

PROFESSOR TECHNOLOGY CO.,LTD.

INTRODUCTION

MIMO(3in1)GNSSL1+L5& 2xLTE Antenna

CPGN17(3in1)-L1+L5-2x4G/LTE-RG174-5M-SMA/Mx3

Magnetic & Adhesive (3M) Mount

3-Cables :1 xGNSS L1+L5 & 2x 4G/LTE

Cable 1:GNSS L1+L5 RG174 Low loss 5M SMA/M S/T

L1:1560-1610Mhz(1575.42/1602.00MHz)

+ L5:1170-1180 MHz(1176.45MHz) 23-28 dBic

Cable 2 : LTE/4G RG174 Low Loss 5M SMA/M S/T

600-960/1710-2170/2400-2700 MHz 2.0-3.5dBi

Cable 3 : LTE/4G RG174 Low Loss 5M SMA/M S/T

600-960/1710-2170/2400-2700 MHz 2.0-3.5dBi



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1. INERAL DESCRIPTION

Model No	Products P/N
CPGN17(3IN1)-L1+L5-2XLTE-RG174-5M-SMA/Mx3	CPGN17-5M-V1

Below is a table summarizing the GNSS L1+L5 / 2xLTE (3-in-1) antenna design specification

Cable 1:

2.1 GNSS Active L1+L5 Antenna Electrical Properties

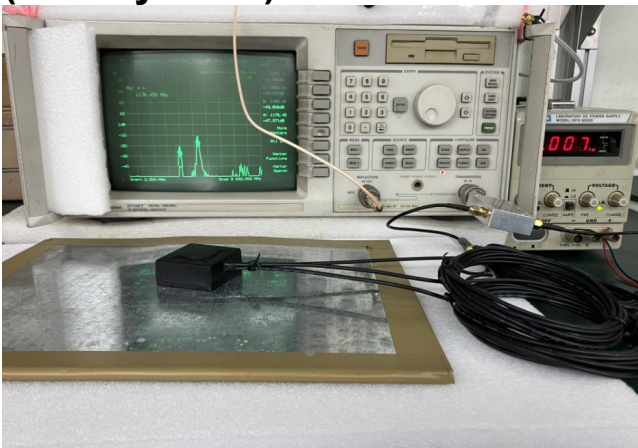
Antenna module type	Ceramic modules stacked in to layers L1 Ceramic + L5 Ceramic
Antenna mouule size	L1:25x25mm & L5:18x18mm
Antenna Frquency Range	L1:1560~1610MHz (1575.42MHz) L5:1165~1185MHz (1176.45MHz)
Antenna Maximun Gain	90° : 2.0 dBi Min. 20° : -5.0 dBi Min. Mounted on the 60mm*60mm ground plane.
LNA Gain	L1:+26~+28dB L5:+22~+26dB
LNA NF	L1:2.3dB L5:1.8dB typical
Axial Ratio	L1:3.0dB L5: 2.8 typical
Noise Figure	L1:1.5dB L5:1.6dB typical
Total Peak System Gain	+22~+28dB
Transmission Log Mag	1575.42MHz (-13.621dB) 1176.45MHz (-15.927dB)
V.S.W.R	<2.0 : 1 Both L1& L5 bands
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.
Horizontal (AZ)Beamwith	360 dearees Both L1& L5 bands
Output Impedance	50Ω
Note: Gain includes the cable loss	

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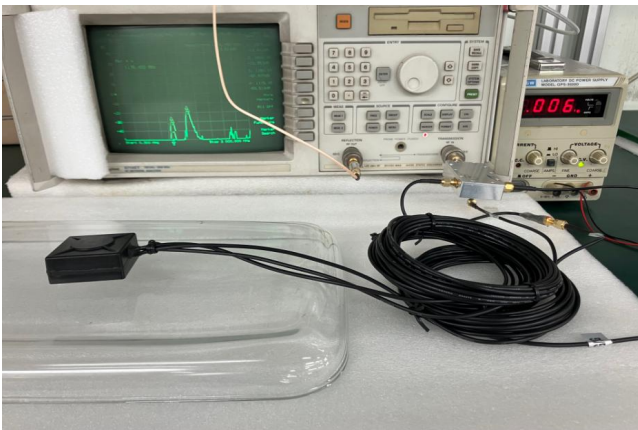
2.2 CPGN17(3in1)-L1+L5 Antenna Mechanical Properties

Parameter	Description
Antenna Mounting	Magnetic Mount and Adhesive Mount (3M)
Waterproof	100 % waterproof.(IP66~IP67)
Shock 10msec. Half sine wave.	Shock 10msec. Half sine wave.
Antenna cable	RG174U Low loss
Antenna Cable Total Length	5000 mm(16.5ft)
Antenna Color	ABS (Black)
Connector	SMA 180°(Male)
Operating Temperature Range	-30°C~+75°C
Storage Temperature Range	-40°C~+80°C

2.3 CPGN17(3in1)-L1+L5 test Magnetic Mount on iron plane (03-May-2023)

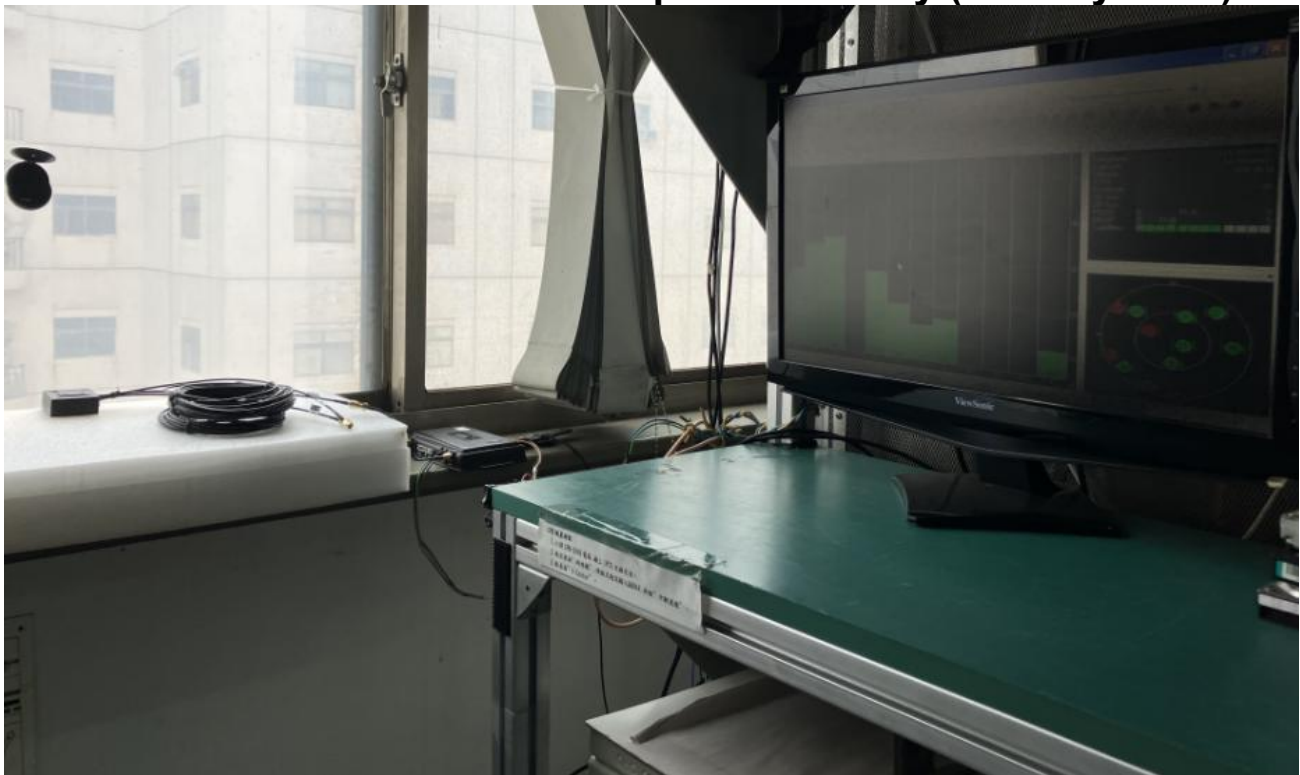


2.4 CPGN17-L1+L5 test Adhesive mount on the glass(03-May)

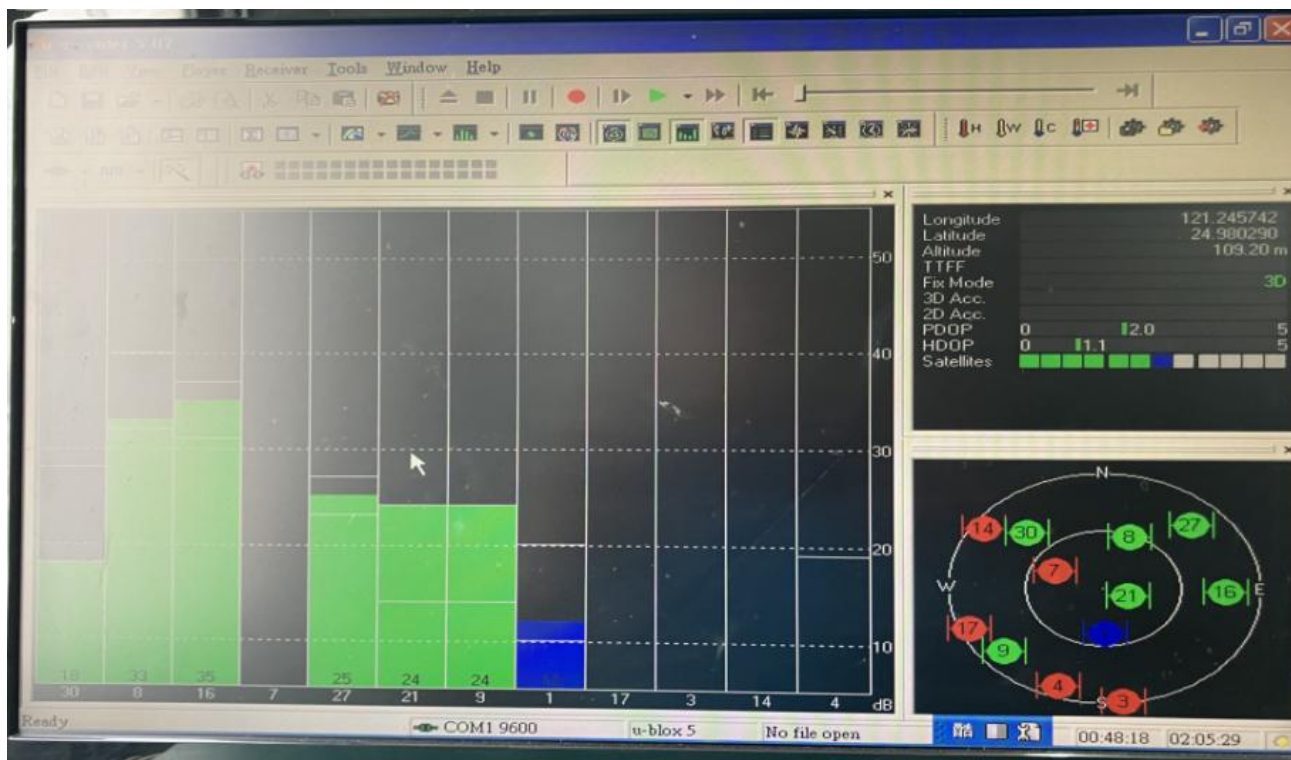


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2.5 CPGN17 L1+L5 Satellite reception intensity (03- May-2023)



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Cable 2:

3.1 4G/LTE Multi-band Antenna Electrical Properties

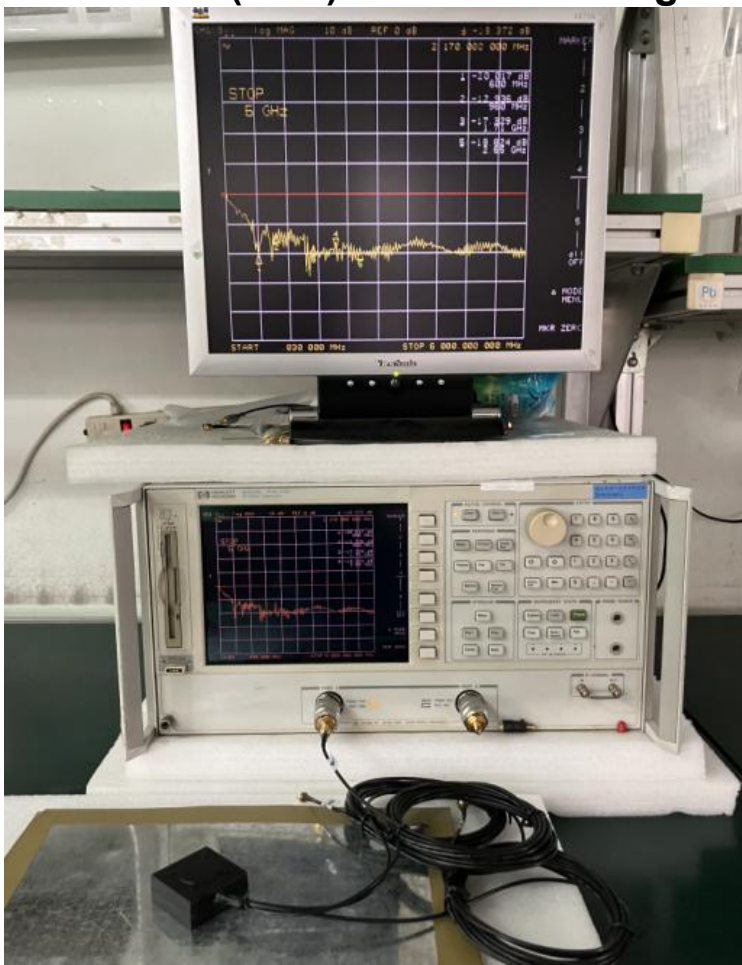
Parameter	Description
Communication System	LTE/4G/3G/AMPS/GSM/DCS/UMTS
Frequency Band (MHz)	600~960/1710~2170/2400~2700MHz
Average Efficiency	87%/85%79%
Average Gain	2.0~3.5dBi
Nominal Impedance	50 ohm
Polarization	Vertical
Return Loss (Check test data)	768.00MHz(-37.284dB),2038.00MHz(-35.024dB) 2650.00MHz(-29.479dB)
V.S.W.R <1.5:1	768.00MHz(1.028:1),2038.00MHz(1.036:1) 2650.00MHz(1.069:1)
Reflection coefficient	768.00MHz(0.014),2038.00MHz(0.018) 2650.00MHz(0.034)

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

Parameter	Description
Antenna Type	External Antenna
Touch Type	Magnetic Mount and Adhesive Mount
Antenna size	L:45mm xW:45mm X20.0mm
Antenna cable	RG174 Low loss cable
Connector Type	SMA 180°(Male)
Antenna Cable Total Length	5000mm(16.5ft) ±50mm
Antenna Color	Black
Waterproof	100% waterproof.(IP66~IP67)
Shock (Drop Test)	25CM drop on concret

3.3CPGN17(3in1)-4G/LTE test Magnetic Mount on iron plate



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Cable 3:

4.1 4G/LTE Multi-band Antenna Electrical Properties

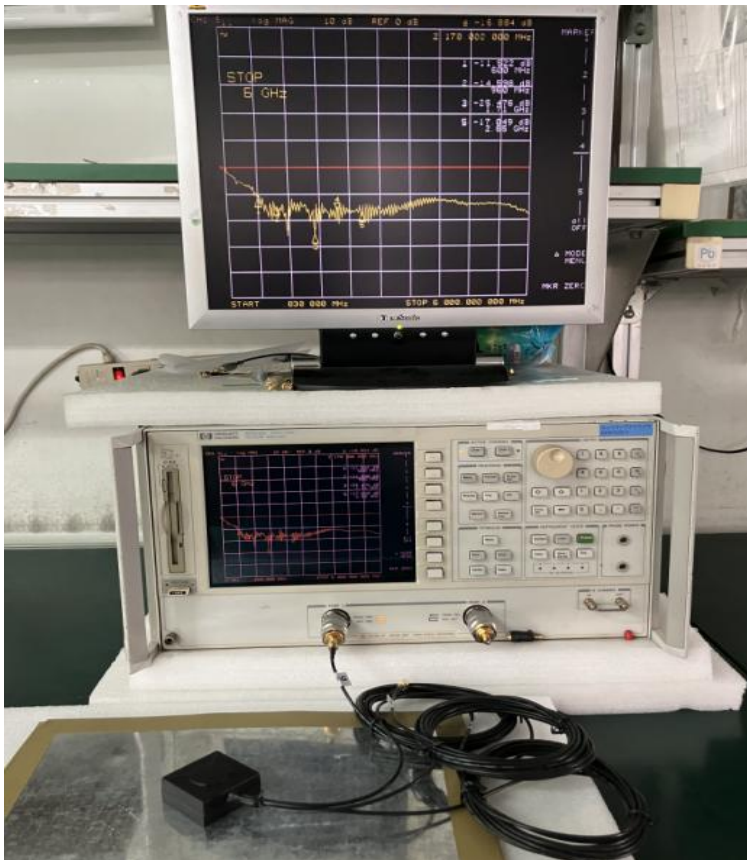
Parameter	Description
Communication System	LTE/4G/3G/AMPS/GSM/DCS/UMTS
Frequency Band (MHz)	600~960/1710~2170/2400~2700MHz
Average Efficiency	78%/79%/78%
Average Gain	2.0~3.5dBi
Nominal Impedance	50 ohm
Polarization	Vertical
Return Loss (Check test data)	883.80MHz(-28.247dB),2083.60MHz(-29.445dB) 2505.00MHz(-28.149dB)
V.S.W.R <1.5:1	883.80MHz(1.081:1),2083.60MHz(1.070:1) 2505.00MHz(10.81:1)
Reflection coefficient	883.80MHz(0.039),2083.60MHz(0.034) 2505.00MHz(0.039)

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

Parameter	Description
Antenna Type	External Antenna
Touch Type	Magnetic Mount and Adhesive Mount
Antenna size	L:45mm xW:45mm X20.0mm
Antenna cable	RG174 Low loss cable
Connector Type	SMA 180°(Male)
Antenna Cable Total Length	5000mm(16.5ft) ±50mm
Antenna Color	Black
Waterproof	100% waterproof.(IP66~IP67)
Shock (Drop Test)	25CM drop on concret

4.3 CPGN17-4G/LTE test Magnetic Mount on iron plate(03-May)

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5. Antenna Appearance Size:

L: 45.0mm (1.77") W: 45.0mm(1.77") H: 20.0m (0.78")

The antenna size is

L:45mm W:45mm H:20mm



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6.Appearance

CPG17(3in1)-GNSS L1+L5-2xLTE-5M-SMA/Mx3

01	Head top	Black	01
02	Twin adhesive	White	01
03	Rubber washer	Black	01
04	RG-174A/U Cable	Black	03
05	SMA 180°(Male)	Colden plating	03
06	Heat-shrink tube	Black	03
07	Label		03

**GNSS L1+L5-2x LTE antenna
Magnetic & Adhesive Mount**

**GNSS Active L1+L5 Antenna <+28dB Gain
Frequency:L1(1560-1610MHz)1575.42Mhz
L5(1170-1180MHz)1176.45MHz
Polarization:RHCP
Average Gain:+23-28dB
Noise Figure: Typ.28 @5V
Output V/S.W.R :<2.0:1
Voltage range : DC 2.4~5.0V**

**4G/LTE Multi-band Antenna 2.0~3.5dBi
Frequency band: 600~960/1710~2170
/2400~2700MHz
Average Gain: 2.0~5.0dBi
Nominal Impedance:50 ohm
V.S.W.R:<1.5:1**

**Cable :RG174U Loss less coaxial cable
Length: 5000mm(5M)
Connector: SMA/M S/T**

RoHS Compliant IP66~IP67

CUSTOMER'S	MODEL	PARTS NUMBER	FREQUENCY	UNIT	SCALE	DATE	VERSION
				M/M			1
TOLERANCE	X, XX±0.15	NAME	PARTS NUMBER	APPROVED	CHECKED	DRAWING	DESIGNED
SURFACE ROUGHNESS	S VV	APPEARANCE					



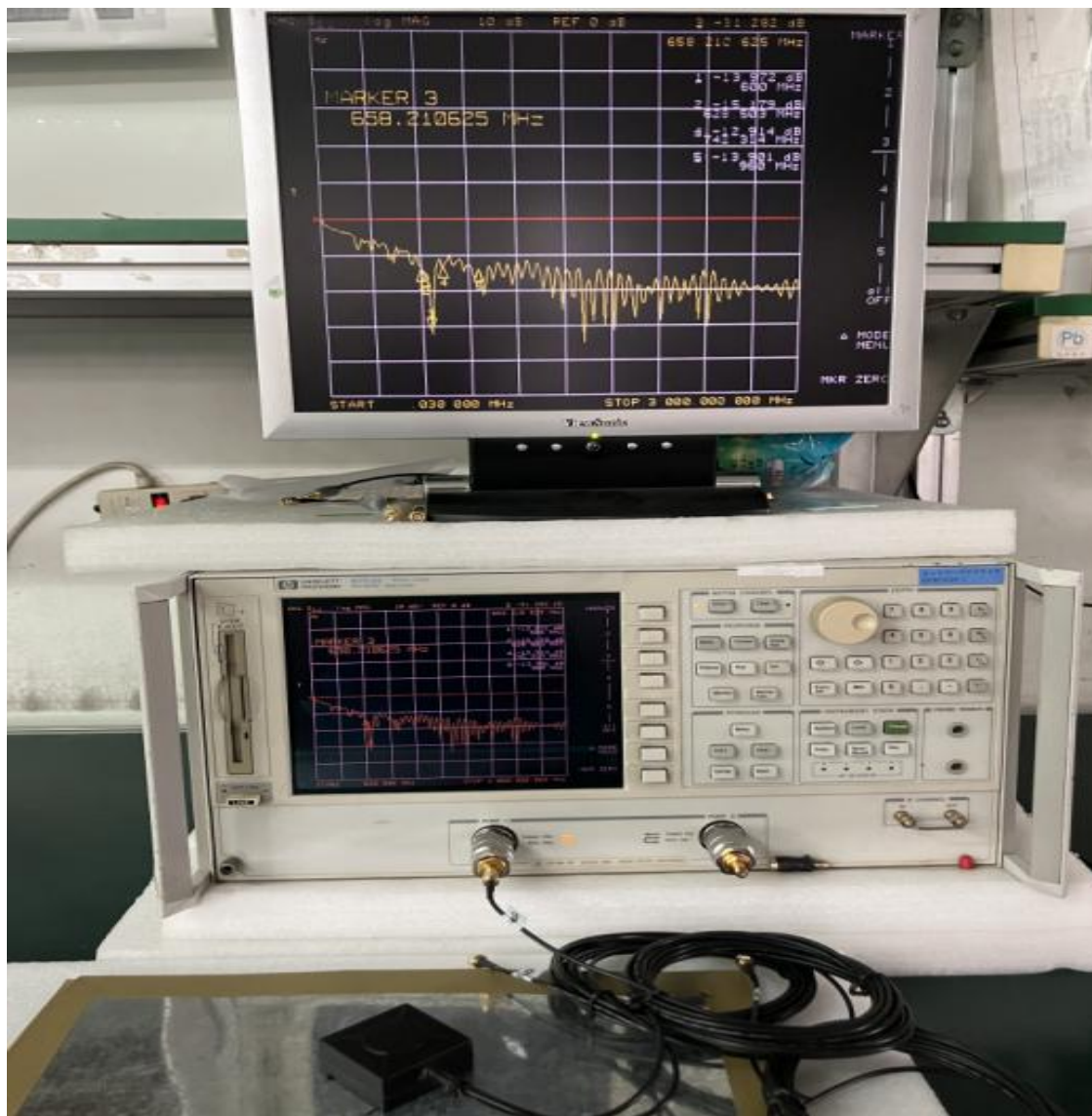
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7. 4G/LTE Multi-band Network analyzer test (05-May-2023)

Cable 2 Frequency : 600~960/1710~2170/2400~2700/MHz

7-1 Detail band test - Frequency : 600~960MHz

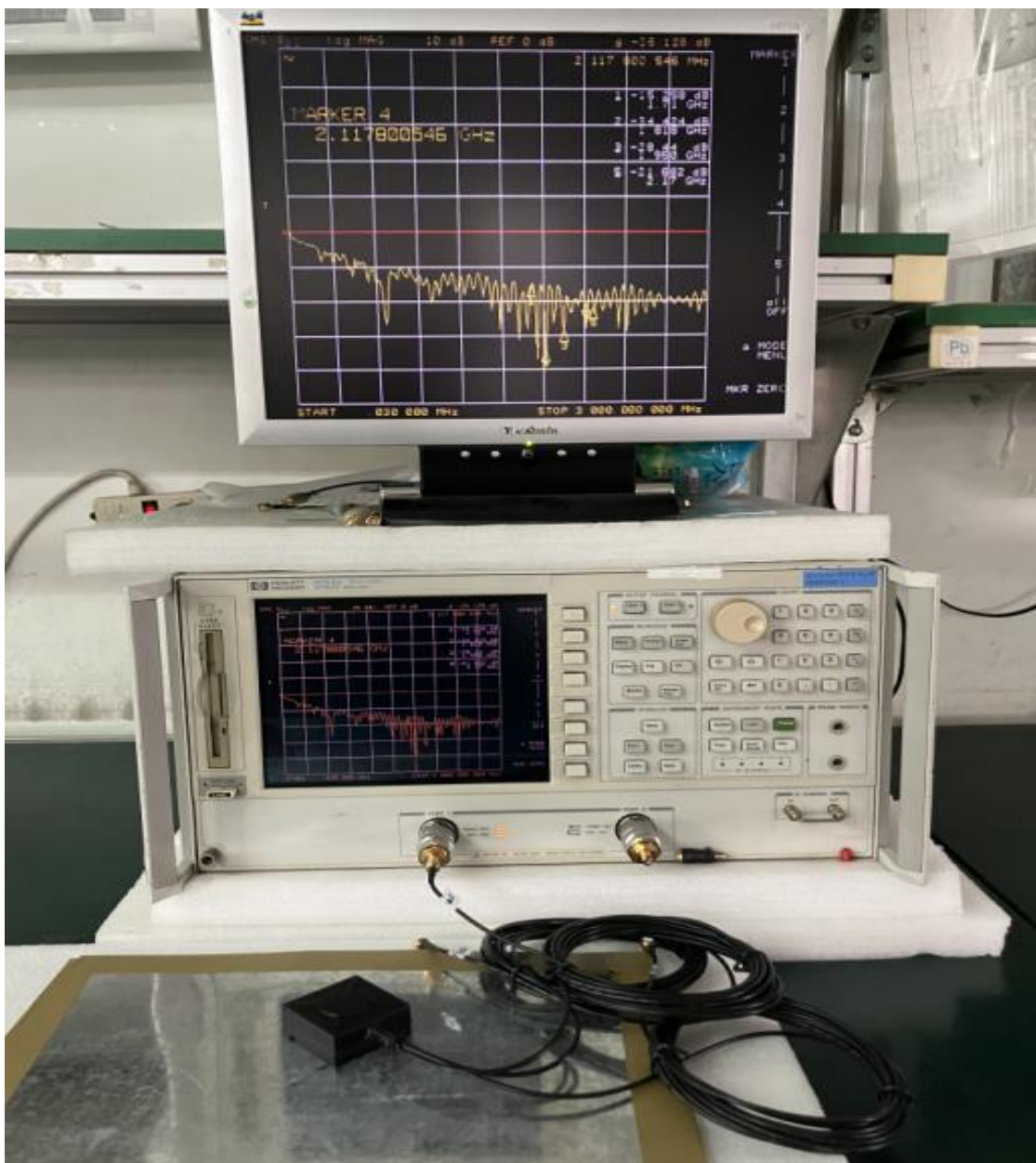
Frequency	Return loss	V.S.W.R	Reflection coefficient
600.000MHz	-13.972dB	1.501:1	0.200
628.502MHz	-15.179dB	1.422:1	0.174
658.210MHz	-31.282dB	1.056:1	0.027
742.314MHz	-12.914dB	1.584:1	0.226
960.000MHz	-13.901dB	1.506:1	0.202



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

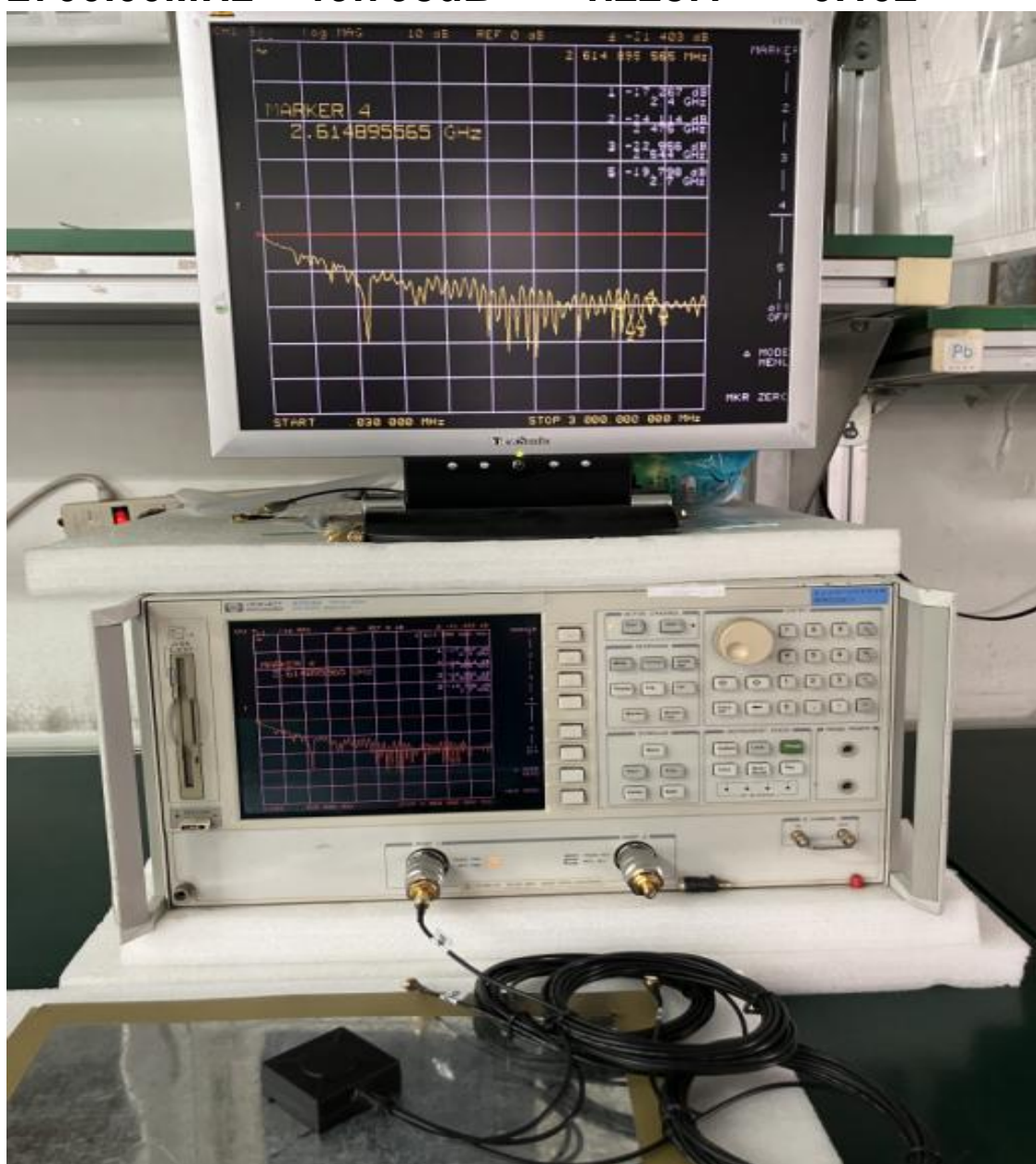
Frequency	Return loss	V.S.W.R	Reflection coefficient
1710.00MHz	-15.258dB	1.417:1	0.173
1818.00MHz	-34.424dB	1.039:1	0.019
1950.00MHz	-28.440dB	1.079:1	0.038
2117.80MHz	-26.128dB	1.104:1	0.049
2170.00MHz	-21.682dB	1.180:1	0.082



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7-3 Detail band test - Frequency : 2400-2700Mhz

Frequency	Return loss	V.S.W.R	Reflection coefficient
2400.00MHz	-17.267dB	1.317:1	0.137
2475.00MHz	-24.114dB	1.133:1	0.062
2600.00MHz	-24.478dB	1.127:1	0.060
2614.48MHz	-21.403dB	1.186:1	0.085
2700.00MHz	-19.798dB	1.228:1	0.102



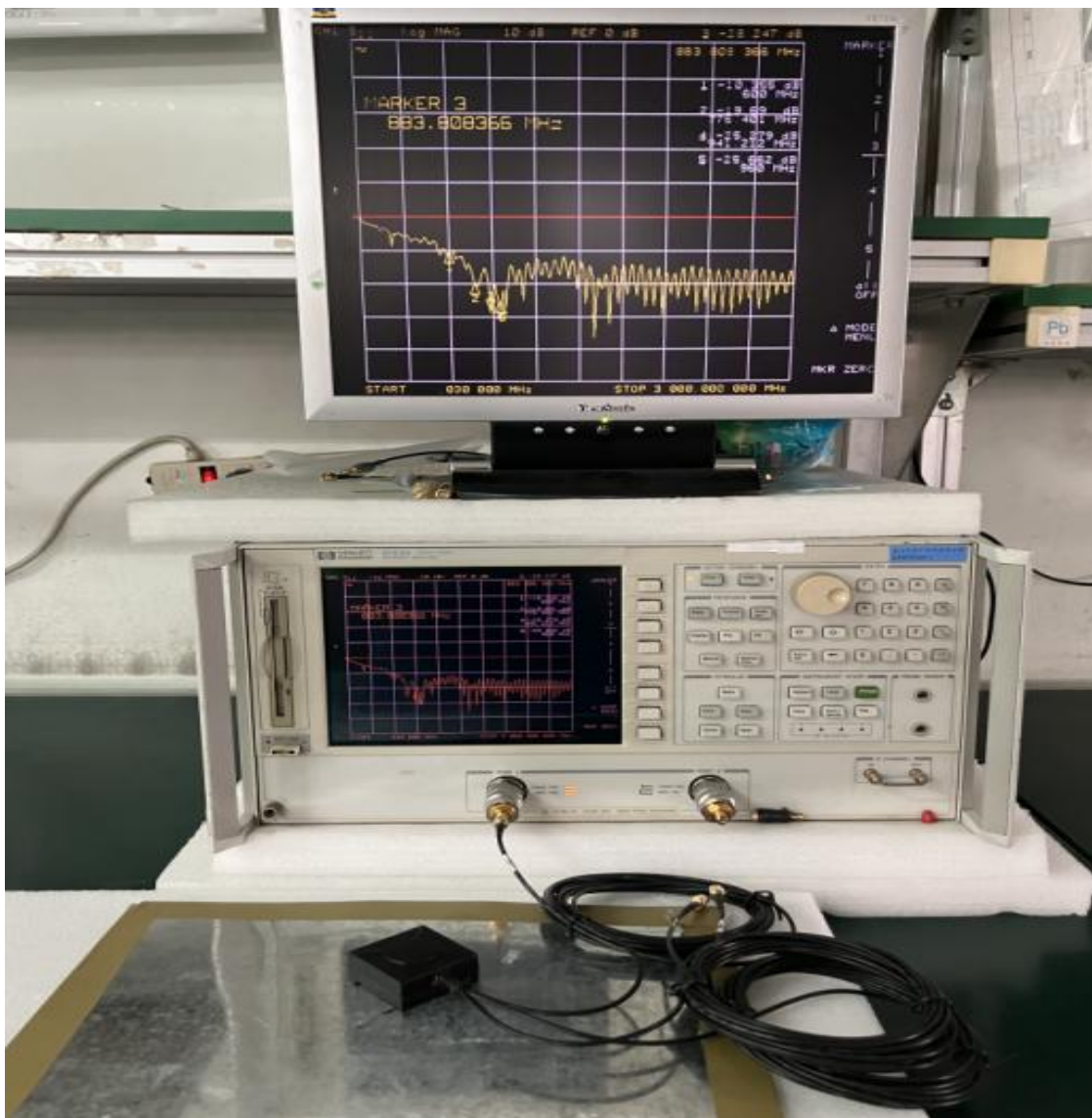
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8. 4G/LTE Multi-band Network analyzer test (05-May-2023)

Cable 3 Frequency : 600~960/1710~2170/2400~2700/MHz

8-1 Detail band test - Frequency : 600~960MHz

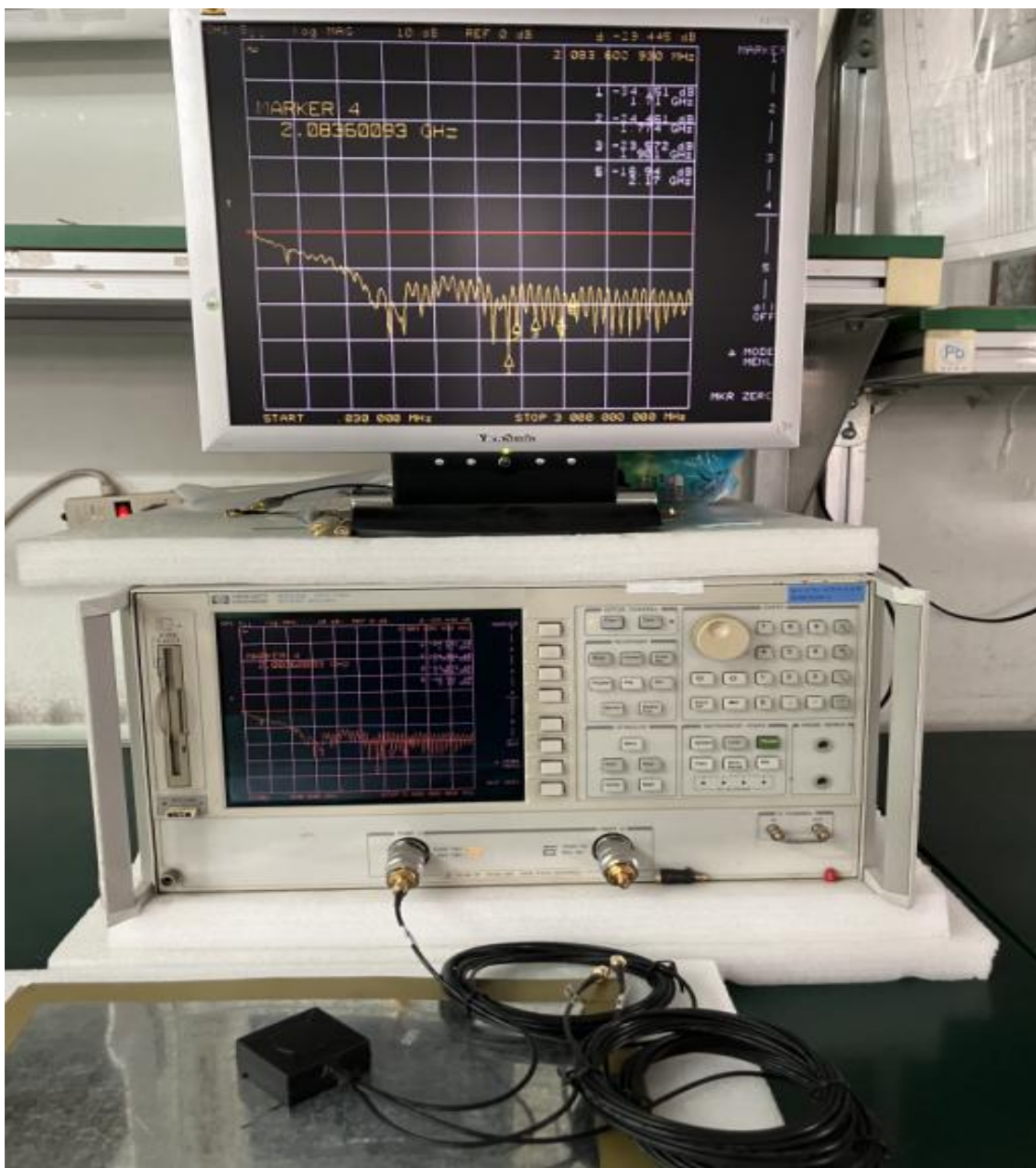
Frequency	Return loss	V.S.W.R	Reflection coefficient
600.000MHz	-10.355dB	1.872:1	0.304
776.401MHz	-19.690dB	1.231:1	0.104
883.808MHz	-28.247dB	1.081:1	0.039
941.212MHz	-25.279dB	1.115:1	0.054
960.000MHz	-25.662dB	1.110:1	0.052



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8-2 Detail band test - Frequency : 1710~2170MHz

Frequency	Return loss	V.S.W.R	Reflection coefficient
1710.00MHz	-34.151dB	1.040:1	0.020
1774.00MHz	-24.461dB	1.127:1	0.060
1901.00MHz	-23.572dB	1.142:1	0.066
2083.60MHz	-29.445dB	1.070:1	0.034
2170.00MHz	-16.940dB	1.332:1	0.142



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8-3 Detail band test - Frequency : 2400-2700Mhz

Frequency	Return loss	V.S.W.R	Reflection coefficient
2400.00MHz	-16.868dB	1.335:1	0.143
2505.00MHz	-28.149dB	1.081:1	0.039
2565.29MHz	-18.891dB	1.256:1	0.114
2622.00MHz	-24.460dB	1.100:1	0.048
2700.00MHz	-23.893dB	1.136:1	0.064

