

Arcadyan Technology		
REG. DATE : 2025.08.08	SPECIFICATION	
REV. DATE : 2025.08.08		
MODEL : LGSWNAX61 (WN9122BTBAX 1-HF-19)		
User Manual		
PRODUCT NAME : Wi-Fi 6E AX and BT V5.4 Combo Module		
MODEL NAME : LGSWNAX61		

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1. Features LGSWNAX61 is the small size and low power module for WiFi 6E wireless LAN & BT5.4. LGSWNAX61 is based on Mediatek MT7921AUN solution. ▪ IEEE 802.11 a/b/g/n/ac/ax Dual Band Dual Concurrent (DBDC) ▪ Support bandwidth 20MHz in 2.4G, 80MHz in 5GHz, 6GHz band ▪ Bluetooth 5.4 with BLE (BT Low energy) ▪ Size : 68mm x 30mm x 6.8mm ▪ Two stream spatial multiplexing up to 300Mbps(802.11n) / 867Mbps(802.11ac) ▪Use on-chip OTP (One-Time Programmable) ▪ Host Interface : USB2.0 (WLAN & BT) - This model is using the common USB2.0 to control WLAN and BT ▪ Security : WAPI, WEP, WPA, WPA2,WPA3, WMM, AES, TKIP, CKIP ▪ Application: DTV, DVR, HD DVD Player, Blue-ray Disk Player, STB		

3. Absolute Maximum Ratings

Caution : The specifications in Table 1 define levels at which permanent damage to the device can occur. Function operation is not guaranteed under these conditions.
Operating at absolute maximum conditions for extend periods can adversely affect the long-term reliability of the device.

Parameter	Min	Max	Unit
Storage Temperature	-20	+80	°C
Storage Humidity (40°C)	-	90	%

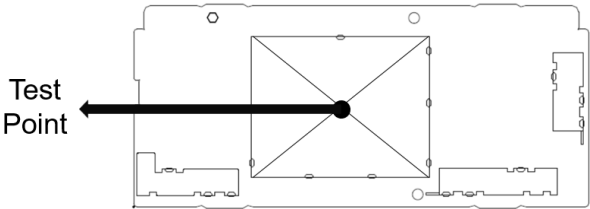
< Table 1 >

. Other conditions

- 1) Do not use or store modules in the corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are contained.
Also, avoid exposure to moisture.
- 2) Store the modules where the temperature
and relative humidity do not exceed 5 to 40°C and 20 to 60%.
- 3) Assemble the modules within 6 months.
Check the soldering ability in case of 6 months over.

4. Operating Conditions

- 4-1. Supply Voltage : +3.3V (+3.135V ~ +3.6V)
- 4-2. Relative Humidity : Less than 85%RH (at 40°C)
- 4-3. The performance of WiFi and Bluetooth are guaranteed for cover(Shield can)
temperature of test point from 0°C ~ 85°C.



5. Standard Test Conditions

The Test for electrical specification shall be performed under the following condition
Otherwise this following conditions, not guaranteed this performance.

5-1. Ambient condition

Temperature	25 ± 5°C
Humidity	65 ± 5%

5-2. Power supply voltages

Input power	Supply Voltage
VDD_3.3V	3.135 ~ 3.6V

5-3. Current consumption

Current Consumption	Min.	Typ.	Max.	Unit
TX Mode (11ac/80MHz)	-	480	1200	mA
Idle and Associated state	-	270	300	
Radio disabled state	-	60	70	

Note 1 : This figure is the RMS(root mean square) Value.

5-4. ESD Information

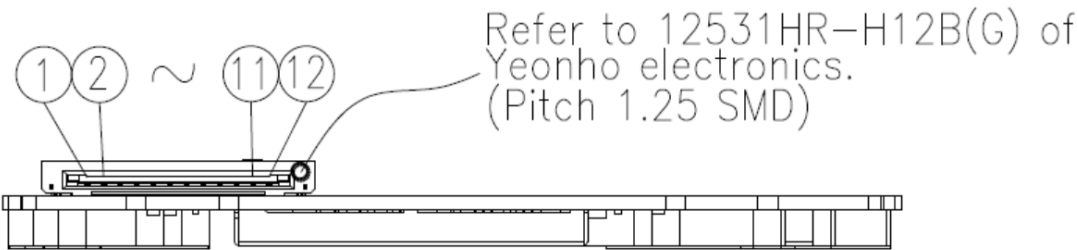
Human Body Model (HBM)	Min.	Max.	Unit
Contact	-	±4	kV
Air	-	±15	

Note 1 : IEC 61000-4-2 (150pF, 330R)

※ Test condition : After 8-pin USB Cable connect to module, progress ESD test.

8. Pin Description

Pin No.	Pin Name	I/O	Pin Description
1	VCC	I	VDD 3.3V
2	D-	I/O	USB Communication signal USB_DN
3	D+	I/O	USB Communication signal USB_DP
4	GND	-	GND
5	WOWL	O	Wake On WLAN
6	VCC	I	VDD 3.3V
7	AUDIO SYNC	O	AUDIO SYNC
8	GND	-	GND
9	RESET	I	RESET
10	WOBLE	O	Host wake up. (Signal from Wi-Fi module to the host)
11	GND	-	GND
12	VCC	-	VDD 3.3V



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9. Mechanical Characteristics

1) Outline view

Item	Test Conditions
Assembly	No defects of wiring, soldering and assembling
Appearance	No dirt, rust, corrosion or foreign material

2) Appearance structure

Item	Test Conditions
Dimension	As assembly drawing
Mounting	As assembly drawing
Weight	8.3g

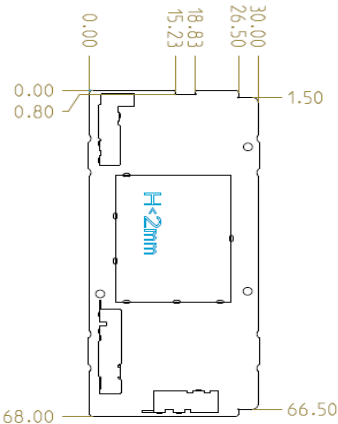
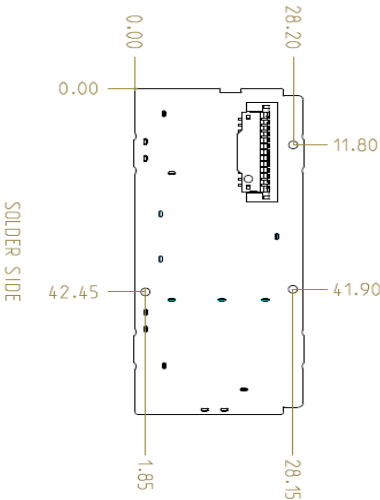
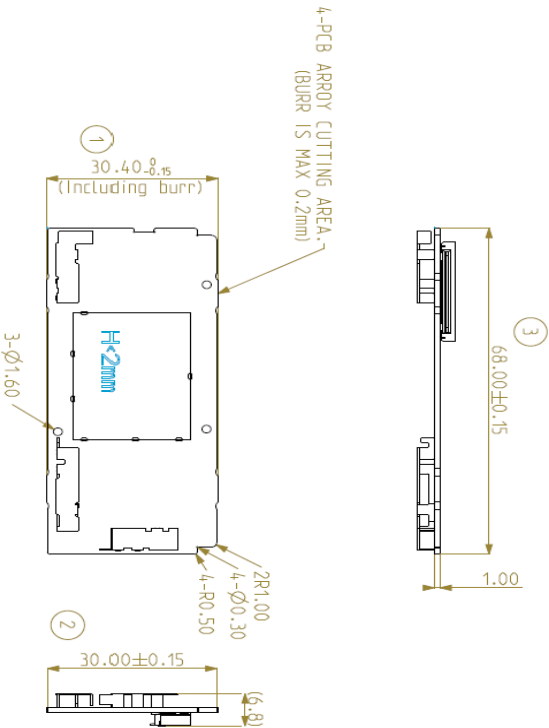
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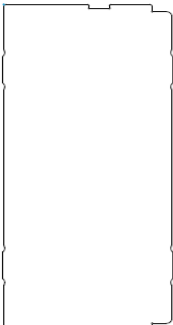
10. Outline Drawing

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Arcadyan Confidential Information

- NOTES :
- 1. Balloon marked are IQC inspection dimensions.
 - 2. Component height limit: As marked on the drawing.
 - 3. The tolerance of PCB thickness is follow the spec:
 - a. Thickness: 0.5~1.0mm (including) +/-10%
 - b. Thickness: 1.2mm +/- 10%
 - c. Thickness: 1.6mm +/- 8%
 - d. Thickness: 2.0mm +/- 8%
 - e. Thickness (other): Please follow RD's command.
 - 4



BOARD SHAPE ONLY FOR LAYOUT IMPORT



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<FCC Statement> FCC Part 15.19 Statements: 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 Part 15.21 statement Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. Regulatory notice to host manufacturer according to KDB 996369 D03 OEM Manual v01> List of applicable FCC rules This module has been granted modular approval as below listed FCC rule parts. -FCC Rule parts 15.247, 15.407 Summarize the specific operational use conditions -The OEM integrator should use equivalent antennas which is the same type and equal or less gain than an antenna listed below in this instruction manual. Limited module procedures (Only limited modular approval) single module Trace antenna designs (Only trace antenna module) N/A If trace antenna designs are applicable, full-detail design specifications are required per D02 Module Q&A Question 11. For a modular transmitter with trace antenna designs, see the guidance in Question 11 of KDB Publication 996369 D02 FAQ – Modules for Micro-Strip Antennas and traces. The integration information shall include for the TCB review the integration instructions for the following aspects: layout of trace design, partslist (BOM), antenna, connectors, and isolation requirements. a) Information that includes permitted variances(e.g., trace boundary limits, thickness, length, width, shape(s), dielectric constant, and impedance as applicable for each type of antenna); b) Each design shall be considered a different type (e.g., antenna length in multiple(s) of frequency, the wavelength, and antenna shape (traces in phase) can affect antenna gain and must be considered); c) The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (PC) board layout; d) Appropriate parts by manufacturer and specifications; e) Test procedures for design verification; and f) Production test procedures for ensuring compliance		

RF exposure considerations

The module has been certified for integration into products only by OEM integrators under the following condition:

- The antenna(s) must be installed such that a minimum separation distance of at least **20 cm** is maintained between the radiator (antenna) and all persons at all times.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

TV use

As long as the three conditions above are met, further transmitter testing will not be required. OEM integrators should provide the minimum separation distance to end users in their end-product manuals.

Antennas

This module is certified with the following integrated antenna.

-Type: Metal Press antenna

- 1) Ant 1(wifi 0) Peak gain: 0.49 dBi for 2.4 GHz and 2.25 dBi for 5 GHz and 2.65 dBi for 6GHz
- 2) Ant.2(wifi 1) Peak gain: 0.69 dBi for 2.4 GHz and 3.11 dBi for 5 GHz and 3.4 dBi for 6GHz
- 3) BT Peak gain: -2.73dBi

Any new antenna type, higher gain than listed antennas should be met the requirements of FCC rule 15.203 and 2.1043 as permissive change procedure.

Label and compliance information**End Product Labeling (FCC)**

The module is labeled with its own FCC ID. If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

“Contains FCC ID: 2B03LLGSWNAX61

Information on test modes and additional testing requirements

-OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, additional transmitter in the host, etc.).

Additional testing, Part 15 Subpart B disclaimer

-The final host product also requires Part 15 subpart B compliance testing with the modular transmitter installed to be properly authorized for operation as a Part 15 digital device.

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Note EMI Considerations

Note that a host manufacture is recommended to use D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties

For standalone mode, reference the guidance in D04 Module Integration Guide and for simultaneous mode; see D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.

How to make changes

Since only Grantees are permitted to make permissive changes, when the module will be used differently than granted, please contact the module manufacture on below contact information.

-. Contact information: younguk.nam@lge.com / Tel: 82-31-8066-5539

[987594 D01 U-NII 6GHz General Requirements v03r01]

- Transmitters in the 5.925-7.125 GHz band are prohibited from operating to control or communicate with unmanned aircraft systems.

<ISED Statement>

RSS-GEN, Sec. 7.1.3—(licence-exempt radio apparatus)

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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure

The antenna (or antennas) must be installed so as to maintain at all times a distance minimum of at least **20 cm** between the radiation source (antenna) and any individual. This device may not be installed or used in conjunction with any other antenna or transmitter.

l'exposition aux RF

L'antenne (ou les antennes) doivent être installées de manière à maintenir en permanence une distance minimale de **20 cm** entre la source de rayonnement (antenne) et toute personne. Cet appareil ne doit pas être installé ni utilisé conjointement à une autre antenne ou un autre émetteur.

End Product Labeling (ISED)

The module is labeled with its own IC Certification Number. If the IC Certification Number are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

“Contains IC: 2703H-LGSWNAX61”

Étiquetage du produit final

Le module est étiqueté avec son propre numéro de certification IC. Si le numéro de certification IC n'est pas visible lorsque le module est installé à l'intérieur d'un autre appareil, alors l'extérieur de l'appareil dans lequel le module est installé doit également afficher une étiquette faisant référence au module inclus. Dans ce cas, le produit final doit être étiqueté dans une zone visible avec les éléments suivants :

"Contient IC : 2703H-LGSWNAX61"

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<ISED Statement>

RSS-247 issue 4

* 5150-5350 MHz is indoor use only.

* 5150-5350 MHz est réservé à une utilisation en intérieur uniquement.

RSS-248 issue 3

- Devices shall not be used for control of or communications with unmanned aircraft systems.
- Devices shall not be used on oil platforms.
- Devices shall not be used on aircraft, except for the low-power indoor access points, indoor subordinate devices, low-power client devices, and very low-power devices operating in the 5925-6425 MHz band, that may be used on large aircraft as defined in the Canadian Aviation Regulations, while flying above 3,048 metres (10,000 feet).
- Devices shall not be used on automobiles.
- Devices shall not be used on trains.
- Devices shall not be used on maritime vessels.

•Les appareils ne doivent pas être utilisés pour le contrôle ni la communication avec des systèmes d'aéronefs sans pilote.

•Les appareils ne doivent pas être utilisés sur des plateformes pétrolières.

•Les appareils ne doivent pas être utilisés à bord d'aéronefs, à l'exception des points d'accès intérieurs à faible puissance, des appareils subordonnés intérieurs, des appareils clients à faible puissance et des appareils à très faible puissance fonctionnant dans la bande de 5 925 à 6 425 MHz. Ces derniers peuvent être utilisés à bord de gros aéronefs, tels que définis dans le Règlement de l'aviation canadien, lorsqu'ils volent à plus de 3 048 mètres (10 000 pieds).

•Les appareils ne doivent pas être utilisés à bord d'automobiles.

•Les appareils ne doivent pas être utilisés dans les trains.

•Les appareils ne doivent pas être utilisés à bord de navires.

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11. CE Statement

RF Exposure The antenna (or antennas) must be installed so as to maintain at all times a distance minimum of at least 20 cm between the radiation source (antenna) and any individual. This device may not be installed or used in conjunction with any other antenna or transmitter

12. Simplified Declaration of Conformity (CE / UK)

Hereby, LG Electronics declares that hat LGSWNAX61 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <http://www.lg.com/global/support/cedoc/cedoc#>

Hereby, [LG Electronics Inc.]. declares that LGSWNAX61 is in compliance with the Radio Equipment Regulations 2017. The full text of the UK declaration of conformity is available at the following internet address: <http://www.lg.com/global/support/cedoc/cedoc#>

The use of the 5150 –5350 MHz band is restricted to indoor use only.
This restriction will be applied in all member states.

The postal address: LG Electronics European Shared Service Center B.V.
Krijgsman 1, 1186 DM Amstelveen, The Netherlands

UK Importer: LG Electronics U.K. Ltd
The postal Address: Velocity 2, Brooklands Drive, Weybridge, KT13 0SL