

# Data sheet of Dielectric Chip Antenna

**Part No. : 2JE05**  
**(434, 868, 915MHz)**

## **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

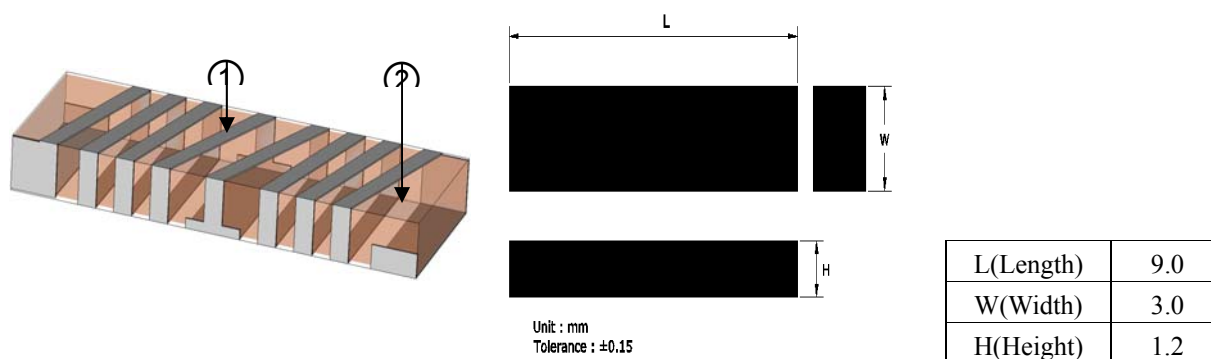
No	ITEM	SPEC.		Matching Value
1	Frequency Range	434MHz	433 ~ 435 MHz	Series1 : 100nH, Series2 : 68nH, Shunt : 5.1pF
		868MHz	867 ~ 869 MHz	Series1 : 27nH, Series2 : 6.8nH, Shunt : 4.7pF
		915MHz	902 ~ 928 MHz	Series1 : 22nH, Series2 : 8.2nH, Shunt : 4.7pF
2	VSWR	2.0 : 1 max.		
3	Gain	434MHz	Avg. -8 dBi min.	
		868MHz	Avg. -7 dBi min.	
		915MHz	Avg. -4 dBi min.	
4	Polarization	Linear		
5	Azimuth Beam Pattern	Omni-directional		
6	Impedance	Nominal 50 $\Omega$		

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

### 1.2 Mechanical Specifications

No	ITEM	Spec.	Remark
1	Electrode	Ag	Pb-free
2	Dimensions (L * W * H)	9.0 * 3.0 * 1.2	mm
3	Unit Weight	0.12 $\pm$ 0.05	g
4	Operating Temperature	-35 ~ +85	$^{\circ}$ C

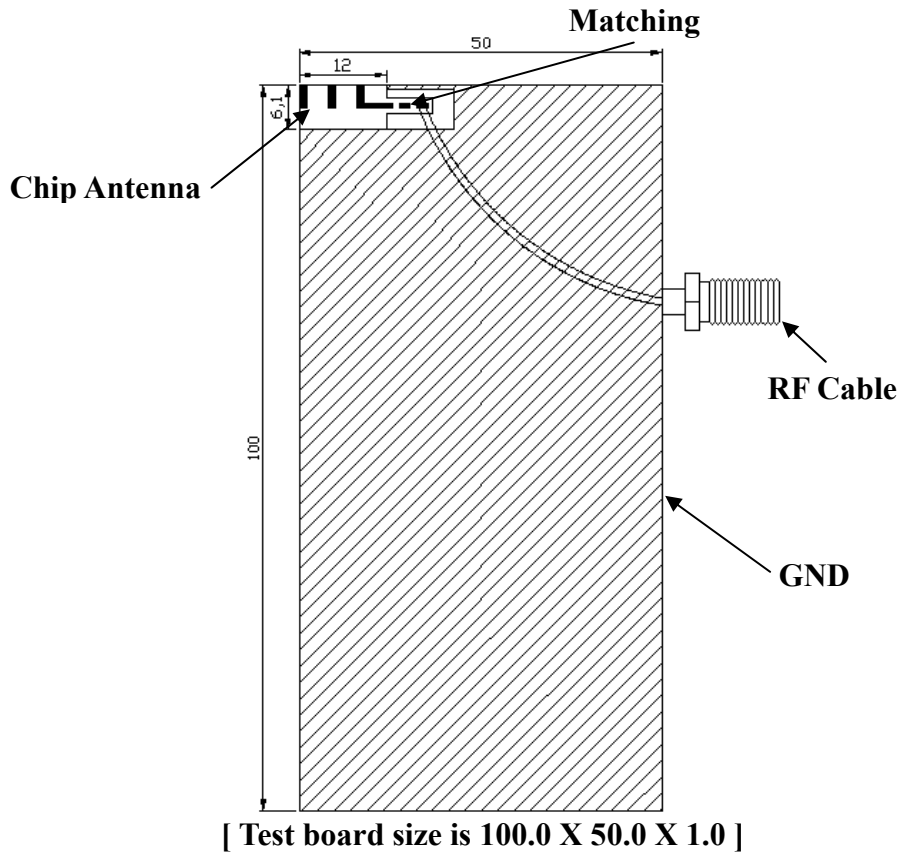
### 1.3 Appearance and Dimensions



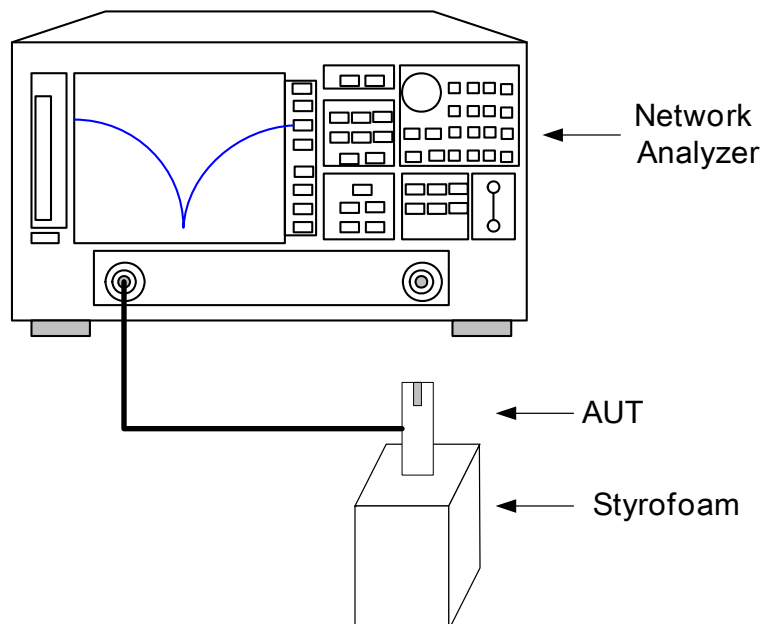
No	Name	Function	Material
1	Electrode	Radiation Element	Ag
2	Ceramic Body	-	Ceramic

## 2. MEASUREMENT

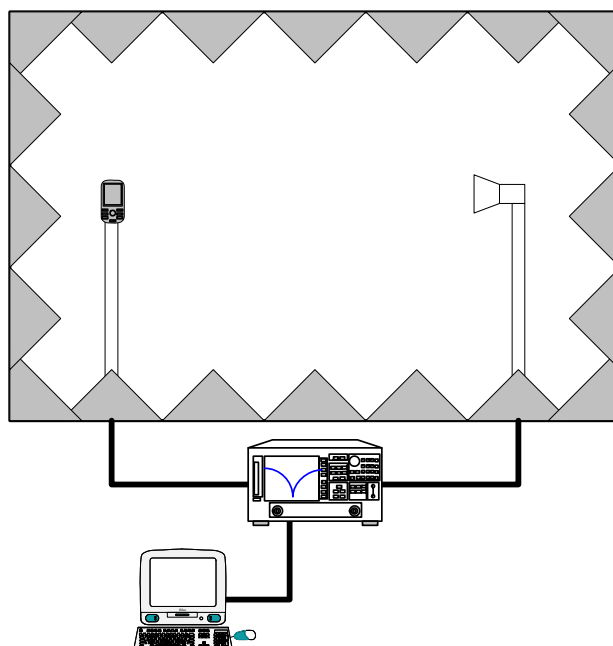
### 2.1 Reference Test Board for Measurement



### 2.2 Diagram for VSWR measurement



## 2.3 Diagram for radiation gain and pattern measurements

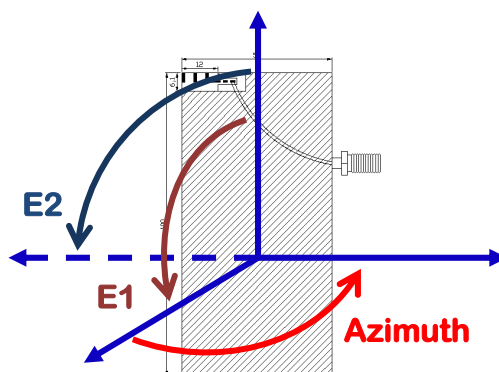


### A. Anechoic chamber spec.

Parameters	Condition	Unit
Chamber size	8x4x4	m
Temperature	21.5	°C
Humidity	55	% RH
Measurement	S21 (8753ES)	
System software	Midas (Orbit/FR)	

### B. Measurement coordinates

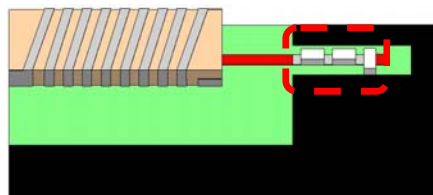
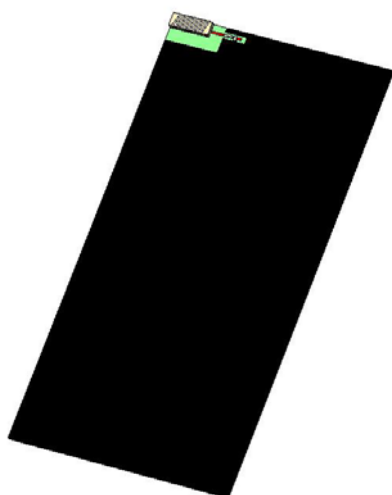
Measurement Plane	Symbol	Rotating direction
Azimuth	Azimuth	$x \rightarrow y$
Elevation1	E1	$z \rightarrow x$
Elevation2	E2	$z \rightarrow y$



### 3. MEASUREMENT RESULT

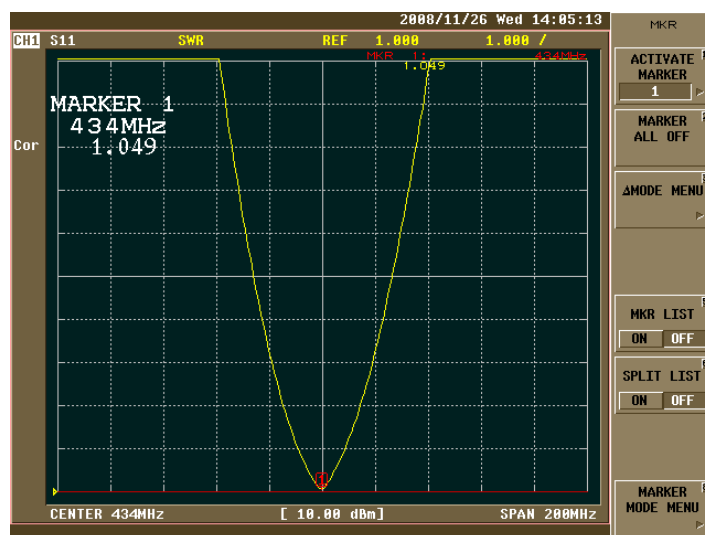
#### 3.1.1 VSWR (434MHz)

##### A. Matching Value (recommend for reference Testboard only)



Matching network	
Series L1	100 nH
Series L2	68 nH
Shunt C	5.1 pF

##### B. Measured data

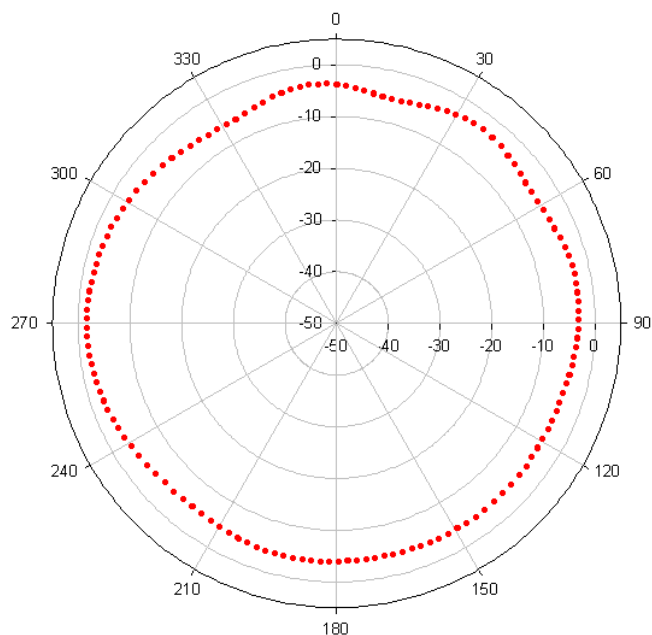


[VSWR: 434 MHz on the testboard]

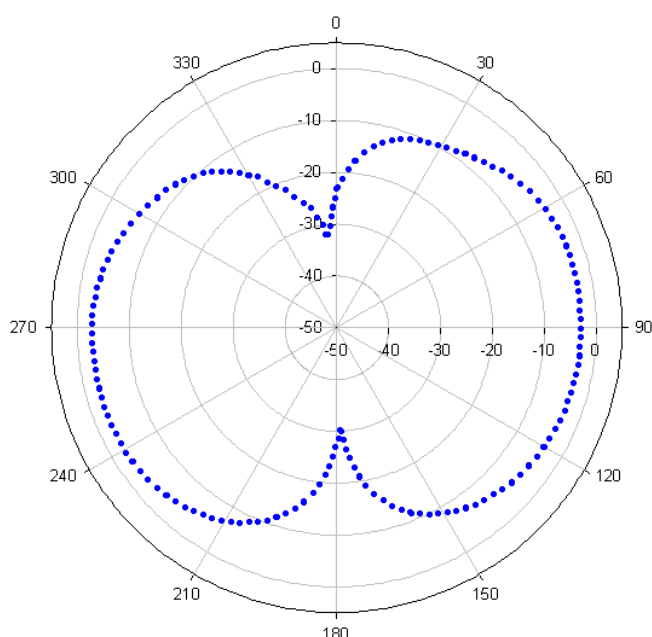
### 3.1.2 Radiation Gain and Pattern

[Measured data table]

	H-plane		E1-plane		E2-plane		Avg. Gain
Polarization	H-pol	V-pol	H-pol	V-pol	H-pol	V-pol	H+V pol
Gain (dBi)	-5.83	-16.52	-14.33	-10.01	-22.57	-9.23	-7.41



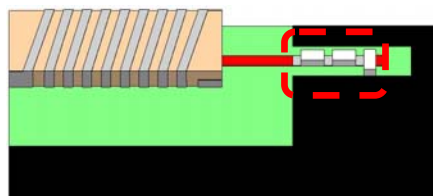
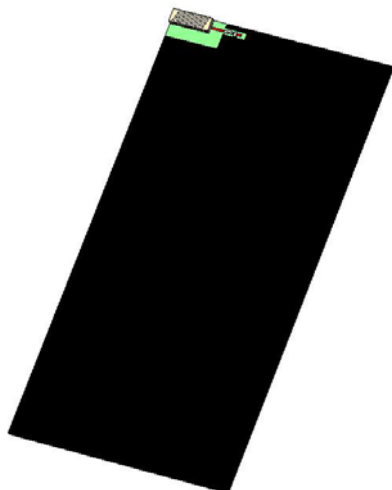
Azimuth@434MHz



Elevation@434MHz

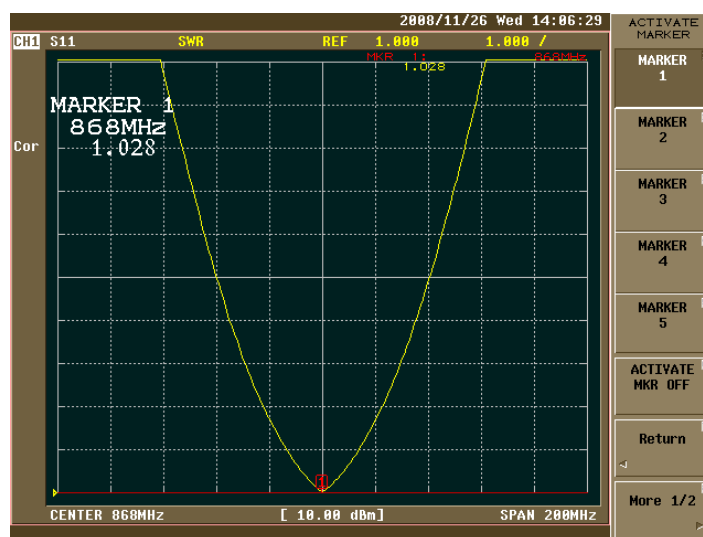
### 3.2.1 VSWR & Smithchart (868MHz)

#### A. Matching Value (recommend for reference Testboard only)



Matching network	
Series L1	27 nH
Series L2	6.8 nH
Shunt C	4.7 pF

#### B. Measured data

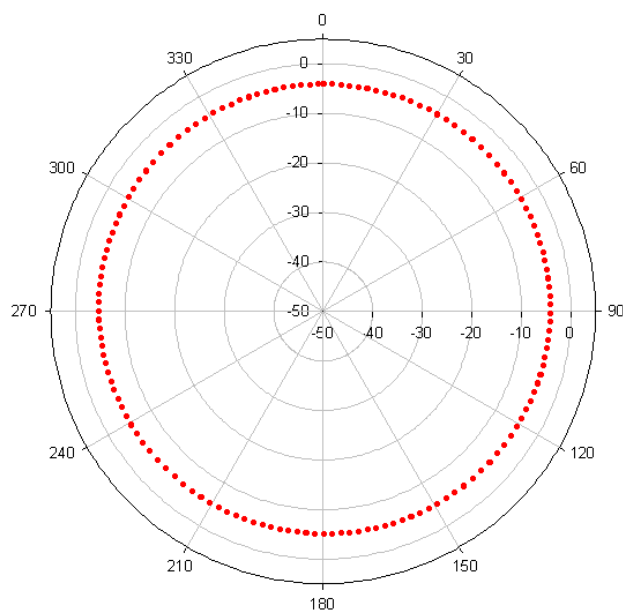


[VSWR: 868 MHz on the testboard]

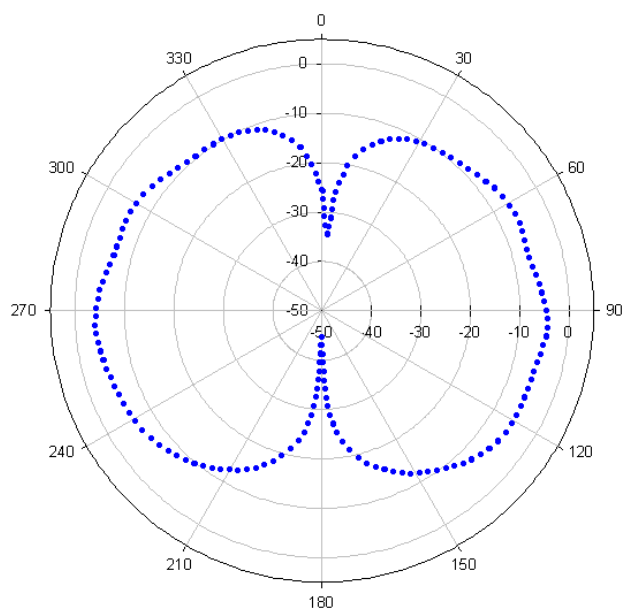
### 3.2.2 Radiation Gain and Pattern

[Measured data table]

	H-plane		E1-plane		E2-plane		Avg. Gain
Polarization	H-pol	V-pol	H-pol	V-pol	H-pol	V-pol	H+V pol
Gain (dBi)	-4.62	-19.32	-16.10	-8.59	-26.83	-8.64	-6.59



Azimuth@868MHz

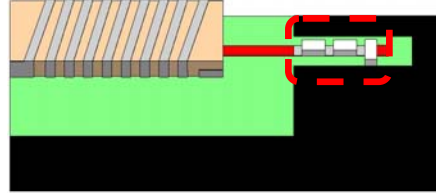
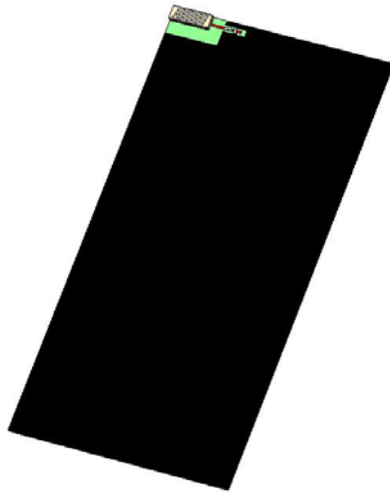


Elevation@868MHz



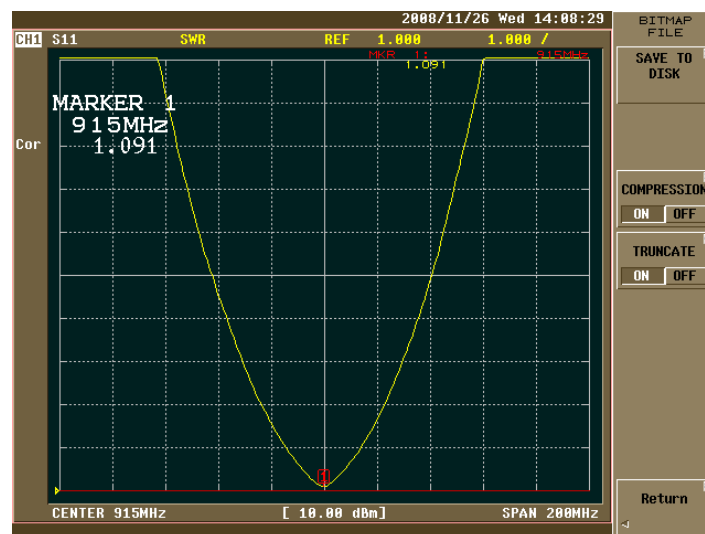
### 3.3.1 VSWR & Smithchart (915MHz)

#### A. Matching Value (recommend for reference Testboard only)



Matching network	
Series L1	22 nH
Series L2	8.2 nH
Shunt C	4.7 pF

#### B. Measured data

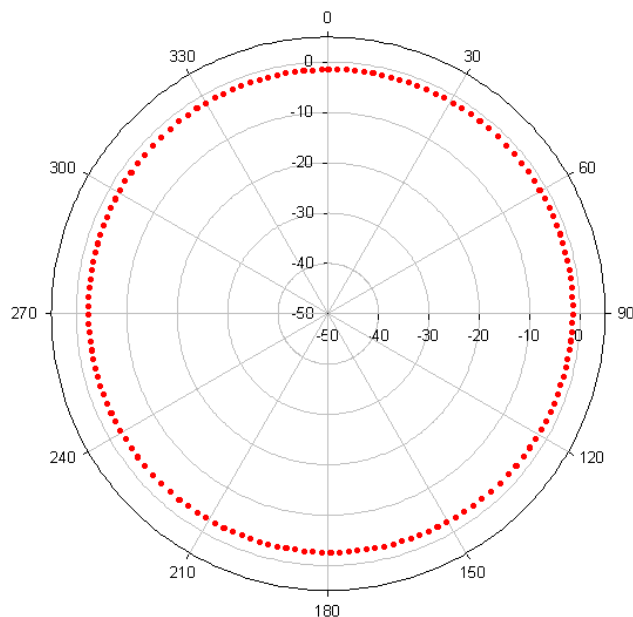


[VSWR: 915 MHz on the testboard]

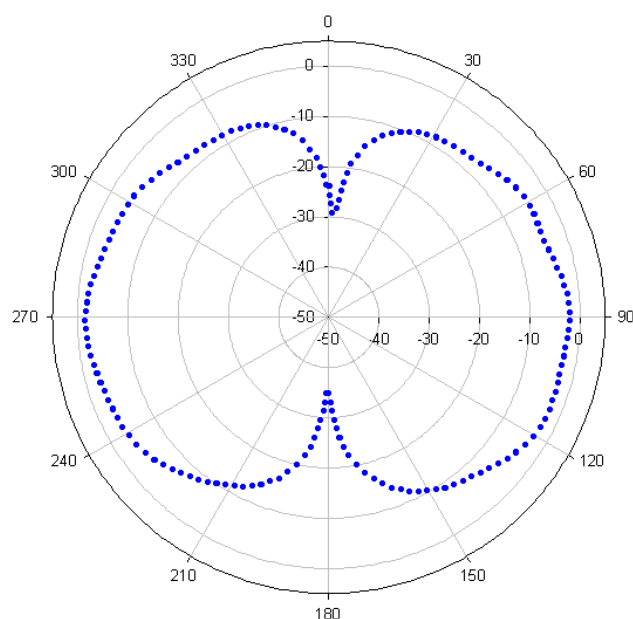
### 3.3.2 Radiation Gain and Pattern

[Measured data table]

	H-plane		E1-plane		E2-plane		Avg. Gain
Polarization	H-pol	V-pol	H-pol	V-pol	H-pol	V-pol	H+V pol
Gain (dBi)	-2.20	-13.62	-11.29	-6.20	-22.16	-5.98	-3.91

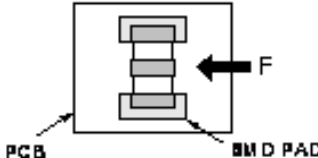


Azimuth@915MHz



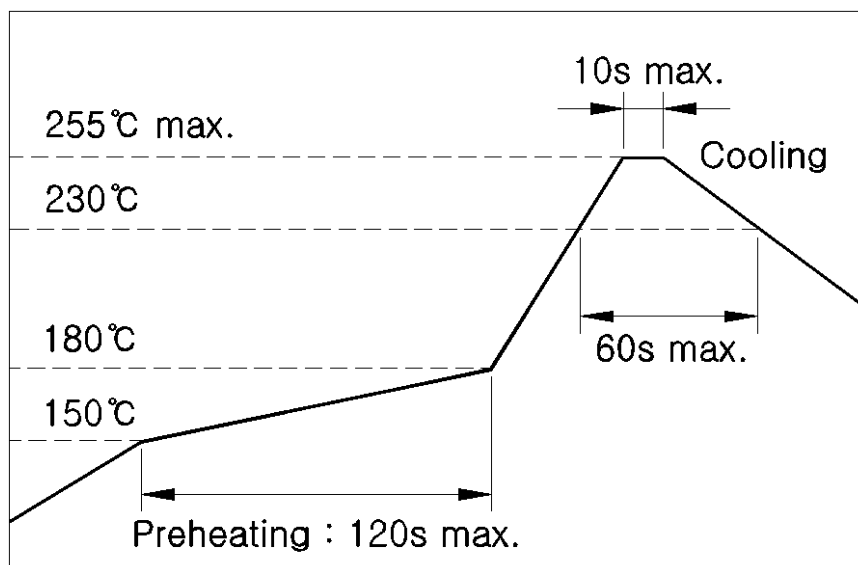
Elevation@915MHz

## 4. RELIABILITY TEST

No	ITEM	TEST CONDITION	TEST REQUIREMENTS
1	Adhesive Strength of Termination	<p>1. Applied force on SMD chip till detached point from PCB.</p> 	<p>1. No mechanical damage by forces applied on the right. 2. Strength (F) &gt; 5 kgf</p>
2	Thermal Shock (Temperature Cycle)	<p>1. 1 cycle / step 1: <math>-40 \pm 3^{\circ}\text{C}</math>, 30 min step 2: <math>+125 \pm 3^{\circ}\text{C}</math>, 30 min 2. Number of cycle: 30 3. Measure after left for 48 hrs min. at room temperature</p>	<p>1. No visual damage 2. Within electric spec (VSWR)</p>
3	High Temperature Resistance	<p>1. Temperature: <math>+125 \pm 5^{\circ}\text{C}</math> 2. Time: <math>1000 \pm 24</math> hrs 3. Measure <math>f_c</math> after left for 24 hrs min. at room temperature</p>	<p>1. No visual damage 2. Within electric spec (VSWR)</p>
4	Low Temperature Resistance	<p>1. Temperature: <math>-40 \pm 5^{\circ}\text{C}</math> 2. Time: <math>1000 \pm 24</math> hrs 3. Measure <math>f_c</math> after left for 48 hrs min. at room temperature</p>	<p>1. No visual damage 2. Within electric spec (VSWR)</p>
5	Humidity (Steady Condition)	<p>1. Humidity: 85 % RH 1. Temperature: <math>+85 \pm 3^{\circ}\text{C}</math> 2. Time: <math>1000 \pm 24</math> hrs 3. Measure <math>f_c</math> after left for 48 hrs min. at room temperature</p>	<p>1. No visual damage 2. Within electric spec (VSWR)</p>

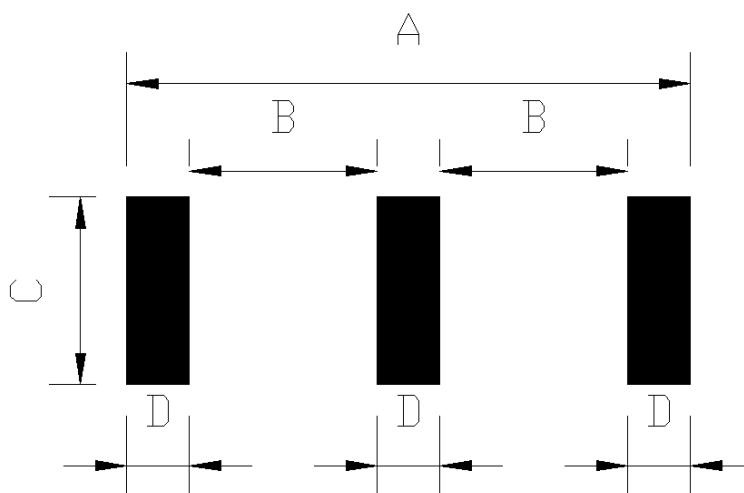
## 5. SOLDERING RECOMMENDATIONS

### 5.1 Reflow Soldering Profile



[ Soldering Reflow Profile for Pb-free ]

### 5.2 Soldering Land Pattern

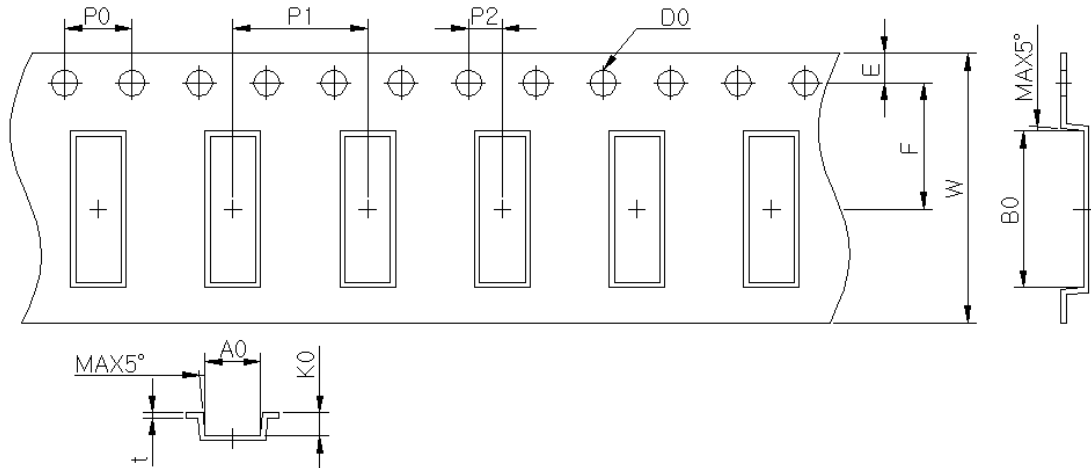


[Unit : mm]

Item	Dimension [mm]	Item	Function
A	9.0	① or ②	Feeding
B	3.0	-	-
C	3.0	-	-
D	1.0		

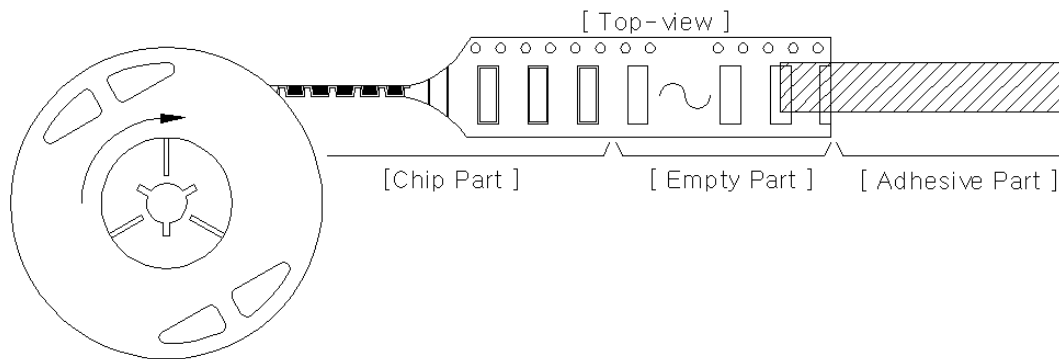
## 6. PACKING

### 6.1 Tape Dimension (unit: mm)



A0	3.20 +0.00/-0.10	P0	4.00±0.10	E	1.75±0.10
B0	9.20 +0.00/-0.01	P1	8.00±0.10	F	7.50±0.10
K0	1.65±0.10	P2	2.00±0.10	W	16.00±0.30
D0	1.55±0.05			t	0.30±0.05

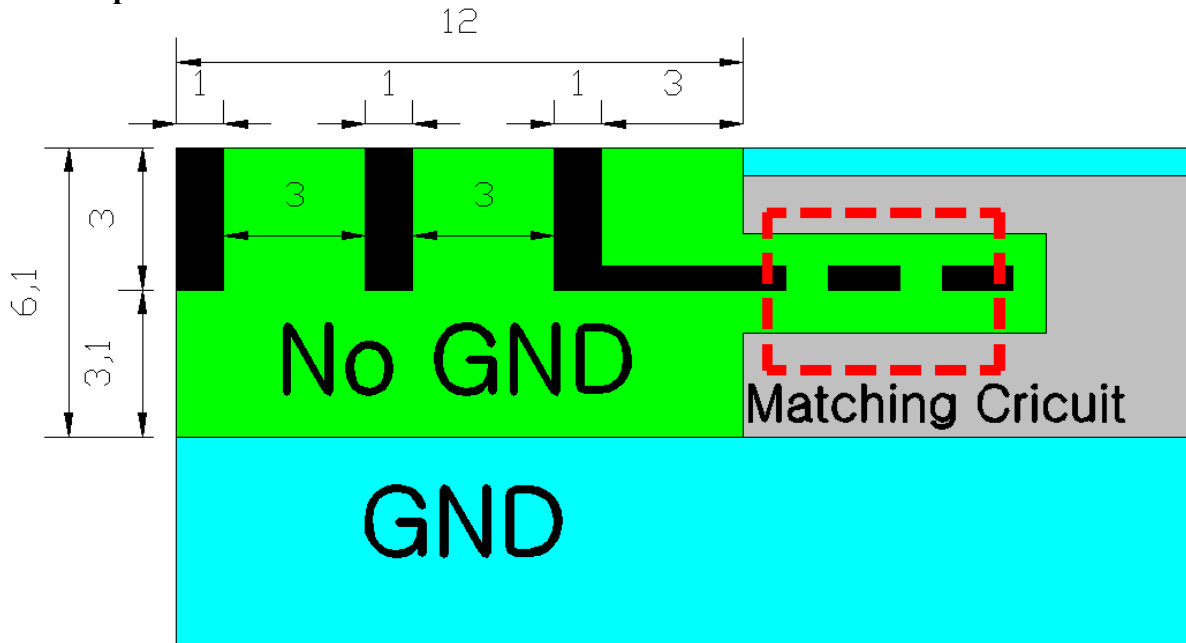
### 6.2 Taping Style



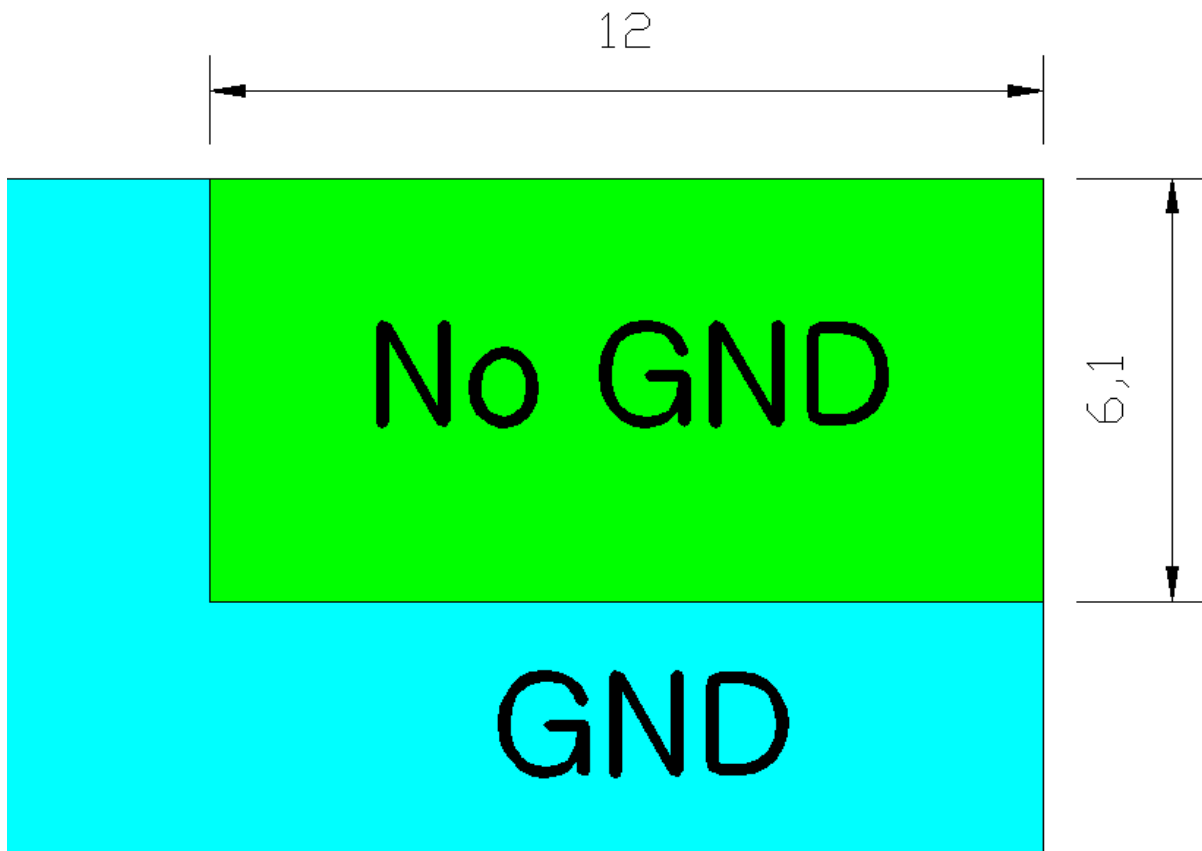
### 6.3 Surface resistance

- 1) Carrier tape: Max.  $10^{11}\Omega$
- 2) Cover tape: Min.  $10^{11}\Omega$
- 3) Reel: Max.  $10^{11}\Omega$

**7. Free Space Size**



[ Board Top Pattern ]



[ Board Bottom Pattern ]