

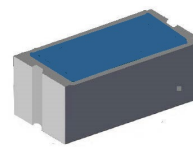
## 2.4GHz Chip Antenna: ZC-AN5020H1R2G45

### Application:

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

### Features

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



### Part number

AAN 5020 H1 R 2G45  
(1) (2) (3) (4) (5)

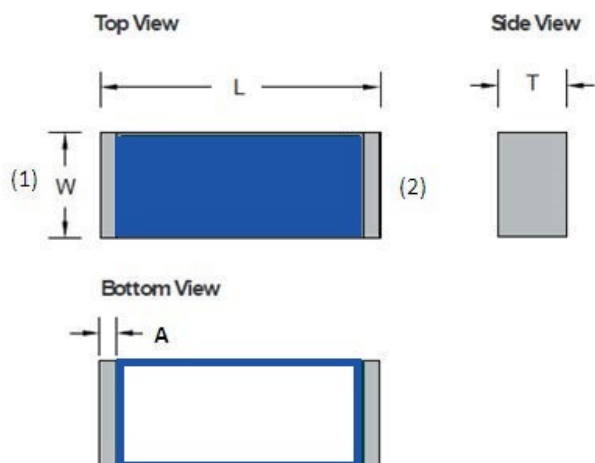
|                  |               |
|------------------|---------------|
| (1) Product Type | Chip Antenna  |
| (2) Size Code    | 5.0x2.0mm     |
| (3) Type Code    | H1            |
| (4) Packing      | Tape and reel |
| (5) Frequency    | 2.45GHz       |

### Electrical Specification

|                           |                  |
|---------------------------|------------------|
| Working Frequency Range   | 2400 ~2484 MHz   |
| Peak Gain                 | 3.5dBi (Typ.)    |
| Impedance                 | 50 Ohm           |
| Return loss               | 10 dB ( Min)     |
| Polarization              | Linear           |
| Azimuth Beamwidth         | Omni-directional |
| Operation Temperature(°C) | -40 ~85°C        |

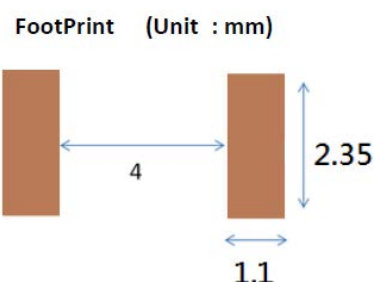
The specification is defined on EVB.

### Dimension and Terminal Configuration



| Dimension (mm) |             |
|----------------|-------------|
| L              | 5.0 +/-0.20 |
| W              | 2.0+- 0.20  |
| T              | 0.60+/-0.20 |
| A              | 0.20+/-0.20 |

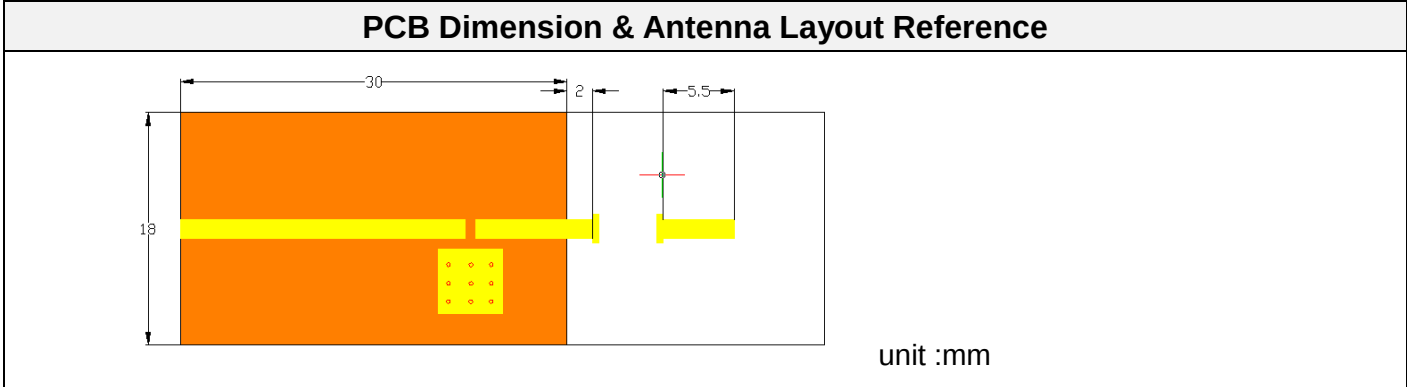
| No. | Terminal Name |
|-----|---------------|
| 1   | Feeding       |
| 2   | Soldering     |



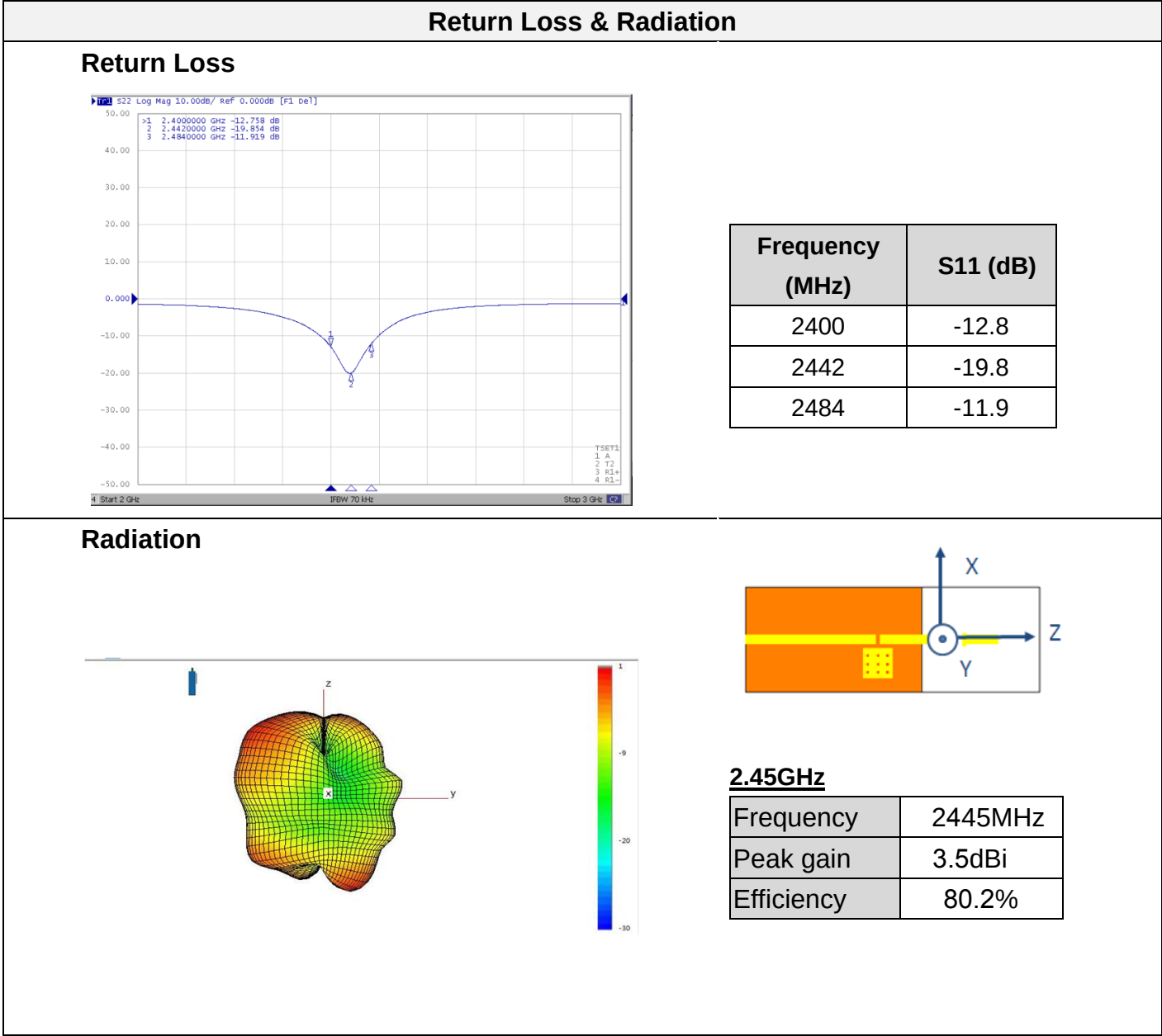
2.4GHz 2.45HHz Chip Antenna: ZC-AN5020H1R2G45



Evaluation Board Reference



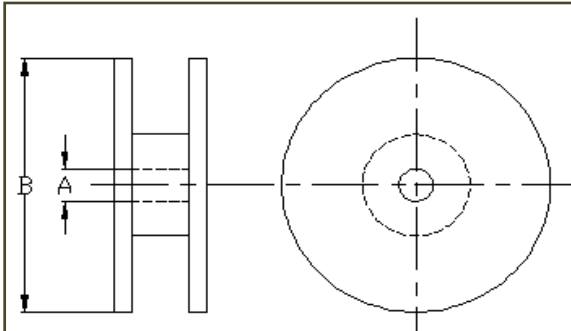
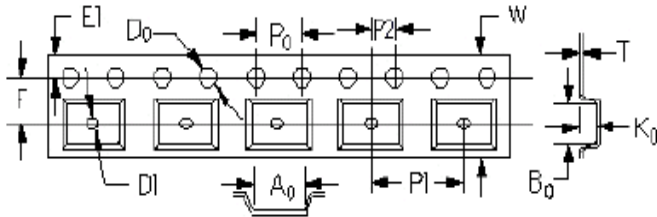
Electrical Characteristics



2.4GHz 2.45HHz Chip Antenna: ZC-AN5020H1R2G45



Taping Specifications

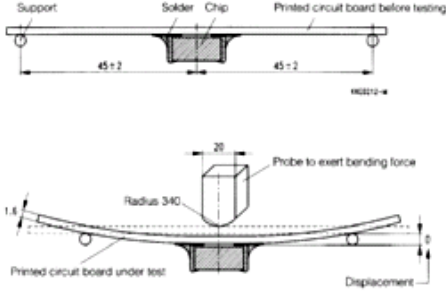
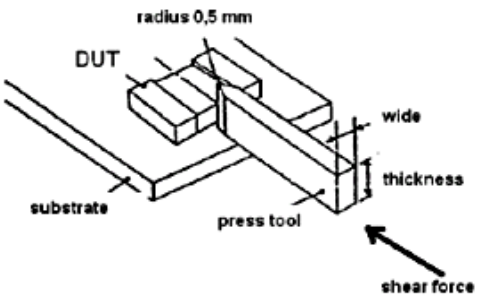
| Reel                                                                                                                                                                                                                             | Taping Blister Tape                                                                |                   |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------|---------------|---------------------------|---|--------------|---------------------------|---|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------|-----------|---------------|----|------------------|-----------------------------------|----|-------------|----------------------------------|---|-------------|-----------------------------------------|----|-------------|---------------------------|----|-------------|----------------------------------|----|-------------|------------|---|-------------------|--------------------------------|----|-------------|---------------------------------|----|-------------|--------------------------------|----|-------------|-------------------|---|-------------|
|                                                                                                                                                  |  |                   |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| <table><tr><th>Checking note</th><th>Index</th><th>Spec (mm)</th></tr><tr><td>Internal diameter of reel</td><td>A</td><td>60.20 ± 0.50</td></tr><tr><td>External diameter of reel</td><td>B</td><td>178 ± 1.00</td></tr></table> | Checking note                                                                      | Index             | Spec (mm)     | Internal diameter of reel | A | 60.20 ± 0.50 | External diameter of reel | B | 178 ± 1.00 | <table><tr><th>Checking note</th><th>Index</th><th>Spec (mm)</th></tr><tr><td>Sprocket hole</td><td>D0</td><td>1.50 +0.10/-0.00</td></tr><tr><td>Distance sprocket hole to outside</td><td>E1</td><td>1.75 ± 0.10</td></tr><tr><td>Distance sprocket hole to pocket</td><td>F</td><td>5.50 ± 0.05</td></tr><tr><td>Distance sprocket hole to sprocket hole</td><td>P0</td><td>4.00 ± 0.10</td></tr><tr><td>Distance pocket to pocket</td><td>P1</td><td>4.00 ± 0.10</td></tr><tr><td>Distance sprocket hole to pocket</td><td>P2</td><td>2.00 ± 0.05</td></tr><tr><td>Tape width</td><td>W</td><td>12.00 +0.30/-0.10</td></tr><tr><td>Pocket width nominal clearance</td><td>A0</td><td>2.28 ± 0.13</td></tr><tr><td>Pocket length nominal clearance</td><td>B0</td><td>5.70 ± 0.13</td></tr><tr><td>Pocket depth minimum clearance</td><td>K0</td><td>1.58 ± 0.10</td></tr><tr><td>Thickness of tape</td><td>T</td><td>0.23 ± 0.02</td></tr></table> | Checking note | Index | Spec (mm) | Sprocket hole | D0 | 1.50 +0.10/-0.00 | Distance sprocket hole to outside | E1 | 1.75 ± 0.10 | Distance sprocket hole to pocket | F | 5.50 ± 0.05 | Distance sprocket hole to sprocket hole | P0 | 4.00 ± 0.10 | Distance pocket to pocket | P1 | 4.00 ± 0.10 | Distance sprocket hole to pocket | P2 | 2.00 ± 0.05 | Tape width | W | 12.00 +0.30/-0.10 | Pocket width nominal clearance | A0 | 2.28 ± 0.13 | Pocket length nominal clearance | B0 | 5.70 ± 0.13 | Pocket depth minimum clearance | K0 | 1.58 ± 0.10 | Thickness of tape | T | 0.23 ± 0.02 |
| Checking note                                                                                                                                                                                                                    | Index                                                                              | Spec (mm)         |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Internal diameter of reel                                                                                                                                                                                                        | A                                                                                  | 60.20 ± 0.50      |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| External diameter of reel                                                                                                                                                                                                        | B                                                                                  | 178 ± 1.00        |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Checking note                                                                                                                                                                                                                    | Index                                                                              | Spec (mm)         |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Sprocket hole                                                                                                                                                                                                                    | D0                                                                                 | 1.50 +0.10/-0.00  |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Distance sprocket hole to outside                                                                                                                                                                                                | E1                                                                                 | 1.75 ± 0.10       |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Distance sprocket hole to pocket                                                                                                                                                                                                 | F                                                                                  | 5.50 ± 0.05       |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Distance sprocket hole to sprocket hole                                                                                                                                                                                          | P0                                                                                 | 4.00 ± 0.10       |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Distance pocket to pocket                                                                                                                                                                                                        | P1                                                                                 | 4.00 ± 0.10       |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Distance sprocket hole to pocket                                                                                                                                                                                                 | P2                                                                                 | 2.00 ± 0.05       |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Tape width                                                                                                                                                                                                                       | W                                                                                  | 12.00 +0.30/-0.10 |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Pocket width nominal clearance                                                                                                                                                                                                   | A0                                                                                 | 2.28 ± 0.13       |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Pocket length nominal clearance                                                                                                                                                                                                  | B0                                                                                 | 5.70 ± 0.13       |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Pocket depth minimum clearance                                                                                                                                                                                                   | K0                                                                                 | 1.58 ± 0.10       |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Thickness of tape                                                                                                                                                                                                                | T                                                                                  | 0.23 ± 0.02       |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| <table><tr><td>Quantity/per reel</td><td>3000 pcs</td></tr><tr><td>Tape material</td><td>Plastic (embossed)</td></tr></table>                                                                                                    | Quantity/per reel                                                                  | 3000 pcs          | Tape material | Plastic (embossed)        |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Quantity/per reel                                                                                                                                                                                                                | 3000 pcs                                                                           |                   |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |
| Tape material                                                                                                                                                                                                                    | Plastic (embossed)                                                                 |                   |               |                           |   |              |                           |   |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |       |           |               |    |                  |                                   |    |             |                                  |   |             |                                         |    |             |                           |    |             |                                  |    |             |            |   |                   |                                |    |             |                                 |    |             |                                |    |             |                   |   |             |

## 2.4GHz 2.45HHz Chip Antenna: ZC-AN5020H1R2G45

### 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℃ / 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<br>specification.              | MIL-STD-202<br>107        |
| Temperature<br>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<br>specification.              | JESD22<br>JA104           |
| High Temperature<br>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<br>specification.              | MIL-STD-202<br>108        |
| Low Temperature<br>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<br>specification.              | MIL-STD-202<br>108        |
| Solderability<br>(SMD Bottom Side)    | Dipping method:<br>a. Temperature: 235 ± 5℃<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℃.<br>Preheating time: 1~2 min.<br>Solder temperature: 260 ± 5℃.<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 2.45HHz Chip Antenna: ZC-AN5020H1R2G45

|                           |                                                                                                                                                                                                                                              |                                                                                                                                                                                  |                         |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>Board Flex (SMD)</b>   | <p>1. Mounting method:<br/>IR-Reflow. PCB Size (L:100 × W:40 × T:1.6mm)</p> <p>2. Apply the load in direction of the arrow until bending reaches 2 mm.</p>  | <p>No Visible Damage.</p>                                                                                                                                                        | <p>AEC-Q200<br/>005</p> |
| <b>Adhesion</b>           | <p>Force of 1.8Kg for 60 seconds.</p>                                                                                                                       | <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.</p> | <p>AEC-Q200<br/>006</p> |
| <b>Physical Dimension</b> | <p>Any applicable method using x10 magnification, micrometers, calipers, gauges, contour projectors, or other measuring equipment, capable of determining the actual specimen dimensions.</p>                                                | <p>In accordance with specification.</p>                                                                                                                                         | <p>JESD22<br/>JB100</p> |

## Revision History

| Revision | Date      | Content   |
|----------|-----------|-----------|
| 1        | 2019/7/20 | New issue |