

Antenna Testing Report

Customer : Shenzhen sangge'er Polytron Technologies Inc

Project Name : ML1

Antenna Manufacturer: Sunnyway Technology(CHINA)

Address: The 6th floor, Building 5, Nantaiyun Innovation Valley Center,
Guangming District, Shenzhen City

Report version: 2024/6/18 A0
Research staff: Xu Jun

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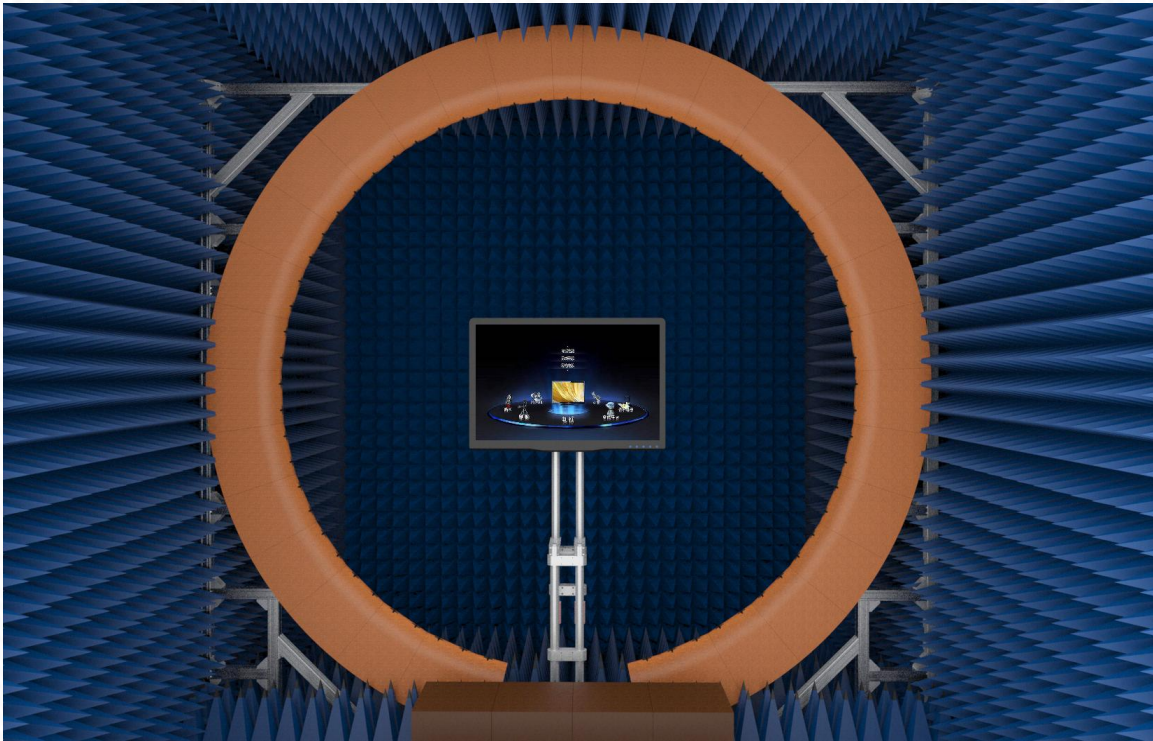
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Prototype status	Debugging machine	Project pictures 
Device type		
Number of antennas	Main antenna; diversity antenna; three-in-one antenna, NFC antenna	
Frequency band		
	WIFI/BT:2.4GHZ/5.8GHZ	
Structural style	FPC	
Environment adjustment	NO Change made	
Matching modification	NO Change made	



The industry's top 64 sensors OTA chamber

Frequency range: 400MHz-11GHz

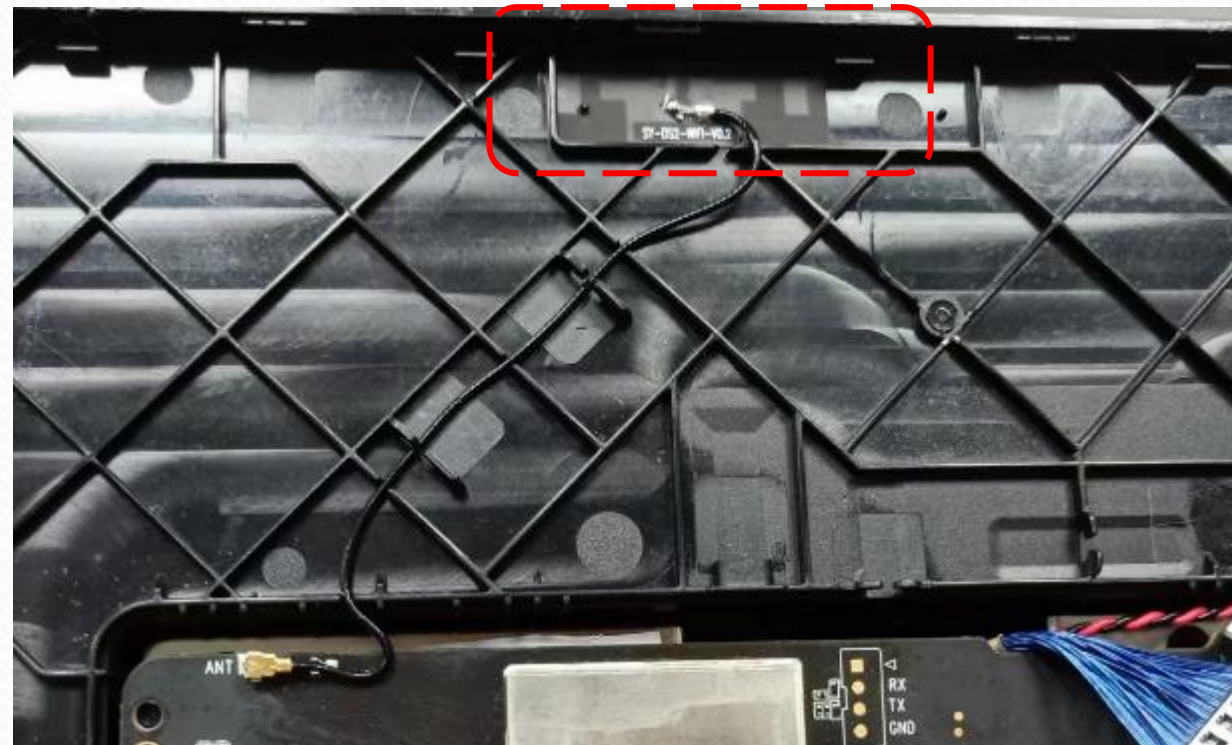
Device Llimitation: 2M

Load-bearing limitation:100KG

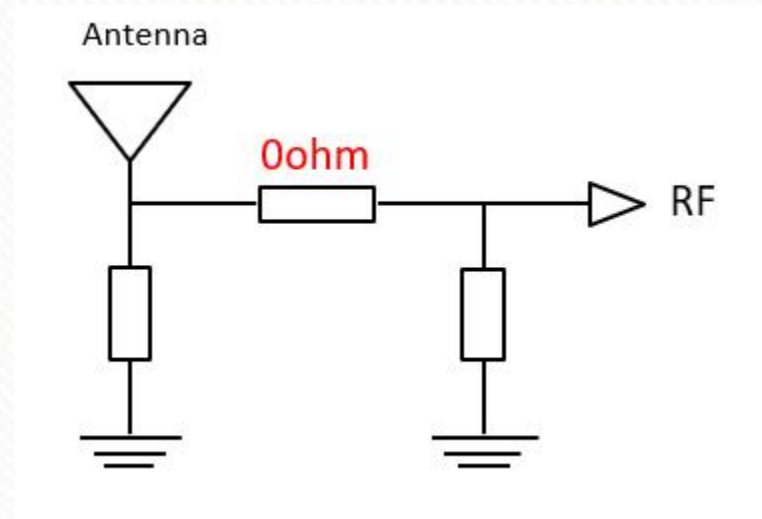
Equipments Items	Total Quantity	Quantity for Shanghai R&D	Quantity for Shenzhen R&D	Quantity for ChongQing R&D
OTA chamber	10	4	5	1
5G Tester (SP9500-CTS)	3	1	1	1
R&S Tester (high configuration CMW500)	6	3	2	1
Japan Anritsu Tester (Dual Channel 8820)	4	2	2	--
NB-IoT Tester (SP8315)	3	1	1	1
Agilent Tester (8960)	9	4	4	--
Agilent Network Analyzer (E5062A)	7	3	3	1
Agilent Network Analyzer (E5071C 8.5GHZ)	11	5	5	1
Agilent Network Analyzer (E5071B 8.5GHZ)	7	3	3	1
R&S Network Analyzer (ZND)	9	4	4	1
R&S Network Analyzer (ZVB)	3	1	1	1
OTA head hand / ear hand / arm hand	5	2	2	1
GPS/WIFI active test equipment	5	2	2	1

Antenna mounting position

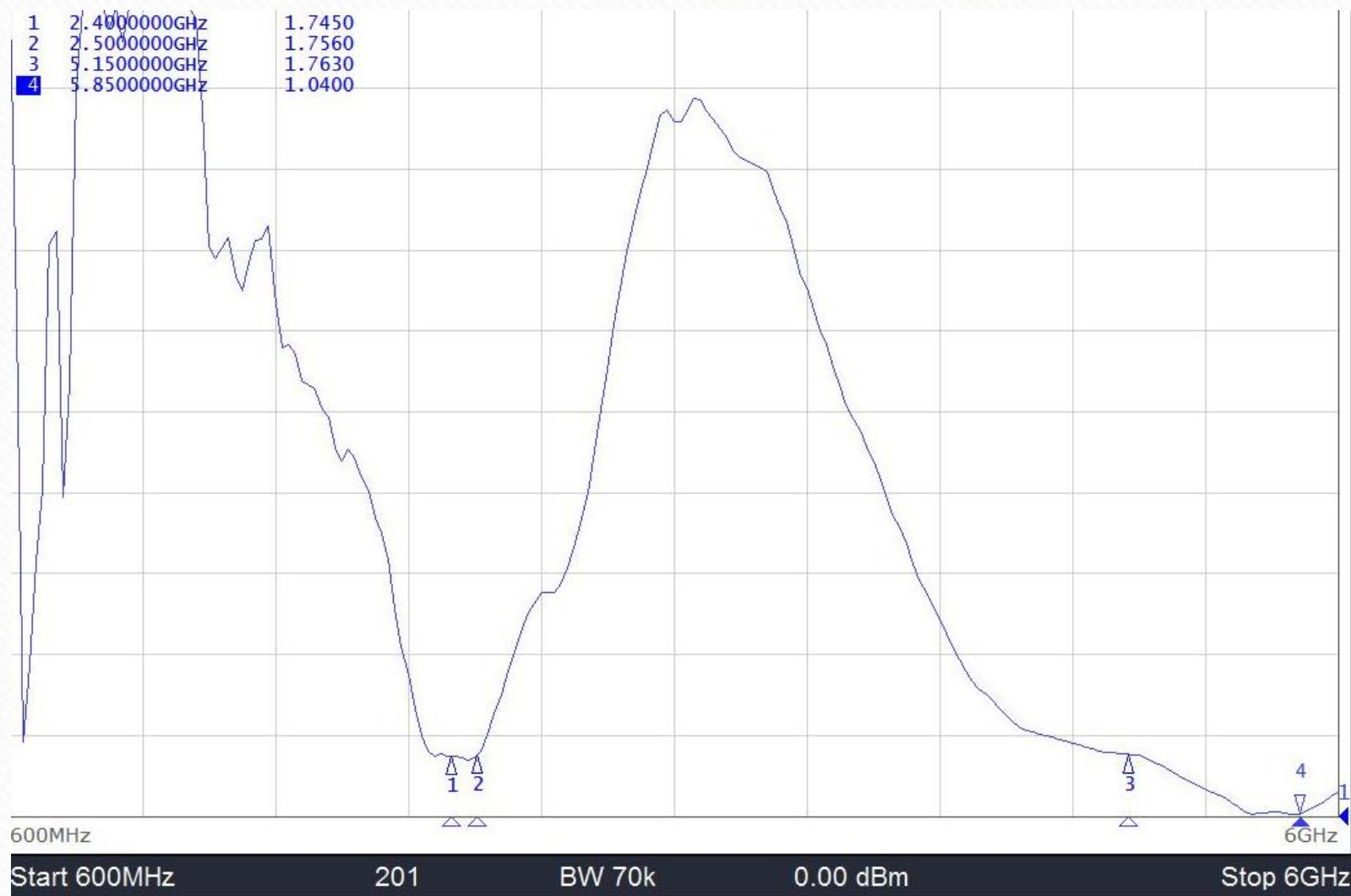
WIFI antenna



WIFI antenna :



S11-VSWR



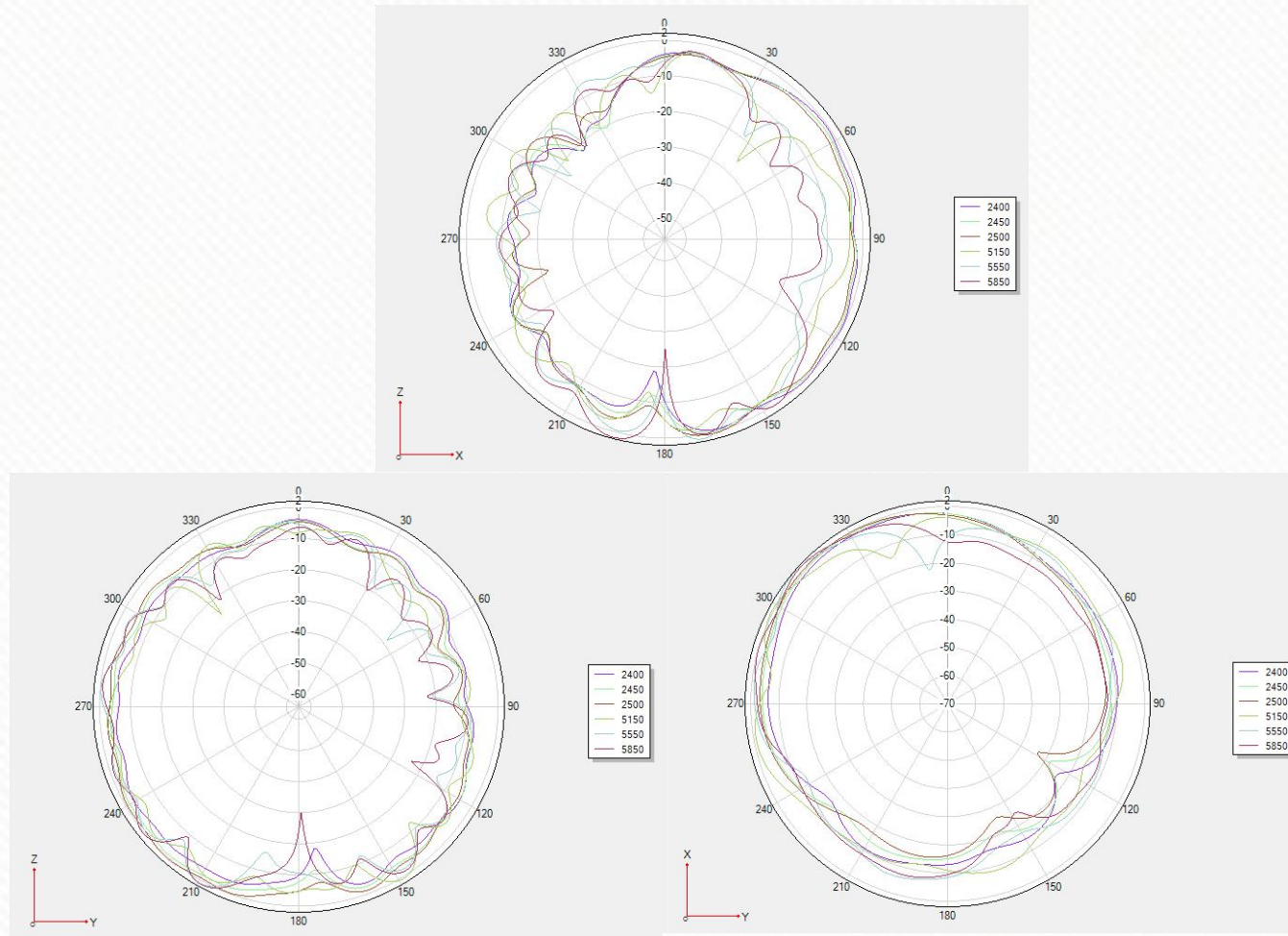
Three-in-one antenna efficiency and gain

Frequency/Mhz	MaxGain/dBi	Efficiency / %
2400	0.54	29.38
2410	0.54	30.06
2420	0.56	29.51
2430	0.66	30.06
2440	1.02	31.62
2450	1.34	34.28
2460	1.41	34.12
2470	1.53	34.12
2480	1.8	35.48
2490	2.05	36.56
2500	1.78	36.14
5150	1.85	25
5200	1.88	25.88
5250	2.11	28.12
5300	2.03	28.18
5350	2.05	27.8
5400	1.98	27.48
5450	1.78	26.73
5500	2.08	26.73
5550	2.69	27.16
5600	3	25.29
5650	3.23	26.24
5700	3.37	28.05
5750	3.41	27.67
5800	3.19	26.12
5850	3.87	28.97

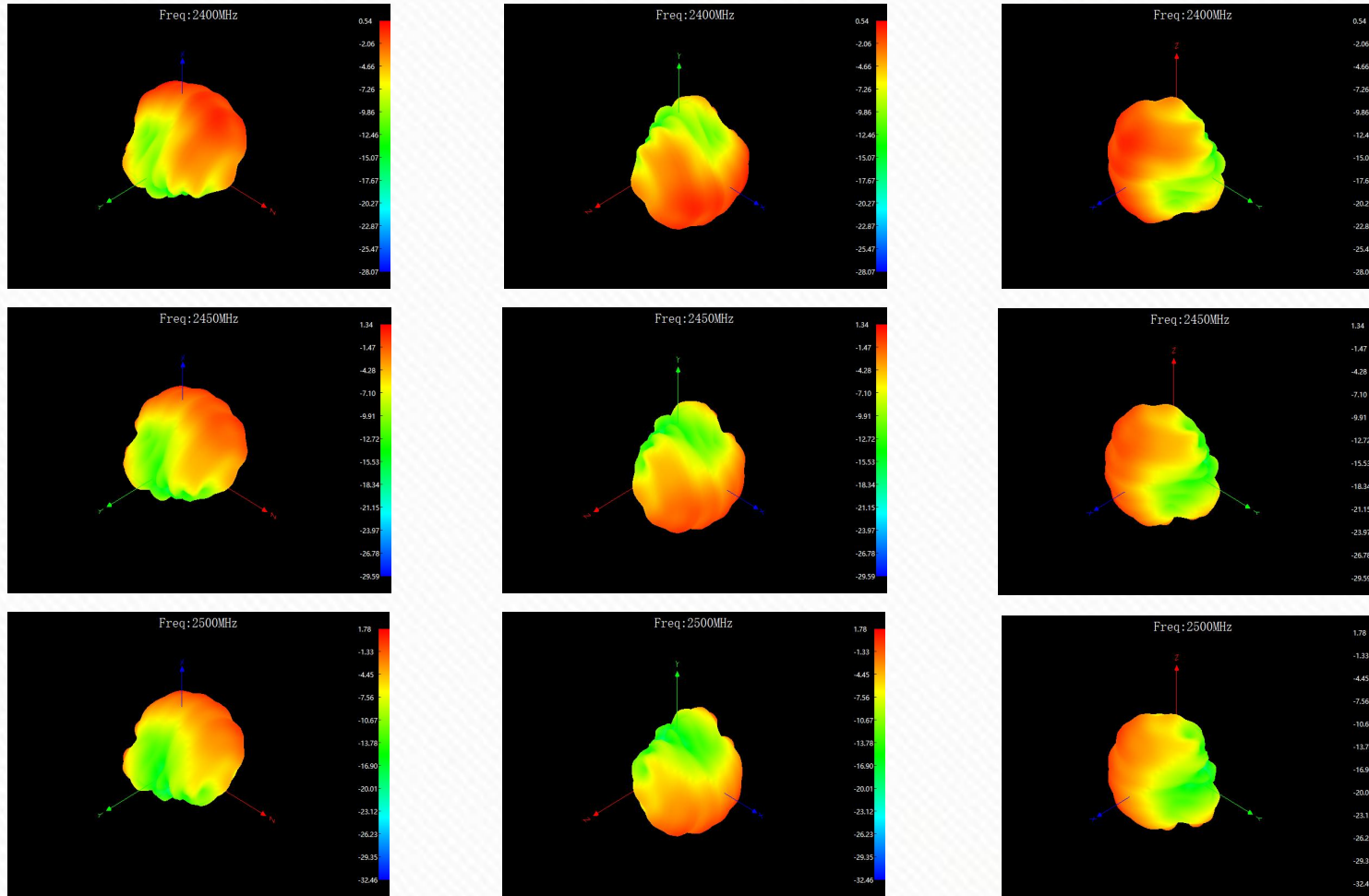
WIFI antenna OTA data

Item	Measurement	Band	Channel	Total
1	TRP	WIFI_B (1M)	1	11.79
2	TRP	WIFI_B (1M)	6	12.39
3	TRP	WIFI_B (1M)	13	12.45
4	TIS(EIRP)	WIFI_B (11M)	13	-82.12
5	TRP	WIFI_G (6M)	1	11.34
6	TRP	WIFI_G (6M)	6	11.21
7	TRP	WIFI_G (6M)	13	11.02
8	TIS(EIRP)	WIFI_G (54M)	13	-68.91
9	TRP	WIFI_N_ISM (6.5M)	1	10.22
10	TRP	WIFI_N_ISM (6.5M)	6	10.42
11	TRP	WIFI_N_ISM (6.5M)	13	10.63
12	TIS(EIRP)	WIFI_N_ISM (65M)	13	-66.64
13	TRP	WIFI_A (6M)	36	8.95
14	TRP	WIFI_A (6M)	149	8.91
15	TRP	WIFI_A (6M)	165	8.87
16	TIS(EIRP)	WIFI_A (54M)	165	-67.43
17	TRP	WIFI_N_UNII (6.5M)	36	7.23
18	TRP	WIFI_N_UNII (6.5M)	149	7.41
19	TRP	WIFI_N_UNII (6.5M)	165	7.12
20	TIS(EIRP)	WIFI_N_UNII (65M)	165	-60.89

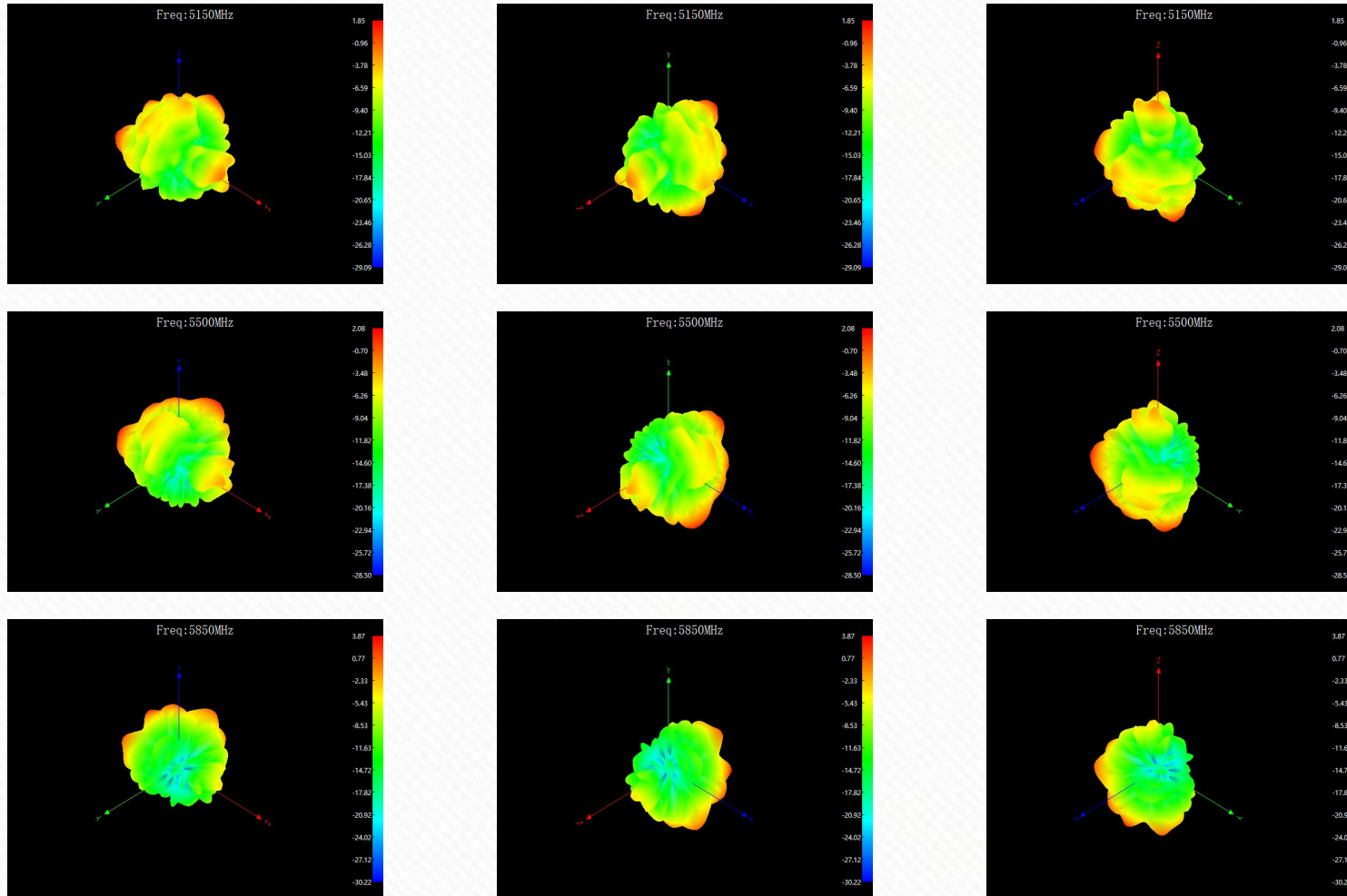
Three-in-one antenna directional pattern



Three-in-one antenna directional pattern

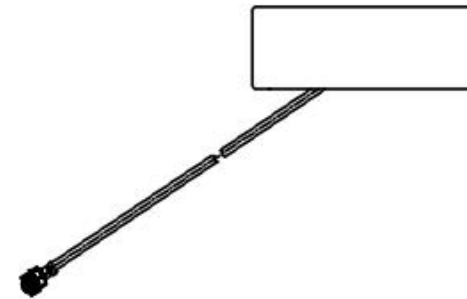
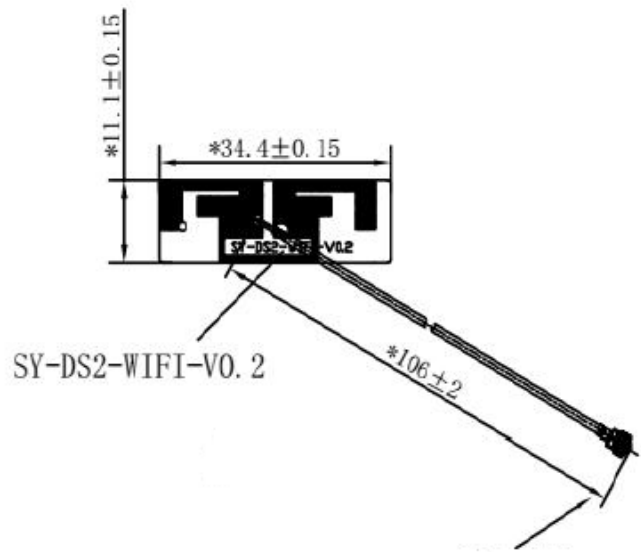


Three-in-one antenna directional pattern

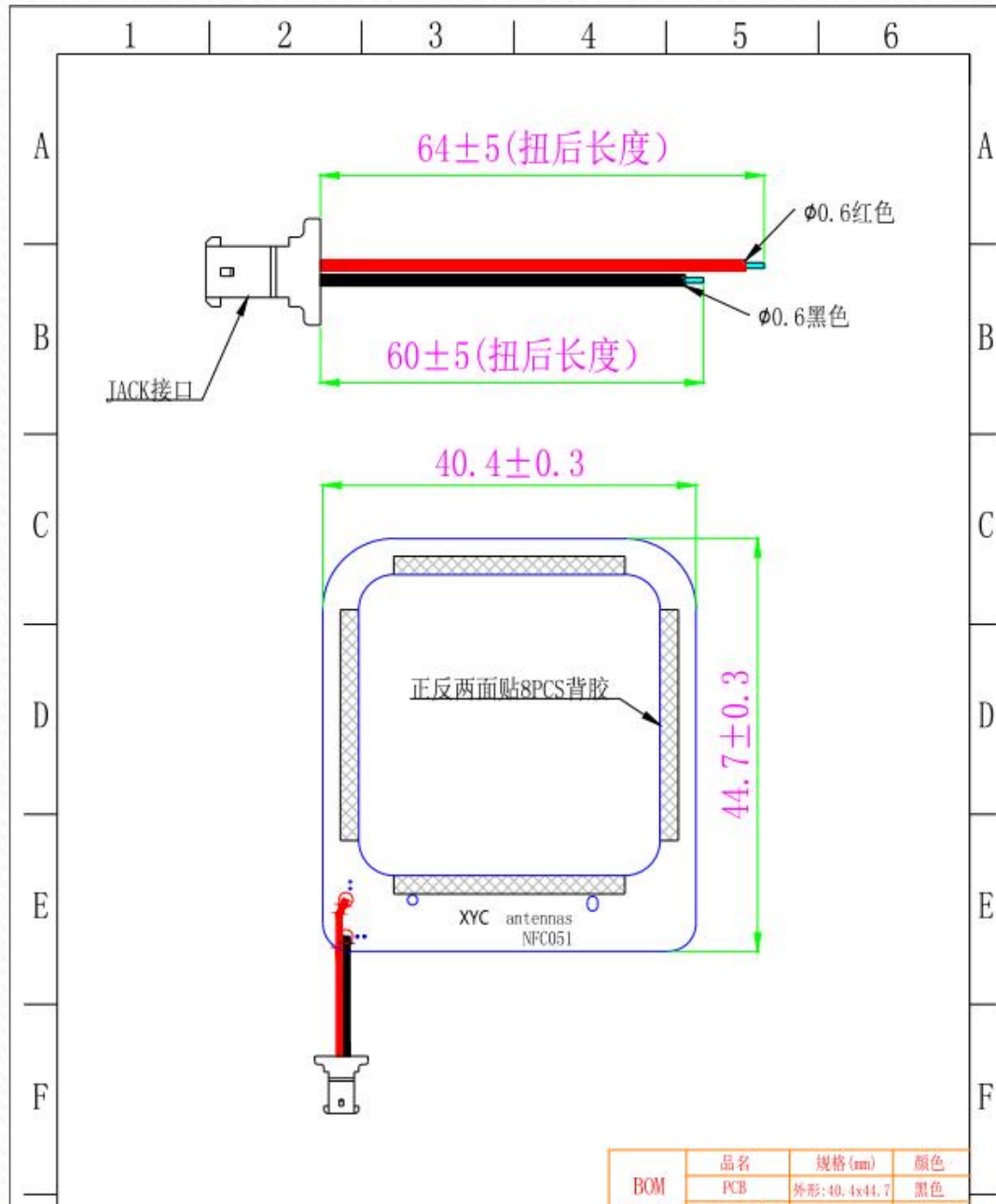


BT/WLAN ANT

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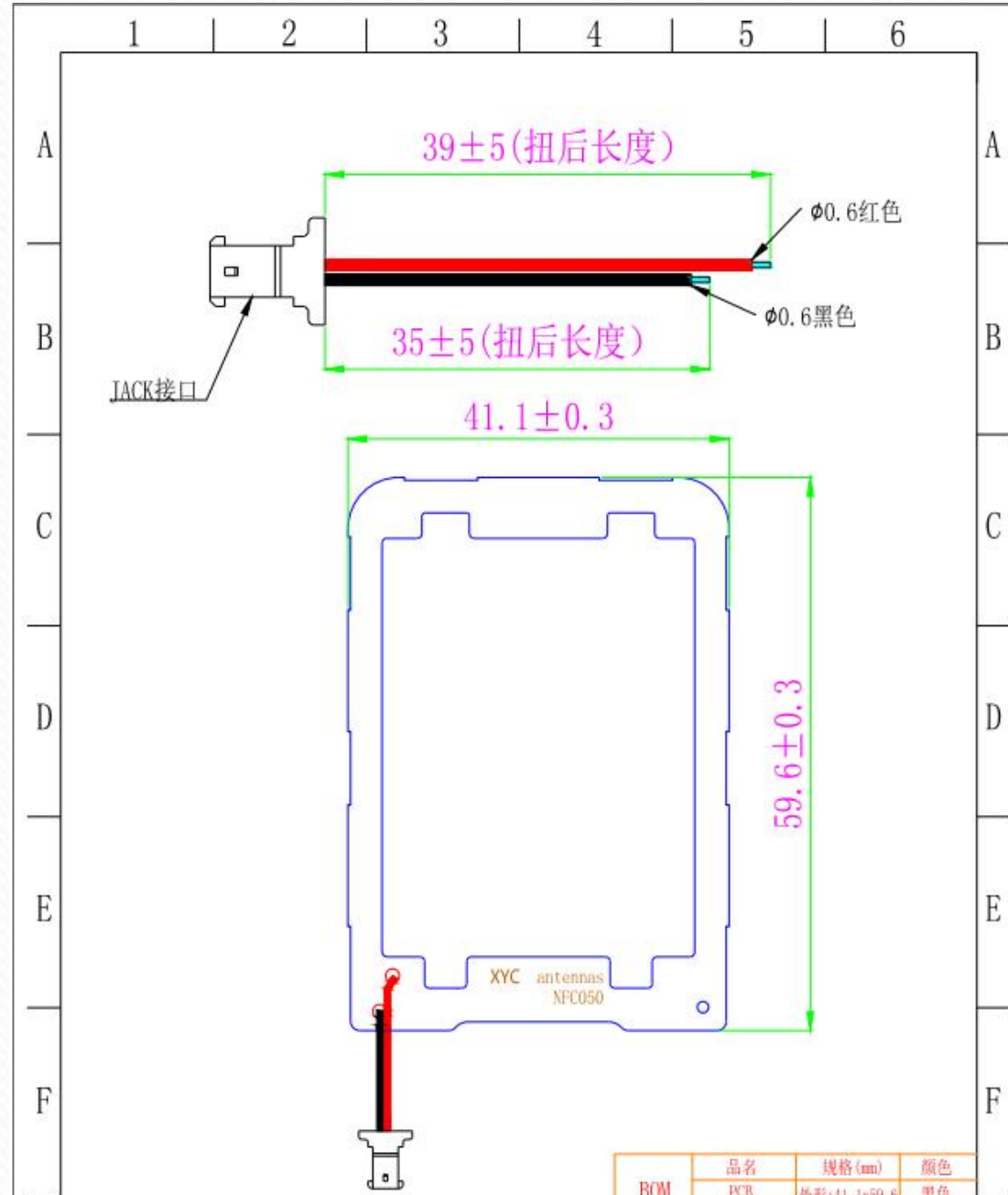


NFC ANT(DS2-51)



We statement that All measurements were performed radiated and therefore additional antenna gain documentation is not required.

NFC ANT(DS2-52)



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