



NANNING FUGUI PRECISION INDUSTRIAL
CO.,LTD.
NO.51,Tongle Road, Foxconn Industrial Park,
District Jiangnan, Nanning, Guangxi China.
Tel: 86-771-5086999 Ext: 35081
FAX: 86-771-2168888 Ext: 64886

<h1>Approval Sheet</h1>

Customer Name: Sony Corporation

Project Name	WLAN/BT Module
Approval Sheet Rev.	V01
Foxconn Part No.	J20H098
SONY Part No.	

Approved by	Reviewed by	Prepared by

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1 Revision History

Date	Document revision	Change Description
2018/04/16	01	Initial release



2 Manufacturing Information

Manufacture Country:

Made in China

Manufacturer:

NANNING FUGUI PRECISION INDUSTRIAL CO.,LTD.

Manufacture Address:

NO.51,Tongle Road, Foxconn Industrial Park, District Jiangnan, Nanning, Guangxi China.



3 Product Overview

J20H098.00 is based on MTK MT7668BUN, MT7668BUN is highly integrated single chip which features a low power 2x2 11a/b/g/n/ac dual-band WiFi subsystem and a Bluetooth subsystem. The WiFi subsystem contains the 802.11a/b/g/n/ac radio, baseband, and MAC that are designed to meet both the low power and high throughput application. MT7668BUN has a 32-bit RISC MCU that handles WiFi and Bluetooth tasks, and an ARM Cortex-R4 MCU that could offload data frame processing in WiFi host driver. The Bluetooth subsystem contains the Bluetooth radio, baseband, link controller. It also uses the 32-bit RISC MCU for the Bluetooth protocols.

3.1 Application scope

The wireless LAN is compliant to IEEE 802.11n, IEEE 802.11 a/b/g and IEEE 802.11 ac standards.

Channel Spacing

2.4GHz -> 5MHz, 5GHz-> 20MHz, 40MHz, 80MHz

Data rate:

1, 2, 5.5, 11Mbps for 802.11b;

6, 9, 12, 18, 24, 36, 48 and 54Mbps for 802.11a/g;

MCS0(6.5Mbps)~MCS7(72.2Mbps) for 802.11n HT20 mode (single chain)

MCS8(13Mbps)~MCS15(144.4Mbps) for 802.11n HT20 mode (dual chains)

MCS0(13.5Mbps)~MCS7(150Mbps) for 802.11n HT40 (5G only) mode (single chain)

MCS8(27Mbps)~MCS15(300Mbps) for 802.11n HT40 (5G only) mode (dual chains);

MCS0(6.5Mbps)~MCS8(86.7Mbps) for 802.11ac VHT20 mode (single chain)

MCS0(13Mbps)~MCS8(173.3Mbps) for 802.11ac VHT20 mode (dual chains)

MCS0(13.5Mbps)~MCS9(200Mbps) for 802.11ac VHT40 mode (single chain)

MCS0(27Mbps)~MCS9(400Mbps) for 802.11ac VHT40 mode (dual chains)

MCS0(29.3Mbps)~MCS9(433.3Mbps) for 802.11ac VHT80 mode (single chain)

MCS0(58.5Mbps)~MCS9(866.7Mbps) for 802.11ac VHT80 mode (dual chains)

BT:

The BT Module is compliant to Bluetooth 4.2 and EDR standard:

Carrier Frequency: 2402MHz ~ 2480 MHz

Carrier Spacing: 1.0MHz for BDR/EDR, 2MHz for LE

Duplexing: TDD

Modulation: FHSS, GFSK, $\pi/4$ -DQPSK, 8DPSK

Symbol Rate: 1Mbps (GFSK), 2Mbps ($\pi/4$ -DQPSK), 3Mbps (8DPSK), LE (GFSK)



4 Module Hardware Overview

4.1 Block Diagram

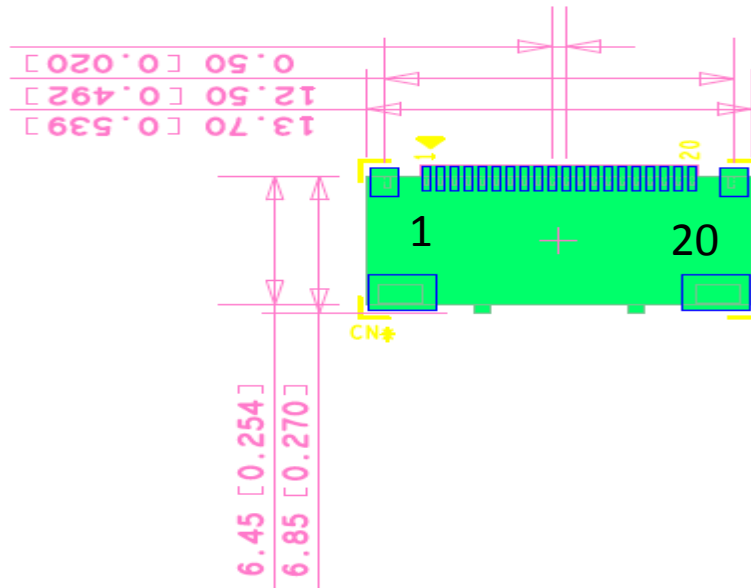
The general HW architecture is shown below Figure:
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4.2 Features

- ◆ IEEE802.11a/b/g/n/ac (2X2) base on MTK MT7668BUN
- ◆ Support BT4.2+LE
- ◆ USB 2.0 Interface, High and Full Speeds supported.
- ◆ Module is powered by the host with a 3.3V +/- 10% supply.
- ◆ Three Metal Antennas on board.
- ◆ 4 layers through Hole PCB design with FR-4 Tg-140 material.

4.3 Interface and Connector

- ◆ Pin definition:
- ◆ Vendor: IRISO
- ◆ Vendor P/N: IMSA-11501S-20Y900



Pin Number	Symbol Name	Status	Pin definition
1	GND	-	Ground
2	GND	-	Ground
3	RST_L	Input	"L"-drive reset signal input from Host
4	WOW_L	Output	Wake on WLAN signal output "L"-drive is hoped when awake Host
5	GND	-	Ground
6	GND	-	Ground
7	VCC	PWR	DC +3.3V
8	VCC	PWR	DC +3.3V
9	VCC	PWR	DC +3.3V
10	VCC	PWR	DC +3.3V
11	VCC	PWR	DC +3.3V
12	VCC	PWR	DC +3.3V
13	VCC	PWR	DC +3.3V
14	GND	-	Ground
15	GND	-	Ground
16	GND	-	Ground
17	DP	I/O	USB_DATA+
18	DM	I/O	USB_DATA-
19	GND	-	Ground
20	GND	-	Ground



5 General Specification

Item	Specification	
WiFi Frequency Range	2412MHz~2462MHz	
	5180MHz~5240MHz	
	5260MHz~5320MHz	
	5500MHz~5700MHz	
	5745MHz~5825MHz	
BT Frequency Range	2402MHz~2480MHz	
Maximum Ripple on Supplied Voltage	330mVpp max	
Temperature	Operating Temperature	-10°C ~60°C
	Storage Temperature	-40°C ~85°C
Humidity	Operating Humidity	20%~90% (Non-condensing)
	Storage Humidity	20%~90% (Non-condensing)

6 Electrical Specification

6.1 Absolute maximum rating

Symbol	Parameter	Maximum rating	Unit
VDD33	3.3V Supply Voltage	-0.3 to 3.63	V

6.2 Recommended operating rating

Symbol	Rating	Min	Typ	Max	Unit
VDD33	3.3V supply voltage	2.97	3.3	3.63	V
T AMBIENT	Ambient Temperature	-10		60	°C

6.3 DC Characteristics

Symbol	Parameter	Conditions	Min	Typ.	Max	Unit
V _{IL}	Input Low Voltage	Input Voltage VDD33	-0.3		VDD33*0.25	V
V _{IH}	Input High Voltage	Input Voltage VDD33	VDD33*0.625		VDD33+0.3	V
V _{OL}	Output Low Voltage	Input Voltage VDD33 I _{OL} =4~16mA	-0.3		0.4	V
V _{OH}	Output High Voltage	Input Voltage VDD33 I _{OL} =4~16mA	VDD33-0.4		VDD33+0.3	V
R _{PU}	Input Pull-up Resistance	Input Voltage VDD33 PU=high, PD=low	40	75	190	KΩ
R _{PD}	Input Pull-Down Resistance	Input Voltage VDD33 PU=low, PD=high	40	75	190	KΩ

6.4 ESD Information

Mode	Level	Unit
HBM	+/-1500	V



7. Host integration instructions

Install module through golden finger.

Federal Communication Commission Interference 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.

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

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 device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

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

The antenna must be installed 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.

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

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 FCC authorization is no longer considered valid and the FCC 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 FCC authorization.

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: AK8J20H098”. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

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.

Industry Canada statement:

This device complies with ISED’s licence-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d’ ISED applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes : (1) le

dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement:

This equipment complies with ISED 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 ISED 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 coimplanté 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: 409B-J20H098".

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: 409B-J20H098".

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 be such that the equipment still complies with the e.i.r.p. limit;
- (iii) the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and
- (iv) the worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in Section 6.2.2(3) shall be clearly indicated.
- (v) 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 5150-5250 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 de 5250 à 5350 MHz et de 5470 à 5725 MHz doit être conforme à la limite de la p.i.r.e.;
- (iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande de 5725 à 5850 MHz) doit être conforme à la limite de la p.i.r.e. spécifiée pour l'exploitation point à point et l'exploitation non point à point, selon le cas;
- (iv) les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la p.i.r.e. applicable au masque d'élévation, et énoncée à la section 6.2.2 3), doivent être clairement indiqués.
- (v) 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 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.


低功率電波輻射性電機管理辦法

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。

1. 使用此產品時應避免影響附近雷達系統之操作。
2. 高增益指向性天線只得應用於固定式點對點系統。(無法外接或替換天線之器材，不用標示)
3. 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。
4. 系統廠商應於平台上標示「本產品內含射頻模組：XXXyyyLPDzzzz-x」字樣。