SPECIFICATION

Patent Pending

Part No. : **MA910.W.A.CG.001**

Product Name : **Guardian** 2 in 1 Wi-Fi MIMO
Adhesive Mount Antenna

Features : Low-Profile Housing – Mounts Flush to Wall
2* Wi-Fi MIMO 2.4GHz/5.8 GHz
IP67 Waterproof Resistant Enclosure
Dims: 146*134*20mm
Cable: 3000mm Low Loss KSR200-P with RP-SMA(M) connectors
Custom Cables and Connectors Available
RoHS Compliant

1. Introduction

The MA910 Guardian is a low-profile 2 in 1 Wi-Fi MIMO wall and adhesive mount external antenna. As part of the first series of panel antenna worldwide designed for IoT gateway and router devices, it belongs to a new generation of combination antenna.

The MA910 Guardian is ideal for Wi-Fi applications requiring the increased data throughput and range provided by MIMO technology, all in a convenient and compact form factor. It is designed with high efficiency and gain as well as high isolation between the antennas to prevent self-interference. Low loss cables are used to keep efficiency high over long cable lengths. With its heavy-duty, fully IP67 casing, the MA910 Guardian can withstand a range of environments.

All of these factors make the MA910 Guardian antenna an excellent choice for use by RF professionals in:

- IoT Gateway and Routers
- HD Video Streaming
- Transportation
- Remote monitoring applications

The standard MA910 Guardian antenna comes with 3 meter, low loss KSR-200-P coaxial cable. Customized cables and connector versions are also available. Also available in black.

2. Specification

2.4GHz/5GHz Wi-Fi Antenna			
Frequency (MHz)		2400~2500	4900~5850
Efficiency (%)			
MIMO_1	Free space	43.80	31.63
	ABS	40.64	32.52
	Glass	40.95	31.05
	Metal	39.31	30.75
	Wall	46.28	30.47
MIMO_2	Free space	33.44	30.94
	ABS	35.14	30.79
	Glass	30.94	30.85
	Metal	34.58	30.00
	Wall	38.41	28.68
Average Gain (dBi)			
MIMO_1	Free space	-3.59	-5.08
	ABS	-3.91	-4.96
	Glass	-3.88	-5.18
	Metal	-4.06	-5.26
	Wall	-3.35	-5.25
MIMO_2	Free space	-4.77	-5.15
	ABS	-4.57	-5.18
	Glass	-5.11	-5.17
	Metal	-4.65	-5.34
	Wall	-4.16	-5.49
Peak Gain (dBi)			
MIMO_1	Free space	3.15	3.14
	ABS	4.14	3.38
	Glass	1.79	3.23
	Metal	4.02	4.18
	Wall	4.27	3.97
MIMO_2	Free space	1.74	3.90
	ABS	0.98	3.63
	Glass	2.55	5.27
	Metal	4.82	4.96
	Wall	2.03	4.17

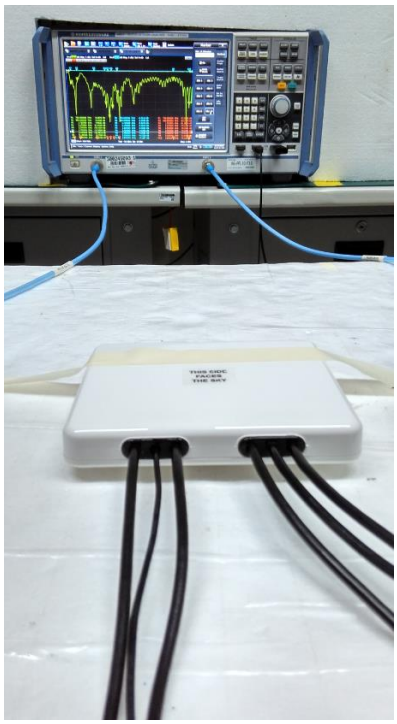
Impedance	50Ω
Polarization	Linear
VSWR	< 3
Cable	3 meter KSR200-P standard, fully customizable
Connector	RP-SMA(M) standard, fully customizable

MECHANICAL	
Antenna Dimensions	146*134*20mm
Casing	ASA
Weight (including cable)	672g
Ingress Protection Rating	IP67
ENVIRONMENTAL	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 90°C
Humidity	Non-condensing 65°C 95% RH

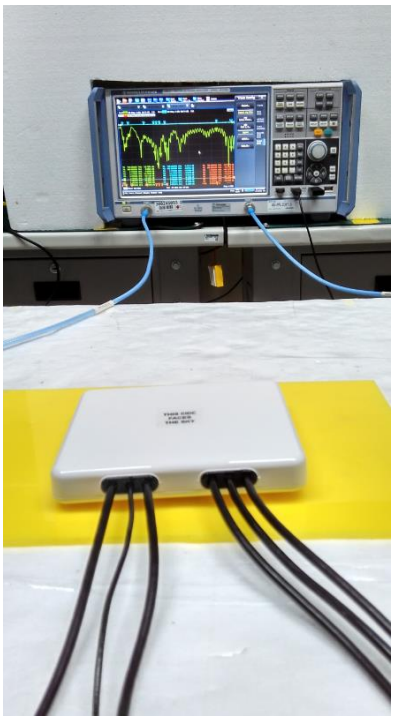
3. Antenna Characteristics

3.1 Wi-Fi MIMO Antenna

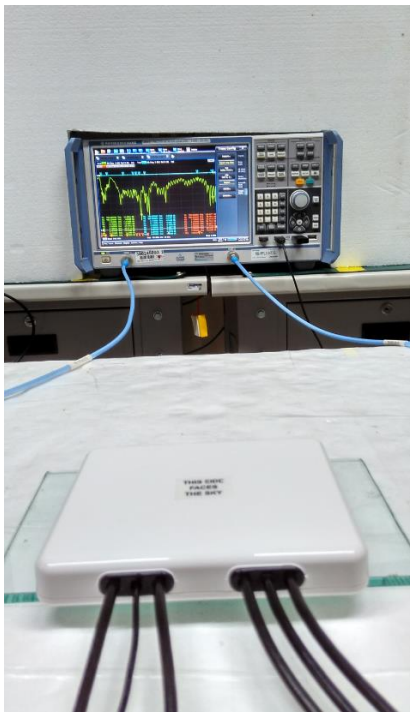
3.1.1 Test Setup



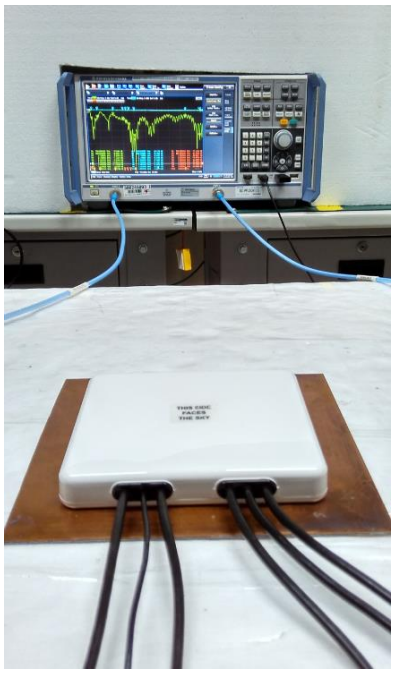
Free space



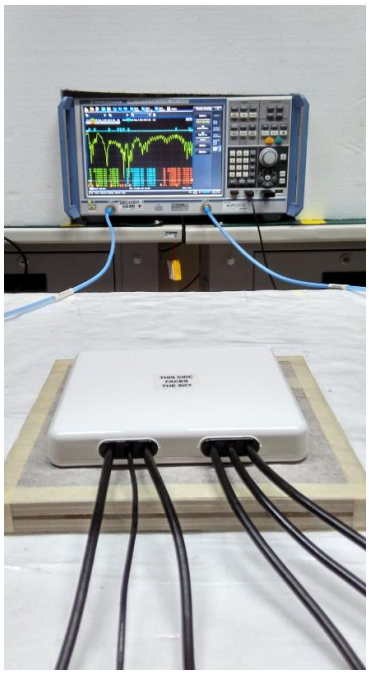
ABS



Glass



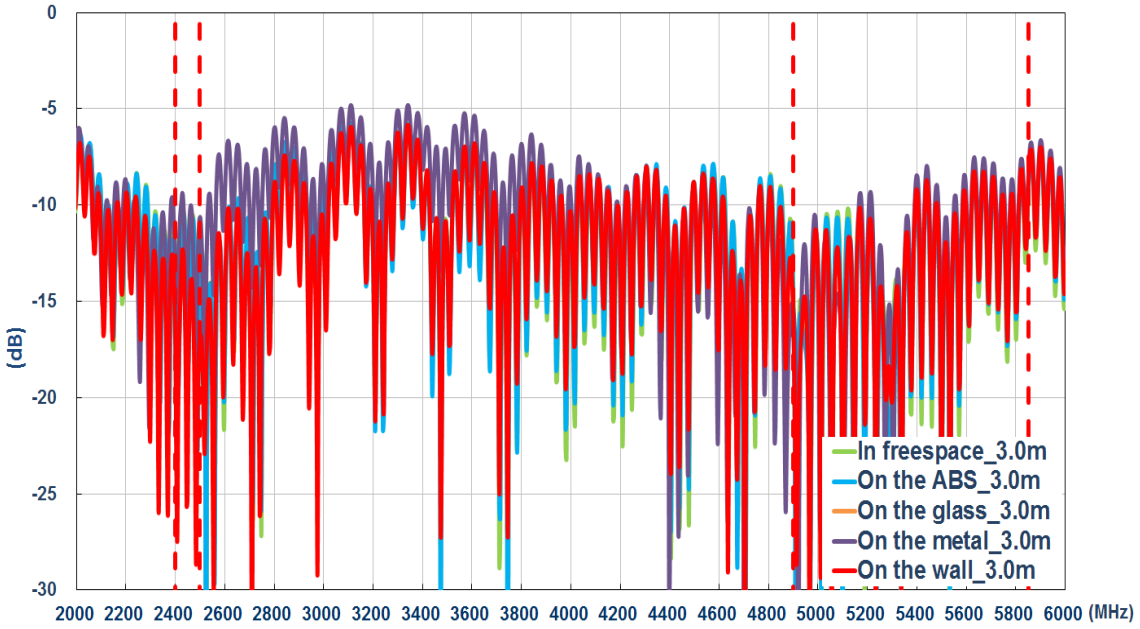
Metal



Wall

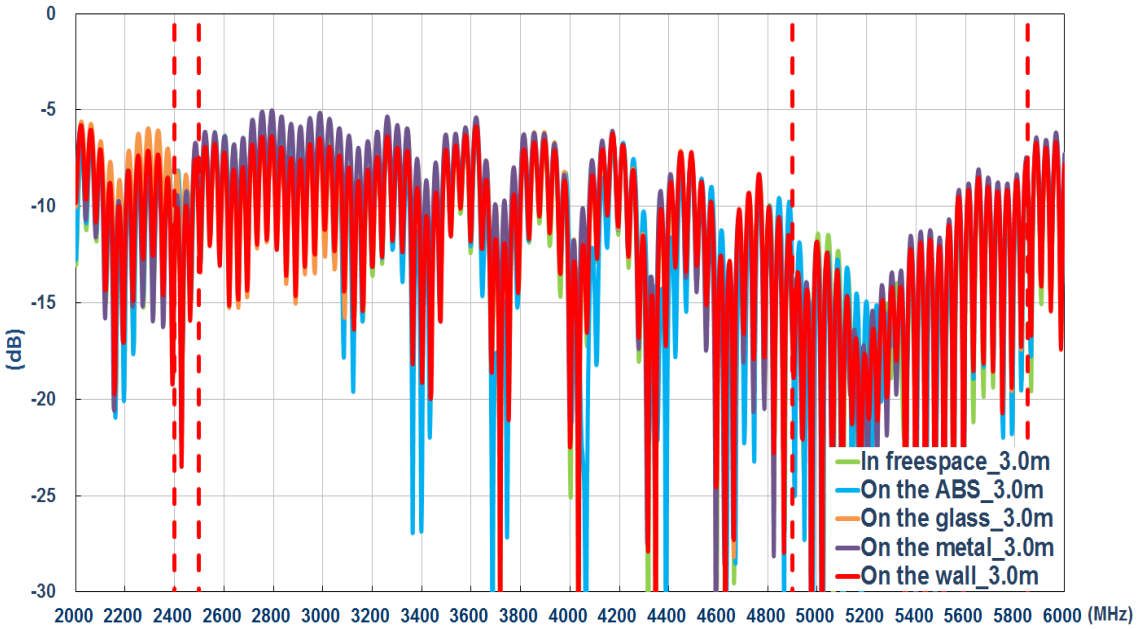
3.1.2 Wi-Fi 1 Antenna Return Loss

Performance in different environments with 3 meter cable length



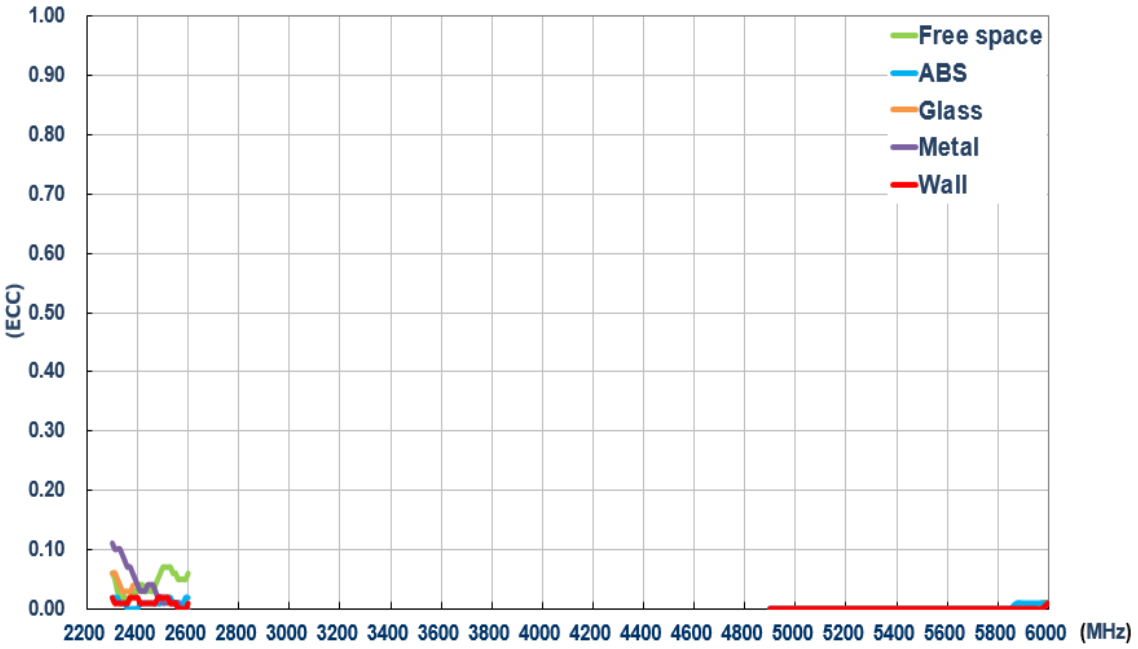
3.1.3 Wi-Fi 2 Antenna Return Loss

Performance in different environments with 3 meter cable length



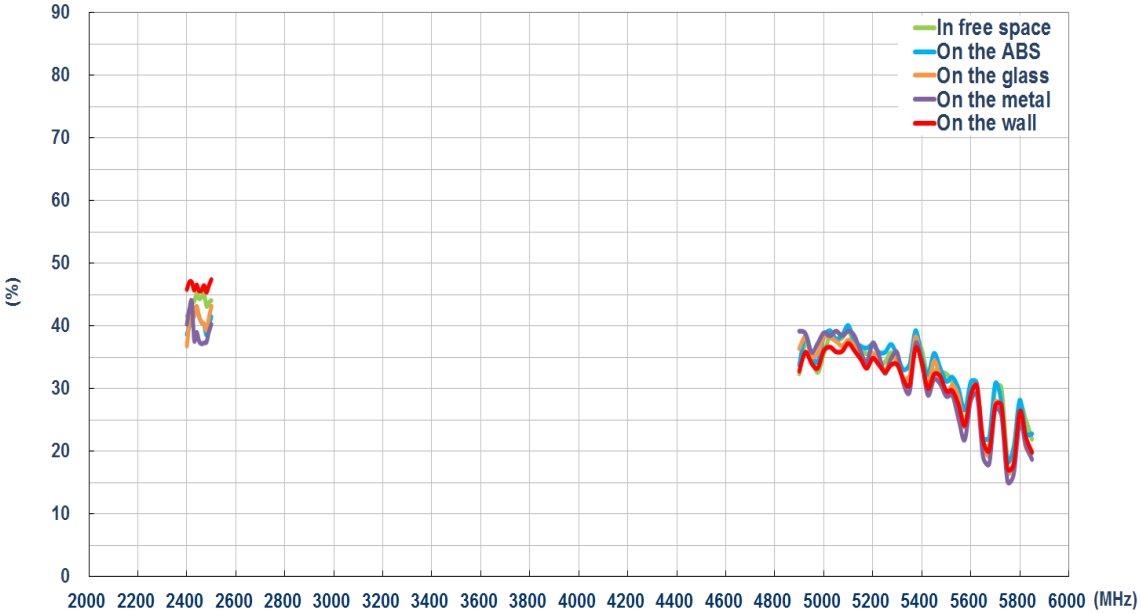
3.1.4 Wi-Fi Envelope Correlation Coefficient

Performance in different environments with 3 meter cable length



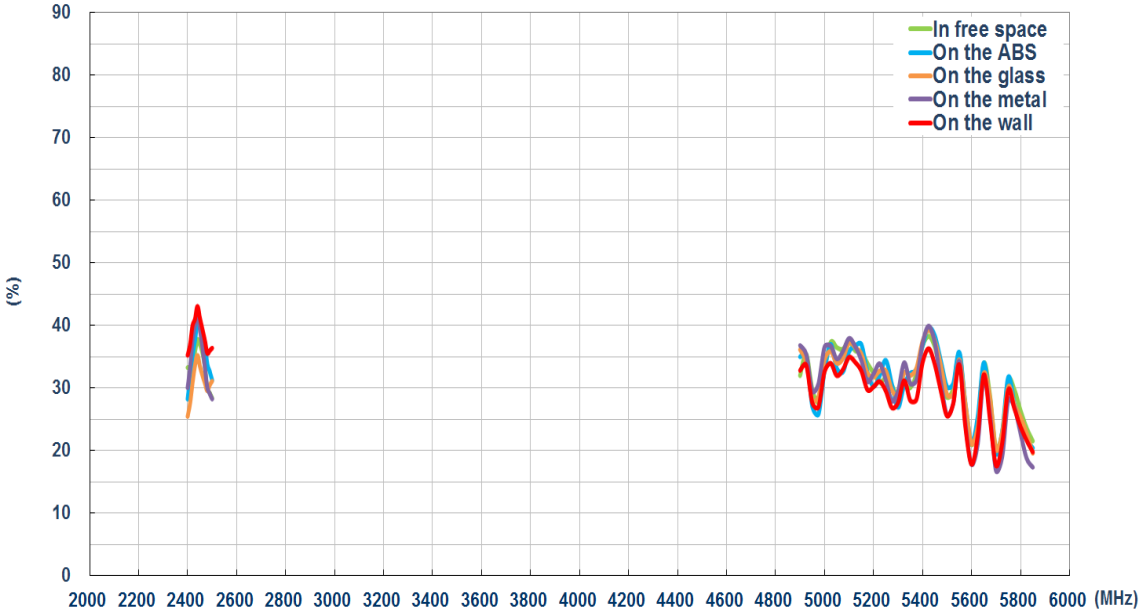
3.1.5 Wi-Fi 1 Antenna Efficiency

Performance in different environments with 3 meter cable length



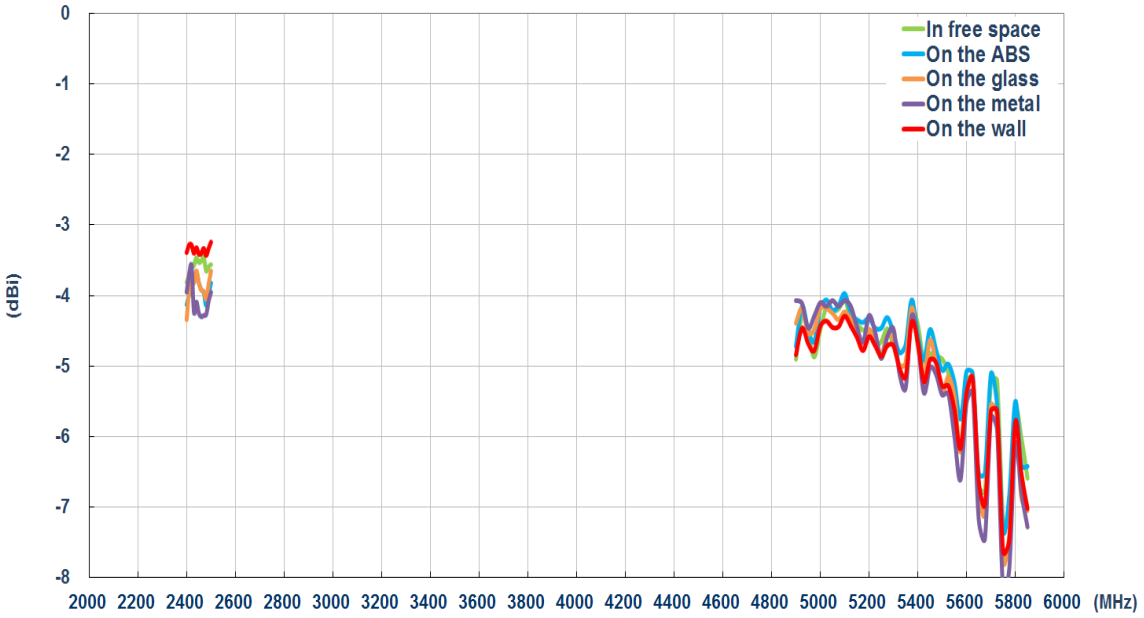
3.1.6 Wi-Fi 2 Antenna Efficiency

Performance in different environments with 3 meter cable length



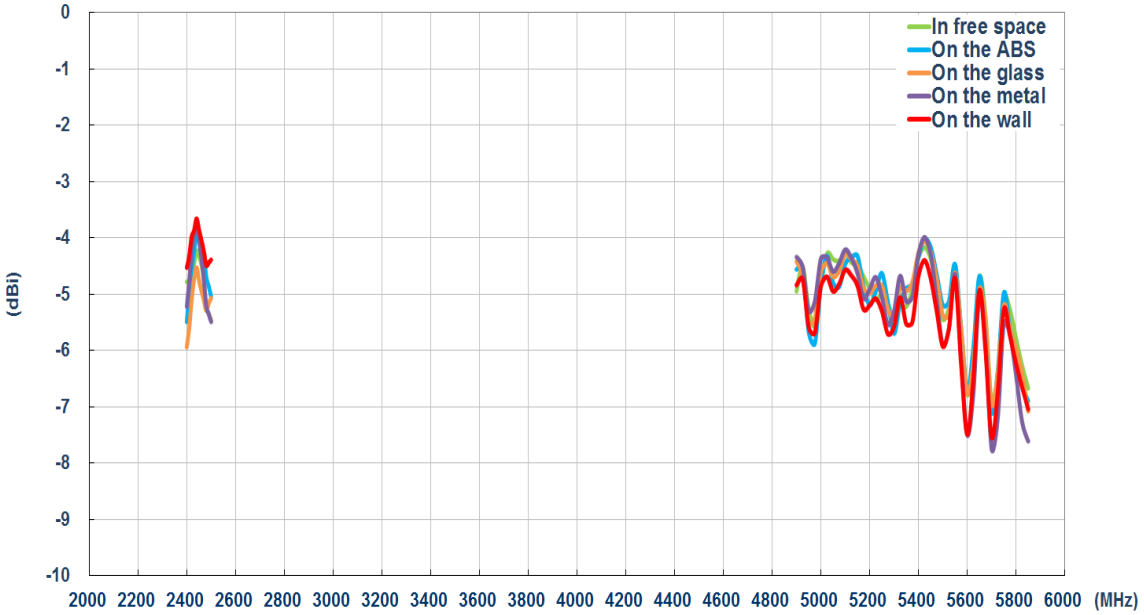
3.1.7 Wi-Fi 1 Antenna Average Gain

Performance in different environments with 3 meter cable length



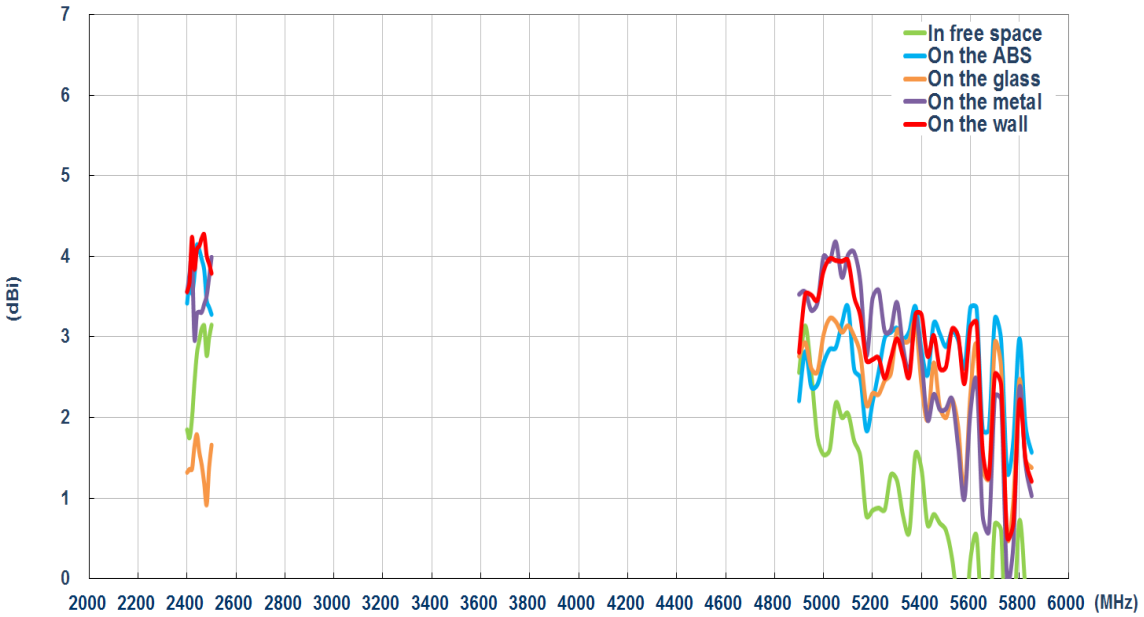
3.1.8 Wi-Fi 2 Antenna Average Gain

Performance in different environments with 3 meter cable length



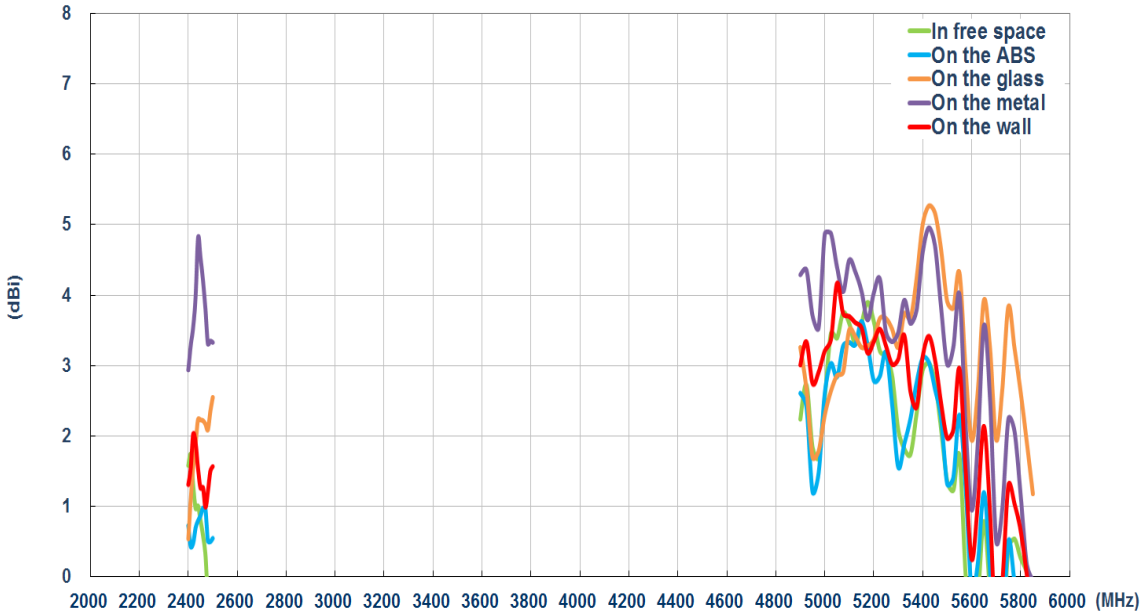
3.1.9 Wi-Fi 1 Antenna Peak Gain

Performance in different environments with 3 meter cable length

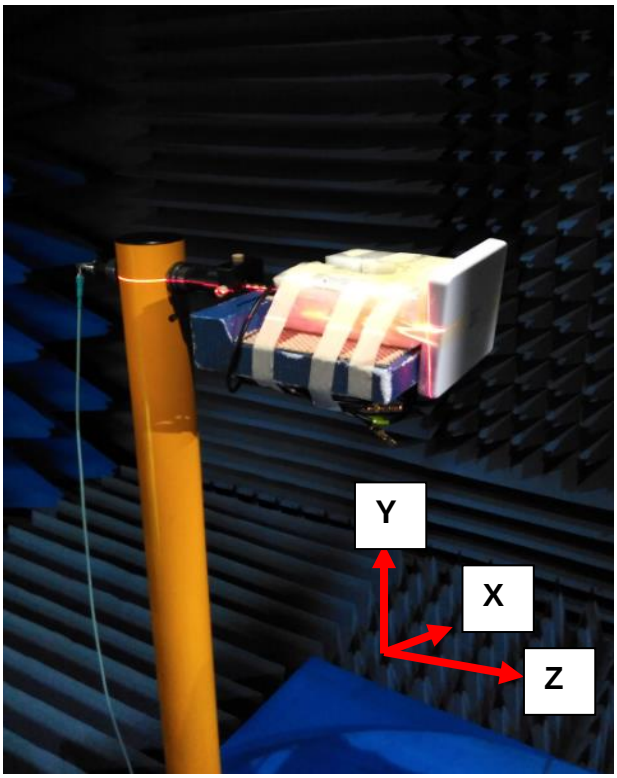


3.1.10 Wi-Fi 2 Antenna Peak Gain

Performance in different environments with 3 meter cable length



3.1.11 Test Setup For Antenna Radiation Pattern

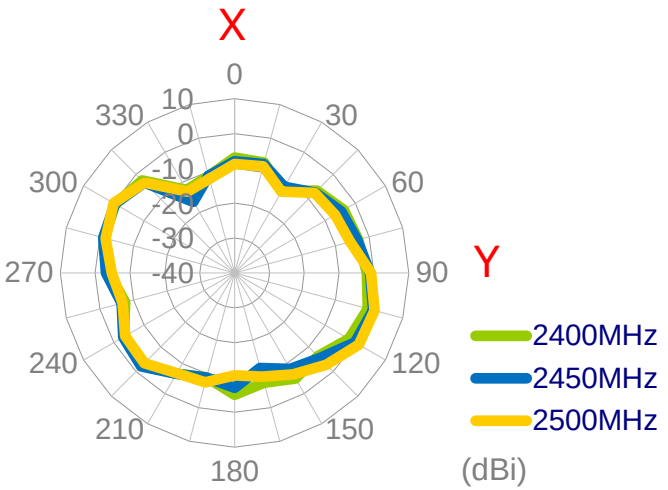


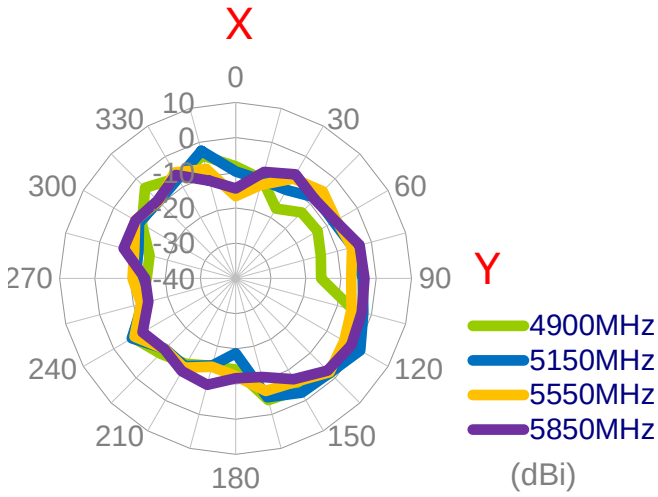
In free space

3.1.12 2D Radiation Pattern

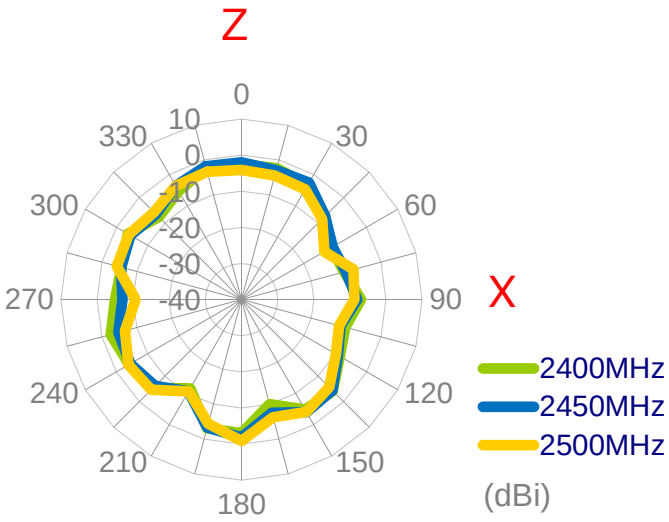
Wi-Fi_MIMO1 with 3M cable length in free space

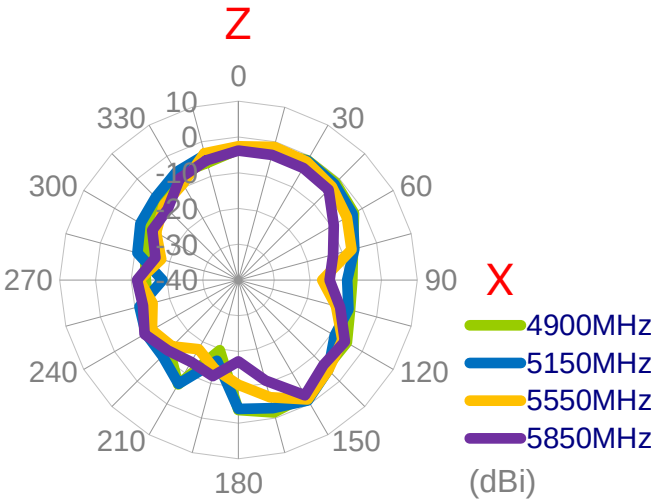
XY Plane



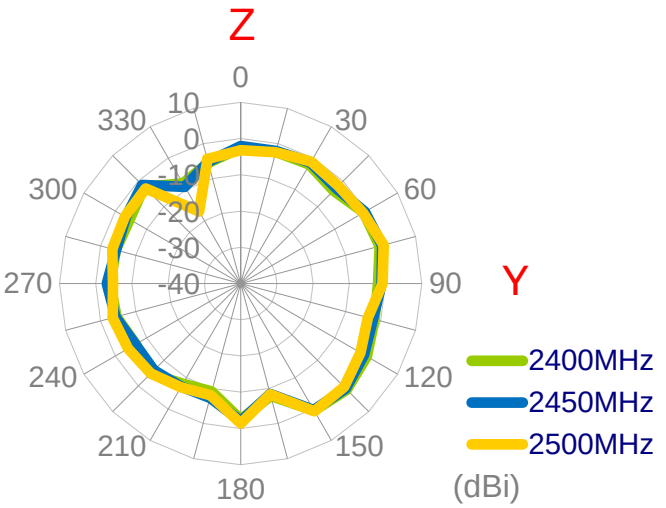


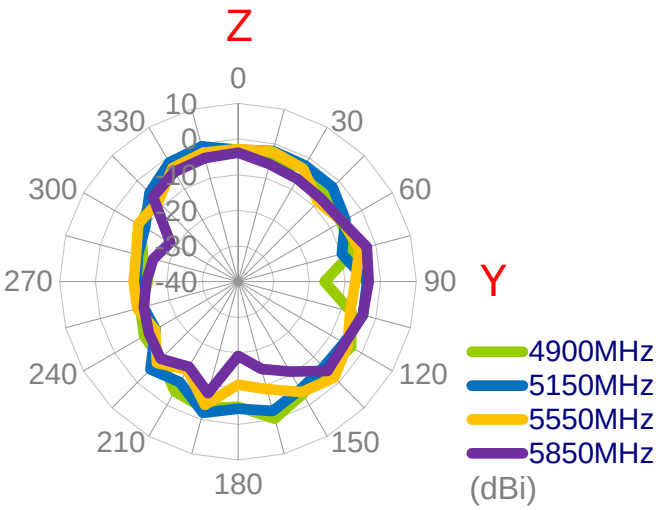
XZ Plane



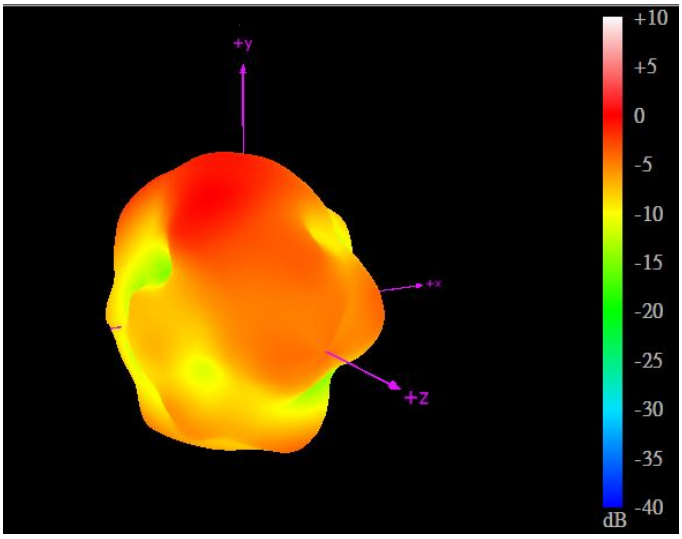


YZ Plane

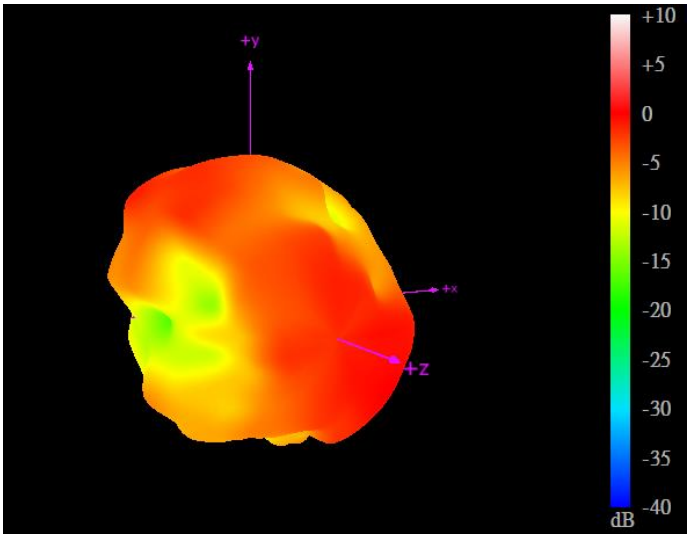




3.1.13 3D Radiation Pattern (Wi-Fi_MIMO1 with 3M cable length in free space)



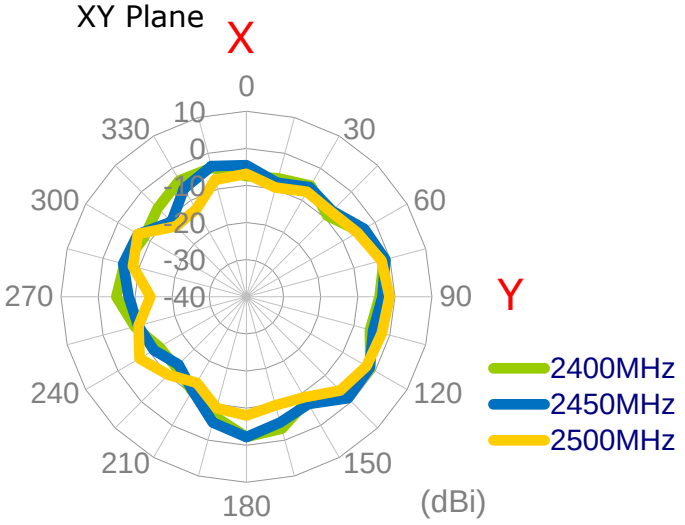
2450MH

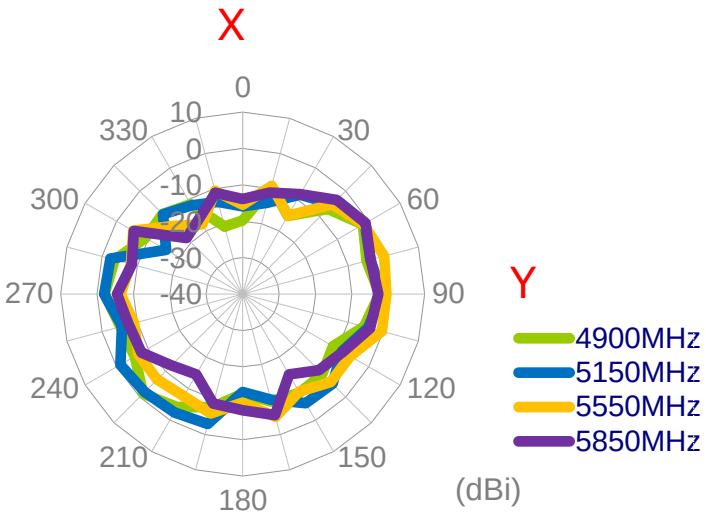


5550MHz

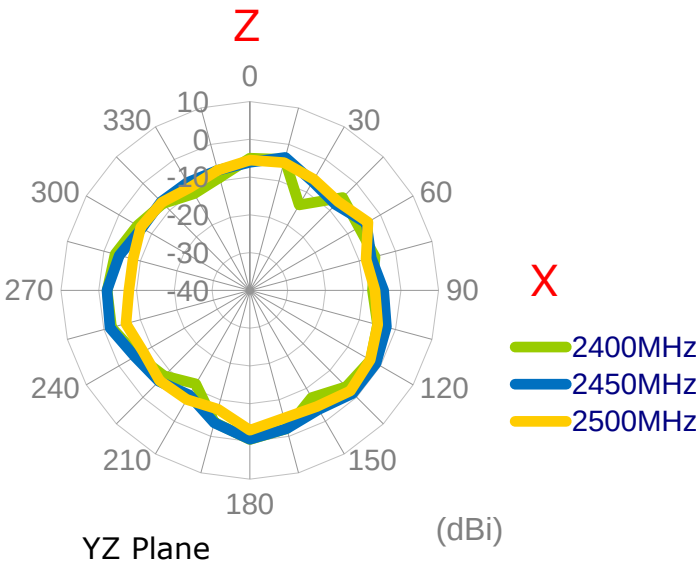
3.1.14 2D Radiation Pattern
Wi-Fi MIMO2 with 3M cable length in free space

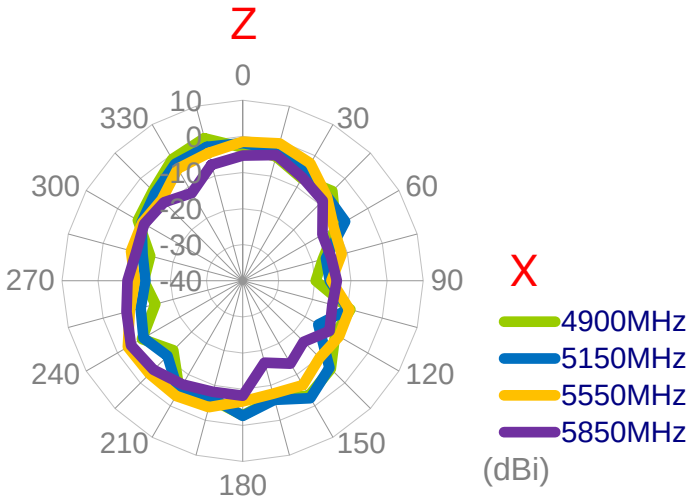
XY Plane



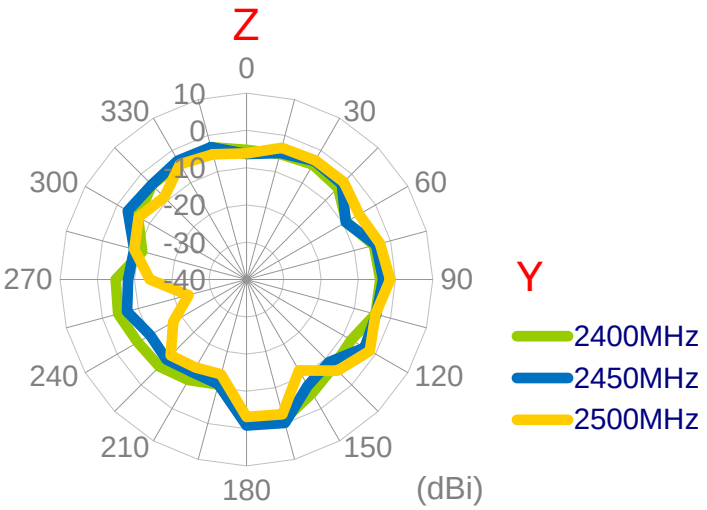


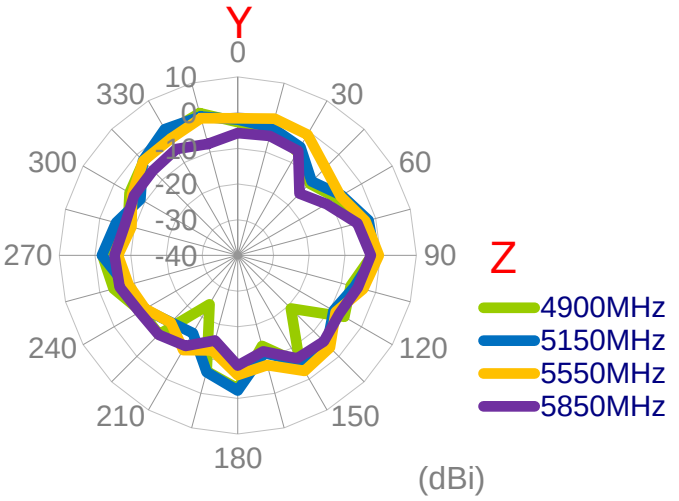
XZ Plane





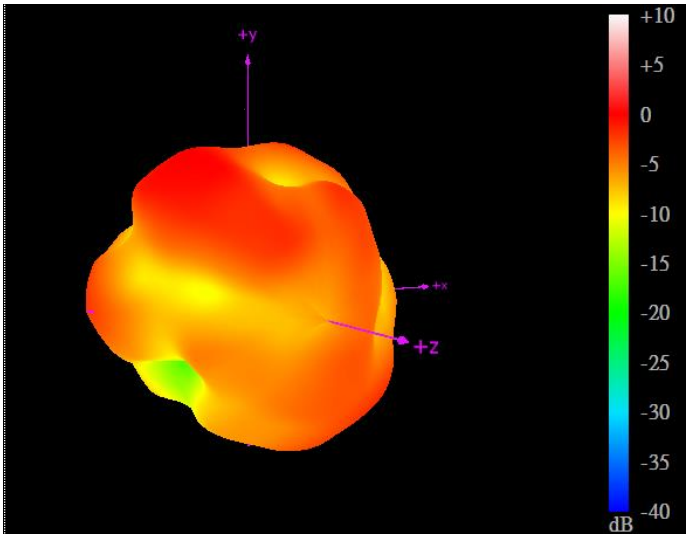
YZ Plane



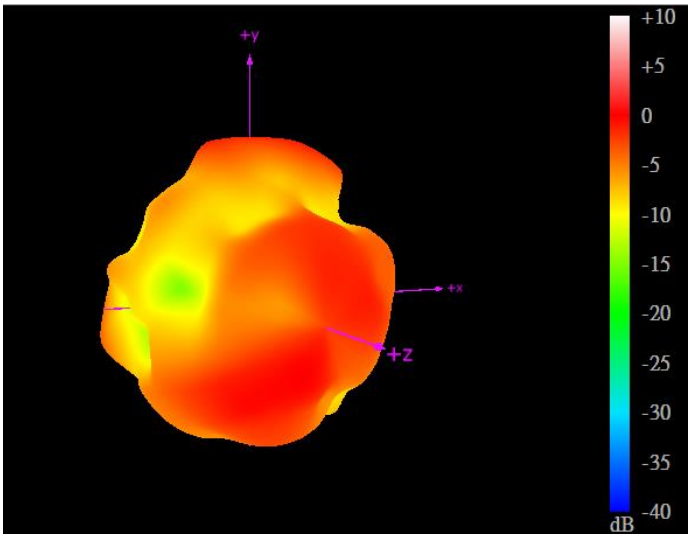


3.1.15 3D Radiation Pattern

Wi-Fi MIMO2 with 3M cable length in free space

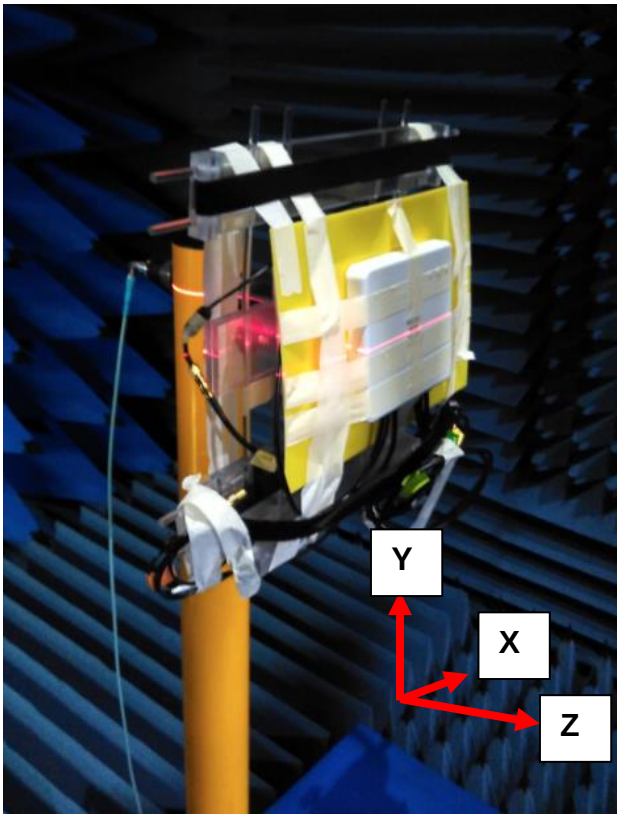


2450MHz



5550MHz

3.1.16 Test Setup for Antenna Radiation Pattern

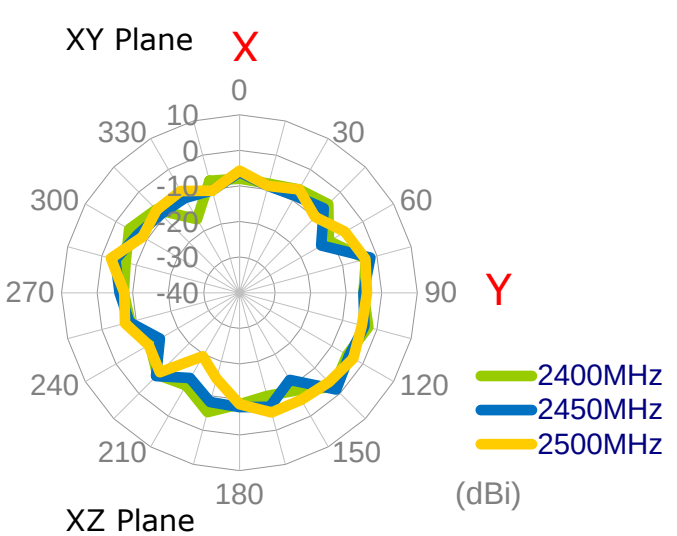


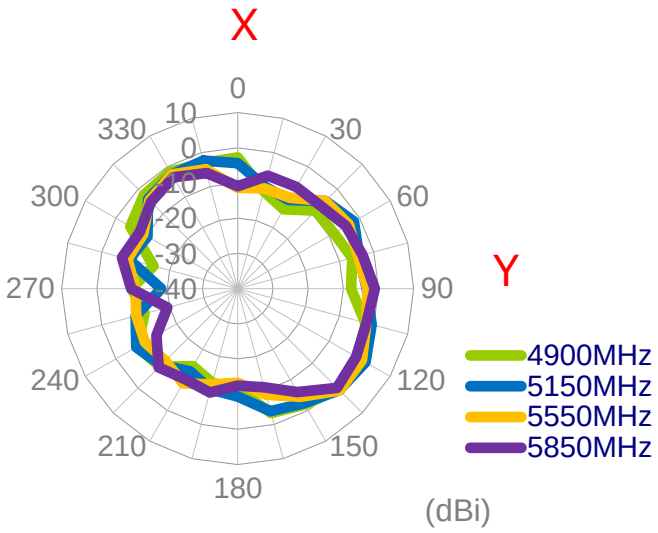
On the ABS

3.1.17 2D Radiation Pattern

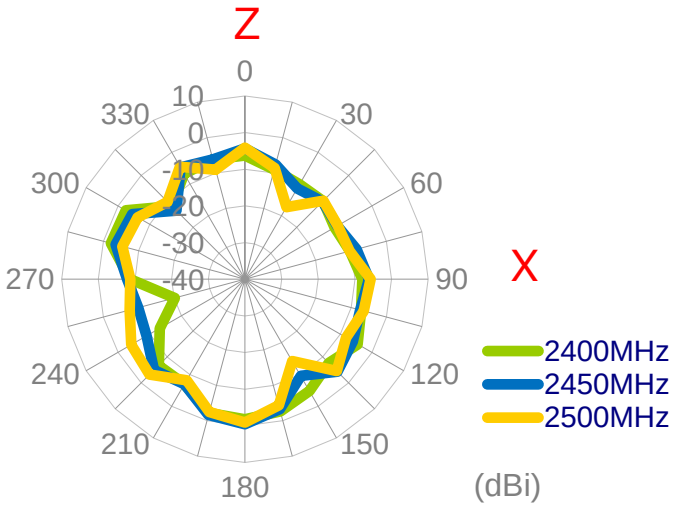
Wi-Fi MIMO1 with 3M cable length on the ABS

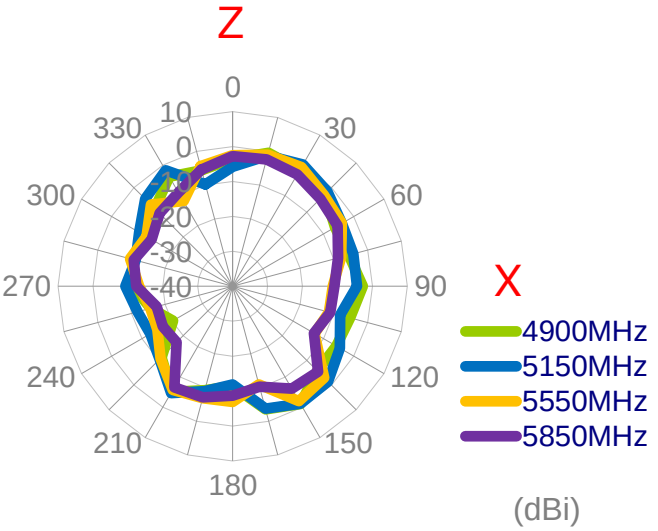
XY Plane



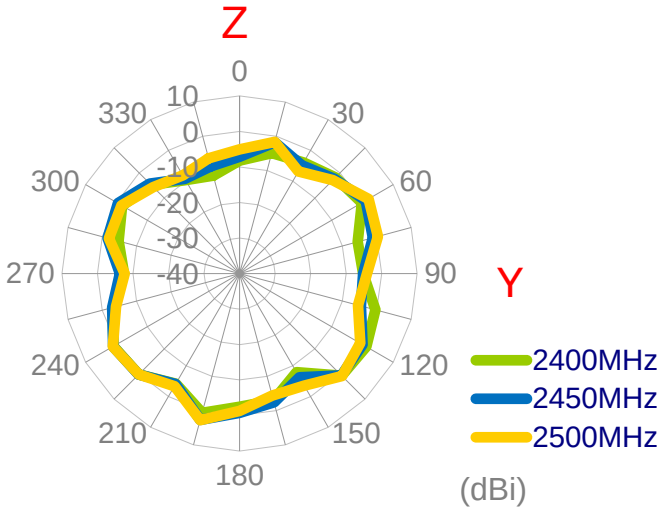


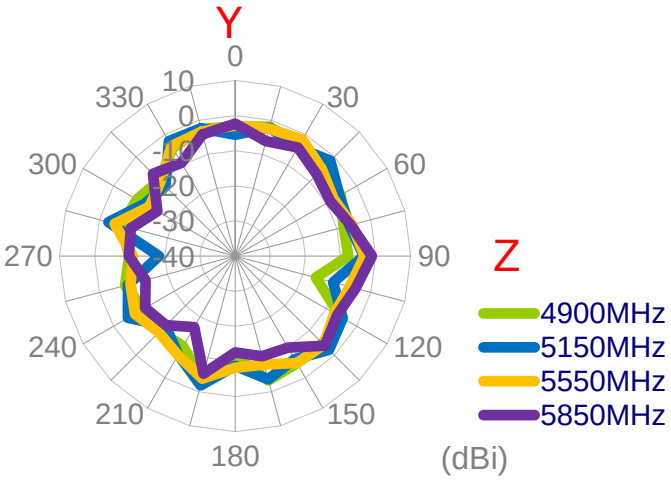
XZ Plane



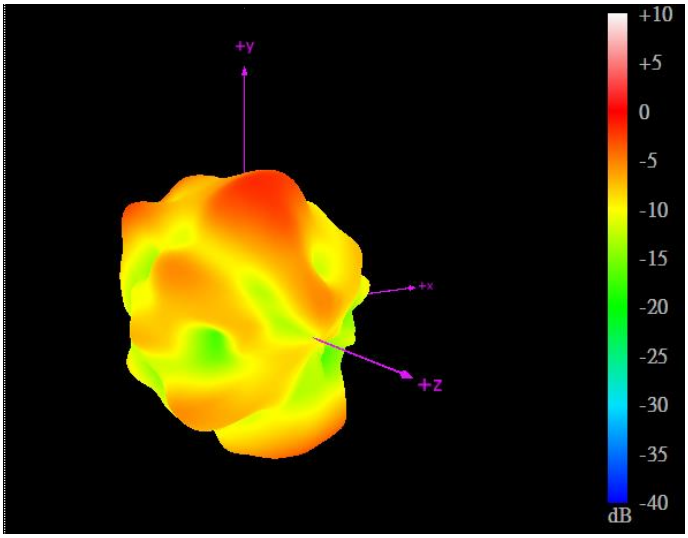


YZ Plane

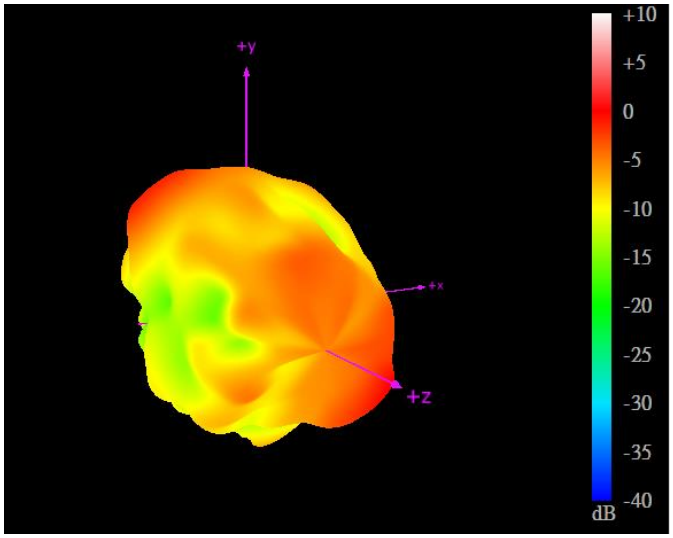




3.1.18 3D Radiation Pattern (Wi-Fi_MIMO1 with 3M cable length on the ABS)



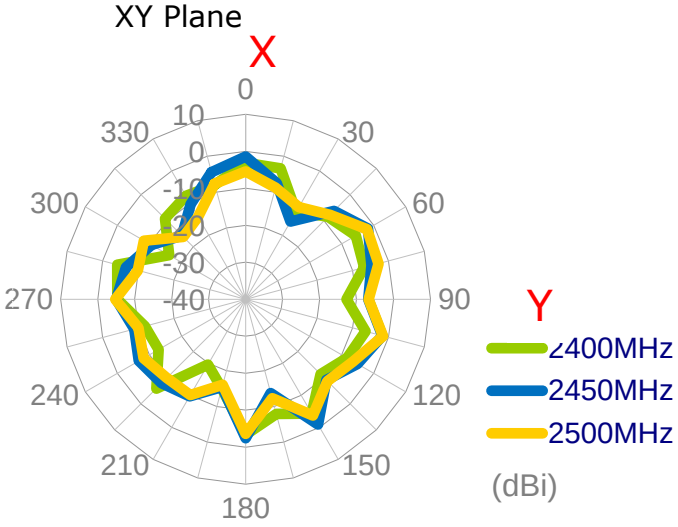
2450MHz

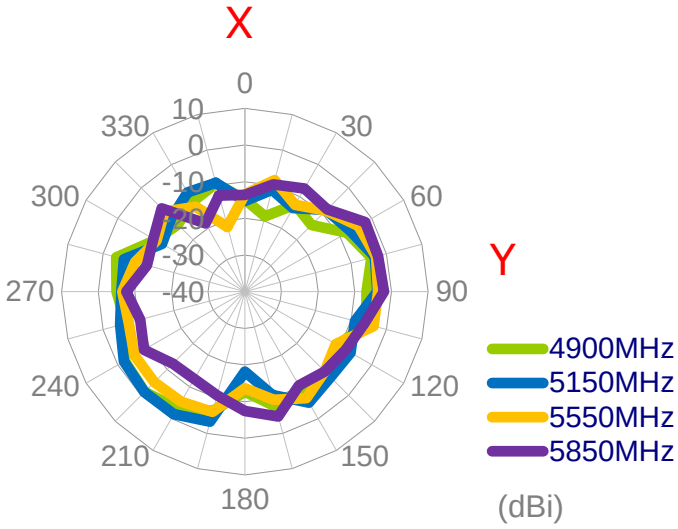


5550MHz

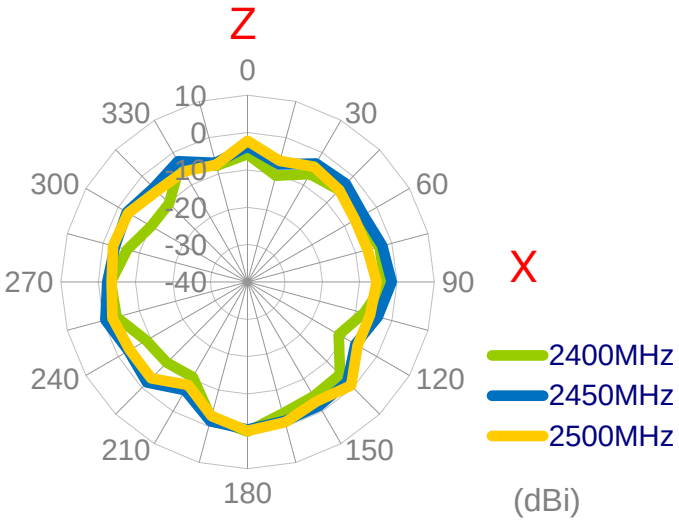
3.1.19 2D Radiation Pattern
Wi-Fi_MIMO2 with 3M cable length on the ABS

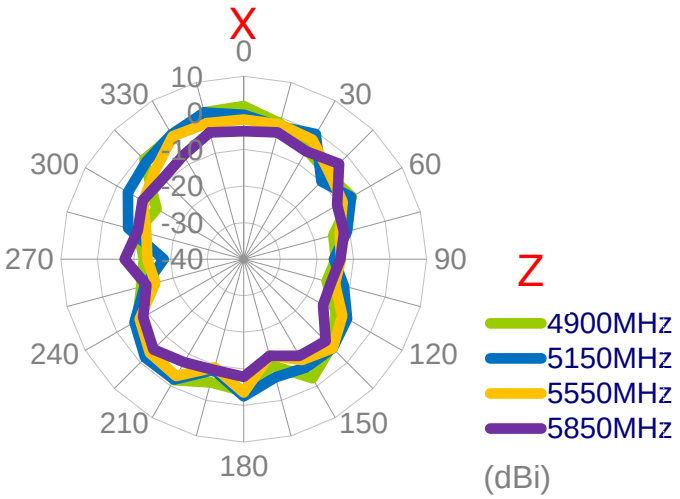
XY Plane



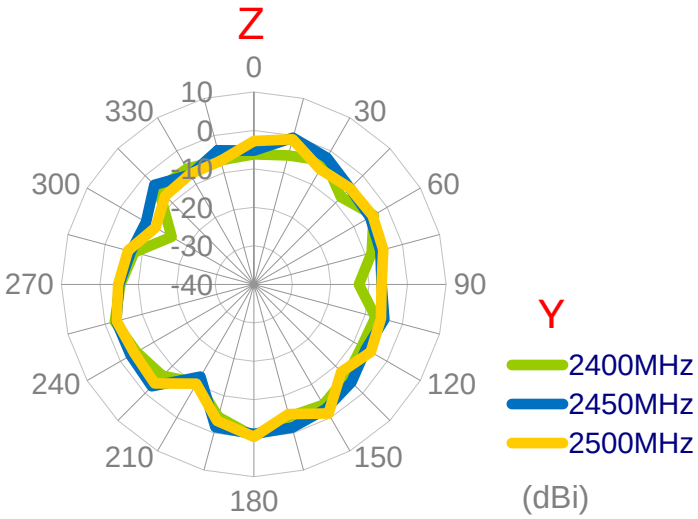


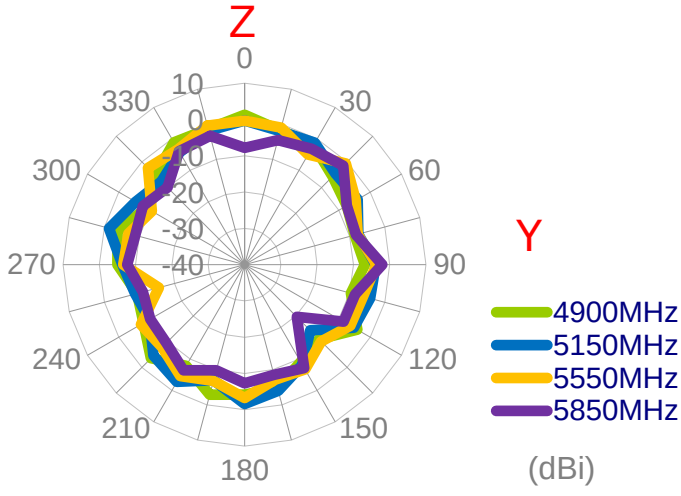
XZ Plane



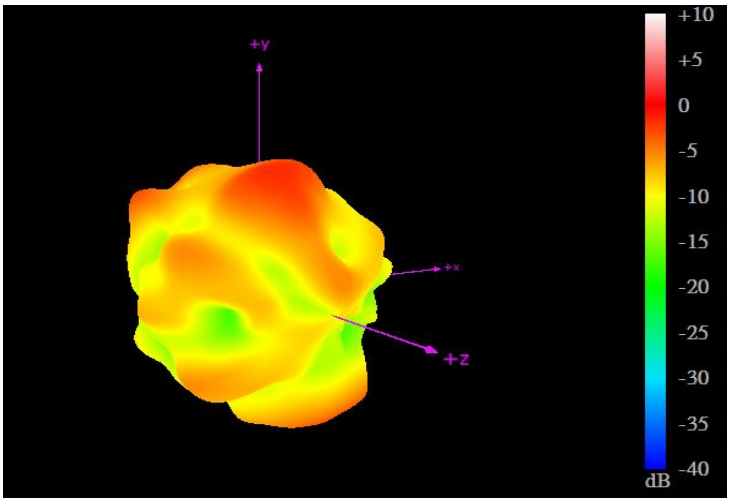


YZ Plane

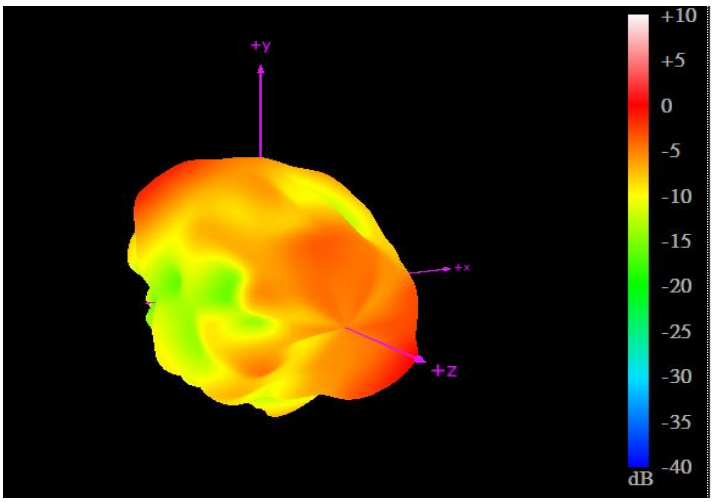




3.1.20 3D Radiation Pattern
Wi-Fi MIMO2 with 3M cable length on the ABS

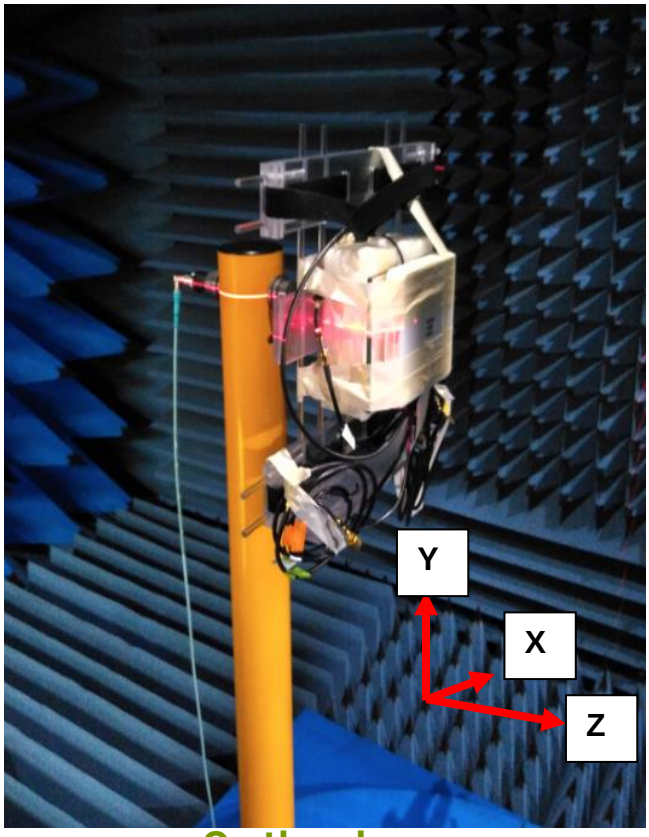


2450MH



5550MH

3.1.21 Test Setup For Antenna Radiation Pattern

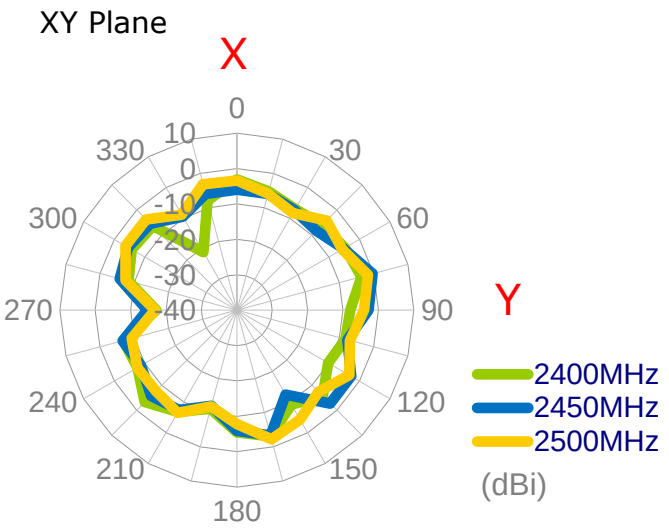


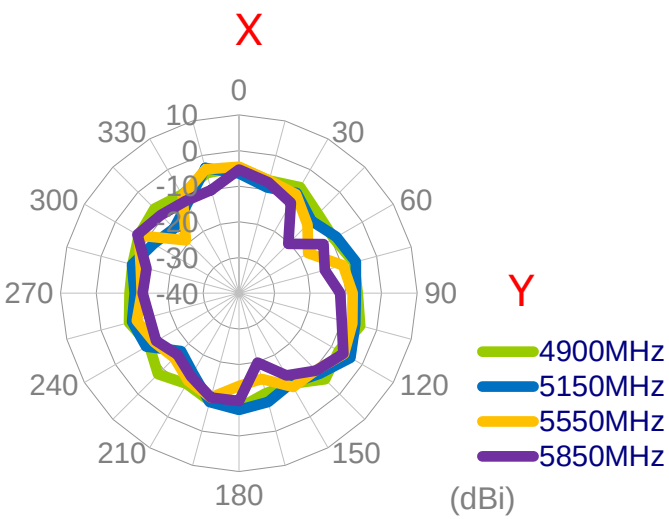
On the glass

3.1.22 2D Radiation Pattern

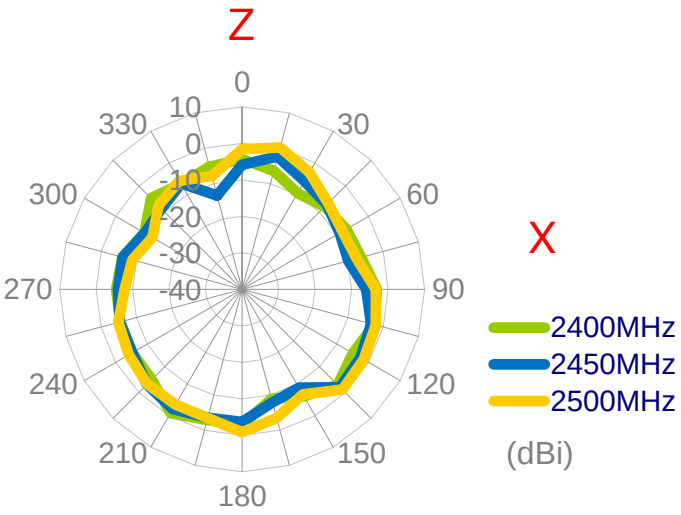
Wi-Fi MIMO1 with 1M cable length on the glass

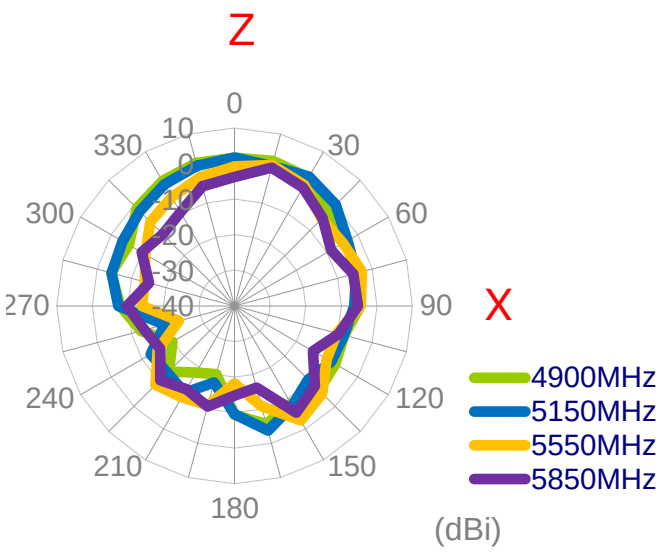
XY Plane



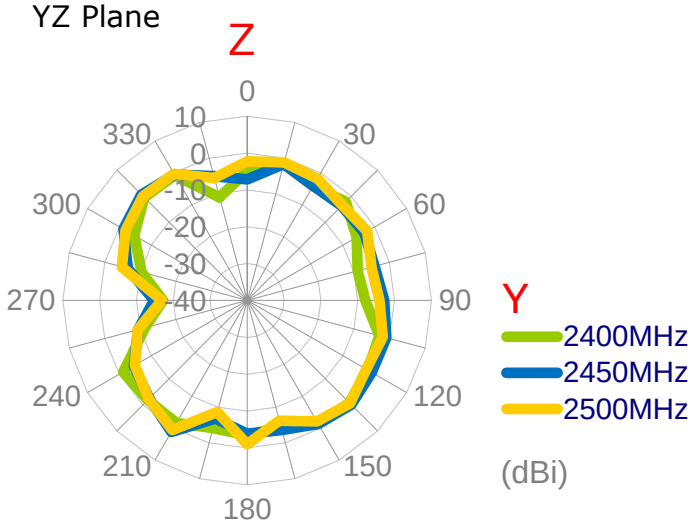


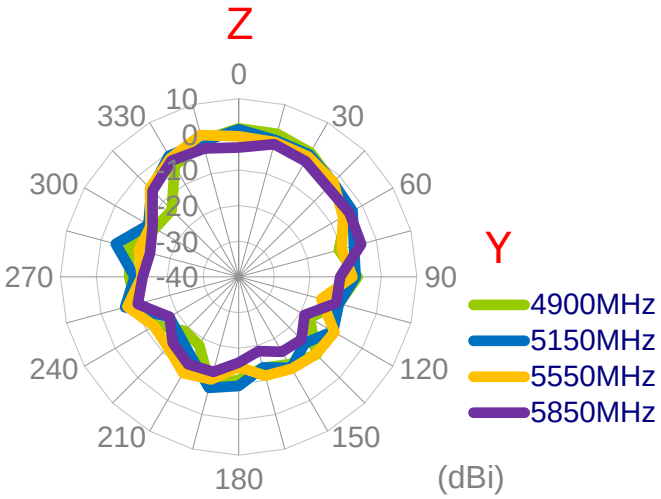
XZ Plane





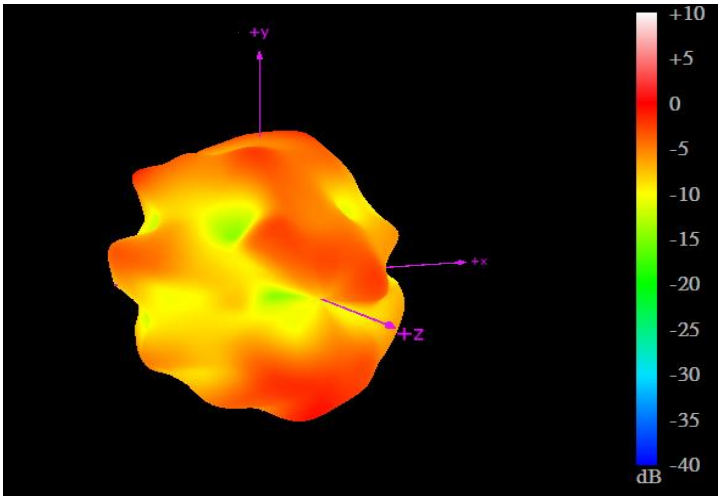
YZ Plane



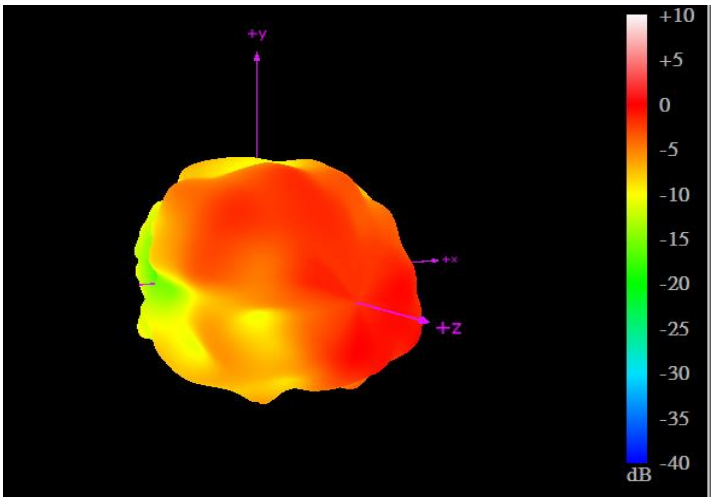


3.1.23 3D Radiation Pattern

Wi-Fi MIMO1 with 3M cable length on the glass



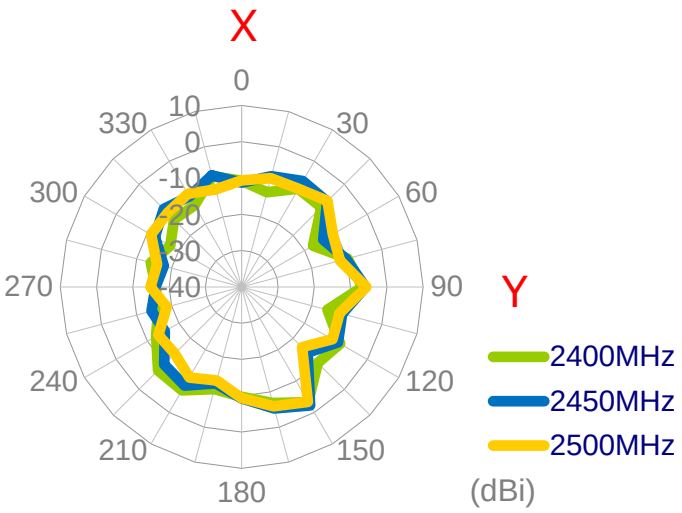
2450MHz

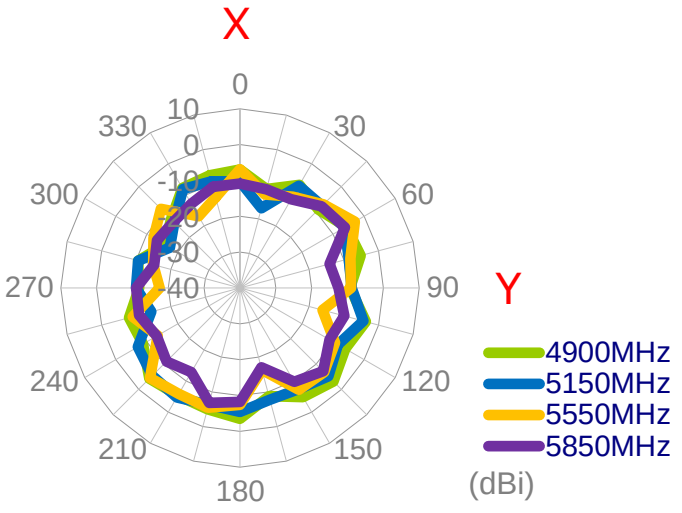


5550MHz

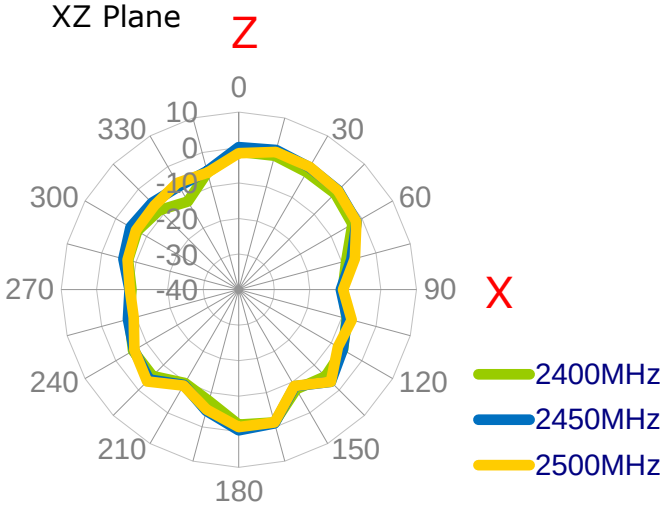
3.1.24 2D Radiation Pattern
Wi-Fi MIMO2 with 3M cable length on the glass

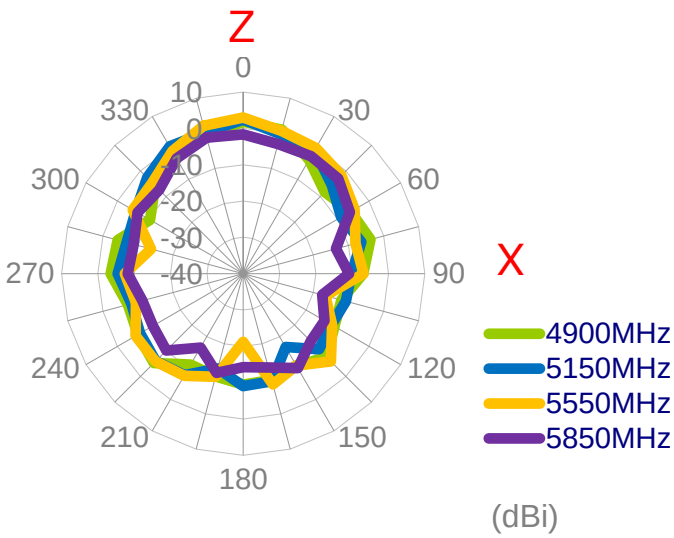
XY Plane



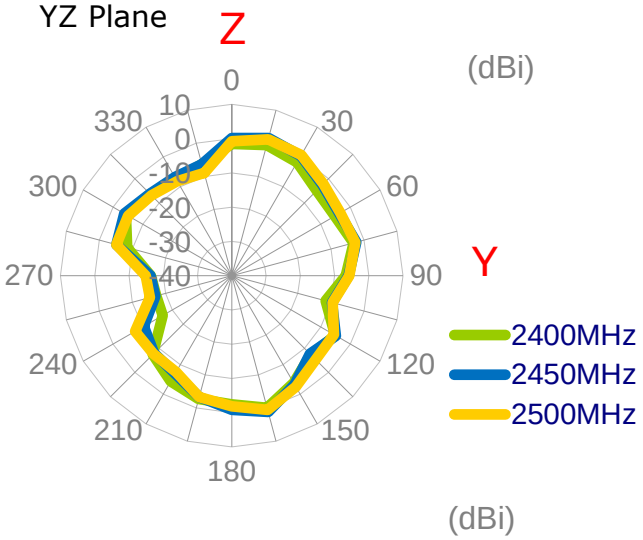


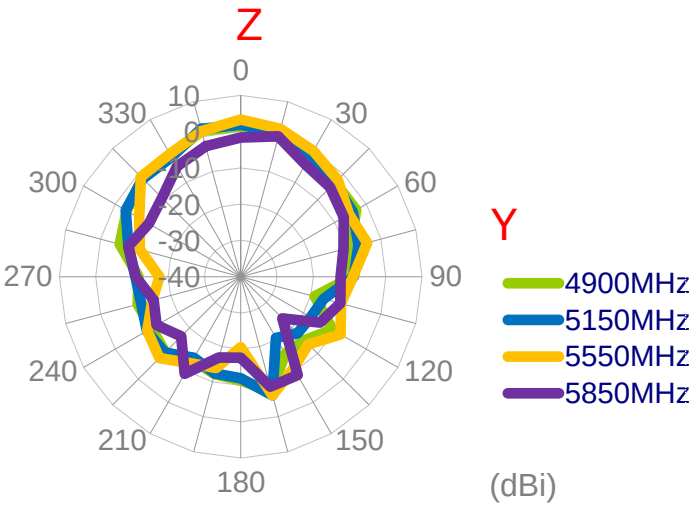
XZ Plane



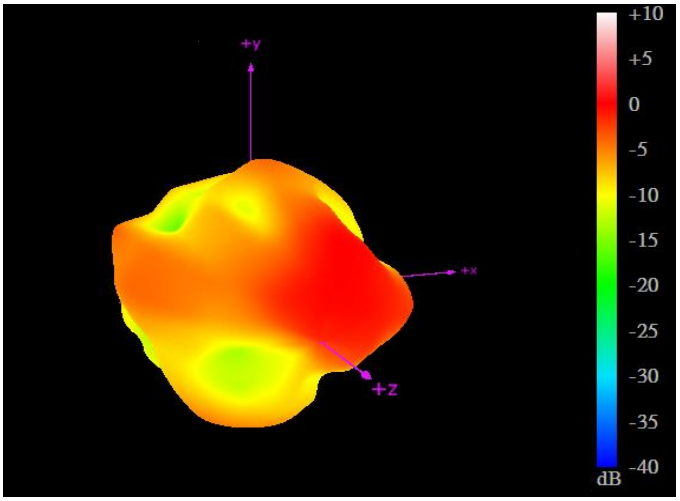


YZ Plane

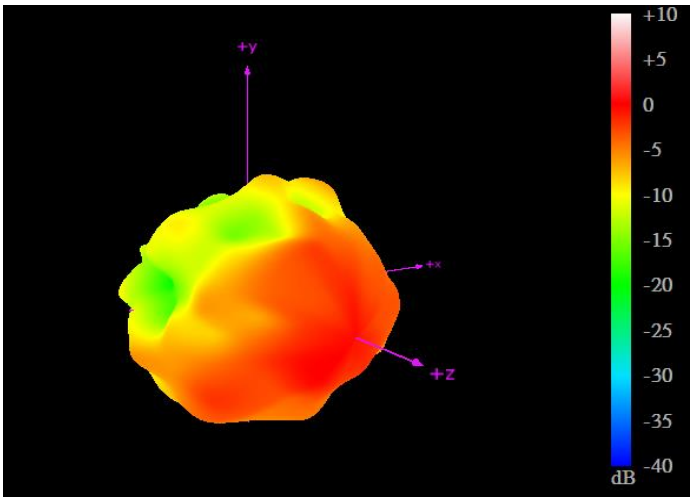




3.1.25 3D Radiation Pattern
Wi-Fi MIMO2 with 3M cable length on the glass

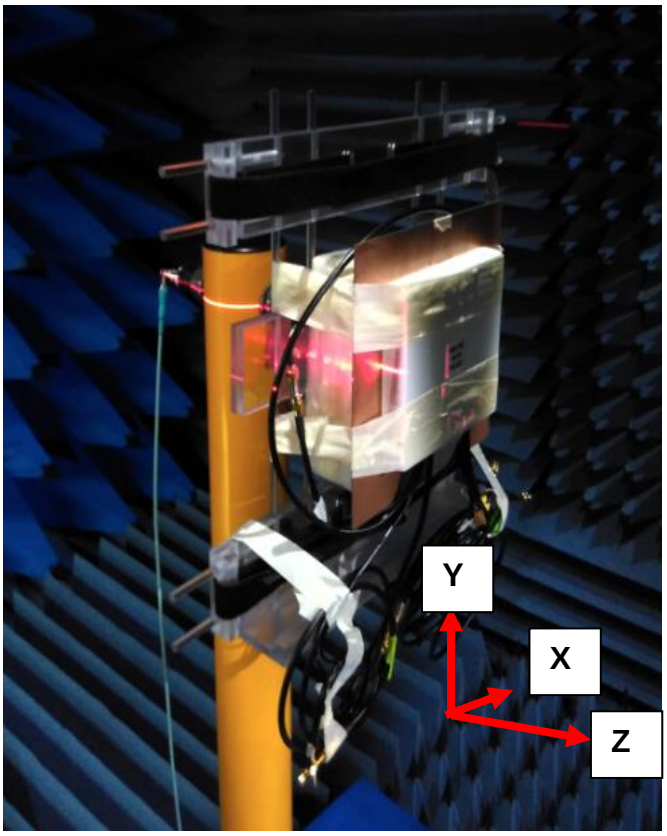


2450MHz



5550MHz

3.1.26 Test Setup For Antenna Radiation Pattern

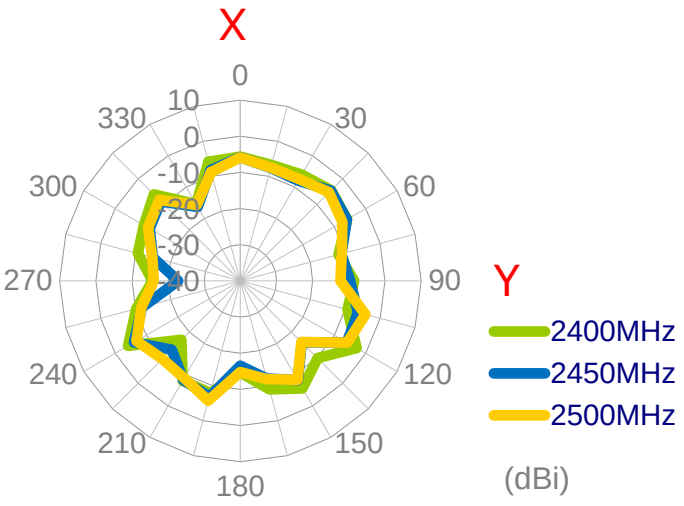


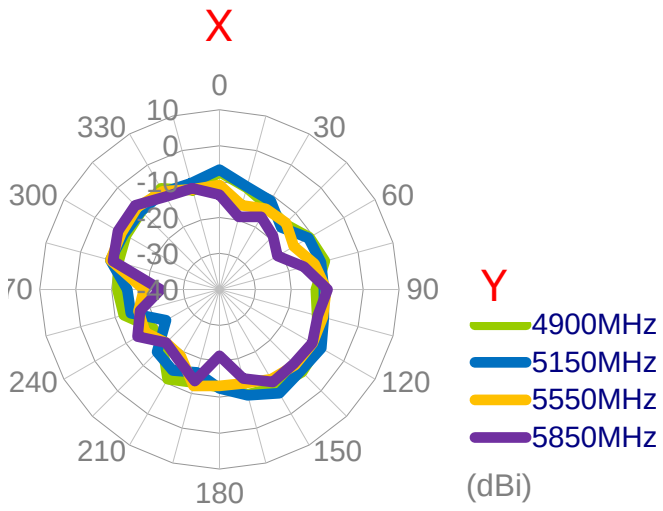
On the metal

3.1.27 2D Radiation Pattern

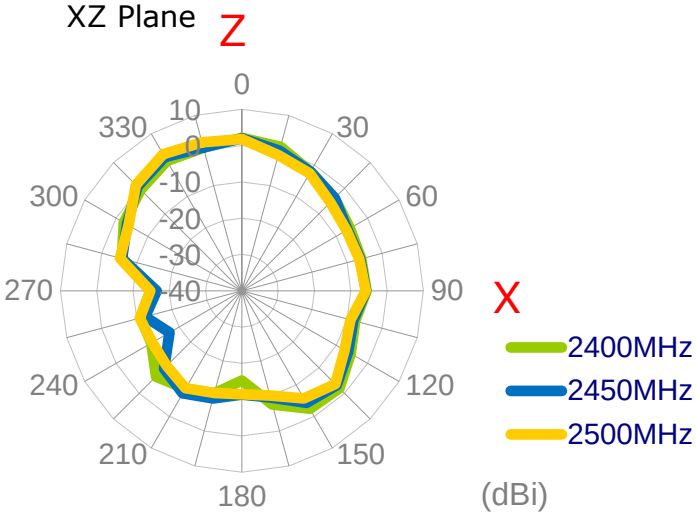
Wi-Fi MIMO1 with 3M cable length on the metal

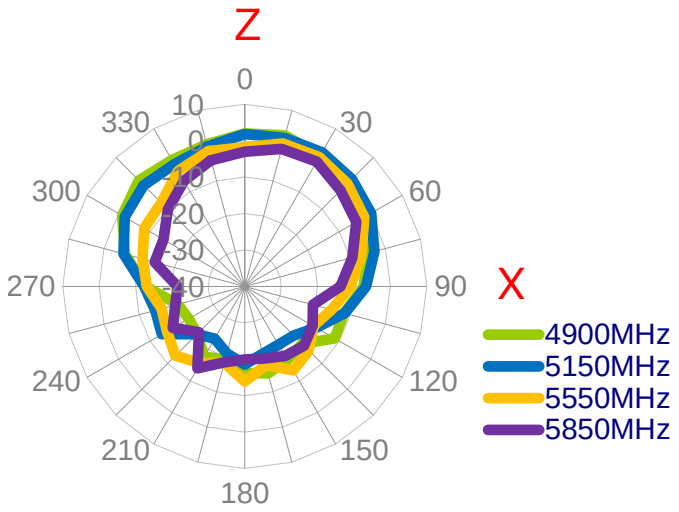
XY Plane



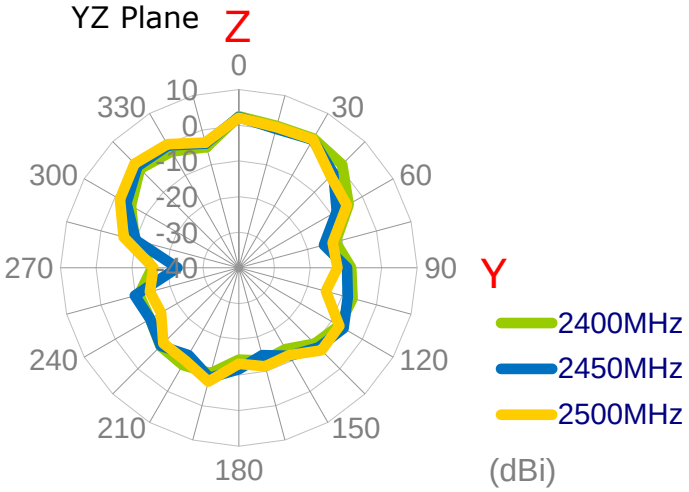


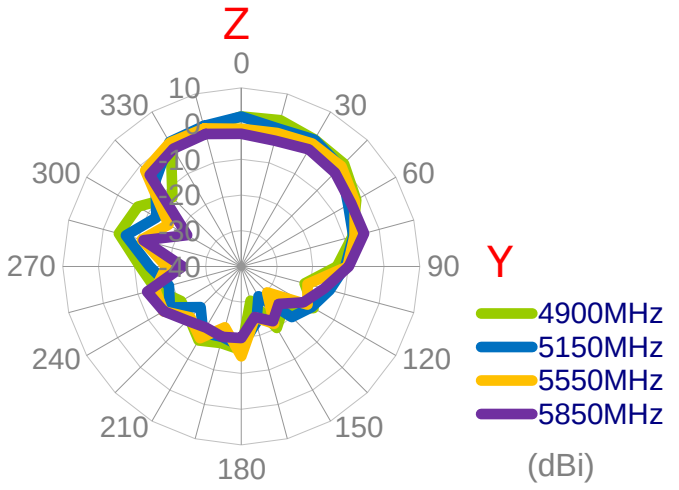
XZ Plane



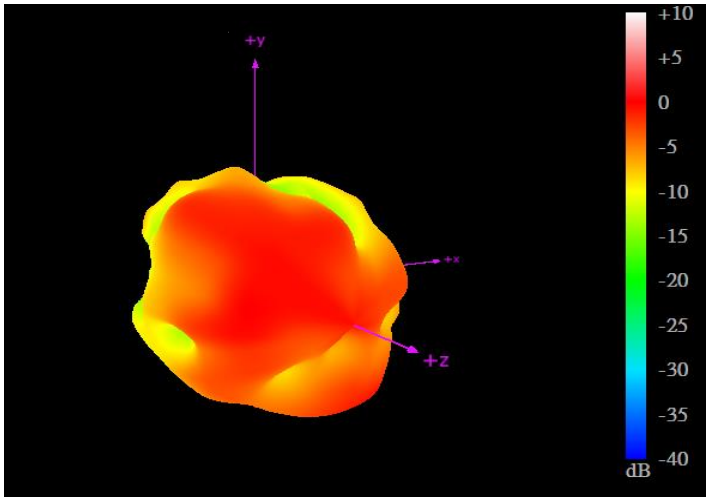


YZ Plane

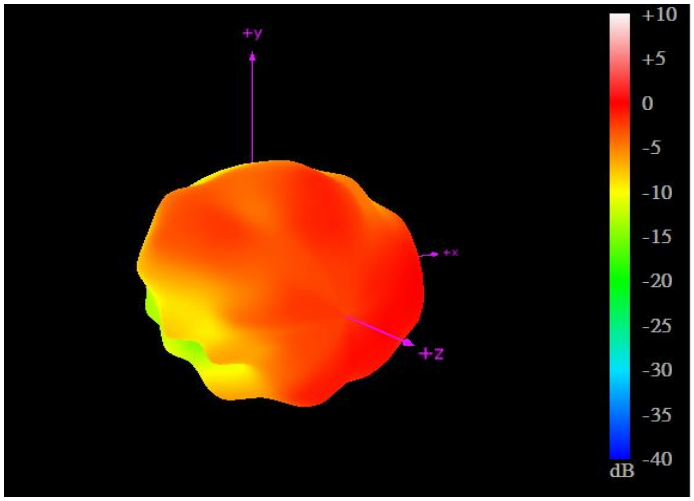




3.1.28 3D Radiation Pattern
(Wi-Fi MIMO1 with 3M cable length on the metal)



2450MHz

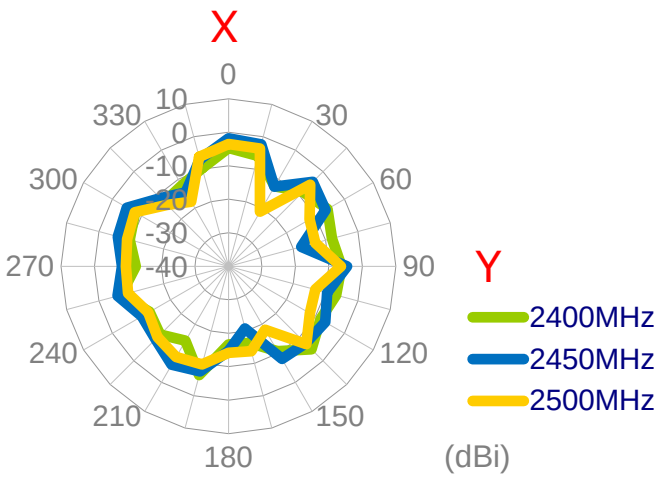


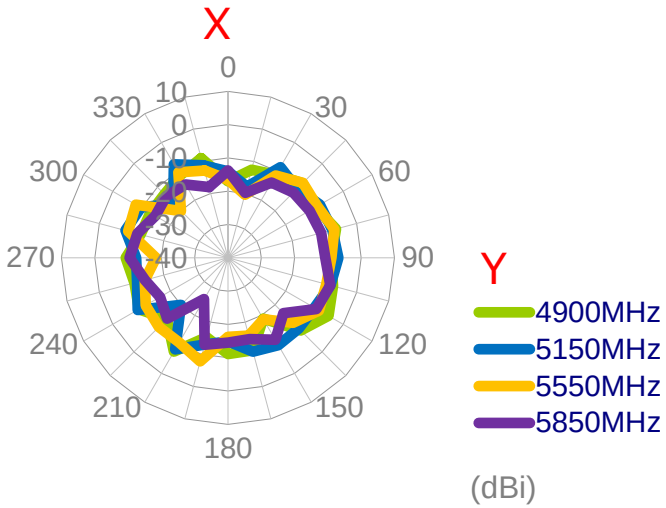
5550MHz

3.1.29 2D Radiation Pattern

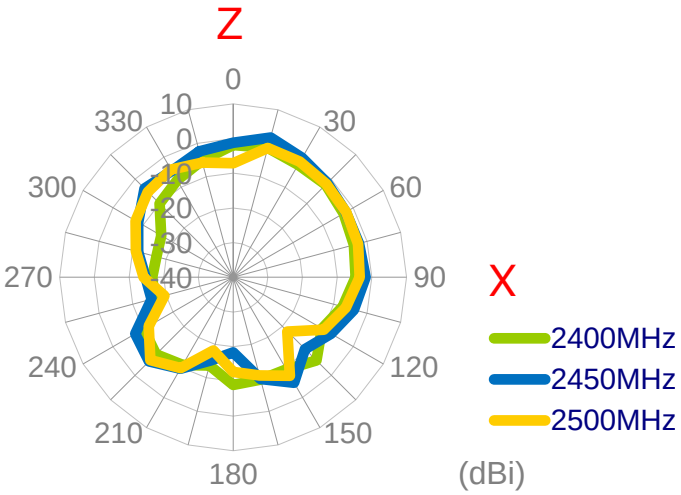
Wi-Fi_MIMO2 with 3M cable length on the metal

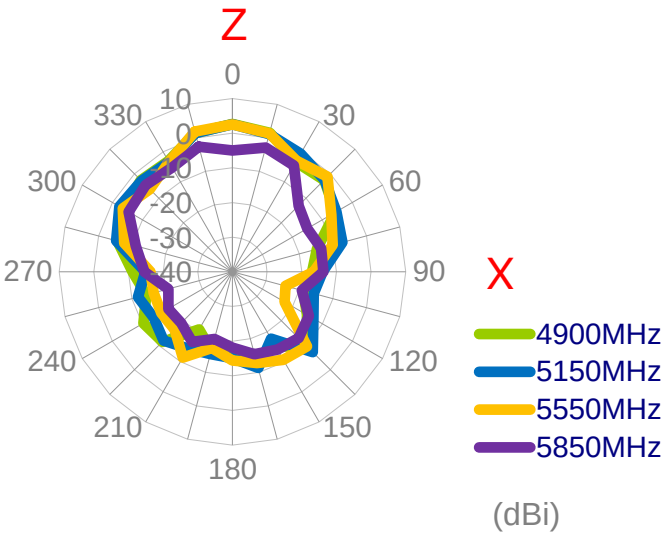
XY Plane



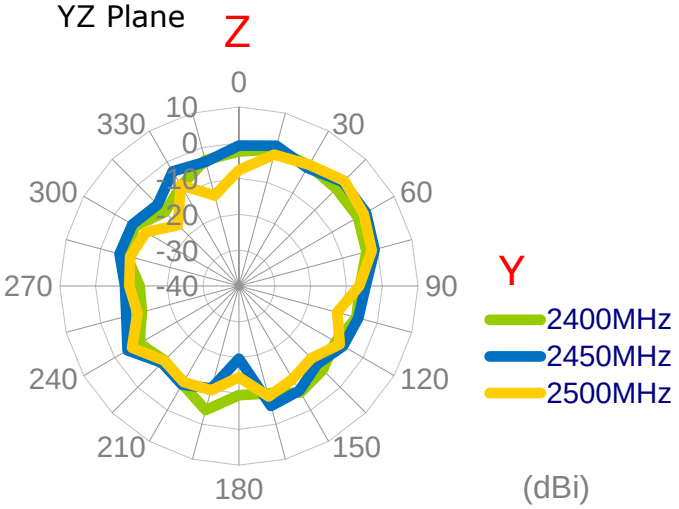


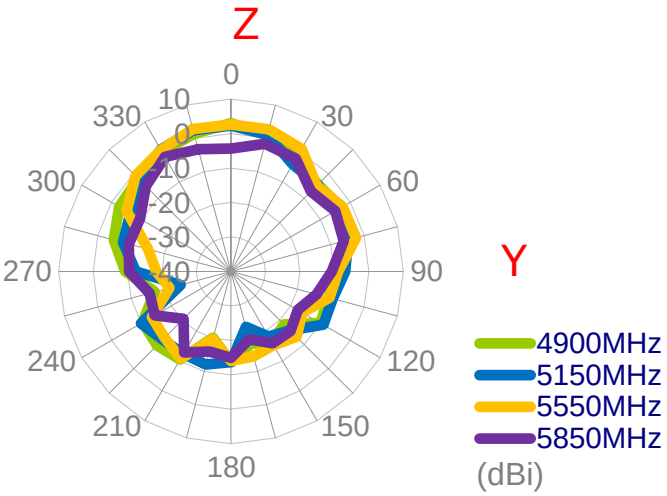
XZ Plane



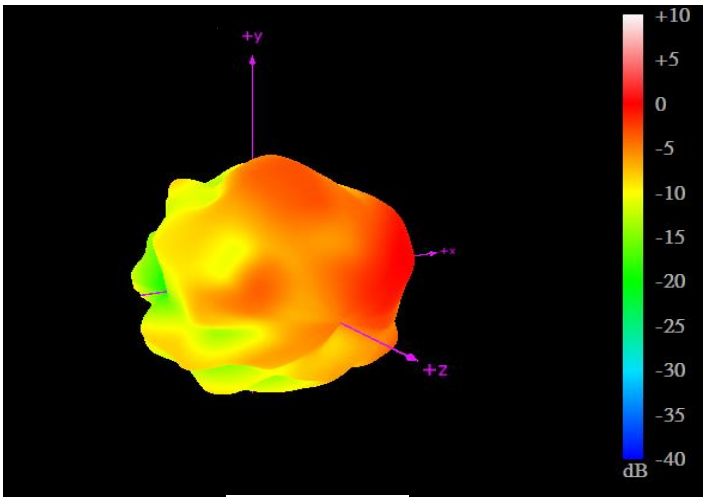


YZ Plane

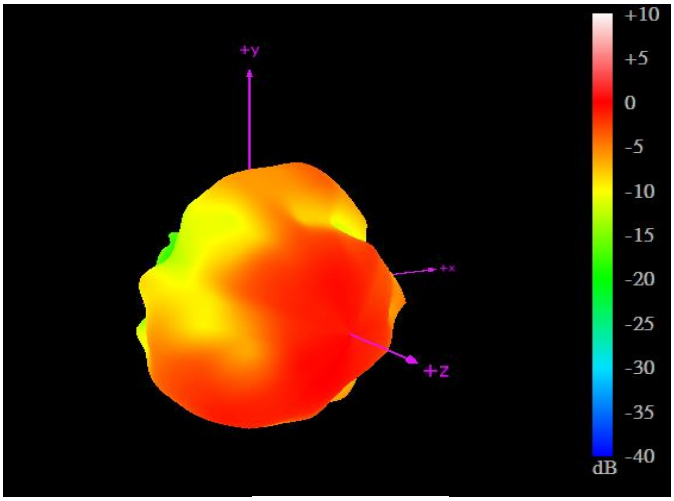




3.1.30 3D Radiation Pattern
Wi-Fi MIMO2 with 3M cable length on the metal

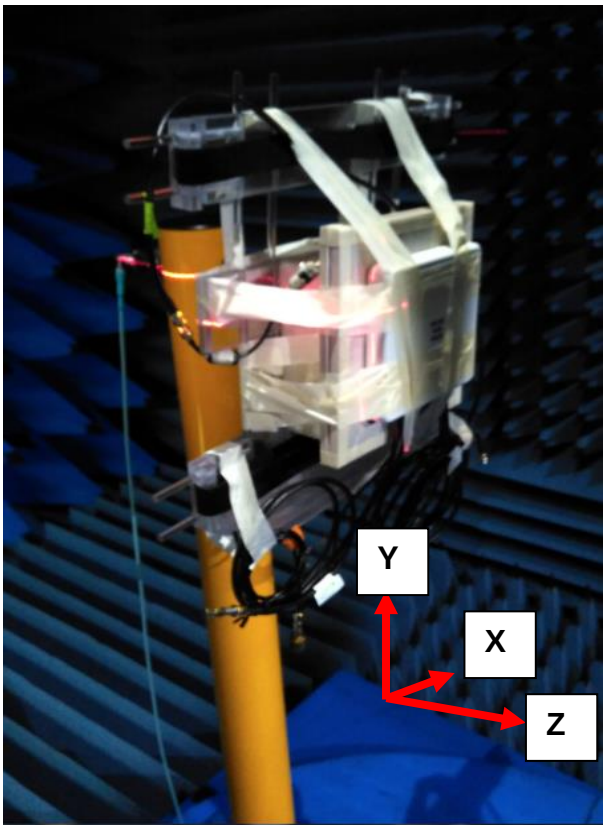


2450MHz



5550MHz

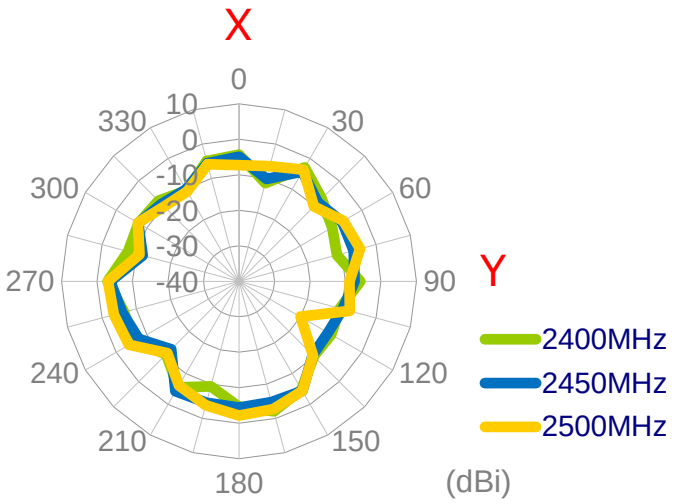
3.1.31 Test Setup For Antenna Radiation Pattern

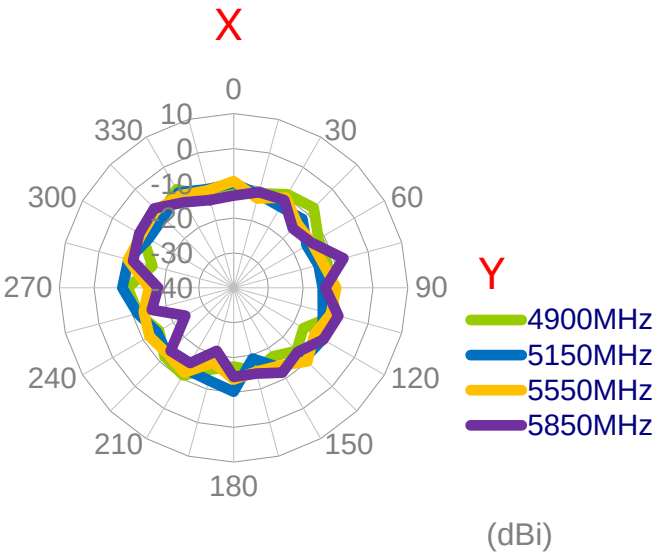


On the Wall

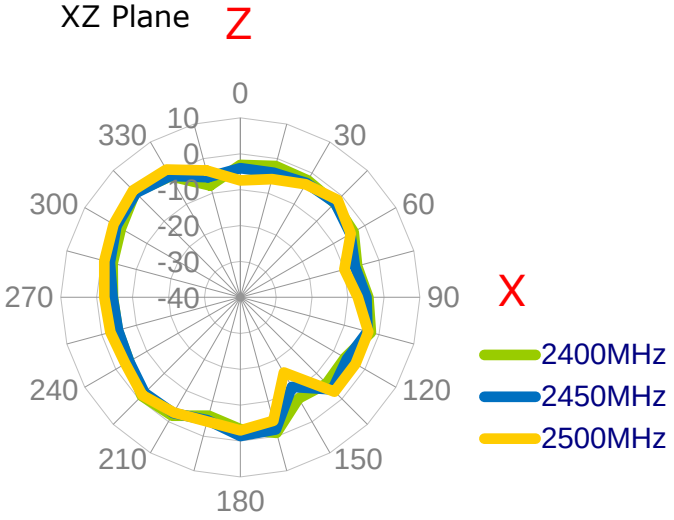
3.1.32 2D Radiation Pattern
Wi-Fi_MIMO1 with 3M cable length in free space

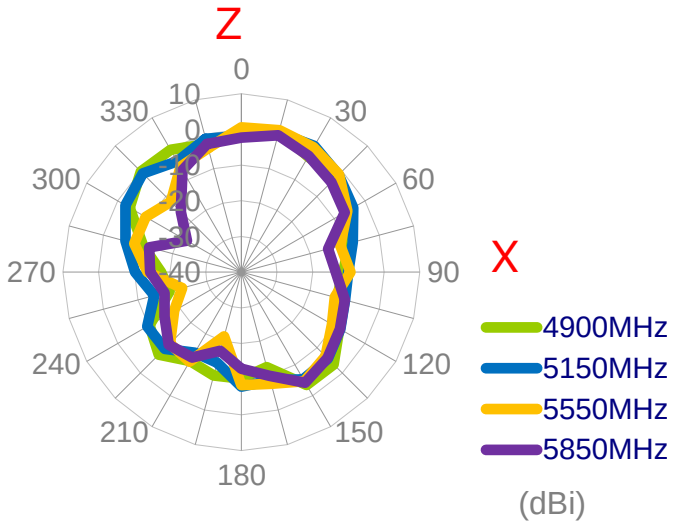
XY Plane



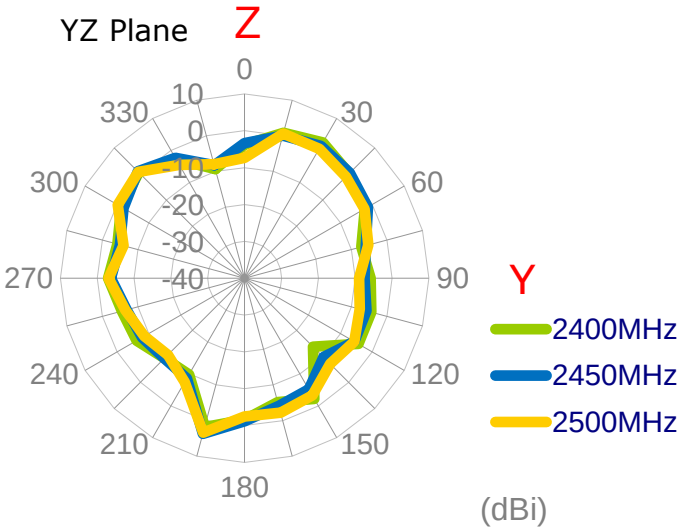


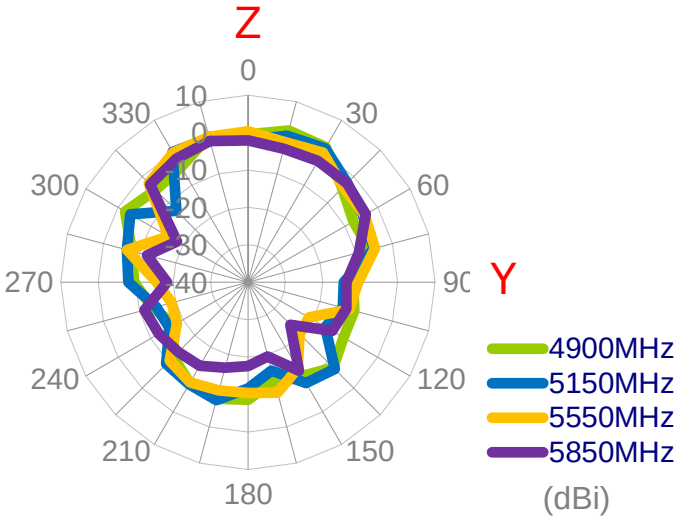
XZ Plane





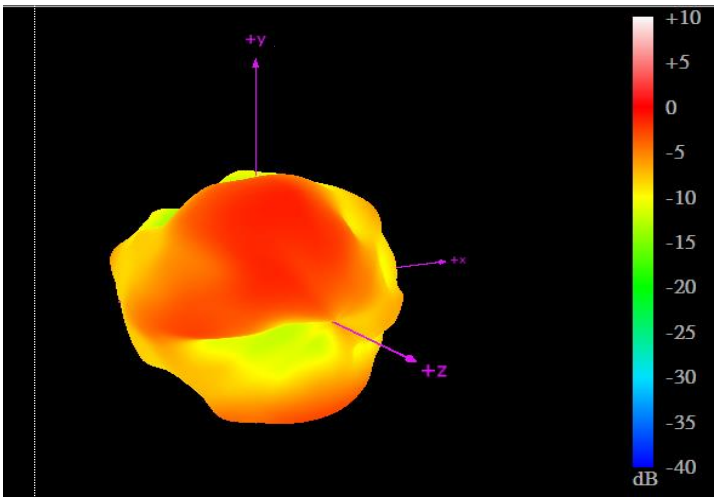
YZ Plane



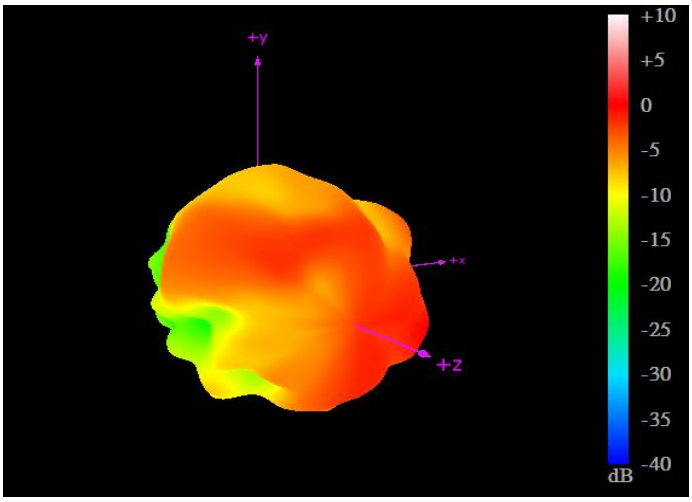


3.1.33 3D Radiation Pattern

Wi-Fi MIMO1 with 3M cable length in free space



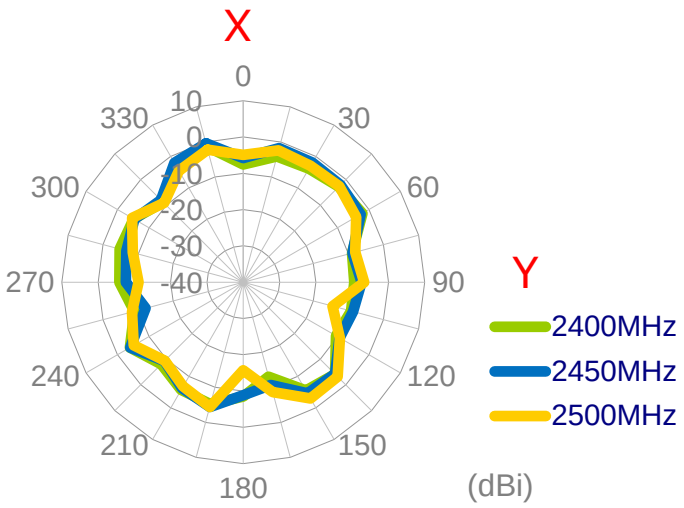
2450MHz

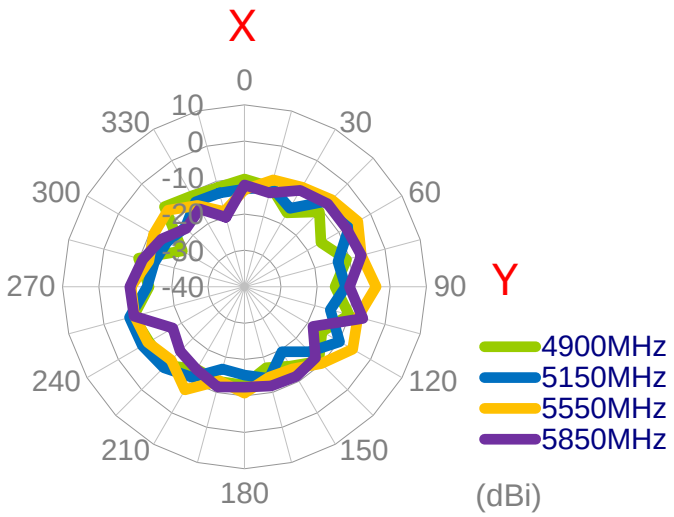


5550MHz

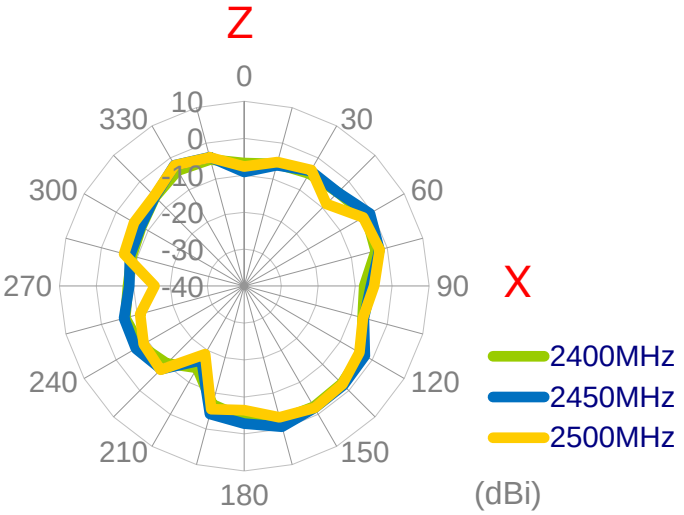
3.1.34 2D Radiation Pattern
Wi-Fi MIMO2 with 3M cable length in free space

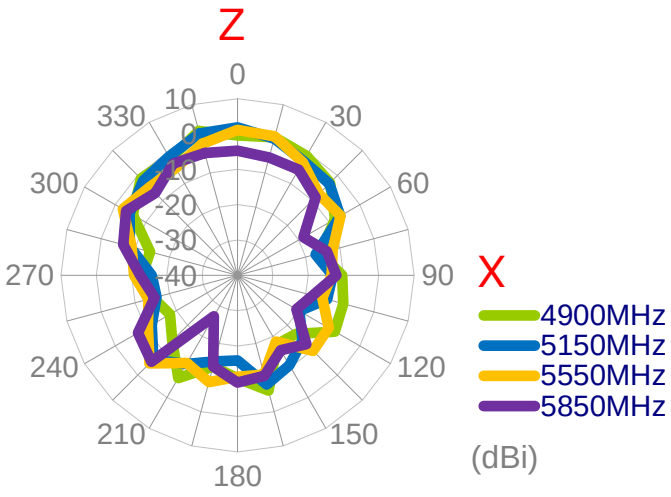
XY Plane



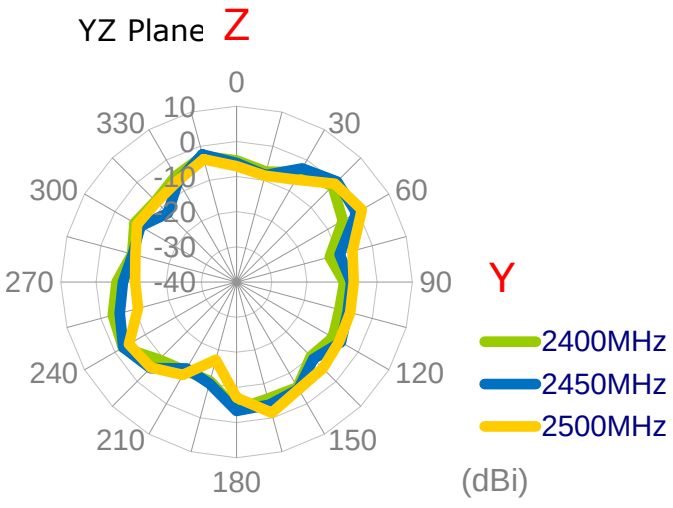


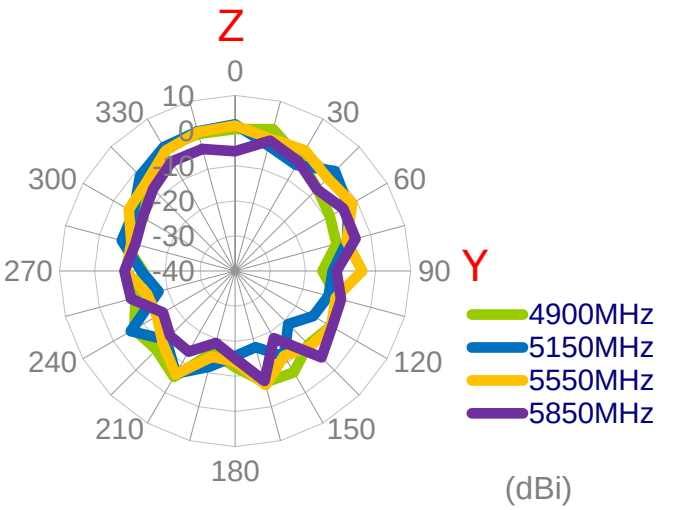
XZ Plane





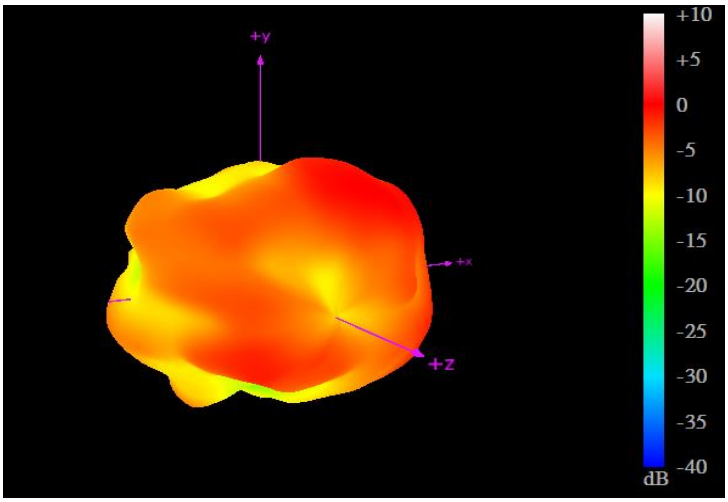
YZ Plane



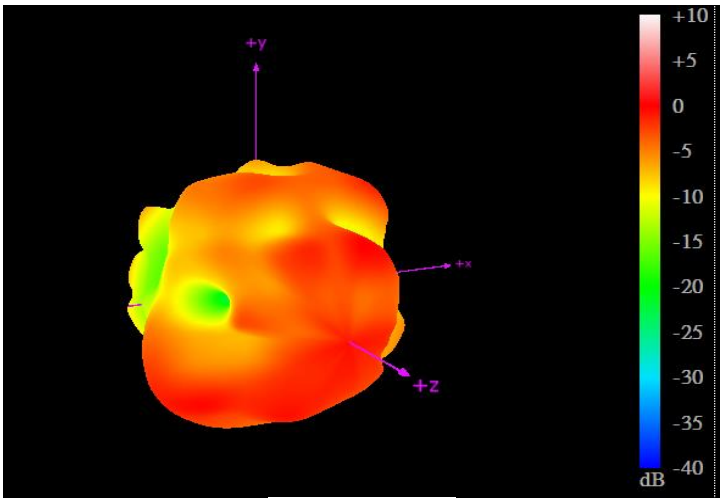


3.1.35 3D Radiation Pattern

Wi-Fi MIMO2 with 3M cable length in free space

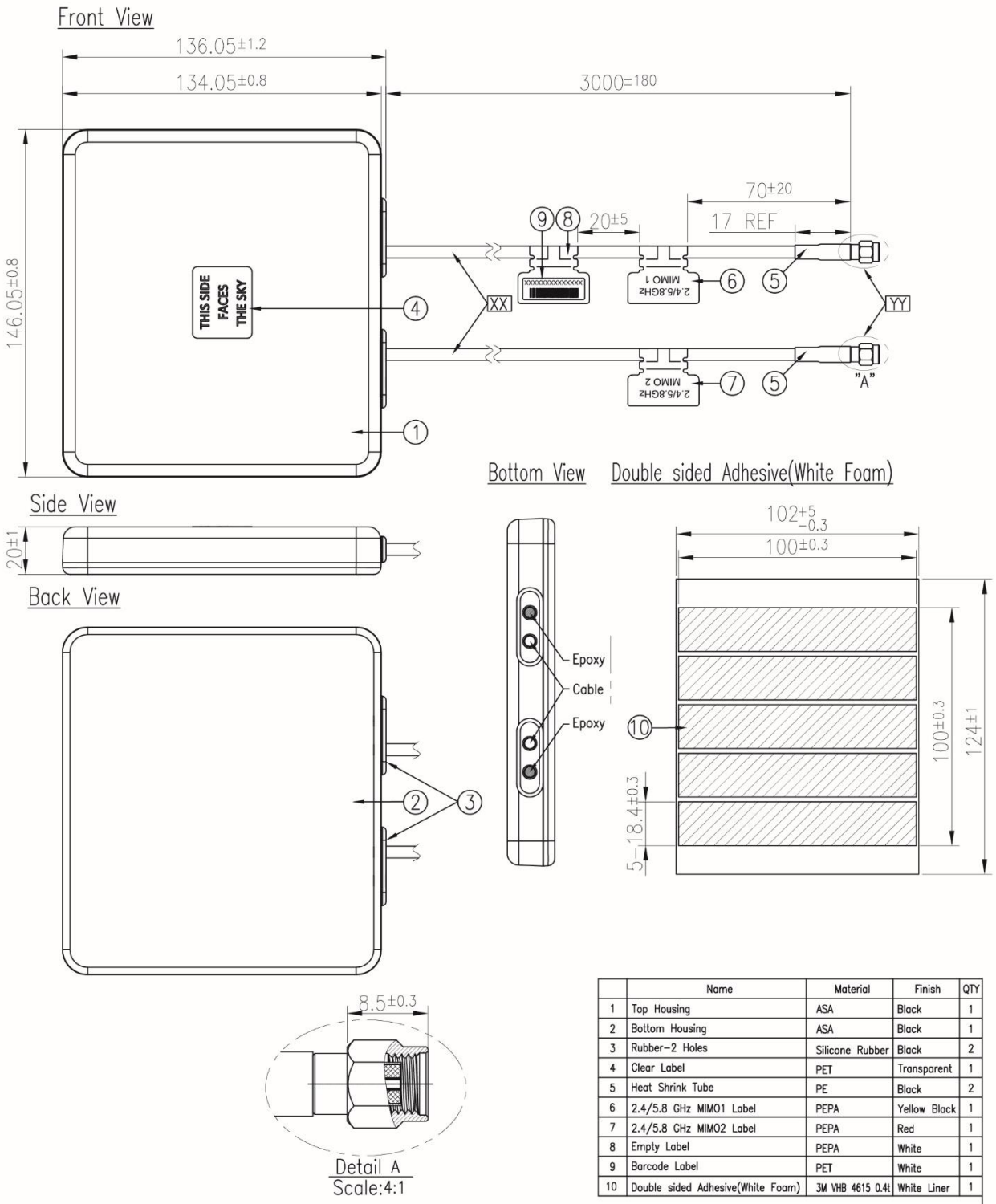


2450MHz



5550MHz

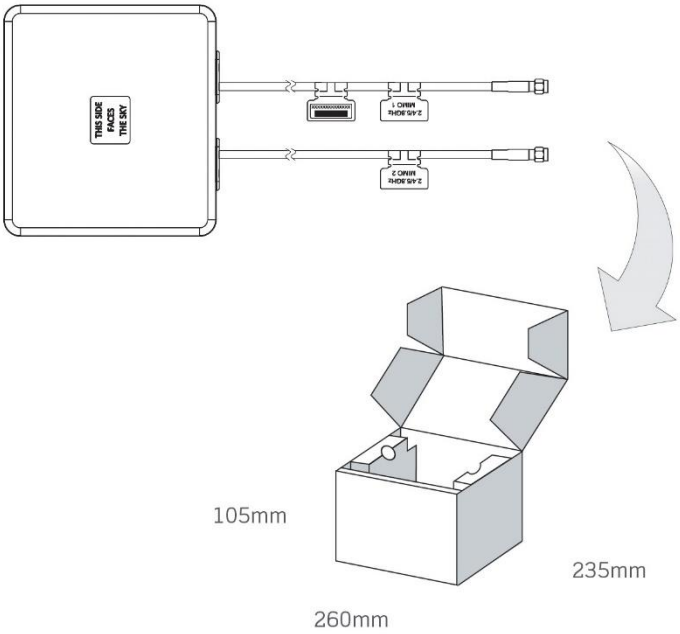
4. Mechanical Drawing (unit:mm)



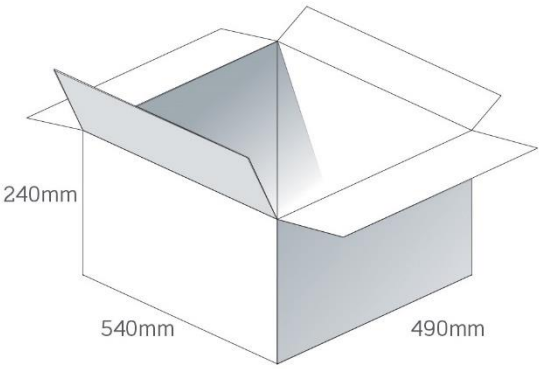
	Name	Material	Finish	QTY
1	Top Housing	ASA	Black	1
2	Bottom Housing	ASA	Black	1
3	Rubber-2 Holes	Silicone Rubber	Black	2
4	Clear Label	PET	Transparent	1
5	Heat Shrink Tube	PE	Black	2
6	2.4/5.8 GHz MIMO1 Label	PEPA	Yellow Black	1
7	2.4/5.8 GHz MIMO2 Label	PEPA	Red	1
8	Empty Label	PEPA	White	1
9	Barcode Label	PET	White	1
10	Double sided Adhesive(White Foam)	3M VHB 4615 0.4t	White Liner	1

	Name	Material	Finish	QTY
XX	Cable Type	CFD200	Black	2
YY	Connector Type	RP-SMA(M)ST	Au Plated	2

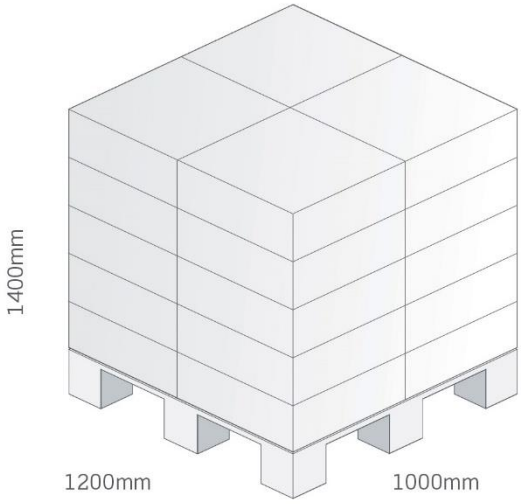
5. Packaging



1 No. MA910.A.CG.001 per small box
Box Dimensions - 260 x 235 x 105mm
Weight - 0.75Kg



8 pcs MA910.A.CG.001 per carton
Carton Dimensions - 540 x 490 x 240mm
Weight - 6.6Kg



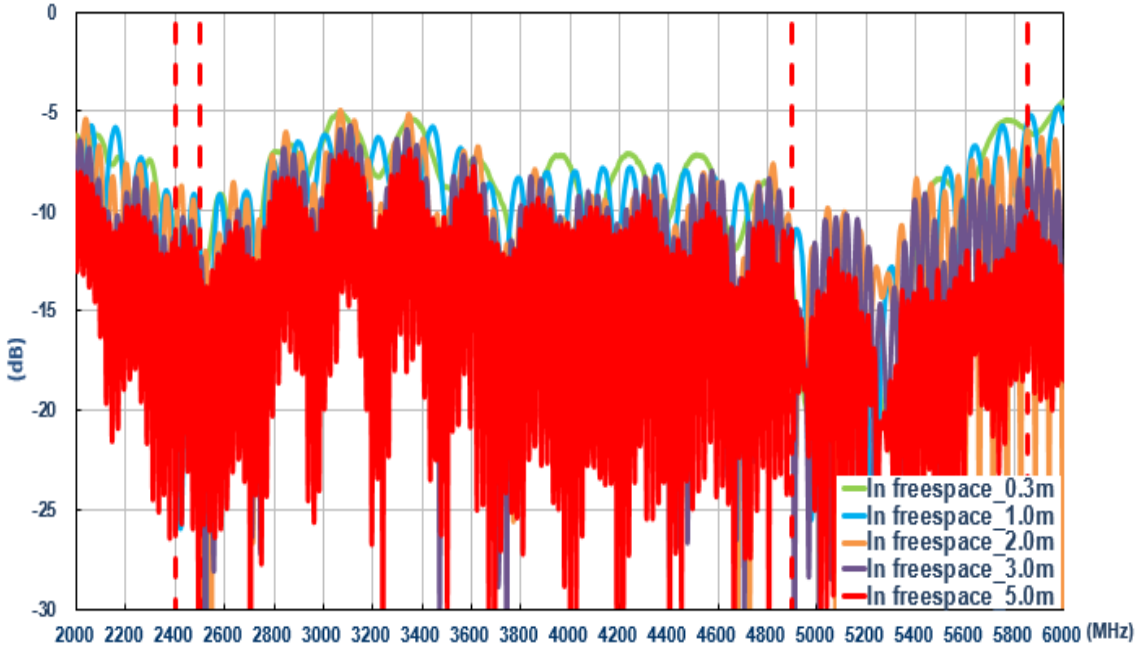
Pallet Dimensions 1200*1000*1400mm
20 Cartons per Pallet
4 Cartons per layer
5 Layers

6. Application Note

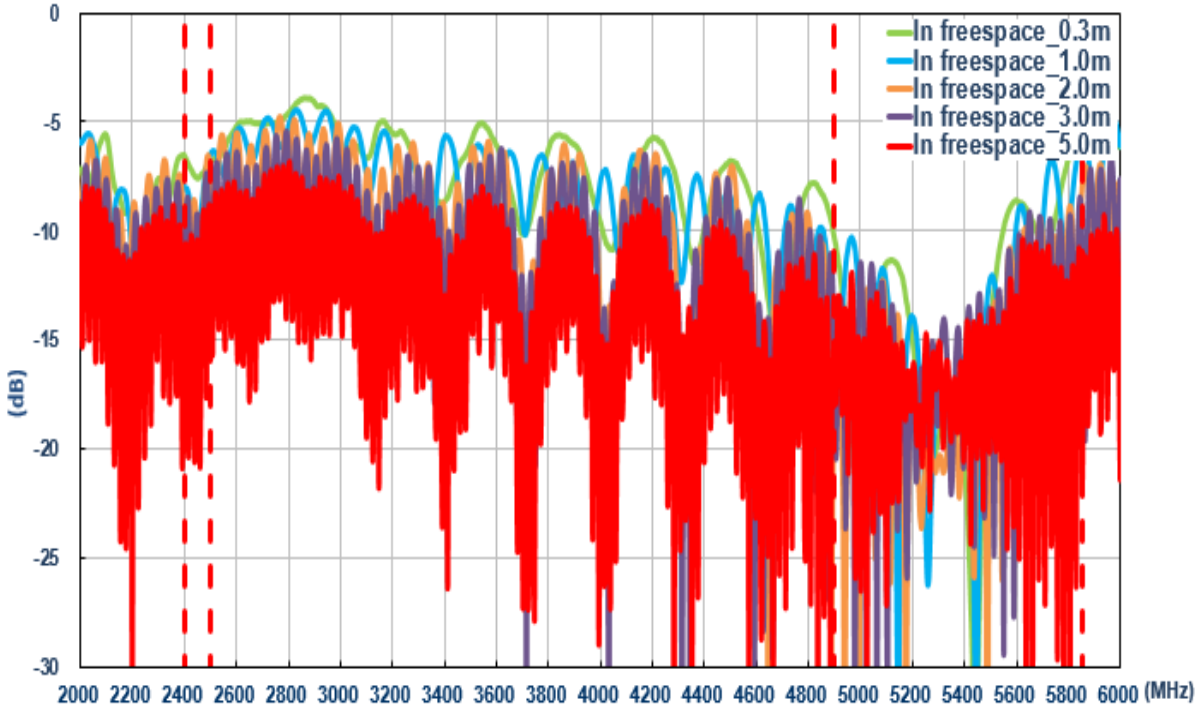
The MA961 antenna performance with different cable lengths is shown below.

6.1 In free space (Wi-Fi)

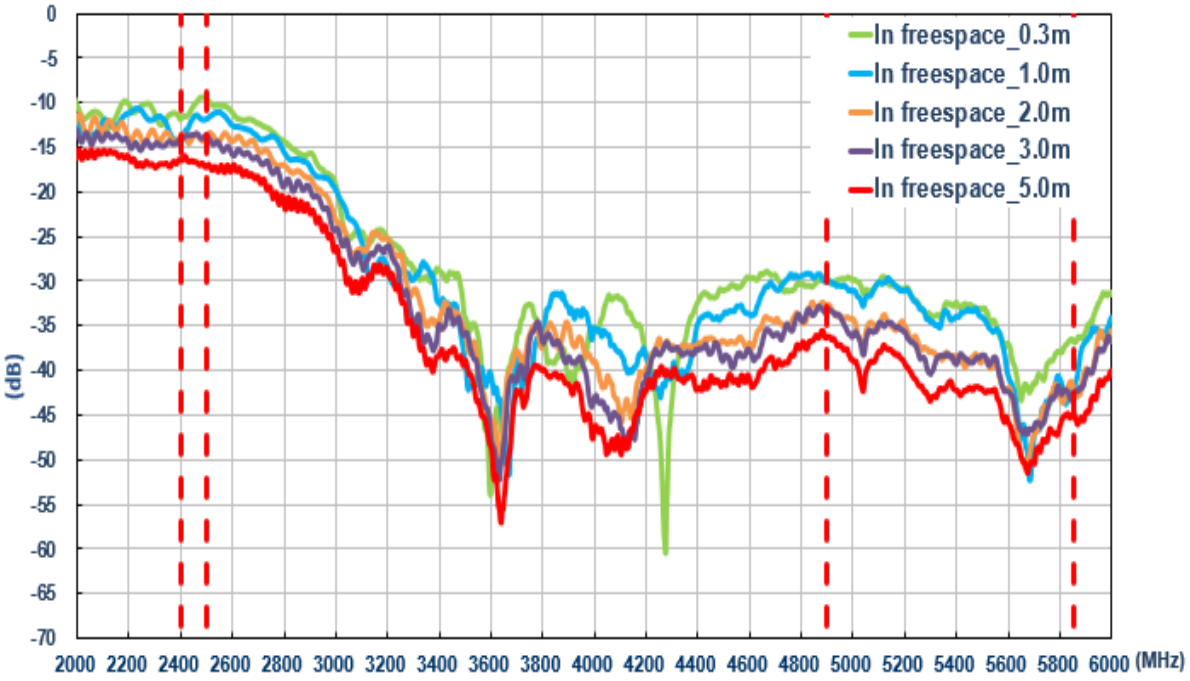
6.1.1 Return Loss (WI-FI_MIMO 1)



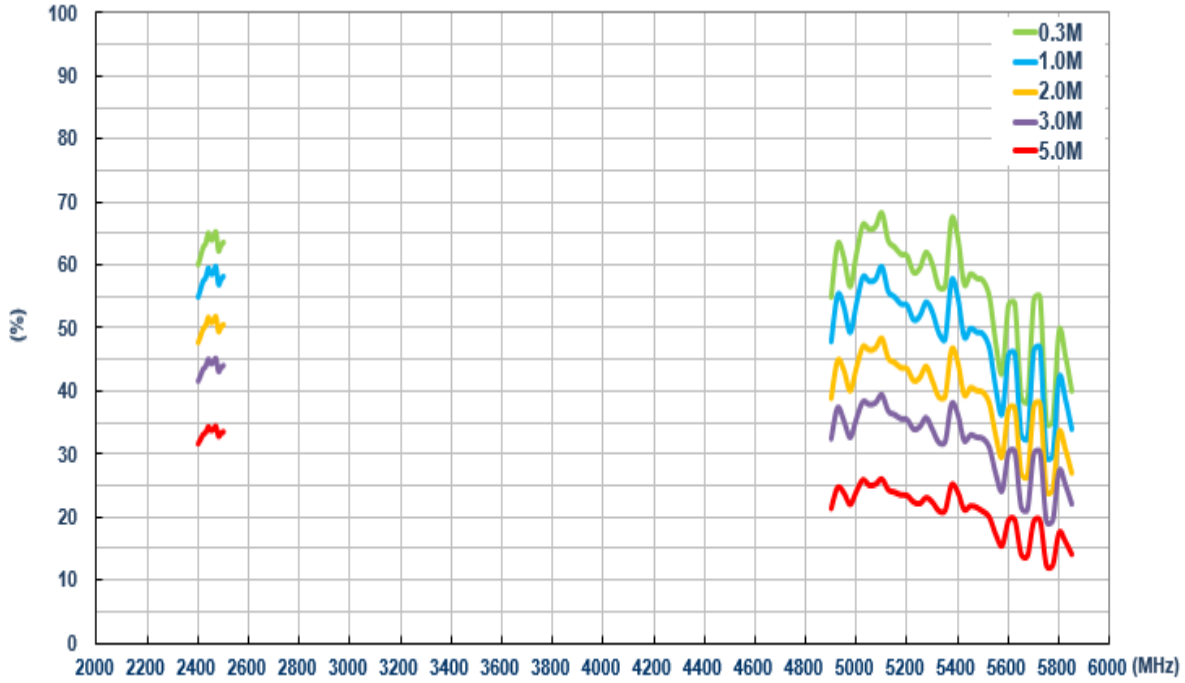
6.1.2 Return Loss (Wi-Fi_MIMO 2)



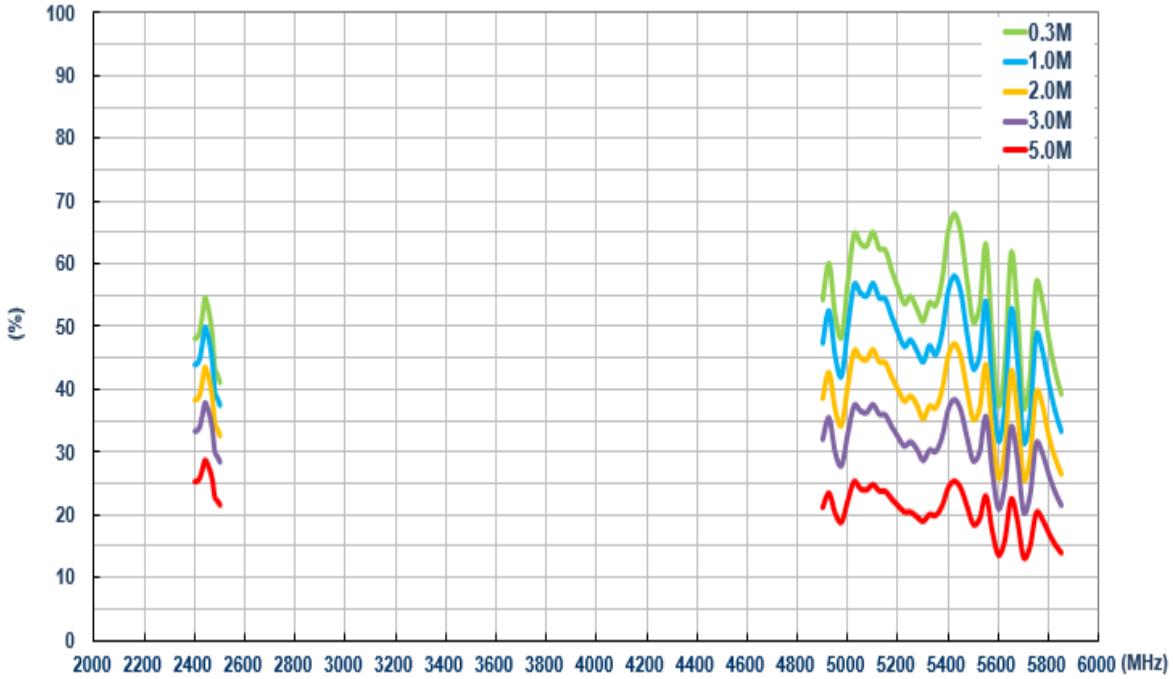
6.1.3 Isolation (Wi-Fi)



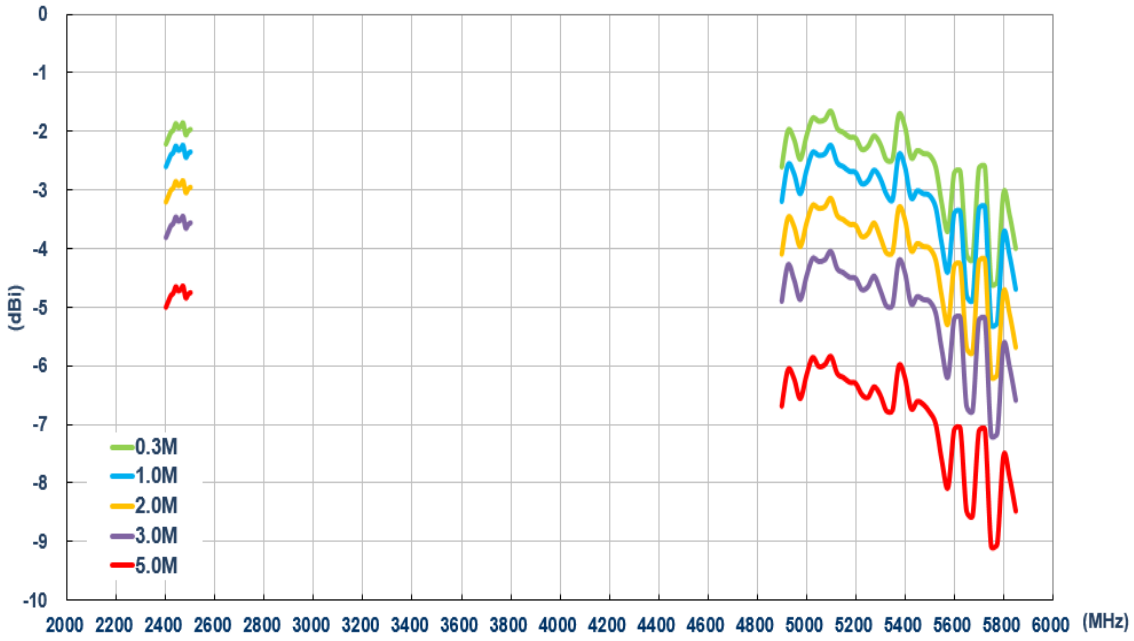
6.1.4 Efficiency (MIMO 1)



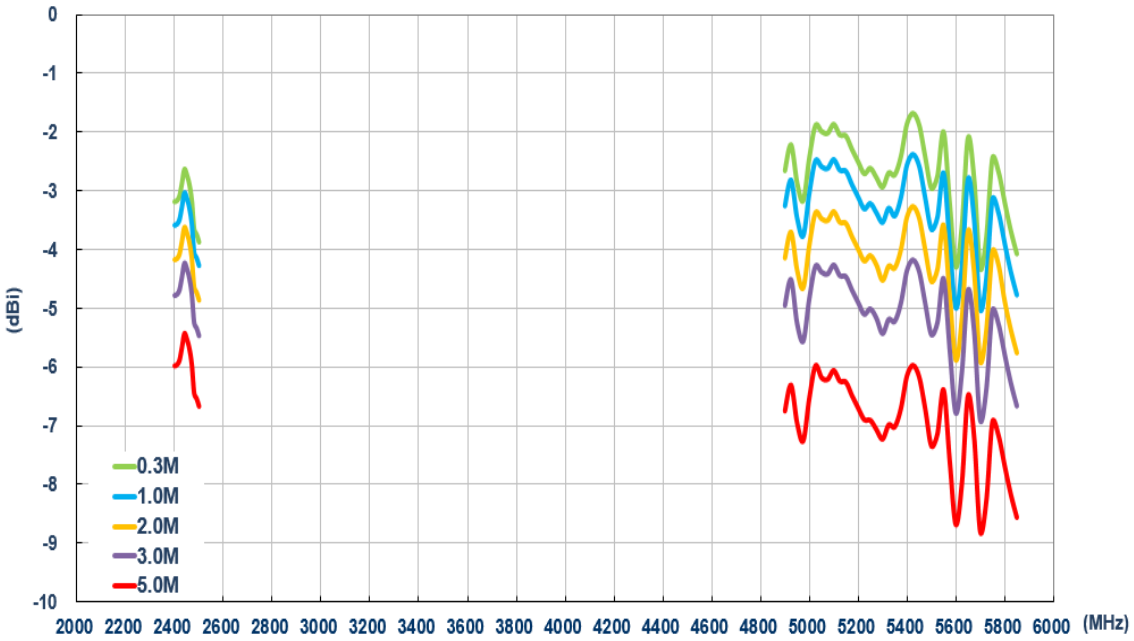
6.1.5 Efficiency (MIMO 2)



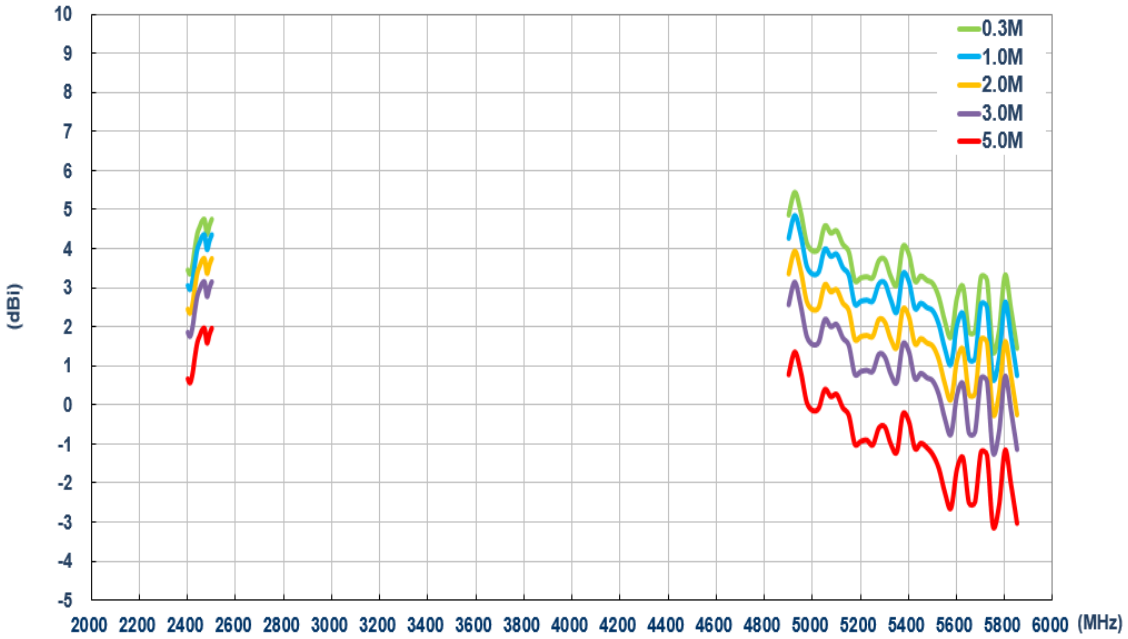
6.1.6 Average Gain (MIMO 1)



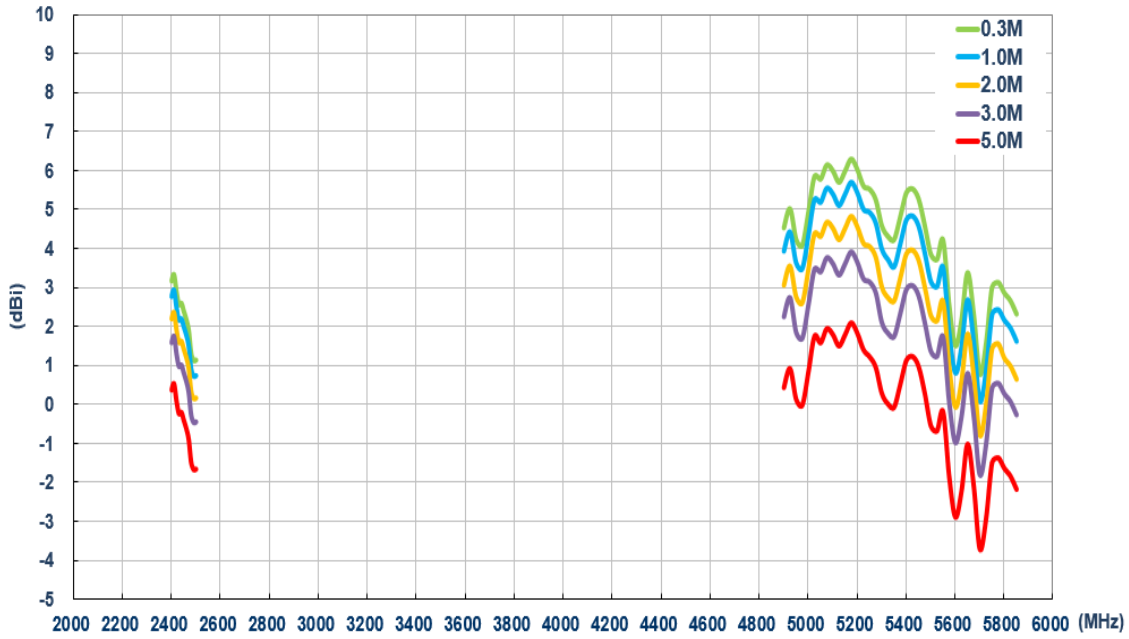
6.1.7 Average Gain (MIMO 2)



6.1.8 Peak Gain (MIMO 1)

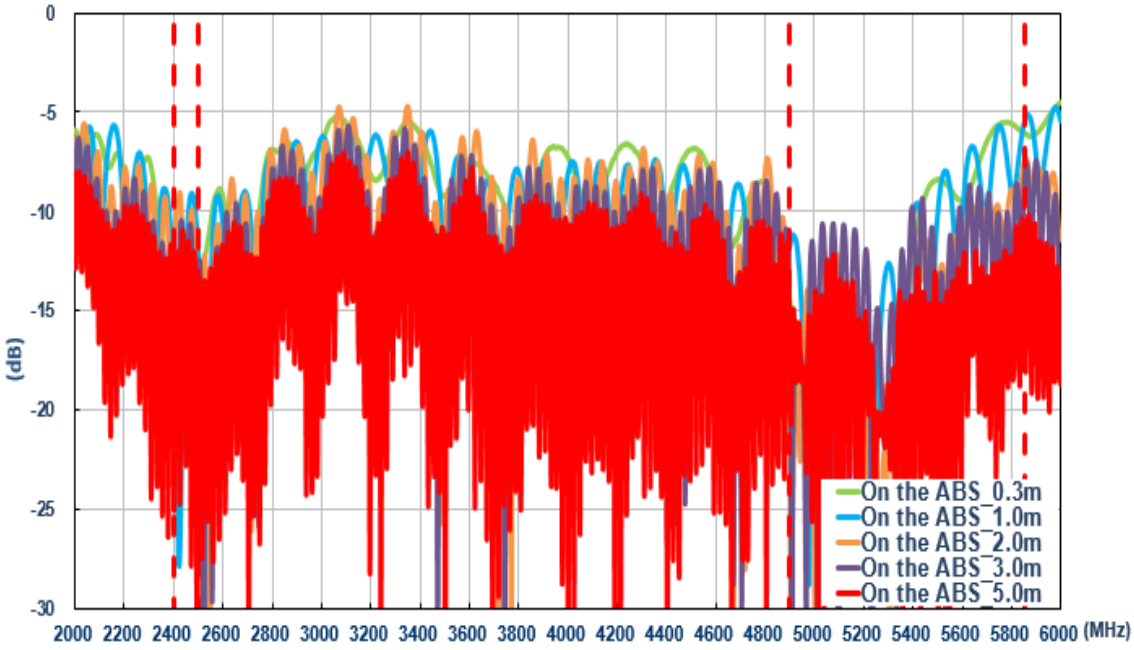


6.1.9 Peak Gain (MIMO 2)

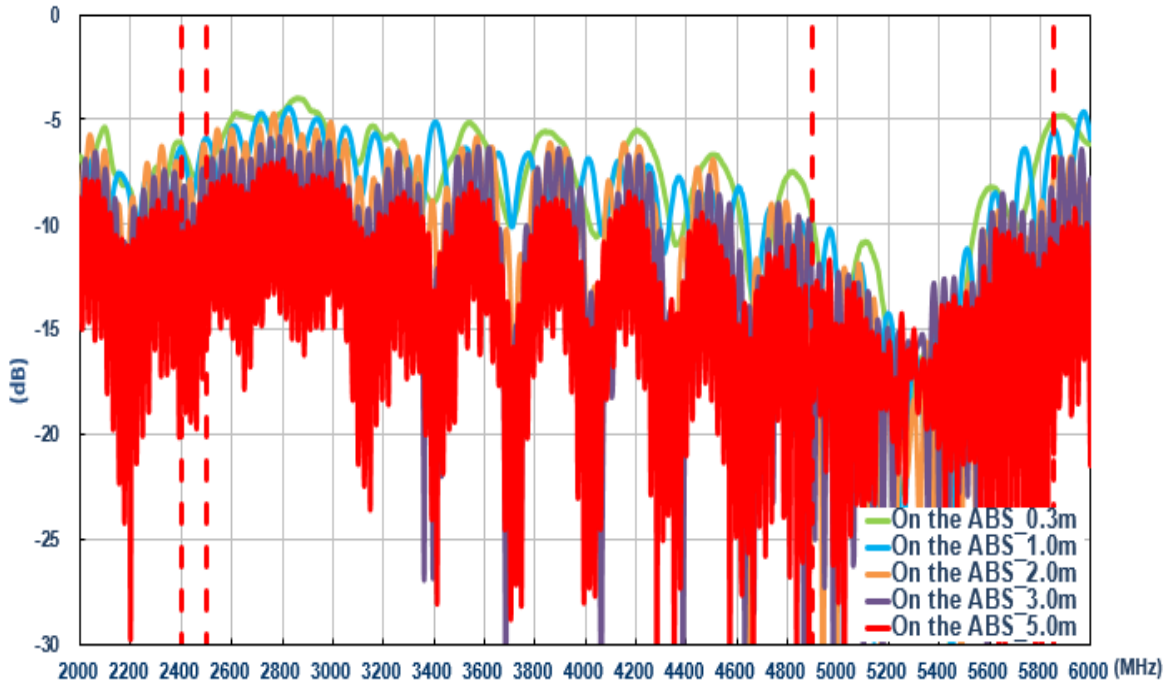


6.2 On the ABS (Wi-Fi)

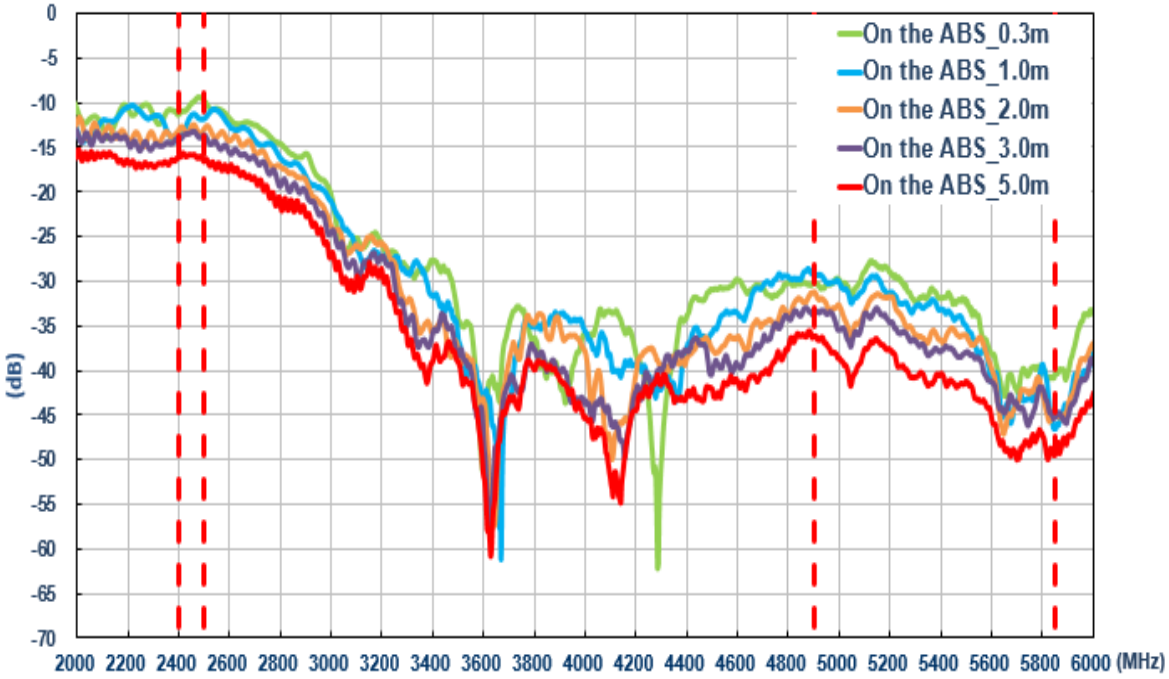
6.2.1 Return Loss (Wi-Fi MIMO 1)



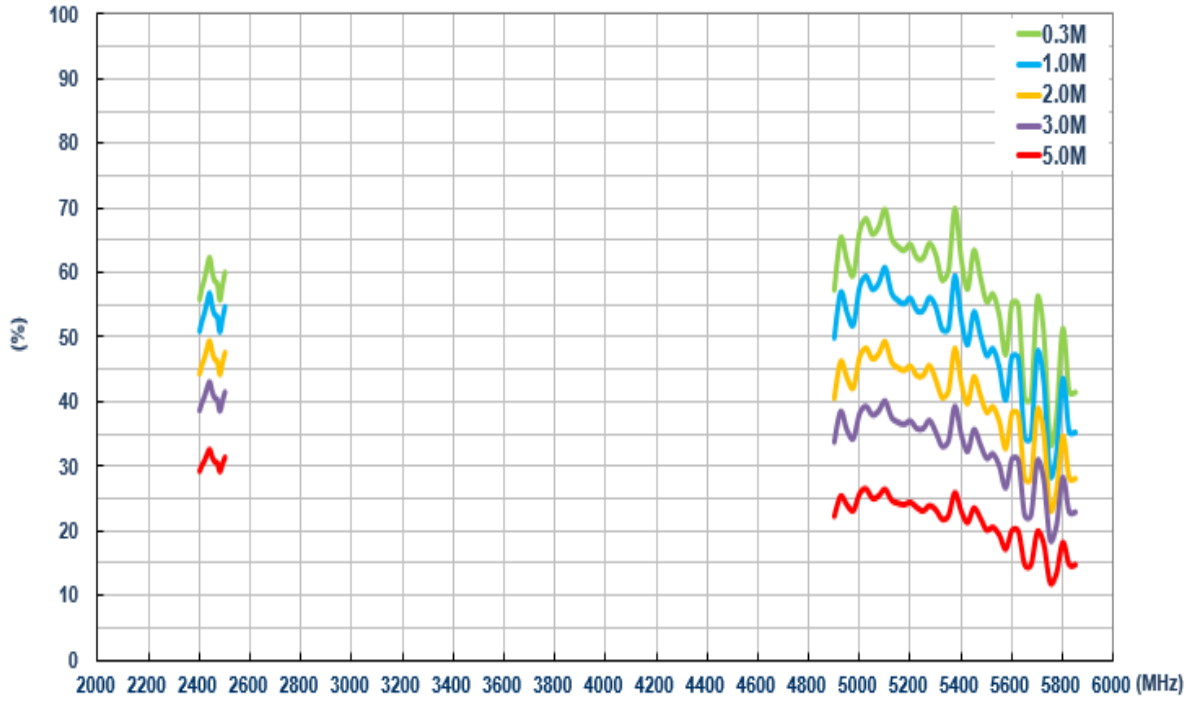
6.2.2 Return Loss (Wi-Fi MIMO 2)



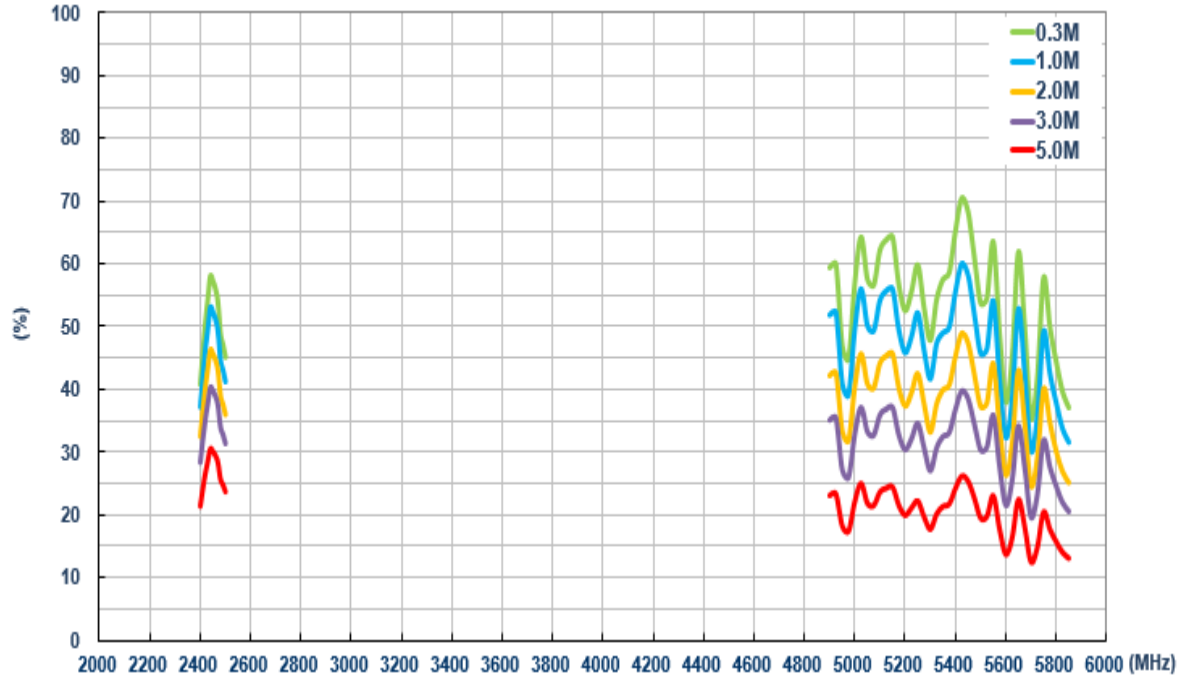
6.2.3 Isolation (Wi-Fi)



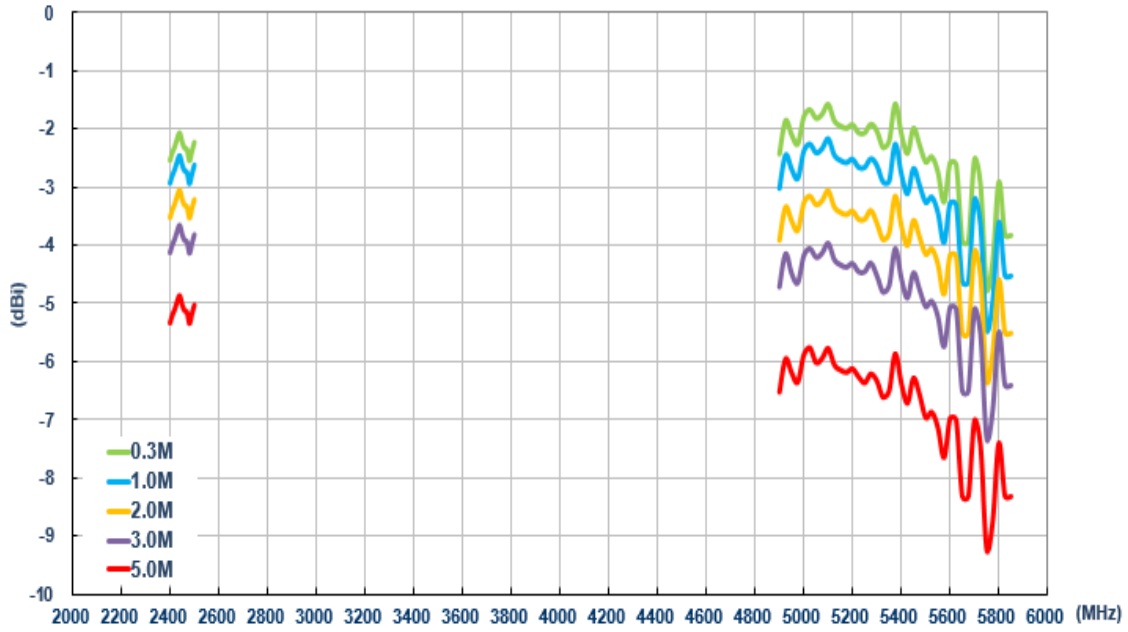
6.2.4 Efficiency (MIMO 1)



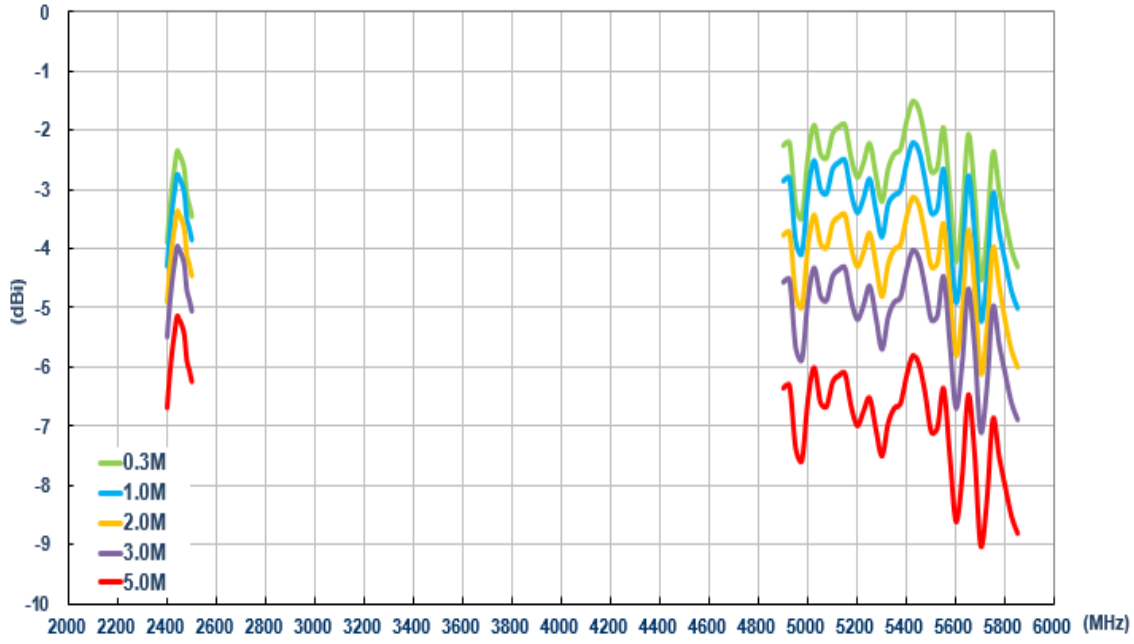
6.2.5 Efficiency (MIMO 2)



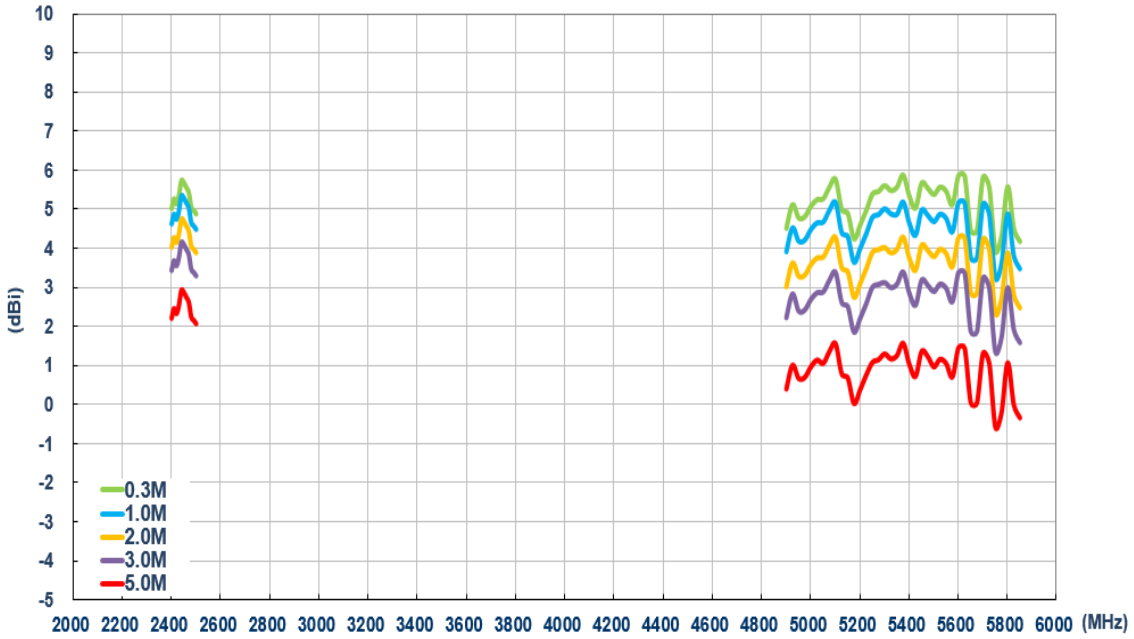
6.2.6 Average Gain (MIMO 1)



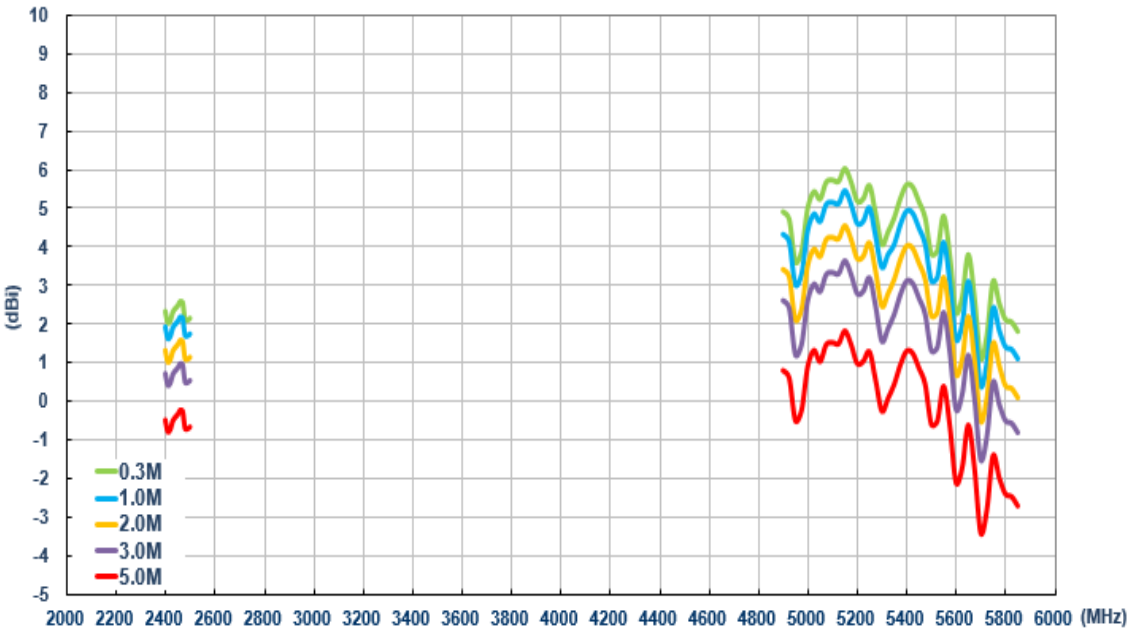
6.2.7 Average Gain (MIMO 2)



6.2.8 Peak Gain (MIMO 1)

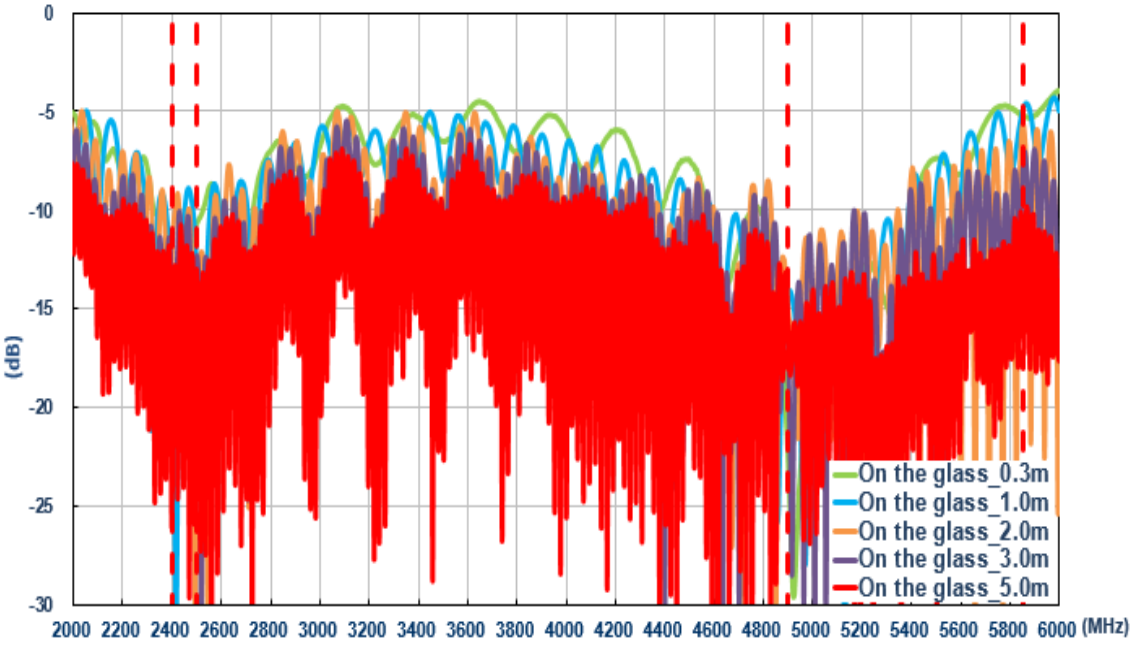


6.2.9 Peak Gain (MIMO 2)

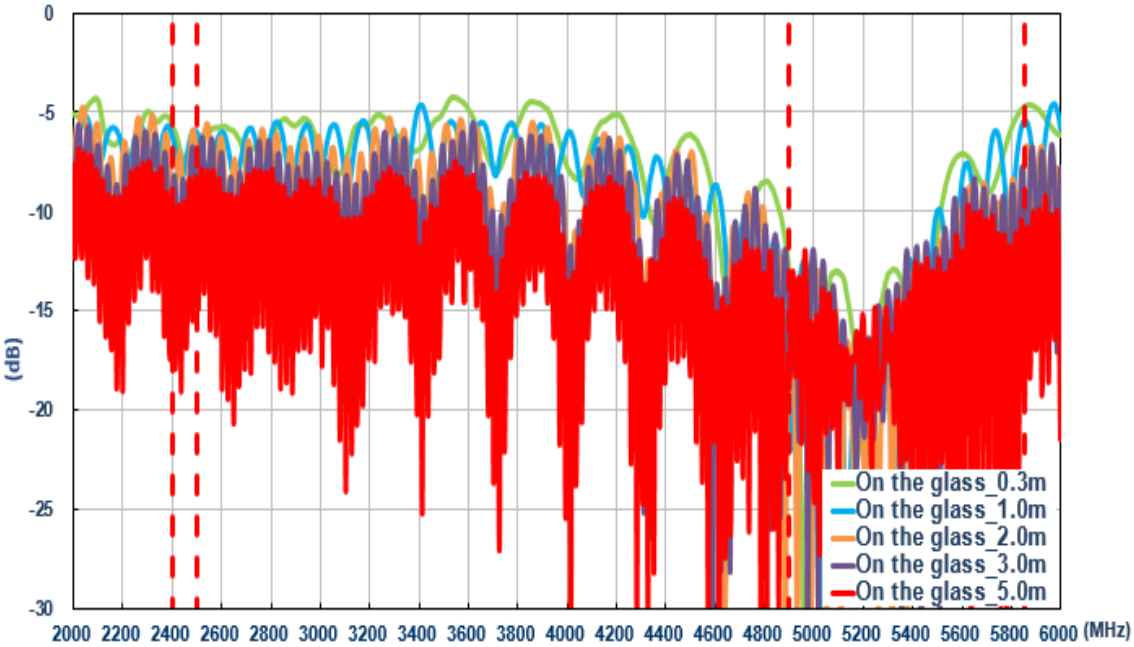


6.3 On the glass (Wi-Fi)

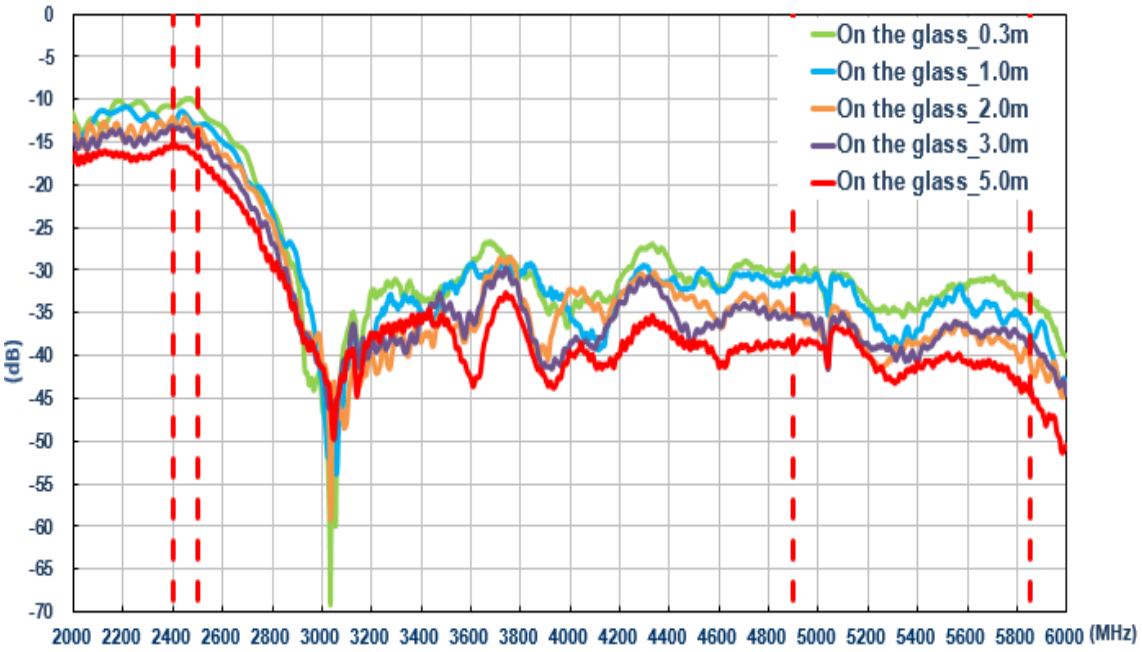
6.35.1 Return Loss (Wi-Fi MIMO 1)



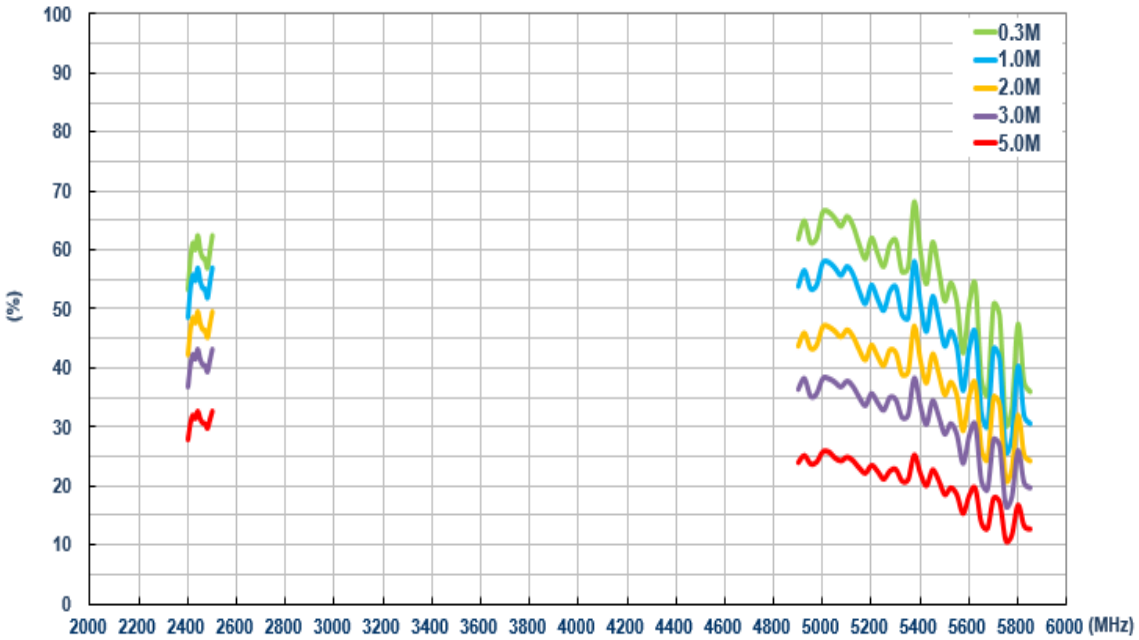
6.35.2 Return Loss (Wi-Fi MIMO 2)



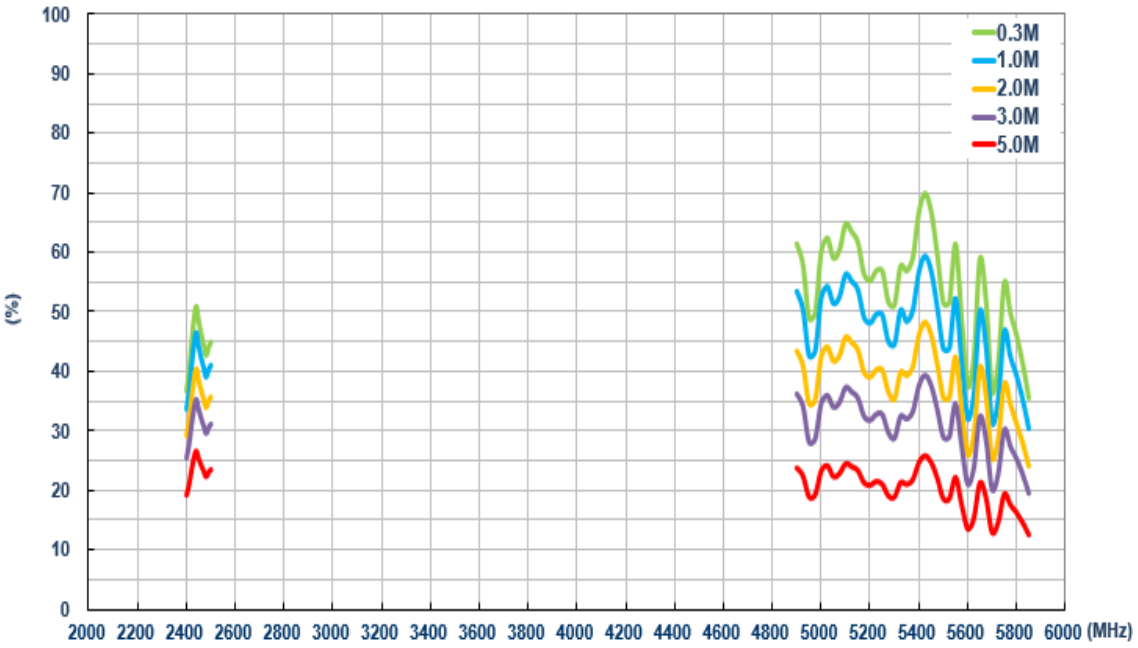
6.3.3 Isolation (Wi-Fi)



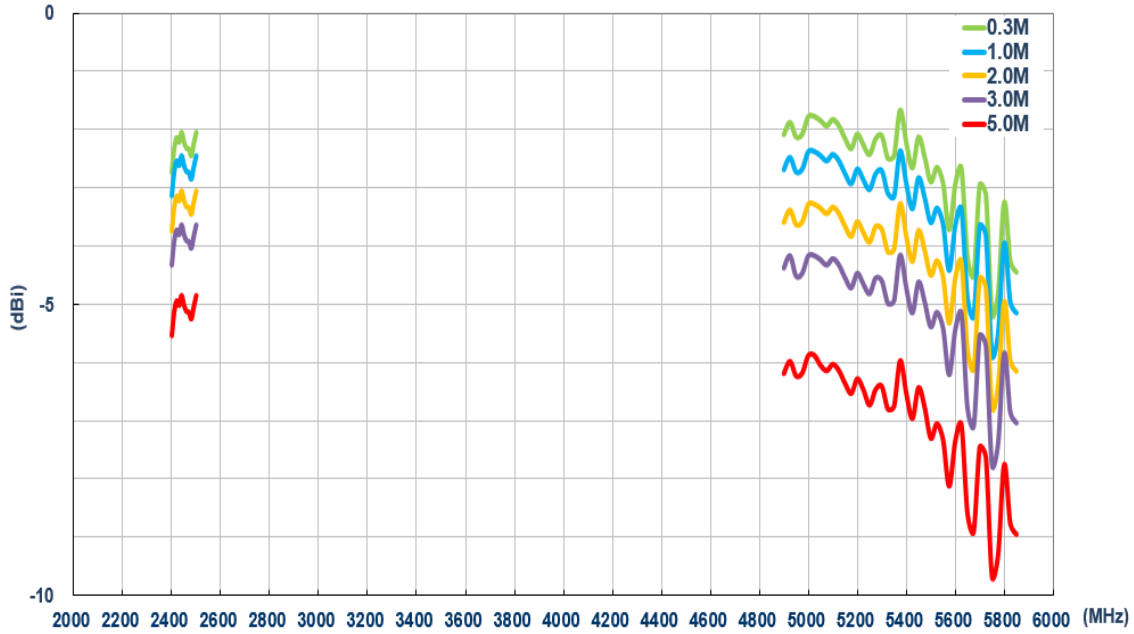
6.3.4 Efficiency (Wi-Fi MIMO 1)



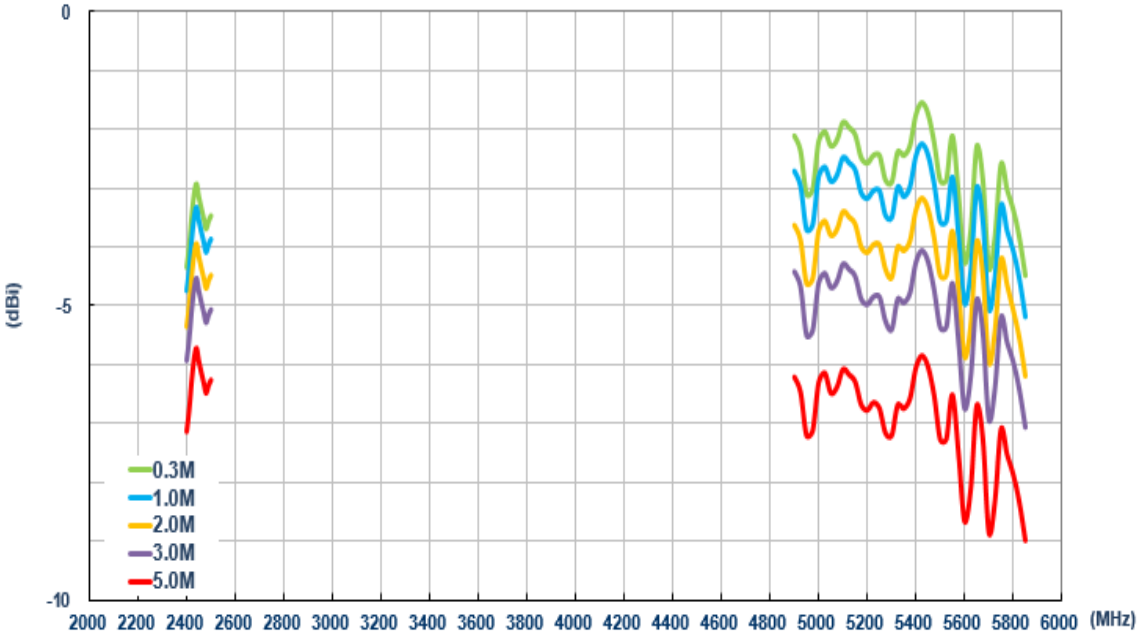
6.3.5 Efficiency (Wi-Fi MIMO 2)



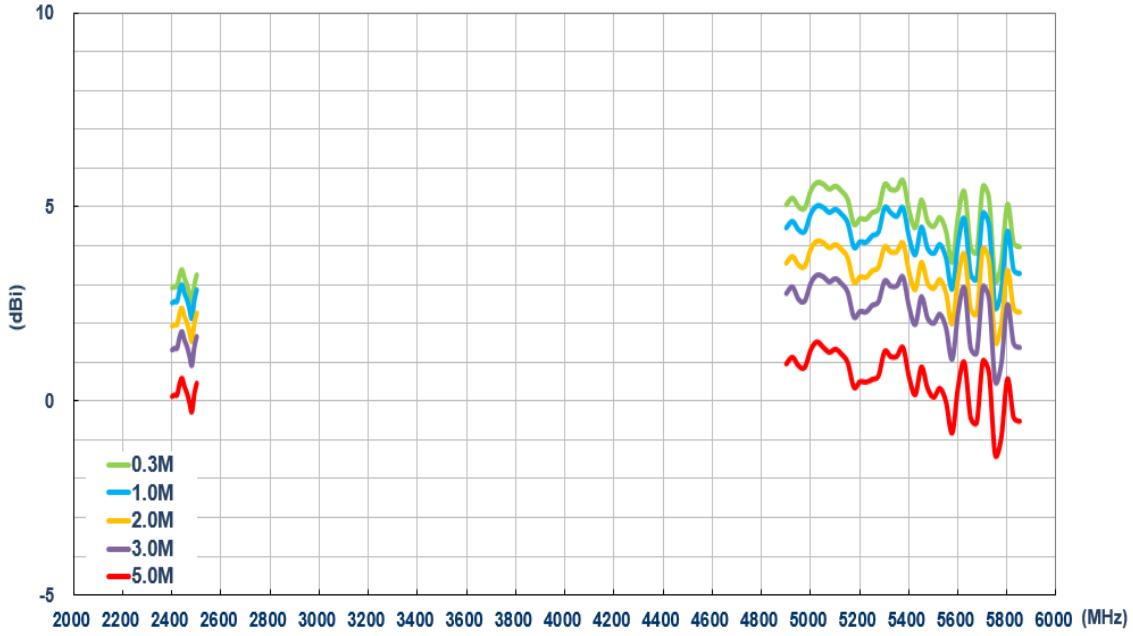
6.3.6 Average Gain (Wi-Fi MIMO 1)



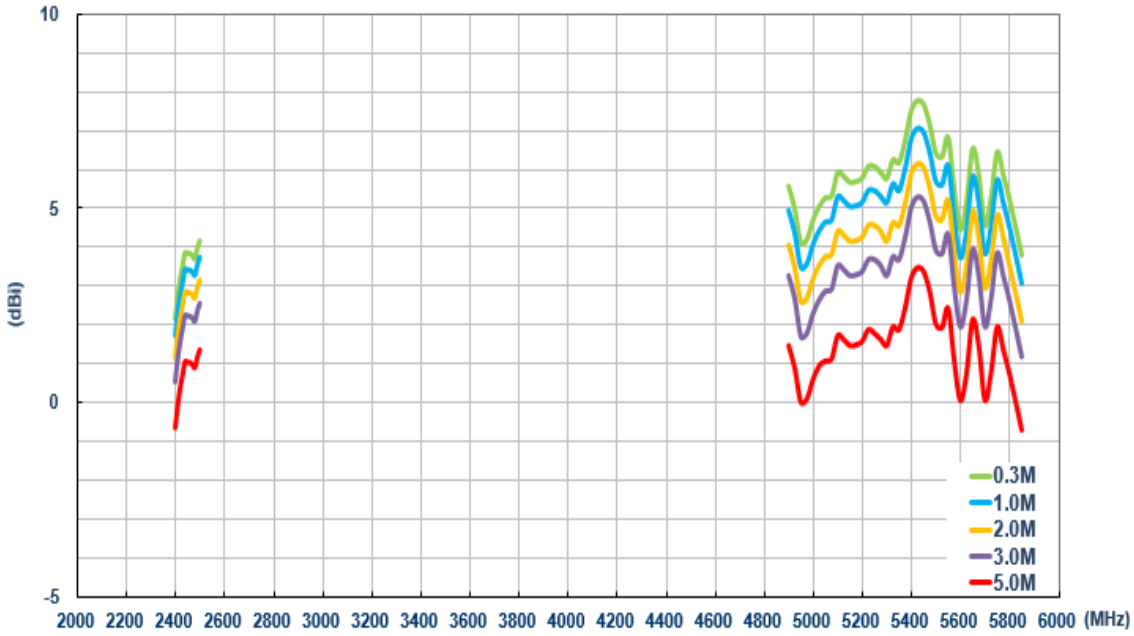
6.3.7 Average Gain (Wi-Fi MIMO 2)



6.3.8 Peak Gain (Wi-Fi MIMO 1)

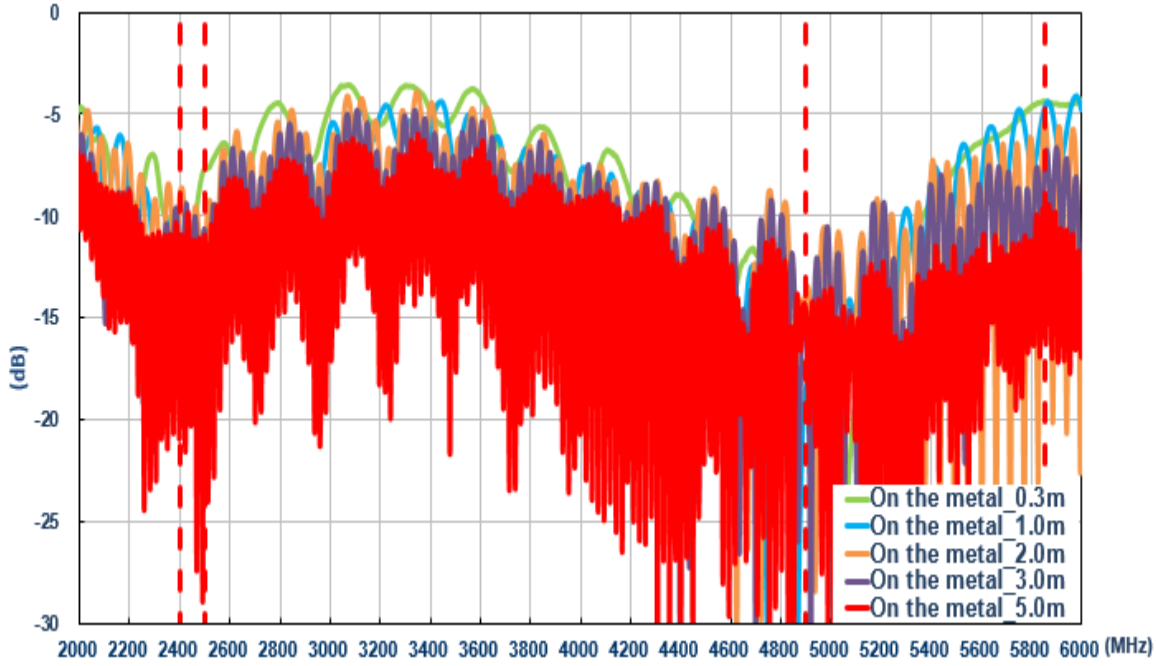


6.3.9 Peak Gain (Wi-Fi MIMO 2)

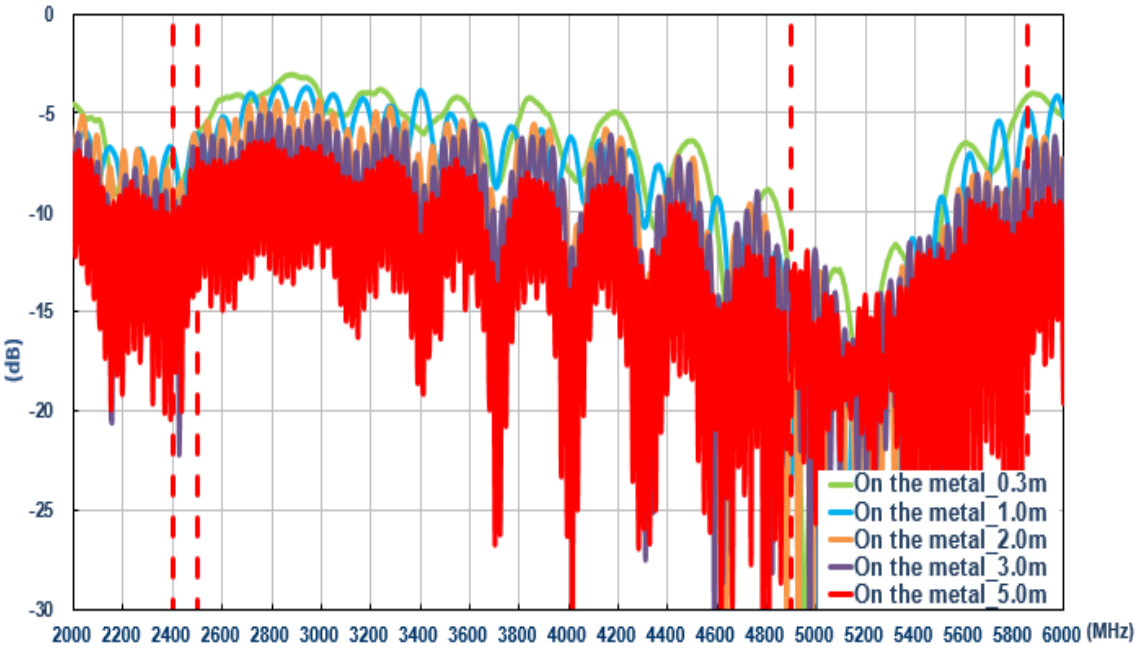


6.4 On the metal (Wi-Fi)

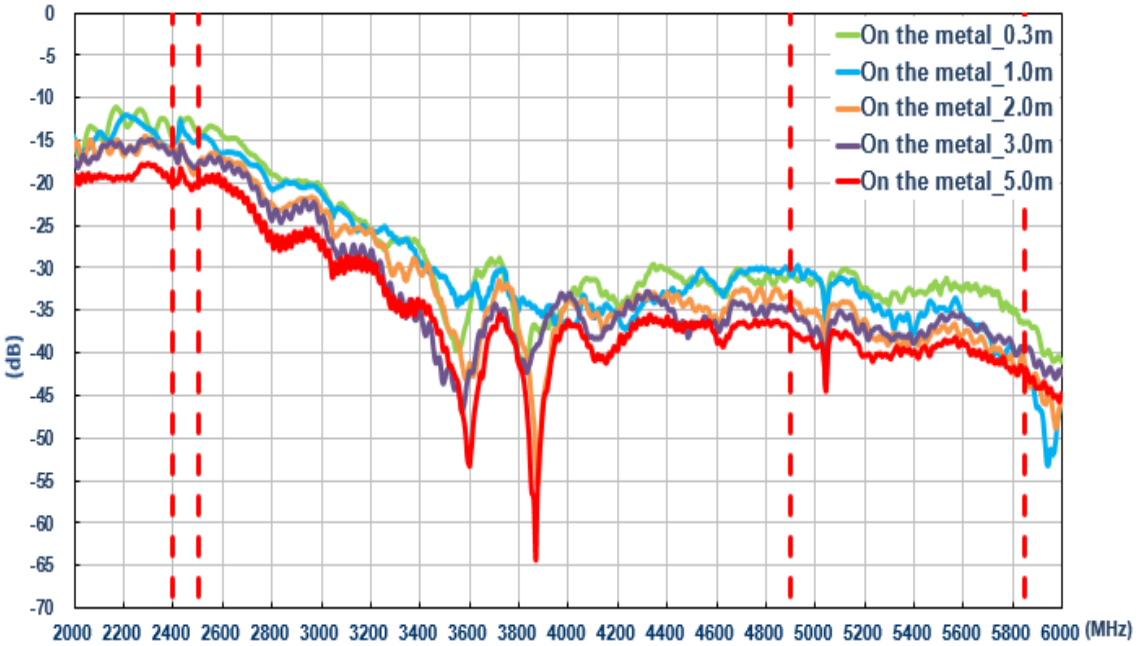
6.4.1 Return Loss (Wi-Fi MIMO 1)



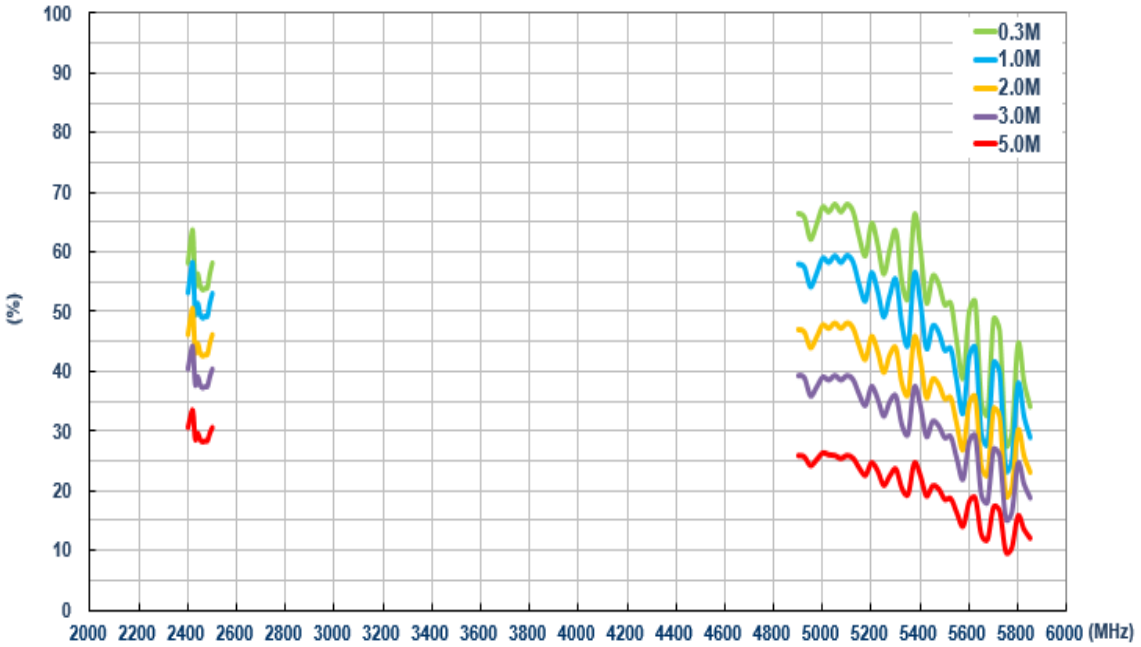
6.4.2 Return Loss (Wi-Fi MIMO 2)



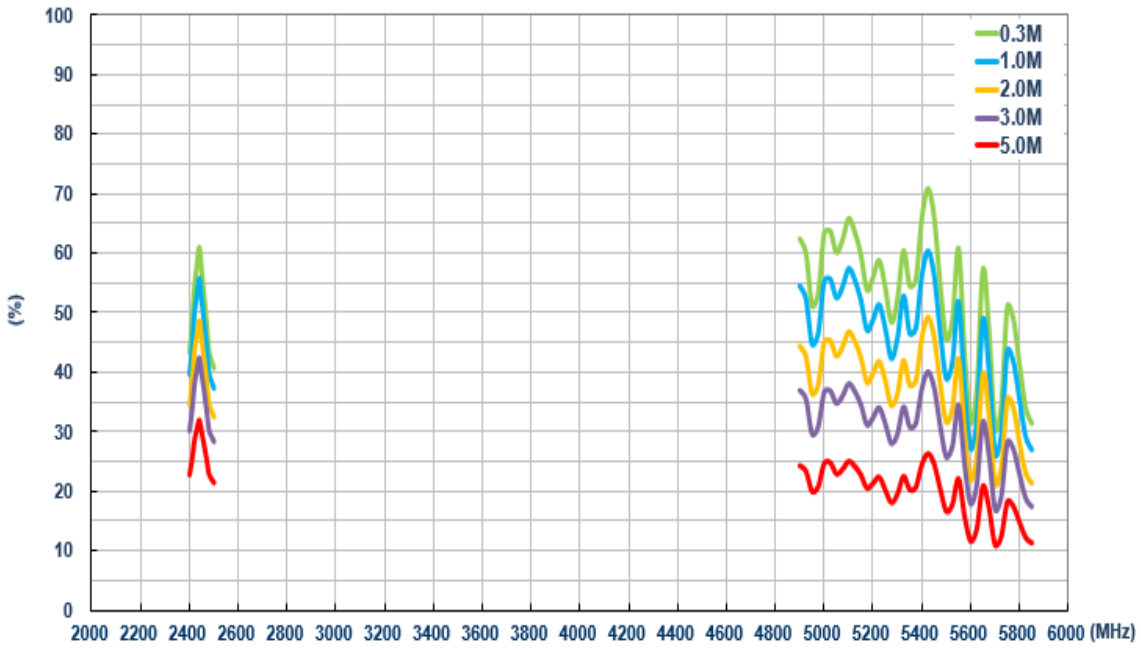
6.4.3 Isolation (Wi-Fi)



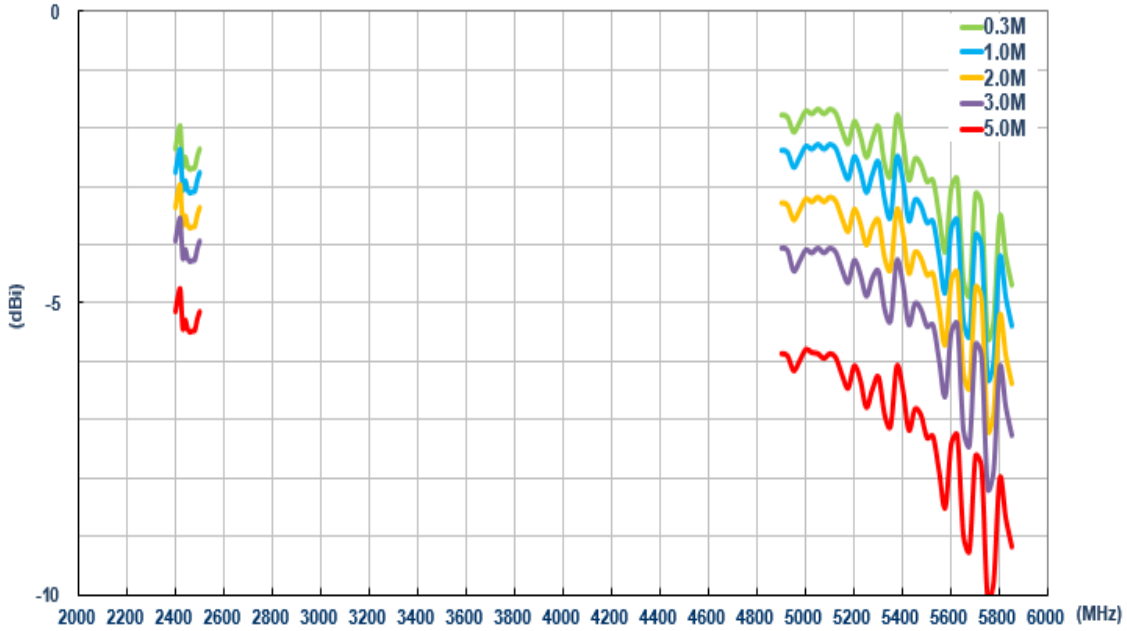
6.4.4 Efficiency (Wi-Fi MIMO 1)



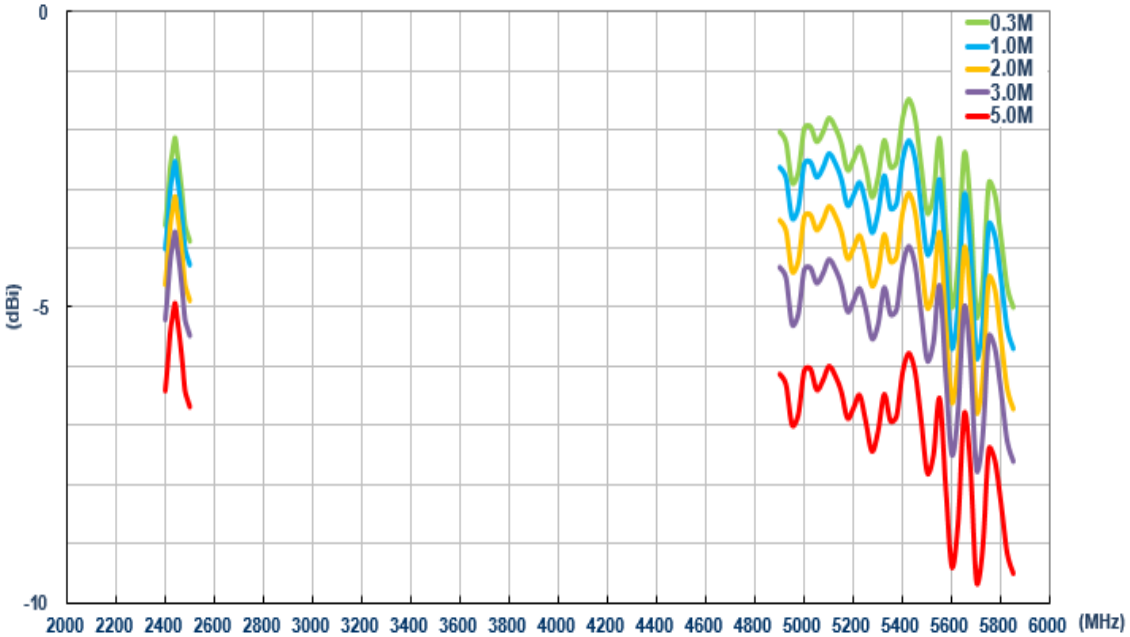
6.4.5 Efficiency (Wi-Fi MIMO 2)



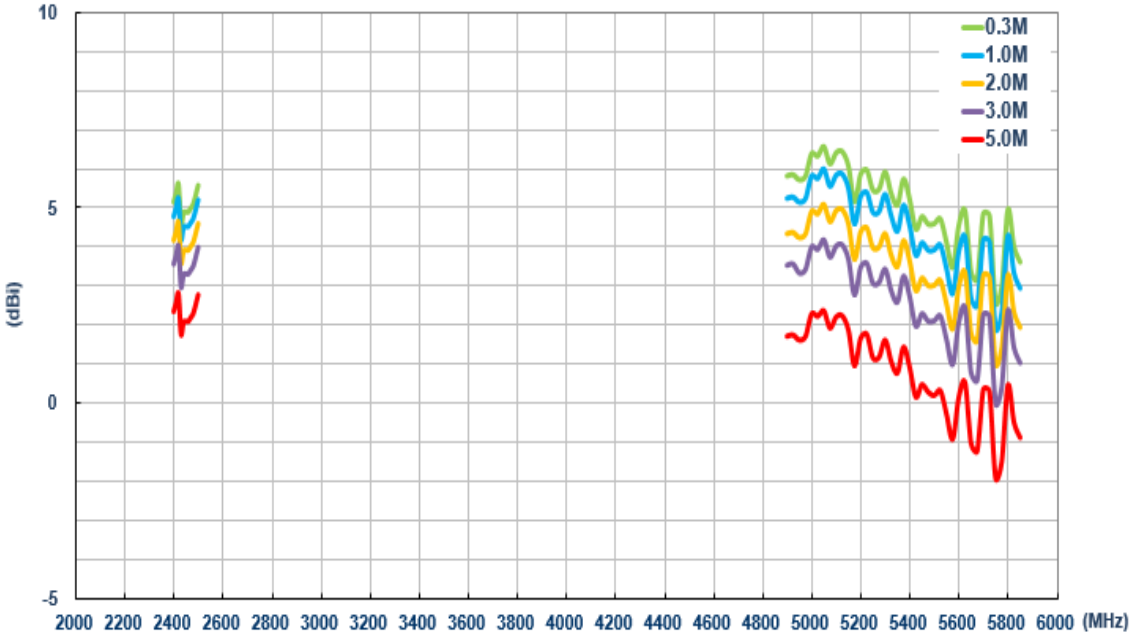
6.4.6 Average Gain (Wi-Fi MIMO 1)



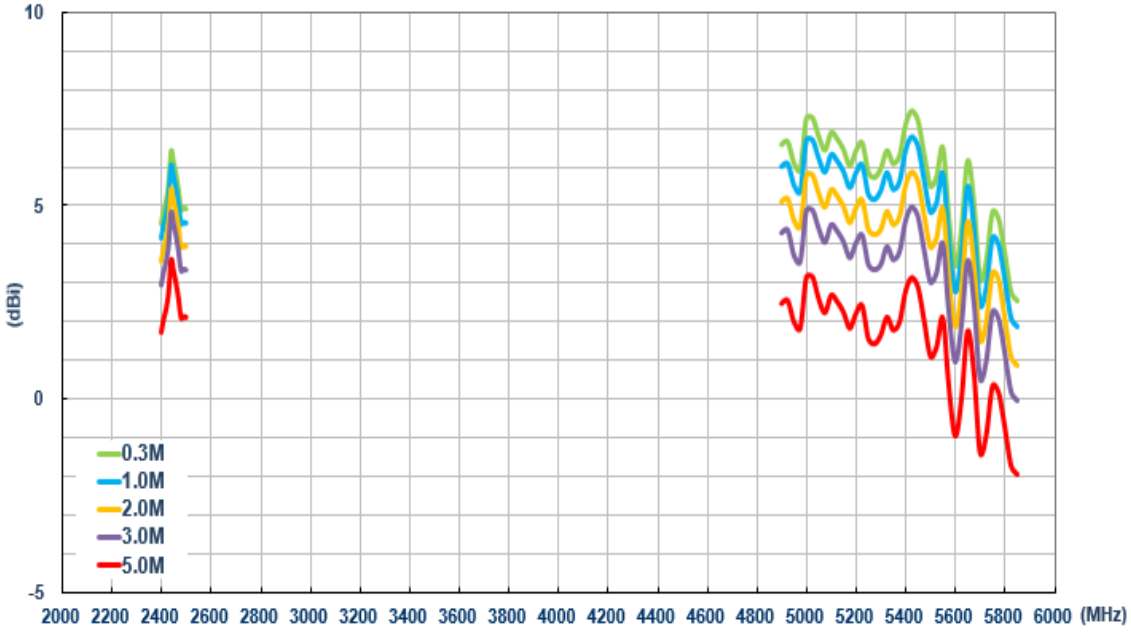
6.4.7 Average Gain (Wi-Fi MIMO 2)



6.4.8 Peak Gain (Wi-Fi MIMO 1)

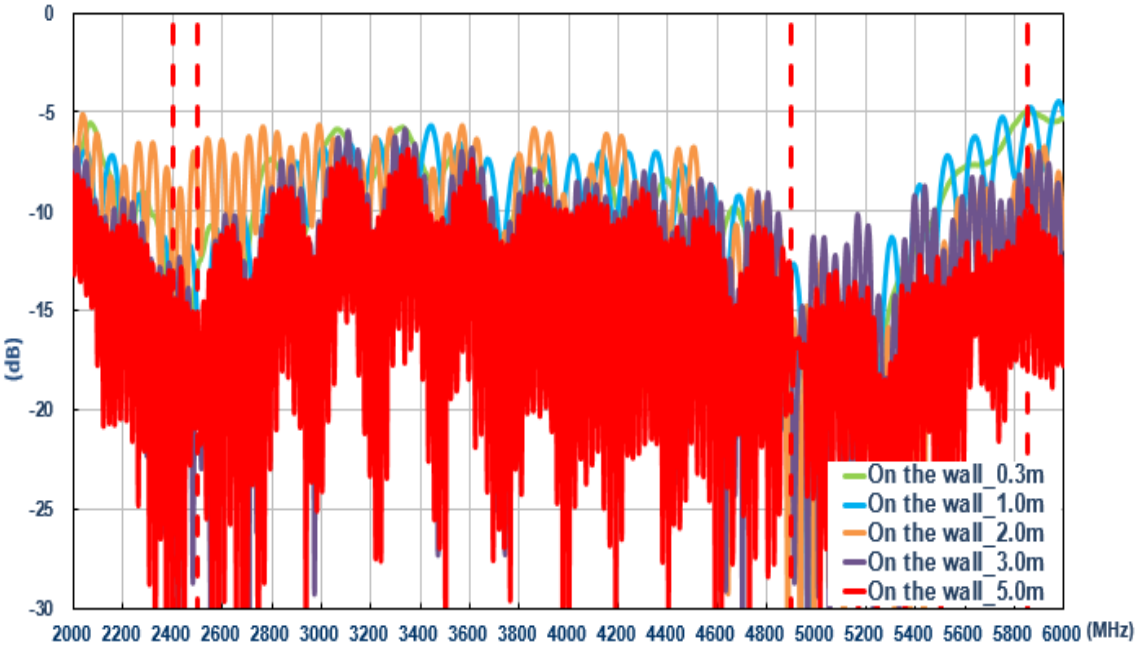


6.4.9 Peak Gain (Wi-Fi MIMO 2)

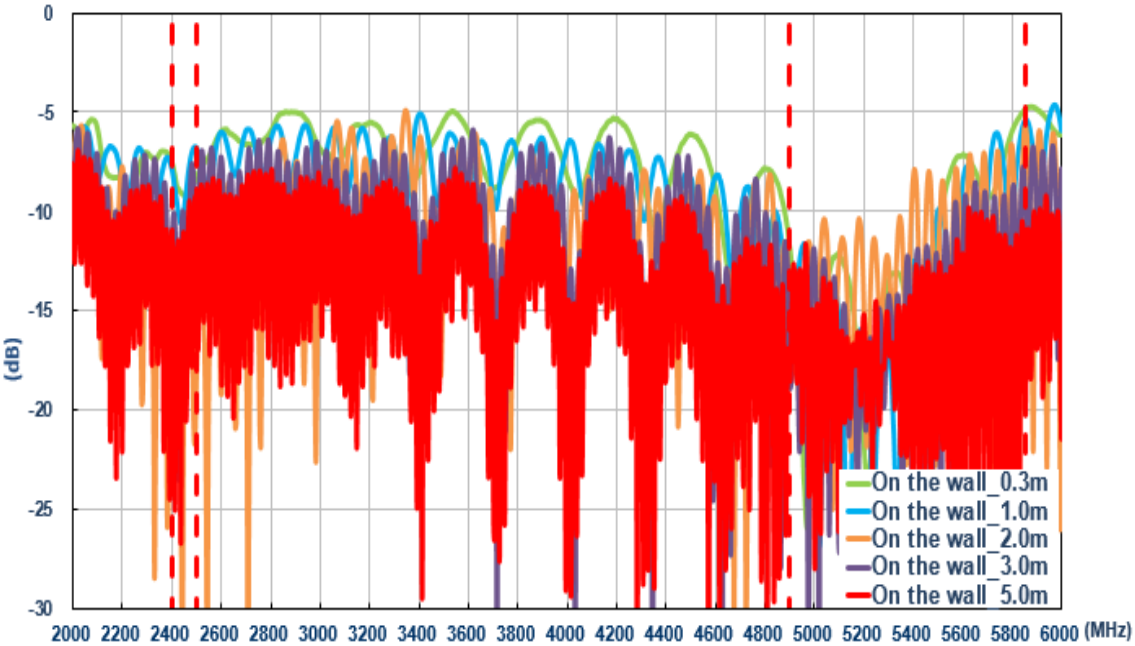


6.5 On the wall (Wi-Fi)

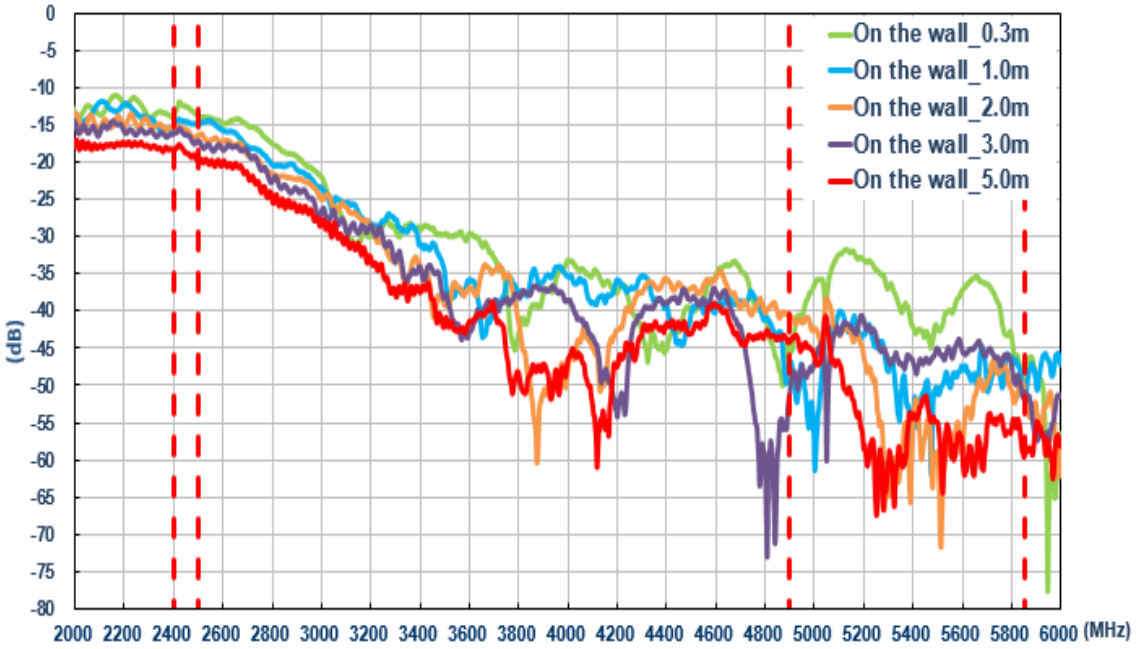
6.5.1 Return Loss (Wi-Fi MIMO 1)



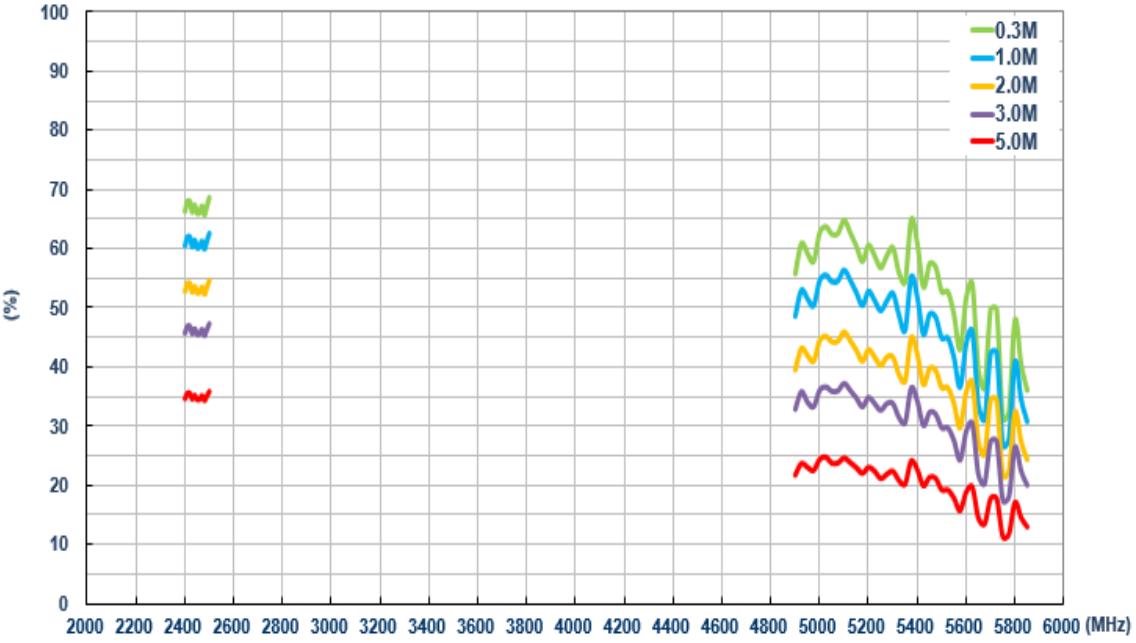
6.5.2 Return Loss (Wi-Fi MIMO 2)



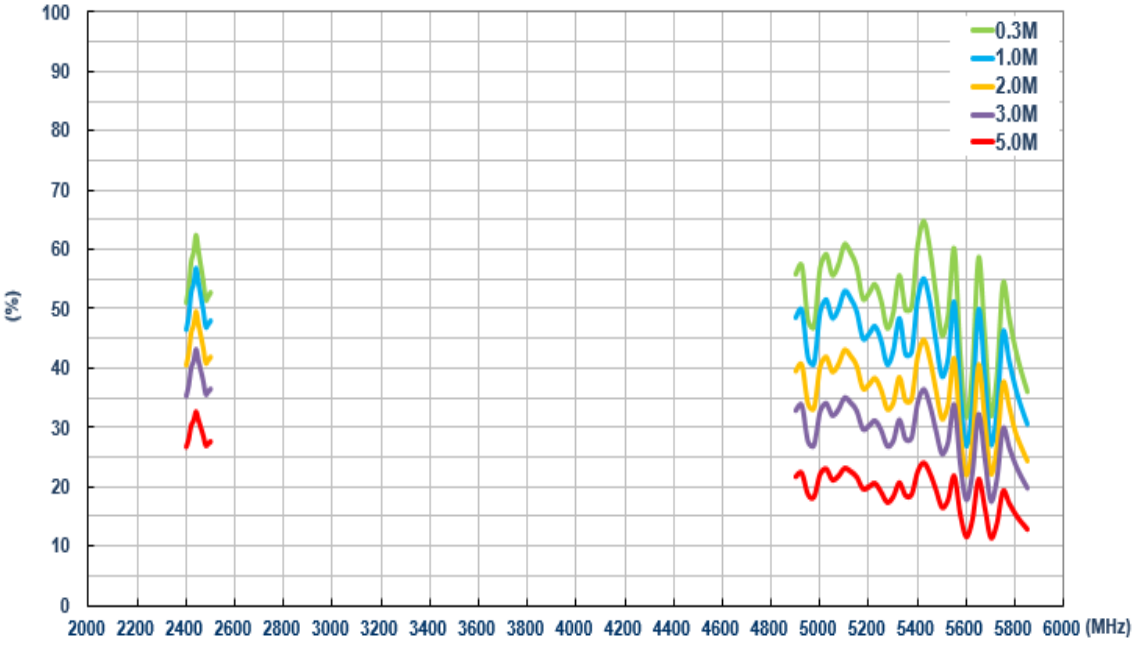
6.5.3 Isolation (Wi-Fi)



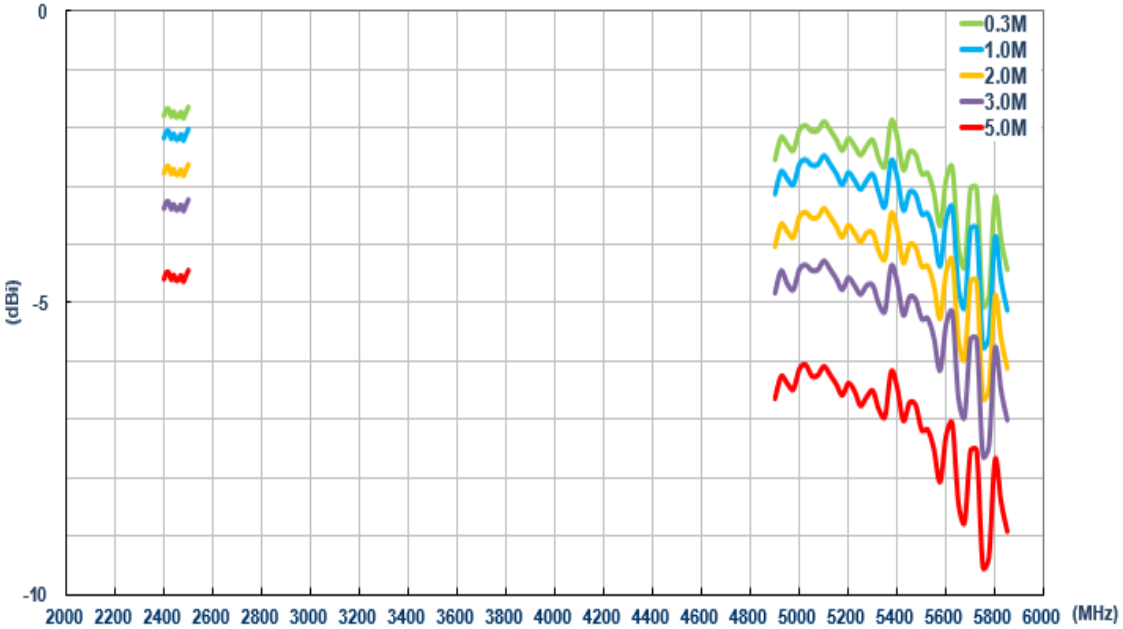
6.5.4 Efficiency (Wi-Fi MIMO 1)



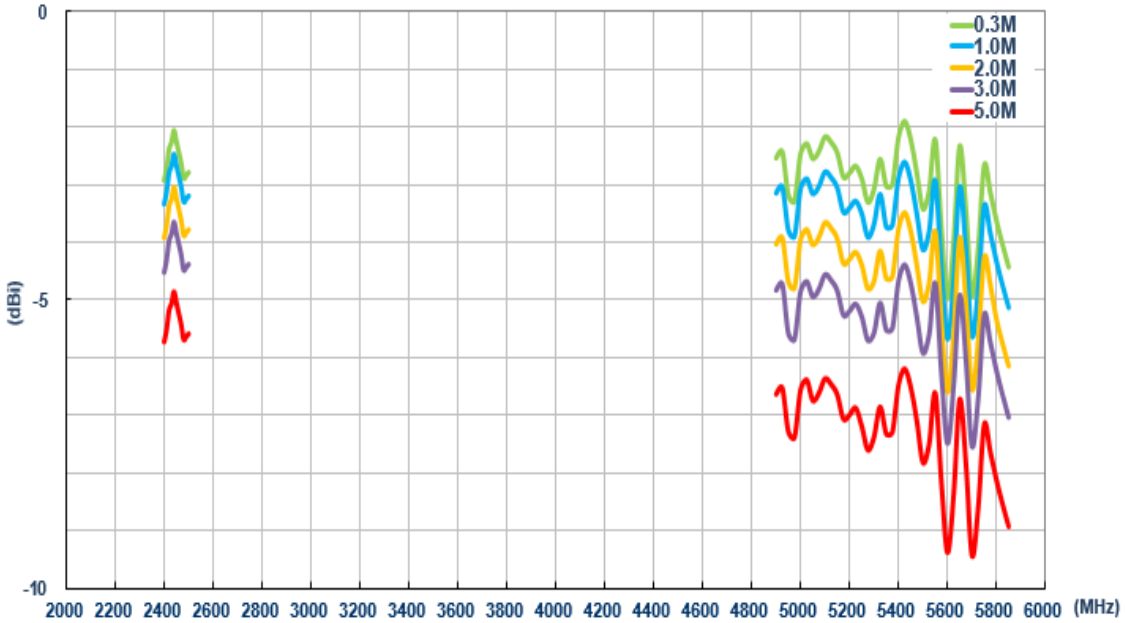
6.5.5 Efficiency (Wi-Fi MIMO 2)



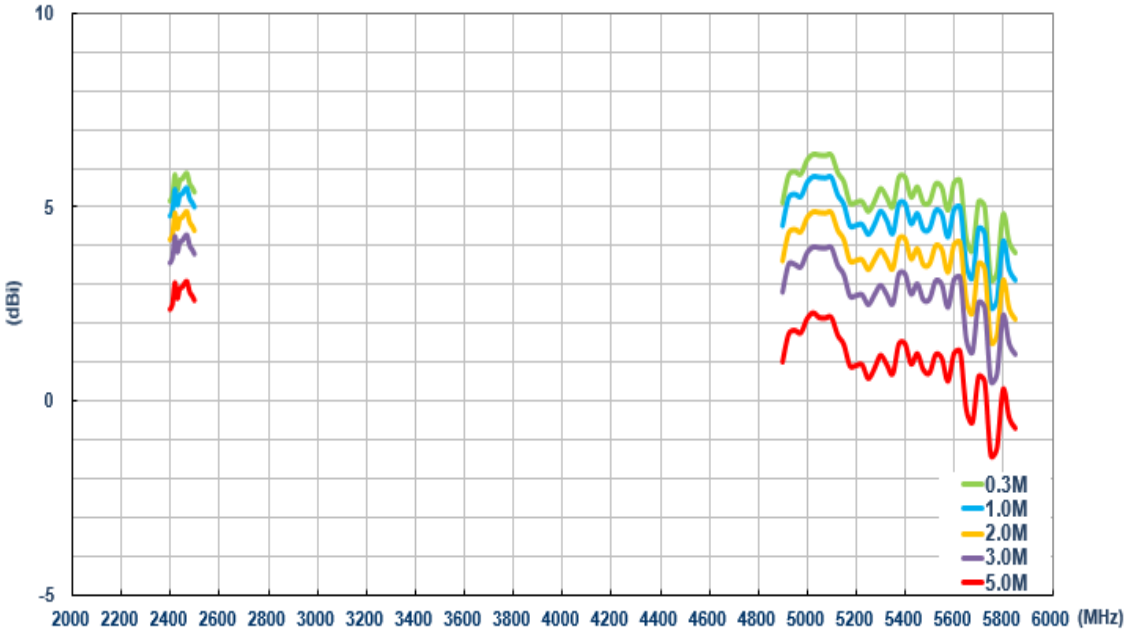
6.5.6 Average Gain (Wi-Fi MIMO 1)



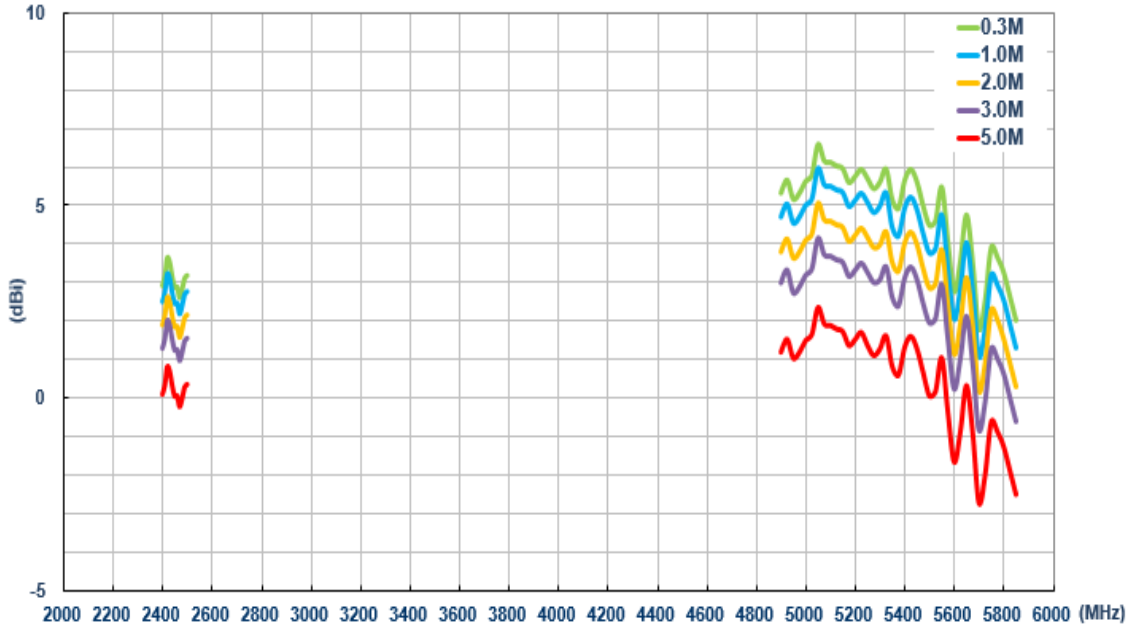
6.5.7 Average Gain (Wi-Fi MIMO 2)



6.5.8 Peak Gain (Wi-Fi MIMO 1)



6.5.9 Peak Gain (Wi-Fi MIMO 2)



OCEAN CHIPS
Океан Электроники
Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

AVIC JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

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«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

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