

## 2.4GHz 1608 Chip Antenna: RANT0603F245S5

### Application:

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

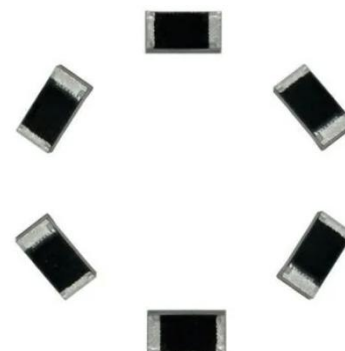
### Features

SMD, high reliability, ultra Impact, Omni-directional...

### Part number Information

RANT   0603   F   245   S   5  
(A)   (B)   (C)   (D)   (E)   (F)

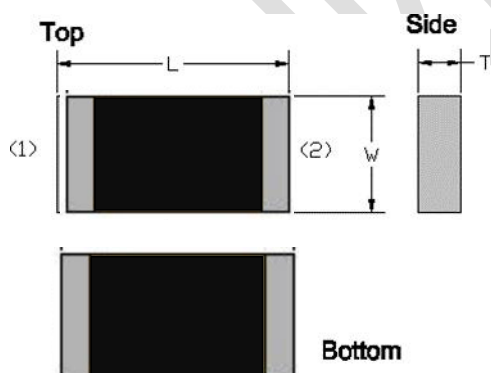
|                  |                       |
|------------------|-----------------------|
| (A)Product Type  | Chip Antenna          |
| (B) Size Code    | 1.6x0.8mm(±0.1mm)     |
| (C) Material     | High K material       |
| (D) Frequency    | 2.4 ~ 2.5GHz          |
| (E) Feeding mode | PIFA & Single Feeding |
| (F) Antenna type | Type=5                |



### Electrical Specification

|                               |                    |
|-------------------------------|--------------------|
| Working Frequency Range       | 2400 ~2500 MHz     |
| Bandwidth                     | 120 MHz (Min.)     |
| Peak Gain                     | 2.7 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) |

### Dimension and Terminal Configuration



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

| Dimension (mm) |             |
|----------------|-------------|
| L              | 1.60 ± 0.10 |
| W              | 0.80 ± 0.10 |
| T              | 0.45 ± 0.10 |

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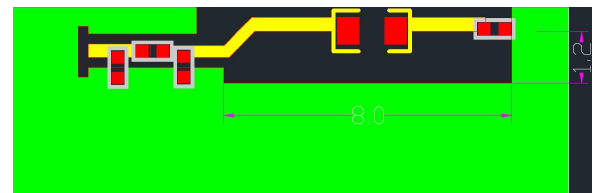
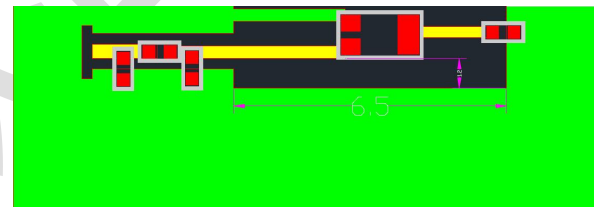
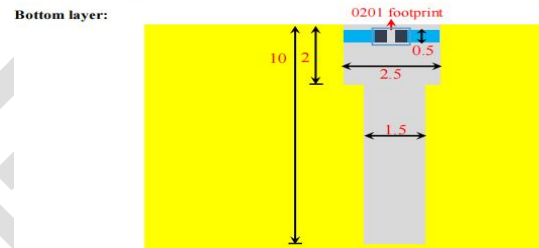
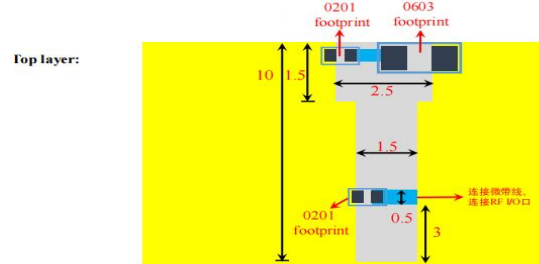
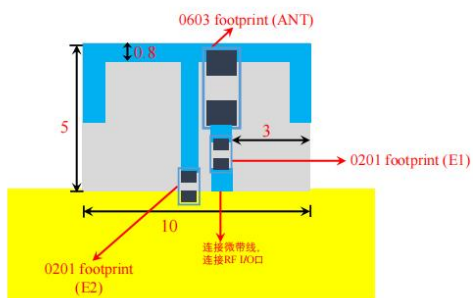
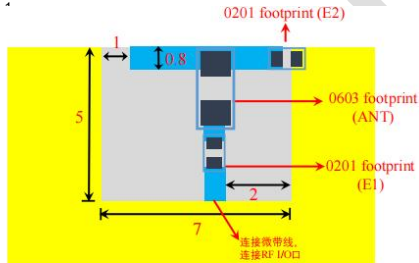
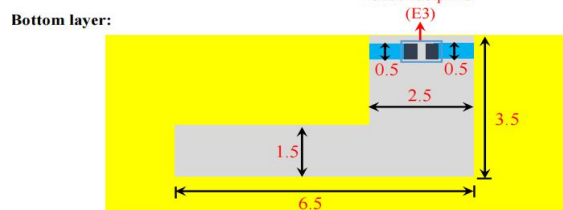
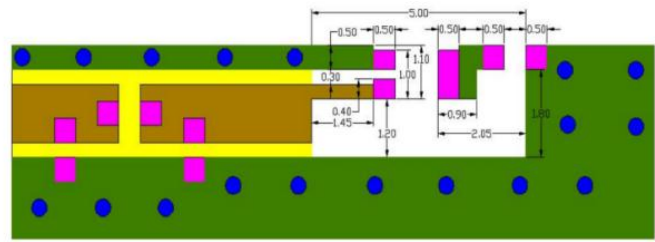
RAIN International Technology Co., Ltd.

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Add: Building F, 709, Yuxing Technology Industrial Park, Nanchang Third Industrial Zone, Xiangxiang Sub-district, Bao'an District, Shenzhen

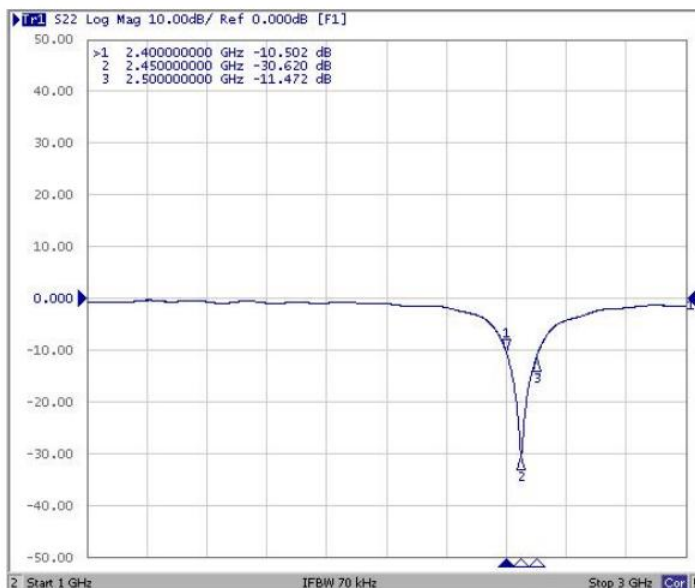
**PCB Dimension Unit :mm**



## Electrical Characteristics

### Return Loss & Radiation

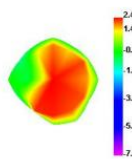
#### Return Loss



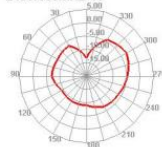
| Frequency(MHz) | S11 (dB) |
|----------------|----------|
| 2400           | -10.50   |
| 2450           | -30.62   |
| 2500           | -11.47   |

#### Radiation

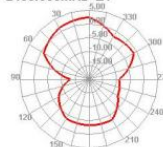
2400.000MHz



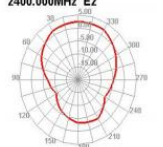
2400.000MHz H



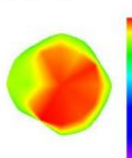
2400.000MHz E1



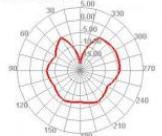
2400.000MHz E2



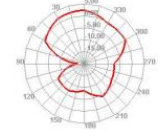
2450.000MHz



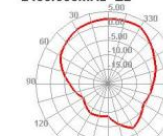
2450.000MHz H



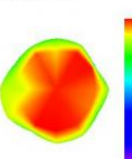
2450.000MHz E1



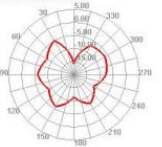
2450.000MHz E2



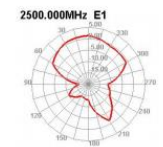
2500.000MHz



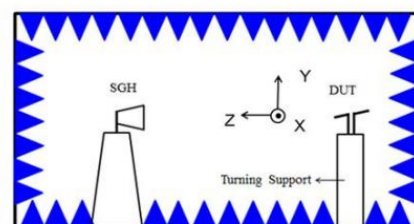
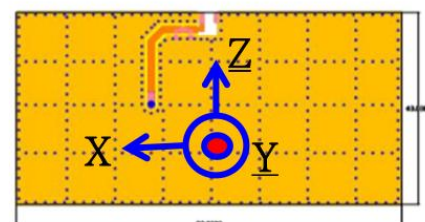
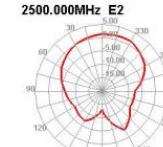
2500.000MHz H



2500.000MHz E1



2500.000MHz E2



|                |       |       |       |
|----------------|-------|-------|-------|
| Frequency(MHz) | 2400  | 2450  | 2500  |
| Efficiency(dB) | -0.91 | -0.61 | -1.01 |
| Efficiency(%)  | 62    | 65    | 60    |
| Gain(dBi)      | 2.4   | 2.7   | 1.5   |

Taping Specifications

Reel and Taping Specification

Reel Specification

The diagram illustrates the dimensions of a 7-inch reel. It includes a front view showing a circular reel with a central hub and four spokes. The side view shows the reel's profile with dimensions A (total width), B (inner diameter), C (hub diameter), and D (total diameter). A label '7" x 8 mm' is positioned below the side view.

| TYPE | SIZE |         | A       | B     | C        | D     |
|------|------|---------|---------|-------|----------|-------|
| 1608 | 7"   | 4K/Reel | 4.0±0.5 | 4.0±2 | 13.5±0.5 | 178±2 |

Tapping Specification

The diagram illustrates the dimensions of a chip antenna carrier. It includes a side view of the carrier with dimensions A (carrier width), B (carrier height), P (pitch), W (carrier width), E (carrier height), F (carrier height), G (carrier height), H (carrier height), D (carrier diameter), and T (carrier thickness). A 'Paper Carrier' diagram is also shown, illustrating the carrier's structure.

| Packaging  | Type | A         | B         | W        | E         | F        | G        | H        | T         | $\psi D$  | P       |
|------------|------|-----------|-----------|----------|-----------|----------|----------|----------|-----------|-----------|---------|
| Paper Type | 1608 | 1.90±0.20 | 3.50±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 | 1.50±0.10 | 4.0±0.1 |

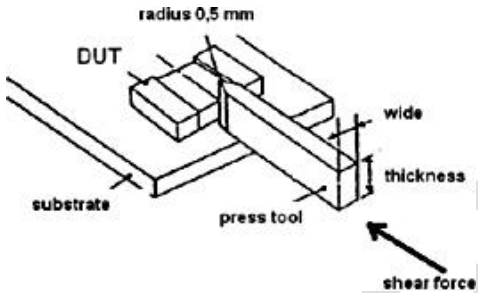
## 2.4GHz 1608 Chip Antenna: RANT0603F245S5



### 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 Initialspec.<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 Initialspec.<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 Initialspec.<br>2. Unpowered; 500hours @ $T=+85^{\circ}\text{C}$ .<br>3. Measurement at $24 \pm 2$ hours aftertest.                                                                                                                                                                                                      | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>108        |
| <b>Low Temperature Storage</b>         | 1. Initial measure: Spec: refer Initialspec.<br>2. Unpowered: 500hours @ $T=-30^{\circ}\text{C}$ .<br>3. Measurement at $24 \pm 2$ hours aftertest.                                                                                                                                                                                                      | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>108        |
| <b>Solderability (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 (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 test condition.                                                                                                                                                                                               | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>Method 106 |

## 2.4GHz 1608 Chip Antenna: RANT0603F245S5

|                           |                                                                                                                                                                                        |                                                                                                                                                                          |              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <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        | 2019/03/01 | New Datasheet                   |
| 2        | 2020/02/22 | Add 2D radiation characteristic |