

## 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               |

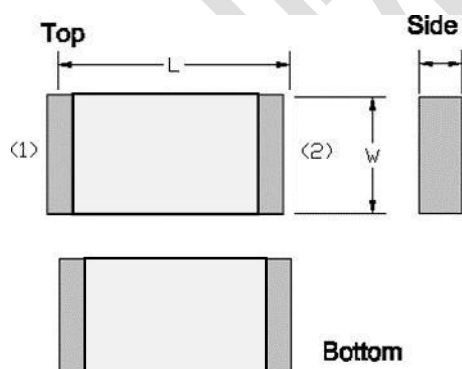


### Electrical Specification

|                               |                    |
|-------------------------------|--------------------|
| Working Frequency Range       | 2400 ~2500 MHz     |
| Bandwidth                     | 120 MHz (Min.)     |
| Peak Gain                     | 1.86 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

[illegible]

## Electrical Characteristics

## Return Loss & Radiation

### Return Loss

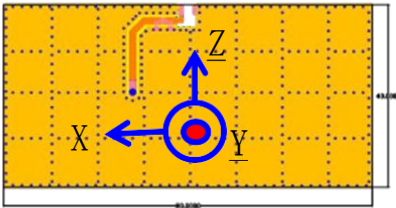
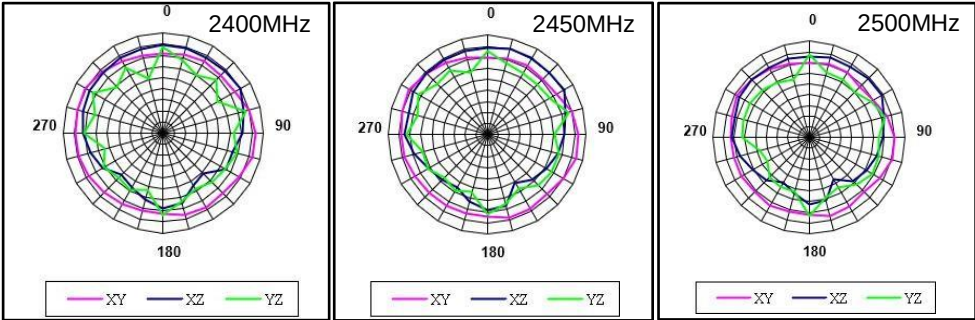
| Point | Frequency (GHz) | S11 (dB) |
|-------|-----------------|----------|
| 1     | 2.400000000     | -10.502  |
| 2     | 2.450000000     | -30.620  |
| 3     | 2.500000000     | -11.472  |

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

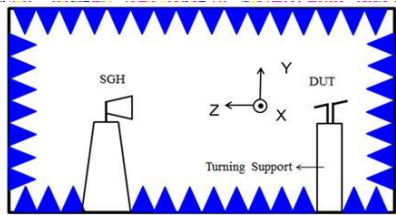
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Radiation



|             | 2400MHz  | 2450MHz  | 2500MHz  |
|-------------|----------|----------|----------|
| Efficiency  | 82.52%   | 85.26%   | 83.01%   |
| Peak Gain   | 0.85 dBi | 1.86 dBi | 0.78 dBi |
| Directivity | 1.89 dBi | 1.97 dBi | 1.91 dBi |



| Reel and Taping Specification |  |
|-------------------------------|--|
|-------------------------------|--|

| TYPE | SIZE |         | A       | B    | C        | D     |
|------|------|---------|---------|------|----------|-------|
| 3216 | 7"   | 5K/Reel | 9.0±0.5 | 60±2 | 13.5±0.5 | 178±2 |

Technical drawing of a paper carrier. The main view shows a side profile with dimensions:  $A$  (width of a segment),  $B$  (height of the carrier),  $P$  (pitch between segments),  $W$  (total width),  $E$  and  $F$  (heights of the lower section),  $H$  and  $G$  (distances between mounting holes), and  $D$  (diameter of a mounting hole). A detail view on the right shows the carrier's profile with the label "Paper Carrier".

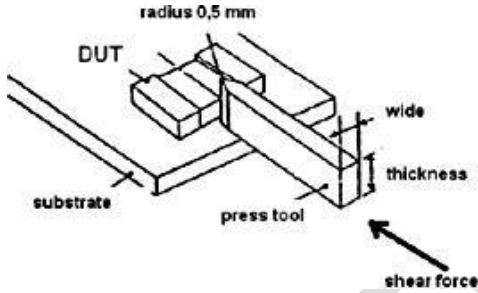
| Packaging  | Type | A                   | B                   | W                  | E                   | F              | G              | H              | T                   | $\psi D$            | P             |
|------------|------|---------------------|---------------------|--------------------|---------------------|----------------|----------------|--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

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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 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<br>specification.              | MIL-STD-202<br>107        |
| Temperature<br>Cycling                | 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<br>specification.              | JESD22<br>JA104           |
| High Temperature<br>Exposure          | 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<br>specification.              | MIL-STD-202<br>108        |
| Low Temperature<br>Storage            | 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<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>   | 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 |