



RTL8851BE
11ax RTL8851BE Combo module
User's Manual

Preliminary Version

2022/12/20



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www.realtek.com

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Parameter	Minimum	Maximum	Units
Storage Temperature	-55	+125	°C
Ambient Operating Temperature	-10	70	°C
Junction Temperature	0	125	°C

Humidity Information

MSL level	3
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Warning

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 device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC multi-transmitter product procedures.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only. FCC regulations restrict the frequency 5850-5895MHz operation of this device to indoor use only.

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

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.

Radiation Exposure Statement:

The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

The SAR test is according to KDB 616217 for test requirements.”

The maximum output power is reduced by software to perform SAR evaluation as application.

The SAR evaluation is according to KDB 616217, and the module approach distance restriction is 5 mm for notebook, 10 mm for tablet.

When this module is installed into the host as portable configuration, only PIFA Antenna as described in this use manual is applicable. When other antenna type is used, it is required for a separate reassessment through a class II permissive change application or new certification

This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

This equipment complies with FCC mobile 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 & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

RTL8851BE User's Manual

Antenna NO.	RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
1	Chain 1	REALTEK	RTK-ANT-0022	3.4	2.4~2.4835GHz	PIFA	IPEX4	300
				5	5.15~5.895GHz			
	Chain 2	REALTEK	RTK-ANT-0022	3.4	2.4~2.4835GHz	PIFA	IPEX4	300
				5	5.15~5.895GHz			
2	Chain 1	Aristotle	RFA-27-C38H1-MHF4300	3	2.4~2.4835GHz	Dipole	IPEX4	300
				5	5.15~5.895GHz			
	Chain 2	Aristotle	RFA-27-C38H1-MHF4300	3	2.4~2.4835GHz	Dipole	IPEX4	300
				5	5.15~5.895GHz			
3	Chain 1	LYNwave	ALX22F-120AA0-00	3.2	2.4~2.4835GHz	Monopole	IPEX4	200
				4	5.15~5.895GHz			
	Chain 2	LYNwave	ALX22F-120AA0-00	3.2	2.4~2.4835GHz	Monopole	IPEX4	200
				4	5.15~5.895GHz			

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following:
 “Contains **FCC ID: TX2-RTL8851BE**”. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all 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.

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.

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment

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 greater than 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 à plus de 20 cm entre le radiateur et votre corps.

Radiation Exposure Statement:

The product comply with the Canada portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

Déclaration d'exposition aux radiations:

Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrôlé.

Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.

The SAR test is according to KDB 616217 for test requirements.”

The maximum output power is reduced by software to perform SAR evaluation as application.

Le test SAR est conforme à KDB 616217 pour les exigences de test.

La puissance de sortie maximale est réduite par un logiciel pour effectuer une évaluation SAR en tant qu'application.

The SAR evaluation is according to KDB 616217, and the module approach distance restriction is 5 mm for notebook, 10 mm for tablet.

L'évaluation SAR est conforme à KDB 616217, et la restriction de distance d'approche du module est de 5 mm pour le portable, 10 mm pour la tablette.

When this module is installed into the host as portable configuration, only PIFA

Antenna as described in this use manual is applicable. When other antenna type is used, it is required for a separate reassessment through a class II permissive change application or new certification

Lorsque ce module est installé dans l'hôte en tant que configuration portable, seule l'antenne PIFA telle que décrite dans ce manuel d'utilisation est applicable. Lorsqu'un autre type d'antenne est utilisé, il est requis pour une réévaluation distincte via une demande de changement permissif de classe II ou une nouvelle certification

Opération portée sur le corps

Cet appareil a été testé pour des opérations typiques portées sur le corps. Pour se conformer aux exigences d'exposition RF, une distance de séparation minimale de **5 mm** doit être maintenue entre le corps de l'utilisateur et le combiné, y compris l'antenne. Les clips de ceinture, les étuis et les accessoires similaires tiers utilisés par cet appareil ne doivent contenir aucun composant métallique. Les accessoires portés sur le corps qui ne répondent pas à ces exigences peuvent ne pas être conformes aux exigences d'exposition RF et doivent être évités.

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

- 1) The antenna must be installed and operated with greater than 20cm 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 et exploitée avec plus de 20 cm 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 and operated with greater than 20cm between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains IC: **6317A-RTL8851BE**”.

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un appareil où l'antenne peut être installée et utilisée à plus de 20 cm entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: **6317A-RTL8851BE** ".

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) for devices with detachable antenna(s), 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) for devices with detachable antenna(s), 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 as appropriate;
- (iv) where applicable, antenna type(s), antenna models(s), and 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.

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) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis pour les dispositifs utilisant les bandes de 5 250 à 5 350 MHz et de 5 470 à 5 725 MHz doit être conforme à la limite de la p.i.r.e;
- (iii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis (pour les dispositifs utilisant la bande de 5 725 à 5 850 MHz) doit être

conforme à la limite de la p.i.r.e. spécifiée, selon le cas;

(iv) lorsqu'il y a lieu, les types d'antennes (s'il y en a plusieurs), les numéros de modèle de l'antenne et les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la p.i.r.e. applicable au masque d'élévation, énoncée à la section 6.2.2.3, doivent être clairement indiqués

This radio transmitter [IC: **6317A-RTL8851BE**] has been approved by Innovation, Science and Economic Development Canada to operate with 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.

Le présent émetteur radio [IC: **6317A-RTL8851BE**] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

Antenna NO.	RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
1	Chain 1	REALTEK	RTK-ANT-0022	3.4	2.4~2.4835GHz	PIFA	IPEX4	300
				5	5.15~5.85GHz			
	Chain 2	REALTEK	RTK-ANT-0022	3.4	2.4~2.4835GHz	PIFA	IPEX4	300
				5	5.15~5.85GHz			
2	Chain 1	Aristotle	RFA-27-C38H1-MHF4300	3	2.4~2.4835GHz	Dipole	IPEX4	300
				5	5.15~5.85GHz			
	Chain 2	Aristotle	RFA-27-C38H1-MHF4300	3	2.4~2.4835GHz	Dipole	IPEX4	300
				5	5.15~5.85GHz			
3	Chain 1	LYNwave	ALX22F-120AA0-00	3.2	2.4~2.4835GHz	Monopole	IPEX4	200
				4	5.15~5.85GHz			
	Chain 2	LYNwave	ALX22F-120AA0-00	3.2	2.4~2.4835GHz	Monopole	IPEX4	200
				4	5.15~5.85GHz			

NCC Statement

取得審驗證明之低功率射頻器材，非經核准，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。

低功率射頻器材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。前述合法通信，指依電信管

理法規定作業之無線電通信。低功率射頻器材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。

系統廠商應於平台上標示「本產品內含射頻模組：XXXyyyLPDzzzz-x」字樣。

系統廠商外包裝需標示 NCC LOGO

本器材限使用下列天線

Antenna NO.	RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
1	Chain 1	REALTEK	RTK-ANT-0022	3.4	2.4~2.4835GHz	PIFA	IPEX4	300
				5	5.15~5.85GHz			
	Chain 2	REALTEK	RTK-ANT-0022	3.4	2.4~2.4835GHz	PIFA	IPEX4	300
				5	5.15~5.85GHz			
2	Chain 1	Aristotle	RFA-27-C38H1-MHF4300	3	2.4~2.4835GHz	Dipole	IPEX4	300
				5	5.15~5.85GHz			
	Chain 2	Aristotle	RFA-27-C38H1-MHF4300	3	2.4~2.4835GHz	Dipole	IPEX4	300
				5	5.15~5.85GHz			
3	Chain 1	LYNwave	ALX22F-120AA0-00	3.2	2.4~2.4835GHz	Monopole	IPEX4	200
				4	5.15~5.85GHz			
	Chain 2	LYNwave	ALX22F-120AA0-00	3.2	2.4~2.4835GHz	Monopole	IPEX4	200
				4	5.15~5.85GHz			

Japan Statement

Host system must be labeled with "Contains MIC ID:xxxxxx“, MIC ID displayed on label.

This device complies with Directive 2014/53/EU and UK Radio Equipment Regulations 2017 SI 2017/1206. issued by the Commission of the European Community.



AT	BE	BG	CZ	DK	EE	FR
DE	IS	IE	IT	EL	ES	CY
LV	LI	LT	LU	HU	MT	NL
NO	PL	PT	RO	SI	SK	TR
FI	SE	CH	UK	HR		



UK

- Declaration of Conformity

EU Declaration of Conformity (DoC)

Hereby we,

Name of manufacturer: Realtek Semiconductor Corp.
 Address: No. 2, Innovation Road II,
 Zip code & City: Hsinchu Science Park, Hsinchu300,
 Country: Taiwan

declare that this DoC is issued under our sole responsibility and that this product:

Product description: 11ax RTL8851BE Combo module
 Type designation(s): RTL8851BE
 Trademark: REALTEK
 Batch / Serial number: N.A.

is in conformity with the relevant Union harmonization legislation:

Radio Equipment directive: 2014 / 53 / EU

and other Union harmonization legislation where applicable:

with reference to the following standards applied:

EN 55032:2015 +A11:2020
EN 301489-1 V2.2.3 (2019-11) ; EN 301489-17 V3.2.4 (2020-09)

EN 300328 V2.2.2 (2019-07)

EN 301893 V2.1.1 (2017-05)

EN 300440 V2.1.1 (2017-03)

EN 62311:2008 ; EN 50665 :2017

IEC 62368-1:2018

The Notified Body Kiwa Ltd., with Notified Body number 0063 performed:

[choose applicable Modules: B+C]

The software version of this equipment: 6001.19.102.0

The frequency and maximum transmitted power in EU are listed as below

Output Power (e.i.r.p.)	WLAN: 2.4GHz: 19.98 dBm 5.18~5.24 GHz : 22.77 dBm 5.26~5.32 GHz :22.80 dBm 5.50~5.70 GHz : 22.95 dBm 5.745~5.825 GHz : 13.88 dBm BT-LE: 11.06 dBm BT-EDR: 16.55 dBm
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UK Declaration of Conformity

We, **Realtek Semiconductor Corp.**

(name of manufacturer or authorized representative)

Of **No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan**

(address)

declare under our sole responsibility that the product

Product Description: **11ax RTL8851BE Combo module**

Brand Name: **REALTEK**

Model No.: **RTL8851BE**

(detailed description of product including name, type, model and supplementary information such as lot, batch or serial number, sources and number of items)

to which this declaration relates, is conformity with the following relevant UK legislation, standards and/or other normative documents.

EN 300328 V2.2.2 (2019-07)

Draft EN 301893 V2.1.50 (2022-12)

EN 62311:2008 ; EN 50665 :2017

EN 55032:2015 +A11:2020

EN 301489-1 V2.2.3 (2019-11) ; EN 301489-17 V3.2.4 (2020-09)

IEC 62368-1:2018

We hereby declare that the above named product is conformity to all the essential requirements of the UK Radio Equipment Regulations 2017 SI 2017/1206.

The UK Approved Body Kiwa Ltd., with Approved Body number 0558 performed:

[choose applicable Modules: B+C]

The software version of this equipment: 6001.19.102.0

The frequency and maximum transmitted power in UK are listed as below

Output Power (e.i.r.p.)	WLAN: 2.4GHz: 19.98 dBm 5.18~5.24 GHz : 22.93 dBm 5.26~5.32 GHz :22.97 dBm 5.50~5.70 GHz : 22.95 dBm 5.69~5.72 GHz: 28.03 dBm 5.745~5.825 GHz : 22.99 dBm BT-LE: 11.06 dBm BT-EDR: 16.55 dBm
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- WLAN 5GHz: Operations in the 5.15-5.35GHz band are restricted to indoor usage only.

Installing the Wireless NGFF module Hardware

Installing PCIe NGFF2230 module to PCIe NGFF2230 connector and connect two external Wi-Fi antennas on I-PEX connectors.



Un-installing the Wireless NGFF module Hardware

Remove 2 external Wi-Fi Antennas from the Wireless PCIe NGFF2230 module board and remove the Wireless PCIe NGFF2230 module board from PCIe NGFF2230 connector port



Installing the WLAN & Bluetooth USB NGFF module

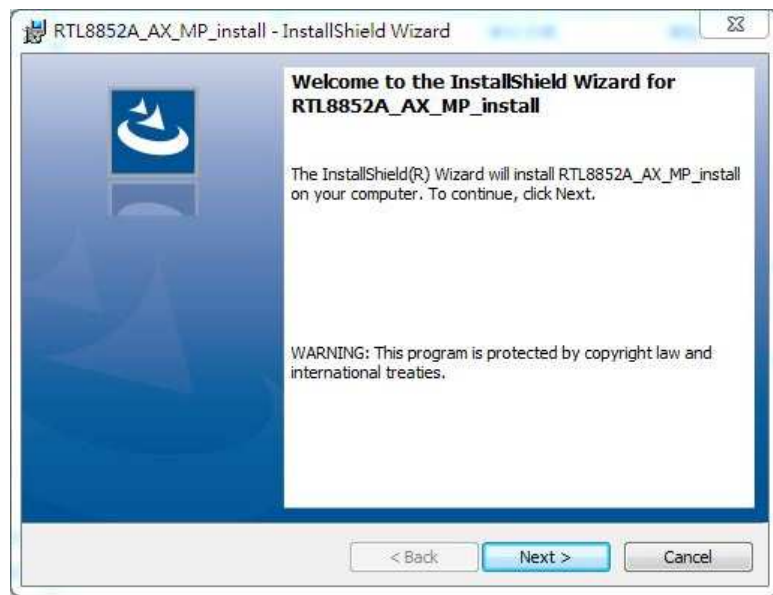
Software

Before you proceed with the installation, please notice following descriptions.

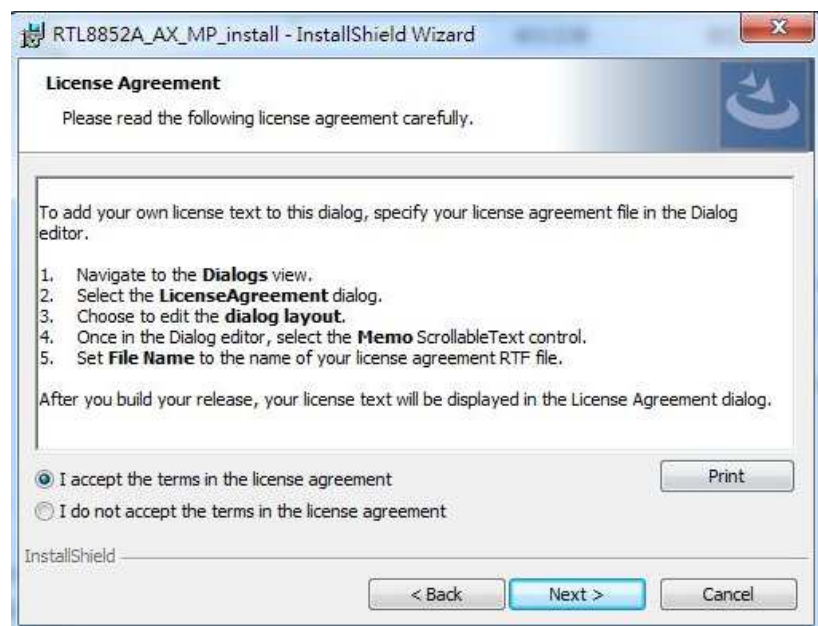
Note1: The following installation was operated under Windows 7.

Note2: If you have installed the WLAN driver & utility before, please uninstall the old version first.

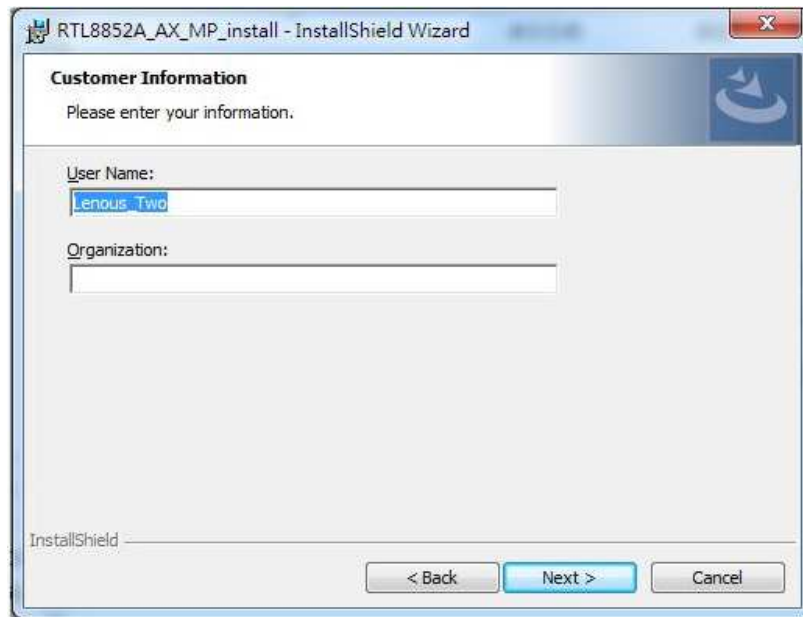
A. Execute the “setup.exe”, Click “Next” to process the installation



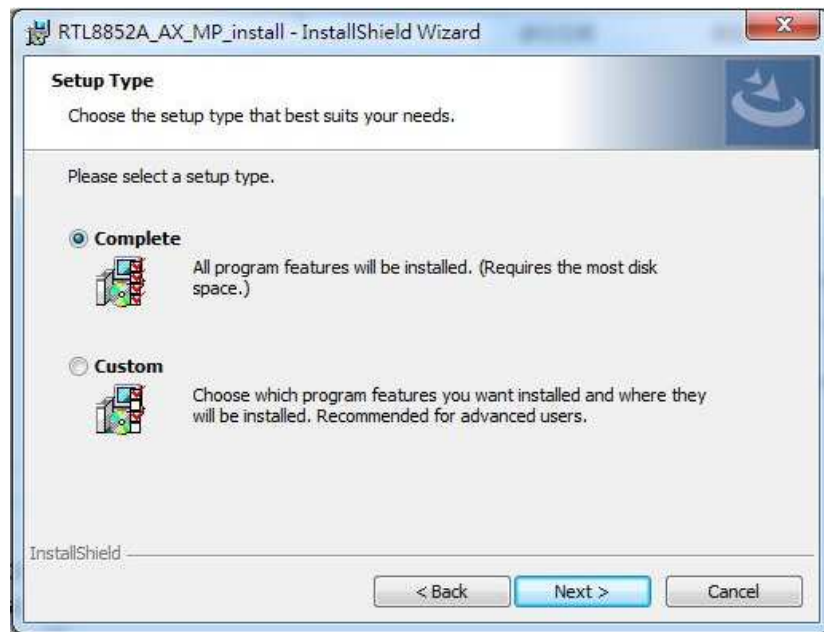
B. Select "I accept the terms in license agreement" and click "Next" to process the installation



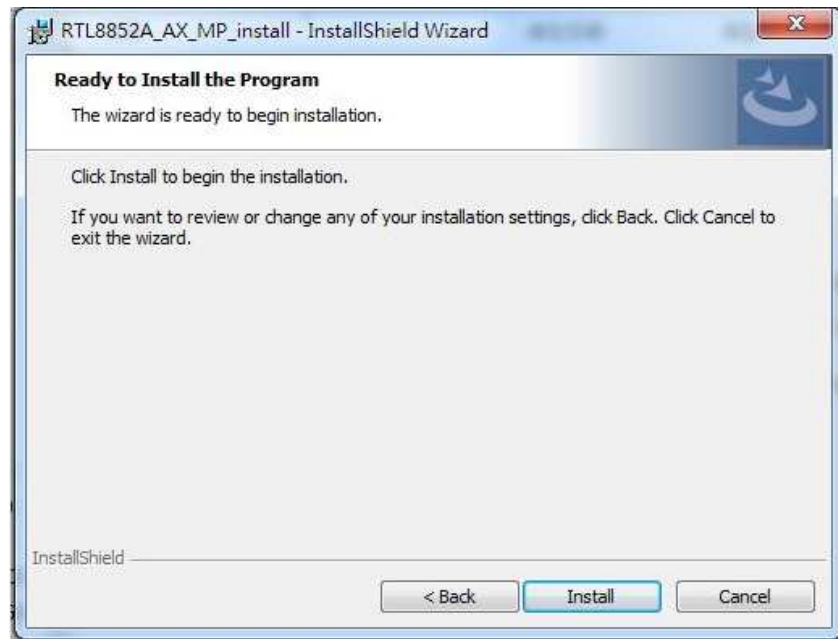
C. Click “Next” button.



D. Select “Complete” and click “Next” button.



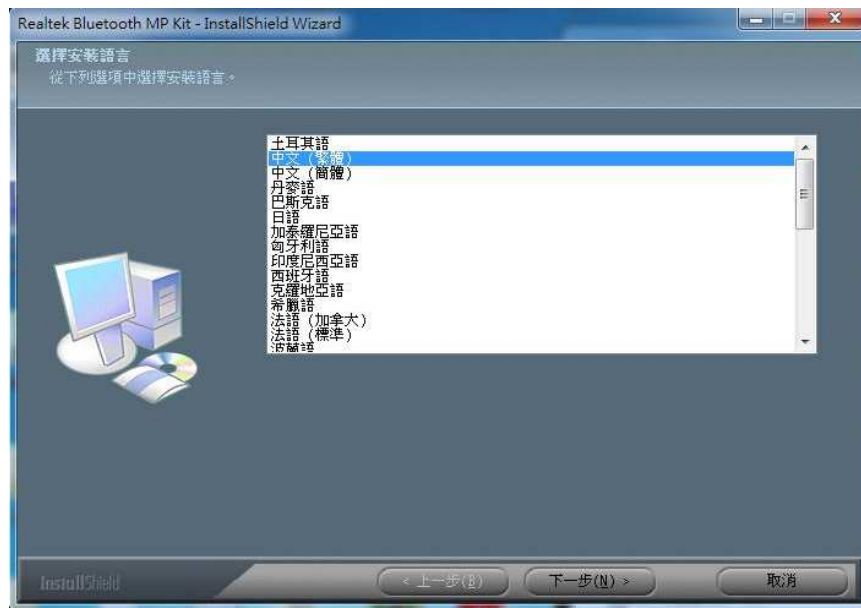
E. Click "Install" button.



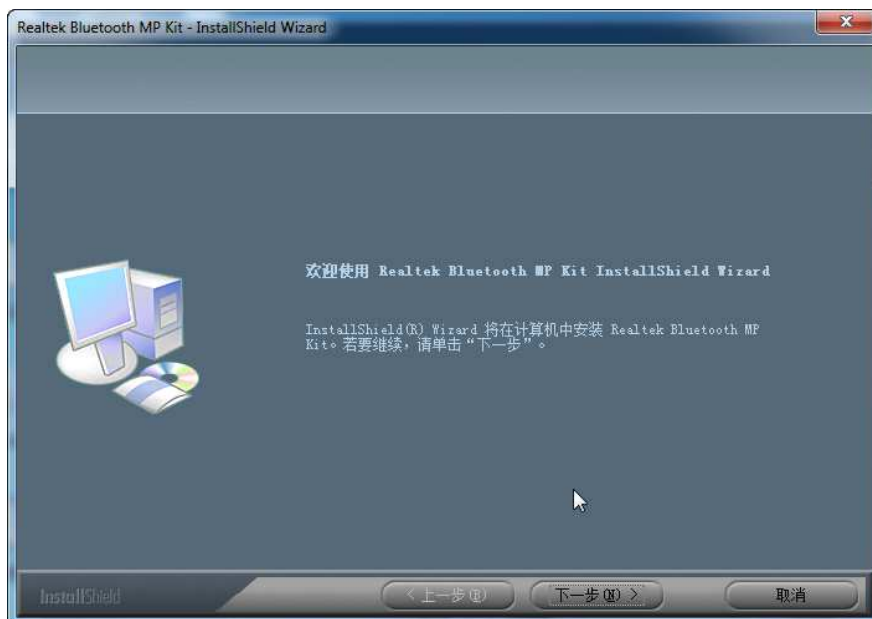
F. Click "Finish" button.



G. Please click “下一步”to continue.



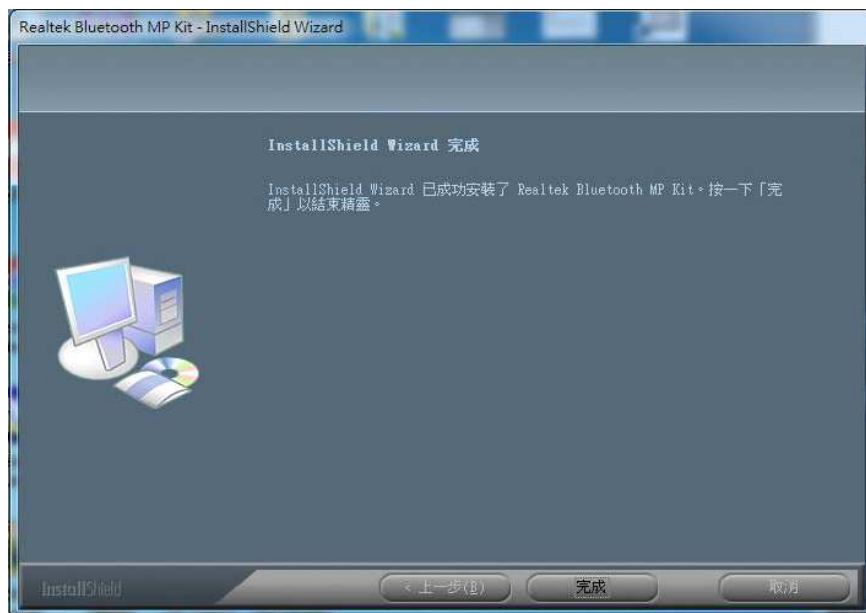
H. Please click “下一步”to continue.



I. Please click “安裝” to start installation.



J. Please click “完成” to finish the installation.



Un-installing the Wireless NGFF module Software

A. Uninstall the RTL8852BE WLAN Driver from “Start”→ “Control Panel”→ “Programs”

Please select items as below and click “Uninstall” to remove RTL8852BE WLAN, BT driver and MP UI.

