User Manual(Based on Intel guidance)

FCC ID : A3LAX211D730QFG(Change in ID, Original/ID: PD9AX211D2)

Module specification

1. Supported Band list

• 802.11abgn+acR2+axR2 MIMO 2x2 – Supports Wi-Fi 6E and includes the new 6GHz band
• Bluetooth® 5.2

2. Environment Specification

Item	Spec.
Storage Temperature	-40 ℃ ~ +70 ℃ (external direct temperture)
Operating Temperature	0 ℃ ~ 50 ℃

3. Pin assignment : M. module / CNVI interface

3-1. Figure of the pin arrangement

PIN #	Functionality	Arrow Marking	Drawing Figure
ANT1 : Aux	Wifi+Bluetooth	White(Blank)	D2W (1216)
ANT2 (ANT3): Main	Wifi Only	Black(Fill)	

ANTENNA PLACEMENT

3-2. Pin Description

Pin No.	Pin name	In / Out	Pin Voltage	Description
1	UIM_POWER_ SRC/GPIO1			
2	UIM_POWER_ SNK			
3	UIM_SWP			
4	3.3V		3.3V	
5	3.3V		3.3V	
6	GND			
7	NFC_RESET#			
8	ALERT#			
9	I2C_CLK			
10	I2C_DATA			
11	COEX1		1.8V	Coexistence with intel LTE
12	COEX2		1.8V	Coexistence with intel LTE
13	COEX3			
14	SYSCLK/GNSS0			
15	TX_BLANKING/GNSS1		1.8V	
16	RESERVED/VDDIO18			
17	GND			
18	RESERVED/ISH2_UART_RXD			
19	RESERVED/ISH2_UART_TXD			
20	GND			
21	ISH1_UART_CTS		1.8V	ISH-UART
22	ISH1_UART_RTS		1.8V	ISH-UART
23	GND			
24	ISH1_UART_RXD		1.8V	ISH-UART
25	ISH1_UART_TXD		1.8V	ISH-UART
26	GND			
27	SUSCLK(32kHz)		3.3V	
28	W_DISABLE1#		3.3V	Wi-Fi On/Off
29	PEWAKE#		3.3V	
30	CLKREQ#		3.3V	PCI Clock Request
31	PERST#		3.3V	PCI Reset
32	GND			
33	REFCLKN0			PCI Reference Clock
34	REFCLKP0			PCI Reference Clock
35	GND			
36	PETn0			PCI Tx
37	PETp0			PCI Tx
38	GND			

39	PERn0			PCI Tx
40	PERp0			PCI Tx
41	GND			
42	CLink_CLK			Intel's proprietary Wi-Fi host I/F for purpose of Active Manageability
43	CLink_DATA			
44	CLink_RESET		3.3V	
45	SDIO_RESET#			SDIO not support in AX210
46	SDIO_WAKE#			SDIO not support in AX210
47	SDIO_DATA3/WIGIG_UART_RXD			SDIO not support in AX210
48	SDIO_DATA2/WIGIG_UART_TXD			SDIO not support in AX210
49	SDIO_DATA1/WIGIG_UART_RTS			SDIO not support in AX210
50	SDIO_DATA0/WIGIG_UART_CTS			SDIO not support in AX210
51	SDIO_CMD			SDIO not support in AX210
52	SDIO_CLK			SDIO not support in AX210
53	UART_WAKE#			UART not support in AX210
54	LPSS_UART_CTS			UART not support in AX210
55	LPSS_UART_TXD			UART not support in AX210
56	LPSS_UART_RXD			UART not support in AX210
57	LPSS_UART_RTS			UART not support in AX210
58	PCM_SYNC/I2S_WS			PCM not support in AX210
59	PCM_IN/I2S_SD_IN			PCM not support in AX210
60	PCM_OUT/I2S_SD_OUT			PCM not support in AX210
61	PCM_CLK/I2S_SCK			PCM not support in AX210
62	GND			
63	W_DISABLE2#			Bluetooth On/Off
64	LED2#			Bluetooth Activity
65	LED1#			Wi-Fi Activity
66	RESERVED/ISH2_UART_RTS			
67	RESERVED/ISH2_UART_CTS			
68	GND			
69	USB_D-			Bluetooth USB
70	USB_D+			Bluetooth USB
71	GND			
72	3.3V			
73	3.3V			
74	GND			
75	GND			
76	GND			
77	RESERVED			

78	RESERVED			
79	RESERVED			
80	RESERVED			
81	RESERVED			
82	RESERVED			
83	RESERVED			
84	RESERVED			
85	RESERVED			
86	RESERVED			
87	RESERVED			
88	RESERVED			
89	RESERVED			
90	RESERVED			
91	RESERVED			
92	RESERVED			
93	RESERVED			
94	RESERVED			
95	RESERVED			
96	RESERVED			
A07~A50	NC			Not used
G1~G4	GND			
GG1~72	GND + Thermal Pad			

Pin #	Pin Name platform pinout	Direction w/respect to Wireless client Module	Function When CNVi Is Used	Function When Standard (Discrete) M.2 Is Used	Comments
A07	GND		GND	Not Applicable	
A08	A4WP_IRQ#		NC	Not Applicable	Not connected
A09	A4WP_CLK		NC	Not Applicable	Not connected
A10	A4WP_DATA		NC	Not Applicable	Not connected
A11	RESERVED		RESERVED	Not Applicable	Not connected
A12	RESERVED		RESERVED	Not Applicable	Not connected
A13	RESERVED		RESERVED	Not Applicable	Not connected

Pin #	Pin Name platform pinout	Direction w/respect to Wireless client Module	Function When CNVi Is Used	Function When Standard (Discrete) M.2 Is Used	Comments
A14	RESERVED		RESERVED	Not Applicable	Not connected
A15	LNA_EN		GND	Not Applicable	Connect to GND
A16	RESERVED		RESERVED	Not Applicable	Not connected
A17	RESERVED		RESERVED	Not Applicable	Not connected
A18	RESERVED		RESERVED	Not Applicable	Not connected
A19	WT_CLKP	I	WT_CLKP	Not Applicable	
A20	WT_CLKN	I	WT_CLKN	Not Applicable	
A21	WT_D0P	I	WT_D0P	Not Applicable	
A22	WT_D0N	I	WT_D0N	Not Applicable	
A23	WT_D1P	I	WT_D1P	Not Applicable	
A24	WT_D1N	I	WT_D1N	Not Applicable	
A25	C_P32K	I	C_P32K	Not Applicable	Connected to 27 on the motherboard
A26	GND		GND	Not Applicable	
A27	RESERVED		RESERVED	Not Applicable	Not connected
A28	RESERVED		RESERVED	Not Applicable	Not connected
A29	RESERVED		RESERVED	Not Applicable	Not connected
A30	RESERVED		RESERVED	Not Applicable	Not connected
A31	GND		GND	Not Applicable	
A32	WGR_CLKP	O	WGR_CLKP	Not Applicable	
A33	WGR_CLKN	O	WGR_CLKN	Not Applicable	
A34	WGR_D0P	O	WGR_D0P	Not Applicable	
A35	WGR_D0N	O	WGR_D0N	Not Applicable	
A36	WGR_D1P	O	WGR_D1P	Not Applicable	
A37	WGR_D1N	O	WGR_D1N	Not Applicable	
A38	BRI_DT	I	BRI_DT	Not Applicable	
A39	BRI_RSP	O	BRI_RSP	Not Applicable	
A40	RGI_DT	I	RGI_DT	Not Applicable	
A41	RGI_RSP	O	RGI_RSP	Not Applicable	

Pin #	Pin Name platform pinout	Direction w/respect to Wireless client Module	Function When CNVi Is Used	Function When Standard (Discrete) M.2 Is Used	Comments
A42	RF_RESET_B	I	RF_RESET_B	Not Applicable	
A43	CLKREQ0	I	CLKREQ0	Not Applicable	
A44	REFCLK0		REFCLK0	Not Applicable	Disconnected/ floating on M.2 side
A45	NO CONNECT		NO CONNECT	Not Applicable	Pin must be left floating
A46	RESERVED		RESERVED	Not Applicable	Not connected
A47	RESERVED		RESERVED	Not Applicable	Not connected
A48	3.3 V		3.3 V	Not Applicable	
A49	3.3 V		3.3 V	Not Applicable	
A50	GND		GND	Not Applicable	

3-3. Power supply :

Requirement of Input Voltage is refer to the below table

No	Item	Pin NO	Min	Typ	Max	Unit	Comments
1	Supply Voltage	VCC	4, 5 ,72, 73	3.135	3.3	3.465	V

3-4. Antenna port

This is a description of the signal line of the antenna interface of this product.

Pin number			Name	Functionality
Chain A	ANT 1	SISO1	Aux	Wifi+Bluetooth
Chain B	ANT 2 (ANT 3)	SISO2	Main	Wifi Only

4. Safety precautions :

This module should be used at authorized places or environments due to frequency jamming possibility while operating. If occur any issues when the module operates at not authorized places or environments, Samsung Electronics does not have any responsibility

5. FCC Part 15 Information and Notices

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.

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.

6. Important Notice to integrators

1. This module is limited to OEM installation ONLY.
2. This module is limited to installation in mobile or fixed applications, according to Part 2.1091(b).
3. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations
4. For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part15 Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitt and the evaluation should confirm that the module's intentional emissions are compliant (i.e.

fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are complaint with the transmitter(s) rule(s). The Grantee will provide guidance to the host manufacturer for Part 15 B requirements if needed.

7. End Product Labeling :

Due to the very small size of the AX211D2W, the marking has been placed in this user manual because the product label on the devices is considered too small to be readable.

FCC ID : A3LAX211D730QFG / IC : 649E-AX211730QFG

Host system must be labeled with "Contains FCC ID : A3LAX211D730QFG", FCC ID displayed on label. and "Contains IC : 649E-AX211730QFG, IC no. displayed on label.

8. Antenna Installation :

Only antennas of the same type and with equal or less gains as 3dBi for the 2.4GHz band and 5dBi for the 5GHz require additional authorization for operation. For testing purposes the following dual band antenna that approximates closely the above limits was used:

Intel Reference Gain/Type/ Separation distance									
Antenna Type	**Antenna Peak gain (In dBi)***								**Distance to the end user (mm)**
	2.4GHz 2400-2483.5 MHz	**5.2GHz** 5150-5250MHz	**5.3GHz** 5250-5350MHz	**5.6GHz** 5470-5725MHz	**5.8GHz** 5725-5850MHz	**6.2GHz** 5925-6425MHz	**6.5GHz** 6425-6525MHz	**6.7GHz** 6525-6875MHz	**7.0GHz** 6875-7125MHz	Generic sku: refer to modular FCC SAR report
Design	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	Mid-power sku: ≥ 8 mm
PIFA	3.23	3.64	3.73	4.77	4.97	4.83	4.30	5.37	5.59	Low power sku: ≥ 5 mm
Dipole	2.89	2.92	3.19	4.41	4.22	4.83	4.30	4.49	5.34	

9. Conditions To Be Observed By Use of 6 GHz Bands (5.925 GHz – 7.125 GHz)

An indoor client device (6XD), where a client device is defined in FCC Part. 15.202, is limited to indoor locations and is under control of a low-power indoor access point (6ID) or subordinate(6PP). It is only possible to operate the client device can only operate under the control of a low-power indoor access point and subordinate.

A client may initiate brief messages to associate with a low-power indoor access point or subordinate and establish a connection only after receiving a confirmation signal confirming that an AP is present and operating on a particular channel. After being associated, the indoor client can only initiate transmission with that access point. Indoor client devices (6XD) are prohibited from making a direct air interface connection to other clients. An indoor client device cannot have a direct connection to the internet.

10. 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.

11. List of applicable FCC rules

This wireless adapter is restricted to indoor use due to its operation in the 5.15 to 5.25 and 5.470 to 5.75GHz frequency ranges. No configuration controls are provided for Intel® wireless adapters allowing any change in the frequency of operations outside the FCC grant of authorization for U.S. operation according to Part 15.407 of the FCC rules.
1) wireless adapters are intended for OEM integrators only.
2) wireless adapters cannot be co-located with any other transmitter unless approved by the FCC

12. 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.

13. RF Exposure Statement

The FCC with its action in ET Docket 96-8 has adopted a safety standard for human exposure to radio frequency (RF)electromagnetic energy emitted by FCC certified equipment. The wireless adapter meets the Human Exposure requirements found in FCC Part 2, 15C, 15E along with guidance from KDB 447498, KDB 248227 and KDB 616217.
Proper operation of this radio according to the instructions found in this manual will result in exposure
substantially below the FCC's recommended limits.
The following safety precautions should be observed:
- Do not touch or move antenna while the unit is transmitting or receiving.
- Do not hold any component containing the radio such that the antenna is very close or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- Do not operate the radio or attempt to transmit data unless the antenna is connected; this behavior may cause
damage to the radio.
- Use in specific environments:
- The use of wireless adapters in hazardous locations is limited by the constraints posed by the safety
directors of such environments.
- The use of wireless adapters on airplanes is governed by the Federal Aviation Administration (FAA).
- The use of wireless adapters in hospitals is restricted to the limits set forth by each hospital.
This module will be installed into any host and SAR re-assessment might be needed for host product. The OEM or integrator is responsible to perform the required additional host regulatory testing and/or obtaining the required host approvals for compliance.

Canada—Industry Canada (IC)

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil se conforme aux normes Canada d'Industrie de RSS permis-exempt. L'utilisation est assujetti aux deux conditions suivantes: (1) cet appareil ne peut pas causer d'interférences, et (2) cet appareil doit accepter des interférences, y compris des interférences qui peuvent causer desopérations non désirées de l'appareil.

Caution: When using IEEE 802.11a wireless LAN, this product is restricted to indoor use due to its operation in the 5.15- to 5.25-GHz frequency range. Industry Canada requires this product to be used indoors for the frequency range of 5.15 GHz to 5.25 GHz to reduce the potential for harmful interference to co-channel mobile satellite systems. High power radar is allocated as the primary user of the 5.25- to 5.35-GHz and 5.65 to 5.85-GHz bands. These radar stations can cause interference with and/or damage to this device. The maximum allowed antenna gain for use with this device is 6dBi in order to comply with the E.I.R.P limit for the 5.25- to 5.35 and 5.725 to 5.85 GHz frequency range in point-to-point operation. To comply with RF exposure requirements all antennas should be located at a minimum distance of 20cm, or the minimum separation distance allowed by the module approval, from the body of all persons.

Attention: l'utilisation d'un réseau sans fil IEEE802.11a est restreinte à une utilisation en intérieur à cause du fonctionnement dans la bande de fréquence 5.15-5.25 GHz. Industry Canada requiert que ce produit soit utilisé à l'intérieur des bâtiments pour la bande de fréquence 5.15-5.25 GHz afin de réduire les possibilités d'interférences nuisibles aux canaux co-existants des systèmes de transmission satellites. Les radars de puissances ont fait l'objet d'une allocation primaire de fréquences dans les bandes 5.25-5.35 GHz et 5.65-5.85 GHz. Ces stations radar peuvent créer des interférences avec ce produit et/ou lui être nuisible. Le gain d'antenne maximum permissible pour une utilisation avec ce produit est de 6 dBi afin d'être conforme aux limites de puissance isotropique rayonnée équivalente (P.I.R.E.) applicable dans les bandes 5.25-5.35 GHz et 5.725-5.85 GHz en fonctionnement point-à-point. Pour se conformer aux conditions d'exposition de RF toutes les antennes devraient être localisées à une distance minimum de 20 cm, ou la distance de séparation minimum permise par l'approbation du module, du corps de toutes les personnes."

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Selon les règlements de Canada d'Industrie, cet émetteur de radio peut seulement fonctionner en utilisant une antenne du type et de gain maximum (ou moindre) que le gain approuvé pour l'émetteur par Canada d'Industrie. Pour réduire les interférences radio potentielles avec les autres utilisateurs, le type d'antenne et son gain devraient être choisis de façon à ce que la puissance isotrope rayonnée équivalente (P.I.R.E.) ne soit pas supérieure à celle qui est nécessaire pour une communication réussie.