

# AW7615-NP1 Dual Band 4x4 802.11ac MiniPCle WiFi Module

WiFi5 11ac 4T4R module 1700Mbps

## Introduction

### ■ Product overview

It fully complies with IEEE802.11ac and IEEE802.11 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. MT7615 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.

MT7615 supports concurrent dual-band operation at 5GHz and 2.4GHz band (DBDC, Dual-Band-Dual-Concurrent).

With the advent of 802.11ac, multi-user MIMO (MU-MIMO) is defined. MT7615 supports MU-MIMO with different configurations. An AP is able to use its antenna arrays to transmit multiple frames to different clients at the same time and over the same frequency spectrum.

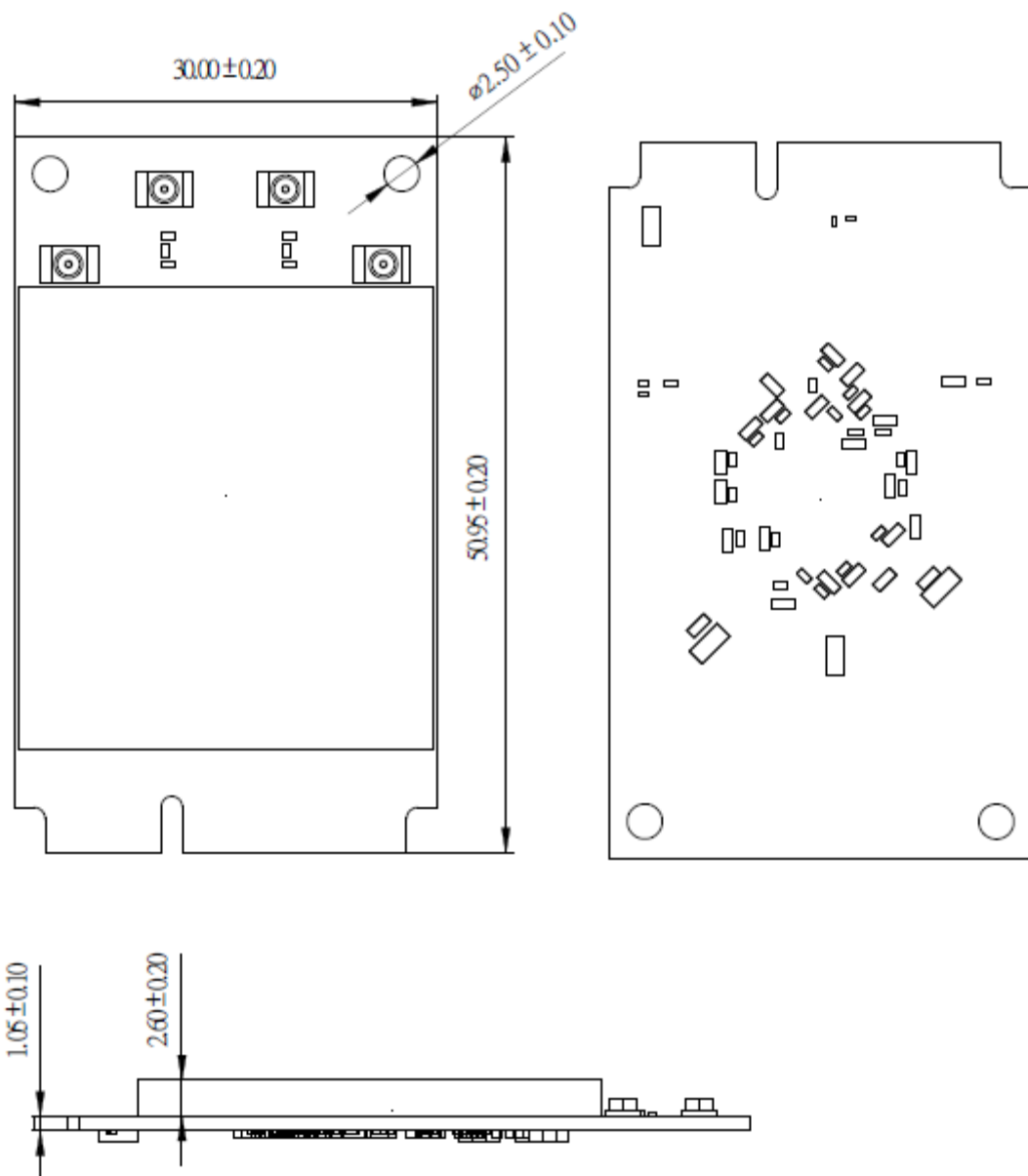
## Features:

- Supports 4x4 11ac 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
- Support 80+80 channels
- Embedded ARM Cortex R4 processor for full host CPU offload
- Embedded 32-bit RISC microprocessor
- iNIC Gen2 with full Wi-Fi offload
- Highly integrated RF with 40nm low power process
- 4T4R with support of up to 1733Mbps PHY rate
- Configurable 4x4/3x3 or 2x2n+2x2ac DBDC
- Noise mitigation:
- Supports background scan function for fast channel switching
- Supports spectrum analysis for non-Wi-Fi signals
- Intelligent power saving
- Hardware-based Airtime Fairness (QoS)
- Integrate high efficiency internal 2.4G/5G PAs
- Intelligent Calibration (iCal) reduces the production time
- Supports external PA/LNA/TRSW design
- Proprietary LTE coexistence over UART
- WoWLAN via GPIO (client mode), supports Host Sleep (AP mode)
- Compact 12mm\*12mm DRQFN118 package with PCIe Gen2 interface

## Specification:

|                      |                                                |
|----------------------|------------------------------------------------|
| Standards            | IEEE802.11ac/b/g/n (4Tx4R)                     |
| Data Rate            | IEEE802.11ac 1733Mbps@TX/RX                    |
|                      | IEEE802.11a/n 600Mbps@TX/RX                    |
|                      | IEEE802.11a/g 108Mbps                          |
|                      | IEEE802.11b 22MbpsIEEE 802.11ac up to 1733Mbps |
| Output Power         | 11b: 20dbm+/- 1.5dbm @ 11Mbps                  |
|                      | 11g: 18dbm+/- 1.5dbm @ 54Mbps                  |
|                      | 11g/n: 18dBm +/- 1.5dbm @MCS7,HT20             |
|                      | 17dBm@MCS7,HT40                                |
|                      | 11a: 16dBm +/- 1.5dbm @ 54Mbps                 |
|                      | 11a/n: 15dBm+/- 1.5dbm @MCS7,HT20              |
|                      | 13dBm@MCS7,HT40                                |
|                      | 11ac HT20: 12+/-1.5dBm@MCS8                    |
|                      | 11ac HT40: 12+/-1.5dBm@MCS9                    |
|                      | 11ac HT80: 12+/-1.5dBm@MCS9                    |
|                      |                                                |
| Receiver Sensitivity | 11b: -89dBm@11Mbps                             |
|                      | 11g: -76dBm@54Mbps                             |
|                      | 11g/n: -74dBm@HT20,MCS7                        |
|                      | -66dBm@HT40,MCS7                               |
|                      | 11a: -75Bm@54Mbps                              |
|                      | 11a/n: -73dBm@HT20,MCS7                        |
|                      | -71dBm@HT40,MCS7                               |
|                      | 11ac: -57dBm+/-2dBm @HT20 MCS8                 |
|                      | 11ac: -54dBm+/-2dBm @HT40 MCS9                 |
|                      | 11ac: -51dBm+/-2dBm @HT80 MCS9                 |
|                      |                                                |
| RF connector         | IPEX connector                                 |
| 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                         |
| Dimension            | 50.95 mm (L) x 30 mm (W)                       |
| Humidity             | Operating Humidity: 10%~90% non-condensing     |
|                      | Storage Humidity: 10%~90% non-condensing       |

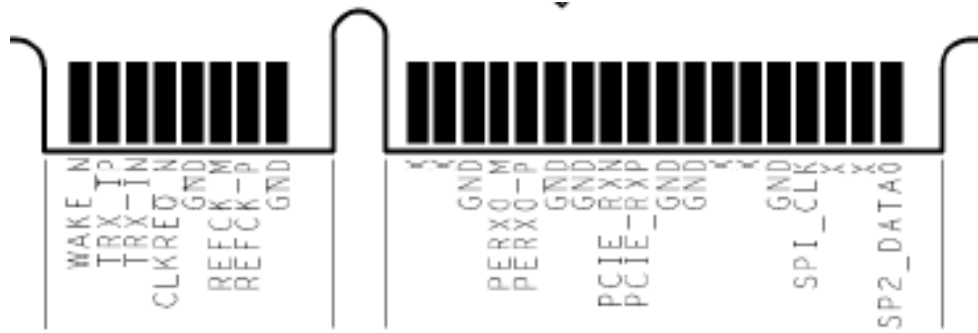
## Mechanical Dimensions



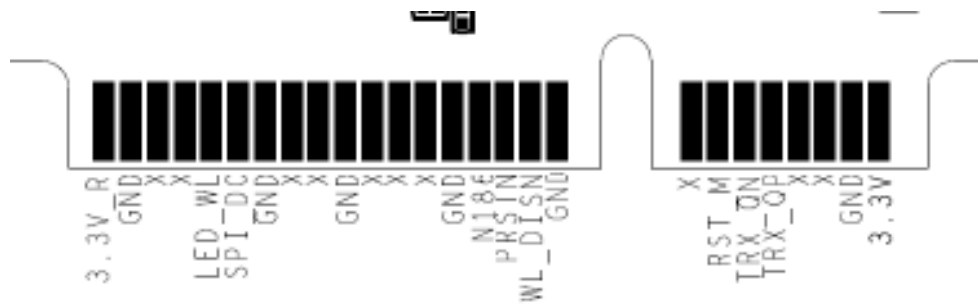
All dimensions are in mm

## Pin Define

TOP pins



Bottom pins



## 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



### 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)               |
|---------------------------------|--------------|--------------|-------------------------|
| 2400-2483.5MHz;<br>5150-5850MHz | ANT010-DAU   | PCB          | 2.4GHz: 5.2<br>5GH: 5.5 |
| 2400-2483.5MHz;<br>5150-5850MHz | A245005N     | PCB          | 2.4GHz: 4<br>5GHz: 5.1  |
| 2400-2483.5MHz                  | A2405N       | PCB          | 2.4GHz: 5.2             |
| 5150-5850MHz                    | A5005N       | PCB          | 5GHz: 5                 |
| 2400-2483.5MHz;<br>5150-5850MHz | A245004      | Dipole       | 2.4GHz: 4<br>5GHz: 5.1  |
| 2400-2483.5MHz;<br>5150-5850MHz | A245002      | Dipole       | 2.4GHz: 2<br>5GHz: 2    |

#### **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: TKZAW7615NP1".

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-AW7615NP1" or "Contains IC: 9968A-AW7615NP1"

Contient le module d'émission IC: 9968A-AW7615NP1

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:**

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.