

# **SPECIFICATION**

## **Chip Antenna**

**Model No. : SENA\_003**

| <b>WRITTEN</b> | <b>CHECKED</b>       | <b>APPROVED</b>      |
|----------------|----------------------|----------------------|
|                | <b>Seunghyun Kim</b> | <b>Seunghyun Kim</b> |
|                |                      |                      |

**July 22, 2009**

### **Notes**

**The contents of this data sheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.**

# 1. SPECIFICATIONS

## 1.1. Electrical Specifications

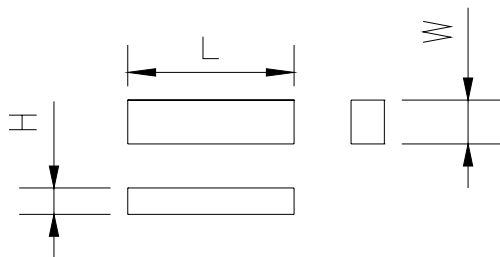
| ITEM                   | SPEC.            | Unit     |
|------------------------|------------------|----------|
| Frequency              | 2400-2485        | MHz      |
| Bandwidth @ VSWR 2.5:1 | 100              | MHz      |
| Gain Max.              | 0.3              | dBi      |
| Polarization           | Linear           |          |
| Azimuth Beam Pattern   | Omni-directional |          |
| Impedance              | 50               | $\Omega$ |

※ These values are measured on the matched reference test board.

## 1.2. Mechanical Specifications

|                        |                 |    |
|------------------------|-----------------|----|
| Electrode              | Silver          |    |
| Dimensions (L x W x H) | 9.0 x 3.0 x 1.2 | mm |
| Operating Temperature  | -35 ~ +85       | °C |

## 1.3. Appearance and Dimensions



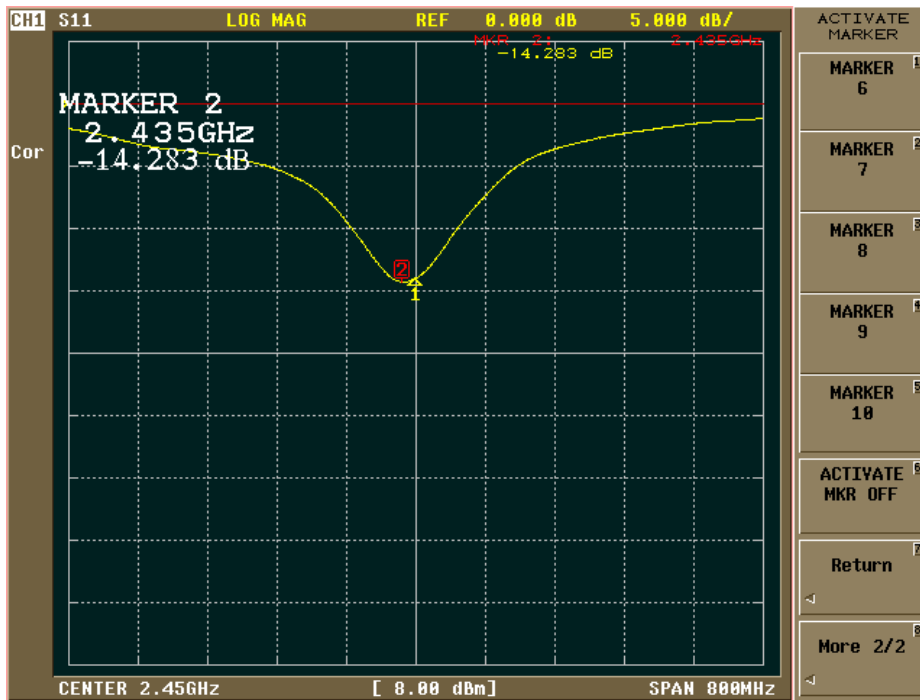
|   |     |
|---|-----|
| L | 9.0 |
| W | 3.0 |
| H | 1.2 |

- unit : mm  
- Tolerance :  $\pm 0.15$

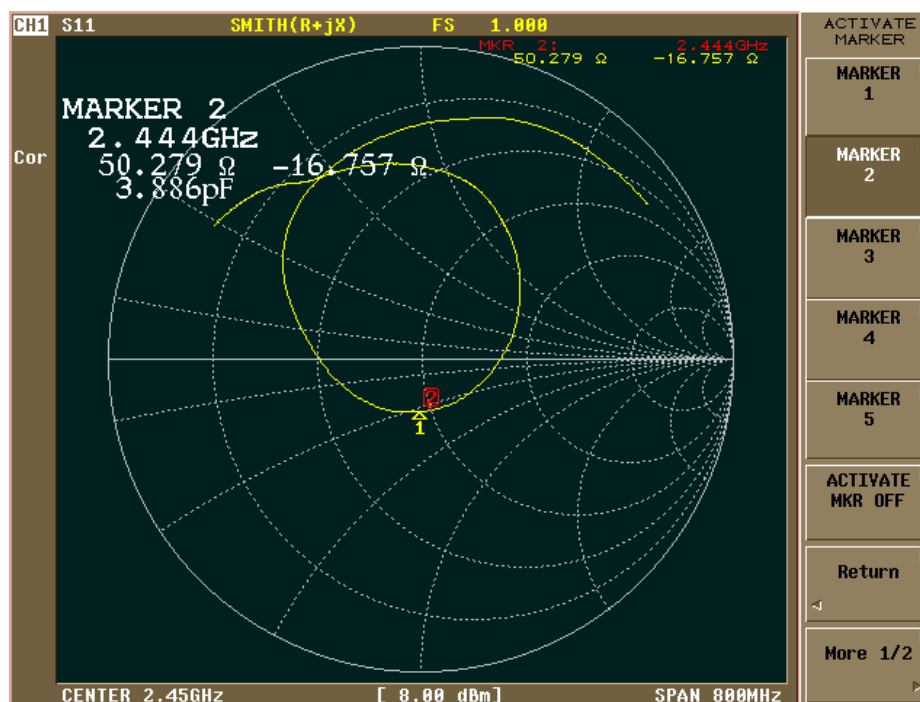
## 2. MEASUREMENT

### 2.1. Electrical Characteristic

#### A. $S_{11}$ (Return Loss)

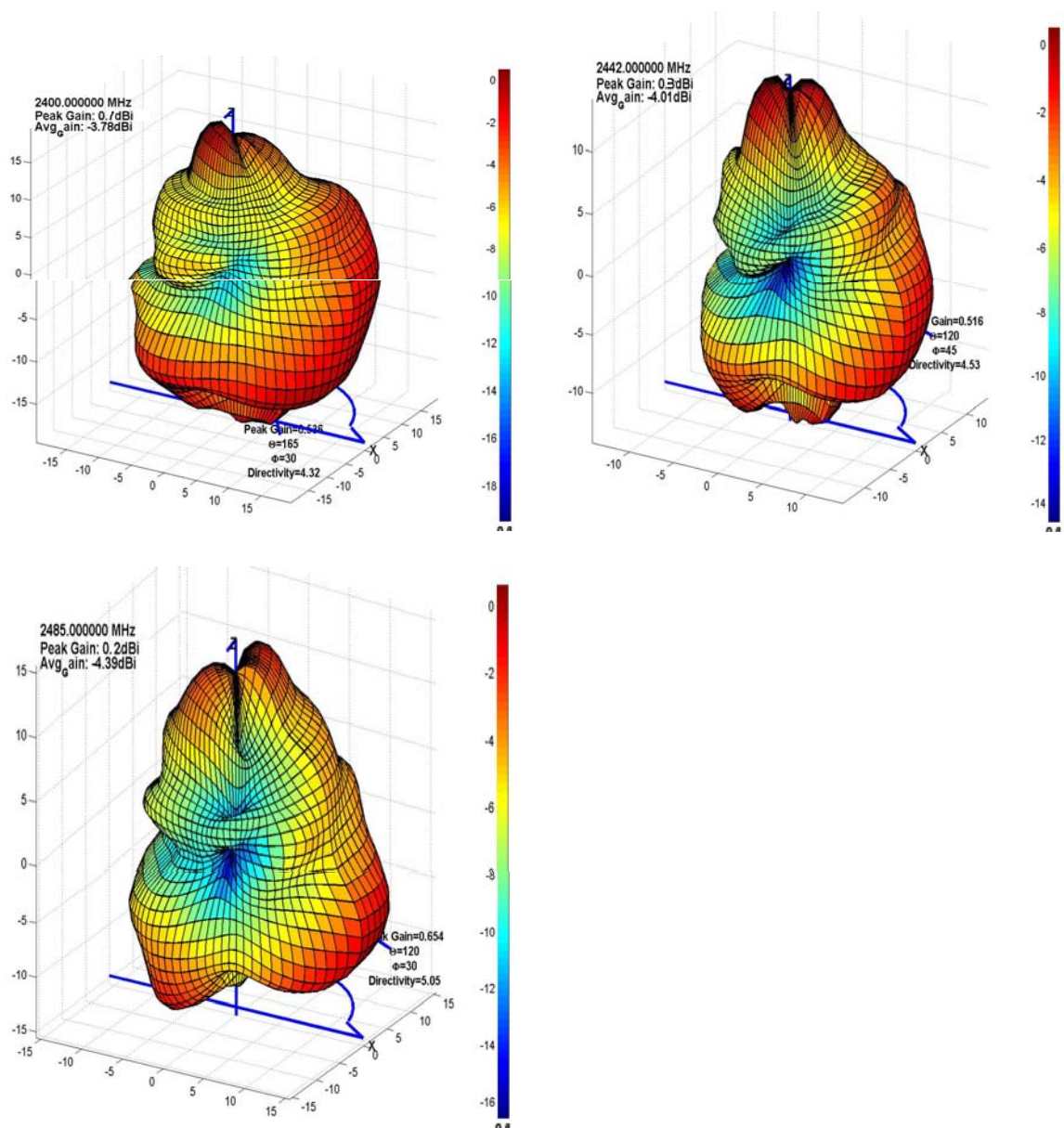


#### B. $S_{11}$ (Smith chart)

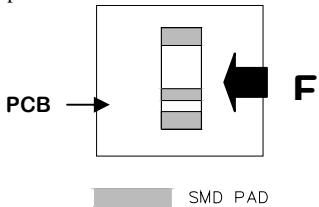


### 3. Radiation Data

| Frequency | Efficiency | Average Gain |          |          | Max Gain |          |         | Max Position   | Directivity |
|-----------|------------|--------------|----------|----------|----------|----------|---------|----------------|-------------|
|           |            | Ver          | Hor      | Total    | Ver      | Hor      | Total   |                |             |
| 2400 MHz  | 41.8 %     | -7.0 dBi     | -6.6 dBi | -3.8 dBi | 0.3 dBi  | -0.8 dBi | 0.1 dBi | Theta165/Pie30 | 4.32 dB     |
| 2442 MHz  | 39.7 %     | -6.9 dBi     | -7.2 dBi | -4.0 dBi | -0.2 dBi | -1.6 dBi | 0.3 dBi | Theta120/Pie45 | 4.53 dB     |
| 2485 MHz  | 36.3 %     | -7.1 dBi     | -7.7 dBi | -4.4 dBi | -2.2 dBi | -1.6 dBi | 0.2 dBi | Theta120/Pie30 | 5.05 dB     |



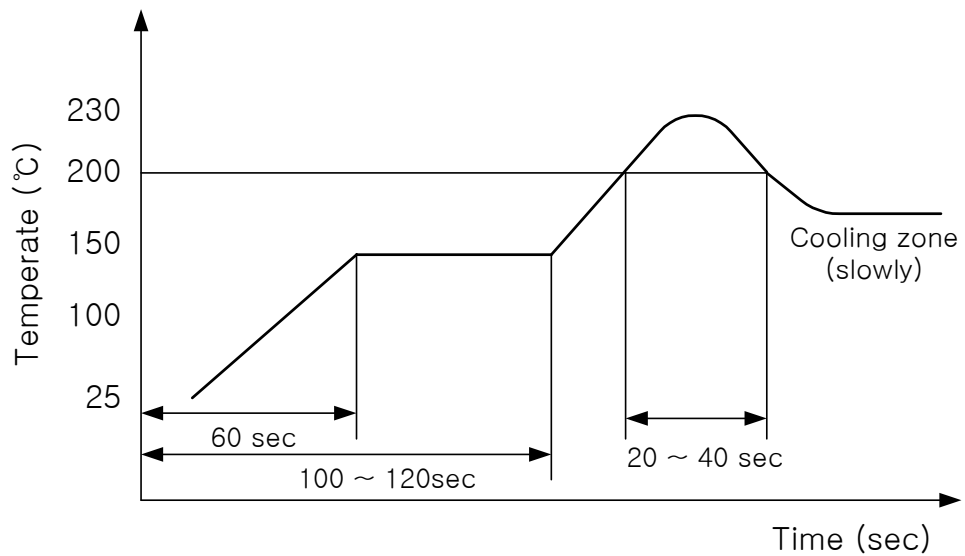
## 4. RELIABILITY TEST

| No | Item                              | Test condition  | Test Requirements  |
|----|-----------------------------------|---|--|
| 1  | Adhesion strength                 | <p>. Applied force on SMD chip till detached point from PCB</p>  <p>PCB →</p> <p>← F</p> <p>■ SMD PAD</p>  | <ol style="list-style-type: none"> <li>1. No mechanical damage by forces applied on the right</li> <li>2. Strength (F) &gt; 5 kgf</li> </ol> |
| 2  | Thermal Shock (Temperature Cycle) | <ol style="list-style-type: none"> <li>1. 1 cycle / step 1 : <math>-40 \pm 3^{\circ}\text{C}</math>, 30 min</li> <li>step 2 : <math>+85 \pm 3^{\circ}\text{C}</math>, 30 min</li> <li>2. Number of cycle : 10</li> <li>3. Measure after left for 48 hrs min. at room temperature</li> </ol> | <ol style="list-style-type: none"> <li>1. No visual damage</li> <li>2. VSWR satisfy</li> </ol>   |
| 3  | High Temperature Resistance       | <ol style="list-style-type: none"> <li>1. Temperature: <math>+85 \pm 5^{\circ}\text{C}</math></li> <li>2. Time : 96 hrs</li> <li>3. Measure VSWR<sub>C</sub> after left for 24 hrs min. at room temperature</li> </ol>  | <ol style="list-style-type: none"> <li>1. No visual damage</li> <li>2. VSWR satisfy</li> </ol>   |
| 4  | Low Temperature Resistance        | <ol style="list-style-type: none"> <li>1. Temperature: <math>-40 \pm 5^{\circ}\text{C}</math></li> <li>2. Time : 96 hrs</li> <li>3. Measure VSWR<sub>C</sub> after left for 48 hrs min. at room temperature</li> </ol>  | <ol style="list-style-type: none"> <li>1. No visual damage</li> <li>2. VSWR satisfy</li> </ol>   |
| 5  | Humidity (Steady Condition)       | <ol style="list-style-type: none"> <li>1. Humidity : 85 % RH</li> <li>1. Temperature: <math>+85 \pm 3^{\circ}\text{C}</math></li> <li>2. Time : 96 hrs</li> <li>3. Measure VSWR<sub>C</sub> after left for 48 hrs min. at room temperature</li> </ol>                                       | <ol style="list-style-type: none"> <li>1. No visual damage</li> <li>2. VSWR satisfy</li> </ol>   |
| 6  | ESD                               | <ol style="list-style-type: none"> <li>1. ESD Level : 8KV</li> <li>2. Mode : Contact discharge</li> <li>3. Number of cycle : 100</li> </ol> <p>※ Used Ref test PCB.</p>   | <ol style="list-style-type: none"> <li>1. No visual damage</li> <li>2. VSWR satisfy</li> </ol>   |

## 5. SOLDERING RECOMMENDATIONS

### 5.1. Reflow Soldering Profile

#### A. Non Pb free



#### B. Pb free

