SMA connector on the evaluation board.
- ❖ Note to the VDDIO voltage level should be the same with GPIO voltage level of Host CPU. (VDDIO 3.3V or 1.8V selection by jump J11)

WiFi software setup:

Please follow up software guideline of Ampak official released.

3. Bluetooth function verification step
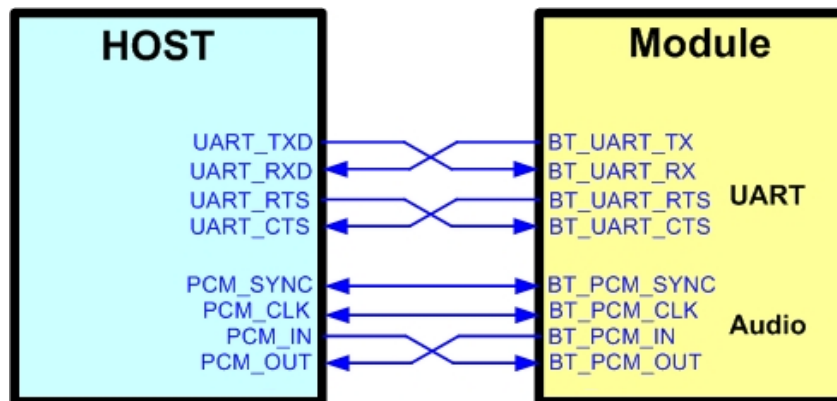
Figure3. Bluetooth verification connection interface to Host UART

Hardware Setup:
- ❖ Refer to Figure3 UART pin definition connects the J1 interface of AP6XXX evaluation board to Host UART control interface.
- ❖ Connects an external antenna at SMA connector on the evaluation board.
- ❖ Note to the VDDIO voltage level should be the same as GPIO voltage level of Host CPU.

WiFi and Bluetooth software setup:
Please follow up software guideline of Ampak official released.

2. Features

IEEE 802.11x Key Features

- Dual-band 2.4GHz/5GHz 802.11a/b/g/n.
- Single-stream IEEE 802.11n support for 20MHz and 40MHz channels provides PHY layer rates up to 150Mbps.
- WLAN host interface options: SDIO v2.0 — up to 50 MHz clock rate
- Support a single antenna shared between WLAN and Bluetooth.
- Security: WEP, WPS, WPA, WPA2, WMM, WAPI, AES,…

Bluetooth Features

- Bluetooth V4.0(BLE) Low Energy with provisions for supporting future specifications.
- Bluetooth Class1 or Class2 transmitter operation.
- BT host digital interface UART(up to 4 Mbps) with support all Bluetooth4.0 package types
- Multipoint operation with up to seven active ACL links, three active SCO and eSCO connections.
- Full support for power savings modes (standard sniff, deep sleep modes)
- ECI - enhanced coexistence support, ability to coordinate BT SCO transmissions around WLAN receives

A simplified block diagram of the module is depicted in the figure below.
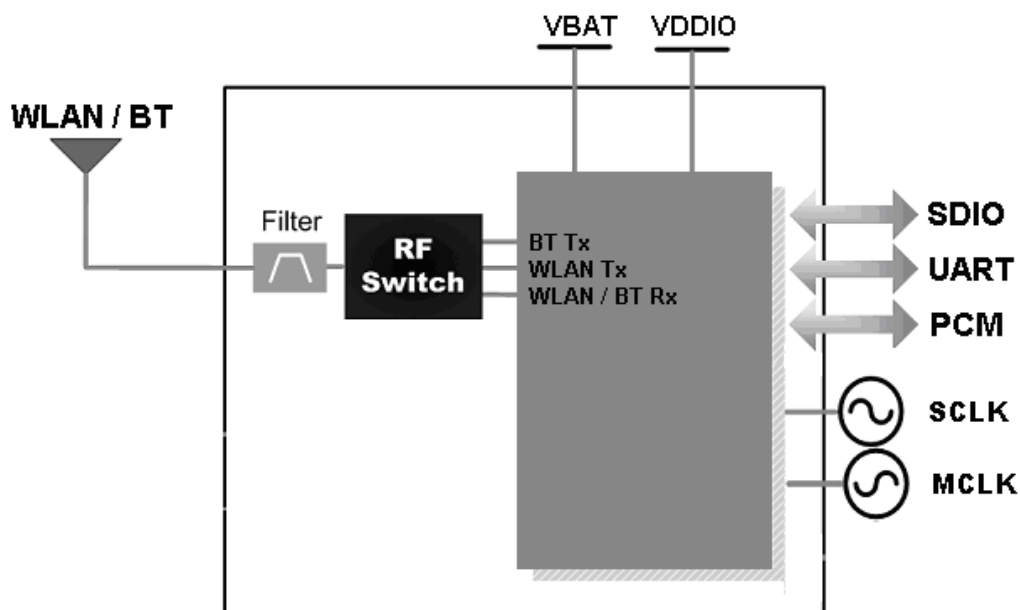
3. Deliverables

3.1 Deliverables

The following products and software will be part of the product.
- Module with packaging
- Evaluation Kits
- Software utility for integration, performance test.
- Product Datasheet.
- Agency certified pre-tested report with the adapter board.

3.2 Regulatory certifications

The product delivery is a pre-tested module, without the module level certification. For module approval, the platform's antennas are required for the certification.

4. General Specification

4.1 General Specification

Model Name	AP6234
Product Description	Supports Wi-Fi dual mode /Bluetooth functionalities
Dimension	L x W x H: 13.0 x15.0 x 1.3 (typical) mm
WiFi Interface	SDIOV2.0
BT Interface	UART/ PCM
Operating temperature	-30°C to 85°C
Storage temperature	-40°C to 85°C
Humidity	Operating Humidity 10% to 95% Non-Condensing

4.2 Voltages

4.2.1 Absolute Maximum Ratings

Symbol	Description	Min.	Max.	Unit
VBAT	Input supply Voltage	-0.5	5	V
VDDIO	Digital/Bluetooth/SDIO/ I/O Voltage	-0.5	3.6	V

4.2.2 Recommended Operating Rating

The module requires two power supplies: VBAT and VDDIO.

	Min.	Typ.	Max.	Unit
Operating Temperature	-30	25	85	deg.C
VBAT	3.0	3.6	4.8	V
VDDIO	1.6	3.3	3.4	V

5. WiFi RF Specification

5.1 2.4GHz & 5GHz RF Specification

Conditions : VBAT=3.6V ; VDDIO=3.3V ; Temp:25°C

Feature	Description
WLAN Standard	IEEE 802.11a/b/g/n, WiFi compliant
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band) 4.900 GHz ~ 5.845 GHz (5.0 GHz ISM Band)
Number of Channels	2.4GHz：Ch1 ~ Ch14 5.0GHz：Please see the table[1]
Modulation	802.11a : OFDM /64-QAM,16-QAM, QPSK, BPSK 802.11b : DQPSK, DBPSK, CCK 802.11 g/n : OFDM /64-QAM,16-QAM, QPSK, BPSK
Output Power	802.11a /54Mbps : 13 dBm ± 1.5 dB @ EVM $\leq$ -25dB 802.11b /11Mbps : 16 dBm ± 1.5 dB @ EVM $\leq$ -9dB 802.11g /54Mbps : 15 dBm ± 1.5 dB @ EVM $\leq$ -25dB 802.11n /MCS7 : 14 dBm ± 1.5 dB @ EVM $\leq$ -28dB
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -88 dBm, typical - MCS=1 PER @ -84 dBm, typical - MCS=2 PER @ -82 dBm, typical - MCS=3 PER @ -80 dBm, typical - MCS=4 PER @ -77 dBm, typical - MCS=5 PER @ -74dBm, typical - MCS=6 PER @ -72 dBm, typical - MCS=7 PER @ -70 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -87 dBm, typical - MCS=1 PER @ -83 dBm, typical - MCS=2 PER @ -81 dBm, typical - MCS=3 PER @ -79 dBm, typical - MCS=4 PER @ -77 dBm, typical - MCS=5 PER @ -76 dBm, typical - MCS=6 PER @ -71 dBm, typical - MCS=7 PER @ -70 dBm, typical
Receive Sensitivity (11g) @10% PER	- 6Mbps PER @ -89 dBm, typical - 9Mbps PER @ -88 dBm, typical - 12Mbps PER @ -86 dBm, typical

	- 18Mbps	PER @ -84 dBm, typical
	- 24Mbps	PER @ -82 dBm, typical
	- 36Mbps	PER @ -78 dBm, typical
	- 48Mbps	PER @ -75 dBm, typical
	- 54Mbps	PER @ -73 dBm, typical
Receive Sensitivity (11b) @8% PER	- 1Mbps	PER @ -95 dBm, typical
	- 2Mbps	PER @ -94 dBm, typical
	- 5.5Mbps	PER @ -90 dBm, typical
	- 11Mbps	PER @ -87 dBm, typical
Receive Sensitivity (11a) @10% PER	- 6Mbps	PER @ -88 dBm, typical
	- 9Mbps	PER @ -86 dBm, typical
	- 12Mbps	PER @ -84 dBm, typical
	- 18Mbps	PER @ -82 dBm, typical
	- 24Mbps	PER @ -80 dBm, typical
	- 36Mbps	PER @ -78 dBm, typical
	- 48Mbps	PER @ -75 dBm, typical
	- 54Mbps	PER @ -73 dBm, typical
Maximum Input Level	802.11b : -10 dBm	
	802.11a/g/n : -20 dBm	
Data Rate	802.11a : 6, 9, 12, 18, 24, 36, 48, 54Mbps	
	802.11b : 1, 2, 5.5, 11Mbps	
	802.11g : 6, 9, 12, 18, 24, 36, 48, 54Mbps	
	802.11n: MCS0, MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

[1]5GHz Channel table

Band (GHz)	Operating Channel Numbers	Channel center frequencies(MHz)
5.15GHz~5.25GHz	36	5180
	40	5200
	44	5220
	48	5240
5.25GHz~5.35GHz	52	5260
	56	5280
	60	5300
	64	5320
5.5GHz~5.7GHz	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620

	128	5640
	132	5660
	136	5680
	140	5700
5.725GHz~5.825GHz	149	5745
	153	5765
	157	5785
	161	5805

6. Bluetooth Specification

6.1 Bluetooth Specification

Conditions : VBAT=3.6V ; VDDIO=3.3V ; Temp:25°C

Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V4.0 of 1, 2 and 3 Mbps.		
Host Interface	UART		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2.400 GHz ~ 2483.5 GHz		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK		
RF Specification			
	Min.	**Typical.**	**Max.**
Output Power (Class 1.5)		10 dBm	
Output Power (Class 2)		2 dBm	
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-80 dBm	
Maximum Input Level	GFSK (1Mbps):-20dBm		
	π/4-DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

7. Pin Assignments

7.1 Pin Outline

< TOP VIEW >
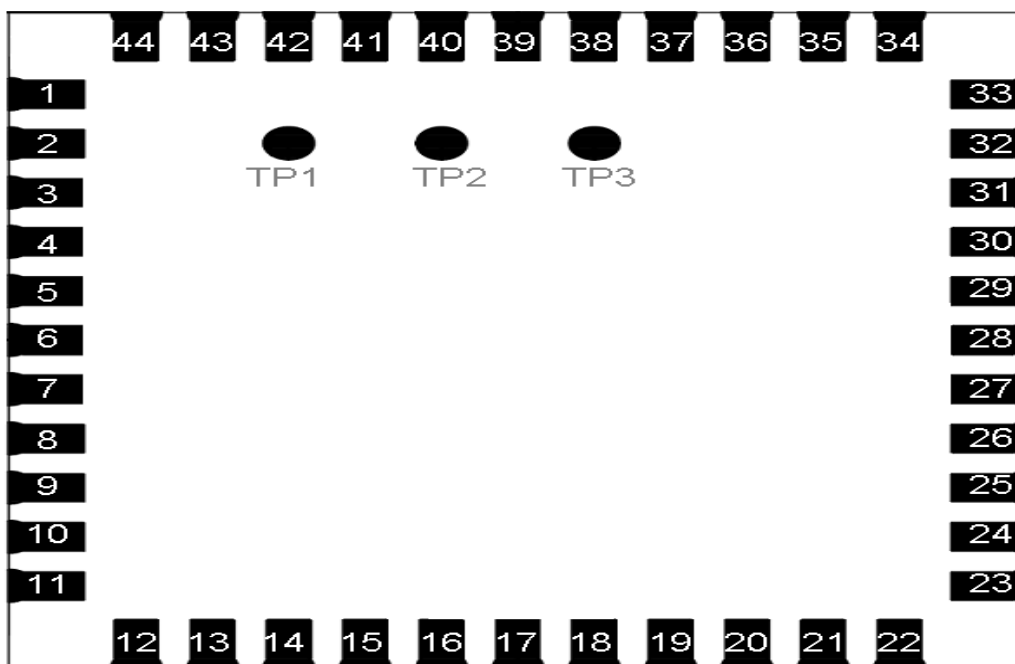
7.2 Pin Definition

NO	Name	Type	Description
1	GND	—	Ground connections
2	WL_BT_ANT	I/O	RF I/O port
3	GND	—	Ground connections
4	NC	—	Floating (Don't connected to ground)
5	NC	—	Floating (Don't connected to ground)
6	BT_WAKE	I	HOST wake-up Bluetooth device
7	BT_HOST_WAKE	O	Bluetooth device to wake-up HOST
8	NC	—	Floating (Don't connected to ground)
9	VBAT	P	Main power voltage source input
10	XTAL_IN	I	Floating (Don't connected to ground)
11	XTAL_OUT	O	Floating (Don't connected to ground)
12	WL_REG_ON	I	Internal regulators power enable/disable
13	WL_HOST_WAKE	O	WLAN to wake-up HOST

Doc. NO:

14	SDIO_DATA_2	I/O	SDIO data line 2
15	SDIO_DATA_3	I/O	SDIO data line 3
16	SDIO_DATA_CMD	I/O	SDIO command line
17	SDIO_DATA_CLK	I/O	SDIO clock line
18	SDIO_DATA_0	I/O	SDIO data line 0
19	SDIO_DATA_1	I/O	SDIO data line 1
20	GND	—	Ground connections
21	VIN_LDO_OUT	P	Internal Buck voltage generation pin
22	VDDIO	P	I/O Voltage supply input
23	VIN_LDO	P	Internal Buck voltage generation pin
24	LPO	I	Low power oscillator clock input (32.768KHz)
25	PCM_OUT	O	PCM Data output
26	PCM_CLK	I/O	PCM clock
27	PCM_IN	I	PCM data input
28	PCM_SYNC	I/O	PCM sync signal
29	NC	—	Floating (Don't connected to ground)
30	NC	—	Floating (Don't connected to ground)
31	GND	—	Ground connections
32	NC	—	Floating (Don't connected to ground)
33	GND	—	Ground connections
34	BT_RST_N	I	Low asserting reset for Bluetooth core
35	NC	—	Floating (Don't connected to ground)
36	GND	—	Ground connections
37	NC	—	Floating (Don't connected to ground)
38	NC	—	Floating (Don't connected to ground)
39	NC	—	Floating (Don't connected to ground)
40	NC	—	Floating (Don't connected to ground)
41	UART_RTS_N	O	Bluetooth UART interface
42	UART_TXD	O	Bluetooth UART interface
43	UART_RXD	I	Bluetooth UART interface
44	UART_CTS_N	I	Bluetooth UART interface
45	TP1	—	Floating (Don't connected to ground)
46	TP2	—	Floating (Don't connected to ground)
47	TP3	—	Floating (Don't connected to ground)