SPECIFICATION AND PERFORMANCE FOR APPROVAL

Part No.: **E421C-5000G1**

Product Description: **ANTENNA 2.4G 5dBi(GAT2)**

Customer :

Customer Part No.:

Sample Qty.

FRE		
Issued By	**Checked BY**	**QA Inspection**
		Warren Chung **Dec-15-2003**
Sales&Marketing Group	**R&D Group**	**QA Group**

Customer		
Customer Approval: ☐ **Approved** ☐ **Concessionary** ☐ **Rejected**		
Issued By	**Checked BY**	**Approved By**
Comments:		

CATALOGUE OF E421C-5000G1 APPROVAL SHEETS

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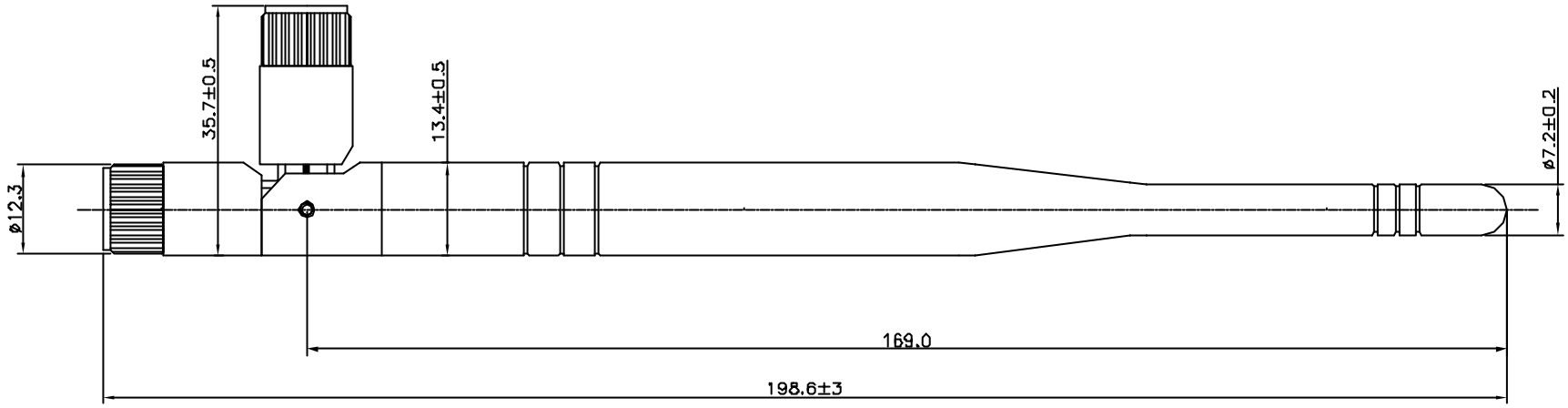
A1RFRD10

REVISION RECORD				
REV	ECO	DESCRIPTION	DRFT	CHKD



NOTE:

ELECTRICAL PROPERTIES

1.DESCRIPTION : 1/4λ SWIVEL TYPE DIPOLE ANTENNA
ø13.4x169+ SMA (GAIN>5dBi)
2.MODEL NO. : AN-G1-XDC
3.FREQUENCY : OPTION
4.IMPEDANCE : 50 Ohms nominal
5.V.S.W.R. : 2.0 max. IN BAND
6.GAIN : 5 dBi, VERTICAL DIRECTION
7.ADMITTED POWER RADIATION : 1W
8.TYPE OF RADIATION : TOROIDAL
9.POLARIZATION : VERTICAL
10.ELECTRICAL LENGTH : 1/4λ ,DIPOLE
11.RADIATION : Omni
12.CONNECTOR TYPE : SMA (MALE/FEMALE OPTION)

MECHANICAL PROPERTIES

1.CABLE : RG-178, 50ohm
2.OPERATING TEMPERATURE RANGE : -20C°~+65C°
3.STORAGE TEMPERATURE RANGE : -30C°~+75C°
4.ANTENNA COVER : TPEE
5.COLOR : OPTION

PART NUMBER : E42XX-5000GX

FREQUENCY/(GAIN)
1: 2.4~2.5GHz /5 dBi

CONNECTOR
C:R-SMA (FEMALE)
D:SMA (MALE)

COLOR
1:BLACK
3:GRAY
4:MIDNIGHT GRAY

MM (INCH)	DFTD ANDY	DATE 07/05/2003	FULL RISE ELECTRONIC CO., LTD
TOLERANCES EXCEPT AS NOTED	CHKD	DATE	
	NFD	DATE	
MM .0 ± 0.2 ± .00 ± 0.10 ± .000 ± 0.075 ±	APPVL	DATE	TITLE ANTENNA 2.4G 5dBi(GAT2)
ANGLES ± 0.5	MATERIAL :		
	QTY :		DRAWING NO. GE423A23 SIZE A3 REV 0
THIRD ANGLE PROJECTION	FINISH :		/PART NO. SEE NOTE
	SCALE : 1.5:1		DO NOT SCALE DRAWING SHEET 1 OF 1

DETACHED USTB

	天線製品規格書 ANTENNA APPROVAL SHEET	主管認印 Approved	品檢人員 Checked	製表人員 Written By
2002 年 12 月 2 日製訂 2002/12/02 Rev.:1		Elvis Liang	Warren Chung	Jet Lee

1. 一般事項(Generation)

1.1 適用範圍 此樣式表適用於 FRE 開發之 E42 Series ISM Band 的無線通訊系統所使用之天線。

Application Field: This approval sheet only use for FRE development E42 Series Wireless LAN antenna of ISM Band.

1.2 使用溫度範圍 -20 ~ 65 ℃

Operation : -20 ~ 65 ℃

1.3 保存溫度範圍 -30 ~ 75 ℃

Storage : -30 ~ 75 ℃

1.4 測試狀態 溫度 5 ~ 35 ℃、相對濕度 45 ~ 85%、氣壓 860 ~ 1060 hpa 的標準狀態下進行測試。但是若對測試結果有質疑的話，可以於溫度 20 ± 2 ℃、相對濕度 65 ± 5%、氣壓 860 ~ 1060hpa 的基準狀態進行測試。

Test Condition: T=5 ~ 35 ℃ , Humidity=45 ~ 85%. If any doubt and you could test under the following standard T= 20 ±2℃ , Humidity = 65±5% , Atmosphere=860 ~ 1060hpa

2. 外觀、構造、尺寸 (Appearance , Construction , Dimension)

2.1 外觀 各部位的修飾加工良好，沒有對於機能有害的生銹、裂痕、瑕疵等等情形。

Appearance : Good manufacture of each parts and without rusting,cracking,defect…etc to damage product.

2.2 機能、尺寸 依據各個製品圖。

Construction, Dimension: According to each product drawing

3. 機械性能 Mechanical Performance

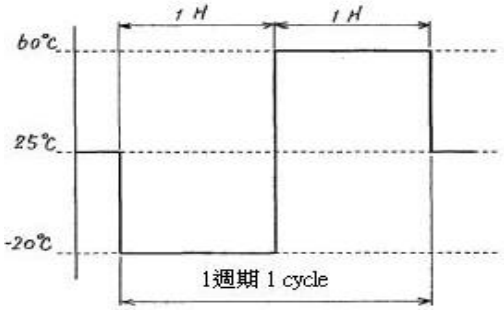
	項目 ITEM	測試條件 TEST CONDITION	規格 SPECIFICATION
3.1	旋轉壽命 Twist Life	左右各 90 ° 旋轉視為一次旋轉, 每分鐘 12 次的速度，動作 500 次之後。 但是，必須是在連接器上沒有施予壓力的狀態。 To rotate 90 ° of left & right as a cycle and totally need to test 500 cycles via 12 cycle/minute	塑體機械性能無異常 The housing after test shall be no functional damage.
3.2	蓋套抗脫落強度 Tensile-Housing	按蓋套的旋轉方向，施加 5 kgf•cm 的旋轉扭矩三秒。 To obey the rotary arrow direction to wrench with 5Kgf.cm within 3sec	樹脂管不會鬆脫 No loosen of the Housing.

3.3	抗振性 Vibration	振擺的比率 ： 10 ~ 55 ~ 10 Hz/分 總振幅 ： 1.5 mm X、Y、Z 方向各 2 小時（總計 6 小時） Ratio: 10-50-10 Hz/minute. Vibration amplitude:1.5 mm To vibrate 2 hrs on X,Y,Z direction(Totally 6 hrs)	外觀、構造無異常 機械性能無異常 符合電氣性能（4.1& 4.2 項） No abnormal of appearance, construction, mechanical. Meet electrical request(Item 4.1&4.2)
3.4	同軸電纜的抗拉強度 Tensile of Coaxial Cable	在同軸電纜的拉出方，施加 1 kgf 的靜止負荷重量一分鐘。 To load 1Kgf weight within 1 minute.	同軸電纜不會脫落 No fall of Coaxial cable. Remarks: This test only for pigtail type.

4. 電氣的性能 Electrical Properties

	項目 ITEM	測試條件 TEST CONDITION	規格 SPECIFICATION
4.1	駐波比 VSWR	放置在任何空間進行檢測。 (VSWR & Return Loss 的檢測方式參考次頁明細圖) To detect on any space. (VSWR & Return Loss testing to read next figure for ref.)	2.0 以下 2.0 Max. (2.4 GHz ~ 2.5 GHz)
4.2	反射損失 Return Loss		-10 dB 以下 -10 dB Max. (2.4 GHz ~ 2.5 GHz)
4.3	特徵阻抗 Impedance		50 Ω
4.4	指向性 Certain direction		無指向性 Uncertain direction
4.5	最大增益 Max GAIN		5 dBi 以上（絕對增益） 5 dBi Min.

5. 耐氣候性 Environmental Performance

	項目 ITEM	測試條件 TEST CONDITION	規格 SPECIFICATION
5.1	耐熱性 Temperature Life	放置在溫度 60 ±2℃中，96 小時後在正常溫濕度下放置 1 小時進行檢測。 To put antenna at 60±2℃ within 96 hrs then take it out to put at normal environment within 1 hour later to detect.	外觀、構造無異常 機械性能無異常 符合電氣性能（4.1& 4.2 項） No abnormal of appearance, construction, mechanical. Meet electrical request(Item 4.1& 4.2)
5.2	耐寒性 Cold	放置在 -10 ±2℃中，96 小時以後，再置於正常溫濕度 1 小時進行檢測。 To keep in -10±2℃ within 96hrs and take out to put at normal environment within 1 hour later to detect.	
5.3	耐溫性 穩定狀態） Humidity (Stable)	放置在+40 ±2℃，相對濕度 90 ~ 95%的狀態，96 小時以後，再置於正常溫濕度 1 小時進行檢測。 To keep in +40±2℃ , damp=90~95% within 96 hrs and take it out to put at normal environment within 1 hour later to detect.	
5.4	熱沖擊測試 Thermal Shock	-20℃，+60℃的狀態各放置 1 小時視為 1 週期，測試 10 週期後，再放置於正常溫濕度 1 小時後進行檢測。 To put antenna at -20℃ & +60℃ and each degree for 1 hour as a cycle , totally need to repeat 10 cycles then put at normal environment within 1 hour later to detect. 	

(註）電氣性能項目的檢測機器

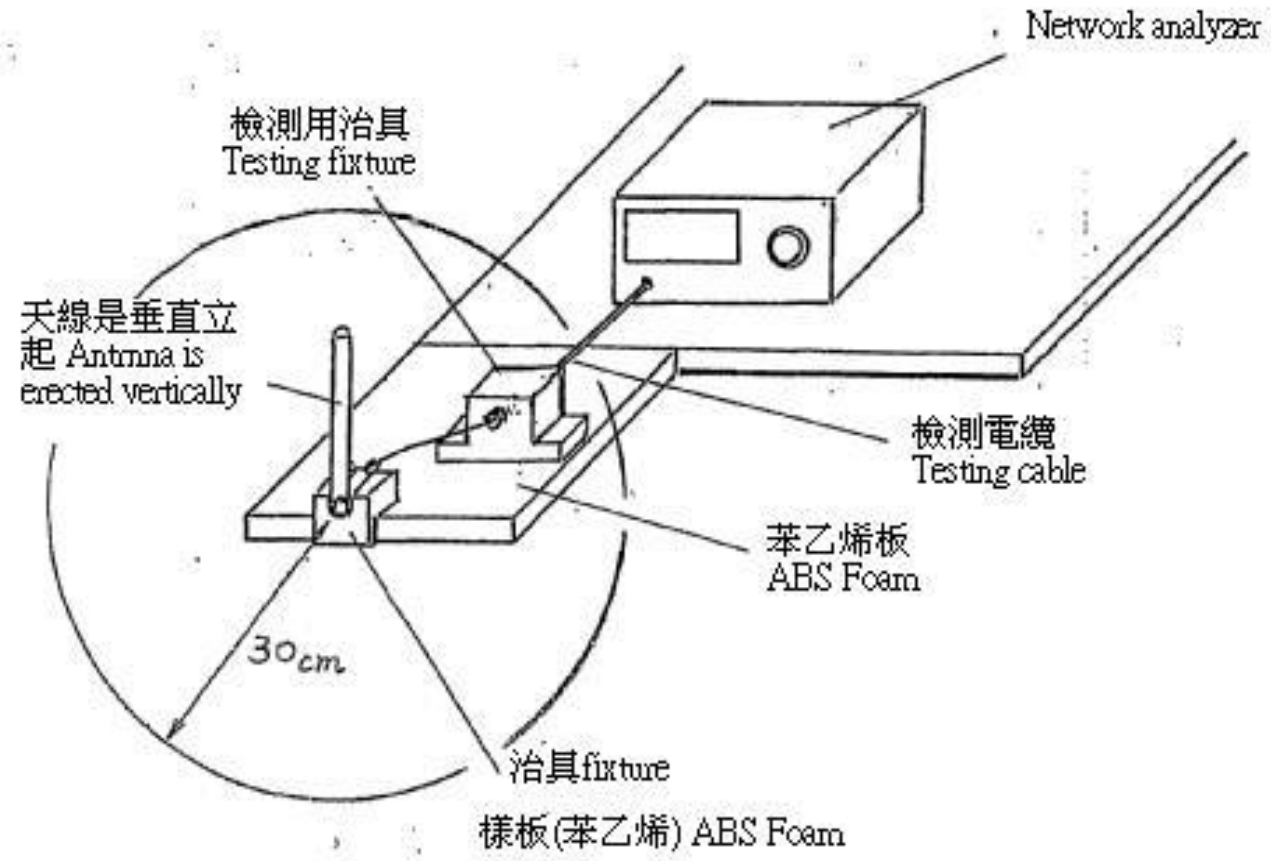
(Remarks) Testing equipments

檢測器(equipment)**：**Agilent Network Analyzer HP-8753ES

生 產 地(Manufacturer)**：台灣平鎮廠**(FRE) **中國寶安廠**

FULL RISE ELECTRONIC CO.,LTD. (Ping Chen, Taoyung , Taiwan)

FULL RISE ELECTRONIC CO.,LTD.(Baoan District, Shenzhen City, China)



●Electrical Properties:

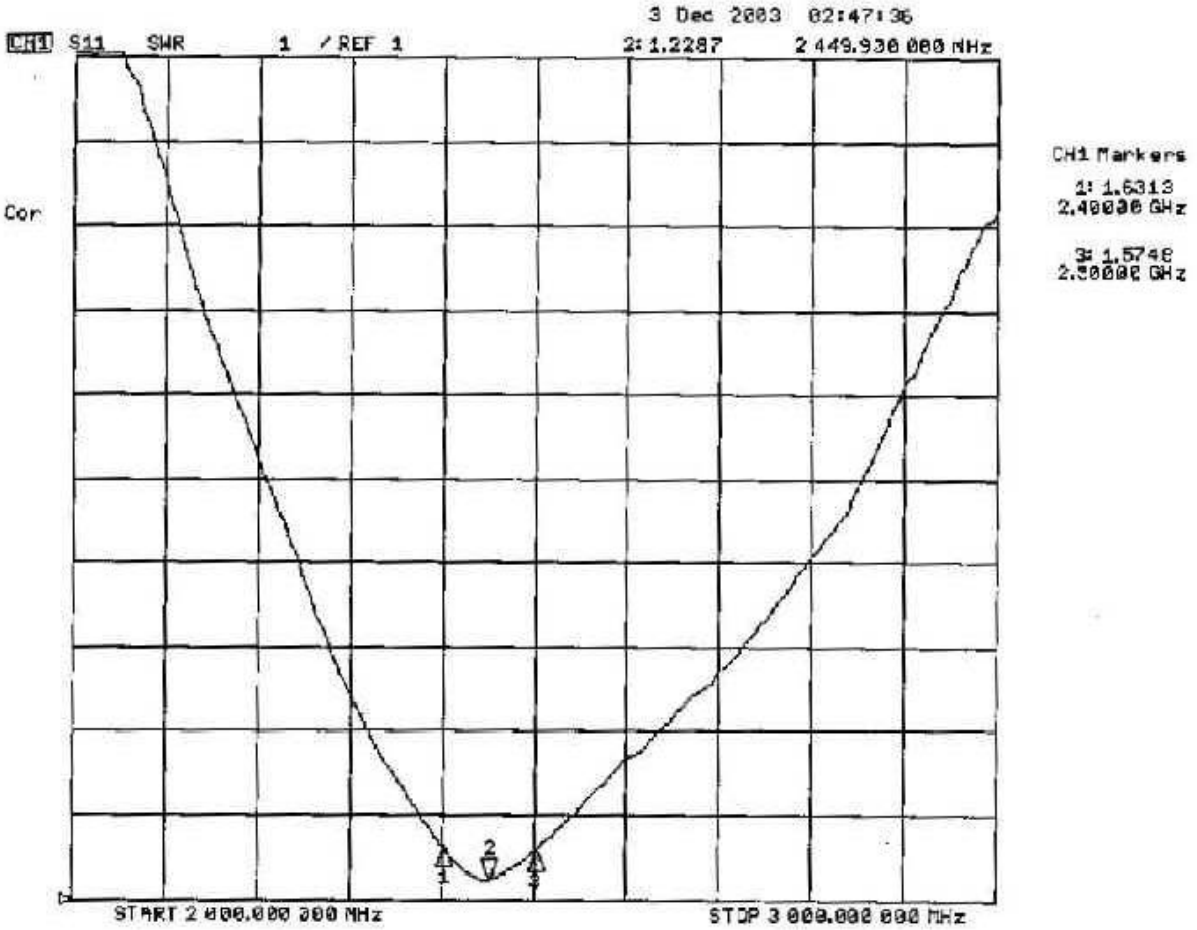
1. Frequency Range: 2.4 ~ 2.5 GHz
2. Impedance: 50 Ohms nominal
3. VSWR: 2.0 max. IN BAND
4. Gain :>5 dBi,Vertical direction

●Test Result:

1.V.S.W.R(For Specification 4.1)**:** ≦2.0

Frequency	2.4 GHz	2.45 GHz	2. 5 GHz
Sample 1	1.631	1.228	1.574
Sample 2	1.623	1.302	1.667
Sample 3	1.539	1.324	1.737
Sample 4	1.429	1.294	1.797
Sample 5	1.614	1.283	1.584

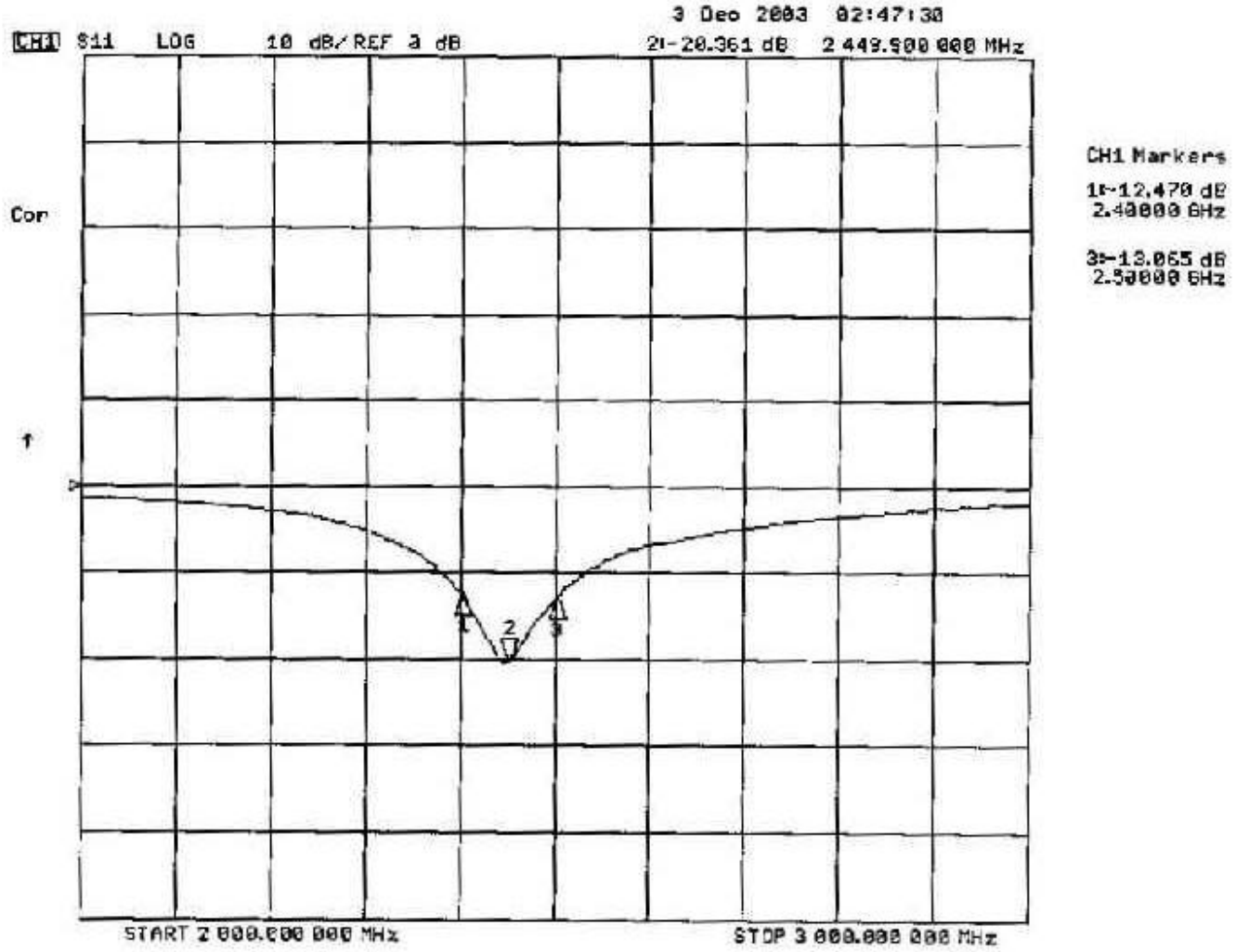
V.S.W.R Profiles



2.Return Loss(For Specification 4.2)**:** ≦-10 dB

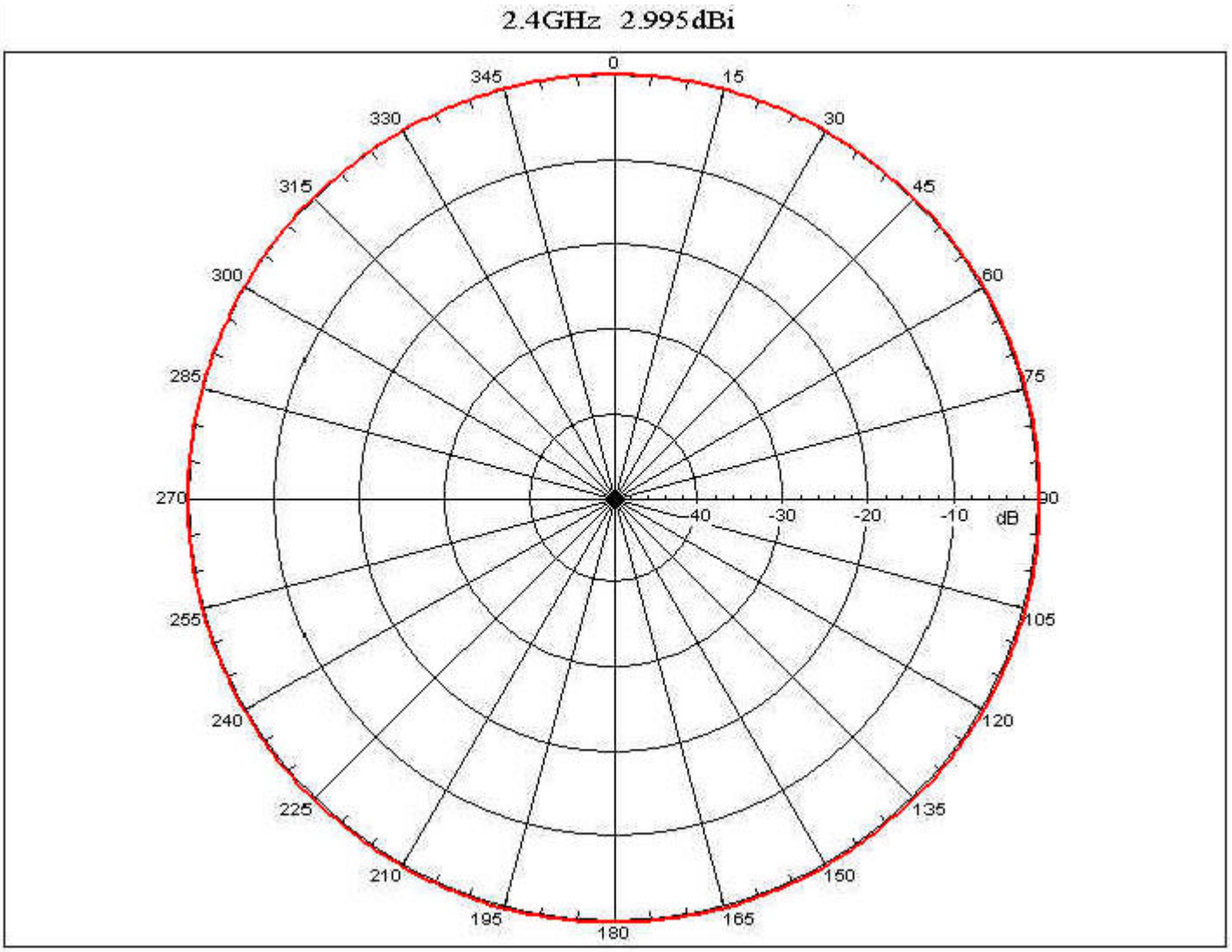
Frequency	2.4 GHz	2.45 GHz	2. 5 GHz
Sample 1	-12.47 dB	-20.36 dB	-13.06 dB
Sample 2	-12.52 dB	-17.81 dB	-12.08 dB
Sample 3	-13.31 dB	-17.02 dB	-11.29 dB
Sample 4	-12.49 dB	-17.96 dB	-12.82 dB
Sample 5	-11.67 dB	-17.38 dB	-12.53 dB

Return Loss Profiles

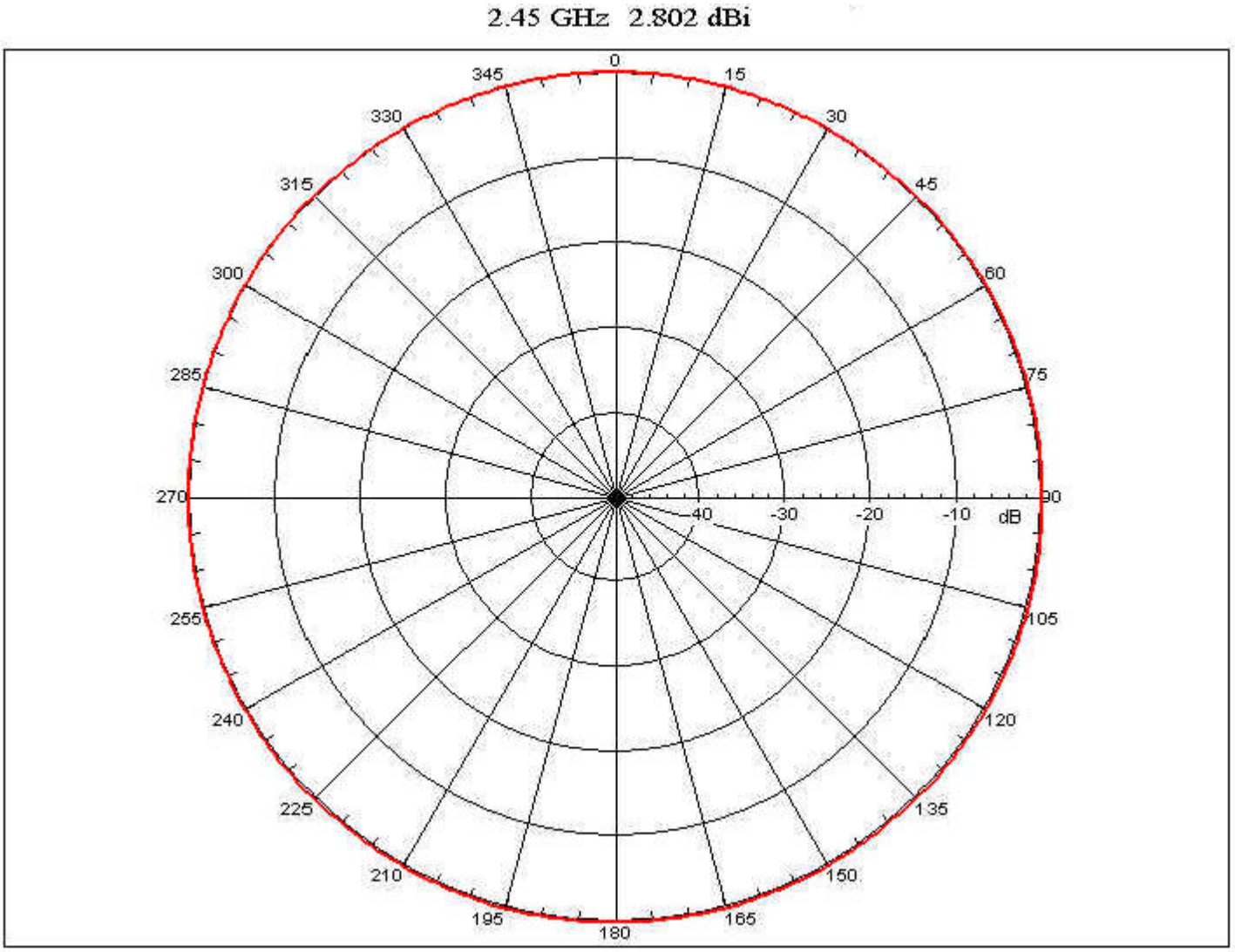


3. Gain (For Specification 4.5)**:** >5 dBi

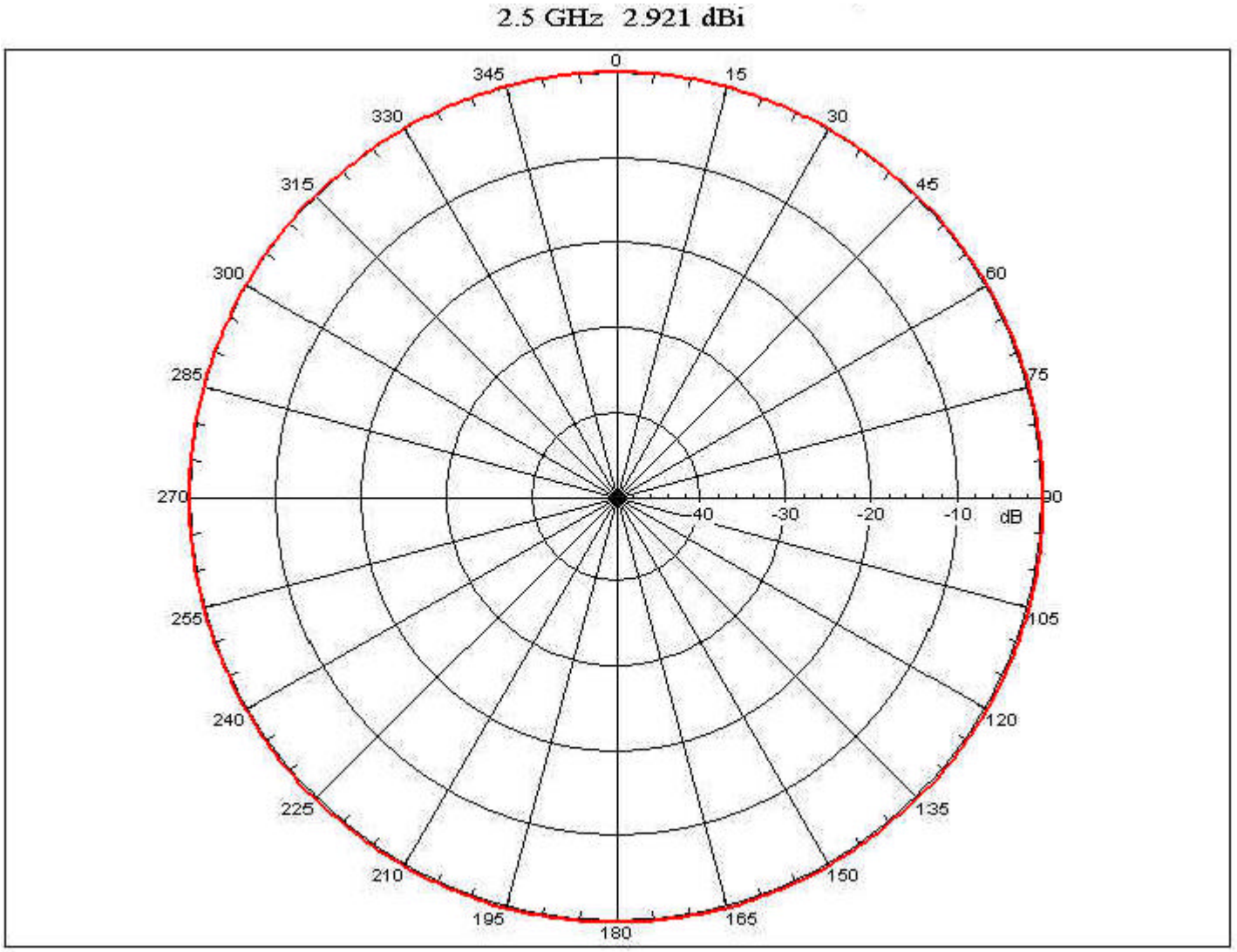
2.4 GHz H-Plain Field Pattern



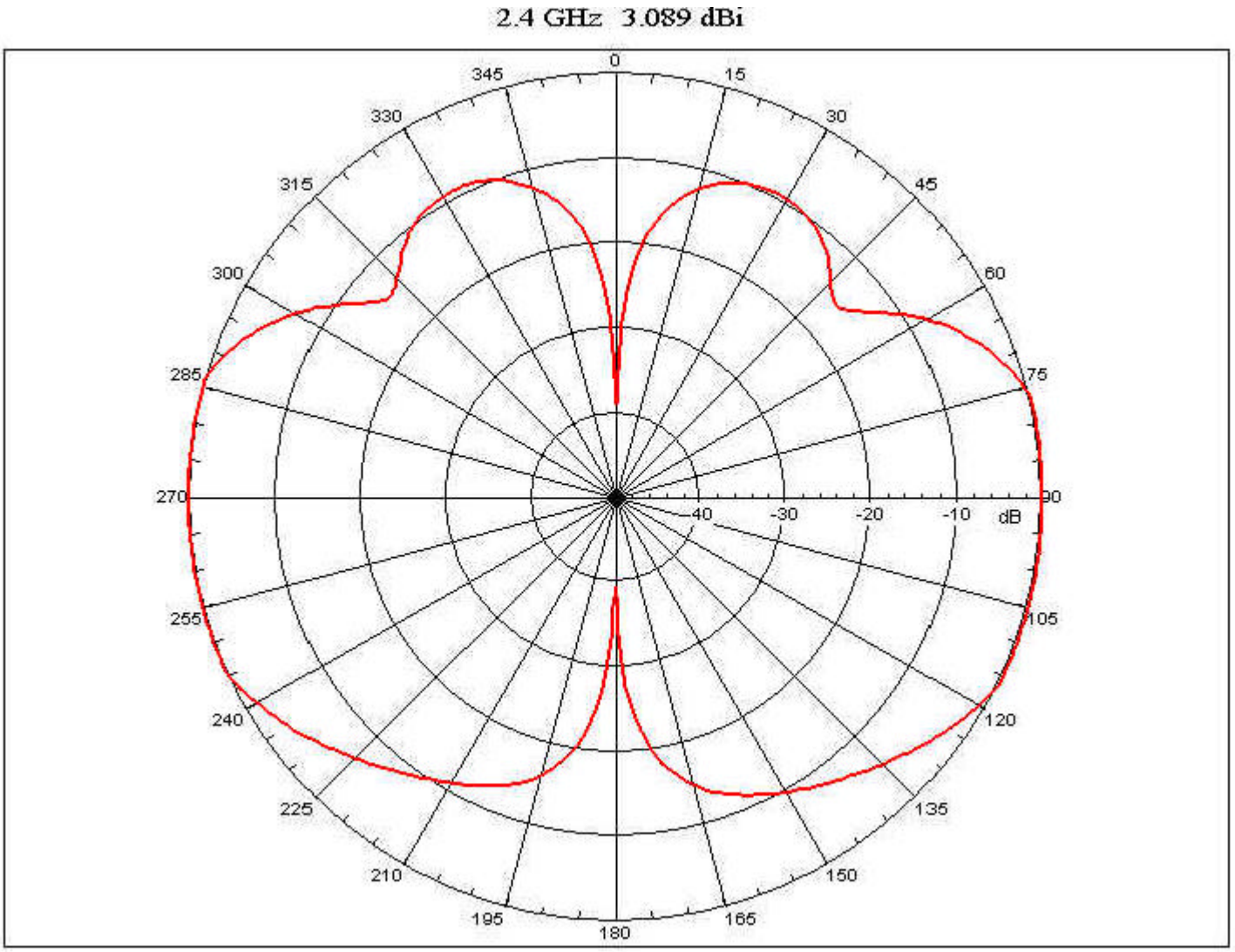
2.45 GHz H-Plain Field Pattern



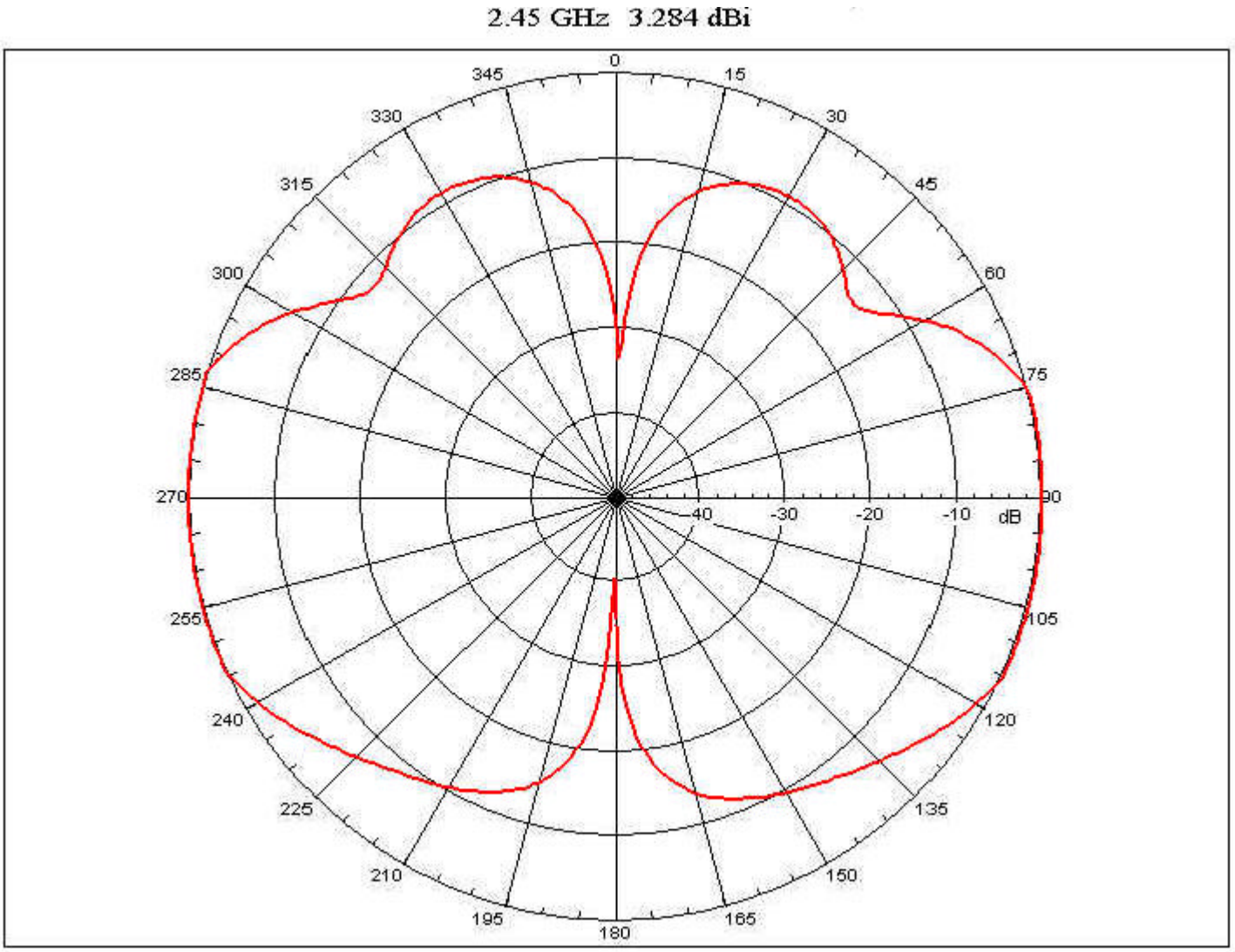
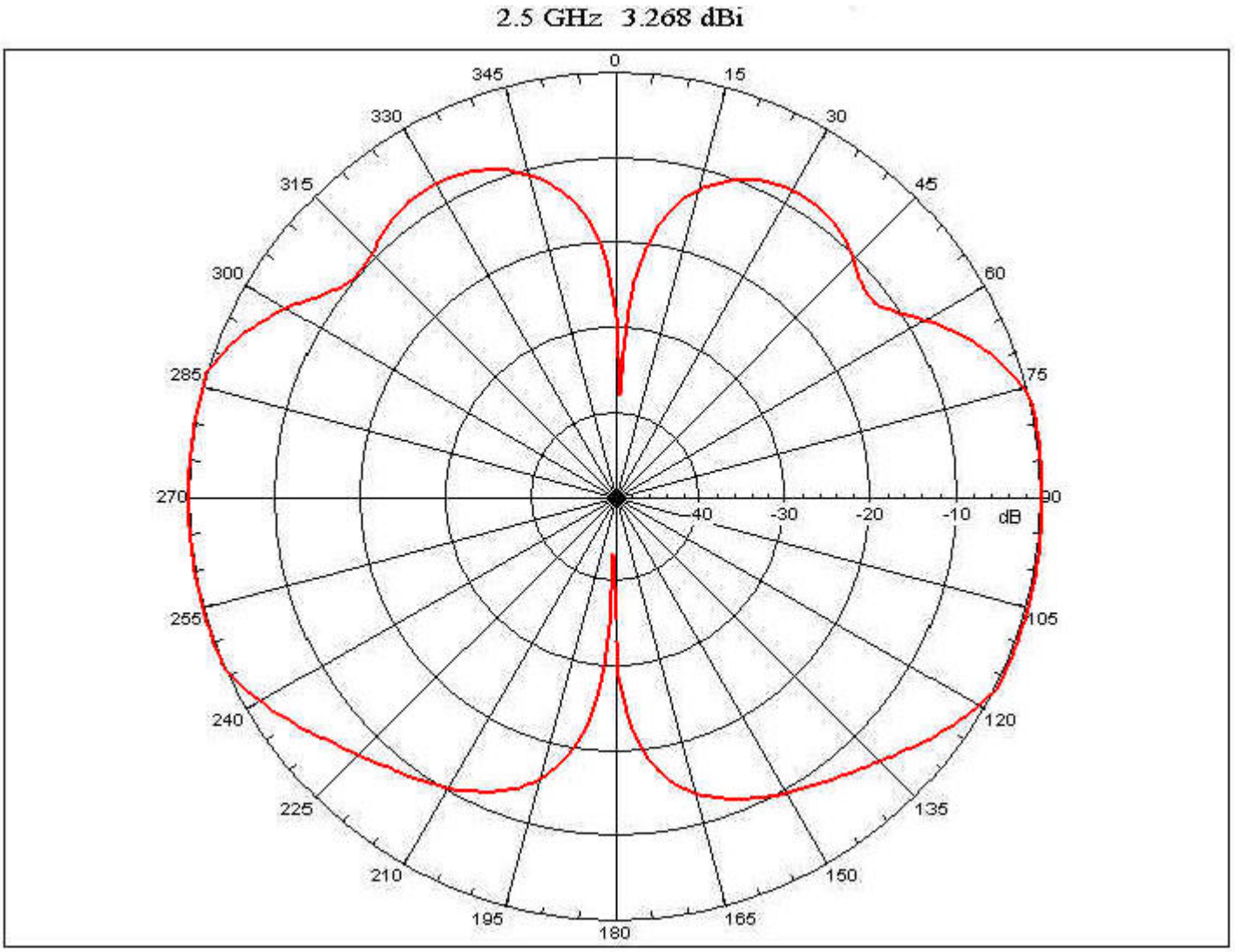
2.5 GHz H-Plain Field Pattern



2.4 GHz E-Plain Field Pattern



2.45GHz E-Plain Field Pattern



2.5GHz E-Plain Field Pattern