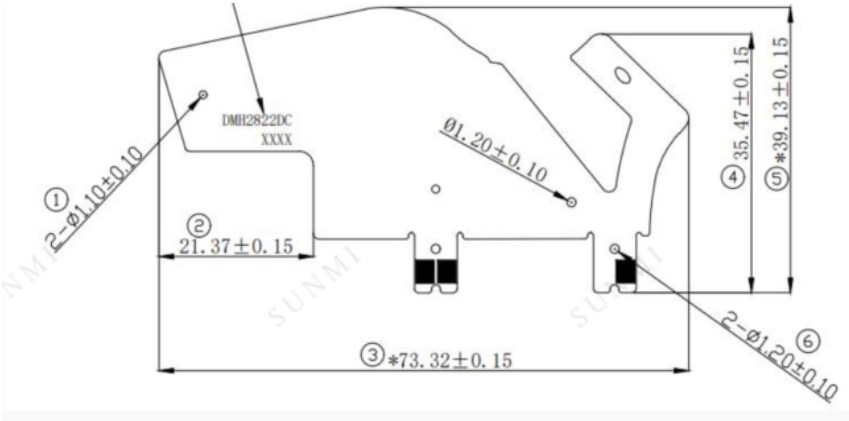
SUNMI	Antenna Passive Test Report				
Project Name	SP01	Engineer	lilei	Checker	
HW Version	DVT	Prototype(S/N)	DE06D38140019	Software Version	1.230110.001 693 test-keys
Temperature/Humidity	25℃/50%	Test Equipment	OTA	Test Date	2023.09.13
Conclusion:		Remarks			

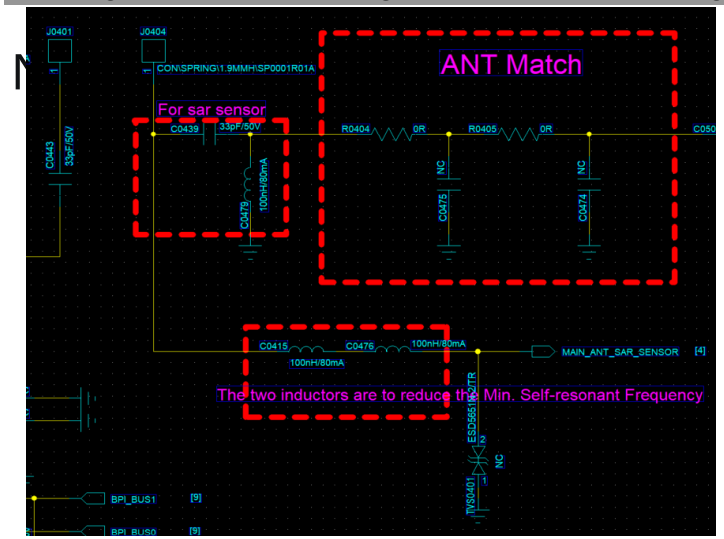
Standard	Fre(Mhz)	Effi(%) (Min~Max)	Probiem Description and Next Step Plan
Main Antenna	600~800	12%-41%	
	800~960	19%-35%	
	1700~2170	30%-38%	
	2300~2400	39%-45%	
	2500~2700	40%-50%	
Div Antenna	600~800	3%-14%	
	800~960	8%-20%	
	1700~2170	25%-35%	
	2300~2400	38%-40%	
	2500~2700	25%-30%	
NFC Antenna	13.56MHz	/	
WiFi	2.4G	30%-40%	
	5G	25%-35%	
GPS	L5	30%	

Main Antenna

Fixture Picture

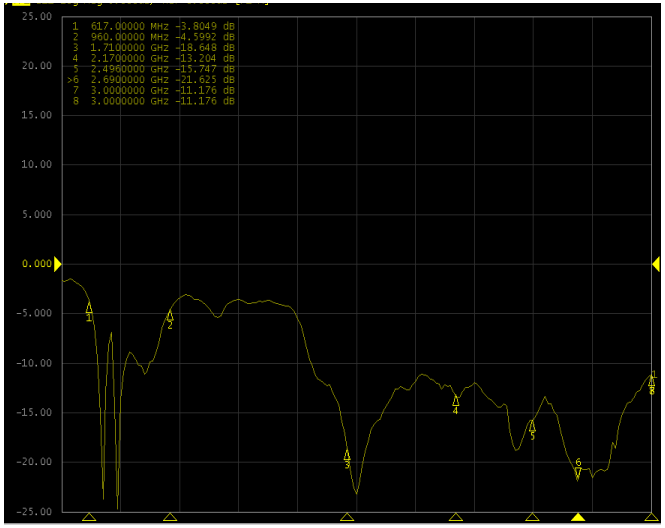


Matching Circuit、Switch Logic Schematic(CAD and Tag Number Diagram)



Element	Matching

S Parameter (Return Loss、Smith)



Passive Performance (Efficiency、Gain)

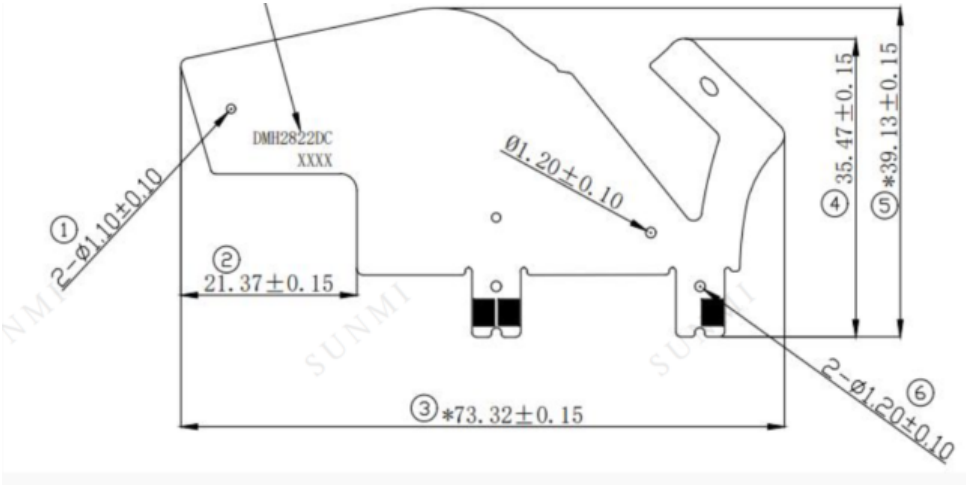
frequency(MHz)	Efficiency(dB)	Gain(dB)	Efficiency(%)
600	-9.80	-6.13	10.5
610	-8.79	-4.80	13.2
620	-7.15	-3.30	19.3
630	-5.90	-1.89	25.7
640	-5.03	-0.92	31.4
650	-4.52	-0.58	35.3
660	-3.98	0.08	40.0
670	-3.76	0.39	42.1
680	-3.84	0.33	41.3
690	-4.53	-0.73	35.2
700	-5.96	-2.21	25.4
710	-8.79	-5.39	13.2
720	-6.65	-2.34	21.6
730	-4.22	0.49	37.9
740	-3.90	0.78	40.7
750	-4.03	0.47	39.6
760	-4.38	-0.06	36.5
770	-4.64	-0.44	34.4

780	-4.71	-0.64	33.8
790	-4.77	-0.88	33.3
800	-4.83	-1.21	32.9
810	-4.80	-1.53	33.1
820	-4.85	-1.68	32.8
830	-4.79	-1.63	33.2
840	-4.85	-1.70	32.8
850	-4.99	-2.03	31.7
860	-5.02	-2.27	31.5
870	-5.28	-2.82	29.7
880	-5.46	-3.55	28.4
890	-5.68	-3.58	27.0
900	-5.79	-3.36	26.4
910	-5.29	-2.54	29.6
920	-5.72	-3.17	26.8
930	-6.34	-3.95	23.2
940	-6.83	-4.33	20.7
950	-6.98	-4.30	20.1
960	-7.26	-4.47	18.8
1700	-4.79	-0.34	33.2
1720	-5.01	-0.70	31.5
1740	-4.73	-0.42	33.6
1760	-4.70	-0.09	33.9
1780	-4.72	0.03	33.7
1800	-4.58	0.00	34.8
1820	-4.61	0.23	34.6
1840	-4.59	0.17	34.8
1860	-4.45	0.17	35.9
1880	-4.55	0.17	35.1
1900	-4.32	0.46	36.9
1920	-4.27	0.60	37.4
1940	-4.61	0.23	34.6

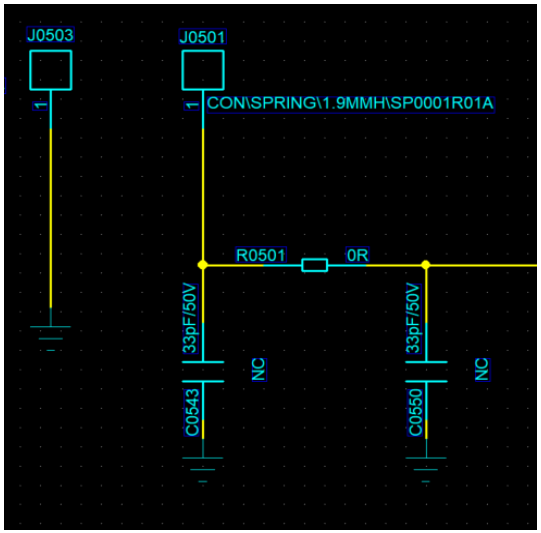
1960	-4.78	0.36	33.3
1980	-5.18	0.73	30.3
2000	-5.43	0.57	28.7
2020	-5.52	0.39	28.0
2040	-5.40	0.59	28.8
2060	-5.22	1.07	30.1
2080	-4.82	1.67	32.9
2100	-4.52	1.67	35.3
2120	-4.13	1.75	38.7
2140	-4.13	1.12	38.6
2160	-4.15	0.63	38.4
2180	-4.17	0.26	38.3
2200	-4.16	0.21	38.3
2220	-4.08	0.23	39.1
2240	-3.89	0.57	40.9
2260	-3.60	0.81	43.7
2280	-3.44	1.08	45.3
2300	-3.39	0.99	45.8
2320	-3.38	1.01	45.9
2340	-3.67	0.80	42.9
2360	-3.91	0.61	40.6
2380	-4.22	0.41	37.9
2400	-4.08	0.12	39.1
2420	-3.76	0.60	42.0
2440	-3.69	0.59	42.8
2460	-3.89	0.38	40.9
2480	-3.86	0.55	41.1
2500	-3.99	0.39	39.9
2520	-3.93	0.29	40.5
2540	-3.87	0.03	41.0
2560	-3.91	-0.17	40.6
2580	-3.62	0.04	43.4
2600	-3.58	0.70	43.8
2620	-3.20	1.54	47.9
2640	-3.09	1.89	49.1
2660	-2.90	2.23	51.3
2680	-2.83	2.41	52.1
2700	-2.88	2.12	51.5

Div Antenna

Fixture Picture

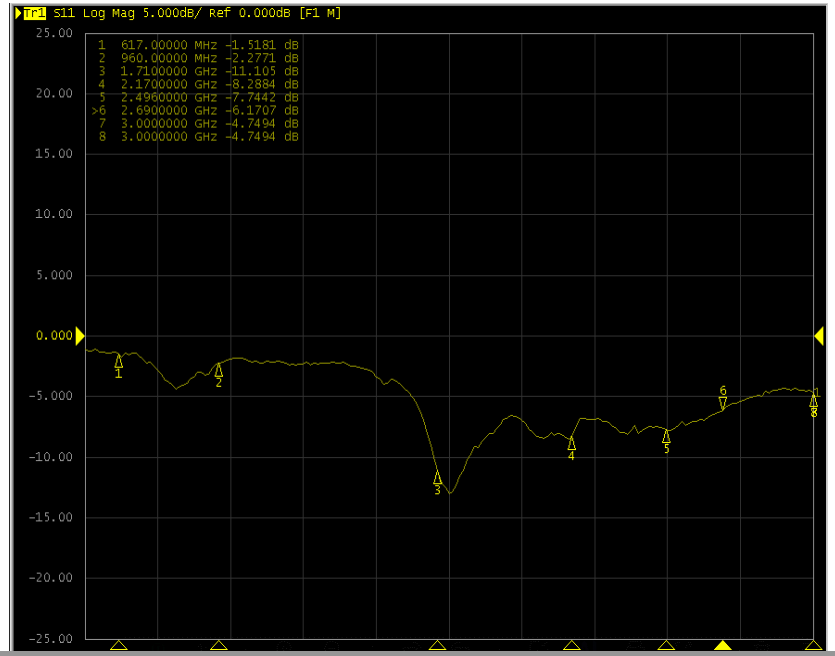


Matching Circuit、Switch Logic Schematic(CAD and Tag Number Diagram)



Element	Matching

S Parameter (Return Loss、Smith)



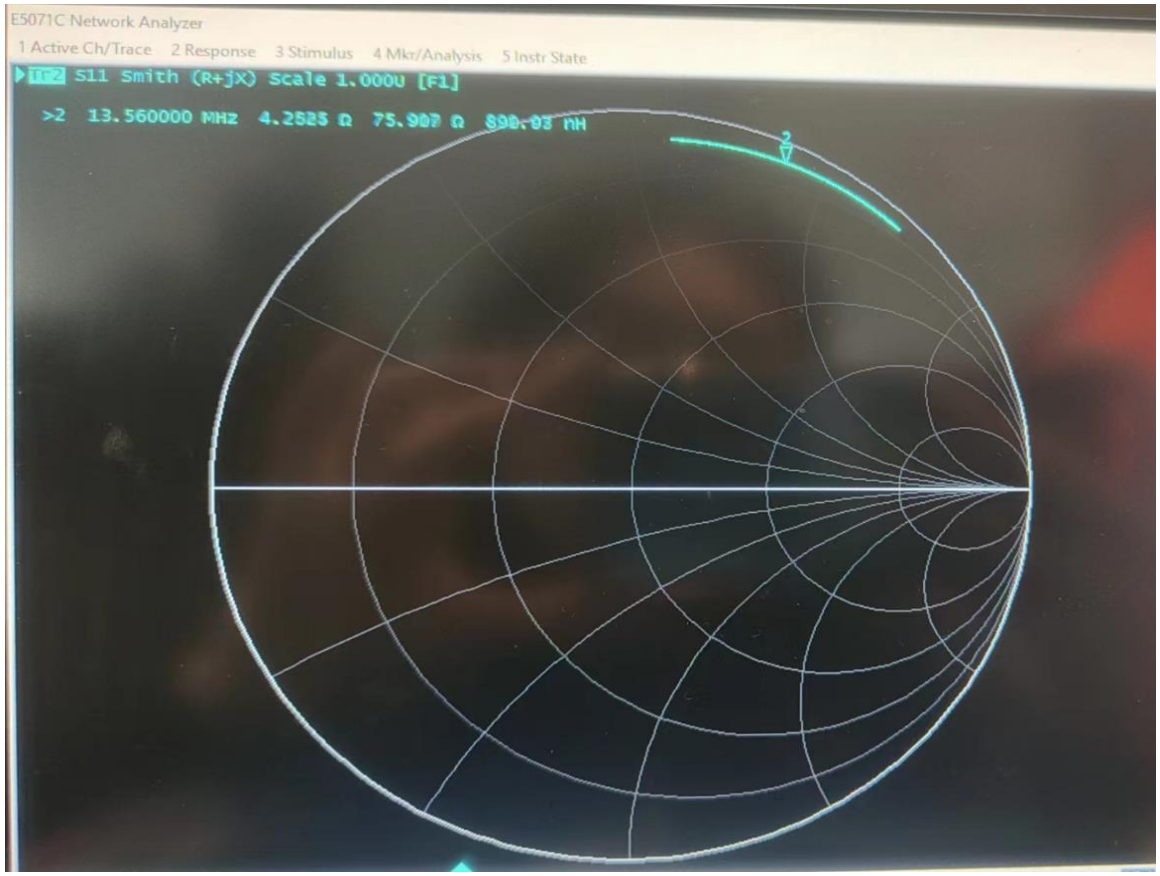
Passive Performance (Efficiency、Gain)

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

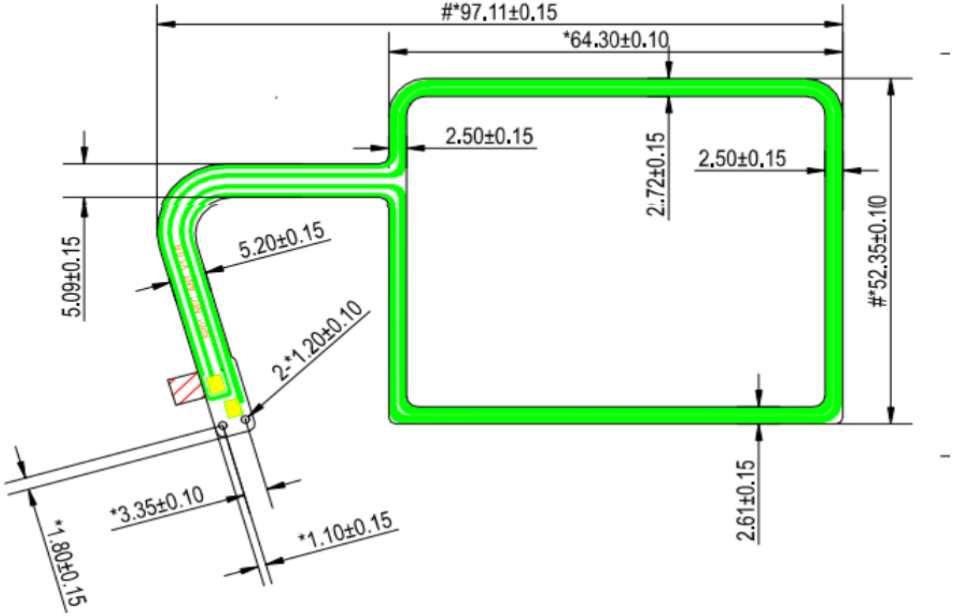
836	-4.38	-8.22	15.06
847	-3.81	-8.08	15.56
849	-3.79	-7.98	15.93
862	-4.23	-7.72	16.89
869	-4.68	-7.80	16.59
880	-5.14	-8.40	14.46
881	-5.17	-8.48	14.20
894	-6.58	-10.31	9.31
897	-7.00	-10.79	8.33
915	-6.08	-8.77	13.26
925	-6.29	-9.05	12.45
942	-7.29	-10.32	9.29
960	-8.10	-11.28	7.45
1805	-0.57	-4.73	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

NFC Antenna

NFC Antenna Reader Mode Load Impedance



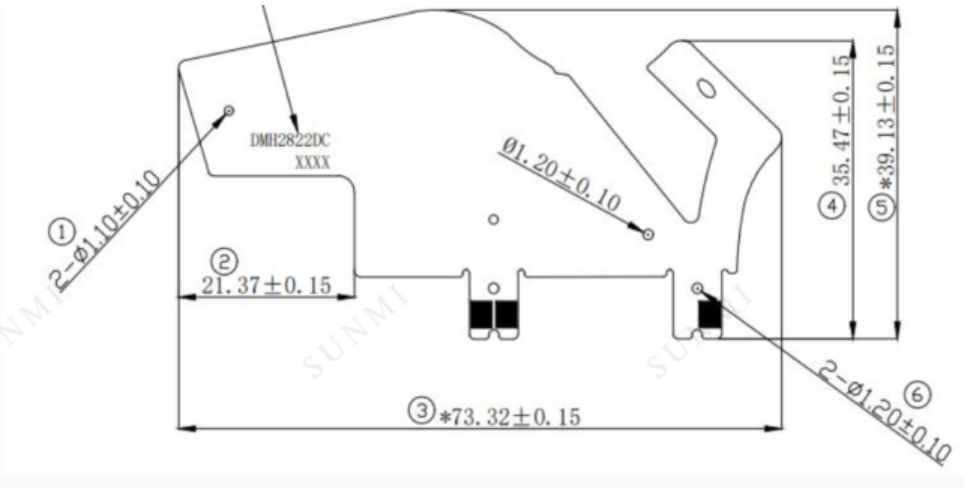
NFC Antenna Specifications



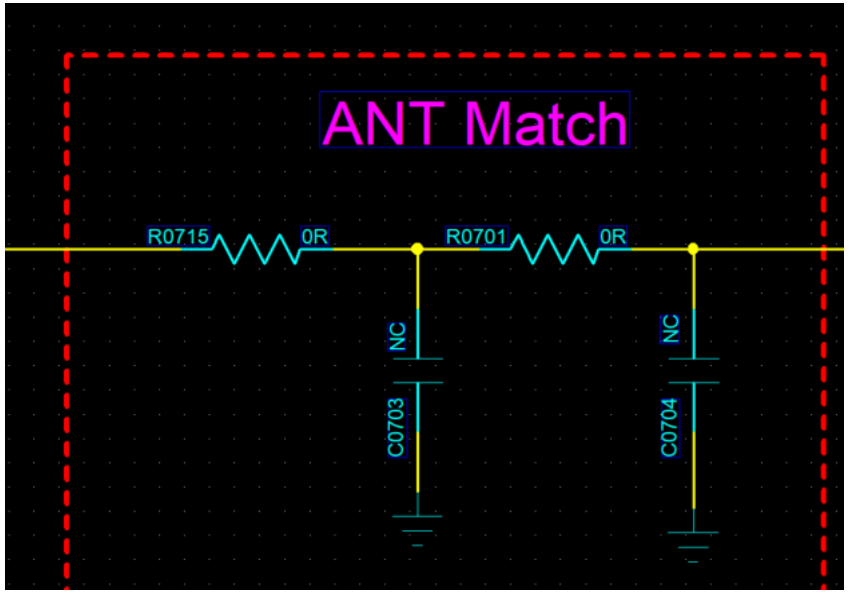
SELECT				√
SPEC. CLASS	A	B	C	D
< 8mm	0.05	0.1	0.1	0.2
8~25mm	0.08	0.15	0.15	0.3
25~80mm	0.12	0.2	0.25	0.4
80~250mm	0.25	0.3	0.4	0.5
ANGLE	0.5			
MATERIAL:	SEE NOTE			
FINISH:	SEE NOTE			

Wifi&Gps

Fixture Picture

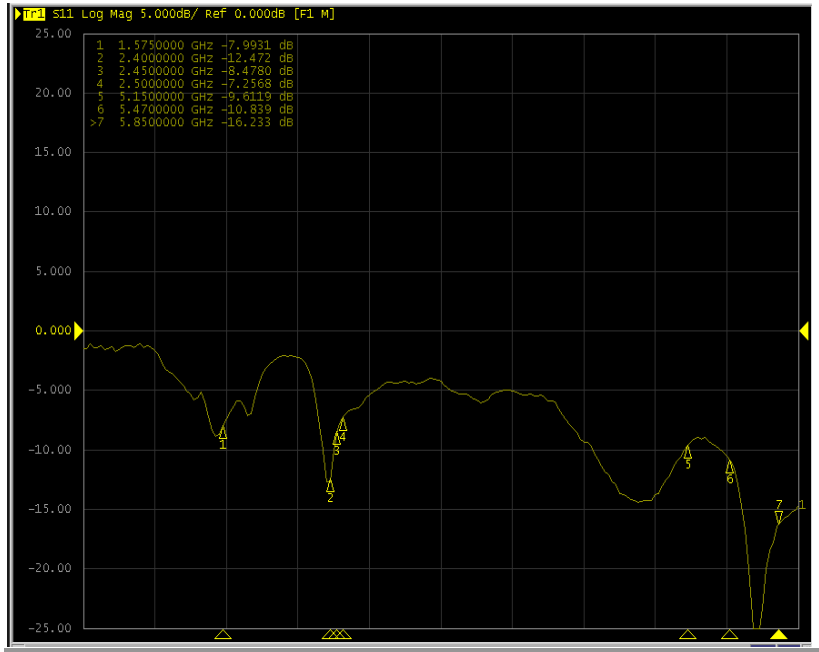


Matching Circuit、Switch Logic Schematic(CAD and Tag Number Diagram)



Element	Matching

S Parameter (Return Loss、Smith)



Passive Performance (Efficiency、Gain)

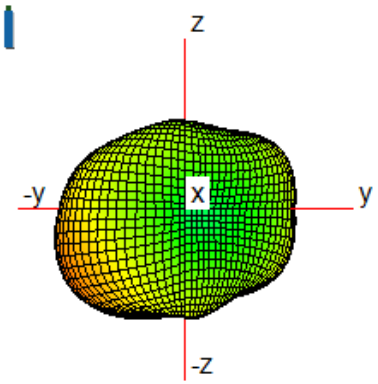
frequency(MHz)	Efficiency(dB)	Gain(dB)	Efficiency(%)
1520	-4.59	-1.69	39.90
1525	-4.54	-1.56	40.36
1530	-4.48	-1.44	40.93
1535	-4.46	-1.20	41.11
1540	-4.44	-1.01	41.30
1545	-4.47	-1.00	41.02
1550	-4.54	-0.97	40.36
1555	-4.63	-0.87	39.54
1560	-4.73	-0.91	38.64
1565	-4.84	-1.00	37.67
1570	-4.95	-1.04	36.73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

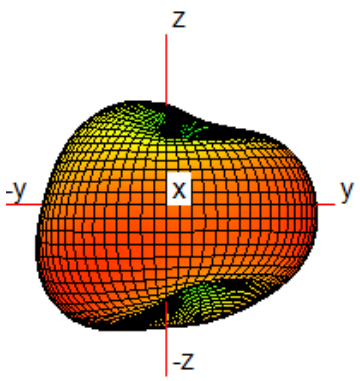
2510	-5.13	2.10	30.70
2520	-5.13	2.04	30.70
2530	-5.13	2.05	30.73
2540	-5.02	2.19	31.48
2550	-4.94	2.08	32.08
2560	-5.12	1.87	30.76
2570	-5.25	1.77	29.85
2580	-4.98	1.84	31.75
2590	-5.07	1.51	31.09
2600	-5.21	1.29	30.14
5000	-5.23	2.15	29.98
5020	-5.46	1.92	28.45
5040	-5.44	1.88	28.56
5060	-5.35	1.97	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

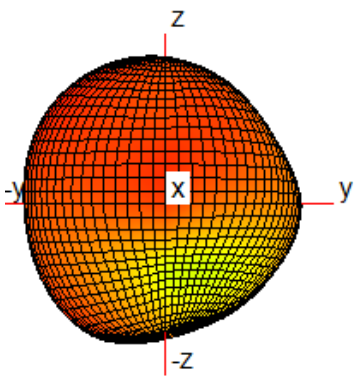
MAIN ANT 3D Pattern



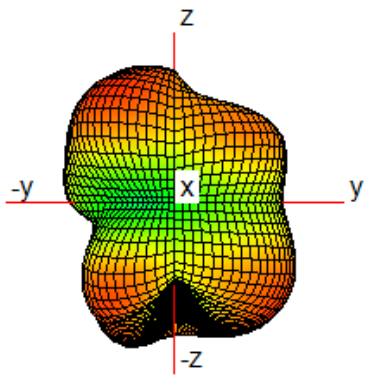
617MHz



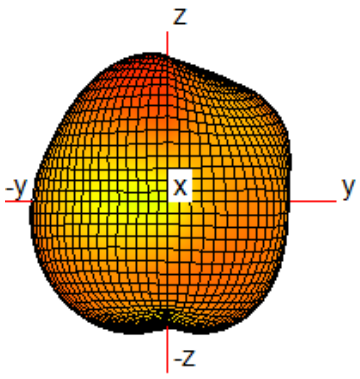
824MHz



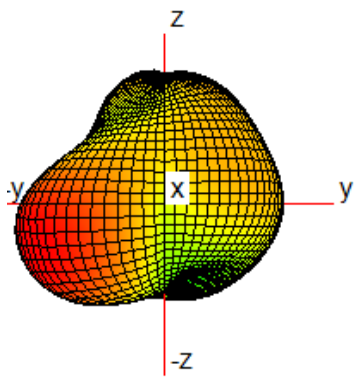
960MHz



1710MHz

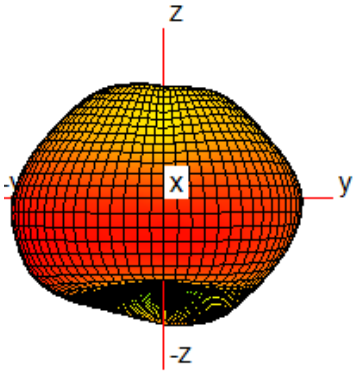


2170MHz

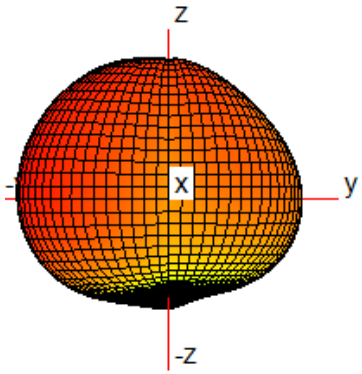


2690MHz

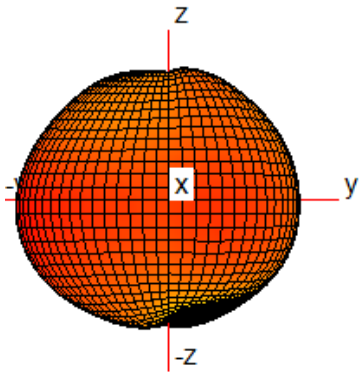
DIVERSITY ANT 3D Pattern



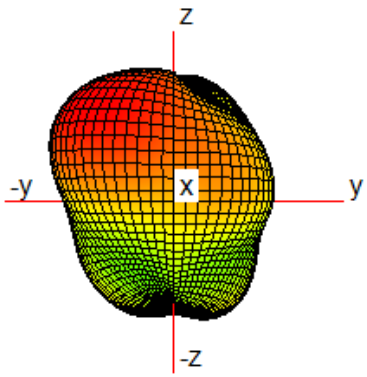
617MHz



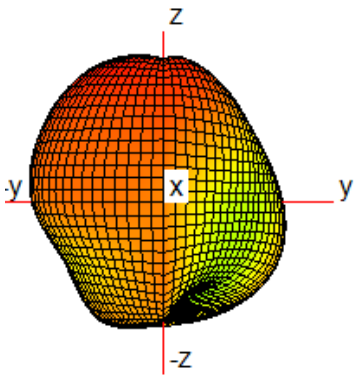
824MHz



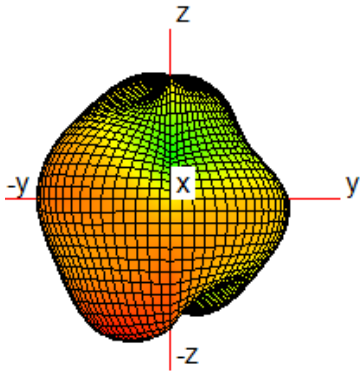
960MHz



1710MHz

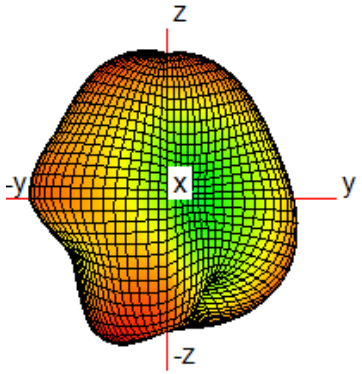


2170MHz

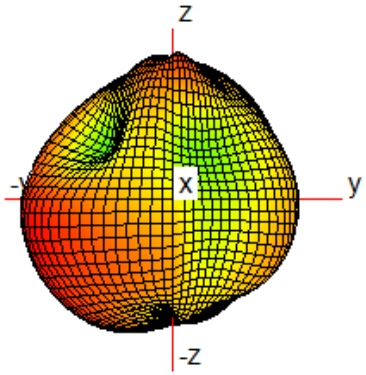


2690MHz

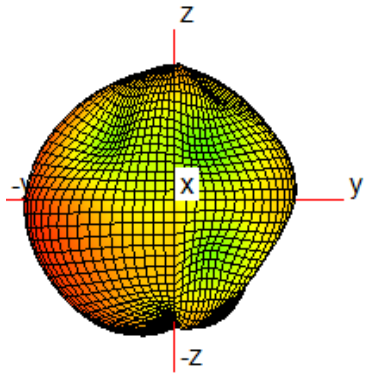
WIFI ANT 3D Pattern



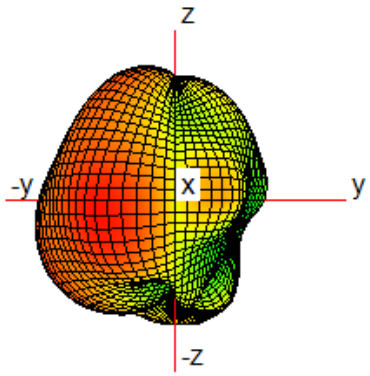
1575MHz



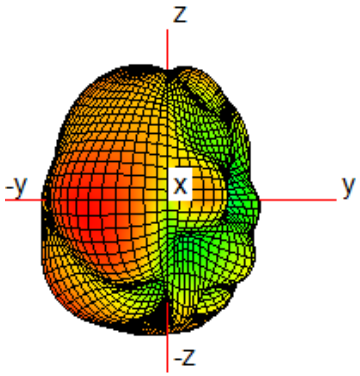
2400MHz



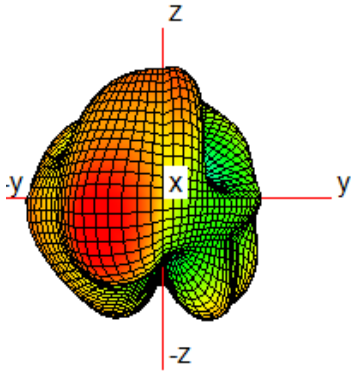
2500MHz



5150MHz



5470MHz



5850MHz