



# Product Specification

## W224Z0

### Wireless Module

W224Z0 is a host-less IoE Smart Network module that enables wireless internet connectivity for any device wishing to be monitored or managed remotely. The W224Z0 is architected for high performance, feature-rich applications. This module is based on QCA4531, a highly integrated and feature-rich IEEE 802.11n 2x2 2.4GHz System-on-a-Chip (SoC). External DDR2 and SPI flash memories are provided that support a big variety of applications. Two antenna ports are available for flexible use of external antennas for the appliances in consideration.

### 1. Product Features

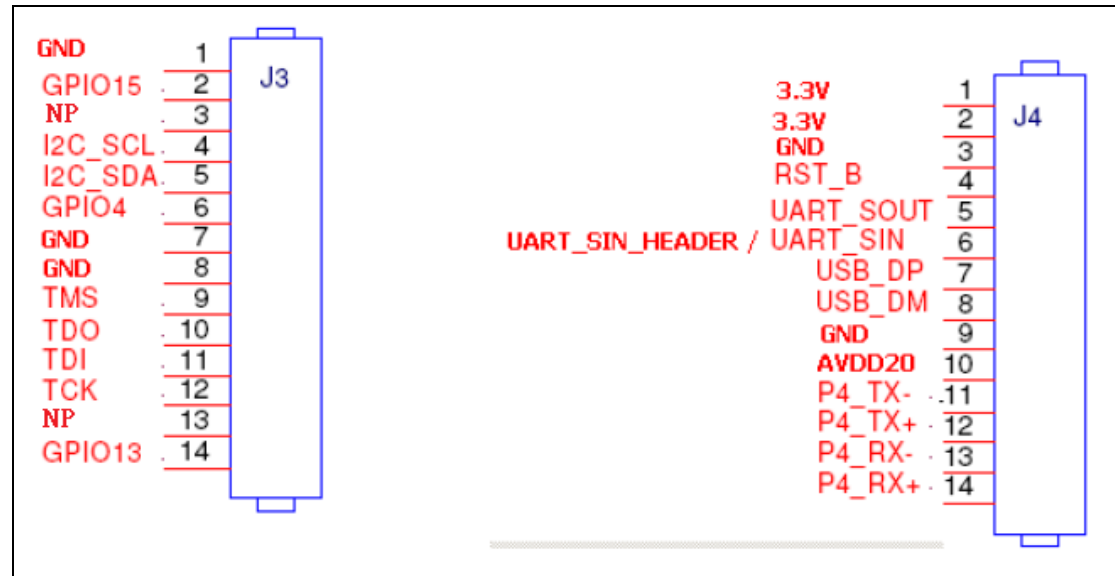
- 2.412-2.484 GHz for worldwide market.
- IEEE 802.11n one and two streams radio.
- Full security support: WPS, WPA, WPA2, WAPI, WEP, TKIP.
- On-board memories: 64MB DDR2 and 1x4Mbit NOR + 1Gbit NAND SPI Flash
- Host interfaces: UART, I2C, GPIO, USB, and Ethernet.
- ROM API support.

## 2. General Specification

| Product Specification          |                                                        |         |                                       |         |      |
|--------------------------------|--------------------------------------------------------|---------|---------------------------------------|---------|------|
| Model Name                     | 1    W224Z0                                            |         |                                       |         |      |
| Solution(HDK version)          | Qualcomm SoC QCA4531/CUS531-030 (DP25-Y9614-1) design. |         |                                       |         |      |
| Form factor                    | Pin header module                                      |         |                                       |         |      |
| Moisture sensitivity level     | MSL:3 (follow IC specification)                        |         |                                       |         |      |
| WLAN Standard                  | IEEE 802.11 b/g/n                                      |         |                                       |         |      |
| Host interface                 | UART, I2C, GPIO, USB, Ethernet                         |         |                                       |         |      |
| Antenna configuration          | 1 or 2 antennas                                        |         |                                       |         |      |
| Dimensions                     |                                                        | Minimum | Typical                               | Maximum | Unit |
|                                | Length                                                 | 44.7    | 45                                    | 45.3    | mm   |
|                                | Width                                                  | 34.7    | 35                                    | 35.3    | mm   |
|                                | Height                                                 |         | 13.5                                  |         | mm   |
|                                | Weight                                                 |         | 10                                    |         | g    |
| Antenna Connector              | 2 RF connectors or 1 RF connector + 1 PCB antenna      |         |                                       |         |      |
| Electrical Specification       |                                                        |         |                                       |         |      |
| Frequency range                | 2.4GHz band                                            |         |                                       |         |      |
| Maximum Conducted Output Power | IEEE 802.11b: 20.45 dBm                                |         |                                       |         |      |
|                                | IEEE 802.11g: 25.17 dBm                                |         |                                       |         |      |
|                                | IEEE 802.11n MCS0 (HT20): 24.88 dBm                    |         |                                       |         |      |
|                                | IEEE 802.11n MCS0 (HT40): 18.00 dBm                    |         |                                       |         |      |
| Receiver Sensitivity           |                                                        |         |                                       |         |      |
| 2.4G Band                      |                                                        | Minimum | Typical                               | Maximum | Unit |
| 802.11b Mode                   | 11Mbps                                                 |         |                                       | -73     | dBm  |
| 802.11g Mode                   | 54Mbps                                                 |         |                                       | -65     | dBm  |
| 802.11n Mode                   | HT20 MCS7                                              |         |                                       | -64     | dBm  |
| 802.11n Mode                   | HT40 MCS7                                              |         |                                       | -61     | dBm  |
| Electrostatic discharge        |                                                        |         |                                       |         |      |
| Human Body Model               | ±2000V, all pins                                       |         | Standard: ANSI/ESDA/JEDEC JS-001-2012 |         |      |
| Charged Device Model           | ±500V, all pins                                        |         | Standard: JESD22-C101                 |         |      |

| Operating Condition                               |        |         |         |         |      |
|---------------------------------------------------|--------|---------|---------|---------|------|
|                                                   |        | Minimum | Typical | Maximum | Unit |
| Operation voltage                                 | DC     | 3.15    | 3.3     | 3.45    | V    |
| Operation temperature                             | C-temp | 0       |         | 50      | °C   |
| Operation temperature<br>(Full load)              | I-temp | -40     |         | 75      | °C   |
| Operation temperature<br>(Low rates≤ 10Mbps, IOT) | I-temp | -40     |         | 85      | °C   |
| Humidity Non-Operating                            |        | 10      |         | 90      | %    |

### 3. Connector Pin-out Definitions



| Pin definitions of J3 |                 |      |                            |
|-----------------------|-----------------|------|----------------------------|
| Pin No.               | Pin definitions | Type | Description                |
| 1                     | GND             |      | Ground                     |
| 2                     | GPIO 15         | I/O  | Configurable interface pin |
| 3                     | NP              |      |                            |
| 4                     | I2C_SCL         | I/O  | Configurable interface pin |
| 5                     | I2C_SDA         | I/O  | Configurable interface pin |
| 6                     | GPIO 4          | I/O  | Configurable interface pin |
| 7                     | GND             |      | Ground                     |
| 8                     | GND             |      | Ground                     |
| 9                     | TMS             | I/O  | Configurable interface pin |
| 10                    | TDO             | I/O  | Configurable interface pin |
| 11                    | TDI             | I/O  | Configurable interface pin |
| 12                    | TCK             | I/O  | Configurable interface pin |
| 13                    | NP              |      |                            |
| 14                    | GPIO 13         | I/O  | Configurable interface pin |

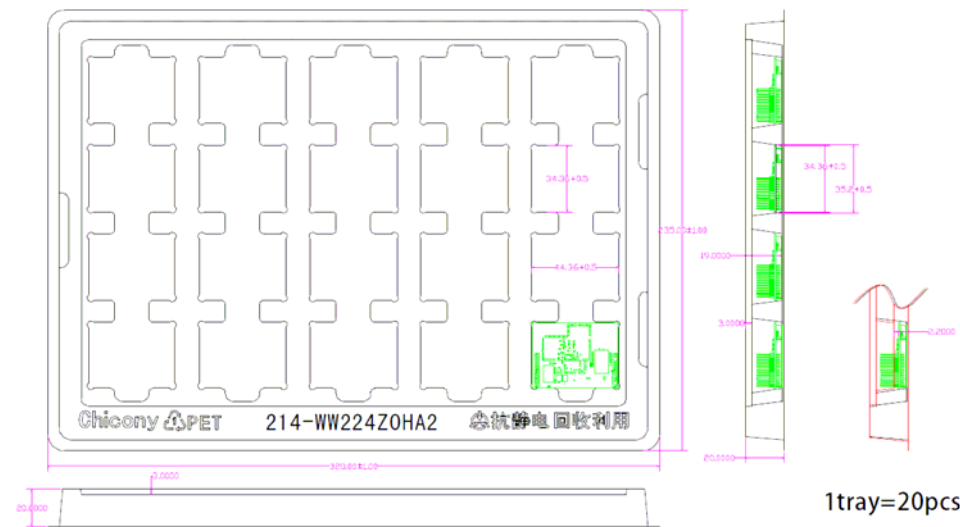
| Pin definitions of J4 |                 |      |             |
|-----------------------|-----------------|------|-------------|
| Pin No.               | Pin definitions | Type | Description |
| 1                     | 3.3V            | I    | 3.3V input  |
| 2                     | 3.3V            | I    | 3.3V input  |
| 3                     | GND             |      | Ground      |

|    |                             |     |                            |
|----|-----------------------------|-----|----------------------------|
| 4  | RST_B                       | I/O | Configurable interface pin |
| 5  | UART_SOUT                   | I/O | Configurable interface pin |
| 6  | UART_SIN_HERDER<br>UART_SIN | I/O | Configurable interface pin |
| 7  | USB_DP                      | I/O | USB D+ signal              |
| 8  | USB_DM                      | I/O | USB D- signal              |
| 9  | GND                         |     | Ground                     |
| 10 | AVDD20                      |     |                            |
| 11 | P4_TX-                      | I/O | Configurable interface pin |
| 12 | P4_TX+                      | I/O | Configurable interface pin |
| 13 | P4_RX-                      | I/O | Configurable interface pin |
| 14 | P4_RX+                      | I/O | Configurable interface pin |

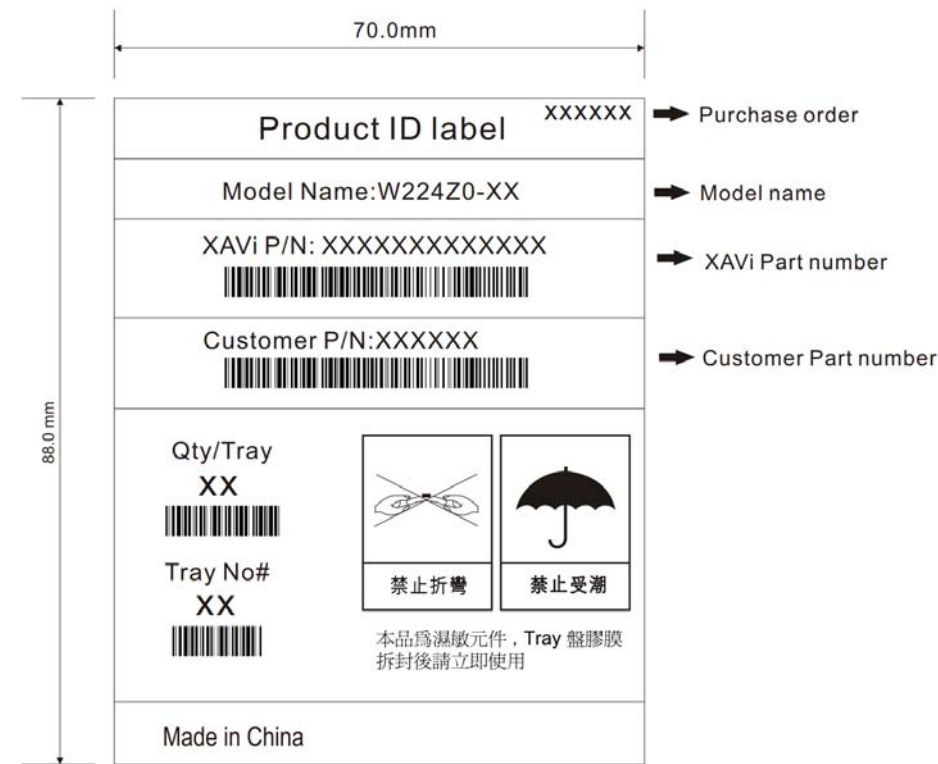
Note: NP = No Place

4. Packing information

4.1 Tray size:



4.2 Label on tray

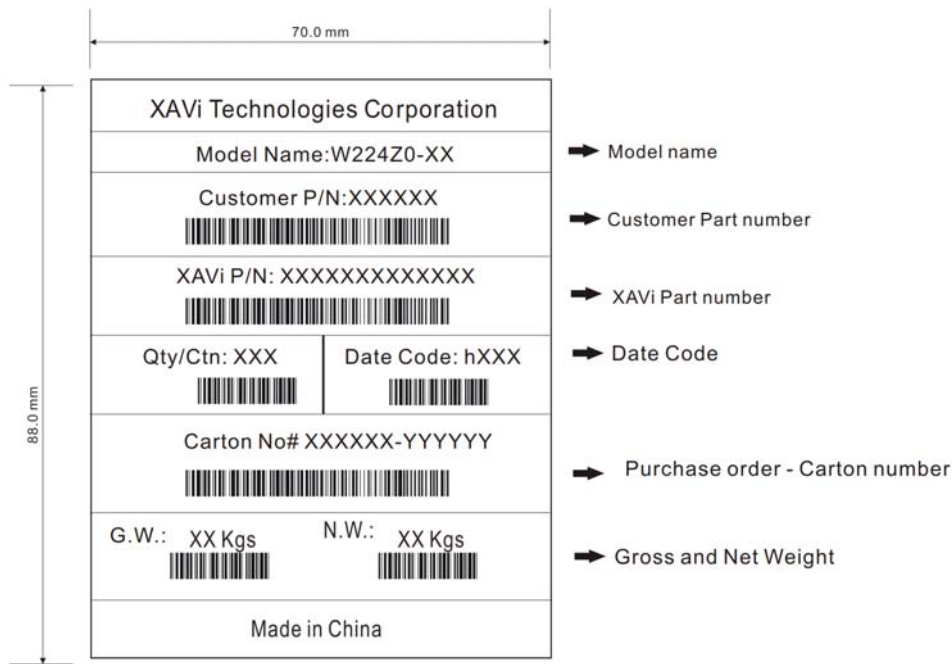


4.3 Carton size: 328mm x 249mm x 188mm

There are 9 trays in one carton (180pcs one carton)



4.4 Carton label size



# FCC Notice

## **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 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.

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.

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

### **IMPORTANT NOTE:**

This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.

Additional testing and certification may be necessary when multiple modules are used.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such

configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

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

#### **USERS MANUAL OF THE END PRODUCT:**

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

If the labelling area is small than the palm of the hand, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of 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.

#### **LABEL OF THE END PRODUCT:**

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: RYU-W224Z0 ".

If the labelling area is larger than the palm of the hand, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

| Ant. | Brand  | Part No.        | Antenna Type    | Connector    | Gain (dBi) | Loss of Cable (dB) | True Gain (dBi) |
|------|--------|-----------------|-----------------|--------------|------------|--------------------|-----------------|
| 1    | TONGDA | T-543-2020003-2 | Dipole Antenna  | Reversed SMA | 5.00       | 0.70               | 4.30            |
| 2    | TONGDA | T-543-2020003-2 | Dipole Antenna  | Reversed SMA | 5.00       | 0.70               | 4.30            |
| 3    | -      | -               | Printed Antenna | N/A          | 4.32       | -                  | 4.32            |

## IC Notice

This device complies with Industry Canada license-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.*

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 radio transmitter (3992A-W224Z0) 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 (3992A-W224Z0) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.*

### IMPORTANT NOTE:

This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.

Additional testing and certification may be necessary when multiple modules are used.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the IC RSS-102 radiation exposure limits set forth for an

population/uncontrolled environment can be satisfied.

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

#### **USERS MANUAL OF THE END PRODUCT:**

In the user manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. 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.

#### **LABEL OF THE END PRODUCT:**

The final end product must be labeled in a visible area with the following "Contains IC: 3992A-W224Z0".

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.

| Ant. | Brand  | Part No.        | Antenna Type    | Connector    | Gain (dBi) | Loss of Cable (dB) | True Gain (dBi) |
|------|--------|-----------------|-----------------|--------------|------------|--------------------|-----------------|
| 1    | TONGDA | T-543-2020003-2 | Dipole Antenna  | Reversed SMA | 5.00       | 0.70               | 4.30            |
| 2    | TONGDA | T-543-2020003-2 | Dipole Antenna  | Reversed SMA | 5.00       | 0.70               | 4.30            |
| 3    | -      | -               | Printed Antenna | N/A          | 4.32       | -                  | 4.32            |

## 低功率射頻模組警語

- (1) 「經型式認證合格之低功率射頻電機，非經許可，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」。
- (2) 「低功率射頻電機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。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機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」。
- (3) 「本模組於取得認證後將依規定於模組本體標示審驗合格標籤，並要求平台廠商於平台上標示「本產品內含射頻模組  CC XX xx LP yyy Z z」。