



Introduction to applied laboratory testing equipment

The company introduced the highest configuration of comprehensive tester CMW500

Test 2G, 3G, 4G, WIFI, BT, NB-LOT





Antenna testing equipment



/GTS 3Dlaboratory:

It belongs to the near field testing lab

/ ETS 3Dlaboratory:

It belongs to the far-field test

/ Network Analyzer 5071C/A338/8753E (Test passive)

/ Comprehensive tester CWM500 (active test) 8852
(conduction test)

/ 1 generation 2 generation head ear test
model



TECHNICAL SERVICE



GTS 3Dlaboratory





02

cellphone condition

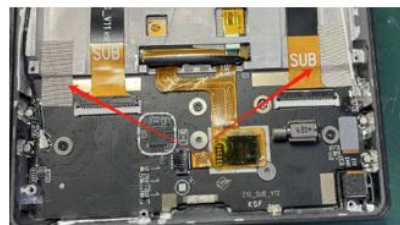
Environmental treatment



Attach a conductive sponge to the position indicated by the arrow for grounding the rear camera metal trim



The middle frame of the hardware is pasted with conductive sponge as shown in the figure

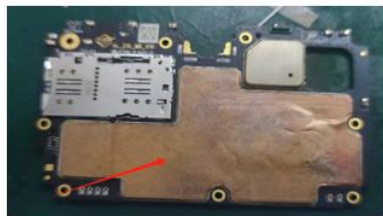


The small plate is grounded with conductive cloth at the two points indicated by the arrow



As shown in the figure, the conductive sponge is reserved at 4 places in the middle frame to ground the motherboard

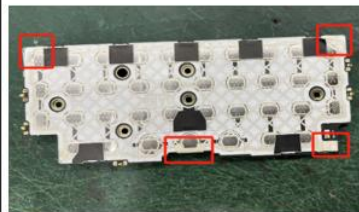
Environmental treatment



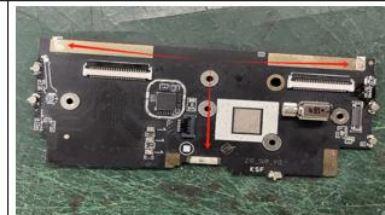
The shield on the back of the motherboard is covered with copper foil



The bottom of the camera is grounded with a double-sided conductive cloth.



Reserve 4 places for the metal dome to be grounded

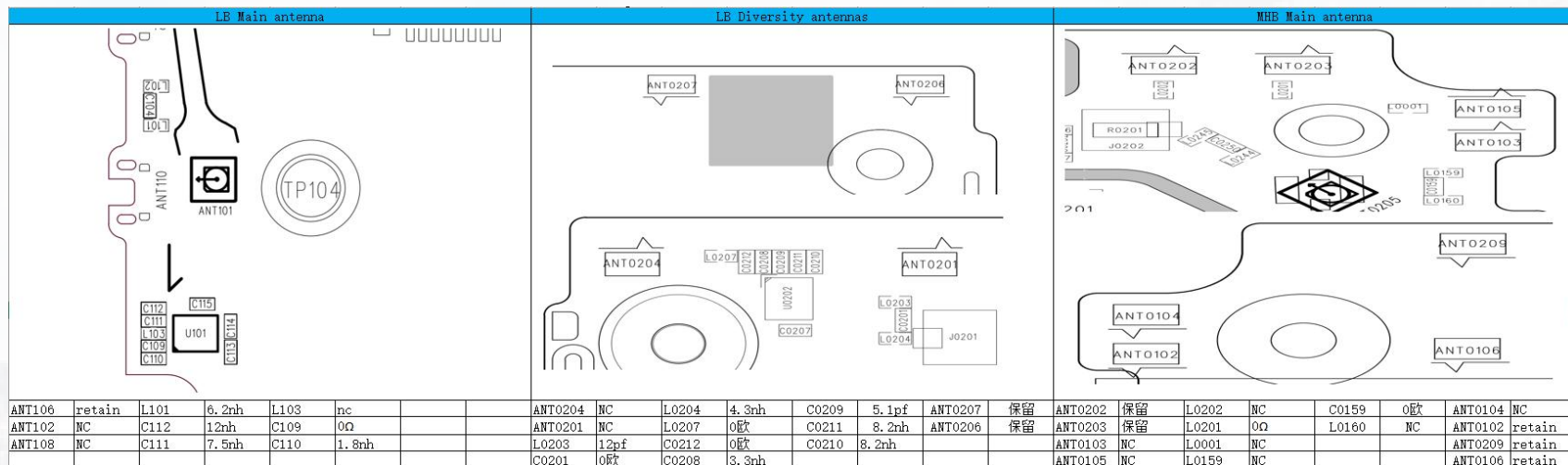


The pins of the metal dome slice are attached to the exposed copper area of the small plate as shown in the figure above



Antenna matching circuit

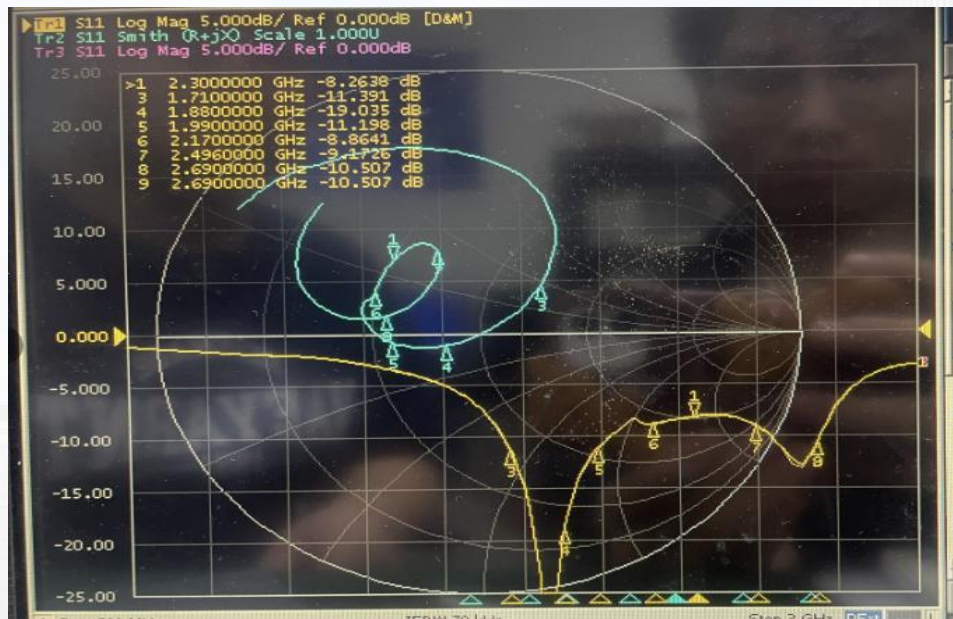
Matching Circuit





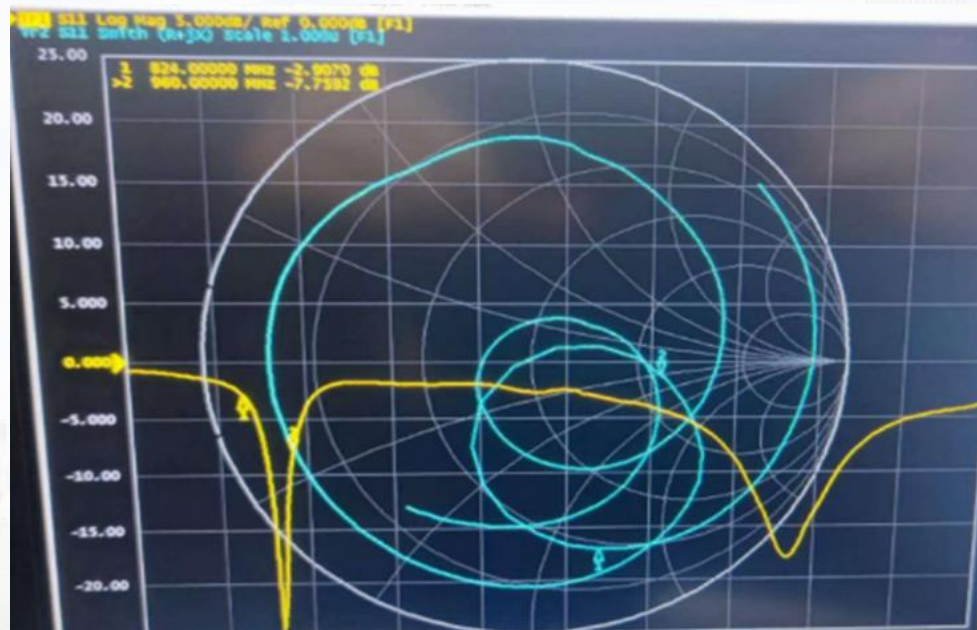
Antenna numerical

MHB Main Antenna S11

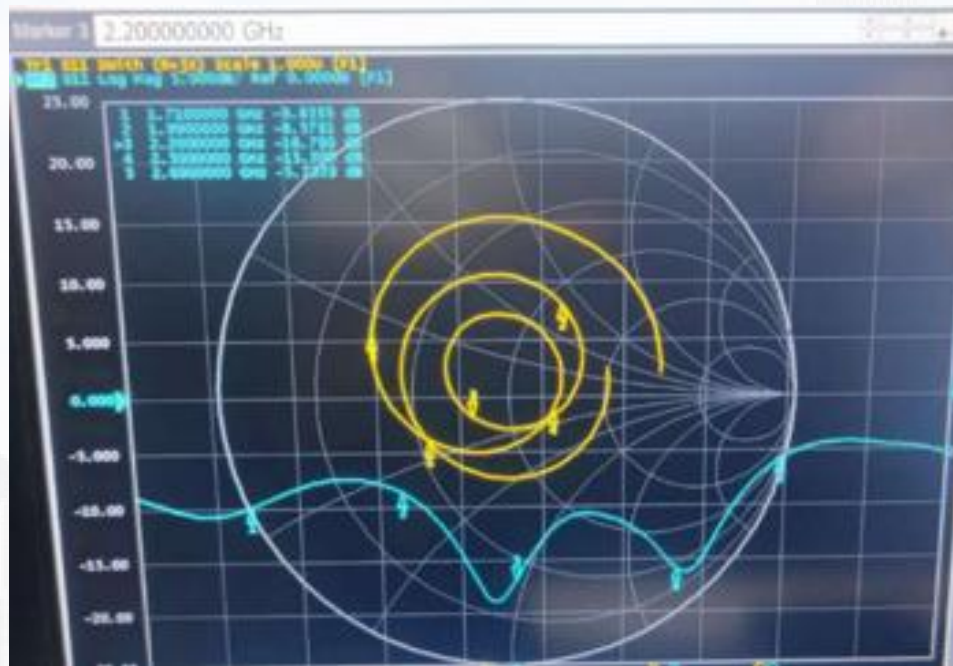


04

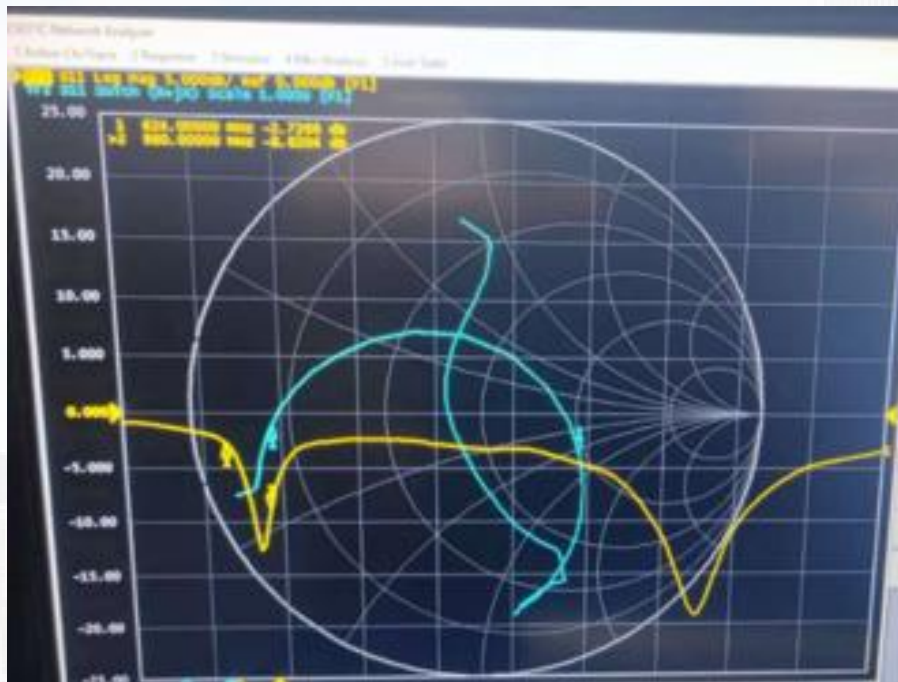
LB Main Antenna S11



MHB Diversity Antenna S11



LB Diversity Antenna S11



BT/WIFI/GPS S11





Main antenna Efficiency

Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)
700	-15.24	-11.27	2.99	1700	-5.13	-0.87	30.7	2010	-5.45	-2.39	28.54	2320	-6.28	-3.55	23.53	2630	-5.27	-2.75	29.7
710	-14.43	-10.73	3.61	1710	-5.08	-0.84	31.07	2020	-5.42	-2.44	28.69	2330	-6.23	-3.6	23.81	2640	-5.29	-2.8	29.59
720	-13.71	-10.24	4.25	1720	-5.15	-0.89	30.55	2030	-5.44	-2.38	28.58	2340	-6.15	-3.56	24.25	2650	-5.25	-2.87	29.84
730	-13.15	-9.47	4.84	1730	-5.24	-1.09	29.92	2040	-5.62	-2.45	27.4	2350	-6.01	-3.43	25.09	2660	-5.23	-3	29.99
740	-12.79	-8.85	5.26	1740	-5.11	-1.17	30.86	2050	-5.72	-2.5	26.78	2360	-5.87	-3.04	25.88	2670	-5.29	-3.18	29.56
750	-12.3	-8.25	5.89	1750	-5.17	-1.22	30.43	2060	-5.65	-2.39	27.23	2370	-5.77	-2.95	26.51	2680	-5.42	-3.47	28.73
760	-11.76	-7.79	6.67	1760	-5.28	-1.5	29.66	2070	-5.51	-2.3	28.12	2380	-5.79	-2.86	26.38	2690	-5.58	-3.47	27.68
770	-11.11	-7.3	7.74	1770	-5.42	-1.98	28.73	2080	-5.37	-2.33	29.06	2390	-5.86	-2.88	25.93	2700	-5.52	-2.98	28.07
780	-10.47	-6.72	8.97	1780	-5.34	-2.41	29.24	2090	-5.44	-2.59	28.6	2400	-5.69	-2.66	27.01				
790	-9.78	-5.78	10.52	1790	-5.21	-2.02	30.11	2100	-5.42	-2.65	28.74	2410	-5.56	-2.53	27.83				
800	-9.03	-5.19	12.5	1800	-5.25	-1.88	29.88	2110	-5.46	-2.81	28.44	2420	-5.76	-2.64	26.56				
810	-8.32	-4.5	14.72	1810	-5.44	-2.09	28.55	2120	-5.83	-2.74	26.12	2430	-5.72	-2.68	26.77				
820	-7.69	-4.05	17.04	1820	-5.62	-2.46	27.42	2130	-5.94	-2.8	25.46	2440	-5.63	-2.54	27.37				
830	-7.01	-3.48	19.89	1830	-5.87	-2.8	25.9	2140	-6	-2.3	25.09	2450	-5.52	-2.46	28.03				
840	-6.41	-2.94	22.84	1840	-6.03	-2.95	24.97	2150	-6.23	-1.91	23.84	2460	-5.54	-2.54	27.93				
850	-5.81	-2.37	26.27	1850	-6.24	-3.33	23.79	2160	-6.19	-1.54	24.02	2470	-5.58	-2.6	27.68				
860	-5.21	-1.87	30.1	1860	-6.46	-3.54	22.61	2170	-6.4	-1.58	22.9	2480	-5.69	-2.8	26.98				
870	-4.67	-1.1	34.11	1870	-6.77	-3.76	21.06	2180	-6.59	-1.79	21.94	2490	-5.76	-2.8	26.56				
880	-4.43	-0.88	36.05	1880	-6.92	-3.71	20.33	2190	-6.53	-1.91	22.22	2500	-5.84	-2.93	26.07				
890	-4.35	-0.69	36.71	1890	-6.65	-3.26	21.62	2200	-6.64	-1.96	21.69	2510	-5.75	-2.77	26.62				
900	-4.42	-0.81	36.16	1900	-6.38	-2.88	23.04	2210	-6.4	-1.61	22.88	2520	-5.72	-2.75	26.81				
910	-4.54	-0.89	35.19	1910	-6.4	-2.81	22.93	2220	-6.81	-3.62	20.84	2530	-5.72	-2.65	26.82				
920	-4.84	-1.13	32.84	1920	-6.45	-2.81	22.67	2230	-6.89	-3.67	20.46	2540	-5.56	-2.51	27.78				
930	-5.22	-1.42	30.09	1930	-6.26	-2.71	23.66	2240	-6.85	-3.55	20.66	2550	-5.42	-2.48	28.72				
940	-5.84	-2.1	26.09	1940	-6.24	-2.85	23.76	2250	-6.75	-3.46	21.14	2560	-5.29	-2.25	29.57				
950	-6.38	-3.09	23.01	1950	-5.93	-2.73	25.53	2260	-6.65	-3.37	21.65	2570	-5.22	-2.24	30.04				
960	-6.97	-4.12	20.08	1960	-6.05	-2.98	24.84	2270	-6.61	-3.37	21.81	2580	-5.27	-2.21	29.73				
970	-7.45	-4.71	17.98	1970	-5.94	-3.01	25.44	2280	-6.6	-3.48	21.88	2590	-5.19	-2.18	30.26				
980	-7.83	-5	16.49	1980	-5.61	-2.53	27.5	2290	-6.48	-3.48	22.49	2600	-5.19	-2.26	30.3				
990	-8.24	-5.43	15.01	1990	-5.53	-2.48	28.02	2300	-6.25	-3.32	23.72	2610	-5.12	-2.34	30.76				
1000	-8.96	-6.13	12.71	2000	-5.38	-2.33	28.97	2310	-6.26	-3.48	23.67	2620	-5.14	-2.4	30.61				



Diversity antenna Efficiency

Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)
700	-6.65	-5.53	13.63	1700	-5.13	-0.87	30.7	2010	-5.45	-2.39	28.54	2320	-6.28	-3.55	23.53	2630	-5.27	-2.75	29.7
710	-6.14	-4.88	15.35	1710	-5.08	-0.84	31.07	2020	-5.42	-2.44	28.69	2330	-6.23	-3.6	23.81	2640	-5.29	-2.8	29.59
720	-7.51	-4.22	17.74	1720	-5.15	-0.89	30.55	2030	-5.44	-2.38	28.58	2340	-6.15	-3.56	24.25	2650	-5.25	-2.87	29.84
730	-6.11	-4.23	15.46	1730	-5.24	-1.09	29.92	2040	-5.62	-2.45	27.4	2350	-6.01	-3.43	25.09	2660	-5.23	-3	29.99
740	-6.51	-4.41	14.08	1740	-5.11	-1.17	30.86	2050	-5.72	-2.5	26.78	2360	-5.87	-3.04	25.88	2670	-5.29	-3.18	29.56
750	-6.52	-4.58	14.06	1750	-5.17	-1.22	30.43	2060	-5.65	-2.39	27.23	2370	-5.77	-2.95	26.51	2680	-5.42	-3.47	28.73
760	-6.54	-4.51	13.99	1760	-5.28	-1.5	29.66	2070	-5.51	-2.3	28.12	2380	-5.79	-2.86	26.38	2690	-5.58	-3.47	27.68
770	-6.4	-4.38	14.44	1770	-5.42	-1.98	28.73	2080	-5.37	-2.33	29.06	2390	-5.86	-2.88	25.93	2700	-5.52	-2.98	28.07
780	-6.19	-4.19	15.18	1780	-5.34	-2.41	29.24	2090	-5.44	-2.59	28.6	2400	-5.69	-2.66	27.01				
790	-6.1	-4.14	15.5	1790	-5.21	-2.02	30.11	2100	-5.42	-2.65	28.74	2410	-5.56	-2.53	27.83				
800	-7.77	-3.66	16.72	1800	-5.25	-1.88	29.88	2110	-5.46	-2.81	28.44	2420	-5.76	-2.64	26.56				
810	-7.38	-3.14	18.28	1810	-5.44	-2.09	28.55	2120	-5.83	-2.74	26.12	2430	-5.72	-2.68	26.77				
820	-7.22	-2.94	18.99	1820	-5.62	-2.46	27.42	2130	-5.94	-2.8	25.46	2440	-5.63	-2.54	27.37				
830	-7.18	-2.92	19.16	1830	-5.87	-2.8	25.9	2140	-6	-2.3	25.09	2450	-5.52	-2.46	28.03				
840	-7.08	-2.9	19.59	1840	-6.03	-2.95	24.97	2150	-6.23	-1.91	23.84	2460	-5.54	-2.54	27.93				
850	-6.84	-2.67	20.69	1850	-6.24	-3.33	23.79	2160	-6.19	-1.54	24.02	2470	-5.58	-2.6	27.68				
860	-6.7	-2.63	21.39	1860	-6.46	-3.54	22.61	2170	-6.4	-1.58	22.9	2480	-5.69	-2.8	26.98				
870	-6.76	-2.65	21.07	1870	-6.77	-3.76	21.06	2180	-6.59	-1.79	21.94	2490	-5.76	-2.8	26.56				
880	-6.75	-2.82	21.12	1880	-6.92	-3.71	20.33	2190	-6.53	-1.91	22.22	2500	-5.84	-2.93	26.07				
890	-6.64	-2.84	21.68	1890	-6.65	-3.26	21.62	2200	-6.64	-1.96	21.69	2510	-5.75	-2.77	26.62				
900	-6.51	-2.94	22.35	1900	-6.38	-2.88	23.04	2210	-6.4	-1.61	22.88	2520	-5.72	-2.75	26.81				
910	-6.25	-2.93	23.72	1910	-6.4	-2.81	22.93	2220	-6.81	-3.62	20.84	2530	-5.72	-2.65	26.82				
920	-6.38	-2.9	23.02	1920	-6.45	-2.81	22.67	2230	-6.89	-3.67	20.46	2540	-5.56	-2.51	27.78				
930	-6.6	-2.93	21.89	1930	-6.26	-2.71	23.66	2240	-6.85	-3.55	20.66	2550	-5.42	-2.48	28.72				
940	-6.7	-2.83	21.4	1940	-6.24	-2.85	23.76	2250	-6.75	-3.46	21.14	2560	-5.29	-2.25	29.57				
950	-6.45	-2.45	22.67	1950	-5.93	-2.73	25.53	2260	-6.65	-3.37	21.65	2570	-5.22	-2.24	30.04				
960	-6.23	-2.31	23.82	1960	-6.05	-2.98	24.84	2270	-6.61	-3.37	21.81	2580	-5.27	-2.21	29.73				
970	-6.1	-2.05	24.54	1970	-5.94	-3.01	25.44	2280	-6.6	-3.48	21.88	2590	-5.19	-2.18	30.26				
980	-6.13	-2.28	24.4	1980	-5.61	-2.53	27.5	2290	-6.48	-3.48	22.49	2600	-5.19	-2.26	30.3				
990	-5.92	-2.05	25.58	1990	-5.53	-2.48	28.02	2300	-6.25	-3.32	23.72	2610	-5.12	-2.34	30.76				
1000	-5.79	-2.03	26.35	2000	-5.38	-2.33	28.97	2310	-6.26	-3.48	23.67	2620	-5.14	-2.4	30.61				



BT/WIFI/GPS Efficiency



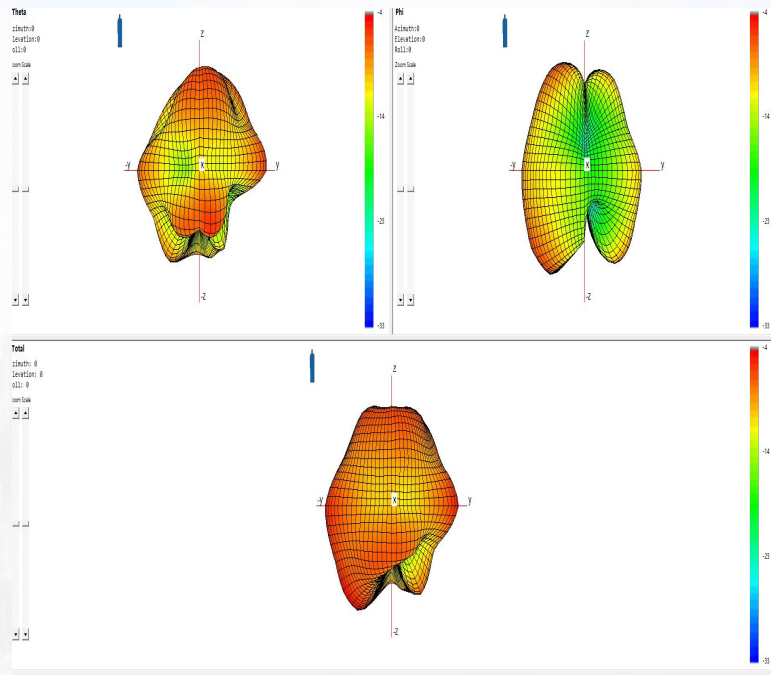
Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)	Freq(MHz)	Effi(dB)	Gain(dBi)	Effi(%)
1550	-5.81	-3.61	26.22	5000	-5.71	-2.65	26.87	5480	-6.56	-1.62	22.1	5960	-5.85	-1.88	26
1555	-5.93	-3.58	25.51	5020	-5.67	-2.54	27.11	5500	-6.34	-1.29	23.24	5980	-6	-1.93	25.14
1560	-5.87	-3.37	25.89	5040	-5.65	-2.48	27.24	5520	-6.11	-1.12	24.49	6000	-6.07	-1.91	24.71
1565	-5.8	-3.2	26.28	5060	-5.68	-2.53	27.03	5540	-6.08	-1.2	24.69				
1570	-5.71	-3	26.85	5080	-5.72	-2.57	26.8	5560	-5.99	-1.26	25.17				
1575	-5.65	-2.8	27.22	5100	-5.79	-2.57	26.37	5580	-5.97	-1.4	25.31				
1580	-5.59	-2.61	27.61	5120	-5.87	-2.45	25.9	5600	-6.01	-1.57	25.08				
1585	-5.55	-2.51	27.85	5140	-5.94	-2.43	25.44	5620	-5.84	-1.49	26.05				
1590	-5.59	-2.54	27.6	5160	-5.98	-2.52	25.24	5640	-5.71	-1.38	26.83				
1595	-5.67	-2.64	27.1	5180	-6.04	-2.52	24.91	5660	-5.68	-1.15	27.06				
1600	-5.72	-2.71	26.8	5200	-6.19	-2.54	24.06	5680	-5.4	-0.77	28.84				
				5220	-6.39	-2.73	22.97	5700	-5.5	-0.84	28.2				
2400	-7.37	-3.6	18.33	5240	-6.5	-2.94	22.38	5720	-5.62	-1.03	27.39				
2410	-7.14	-3.43	19.3	5260	-6.51	-2.9	22.35	5740	-5.41	-0.93	28.79				
2420	-7.05	-3.18	19.72	5280	-6.56	-2.95	22.09	5760	-5.6	-1.32	27.54				
2430	-6.98	-3.14	20.05	5300	-6.62	-2.92	21.76	5780	-5.63	-1.62	27.38				
2440	-6.65	-2.72	21.62	5320	-6.74	-2.91	21.18	5800	-5.35	-1.74	29.16				
2450	-6.47	-2.5	22.53	5340	-6.84	-2.89	20.7	5820	-5.69	-2.35	26.96				
2460	-6.64	-2.67	21.69	5360	-6.96	-2.91	20.13	5840	-5.52	-1.93	28.07				
2470	-6.66	-2.72	21.57	5380	-6.76	-2.14	21.09	5860	-5.77	-2.01	26.48				
2480	-6.72	-2.75	21.28	5400	-6.75	-2.09	21.14	5880	-5.83	-1.99	26.14				
2490	-6.77	-2.74	21.05	5420	-6.69	-2.01	21.42	5900	-5.54	-1.46	27.93				
2500	-7.03	-2.96	19.83	5440	-6.78	-2.14	21	5920	-6.06	-1.99	24.78				
				5460	-6.68	-1.91	21.47	5940	-5.86	-1.8	25.97				



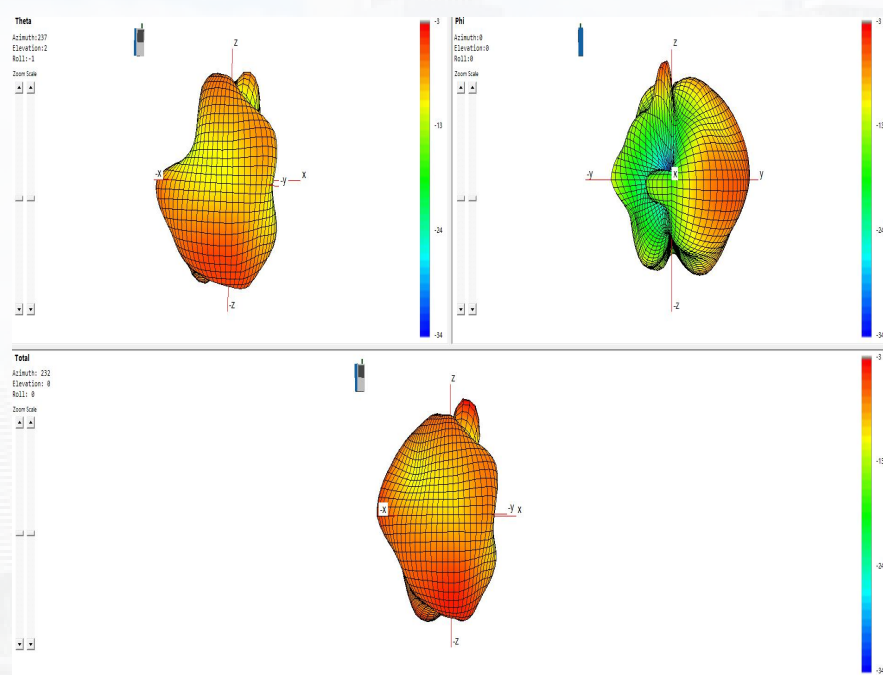
BT/WIFI Antenna Pattern



BT/2.4G WIFI



5G WIFI





Antenna active data



MHE antennas				
Band	CH	TRP	CH	TIS (灭屏)
B1(10M)	18050	18.95		
	18300	19.08		
	18550	18.34	550	-92.13
B2(10M)	18650	18.97		
	18900	19.96		
	19150	20.52	1150	-94.71
B3(10M)	19250	17.5		
	19575	18.02		
	19900	18.4	1900	-96.77
B4(10M)	20000	17.44		
	20175	17.86		
	20350	18.04	2350	-93.18
B7(10M)	20850	18.58		
	21100	18.67		
	21350	18.98	3350	-95.75
B25(10M)	26065	18.72		
	26365	19.76		
	26665	20.01	8665	-93.13
B38(20M)	37850	18.35		
	38000	18.21		
	38150	18.37	38150	-92.03
B39(20M)	38350	18.12		
	38450	18.17		
	38550	18.48	38550	-91.62
B40(20M)	38750	18.61		
	39150	18.36		
	39550	18.03	38750	-91.44
B41(20M)	39750	18.76		
	40620	18.21		
	41490	18.25	40620	-91.46
B66(10M)	132022	17.47		
	132322	17.88		
	132622	18.23	67086	-92.87

LB antennas				
Band	CH	TRP	CH	TIS (灭屏)
B5(10M)	20450	18.21		
	20525	18.03		
	20600	18.16	2600	-94.98
B8(10M)	21500	17.98		
	21625	17.23		
	21750	17.87	3750	-94.49
B12(5M)	23035	17.83		
	23095	17.34		
	23155	17.64	5155	-92.64
B13(5M)	23230	17.52		
	23205	17.42		
	23255	17.73	5230	-93.34
B17(5M)	23780	17.43		
	23790	17.46		
	23800	17.49	5800	-92.21
B18(5M)	23900	18.83		
	23925	18.08		
	23950	18.11	5925	-96.34
B19(5M)	24050	18.76		
	24075	18.73		
	24100	18.62	6075	-96.97
B20(10M)	24200	18.16		
	24300	18.54		
	24400	18.9	6400	-93.24
B26(5M)	26740	17.96		
	26865	18.36		
	26990	18.19	9015	-96.1
B28(10M)	27260	17.94		
	27435	18.46		
	27610	18.19	9435	-91.26

WIFI&GPS antennas				
Band	CH	TRP	CH	TIS
11-B (11M)	1	10.29	1	-80.36
	6	10.37	6	-80.37
	11	10.56	11	-80.34
5G-A (6M)	40	7.87	40	-86.32
	56	7.36	56	-86.11
	157	8.54	157	-86.45
Band	CH	C/N	CH	TIS
GPS	0	41.39	0	-152.14



Antenna structural drawings



Antenna Diagram

