

Antenna Testing Report

Customer : Shenzhen sangge'er Polytron Technologies Inc

Project Name : MR1-11

Antenna Manufacturer: Sunnyway Technology(CHINA)

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

Report version: 2026/03/05 A0
Research staff: Jie Yang

Version	Report date	Remark
A0	2026.03.05	Antenna test report
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2.Project Overview ·····

3.Equipment List·····

4. Antenna mounting position·····

5.Passive parameters ·····

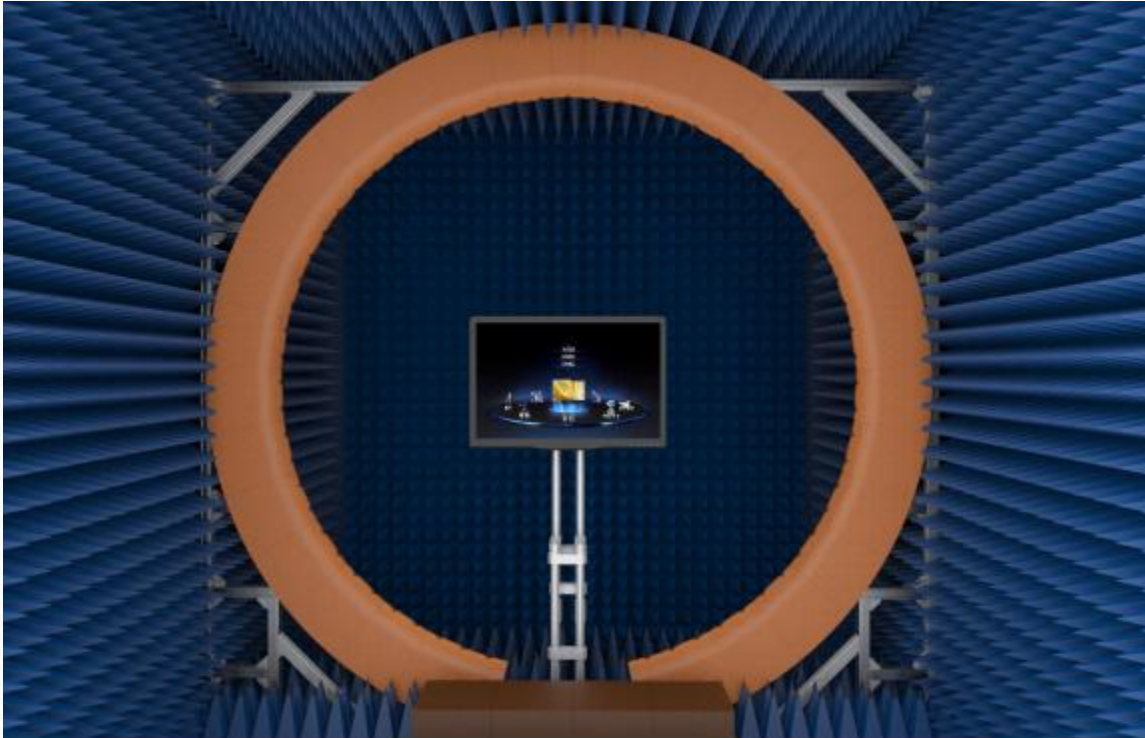
6.Passive efficiency and gain ·····

7.OTA test data ·····

8.Directiona pattern ·····

9.Summary·····

Prototype status	Debugging machine	Project pictures 
Device type		
Number of antennas	Main antenna; diversity antenna; three-in-one antenna; NFC antenna	
Frequency band	GSM : 850/900/1800/1900	
	WCDMA : B1/2/5/8	
	LTE: B 2/4/5/12/13/14/17/25/26/66/71	
Structural style	FPC	
Environment adjustment	Change made	
Matching modification	Change made	



The industry's top 64 sensors OTA chamber

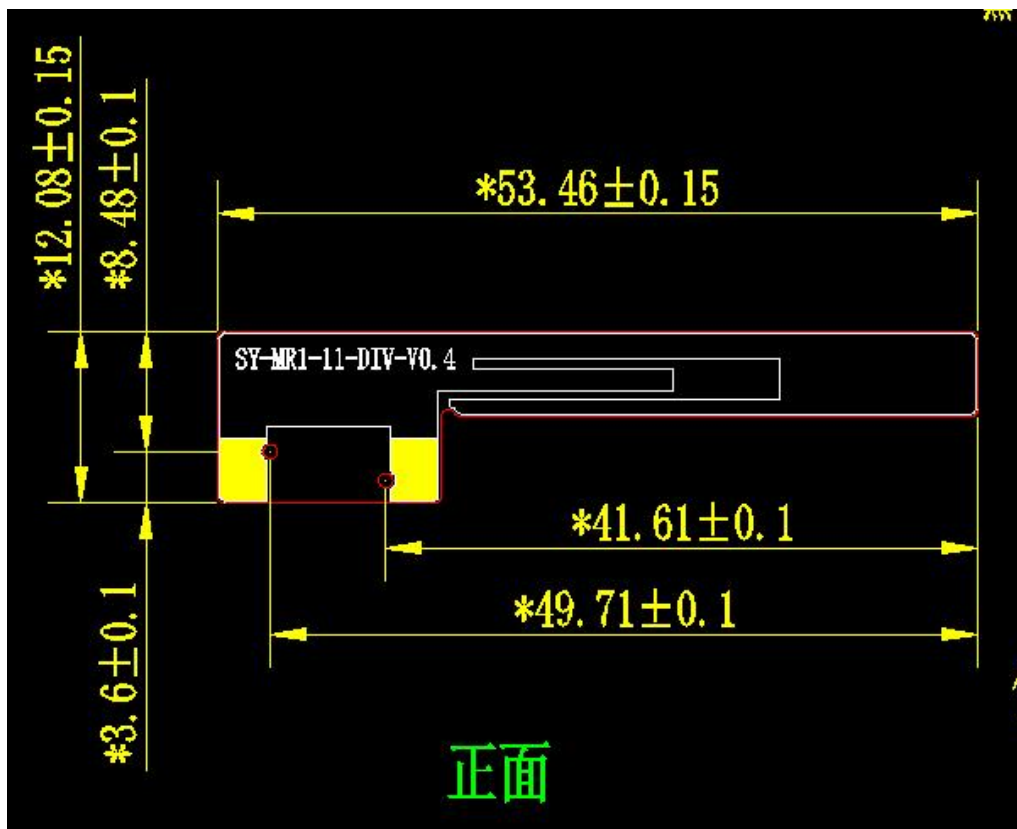
Frequency range: 400MHz-11GHz

Device Llimitation: 2M

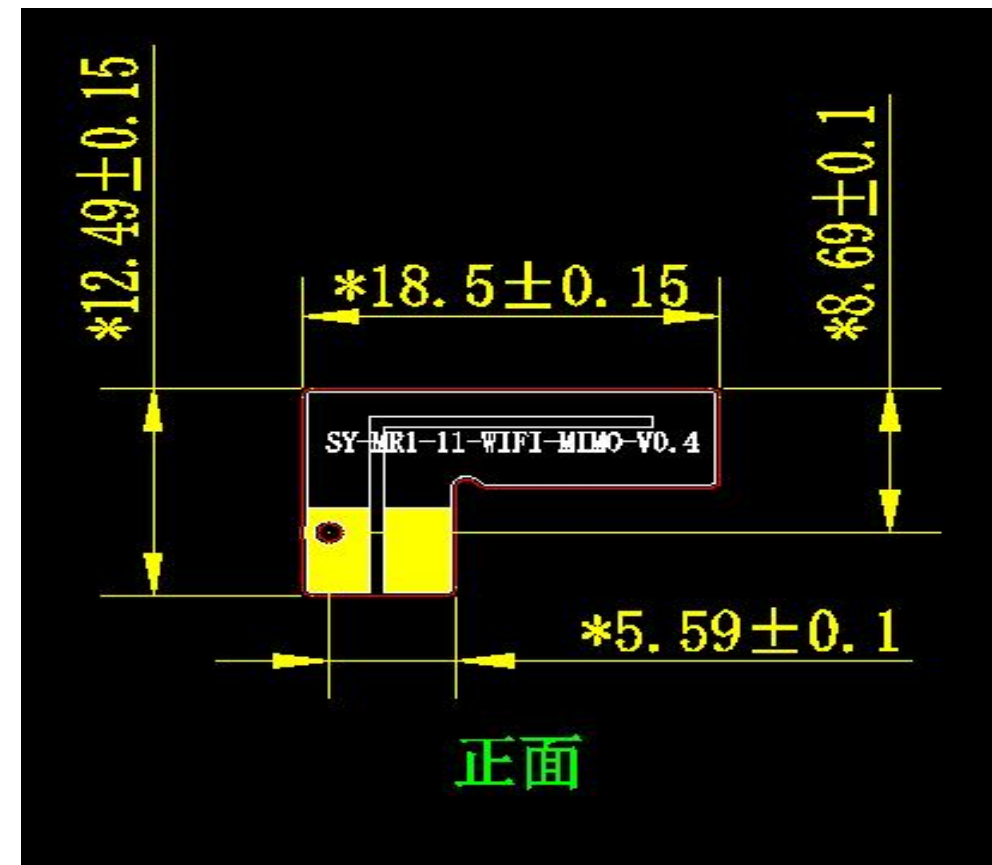
Load-bearing limitation:100KG

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

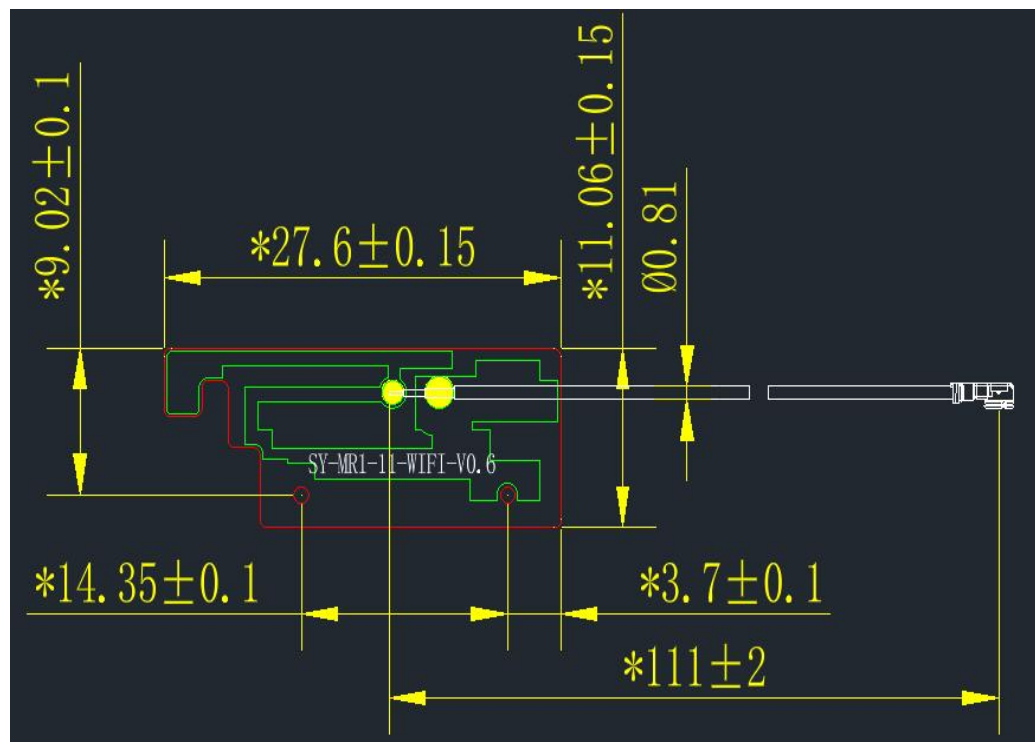
DIV Antenna



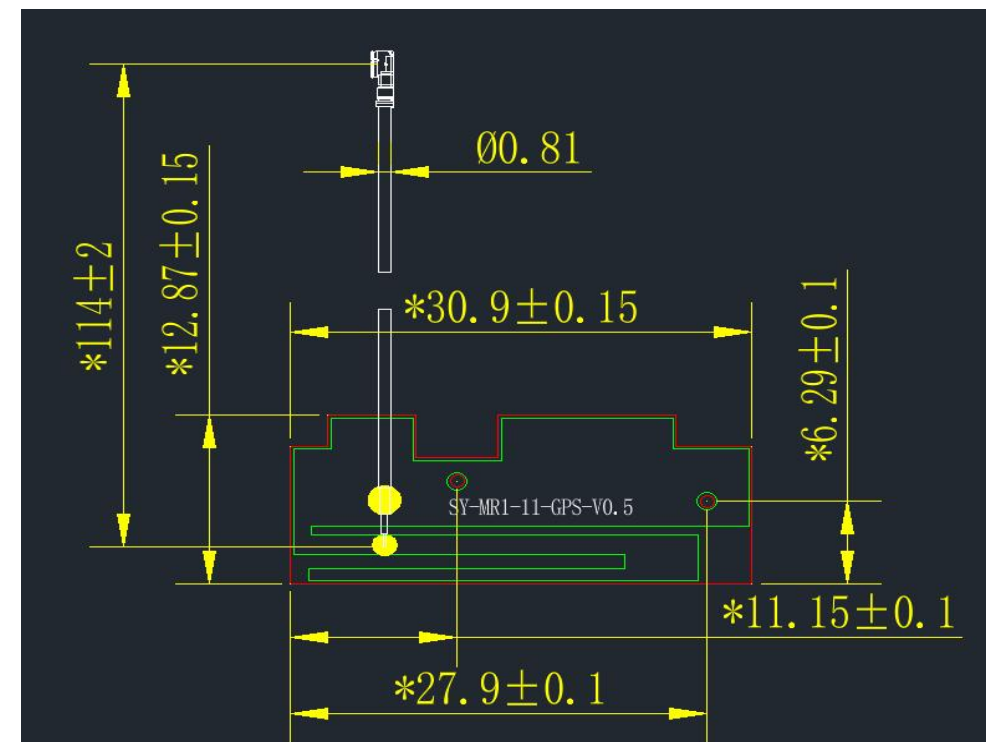
WIFI MIMO Antenna



WIFI Antenna

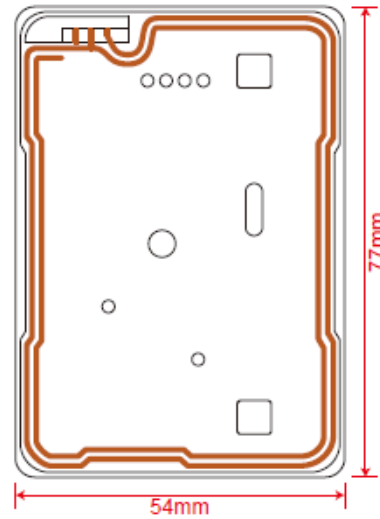


GPS Antenna



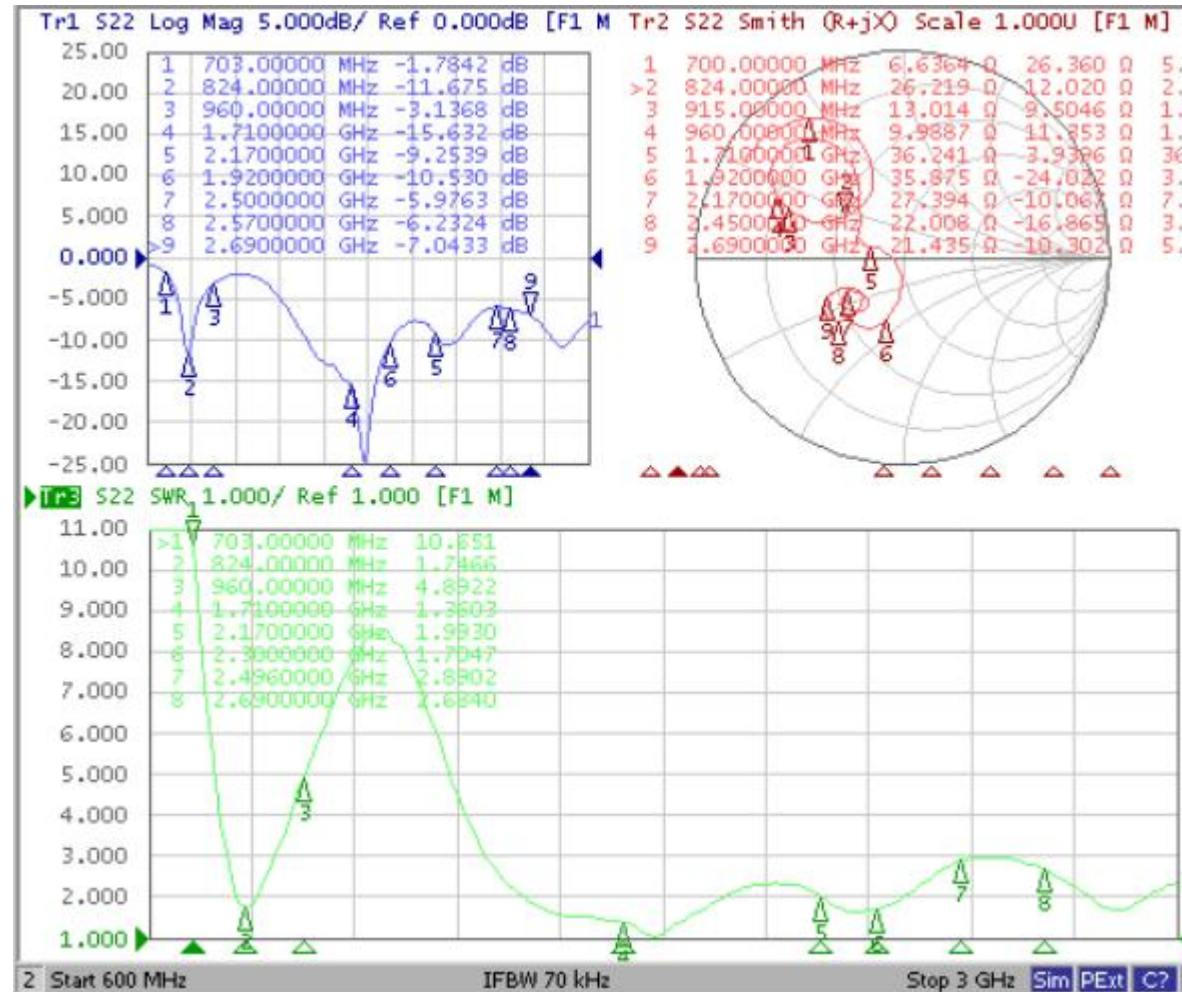
Antenna mounting position

NFC antenna



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

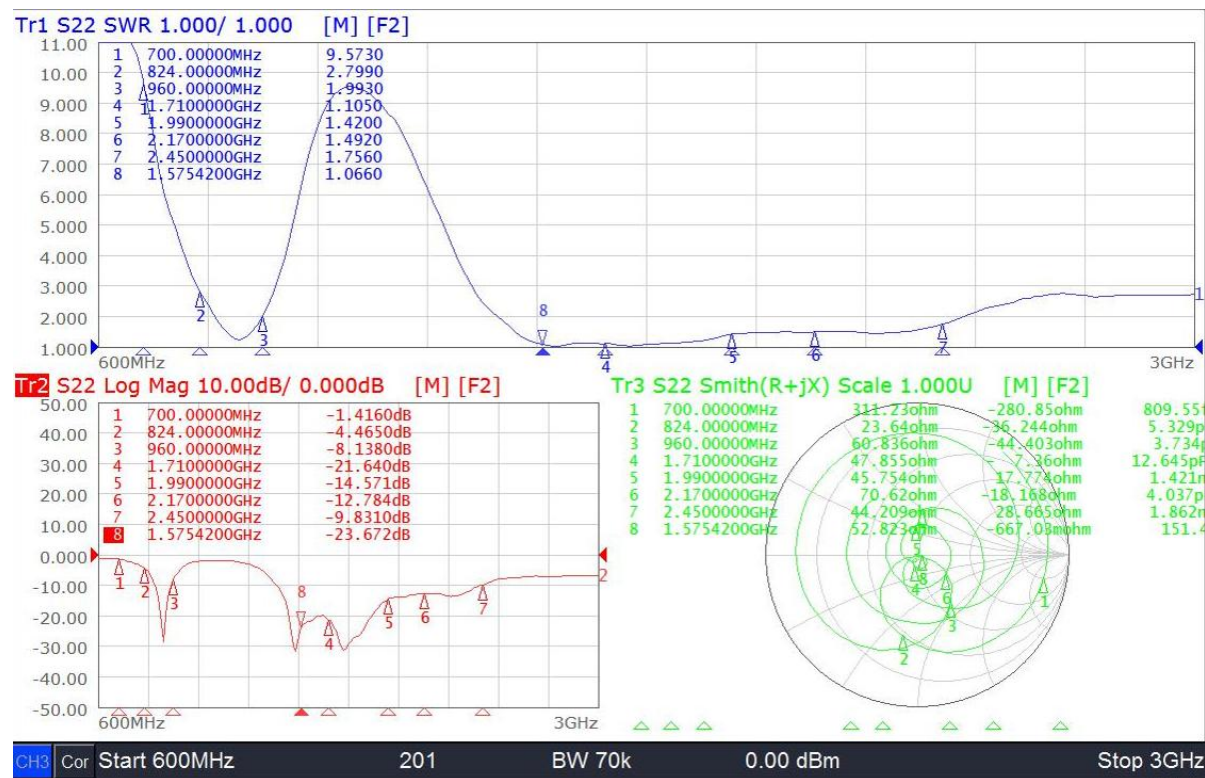
S11-VSWR



Main antenna efficiency and gain

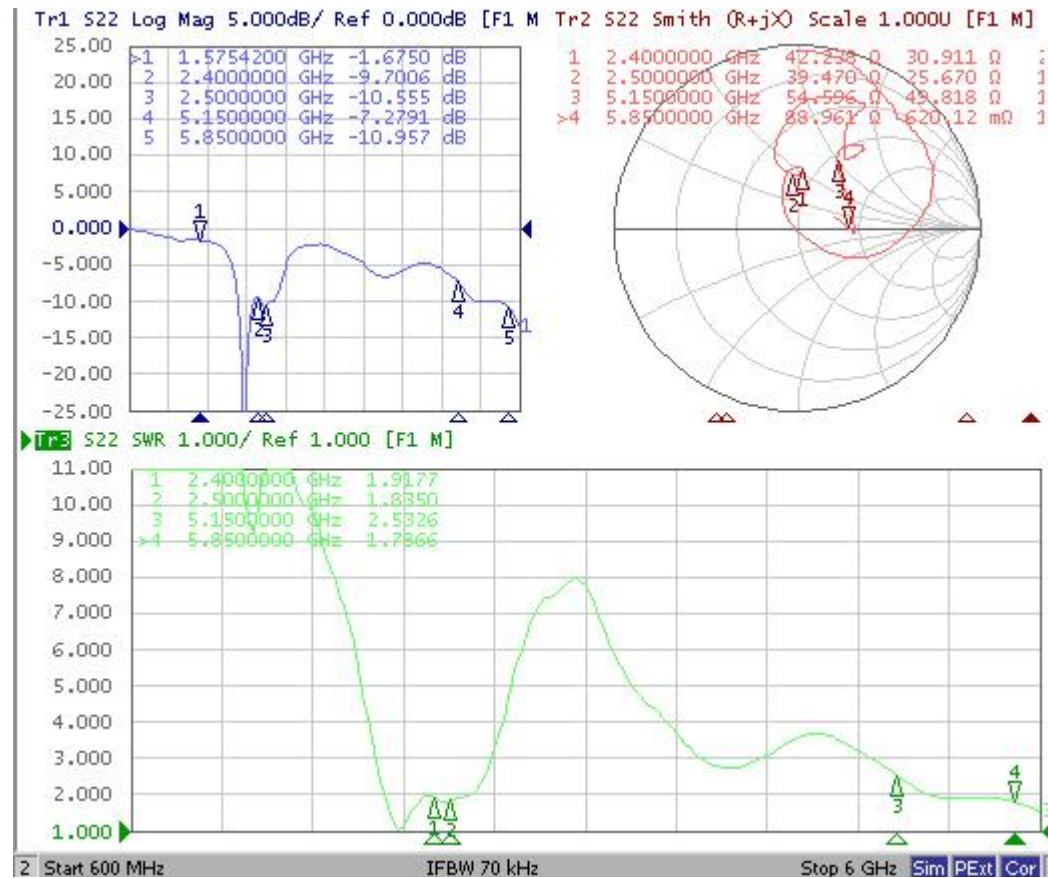
Frequency/Mhz	MaxGain/dBi	Efficiency / %	Frequency/Mhz	MaxGain/dBi	Efficiency / %
650	-1.59	1.96	1700	0.31	35.81
710	-1.68	2.62	1720	0.97	40.74
720	-1.75	3.1	1740	1.36	41.3
730	-1.07	4.07	1760	1.12	39.63
740	-1.49	4.84	1780	0.32	40.27
750	-1.09	6.5	1800	0.66	39.81
760	-1.25	7.67	1820	0.68	37.33
770	-2.24	11.07	1840	-0.37	33.04
780	-1.97	12.65	1860	-0.99	28.71
790	-2.26	16.6	1880	1.21	23.44
800	-2.82	18.03	1900	-2.42	21.88
810	-1.55	21.04	1920	-2.1	26.85
820	-1.73	21.73	1940	-1.87	31.92
830	-1.31	22.44	1960	-2.53	32.51
840	-1.75	23.01	1980	-2.71	33.42
850	-1.74	22.54	2000	-2.54	36.31
860	-1.42	19.86	2020	-2.18	39.99
870	-1.52	17.42	2040	-1.95	43.95
880	-1.62	15.89	2060	-1.03	44.66
890	-1.86	15	2080	0.01	44.95
900	-1.5	11.64	2100	0.07	42.16
			2120	-0.65	40.62
			2140	-1.04	38.45
			2160	-0.94	37.18
			2180	-1.36	33.65
			2200	-1.84	30.41

S11-VSWR



Frequency/Mhz	Efficiency / %	Frequency/Mhz	Efficiency / %
690	28.84	1710	52.24
700	29.72	1745	55.08
710	29.23	1780	54.7
720	29.82	1815	54.58
730	30.5	1850	56.1
740	30.84	1885	51.88
750	30.94	1920	51.52
760	35.41	1955	52.48
770	39.04	1990	50.47
780	41.92	2025	47.75
790	44.83	2060	49.89
800	44.12	2095	50.47
810	43.04	2130	50.12
820	41.84	2165	51.05
830	41.19	2200	49.55
840	39.85	2235	47.86
850	38.18	2270	46.77
860	38.31	2305	44.87
870	38.58	2340	43.25
880	38.05	2375	42.56
890	38.58	2410	40.36
900	39.58	2445	38.99
910	39.92	2480	38.82
920	39.17	2515	37.33
930	39.04	2550	35.65
940	36.85	2585	34.83
950	35.64	2620	33.19
960	34.27	2655	30.69
		2690	29.85

S11-VSWR

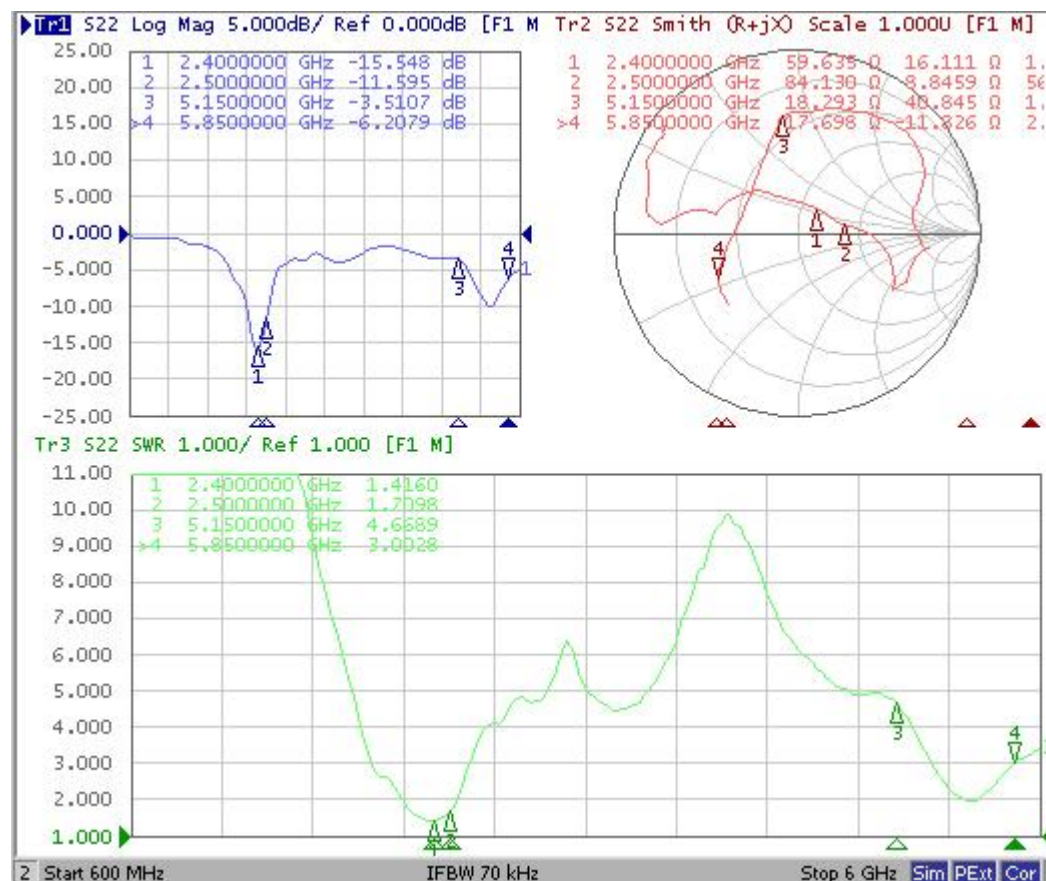


Frequency/Mhz	MaxGain/dBi	Efficiency / %
2400	2.24	38.73
2410	2.17	41.22
2420	1.57	35.2
2430	1.8	35.06
2440	2	36.62
2450	2.14	41.48
2460	2.41	38.96
2470	2.18	40.32
2480	2.37	40.89
2490	2.14	41.06
2500	2.23	41.31
5150	2.23	31.12
5200	2.53	33.18
5250	2.75	34.79
5300	2.62	36.48
5350	2.05	38.73
5400	2.43	39.83
5450	2.37	41.64
5500	2.48	43.19
5550	2.28	43.19
5600	2.33	44.99
5650	2.32	45.36
5700	2.22	44.99
5750	2.32	44.36
5800	2.29	44.45
5850	2.51	43.02

Frequency/Mhz	MaxGain/dBi	Efficiency / %
5900	1.29	43.93
5950	1.69	47.85
6000	1.84	49.72
6050	1.33	47.14
6100	1.37	46.76
6150	1.54	48.53
6200	1	45.02
6250	0.57	40.8
6300	0.9	43.33
6350	0.77	42.66
6400	0.79	40.71
6450	0.33	38.38
6500	0.02	37.31
6550	0.15	38.74
6600	0.41	41.49
6650	-0.22	44.39
6700	0.02	46.41
6750	0.2	48.37
6800	0.29	49.48
6850	3.77	48.55
6900	3.8	52.06
6950	3.1	46.88
7000	2.24	42.21
7050	1.61	41.86
7100	1.79	38.93

Item	Measurement	Band	Channel	Total
1	TRP	WIFI_B (1M)	1	11.62
2	TRP	WIFI_B (1M)	6	11.21
3	TRP	WIFI_B (1M)	11	12.26
4	TIS(EIRP)	WIFI_B (11M)	11	-83.54
5	TRP	WIFI_G (6M)	1	13.51
6	TRP	WIFI_G (6M)	6	13.2
7	TRP	WIFI_G (6M)	11	13.7
8	TIS(EIRP)	WIFI_G (54M)	11	-69.59
9	TRP	WIFI_N_ISM (6.5M)	1	13.46
10	TRP	WIFI_N_ISM (6.5M)	6	12.6
11	TRP	WIFI_N_ISM (6.5M)	11	12.93
12	TIS(EIRP)	WIFI_N_ISM (65M)	11	-68.97
13	TRP	WIFI_A (54M)	36	10.24
14	TRP	WIFI_A (54M)	149	10.57
15	TRP	WIFI_A (54M)	165	10.06
16	TIS(EIRP)	WIFI_A (54M)	165	-68.24
17	TRP	WIFI_N_UNII (65M)	36	8.76
18	TRP	WIFI_N_UNII (65M)	149	9.31
19	TRP	WIFI_N_UNII (65M)	165	8.82
20	TIS(EIRP)	WIFI_N_UNII (65M)	165	-64.53

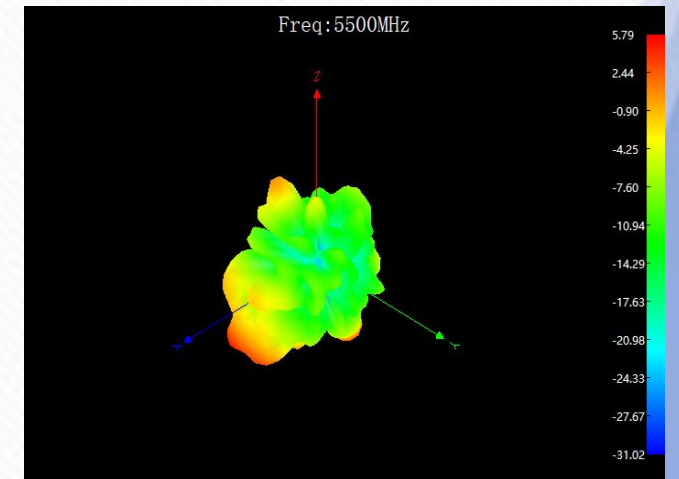
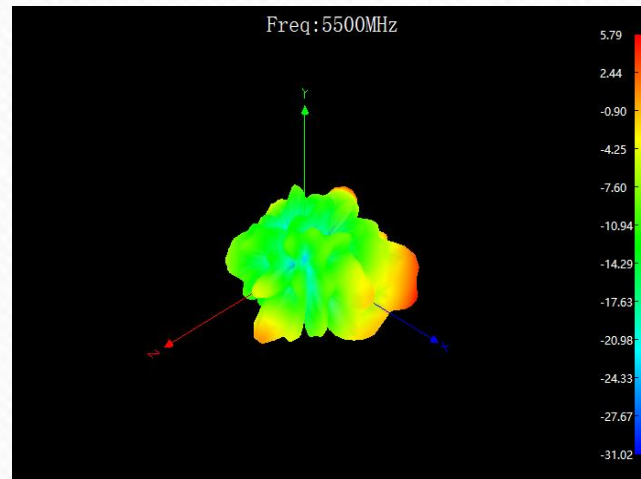
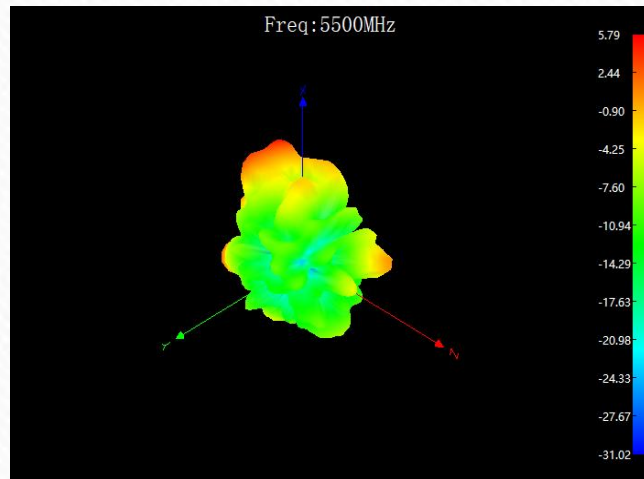
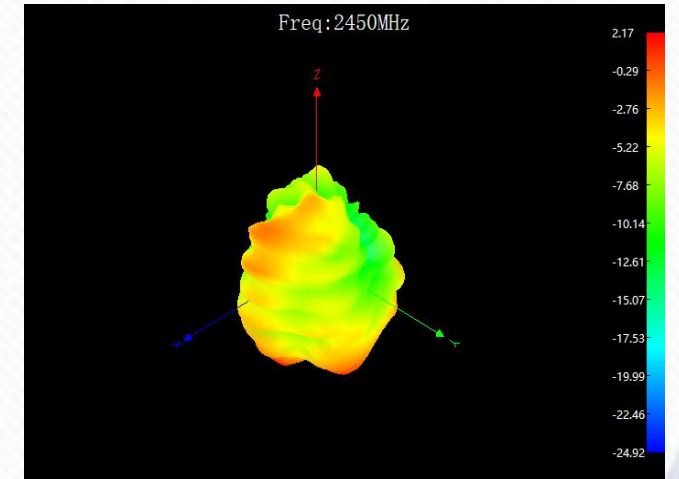
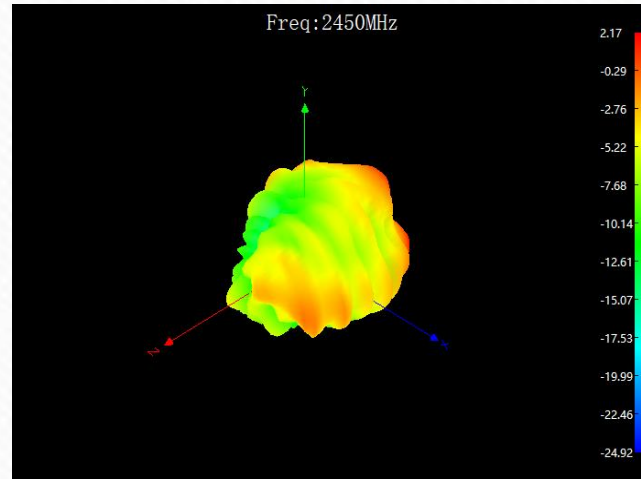
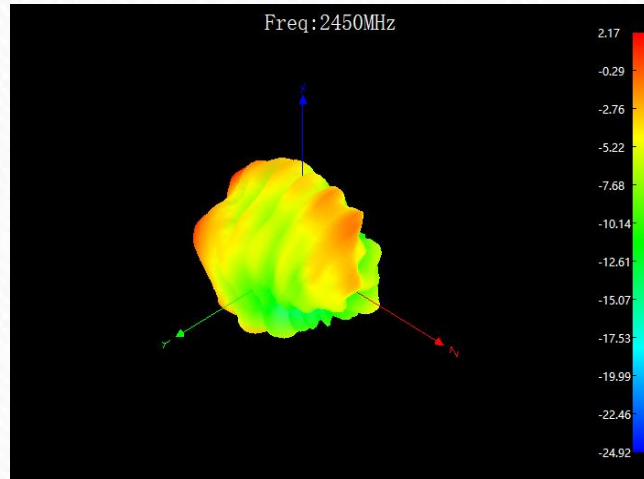
S11-VSWR



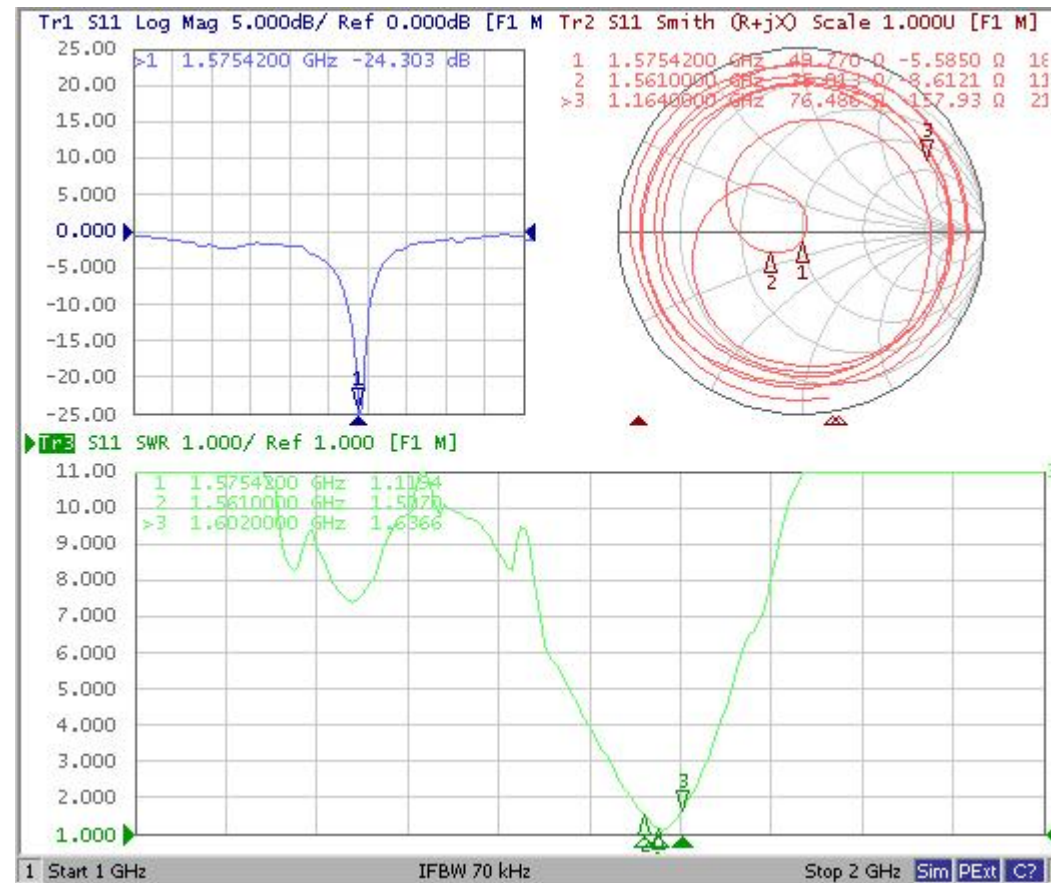
Frequency/Mhz	MaxGain/dBi	Efficiency / %
2400	1.21	42.89
2410	1.22	44.39
2420	1.02	46.41
2430	2.2	48.37
2440	1.29	49.48
2450	1.39	50.6
2460	1.43	51.24
2470	2.41	52.06
2480	1.65	52.79
2490	1.62	52.23
2500	1.54	51.94
5150	1.29	33.93
5200	1.13	32.51
5250	1.89	34.59
5300	2.09	36.32
5350	2.58	37.93
5400	2.71	34.06
5450	2.75	32.89
5500	2.67	35.4
5550	2.31	35.89
5600	2.53	37.58
5650	2.19	37.24
5700	2.27	37.58
5750	2.15	37.41
5800	2.01	38.28
5850	2.02	38.73

Frequency/Mhz	MaxGain/dBi	Efficiency / %
5900	0.34	30.34
5950	1.04	32.81
6000	-0.07	31.23
6050	0.3	31.05
6100	0.61	33.72
6150	1.38	34.51
6200	1.27	32.21
6250	1.51	33.42
6300	1.41	33.42
6350	1.67	33.42
6400	1.81	32.89
6450	2.05	30.76
6500	2.16	30.27
6550	2.47	31.33
6600	2.82	33.5
6650	3.16	34.99
6700	3.02	34.12
6750	2.73	32.73
6800	1.98	32.23
6850	1.81	32.49
6900	1.71	32.28
6950	1.8	31.55
7000	1.84	31.69
7050	1.93	30.97
7100	1.69	31.06

Item	Measurement	Band	Channel	Total
1	TRP	WIFI_B (1M)	1	11.53
2	TRP	WIFI_B (1M)	6	11.28
3	TRP	WIFI_B (1M)	11	11.46
4	TIS(EIRP)	WIFI_B (11M)	11	-82.76
5	TRP	WIFI_G (6M)	1	14.65
6	TRP	WIFI_G (6M)	6	13.95
7	TRP	WIFI_G (6M)	11	13.71
8	TIS(EIRP)	WIFI_G (54M)	11	-73.62
9	TRP	WIFI_N_ISM (6.5M)	1	13.68
10	TRP	WIFI_N_ISM (6.5M)	6	13.1
11	TRP	WIFI_N_ISM (6.5M)	11	12.87
12	TIS(EIRP)	WIFI_N_ISM (65M)	11	-69.77
13	TRP	WIFI_A (54M)	36	11.06
14	TRP	WIFI_A (54M)	149	10.77
15	TRP	WIFI_A (54M)	165	10.25
16	TIS(EIRP)	WIFI_A (54M)	165	-67.09
17	TRP	WIFI_N_UNII (65M)	36	9.01
18	TRP	WIFI_N_UNII (65M)	149	8.01
19	TRP	WIFI_N_UNII (65M)	165	8.69
20	TIS(EIRP)	WIFI_N_UNII (65M)	165	-63.02



S11-VSWR



Frequency/Mhz	MaxGain/dBi	Efficiency / %
1555	-1.67	37.77
1556	-1.7	37.19
1557	-1.73	36.69
1558	-1.77	36.34
1559	-1.79	36.2
1560	-1.78	36.41
1561	-1.67	36.76
1562	-1.56	37.41
1563	-1.47	38.14
1564	-1.34	38.89
1565	-1.22	39.81
1566	-1.18	40.43
1567	-1.1	41.08
1568	-0.97	41.89
1569	-0.81	42.64
1570	-0.65	43.5
1571	-0.52	44.19
1572	-0.44	44.55
1573	-0.44	44.55
1574	-0.5	44.11
1575	-0.58	43.24
1576	-0.64	42.22
1577	-0.72	41.24
1578	-0.83	40.28
1579	-0.94	39.65
1580	-1.01	39.27
1581	-1	39.11
1582	-0.99	39.04

Frequency/Mhz	MaxGain/dBi	Efficiency / %
1583	-0.99	39.11
1584	-1.01	39.04
1585	-1.04	38.89
1586	-1.15	38.66
1587	-1.23	38.28
1588	-1.3	37.92
1589	-1.33	37.41
1590	-1.36	36.97
1591	-1.42	36.55
1592	-1.47	36.06
1593	-1.56	35.51
1594	-1.67	34.97
1595	-1.76	34.44
1596	-1.8	33.99
1597	-1.84	33.61
1598	-1.89	33.42
1599	-1.95	33.42
1600	-1.99	33.54
1601	-1.95	33.73
1602	-1.91	34.05
1603	-1.87	34.44
1604	-1.82	34.91
1605	-1.75	35.44
1606	-1.73	35.79
1607	-1.68	36.27
1608	-1.61	36.83
1609	-1.56	37.41
1610	-1.45	37.92

📶	纬度: 22.7387253°	时间: 07:27:16 上午
	经度: 113.9164444°	TTFF: 2235 sec
	高度: 103.6 m	H/V 精度: 1.0/24.0 m
	高度(MSL): 103.6 m	卫星数量: 9/9/10
	速度: 0.0 m/s	方位: 1.3°
	速度精度: 0.1 m/s	方位精度:
	PDOP: 1.0	H/V DOP: 0.7/0.7

ID	GNSS	CF	C/N0	标识	高度角	方位角
3		1599.750	36.0	EU	15°	240°
4		1599.750	37.0	EU	53°	305°
8		1599.750	34.0	EU	38°	199°
9		1599.750	36.0	EU	16°	319°
16		1599.750	37.0	EU	56°	348°
18		1599.750		E	3°	68°
26		1599.750	42.0	EU	34°	36°
27		1599.750	39.0	EU	66°	164°
28		1599.750	44.0	EU	19°	98°
31		1599.750	47.0	EU	41°	74°

星基增强系统 (SBAS) 卫星不可用

1. Latest machine test data.
2. There are changes to the match.

Thank You

Shanghai R&D Center: 1F, Building 4, No.99, Lane 215, Gaoguang Road, Qingpu District, Shanghai, 201799, PRC

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

ChongQing R&D Center: 1F, ARM Ecological Industrial Park, 19 East Datugu Road, Xiantao, Yubei District, Chongqing, 401120, PRC

Huizhou Factory: 4-5F, No.1, Central Village Road, Longhu Industrial Zone, Shuikou Town, Huicheng District, Huizhou, 516255, PRC

TEL: 021-60835368 E-mail: sales@sunnyway-iot.com

www.sunnyway-iot.com

