



A司南微电子（深圳）有限公司
SINAWELL Electronics (Shenzhen)Co.,LTD

Antenna passive measurement

客户名: **cpdevice**

项目名: **APOLLO 7**

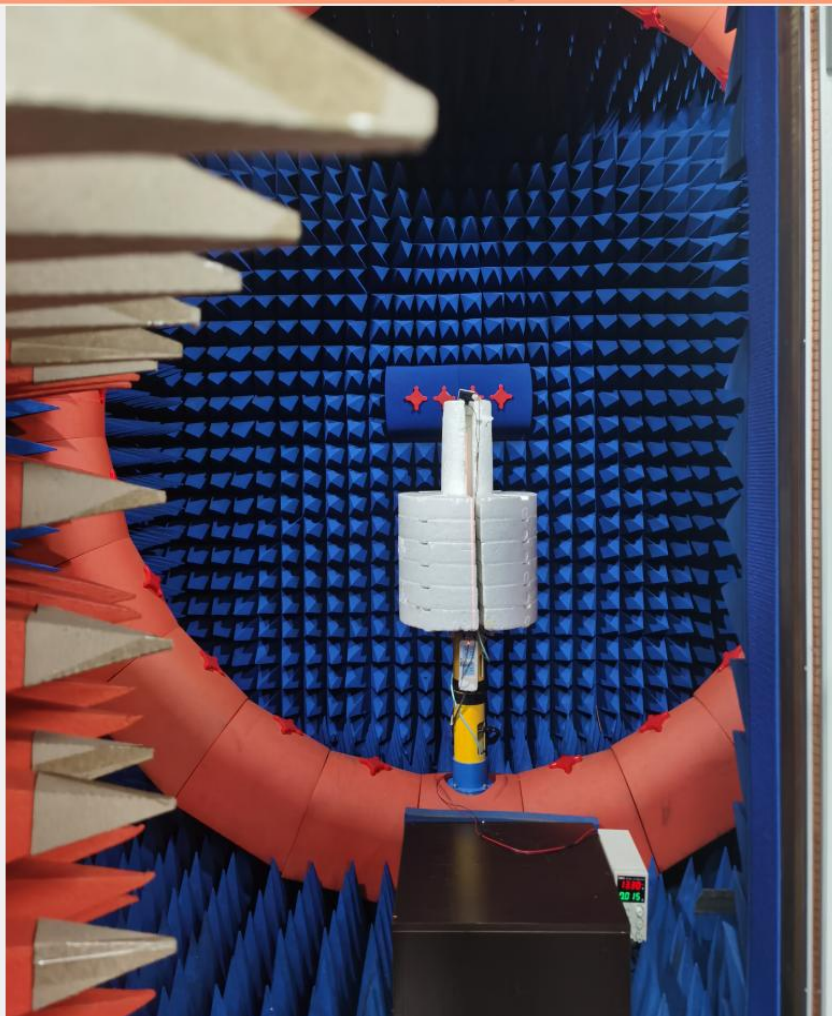
时 间: **2023.5.10**

antenna passive measurement

Customer name		cpdevice	item	APOLLO2 7
NO	item		recount	
1	Frequency		700-960MHZ/1700-2700MHZ/2400-2500MHZ/5100-5800MHZ	
2	Project type		SN1357	
4	Feed point type		IPEX	
5	Antenna type		FPC + cable	
6	working temperature		-40° C -- +85° C	

testing facility

16 probe microwave anechoic chamber
CMW500 Comprehensive measuring instrument



Equipment Under Test

APOLLO2 7

front



the back



LTE Antenna passive test data

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
700	25.47	-5.94	-0.61
710	27.35	-5.63	-0.39
720	29.36	-5.32	-0.15
730	31.14	-5.07	0.38
740	32.09	-4.94	0.66
750	34.37	-4.64	0.88
760	37.46	-4.26	1.1
770	39.49	-4.04	0.88
780	27.48	-5.61	-0.78
790	28.63	-5.43	-0.18
800	44.31	-3.54	2.54
810	45.91	-3.38	2.75
820	45.23	-3.45	2.62
830	44.4	-3.53	2.34
840	41.68	-3.8	1.82
850	37.44	-4.27	1.2
860	32.31	-4.91	2.22
870	35.44	-4.5	1.58
880	39.65	-4.02	2.44
890	41.37	-3.83	3.28
900	41.37	-3.83	3.17
910	41.34	-3.84	2.55
920	41.42	-3.83	2.68
930	40.08	-3.97	2.74
940	37.25	-4.29	2.36
950	33.95	-4.69	1.75
960	31.26	-5.05	0.73
1710	27.58	-5.59	0.3
1720	27.44	-5.62	0.02
1730	27.57	-5.6	-0.12
1740	28.91	-5.39	-0.05
1750	29.13	-5.36	-0.17
1760	29.07	-5.37	-0.21
1770	29.32	-5.33	-0.32
1780	30.03	-5.22	-0.18
1790	30.98	-5.09	-0.13
1800	31.55	-5.01	-0.05
1810	31.35	-5.04	-0.12
1820	32.1	-4.93	-0.09
1830	31.27	-5.05	-0.37
1840	31.15	-5.07	-0.56
1850	31.83	-4.97	-0.42
1860	31.83	-4.97	-0.53
1870	32.5	-4.88	-0.45
1880	34.05	-4.68	0.25
1890	36.97	-4.32	0.71
1900	43.99	-3.57	1.12
1910	51.77	-2.86	1.29
1920	57.17	-2.43	1.2
1930	58.94	-2.3	1.65
1940	59.83	-2.23	2.06
1950	61.17	-2.13	2.42
1960	62.77	-2.02	2.83
1970	63.57	-1.97	3.12
1980	64.13	-1.93	3.31
1990	63.93	-1.94	3.49
2000	63.99	-1.94	3.55

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2010	64.92	-1.88	3.71
2020	65.17	-1.86	3.75
2030	65.32	-1.85	3.76
2040	65.09	-1.86	3.79
2050	63.55	-1.97	3.81
2060	62.69	-2.03	3.89
2070	64.21	-1.92	4.12
2080	64.92	-1.88	4.19
2090	63.25	-1.99	4.1
2100	62.66	-2.03	4.11
2110	63.02	-2.01	4.12
2120	63.4	-1.98	4.12
2130	64.03	-1.94	4.1
2140	64.22	-1.92	4.23
2150	63.88	-1.95	4.23
2160	61.74	-2.09	4.06
2170	60.69	-2.17	4.16
2300	65.43	-1.84	4.05
2310	64.24	-1.92	3.9
2320	62.98	-2.01	3.84
2330	62.82	-2.02	3.97
2340	63.42	-1.98	3.99
2350	64.29	-1.92	4.05
2360	64.3	-1.92	4.11
2370	63.87	-1.95	4.03
2380	61.3	-2.13	3.86
2390	58.16	-2.35	3.48
2400	58.06	-2.36	3.42
2410	56.03	-2.52	3.22
2420	50.91	-2.93	2.76
2430	48.37	-3.15	2.52
2440	47.26	-3.26	2.43
2450	46.61	-3.32	2.35
2460	44.95	-3.47	2.17
2470	43.06	-3.66	1.96
2480	40.1	-3.97	1.58
2490	37.46	-4.26	1.22
2500	34.61	-4.61	0.88
2510	33.46	-4.75	0.69
2520	31.87	-4.97	0.44
2530	29.93	-5.24	-0.01
2540	29.61	-5.29	-0.05
2550	28.71	-5.42	-0.24
2560	27.89	-5.55	-0.44
2570	26.78	-5.72	-0.75
2580	24.87	-6.04	-1.29
2590	24.34	-6.14	-1.6
2600	23.59	-6.27	-1.8
2610	23.14	-6.36	-0.78
2620	22.85	-6.41	-0.87
2630	22.19	-6.54	-1.16
2640	22.25	-6.53	-1.28
2650	22.55	-6.47	-1.09
2660	23.61	-6.27	-0.86
2670	24.33	-6.14	-0.51
2680	24.66	-6.08	-0.34
2690	25	-6.02	-0.13
2700	25.65	-5.91	-0.08

LTE DIV Antenna passive test data

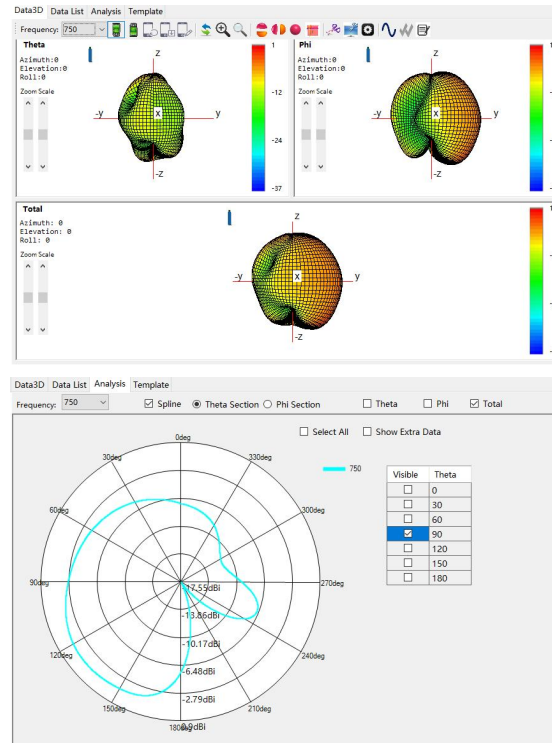
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
700	5.67	-12.46	-7.69	2010	14.74	-8.32	-3.55
710	5.77	-12.39	-7.19	2020	15.27	-8.16	-3.98
720	5.96	-12.24	-6.63	2030	15.46	-8.11	-3.96
730	6.18	-12.09	-6.22	2040	16.19	-7.91	-3.54
740	6.16	-12.11	-6.29	2050	16.53	-7.82	-3.34
750	6.32	-12	-6.29	2060	16.46	-7.84	-3.71
760	6.53	-11.85	-6.32	2070	17.59	-7.55	-3.38
770	6.71	-11.73	-6.53	2080	18.37	-7.36	-3.16
780	6.78	-11.69	-6.9	2090	18.44	-7.34	-3.06
790	6.95	-11.58	-6.88	2100	19.17	-7.17	-2.76
800	7.13	-11.47	-7.11	2110	19.29	-7.15	-2.66
810	7.38	-11.32	-6.65	2120	20.05	-6.98	-2.4
820	7.39	-11.31	-6.36	2130	20.91	-6.8	-2.05
830	7.53	-11.23	-5.86	2140	21.09	-6.76	-1.78
840	7.19	-11.43	-5.96	2150	21.77	-6.62	-1.52
850	7.24	-11.4	-6.13	2160	21.54	-6.67	-1.46
860	7.51	-11.24	-6.07	2170	21.43	-6.69	-1.34
870	8.06	-10.94	-5.86	2300	21.15	-6.75	-1.82
880	8.33	-10.79	-5.7	2310	20.53	-6.88	-1.87
890	8.29	-10.82	-5.76	2320	20.41	-6.9	-1.75
900	8.06	-10.94	-5.8	2330	20.75	-6.83	-1.64
910	7.93	-11.01	-5.91	2340	21.74	-6.63	-1.33
920	7.86	-11.05	-5.57	2350	22.72	-6.44	-1.06
930	7.71	-11.13	-5.26	2360	23.4	-6.31	-0.98
940	7.74	-11.11	-5.43	2370	24.08	-6.18	-0.83
950	8.02	-10.96	-5.67	2380	23.89	-6.22	-0.83
960	8.48	-10.71	-5.94	2390	23.62	-6.27	-0.84
1710	5.12	-12.91	-8.89	2400	24.01	-6.2	-0.71
1720	5.23	-12.82	-8.78	2410	23.6	-6.27	-0.63
1730	5.6	-12.52	-8.64	2420	22.1	-6.56	-0.75
1740	6.23	-12.05	-7.87	2430	21.37	-6.7	-0.65
1750	6.74	-11.71	-7.43	2440	21.35	-6.71	-0.31
1760	6.9	-11.61	-7.19	2450	21.49	-6.68	-0.09
1770	6.89	-11.62	-7	2460	20.91	-6.8	-0.04
1780	7.11	-11.48	-6.67	2470	20.85	-6.81	0.03
1790	7.35	-11.34	-6.61	2480	20.09	-6.97	-0.12
1800	7.48	-11.26	-7.09	2490	19.28	-7.15	-0.34
1810	7.53	-11.23	-7.22	2500	18.37	-7.36	-0.49
1820	7.73	-11.12	-7.27	2510	17.74	-7.51	-0.61
1830	8	-10.97	-6.9	2520	17.47	-7.58	-0.64
1840	8.5	-10.7	-6.14	2530	17.05	-7.68	-0.84
1850	8.5	-10.7	-6.18	2540	16.98	-7.7	-0.91
1860	8.76	-10.58	-5.86	2550	17.27	-7.63	-0.93
1870	8.69	-10.61	-5.77	2560	17.05	-7.68	-1.21
1880	8.7	-10.61	-6.03	2570	17.05	-7.68	-1.17
1890	8.83	-10.54	-5.85	2580	17.02	-7.69	-1.05
1900	9.16	-10.38	-6.22	2590	17.04	-7.69	-1.02
1910	9.86	-10.06	-6.37	2600	17.23	-7.64	-0.88
1920	10.29	-9.87	-5.97	2610	17.23	-7.64	-0.86
1930	10.51	-9.78	-5.87	2620	17.18	-7.65	-0.8
1940	11.12	-9.54	-5.53	2630	16.97	-7.7	-0.93
1950	11.54	-9.38	-5.41	2640	16.76	-7.76	-0.97
1960	12.07	-9.18	-5.06	2650	16.95	-7.71	-1
1970	12.59	-9	-4.84	2660	16.99	-7.7	-1.01
1980	12.95	-8.88	-4.53	2670	16.57	-7.81	-1.19
1990	13.75	-8.62	-3.95	2680	16.19	-7.91	-1.37
2000	14.33	-8.44	-3.66	2690	15.41	-8.12	-1.73
				2700	15.76	-8.02	-1.71

WIFI Antenna passive test data

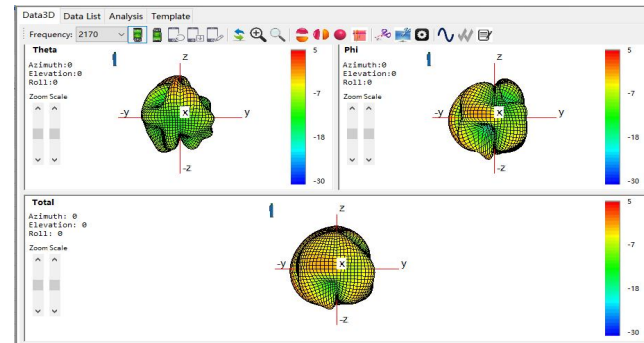
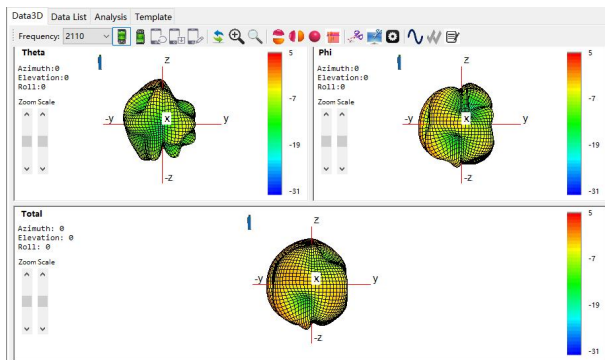
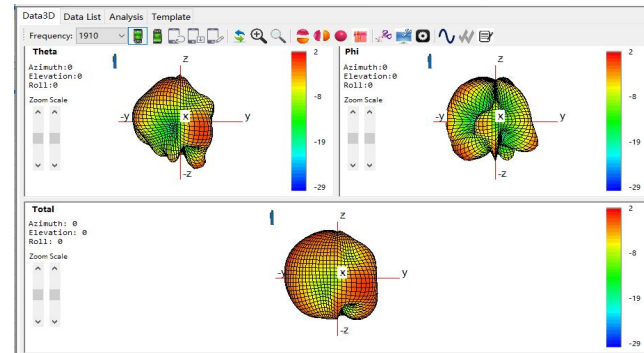
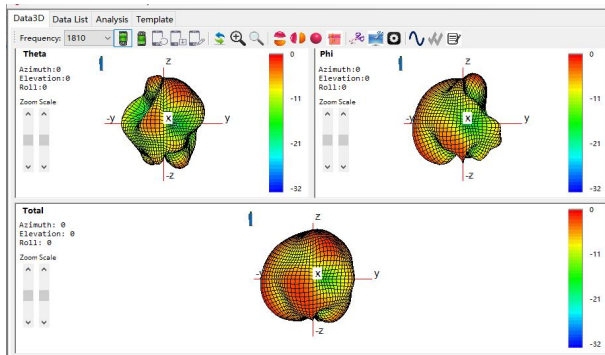
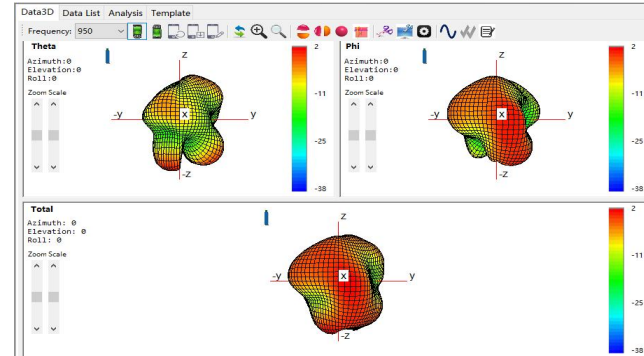
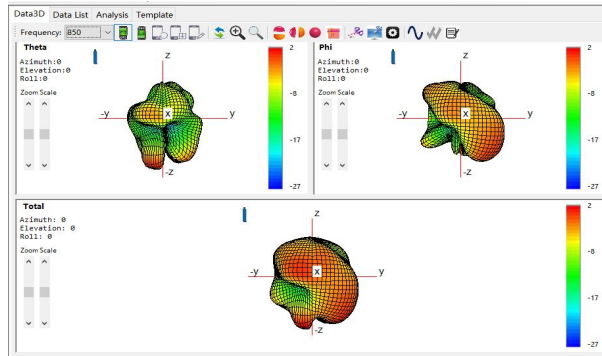
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	14.29	-8.45	-0.68
2410	14.48	-8.39	-0.55
2420	13.81	-8.6	-0.84
2430	13.86	-8.58	-0.7
2440	14.14	-8.49	-0.64
2450	14.39	-8.42	-0.43
2460	14.2	-8.48	-0.42
2470	13.73	-8.62	-0.5
2480	13.02	-8.85	-0.66
2490	12.52	-9.02	-0.83
2500	12	-9.21	-1.08
5100	20.65	-6.85	-1.64
5110	20.56	-6.87	-1.73
5120	20.54	-6.87	-1.71
5130	20.95	-6.79	-1.68
5140	21.06	-6.77	-1.68
5150	20.7	-6.84	-1.77
5160	21.34	-6.71	-1.68
5170	21.73	-6.63	-1.66
5180	21.42	-6.69	-1.71
5190	21.84	-6.61	-1.53
5200	21.7	-6.63	-1.4
5210	21.55	-6.66	-1.3
5220	21.85	-6.61	-1.07
5230	22.23	-6.53	-0.82
5240	22.54	-6.47	-0.6
5250	22.79	-6.42	-0.4
5260	21.96	-6.58	-0.52
5270	21.26	-6.72	-0.53
5280	21.12	-6.75	-0.44
5290	20.67	-6.85	-0.5
5300	19.09	-7.19	-0.76
5310	17.97	-7.45	-1.03
5320	17.28	-7.62	-1.14
5330	16.07	-7.94	-1.44
5340	15.76	-8.02	-1.49
5350	16.1	-7.93	-1.37
5360	15.59	-8.07	-1.55
5370	15.29	-8.16	-1.68
5380	16.01	-7.96	-1.49
5390	16.35	-7.86	-1.44
5400	15.91	-7.98	-1.6
5410	15.62	-8.06	-1.75
5420	15.54	-8.09	-1.9
5430	14.8	-8.3	-2.15

Freq (MHz)	Effi (%)	Effi (dB)	Gai (dBi)
5440	14.28	-8.45	-2.39
5450	13.79	-8.6	-2.64
5460	12.43	-9.06	-3.18
5470	11.4	-9.43	-3.76
5480	11.37	-9.44	-3.91
5490	10.89	-9.63	-4.24
5500	10.57	-9.76	-4.46
5510	10.37	-9.84	-4.59
5520	10.1	-9.96	-4.77
5530	10.27	-9.88	-4.75
5540	10.86	-9.64	-4.53
5550	11.19	-9.51	-4.34
5560	10.88	-9.63	-4.43
5570	10.5	-9.79	-4.4
5580	10.55	-9.77	-4.27
5590	10.87	-9.64	-3.98
5600	10.95	-9.61	-3.8
5610	10.82	-9.66	-3.68
5620	10.4	-9.83	-3.66
5630	10.1	-9.95	-3.65
5640	10.38	-9.84	-3.35
5650	11.03	-9.57	-2.97
5660	11.08	-9.55	-2.76
5670	10.52	-9.78	-2.93
5680	10.23	-9.9	-2.89
5690	10.17	-9.93	-2.87
5700	10.58	-9.76	-2.63
5710	10.55	-9.77	-2.63
5720	9.85	-10.07	-2.91
5730	9.76	-10.11	-3
5740	9.81	-10.08	-3.05
5750	10.1	-9.96	-2.99
5760	10.9	-9.63	-2.77
5770	10.8	-9.67	-2.92
5780	10.28	-9.88	-3.27
5790	10.63	-9.74	-3.25
5800	11.33	-9.46	-3.16
5810	12.13	-9.16	-3.04
5820	11.94	-9.23	-3.25
5830	11.44	-9.42	-3.34
5840	12.02	-9.2	-3.02
5850	12.2	-9.14	-2.96

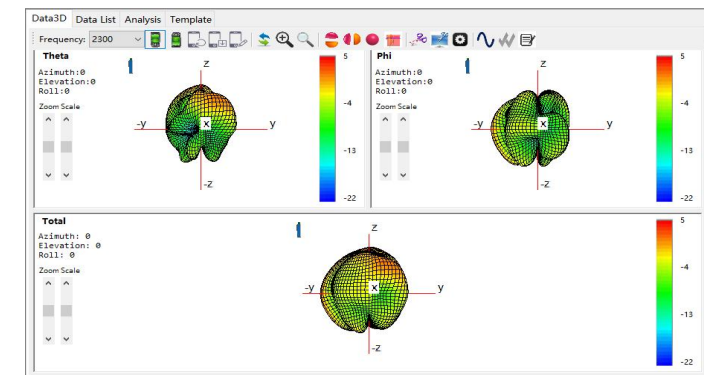
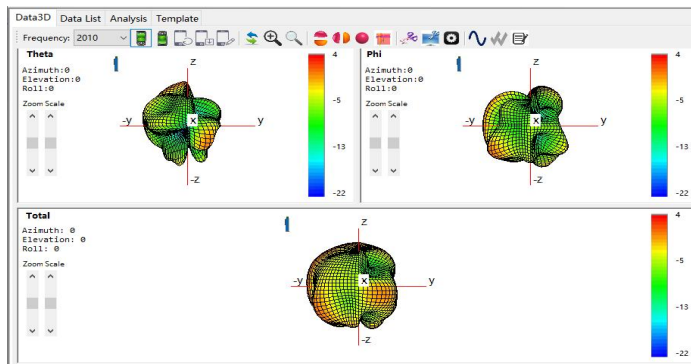
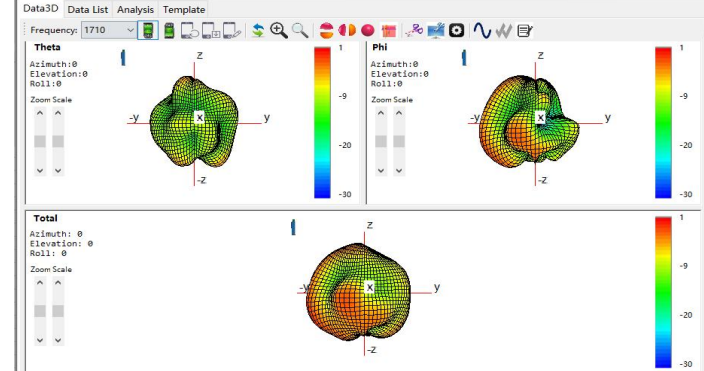
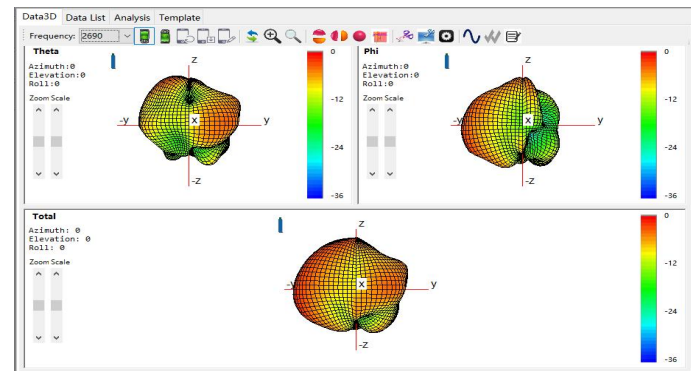
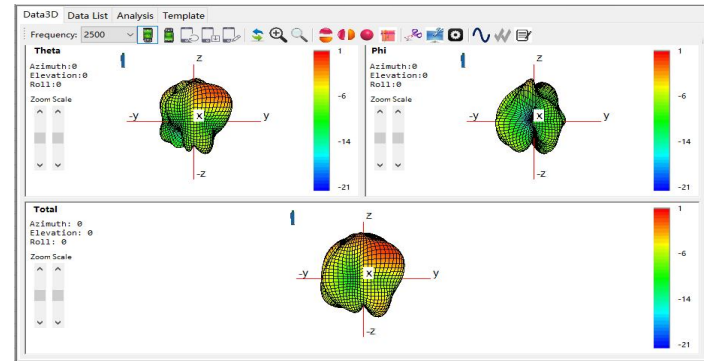
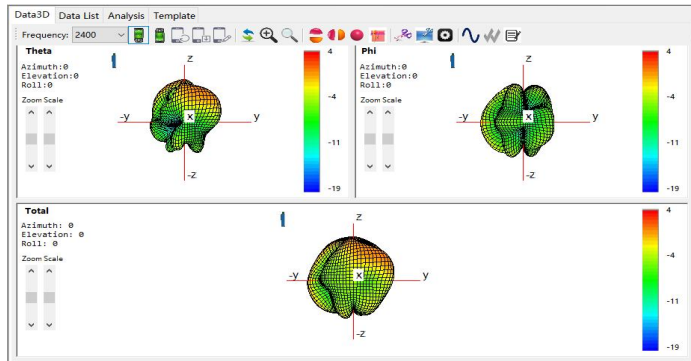
LTE MAIN Antenna directional diagram



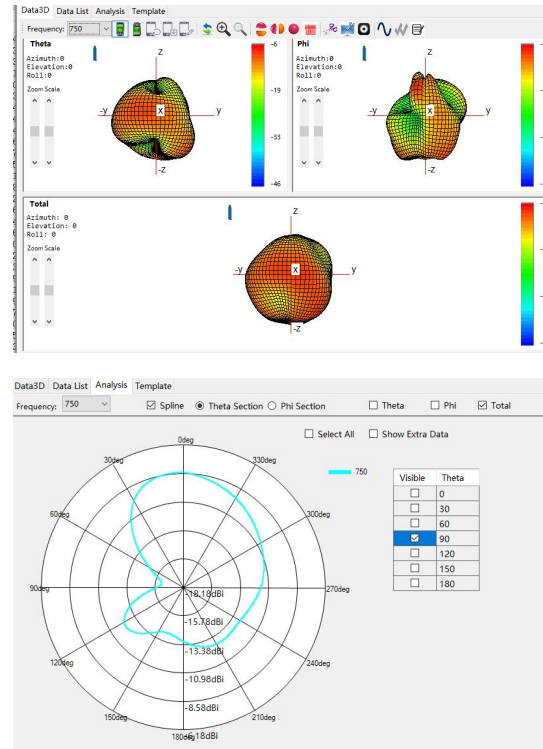
LTE MAIN Antenna directional diagram



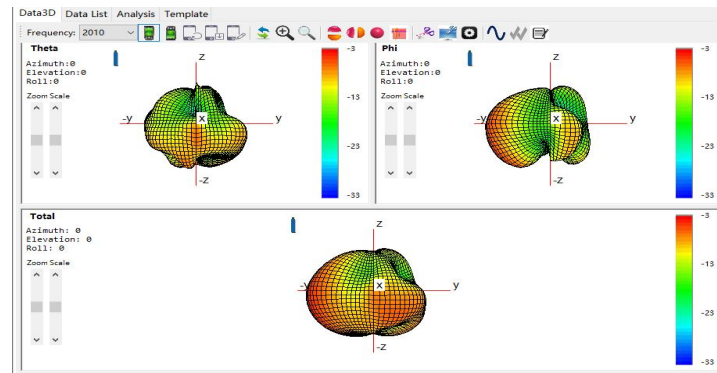
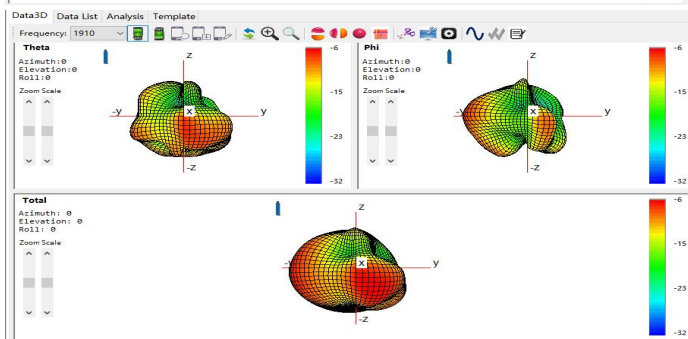
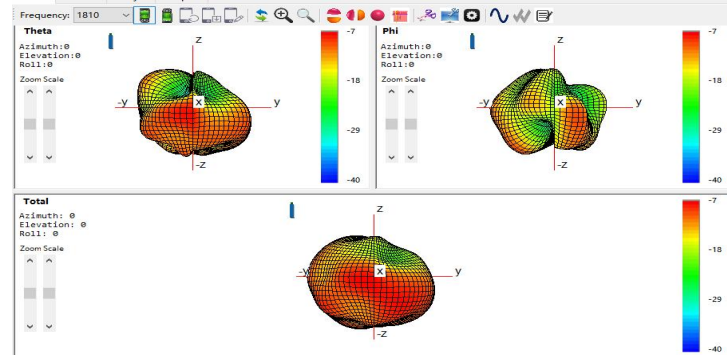
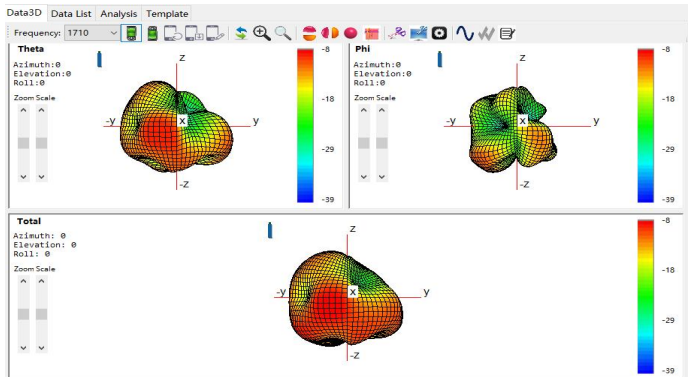
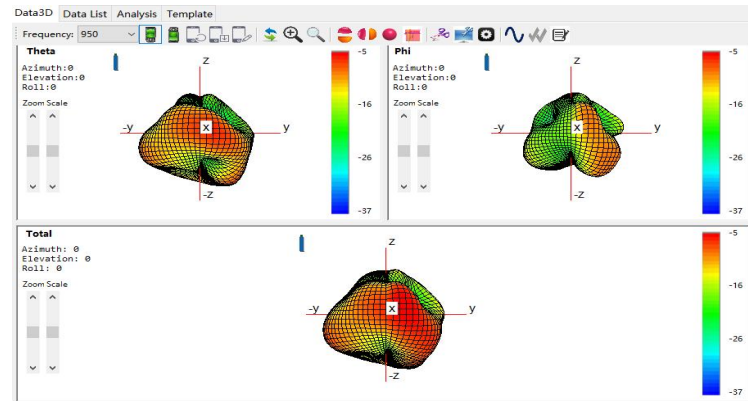
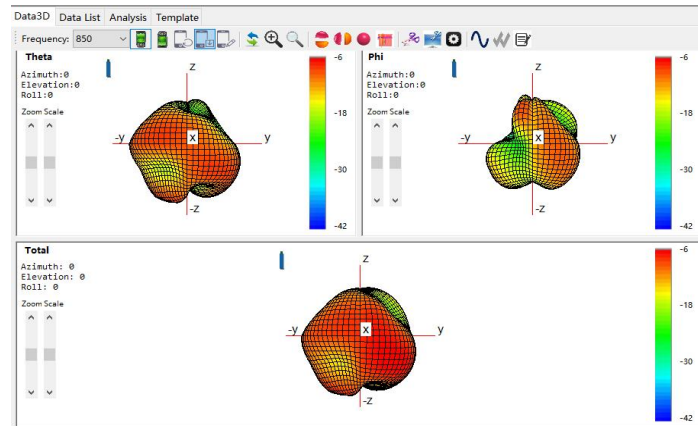
LTE MAIN Antenna directional diagram



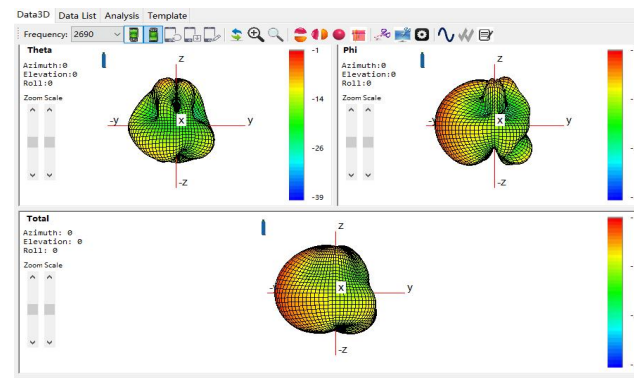
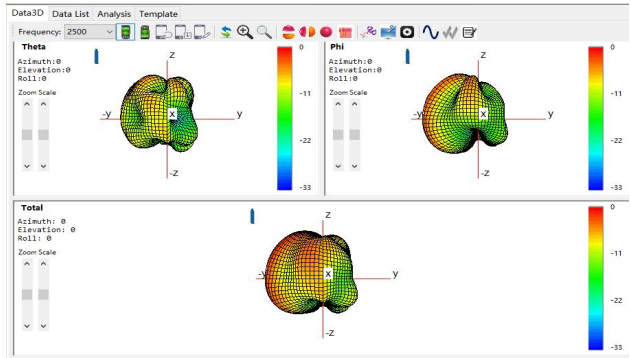
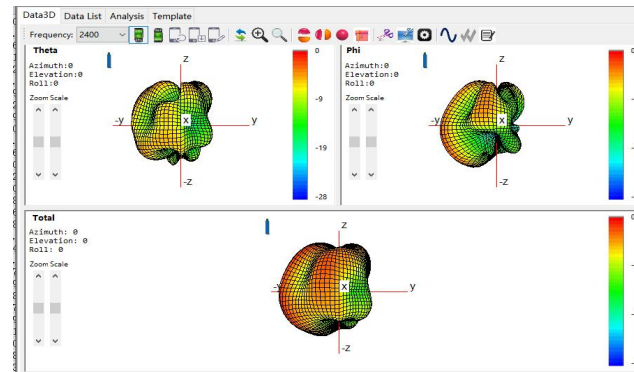
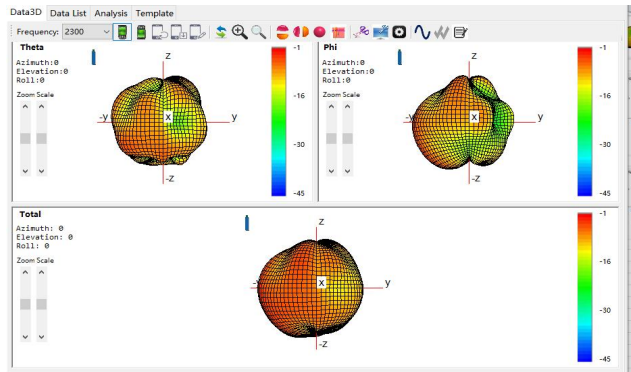
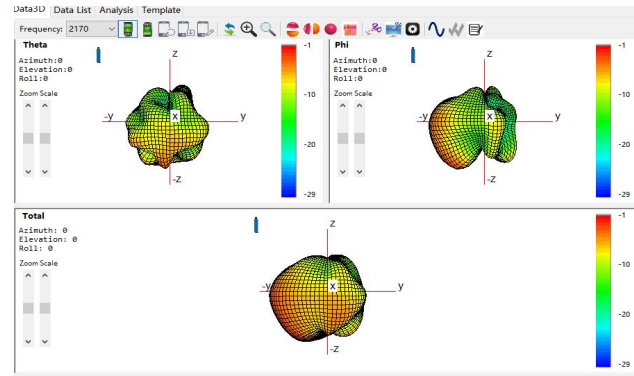
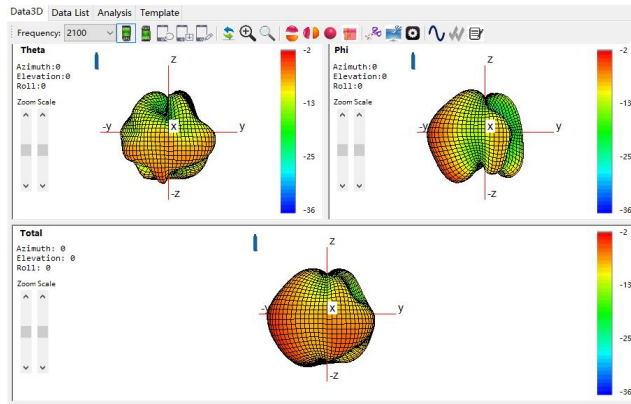
LTE DIV Antenna directional diagram



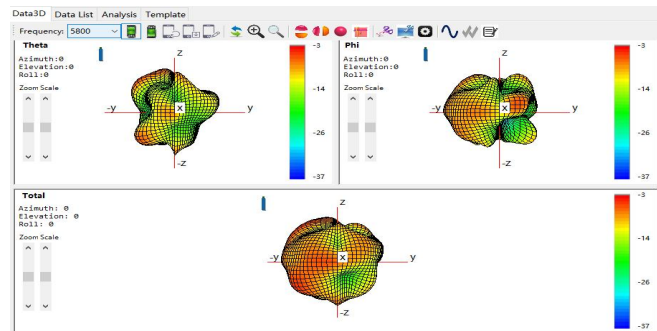
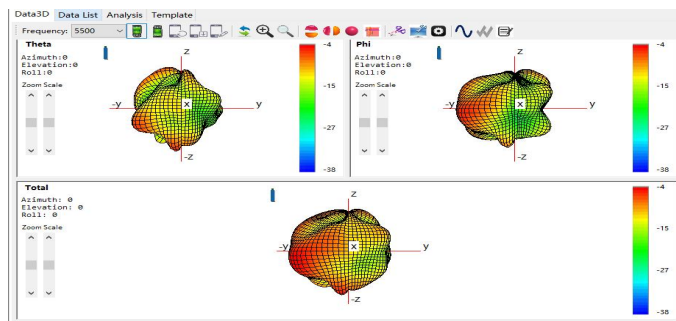
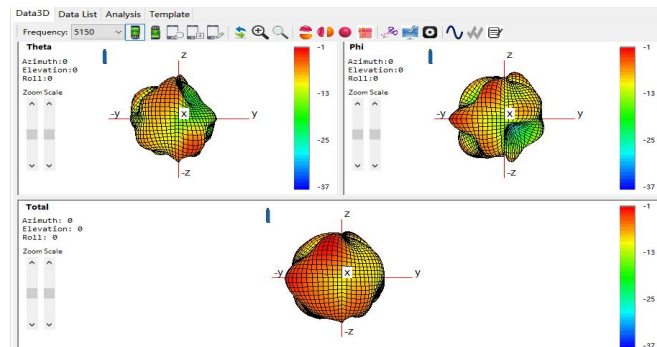
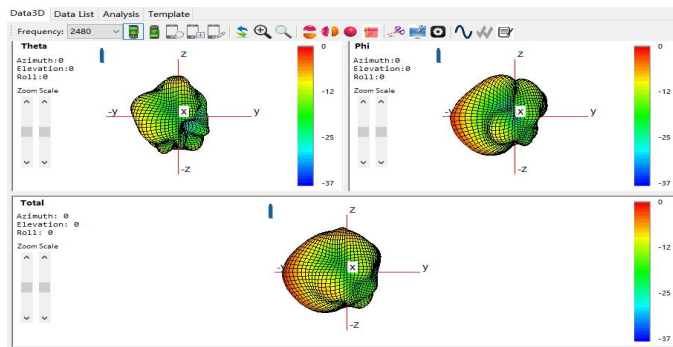
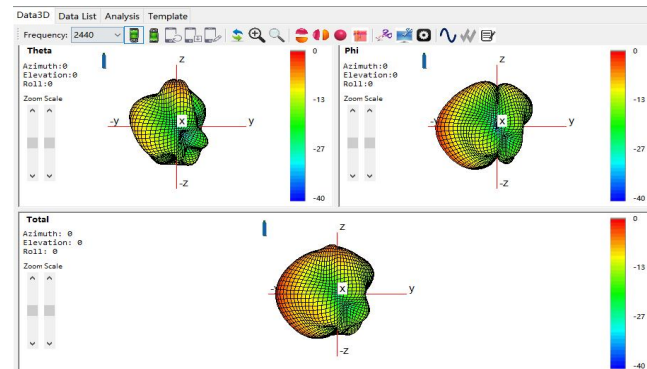
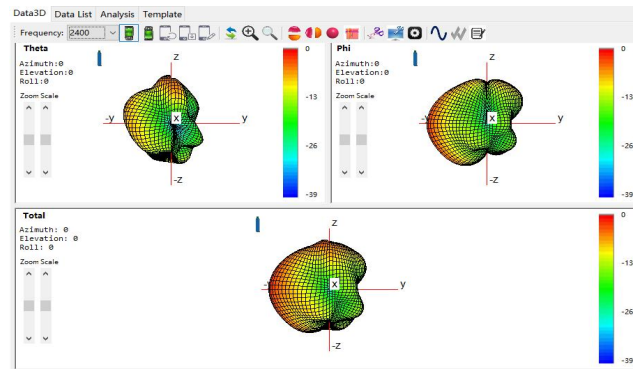
LTE DIV Antenna directional diagram



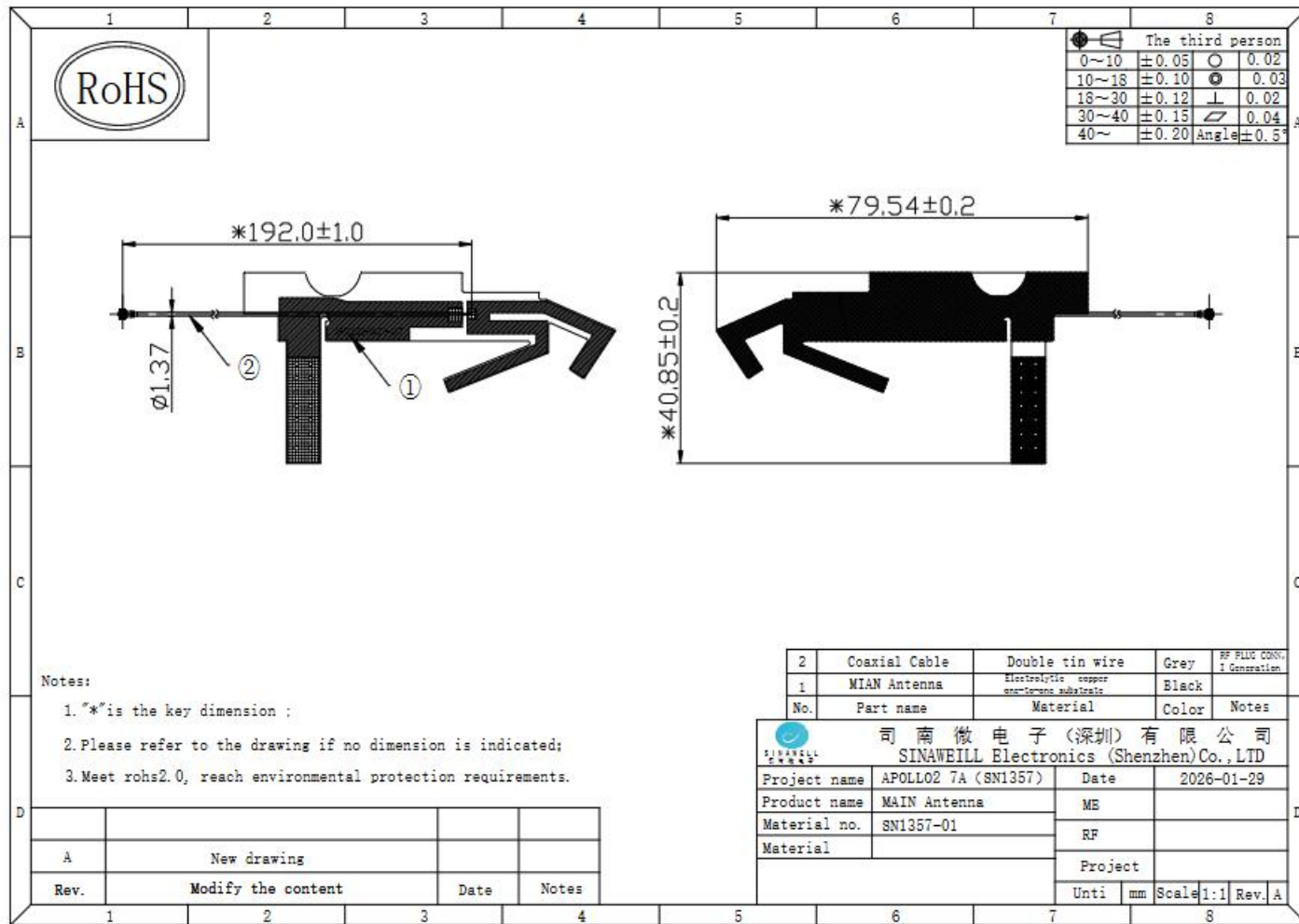
LTE DIV Antenna directional diagram



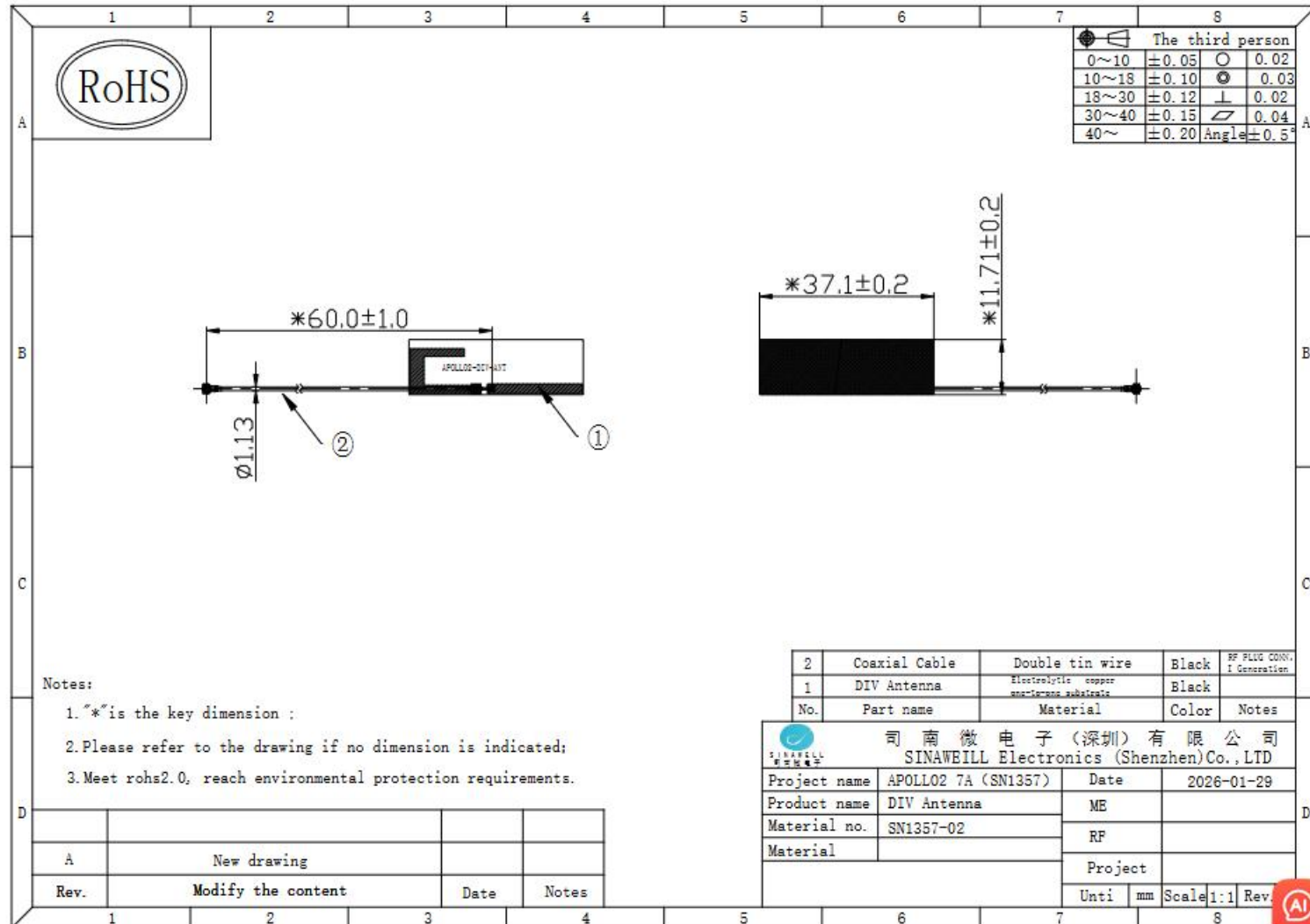
WIFI Antenna directional diagram



MAIN Antenna structure drawing



DIV Antenna structure drawing



WIFI Antenna structure drawing

