

HX-CSX280A measurement antenna performance test report

The antenna indicator test items are shown in the following table

Antenna indicator test item

Test item	request
GNSS antenna gain	Maximum gain $\geq 5.0\text{dB}$
Antenna axis ratio	$\leq 3\text{dB}$
4G antenna gain	Maximum gain $\geq 1\text{dB}$
WIFI antenna gain	Maximum gain $\geq 0.5\text{dB}$

1 Antenna characteristics

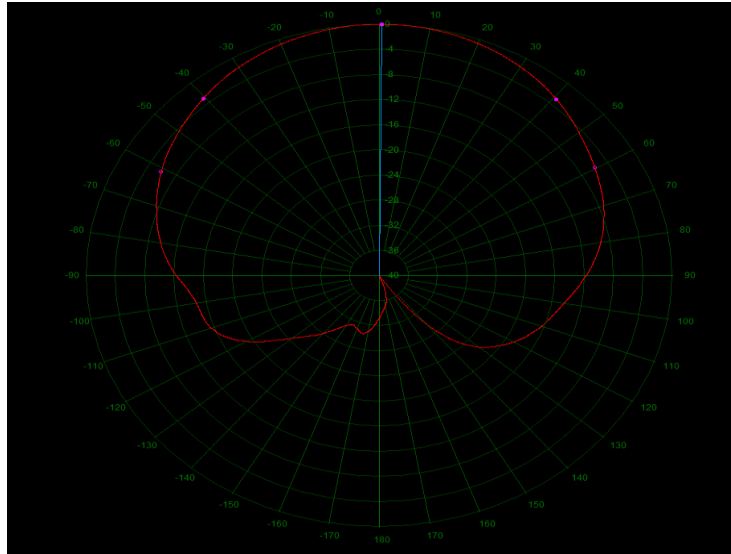
Frequency point (MHz).	Normal gain (dBi).	20 degrees low elevation gain (dBi).	Shaft ratio (dB).
1176	2.07	-3.82	1.20
1179	2.32	-3.62	1.23
1182	2.49	-3.49	1.23
1185	2.62	-3.41	1.29
1188	2.78	-3.31	1.32
1191	3.02	-3.12	1.35
1194	3.25	-2.94	1.37
1197	3.40	-2.82	1.42
1200	3.54	-2.70	1.48
1203	3.73	-2.50	1.53
1206	3.93	-2.30	1.56
1209	4.07	-2.15	1.61
1212	4.18	-2.03	1.65
1215	4.30	-1.91	1.64
1218	4.42	-1.77	1.61
1221	4.52	-1.65	1.59
1224	4.60	-1.56	1.57
1227	4.65	-1.48	1.55
1230	4.72	-1.40	1.53
1233	4.82	-1.30	1.52
1236	4.99	-1.20	1.51

1239	5.09	-1.18	1.50
1242	5.14	-1.02	1.50
1245	5.27	-1.01	1.51
1248	5.03	-1.14	1.52
1251	4.97	-1.27	1.54
1254	4.83	-1.39	1.53
1257	4.75	-1.52	1.50
1260	4.74	-1.69	1.47
1263	4.68	-1.79	1.45
1266	4.59	-1.92	1.46
1269	4.55	-2.00	1.46
1272	4.52	-2.06	1.46
1275	4.41	-2.18	1.45
1278	4.24	-2.36	1.44

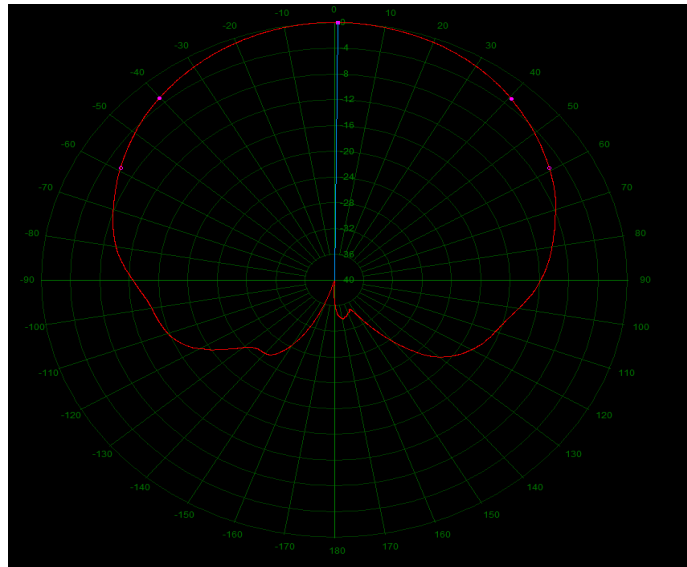
Frequency point (MHz).	Normal gain (dBi).	20 degrees low elevation gain (dBi).	Shaft ratio (dB).
1559	4.66	-3.07	0.84
1562	4.72	-2.94	0.80
1565	4.83	-2.74	0.77
1568	4.90	-2.60	0.75
1571	4.78	-2.55	0.73
1574	4.64	-2.47	0.72
1577	4.65	-2.26	0.71
1580	4.78	-2.11	0.71
1583	4.82	-2.07	0.69
1586	4.72	-2.07	0.68
1589	4.68	-2.01	0.66
1592	4.82	-1.99	0.66
1595	4.95	-2.13	0.65
1598	4.75	-2.31	0.65
1601	4.59	-2.31	0.65
1604	4.38	-2.20	0.64
1607	4.45	-2.17	0.62
1610	4.40	-2.26	0.61

1.3 Antenna Pattern

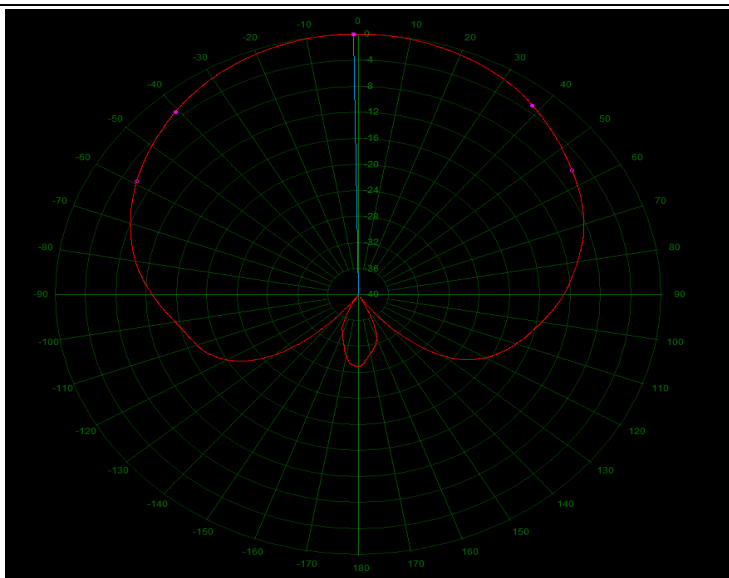
1.3.1 The GNSS antenna measured pattern is as follows:



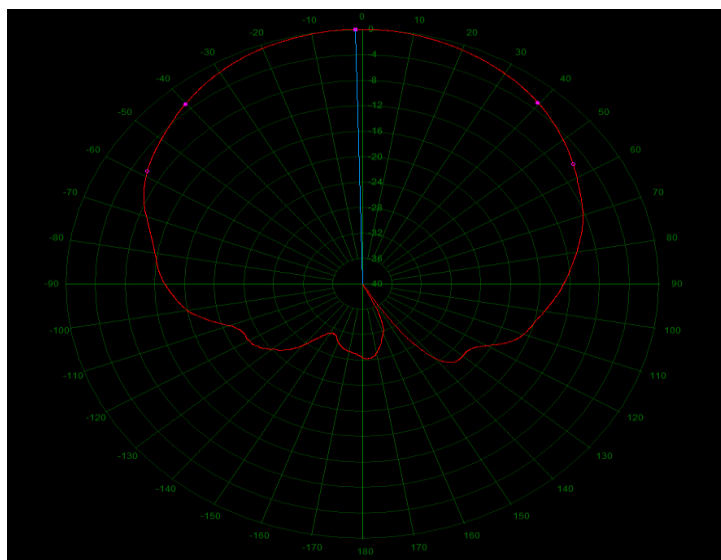
1176MHz



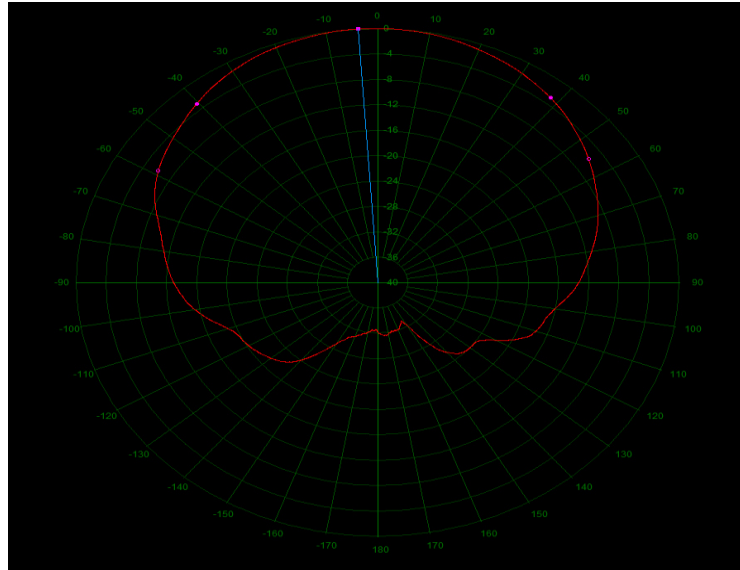
1227MHz



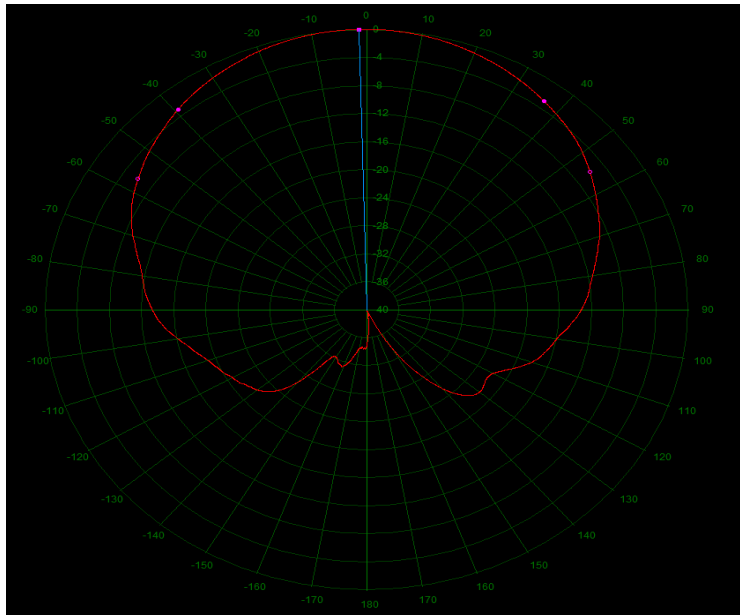
1278MHz



1559MHz



1574MHz



1610MHz

1.2 The measured data of 4G antennas are as follows:

4G1 antenna data

Frequency range (Mhz)	Frequency Point (MHz)	Gain (dBi).	Efficiency (%)
791 - 821	794	-7.20	6.47
824-849	830	-0.69	25.8
	848	-0.03	33.03

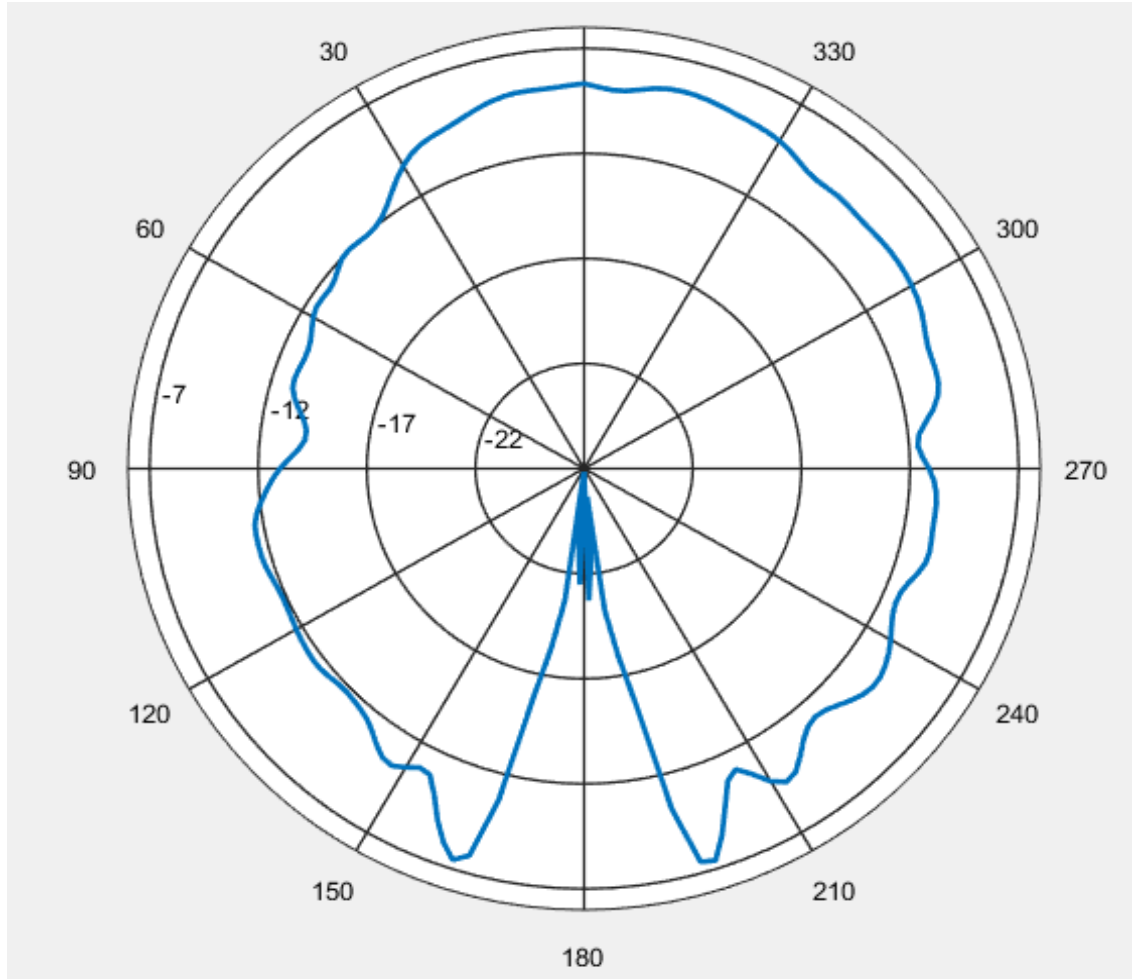
880-915	900	0.72	40.99
925-960	930	-2.46	23.19
1710-1755	1710	-3.47	11.24
1710-1785	1750	-2.87	14.17
1805-1880	1810	-1.44	19.95
1920-1980	1920	1.93	46.89
	1950	2.33	52.21
1850-1910	1870	1.93	32.17
2110-2170	2115	-1.14	22.73
2300-2400	2350	0.96	43.44
2500-2570	2570	0.51	27.15
2570-2620	2570	0.51	27.15
2496-2690	2555	0.74	29.69
	2625	-1.47	20.01

WIFI/BT antenna data

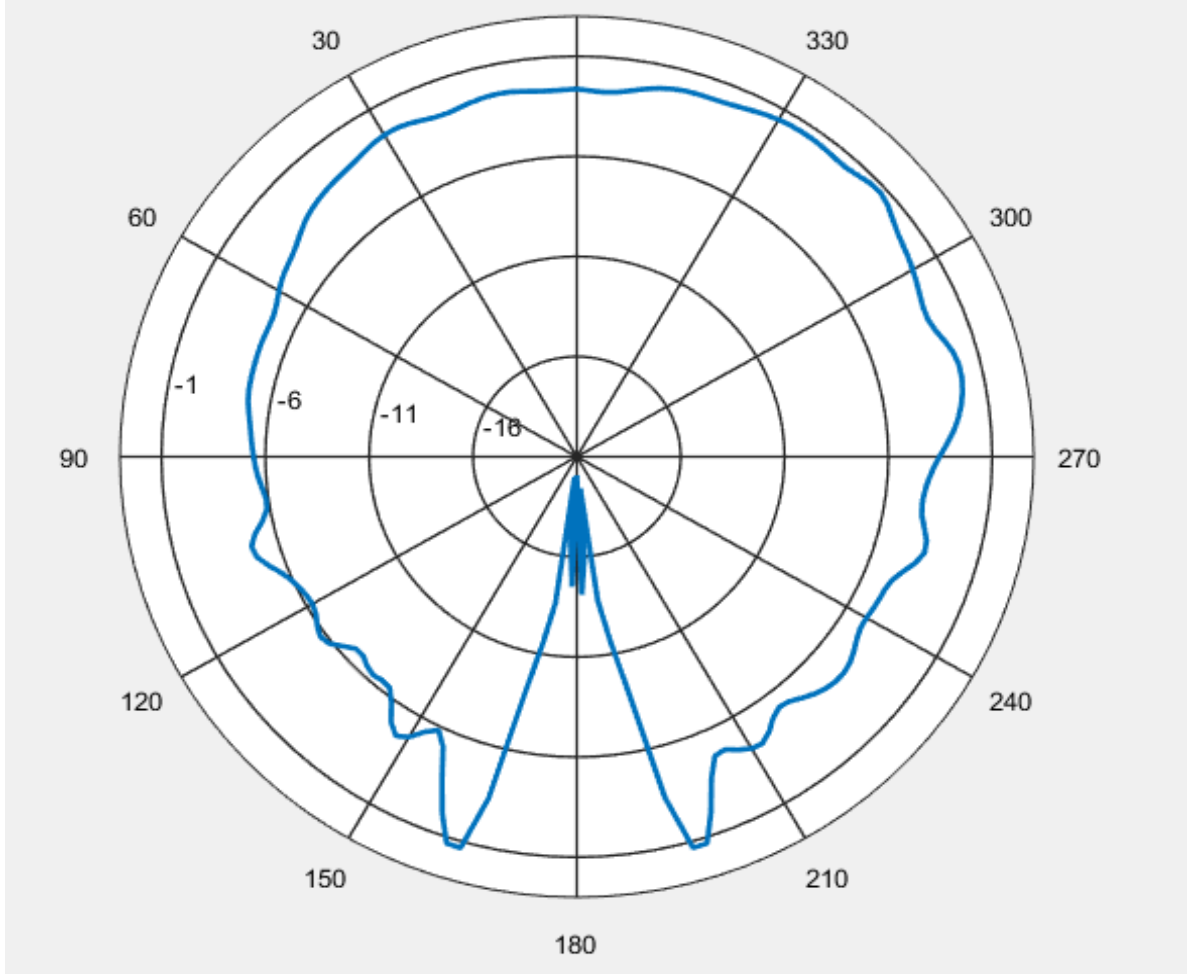
		Gain (dBi).	Efficiency (%)
WIFI/BT	2410	1.23	44.27
	2420	1.33	45.41
	2430	1.32	44.99
	2440	1.31	45.82
	2450	1.09	45.82
	2460	1.09	47.26
	2470	1.11	47.55
	2480	1.03	46.27
	2490	1.08	45.84
	2500	0.94	44.37
WIFI6	5100	-3.57	14.46
	5200	-1.32	22.56
	5300	0.31	33.11
	5400	-0.23	27.92
	5500	-2.61	17.22
	5600	-3.53	12.86
	5700	-3.80	11.32
	5800	-2.61	13.80
	5900	-0.86	19.38
	6000	-0.39	20.40

1.3 The measured pattern of 4G antenna is as follows:

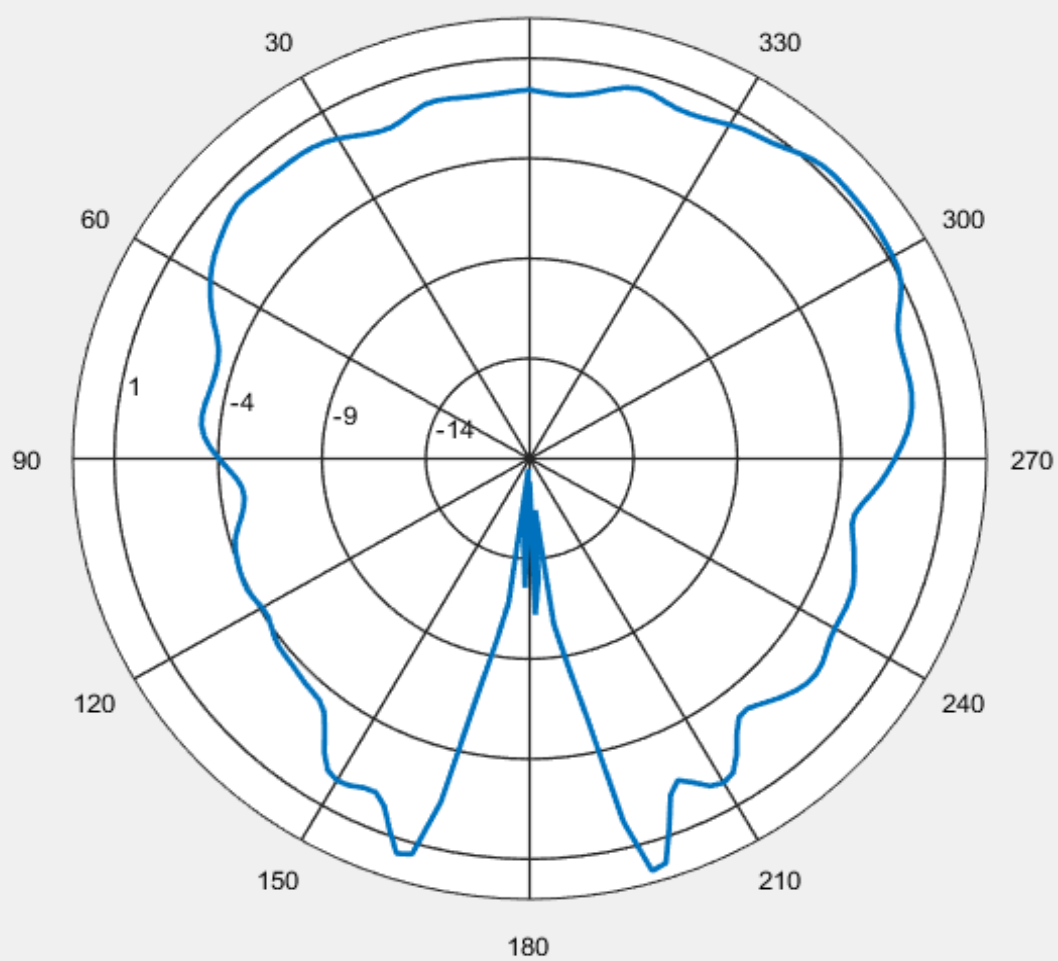
4G1



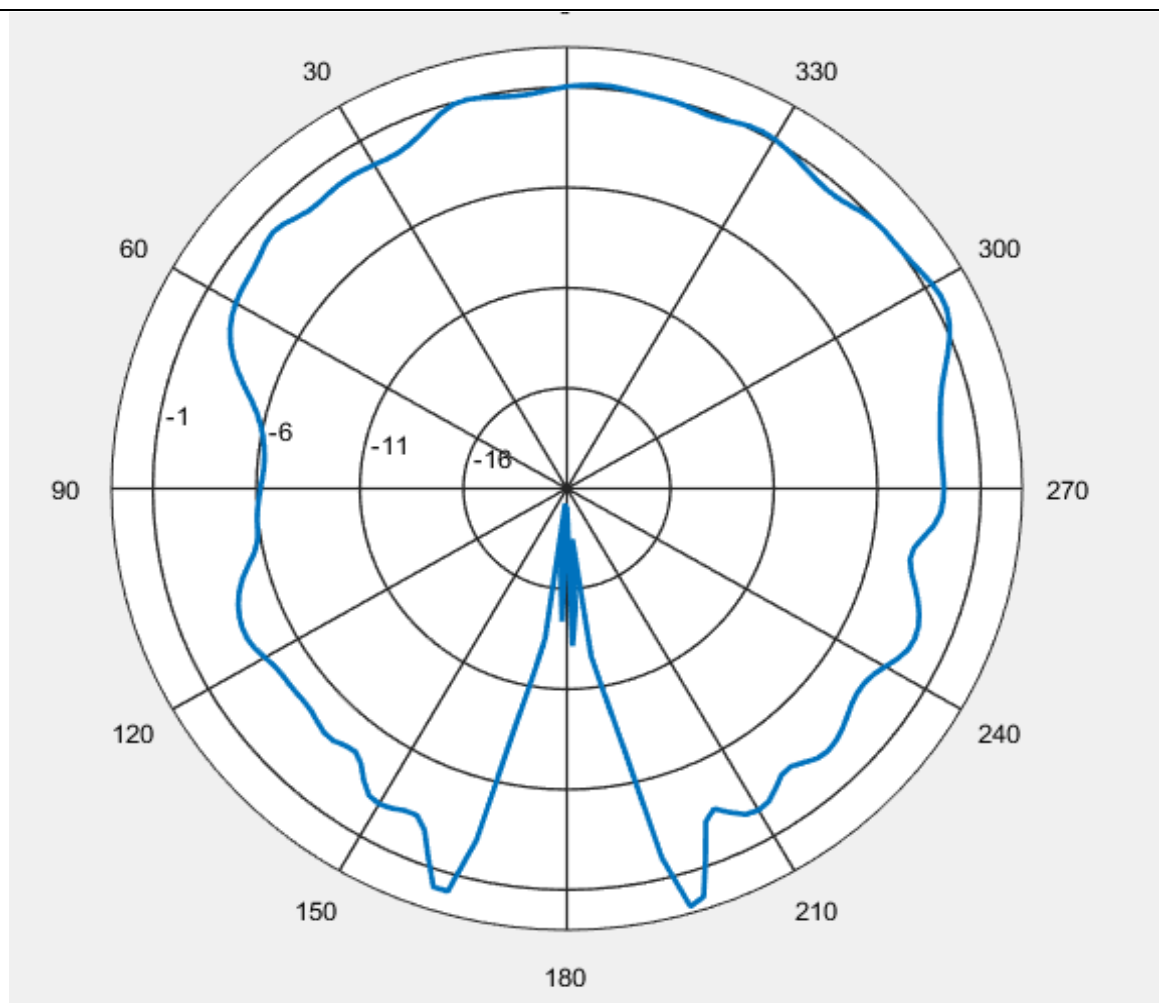
794MHz



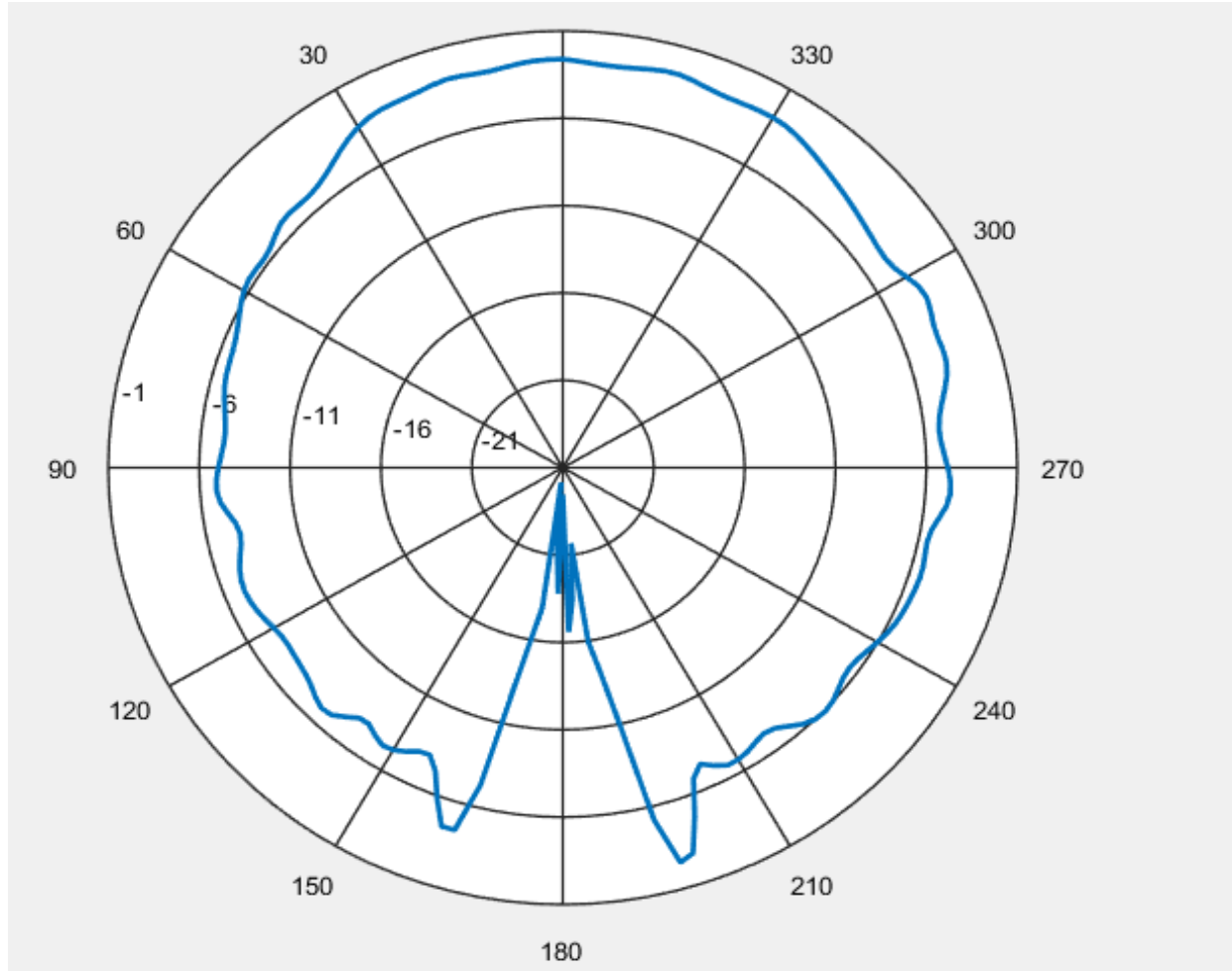
848 MHz



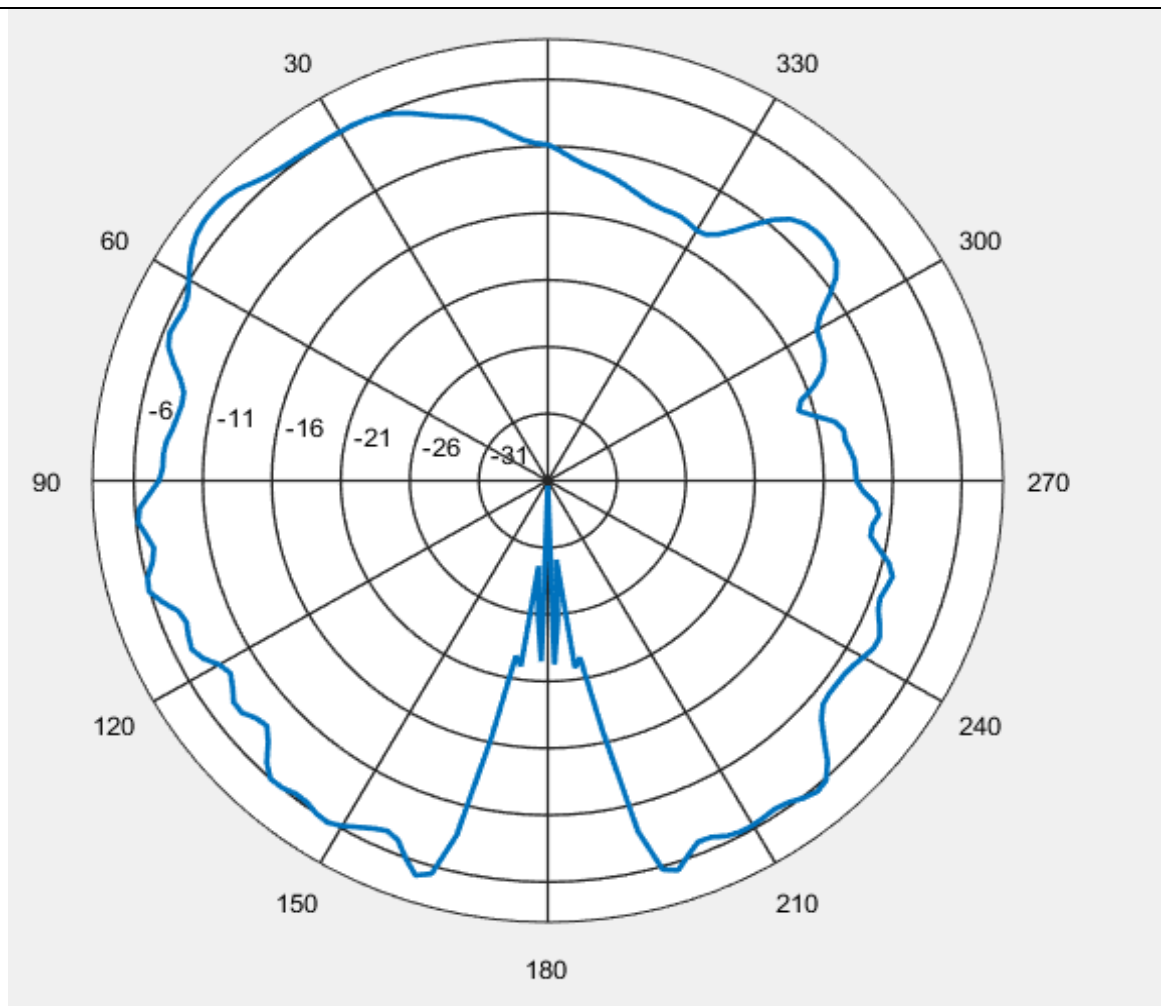
874 MHz



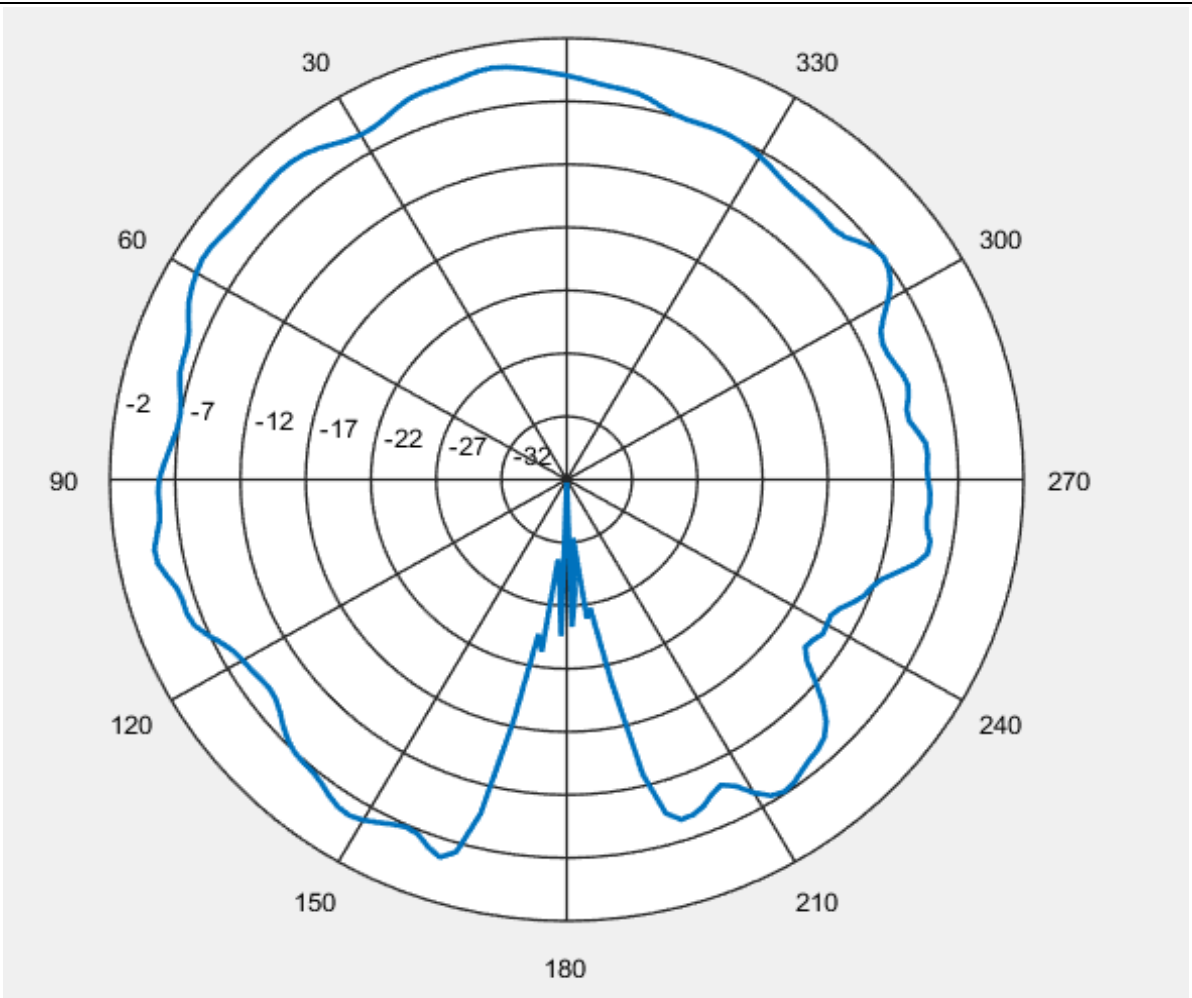
900 MHz



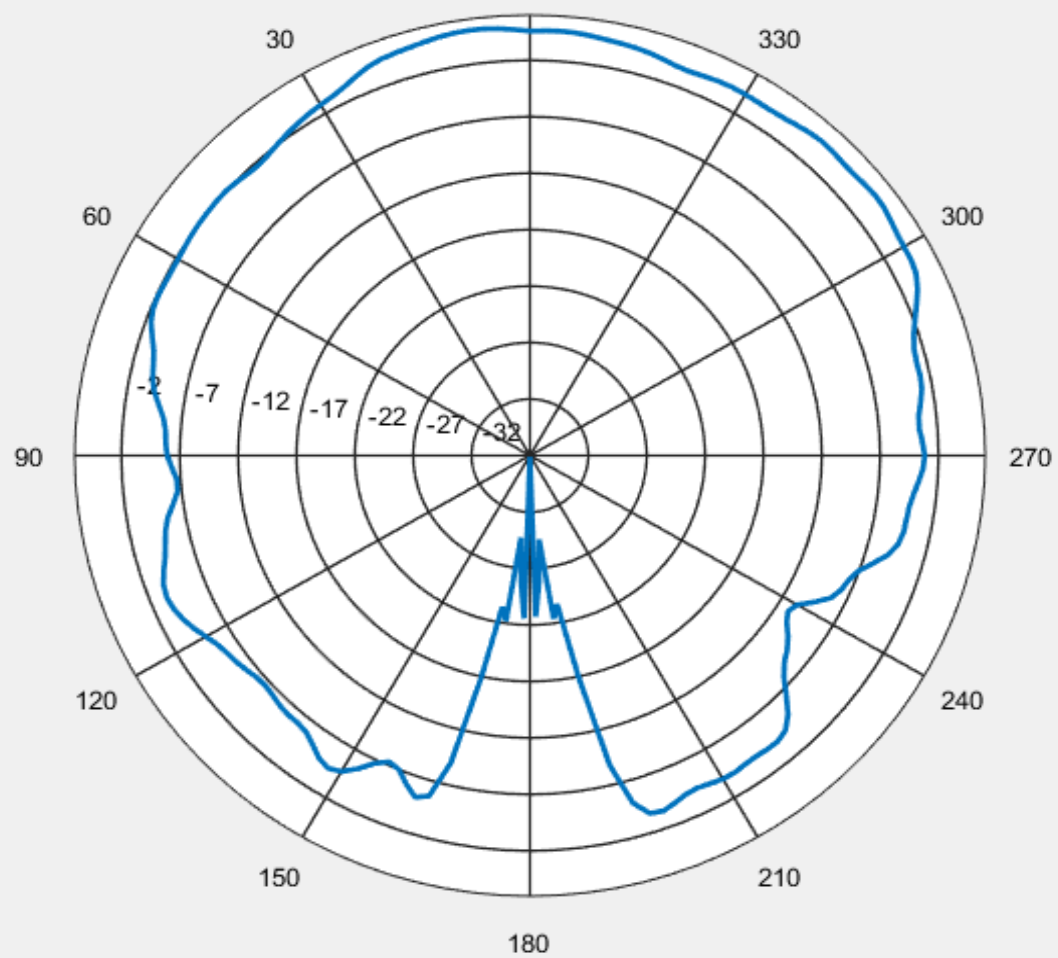
930 MHz



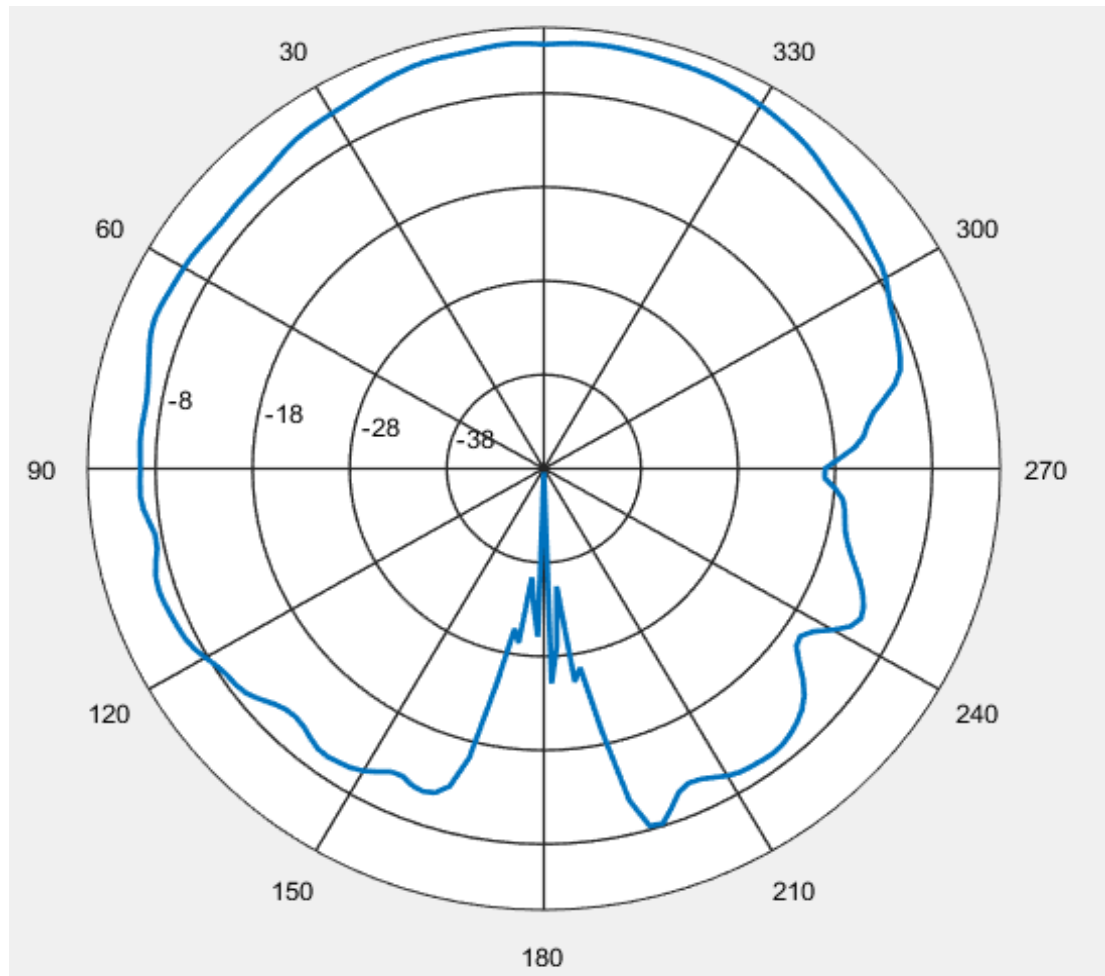
1750 MHz



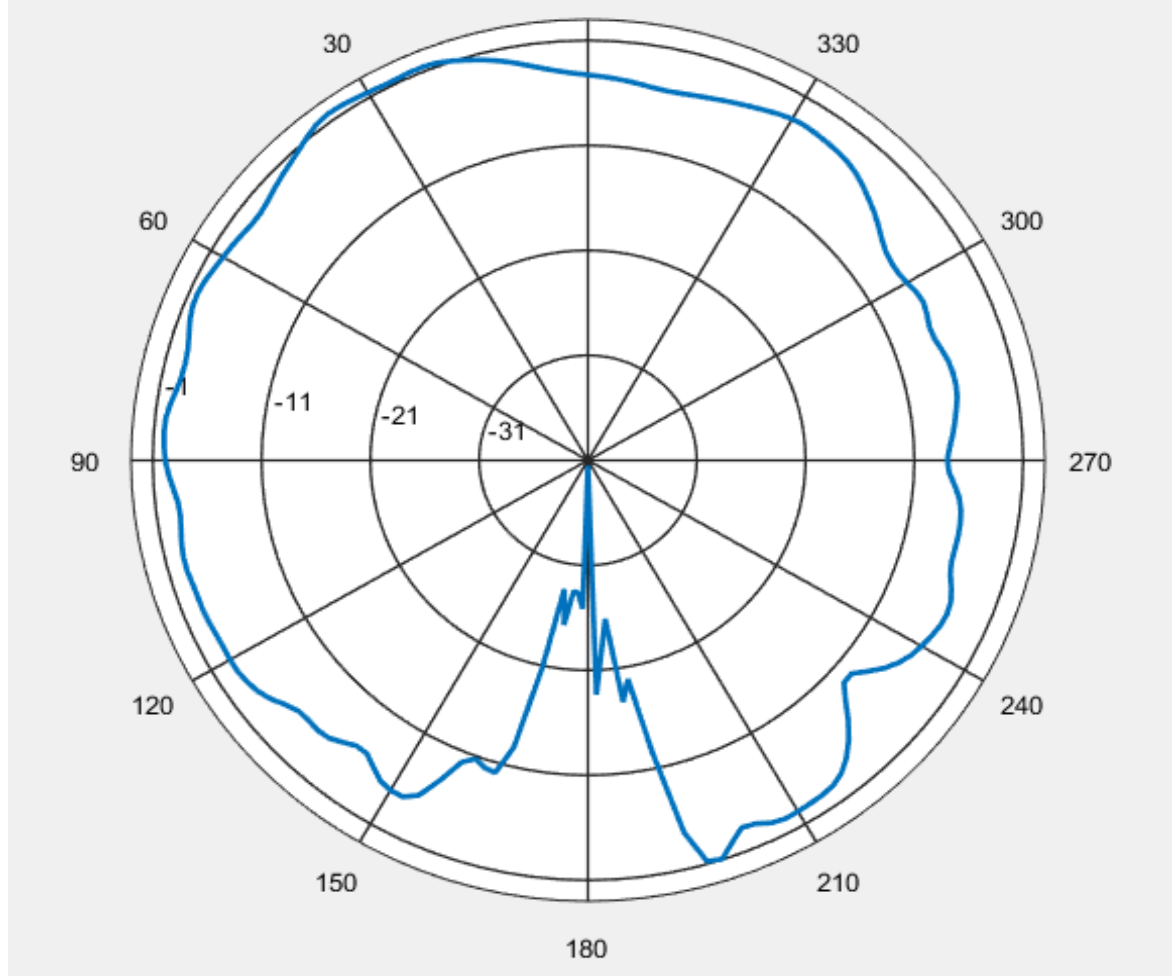
1810 MHz



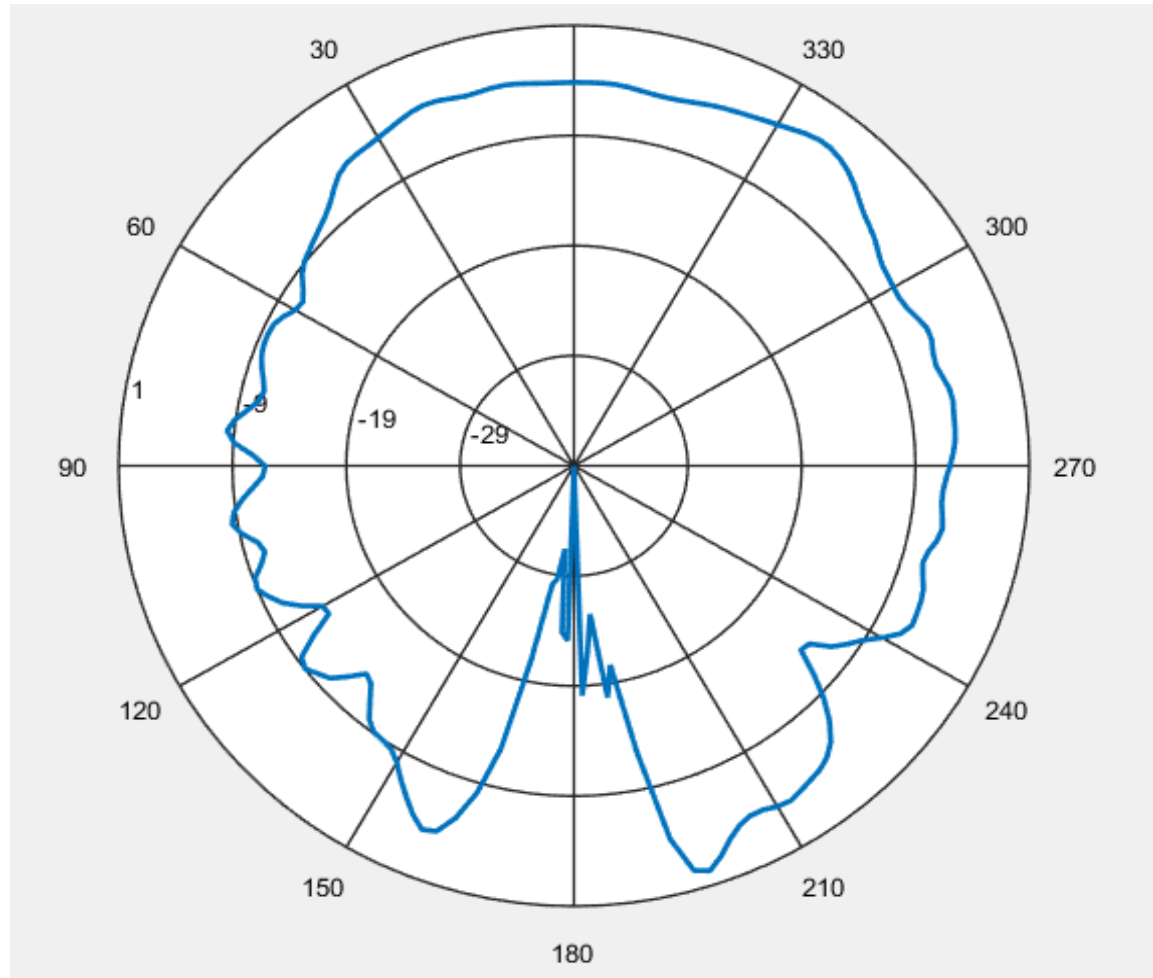
1950 MHz



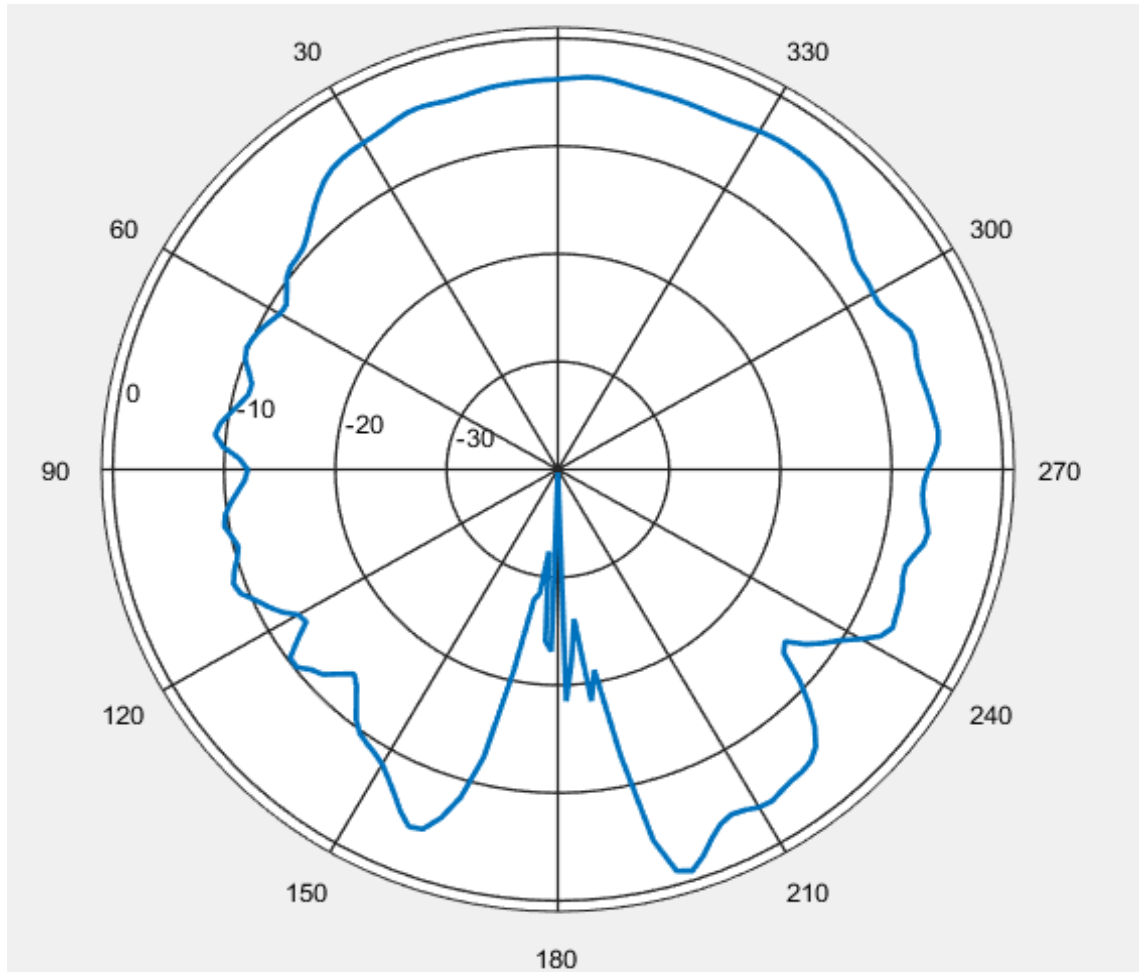
2115 MHz



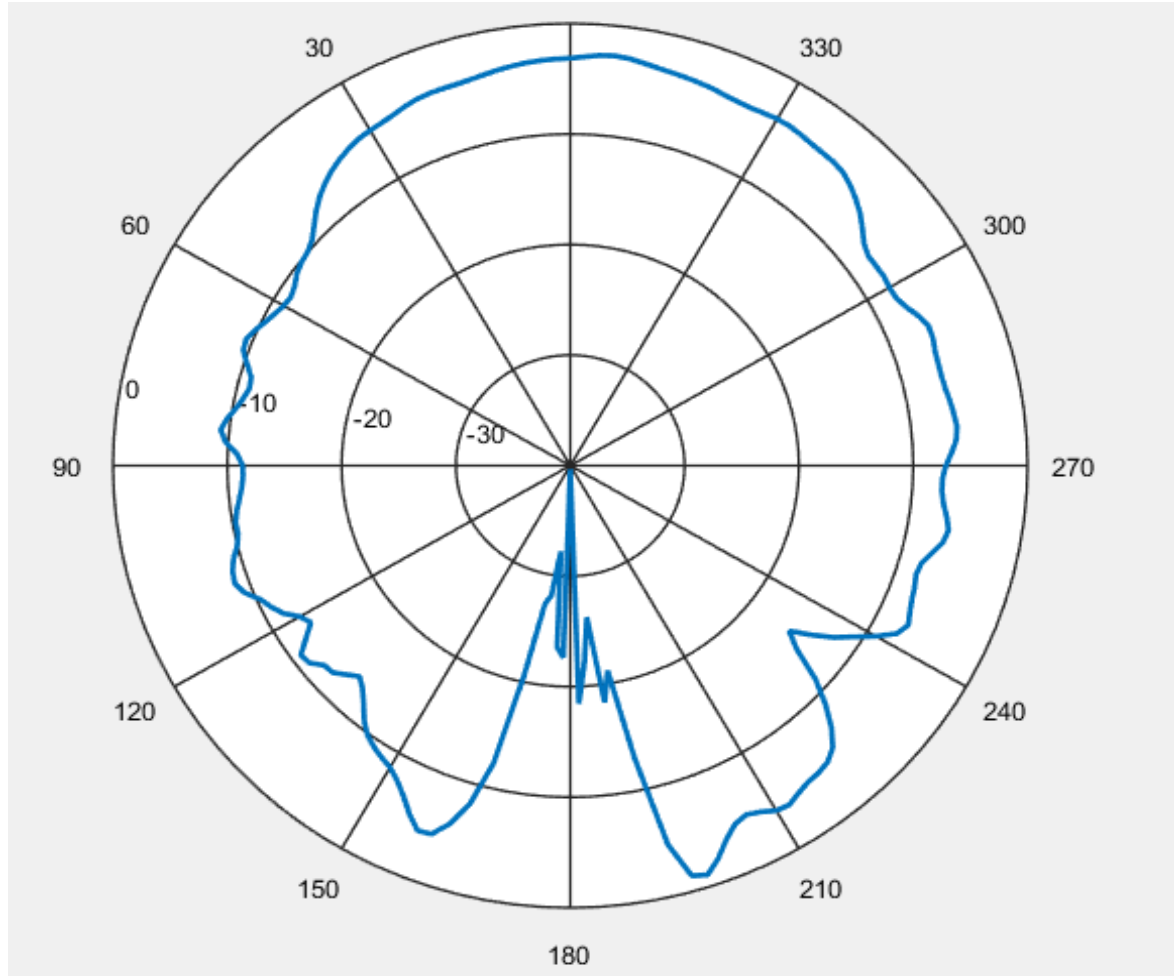
2350 MHz



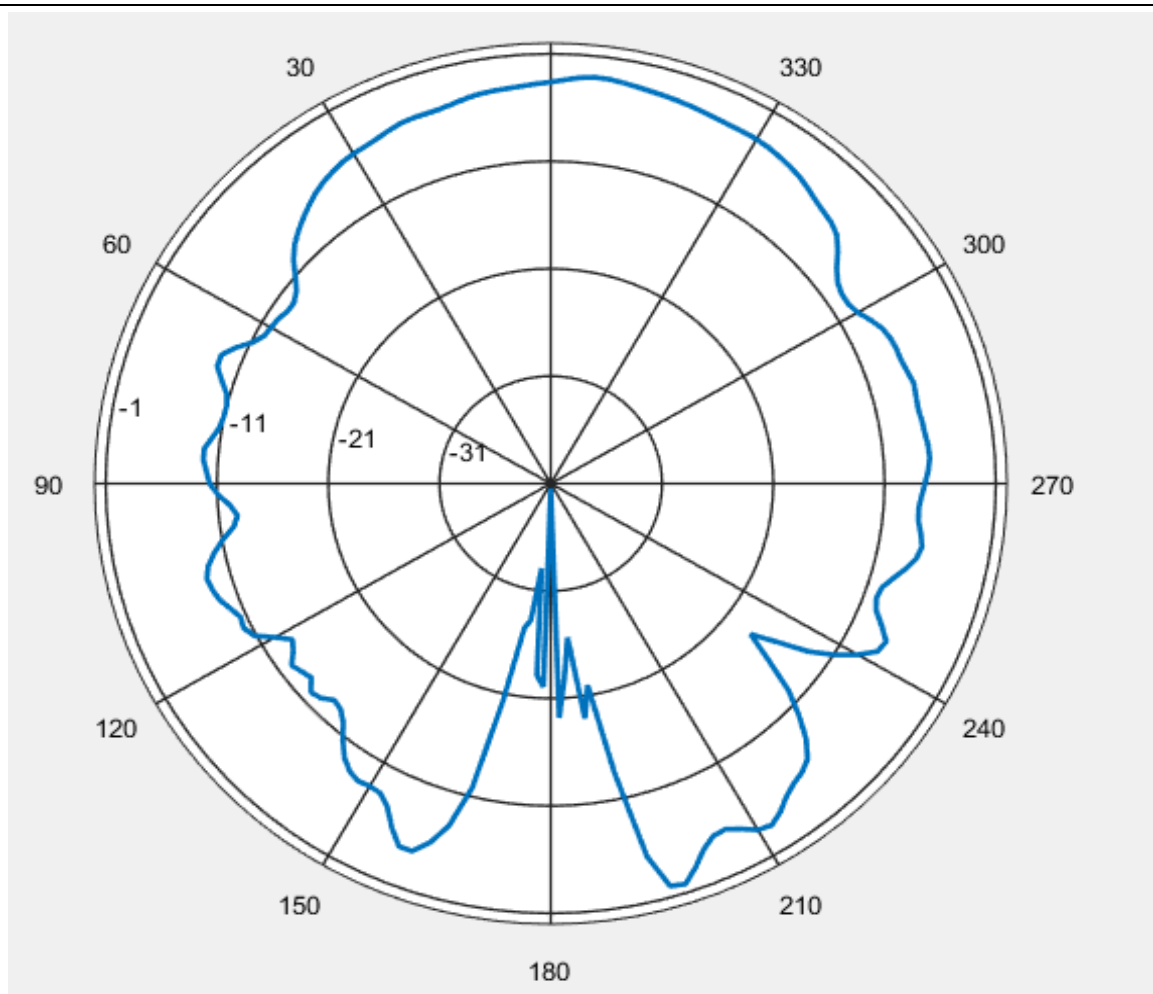
2580 MHz



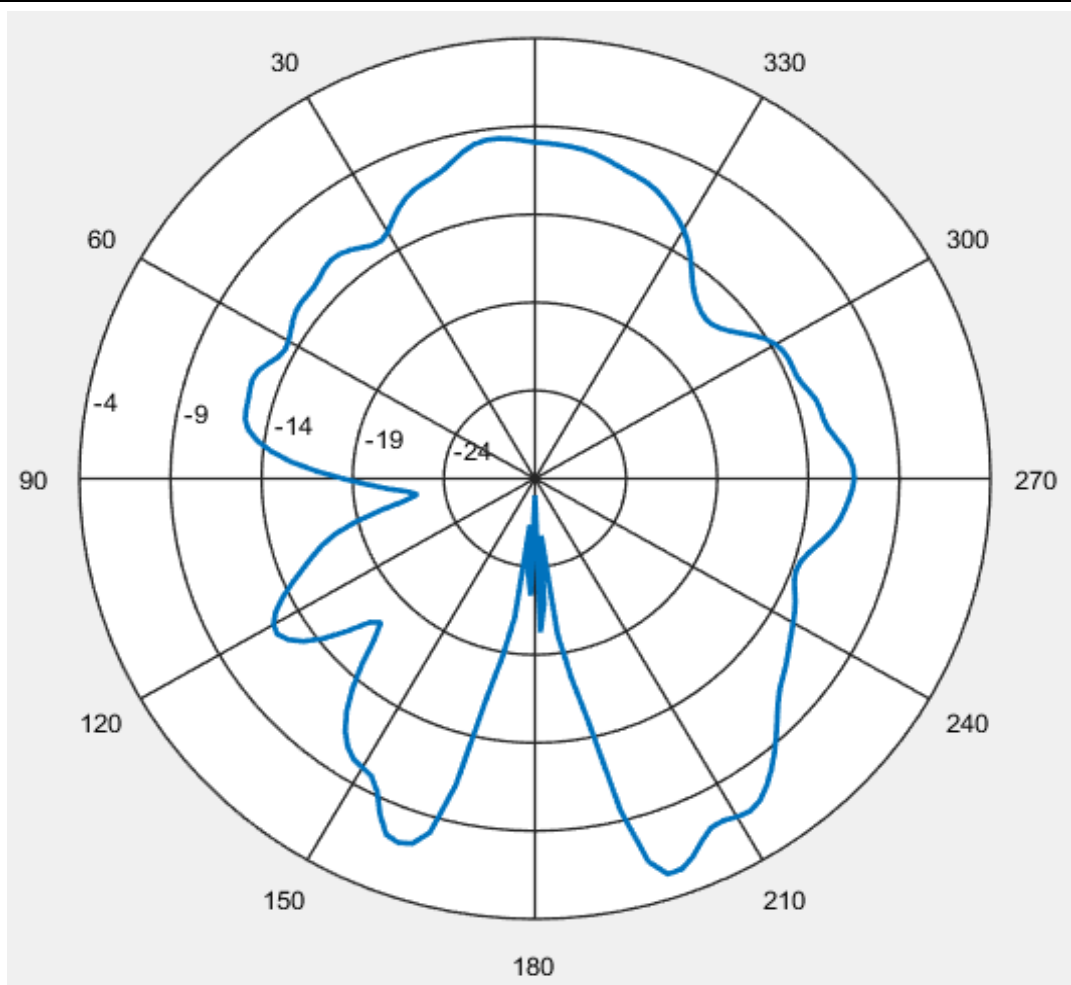
2593 MHz



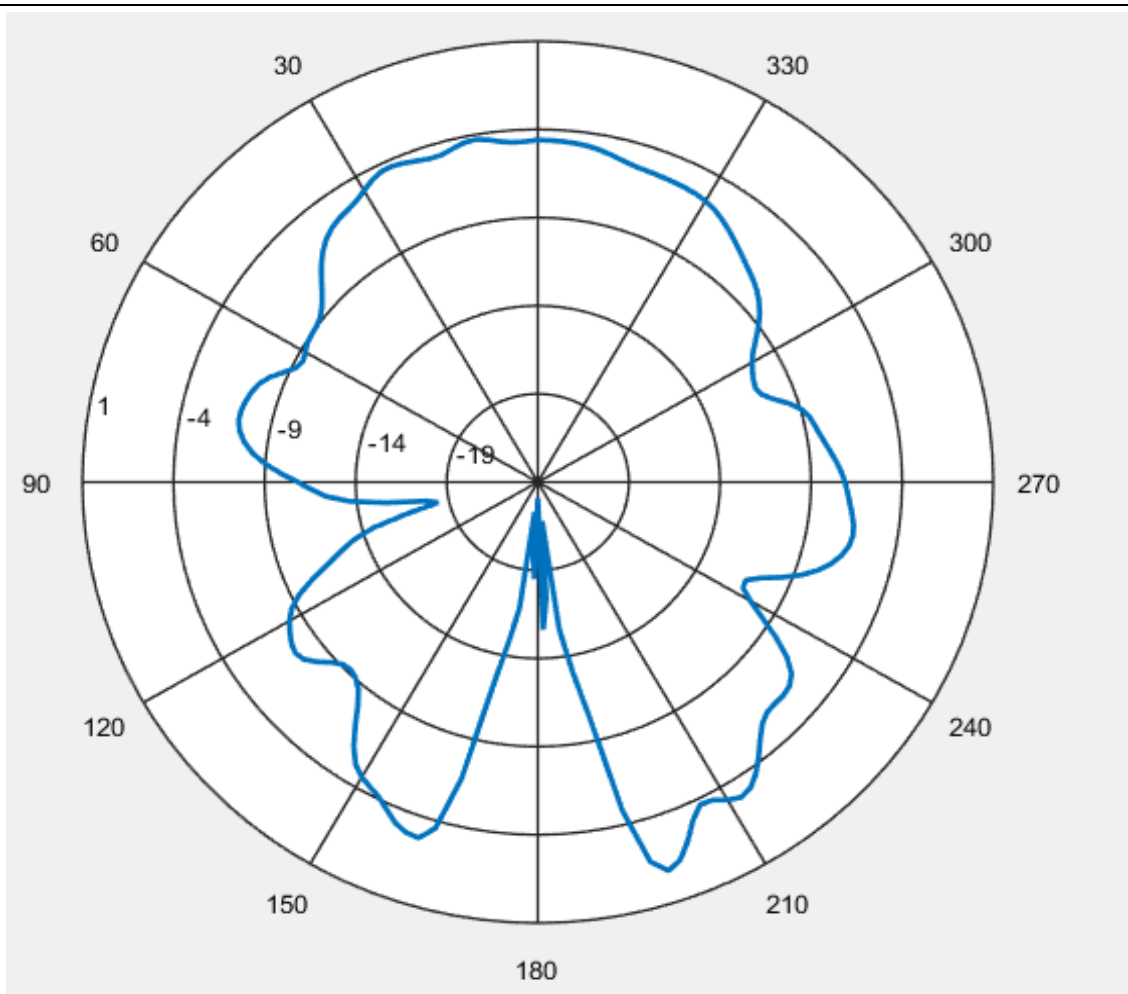
2605 MHz



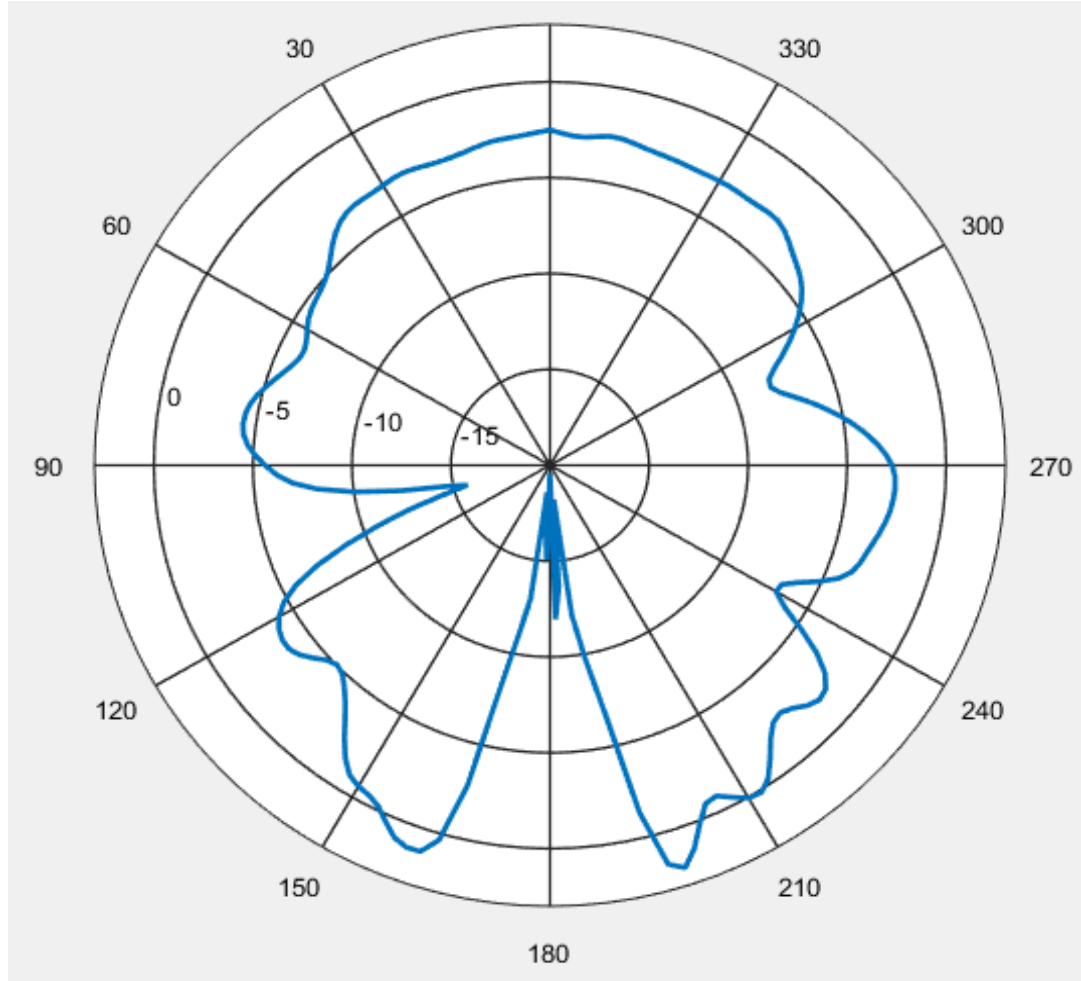
2625MHz



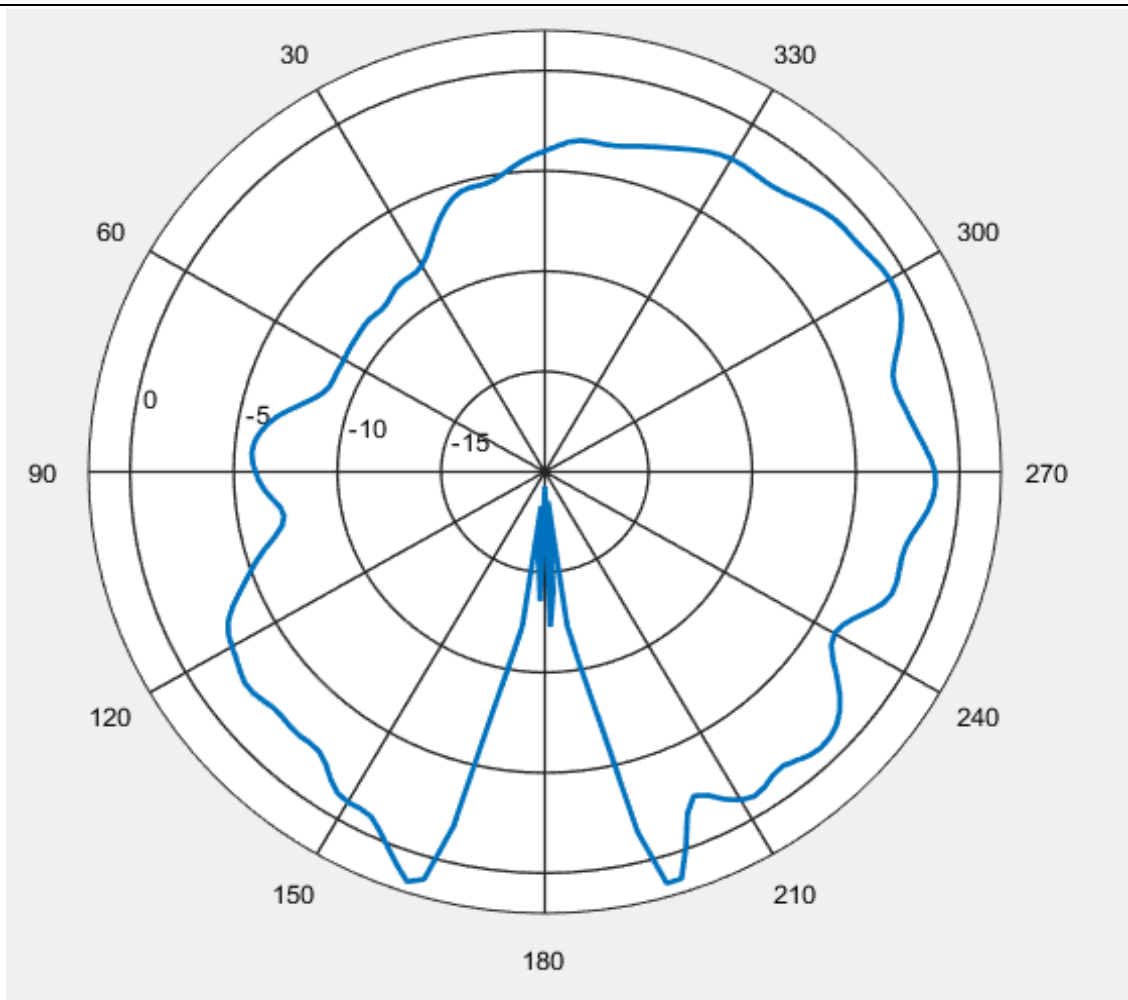
794MHz



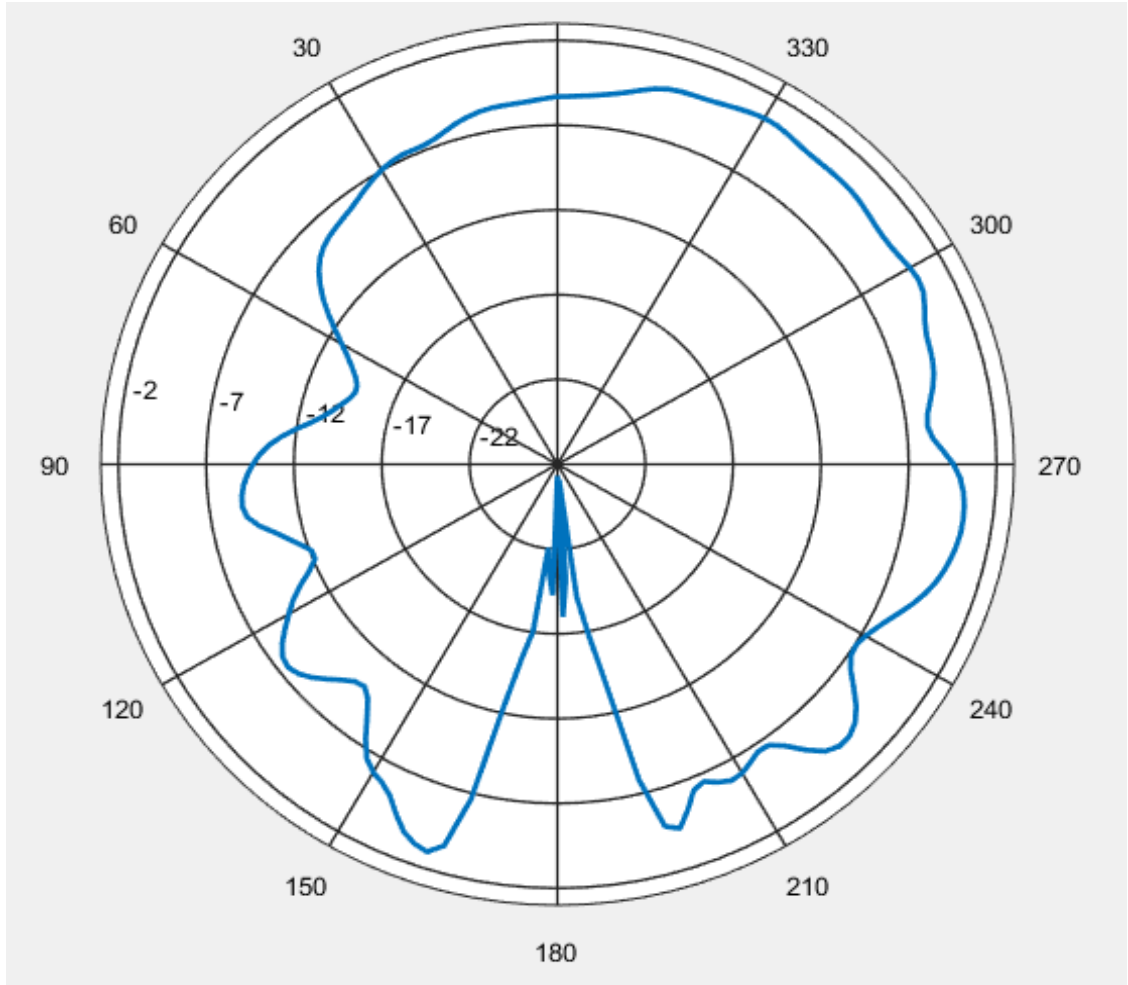
848 MHz



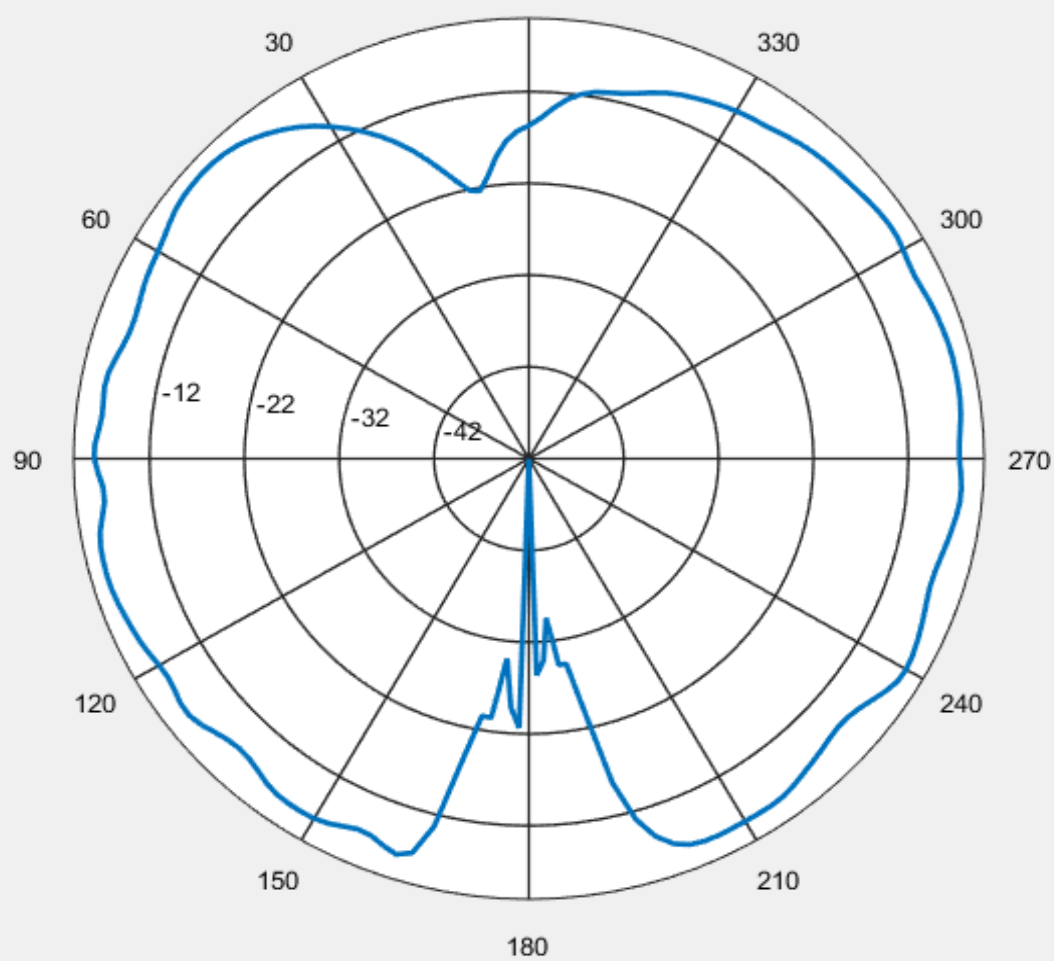
874 MHz



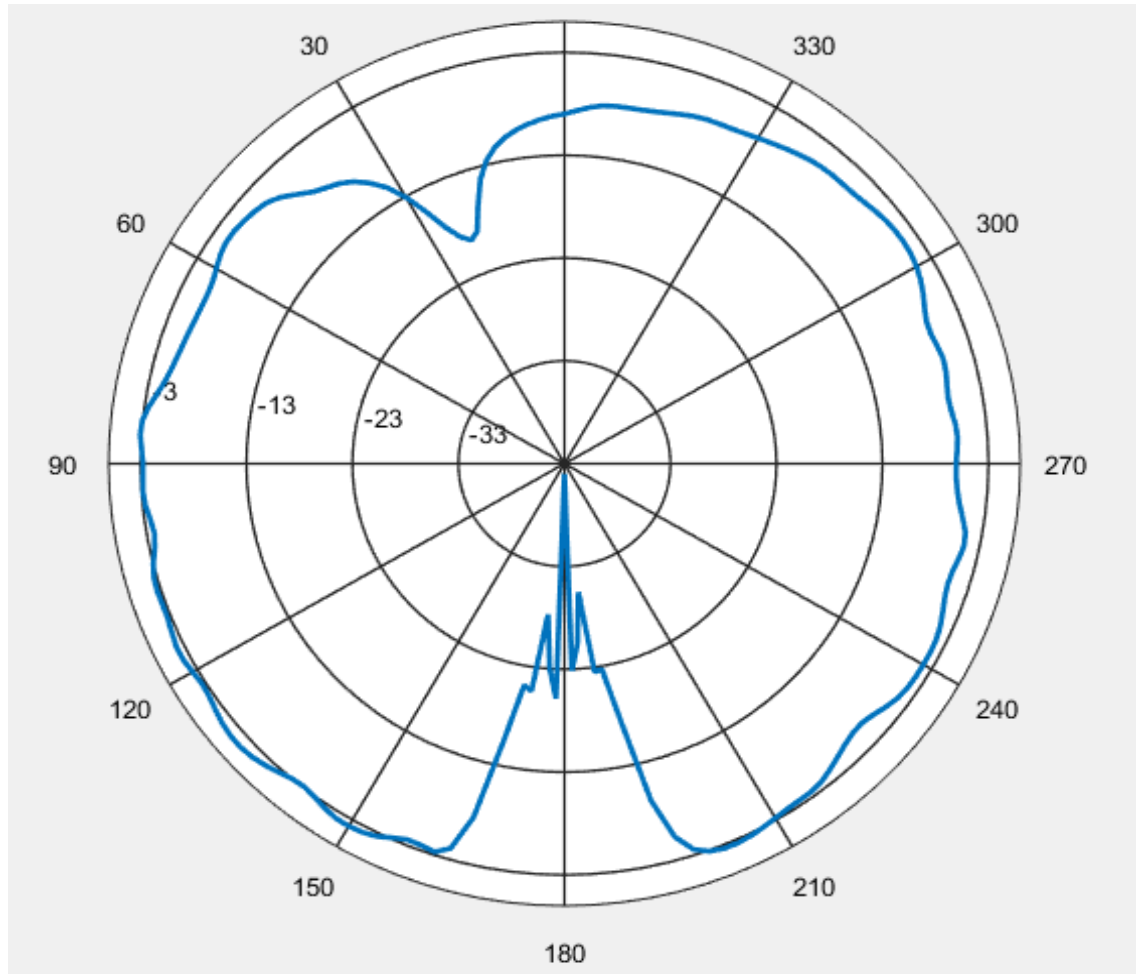
900 MHz



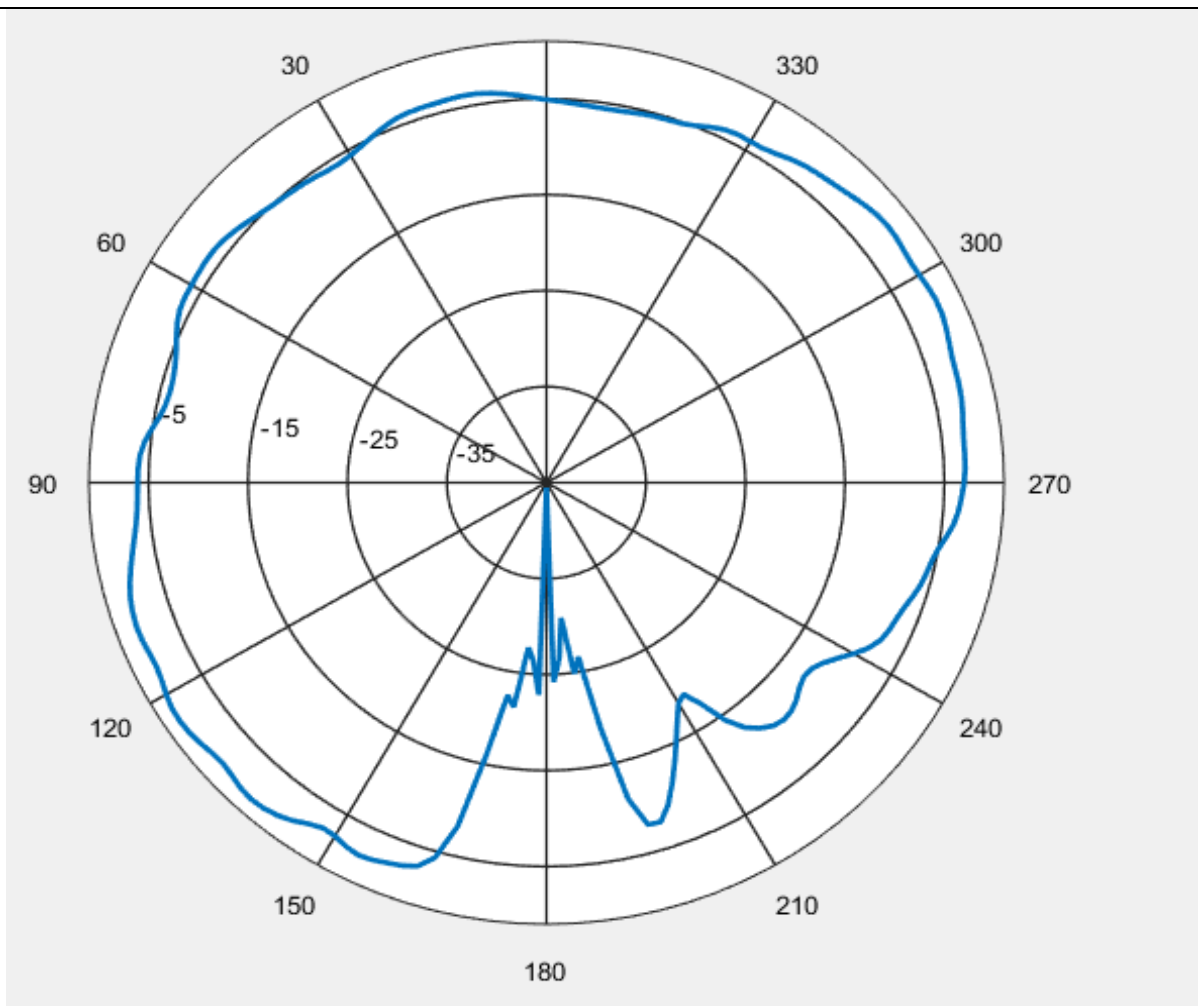
930 MHz



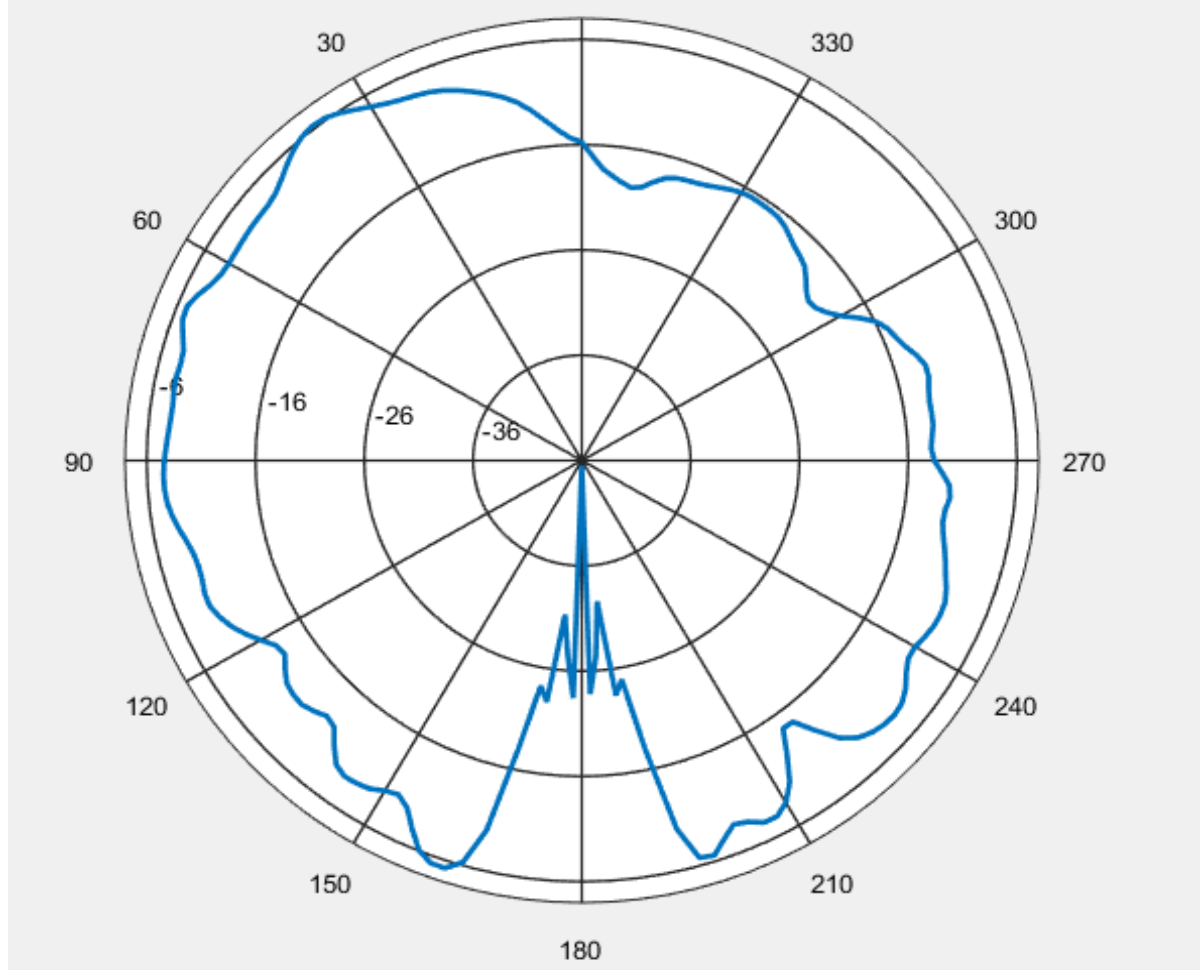
1750 MHz



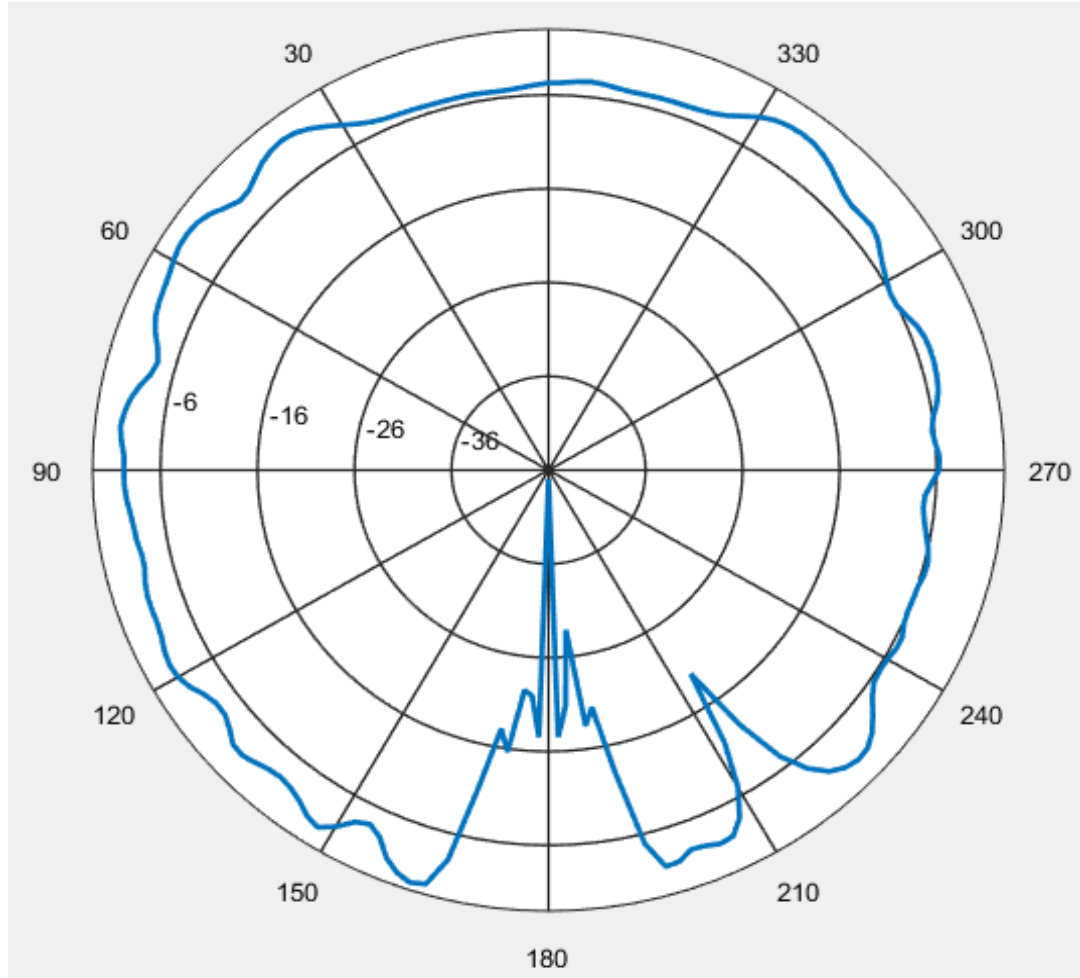
1810 MHz



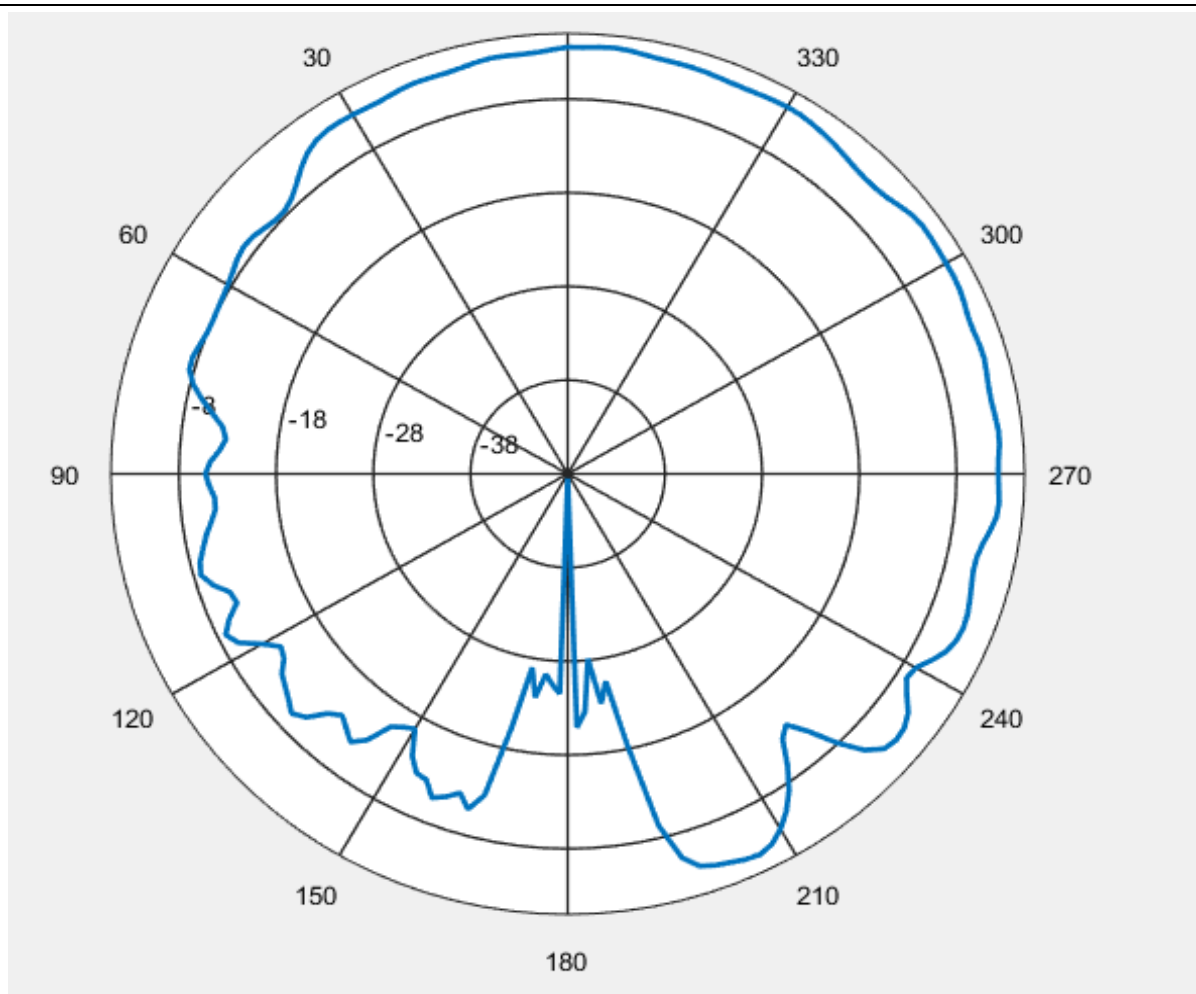
1950 MHz



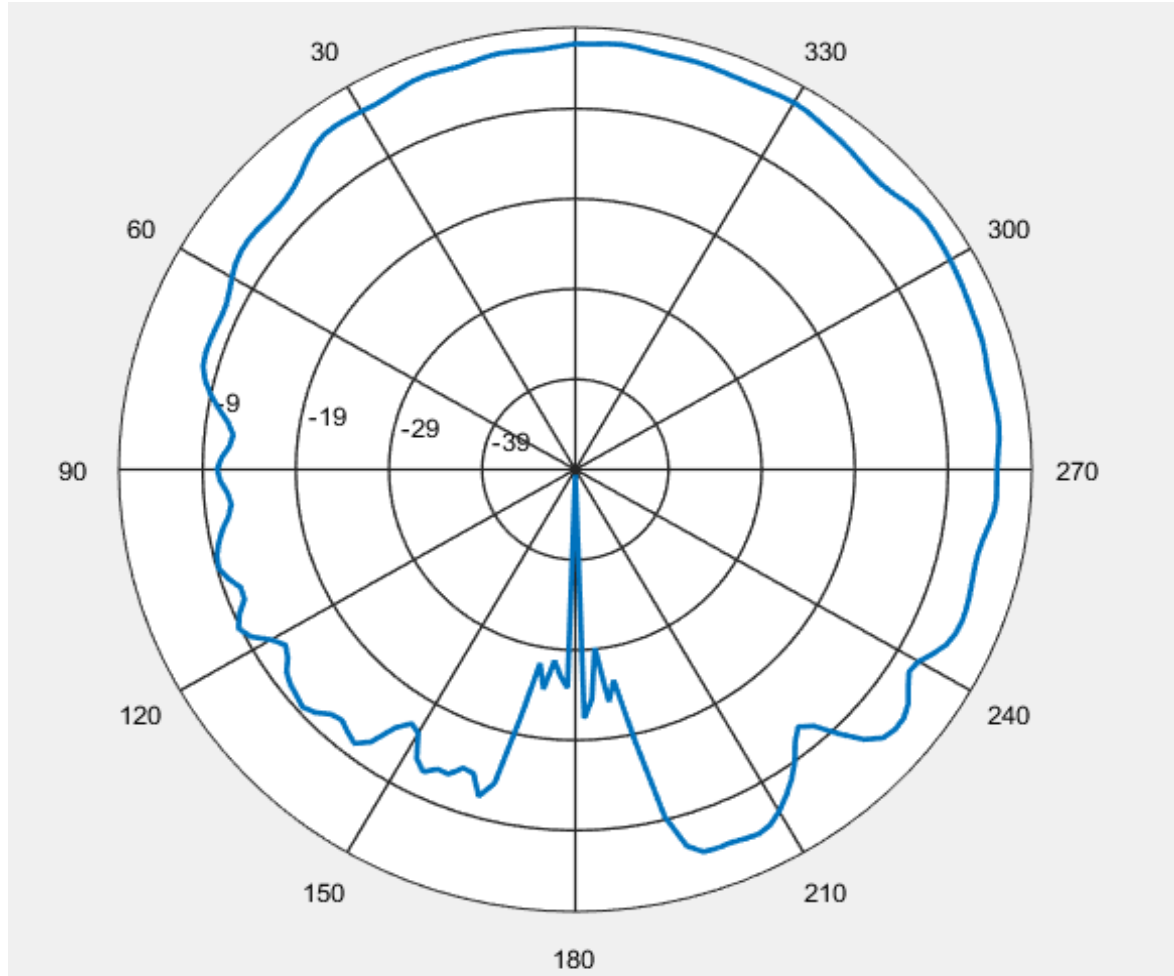
2115 MHz



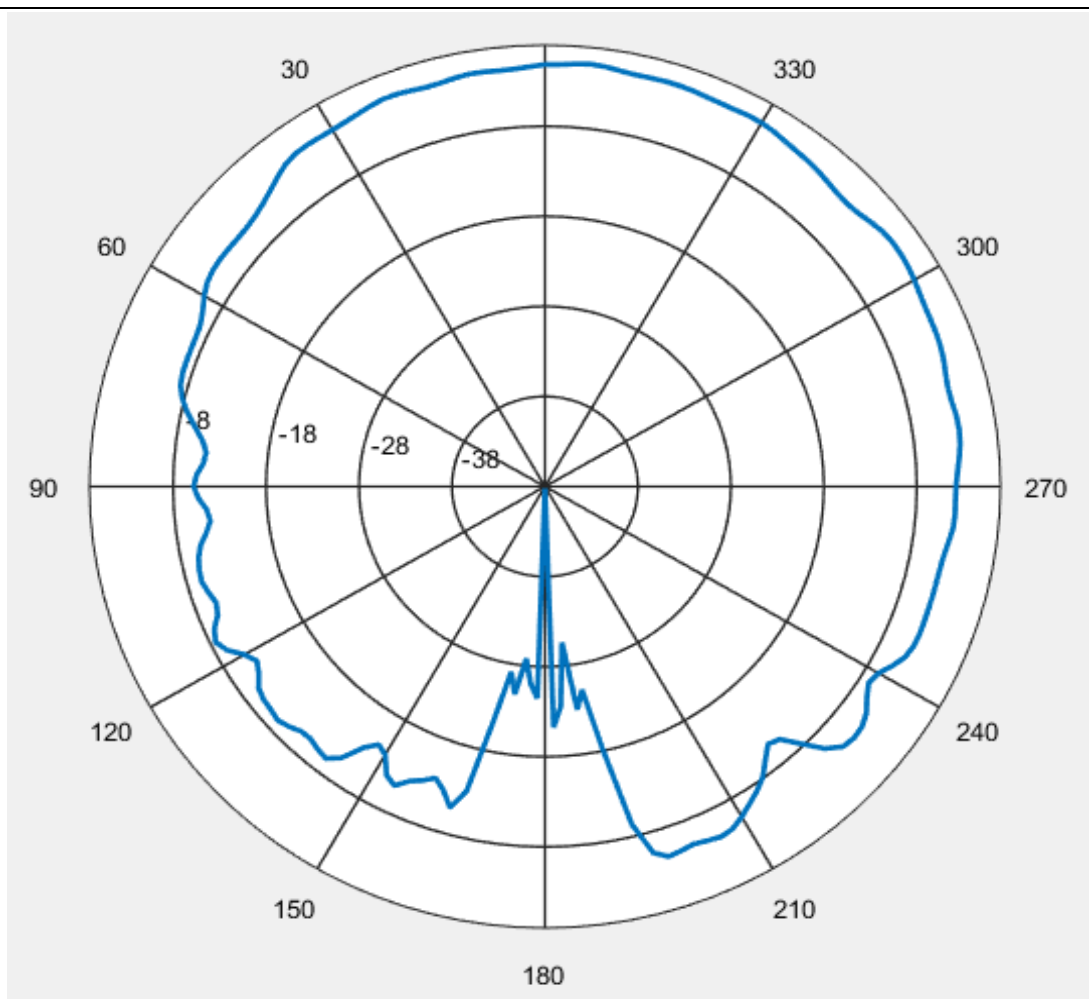
2350 MHz



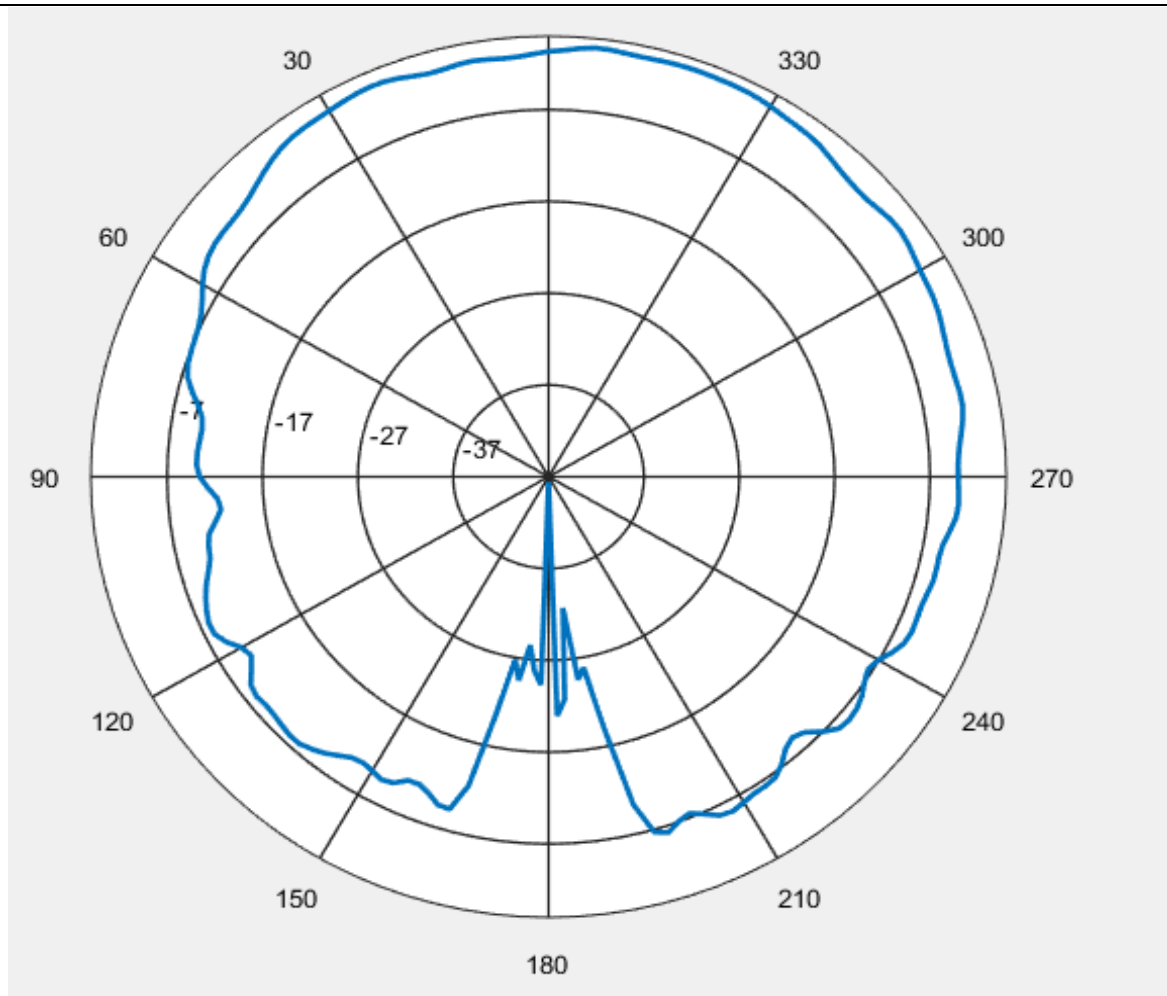
2580 MHz



2593 MHz

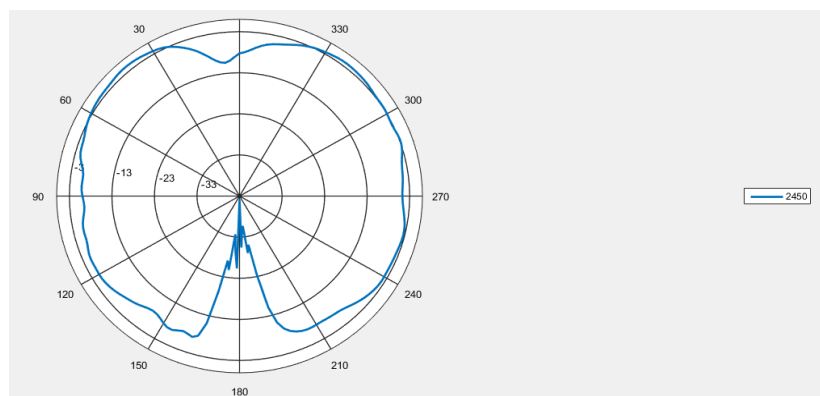


2605 MHz

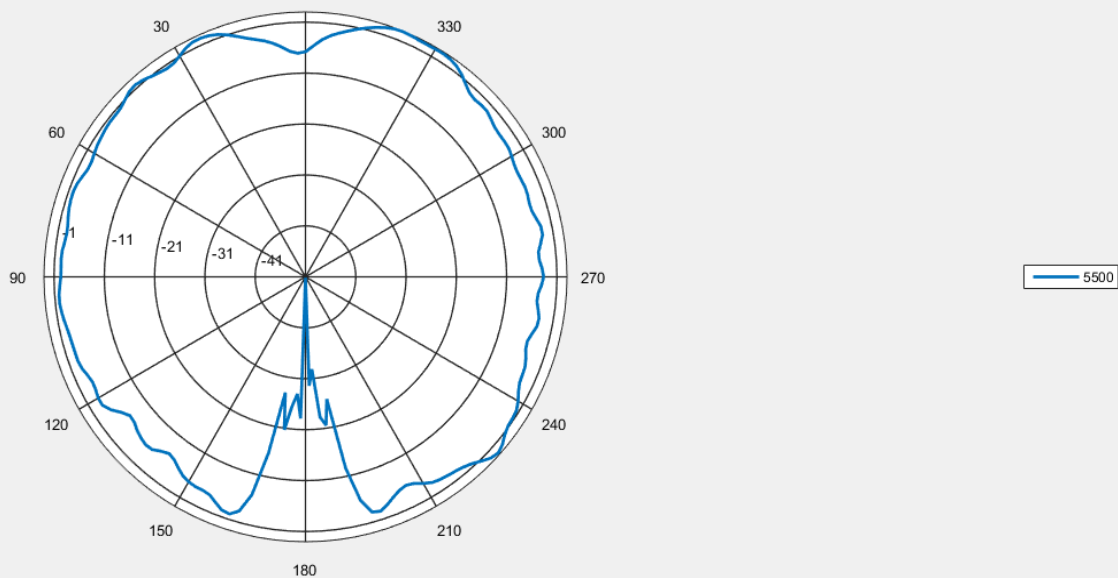


2625MHz

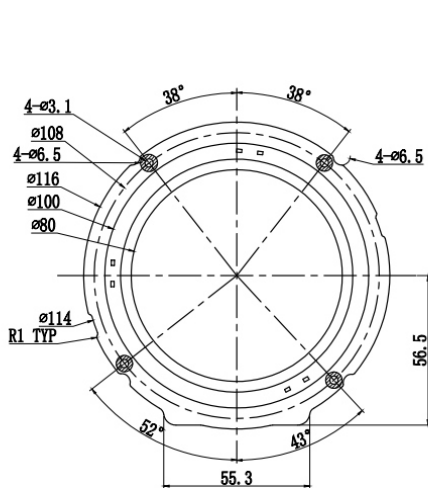
1.4 The measured pattern of WIFI antenna is as follows:



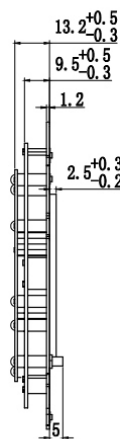
2450MHz



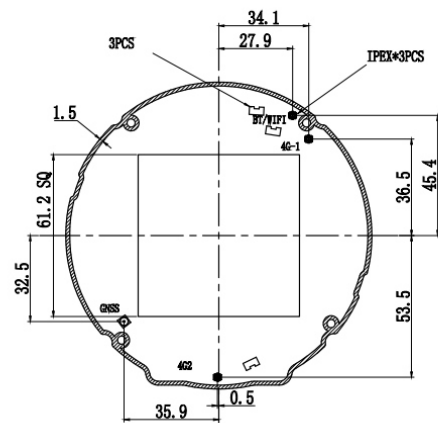
5500MHz



TOP VIEW



SIDE VIEW



BOTTOM VIEW

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