

WUBT-281AX

802.11ax/ac/b/g/n 2T2R

Wi-Fi USB Module



SparkLAN **WUBT-281AX** is a highly integrated single-chip Wireless LAN (WLAN) USB3.0 module which supports 2 streams 802.11ax solutions with multi-user MIMO (Multiple-Input, Multiple-Output) wireless LAN (WLAN). It is integrated 2Tx2R WLAN MAC, baseband, and dual band RF in a single chip USB3.0 module. **WUBT-281AX** provides a cost effective solution for M2M (machine to machine) connectivity product/device by one USB port.

WUBT-281AX 802.11ac/ax/b/g/n 2Tx2R USB WLAN module with various USB3.0 input format & internal printing or external RF antenna connector for high performance wireless LAN device. It is designed to provide completely M2M connection & excellent cost performance with low power consumption and enhance the advantages of robust system & applications.

Embedded Application

Applications include portable handheld devices, thin client computer, medical devices, network security & monitoring, 3D printer, TV, STB, POS, digital signs, gaming machine, robotic machinery, industrial tablets, etc.

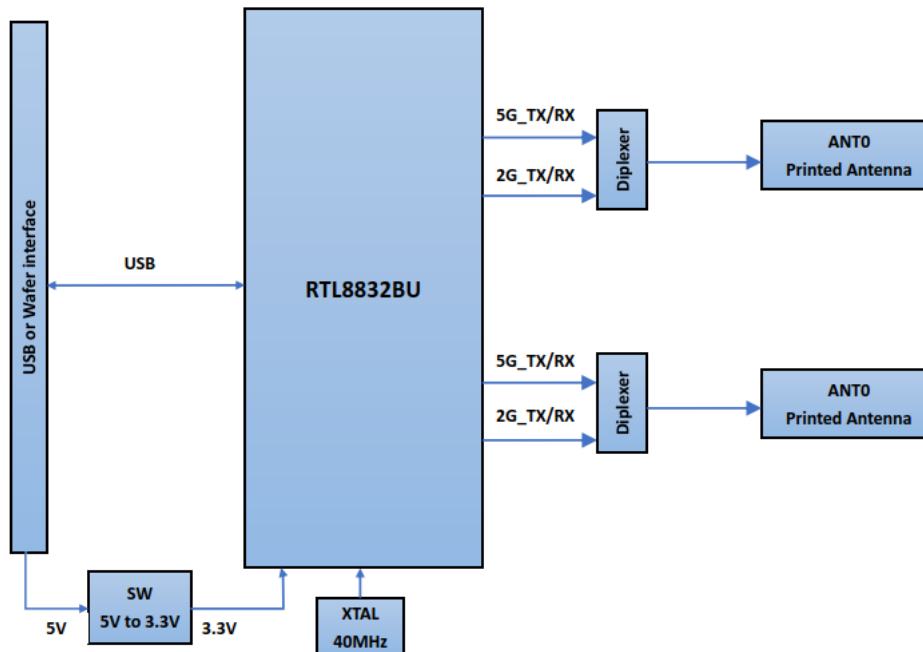
Key Feature

- 802.11ax/ac/b/g/n Wi-Fi
- Support 802.11ax/ac 2x2, compliant with MU-MIMO. Operates in 2.4GHz and 5GHz frequency bands
- Maximum data rates: 54Mbps in 802.11g, 300Mbps in 802.11n, 866.7Mbps in 802.11ac, 573.5Mbps in 802.11ax(2.4GHz), 1201MGbps in 802.11ax(5GHz).
- Support Operation Systems (Android/Linux/Windows)

Specification

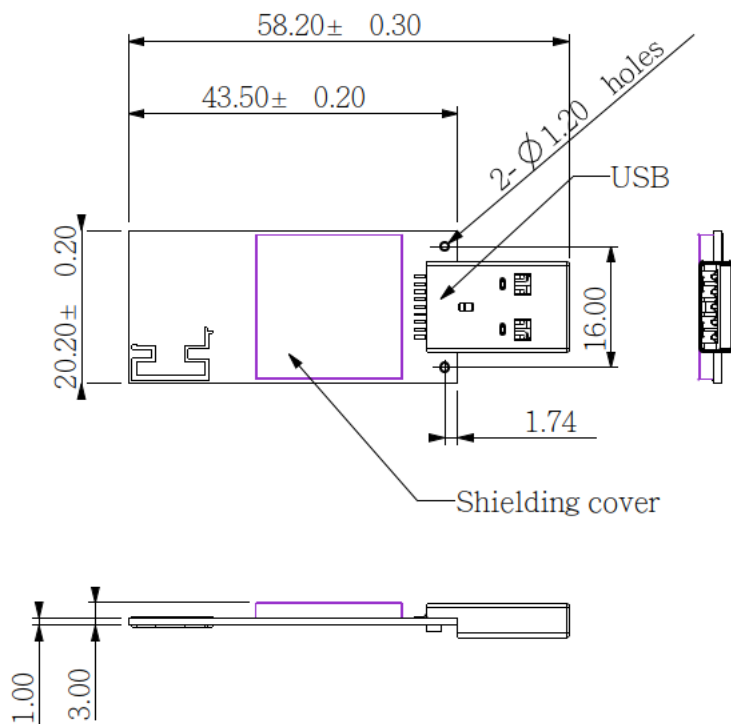
Standards	IEEE 802.11ax/ac/b/g/n (2T2R)
Chipset	Realtek RTL8832BU
Data Rate	802.11b: 11Mbps 802.11a/g: 54Mbps 802.11n: MCS0~15 802.11ac: MCS0~9 802.11ax: HE0~11
Operating Frequency	IEEE 802.11 ax/ac/a/b/g/n ISM Band: 2.412GHz~2.484GHz, 5.150GHz~5.850GHz *Subject to local regulations
Interface	WLAN: USB
Form Factor	USB 3.0 Type A / 9 Pin Wafer
Antenna	2 x IPEX MHF1 connectors or printed antenna for 2T2R
Modulation	WiFi : 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) 802.11ax: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM)
Power Consumption (TBD)	TX Mode: 300 mA (Max.) RX Mode: 300 mA (Max.)
Operating Voltage	DC 5V
Operating Temperature Range	-20°C ~+70°C
Storage Temperature Range	-55°C ~+125°C
Humidity (Non-Condensing)	5%~90% (Operating) 5%~90% (Storing)
Dimension (in mm)	[PU][MU] : 58.2mm(±0.3mm) x 20.2mm(±0.3mm) x 4.5 mm(±0.3mm) (L x W x H)
Weight (g)	[PU][MU] : 4.6g
Security	64/128-bits WEP, WPA, WPA2, 802.1x, WPA3-SAE R2

Block Diagram



Mechanical Dimension (mm)

USB3.0 Type A: WUBT-281AX [PU] /WUBT-281AX [MU]



Mechanical Dimension (mm)

Wafer: WUBT-281AX [P9W] /WUBT-281AX [M9W]

Installation

- Connect the Module to the slot of the computer.
- Install Wi-Fi driver.
- After the Wi-Fi Driver is installed , click the Network icon on the Windows, then search the network , and connect the Wireless Network you want.

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 or more 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 your authority to operate the equipment.

RF exposure statements

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 36 centimeters between the radiator and your body or nearby persons.

CFR 47 FCC PART 15 SUBPART C (15.247) and SUBPART E (15.407) has been investigated. It is applicable to the modular transmitter.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

This radio transmitter RYK-WUBT281AX has been approved by Federal Communications Commission 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.

Unique antenna connector (RP-SMA) must be used on the Part 15 authorized transmitters used in the host product.

Antenna Type	Brand	Antenna Model	Maximum Gain (dBi)	
			2.4 GHz	5GHz
Dipole	SparkLAN	AD-315N	3 dBi	5 dBi
Dipole	SparkLAN	AD-103AG	2.02 dBi	2.03 dBi
Dipole	SparkLAN	AD-305N	5 dBi	5.53 dBi
Dipole	SparkLAN	AD-303N	3.14 dBi	3.45 dBi
Dipole	SparkLAN	AD-302N	3.14 dBi	2.87 dBi
Printed Antenna	SparkLAN	ANTENNA-R	-13.33 dBi	6.05 dBi
Printed Antenna	SparkLAN	ANTENNA-L	-13.74 dBi	4.86 dBi

Length of RF cable:150mm

Connector type of RF cable: I-PEX/MHF1 to RP-SMA(F)

If the FCC identification number 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. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: RYK-WUBT281AX” Or “Contains FCC ID: RYK-WUBT281AX”

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

KDB 996369 D03 OEM Manual v01r01:

2.1 General:

Please refer to the relevant content in this User Manual as the relevant information.

2.2 List of applicable FCC rules

The FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247 and Subpart E Section 15.407 has been investigated. These FCC rules are applicable to this modular transmitter

2.3 Summarize the specific operational use conditions

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

2.4 Limited module procedure:

This modular transmitter is not a limited module approval procedure.

2.5 Trace antenna designs

This modular transmitter is not Trace antenna design.

2.6 RF exposure considerations

This modular transmitter complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 36 cm between the radiator and your body or nearby persons.

2.7 Antennas

Antenna Type	Brand	Antenna Model	Maximum Gain (dBi)	
			2.4 GHz	5GHz
Dipole	SparkLAN	AD-315N	3 dBi	5 dBi
Dipole	SparkLAN	AD-103AG	2.02 dBi	2.03 dBi
Dipole	SparkLAN	AD-305N	5 dBi	5.53 dBi
Dipole	SparkLAN	AD-303N	3.14 dBi	3.45 dBi
Dipole	SparkLAN	AD-302N	3.14 dBi	2.87 dBi
Printed Antenna	SparkLAN	ANTENNA-R	-13.33 dBi	6.05 dBi
Printed Antenna	SparkLAN	ANTENNA-L	-13.74 dBi	4.86 dBi

2.8 Label and compliance information

The following information must be indicated on the host device of this module;

Contains Transmitter Module FCC ID: RYK-WUBT281AX

or

Contains FCC ID: RYK-WUBT281AX

2.9 Information on test modes and additional testing requirements

This module is approved as a stand-alone module. If the end product will include multiple, simultaneously transmitting transmitters or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer must consult with module manufacturer for the installation method in end system. It is recommended that the host product manufacturer, installing the modular transmitter, perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emission limits or band edge limit. If the host product manufacturer finds during these investigative measurements that the transmitter emissions from their product are high and likely to exceed the limit, it may be necessary for the host product manufacturer to work with the module manufacturer to consider more thorough investigation and mitigation measures. If the host product manufacturer does find the composite system (host product and modular transmitter) does exceed the spurious emission or output power limit. It is the responsibility of the host product manufacturer not to market the product in the U.S.

2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

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 modular transmitter in the user manual of the end product which integrates this modular transmitter. The end user manual shall include all required regulatory information and warning as shown in this manual.

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Industry Canada statement:

This device complies with Industry Canada license-exempt RSSs. 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;
- 2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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 specified for point-to-point and non-point-to-point operation as appropriate; and

Avertissement:

- 1) Le dispositif fonctionnant dans la bande 5150-5250 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;
- 2) Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la limitation P.I.R.E.;
- 3) Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant la bande 5725-5850 MHz doit se conformer à la limitation P.I.R.E. spécifiée

pour l'exploitation point à point et non point à point, selon le cas.

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 36cm between the radiator & your body.

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 36 cm de distance entre la source de rayonnement et votre corps.

This radio transmitter (IC: 6158A-WUBT281AX has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain 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 (IC: 6158A-WUBT281AX a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés cidessous 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, sont strictement interdits pour l'exploitation de l'émetteur.

Antenna Type	Brand	Antenna Model	Maximum Gain (dBi)	
			2.4 GHz	5GHz
Dipole	SparkLAN	AD-315N	3 dBi	5 dBi
Dipole	SparkLAN	AD-103AG	2.02 dBi	2.03 dBi
Dipole	SparkLAN	AD-305N	5 dBi	5.53 dBi
Dipole	SparkLAN	AD-303N	3.14 dBi	3.45 dBi
Dipole	SparkLAN	AD-302N	3.14 dBi	2.87 dBi
Printed Antenna	SparkLAN	ANTENNA-R	-13.33 dBi	6.05 dBi
Printed Antenna	SparkLAN	ANTENNA-L	-13.74 dBi	4.86 dBi

If the ISED certification number 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. This exterior label can use

Si le numéro de certification ISDE 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. Cette étiquette extérieure peut utiliser un libellé comme celui-ci: " Contient IC: 6158A-WUBT281AX".

Plaque signalétique du produit final:

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 6158A-WUBT281AX ".

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 manue

Must use the device only in host devices that meet the FCC/ISED RF exposure category of mobile, which means the device is installed and used at distances of at least 36 cm from persons.

The end user manual shall include FCC Part 15 /ISED RSS GEN compliance statements related to the transmitter as show in this manual.

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B, ICES 003.

Host manufacturer is strongly recommended to confirm compliance with FCC/ISED requirements for the transmitter when the module is installed in the host.

Must have on the host device a label showing Contains FCC ID: 6158A-WUBT281AX, Contains IC: 6158A-WUBT281AX

The use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual.

If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

L'hôte doit utiliser l'instrument uniquement dans des dispositifs qui répondent à la fcc / (catégorie d'exposition rf mobile, ce qui signifie le dispositif est installé et utilisé à une distance d'au moins 36 cm de personnes.

le manuel de l'utilisateur final doit inclure la partie 15 / (fac rss gen déclarations de conformité relatives à l'émetteur que de montrer dans ce manuel.

le fabricant est responsable de la conformité de l'hôte, le système d'accueil avec le module installé avec toutes les autres exigences applicables du système comme la partie 15 b, ics - 003. accueillir le fabricant est fortement recommandé de confirmer la conformité avec les exigences de la fcc / (émetteur lorsque le module est installé dans l'hôte.

le dispositif d'accueil doivent avoir une étiquette indiquant contient FCC ID: RYK-WUBT239ACNBT, contient IC : 6158A-WUBT281AX

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。

應避免影響附近雷達系統之操作。

高增益指向性天線只得應用於固定式點對點系統。

安裝該模組之主體裝置或設備上標示【內含發射器模組  CC XX xx YY vvv Z z W】