# PRODUCT SPECIFICATION

**TITLE**

## 2.4/5GHz SMT Chip Antenna

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# 2.4/5GHz SMT Chip Antenna

## 1.0 SCOPE

This Product Specification covers the mechanical, electrical and environmental performances requirements and test methods for 2.4/5GHz SMT chip antenna.

## 2.0 PRODUCT DESCRIPTION

### 2.1 PRODUCT NAME AND SERIES NUMBER

Product name: 2.4/5GHz SMT Chip Antenna 146175-0001

### 2.2 Design and Construction

Antenna shall be of the design, construction and physical dimensions specified on the applicable sales drawing.

### 2.3 Materials

a) Housing: Refer to respective Molex sales or engineering drawings
b) Plating: Refer to respective Molex sales or engineering drawings

## 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See drawings and other sections of this specification for the relevant reference documents. In cases where the specification differs from the drawings, the drawings take precedence.

## 4.0 RATINGS

### 4.1 RF POWER

2 Watts

### 4.2 TEMPERATURE

Operating: - 40°C to + 125°C
Storage : - 40°C to + 125°C

### 4.3 HUMIDITY

Storage : +15~70% RH
Test : +80~95% RH

## 5.0 PERFORMANCE

### 5.1 ELECTRICAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT | |
|---|---|---|---|---|
| 5.1.1 | Frequency Range | Measure antenna on recommended PCB through VNA E5071C | 2400MHz-2483.5MHz | 5150MHz-5850MHz |
| 5.1.2 | Return Loss | Measure antenna on recommended PCB through VNA E5071C | < -6 dB | < -6 dB |
| 5.1.3 | Peak Gain | Measure antenna on recommended PCB through OTA chamber | 3dBi | 4.2dBi |
| 5.1.4 | Avg. Total Efficiency | Measure antenna on recommended PCB through OTA chamber | >70% | >70% |
| 5.1.5 | Polarization | Measure antenna on recommended PCB through OTA chamber | Linear | Linear |
| 5.1.6 | Input Impedance | Measure antenna on recommended PCB through VNA E5071C | 50Ohms | 50Ohms |

### 5.2 MECHANICAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| 5.2.1 | Plating thickness measure | Use X-ray measure the thickness of plating | The plating thickness spec: Cu 12~16um; Ni 1~2.5um; Au 0.1~0.2um. |
| **5.2.2** | Cross cut Test | Cross cut adhesion test Testing is performed in accordance with ASTM D-3359-93 | Acceptance criteria > 2B as acceptance, <35% peeling off. |

### 5.3 RELIABILITY REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| **5.3.1** | Peeling Force | Apply six axial peeling force on parts soldered on the PCB at the speed rate of 25±3 mm/minute | 8 N Min |
| **5.3.2** | Solderability testing | Dip solder tails into the molten solder (held at 245+-5°C for 5s) | Solder coverage: 95% Min. |

### 5.4 ENVIRONMENTAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| **5.4.1** | **Humidity Test** | 1.Test condition:<br>The device under test is kept for 12 hours in an environment with a temperature of 55 degrees and a relating humidity of 95%. Thereafter for 12 Hours in an environment with a temperature of 25 degrees and a relative humidity of 95%. The cycle is repeated until a total of 6 cycles have been completed. Hereafter the conditions are stabilized at room temperature. | 1) Parts should meet RF spec before and after test.<br>2） No cosmetic problem |
| **5.4.2** | **Temperature cycling test** | 1.Test condition:<br>The device under test at -40 ℃⇔125 ℃ by 72 cycles, Dwell of 30 mins, tranistion time between Dwell 15 secs (~ 61 mins / cycle ) and each item should be measured after exposing them in normal temperature and humidity for 24 h. | 1) Parts should meet RF spec before and after test.<br>2） No cosmetic problem |
| **5.4.3** | **Salt mist test** | 1.Test condition:<br>The device under test is exposed to a spray of a 5% (by volume) resolution of Nacl in water for 2 hours. Thereafter the device under test is left for 1 week in room temperature at a relative humidity of 95%. The cycle is repeated until a total of 2 cycles have been completed. Here after the conditions are stabilized at room temperature. | 1) Parts should meet RF spec before and after test.<br>2) No visible corrosion. Discoloration accept. |
| **5.4.4** | **HNO3 Test** | General test condition | 1) No corrosion. |

The meaning of text "**No mechanical damage**" in the table above is:

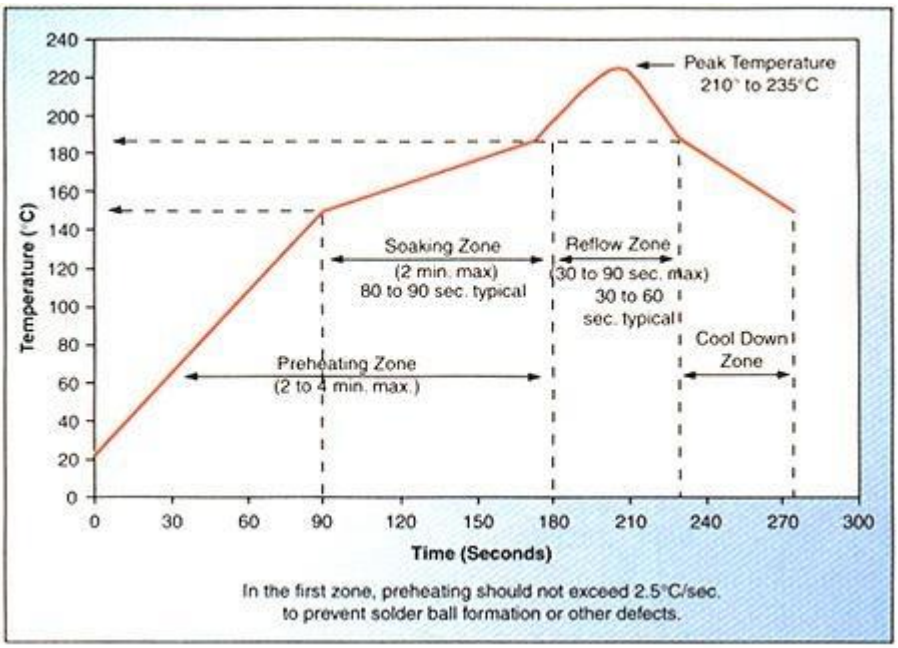
a. no soldering problem
b. no adhesion problem of glue
c. no peel off of plating

### 6.0 TEST GROUPINGS

Note: All test specimens (except group 5) shall pass the reflow process for 3 times.

| Test Item | Description | Group1 | Group2 | Group3 | Group4 | Group5 | Group6 |
|---|---|---|---|---|---|---|---|
| 5.3.1 | Peeling Force | X | | | | | |
| 5.3.2 | Solderability testing | | X | | | | |
| 5.4.1 | Humidity Test | | | X | | | |
| 5.4.2 | Temperature cycling test | | | | X | | |
| 5.4.3 | Salt mist test | | | | | X | |
| 5.4.4 | HNO3 Test | | | | | | X |
| | Sample Quantity | 5 | 5 | 5 | 5 | 5 | 5 |

## 7.0 RECOMMENDED REFLOW CONDITION




## 8.0 PACKAGING

Refer to the Molex related packaging drawings.