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RS485 WiFi Antenna Simulation Report

ZYXEL / IAP500BE

Version: V 1.00

Released Date: 2024/07/04

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Reviewed By :

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Revised History



Released Date	Version	Record
2024/07/04	V1.00	Antenna test report

Specification



Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
WiFi 2/5G	1	2400-2500(MHz) /4900-5850 (MHz)	

Requirements of Measurement

Test Item	Specification	Remark
Return loss	> 10 dB	
Isolation	None	
Peak gain	< 2dBi (2400-2500 MHz) < 3dBi (4900-5850 MHz)	
H-Plane Average gain	> -5.5dBi	
Efficiency	> 65%	
Radiation pattern	Scale: +10 ~ -40dBi, Angle step size: 5 degree	

Antenna Dimension and Placement



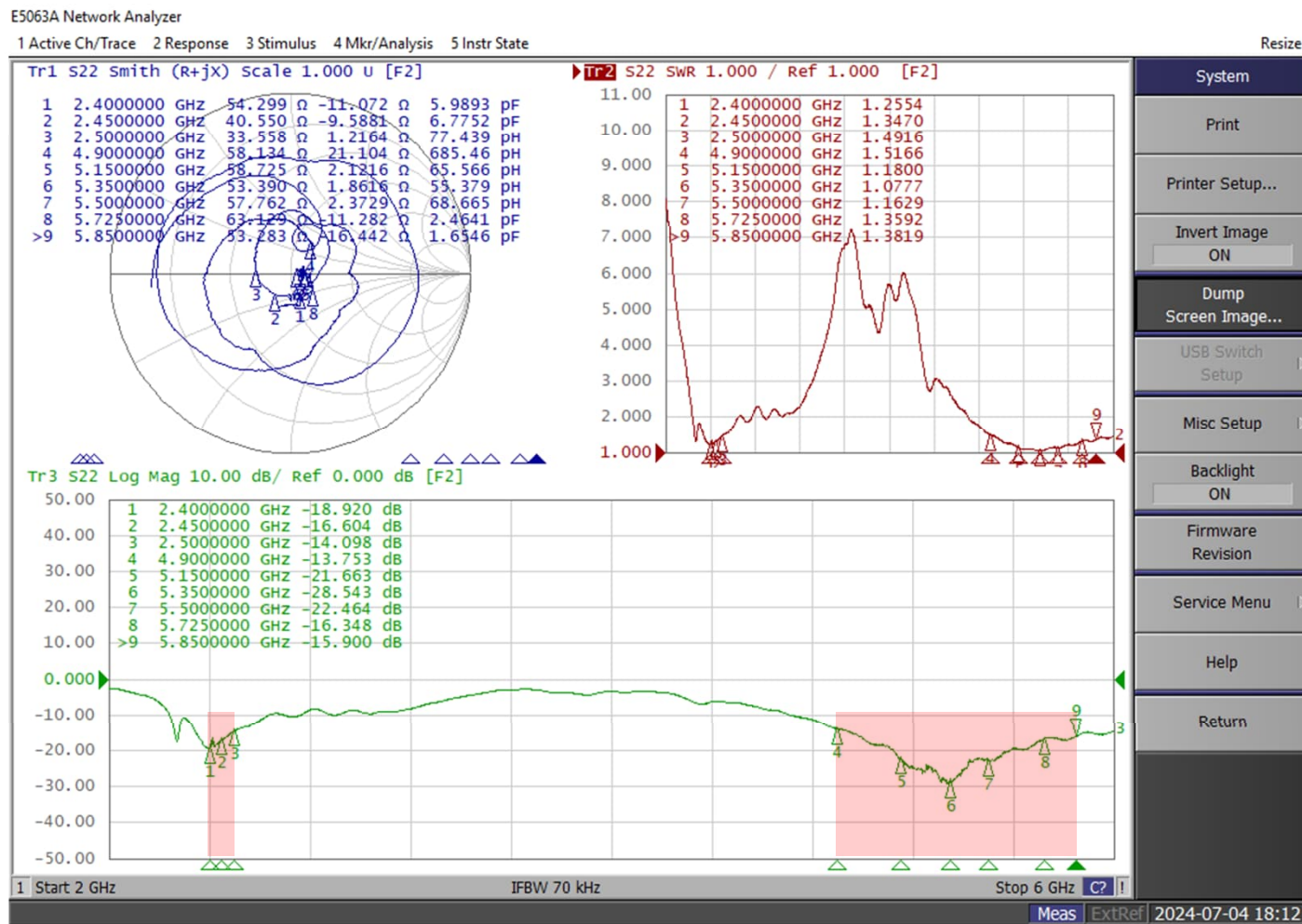
Test Setup for S-parameter Measurement



Equipment	Brand	Model	S/N
Network Analyzer	Keysight	E5063A	MY54706080



Return Loss

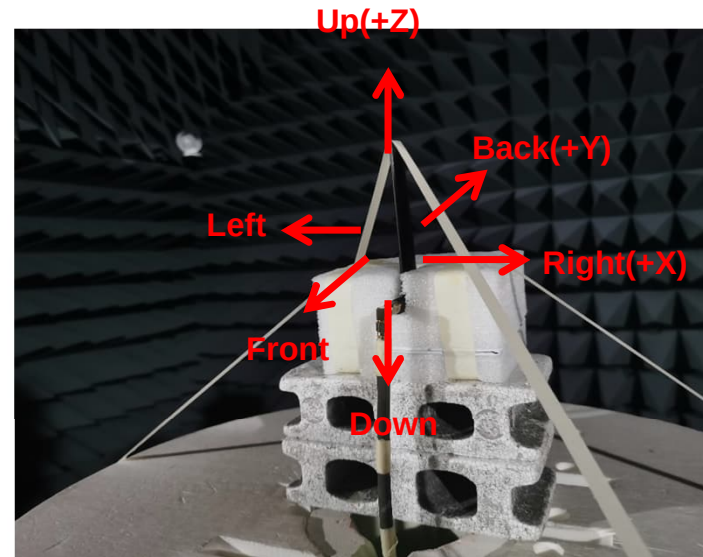


Test Setup for Radiation Pattern Measurement



•SATIMO SG-24L Multi-Probe Antenna Measurement System

- Angle between probes: 15°
- Frequency range: 400 MHz – 8.5 GHz
- Chamber Room Size: 5m L x 5m W x 5m H
- Software: Wave Studio
- Calibration date: 2023.04.28
- Calibration due date: 2024.05.28



2D Radiation Pattern Results



2G Antenna



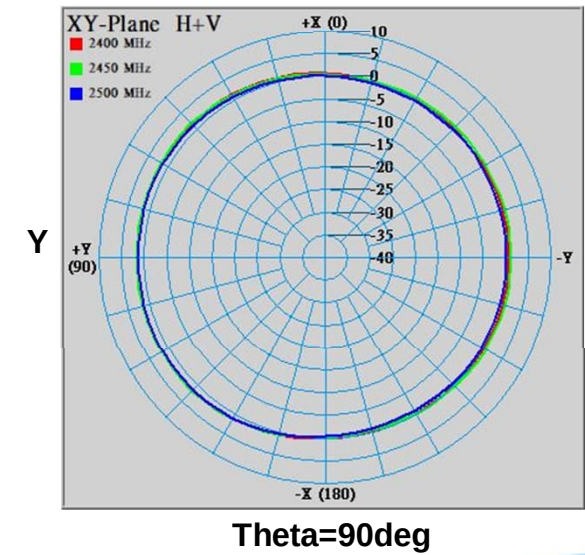
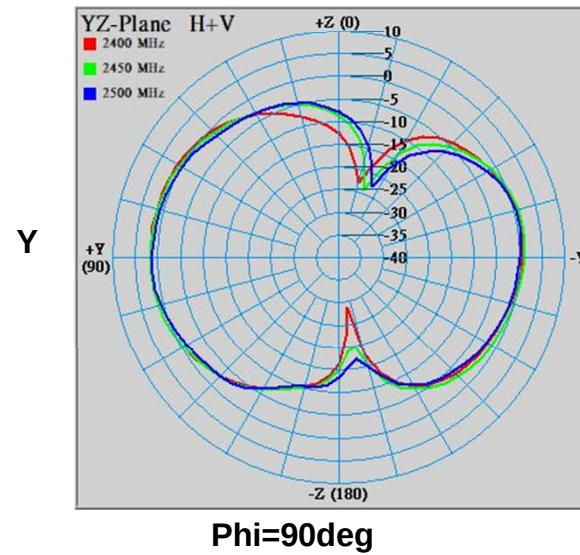
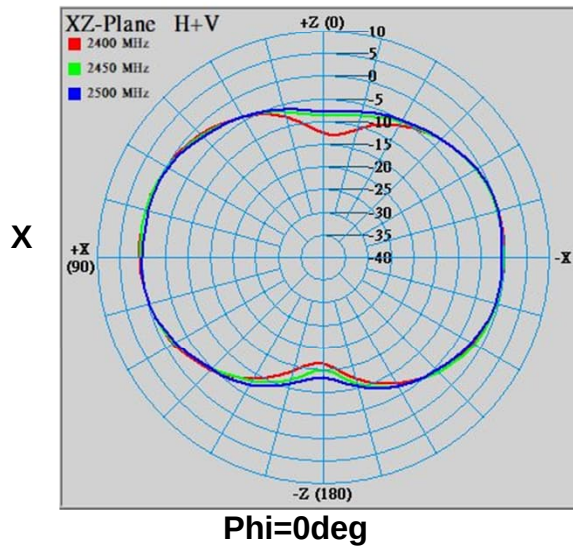
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2D Radiation Pattern Results



5G Antenna



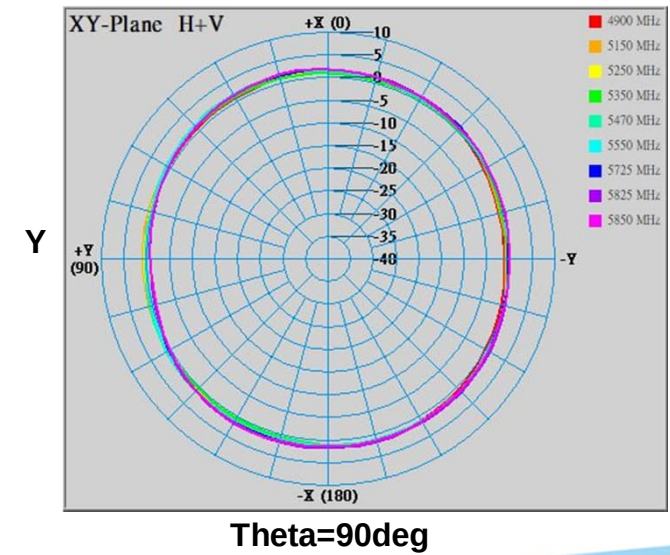
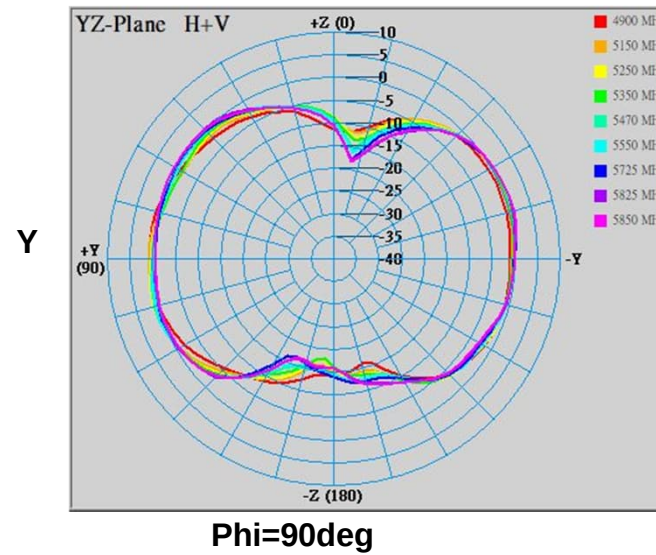
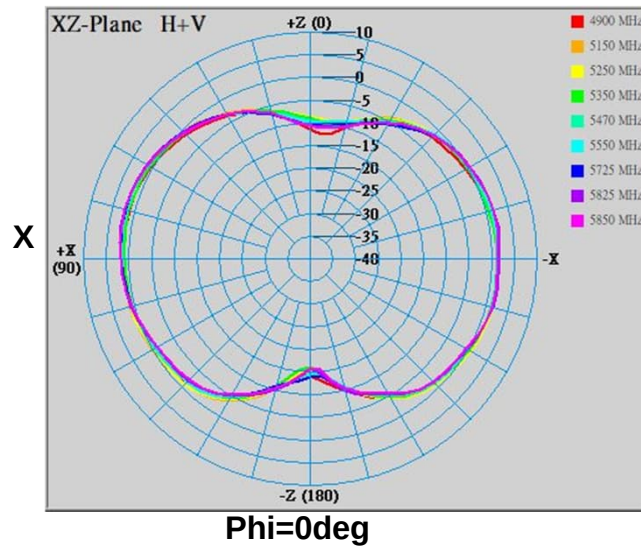
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Return Loss

Frequency(MHz)	Antenna (dB)
2400	18.9
2450	16.6
2500	14.0
4900	13.7
5150	21.6
5350	28.5
5500	22.4
5725	16.3
5850	15.9

3D Peak Gain& Efficiency



Frequency (MHz)	Antenna		
	Peak Gain (dBi)	Efficiency (dB)	Efficiency (%)
2400	1.88	-1.12	77
2450	1.92	-0.91	81
2500	1.60	-1.20	78
4900	1.63	-1.79	66
5150	1.92	-1.69	68
5250	2.10	-1.60	69
5350	1.86	-1.87	65
5470	2.20	-1.48	71
5550	2.31	-1.47	71
5725	2.20	-1.53	70
5825	2.43	-1.41	72
5850	2.37	-1.53	70

2D Peak Gain& Average Gain



Frequency (MHz)	X-Z Plane		Y-Z Plane		X-Y Plane	
	Peak Gain (dBi)	Avg. Gain(dBi)	Peak Gain (dBi)	Avg. Gain(dBi)	Peak Gain (dBi)	Avg. Gain(dBi)
2400	0.76	-2.79	1.75	-2.12	1.86	0.90
2450	0.62	-2.72	1.70	-1.93	1.89	1.06
2500	0.20	-2.84	1.38	-2.60	1.58	0.51
4900	1.55	-1.48	0.89	-2.90	1.38	0.63
5150	1.61	-1.20	1.03	-2.52	1.47	0.81
5250	1.71	-1.17	1.14	-2.37	1.58	0.88
5350	1.41	-1.50	0.71	-2.56	1.37	0.64
5470	1.75	-1.33	1.17	-2.29	1.94	1.03
5550	2.02	-1.28	1.03	-2.33	1.85	1.02
5725	2.10	-1.28	1.27	-2.46	1.82	0.97
5825	2.33	-1.18	1.12	-2.33	2.01	1.08
5850	2.26	-1.30	1.26	-2.40	2.03	0.98