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INTRODUCTION

MIMO Antenna CPG37S(7-in-1)-V1
Permanent Screws Mount (M16x1.5P)

7-Cables :1 x GNSS, 2xLTE 5G/4G, 4xWiFI/WiMAX

Cable 1:GPS/Glonass RG174 1.83M (6ft) SMA/M S/T
1575.42/1602.00MHz 5 dBic (27~30dBi)

Cables 2-3: LTE/5G4G/3G/2G RG174 1.83M(6ft) SMA/M S/T
690-960/1710-2170/2500-2700/3200-3800MHz 2-5dBi

Cables 4-7: WiFi/WiMAX RG174 1.83M (6ft) SMA/M RP S/T
2.4-2.5/5.0-5.2/5.8~5.95GHz 2-5dBi

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1.NERAL DESCRIPTION

Model No	Products P/N
CPG37S(7-in-1)-V1-RG174-1.83M(6ft)-SMA/M	CPG37S-1.83M(6ft)

Below is a table summarizing the GNSS/LTE 5G/4G/3G, WiFi (7-in-1) antenna design specification

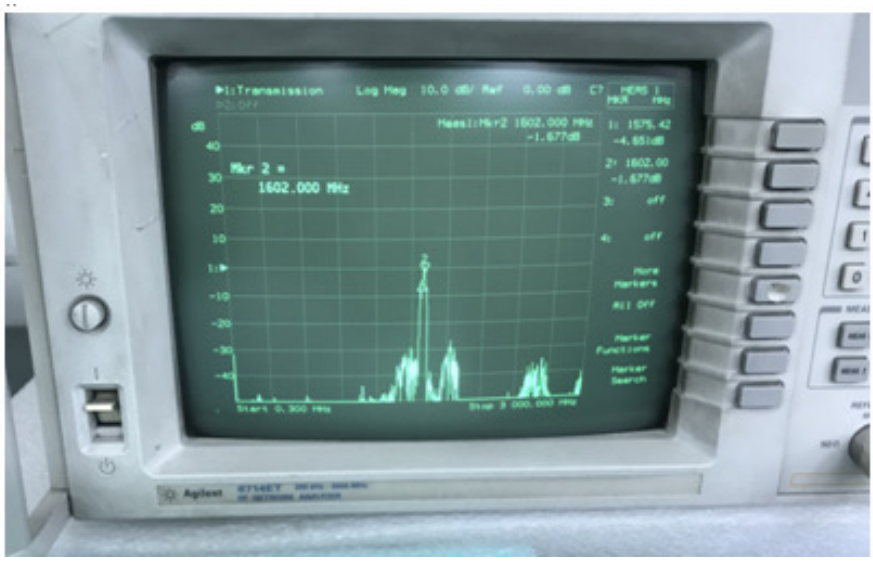
Cable 1:

2.1 GPS/GLONASS Antenna Electrical Properties

Antenna Gain	90° : 2.0 dBi Min. 20° : -5.0 dBi Min. Mounted on the 60mm*60mm ground plane.
Polarization	RHCP
Axial Ratio	90° : Max 3.0dB Mounted on the 60mm*60mm ground plane.
Input Voltage	2.4V-5.0V
Power Consumption	At 2.4 V Type: 13mA. Max: 16mA. At 5.0 V Type: 18mA. Max: 22mA.
Parameter	**Description**
GPS/Glonass Center Frequency Band	1575.42 /1602MHz ± 1.023 MHz.
V.S.W.R	<1.5：1
Note: Gain includes the cable loss	

2.2GPS/GLONASS LNA Electrical Properties

Parameter	Description
Frequency Range	1575.42/1602.00 ± 1.023 MHz
Gain	27~29 ± 4.5dB (+ 25 ℃± 5℃)
27~29 ± 4.5dB (+ 25 ℃± 5℃)	1.5 dB Max. (+25 ℃ ± 5℃) 2.2 dB Max. (+85 ℃)SMA 180°(Male)
Out Band Rejection	for = 1575.42/1602 MHz for ± 20 MHz 7dB MIN for ± 30 MHz 12dB MIN for ± 50 MHz 20dB MIN for ± 100 MHz 30dB MIN
Output Impedance	50Ω



2.3 GPS/GLONASS Antenna Mechanical Properties

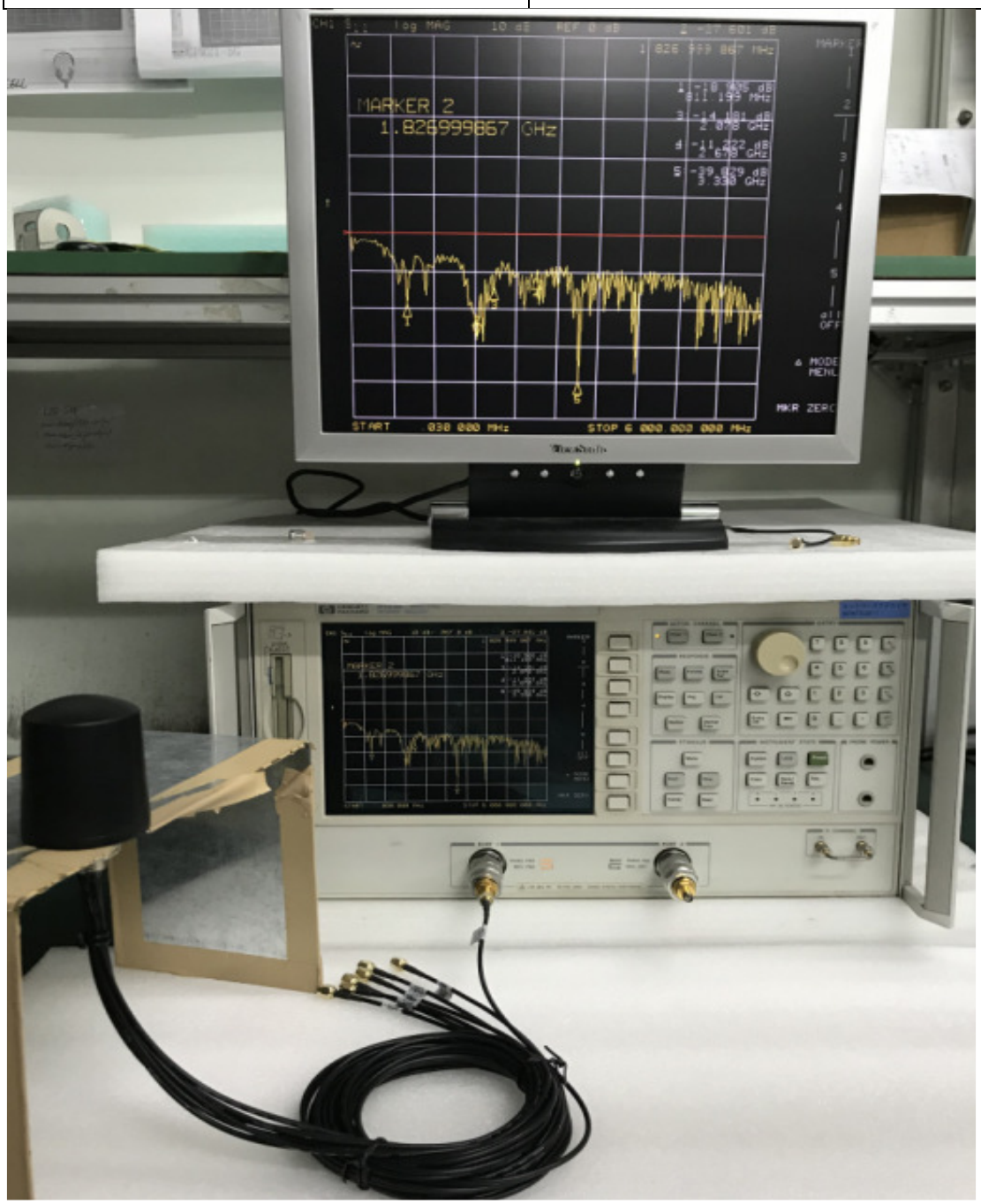
Parameter	Description
Antenna Mounting	Permanent screws mount (M12 x1P)
Waterproof	100 % waterproof.(IP66~IP67)
Shock 10msec. Half sine wave.	Shock 10msec. Half sine wave.
Antenna cable	RG174U Low less
Antenna Cable Total Length	1830 mm(6ft)
Antenna Color	ABS (Black)
Connector	SMA 180°(Male)
Operating Temperature Range	-30℃~+75℃
Storage Temperature Range	-40℃~+80℃

Cable 2-3:

3.1 LTE 5G/4G/3G/GSM Multi-band Antenna Electrical Properties

Parameter	Description
Communication System	5G/4G/3G/AMPS/GSM/DCS/UMTS/LTE
Frequency Band (MHz)	690~960/1710~2170/2300~2700/3200~3800MHz
Average Efficiency	47%/67%/59%/54%/57%
Average Gail	2.0~5.0dBi
Nominal Impedance	50 ohm

Polarization	Vertical
Return Loss	Please See Data
V.S.W.R	<1.5：1



3.2 LTE/5G/4G/3G/2G Multi-band Antenna Mechanical Properties

Parameter	Description

Antenna Type	External Antenna
Touch Type	Screw Type (M12x1P)
Antenna cable	RG174 Low loss cable
Connector Type	SMA 180°(Male)
Antenna Cable Total Length	1830mm(6ft) ±50mm
Antenna Color	Black
Waterproof	100% waterproof.(IP66~IP67)
Shock (Drop Test)	25CM drop on concret

Cable 4-5:

4.1 WiFi /WiMAX 2.4G/5.2G Antenna Electrical Properties

Parameter	Description
WiFi/WiMAX	Wireless LAN (2.4/5.2/5.8GHz)
Frequency Band	2.4~2.5 /4.9~5.2/5.8~6.0GHz
Nominal Impedance	50 ohm
Polarization	Vertical
Antenna Gain	2.0~5.0 dBi
Return Loss	Please See Data
V.S.W.R	<2.0：1

4.2 WiFi /WiMAX 2.4/5.2GHz Antenna Mechanical Properties

Parameter	Description
Antenna Cable	RG174 Low less
Antenna Mounting	Permanent Screws Mount (M12 x1P)
Waterproof .	100 % waterproof.
Connector Type	SMA /M 180° Reverse (公頭母 PIN)
Antenna Cable Total Length	1830mm ±50mm (6ft)
Antenna Color	ABS (Black)
Operating Temperature Range	-35°C~+75C
Storage Temperature Range	-40°C~+80°C

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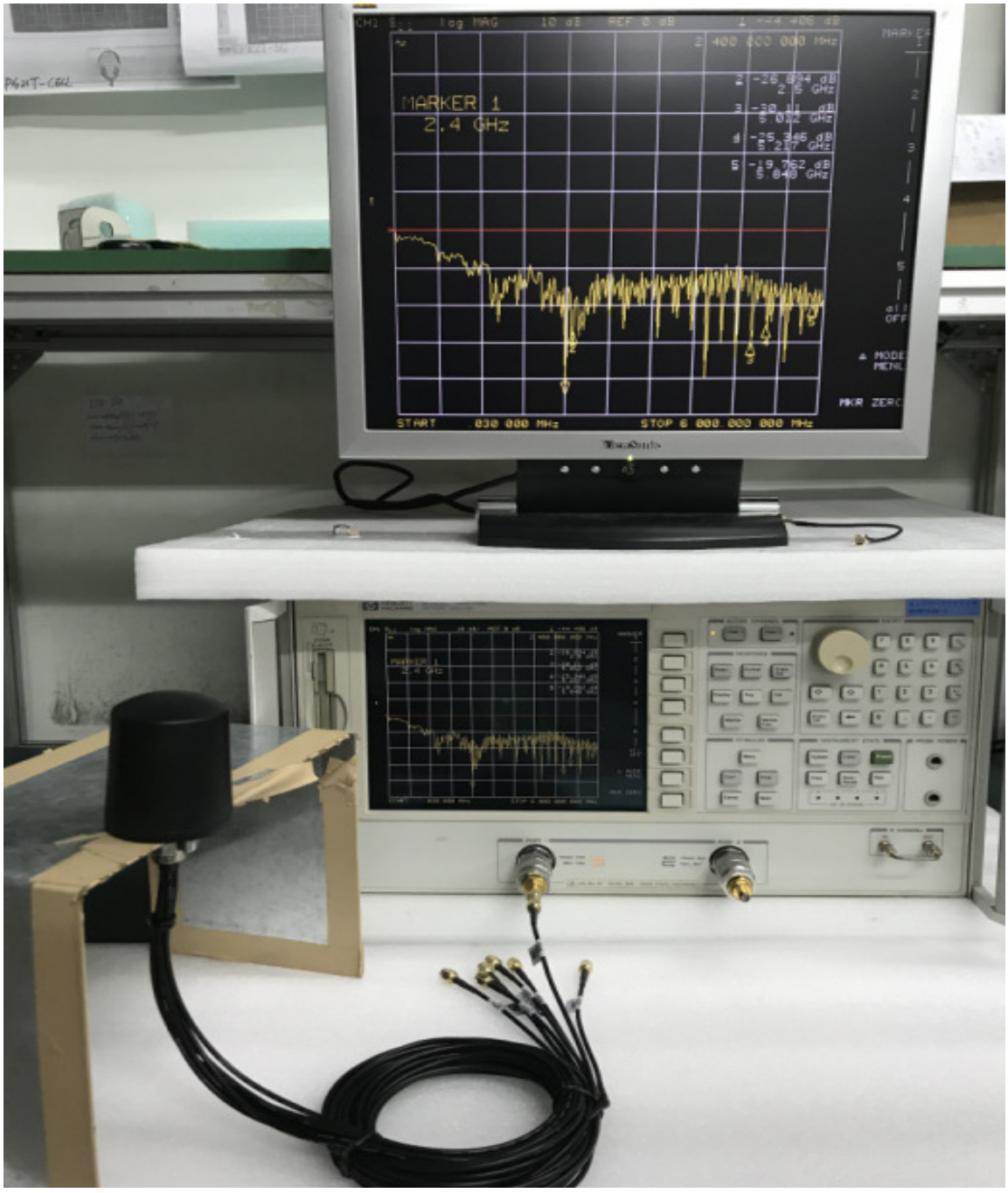

5.Antenna Appearance Size: M16 x1.5P
Diameter :54.7 mm (2.15”)
Height : 60mm (2.36”)

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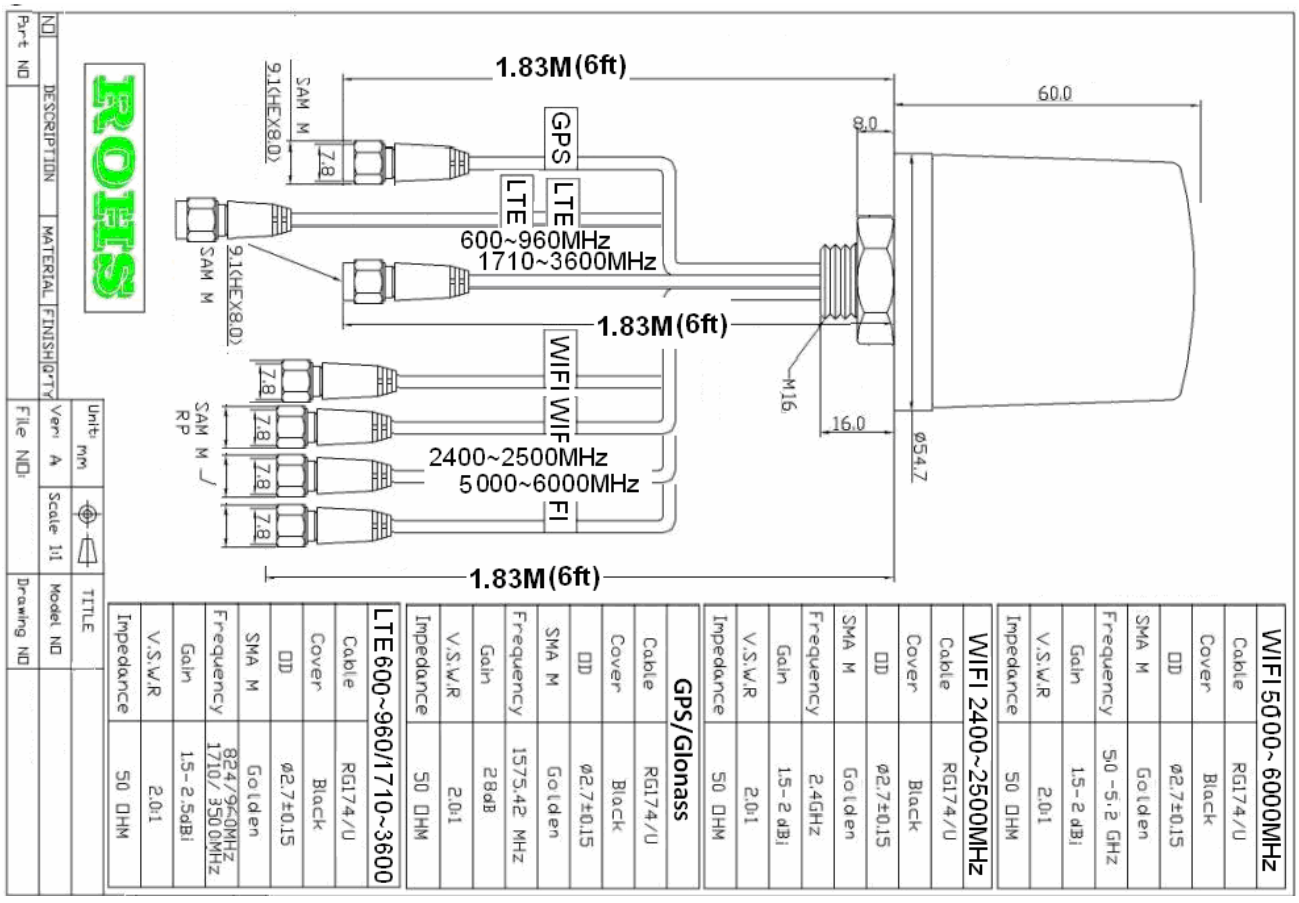


WIFI 5000~6000MHz	
Cable	RG174/U
Cover	Black
OD	Ø2.7±0.15
SMA M	Golden
Frequency	5.0 ~5.2 GHz
Gain	1.5~2 dBi
V.S.W.R	2.0:1
Impedance	50 OHM

WIFI 2400~2500MHz	
Cable	RG174/U
Cover	Black
OD	Ø2.7±0.15
SMA M	Golden
Frequency	2.4GHz
Gain	1.5~2 dBi
V.S.W.R	2.0:1
Impedance	50 OHM

GPS/Glonass	
Cable	RG174/U
Cover	Black
OD	Ø2.7±0.15
SMA M	Golden
Frequency	1575.42 MHz
Gain	28dB
V.S.W.R	2.0:1
Impedance	50 OHM

LTE 600~960/1710~3600	
Cable	RG174/U
Cover	Black
OD	Ø2.7±0.15
SMA M	Golden
Frequency	824/960MHz 1710/3500MHz
Gain	1.5~2.5dBi
V.S.W.R	2.0:1
Impedance	50 OHM

6 .GPS/Glonass Antenna Frequency : 1575.42/1602.00 MHz

6-1. Electrical Specification:

- All values are defined at 25±15℃,65 ± 20％RH , power handling 1 u watt , air pressure 960±100 HPA unless noted.
- Patch characteristics are measured with 70x70 mm ground plane in an anechoic chamber.

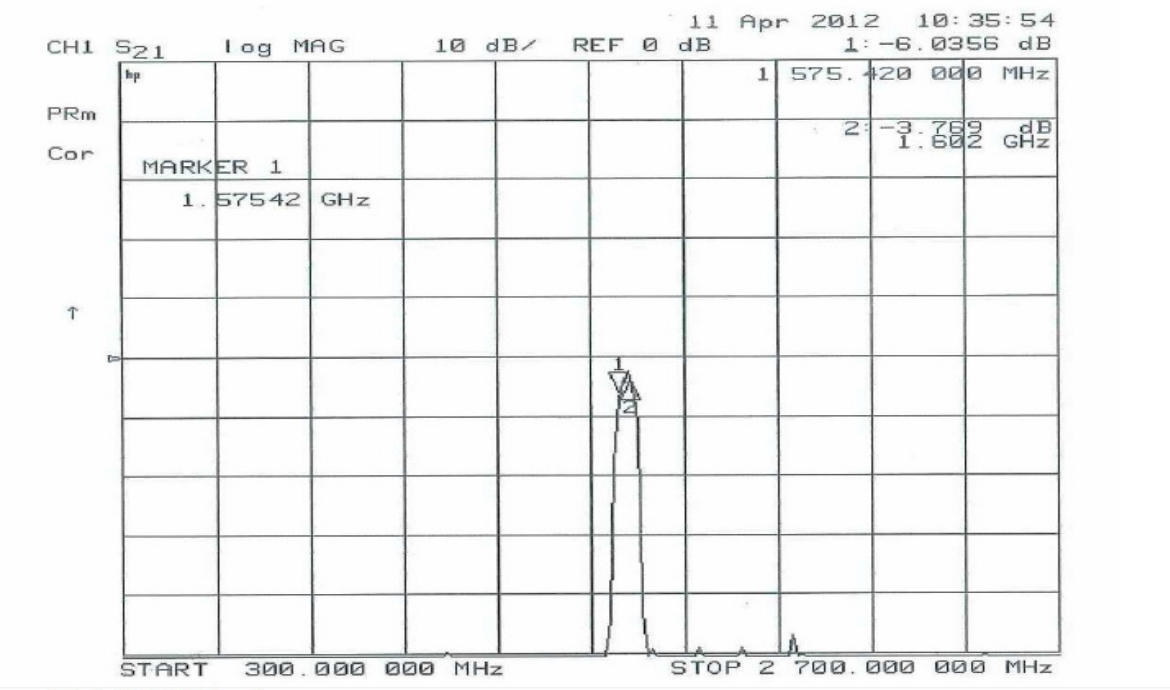
6-2) Patch

Characteristics	Specification
Center Frequency	1575.42 /1602.00±1.023 MHz (when covered with a radome and measured by LNA ground plane)
Bandwidth (10dB return loss)	10 MHz min @S11≦-10dB
Gain at Zenith	2 dBic type
Gain at 10° elevation	-7 dBic min
Polarization	R.H.C.P
Axial Ratio	3 dB type
VSWR	<2.0:1

6-3) Filter / LNA

Characteristics	Specification
Center Frequency	1575 -1610 MHz
Gain	27 dB type
Noise Figure	1.5 dB type
Output V.S.W.R	2.0 max
Voltage	2.3~5.5 V
Current	2.3V：6.6 mA Typical
	3.0 V：8.6 mA Typical
	4.0 V：12.6 mA Typical
	5.5 V：16 mA Typical

6-4 GPS/Glonass Log MAG & U FS



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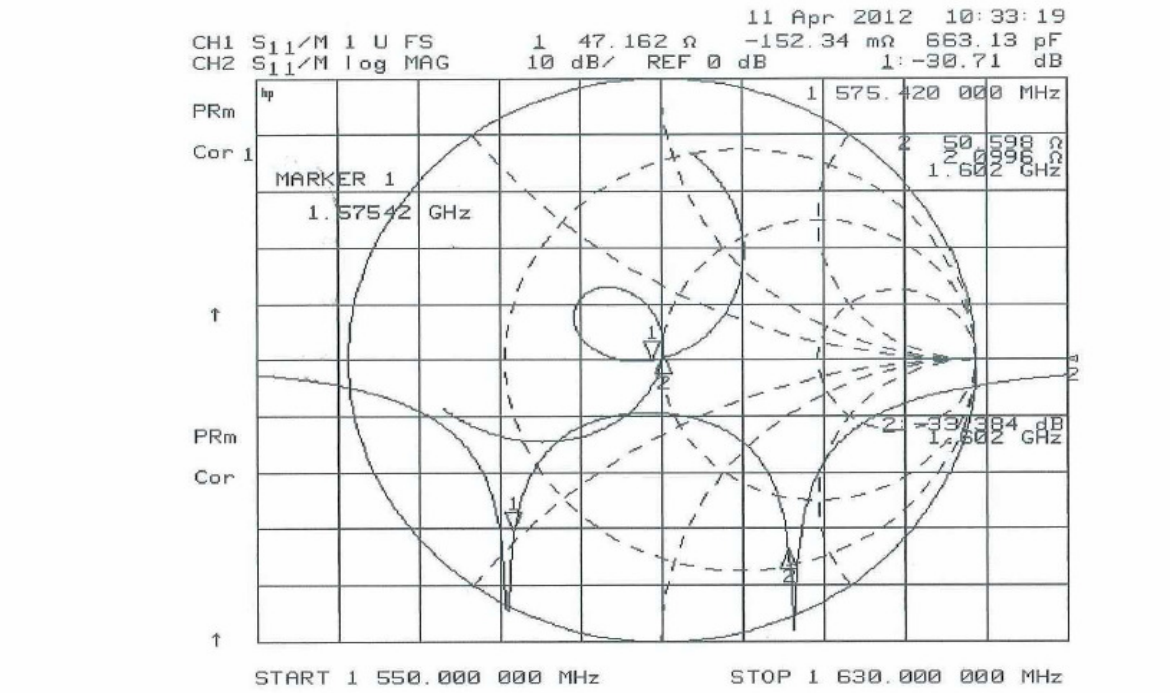
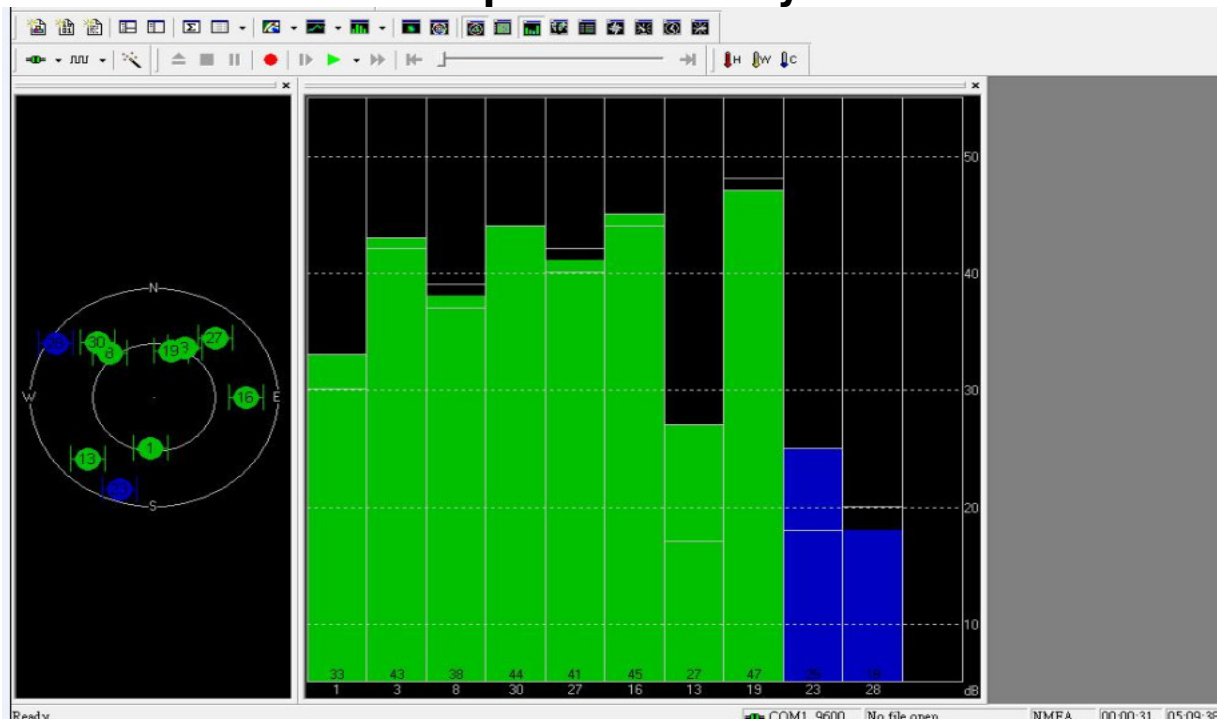
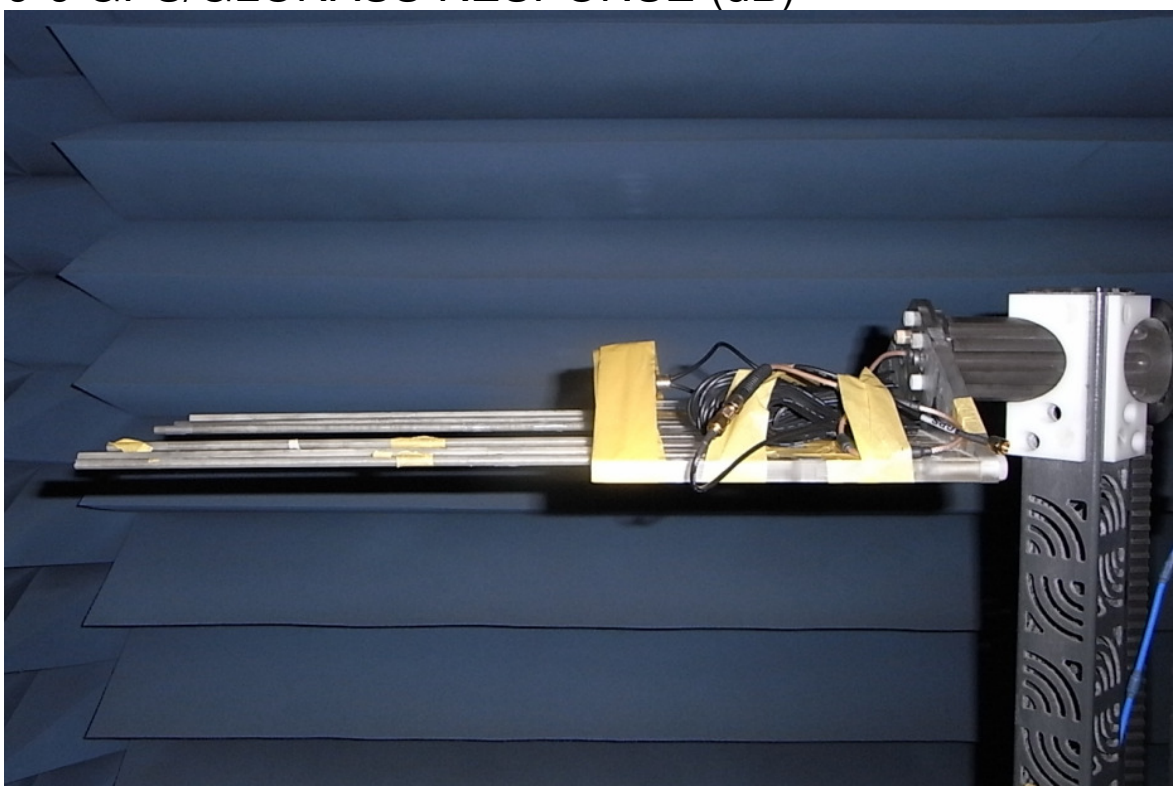


6-5 GPS Satellite reception intensity



6-6 GPS/GLONASS RESPONSE (dB)



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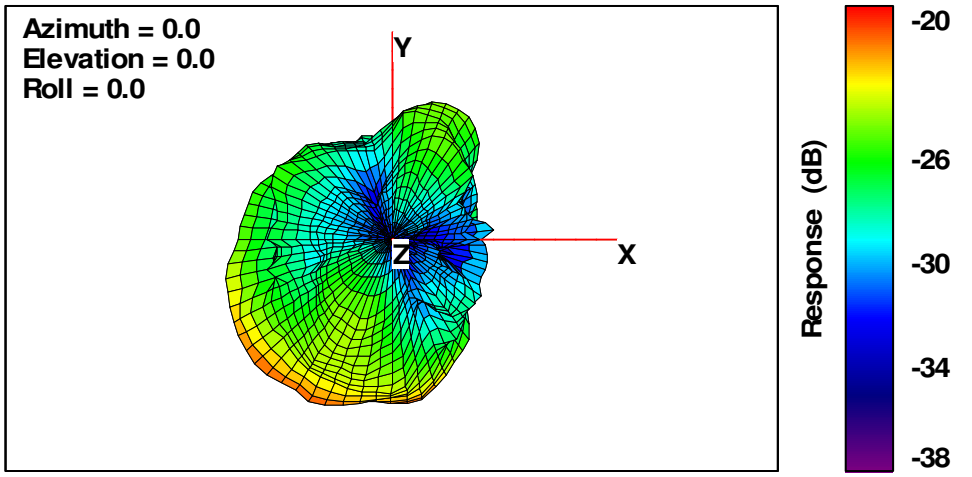
1575.42MHz

Total



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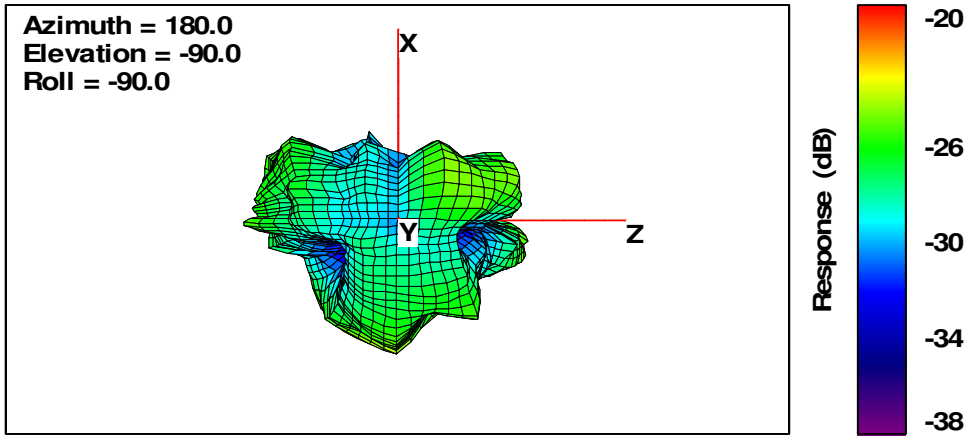

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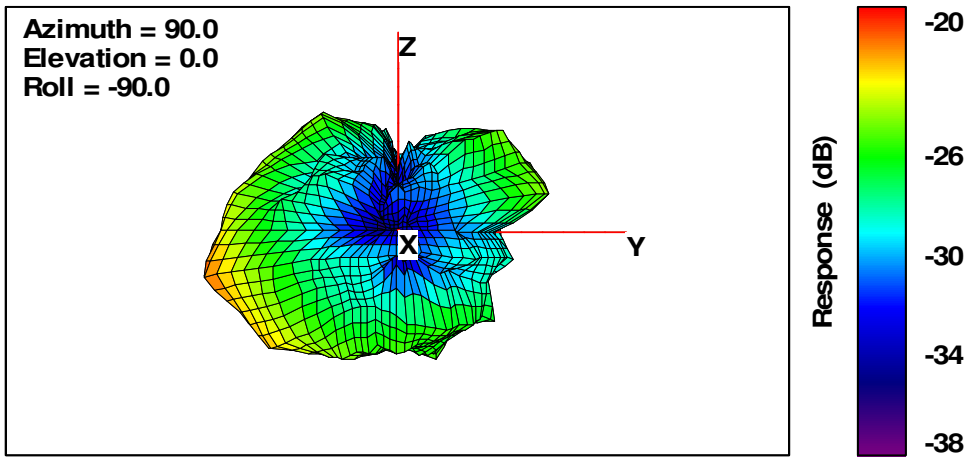

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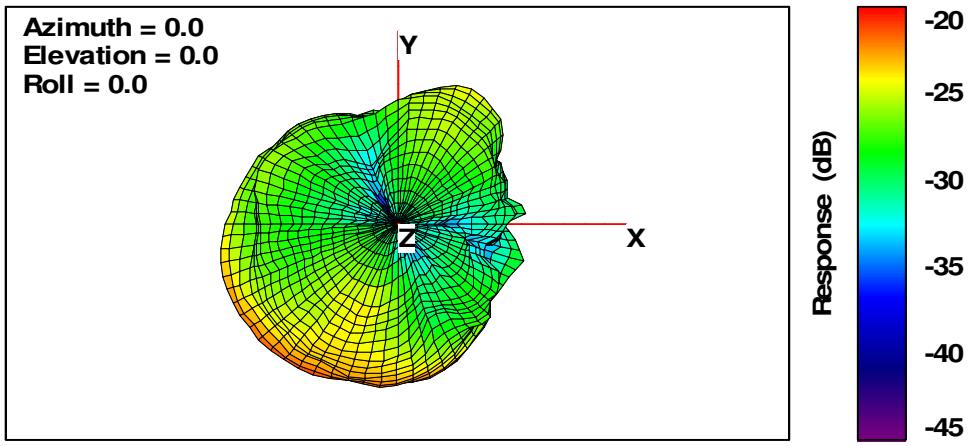
1602.00MHz

Total



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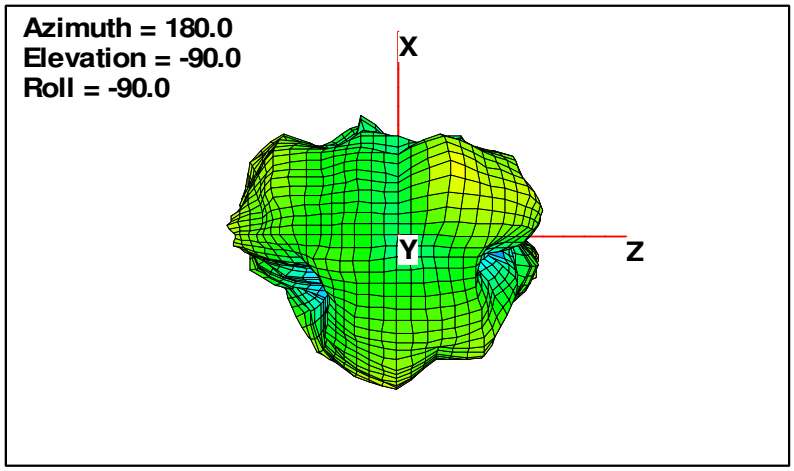

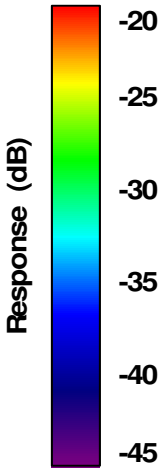

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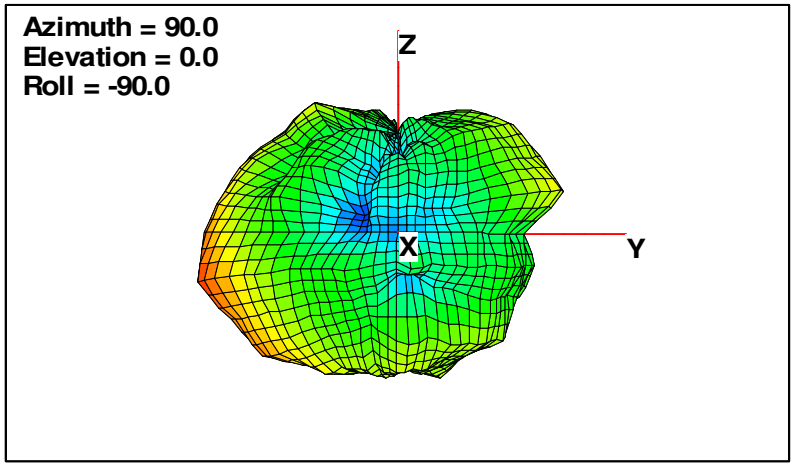

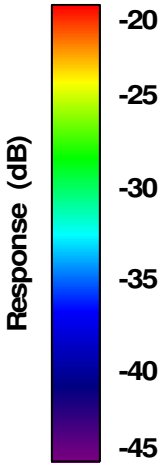

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7.LTE/5G/4G/3G Multi -band Networt analyzer test
Frequency :690~960/1710~2170/2300~2700/3200~3800MHz
Cable 2-3

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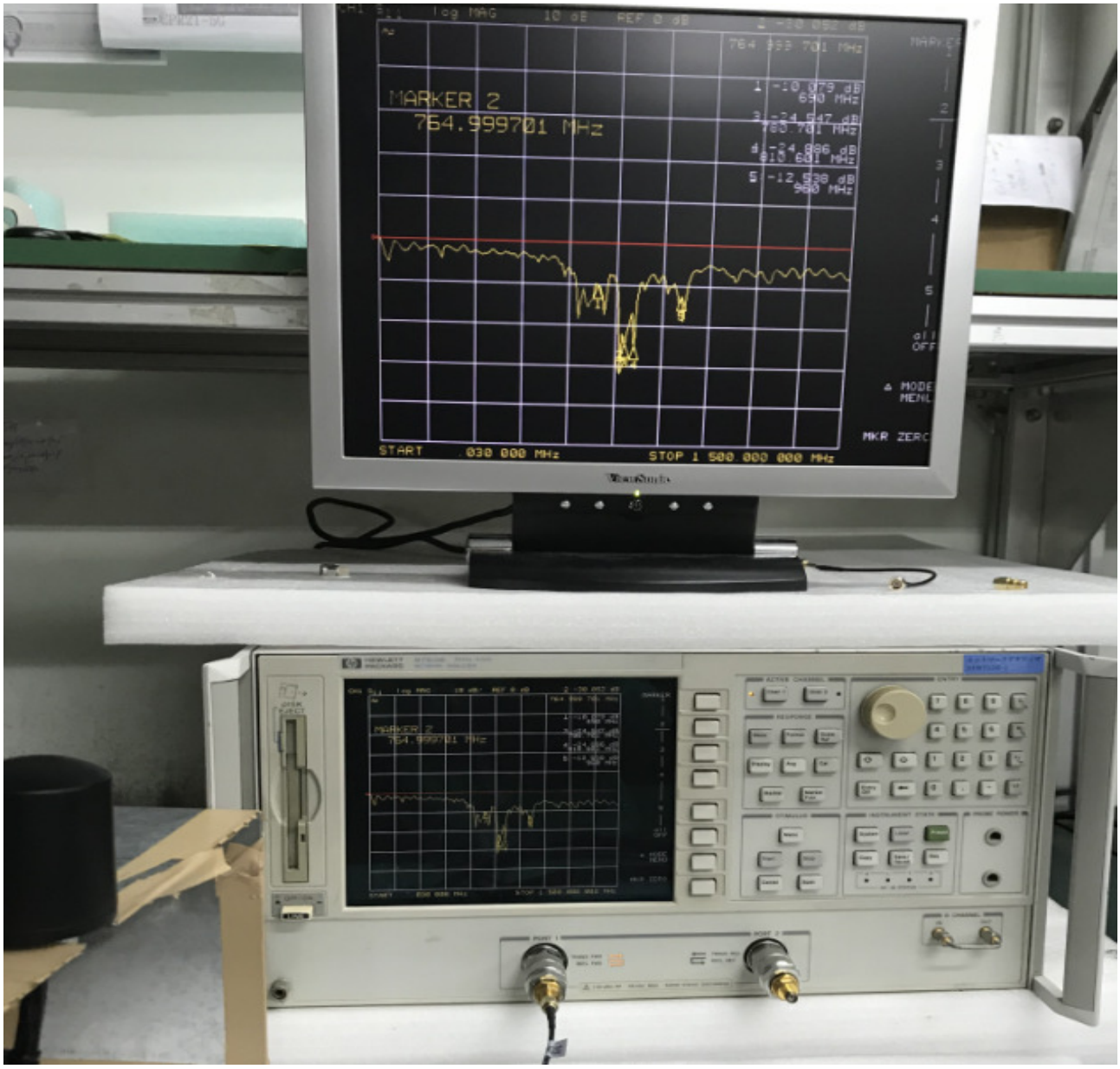
Detail band test - frequency : 690~960MHz

Frequency	Return loss	V.S.W.R	Reflection coefficient
690.000MHz	-10.979dB	1.788:1	0.283
764.999MHz	-20.052dB	1.221:1	0.099
783.701MHz	-24.547dB	1.126:1	0.059
810.601MHz	-24.886dB	1.121:1	0.057
960.000MHz	-12.538dB	1.618:1	0.236



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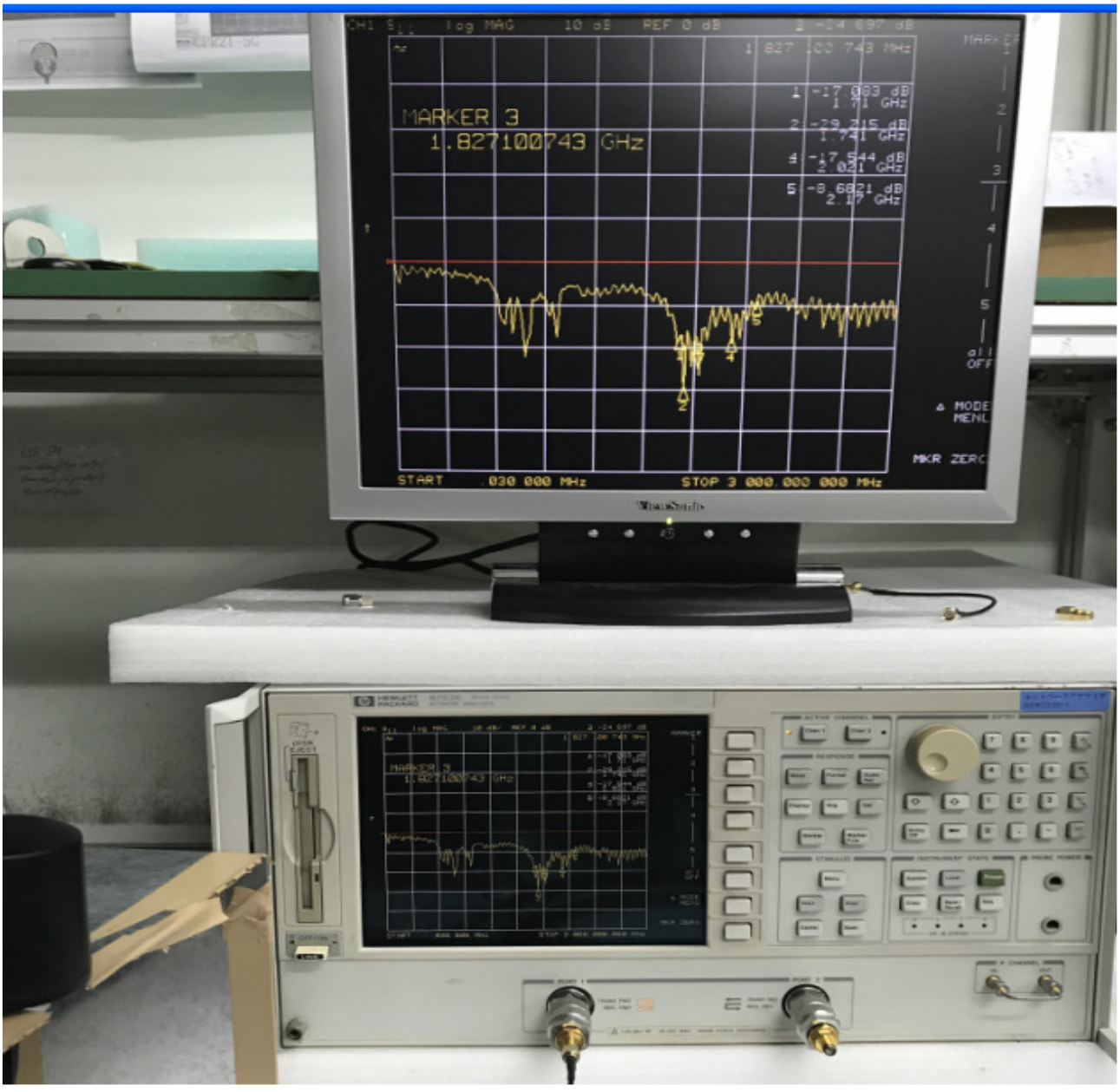
7-2 Detail band test - frequency : 1710~2170MHz

Frequency	Return loss	V.S.W.R	Reflection coefficient
1710.00MHz	-17.093dB	1.325:1	0.140
1741.10MHz	-29.215dB	1.072:1	0.035
1827.71MHz	-24.697dB	1.124:1	0.058
2021.00MHz	-17.544dB	1.306:1	0.133
2170.00MHz	-8.8621dB	2.127:1	0.360



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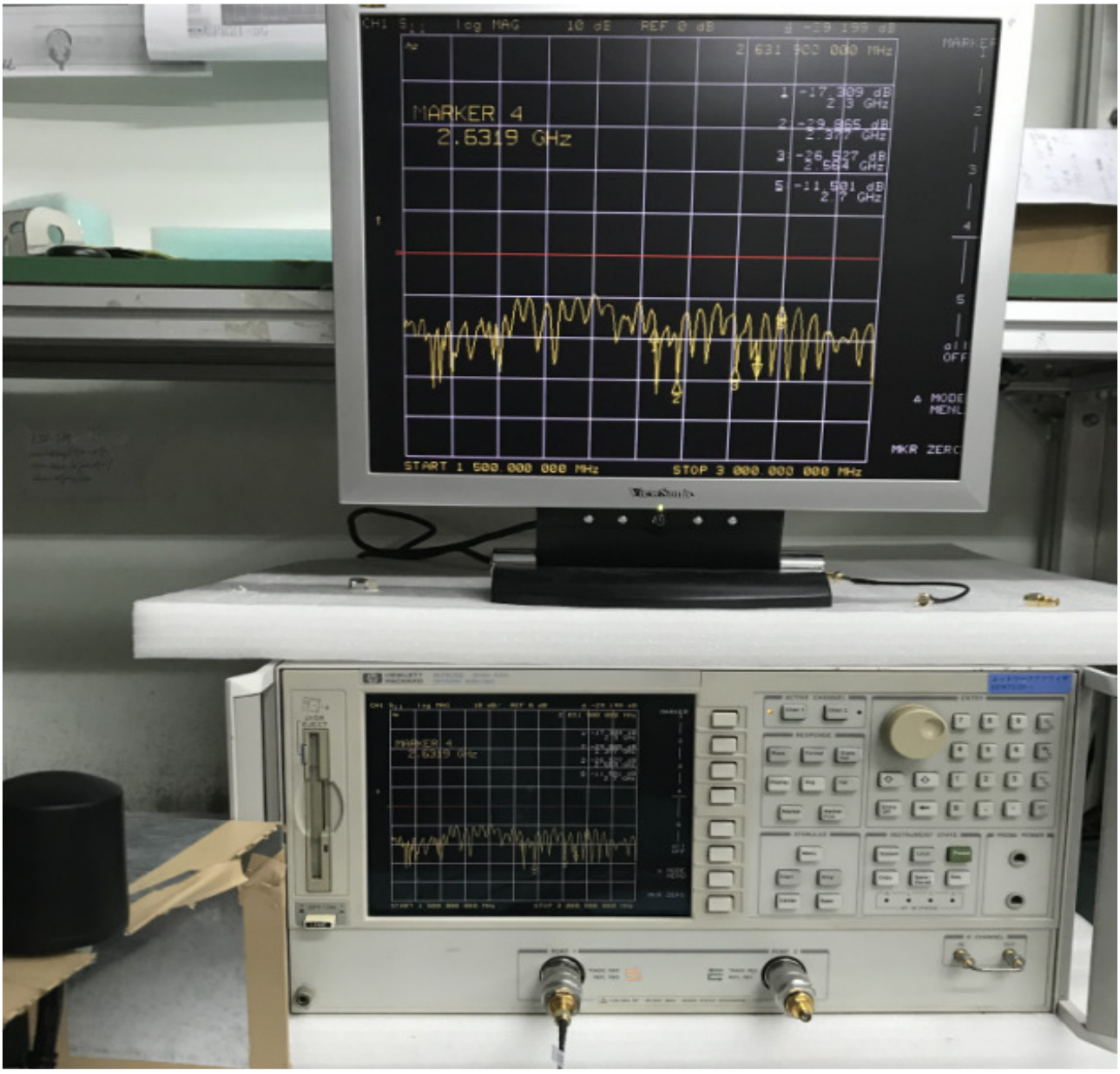
7-3 Detail band test - frequency : 2300-2700Mhz

Frequency	Return loss	V.S.W.R	Reflection coefficient
2300.00MHz	-17.309dB	1.316:1	0.136
2377.00MHz	-29.869dB	1.066:1	0.032
2564.00MHz	-26.527dB	1.099:1	0.047
2631.90MHz	-29.199dB	1.072:1	0.035
2700.00MHz	-11.051dB	1.779:1	0.280



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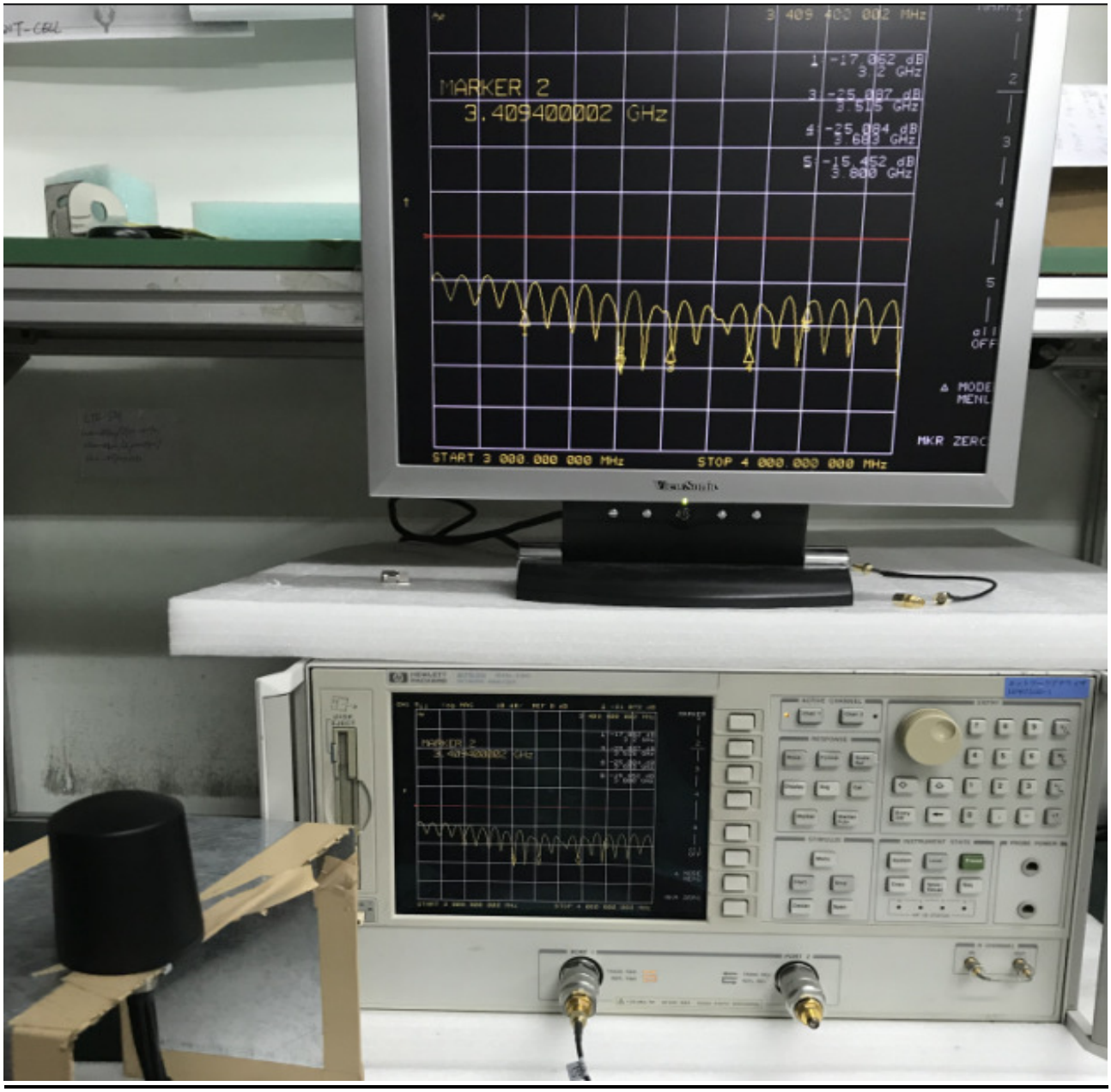
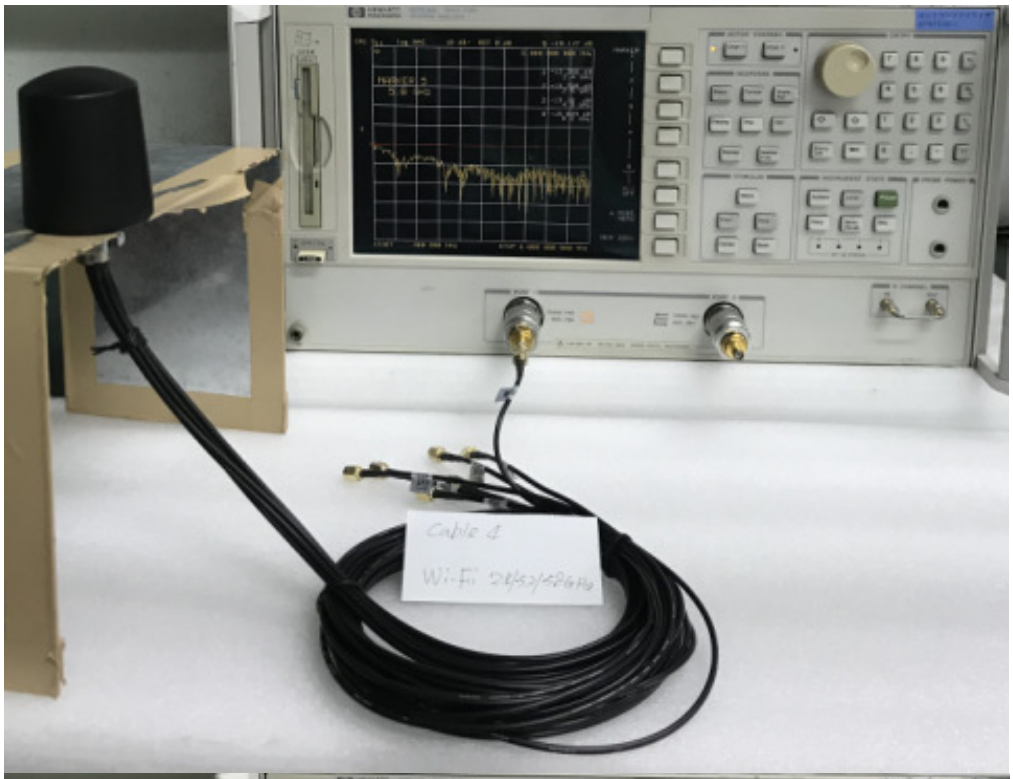
7-4 Detail band test - frequency : 3200~3800MHz

Frequency	Return loss	V.S.W.R	Reflection coefficient
3200.00MHz	-17.062dB	1.326:1	0.140
3409.94MHz	-29.882dB	1.006:1	0.032
3515.00MHz	-25.087dB	1.118:1	0.056
3683.00MHz	-25.084dB	1.118:1	0.056
3800.00MHz	-15.452dB	1.406:1	0.169



8.WiFi/WiMAX Multi -band Networt analyzer test
Frequency : 2.4-2.5 / 5.0~5.2/5.8~5.95GHz
Cable 4-7



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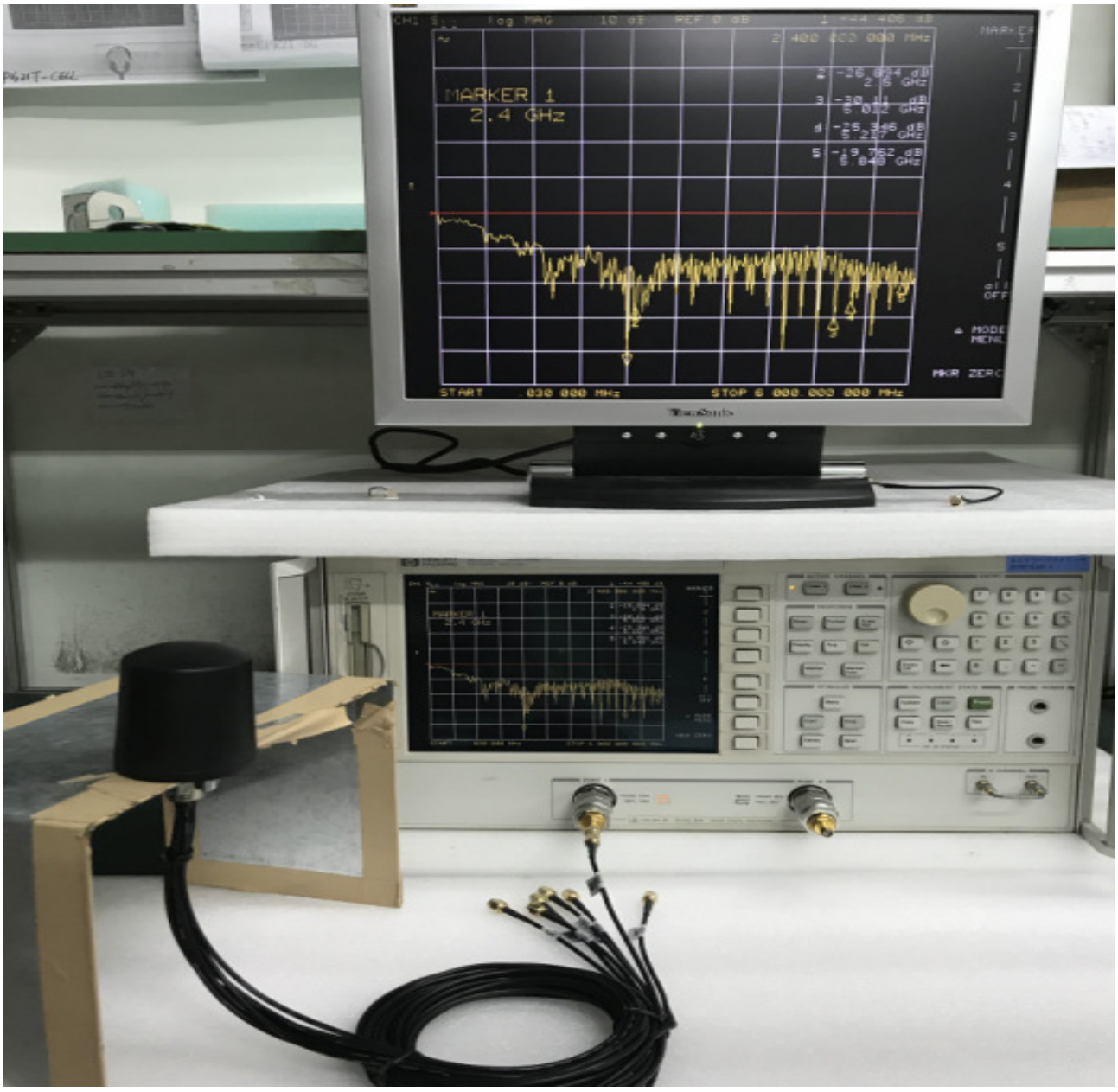
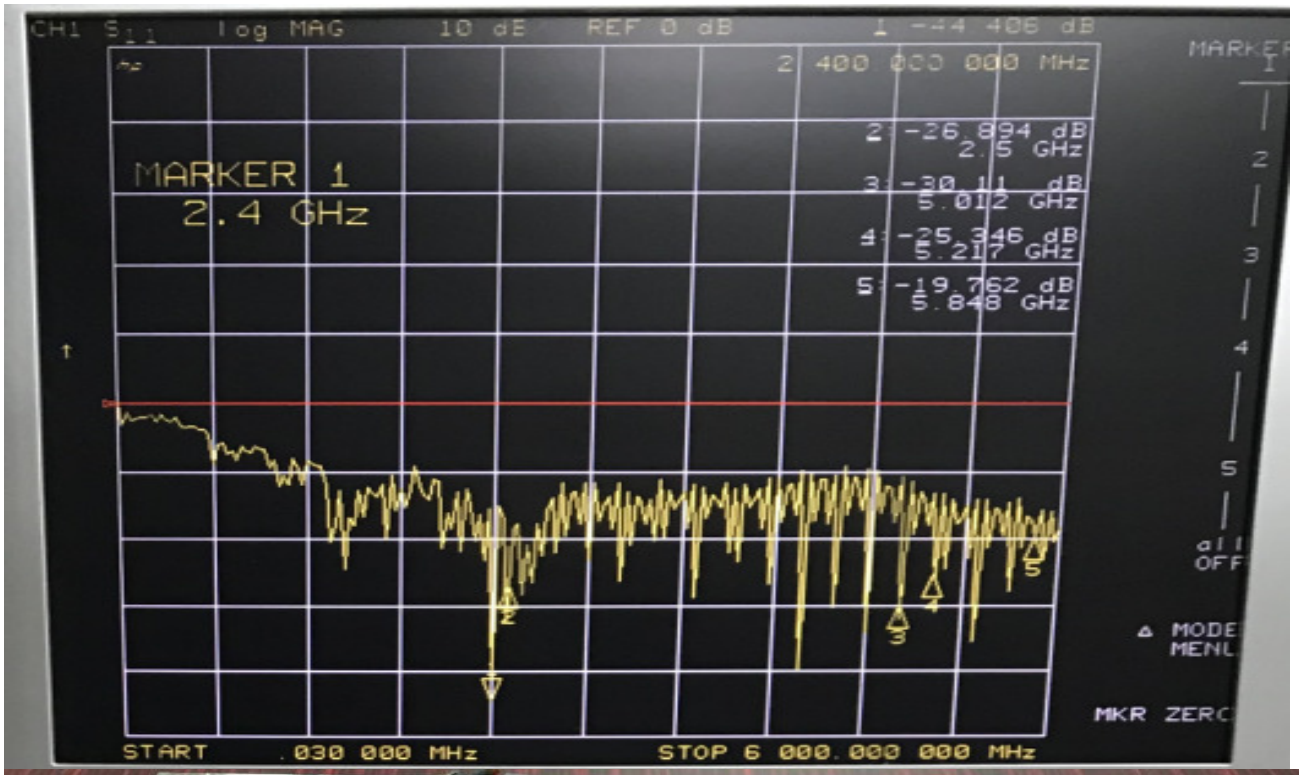
8-1 Detail band test-frequency: 2.4~2.5/5.0~5.2/5.8~5.9GHz

Frequency	Return loss	V.S.W.R	Reflection coefficient
2400.00MHz	-44.406dB	1.012:1	0.006
2500.00MHz	-26.894dB	1.095:1	0.045
5012.00MHz	-30.110dB	1.064:1	0.031
5217.00MHz	-25.346dB	1.114:1	0.054
5848.00MHz	-19.762dB	1.229:1	0.103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