RTL8723BS

Combo NGFF1216 User's Manual

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USING THIS DOCUMENT

This document is intended for the software engineer's reference and provides detailed programming information.

Though every effort has been made to ensure that this document is current and accurate, more information may have become available subsequent to the production of this guide. In that event, please contact your Realtek representative for additional information that may help in the development process.

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1. General Description

1.1. RTL8723BS

The Realtek RTL8723BS is a highly integrated single-chip 802.11n Wireless LAN (WLAN) SDIO network interface controller with integrated Bluetooth 2.1/3/0/4.0 USB interface controller. It combines a WLAN MAC, a 1T1R capable WLAN baseband, and RF in s single chip. The RTL8723BS provides a complete solution for a high-performance integrated wireless and Bluetooth device.

The integration provides better coordination between 802.11 and Bluetooth, and with sophisticated dynamic power control and packet traffic arbitration, RTL8723BS is able to provide the best coexistence performance.

RTL8723BS also integrates RF/PA/LNA for both 802.11n and Bluetooth so that the number of external components is reduced to minimum. The 802.11 part supports 150Mbps PHY rate and delivers reliable throughput from an extended distance.

The Bluetooth part supports latest 3.0+HS/4.0+LE operation and provides smooth user experience under all usage scenarios. Optimized RF architecture and baseband algorithms provide superb performance and lowest power consumption.

1.2. Environmental

1.2.1. Operating

Operating Temperature: 0 to 70 °C
Relative Humidity: 5-90% (non-condensing)

1.2.2. Storage

Temperature: -55 to 125 °C
Relevant Humidity: 5-95% (non-condensing)

1.3. Functional Specifications

Table 1. Functional Specifications

Standards	***WiFi:*** IEEE 802.11b, IEEE 802.11g, Draft IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i ***BT:*** BT v3.0, v4.0
Bus Interface	***WiFi:*** SDIO ***BT:*** UART
Form Factor	NGFF1216
Data Rate	**802.11b:** 11, 5.5, 2, 1 Mbps; **802.11g:**

	54, 48, 36, 24, 18, 12, 9, 6 Mbps **802.11n:** MCS 0 to 7 for HT20MHz; MCS 0 to 7 for HT40MHz **BT:** 1/2/3 Mbps
Media Access Control	***WiFi:*** CSMA/CA with ACK ***WiFi* + BT:** AFH, Time Division
Modulation Techniques	***802.11b***: CCK, DQPSK, DBPSK ***802.11g***: 64 QAM, 16 QAM, QPSK, BPSK ***802.11n***: BPSK, QPSK, 16-QAM, 64-QAM ***BT***: GFSK, π/4 DQPSK, 8DPSK
Network Architecture	***WiFi***: Ad-hoc mode (Peer-to-Peer) Infrastructure mode
Operating Channel	***WiFi 2.4GHz:*** 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 13: (Ch. 1-14) – Japan ***BT 2.4GHz:*** Ch. 0 ~78
Frequency Range	2.400GHz ~ 2.4835 GHz
Security	***WiFi*** : WPA, WPA-PSK, WPA2, WPA2-PSK, WEP 64bit & 128bit, IEEE 802.11x, IEEE 802.11i ***BT:*** Simple Paring
Operating Voltage	3.3 V ±9% I/O supply voltage

1.4. Warning

1.4.1 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.

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.

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.

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.

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC multi-transmitter product procedures.
Refering to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without C2P.

This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.
Additional testing and certification may be necessary when multiple modules are used.

USERS MANUAL OF THE END PRODUCT:
In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of 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.

LABEL OF THE END PRODUCT:
The final end product must be labeled in a visible area with the following " Contains TX FCC ID: TX2-RTL8723BS ". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

1.4.2 Industry Canada Statement

This device complies with Industry Canada license-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

French translation:
Ce dispositif est conforme aux CNR d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet 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.

This device has been designed to operate with an antenna having a maximum gain of 3.5dBi.
Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.
To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the EIRP is not more than required for successful communication.

French translation:
Ce dispositif a été conçu pour fonctionner avec une antenne ayant un gain maximum de 3.5 dBi. Une antenne à gain plus élevé est strictement interdite par les règlements d'Industrie Canada. L'impédance d'antenne requise est de 50 ohms.
Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peutfonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pourl'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectriqueà l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que lapuissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité

nécessaire àl'établissement d'une communication satisfaisante.

IMPORTANT NOTE:

IC 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.

French translation:

NOTE IMPORTANTE: (Pour l'utilisation de dispositifs mobiles)
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.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.
Pour les produits disponibles aux États-Unis / Canada du marché, seul le canal 1 à 11 peuvent être exploités. Sélection d'autres canaux n'est pas possible.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures.
Refering to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without reassessment permissive change.
Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

This module is intended for OEM integrator. The OEM integrator is still responsible for the IC compliance requirement of the end product, which integrates this module.

USERS MANUAL OF THE END PRODUCT:
In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. 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.

LABEL OF THE END PRODUCT:
The final end product must be labeled in a visible area with the following " Contains TX IC : 6317A-RTL8723BS ".

This radio transmitter (identify the device by certification number, or model number if Category II) 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 (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) 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.

1.4.3 NCC 警語

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。

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。

本模組於取得認證後將依規定於模組本體標示審合格籤。

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

1.4.4 Japan Statement

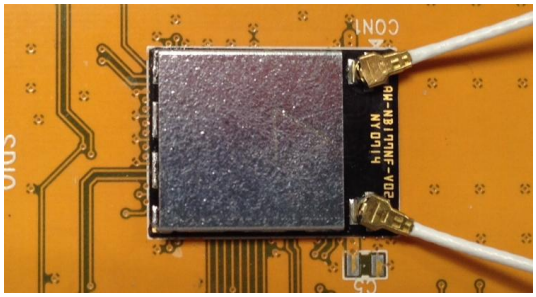
Host system must be labeled with "Contains MIC ID:xxxxxx“, MIC ID displayed on label

Installing the Wireless NGFF1216 module Hardware

Step 1. Shut down the computer.

Step 2. Mount the NGFF1216 module on motherboard by soldering.

Step 3. Connect external Wi-Fi/BT antenna to corresponding RF connector.

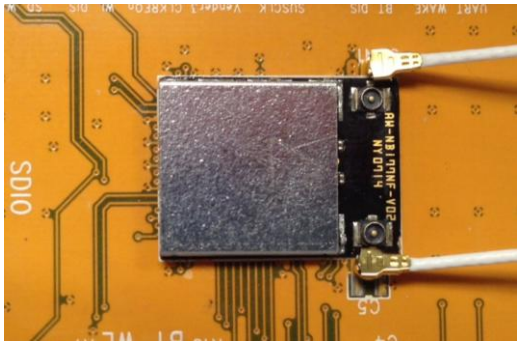


Step 4. Power on the computer.

Un-installing the Wireless NGFF1216 module Hardware

Step 1. Shut down the computer.

Step 2. Remove external Wi-Fi/BT antenna from the wireless NGFF1216 module board.



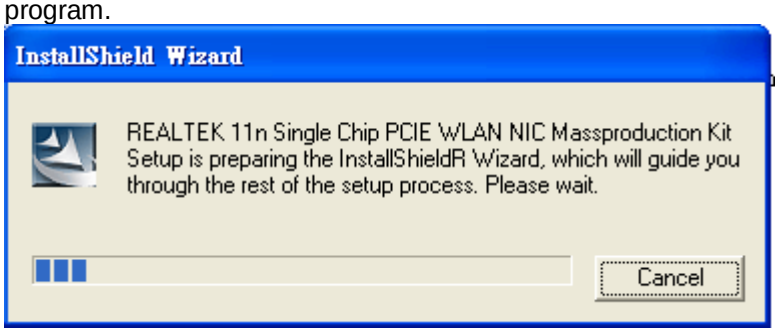
Step 3. Unmount the NGFF1216 module from motherboard by soldering.

Installing the Wireless SDIO module Software

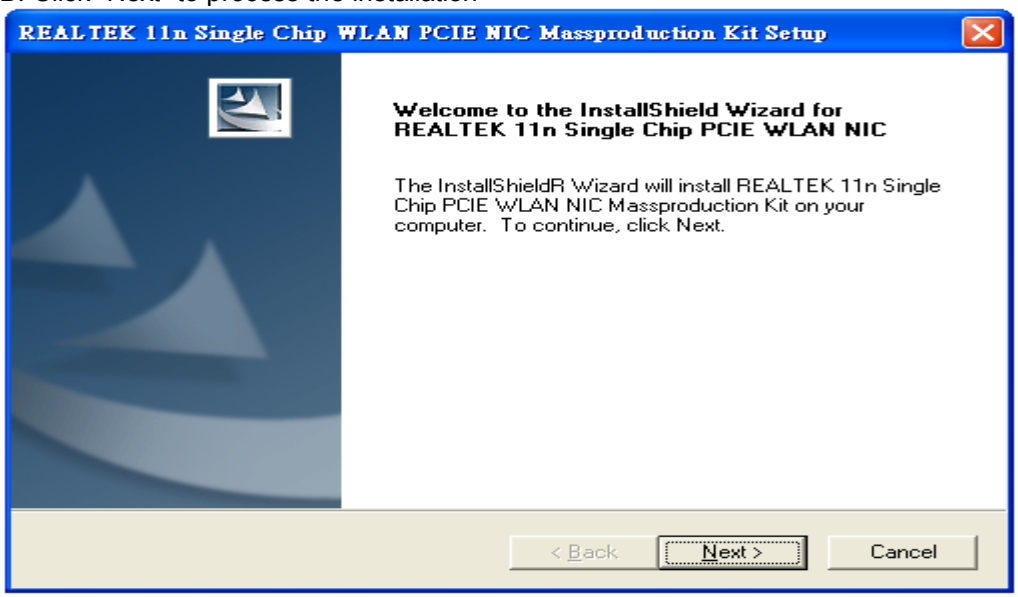
Before you proceed with the installation, please notice following descriptions.
Note1: The following installation was operated under Windows XP.
(Procedures are similar for Windows 98SE/Me/2000.)
Note2: If you have installed the WLAN driver & utility before, please uninstall the old version first.
If you install the "Realtek11n Single Chip SDIO WLAN NIC Mass production kit" into your laptop computer

before installing the software program from the CD.

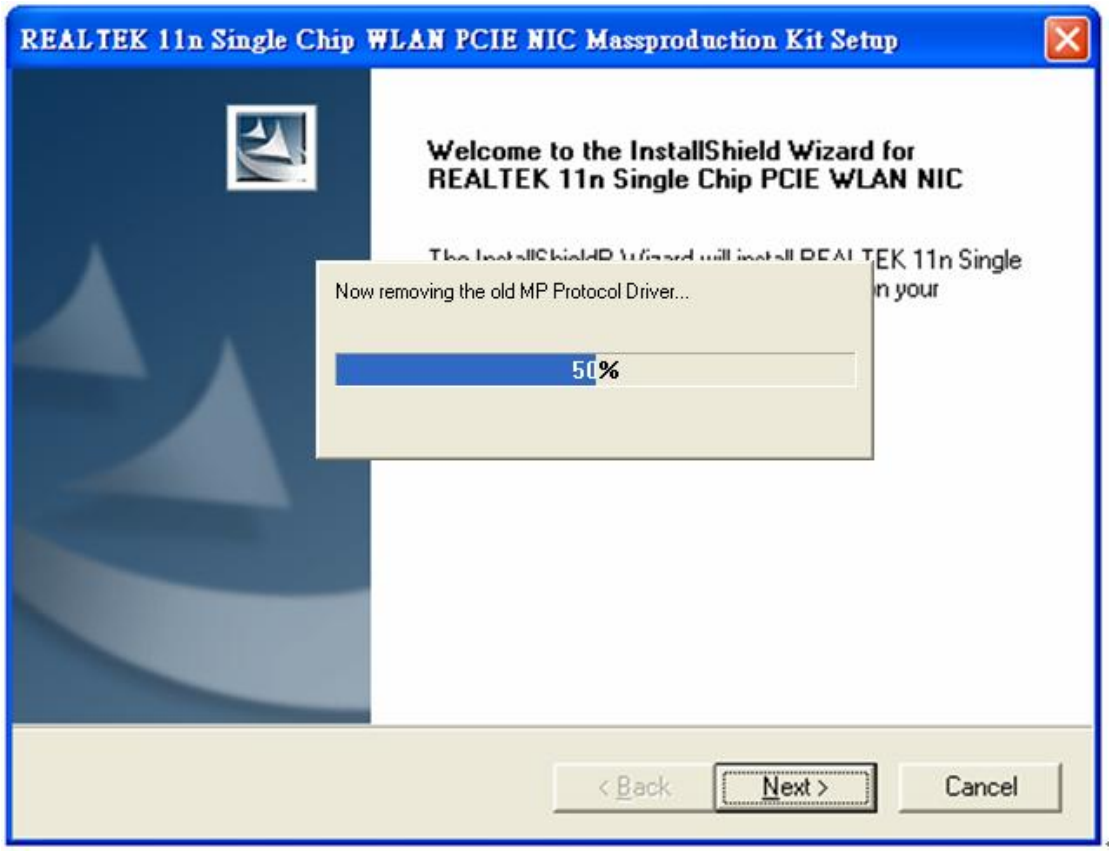
A. Insert the Installation CD to your CD-ROM Drive. Execute the “setup” program.



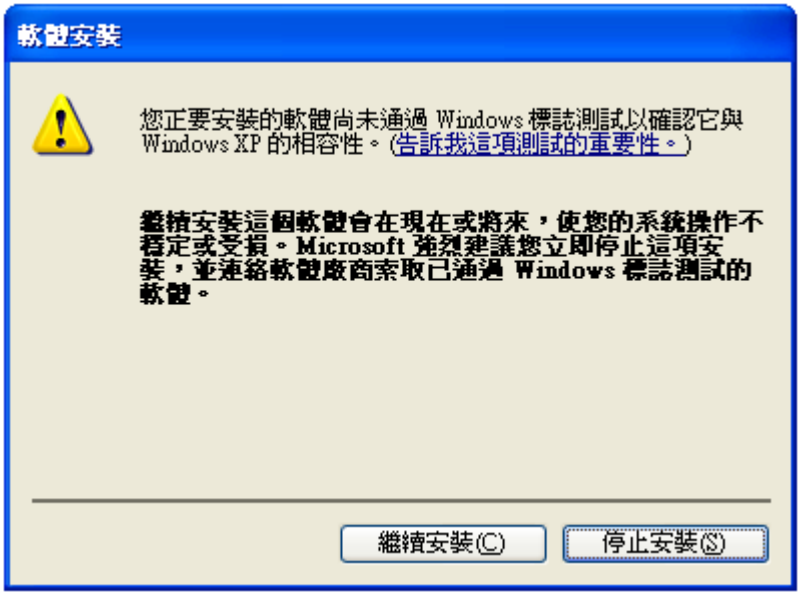
B. Click “Next” to process the installation



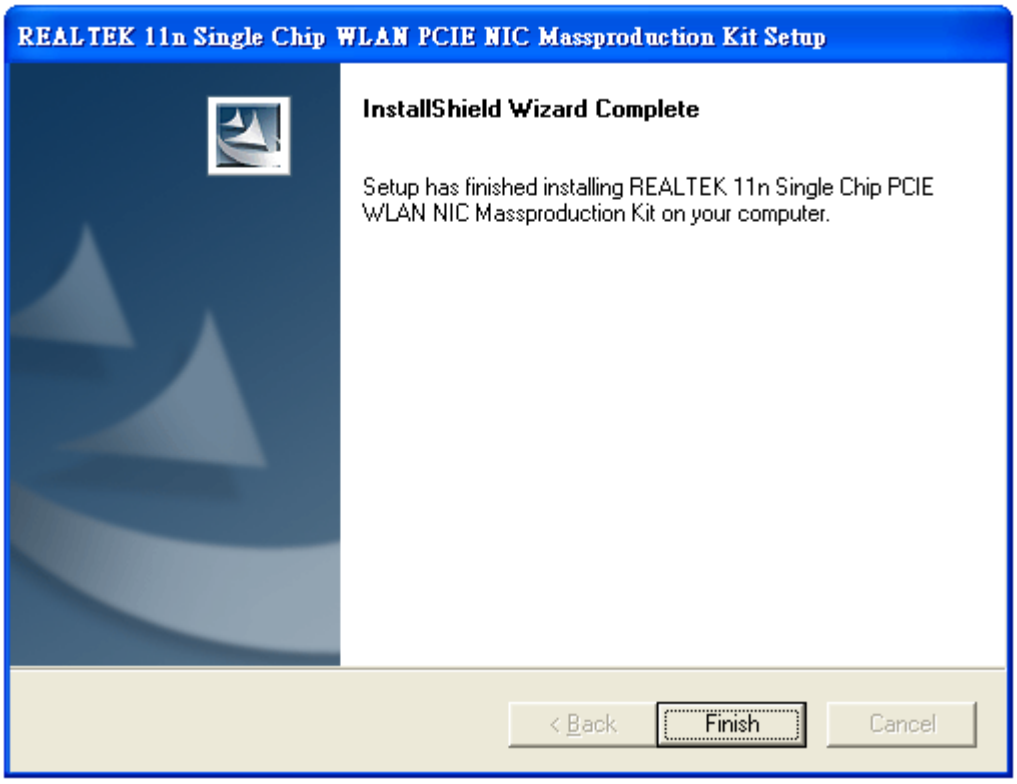
C. The system starts to install the software of the WLAN adapter.



D. The system will automatically detect the card and display “Hardware Installation” screen. Click “繼續安裝” to continue.



E. Please click “Finish” to complete the installation.

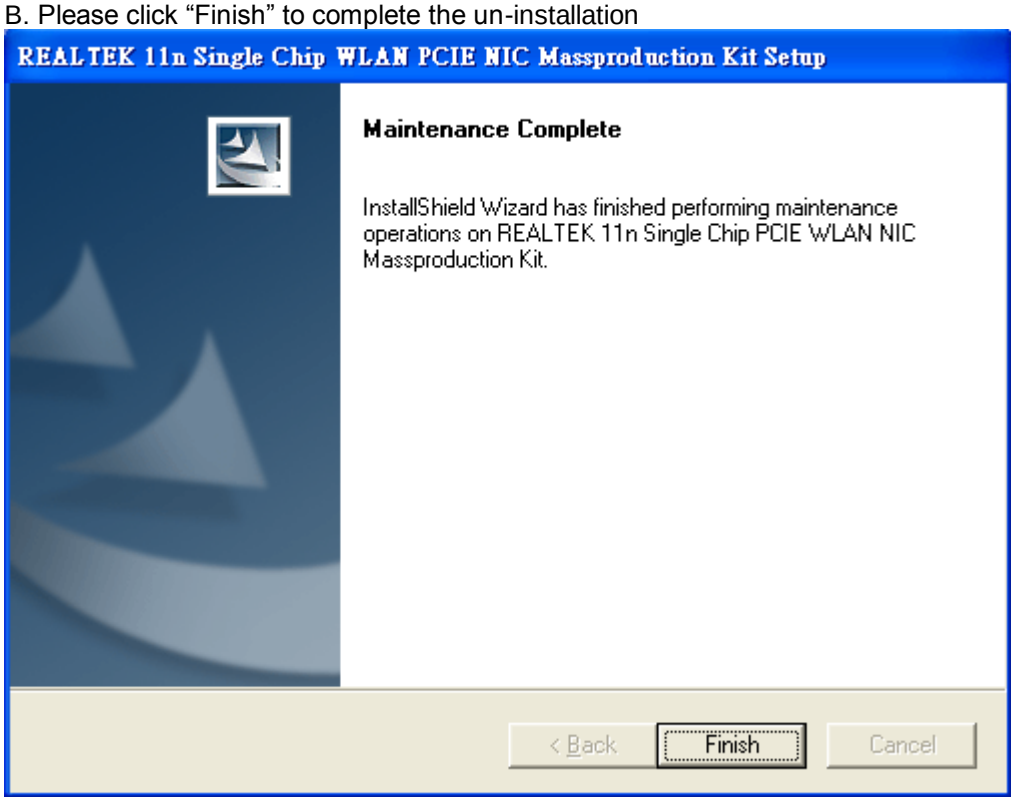

REALTEK 11n Single Chip WLAN PCIE NIC Massproduction Kit Setup
InstallShield Wizard Complete
Setup has finished installing REALTEK 11n Single Chip PCIE WLAN NIC Massproduction Kit on your computer.
< Back
Finish
Cancel

Un-installing the Wireless SDIO module Software

If you install Realtek11n Single Chip SDIO WLAN NIC Mass production kit into your laptop computer after installing the software program from the CD.
When you install Realtek11n Single Chip WLAN SDIO MINICARD Adapter,
the following dialog will be shown.

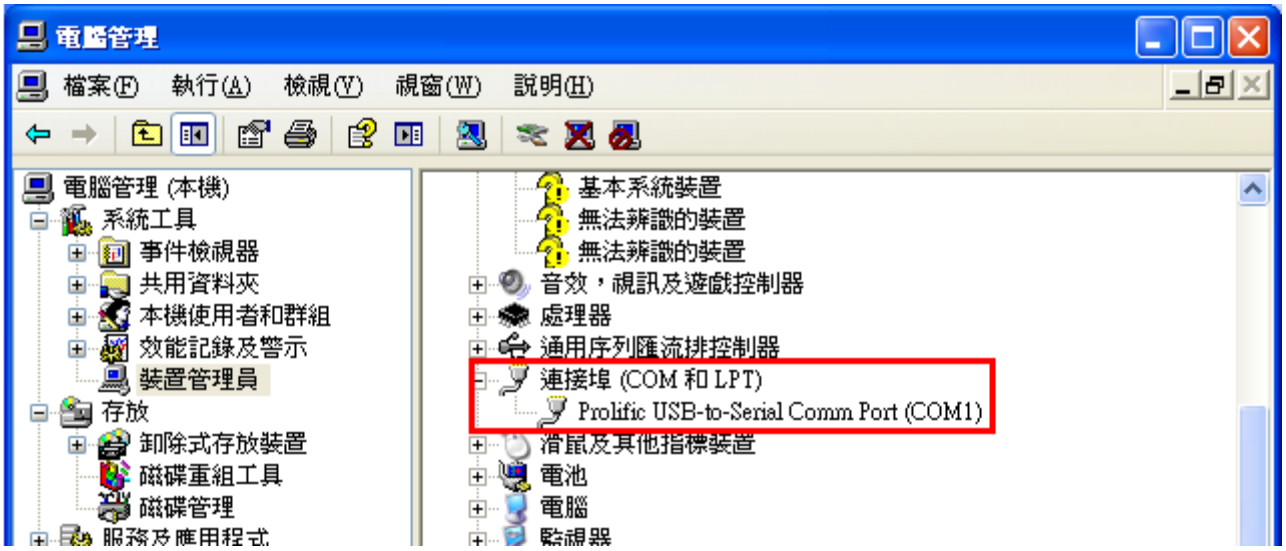
A. Uninstall the RTL8723BS WLAN Driver from “Start”→ “All Programs”→ “Realtek11n Single Chip WLAN SDIO NIC Mass production kit” or “Control Panel”“”→“Change or Remove Programs”.
Please click “Un-install” (or “Change/Remove”) to remove RTL8723BS WLAN driver.

B. Please click “Finish” to complete the un-installation

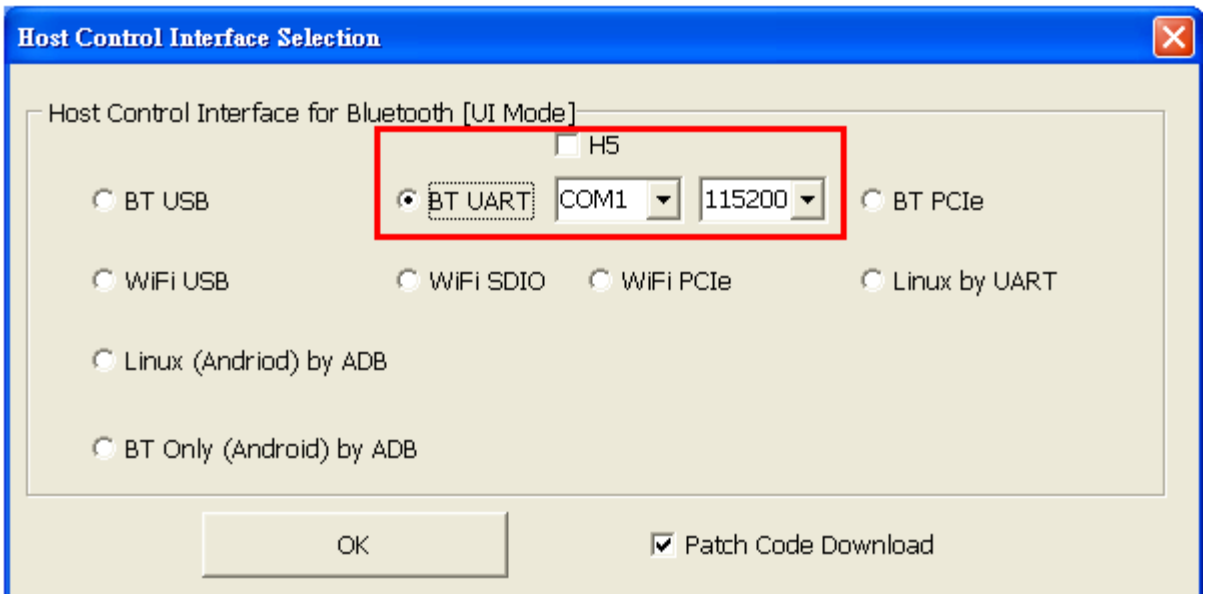


Installing the Bluetooth Module Software

A. Connect the USB-to-RS232 adapter to computer.



B. Choose the right COM port and baud rate setting from the BT test UI, then press the OK button below.



C. The driver will be installed successfully as shown below.

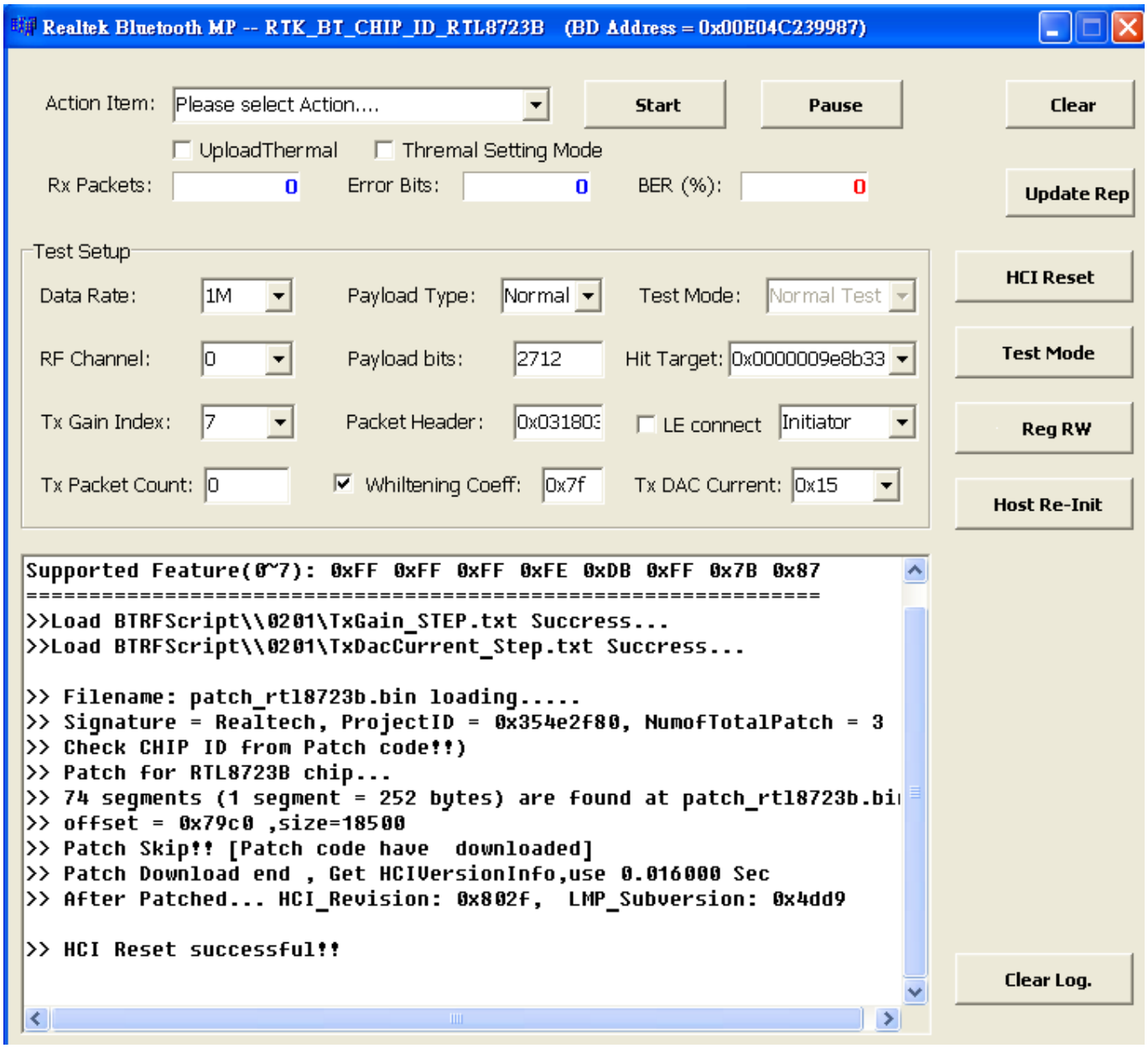


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Table for Filed Antenna

No.	Brand	Ant. Type	Con. Type	Peak Gain (dBi)	Model No.
1	LYNwave	PIFA	IPEX MHF4	TX1: 3.5	TX1: ALA110-222050-300011
2	FVC	PIFA	IPEX	TX1: 1.58 TX2: 1.75	K05007012102
3	FVC	PIFA	IPEX	TX1: 2.7 TX2: 2.19	K05007013402
4	FVC	PIFA	IPEX	TX1: 1.51 TX2: 2.04	K05007012803
5	FVC	PIFA	IPEX	TX1: 2.53 TX2: 2.28	K05007015501
6	FVC	PIFA	IPEX	TX1: 2.85 TX2: 1.59	K05007014501
7	FVC	PIFA	IPEX	TX1: 3.00 TX2: 1.52	K05007014201
8	FVC	PIFA	IPEX	TX1: 1.85 TX2: 1.94	TX1: K05007014901 TX2: K05007015001
9	ACON	PIFA	IPEX	TX1: -0.57 TX2: -1.61	TX1: APP6P-700900 TX2: APP6P-700900
10	JEM	PIFA	IPEX	TX1: 2.23 TX2: 2.21	1510-0122-0022(IA-120073)
11	WGT	PIFA	IPEX	TX1: 3.2 TX2 :2.76	TX1: SKX51WMPB01+C TX2: SKX51WMPB02+C
12	Yageo	PIFA	IPEX	TX1: 0.24 TX2: 0.59	TX1: ANTA0ZP08021WLAN1 TX2: ANTA0ZP08021WLAN2
13	WGT	PIFA	IPEX	TX1: 1.79 TX2: 0.66	TX1: SK 81WMPB01+A TX2: SK 81WMPB02+A
14	WGT	PIFA	IPEX	TX1: 1.36 TX2: 2.88	SKW2UWMPB01+A
15	WGT	PIFA	IPEX	TX1: 1.85 TX2: 3.14	SKW31WMPB01+A
16	WGT	PIFA	IPEX	TX1: -1.84 TX2: -2.93	TX1: SKM11WMPB03+A TX2: SKM11WMPB02+D
17	WGT	PIFA	IPEX	TX1: 2.46 TX2: 2.91	SKC45WMPB03+B
18	WGT	PIFA	IPEX	TX1: 1.25 TX2: 3.17	SKW24WMPB01+B
19	WGT	PIFA	IPEX	TX1: 0.76 TX2: 0.09	TX1: SK555WMPB01+B TX2: SK555WMPB02+B

20	ACON	PIFA	IPEX	TX1: 1.94 TX2: 1.40	TX1: DQ60APP6P81 TX2: DQ60APP6P80
21	HONGLIN	PIFA	IPEX	TX1: -0.50 TX2: -0.19	TX1: DQ602352300 TX2: DQ602352200
22	Amphenol	PIFA	IPEX	TX1: 1.82 TX2: 2.64	TX1: DC330016100 TX2: DC330016110
23	Amphenol	PIFA	IPEX	TX1: -0.35 TX2: 0.59	TX1: DC330016180 TX2: DC330016190
24	Luxshare-ICT	PIFA	IPEX	TX1: -0.07 TX2: 0.32	TX1: DC330015Z80 TX2: DC330015Z90
25	Luxshare-ICT	PIFA	IPEX	TX1: -1.45 TX2: -0.37	TX1: DC330015Z00 TX2: DC330015Z10
26	Amphenol	PIFA	IPEX	TX1: 1.64 TX2: 1.47	TX1: DC330016160 TX2: DC330016170
27	Luxshare-ICT	PIFA	IPEX	TX1: -0.38 TX2: -0.60	TX1: DC330015Z60 TX2: DC330015Z70
28	Amphenol	PIFA	IPEX	TX1: 1.67 TX2: 2.26	TX1: DC3300161A0 TX2: DC3300161B0
29	Luxshare-ICT	PIFA	IPEX	TX1: 1.1 TX2: 0.1	TX1: DC330015ZA0 TX2: DC330015ZB0
30	Amphenol	PIFA	IPEX	TX1: -0.22 TX2: -1.73	TX1: DC330016200 TX2: DC330016210
31	Amphenol	PIFA	IPEX	TX1: -2.62 TX2: -0.70	TX1: DC330016220 TX2: DC330016230
32	Luxshare-ICT	PIFA	IPEX	TX1: -0.94 TX2: -1.11	TX1: DC330016020 TX2: DC330016030
33	Luxshare-ICT	PIFA	IPEX	TX1: -4.49 TX2: -1.68	TX1: DC330016000 TX2: DC330016010
34	Amphenol	PIFA	IPEX	TX1: -0.46 TX2: -0.98	TX1: DC330016260 TX2: DC330016270
35	Luxshare-ICT	PIFA	IPEX	TX1: -0.43 TX2: 0.84	TX1: DC330016060 TX2: DC330016070
36	HIGH-TEK	PIFA	IPEX	TX1: -0.69 TX2: -0.61	TX1: DC33001C100 TX2: DC33001C100
37	JESS-LINK	PIFA	IPEX	TX1: -1.90 TX2: -0.98	TX1: DC33001AX00 TX2: DC33001AX00
38	YAGEO	PIFA	IPEX	TX1: -0.27 TX2: -0.88	TX1: 25.90AH8.021 TX2: 25.90AH7.021
39	ACON	PIFA	IPEX	TX1: 0.96 TX2: 1.33	TX1: ATP6P-700000 TX2: ATP6P-700001

40	ACON	PIFA	IPEX	TX1: 1.92 TX2: 2.20	TX1: APP6P-700853 TX2: APP6P-700854
41	ACON	PIFA	IPEX	TX1: 1.20 TX2: 0.11	APP6P-700931
42	WNC	PIFA	IPEX	TX1: 0.24 TX2: -0.58	TX1: 25.90AH8.001 TX2: 25.90AH7.001
43	ACON	PIFA	IPEX	TX1: -0.84 TX2: -1.60	APP6P-700932
44	WNC	PIFA	IPEX	TX1: 0.20 TX2: -0.60	81EAAS15.G01 (DC33001EK00)
45	Luxshared	PIFA	IPEX	TX1: -0.77	L01RF035-DT-R
46	TE	PIFA	IPEX	TX1: -0.63 TX2: -1.69	TX1: 25.90AC4.011 TX2: 25.90AC3.011
47	WNC	PIFA	IPEX	TX1: 1.19 TX2: -0.14	TX1: 25.90AC4.001 TX2: 25.90AC3.001
48	WGT	PIFA	IPEX	TX1: 1.05 TX2: -0.41	TX1: SK110WMPB01+A TX2: SK110WMPB02+A
49	WGT	PIFA	IPEX	TX1: -1.61 TX2: -2.84	TX1: SKW23WMPB01+A TX2: SKW23WMPB02+A
50	WGT	PIFA	IPEX	TX1: -0.66 TX2: 0.78	TX1: SK547WMPB01+A TX2: SK549WMPB02+A
51	WGT	PIFA	IPEX	TX1: -0.93 TX2: 0.20	TX1: SK740WMPB01+A TX2: SK740WMPB02+A
52	WGT	PIFA	IPEX	TX1: 3.03 TX2: 0.55	TX1: SK840WMPB01+B_SN TX2: SK840WMPB01+B_SN
53	WNC	PIFA	IPEX	TX1: -0.26 TX2: -0.67	TX1: 81EAAS15.G02 TX2: 81EAAS15.G02
54	WNC	PIFA	IPEX	TX1: 0.89 TX2: 0.14	DC33001EK40 (81EAAS15.G05)
55	WNC	PIFA	IPEX	TX1: -0.06 TX2: 0.25	TX1: 81.EL415.G28.X01 TX2: 81.EL415.G29.X01

56	TONGDA	PIFA	IPEX	TX1: -0.57 TX2: 0.14	TX1: T-543-900100-12 TX2: T-543-900100-12
57	TONGDA	PIFA	IPEX	TX1: -1.96 TX2: 0.11	TX1: DC33001F300 / T-543-900100-02 TX2: DC33001F300 / T-543-900100-02
58	TONGDA	PIFA	IPEX	TX1: -0.37 TX2: 0.39	TX1: T-543-900100-01 TX2: T-543-900100-01
59	WGT	PIFA	IPEX	TX1: 0.46 TX2: -0.79	TX1: SKCZTWMPB01+A TX2: SKCZTWMPB02+A
60	WGT	PIFA	IPEX	TX1: 1.48 TX2: 1.15	TX1: SK670WMPB01+A TX2: SK670WMPB02+A
61	INPAQ	PIFA	IPEX	TX1: -3.66 TX2: -1.78	TX1: WA-P-LB-02-082 TX2: WA-P-LB-01-046
62	Smart-Approach	PIFA	IPEX	TX1: -4.42 TX2: -4.71	TX1: SE-ECZA0-001 TX2: SE-ECZA0-002
63	WNC	PIFA	IPEX	TX1: 0.26 TX2: -0.65	TX1: 81EAAS15.G13 TX2: 81EAAS15.G14
64	WNC	PIFA	IPEX	TX1: 0.01 TX2: -0.36	TX1: 81EAAS15.G09 TX2: 81EAAS15.G10
65	ACON	PIFA	IPEX	TX1: 1.84 TX2: 1.05	TX1: APP6P-700917 TX2: APP6P-700918
66	ACON	PIFA	IPEX	TX1: 0.17 TX2: -1.20	TX1: APP6P-700915 TX2: APP6P-700916
67	JEM	PIFA	IPEX	TX1: 2.13 TX2: 2.04	TX1: IA 120278 TX2: IA 120279
68	JEM	PIFA	IPEX	TX1: 2.06 TX2: 2.77	IA-120007
69	JEM	PIFA	IPEX	TX1: 1.60 TX2: 2.93	IA-120007
70	WGT	PIFA	IPEX	TX1: 0.76 TX2: 0.46	TX1: SK94SWMPB01+B TX2: SK94SWMPB01+B
71	WGT	PIFA	IPEX	TX1: 1.32 TX2: 1.86	TX1: SK94TWMPB01+B TX2: SK94TWMPB01+B
72	WGT	PIFA	IPEX	TX1: -0.03 TX2: -0.13	TX1: SK50SWMPB01+A TX2: SK50SWMPB02+A
73	ACON	PIFA	IPEX	TX1: 0.84 TX2: -0.27	TX1: APM8P-700072 TX2: APM8P-700073
74	ACON	PIFA	IPEX	TX1: 0.76 TX2: -0.52	TX1: APP8P-700461 TX2: APP8P-700462
75	ACON	PIFA	IPEX	TX1: 1.74 TX2: 1.01	TX1: APM8P-700070 TX2: APM8P-700071

76	ACON	PIFA	IPEX	TX1: 2.92 TX2: 0.06	TX1: APP8P-700463 TX2: APP8P-700464
77	HongLin	PIFA	IPEX	TX1: -0.8 TX2: 0.72	TX1: 260-24018 TX2: 260-24017
78	WNC	PIFA	IPEX	TX1: -0.85 TX2: -0.51	TX1: DC33001CA20 (81.EK515.G52) TX2: DC33001CA30 (81.EK515.G53)
79	ACON	PIFA	IPEX	TX1: 0.82 TX2: 2.07	TX1: APP8P-700473 TX2: APP8P-700474
80	HongLin	PIFA	IPEX	TX1: 1.88 TX2: 1.31	TX1: 260-24016 TX2: 260-24015
81	HongLin	PIFA	IPEX	TX1: 0.87 TX2: -0.53	TX1: 260-24011 TX2: 260-24010
82	HongLin	PIFA	IPEX	TX1: 0.34 TX2: 1.98	TX1: 260-24013 TX2: 260-24012
83	HongLin	PIFA	IPEX	TX1: 1.92 TX2: -0.14	TX1: 260-24001 TX2: 260-24000
84	HongLin	PIFA	IPEX	TX1: 1.85 TX2: 0.94	TX1: 260-24003 TX2: 260-24002
85	Smart Approach	PIFA	IPEX	TX1: 0.37 TX2: 1.35	TX1: SE-ECWGP-001 TX2: SE-ECWGP-002
86	Smart Approach	PIFA	IPEX	TX1: 0.08 TX2: 1.33	TX1: SE-ECLG2-001 TX2: SE-ECLG2-002
87	Smart Approach	PIFA	IPEX	TX1: 1.19 TX2: 1.54	TX1: SE-ECWGR-001 TX2: SE-ECWGR-002
88	Smart Approach	PIFA	IPEX	TX1: -0.04 TX2: 1.10	TX1: SE-ECLG1-001 TX2: SE-ECLG1-002
89	WNC	PIFA	IPEX	TX1: 0.45 TX2: 1.06	TX1: 81.EK515.G36 TX2: 81.EK515.G37
90	WNC	PIFA	IPEX	TX1: -0.90 TX2: -2.06	TX1: DC33001CA00 (81.EK515.G46) TX2: DC33001CA10 (81.EK515.G47)
91	WNC	PIFA	IPEX	TX1: 0.77 TX2: 0.11	TX1: 81.EK515.G38 TX2: 81.EK515.G39
92	WNC	PIFA	IPEX	TX1: -0.20 TX2: -1.54	TX1: DC33001CC00 (81.EK515.G48) TX2: DC33001CC10 (81.EK515.G49)
93	JEM	PIFA	IPEX	TX1: 2.77 TX2: 3.13	TX1: IA-130306 TX2: IA-130307
94	JEM	PIFA	IPEX	TX1: 2.09 TX2: 1.77	TX1: IA-130082 TX2: IA-130083
95	JEM	PIFA	IPEX	TX1: 1.68 TX2: 1.52	TX1: IA-130086 (13B130-FT2070) TX2: IA-130087 (13B130-FT2071)

96	JEM	PIFA	IPEX	TX1: 2.13 TX2: 1.85	TX1: IA-130086 (13B130-FT2070) TX2: IA-130087 (13B130-FT2071)
97	WGT	PIFA	IPEX	TX1: 2.81 TX2: 1.92	TX1: EGTZ2WIPB01+A (13B130-JV3051 ES) TX2: EGTZ2WIPB02+A (13B130-JV3050 ES)
98	WGT	PIFA	IPEX	TX1: 2.5 TX2: 1.65	TX1: EGS45WIPB02+A (13B130-FT2050) TX2: EGS45WIPB01+A (13B130-FT2051)
99	WGT	PIFA	IPEX	TX1: -3.11 TX2: 1.46	TX1: EGS45WIPB02+A (13B130-FT2050) TX2: EGS45WIPB01+A (13B130-FT2051)
100	Luxshare	PIFA	IPEX	TX1: -1.45 TX2: 0.11	TX1: L01RF024-YT-R TX2: L01RF032-YT-R
101	Luxshare	PIFA	IPEX	TX1: 2.51 TX2: 0.14	TX1: L01RF031-DT-R TX2: L01RF013-R
102	Luxshare	PIFA	IPEX	TX1: 2.51 TX2: -0.14	TX1: L01RF031-DT-R TX2: L01RF014-R
103	Luxshare	PIFA	IPEX	TX1: 2.51 TX2: -0.04	TX1: L01RF031-DT-R TX2: L01RF022-DT-R
104	Luxshare	PIFA	IPEX	TX1: 2.51 TX2: 2.51	TX1: L01RF031-DT-R TX2: L01RF031-DT-R
105	JEM	PIFA	IPEX	TX1: 2.64 TX2: -0.19	TX1: IA-130096 TX2: IA-130096
106	JEM	PIFA	IPEX	TX1: 2.03 TX2: -1.19	TX1: IA-130173 TX2: IA-130173
107	JEM	PIFA	IPEX	TX1: 1.05 TX2: -1.60	TX1: IA-130313 TX2: IA-130313
108	JEM	PIFA	IPEX	TX1: 2.57 TX2: 1.55	TX1: IA-130314 TX2: IA-130314
109	Smart Approach	PIFA	IPEX	TX1: -0.27 TX2: 0.85	TX1: SE-ECWU6-001 TX2: SE-ECWU6-001
110	Smart Approach	PIFA	IPEX	TX1: 0.22 TX2: 0.94	TX1: SE-ECWF5-001 TX2: SE-ECWF5-001
111	Yageo	PIFA	IPEX	TX1: -0.12 TX2: -1.03	TX1: CAN4313NC0753LLB1 TX2: CAN4313NC0753LLB1
112	Smart Approach	PIFA	IPEX	TX1: -0.57 TX2: 1.13	TX1: SE-ECWF5-002 TX2: SE-ECWF5-002

113	Yageo	PIFA	IPEX	TX1: 1.13 TX2: -0.03	TX1: CAN4313NC0753LLB2 TX2: CAN4313NC0753LLB2
114	Hong-Lin	PIFA	IPEX	TX1: 2.85 TX2: 0.43	TX1: 260-23557 TX2: 260-23556
115	ACON	PIFA	IPEX	TX1: 0.17 TX2: -1.20	TX1: APP6Y-700000 TX2: APP6Y-700001
116	ACON	PIFA	IPEX	TX1: 1.84 TX2: 1.05	TX1: APP6Y-700002 TX2: APP6Y-700003
117	WNC	PIFA	IPEX	TX1: 0.01 TX2: -0.36	TX1: 81EAAS15.G19 TX2: 81EAAS15.G20
118	WNC	PIFA	IPEX	TX1: 0.26 TX2: -0.65	TX1: 81EAAS15.G17 TX2: 81EAAS15.G18
119	ACON	PIFA	IPEX	TX1: 0.32 TX2: 0.53	TX1: 25.90ALM.001 (AMM8P-700026) TX2: 25.90ALN.001 (AMM8P-700027)
120	INNOWAVE	PIFA	IPEX	TX1: 0.77 TX2: -0.62	TX1: 25.90ALO.001 (640-INNEP0008-A) TX2: 25.90ALP.001 (640-INNEP0007-A)
121	ACON	PIFA	IPEX	TX1: 1.73 TX2: 1.47	TX1: AMM6P-700025 (25.90AL4.001) TX2: AMM6P-700026 (25.90AL5.001)
122	INNOWAVE	PIFA	IPEX	TX1: 0.54 TX2: 1.79	TX1: 25.90AL7.001 (640-INNEP0005-A) TX2: 25.90AL8.001 (640-INNEP0006-A)
123	Foxconn	PIFA	IPEX	TX1: -4.13 TX2: -2.85	TX1: DQ608300300 TX2: DQ608300300
124	WGT	PIFA	IPEX	TX1: 1.32 TX2: 1.86	TX1: SK94TWMPB01+D TX2: SK94TWMPB01+D
125	HONGLIN	PIFA	IPEX	TX1: 0.64 TX2: 2.01	TX1: 260-24032 TX2: 260-24031
126	TONGDA	PIFA	IPEX	TX1: 1.95 TX2: 0.96	TX1: DC33001GR00 / T-543-9021004-1 TX2: DC33001GR10 / T-543-9021004-2
127	INPAQ	PIFA	IPEX	TX1: -3.18 TX2: -0.93	TX1: WA-P-LB-02-088 TX2: WA-P-LB-01-049
128	Smart-Approach	PIFA	IPEX	TX1: -0.23 TX2: -2.93	TX1: SE-ECSA0-001 TX2: SE-ECSA0-002
129	Auden	PIFA	IPEX	TX1: -0.02 TX2: 2.03	TX1: BAUK01063-WIFI-L TX2: BAUK01063-WIFI-R
130	INPAQ	PIFA	IPEX	TX1: -0.11 TX2: 1.00	TX1: WA-P-LB-10-015-L TX2: WA-P-LB-10-015-R
131	JEM	PIFA	IPEX	TX1: 0.08 TX2: 1.07	TX1: IA-130361 TX2: IA-130362
132	JEM	PIFA	IPEX	TX1: 2.63	TX1: IA-130157 (13B130-FU4070)

				TX2: 0.19	TX2: IA-130158 (13B130-FU4071)
133	WGT	PIFA	IPEX	TX1: 2.82 TX2: 1.57	TX1: EGC10WIPB01+A (13B130-FS8050) TX2: EGC10WIPB02+A (13B130-FS8051)
134	WGT	PIFA	IPEX	TX1: 3.38 TX2: 3.28	TX1: EG10MWIPB01+A (13B130-FU4051 ES) TX2: EG10MWIPB02+A (13B130-FU4050 ES)
135	WNC	PIFA	IPEX	TX1: 2.75 TX2: 1.79	TX1: 81.EEW.15.GAF (25.90AEM.001) TX2: 81.EEW.15.GAG (25.90AEN.001)
136	ACON	PIFA	IPEX	TX1: -0.21 TX2: -0.82	TX1: AMM6P-700041 (025.9001G.0001) TX2: AMM8P-700031 (025.9001H.0001)
137	INNOWAVE	PIFA	IPEX	TX1: 1.58 TX2: 0.51	TX1: 640-INNEP0036-A (025.9001I.0001) TX2: 640-INNEP0037-A (025.9001J.0001)
138	LUXSHARE	PIFA	IPEX	TX1: 1.27 TX2: -0.1	TX1: DC330017L00 TX2: DC330017L10
139	Speed	PIFA	IPEX	TX1: 0.23 TX2: 1.25	TX1: DC330017G00 TX2: DC330017G10
140	LUXSHARE	PIFA	IPEX	TX1: 1.60 TX2: 0.84	TX1: DC330017M00 TX2: DC330017M10
141	Speed	PIFA	IPEX	TX1: 1.87 TX2: 2.85	TX1: DC330017J00 TX2: DC330017J10
142	WNC	PIFA	IPEX	TX1: 1.55 TX2: 0.76	TX1: 81.EKU15.G59 TX2: 81.EKU15.G60
143	TONGDA	PIFA	IPEX	TX1: -0.23 TX2: 0.83	TX1: T-543-9021015-1 TX2: T-543-9021015-2
144	ACON	PIFA	IPEX	TX1: -0.7 TX2: -1.85	TX1: APP6Y-700015 TX2: APP6Y-700016
145	Smart Approach	PIFA	IPEX	TX1: 1.33 TX2: 1.13	TX1: SE-ECB14-001 TX2: SE-ECB14-002
146	HONGLIN	PIFA	IPEX	TX1: -1.15 TX2: 0.42	TX1: 260-24034 TX2: 260-24033
147	Speed	PIFA	IPEX	TX1: -0.09 TX2: -2.17	TX1: F.0G.FH-6004-001 TX2: F.0G.FH-6004-002
148	WNC	PIFA	IPEX	TX1: 1.91 TX2: 1.72	TX1: 81.EKU15.G61 TX2: 81.EKU15.G62
149	WNC	PIFA	IPEX	TX1: 0.49	TX1: 81.EKU15.G55

				TX2: 1.30	TX2: 81.EKU15.G56
150	TONGDA	PIFA	IPEX	TX1: 1.86 TX2: -0.25	TX1: T-543-9021017-1 TX2: T-543-9021017-2
151	Smart approach	PIFA	IPEX	TX1: 0.19 TX2: 0.75	TX1: SE-ECB15-001 TX2: SE-ECB15-002
152	ACON	PIFA	IPEX	TX1: 0.47 TX2: 1	TX1: APP6Y-700021 TX2: APP6Y-700022
153	HONGLIN	PIFA	IPEX	TX1: 0.53 TX2: 1.75	TX1: 260-24036 TX2: 260-24035
154	Speed	PIFA	IPEX	TX1: -0.96 TX2: -0.32	TX1: F.0G.FH-6005-001 TX2: F.0G.FH-6005-002
155	WNC	PIFA	IPEX	TX1: 1.91 TX2: 1.97	TX1: 81.EKU15.G57 TX2: 81.EKU15.G58
156	WNC	PIFA	IPEX	TX1: 1.94 TX2: 0.62	TX1: 81.EKU15.G53 TX2: 81.EKU15.G54
157	TONGDA	PIFA	IPEX	TX1: 1.95 TX2: 0.36	TX1: T-543-9021010-1 TX2: T-543-9021010-2
158	Smart approach	PIFA	IPEX	TX1: 0.30 TX2: 1.02	TX1: SE-ECWE0-001 TX2: SE-ECWE0-002
159	ACON	PIFA	IPEX	TX1: 0.27 TX2: 1.34	TX1: APP6Y-700019 TX2: APP6Y-700020
160	HIGH-TEK	PIFA	IPEX	TX1: 1.19 TX2: 0.3	TX1: 0ACCN013035N TX2: 0ACCN013035N
161	Smart approach	PIFA	IPEX	TX1: 0.61 TX2: 1.29	TX1: SE-ECVY1-001 TX2: SE-ECVY1-001
162	Smart approach	PIFA	IPEX	TX1: 1.80 TX2: -3.13	TX1: SE-ECVY2-001 TX2: SE-ECVY2-001
163	TONGDA	PIFA	IPEX	TX1: 1.98 TX2: 1.85	TX1: T-543-9021012-A TX2: T-543-9021012-A
164	HIGH-TEK	PIFA	IPEX	TX1: -0.07 TX2: -1.81	TX1: 0ACCN013036 TX2: 0ACCN013036
165	Zhan yun	PIFA	IPEX	TX1: 1.16 TX2: 1.31	TX1: QTFF6-EQL0202A TX2: QTFF6-EQL0202A
166	Zhan yun	PIFA	IPEX	TX1: 0.34 TX2: 0.56	TX1: QTFF6-EQL0102A TX2: QTFF6-EQL0102A
167	VSO	PIFA	IPEX	TX1: 2.07 TX2: 0.39	TX1: 821-101-01211090 TX2: 821-101-01211100
168	Hong-Lin	PIFA	IPEX	TX1: 2.85 TX2: 0.43	TX1: 260-23557 TX2: 260-23556
169	HIGH-TEK	PIFA	IPEX	TX1: -0.87	TX1: 025.9002N.0011

				TX2: 0.77	TX2: 025.9002M.0011
170	WNC	PIFA	IPEX	TX1: 0.33 TX2: 1.03	TX1: 025.9002N.0001 TX2: 025.9002M.0001
171	HIGH-TEK	PIFA	IPEX	TX1: -0.6 TX2: -1.54	TX1: 025.90027.0011 TX2: 025.90026.0011
172	WNC	PIFA	IPEX	TX1: -1.09 TX2: 0.62	TX1: 025.90027.0001 TX2: 025.90026.0001
173	INNOWAVE	PIFA	IPEX	TX1: -1.17 TX2: 1.63	TX1: 025.90019.0001 (640-INNEP0030-A) TX2: 025.9001A.0001 (640-INNEP0031-A)
174	WNC	PIFA	IPEX	TX1: 0.82 TX2: 0.49	TX1: 025.90017.0001 (81.EEW15.GEL) TX2: 025.90018.0001 (81.EEW15.GEM)
175	WGT	PIFA	IPEX	TX1: -0.93 TX2: -0.36	TX1: SK970WIPB01+A TX2: SK970WIPB02+A
176	TONGDA	PIFA	IPEX	TX1: 1.98 TX2: 1.91	TX1: T-543-9021011-A TX2: T-543-9021011-A
177	Foxconn	PIFA	IPEX	TX1: 2.27 TX2: 1.14	TX1: 79011HU00-600-G TX2: 79011HU00-600-G
178	Yageo	PIFA	IPEX	TX1: 1.06	TX1: DQ600856200/ ANTA0HQ08562WLGP4
179	Foxconn	PIFA	IPEX	TX1: -0.57 TX2: -0.97	TX1: DQ6V5NS3300 (WDAN-HQV5NS33-DH) TX2: DQ6V5NS3300 (WDAN-HQV5NS33-DH)
180	Foxconn	PIFA	IPEX	TX1: -0.07	TX1: DQ6V5NS3100 (WDAN-HQV5NS31-DH)
181	Foxconn	PIFA	IPEX	TX1: 0.30 TX2: -0.18	TX1: DQ6V5TS3300 (WDAN-HQV5TS33-DH) TX2: DQ6V5TS3300 (WDAN-HQV5TS33-DH)
182	Foxconn	PIFA	IPEX	TX1: 2.25	TX1: DQ6V5TS3100 (WDAN-HQV5TS31-DH)
183	Foxconn	PIFA	IPEX	TX1: 0.48 TX2: -0.69	TX1: DQ6V7NS3300 (WDAN-HQV7NS33-DH) TX2: DQ6V7NS3300 (WDAN-HQV7NS33-DH)
184	Foxconn	PIFA	IPEX	TX1: -0.89	TX1: DQ6V7NS3100 (WDAN-HQV7NS31-DH)
185	Foxconn	PIFA	IPEX	TX1: 2.34	TX1: DQ6V7TS3100 (WDAN-HQV7TS31-DH)
186	Foxconn	PIFA	IPEX	TX1: 1.44	TX1: DQ6V4NS3300

				TX2: 1.04	(WDAN-HQV4NS33-DH) TX2: DQ6V4NS3300 (WDAN-HQV4NS33-DH)
187	Foxconn	PIFA	IPEX	TX1: -0.93	TX1: DQ6V4NS3100 (WDAN-HQV4NS31-DH)
188	Foxconn	PIFA	IPEX	TX1: 1.25 TX2: 3.36	TX1: DQ6V4TS3300 (WDAN-HQV4TS33-DH) TX2: DQ6V4TS3300 (WDAN-HQV4TS33-DH)
189	Foxconn	PIFA	IPEX	TX1: 2.39	TX1: DQ6V4TS3100 (WDAN-HQV4TS31-DH)
190	Foxconn	PIFA	IPEX	TX1: -0.52 TX2: 2.89	TX1: DQ6V7TS3300 (WDAN-HQV7TS33-DH) TX2: DQ6V7TS3300 (WDAN-HQV7TS33-DH)
191	JESS-LINK	PIFA	IPEX	TX1: -0.97 TX2: -1.03	TX1: DQ613A00032 (PANT13A00008-6) TX2: DQ613A00032 (PANT13A00008-6)
192	JESS-LINK	PIFA	IPEX	TX1: -0.03	TX1: DQ613A00033 (PANT13A00007-9)
193	JESS-LINK	PIFA	IPEX	TX1: -1.46 TX2: -0.43	TX1: DQ613A00024 (PANT13A00008-8) TX2: DQ613A00024 (PANT13A00008-8)
194	JESS-LINK	PIFA	IPEX	TX1: 0.29	TX1: DQ613A00025 (PANT13A00008-2)
195	JESS-LINK	PIFA	IPEX	TX1: -0.40 TX2: 0.40	TX1: DQ613A00028 (PANT13A00008-4) TX2: DQ613A00028 (PANT13A00008-4)
196	JESS-LINK	PIFA	IPEX	TX1: 0.93	TX1: DQ613A00029 (PANT13A00007-7)
197	TONGDA	PIFA	IPEX	TX1: 0.04 TX2: -1.22	TX1: DC33001H800 / T-543-9001008-1 TX2: DC33001H810 / T-543-9001008-2
198	WNC	PIFA	IPEX	TX1: -0.02 TX2: 2.24	TX1: DC33001H900 / 81EAAK15.GCC TX2: DC33001H910 / 81EAAK15.GCD
199	Yageo	PIFA	IPEX	TX1: 0.67 TX2: -0.83	TX1: DC33001HB00 / ANTA0HC08231WLAN1 TX2: DC33001HB10 / ANTA0HC08231WLAN2
200	ACON	PIFA	IPEX	TX1: -1.36 TX2: -1.53	TX1: 6036B0110902 (APP8P-700479) TX2: 6036B0111002 (APP8P-700480)
201	WNC	PIFA	IPEX	TX1: -0.75 TX2: 1.05	TX1: 6036B0110901 (81EAAK15.G66) TX2: 6036B0111001 (81EAAK15.G67)
202	Smart Approach	PIFA	IPEX	TX1: 0.93 TX2: -0.55	TX1: DC33001HF00/ SE-ECS41-001 TX2: DC33001HF10/ SE-ECS41-002
203	TONGDA	PIFA	IPEX	TX1: 0.74 TX2: -0.07	TX1: DC33001HE00 / T-543-9001007-1 TX2: DC33001HE10 / T-543-9001007-2

204	WNC	PIFA	IPEX	TX1: 0.39 TX2: 0.27	TX1: DC33001HD00/ 81EAAK15.GCA TX2: DC33001HD10/ 81EAAK15.GCB
205	SIMYA	PIFA	IPEX	TX1: 1.30 TX2: -0.65	TX1: DQ601001400 TX2: DQ601001400
206	SIMYA	PIFA	IPEX	TX1: 0.72	TX1: DQ601001500
207	SIMYA	PIFA	IPEX	TX1: -1.82 TX2: 1.86	TX1: DQ601001200 TX2: DQ601001200
208	SIMYA	PIFA	IPEX	TX1: 1.27	TX1: DQ601001300
209	SIMYA	PIFA	IPEX	TX1: 2.23 TX2: 1.38	TX1: DQ601001800 TX2: DQ601001800
210	SIMYA	PIFA	IPEX	TX1: 0.18	TX1: DQ601001900
211	SIMYA	PIFA	IPEX	TX1: 2.23	TX1: DQ601001700
212	SIMYA	PIFA	IPEX	TX1: 0.04 TX2: 0.38	TX1: DQ601001000 TX2: DQ601001000
213	SIMYA	PIFA	IPEX	TX1: 1.60	TX1: DQ601001100
214	SIMYA	PIFA	IPEX	TX1: -0.79 TX2: 1.62	TX1: DQ601000800 TX2: DQ601000800
215	SIMYA	PIFA	IPEX	TX1: 2.20	TX1: DQ601000900
216	ACON	PIFA	IPEX	TX1: 0.51	TX1: 6036B0121903 (APP6P-701022)
217	Smart Approach	PIFA	IPEX	TX1: -0.55	TX1: 6036B0121901 (SE-EISW4-001)
218	SIMYA	PIFA	IPEX	TX1: 2.23 TX2: 1.38	TX1: DQ601001600 TX2: DQ601001600
219	WNC	PIFA	IPEX	TX1: 2.59	TX1: DQ6R15G1000 (81EAAR15.G10)
220	WNC	PIFA	IPEX	TX1: 0.83	TX1: DQ6R15G5400 (81EAAR15.G54)
221	WNC	PIFA	IPEX	TX1: -0.14 TX2: -0.24	TX1: DQ6R15G1100 (81EAAR15.G11) TX2: DQ6R15G1100 (81EAAR15.G11)
222	WNC	PIFA	IPEX	TX1: -0.67	TX1: DQ6R15G1200 (81EAAR15.G12)
223	WNC	PIFA	IPEX	TX1: -0.23 TX2: 0.96	TX1: DQ6R15G1300 (81EAAR15.G13) TX2: DQ6R15G1300 (81EAAR15.G13)
224	WNC	PIFA	IPEX	TX1: 1.22	TX1: DQ6R15G1400 (81EAAR15.G14)
225	WNC	PIFA	IPEX	TX1: 1.29 TX2: 1.99	TX1: DQ6R15G1500 (81EAAR15.G15) TX2: DQ6R15G1500 (81EAAR15.G15)
226	WNC	PIFA	IPEX	TX1: 1.52	TX1: DQ6R15G1600 (81EAAR15.G16)
227	WNC	PIFA	IPEX	TX1: -0.91 TX2: 1.99	TX1: DQ6R15G1700 (81EAAR15.G17) TX2: DQ6R15G1700 (81EAAR15.G17)
228	WNC	PIFA	IPEX	TX1: 2.45	TX1: DQ6R15G1800 (81EAAR15.G18)
229	WNC	PIFA	IPEX	TX1: 0.80 TX2: 0.01	TX1: DQ6R15G5600 (81EAAR15.G56) TX2: DQ6R15G5600 (81EAAR15.G56)
230	WNC	PIFA	IPEX	TX1: 2.33	TX1: DQ6R15G5700 (81EAAR15.G57)

231	WNC	PIFA	IPEX	TX1: 0.46 TX2: 2.13	TX1: DQ6R15G0900 (81EAAR15.G09) TX2: DQ6R15G0900 (81EAAR15.G09)