AW7915-NP1 WiFi6 4T4R Dual Bands Selectable 802.11ax / ac / a / b / g / n 2.4G / 5GHz mPCIe Card

WiFi6 11ax 4T4R module 2400Mbps

Introduction

■ Product overview

AW7915-NP1 is a WiFi6 Mini PCIe Module 4T4R based on Mediatek MT7915AN which is a WiFi Mini PCIe single chip which supports 2401 Mbps PHY rate with   PCIe2.1. It fully complies with IEEE 802.11ax/ac and IEEE 802.11 ac/a/b/g/n standards, offering feature-rich wireless connectivity at high standards, and delivering reliable, cost-effective throughput from an extended distance.

Optimized RF architecture and base band algorithms provide superb performance and low power consumption. Intelligent MAC design deploys a high efficient offload engine and hardware data processing accelerators which completely offloads Wi-Fi task of the host processor. MT7915AN is designed to support standard based features in the areas of security, quality of service and international regulations, giving end users the greatest performance any time and in any circumstance.

MT7915AN is designed to support high data throughput over WiFi. The host interface PCIe are integrated to provide stable bandwidth between the host platform and MT7915AN.

Deep sleep mode:
Multiple power domains are implement on chip. In deep sleep mode, the PMU could be configured in a low power state to save the power consumption.

Two CPU systems: There are both 32-bits RISC MCU subsystem. The CPU has its local memory. There are several options of clock frequency to provide the optimal performance with the best power consumption. The 32-bit RISC MCU is used to do clocck control, power management, and host interface configuration. PDMA (packet DMA) engines are integrated to support on-the-fly data buffer management.

MT7915AN had the WiFi MAC and BBP subsystem and use with MT7975N together, which provide the best-in-class radio and low power performance. And the Wi-Fi MAC and BBP subsystem and use with MT7975N together, which provide the best-in-class radio and low power performance.

With the advent of 802.11ax/ac, multi-user MIMO (MU-MIMO) is defined. MT7915AN supports MU-MIMO with different configurations.

Features:

■ Supports 4×4 4SS 11ax wave2 MU-MIMO
■ MU-MIMO configurations of
■ 4 users: 4*1ss
■ 3 users: 2*1ss + 1*2ss or 3*1ss
■ 2 users: 2*2ss or 1*1ss + 1*2ss or 2*1ss
■ Supports 5, 10, 20, 40, 80, 80+80 channels
■ Suppport MU-OFDMA TX/RX

- Embedded ARM Cortex R4 processor for full host CPU offload
- Embedded 32-bit RISC microprocessor
- Support STBC, LDPC, TX Beamformer and RX Beamformee
- Greenfield, mixed mode, legacy modes support
- Highly integrated RF with 40nm low power process
- 4T4R with support of up to 2401Mbps PHY rate
- Configurable 4×4/3×3 or 2x2n+2x2ax DBDC
- Noise mitigation:
- Supports background scan function for fast channel switching
- Supports spectrum analysis for non-Wi-Fi signals
- Intelligent power saving
- WFA WMM, WMM PS (QoS)
- Integrate high efficiency internal 4G/5G PAs
- Intelligent Calibration (iCal) reduces the production time
- WoWLAN via GPIO (client mode), supports Host Sleep (AP mode)

Specification:

Standards	Wireless: IEEE 802.11ax/ac/b/g/n (4Tx4R)
Data Rate	IEEE802.11ax 2401Mbps @TX/RX
	IEEE802.11ac 1733Mbps @TX/RX
	IEEE802.11a/n 600Mbps @TX/RX
	IEEE802.11a/g 108Mbps
	IEEE802.11b 22Mbps
Output Power	11b: 23dbm+/- 1.5dbm @11Mbps
	11g: 20dbm+/- 1.5dbm @54Mbps
	11g/n: 20dBm +/- 1.5dbm @MCS7, HT20
	17dBm@MCS7,HT40
	11a: 19.5dBm +/- 1.5dbm @54Mbps
	11a/n: 19.5dBm+/- 1.5dbm @MCS7, HT20
	17dBm@MCS7, HT40
	11ac HT20: 20+/-1.5dBm @MCS8
	11ac HT40: 17+/-1.5dBm @MCS9
	11ac HT80: 14.5+/-1.5dBm @MCS9
	11ax HT20: 20+/-1.5dBm @MCS9
	11ax HT40: 17 +/- 1.5dBm @MCS9
	11ax HT80: 14.5 +/- 1.5dBm @MCS11

Receiver Sensitivity	11b: -99dBm @11Mbps
	11g: -95dBm @54Mbps
	11g/n: -90dBm @HT20, MCS7
	-86dBm @HT40, MCS7
	11a: -90Bm @54Mbps
	11a/n: -85dBm @HT20, MCS7
	-81dBm @HT40, MCS7
	11ac: -90dBm +/- 2dBm @VHT20 MCS8
	11ac: -85dBm +/- 2dBm @VHT40 MCS9
	11ac: -68dBm +/- 2dBm @VHT80 MCS9
	11ax: -61dBm +/- 2dBm @HE20 MCS11
	11ax: -58dBm +/- 2dBm @HE40 MCS11
	11ax: -55dBm +/- 2dBm @HE80 MCS11
Antenna	External Antenna connector (IPEX) x4
Frequency Range	US, Canada 2.412GHz~2.462 GHz (CH1~CH11)
	EU, Japan: 2.412GHz~2.472GHz (CH1~CH13)
	5.150GHz~5.250GHz、5.725GHz~5.850GHz
Software	Security: 64/128-bit WEP Encryption, WPA, WPA2
	Driver: Linux
Operating Voltage	DC 3.3V ± 5%
Temperature	Operating: 0°C ~ +70°C
	Storage : -20°C ~ +90°C
Humidity	Operating Humidity: 10%~90% non-condensing
	Storage Humidity: 10%~90% non-condensing
Dimension	50.95(H) x 30(W)mm

Mechanical Dimensions
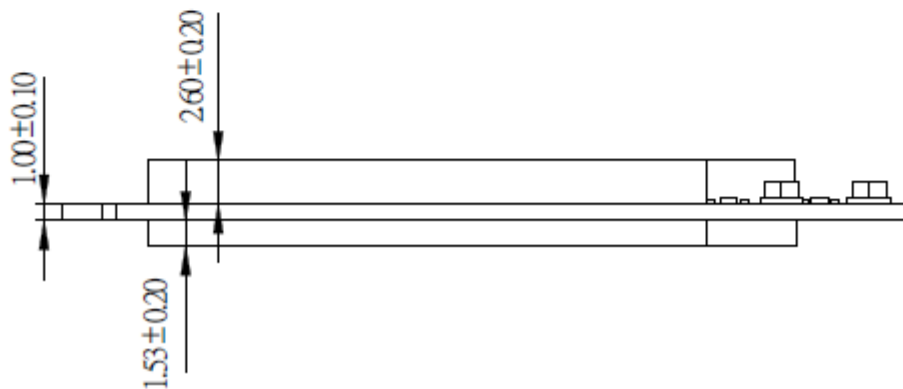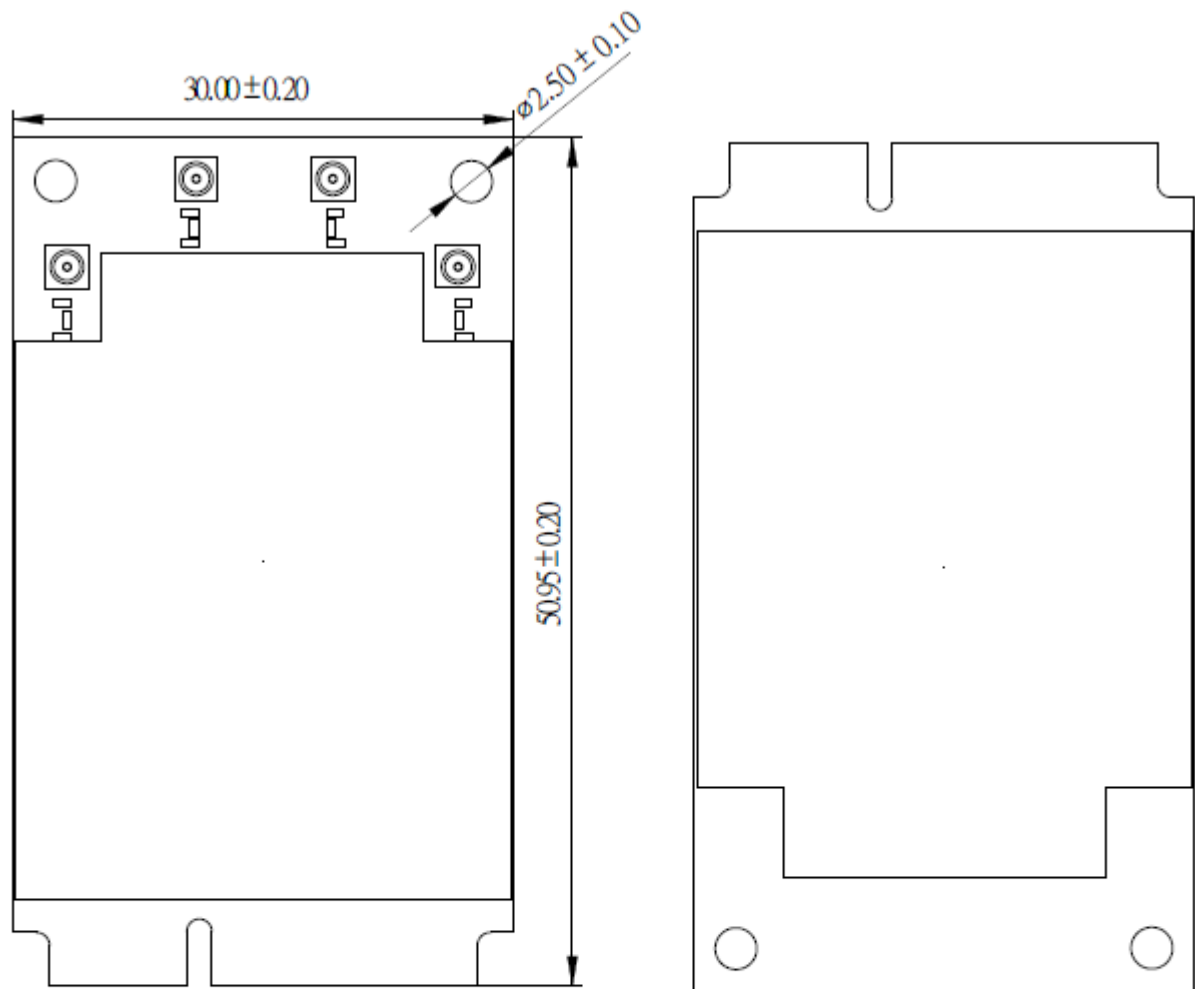
All dimensions are in mm

Pin define

AW7915-NP1 PINS OUT

TOP SIDE

DOWN SIDE
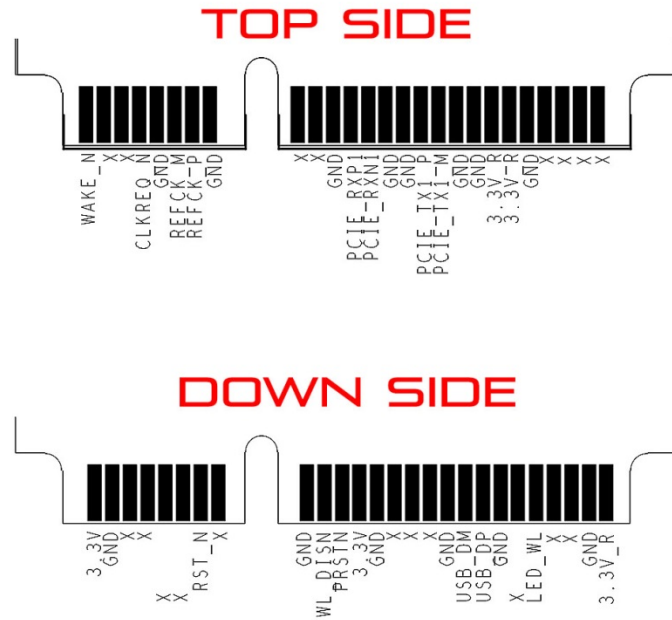
Packing information

Using antistatic tray.

One tray for 35pcs PCBA.

One carton for 23 trays=805 PCBAs

One tray for 35pcs PCBA

23 trays in one carton

Sealing carton

Carton label is as below:

One carton label

Compliance Information

OEM integration instructions:

This device is intended only for OEM integrators under the following conditions,
The module is only limited to installation in mobile applications. The antenna must be installed such that 20 cm is
maintained between the antenna and users, and the transmitter module may not be co-located with any other transmit or antenna. The module shall be only used with the integral antenna(s) that has been originally tested and certified with this module.
As long as 3 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 requirement with this module installed (for example, digital device emission, PC peripheral requirements, etc.)

OEM integration instructions:

In the event that these conditions cannot be met (for example certain laptop configuration or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these and circumstance, the OEM integrator will be responsible for re-evaluating. The end product (including the transmitter) and obtaining a separate FCC authorization

End product labeling:

This transmitter module is authorization only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following,
"Contains Transmitter Module FCC ID: TKZAW7915NP1 or Contains FCC ID: TKZAW7915NP1"

Information that must be placed in the end user manual:

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.

FCC 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.

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 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 device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

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.

ISED Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1.This device may not cause interference.

2.This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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.

Les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

ISED Radiation Exposure Statement:

This equipment complies with IC RSS-102 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.

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 20cm de distance entre la source de rayonnement et votre corps.

The transmitter module may not be co-located with any other transmitter or antenna.

Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

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 module is intended for OEM integrators under the following conditions:

1. Ensure that the end-user has no manual instructions to remove or install module.

2. This module is certified pursuant to Part 15 rules section 15.247, 15.407 and RSS-247.

3. This module has been approved to operate with the antenna types listed below, with the maximum permissible gain indicated.

Frequency Band	Model Number	Antenna Type	Gain(dBi)	Cable Loss
2400-2483.5MHz;	ANT010-DAU	PCB	2.4GHz: 5.2 5GHz: 5.5	0.3dBi

5150-5850MHz				
2400-2483.5MHz; 5150-5850MHz	ANT003	PCB	2.4GHz: 2.5 5GHz: 2.5	0.3dBi
2400-2483.5MHz; 5150-5850MHz	A245005N	PCB	2.4GHz: 4 5GHz: 5.1	0.3dBi
2400-2483.5MHz	A2405N	PCB	2.4GHz: 5.2	0.3dBi
5150-5850MHz	A5005N	PCB	5GHz: 5	0.3dBi
2400-2483.5MHz; 5150-5850MHz	A245004	Dipole	2.4GHz: 4 5GHz: 5.1	0.3dBi
2400-2483.5MHz; 5150-5850MHz	A245002	Dipole	2.4GHz: 2 5GHz: 2	0.3dBi

4. Label and compliance information

Label of the end product:

FCC

The host product must be labeled in a visible area with the following " Contains FCC ID: TKZAW7915NP1".

The end product shall bear the following 15.19 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.

ISED

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains transmitter module IC: 9968A-AW7915NP1" or "Contains IC: 9968A-AW7915NP1"

Contient le module d'émission IC: 9968A-AW7915NP1

The Host Model Number (HMN) must be indicated at any location on the exterior of the end product or product packaging or product literature which shall be available with the end product or online.

5. Information on test modes and additional testing requirements

This module has been approved under stand-alone configuration.

OEM integrator has be limited the operation channels in channel 1-11 for 2.4GHz band.

The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093/RSS-102 and different antenna configurations.

The information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host can be found at KDB Publication 996369 D04.

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, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC/ISED authorization is no longer considered valid and the FCC/IC No. cannot 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/ISED authorization.

6. Additional testing, Part 15 Subpart B and ICES-003 disclaimer

Appropriate measurements (e.g. Part 15 Subpart B compliance) and if applicable additional equipment authorizations (e.g. SDoC) of the host product to be addressed by the integrator/manufacturer.

This module is only FCC/ISED authorized for the specific rule parts 15.247, 15.407/RSS-247 listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC/ISED rules that apply to the host product as being Part 15 Subpart B/ICES-003 compliant.

7. The user manual of the end product should include:

FCC:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.

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.

The antenna(s) used for this transmitter must not transmit simultaneously with any other antenna or transmitter.

ISED:

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