

ASUS GO- Antenna passive test Report

V02

Making by: qin dong yu

date: 2023.08.09

Report change list



Version	Change description	Author	date
V01	First version	Qin dong yu	2023.05.31
v02	Add information such as antenna model, darkroom calibration, maximum direction, etc	Qin dong yu	2023.08.09

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

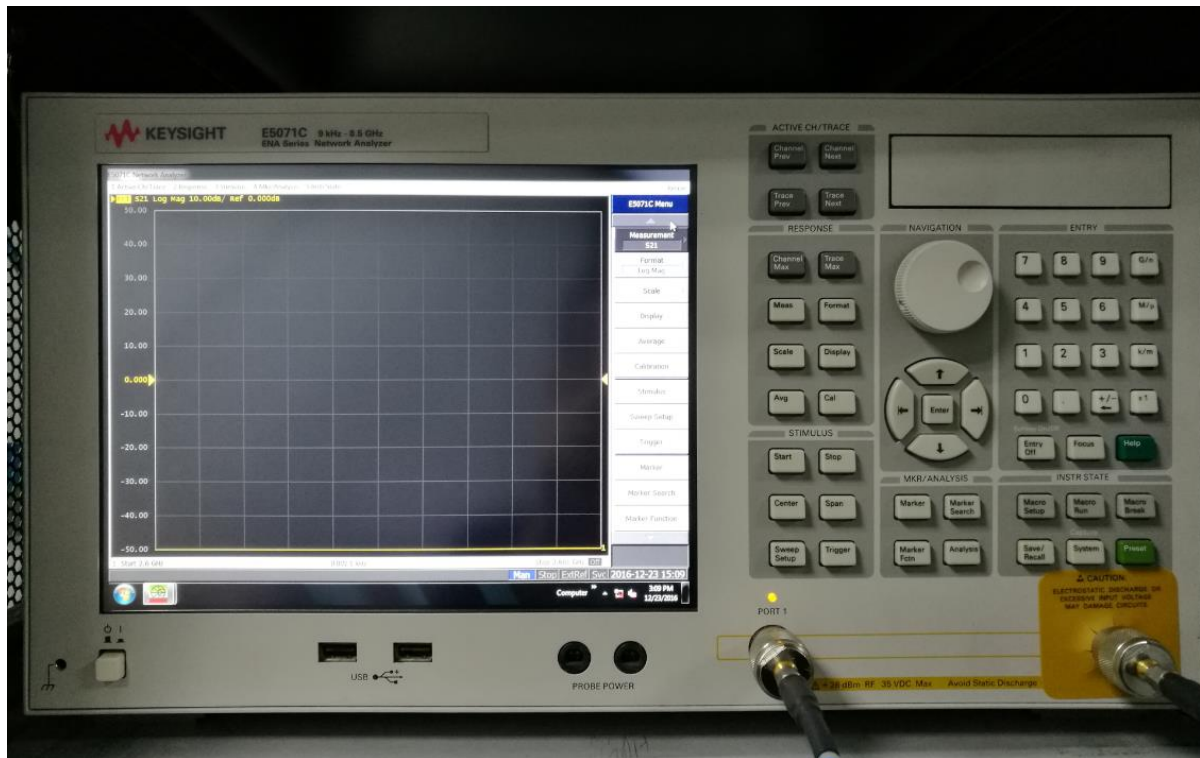
- Test Condition: the network analyzer(E5071C) and SATIMO microwave anechoic chamber
- Passive measurement results are presented
- mock up

Antenna model / manufacturer

Frequency	model number	manufacturer	Manufacturer's address
2G ANT1	2.4G PCB ant1	T&W	No. 2 Danzi North Road, Kengzi Street, Pingshan District, Shenzhen, Guangdong
2G ANT2	2.4G PCB ant2	T&W	No. 2 Danzi North Road, Kengzi Street, Pingshan District, Shenzhen, Guangdong
5G ANT1	EmW201b-N	be-comfortable	Room 1603/1606, Building C6, Hengfeng,Industrial City, Zhoushi Road, Xixiang Town, Bao'an District, Shenzhen
5G ANT2	5G PCB ant2	T&W	No. 2 Danzi North Road, Kengzi Street, Pingshan District, Shenzhen, Guangdong
5G ANT3	EmW201b-N	be-comfortable	Room 1603/1606, Building C6, Hengfeng,Industrial City, Zhoushi Road, Xixiang Town, Bao'an District, Shenzhen

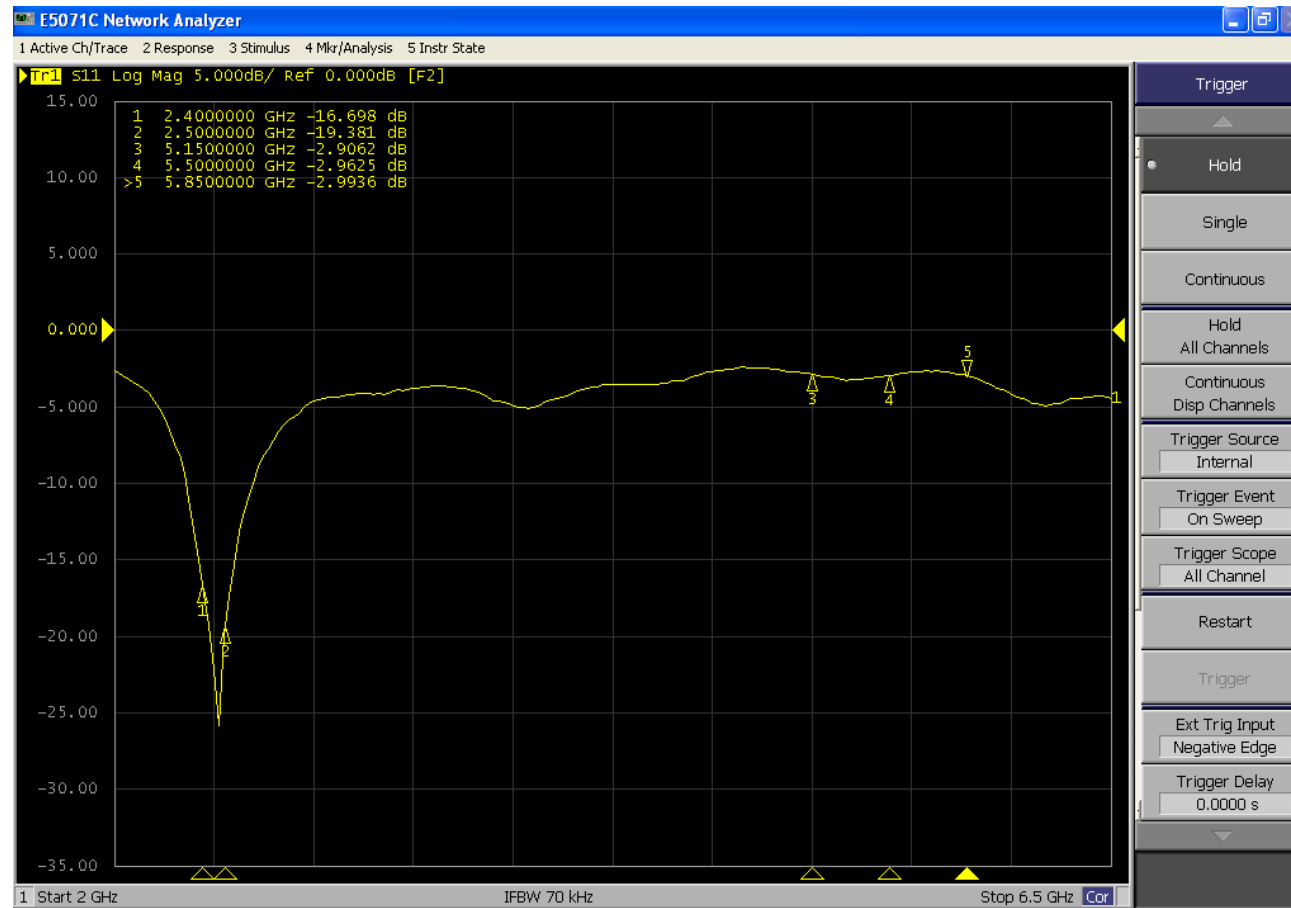
Return Loss and Isolation

Measurement Condition



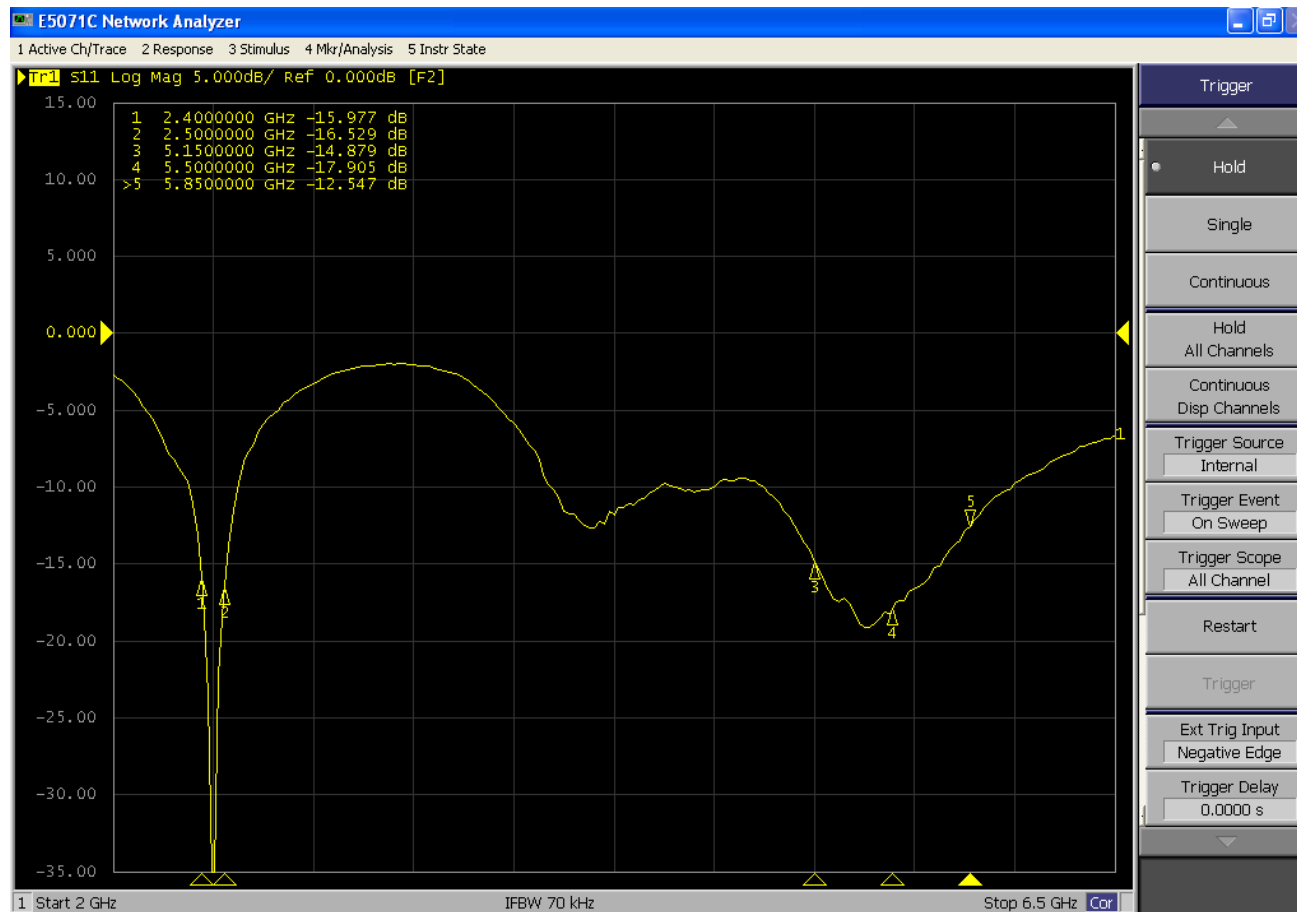
The network Analyzer

Return Loss—2.4G ANT1



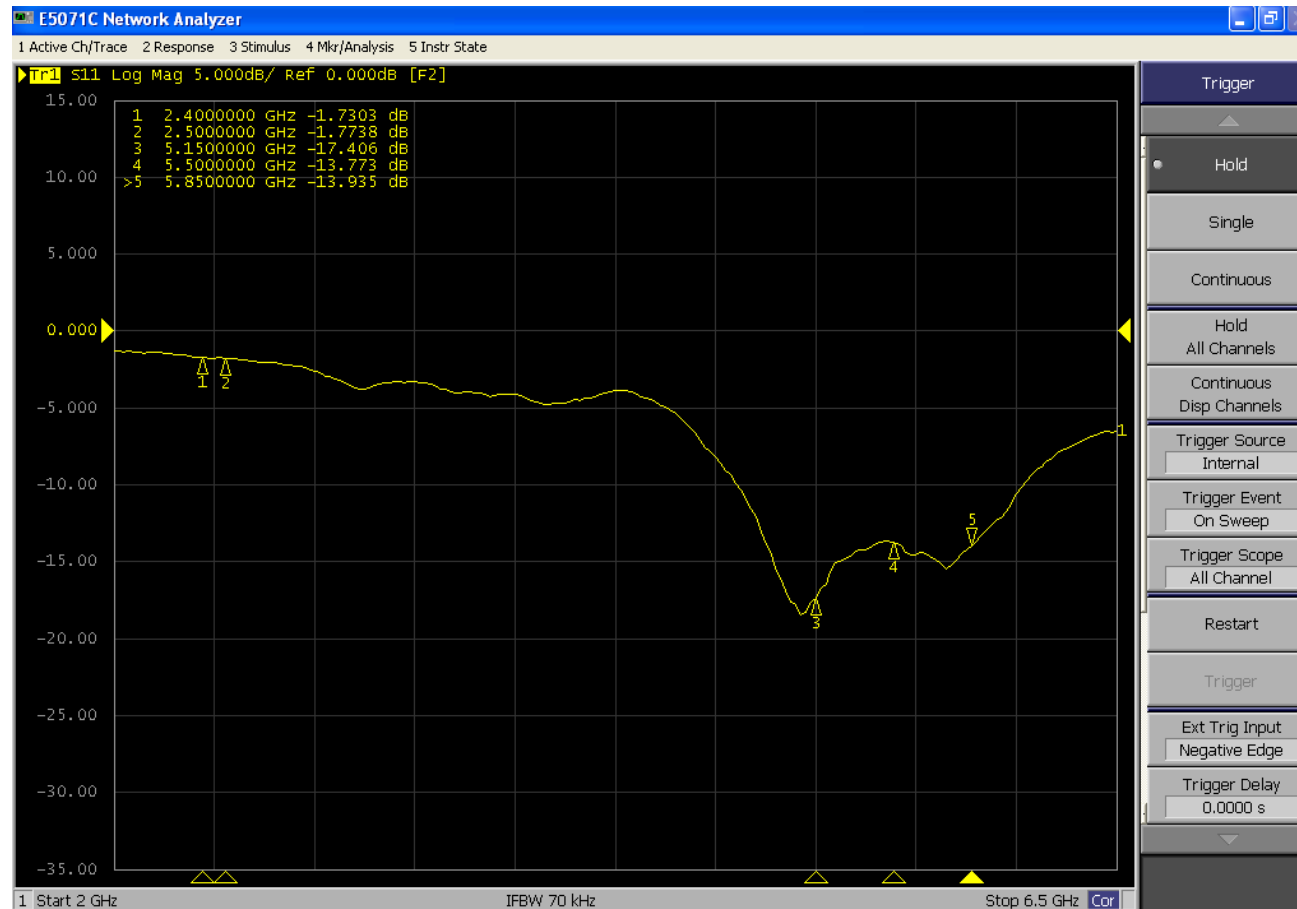
2.4G ANT1 Return loss: < -16dB

Return Loss—2.4G ANT2



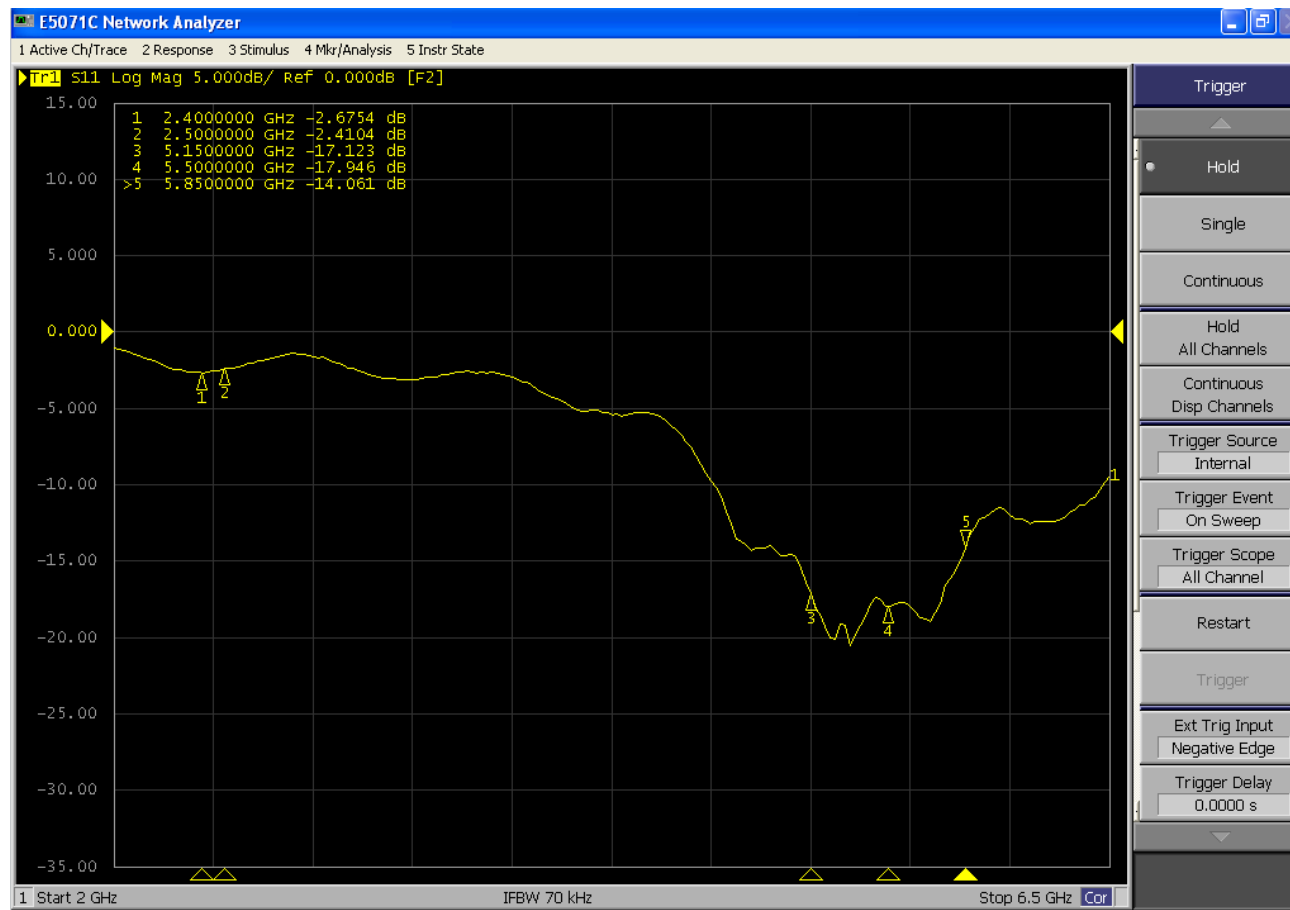
2.4G ANT2 Return loss: $< -15\text{dB}$

Return Loss—5G ANT1



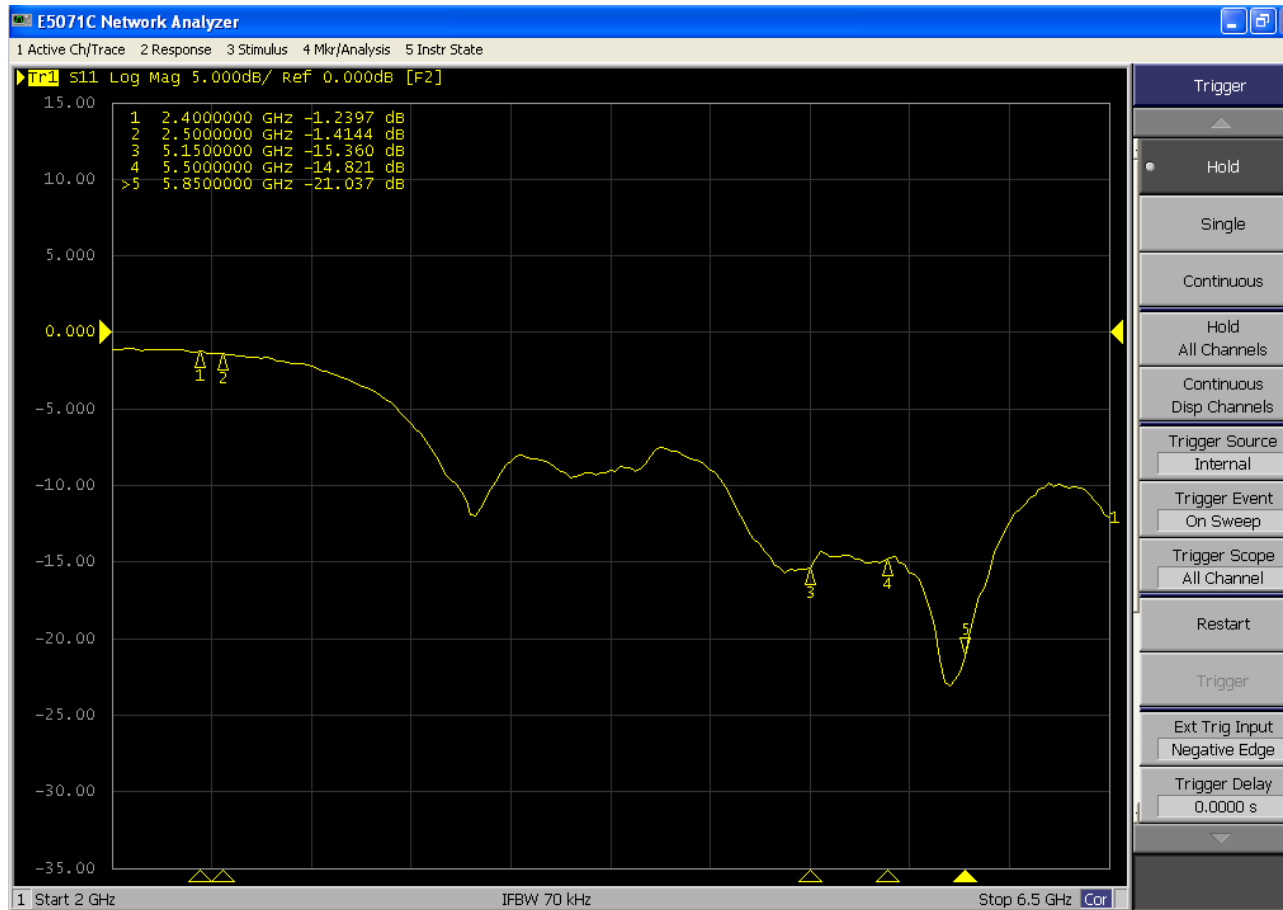
5G ANT1 Return loss: $< -13\text{dB}$

Return Loss—5G ANT2



5G ANT2 Return loss: $< -14\text{dB}$

Return Loss—5G ANT3

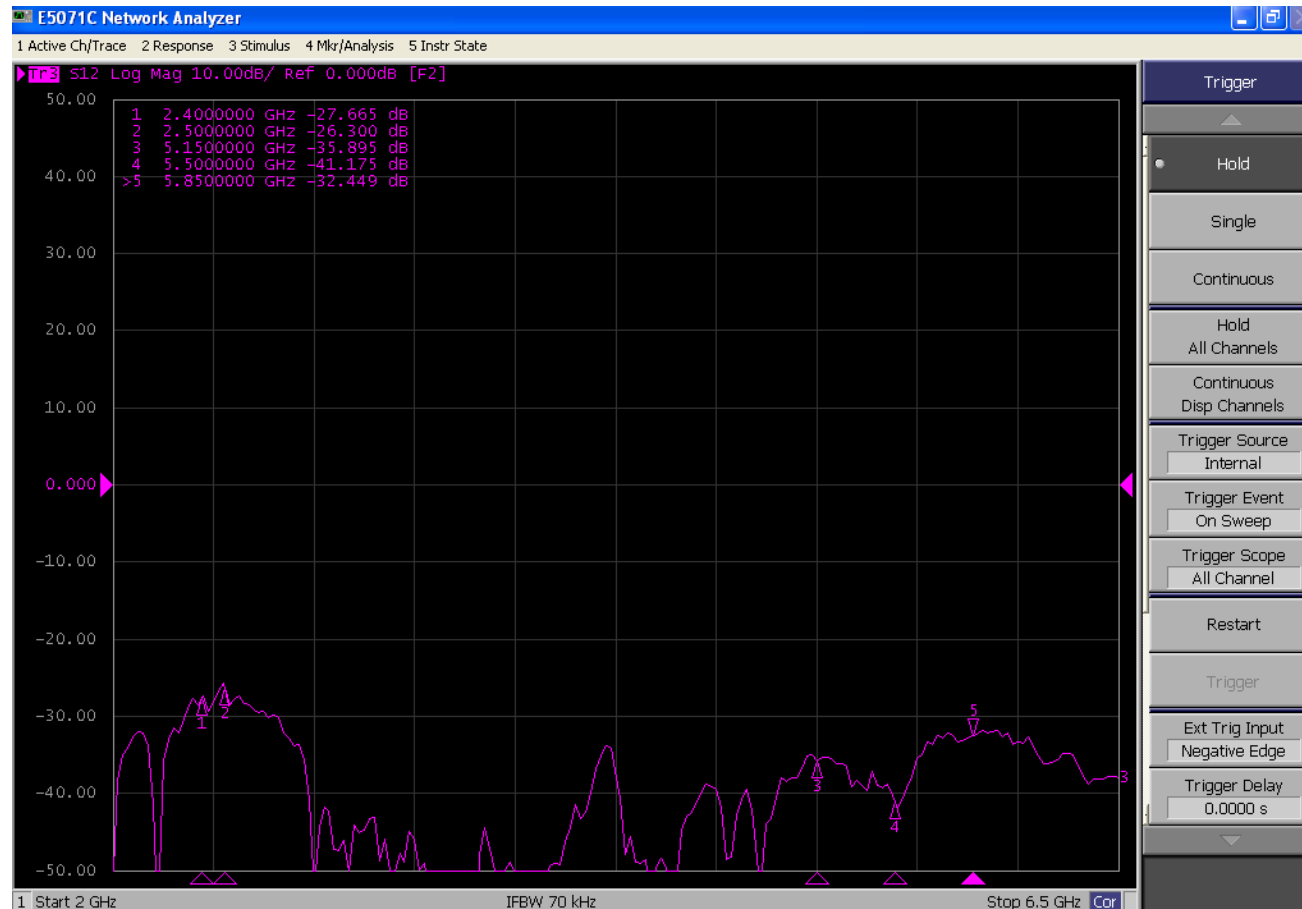


5G ANT3 Return loss: $< -14\text{dB}$

Test result

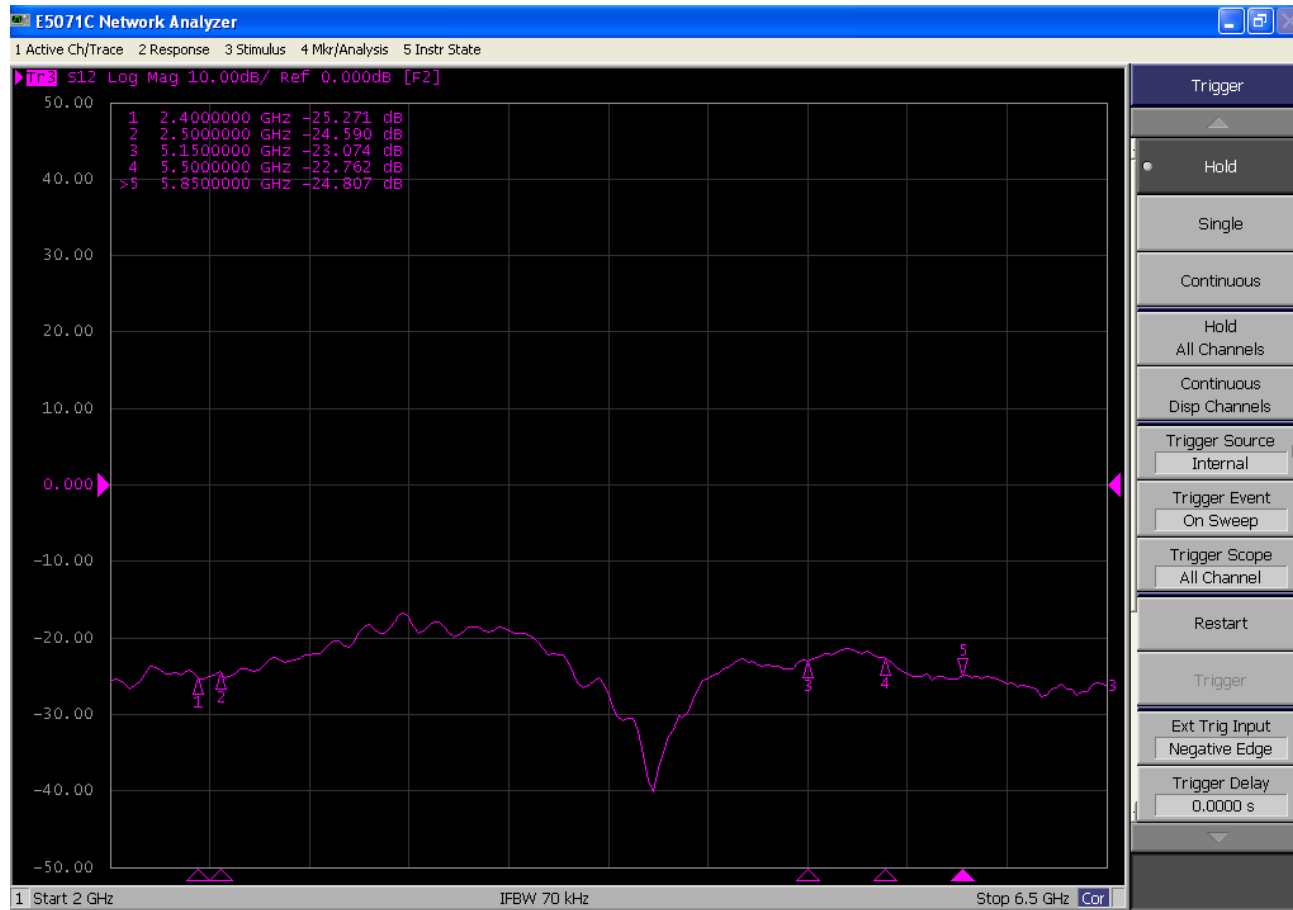
Return Loss					
Frequency(GHz)	2.4	2.5	5.15	5.5	5.85
2.4G ANT1	<-15dB				
2.4G ANT2					
5G ANT1			<-13dB		
5G ANT2					
5G ANT3					

Isolation 2.4G ANT1 & 2.4G ANT2



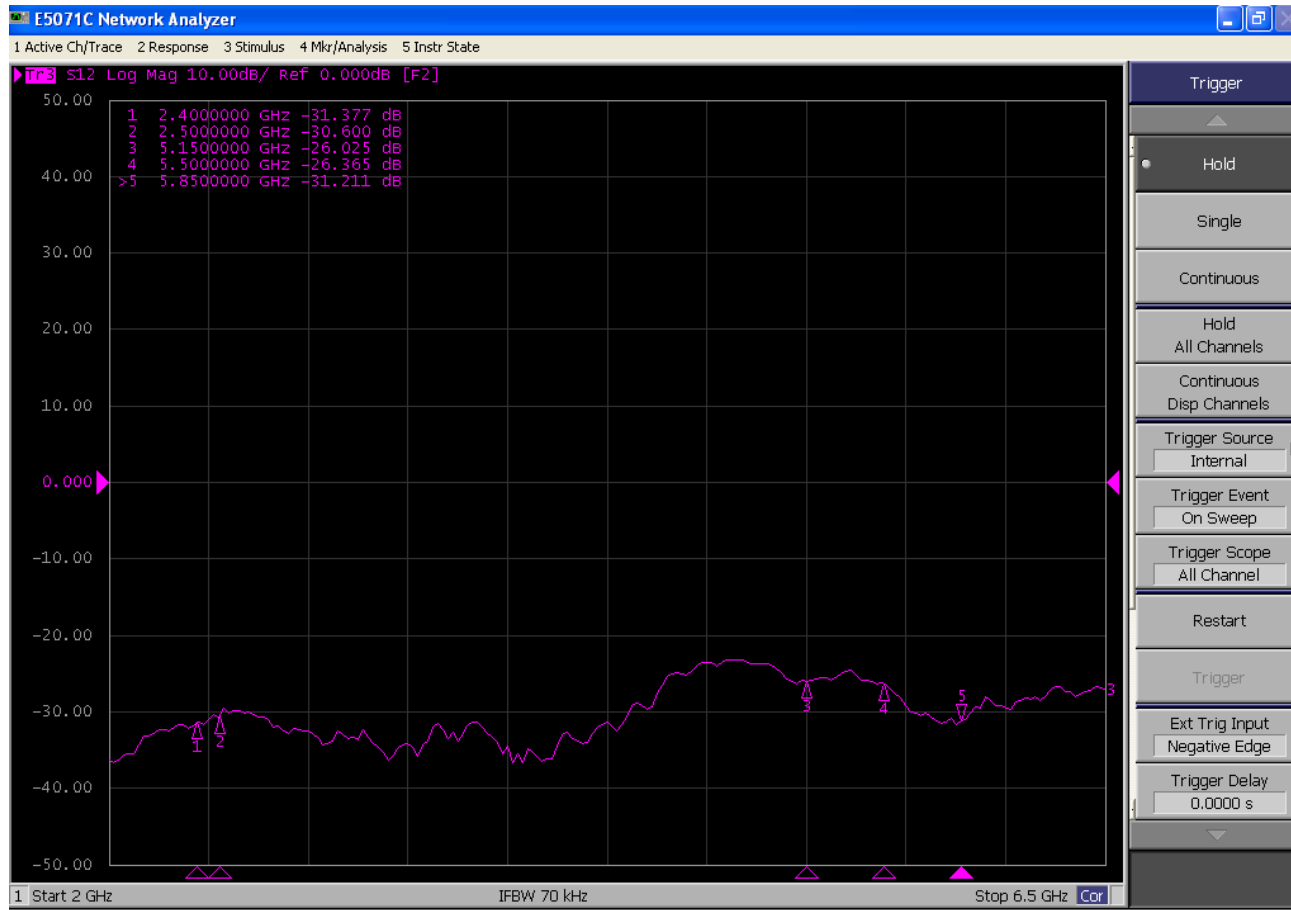
Isolation: 2.4G ANT1 & 2.4G ANT2 < -26dB

Isolation 2.4G ANT1 & 5G ANT1



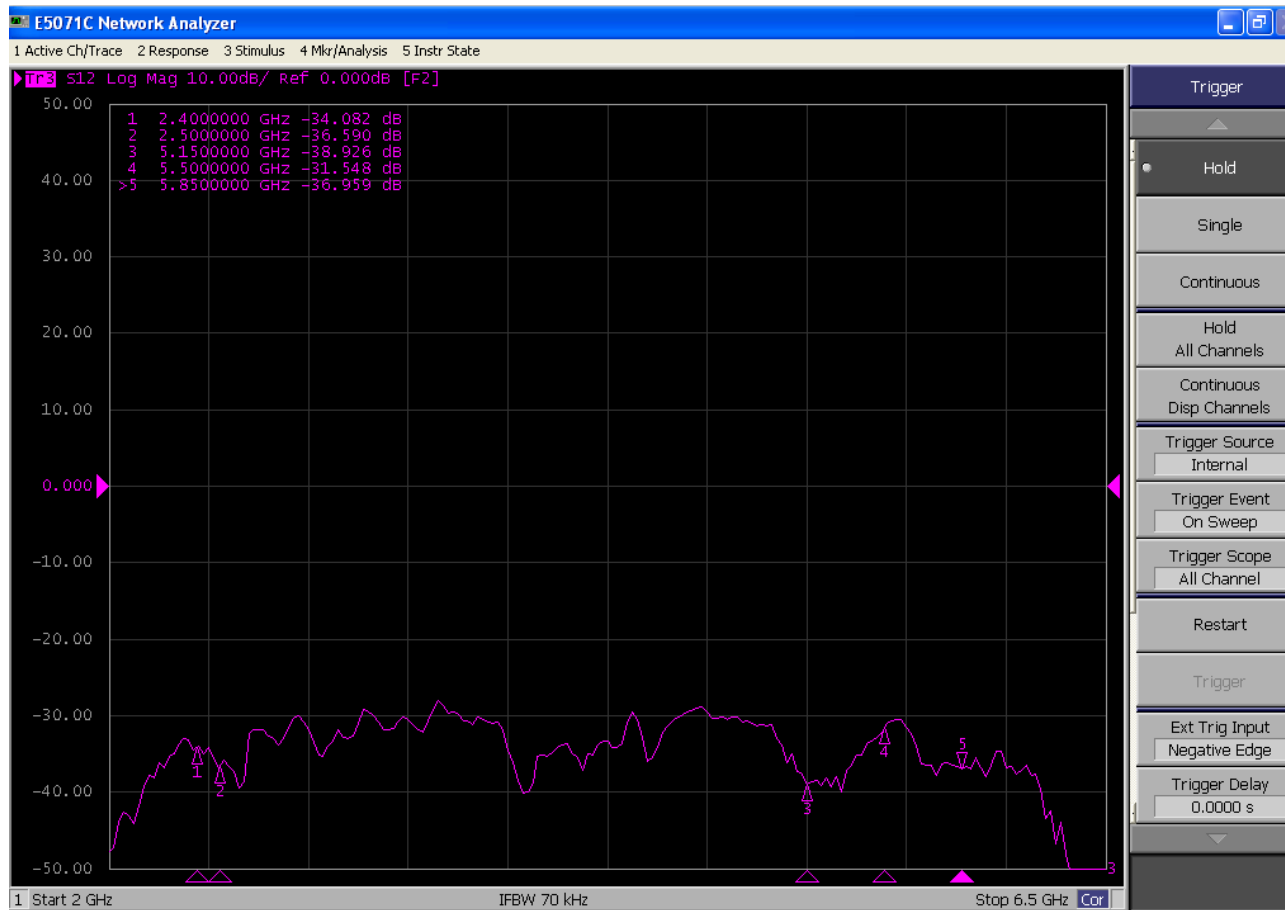
Isolation: 2.4G ANT1 & 5G ANT1 < -22.7dB

Isolation 2.4G ANT1 & 5G ANT2



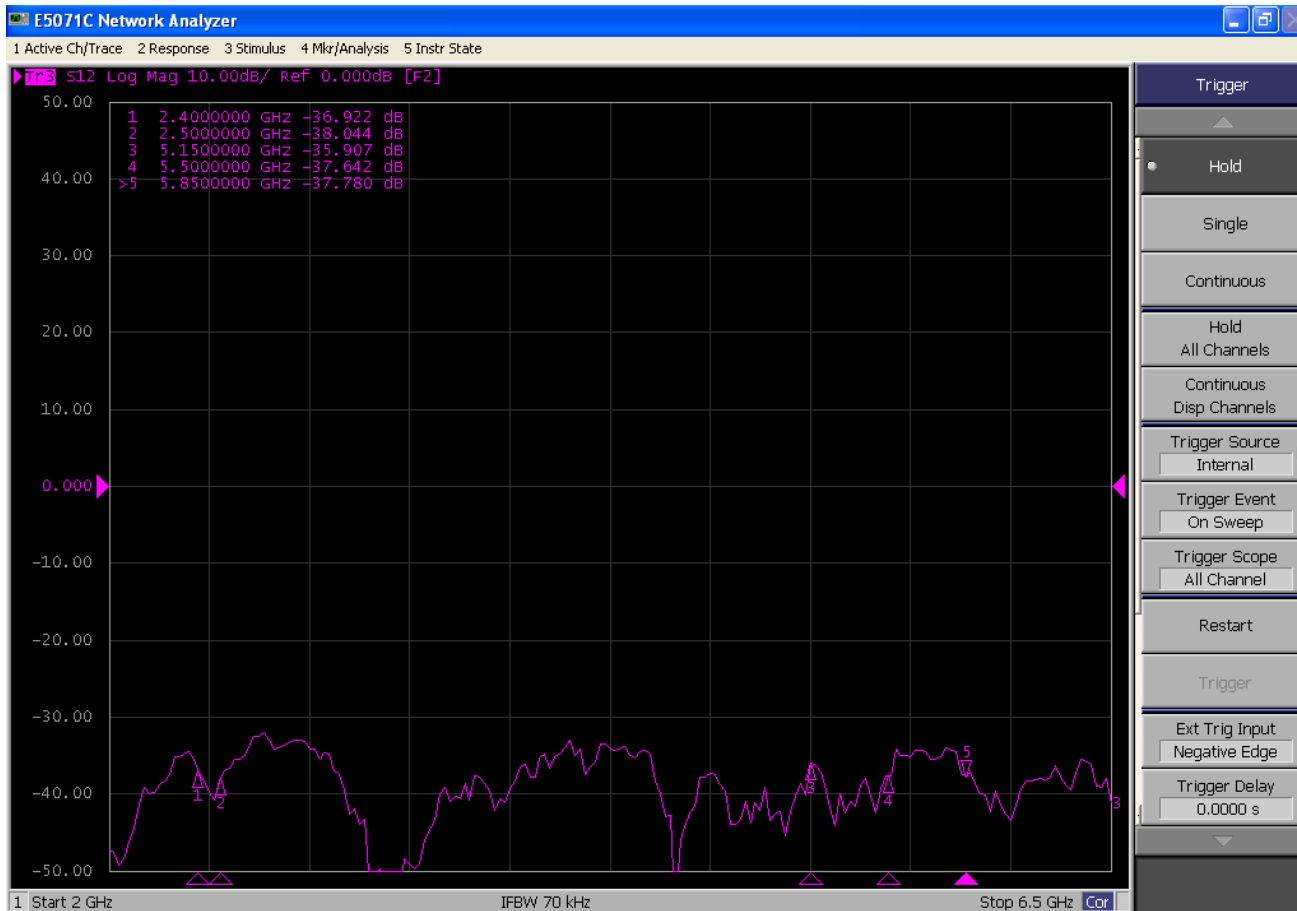
Isolation: 2.4G ANT1 & 5G ANT2 < -26dB

Isolation 2.4G ANT1 & 5G ANT3



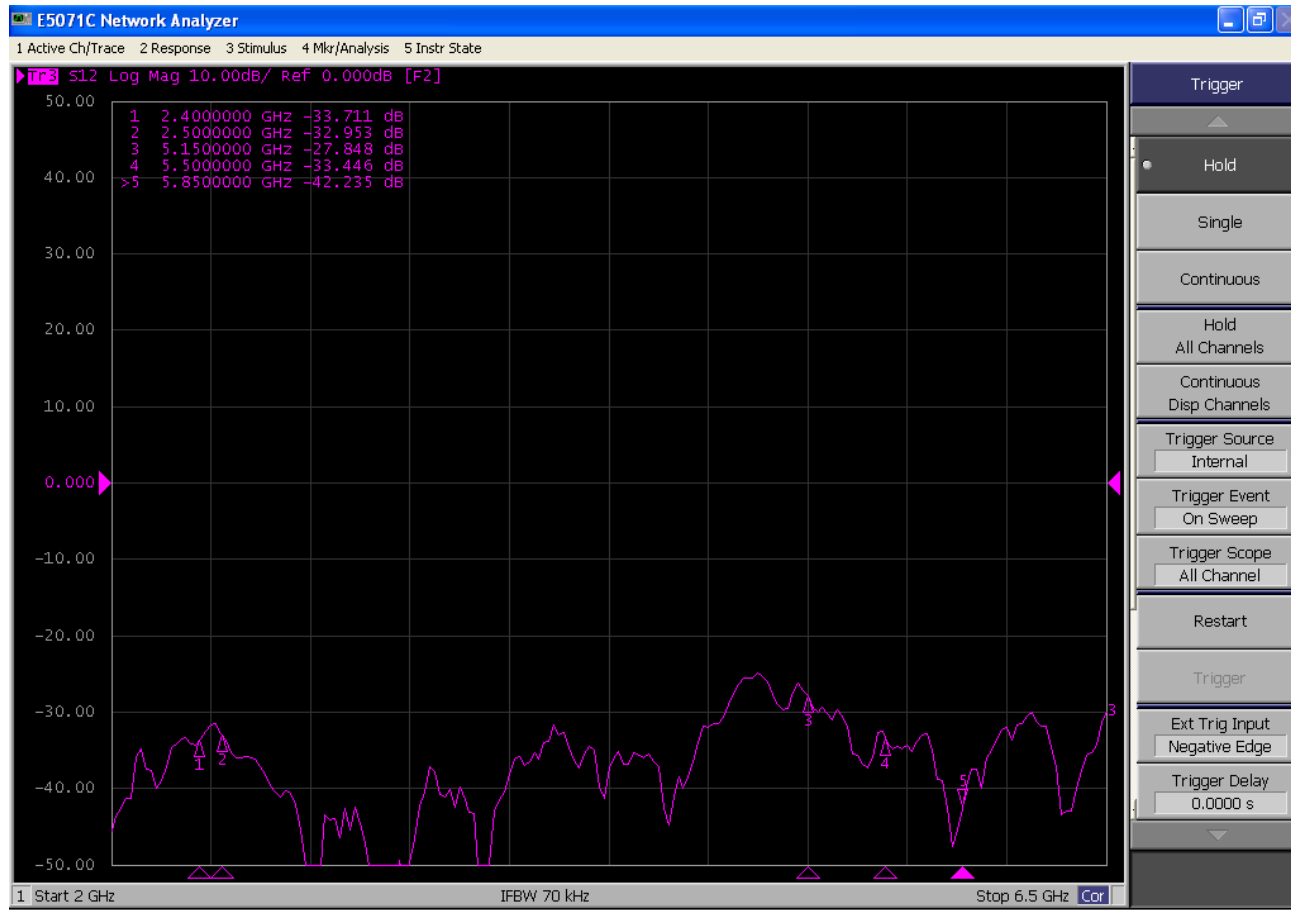
Isolation: 2.4G ANT1 & 5G ANT3 < -31dB

Isolation 2.4G ANT2 & 5G ANT1



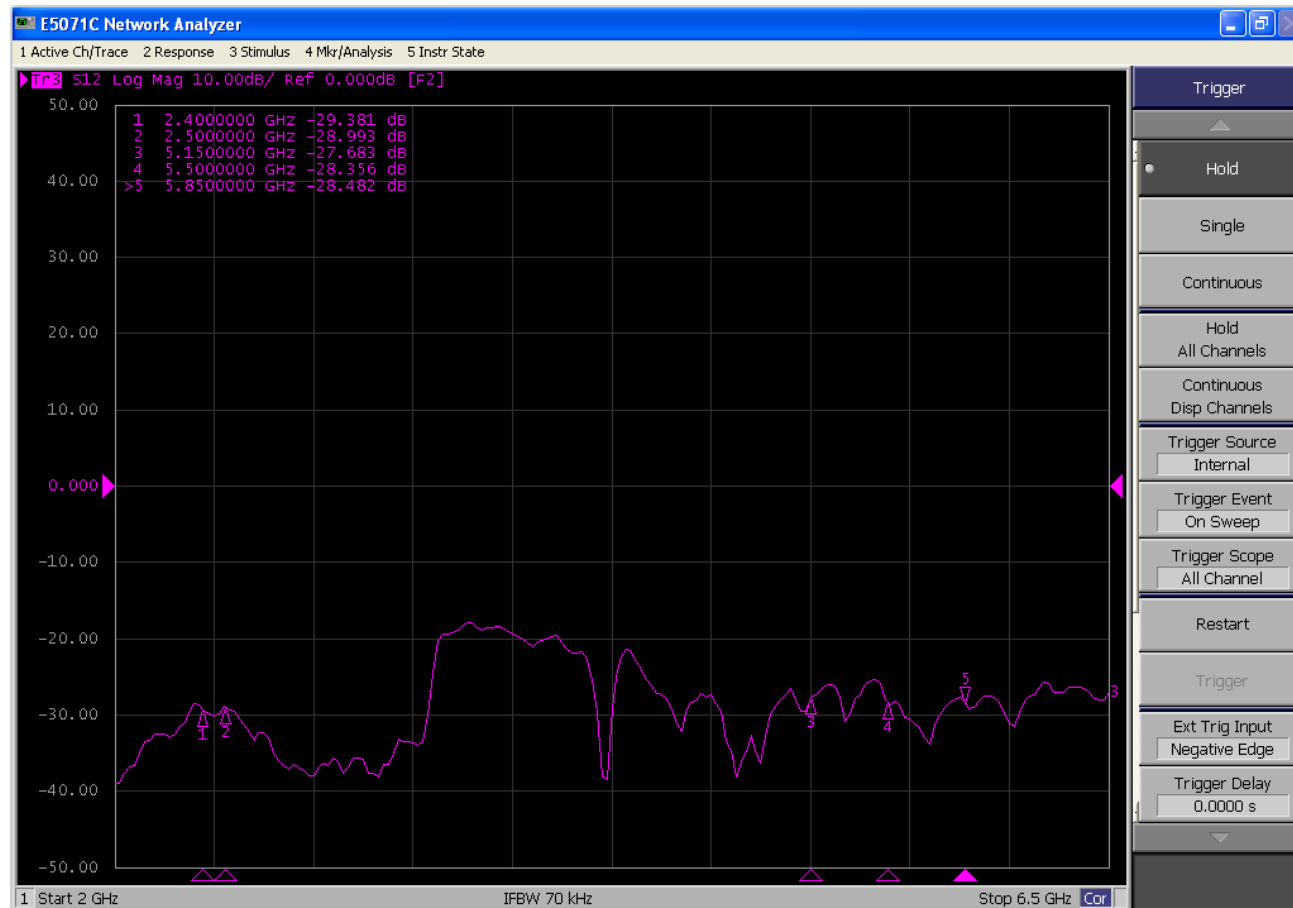
Isolation: 2.4G ANT2 & 5G ANT1 < -35dB

Isolation 2.4G ANT2 & 5G ANT2



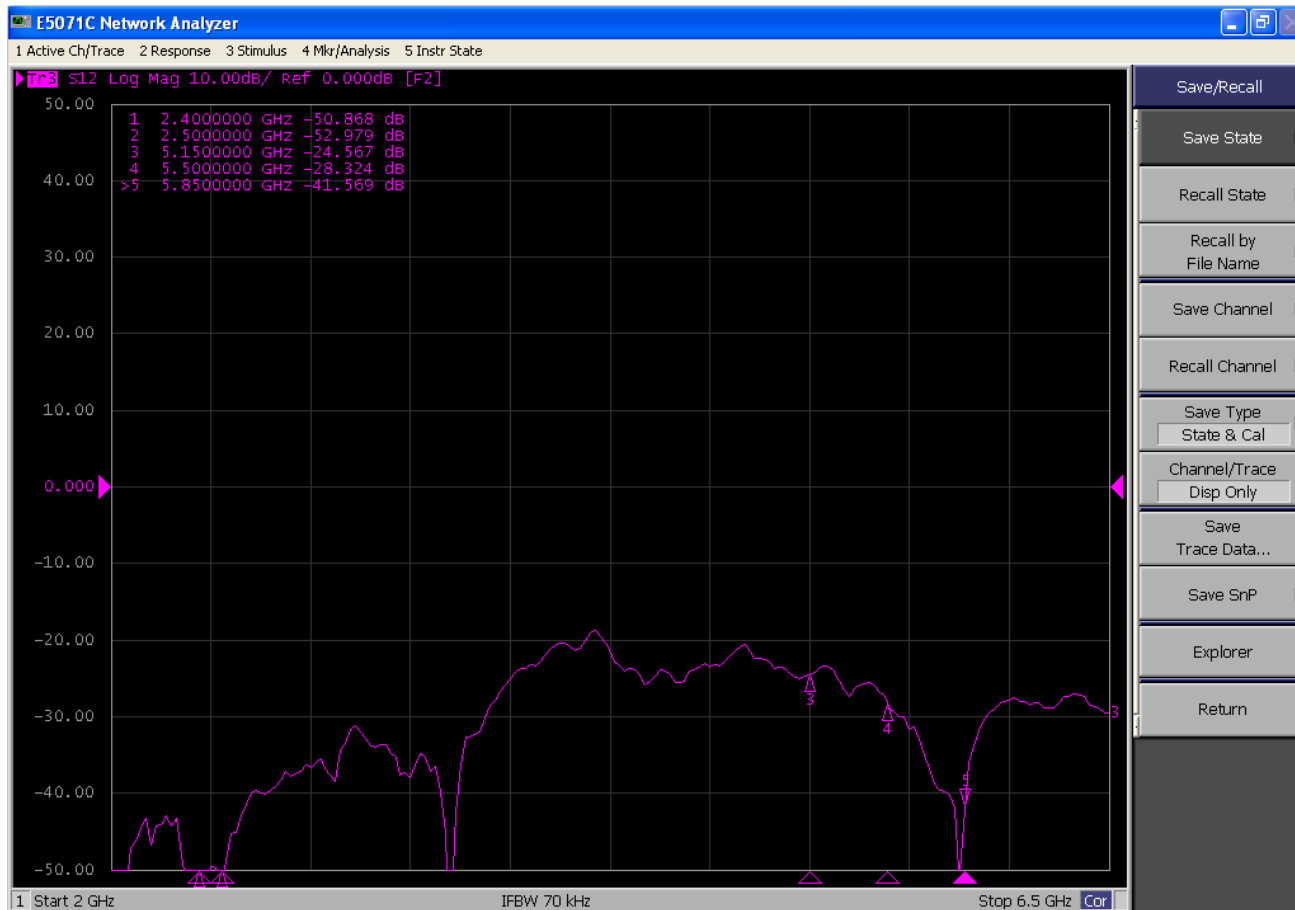
Isolation: 2.4G ANT2 & 5G ANT2 < -32dB

Isolation 2.4G ANT2 & 5G ANT3



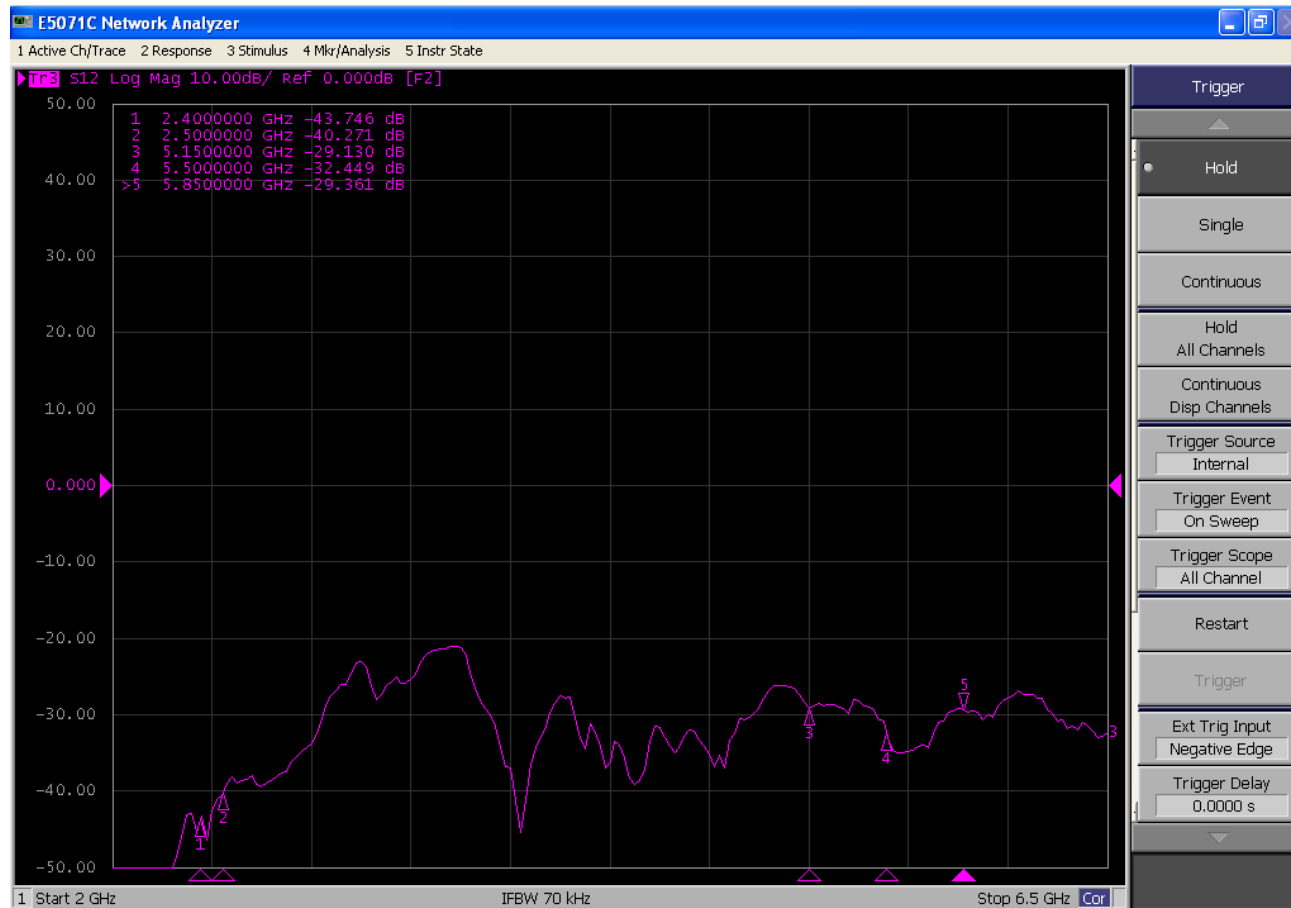
Isolation: 2.4G ANT2 & 5G ANT3 < -27dB

Isolation 5G ANT1 & 5G ANT2



Isolation: 5G ANT1 & 5G ANT2 < -24dB

Isolation 5G ANT1 & 5G ANT3



Isolation: 5G ANT1 & 5G ANT3 < -29dB

Isolation 5G ANT2 & 5G ANT3



Isolation: 5G ANT2 & 5G ANT3 < -22dB

Isolation: WIFI

Test result

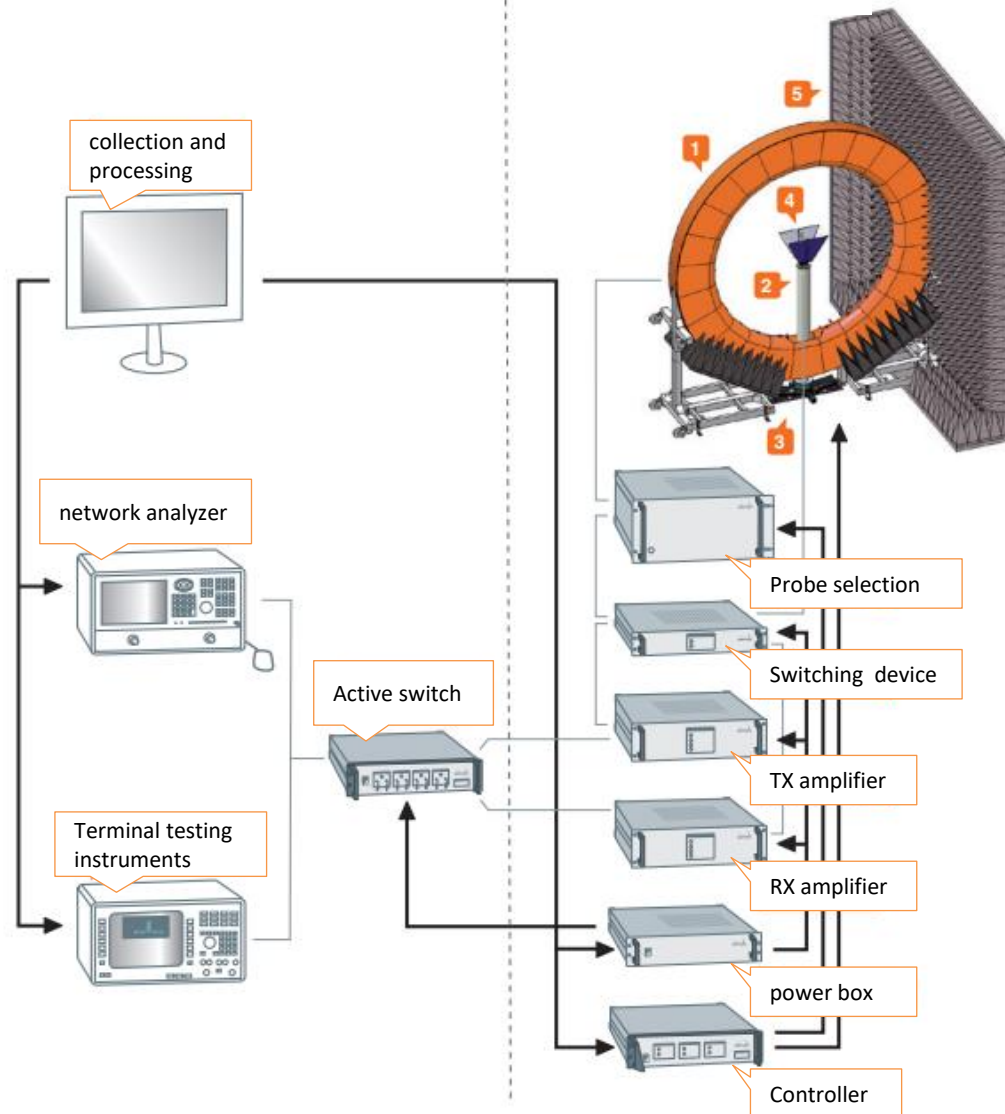
Isolation (dB)					
Frequency(GHz)	2.4G ANT1	2.4G ANT2	5G ANT1	5G ANT2	5G ANT3
2.4G ANT1		-26	-22.7	-26	-31
2.4G ANT2			-35	-32	-27
5G ANT1				-24	-29
5G ANT2					-22
5G ANT3					

2D/3D Radiation pattern

Topology

instrument

chamber

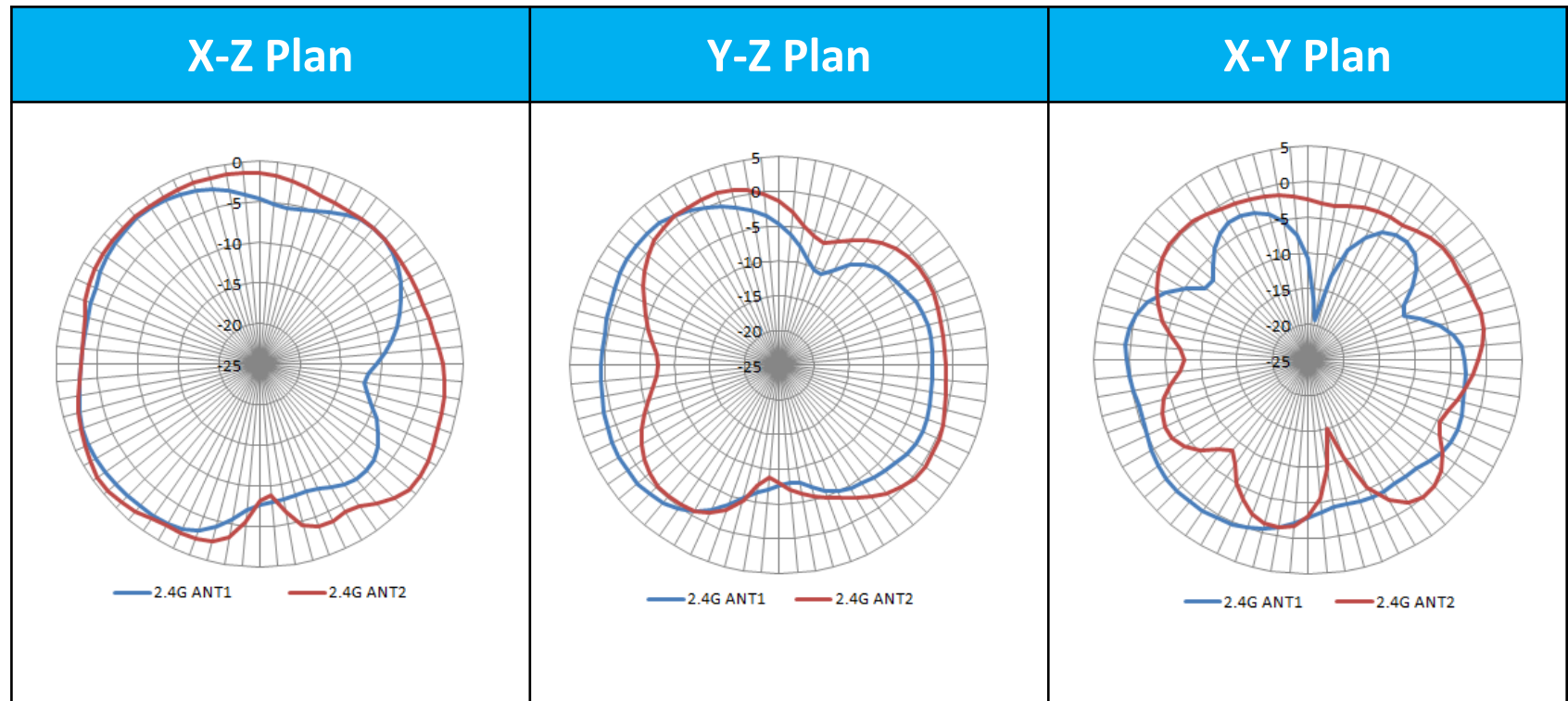


2D/3D Radiation pattern

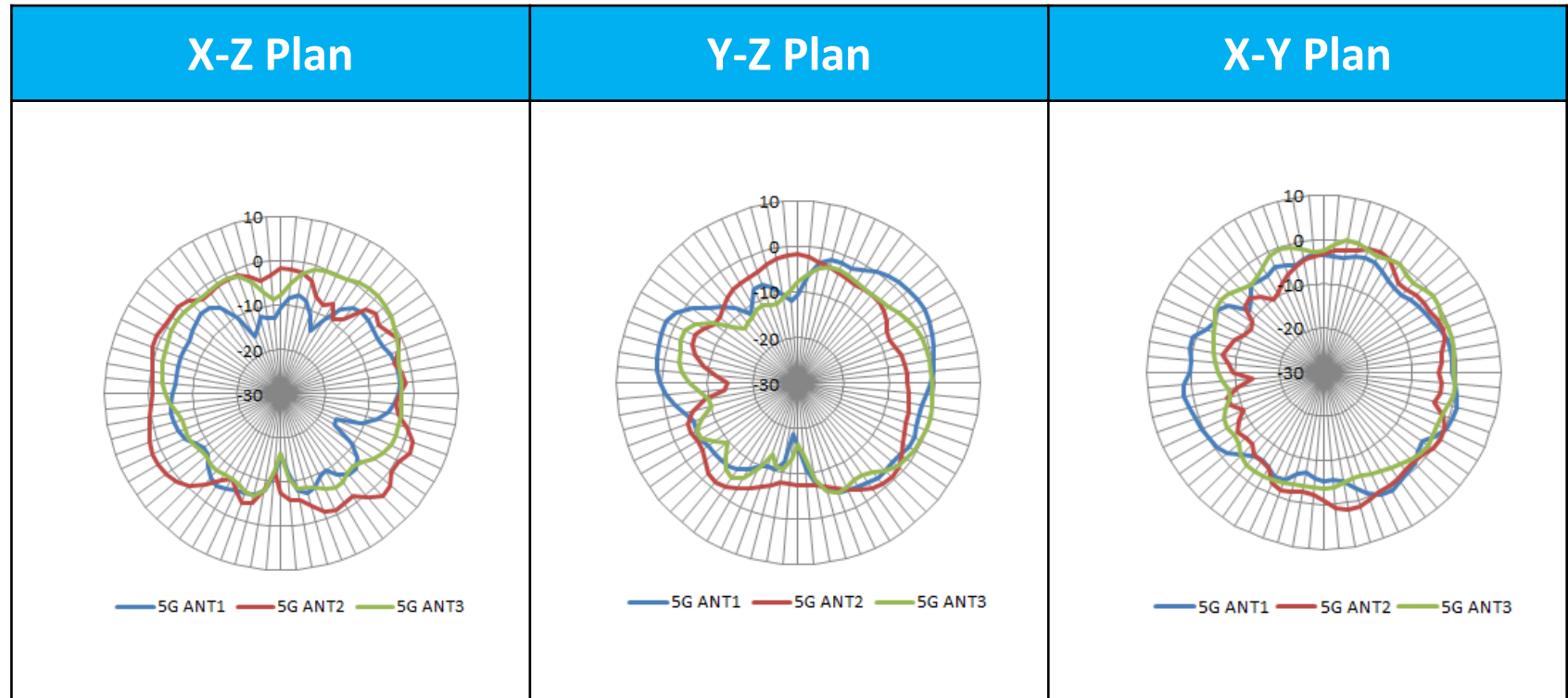
Calibrated and measurement equipment table list

Describe	Manufacturer	Model Number	Serial Number	Cal.Date	Cal.Due Date
Full Anechoic Wireless Test chamber	MVG	SG-24	N/A	N.C.R	-----
Test Software	1、 SPM (Ant Gain) 2、 Wave Studio(TRP/TIS) 3、 Sunvey.Measurement (TRP/TIS)	N/A	N/A	N.C.R	-----
Multi-Axis Positioning System (MAPS)	MVG	ML.C	227-05.3.1.5	N.C.R	-----
Turn Table	MVG	2016	N/A	N.C.R	-----
Dual Polarization Horn	MVG	SH600	SH600-89	N.C.R	-----
ENA Series Network Analyzer	Keysight	E5071C	MY46523716	Oct.18,2022	Oct.18,2023
Wideband Radio Communication Tester	R&S	CMW500	1201.0002K50-154768-un	Oct.17,2022	Oct.17,2023

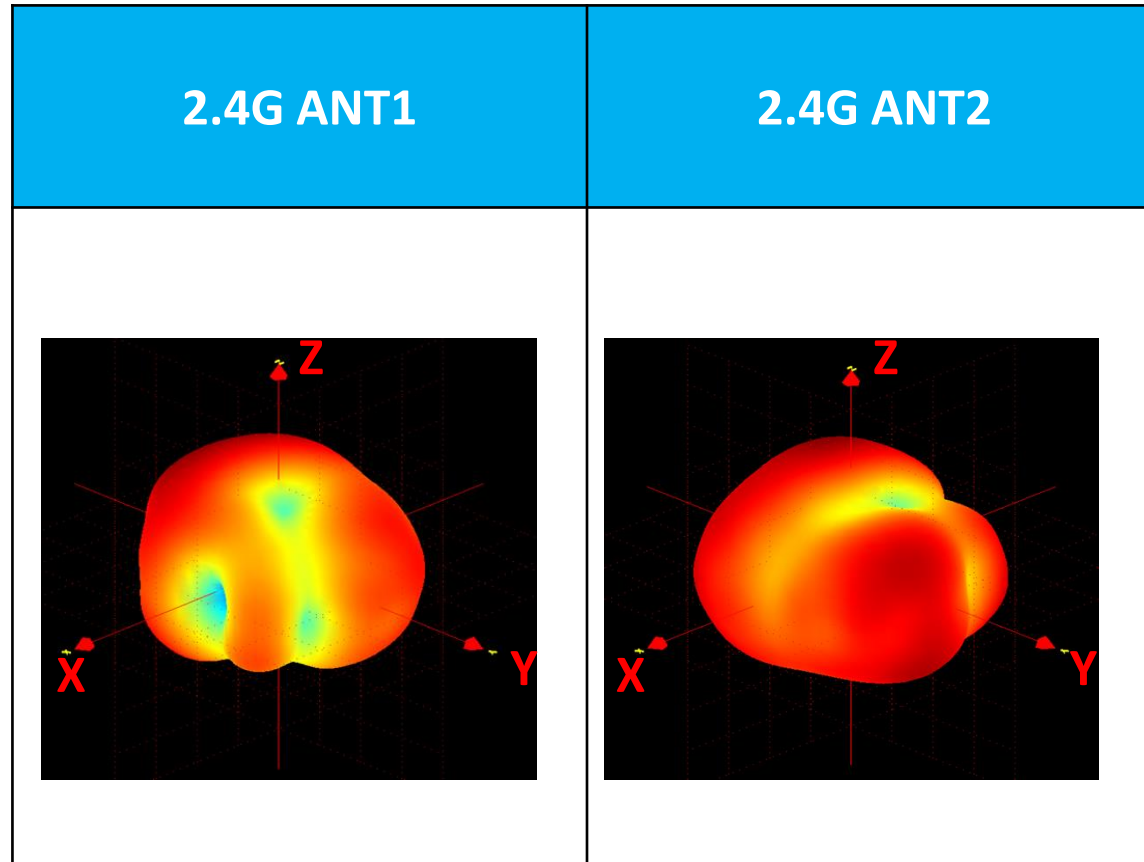
2D Radiation pattern 2.45G



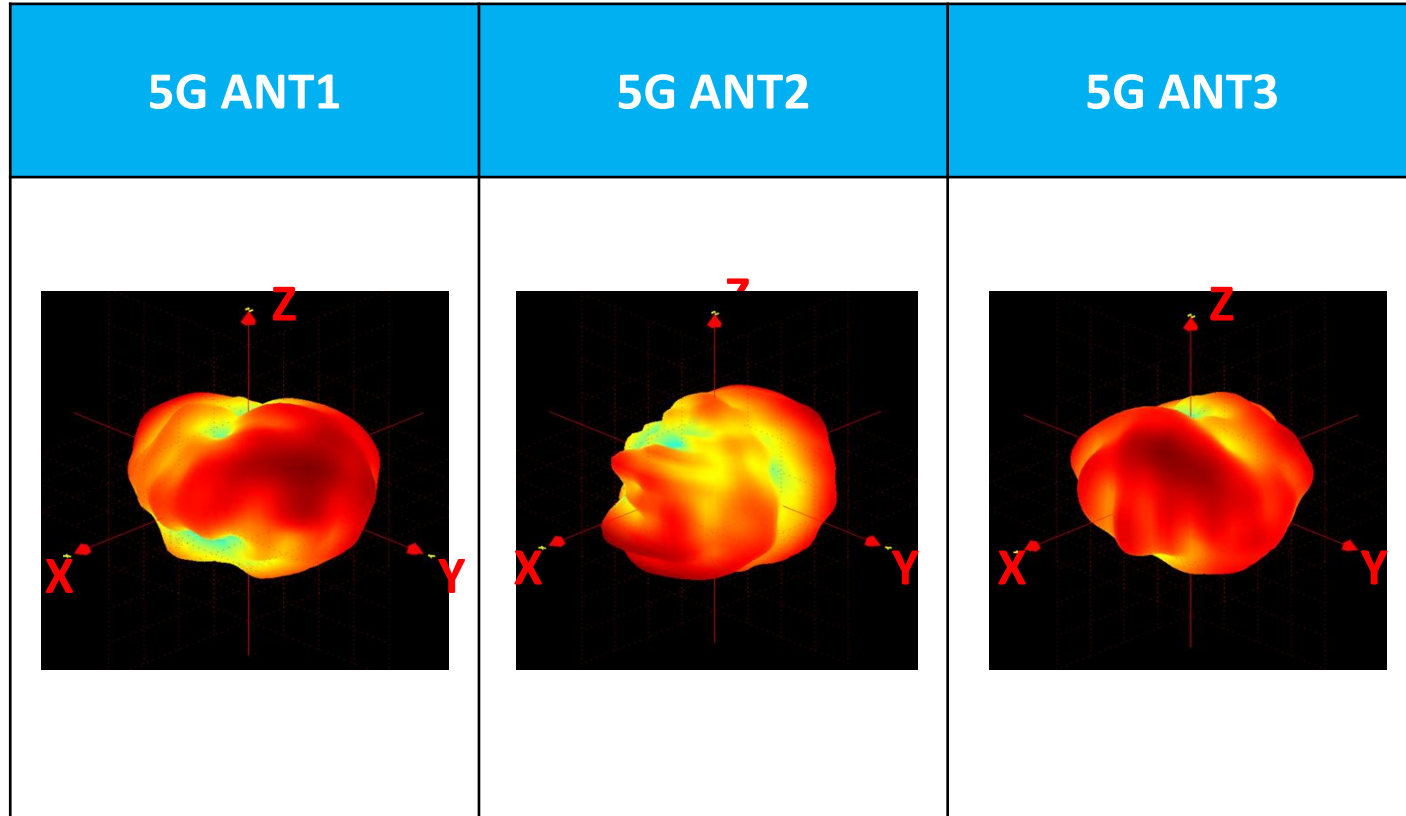
2D Radiation pattern 5.5G



3D Radiation pattern : WIFI_2.45GHz



3D Radiation pattern : WIFI_5.5GHz



Efficiency and Peak Gain

Test result

ANT	Frequency (GHz)	Peak Gain (dBi)	Peak Gain (dBi) @	Efficiency (%)
2.4G ant1	2.4	2.5	$\theta = -50$; $\phi = 129$	70.3
	2.5	2.7	$\theta = -48$; $\phi = 131$	71.6
2.4G ant2	2.4	2.5	$\theta = -24$; $\phi = 59$	75.9
	2.5	2.3	$\theta = -24$; $\phi = 64$	73.3
5G ant1	5.15	3.3	$\theta = 51$; $\phi = 78$	66.3
	5.5	3.5	$\theta = 54$; $\phi = 74$	64.5
	5.85	3.2	$\theta = 56$; $\phi = 70$	63.8
5G ant2	5.15	3.6	$\theta = 123$; $\phi = 165$	67.5
	5.5	3.4	$\theta = 110$; $\phi = 170$	66.2
	5.85	3.3	$\theta = 108$; $\phi = 173$	65.1
5G ant3	5.15	3.2	$\theta = 45$; $\phi = 33$	63.5
	5.5	2.9	$\theta = 45$; $\phi = 30$	65.8
	5.85	3.1	$\theta = 48$; $\phi = 41$	64.9

Peak gain = reading value + factor

- ◆ All WIFI antennas` Return loss are $\leq -13\text{dB}$ @ 2.4G&5G
- ◆ The isolation of all WIFI antennas are $\leq -22\text{dB}$
- ◆ WIFI ANT efficient: $>70\%$ @2.4G, 65% @5G
- ◆ 2.4G ANT peak gain: 2.5dBi
- ◆ 5G ANT peak gain: 3~3.5dBi

Thanks!

