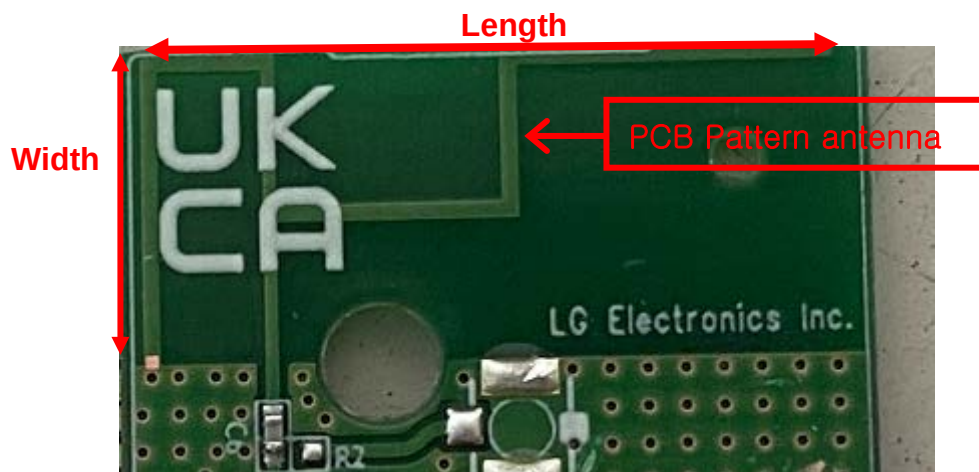


Antenna Information

Item	Contents	
Antenna Type	PCB pattern antenna	
Antenna peak gain	Bluetooth Low Energy	1.72 dB i
	WLAN 2.4G	1.70 dB i
Manufacturer / Model name	RADINA Co., Ltd / T206	
Address of manufacturer	606-2 Edgineering Center Annex Bldg., 222, Wangsimni-ro, Seongdong-gu, Seoul, Republic of Korea, 04763	
Test laboratory	RADINA Co., Ltd	
Antenna Length	1.9 cm	
Antenna Width	0.9 cm	



Model name: LCWB-006

Ohsung T206

RADINA Co., Ltd
MobiAn Inc.

TEL: 82-2-463-0373

FAX: 82-2-463-0374

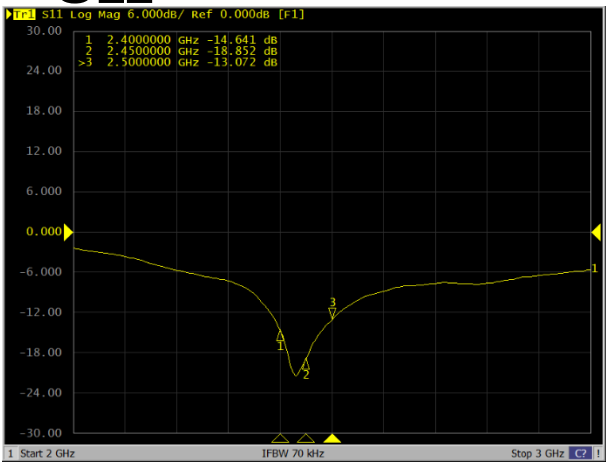
E- mail: RADINA@radina.co.kr

Seongdong-gu, Seoul 133-112, Korea

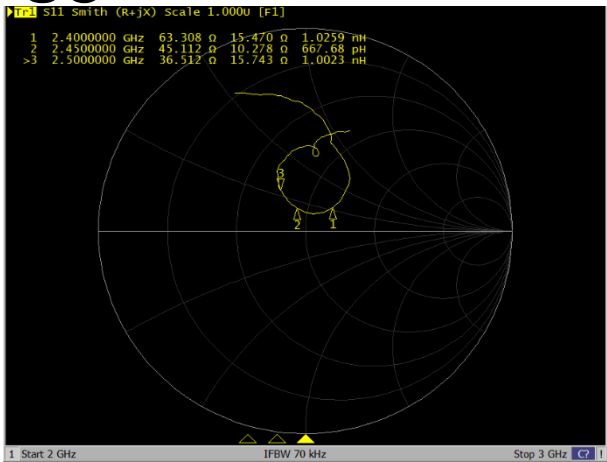
Antenna Measurement Data



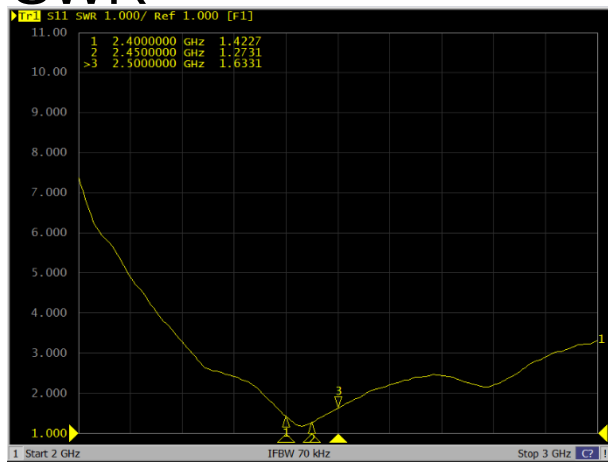
S11



SC



SWR



Efficiency

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Frequency [MHz]	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency [dB]	-1.99	-1.99	-1.84	-1.87	-1.86	-2.12	-1.72	-1.95	-1.97	-1.63	-1.61	-1.59	-1.90	-1.91	-1.79	-1.67	-1.41	-1.81	-2.18	-2.01
Efficiency [%]	63.2	63.2	65.5	65.1	65.1	61.3	67.3	63.9	63.6	68.7	69.1	69.3	64.6	64.3	66.3	68.1	72.2	65.9	60.6	63.0
TRG _e [dB]	-2.35	-2.35	-2.20	-2.24	-2.24	-2.53	-2.11	-2.35	-2.38	-2.05	-2.03	-2.02	-2.33	-2.37	-2.23	-2.12	-1.86	-2.28	-2.64	-2.47
Gain _e Peak [dB]	1.08	1.08	1.44	1.17	1.30	0.91	1.44	0.97	0.95	1.51	1.52	1.56	1.27	1.16	1.23	1.23	1.62	0.91	0.74	0.84
Gain _e Min [dB]	-25.71	-25.71	-23.70	-25.24	-22.23	-23.28	-23.14	-22.94	-21.09	-21.13	-20.88	-17.54	-19.73	-20.14	-18.00	-16.32	-15.20	-16.25	-17.14	-19.14
TRG _p [dB]	-13.00	-13.00	-12.77	-12.68	-12.63	-12.64	-12.67	-12.51	-12.35	-12.00	-11.96	-11.90	-12.07	-11.94	-11.96	-11.73	-11.51	-11.73	-12.07	-12.00
Gain _p Peak [dB]	-6.56	-6.56	-6.15	-6.09	-6.05	-6.08	-6.02	-5.84	-5.80	-5.51	-5.32	-5.28	-4.87	-5.59	-5.23	-5.04	-4.48	-5.08	-5.36	-4.98
Gain _p Min [dB]	-30.79	-30.79	-35.55	-38.51	-37.26	-34.38	-34.52	-30.93	-30.72	-27.68	-27.56	-26.85	-26.38	-30.12	-27.82	-25.43	-23.53	-25.81	-25.38	-30.55
UHRG [dB]	-5.39	-5.39	-5.25	-5.27	-5.28	-5.52	-5.15	-5.38	-5.41	-5.06	-5.04	-5.03	-5.29	-5.34	-5.23	-5.11	-4.89	-5.31	-5.70	-5.58
UHRG/TRG [%]	45.7	45.7	45.5	45.7	45.6	45.7	45.4	45.3	45.2	45.4	45.3	45.3	45.8	45.5	45.2	45.3	44.9	44.7	44.4	43.9
H-Plane	-0.45	-0.45	-0.26	-0.36	-0.33	-0.63	-0.22	-0.39	-0.51	-0.22	-0.12	-0.14	-0.47	-0.48	-0.41	-0.27	0.00	-0.41	-0.82	-0.65
E1-Plane, AVG [dB]	-3.50	-3.50	-3.31	-3.38	-3.38	-3.70	-3.37	-3.51	-3.57	-3.26	-3.25	-3.14	-3.42	-3.56	-3.39	-3.23	-3.00	-3.26	-3.81	-3.59
E2-Plane, AVG [dB]	-3.41	-3.41	-3.27	-3.29	-3.24	-3.57	-3.09	-3.47	-3.45	-3.07	-2.98	-3.00	-3.32	-3.37	-3.25	-3.14	-2.81	-3.42	-3.72	-3.53
Peak Gain [dB]	1.25	1.25	1.62	1.35	1.45	1.11	1.61	1.12	1.12	1.70	1.65	1.69	1.35	1.29	1.37	1.40	1.72	1.00	0.81	0.90
Directivity [dB]	3.24	3.24	3.45	3.22	3.31	3.23	3.33	3.07	3.08	3.34	3.26	3.28	3.25	3.21	3.15	3.06	3.13	2.81	2.99	2.91
Minimum Gain [dB]	-18.00	-18.00	-18.61	-17.93	-18.12	-17.78	-18.24	-18.19	-17.35	-16.03	-14.70	-14.00	-14.97	-13.62	-14.14	-12.70	-11.98	-11.99	-13.73	-13.40
Test Condition	FS																			
Antenna Type																				
Average Efficiency	-1.62 dB 68.80 %																			

2023.11.10

RA-N2208-02

APPROVAL SHEET

MODEL : T206
Antenna layout

Review	Consent	Approval

Messrs. OHSUNG ELECTRONICS Co.,Ltd



RadiNa Co. ,Ltd

TEL:+82-2-463-0373

FAX:+82-2-463-0374

	PRODUCT APPROVAL SHEET		GRO822023WF81			
	MODEL NAME	T206	REV.	1.0	Page	2 / 10

Table of contents

1. Revision History

2. Product Information

2.1 General Features

2.2 Electrical Specifications

3. Pattern Specifications

4. Matching Network

5. Electrical Characteristics

5.1 VSWR

5.2 Smith Chart

5.3 2D-GAIN

6. Passive Measurement

7. Measurement Process

	PRODUCT APPROVAL SHEET		GRO822023WF81			
	MODEL NAME	T206	REV.	1.0	Page	3 / 10

1. Revision History

NO.	Before	After	Reason	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

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	PRODUCT APPROVAL SHEET		GRO822023WF81			
	MODEL NAME	T206	REV.	1.0	Page	4 / 10

2. Product Information

2.1 General Features

PART NUMBER	GradiANT (AT206-RADINA)
ANTENNA TYPE	PCB Pattern Antenna
APPLICATIONS	Wi-Fi & BLE

2.2 Electrical Specifications

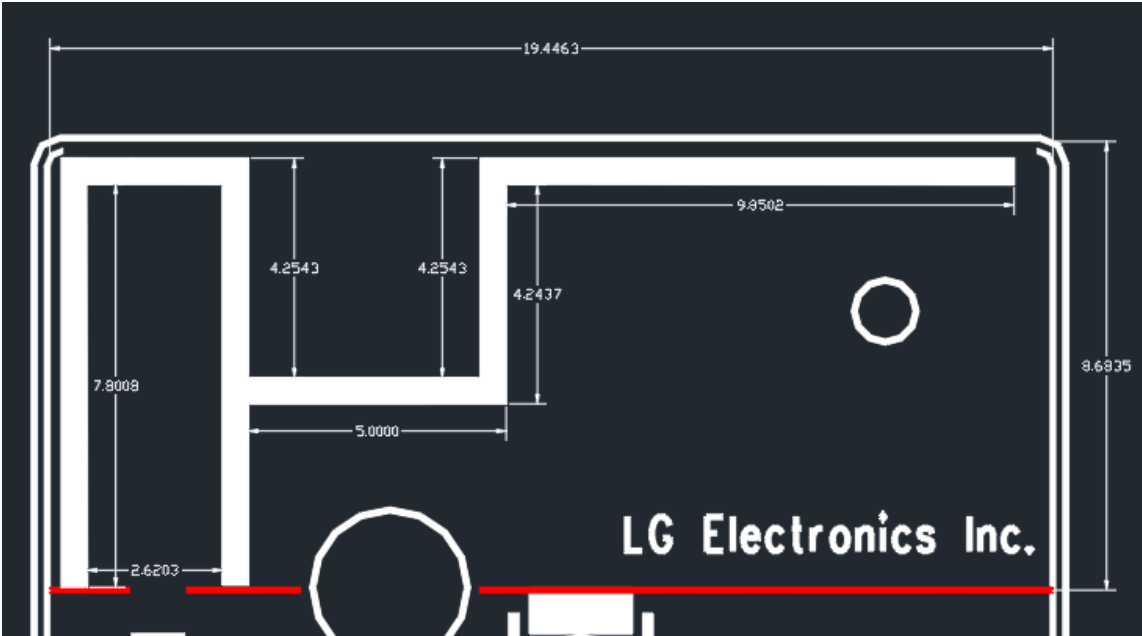
Frequency Range1 (TX)		2400MHz~2485MHz	
Frequency Range1 (RX)		2400MHz~2485MHz	
IMPEDANCE		50 Ω	
V.S.W.R	TX	2400MHz	2485MHz
		3 ↓	3 ↓
	RX	2400MHz	2485MHz
		3 ↓	3 ↓
Average Gain		-1.62 dBi	
Peak Gain		1.72 dBi	
RADIATION PATTERN		Omni-directional	
POLARIZATION		Linear	
Measurement		RADINA. Co., LTD	

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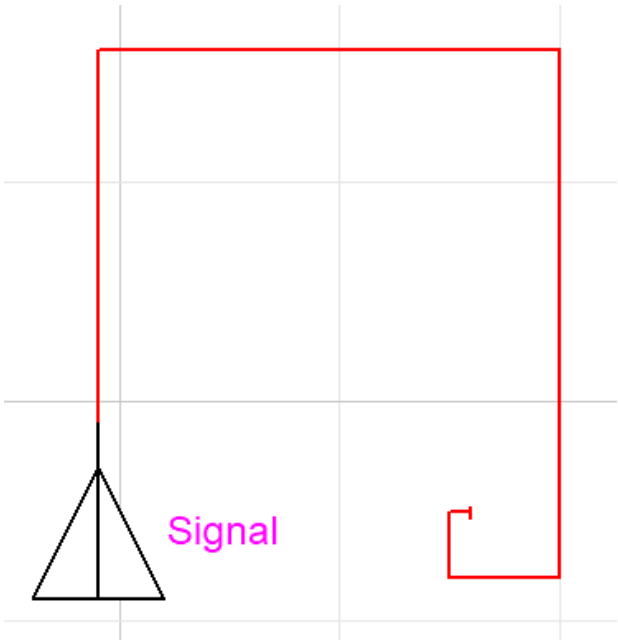
	PRODUCT APPROVAL SHEET		GRO822023WF81			
	MODEL NAME	T206	REV.	1.0	Page	5 / 10

3. Pattern Specifications



4. Matching Network

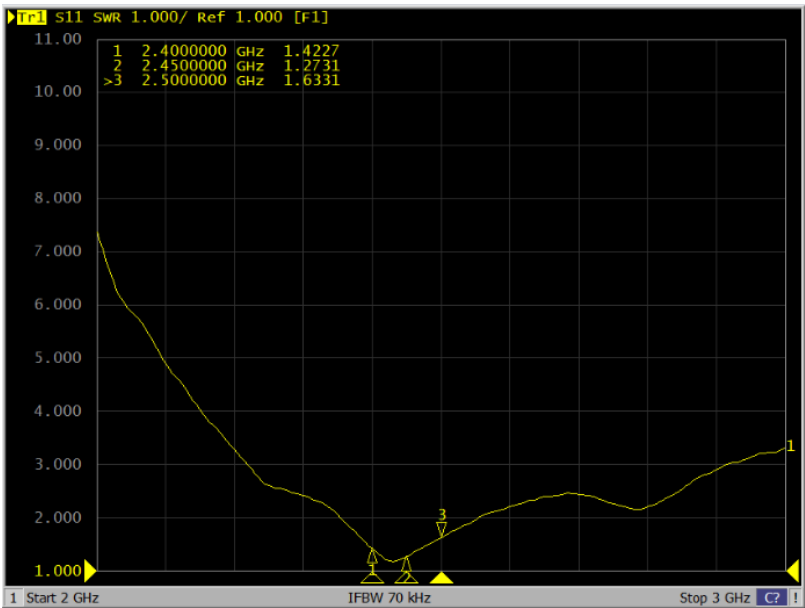
Capacitor value can be changed depending on different situation



	PRODUCT APPROVAL SHEET		GRO822023WF81			
	MODEL NAME	T206	REV.	1.0	Page	6 / 10

5. Electrical Characterristics

5.1 VSWR

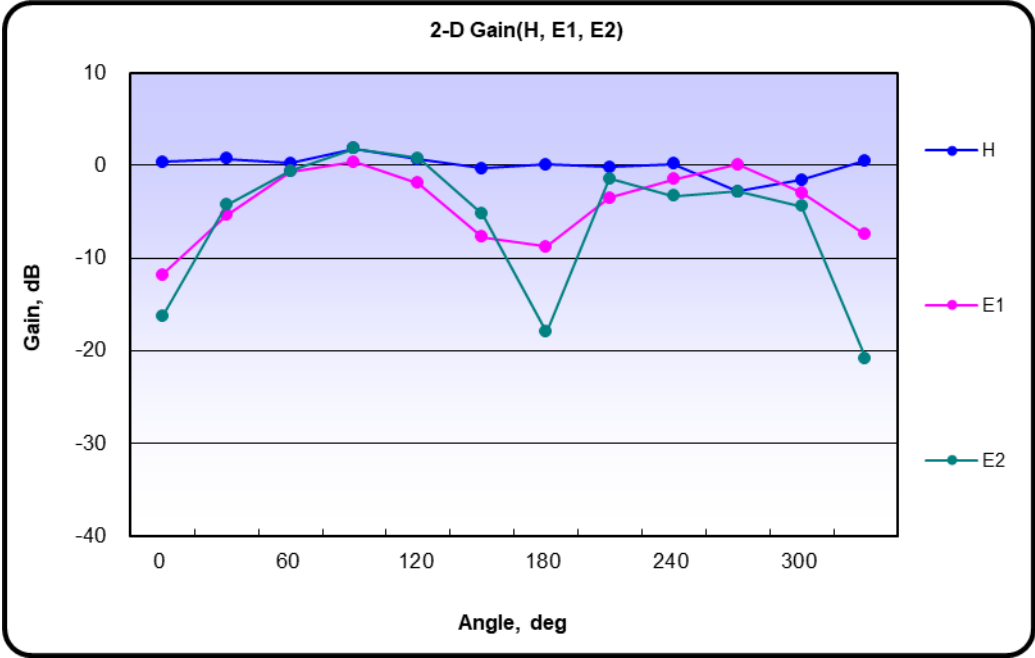


5.2 SMITH CHART



	PRODUCT APPROVAL SHEET		GRO822023WF81			
	MODEL NAME	T206	REV.	1.0	Page	7 / 10

5.3
2D-GAIN



	PRODUCT APPROVAL SHEET		GRO822023WF81			
	MODEL NAME	T206	REV.	1.0	Page	8 / 10

6. Passive Measurement

	1	2	3	4	5	6	7	8	9	10
Frequency [MHz]	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445
Efficiency [dBi]	-1.99	-1.99	-1.84	-1.87	-1.86	-2.12	-1.72	-1.95	-1.97	-1.63
Efficiency [%]	63.2	63.2	65.5	65.1	65.1	61.3	67.3	63.9	63.6	68.7
TRG _θ [dB]	-2.35	-2.35	-2.20	-2.24	-2.24	-2.53	-2.11	-2.35	-2.38	-2.05
Gain _{θ Peak} [dB]	1.08	1.08	1.44	1.17	1.30	0.91	1.44	0.97	0.95	1.51
Gain _{θ Min} [dB]	-25.71	-25.71	-23.70	-25.24	-22.23	-23.28	-23.14	-22.94	-21.09	-21.13
TRG _φ [dB]	-13.00	-13.00	-12.77	-12.68	-12.63	-12.64	-12.67	-12.51	-12.35	-12.00
Gain _{φ Peak} [dB]	-6.56	-6.56	-6.15	-6.09	-6.05	-6.08	-6.02	-5.84	-5.80	-5.51
Gain _{φ Min} [dB]	-30.79	-30.79	-35.55	-38.51	-37.26	-34.38	-34.52	-30.93	-30.72	-27.68
UHRG [dB]	-5.39	-5.39	-5.25	-5.27	-5.28	-5.52	-5.15	-5.38	-5.41	-5.06
UHRG/TRG [%]	45.7	45.7	45.5	45.7	45.6	45.7	45.4	45.3	45.2	45.4
H-Plane	-0.45	-0.45	-0.26	-0.36	-0.33	-0.63	-0.22	-0.39	-0.51	-0.22
E1-Plane, AVG [dB]	-3.50	-3.50	-3.31	-3.38	-3.38	-3.70	-3.37	-3.51	-3.57	-3.26
E2-Plane, AVG [dB]	-3.41	-3.41	-3.27	-3.29	-3.24	-3.57	-3.09	-3.47	-3.45	-3.07
Peak Gain [dBi]	1.25	1.25	1.62	1.35	1.45	1.11	1.61	1.12	1.12	1.70
Directivity [dBi]	3.24	3.24	3.45	3.22	3.31	3.23	3.33	3.07	3.08	3.34
Minimum Gain [dBi]	-18.00	-18.00	-18.61	-17.93	-18.12	-17.78	-18.24	-18.19	-17.35	-16.03

	11	12	13	14	15	16	17	18	19	20
Frequency [MHz]	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency [dBi]	-1.61	-1.59	-1.90	-1.91	-1.79	-1.67	-1.41	-1.81	-2.18	-2.01
Efficiency [%]	69.1	69.3	64.6	64.3	66.3	68.1	72.2	65.9	60.6	63.0
TRG _θ [dB]	-2.03	-2.02	-2.33	-2.37	-2.23	-2.12	-1.86	-2.28	-2.64	-2.47
Gain _{θ Peak} [dB]	1.52	1.56	1.27	1.16	1.23	1.23	1.62	0.91	0.74	0.84
Gain _{θ Min} [dB]	-20.88	-17.54	-19.73	-20.14	-18.00	-16.32	-15.20	-16.25	-17.14	-19.14
TRG _φ [dB]	-11.96	-11.90	-12.07	-11.94	-11.96	-11.73	-11.51	-11.73	-12.07	-12.00
Gain _{φ Peak} [dB]	-5.32	-5.28	-4.87	-5.59	-5.23	-5.04	-4.48	-5.08	-5.36	-4.98
Gain _{φ Min} [dB]	-27.56	-26.85	-26.38	-30.12	-27.82	-25.43	-23.53	-25.81	-25.38	-30.55
UHRG [dB]	-5.04	-5.03	-5.29	-5.34	-5.23	-5.11	-4.89	-5.31	-5.70	-5.58
UHRG/TRG [%]	45.3	45.3	45.8	45.5	45.2	45.3	44.9	44.7	44.4	43.9
H-Plane	-0.12	-0.14	-0.47	-0.48	-0.41	-0.27	0.00	-0.41	-0.82	-0.65
E1-Plane, AVG [dB]	-3.25	-3.14	-3.42	-3.56	-3.39	-3.23	-3.00	-3.26	-3.81	-3.59
E2-Plane, AVG [dB]	-2.98	-3.00	-3.32	-3.37	-3.25	-3.14	-2.81	-3.42	-3.72	-3.53
Peak Gain [dBi]	1.65	1.69	1.35	1.29	1.37	1.40	1.72	1.00	0.81	0.90
Directivity [dBi]	3.26	3.28	3.25	3.21	3.15	3.06	3.13	2.81	2.99	2.91
Minimum Gain [dBi]	-14.70	-14.00	-14.97	-13.62	-14.14	-12.70	-11.98	-11.99	-13.73	-13.40

Average Efficiency	-1.62dBi	68.80%
Peak Gain	1.72dBi	

	PRODUCT APPROVAL SHEET		GRO822023WF81			
	MODEL NAME	T206	REV.	1.0	Page	9 / 10

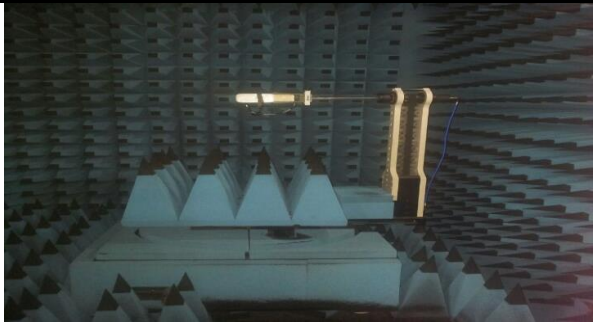
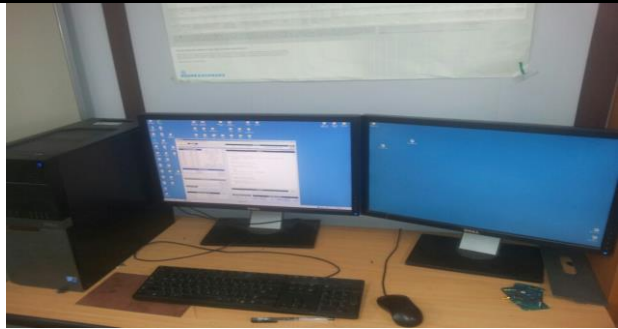
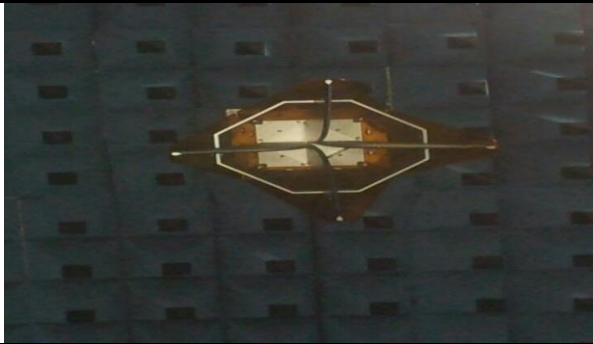
7.Measurement Process

7.1 SWR / Return loss

	Set Condition
Network Analyzer	Agilent 8753ES
Cable	Semi-ridid (40mm, 60mm)
Test condition	

7.2 Gain

Antenna gain is measured in the anechoic chamber of this company.

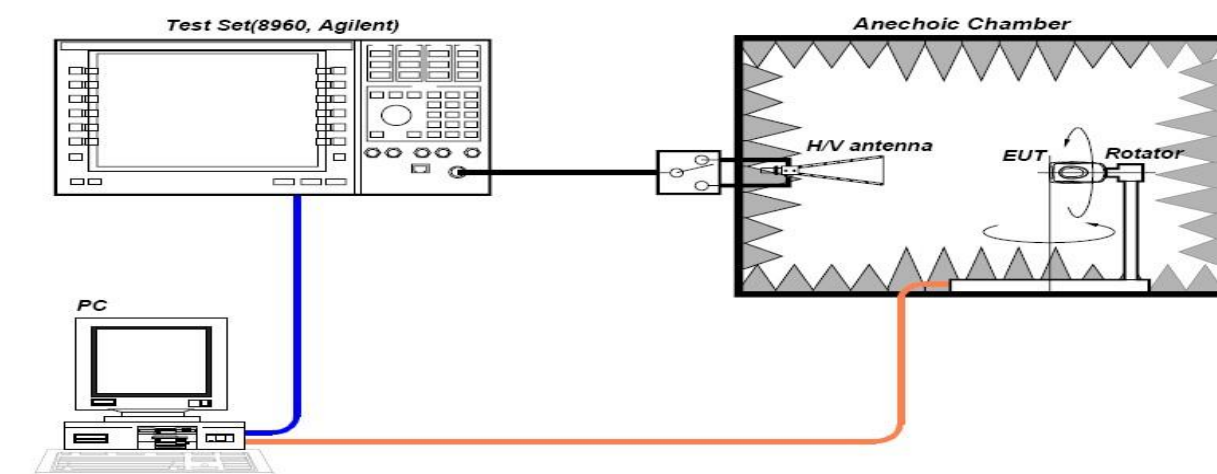
Anechoic Chamber for Antenna Gain Measurement	
	
	

	PRODUCT APPROVAL SHEET		GRO822023WF81			
	MODEL NAME	T206	REV.	1.0	Page	10 / 10

7.3 Gain test block diagram

Active test Sysetm

- TRP, NHPRP, UHRP
- TIS, NHPIS, UHIS
- Relative Sensitivity



Passiver test Sysetm

- Efficiency
- Peak Gain, Avg, Gain
- Min, Max PWR

