

## 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/C DMA 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/C DMA 700/800/ 850/900	GNSS	LTE/GSM/HSP A/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



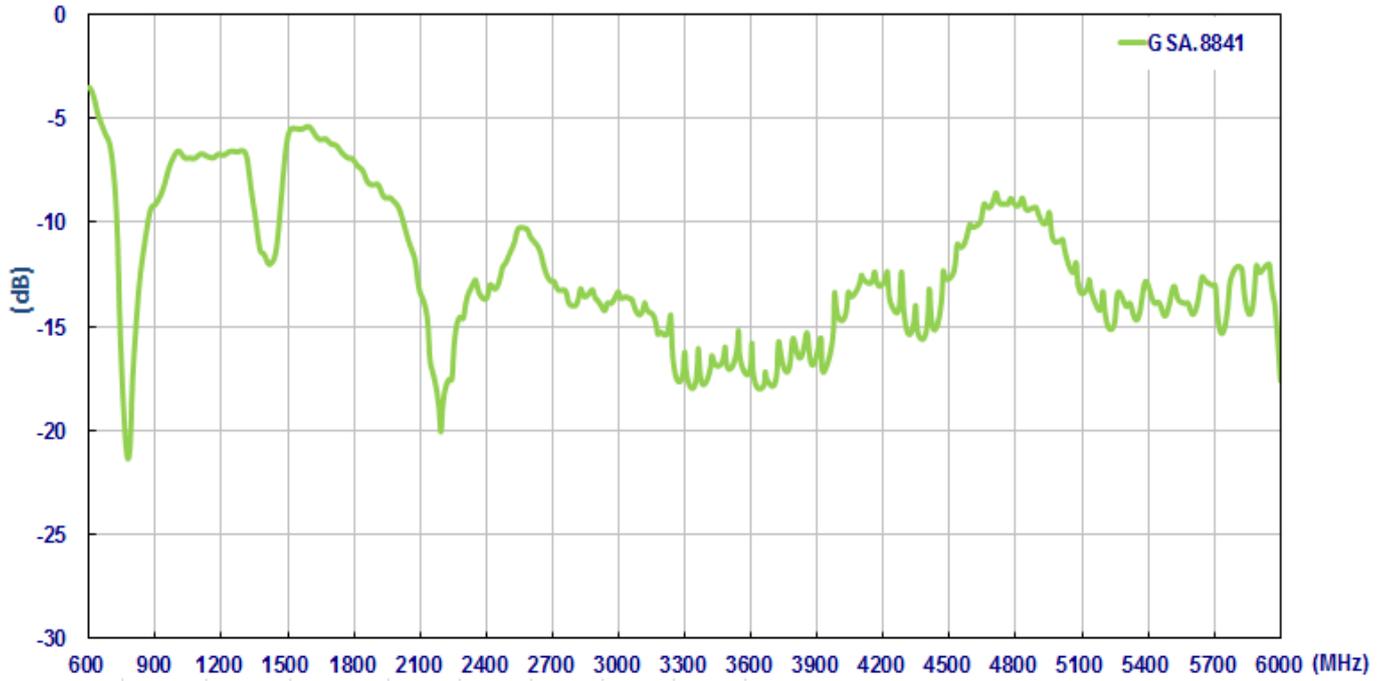
b) On 2mm ABS Base



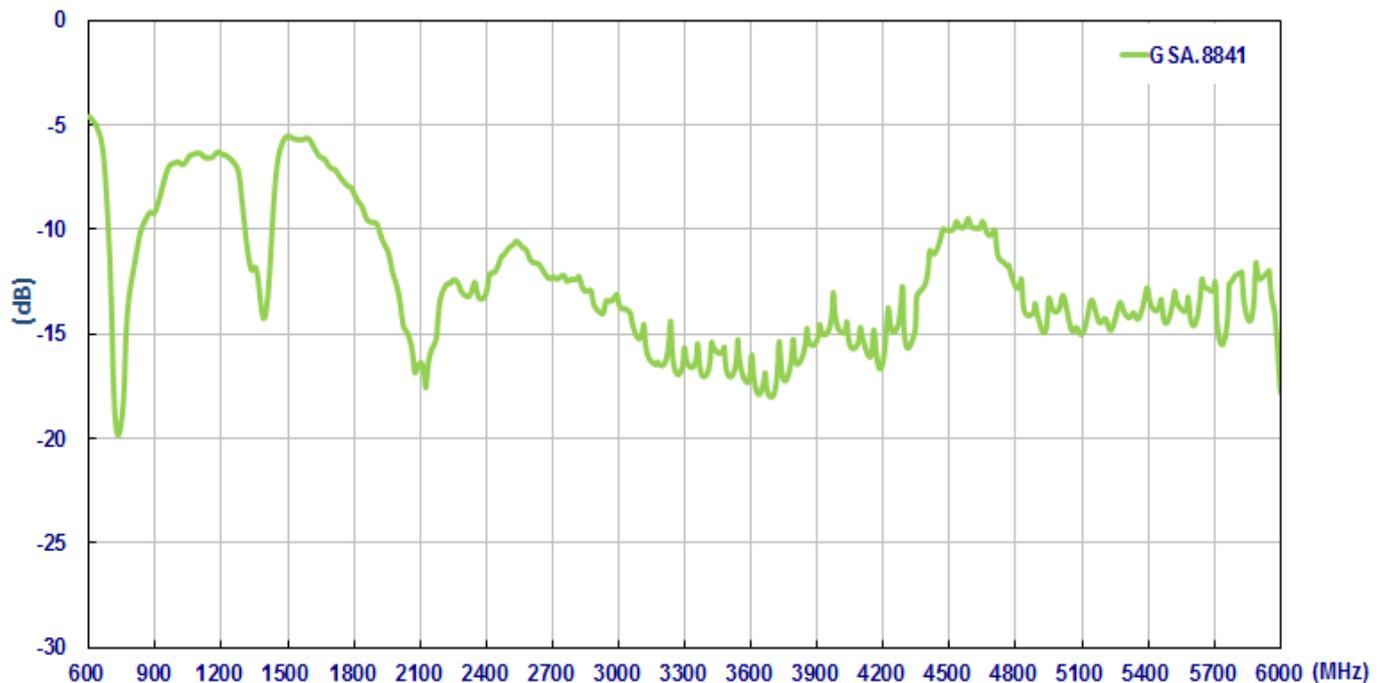
c) On the Glass Base

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

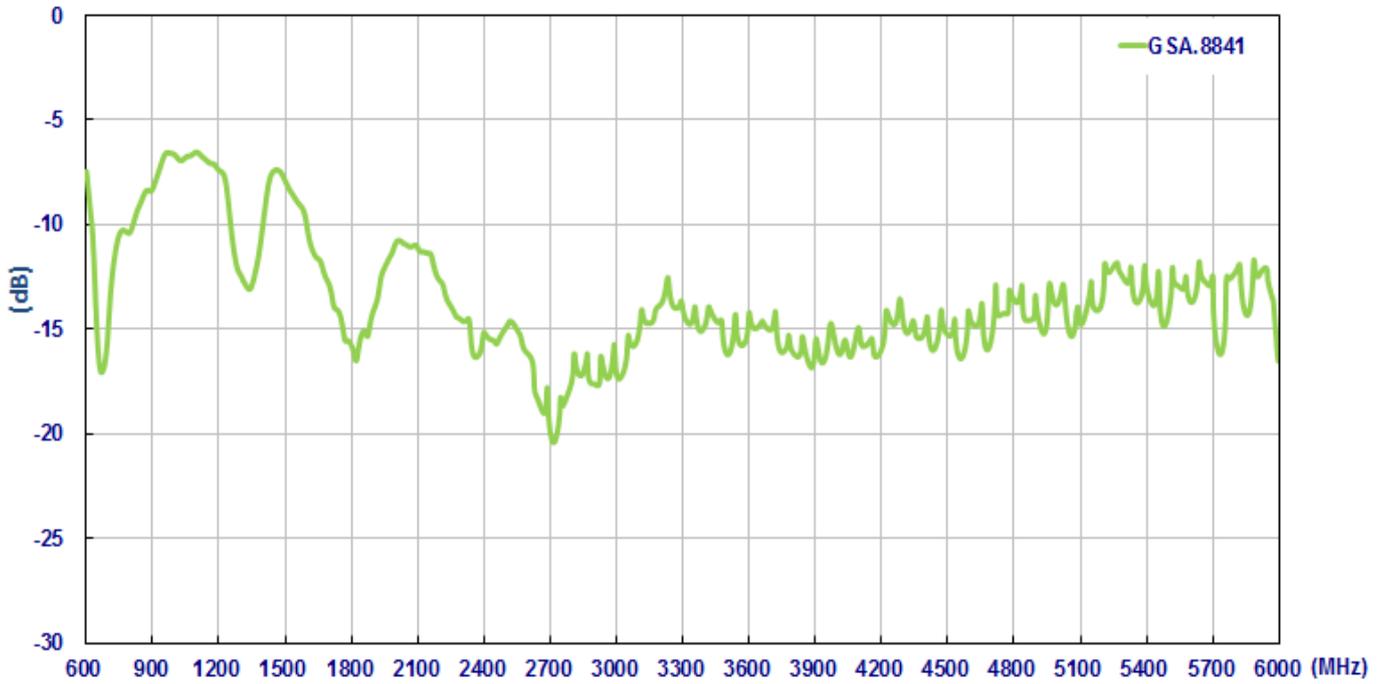
### 3.2 Return loss



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

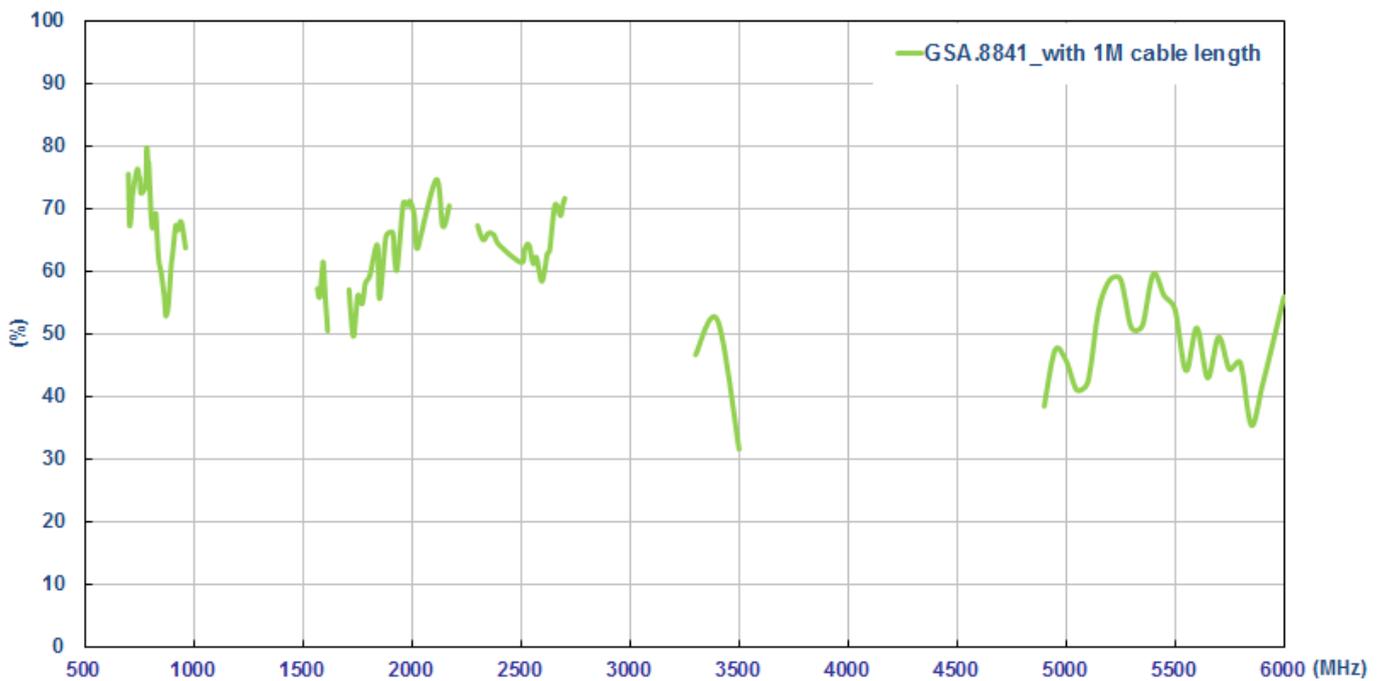


**Figure3.** Return loss of GSA.8841 with 1 meter cable length on the 2mm ABS base

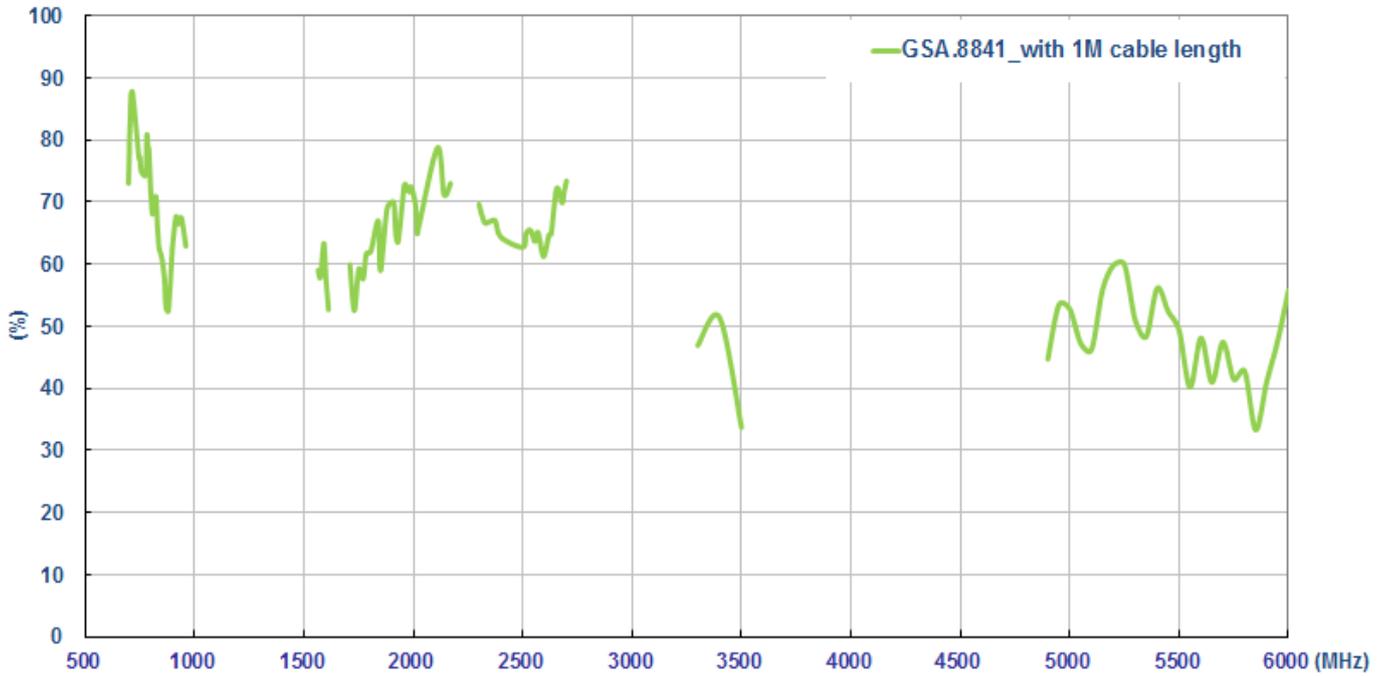


**Figure4.** Return loss of GSA.8841 with 1 meter cable length on the glass base

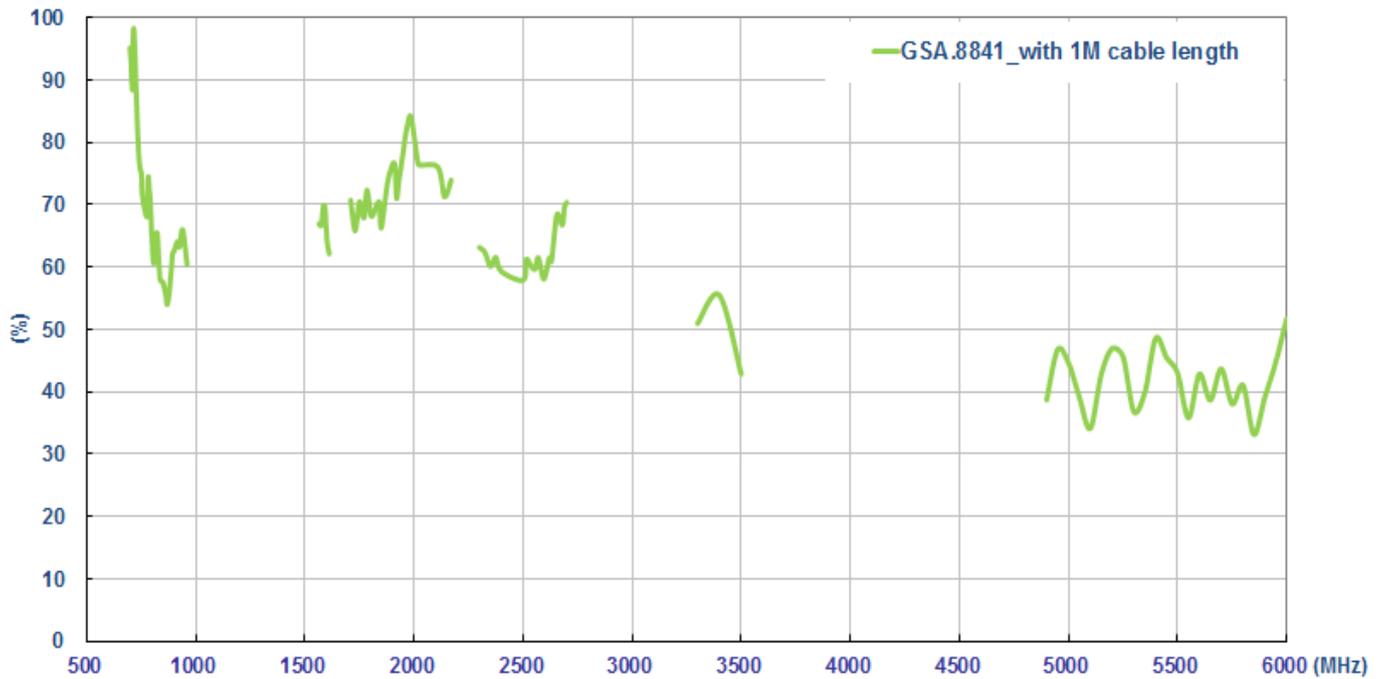
### 3.3 Efficiency



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

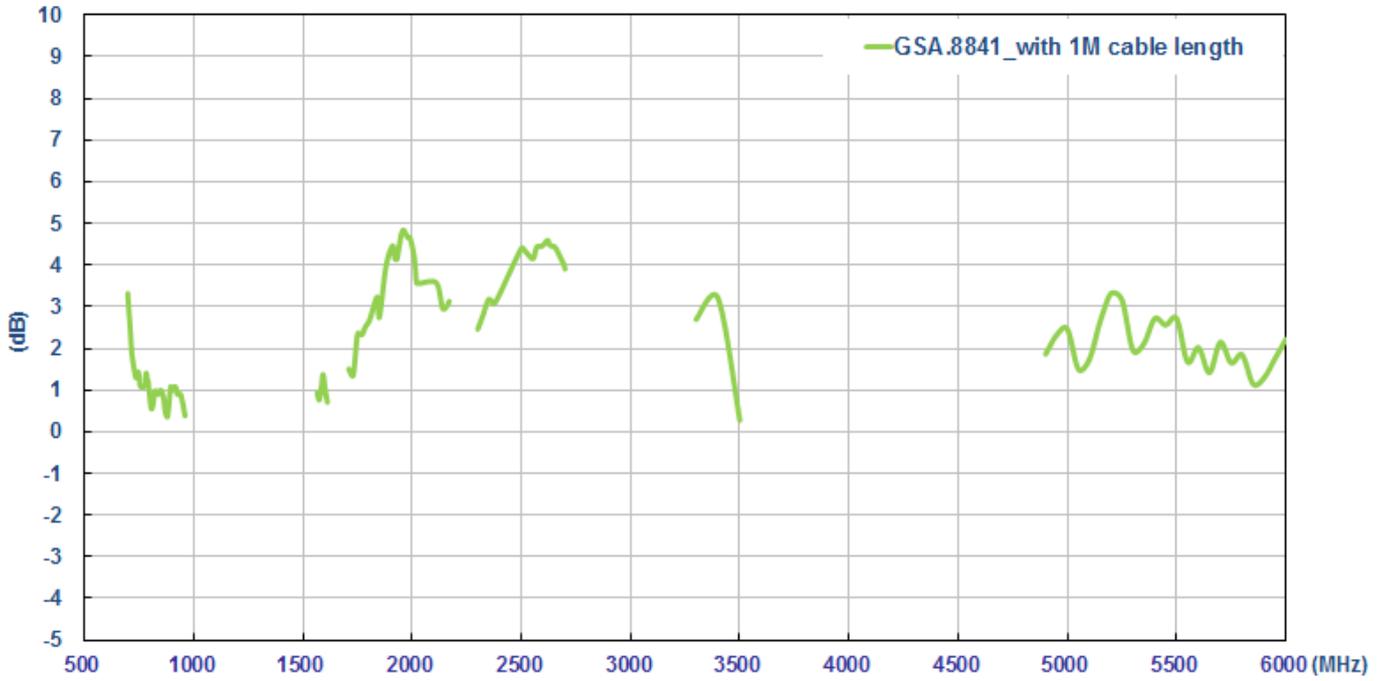


**Figure6.** Efficiency of GSA.8841 with 1 meter cable length on the 2mm ABS base

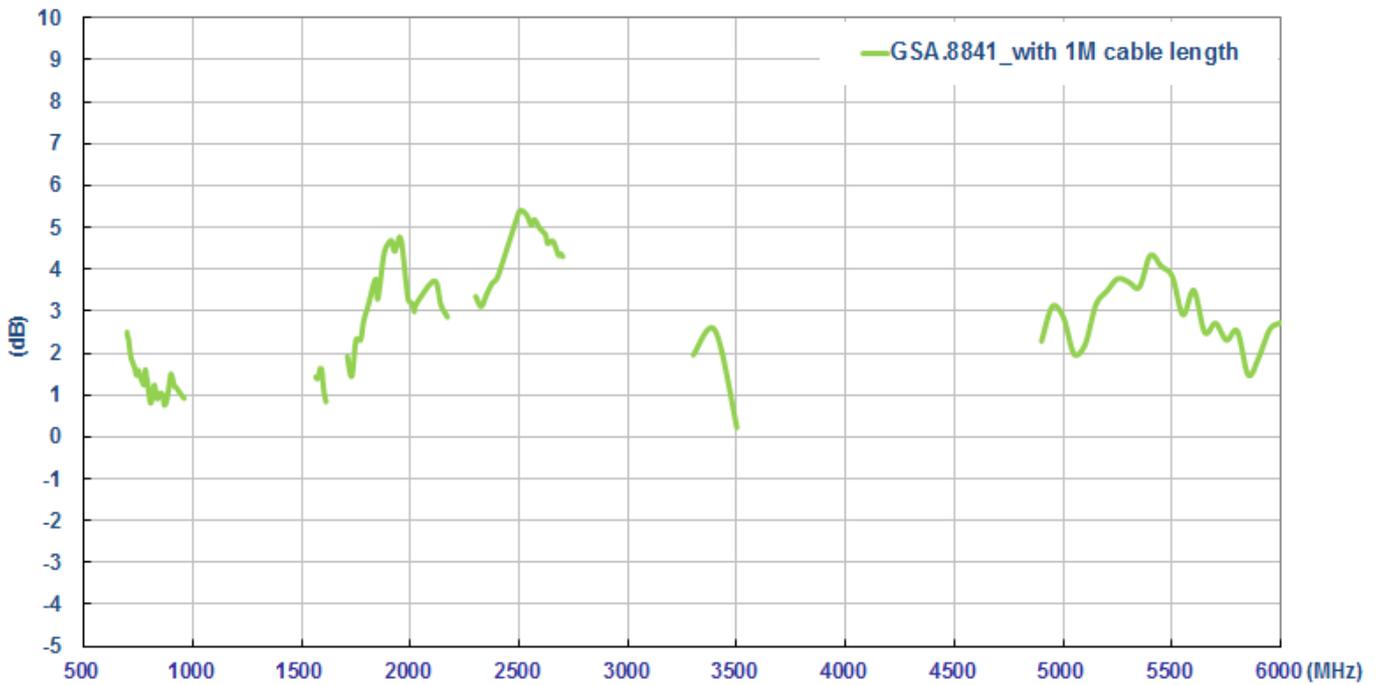


**Figure7.** Efficiency of GSA.8841 with 1 meter cable length on the glass base

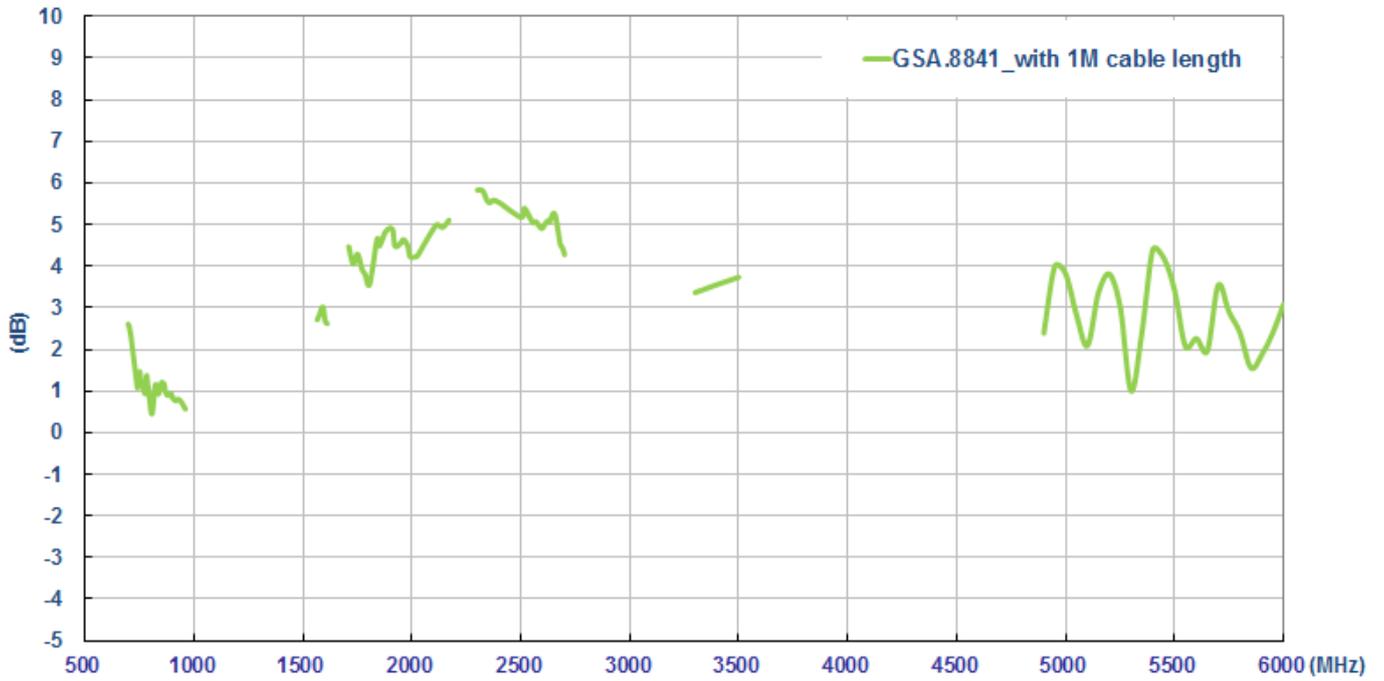
### 3.4 Peak gain



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

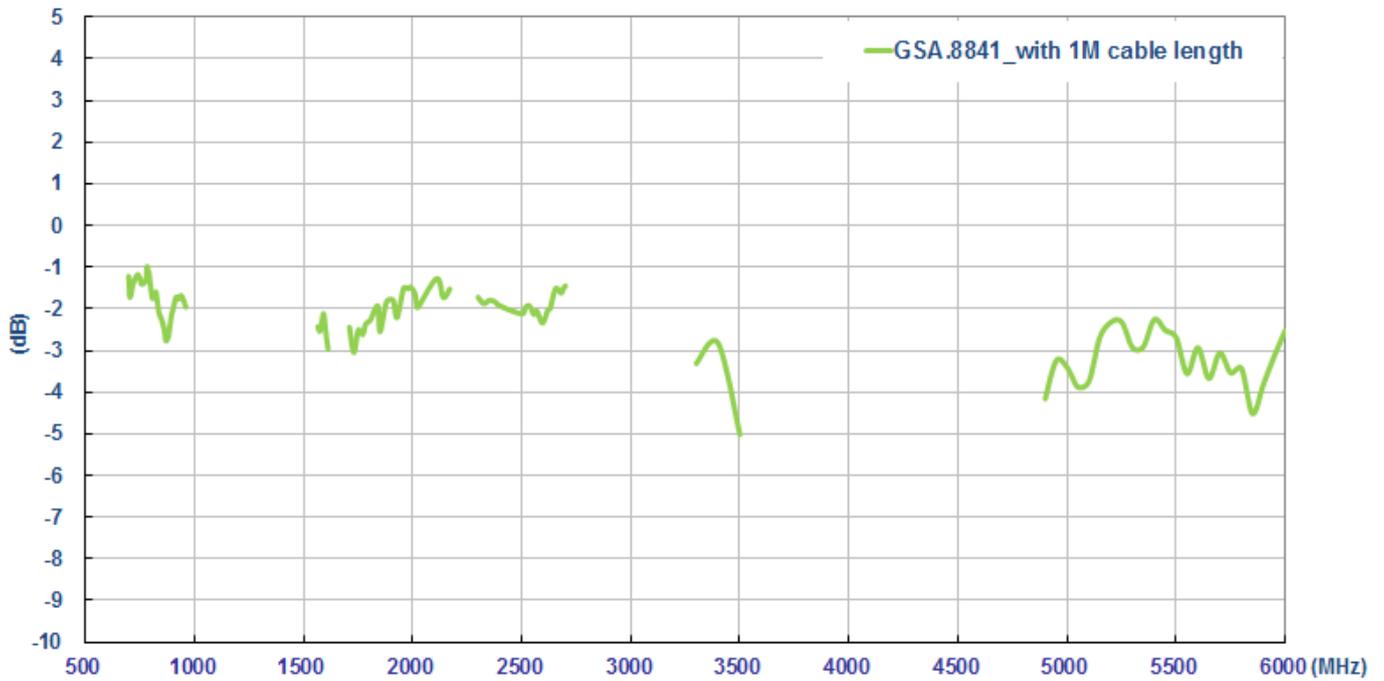


**Figure9.** Peak gain of GSA.8841 with 1 meter cable length on the 2mm ABS base

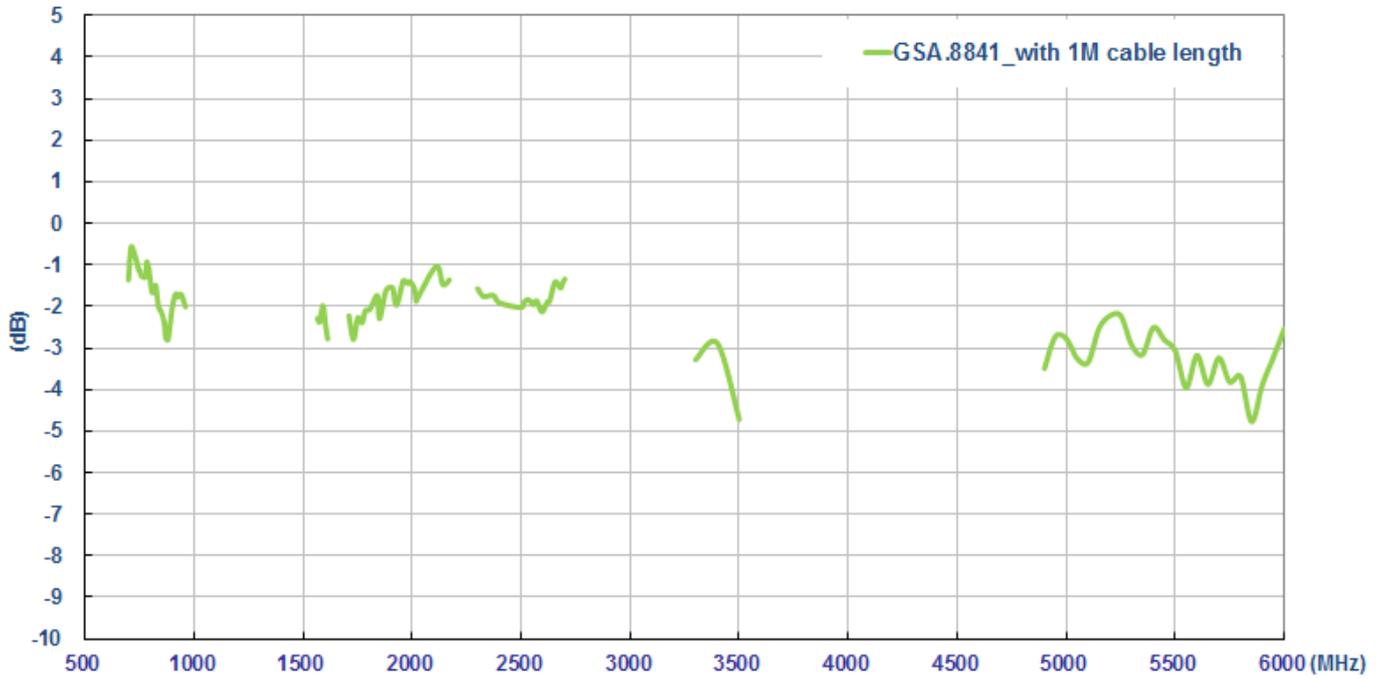


**Figure10.** Peak gain of GSA.8841 with 1 meter cable length on the glass base

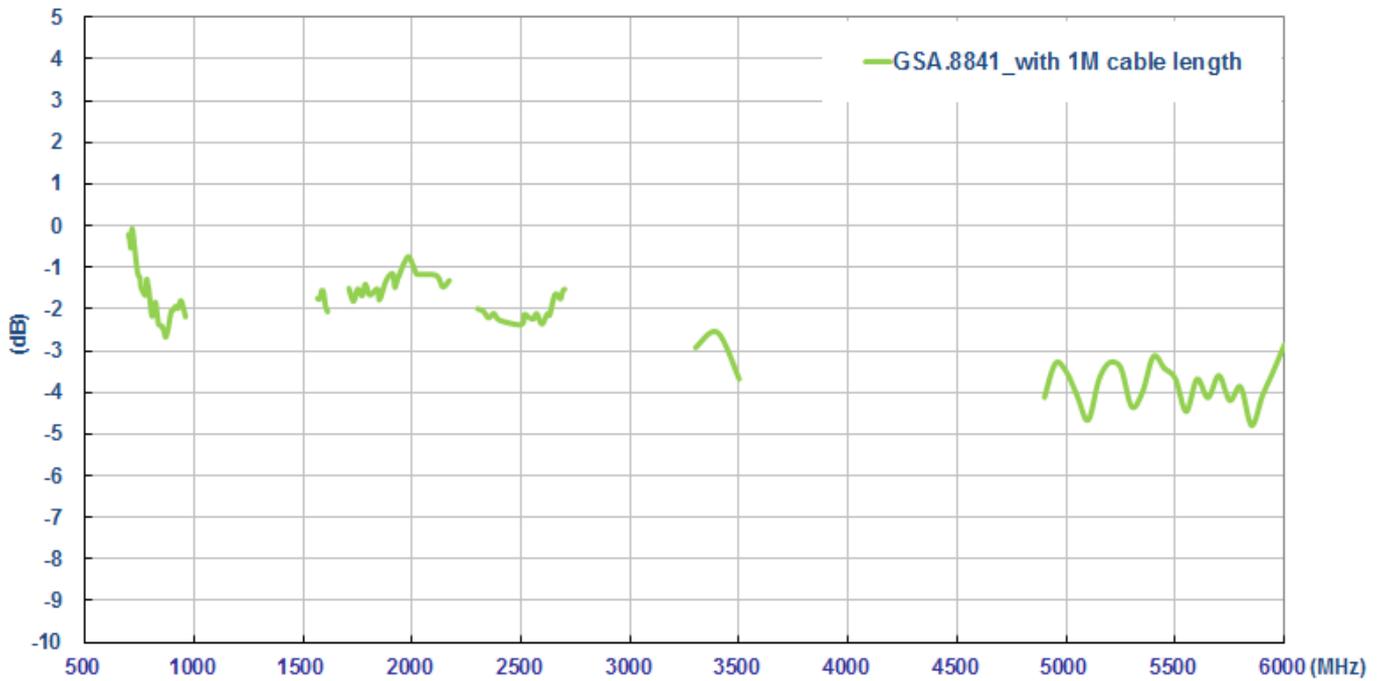
### 3.5 Average gain



**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



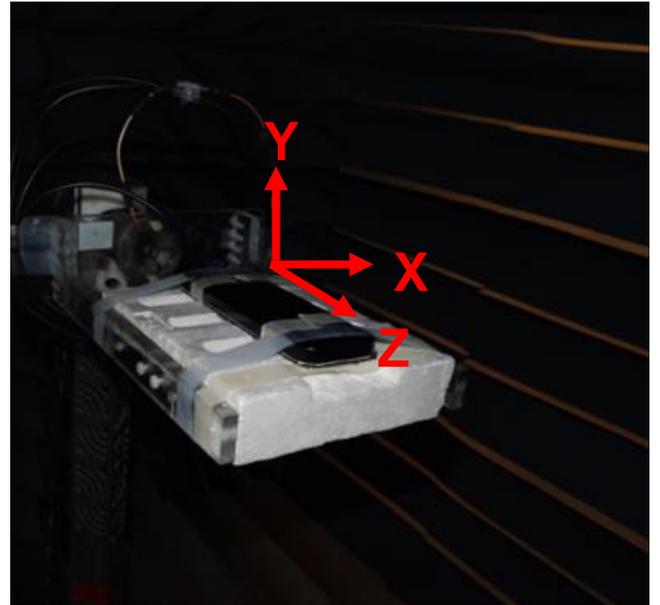
**Figure13.** Average gain of GSA.8841 with 1 meter cable length on the glass base

## 4. Antenna Radiation Patterns

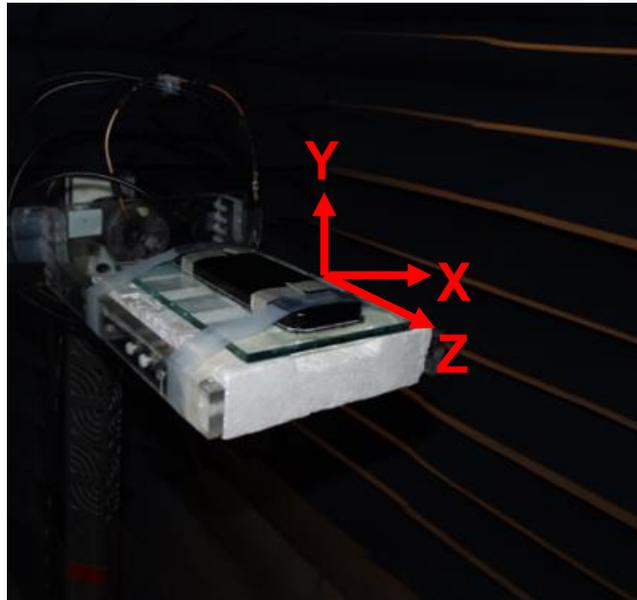
The antenna radiation patterns were measured in ETS Anechoic Chamber. The measurement setup as below,



a) In free space



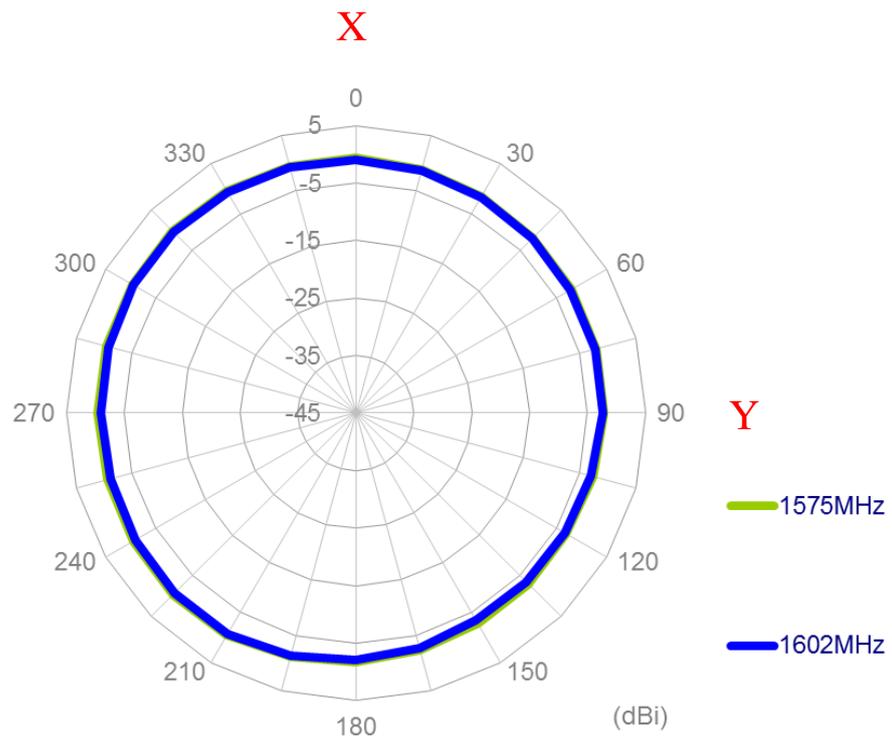
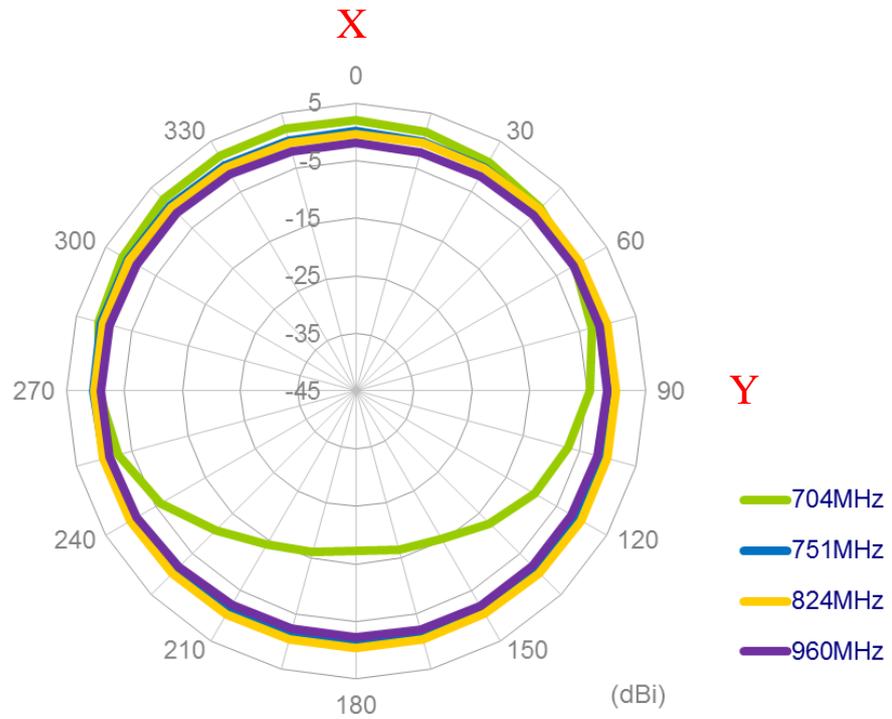
2) On 2mm ABS base

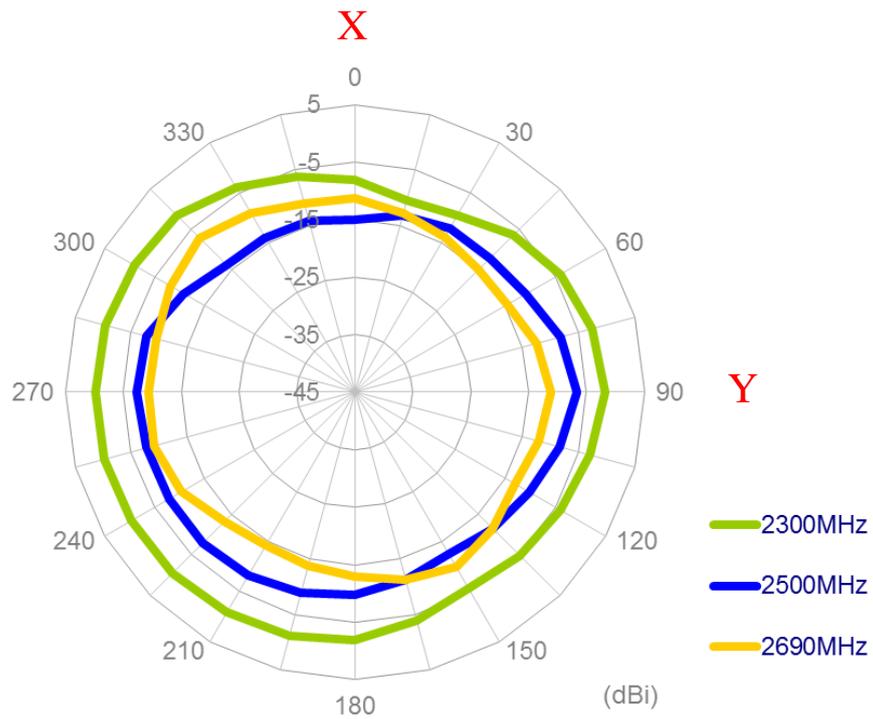
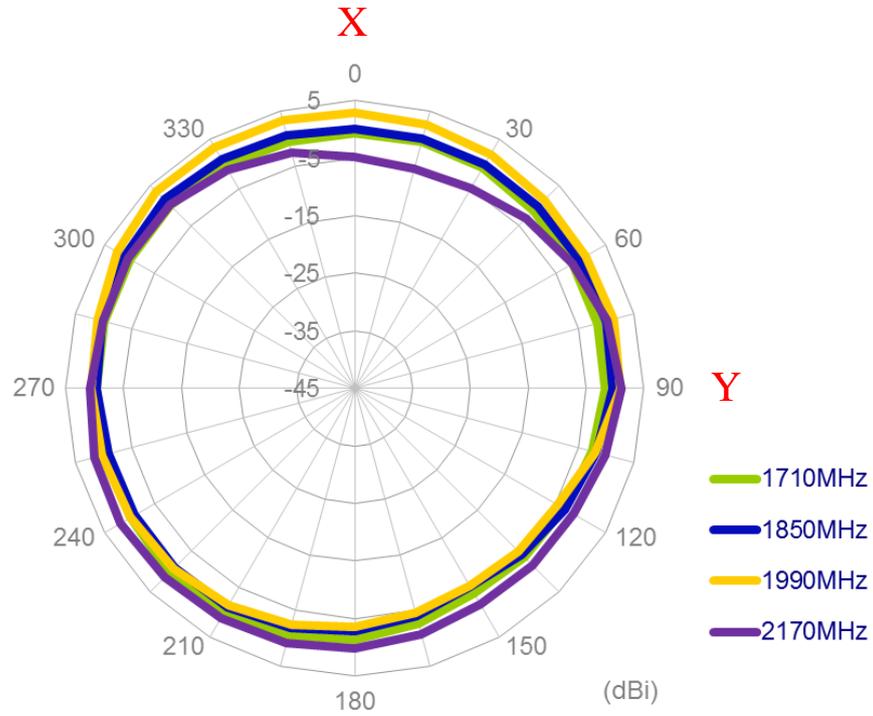


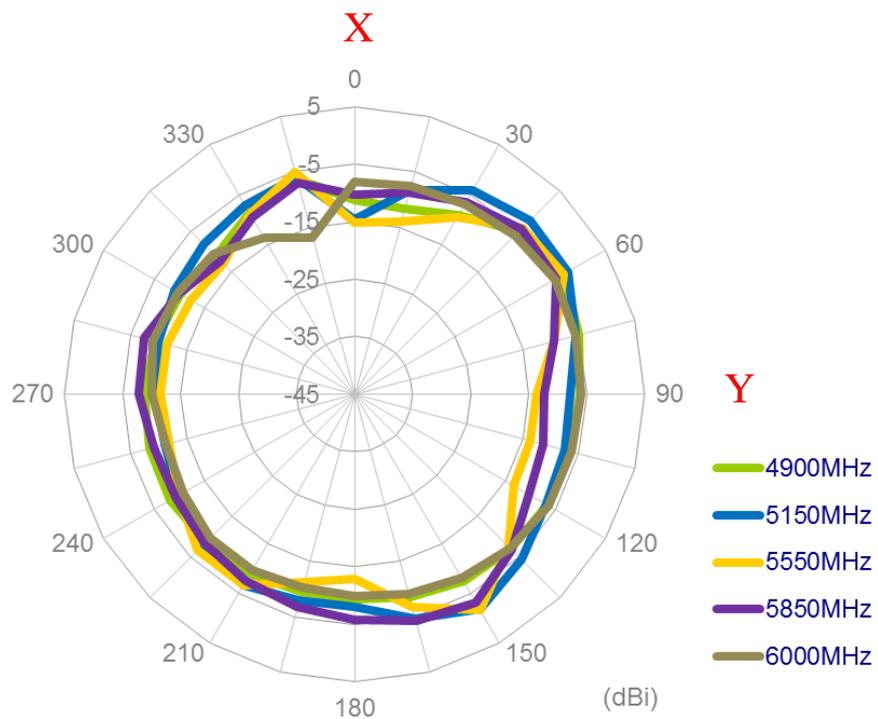
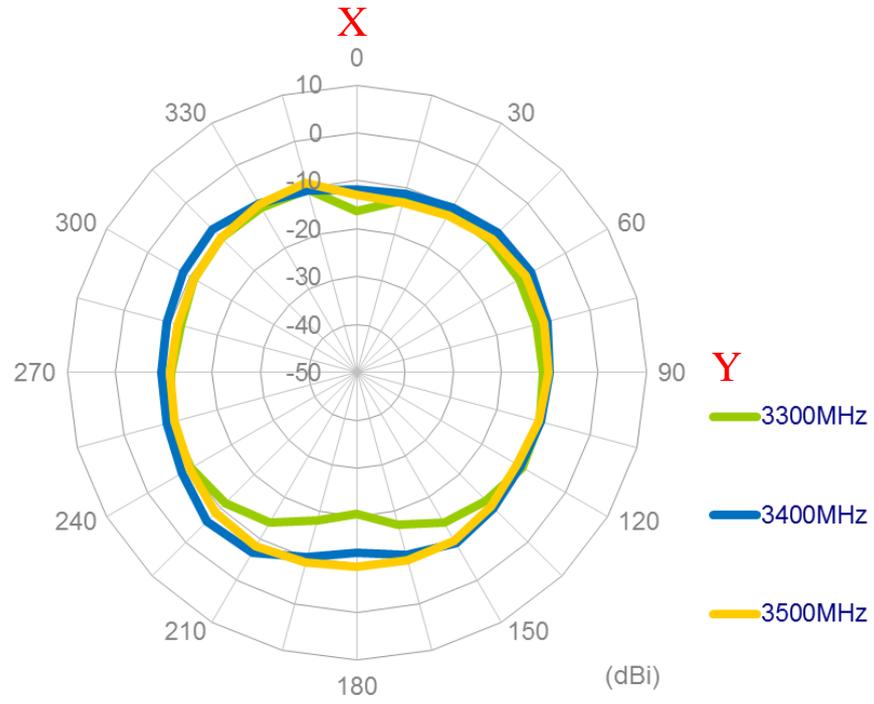
3) On the glass base

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

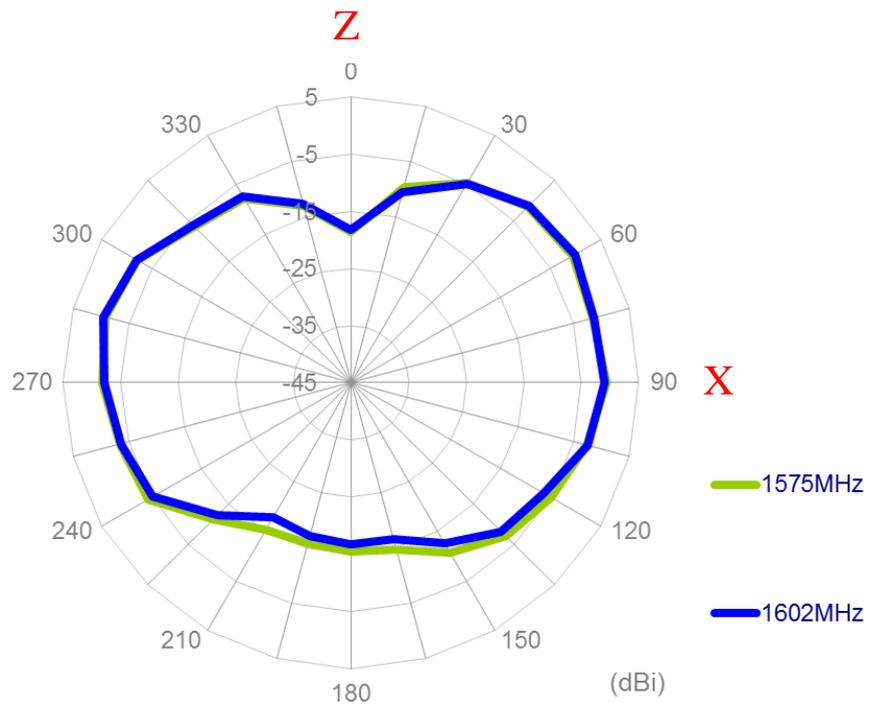
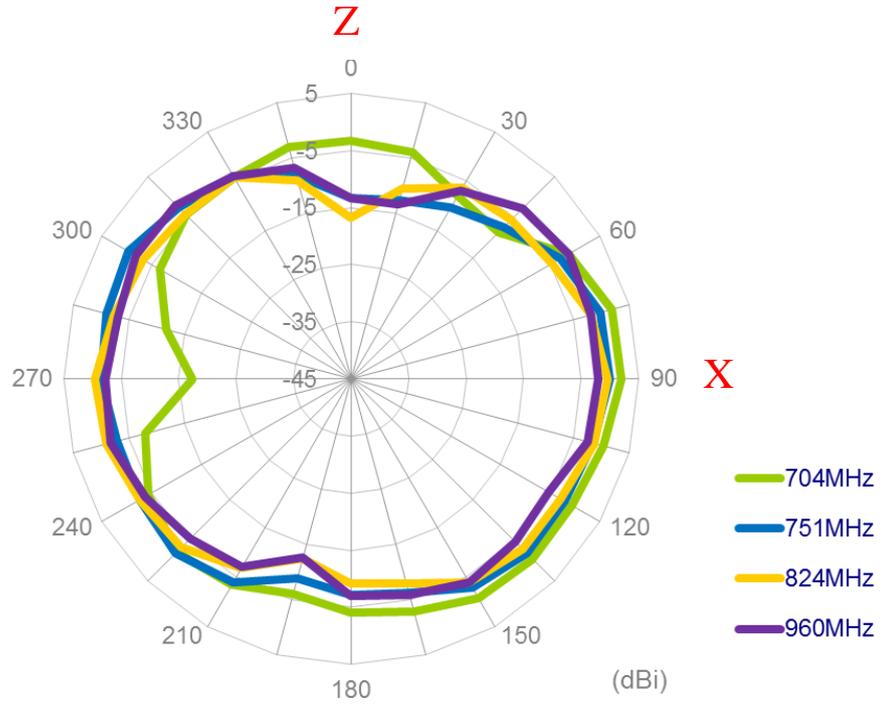
### 4.1 Antenna radiation patterns XY plane (Antenna with 1 meter cable length in free space)

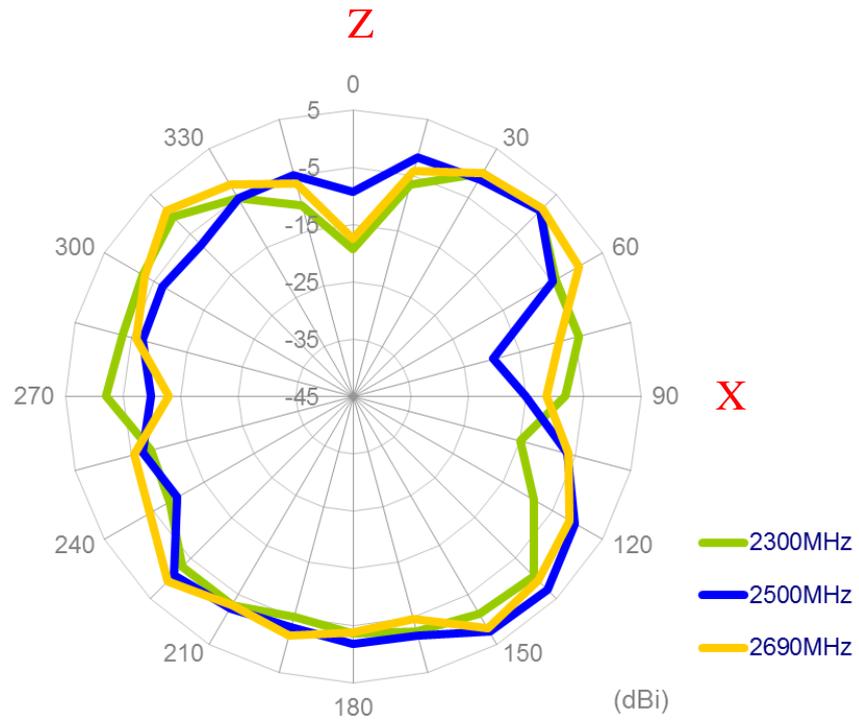
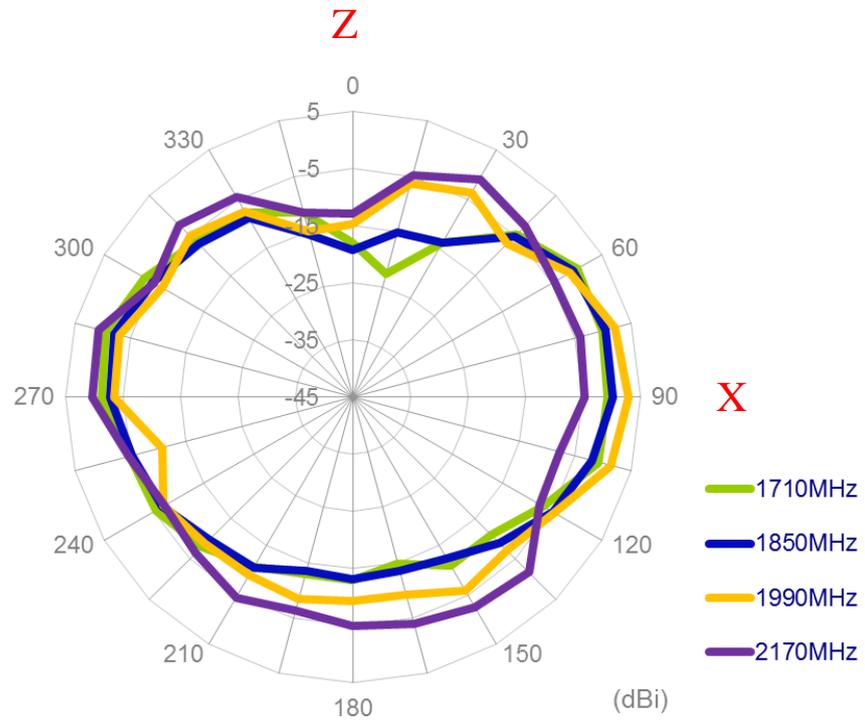


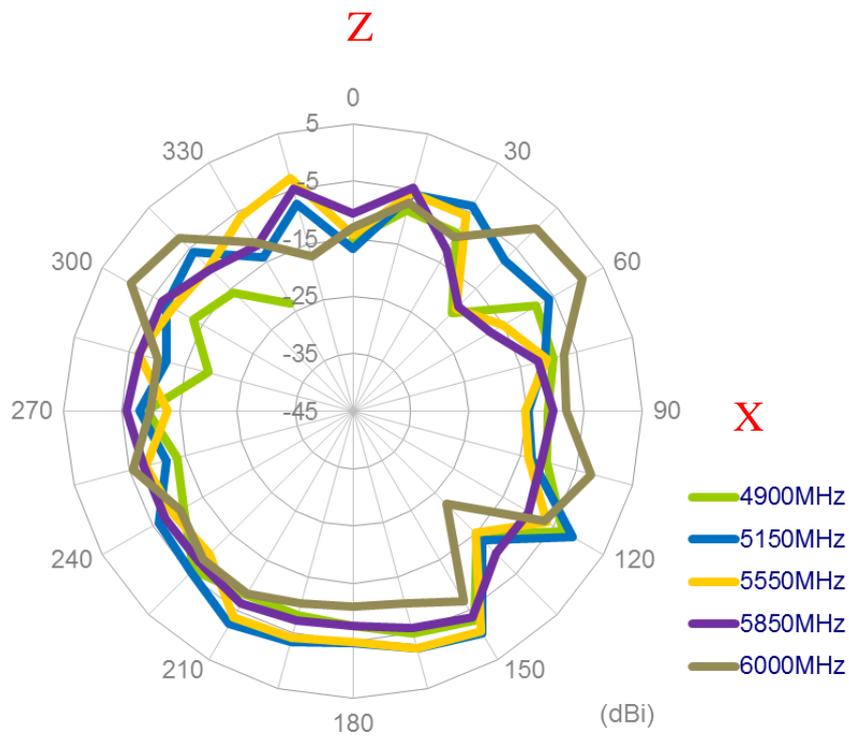
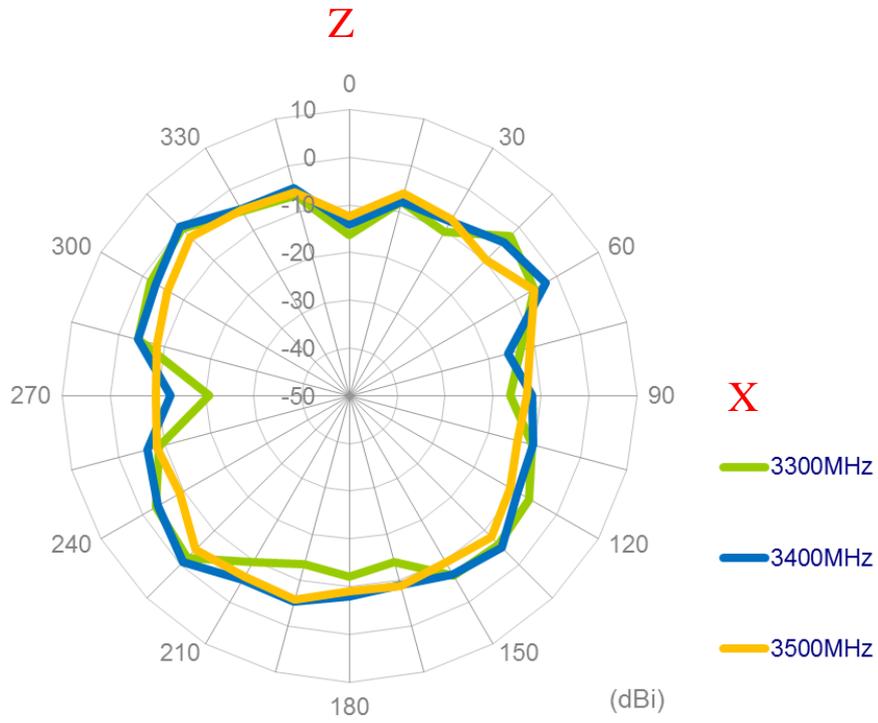




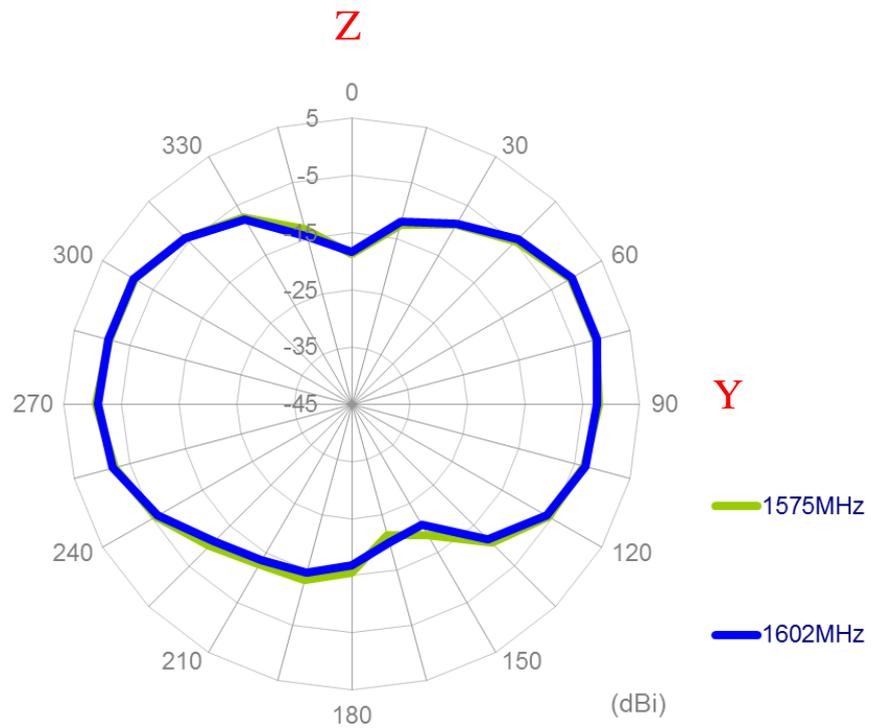
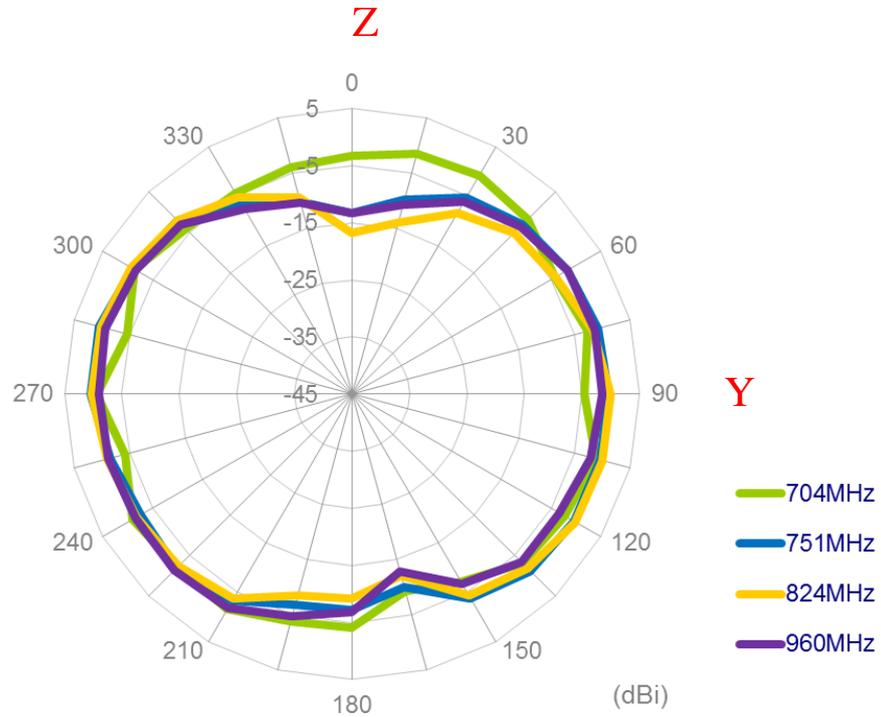
## 4.2 XZ plane (Antenna with 1 meter cable length in free space)

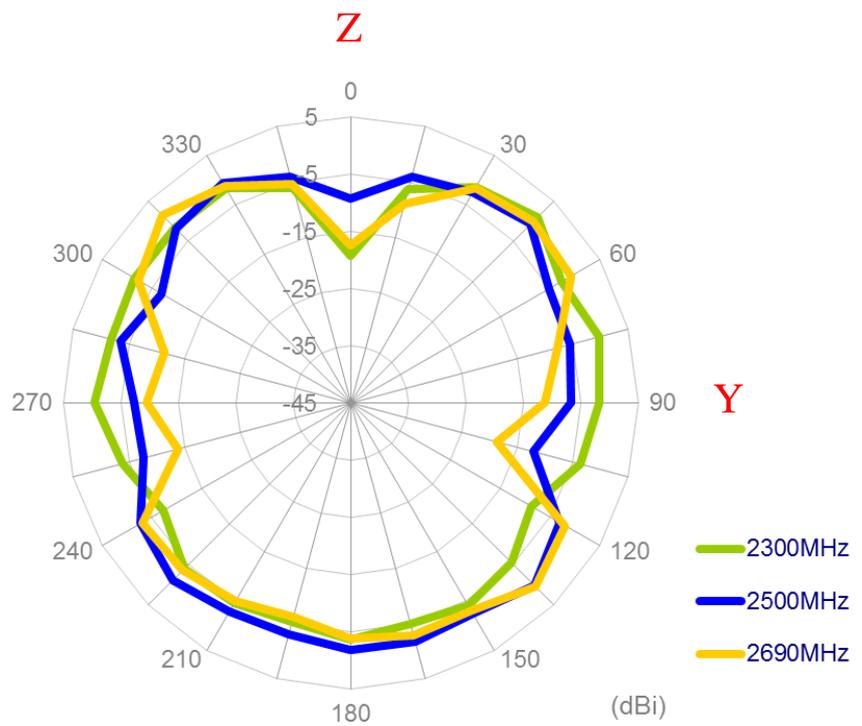
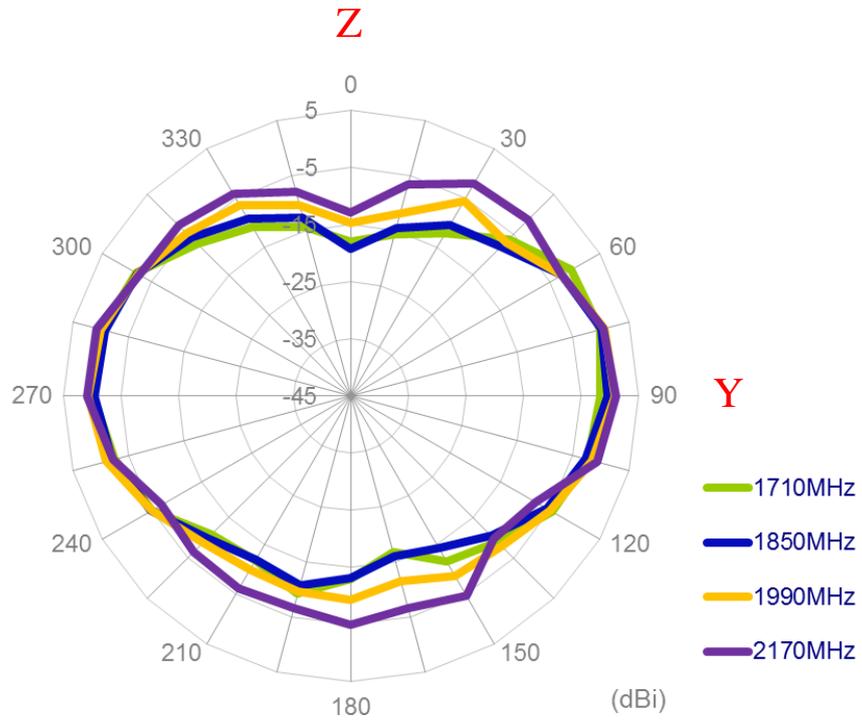


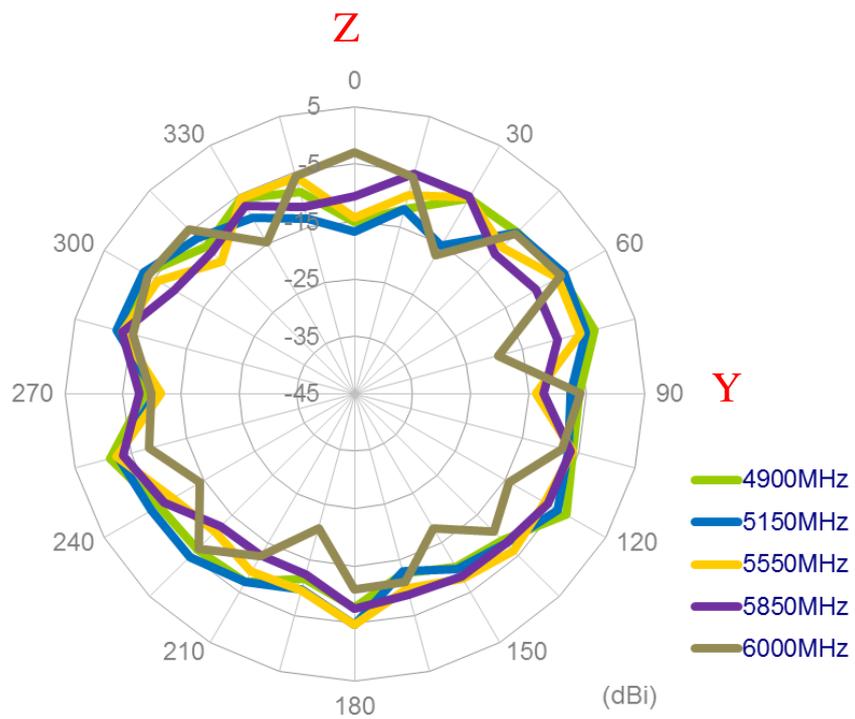
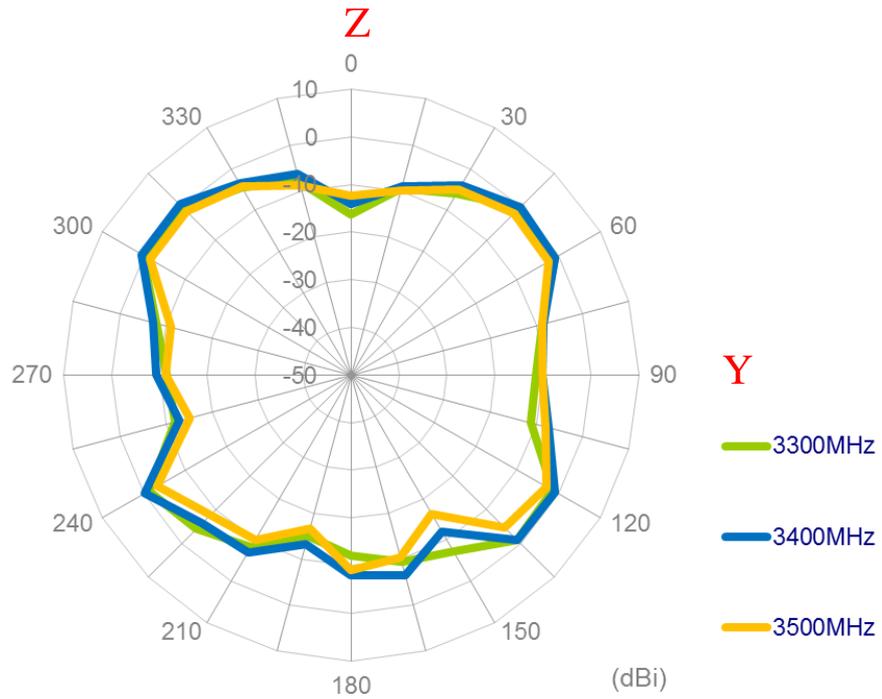




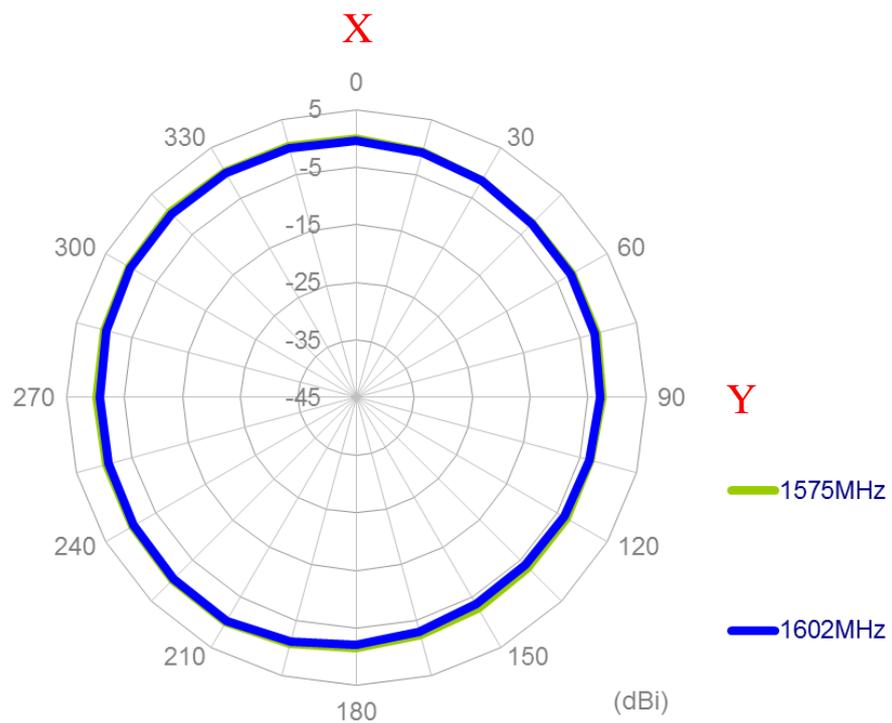
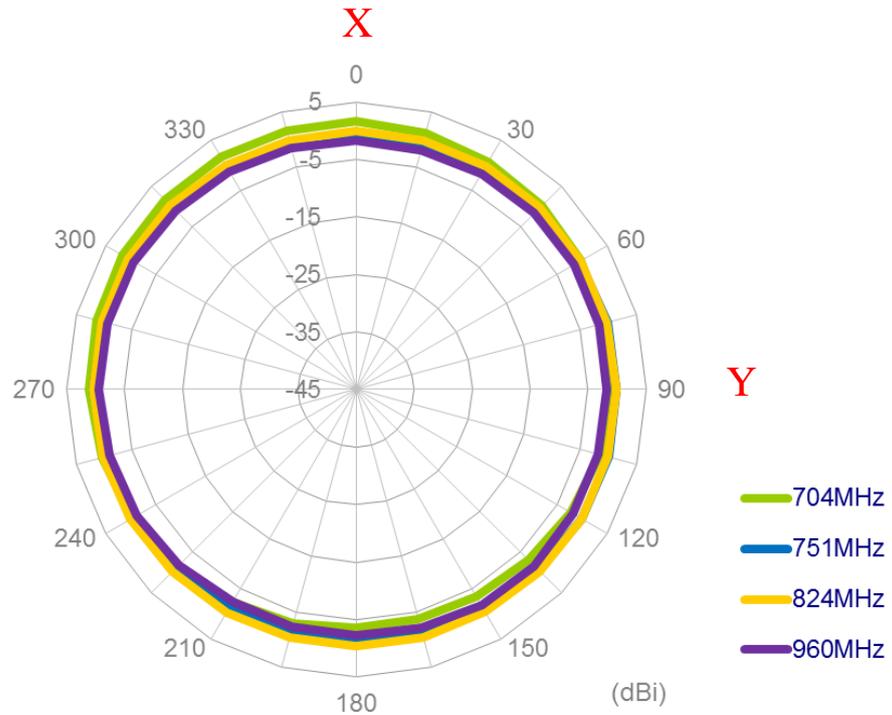
### 4.3 YZ plane (Antenna with 1 meters cable length in free space)

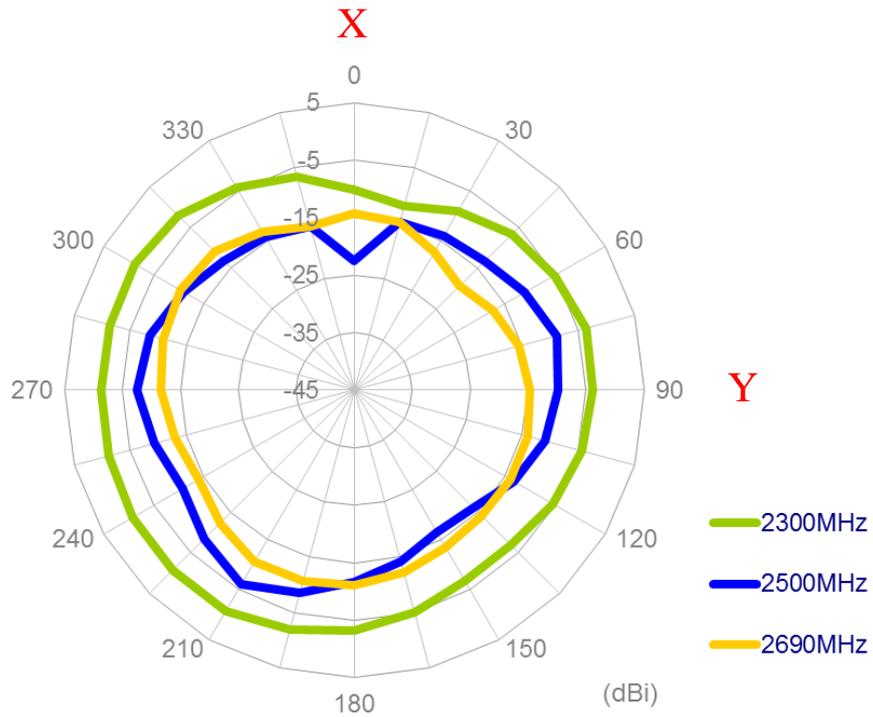
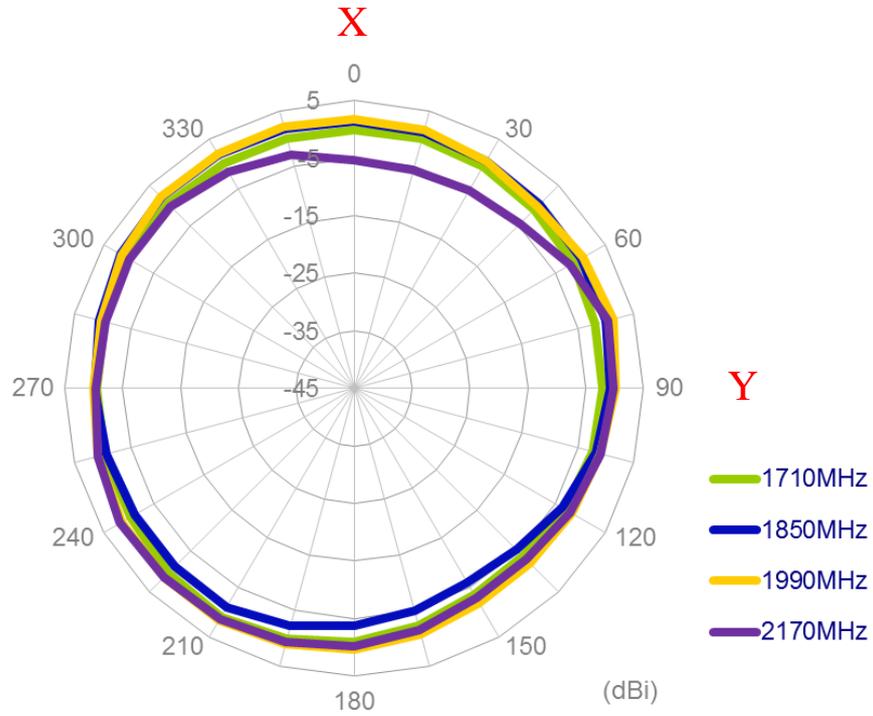


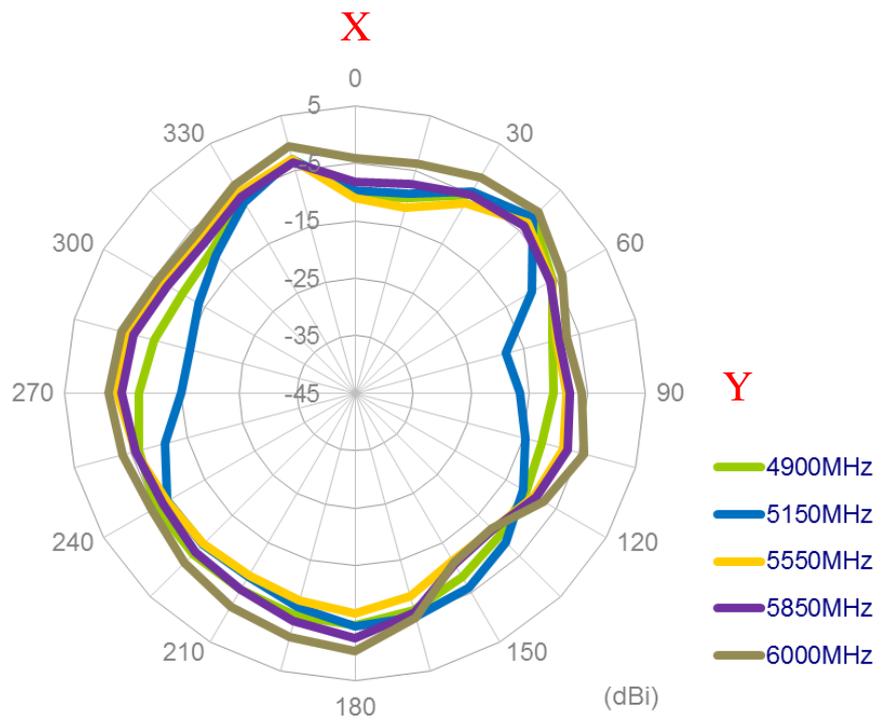
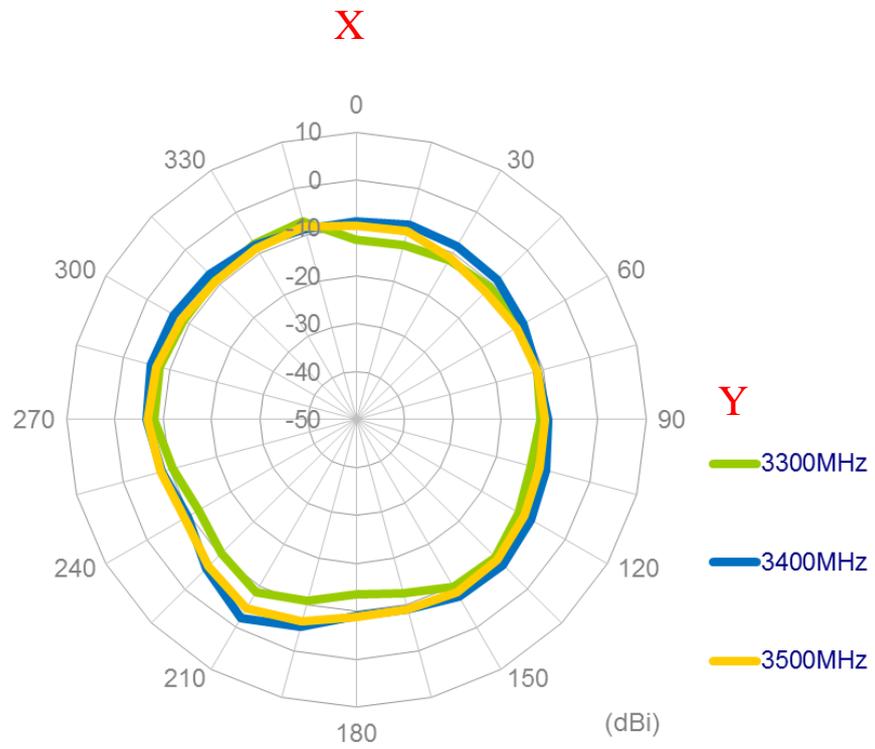




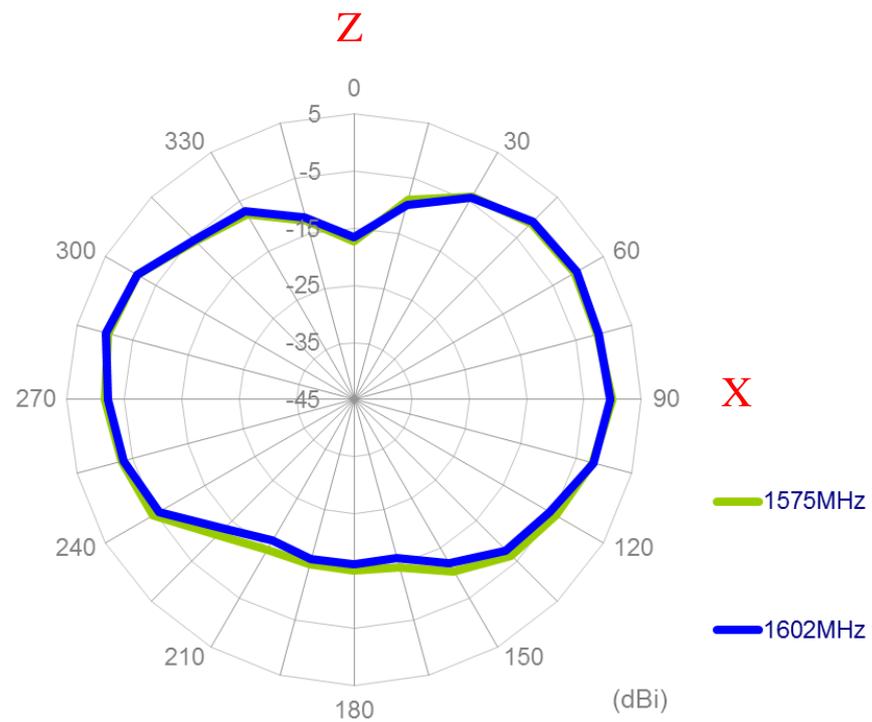
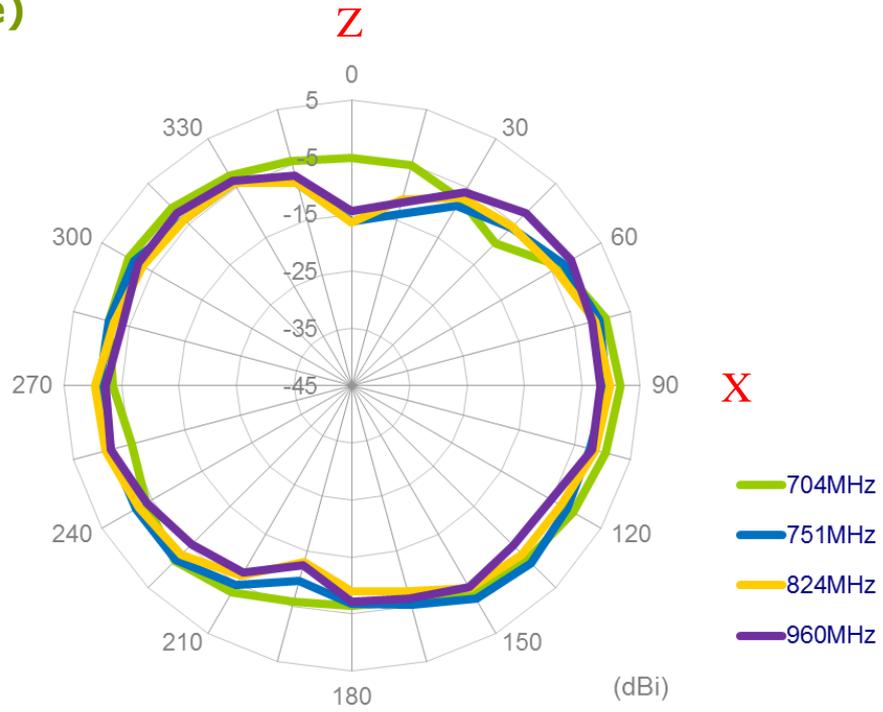
### 4.4 XY plane (Antenna with 1 meter cable length on the 2mm ABS base)

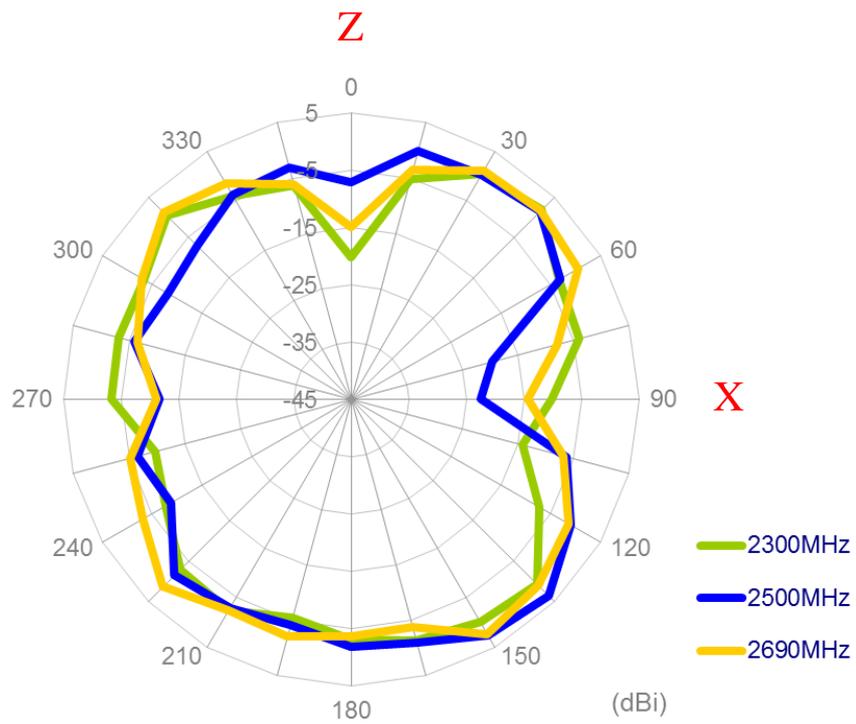
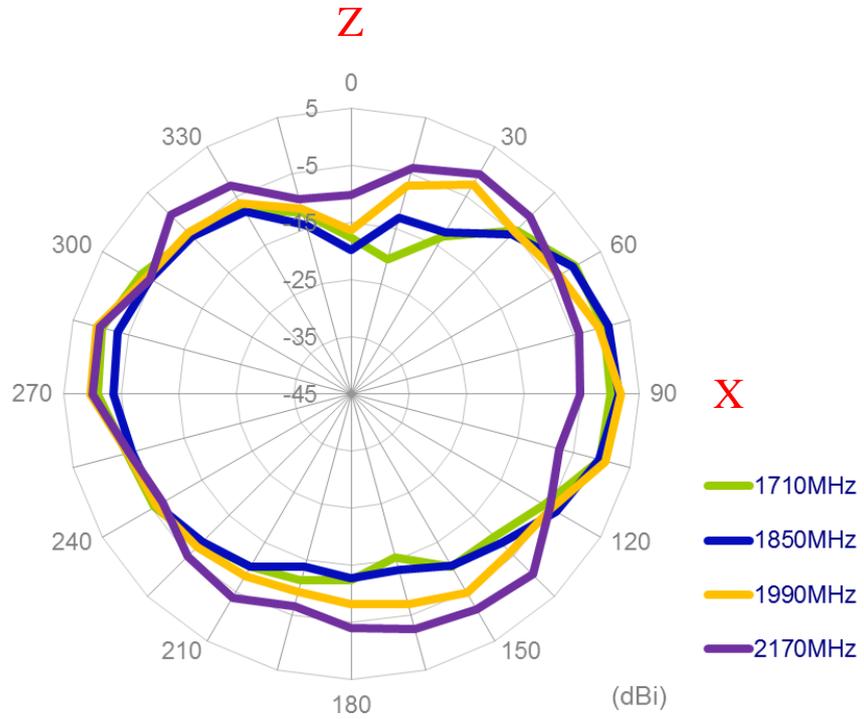


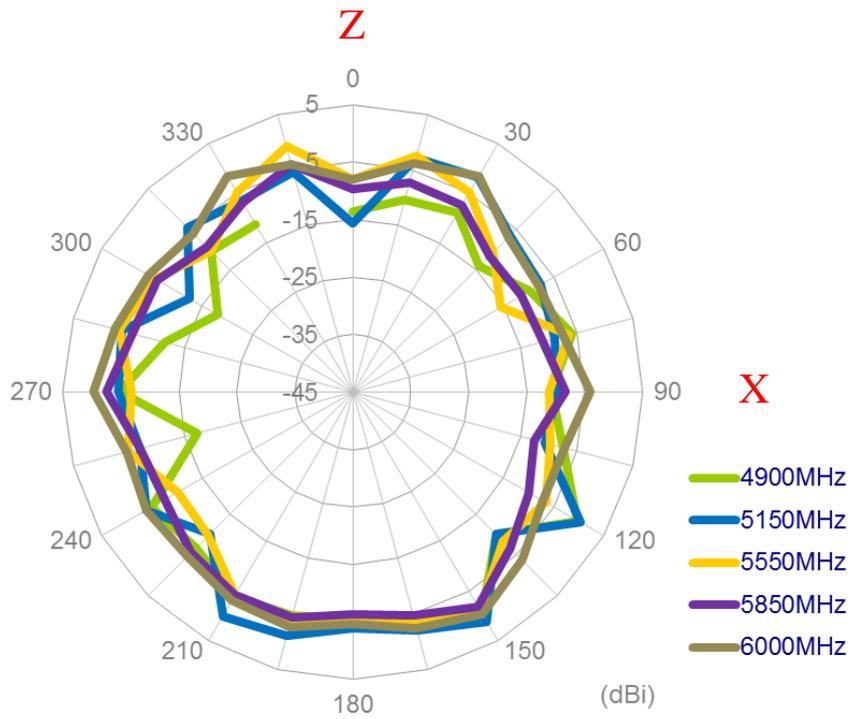
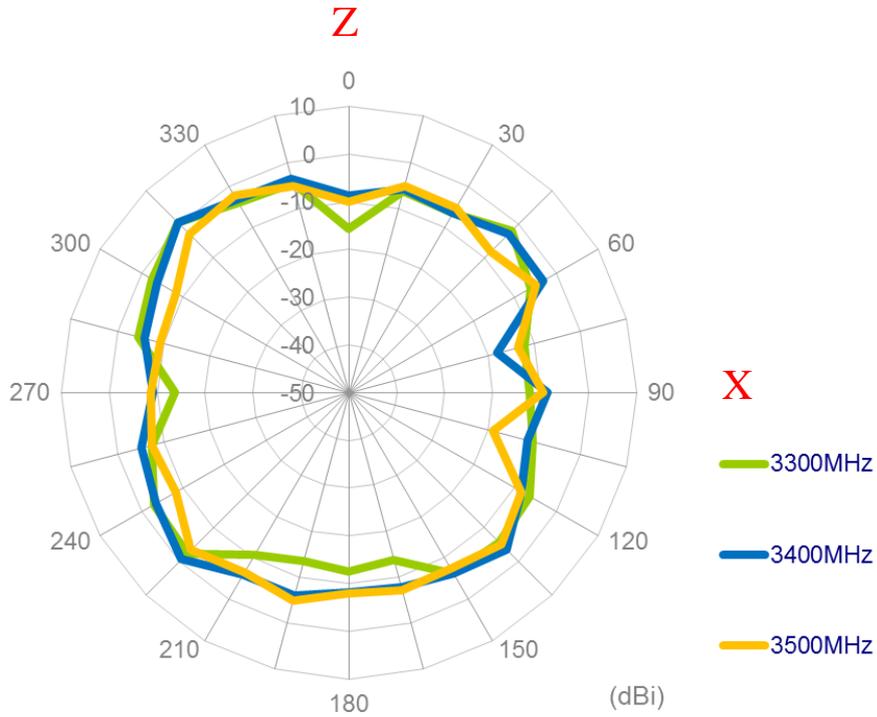




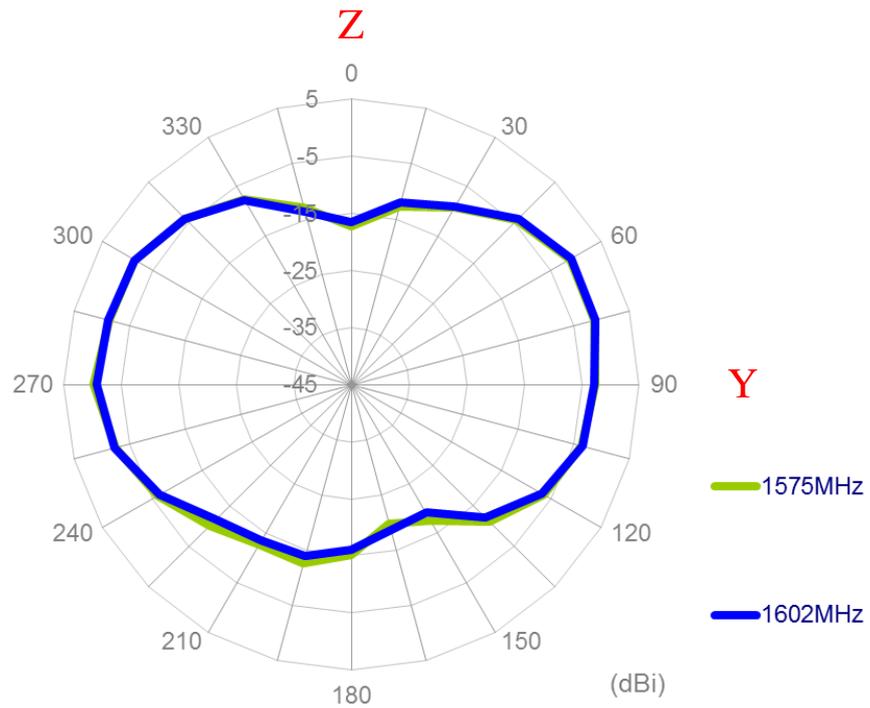
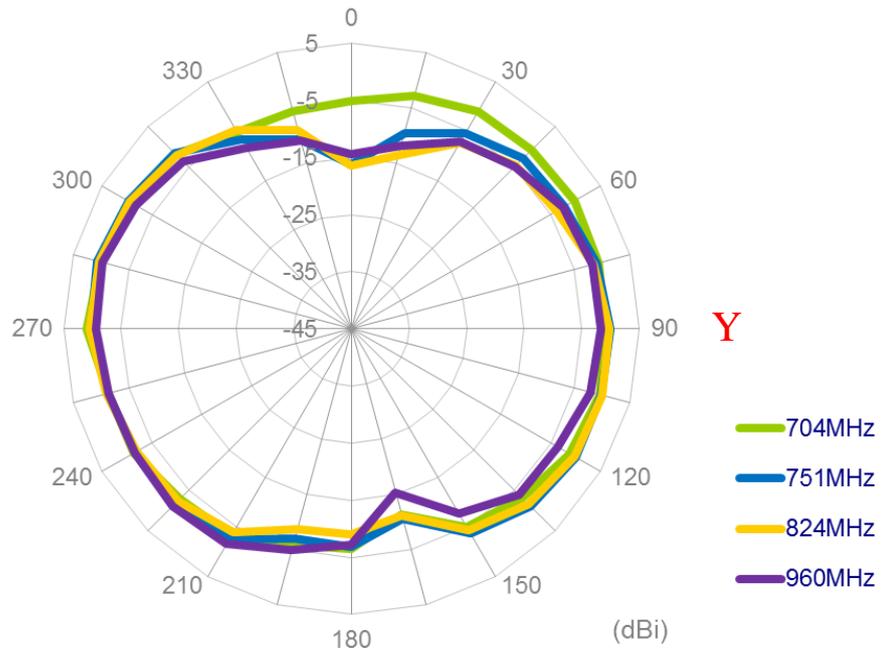
### 4.5 XZ plane (Antenna with 1 meter cable length on the 2mm ABS base)

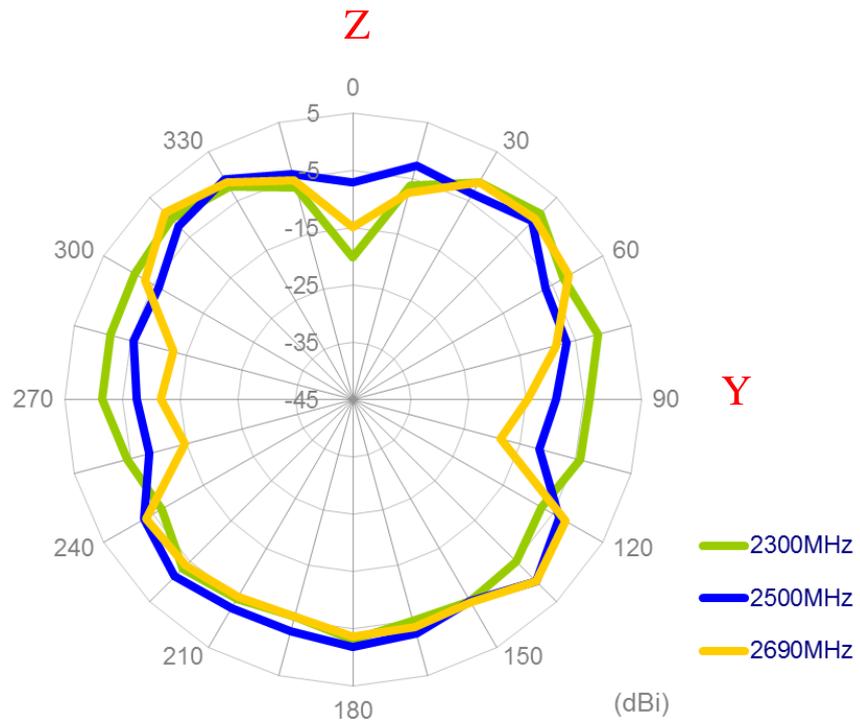
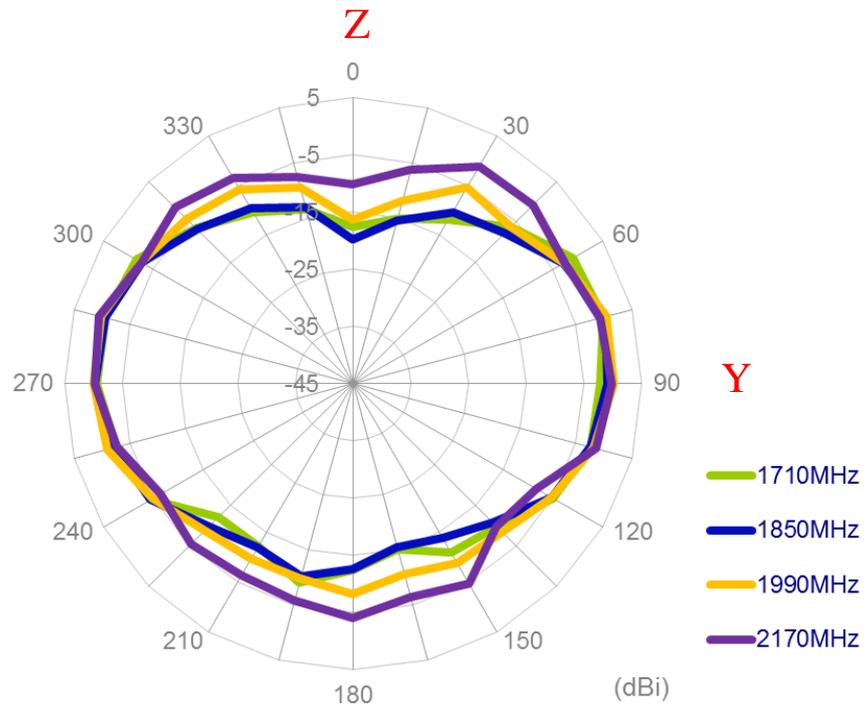


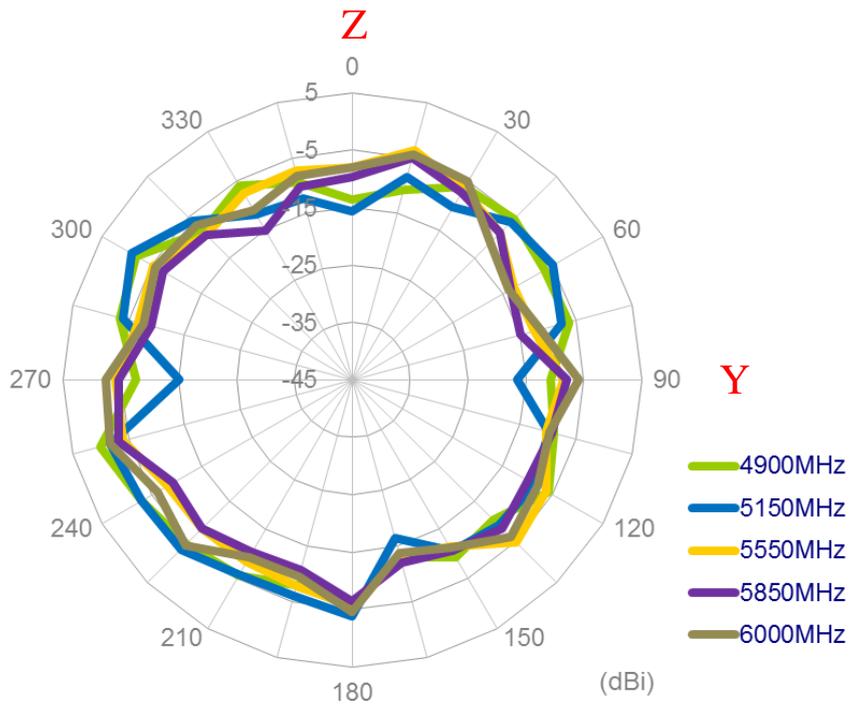
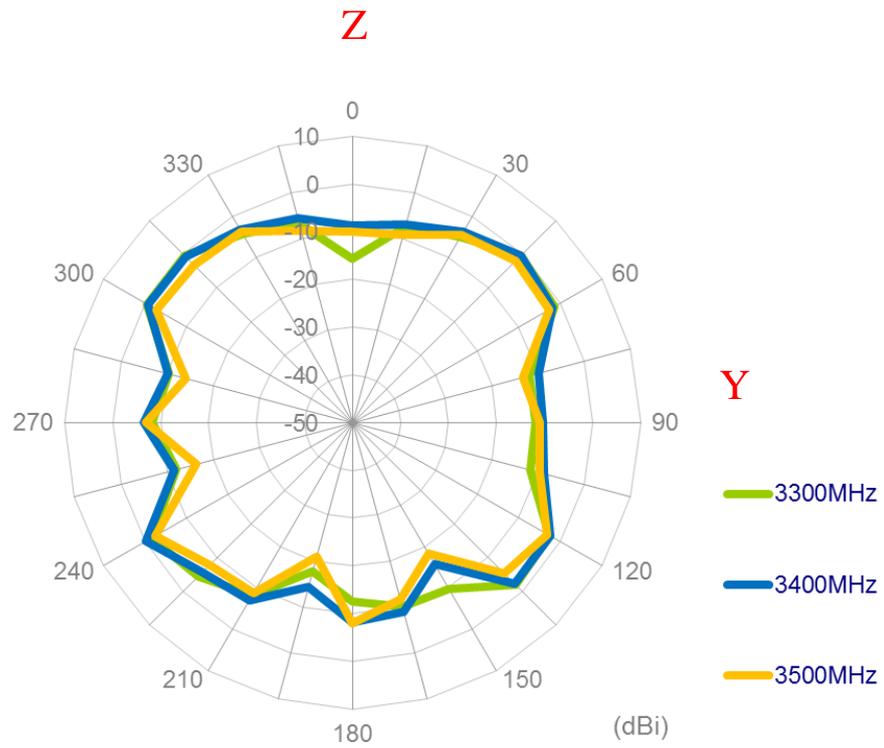




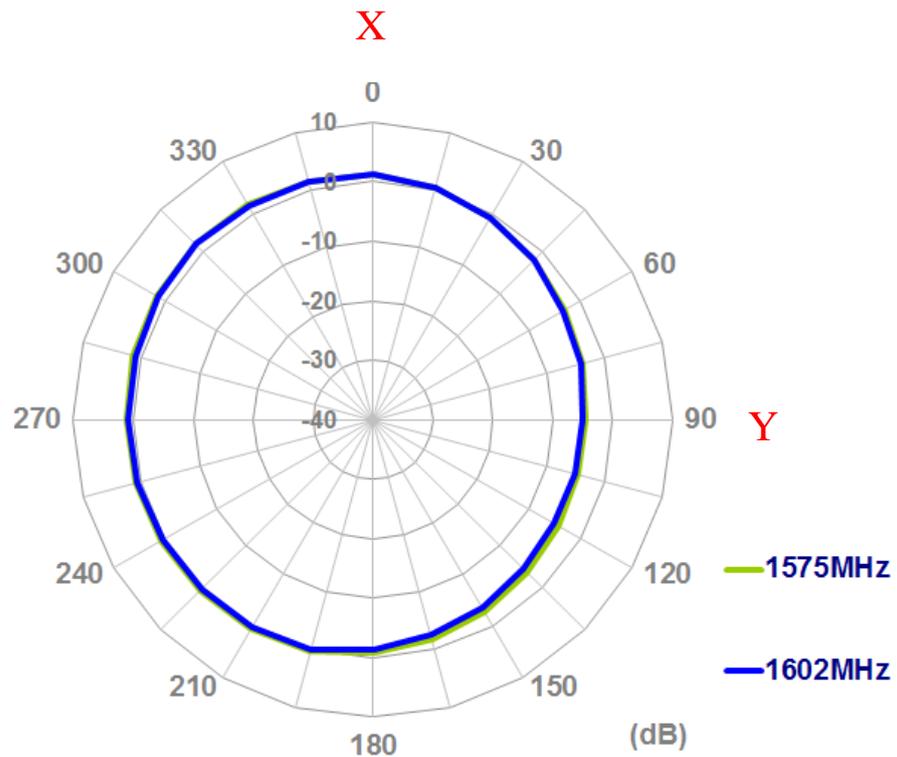
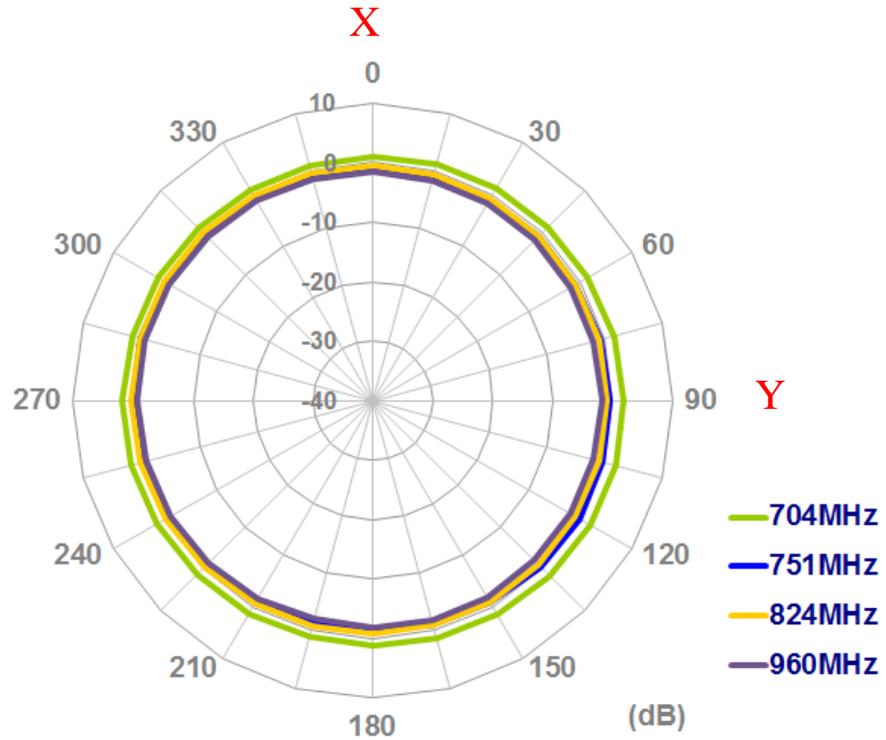
### 4.6 YZ plane (Antenna with 1 meters cable length on the 2mm ABS base)

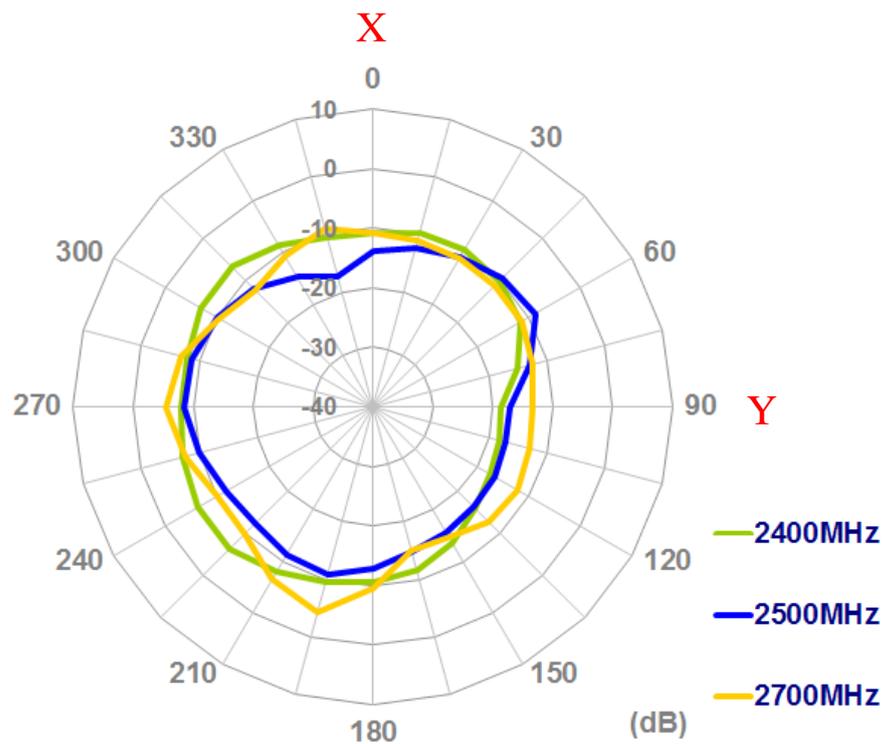
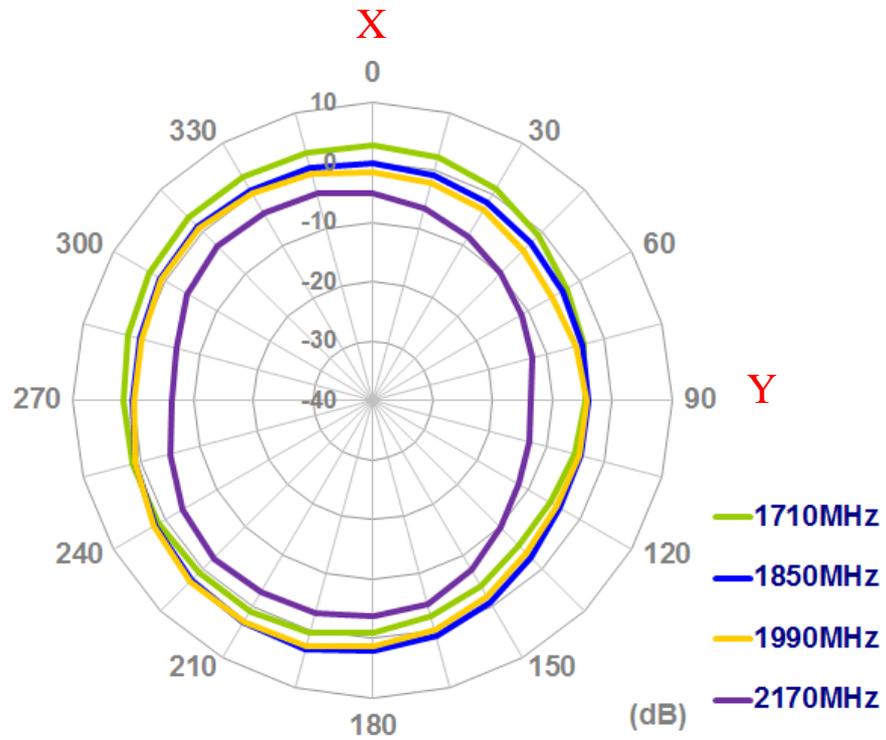


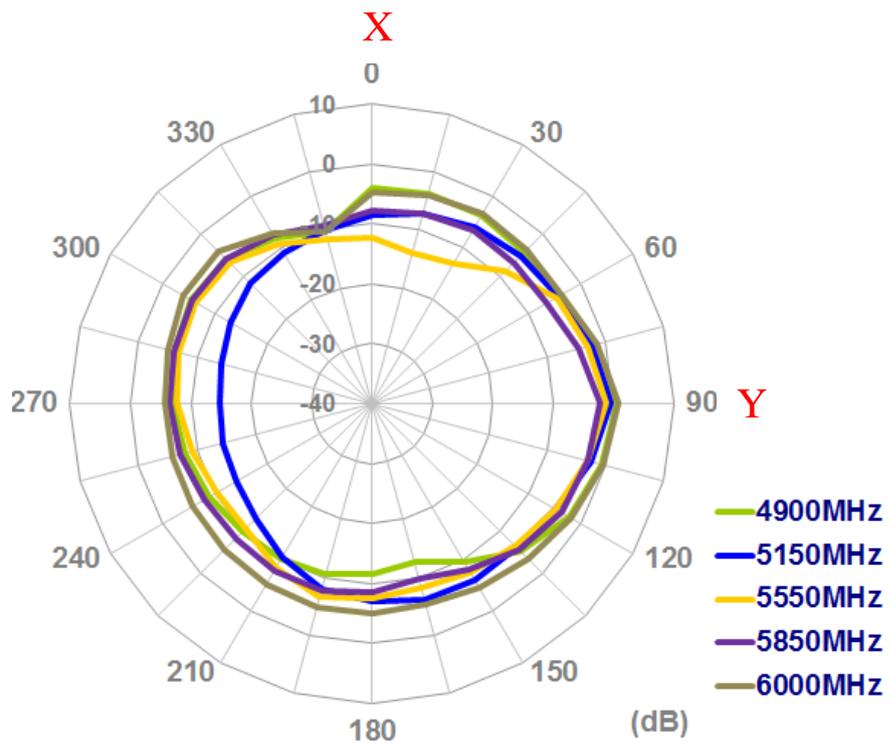
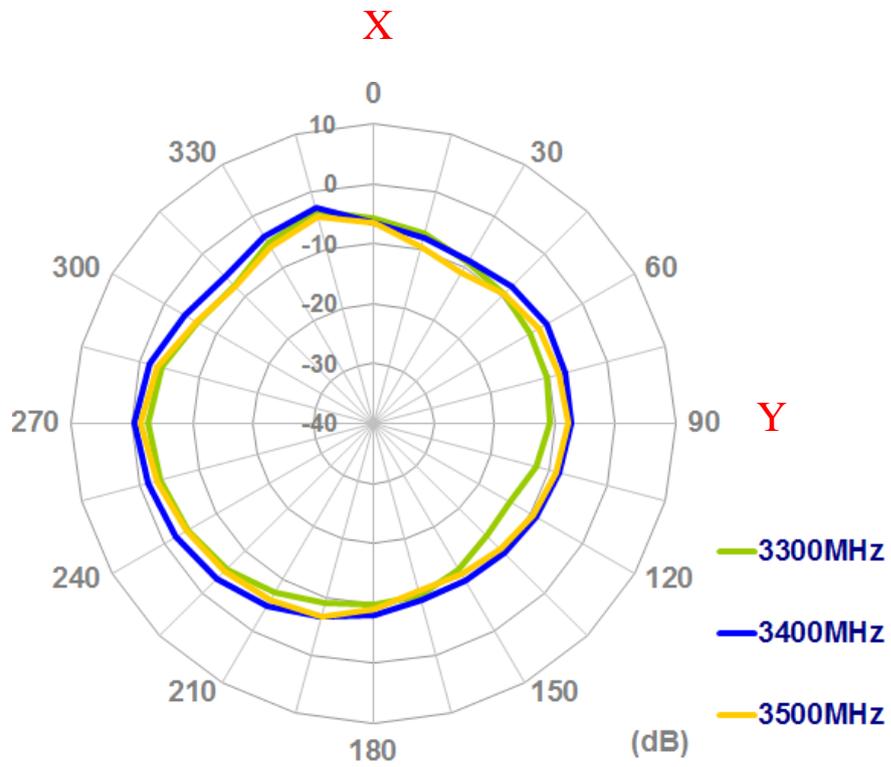




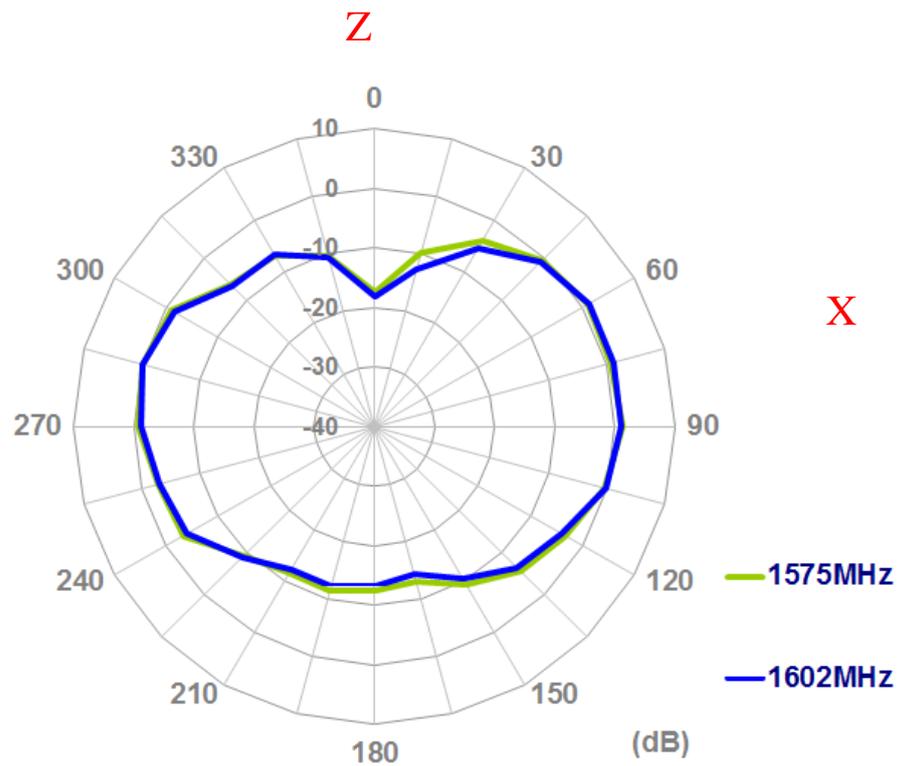
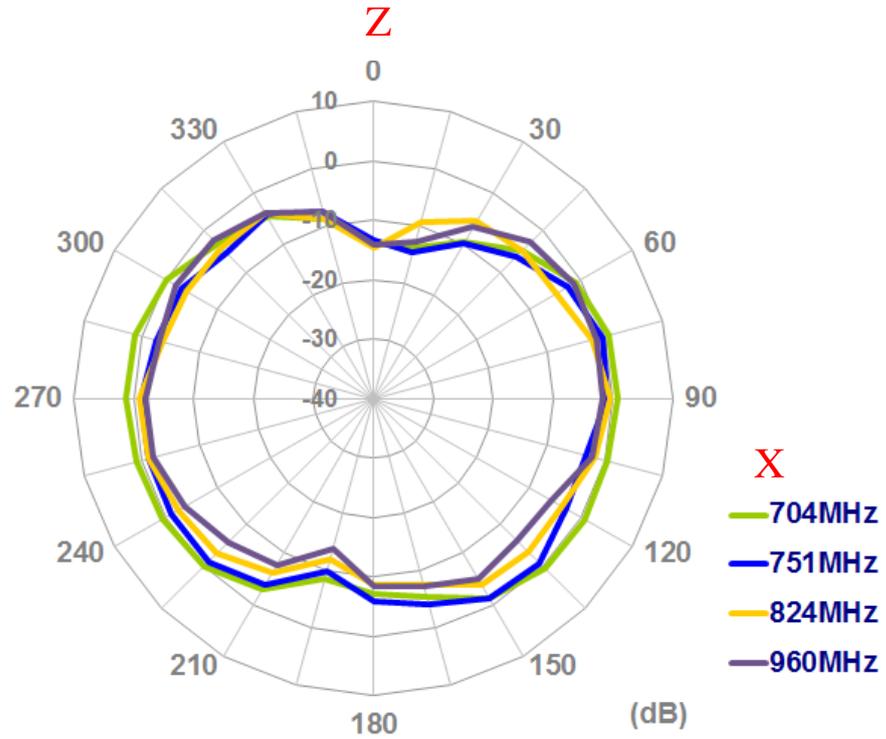
### 4.7 XY plane (Antenna with 1 meter cable length on the glass base)

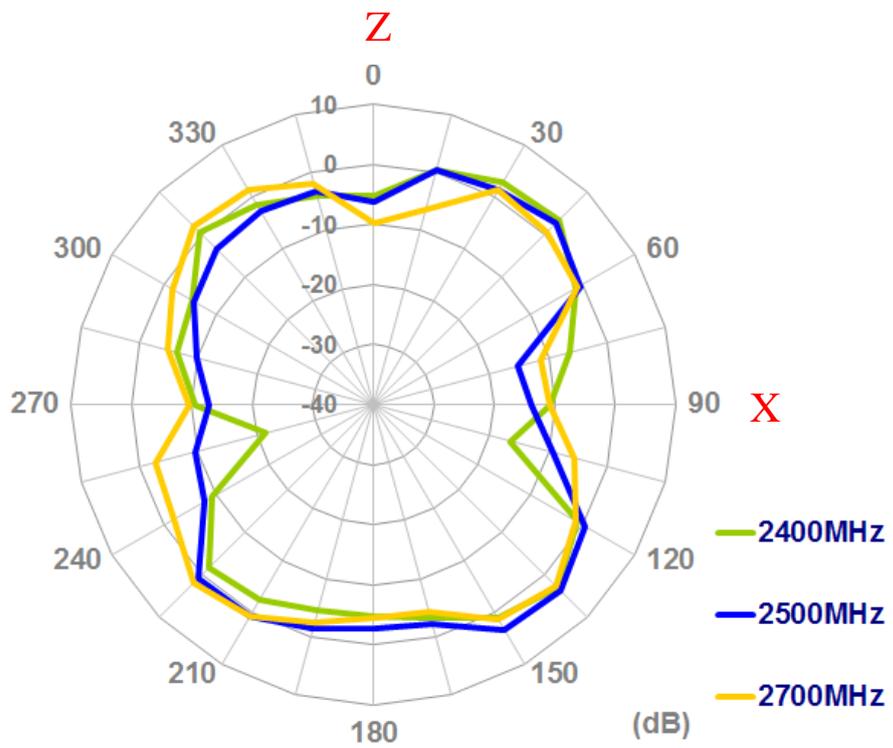
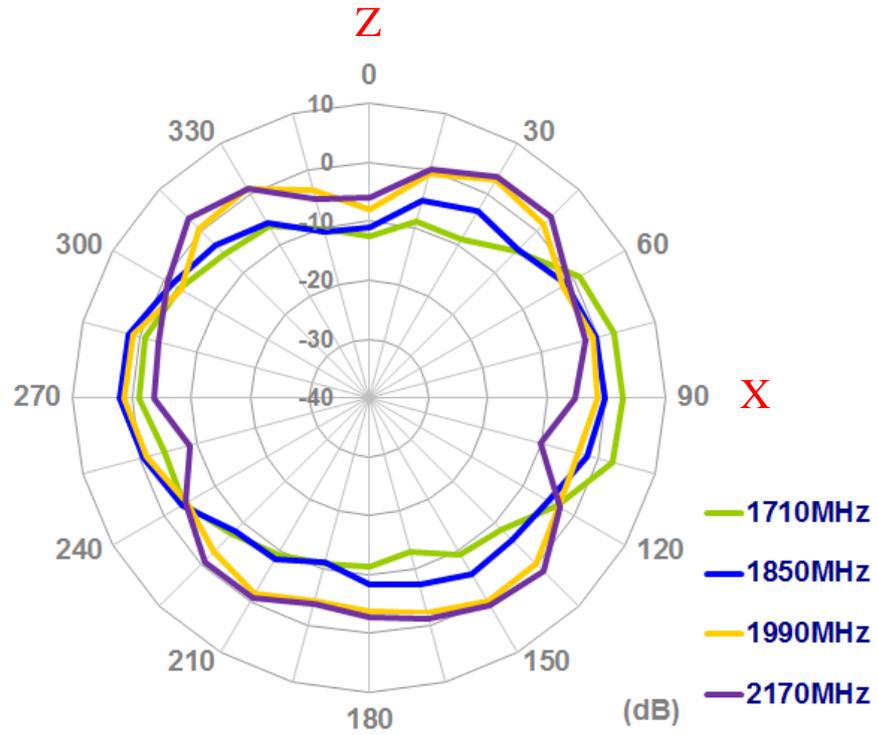


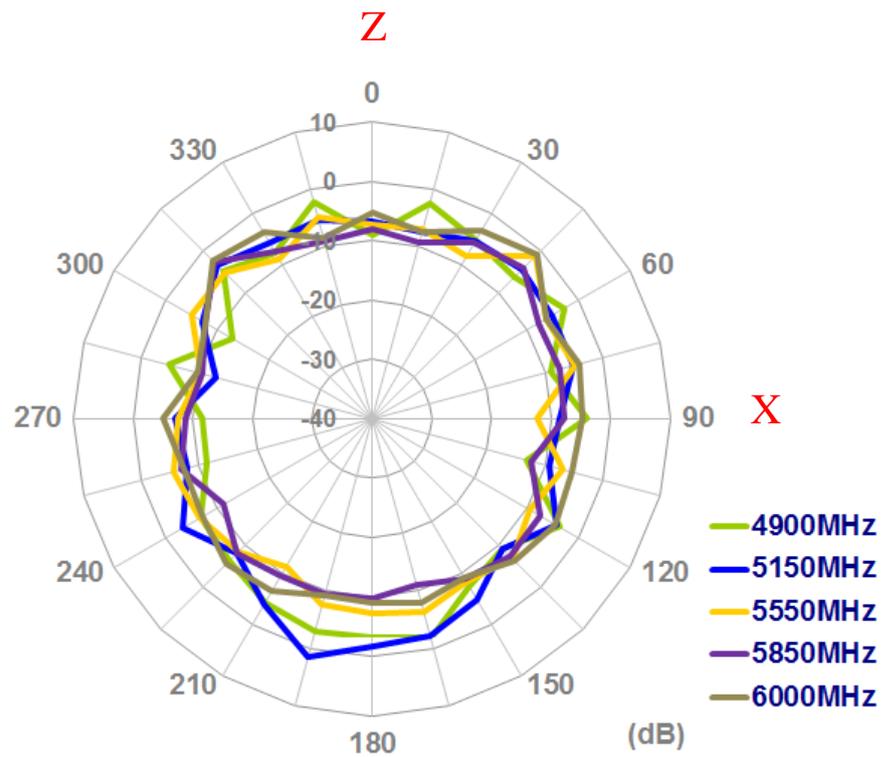
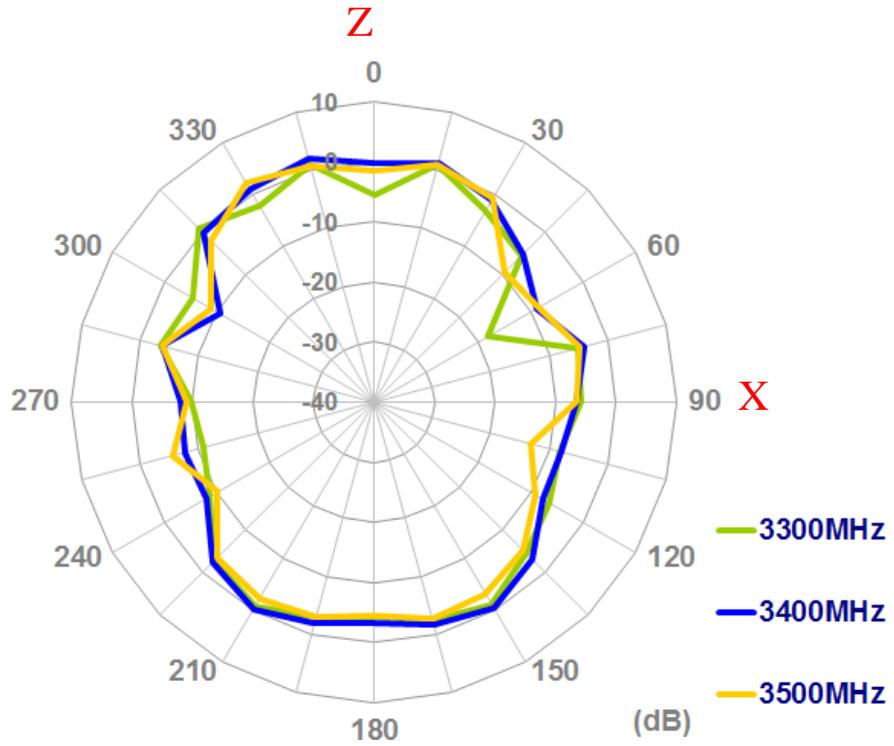




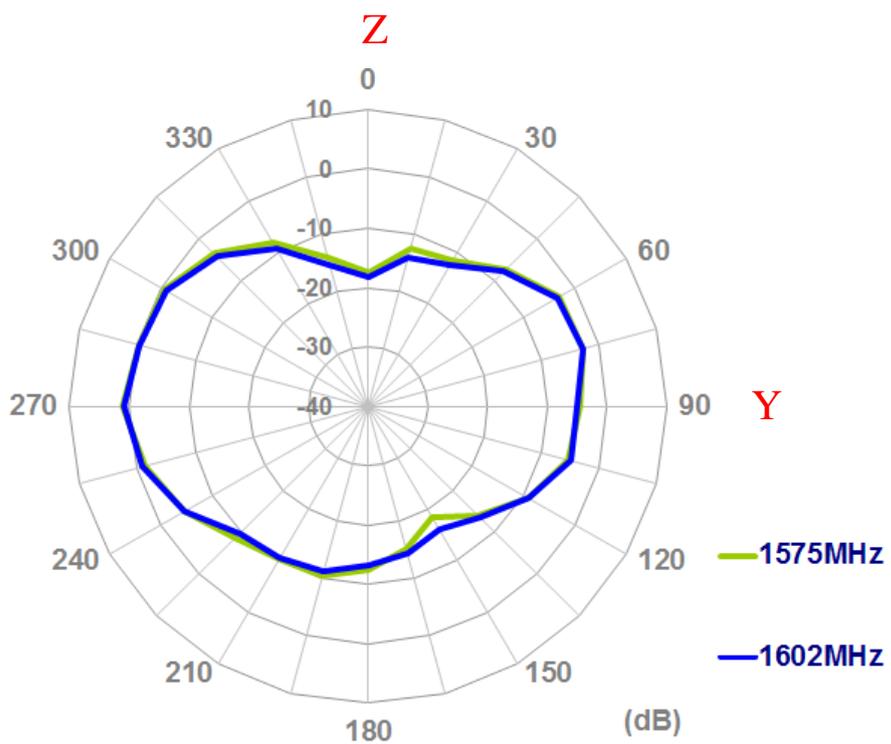
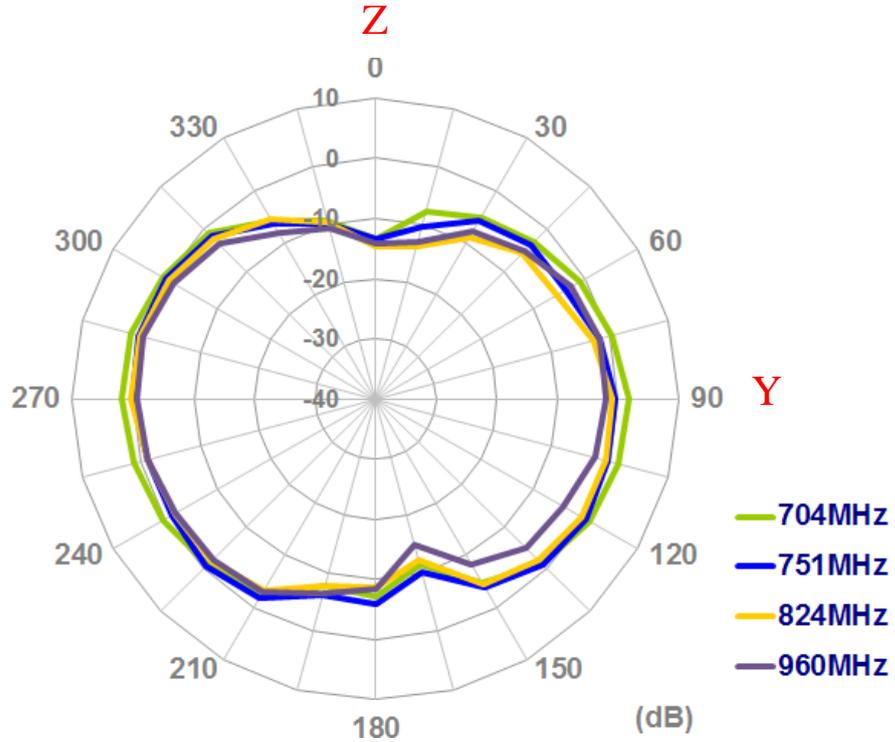
### 4.7 XZ plane (Antenna with 1 meter cable length on the glass base)

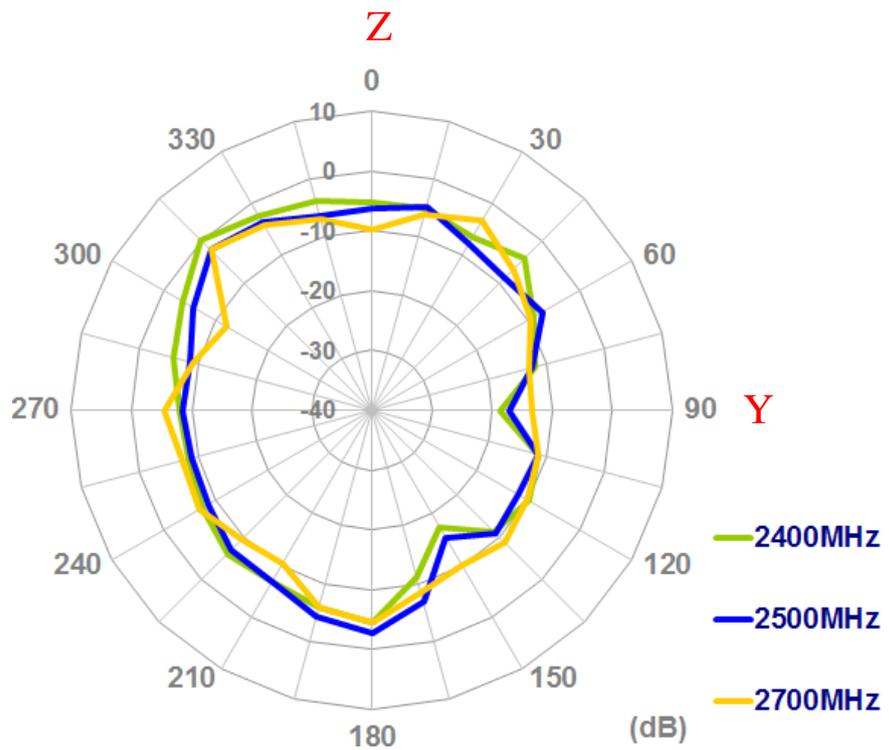
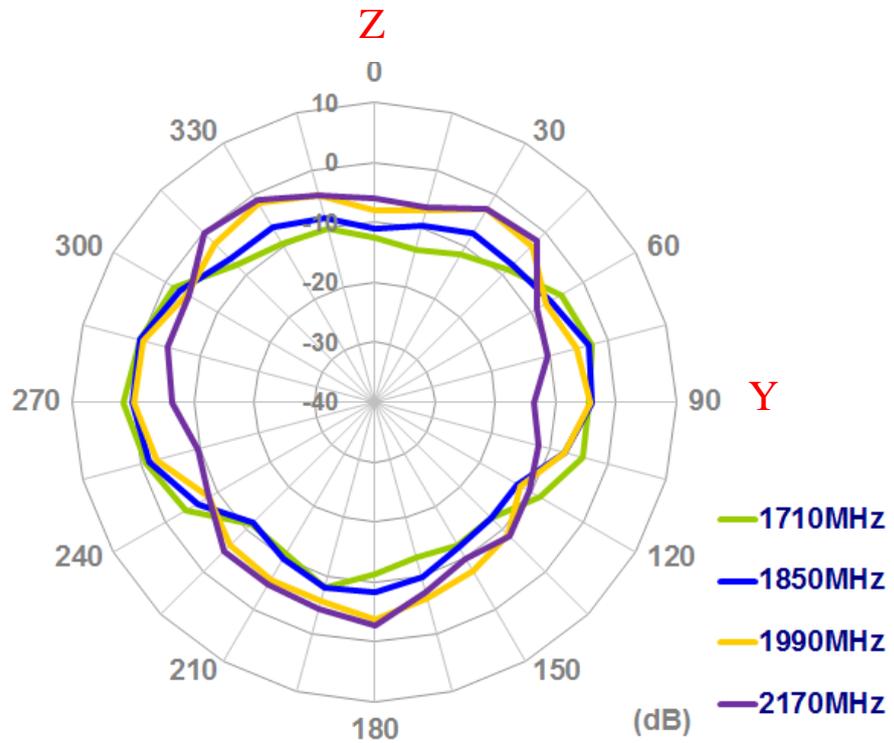


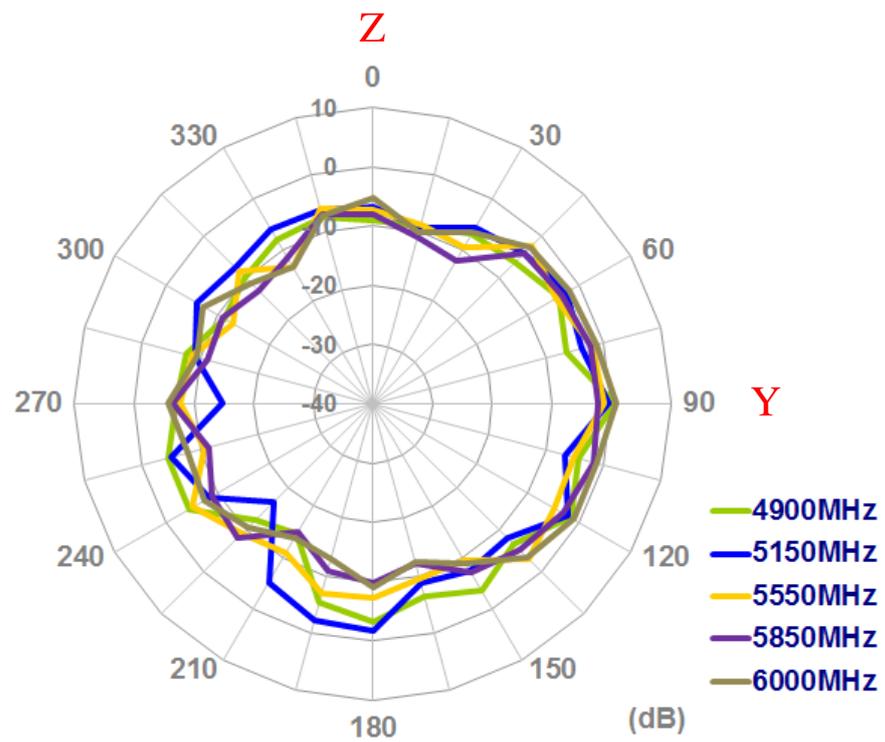
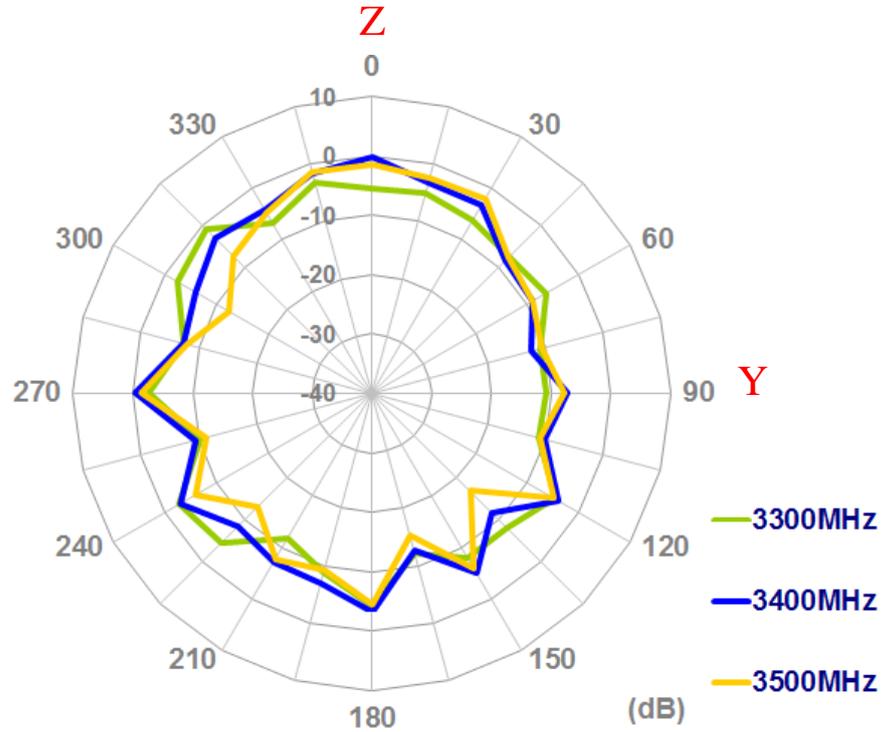




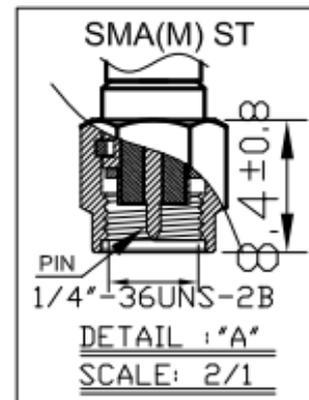
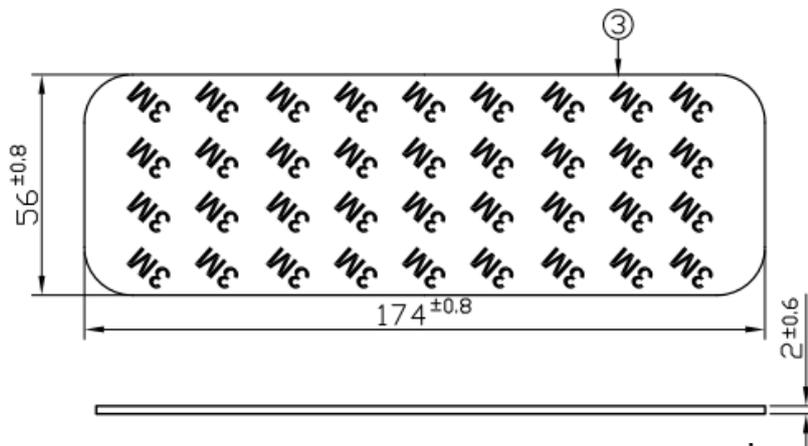
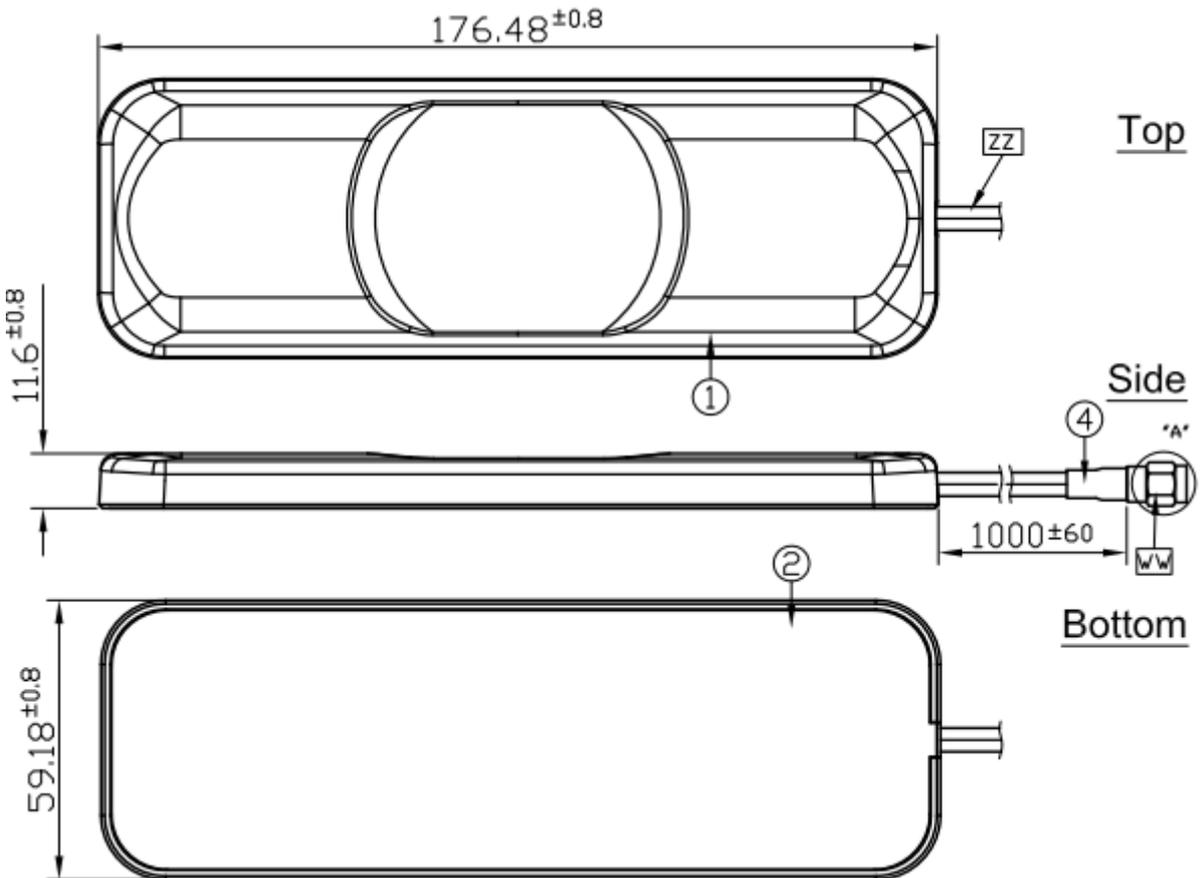
### 4.8 YZ plane (Antenna with 1 meters cable length on the glass base)







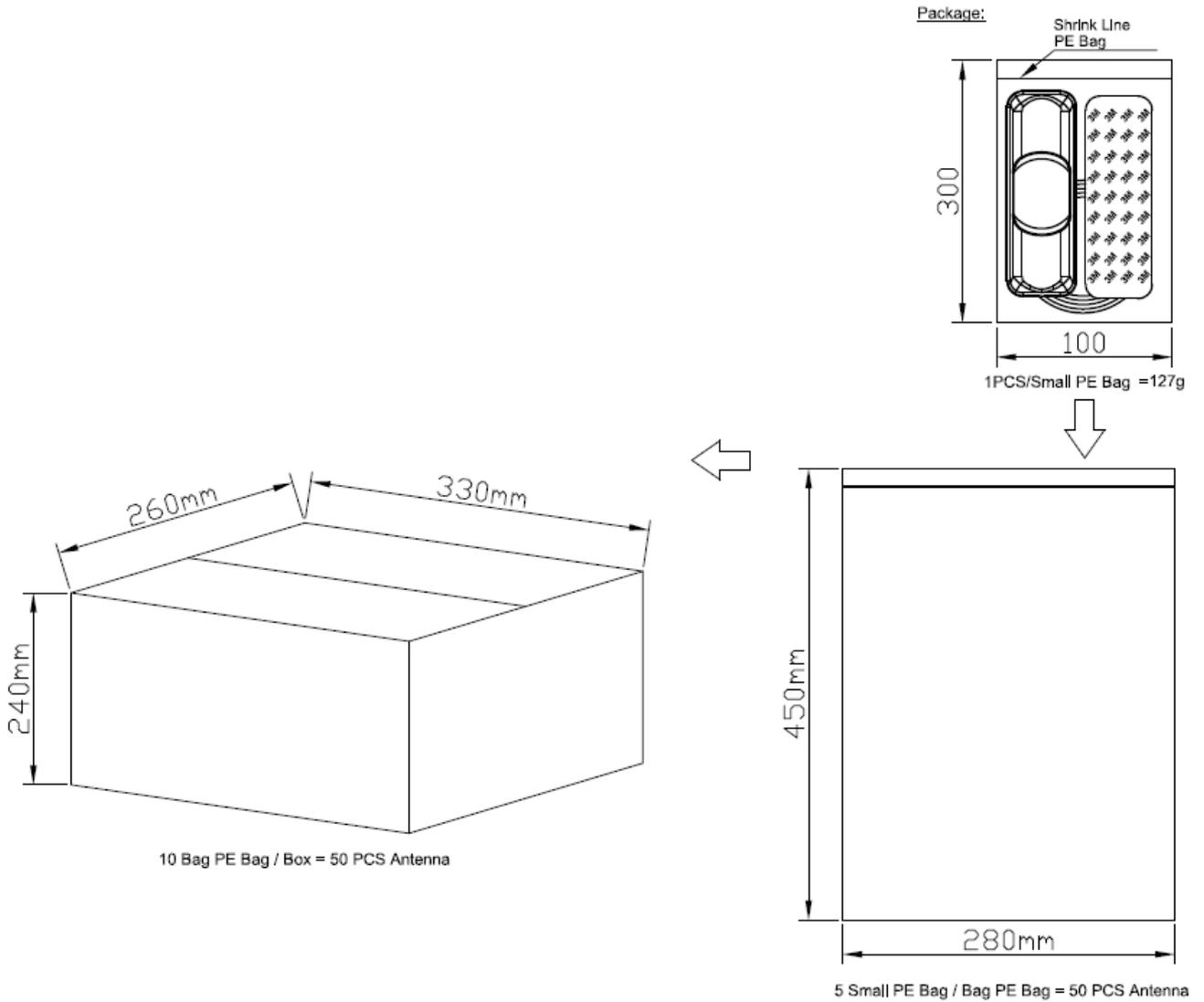
## 5. DRAWING



	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



## 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)

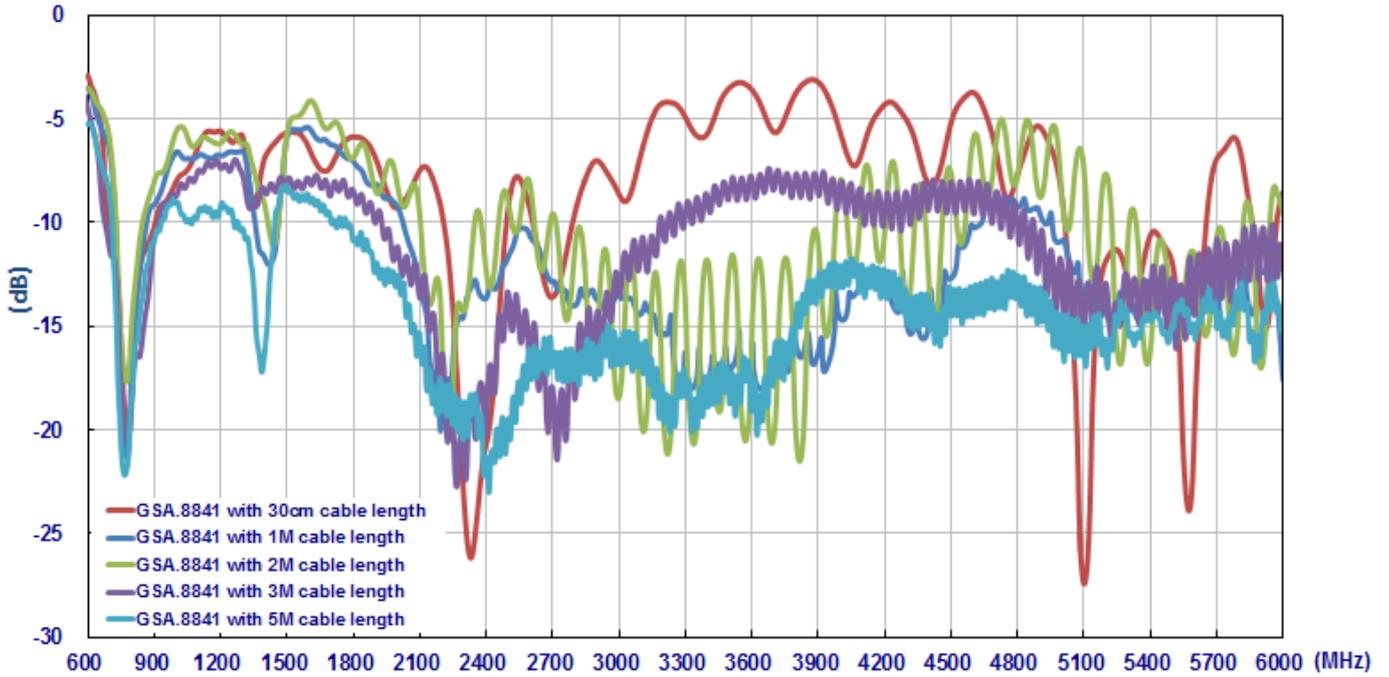


Figure 15. Measured the return loss of GSA.8841 Antenna with difference cable length

### 7.2 Efficiency (in free space)

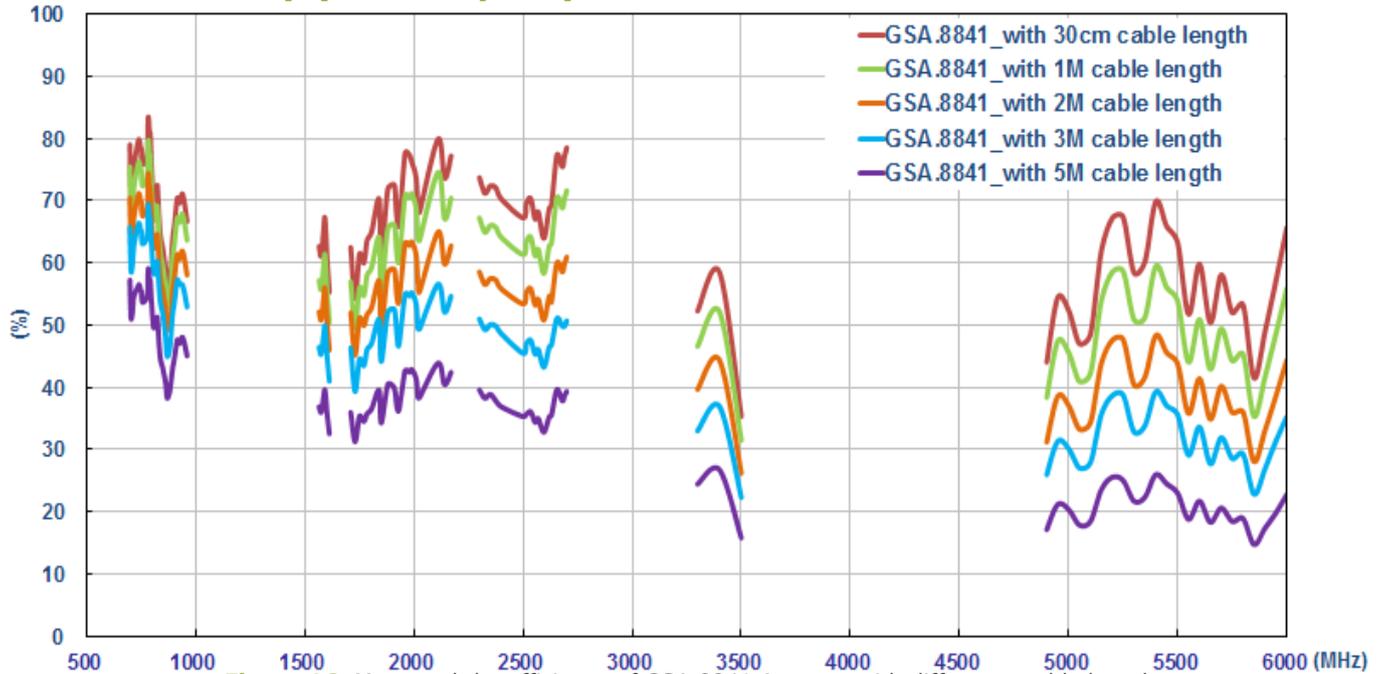


Figure 16. Measured the efficiency of GSA.8841 Antenna with difference cable length

### 7.3 Average Gain (in free space)

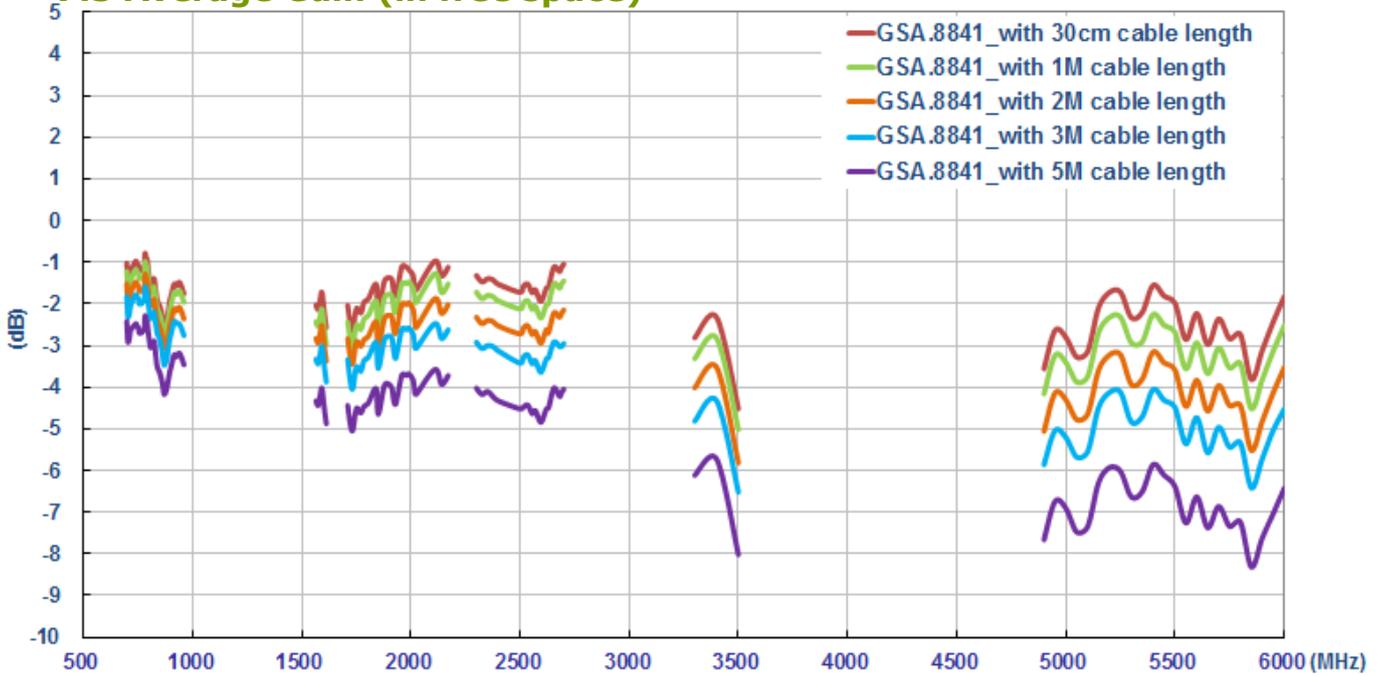


Figure 17. Measured the Average Gain of GSA.8841 Antenna with difference cable length

### 7.4 Peak Gain (in free space)

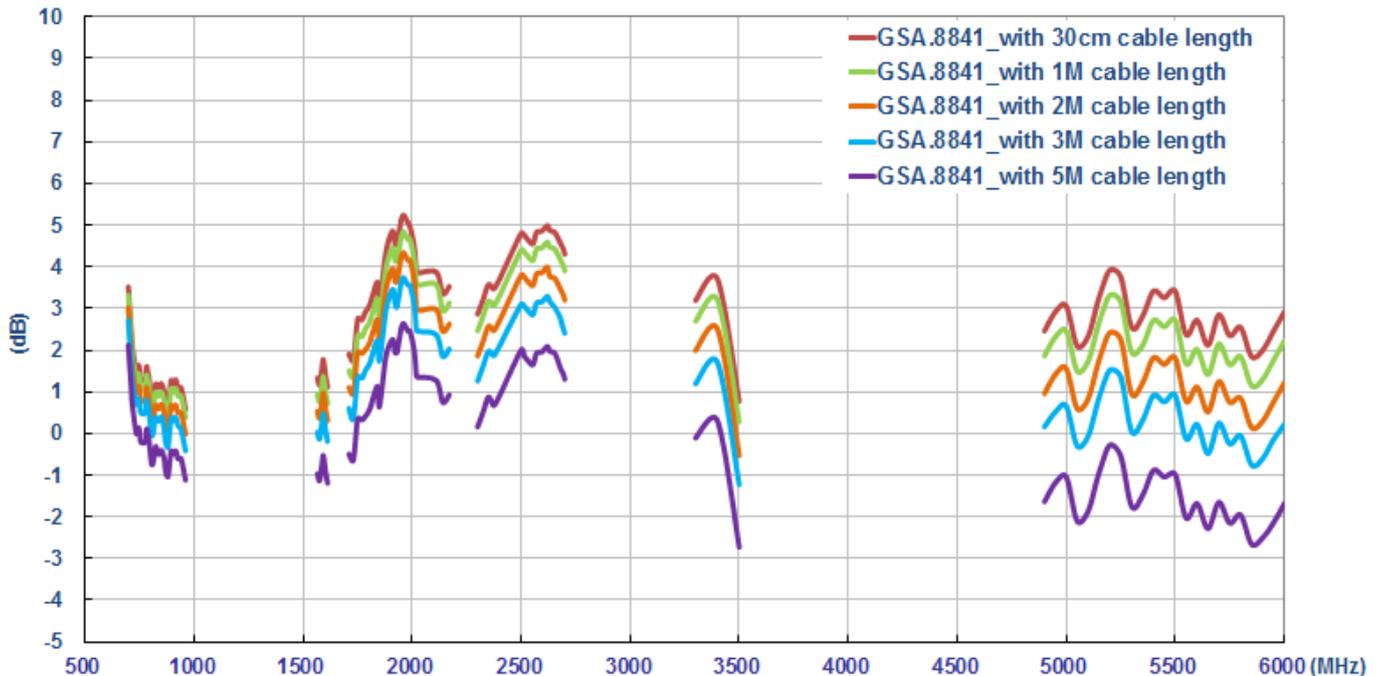


Figure 18. Measured the Peak Gain of GSA.8841 Antenna with difference cable length

### 7.5 Return loss (on the 2mm ABS base)

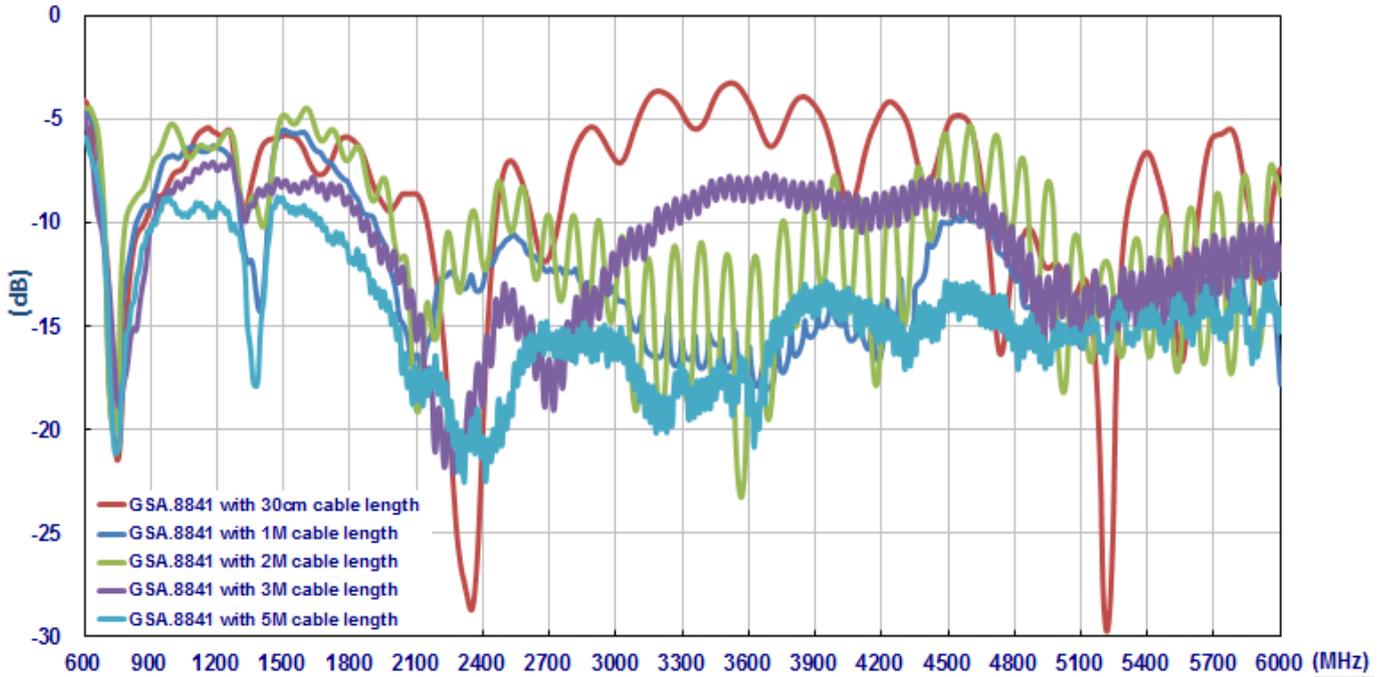


Figure 19. Measured the return loss of GSA.8841 Antenna with difference cable length

### 7.6 Efficiency (on the 2mm ABS base)

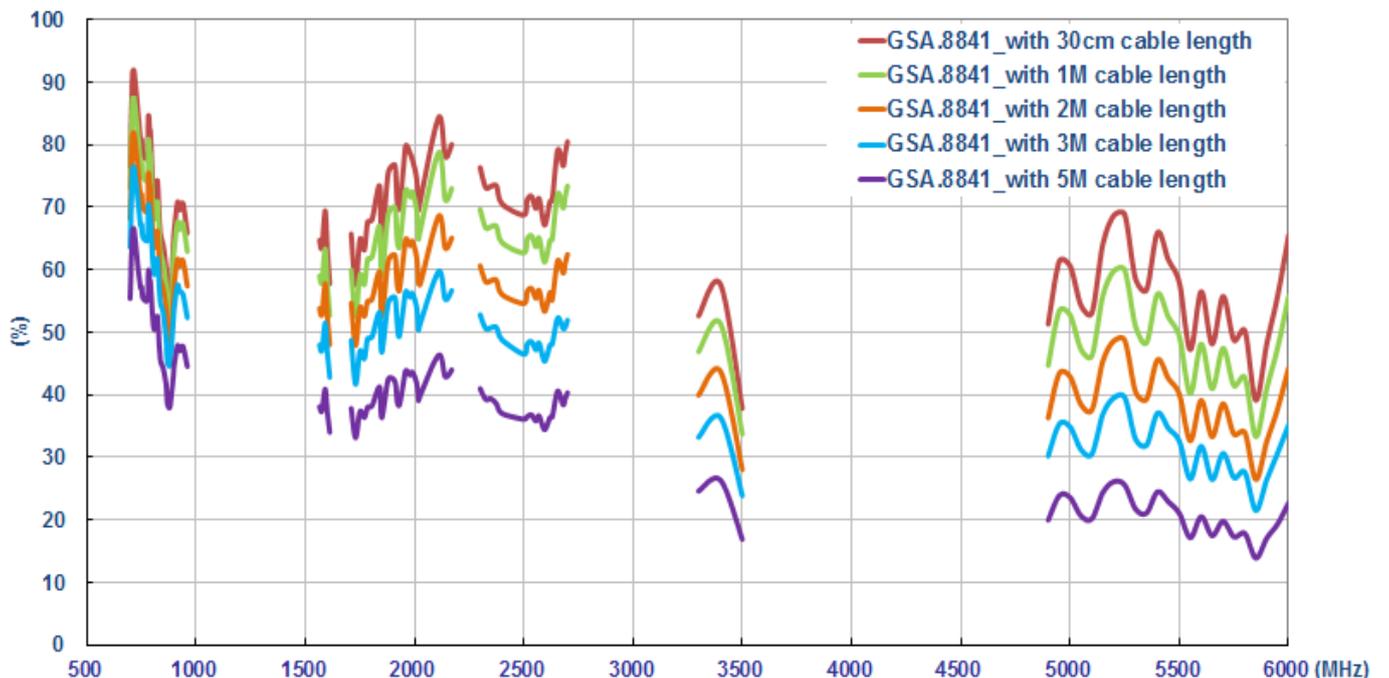


Figure 20. Measured the efficiency of GSA.8841 Antenna with difference cable length

### 7.7 Average Gain (on the 2mm ABS base)

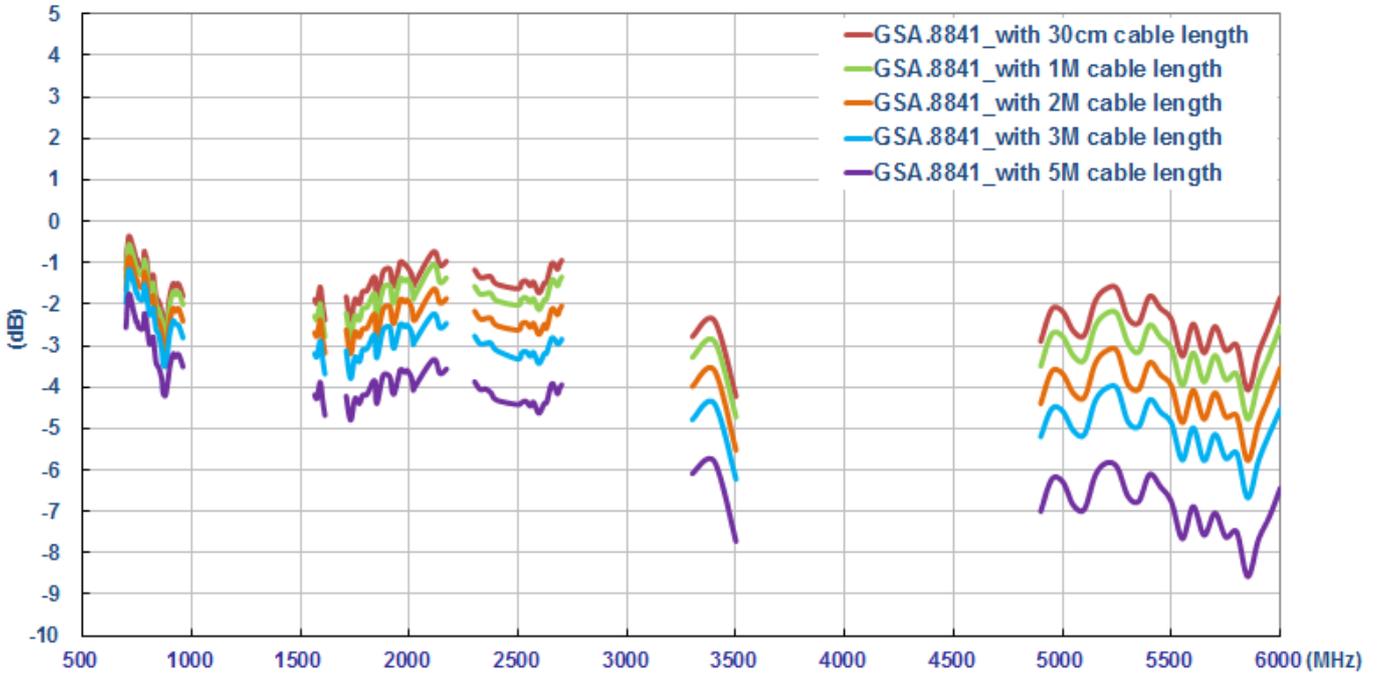


Figure 21. Measured the Average Gain of GSA.8841 Antenna with difference cable length

### 7.8 Peak Gain (on the 2mm ABS base)

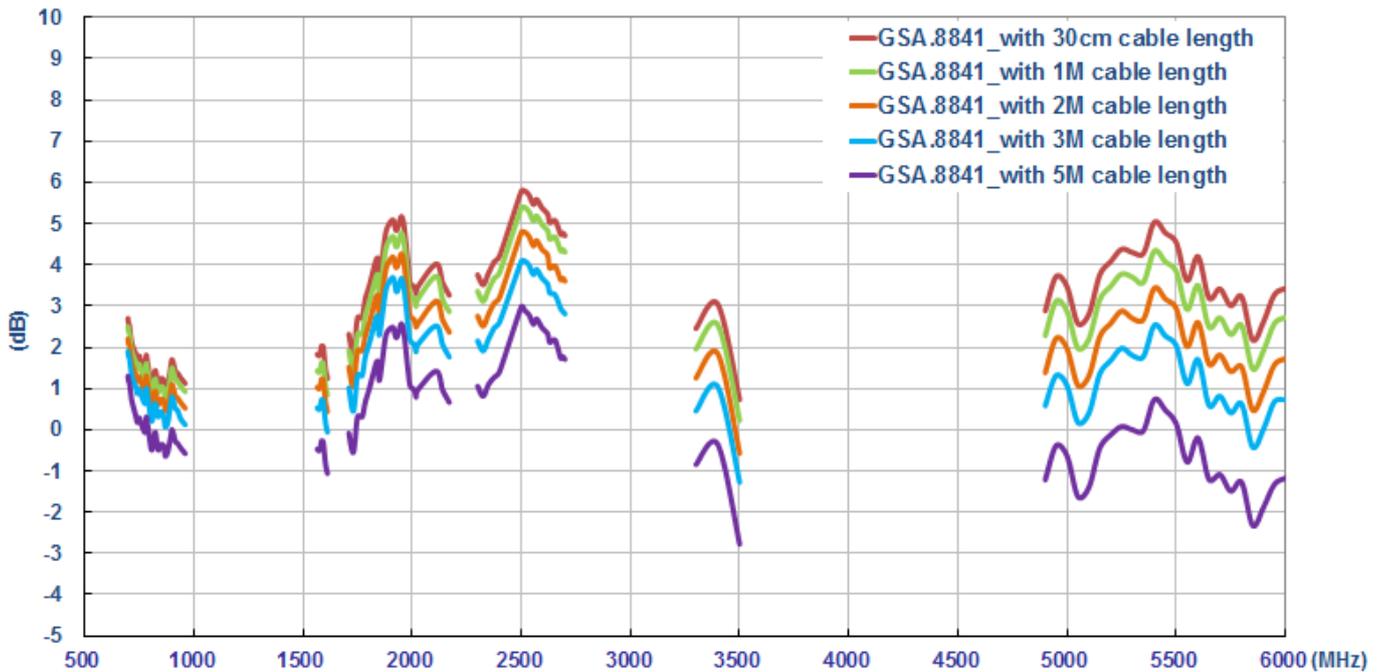


Figure 22. Measured the Peak Gain of GSA.8841 Antenna with difference cable length

### 7.9 Return loss (on the glass base)

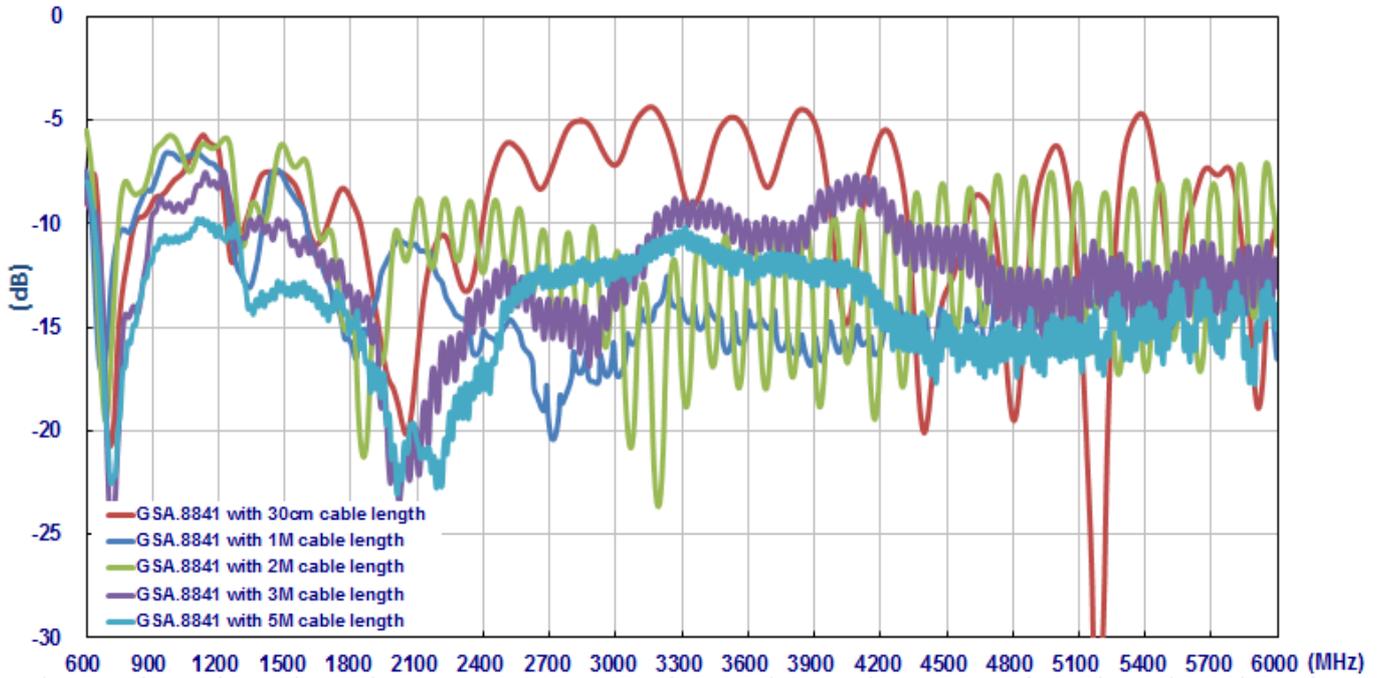


Figure 23. Measured the return loss of GSA.8841 Antenna with difference cable length

### 7.10 Efficiency (on the glass base)

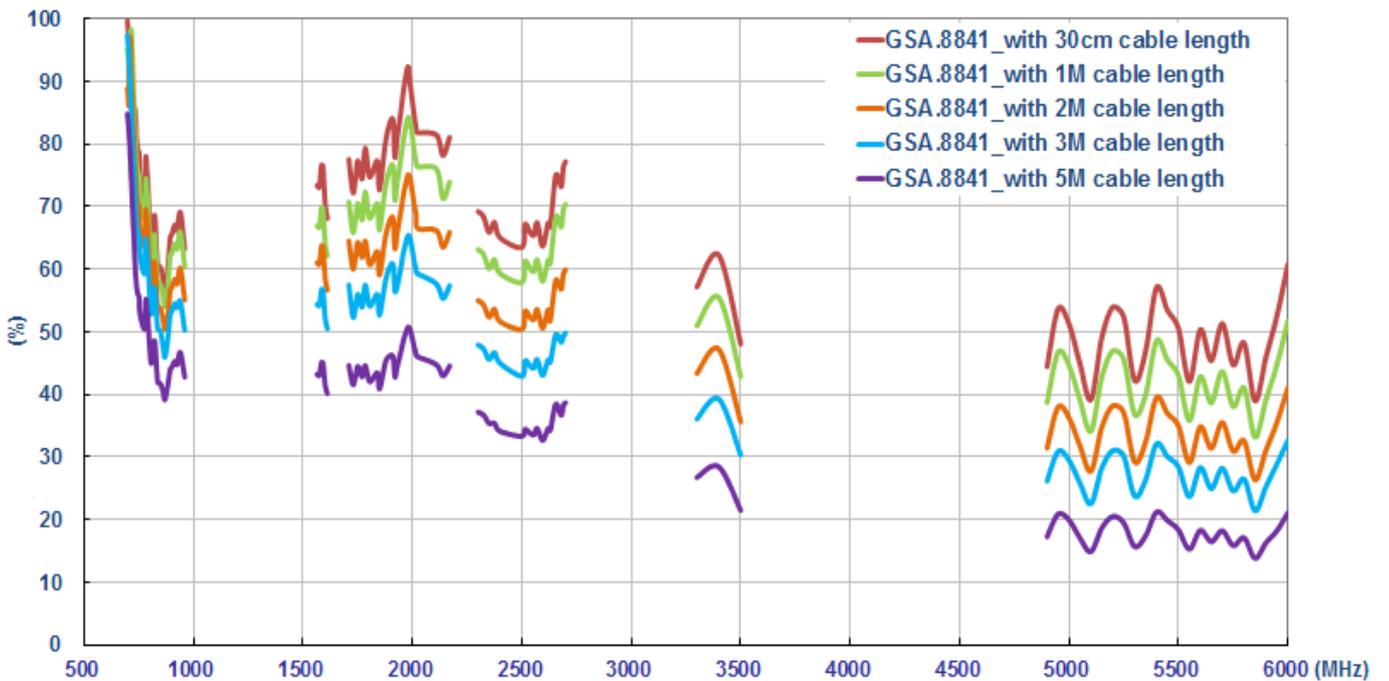


Figure 24. Measured the efficiency of GSA.8841 Antenna with difference cable length

### 7.11 Average Gain (on the glass base)

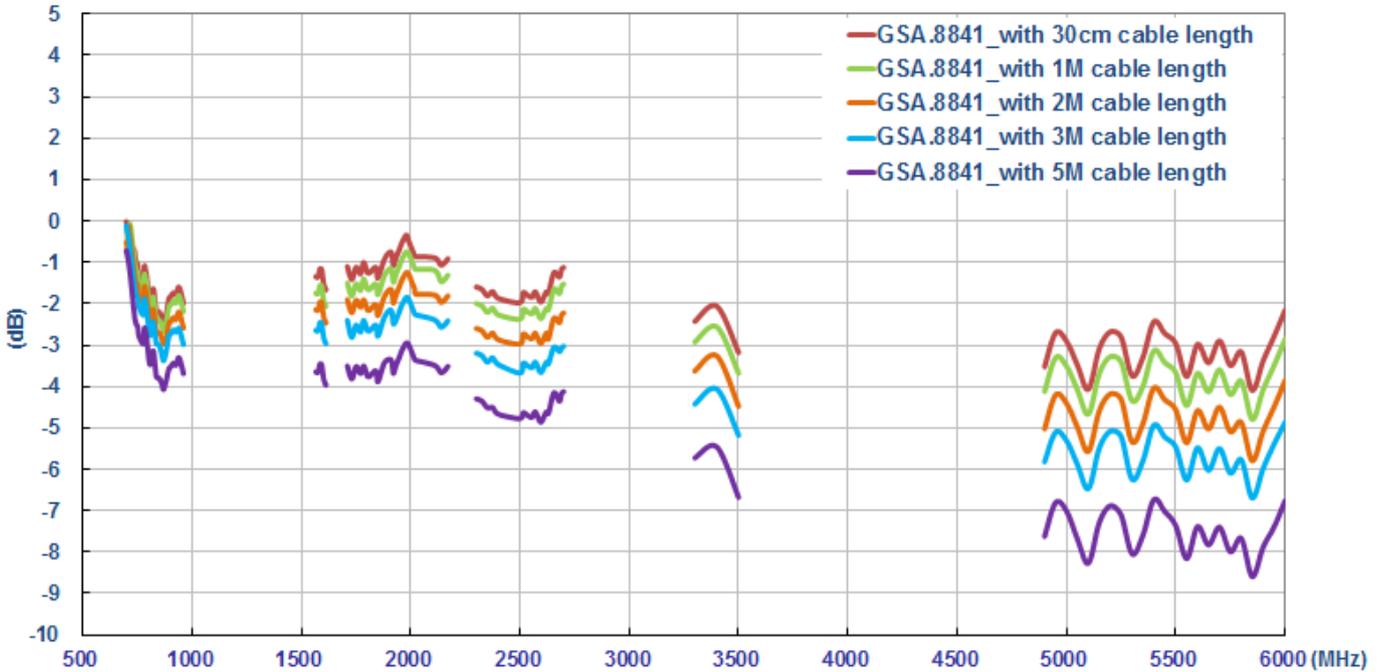


Figure 25. Measured the Average Gain of GSA.8841 Antenna with difference cable length

### 7.12 Peak Gain (on the glass base)

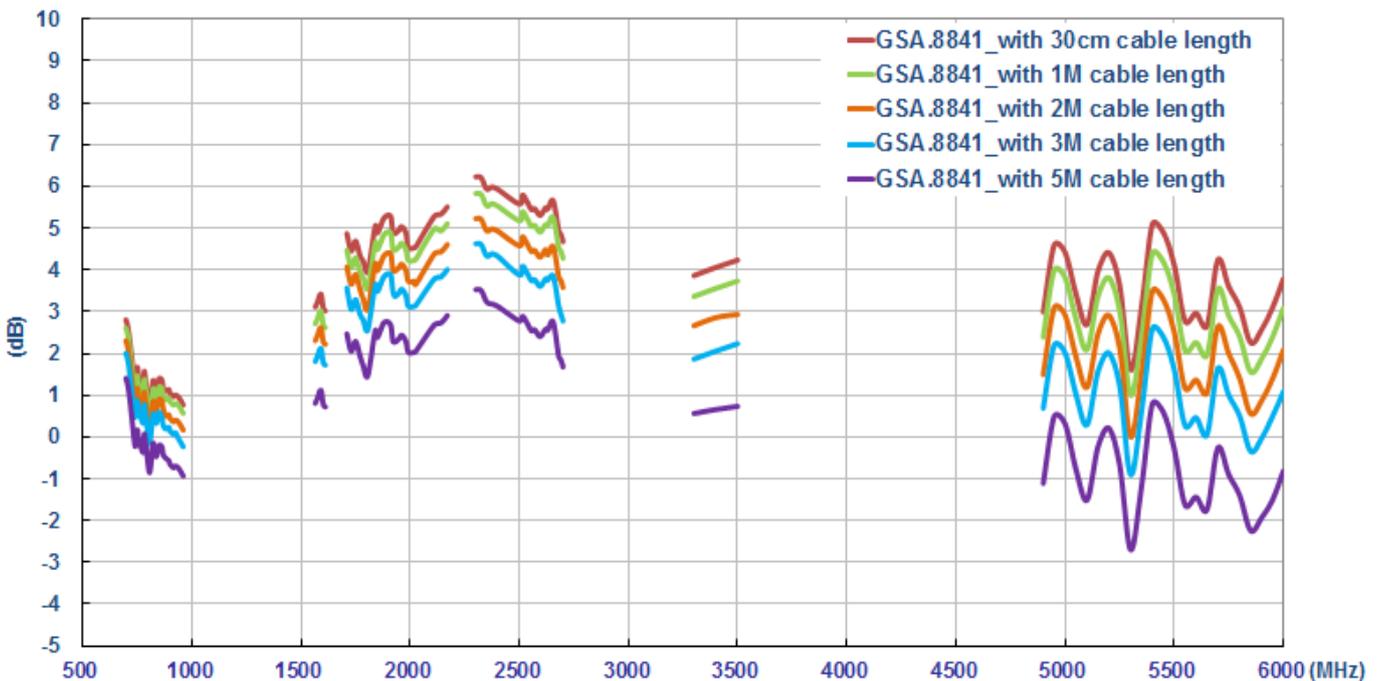


Figure 26. Measured the Peak Gain of GSA.8841 Antenna with difference cable length

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