Antenna design and data

Project name: WR-100

Required frequency band: 2.4G WI-FI / domestic 4 G

Research and development project: Li Donghai

Completion date: May 08,2024

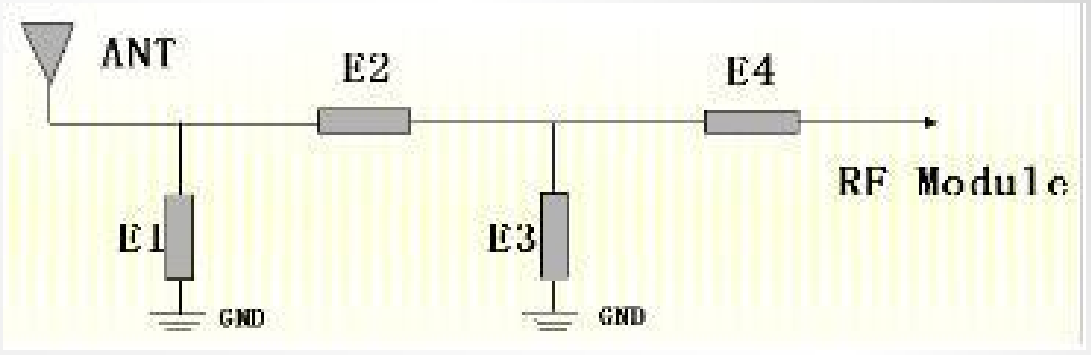
catalogue

CONTENTS

basic information

test macro

- SATIMO Dark room equipped: Anritsu MT8820C /Agilent E5071C/StarPoint SP9500
- The ETS darkroom is equipped with: CMW500/Agilent 8960
- network analyzer: Agilent E5071C

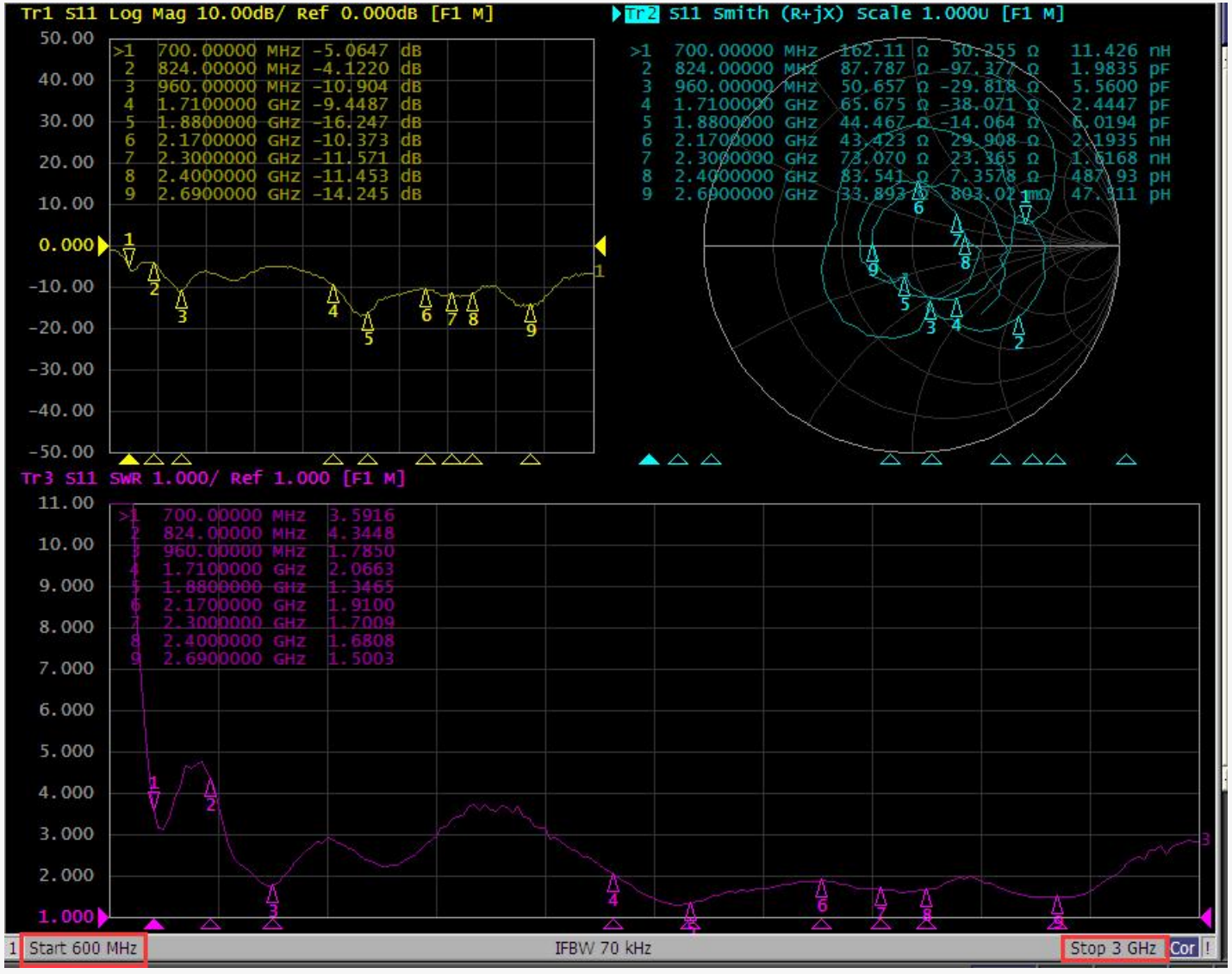


antenna loading coil

Antenna circuit matching description

Match without change

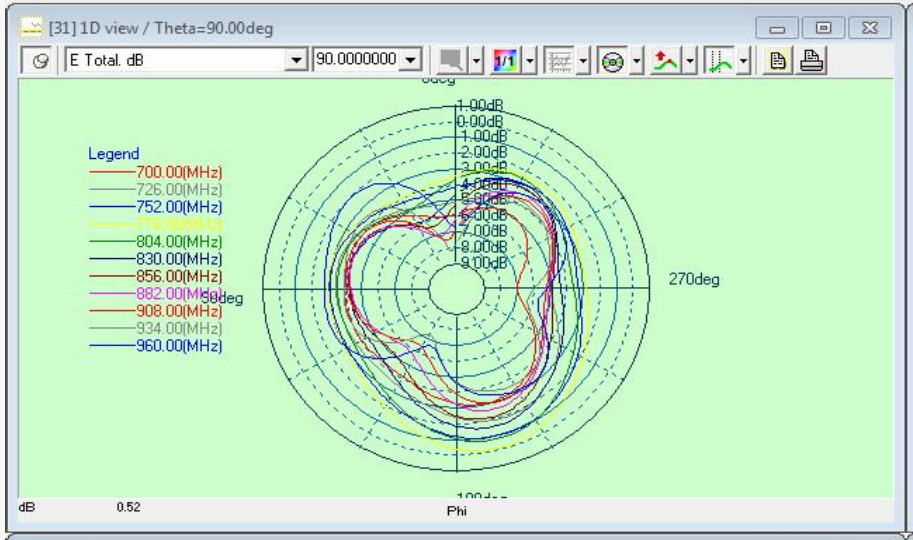
test data: LTE antenna- (SWR / Log Mag / Smith)

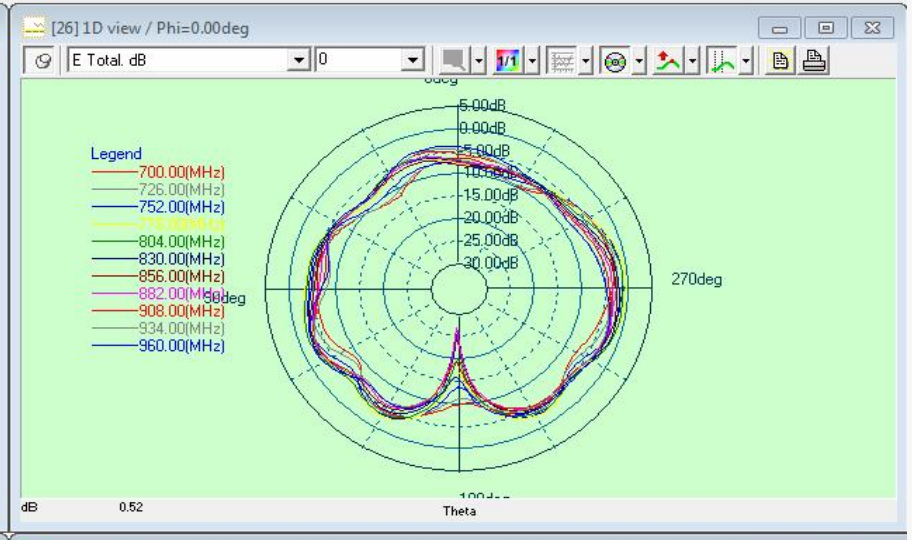


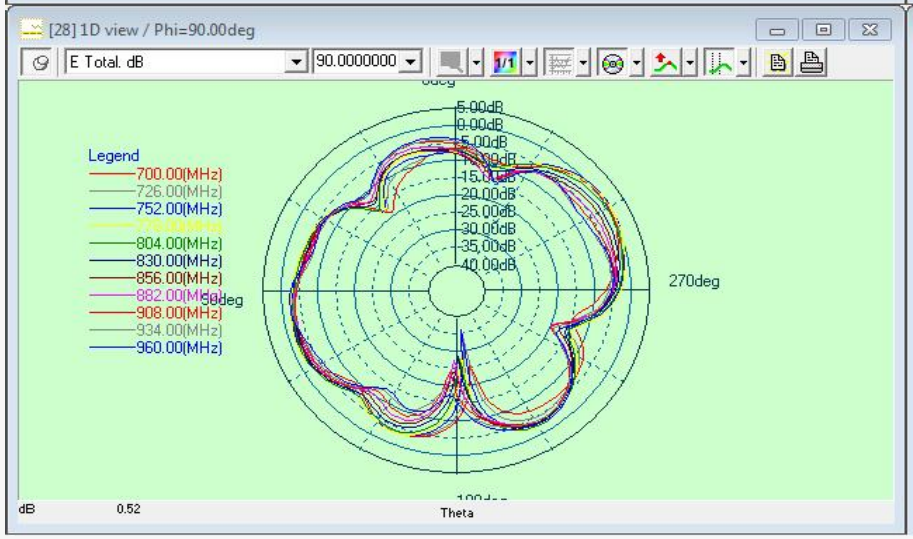
test data:

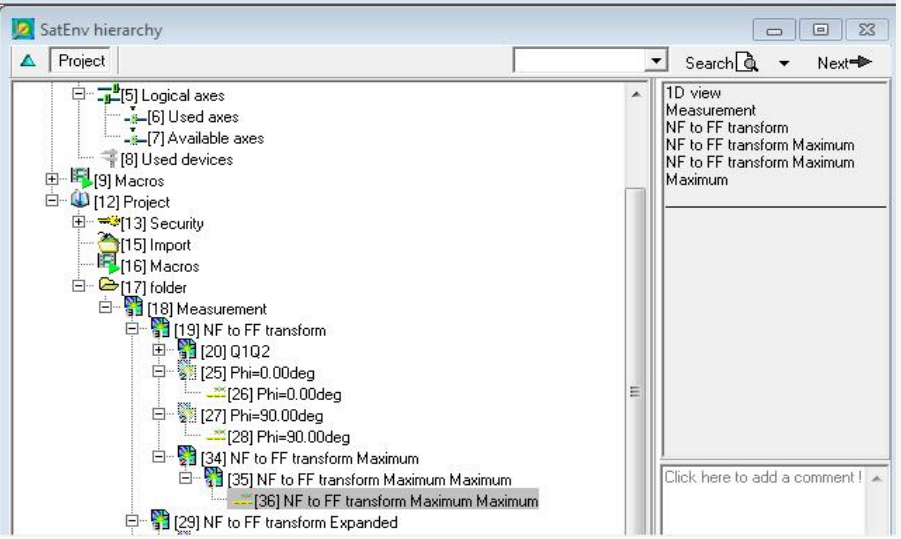
LTE antenna passive data- (efficiency / gain / orientation diagram)

700-960MHZ Efficiency		
Frequency	Efficiency	Gain.dBi
700MHz	29%	0.45
726MHz	34%	0.87
752MHz	40%	1.00
778MHz	43%	0.84
804MHz	39%	-0.06
830MHz	33%	-1.47
856MHz	29%	-2.15
882MHz	27%	-2.65
908MHz	26%	-2.90
934MHz	25%	-2.80
960MHz	28%	-1.69







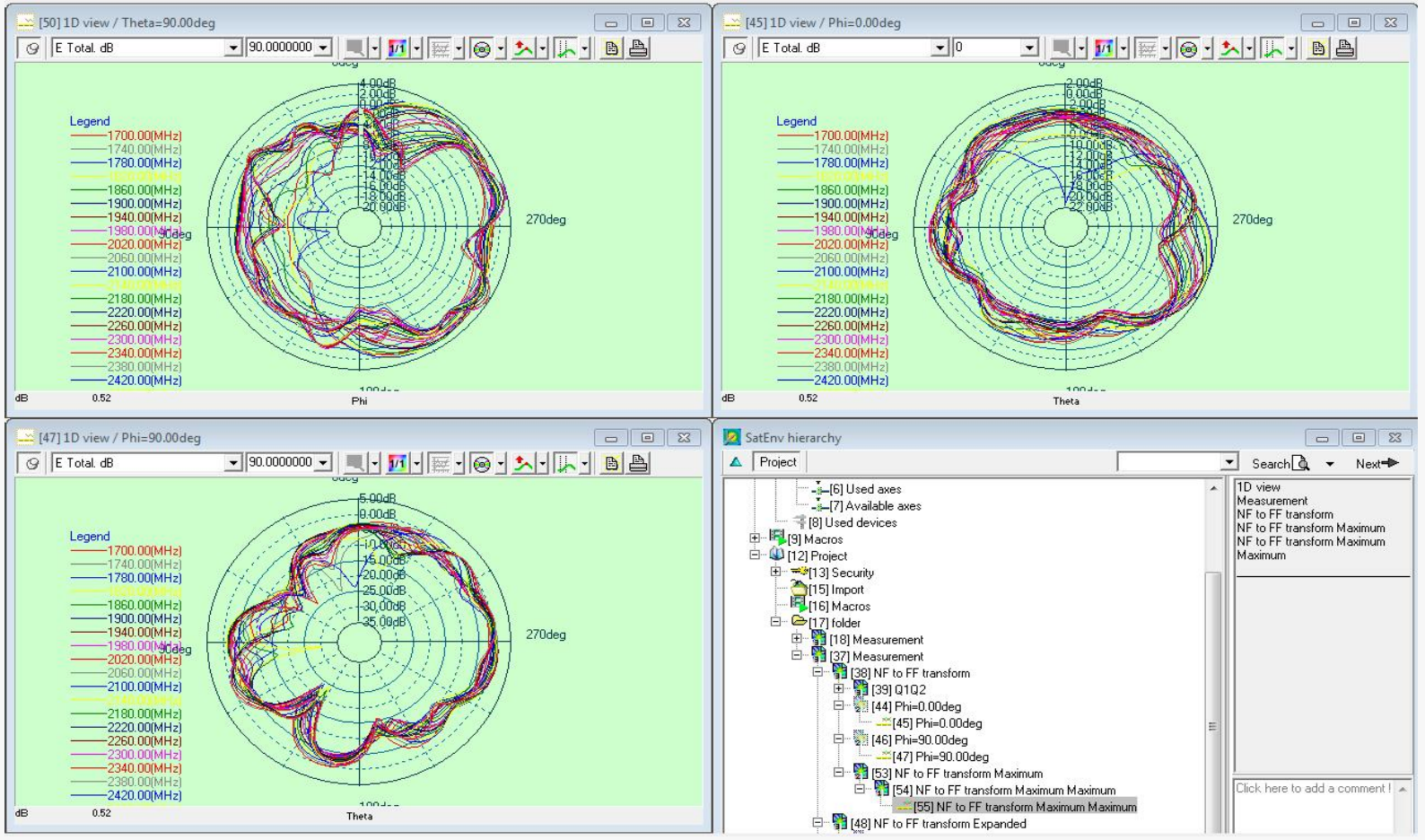


test data:

LTE antenna passive data- (efficiency / gain / orientation diagram)

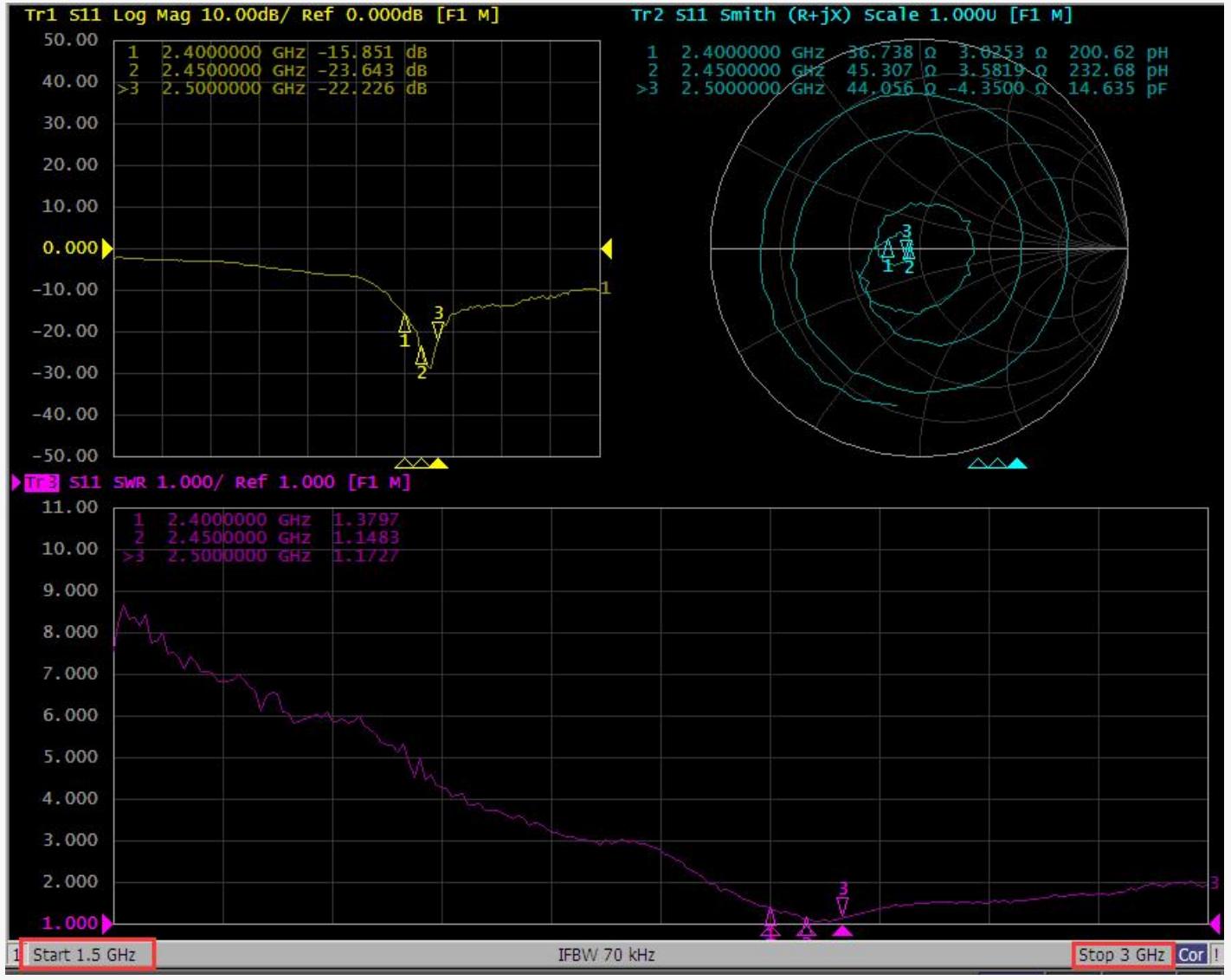
1700-2700MHZ Efficiency		
Frequency	Efficiency	Gain.dBi
1700MHz	49%	2.49
1740MHz	49%	2.90
1780MHz	54%	3.64
1820MHz	53%	3.76
1860MHz	50%	3.71
1900MHz	48%	3.39
1940MHz	51%	3.57
1980MHz	46%	2.92
2020MHz	47%	3.00
2060MHz	50%	2.99
2100MHz	48%	2.86
2140MHz	51%	3.07
2180MHz	49%	2.73
2220MHz	46%	2.41
2260MHz	42%	2.09
2300MHz	41%	1.99
2340MHz	43%	2.11
2380MHz	41%	1.87
2420MHz	44%	2.55
2460MHz	45%	3.49
2500MHz	46%	3.64

2540MHz	47%	3.58
2580MHz	50%	3.66
2620MHz	54%	3.82
2660MHz	52%	3.67
2700MHz	53%	3.71



test data:

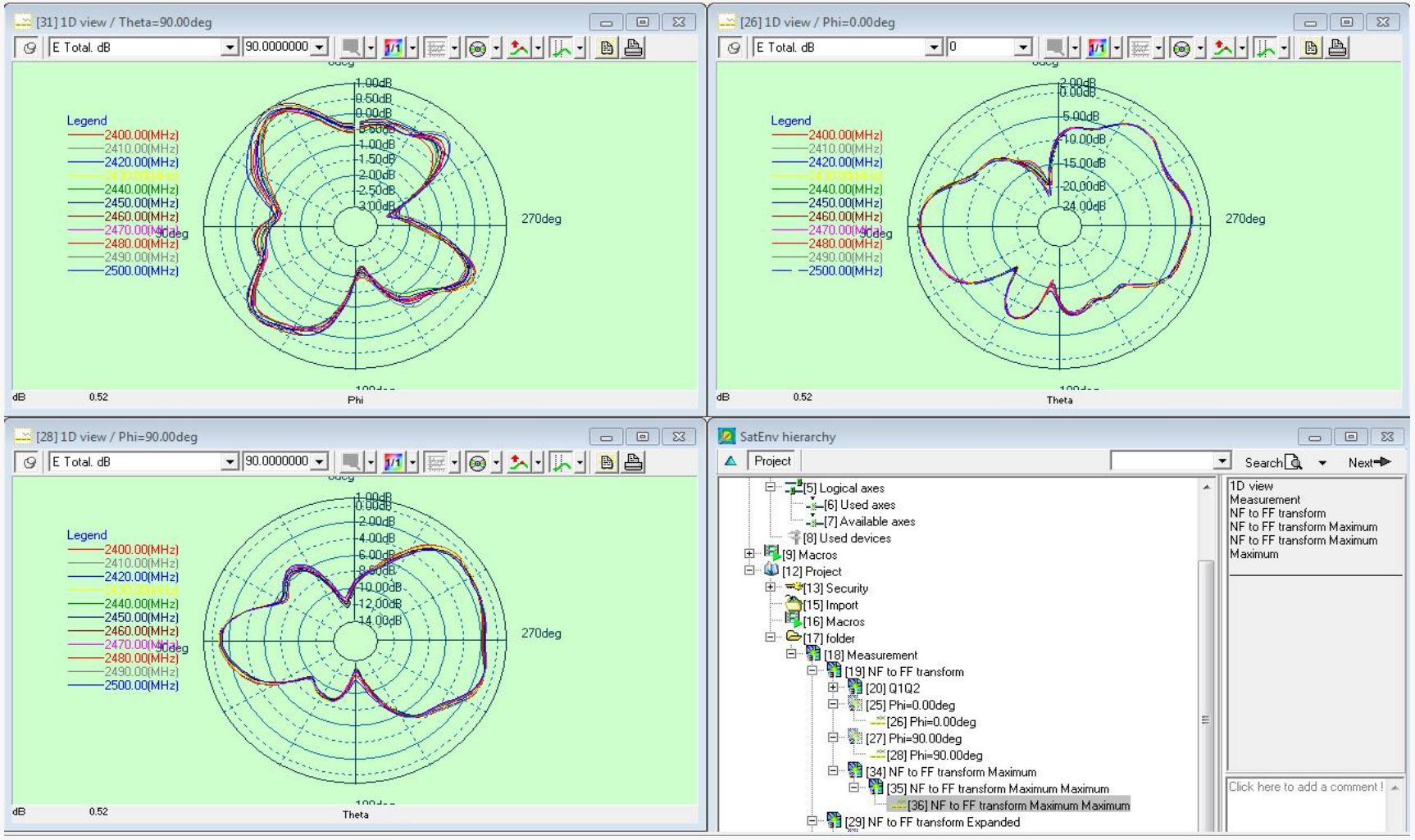
WIFI antenna- (SWR / Log Mag / Smith)



test data:

WIFI Antenna Passive Data- (Efficiency / Gain / Direction Map)

2400-2500MHZ Efficiency		
Frequency	Efficiency	Gain.dBi
2400MHz	47%	0.96
2410MHz	47%	0.90
2420MHz	47%	0.95
2430MHz	47%	0.96
2440MHz	46%	0.79
2450MHz	46%	0.91
2460MHz	47%	1.09
2470MHz	45%	0.86
2480MHz	46%	0.86
2490MHz	48%	1.09
2500MHz	47%	0.98



test data

4G active data-Active data

Band	Channel	free space (FS)		Band	Channel	free space (FS)	
		TRP	TIS			TRP	TIS
FDD B1	L	20.28		FDD B3	L	20.76	
	M	20.02			M	20.62	
	H	20.26	-94.63		H	20.87	-93.23
FDD B7	L	21.54		FDD B8	L	17.66	
	M	21.68			M	18.04	
	H	20.78	-92.85		H	19.31	-90.02
FDD B20	L	17.09		FDD B28	L	19.99	
	M	18.63			M	17.70	
	H	17.43	-86.01		H	16.13	-85.35
T DD B38	L	20.38		T DD B39	L	20.95	
	M	20.80	20mhz		M	19.75	20mhz
	H	21.23	-94.64		H	21.75	-91.22
TDD B41	L	19.52					
	M	20.41	20mhz				
	H	20.69	-92.11				

test data

WI-FI active data-Active data

Antenna Performance Table						
		Channel No.	TRP (dBm)		TIS (dBm)	
2.4G	b pattern	1	13.91		-85.93	
		6	13.88		-83.60	
		11	14.19		-86.79	
	g pattern	1	15.65		-73.22	
		6	15.52		-70.92	
		11	15.91		-74.16	
	n pattern	1	15.7		-68.25	
		6	15.5		-66.84	
		11	16.04		-69.75	

Planning summary

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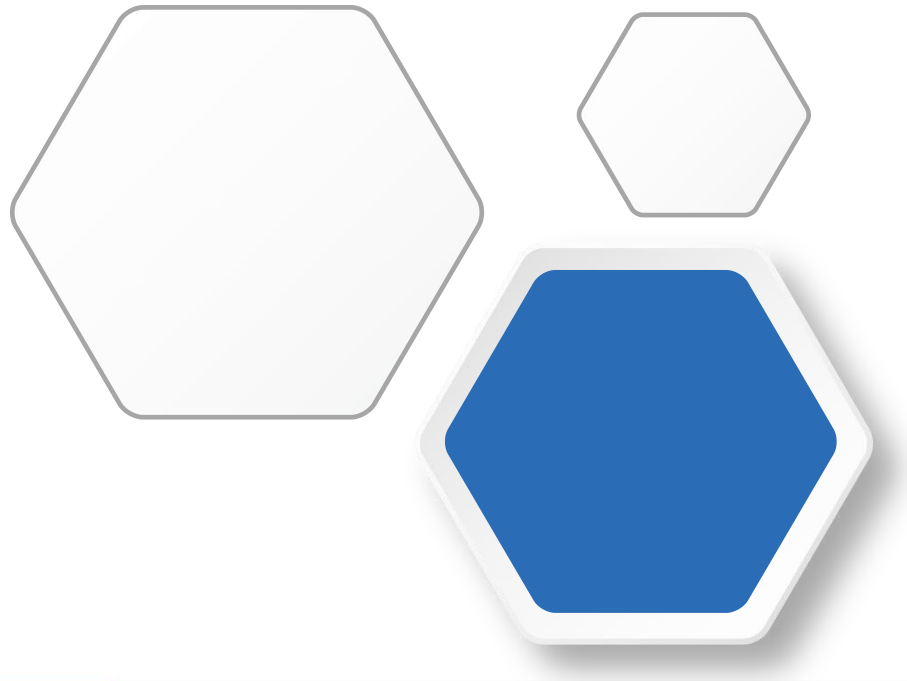
1. FDD is 10 mhz, and TDD is 20 mhz.

2. No environmental treatment.

THANK YOU



Project diagram:

Test placement diagram: