

WA-P-LTE12LTE11LBLB-12-001-B Specification

1. Explanation of part number :

$$\frac{\underline{\mathbf{WA}}}{(1)} - \frac{\underline{\mathbf{P}}}{(2)} - \frac{\underline{\mathbf{LTE12LTE11LBLB}}}{(3)} - \frac{\underline{\mathbf{12}}}{(4)} - \frac{\underline{\mathbf{001}}}{(5)} - \frac{\underline{\mathbf{B}}}{(6)}$$

(1) Product Type : 1.LTE Antenna 2.WiFi Antenna 3.BT+WiFi5.8G Antenna

(2) Material: PCB+CABLE

(3) Frequency : ①699MHz-960MHz, 1710MHz-2690MHz

②1710MHz-2690MHz

③2400MHz-2500MHz, 5150MHz-5850MHz

④2400MHz-2500MHz, 5150MHz-5850MHz

(4) Coaxial Cable Type : 12

(5) Suffix :001

(6) B:車用前装

2. Storage Condition:

Temperature	-40 to +90 °C
Humidity	65±20 % RH

3. Operating Condition:

Temperature	-40 to +90 °C
Humidity	65±20 % RH

UNLESS OTHER SPECIFIED TOLERANCES ON :

$$X=\pm \quad X.X=\pm \quad X.XX=\pm$$

ANGLES=± **HOLEDIA=±**



佳邦科技股份有限公司

INPAQ TECHNOLOGY CO., LTD.

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SCALE :

UNIT : mm

DRAWN BY：骆拓夫

CHECKED BY: 赵付辉

DESIGNED BY : 牛永林

APPROVED BY : 赵付辉

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4. Electrical Specification :

Those specifications were specially defined for 惠州华阳_ **HS7012A (C857 海外版)** **LTE&WIFI** model, and all characteristics were measured under the model's handset testing.

4-1. Frequency Band:

Frequency Band	MHz
LTE-Main	699MHz-960MHz,1710MHz-2690MHz
LTE-Aux	1710MHz-2690MHz
WIFI	2400MHz-2500MHz, 5150MHz-5850MHz
BT	2400MHz-2500MHz, 5150MHz-5850MHz

4-2. Impedance

50 ohm nominal

4-3. Matching circuit

None

4-4. VSWR

4-4.1 Measuring Method

- 1.A 50 Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the VSWR
2. Keeping this jig away from metal at least 20cm

UNLESS OTHER SPECIFIED TOLERANCES ON :

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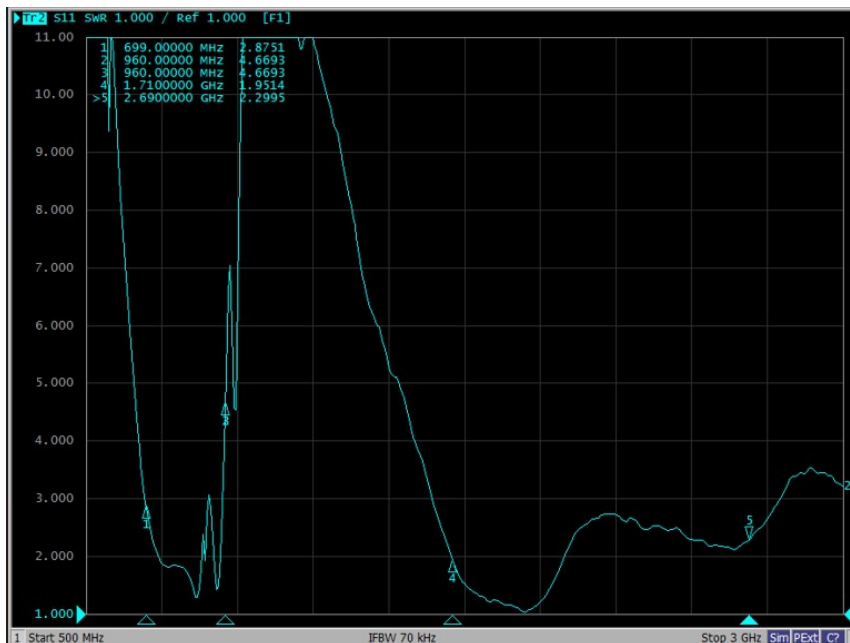
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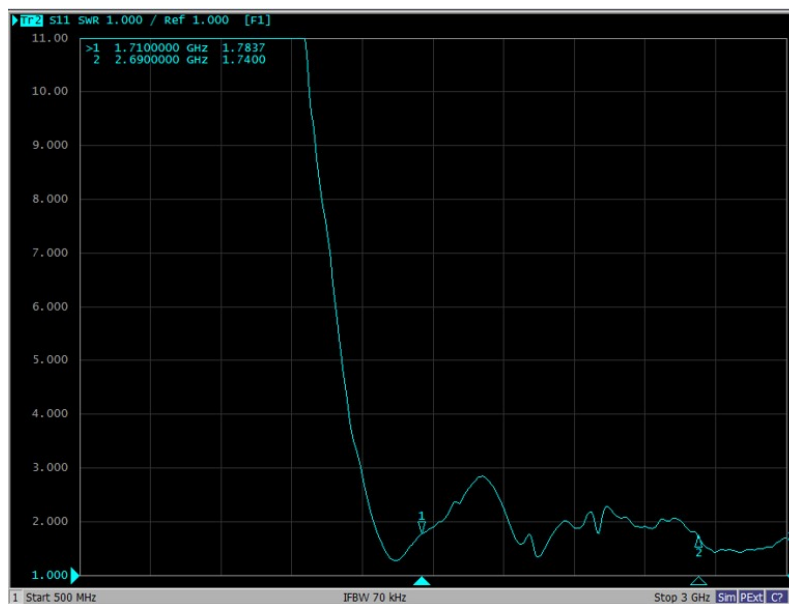
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4-4.2 Measurement frequency points and VSWR value



LTE-MAIN	Frequency (Unit MHz)	699	960	1710	2690
	VSWR	2.88	4.67	1.95	2.30



LTE-AUX	Frequency (Unit MHz)	1710	2690
	VSWR	1.78	1.74

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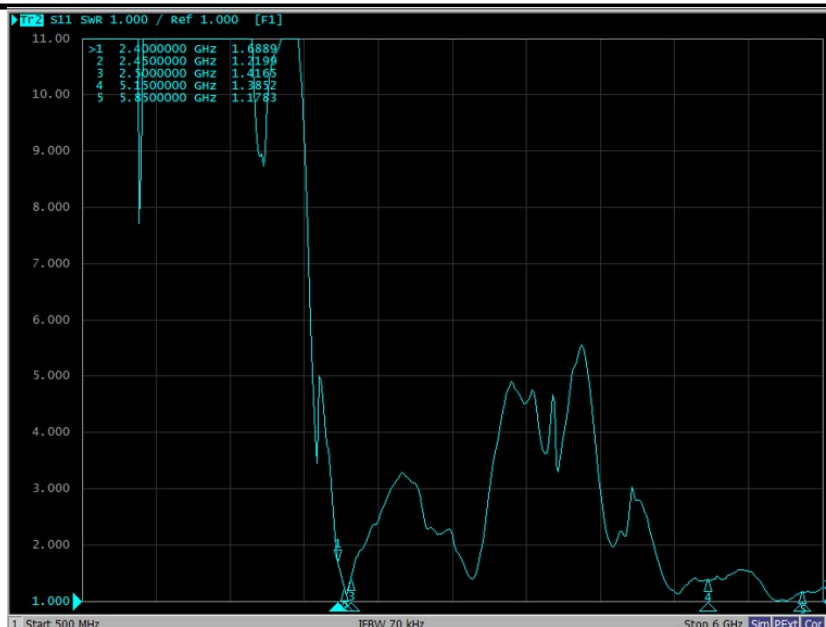
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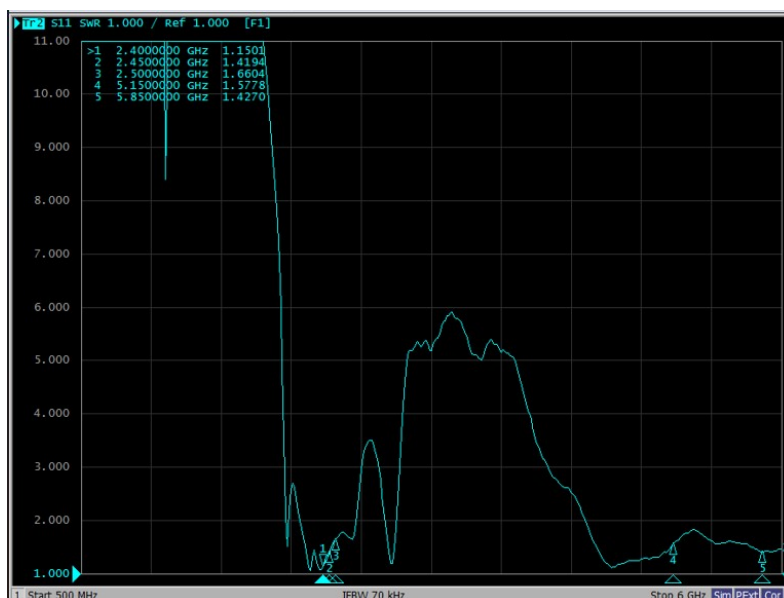
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WiFi	Frequency (Unit MHz)	2400	2500	5150	5850
	VSWR	1.69	1.42	1.39	1.18



BT	Frequency (Unit MHz)	2400	2450	2500	5150	5850
	VSWR	1.15	1.42	1.67	1.58	1.43

4-5. Efficiency and Gain

4-5.1 Measure method

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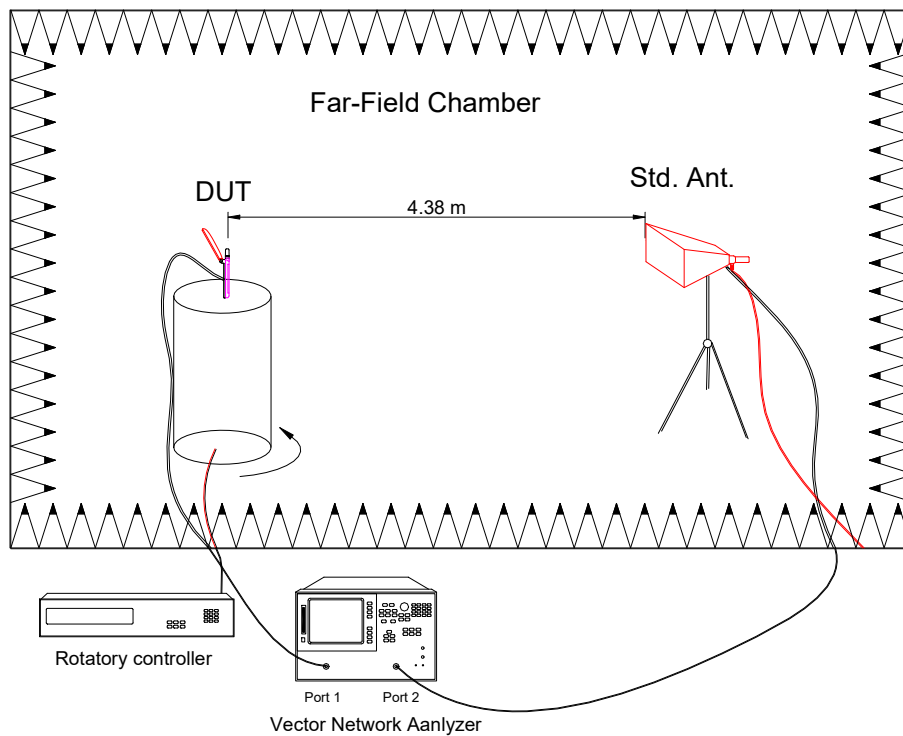
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1. Using a low loss coaxial cable to link a standard handset
2. Fixed this handset jig on chamber's rotator plane
3. Linking jig into network analyzer port and using a probing horn antenna to collect data.
4. Using another standard gain horn antenna to calibrated those data

4-5.2 Chamber definition

1. An anechoic chamber (7mx4mx3m) which satisfied far-field condition was applied to avoid multi-path effect
2. The quite room region is 40cmx40cmx40cm at the center of rotator
3. The distance between DUT and standard antenna is 4.38 m
4. Probing antenna (9120D horn antenna) and standard gain horn antenna (BBHA9120 LPF 700MHz ~6GHz)



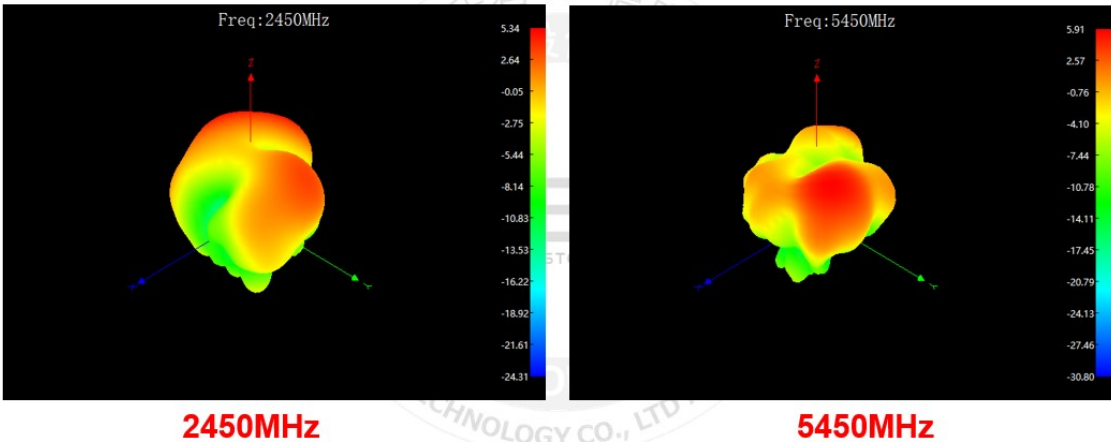
4-5.3 Efficiency and Gain

Antenna gain is marked (dBi) and is based on STANDARD HORN antenna. The data shows Peak Gain and Average Gain.

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3D Radiation Pattern Results

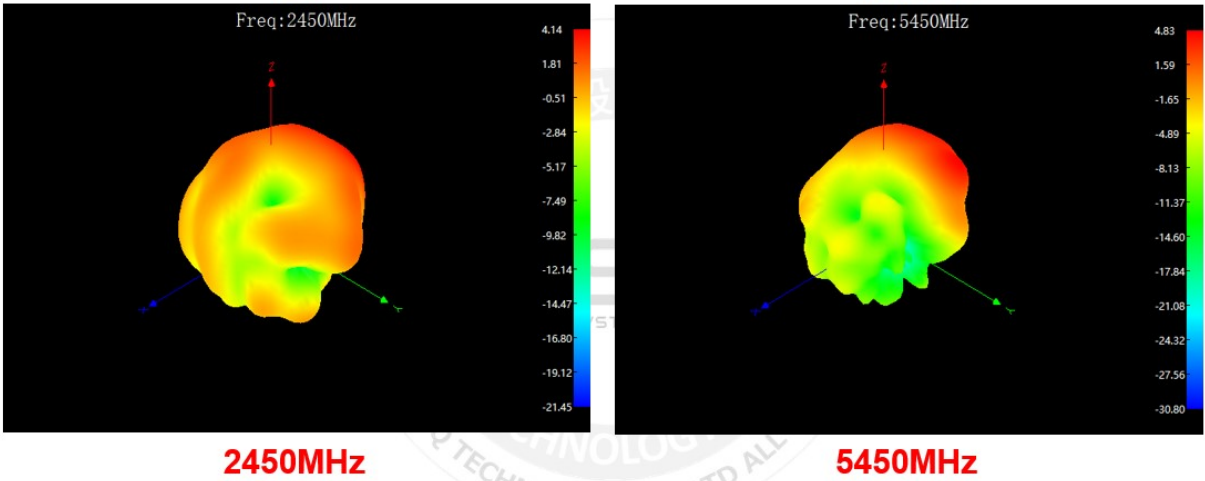
WIFI



3D Radiation Pattern Results

BT

WiFi 5G



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ANGLES=± HOLEDIA=±

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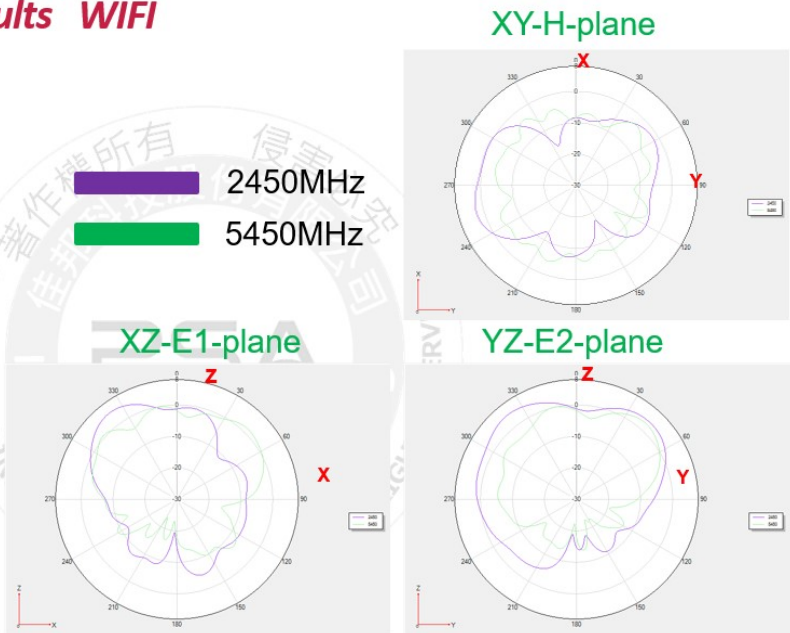
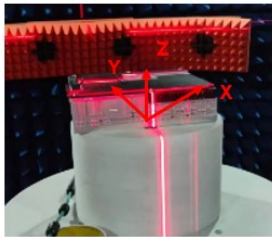
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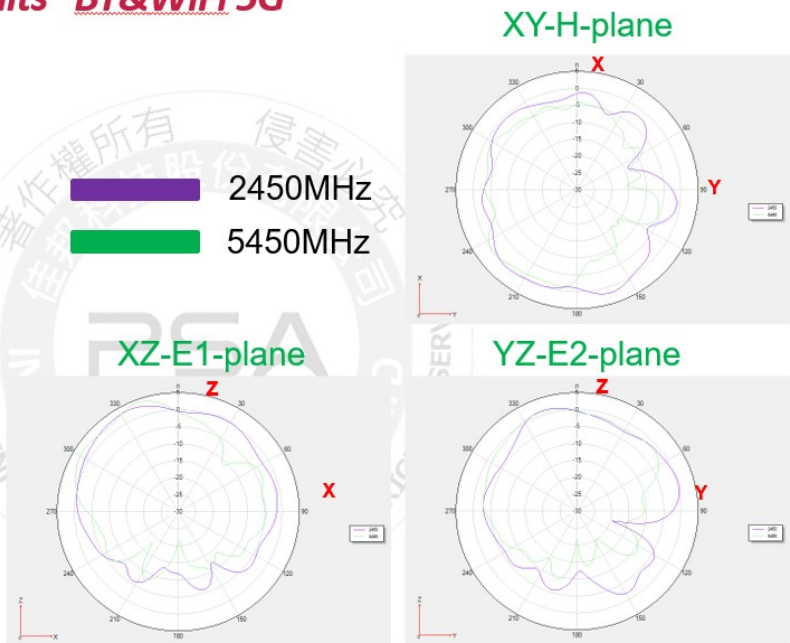
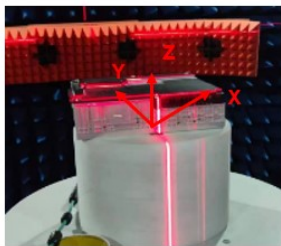
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2D Radiation Pattern Results WIFI



2D Radiation Pattern Results BT&WiFi 5G



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X=± X.X=± X.XX=±

ANGLES=± HOLEDIA=±

SCALE :

UNIT : mm

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Results Summary-Peak Gain &Efficiency

Frequency (MHz)	LTE MAIN			Frequency (MHz)	LTE MAIN		
	Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)		Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)
699	-4.86	32.66	-1.76	840	-2.36	58.08	1.16
710	-4.45	35.89	-1.32	850	-2.88	51.52	1.45
720	-3.87	41.02	-1.06	860	-3.87	41.02	1.93
730	-3.74	42.27	-0.96	870	-4.32	36.98	1.47
740	-3.85	41.21	-0.84	880	-4.47	35.73	1.38
750	-3.58	43.85	-0.12	890	-4.11	38.82	1.55
760	-3.1	48.98	-0.06	900	-3.51	44.57	1.54
770	-2.86	51.76	-0.2	910	-3.01	50.00	1.85
780	-2.58	55.21	0.84	920	-2.68	53.95	2.47
790	-2.36	58.08	0.77	930	-2.14	61.09	3.24
800	-2.18	60.53	0.86	940	-2.61	54.83	2.38
810	-2.05	62.37	1	950	-3.56	44.06	1.64
820	-2.01	62.95	1.28	960	-5.21	30.13	-0.42
830	-1.92	64.27	2.37				

Results Summary-Peak Gain &Efficiency

Frequency (MHz)	LTE MAIN			Frequency (MHz)	LTE MAIN		
	Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)		Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)
1710	-2.02	62.81	3.69	2230	-3.19	47.97	3.35
1750	-2	63.1	2.44	2270	-3.29	46.88	4.12
1790	-2.03	62.66	2.53	2310	-3.16	48.31	4.35
1830	-2.38	57.81	2.86	2350	-2.91	51.17	3.99
1870	-1.97	63.53	3.57	2390	-3.16	48.31	4.15
1910	-1.94	63.97	3.62	2430	-2.97	50.47	4.12
1950	-2.04	62.52	3.22	2470	-2.97	50.47	4.15
1990	-2.14	61.09	3.23	2510	-3.04	49.66	3.6
2030	-2.41	57.41	3.32	2550	-3.33	46.45	3.52
2070	-2.65	54.33	3.21	2590	-3.56	44.06	3.88
2110	-2.6	54.95	3.6	2630	-3.49	44.77	3.5
2150	-2.11	61.52	3.61	2670	-3.34	46.34	3.96
2190	-2.74	53.21	3.76	2690	-3.33	46.45	4

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=±

ANGLES=± HOLEDIA=±



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Results Summary-Peak Gain &Efficiency

Frequency (MHz)	LTE AUX			Frequency (MHz)	LTE AUX		
	Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)		Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)
1710	-2.33	58.48	3.03	2230	-1.74	66.99	2.92
1750	-2.07	62.09	3.27	2270	-2.61	54.83	1.86
1790	-1.76	66.68	3.89	2310	-3.07	49.32	3.55
1830	-1.67	68.08	4.31	2350	-2.85	51.88	3.67
1870	-1.84	65.46	3.49	2390	-3.16	48.31	2.8
1910	-1.44	71.78	4.49	2430	-3.71	42.56	3.36
1950	-1.62	68.87	3.83	2470	-4.66	34.2	2.33
1990	-1.8	66.07	3.9	2510	-4.13	38.64	1.94
2030	-1.94	63.97	3.74	2550	-3.64	43.25	2.68
2070	-2.32	58.61	2.56	2590	-3.05	49.55	4.66
2110	-2.83	52.12	1.4	2630	-2.38	57.81	5.28
2150	-2.62	54.7	3.23	2670	-1.94	63.97	6.61
2190	-1.68	67.92	2.87	2690	-2.02	62.81	7.05

Results Summary-Peak Gain &Efficiency

Frequency (MHz)	WiFi (2.4G)			Frequency (MHz)	WiFi (5G)		
	Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)		Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)
2400	-2.82	52.24	4.54	5150	-2.24	59.7	5.59
2410	-2.58	55.21	4.58	5200	-2.17	60.67	6.16
2420	-2.23	59.84	4.69	5250	-2.18	60.53	5.67
2430	-1.98	63.39	4.76	5300	-2.6	54.95	4.93
2440	-2.09	61.8	5.02	5350	-2.48	56.49	5.33
2450	-2.15	60.95	5.34	5400	-2.36	58.08	5.93
2460	-2.08	61.94	5.46	5450	-2.48	56.49	5.91
2470	-2.18	60.53	5.71	5500	-2.51	56.1	6.08
2480	-2.2	60.26	5.72	5550	-2.37	57.94	6.38
2490	-2.21	60.12	5.77	5600	-2.26	59.43	6.64
2500	-2.27	59.29	5.69	5650	-2.07	62.09	6.49
				5700	-2.13	61.24	6.18
				5750	-1.98	63.39	5.93
				5800	-2.01	62.95	6.63
				5850	-2.12	61.38	7.26

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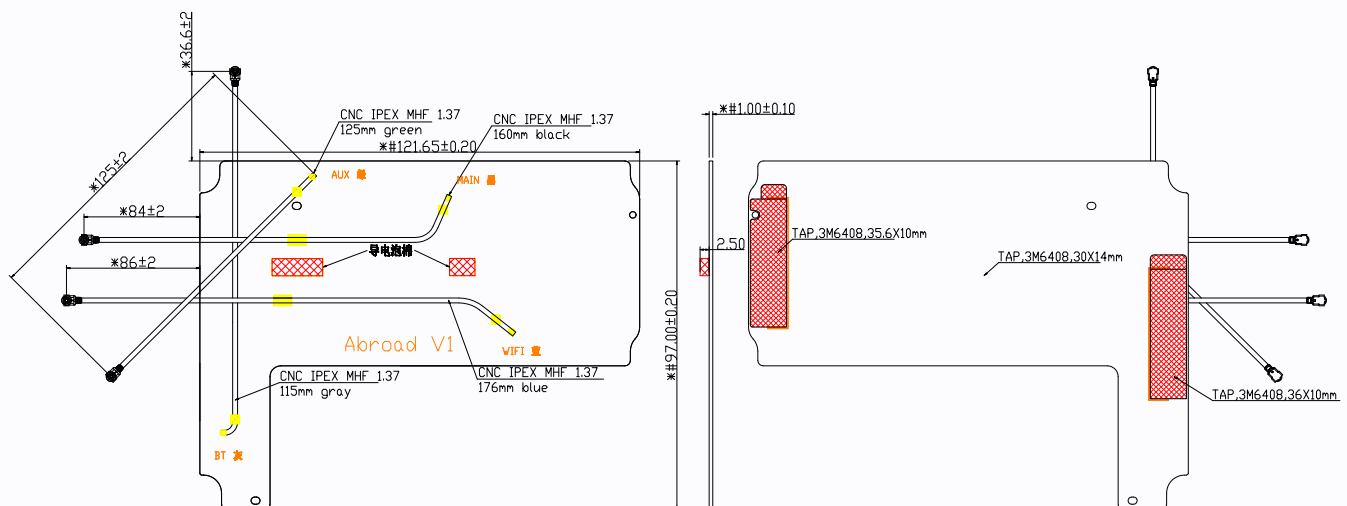
Results Summary-Peak Gain & Efficiency

Frequency (MHz)	BT			Frequency (MHz)	WiFi (5G)		
	Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)		Efficiency (dB)	Efficiency (%)	Peak Gain (dBi)
2400	-2.09	61.80	4.98	5150	-2.22	59.98	3.95
2410	-2.21	60.12	4.58	5200	-2.49	56.36	3.68
2420	-2.12	61.38	4.63	5250	-2.55	55.59	3.7
2430	-2.12	61.38	4.4	5300	-2.67	54.08	4.27
2440	-2.13	61.24	4.25	5350	-2.25	59.57	4.91
2450	-2.09	61.80	4.14	5400	-2.14	61.09	5.23
2460	-2.31	58.75	3.77	5450	-2.11	61.52	4.83
2470	-2.14	61.09	3.77	5500	-1.89	64.71	4.81
2480	-2.28	59.16	3.35	5550	-1.74	66.99	5.01
2490	-2.11	61.52	3.36	5600	-1.85	65.31	4.73
2500	-2.23	59.84	3.02	5650	-1.82	65.77	4.65
				5700	-1.92	64.27	4.57
				5750	-1.8	66.07	4.97
				5800	-1.98	63.39	5.45
				5850	-2	63.1	5.32

5. Mechanical Specification:

5-1. Mechanical Configuration (Unit: mm)

The appearance of the antenna is according to drawing Figure 5-1-1



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