



规格承认书

Approval Sheet

地址：深圳市宝安区福永镇福海街道塘尾股份商务大厦1506

Tel: 0755-82103639 QQ: 487580356 Email: Stephdeng Vis@126.com



深圳星源创科技有限公司

Shen Zhen Xing Yuan Chuang Technology Co., Ltd

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Specification

1.1 Electrical Properties

Characteristics	Specifications
Working Band	2.4GWiFi/BT; 5GWiFi
Antenna From	PIFA
Impedance	50 Ω
Polarization	Linear
Peak Effi	42%@2.4G; 48%@5G

1.2 Physical Properties

Characteristics	Specifications
Operating Temp	-10°C~+60°C
Storage Temp	-10°C~+70°C
Humidity	10~95%RH

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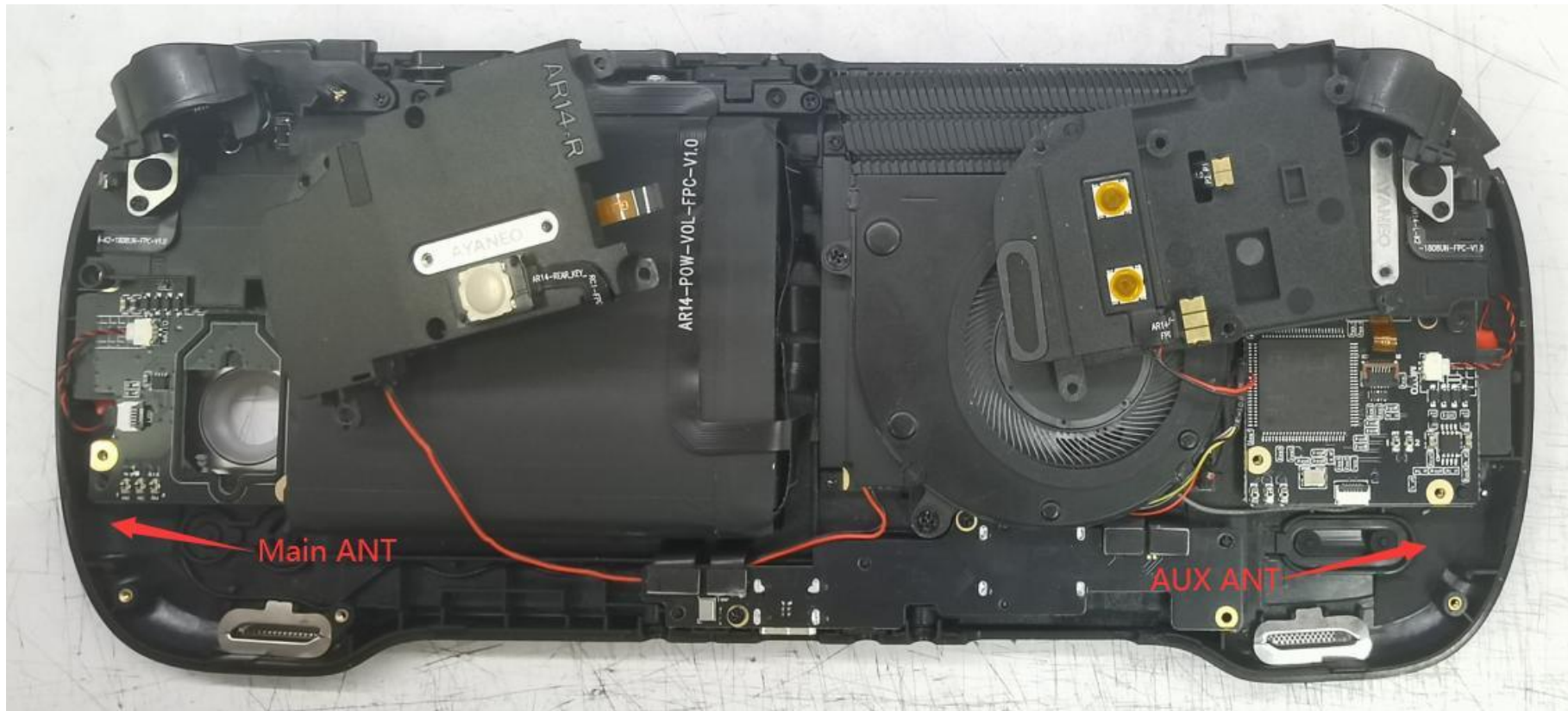
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Antenna Placement



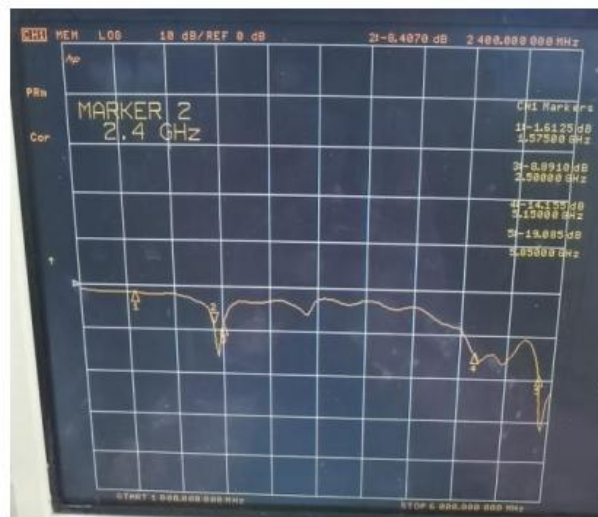
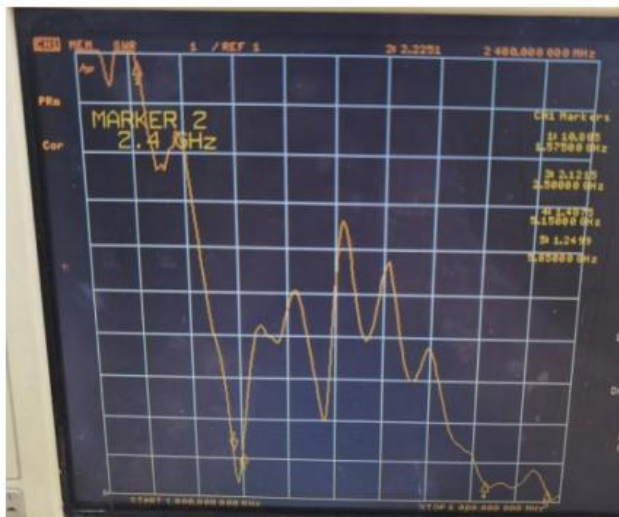
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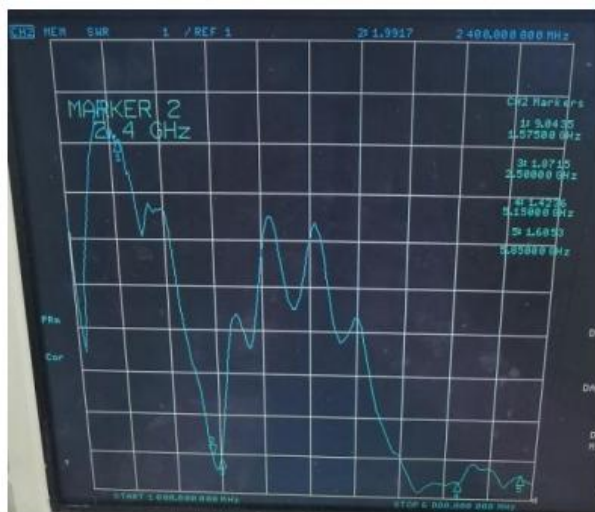
Test Data

S11 Parameter-VSWR(ANT1)



Frequency (MHZ)	2400	2500	5150	5850
VSWR	2.22	2.12	1.40	1.24
Return Loss (DB)	-8.40	-8.89	-14.15	-19.08

S11 Parameter-VSWR(ANT2)



Frequency (MHZ)	2400	2500	5150	5850
VSWR	1.99	1.87	1.42	1.60
Return Loss (DB)	-9.59	-10.35	-15.14	-12.67

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Efficiency Table (ANT1 2.4G) Main Ant

Passive Test For WIFI2.4												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	irectivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
2400	34.95	-4.57	1.98	-0.17	13.753	21.198	1.98	-16.79	6.55	30	45.78	46.01
2410	34.28	-4.65	1.48	-0.67	13.98	20.302	1.48	-17.67	6.13	30	46.01	46.29
2420	32.89	-4.83	1.15	-1	13.608	19.281	1.15	-19.14	5.98	30	45.73	46
2430	34.14	-4.67	1.36	-0.79	14.054	20.09	1.36	-20.85	6.02	30	46.01	46.36
2440	39.29	-4.06	2.1	-0.05	16.042	23.253	2.1	-20.56	6.16	30	46.12	46.48
2450	40.54	-3.92	2.08	-0.07	16.809	23.736	2.08	-19.38	6	30	46.12	46.54
2460	36.96	-4.32	1.32	-0.83	15.807	21.157	1.32	-20.38	5.64	30	46.14	46.52
2470	36.82	-4.34	0.93	-1.22	16.253	20.565	0.93	-20.82	5.27	30	46.4	46.8
2480	39.22	-4.06	1.1	-1.05	17.592	21.629	1.1	-20.54	5.17	30	46.26	46.64
2490	42.21	-3.75	1.61	-0.54	18.861	23.353	1.61	-20.21	5.36	30	46.51	46.91
2500	38.91	-4.1	1.35	-0.8	17.462	21.447	1.35	-20.03	5.45	30	46.47	46.86

Efficiency Table (ANT2 2.4G) AUX Ant

Passive Test For WIFI2.4												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	irectivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
2400	30.72	-5.13	-0.34	-2.49	12.101	18.62	-0.34	-17.01	4.79	0	45.78	46.01
2410	32.36	-4.9	-0.61	-2.76	12.879	19.479	-0.61	-15.77	4.29	0	46.01	46.29
2420	33.18	-4.79	-0.72	-2.87	13.515	19.667	-0.72	-14.71	4.07	0	45.73	46
2430	32.63	-4.86	-1.1	-3.25	13.302	19.329	-1.1	-16.12	3.76	0	46.01	46.36
2440	34.17	-4.66	-0.82	-2.97	13.696	20.469	-0.82	-17.63	3.84	0	46.12	46.48
2450	35.96	-4.44	-0.43	-2.58	14.314	21.647	-0.43	-17.95	4.02	0	46.12	46.54
2460	35.14	-4.54	-0.19	-2.34	13.913	21.225	-0.19	-17.37	4.36	0	46.14	46.52
2470	34.79	-4.59	-0.19	-2.34	13.676	21.114	-0.19	-17.49	4.4	0	46.4	46.8
2480	36.57	-4.37	0.03	-2.12	14.297	22.272	0.03	-18.99	4.4	30	46.26	46.64
2490	36.96	-4.32	0.2	-1.95	14.552	22.408	0.2	-19.57	4.52	30	46.51	46.91
2500	34.75	-4.59	-0.07	-2.22	13.871	20.879	-0.07	-19.42	4.52	30	46.47	46.86

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Efficiency Table (ANT1 5G) Main Ant

Passive Test For WIFI5G												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Directivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
5150	35.35	-4.52	1.37	-0.78	19.162	16.189	1.37	-19.13	5.89	0	49.82	49.4
5170	36.77	-4.34	1.73	-0.42	20	16.772	1.73	-17.8	6.08	0	50.13	49.77
5190	36.66	-4.36	2	-0.15	20.037	16.619	2	-17.92	6.36	0	50.42	49.95
5210	40.54	-3.92	2.28	0.13	22.361	18.177	2.28	-19.61	6.2	0	50.88	50.49
5230	39.54	-4.03	1.94	-0.21	21.789	17.756	1.94	-19.95	5.97	0	50.42	50.08
5250	42.88	-3.68	2.3	0.15	23.486	19.397	2.3	-20.97	5.98	0	51.02	50.72
5270	44.57	-3.51	2.62	0.47	24.435	20.134	2.62	-17.12	6.13	0	50.85	50.6
5290	46.14	-3.36	2.67	0.52	25.299	20.838	2.67	-16.57	6.03	0	51.34	51.12
5310	43.35	-3.63	2.36	0.21	23.695	19.656	2.36	-18.7	5.99	0	50.44	50.36
5330	45.19	-3.45	2.47	0.32	24.372	20.818	2.47	-22.73	5.92	0	51.08	51.01
5350	47.43	-3.24	2.79	0.64	25.114	22.313	2.79	-19.9	6.02	0	51.02	51.01
5370	46.56	-3.32	2.72	0.57	24.448	22.11	2.72	-17.05	6.04	0	50.91	50.95
5390	41.06	-3.87	2.14	-0.01	21.488	19.575	2.14	-16.52	6.01	30	50.46	50.43
5410	48.71	-3.12	2.84	0.69	25.319	23.386	2.84	-16.01	5.97	30	51.18	51.09
5430	42.06	-3.76	2.36	0.21	21.508	20.554	2.36	-17.1	6.12	30	50.69	50.7
5450	46.21	-3.35	3.02	0.87	23.207	23.002	3.02	-18.71	6.37	30	50.71	50.85
5470	42.22	-3.74	2.73	0.58	21.04	21.183	2.73	-18.29	6.48	30	50.93	50.83
5490	43.59	-3.61	2.77	0.62	21.816	21.777	2.77	-16.71	6.38	30	50.92	50.79
5510	43.68	-3.6	2.73	0.58	21.593	22.088	2.73	-16.79	6.33	0	51.18	51.16
5530	45.69	-3.4	2.98	0.83	22.136	23.55	2.98	-17.09	6.38	0	51.44	51.3
5550	48.56	-3.14	2.98	0.83	23.083	25.478	2.98	-20.25	6.12	0	51.89	51.76
5570	45.6	-3.41	2.31	0.16	21.444	24.152	2.31	-24.91	5.72	0	51.42	51.33
5590	47.98	-3.19	2.35	0.2	22.15	25.834	2.35	-24.73	5.54	0	51.71	51.76
5610	45.29	-3.44	2.11	-0.04	20.541	24.744	2.11	-22.55	5.55	0	51.17	51.22
5630	48.74	-3.12	2.45	0.3	21.736	27.001	2.45	-18.83	5.57	0	51.78	51.77
5650	45.62	-3.41	2.06	-0.09	20.282	25.342	2.06	-19.19	5.47	0	51.47	51.55
5670	45.16	-3.45	1.98	-0.17	19.996	25.16	1.98	-20.11	5.43	0	52.12	52.28
5690	46.35	-3.34	2.36	0.21	20.254	26.1	2.36	-17.86	5.7	0	52.12	52.25
5710	41.76	-3.79	2.12	-0.03	18.049	23.709	2.12	-18.76	5.91	30	51.95	52.05
5730	47.57	-3.23	2.85	0.7	20.888	26.678	2.85	-19.58	6.07	30	51.59	51.69
5750	40.16	-3.96	2	-0.15	17.9	22.256	2	-20.7	5.97	30	51.12	51.15
5770	43.84	-3.58	2.28	0.13	19.553	24.283	2.28	-20.98	5.86	60	51.02	51.06
5790	37.99	-4.2	1.77	-0.38	16.985	21.004	1.77	-20.93	5.97	60	51.08	51.16
5810	41.27	-3.84	2.22	0.07	18.57	22.698	2.22	-19.76	6.06	30	51.36	51.43
5830	38.66	-4.13	2.07	-0.08	17.408	21.25	2.07	-17.31	6.2	30	51.65	51.66
5850	43.25	-3.64	2.8	0.65	19.258	23.994	2.8	-14.83	6.44	90	51.88	52.05

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Efficiency Table (ANT2 5G) AUX Ant

Passive Test For WIFI5G												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBi)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Directivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
5150	22.78	-6.42	-1.9	-4.05	11.569	11.211	-1.9	-19.62	4.52	90	49.82	49.4
5170	24.67	-6.08	-1.63	-3.78	12.245	12.429	-1.63	-22.28	4.45	30	50.13	49.77
5190	24.37	-6.13	-1.42	-3.57	11.839	12.534	-1.42	-24.63	4.71	30	50.42	49.95
5210	26.95	-5.69	-0.39	-2.54	12.934	14.012	-0.39	-19.03	5.31	30	50.88	50.49
5230	27.59	-5.59	0.09	-2.06	13.154	14.435	0.09	-16.25	5.68	30	50.42	50.08
5250	29.54	-5.3	0.82	-1.33	13.864	15.674	0.82	-16.95	6.12	30	51.02	50.72
5270	29.79	-5.26	1.06	-1.09	13.871	15.918	1.06	-16	6.32	30	50.85	50.6
5290	31.06	-5.08	1.4	-0.75	14.452	16.607	1.4	-16.17	6.48	60	51.34	51.12
5310	29.6	-5.29	1.15	-1	13.88	15.722	1.15	-15.19	6.44	60	50.44	50.36
5330	31.06	-5.08	1.38	-0.77	14.532	16.527	1.38	-15.29	6.46	60	51.08	51.01
5350	31.32	-5.04	1.47	-0.68	14.519	16.805	1.47	-16.61	6.51	90	51.02	51.01
5370	29.93	-5.24	1.1	-1.05	13.799	16.129	1.1	-16.12	6.34	60	50.91	50.95
5390	26.61	-5.75	0.41	-1.74	12.478	14.135	0.41	-16.85	6.16	60	50.46	50.43
5410	32.91	-4.83	0.98	-1.17	15.299	17.613	0.98	-15.62	5.81	60	51.18	51.09
5430	27.21	-5.65	0.01	-2.14	12.396	14.815	0.01	-18.24	5.66	60	50.69	50.7
5450	30.84	-5.11	0.59	-1.56	13.944	16.897	0.59	-17.4	5.7	30	50.71	50.85
5470	27.23	-5.65	-0.17	-2.32	12.461	14.768	-0.17	-21.25	5.48	60	50.93	50.83
5490	30.05	-5.22	0.79	-1.36	13.565	16.487	0.79	-20.36	6.01	90	50.92	50.79
5510	31.26	-5.05	0.87	-1.28	13.333	17.924	0.87	-16.91	5.92	30	51.18	51.16
5530	33.33	-4.77	0.88	-1.27	13.512	19.817	0.88	-16.98	5.65	30	51.44	51.3
5550	34.46	-4.63	1.45	-0.7	14.101	20.359	1.45	-17.97	6.08	30	51.89	51.76
5570	32.53	-4.88	1.82	-0.33	13.347	19.187	1.82	-21.9	6.7	30	51.42	51.33
5590	36.66	-4.36	2.61	0.46	14.396	22.263	2.61	-23.26	6.97	30	51.71	51.76
5610	33.47	-4.75	2.11	-0.04	12.966	20.505	2.11	-23.32	6.87	30	51.17	51.22
5630	35.04	-4.55	2.24	0.09	14.098	20.946	2.24	-18.16	6.79	30	51.78	51.77
5650	32.43	-4.89	2.4	0.25	13.872	18.557	2.4	-15.42	7.29	60	51.47	51.55
5670	32.85	-4.83	2.61	0.46	14.353	18.501	2.61	-14.25	7.44	30	52.12	52.28
5690	34.22	-4.66	2.73	0.58	14.675	19.55	2.73	-15.74	7.39	30	52.12	52.25
5710	29.89	-5.25	1.61	-0.54	13.212	16.674	1.61	-16.29	6.85	300	51.95	52.05
5730	33.97	-4.69	1.87	-0.28	15.86	18.108	1.87	-15.57	6.56	300	51.59	51.69
5750	29.76	-5.26	1.35	-0.8	14.251	15.513	1.35	-16.56	6.61	300	51.12	51.15
5770	33.77	-4.71	2.16	0.01	16.276	17.493	2.16	-15.46	6.87	0	51.02	51.06
5790	30.55	-5.15	1.69	-0.46	14.869	15.684	1.69	-13.76	6.84	0	51.08	51.16
5810	33.44	-4.76	1.78	-0.37	16.752	16.685	1.78	-12.91	6.53	0	51.36	51.43
5830	32.72	-4.85	1.42	-0.73	16.816	15.906	1.42	-15.13	6.27	0	51.65	51.66
5850	36.71	-4.35	2.11	-0.04	18.597	18.115	2.11	-14.76	6.46	60	51.88	52.05

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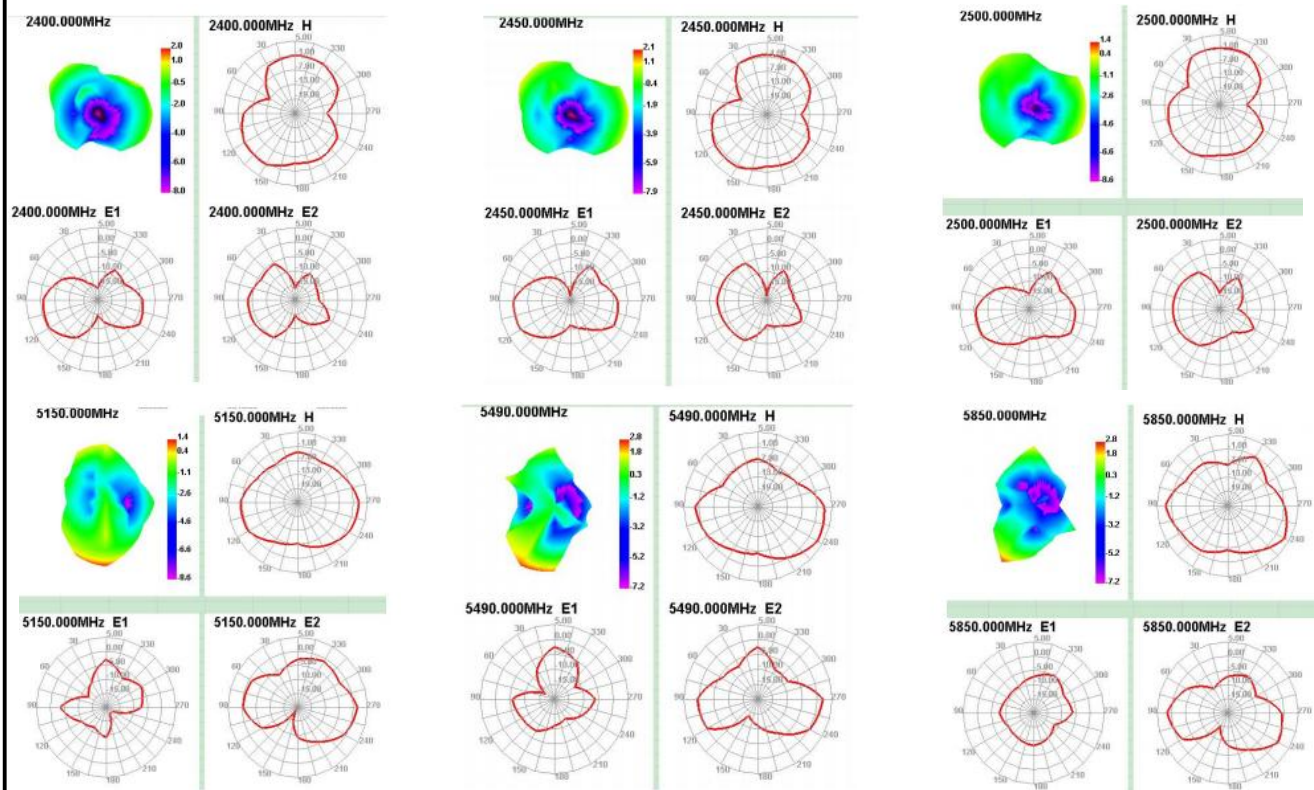
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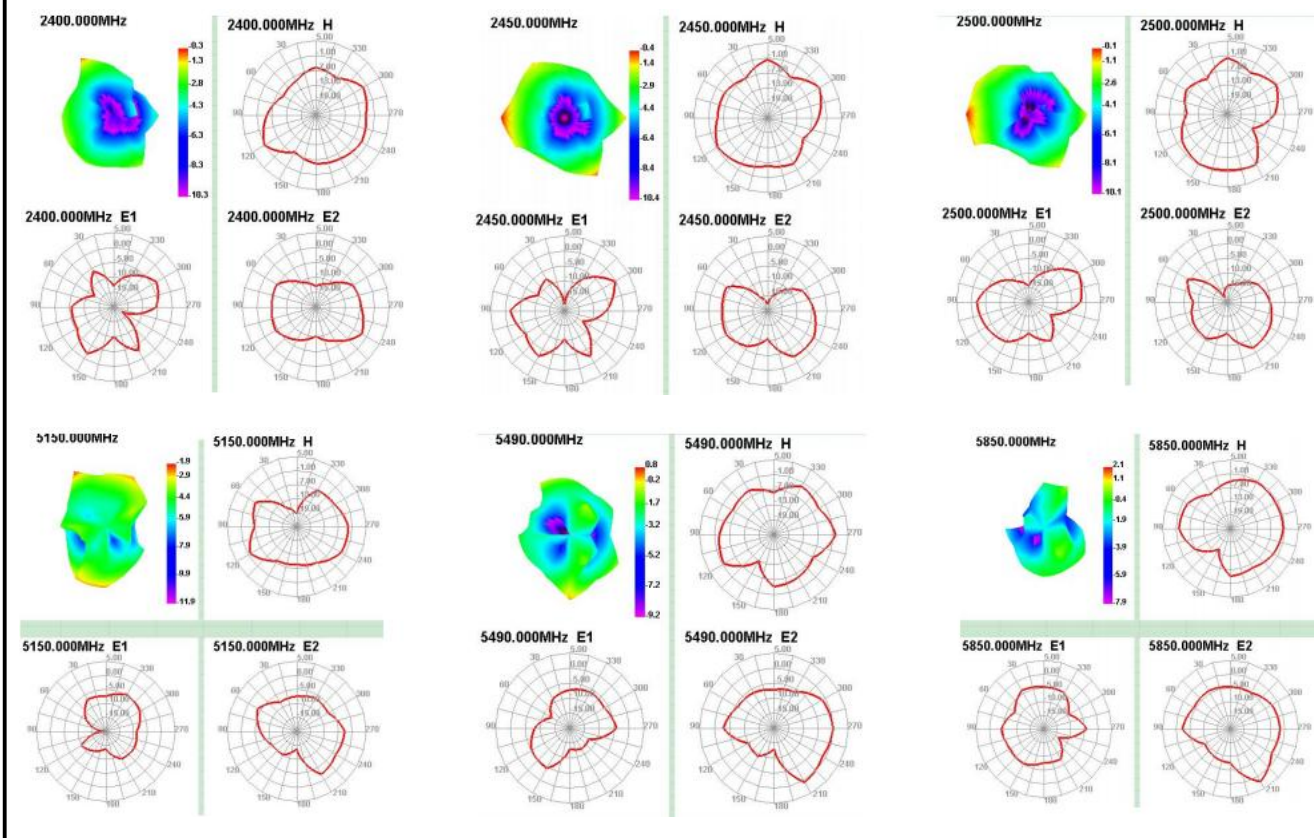
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ANTENNA Shen Zhen Xing Yuan Chuang Technology Co., Ltd

Radiation Pattern(ANT1)



Radiation Pattern(ANT2)



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WiFi Active Test Data

802.11b	Frequency	TRP		TIS	
	2412	CH1 11Mbps	12.33	CH1 11Mbps	-79.23
	2437	CH6 11Mbps	12.38	CH6 11Mbps	-79.38
	2467	CH11 11Mbps	12.37	CH11 11Mbps	-79.23
802.11a		TRP		TIS	
	5180	CH36 6Mbps	11.67	CH36 54Mbps	-70.54
	5300	CH60 6Mbps	11.77	CH60 54Mbps	-70.39
	5805	CH161 6Mbps	11.48	CH161 54Mbps	-70.44

BT Test

BT

测试环境：开放空间(通道)

测试工具：蓝牙音响

测试距离：10+m

结果：播放音乐流畅，无杂音。



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Throughput test(2.4G)

上行		下行	
图片	36.0 MBytes	382 Mbits/sec	1D Interval Transfer Bandwidth
	40.1 MBytes	337 Mbits/sec	272 17.0-18.0 sec 30.4 MBytes 255 Mbits/sec
	39.5 MBytes	331 Mbits/sec	ID Interval Transfer Bandwidth
	36.1 MBytes	303 Mbits/sec	272 18.0-19.0 sec 34.3 MBytes 287 Mbits/sec
	39.1 MBytes	328 Mbits/sec	ID Interval Transfer Bandwidth
	33.1 MBytes	278 Mbits/sec	272 19.0-20.0 sec 36.7 MBytes 308 Mbits/sec
	37.6 MBytes	316 Mbits/sec	ID Interval Transfer Bandwidth
	1.08 GBytes	310 Mbits/sec	272 20.0-21.0 sec 29.4 MBytes 247 Mbits/sec
			ID Interval Transfer Bandwidth
			272 21.0-22.0 sec 25.0 MBytes 209 Mbits/sec
图片			ID Interval Transfer Bandwidth
			272 22.0-23.0 sec 32.4 MBytes 271 Mbits/sec
			ID Interval Transfer Bandwidth
			272 23.0-24.0 sec 35.3 MBytes 296 Mbits/sec
			ID Interval Transfer Bandwidth
			272 24.0-25.0 sec 21.5 MBytes 180 Mbits/sec
			ID Interval Transfer Bandwidth
			272 25.0-26.0 sec 25.8 MBytes 216 Mbits/sec
			ID Interval Transfer Bandwidth
			272 26.0-27.0 sec 41.6 MBytes 349 Mbits/sec
图片			ID Interval Transfer Bandwidth
			272 27.0-28.0 sec 39.5 MBytes 332 Mbits/sec
			ID Interval Transfer Bandwidth
			272 28.0-29.0 sec 36.9 MBytes 309 Mbits/sec
			ID Interval Transfer Bandwidth
			272 29.0-30.0 sec 32.8 MBytes 275 Mbits/sec
			ID Interval Transfer Bandwidth
			272 0.0-30.0 sec 955 MBytes 367 Mbits/sec

Throughput test(5G)

上行		下行	
图片	61.5 MBytes	516 Mbits/sec	1D Interval Transfer Bandwidth
	72.1 MBytes	605 Mbits/sec	276 17.0-18.0 sec 82.4 MBytes 692 Mbits/sec
	79.2 MBytes	665 Mbits/sec	ID Interval Transfer Bandwidth
	82.5 MBytes	692 Mbits/sec	276 18.0-19.0 sec 82.5 MBytes 692 Mbits/sec
	90.4 MBytes	758 Mbits/sec	ID Interval Transfer Bandwidth
	83.8 MBytes	703 Mbits/sec	276 19.0-20.0 sec 79.8 MBytes 669 Mbits/sec
	76.8 MBytes	644 Mbits/sec	ID Interval Transfer Bandwidth
	2.55 GBytes	730 Mbits/sec	276 20.0-21.0 sec 80.4 MBytes 674 Mbits/sec
			ID Interval Transfer Bandwidth
			276 21.0-22.0 sec 82.6 MBytes 693 Mbits/sec
图片			ID Interval Transfer Bandwidth
			276 22.0-23.0 sec 74.7 MBytes 626 Mbits/sec
			ID Interval Transfer Bandwidth
			276 23.0-24.0 sec 64.8 MBytes 543 Mbits/sec
			ID Interval Transfer Bandwidth
			276 24.0-25.0 sec 69.4 MBytes 582 Mbits/sec
			ID Interval Transfer Bandwidth
			276 25.0-26.0 sec 75.6 MBytes 634 Mbits/sec
			ID Interval Transfer Bandwidth
			276 26.0-27.0 sec 77.3 MBytes 648 Mbits/sec
图片			ID Interval Transfer Bandwidth
			276 27.0-28.0 sec 83.4 MBytes 699 Mbits/sec
			ID Interval Transfer Bandwidth
			276 28.0-29.0 sec 81.2 MBytes 681 Mbits/sec
			ID Interval Transfer Bandwidth
			276 29.0-30.0 sec 76.3 MBytes 640 Mbits/sec
			ID Interval Transfer Bandwidth
			276 0.0-30.0 sec 2.20 GBytes 631 Mbits/sec

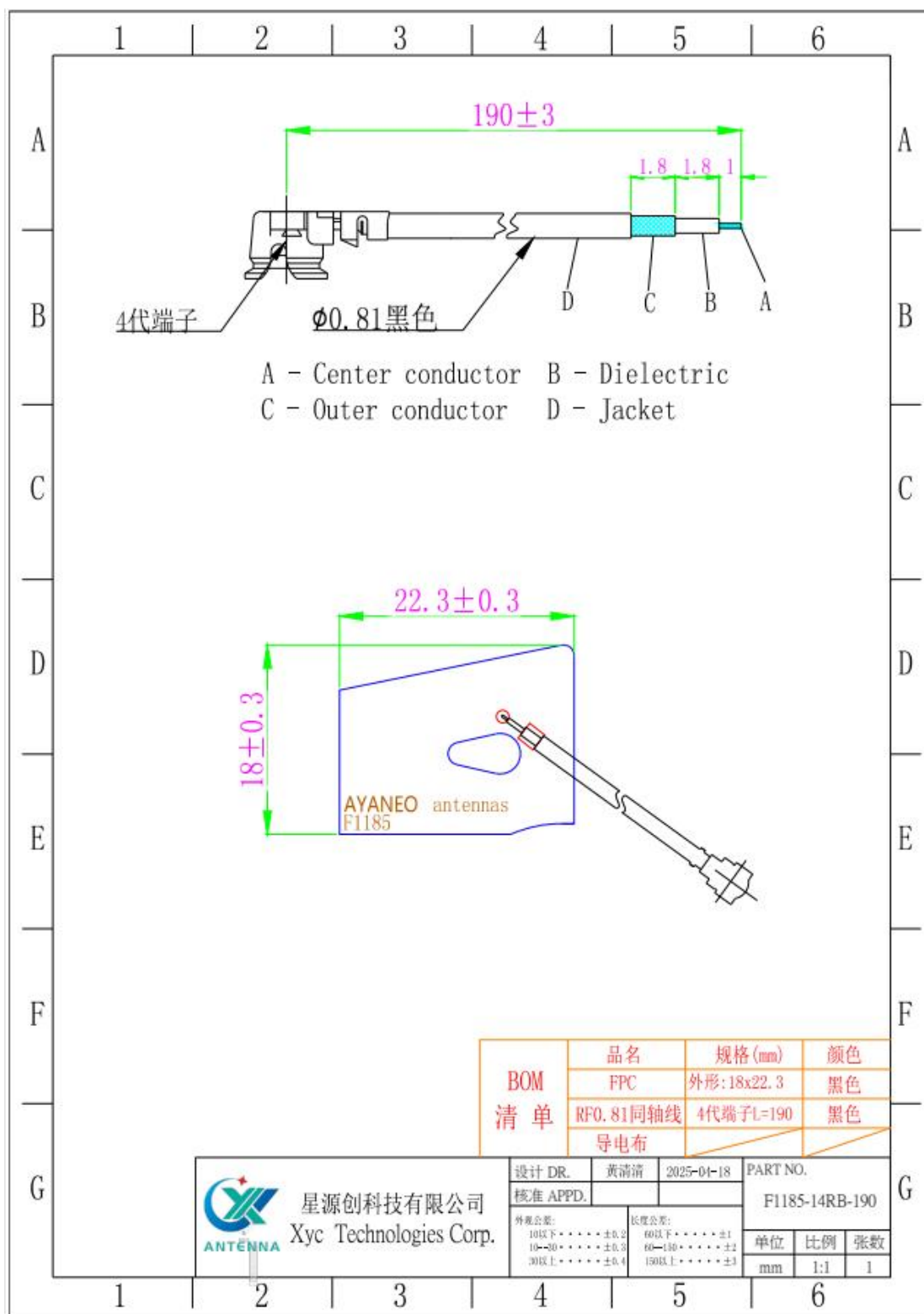
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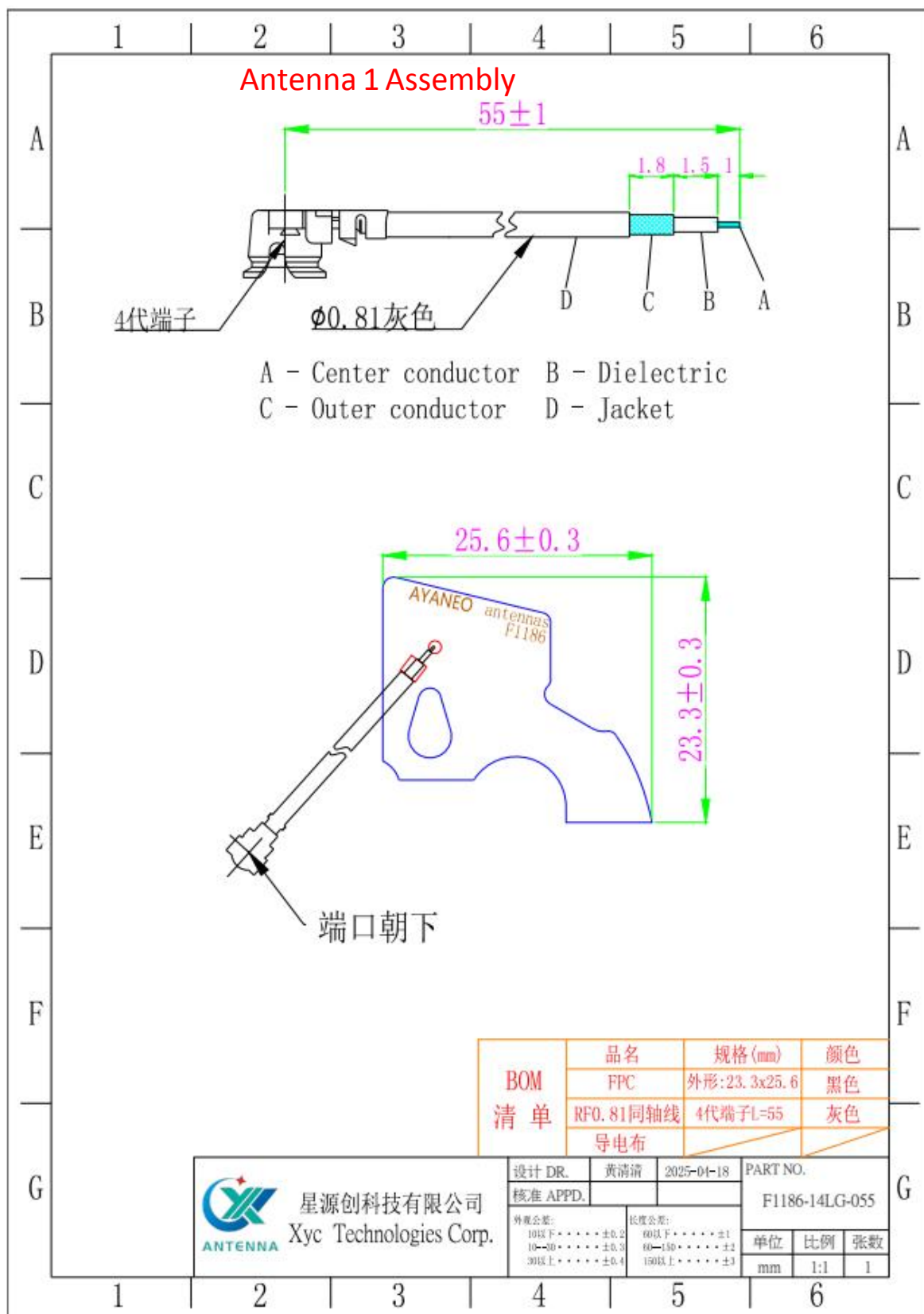
Antenna 2 Assembly





深圳星源创科技有限公司

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