SPECIFICATION

Part No.	:	**GSA.8841.A.105111**
Product Name	:	Wideband 4G LTE Ibar Antenna 698MHZ to 6000MHz
Features	:	LTE / GSM / CDMA /DCS /PCS / WCDMA / UMTS / HSDPA / GPRS / EDGE /GPS /Wi-Fi 176mm * 59mm *11.6mm 698MHz to 960MHz, 1575.42MHz 1710MHz to 2700Mhz 5150MHz to 5850MHz With 1M NFC-200 and SMA(M) Connector RoHS Compliant

Photo:

1. Introduction

The GSA.8841 LTE Wideband I-Bar Antenna is an external adhesive mount solution on glass and plastic for automotive and telematics applications. It covers not only LTE, but all Cellular, ISM and Wi-Fi working frequencies in the 700-6000 MHz spectrum. It has the highest wide-band efficiency in its range of any antenna in its category today.

The GSA.8841 has been primarily designed for use with 4G LTE modules and devices that require the highest possible efficiency and peak gain to deliver best in class throughput on all major cellular 4G bands worldwide for telematics applications.

- High speed HD video
- Real-time streaming
- High capacity MIMO networks on public transportation

It comes with 1 meters coaxial cable and SMA (M) connector, in a low profile compact format for mounting via high quality first tier automotive approved 3M adhesive foam. Stable radiation is observed on both glass and plastic.

The GSA.8841 is backward compatible with 3G and 2G cellular applications such as HSPA, as well as covering WI-FI bands, and even has GPS included for E911 applications.

It is an ideal solution for any device requiring high, reliable performance. It will meet nearly all carrier certification requirements from an efficiency standpoint. The antenna also makes an excellent reference antenna for test purposes. It has been designed as an omni-directional antenna and the radiation patterns show this and are stable across all bands.

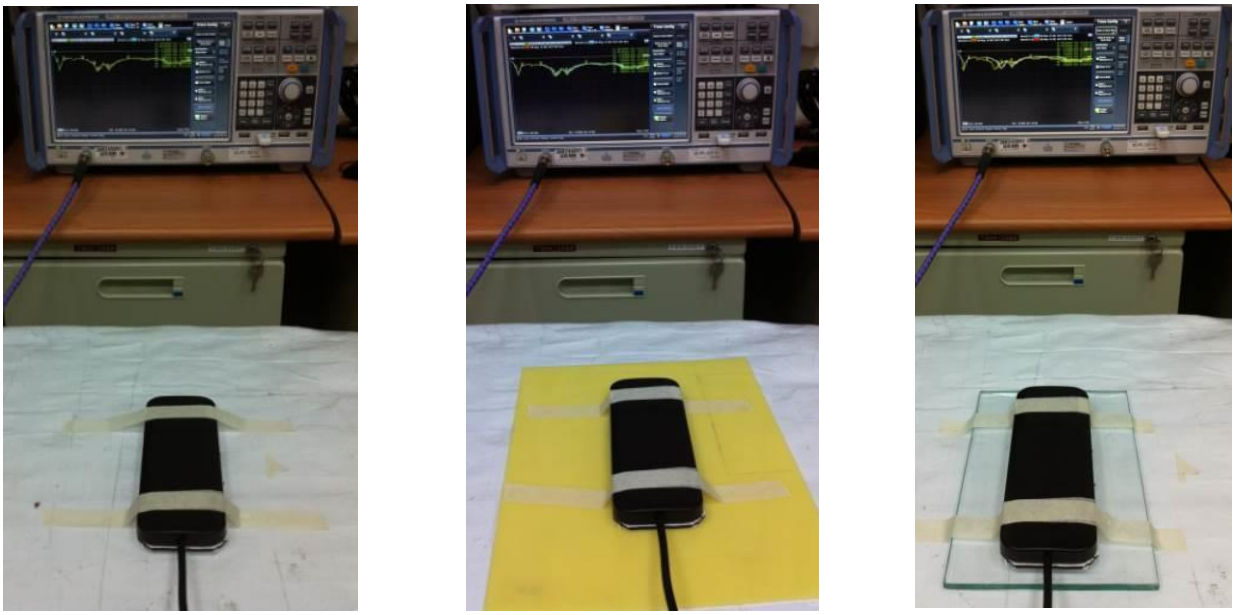
2. Specification

ELECTRICAL								
Standard		LTE/GSM/CDMA 700/800/850/900	GNSS	LTE/GSM/HSPA/CDMA 1700/1800/1900	UMTS/HSPA 2100	Wi-Fi 2400	LTE 2600	Wi-Fi 5800
Frequency (MHz)		698~960	1565~1612	1710~1990	1920~2170	2400~2500	2500~2700	4800~6000
Efficiency (%)								
In free space	30cm	71.88	62.03	67.62	67.81	68.79	71.08	48.73
	1M	68.64	56.57	61.77	62.39	62.74	64.83	43.43
	2M	63.75	51.59	55.33	56.02	54.64	55.89	36.76
	3M	59.34	45.98	48.75	49.59	47.06	47.47	30.75
	5M	50.54	36.53	37.87	39.04	36.10	36.30	22.34
On the 2mm ABS Base	30cm	74.99	64.23	70.69	70.33	69.68	73.11	49.39
	1M	71.62	58.58	64.58	64.68	63.55	66.67	44.02
	2M	66.53	53.42	57.85	58.07	55.35	57.49	37.25
	3M	61.93	47.61	50.97	51.41	47.67	48.82	31.16
	5M	52.78	37.82	39.60	40.45	36.57	37.33	22.63
On the Glass Base	30cm	74.73	73.00	80.37	77.79	64.27	69.10	55.18
	1M	71.86	66.58	73.41	71.51	58.62	63.02	49.18
	2M	67.23	60.72	65.79	64.21	51.05	54.33	41.44
	3M	64.50	54.12	57.94	56.81	43.97	46.14	34.81
	5M	55.06	42.99	45.03	44.67	33.73	35.28	24.97
Average Gain(dBi)								
In free space	30cm	-1.46	-2.08	-1.72	-1.71	-1.63	-1.49	-3.22
	1M	-1.66	-2.48	-2.12	-2.07	-2.03	-1.89	-3.72
	2M	-1.98	-2.88	-2.59	-2.54	-2.63	-2.53	-4.45
	3M	-2.29	-3.38	-3.14	-3.07	-3.28	-3.24	-5.22
	5M	-2.99	-4.38	-4.23	-4.11	-4.43	-4.41	-6.62
On the 2mm ABS Base	30cm	-1.29	-1.93	-1.52	-1.55	-1.57	-1.37	-3.13
	1M	-1.49	-2.33	-1.92	-1.91	-1.97	-1.77	-3.63
	2M	-1.81	-2.73	-2.39	-2.38	-2.57	-2.41	-4.37
	3M	-2.12	-3.23	-2.94	-2.91	-3.22	-3.12	-5.13
	5M	-2.82	-4.23	-4.04	-3.95	-4.37	-4.28	-6.53
On the Glass Base	30cm	-1.33	-1.37	-0.96	-1.11	-1.92	-1.62	-2.62
	1M	-1.50	-1.77	-1.35	-1.47	-2.32	-2.02	-3.12
	2M	-1.80	-2.17	-1.83	-1.94	-2.92	-2.66	-3.87
	3M	-2.02	-2.67	-2.38	-2.47	-3.57	-3.37	-4.62
	5M	-2.72	-3.67	-3.47	-3.51	-4.72	-4.53	-6.07

Peak Gain(dBi)								
Standard		LTE/GSM/CDMA 700/800/850/900	GNSS	LTE/GSM/HSPA/CDMA 1700/1800/1900	UMTS/HSPA 2100	Wi-Fi 2400	LTE 2600	Wi-Fi 5800
Frequency (MHz)		698~960	1565~1612	1710~1990	1920~2170	2400~2500	2500~2700	4800~6000
In free space	30cm	1.56	1.38	3.79	3.06	4.25	4.70	2.56
	1M	1.36	0.98	3.40	2.69	3.85	4.30	2.06
	2M	1.04	0.58	2.92	2.23	3.25	3.66	1.33
	3M	0.73	0.08	2.37	1.70	2.60	2.95	0.56
	5M	0.03	-0.92	1.28	0.66	1.45	1.79	-0.84
On the 2mm ABS Base	30cm	1.65	1.74	3.85	3.13	5.00	5.27	2.08
	1M	1.45	1.34	3.46	2.76	4.60	4.87	1.58
	2M	1.13	0.94	2.99	2.30	4.00	4.23	0.84
	3M	0.81	0.44	2.44	1.77	3.35	3.52	0.08
	5M	0.11	-0.56	1.34	0.73	2.20	2.35	-1.32
On the Glass Base	30cm	1.52	3.20	4.76	4.12	5.75	5.35	4.14
	1M	1.32	2.80	4.37	3.76	5.35	4.95	3.64
	2M	0.99	2.40	3.89	3.29	4.75	4.31	2.89
	3M	0.68	1.90	3.34	2.76	4.10	3.60	2.14
	5M	-0.02	0.90	2.25	1.72	2.95	2.44	0.69
Impedance		50Ω						
Polarization		Linear						
Radiation Pattern		Omni						
Input Power		5 W						
MECHANICAL								
Casing		ABS						
Coaxial Cable		NFC-200 Low Loss Cable						
Cable Length		1 Meter Standard, Fully Customizable						
Connector		SMA Male Standard, Fully Customizable						
Water Proof Level		IP65						
Adhesive		3M9448+CR4305 Double Sided Adhesive						
Weight		127g						
ENVIRONMENTAL								
Operation Temperature Range		-40°C to 85°C						
Storage Temperature Range		-40°C to 85°C						
Humidity		Non-condensing 65°C 95% RH						

3. Antenna Characteristics

3.1 Testing setup



a) In free space b) On 2mm ABS Base c) On the Glass Base

Figure.1 Test setup; a) In free space, b) On 2mm ABS Base, c) On the Glass Base

3.2 Return loss

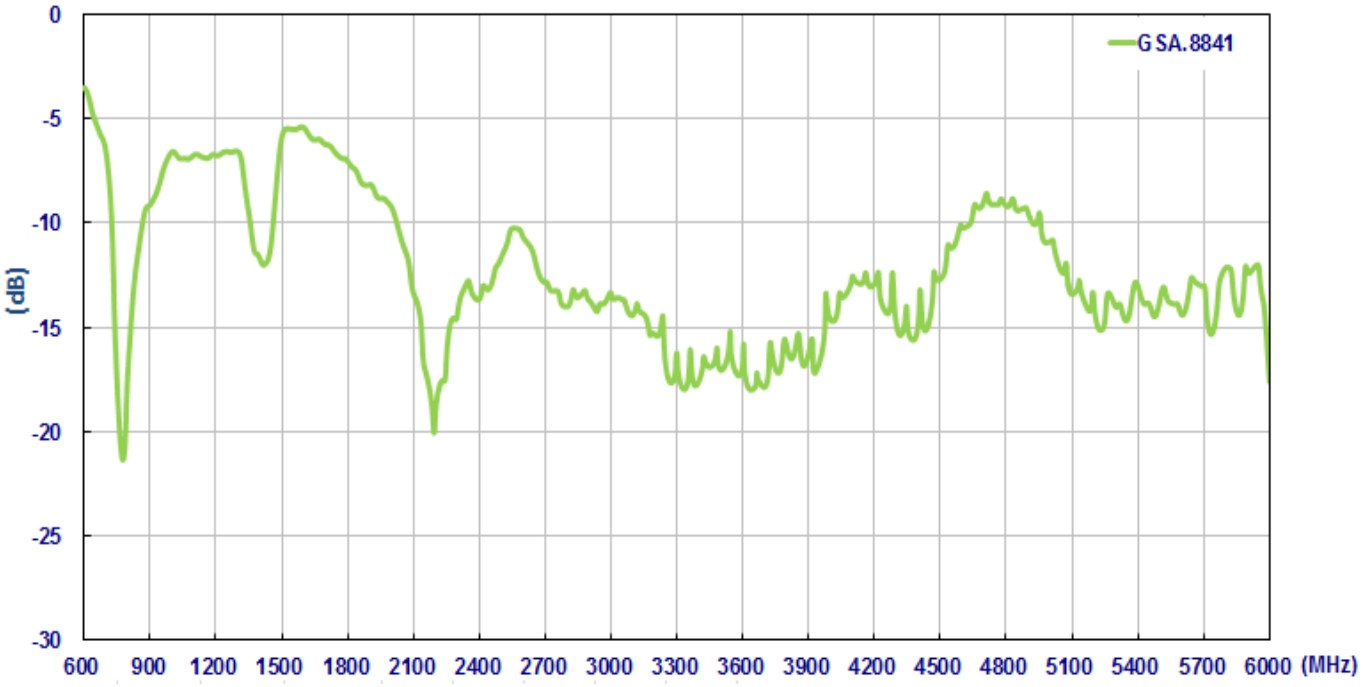


Figure2. Return loss of GSA.8841 with 1 meter cable length in free space

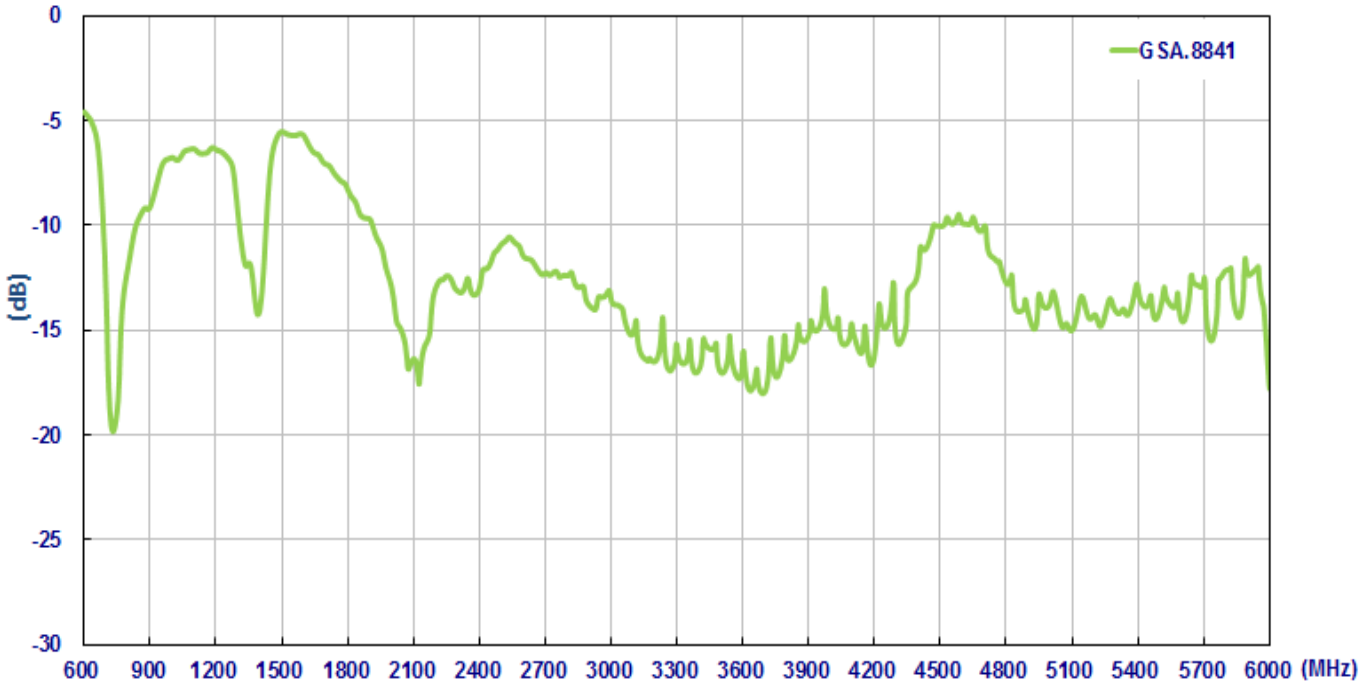


Figure3. Return loss of GSA.8841 with 1 meter cable length on the 2mm ABS base

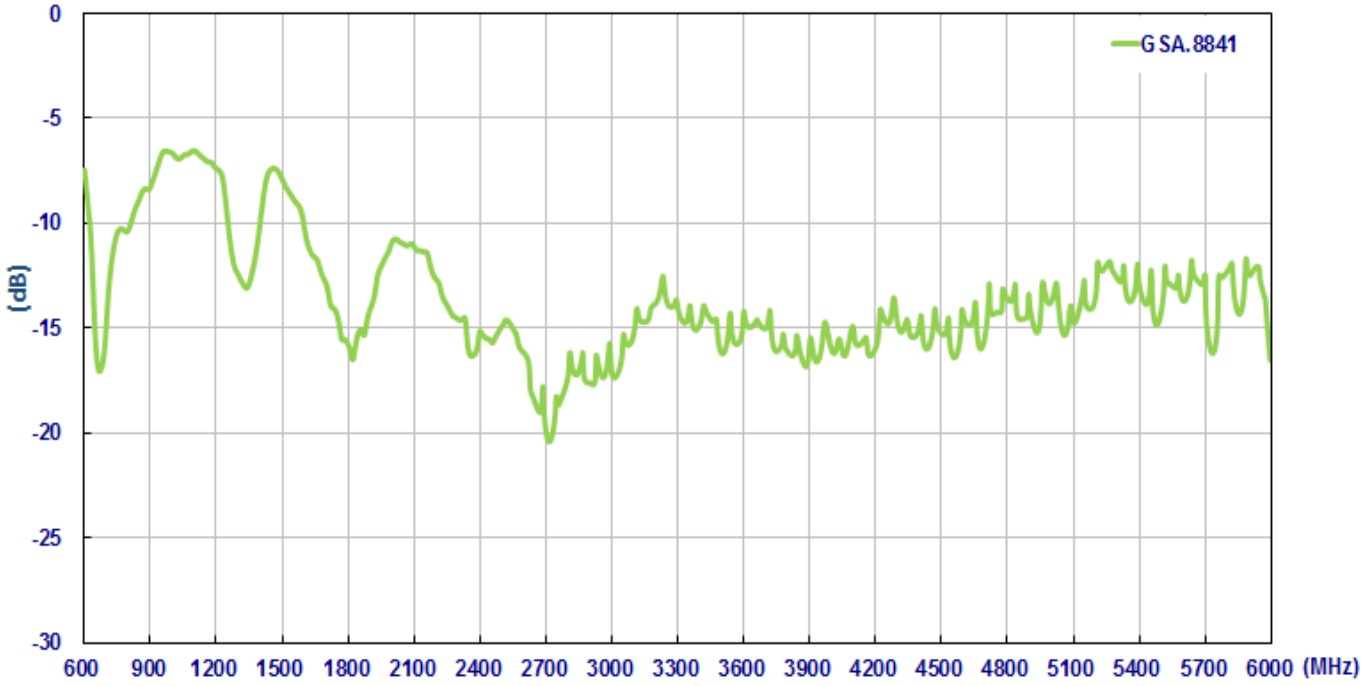


Figure4. Return loss of GSA.8841 with 1 meter cable length on the glass base

3.3 Efficiency

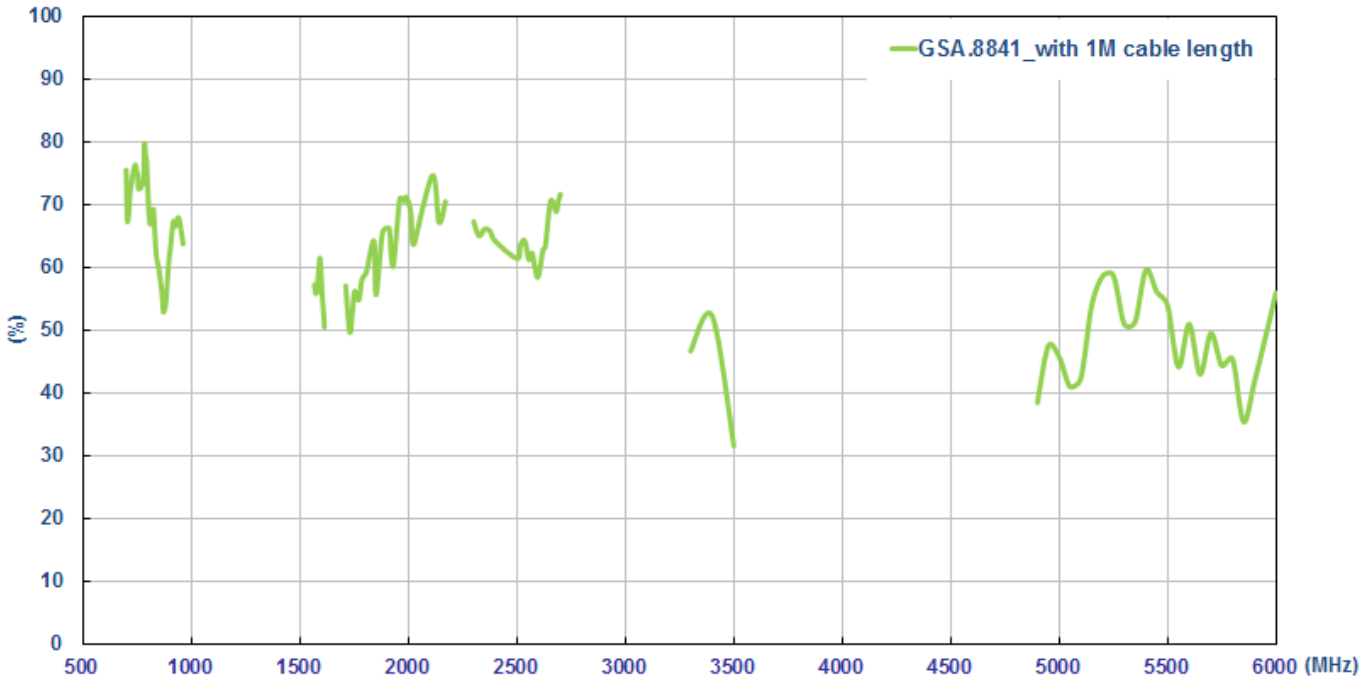


Figure5. Efficiency of GSA.8841 with 1 meter cable length in free space

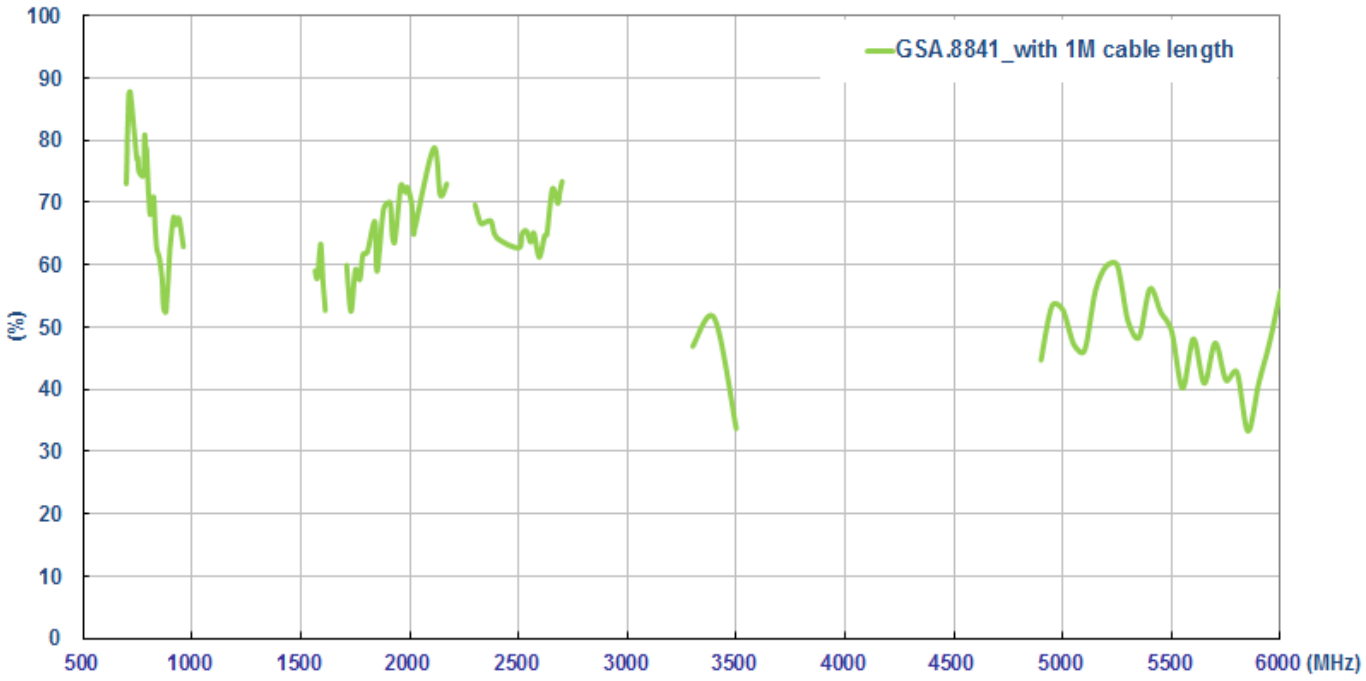


Figure6. Efficiency of GSA.8841 with 1 meter cable length on the 2mm ABS base

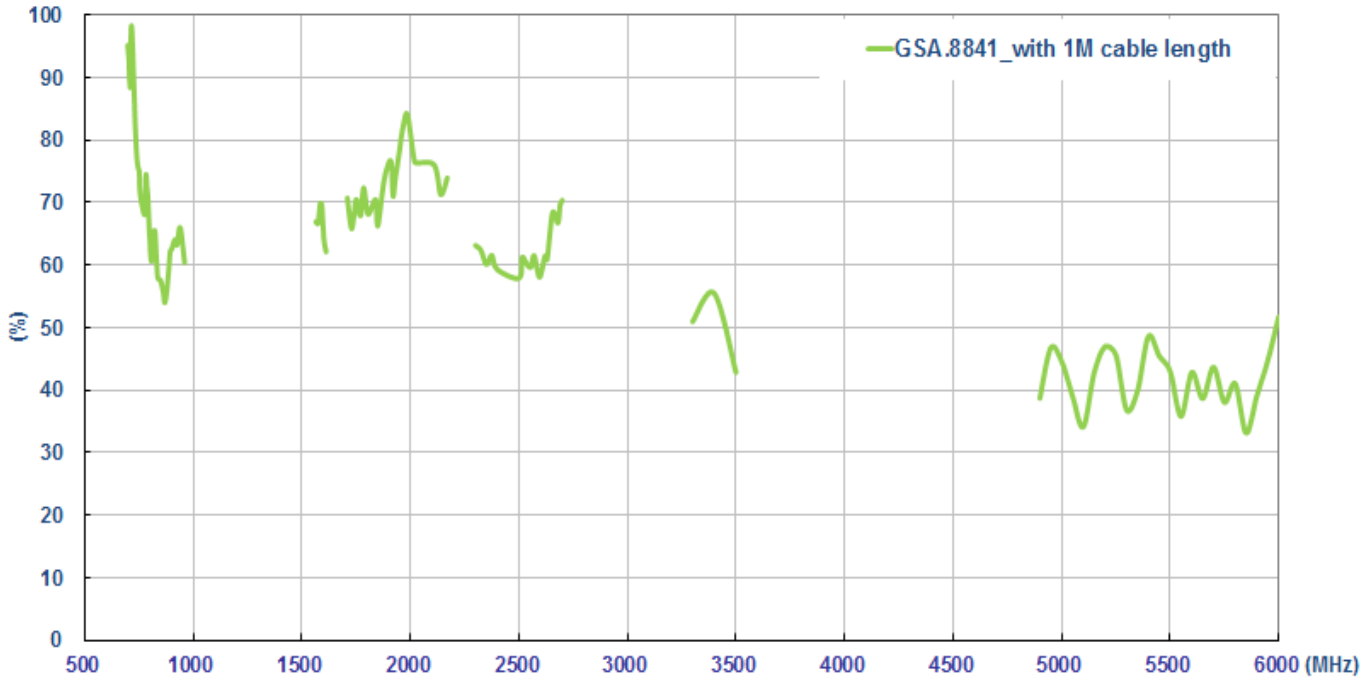


Figure7. Efficiency of GSA.8841 with 1 meter cable length on the glass base

3.4 Peak gain

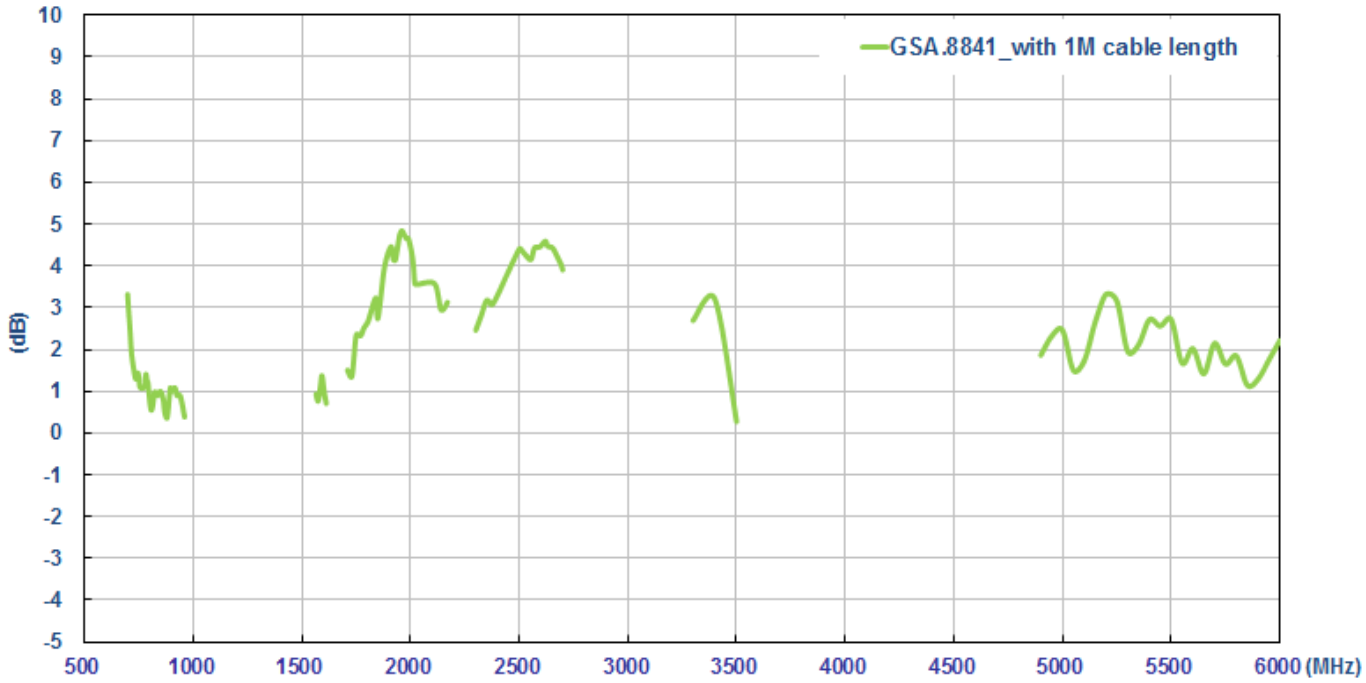


Figure8. Peak gain of GSA.8841 with 1 meter cable length in free space

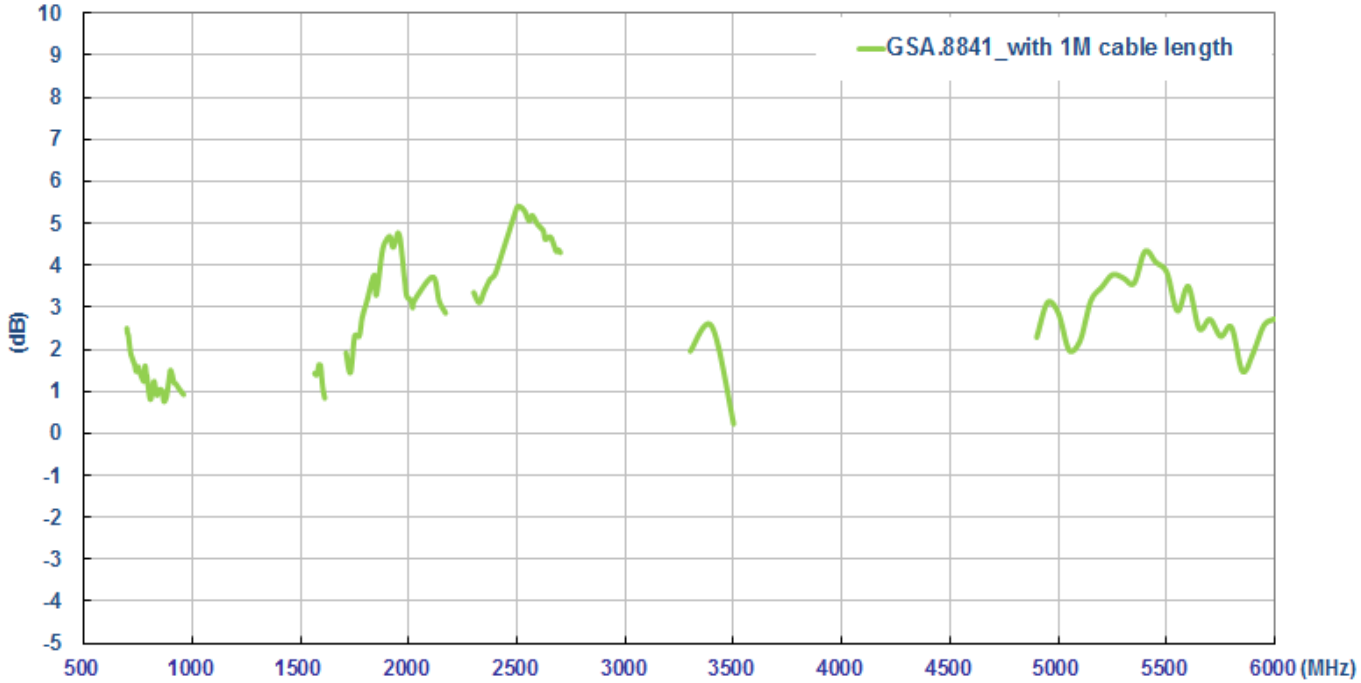


Figure9. Peak gain of GSA.8841 with 1 meter cable length on the 2mm ABS base

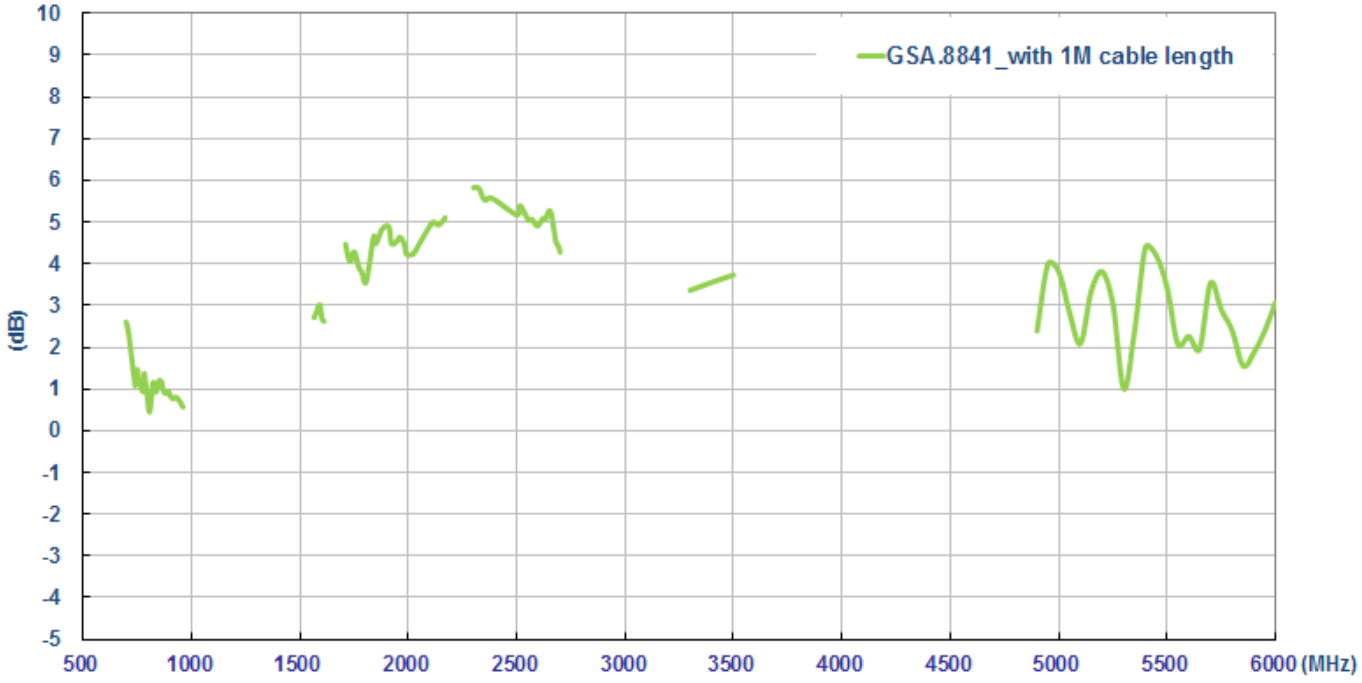


Figure10. Peak gain of GSA.8841 with 1 meter cable length on the glass base

3.5 Average gain

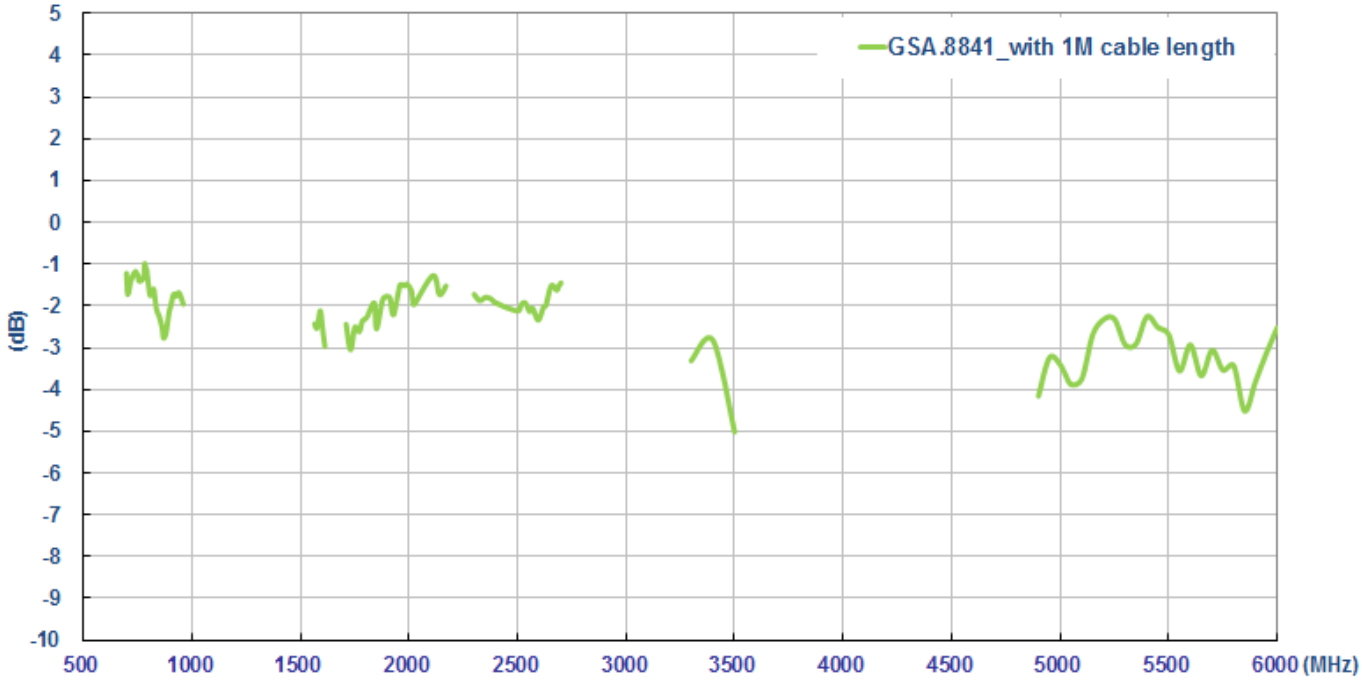


Figure11. Average gain of GSA.8841 with 1 meter cable length in free space

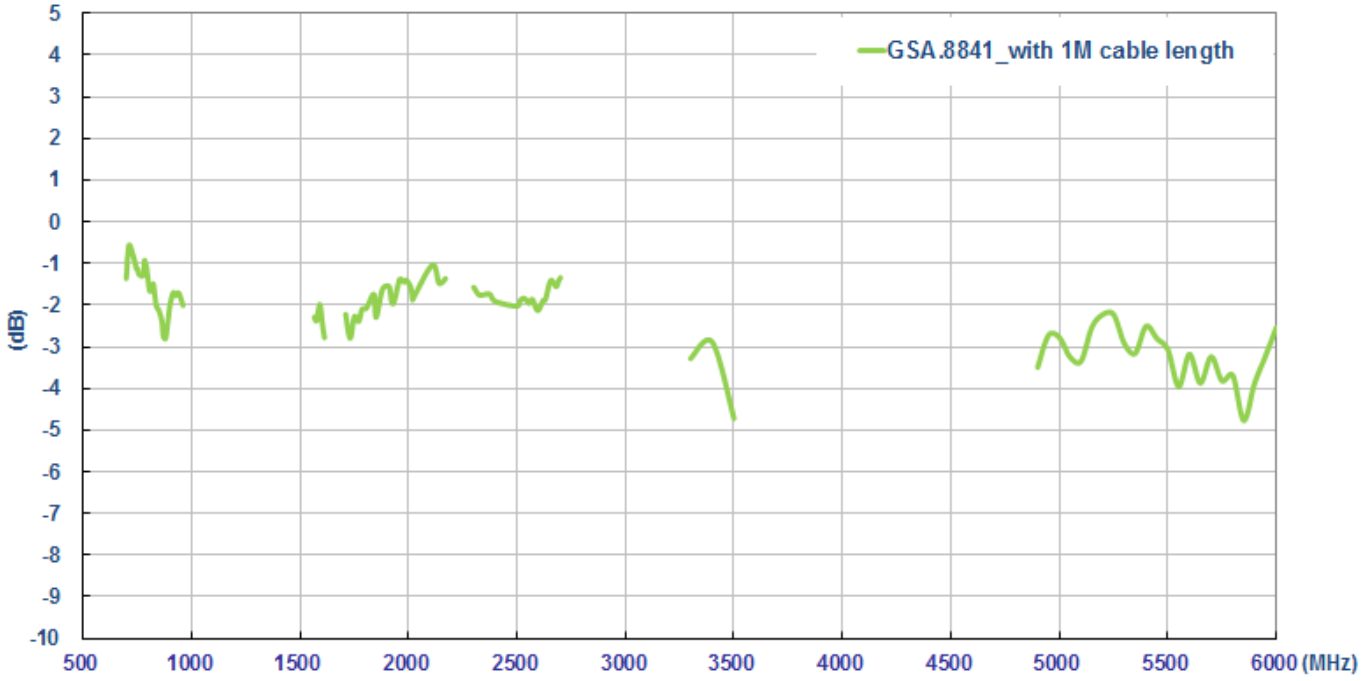


Figure12. Average gain of GSA.8841 with 1 meter cable length on the 2mm ABS base

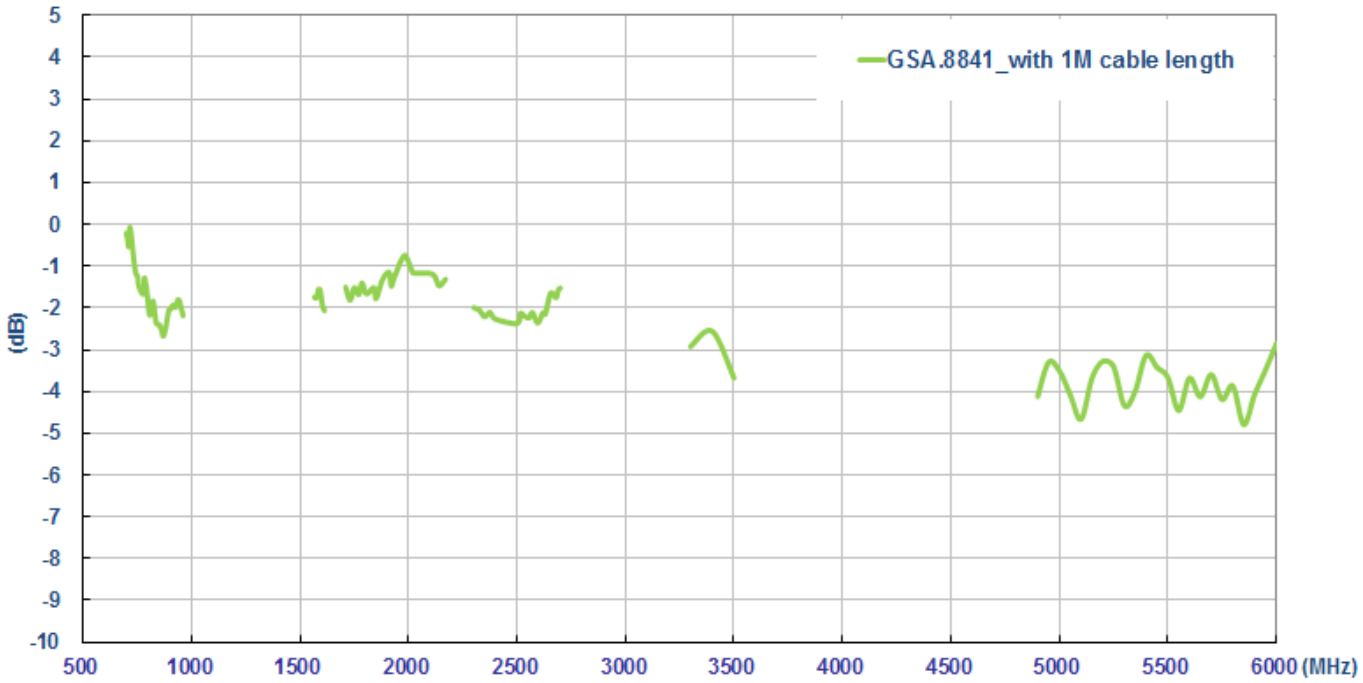
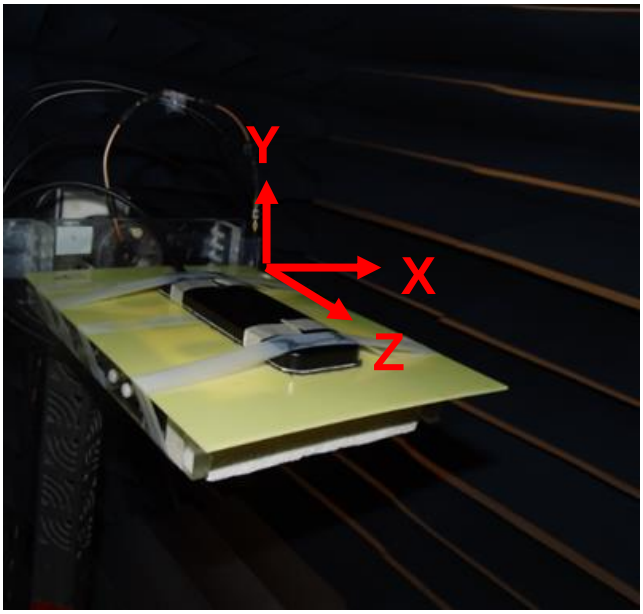


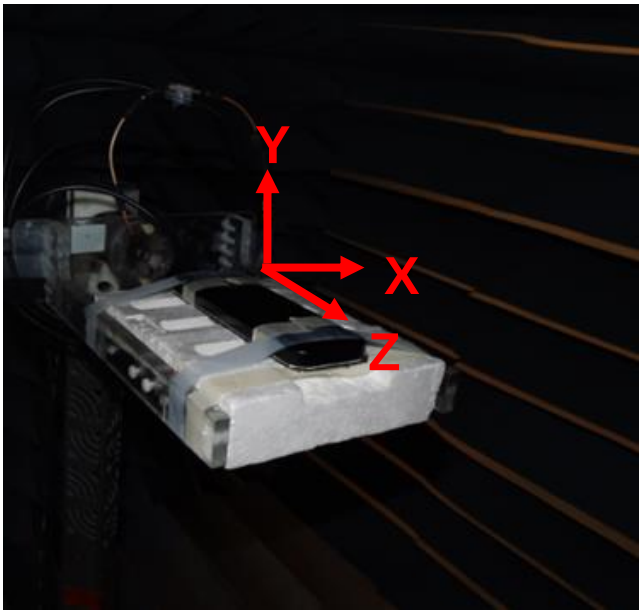
Figure13. Average gain of GSA.8841 with 1 meter cable length on the glass base

4. Antenna Radiation Patterns

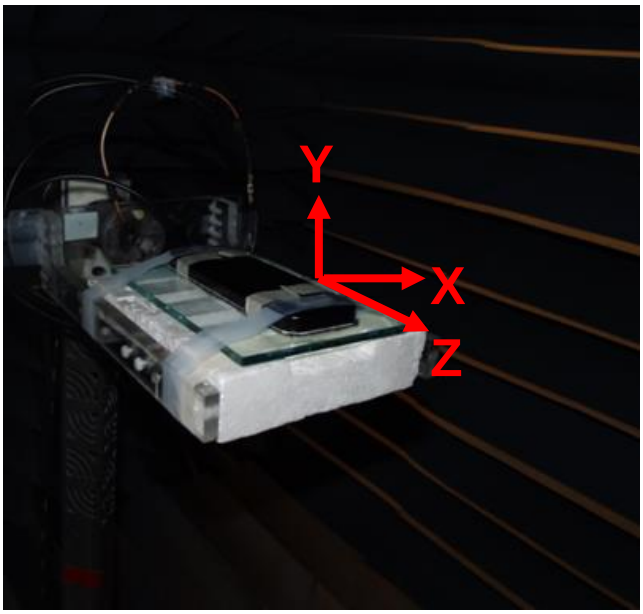
The antenna radiation patterns were measured in ETS Anechoic Chamber. The measurement setup as below,



a) In free space



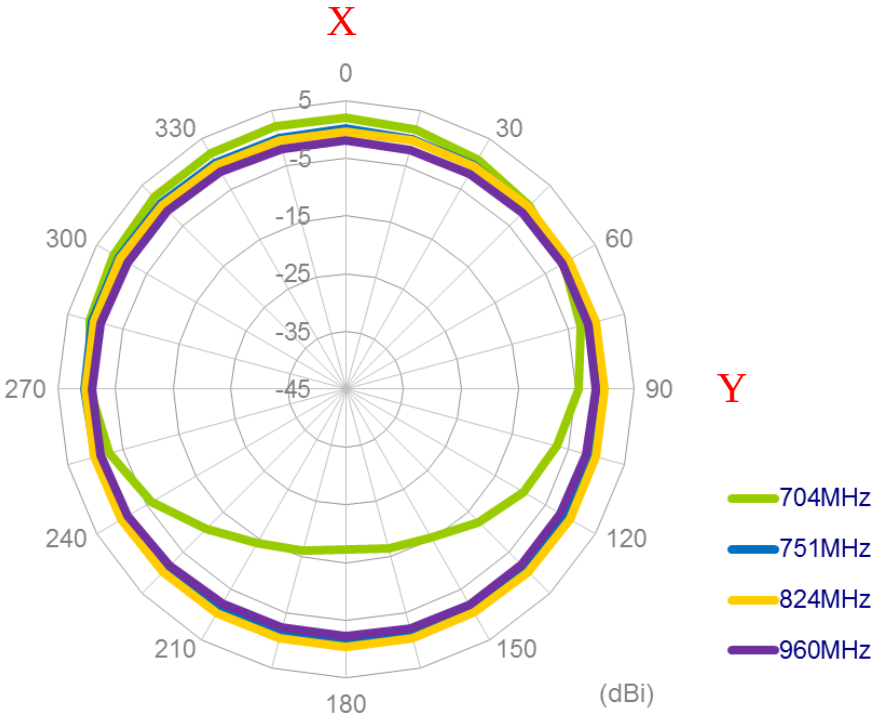
2) On 2mm ABS base

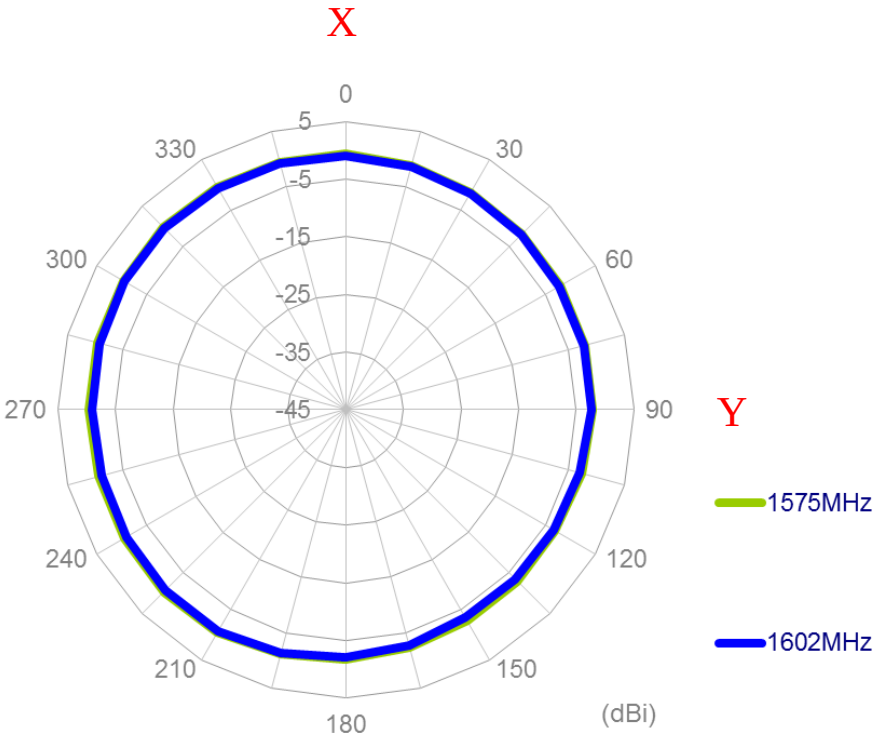


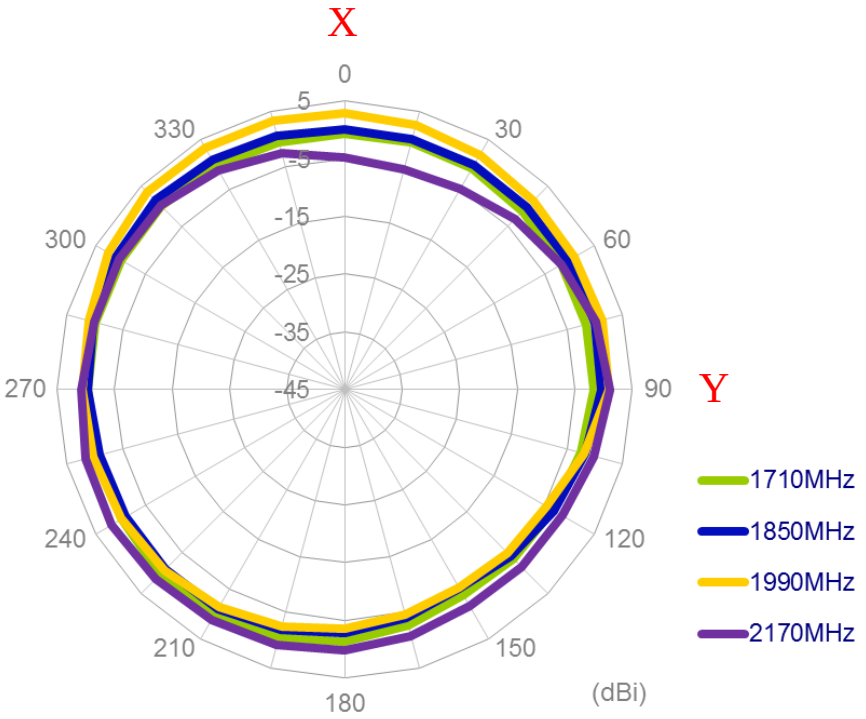
3) On the glass base

Figure.14 The measurement setup; a) In free space, b) On the 2mm ABS base, c) On the glass base

4.1 Antenna radiation patterns
XY plane (Antenna with 1 meter cable length in free space)






X
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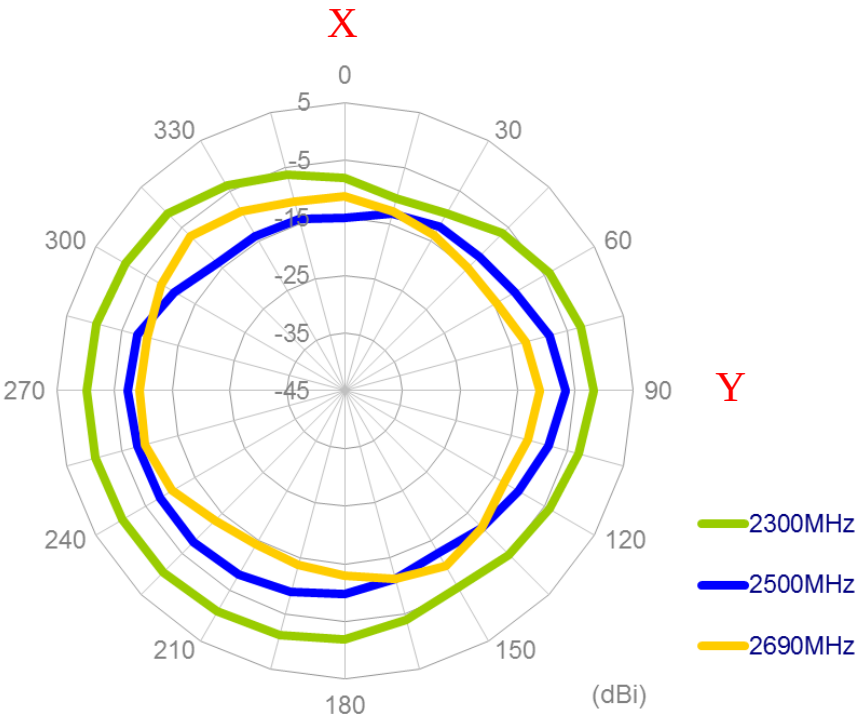
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
Y
(dBi)
1710MHz
1850MHz
1990MHz
2170MHz


X
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90
120
150
180
210
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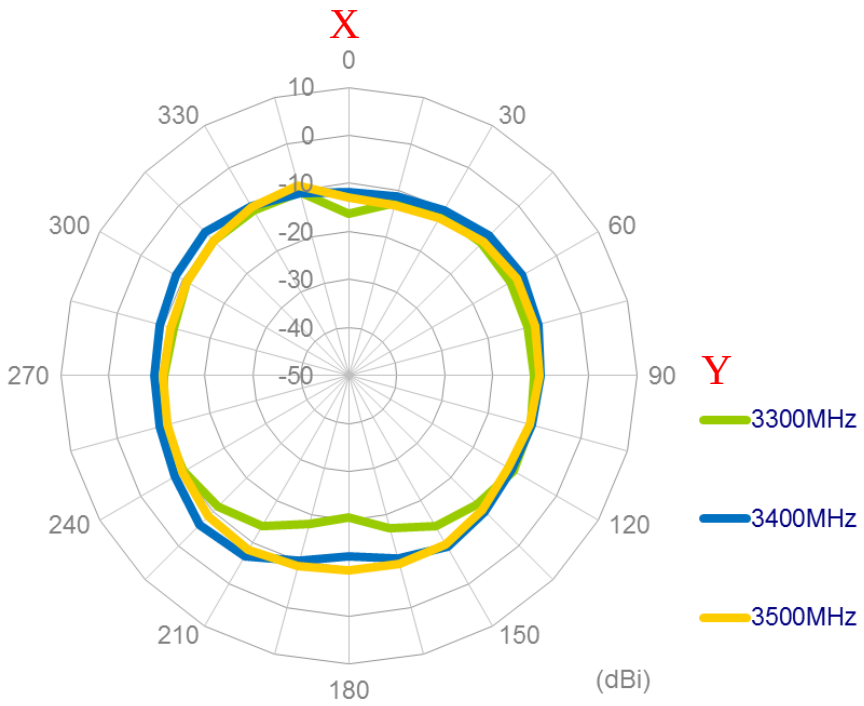
270
300
330
5
-5
-15
-25
-35
-45
Y
(dBi)
2300MHz
2500MHz
2690MHz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10
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-10
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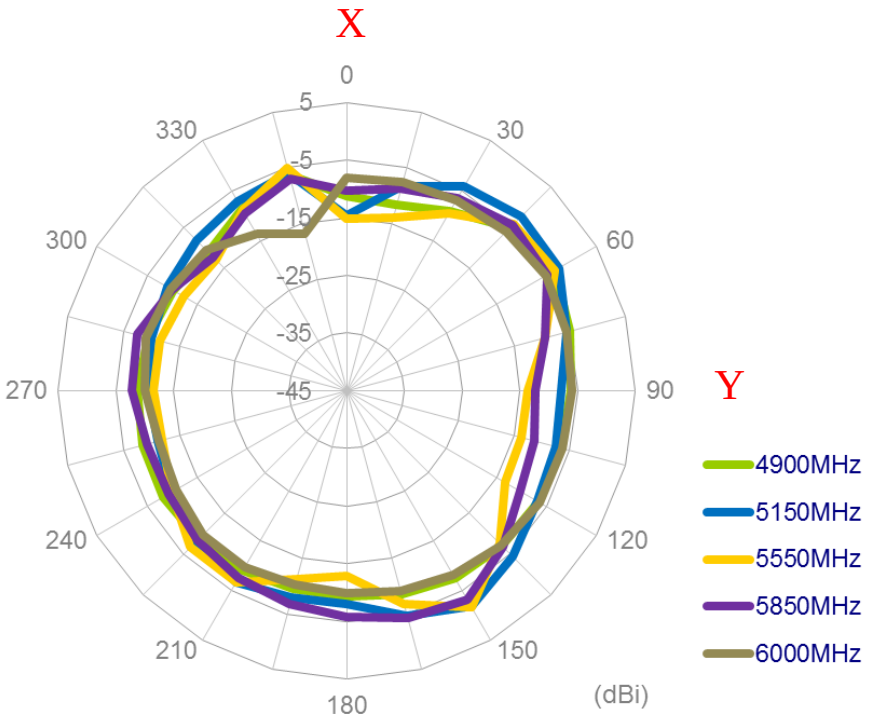
-40
-50
Y
3300MHz
3400MHz
3500MHz
(dBi)


X
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300
330
5
-5
-15
-25
-35
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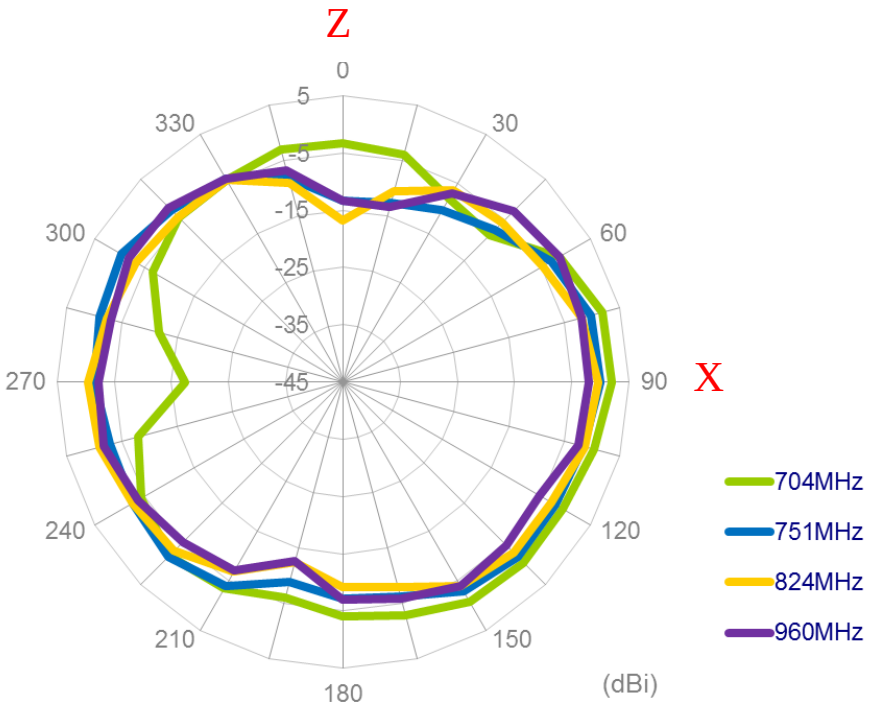
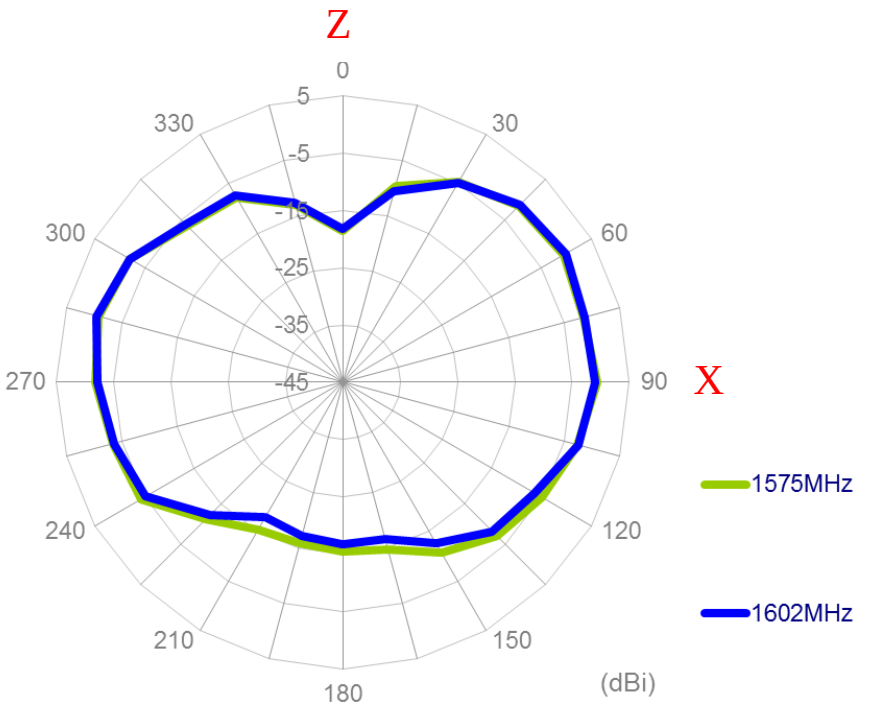
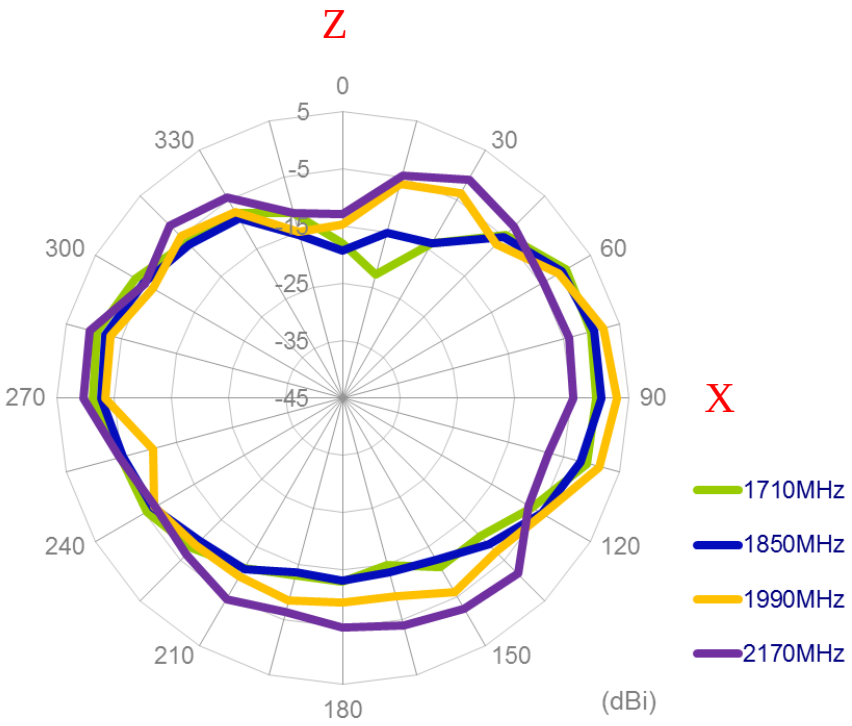
Y
4900MHz
5150MHz
5550MHz
5850MHz
6000MHz
(dBi)

4.2 XZ plane (Antenna with 1 meter cable length in free space)



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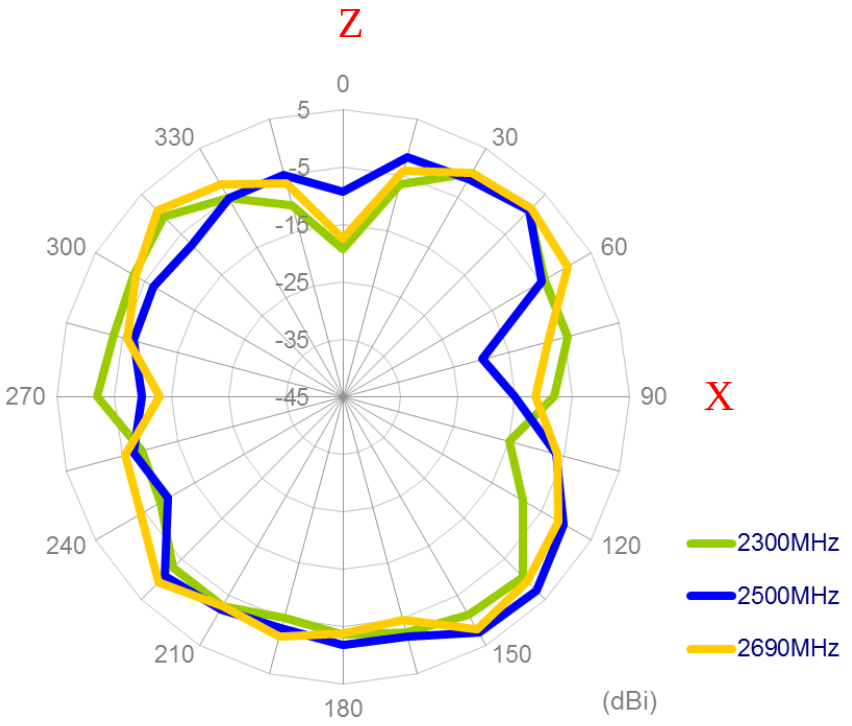
5
-5
-15
-25
-35
-45
30
60
90
120
150
180
210
240
270
300
330
X
(dBi)
1710MHz
1850MHz
1990MHz
2170MHz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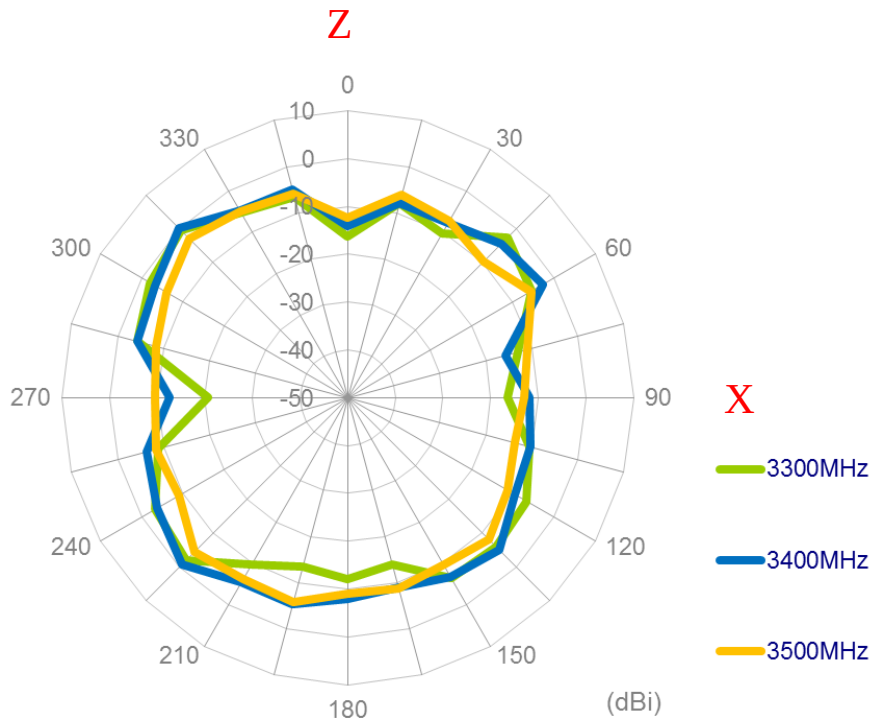
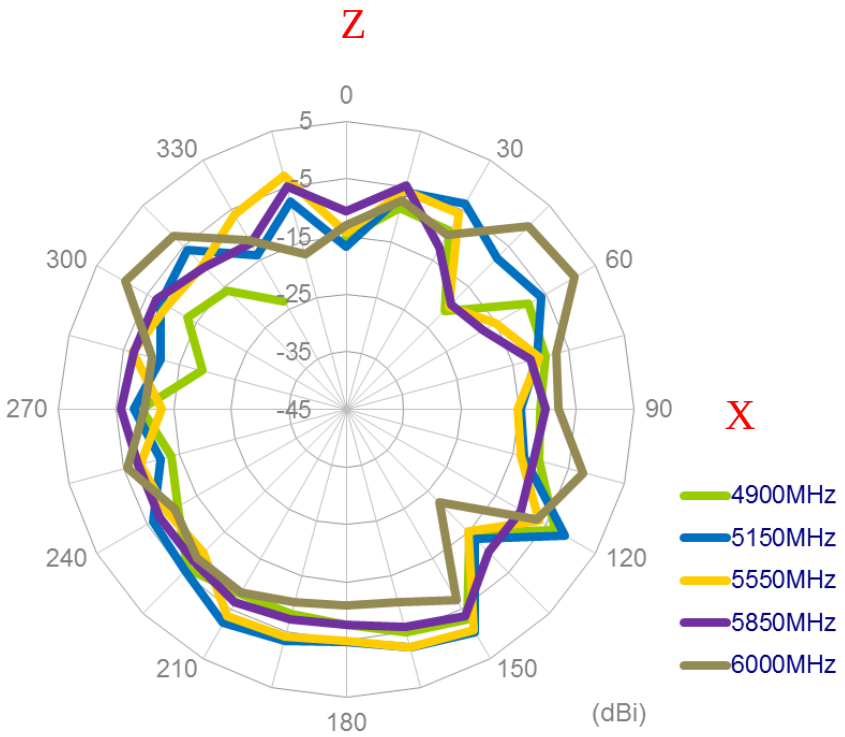
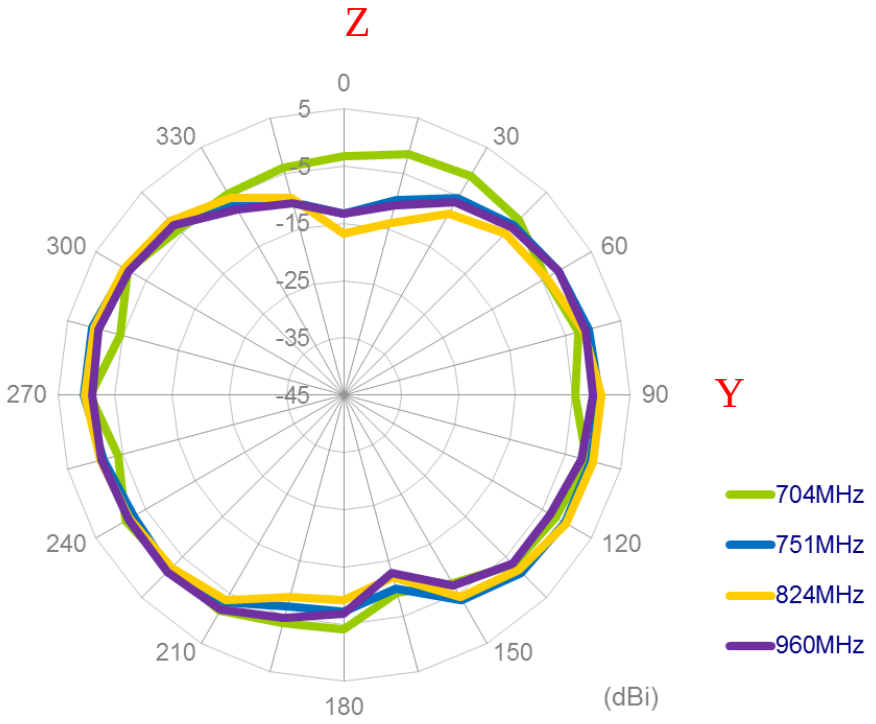
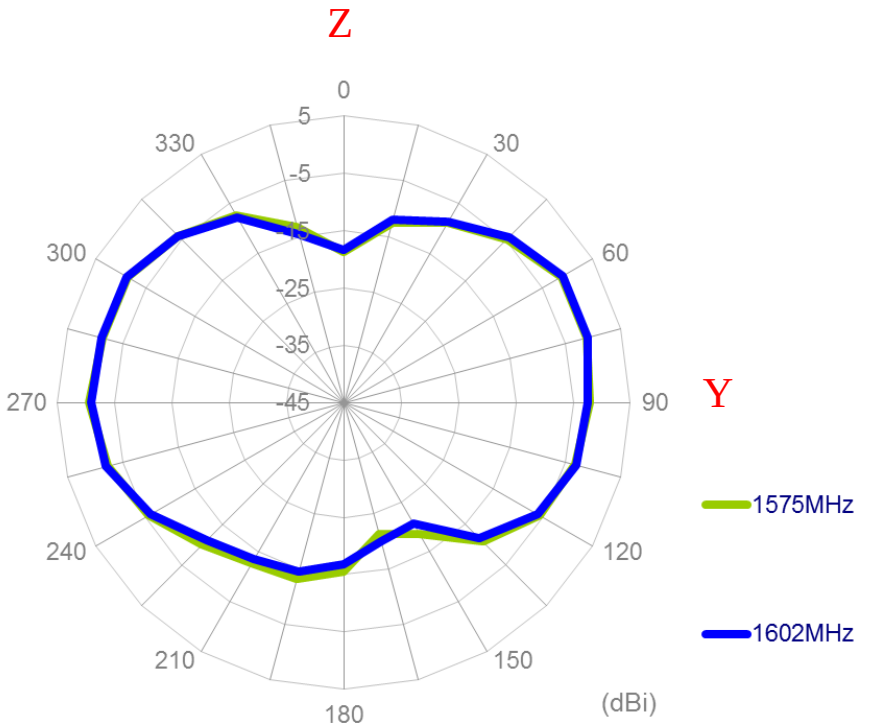
5
-5
-15
-25
-35
-45
30
60
90
120
150
180
210
240
270
300
330
X
(dBi)
2300MHz
2500MHz
2690MHz

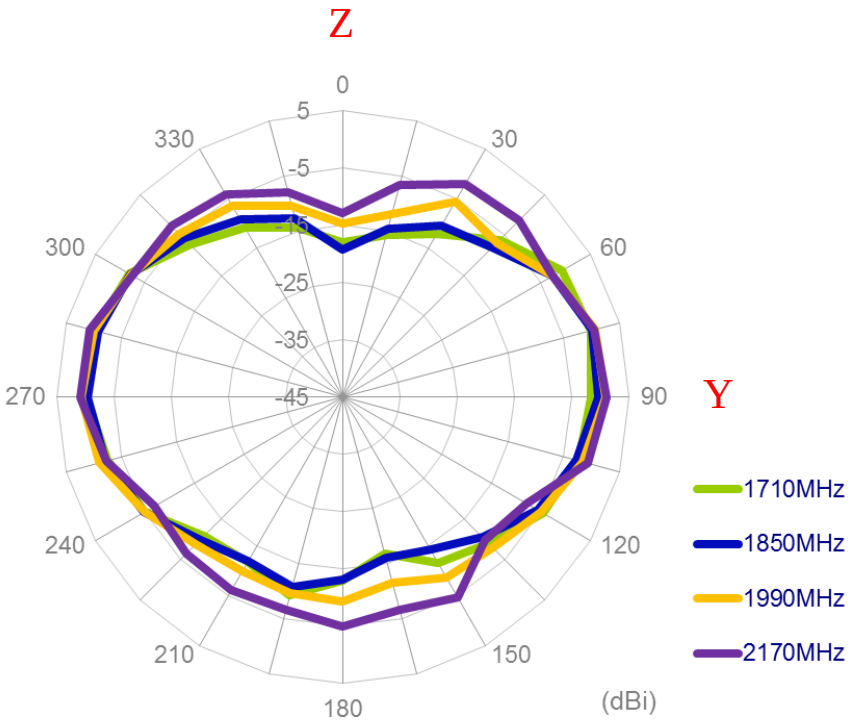

Z
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
-50
X
3300MHz
3400MHz
3500MHz
(dBi)

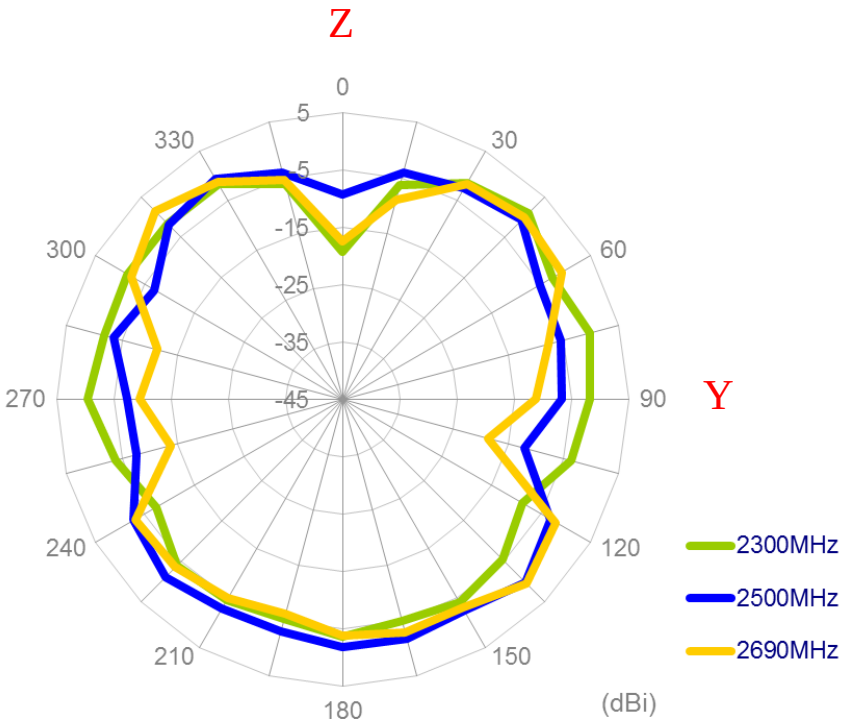

Z
0
30
60
90
120
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
X
4900MHz
5150MHz
5550MHz
5850MHz
6000MHz
(dBi)

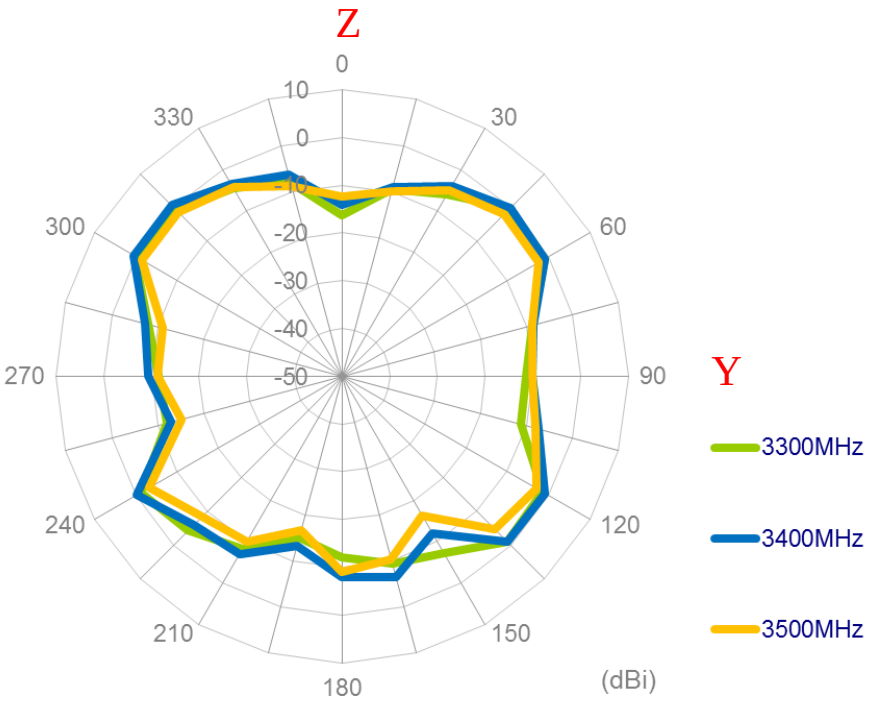
4.3 YZ plane (Antenna with 1 meters cable length in free space)

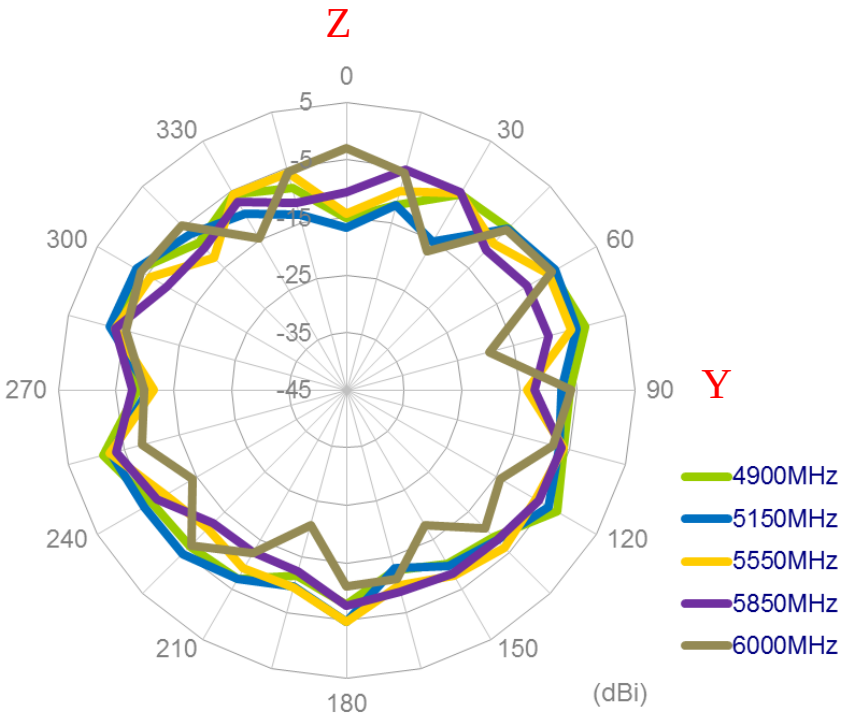




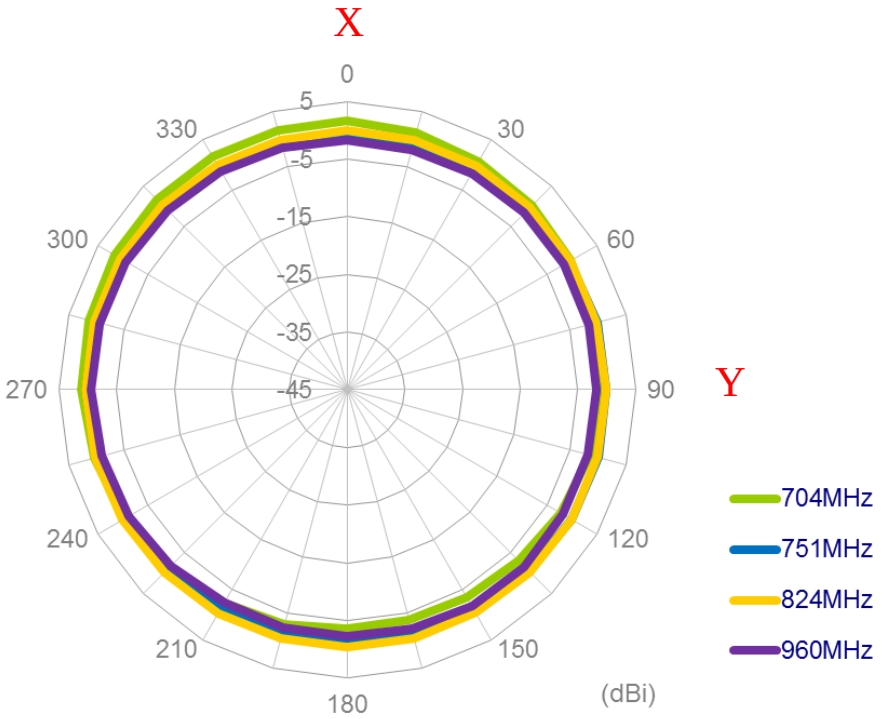

Z
0
30
60
90
120
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
Y
1710MHz
1850MHz
1990MHz
2170MHz
(dBi)

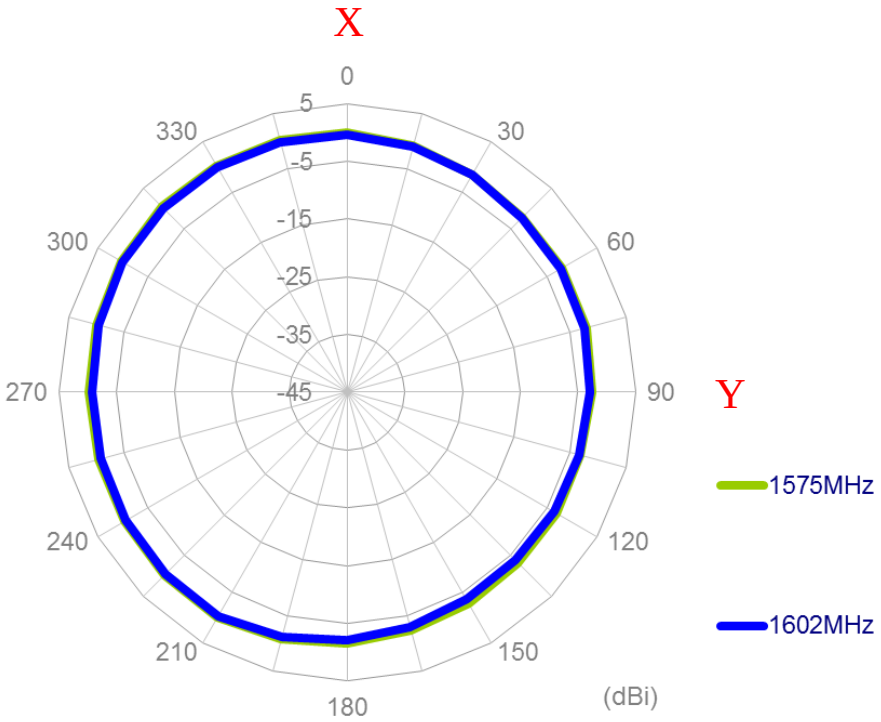

Z
0
30
60
90
120
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
Y
2300MHz
2500MHz
2690MHz
(dBi)

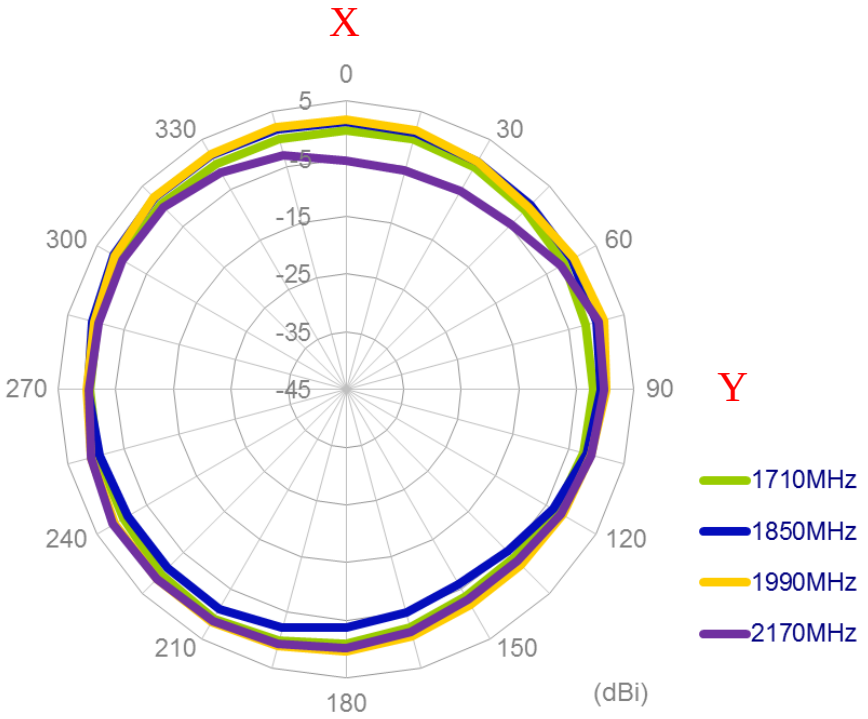

Z
0
10
30
60
90
120
150
180
210
240
270
300
330
0
-10
-20
-30
-40
-50
Y
3300MHz
3400MHz
3500MHz
(dBi)

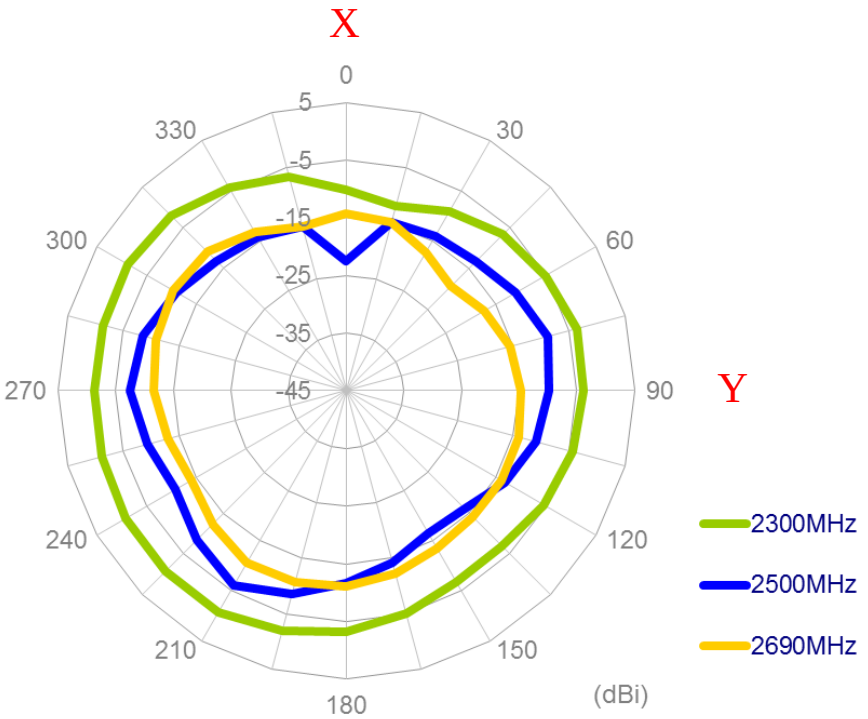

Z
0
5
30
60
90
120
150
180
210
240
270
300
330
-5
-15
-25
-35
-45
Y
4900MHz
5150MHz
5550MHz
5850MHz
6000MHz
(dBi)

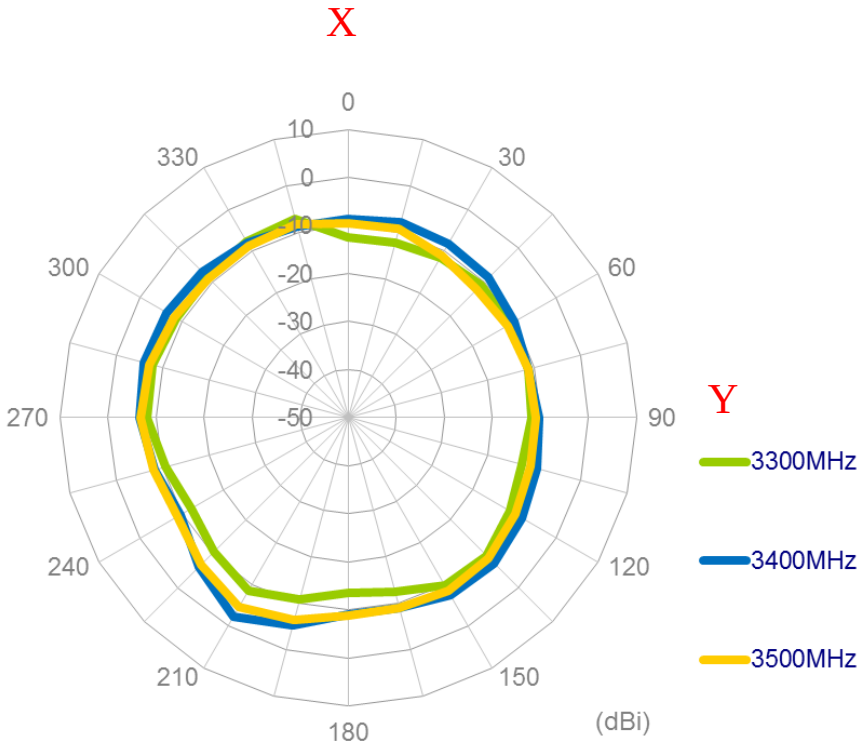
4.4 XY plane (Antenna with 1 meter cable length on the 2mm ABS base)

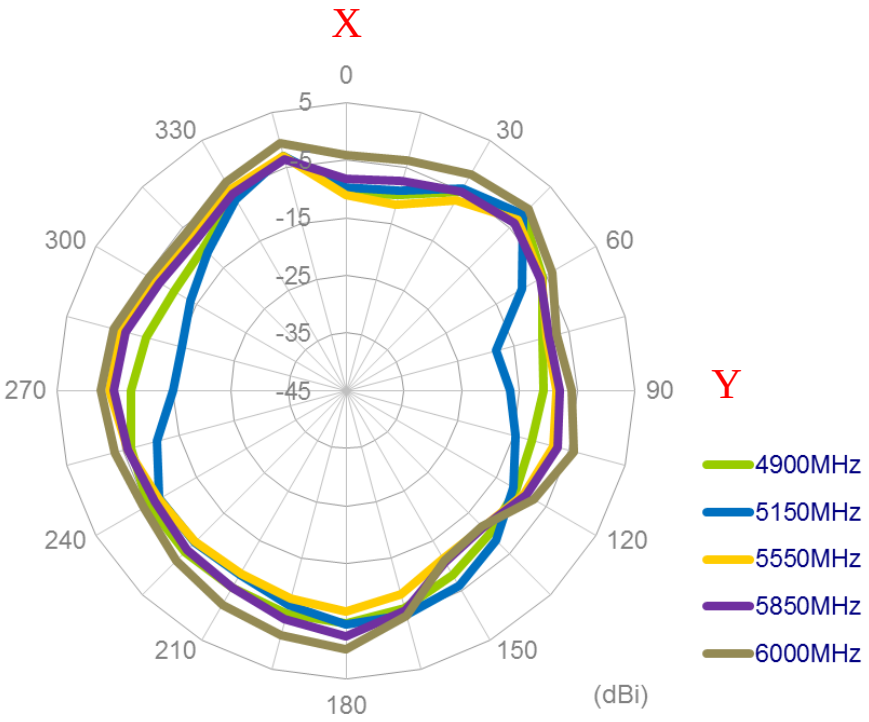




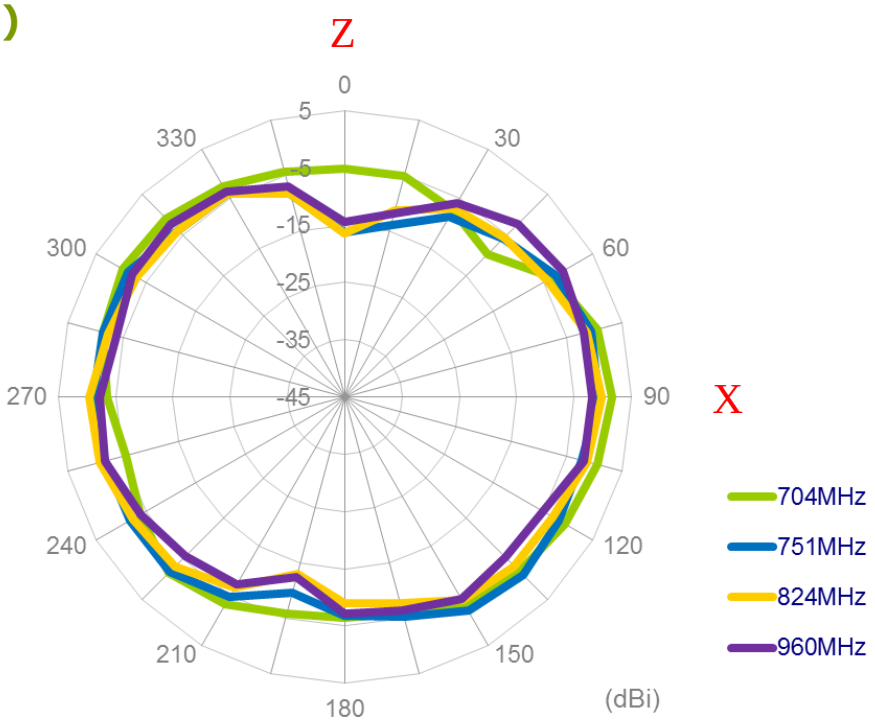

X
0
30
60
90
120
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
Y
(dBi)
1710MHz
1850MHz
1990MHz
2170MHz

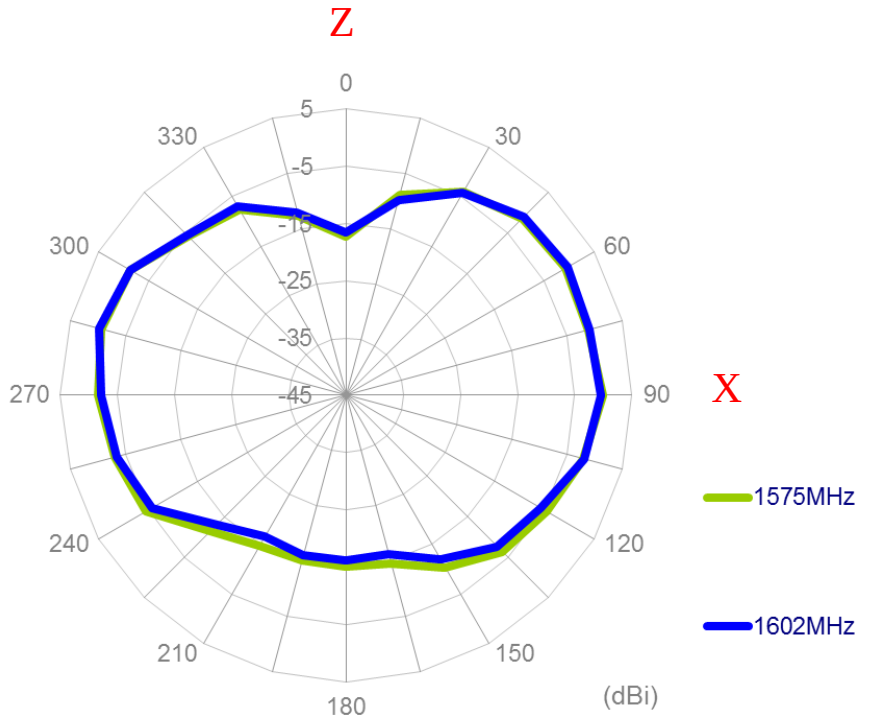

X
0
30
60
90
120
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
Y
(dBi)
2300MHz
2500MHz
2690MHz

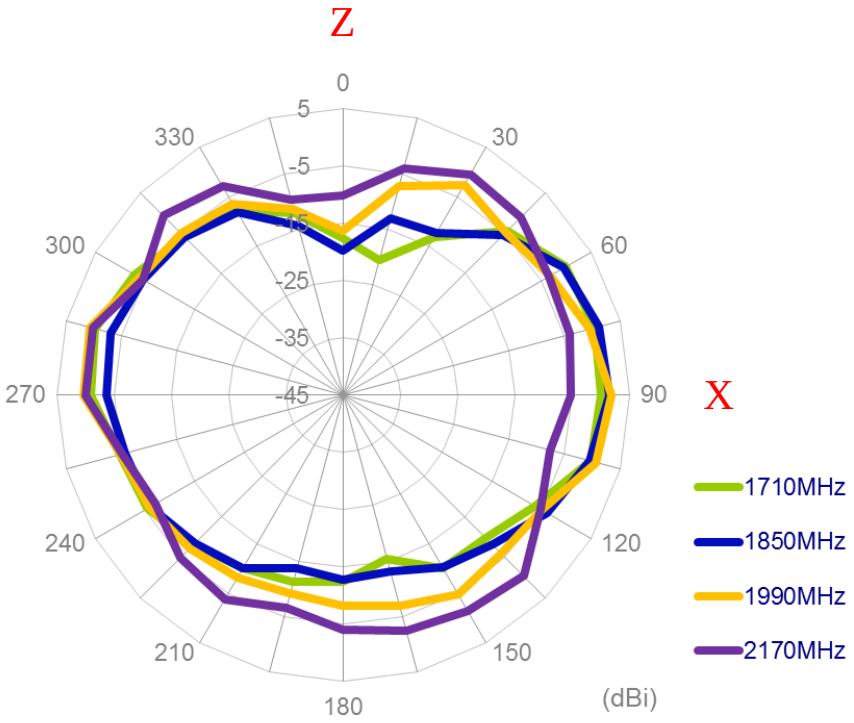

X
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
-50
(dBi)
Y
3300MHz
3400MHz
3500MHz

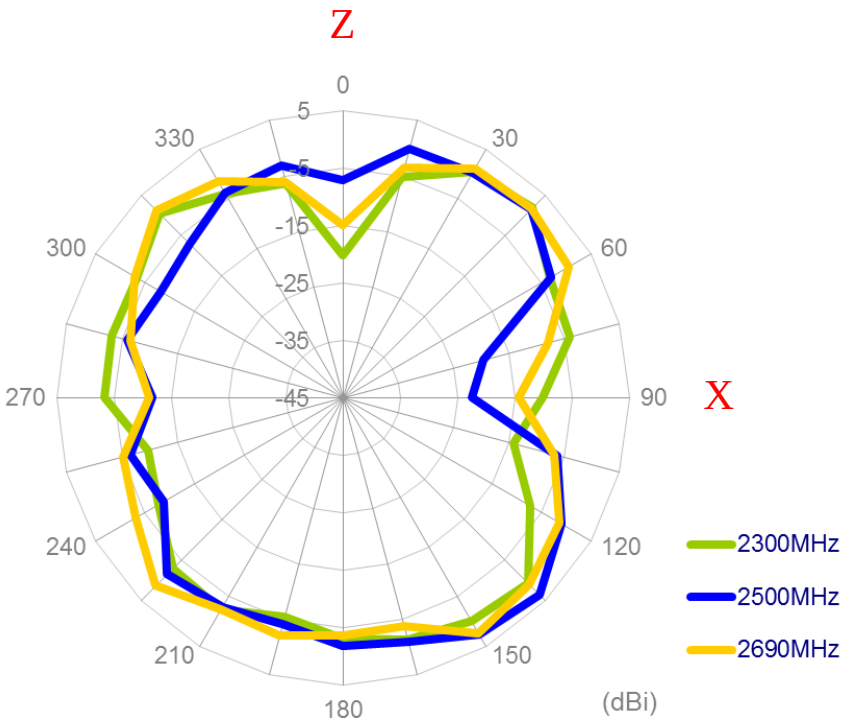

X
0
30
60
90
120
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
(dBi)
Y
4900MHz
5150MHz
5550MHz
5850MHz
6000MHz

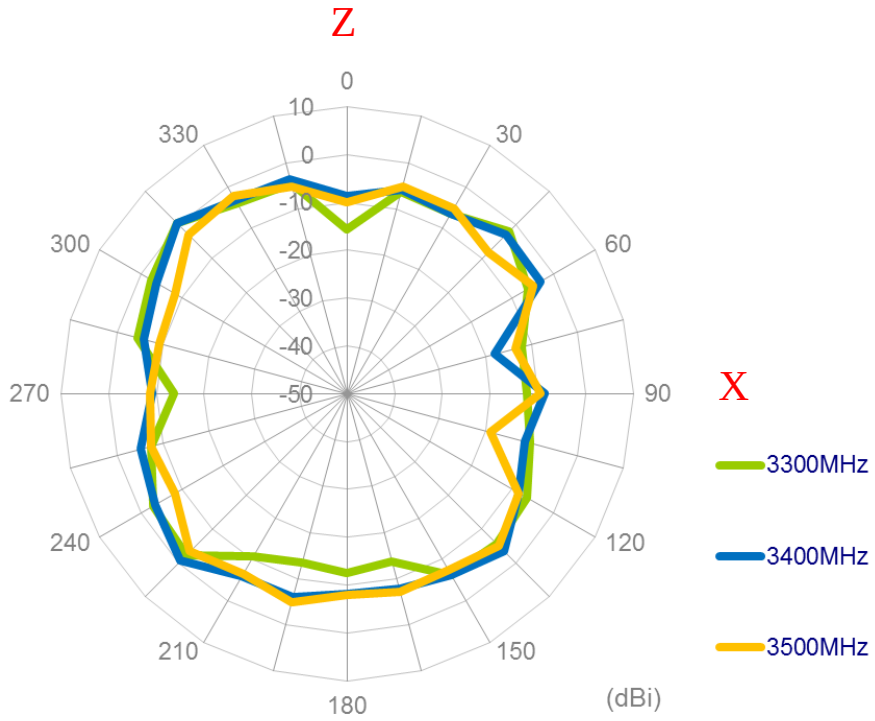
4.5 XZ plane (Antenna with 1 meter cable length on the 2mm ABS base)

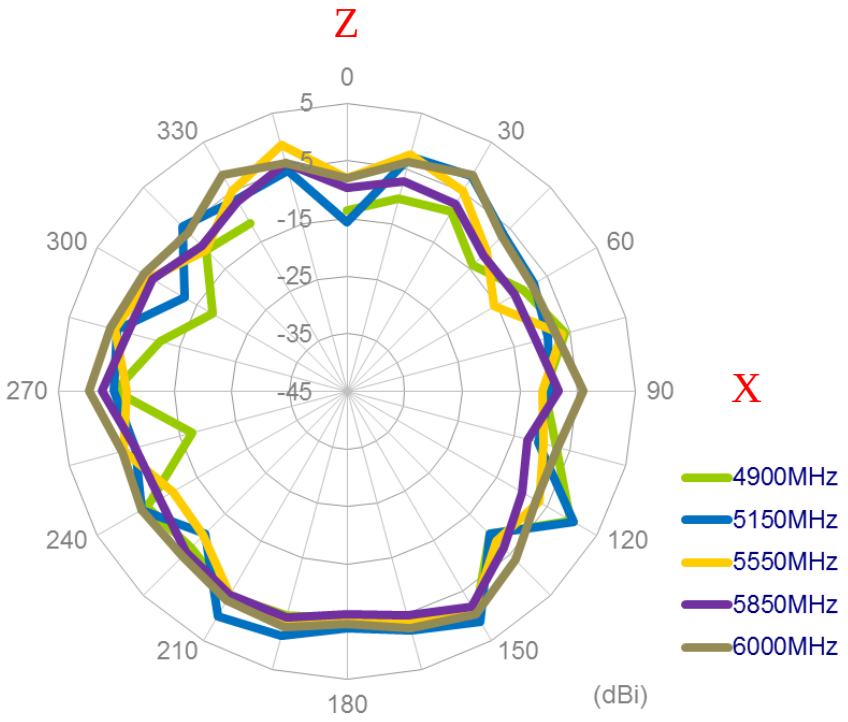




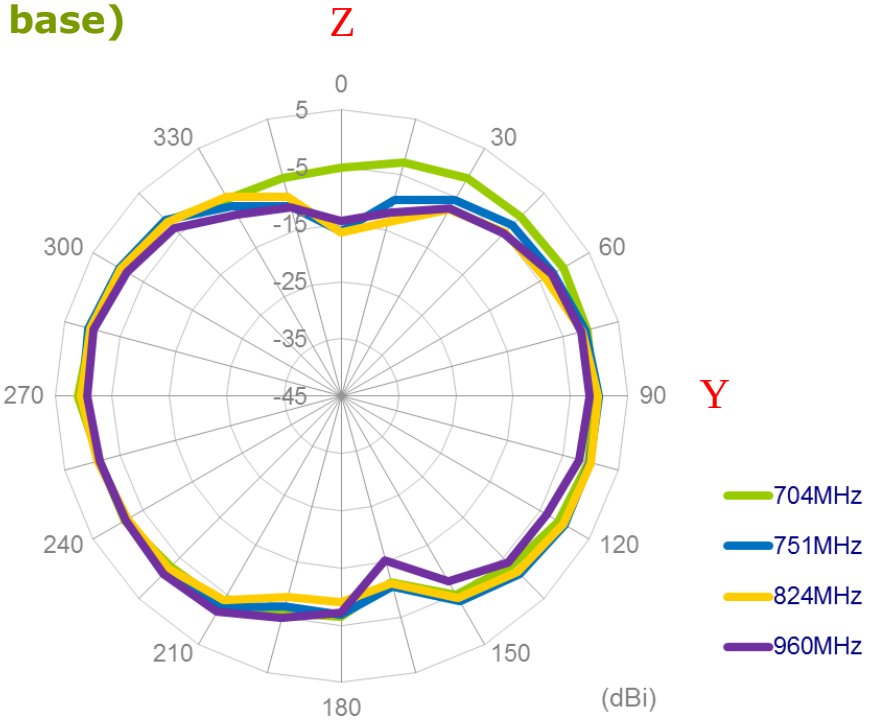

Z
0
30
60
90
120
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
X
(dBi)
1710MHz
1850MHz
1990MHz
2170MHz

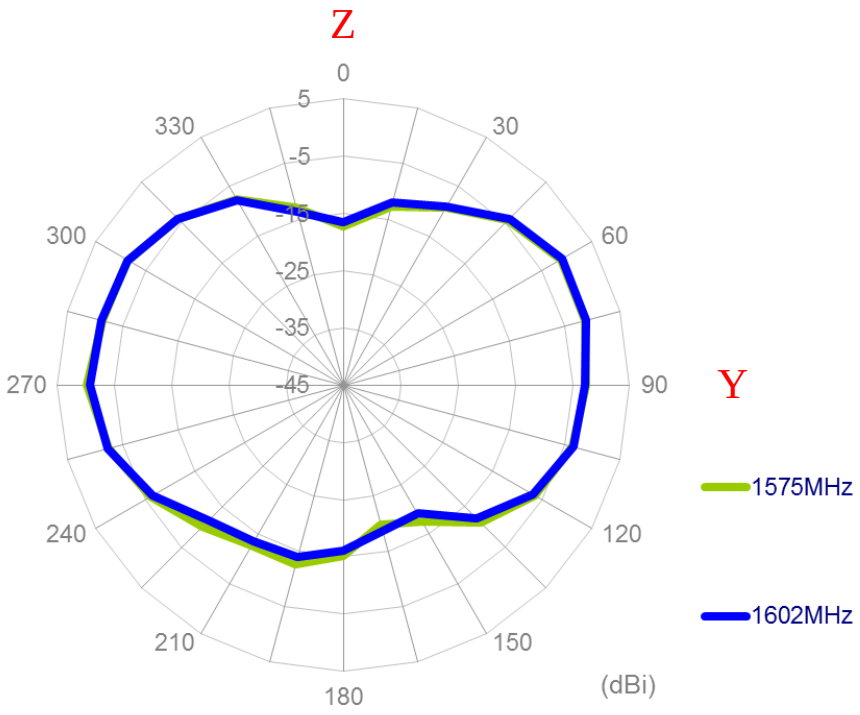

Z
0
30
60
90
120
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
X
(dBi)
2300MHz
2500MHz
2690MHz

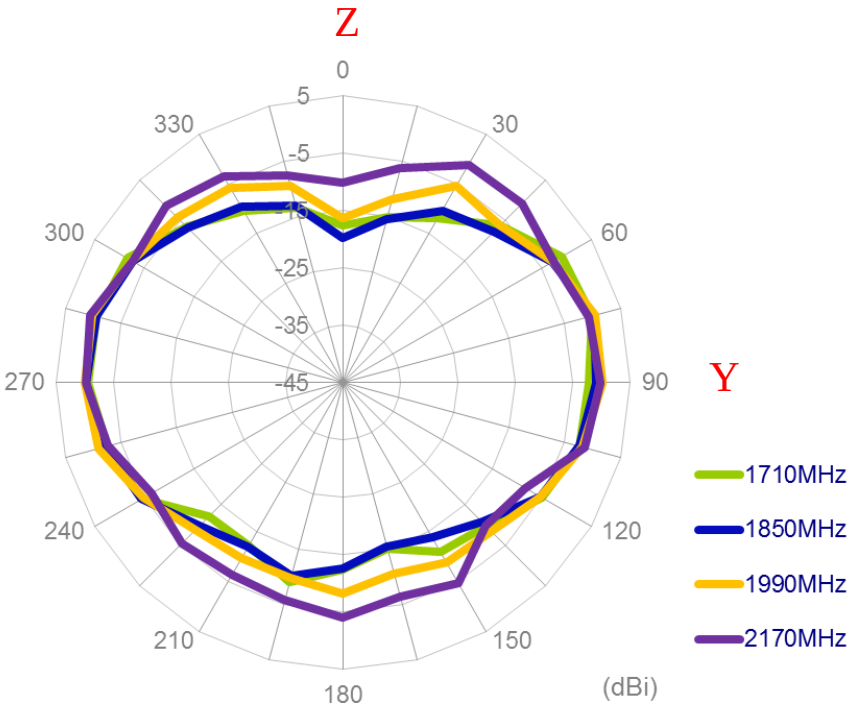

Z
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
-50
X
(dBi)
3300MHz
3400MHz
3500MHz

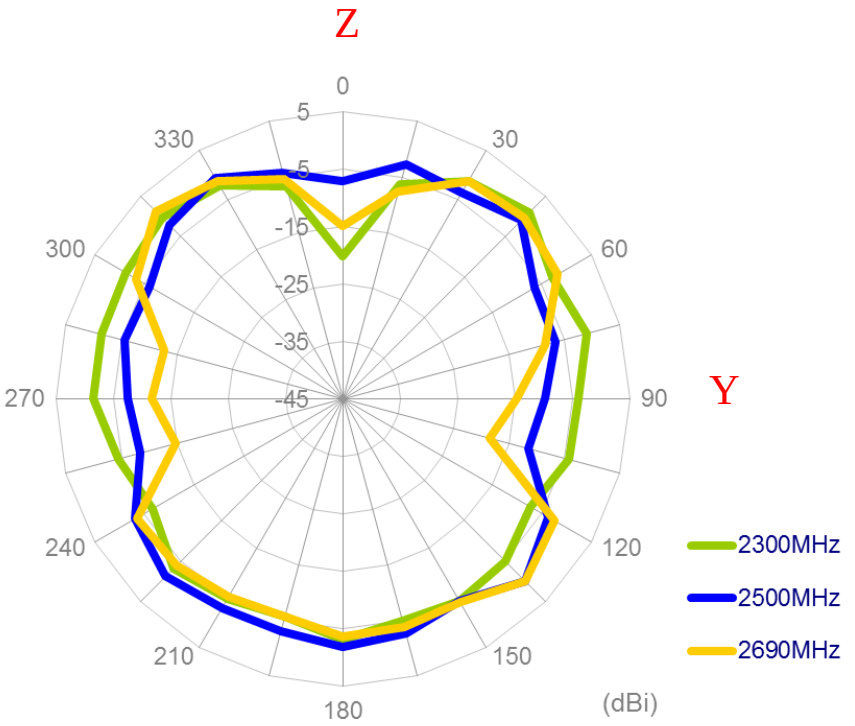

Z
0
30
60
90
120
150
180
210
240
270
300
330
5
-5
-15
-25
-35
-45
X
(dBi)
4900MHz
5150MHz
5550MHz
5850MHz
6000MHz

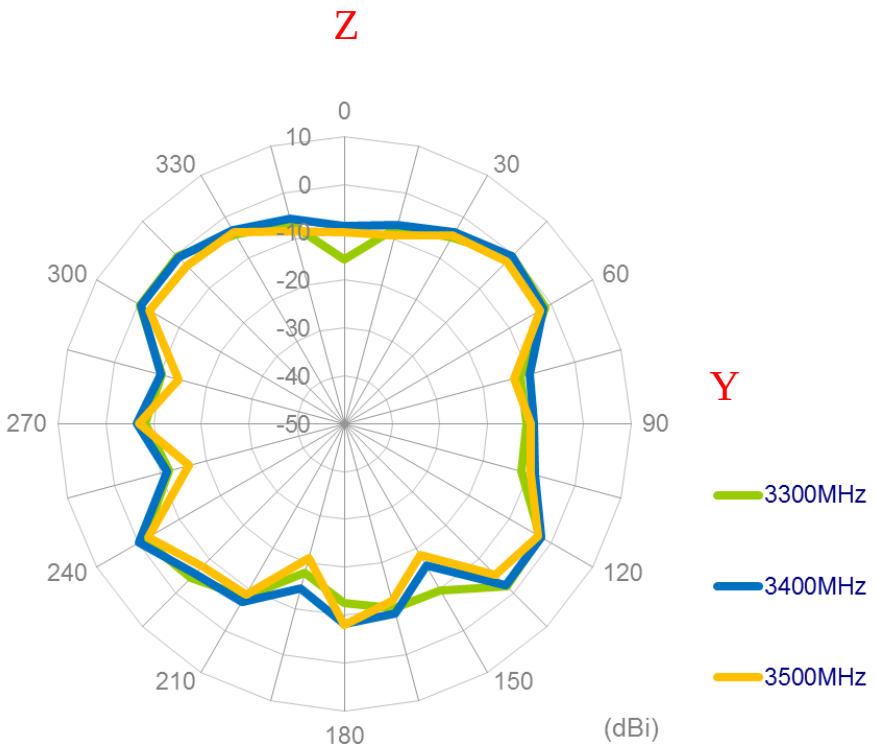
4.6 YZ plane (Antenna with 1 meters cable length on the 2mm ABS base)

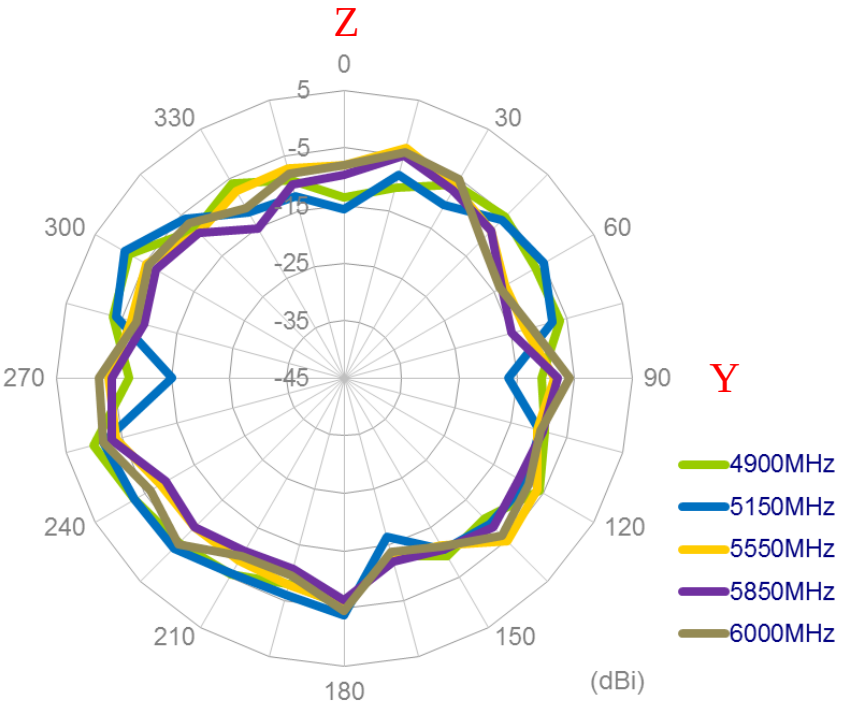




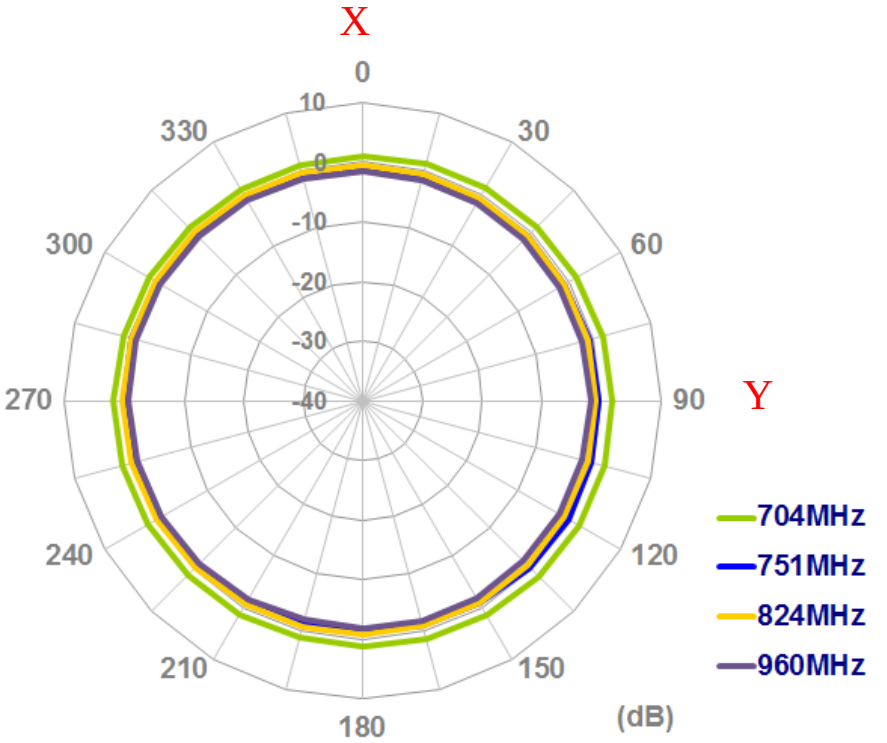

Z
0
5
30
60
90
120
150
180
210
240
270
300
330
-5
-15
-25
-35
-45
Y
(dBi)
1710MHz
1850MHz
1990MHz
2170MHz

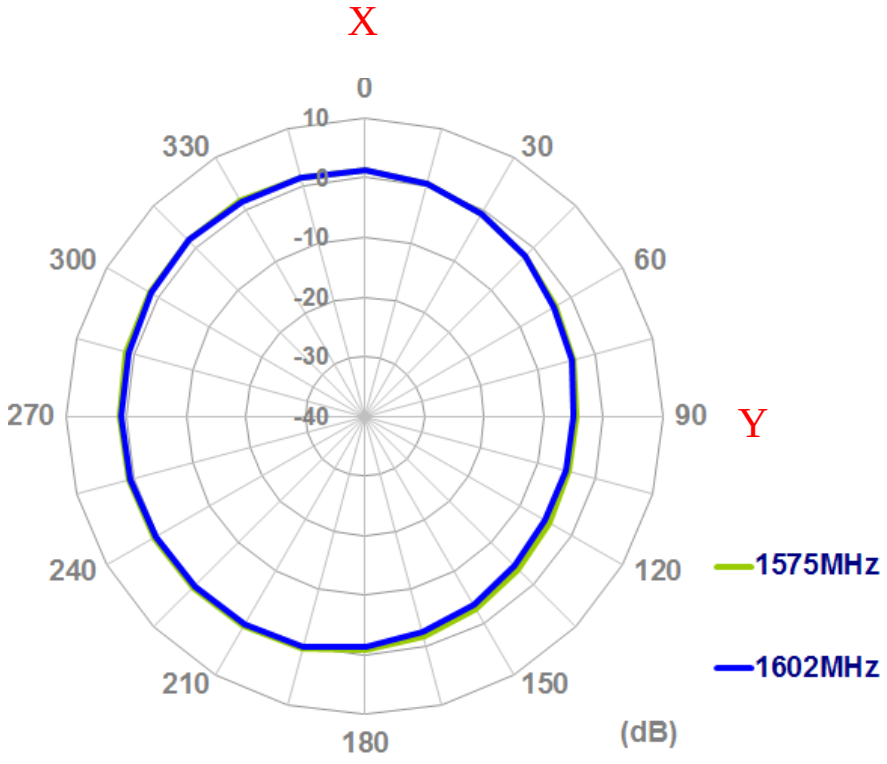

Z
0
5
30
60
90
120
150
180
210
240
270
300
330
-5
-15
-25
-35
-45
Y
(dBi)
2300MHz
2500MHz
2690MHz

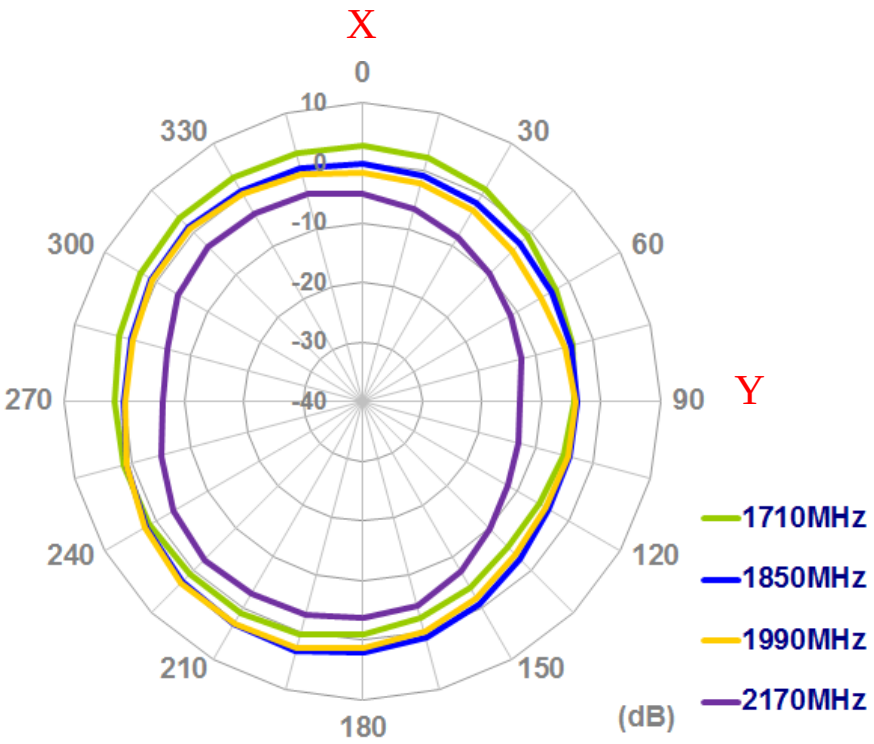

Z
0
10
0
-10
-20
-30
-40
-50
30
60
90
120
150
180
210
240
270
300
330
Y
3300MHz
3400MHz
3500MHz
(dBi)

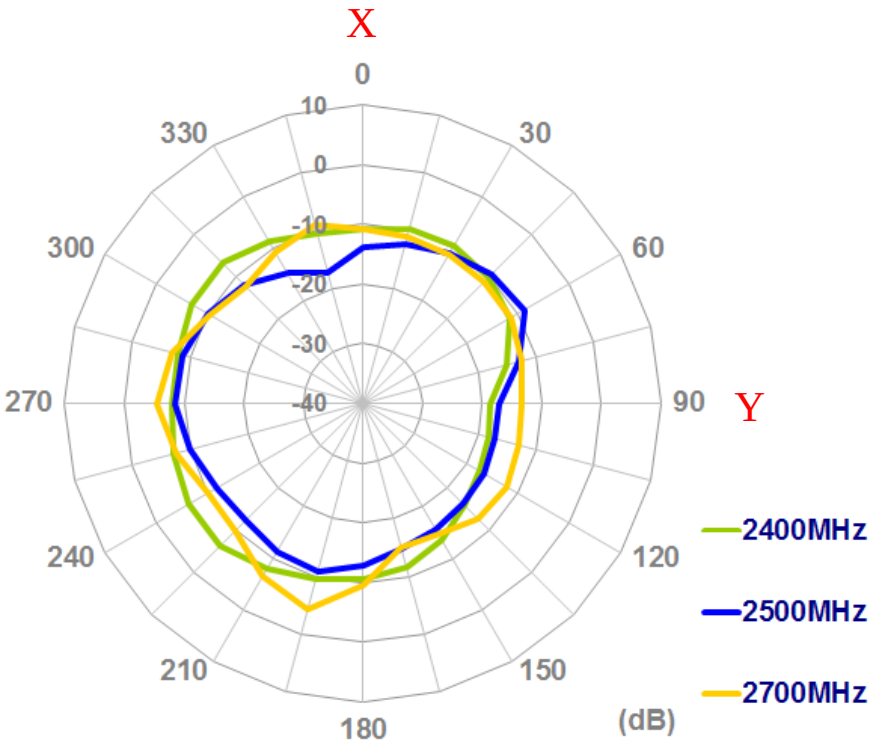

Z
0
5
-5
-15
-25
-35
-45
30
60
90
120
150
180
210
240
270
300
330
Y
4900MHz
5150MHz
5550MHz
5850MHz
6000MHz
(dBi)

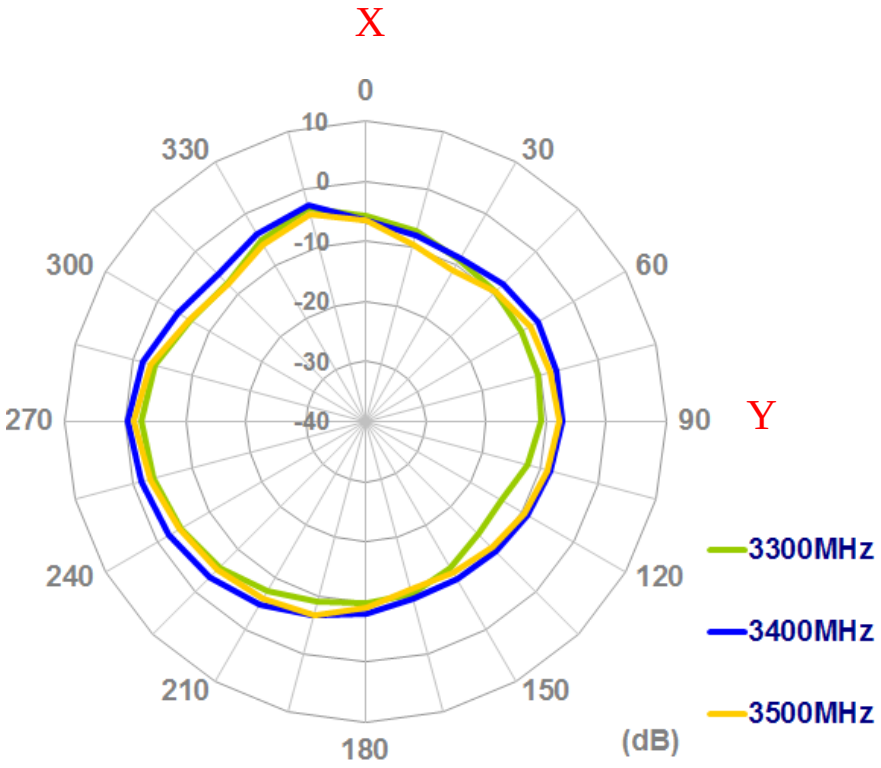
4.7 XY plane (Antenna with 1 meter cable length on the glass base)

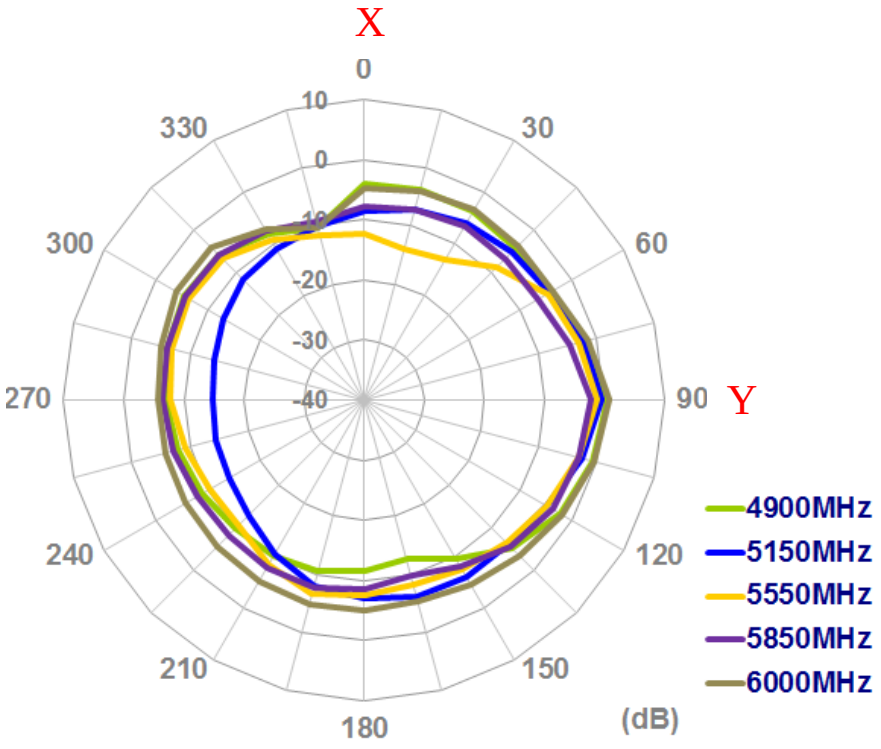




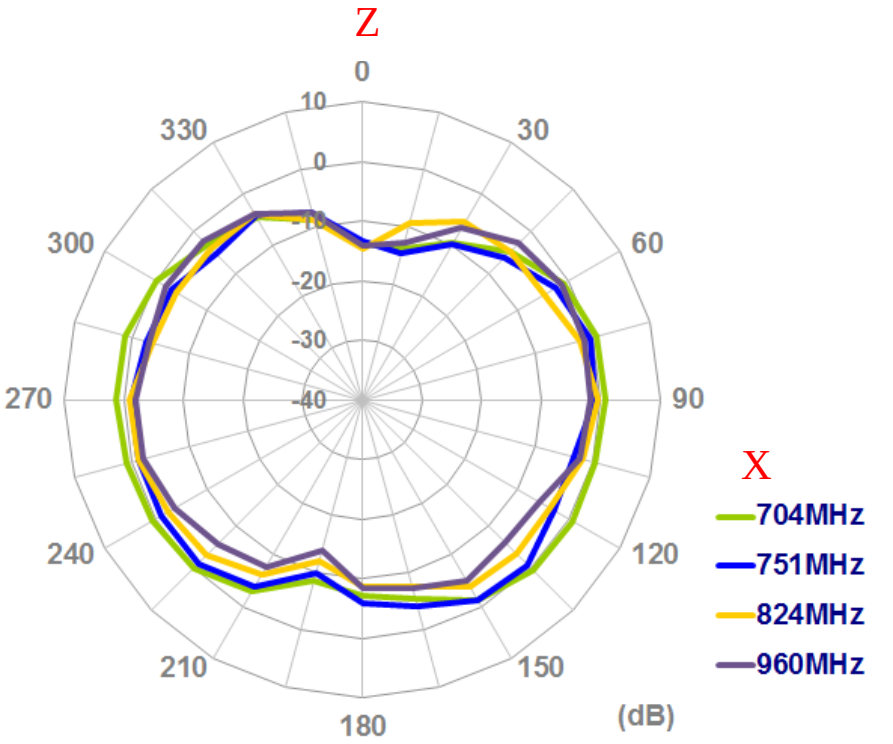

X
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
Y
(dB)
1710MHz
1850MHz
1990MHz
2170MHz

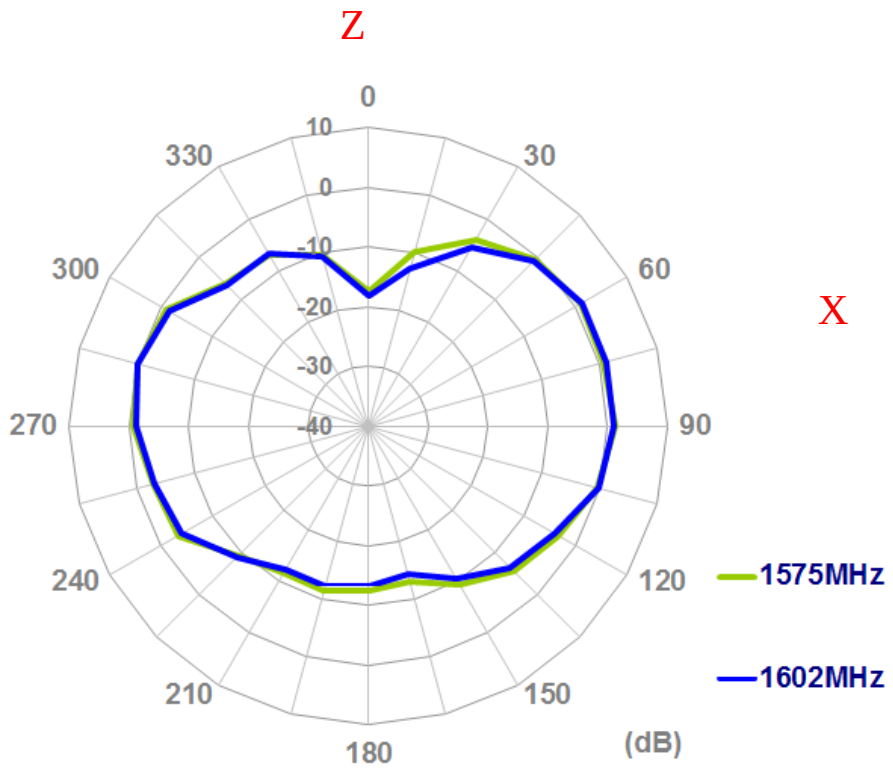

X
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
Y
(dB)
2400MHz
2500MHz
2700MHz

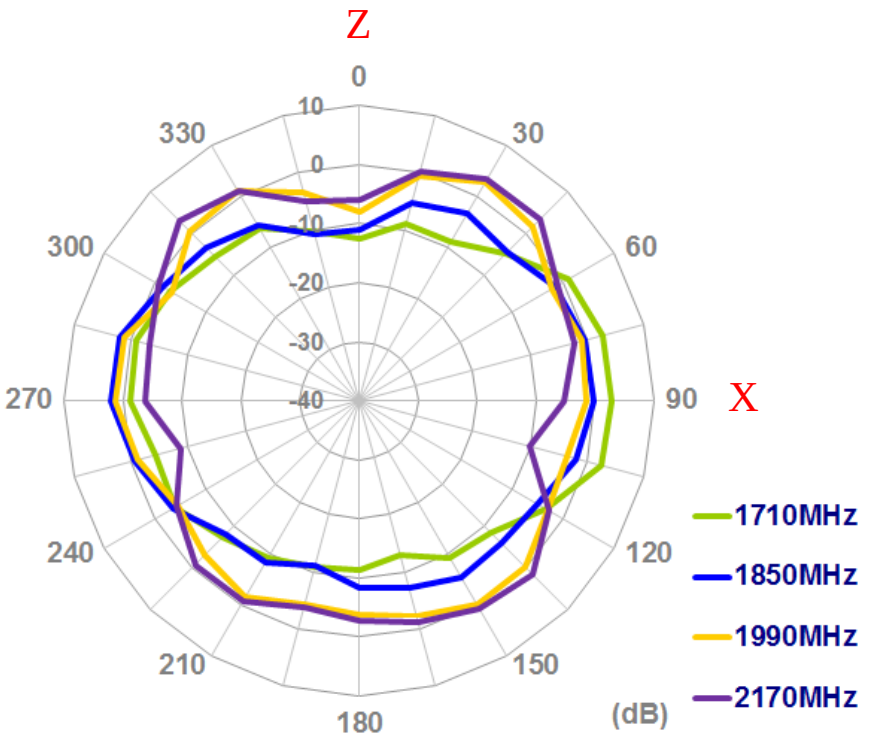

X
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
Y
(dB)
3300MHz
3400MHz
3500MHz

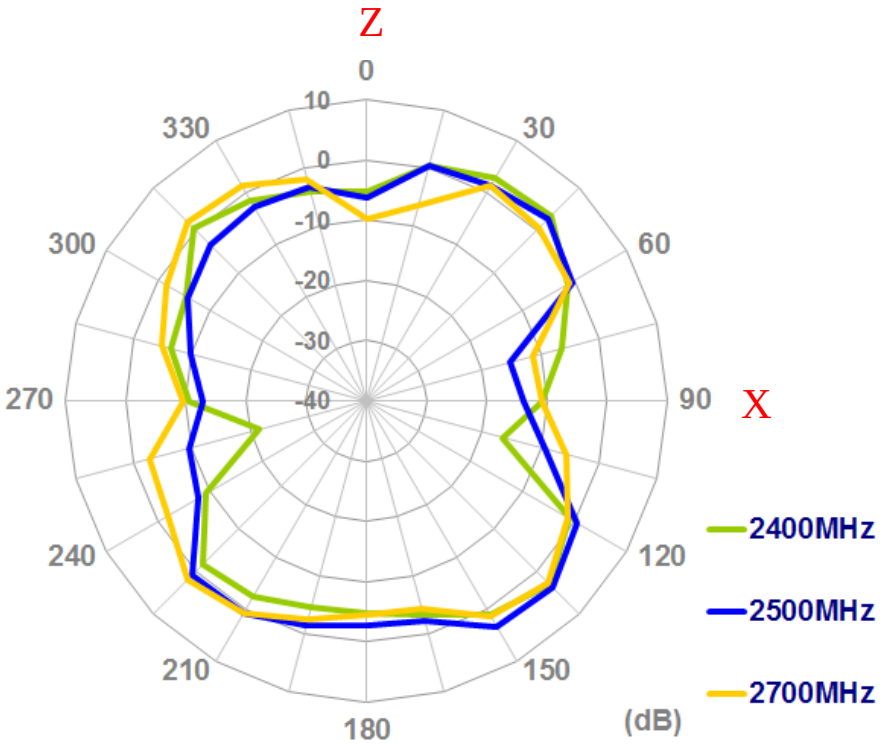

X
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-20
-30
-40
Y
(dB)
4900MHz
5150MHz
5550MHz
5850MHz
6000MHz

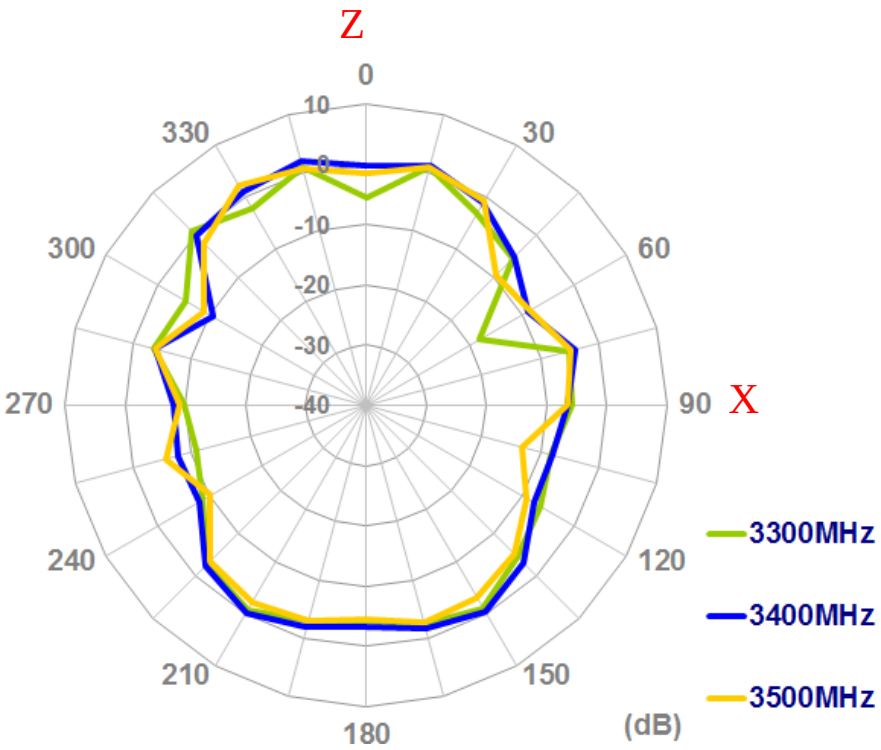
4.7 XZ plane (Antenna with 1 meter cable length on the glass base)

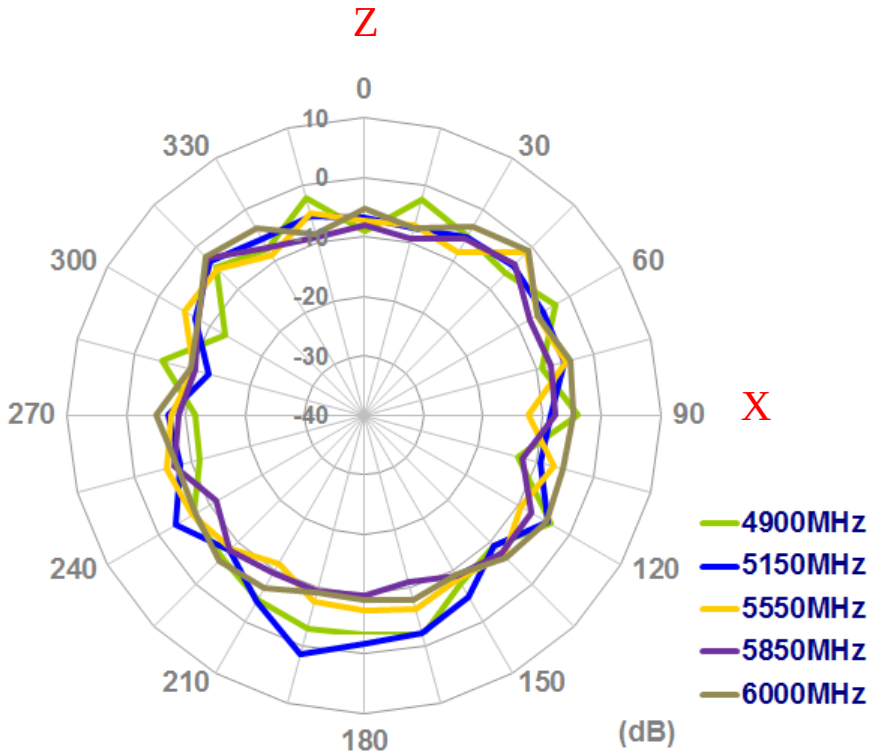




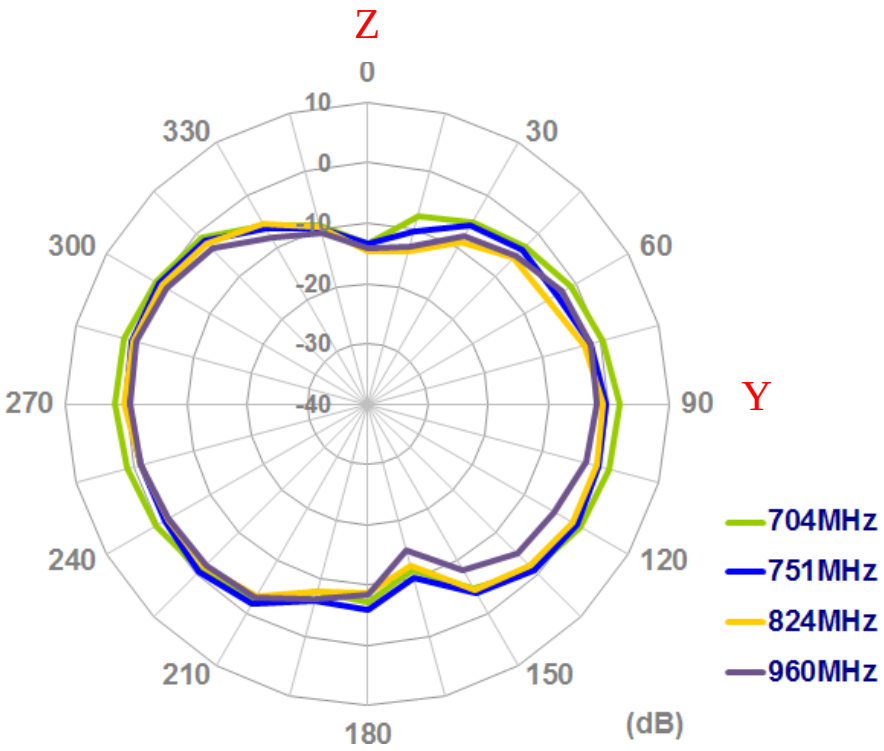

Z
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
X
(dB)
1710MHz
1850MHz
1990MHz
2170MHz

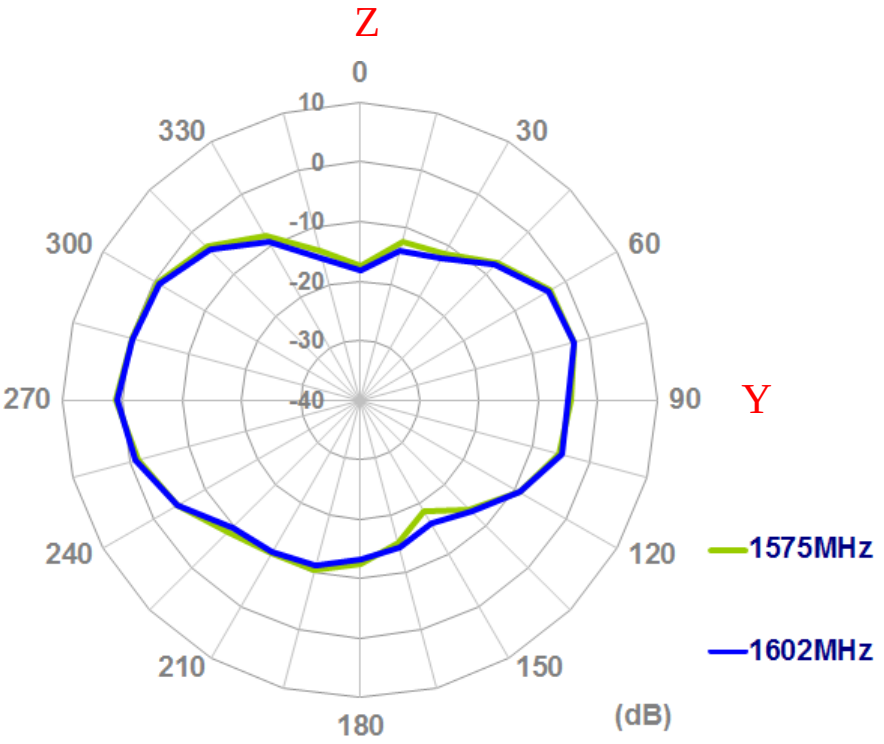

Z
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
X
(dB)
2400MHz
2500MHz
2700MHz

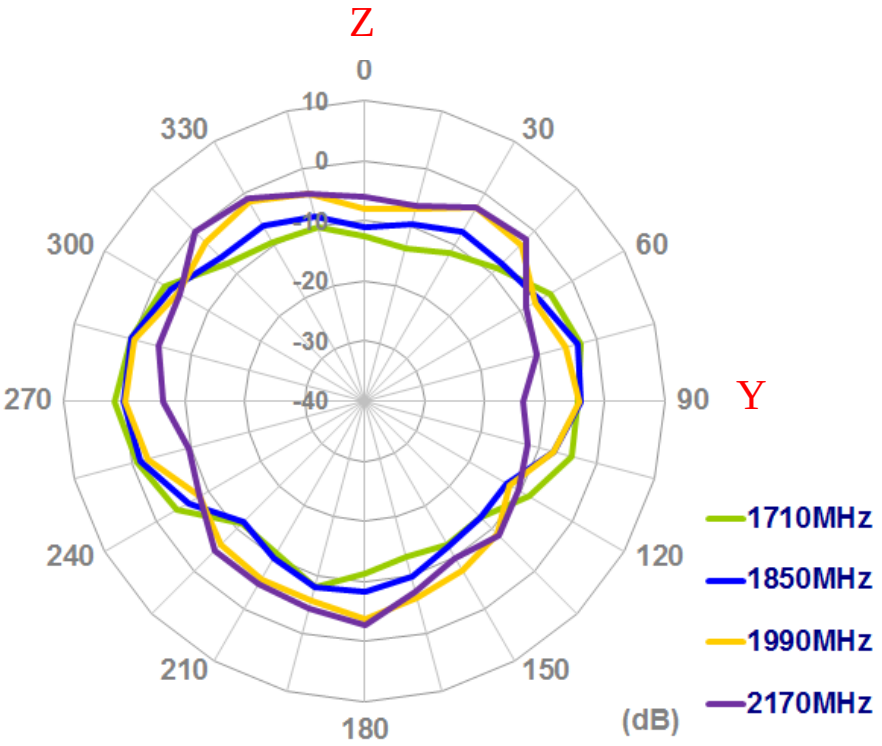

Z
0
10
30
330
60
300
-10
-20
-30
270
-40
90
X
240
120
210
150
180
(dB)
3300MHz
3400MHz
3500MHz

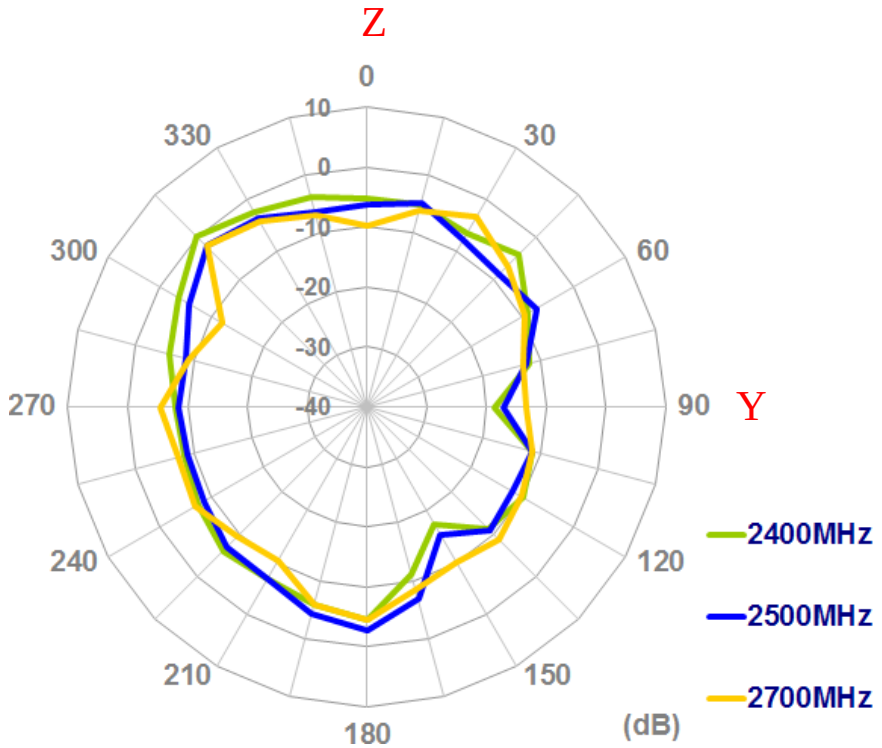

Z
0
10
30
330
0
60
300
-20
-30
270
-40
90
X
240
120
210
150
180
(dB)
4900MHz
5150MHz
5550MHz
5850MHz
6000MHz

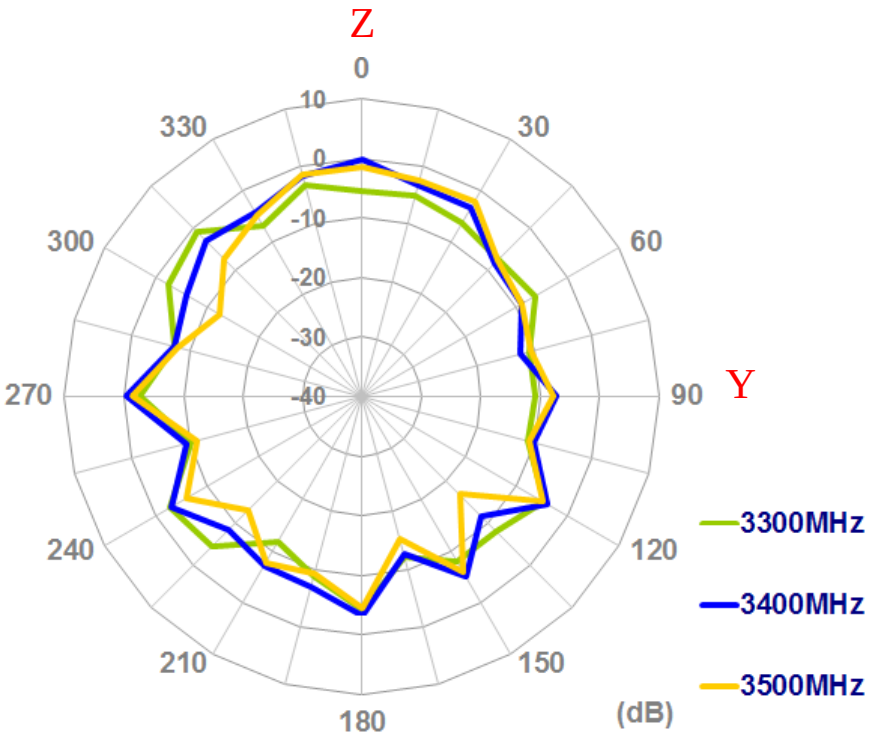
4.8 YZ plane (Antenna with 1 meters cable length on the glass base)

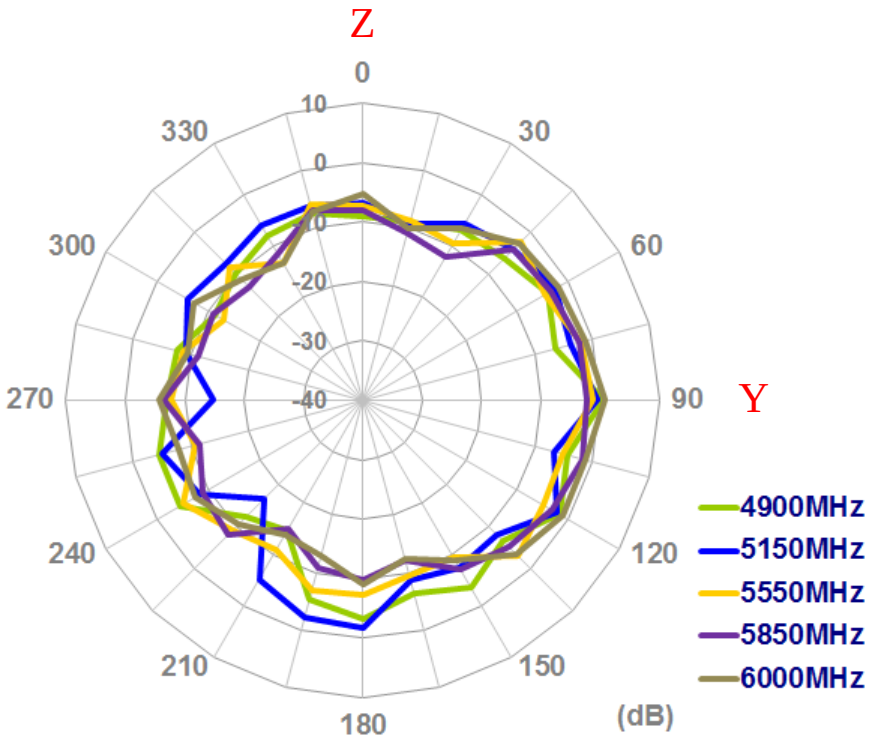




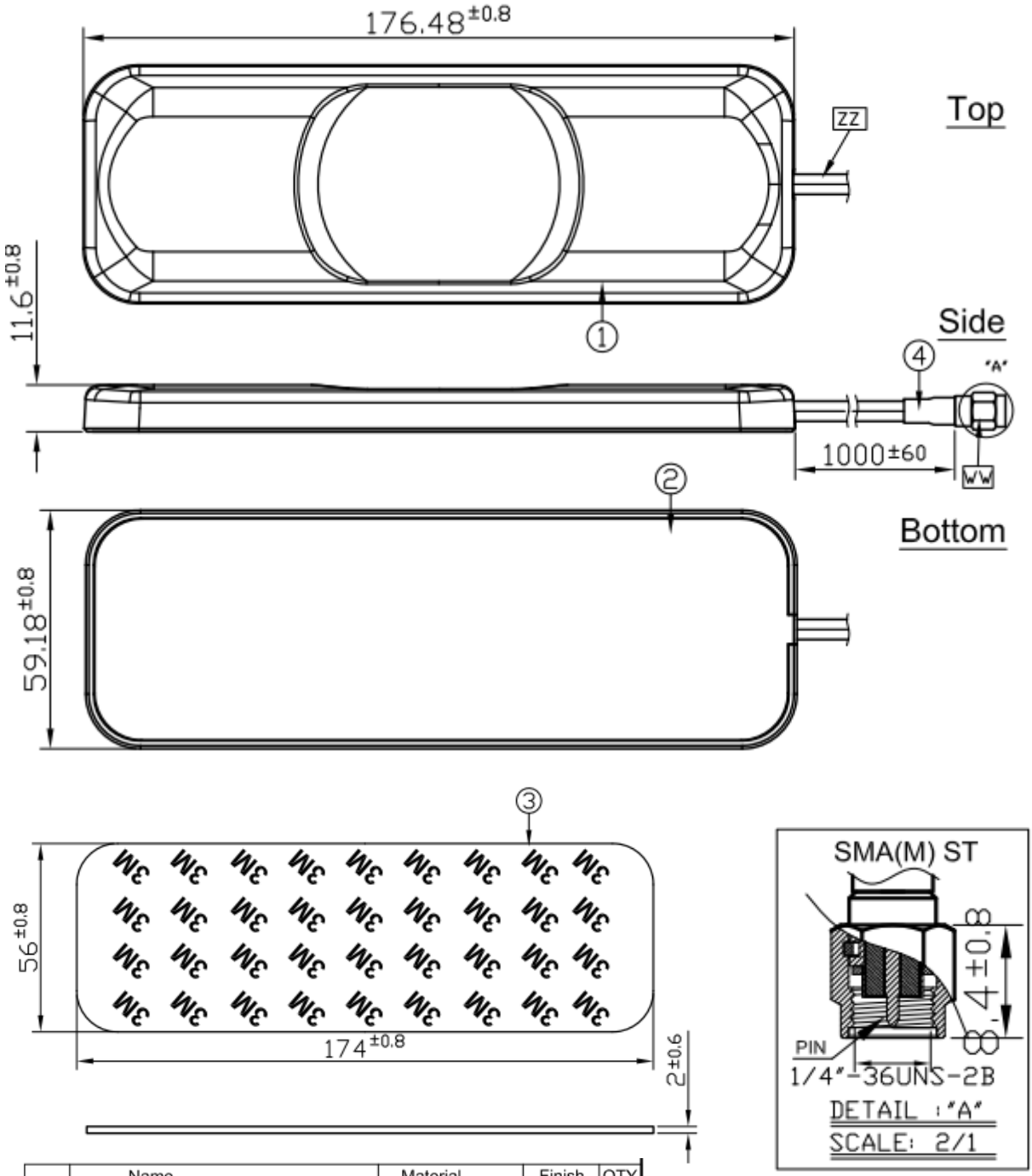

Z
0
30
60
90
Y
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
(dB)
1710MHz
1850MHz
1990MHz
2170MHz


Z
0
30
60
90
Y
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
(dB)
2400MHz
2500MHz
2700MHz


Z
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
Y
(dB)
3300MHz
3400MHz
3500MHz


Z
0
30
60
90
120
150
180
210
240
270
300
330
10
0
-10
-20
-30
-40
Y
(dB)
4900MHz
5150MHz
5550MHz
5850MHz
6000MHz

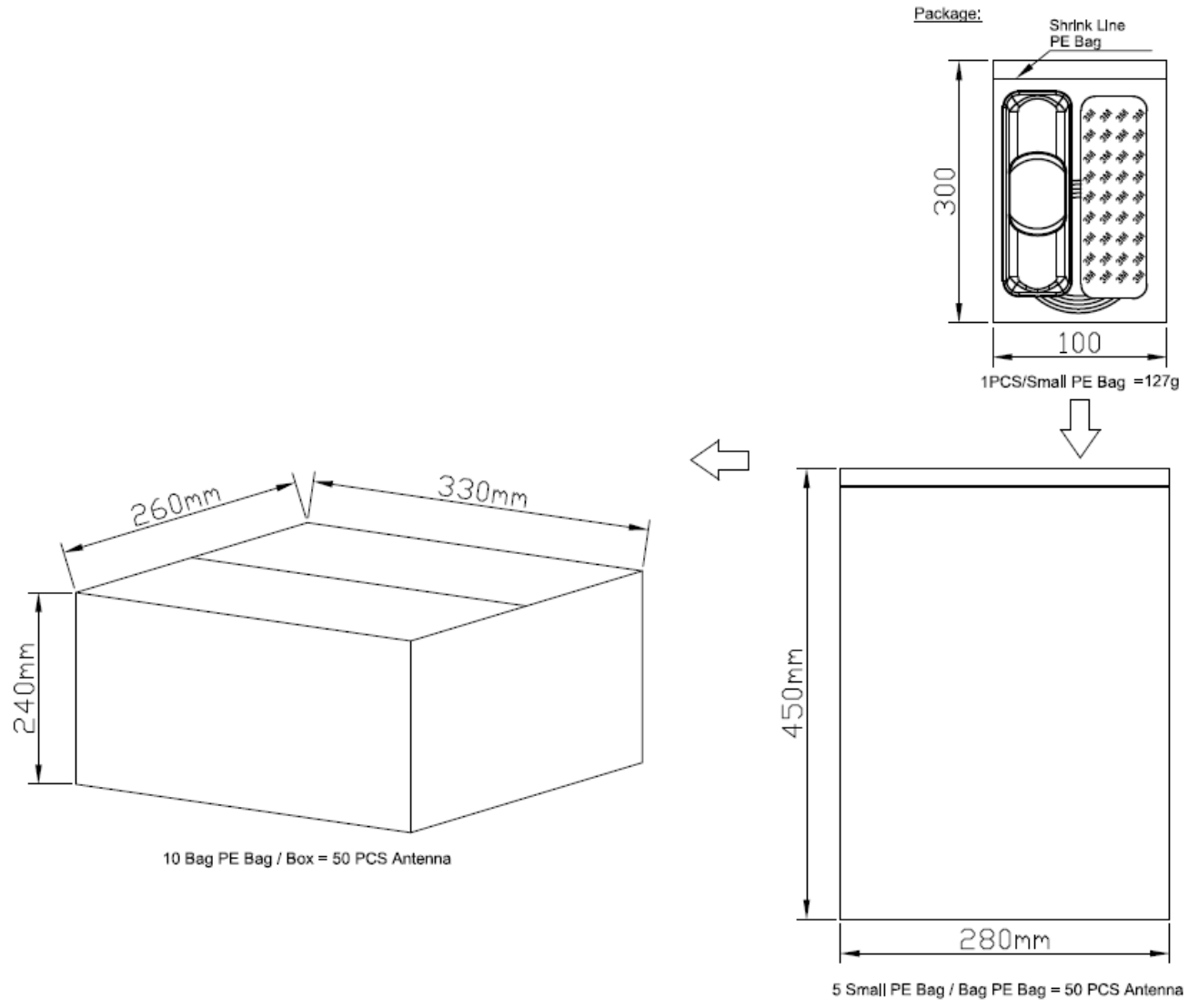
5. DRAWING



	Name	Material	Finish	QTY
1	Housing Top GSA8841	ABS	Black	1
2	Housing Bottom GSA8841	ABS	Black	1
3	3M Double Sided Adhesive With Foam	3M9448+CR4305	Black	1
4	Heat Shrink Tube (CFD 200)	PE	Black	1

	Name	Spec	Finish	QTY
WW	Connector Type	SMA(M) ST	Gold	1
ZZ	Cable Type	NFC 200	Black	1

6. Packaging


Package:
Shrink Line
PE Bag
300
100
1PCS/Small PE Bag =127g
260mm
330mm
240mm
10 Bag PE Bag / Box = 50 PCS Antenna
450mm
280mm
5 Small PE Bag / Bag PE Bag = 50 PCS Antenna

7. Application Note

The GSA.8841 antenna measurement with difference cable length and difference environments, the performance is shown as below,

7.1 Return loss(in free space)

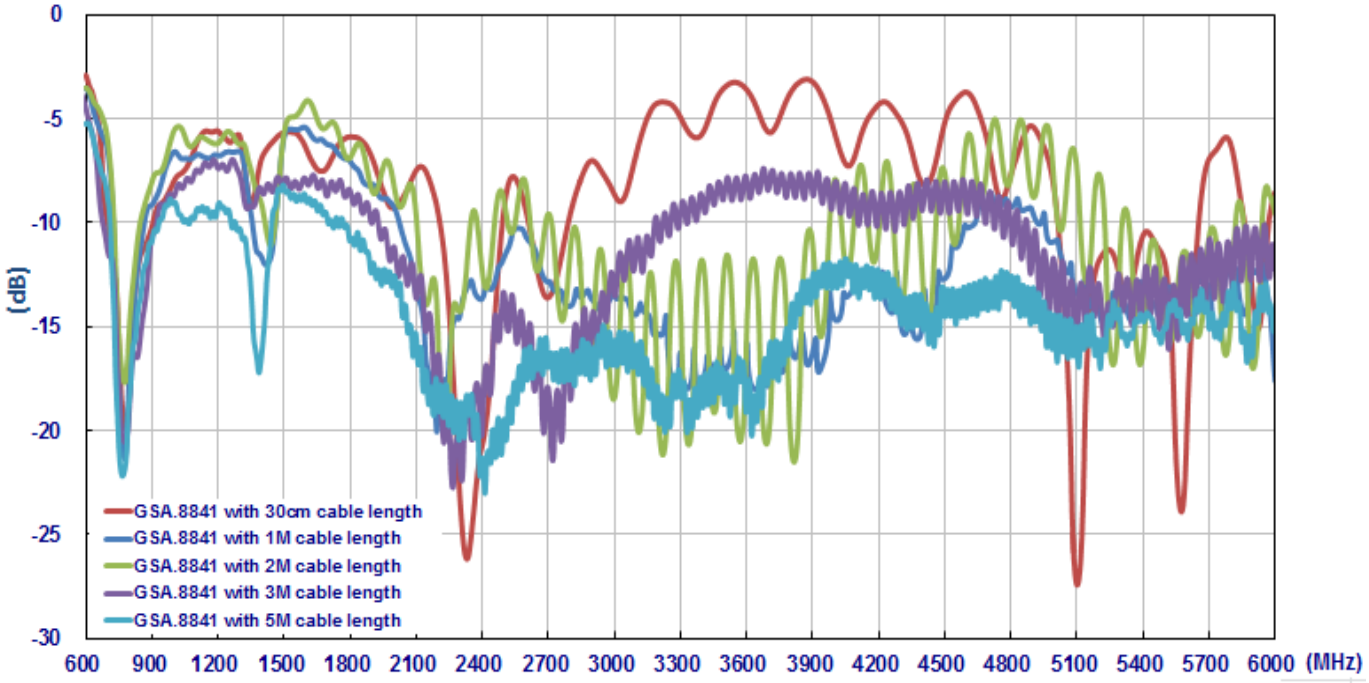


Figure 15. Measured the return loss of GSA.8841 Antenna with difference cable length

7.2 Efficiency (in free space)

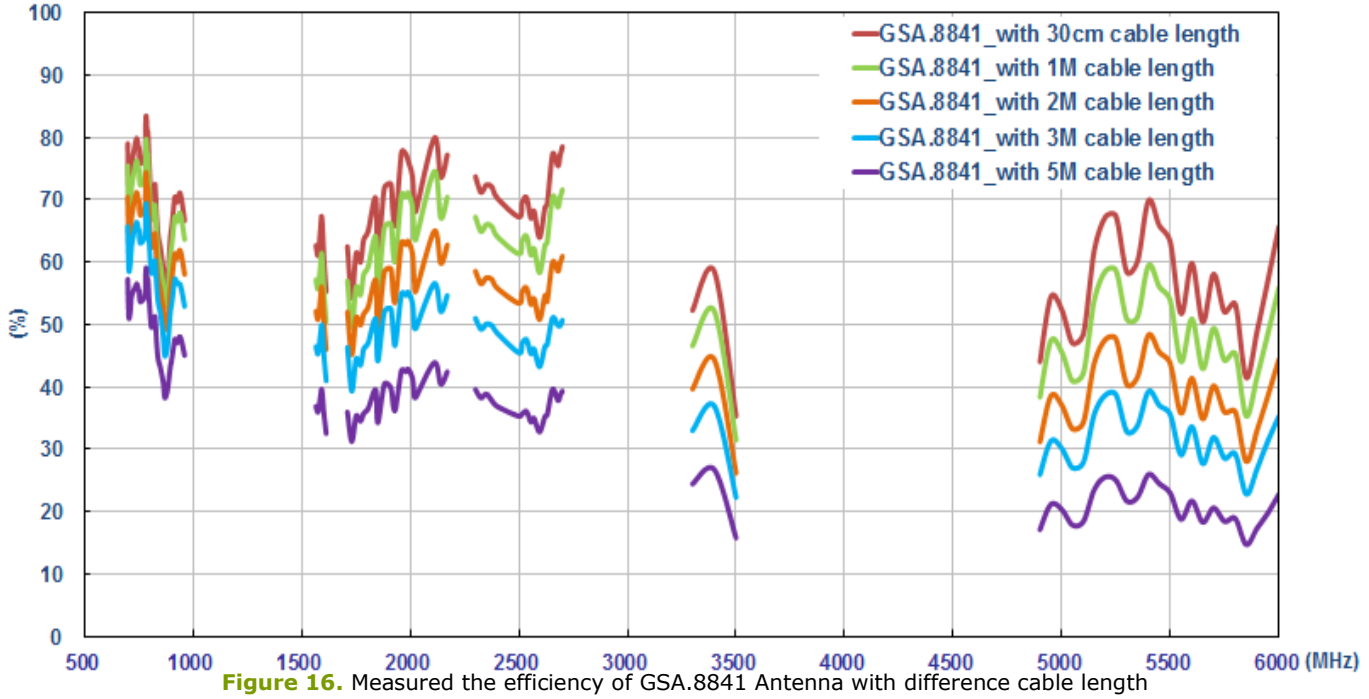


Figure 16. Measured the efficiency of GSA.8841 Antenna with difference cable length

7.3 Average Gain (in free space)

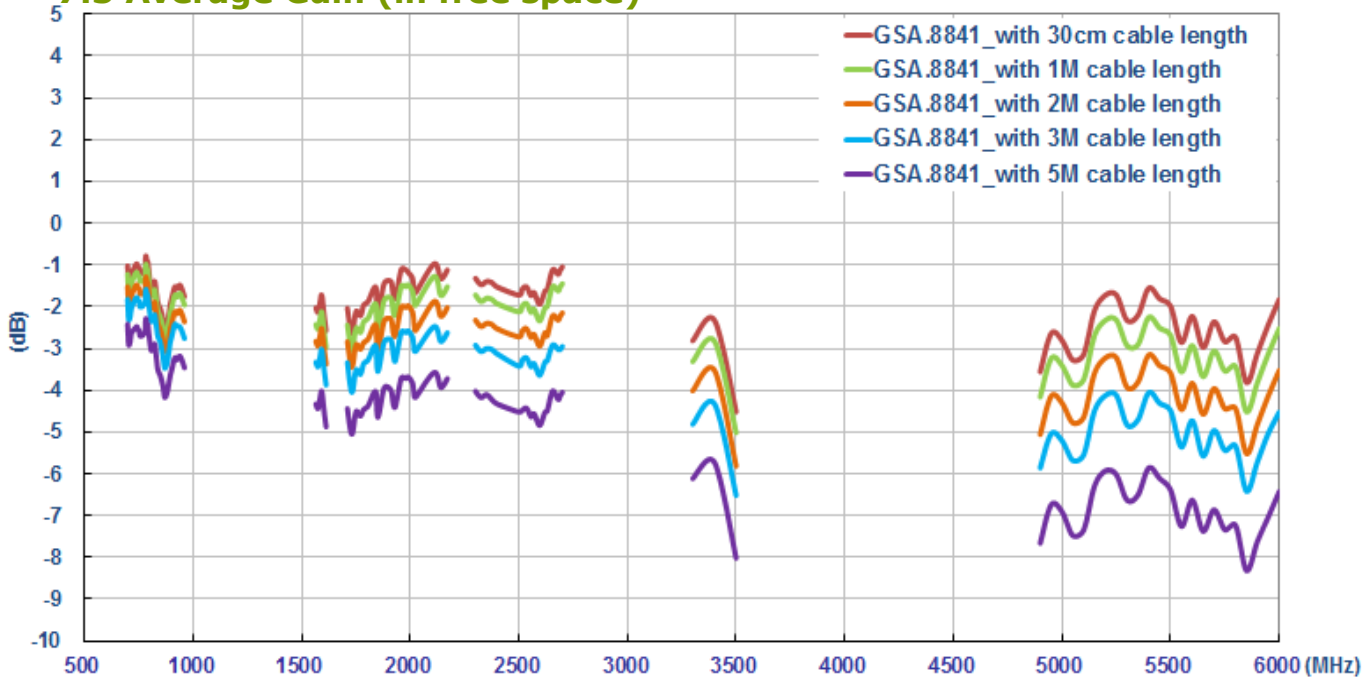


Figure 17. Measured the Average Gain of GSA.8841 Antenna with difference cable length

7.4 Peak Gain (in free space)

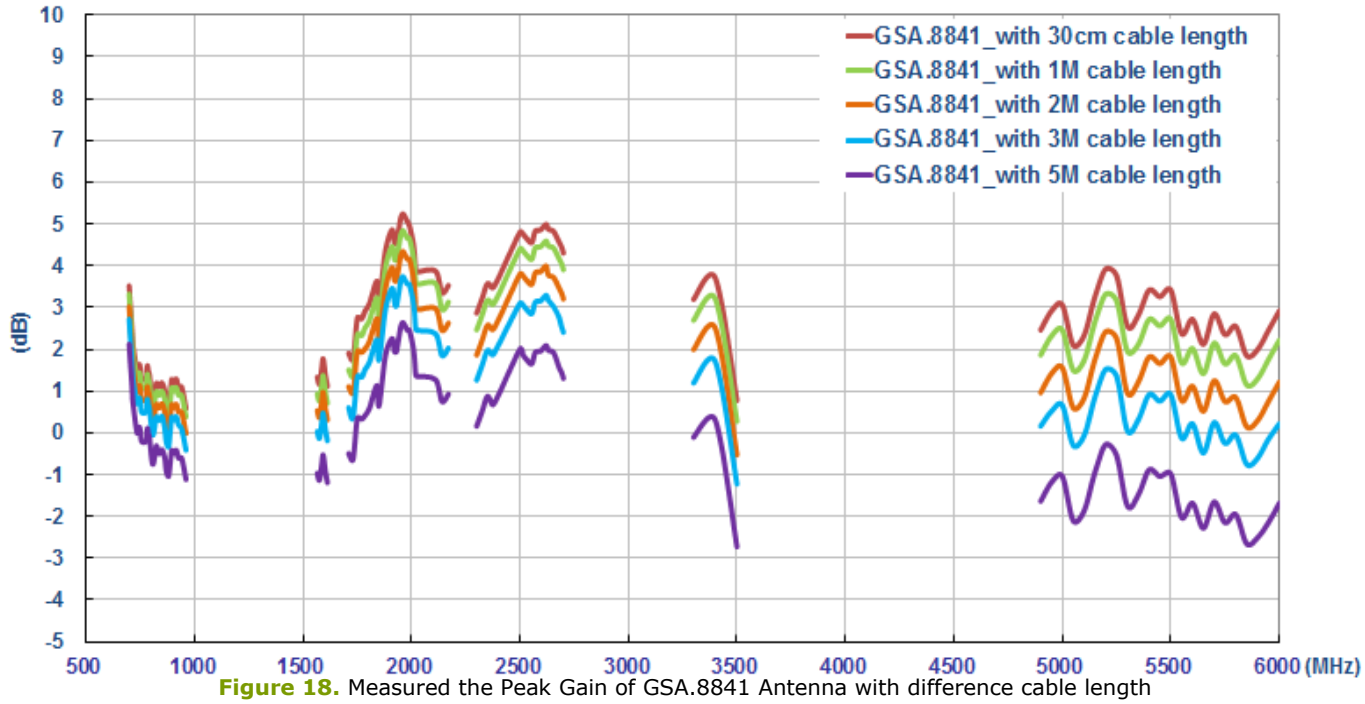


Figure 18. Measured the Peak Gain of GSA.8841 Antenna with difference cable length

7.5 Return loss (on the 2mm ABS base)

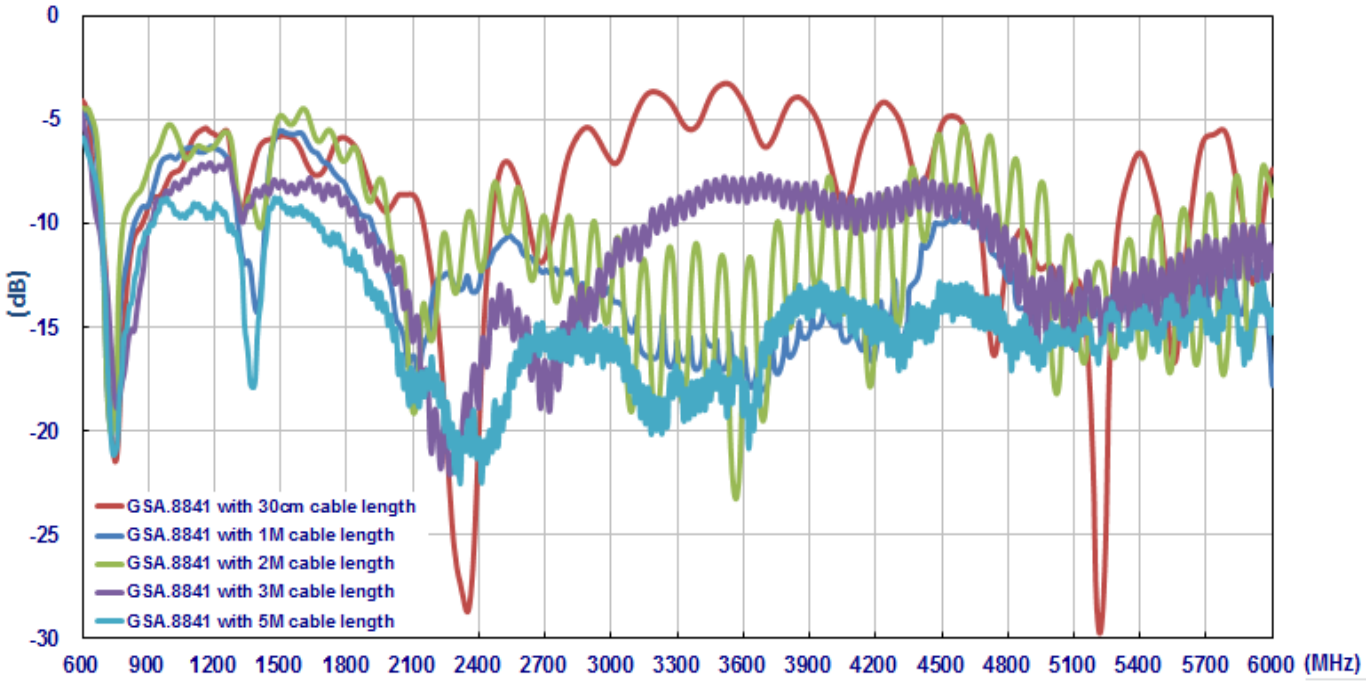


Figure 19. Measured the return loss of GSA.8841 Antenna with difference cable length

7.6 Efficiency (on the 2mm ABS base)

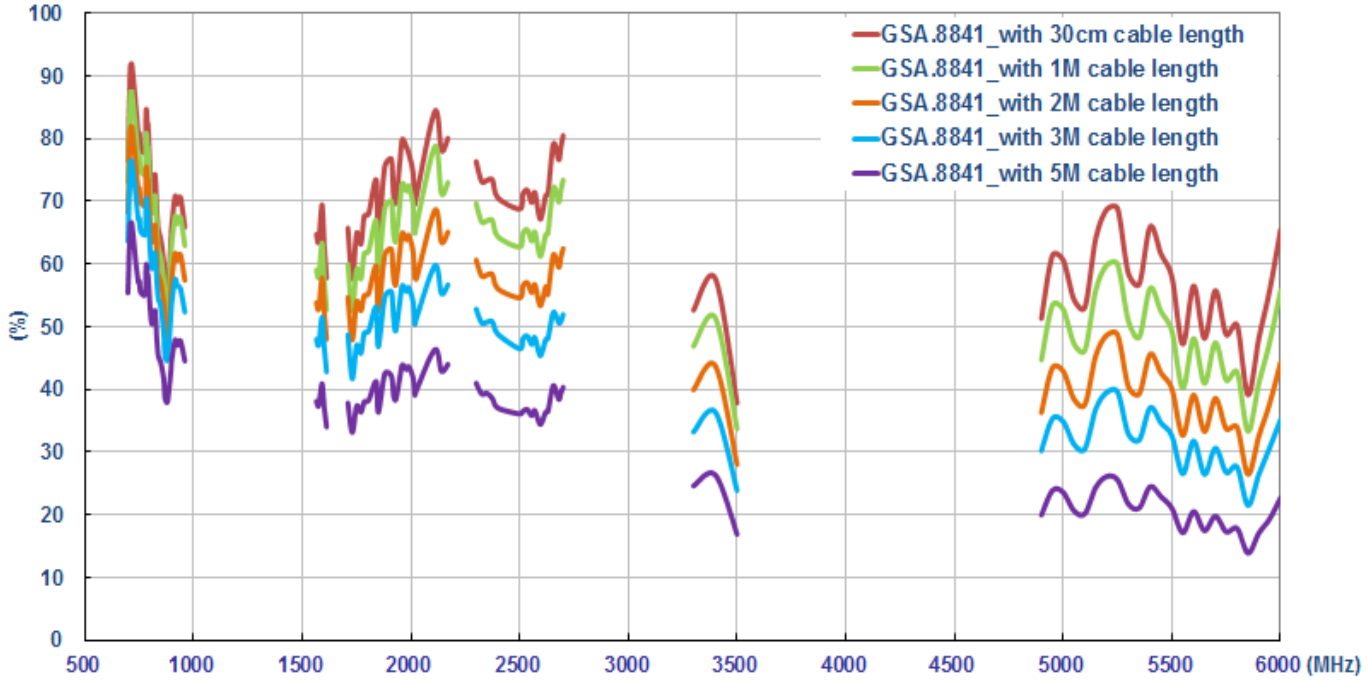


Figure 20. Measured the efficiency of GSA.8841 Antenna with difference cable length

7.7 Average Gain (on the 2mm ABS base)

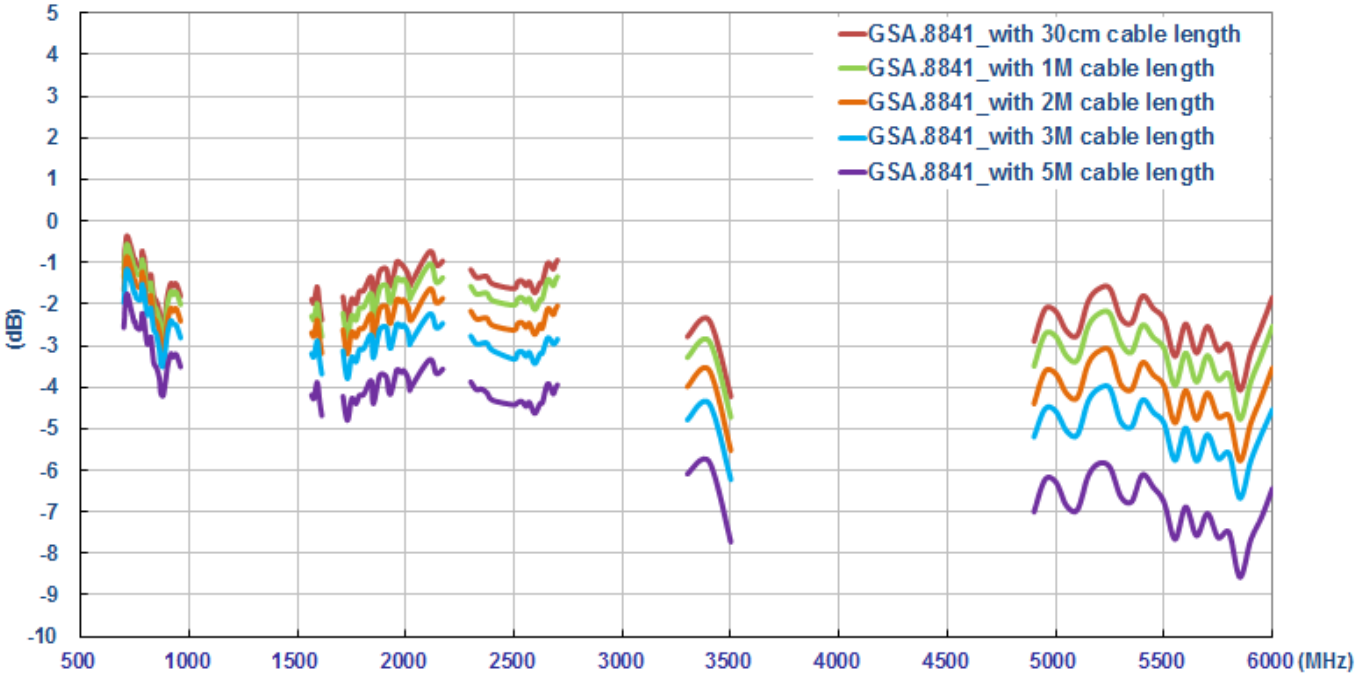


Figure 21. Measured the Average Gain of GSA.8841 Antenna with difference cable length

7.8 Peak Gain (on the 2mm ABS base)

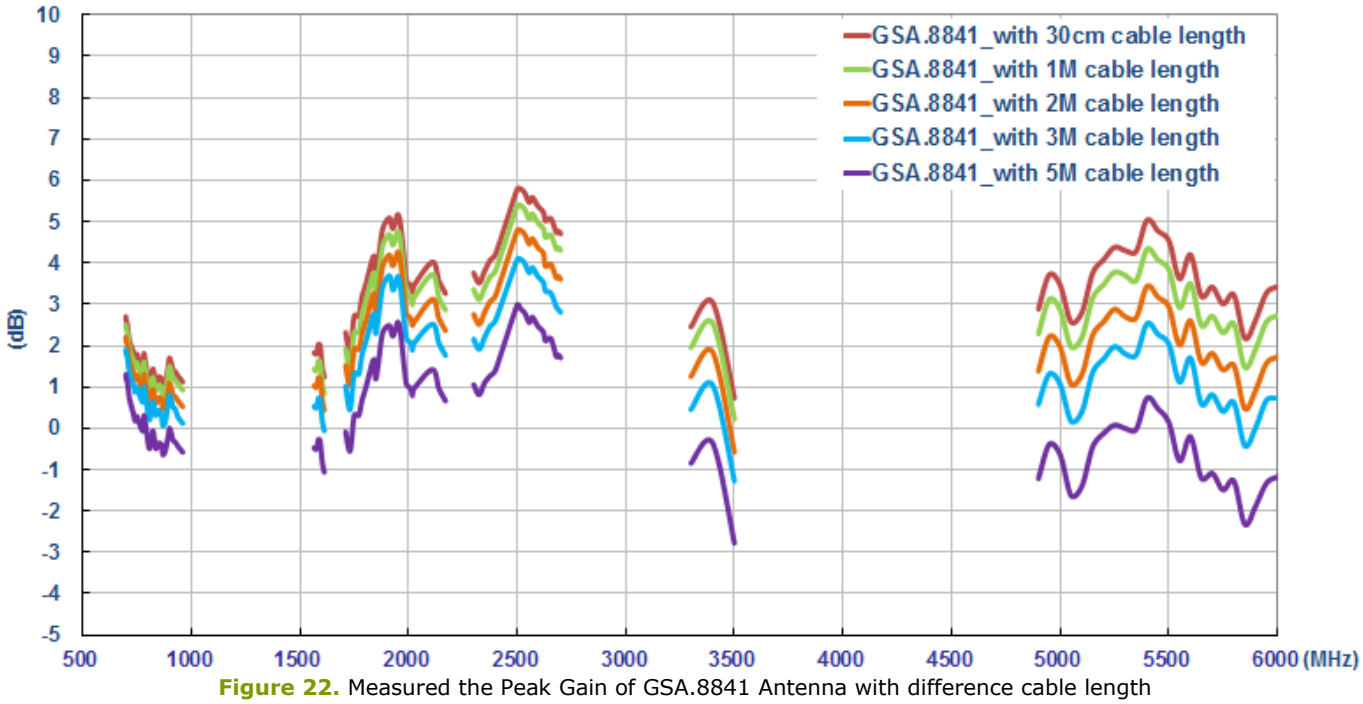


Figure 22. Measured the Peak Gain of GSA.8841 Antenna with difference cable length

7.9 Return loss (on the glass base)

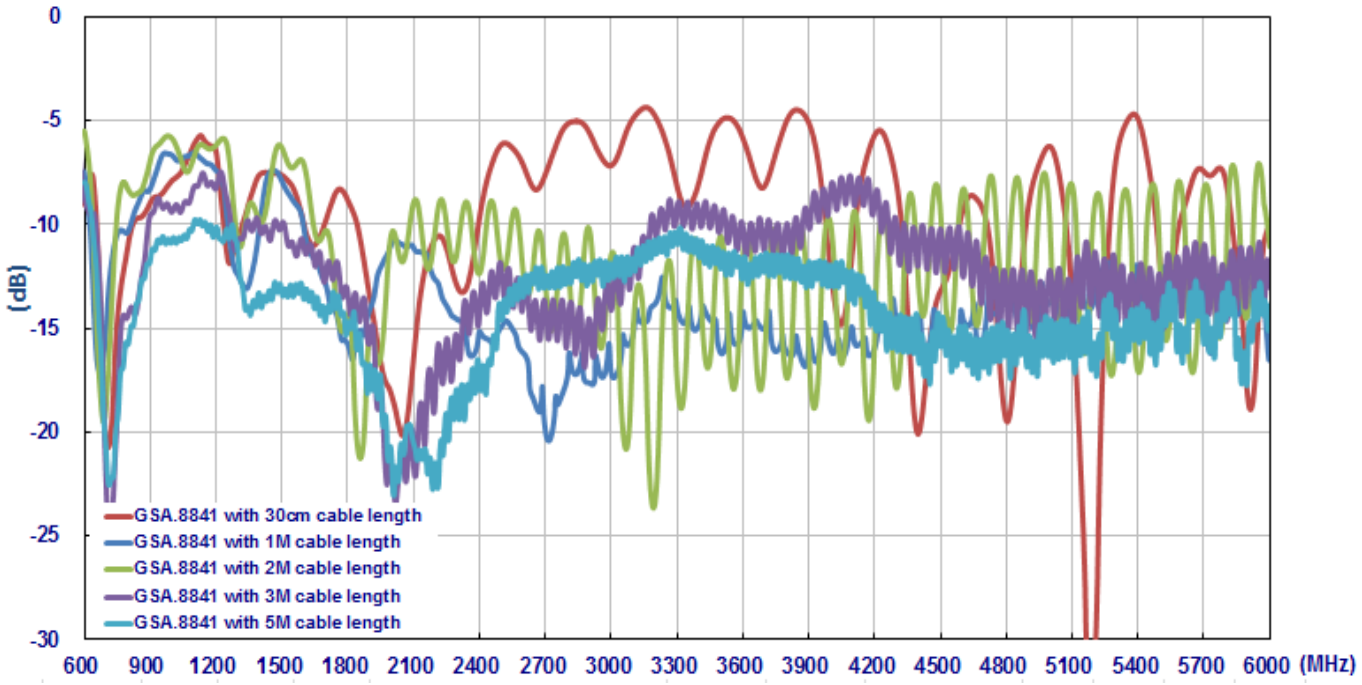


Figure 23. Measured the return loss of GSA.8841 Antenna with difference cable length

7.10 Efficiency (on the glass base)

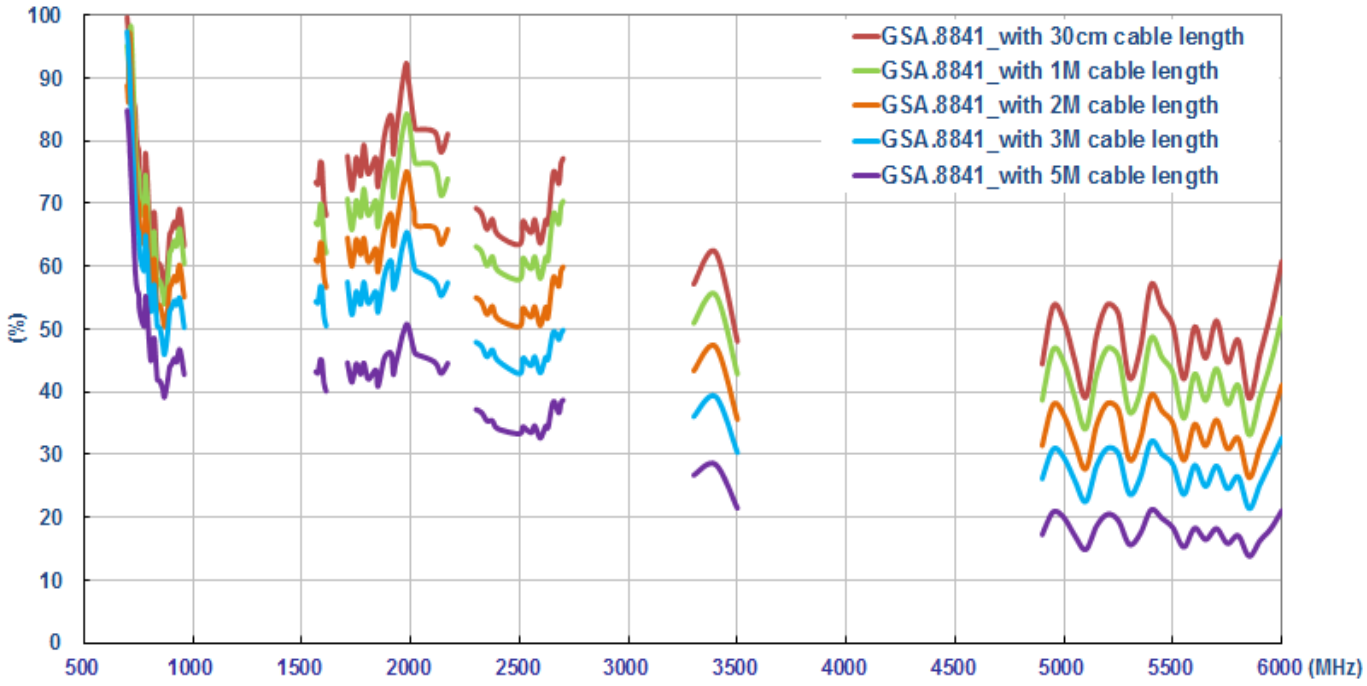


Figure 24. Measured the efficiency of GSA.8841 Antenna with difference cable length

7.11 Average Gain (on the glass base)

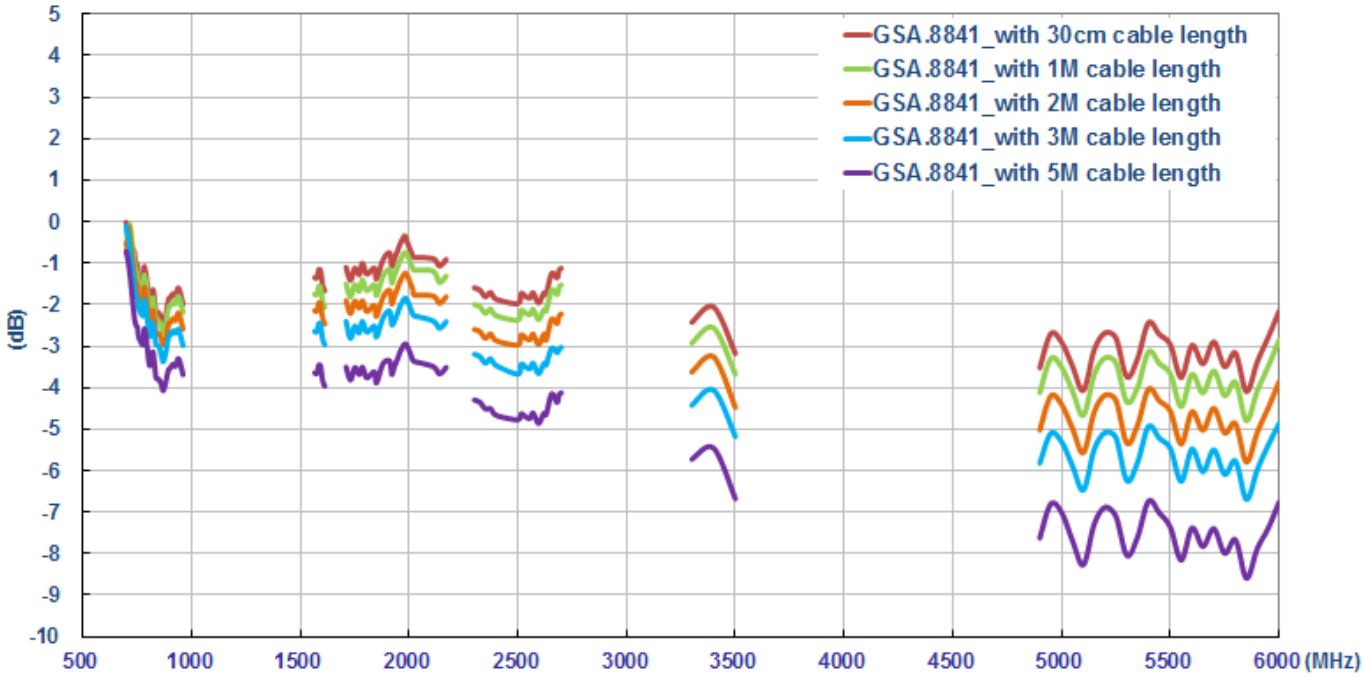


Figure 25. Measured the Average Gain of GSA.8841 Antenna with difference cable length

7.12 Peak Gain (on the glass base)

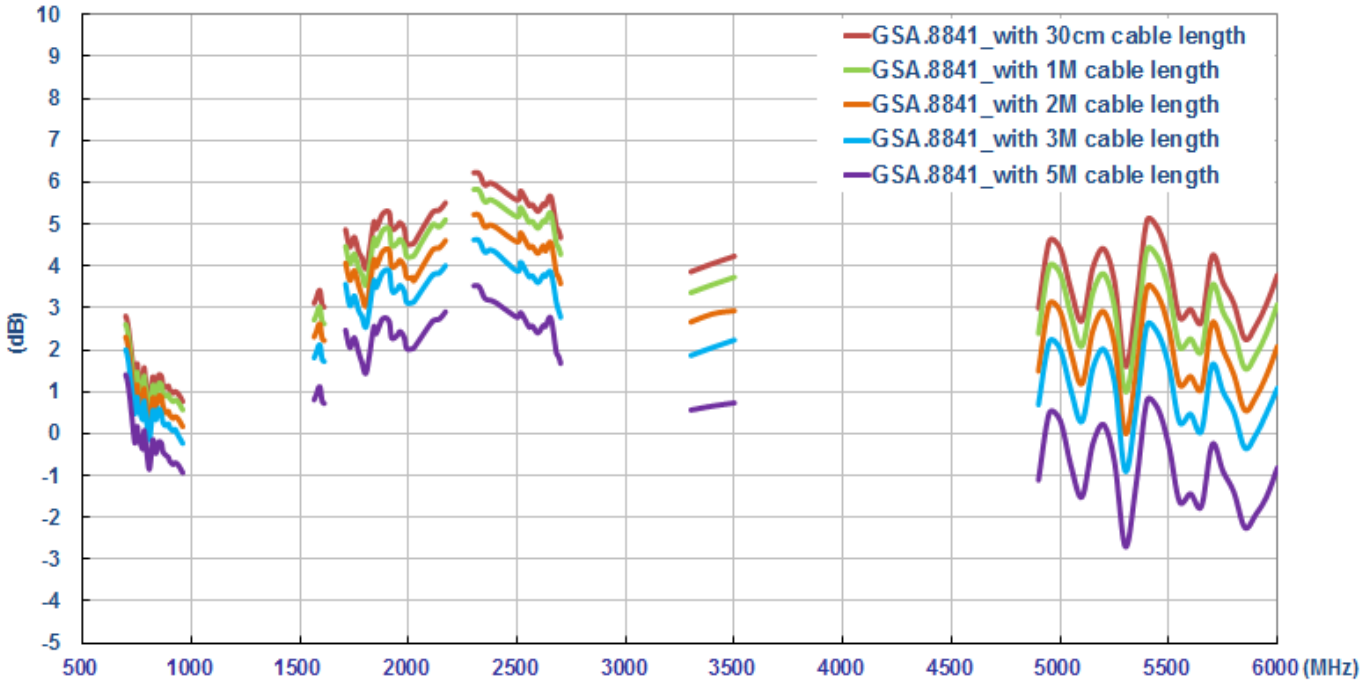


Figure 26. Measured the Peak Gain of GSA.8841 Antenna with difference cable length

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