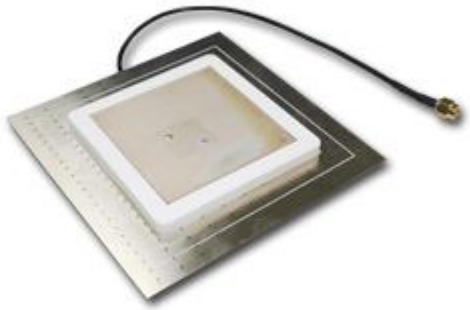
RFID INTERNAL ANTENNA

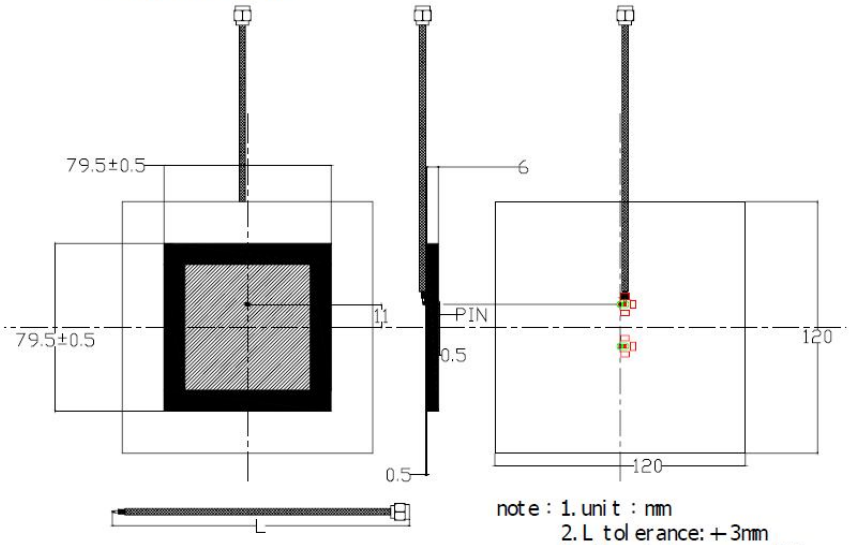
MODEL: IA-868A



SPECIFICATION

1.	**WORKING FREQUENCE**	**865~868Mhz or 902~928Mhz**
2.	**Patch Antenna**	**Dielectric Ceramics**
3.	**IMPEDANCE**	**50 Ohm**
4.	**V.S.W.R**	**1.5**
5.	**GAIN**	**5dBi**
6.	**Cable & Connector**	**RG174-200mm-SMA(M)**
7.	**POLARIZATION**	**RHCP**
8.	**POWER HANDLING**	**2 W**
9.	**OPERATING TEMPERATURE**	**-40°C -- +85°C**
10.	**Antenna Dimensions**	**120 mm x 120 mm x 6.5mm**

Dimension



Electrical Characteristics

型　號 / 特　性	IA-868-200mm-SMA(M)
頻率範圍 Frequency Range	855~880 Mhz
中心頻率 Center Frequency	868 +/-2Mhz
電壓駐波比 V.S.W.R	1.5:1
帶　寬 Band Width	＞26MHz
阻　抗 Impendence	50 Ω
最高增益 Peak Gain	5.0dBic , Based on 12×12cm ground plane without cable
天線極化 Polarization	RHCP

Testing Conditions

工作温度 Operation Temp	-20℃~+65℃
儲存温度 Storage Temp	-40℃~+85℃
振動 Vibration	Sine sweep 1g(0-p) 10~50~10Hz each axis

Sample Test

I. SUMMARY：

This report to account for the measurement setup and result of the Antenna.

1. The measurement setup includes s-parameter, pattern, and gain measurement.
2. The measured data for Antenna are presented and analysis.

II. S-PARAMETER MEASUREMENT：

1.Reflection coefficient :

(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.

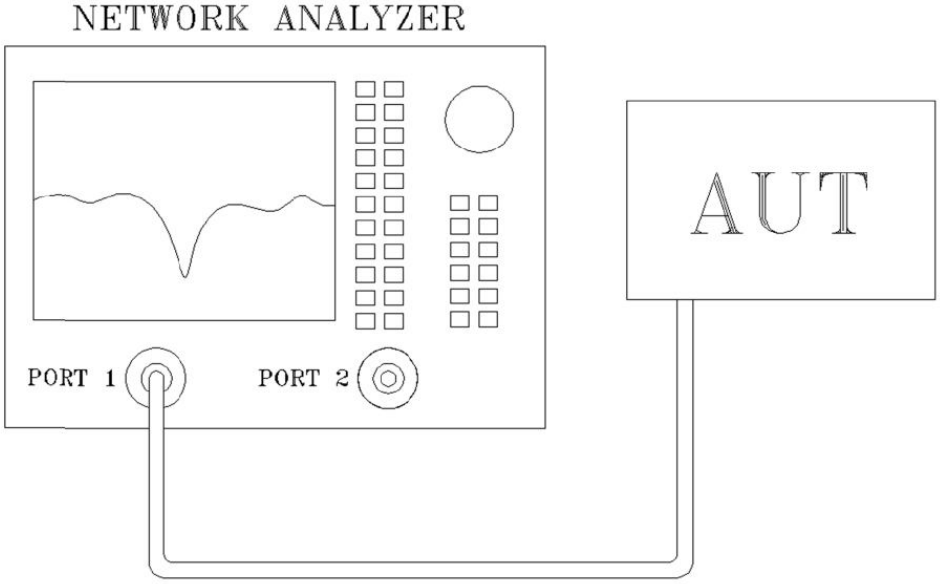
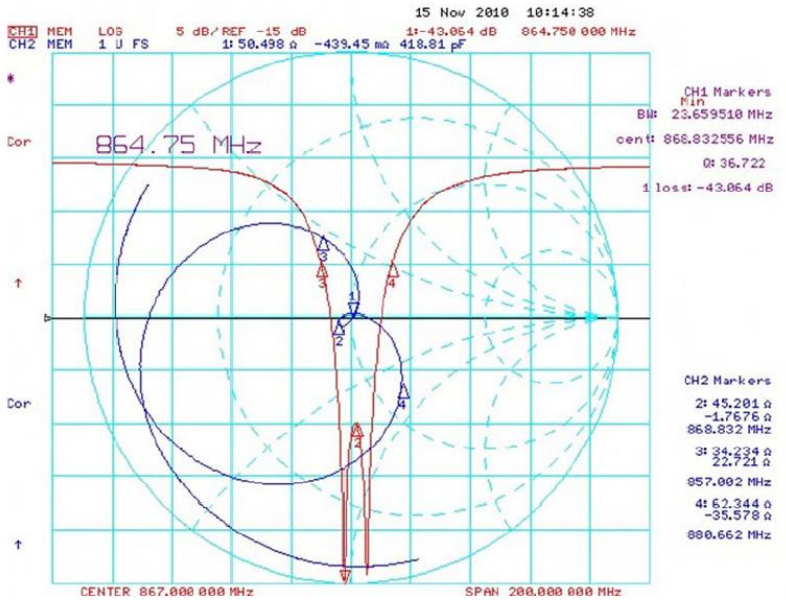
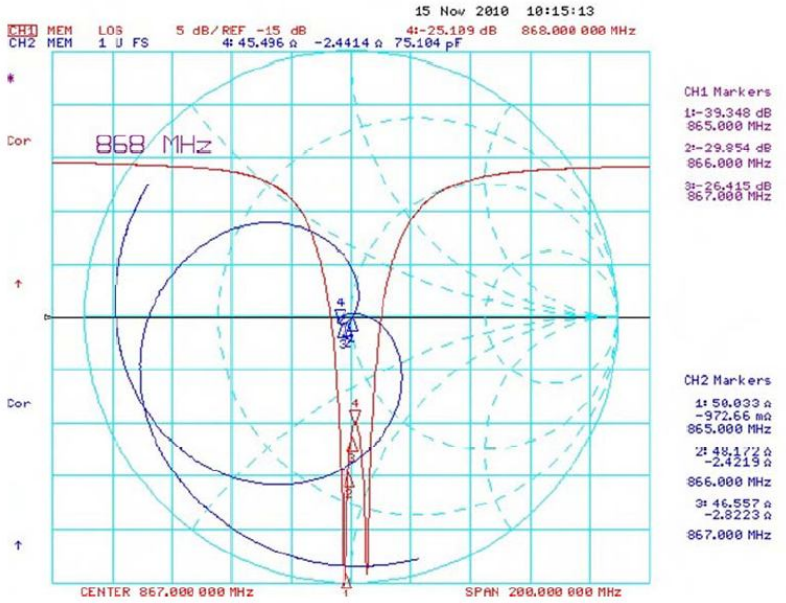


Fig.1 Antenna measured in Network Analyzer

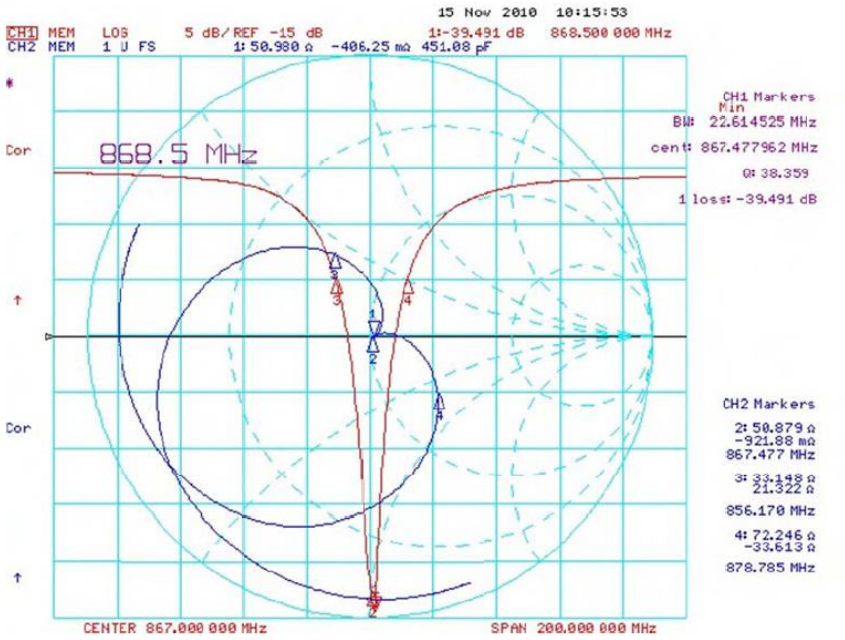
S-PARAMETER TEST RESULT：

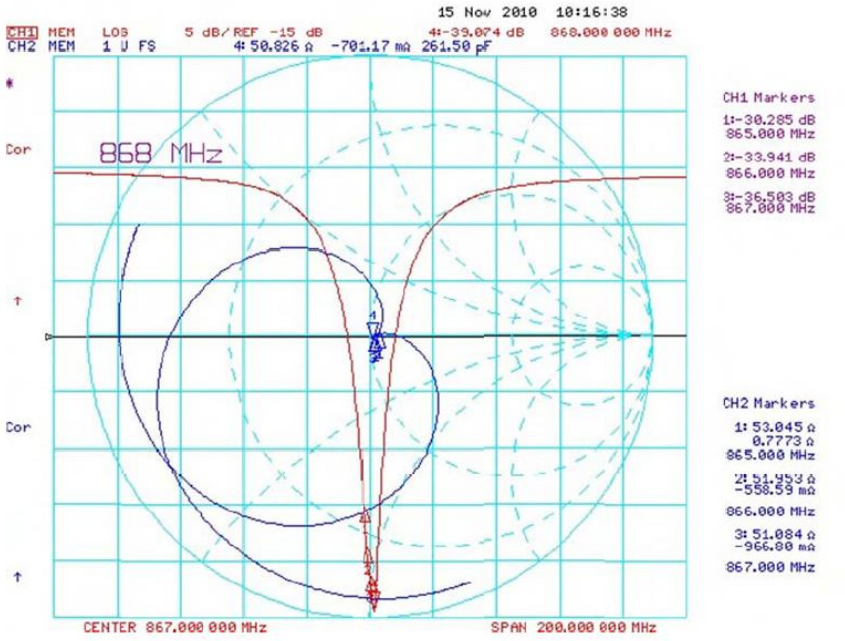
1. SAMPLE-1



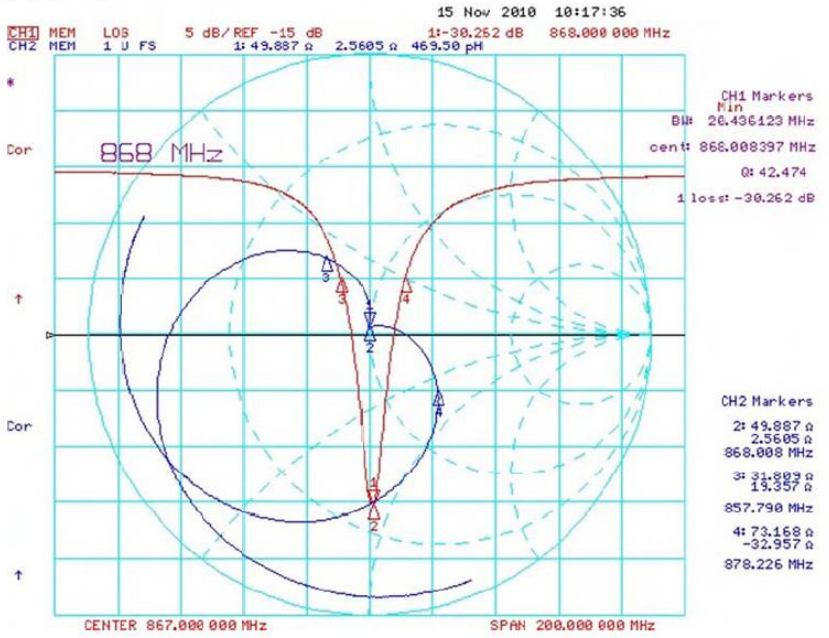


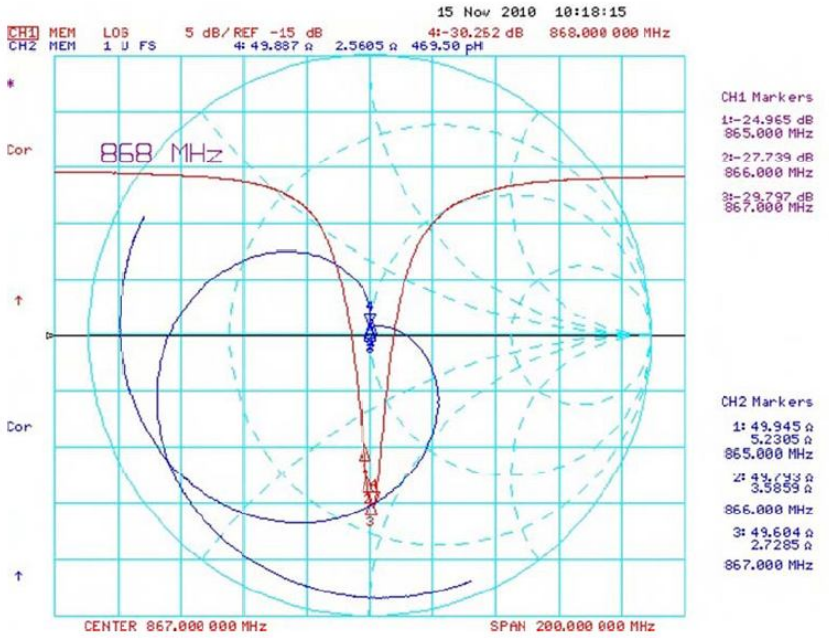
SAMPLE-2


15 Nov 2010 10:15:53
CH1 MEM LOG 5 dB/ REF -15 dB 1:-39.491 dB 868.500 000 MHz
CH2 MEM 1 U FS 1: 50.980 Ω -406.25 mΩ 451.08 pF
868.5 MHz
CH1 Markers
Min
BW: 22.614525 MHz
cent: 867.477962 MHz
Q: 38.359
1 loss: -39.491 dB
CH2 Markers
2: 50.879 Ω
-921.88 mΩ
867.477 MHz
3: 33.148 Ω
21.322 Ω
856.170 MHz
4: 72.246 Ω
-33.613 Ω
878.785 MHz
CENTER 867.000 000 MHz
SPAN 200.000 000 MHz

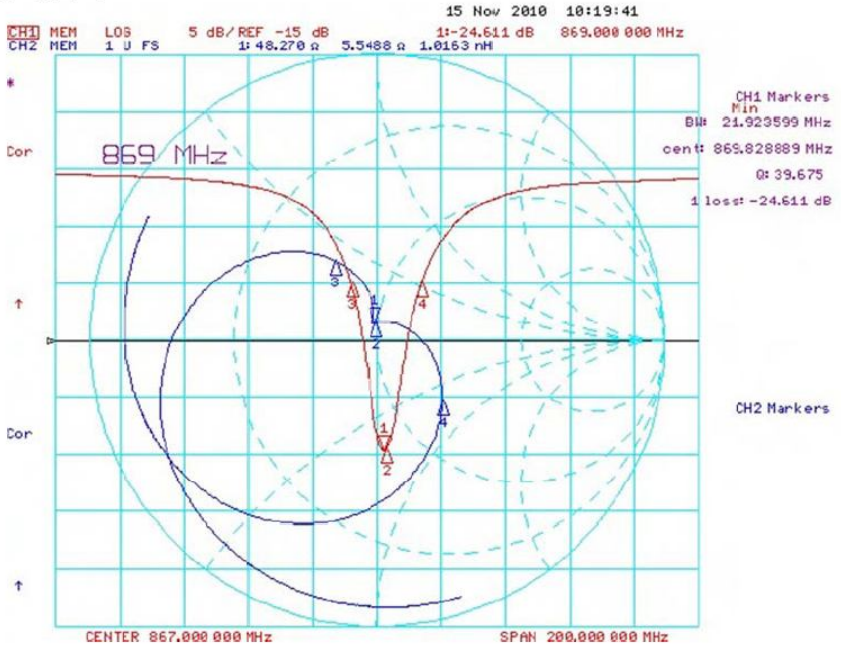

15 Nov 2010 10:16:38
CH1 MEM LOG 5 dB/ REF -15 dB 4:-39.074 dB 868.000 000 MHz
CH2 MEM 1 U FS 4: 50.826 Ω -701.17 mΩ 261.50 pF
868 MHz
CH1 Markers
1:-30.285 dB
865.000 MHz
2:-33.941 dB
866.000 MHz
3:-36.503 dB
867.000 MHz
CH2 Markers
1: 53.045 Ω
0.7773 Ω
865.000 MHz
2: 51.953 Ω
-558.59 mΩ
866.000 MHz
3: 51.084 Ω
-966.80 mΩ
867.000 MHz
CENTER 867.000 000 MHz
SPAN 200.000 000 MHz

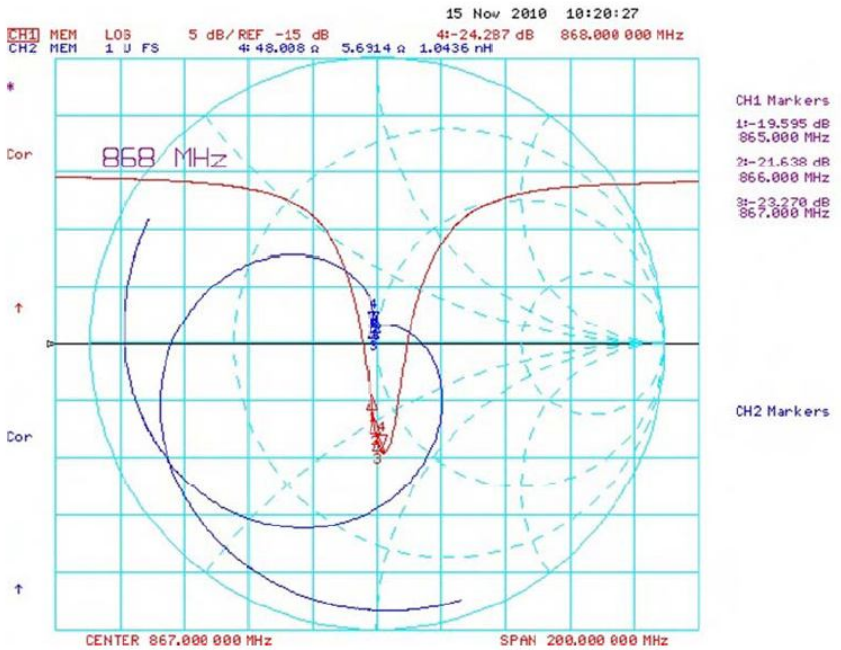
SAMPLE-3


15 Nov 2010 10:17:36
CH1 MEM LOG 5 dB/ REF -15 dB 1:-30.252 dB 868.000 000 MHz
CH2 MEM 1 U FS 1: 49.887 Ω 2.5605 Ω 469.50 pM
868 MHz
CH1 Markers
Min
BW: 26.436123 MHz
cent: 868.008397 MHz
Q: 42.474
1 loss: -30.262 dB
CH2 Markers
2: 49.887 Ω
2.5605 Ω
868.008 MHz
3: 31.889 Ω
19.357 Ω
857.790 MHz
4: 73.168 Ω
-32.957 Ω
878.226 MHz
CENTER 867.000 000 MHz
SPAN 200.000 000 MHz


15 Nov 2010 10:18:15
CH1 MEM LOG 5 dB/ REF -15 dB 4:-30.252 dB 868.000 000 MHz
CH2 MEM 1 U FS 4: 49.887 Ω 2.5605 Ω 469.50 pM
868 MHz
CH1 Markers
1:-24.965 dB
865.000 MHz
2:-27.739 dB
866.000 MHz
3:-29.797 dB
867.000 MHz
CH2 Markers
1: 49.945 Ω
5.2305 Ω
865.000 MHz
2: 44.678 Ω
3.5859 Ω
866.000 MHz
3: 49.604 Ω
2.7285 Ω
867.000 MHz
CENTER 867.000 000 MHz
SPAN 200.000 000 MHz

SAMPLE-4


15 Nov 2010 10:19:41
CH1 MEM LOG 5 dB/ REF -15 dB 1:-24.611 dB 869.000 000 MHz
CH2 MEM 1 U FS 1: 48.270 Ω 5.5488 Ω 1.0163 nH
869 MHz
CH1 Markers
Min
BW: 21.923599 MHz
cent: 869.828889 MHz
Q: 39.675
1 loss: -24.611 dB
CH2 Markers
CENTER 867.000 000 MHz
SPAN 200.000 000 MHz


15 Nov 2010 10:20:27
CH1 MEM LOG 5 dB/ REF -15 dB 4:-24.287 dB 868.000 000 MHz
CH2 MEM 1 U FS 4: 48.008 Ω 5.6914 Ω 1.0436 nH
868 MHz
CH1 Markers
1:-19.595 dB
865.000 MHz
2:-21.638 dB
866.000 MHz
3:-23.270 dB
867.000 MHz
CH2 Markers
CENTER 867.000 000 MHz
SPAN 200.000 000 MHz

IIII. THE TEST INFORMATION IN ANECHOIC CHAMBER

1. Measurement System:

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

(b) Anechoic chamber description:

(1) The anechoic chamber is a far-field measurement system with size of 3.25M*2.84M*6.4M. The quiet zone of this chamber shall be greater than 70cm @ 0.9GHz, 50cm @ 1.8GHz, 44cm @ 2.4GHz, 28cm @ 5.8GHz, 16cm @ 18GHz.

(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 two step rotators. We control the rotating angle for accurate or rough measurement.

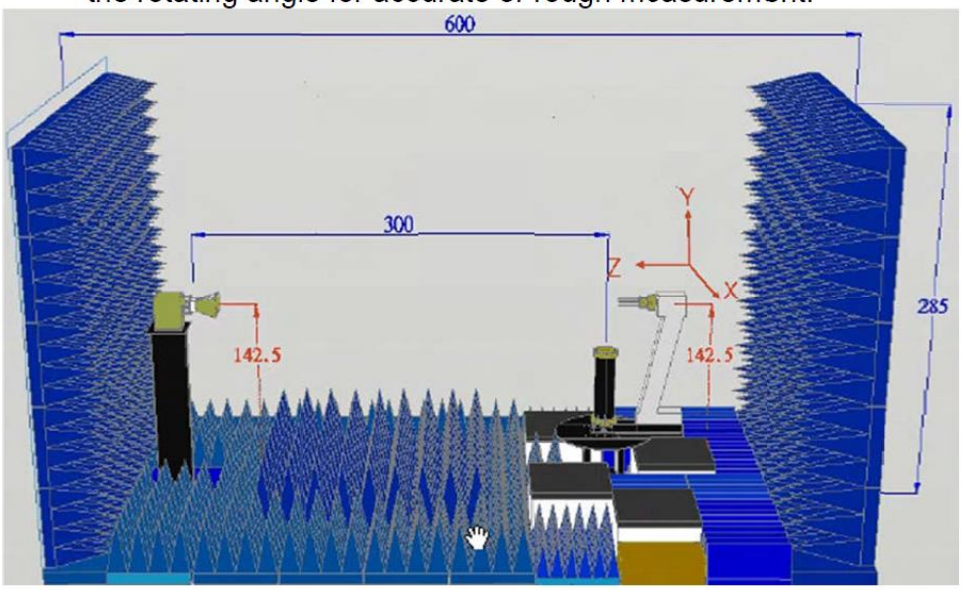


Fig.2 The interior components of the anechoic

(3) While we measure the radiation patterns by rotating AUT with 360 degrees phi axis along 180 degrees theta axis 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

(4) The axis defined in the Fig.3.

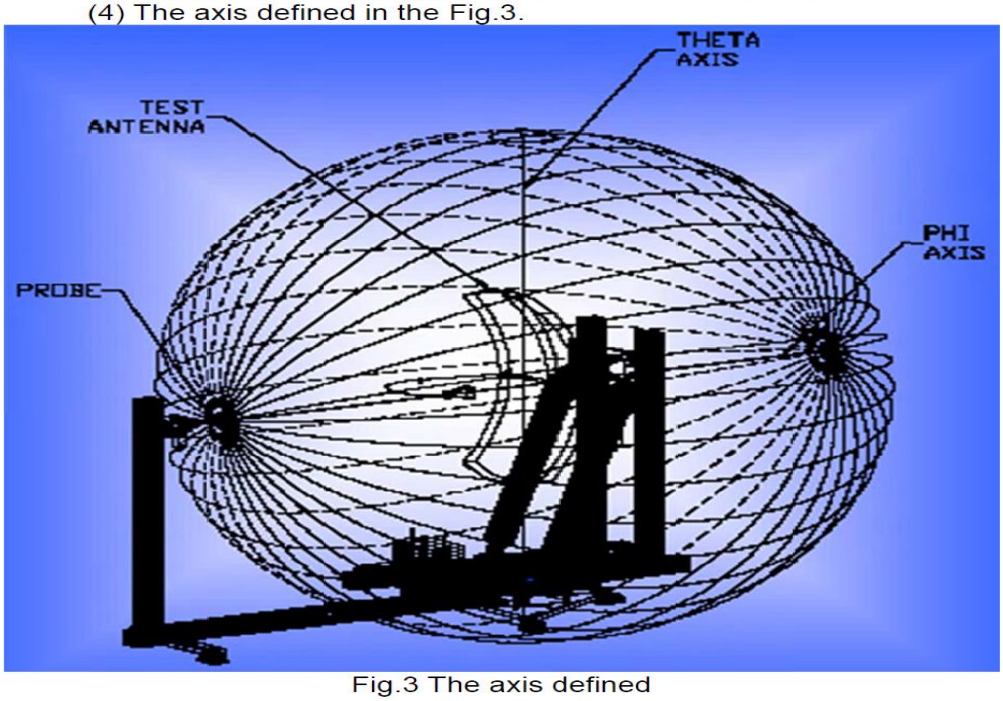
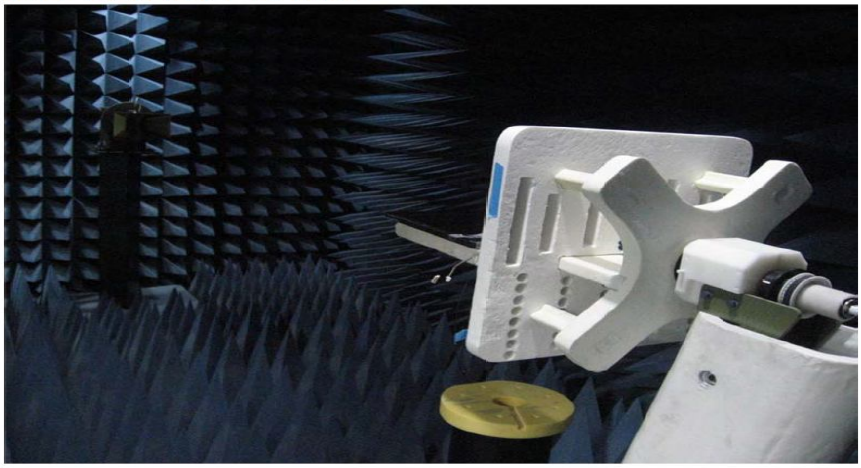
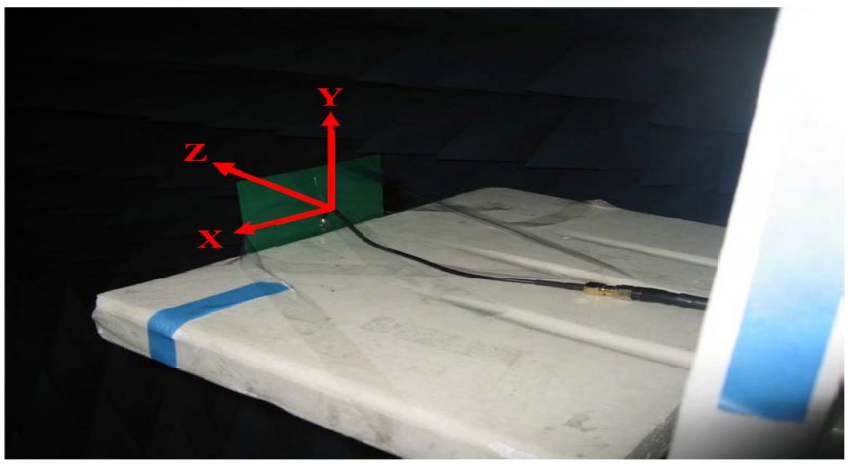


Fig.3 The axis defined

V. CHAMBER TEST PICTURE

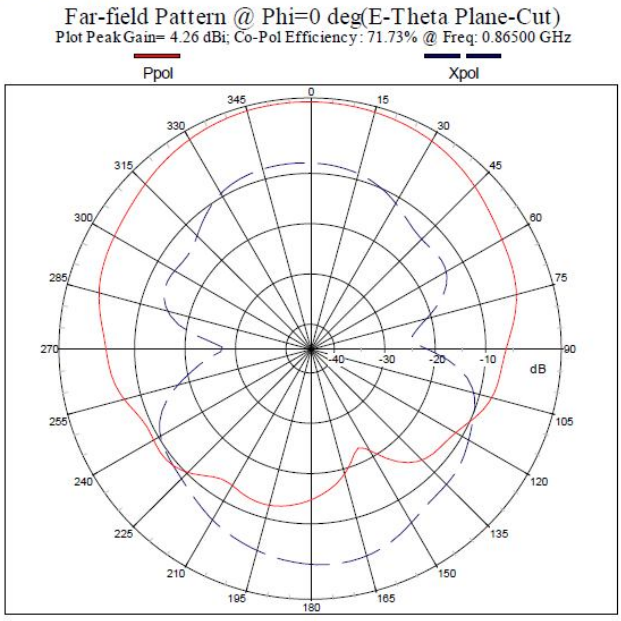




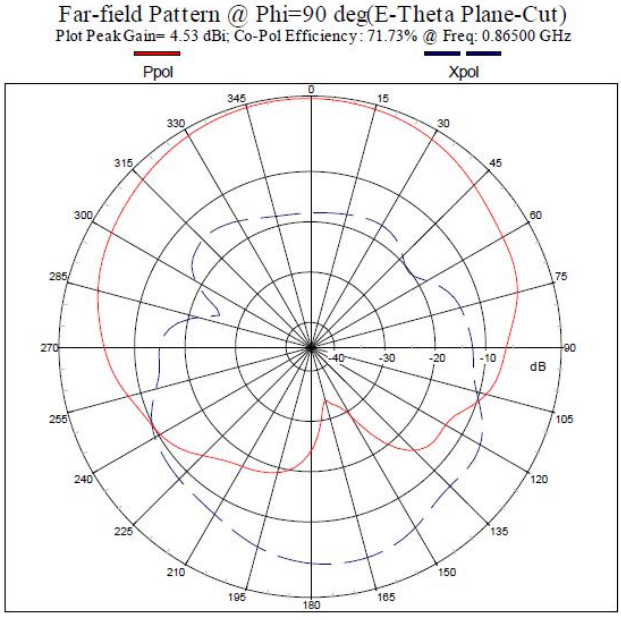
VI. CHAMBER TEST RESULT

1. PATTERN

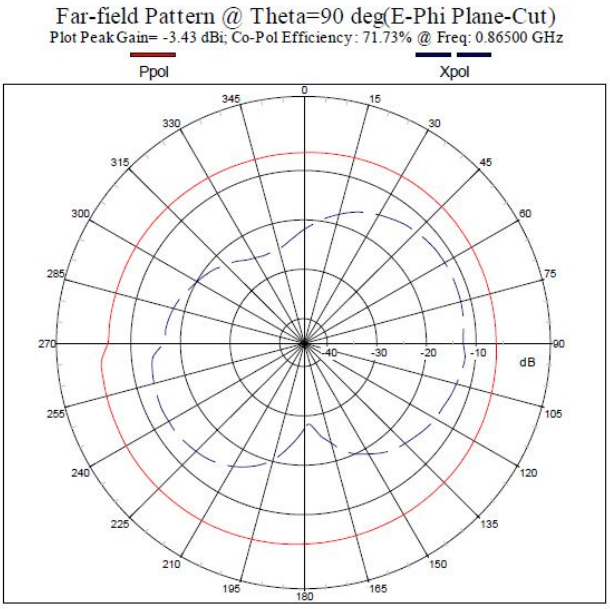
(a) Frequency：865MHz



XZ-PLANE

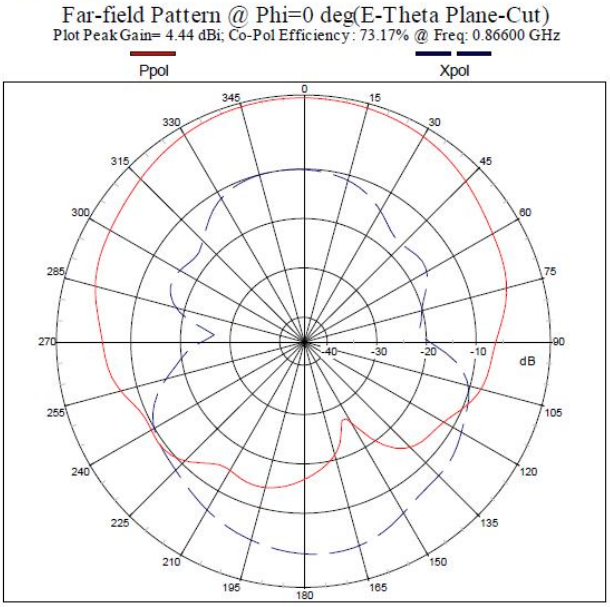


YZ-PLANE



XY-PLANE

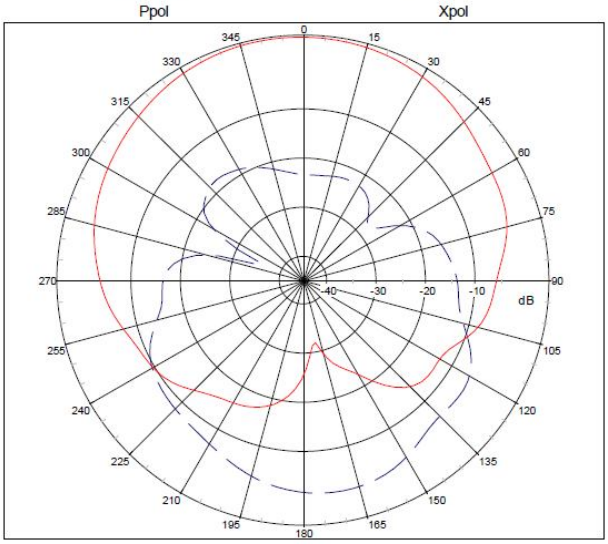
(b) Frequency：866MHz



XZ-PLANE

Far-field Pattern @ Phi=90 deg(E-Theta Plane-Cut)

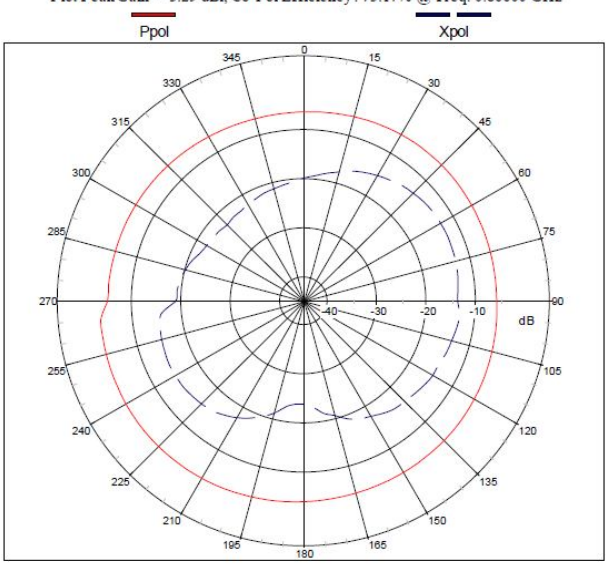
Plot Peak Gain= 4.64 dBi; Co-Pol Efficiency: 73.17% @ Freq: 0.86600 GHz



YZ-PLANE

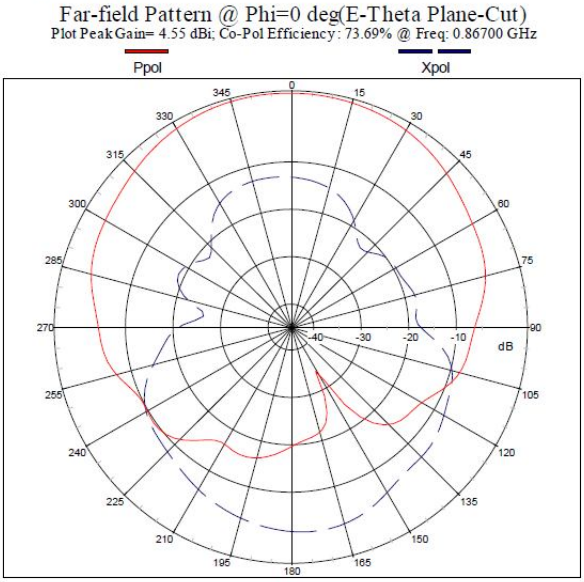
Far-field Pattern @ Theta=90 deg(E-Phi Plane-Cut)

Plot Peak Gain= -3.29 dBi; Co-Pol Efficiency: 73.17% @ Freq: 0.86600 GHz

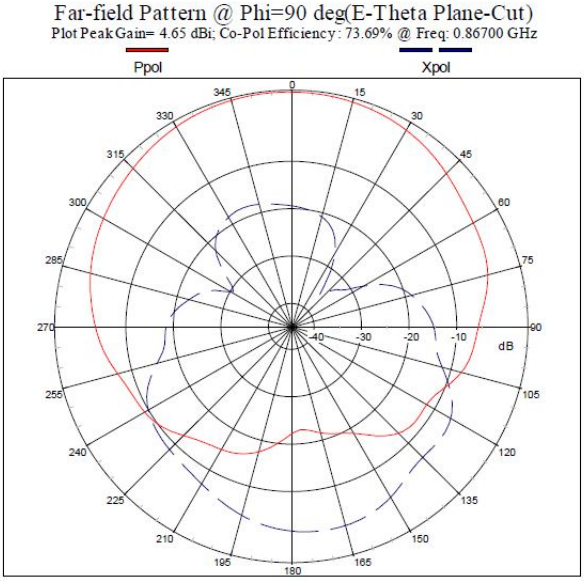


XY-PLANE

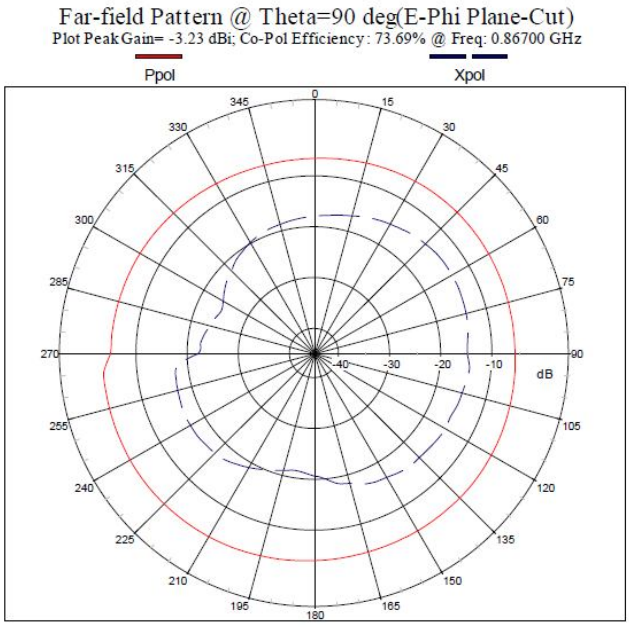
(c) Frequency：867MHz



XZ-PLANE

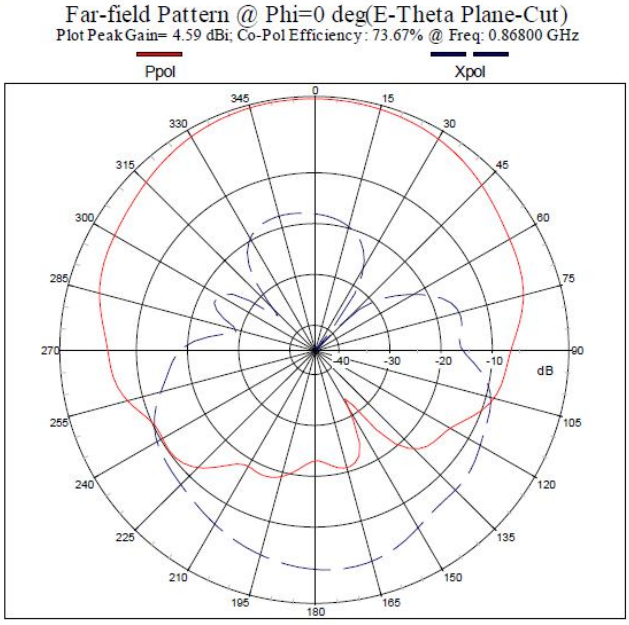


YZ-PLANE



XY-PLANE

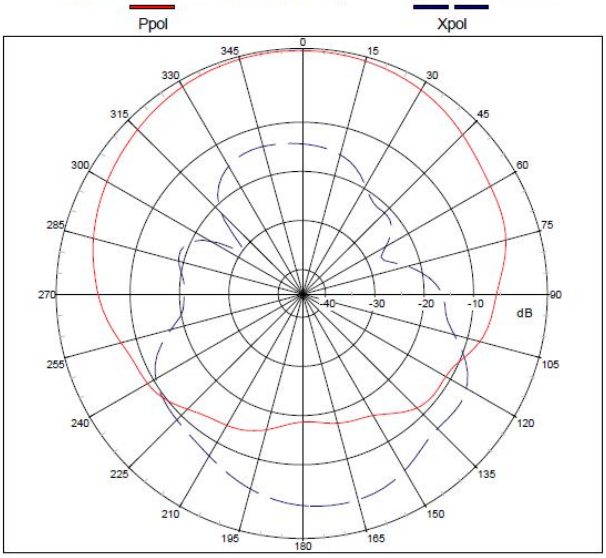
(d) Frequency：868MHz



XZ-PLANE

Far-field Pattern @ Phi=90 deg(E-Theta Plane-Cut)

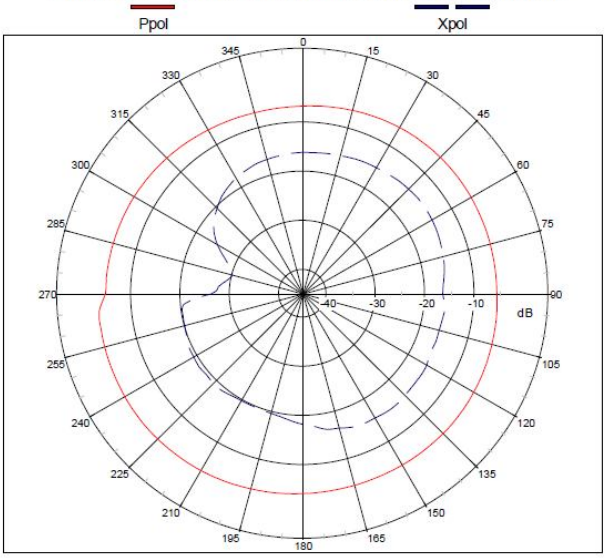
Plot Peak Gain= 4.60 dBi; Co-Pol Efficiency: 73.67% @ Freq: 0.86800 GHz



YZ-PLANE

Far-field Pattern @ Theta=90 deg(E-Phi Plane-Cut)

Plot Peak Gain= -3.24 dBi; Co-Pol Efficiency: 73.67% @ Freq: 0.86800 GHz



XY-PLANE

2. TEST VALUE

(a) Gain & Efficiency & Axial Ratio

Freq. (MHz)	Gain (dBic)	Gain_Power (dBic)	3D-avgGain (dBic)	Total Rad. Efficiency(%)	Axial Ratio
865	4.56	4.67	-1.44	71.73	4.37
866	4.66	4.72	-1.36	73.13	3.30
867	4.67	4.72	-1.33	73.69	2.26
868	4.63	4.69	-1.33	73.67	1.28

VII. PICTURE