

# 6223C-PUD

**Wi-Fi 2.4G 1T1R 11n + BT 4.2**

**Module specification**



## 6223C-PUDModule specification

**Office: 6th Floor, Building U6, Junxiang U8, Hangcheng Avenue, Baoan District, Shenzhen city, Guangdong Province, China**

**Factory: No. 8 litong Road, Liuyang Economic and Technological Development Zone, Changsha, Hunan, China**

**Telephone: + 86-755-2955-8186**

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

|       |       |     |
|-------|-------|-----|
| 客户承认： | _____ | 公司  |
|       | _____ | 标题  |
|       | _____ | 签名  |
|       | _____ | 日期  |
|       | _____ | 欧智通 |

## 变更履历

| 版本  | 日期         | 描述                                 | 编辑  | 核准    |
|-----|------------|------------------------------------|-----|-------|
| 1.0 | 2018/10/18 | New version                        | Lzm | Jacky |
| 1.1 | 2018/12/18 | Modify the telephone number        | Lzm | Lxy   |
| 1.2 | 2018/12/25 | Modify the office and TEL          | Lzm | Lxy   |
| 1.3 | 2021/04/13 | Proofread specification details    | Lxy | Szs   |
| 1.3 | 2021/05/20 | Supplementary Material list        | Lxy | Szs   |
| 1.4 | 2021/07/12 | Modifying Bluetooth Specifications | Lxy | QJP   |

## CONTENTS

|                                             |           |
|---------------------------------------------|-----------|
| <b>1 Overview.....</b>                      | <b>1</b>  |
| 1.1 Introduction.....                       | 1         |
| 1.2 Features.....                           | 1         |
| 1.4 General Specification.....              | 2         |
| 1.5 Recommended Operating Rating.....       | 3         |
| ※1.6 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.....              | 5         |
| <b>3 Bluetooth Specification.....</b>       | <b>7</b>  |
| 3.1 Bluetooth Specification.....            | 7         |
| <b>4 Pin Assignments.....</b>               | <b>8</b>  |
| 4.1 Pin Outline.....                        | 8         |
| 4.2 Pin Definition.....                     | 9         |
| <b>5 Dimensions.....</b>                    | <b>12</b> |
| 5.1 Module Picture.....                     | 12        |
| 5.2 Physical Outline.....                   | 12        |
| 5.3 Module Physical Dimensions.....         | 13        |
| 5.4 Connector Specification.....            | 13        |
| 5.5 Marking Description.....                | 14        |
| <b>6 Host Interface Timing Diagram.....</b> | <b>15</b> |
| 6.1 PCIe Bus during Power On Sequence.....  | 15        |
| 6.2 PCIe PERST# Timing Sequence.....        | 15        |
| 6.3 Power Off Sequence.....                 | 16        |
| <b>7 Reference Design.....</b>              | <b>17</b> |
| <b>8 Ordering Information.....</b>          | <b>18</b> |
| <b>9 The Key Material List.....</b>         | <b>18</b> |
| <b>10 Recommended Reflow Profile.....</b>   | <b>19</b> |
| <b>11 Package Information.....</b>          | <b>20</b> |
| 11.1 Reel.....                              | 20        |
| 11.2 Carrier Tape Detail.....               | 20        |
| 11.3 Packaging Detail.....                  | 21        |
| 12. Moisture sensitivity.....               | 21        |

# **1. Overview**

## **1.1 Introduction**

6223C-PUD is a highly integrated module that supports 802.11b/g/n 1T1R, PCIe port, USB Bluetooth port and wifi speed up to 150Mbps. Bluetooth supports V2.1+V4.2 systems.

## **1.2 Features**

12 x16 the LGA encapsulation

Anyway IEEE802.11b /g/n+BT v2.1/v4.2 system, BLE4.0 dual-mode

Subscribed 2.4g 11n supports a maximum speed of 150Mbps

Anyway Wifi data interface supports PCIe V1.1

Slim Bluetooth data interface supports USB 2.0 and SUPPORTS PCM

Footed supports IEEE802.11e/I, WAPI

Anyway WiFi supports P2P apps

**BLOCK DIAGRAM:**

Confidential

## 1.2 General Specification

|                     |                                                                    |
|---------------------|--------------------------------------------------------------------|
| Module type         | 6223C-PUD                                                          |
| describe            | Wi-Fi/Bluetooth module                                             |
| size                | L x W x H: 16 x 12 x 1.65 mm                                       |
| Wi-fi interface     | PCI-e                                                              |
| BT interface        | USB / PCM                                                          |
| Working temperature | 0°C to 70°C                                                        |
| Storage temperature | -40°C to 80°C                                                      |
| RoHS                | All hardware components are fully compliant with EU RoHS directive |

## 1.4 Recommended Operating Rating

|                     | Min.                  | Typ.   | Max. | Unit  |
|---------------------|-----------------------|--------|------|-------|
| Working temperature | 0                     | 25     | 70   | deg.C |
| VDD                 | 3.15                  | 3.3    | 3.45 | V     |
| VDDIO               | 3.15                  | 3.3    | 3.45 | V     |
| power dissipation   | VCC33 = 3.3V(Unit:mA) |        |      |       |
|                     | Wi-Fi on Mode         | 150.15 |      |       |
|                     | TX<br>(2.4G HT40)     | 300    |      |       |
|                     | RX<br>(2.4G HT40)     | 158    |      |       |

## ※1.5 EEPROM information

wifi

|            |                                |
|------------|--------------------------------|
| Reg Domain | Channels 1-11 with active scan |
| Vendor ID  | 0x10EC                         |
| Device ID  | 0xD723                         |

BT

|            |        |
|------------|--------|
| Vendor ID  | 0x0BDA |
| Product ID | 0xD723 |

## 2 Wi-Fi Rf specification

### 2.1 2.4GHz Rf specification

| features                                      | describe                                                                        |               |
|-----------------------------------------------|---------------------------------------------------------------------------------|---------------|
| WLAN standard                                 | 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) |               |
| Frequency range                               | 802.11b/g/n(HT20): 2412MHz to 2462MHz<br>802.11n(HT40): 2422MHz to 2452MHz      |               |
| Channel number                                | 802.11b/g/n(HT20): 11<br>802.11n(HT40):7                                        |               |
| The output power                              | 11Mbps : 12 dBm ± 1.5 dB @ EVM -9dB                                             |               |
|                                               | 54Mbps : 12 dBm ± 1.5 dB @ EVM -25dB                                            |               |
|                                               | MCS7 : 12 dBm ± 1.5 dB @ EVM -28dB                                              |               |
| spectrum                                      | 符合 IEEE 标准                                                                      |               |
| The frequency error                           | ±20 ppm                                                                         |               |
| The test item                                 | Typical Value                                                                   | Typical Value |
| Receive Sensitivity<br>(11b,20MHz)@8%PER      | - 1Mbps PER @ -92 dBm                                                           | ≤-83          |
|                                               | - 2Mbps PER @ -90 dBm                                                           | ≤-80          |
|                                               | - 5.5Mbps PER @ -87 dBm                                                         | ≤-79          |
|                                               | - 11Mbps PER @ -85 dBm                                                          | ≤-76          |
| Receive Sensitivity<br>(11g,20MHz)@10%<br>PER | - 6Mbps PER @ -89 dBm                                                           | ≤-85          |
|                                               | - 9Mbps PER @ -88 dBm                                                           | ≤-84          |
|                                               | - 12Mbps PER @ -87 dBm                                                          | ≤-82          |
|                                               | - 18Mbps PER @ -84 dBm                                                          | ≤-80          |
|                                               | - 24Mbps PER @ -81 dBm                                                          | ≤-77          |
|                                               | - 36Mbps PER @ -78 dBm                                                          | ≤-73          |
|                                               | - 48Mbps PER @ -73 dBm                                                          | ≤-69          |
|                                               | - 54Mbps PER @ -71 dBm                                                          | ≤-68          |
| Receive Sensitivity<br>(11n,20MHz)@10%<br>PER | - MCS=0 PER @ -89 dBm                                                           | ≤-85          |
|                                               | - MCS=1 PER @ -86 dBm                                                           | ≤-82          |
|                                               | - MCS=2 PER @ -84 dBm                                                           | ≤-80          |
|                                               | - MCS=3 PER @ -80 dBm                                                           | ≤-77          |
|                                               | - MCS=4 PER @ -77 dBm                                                           | ≤-73          |
|                                               | - MCS=5 PER @ -72 dBm                                                           | ≤-69          |
|                                               | - MCS=6 PER @ -71 dBm                                                           | ≤-68          |
|                                               | - MCS=7 PER @ -69 dBm                                                           | ≤-67          |

|                                               |                       |      |
|-----------------------------------------------|-----------------------|------|
| Receive Sensitivity<br>(11n,20MHz)@10%<br>PER | - MCS=0 PER @ -88 dBm | ≤-82 |
|                                               | - MCS=1 PER @ -85 dBm | ≤-79 |
|                                               | - MCS=2 PER @ -83 dBm | ≤-77 |
|                                               | - MCS=3 PER @ -79 dBm | ≤-74 |
|                                               | - MCS=4 PER @ -76 dBm | ≤-70 |
|                                               | - MCS=5 PER @ -71 dBm | ≤-66 |
|                                               | - MCS=6 PER @ -69 dBm | ≤-65 |
|                                               | - MCS=7 PER @ -67 dBm | ≤-64 |
| Maximum Input Level                           | 802.11b : -10 dBm     |      |
|                                               | 802.11g/n : -20 dBm   |      |
| Antenna Reference                             | 2 dBi peak gain       |      |

## 3 Bluetooth Specification

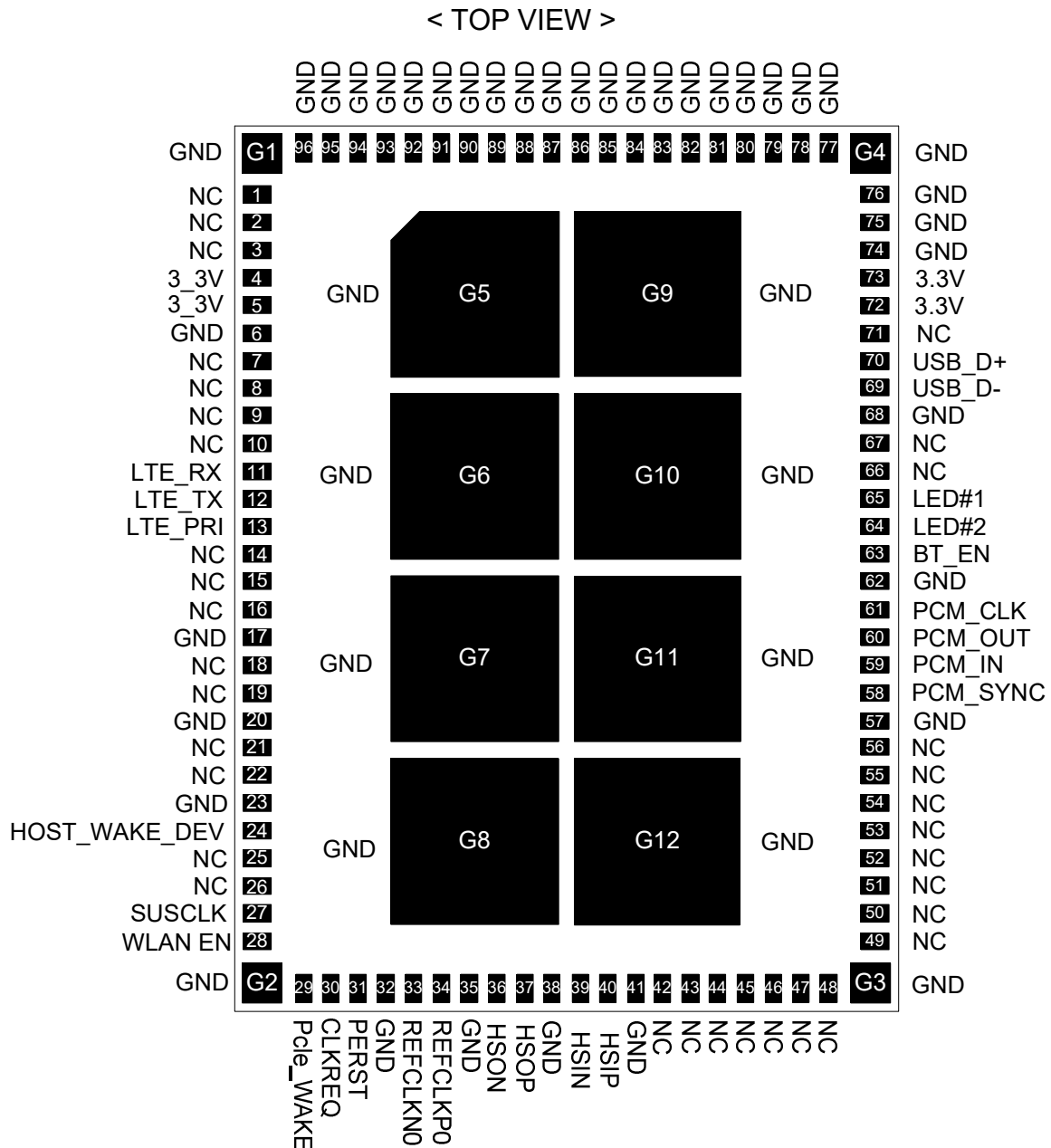
### 3.1 Bluetooth Specification

| Feature                                              | Description                 |         |         |
|------------------------------------------------------|-----------------------------|---------|---------|
| <b>General Specification</b>                         |                             |         |         |
| standard                                             | BT v2.1+v4.2/BLE4.0.        |         |         |
| Data interface                                       | USB2.0                      |         |         |
| Antenna reference                                    | 2 dBi peak gain             |         |         |
| Frequency range                                      | 2402MHz-2480MHz             |         |         |
| Channel number                                       | 79 channels                 |         |         |
| Modulation method                                    | GFSK, $\pi/4$ -DQPSK, 8DPSK |         |         |
| <b>Rf specifications</b>                             |                             |         |         |
|                                                      | Minimum                     | typical | maximum |
| Output power (Class 1)                               | 2 dBm                       | 5 dBm   | 8 dBm   |
| Sensitivity@ BER=0.1%<br>for GFSK (1Mbps)            |                             | -92 dBm |         |
| Sensitivity@ BER=0.01%<br>for $\pi/4$ -DQPSK (2Mbps) |                             | -86 dBm |         |
| Sensitivity@ BER=0.01%<br>for 8DPSK (3Mbps)          |                             | -85 dBm |         |

|                     |                                |
|---------------------|--------------------------------|
| Maximum input level | GFSK (1Mbps):-20dBm            |
|                     | $\pi/4$ -DQPSK (2Mbps) :-20dBm |
|                     | 8DPSK (3Mbps) :-20dBm          |

## 4 Pin Assignments

### 4.1 Pin Outline



### 4.2 Pin Definition

| Pin | Name | Type | Description | Level |
|-----|------|------|-------------|-------|
|-----|------|------|-------------|-------|

|           |               |     |                                                                                                          |       |
|-----------|---------------|-----|----------------------------------------------------------------------------------------------------------|-------|
| <b>1</b>  | NC            | —   | No connect                                                                                               |       |
| <b>2</b>  | NC            | —   | No connect                                                                                               |       |
| <b>3</b>  | NC            | —   | No connect                                                                                               |       |
| <b>4</b>  | 3_3V          | P   | power input                                                                                              | 3.3V  |
| <b>5</b>  | 3_3V          | P   | power input                                                                                              | 3.3V  |
| <b>6</b>  | GND           | —   | grounding                                                                                                |       |
| <b>7</b>  | NC            | —   | No connect                                                                                               |       |
| <b>8</b>  | NC            | —   | No connect                                                                                               |       |
| <b>9</b>  | NC            | —   | No connect                                                                                               |       |
| <b>10</b> | NC            | —   | No connect                                                                                               |       |
| <b>11</b> | LTE_RX        | I/O | LTE coexist signal                                                                                       | VDDIO |
| <b>12</b> | LTE_TX        | I/O | LTE coexistence signal                                                                                   | VDDIO |
| <b>13</b> | LTE_PRI       | I/O | LTE coexistence signal<br>Share with GPIO12<br>0: internal NV memory select<br>1: External EEPROM select | VDDIO |
| <b>14</b> | NC            | —   | No connect                                                                                               |       |
| <b>15</b> | NC            | —   | No connect                                                                                               |       |
| <b>16</b> | NC            | —   | No connect                                                                                               |       |
| <b>17</b> | GND           | —   | grounding                                                                                                |       |
| <b>18</b> | NC            | —   | No connect                                                                                               |       |
| <b>19</b> | NC            | —   | No connect                                                                                               |       |
| <b>20</b> | GND           | —   | grounding                                                                                                |       |
| <b>21</b> | NC            | —   | No connect                                                                                               |       |
| <b>22</b> | NC            | —   | No connect                                                                                               |       |
| <b>23</b> | GND           | —   | grounding                                                                                                |       |
| <b>24</b> | HOST_WAKE_DEV | I/O | Host wake up DEV, GPIO13                                                                                 | VDDIO |
| <b>25</b> | NC            | —   | No connect                                                                                               |       |
| <b>26</b> | NC            | —   | No connect                                                                                               |       |
| <b>27</b> | SUSCLK        | I   | External RTC input(32.768kHz)<br>Share with GPIO15<br>0: USB1.2 or 2.0<br>1: otherwise                   | VDDIO |
| <b>28</b> | WLAN EN       | I   | WLAN EN<br>1: WLAN on, PCIe on (default)                                                                 | VDD   |

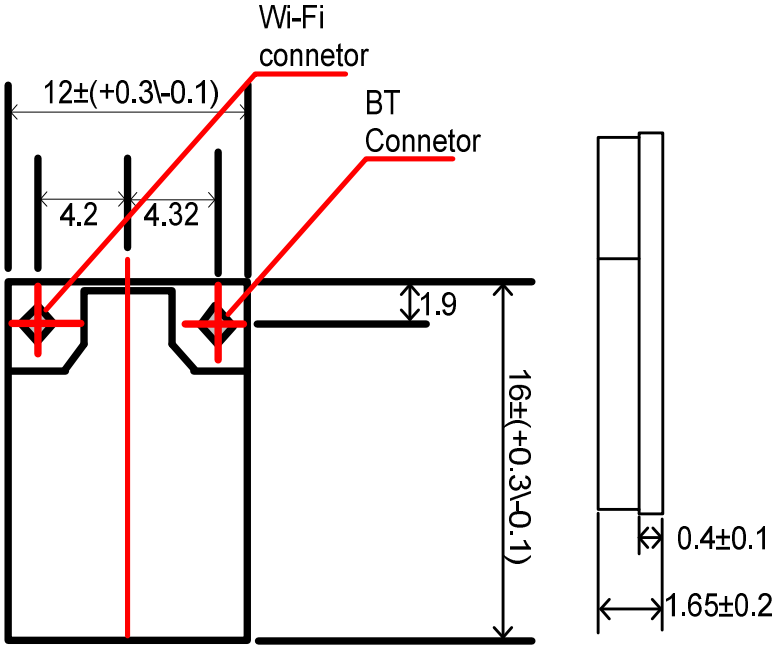
|           |           |       |                                                                                                                                                                                              |       |
|-----------|-----------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
|           |           |       | 0: WLAN off, PCIe off                                                                                                                                                                        |       |
| <b>29</b> | PCIe_WAKE | O/D   | Power management event: open drain, active low.<br>Used to reactivate the PCIe slot's main power rails<br>and reference clocks.<br>Share with BT wake up host function via sideband signals. | VDDIO |
| <b>30</b> | CLKREQ    | I/O/D | PCI-e reference clock request signal.<br>Can be shared with BT device clock request function                                                                                                 | VDDIO |
| <b>31</b> | PERST     | I     | PCI-e reset signal: active low.                                                                                                                                                              | VDDIO |
| <b>32</b> | GND       | —     | grounding                                                                                                                                                                                    |       |
| <b>33</b> | REFCLKN0  | I     | PCI-E CLK Difference -                                                                                                                                                                       |       |
| <b>34</b> | REFCLKP0  | I     | PCI-E CLK Difference +                                                                                                                                                                       |       |
| <b>35</b> | GND       | —     | grounding                                                                                                                                                                                    |       |
| <b>36</b> | HS0N      | O     | PCI-E Data Out Difference -                                                                                                                                                                  |       |
| <b>37</b> | HS0P      | O     | PCI-E Data Out Difference +                                                                                                                                                                  |       |
| <b>38</b> | GND       | —     | grounding                                                                                                                                                                                    |       |
| <b>39</b> | HS1N      | I     | PCI-E Data IN Difference -                                                                                                                                                                   |       |
| <b>40</b> | HS1P      | I     | PCI-E Data IN Difference +                                                                                                                                                                   |       |
| <b>41</b> | GND       | —     | grounding                                                                                                                                                                                    |       |
| <b>42</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>43</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>44</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>45</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>46</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>47</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>48</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>49</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>50</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>51</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>52</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>53</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>54</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>55</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>56</b> | NC        | —     | No connect                                                                                                                                                                                   |       |
| <b>57</b> | GND       | —     | grounding                                                                                                                                                                                    |       |
| <b>58</b> | PCM_SYNC  | I/O   | PCM sync signal                                                                                                                                                                              | VDDIO |
| <b>59</b> | PCM_IN    | I     | PCM data input                                                                                                                                                                               | VDDIO |

|        |         |     |                                                 |       |
|--------|---------|-----|-------------------------------------------------|-------|
| 60     | PCM_OUT | O   | PCM Data output                                 | VDDIO |
| 61     | PCM_CLK | I/O | PCM clock                                       | VDDIO |
| 62     | GND     | —   | grounding                                       |       |
| 63     | BT_EN   | I   | 1:BT on, USB on (default)<br>0: BT off, USB off | VDDIO |
| 64     | LED#2   | O   | BT link LED,active low.                         | VDDIO |
| 65     | LED#1   | O   | WLAN link LED,active low.                       | VDDIO |
| 66     | NC      | —   | No connect                                      |       |
| 67     | NC      | —   | No connect                                      |       |
| 68     | GND     | —   | grounding                                       |       |
| 69     | USB_D-  | I/O | USB differential -                              |       |
| 70     | USB_D+  | I/O | USB differential +                              |       |
| 71     | NC      | —   | No connect                                      |       |
| 72     | 3.3V    | P   | Main power voltage source input 3.3V            | 3.3V  |
| 73     | 3.3V    | P   | Main power voltage source input 3.3V            | 3.3V  |
| 74~76  | GND     | —   | grounding                                       |       |
| G1-G12 | GND     | —   | grounding                                       |       |

P:POWER I:INPUT O:OUTPUT VDDIO:3.3V

## 5. Dimensions

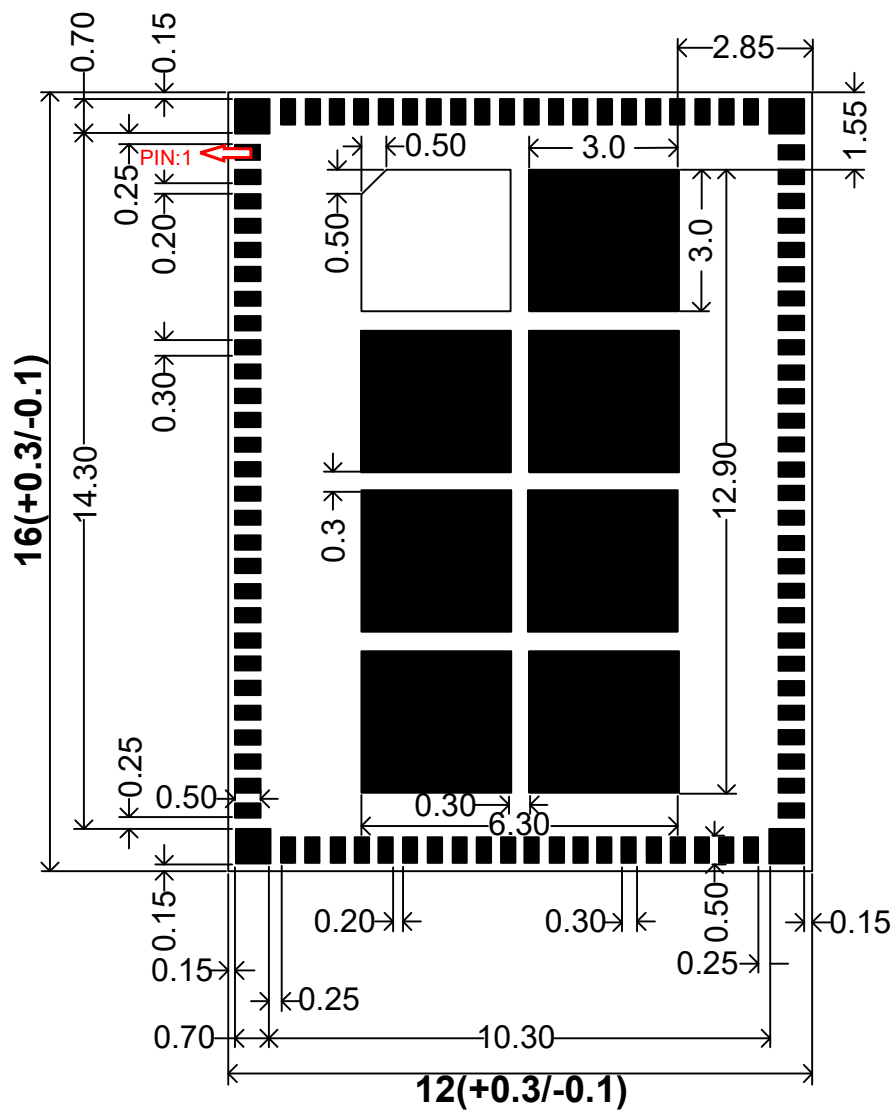
### 5.1 Module picture

|                                                                                                                           |                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p>L x W : 16 x 12 (+0.3/-0.1) mm</p>  |  |
| <p>H: 1.65 (±0.2) mm</p>                                                                                                  |                                                                                      |
| <p>重量</p>                                                                                                                 | <p>0.69g</p>                                                                         |

## 5.2 Physical Outline

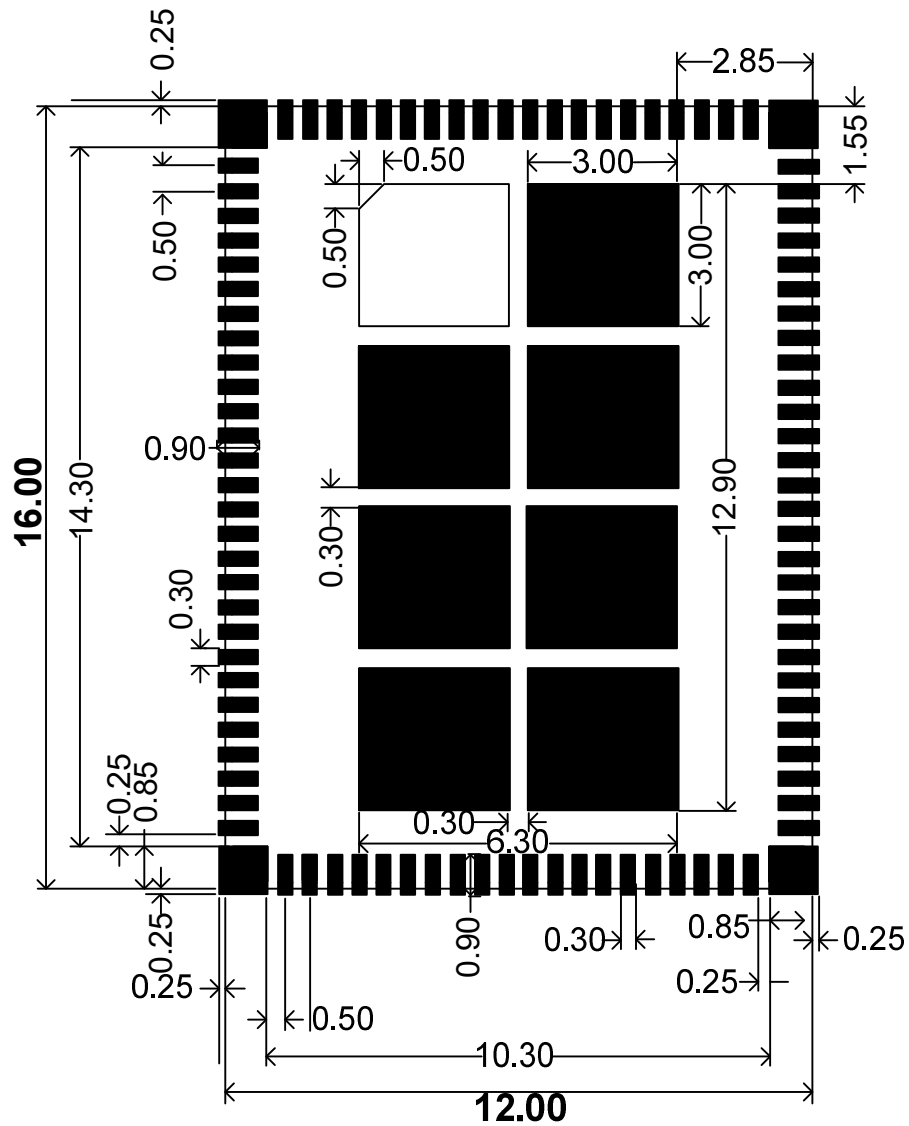
(Unit: mm)

< TOP VIEW >

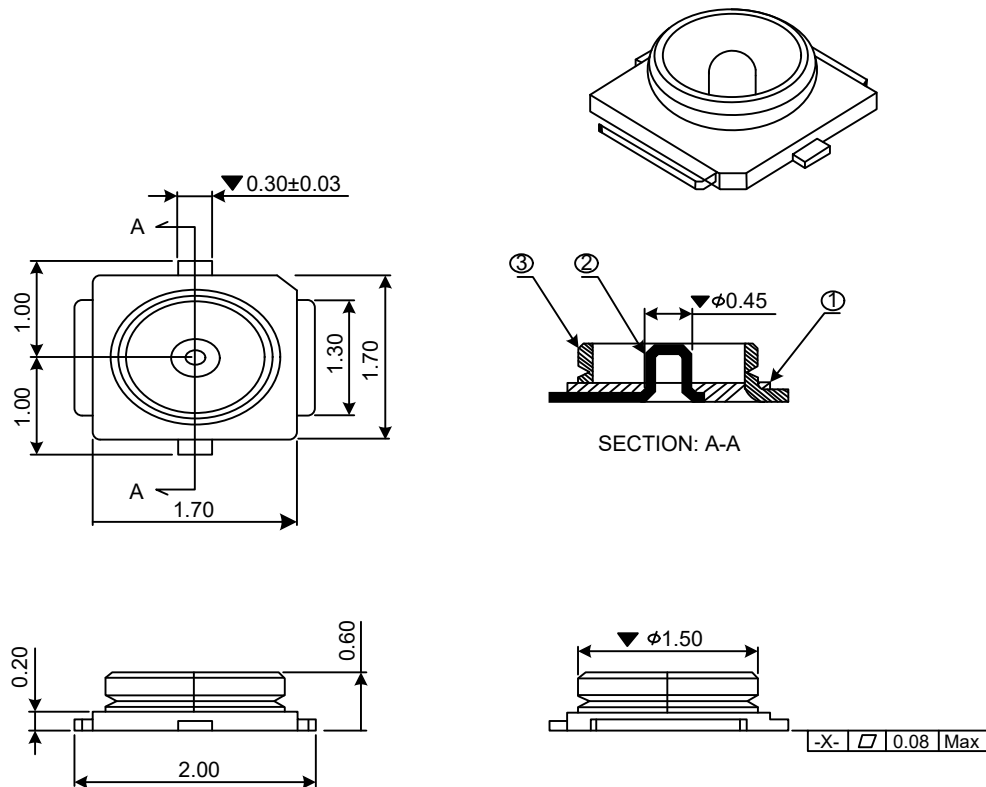


### 5.3 Module Physical Dimensions

(Unit: mm)

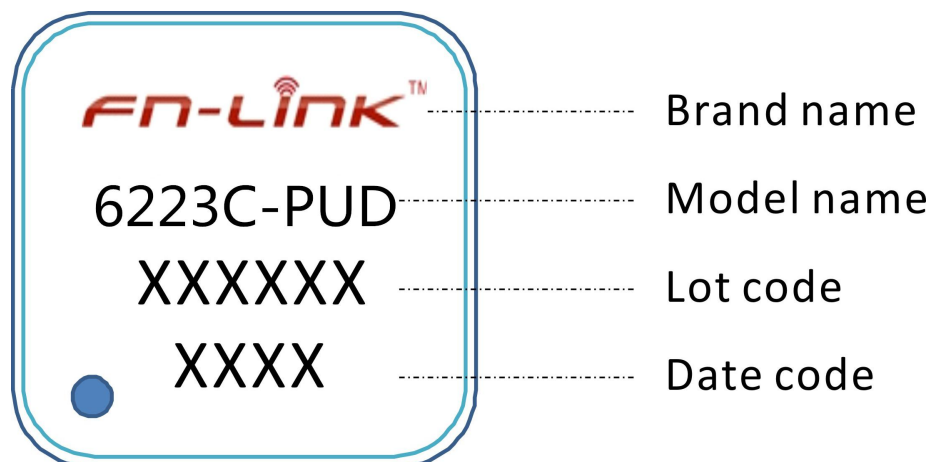


## 5.4 Connector Specification



## 5.5 Marking Description

< TOP VIEW >



## 6. Host Interface Timing Diagram

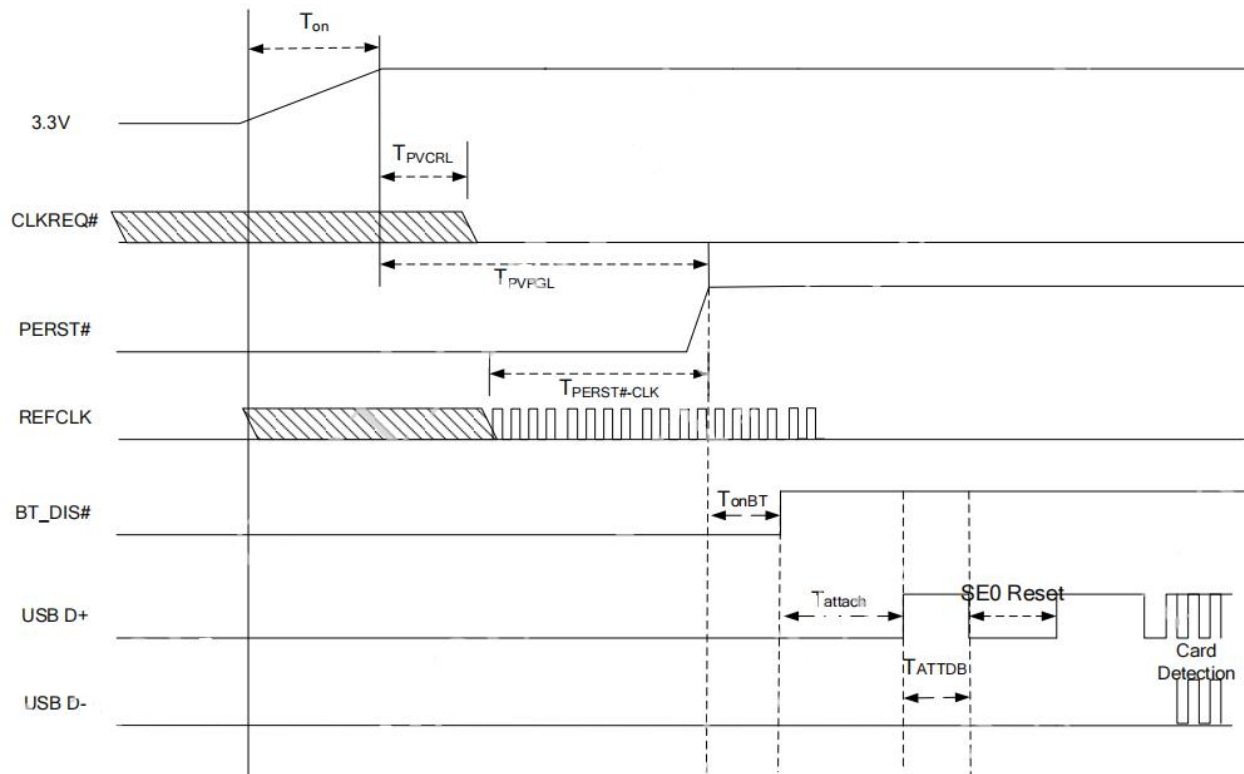
### 6.1 Bus during Power On Sequence

The boot timing diagram is only for cold boot;

If system goes to S3, S4 or reboot without power off 3v3, BT\_DIS is not allowed to be asserted;

BT\_DIS low duty require at least 5ms;

Do not driving any USB signal when BT\_DIS is low;



$T_{on}$ : the main power ramp up duration

$T_{PRVRL}$ : power valid to CLKREQ# output active

$T_{PVPGL}$ : power valid to PERST# input inactive

$T_{PERST\#-CLK}$ : reference clock stable before PERST# inactive

$T_{onBT}$ : the time interval to turn on BT after PERST# de-asserted

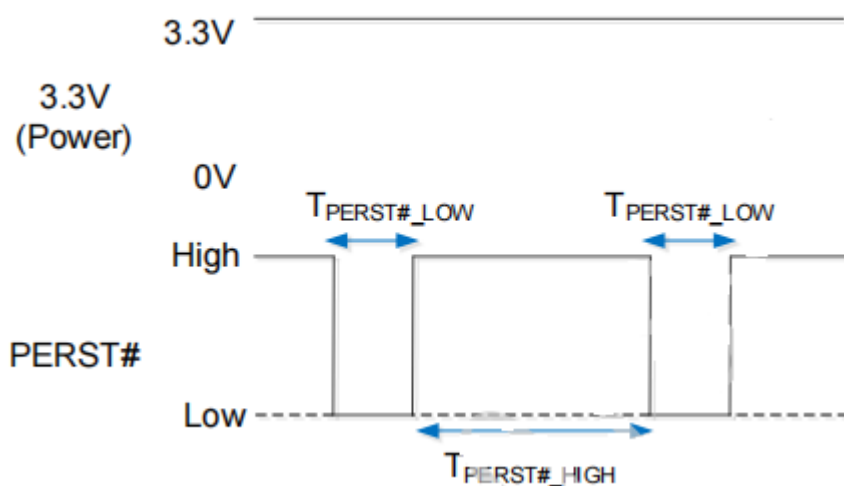
$T_{attach}$ : the interval between BT\_DIS to USB attached state

$T_{ATTDB}$ : the debounce interval with a minimal duration of 100ms that provide by USB system software

$T_{SE0\ Reset}$ : USB host send SE0 Reset duration

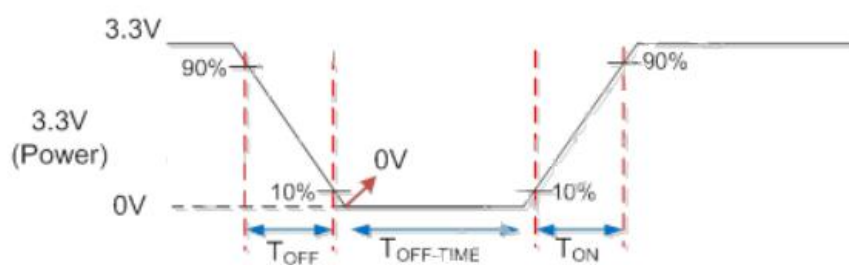
| Symbol            | Unit | Min                                           | Typical | Max |
|-------------------|------|-----------------------------------------------|---------|-----|
| $T_{on}$          | ms   | 0.2                                           | 1.5     | 5   |
| $T_{PVCRL}$       | us   | --                                            |         | 100 |
| $T_{PVPGL}$       | ms   | Implementation specific;<br>recommended 50 ms |         | --  |
| $T_{PERST\#-CLK}$ | us   | 100                                           |         | --  |
| $T_{onBT}$        | ms   | 10                                            | 50      | --  |
| $T_{attach}$      | ms   | 0.5                                           | 0.7     | 5   |
| $T_{ATTDB}$       | ms   | 100                                           | --      | --  |
| $T_{SE0\ Reset}$  | ms   | 10                                            | --      | 20  |

## 6.2 PCIe PERST# Timing Sequence



|                     | Min | Typical | Max | Unit | Description          |
|---------------------|-----|---------|-----|------|----------------------|
| $T_{PERST\#\_LOW}$  | 6   | 10      | X   | ms   | PERST# low duration  |
| $T_{PERST\#\_HIGH}$ | 400 | 500     | X   | ms   | PERST# high duration |

## 6.3 Power Off Sequence



| Symbol         | Unit | Min | Typical | Max |
|----------------|------|-----|---------|-----|
| $T_{OFF}$      | ms   | 5   | 20      | 50  |
| $T_{OFF-TIME}$ | ms   | 500 | --      | --  |
| $T_{ON}$       | ms   | 0.5 | 1.5     | 5   |

## 7. Reference Design

Schematics

Confidential

## **8.Ordering Information**

| Part No.      | Description                                                             |
|---------------|-------------------------------------------------------------------------|
| FG6223CPUD-W1 | RTL8723DE, b/g/n, Wi-Fi+BLE4.2, 1T1R, 12X16mm, PCIE+USB, PCB V3.0, 双天线座 |

## 9.The Key Material List

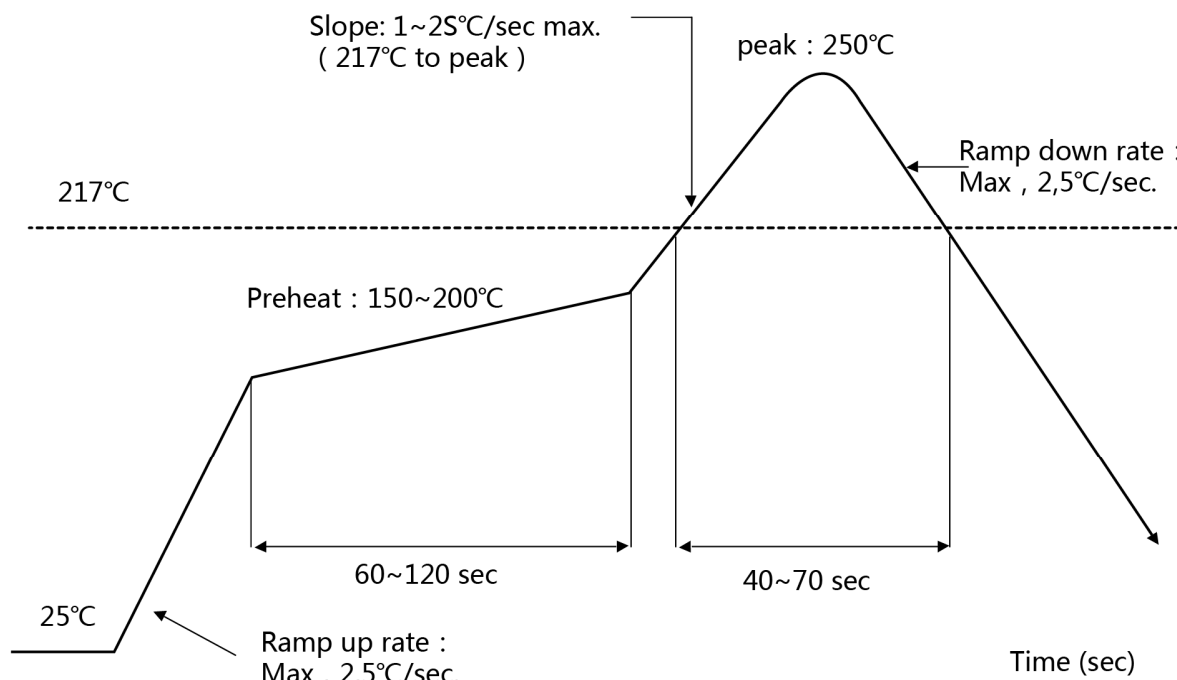
|                        |                                                               |                                                  |
|------------------------|---------------------------------------------------------------|--------------------------------------------------|
| crystal                | 1612/2016,40MHZ,15pF,10ppm                                    | ECEC,HOSONIC,TKD,JWT                             |
| PCB                    | 6223C-PUD V3.0,green, 4L, 12X16X0.4mm                         | XY-PCB,KX-PCB,SL-PCB,S<br>unlord,Brain-power PCB |
| Main<br>chip           | RTL8723DE-VB-CG QFN56P                                        | Realtek                                          |
| Shielding<br>cover     | 6223C-PUD-V3.0 屏蔽盖 尺寸<br>11.35x15.35x1.25mm 洋白铜,无定位脚,带<br>绝缘层 | 信太,精力通                                           |
| The<br>antenna<br>seat | 4 generation antenna base                                     | 佳沃,创迪尔                                           |

## 10. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

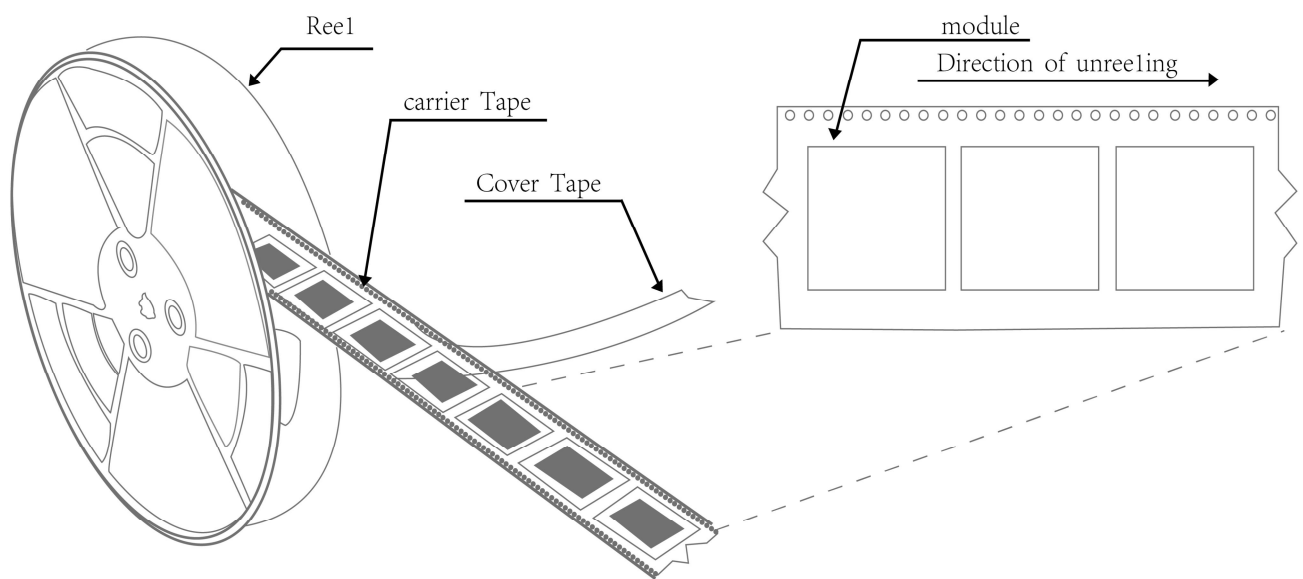
Number of Times : □2 times



## 11 Package Information

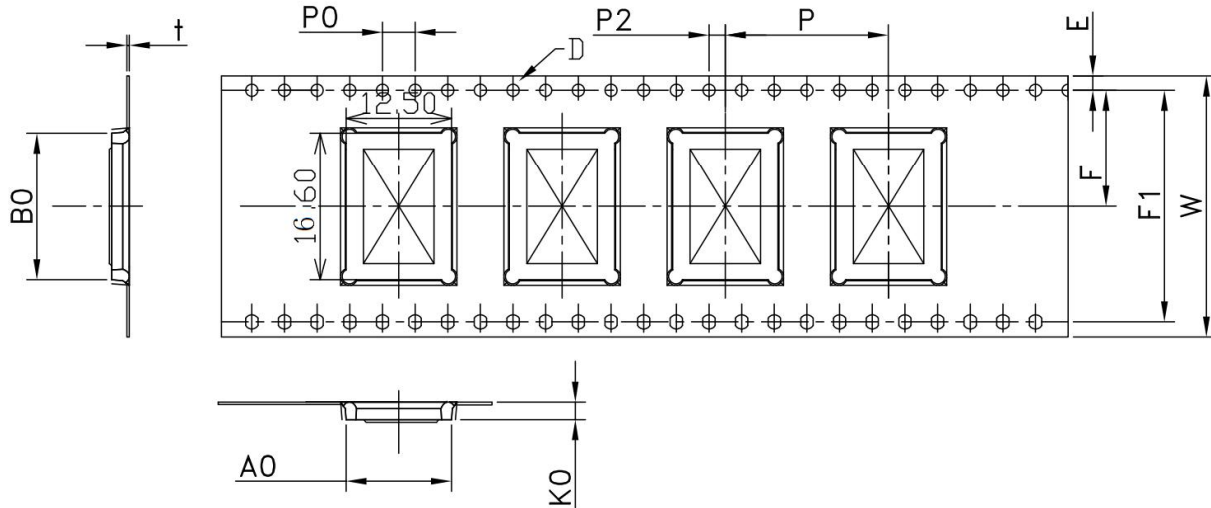
### 11.1 Reel

A roll of 2000pcs

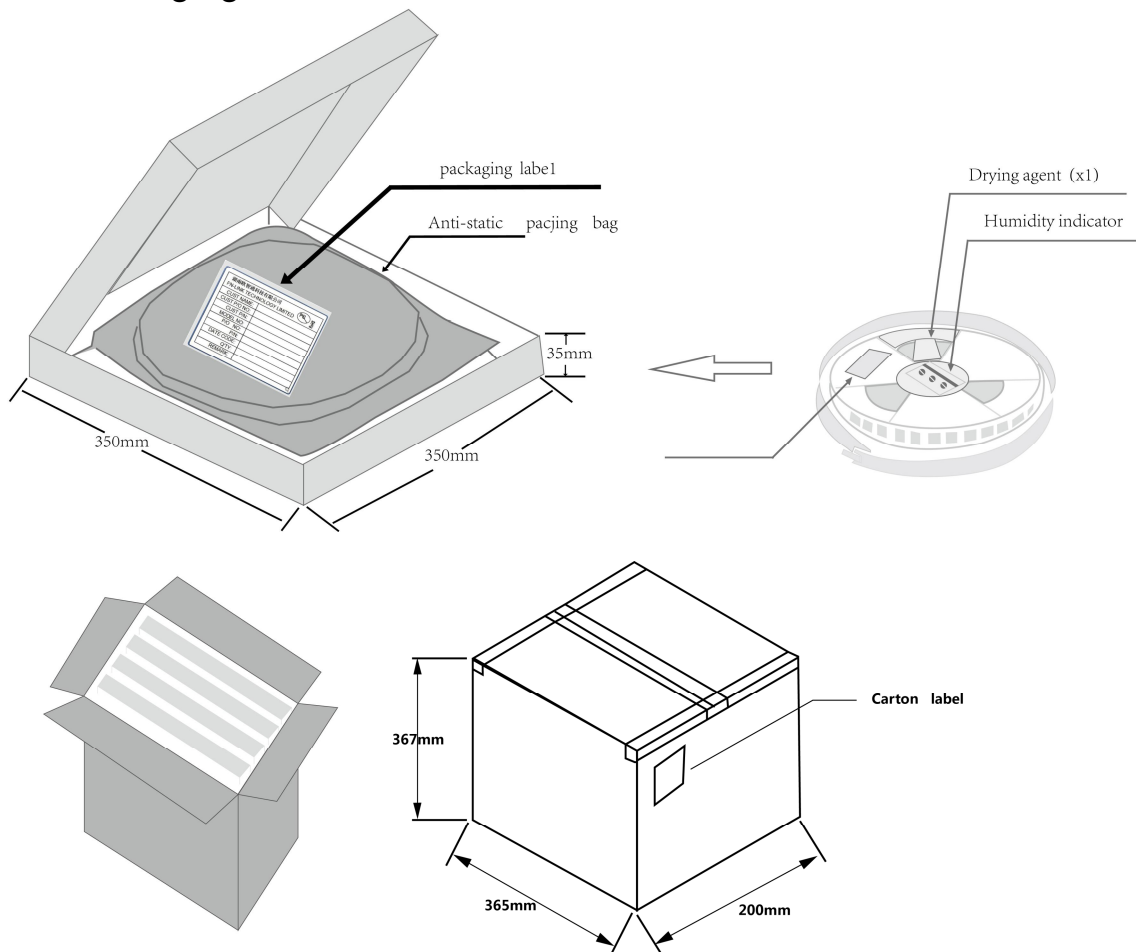


### 11.2 Carrier Tape Detail

| ITEM | W            | A0    | B0    | D            | E    | F     | F1    | K0    | P0   | P2    | P    | T     |
|------|--------------|-------|-------|--------------|------|-------|-------|-------|------|-------|------|-------|
| DIM  | 32           | 12.50 | 16.60 | 1.5          | 1.75 | 14.20 | 28.4  | 2.15  | 4.0  | 2.0   | 20.0 | 0.30  |
| TOLE | +0.3<br>-0.3 | ±0.18 | ±0.18 | +0.1<br>-0.0 | ±0.1 | ±0.15 | ±0.10 | ±0.10 | ±0.1 | ±0.15 | ±0.1 | ±0.05 |



### 11.3 Packaging Detail



### 12. 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:

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

## FCC Statement

FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Integral FPC Antenna , Antenna gain 2dBi

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.

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

Note: 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 Radiation Exposure Statement

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device. This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: 2AATL-6223C-PUD Or Contains FCC ID: 2AATL-6223C-PUD ”

When the module is installed inside another device, the user manual of the host must contain below warning statements;

1. 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;  
(2) This device must accept any interference received, including interference that may cause undesired operation.

Note: 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.

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

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

Any company of the host device which install this modular with modular approval should perform the test of radiated & conducted emission and spurious emission, etc. according to FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement, Only if the test result comply with FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement, then the host can be sold legally.