

## Application:

WLAN, 802.11b/g, Bluetooth, WLAN, etc...

## Features

SMD, high reliability, ultra Impact, Omni-directional

## Part number Information

**RANT**   **2012**   **F**   **245**   **X**   **5**  
 (A)   (B)   (C)   (D)   (E)   (F)



|                  |                       |
|------------------|-----------------------|
| (A) Product Type | Chip Antenna          |
| (B) Size Code    | 2.0x1.2mm(+/-0.2mm)   |
| (C) Material     | High K material       |
| (D) Frequency    | 2.4 ~ 2.5GHz          |
| (E) Feeding mode | PIFA & Single Feeding |
| (F) Antenna type | Type=5                |

## Electrical Specification

|                               |                    |
|-------------------------------|--------------------|
| Working Frequency Range       | 2400 ~2484 MHz     |
| Bandwidth                     | 84 (Min.)          |
| Peak Gain                     | 1.7 dBi (Typ.)     |
| Impedance                     | 50 Ohm             |
| Return loss                   | 10 dB ( Min)       |
| Polarization                  | Linear             |
| Azimuth Beamwidth             | Omni-directional   |
| Operation Temperature(°C)     | -40 ~85°C          |
| Resistance to Soldering Heats | 10sec. ( @ 280°C)  |
| Termination                   | Ni / Au (Leadless) |

The specification is defined on EVB.

## Dimension and Terminal Configuration



| Dimension (mm) |             |
|----------------|-------------|
| L              | 2.05+/-0.15 |
| W              | 1.20+/-0.15 |
| T              | 0.65+/-0.10 |

| No. | Terminal Name |
|-----|---------------|
| 1   | Feeding/GNG   |
| 2   | GND           |

**2.4GHz 2012 Chip Antenna: RANT2012F245X5**

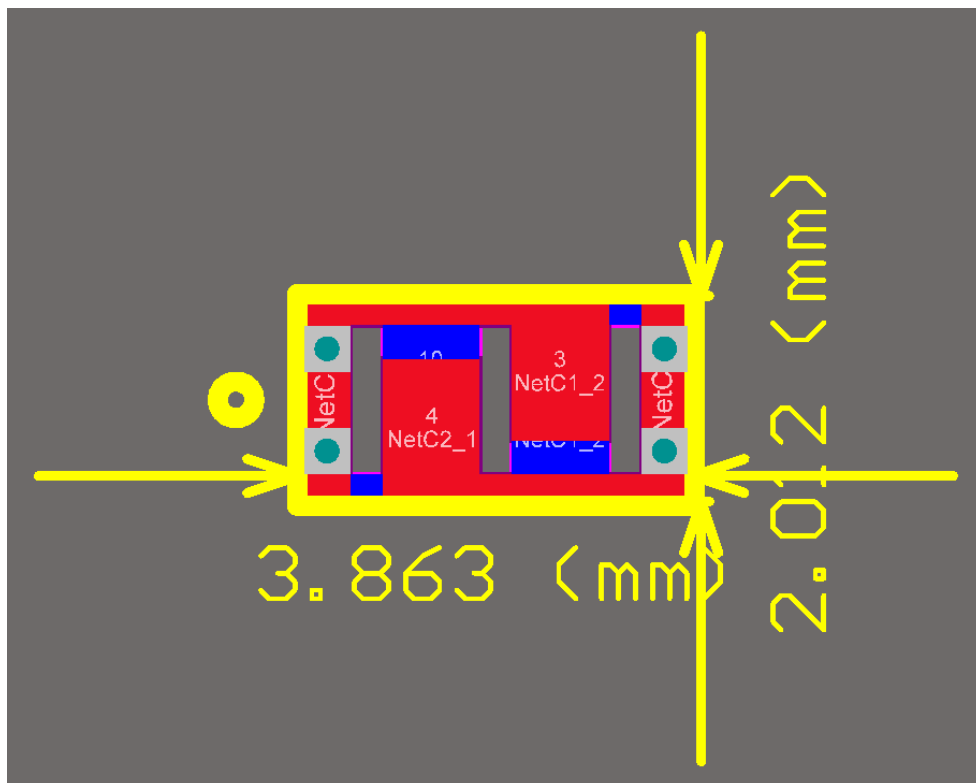


Manufacturer : RAIN International Technology Co., Ltd.



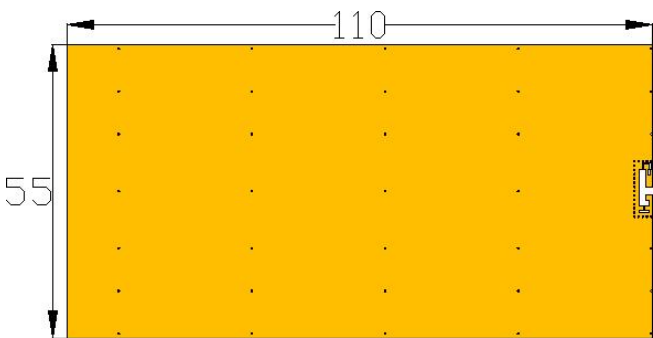
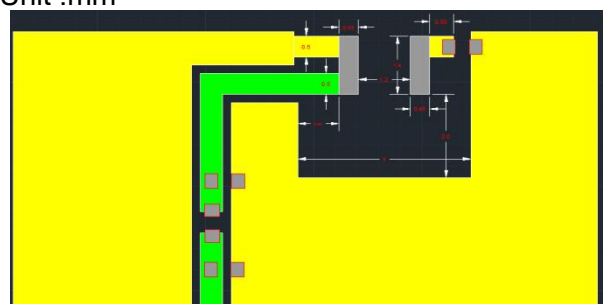
Address: Building 709, Yuxing Science and Technology Industrial Park, Science and Technology Industrial Park, Third Industrial Zone, Nanchang, Nanchang Community , Xixiang Street, Bao'an District, Shenzhen, China

## Onboard antenna



2.4GHz 2012 Chip Antenna: RANT2012F245X5

## Evaluation Board Reference

| PCB Dimension                                                                     | Antenna Layout Reference                                                                           |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
|  | <p>Unit :mm</p>  |

## Electrical Characteristics

Return Loss & Radiation

Return Loss

Ch1 Start 2 GHz Pwr 0 dBm Stop 3 GHz

| Frequency(MHz) | S11 (dB) |
|----------------|----------|
| 2400           | -10.77   |
| 2450           | -24.81   |
| 2484           | -10.243  |

Radiation

— Hori — Ver — Total

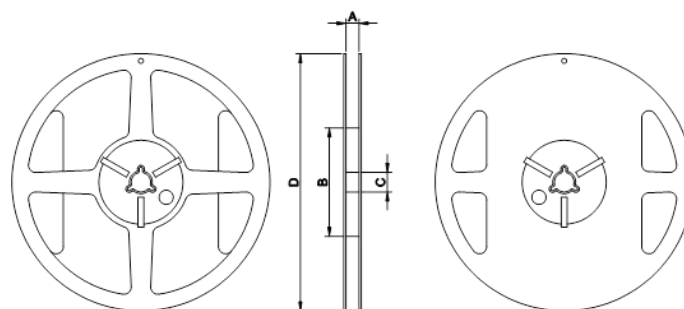
|            | 2400MHz | 2450MHz | 2500MHz |
|------------|---------|---------|---------|
| Efficiency | 70.56%  | 75.25%  | 71.01%  |

## 2.4GHz 2012 Chip Antenna: RANT2012F245X5

## Taping Specifications

### Reel and Taping Specification

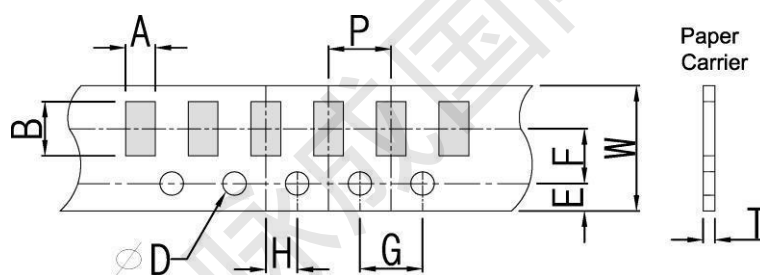
#### Reel Specification



7" x 8 mm

| TYPE | SIZE |         | A       | B    | C        | D     |
|------|------|---------|---------|------|----------|-------|
| 2012 | 7"   | 5K/Reel | 9.0±0.5 | 60±2 | 13.5±0.5 | 178±2 |

#### Tapping Specification



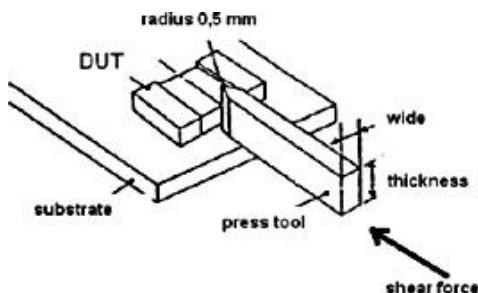
| Packaging  | Type | A         | B         | W        | E         | F        | G        | H        | T         | D         | P       |
|------------|------|-----------|-----------|----------|-----------|----------|----------|----------|-----------|-----------|---------|
| Paper Type | 2012 | 1.50±0.20 | 2.30±0.20 | 8.0±0.20 | 1.75±0.10 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.75±0.10 | 1.57±0.10 | 4.0±0.1 |

**2.4GHz 2012 Chip Antenna: RANT2012F245X5**

## Reliability Table

| Test Item                                  | Procedure                                                                                                                                                                                                                                                                                                                                                 | Requirements<br>Ceramic Type                                          | Remark<br>(Reference)     |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------|
| <b>Electrical Characterization</b>         |                                                                                                                                                                                                                                                                                                                                                           | Fulfill the electrical specification                                  | User Spec.                |
| <b>Thermal Shock</b>                       | 1. Preconditioning:<br>$50 \pm 10^{\circ}\text{C}$ / 1 hr , then keep for $24 \pm 1$ hrs at room temp.<br>2. Initial measure: Spec: refer Initial spec.<br>3. Rapid change of temperature test:<br>$-30^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ ; 100 cycles;<br>15 minutes at Lower category temperature;<br>15 minutes at Upper category temperature. | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>107        |
| <b>Temperature Cycling</b>                 | 1. Initial measure: Spec: refer Initial spec.<br>2. 100 Cycles ( $-30^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ ), Soak Mode=1 (2 Cycle/hours).<br>3. Measurement at $24 \pm 2$ Hours after test condition.                                                                                                                                               | No Visible Damage.<br>Fulfill the electrical specification.           | JESD22<br>JA104           |
| <b>High Temperature Exposure</b>           | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered; 500hours @ $T=+85^{\circ}\text{C}$ .<br>3. Measurement at $24 \pm 2$ hours after test.                                                                                                                                                                                                     | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>108        |
| <b>Low Temperature Storage</b>             | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered: 500hours @ $T=-30^{\circ}\text{C}$ .<br>3. Measurement at $24 \pm 2$ hours after test.                                                                                                                                                                                                     | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>108        |
| <b>Solderability<br/>(SMD Bottom Side)</b> | Dipping method:<br>a. Temperature: $235 \pm 5^{\circ}\text{C}$<br>b. Dipping time: $3 \pm 0.5\text{s}$                                                                                                                                                                                                                                                    | The solder should cover over 95% of the critical area of bottom side. | IEC 60384-21/22<br>4.10   |
| <b>Soldering Heat Resistance<br/>(RSH)</b> | Preheating temperature: $150 \pm 10^{\circ}\text{C}$ .<br>Preheating time: 1~2 min.<br>Solder temperature: $260 \pm 5^{\circ}\text{C}$ .<br>Dipping time: $5 \pm 0.5\text{s}$                                                                                                                                                                             | No Visible Damage.                                                    | IEC 60384-21/22<br>4.10   |
| <b>Vibration</b>                           | 5g's for 20 min., 12 cycles each of 3 orientations<br>Note: Use 8"X5" PCB .031" thick 7 secure points on, one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.                                                                                                            | No Visible Damage.                                                    | MIL-STD-202<br>Method 204 |
| <b>Mechanical Shock</b>                    | Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks)<br>Peak value: 1,500g's<br>Duration: 0.5ms<br>Velocity change: 15.4 ft/s<br>Waveform: Half-sine                                                                                                                              | No Visible Damage.                                                    | MIL-STD-202<br>Method 213 |
| <b>Humidity Bias</b>                       | 1. Humidity: 85% R.H., Temperature: $85 \pm 2^{\circ}\text{C}$ .<br>2. Time: $500 \pm 24$ hours.<br>3. Measurement at $24 \pm 2$ hrs after testcondition.                                                                                                                                                                                                 | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>Method 106 |

## 2.4GHz 2012 Chip Antenna: RANT2012F245X5

|                           |                                                                                                                                                                                        |                                                                                                                                                                          |              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Board Flex (SMD)</b>   | 1. Mounting method:<br>IR-Reflow. PCB Size (L:100 × W:40 × T:1.6mm)<br>2. Apply the load in direction of the arrow until bending reaches 2 mm.                                         | No Visible Damage.                                                                                                                                                       | AEC-Q200 005 |
| <b>Adhesion</b>           | Force of 1.8Kg for 60 seconds.<br>                                                                    | No Visible Damage<br>Magnification of 20X or greater may be employed for inspection of the mechanical integrity of the device body terminals and body/terminal junction. | AEC-Q200 006 |
| <b>Physical Dimension</b> | Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions. | In accordance with specification.                                                                                                                                        | JESD22 JB100 |

### Revision History

| Revision | Date       | Content       |
|----------|------------|---------------|
| 1        | 2020/10/15 | New Datasheet |