

## 2.4GHz 1608 Chip Antenna: RANT1608F245C04

### Application:

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

### Features

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

### Part number Information

RANT 1608 F 245 C 04  
(A) (B) (C) (D) (E) (F)

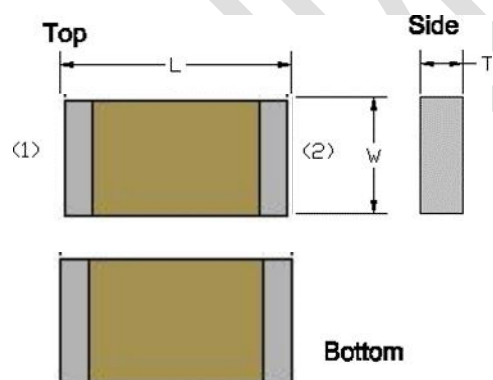
|                  |                       |
|------------------|-----------------------|
| (A)Product Type  | Chip Antenna          |
| (B) Size Code    | 1.6x0.8mm(±0.1mm)     |
| (C) Material     | High K material       |
| (D) Frequency    | 2.4 ~ 2.5GHz          |
| (E) Feeding mode | PIFA & Single Feeding |
| (F) Antenna type | Type=04               |



### 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



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

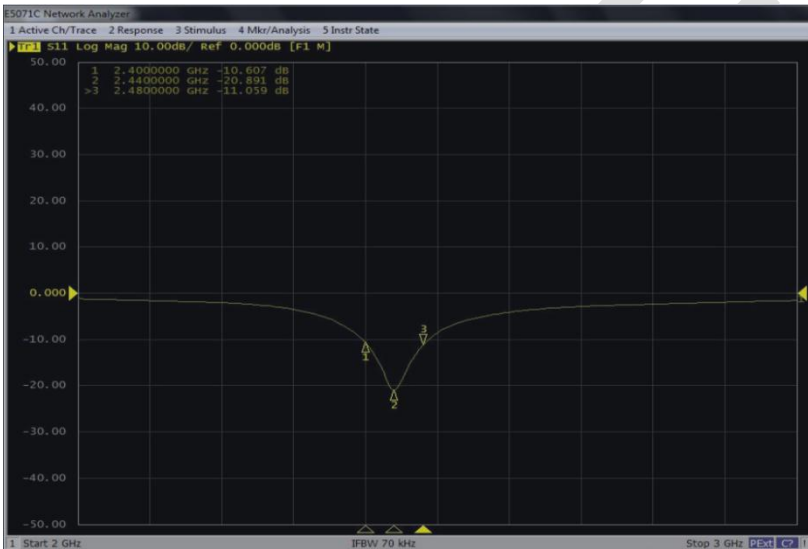
| No. | Terminal Name |
|-----|---------------|
| 1   | Feeding/GNG   |
| 2   | GND/Feeding   |

**PCB Dimension**

**Antenna Layout Reference**

# Return Loss & Radiation

## ELECTRICAL CHARACTERISTICSS11



5071C Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mix/Analysis 5 Instr State

▶ S11 Log Mag 10.00dB/ Ref 0.000dB [F1 M]

| 1             | 2          | 3 | 4 |
|---------------|------------|---|---|
| 2.4000000 GHz | -10.607 dB |   |   |
| 2.4400000 GHz | -20.891 dB |   |   |
| 2.4800000 GHz | -11.059 dB |   |   |

50.00

40.00

30.00

20.00

10.00

0.000

-10.00

-20.00

-30.00

-40.00

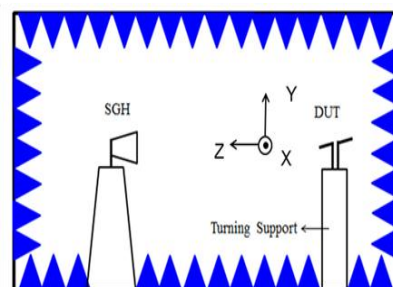
-50.00

1 Start 2 GHz

IFBW 70 kHz

Stop 3 GHz [Next] [C] [I]

Figure 10 displays the radiation pattern of a 1000-watt antenna system across three frequencies: 2400 MHz, 2450 MHz, and 2500 MHz. The figure is organized into a 3x4 grid of polar plots. The first two columns show the 'Polar' radiation pattern (blue curves), and the next two columns show the 'Total' radiation pattern (red curves). The rows correspond to the frequencies 2400 MHz, 2450 MHz, and 2500 MHz. Each plot includes a legend in the top-left corner indicating the red curve is 'Total' and the blue curve is 'Polar'. The plots show the radiation pattern in a polar coordinate system with angles from 0 to 360 degrees and radial distances from 0 to 100 units. The radiation patterns are generally circular, with some variations in shape and size across the frequencies and between the 'Polar' and 'Total' patterns.



| Frequ<br>ncy | Effic | Percen | Gain |
|--------------|-------|--------|------|
| 2400         | -1.64 | 72.27% | 2.38 |
| 2450         | -1.33 | 75.34% | 2.7  |
| 2500         | -1.59 | 72.98% | 2.59 |

Taping Specifications

Reel and Taping Specification

Reel Specification

7" x 8 mm

| 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

Paper Carrier

| 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 |

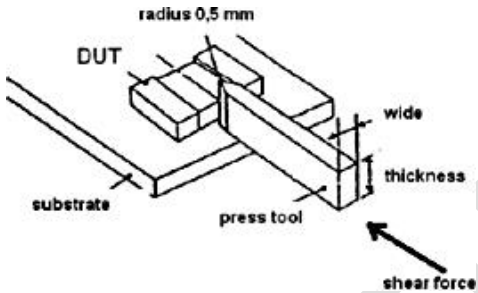
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### Reliability Table

| 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-202 107        |
| <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 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 after test.                                                                                                                                                                                                     | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202 108        |
| <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 after test.                                                                                                                                                                                                     | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202 108        |
| <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 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 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 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 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 Method 106 |

## 2.4GHz 1 6 0 8 Chip Antenna: RANT1608F245C04

|                           |                                                                                                                                                                                        |                                                                                                                                                                          |              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <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 |