

## 2.4GHz 3216 Chip Antenna: RANT3216F245X07

### Application:

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

### Features

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

### Part number Information

RANT   3216   F   245   X   07  
(A)   (B)   (C)   (D)   (E)   (F)

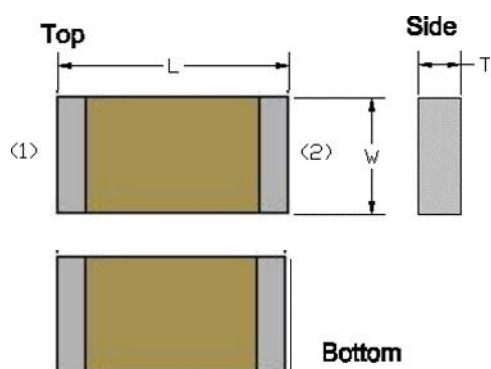
|                  |                       |
|------------------|-----------------------|
| (A)Product Type  | Chip Antenna          |
| (B) Size Code    | 3.2x1.6mm(±0.2mm)     |
| (C) Material     | High K material       |
| (D) Frequency    | 2.4 ~ 2.5GHz          |
| (E) Feeding mode | PIFA & Single Feeding |
| (F) Antenna type | Type=07               |



### 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

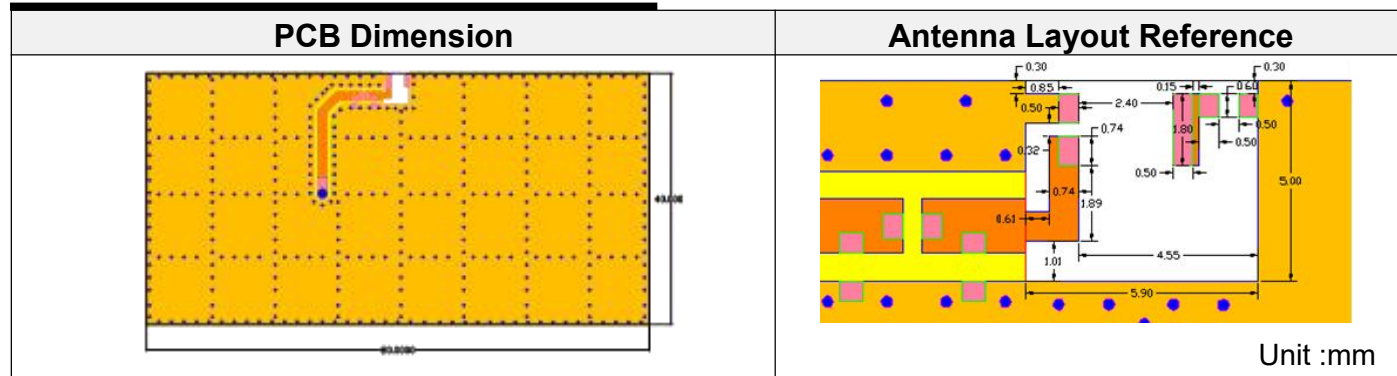


| Dimension (mm) |             |
|----------------|-------------|
| L              | 3.20 ± 0.20 |
| W              | 1.60 ± 0.20 |
| T              | 0.85 ± 0.20 |

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

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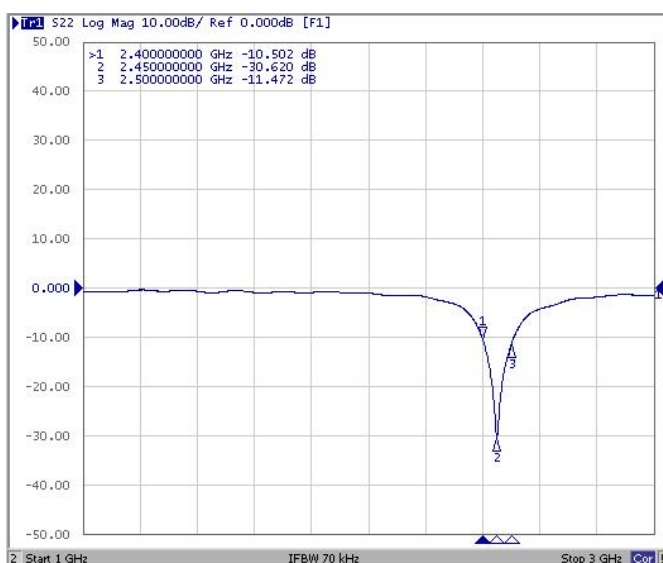
## Evaluation Board Reference



## Electrical Characteristics

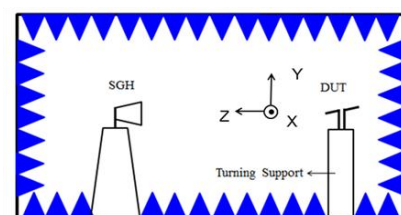
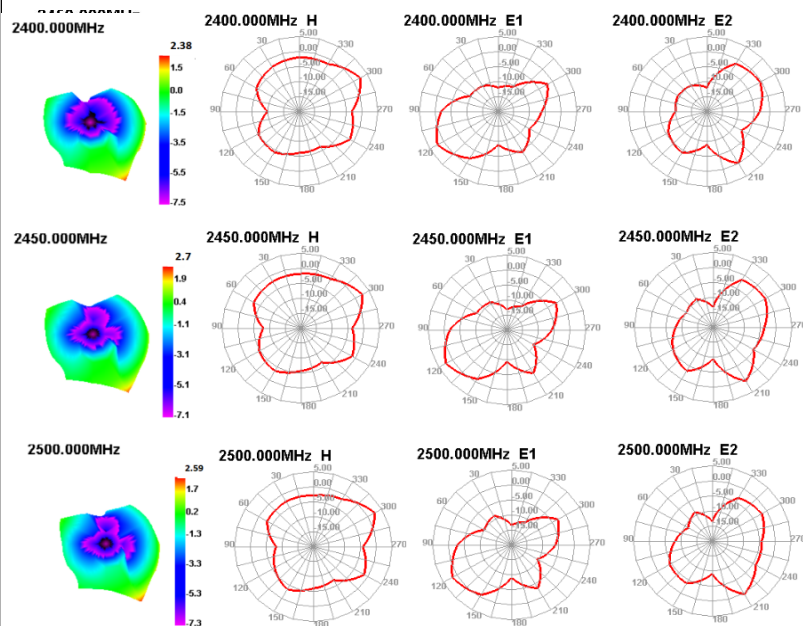
### Return Loss & Radiation

#### Return Loss



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

#### Radiation



### Electrical Characteristics

| Frequency | Effic | Perce  | Gain (DBi) |
|-----------|-------|--------|------------|
| 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 |         | RAIN International Technology Co., Ltd. |      | C        | D     |
|------|------|---------|-----------------------------------------|------|----------|-------|
| 3216 | 7"   | 4K/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         | ψD        | P       |
|------------|------|-----------|-----------|----------|-----------|----------|----------|----------|-----------|-----------|---------|
| Paper Type | 3216 | 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 ± 10°C / 1 hr , then keep for 24 ± 1 hrs at room temp.<br>2. Initial measure: Spec: refer Initialspec.<br>3. Rapid change of temperature test:<br>-30°C to +85°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°C to +85°C), Soak Mode=1 (2 Cycle/hours).<br>3. Measurement at 24 ± 2Hours 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°C.<br>3. Measurement at 24 ± 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°C.<br>3. Measurement at 24 ± 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 ± 5°C<br>b. Dipping time: 3 ± 0.5s                                                                                                                                                                                                                         | 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 ± 10°C.<br>Preheating time: 1~2 min.<br>Solder temperature: 260 ± 5°C.<br>Dipping time: 5 ± 0.5s                                                                                                                                                                      | 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 ± 2 °C.<br>2. Time: 500 ± 24 hours.<br>3. Measurement at 24 ± 2hrs after test condition.                                                                                                                                                                   | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>Method 106 |

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|                           |                                                                                                                                                                                        |                                                                                                                                                                          |              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <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        | 2022/02/22 | Add 2D radiation characteristic |