Manuals+ — User Manuals Simplified.

REALTEK RTL8851BE Combo Module User Manual

Contents

REALTEK RTL8851BE Combo Module

REALTEK-RTL8851BE-Combo-Module-PRODUCT

Specifications

- Model: RTL8851BE

- Module Type: 11ax RTL8851BE Combo module

- Version: Preliminary Version 2022/12/20

- Manufacturer: Realtek Semiconductor Corp.

- Address: No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan

- Contact: Tel.: +886-3-578-0211, Fax: +886-3-577-6047
- Website: **www.realtek.com**

Product Usage Instructions

TemperatureThe RTL8851BE module should be operated within the specified temperature range to ensure optimal performance and longevity. It is recommended to use the module in an environment with a temperature between 0°C and 40°C.

WarningFederal 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.
2. This device must accept any interference received, including interference that may cause undesired operation.

To minimize interference and ensure proper operation, follow these recommendations:

- 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 a minimum distance of 20cm between the radiator and your body.

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:

1. List of applicable FCC rules
2. Summarize the specific operational use conditions
3. Limited module procedures
4. Trace antenna designs

For more detailed information on the above sections, please refer to the RTL8851BE User's Manual.

Frequently Asked Questions (FAQ)

What is the recommended operating temperature for the RTL8851BE module?The recommended operating temperature range for the RTL8851BE module is 0°C to 40°C.

Can the RTL8851BE module cause interference with other devices?No, the RTL8851BE module complies

with Part 15 of the FCC Rules and should not cause harmful interference. However, it is important to follow the recommended guidelines to minimize interference.

Can I use the RTL8851BE module outdoors?No, the operation in the frequency range of 5.15-5.25GHz is restricted to indoor usage only.

What is the minimum distance between the RTL8851BE module and the body for safe operation? The RTL8851BE module should be installed and operated with a minimum distance of 20cm between the radiator and your body to comply with FCC radiation exposure limits.

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www.realtek.com

Temperature

Temnerature Limit Ratings

Table 12. Temperature Limit Ratings

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

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 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.

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

List of applicable FCC rules
This module has been tested for compliance to FCC Part 15

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.

Limited module procedures
Not applicable.

Trace antenna designs
Not applicable.

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.

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.

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			

Label and compliance information
The final end product must be labeled in a visible area with the following: "Contains FCC 11): 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.

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 cenain 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: (l) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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.

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.

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.

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".

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.

Caution :

1. 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;

2. 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;

3. 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;

4. 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.

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.

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

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 Smtement

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

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

	WLAN:
Output Power (e.i.r.p.)	**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

WLAN 5GHz: Operations in the 5.15-5.35GHz band are restricted to indoor usage only.

Installing the Wireless NGFF module Hardware

Insulling PCIe NGFF2230 moduE to PCIe NGFF2230 conne&r and connect Ovo external Wi-Fi antennas on I-PEX connectors.

Un-installing the Wireless NGFF module Hardware

Remove 2 Wi-Fi Antennas from ere WireEss PCIe NGFF2230 moduE board and remove Wirebss PCIe NGFF2230 board from PCIe NGFF2230 port

Installing the WLAN & Bluetooth USB NGFF module Software

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

Note 1: The following installation was operated under Windows 7.
Note 2: If you have installed the WLAN driver & utility before, please uninstall the old version first.

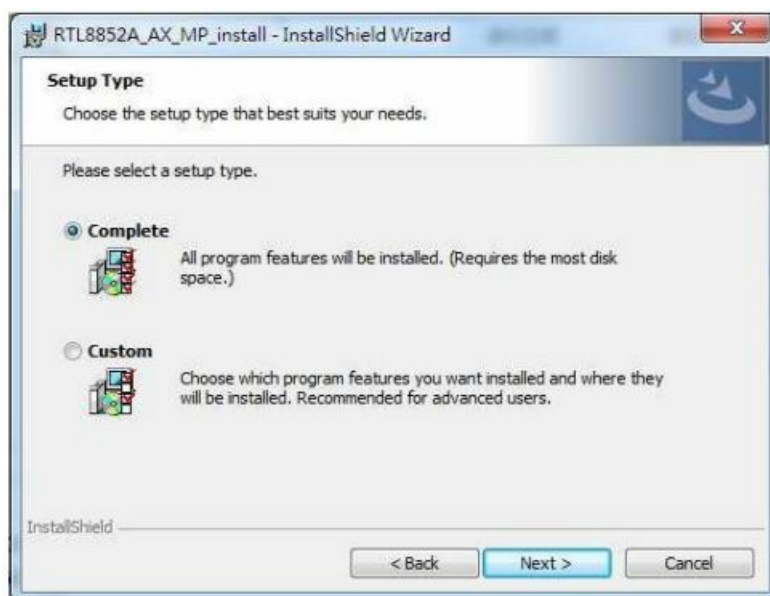- A. Execute the "setup.exe", Click "Next" to process the installation

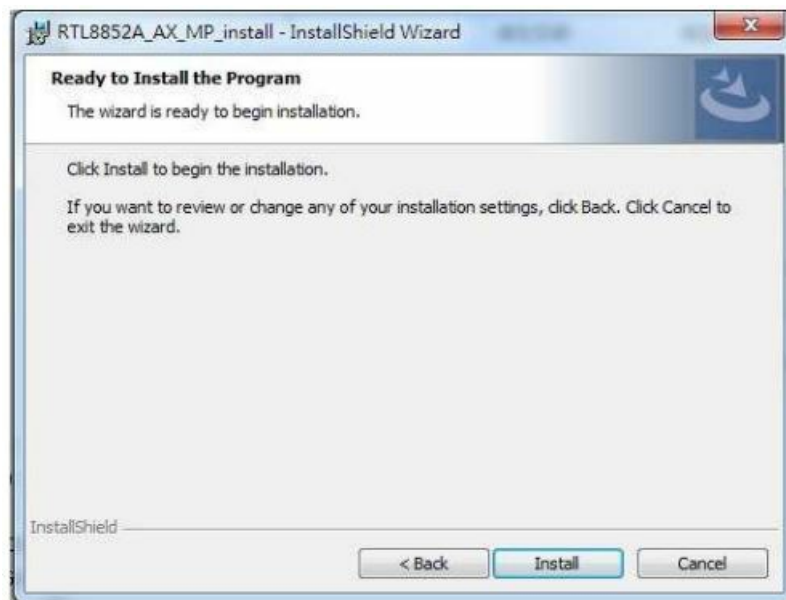- B. Select "I accept the terms in license agreement" and click "Next" to process the installation
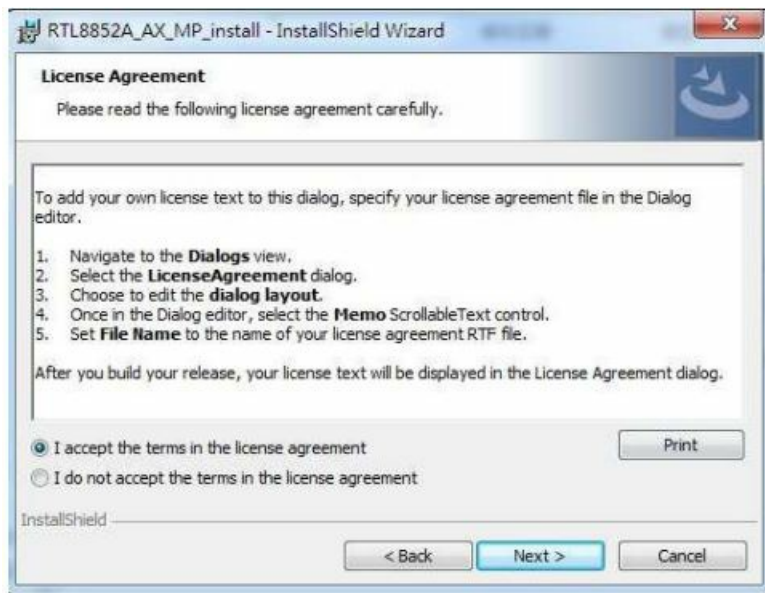
- C. Click "Next" button.
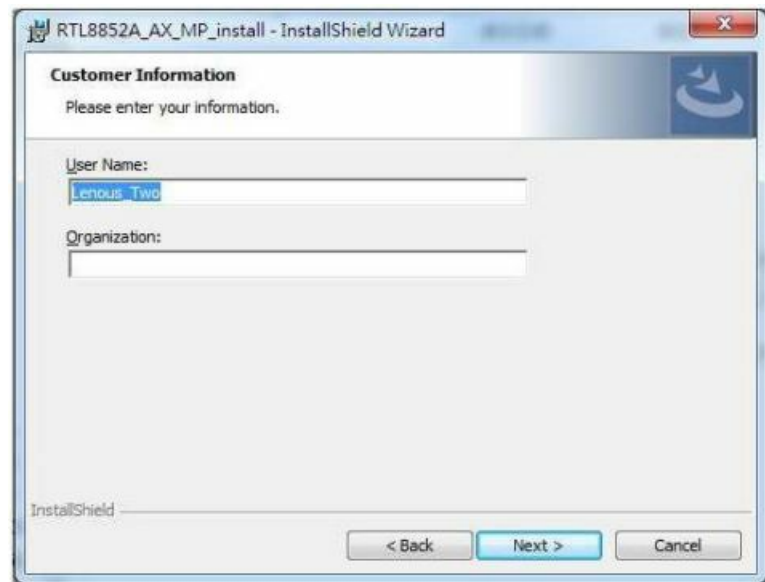
- D. Select "Complete" and click "Next" button.
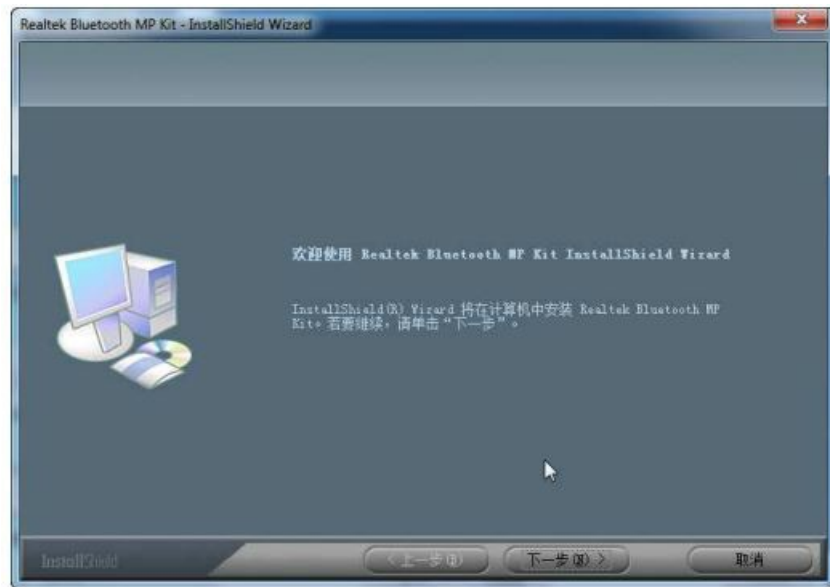

- E. Click "Install" button.

- F. Click "Finish" button.

- G. Please click " "to continue.
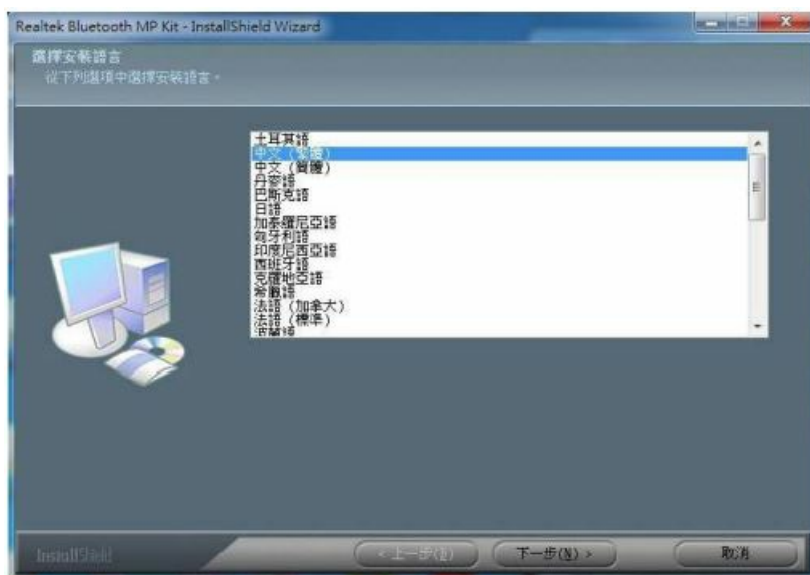
- H. Please click continue.

- I. Please click "4. 'to start installation.

- J. Please click 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 I-JI.

Documents / Resources

[**REALTEK RTL8851BE Combo Module**](#) [pdf] User Manual
RTL8851BE Combo Module, RTL8851BE, Combo Module, Module

[**REALTEK RTL8851BE Combo Module**](#) [pdf] User Manual
TX2-RTL8851BE, TX2RTL8851BE, RTL8851BE, RTL8851BE Combo Module, Combo Module, Module

References

- [**User Manual**](#)