

Preliminary

# **SPECIFICATION**

## **Chip Antenna**

**Manufacturer: Sena Technologies, Inc.**

**Part Number: SENA\_009**

<b>WRITTEN</b>	<b>CHECKED</b>	<b>APPROVED</b>
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**Sena Technologies, Inc.**

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# 1. SPECIFICATIONS

## 1.1. Electrical Specifications

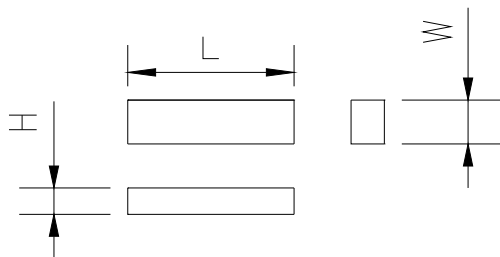
ITEM	SPEC.	Unit
Frequency	2400-2485	MHz
Bandwidth @ VSWR 2.5:1	100	MHz
Gain Max.	1	dBi
Polarization	Linear	
Azimuth Beam Pattern	Omni-directional	
Impedance	50	$\Omega$

※ 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



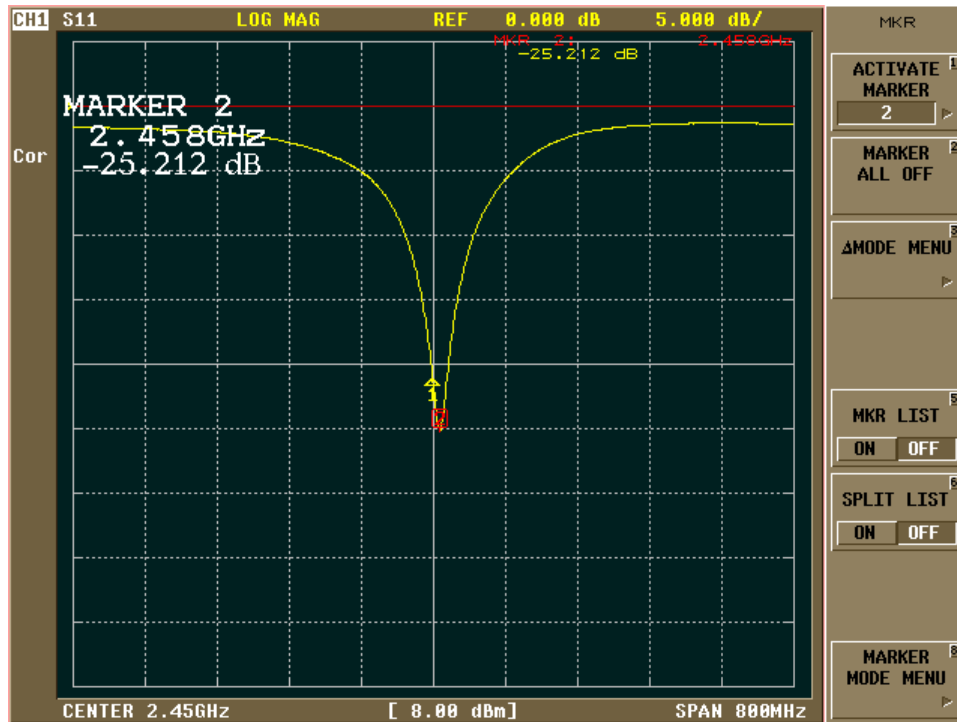
- unit : mm  
- Tolerance :  $\pm 0.15$

L	9.0
W	3.0
H	1.2

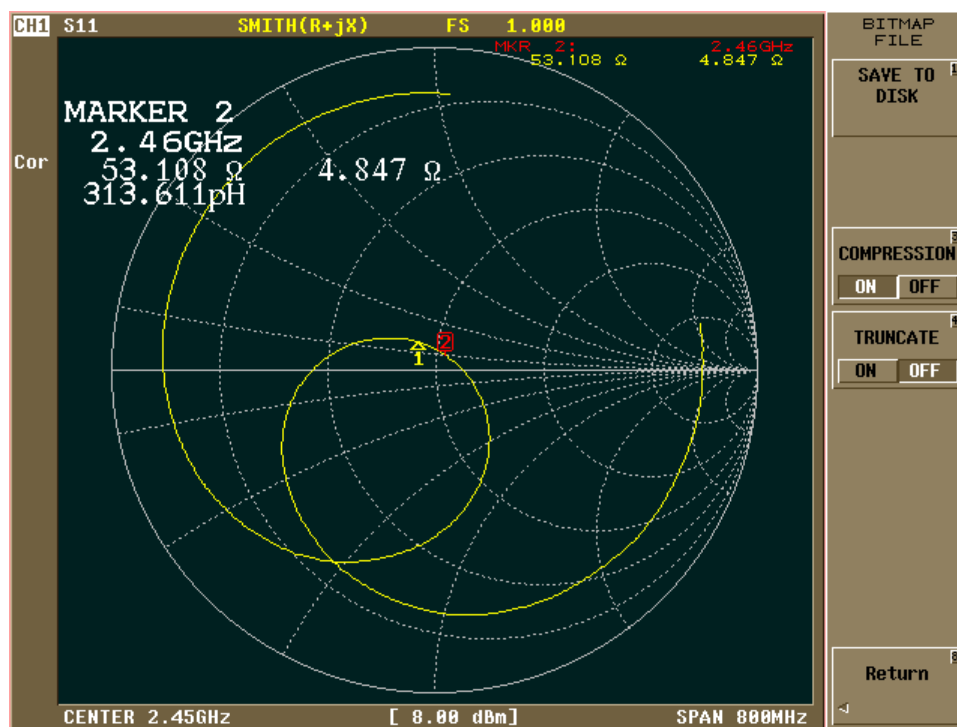
## 2. MEASUREMENT

### 2.1. Electrical Characteristic

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

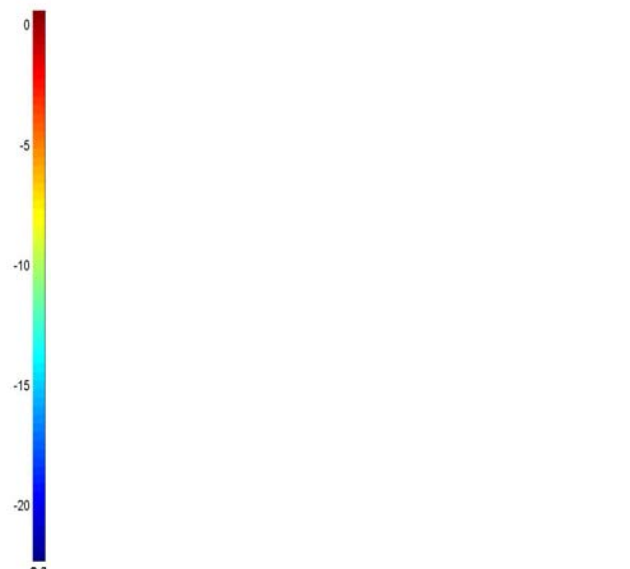
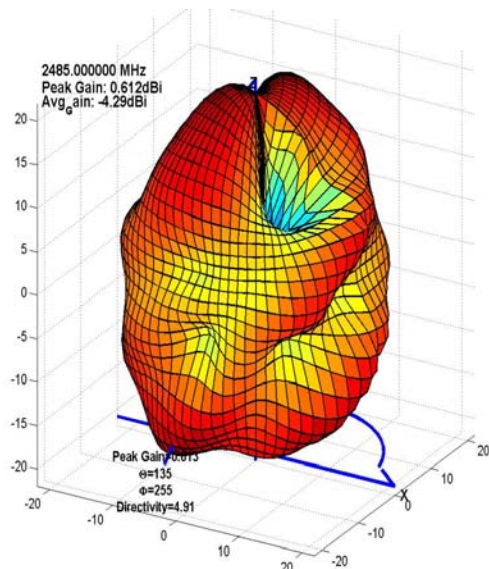
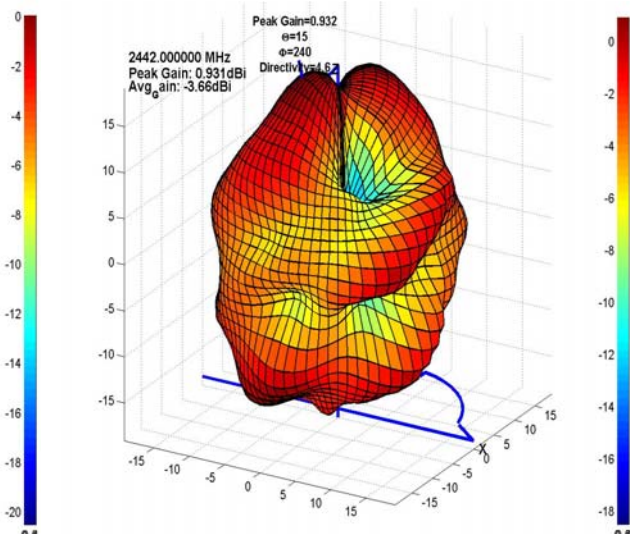
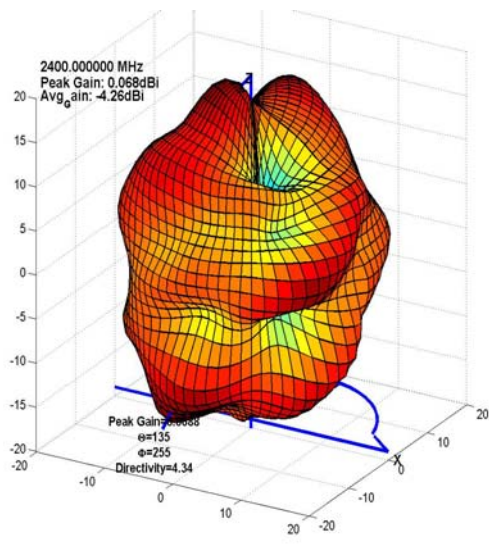


#### B. (Smith chart)

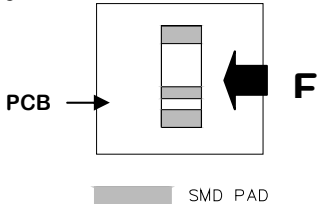
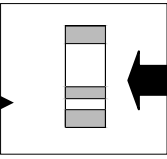



### 3. Radiation Data

Frequency	Efficiency	Average Gain			Max Gain			Max Position	Directivity
		Ver	Hor	Total	Ver	Hor	Total		
2400 MHz	37.4 %	-6.6 dBi	-8.0 dBi	-4.3 dBi	-1.1 dBi	-0.9 dBi	0.1 dBi	Theta135/Pie255	4.34 dB
2442 MHz	43.0 %	-6.0 dBi	-7.5 dBi	-3.7 dBi	-0.3 dBi	-0.1 dBi	0.5 dBi	Theta15/Pie240	4.60 dB
2485 MHz	37.2 %	-6.6 dBi	-8.1 dBi	-4.3 dBi	-0.1 dBi	-0.2 dBi	0.2 dBi	Theta135/Pie255	4.91 dB

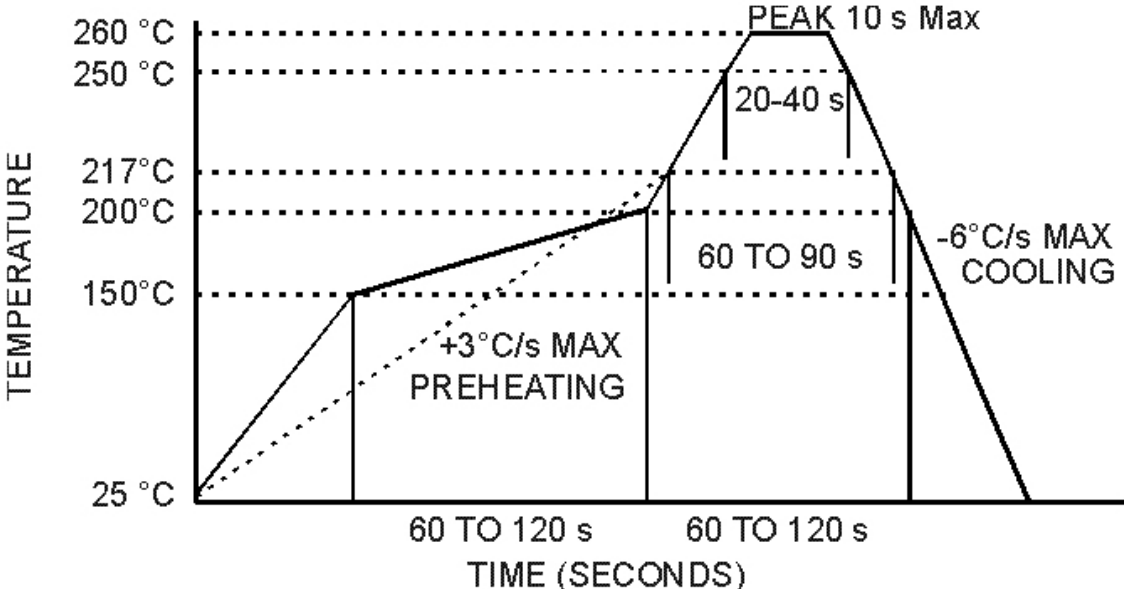


## 4. RELIABILITY TEST

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

# 5. SOLDERING RECOMMENDATIONS

## 5.1. Reflow Soldering Profile



**Note: All the through hole devices can withstand 260°C soldering by terminals only (ie wave solder or hand soldering process)**