

D-1RF5A

External GNSS/LTE/ Wi-Fi Combo Antenna

GNSS

CELLULAR

The D-1RF5A is a high-performance combo antenna that supports GNSS, LTE, and Wi-Fi frequencies. With its IP66 rating and black enclosure, it is designed to withstand harsh environmental conditions, making it ideal for outdoor use. The SMA connector ensures easy connectivity to various devices.

The D-1RF5A is compact and easy to install. It is a reliable and versatile option for IoT applications that require high-performance wireless connectivity, such as smart agriculture, smart cities, and fleet management.



Ø85 x 25 mm

Document Information

Product	D-1RF5A
Part Number	D-1RF5A
Description	External GNSS/LTE/Wi-Fi Combo Antenna
Version	2.0 (current)
Date	30-Oct-2023
Status	Released

Revision History

Version	Date	Author	Changes
1.0	16-Dec-2020	Amy Li	Initial Release
2.0	30-Oct-2023	Ivy Liao	New layout and design

Product Overview

Product Description

The D-1RF5A is a high-performance combo antenna that supports GNSS, LTE, and 2.4G WI-FI frequencies. With its IP66 rating and black enclosure, it is designed to withstand harsh environmental conditions, making it ideal for outdoor use. The SMA connector ensures easy connectivity to various devices.

The D-1RF5A is compact and easy to install. It is a reliable and versatile option for IoT applications that require high-performance wireless connectivity, such as smart agriculture, smart cities, and fleet management.

Key Features

- Support the LTE / GNSS / Wi-Fi
- Wide Application
- High Reliability/Sensitivity
- IP66 waterproof
- RoHS Compliant

Applications

- LTE Radios
- Gateways
- Set-top Boxes.
- Security
- Transportation
- Smart Agriculture

Electrical Specifications

Frequency					VSWR	Peak Gain	Efficiency
LTE	700	-	2700	MHz	2	5 d Bi	60%
GNSS	1561	-	1575	MHz	1.8	2 d Bi	60%
Wi-Fi	2400	-	2500	MHz	1.3	2.9 d Bi	35%
Wi-Fi	5150	-	5850	MHz	1.3	3.3 d Bi	25%

Frequency Range	700– 2700 MHz
Impedance	50 Ω
Polarization	Linear

Radiation	Omnidirectional
Electrical Type	Monopole

GPS Antenna

Frequency Range	1575.42MHz,1561.098MHZ
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Impedance	50 Ω
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Polarization	RHCP
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Dimension	25*25*4mm
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Electrical Type	Monopole
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Band Width	CF $\pm$ 3MHz
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GNSS LNA

Gain	20 $\pm$ 2dB
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Filter Insertion Loss	<3dB
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Supply Voltage	3.3V MAX
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Noise Figure	<1.5
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Ex-band Attenuation	35dB@CF+50MHz/50dB@CF-100MHz
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Current Consumption	10~20mA
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Mechanical Specifications

Type	Hinge
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Dimensions	Ø85 x 25 mm
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Connector	SMA
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Cable type	LMR100
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Cable Length	50 cm
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Mounting Type	Connector Mount
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Casing	YES
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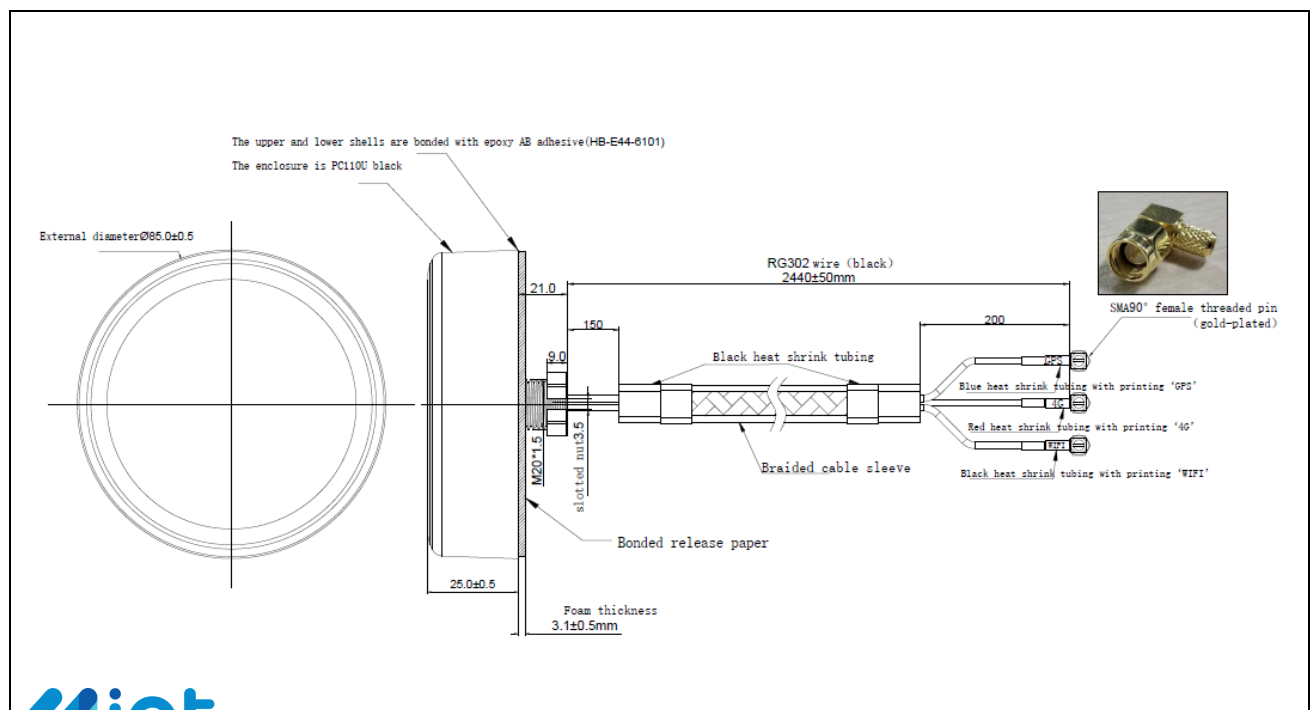
Color	Black
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Material	PC + ABS
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Caution:

1. Do not apply excess mechanical stress to the component body or terminations. Do not attempt to re-form or bend the components, as this will cause damage to the component.
2. Do not expose the component to an open flame.
3. This specification applies to the functionality of the component as a single unit. Please ensure the component is thoroughly evaluated in the application circuit.

Product Image and Dimensions



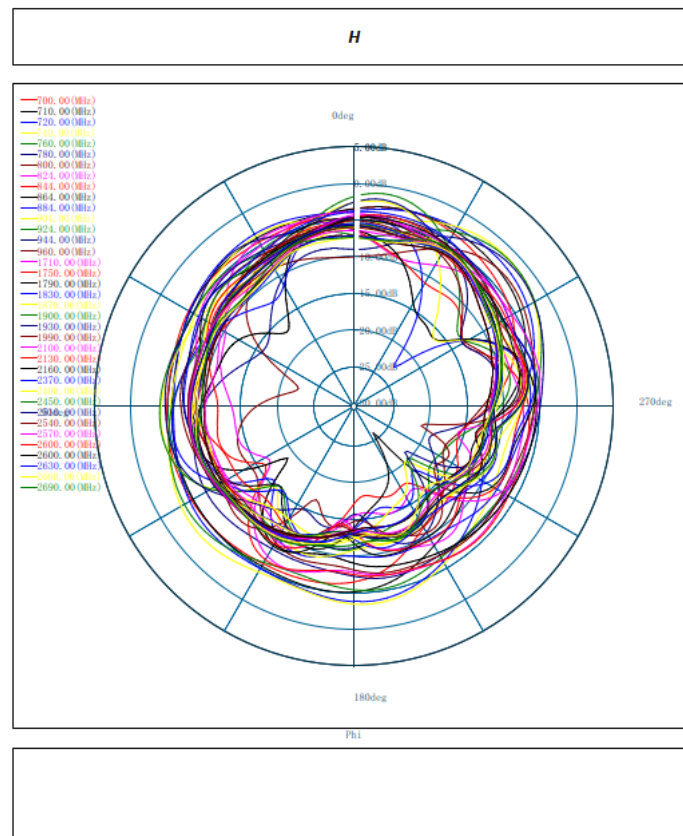
LTE Radiation Pattern

A radiation pattern is a graphical representation of the directional properties of an antenna. It shows how electromagnetic waves are distributed in space in relation to the direction of propagation.

By understanding the information provided by a radiation pattern, it is possible to optimize the design and performance of an antenna for specific applications.

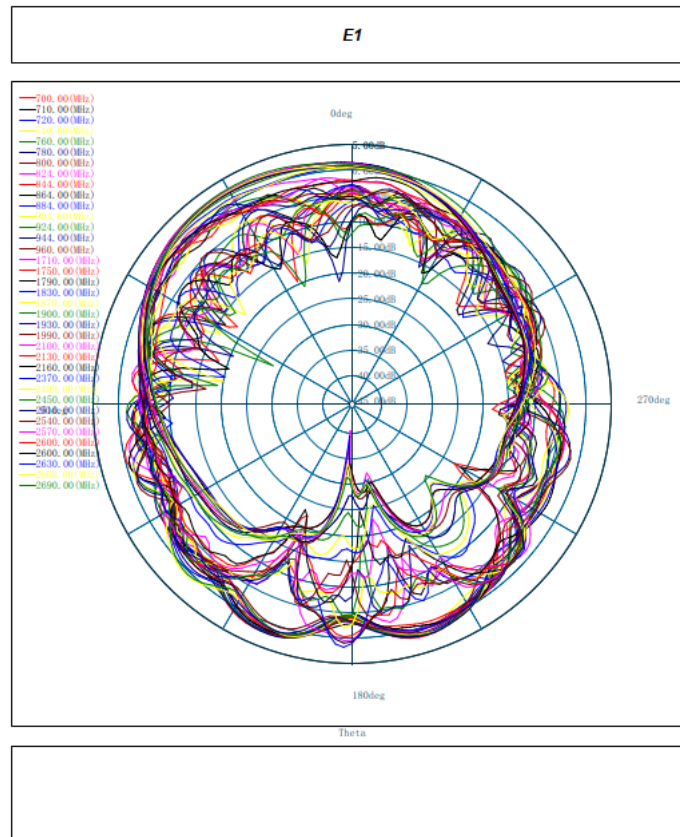
XY Plane (H)

700 – 2700 MHz



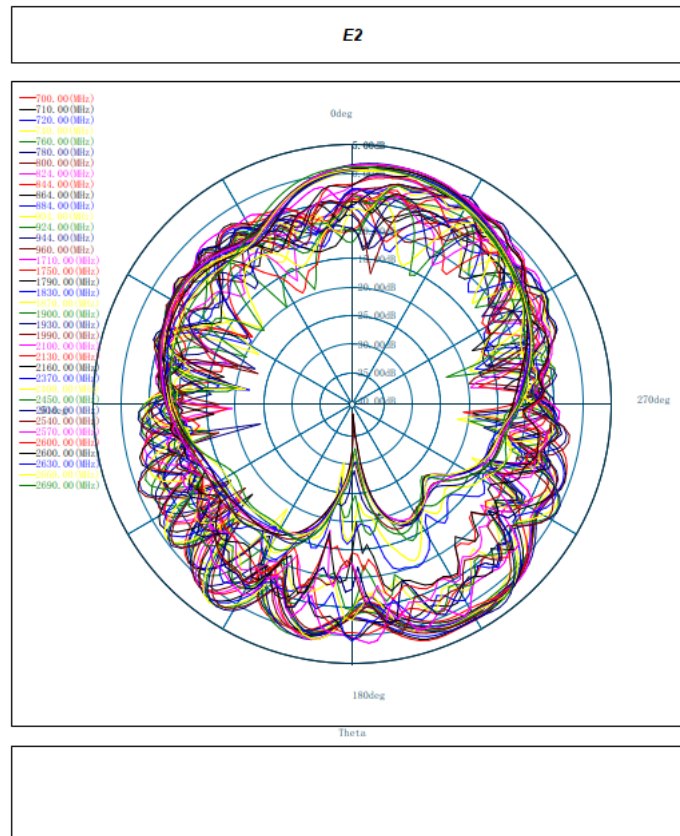
XZ Plane (E1)

700 – 2700 MHz



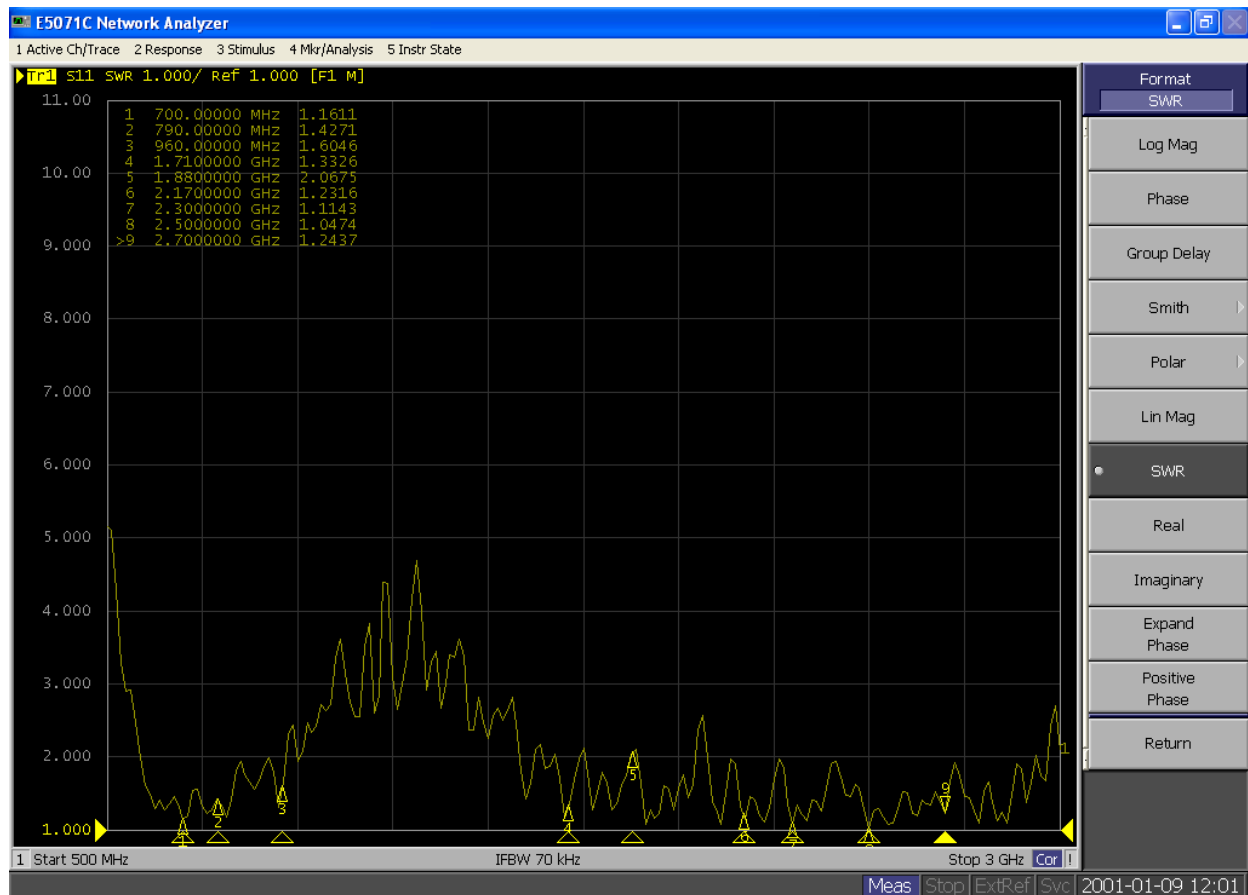
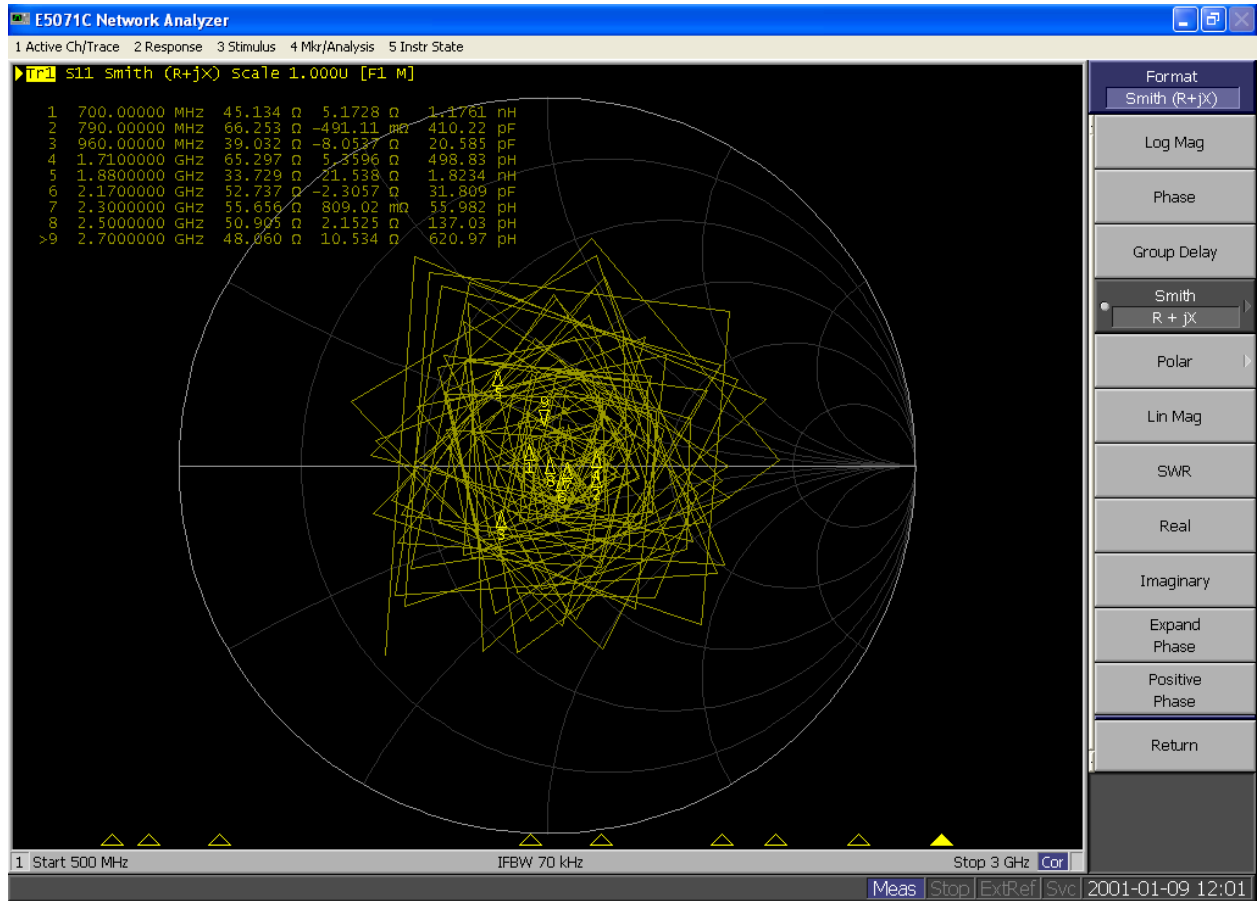
YZ Plane (E2)

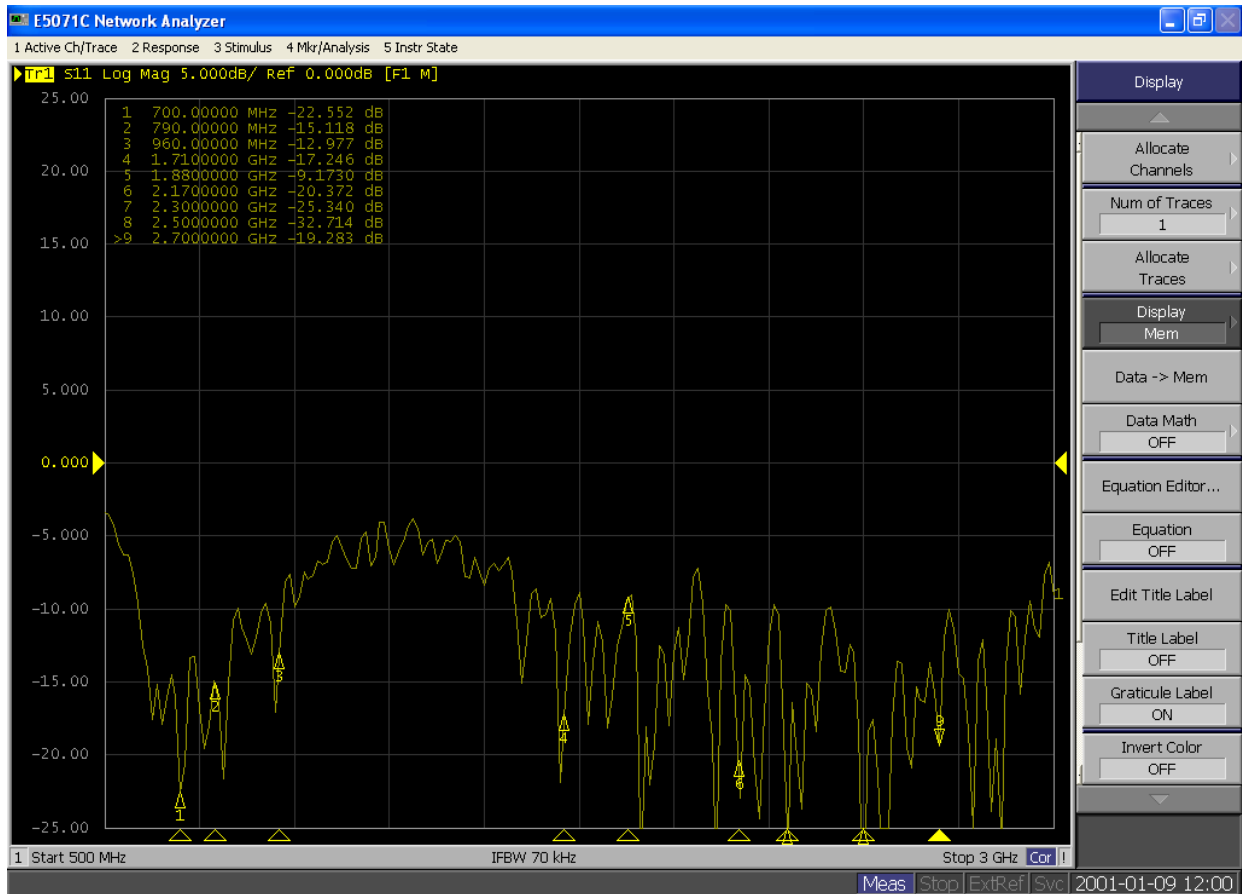
700 – 2700 MHz



LTE Antenna Smith and VSWR

Frequency	VSWR	Frequency	VSWR
699 MHz	1.16	2170 MHz	1.23
790 MHz	1.42	2300 MHz	1.11
960 MHz	1.60	2500 MHz	1.04
1710 MHz	1.33	2700 MHz	1.24
1880 MHz	2.06		





LTE Antenna Efficiency and Gain

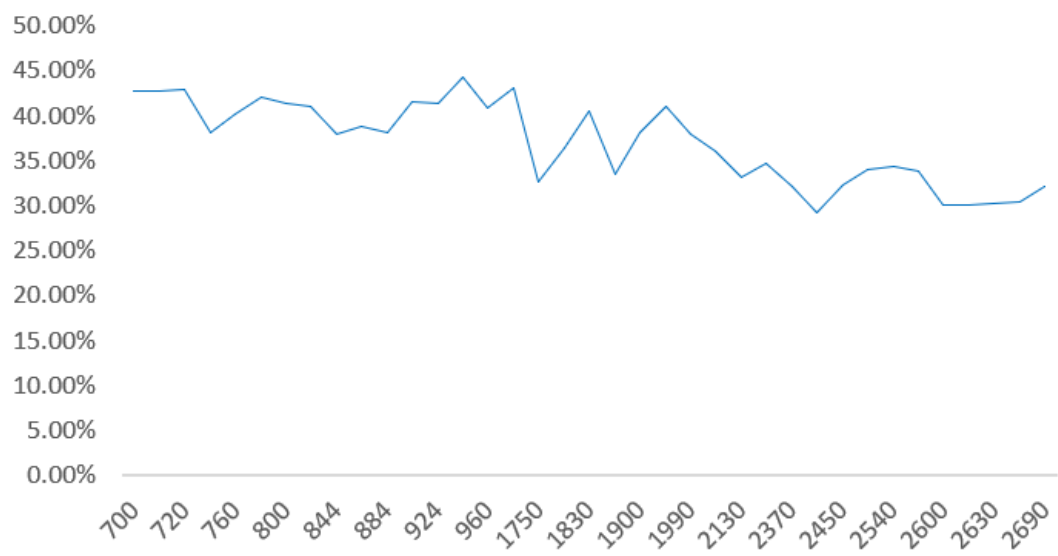
Frequency	Efficiency	Gain
700 MHz	42.8%	3.87
710 MHz	42.7%	3.90
720 MHz	42.9%	3.78
740 MHz	38.2%	3.05
760 MHz	40.2%	3.56
780 MHz	42.0%	3.23
800 MHz	41.3%	2.74
824 MHz	41.0%	2.94
844 MHz	37.9%	2.33
864 MHz	38.8%	2.42
884 MHz	38.2%	2.36
904 MHz	41.6%	2.48
924 MHz	41.3%	2.87

Frequency	Efficiency	Gain
1870 MHz	33.5%	0.83
1900 MHz	38.2%	1.75
1930 MHz	41.1%	2.37
1990 MHz	37.9%	1.85
2100 MHz	36.1%	2.22
2130 MHz	33.2%	1.65
2160 MHz	34.7%	1.62
2370 MHz	32.2%	2.04
2400 MHz	29.3%	1.42
2450 MHz	32.3%	2.30
2510 MHz	34.0%	2.94
2540 MHz	34.4%	3.09
2570 MHz	33.8%	3.30

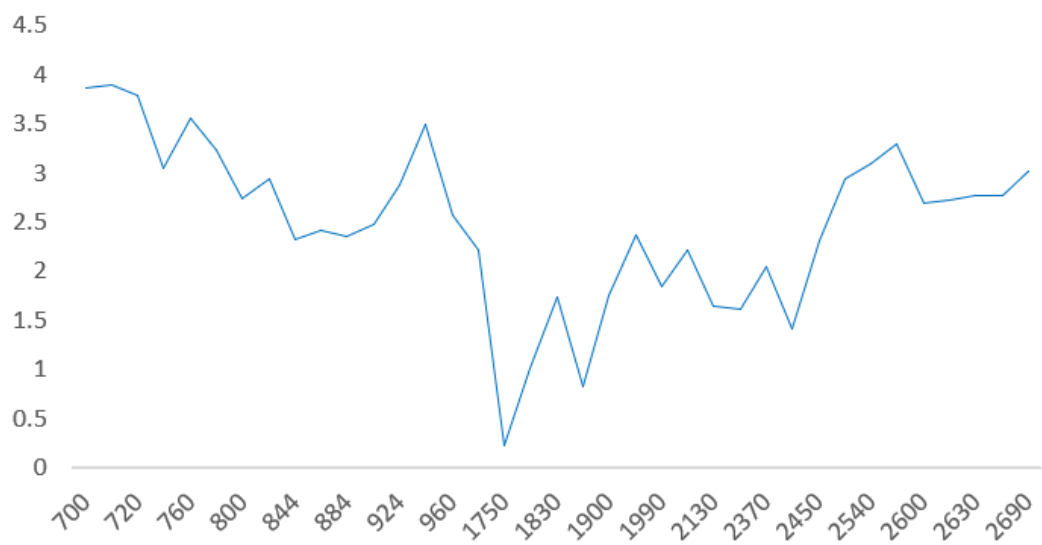
944	MHz	44.3%	3.50
960	MHz	40.8%	2.57
1710	MHz	43.1%	2.22
1750	MHz	32.6%	0.22
1790	MHz	36.5%	1.02
1830	MHz	40.5%	1.73

2600	MHz	30.1%	2.70
2600	MHz	30.1%	2.73
2630	MHz	30.2%	2.77
2660	MHz	30.4%	2.77
2690	MHz	32.1%	3.02

Efficiency



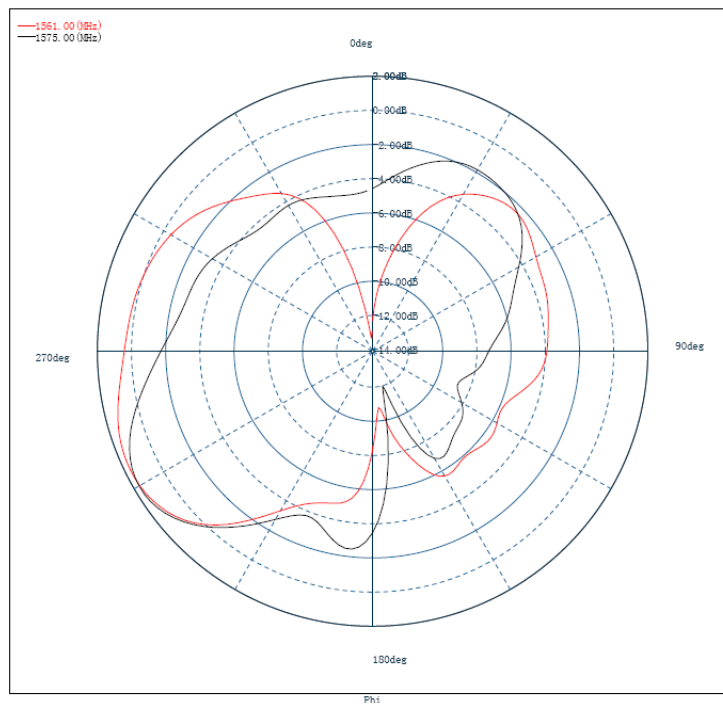
Gain



GPS Radiation Pattern

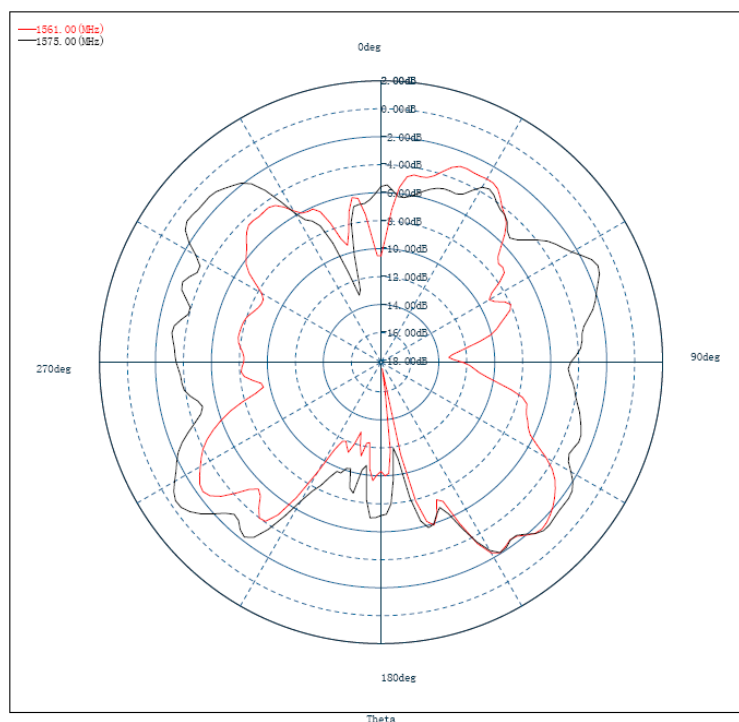
XY Plane (H)

1561 – 1575 MHz



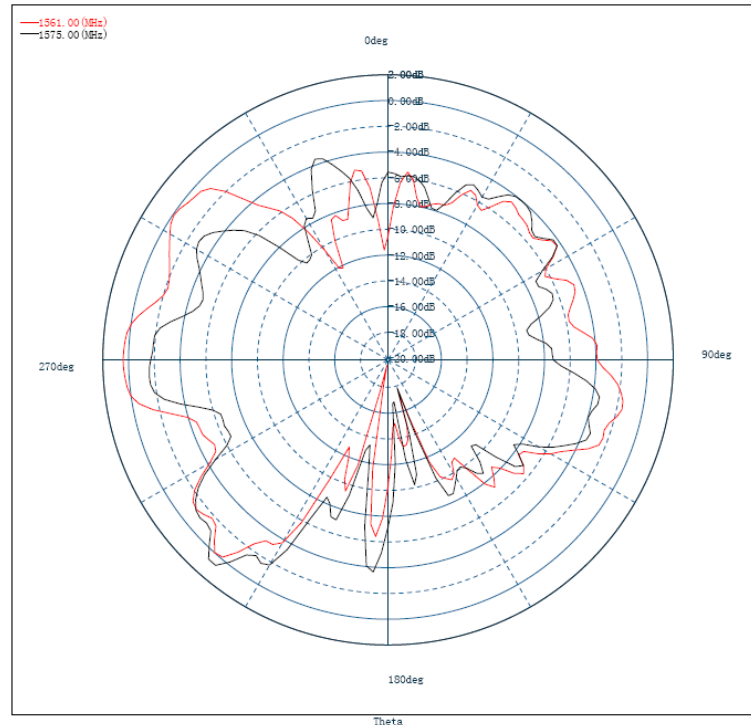
XY Plane (E1)

1561 – 1575 MHz



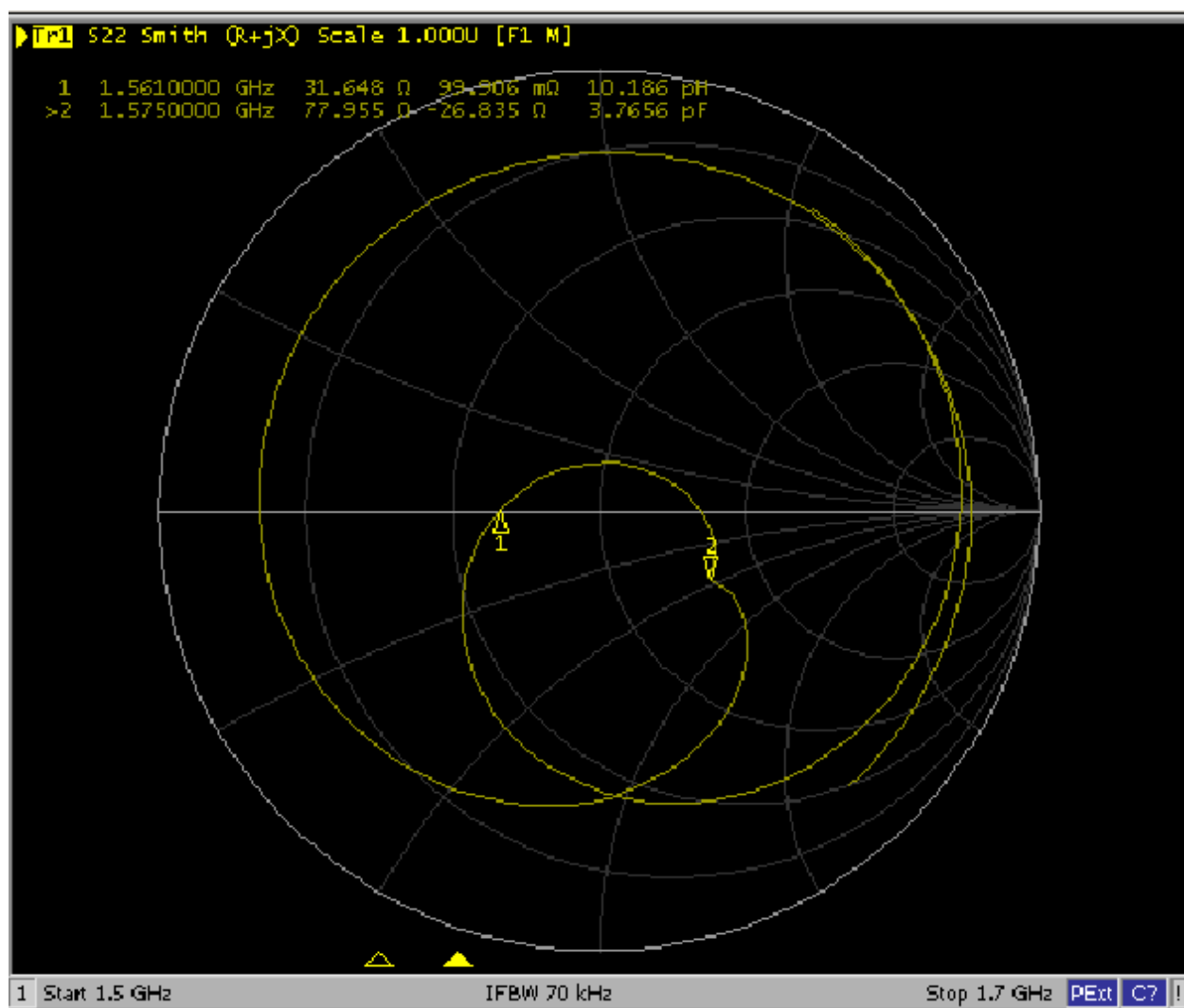
XY Plane (E2)

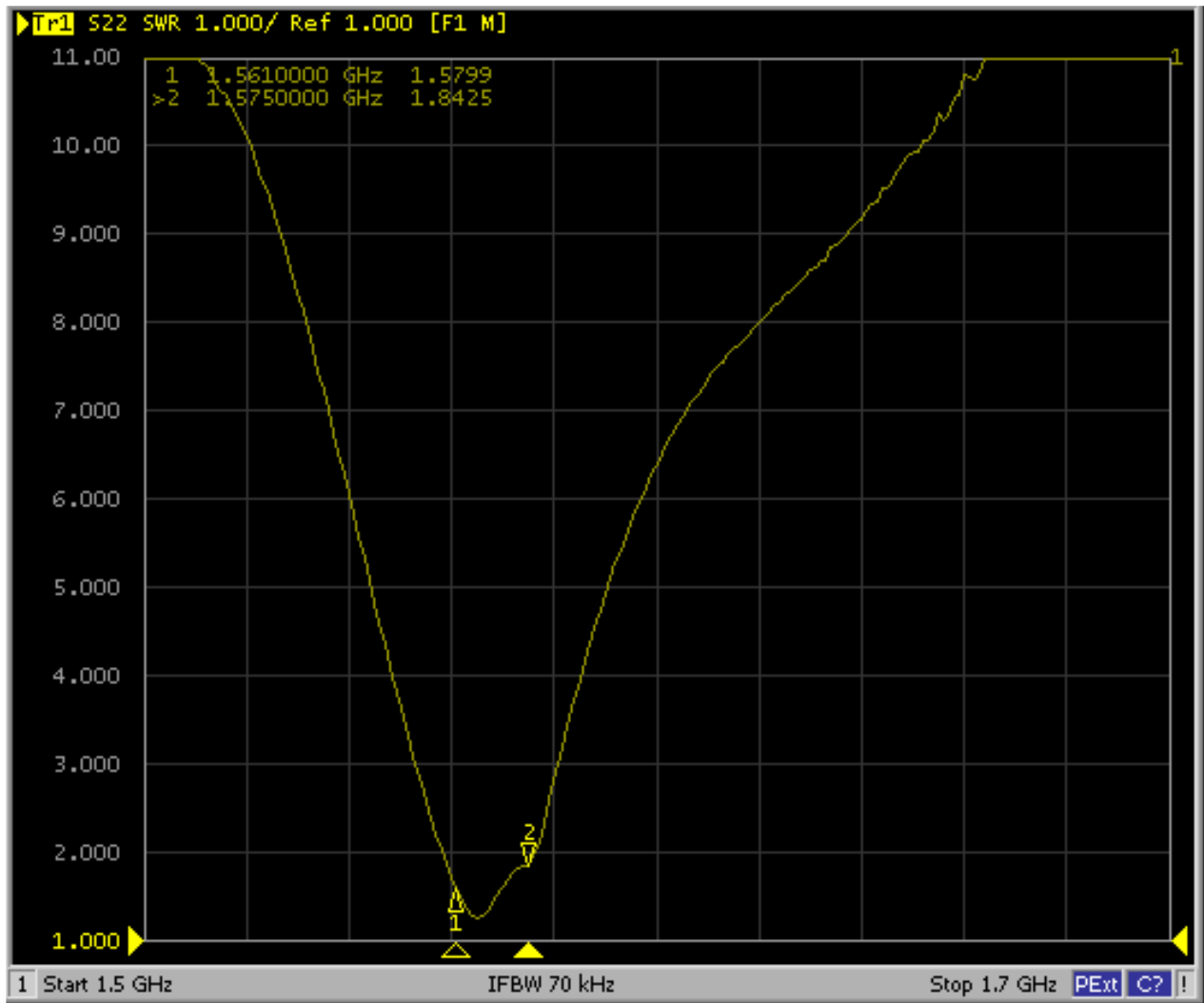
1561 – 1575 MHz



GPS Antenna Smith and VSWR

Frequency		VSWR	Frequency		VSWR
1561	MHz	1.5799	1575	MHz	1.8425





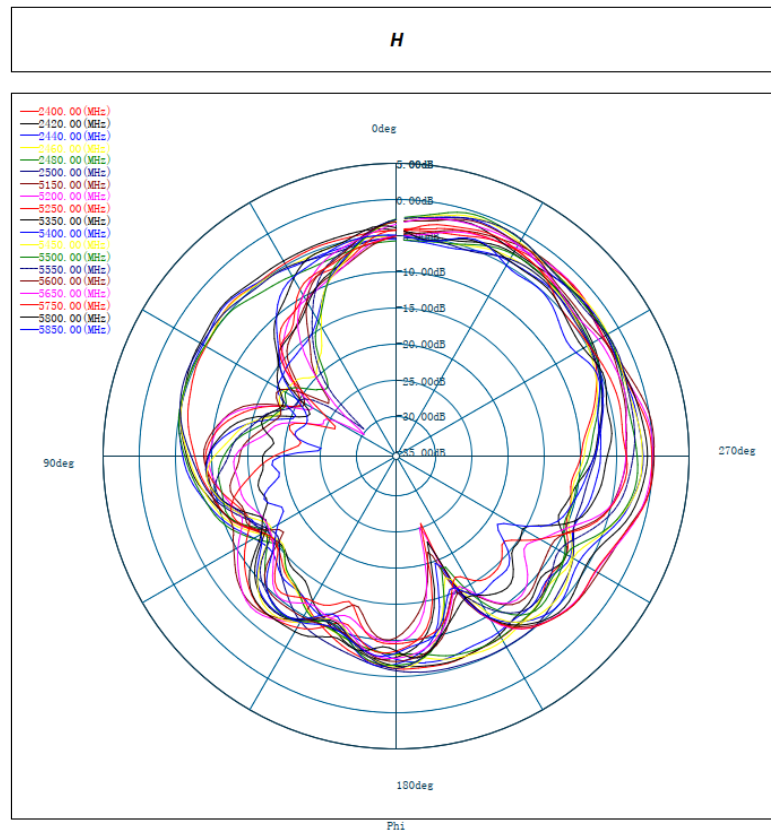
GPS Antenna Efficiency and Gain

Frequency		Efficiency	Gain
1561	MHz	60%	1.75
1575	MHz	60%	2.00

Wi-Fi Radiation Pattern

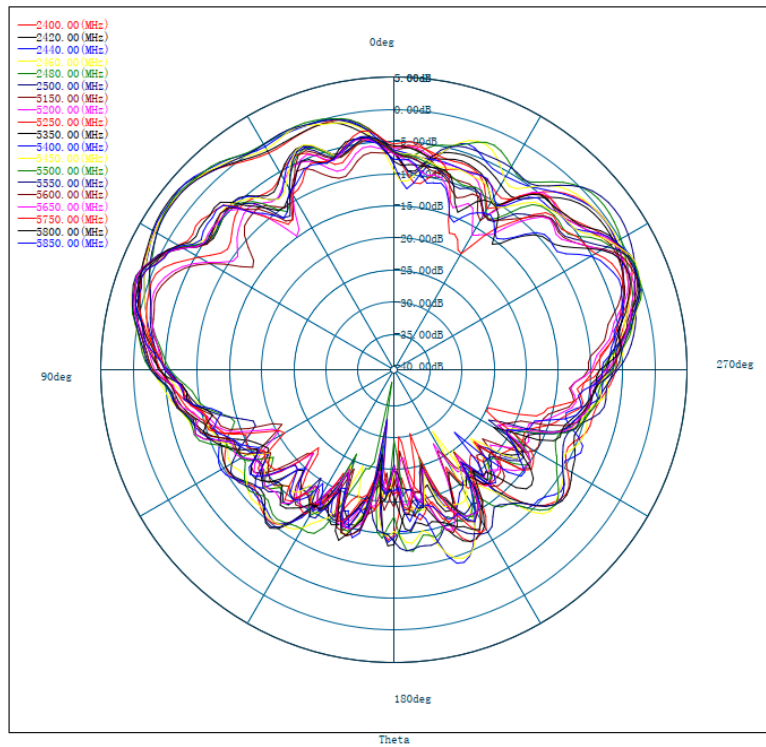
XY Plane (H)

2400 – 2500,5150-5850 MHz



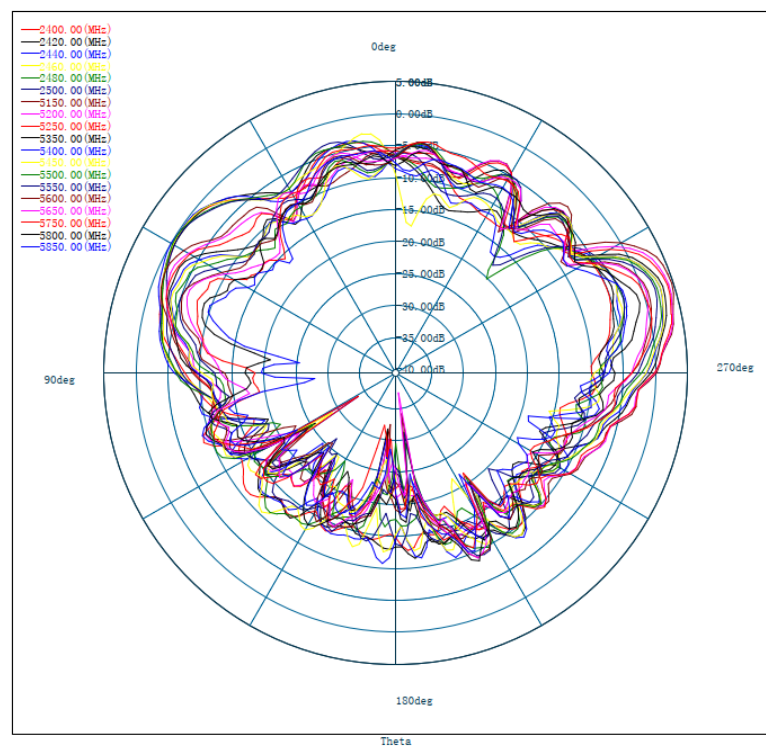
XY Plane (E1)

2400 – 2500,5150-5850 MHz

E1

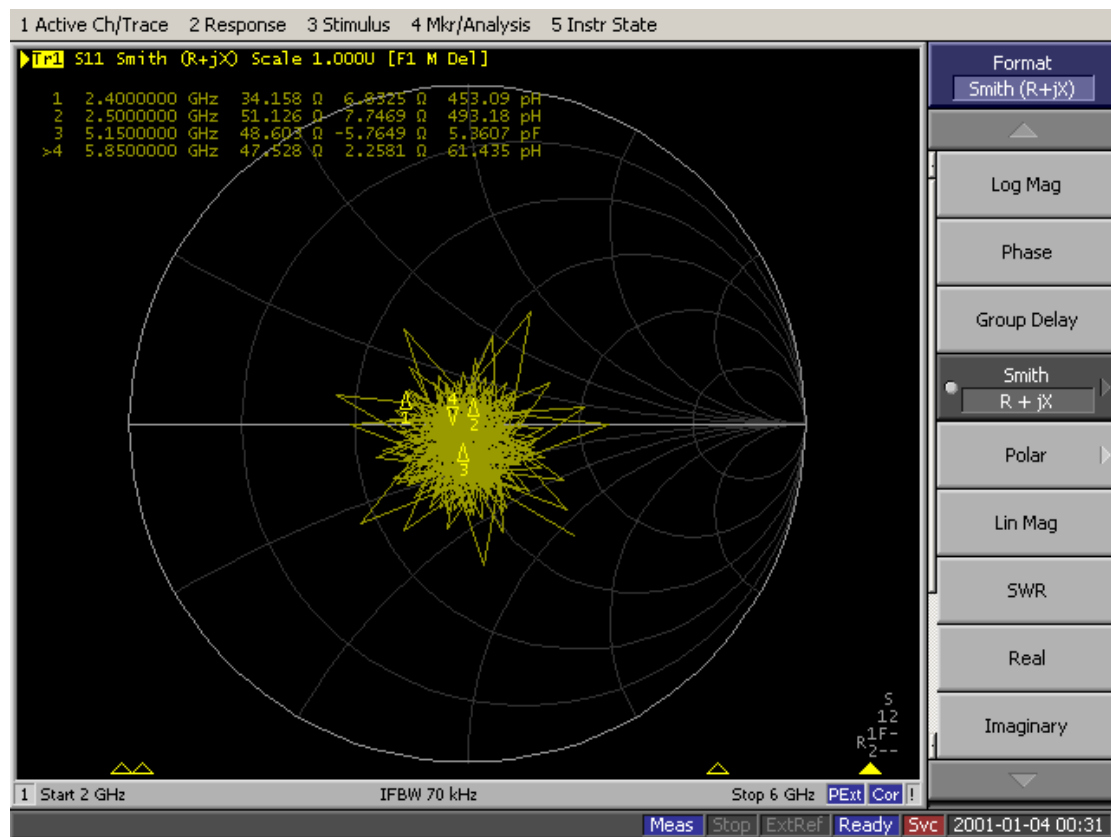
XY Plane (E2)

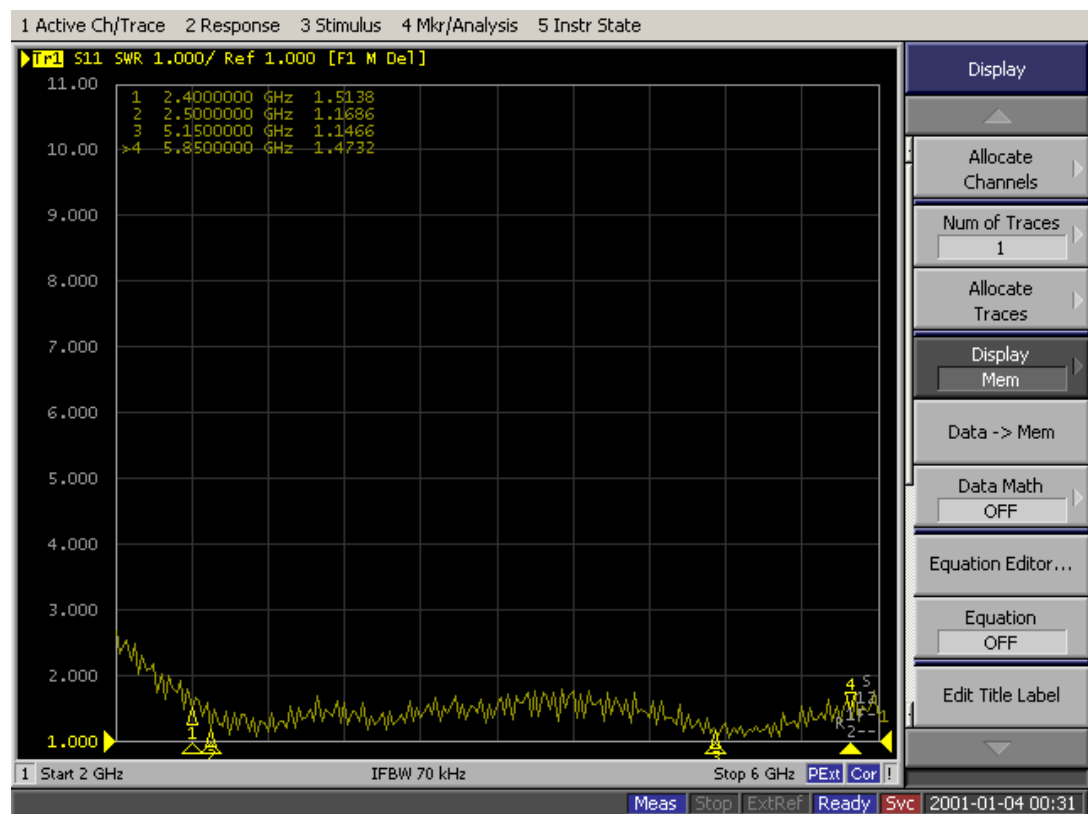
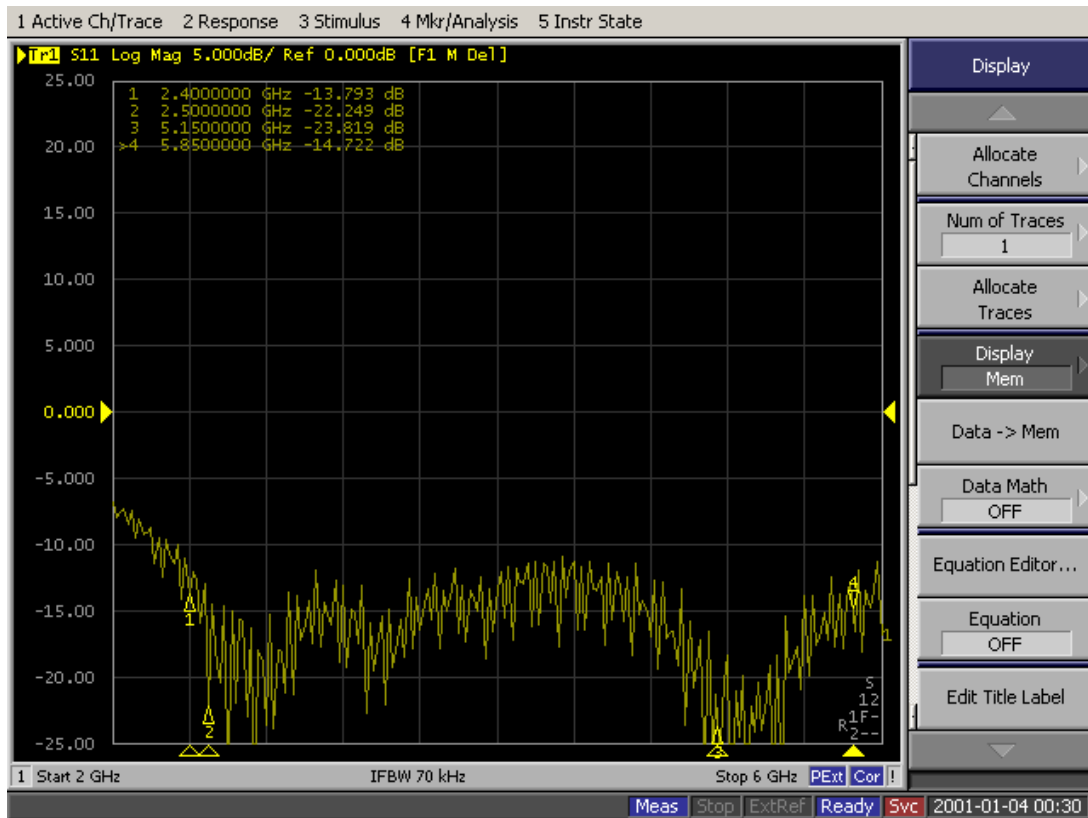
2400 – 2500, 5150–5850 MHz

E2

Wi-Fi Antenna Smith and VSWR

Frequency			VSWR		
2400	MHz	1.5138	2500	MHz	1.1686
5150	MHz	1.1466	5850	MHz	1.4732

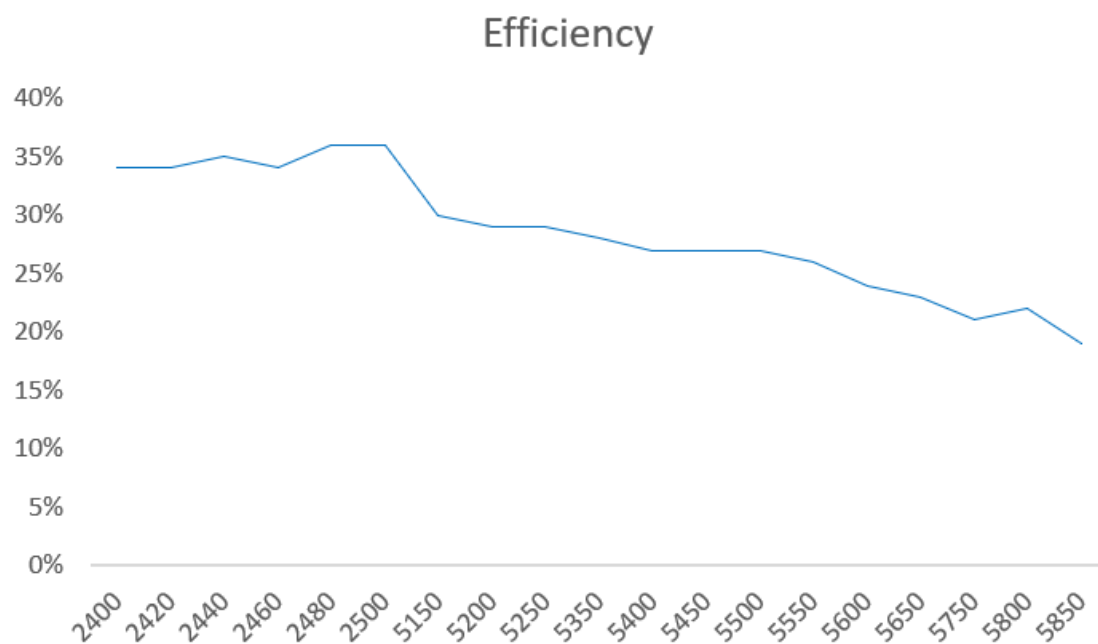


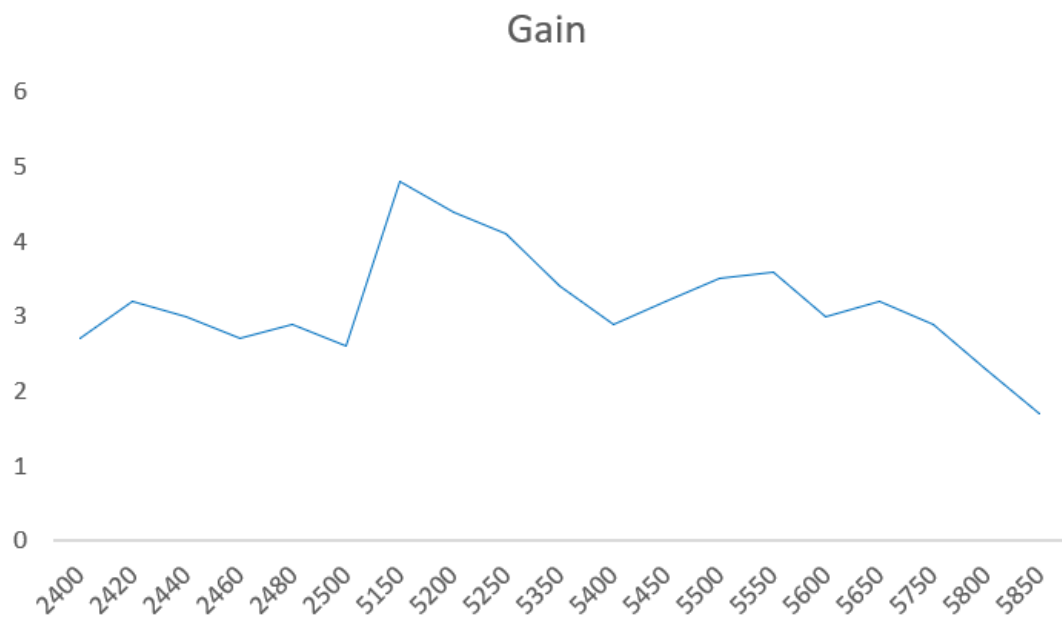


Wi-Fi Antenna Efficiency and Gain

Frequency	Efficiency	Gain
2400 MHz	34%	2.7
2420 MHz	34%	3.2
2440 MHz	35%	3.0
2460 MHz	34%	2.7
2480 MHz	36%	2.9
2500 MHz	36%	2.6
5150 MHz	30%	4.8
5200 MHz	29%	4.4
5250 MHz	29%	4.1
5350 MHz	28%	3.4

Frequency	Efficiency	Gain
5400 MHz	27%	2.9
5450 MHz	27%	3.2
5500 MHz	27%	3.5
5550 MHz	26%	3.6
5600 MHz	24%	3.0
5650 MHz	23%	3.2
5750 MHz	21%	2.9
5800 MHz	22%	2.3
5850 MHz	19%	1.7





Environmental Data

Operating Temperature	-40 °C to +85 °C
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IP Rating	IP66
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Certifications and Approvals

Type Approvals	N/A
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Standards	N/A
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Health & Safety	N/A
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Compliance	RoHS
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Ordering Information

Product Variants

Part Number	Description
D-1RF5A	External GNSS/LTE Combo Antenna

About MIOT

Miot Wireless Solutions, headquartered in Suzhou, China, was established in 2017. It has subsidiaries in Canada, the United States, Brazil, and EMEA. MIOT is a professional designer and manufacturer of Antennas and IoT PCBA products, providing turn-key service to customers worldwide.

Our talented R&D team has experienced antenna, hardware, and software engineers who can participate in your new project, from something simple like antenna/selection and design, to complete turn-key services, which entails taking your concept and ideas through design, prototyping, debugging, certification, and manufacturing. Miot offers reliable products at reasonable prices with fast delivery times to help you get ahead in the market.

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