

SPECIFICATION AND PERFORMANCE FOR APPROVAL

P/N: E421C-5000G1 2003/12/15 REV.0 1 of 37

Part No.: E421C-5000G1

Product Description: ANTENNA 2.4G 5dBi(GAT2)

Customer : _____

Customer Part No.: _____

Sample Qty. _____

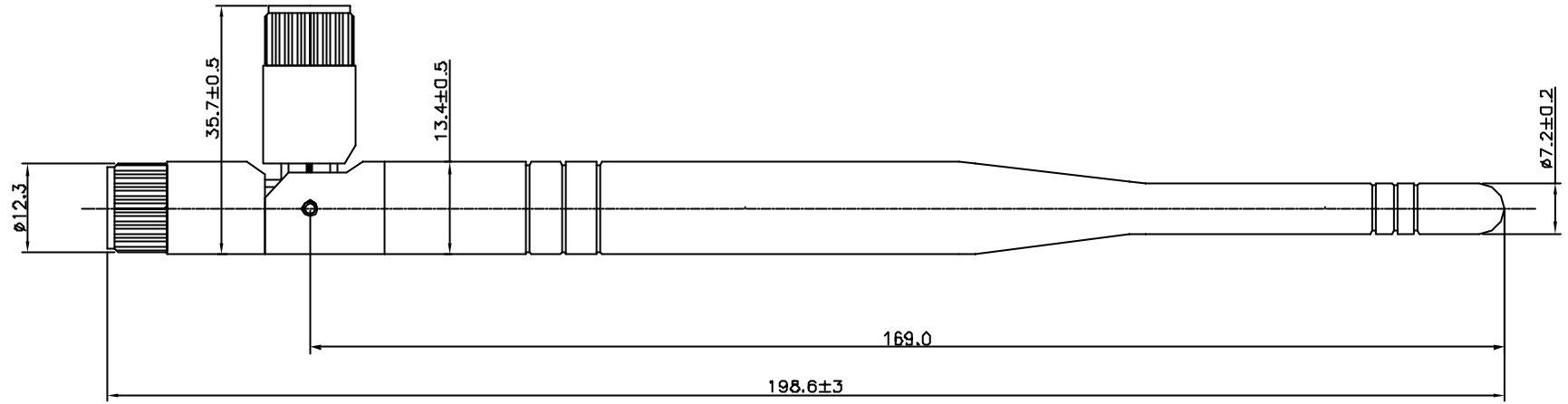
FRE		
Issued By	Checked BY	QA Inspection
		Warren Chung Dec-15-2003
Sales&Marketing Group	R&D Group	QA Group

Customer		
Customer Approval: <input type="checkbox"/> Approved <input type="checkbox"/> Concessionary <input type="checkbox"/> Rejected		
Issued By	Checked BY	Approved By

Comments:

A1RFRD10

REVISION RECORD				
REV	ECO	DESCRIPTION	DRFT	CHKD



NOTE:

ELECTRICAL PROPERTIES

- DESCRIPTION : 1/4 λ SWIVEL TYPE DIPOLE ANTENNA
 φ13.4x169+ SMA (GAIN>5dBi)
- MODEL NO. : AN-G1-XDC
- FREQUENCY : OPTION
- IMPEDANCE : 50 Ohms nominal
- V.S.W.R. : 2.0 max. IN BAND
- GAIN : 5 dBi, VERTICAL DIRECTION
- ADMITTED POWER RADLATION : 1W
- TYPE OF RADLATION : TOROIDAL
- POLARIZATION : VERTICAL
- ELECTRICAL LENGTH : 1/4 λ ,DIPOLE
- RADIATION : Omni
- CONNECTOR TYPE : SMA (MALE/FEMALE OPTION)

MECHANICAL PROPERTIES

- CABLE : RG-178, 50ohm
- OPERATING TEMPERATURE RANGE : -20C~+65C
- STORAGE TEMPERATURE RANGE : -30C~+75C
- ANTENNA COVER : TPEE
- 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

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

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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
<p>1. 一般事項(Generation)</p> <p>1.1 適用範圍 Application Field: 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。 This approval sheet only use for FRE development E42 Series Wireless LAN antenna of ISM Band.</p> <p>1.2 使用溫度範圍 Operation : -20 ~ 65 20 ~ 65</p> <p>1.3 保存溫度範圍 Storage : -30 ~ 75 -30 ~ 75</p> <p>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</p> <p>2. 外觀、構造、尺寸 (Appearance , Construction , Dimension)</p> <p>2.1 外觀 Appearance : 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。 Good manufacture of each parts and without rusting,cracking,defect...etc to damage product.</p> <p>2.2 機能、尺寸 Construction, Dimension: 依據各個製品圖。 According to each product drawing</p> <p>3. 機械性能 Mechanical Performance</p>				
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.		

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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

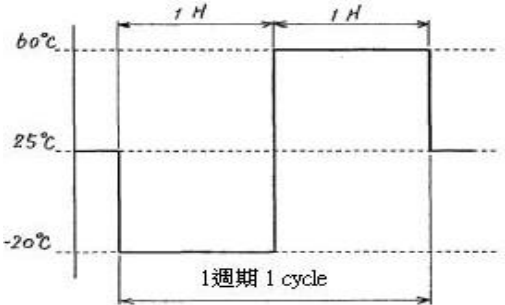
	項目 ITEM	測試條件 TEST CONDITION	規格 SPECIFICATION
4.1	駐波比 VSWR	放在任何空間進行檢測。 (VSWR & Return Loss 的檢測方式參考次頁明細圖) To detect on any space. (VSWR & Return Loss testing to read next figure for ref.)	2.0 以下 2.0 Max. (2.4 GHz ~ 2.5 GHz)
4.2	反射損失 Return Loss		-10 dB 以下 -10 dB Max. (2.4 GHz ~ 2.5 GHz)
4.3	特徵阻抗 Impedance		50
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.

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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.
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.	Meet electrical request(Item 4.1& 4.2)
5.3	耐溫性 穩定狀態) Humidity (Stable)	放置在 $+40 \pm 2$ ，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 $+40 \pm 2$, 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.	

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(註) 電氣性能項目的檢測機器

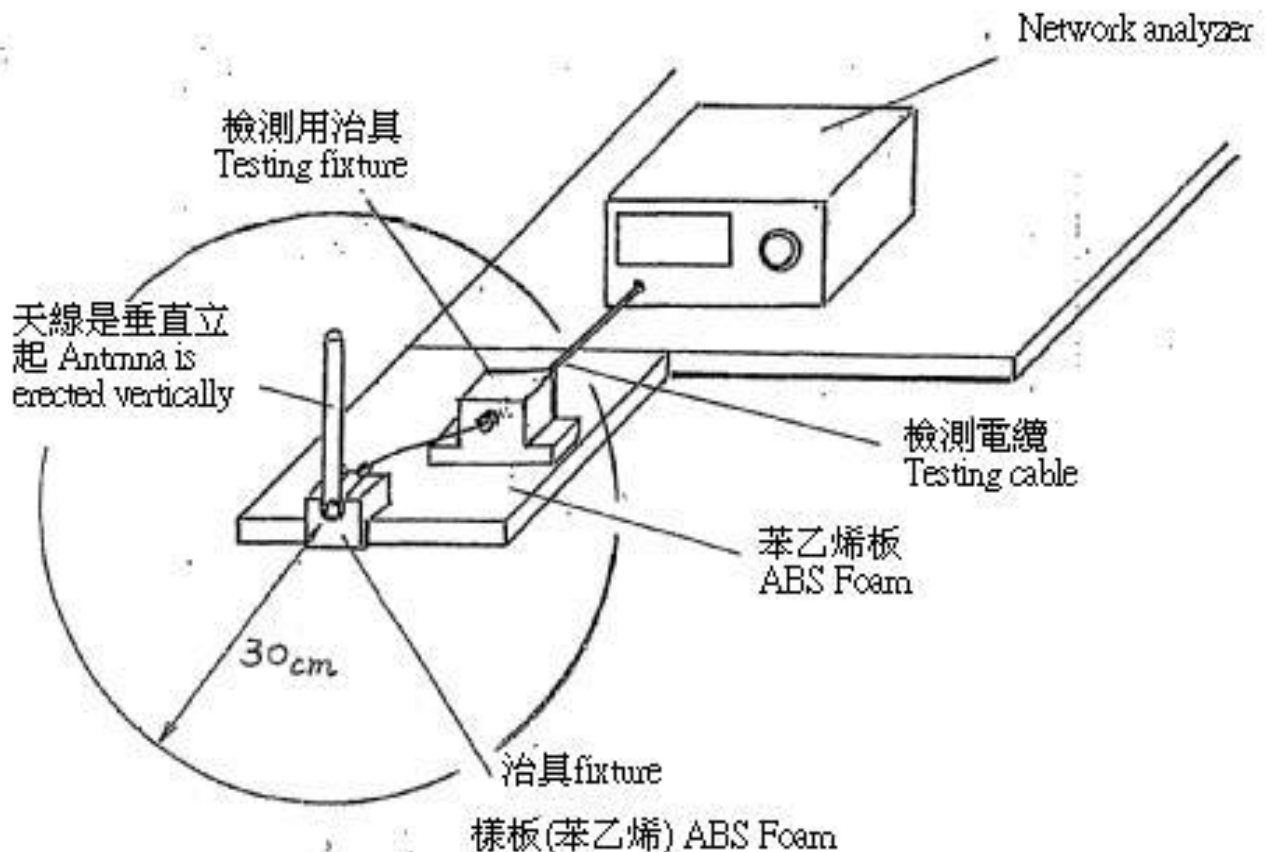
(Remarks) Testing equipments

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)



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Electrical Properties:

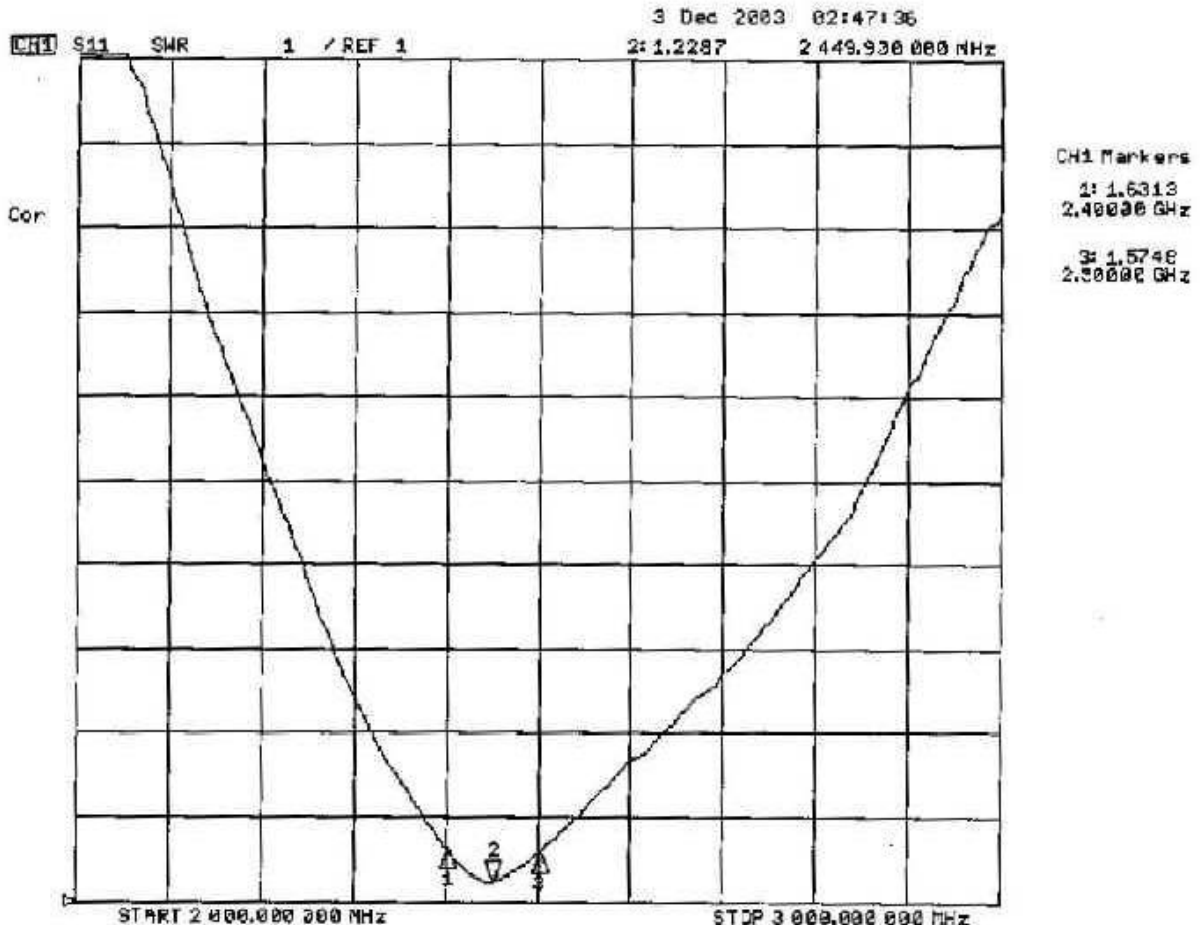
1. Frequency Range: 2.4 ~ 2.5 GHz
2. Impedance: 50 Ohms nominal
3. VSWR: 2.0 max. IN BAND
4. Gain :>5 dBi, Vertical direction

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



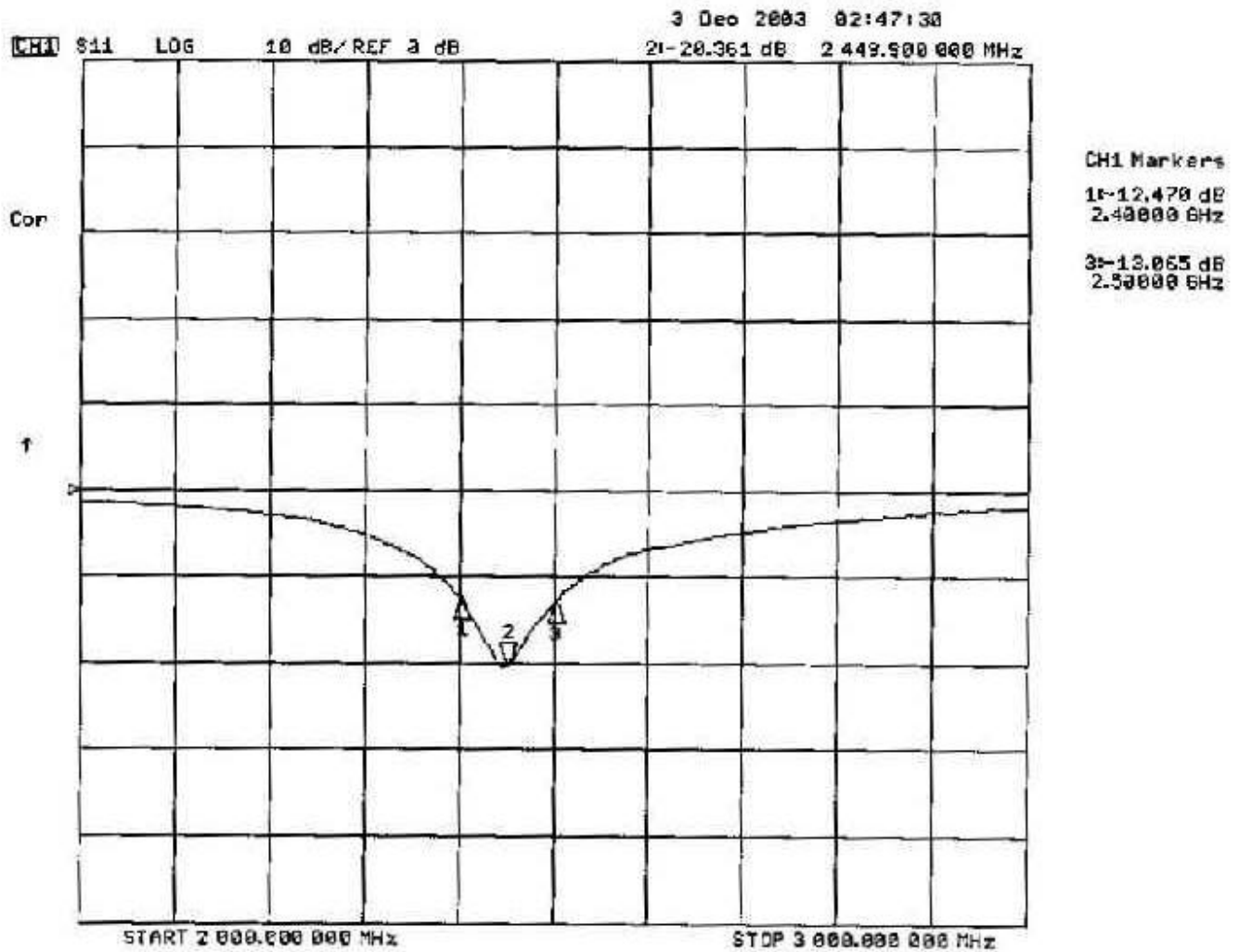
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2.Return Loss(For Specification 4.2): -10 dB

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



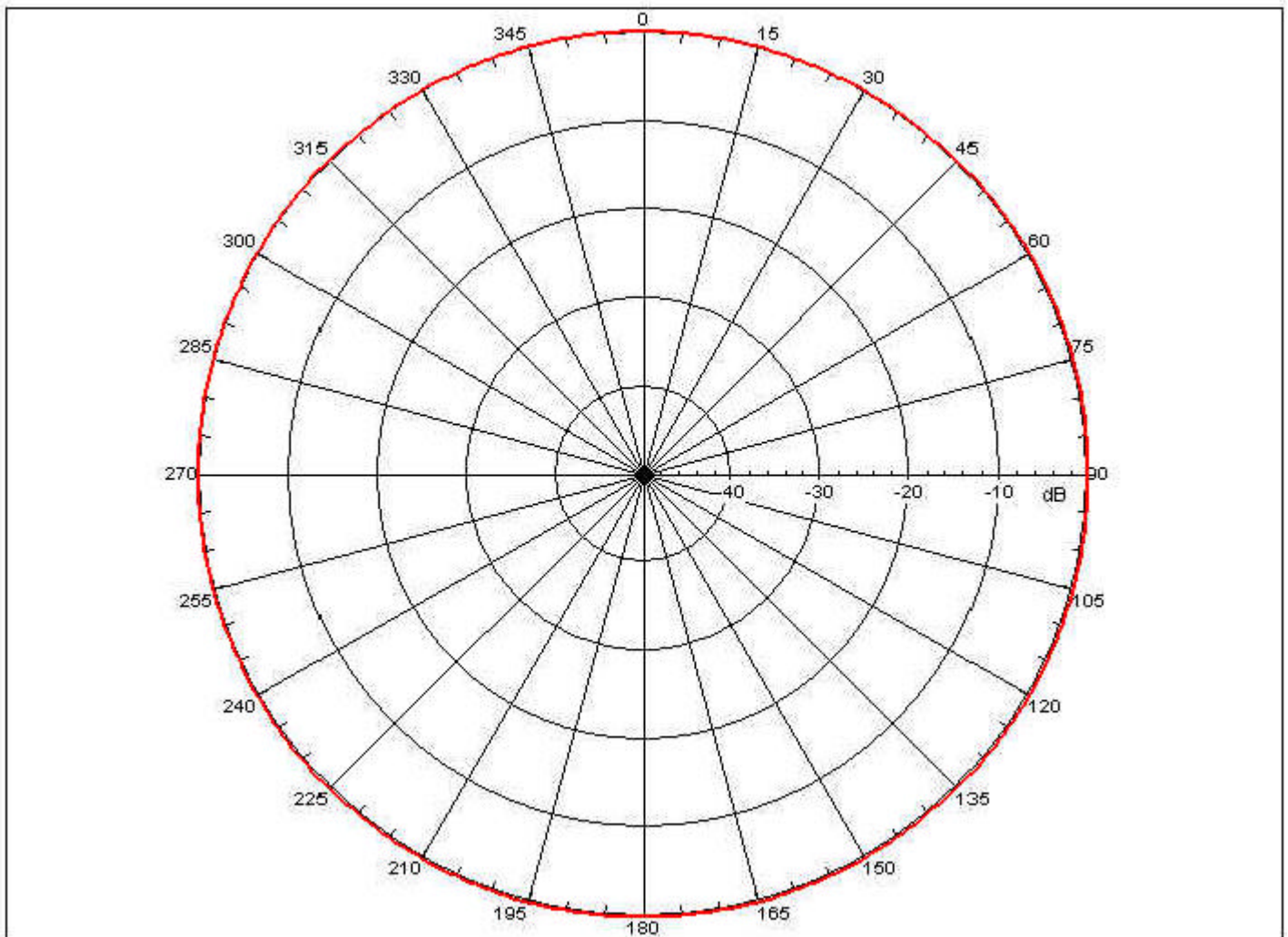
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3. Gain (For Specification 4.5): >5 dBi

2.4 GHz H-Plain Field Pattern

2.4GHz 2.995dBi

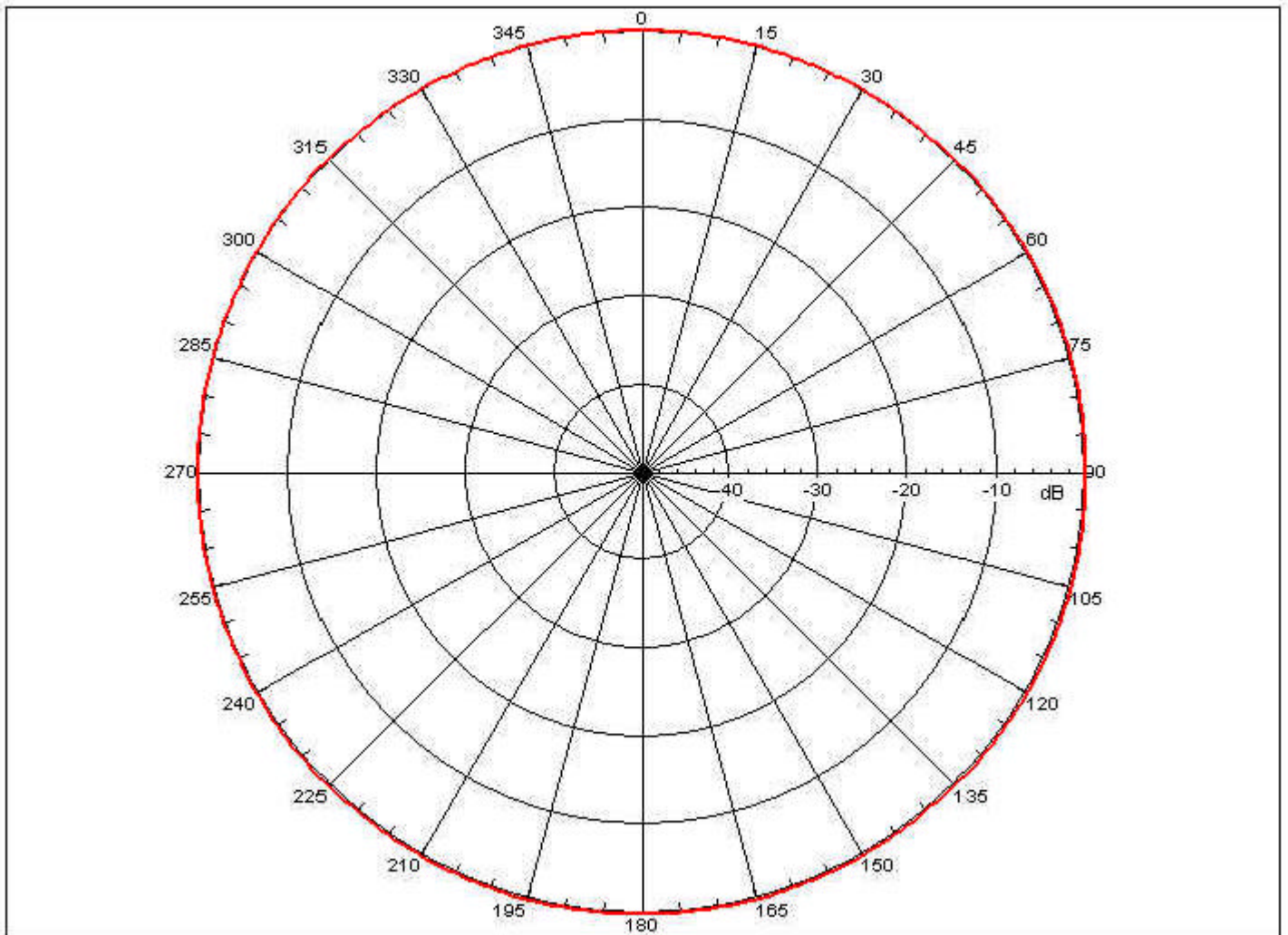


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2.45 GHz H-Plain Field Pattern

2.45 GHz 2.802 dBi

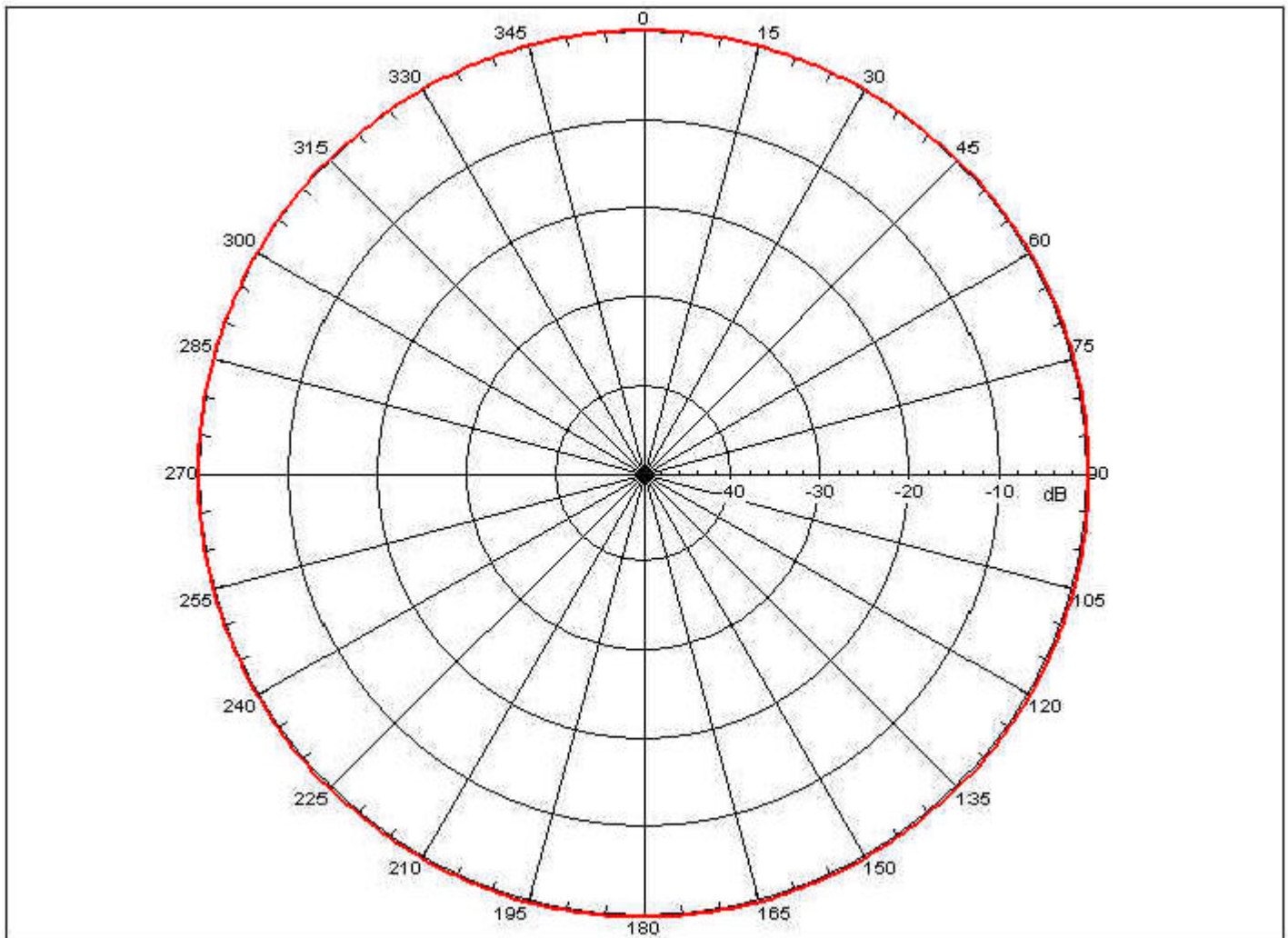


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2.5 GHz H-Plain Field Pattern

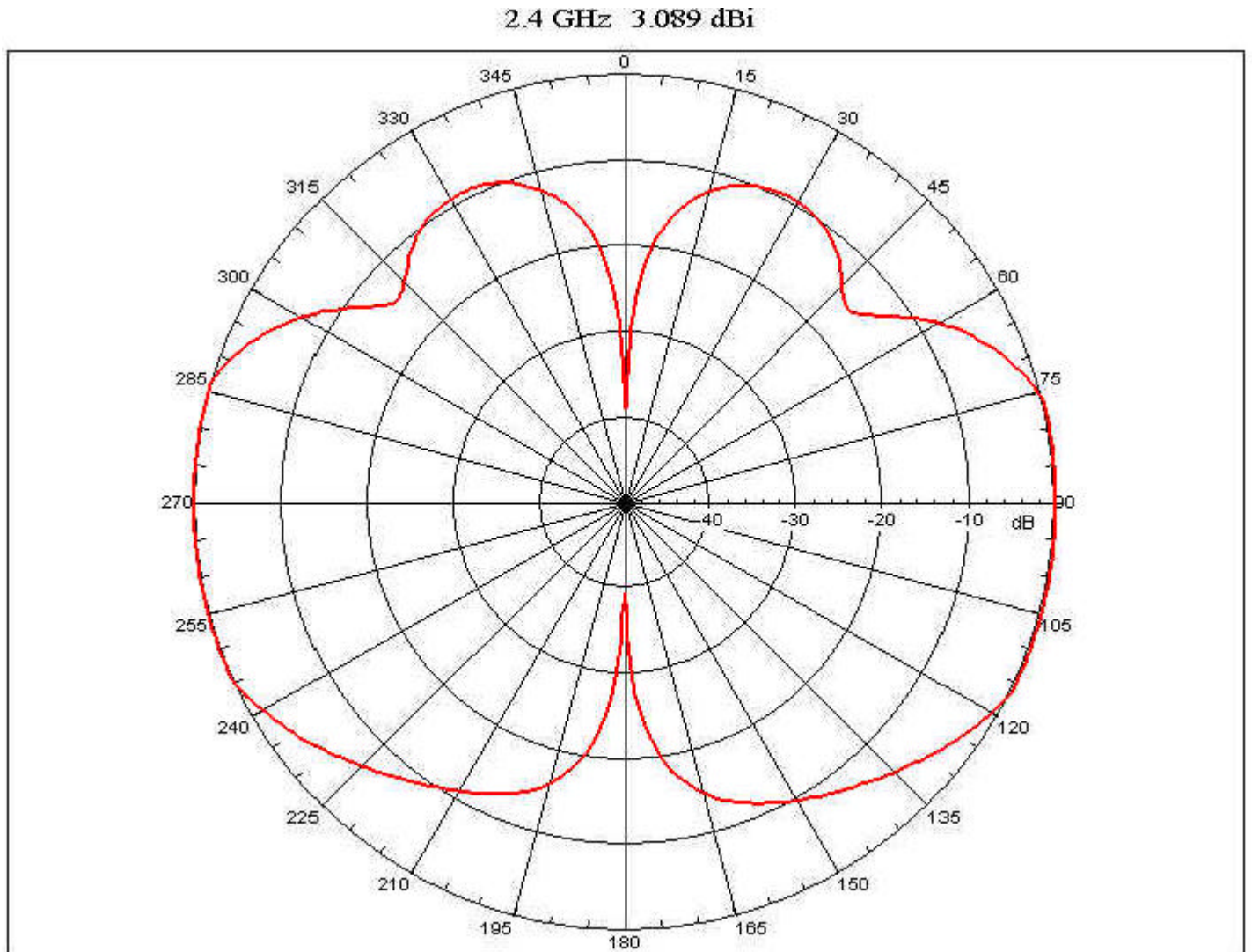
2.5 GHz 2.921 dBi



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2.4 GHz E-Plane Field Pattern

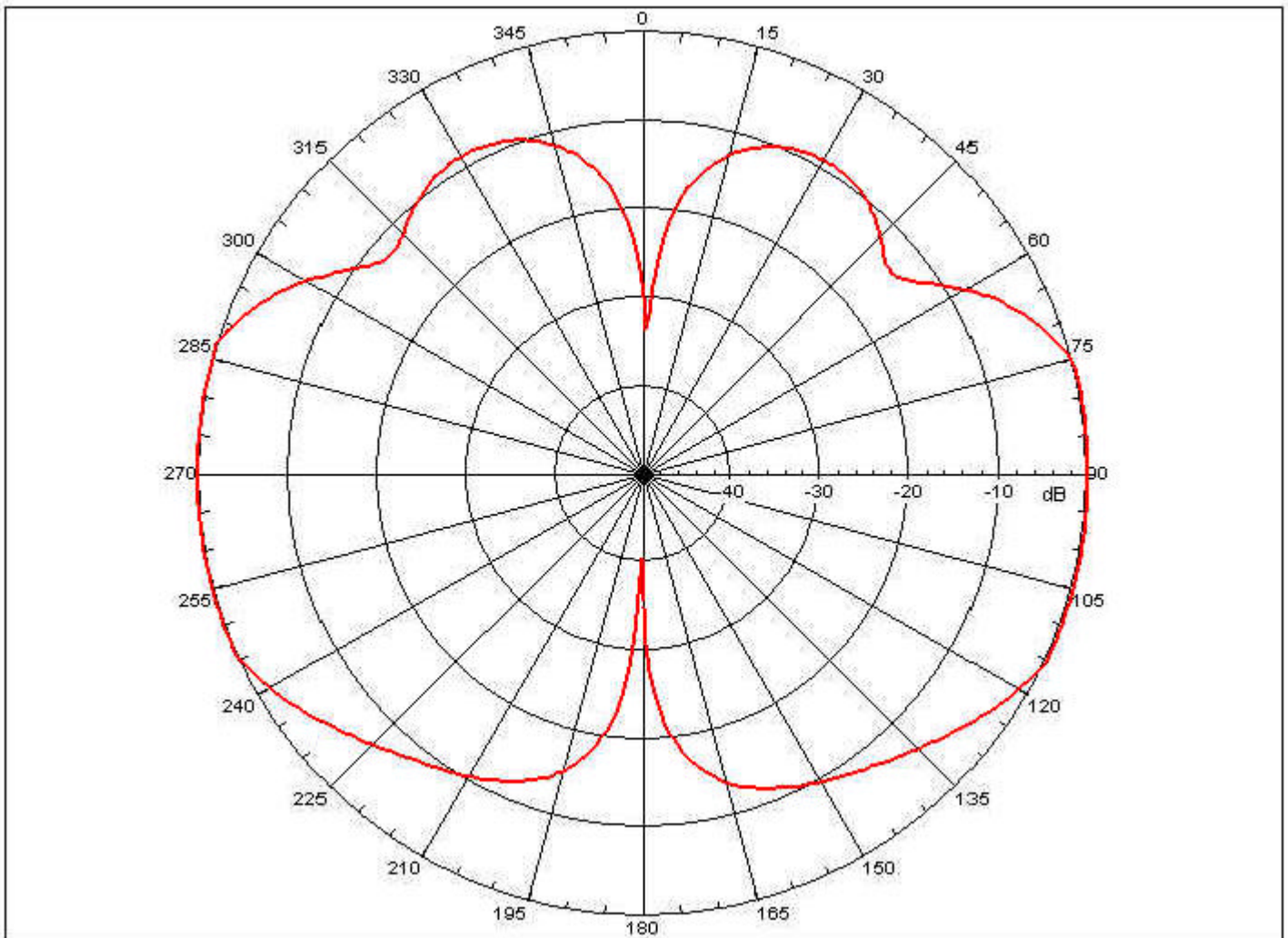


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2.45GHz E-Plane Field Pattern

2.45 GHz 3.284 dBi



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2.5GHz E-Plane Field Pattern

2.5 GHz 3.268 dBi

