規格書
Specification

客　戶：
Customer
品　名：　LTCC Chip Antenna
Part name
型　號：　A02
Mode No.

CHIEF	SALES	R&D	DESIGN
Martin	James	GWP	Hui
Date: 2008.12.19		Date: 2008.12.19	

驊 原 科 技 股 份 有 限 公 司
WIESON INTERNATIONAL CO., LTD.

WIESON INTERNATIONAL CO., LTD.	SPECIFICATION LIST	TYPE OF PRODUCT
		A02 LTCC Chip Antenna

INDEX

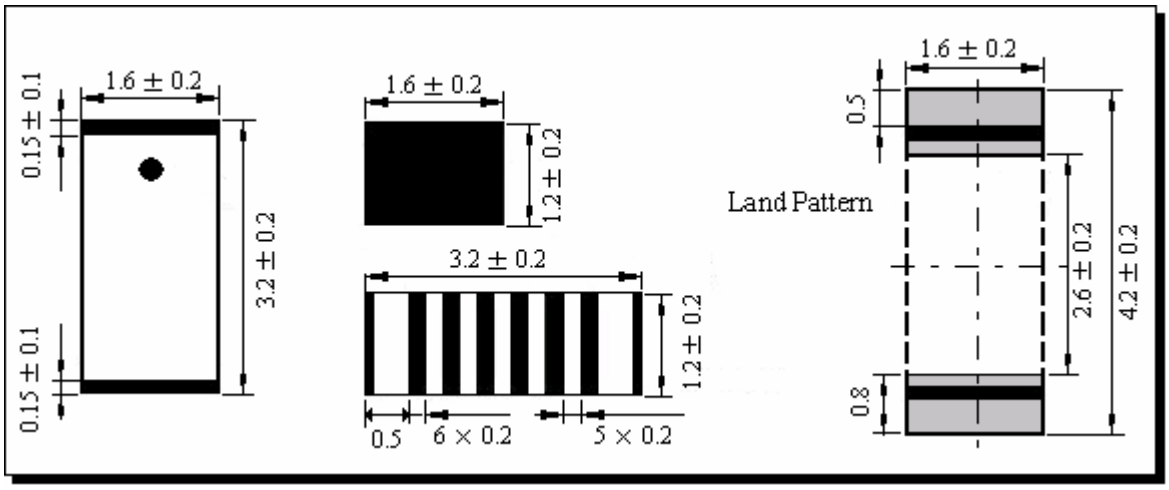
Rev	Date	Description	Edited by	Approvals	
				Prepared	Hui
01	2008.12.19	NEW RELEASE	Hui	Checked	GWP
				Approved	Martin
				Issued No	1.0
				Sheet	**2 OF 17**

一. 概述 Introduction

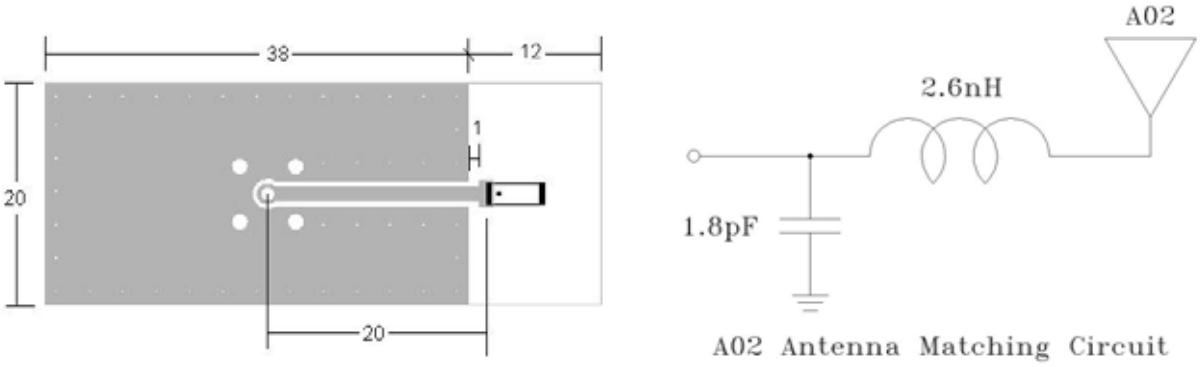
"驊原"微波多層片狀陶瓷天線 GPL 系列產品用於無線區域網路、藍芽天線、手機多頻天線、GPS 等小體積貼版式設計。

"WIESON" microwave multi-layer chip ceramic antenna GPL series are designed to be used in WLAN, Bluetooth, multiple-band mobile phone antenna, GPS, etc and compact size SMD chip design.

二. 外型尺寸 Dimensions



三. 測試電路 Evaluation Board



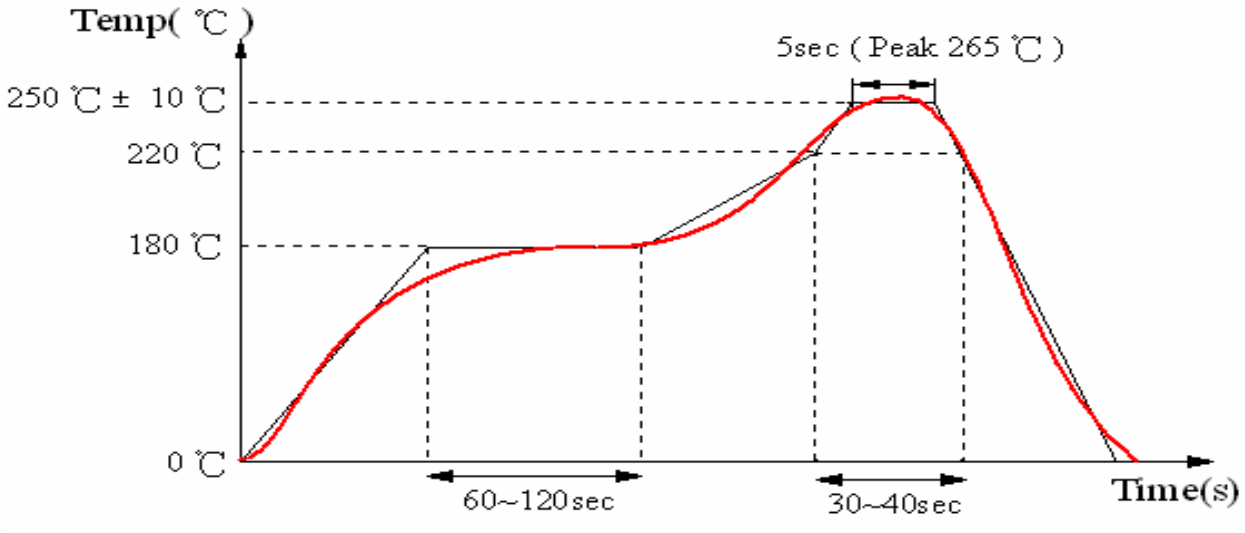
A02 Antenna Matching Circuit

四. 電氣特性Electrical Characteristics

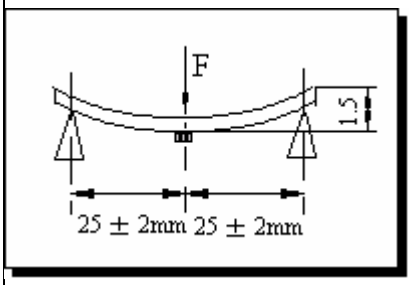
項目	Item	特性	Specification
中心頻率	Center Frequency	2450 ± 25 MHz	
頻寬	Bandwidth	>100MHz	
增益	Gain	1 dBi Typical	
電壓駐波比	VSWR	2.0 MAX.	
極化方式	Polarization	線性	Linear
方位角	Azimuth Beam width	全向性	Omni-directional
阻抗	Impedance	50 Ohm	

※本天線在應用 PCB 上通過設計匹配電路，將天線工作頻率調整到 2.45GHz 的中心頻率。

五. 回流焊溫度Reflow Soldering Standard Condition



六. 環境測試Environmental Test

測試項目 Item		測試條件 Requirement
振動	Vibration Resist	在振動頻率爲 10~55Hz 振幅爲 1.5mm 沿 X,Y,Z 方向各振動 2 小時
落摔	Drop Shock	在 100CM 高度處按 X,Y,Z 三個面分別自由落下在木質地板上共 3 次
焊接耐熱	Solder Heat Proof	能承受經 120~150℃的溫度預熱 120 秒後，在 255℃+5℃的焊錫浸 5±0.5 秒。
結合力	Tensile Strength of Terminal	在產品電極端上或表面上能承受 1 公斤拉力 10±1 秒。
耐彎曲	Bending Resist Test	 將產品按圖焊在 1.6±0.2mm 的 PCB 中間，由箭頭方向施力：1mm/s，彎曲距離：1.5mm，保持 5±1 秒，產品金屬無脫落。
耐濕熱	Moisture Proof	在溫度爲 60±2℃，相對濕度 90~95%的恆溫恆濕機器中放置 96 小時，在常溫中恢復 1~2 小時。
高溫	High Temperature Endurance	在溫度爲 85±5℃的恆溫箱中放置 24±2 小時，在常溫中恢復 1~2 小時。
低溫	Low Temperature Endurance	在溫度爲-40±5℃的恆溫箱中放置 24±2 小時，在常溫中恢復 1~2 小時。
冷熱衝擊	Temperature Cycle Test	在-25℃中保持 30 分鐘，在+85℃中保持 30 分鐘，共循環 5 次後在常溫中恢復 1~2 小時。

基礎條件

項目	Item	條件 Requirement
溫度範圍	Temperature range	25±5℃
相對濕度範圍	Relative Humidity range	55~75%RH
工作溫度	Operating Temperature range	-40℃~+85℃
儲存溫度	Storage Temperature range	-40℃~+85℃

七. 測試報告 Test Report

1. S-PARAMETER

Summary：

This report to account for the measurement setup and result of LTCC Chip antenna.
(1) The measurement setup includes reflection coefficient, pattern, and gain measurement.
(2) The measured data for LTCC Chip antenna are presented and analysis.

I. Measurement Coefficient Measurement：

A. Reflection Coefficient Measurement：

(a) Instrument：Network Analyzer.

(b) Setup：

(1) Calibrate the Network Analyzer by one port calibration using O.S.L. calibration kits.

(2) Connect the antenna under test to the Network Analyzer.

(3) Measure the S11(reflection coefficient) shown in Fig. 1.

(4) Generally, the S11 is less than –10dB to ensure the 90% power into antenna and only less than 10% power back to system.

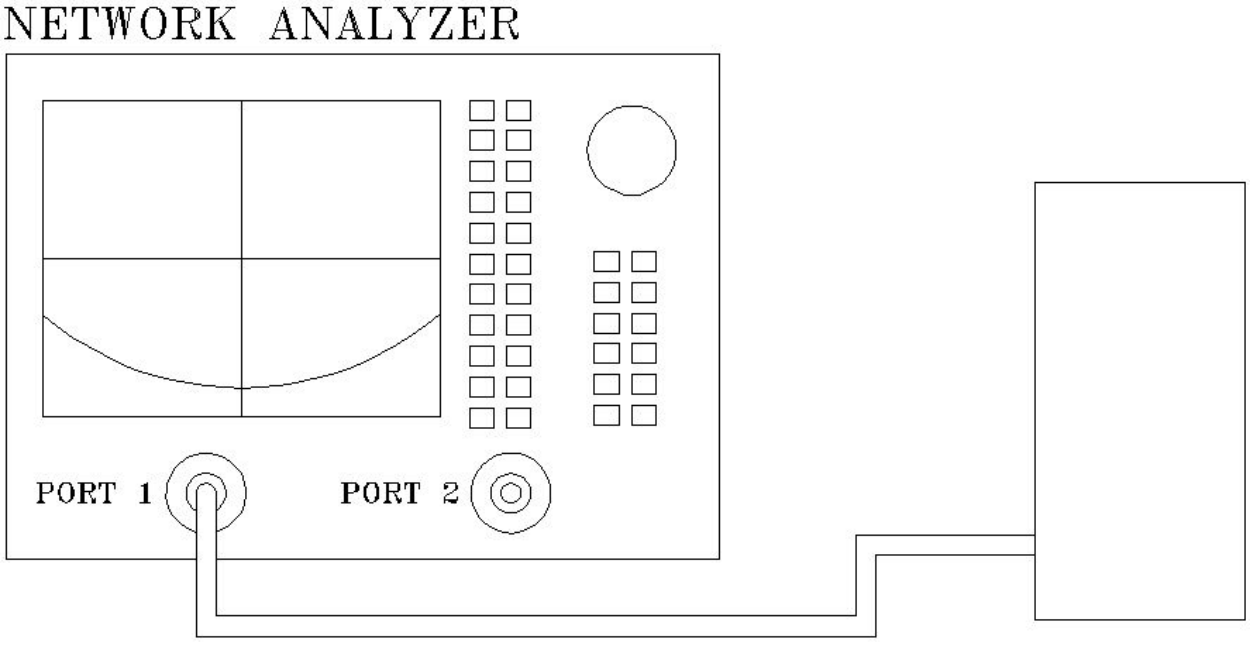
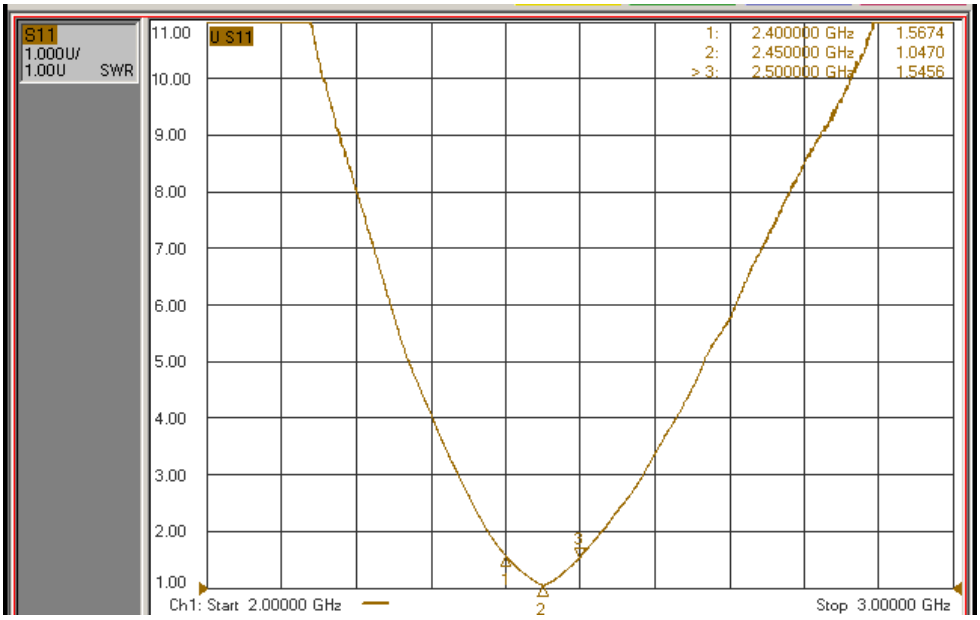


Fig. 1 A02 LTCC chip antenna measured in Network Analyzer.

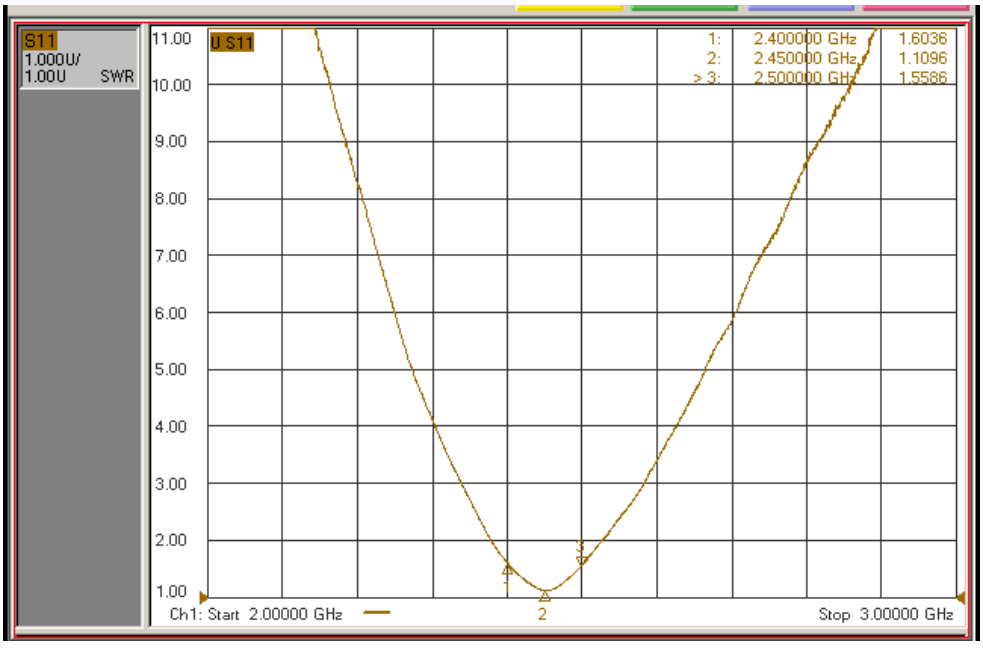
II. Test Value：

A. VSWR

Frequency / Sample	2.40GHz	2.45GHz	2.50GHz
1	1.5674	1.0470	1.5456
2	1.6036	1.1096	1.5586



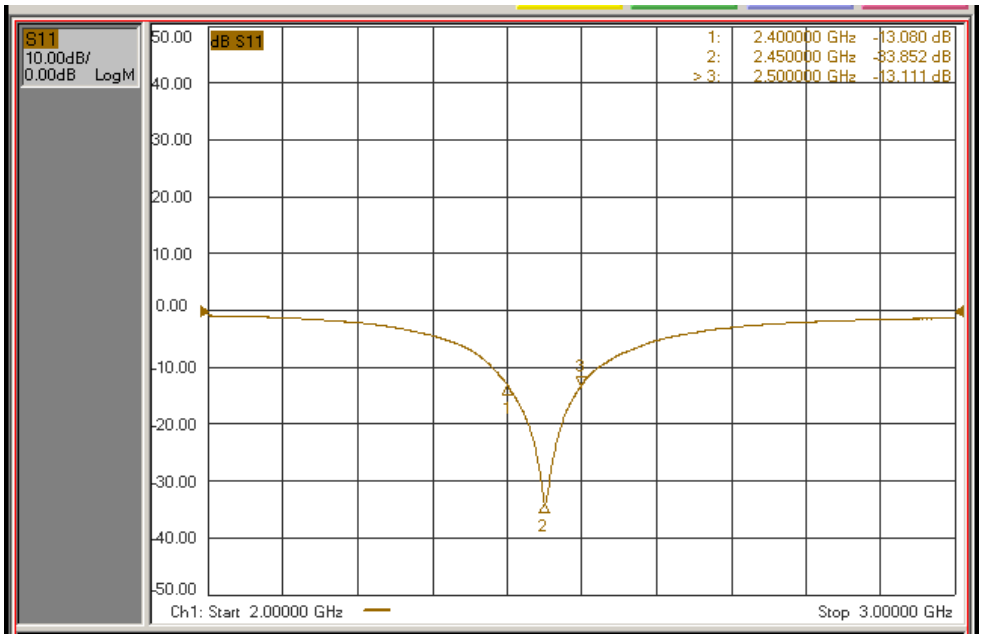
SAMLE-1



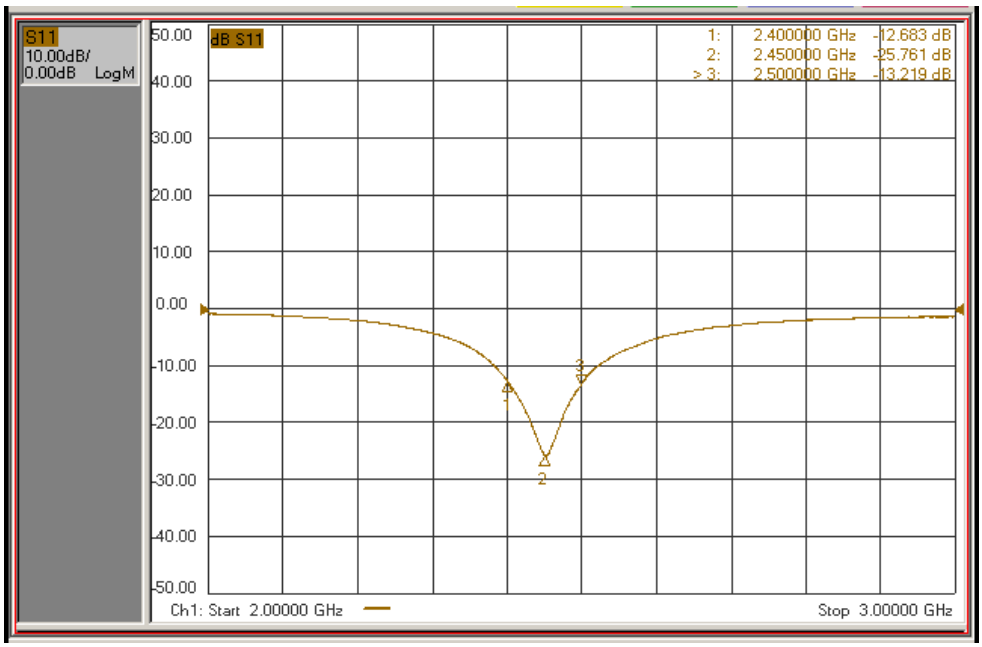
SAMPLE-2

B. RETURN LOSS

Frequency / Sample	2.40GHz	2.45GHz	2.50GHz
1	-13.080	-33.852	-13.111
2	-12.683	-25.761	-13.219

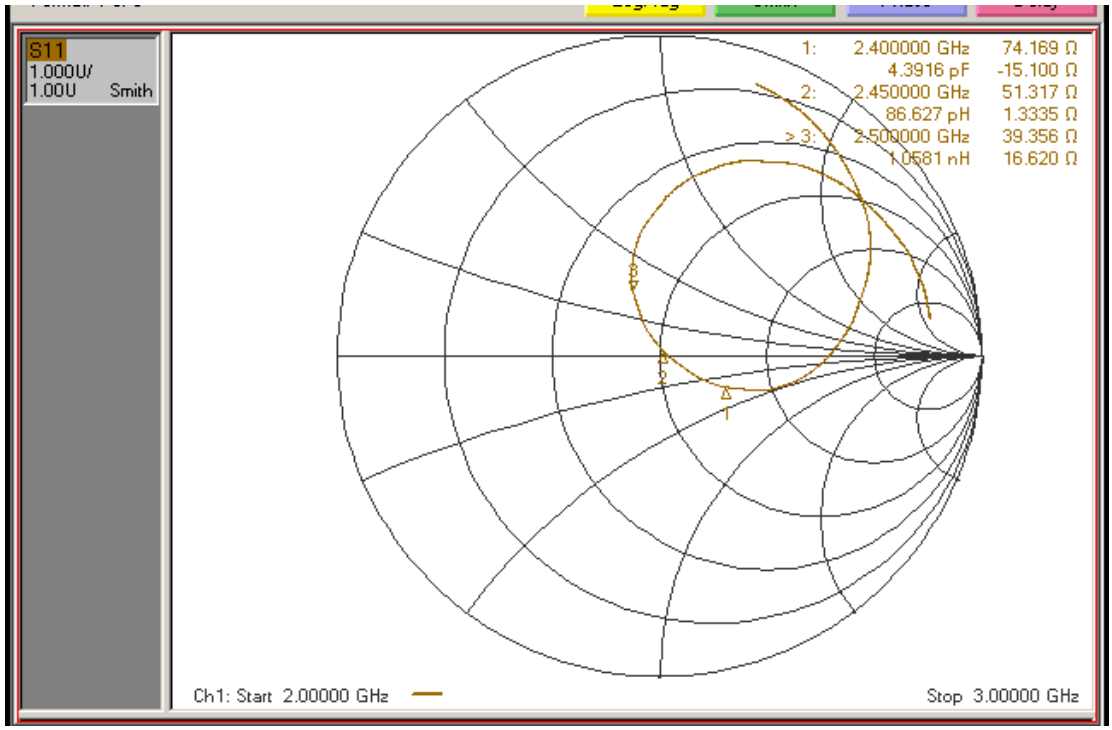


SAMPLE-1

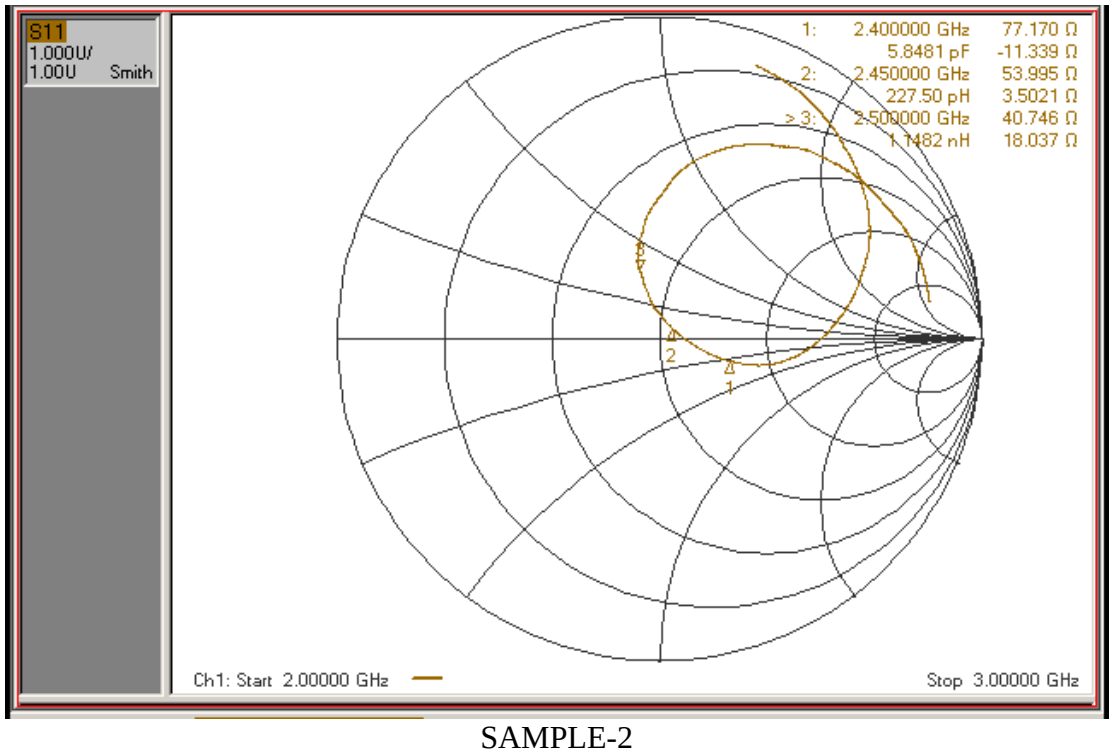


SAMPLE-2

C. SMITH CHART



SAMPLE-1



SAMPLE-2

2. 2D PATTERN

I. Measurement

(a) **Instruments**：anechoic chamber, network analyzer, standard gain antenna.

(b) **chamber description**：

(1) The anechoic chamber is a far-field measurement system with size of 3.25M*2.84M*6.4M. The quiet zone region is 44cm*44cm*44cm at frequency range of 2.4GHz in the center of the rotator.

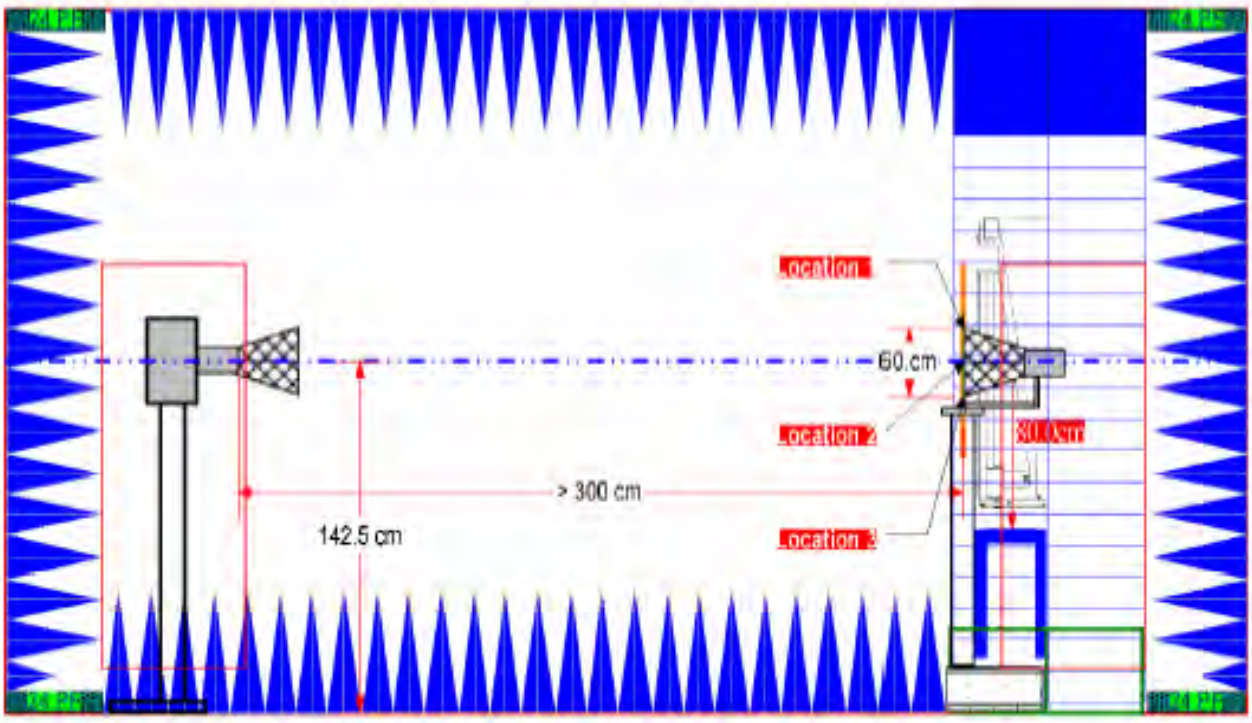


Fig. 2 The interior components of the anechoic.

(2) Fig. 2. shows the interior components of the anechoic chamber. The antenna standard antenna as probe and antenna under test is 3M. The antenna under test is fixed on a step rotator. We can control the rotating angle for accurate or rough measurement.

(3) While we measure the radiation patterns by rotating AUT with 360 degrees and repeat again by replacing the AUT with the standard gain antenna under test, we compare both data and using a formula to obtain the

$$G_{AUT} = G_{stand} + P_{AUT} - P_{stand}$$

G_{AUT}：Gain of AUT

G_{stand}：Gain of Standard Gain Antenna

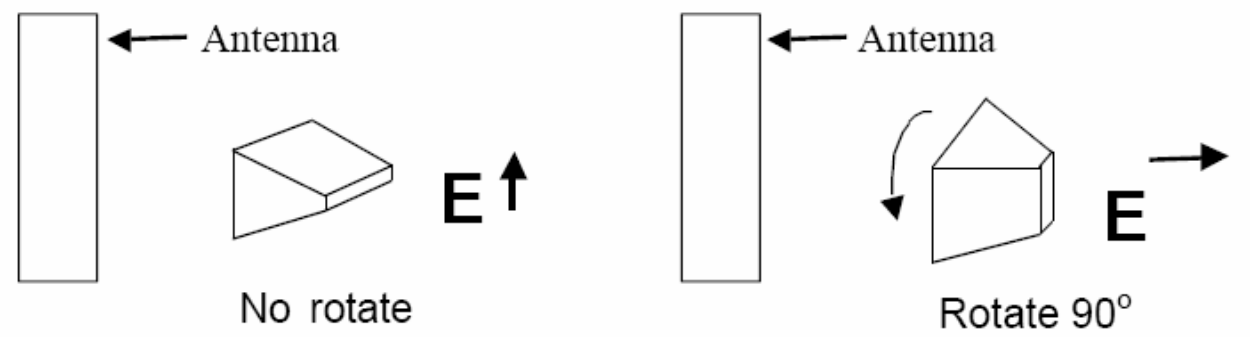
P_{AUT}：Measured Power of AUT

P_{stand}：Measured Power of Standard Gain Antenna

(3) Gain of AUT. The standard gain antenna is a gain horn(SG-430 1.7GHz ~ 2.6GHz).

(4) The planes defined in the Fig. 4 which we want to measure are H(X-Y) , E1(X-Z) and E2(Y-Z) planes. The vertical or horizontal polarization's power is measured by rotating the antenna probe to 0 degree or to 90 degree shown in Fig. 3, respectively. While we combine both vertical and horizontal power, we obtain total power.

(5) From the total power in three basic planes(H, and E), we can analyze the performance of the antenna is good or not.



(a) Antenna Probe at 0 degree as a vertical polarization.

(b) Antenna Probe at 90 degree as a horizontal polarization.

Fig. 3. The definition of vertical and horizontal polarization.

(c) Plane definition：

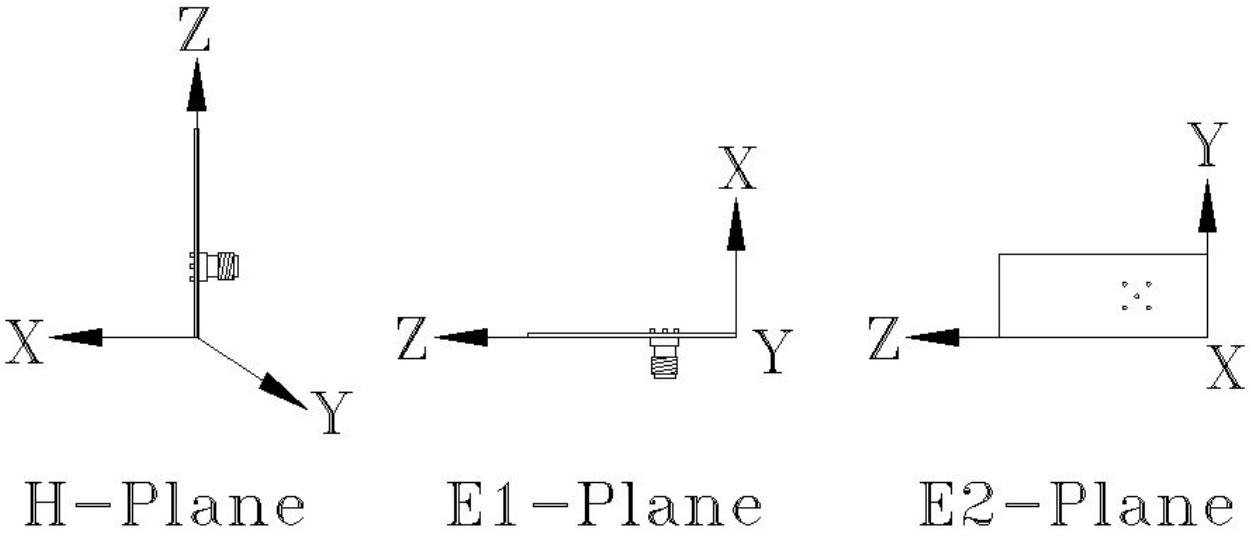


Fig. 4. The plane definition：H-Plane , E1-Plane and E2-Plane.

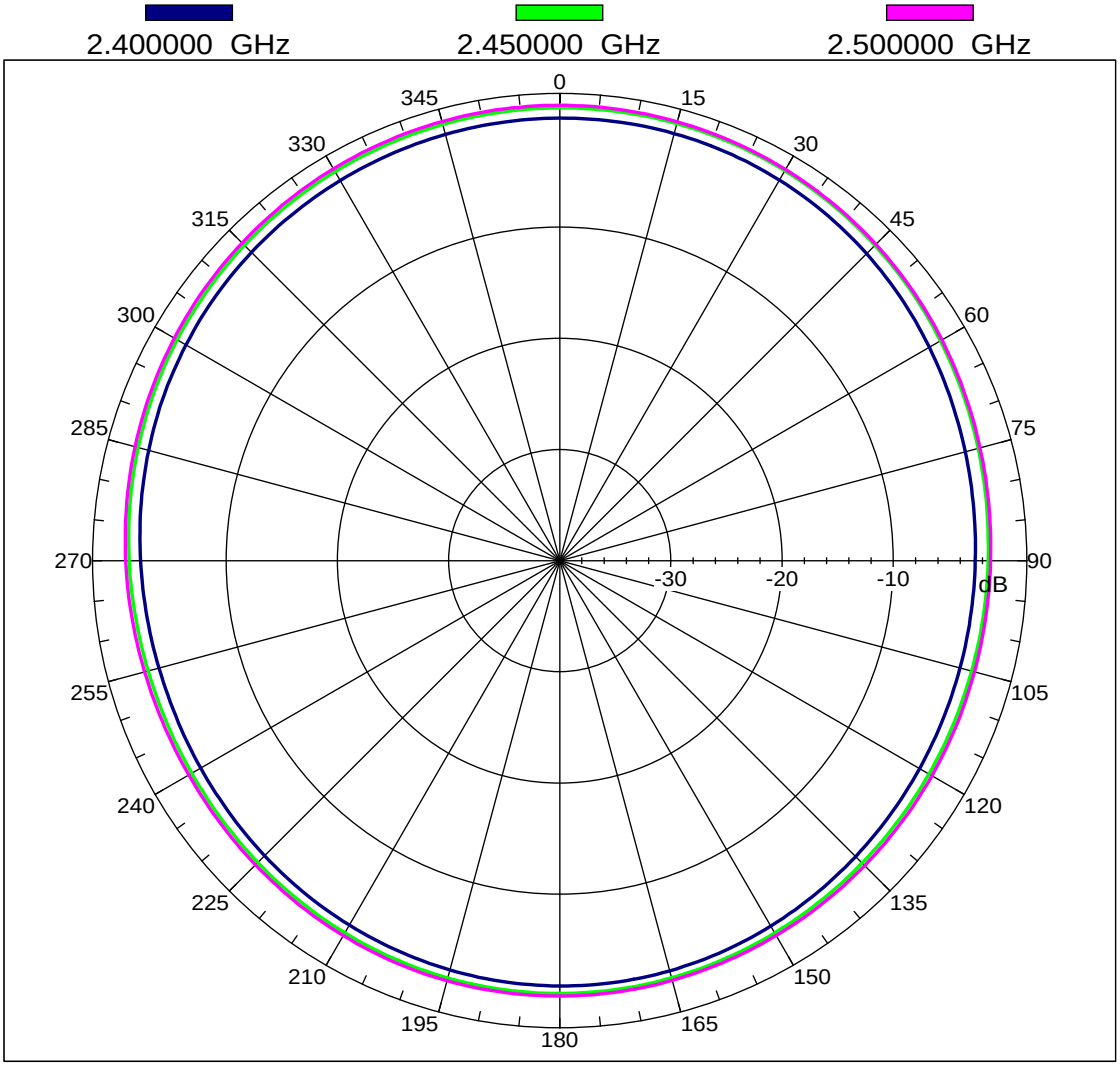
Ⅰ Ⅰ. Test Value：

A. Sample-1

（1）H-Plane

Frequency / Gain（dBi）	2.40GHz	2.45GHz	2.50GHz
Peak	-0.21363	0.70693	0.9275
Avg.	-1.661	-0.732	-0.483

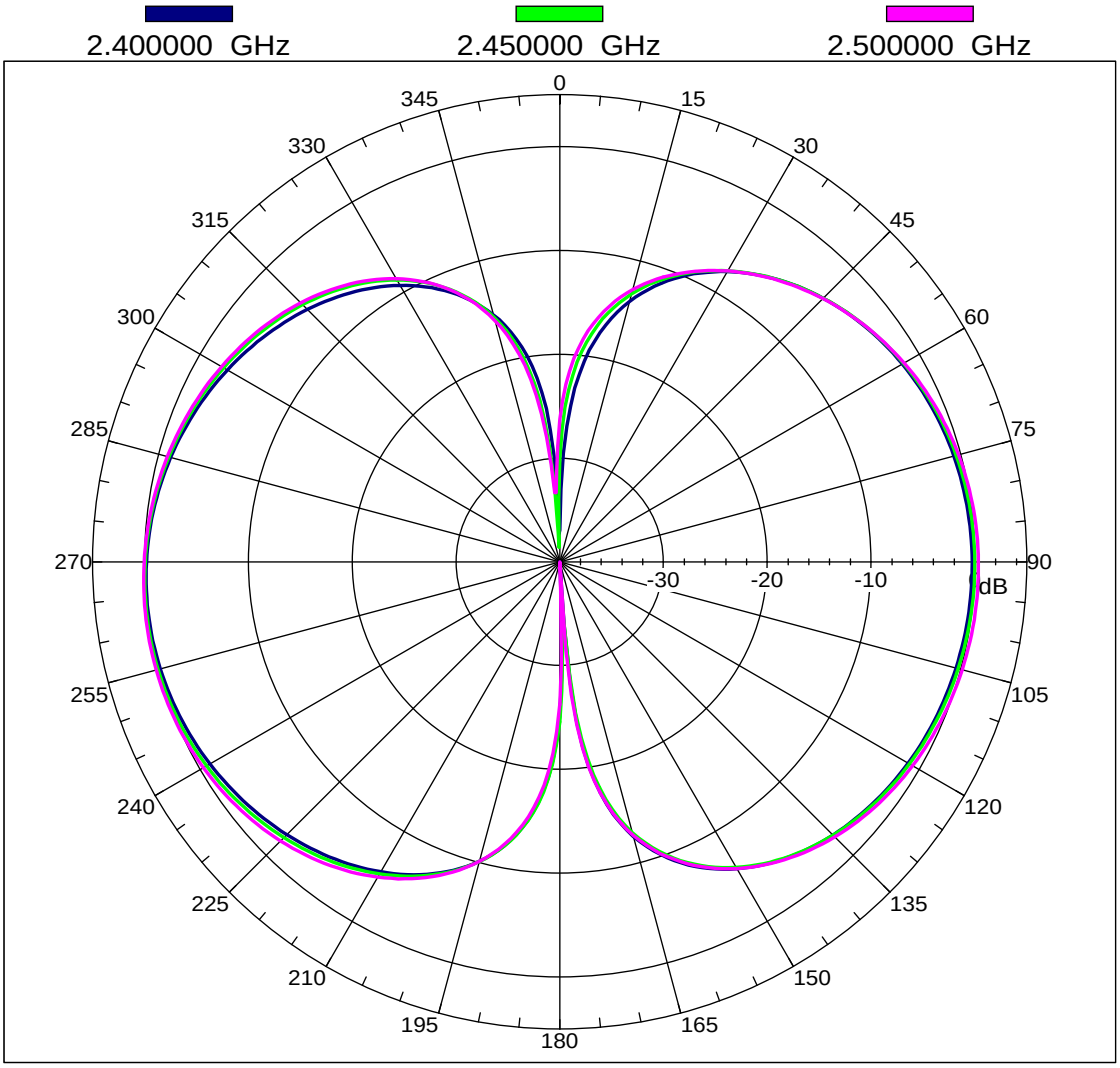
Far-field amplitude of A02 LTCC Chip Antenna H-Plane.nsi



（2）E1-Plane

Frequency / Gain（dBi）	2.40GHz	2.45GHz	2.50GHz
Peak	-0.07064	0.09436	0.35672
Avg.	-4.492	-4.276	-4.051

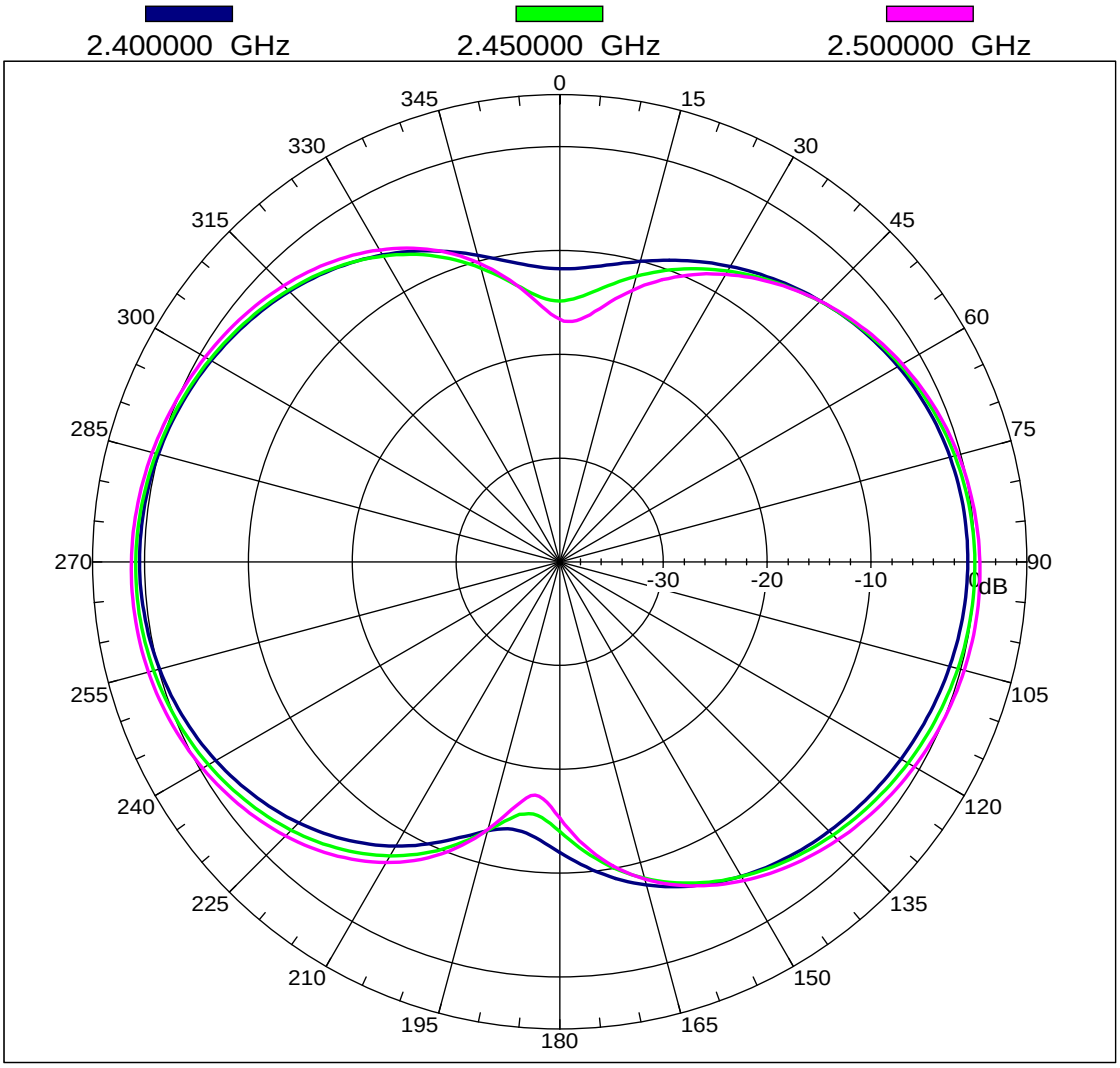
Far-field amplitude of A02 LTCC Chip Antenna E1-Plane.nsi



（3）E2-Plane

Frequency / Gain（dBi）	2.40GHz	2.45GHz	2.50GHz
Peak	0.46674	0.84435	1.27986
Avg.	-3.956	-3.716	-3.314

Far-field amplitude of A02 LTCC Chip Antenna E2-Plane.nsi

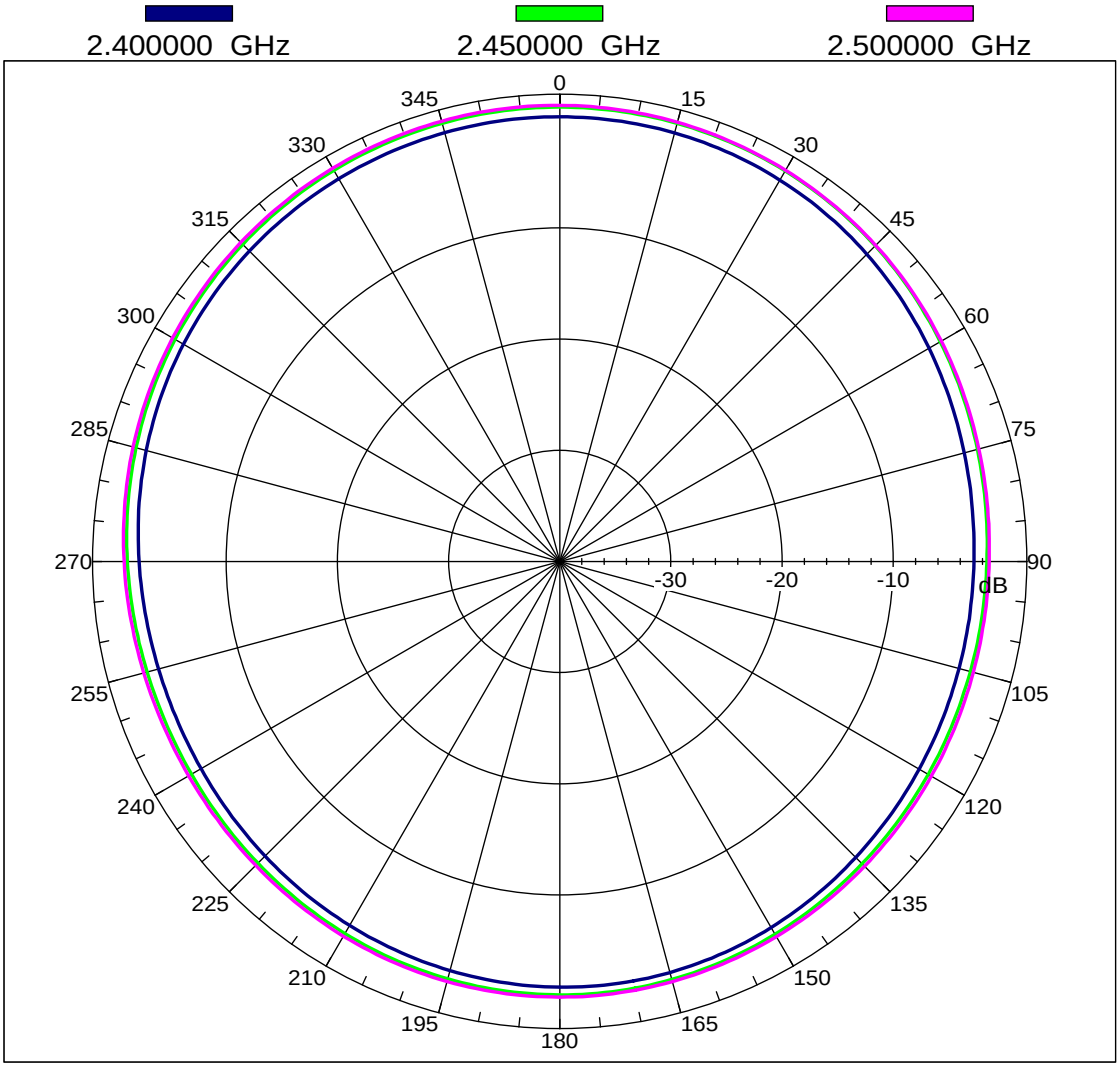


B. Sample-2

（1）H-Plane

Frequency / Gain（dBi）	2.40GHz	2.45GHz	2.50GHz
Peak	-0.03555	0.83865	0.99994
Avg.	-1.589	-0.666	-0.451

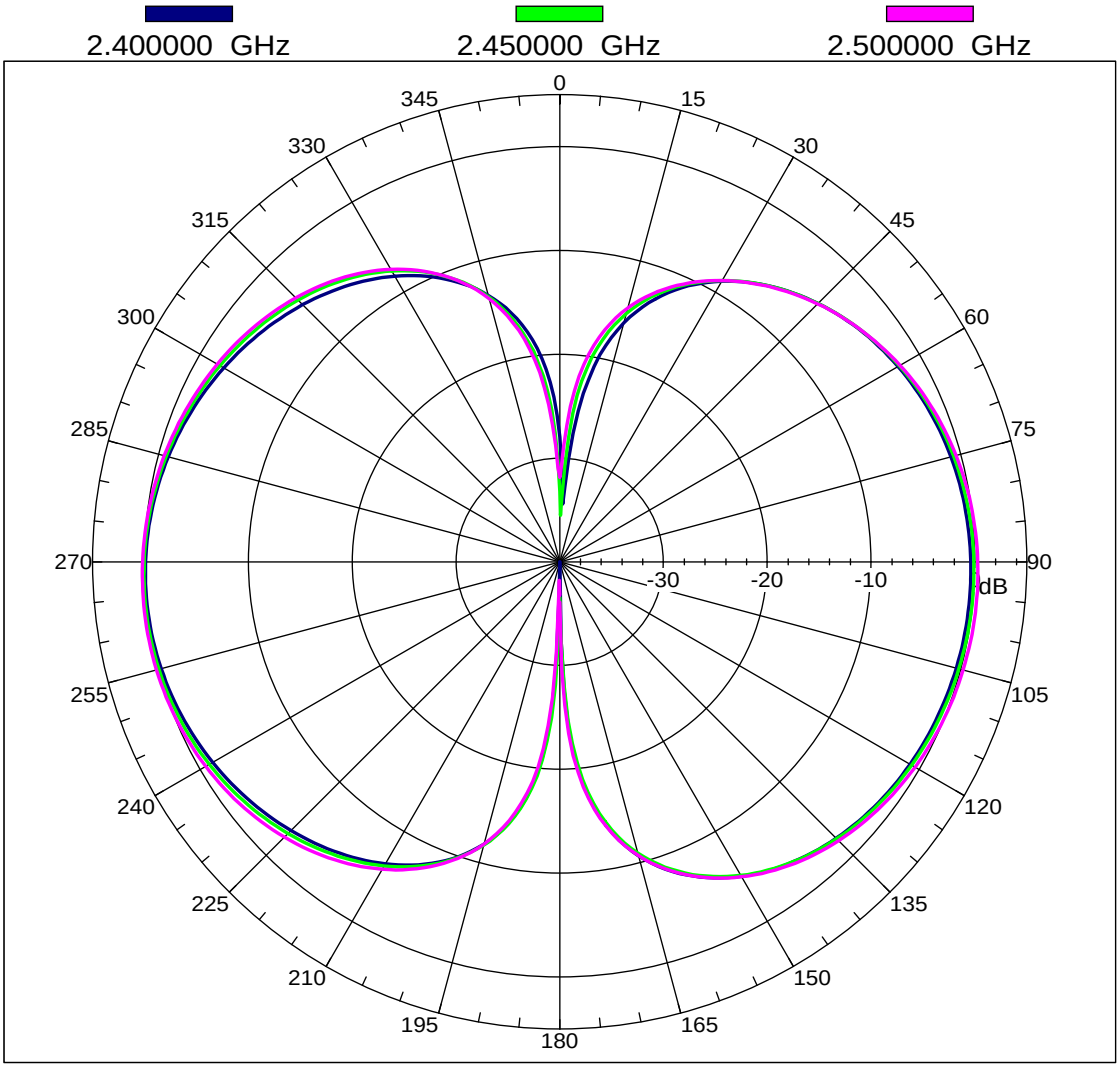
Far-field amplitude of A02 LTCC Chip Antenna H-Plane.nsi



（2）E1-Plane

Frequency / Gain（dBi）	2.40GHz	2.45GHz	2.50GHz
Peak	-0.052	0.1088	0.33895
Avg.	-4.524	-4.297	-4.039

Far-field amplitude of A02 LTCC Chip Antenna E1-Plane.nsi



（3）E2-Plane

Frequency / Gain（dBi）	2.40GHz	2.45GHz	2.50GHz
Peak	0.40821	0.83895	1.28315
Avg.	-4.013	-3.727	-3.314

Far-field amplitude of A02 LTCC Chip Antenna E2-Plane.nsi