

*Specification*  
*For*  
*LTCC Chip Antenna*

***Model Name : RCA2450P52***

***Customer :***

***Title:***

***Name :***

***APPROVED***

***By Date :*** \_\_\_\_\_

***Signature :*** \_\_\_\_\_

***RN2 Technologies co., Ltd.***

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***Issued Date :*** \_\_\_\_\_

\_\_\_\_\_

***KI TAE KIM***

## 1. Description and Application

**MODEL : RCA2450P52**

### Description

Surface mount, LTCC Chip Antenna

### Features

- Multilayer LTCC( Low Temperature Cofired Ceramics) Technology
- SMD ( Surface Mounted Device )
- Miniature Size
- High Stability in Temperature/Humidity Change
- Free Impedance Matching
- Suitable for 2450MHz Working Frequency Operation

### Applications

- Bluetooth device ( mobile Phone, headset, carkit, serial port, dongle, MP3 )
- WLAN ( Access Point, Notebook, PDA )
- DMB( receiver )
- HPi( High speed Portable internet)

## 2. Temperature Range

Operating temperature range : -40 to + 85

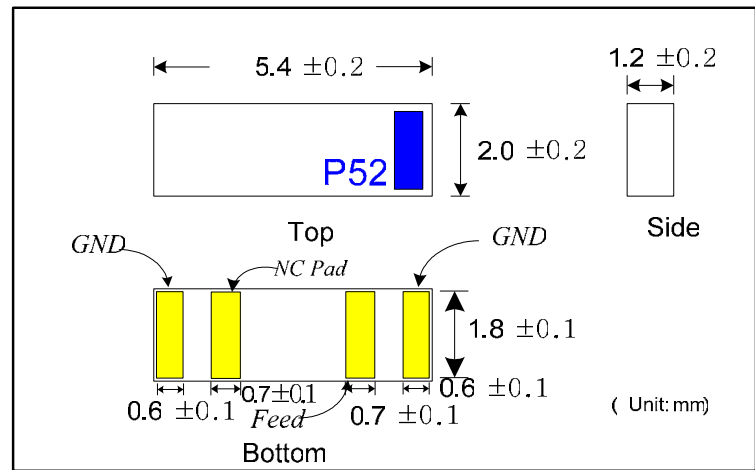
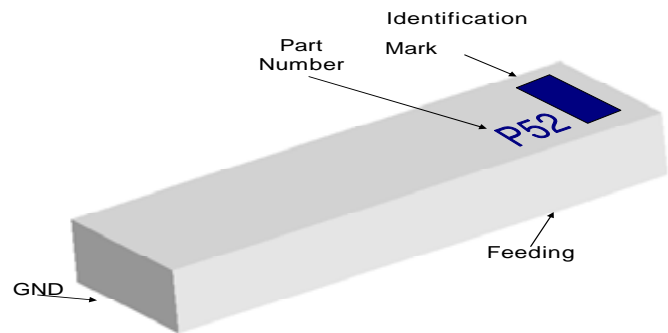
## 3. Properties

### 3.1 Electrical Specification :

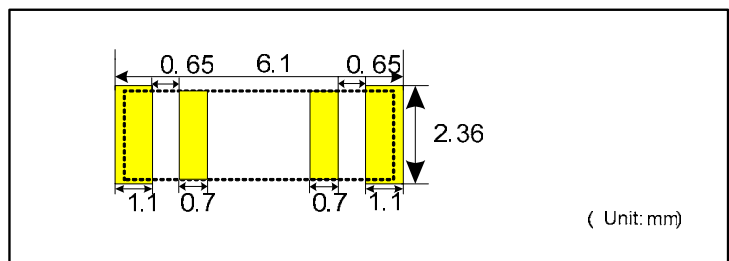
ITEM	Specification
Model	P52
Center frequency	2.45GHz
Bandwidth	100 MHz min.
Gain	2 dBi Max
VSWR	2 Max
Polarization	Linear
Azimuth Beamwidth	Omni
Impedance	50 $\Omega$

### 3.2 Mechanical Specification

#### Mechanical Outline & Feeding

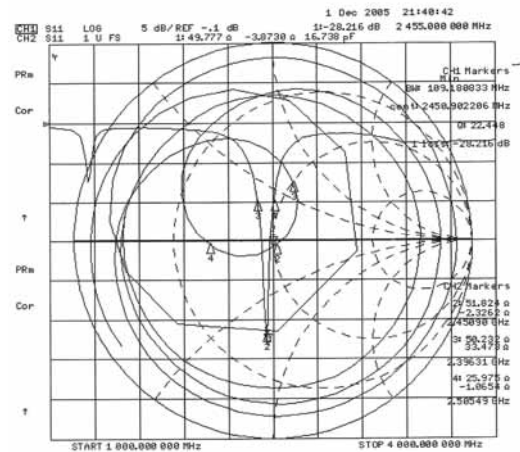


### 3.3 Land Layout

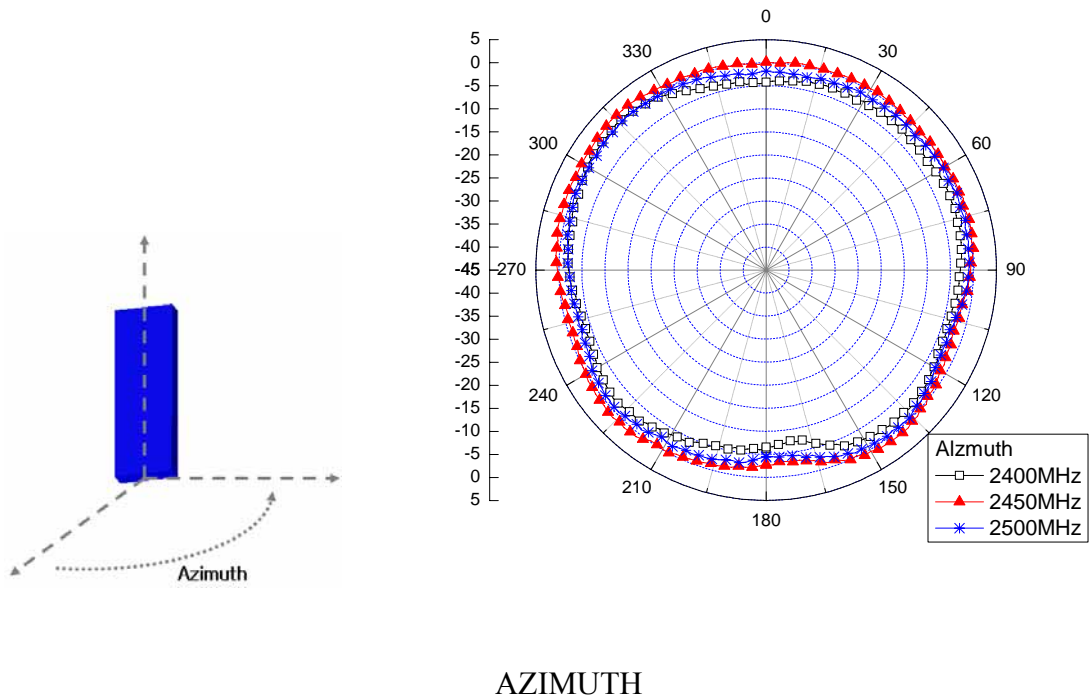


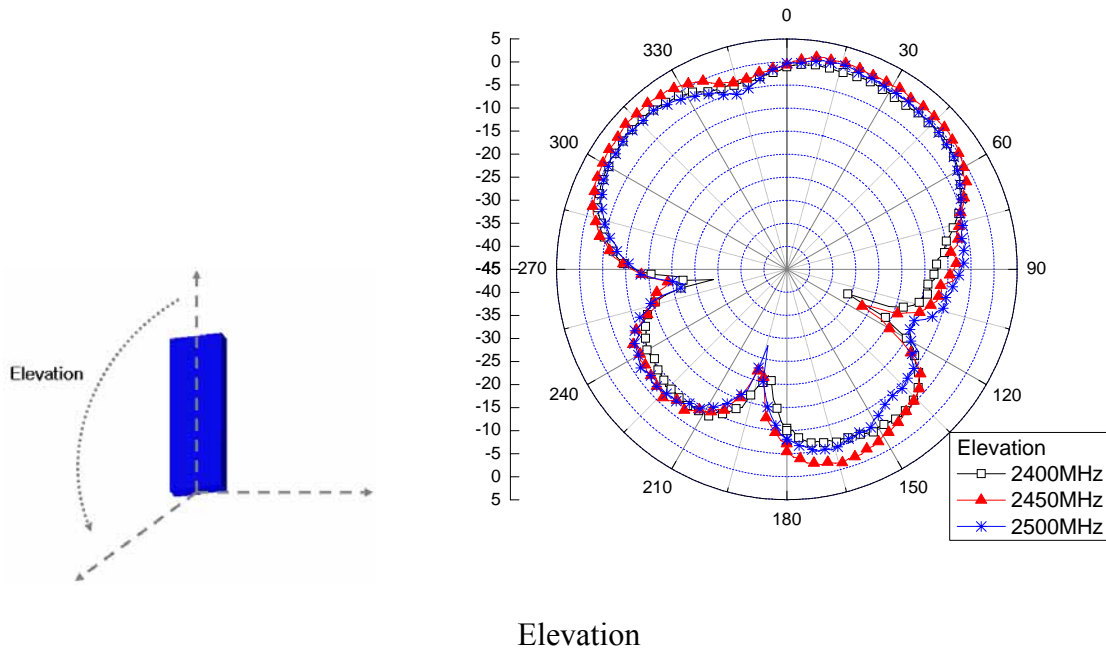
# 4. Electrical characteristics

## 4.1 Measurement Data ( S11 & Smith chart )



## 4.2 Radiation pattern



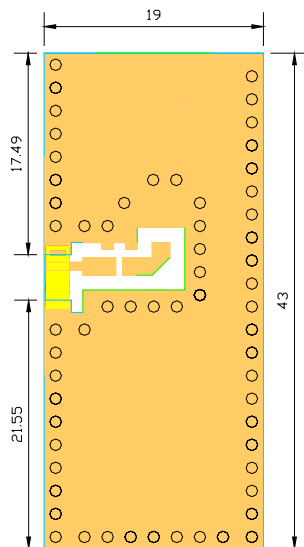


R.F. Anechoic Antenna Chamber (10.0m×6.0m×4.0m)

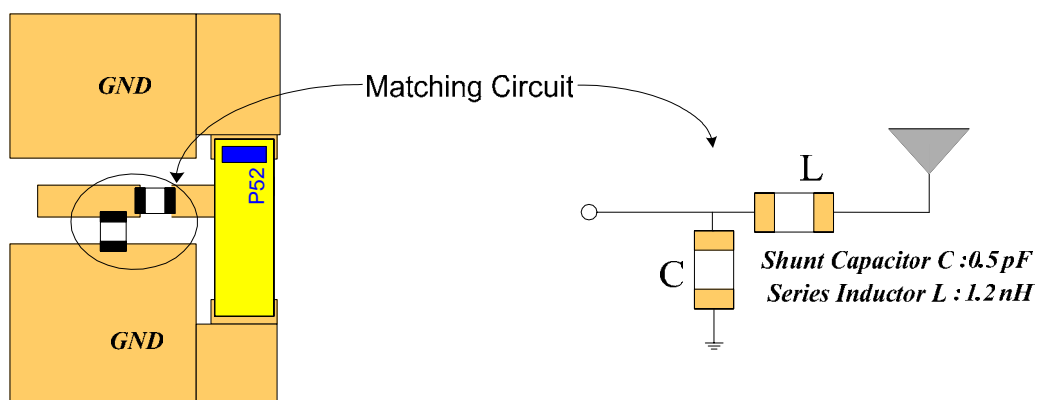
Units(dBi)	Frequency (MHz)	Gain		
		Average	Min	Max
Azimuth	2400	-4.11	-4.58	0.43
	2450	-2.44	-2.16	2.08
	2500	-3.93	-3.09	1.09
Elevation	2400	-2.66	-30.76	0.32
	2450	0.03	-26.80	1.79
	2500	-1.51	-27.96	0.04

## 5. Test board and matching circuit for measurements

### Test board



### 5.2 Matching Circuits for measurements

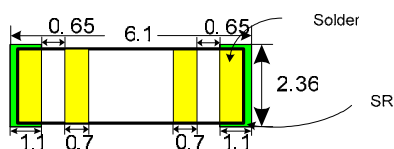


In such case of internal SMD antenna, the resonant frequency is dependent on the GND size or other nearby active/passive components, and therefore can be different from what is measured on our test board.

## 6. Soldering Conditions

### 6.1 Recommended Solder

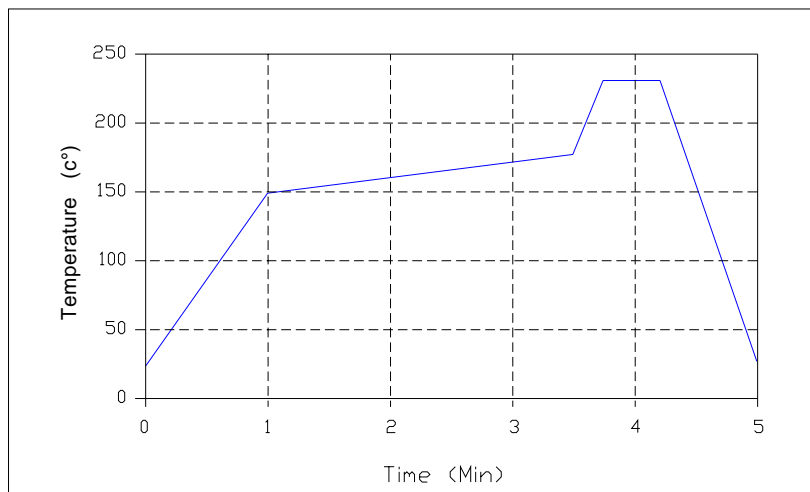
- A Sn/Pb/Ag ratio of 62/36/2 is recommended to inhibit dissolution of silver coating into molten solder
- Do not allow the iron-tip to directly touch the ceramic element



Recommended Solder quantity & area

### 6.2 Solder reflow Profile

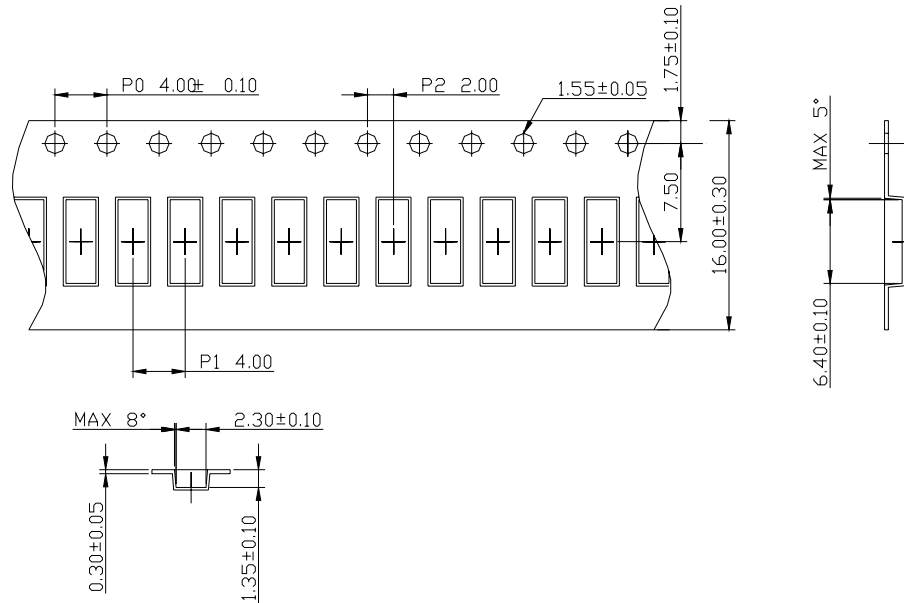
soaking condition: 230 , 20 sec. Max



## 7. Packaging

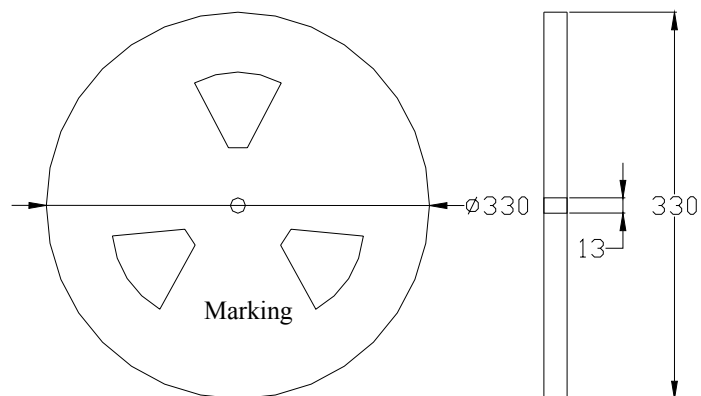
Dimension of the tape

(Unit : mm)



Dimension of the reel

(Unit : mm)



Quantity per reel : 10000 pcs

## 8. Environmental Specification.

ITEM	PROCEDURE	REQUIREMENTS/RESULT
Temperature Cycle (Thermal Shock)	Test Sample on the testing Jig 1. One Cycle : Step1: $85 \pm 5^{\circ}\text{C}$ for 30min Step2: $-40 \pm 5^{\circ}\text{C}$ for 30min 2. Number of Cycles : 100 3. Normal Condition in 1 hour	1. Meet the electrial Specification after test
Solderability	Test Sample on the testing Jig 1. Solder : $230 \pm 5^{\circ}\text{C}$ for $5 \pm 1$ sec.	1. More than 85% of the electrode pad shall be covered with solder.
Heat Resistance	Test Sample on the testing Jig 1. Temperature : $85 \pm 2^{\circ}\text{C}$ 2. Duration : 1000 + 48 hours	1. Meet the electrial Specification after test
Low Temp. Resistance	Test Sample on the testing Jig 1. Temperature : $-40 \pm 5^{\circ}\text{C}$ 2. Duration : 1000 + 48 hours	1. Meet the electrial Specification after test
Vibration Resistance	Test Sample on the testing Jig 1. Frequency: 10~ 55MHz 2. Acceleration : 10g 3. Sweep Time: 1.5 mm, 2hours/axis 4. Axis : X, Y and Z direction	1. No appearance damage 2. Meet the electrial Specification after test
Humidity Resistance	Test Sample on the testing Jig 1. One Cycle : Step1:Temperature $85^{\circ}\text{C}$ for 500 hours with humidity 85% Step2: Decrease Temperature $85^{\circ}\text{C}$ to $25^{\circ}\text{C}$ 2. Maintain for 1~2 hour after decreasing temperature $25^{\circ}\text{C}$	1. Meet the electrial Specification after test

Drop Shock	Test Sample on the testing Jig 1. Dropped onto hard wood from height of 50 cm for 5 times; each x, y and z direction except I/O direction.	1. No appearance damage 2. Meet the electrical Specification after test
Shock /Deflection	Test Sample on the testing Jig Shown Fig 1 Acceleration : 980m/s <sup>2</sup> Period : 6ms Cycle : 10 Times	No appearance damage and 2mm Deflection
Soldering Strength	Pushing Force at 0.5mm/s until electrode pads are pealed off or ceramics are broken Test Sample on the testing Jig Shown Fig 2	3.5kgf Minimum (electrode pads are pealed off or ceramics are broken)
Tensile Strength	Test Sample on the testing Jig Shown Fig 3	1. No mechanical damage by forces applied on the right 2. Strength (F) > 4kgf
Dipping test	Step1 : 120~150 for 1min preheating Step2 : 270 ± 5°C for 20± 0.5sec	1. No appearance damage 2. More than 85% of the electrode pad shall be covered with solder.
Reflow test	Preheat Temp. : 160± 10 °C Preheat Period : 60sec Peak Temp. : 255± 5 °C Peak Period : 10sec	1. No appearance damage 2. More than 85% of the electrode pad shall be covered with solder.

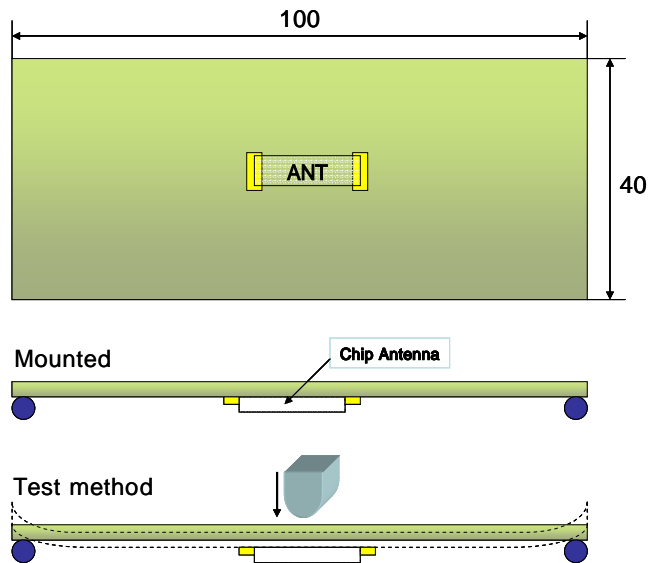


Fig 1. Deflection test board

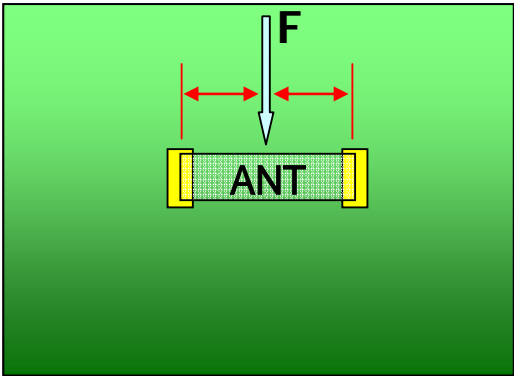


Fig 2. Soldering Strength test board

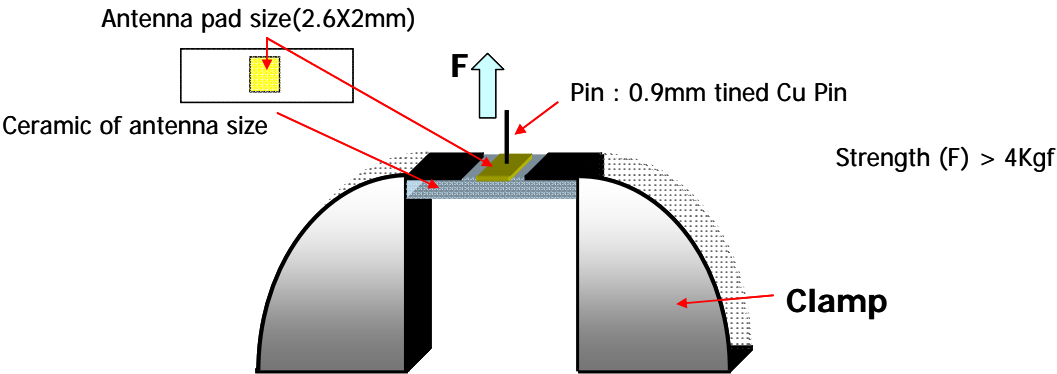


Fig 3. Tensile Strength test method