

# 1.6X0.8X0.5 (mm) WiFi/Bluetooth Ceramic Chip Antenna (MB1608)

## Engineering Specification

### 1. Product Number

MB 1608F06 - R

1 2 3 4 5



|                 |              |
|-----------------|--------------|
| (1)Product Type | Chip Antenna |
| (2)Size Code    | 1.6X0.8 mm   |
| (3)Type Code    | F06          |
| (4)Packing      | Paper &Reel  |
| (5)Frequency    | 2.45GHz      |



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## 2. Features

- \*Stable and reliable in performances
- \*Low temperature coefficient of frequency
- \*Low profile, compact size
- \*RoHS compliance
- \*SMT processes compatible

## 3. Applications

- \*Bluetooth earphone systems
- \*Hand-held devices when WiFi /Bluetooth functions are needed, e.g., Smart phone.
- \*IEEE802.11 b/g/n
- \*ZigBee
- \*Wireless PCMCIA cards or USB dongle

## 4. Description

LOTUS chip antenna series are specially designed for WiFi/Bluetooth applications. Based on LOTUS proprietary design and processes, this chip antenna has excellent stability and sensitivity to consistently provide high signal reception efficiency.

## 5. Electrical Specifications (80 x 40 mm<sup>2</sup> ground plane)

5-1. Electrical Table

| Characteristics    |            | Specifications      | Unit |
|--------------------|------------|---------------------|------|
| Outline Dimensions |            | 1.6x0.8x0.8         | mm   |
| Working Frequency  |            | 2400~2500           | MHz  |
| VSWR               |            | 2 Max.              |      |
| Impedance          |            | 50                  | Ω    |
| Polarization       |            | Linear Polarization |      |
| Gain               | Peak       | 2.5 (typical)       | dBi  |
|                    | Efficiency | 58 (typical)        | %    |



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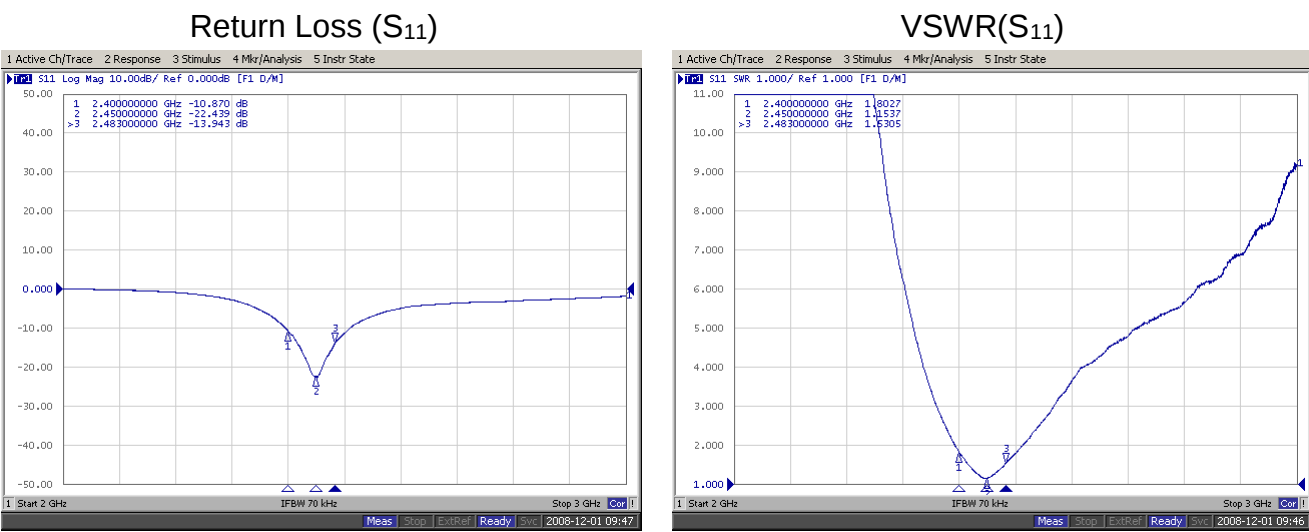
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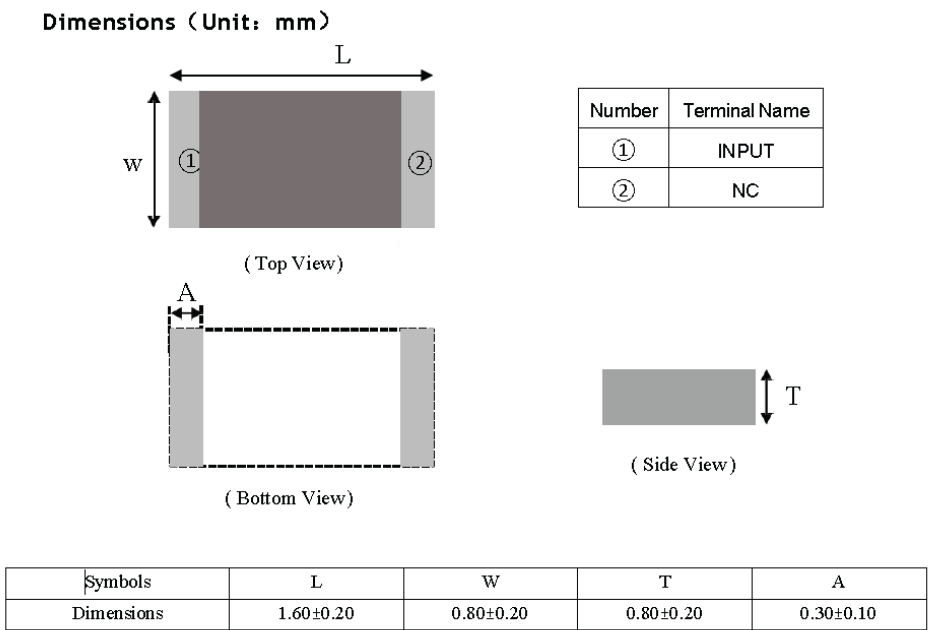
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5-2. Return Loss & VSWR



6. Antenna Dimensions & Test Board (unit: mm)

a. Antenna Dimensions

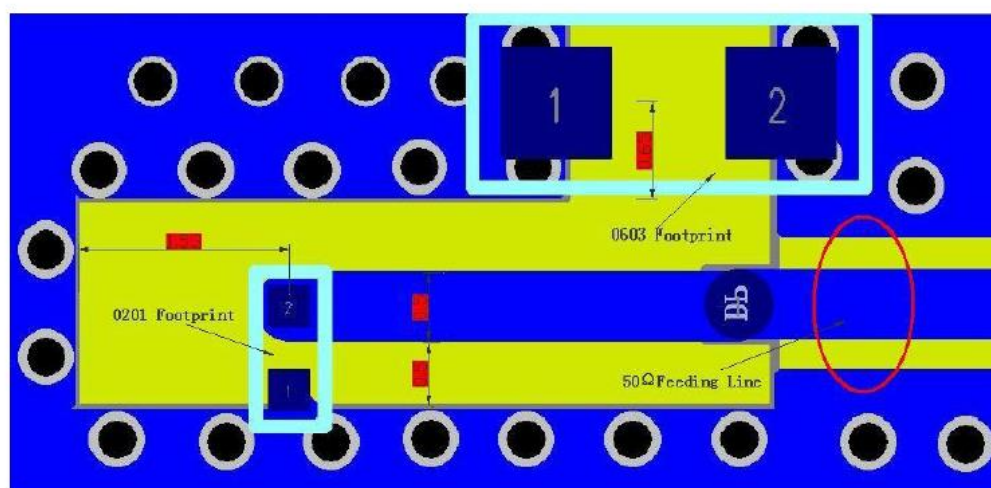
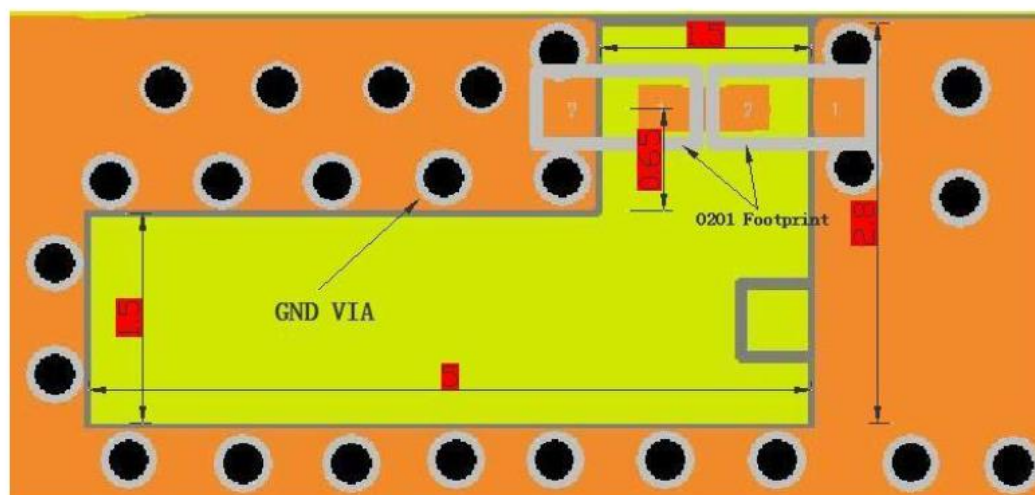


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b. Test Board with Antenna

Unit: mm



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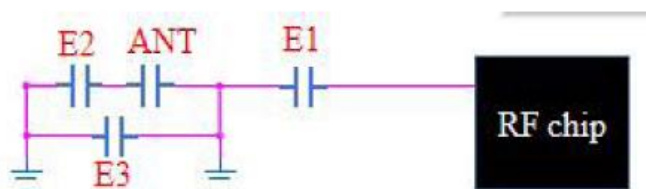
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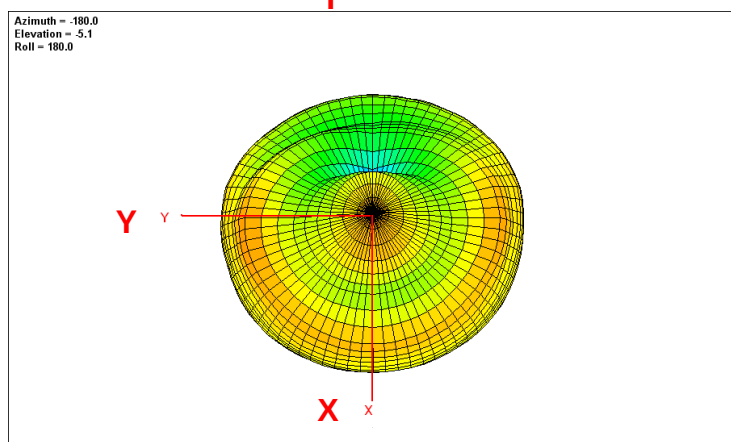
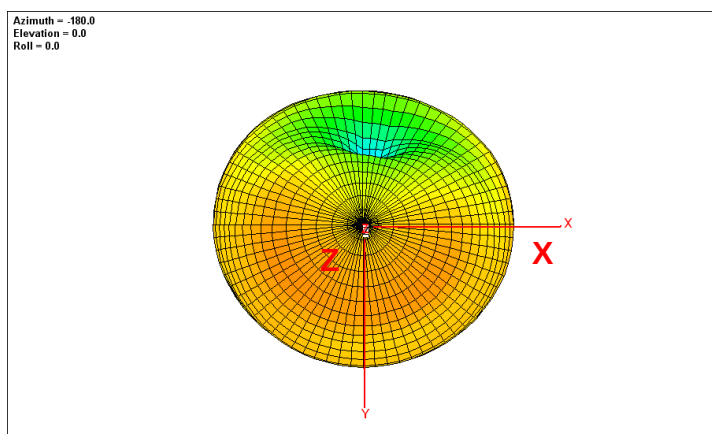
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原理图



## 7. Radiation Pattern (80 x 40 mm<sup>2</sup> ground plane)

### 7-1. 3D Gain Pattern @ 2442 MHz



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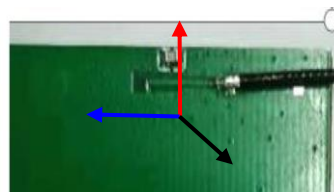
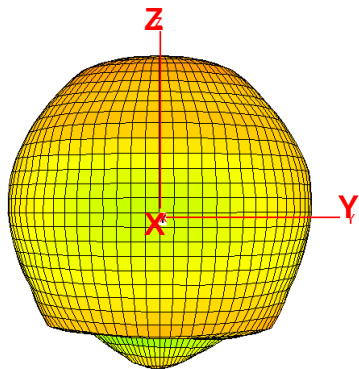
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Azimuth = 0.0  
 Elevation = -90.0  
 Roll = 180.0



## 7-2. 3D Efficiency Table

| Frequency( MHz) | 2400 | 2410 | 2420 | 2430 | 2442 | 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 (%)  | 53.8 | 54.7 | 55.3 | 56.4 | 57.5 | 58.0 | 57.0 | 56.6 | 55.1 | 54.6 | 54.5 |
| Gain (dBi)      | 2.1  | 2.2  | 2.3  | 2.4  | 2.5  | 2.5  | 2.4  | 1.8  | 1.7  | 1.6  | 1.4  |



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### Temperature Cycle Test

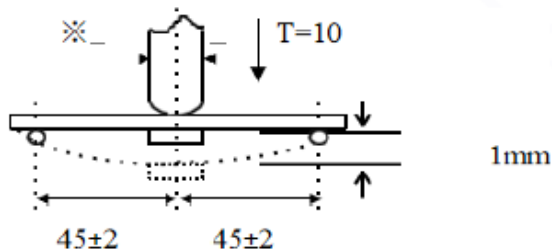
10 ± 1 S Applied Force: 5 N Duration: 10 ± 1 S  
Preheating conditions: up-category temperature, 1 h  
Recovery time: 24 ± 1 h  
Initial Measurement  
Cycling Times: 5 times, 1 cycle, 4 steps:

| 阶段  | 温度(℃)                                     | 时间(分钟) |
|-----|-------------------------------------------|--------|
| 第1步 | 下限温度( $\text{C}_{\text{VIB-21 ZH}}=30$ )  | 30     |
| 第2步 | 常温(+20)                                   | 2~3    |
| 第3步 | 上限温度( $\text{C}_{\text{VIB-21 ZH}}=+27$ ) | 30     |
| 第4步 | 常温(+20)                                   | 2~3    |

### Resistance to Soldering Heat

Preheating: 80 to 120°C; 10~30s. Solder Temperature: 235±5°C; Duration: 2±0.5s. Solder Temperature: 245±5°C  
Duration: 2±0.5s, Preheating: 100 to 200°C; 10±2min.  
Solder Temperature: 265±5°C; Duration: 10±1s  
Clean the capacitor with solvent and examine it with a 10X(min.) microscope.  
Recovery Time: 24±2h  
Recovery condition: Room temperature

### Resistance to Flexure of Substrate



Test Board: Al<sub>2</sub>O<sub>3</sub> or PCB    Warp: 1mm    Speed: 0.5mm/sec.  
Unit: mm

The measurement should be made with the board in the bending position.



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## Dependability Test

|                       |             |
|-----------------------|-------------|
| Test Temperature      | 25°C ± 3°C  |
| Operating Temperature | -25°C~+85°C |
| Temperature           | 5~40°C      |
| Relative Humidity     | 20~70%      |

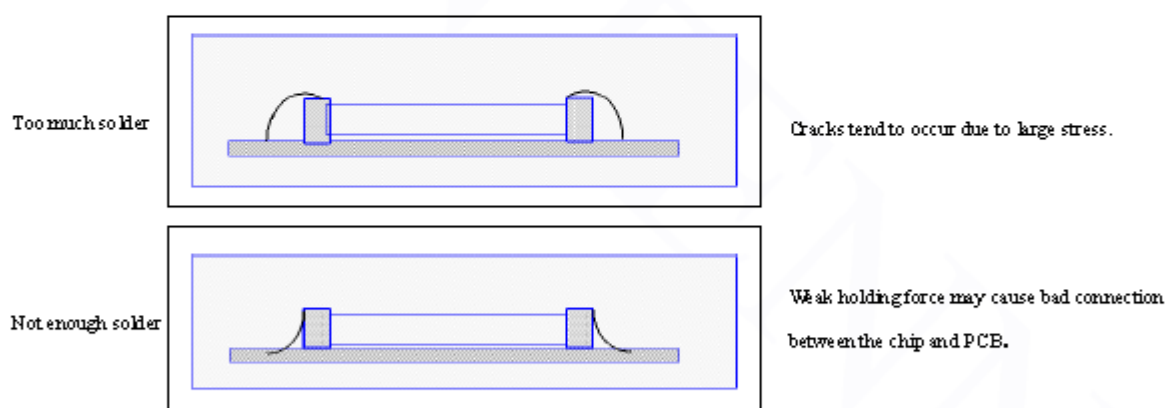
## Moisture Proof

Temperature: 40 ± 2°C Humidity: 90~95%RH  
Duration: 500h  
Recovery conditions: Room temperature Recovery Time: 24h (Class1) or 48h (Class2)

## Solderability

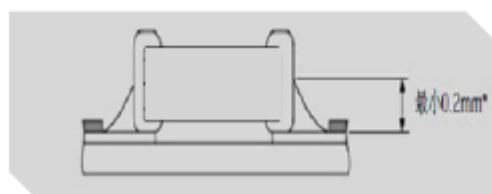
At least 95% of the terminal electrode is covered by new solder.  
Preheating conditions: 80 to 120°C; 10~30s.  
Solder Temperature: 235 ± 5°C Duration 2 ± 0.5s, Solder Temperature 245 ± 5°C Duration 2 ± 0.5s

## Optimum Solder Amount for Reflow Soldering

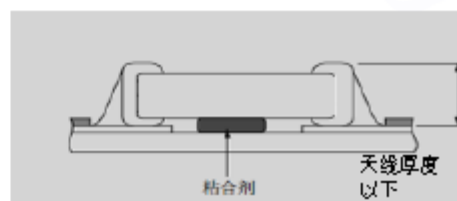


## Recommended Soldering Amounts

The optimal solder fillet amounts for re-flow soldering



The optimal solder fillet amounts for wave soldering



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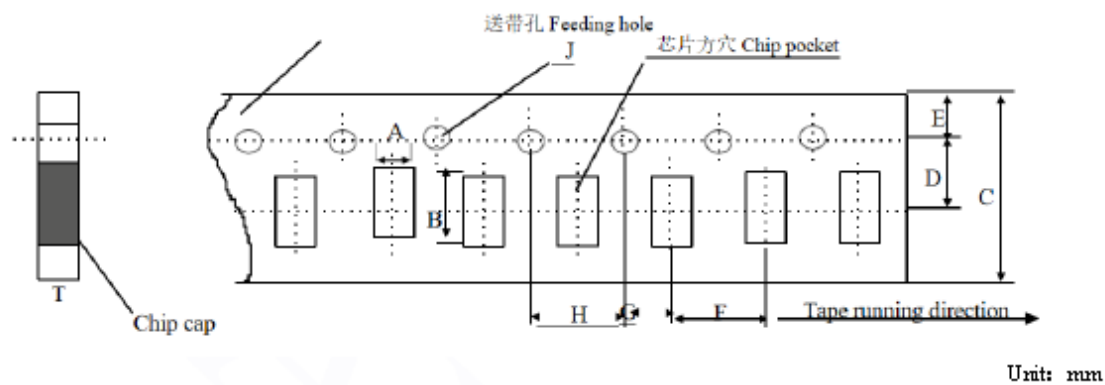
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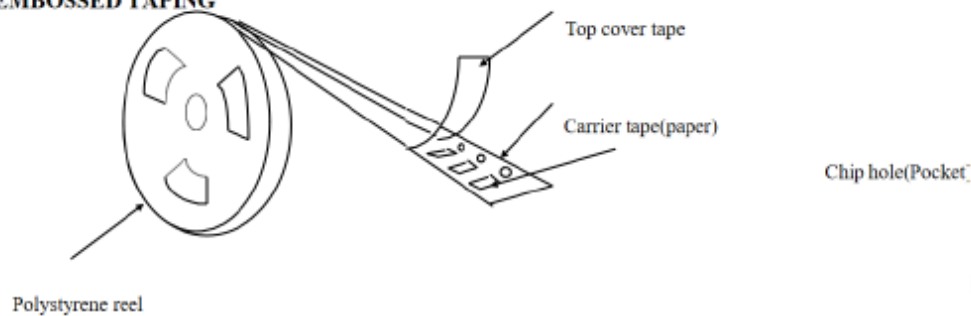
Dimensions of paper taping



| 代号 Code<br>纸带规格<br>papersize | A             | B             | C             | D*            | E             | F             | G*            | H             | J                | T           |
|------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|-------------|
| 尺寸                           | 1.10<br>±0.10 | 1.90<br>±0.10 | 8.00<br>±0.10 | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50<br>+0/-0.10 | 1.10<br>Max |

Reel (4000 pcs/Reel)

EMBOSED TAPING



Storage Period

The guaranteed period for solderability is 6 months (Under deliver package condition).  
Temperature: 5~40°C /Relative Humidity: 20~70%



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