

## 2.4GHz 3216 Chip Antenna: RANT3216F245C03

### 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)

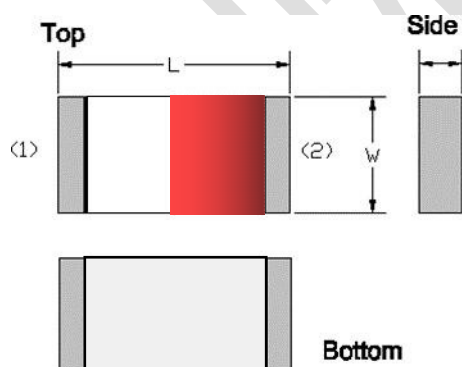
|                  |                       |
|------------------|-----------------------|
| (A)Product Type  | Chip Antenna          |
| (B) Size Code    | 3.2x1.6mm(±0.2mm)     |
| (C) Material     | High K material       |
| (D) Frequency    | 2.4 ~ 2.5GHz          |
| (E) Feeding mode | PIFA & Single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

### Electrical Specification

|                               |                    |
|-------------------------------|--------------------|
| Working Frequency Range       | 2400 ~2500 MHz     |
| Bandwidth                     | 120 MHz (Min.)     |
| Peak Gain                     | 1.24 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



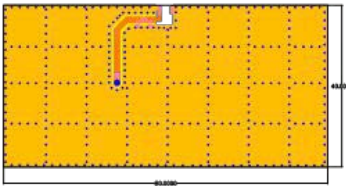
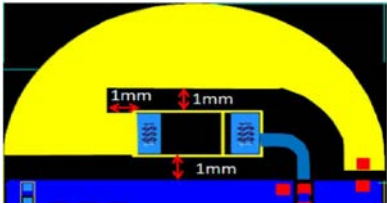
| Dimension (mm) |             |
|----------------|-------------|
| L              | 3.20 ± 0.20 |
| W              | 1.60 ± 0.20 |
| T              | 0.45 ± 0.20 |

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

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Evaluation Board Reference

| 长条板PCB<br>推荐<br>Dimension                                                         | 圆板Antenna Layout Reference                                                                             |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
|  |  <div>Unit :mm</div> |

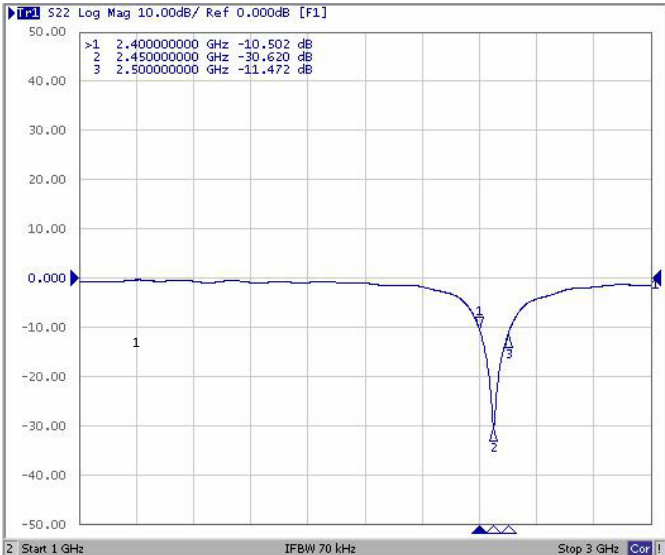
Electrical Characteristics

## Return Loss & Radiation

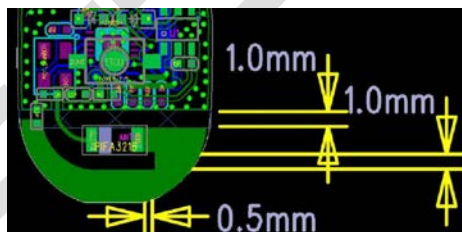
### Return Loss

Plot: S22 Log Mag 10.00dB/ Ref 0.000dB [F1]

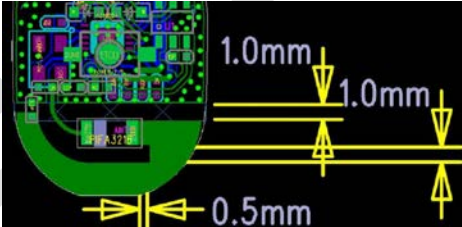
| Point | Frequency (GHz) | Return Loss (dB) |
|-------|-----------------|------------------|
| 1     | 2.400000000     | -10.502          |
| 2     | 2.450000000     | -30.620          |
| 3     | 2.500000000     | -11.472          |



Start 1 GHz | IFBW 70 kHz | Stop 3 GHz | Cor



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

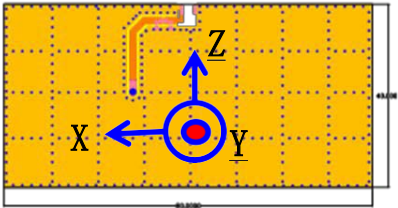
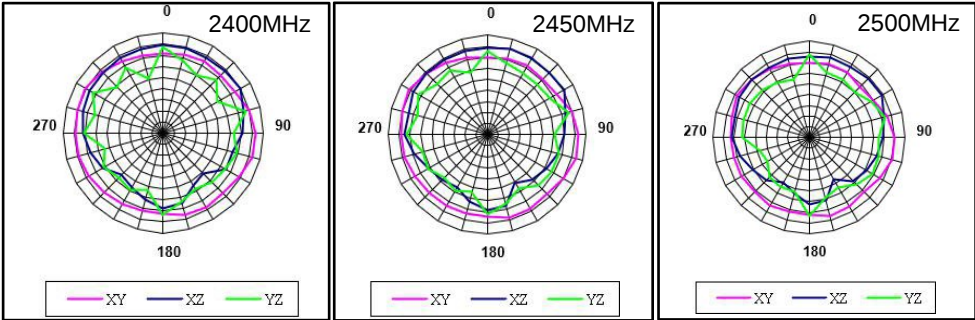


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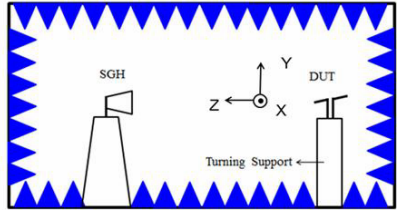
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Radiation



|             | 2400MHz  | 2450MHz  | 2500MHz  |
|-------------|----------|----------|----------|
| Efficiency  | 82.52%   | 85.26%   | 83.01%   |
| Peak Gain   | 1.15 dBi | 1.24 dBi | 1.19 dBi |
| Directivity | 1.89 dBi | 1.97 dBi | 1.91 dBi |



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

Paper Carrier

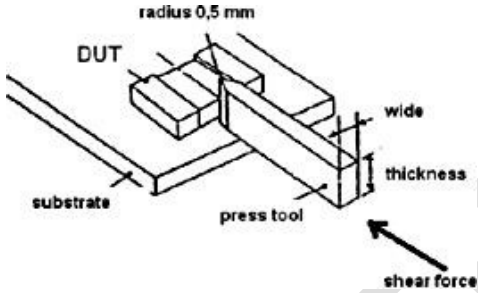
| Packaging  | Type | A             | B             | W            | E             | F        | G        | H        | T             | ψD            | P       |
|------------|------|---------------|---------------|--------------|---------------|----------|----------|----------|---------------|---------------|---------|
| Paper Type | 3216 | 1.90±0.2<br>0 | 3.50±0.2<br>0 | 8.0±0.2<br>0 | 1.75±0.1<br>0 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.75±0.1<br>0 | 1.50±0.1<br>0 | 4.0±0.1 |

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### Reliability Table

| Test Item                             | Procedure                                                                                                                                                                                                                                                                                          | Requirements<br>Ceramic Type                                                | Remark<br>(Reference)     |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------|
| Electrical<br>Characterization        |                                                                                                                                                                                                                                                                                                    | Fulfill the electrical<br>specification                                     | User Spec.                |
| Thermal<br>Shock                      | 1. Preconditioning:<br>50 ± 10°C / 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°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<br>specification.              | MIL-STD-202<br>107        |
| Temperature<br>Cycling                | 1. Initial measure: Spec: refer Initial spec.<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<br>specification.              | JESD22<br>JA104           |
| High Temperature<br>Exposure          | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered; 500hours @ T=+85°C.<br>3. Measurement at 24 ± 2 hours after test.                                                                                                                                                                   | No Visible Damage.<br>Fulfill the electrical<br>specification.              | MIL-STD-202<br>108        |
| Low Temperature<br>Storage            | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered; 500hours @ T= -30°C.<br>3. Measurement at 24 ± 2 hours after test.                                                                                                                                                                  | No Visible Damage.<br>Fulfill the electrical<br>specification.              | MIL-STD-202<br>108        |
| Solderability<br>(SMD Bottom Side)    | Dipping method:<br>a. Temperature: 235 ± 5°C<br>b. Dipping time: 3 ± 0.5s                                                                                                                                                                                                                          | The solder should cover<br>over 95% of the critical<br>area of bottom side. | IEC 60384-21/22<br>4.10   |
| Soldering Heat<br>Resistance<br>(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<br>side and 2 secure points at corners of opposite sides. Parts<br>mounted within 2" from any secure point. Test from 10-2000<br>Hz.                                            | No Visible Damage.                                                          | MIL-STD-202<br>Method 204 |
| Mechanical<br>Shock                   | Three shocks in each direction shall be applied along the three<br>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<br>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<br>specification.              | MIL-STD-202<br>Method 106 |

## 2.4GHz 3216 Chip Antenna: RANT3216F245C01

|                           |                                                                                                                                                                                                         |                                                                                                                                                                          |              |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Board Flex (SMD)</b>   | <ol style="list-style-type: none"> <li>1. Mounting method:<br/>IR-Reflow. PCB Size (L:100 × W:40 × T:1.6mm)</li> <li>2. Apply the load in direction of the arrow until bending reaches 2 mm.</li> </ol> | No Visible Damage.                                                                                                                                                       | AEC-Q200 005 |
| <b>Adhesion</b>           | <p>Force of 1.8Kg for 60 seconds.</p>                                                                                  | 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 |