

## PRODUCT SPECIFICATION

**MODEL NAME:** WCBN3603A-SS

**MODULE PN:** AAZ100075G0

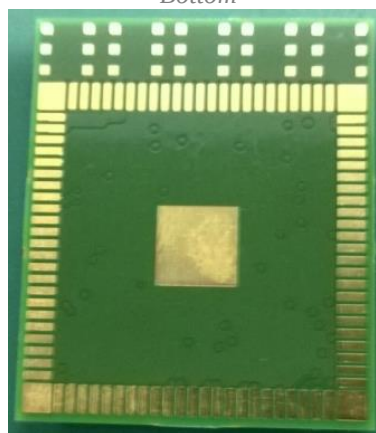
**SEC CODE:** \_\_\_\_\_

Version 1.0

TOP



Bottom



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**1. Change History**

| Revision    | Date       | Author    | Change List |
|-------------|------------|-----------|-------------|
| Version 1.0 | 2014/06/18 | Kaysa Lee | Preliminary |

**2. Location information for Manufacturing Factory**

|            | 1 <sup>st</sup> Case | 2 <sup>nd</sup> Case | 3 <sup>rd</sup> Case |
|------------|----------------------|----------------------|----------------------|
| Fab        | x                    |                      |                      |
| Assembly   | Lite-On CZ           |                      |                      |
| Final Test | Lite-On CZ           |                      |                      |

### 3. General Description

#### BT Feature:

- Bluetooth V4.0 LE, V3.0 HS, Bluetooth V2.1+EDR system, backwards compatible with BT version of 1.1, 1.2 and 2.0
- Support Class II (TX power maximum to +4dBm)
- BT transmission speed including 1M, 2M and 3Mbps EDR operations
- Support for Simple Pairing (SP) and Enhanced Inquiry Response (EIR) function
- Support for SCATTERNET and PICONET
- HCI USB interface to work with Windows upper layer stack

#### WiFi Feature:

- Operate at ISM frequency Band(2.4GHz)
- IEEE Standards Support, 802.11b, 802.11g and 802.11n
- WiFi using mini PCIe interface
- Enterprise level security supporting: WPA, WPA2
- Support 1 transmission and 1 receiving, transmission rate can up to 150Mbps (Physical Rate) in downstream and upstream
- Full feature software utility for easy configuration and management

#### Common Feature:

- Form Factor: M.2 2226
- Support OS: Windows Win7/Win8
- Support for BT & WLAN Co-existence
- RoHS Compliance
- Low Halogen Compliance
- WiFi:

|                     |                                                                                       |
|---------------------|---------------------------------------------------------------------------------------|
| Reg Domain          | Most of World SKU<br>Channel 1-11 with active scan<br>Channel 12~13 with passive scan |
|                     | 0x006A                                                                                |
| Vendor ID           | 0x168C                                                                                |
| Device ID           | 0x0036                                                                                |
| Subsystem ID        | 0x4129                                                                                |
| Subsystem Vendor ID | 0x144D                                                                                |

- BT:

|            |        |
|------------|--------|
| Vendor ID  | 0x0CF3 |
| Product ID | 0x3004 |

#### 4. CTQ (Critical To Quality), Main Control Items

#### 5. Electrical Characteristics

##### Main chipset

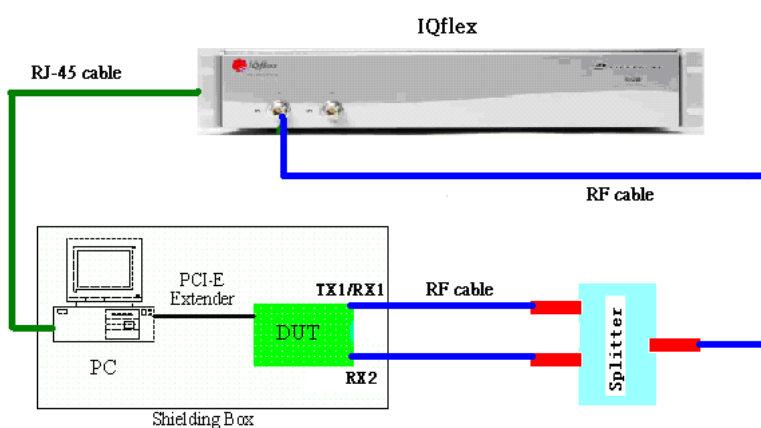
Qualcomm Atheros QCA9565

##### Functional Specifications

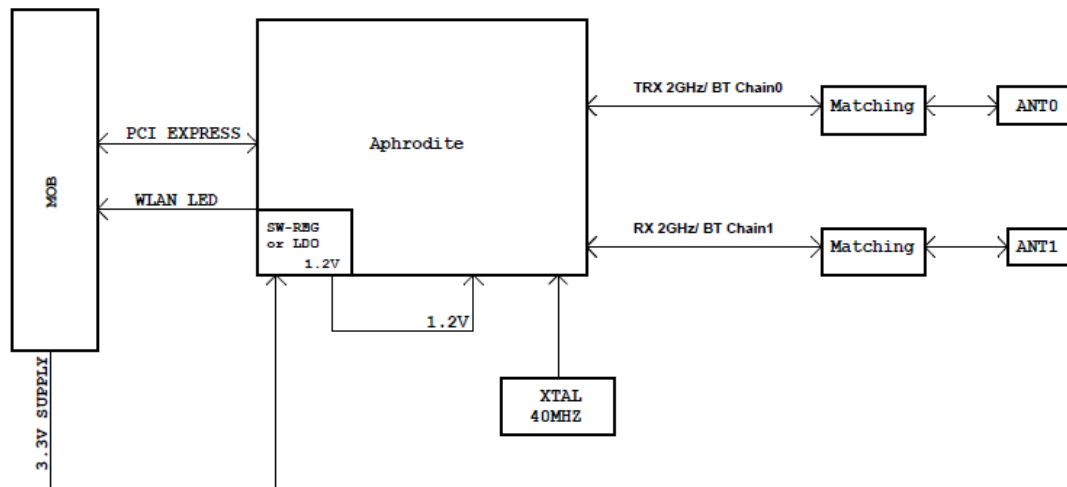
| BT Function                                        |                                                                                                                                                 |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard                                           | Bluetooth V4.0LE, V3.0 HS, V2.1+EDR,                                                                                                            |
| Bus Interface                                      | USB                                                                                                                                             |
| Data Rate                                          | 1 Mbps, 2Mbps and Up to 3Mbps                                                                                                                   |
| Modulation Scheme                                  | GFSK, $\pi/4$ -DQPSK and 8-DPSK                                                                                                                 |
| Frequency Range                                    | 2.402~2.480 GHz                                                                                                                                 |
| Transmit Output Power                              | $-6 \leq \text{Output Power} \leq +4$ ; Class 2 Device                                                                                          |
| Receiver Sensitivity                               | $< 0.1\%$ BER at -70dBm                                                                                                                         |
| Software                                           | Bluetooth Suite                                                                                                                                 |
| WiFi Function                                      |                                                                                                                                                 |
| Standard                                           | IEEE802.11b; IEEE 802.11g; IEEE 802.11n                                                                                                         |
| Bus Interface                                      | PCI Express                                                                                                                                     |
| Data Rate                                          | 802.11b:<br>11, 5.5, 2, 1 Mbps<br>802.11g:<br>54, 48, 36, 24, 18, 12, 9, 6 Mbps<br>802.11n:<br>MCS 0 to 7 for HT20MHz<br>MCS 0 to 7 for HT40MHz |
| Media Access Control                               | CSMA/CA with ACK                                                                                                                                |
| Modulation Techniques:                             | <b>802.11b:</b><br>CCK, DQPSK, DBPSK<br><b>802.11g, 11a:</b><br>64QAM, 16QAM, QPSK, BPSK<br><b>802.11n:</b><br>BPSK, QPSK, 16QAM, 64QAM         |
| Network Architecture                               | Ad-hoc mode (Peer-to-Peer )<br>Infrastructure mode                                                                                              |
| Operation Channel                                  | <b>2.4GHz</b><br>11: (Ch. 1-11) – United States<br>13: (Ch. 1-13) – Europe<br>14: (Ch. 1-14) – Japan                                            |
| Frequency Range                                    | <b>802.11bg</b><br>2.412 ~ 2.4835 GHz                                                                                                           |
| Transmit Output Power – 2x2<br>(Tolerance: +-2dBm) | <b>802.11b / CCK :</b><br>17 dBm@6,9,12,18,24Mbps<br><b>802.11g / OFDM:</b><br>18 dBm@6,9,12,18,24Mbps<br>17 dBm@36Mbps                         |

|                                      |                                                                                                                                                                                                                                                                                   |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | 16 dBm@48Mbps<br>14 dBm@54Mbps<br><b>802.11n / HT20:</b><br>17 dBm@MCS0,1,2,3,4<br>16 dBm@MCS5<br>15 dBm@MCS6<br>13 dBm@MCS7<br><b>802.11n / HT40:</b><br>16 dBm@MCS0,1,2,3,4<br>16 dBm@MCS5<br>15 dBm@MCS6<br>13 dBm@MCS7                                                        |
| <b>Receive Sensitivity</b>           | <b>802.11b:</b><br>Less than -76dBm<br><b>802.11g / 11a:</b><br>Less than -82dBm @ 6Mbps<br>Less than -65dBm @54Mbps<br><b>802.11n:</b><br><b>HT20</b><br>Less than -82dBm @ MCS0<br>Less than -64dBm @ MCS7<br><b>HT40</b><br>Less than -79dBm @ MCS0<br>Less than -61dBm @ MCS7 |
| <b>Security</b>                      | WPA, WPA2, WPS, IEEE 802.1X, IEEE 802.11i                                                                                                                                                                                                                                         |
| <b>Common Function</b>               |                                                                                                                                                                                                                                                                                   |
| <b>Operating Voltage</b>             | 3.3 V ± 10% I/O supply voltage                                                                                                                                                                                                                                                    |
| <b>Antenna Type</b>                  | Dual MHF4 RF connector                                                                                                                                                                                                                                                            |
| <b>Operating/Storage Temperature</b> | <b>Operating</b><br>Operating Temperature: 0 to 75 °C<br>Relative Humidity: 5-90% (non-condensing)<br><b>Storage</b><br>Temperature: -40 to 85 °C<br>Relevant Humidity: 5-95% (non-condensing)                                                                                    |

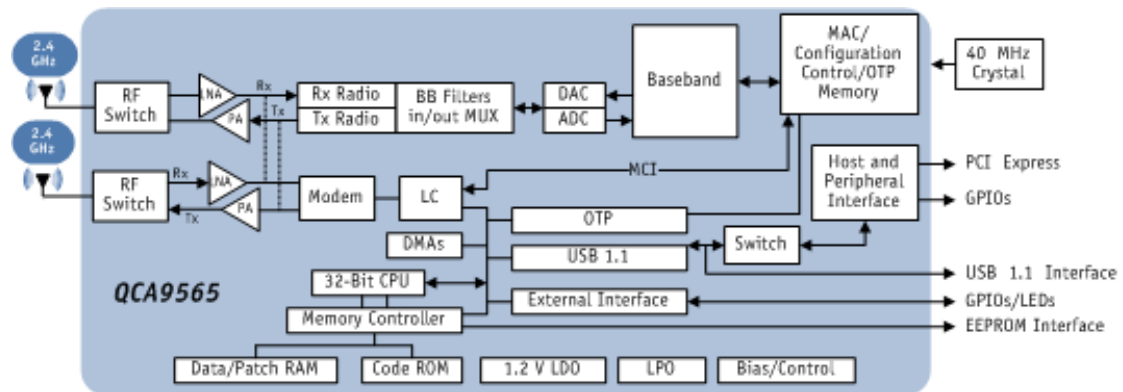
## 6. Test Setup



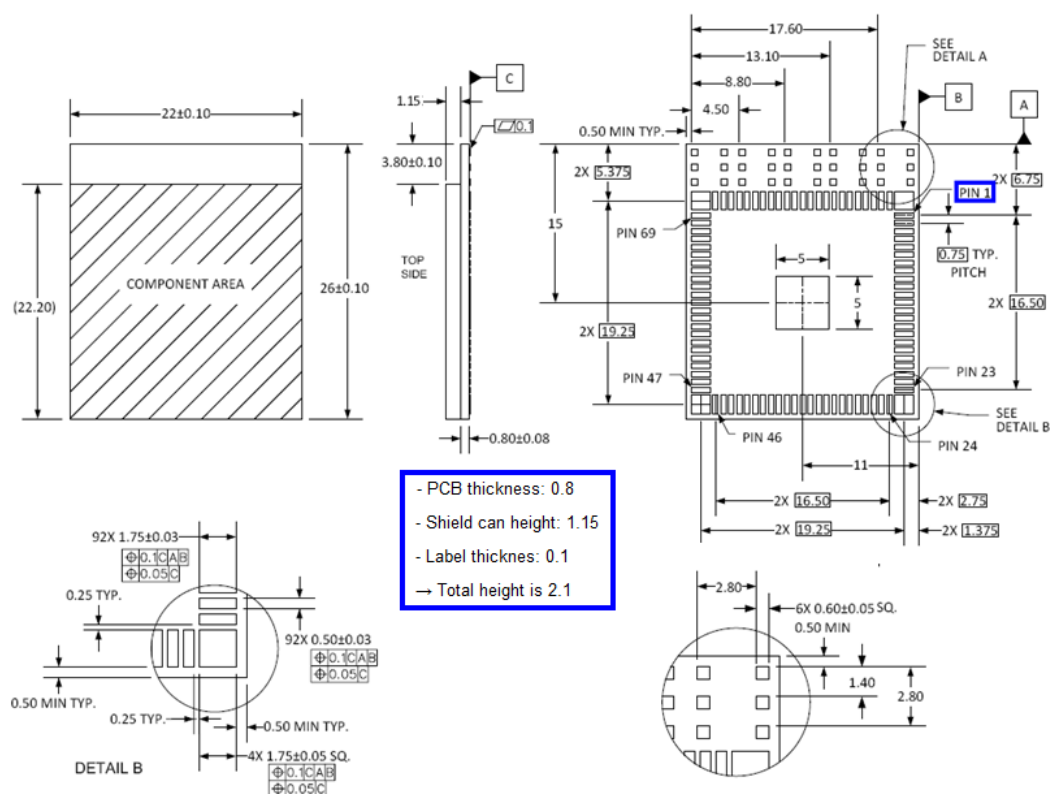
## 7. Internal Block Diagram



## 8. Basic Theory



## 9. Pin Definition



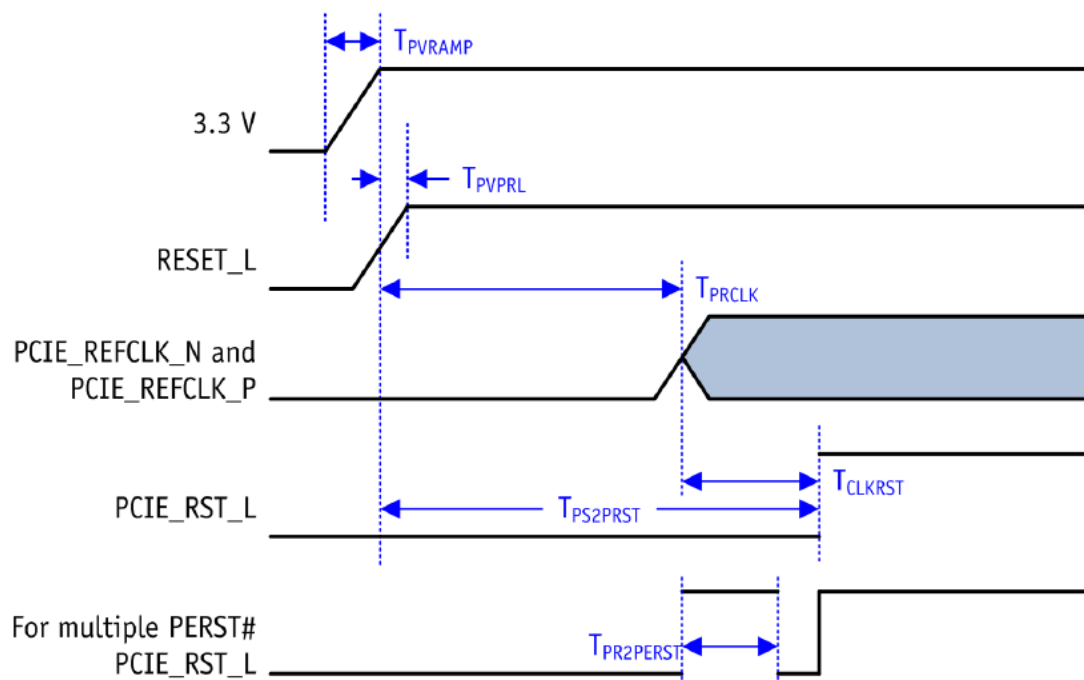
|                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                     |  |  |  |
|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---------------------|--|--|--|
| <div>GND (G1)</div>           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | <div>GND (G4)</div> |  |  |  |
| <div>Top View</div>           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                     |  |  |  |
| <div>Module Side Pinout</div> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                     |  |  |  |
| <div>GND (G2)</div>           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | <div>GND (G3)</div> |  |  |  |

Top View

Module Side Pinout

## 10. Application Note

Power up sequencing:



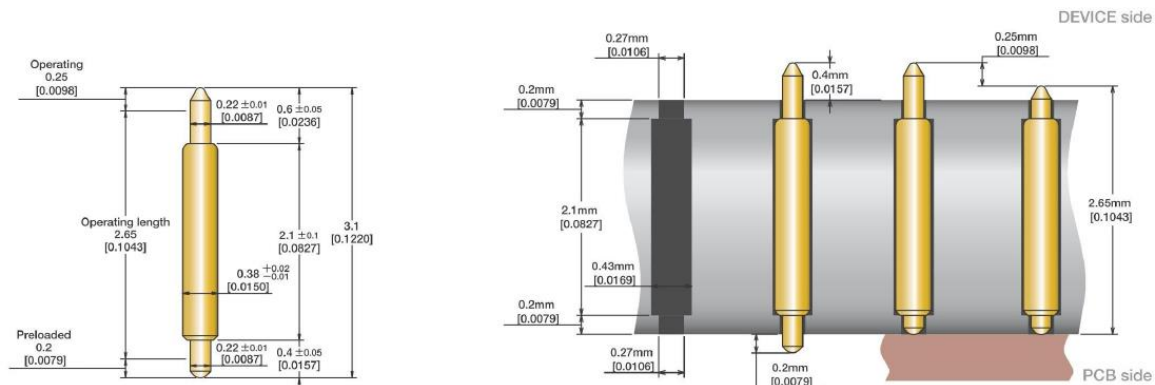
| Signal Name    | Description                                                    | Min                      | Max  |
|----------------|----------------------------------------------------------------|--------------------------|------|
| $T_{PVRAMP}$   | Power Supply Ramp on 3.3 V                                     | —                        | 1 ms |
| $T_{PVPRL}$    | Power Valid to RST_L Asserted                                  | 0 $\mu$ s <sup>1</sup>   | —    |
| $T_{PRCLK}$    | RST_L De-asserted to PCIE_REFCLK_N and PCIE_REFCLK_P Stable    | 100 $\mu$ s              | —    |
| $T_{CLKRST}$   | PCIE_REFCLK_N and PCIE_REFCLK_P Stable to PCIE_RST_L De-assert | 100 $\mu$ s <sup>2</sup> | —    |
| $T_{PS2PRST}$  | Power Supply Stable to PCIE_RST_L De-assert                    | 10 ms                    | —    |
| $T_{PR2PERST}$ | Interval for Multiple PCIE_RST_L                               | 40 ms                    | —    |

## 11. Specification of Measurement JIG

Model / PART NUMBER :

# KGW-050-001RA

Pin outline in millimeter [inch]

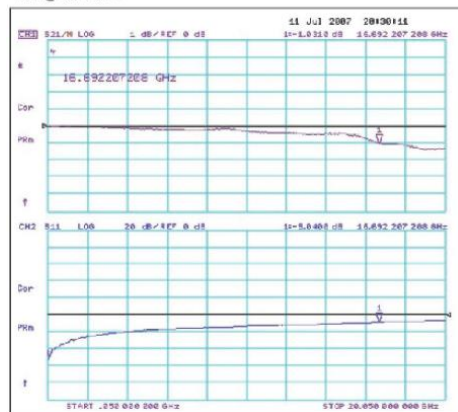


### SPECIFICATIONS (Approximate Average Values)

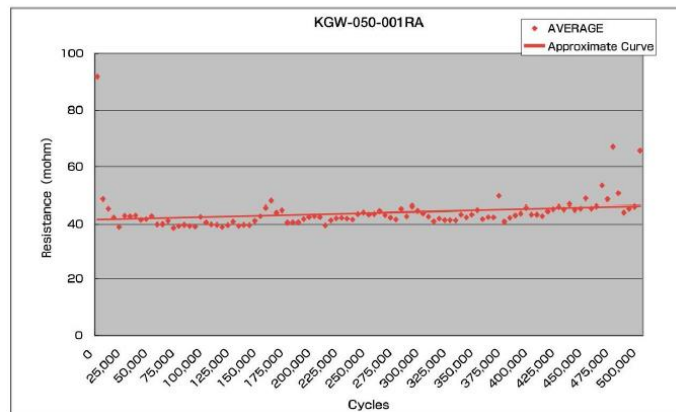
|                           |                                    |                                         |
|---------------------------|------------------------------------|-----------------------------------------|
| Mechanical Specifications | Spring force at working travel     | 18gf (0.63oz.)@0.45mm(0.018inch) Travel |
|                           | Operating Temperature:             | -40 to 120 °C                           |
|                           | Life Span at Operating Temperature | 500K Cycles                             |
| Electrical Specifications | Current Rating (Continuous)        | 1.4A                                    |
|                           | Self Inductance                    | 0.82nH                                  |
|                           | Bandwidth @-1dB                    | 16.7GHz                                 |
|                           | DC resistance                      | 100mohm@0.45mm(0.018inch) Travel        |
| Material and Finishes     | Top Plunger                        | Hardened BeCu/Au alloy plated           |
|                           | Bottom Plunger                     | Hardened BeCu/Au plated                 |
|                           | Barrel                             | Au Clad                                 |
|                           | Spring                             | Music Wire/Au plated                    |

### Insertion loss data

-1dB@16.7GHz

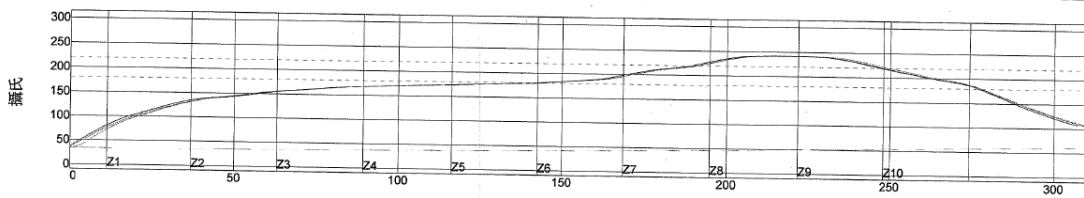


### Life test data



## 12. Reflow Profile

| 溫度設置 (攝氏)            |     |     |     |     |     |     |     |     |     |     |
|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 溫區                   | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
| 上溫區                  | 150 | 160 | 170 | 175 | 175 | 180 | 200 | 230 | 255 | 245 |
| 下溫區                  | 150 | 160 | 170 | 175 | 175 | 180 | 200 | 230 | 255 | 245 |
| 傳送帶速度 (mm/min): 1000 |     |     |     |     |     |     |     |     |     |     |

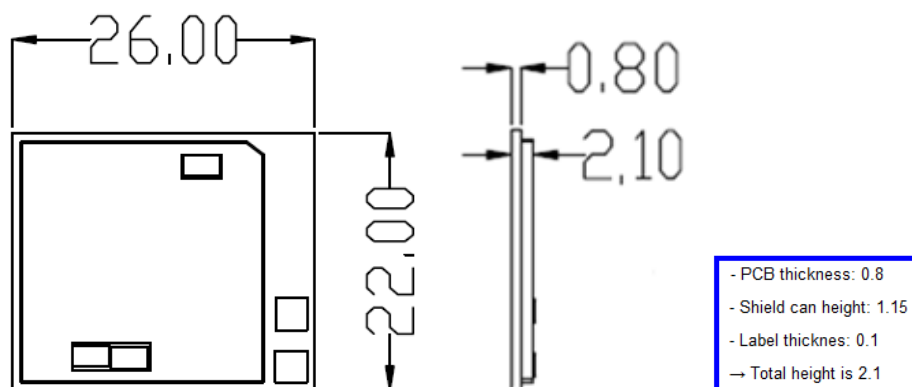


| PW= 90% | 最高下降斜率 |     | 恆溫時間 150至180C |     | 回流時間 / 220C |     | 最高溫度   |     | 斜率1 (40-150C) |     | 斜率2 (220-250C) |    |
|---------|--------|-----|---------------|-----|-------------|-----|--------|-----|---------------|-----|----------------|----|
| B1-Y301 | -1.99  | 50% | 85.31         | 27% | 58.33       | 89% | 242.18 | 22% | 2.32          | 76% | 1.27           | 1% |
| B2-Y301 | -2.03  | 49% | 86.92         | 35% | 57.43       | 83% | 242.28 | 23% | 2.34          | 79% | 1.33           | 6% |
| B3-Y301 | -2.14  | 43% | 86.00         | 30% | 58.56       | 90% | 242.84 | 28% | 2.32          | 76% | 1.32           | 5% |
| B4-Y301 | -2.07  | 46% | 86.83         | 34% | 57.75       | 85% | 242.12 | 21% | 2.34          | 79% | 1.29           | 3% |
| B5-Y301 | -2.01  | 50% | 86.12         | 31% | 56.90       | 79% | 241.98 | 20% | 2.36          | 81% | 1.28           | 3% |
| 落差      | 0.15   |     | 1.61          |     | 1.66        |     | 0.86   |     | 0.04          |     | 0.06           |    |

## 13. Initial Test Report

## 14. Reliability Test Report

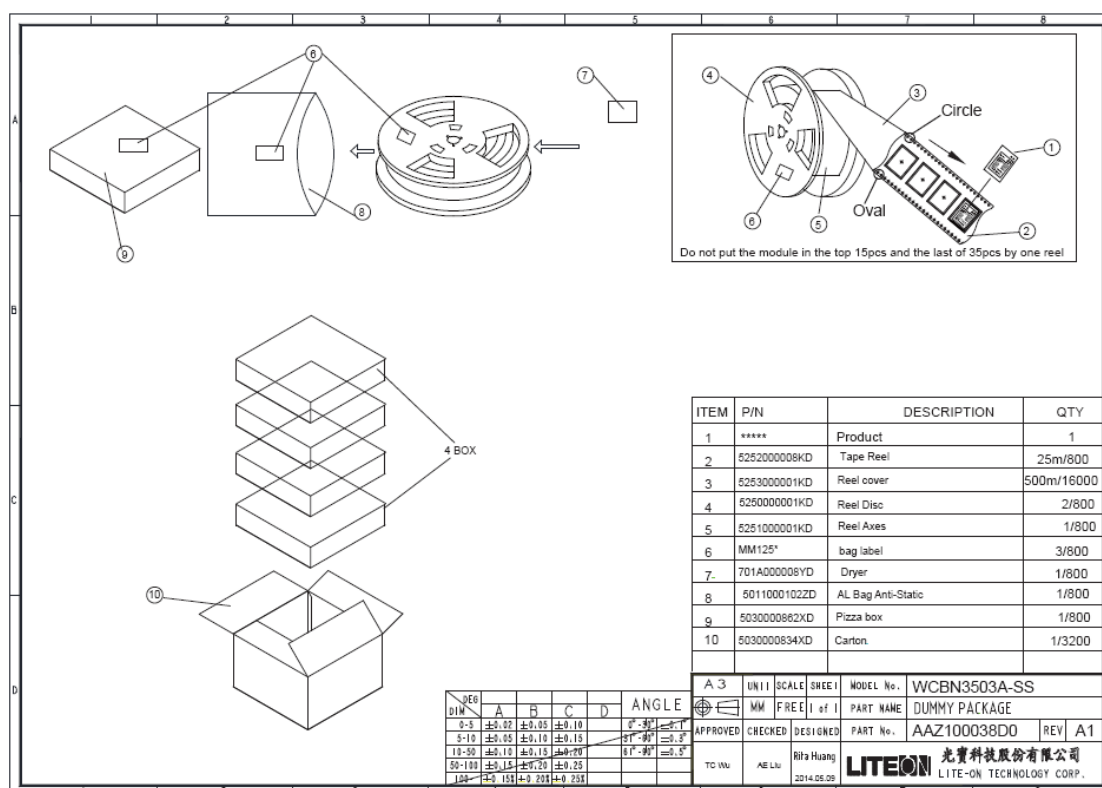
## 15. Mechanical Characteristics

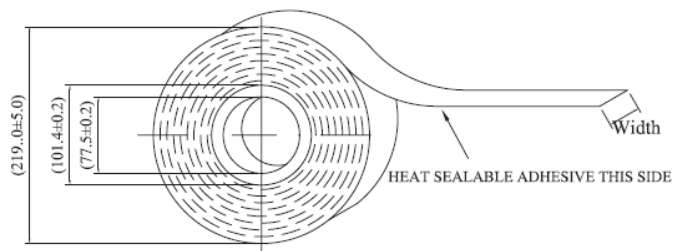


Tolerance: +/- 0.1mm

## 16. Structure and Material

## 17. Packaging Reel & Tape





**Note:**

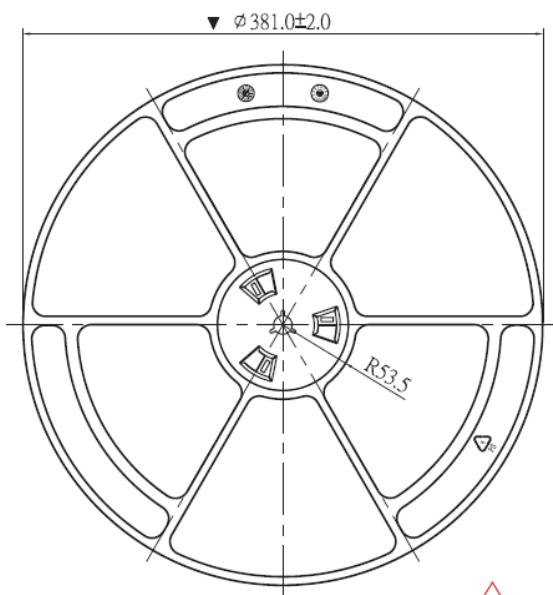
- 1.Material:Antistatic Polyester
- 2.Color:Transparent, Colorless
- 3.Surface resistivity is  $1 \times 10^9 \sim 1 \times 10^{11} \Omega$
- 4.Surface friction voltage is less than 100 V
- 5.Size:W=37.5mm

| Width<br>(mm) | Length<br>(M)Min | Carrier width<br>(mm) | Thickness<br>( $\mu\text{m}$ ) |
|---------------|------------------|-----------------------|--------------------------------|
| 37.5±0.1      | 480              | 44.0                  | 62±5                           |



| A4       | UNIT    | SCALE    | SHEET | MODEL No.                | PART NAME  | PART No.     | REV | A1 |
|----------|---------|----------|-------|--------------------------|------------|--------------|-----|----|
|          | MM      | NON      | 1(1)  |                          | Reel Cover | 5253000001KD |     |    |
| APPROVED | CHECKED | DESIGNED |       | Rita Huang<br>2012.11.23 |            |              |     |    |

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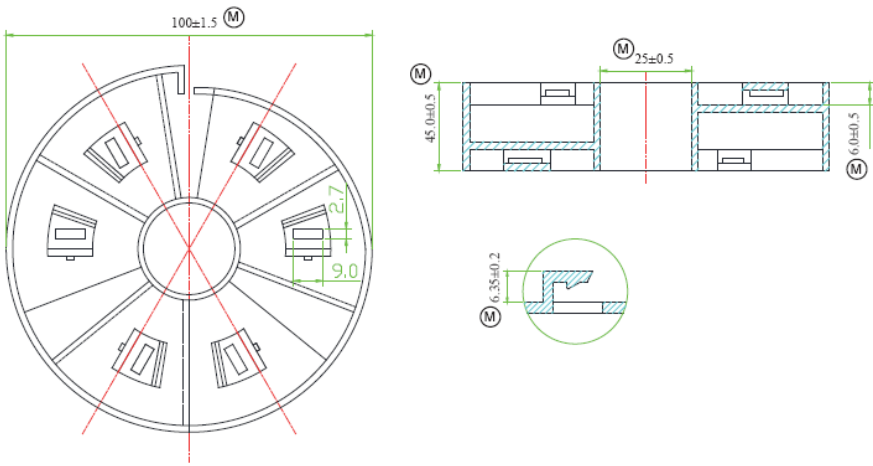
**Note:**

- 1.Material:HIPS
- 2.Color:Blue
- 3.Surface resistivity is  $1 \times 10^7 \sim 1 \times 10^{11} \Omega$
- 4.Surface friction voltage is less than 100 V
- 5.Size:15 inch



| A4       | UNIT    | SCALE    | SHEET | MODEL No.                | PART NAME | PART No.     | REV | A1 |
|----------|---------|----------|-------|--------------------------|-----------|--------------|-----|----|
|          | MM      | NON      | 1(1)  |                          | Reel Disc | 5250000001KD |     |    |
| APPROVED | CHECKED | DESIGNED |       | Rita Huang<br>2012.11.23 |           |              |     |    |

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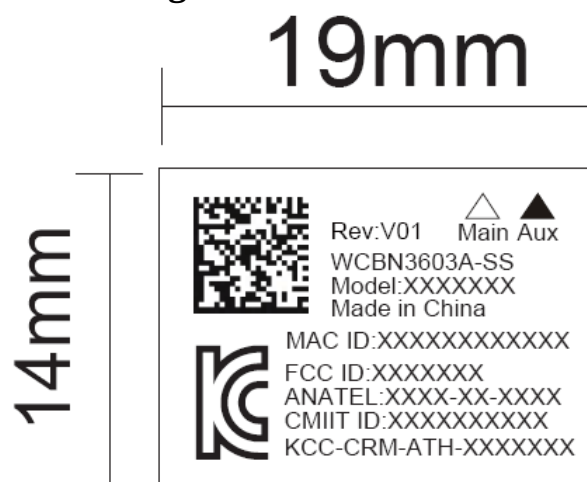
Note:  
1. Material: HIPS  
2. Color: Blue  
3. Marked (M) is the critical dimension

! 不得含有  
WI-CQES-002  
要求禁用之有機、有害物質

| LIMITS UNLESS OTHERWISE NOTED |                     |
|-------------------------------|---------------------|
| X <sub>1</sub> ±              | X <sub>2</sub> ±    |
| .X ±                          | .X <sup>°</sup> ±   |
| .XX ±                         | .XX <sup>°</sup> ±  |
| .XXX ±                        | .XXX <sup>°</sup> ± |

|          |         |                          |                                                      |              |           |    |  |
|----------|---------|--------------------------|------------------------------------------------------|--------------|-----------|----|--|
| A4       | UNIT    | SCALE                    | SHEET                                                | MODEL No.    |           |    |  |
|          | MM      | NON                      | 1(1)                                                 | PART NAME    | Reel Axes |    |  |
| APPROVED | CHECKED | DESIGNED                 | PART No.                                             | 5251000001KD | REV       | A1 |  |
|          |         | Rita Huang<br>2012.11.23 | <b>LITEON</b> 光寶科技股份有限公司<br>LITE-ON TECHNOLOGY CORP. |              |           |    |  |

## 18. Marking

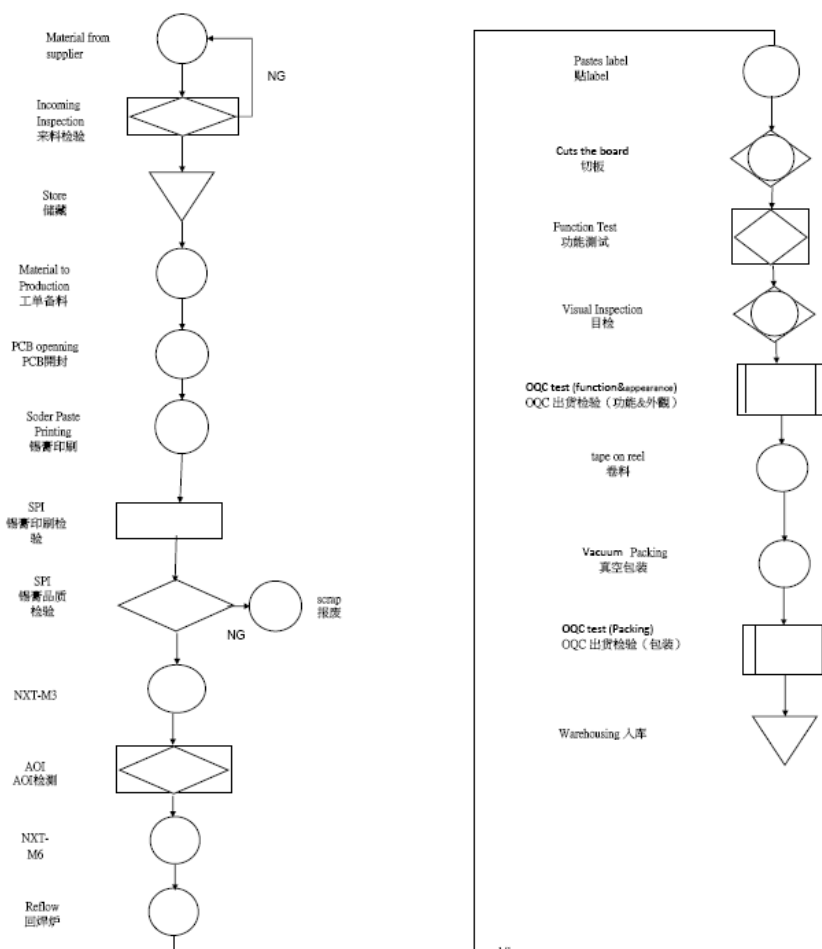


1.2維條碼為(ECC 200)

條碼顯示內容為:XXXXXXXXXXXX(業務提供)

2:BD=MAC+1

## 19. Control Chart



1/1

**20. Lead Free**

This product is a module not IC which has no outside terminal, the contact with customer platform is through the bottom pad. We don't do whisker test for module.

**21. RoHS Qualification Report**

**22. Sample History**

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**23. BOM List**

**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.

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**IMPORTANT NOTE:****Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to theUS/CANADA

**Antenna General Information**

| Model | Used for  | Ant. Type | Connector | Gain (dBi)    |
|-------|-----------|-----------|-----------|---------------|
| Main  | Wi-Fi     | PIFA      | U.FL      | 3 @ 2.4GHz    |
| Aux   | Bluetooth | PIFA      | U.FL      | 3.62 @ 2.4GHz |

Note: An extended coax cable was supplied for this antenna with below info.:

- ✧ Cable loss: 1dB
- ✧ Connector type: U.FL

**This device is intended only for OEM integrators under the following conditions:**

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna,
- 3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

**IMPORTANT NOTE**

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

**End Product Labeling**

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID:PPQ-SS335".

**Manual Information to the End User**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrate this module.

The end user manual shall include all required regulatory information/warning as show in this manual.