

1.6X0.8X0.5 (mm) WiFi/Bluetooth Ceramic Chip Antenna (MB1608H1) Engineering

Specification 1. Product Number

| | | | | |
|----|------|----|-----|----|
| MB | 1608 | H1 | -01 | -R |
| 1 | 2 | 3 | 4 | 5 |



2. Features

| | |
|-----------------|-----------------|
| (1)Product Type | Ceramic Antenna |
| (2)Size Code | 1.6x0.8x0.5mm |
| (3)Type Code | H1 |
| (4)Packing | Paper &Reel |
| (5)Frequency | 2.45GHz |



Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGY CO., LTD

TITLE : 1.6x 0.8 x0.5(mm) WiFi/Bluetooth Ceramic Chip
Antenna (MB1608H1) Engineering Specification

DOCUMENT
NO.

MB1608H1-01-R

REV.
A

- *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

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

5. Electrical Specifications (40 x 40 mm² ground plane)

5-1. Electrical Table

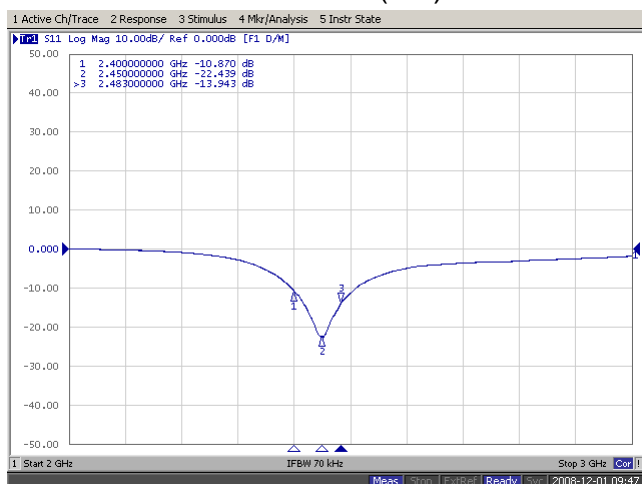
| Characteristics | | Specifications | Unit |
|--------------------|------------|---------------------|------|
| Outline Dimensions | | 1.6x0.8x0.5 | mm |
| Working Frequency | | 2400~2500 | MHz |
| VSWR | | 2 Max. | |
| Impedance | | 50 | Ω |
| Polarization | | Linear Polarization | |
| Gain | Peak | 1.5 (typical) | dBi |
| | Efficiency | 65 (typical) | % |



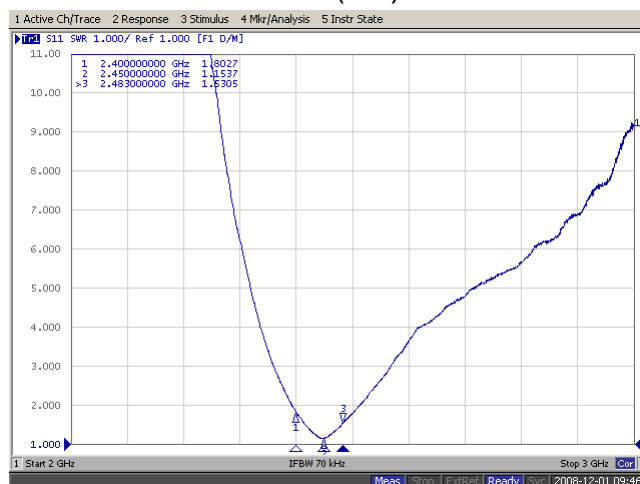
Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGY CO., LTD

5-2. Return Loss & VSWR

Return Loss (S_{11})



VSWR(S_{11})



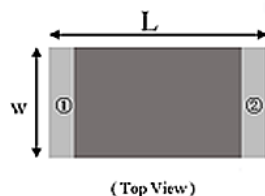
6. Antenna Dimensions (unit: mm)

a. Antenna Dimensions

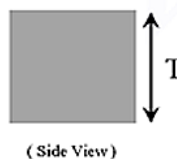
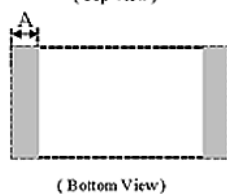
Applications

1. Bluetooth
2. Wireless LAN
3. ISM band 2.4GHz wireless applications

Dimensions (Unit: mm)



| Number | Terminal Name |
|--------|---------------|
| ① | INPUT |
| ② | NC |



| Symbols | L | W | T | A |
|------------|-------------|-------------|------------|-------------|
| Dimensions | 1.60 ± 0.20 | 0.80 ± 0.20 | 0.5 ± 0.20 | 0.30 ± 0.10 |



Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGY CO., LTD

**TITLE : 1.6x 0.8 x0.5(mm) WiFi/Bluetooth Ceramic Chip
Antenna (MB1608H1) Engineering Specification**

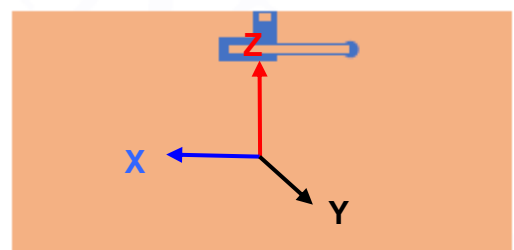
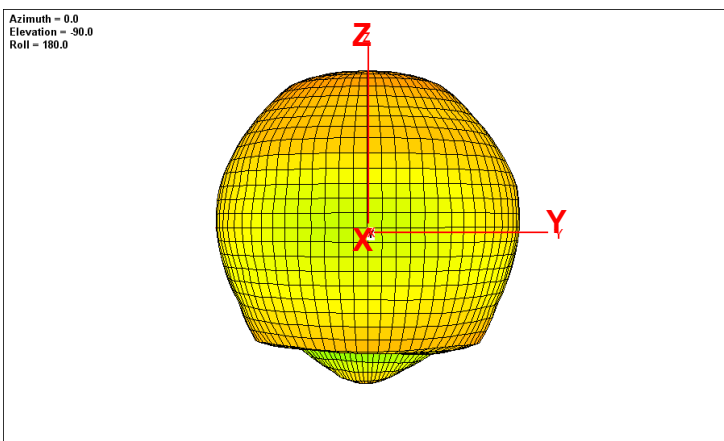
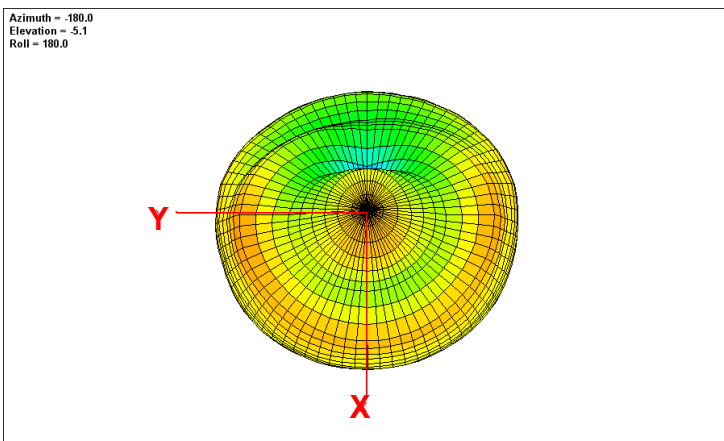
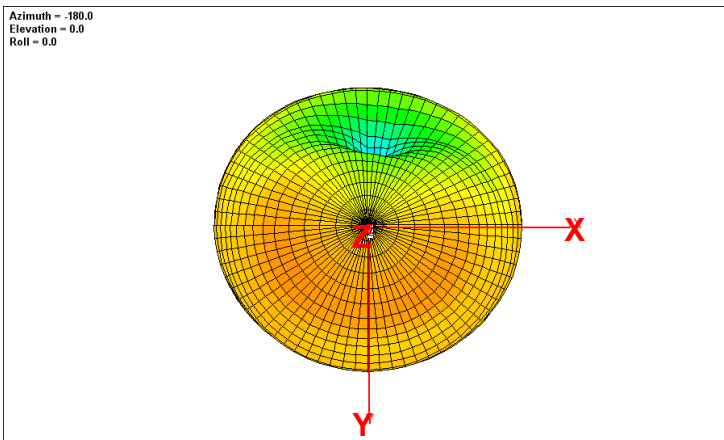
**DOCUMENT
NO.**

MB1608H1-01-R

**REV.
A**

7. Radiation Pattern (80 x 40 mm² ground plane)

7-1. 3D Gain Pattern @ 2442 MHz



Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGY CO., LTD

TITLE : 1.6x 0.8 x0.5(mm) WiFi/Bluetooth Ceramic Chip
Antenna (MB1608H1) Engineering Specification

DOCUMENT
NO.

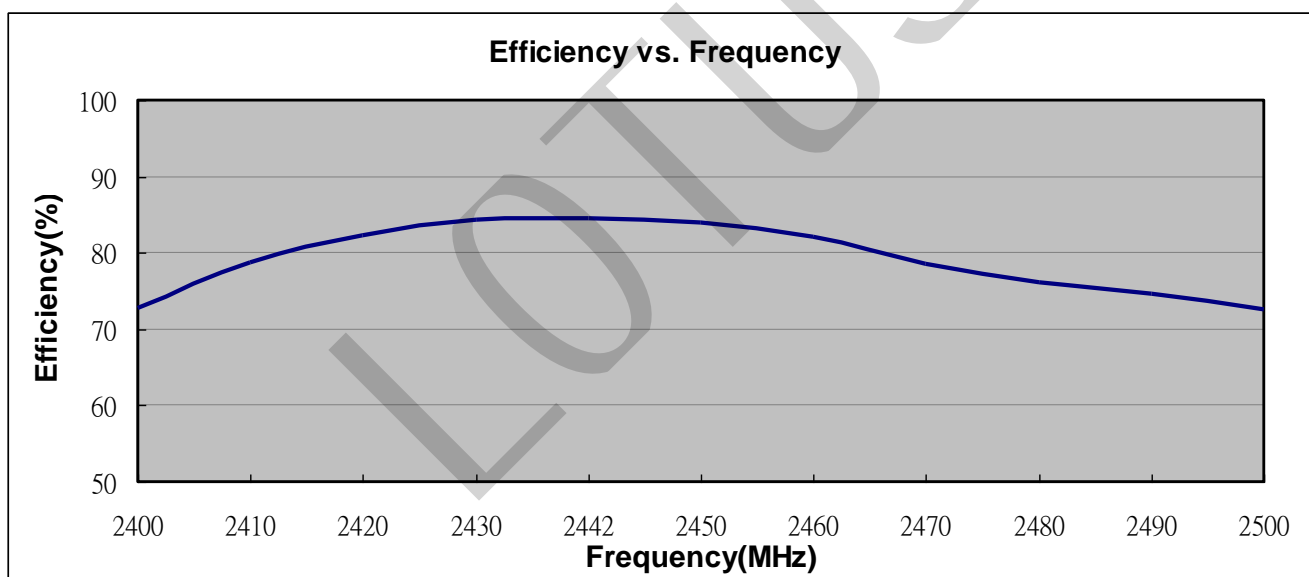
MB1608H1-01-R

REV.
A

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 (%) | 62.8 | 63.7 | 64.3 | 64.4 | 65.5 | 65.0 | 64.0 | 63.6 | 63.1 | 62.6 | 61.5 |
| Gain (dBi) | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 |

7-3. 3D Efficiency vs. Frequency



8. Layout Guide

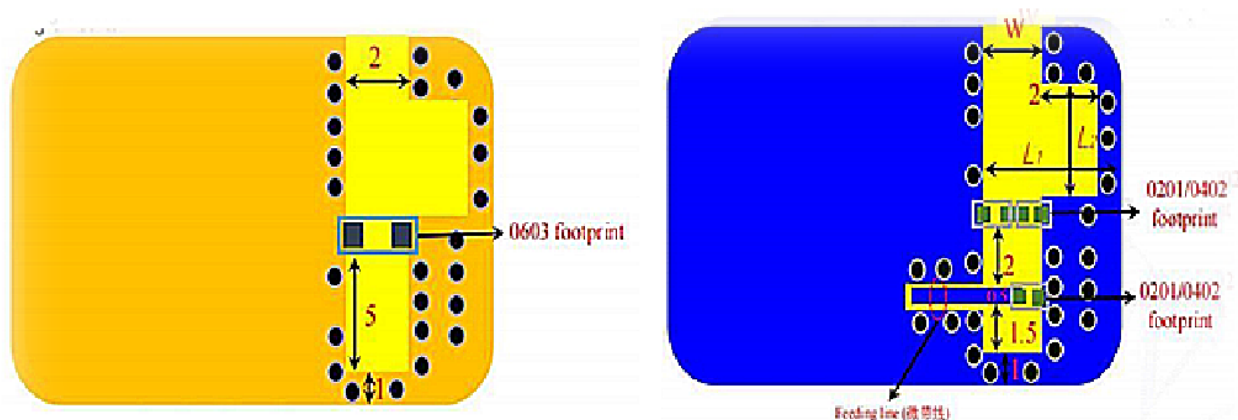
a. Solder Land Pattern:

Land pattern for soldering (gray marking areas) is as shown below. Depending on



LOTUS ANTENNA TECHNOLOGY CO., LTD

Customer's requirement, matching circuit as shown below is also recommended.



Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGY CO., LTD

TITLE : 1.6x 0.8 x0.5(mm) WiFi/Bluetooth Ceramic Chip
Antenna (MB1608H1) Engineering Specification

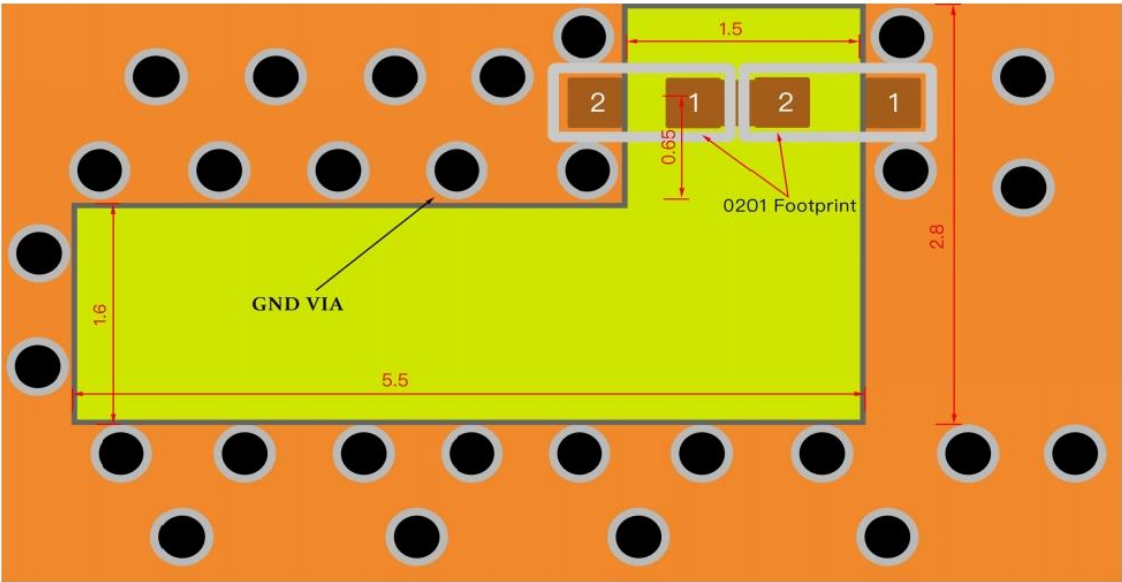
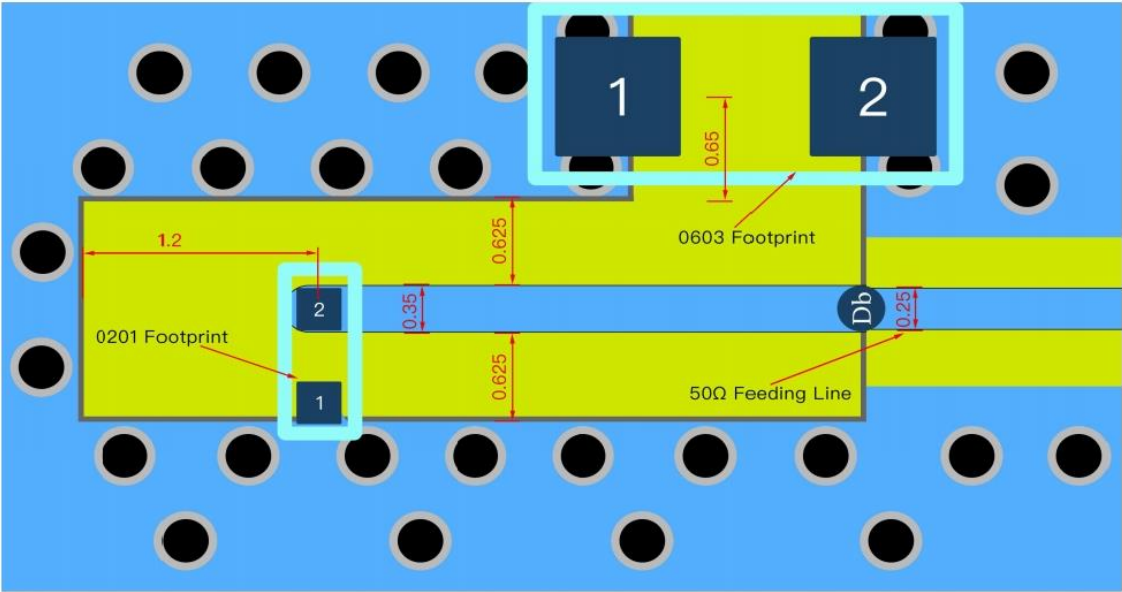
**DOCUMENT
NO.**

MB1608H1-01-R

**REV.
A**

PAGE 6 OF 11

Evaluation Board and Matching Circuits



Bottom View

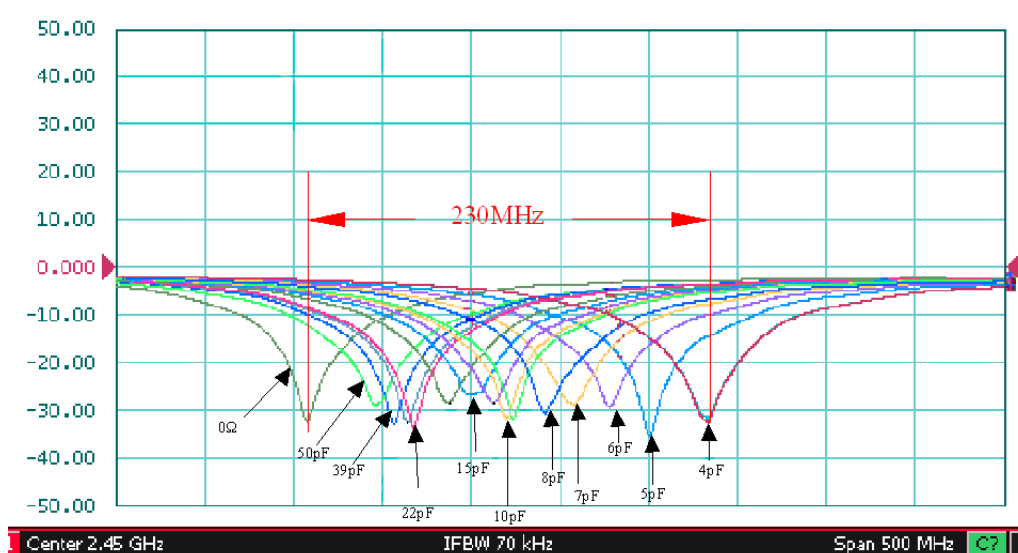
Unit : mm

c. Fine tuning element vs. Center frequency



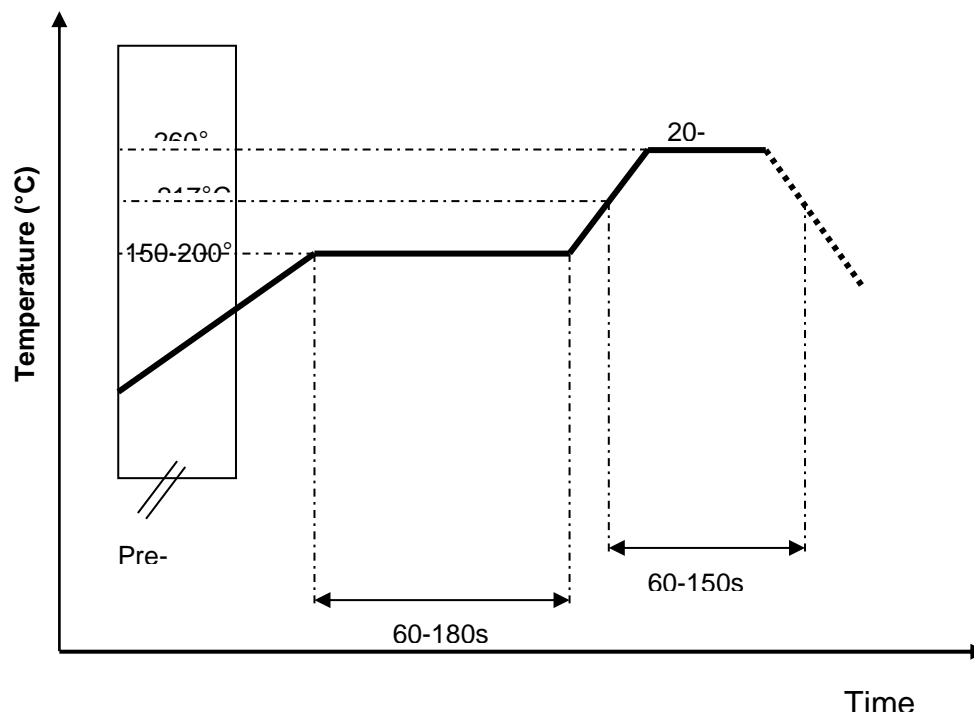
Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGY CO., LTD

| | | | |
|--|--------------|---------------|------|
| TITLE : 1.6x 0.8 x0.5(mm) WiFi/Bluetooth Ceramic Chip Antenna (MB1608H1) Engineering Specification | DOCUMENT NO. | MB1608H1-01-R | REV. |
| | | | A |
| PAGE 7 OF 11 | | | |



9. Soldering Conditions

a. Typical Soldering Profile for Lead-free Process

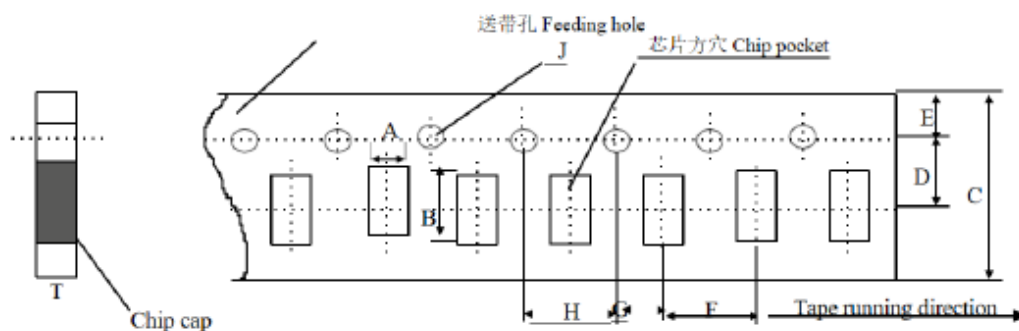


Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGY CO., LTD

Packing

- (1) Quantity/Reel: 5000 pcs/Reel
- (2) Plastic tape:

Dimensions of paper taping

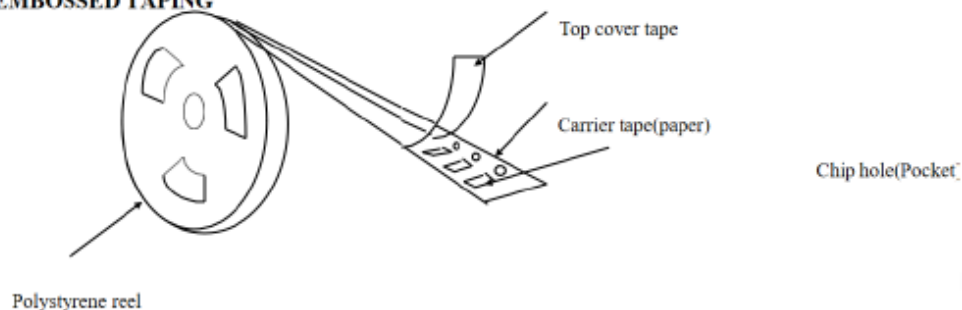


Unit: mm

| 代号 Code 纸带规格 papersize | A | B | C | D* | E | F | G* | H | J | T |
|------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------|
| 尺寸 | 1.10 ±0.10 | 1.90 ±0.10 | 8.00 ±0.10 | 3.50 ±0.05 | 1.75 ±0.10 | 4.00 ±0.10 | 2.00 ±0.10 | 4.00 ±0.10 | 1.50 ±0.10 | 1.10 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%



Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGY CO., LTD

**TITLE : 1.6x 0.8 x0.5(mm) WiFi/Bluetooth Ceramic Chip
Antenna (MB1608H1) Engineering Specification**

**DOCUMENT
NO.**

MB1608H1-01-R

**REV.
A**

Reliability Table

| Test Item | Procedure | Requirements Ceramic Type | Remark (Reference) |
|---------------------------------------|---|---|-------------------------|
| Electrical Characterization | | Fulfill the electrical specification | User Spec. |
| Thermal Shock | 1. Preconditioning: 50 ± 10°C / 1 hr, then keep for 24 ± 1 hrs at room temp. 2. Initial measure: Spec: refer Initial spec. 3. Rapid change of temperature test: -30°C to +85°C; 100 cycles; 15 minutes at Lower category temperature; 15 minutes at Upper category temperature. | No Visible Damage. Fulfill the electrical specification. | MIL-STD-202 107 |
| Temperature Cycling | 1. Initial measure: Spec: refer Initial spec. 2. 100 Cycles (-30°C to +85°C), Soak Mode=1 (2 Cycle/hours). 3. Measurement at 24 ± 2Hours after test condition. | No Visible Damage. Fulfill the electrical specification. | JESD22 JA104 |
| High Temperature Exposure | 1. Initial measure: Spec: refer Initial spec. 2. Unpowered; 500hours @ T=+85°C. 3. Measurement at 24 ± 2 hours after test. | No Visible Damage. Fulfill the electrical specification. | MIL-STD-202 108 |
| Low Temperature Storage | 1. Initial measure: Spec: refer Initial spec. 2. Unpowered; 500hours @ T= -30°C. 3. Measurement at 24 ± 2 hours after test. | No Visible Damage. Fulfill the electrical specification. | MIL-STD-202 108 |
| Solderability (SMD Bottom Side) | Dipping method: a. Temperature: 235 ± 5°C b. Dipping time: 3 ± 0.5s | The solder should cover over 95% of the critical area of bottom side. | IEC 60384-21/22 4.10 |
| Soldering Heat Resistance (RSH) | Preheating temperature: 150 ± 10°C. Preheating time: 1~2 min. Solder temperature: 260 ± 5°C. Dipping time: 5 ± 0.5s | No Visible Damage. | IEC 60384-21/22 4.10 |



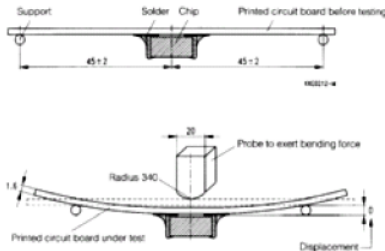
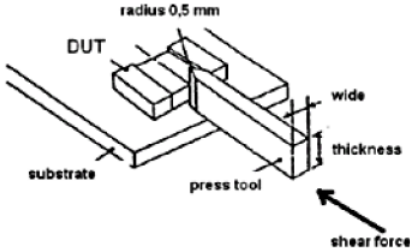
Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGYCO.,LTD

**TITLE : 1.6x 0.8 x0.5(mm) WiFi/Bluetooth Ceramic Chip
Antenna (MB1608H1) Engineering Specification**

**DOCUMENT
NO.**

MB1608H1-01-R

**REV.
A**

| | | | |
|--------------------|--|--|--------------|
| Board Flex (SMD) | <p>1. Mounting method: 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 005 |
| Adhesion | <p>Force of 1.8Kg for 60 seconds.</p>  | No Visible Damage 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 |
| Physical Dimension | 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 |



Building 6, Phase 2, Xinyuan Community, Minzhi Avenue,
Longhua New District, Shenzhen City
LOTUS ANTENNA TECHNOLOGY CO., LTD

**TITLE : 1.6x 0.8 x0.5(mm) WiFi/Bluetooth Ceramic Chip
Antenna (MB1608H1) Engineering Specification**

**DOCUMENT
NO.**

MB1608H1-01-R

**REV.
A**