



## Antenna Passive Test Report

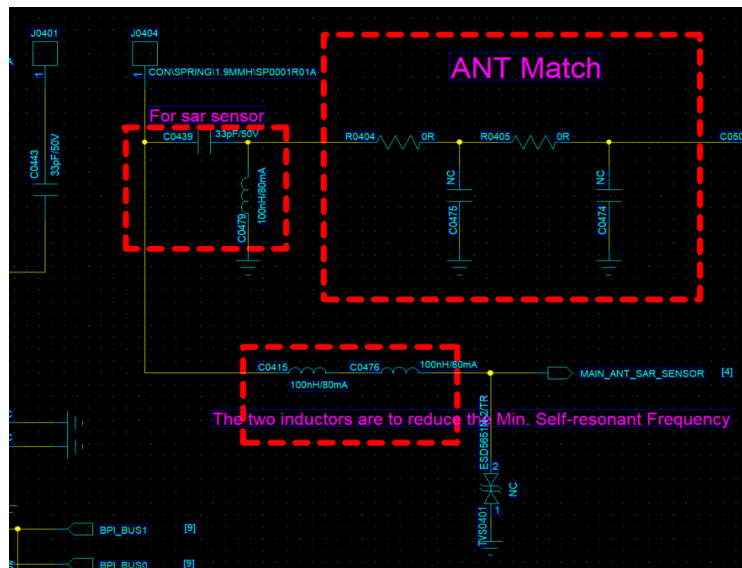
Project Name	SP01	Engineer	lilei	Checker	
HW Version	DVT	Prototype(S/N)		Software Version	
Temperature/Humidity	25°C/50%	Test Equipment	OTA	Test Date	2024/7/4
<b>Conclusion:</b>		Remarks			
Standard	Fre(Mhz)	Effi(%) (Min~Max)	Probiem Description and Next Step Plan		
Main Antenna	600~800	12%-41%			
	800~960	19%-35%			
	1700~2170	30%-38%			
	2300~2400	39%-45%			
	2500~2700	40%-50%			
Div Antenna	600~800	3%-14%			
	800~960	8%-20%			
	1700~2170	25%-35%			
	2300~2400	38%-40%			
	2500~2700	25%-30%			
WiFi	2.4G	30%-40%			
	5G	25%-35%			
GPS	L5	30%			
NFC Antenna	13.56MHz	/			

# Main Antenna

Fixture Picture

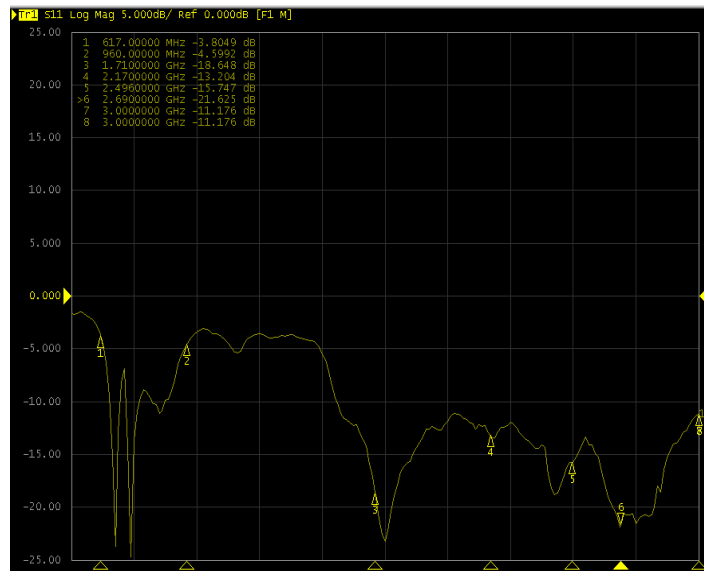


## Matching Circuit, Switch Logic Schematic (CAD and Tag Number Diagram)



Element	Matching

## S Parameter (Return Loss, Smith)



## Passive Performance (Efficiency, Gain)

frequency (MHz)	Gain (dB)	Efficiency (dB)	
600	-10.38	-13.39	
610	-10.08	-12.98	
620	-9.27	-11.98	
630	-8.33	-10.80	
640	-7.61	-9.76	
650	-6.73	-8.73	
660	-5.11	-7.47	
670	-3.68	-6.38	
680	-2.22	-5.24	
690	-1.28	-4.60	
700	0.59	-3.07	
710	0.66	-2.81	
720	1.08	-3.45	



730	-0.60	-3.82	
740	-1.67	-4.85	
750	-2.66	-5.93	
760	-2.70	-5.96	
770	-2.88	-6.08	
780	-3.28	-6.59	
790	-3.43	-6.76	
800	-2.20	-5.98	
810	-2.88	-7.17	
820	-2.14	-6.77	
830	-1.39	-6.38	
840	-1.49	-6.47	
850	-1.04	-6.38	
860	-1.02	-6.33	
870	-1.43	-6.06	
880	-1.65	-6.22	
890	-1.74	-6.68	
900	-1.85	-7.16	
910	-1.82	-7.15	
920	-2.01	-7.33	
930	-2.03	-7.52	
940	-1.66	-7.29	
950	-1.77	-7.19	
960	-1.87	-7.27	
1700	0.20	-5.35	
1720	0.14	-5.14	
1740	-0.57	-5.31	
1760	0.14	-5.08	
1780	0.13	-4.94	
1800	0.07	-4.71	
1820	-0.14	-4.70	
1840	-0.63	-4.88	
1860	-1.17	-5.24	
1880	-1.56	-5.59	
1900	-0.85	-5.36	

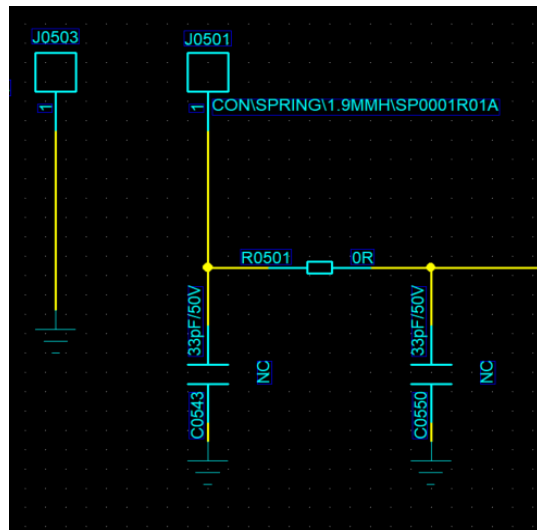
1920	-0.32	-5.07	
1940	-0.16	-4.88	
1960	-0.36	-4.90	
1980	-0.46	-5.01	
2000	0.37	-4.75	
2020	0.89	-4.45	
2040	0.93	-4.42	
2060	0.60	-4.60	
2080	0.83	-4.58	
2100	1.13	-4.37	
2120	1.33	-4.03	
2140	1.32	-3.91	
2160	1.28	-4.01	
2180	1.38	-4.00	
2200	1.35	-4.18	
2220	0.91	-4.64	
2240	0.05	-5.33	
2260	-0.39	-5.47	
2280	-0.17	-4.94	
2300	-0.46	-4.91	
2320	-0.84	-5.13	
2340	-1.38	-5.46	
2360	-1.90	-5.75	
2380	-1.82	-6.30	
2400	-1.86	-6.35	
2420	-1.46	-5.86	
2440	-1.25	-5.37	
2460	-1.18	-5.18	
2480	-1.19	-4.83	
2500	-1.73	-4.85	
2520	-2.34	-5.11	
2540	-2.66	-5.38	
2560	-2.05	-4.86	
2580	-1.64	-4.36	
2600	-1.65	-4.45	

2620	-0.91	-4.10	
2640	-0.60	-3.99	
2660	-0.24	-3.77	
2680	-0.24	-3.53	
2700	-0.04	-3.53	

# Div Antenna

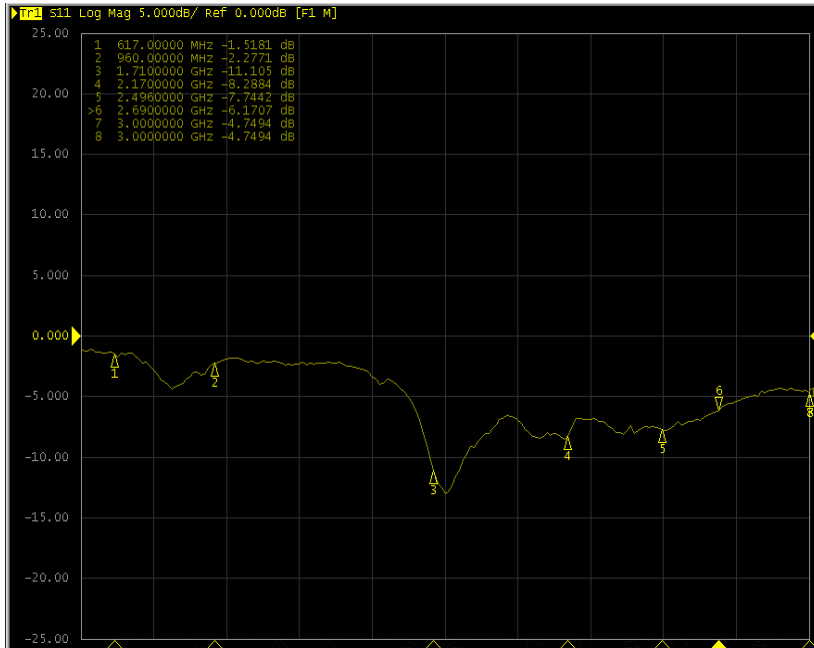
Fixture Picture

Matching Circuit, Switch Logic Schematic (CAD and Tag Number Diagram)



Element	Matching

## S Parameter (Return Loss, Smith)



## Passive Performance (Efficiency, Gain)

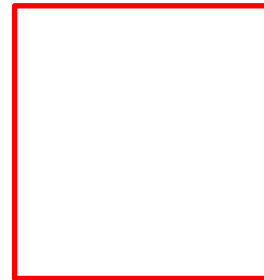
frequency (MHz)	Gain (dB)	Efficiency (dB)	Efficiency (%)
617	-11.39	-14.80	3.31
663	-9.67	-12.97	5.04
704	-7.86	-11.47	7.13
729	-7.65	-11.31	7.40
746	-6.91	-10.81	8.30
751	-6.46	-10.32	9.29
756	-6.06	-9.78	10.53
777	-5.36	-8.61	13.76
791	-5.69	-8.77	13.26
806	-5.53	-8.57	13.89
815	-5.10	-8.35	14.61
821	-4.89	-8.51	14.08
824	-4.86	-8.47	14.23
832	-4.59	-8.22	15.07



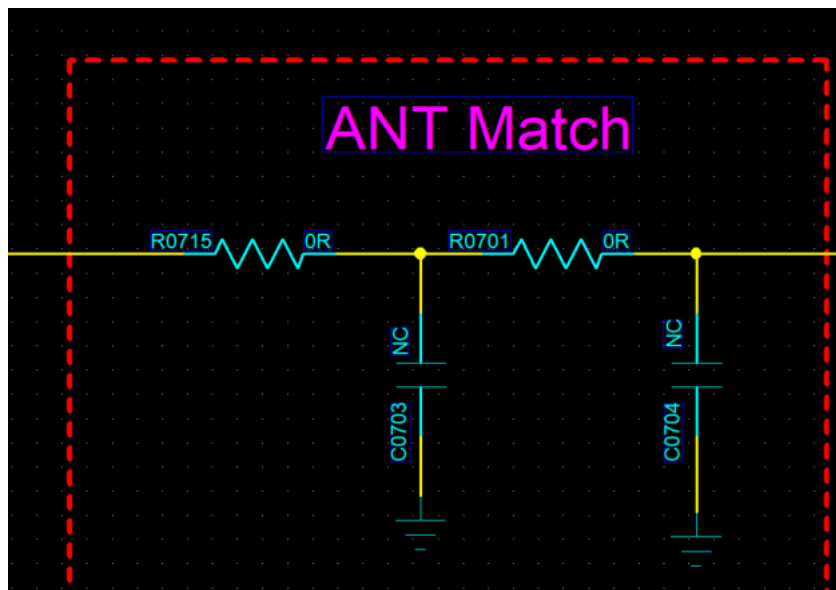
836	-4.38	-8.22	15.06
847	-3.81	-8.08	15.56
849	-3.79	-7.98	15.93
862	-4.23	-7.72	16.89
869	-4.68	-7.80	16.59
880	-5.14	-8.40	14.46
881	-5.17	-8.48	14.20
894	-6.58	-10.31	9.31
897	-7.00	-10.79	8.33
915	-6.08	-8.77	13.26
925	-6.29	-9.05	12.45
942	-7.29	-10.32	9.29
960	-8.10	-11.28	7.45
1805	-0.57	-4.73	33.62
1880	-0.70	-4.90	32.35
1920	-0.95	-5.04	31.37
1980	-2.84	-6.06	24.75
2155	0.17	-4.83	32.91
2170	-0.26	-5.23	29.99
2200	-1.68	-5.71	26.87
2300	1.29	-4.62	34.55
2350	1.07	-4.31	37.10
2400	1.03	-4.32	37.01
2500	0.08	-5.20	30.19
2535	0.65	-5.05	31.26
2570	0.71	-5.39	28.88
2593	0.83	-5.45	28.51
2595	0.82	-5.50	28.16
2620	0.85	-5.48	28.32
2655	0.65	-5.47	28.36
2690	0.40	-5.62	27.43

# BT/WIFI/GNSS antenna

Fixture Picture

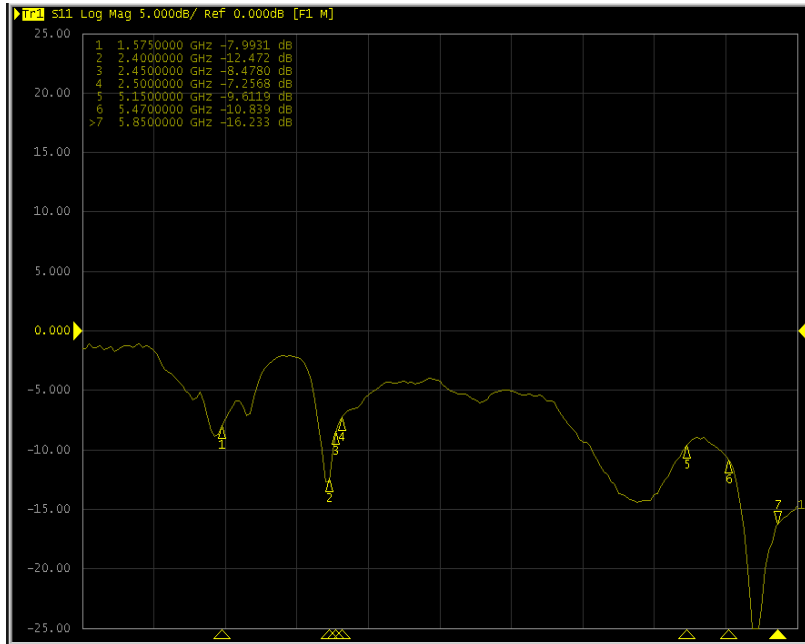


## Matching Circuit, Switch Logic Schematic(CAD and Tag Number Diagram)



Element	Matching

## S Parameter (Return Loss, Smith)



## Passive Performance (Efficiency, Gain)

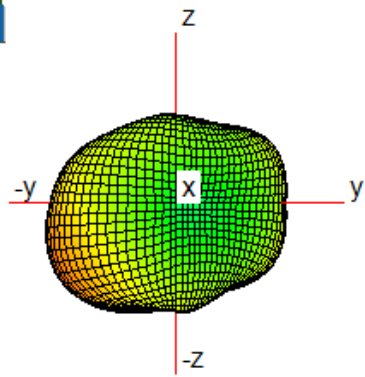
frequency (MHz)	Efficiency (dB)	Gain (dB)	Efficiency (%)
1520	-4.59	-1.69	39.90
1525	-4.54	-1.56	40.36
1530	-4.48	-1.44	40.93
1535	-4.46	-1.20	41.11
1540	-4.44	-1.01	41.30
1545	-4.47	-1.00	41.02
1550	-4.54	-0.97	40.36
1555	-4.63	-0.87	39.54
1560	-4.73	-0.91	38.64
1565	-4.84	-1.00	37.67
1570	-4.95	-1.04	36.73
1575	-5.11	-1.22	35.40
1580	-5.25	-1.35	34.28

1585	-5.35	-1.47	33.50
1590	-5.47	-1.61	32.58
1595	-5.63	-1.74	31.41
1600	-5.80	-1.90	30.20
1605	-6.00	-2.09	28.84
1610	-6.13	-2.25	27.99
1615	-6.29	-2.42	26.98
1620	-6.42	-2.51	26.18
1625	-6.50	-2.61	25.70
1630	-6.71	-2.88	24.49
1635	-6.87	-3.18	23.60
1640	-7.00	-3.19	22.91
1645	-7.14	-3.22	22.18
1650	-7.21	-3.15	21.83
2300	-6.29	0.38	23.48
2310	-5.94	0.72	25.47
2320	-5.60	0.87	27.51
2330	-5.29	1.04	29.58
2340	-4.94	1.21	32.08
2350	-4.59	1.28	34.73
2360	-4.24	1.47	37.69
2370	-4.01	1.67	39.72
2380	-4.03	1.77	39.53
2390	-4.00	1.86	39.81
2400	-3.96	2.02	40.14
2410	-3.97	2.19	40.08
2420	-4.03	2.21	39.54
2430	-4.25	2.20	37.57
2440	-4.48	2.14	35.69
2450	-4.70	2.00	33.92
2460	-4.97	1.81	31.87
2470	-5.09	1.90	31.01
2480	-5.20	1.88	30.17
2490	-5.39	1.65	28.89
2500	-5.27	1.85	29.70

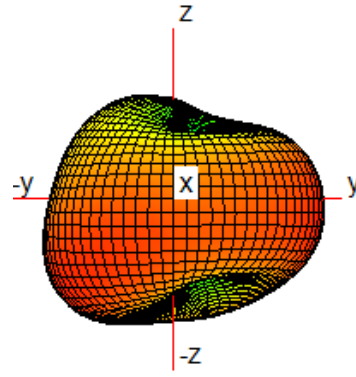
2510	-5.13	2.10	30.70
2520	-5.13	2.04	30.70
2530	-5.13	2.05	30.73
2540	-5.02	2.19	31.48
2550	-4.94	2.08	32.08
2560	-5.12	1.87	30.76
2570	-5.25	1.77	29.85
2580	-4.98	1.84	31.75
2590	-5.07	1.51	31.09
2600	-5.21	1.29	30.14
5000	-5.23	2.15	29.98
5020	-5.46	1.92	28.45
5040	-5.44	1.88	28.56
5060	-5.35	1.97	29.14
5080	-5.74	1.60	26.67
5100	-5.51	1.86	28.13
5120	-5.53	1.76	27.96
5140	-5.25	2.06	29.88
5160	-5.12	2.09	30.76
5180	-5.33	1.93	29.33
5200	-5.69	1.57	26.96
5220	-5.33	1.99	29.33
5240	-5.20	2.19	30.21
5260	-4.74	2.56	33.61
5280	-4.69	2.60	33.99
5300	-4.85	2.36	32.74
5320	-4.80	2.18	33.14
5340	-4.85	1.72	32.70
5360	-5.13	0.96	30.68
5380	-5.08	0.78	31.07
5400	-5.70	0.05	26.89
5420	-5.79	-0.15	26.37
5440	-5.47	0.04	28.38
5460	-5.84	-0.25	26.08
5480	-5.35	0.24	29.16

5500	-5.64	0.06	27.27
5520	-5.42	0.68	28.71
5540	-5.11	0.89	30.83
5560	-5.29	1.06	29.56
5580	-5.29	1.02	29.60
5600	-5.61	0.63	27.48
5620	-5.71	0.29	26.85
5640	-5.12	0.79	30.75
5660	-5.21	0.46	30.16
5680	-4.67	1.00	34.11
5700	-4.84	1.10	32.81
5720	-5.48	0.75	28.28
5740	-4.85	1.61	32.73
5760	-4.96	1.73	31.89
5780	-5.45	1.35	28.50
5800	-5.39	1.81	28.88
5820	-5.99	1.42	25.17
5840	-5.29	2.34	29.55
5860	-5.55	2.29	27.89
5880	-5.40	2.67	28.85
5900	-5.39	2.92	28.90
5920	-5.40	3.09	28.83
5940	-5.25	3.30	29.88
5960	-5.49	2.87	28.23
5980	-5.28	3.02	29.63
6000	-5.49	2.61	28.22

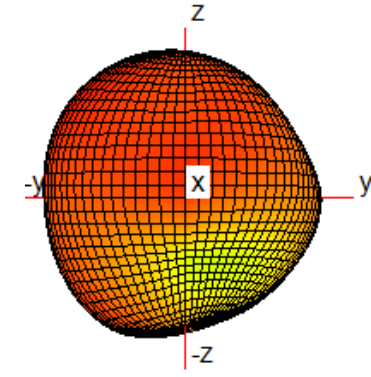
# MAIN ANT 3D Pattern



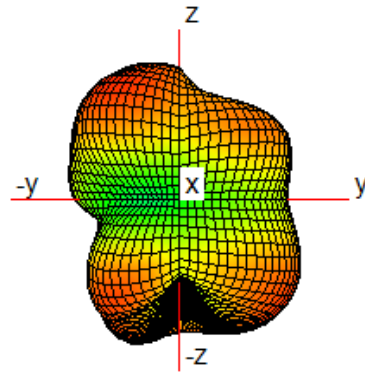
617MHz



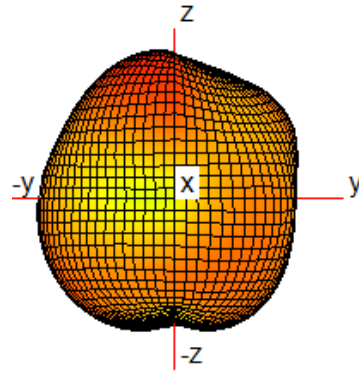
824MHz



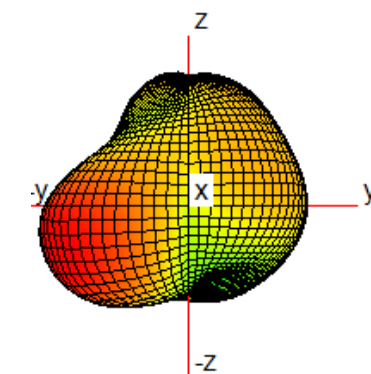
960MHz



1710MHz

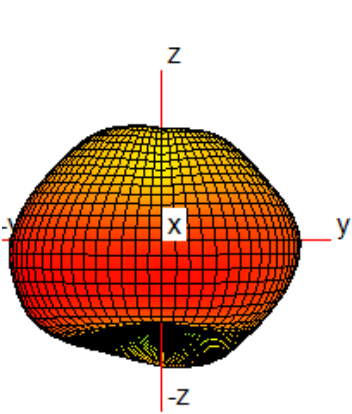


2170MHz

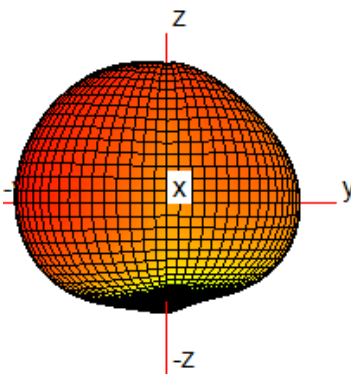


2690MHz

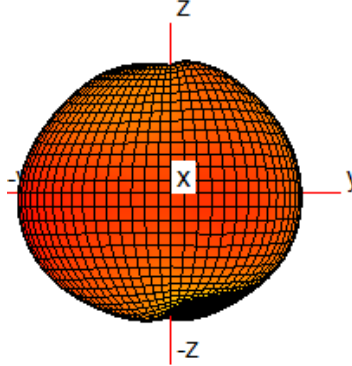
DIVERSITY ANT 3D Pattern



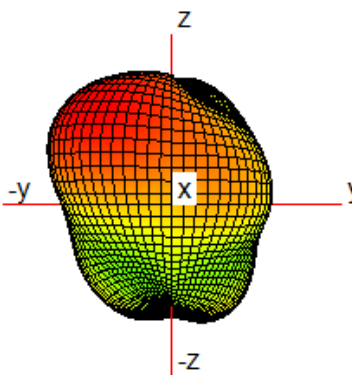
617MHz



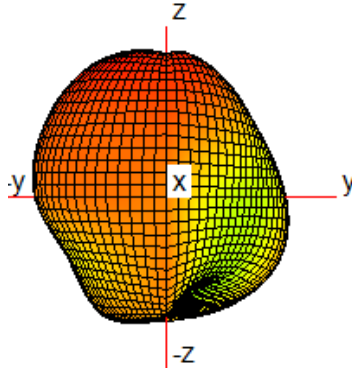
824MHz



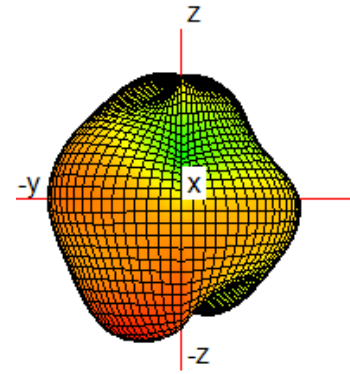
960MHz



1710MHz



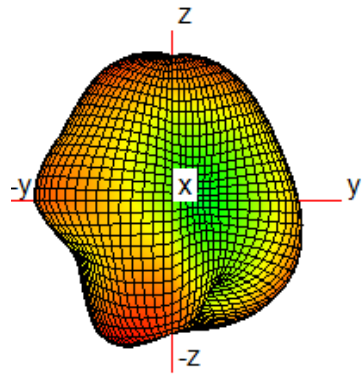
2170MHz



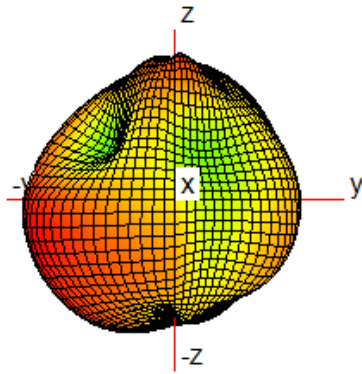
2690MHz



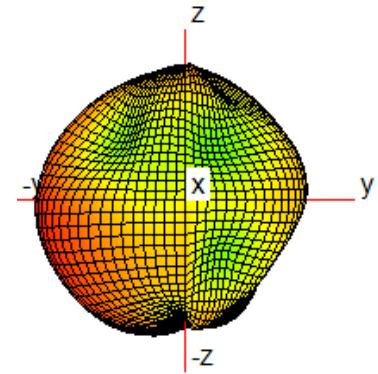
# WIFI ANT 3D Pattern



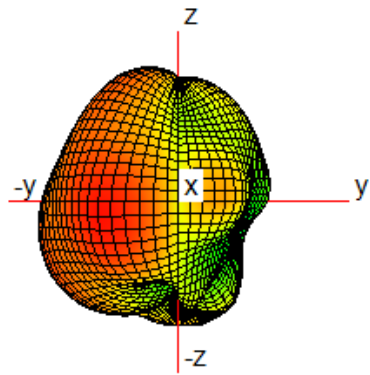
1575MHz



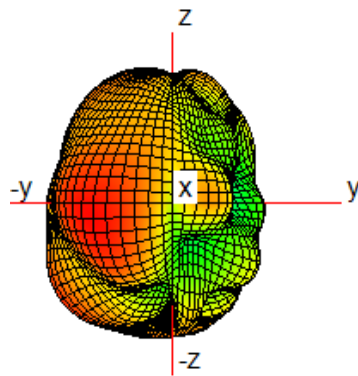
2400MHz



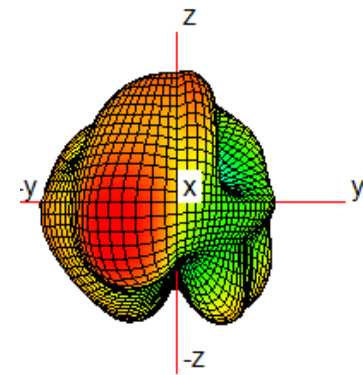
2500MHz



5150MHz



5470MHz



5850MHz