

# 2.4GHz 2012 Chip Antenna:YL2012F6P2G45

## Application:

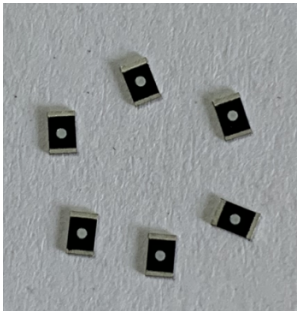
WLAN, 802.11b/g, Bluetooth, etc...

## Features

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

## Part number

|                 |              |   |           |          |             |
|-----------------|--------------|---|-----------|----------|-------------|
| <u>YL</u>       | <u>2012</u>  | - | <u>F6</u> | <u>P</u> | <u>2G45</u> |
| (1)             | (2)          |   | (3)       | (4)      | (5)         |
| (1)Product Type | Chip Antenna |   |           |          |             |
| (2)Size Code    | 2.0x1.2mm    |   |           |          |             |
| (3)Type Code    | F6           |   |           |          |             |
| (4)Packing      | Paper Tape   |   |           |          |             |
| (5)Frequency    | 2.45GHz      |   |           |          |             |

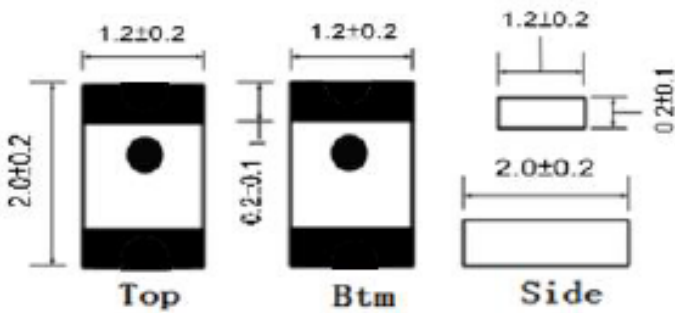


## Electrical Specification

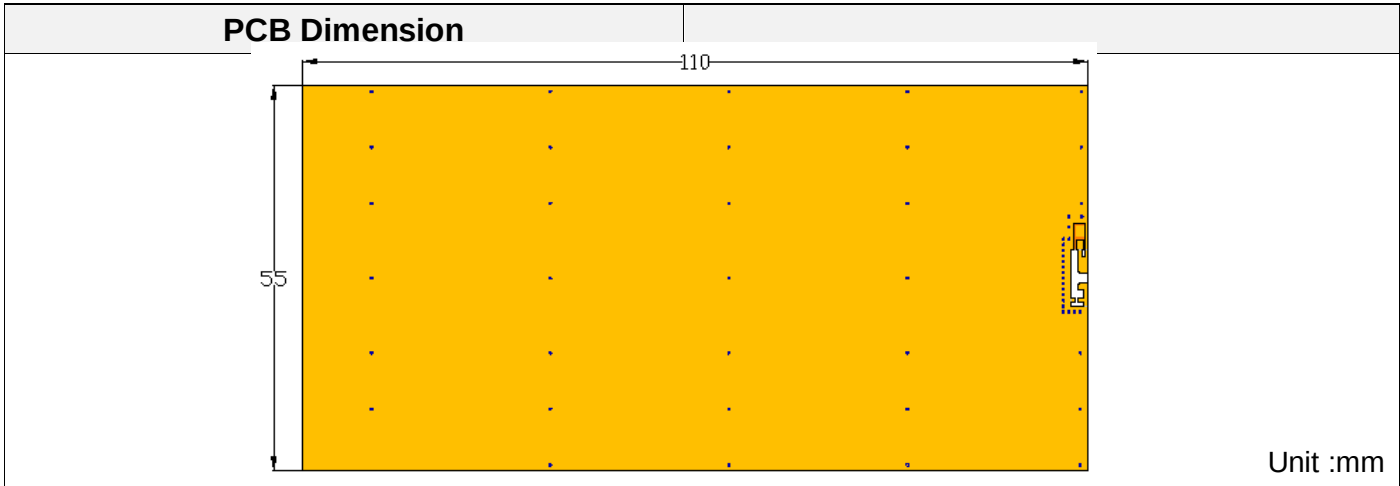
|                          |                  |
|--------------------------|------------------|
| Working Frequency Range  | 2400 ~2484 MHz   |
| Peak Gain                | 2.58dBi (Typ.)   |
| Impedance                | 50 Ohm           |
| Return loss              | 10 dB ( Min)     |
| Polarization             | Linear           |
| Azimuth Beamwidth        | Omni-directional |
| Operation Temperature(℃) | -40 ~85℃         |

The specification is defined on EVB.

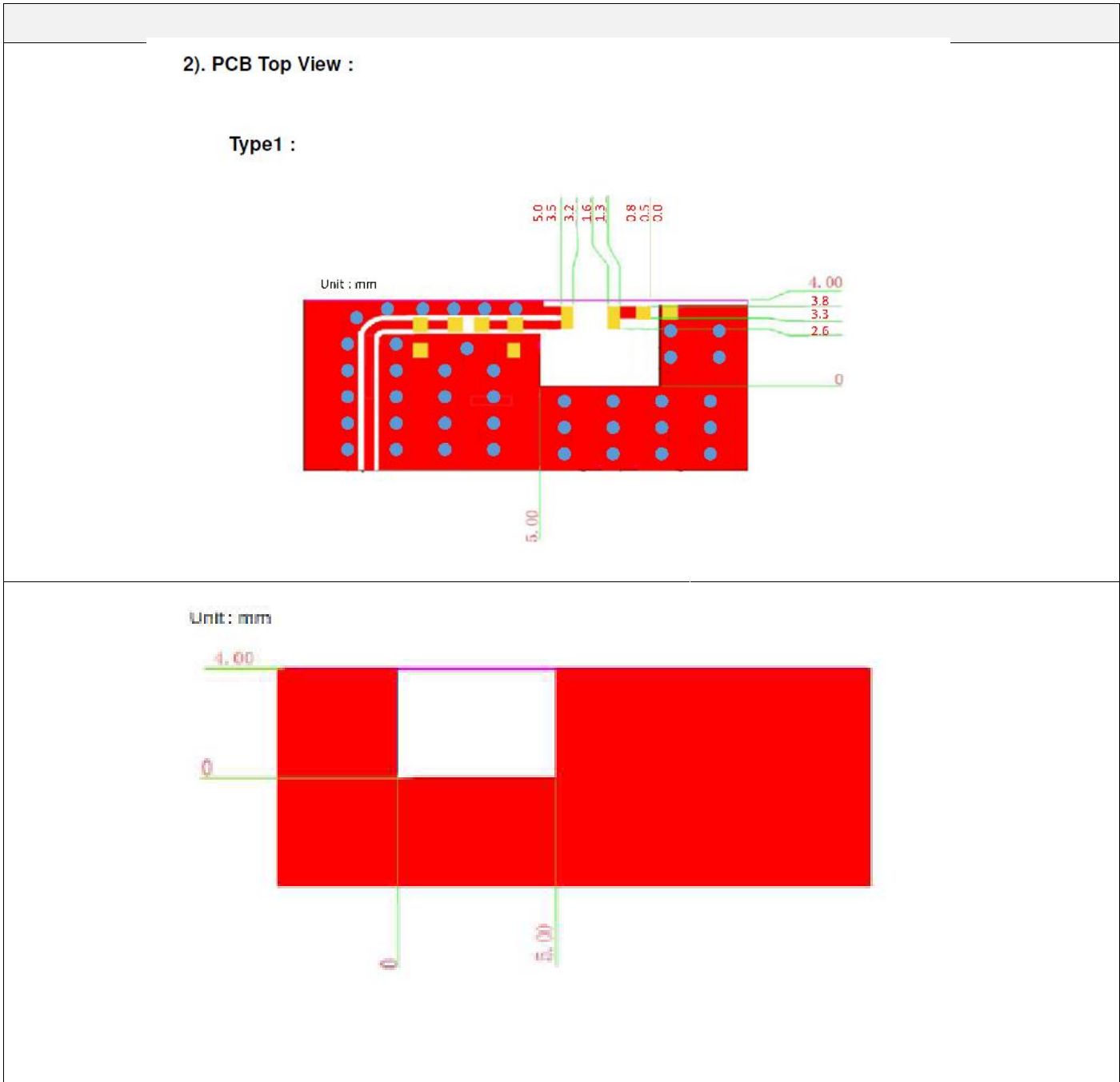
## Dimension and Terminal Configuration



Evaluation Board Reference



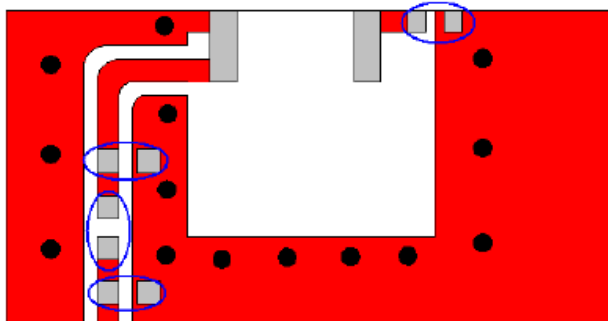
Electrical Characteristics



## 2.4GHz 2.45HHz Chip Antenna:YL2012F6P2G45

### Evaluation Board Reference

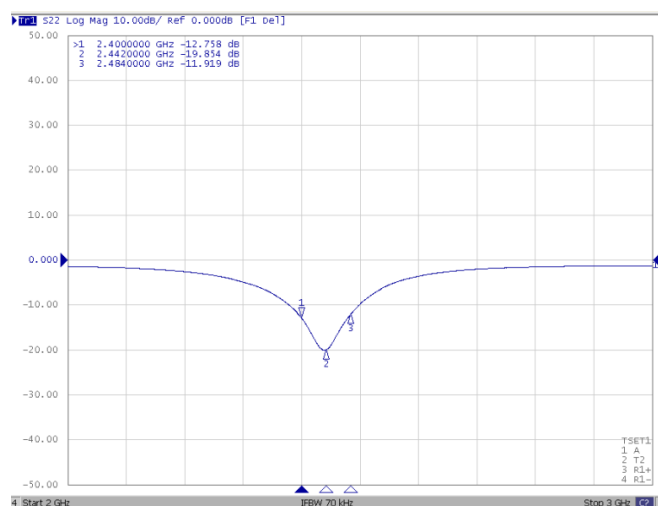
PCB Dimension & Antenna Layout Reference



### Electrical Characteristics

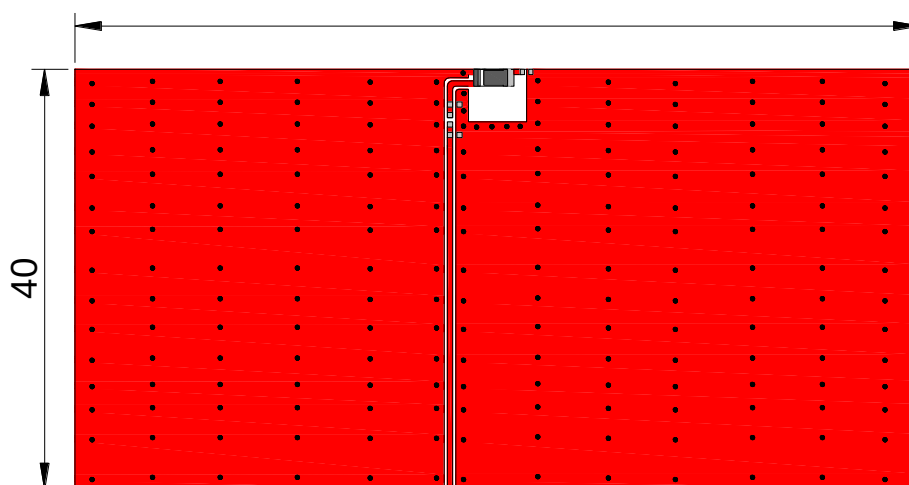
Return Loss & Radiation

#### Return Loss

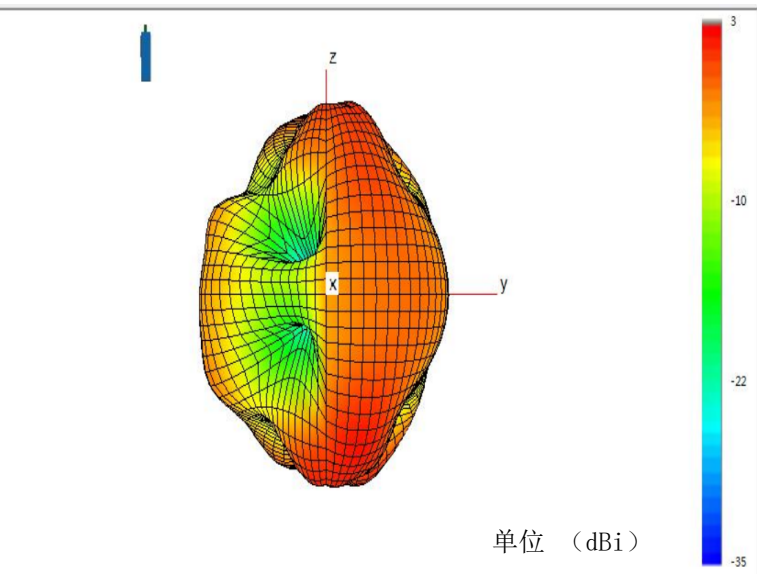


| Frequency (MHz) | S11 (dB) |
|-----------------|----------|
| 2400            | -12.8    |
| 2442            | -19.8    |
| 2484            | -11.9    |

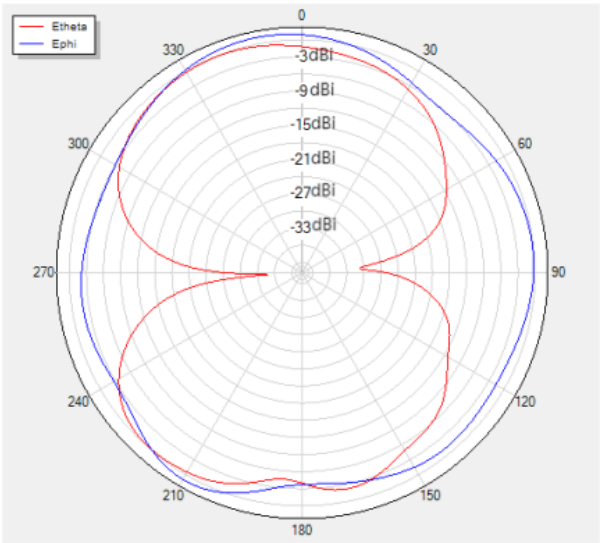
#### Test Board with Antenna



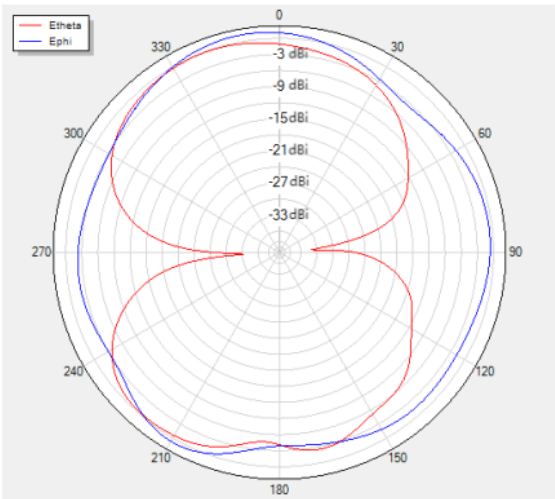
3D&2D Radiation Drawing



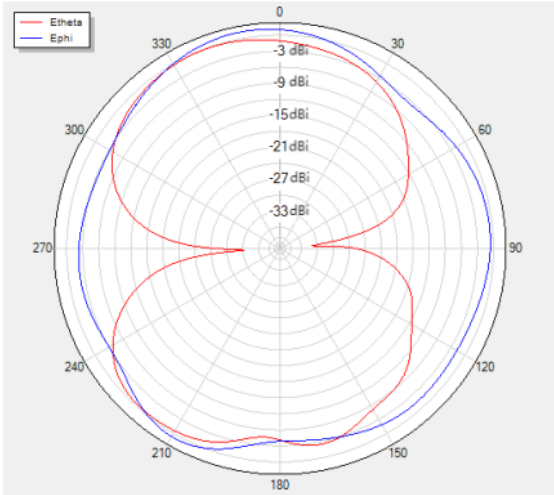
Channel (MHz) 2400      Max= 2.15dBi



Channel (MHz) 2450      Max= 2.56dBi



Channel (MHz) 2480      Max= 1.86dBi

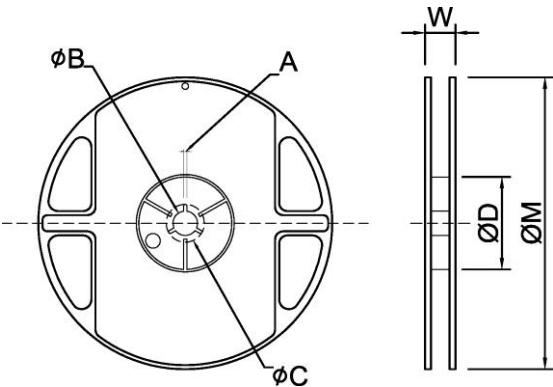


| Frequency( MHz  | 2400 | 2410 | 2420 | 2430 | 2440 | 2450 | 2460 | 2470 | 2480 | 2490 | 2500 |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| Efficiency (dB) | -1.4 | -1.0 | -0.9 | -0.7 | -0.7 | -0.8 | -0.9 | -1.1 | -1.2 | -1.3 | -1.4 |
| Efficiency (%)  | 72.8 | 73.7 | 74.3 | 74.4 | 75.5 | 75.0 | 74.0 | 73.6 | 73.1 | 72.6 | 71.5 |
| Gain (dBi)      | 2.15 | 2.24 | 2.30 | 2.41 | 2.58 | 2.56 | 2.42 | 1.95 | 1.86 | 1.67 | 1.68 |

Taping Specifications

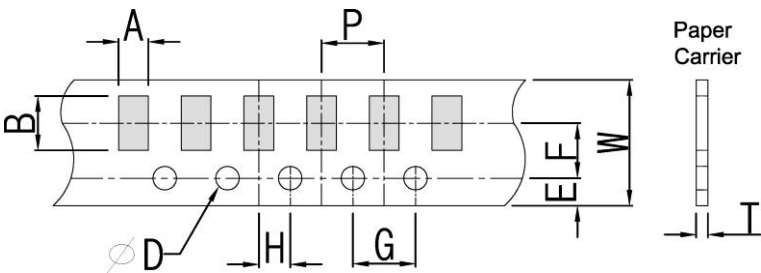
Reel and Taping Specification

Reel Specification



| TYPE | SIZE |         | A             | $\phi B$       | $\phi C$     | $\phi D$     | W              | $\phi M$      |
|------|------|---------|---------------|----------------|--------------|--------------|----------------|---------------|
| 2012 | 7"   | 6K/Reel | 2.0 $\pm$ 0.5 | 13.5 $\pm$ 1.0 | 21 $\pm$ 1.0 | 60 $\pm$ 1.0 | 11.5 $\pm$ 2.0 | 178 $\pm$ 2.0 |

Tapping Specification

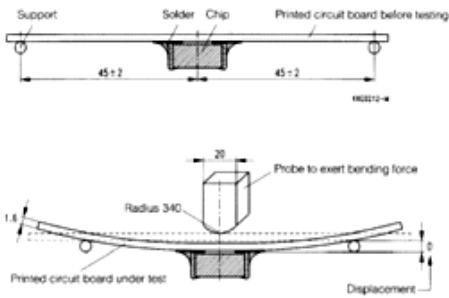
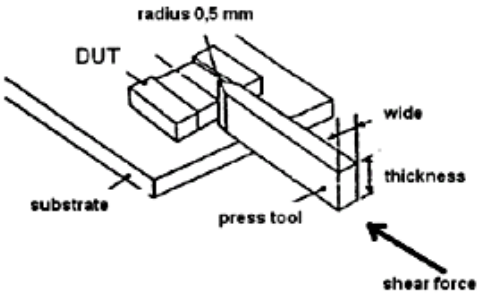


| Packaging  | Type | A               | B               | W              | E               | F              | G              | H              | T               | $\phi D$                            | P             |
|------------|------|-----------------|-----------------|----------------|-----------------|----------------|----------------|----------------|-----------------|-------------------------------------|---------------|
| Paper Type | 2012 | 1.90 $\pm$ 0.20 | 3.50 $\pm$ 0.20 | 8.0 $\pm$ 0.20 | 1.75 $\pm$ 0.10 | 3.5 $\pm$ 0.05 | 4.0 $\pm$ 0.10 | 2.0 $\pm$ 0.05 | 0.75 $\pm$ 0.10 | 1.50 <sup>+0.10</sup> <sub>-0</sub> | 4.0 $\pm$ 0.1 |

**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>$50 \pm 10^{\circ}\text{C}$ / 1 hr , then keep for $24 \pm 1$ hrs at room temp.<br>2. Initial measure: Spec: refer Initial spec.<br>3. Rapid change of temperature test:<br>$-30^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ ; 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 Initial spec.<br>2. 100 Cycles ( $-30^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ ), Soak Mode=1 (2 Cycle/hours).<br>3. Measurement at $24 \pm 2$ Hours after test condition.                                                                                                                                               | No Visible Damage.<br>Fulfill the electrical specification.           | JESD22<br>JA104           |
| <b>High Temperature Exposure</b>       | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered; 500hours @ $T=+85^{\circ}\text{C}$ .<br>3. Measurement at $24 \pm 2$ hours after test.                                                                                                                                                                                                     | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>108        |
| <b>Low Temperature Storage</b>         | 1. Initial measure: Spec: refer Initial spec.<br>2. Unpowered: 500hours @ $T= -30^{\circ}\text{C}$ .<br>3. Measurement at $24 \pm 2$ hours after test.                                                                                                                                                                                                    | No Visible Damage.<br>Fulfill the electrical specification.           | MIL-STD-202<br>108        |
| <b>Solderability (SMD Bottom Side)</b> | Dipping method:<br>a. Temperature: $235 \pm 5^{\circ}\text{C}$<br>b. Dipping time: $3 \pm 0.5\text{s}$                                                                                                                                                                                                                                                    | 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: $150 \pm 10^{\circ}\text{C}$ .<br>Preheating time: 1~2 min.<br>Solder temperature: $260 \pm 5^{\circ}\text{C}$ .<br>Dipping time: $5 \pm 0.5\text{s}$                                                                                                                                                                             | 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: $85 \pm 2^{\circ}\text{C}$ .<br>2. Time: $500 \pm 24$ hours.<br>3. Measurement at $24 \pm 2$ hrs 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>   | <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>  | No Visible Damage.                                                                                                                                                       | AEC-Q200<br>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<br>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<br>JB100 |

## Revision History

| Revision | Date      | Content   |
|----------|-----------|-----------|
| 1        | 2022/1/20 | New issue |