

# 6222D-UUC

**Wi-Fi Dual-band 2X2 11ac +Bluetooth 5.0**

**Combo Module Datasheet**

# 6222D-UUC Module Datasheet

Office: 14th floor, Block B, phoenix zhigu, Xixiang Street, Baoan District, Shenzhen

Factory: NO.8, Litong RD., Liuyang Economic & Technical Development Zone, Changsha, CHINA

TEL: +86-755-2955-8186

Website: [www.fn-link.com](http://www.fn-link.com)

Customer Approval : \_\_\_\_\_ Company  
\_\_\_\_\_  
Title  
\_\_\_\_\_  
Signature  
\_\_\_\_\_  
Date  
\_\_\_\_\_  
Fn-Link

## Revision History

| Version | Date       | Revision Content                                                                            | Draft | Approved |
|---------|------------|---------------------------------------------------------------------------------------------|-------|----------|
| 1.0     | 2020/04/22 | New version                                                                                 | LYJ   | SZS      |
| 1.1     | 2020/06/09 | Update Pin assignments, reference design and ordering information for share antenna version | LYJ   | SZS      |
| 1.2     | 2020/08/04 | Update Power on sequence                                                                    | LYJ   | SZS      |
| 1.3     | 2020/08/19 | Update ordering information                                                                 | LYJ   | SZS      |
| 1.4     | 2020/08/26 | Update 2.4G RF Specification                                                                | LYJ   | SZS      |
| 1.5     | 2020/9/1   | Update Module Picture and Marking Description                                               | LYJ   | SZS      |
| 2.0     | 2021/3/16  | Add -W4 info                                                                                | LGP   | SZS      |
| 2.1     | 2021/08/31 | added package PAD dimension                                                                 | LXY   | QJP      |
| 2.2     | 2021/09/26 | Updated ipex spec.                                                                          | LXY   | QJP      |
| 2.3     | 2023/10/30 | Update Recommended Reflow Profile                                                           | LXY   | QJP      |
| 2.4     | 2024/07/02 | Delete Part No. -W4                                                                         | LXY   | QJP      |
| 2.5     | 2024/08/14 | Add Certificate No                                                                          | Lxp   | QJP      |
| 2.6     | 2024/09/24 | Update Marking Description                                                                  | Lxp   | QJP      |
| 2.7     | 2024/12/03 | Update -W1 picture                                                                          |       |          |

# CONTENTS

|                                            |           |
|--------------------------------------------|-----------|
| <b>1 Overview .....</b>                    | <b>1</b>  |
| 1.1 Introduction .....                     | 1         |
| 1.2 Features .....                         | 1         |
| 1.3 General Specification .....            | 2         |
| 1.4 Recommended Operating Rating .....     | 3         |
| ※1.5 EEPROM Information .....              | 3         |
| <b>2 Wi-Fi RF Specification .....</b>      | <b>4</b>  |
| 2.1 2.4GHz RF Specification .....          | 4         |
| 2.2 5GHz RF Specification .....            | 6         |
| <b>3 Bluetooth Specification .....</b>     | <b>10</b> |
| 3.1 Bluetooth Specification .....          | 10        |
| <b>4 Pin Assignments .....</b>             | <b>11</b> |
| <b>5 Dimensions .....</b>                  | <b>13</b> |
| 5.1 Module Picture .....                   | 13        |
| 5.2 Physical Outline .....                 | 14        |
| 5.3 Marking Description .....              | 15        |
| 5.4 List of certified information .....    | 16        |
| 5.5 Layout Recommendation .....            | 17        |
| <b>6 Reference Design .....</b>            | <b>18</b> |
| <b>7 Power on Sequence .....</b>           | <b>19</b> |
| <b>8 Ordering Information .....</b>        | <b>21</b> |
| <b>9 The Key Material List .....</b>       | <b>21</b> |
| <b>10 Recommended Reflow Profile .....</b> | <b>22</b> |
| <b>11 Package Information .....</b>        | <b>23</b> |
| 11.1 Reel .....                            | 23        |
| 11.2 Packaging Detail .....                | 23        |
| 10.3 Carrier Tape Detail .....             | 25        |
| 10.4 Moisture sensitivity .....            | 25        |

# 1 Overview

## 1.1 Introduction

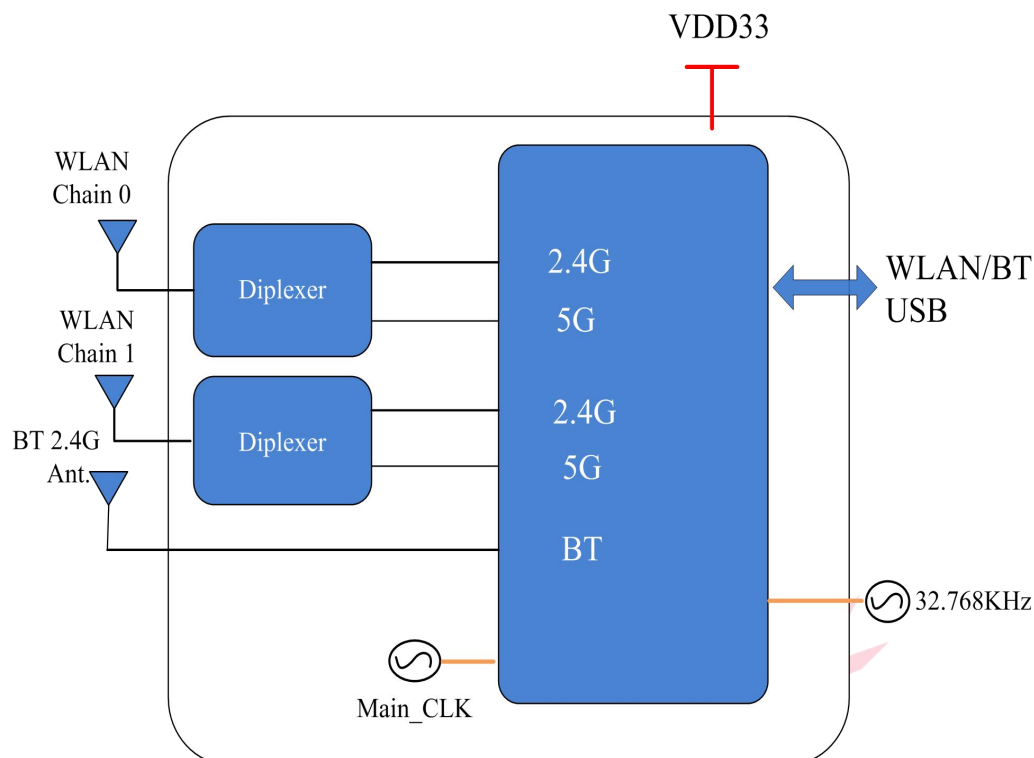
Fn-Link Technology would like to announce a low-cost and low-power consumption module which has all of the Wi-Fi and Bluetooth functionalities. The highly integrated module makes the possibilities of web browsing, VoIP, Bluetooth headsets applications. With seamless roaming capabilities and advanced security, also could interact with different vendors' 802.11a/b/g/n/ac 2x2 Access Points in the wireless LAN.

The wireless module complies with IEEE 802.11 a/b/g/n/ac 2x2 MIMO standard and it can achieve up to a speed of 867Mbps with dual stream in 802.11n to connect the wireless LAN. The integrated module provides USB2.0 interface for Wi-Fi and Bluetooth. This compact module is a total solution for a combination of Wi-Fi + BT technologies. The module is specifically developed for Smart TV and OTT Box application.

## 1.2 Features

- Highly integrated wireless local area network(WLAN) system-on-chip (SOC) for 5 GHZ 802.11ac, or 2.4G/5G 802.11n WLAN applications.
- Dual-stream spatial multiplexing up to 867 Mbps data rate.
- Supports 20/40MHz at 2.4GHz and supports 20/40/80MHz at 5GHz
- Supports USB interface for WLAN and Bluetooth.
- Complies with USB2.0 for WLAN and BT controller.
- Supports Bluetooth V5.0+HS, BLE and be backwards compatible with Bluetooth 1.2, 2.X+ enhance data rate.
- Supports Bluetooth for class1 , class2 and class3 power level transmissions.

## Block Diagram:



Note: The module has share antenna and non-share antenna version, please refer to the ordering information or contact us for detail.

### 1.3 General Specification

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| Model Name            | 6222D-UUC                                                          |
| Product Description   | Support Wi-Fi/Bluetooth                                            |
| Dimension             | L x W x H: 27 x 18 x 2.03 mm                                       |
| Wi-Fi Interface       | USB 2.0                                                            |
| BT Interface          | USB 2.0                                                            |
| Operating temperature | 0°C <sup>1</sup> to 70°C                                           |
| Storage temperature   | -40°C to 85°C                                                      |
| Humidity              | Operating Humidity 10% to 95% Non-Condensing                       |
| RoHS                  | All hardware components are fully compliant with EU RoHS directive |

1. Sample module extremely test passed at -20°C.

## 1.4 Recommended Operating Rating

|                       |                   | Min.                  | Typ. | Max. | Unit  |
|-----------------------|-------------------|-----------------------|------|------|-------|
| Operating Temperature |                   | 0                     | 25   | 70   | deg.C |
| VCC33                 |                   | 3.15                  | 3.3  | 3.45 | V     |
| VDDIO                 |                   | -                     | 3.3  | -    | V     |
| Power Consumption     |                   | VCC33 = 3.3V(Unit:mA) |      |      |       |
|                       | Wi-Fi on Mode     | 130                   |      |      |       |
|                       | TX<br>(2.4G HT20) | 459                   |      |      |       |
|                       | RX<br>(2.4G HT20) | 210                   |      |      |       |
|                       | TX<br>(5G HT80)   | 510                   |      |      |       |
|                       | RX<br>(5G HT80)   | 210                   |      |      |       |
|                       | BT on             | 32                    |      |      |       |

## ※1.5 EEPROM Information

WI-FI

|            |       |
|------------|-------|
| Vendor ID  | 0BDAh |
| Product ID | C82Ch |

## 2 Wi-Fi RF Specification

### 2.1 2.4GHz RF Specification

| Feature                                       | Description                                              |                        |            |                |  |
|-----------------------------------------------|----------------------------------------------------------|------------------------|------------|----------------|--|
| WLAN Standard                                 | IEEE 802.11b/g/n Wi-Fi compliant                         |                        |            |                |  |
| Frequency Range                               | 2.400 GHz ~ 2.4835 GHz (2.4 GHz ISM Band)                |                        |            |                |  |
| Number of Channels                            | 2.4GHz: Ch1 ~ Ch14                                       |                        |            |                |  |
| Output Power                                  | 802.11b /11Mbps : 17 dBm $\pm$ 1.5 dB @ EVM $\leq$ -9dB  |                        |            |                |  |
|                                               | 802.11g /54Mbps : 15 dBm $\pm$ 1.5 dB @ EVM $\leq$ -25dB |                        |            |                |  |
|                                               | 802.11n /MCS7 : 14 dBm $\pm$ 1.5 dB @ EVM $\leq$ -28dB   |                        |            |                |  |
| Spectrum Mask                                 | Min. b/g/n                                               | Typ. b/g/n             | Max. b/g/n | Unit b/g/n     |  |
| 1 <sup>st</sup> side lobes(to fc $\pm$ 11MHZ) | -                                                        | -40/-30/-40            | -          | dBr            |  |
| 2 <sup>st</sup> side lobes(to fc $\pm$ 22MHZ) | -                                                        | -51/-33/-58            | -          | dBr            |  |
| Freq. Tolerance                               | -20/-20/-20                                              | -                      | 20/20/20   | ppm            |  |
| Test Items                                    | Test Value                                               |                        |            | Standard Value |  |
| SISO Receive Sensitivity (11b,20MHz) @8% PER  | - 1Mbps                                                  | PER @ -92 dBm, typical |            | $\leq$ -83     |  |
|                                               | - 2Mbps                                                  | PER @ -90 dBm, typical |            | $\leq$ -80     |  |
|                                               | - 5.5Mbps                                                | PER @ -87 dBm, typical |            | $\leq$ -79     |  |
|                                               | - 11Mbps                                                 | PER @ -85 dBm, typical |            | $\leq$ -76     |  |
| SISO Receive Sensitivity (11g,20MHz) @10% PER | - 6Mbps                                                  | PER @ -89 dBm, typical |            | $\leq$ -85     |  |
|                                               | - 9Mbps                                                  | PER @ -88 dBm, typical |            | $\leq$ -84     |  |
|                                               | - 12Mbps                                                 | PER @ -87 dBm, typical |            | $\leq$ -82     |  |
|                                               | - 18Mbps                                                 | PER @ -84 dBm, typical |            | $\leq$ -80     |  |
|                                               | - 24Mbps                                                 | PER @ -81 dBm, typical |            | $\leq$ -77     |  |
|                                               | - 36Mbps                                                 | PER @ -78 dBm, typical |            | $\leq$ -73     |  |
|                                               | - 48Mbps                                                 | PER @ -73 dBm, typical |            | $\leq$ -69     |  |
|                                               | - 54Mbps                                                 | PER @ -71 dBm, typical |            | $\leq$ -68     |  |
| SISO Receive Sensitivity (11n,20MHz) @10% PER | - MCS=0                                                  | PER @ -89 dBm, typical |            | $\leq$ -85     |  |
|                                               | - MCS=1                                                  | PER @ -86 dBm, typical |            | $\leq$ -82     |  |
|                                               | - MCS=2                                                  | PER @ -84 dBm, typical |            | $\leq$ -80     |  |
|                                               | - MCS=3                                                  | PER @ -80 dBm, typical |            | $\leq$ -77     |  |
|                                               | - MCS=4                                                  | PER @ -77 dBm, typical |            | $\leq$ -73     |  |
|                                               | - MCS=5                                                  | PER @ -72 dBm, typical |            | $\leq$ -69     |  |
|                                               | - MCS=6                                                  | PER @ -71 dBm, typical |            | $\leq$ -68     |  |

|                                                 |                                       |              |                        |      |
|-------------------------------------------------|---------------------------------------|--------------|------------------------|------|
|                                                 |                                       | - MCS=7      | PER @ -69 dBm, typical | ≤-67 |
| SISO<br>Sensitivity<br>(11n,40MHz)<br>PER       | Receive<br>@10%                       | - MCS=0      | PER @ -88 dBm, typical | ≤-82 |
|                                                 |                                       | - MCS=1      | PER @ -85 dBm, typical | ≤-79 |
|                                                 |                                       | - MCS=2      | PER @ -83 dBm, typical | ≤-77 |
|                                                 |                                       | - MCS=3      | PER @ -79 dBm, typical | ≤-74 |
|                                                 |                                       | - MCS=4      | PER @ -76 dBm, typical | ≤-70 |
|                                                 |                                       | - MCS=5      | PER @ -71 dBm, typical | ≤-66 |
|                                                 |                                       | - MCS=6      | PER @ -70 dBm, typical | ≤-65 |
|                                                 |                                       | - MCS=7      | PER @ -68 dBm, typical | ≤-64 |
| MIMO<br>Sensitivity<br>(11n ,20MHz) @10%<br>PER | Receive                               | - MCS=0      | PER @ -89 dBm, typical | ≤-85 |
|                                                 |                                       | - MCS=1      | PER @ -86 dBm, typical | ≤-82 |
|                                                 |                                       | - MCS=2      | PER @ -84 dBm, typical | ≤-80 |
|                                                 |                                       | - MCS=3      | PER @ -80 dBm, typical | ≤-77 |
|                                                 |                                       | - MCS=4      | PER @ -77 dBm, typical | ≤-73 |
|                                                 |                                       | - MCS=5      | PER @ -72 dBm, typical | ≤-69 |
|                                                 |                                       | - MCS=6      | PER @ -71 dBm, typical | ≤-68 |
|                                                 |                                       | - MCS=7      | PER @ -69 dBm, typical | ≤-67 |
|                                                 |                                       | - MCS=8, 15, | PER @ -89 dBm, typical | ≤-85 |
| MIMO<br>Sensitivity<br>(11n,40MHz) @10%<br>PER  | Receive                               | - MCS=0      | PER @ -88 dBm, typical | ≤-82 |
|                                                 |                                       | - MCS=1      | PER @ -85 dBm, typical | ≤-79 |
|                                                 |                                       | - MCS=2      | PER @ -83 dBm, typical | ≤-77 |
|                                                 |                                       | - MCS=3      | PER @ -79 dBm, typical | ≤-74 |
|                                                 |                                       | - MCS=4      | PER @ -76 dBm, typical | ≤-70 |
|                                                 |                                       | - MCS=5      | PER @ -71 dBm, typical | ≤-66 |
|                                                 |                                       | - MCS=6      | PER @ -70 dBm, typical | ≤-65 |
|                                                 |                                       | - MCS=7      | PER @ -68 dBm, typical | ≤-64 |
|                                                 |                                       | - MCS=8, 15, | PER @ -88 dBm, typical | ≤-82 |
|                                                 |                                       | - MCS=15,    | PER @ -68 dBm, typical | ≤-64 |
| Maximum Input Level                             | 802.11b : -10 dBm                     |              |                        |      |
|                                                 | 802.11g/n : -20 dBm                   |              |                        |      |
| Antenna Reference                               | Small antennas with 0~2 dBi peak gain |              |                        |      |

## 2.2 5GHz RF Specification

| Feature                                          | Description                                     |                |
|--------------------------------------------------|-------------------------------------------------|----------------|
| WLAN Standard                                    | IEEE 802.11a/n/ac 2x2, Wi-Fi compliant          |                |
| Frequency Range                                  | 5.150 GHz ~ 5.850 GHz (5.0 GHz ISM Band)        |                |
| Number of Channels                               | 5.0GHz: Please see the table <sup>1</sup>       |                |
| Output Power                                     | 802.11a /54Mbps : 15 dBm ± 1.5 dB @ EVM ≤ -25dB |                |
|                                                  | 802.11n /MCS7 : 14 dBm ± 1.5 dB @ EVM ≤ -28dB   |                |
|                                                  | 802.11ac /MCS9 : 13 dBm ± 1.5 dB @ EVM ≤ -32dB  |                |
| Test Items                                       | Test Value                                      | Standard Value |
| SISO Receive Sensitivity<br>(11a,20MHz) @10% PER | - 6Mbps PER @ -88 dBm                           | ≤-85           |
|                                                  | - 9Mbps PER @ -87 dBm                           | ≤-84           |
|                                                  | - 12Mbps PER @ -86 dBm                          | ≤-82           |
|                                                  | - 18Mbps PER @ -83 dBm                          | ≤-80           |
|                                                  | - 24Mbps PER @ -80 dBm                          | ≤-77           |
|                                                  | - 36Mbps PER @ -77 dBm                          | ≤-73           |
|                                                  | - 48Mbps PER @ -72 dBm                          | ≤-69           |
|                                                  | - 54Mbps PER @ -70 dBm                          | ≤-68           |
| SISO Receive Sensitivity<br>(11n,20MHz) @10% PER | - MCS=0 PER @ -88 dBm                           | ≤-85           |
|                                                  | - MCS=1 PER @ -85 dBm                           | ≤-82           |
|                                                  | - MCS=2 PER @ -83 dBm                           | ≤-80           |
|                                                  | - MCS=3 PER @ -80 dBm                           | ≤-77           |
|                                                  | - MCS=4 PER @ -76 dBm                           | ≤-73           |
|                                                  | - MCS=5 PER @ -71 dBm                           | ≤-69           |
|                                                  | - MCS=6 PER @ -70 dBm                           | ≤-68           |
|                                                  | - MCS=7 PER @ -68 dBm                           | ≤-67           |
| MIMO Receive Sensitivity<br>(11n,20MHz) @10% PER | - MCS=0 PER @ -89 dBm                           | ≤-82           |
|                                                  | - MCS=1 PER @ -88 dBm                           | ≤-80           |
|                                                  | - MCS=2 PER @ -86 dBm                           | ≤-79           |
|                                                  | - MCS=3 PER @ -83 dBm                           | ≤-78           |
|                                                  | - MCS=4 PER @ -79 dBm                           | ≤-74           |
|                                                  | - MCS=5 PER @ -74 dBm                           | ≤-68           |
|                                                  | - MCS=6 PER @ -73 dBm                           | ≤-66           |
|                                                  | - MCS=7 PER @ -71 dBm                           | ≤-64           |
|                                                  | - MCS=8 PER @ -69 dBm                           | ≤-64           |
|                                                  | - MCS=15 PER @ -68 dBm                          | ≤-63           |

|                                                   |                             |      |
|---------------------------------------------------|-----------------------------|------|
| SISO Receive Sensitivity<br>(11n,40MHz) @10% PER  | - MCS=0 PER @ -85 dBm       | ≤-82 |
|                                                   | - MCS=1 PER @ -82 dBm       | ≤-79 |
|                                                   | - MCS=2 PER @ -80 dBm       | ≤-77 |
|                                                   | - MCS=3 PER @ -77 dBm       | ≤-74 |
|                                                   | - MCS=4 PER @ -73 dBm       | ≤-70 |
|                                                   | - MCS=5 PER @ -69 dBm       | ≤-66 |
|                                                   | - MCS=6 PER @ -67 dBm       | ≤-65 |
|                                                   | - MCS=7 PER @ -66 dBm       | ≤-64 |
| MIMO Receive Sensitivity<br>(11n,40MHz) @10% PER  | - MCS=0 PER @ -87 dBm       | ≤-79 |
|                                                   | - MCS=1 PER @ -85 dBm       | ≤-76 |
|                                                   | - MCS=2 PER @ -83 dBm       | ≤-74 |
|                                                   | - MCS=3 PER @ -80 dBm       | ≤-71 |
|                                                   | - MCS=4 PER @ -76 dBm       | ≤-67 |
|                                                   | - MCS=5 PER @ -72 dBm       | ≤-63 |
|                                                   | - MCS=6 PER @ -70 dBm       | ≤-62 |
|                                                   | - MCS=7 PER @ -69 dBm       | ≤-63 |
|                                                   | - MCS=8 PER @ -85 dBm       | ≤-79 |
|                                                   | - MCS=15 PER @ -66 dBm      | ≤-61 |
| SISO Receive Sensitivity<br>(11ac,20MHz) @10% PER | - MCS=0, NSS1 PER @ -86 dBm | ≤-82 |
|                                                   | - MCS=1, NSS1 PER @ -84 dBm | ≤-80 |
|                                                   | - MCS=2, NSS1 PER @ -82 dBm | ≤-77 |
|                                                   | - MCS=3, NSS1 PER @ -79 dBm | ≤-73 |
|                                                   | - MCS=4, NSS1 PER @ -75 dBm | ≤-69 |
|                                                   | - MCS=5, NSS1 PER @ -70 dBm | ≤-68 |
|                                                   | - MCS=6, NSS1 PER @ -69 dBm | ≤-67 |
|                                                   | - MCS=7, NSS1 PER @ -68 dBm | ≤-62 |
|                                                   | - MCS=8, NSS1 PER @ -64 dBm | ≤-60 |
| MIMO Receive Sensitivity<br>(11ac,20MHz) @10% PER | - MCS=0, NSS1 PER @ -88 dBm | ≤-79 |
|                                                   | - MCS=1, NSS1 PER @ -87 dBm | ≤-77 |
|                                                   | - MCS=2, NSS1 PER @ -85 dBm | ≤-74 |
|                                                   | - MCS=3, NSS1 PER @ -82 dBm | ≤-71 |
|                                                   | - MCS=4, NSS1 PER @ -78 dBm | ≤-66 |
|                                                   | - MCS=5, NSS1 PER @ -73 dBm | ≤-65 |
|                                                   | - MCS=6, NSS1 PER @ -72 dBm | ≤-64 |
|                                                   | - MCS=7, NSS1 PER @ -71 dBm | ≤-59 |
|                                                   | - MCS=8, NSS1 PER @ -67 dBm | ≤-57 |

|                                                   |                             |      |
|---------------------------------------------------|-----------------------------|------|
| SISO Receive Sensitivity<br>(11ac,40MHz) @10% PER | - MCS=0, NSS1 PER @ -84 dBm | ≤-79 |
|                                                   | - MCS=1, NSS1 PER @ -81 dBm | ≤-77 |
|                                                   | - MCS=2, NSS1 PER @ -79 dBm | ≤-74 |
|                                                   | - MCS=3, NSS1 PER @ -76 dBm | ≤-70 |
|                                                   | - MCS=4, NSS1 PER @ -73 dBm | ≤-66 |
|                                                   | - MCS=5, NSS1 PER @ -68 dBm | ≤-65 |
|                                                   | - MCS=6, NSS1 PER @ -67 dBm | ≤-64 |
|                                                   | - MCS=7, NSS1 PER @ -66 dBm | ≤-59 |
|                                                   | - MCS=8, NSS1 PER @ -61 dBm | ≤-57 |
|                                                   | - MCS=9, NSS1 PER @ -60 dBm | ≤-55 |
| MIMO Receive Sensitivity<br>(11ac,40MHz) @10% PER | - MCS=0, NSS1 PER @ -86 dBm | ≤-79 |
|                                                   | - MCS=1, NSS1 PER @ -84 dBm | ≤-76 |
|                                                   | - MCS=2, NSS1 PER @ -82 dBm | ≤-74 |
|                                                   | - MCS=3, NSS1 PER @ -79 dBm | ≤-72 |
|                                                   | - MCS=4, NSS1 PER @ -76 dBm | ≤-67 |
|                                                   | - MCS=5, NSS1 PER @ -71 dBm | ≤-63 |
|                                                   | - MCS=6, NSS1 PER @ -70 dBm | ≤-62 |
|                                                   | - MCS=7, NSS1 PER @ -69 dBm | ≤-61 |
|                                                   | - MCS=8, NSS1 PER @ -64 dBm | ≤-56 |
|                                                   | - MCS=9, NSS1 PER @ -63 dBm | ≤-54 |
| SISO Receive Sensitivity<br>(11ac,80MHz) @10% PER | - MCS=0, NSS1 PER @ -81 dBm | ≤-79 |
|                                                   | - MCS=1, NSS1 PER @ -78 dBm | ≤-76 |
|                                                   | - MCS=2, NSS1 PER @ -76 dBm | ≤-74 |
|                                                   | - MCS=3, NSS1 PER @ -72 dBm | ≤-71 |
|                                                   | - MCS=4, NSS1 PER @ -69 dBm | ≤-67 |
|                                                   | - MCS=5, NSS1 PER @ -66 dBm | ≤-63 |
|                                                   | - MCS=6, NSS1 PER @ -64 dBm | ≤-62 |
|                                                   | - MCS=7, NSS1 PER @ -62 dBm | ≤-61 |
|                                                   | - MCS=8, NSS1 PER @ -58 dBm | ≤-56 |
|                                                   | - MCS=9, NSS1 PER @ -56 dBm | ≤-54 |
| MIMO Receive Sensitivity<br>(11ac,80MHz) @10% PER | - MCS=0, NSS1 PER @ -82 dBm | ≤-76 |
|                                                   | - MCS=1, NSS1 PER @ -81 dBm | ≤-73 |
|                                                   | - MCS=2, NSS1 PER @ -79 dBm | ≤-71 |
|                                                   | - MCS=3, NSS1 PER @ -75 dBm | ≤-68 |
|                                                   | - MCS=4, NSS1 PER @ -72 dBm | ≤-64 |
|                                                   | - MCS=5, NSS1 PER @ -69 dBm | ≤-60 |

|                     |                                       |      |
|---------------------|---------------------------------------|------|
|                     | - MCS=6, NSS1 PER @ -67 dBm           | ≤-59 |
|                     | - MCS=7, NSS1 PER @ -65 dBm           | ≤-58 |
|                     | - MCS=8, NSS1 PER @ -61 dBm           | ≤-53 |
|                     | - MCS=9, NSS1 PER @ -60 dBm           | ≤-51 |
| Maximum Input Level | 802.11a/n : -30 dBm                   |      |
| Antenna Reference   | Small antennas with 0~2 dBi peak gain |      |

### 15GHz(20MHz) Channel table

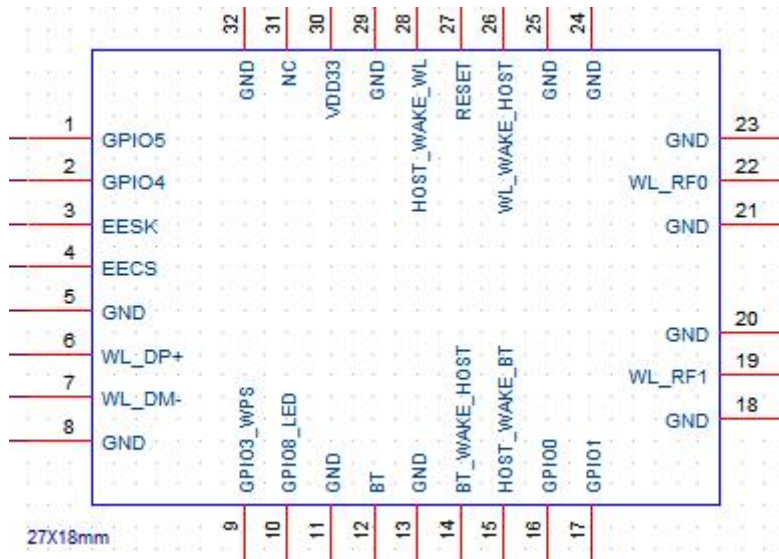
| Band range      | Operating Channel Numbers | Channel center frequencies(MHz) |
|-----------------|---------------------------|---------------------------------|
| 5150MHz~5250MHz | 36                        | 5180                            |
|                 | 40                        | 5200                            |
|                 | 44                        | 5220                            |
|                 | 48                        | 5240                            |
| 5250MHz~5350MHz | 52                        | 5260                            |
|                 | 56                        | 5280                            |
|                 | 60                        | 5300                            |
|                 | 64                        | 5320                            |
| 5470MHz~5725MHz | 100                       | 5500                            |
|                 | 104                       | 5520                            |
|                 | 108                       | 5540                            |
|                 | 112                       | 5560                            |
|                 | 116                       | 5580                            |
|                 | 120                       | 5600                            |
|                 | 124                       | 5620                            |
|                 | 128                       | 5640                            |
|                 | 132                       | 5660                            |
|                 | 136                       | 5680                            |
|                 | 140                       | 5700                            |
|                 | 149                       | 5745                            |
| 5725MHz~5850MHz | 153                       | 5765                            |
|                 | 157                       | 5785                            |
|                 | 161                       | 5805                            |
|                 | 165                       | 5825                            |

## 3 Bluetooth Specification

### 3.1 Bluetooth Specification

| Feature                                               | Description                           |          |         |
|-------------------------------------------------------|---------------------------------------|----------|---------|
| <b>General Specification</b>                          |                                       |          |         |
| Bluetooth Standard                                    | Bluetooth V5.0 of 1, 2 and 3 Mbps.    |          |         |
| Host Interface                                        | USB2.0                                |          |         |
| Antenna Reference                                     | Small antennas with 0~2 dBi peak gain |          |         |
| Frequency Band                                        | 2400 MHz ~ 2483.5 MHz                 |          |         |
| Number of Channels                                    | 79 channels                           |          |         |
| Modulation                                            | GFSK, $\pi/4$ -DQPSK,8DPSK            |          |         |
| <b>RF Specification</b>                               |                                       |          |         |
|                                                       | Min.                                  | Typical. | Max.    |
| Output Power (Class 1.5)                              | 4 dBm                                 | 5.4 dBm  | 10 dBm  |
| Sensitivity @ BER=0.1%<br>for GFSK (1Mbps)            | -92 dBm                               | -82 dBm  | -70 dBm |
| Sensitivity @ BER=0.01%<br>for $\pi/4$ -DQPSK (2Mbps) | -92 dBm                               | -80 dBm  | -70 dBm |
| Sensitivity @ BER=0.01%<br>for 8DPSK (3Mbps)          | -85 dBm                               | -80 dBm  | -70 dBm |
| Maximum Input Level                                   | GFSK (1Mbps):-20dBm                   |          |         |
|                                                       | $\pi/4$ -DQPSK (2Mbps) :-20dBm        |          |         |
|                                                       | 8DPSK (3Mbps) :-20dBm                 |          |         |

## 4 Pin Assignments

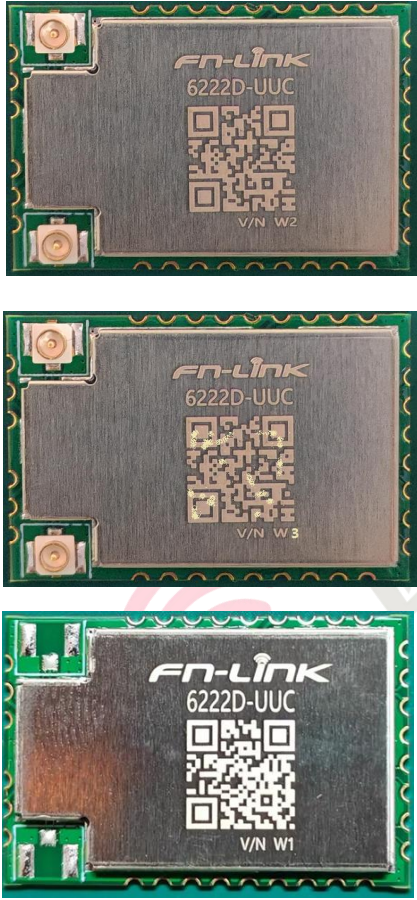
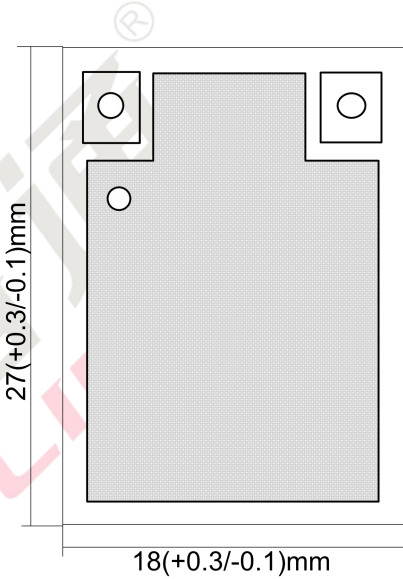
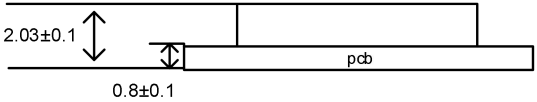


| NO. | Name         | Type | Description                                                    | Voltage |
|-----|--------------|------|----------------------------------------------------------------|---------|
| 1   | GPIO5        | I/O  | IC GPIO5<br>(sFlash MISO PIN)                                  |         |
| 2   | GPIO4        | I/O  | IC GPIO4<br>(sFlash MOSI PIN)                                  |         |
| 3   | EESK         | I/O  | External Serial Flash clock<br>(sFlash for dongle application) |         |
| 4   | EECS         | I/O  | External 32K or RTC clock input<br>(sFlash CS PIN)             |         |
| 5   | GND          | —    | Ground connections                                             |         |
| 6   | WL_DP+       | I/O  | USB data+ (USB2.0)                                             |         |
| 7   | WL_DM-       | I/O  | USB data- (USB2.0)                                             |         |
| 8   | GND          | —    | Ground connections                                             |         |
| 9   | GPIO3_WPS    | —    | IC GPIO3(WLAN WPS )                                            |         |
| 10  | GPIO8_LED    | —    | IC GPIO8(WLAN LED low active)                                  |         |
| 11  | GND          | —    | Ground connections                                             |         |
| 12  | BT_RF        | I/O  | BT RF port                                                     |         |
| 13  | GND          | —    | Ground connections                                             |         |
| 14  | BT_WAKE_HOST | O    | BT wake up HOST                                                | 3.3V    |
| 15  | HOST_WAKE_BT | I    | HOST Wake up BT                                                | 3.3V    |
| 16  | GPIO0        | —    | IC GPIO0                                                       |         |
| 17  | GPIO1        | —    | IC GPIO1                                                       |         |

|    |              |     |                                                        |      |
|----|--------------|-----|--------------------------------------------------------|------|
| 18 | GND          | —   | Ground connections                                     |      |
| 19 | WL_RF1       | I/O | 2.4G/5G Wi-Fi RF port1 / BT Combo (Option)             |      |
| 20 | GND          | —   | Ground connections                                     |      |
| 21 | GND          | —   | Ground connections                                     |      |
| 22 | WL_RF0       | I/O | 2.4G/5G Wi-Fi RF port0 (Option)                        |      |
| 23 | GND          | —   | Ground connections                                     |      |
| 24 | GND          | —   | Ground connections                                     |      |
| 25 | GND          | —   | Ground connections                                     |      |
| 26 | WL_WAKE_HOST | O   | WLAN wake up HOST (Shared with IC GPIO6)               | 3.3V |
| 27 | RESET        | I   | Enable pin for device<br>ON: pull high ; OFF: pull low | 3.3V |
| 28 | HOST_WAKE_WL | I   | HOST_WAKE_WLAN (Shared with IC GPIO7)                  | 3.3V |
| 29 | GND          | —   | Ground connections                                     |      |
| 30 | VDD33        | P   | 3.3V Voltage input                                     | 3.3V |
| 31 | NC           | —   | No connection (Floating)                               |      |
| 32 | GND          | —   | Ground connections                                     |      |

## 5 Dimensions

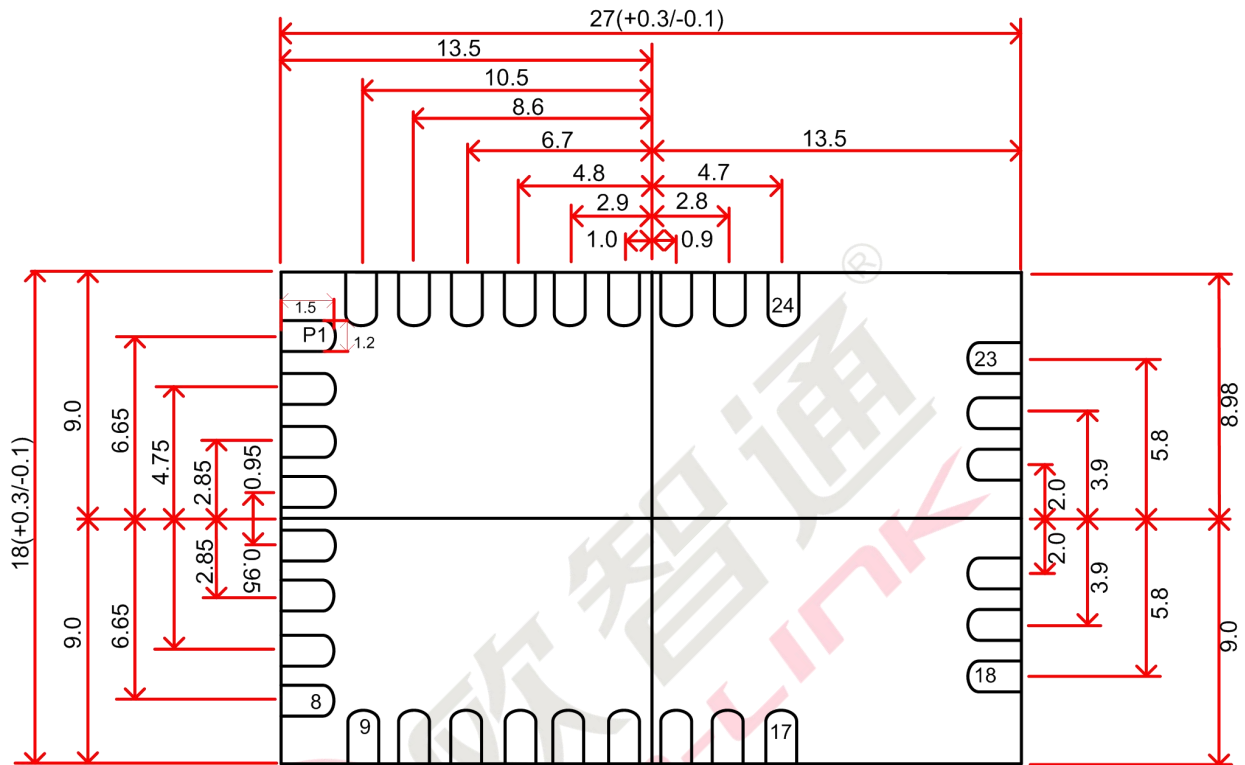
### 5.1 Module Picture

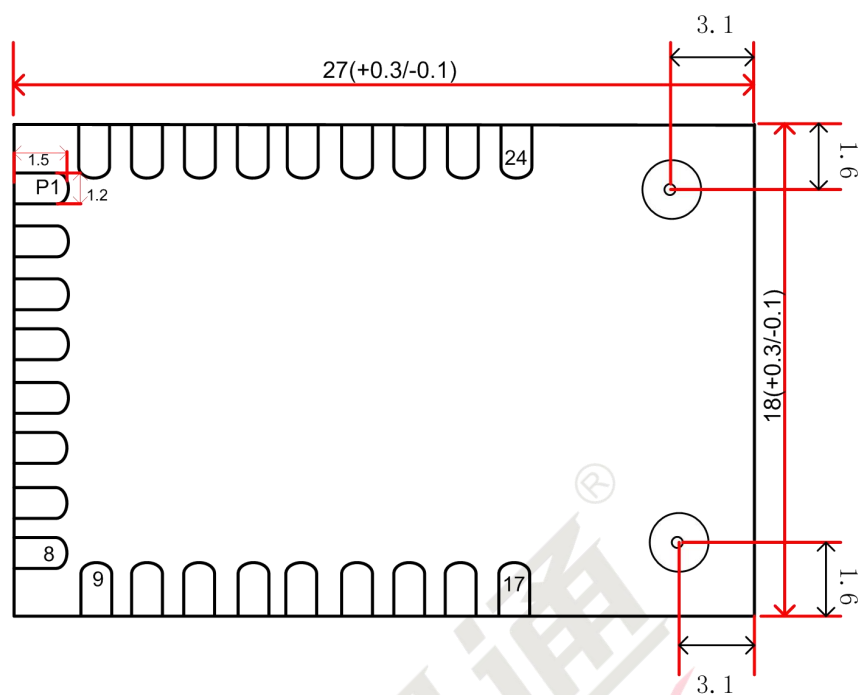
|                                                                                                                                                               |                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p>L x W: 27x 18(+0.3-0.1) mm<br/>FG6222DUUC-W0/W1/W2/W3</p> <p>W1 TBD</p>  |   |
| <p>H: 2.03(±0.1) mm</p>                                                                                                                                       |  |
| <p><b>Weight</b></p>                                                                                                                                          | <p>1.58(±0.1)g</p>                                                                   |

## 5.2 Physical Outline

(Unit: mm)

< TOP VIEW >





### 5.3 Marking Description

< TOP VIEW >



备注：

二维码内容：112233445566;FG6222DUUC-W2

1. Fn-Link 商标 logo

2. 机型：6222D-UUC

3. 二维码：编码规则为“wifi mac 地址:成品料号”

例如：112233445566;FG6222DUUC-W2（MAC 地址以实际为准）

——BT MAC 在 WIFI MAC 基础上+1（WIFI 地址需跳 1，不能与 BT 地址重复），二维码中不显示此内容。

4.V/N W2（V/N 到 W2 之间为两个空格，W2 为成品料号后缀，与二维码右对齐。）



备注：

二维码内容：112233445566;FG6222DUUC-W1

1. Fn-Link 商标 logo

2. 机型：6222D-UUC

3. 二维码：编码规则为“wifi mac 地址;成品料号”

例如：112233445566;FG6222DUUC-W1（MAC 地址以实际为准）

----BT MAC 在 WIFI MAC 基础上+1（WIFI 地址需跳 1，不能与 BT 地址重复），二维码中不显示此内容。

4.V/N W1（V/N 到 W1 之间为两个空格，W1 为成品料号后缀，与二维码右对齐。）

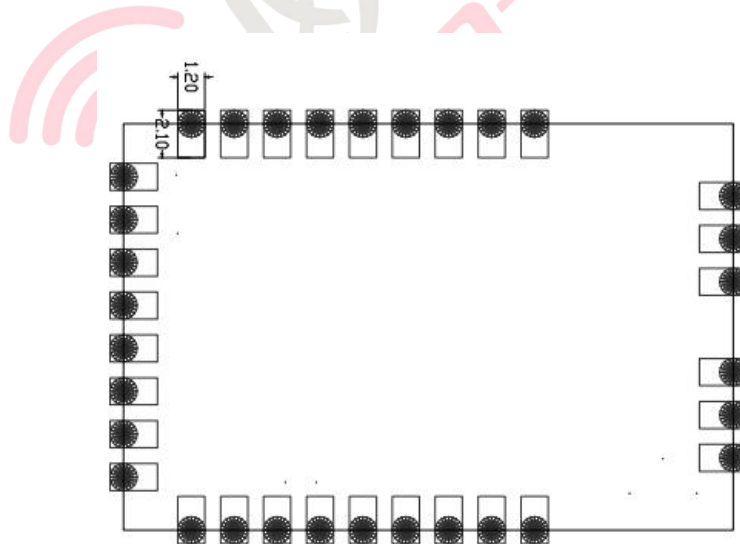
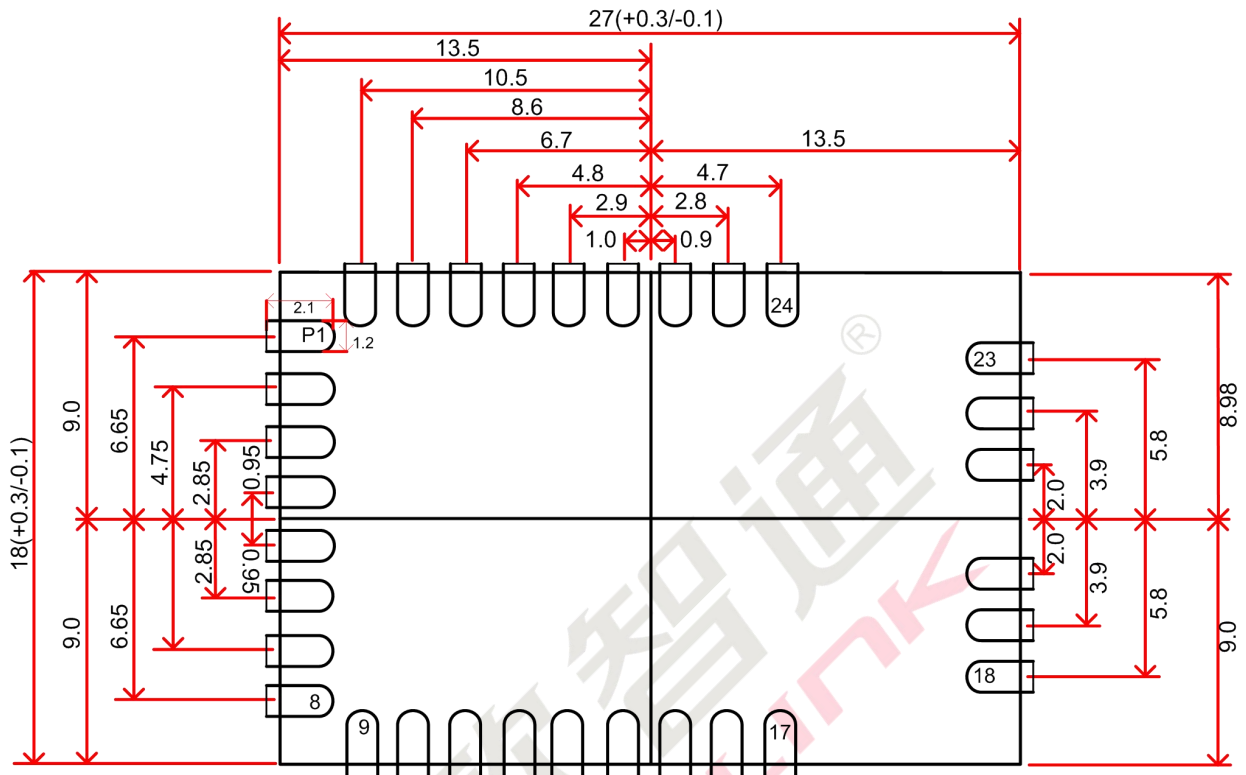
## 5.4 List of certified information

| Certification project | Certificate number     |
|-----------------------|------------------------|
| SRRC                  | CMIIT ID:2021AP8401(M) |
| FCC                   | 2AATL-6222D-UUC        |
| CE                    | 1348-5-2021-112917     |
| IC                    | TBD                    |
| NCC                   | TBD                    |
| KCC                   | TBD                    |
| TELEC                 | R210-177812            |
| Brazil                | TBD                    |
| Argentina             | TBD                    |
| Japan                 | TBD                    |

## 5.5 Layout Recommendation

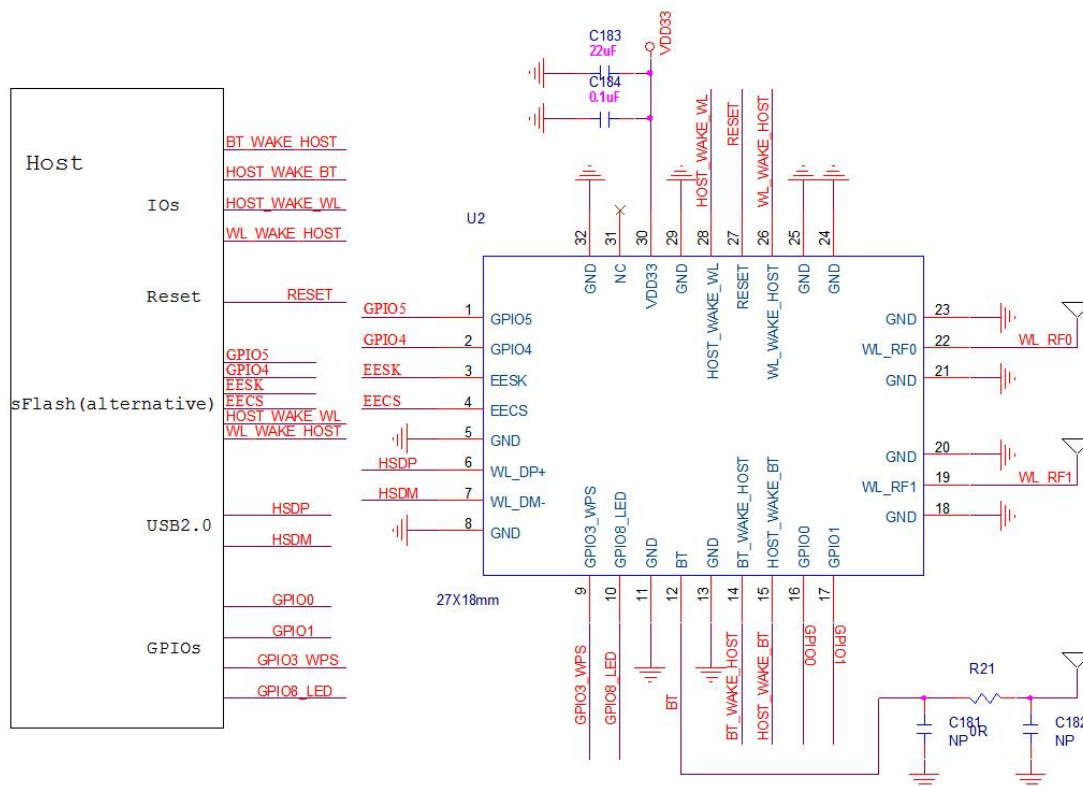
(Unit: mm)

< TOP VIEW >

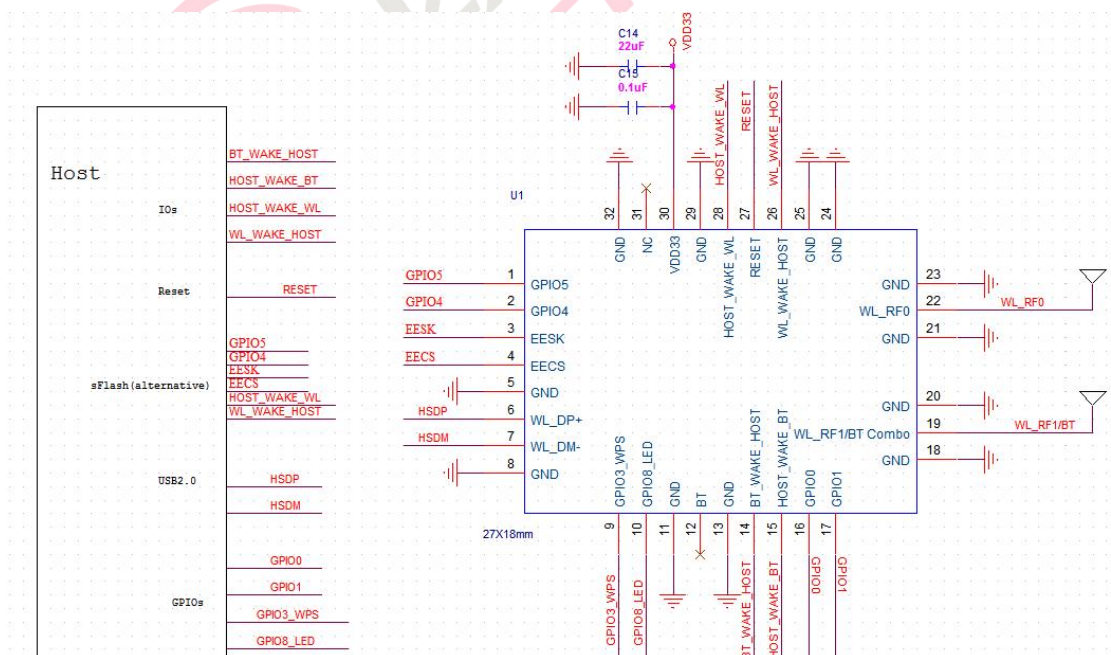


## 6 Reference Design

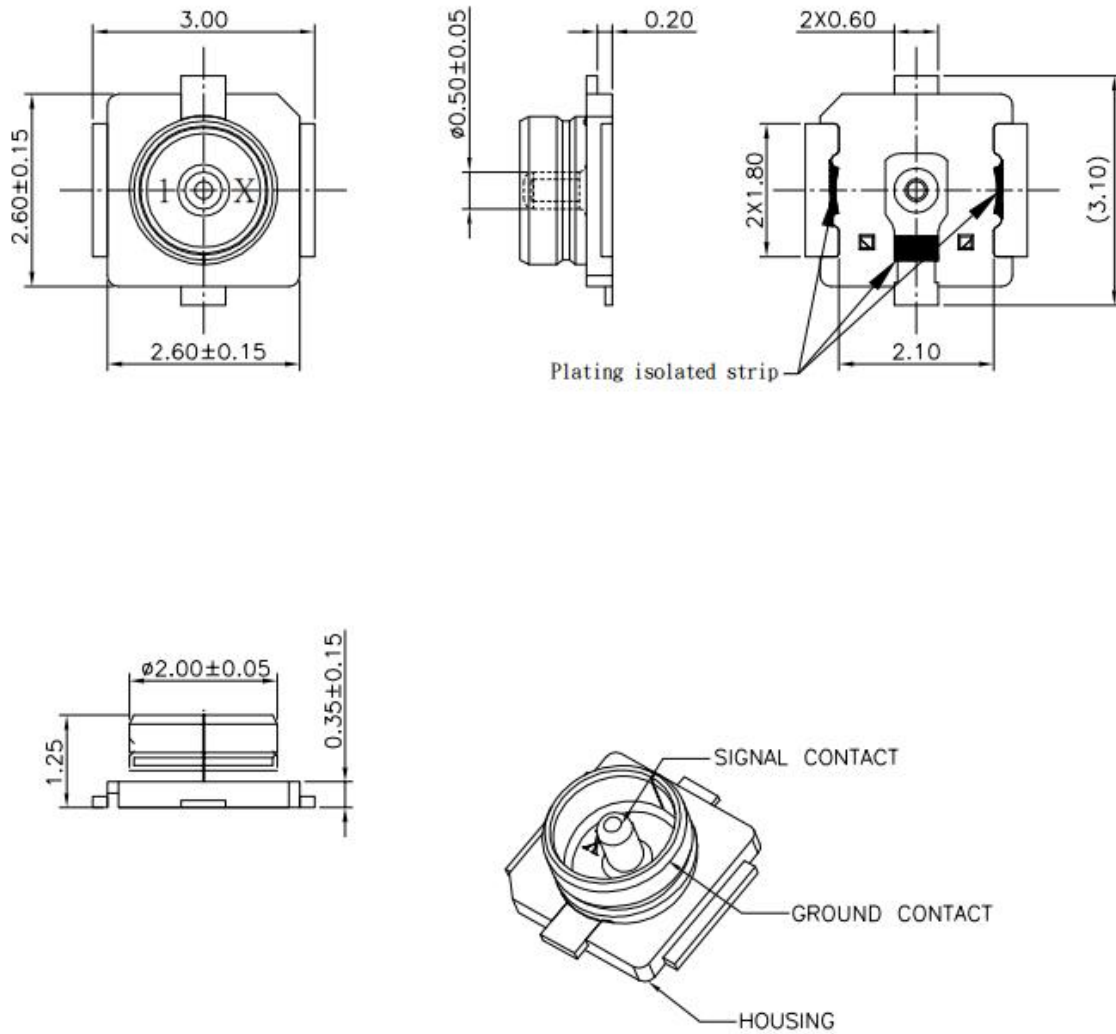
No Share BT Antenna:



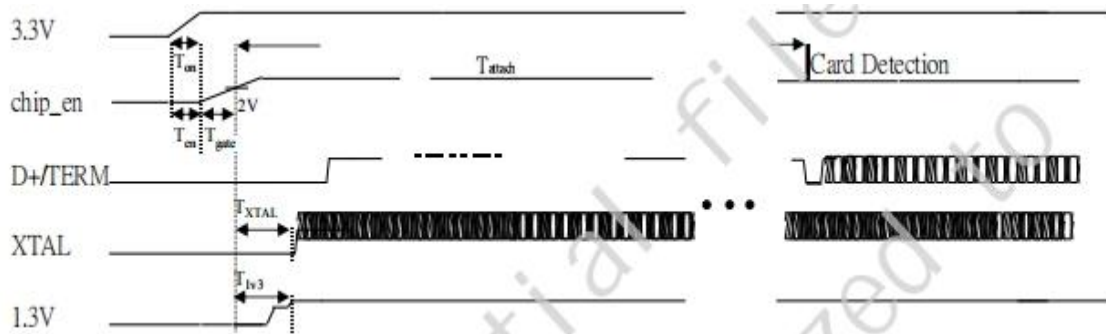
Share BT Antenna:



IPEX connetor spec



## 7 Power on Sequence



**Figure 3. RTL8822CU USB Bus Power on Sequence**

**T<sub>on</sub>:** The main power ramp up duration

**T<sub>en</sub>:** Interval between the rising point of 3.3V and chip\_en

**T<sub>gate</sub>:** Interval of 3.3V to be gated when chip\_en voltage level < 2V

**T<sub>attach</sub>:** USB attach state. The duration from resistor attached to USB host starting card detection procedure

**T<sub>xtal</sub>:** XTAL starts

#### Power on Flow Description

After the main 3.3V ramp up, the internal power on reset is released by the power ready detection circuit and the power management unit is enabled. The power management unit enables the internal regulator and clock circuits.

The power management unit also enables the USB circuits.

USB analog circuits attach resistors to indicate the insertion of the USB device.

**Table 14. Typical Timing Range**

|                     | Unit | Min. | Typical | Max. |
|---------------------|------|------|---------|------|
| T <sub>on</sub>     | ms   | -    | 1.5     | 5    |
| T <sub>en</sub>     | ms   | 0    | 0       | 5    |
| T <sub>gate</sub>   | ms   | 0    | 1.5     | 8    |
| T <sub>attach</sub> | ms   | 100  | 250     | -    |
| T <sub>xtal</sub>   | ms   | -    | 1.5     | 8    |

## 8 Ordering Information

| Part No.      | Description                                                                        |
|---------------|------------------------------------------------------------------------------------|
| FG6222DUUC-W0 | RTL8822CU-CG,802.11a/b/g/n/ac+BLE5.0,2T2R+BT ANT,18.0*27.0,USB2.0, 带天线座, 双天线       |
| FG6222DUUC-W1 | RTL8822CU-CG,802.11a/b/g/n/ac+BLE5.0,2T2R+BT ANT,18.0*27.0,USB2.0,不带天线座, 三天线       |
| FG6222DUUC-W2 | RTL8822CU-CG,a/b/g/n/ac,Wi-Fi+BLE5.0,2T2R+BT ANT,18X27mm,USB2.0,带天线座, 三天线          |
| FG6222DUUC-W3 | RTL8822CU-CG,802.11a/b/g/n/ac+BLE5.0,2T2R+BT ANT,18.0*27.0,USB2.0,带天线座, 三天线(12dbm) |

## 9 The Key Material List

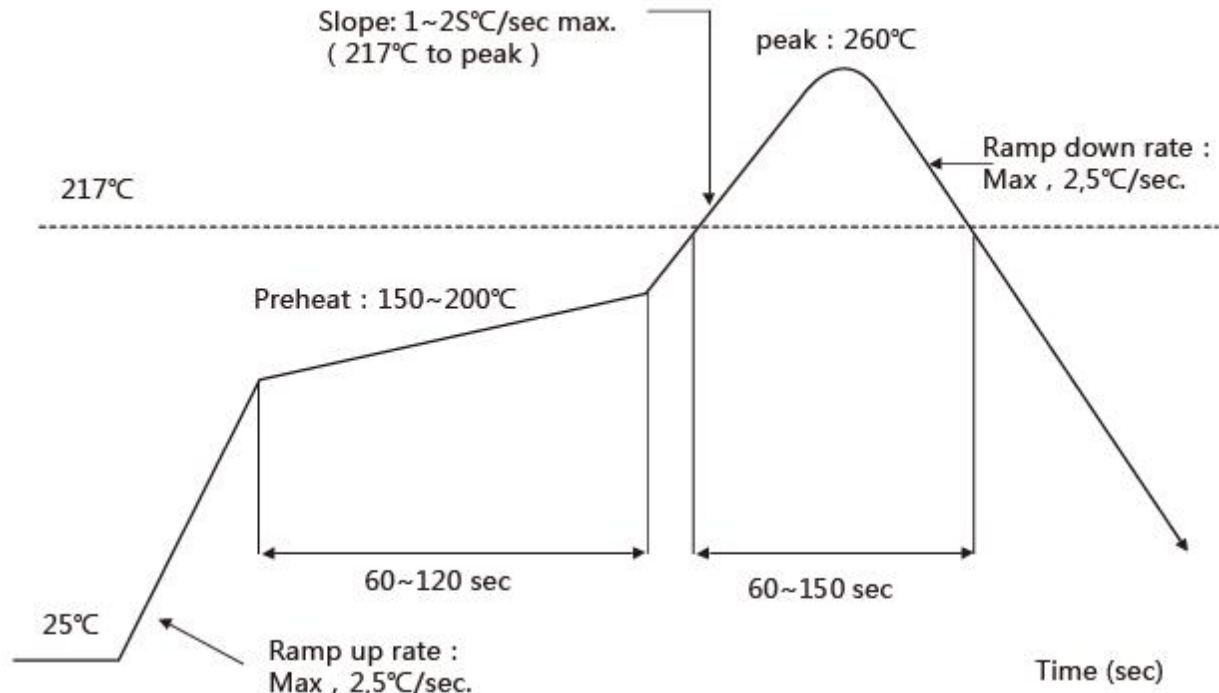
| Item | Part Name | Description                                                              | Manufacturer                           |
|------|-----------|--------------------------------------------------------------------------|----------------------------------------|
| 1    | Inductor  | 2016 2.2uH, $\pm 20\%$                                                   | Cenker, Sunlord, Ceaiya                |
| 2    | Diplexer  | 1608 Dual-band, dual-mode 2.4GHz/5GHz WLAN                               | Glead, Walsin, ACX, Murata, MAG.LAYERS |
| 3    | Crystal   | 3225 40MHz -40~110℃                                                      | ECEC, TKD, Hosonic, JWT, TXC           |
| 4    | Chipset   | RTL8822CU-CG                                                             | Realtek                                |
| 5    | PCB       | FR4, 4 LAYER, GREEN                                                      | XY-PCB, GDKX, Sunlord, SLPCB           |
| 6    | IPEX      | 1代 UFLR-MINIPCL,MRF IRECEPTACLE .(19.002A7-0001 R0)<br>(CD-ARF013-P02AW) | BonWorld,LOTCONN                       |

## 10 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature:  $<260^{\circ}\text{C}$

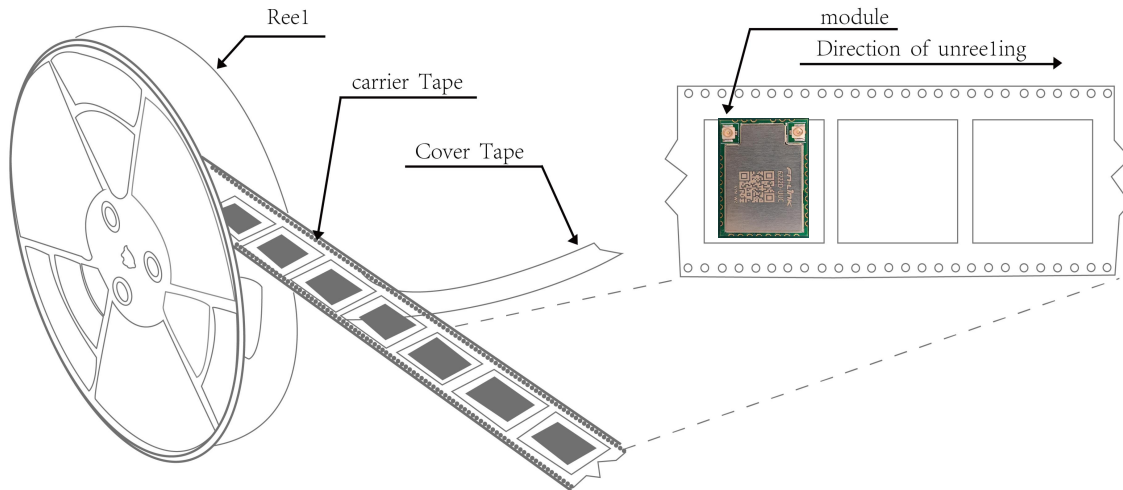
Number of Times:  $\leq 2$  times



## 11 Package Information

### 11.1 Reel

A roll of 800pcs



### 11.2 Packaging Detail

the take-up package



Using self-adhesive tape

Size of black tape:24mm\*32.6m the cover tape :2.13mm\*32.6m

Color of plastic disc:blue

A roll of 800pcs



NY bag size:460mm\*385mm

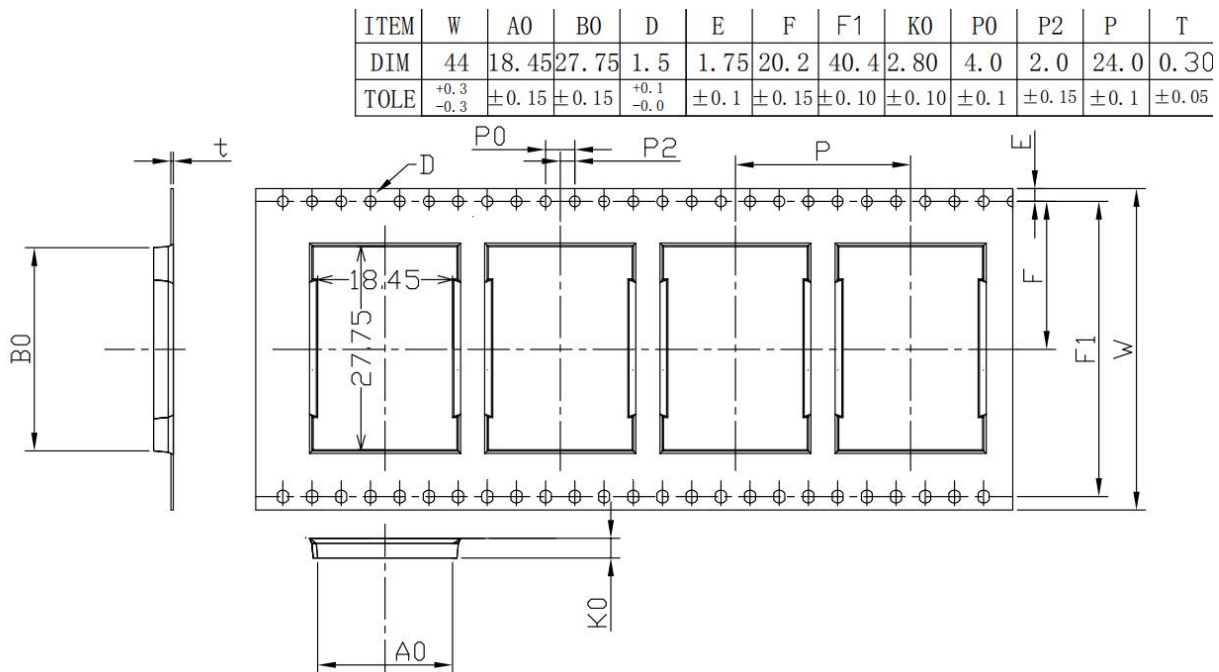


size : 350\*350\*35mm



The packing case size:350\*210\*370mm

## 10.3 Carrier Tape Detail



## 10.4 Moisture sensitivity

The Modules is a Moisture Sensitive Device level 3, in according with standard IPC/JEDEC J-STD-020, take care all the relatives requirements for using this kind of components.

Moreover, the customer has to take care of the following conditions:

- Calculated shelf life in sealed bag: 12 months at  $<40^{\circ}\text{C}$  and  $<90\%$  relative humidity (RH)
- Environmental condition during the production:  $30^{\circ}\text{C}$  /  $60\%$  RH according to IPC/JEDEC J-STD-033A paragraph 5
- The maximum time between the opening of the sealed bag and the reflow process must be 168 hours if condition
- "IPC/JEDEC J-STD-033A paragraph 5.2" is respected
- Baking is required if conditions b) or c) are not respected
- Baking is required if the humidity indicator inside the bag indicates  $10\%$  RH or more