

MSI GRBE94_ Antenna Passive Report

(Plan H 1)

V6.0

Report Change List



Version	Change description	Author	Date
V1.0	First version	Wen	2025.09.18
V2.0	High-gain antennas	Xiao	2025.11.21
V3.0	6G plan B	Xiao	2025.12.3
V4.0	Plan H (25F+6B)	Xiao	2025.12.7
V5.0	Plan H 1	Xiao	2025.12.23
V6.0	Plan H 1+底塞	Xiao	2026.01.07

CONTENTS

- ◆ **Purpose & Environment**
- ◆ **DUT Antenna**
- ◆ **Return Loss and Isolation**
- ◆ **2D&3D Radiation Pattern**
- ◆ **Peak Gain and Efficiency**
- ◆ **Summary**

Purpose

- Meet the electrical performance index ;
- Confirm the antenna scheme to meet the design requirements;

Environment

- Test Condition: the network analyzer(E5071C) and SATIMO microwave anechoic chamber
- Passive measurement results are presented mock up

Antenna Model

Ant 1



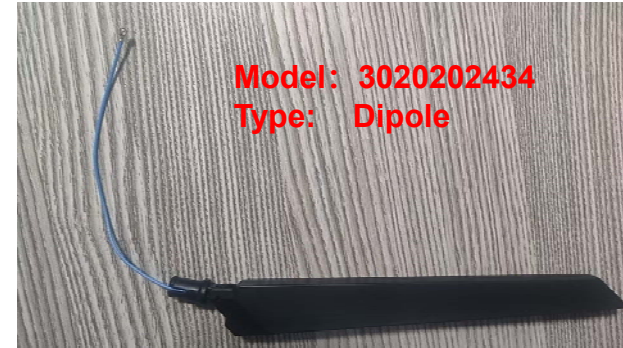
Size: 105*7.7mm L=162mm

Ant 2



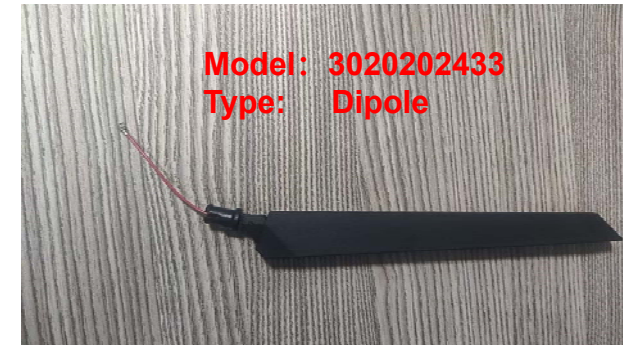
Size: 105*7.7mm L=80mm

Ant 3



Size: 72*13*0.6mm L=125mm

Ant 4



Size: 72*13*0.6mm L=55mm

DUT Antenna



1. Main Antenna manufacturer :

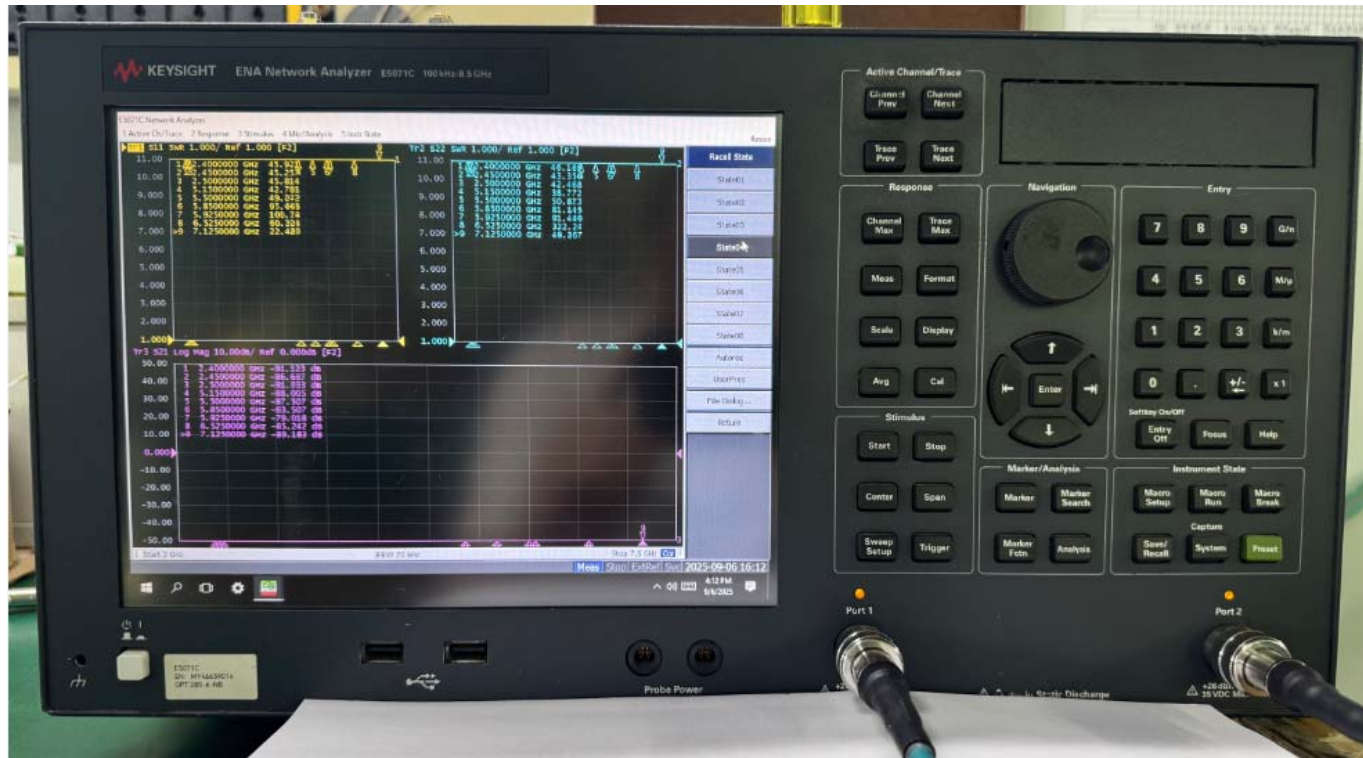
Dongguan City Renfeng Electronic Technology Co., LTD

Manufacturer address:

No. 1, Sankeng Industrial Zone, Qinghutou, Tangxia Town,
Dongguan, Guangdong, China.

Return Loss and Isolation

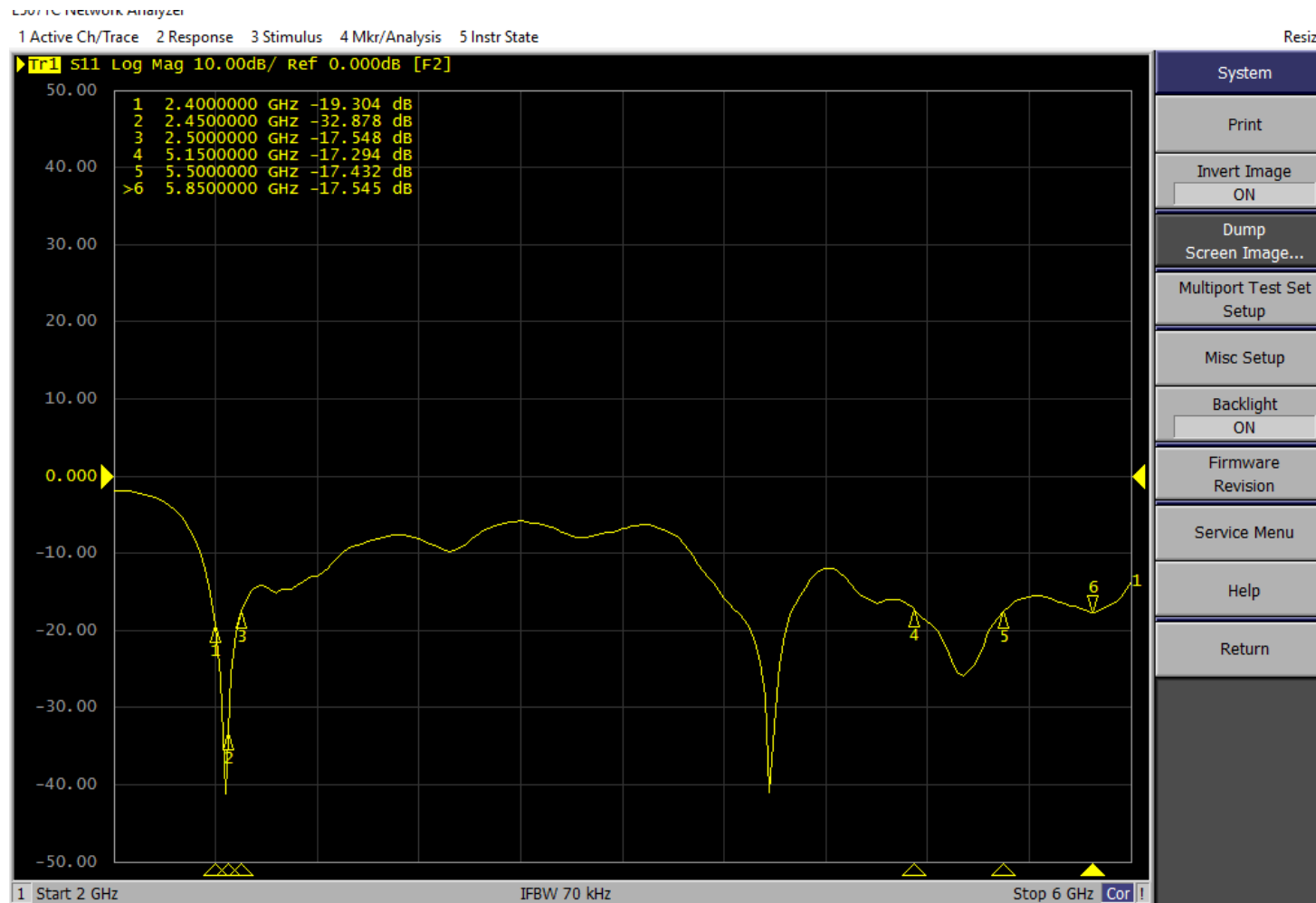
Measurement Condition



The network Analyzer

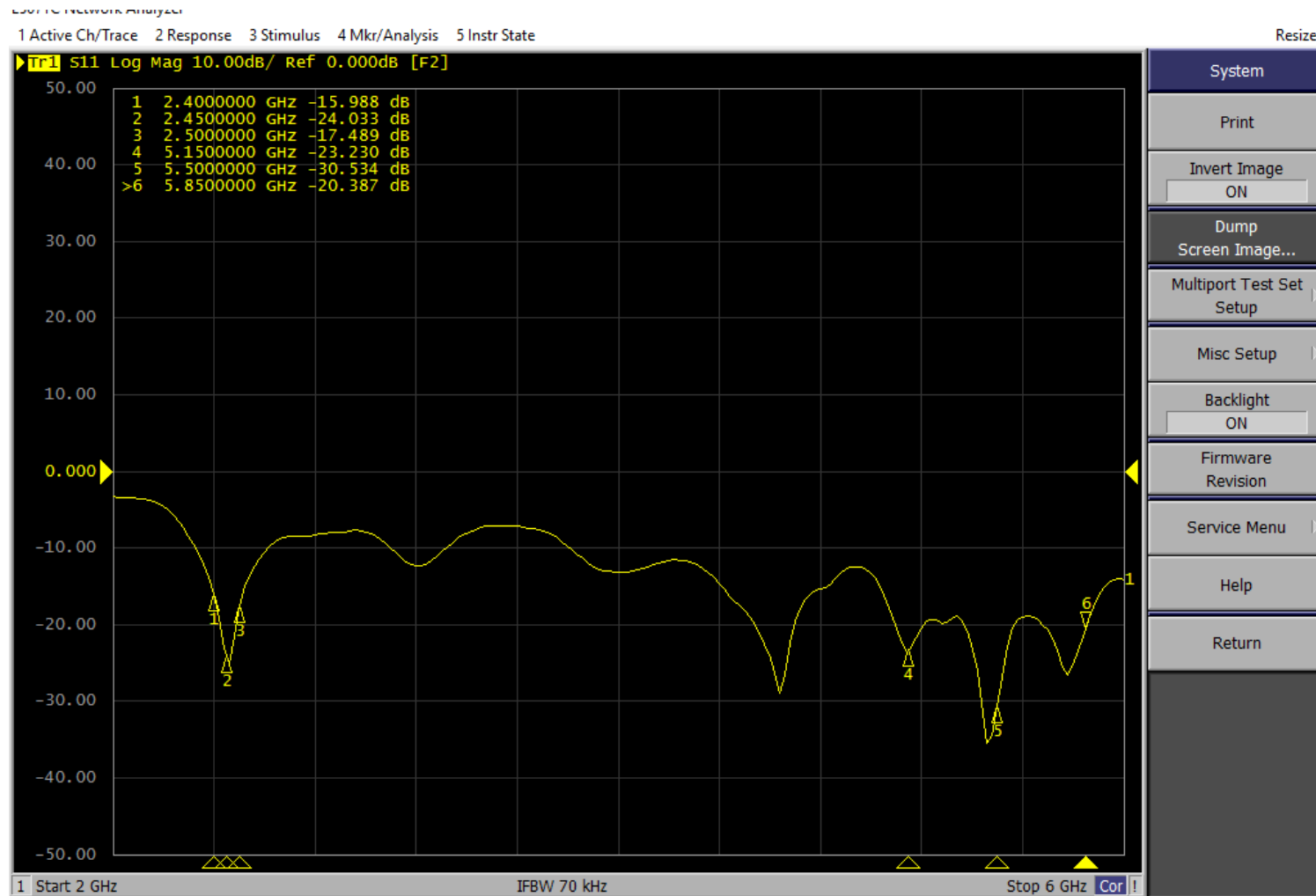
Return loss

ANT1-2.4/5G (2.4-2.5GHz 5.15-5.85GHz)



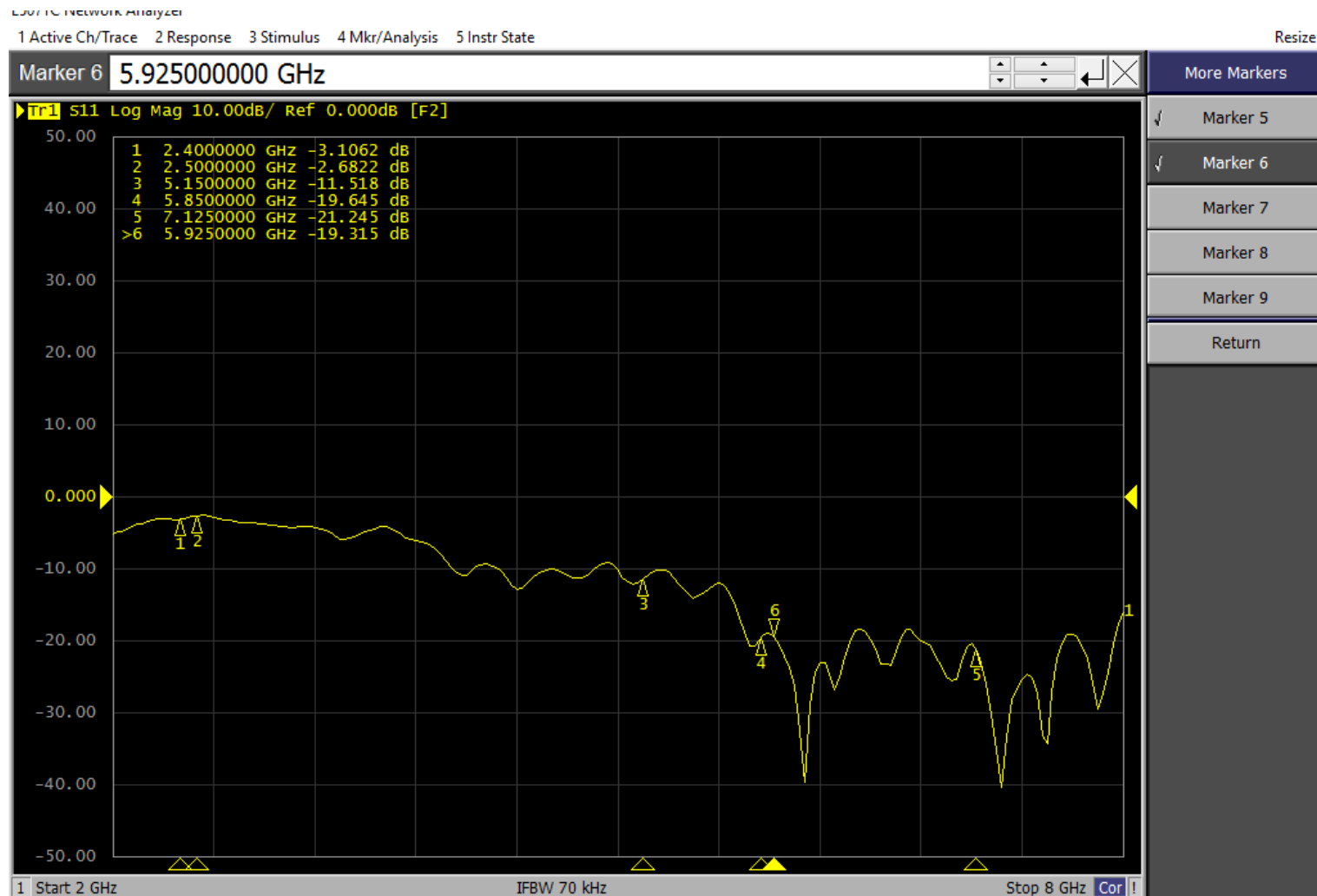
Return loss

ANT2-2.4/5G (2.4-2.5GHz 5.15-5.85GHz)



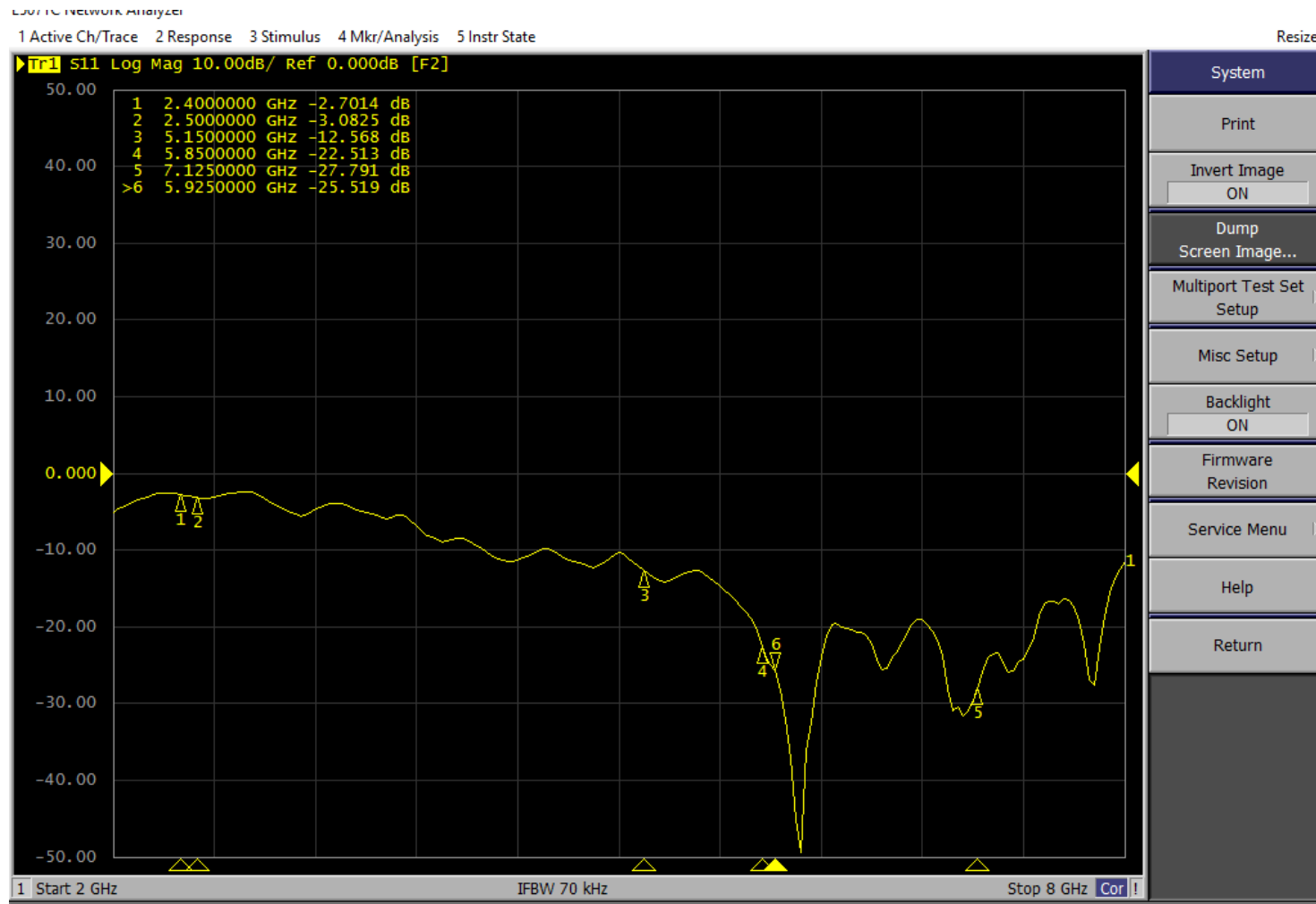
Return loss

ANT3-6G (5.925-7.125GHz)



Return loss

ANT4-6G (5.925-7.125GHz)



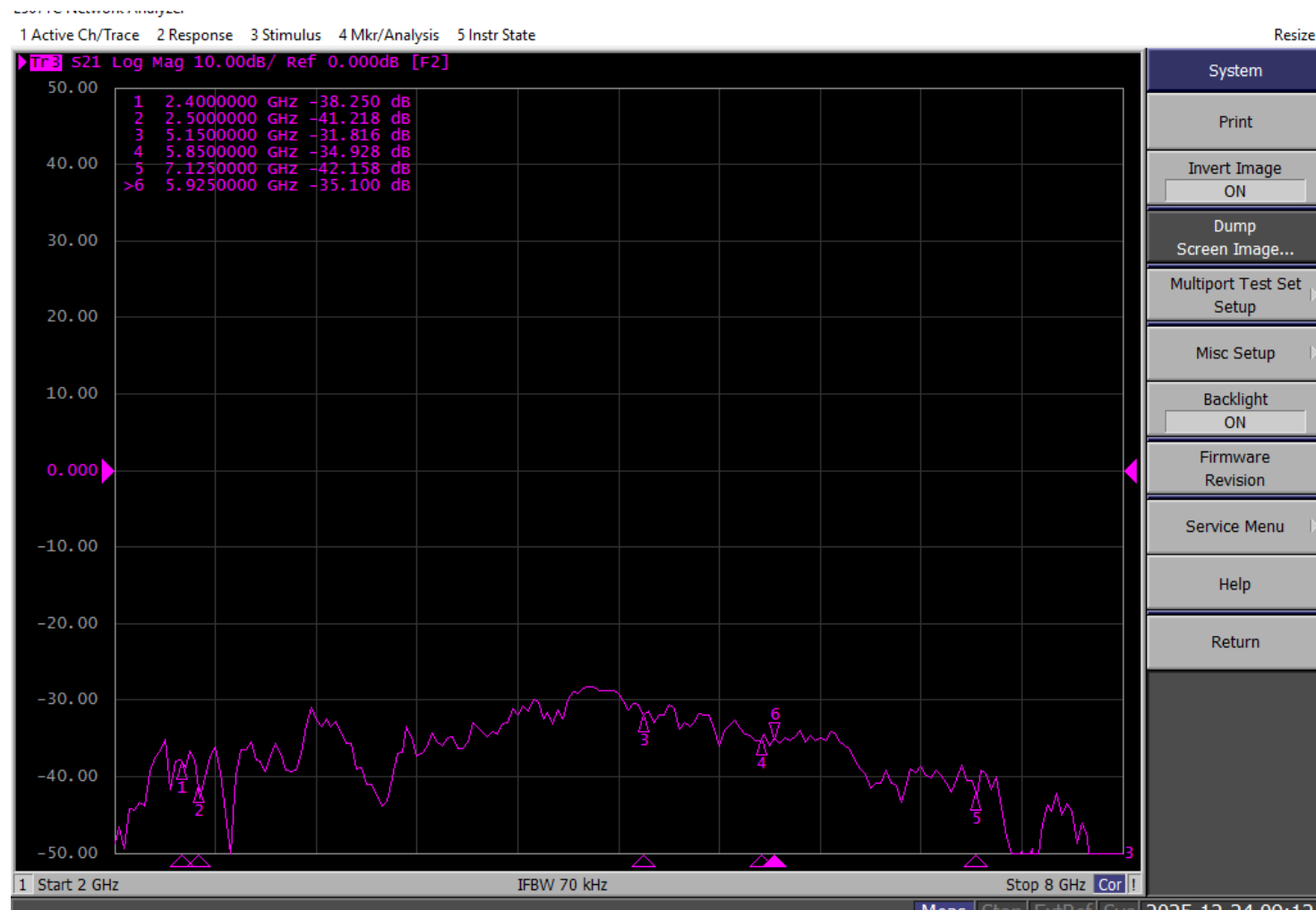
Return loss

Return loss				
ANT	Frequency/NO.	2.4-2.5GHz	5.15-5.85GHz	5.925-7.125GHz
2.4/5G	ANT1	<-11.7dB	<-11.7dB	NA
	ANT2			NA
6G	ANT3	NA	NA	<-11.7dB
	ANT4	NA	NA	

- The WIFI 2.4G antenna's Return loss $< -11.7\text{dB}$;
- The WIFI 5G antenna's Return loss $< -11.7\text{dB}$;
- The WIFI 6G antenna's Return loss $< -11.7\text{dB}$;

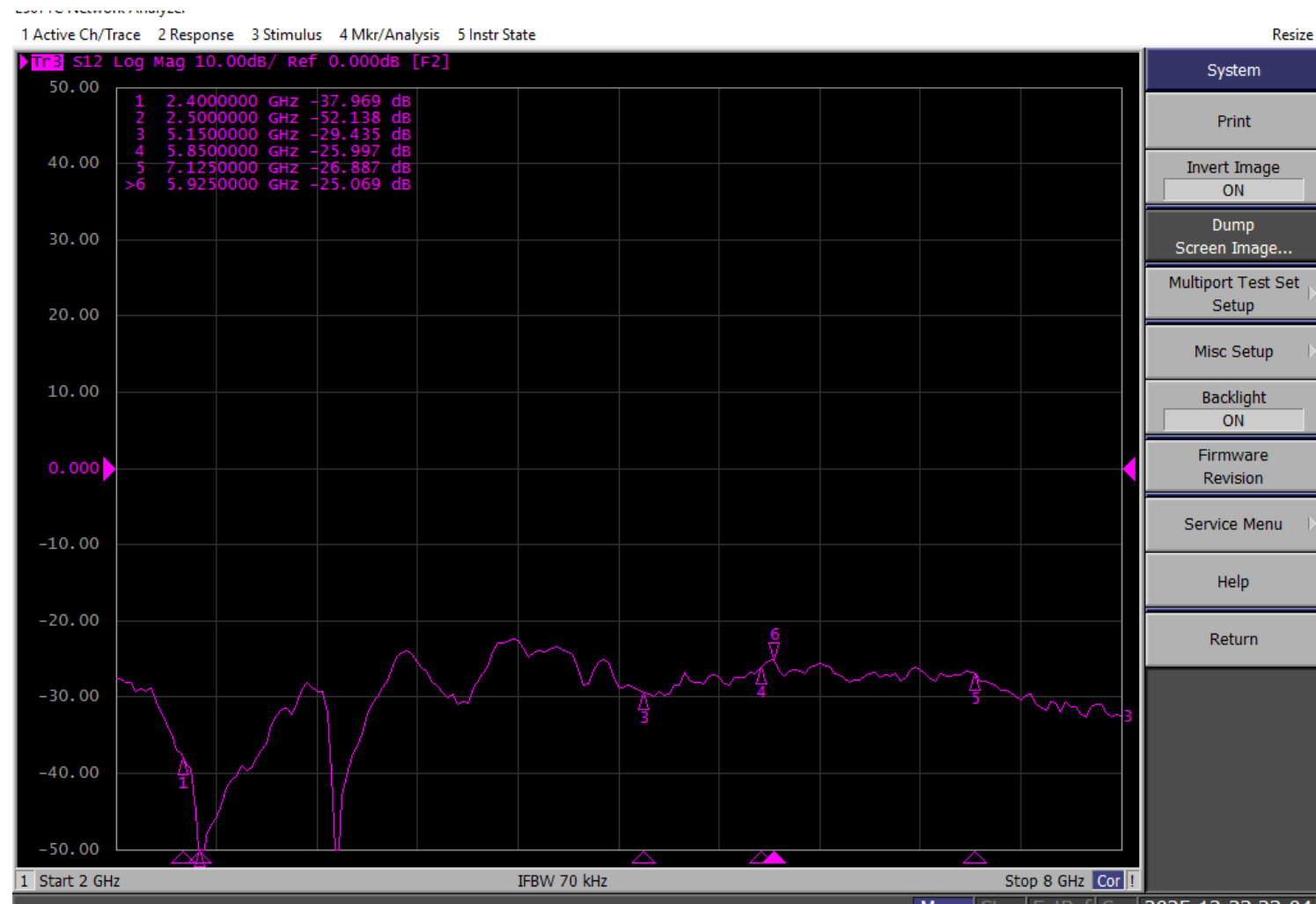
Isolation

ANT1&ANT2-2.4/5G



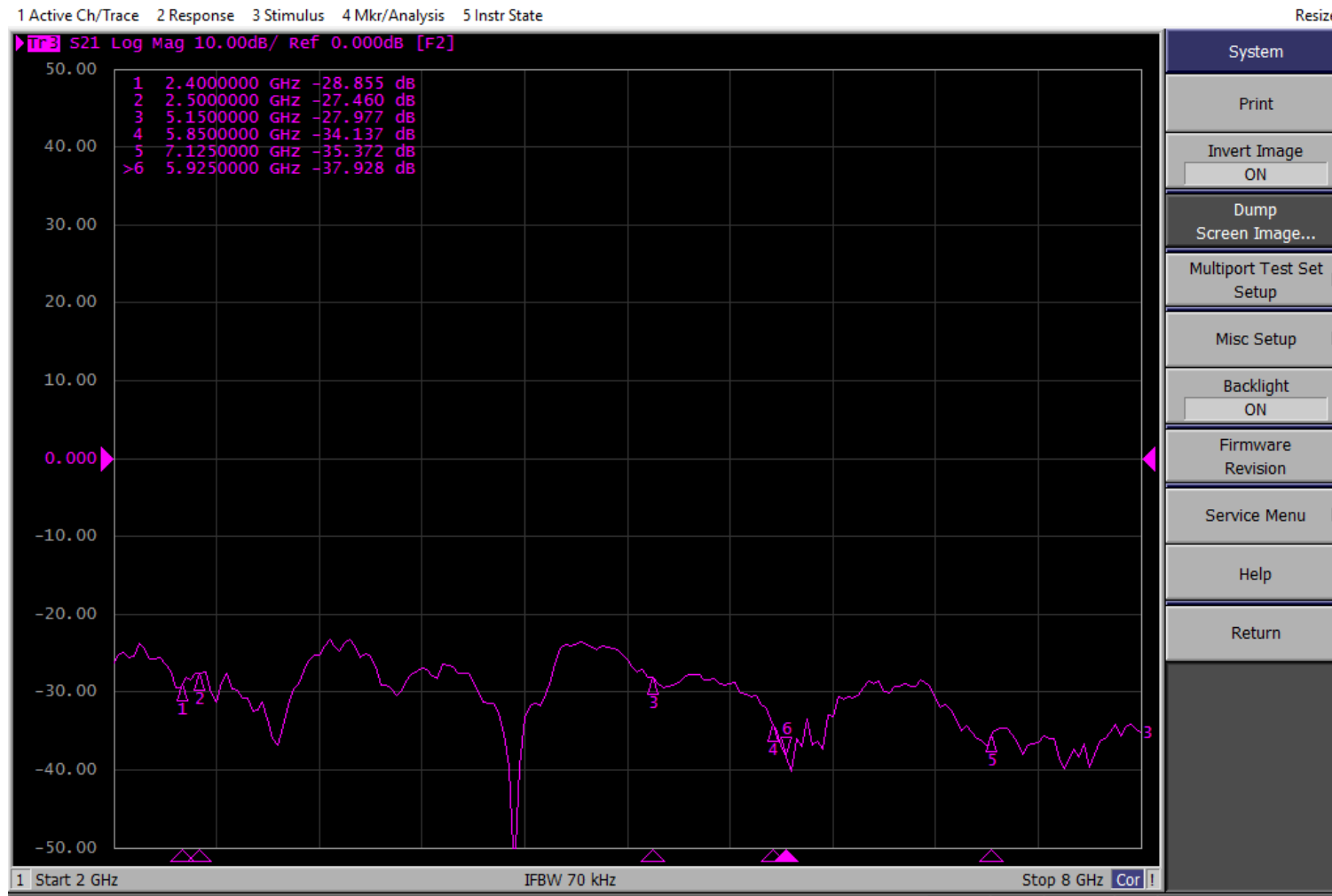
Isolation

ANT3&ANT4-6G



Isolation

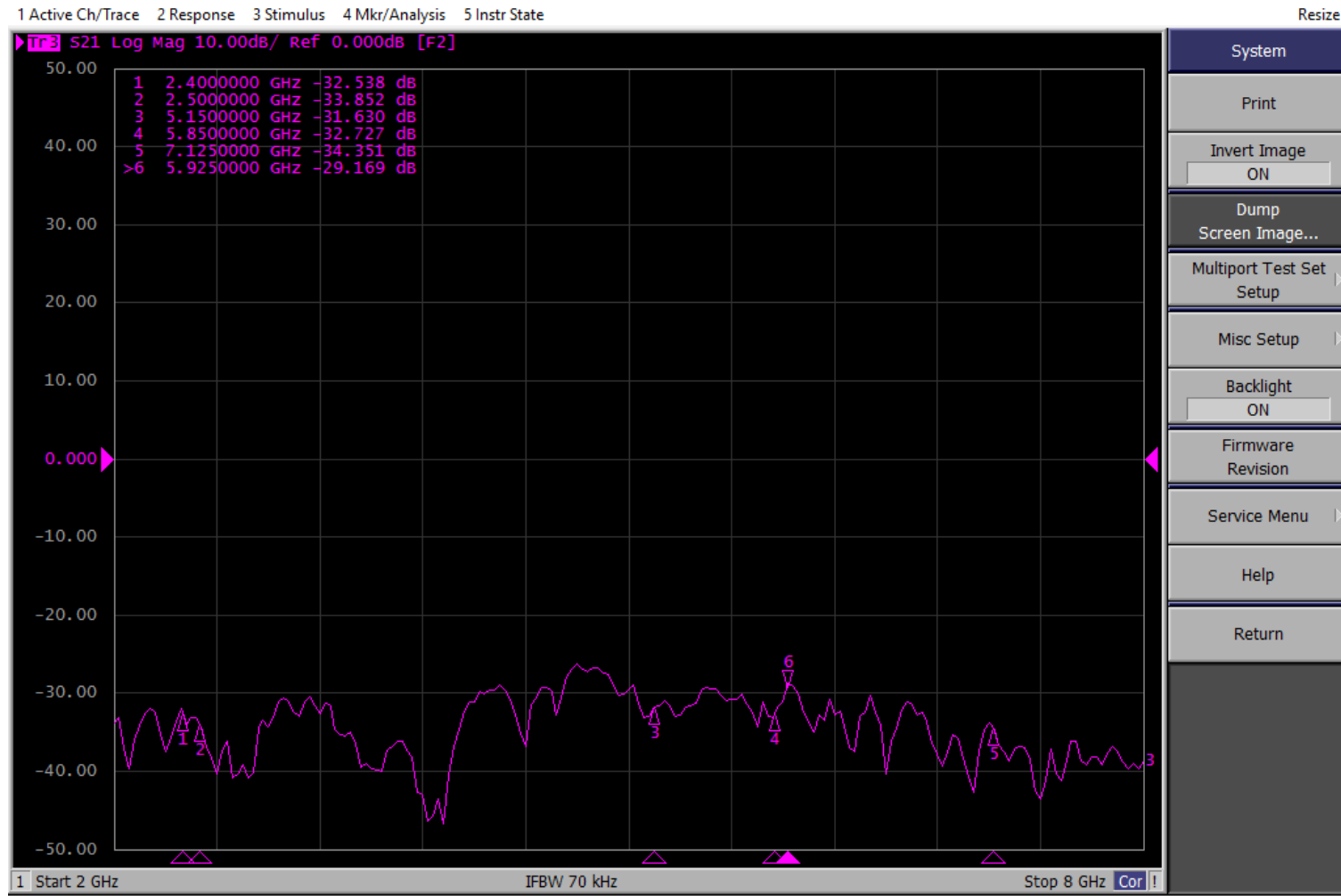
ANT1&ANT3-2.4/5/6G



Isolation

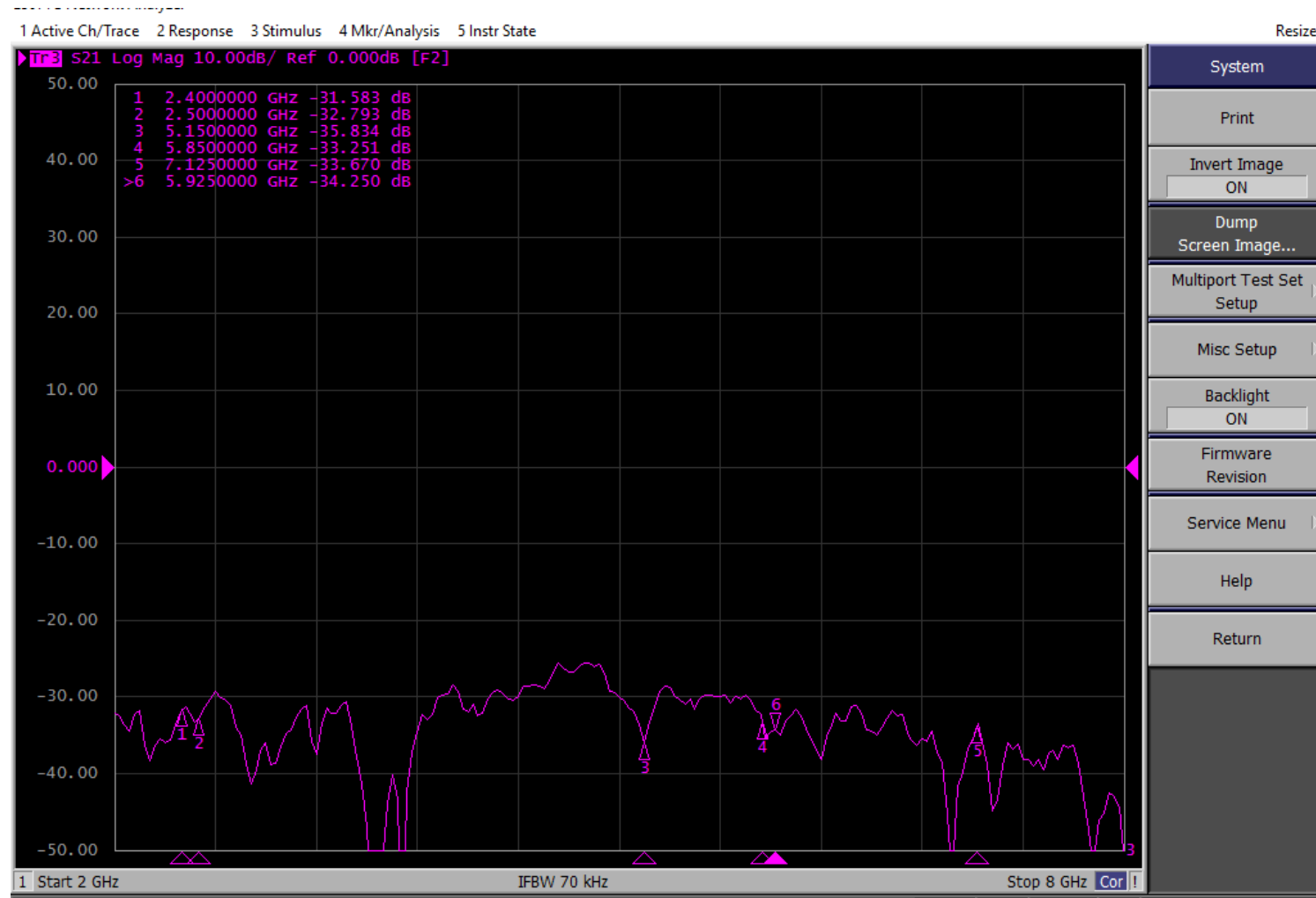


ANT1&ANT4-2.4/5/6G



Isolation

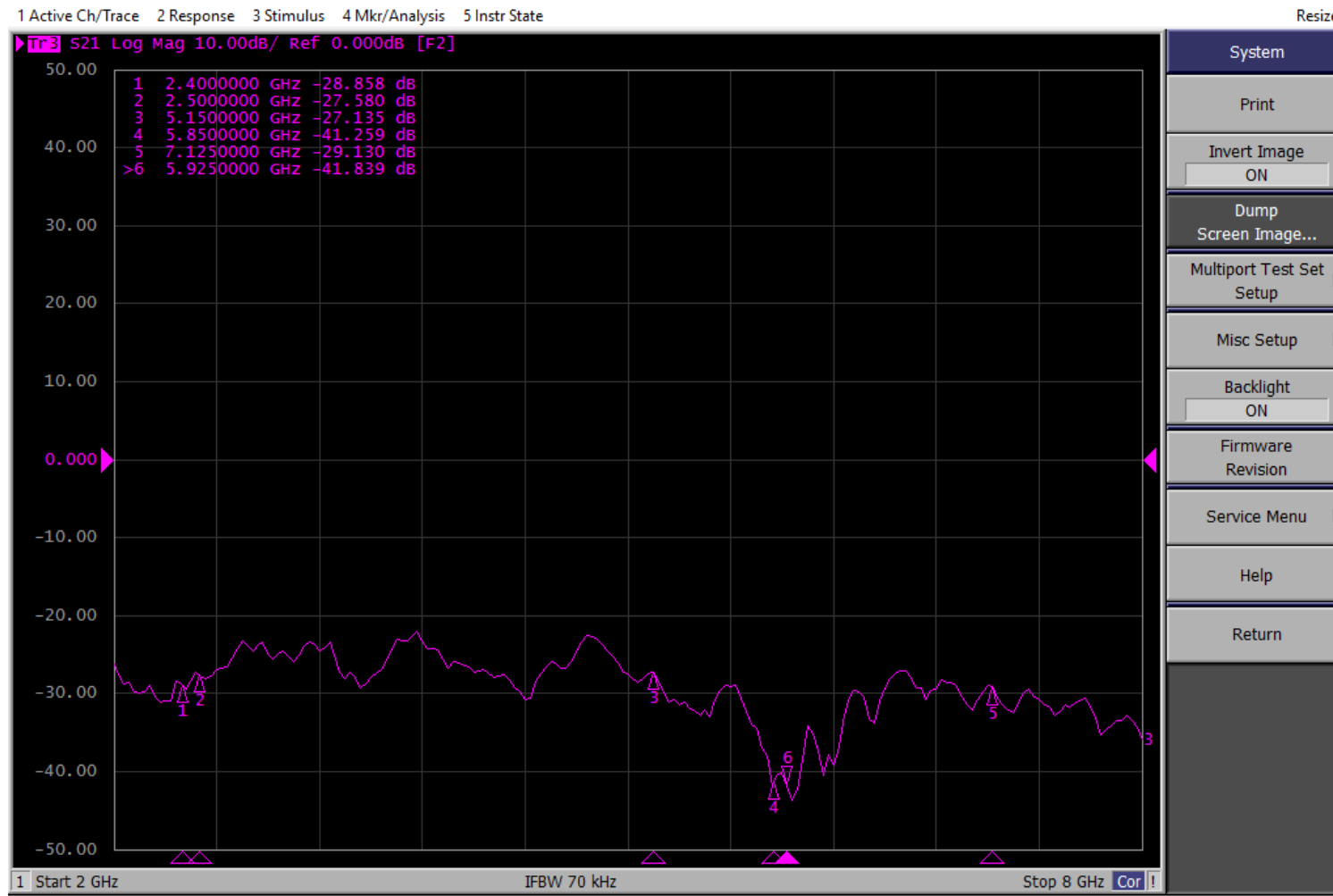
ANT2&ANT3-2.4/5/6G



Isolation



ANT2&ANT4-2.4/5/6G



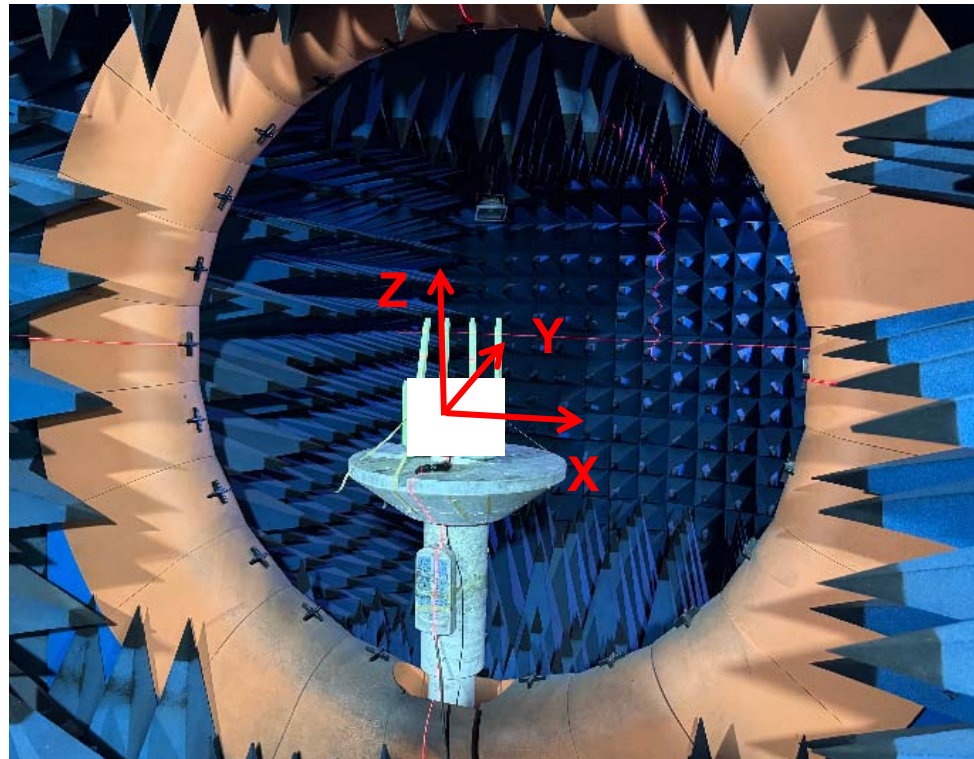
Isolation

Isolation				
ANT	Frequency/NO.	2.4-2.5GHz	5.15-5.85GHz	5.91-7.125GHz
2.4/5G	ANT1	<-30dB	<-30dB	<-25dB
	ANT2			
6G	ANT3	<-25dB	<-25dB	<-25dB
	ANT4			

- The Isolation between WIFI 2.4G antennas < - 30dB;
- The Isolation between WIFI 5G antennas < - 30dB;
- The Isolation between WIFI 6G antennas < - 25dB;
- The Isolation between WIFI 5G &6G antennas < - 25dB;

2D/3D Radiation pattern

Measurement Condition

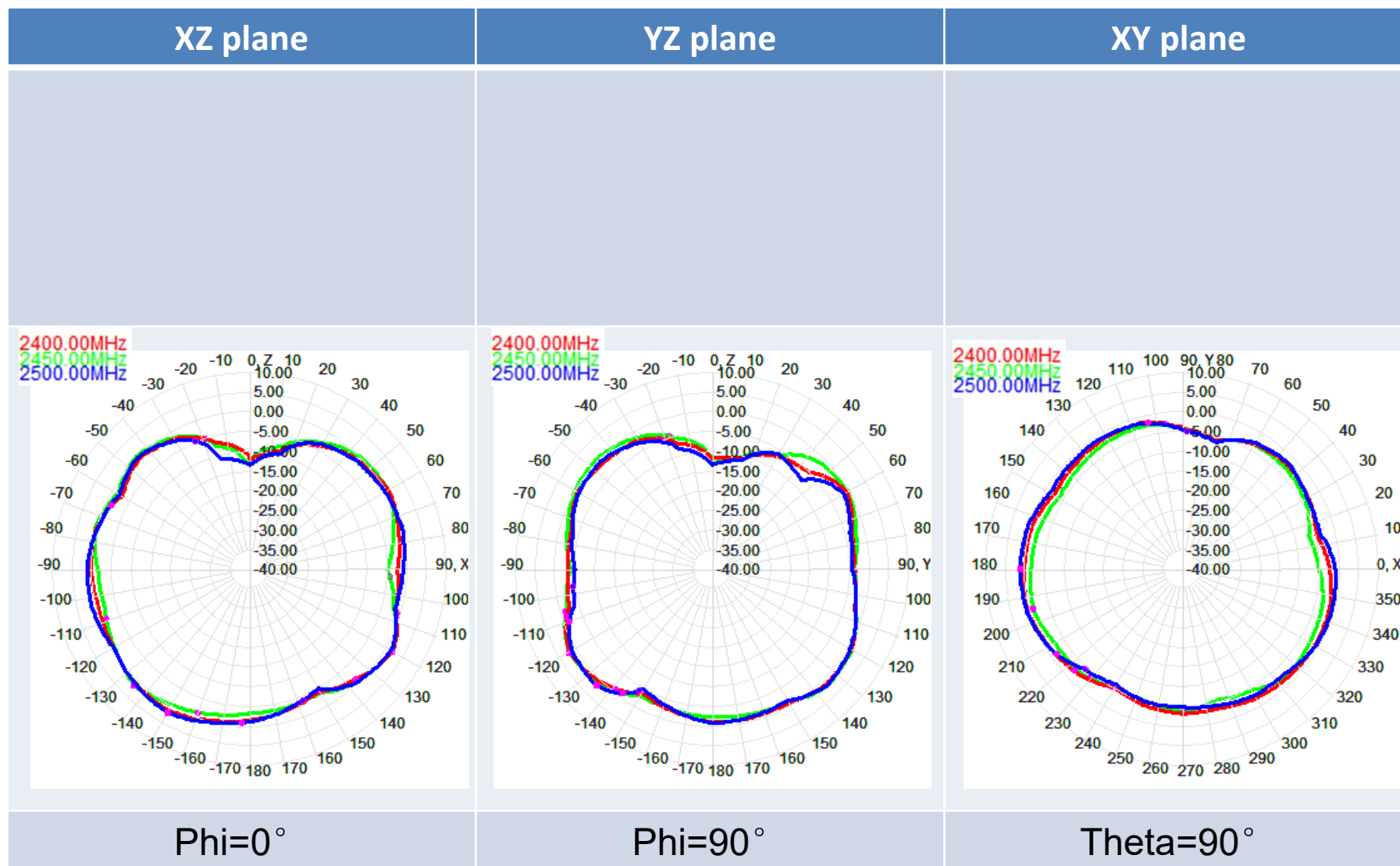


Microwave anechoic chamber

2D Radiation Pattern@2G

T&W

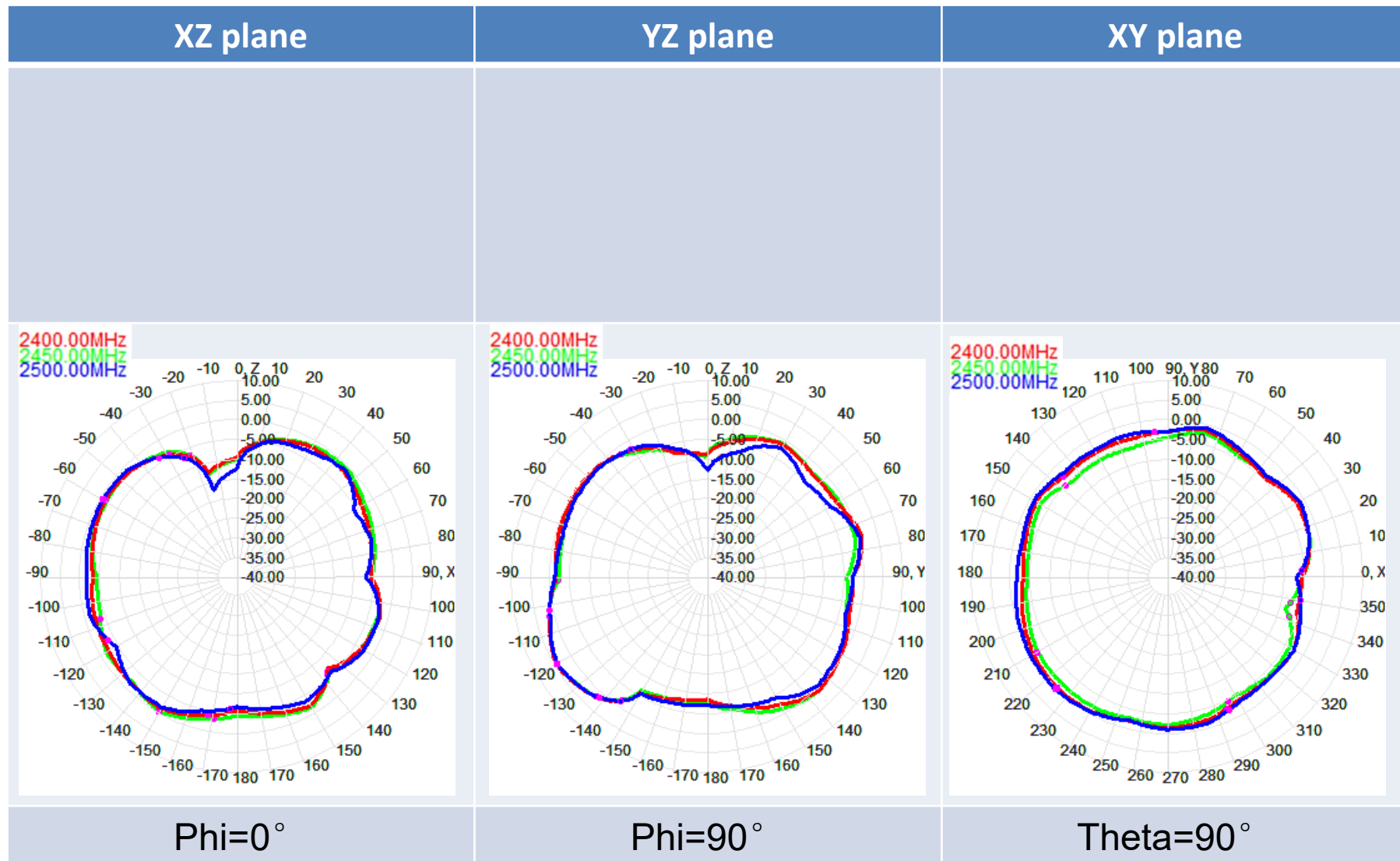
ANT1



2D Radiation Pattern@2G

T&W

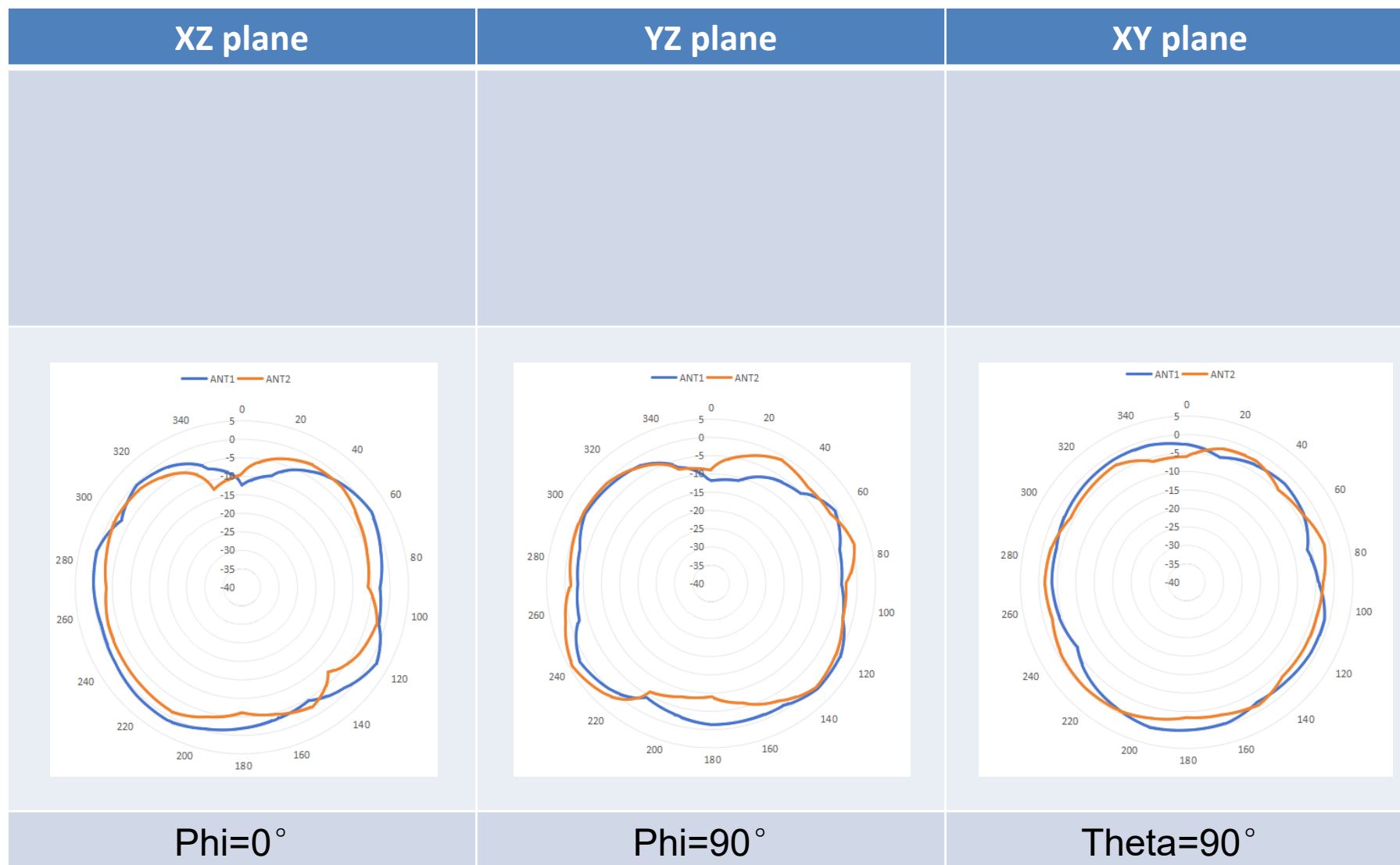
ANT2



2D Radiation Pattern@2.45GHz

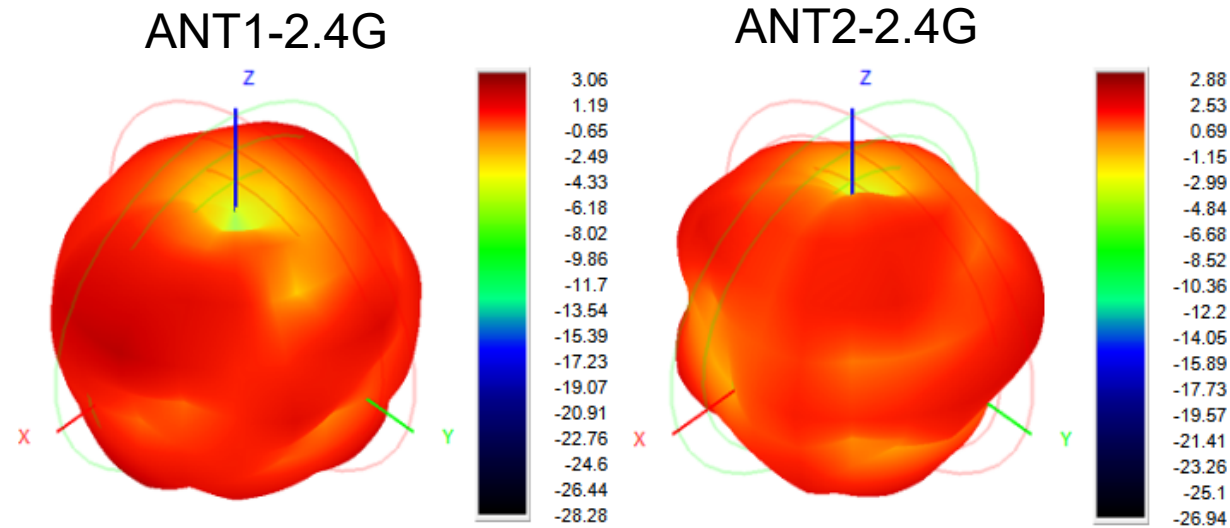
T&W

ANT1&ANT2



3D Radiation Pattern@2.45GHz

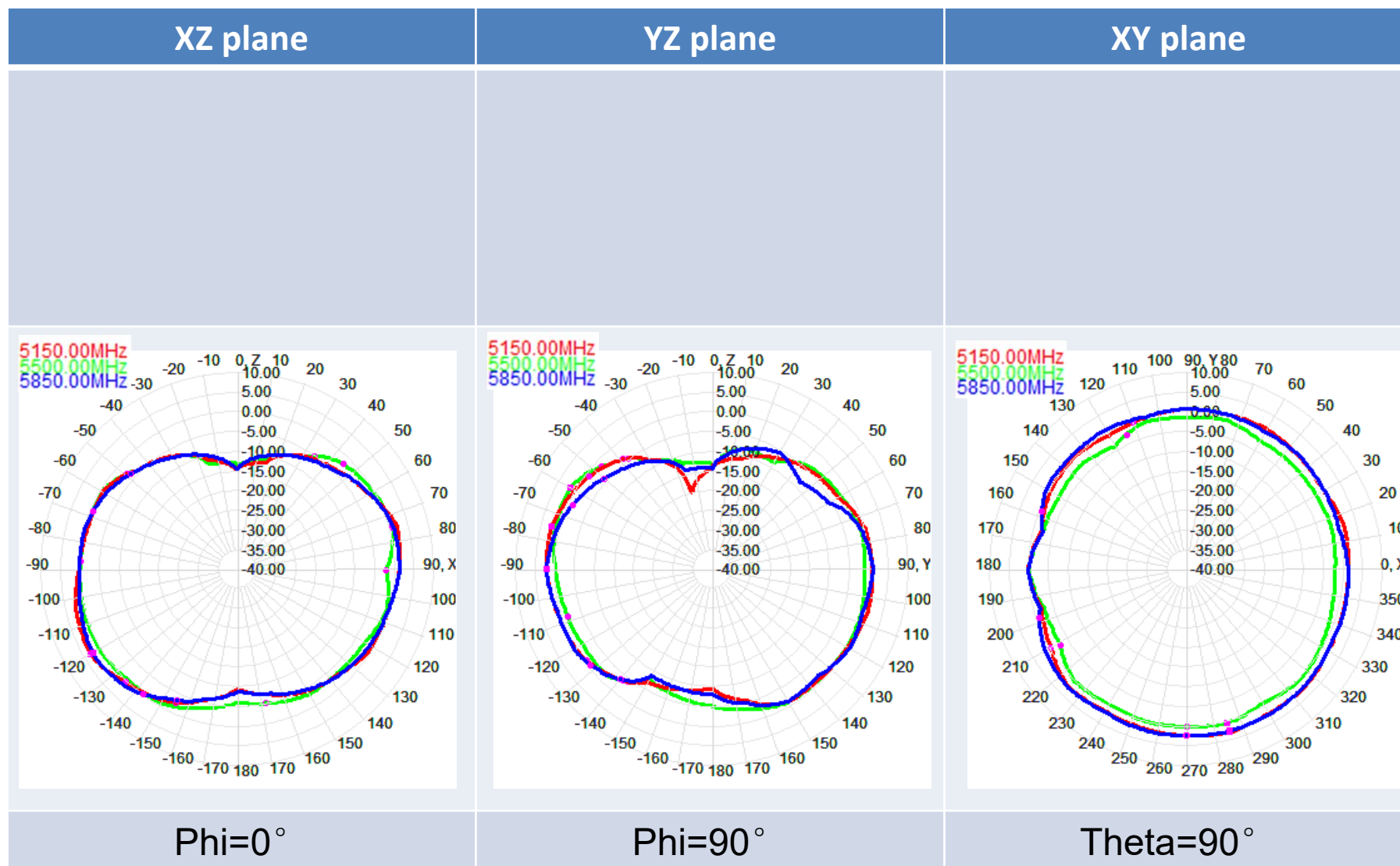
T&W



2D Radiation Pattern@5G

T&W

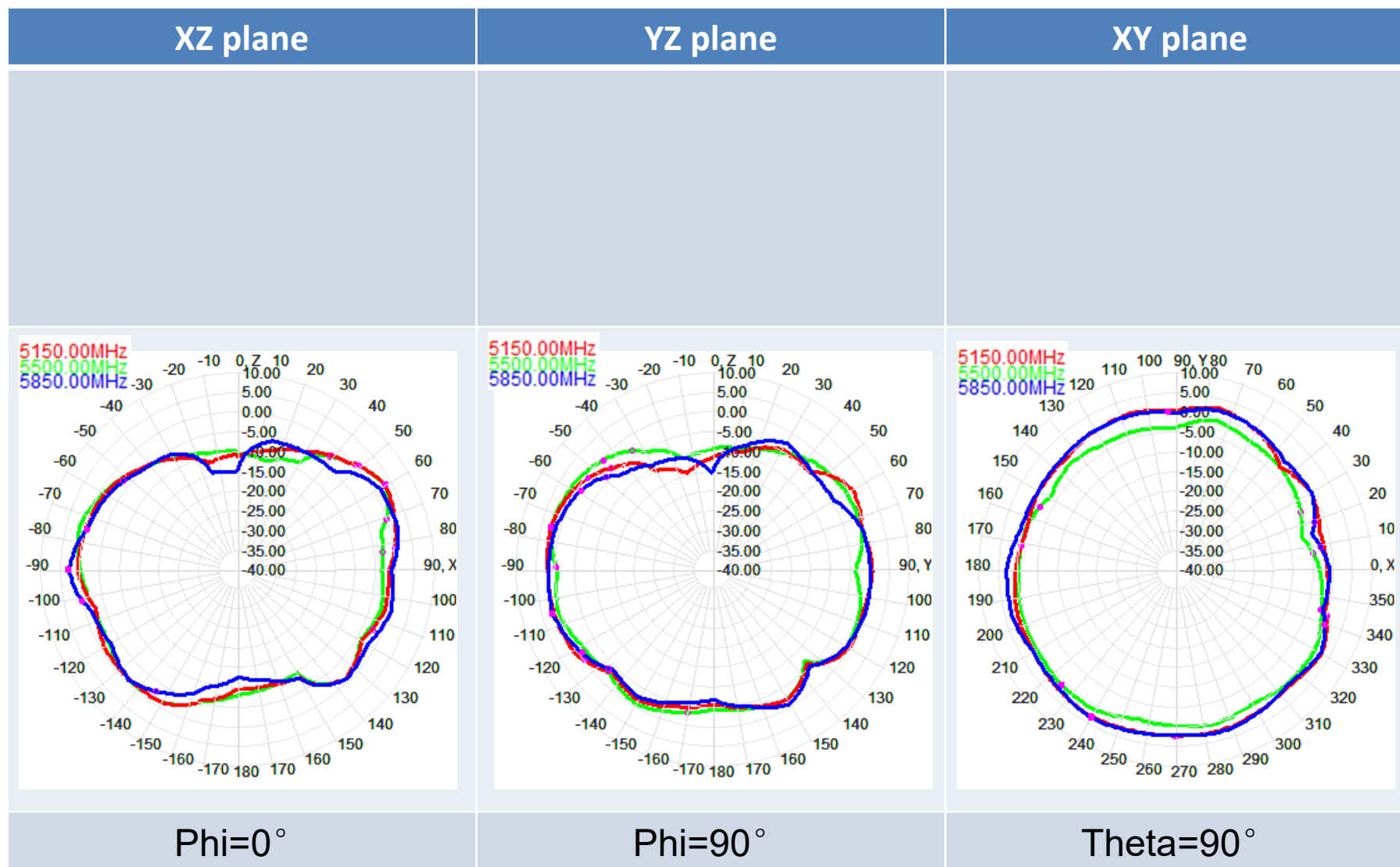
ANT1



2D Radiation Pattern@5G

T&W

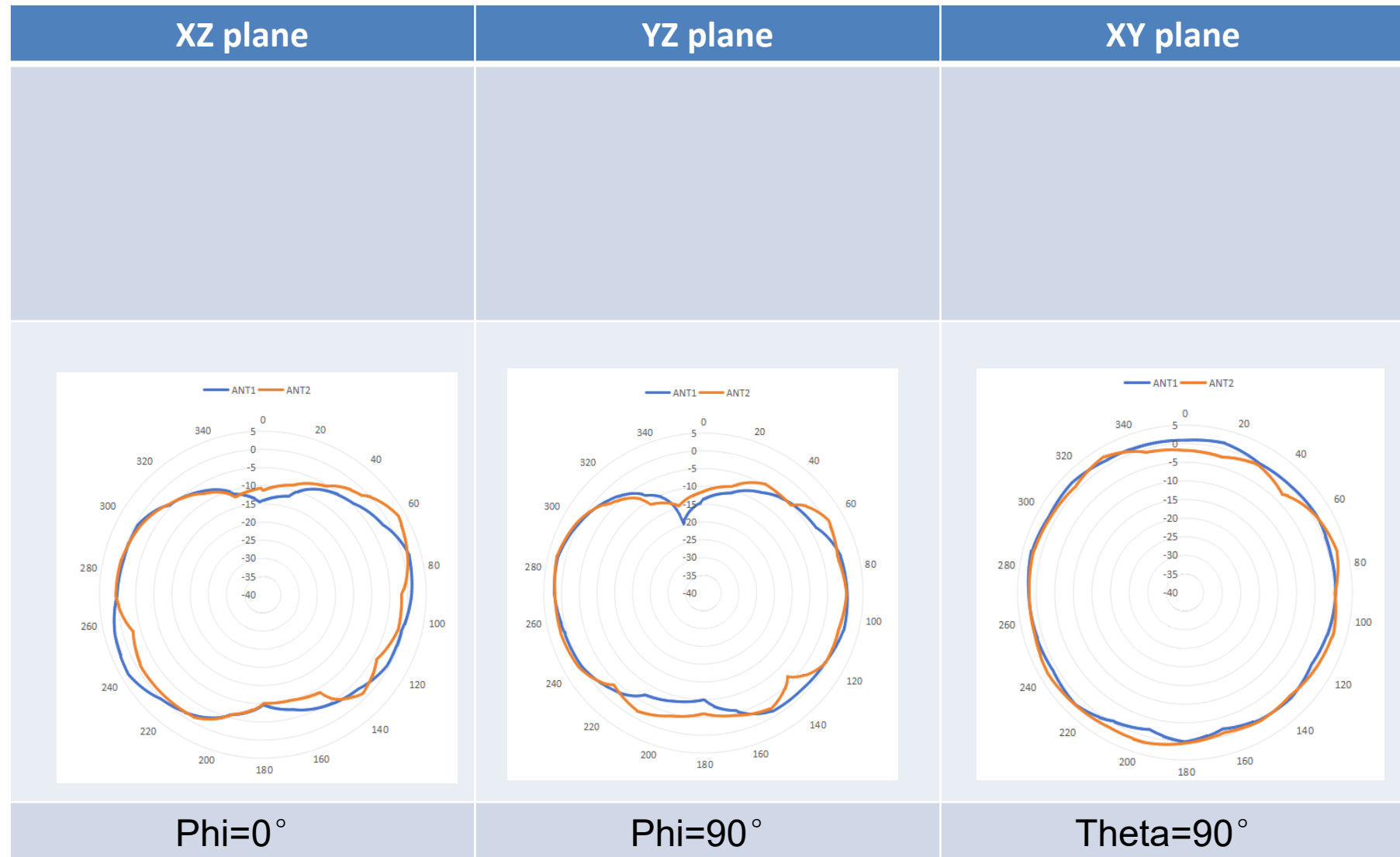
ANT2



2D Radiation Pattern@5.5GHz

T&W

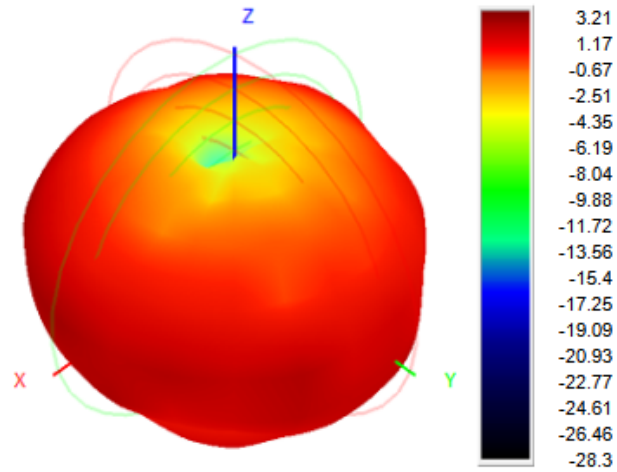
ANT1&ANT2



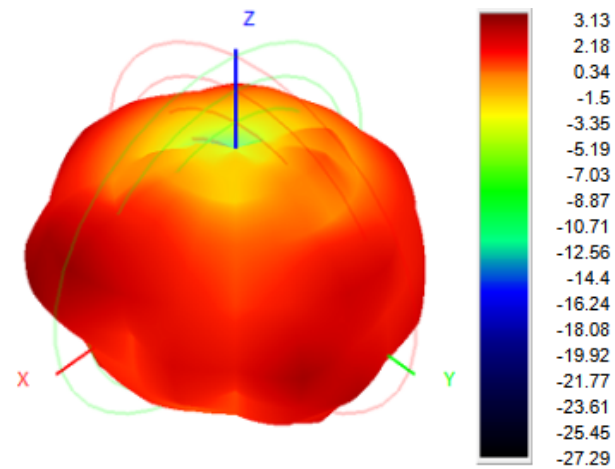
3D Radiation Pattern@5.5GHz

T&W

ANT1-5G



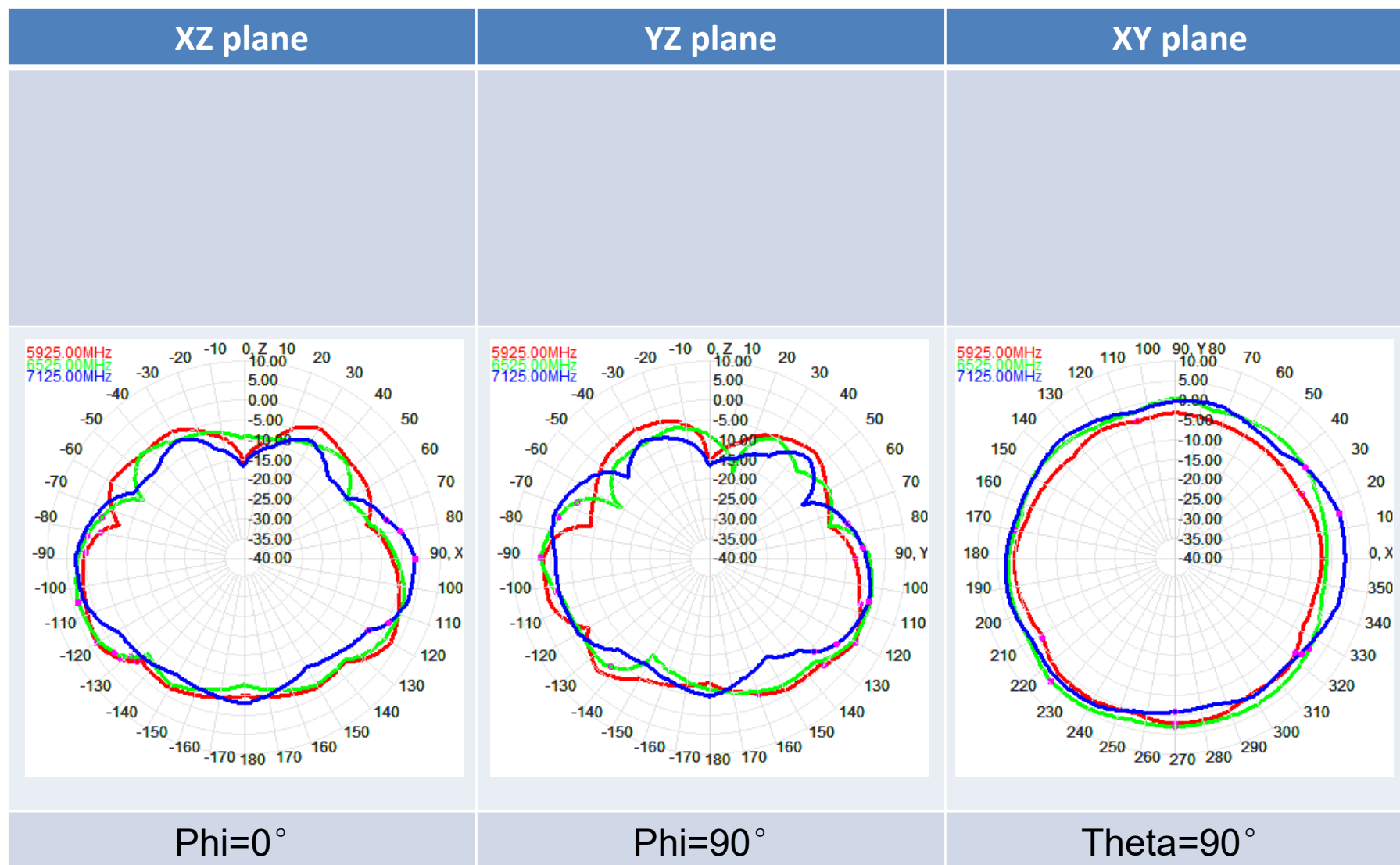
ANT2-5G



2D Radiation Pattern@6G

T&W

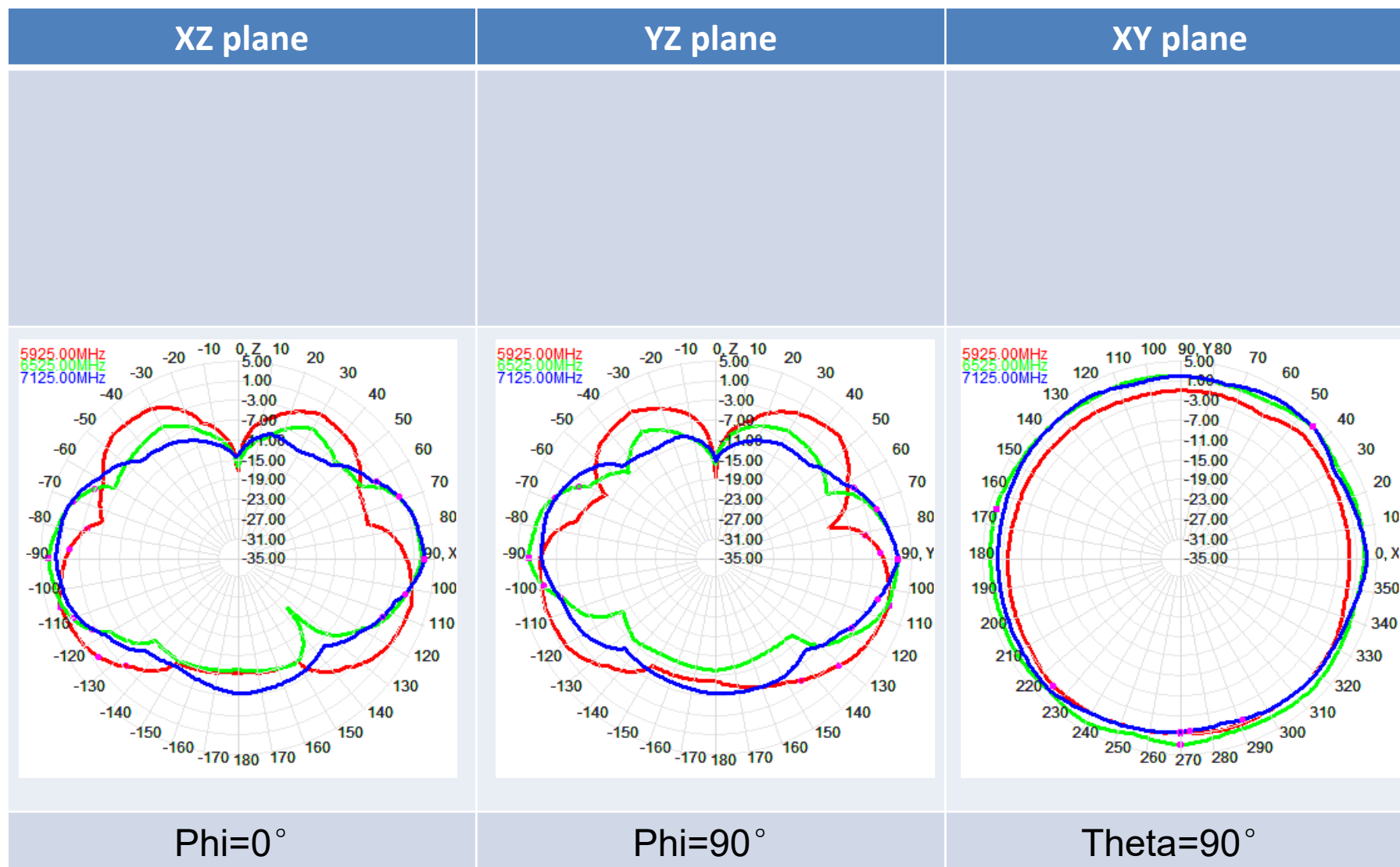
ANT3



2D Radiation Pattern@6G

T&W

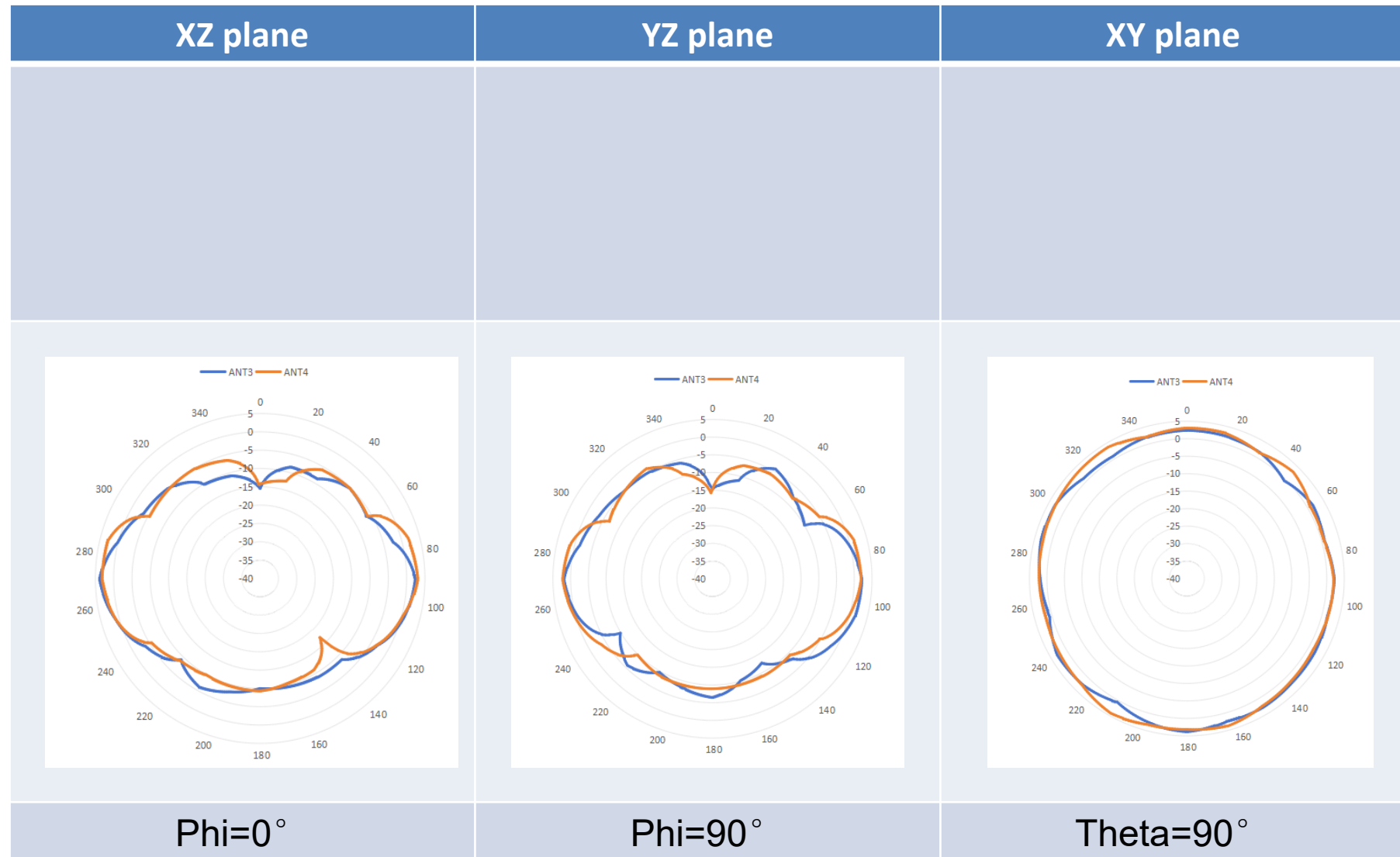
ANT4



2D Radiation Pattern@6.525GHz

T&W

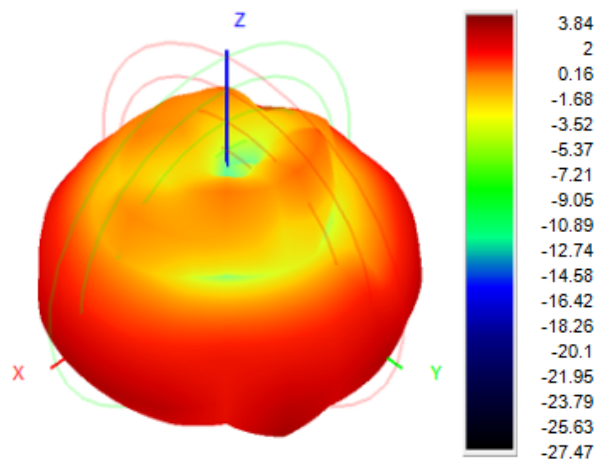
ANT3&ANT4



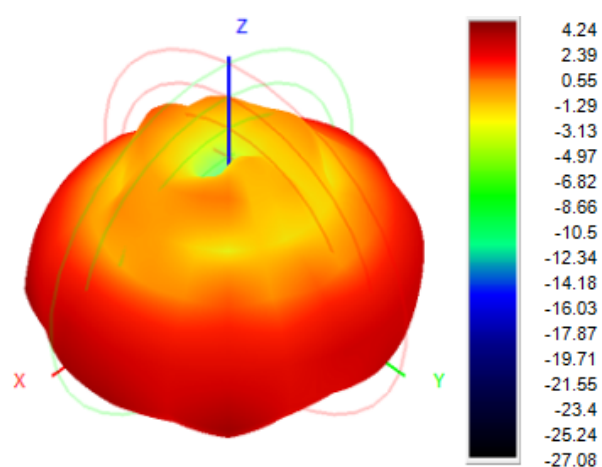
3D Radiation Pattern@6.525GHz

T&W

ANT3-6G



ANT4-6G



Gain & Efficiency

	ANT1		ANT2	
Frequency (GHz)	Gain (dBi)	Efficiency (%)	Gain (dBi)	Efficiency (%)
2.4	3.12	71.83	2.95	73.11
2.45	3.06	69.74	2.88	75.51
2.5	2.73	70.31	3.09	71.31
5.150	3.19	70.96	3.25	69.38
5.250	3.12	69.18	3.63	70.92
5.350	3.59	70.83	3.05	73.76
5.470	2.84	66.7	3.21	68.72
5.600	2.97	69.98	3.06	72.22
5.725	2.86	69.43	3.07	70.54
5.785	3.04	65.95	2.94	67.92
5.850	3.32	68.9	3.39	69.33

- The WIFI 2.4G antenna's Gain $\leq 3.12\text{dBi}$, Efficiency $> 65\%$;
- The WIFI 5G antenna's Gain $\leq 3.63\text{dBi}$, Efficiency $> 60\%$;

Gain & Efficiency

	ANT3		ANT4	
Frequency (GHz)	Gain (dBi)	Efficiency (%)	Gain (dBi)	Efficiency (%)
5925	2.93	62.43	3.24	69.38
6025	2.96	65.11	3.09	65.86
6125	2.99	68.50	2.98	68.61
6225	3.63	66.19	3.91	69.19
6325	3.55	62.76	3.79	66.37
6425	3.53	64.95	3.76	66.94
6525	3.84	65.49	4.24	66.64
6625	3.85	61.79	4.43	66.30
6725	3.83	63.48	3.77	65.12
6875	3.47	68.23	3.52	67.24
6925	3.25	61.55	3.28	67.80
7025	3.16	61.04	3.03	65.87
7125	3.81	65.08	3.49	69.64

- The WIFI 6G antenna's Gain $\leq 4.43\text{dBi}$, Efficiency $> 60\%$;

Combined Gain

	ANT1&ANT2							
Freq	2.4G	2.45G	2.5G	5.150G	5.350G	5.600G	5.785G	5.850G
Correlated	5.90	5.85	5.89	4.88	5.73	5.91	5.87	5.94
UnCorrelated	2.75	2.78	2.88	1.87	2.94	2.97	2.94	2.99

	ANT3&ANT4				
Freq	6.125G	6.425G	6.625G	7 G	7.125G
Correlated	5.74	6.30	6.10	5.89	6.06
UnCorrelated	2.73	3.29	3.12	2.88	3.09

- Uncorrelated combined gain $\leq 2.88\text{dBi}@2.4\text{G}$
- Correlated combined gain $\leq 5.9 \text{ dBi}@2.4\text{G}$
- Uncorrelated combined gain $\leq 2.99\text{dBi}@5\text{G}$
- Correlated combined gain $\leq 5.94 \text{ dBi}@5\text{G}$
- Uncorrelated combined gain $\leq 3.29\text{dBi}@6\text{G}$
- Correlated combined gain $\leq 6.3 \text{ dBi}@6\text{G}$

Summary

- **Return loss**

The data on page 12 shows:

- The WIFI 2.4G antenna's Return loss $< -11.7\text{dB}$;
- The WIFI 5G antenna's Return loss $< -11.7\text{dB}$;
- The WIFI 6G antenna's Return loss $< -11.7\text{dB}$;

- **Isolation**

The data on page 19 shows:

- The Isolation between WIFI 2.4G antennas $< -30\text{dB}$;
- The Isolation between WIFI 5G antennas $< -30\text{dB}$;
- The Isolation between WIFI 6G antennas $< -25\text{dB}$;
- The Isolation between WIFI 5G & 6G antennas $< -25\text{dB}$;

- **Gain & Efficiency**

The data on page 33、34 shows:

- The WIFI 2.4G antenna's Gain $\leq 3.12\text{dBi}$, Efficiency $> 65\%$;
- The WIFI 5G antenna's Gain $\leq 3.63\text{dBi}$, Efficiency $> 60\%$;
- The WIFI 6G antenna's Gain $\leq 4.43\text{dBi}$, Efficiency $> 60\%$;



Through the above data analysis, the single antenna can meet the performance requirements.

Thanks!

