

INTRODUCTION

ADA-2X, The ultimate custom made screw mount antenna enabling you to combine GNSS + LTE + WIFI the way you want without engineering charges or massive volumes

Up to 8 cables RG174
or 5 cables CFD195.

Cost-effective

Sturdy design

Short response time



On the following pages you will find the datasheet of a ADA-2X version used by one of our customers.

If you tell us what you need for your application, we will send you a data sheet followed by a sample for your evaluation.

Contact:

Adactus AB, Mariehillsvägen 19, 13337
Saltsjöbaden, Sweden

Tel. +46 8 6081770; Email. m2m@adactus.se

Customized version of ADA-2X

1.GENERAL DESCRIPTION

Model P/N	Products No
ADA-25-(5-in-1)-RG174-1.83M(6ft)-SMA/M	ADA-25

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

Cable 1:

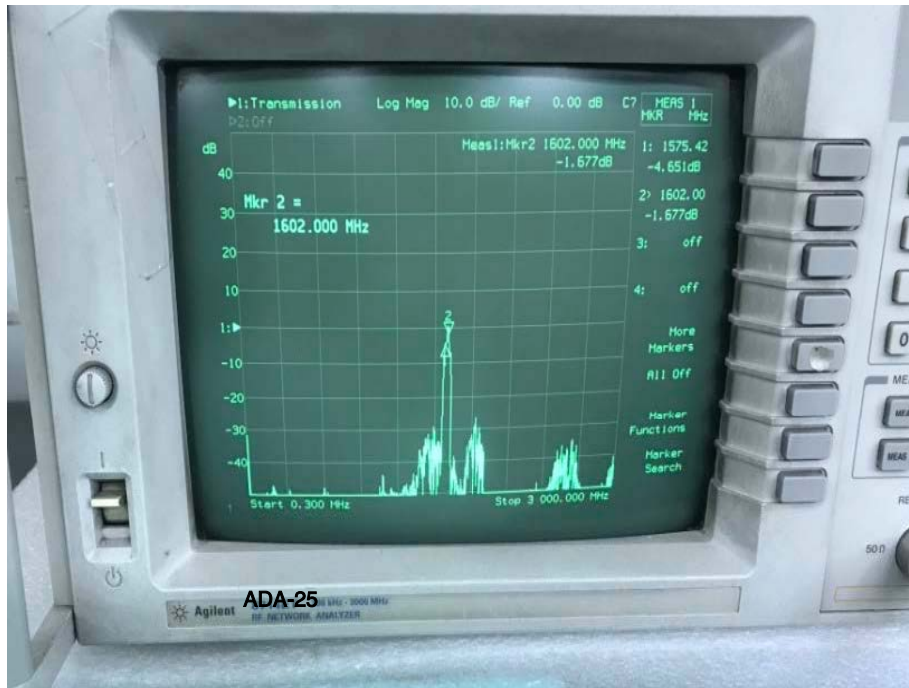
2.1 GPS/GLONASS Antenna Electrical Properties

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 $\pm$ 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 $\pm$ 1.023 MHz
Gain	27~29 $\pm$ 4.5dB (+ 25 °C $\pm$ 5°C)
27~29 $\pm$ 4.5dB (+ 25 °C $\pm$ 5°C)	1.5 dB Max. (+25 °C $\pm$ 5°C) 2.2 dB Max. (+85 °C)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	50 Ω



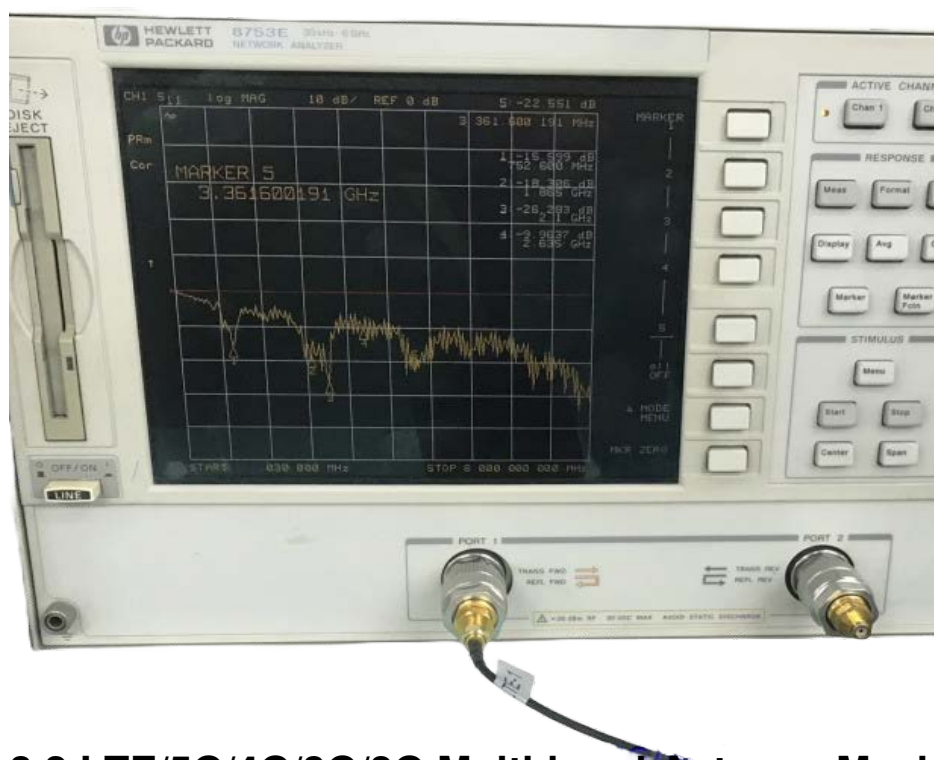
2.3 GPS/GLONASS Antenna Mechanical Properties

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 loss
Antenna Cable Total Length	1830 mm(6ft)
Antenna Color	ABS (Black)
Connector	SMA 180°(Male)
Operating Temperature Range	-30 °C~+75 °C
Storage Temperature Range	-40 °C~+80 °C

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)	690~960/1710~2170/2500~2700/3300~3600MHz
Average Efficiency	47%/67%/59%/54%/57%
Average Gain	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

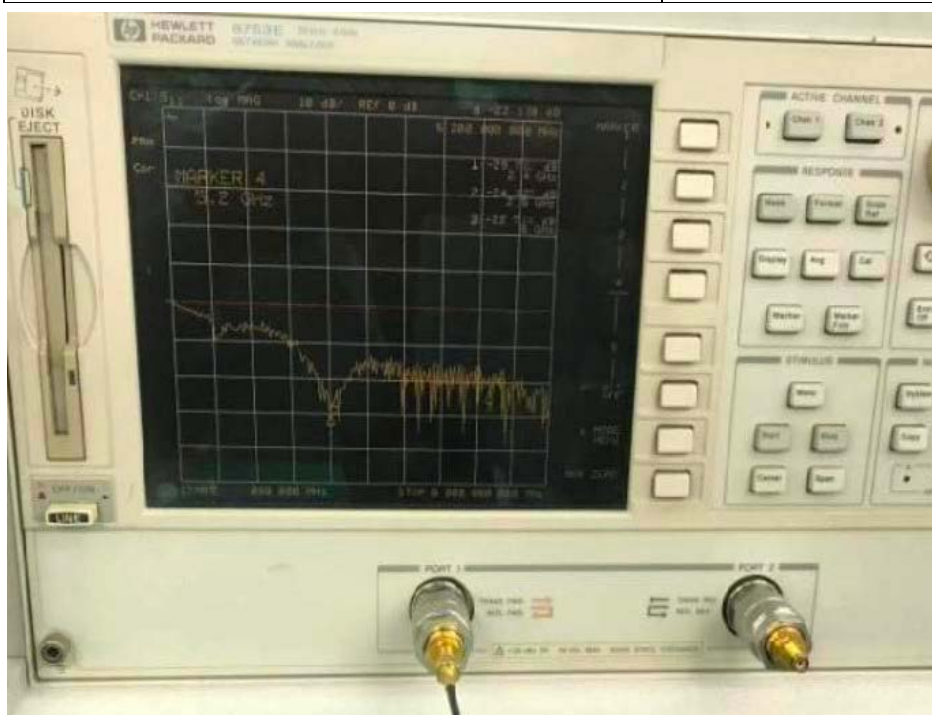
Parameter	Description
Antenna Type	External Antenna
Touch Type	Screw Type (M12x1P)
Antenna cable	RG174 Low loss cable

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 (2.4/5.2GHz)
Frequency Band	2.4~2.5 /5.0~5.2GHz
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



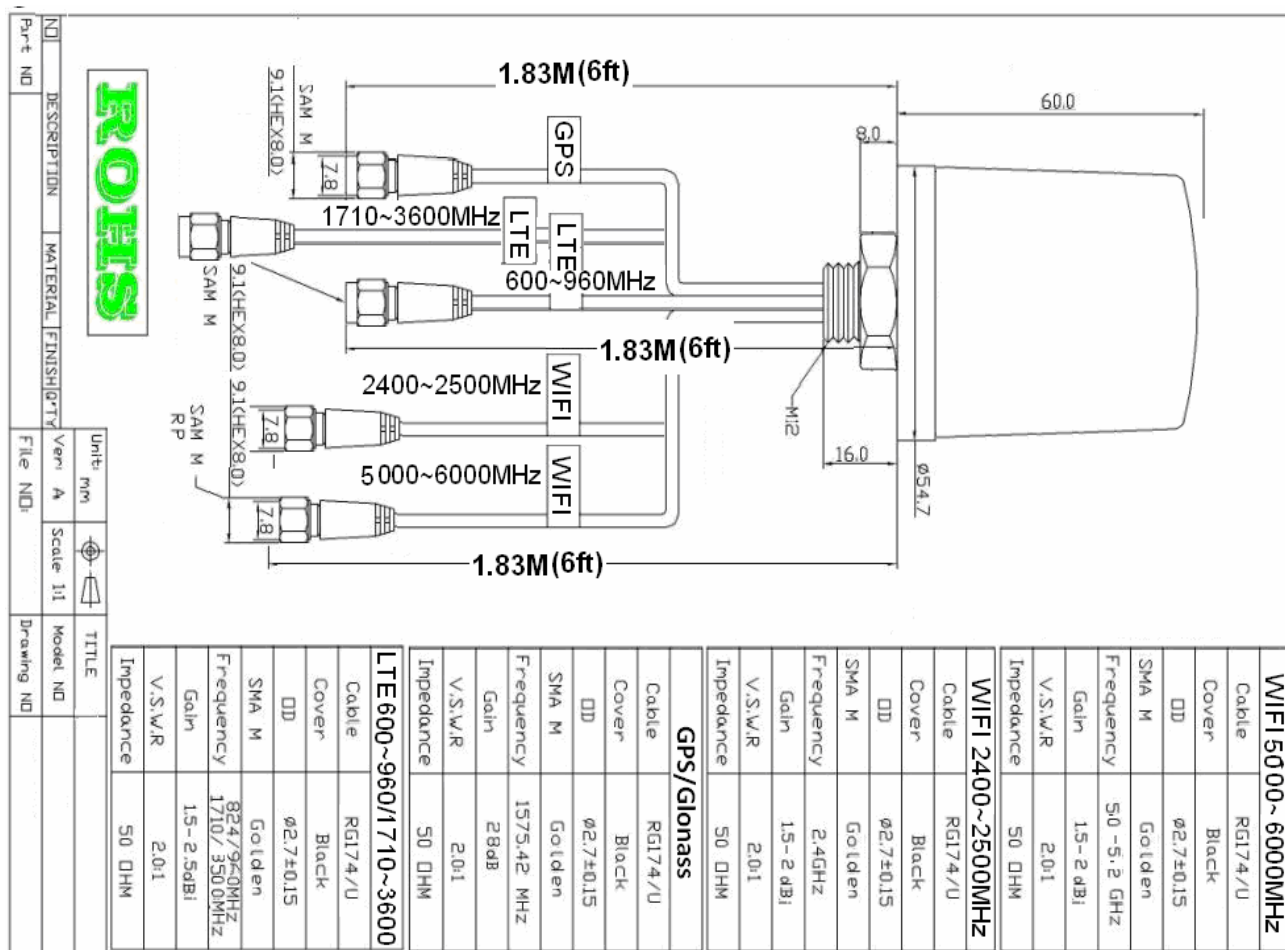
4.2 WiFi/WiMAX 2.4/5.2GHz Antenna Mechanical Properties

Parameter	Description
Antenna Cable	RG174 Low loss
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~+75°C
Storage Temperature Range	-40°C~+80°C

5. Antenna Appearance Size: M12 x1P

Diameter :54.7 mm (2.15")

Height : 60mm (2.36")



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

6-1. Electrical Specification:

*All values are defined at $25\pm 15^{\circ}\text{C}$, $65 \pm 20\%$ 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.

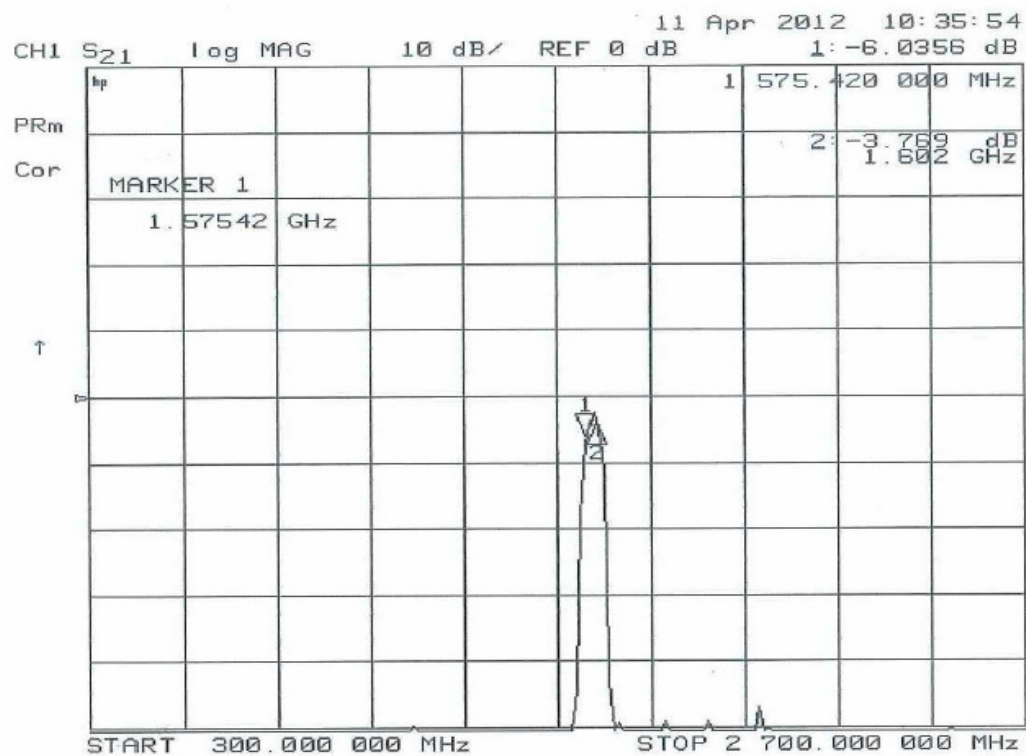
6-2 Patch

Characteristics	Specification
Center Frequency	1575.42 /1602.00 $\pm$ 1.023 MHz (when covered with a radome and measured by LNA ground plane)
Bandwidth (10dB return loss)	10 MHz min @S11 $\leq$ -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

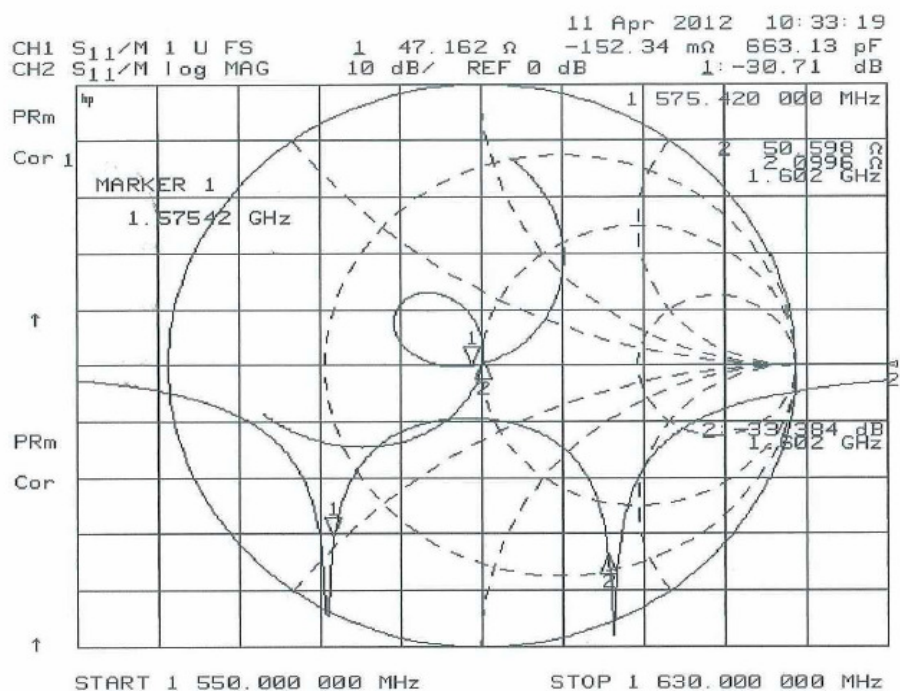
6-3 Filter / LNA

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

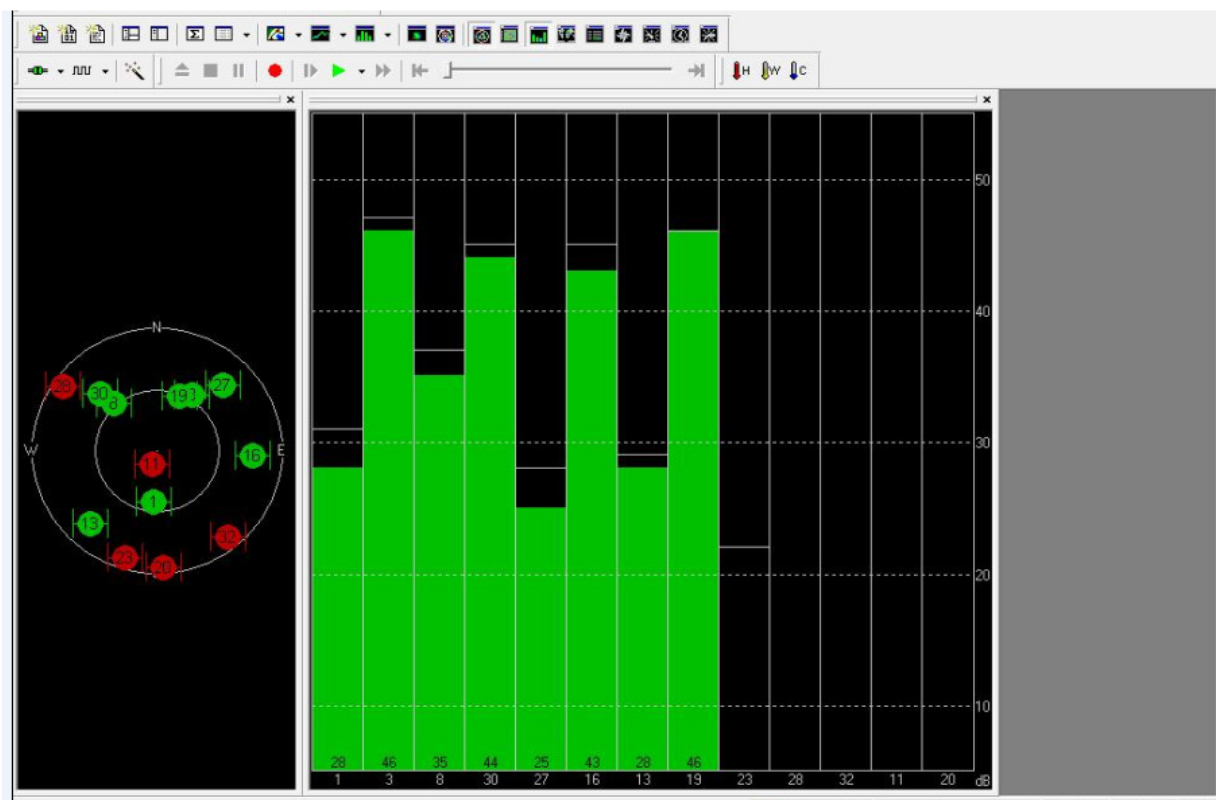
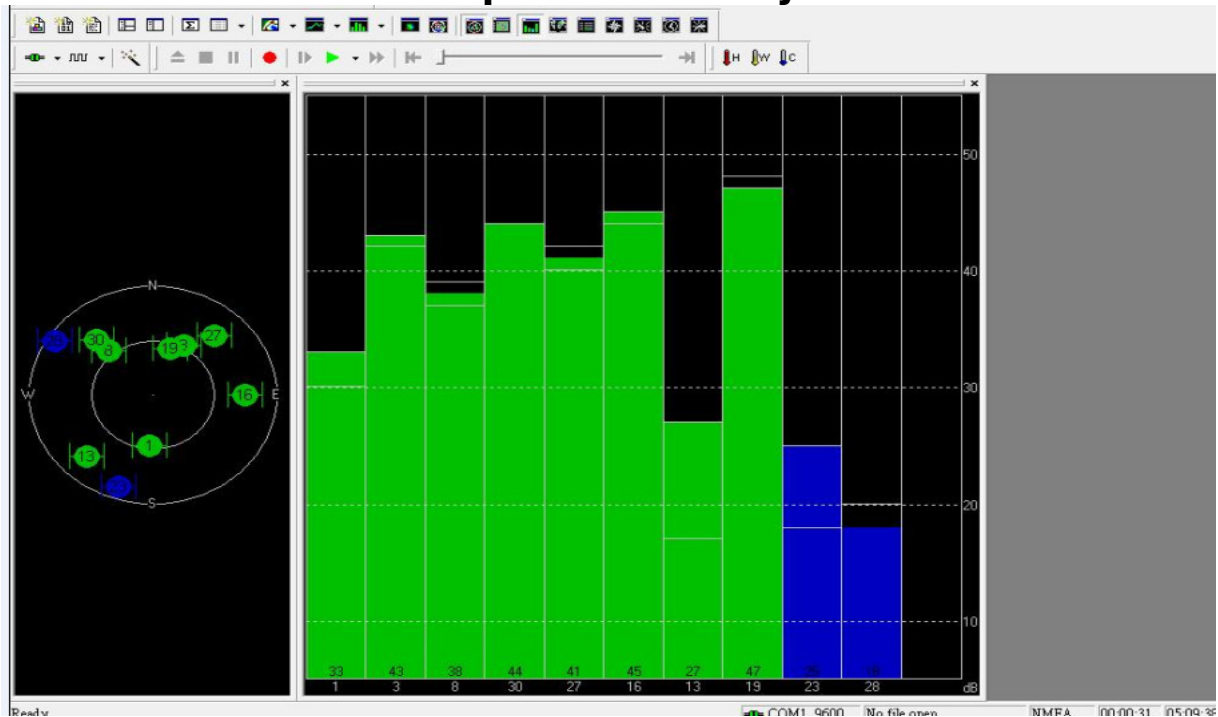
6-4 GPS/Glonass Log MAG & U FS



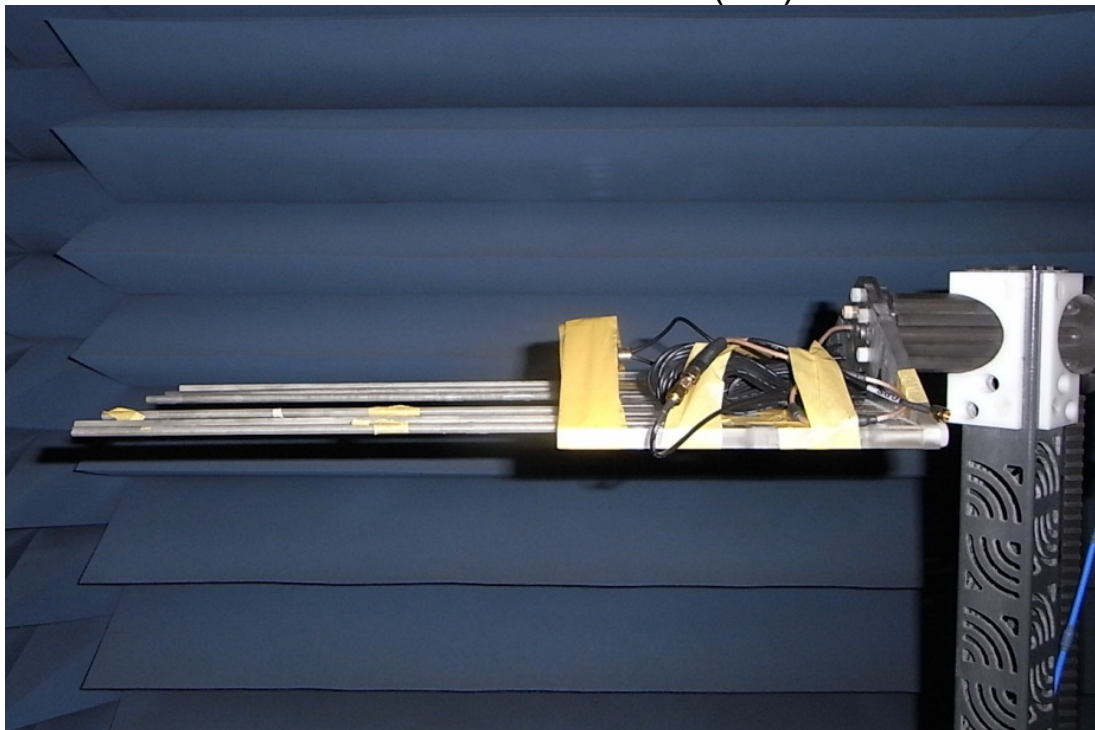
天線靜態圖



6-5 GPS Satellite reception intensity

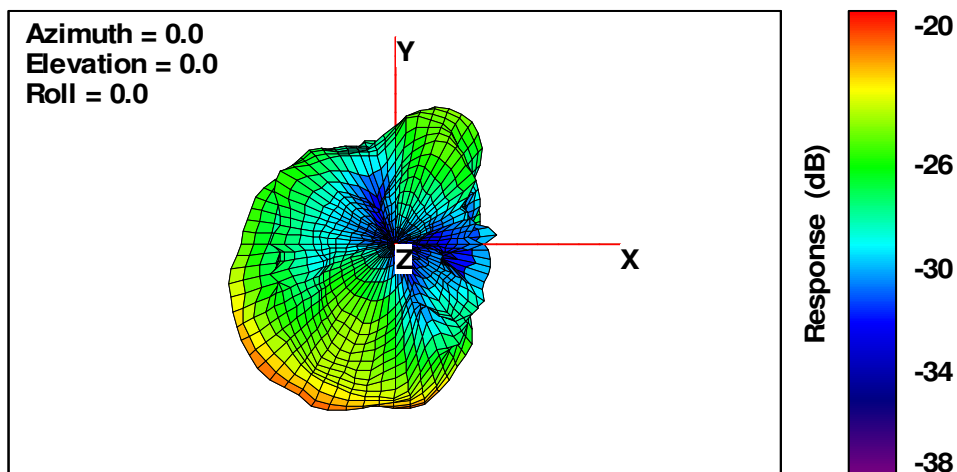


6-6 GPS/GLONASS RESPONSE (dB)



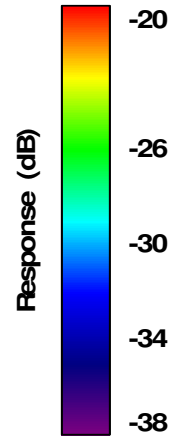
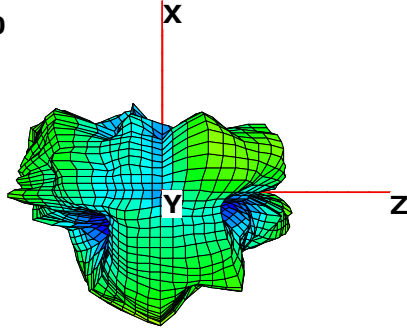
1575.42MHz

Total



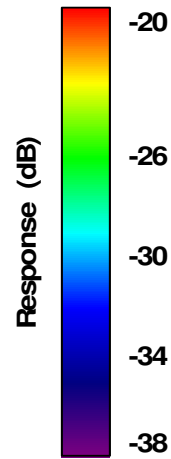
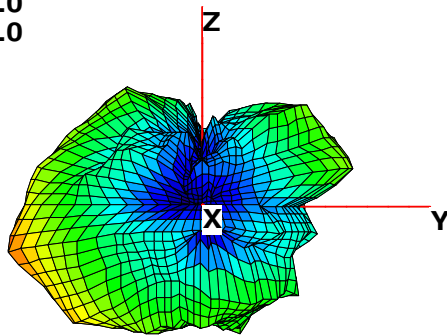
Total

Azimuth = 180.0
Elevation = -90.0
Roll = -90.0



Total

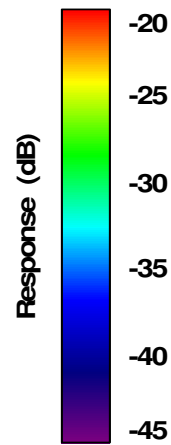
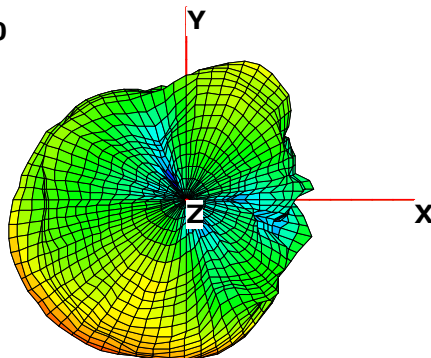
Azimuth = 90.0
Elevation = 0.0
Roll = -90.0



1602.00MHz

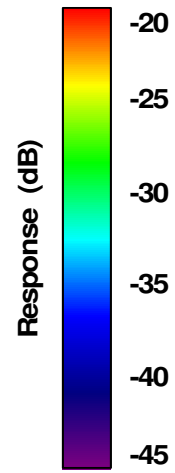
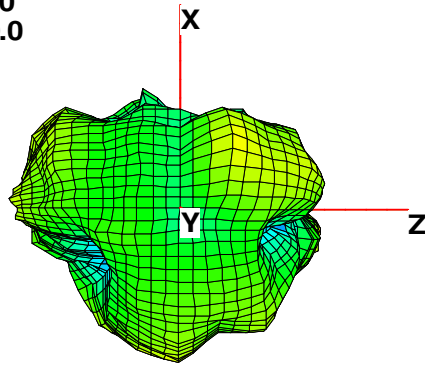
Total

Azimuth = 0.0
Elevation = 0.0
Roll = 0.0



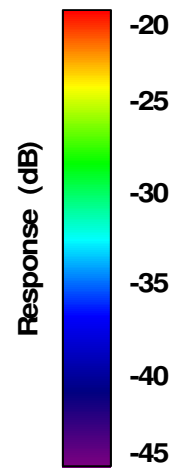
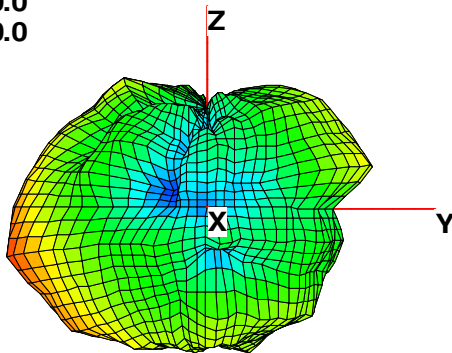
Total

Azimuth = 180.0
Elevation = -90.0
Roll = -90.0



Total

Azimuth = 90.0
Elevation = 0.0
Roll = -90.0



7.LTE/5G/4G/3G Multi -band Network analyzer test

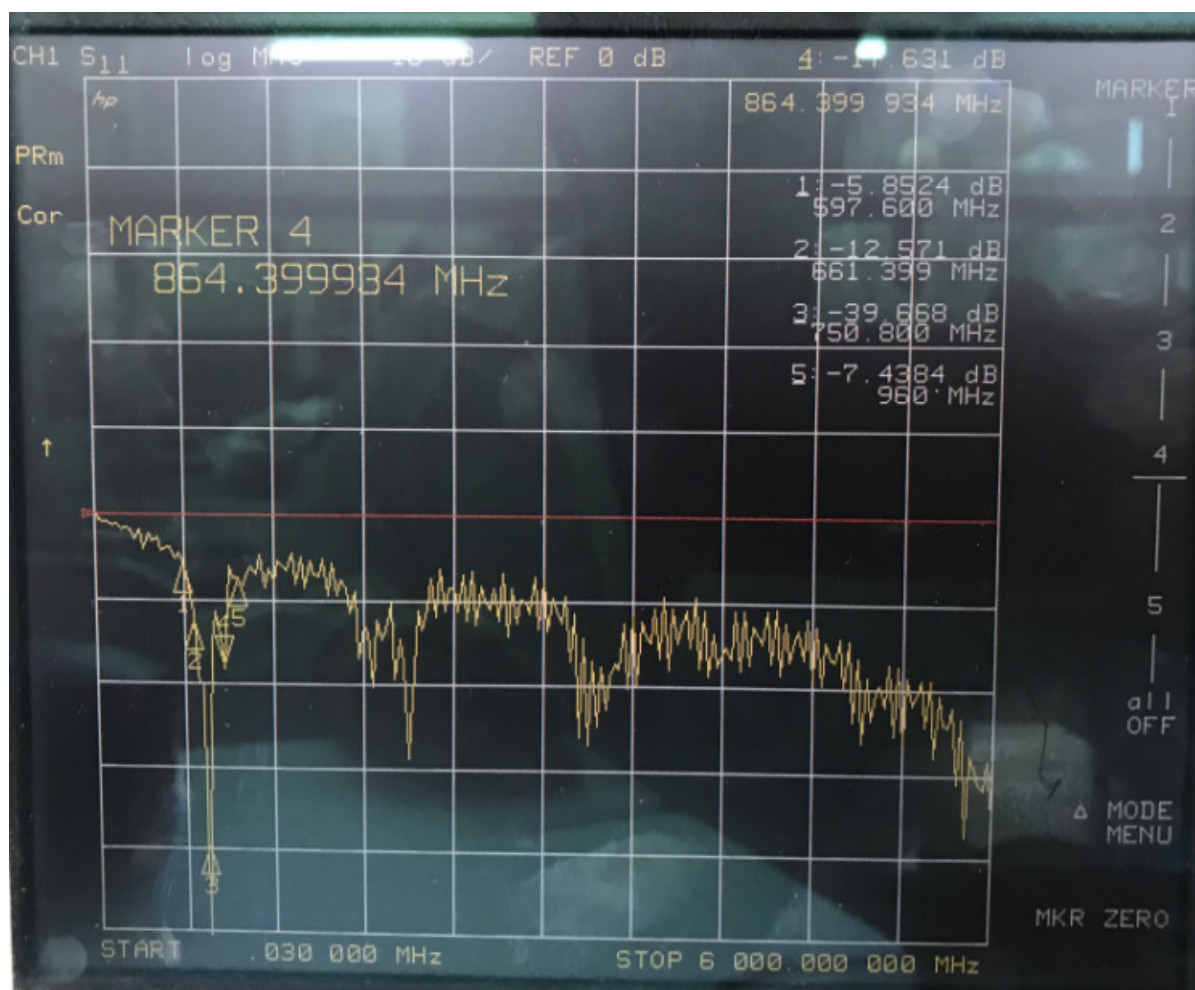
Frequency :

690~960/1710~2170/2500~2700/3300~3600MHz

Cable 2-3

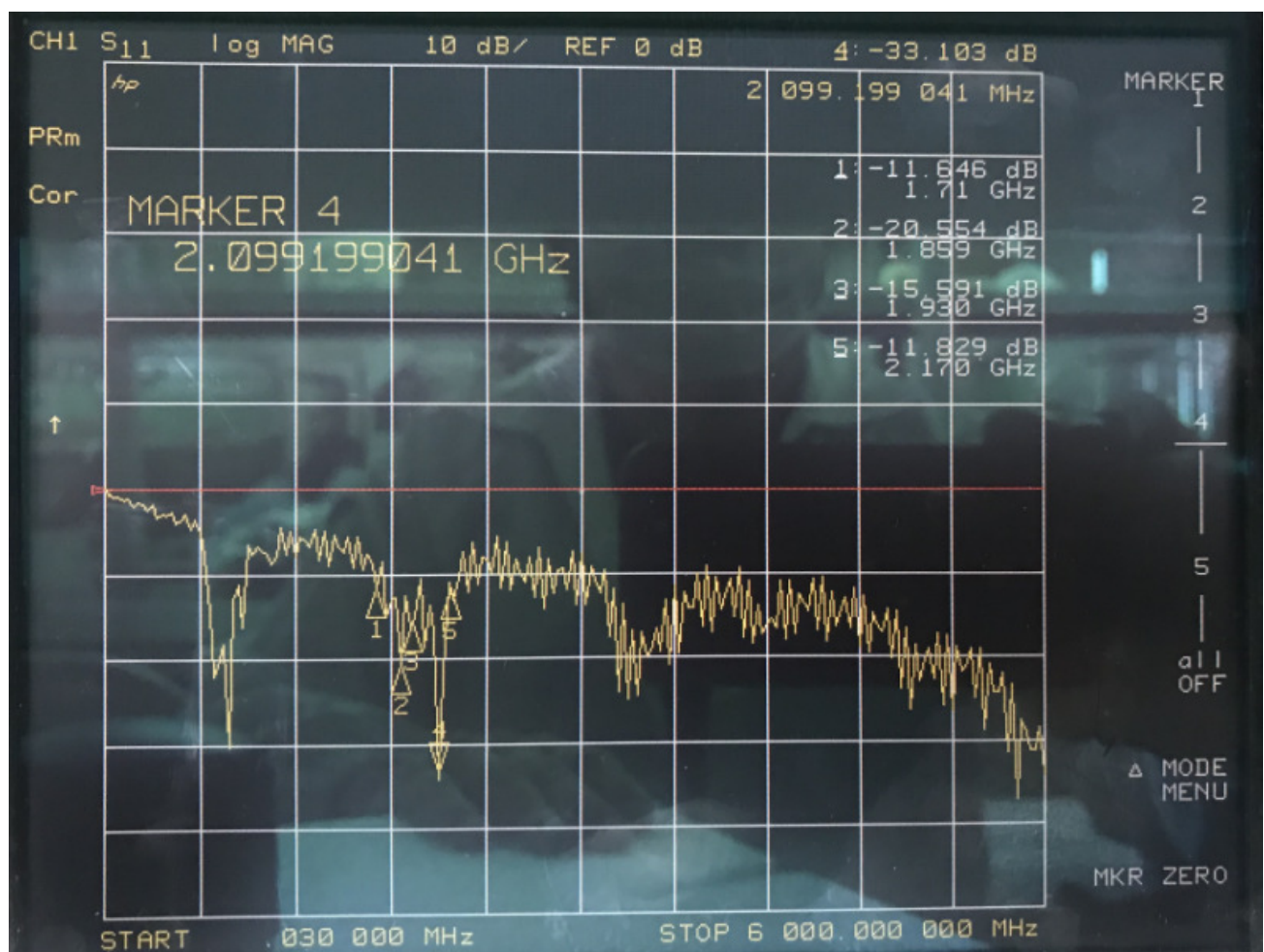
7-1 Detail band test - Frequency : 690~960MHz

Frequency	Return loss	V.S.W.R	Reflection coefficient
597.600MHz	-5.8524dB	3.080:1	0.510
661.339MHz	-12.571dB	1.615:1	0.235
750.800MHz	-39.668dB	1.021:1	0.010
864.399MHz	-17.631dB	1.302:1	0.131
960.000MHz	-7.4384dB	2.476:1	0.425



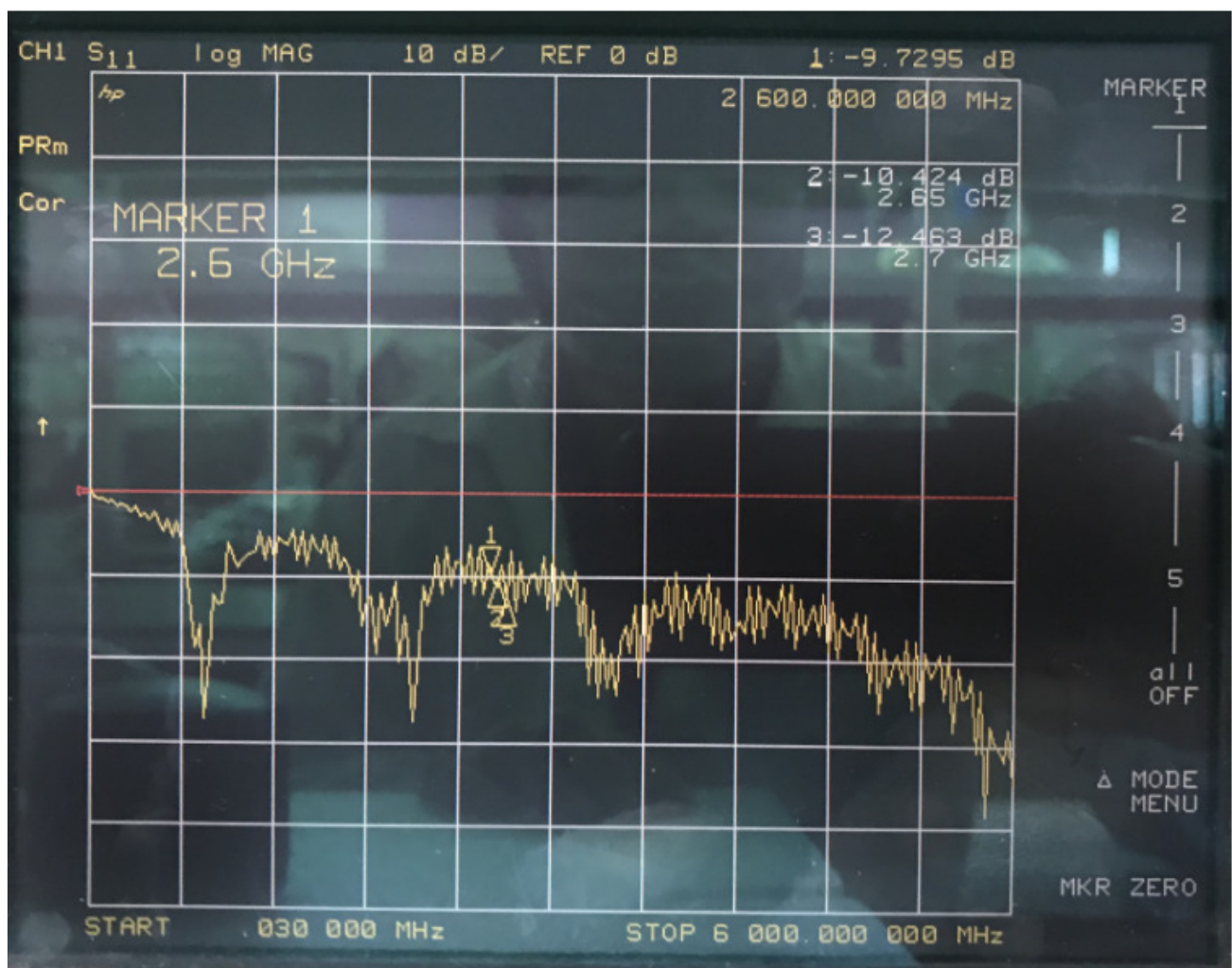
7-2 Detail band test - Frequency : 1710~2170MHz

Frequency	Return loss	V.S.W.R	Reflection coefficient
1710.00MHz	-11.646dB	1.709:1	0.262
1859.10MHz	-20.554dB	1.069:1	0.033
1930.00MHz	-15.591dB	1.398:1	0.166
2099.19MHz	-33.103dB	1.045:1	0.022
2170.00MHz	-11.829dB	1.689:1	0.256



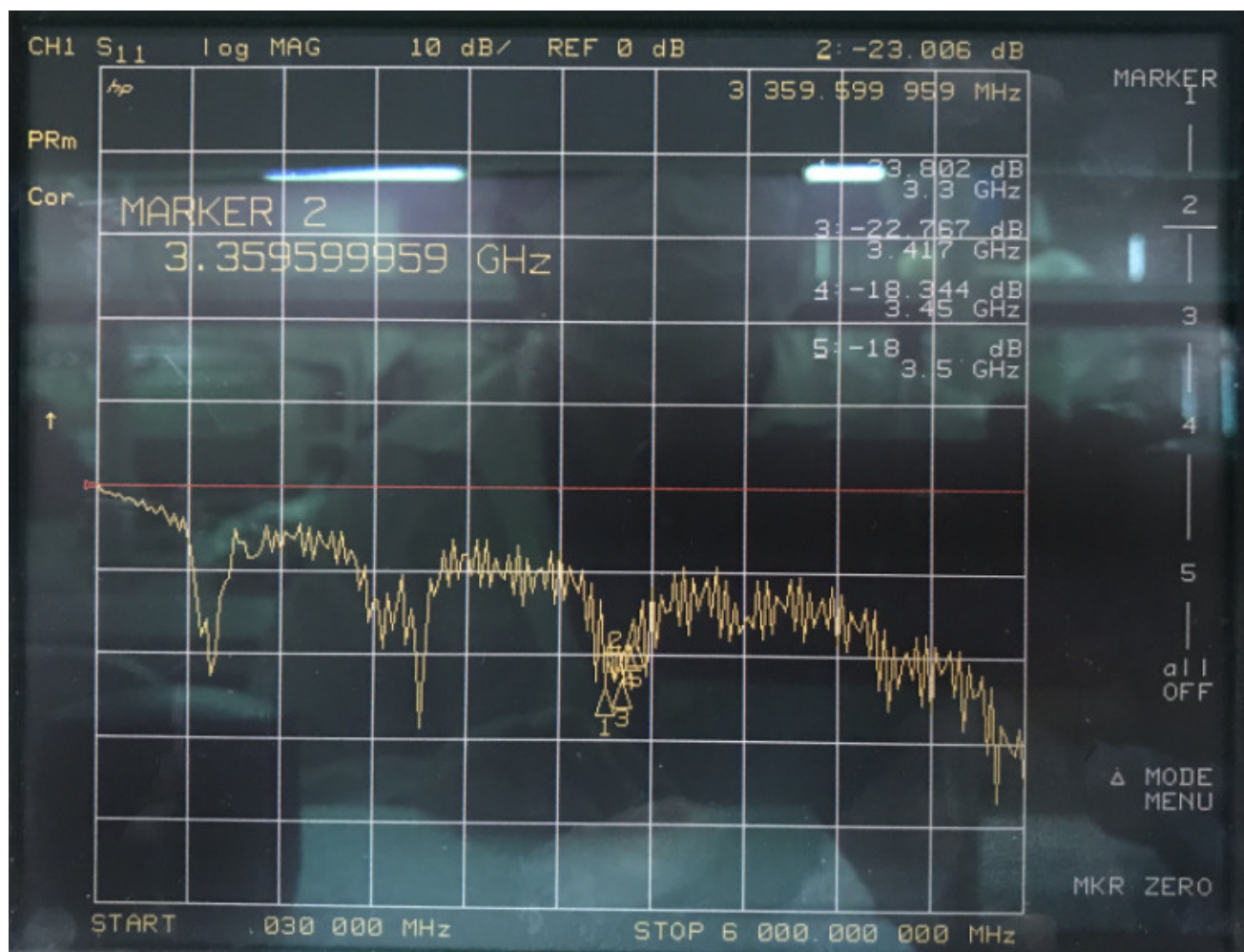
7-3 Detail band test - Frequency : 2500-2700Mhz

Frequency	Return loss	V.S.W.R	Reflection coefficient
2600.00MHz	-9.7295dB	1.968:1	0.326
2650.00MHz	-10.424dB	1.862:1	0.301
2700.00MHz	-12.463dB	1.625:1	0.238



7-4 Detail band test - Frequency : 3300~3600MHz

Frequency	Return loss	V.S.W.R	Reflection coefficient
3300.00MHz	-23.802dB	1.138:1	0.065
3359.00MHz	-23.006dB	1.152:1	0.071
3417.00MHz	-22.767dB	1.157:1	0.073
3450.00MHz	-18.344dB	1.275:1	0.121
3500.00MHz	-18.000dB	1.288:1	0.126



8.WiFi/WiMAX Multi -band Network analyzer test

Frequency : 2.4-2.5 / 5.0-5.2 GHz

Cable 4-5

8-1 Detail band test - Frequency : 2.4~2.5/5.0~5.2GHz

Frequency	Return loss	V.S.W.R	Reflection coefficient
2404.00MHz	-43.004dB	1.014:1	0.007
2494.00MHz	-26.708dB	1.096:1	0.046
5071.00MHz	-23.489dB	1.143:1	0.067
5146.00MHz	-19.855dB	1.226:1	0.102
5220.00MHz	-29.034dB	1.073:1	0.035

