# 2.4GHz 3216 Chip Antenna: RANT3216F245C03

RAIN

## Application:

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

## Features

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

## Part number Information

| RANT | 3216 | F | 245 | C | 03 |
|---|---|---|---|---|---|
| (A) | (B) | (C) | (D) | (E) | (F) |

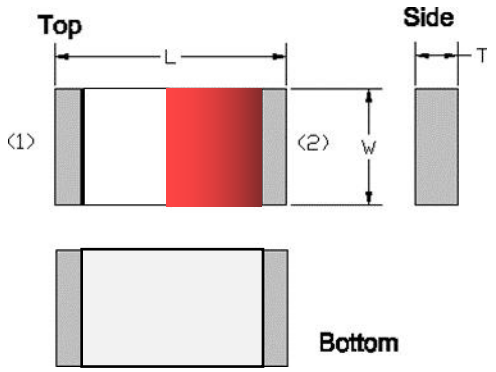
| | |
|---|---|
| (A)Product Type | Chip Antenna |
| (B) Size Code | 3.2x1.6mm(±0.2mm) |
| (C) Material | High K material |
| (D) Frequency | 2.4 ~ 2.5GHz |
| (E) Feeding mode | PIFA & Single Feeding |
| (F) Antenna type | Type=03 |

## 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(℃) | -40 ~85℃ |
| Resistance to Soldering Heats | 10sec. ( @ 280℃) |
| Termination | Ni / Au (Leadless) |

The specification is defined on EVB.

## Dimension and Terminal Configuration




| Dimension (mm) | |
|---|---|
| L | 3.20 ± 0.20 |
| W | 1.60 ± 0.20 |
| T | 0.45 ± 0.20 |

| No. | Terminal Name |
|---|---|
| 1 | Feeding/GNG |
| 2 | GND/Feeding |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lead-free RoHS compliant

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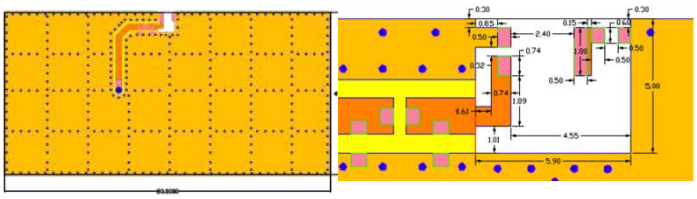
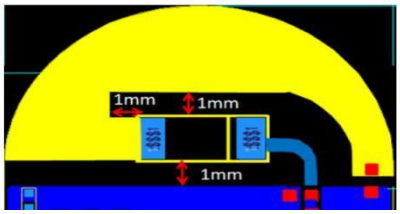
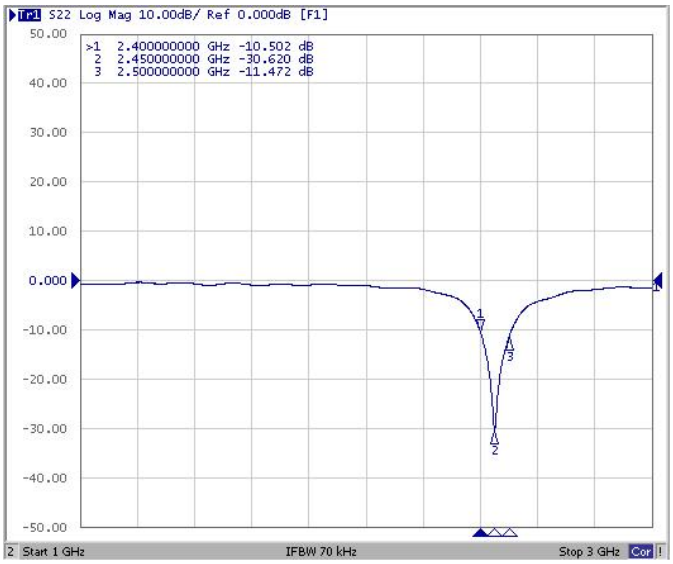
## Evaluation Board Reference

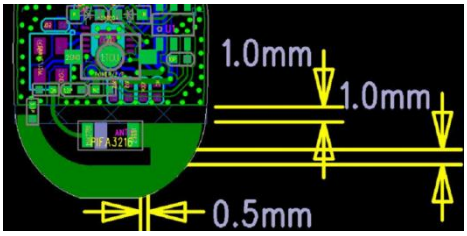
| Splat PCB recommend Dimension | Plectane Antenna Layout Reference |
|---|---|
|  | Unit :mm   |

## Electrical Characteristics

### Return Loss & Radiation

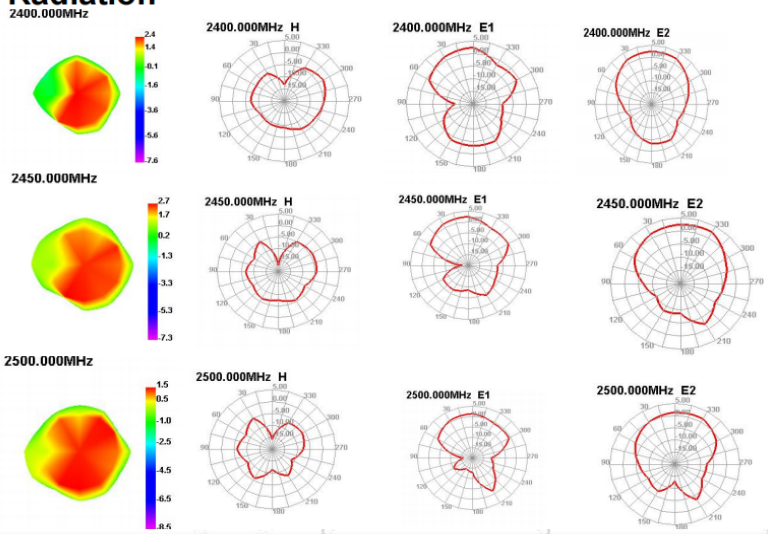
#### Return Loss

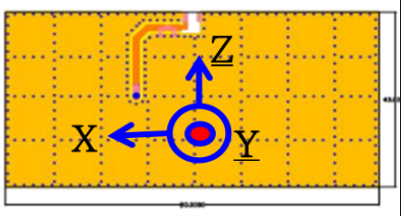


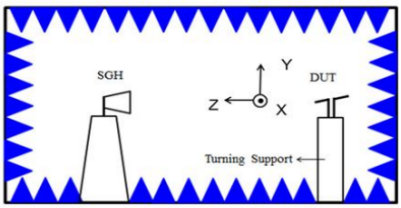




| Frequency(MHz) | S11 (dB) |
|---|---|
| 2400 | -10.50 |
| 2450 | -30.62 |
| 2500 | -11.47 |

#### Radiation




| 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 |

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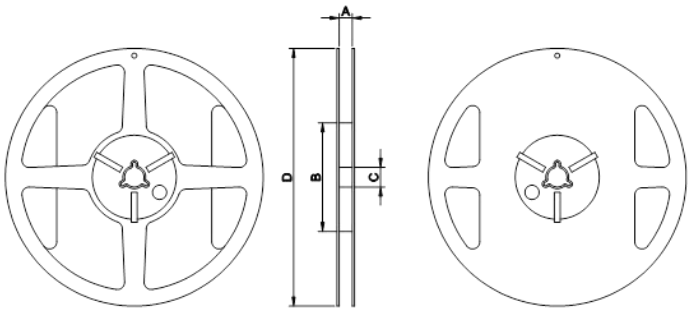
## Taping Specifications

### Reel and Taping Specification

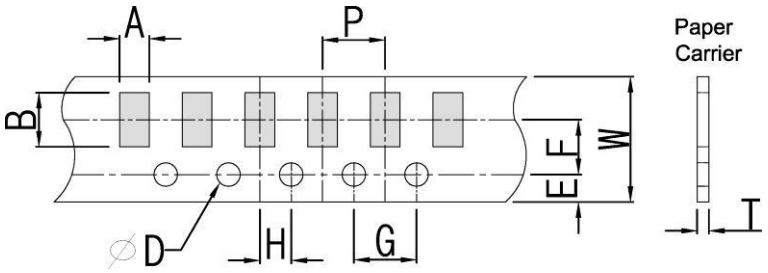
#### Reel Specification




7" x 8 mm

| TYPE | SIZE | | A | B | C | D |
|---|---|---|---|---|---|---|
| 3216 | 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 | 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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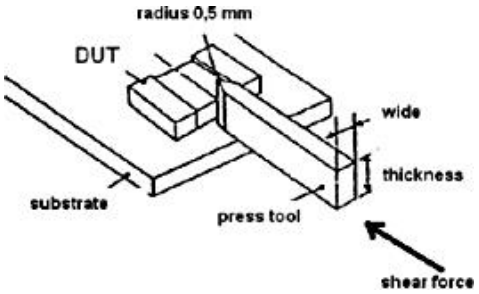
## Reliability Table

| Test Item | Procedure | Requirements Ceramic Type | Remark (Reference) |
|---|---|---|---|
| **Electrical Characterization** | | Fulfill the electrical specification | User Spec. |
| **Thermal Shock** | 1. Preconditioning:<br>50 ± 10℃ / 1 hr , then keep for 24 ± 1 hrs at room temp.<br>2. Initial measure: Spec: refer Initial spec.<br>3. Rapid change of temperature test:<br>-30℃ to +85℃; 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 |
| **Temperature Cycling** | 1. Initial measure: Spec: refer Initial spec.<br>2. 100 Cycles (-30℃ to +85℃), 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 |
| **High Temperature Exposure** | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered; 500hours @ T=+85℃.<br>3. Measurement at 24 ± 2 hours after test. | No Visible Damage.<br>Fulfill the electrical specification. | MIL-STD-202<br>108 |
| **Low Temperature Storage** | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered: 500hours @ T=-30℃.<br>3. Measurement at 24 ± 2 hours after test. | No Visible Damage.<br>Fulfill the electrical specification. | MIL-STD-202<br>108 |
| **Solderability (SMD Bottom Side)** | 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 |
| **Soldering Heat Resistance (RSH)** | 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 |
| **Vibration** | 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 |
| **Mechanical Shock** | 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 |
| **Humidity Bias** | 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 |

| | | | |
|---|---|---|---|
| **Board Flex (SMD)** | 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 |
| **Adhesion** | Force of 1.8Kg for 60 seconds.<br>  <br> | No Visible Damage 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 |
| **Physical Dimension** | 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 |
| 3 | 2020/02/22 | Add 2D radiation characteristic |