



Antenna Test Report

Project No	P24041G4B	PCB Version	GM002PX_V1.0
Tester	XuNing	Date	2025.4.27
Auditing		Date	
Approval		Date	

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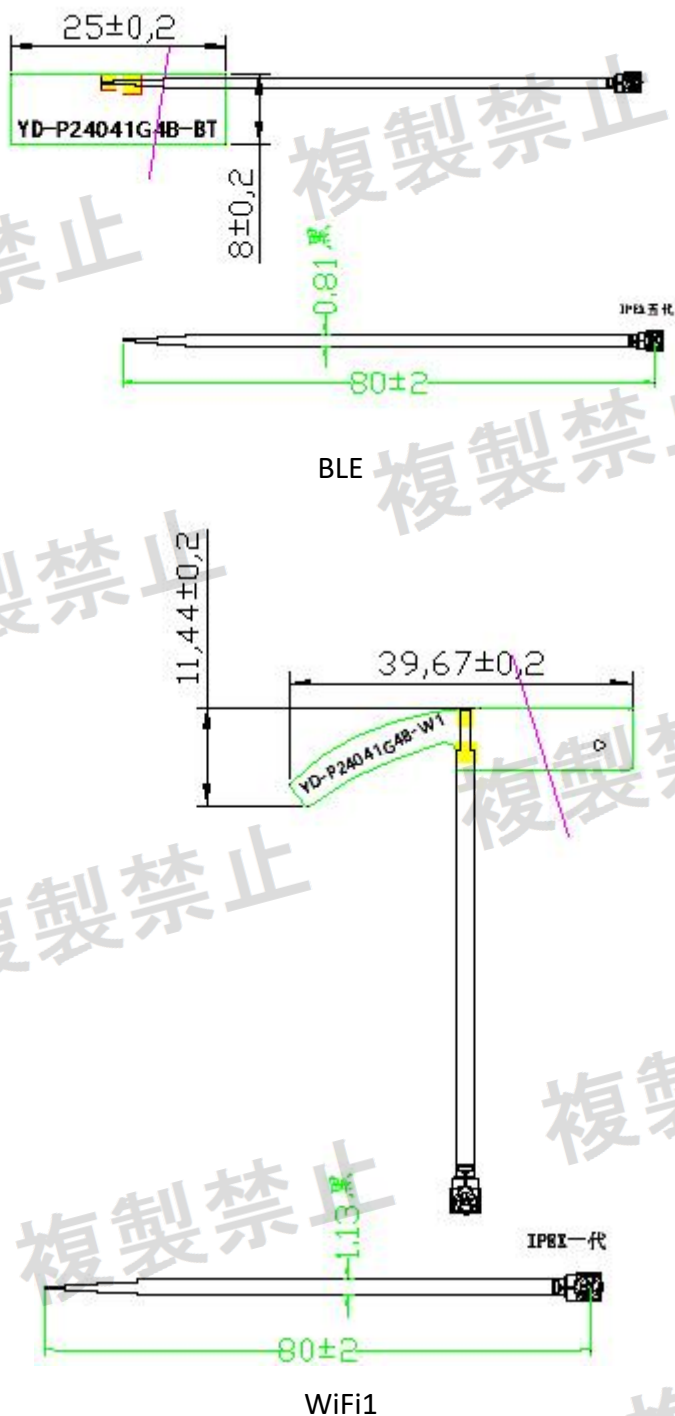
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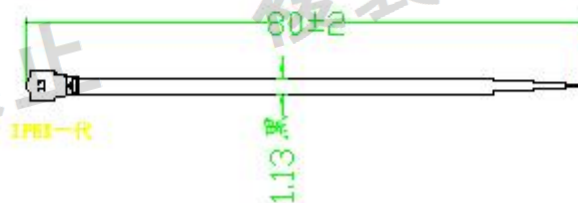
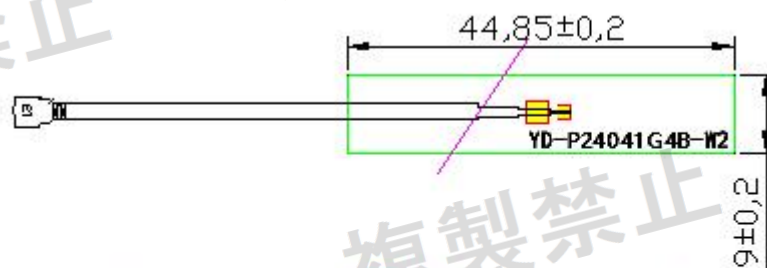
2. Technical Specification

Electrical Specifications	
Frequency Range	BLE: 2400-2480 MHz WiFi: 2480-2500MHz LoRa868:830-890MHz LoRa915: 900-930MHz LTE: 678-960MHz&1710~2700MHz
Peak Gain(dBi)	BLE0: 3.37 BLE1:4.28 LoRa868:2.16 LoRa915:2.08 WiFi1: 5.24 WiFi2: 4.4 LTE(NA) Band2: 4.11 Band4: 5.29 Band5: 3.7 Band12: -0.07 Band13: 4.27 Band66: 5.29 LTE (EU) Band1: 5.29 Band3: 1.7 Band7: 3.76 Band8: 0.1 Band20: 4.11 Band28: 4.27 LTE(CN) Band1: 5.29 Band3: 1.7 Band5: 3.7 Band8: 0.1 Band34: 3.89 Band39: 3.16 Band40: 3.34 Band41: 3.76
Return Loss	≤-10dB

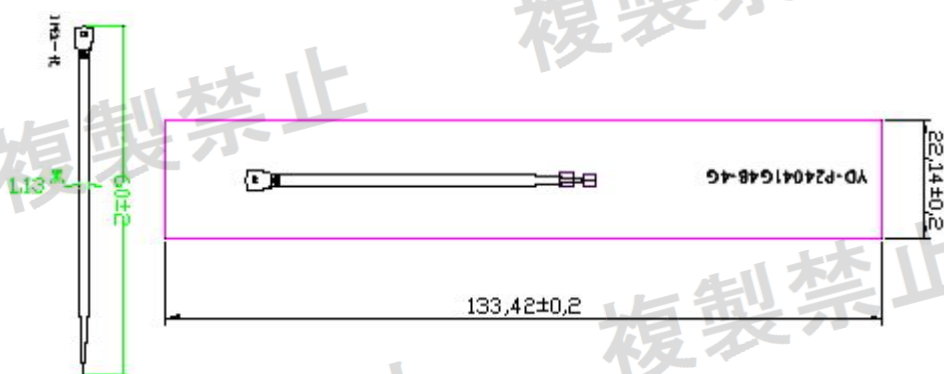
VSWR	≤3.0
Bandwidth (S11≤-10dB)	MHz
Input Impedance	50Ω
Radiation direction	Omni
Polarization Type	Linear
Lightning Protection	DC grounding
Power Capacity	1000mW (30dBm)
Mechanical Specifications	
Antenna Size	BLE: 25mm× 8 mm WiFi1:39.67mm×11.44mm WiFi2: 44.85mm×9mm LTE: 133.42mm×22.14mm Lora868/915: 195mm×∅ 13mm
Core Radiator	Copper
Coaxial wire	/
Connect Type	/
Operating Temperature	-20 to +60℃
Storage Temperature	-10 to +60℃

3. The shape and size of the antenna

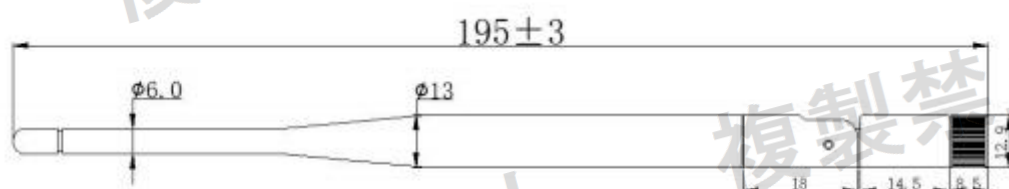




WiFi2



4G



SMA-公头母针

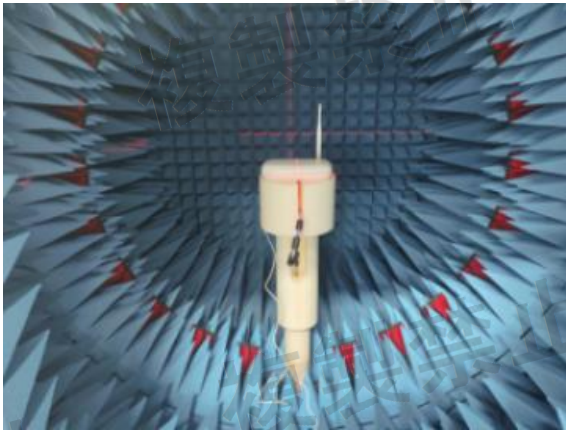
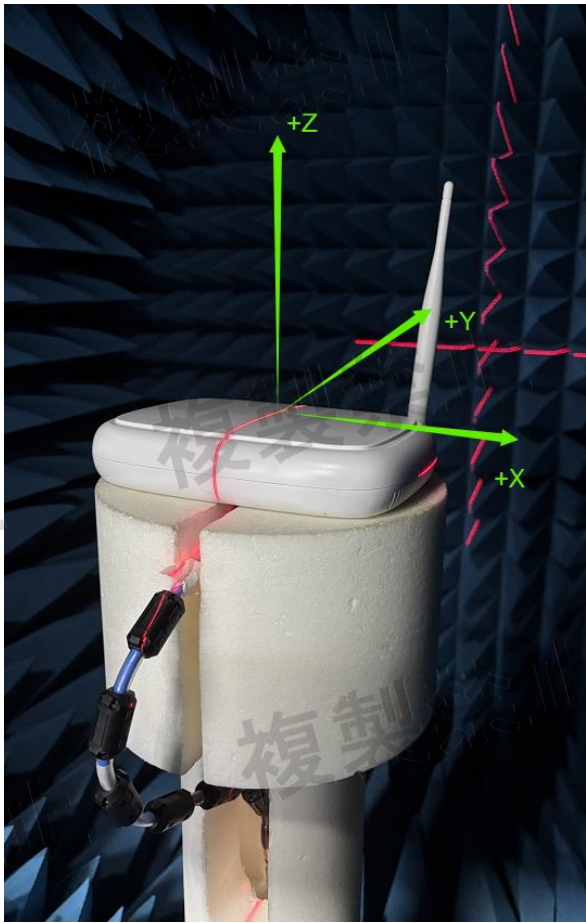
Lora868/915

Unit: mm

4. The result of the test

4.1. Antenna Gain and Efficiency

4.1.1. Product coordinate axis position

Inside the microwave anechoic chamber	Product coordinate axis position
	

4.1.2. Gain and Efficiency data sheet

BLE0

频率 (MHz)	增益 (dBi)	效率 (dB)	效率 (%)
2400	3.37	-2.6	54.97
2402	3.28	-2.62	54.64
2404	3.19	-2.64	54.39
2406	3.12	-2.67	54.1
2408	3.02	-2.7	53.75
2410	2.92	-2.72	53.43
2412	2.81	-2.76	53
2414	2.72	-2.78	52.72
2416	2.59	-2.79	52.56
2418	2.5	-2.82	52.21
2420	2.38	-2.86	51.75
2422	2.28	-2.89	51.44
2424	2.16	-2.91	51.14
2426	1.91	-2.94	50.77
2428	1.81	-2.96	50.6
2430	1.72	-2.98	50.33
2432	1.67	-2.99	50.27
2434	1.6	-3	50.17
2436	1.41	-3.02	49.88
2438	1.32	-3.02	49.91
2440	1.21	-3.01	50.02
2442	1.1	-2.99	50.27
2444	1	-2.99	50.29
2446	0.91	-3.02	49.93
2448	0.98	-3.02	49.92
2450	1.08	-2.98	50.33
2452	1.18	-2.98	50.37
2454	1.29	-2.96	50.61
2456	1.43	-2.95	50.67
2458	1.5	-2.98	50.4
2460	1.56	-3.01	50
2462	1.61	-3.04	49.68
2464	1.69	-3.04	49.7
2466	1.78	-3.02	49.92
2468	1.87	-2.99	50.26
2470	1.9	-2.99	50.21
2472	1.94	-2.98	50.36
2474	1.97	-2.98	50.34
2476	2	-2.98	50.32
2478	2.05	-2.95	50.68
2480	2.11	-2.91	51.13

BLE1

频率 (MHz)	增益 (dBi)	效率 (dB)	效率 (%)
2400	3.83	-2.81	52.36
2402	3.86	-2.81	52.31
2404	3.9	-2.81	52.4
2406	3.97	-2.79	52.56
2408	3.99	-2.8	52.49
2410	4.02	-2.8	52.44
2412	4.04	-2.81	52.34
2414	4.06	-2.81	52.32
2416	4.07	-2.79	52.55
2418	4.09	-2.81	52.38
2420	4.11	-2.84	52
2422	4.13	-2.85	51.83
2424	4.15	-2.87	51.7
2426	4.05	-2.88	51.52
2428	4.09	-2.88	51.52
2430	4.12	-2.89	51.36
2432	4.2	-2.89	51.38
2434	4.26	-2.9	51.32
2436	4.21	-2.91	51.12
2438	4.25	-2.9	51.24
2440	4.28	-2.89	51.36
2442	4.27	-2.87	51.63
2444	4.24	-2.87	51.62
2446	4.15	-2.9	51.27
2448	4.15	-2.9	51.29
2450	4.18	-2.86	51.72
2452	4.2	-2.86	51.75
2454	4.21	-2.84	51.96
2456	4.22	-2.84	51.96
2458	4.17	-2.87	51.59
2460	4.12	-2.92	51.07
2462	4.07	-2.96	50.63
2464	4.06	-2.96	50.56
2466	4.06	-2.96	50.62
2468	4.07	-2.95	50.74
2470	4.05	-2.96	50.59
2472	4.05	-2.96	50.56
2474	4.03	-2.98	50.36
2476	3.95	-3	50.09
2478	3.96	-2.99	50.27
2480	3.97	-2.96	50.56

LORA(868Mhz)

频率 (MHz)	增益 (dBi)	效率 (dB)	效率 (%)
867	2.14	-1.41	72.21
868	2.16	-1.42	72.11

LORA(915Mhz)

频率 (MHz)	增益 (dBi)	效率 (dB)	效率 (%)
902	2.08	-0.87	81.87
903	2.06	-0.86	82.03

WIFI1

频率(MHz)	增益(dBi)	效率(dB)	效率(%)
2400	5.13	-1.09	77.86
2402	5.14	-1.11	77.47
2404	5.15	-1.13	77.14
2406	5.21	-1.13	77.15
2408	5.23	-1.13	77.04
2410	5.24	-1.14	76.90
2412	5.22	-1.16	76.54
2414	5.21	-1.17	76.40
2416	5.20	-1.18	76.21
2418	5.21	-1.18	76.16
2420	5.20	-1.20	75.86
2422	5.20	-1.21	75.75
2424	5.18	-1.22	75.55
2426	5.18	-1.21	75.61
2428	5.15	-1.22	75.49
2430	5.12	-1.23	75.33
2432	5.12	-1.22	75.48
2434	5.10	-1.23	75.42
2436	5.14	-1.22	75.54
2438	5.12	-1.21	75.64
2440	5.10	-1.20	75.83
2442	5.05	-1.17	76.31
2444	4.98	-1.16	76.51
2446	4.91	-1.17	76.46
2448	4.83	-1.16	76.50
2450	4.78	-1.13	77.03
2452	4.73	-1.13	77.13
2454	4.71	-1.10	77.60
2456	4.70	-1.09	77.82
2458	4.64	-1.10	77.66
2460	4.55	-1.13	77.16
2462	4.47	-1.15	76.66
2464	4.42	-1.15	76.77
2466	4.41	-1.12	77.23
2468	4.37	-1.10	77.65
2470	4.30	-1.11	77.53
2472	4.24	-1.10	77.71
2474	4.17	-1.10	77.59
2476	4.13	-1.09	77.73
2478	4.09	-1.07	78.19
2480	4.07	-1.03	78.80
2482	4.03	-1.02	79.08
2484	3.98	-1.02	79.11
2486	4.00	-1.01	79.22
2488	4.01	-1.00	79.38
2490	4.05	-0.98	79.87
2492	4.07	-0.96	80.11
2494	4.07	-0.96	80.15
2496	4.06	-0.96	80.13
2498	4.05	-0.98	79.76
2500	4.05	-0.99	79.58

WIFI2

频率(MHz)	增益(dBi)	效率(dB)	效率(%)
2400	4.40	-1.94	64.01
2402	4.36	-1.95	63.78
2404	4.33	-1.96	63.74
2406	4.31	-1.95	63.77
2408	4.28	-1.95	63.77
2410	4.24	-1.96	63.72
2412	4.18	-1.97	63.50
2414	4.14	-1.98	63.44
2416	4.12	-1.98	63.46
2418	4.09	-1.98	63.39
2420	4.04	-2.00	63.14
2422	3.99	-2.01	62.96
2424	3.94	-2.02	62.84
2426	3.83	-2.03	62.72
2428	3.81	-2.03	62.66
2430	3.79	-2.03	62.59
2432	3.81	-2.02	62.74
2434	3.81	-2.02	62.74
2436	3.73	-2.04	62.56
2438	3.72	-2.03	62.67
2440	3.72	-2.01	62.92
2442	3.70	-1.97	63.49
2444	3.67	-1.95	63.76
2446	3.57	-1.98	63.44
2448	3.53	-1.96	63.65
2450	3.51	-1.92	64.22
2452	3.51	-1.91	64.43
2454	3.52	-1.88	64.86
2456	3.53	-1.88	64.86
2458	3.50	-1.89	64.77
2460	3.45	-1.91	64.45
2462	3.40	-1.93	64.11
2464	3.39	-1.91	64.36
2466	3.41	-1.89	64.75
2468	3.43	-1.86	65.12
2470	3.41	-1.87	65.04
2472	3.40	-1.86	65.22
2474	3.38	-1.85	65.26
2476	3.35	-1.85	65.32
2478	3.36	-1.81	65.86
2480	3.38	-1.77	66.48
2482	3.38	-1.75	66.81
2484	3.38	-1.74	66.96
2486	3.34	-1.75	66.84
2488	3.35	-1.73	67.18
2490	3.38	-1.69	67.74
2492	3.38	-1.67	68.05
2494	3.38	-1.65	68.32
2496	3.32	-1.67	68.00
2498	3.28	-1.69	67.81
2500	3.26	-1.68	67.86

LTE

Band1	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	1920	3	-2.61	54.78	5.29
	1925	3.22	-2.53	55.84	
	1930	3.11	-2.48	56.49	
	1935	3.25	-2.38	57.76	
	1940	3.37	-2.35	58.27	
	1945	3.45	-2.20	60.27	
	1950	3.52	-2.03	62.62	
	1955	3.56	-1.99	63.25	
	1960	3.69	-1.84	65.4	
	1965	3.83	-1.78	66.32	
	1970	3.86	-1.67	68.1	
	1975	3.92	-1.65	68.34	
	1980	3.96	-1.57	69.71	
	2110	5.29	-1.58	69.42	
	2115	5.19	-1.70	67.56	
	2120	5.16	-1.59	69.29	
	2125	5.13	-1.58	69.53	
	2130	5.1	-1.62	68.91	
	2135	5.07	-1.54	70.08	
	2140	4.85	-1.62	68.83	
	2145	4.76	-1.59	69.29	
	2150	4.61	-1.69	67.71	
	2155	4.5	-1.73	67.16	
	2160	4.4	-1.76	66.61	
	2165	4.48	-1.63	68.64	
	2170	4.14	-1.88	64.84	

Band2	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	1850	0.9	-4.07	39.21	4.11
	1855	0.83	-4.08	39.12	
	1860	0.85	-3.89	40.79	
	1865	0.88	-3.82	41.49	
	1870	0.99	-3.69	42.77	
	1875	1.25	-3.48	44.83	
	1880	1.39	-3.41	45.61	
	1885	1.7	-3.33	46.47	
	1890	1.88	-3.29	46.87	
	1895	2.13	-3.09	49.04	
	1900	2.41	-3.00	50.11	
	1905	2.35	-3.02	49.85	
	1910	2.88	-2.79	52.56	
	1930	3.11	-2.48	56.49	
	1935	3.25	-2.38	57.76	
	1940	3.37	-2.35	58.27	
	1945	3.45	-2.20	60.27	
	1950	3.52	-2.03	62.62	
	1955	3.56	-1.99	63.25	
	1960	3.69	-1.84	65.4	
	1965	3.83	-1.78	66.32	
	1970	3.86	-1.67	68.1	
	1975	3.92	-1.65	68.34	
	1980	3.96	-1.57	69.71	
	1985	4.11	-1.37	72.9	
	1990	4.03	-1.41	72.25	

Band3	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	1710	0.53	-4.41	36.21	1.7
	1715	0.72	-4.30	37.14	
	1720	0.81	-4.26	37.51	
	1725	0.98	-4.17	38.31	
	1730	1.12	-4.11	38.79	
	1735	1.18	-4.08	39.11	
	1740	1.3	-4.00	39.82	
	1745	1.22	-4.04	39.42	
	1750	1.29	-3.91	40.63	
	1755	1.51	-3.80	41.68	
	1760	1.59	-3.83	41.44	
	1765	1.7	-3.76	42.02	
	1770	1.65	-3.80	41.73	
	1775	1.64	-3.79	41.8	
	1780	1.57	-3.82	41.46	
	1785	1.43	-3.93	40.48	
	1805	1.59	-3.78	41.88	
	1810	1.45	-3.88	40.95	
	1815	1.48	-3.84	41.33	
	1820	1.32	-3.90	40.71	
	1825	1.04	-4.04	39.46	
	1830	0.81	-4.08	39.1	
	1835	0.91	-4.05	39.33	
	1840	0.93	-4.08	39.1	
	1845	0.97	-4.02	39.66	
	1850	0.9	-4.07	39.21	
	1855	0.83	-4.08	39.12	
	1860	0.85	-3.89	40.79	
	1865	0.88	-3.82	41.49	
	1870	0.99	-3.69	42.77	
	1875	1.25	-3.48	44.83	
	1880	1.39	-3.41	45.61	

Band4	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	1710	0.53	-4.41	36.21	5.29
	1715	0.72	-4.30	37.14	
	1720	0.81	-4.26	37.51	
	1725	0.98	-4.17	38.31	
	1730	1.12	-4.11	38.79	
	1735	1.18	-4.08	39.11	
	1740	1.3	-4.00	39.82	
	1745	1.22	-4.04	39.42	
	1750	1.29	-3.91	40.63	
	1755	1.51	-3.80	41.68	
	2110	5.29	-1.58	69.42	
	2115	5.19	-1.70	67.56	
	2120	5.16	-1.59	69.29	
	2125	5.13	-1.58	69.53	
	2130	5.1	-1.62	68.91	
	2135	5.07	-1.54	70.08	
	2140	4.85	-1.62	68.83	
	2145	4.76	-1.59	69.29	
	2150	4.61	-1.69	67.71	
	2155	4.5	-1.73	67.16	

Band5	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	823	3.7	-2.44	56.98	3.7
	828	3.43	-2.57	55.29	
	833	3.07	-2.90	51.25	
	838	3.07	-2.91	51.21	
	843	2.41	-3.20	47.88	
	848	1.83	-3.55	44.15	
	868	0.79	-3.98	39.99	
	873	0.49	-4.15	38.46	
	878	0.22	-4.27	37.41	
	883	0.03	-4.40	36.32	
	888	0.07	-4.45	35.9	
	893	0.1	-4.50	35.5	

Band7	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	2500	2.54	-2.06	62.19	3.76
	2505	2.59	-2.00	63.11	
	2510	2.58	-2.01	63.01	
	2515	2.6	-1.98	63.38	
	2520	2.5	-1.98	63.41	
	2525	2.22	-2.05	62.36	
	2530	2.39	-1.98	63.36	
	2535	2.41	-1.95	63.89	
	2540	2.54	-1.85	65.3	
	2545	2.67	-1.78	66.39	
	2550	2.74	-1.76	66.67	
	2555	3.01	-1.75	66.87	
	2560	3.34	-1.70	67.55	
	2565	3.41	-1.68	67.94	
	2570	3.46	-1.67	68.09	
	2620	3.65	-1.65	68.44	
	2625	3.68	-1.62	68.83	
	2630	3.61	-1.64	68.5	
	2635	3.61	-1.67	68.1	
	2640	3.63	-1.66	68.3	
	2645	3.76	-1.61	68.99	
	2650	3.69	-1.64	68.63	
	2655	3.66	-1.67	68.03	
	2660	3.72	-1.64	68.55	
	2665	3.58	-1.68	67.87	
	2670	3.63	-1.67	68.02	
	2675	3.4	-1.69	67.79	
	2680	3.16	-1.73	67.18	
	2685	3.27	-1.64	68.5	
	2690	3.33	-1.64	68.61	

Band8	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	883	0.03	-4.40	36.32	0.1
	888	0.07	-4.45	35.9	
	893	0.1	-4.50	35.5	
	898	-0.06	-4.60	34.64	
	903	-0.29	-4.80	33.14	
	908	-0.5	-5.03	31.43	
	913	-0.68	-5.14	30.61	
	928	-1.65	-5.38	28.98	
	933	-1.62	-5.53	27.98	
	938	-1.56	-5.61	27.51	
	943	-1.53	-5.76	26.54	
	948	-1.49	-5.89	25.77	
	953	-1.55	-6.02	24.98	
	958	-1.71	-6.14	24.32	
	960	-1.6	-6.12	24.43	

Band12	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	698	-2.06	-6.57	22.02	-0.07
	703	-2.07	-6.39	22.95	
	708	-1.78	-6.13	24.4	
	713	-1.88	-5.99	25.2	
	728	-1.66	-5.16	30.51	
	733	-1.12	-4.60	34.71	
	738	-0.58	-4.18	38.23	
	743	-0.07	-3.90	40.69	
Band13	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	778	4.27	-2.63	54.54	4.27
	783	3.88	-2.75	53.03	
	788	3.62	-2.69	53.81	
	748	0.49	-3.62	43.4	
	753	0.83	-3.51	44.53	
	758	1.28	-3.29	46.89	
Band20	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	833	3.07	-2.90	51.25	4.11
	838	3.07	-2.91	51.21	
	843	2.41	-3.20	47.88	
	848	1.83	-3.55	44.15	
	853	1.57	-3.66	43.06	
	858	1.37	-3.70	42.64	
	863	1.1	-3.82	41.49	
	793	3.68	-2.59	55.1	
	798	3.9	-2.28	59.15	
	803	4.11	-2.13	61.26	
	808	4.08	-2.17	60.74	
	813	4.09	-2.21	60.18	
	818	3.84	-2.32	58.58	
	823	3.7	-2.44	56.98	

Band28	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	703	-2.07	-6.39	22.95	4.27
	708	-1.78	-6.13	24.4	
	713	-1.88	-5.99	25.2	
	718	-1.85	-5.68	27.01	
	723	-1.99	-5.52	28.05	
	728	-1.66	-5.16	30.51	
	733	-1.12	-4.60	34.71	
	738	-0.58	-4.18	38.23	
	743	-0.07	-3.90	40.69	
	748	0.49	-3.62	43.4	
	758	1.28	-3.29	46.89	
	763	1.79	-3.16	48.33	
	768	2.55	-2.96	50.53	
	773	3.71	-2.75	53.1	
	778	4.27	-2.63	54.54	
	783	3.88	-2.75	53.03	
	788	3.62	-2.69	53.81	
	793	3.68	-2.59	55.1	
	798	3.9	-2.28	59.15	
	803	4.11	-2.13	61.26	

Band34	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	2010	3.87	-1.55	69.93	3.89
	2015	3.89	-1.60	69.14	
	2020	3.89	-1.64	68.55	
	2025	3.83	-1.76	66.69	

Band39	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	1880	1.39	-3.41	45.61	3.16
	1885	1.7	-3.33	46.47	
	1890	1.88	-3.29	46.87	
	1895	2.13	-3.09	49.04	
	1900	2.41	-3.00	50.11	
	1905	2.35	-3.02	49.85	
	1910	2.88	-2.79	52.56	
	1915	3.16	-2.55	55.61	
	1920	3	-2.61	54.78	

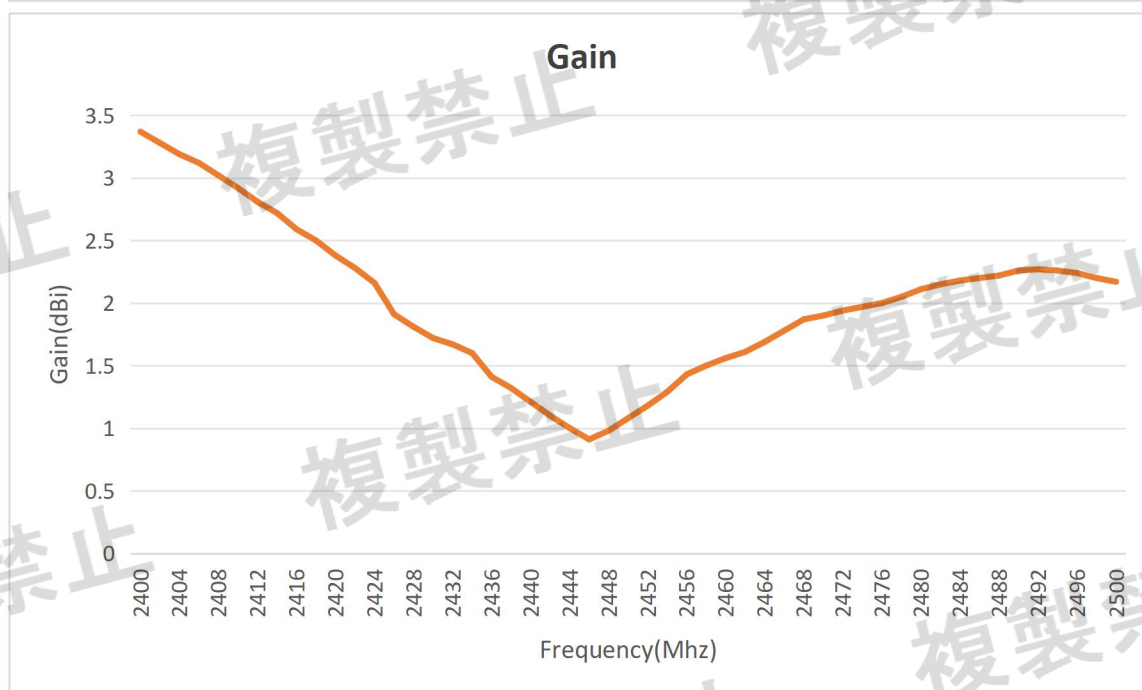
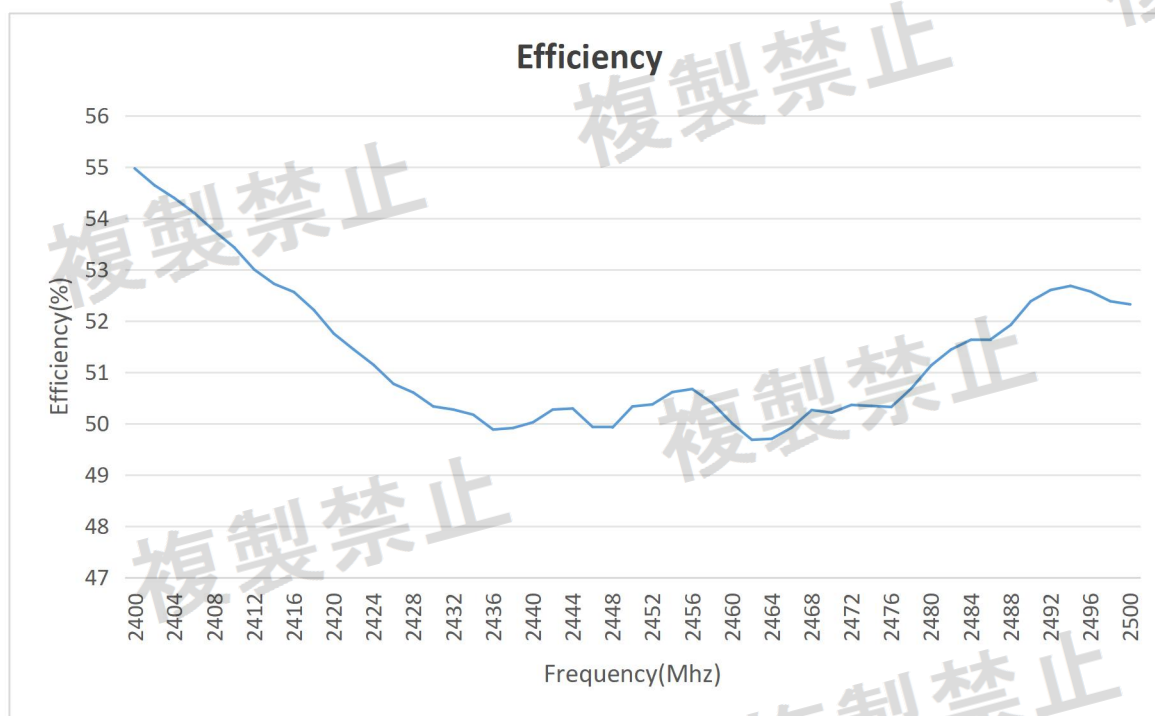
Band40	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	2300	3.3	-2.34	58.32	3.34
	2305	3.34	-2.27	59.33	
	2310	3.06	-2.35	58.27	
	2315	3.14	-2.35	58.24	
	2320	3.19	-2.33	58.46	
	2325	3.15	-2.40	57.54	
	2330	3.29	-2.29	58.98	
	2335	3.31	-2.27	59.3	
	2340	3.26	-2.27	59.32	

Band41	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	2535	2.41	-1.95	63.89	3.76
	2540	2.54	-1.85	65.3	
	2545	2.67	-1.78	66.39	
	2550	2.74	-1.76	66.67	
	2555	3.01	-1.75	66.87	
	2560	3.34	-1.70	67.55	
	2565	3.41	-1.68	67.94	
	2570	3.46	-1.67	68.09	
	2575	3.52	-1.60	69.18	
	2580	3.5	-1.60	69.21	
	2585	3.53	-1.61	69.05	
	2590	3.57	-1.59	69.33	
	2595	3.55	-1.64	68.56	
	2600	3.55	-1.63	68.67	
	2605	3.54	-1.63	68.65	
	2610	3.57	-1.61	69.01	
	2615	3.68	-1.59	69.38	
	2620	3.65	-1.65	68.44	
	2625	3.68	-1.62	68.83	
	2630	3.61	-1.64	68.5	
	2635	3.61	-1.67	68.1	
	2640	3.63	-1.66	68.3	
	2645	3.76	-1.61	68.99	
	2650	3.69	-1.64	68.63	
	2655	3.66	-1.67	68.03	
	2660	3.72	-1.64	68.55	
	2665	3.58	-1.68	67.87	
	2670	3.63	-1.67	68.02	
	2675	3.4	-1.69	67.79	

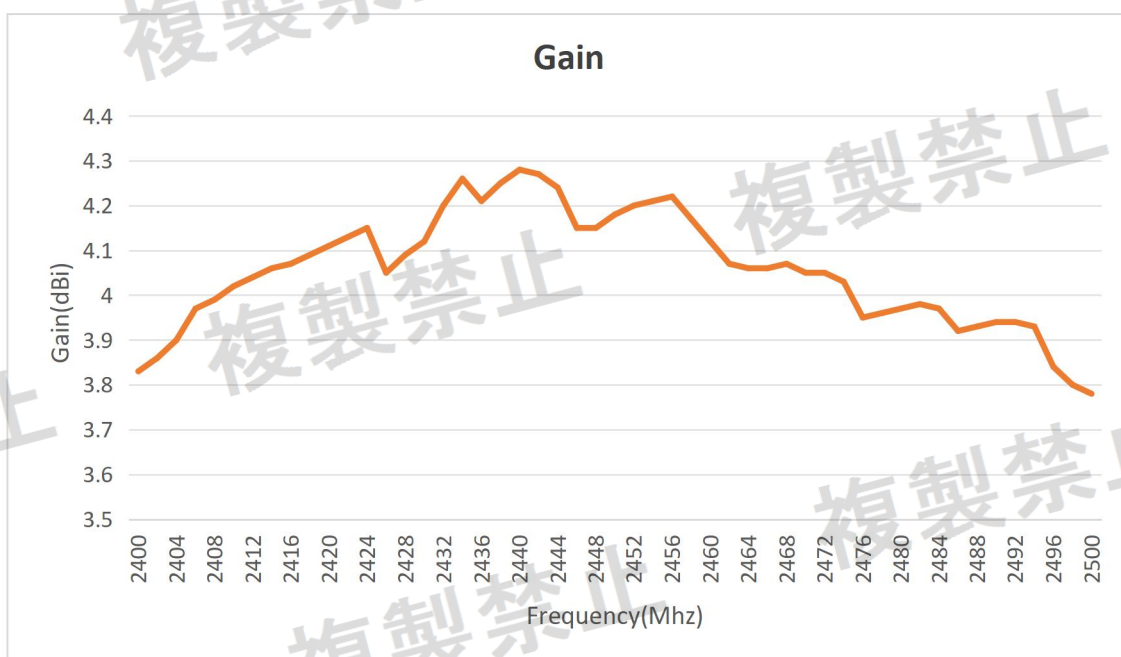
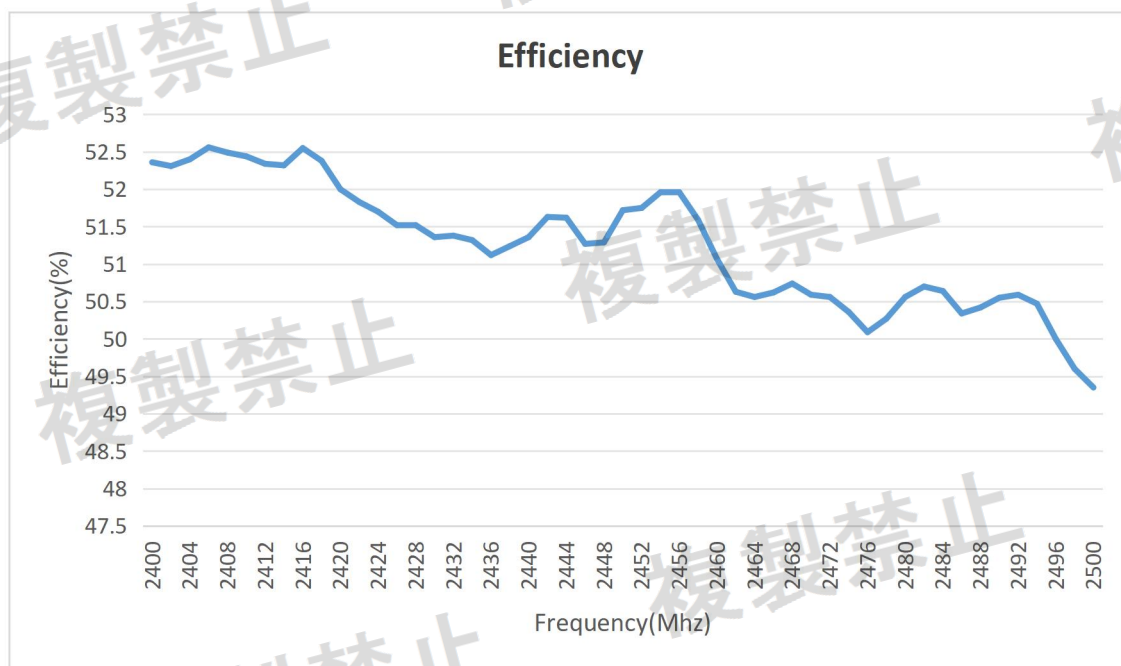
Band66	频率(MHz)	增益(dBi)	效率(dB)	效率(%)	PeakGain (dBi)
	1710	0.53	-4.41	36.21	5.29
	1715	0.72	-4.3	37.14	
	1720	0.81	-4.26	37.51	
	1725	0.98	-4.17	38.31	
	1730	1.12	-4.11	38.79	
	1735	1.18	-4.08	39.11	
	1740	1.3	-4	39.82	
	1745	1.22	-4.04	39.42	
	1750	1.29	-3.91	40.63	
	1755	1.51	-3.8	41.68	
	1760	1.59	-3.83	41.44	
	1765	1.7	-3.76	42.02	
	1770	1.65	-3.8	41.73	
	1775	1.64	-3.79	41.8	
	1780	1.57	-3.82	41.46	
	2110	5.29	-1.58	69.42	
	2115	5.19	-1.7	67.56	
	2120	5.16	-1.59	69.29	
	2125	5.13	-1.58	69.53	
	2130	5.1	-1.62	68.91	
	2135	5.07	-1.54	70.08	
	2140	4.85	-1.62	68.83	
	2145	4.76	-1.59	69.29	
	2150	4.61	-1.69	67.71	
	2155	4.5	-1.73	67.16	
	2160	4.4	-1.76	66.61	
	2165	4.48	-1.63	68.64	
	2170	4.14	-1.88	64.84	
	2175	4.05	-1.86	65.21	
	2180	3.95	-1.91	64.48	
	2185	3.86	-1.91	64.42	
	2190	3.79	-1.87	64.96	
	2195	3.59	-2.06	62.17	
	2200	3.6	-1.99	63.28	

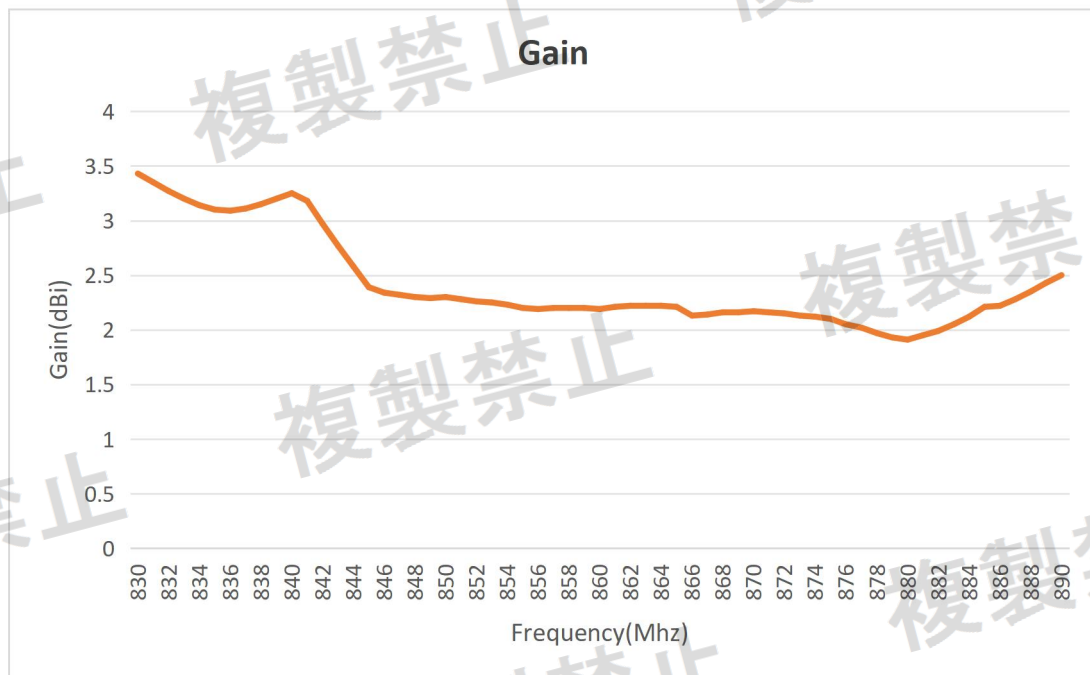
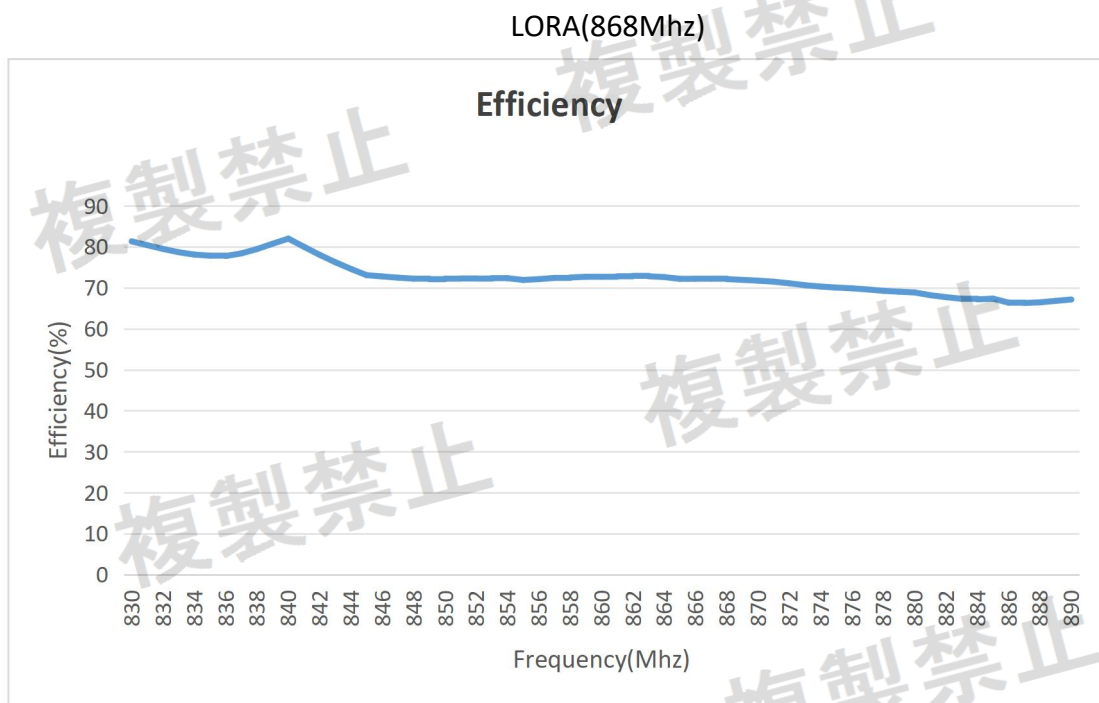
4.1.3. Graphs of Gain and Efficiency

BLE0

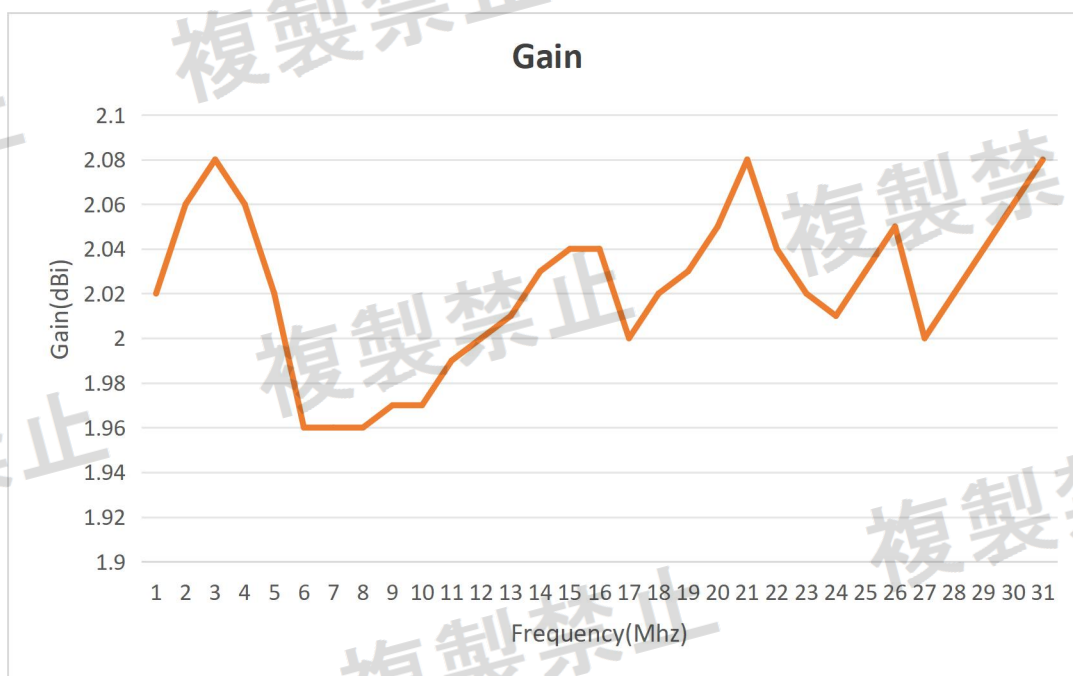
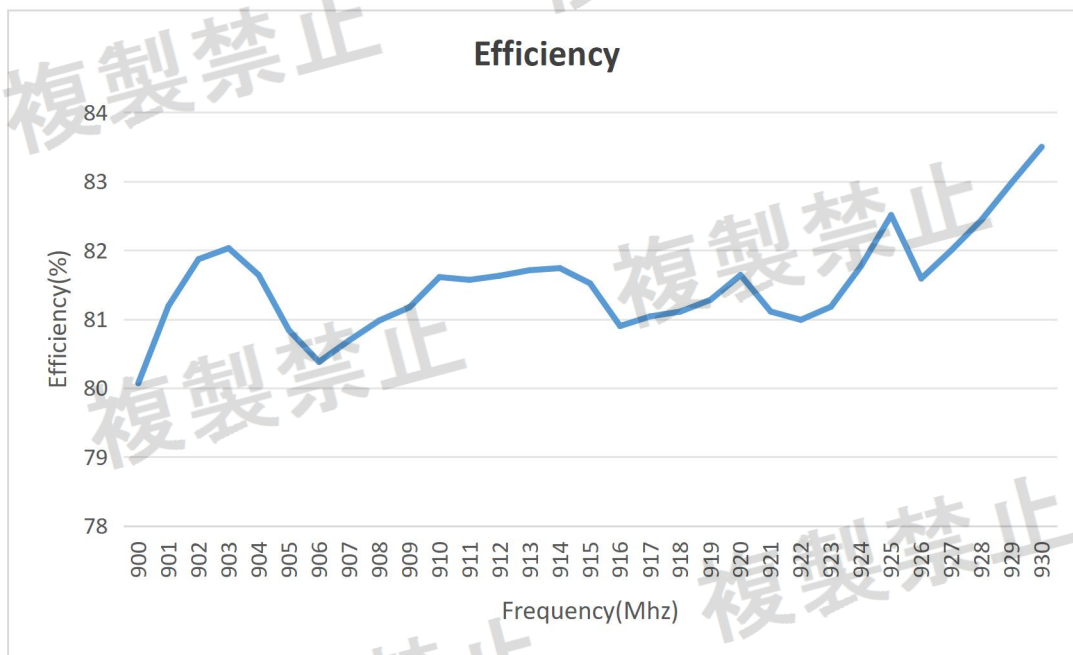


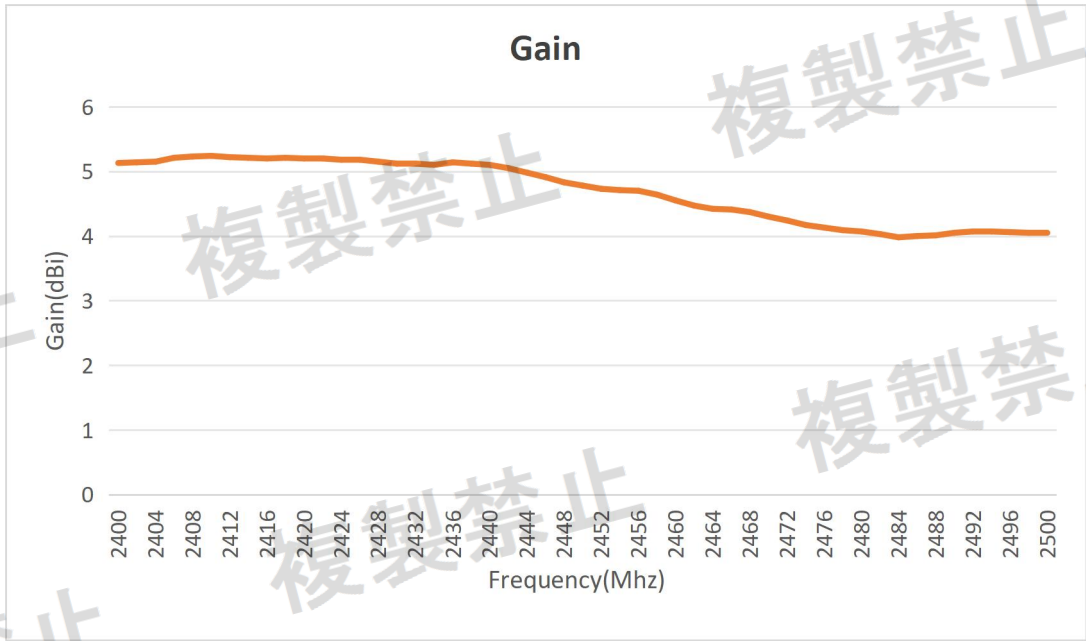
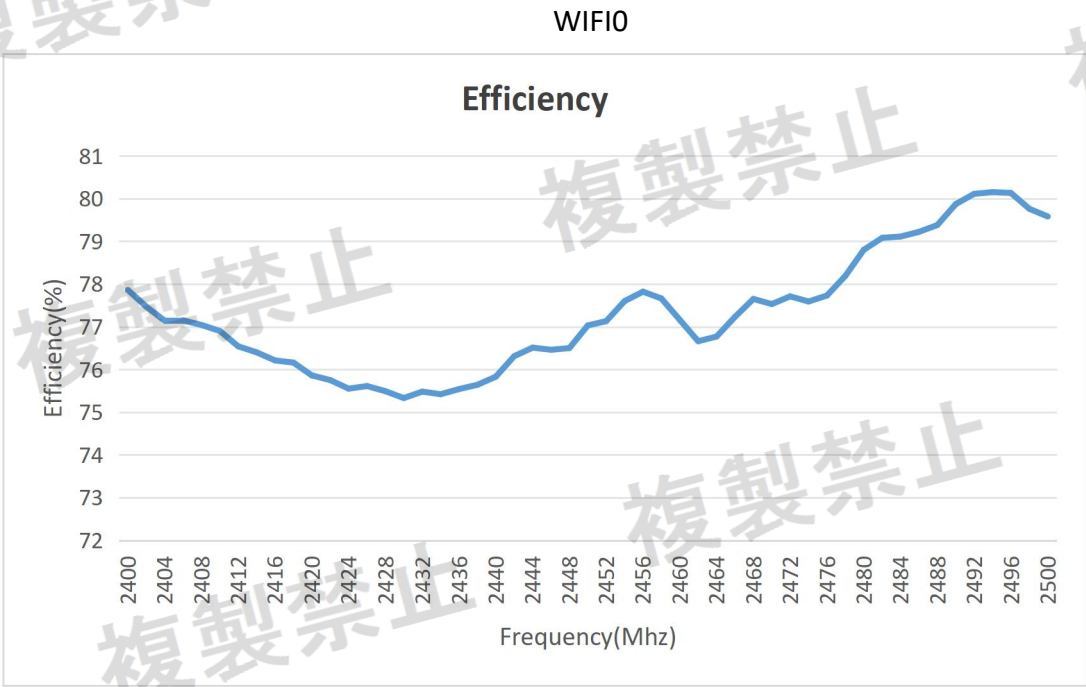
BLE1



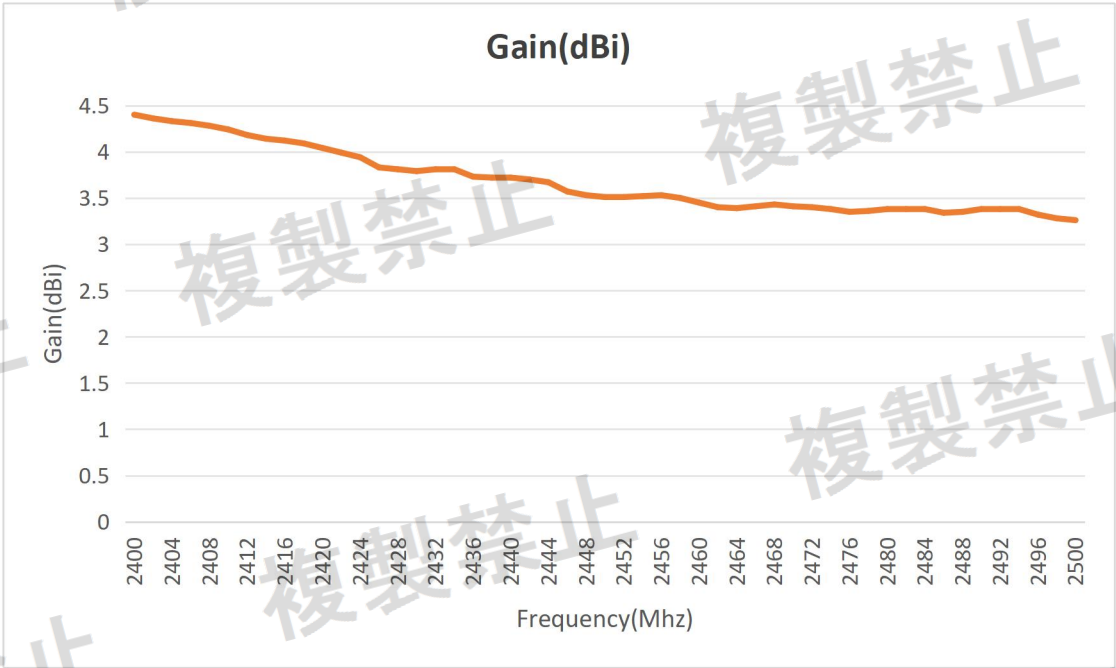
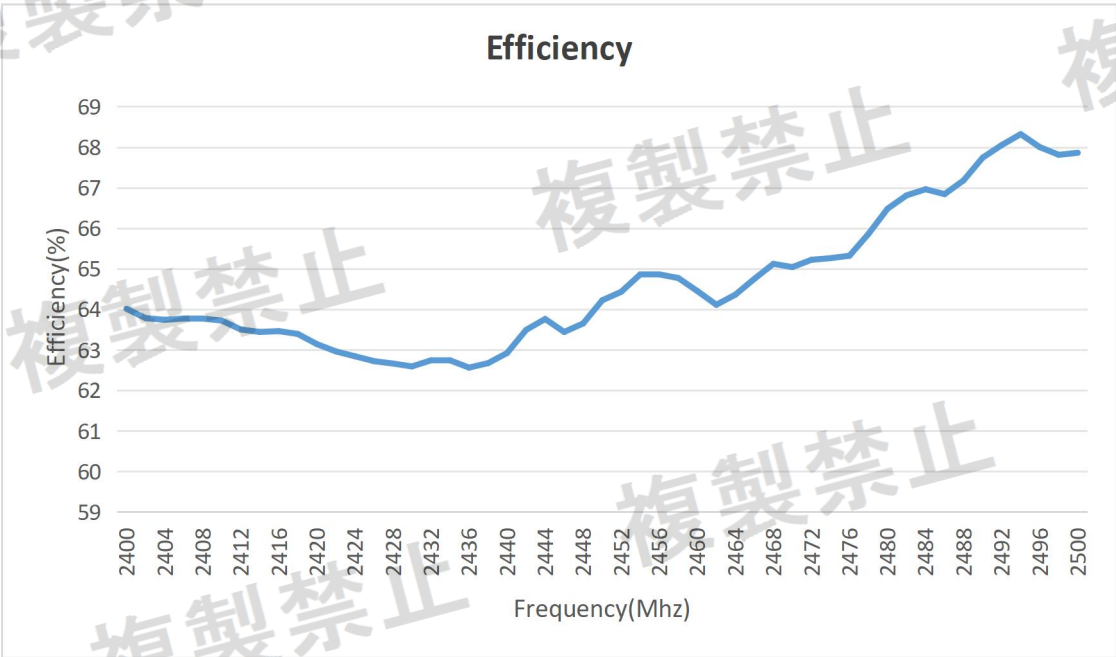


LORA(915Mhz)

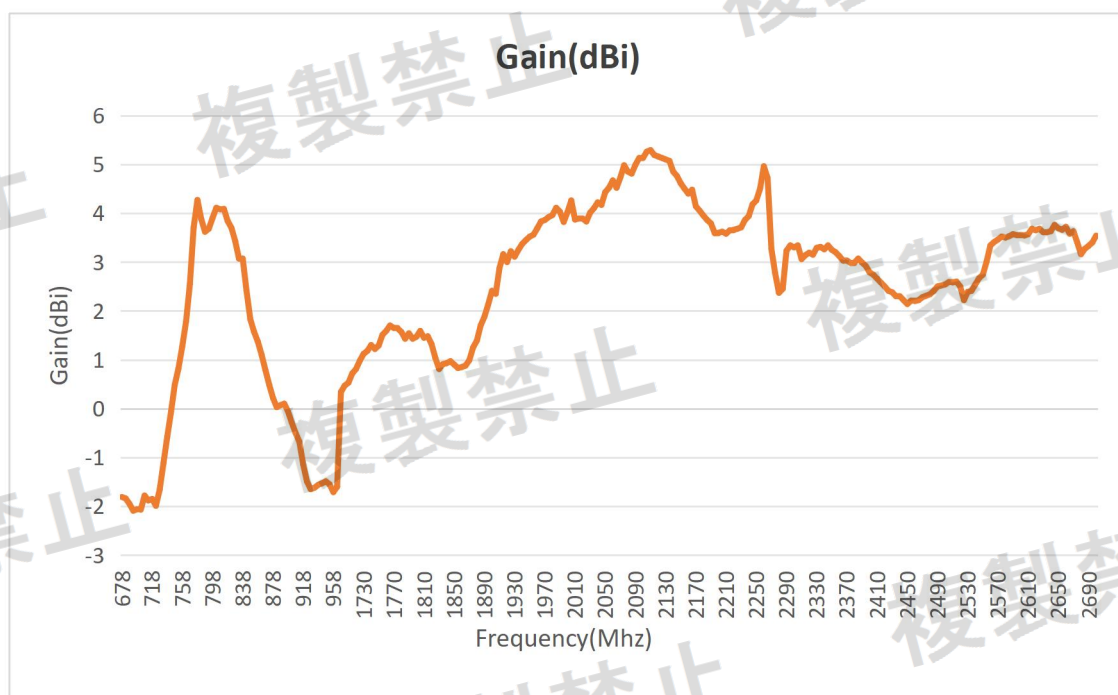
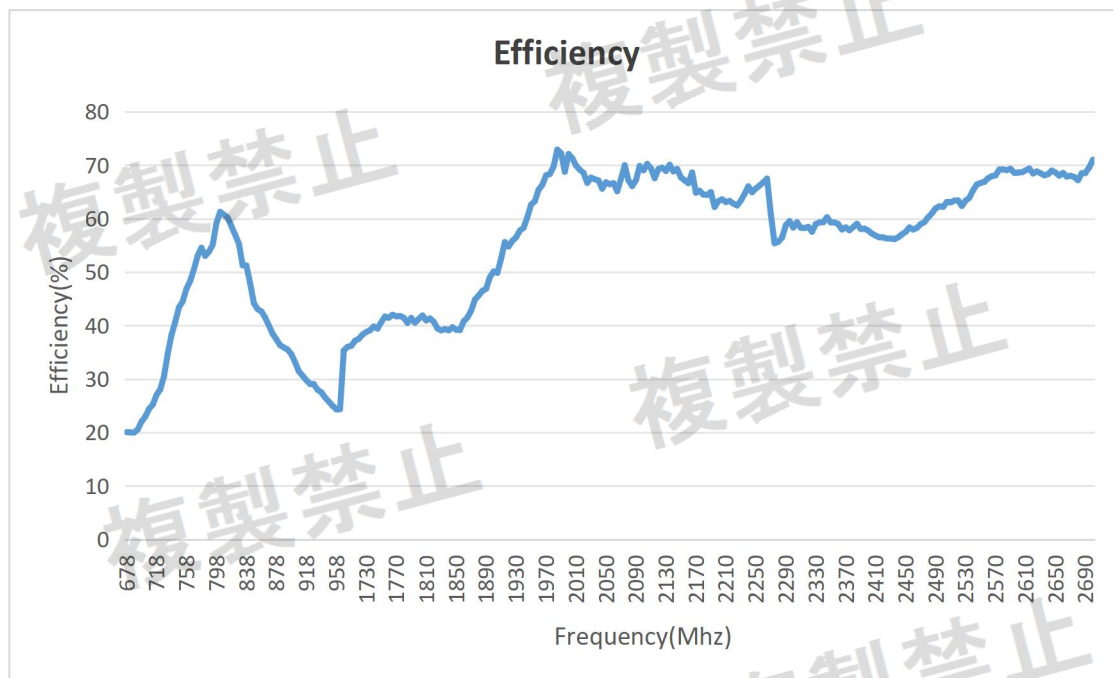




WIFI1

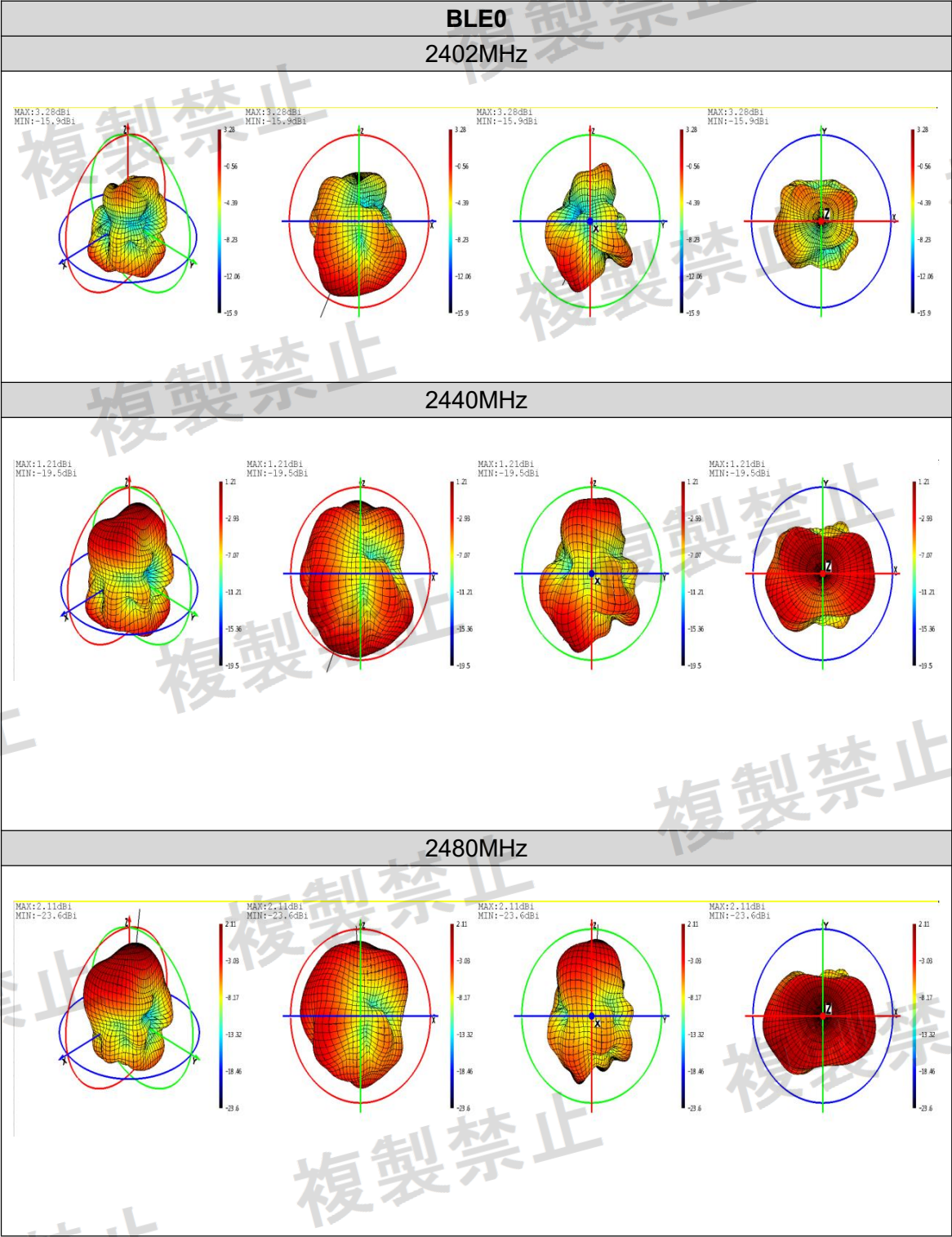


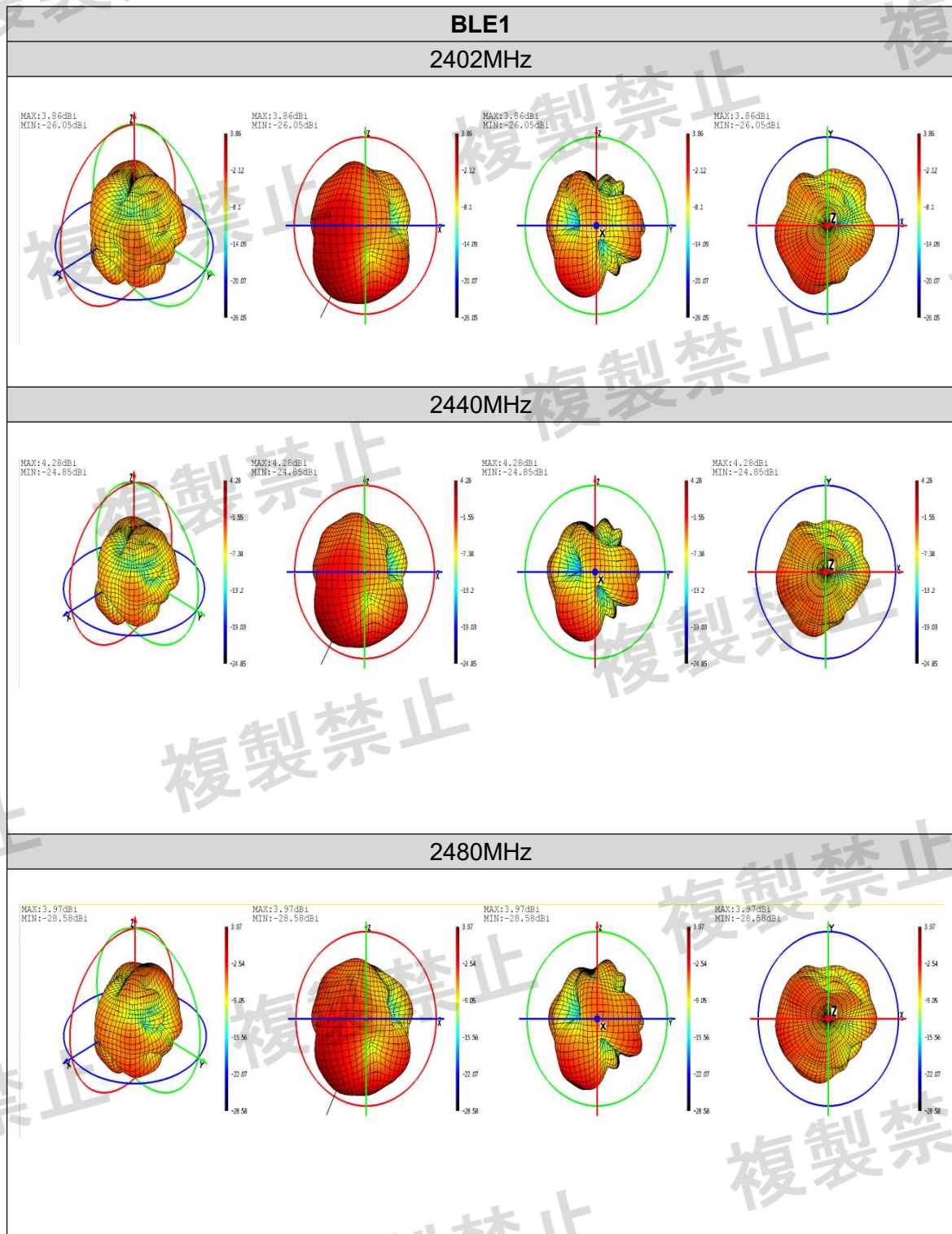
LTE



4.2.Radiation Pattern

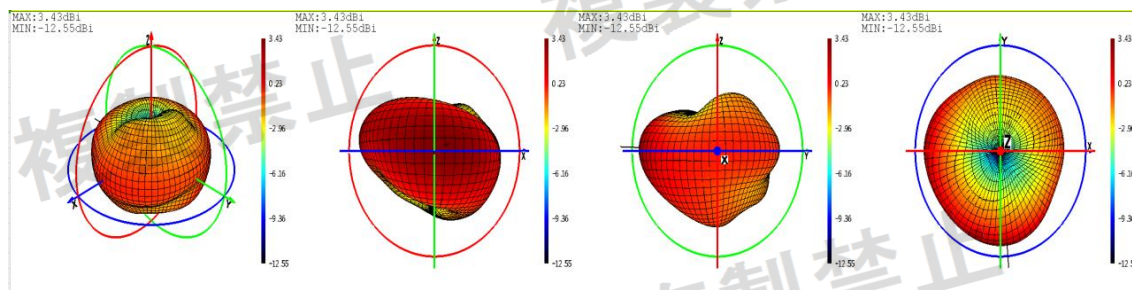
4.2.1. 3D Radiation Pattern



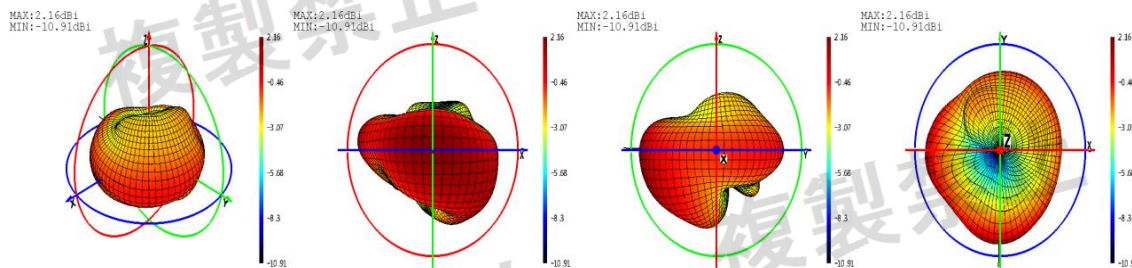


LORA(868Mhz)

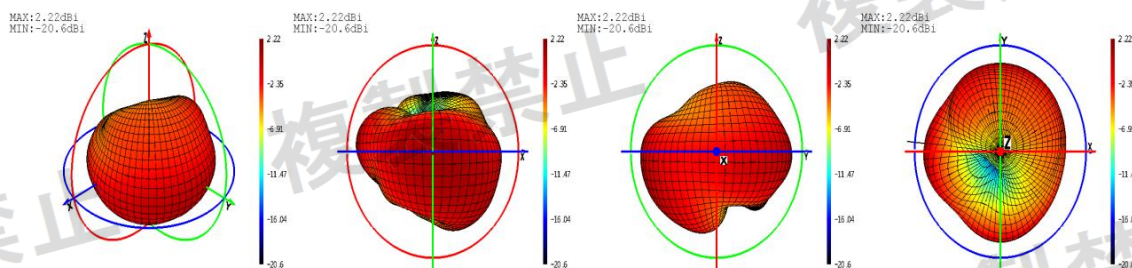
830MHz



868MHz

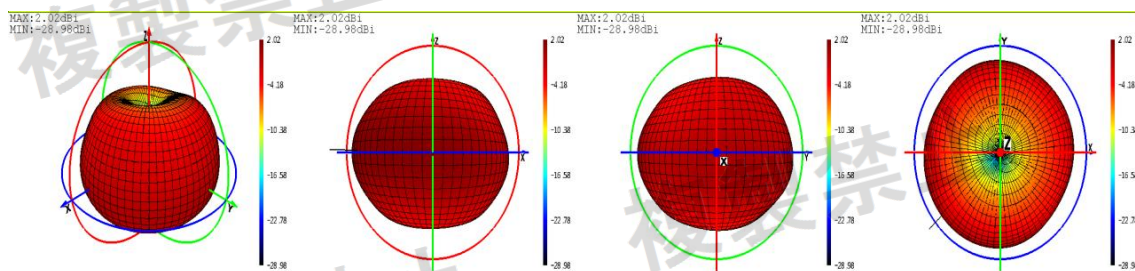


886MHz

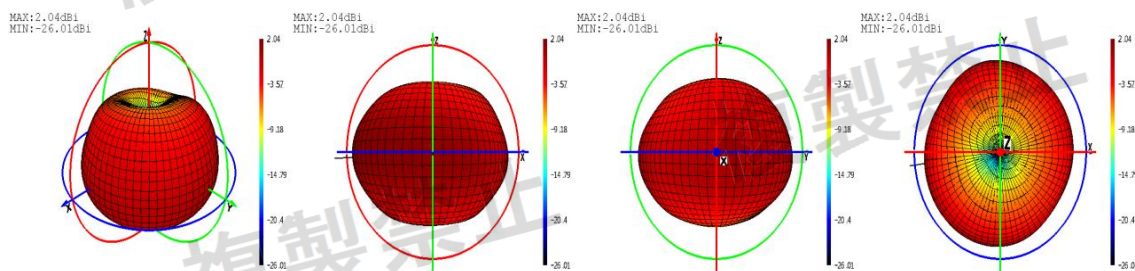


LORA(915Mhz)

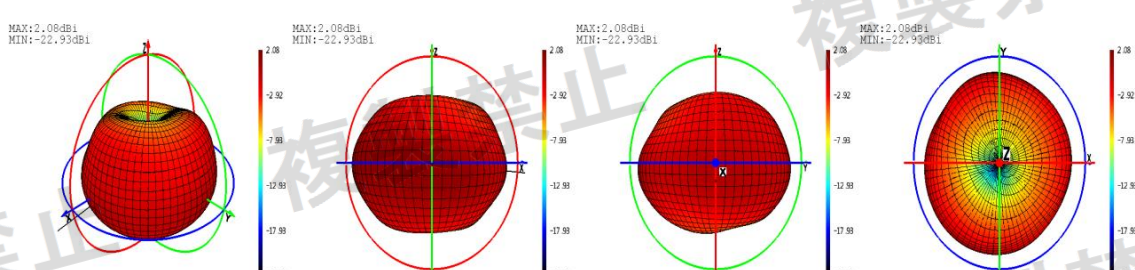
900MHz

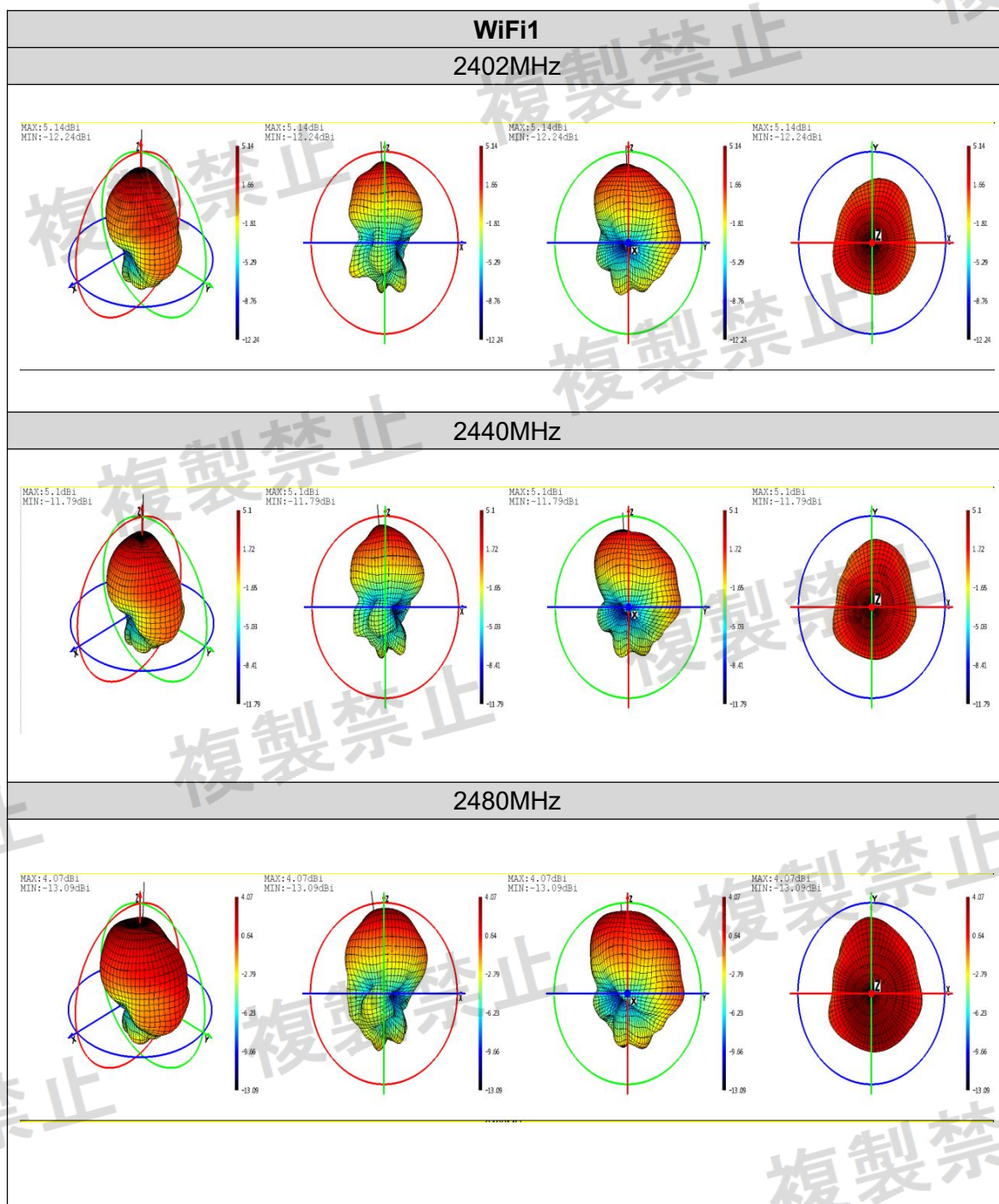


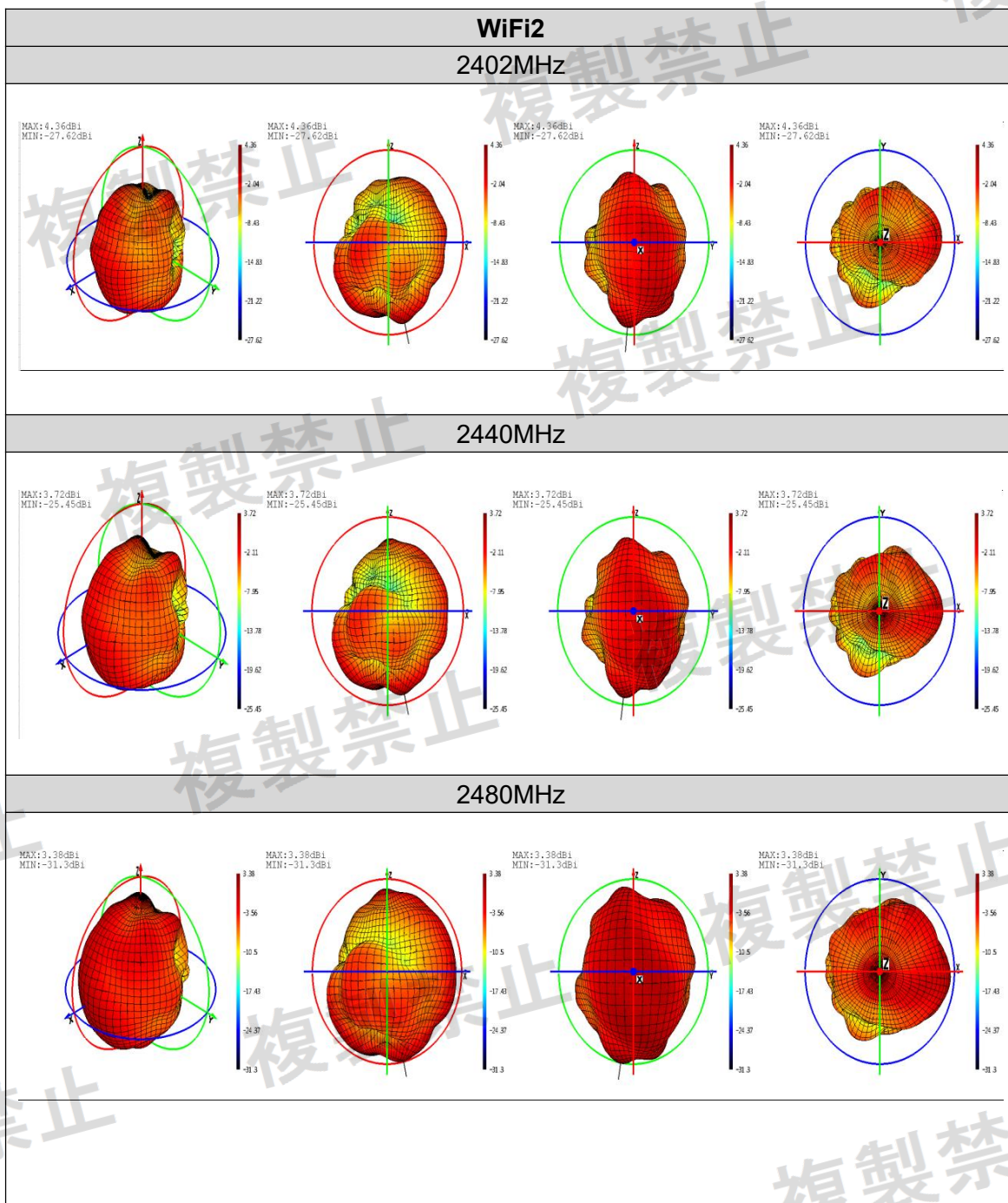
915MHz

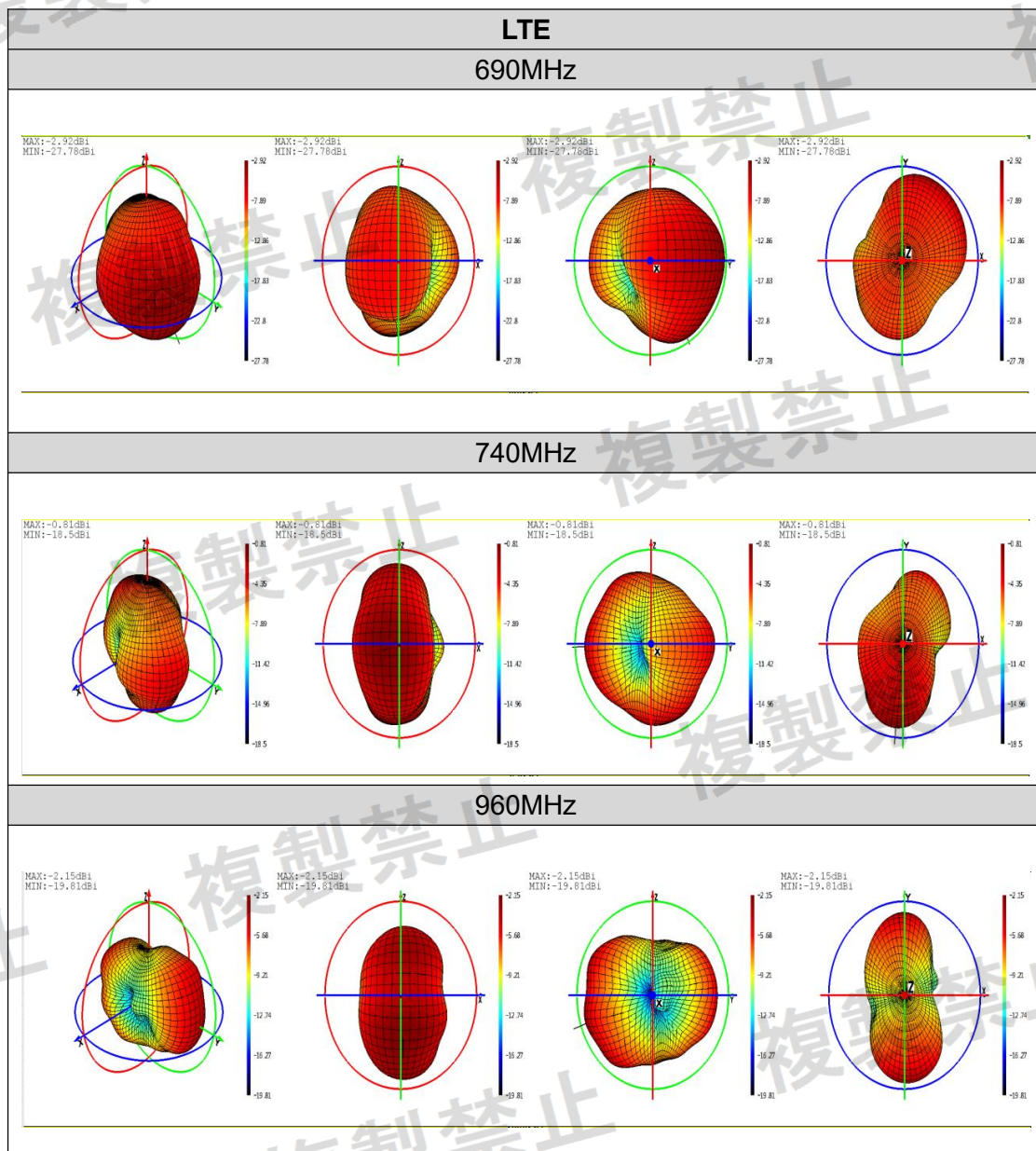


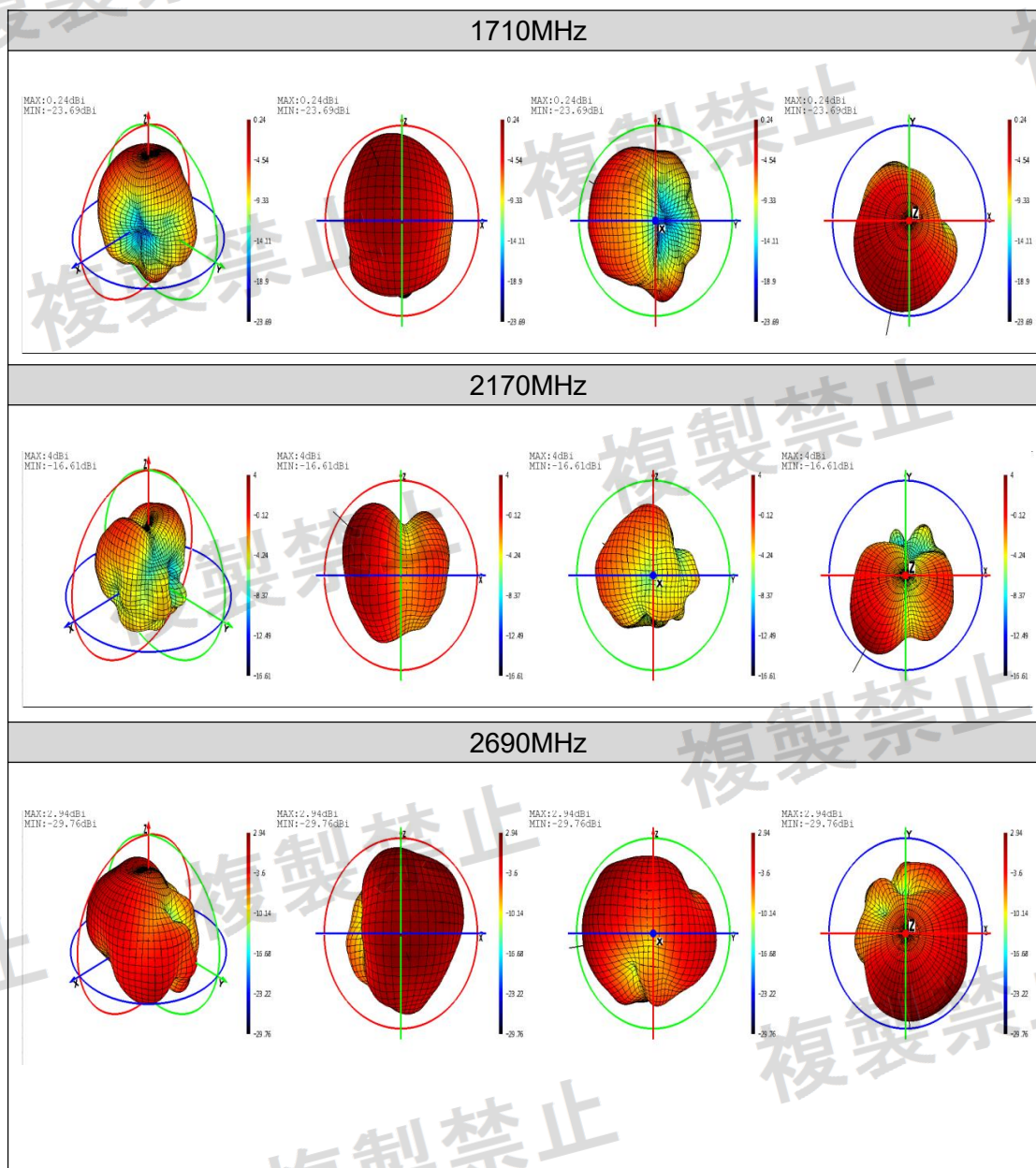
930MHz







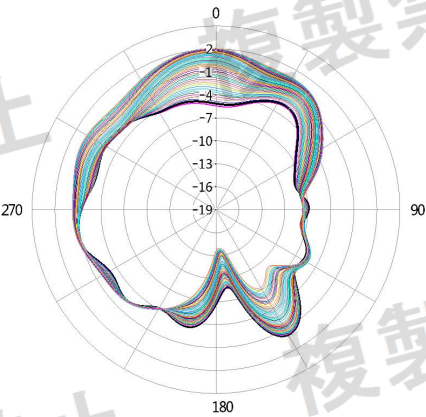




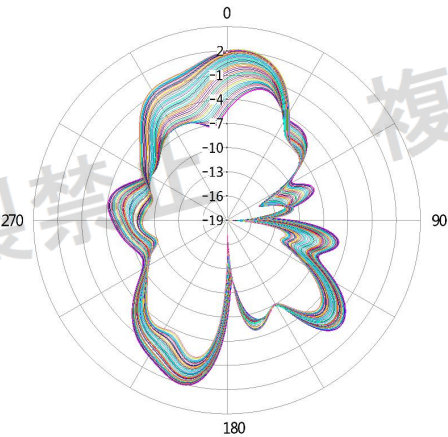
4.2.2. 2D Radiation Pattern

BLE0

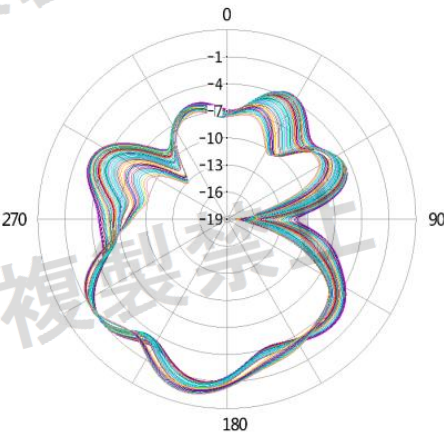
E1, XZ-Face, $\phi=0^\circ$; (E1, $\theta=0^\circ\sim360^\circ$, $\phi=0^\circ$)



E2, YZ-Face, $\phi=90^\circ$; (E2, $\theta=0^\circ\sim360^\circ$, $\phi=90^\circ$)



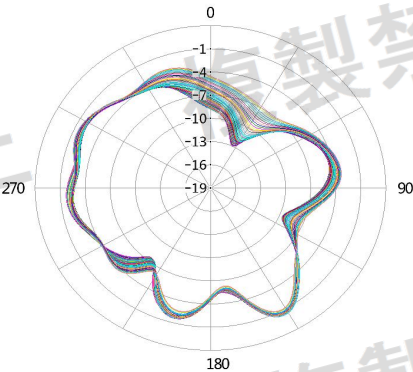
H, XY-Face, $\theta=90^\circ$; (H, $\phi=0^\circ\sim360^\circ$, $\theta=90^\circ$)



BLE1

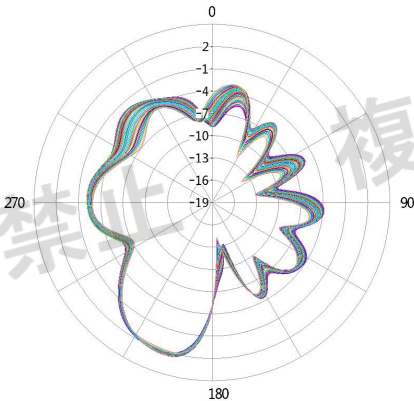
E1, XZ-Face, $\phi=0^\circ$; (E1, $\theta=0\sim360^\circ$, $\phi=0^\circ$)

Angle: 306.59
Power: -7.59



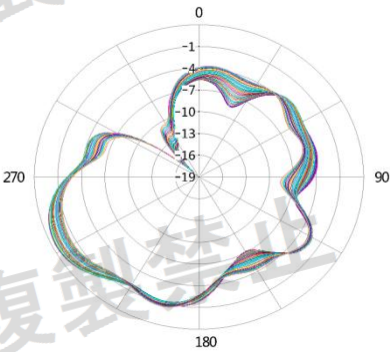
E2, YZ-Face, $\phi=90^\circ$; (E2, $\theta=0\sim360^\circ$, $\phi=90^\circ$)

Angle: 23.1
Power: 14.59

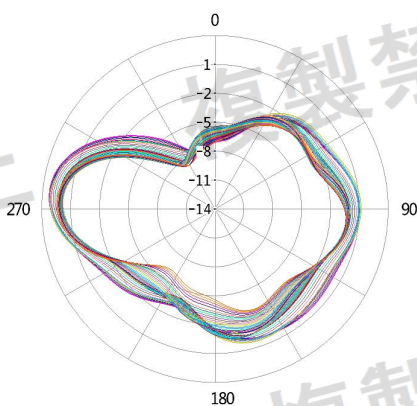
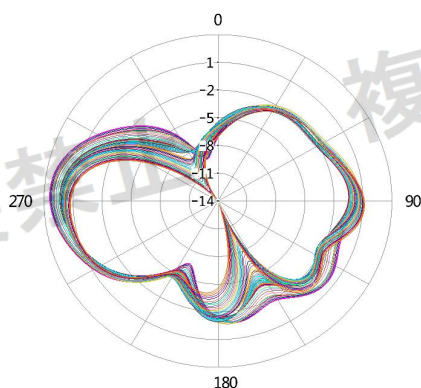
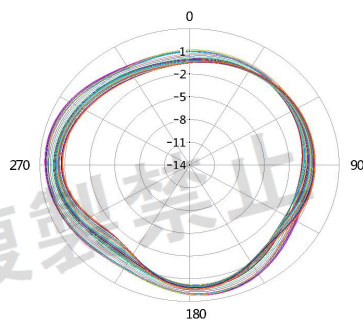


H, XY-Face, $\theta=90^\circ$; (H, $\phi=0\sim360^\circ$, $\theta=90^\circ$)

Angle: 32.93
Power: 18.15

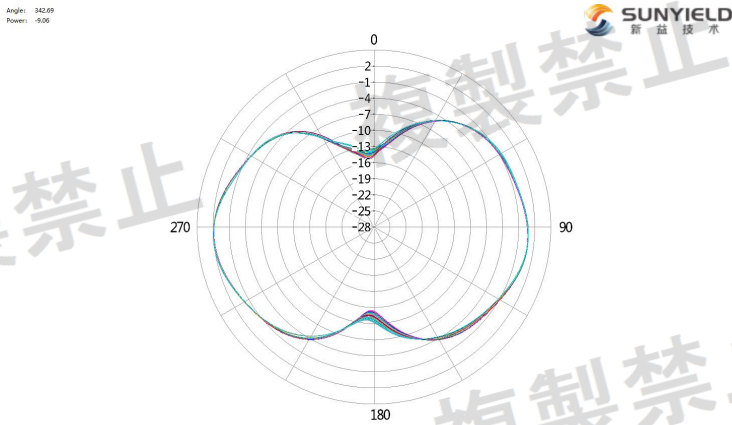


LORA(868Mhz)

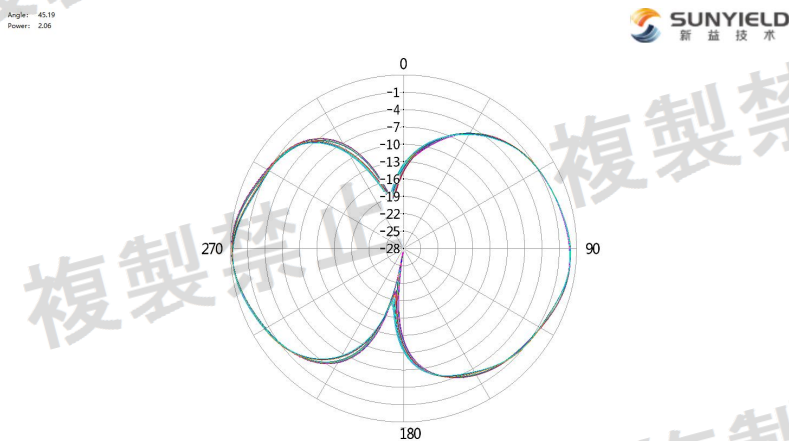
E1, XZ-Face, $\phi=0^\circ$; (E1, $\theta=0^\circ\sim 360^\circ$, $\phi=0^\circ$)Angle: 42.1
Power: 23.16E2, YZ-Face, $\phi=90^\circ$; (E2, $\theta=0^\circ\sim 360^\circ$, $\phi=90^\circ$)Angle: 68.65
Power: 14.1H, XY-Face, $\theta=90^\circ$; (H, $\phi=0^\circ\sim 360^\circ$, $\theta=90^\circ$)Angle: 15.82
Power: 6.13

LORA(915Mhz)

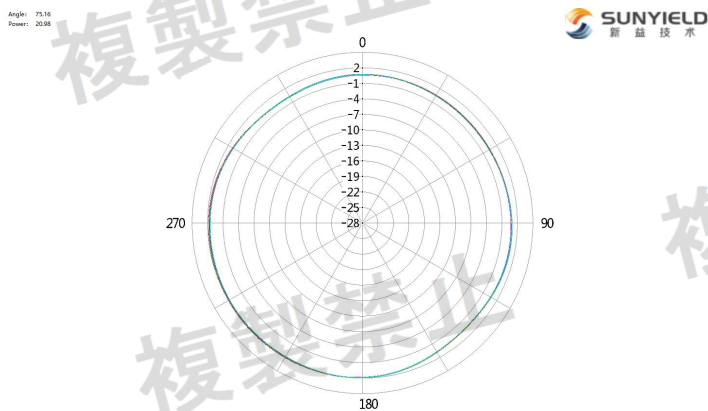
E1, XZ-Face, phi=0° ; (E1, theta=0~360° , phi=0°)



E2, YZ-Face, phi=90° ; (E2, theta=0~360° , phi=90°)



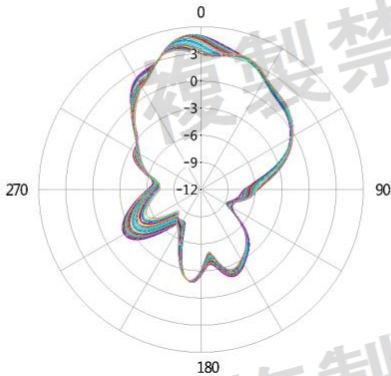
H, XY-Face, theta=90° ; (H, phi=0~360° , theta=90°)



WIFI0

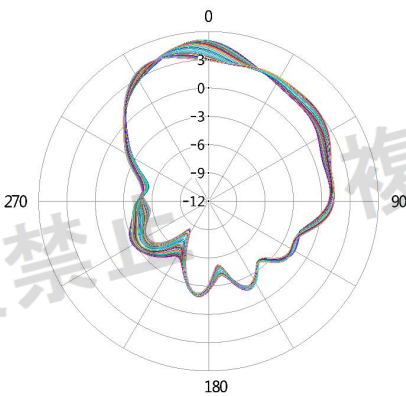
E1, XZ-Face, phi=0° ; (E1, theta=0~360° , phi=0°)

Angle: 322.5
Power: -5.72



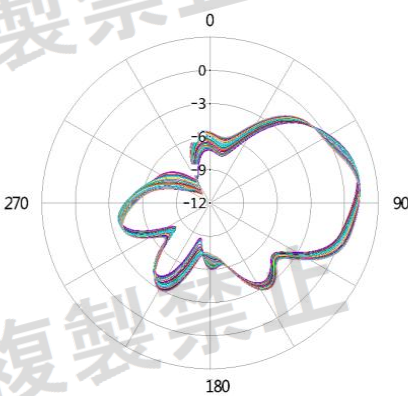
E2, YZ-Face, phi=90° ; (E2, theta=0~360° , phi=90°)

Angle: 33.25
Power: -13.31



H, XY-Face, theta=90° ; (H, phi=0~360° , theta=90°)

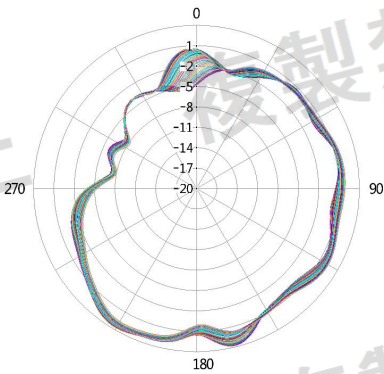
Angle: 61.47
Power: 8.02



WIFI1

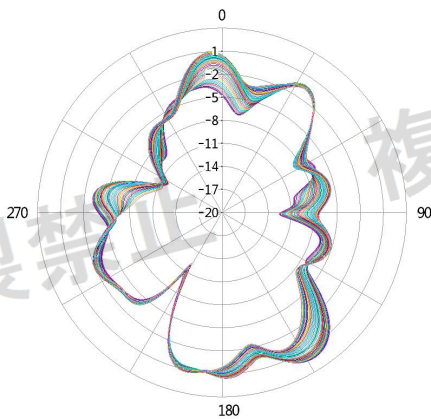
E1, XZ-Face, $\phi=0^\circ$; (E1, $\theta=0\sim360^\circ$, $\phi=0^\circ$)

Angle: 84.87
Power: 13.26



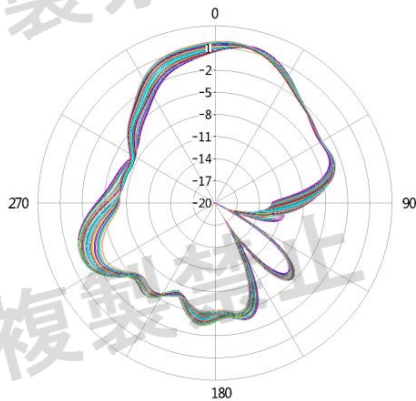
E2, YZ-Face, $\phi=90^\circ$; (E2, $\theta=0\sim360^\circ$, $\phi=90^\circ$)

Angle: 60.27
Power: -0.94



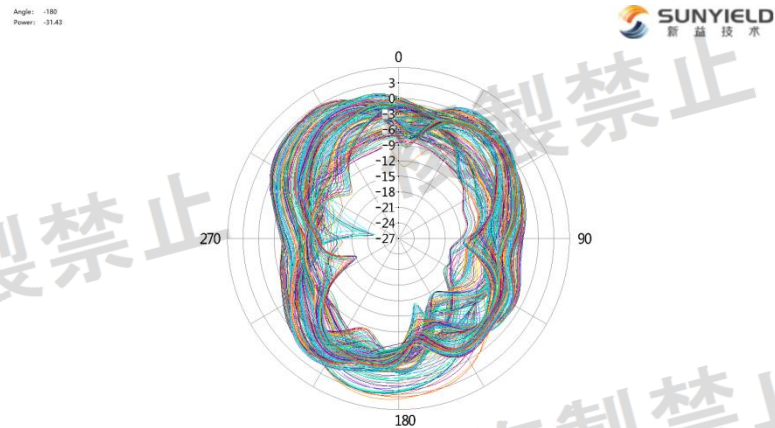
H, XY-Face, $\theta=90^\circ$; (H, $\phi=0\sim360^\circ$, $\theta=90^\circ$)

Angle: 80.98
Power: 2.18

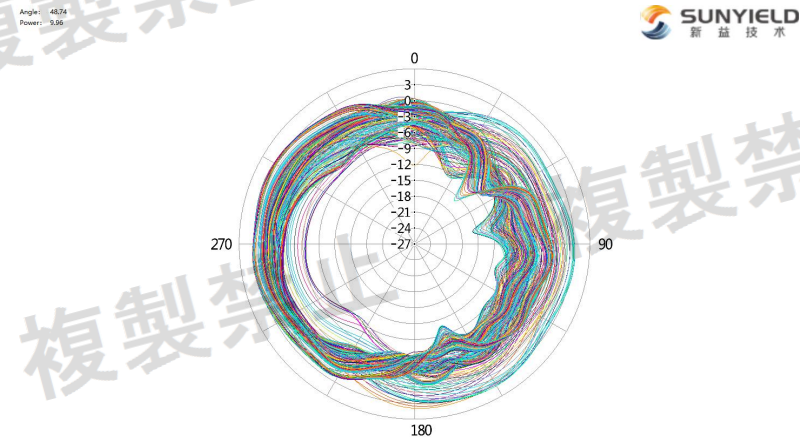


LTE

E1, XZ-Face, $\phi=0^\circ$; (E1, $\theta=0^\circ\sim360^\circ$, $\phi=0^\circ$)



E2, YZ-Face, $\phi=90^\circ$; (E2, $\theta=0^\circ\sim360^\circ$, $\phi=90^\circ$)



H, XY-Face, $\theta=90^\circ$; (H, $\phi=0^\circ\sim360^\circ$, $\theta=90^\circ$)

