

Specification
For
LTCC Chip Antenna

Model Name : RCA2450P52

Customer :

Title:

Name :

APPROVED

By Date : _____

Signature : _____

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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

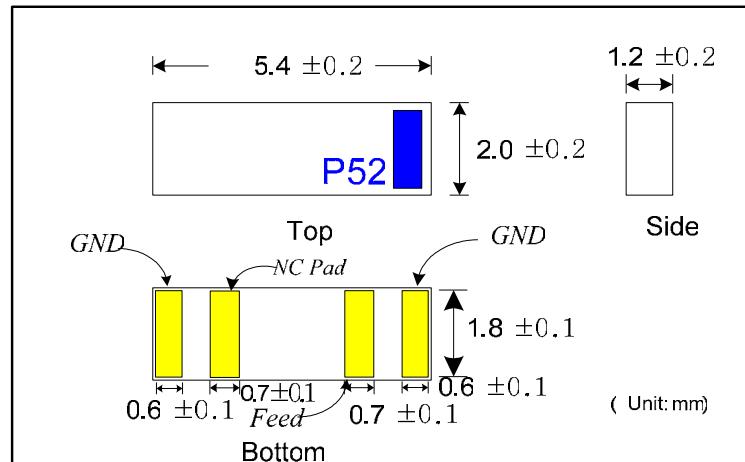
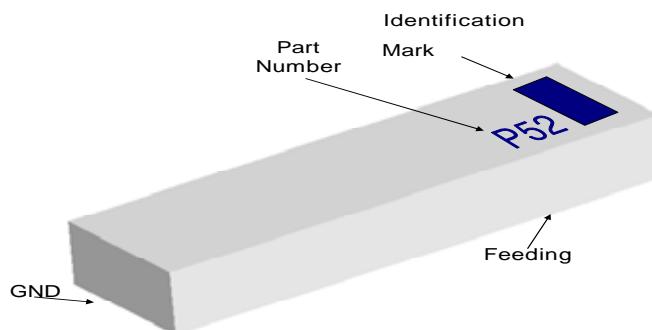
3. Properties

3.1 Electrical Specification :

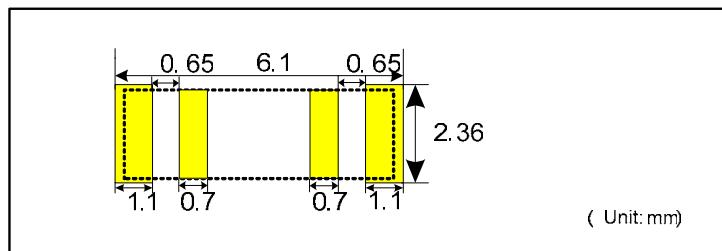
ITEM	Specification
Model	P52
Center frequency	2.45GHz
Bandwidth	100 MHz min.
Gain	2 dBi Max
VSWR	2 Max
Polarization	Linear
Azimuth Beamwidth	Omni
Impedance	50 Ω

3.2 Mechanical Specification

Mechanical Outline & Feeding

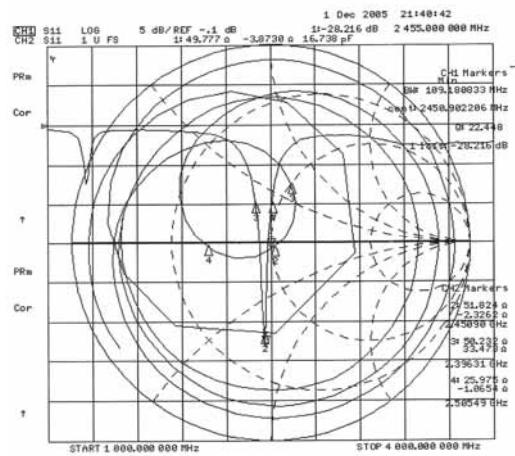


3.3 Land Layout

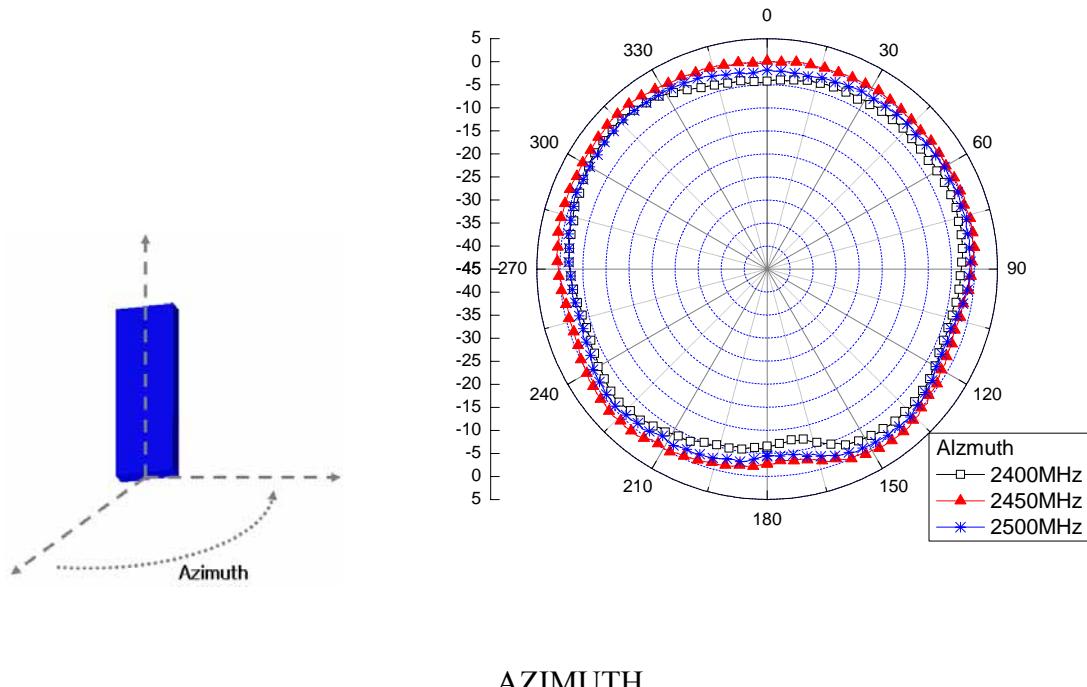


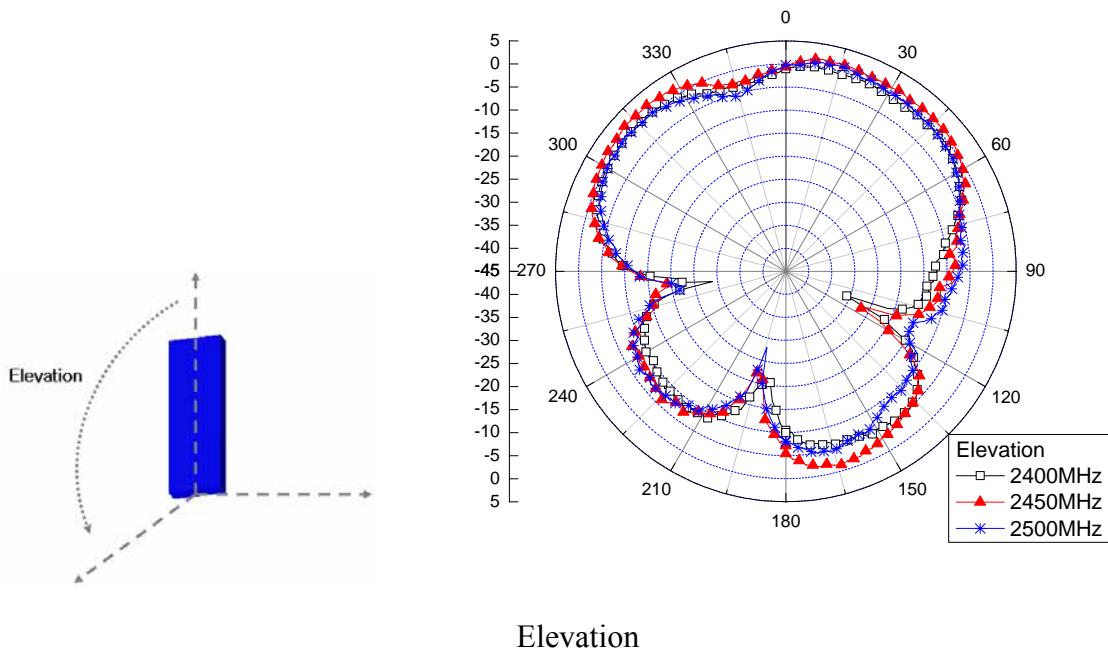
4. Electrical characteristics

4.1 Measurement Data (S11 & Smith chart)



4.2 Radiation pattern



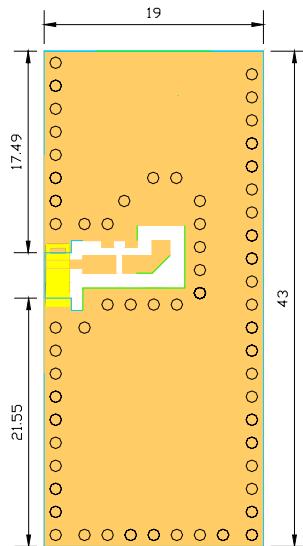


R.F. Anechoic Antenna Chamber (10.0m×6.0m×4.0m)

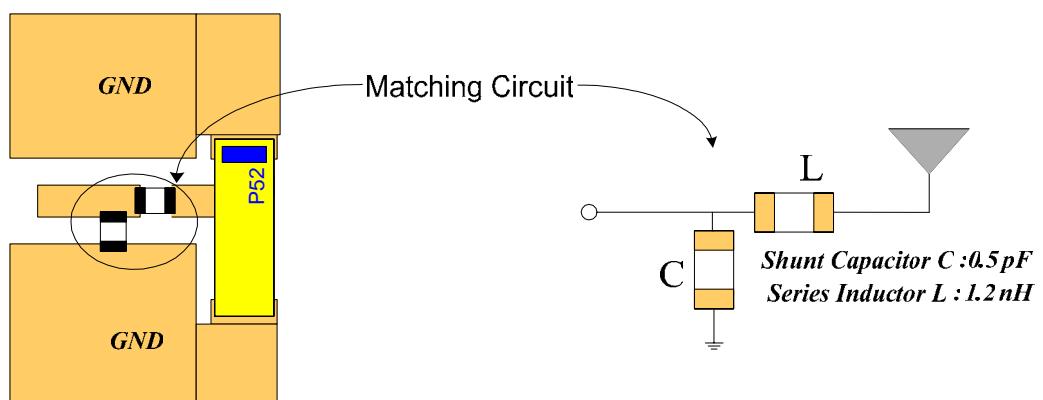
Units(dBi)	Frequency (MHz)	Gain		
		Average	Min	Max
Azimuth	2400	-4.11	-4.58	0.43
	2450	-2.44	-2.16	2.08
	2500	-3.93	-3.09	1.09
Elevation	2400	-2.66	-30.76	0.32
	2450	0.03	-26.80	1.79
	2500	-1.51	-27.96	0.04

5. Test board and matching circuit for measurements

Test board



5.2 Matching Circuits for measurements

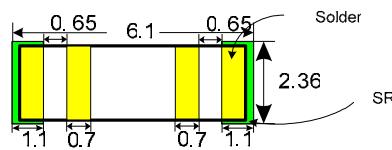


In such case of internal SMD antenna, the resonant frequency is dependent on the GND size or other nearby active/passive components, and therefore can be different from what is measured on our test board.

6. Soldering Conditions

6.1 Recommended Solder

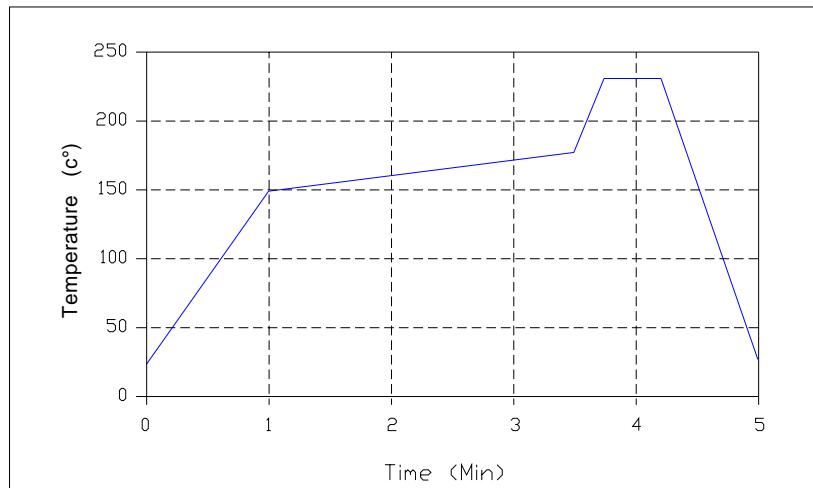
- A Sn/Pb/Ag ratio of 62/36/2 is recommended to inhibit dissolution of silver coating into molten solder
- Do not allow the iron-tip to directly touch the ceramic element



Recommended Solder quantity & area

6.2 Solder reflow Profile

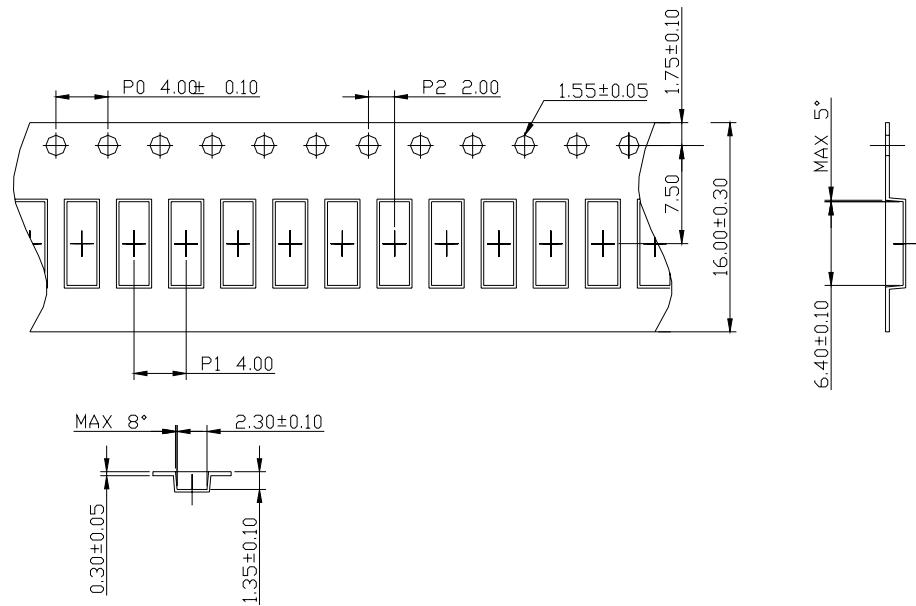
soaking condition: 230 , 20 sec. Max



7. Packaging

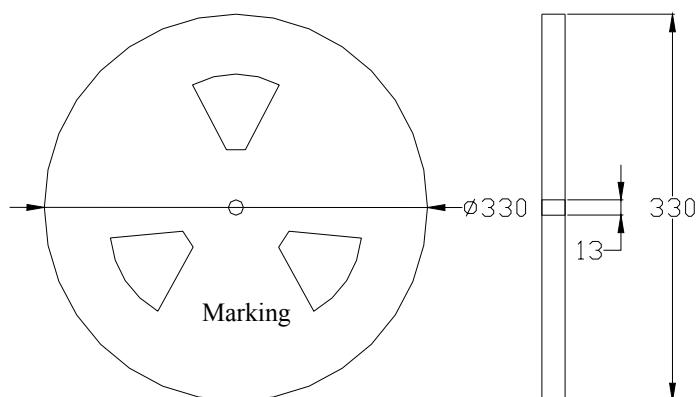
Dimension of the tape

(Unit : mm)



Dimension of the reel

(Unit : mm)



Quantity per reel : 10000 pcs

8. Environmental Specification.

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

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

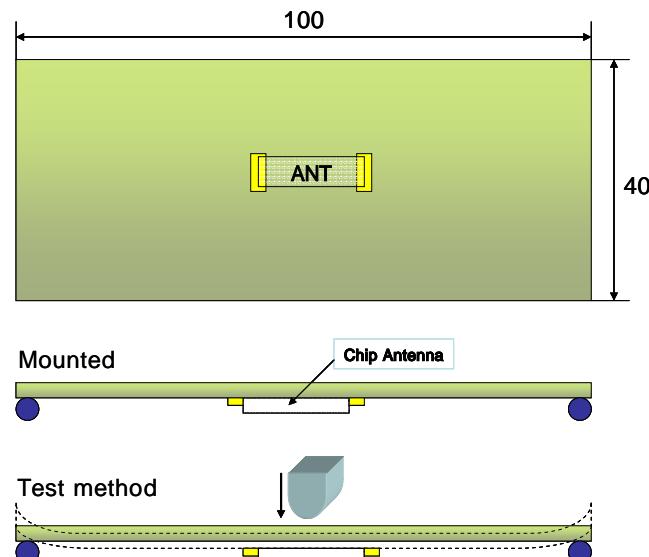


Fig 1. Deflection test board

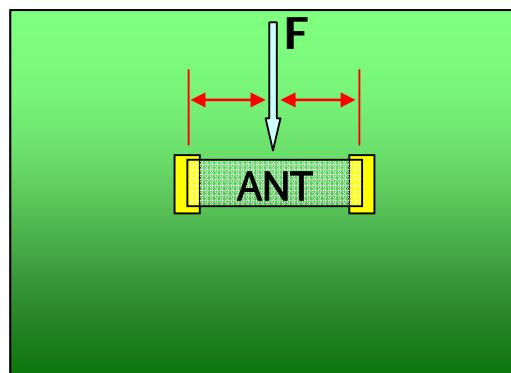


Fig 2. Soldering Strength test board

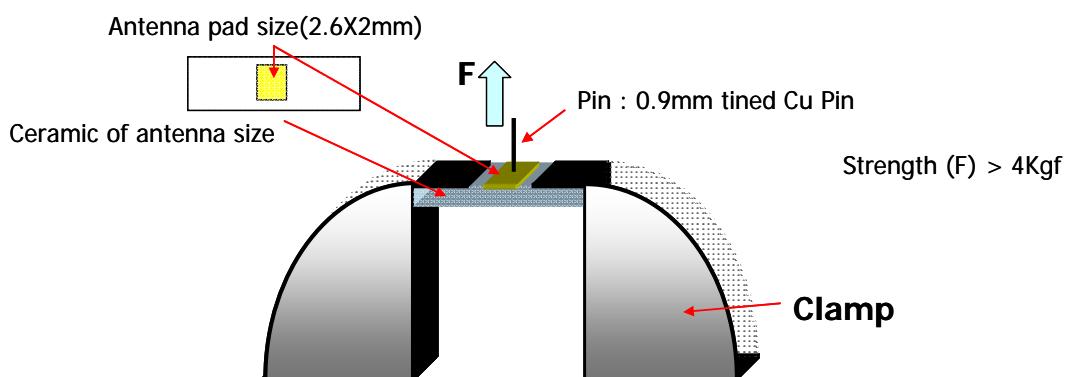


Fig 3. Tensile Strength test method