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Confidential
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SPECIFICATION FOR APPROVAL

CUSTOMER/PROJECT :	<u>K10</u>
CUSTOMER P.N./	<u></u>
PRODUCT NAME./	<u>main antenna+WiFi antenna</u>
MODEL NO./	<u>3V150A</u>
Antenna Type/	<u>FPC ANTENNA</u>

1 Definition of noun

dBi	Decibel relative isotropic antenna
Tx	Transmit frequency
Rx	Receive frequency
TRP	Total Radiated Power
TIS	Total Isotropic Sensitivity
VSWR	Voltage Standing Wave Ratio
GSM	Global Service for Mobile communication
DCS	Digital Communication System
CDMA	Code Division Multiple Access
WCDMA	Wideband Code Division Multiple Access

2 Test equipment

can be added or removed as needed:

Vector network analyzer,

Comprehensive tester,

GTS anechoic chamber

3 Applicable Frequency Band

	Uplink	Downlink
GSM850	824MHz~849MHz	869MHz~894MHz
PCS1900	1850MHz~1910MHz	1930MHz~1990MHz
CDMA800	825MHz~835MHz	870MHz~880 MHz
CDMA2000	824MHz ~849MHz	869MHz ~894MHz
WCDMA	824MHz~2170MHz	2110MHz~2170MHz
GPS	1570MHz-1580MHz	1570MHz-1580MHz
WIFI (2. 4G/5G)	2400MHz~5850MHz	2400MHz~5850MHz
LTE	620MHz ~2690MHz	620MHz ~2690MHz

4 Basic test items

SWR

Smith Impedance Diagram

antenna pattern

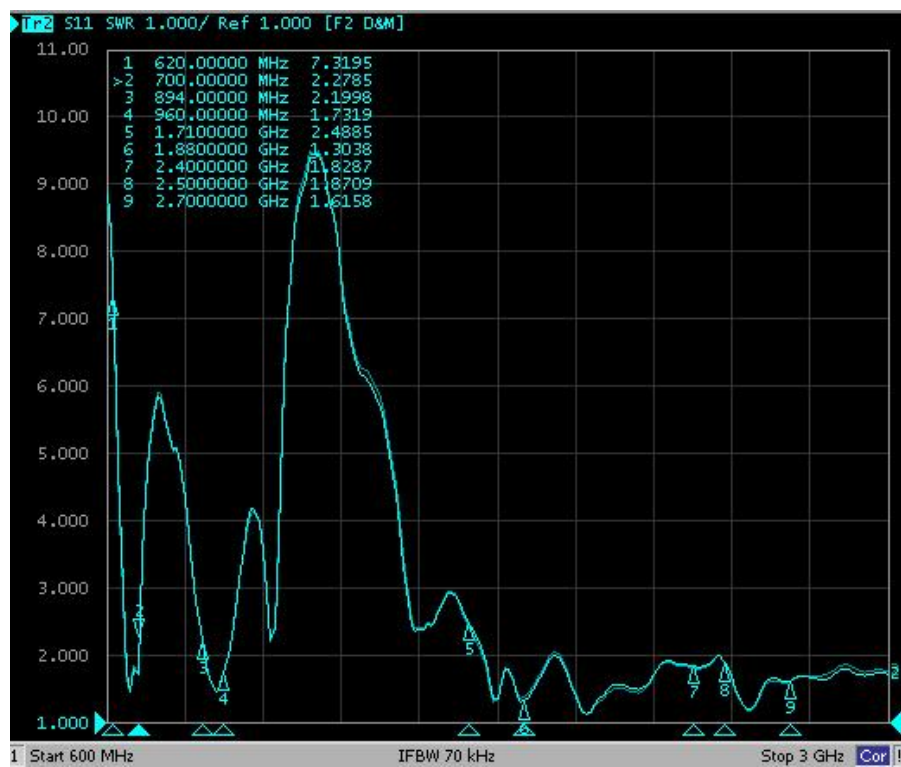
Gain and Efficiency

TRP&TISTEST

5 Test metrics and data charts

5.1 SWR main antenna

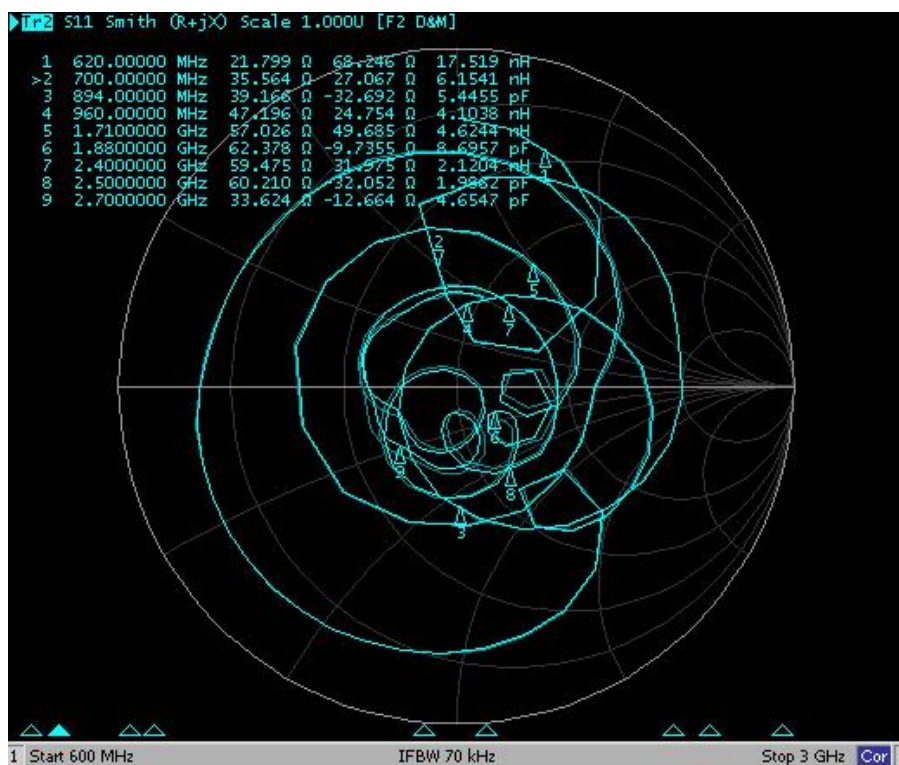
5.1.1 SWR



5.1.2 SWR

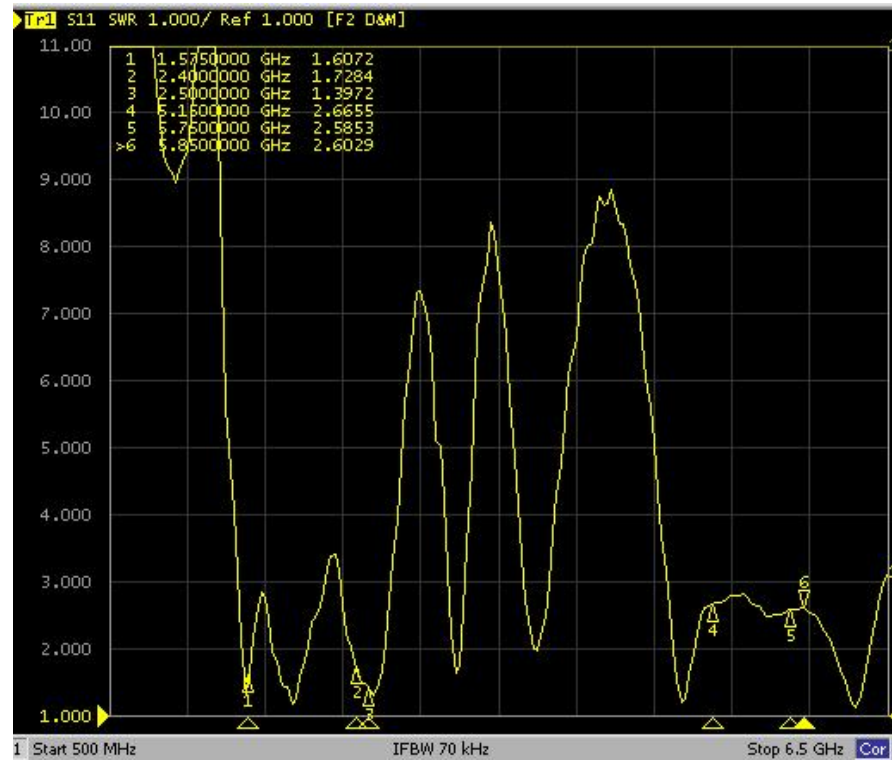
Freq/MHz	620	700	890	960	1710	1880	2400	2690
VSWR	7.3	2.7	2.1	1.7	2.4	1.3	1.8	1.6

Smith impedance chart



5.2 SWR WiFi antenna

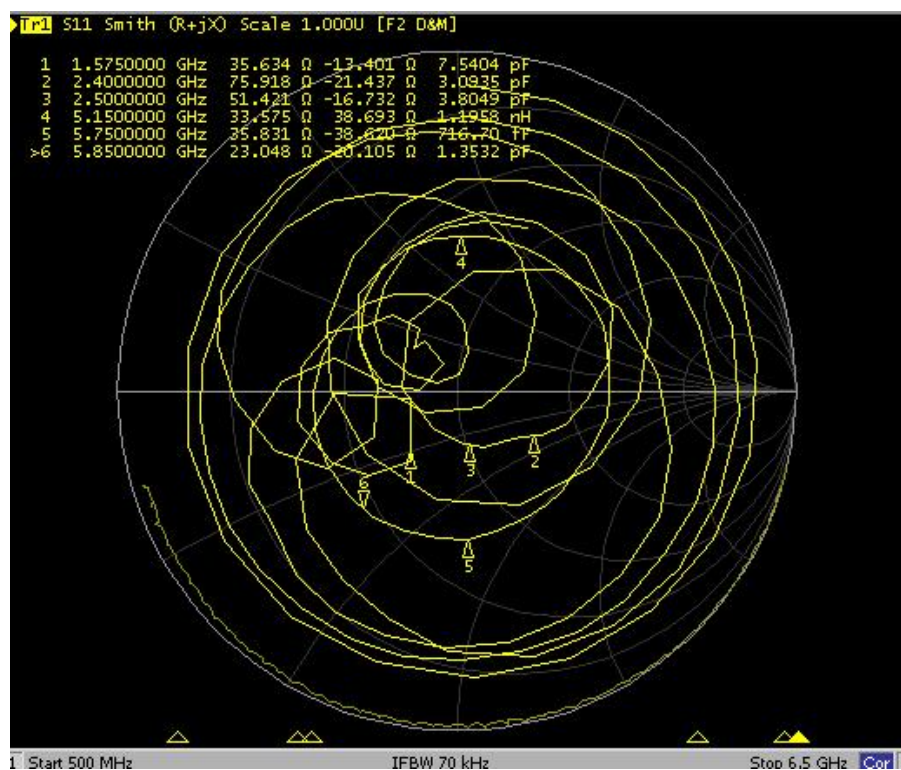
5.2.1 SWR



5.2.2 SWR

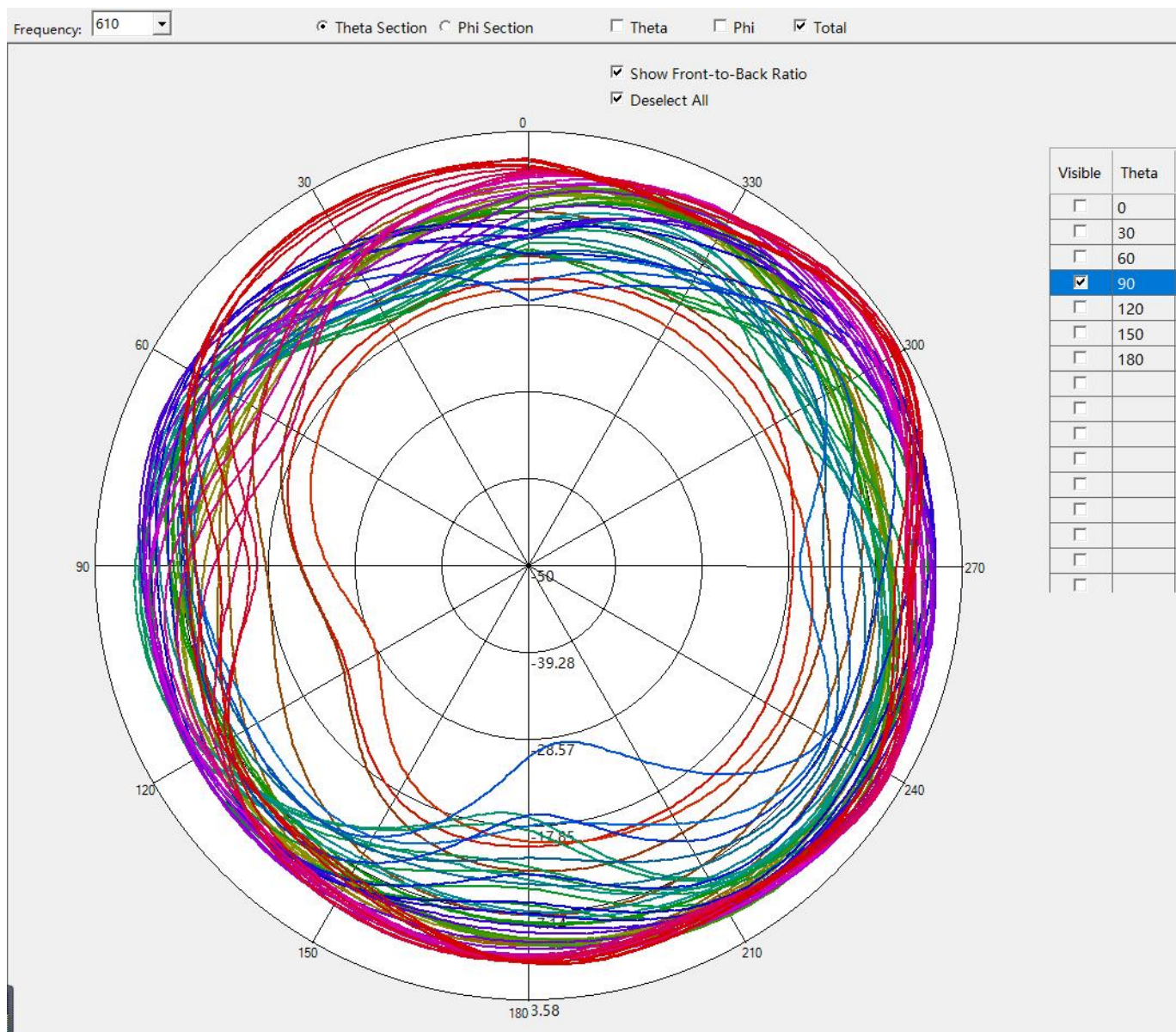
Freq/MHz	1575	2400	2500	5150	5750	5850
VSWR	1.6	1.7	1.3	2.6	2.5	2.6

Smith Impedance Diagram

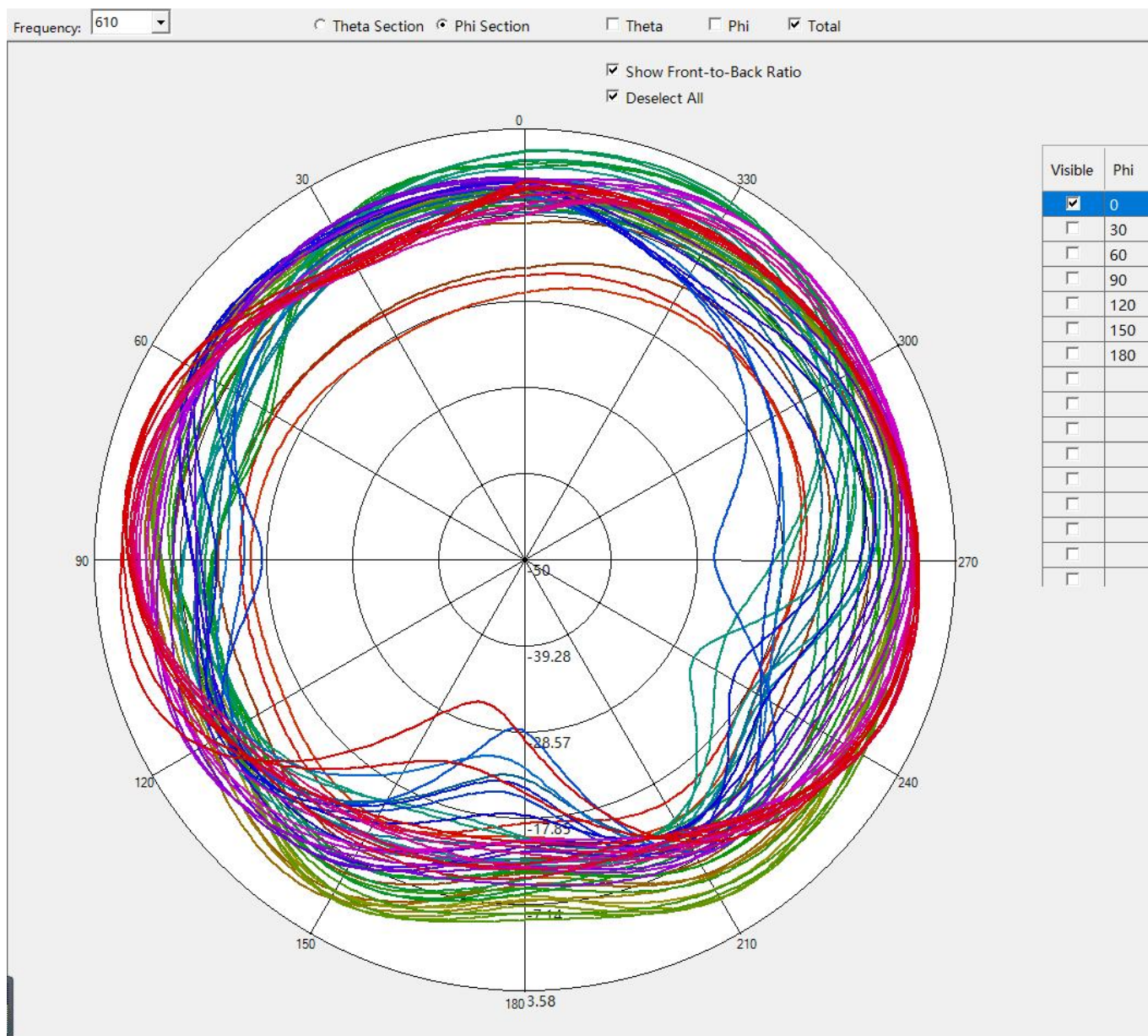


5.3 antenna pattern main antenna

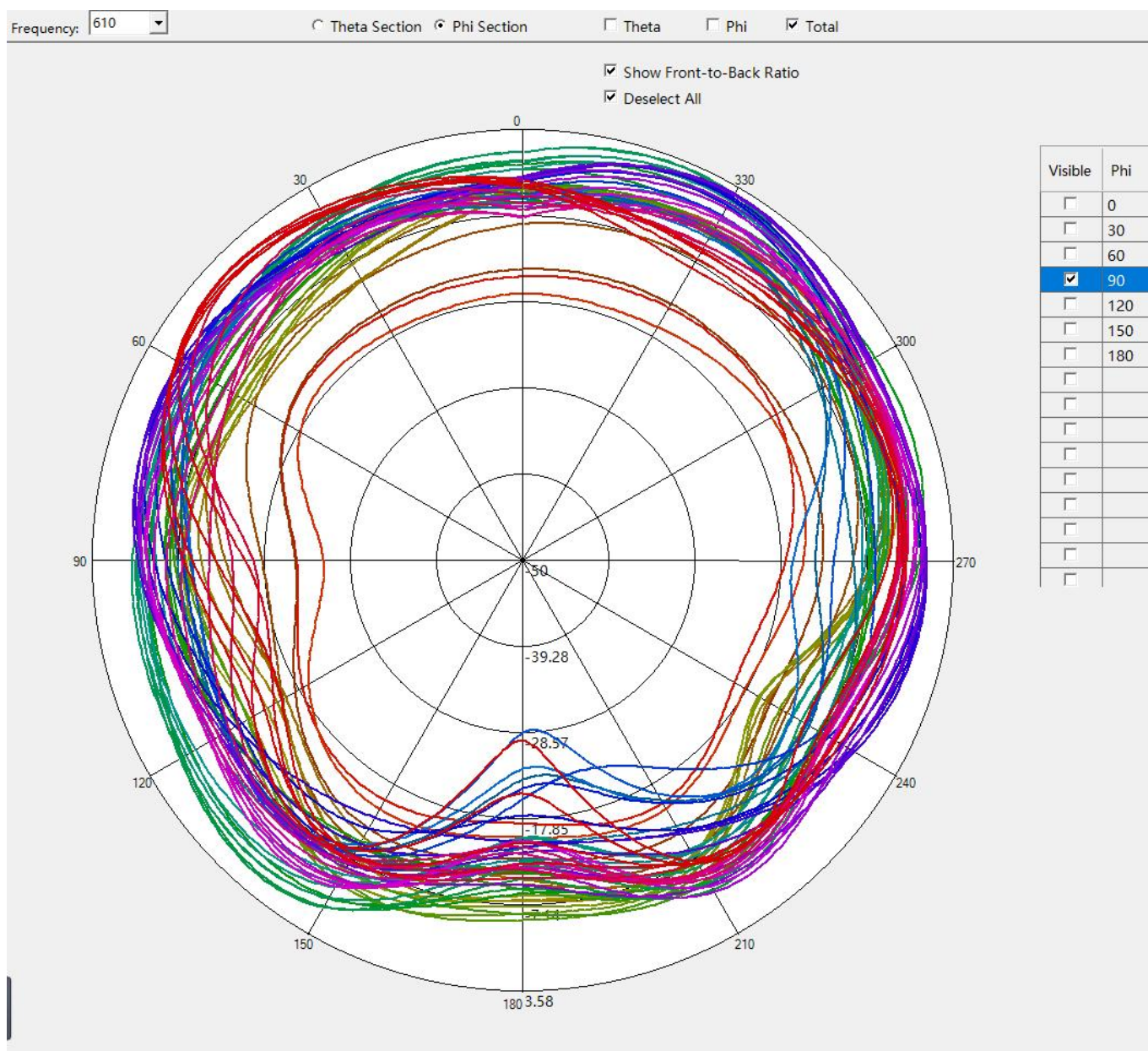
5.3.1 H-plane



E1

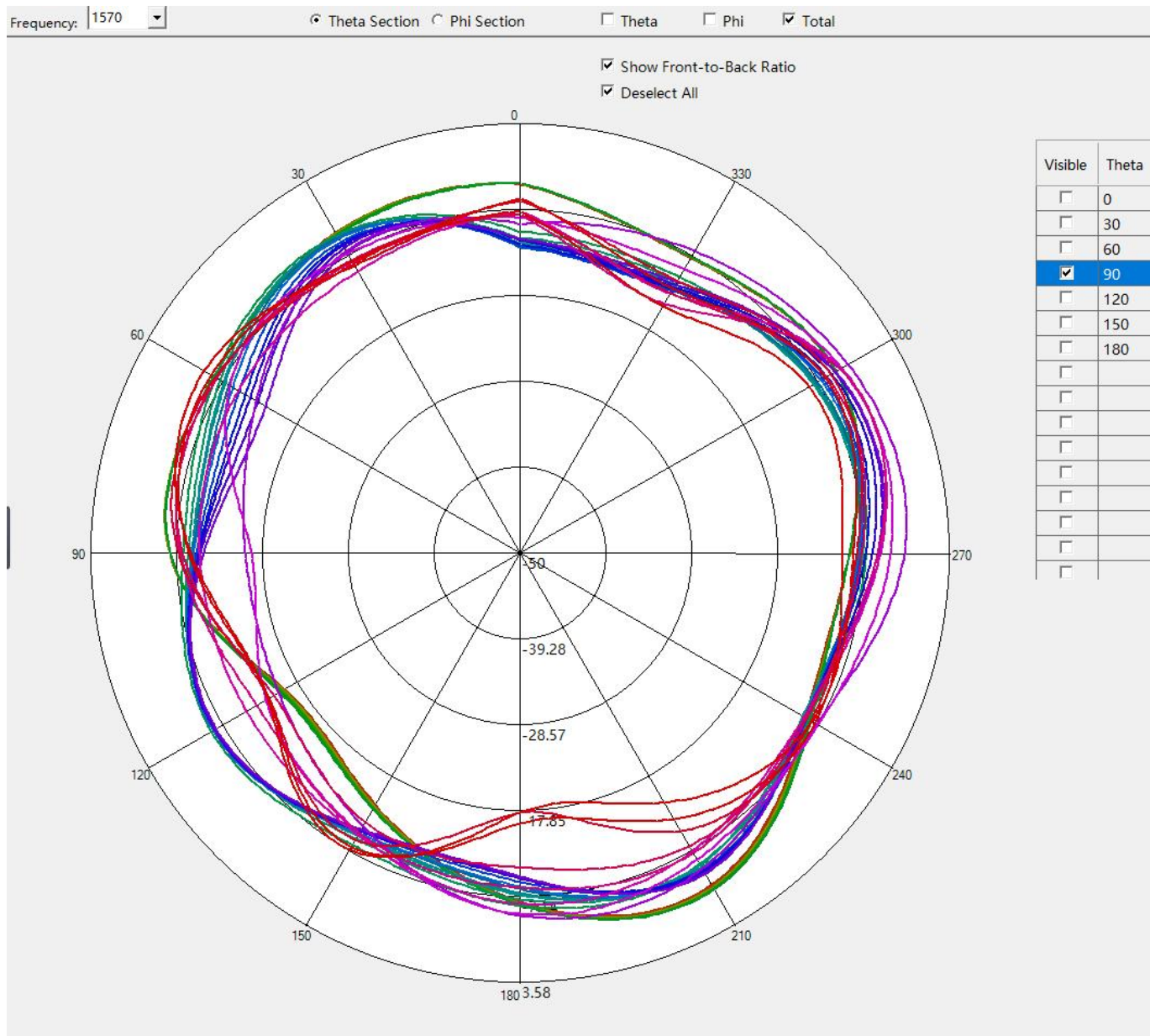


E2



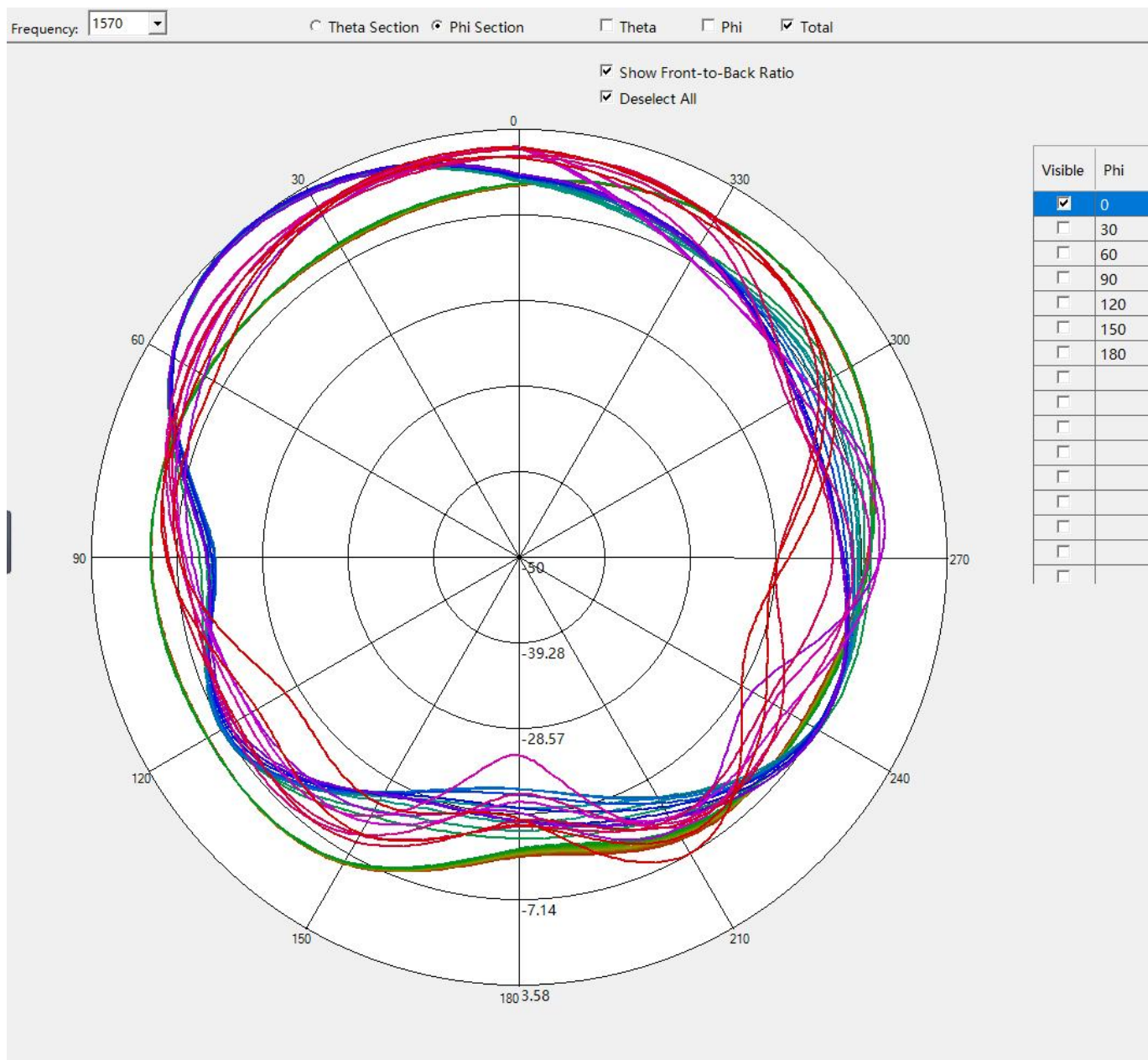
5.4 antenna pattern WiFi antenna

5.4.1 H-plane

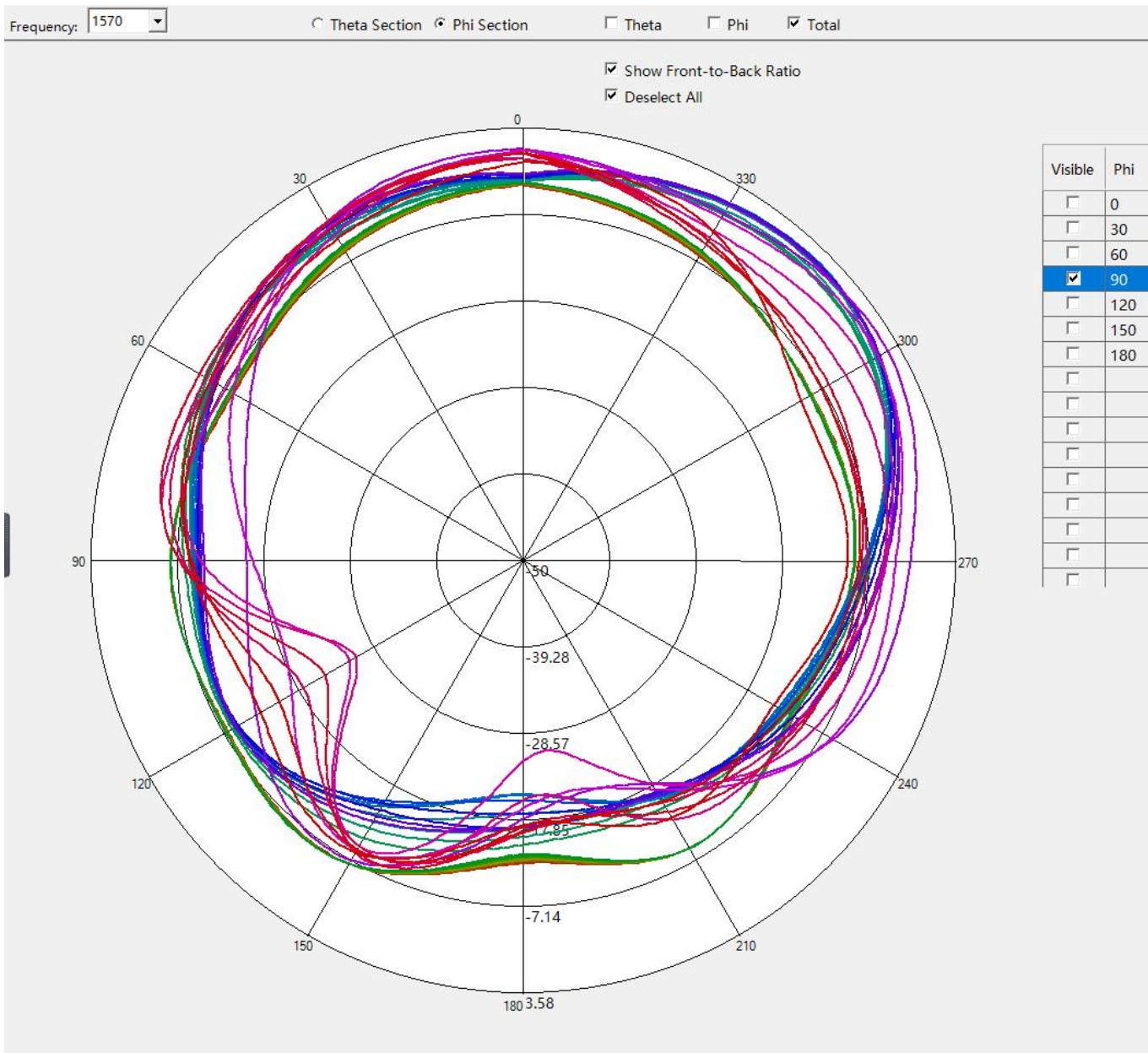


5.4.2 E-plane

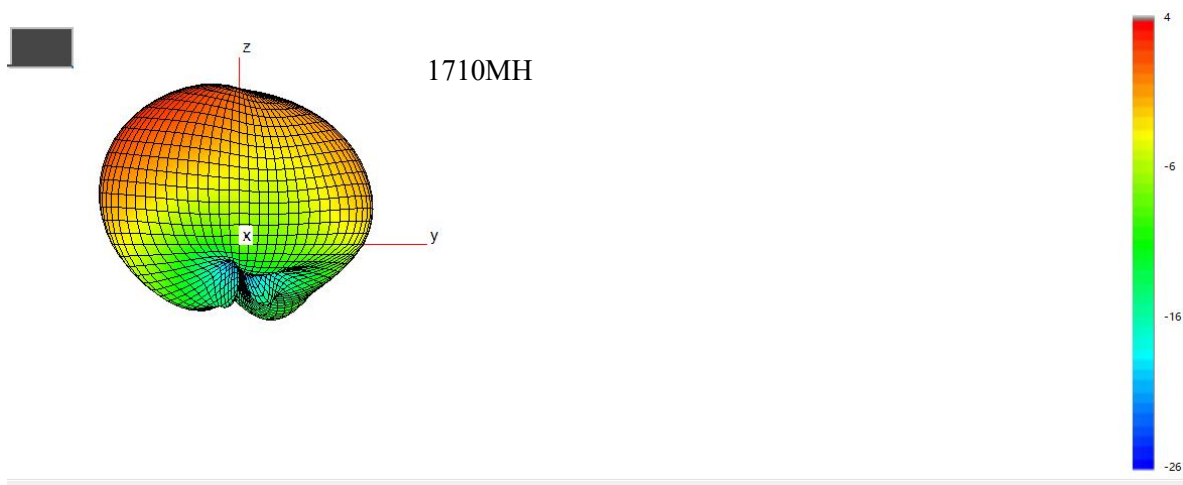
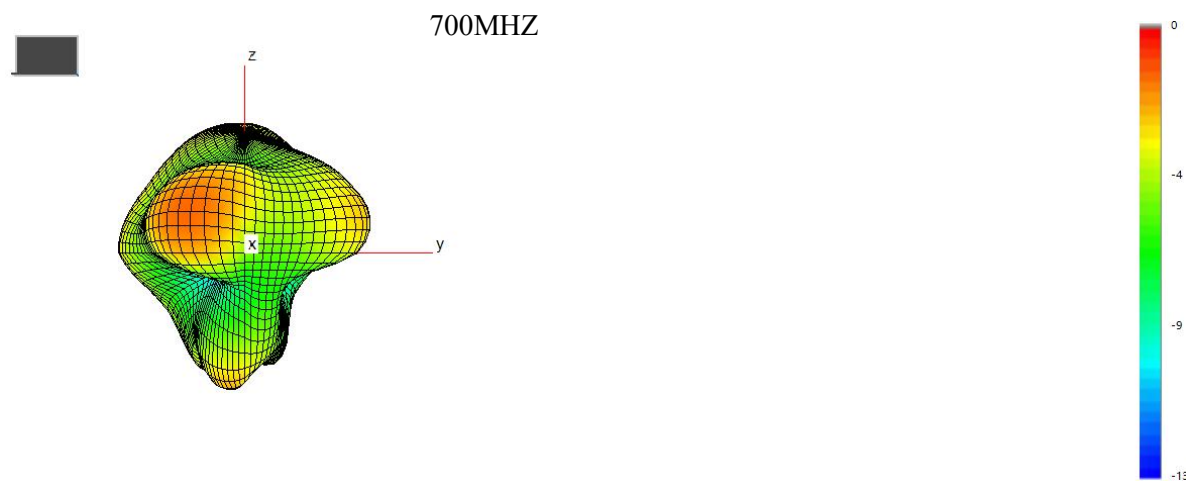
E1

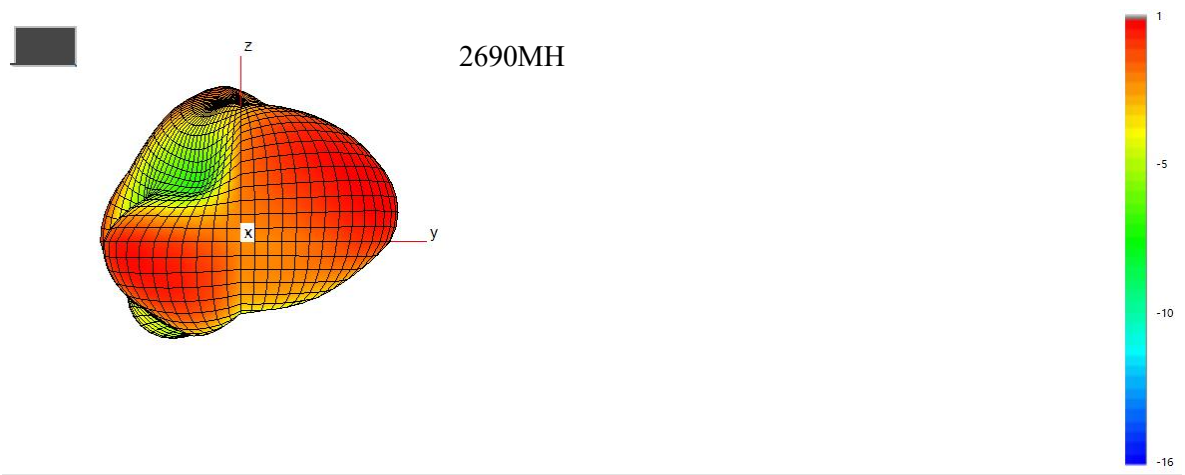


E2

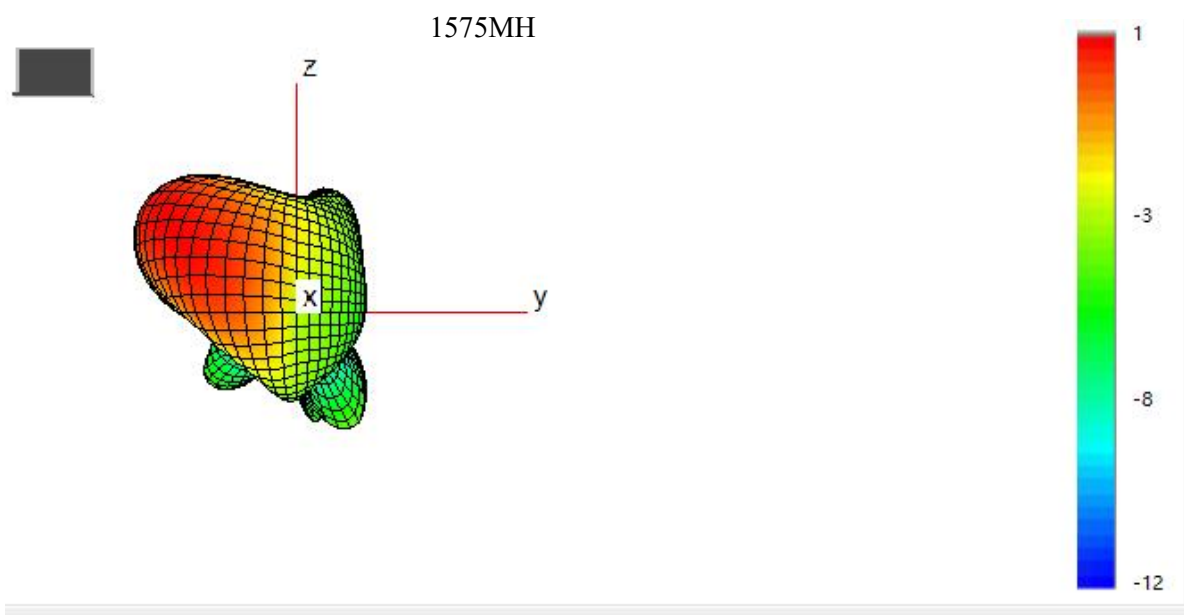


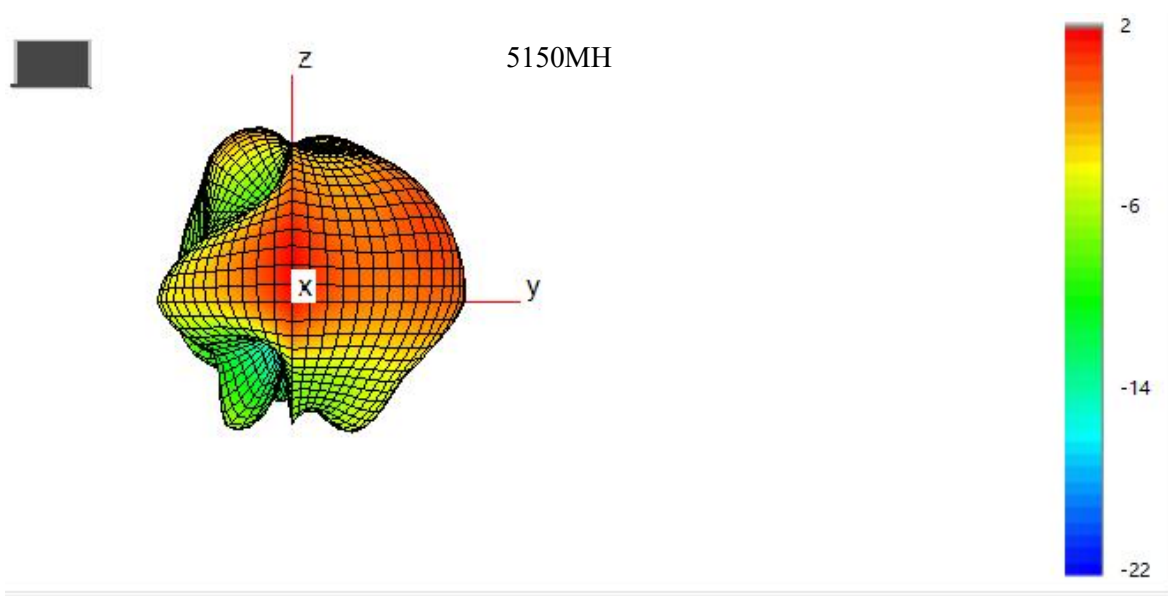
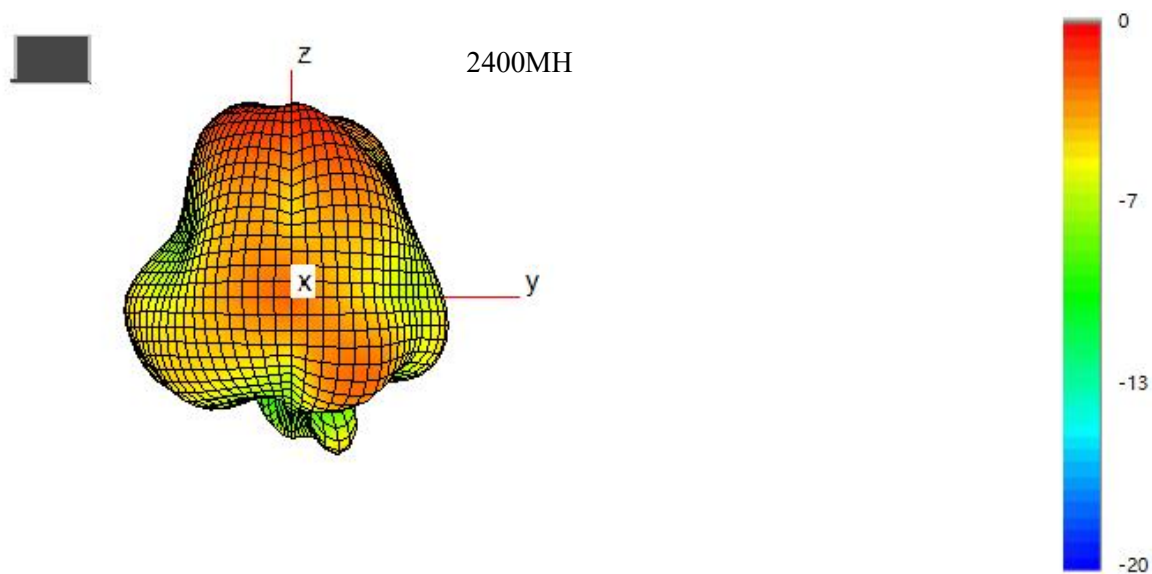
3D antenna pattern main antenna





3D antenna pattern WiFi antenna





5.5 antenna and gain main antenna

Freq (MHZ)	Eff (%)	GAI (dBi)		Freq (MHZ)	Eff (%)	GAIN (dBi)		Freq (MHZ)	Eff (%)	GAIN (dBi)
620	13.53	-5.56		1710	43.57	1.02		2300	43.51	2.45
640	15.02	-4.02		1750	43.48	2.24		2330	43.54	2.41
660	21.28	-2.28		1790	42.19	1.24		2370	38.65	1.71
680	32.13	-1.63		1830	41.67	1.76		2400	37.84	1.57
700	20.05	-0.50		1870	40.35	1.53		2450	35.40	0.91
720	23.07	-0.06		1900	37.98	1.43		2480	34.42	1.07
740	22.31	-0.17		1930	36.91	1.86		2510	37.60	1.43
760	20.94	-0.71		1960	39.69	2.35		2540	37.46	1.36
780	25.97	0.56		1990	41.37	2.15		2570	42.42	2.24
800	27.69	0.71		2100	39.10	1.42		2600	42.91	2.79
820	29.26	0.41		2130	37.64	1.34		2630	43.01	2.92
840	25.64	-0.57		2160	35.42	1.45		2660	43.23	2.58
860	27.13	-1.42						2690	41.75	2.17
880	30.63	-2.20								
900	23.84	-3.26								
900	20.05	-0.50								

LTE

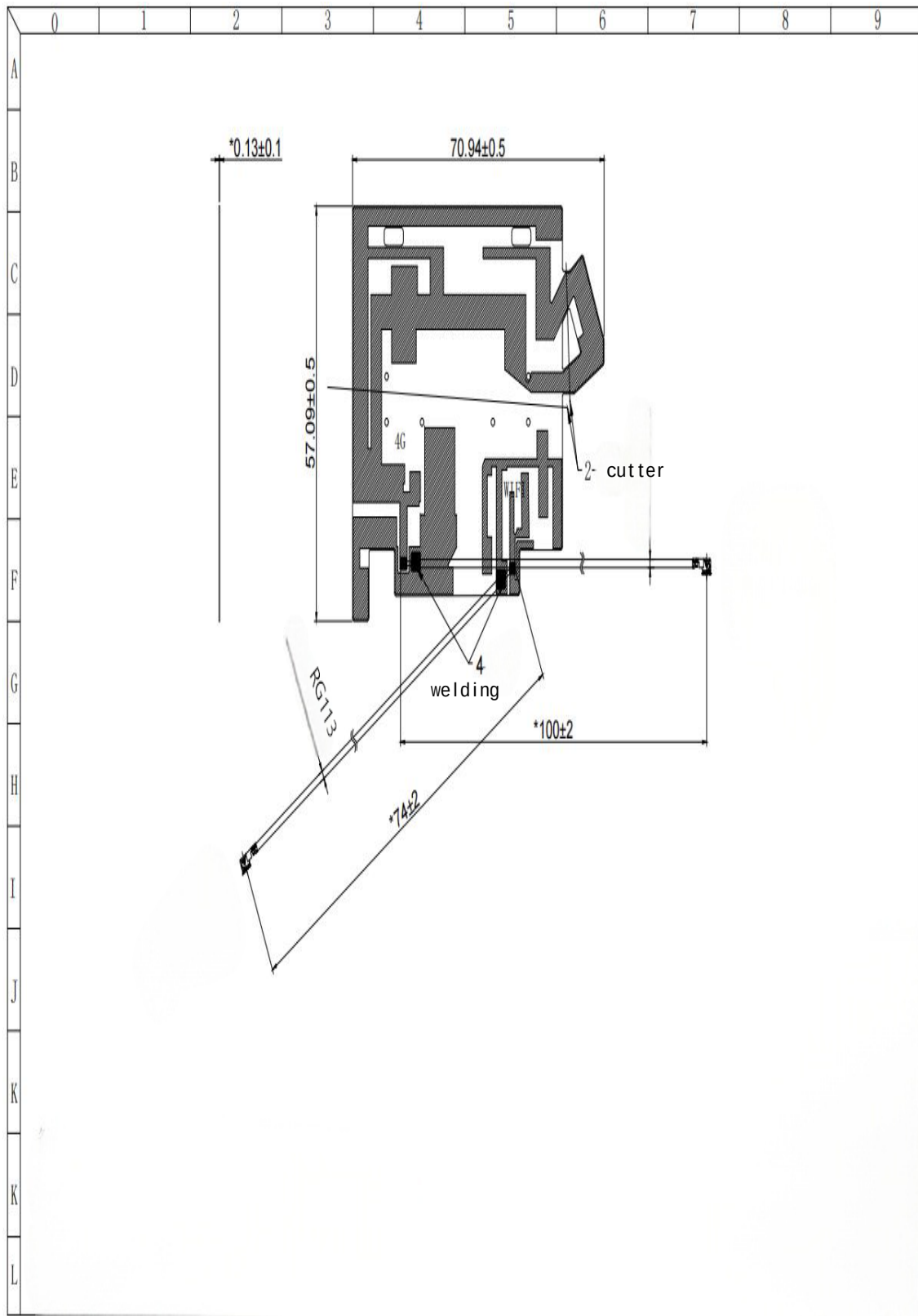
FDD		TRP(dBm)	TIS(dBm)
	Channel	Average value	Average value
BAND2	650	19.38	
	900	18.53	
	1150	17.27	-96.93
BAND4	2000	18.03	
	2175	17.59	
	2350	18.00	-97.58
BAND5	2450	17.84	
	2525	18.32	
	2600	18.77	-93.86
BAND7	2800	18.89	
	3100	19.10	
	3400	19.17	-95.31
BAND12	5060	16.19	
	5095	16.37	
	5130	16.25	-88.87
BAND13			
	5230	17.11	-85.63
BAND14			
	5330	17.44	-87.98

BAND17	5780	16.38	
	5790	16.30	
	5800	16.20	-86.78
BAND25	8065	18.18	
	8365	18.05	
	8665	17.36	-98.34
BAND26	8740	17.30	
	8865	17.73	
	8990	18.35	-96.00
BAND66	66486	17.52	
	66786	17.43	
	67086	17.78	-97.42
BAND71	68636	14.68	
	68761	14.82	
	68886	14.47	-82.38

TDD		<u>TRP</u>	<u>TIS</u>
	Channel	Average value	Average value
BAND38	37800	17.54	
	38000	17.60	
	38200	17.25	-92.22
BAND41	40340	17.31	
	40740	17.25	
	41140	17.93	-92.73

5.6 antenna and gain WiFi antenna

Freq (MHZ)	Eff (%)	GAIN (DB i)		Freq (MHZ)	Eff (%)	GAIN (DB i)		Freq (MHZ)	Eff (%)	GAIN (DB i)
1570	30.35	0.07		2400	38.34	3.31		5150	34.95	2.13
1571	30.55	0.09		2410	36.42	3.19		5250	39.75	3.36
1572	30.75	0.12		2420	36.17	3.26		5350	38.10	2.84
1573	30.88	0.14		2430	38.72	3.70		5450	40.58	3.45
1574	31.00	0.14		2440	39.70	3.81		5550	35.67	3.36
1575	31.10	0.16		2450	40.44	3.88		5650	35.51	3.15
1576	31.18	0.16		2460	39.75	3.76		5750	32.71	3.03
1577	31.24	0.16		2470	38.86	3.62		5850	31.78	2.87
1578	31.30	0.16		2480	40.66	3.77				
1579	31.30	0.14		2490	40.87	3.63				
1580	31.28	0.10		2500	39.36	3.28				



NFC antenna

