

DATE : 2007/11/22

CUSTOMER : CLEVO CO.

# APPROVAL SHEET

<b>MODEL</b>	TN120R
<b>DESCRIPTION</b>	PIFA For Bluetooth Antenna 2.4~2.5GHZ / 5.15~5.875GHZ
<b>SUPPLIER P/N</b>	K05007004603
<b>CUSTOMER P/N</b>	6-23-7M12R-052
<b>FILE P/N</b>	

FAVORTRON			CUSTOMER	
Manager	Supervisor	Engineer		
Dominic	Vincent	Kristy		

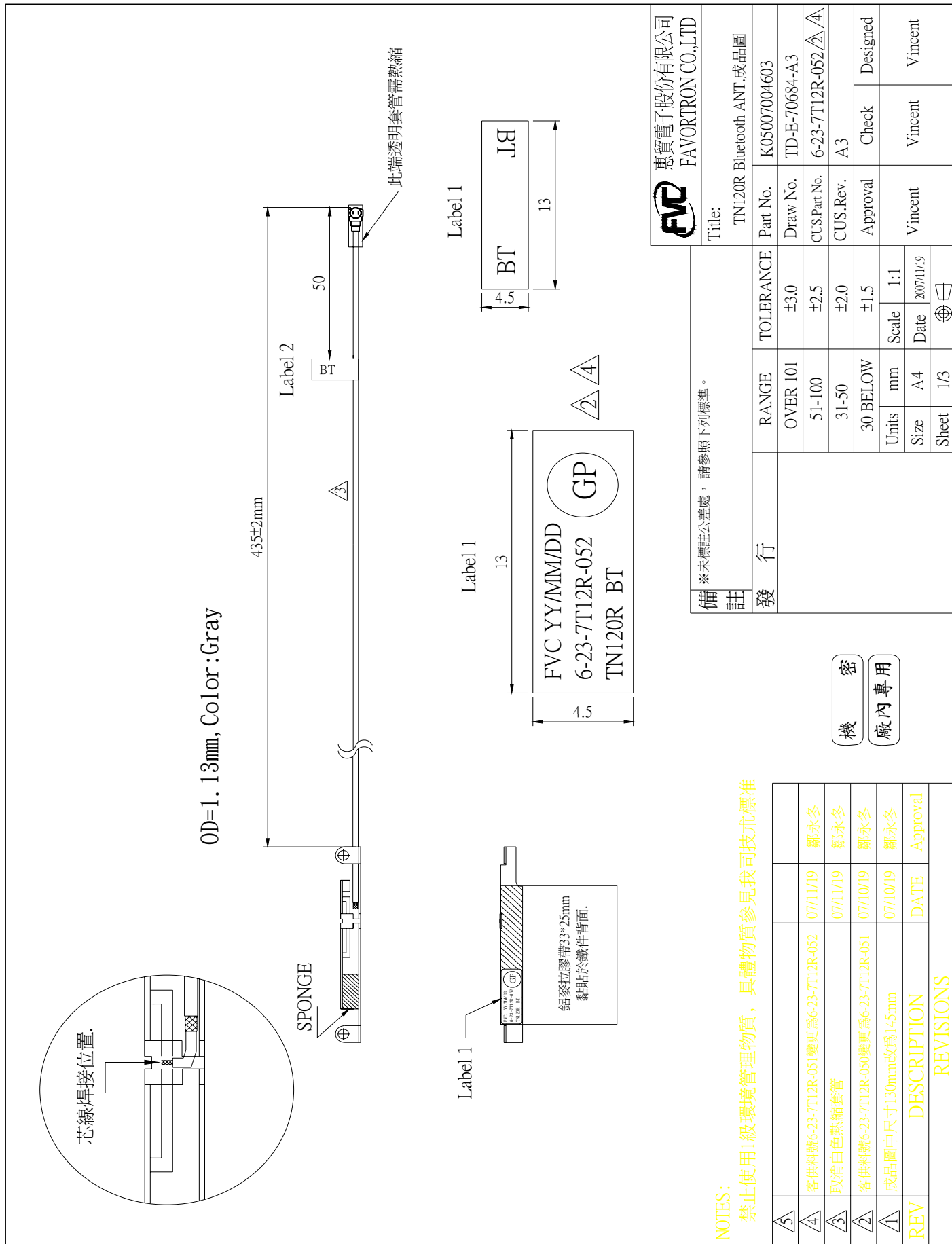


**惠貿電子股份有限公司**  
**FAVORTRON CO., LTD**

台北縣新店市民權路 108-1 號 4F  
4F, No. 108-1, Minchziuan Rd., SHzindian City,  
Taipei HZsien 231, Taiwan. R.O.C

TEL: (02) 2218-2189  
FAX: (02) 2218-5420  
[URL: www.fvc.com.tw](http://www.fvc.com.tw)

# 1. DRAWING ASSEMBLY



## NOTES:

禁止使用1級環境管理物質，具體物質參見我司技術標準

REV	DESCRIPTION	DATE	Approval
1			
2	客供料號6-23-7T12R-051變更高為6-23-7T12R-052	07/11/19	鄒永冬
3	取消白色熱縮套管	07/11/19	鄒永冬
4	客供料號6-23-7T12R-050變更高為6-23-7T12R-051	07/10/19	鄒永冬
5	成品圖中尺寸130mm改為145mm	07/10/19	鄒永冬
	REVISIONS		

備註

※未標註公差處，請參照下列標準。

發行	RANGE	TOLERANCE
	OVER 101	±3.0
	51-100	±2.5
	31-50	±2.0
	30 BELOW	±1.5
Units	mm	Scale 1:1
Size	A4	Date 2007/11/19
Sheet	1/3	



惠質電子股份有限公司  
FAVORTRON CO.,LTD

Title:

TN120R Bluetooth ANT. 成品圖

Part No.

K05007004603

Draw No.

TD-E-70684-A3

CUS.Part No.

6-23-7T12R-052

CUS.Rev.

A3

Approval

Check

Designed

Vincent

Vincent

Vincent

# BOM

## B O M

ITEM	COMPONENT	Q'TY	DESCRIPTION	FAVORTRON P/N	VENDER
1	同軸線(含接頭)	1	OD1.13mm/單頭I-PEX/454mm/灰色	M04007239001	FVC
2	SPONGE	1	8mm*3mm*t=3.5mm	M01009001002	昊泰
3	M540G-RIGHT-PIFA 鐵件	1	進口馬口鐵t=0.4mm/H	M02007002001	品欣
4	TUBE	1	OD2.5*20mm(透明)內徑3.1±0.2壁厚0.25±0.1	B02009714999	三聯
5	鋁麥拉膠帶	1	33mm*25mm t=0.1(鋁箔面背電膠33mm*5mm)	M01005001002	隆揚
6	LABEL	2	4.5x13mm 白色	G01013007001	亞識
7					
8					
9					
10					
11					
12					

△

### SUB BOM (M04007239001)

ITEM	COMPONENT	Q'TY	DESCRIPTION	FAVORTRON P/N	VENDER
1	Connector	1	接頭 MHF PLUG(I-PEX)鍍金(20278-111R-13)	L07001001001	I-PEX
2	同軸線	1	同軸線OD1.13*453mm(灰色)	M04005008001	日立信電



Title: TN120R Bluetooth ANT BOM 表

Part No. K05007004603

Draw No. TD-E-70684-A3

CUS.Part No. 6-23-7T12R-052/△/△

CUS.Rev. A3

Approval Check Designed

Vincent Vincent Vincent

發行

備註

機密

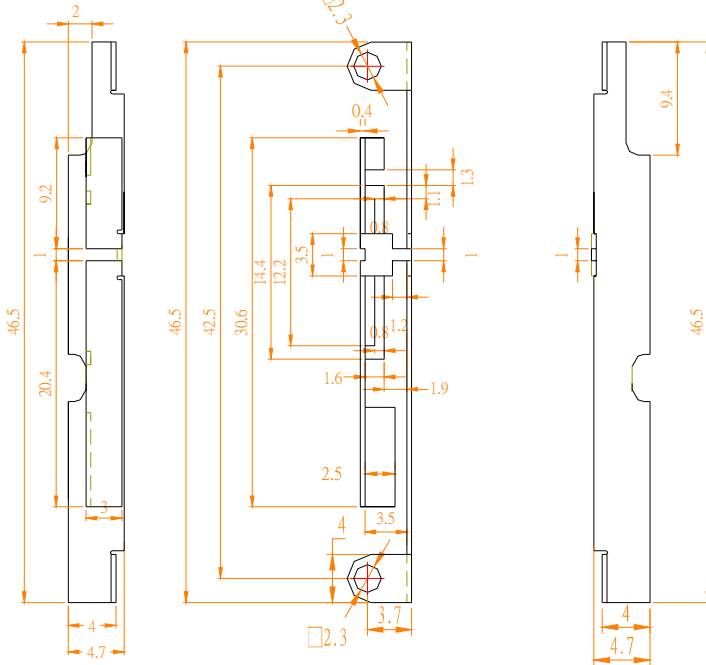
廠內專用

NOTES:

禁止使用1級環境管理物質，具體物質參見我司技術標準

Date 2007/11/19 Sheet 2/3

# 鐵件



**Remark:**

1. MATERIAL :馬口鐵
2. t = 0.4mm ±0.05
3. 表面不得有毛邊
4. 外觀不得有壓傷油污刮傷手紋
5. 未標示公差範圍者請詳公差欄標示值。

備註 ※未標註公差處，請參照下列標準。

發行

RANGE	TOLERANCE
Over 101	±.5
51-100	±.0
31-50	±0.3
30 Below	±0.2
Units	MM
Rev.	A0
Size	A4
Scale	1:1
Sheet	PAGE

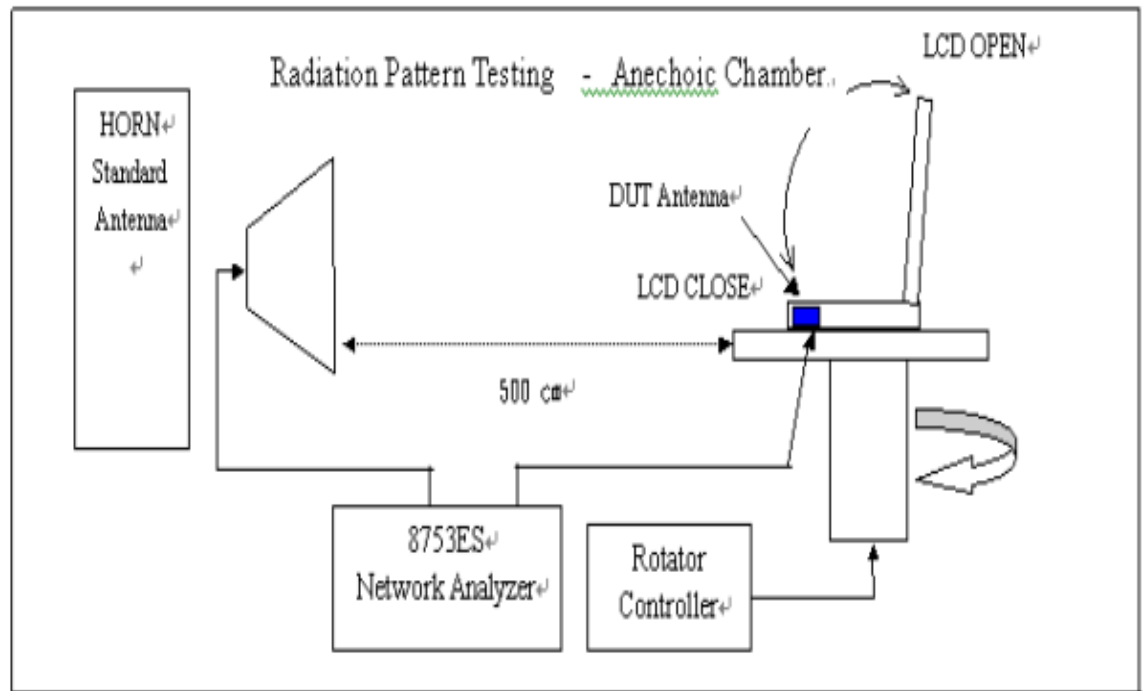

 惠賢電子股份有限公司  
 FAVORTRON CO.,LTD.

TITLE:  
 藍天M540G-RIGHT-PIFA

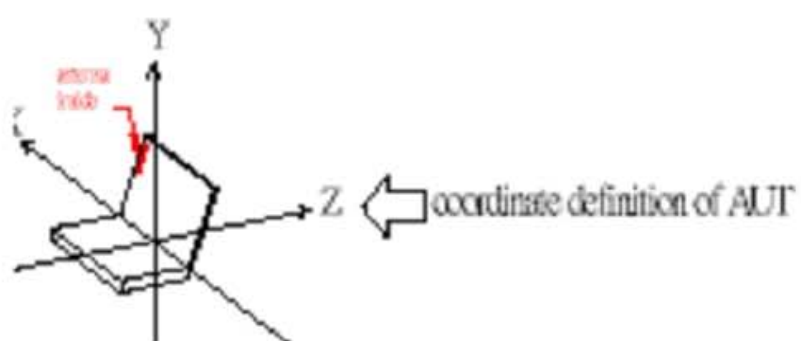
PART NO.	M02007002001
DRAW NO.	TD-E-50656-A1
Customer No.	
Customer REV.	
APPROVAL	CHECKED
	DRAWN
Nick	James
	Kelly

1.

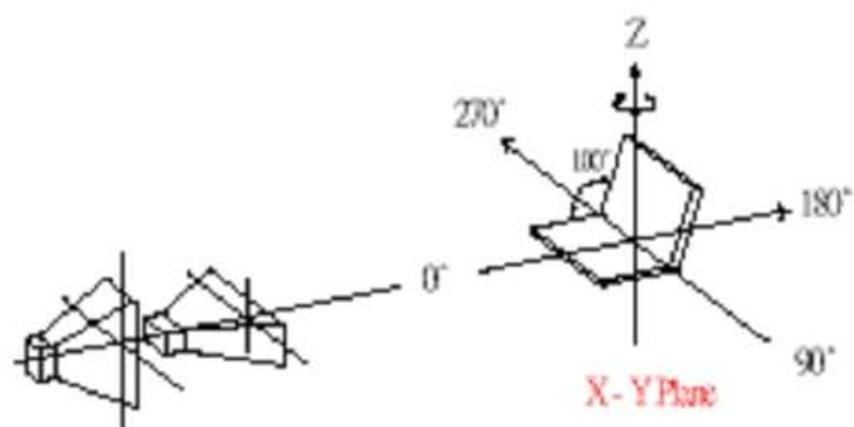
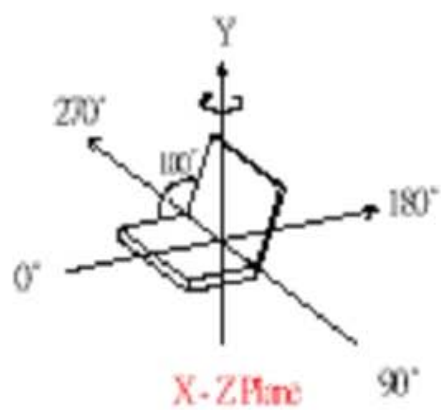
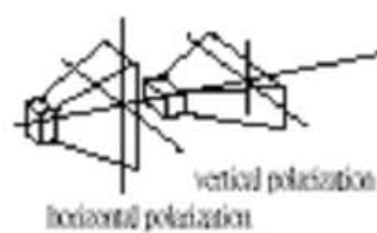
## 天線測試方法



## Coordinate Definition

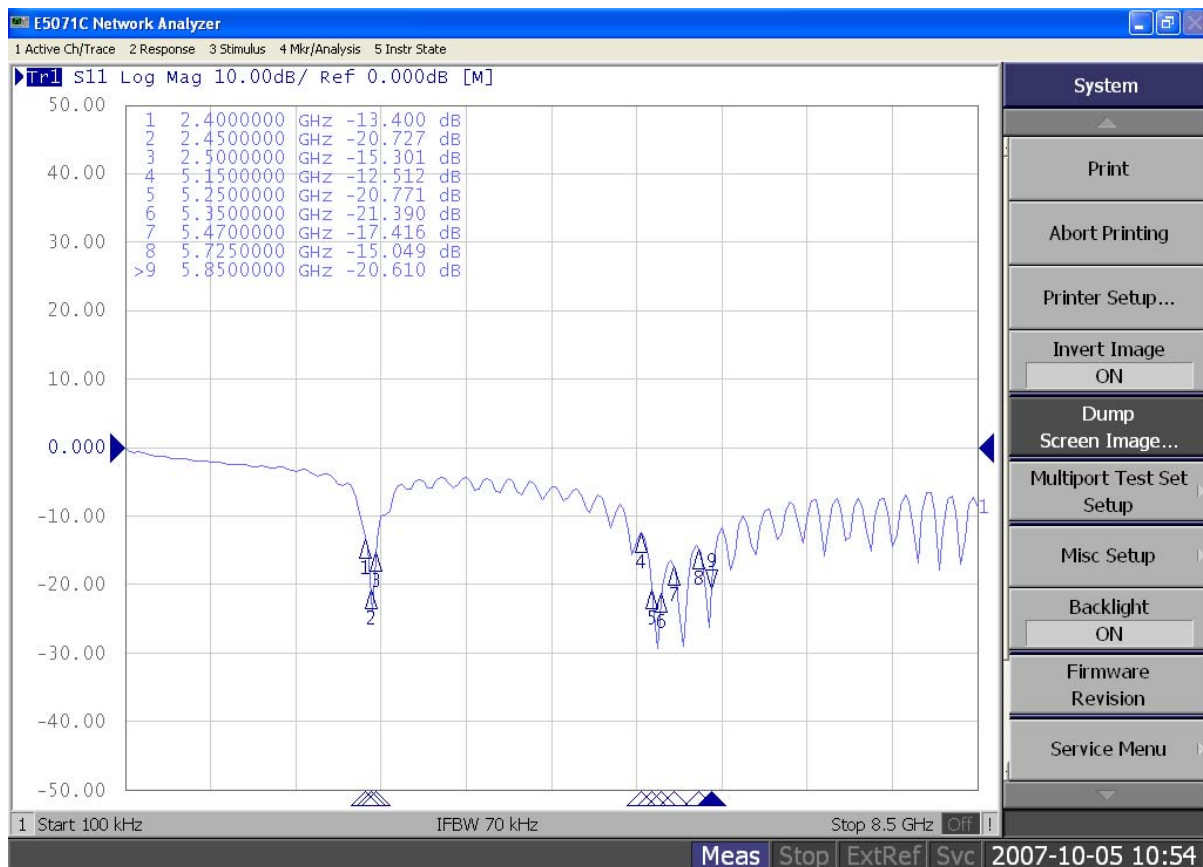


### KORNANTENNA

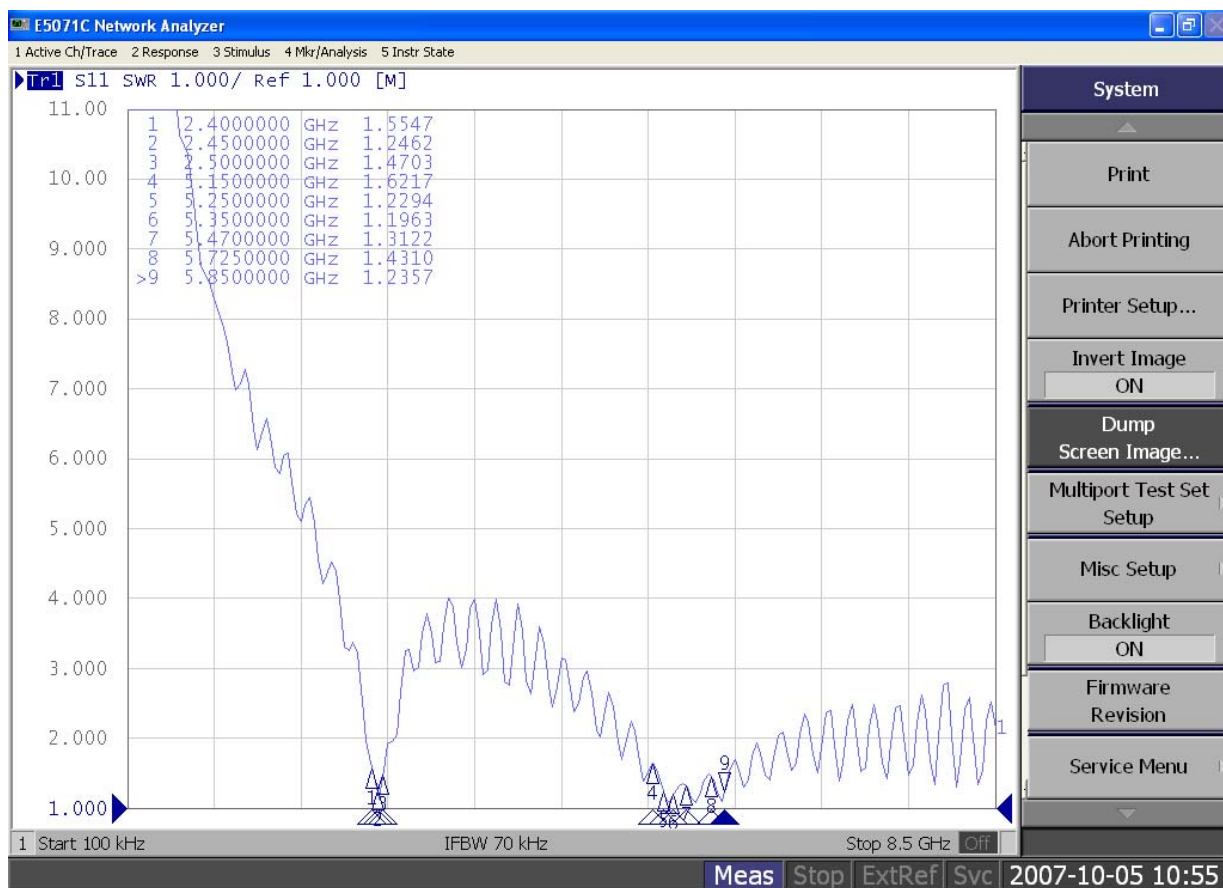


## 2. Bluetooth

### 2.4~2.5GHZ & 5.15~5.875GHZ / Return Loss



### 2.4~2.5GHZ & 5.15~5.875GHZ / VSWR



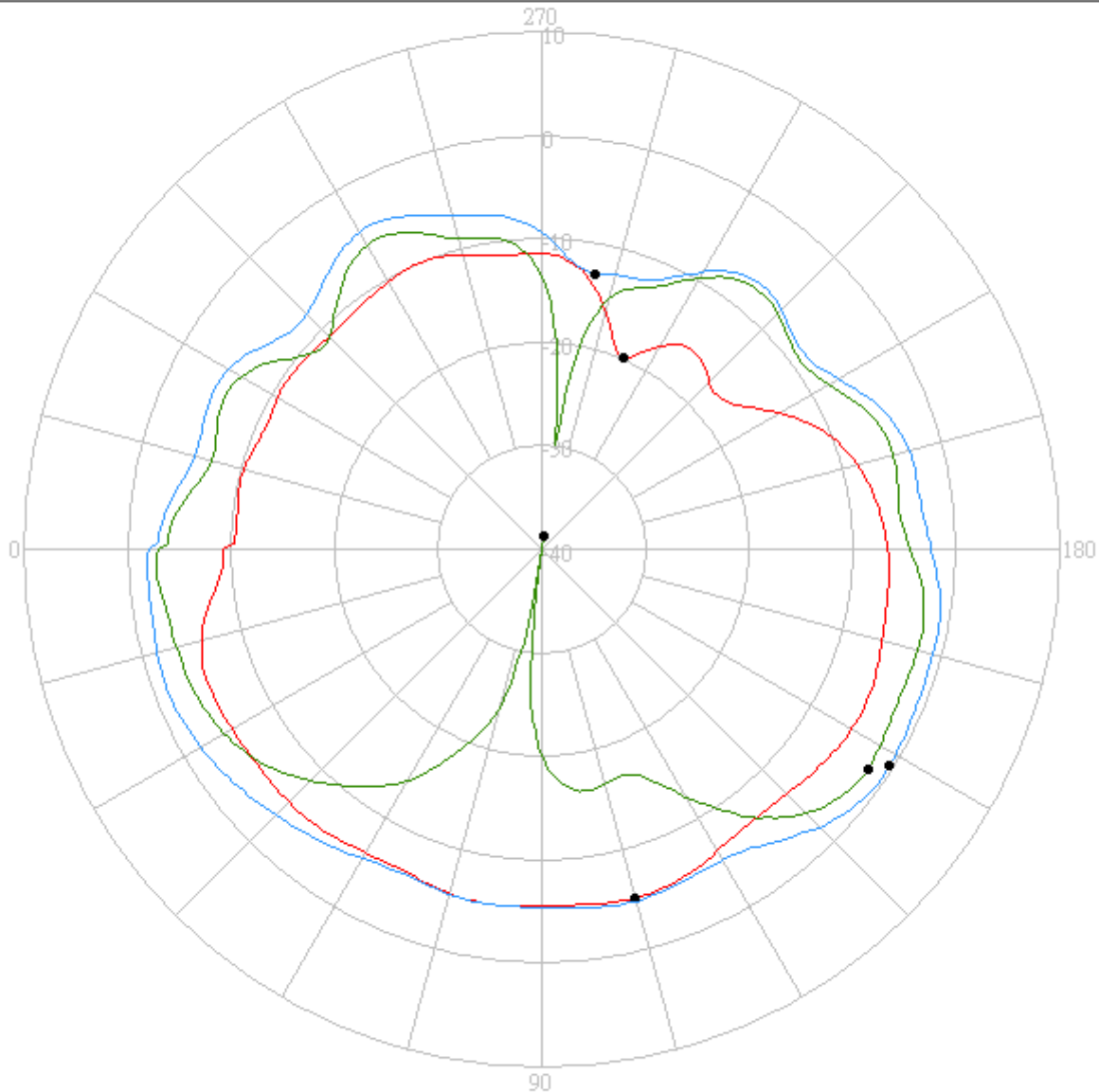
### 3.Gain & Pattern –Bluetooth

#### a. 2.4GHz



## FAVORTRON Co. Ltd Antenna Pattern Measurement

4F, No. 108-1, Min Chuan Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C. Tel:886-2-2218-2189,  
Fax:886-2-2218-5760



Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	2400.00	-5.13 / 105.00	-20.00 / 247.00	-7.78	Ver.	2007/10/5
2	TN120R	BT	2400.00	-2.06 / 146.00	-43.19 / 82.00	-6.66	Hor.	2007/10/5
3	TN120R	BT	2400.00	-0.47 / 148.00	-12.95 / 259.00	-4.17	V+H	2007/10/5



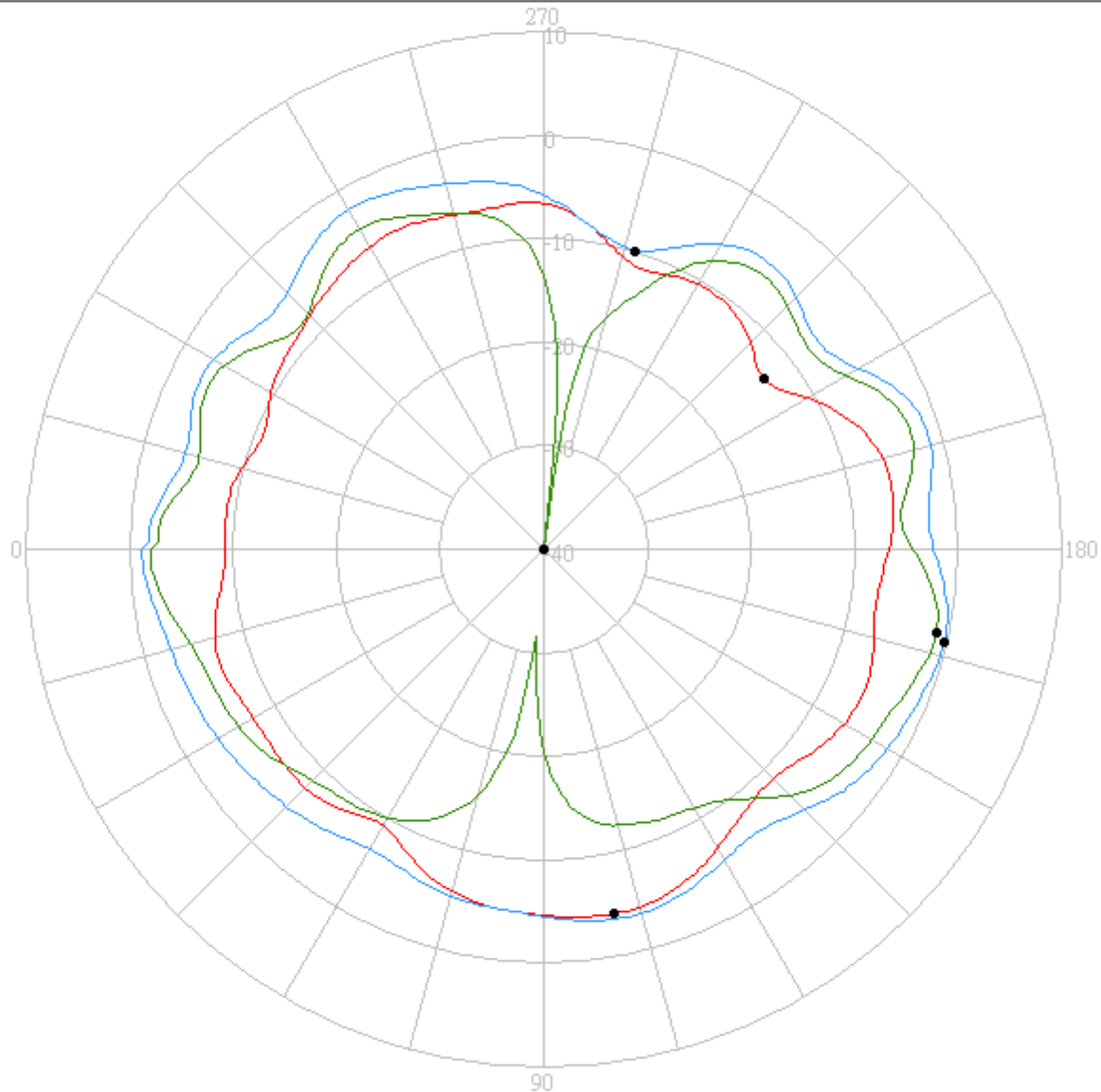
## b. 2.45GHz



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4F, No. 108-1, Min Chuan Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C. Tel:886-2-2218-2189,  
Fax:886-2-2218-5760



Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	2450.00	-4.15 / 101.00	-13.09 / 218.00	-7.39	Ver.	2007/10/5
2	TN120R	BT	2450.00	-1.27 / 168.00	-48.49 / 263.00	-6.06	Hor.	2007/10/5
3	TN120R	BT	2450.00	-0.30 / 167.00	-9.86 / 253.00	-3.67	V+H	2007/10/5

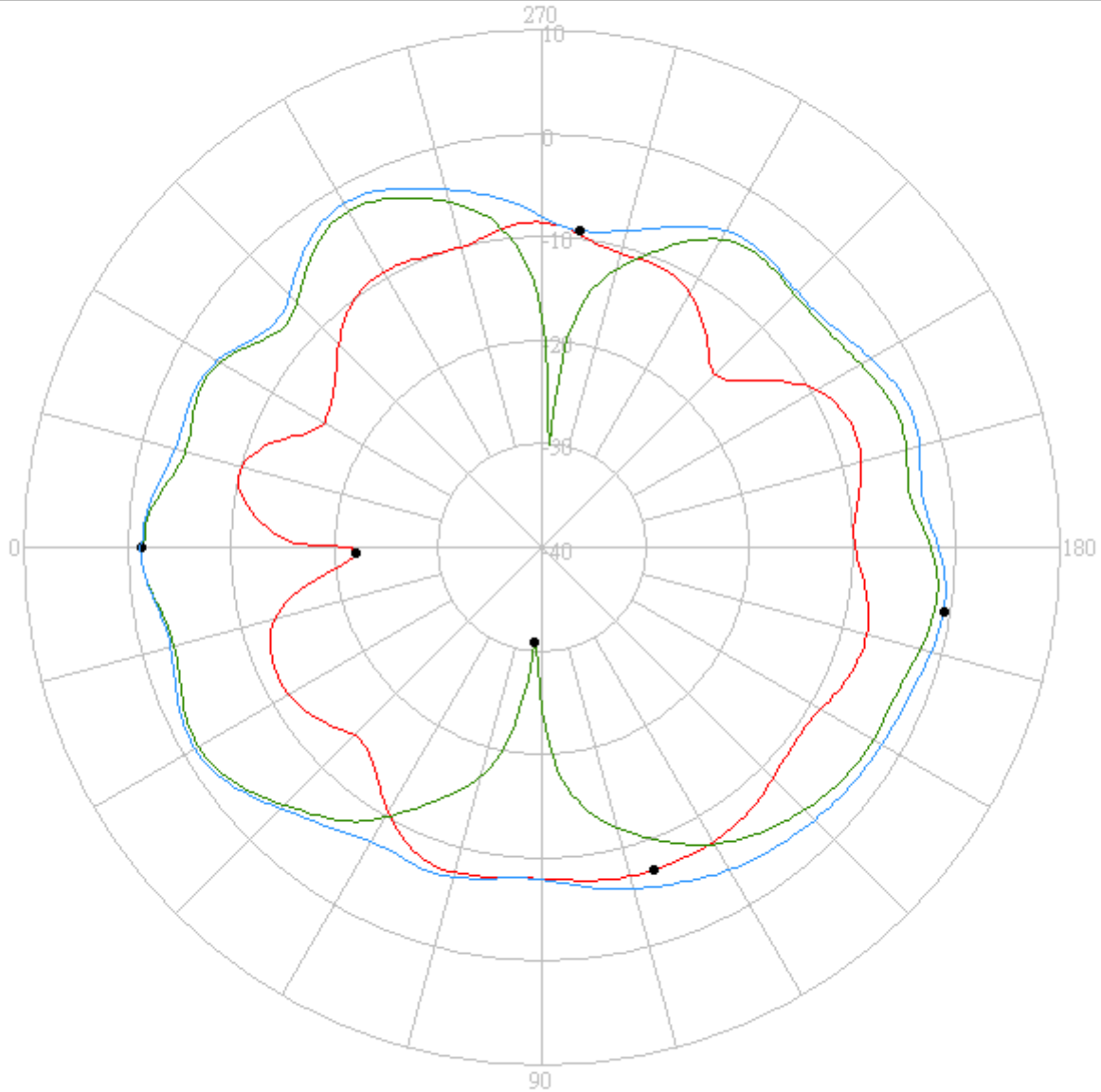
c. 2.5GHz



# FAVORTRON Co. Ltd

## Antenna Pattern Measurement

4F, No. 108-1, Min Chuan Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C. Tel:886-2-2218-2189, Fax:886-2-2218-5760



Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	2500.00	-7.00 / 109.00	-21.98 / 2.00	-9.79	Ver.	2007/10/5
2	TN120R	BT	2500.00	-1.28 / 0.00	-30.78 / 86.00	-4.85	Hor.	2007/10/5
3	TN120R	BT	2500.00	-0.72 / 171.00	-9.20 / 263.00	-3.64	V+H	2007/10/5

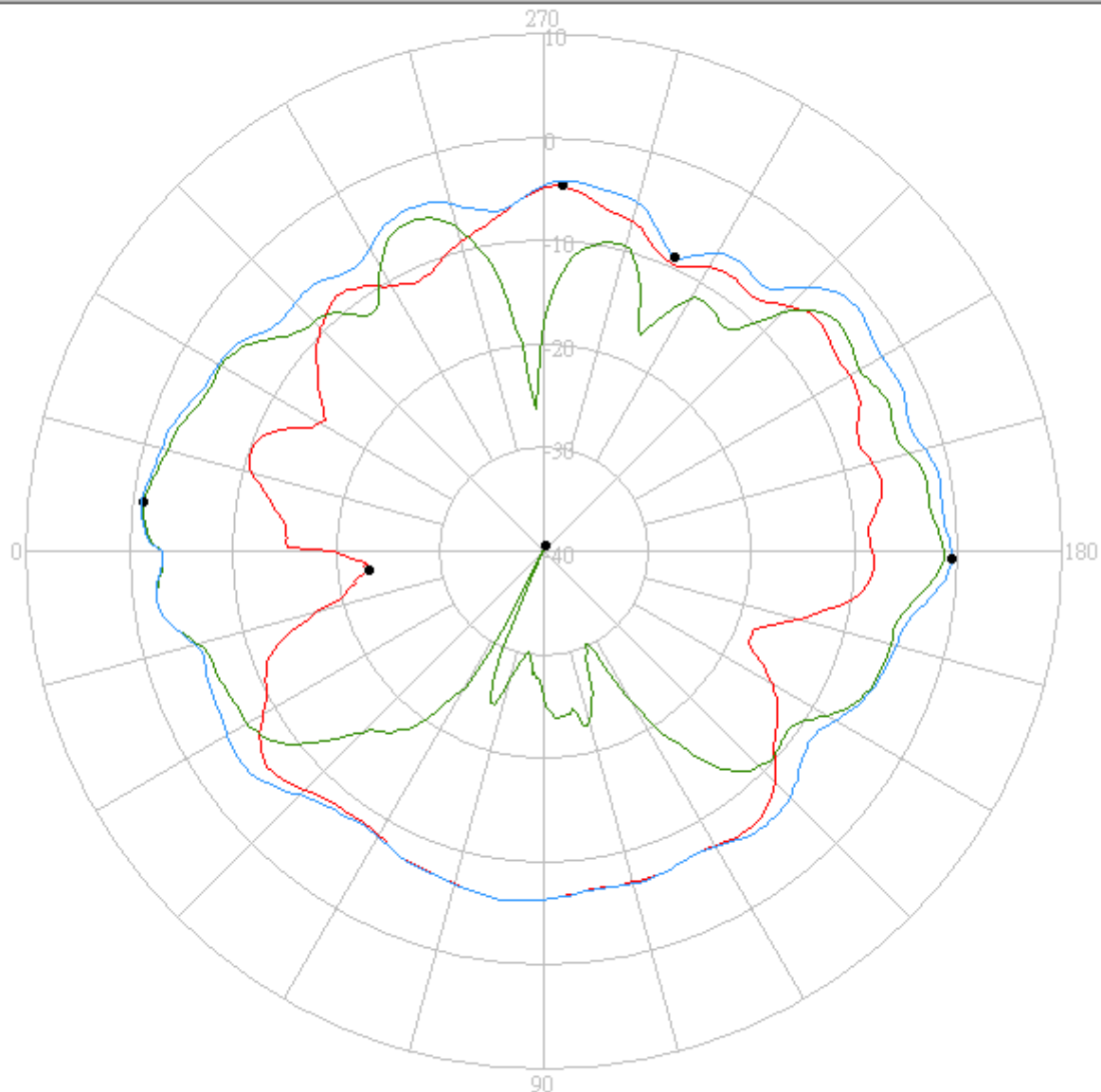
## d. 4.9GHz



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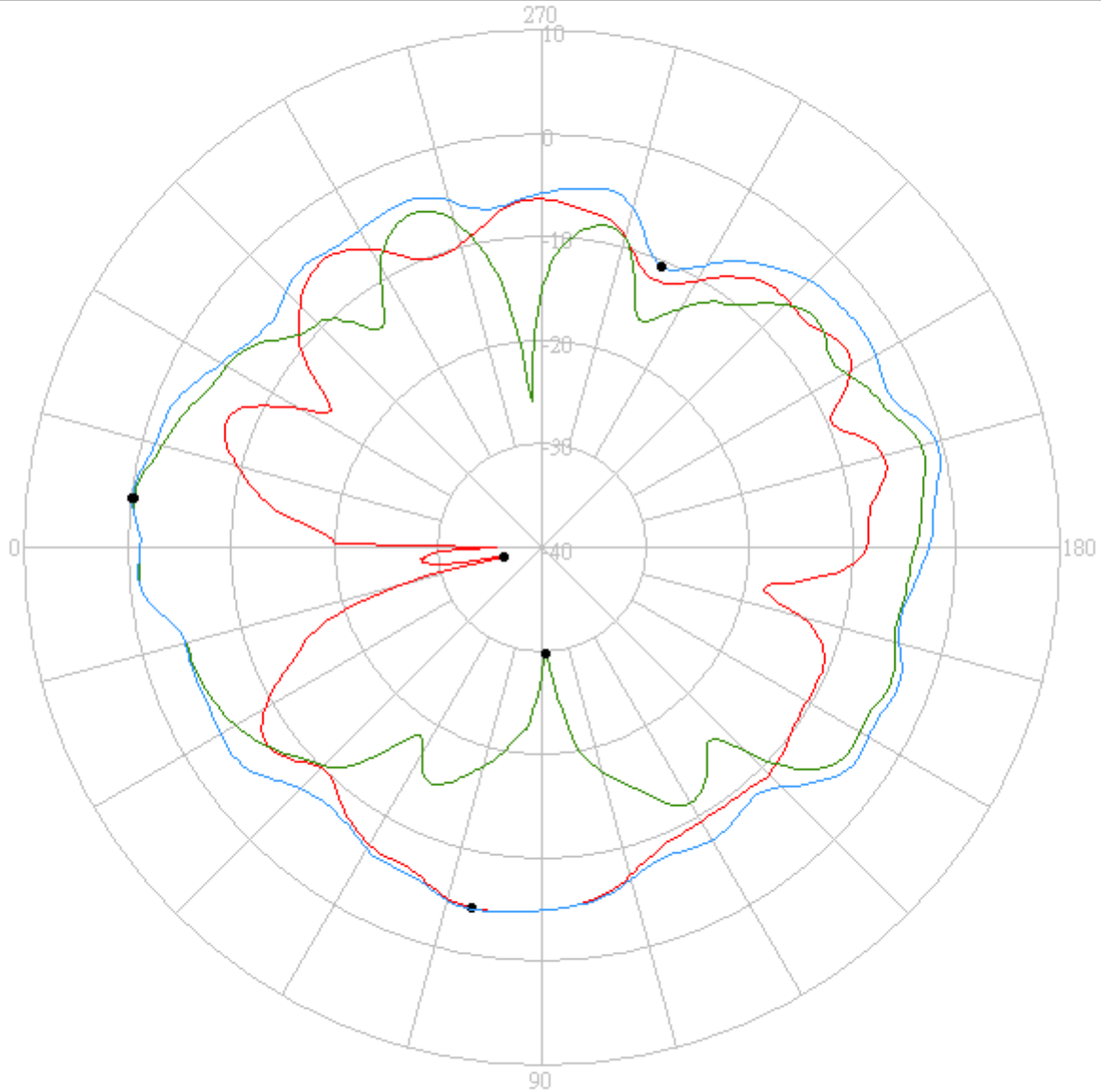
Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	4900.00	-4.68 / 267.00	-23.04 / 6.00	-8.39	Ver.	2007/10/5
2	TN120R	BT	4900.00	-1.13 / 353.00	-40.60 / 64.00	-6.84	Hor.	2007/10/5
3	TN120R	BT	4900.00	-0.58 / 179.00	-8.90 / 246.00	-4.53	V+H	2007/10/5

# e. 5.075GHz



## FAVORTRON Co. Ltd Antenna Pattern Measurement

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Fax:886-2-2218-5760



Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5075.00	-4.48 / 79.00	-36.27 / 13.00	-8.23	Ver.	2007/10/5
2	TN120R	BT	5075.00	-0.34 / 353.00	-29.66 / 92.00	-6.37	Hor.	2007/10/5
3	TN120R	BT	5075.00	-0.19 / 353.00	-10.57 / 247.00	-4.19	V+H	2007/10/5

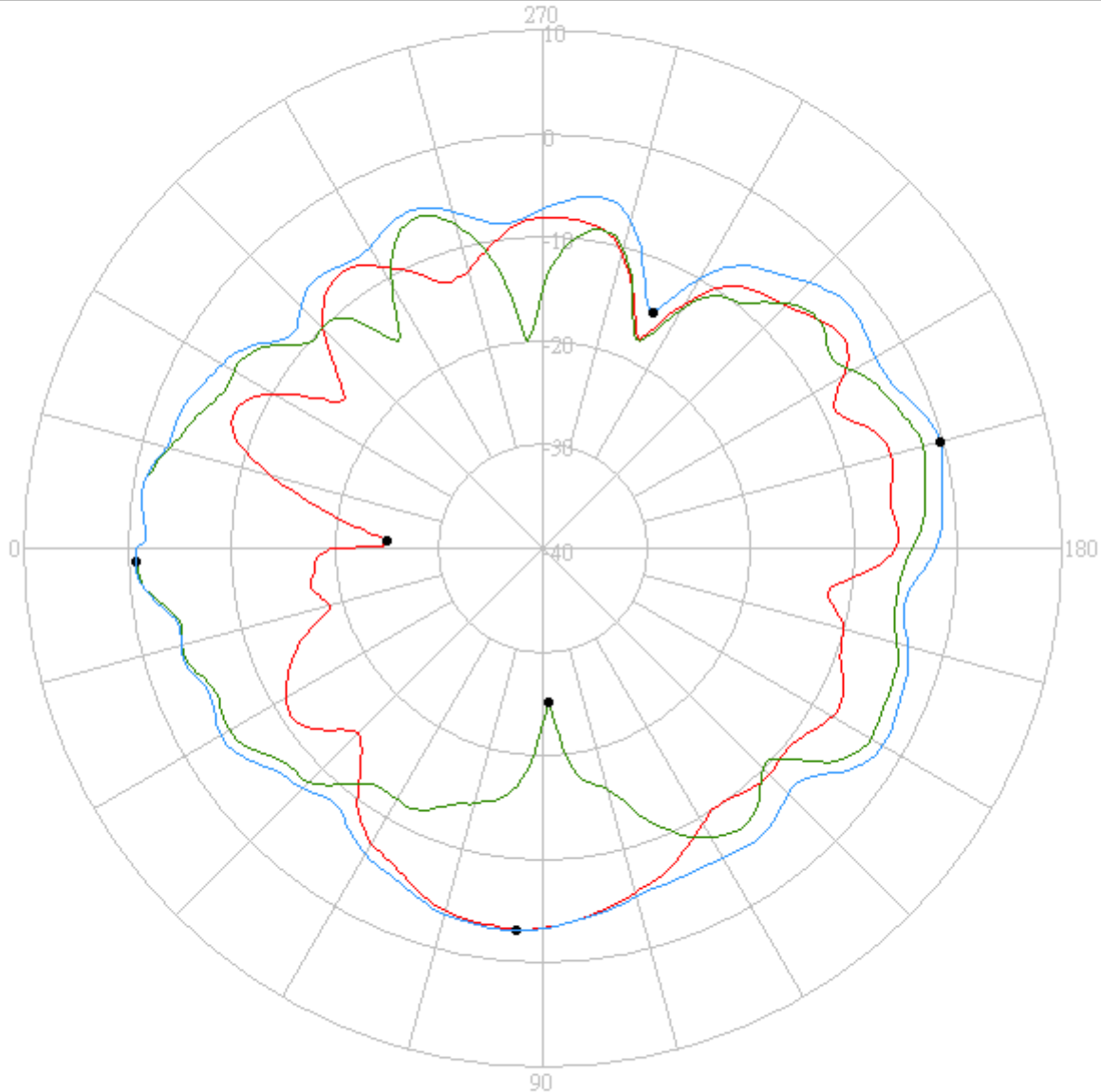
## f. 5.15GHz



# FAVORTRON Co. Ltd

## Antenna Pattern Measurement

4F, No. 108-1, Min Chuan Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C. Tel:886-2-2218-2189,  
Fax:886-2-2218-5760



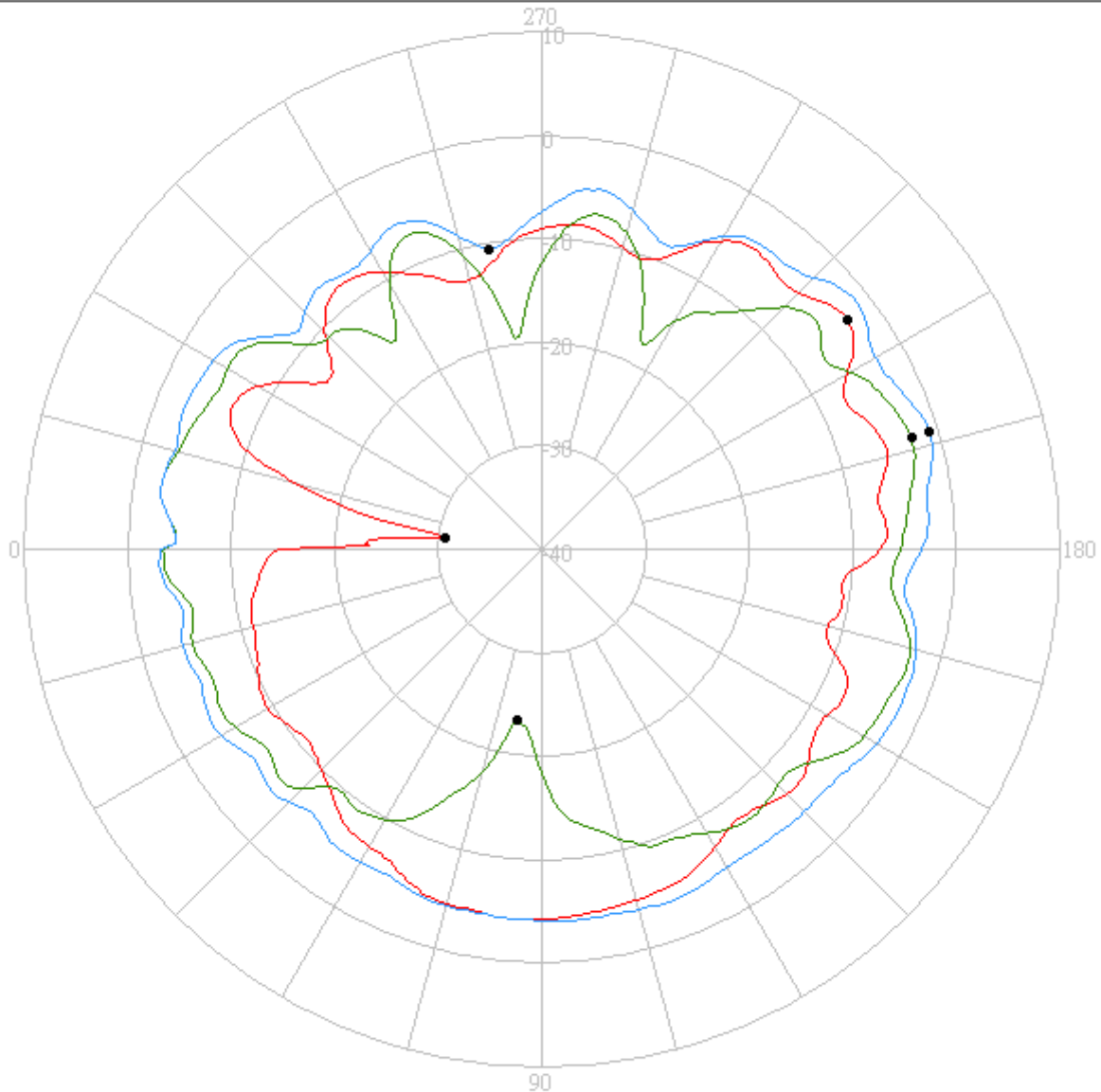
Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5150.00	-3.17 / 86.00	-24.88 / 357.00	-8.20	Ver.	2007/10/5
2	TN120R	BT	5150.00	-0.82 / 2.00	-25.23 / 92.00	-6.36	Hor.	2007/10/5
3	TN120R	BT	5150.00	-0.35 / 195.00	-14.87 / 245.00	-4.17	V+H	2007/10/5

# g. 5.25GHz



## FAVORTRON Co. Ltd Antenna Pattern Measurement

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Fax:886-2-2218-5760



Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5250.00	-3.14 / 217.00	-30.67 / 353.00	-7.52	Ver.	2007/10/5
2	TN120R	BT	5250.00	-2.73 / 197.00	-23.38 / 82.00	-6.84	Hor.	2007/10/5
3	TN120R	BT	5250.00	-0.85 / 197.00	-10.60 / 280.00	-4.16	V+H	2007/10/5

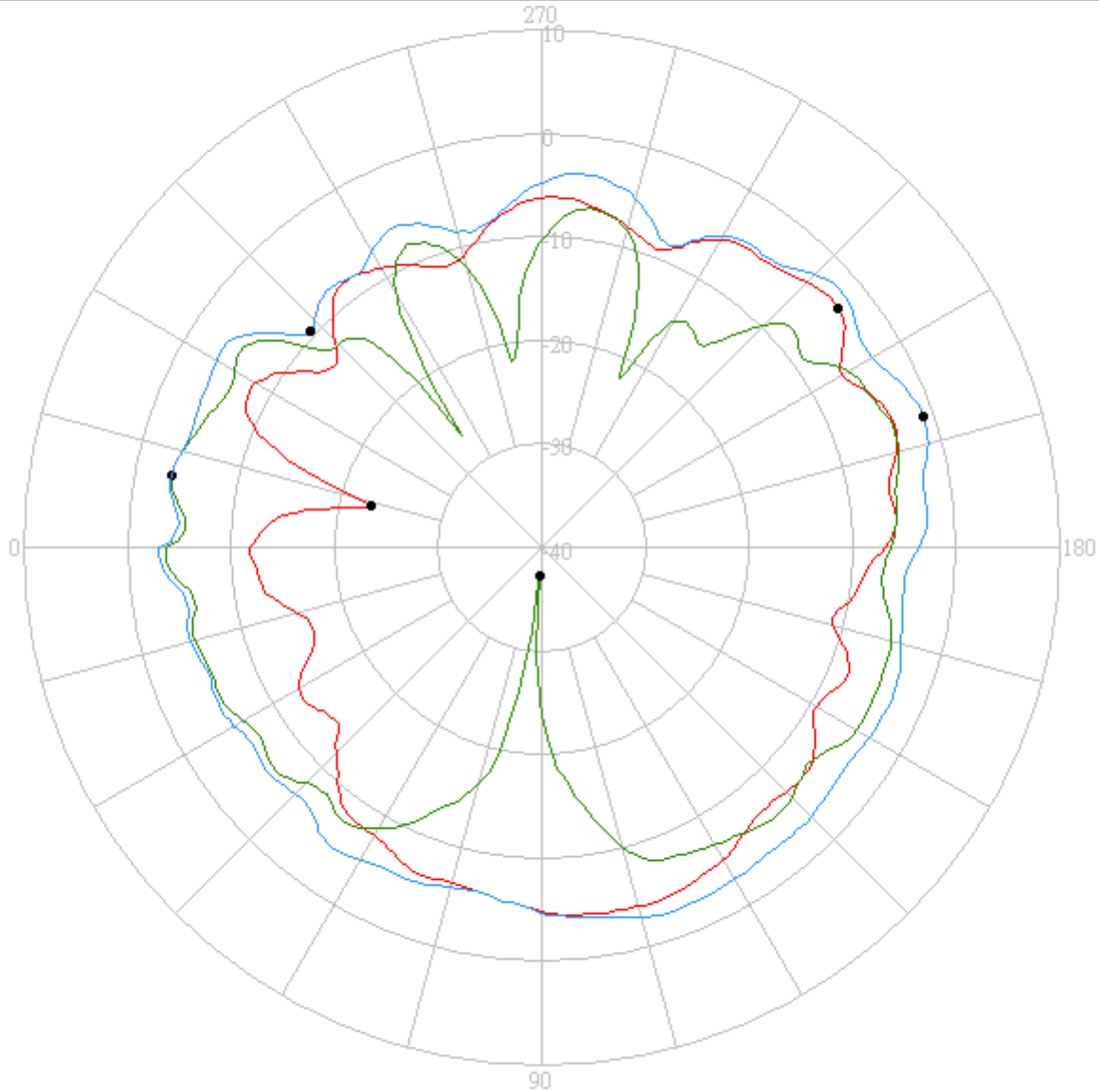
## h. 5.35GHz



# FAVORTRON Co. Ltd

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4F, No. 108-1, Min Chuan Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C. Tel:886-2-2218-2189,  
Fax:886-2-2218-5760



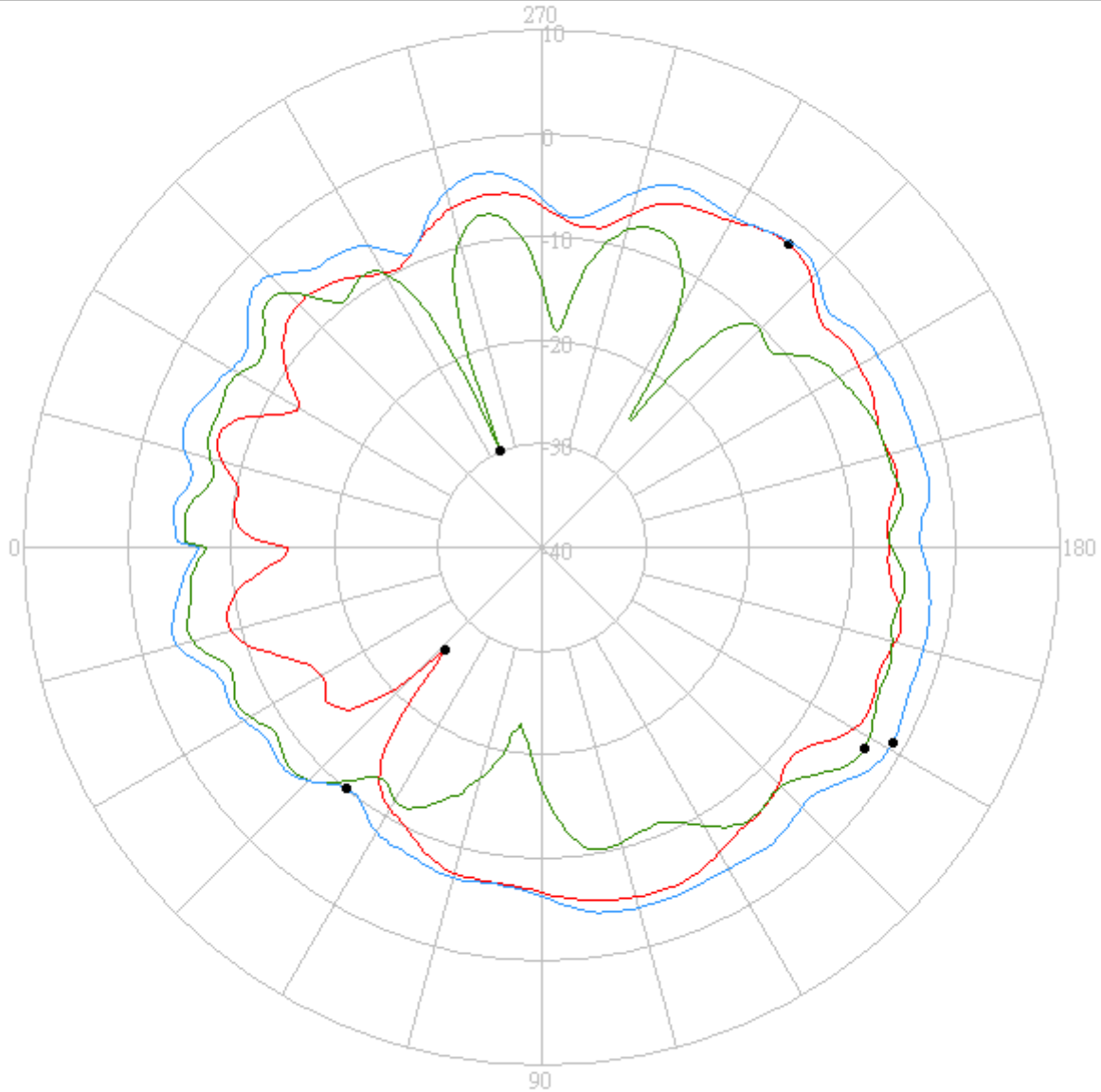
Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5350.00	-3.19 / 219.00	-23.06 / 346.00	-7.34	Ver.	2007/10/5
2	TN120R	BT	5350.00	-3.64 / 349.00	-37.26 / 85.00	-7.43	Hor.	2007/10/5
3	TN120R	BT	5350.00	-1.03 / 199.00	-9.42 / 317.00	-4.37	V+H	2007/10/5

# i. 5.47GHz



## FAVORTRON Co. Ltd Antenna Pattern Measurement

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Fax:886-2-2218-5760



Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5470.00	-2.23 / 231.00	-26.41 / 47.00	-6.80	Ver.	2007/10/5
2	TN120R	BT	5470.00	-3.31 / 148.00	-29.76 / 293.00	-7.70	Hor.	2007/10/5
3	TN120R	BT	5470.00	-1.18 / 151.00	-10.13 / 51.00	-4.21	V+H	2007/10/5



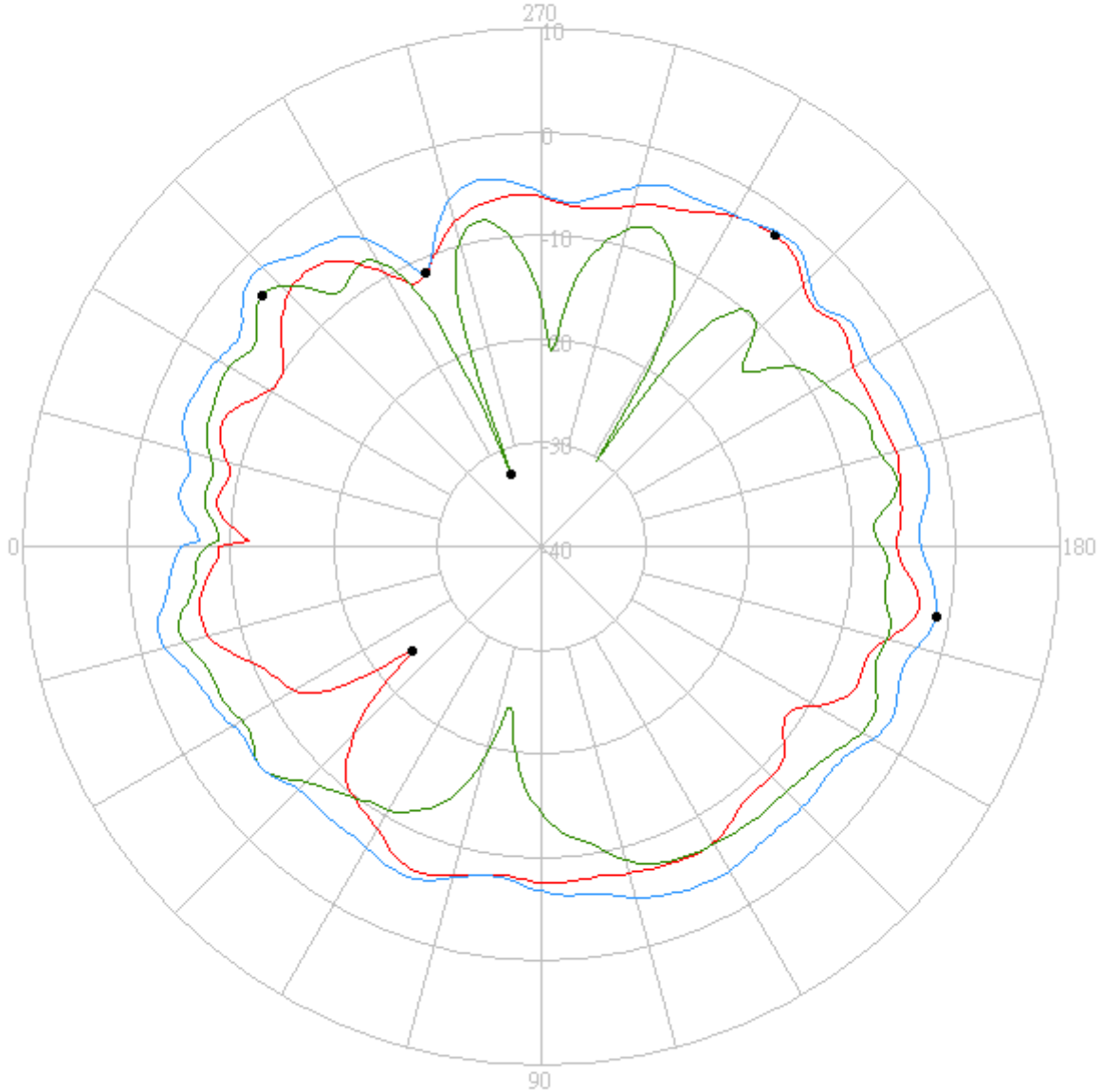
j. 5.6GHz



# FAVORTRON Co. Ltd

## Antenna Pattern Measurement

4F, No. 108-1, Min Chuan Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C. Tel:886-2-2218-2189, Fax:886-2-2218-5760



Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5600.00	-2.44 / 233.00	-23.90 / 39.00	-6.77	Ver.	2007/10/5
2	TN120R	BT	5600.00	-3.82 / 318.00	-32.40 / 292.00	-7.65	Hor.	2007/10/5
3	TN120R	BT	5600.00	-1.38 / 170.00	-11.32 / 293.00	-4.18	V+H	2007/10/5

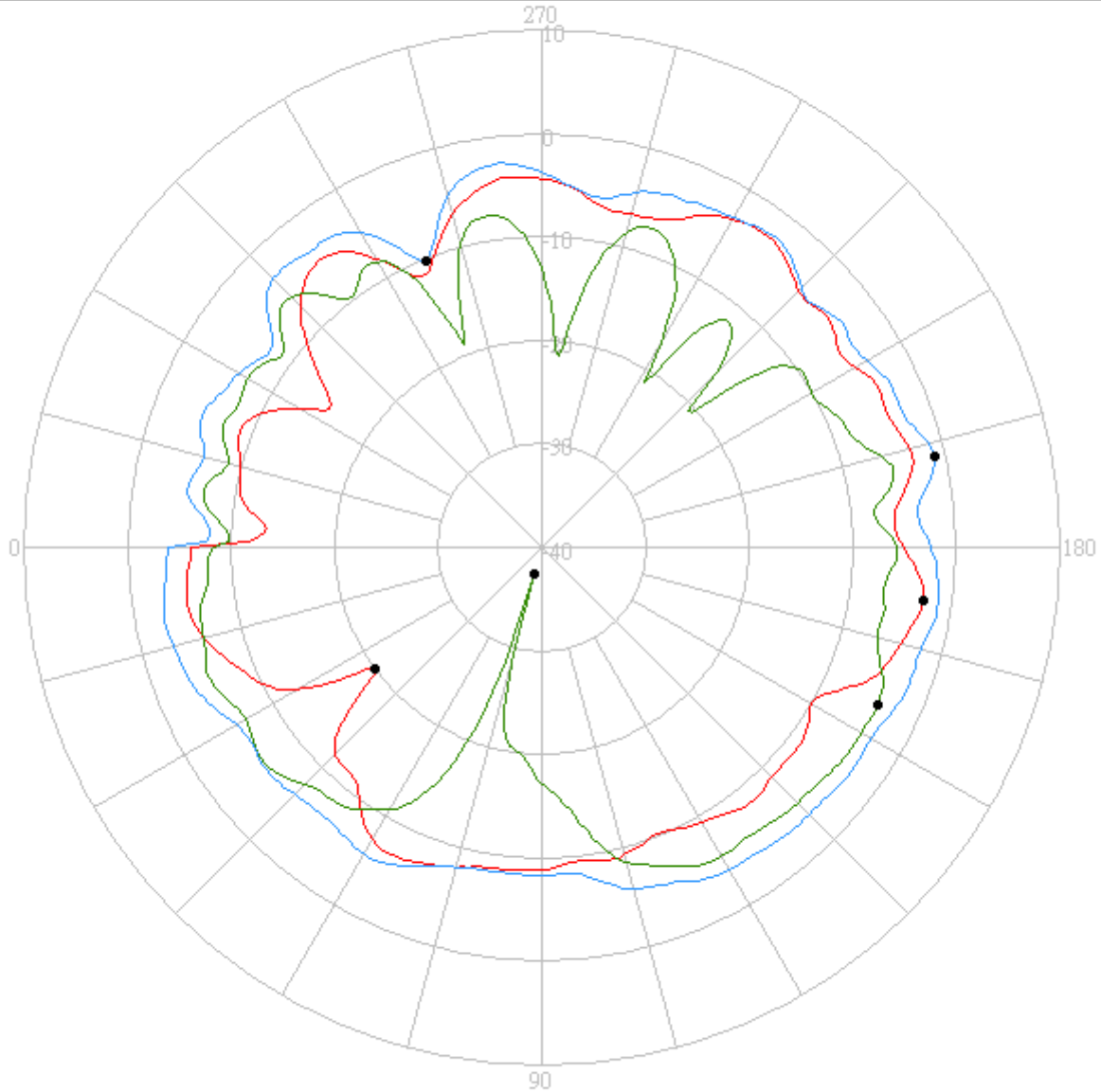
k. 5.725GHz



# FAVORTRON Co. Ltd

## Antenna Pattern Measurement

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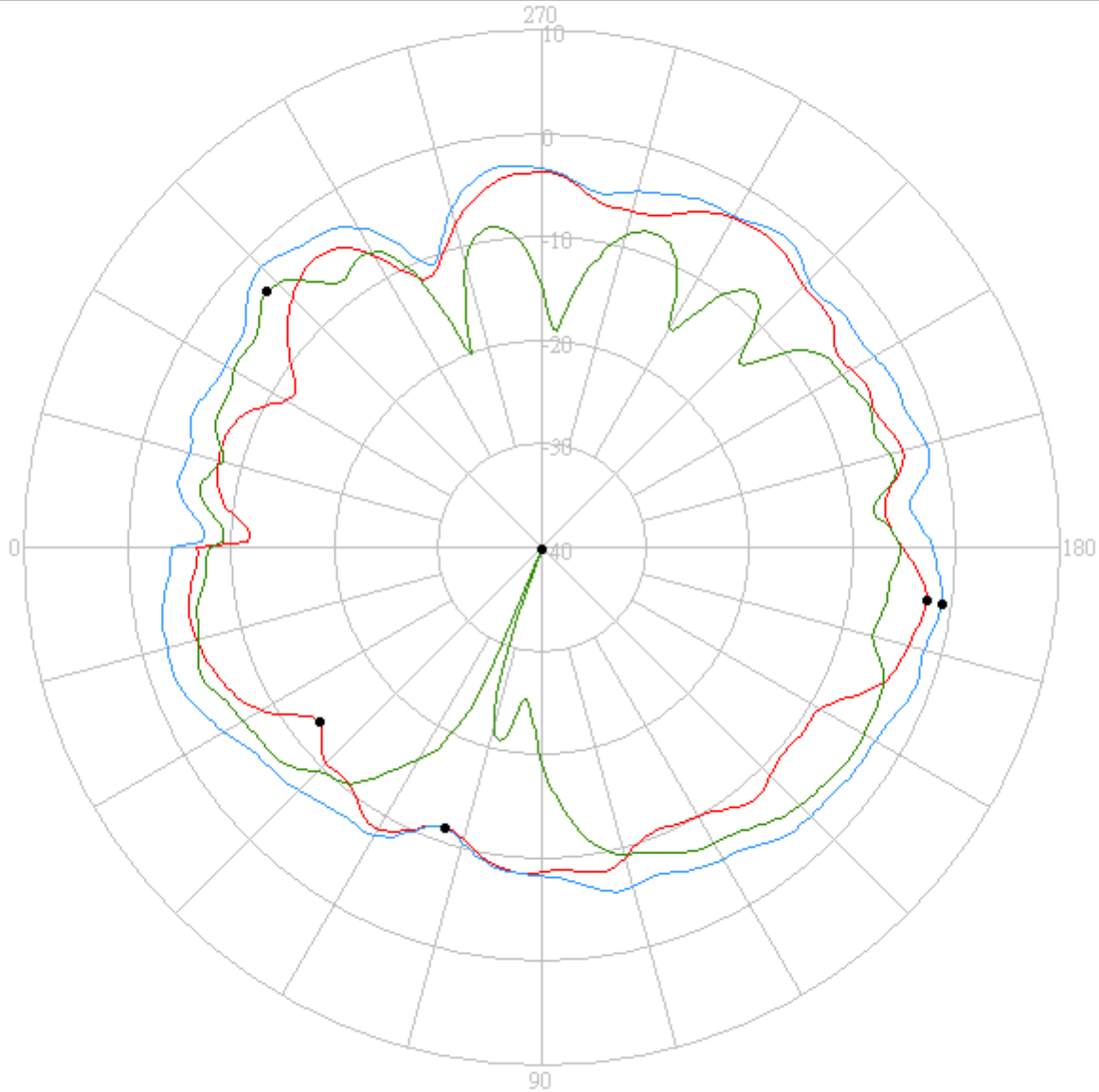
Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5725.00	-2.84 / 172.00	-20.04 / 36.00	-6.73	Ver.	2007/10/5
2	TN120R	BT	5725.00	-4.20 / 155.00	-37.43 / 74.00	-7.97	Hor.	2007/10/5
3	TN120R	BT	5725.00	-1.14 / 193.00	-10.22 / 292.00	-4.29	V+H	2007/10/5

# 1. 5.785GHz



## FAVORTRON Co. Ltd Antenna Pattern Measurement

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Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5785.00	-2.51 / 172.00	-12.72 / 38.00	-6.56	Ver.	2007/10/5
2	TN120R	BT	5785.00	-3.70 / 317.00	-39.78 / 70.00	-7.57	Hor.	2007/10/5
3	TN120R	BT	5785.00	-0.99 / 172.00	-11.35 / 71.00	-4.02	V+H	2007/10/5

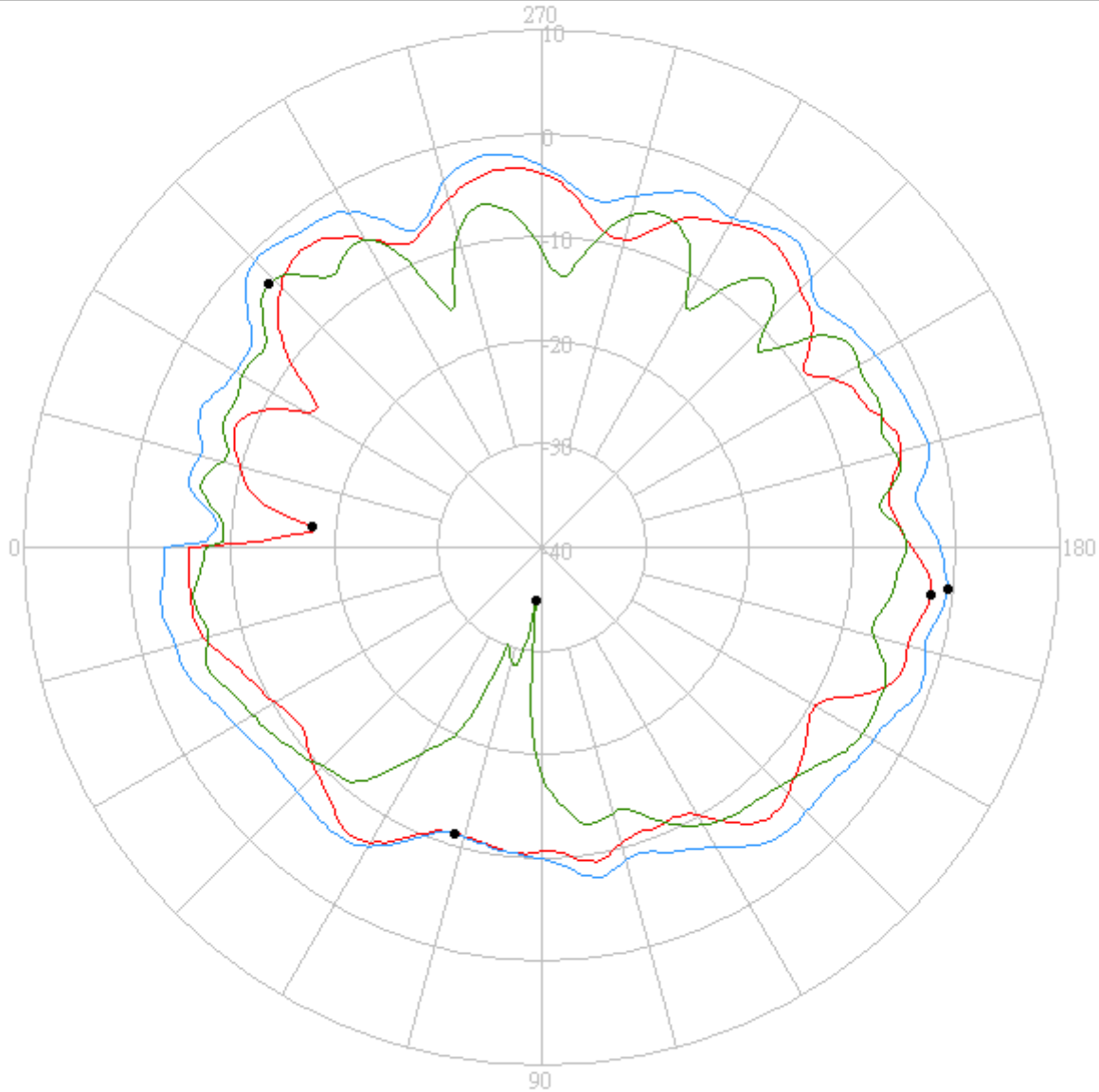
m. 5.85GHz



# FAVORTRON Co. Ltd

## Antenna Pattern Measurement

4F, No. 108-1, Min Chuan Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C. Tel:886-2-2218-2189, Fax:886-2-2218-5760



Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5850.00	-2.21 / 173.00	-17.80 / 355.00	-6.51	Ver.	2007/10/5
2	TN120R	BT	5850.00	-3.35 / 316.00	-34.88 / 83.00	-7.51	Hor.	2007/10/5
3	TN120R	BT	5850.00	-0.64 / 174.00	-11.15 / 73.00	-3.97	V+H	2007/10/5

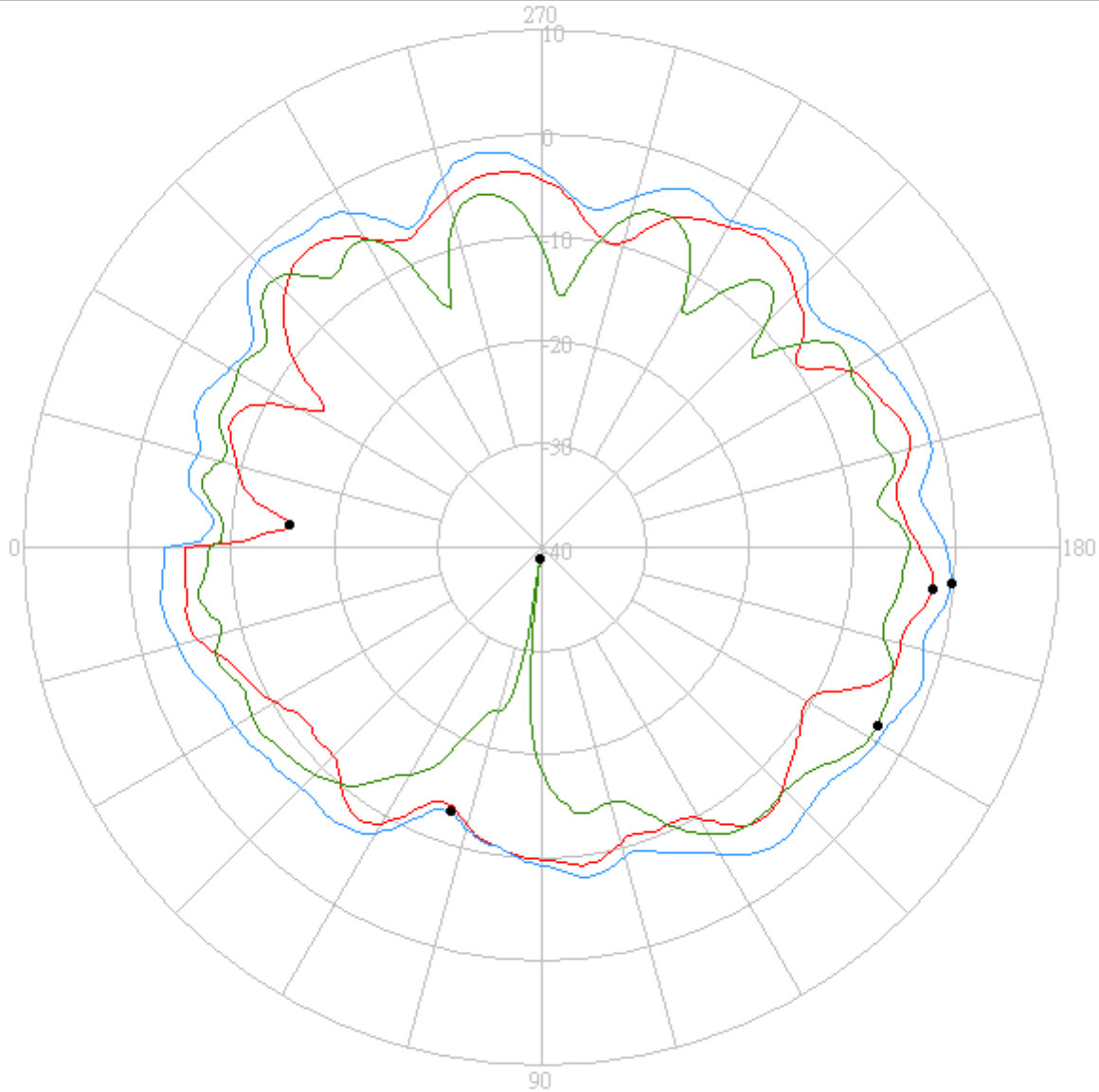
n. 5.875GHz



# FAVORTRON Co. Ltd

## Antenna Pattern Measurement

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Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	TN120R	BT	5875.00	-2.10 / 174.00	-15.61 / 355.00	-6.60	Ver.	2007/10/5
2	TN120R	BT	5875.00	-3.30 / 152.00	-38.81 / 83.00	-7.39	Hor.	2007/10/5
3	TN120R	BT	5875.00	-0.33 / 175.00	-13.07 / 71.00	-3.97	V+H	2007/10/5