

Helix 1.5 Antenna Performance Data

2023-08-11

Contents:

Antenna performance

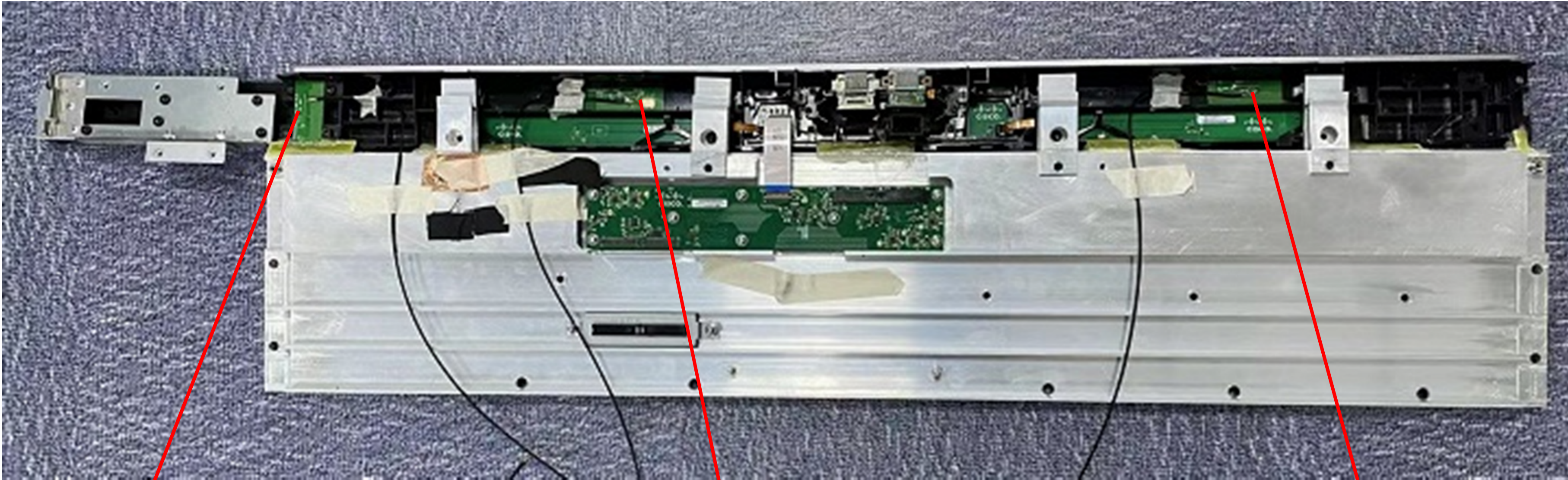
Table 1. Specification for Wifi antenna (Antenna A and B)

Parameter	Value/Limit
Frequency bands	Wifi 6E (2400-2500MHz, 5170-5840MHz, 5920-7130MHz)
Return Loss	More than 10dB
VSWR	1.9:1 or better
Efficiency	Better than 50% at 2400-2500MHz band Better than 40% at 5170-7130MHz bands
Gain	Maximum 5dBi peak gain
Radiation Pattern	Omni-directional
Polarization	Linear
Isolation	Better than 20dB between wifi antennas Better than 35dB between wifi and Bluetooth antenna

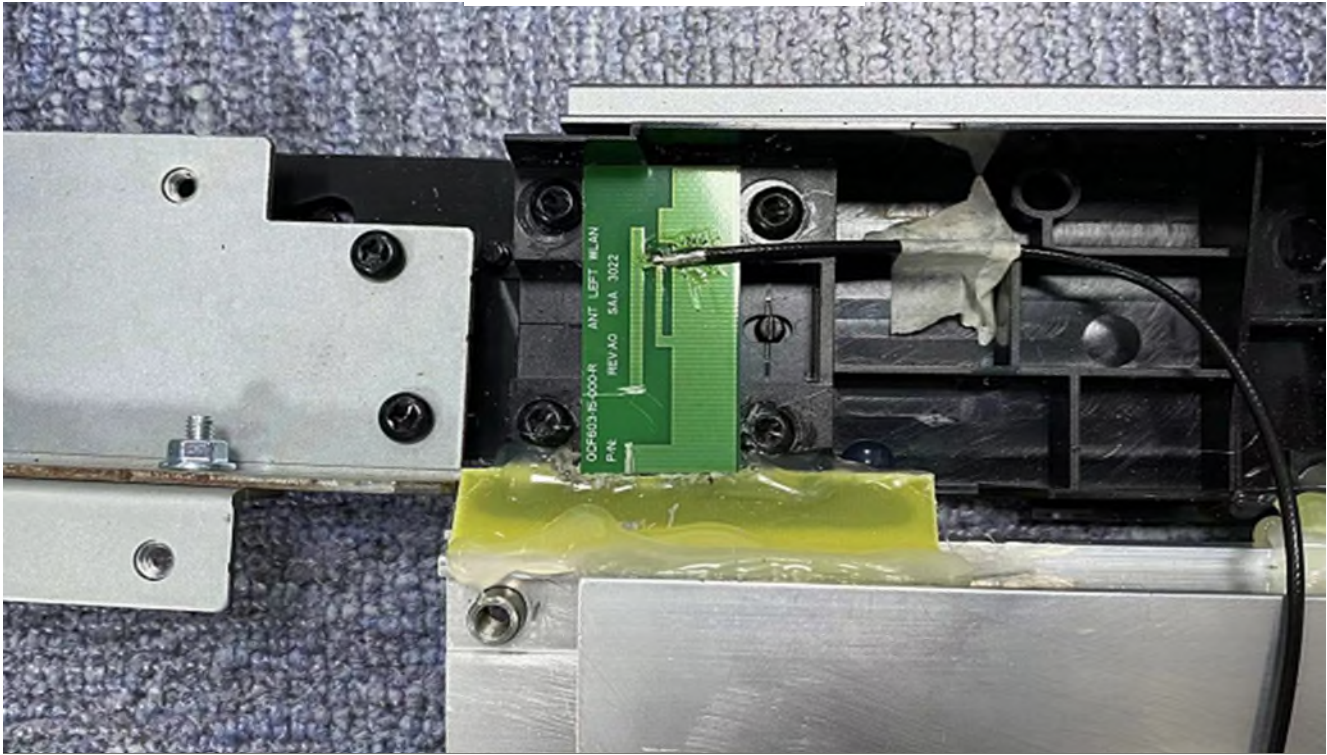
Table 2. Specification for Bluetooth antenna (Antenna C)

Parameter	Value/Limit
Frequency band	2400-2500MHz
Return Loss	More than 10dB
VSWR	1.9:1 or better
Efficiency	Better than 50%
Gain	Maximum 3.5-4dBi peak gain
Radiation Pattern	Main lobe front facing hemisphere
Polarization	Linear
Isolation	Better than 35dB between wifi and Bluetooth antenna

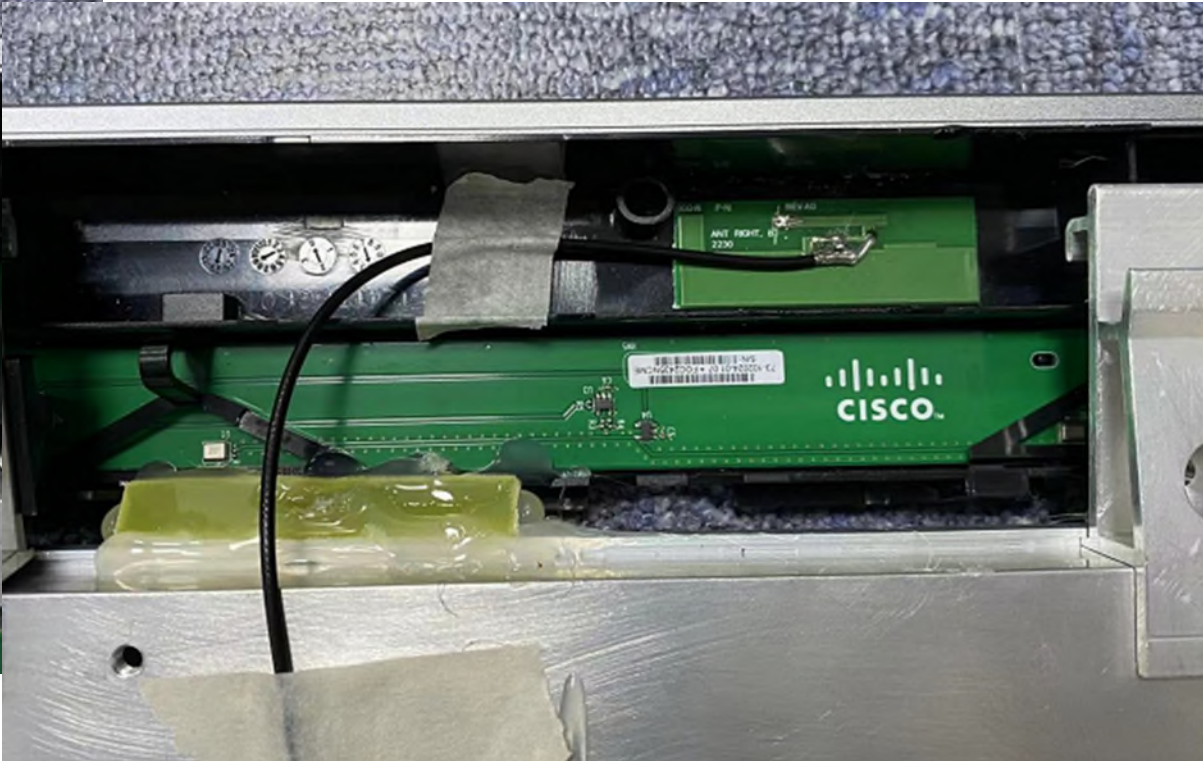
Mockup Picture



WLAN 1



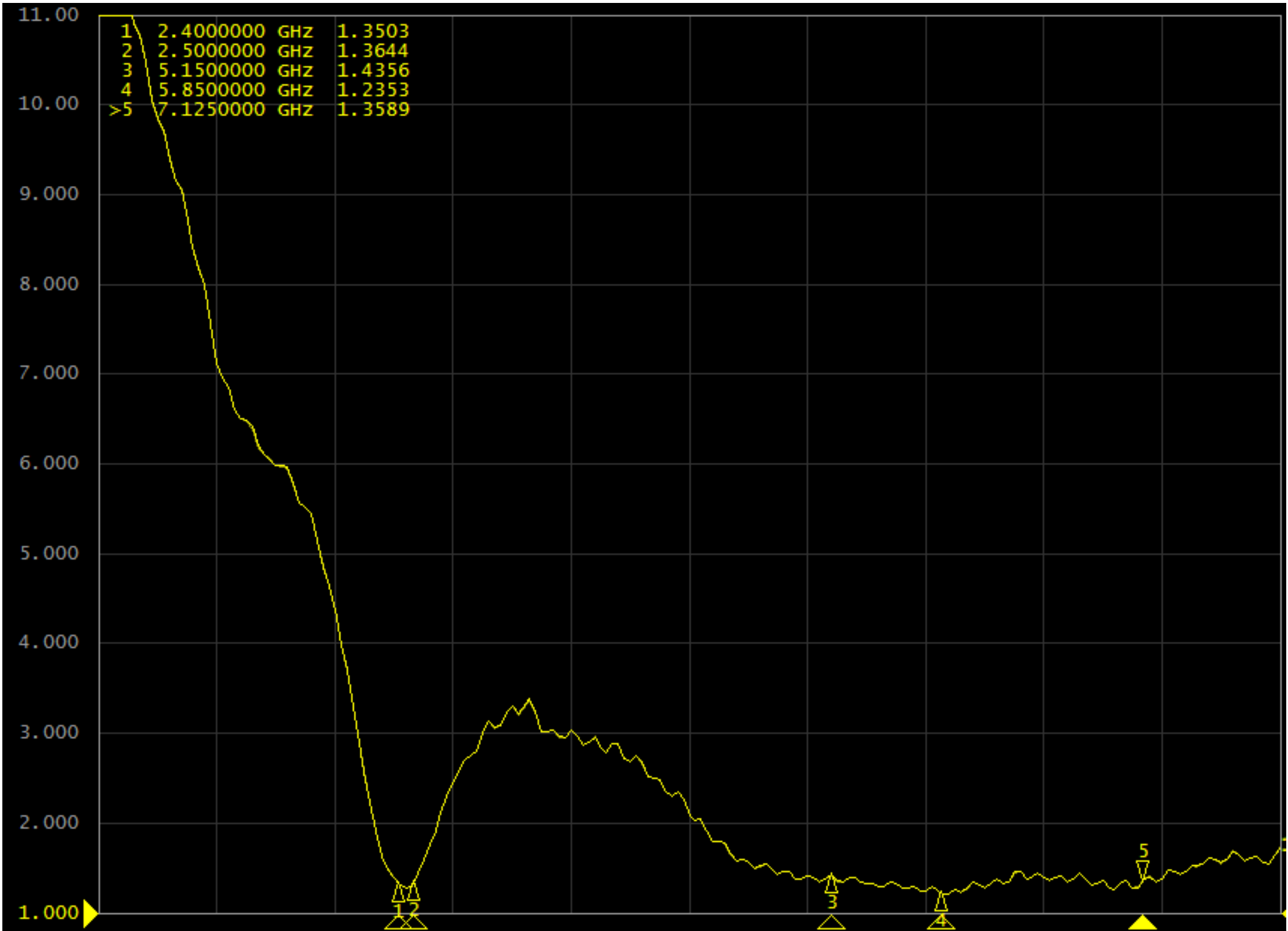
BT



Antenna Performance

➤ 55 inch____WLAN1 (cable length=695mm)

VSWR

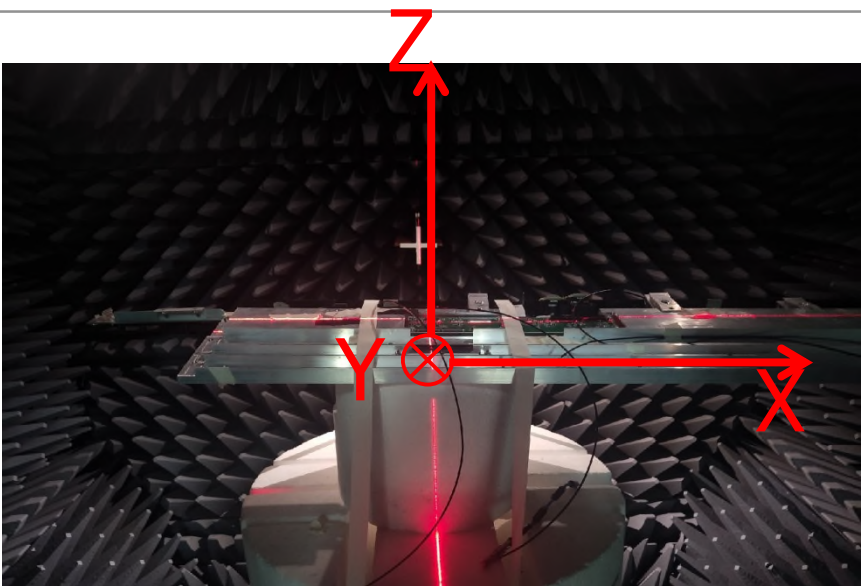


Comments:

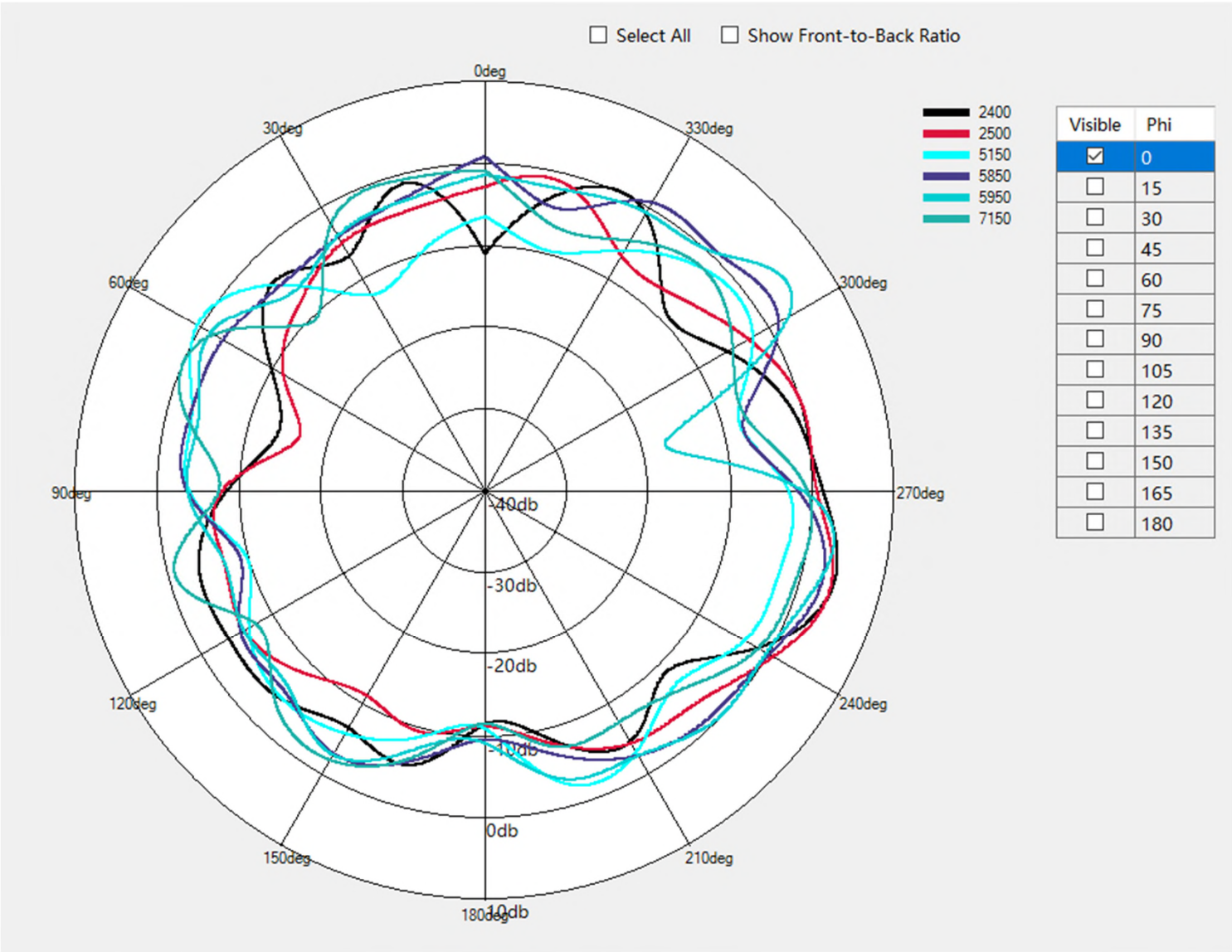
- VSWR is below 1.9.

Antenna Performance

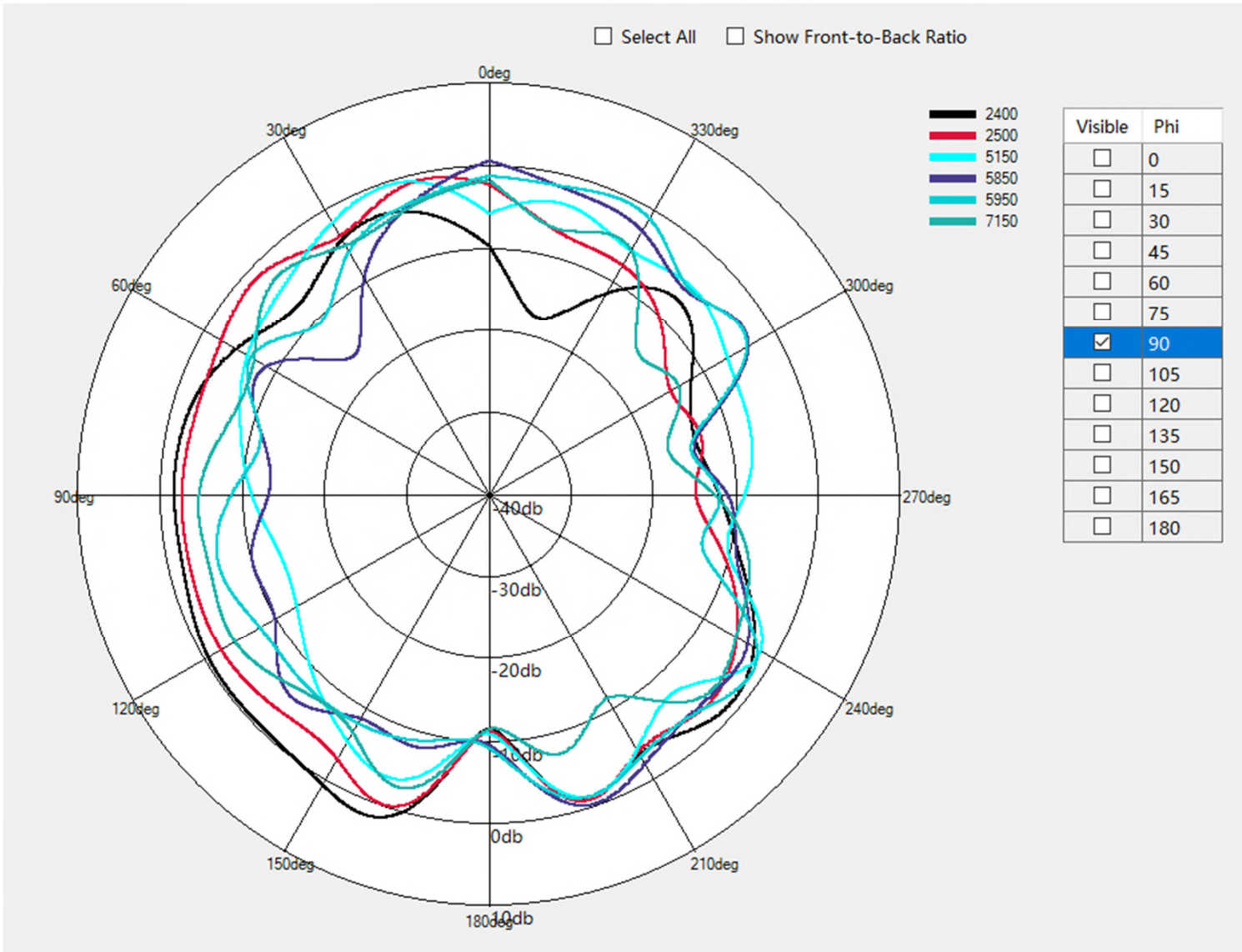
➤ 55 inch____WLAN1 (cable length=695mm)



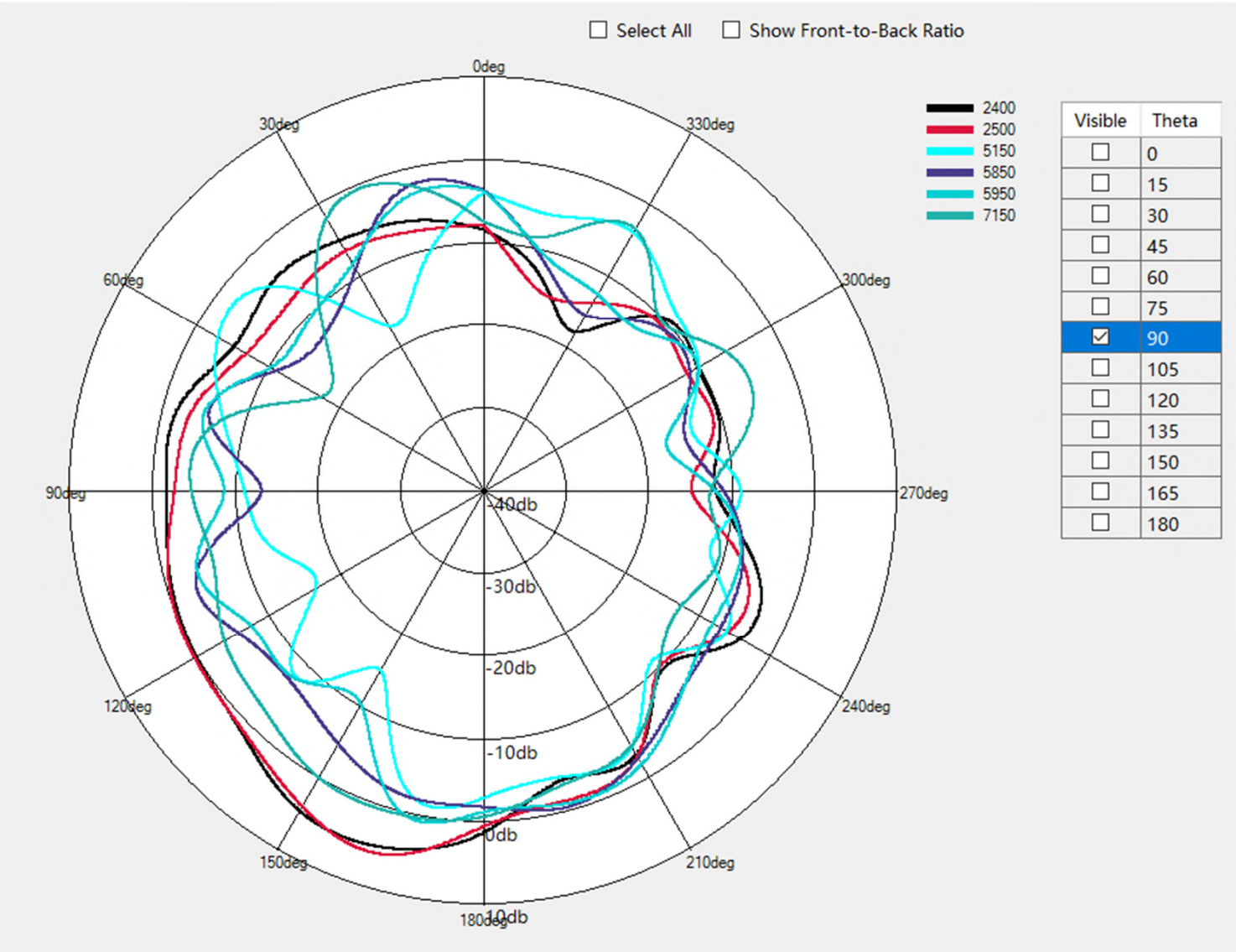
Phi=0 (XZ Plane)



Phi=90(YZ Plane)



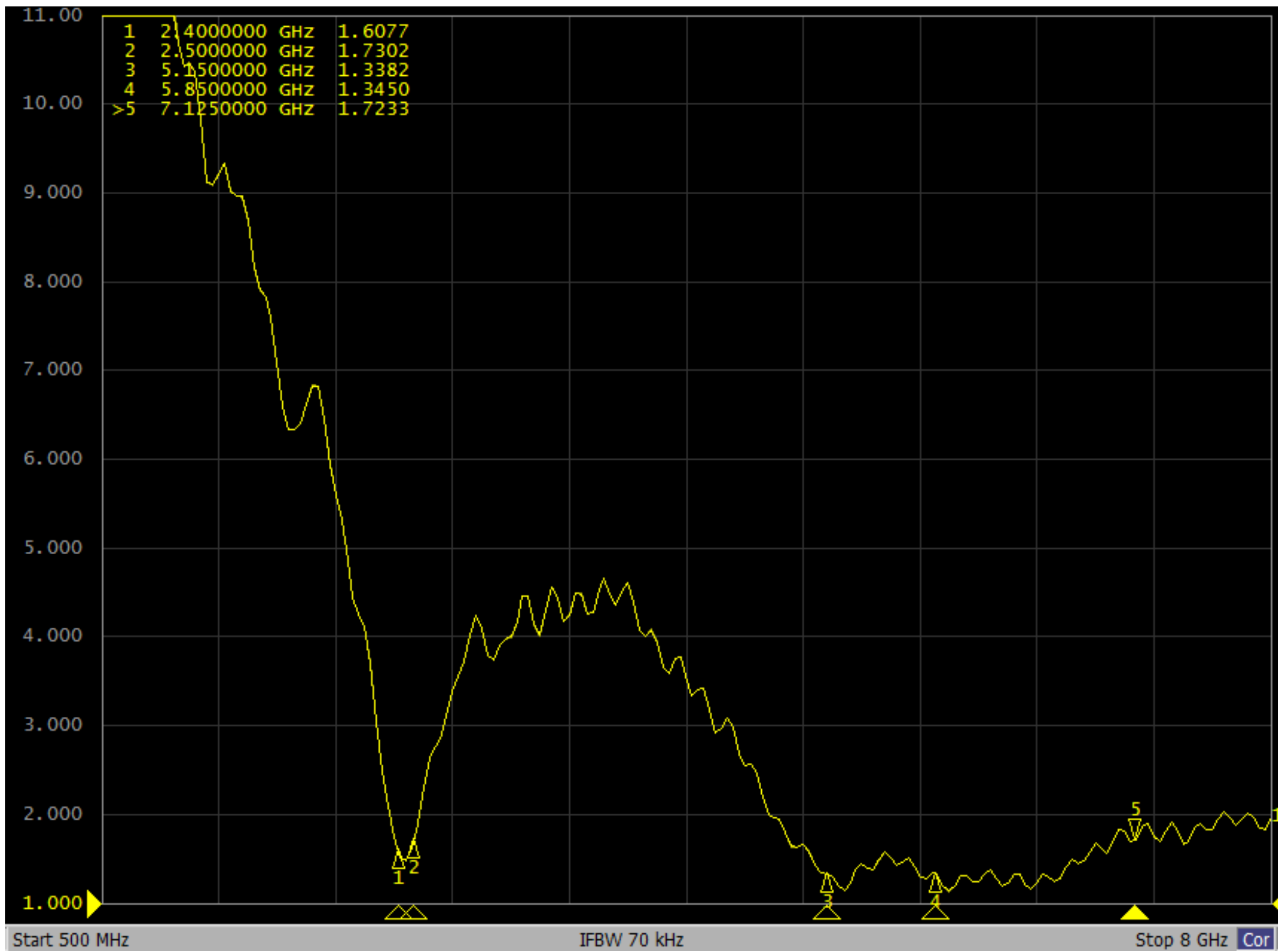
Theta=90(XY Plane)



Antenna Performance

➤ 55 inch____WLAN2 (cable length=635mm)

VSWR

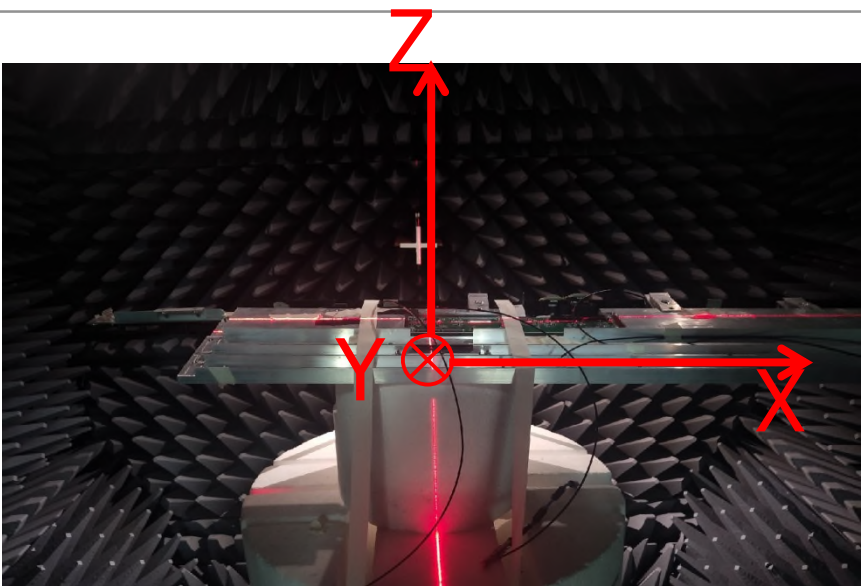


Comments:

- VSWR is below 1.9.

Antenna Performance

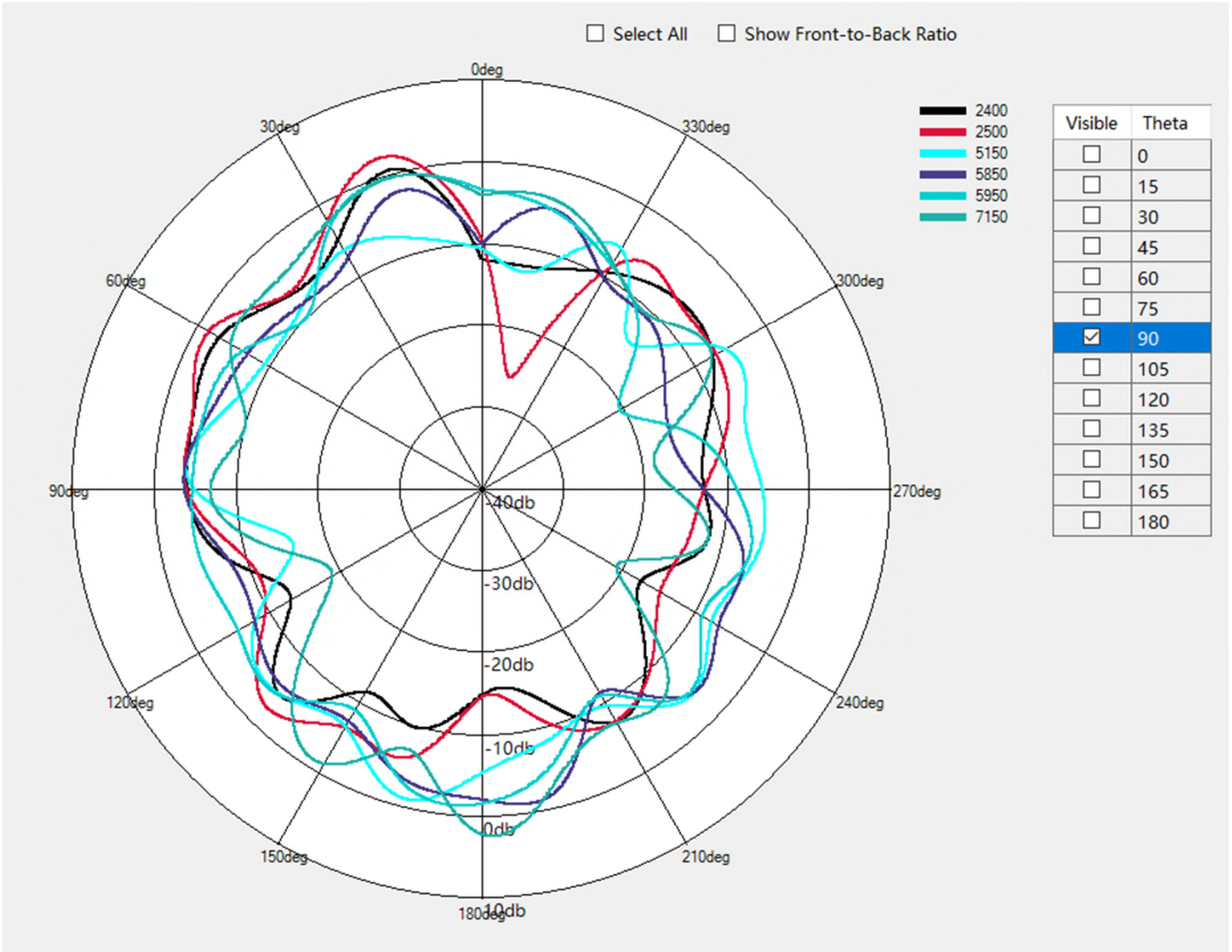
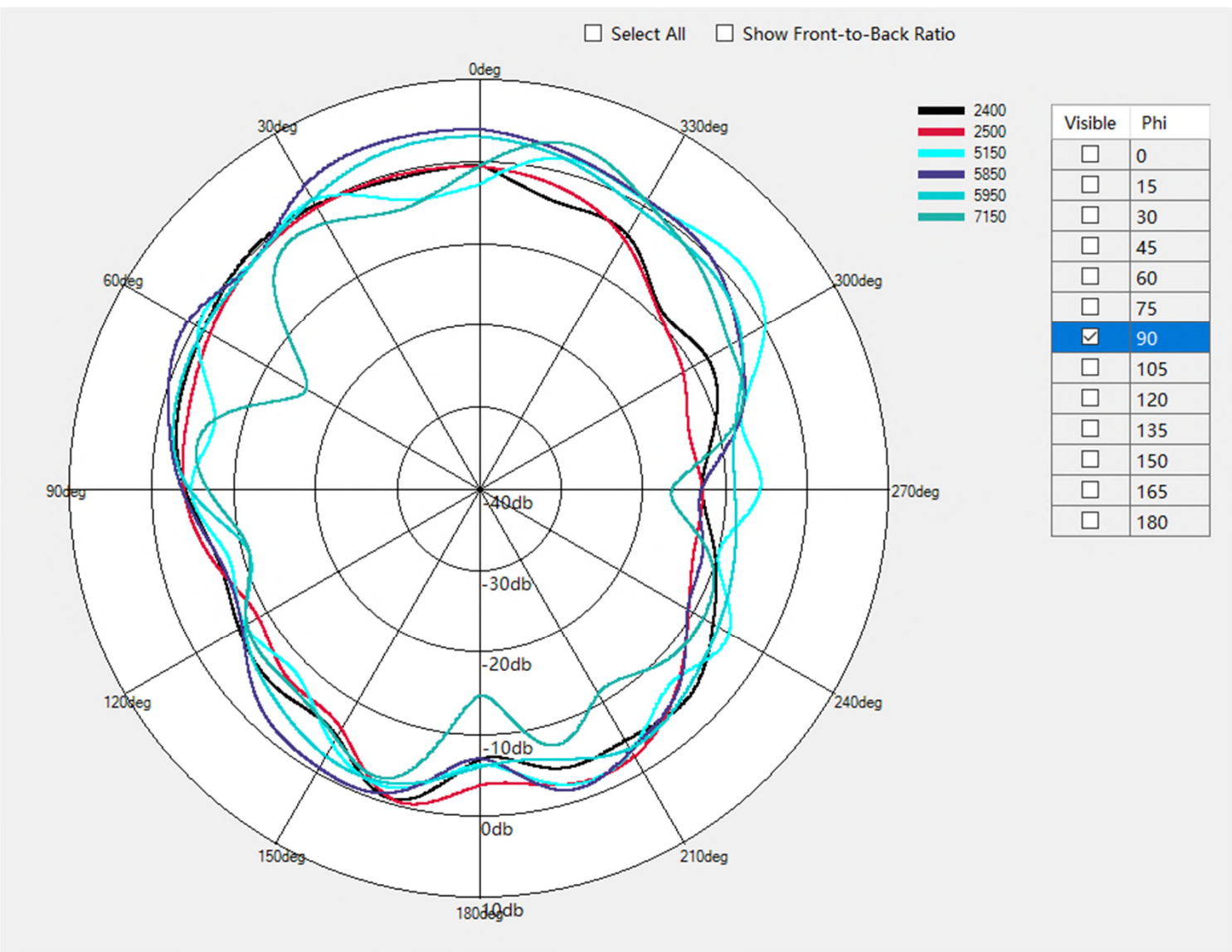
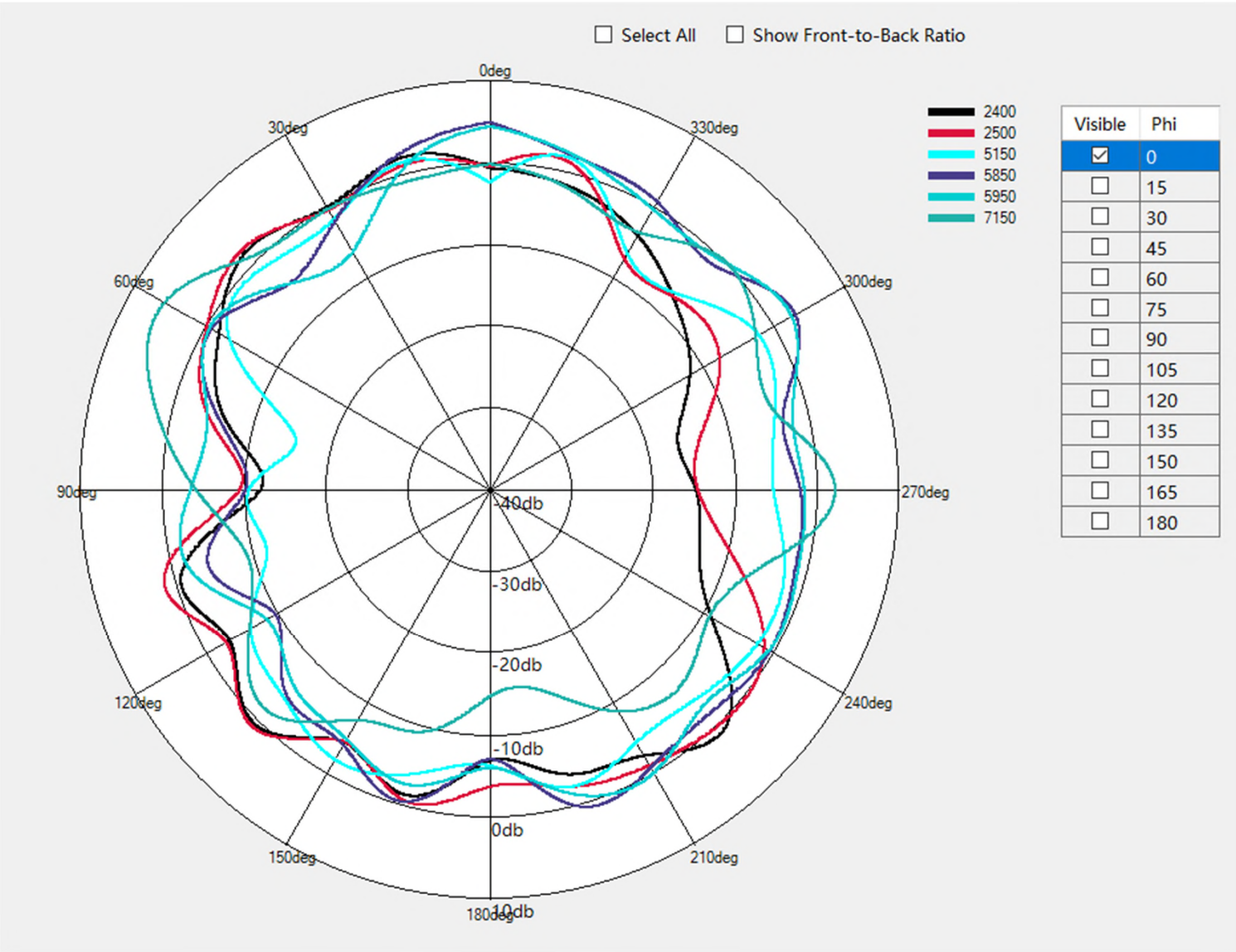
➤ 55 inch____WLAN2 (cable length=635mm)



Phi=0 (XZ Plane)

Phi=90(YZ Plane)

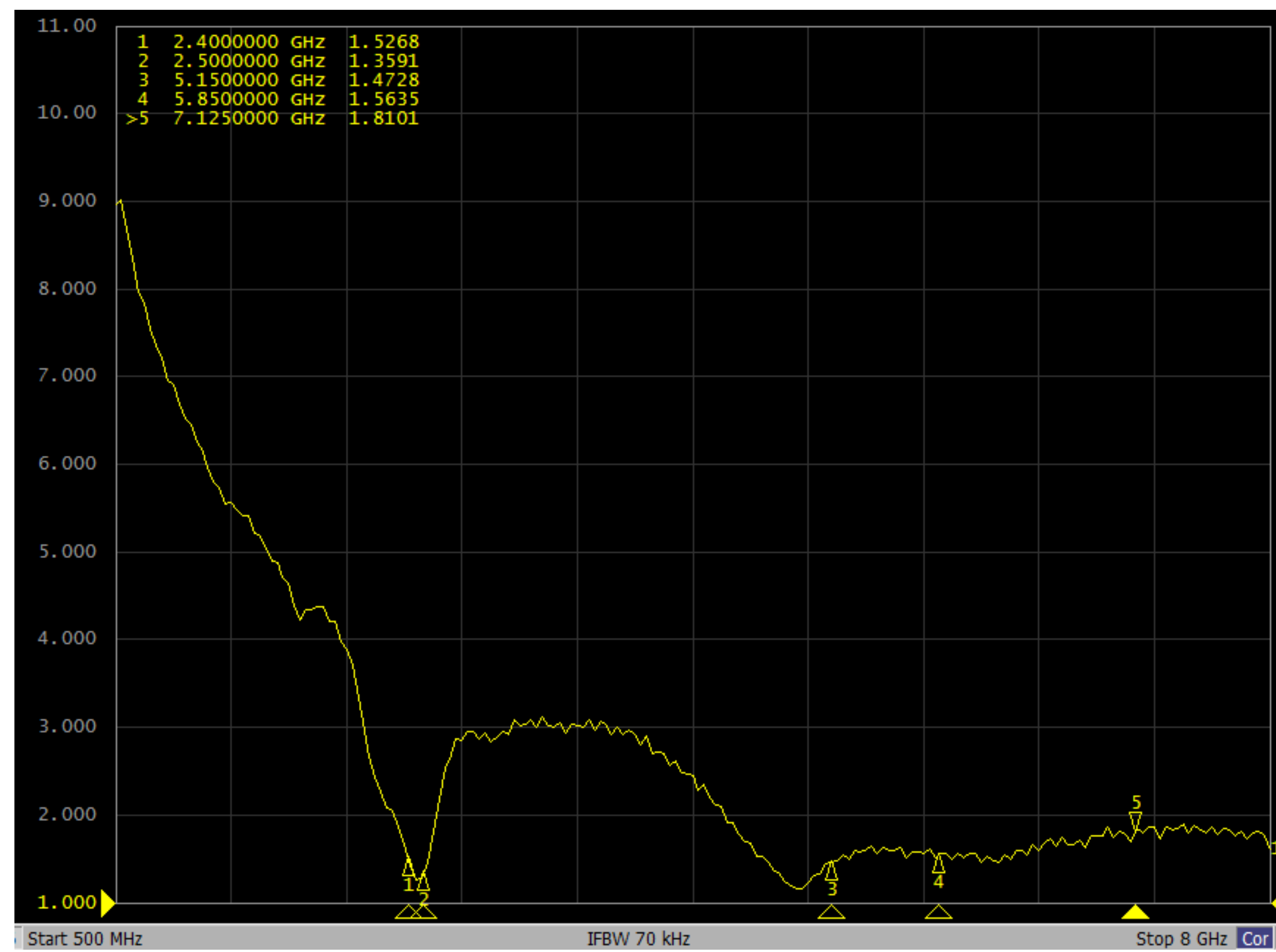
Theta=90(XY Plane)



Antenna Performance

➤ 55 inch____BT(cable length=1030mm)

VSWR

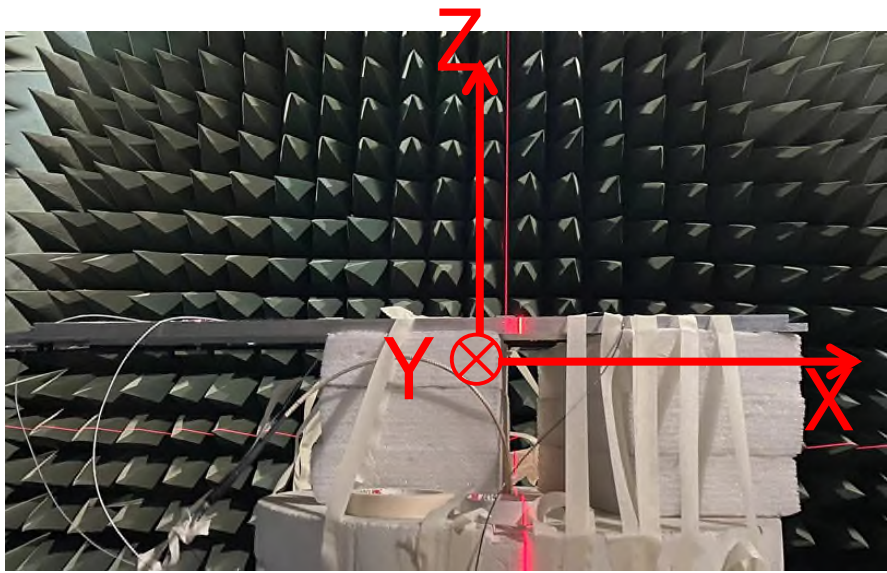


Comments:

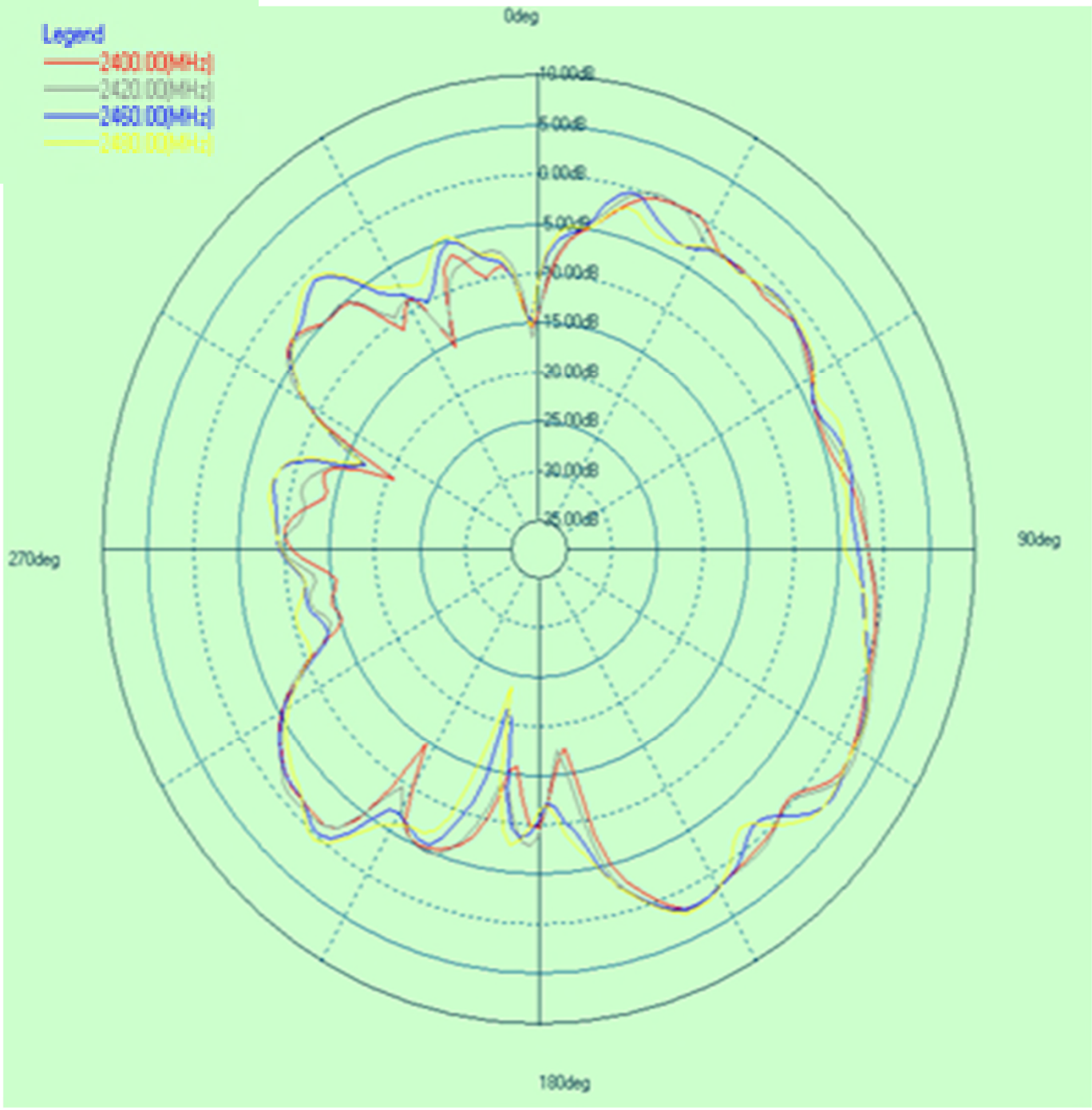
- VSWR is below 1.9.

Antenna Performance

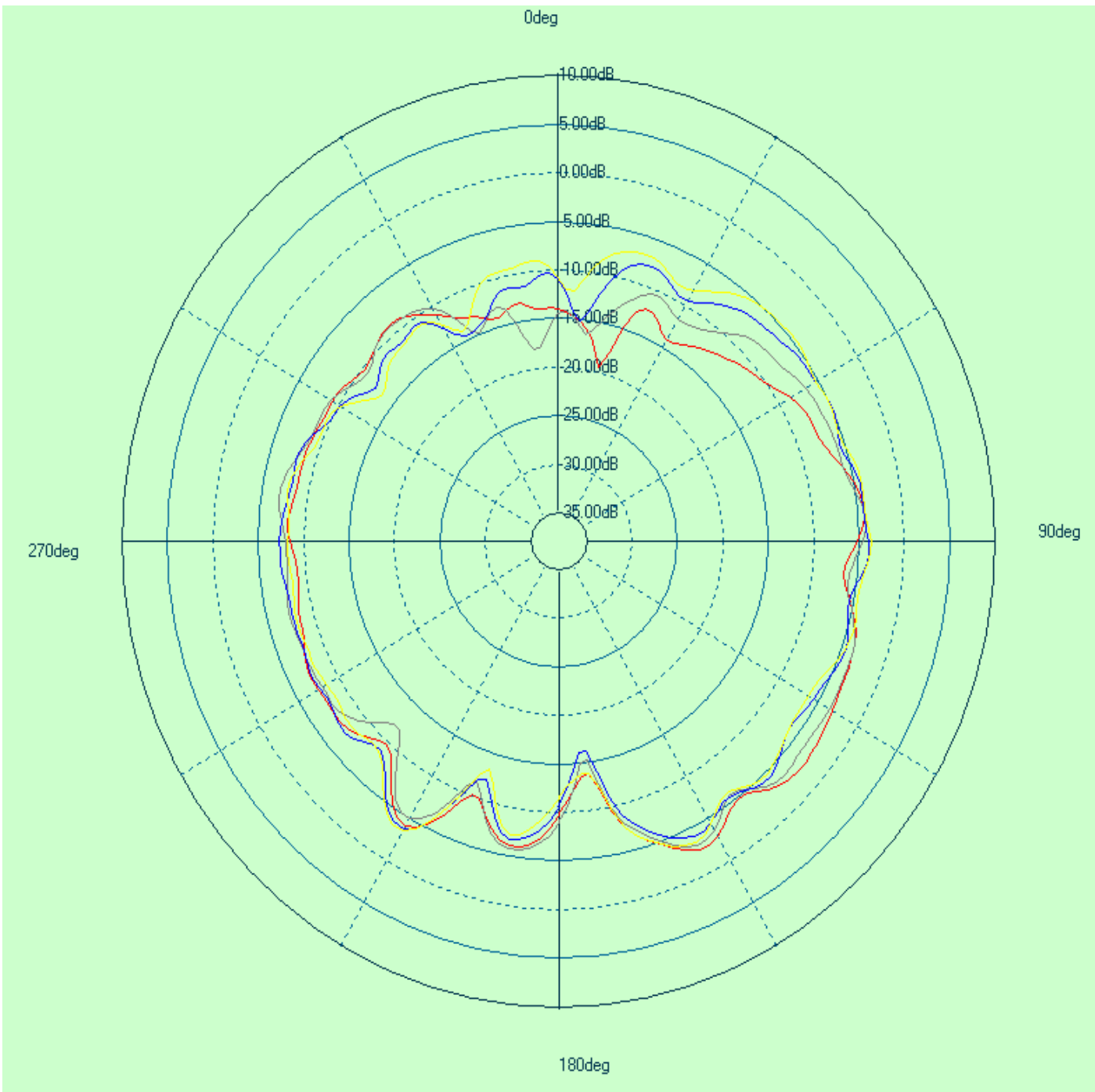
➤ 55 inch____BT(cable length=1030mm)



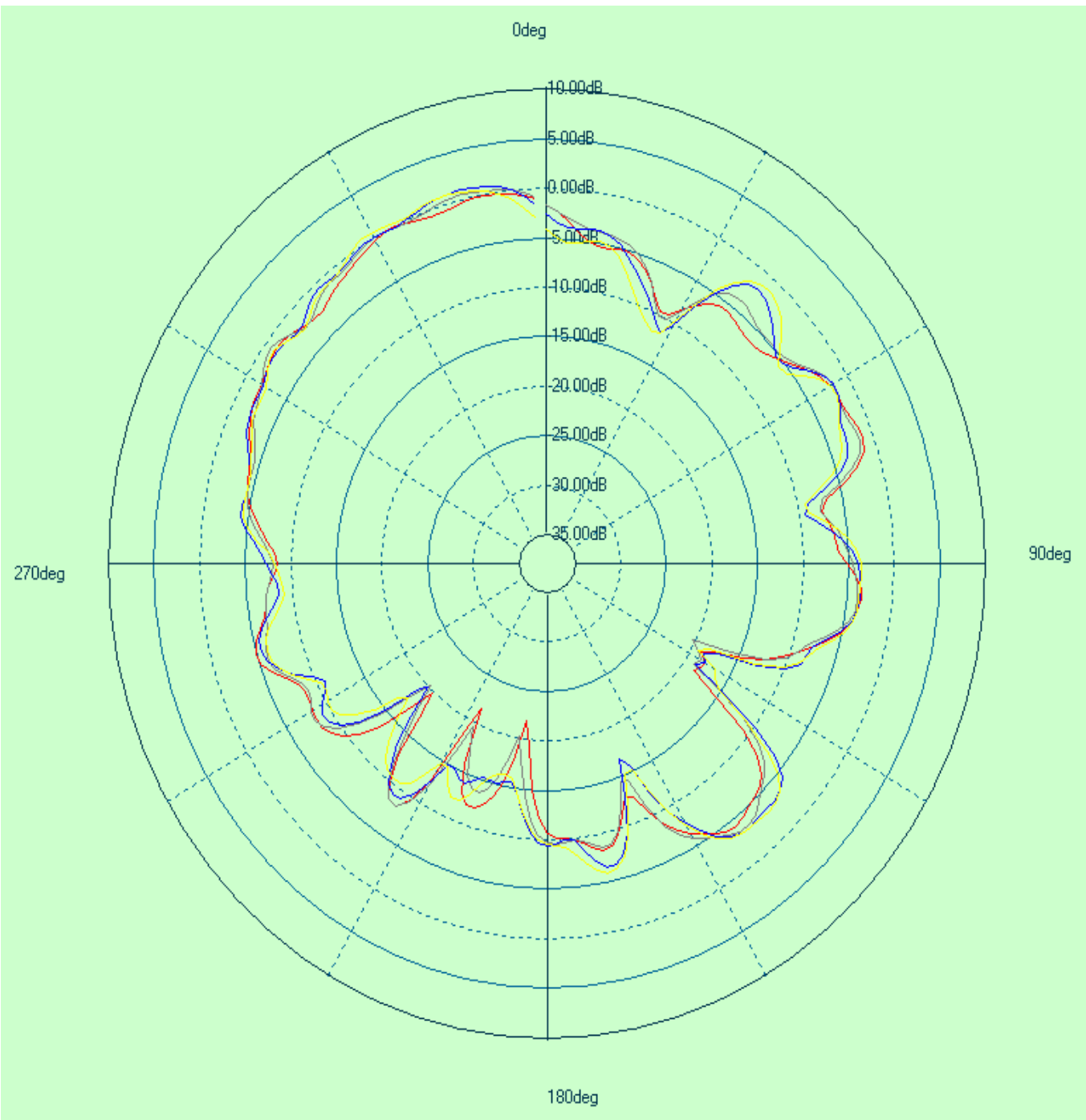
Phi=0 (XZ Plane)



Phi=90(YZ Plane)



Theta=90(XY Plane)

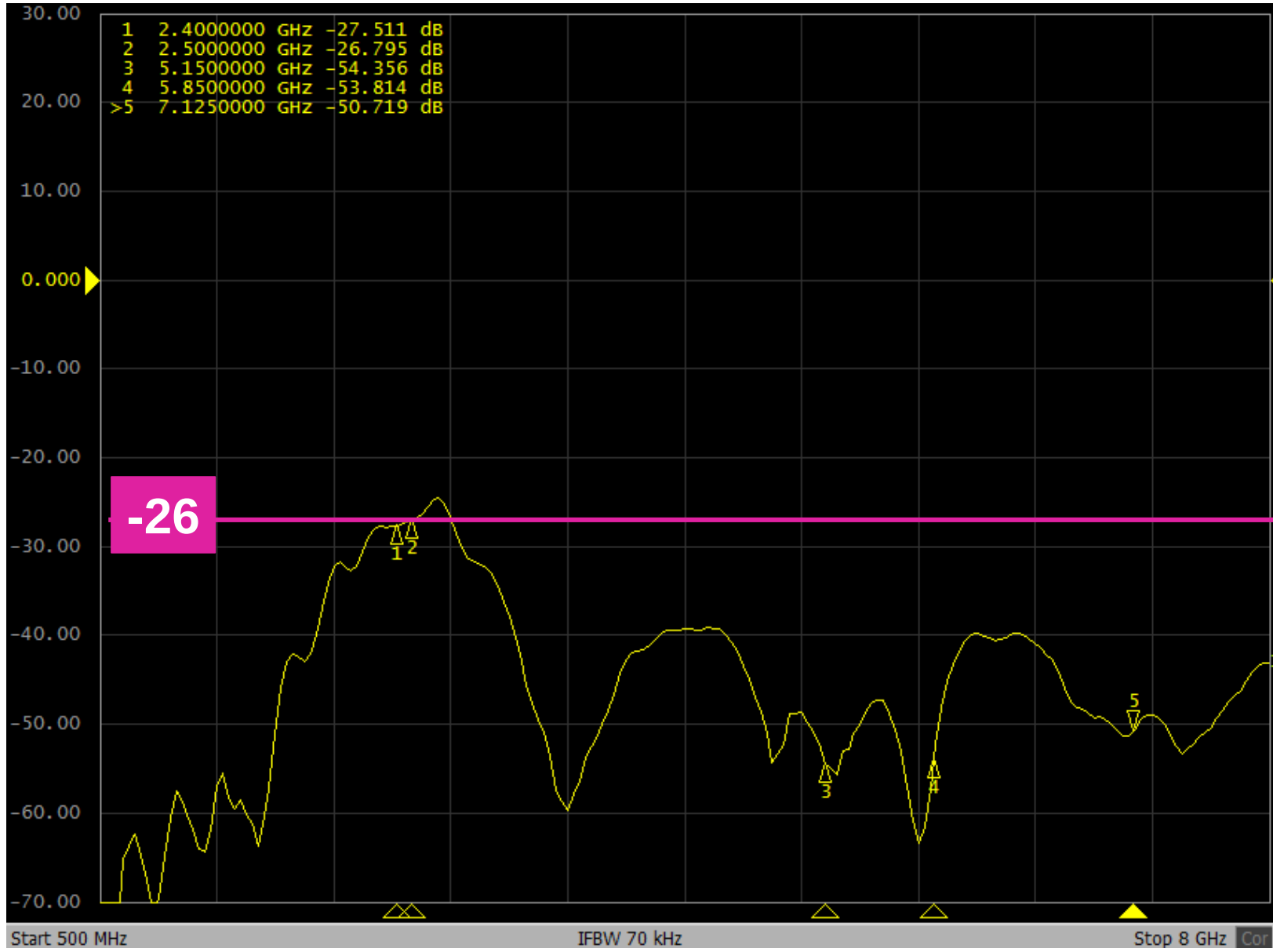


Antenna Performance

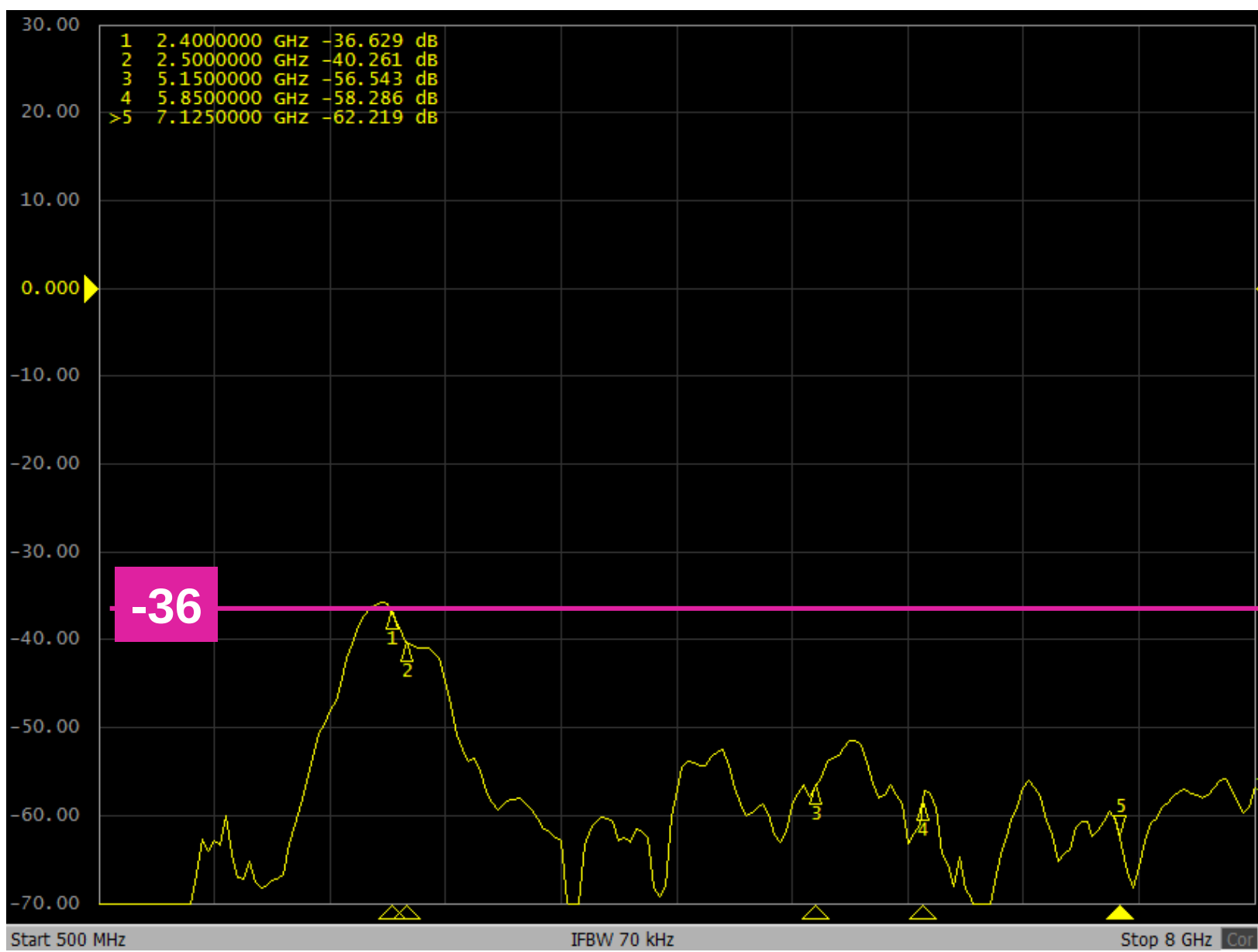
➤ Isolation of 55 inch mockup



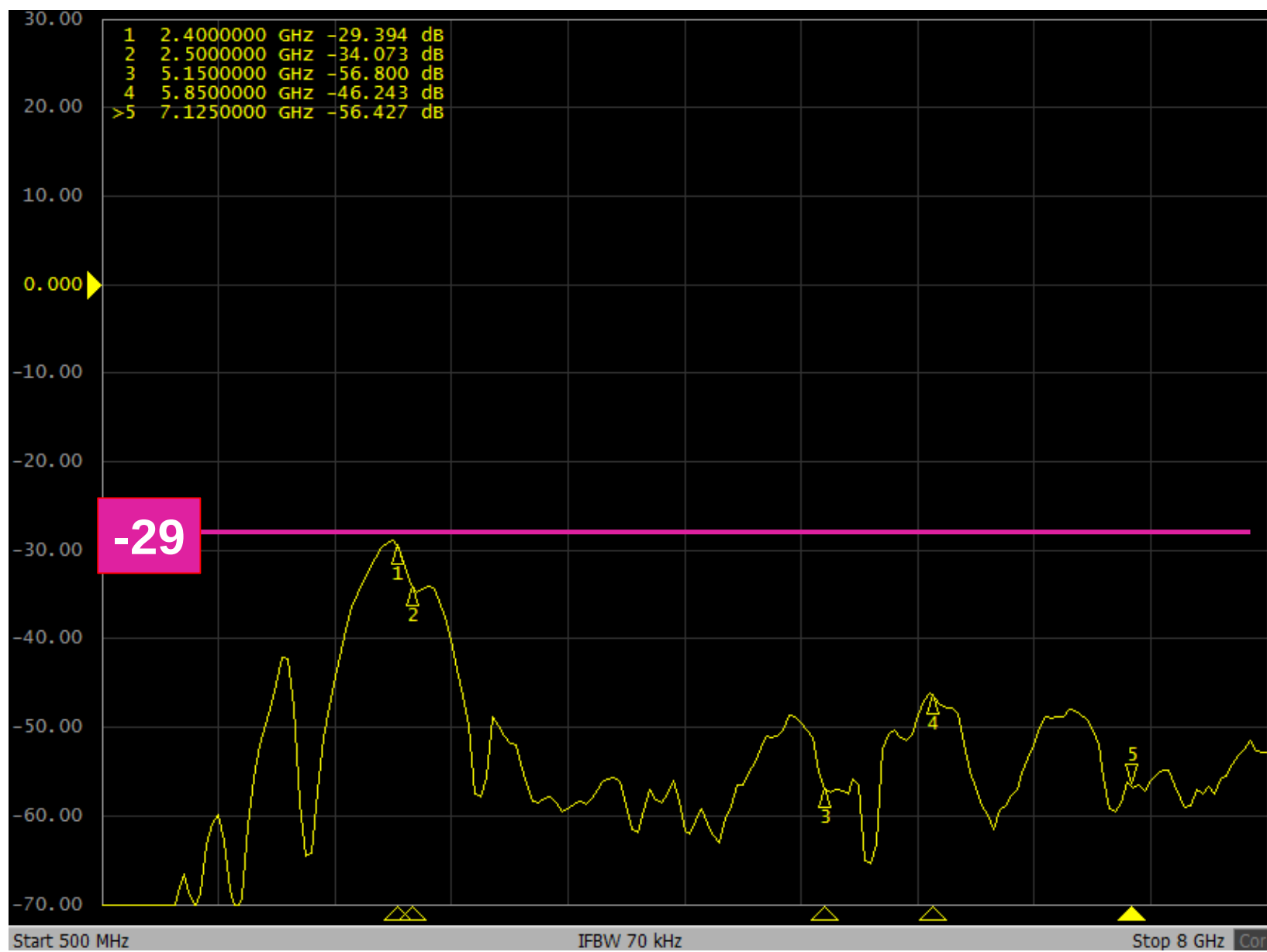
WLAN 1 <----> WLAN 2



WLAN 1 <----> BT



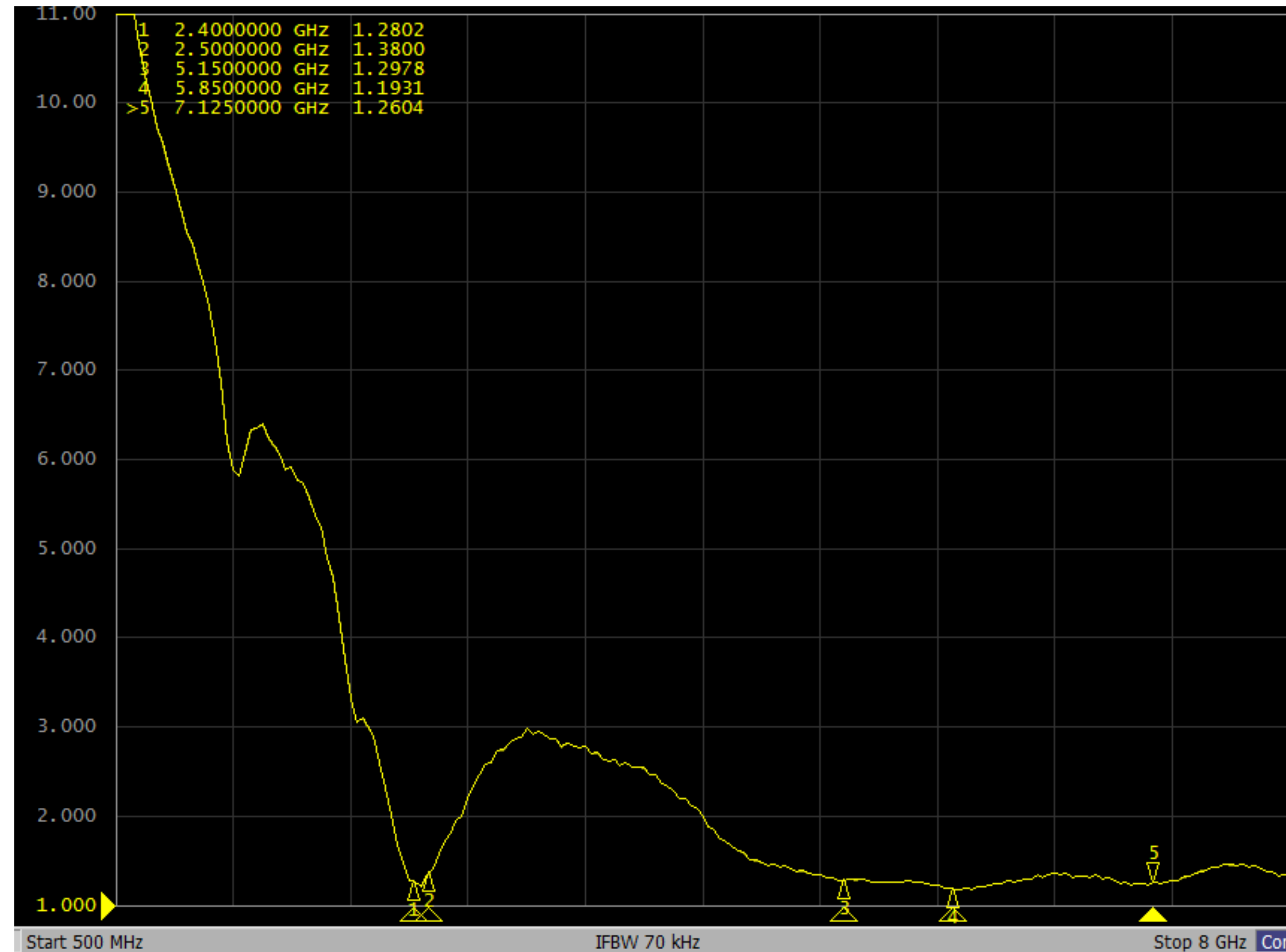
WLAN 2 <----> BT



Antenna Performance

- 75 inch____WLAN1 (cable length=1065mm)

VSWR

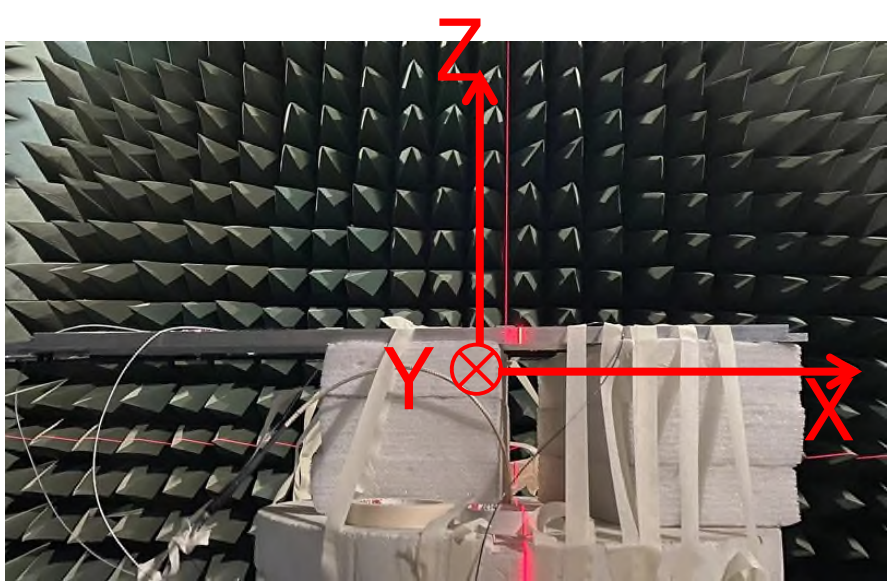


Comments:

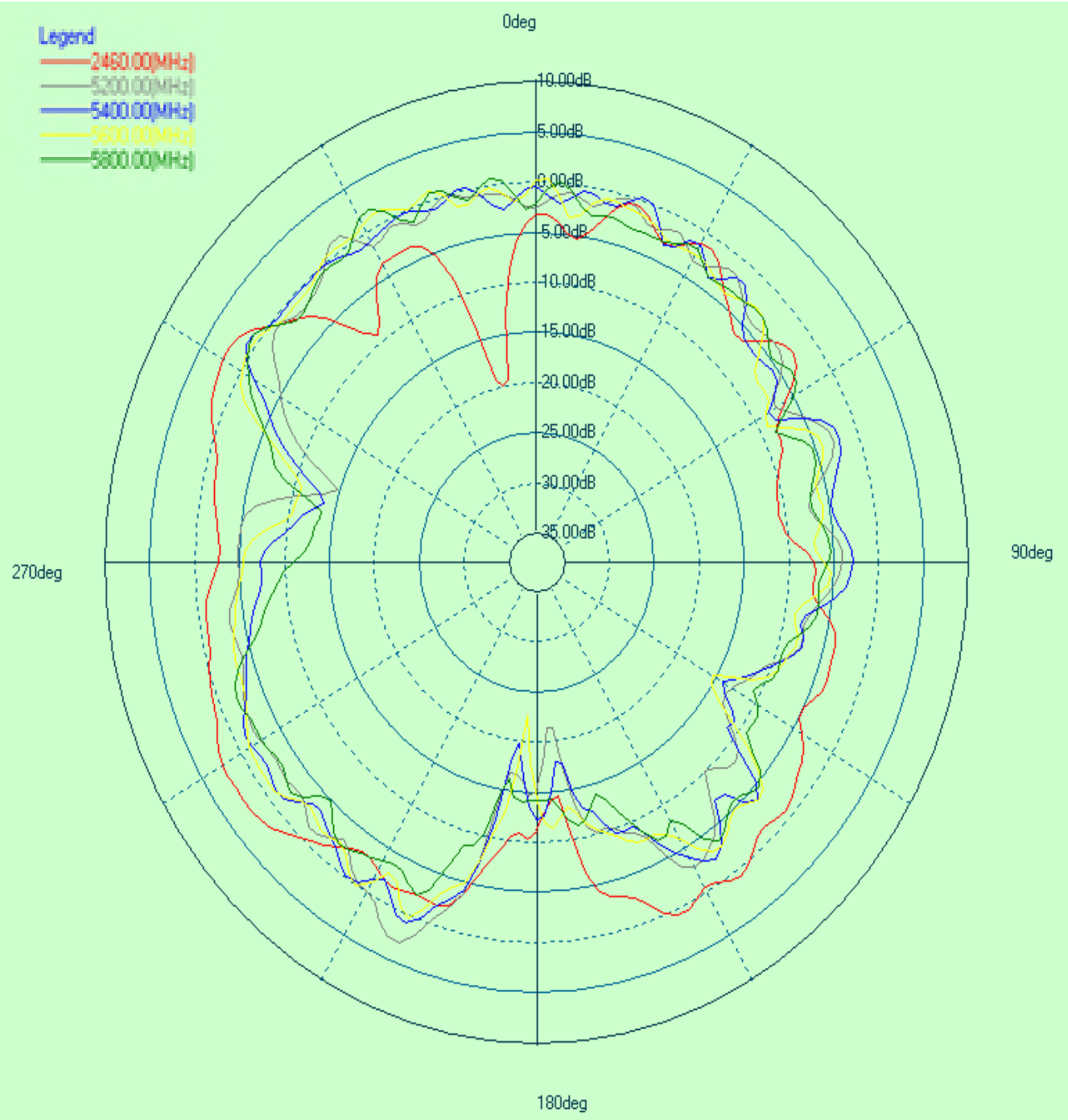
- VSWR is below 1.9.

Antenna Performance

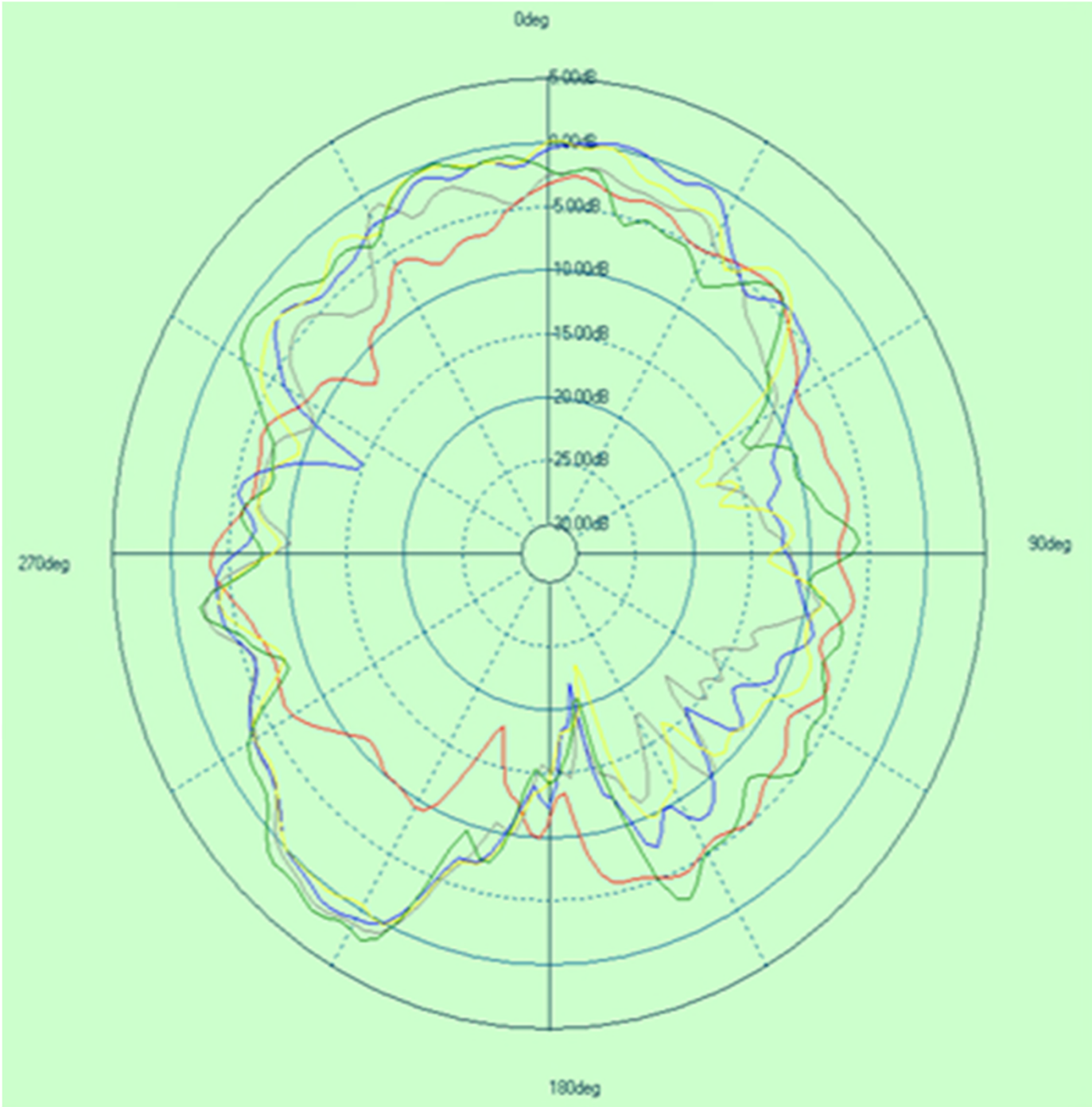
➤ 75 inch____WLAN1 (cable length=1065mm)



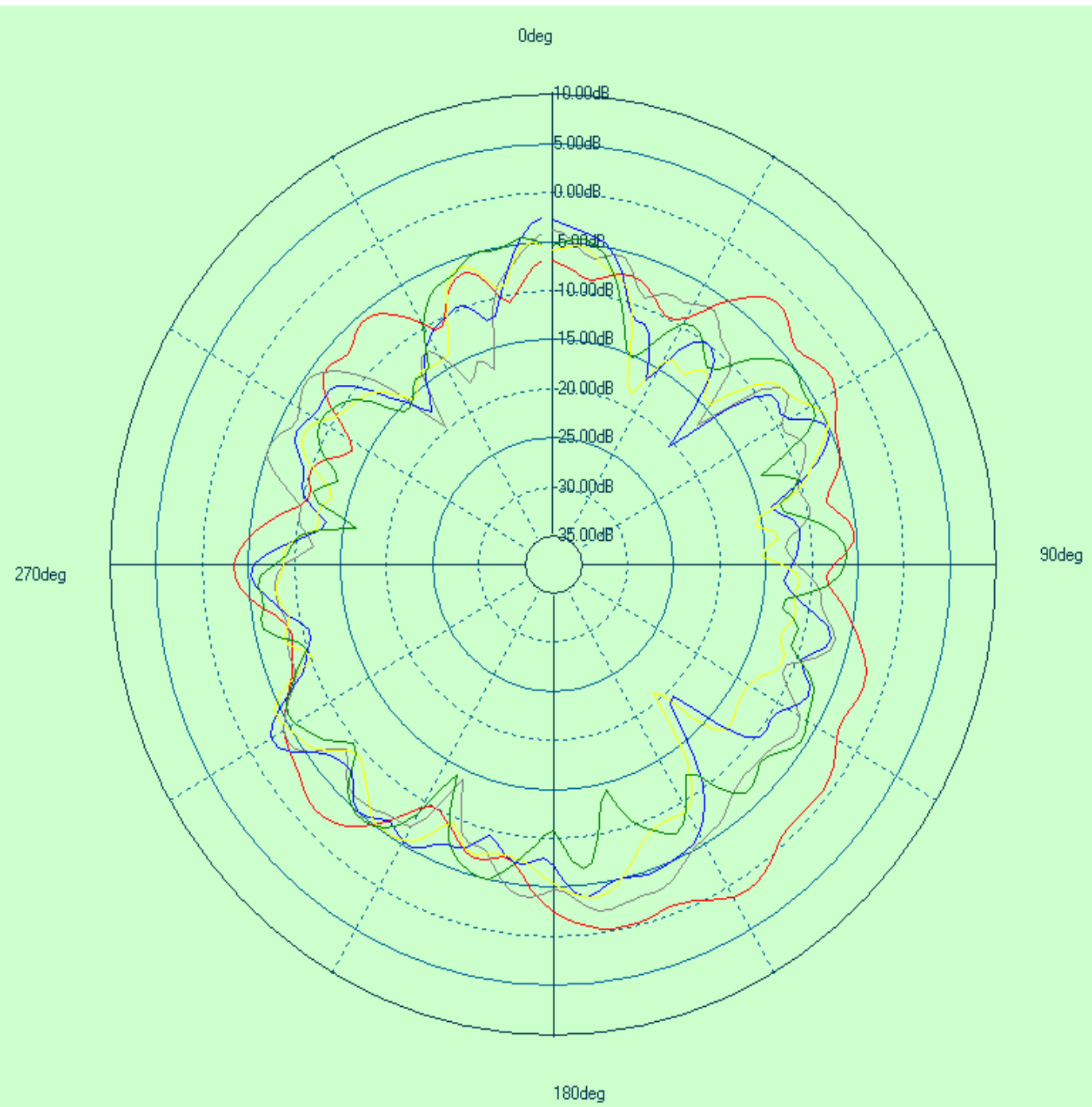
Phi=0 (XZ Plane)



Phi=90(YZ Plane)



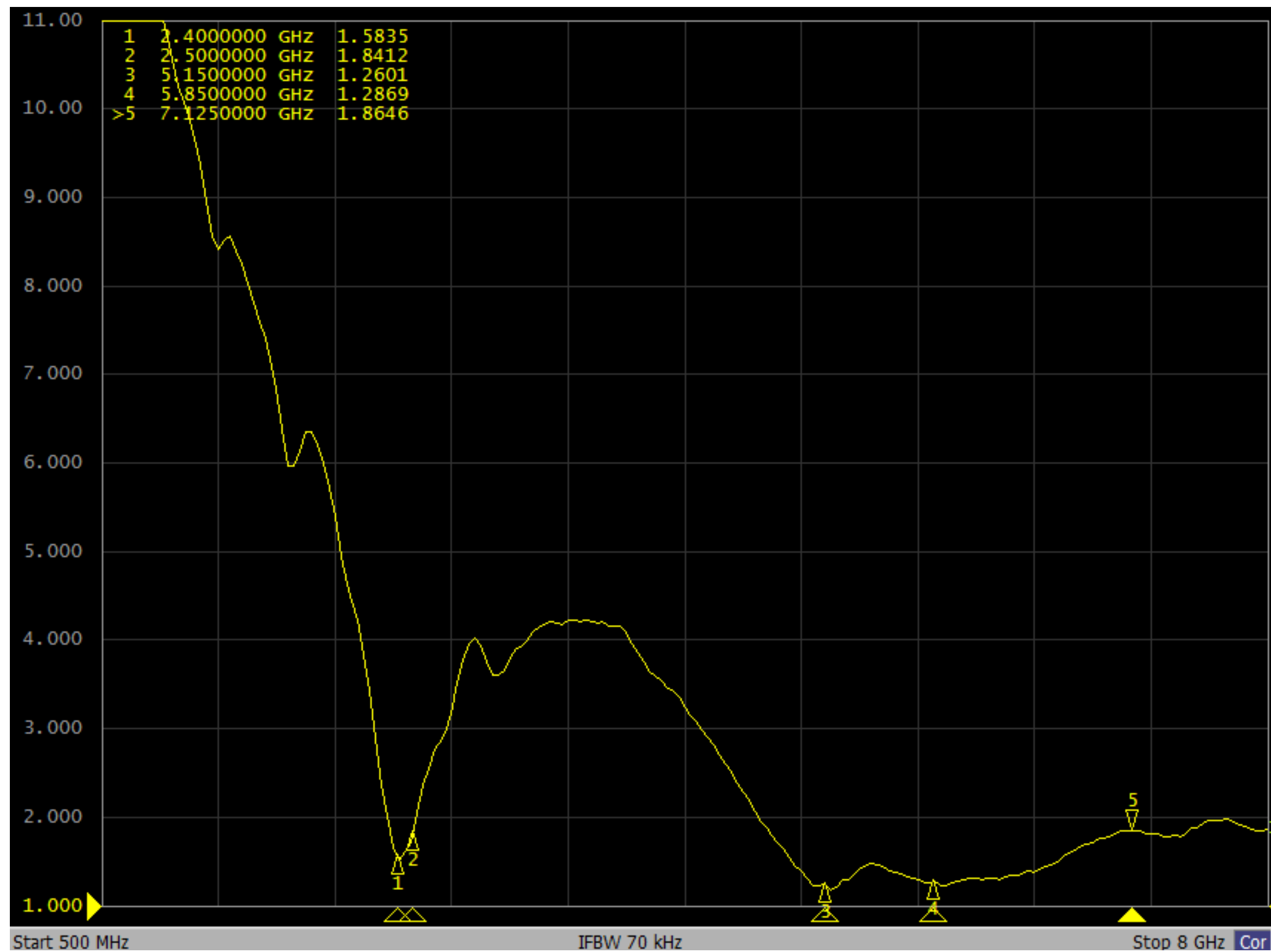
Theta=90(XY Plane)



Antenna Performance

➤ 75 inch____WLAN2 (cable length=900mm)

VSWR

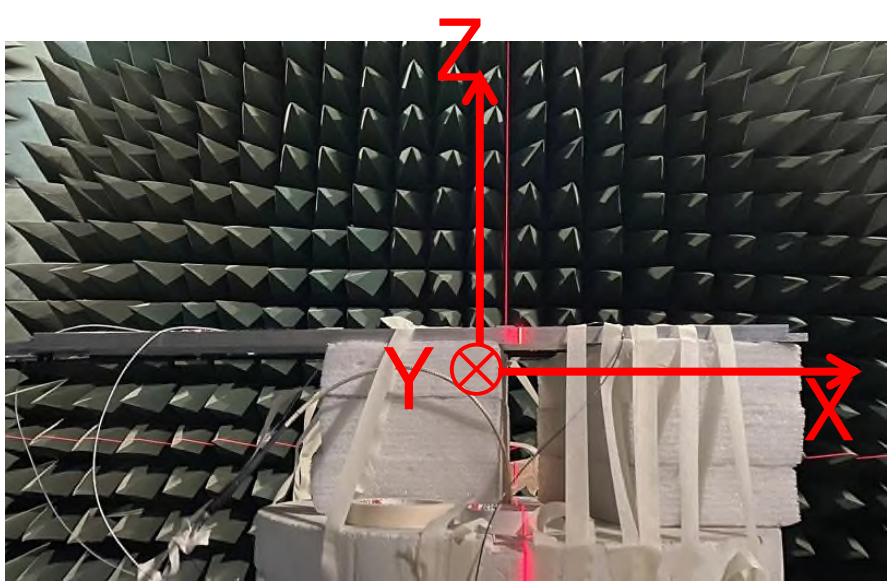


Comments:

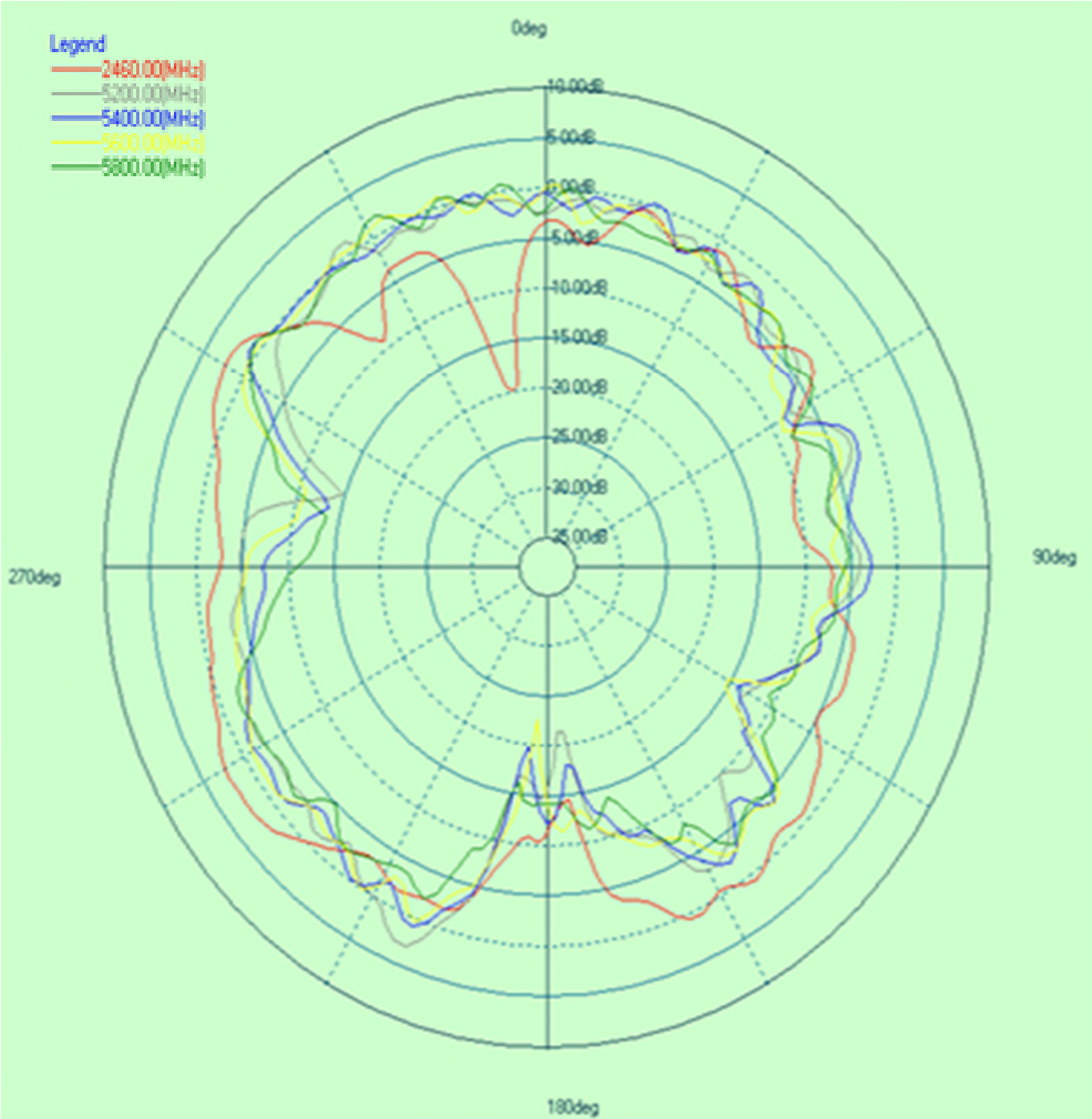
- VSWR is below 1.9.

Antenna Performance

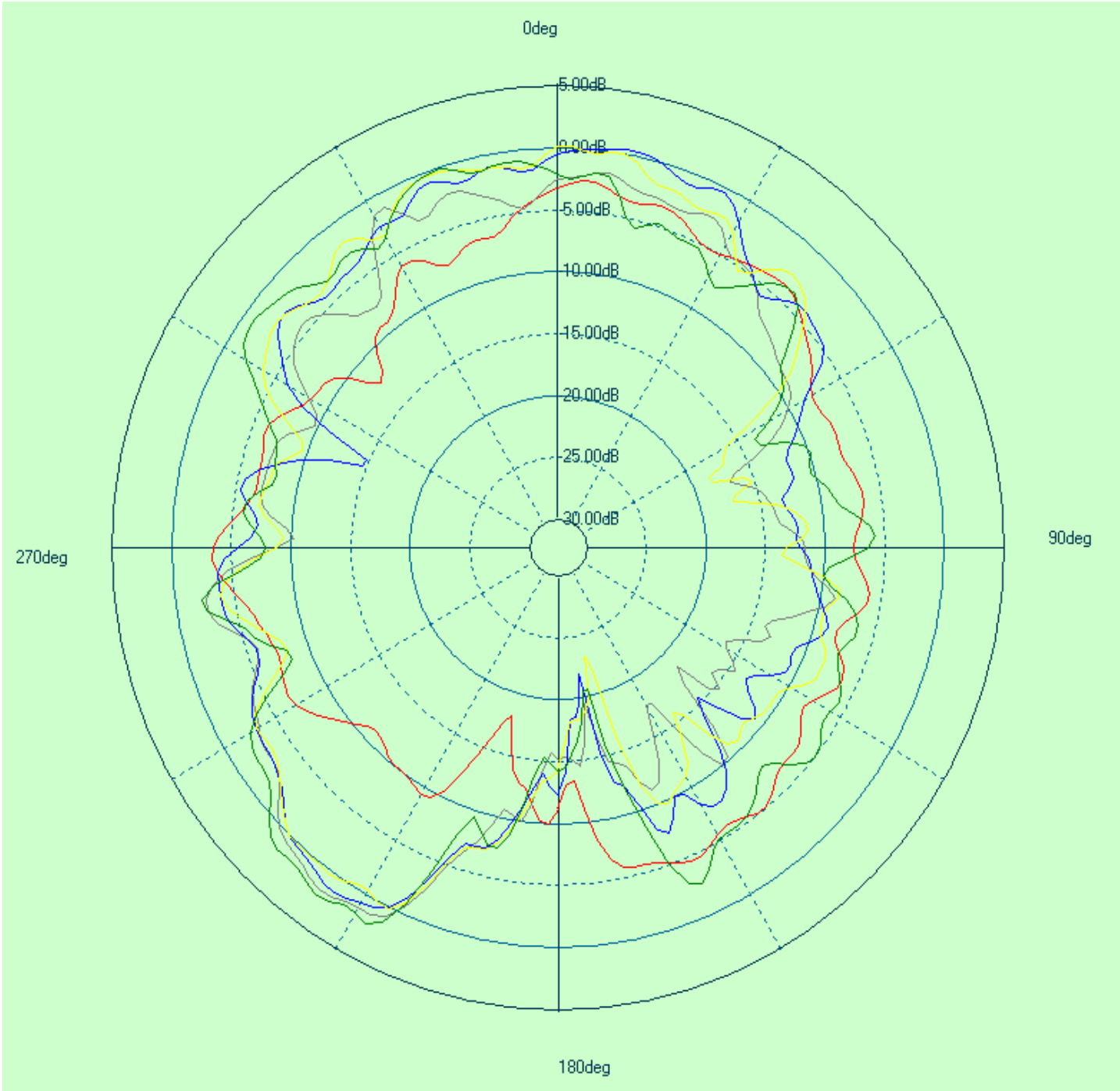
➤ 75 inch____WLAN2 (cable length=900mm)



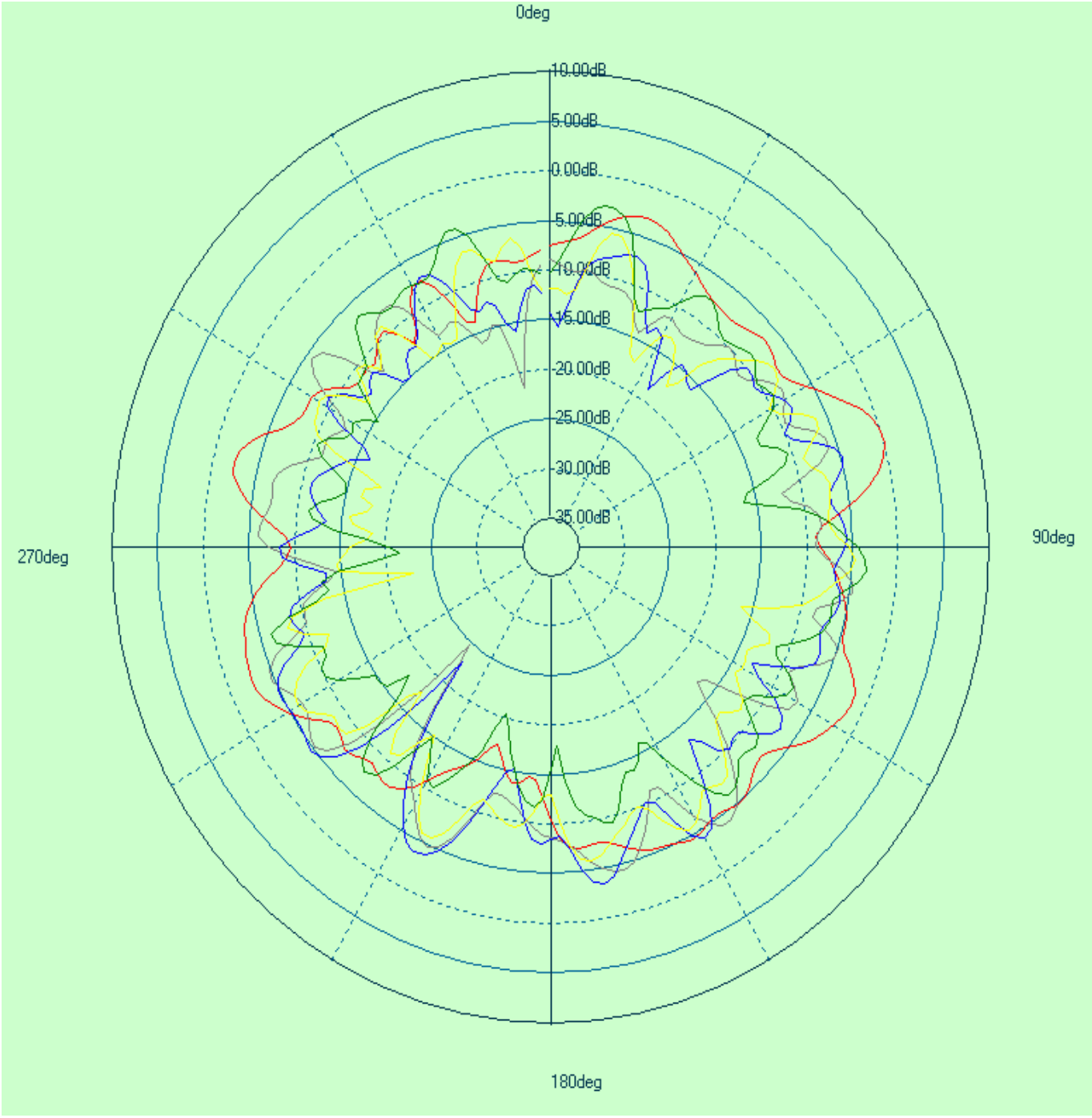
Phi=0 (XZ Plane)



Phi=90(YZ Plane)



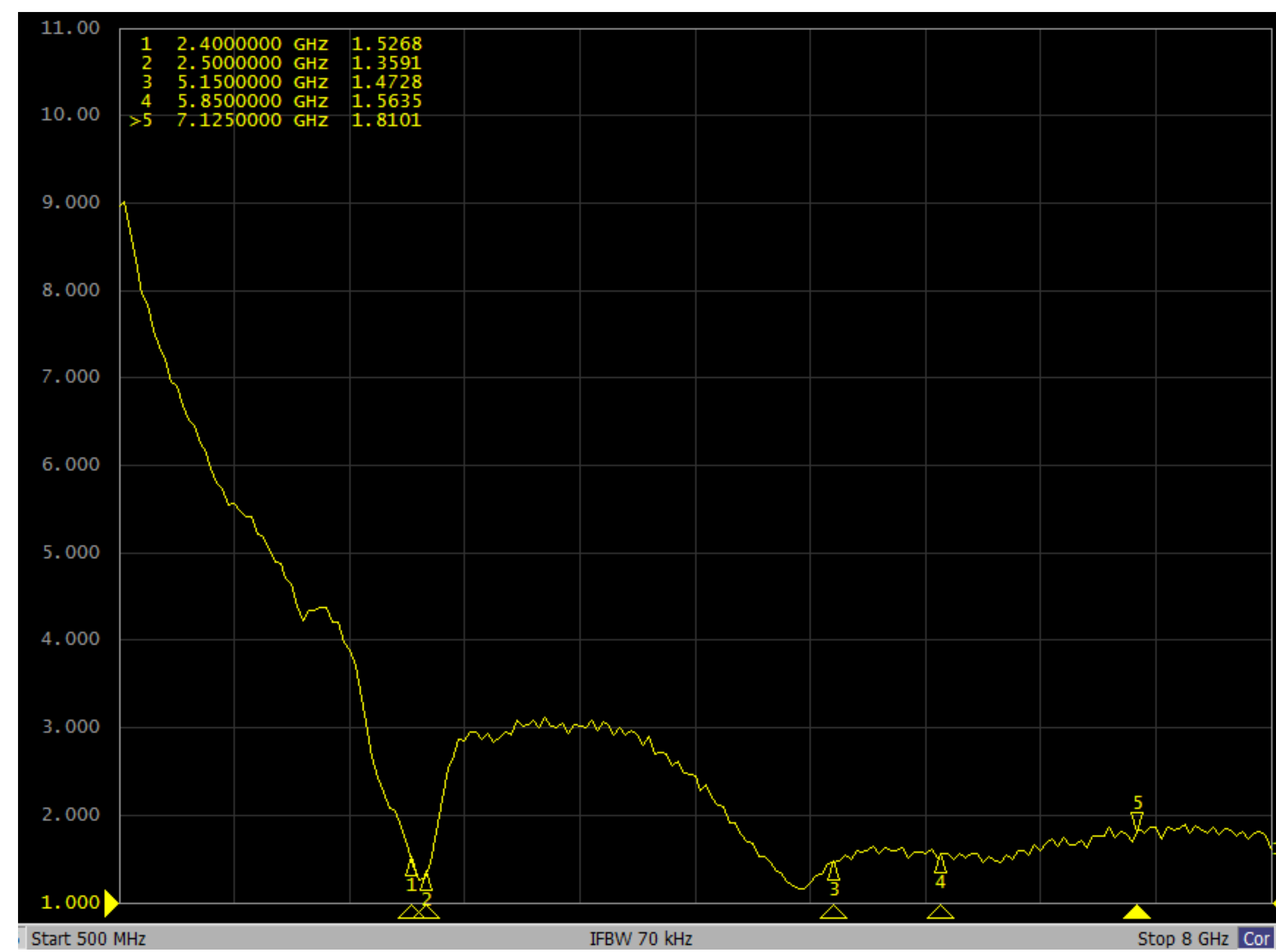
Theta=90(XY Plane)



Antenna Performance

➤ 75 inch____BT(cable length=1300mm)

VSWR

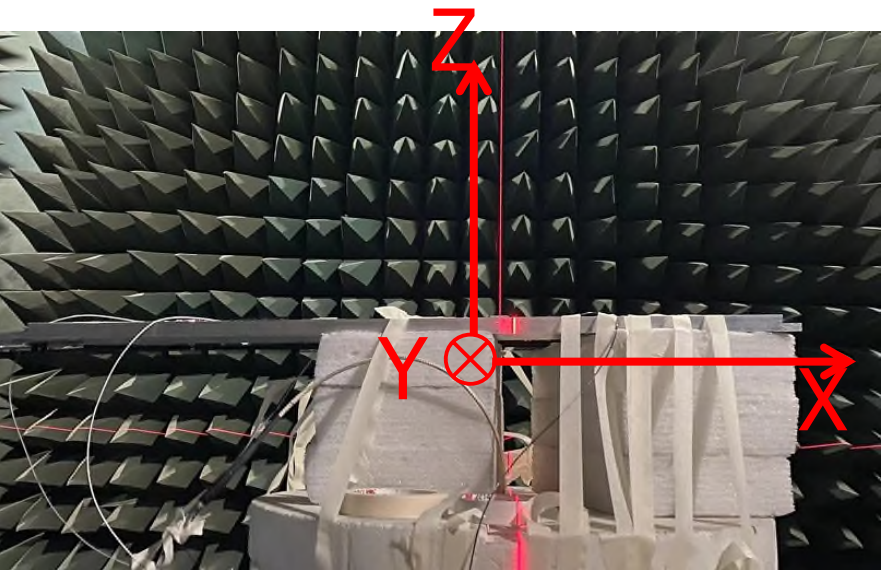


Comments:

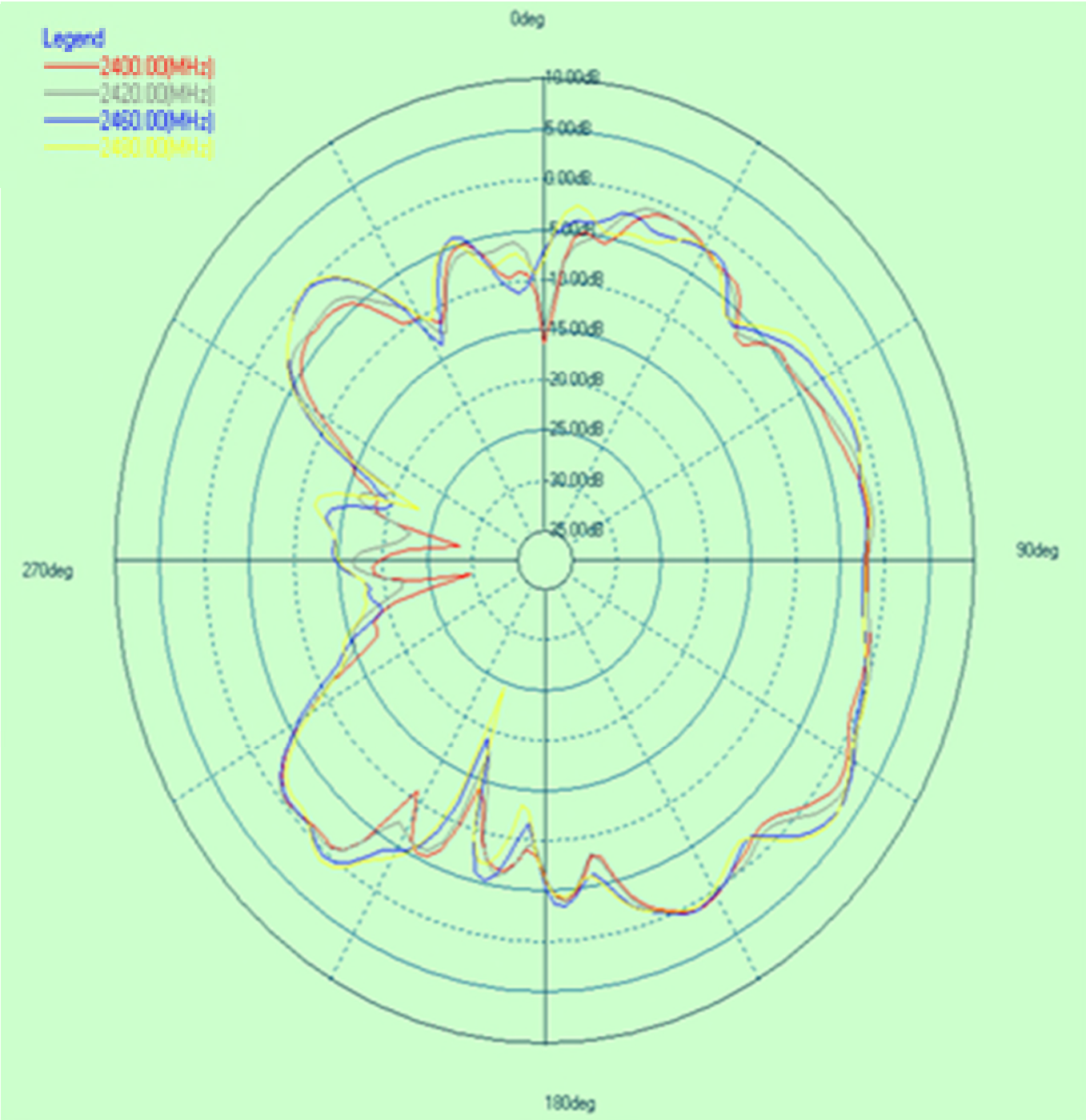
- VSWR is below 1.9.

Antenna Performance

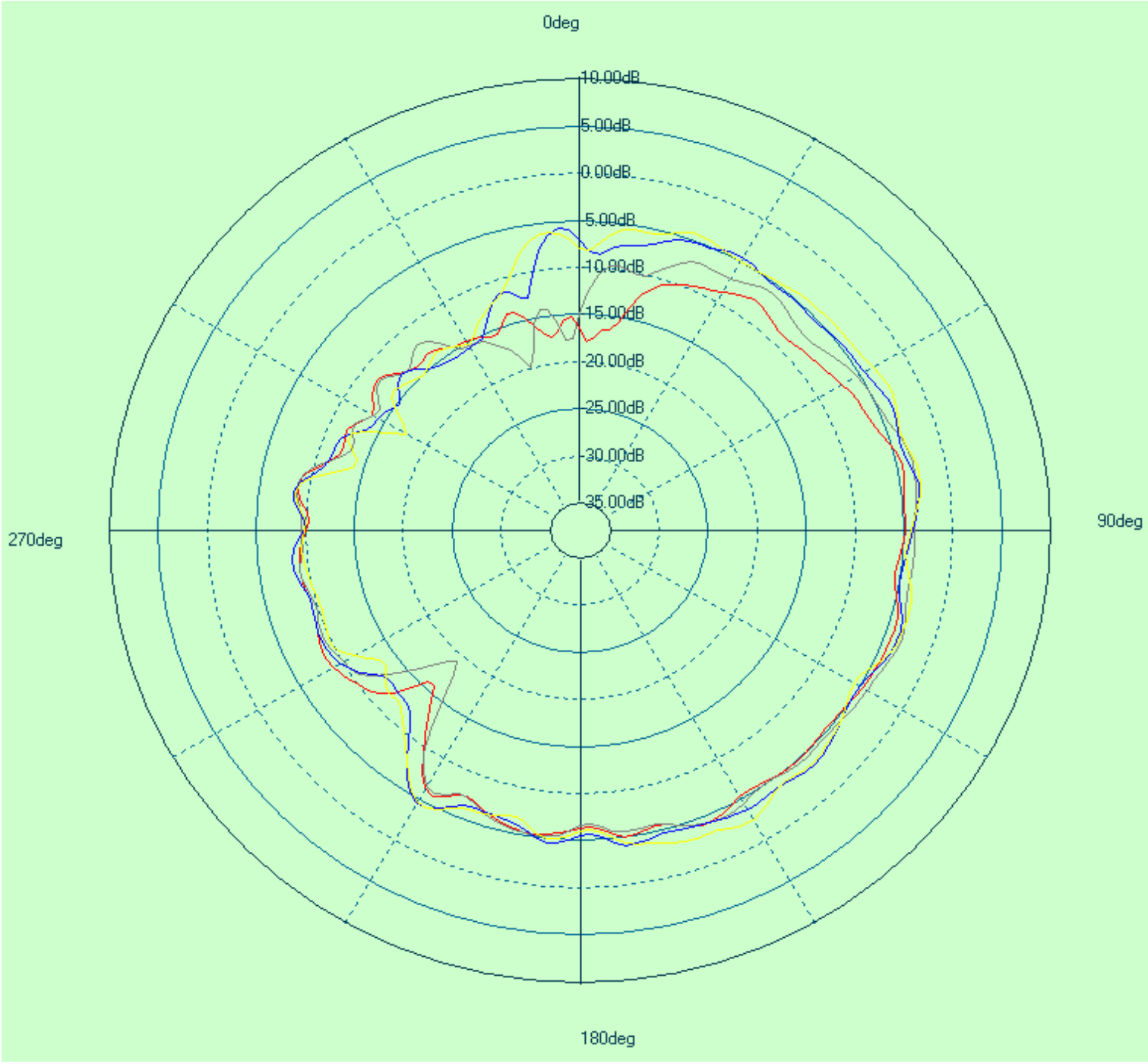
➤ 75 inch____BT(cable length=1300mm)



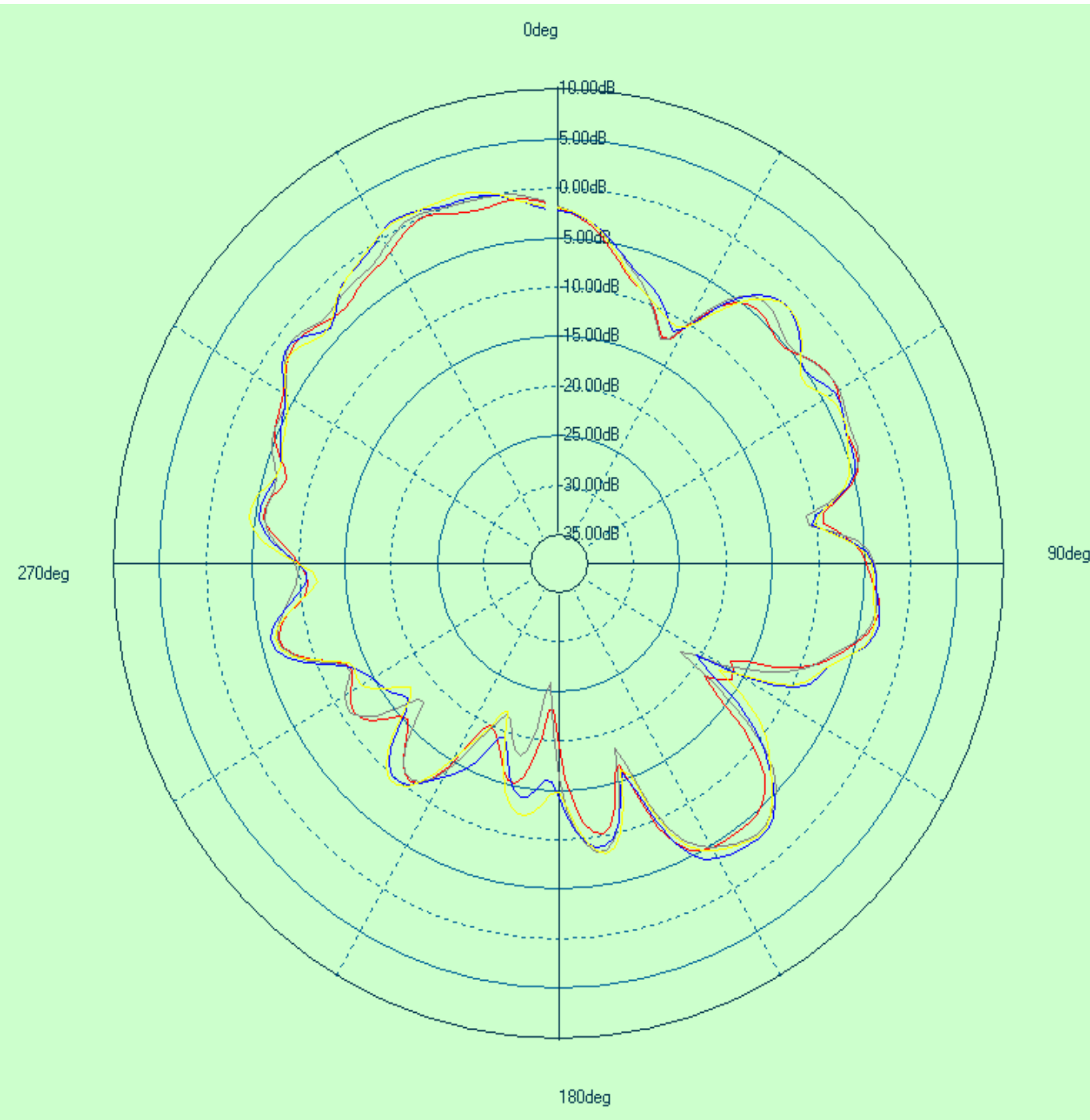
Phi=0 (XZ Plane)



Phi=90(YZ Plane)



Theta=90(XY Plane)

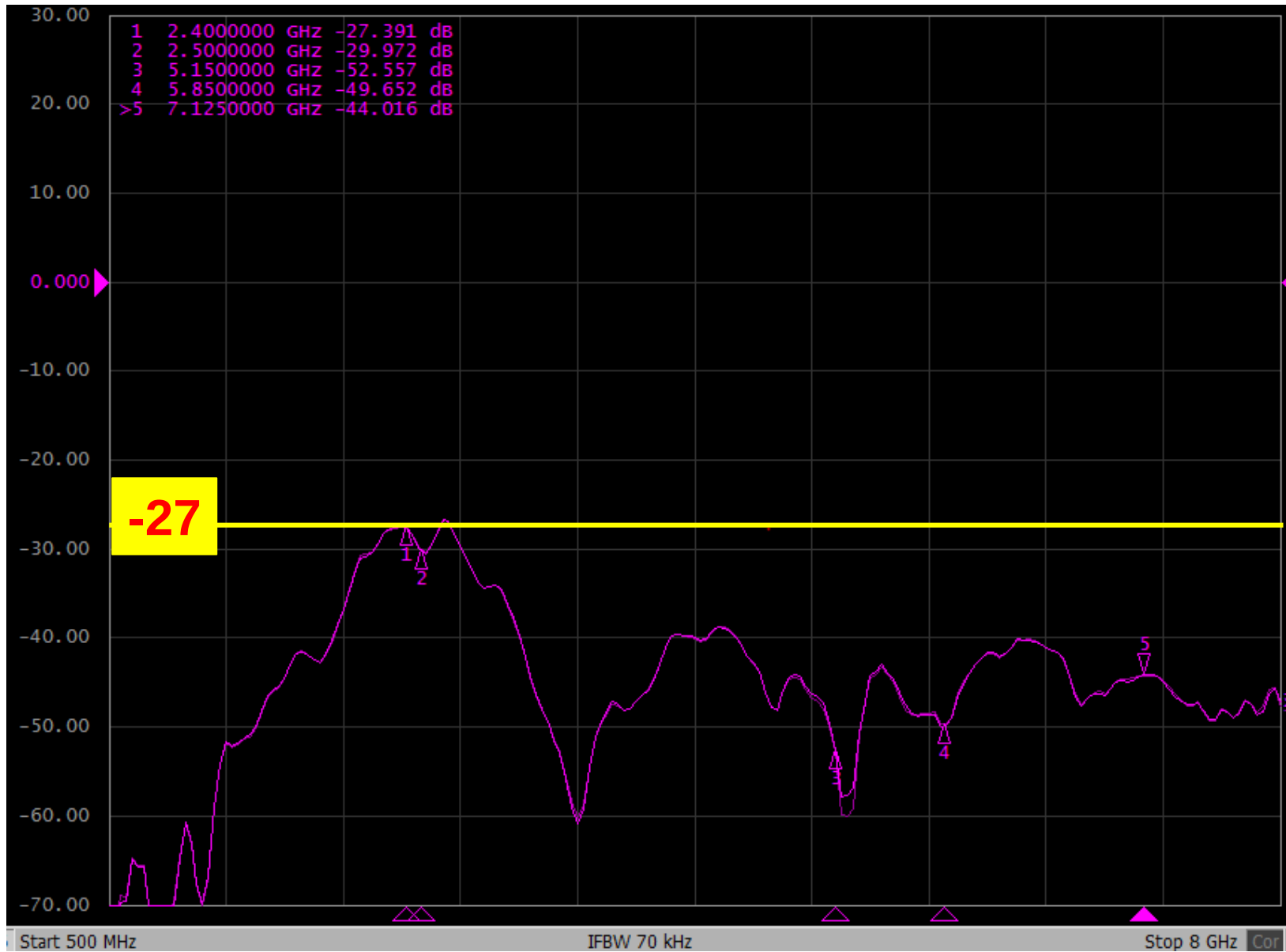


Antenna Performance

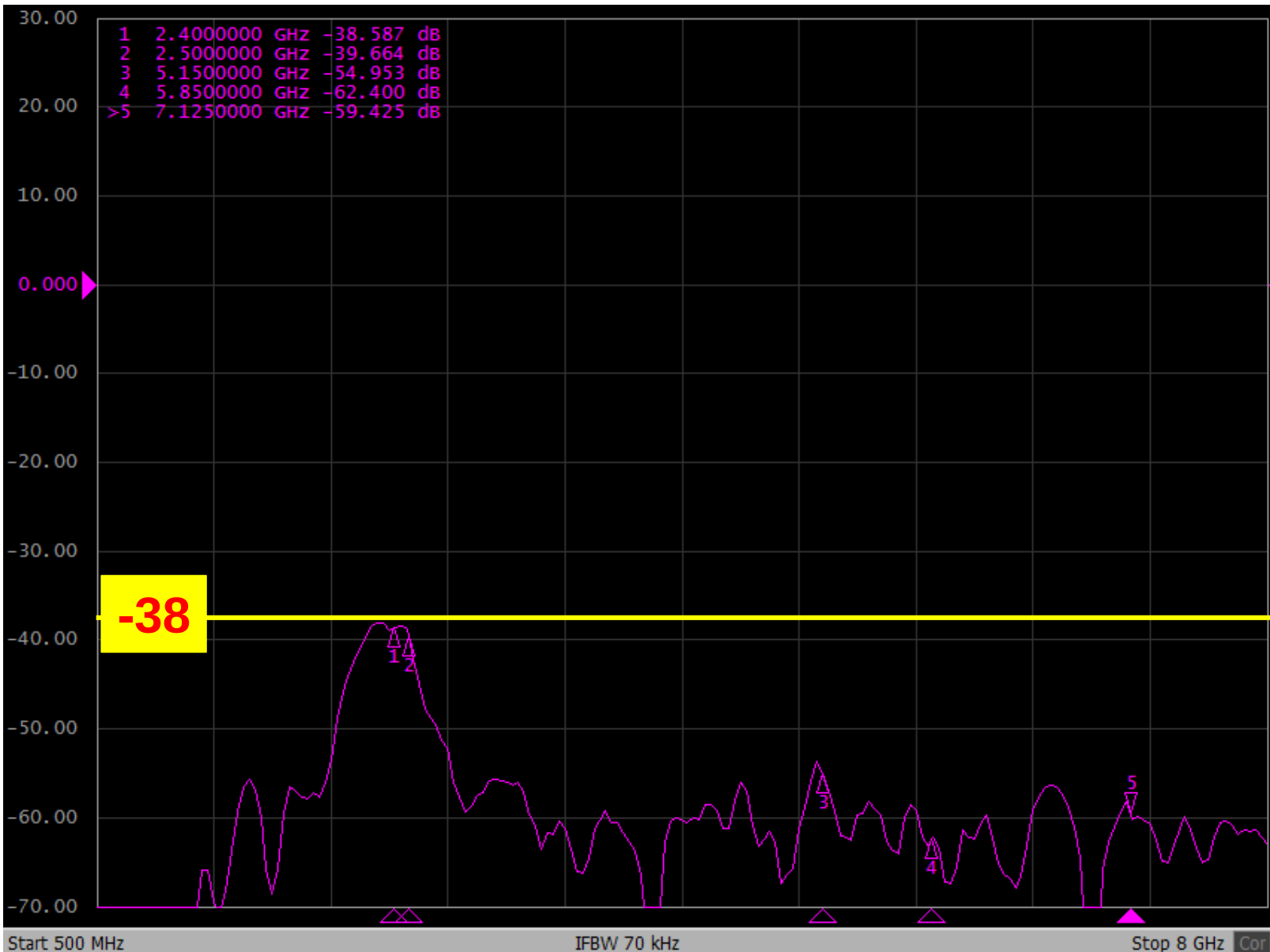
➤ Isolation of 75 inch mockup



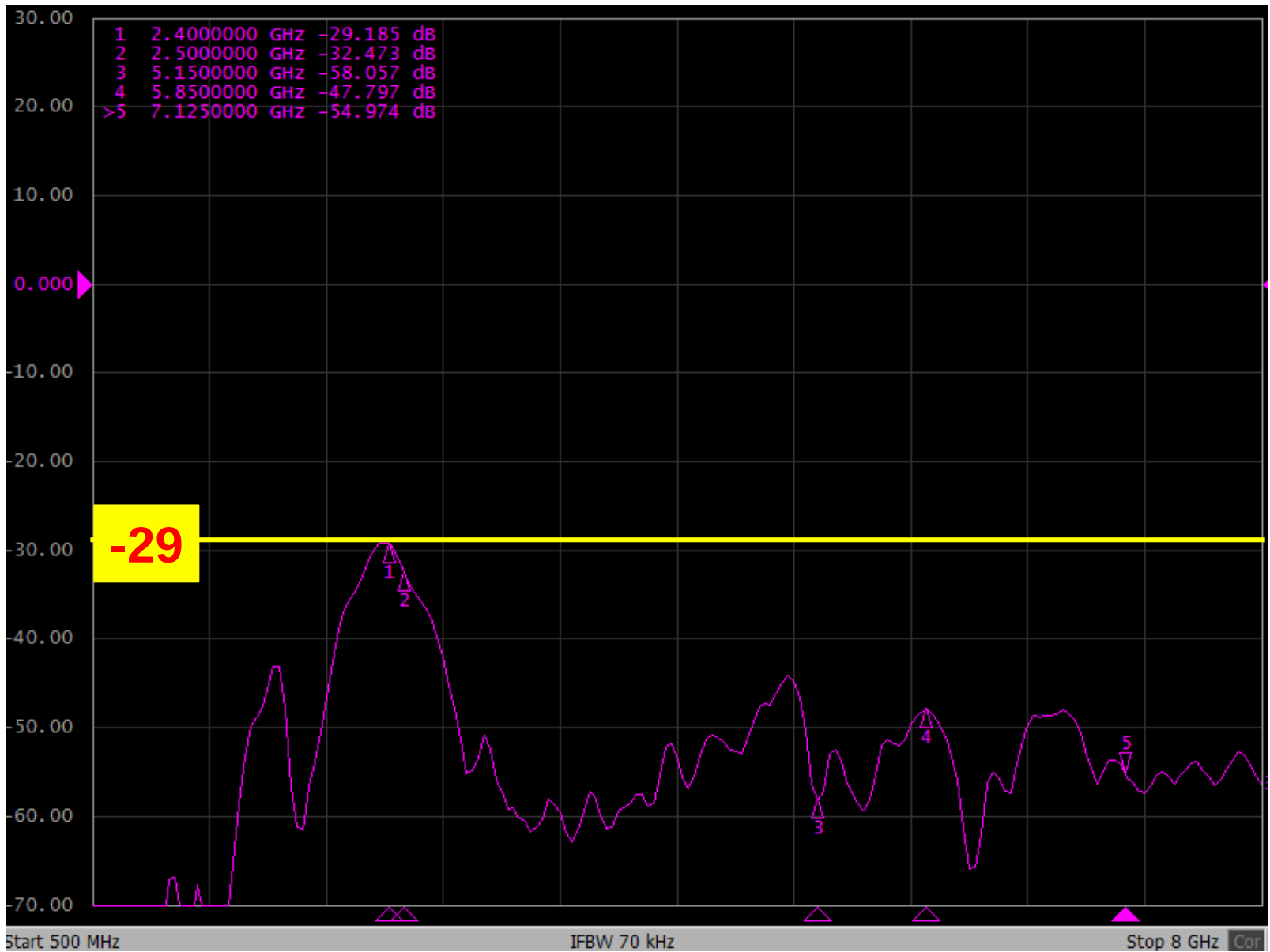
WLAN 1 <----> WLAN 2



WLAN 1 <----> BT



WLAN 2 <----> BT



Antenna Performance

➤ Latest complete test data.

	55 inch WLAN1		55 inch WLAN2		55 inch BT		75 inch WLAN1		75 inch WLAN2		75 inch BT	
Frequency	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)
2400	65%	3.9	49%	2.8	44%	4.7	55%	3.6	40%	1.1	42%	4.2
2420	63%	3.8	50%	3.4	46%	5.2	54%	3.5	43%	1.6	42%	4.0
2440	62%	3.8	51%	4.0	48%	5.3	53%	3.4	43%	2.2	42%	4.0
2460	63%	3.7	50%	4.2	48%	5.5	54%	3.8	45%	2.3	42%	4.3
2480	63%	3.8	49%	4.1	48%	3.8	53%	3.6	45%	1.9	43%	4.5
2500	61%	4.0	47%	3.3	46%	3.7	53%	3.7	44%	1.7	43%	4.7
5150	44%	2.2	42%	3.3			34%	1.2	39%	2.2		
5250	45%	2.2	46%	3.7			35%	1.5	42%	2.4		
5350	44%	2.1	51%	3.5			35%	1.1	43%	3.6		
5450	44%	2.4	52%	4.8			33%	1.7	43%	2.8		
5550	43%	2.7	52%	5.8			32%	1.7	45%	3.4		
5650	42%	2.6	49%	5.3			33%	2.1	47%	4.8		
5750	44%	3.3	47%	4.9			33%	2.2	47%	4.6		
5850	44%	3.0	46%	3.9			35%	1.4	46%	4.1		
5950	43%	3.3	45%	3.9			33%	1.9	42%	3.7		
6050	46%	2.8	48%	3.7			36%	2.6	44%	3.6		
6150	49%	3.1	50%	2.6			37%	2.5	46%	2.7		
6250	46%	3.0	47%	3.7			34%	1.0	43%	3.8		
6350	44%	2.7	45%	3.1			32%	1.5	40%	4.3		
6450	43%	2.5	43%	3.6			33%	2.1	39%	3.7		
6550	44%	2.1	45%	4.6			33%	2.2	37%	3.7		
6650	45%	2.6	43%	4.8			36%	1.7	37%	4.1		
6750	44%	2.0	42%	5.2			34%	1.0	38%	4.9		
6850	44%	2.0	46%	5.8			35%	1.6	39%	4.7		
6950	41%	2.8	41%	5.5			30%	1.4	33%	4.0		
7050	41%	2.7	42%	6.0			31%	1.0	31%	4.0		
7150	40%	2.7	43%	6.1			31%	1.0	30%	3.5		

Thanks!