

PSA

PASSIVE SYSTEM ALLIANCE
INPAQ TECHNOLOGY CO., LTD.

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PASSIVE SYSTEM ALLIANCE

USI_Doublemint

Presented by

Calvin

2025/ 04/ 18



Version	Date	Description	Author
V01	2024/05/27	New Release	Calvin
V02	2024/05/30	Bottom antenna modify	Calvin
V03	2024/06/14	Bottom antenna modify	Calvin
V03	2024/06/15	Mechanical design change and fine-tune	Calvin
V04	2024/06/26	Adding Antenna pattern which used in metal GDO Housing	Calvin
V04	2024/06/27	Antenna cable outlet direction fixed and update antenna pattern	Calvin
V05	2024/08/02	Check antenna passive performance on Doublemint camera module	Calvin
V06	2025/01/10	Add Shielding can 、 Gasket passive test	Calvin
V07	2025/04/18	Check antenna active performance on Doublemint DVT camera module	Calvin

OUTLINE

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- 2.4 Antenna 3D Radiation Patterns

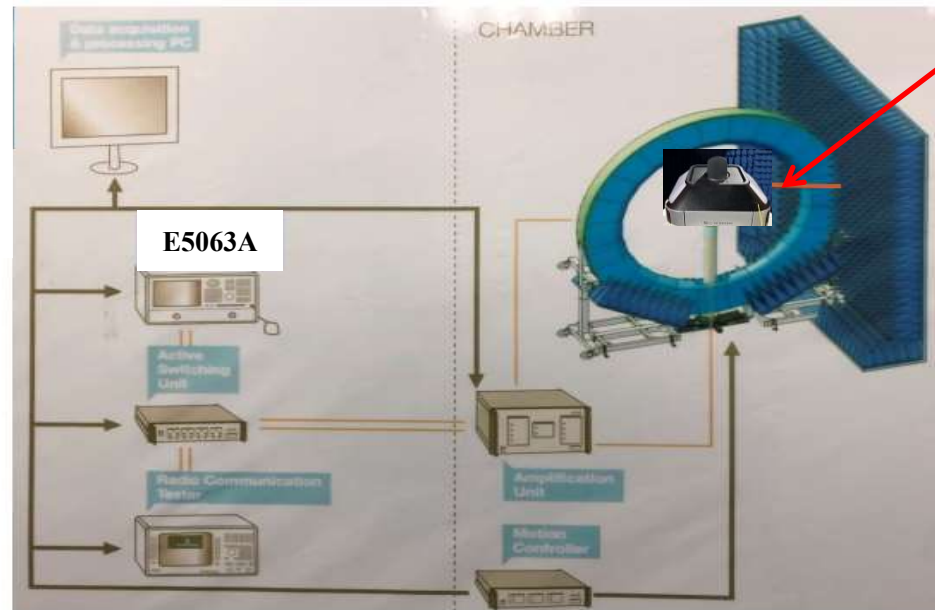
3. Summary

1. Measurement Information

1.1 Experimental Setup

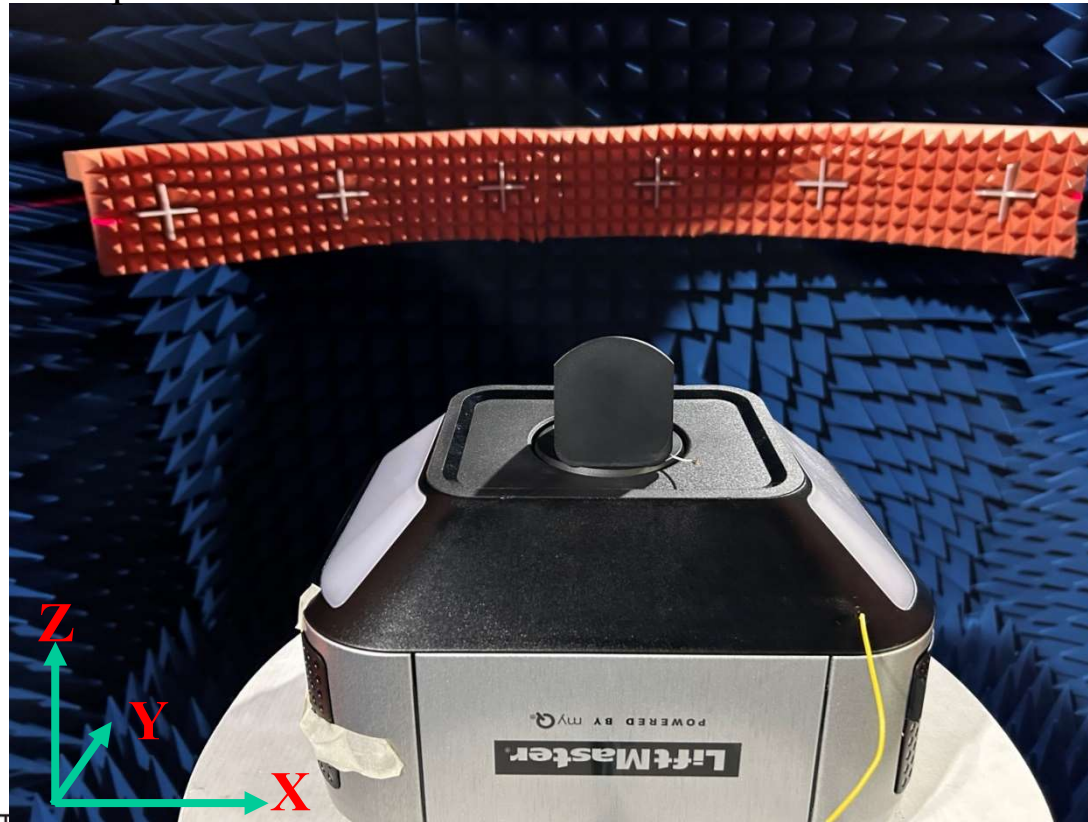
Test Equipment

- Network Analyzer : E5063A
- 3D Antenna Chamber : XH-MPS2430



1. Measurement Information

1.1 Test Set-up



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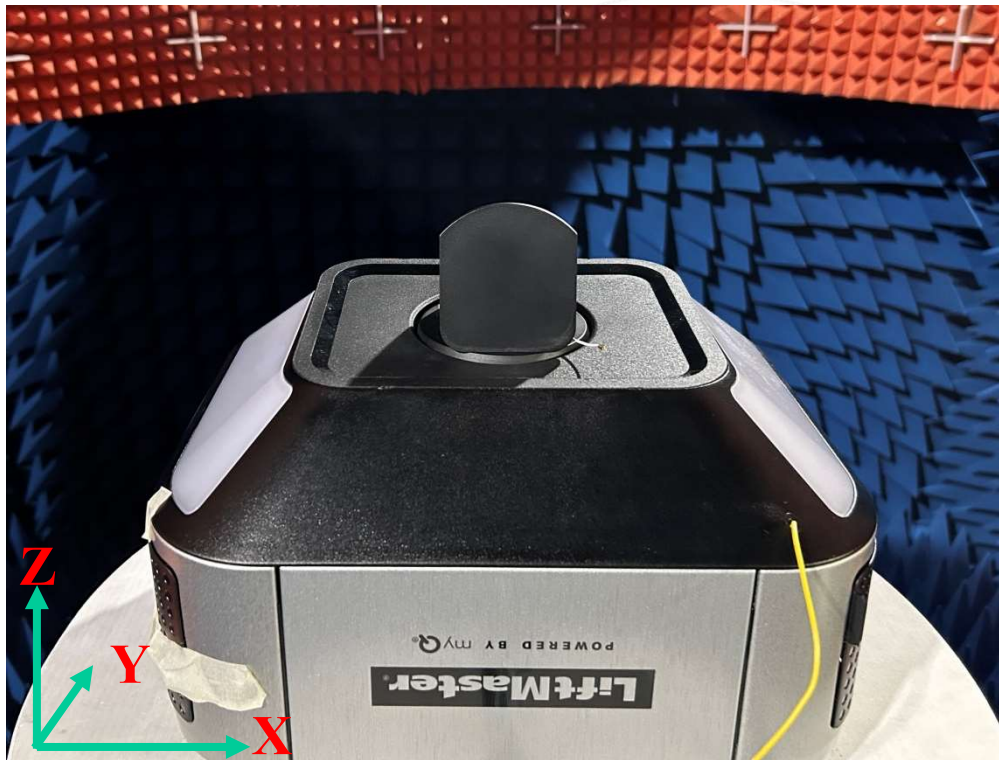
1. Measurement Information

1.1 Experimental Setup

Brand	INPAQ
Model name	Doublemint
Antenna Part Number	RFPCA471415EMAB401
Manufacture information	INPAQ TECHNOLOGY CO.,LTD 佳邦科技股份有限公司
Test Engineer name	Calvin Liu
Test Date	2025/04/09
Test equipment	P.6
Test set-up photo	P.7
Antenna type	PIFA

1. Measurement Information

1.1 Experimental Setup



Camera Angle



0°



30°



60°

1. Measurement Information

1.2 Antenna Solution Detail



2. Antenna Characteristics

0°

2.1 S-Parameter



2. Antenna Characteristics

30°

2.1 S-Parameter



2. Antenna Characteristics

60°

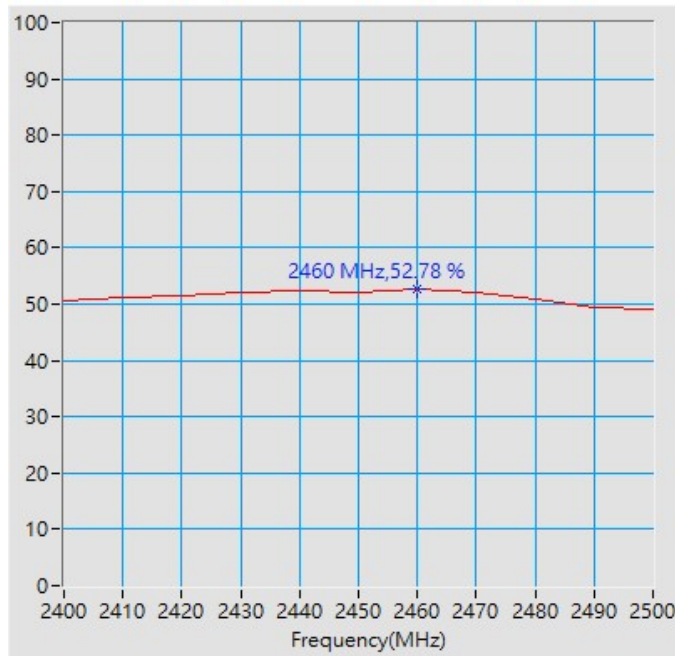
2.1 S-Parameter



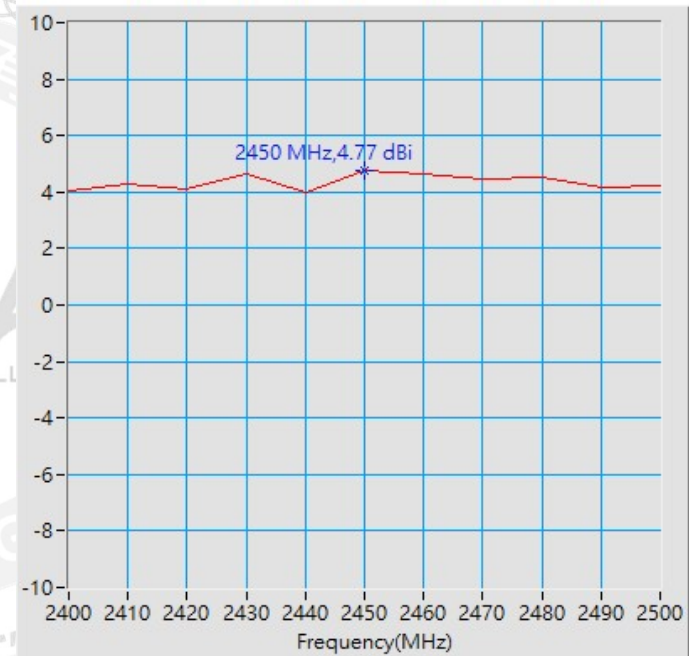
2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

0°



Maximum Efficiency at 2460 MHz : 52.78 %

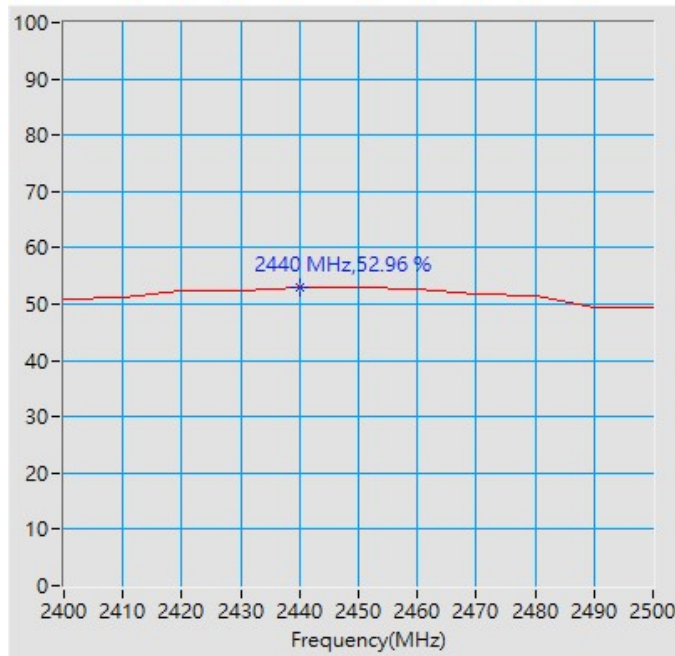


Maximum Peak Gain at 2450 MHz : 4.77 dBi

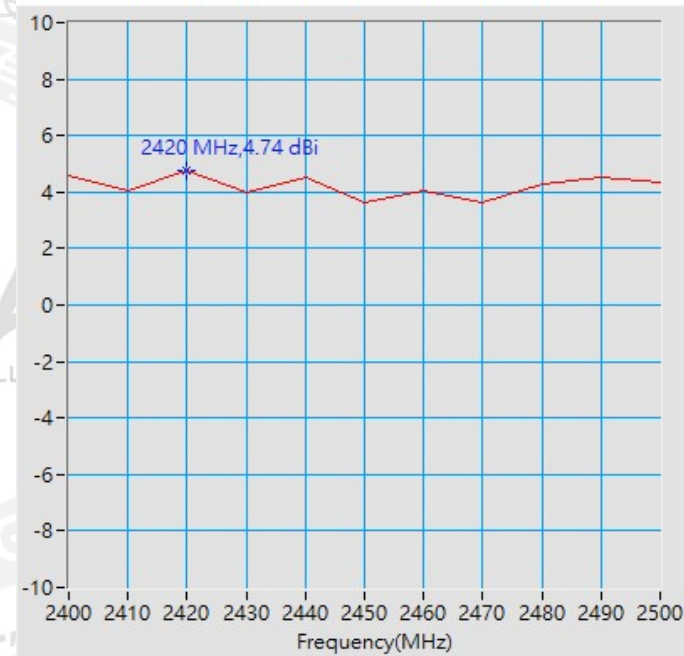
2. Antenna Characteristics

30°

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 2440 MHz : 52.96 %

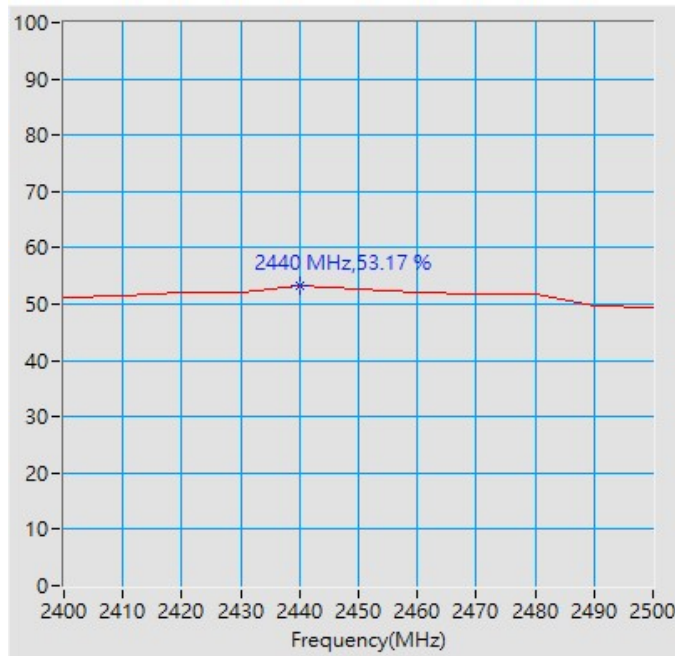


Maximum Peak Gain at 2420 MHz : 4.74 dBi

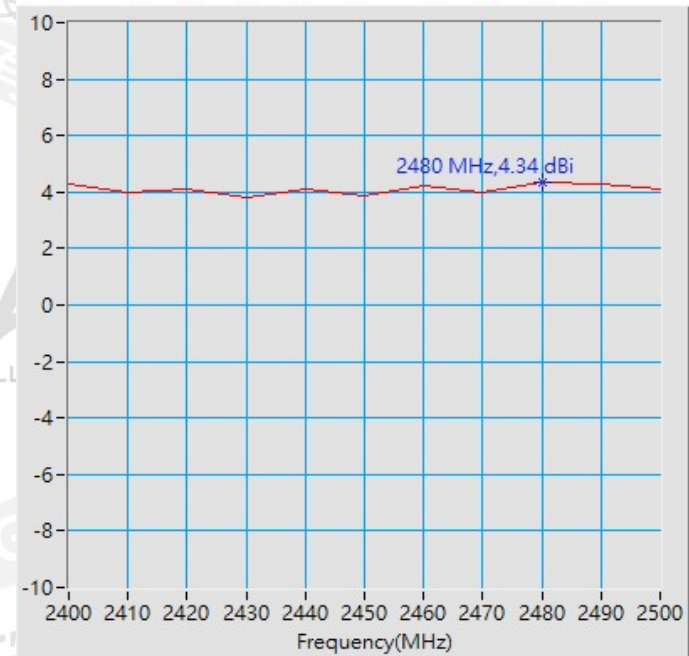
2. Antenna Characteristics

60°

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 2440 MHz : 53.17 %



Maximum Peak Gain at 2480 MHz : 4.34 dBi

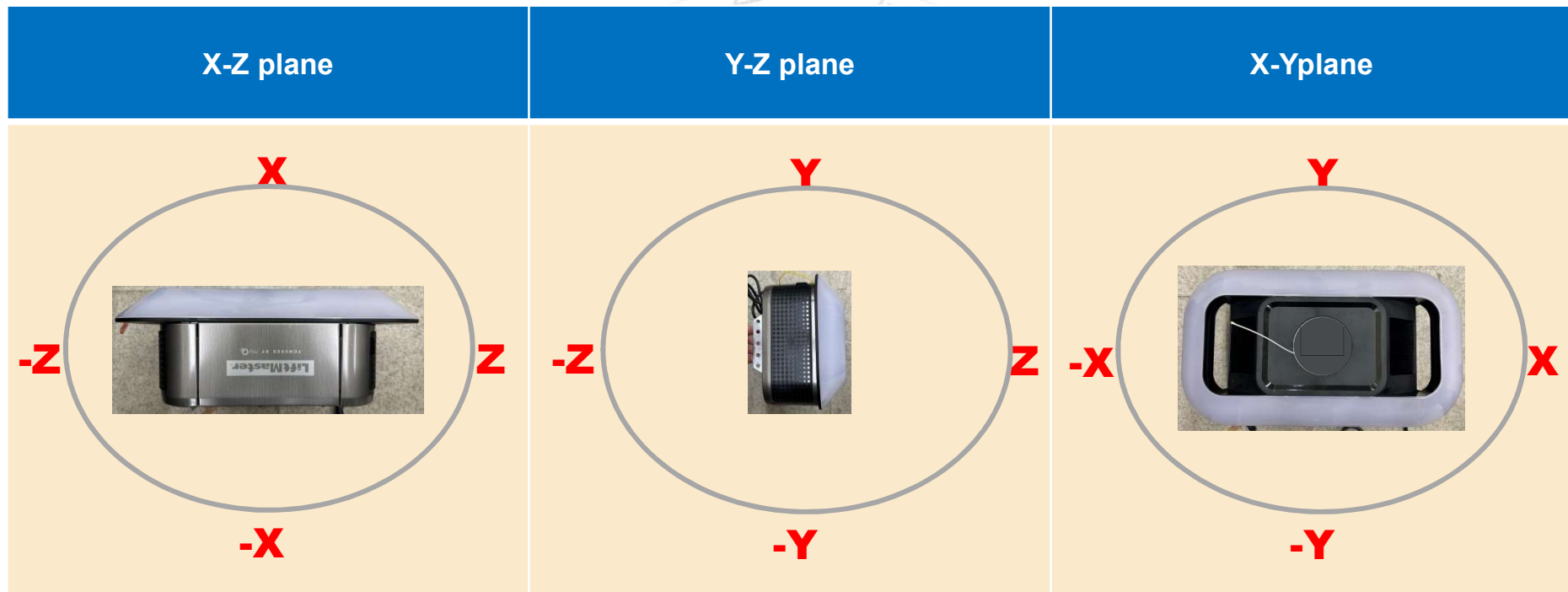
2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

Doublemint_Antenna						
Angle	0		30		60	
Frequency (MHz)	Efficiency (%)	Peak gain (dBi)	Efficiency (%)	Peak gain (dBi)	Efficiency (%)	Peak gain (dBi)
2400	50.51	4.03	50.80	4.58	51.28	4.31
2450	52.01	4.77	52.84	3.63	52.77	3.86
2500	49.07	4.25	49.37	4.32	49.32	4.12

2. Antenna Characteristics

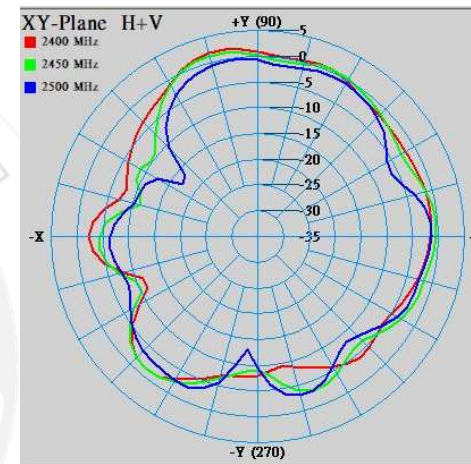
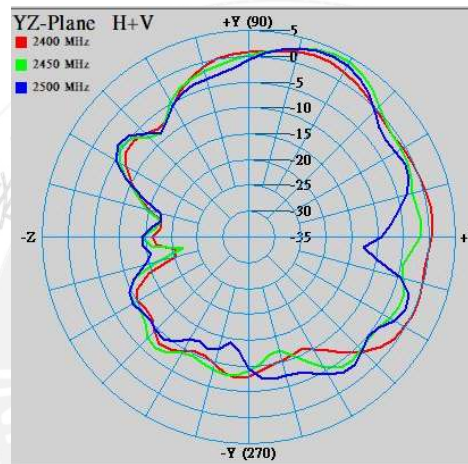
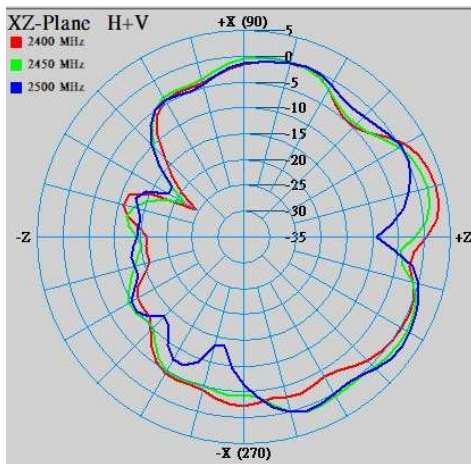
2.3 3 views of antenna



2. Antenna Characteristics

0°

2.3 2D Radiation Patterns

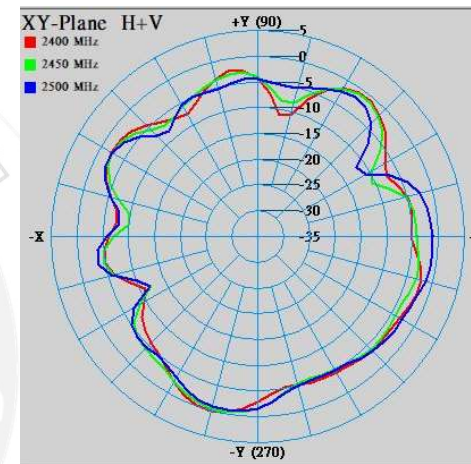
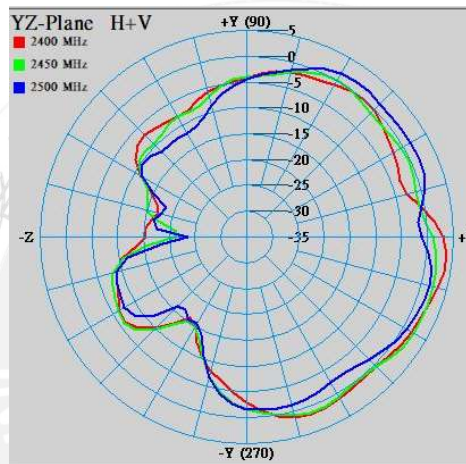
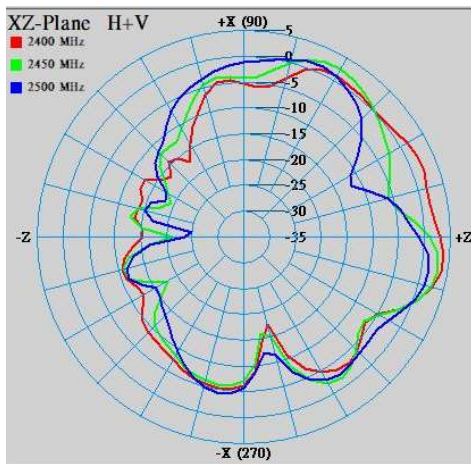


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
2400	3.59	-2.60	2.46	-2.62	1.88	-2.62
2450	1.78	-2.41	4.19	-2.81	1.28	-2.69
2500	2.32	-2.85	3.51	-3.55	-0.39	-3.90

2. Antenna Characteristics

30°

2.3 2D Radiation Patterns

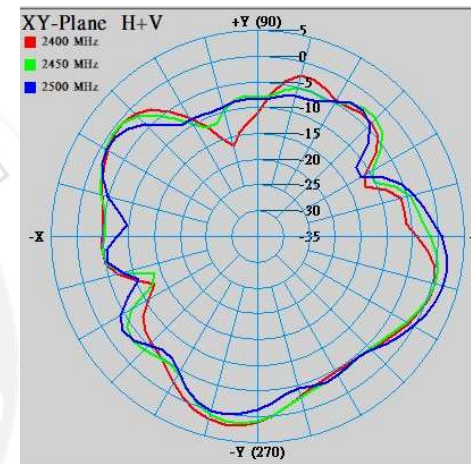
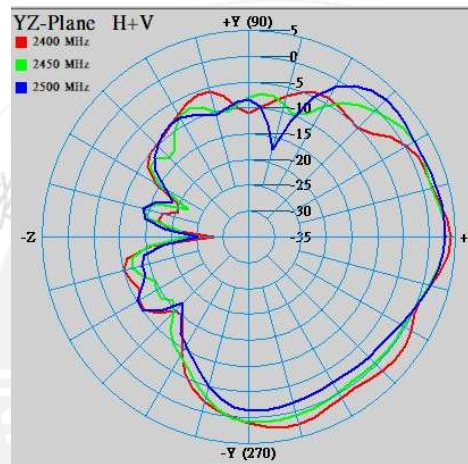
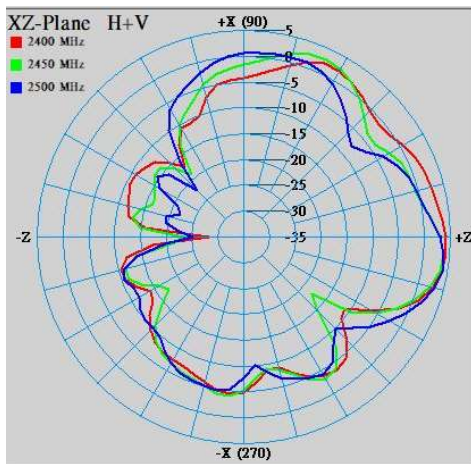


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
2400	3.86	-2.85	3.88	-2.04	-0.01	-4.02
2450	3.14	-3.53	2.40	-2.15	-0.43	-4.14
2500	1.50	-4.12	1.88	-2.49	-0.81	-3.83

2. Antenna Characteristics

60°

2.3 2D Radiation Patterns

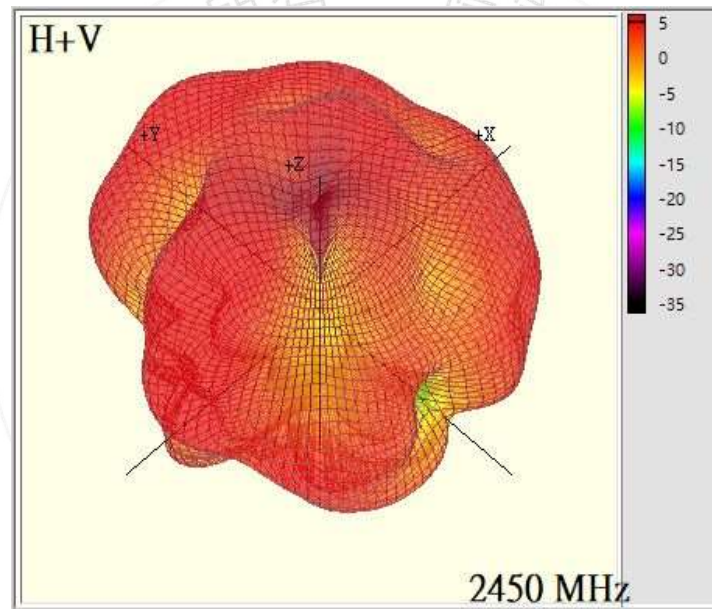


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
2400	4.28	-2.45	4.07	-1.69	1.96	-3.25
2450	3.86	-2.92	3.10	-2.26	1.55	-3.18
2500	4.04	-3.05	2.99	-2.40	2.29	-3.30

2. Antenna Characteristics

2.3 3D Radiation Patterns

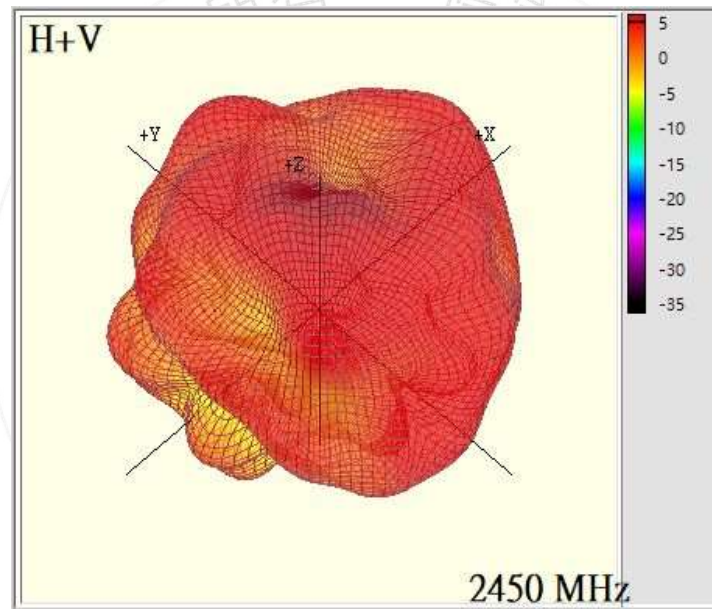
0°



2. Antenna Characteristics

2.3 3D Radiation Patterns

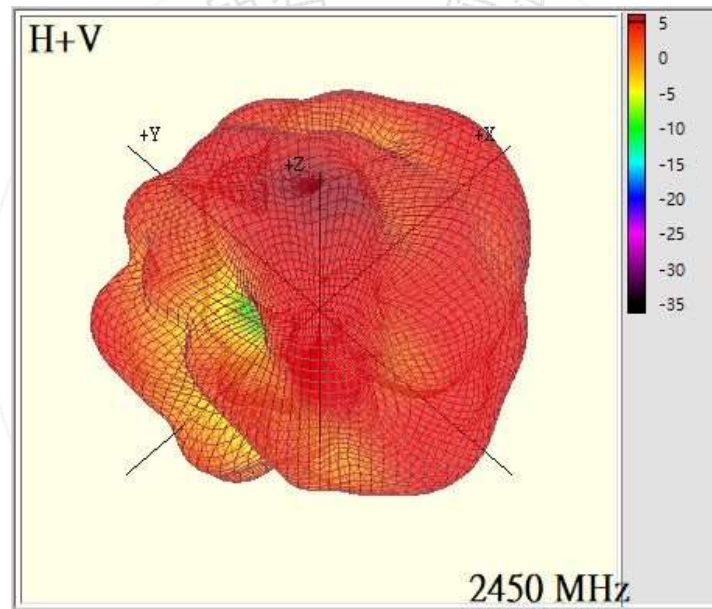
30°



2. Antenna Characteristics

2.3 3D Radiation Patterns

60°



3. Summary

- The performance of antennas is shown in table

	Doublemint_Antenna		
Angle	0	30	60
Maximum Efficiency (%)	52.78	52.96	53.17
Maximum Gain (dBi)	4.77	4.74	4.34

Thank you

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