



Product specification acknowledgment.

Shenzhen Maya antenna lab

R&D center in ShenZhen

The mobile communication terminal antenna

PRODUCT NAME **GQ5017**

CUSTOMER NAME 冠群

account party	Development party		
Customer acknowledges	Quality Department	R&D Department	approved by
		ME: RF:	
Date:	Date:		

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1. aim

For the Production from shenzhen maya communication equipment co., LTD. That mobile communication terminal antenna product specifications and test methods for specification, avoid the test conditions, the error caused by different methods

Antenna debug design requirement frequency band.

Fre	BAND
2G	GSM900/850/1800/1900 BC0/1/10
3G	WCDMA1/2/5/8
4G	LTE-1/2/3/4/5/7/8/12/13/17/18/19/20/25/26/28/34/38/39/40/41/66/71
5G	NR-1/2/3/5/7/8/20/25/28/66/38/40/41/71/77/78/79
other	GPS/WIFI/BT NFC FM

2. Electrical

Test method description and data.

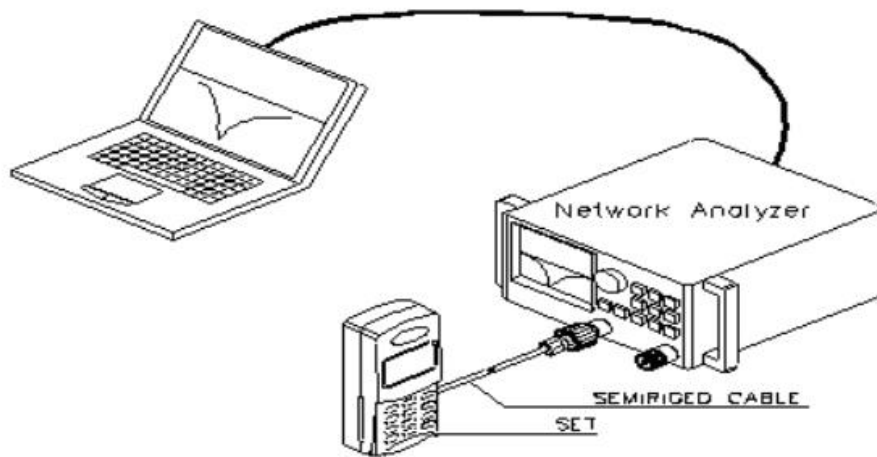
Device name	use
Vector Network Analyzer	S11/Impedance/ Passive Test
Agilent 8960 SP6010 R&S CMU200	GSM, GPRS, EDGE, CDMA2000, 1xeV-DO, TD-SCDMA, WCDMA, HSDPA mobile phone mobile communication equipment test.
R&S CMW500 MT8820C	Including TD-SCDMA, WCDMA, HSDPA, LTE, WIFI, GPS mobile phone mobile communication equipment test.
SP9500E	5G、SA、NSA
Agilent E4438C	Test active GPS
MVG Chamber	Passive Test / OTA active Test / Efficiency/Gain



3. Passive Test Report

Test equipment: network analyzer.

Test method: with a 50 ohm CABLE CABLE from the instrument test port is derived, using the calibration after a calibration mechanism of SMA connector, connecting hand records related to the frequency points corresponding return loss and standing wave ratio data.



测试示意图

3.1 Active Test Report

TRP/TIS

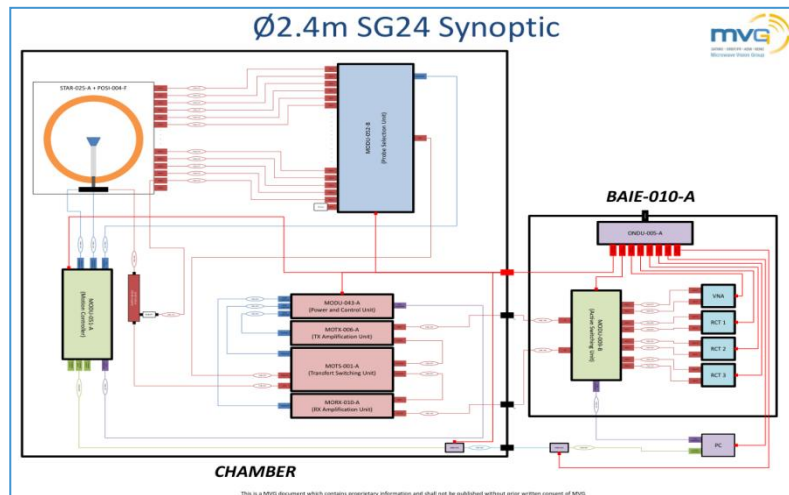
From testing tools, measuring, network analyzer, full waves far field ETS, French MVG SG24LT (Salmio) near field 3 d microwave dark room, the high precision positioning system and its controller and the computer with automatic test procedure test environment: the temperature of 22 °C + 3 °C, humidity 60% plus or minus 60% test methods: Using EST or 24 It Satimo system software Test method and calculation of TRP when tested TRP, DUT (Device Under Test) is in a state of maximum transmitted power, including three to choose channel Test, by positioning system control the location of the DUT, with 15 degrees for step length, measuring three dimensional space, the effective radiated power (EIRP) at various points through the average of the integral sphere, computation formula is as follows

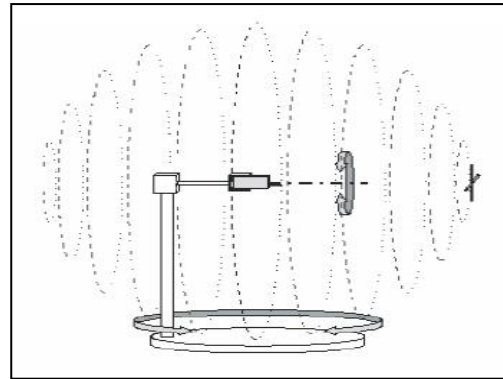
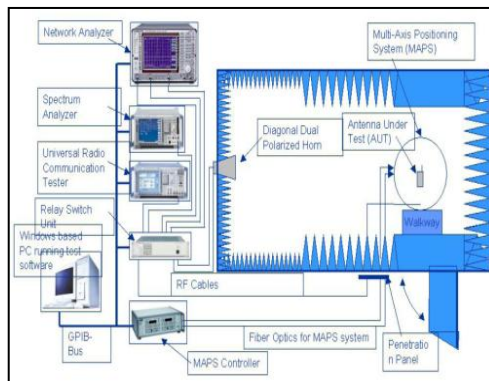
$$TRP \cong \frac{\pi}{2NM} \sum_{i=1}^{N-1} \sum_{j=0}^{M-1} [EiRP_{\theta}(\theta_i, \phi_j) + EiRP(\theta_i, \phi_j)] \sin(\theta_i)$$



In TIS test, the DUT at the maximum transmission power of the state, including three to choose channel test, by controlling the location of the DUT, at 30 degrees for the step length, measuring the three dimensional space each point receiving sensitivity, the average of the sphere by integral calculation, calculation formula is as follows:

$$TIS \cong \frac{2NM}{\pi \sum_{i=1}^{N-1} \sum_{j=0}^{M-1} \left[\frac{1}{EIS_{\theta}(\theta_i, \phi_j)} + \frac{1}{EIS_{\phi}(\theta_i, \phi_j)} \right] \sin(\theta_i)}$$







3.2 Active Report.

2G	BAND	GSM900			DCS1800		
	CHANNEL	1	62	124	512	699	885
	TRP	25.56	26.28	26.33	25.61	25.52	25.2
	TIS			-101.93			-101.38
	BAND	GSM850			PCS1900		
	CHANNEL	128	192	251	512	661	810
	TRP	25.85	26.24	26.5	25.94	25.6	24.97
	TIS			-102.06			-102.23
3G	BAND	WCDMA-B1			WCDMA-B2		
	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	16.4	16.6	16.5	16.7	16.7	16.6
	TIS			-103.1			-103.5
	BAND	WCDMA-B4			WCDMA-B5		
	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	16.7	16.8	16.7	15.6	15.7	16.0
	TIS			-103.4			-102.6
3G	BAND	WCDMA-B6			WCDMA-B8		
	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	15.7	15.6	15.7	15.5	16.0	16.1
	TIS			-101.1			-102.3
	BAND	WCDMA-B19					
	CHANNEL	Low	Medium	High			
	TRP	15.7	15.7	15.7			
	TIS			-101.2			
4G	BAND	LTE-B1			LTE-B2		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	15.41	15.97	15.52	15.3	15.66	15.48
	TIS			-90.26			-90.61
	BAND	LTE-B3			LTE-B4		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	16.44	16.93	16.83	16.56	16.29	16.91
	TIS			-92.49			-92.28



4G	BAND	LTE-B5			LTE-B7		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	15.58	15.65	15.81	13.08	12.86	12.19
	TIS			-89.49			-89.34
	BAND	LTE-B8			LTE-B12		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	15.51	15.86	16.26	15.56	15.97	16.32
	TIS			-88.24			-88.31
4G	BAND	LTE-B13			LTE-B17		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	15.15	15.36	15.72	15.77	15.89	15.48
	TIS			-88.49			-87.19
	BAND	LTE-B18			LTE-B19		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	16.18	16.37	15.39	15.32	15.13	15.98
	TIS			-89.76			-93.28
4G	BAND	LTE-B20			LTE-B25		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	15.13	14.66	14.16	15.87	16.28	16.04
	TIS			-90.58			-91.34
	BAND	LTE-B26			LTE-B28		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	16.12	15.16	15.74	15.33	15.62	15.95
	TIS			-90.28			-92.24
4G	BAND	LTE-B66			LTE-71		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	16.18	16.94	16.85	15.42	15.73	16.24
	TIS			-90.72			-90.29
	BAND	LTE-B34					
	CHANNEL	Low	Middle	High			
	TRP	14.28	14.43	14.67			
	TIS			-89.15			
4G	BAND	LTE-B38			LTE-B39		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	17.76	17.94	18.71	15.77	15.58	15.46
	TIS			-90.78			-92.16
	BAND	LTE-B40			LTE-41		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	15.83	14.38	14.33	17.91	18.06	18.19
	TIS			-90.52			-90.57



5G	BAND	N1			N2		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	17.04	17.61	16.34	16.25	16.53	17.23
	TIS			-91.01			-91.64
	BAND	N3			N5		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	16.48	17.21	17.06	17.08	17.34	17.36
	TIS			-91.27			-86.81
5G	BAND	N7			N8		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	15.05	15.25	15.35	15.97	16.47	16.85
	TIS						-86.42
	BAND	N20			N28		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	16.74	15.11	16.28	15.85	16.12	16.34
	TIS			-86.79			-86.25
5G	BAND	N25			N66		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	16.29	16.98	16.64	17.26	16.17	16.55
	TIS			-91.26			-91.65
	BAND	N38			N40		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	18.79	18.04	18.68	16.67	17.82	16.11
	TIS			-90.79			-89.31
5G	BAND	N41			N77		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	18.41	18.75	18.39	18.37	18.26	18.55
	TIS			-84.89			-85.92
	BAND	N78			N79		
	CHANNEL	Low	Middle	High	Low	Middle	High
	TRP	18.49	18.31	18.24	16.25	17.44	17.89
	TIS			-84.98			-84.86
5G	BAND	N71					
	CHANNEL	Low	Middle	High			
	TRP	15.42	15.78	16.01			
	TIS			-84.89			
WIFI	BAND	WiFi-b			WiFi-a		
	CHANNEL	L	M	H	L	M	H
	TRP	12.02	12.45	12.81	12.15	12.25	12.57
	TIS			-81.26			-70.26



3.3 Passive Test Report.

WIFI/GPS Gain(ANT-8)

Freq	Gain	Freq	Gain	Freq	Gain
1560	0.1	2400	-0.3	5200	2.4
1570	0.2	2420	0.02	5300	2.7
1580	0.5	2440	0.70	5400	2.2
1590	0.5	2460	0.71	5500	2.1
1176	-2.3	2480	0.81	5600	2.1
		2500	0.52	5700	1.5
				5800	1.3
				6000	-3.3
				6300	-4.2
				6600	-4.3
				6900	-4.7

WIFI/GPS Gain(ANT-0)

Freq	Gain	Freq	Gain
2400	0.58	5200	3.81
2420	0.95	5300	3.87
2440	1.33	5400	3.14
2460	1.27	5500	2.79
2480	0.88	5600	1.76
2500	0.75	5700	0.53
		5800	0.23
		6000	1.34
		6300	1.64
		6600	1.28
		6900	1.67

MAIN Gain

Freq	Gain	Freq	Gain	Freq	Gain
700	-4.8	950	-3.0	2160	0.5
710	-4.3	960	-3.8	2180	0.6
720	-5.0	1700	-1.0	2300	0.4
730	-4.0	1720	-1.4	2320	0.7
740	-3.9	1740	-1.0	2340	0.8
750	-3.5	1760	-0.6	2360	0.4
760	-3.0	1780	-0.5	2380	0.6



770	-3.5	1800	-0.4	2400	0.3
780	-3.0	1820	-0.2	2420	0.3
790	-3.5	1840	-0.2	2440	0.01
800	-2.9	1860	-0.4	2460	0.3
810	-2.4	1880	-0.6	2480	0.5
820	-4.1	1900	-0.5	2500	0.2
830	-3.5	1920	-0.8	2520	0.1
840	-3.3	1940	-0.4	2540	-0.05
850	-3.2	1960	-0.6	2560	-0.01
860	-2.9	1980	-0.5	2580	-0.05
870	-2.7	2000	-0.4	2600	-0.12
880	-2.6	2020	-0.4	2620	-0.2
890	-3.2	2040	-0.2	2640	-0.5
900	-2.6	2060	0.2	2660	-0.6
910	-2.0	2080	0.4	2680	-0.7
920	-1.7	2100	0.5	2700	-0.8
930	-1.5	2120	0.5		
940	-1.4	2140	0.6		

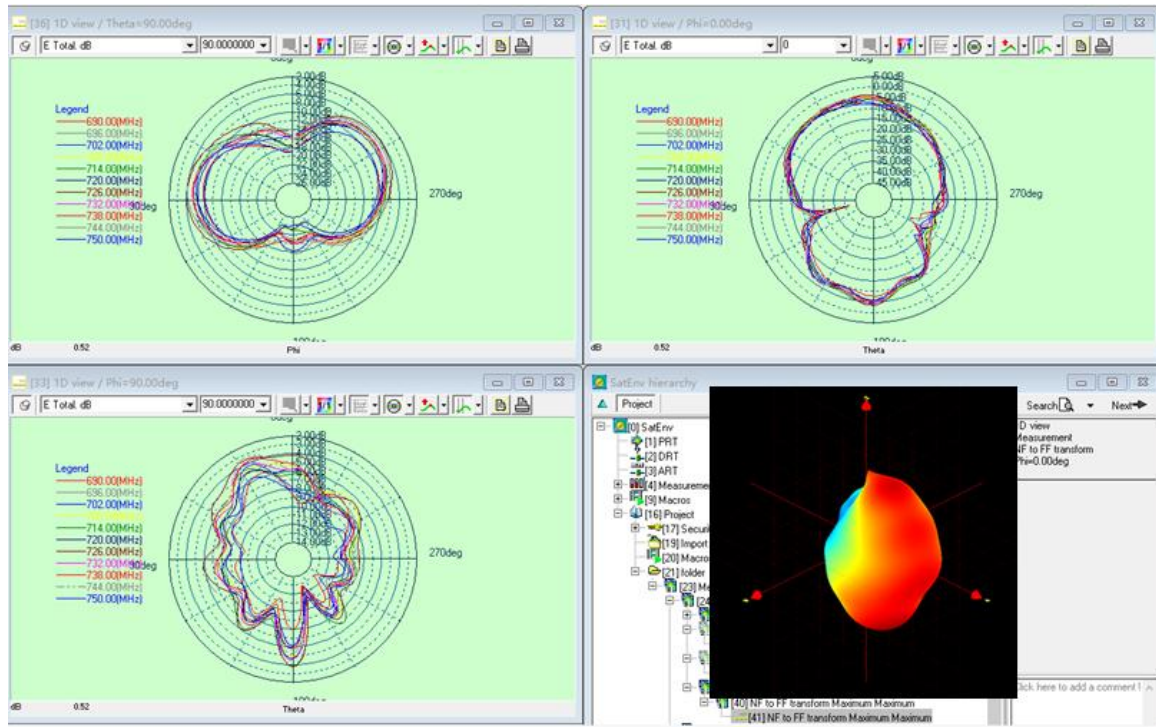
5G MAIN Gain

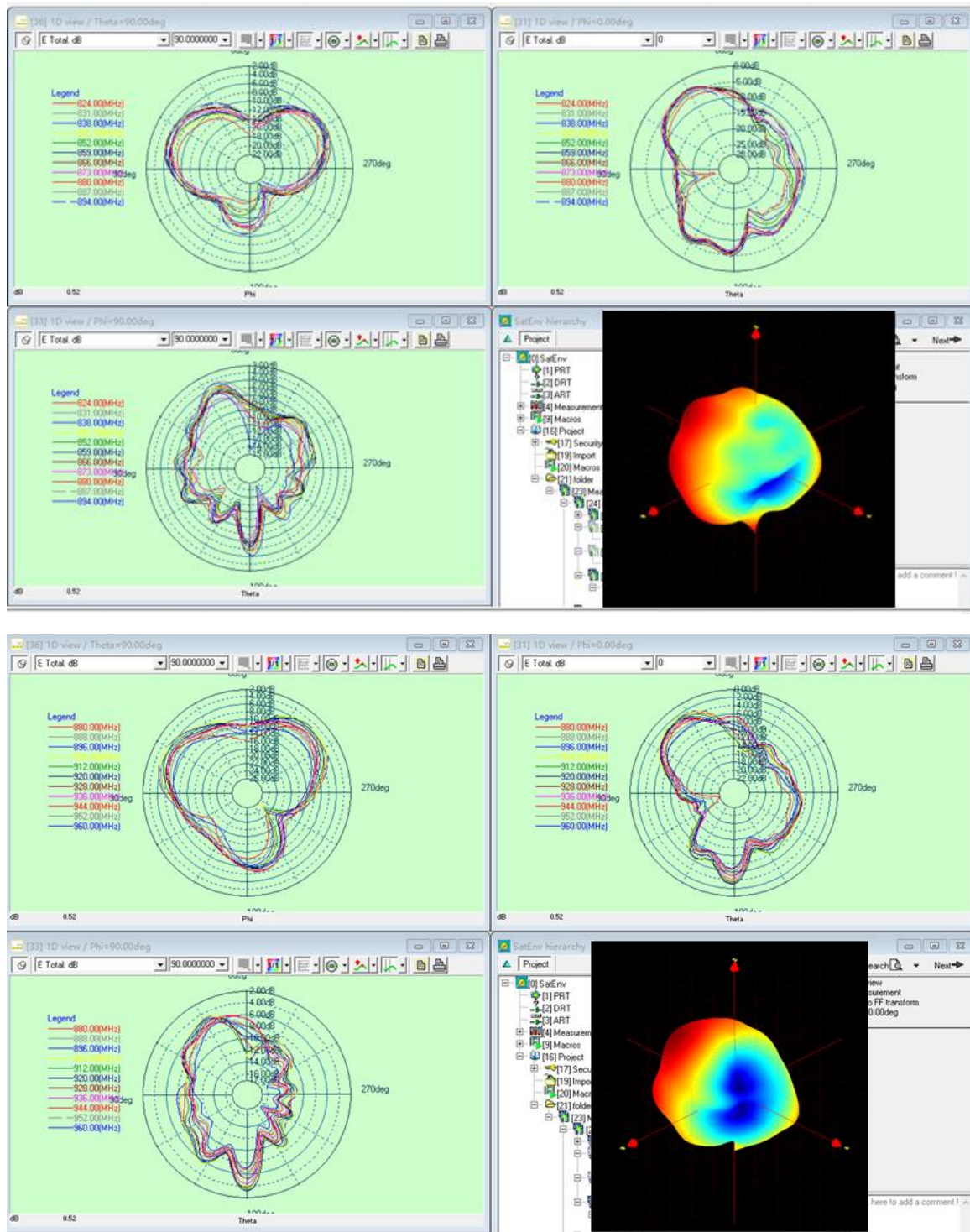
Freq	Gain
3300	1.6
3400	2.3
3500	2.3
3600	1.6
3700	1.5
3800	1.3
3900	1.3
4000	1.5
4100	1.0
4200	1.1
4300	1.2
4600	0.9
4900	0.3



Passive Pattern

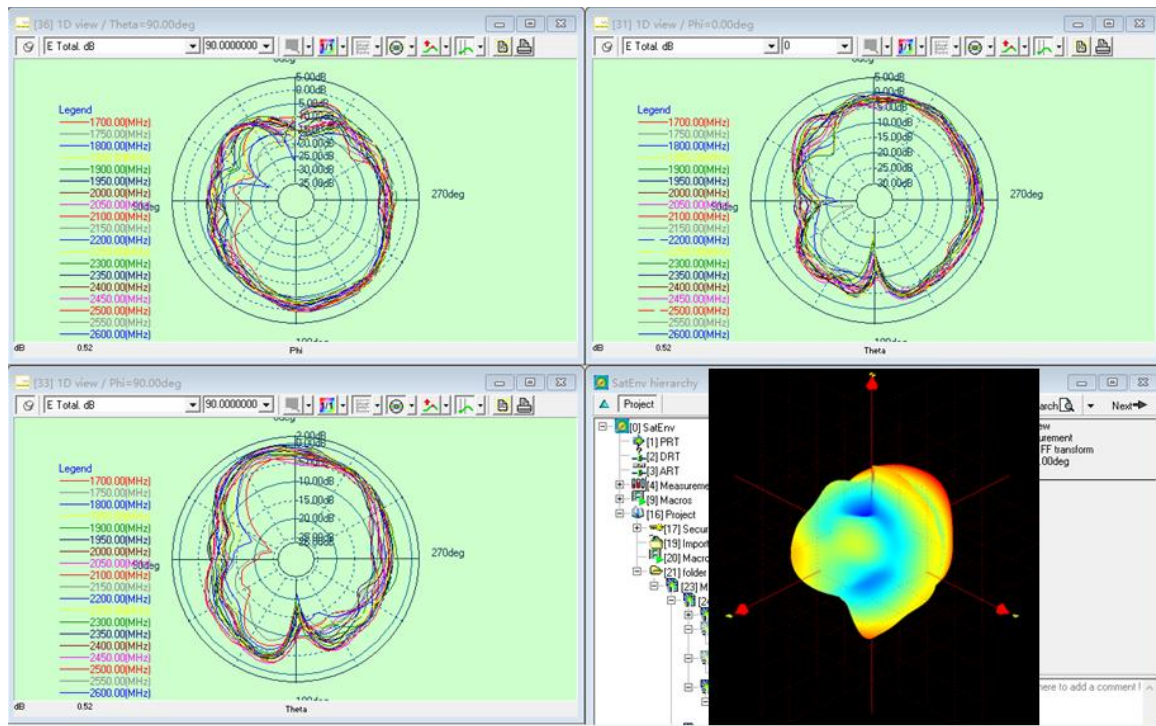
690-960MHz



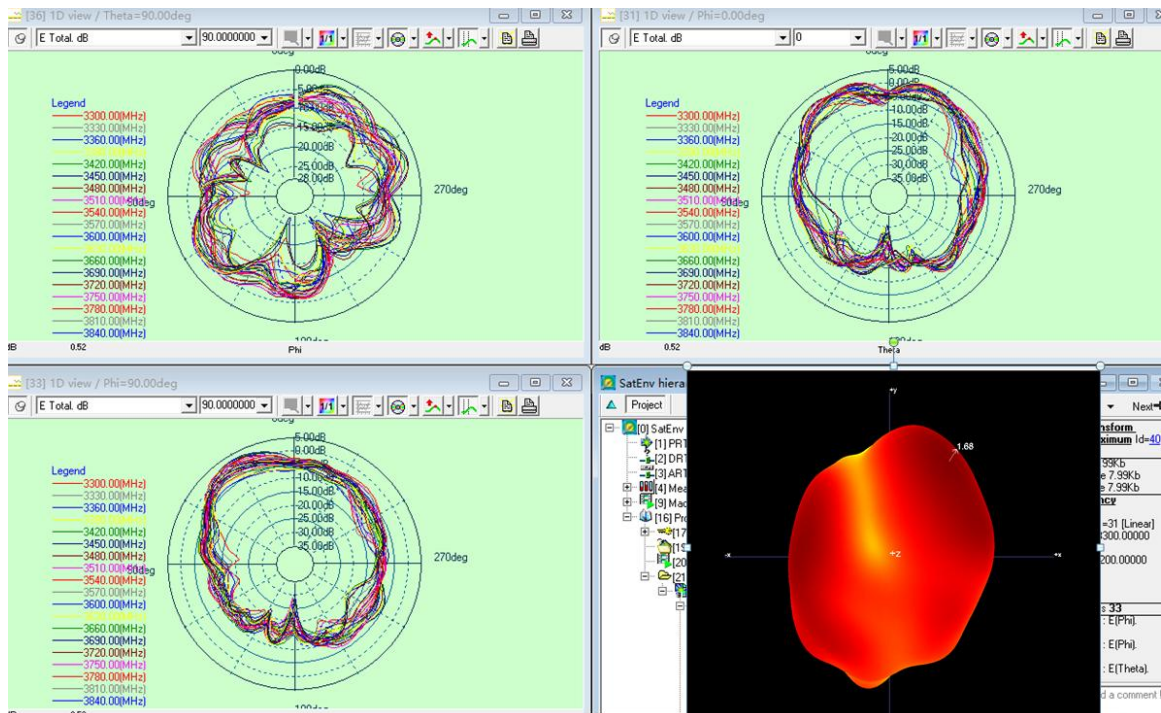




1700-2700MHz

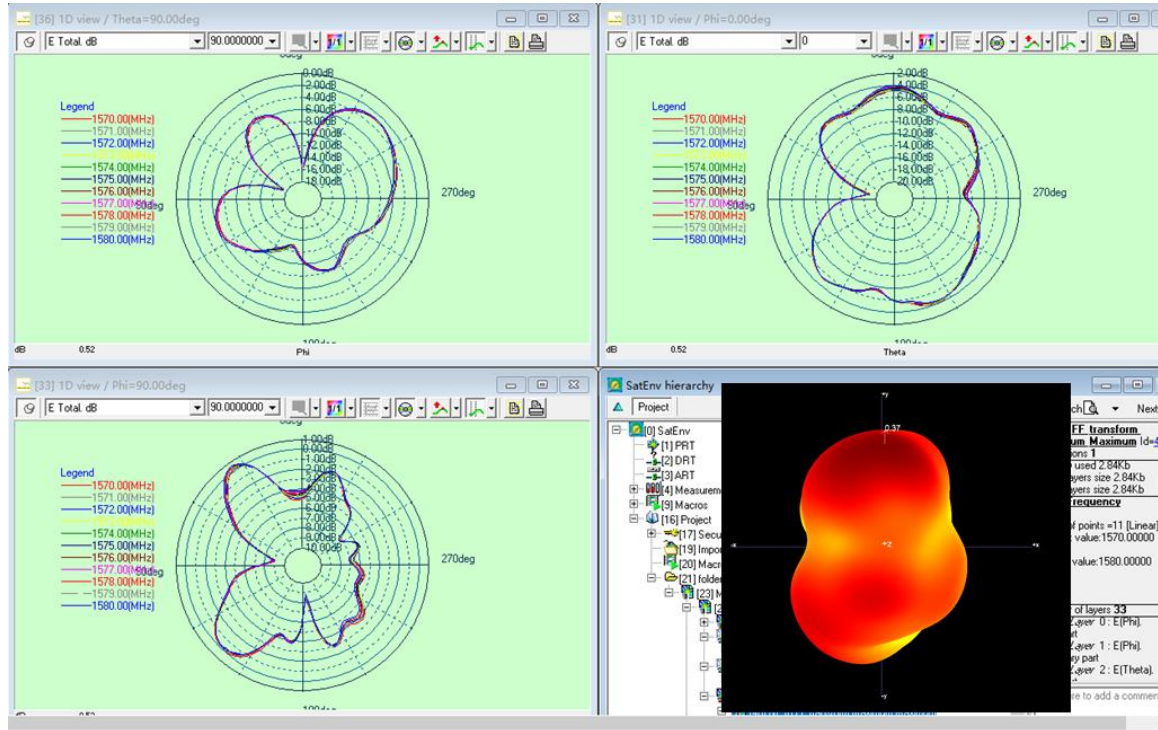


3300-5000MHz

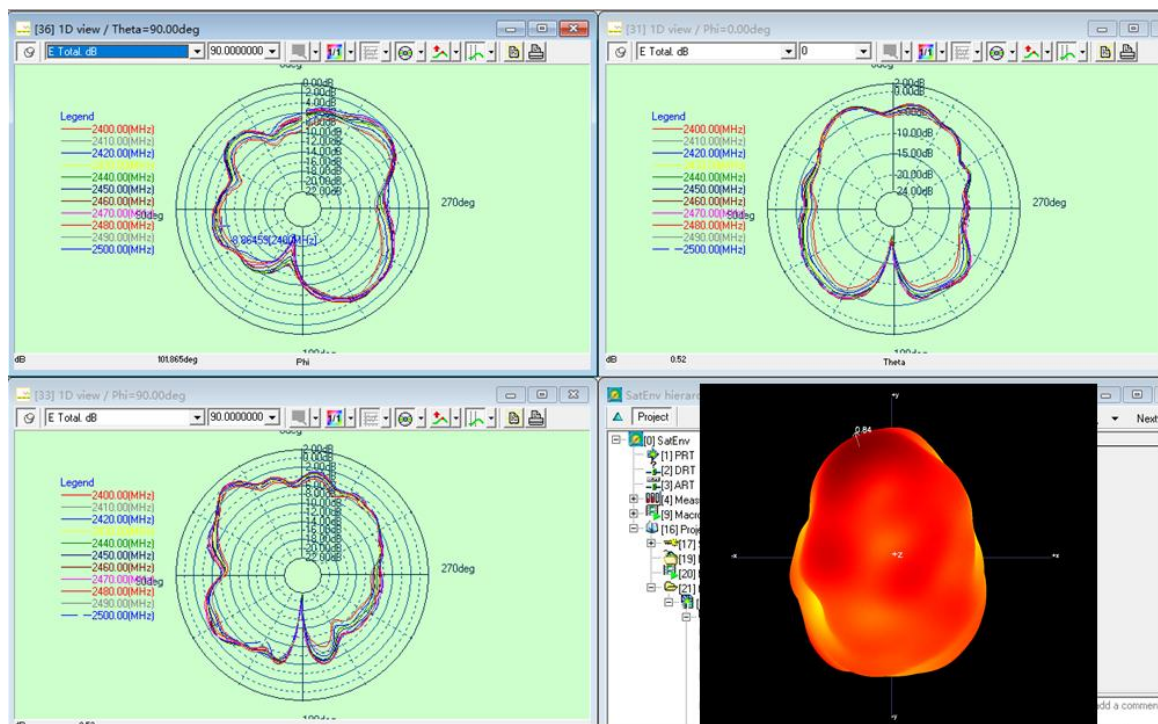




1570-1580MHz

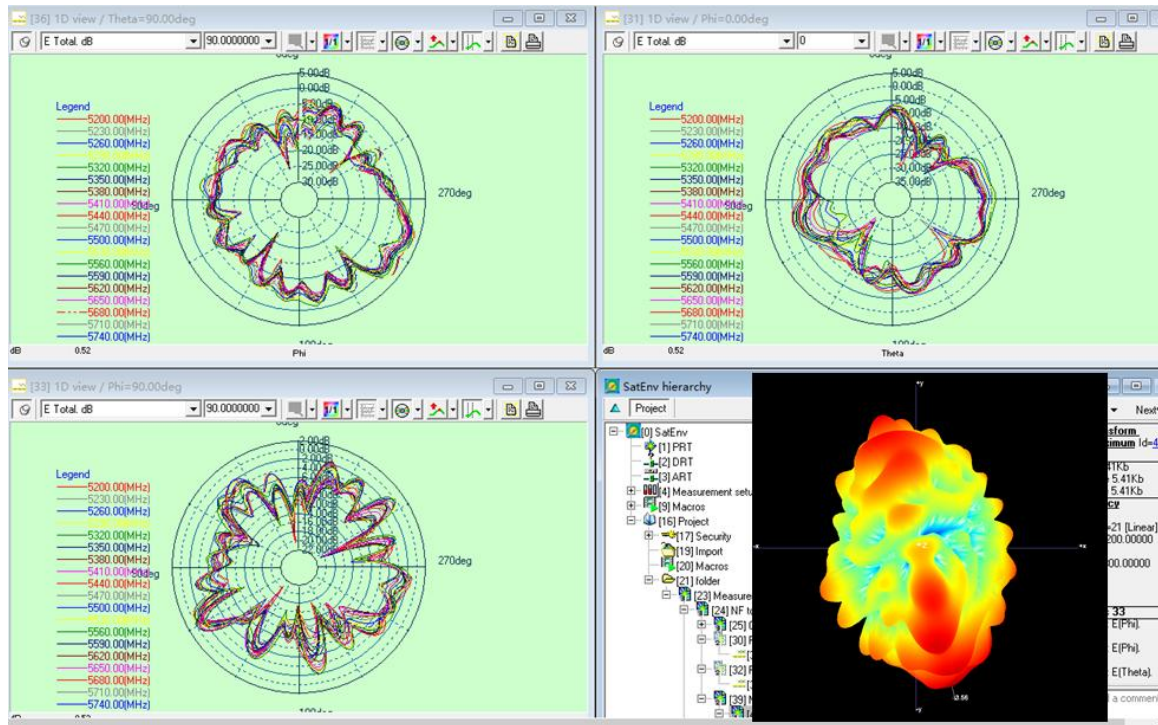


2400-2500MHz





5200-6000MHz



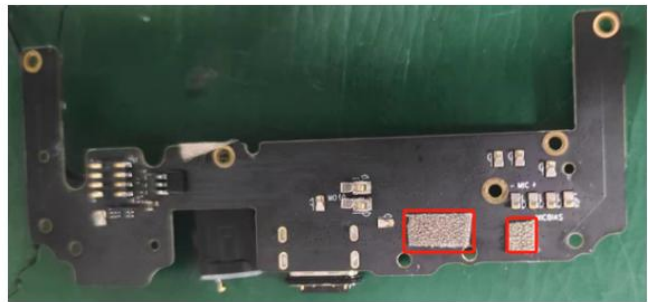
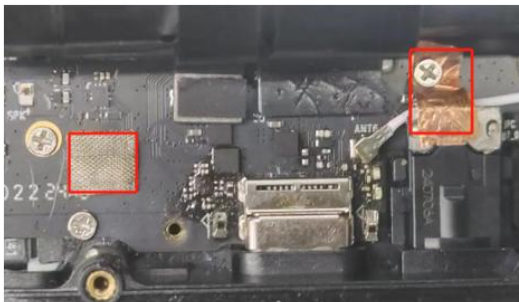
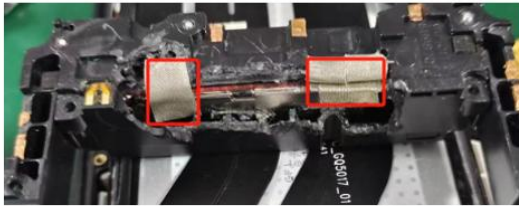


ANT-0天线设计: main antenna design	
位号 Element	值 Value
C2801	5.1nH



5.Environmental treatment

Figure: The motherboard is grounded with a conductive sponge.



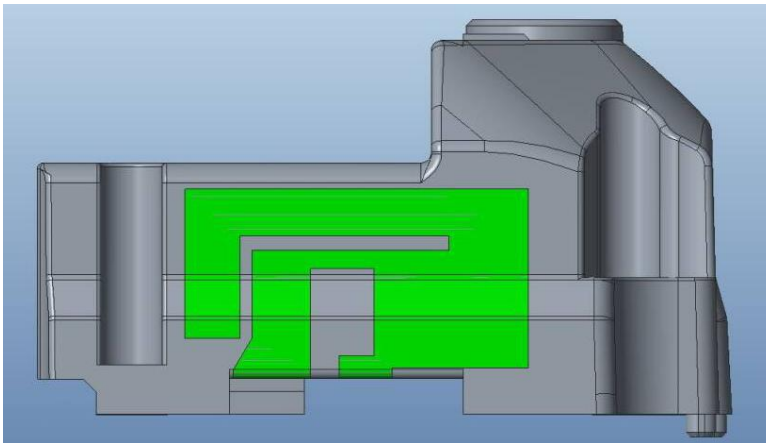
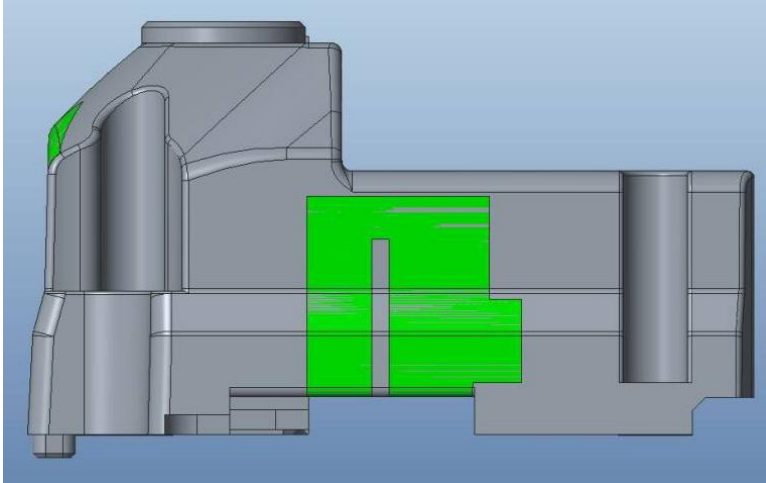
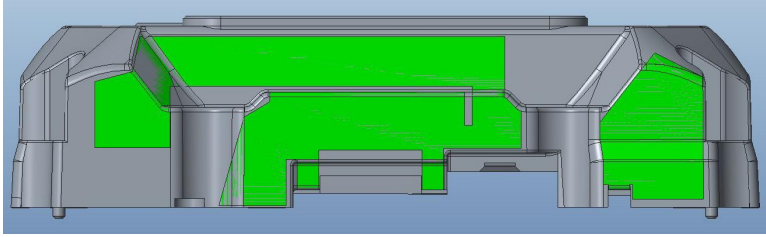


6. Structural drawings

Mobile phone figure

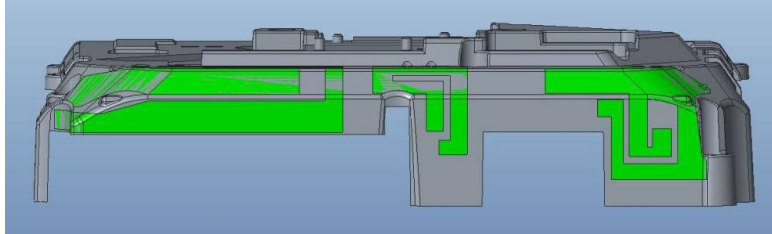


Lower bracket Antenna

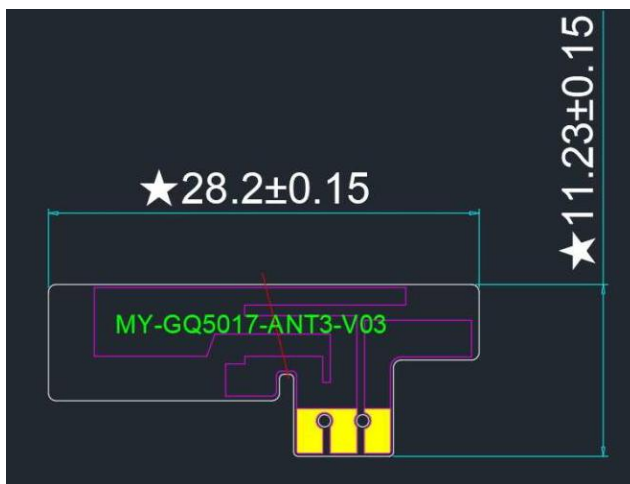




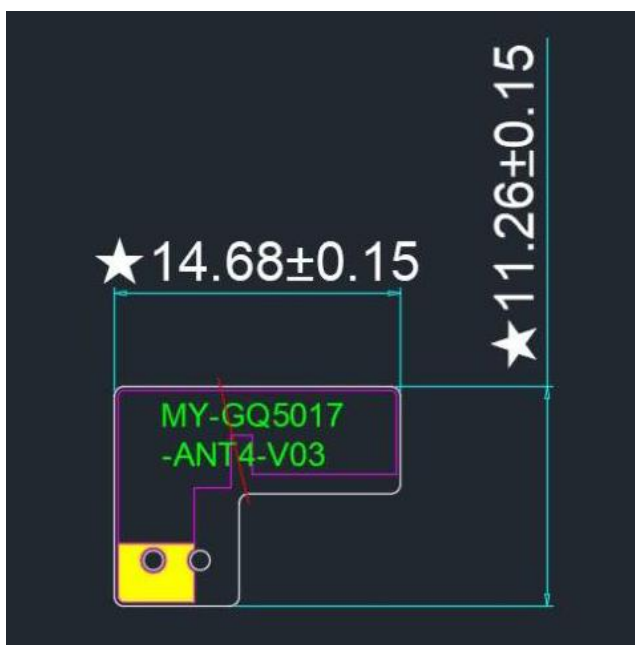
Upper bracket Antenna



ANT3 Antenna

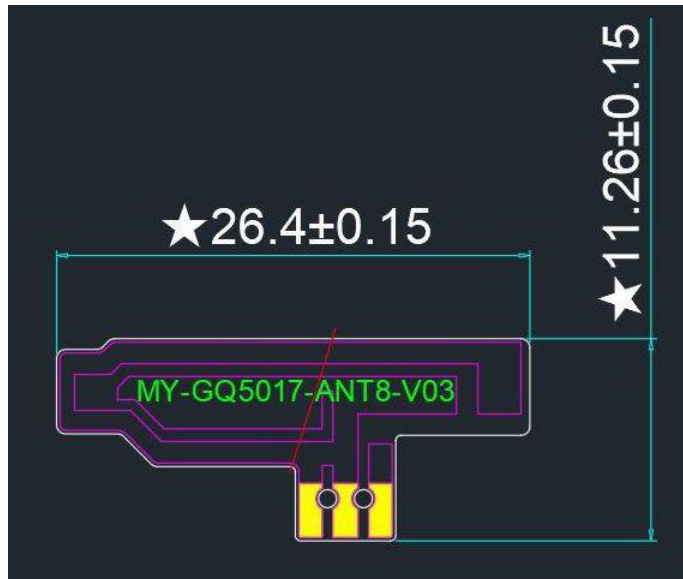


ANT4 Antenna

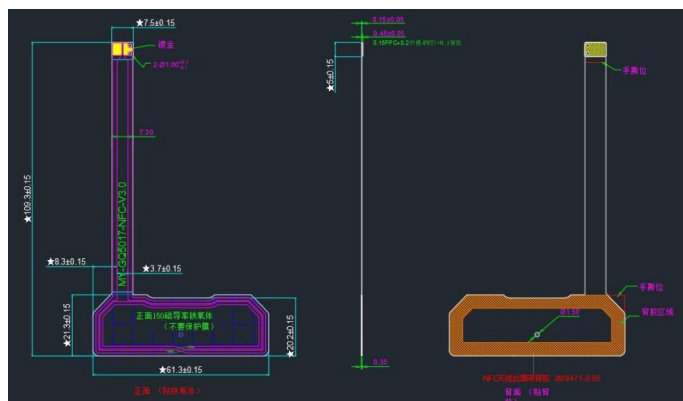




ANT8 Antenna



NFC Antenna



FM Antenna

