



Antenna Solution for M60 project D-Link / M60

TOM

2023.03.17

V3.0

Antenna Type _ Dipole

Address: No. 8, Liuzhou Road, Lushan Industrial Park, Xinxing Development Zone, Changshu City, Jiangsu Province

2023/3/15

Executive Summary

- **Testing contents**

- Test Environment and Equipment
- HB Antenna Photo
- Test Result :Return loss
- Test Result :Isolation
- DUT orientation setting
- Antenna radiation pattern
- Test Result : Gain Table



Version information

Version	Remark	Date
V3.0	Antenna solution	20230317



Test Environment & Equipment

- SATIMO SG 24 Multi-Probe Antenna Measurement System
- Angle between probes: 15°
- Frequency range: 400 MHz - 6 GHz
- Chamber Room Size: 4.0 m L x 4.0 m W x 4.0 m H

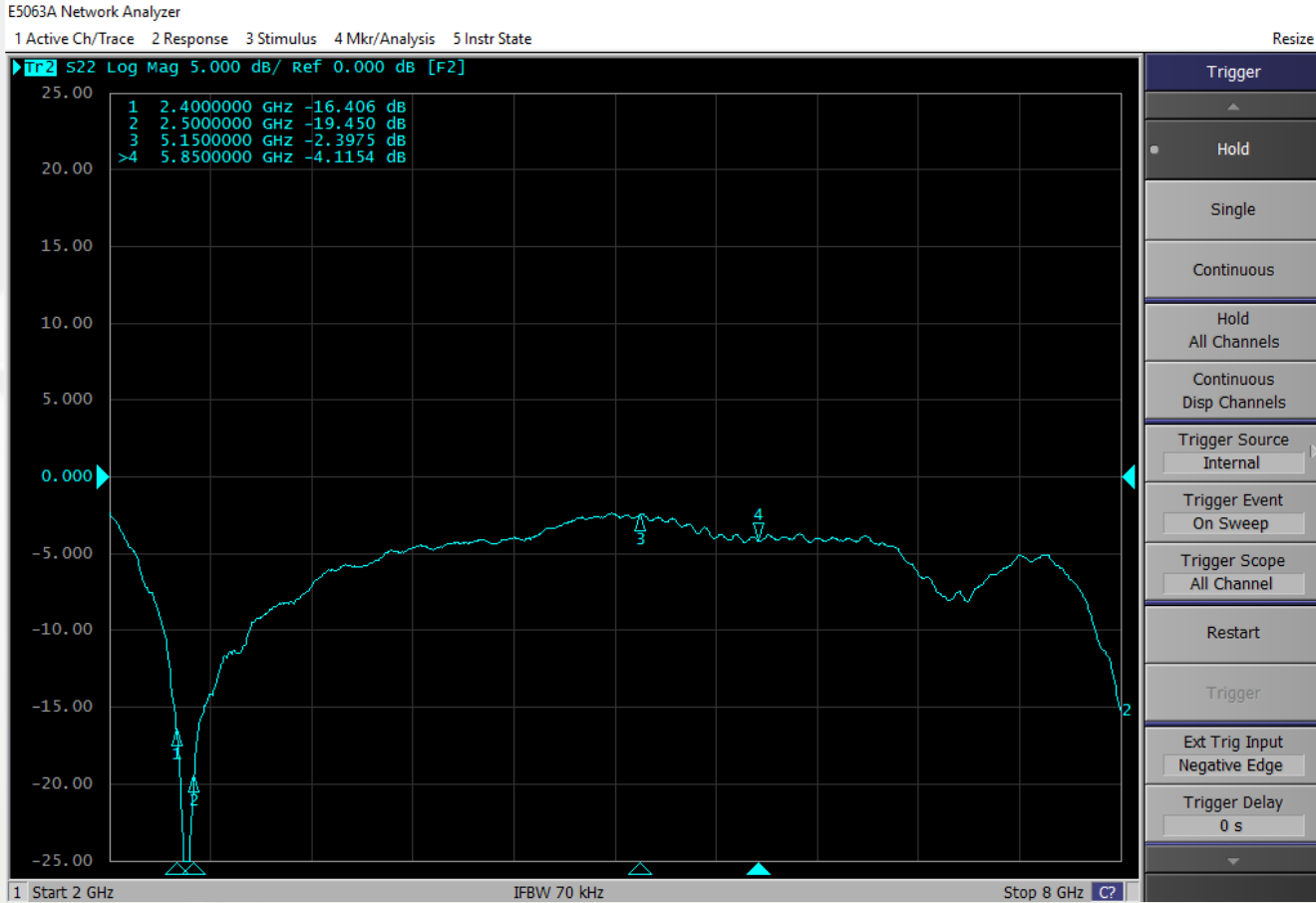


VSWR were performed using an Agilent S-parameter Network Analyzer.



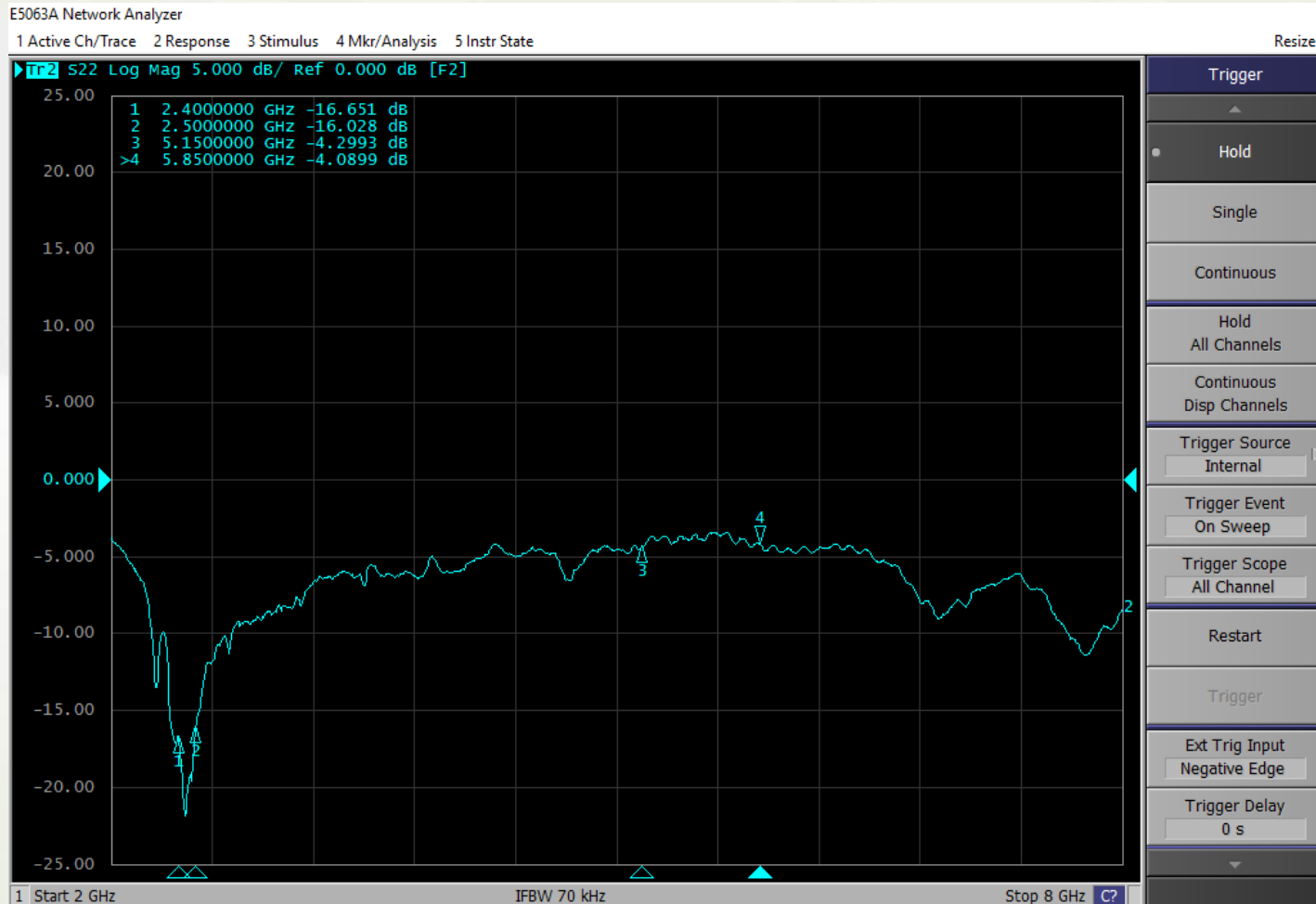
Test Result : Return Loss

2G1

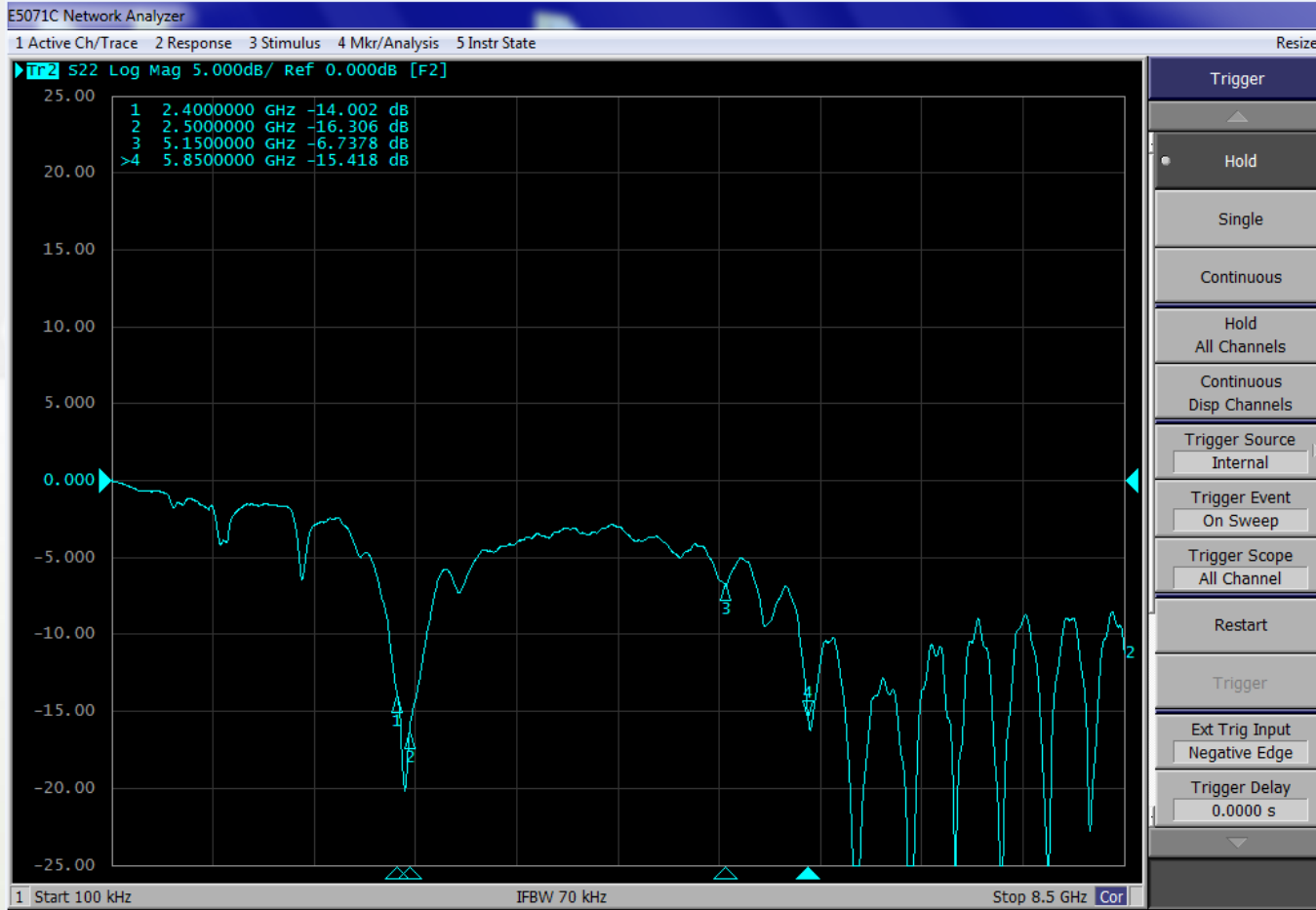


Test Result : Return Loss

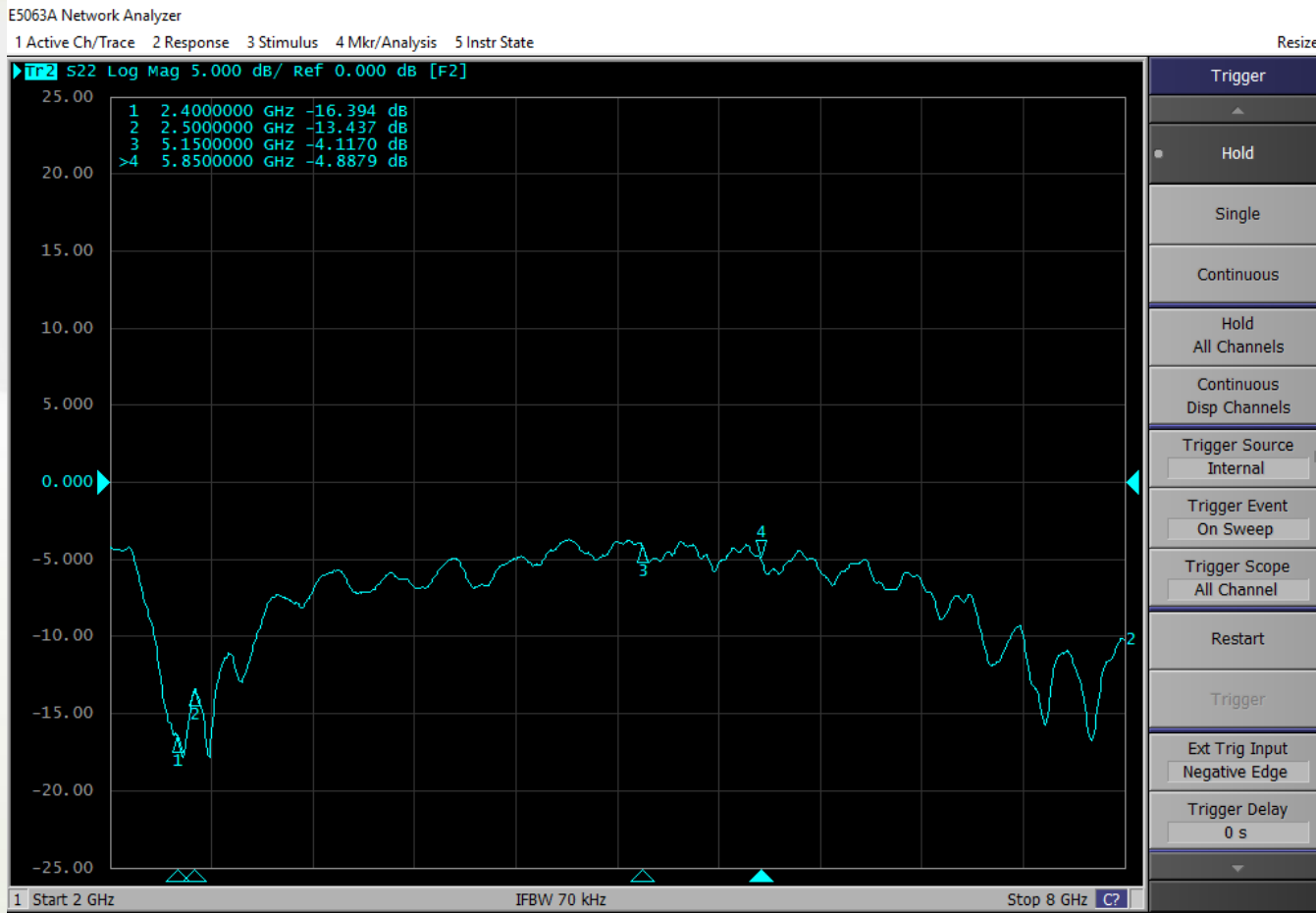
2G2



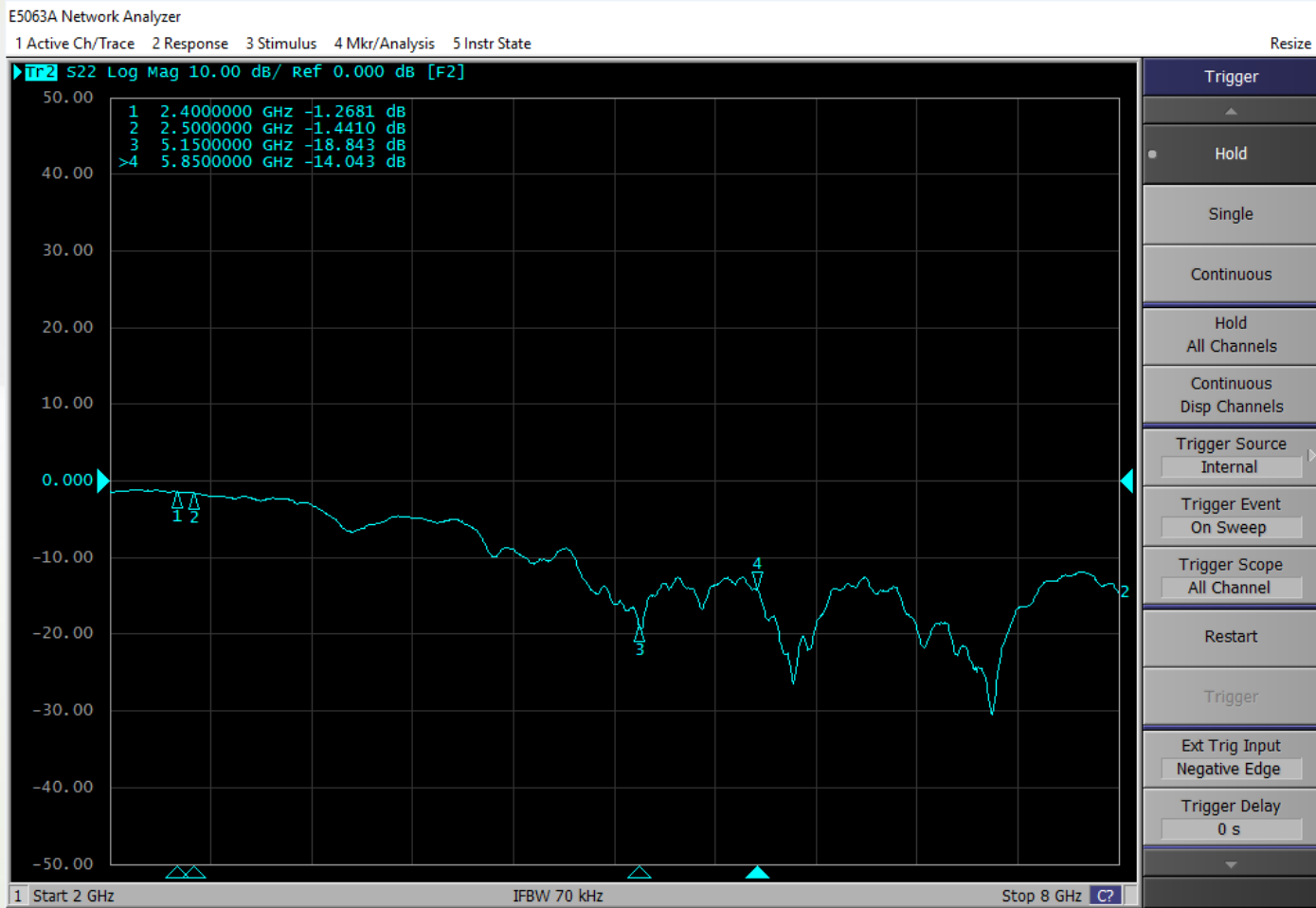
Test Result : Return Loss 2G3



Test Result : Return Loss 2G4



Test Result : Return Loss 5G1



Test Result : Return Loss

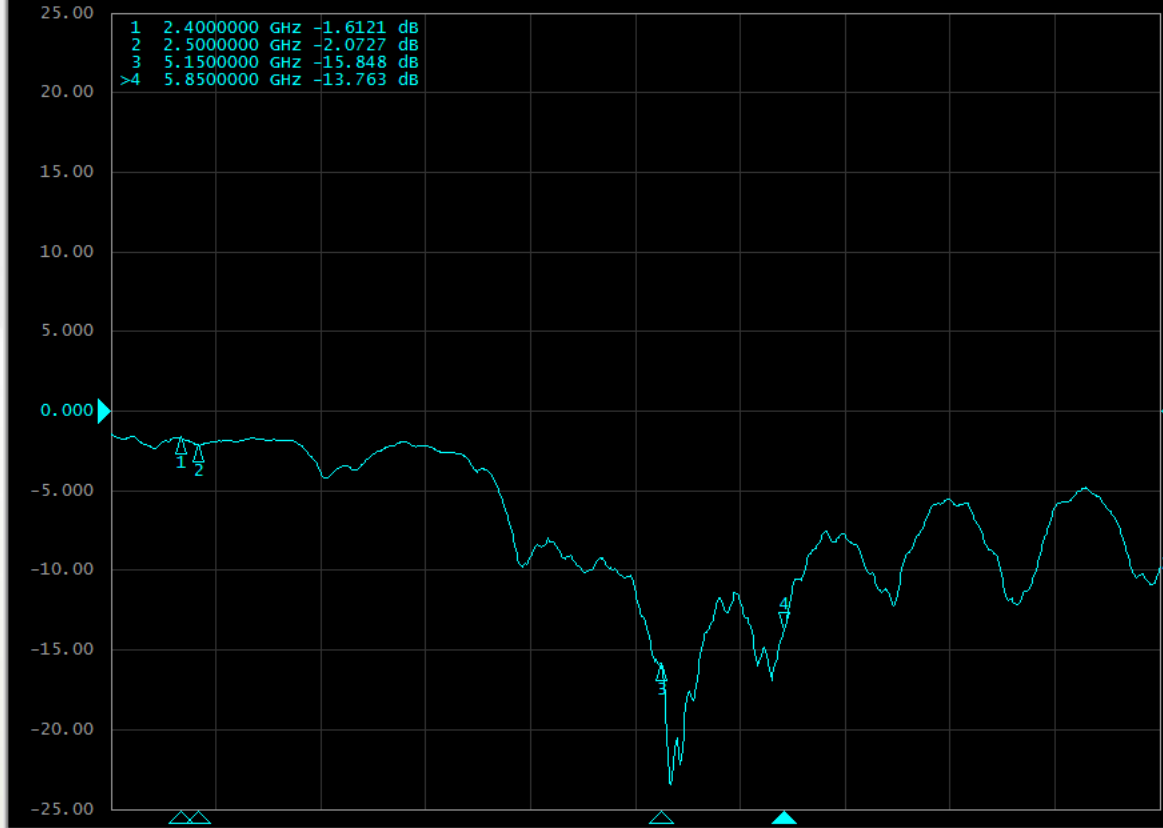
5G2

E5063A Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

Resize

S22 Log Mag 5.000 dB/ Ref 0.000 dB [F2]



1 Start 2 GHz IFBW 70 kHz Stop 8 GHz C2

Trigger

Hold

Single

Continuous

Hold All Channels

Continuous Disp Channels

Trigger Source Internal

Trigger Event On Sweep

Trigger Scope All Channel

Restart

Trigger

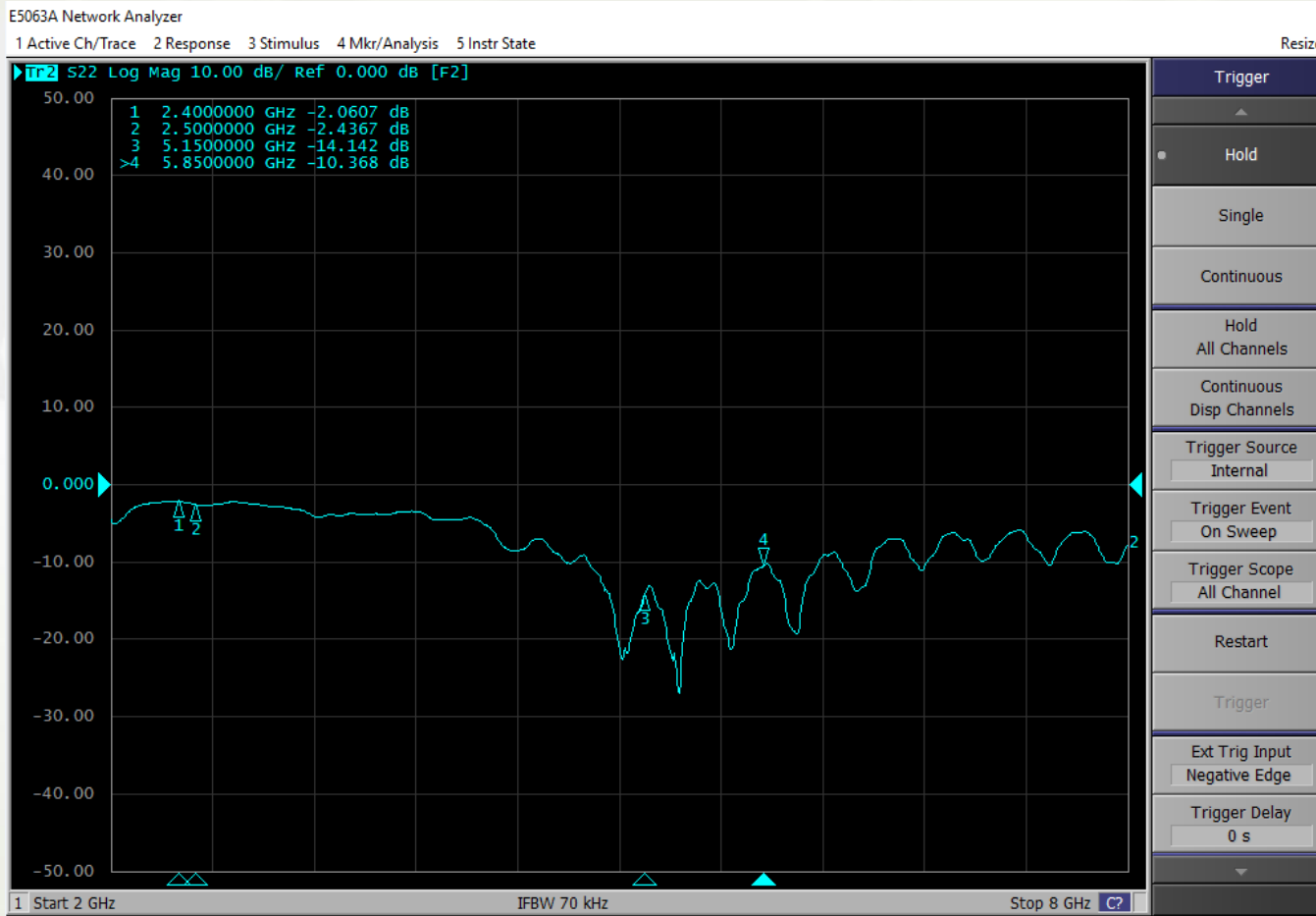
Ext Trig Input Negative Edge

Trigger Delay 0 s



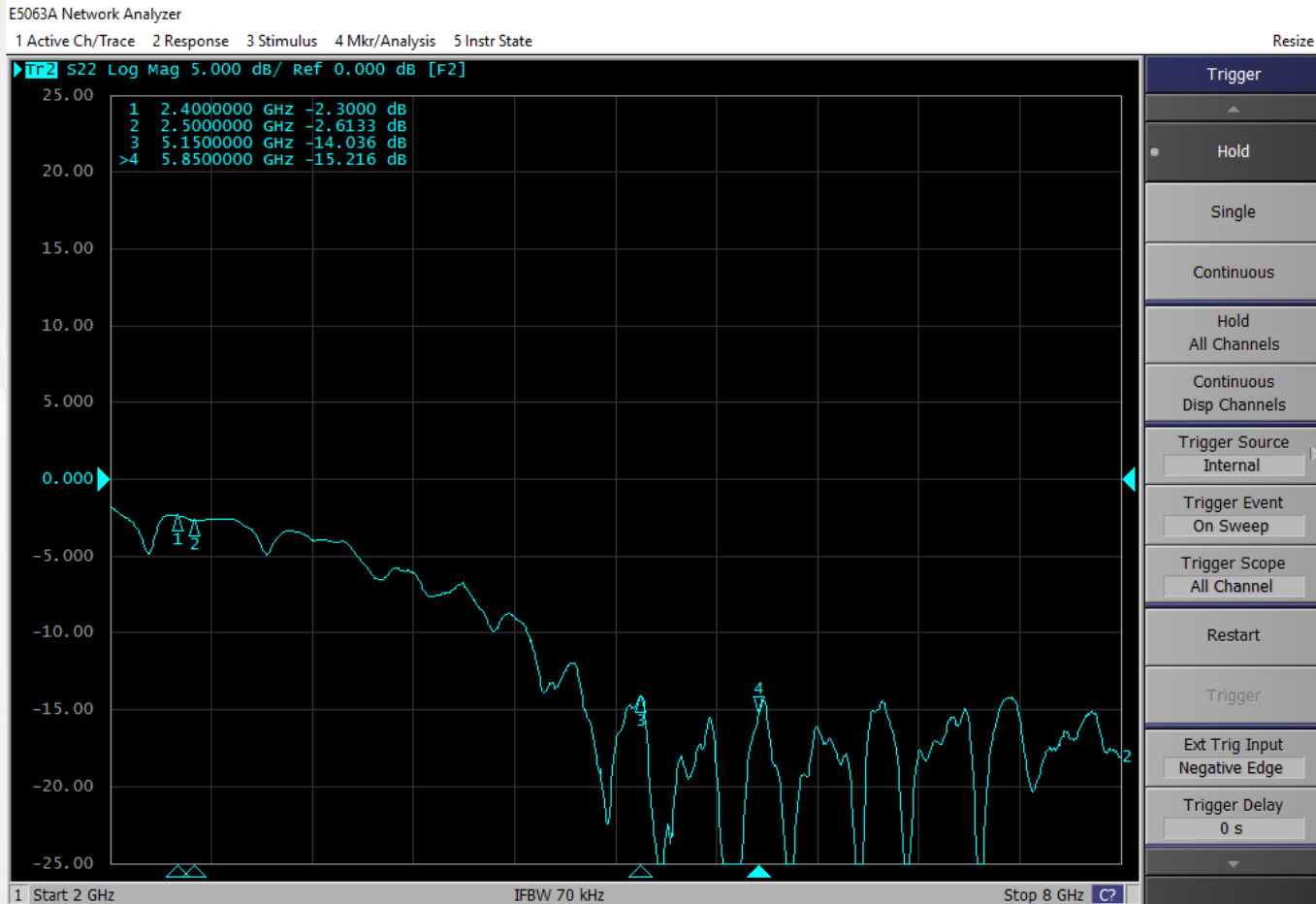
Test Result : Return Loss

5G3



Test Result : Return Loss

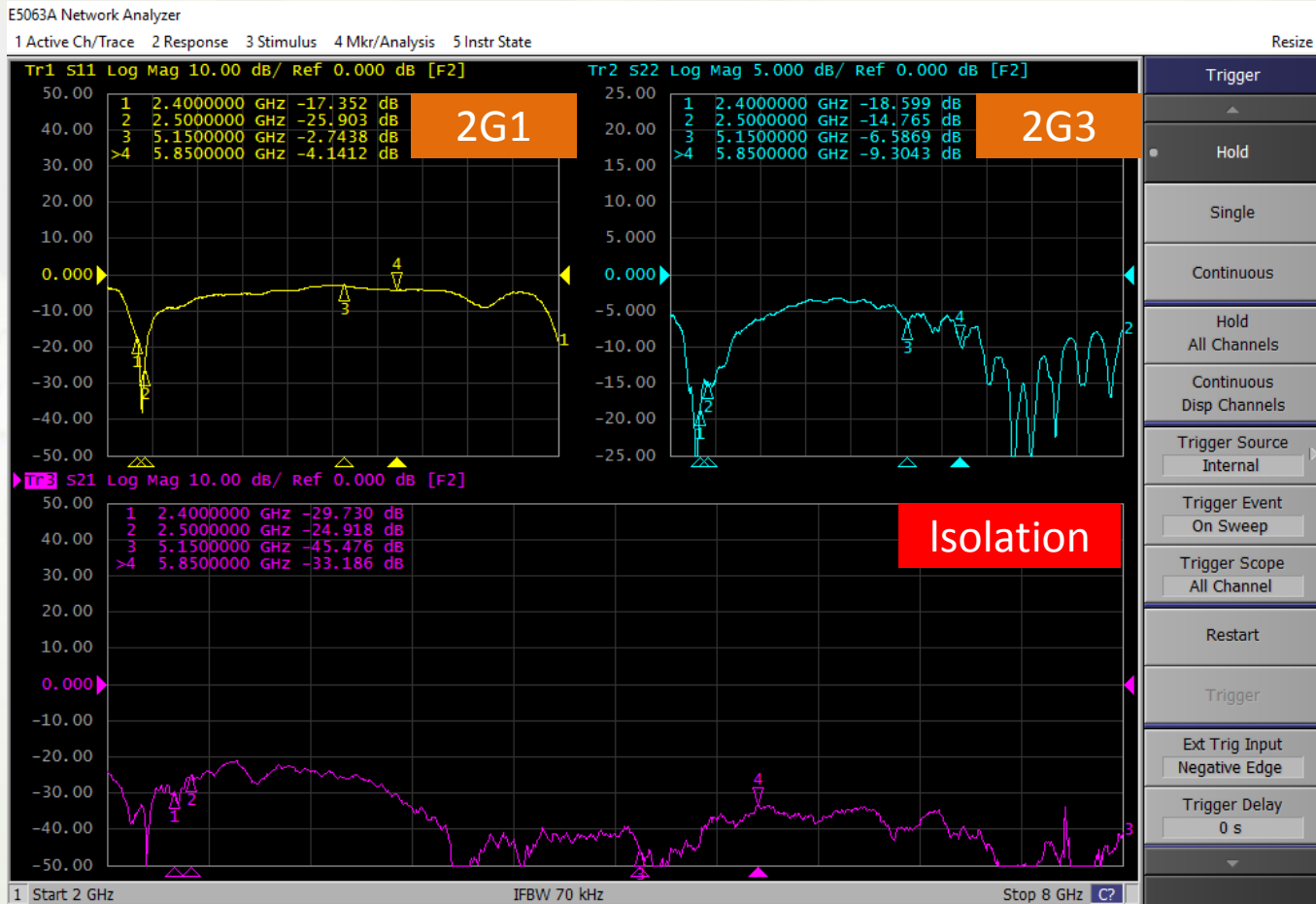
5G4



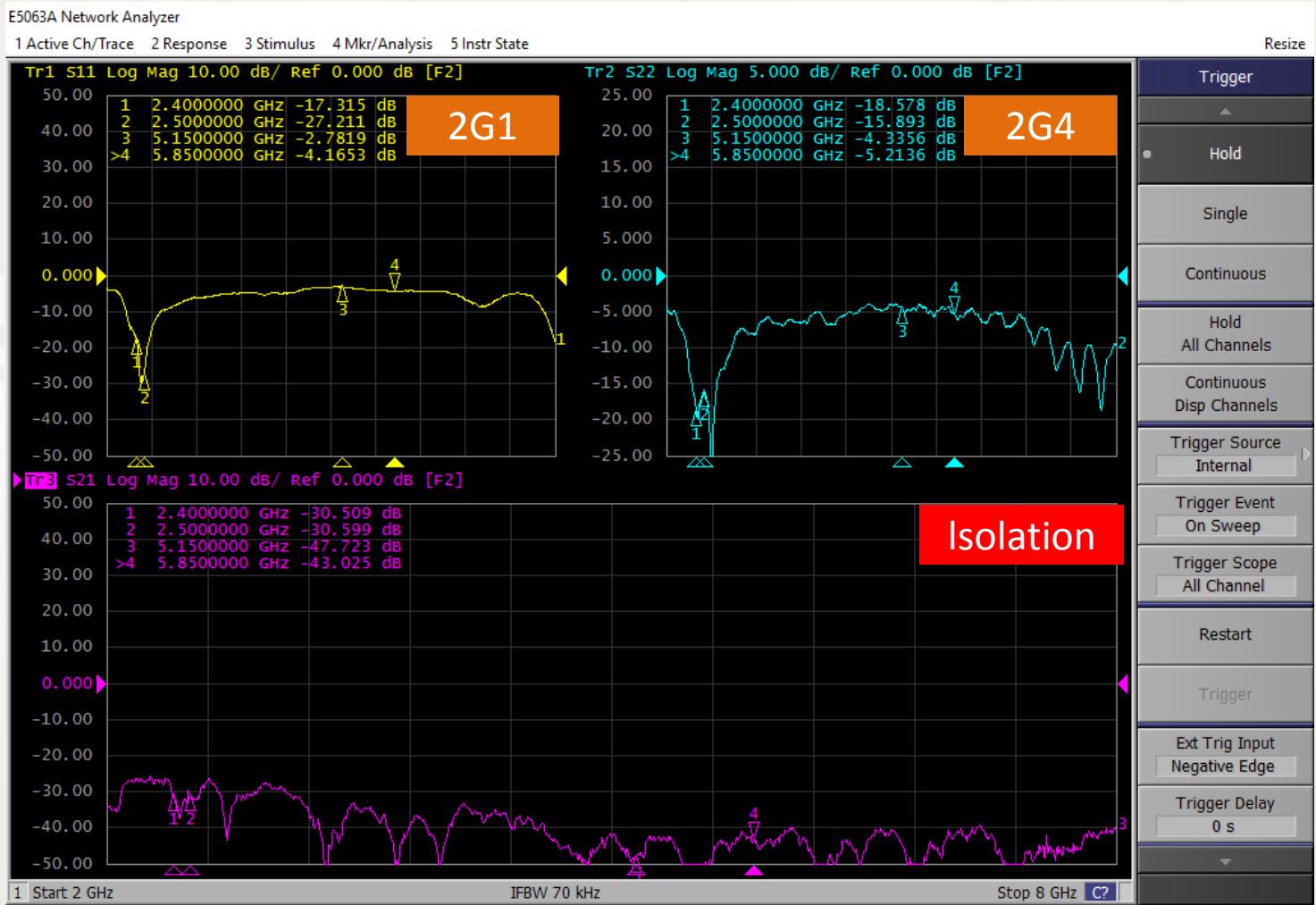
Test Result : Return Loss & Isolation



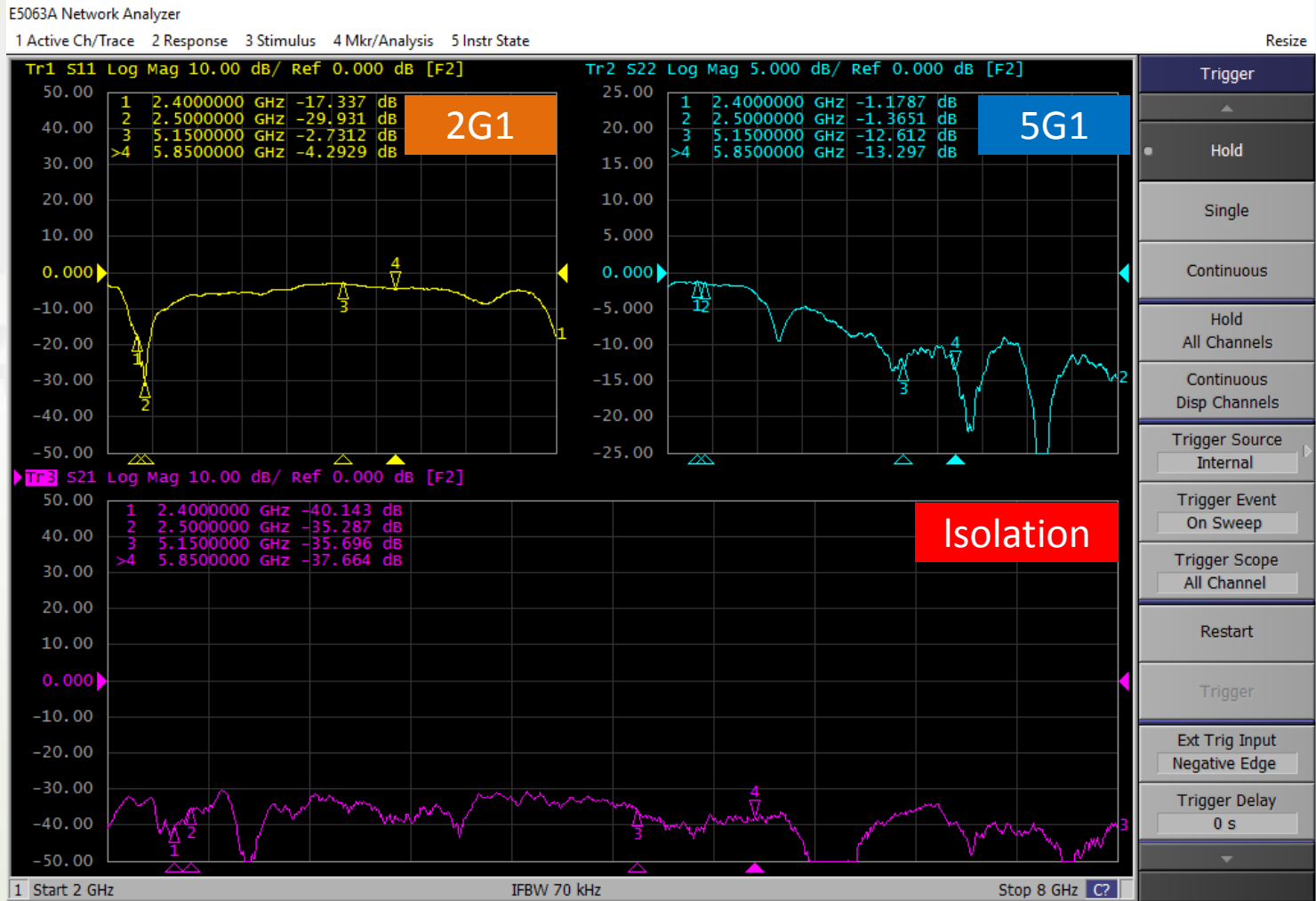
Test Result : Return Loss & Isolation



Test Result : Return Loss & Isolation



Test Result : Return Loss & Isolation



Trigger

Hold

Single

Continuous

Hold All Channels

Continuous Disp Channels

Trigger Source Internal

Trigger Event On Sweep

Trigger Scope All Channel

Restart

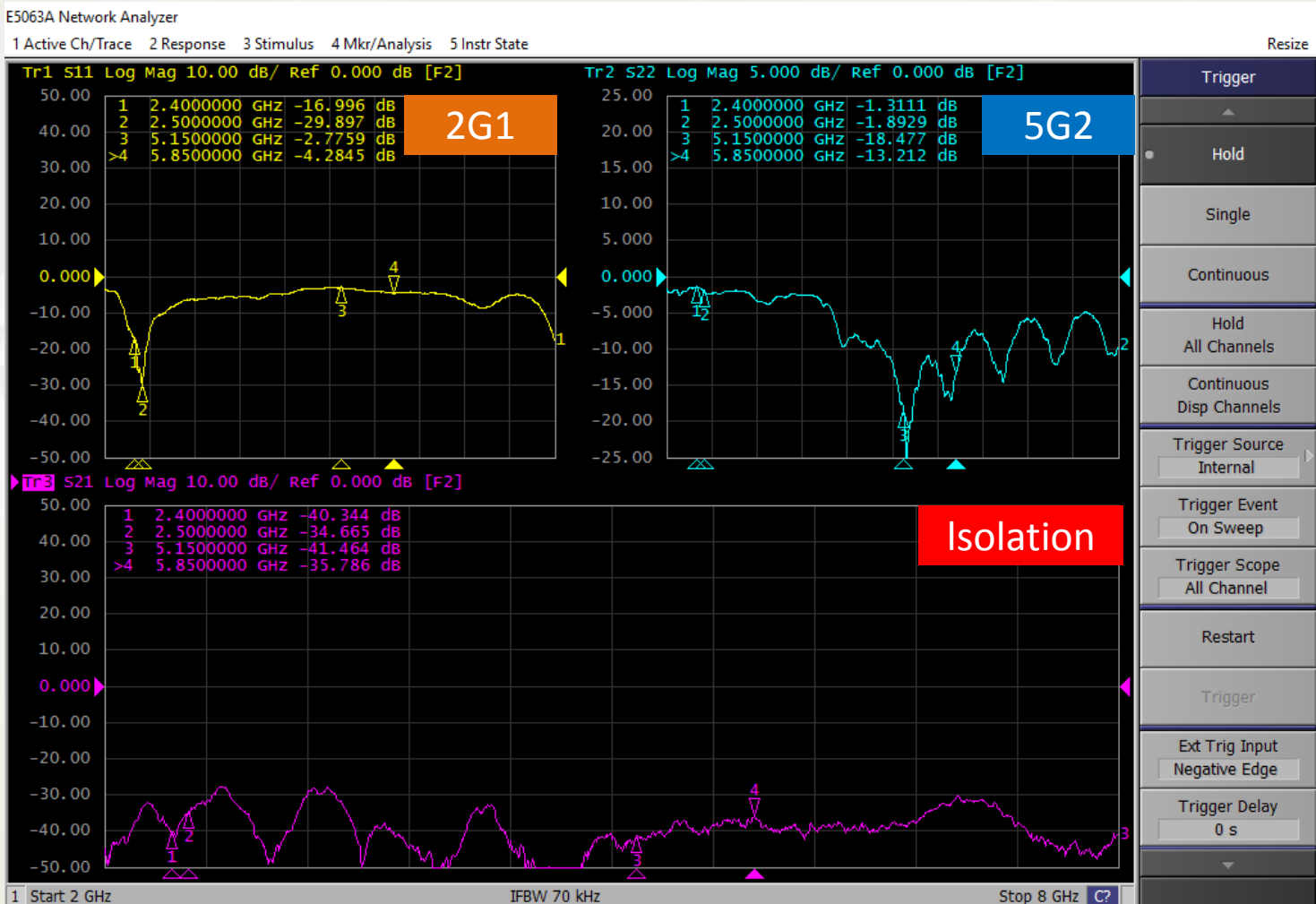
Trigger

Ext Trig Input Negative Edge

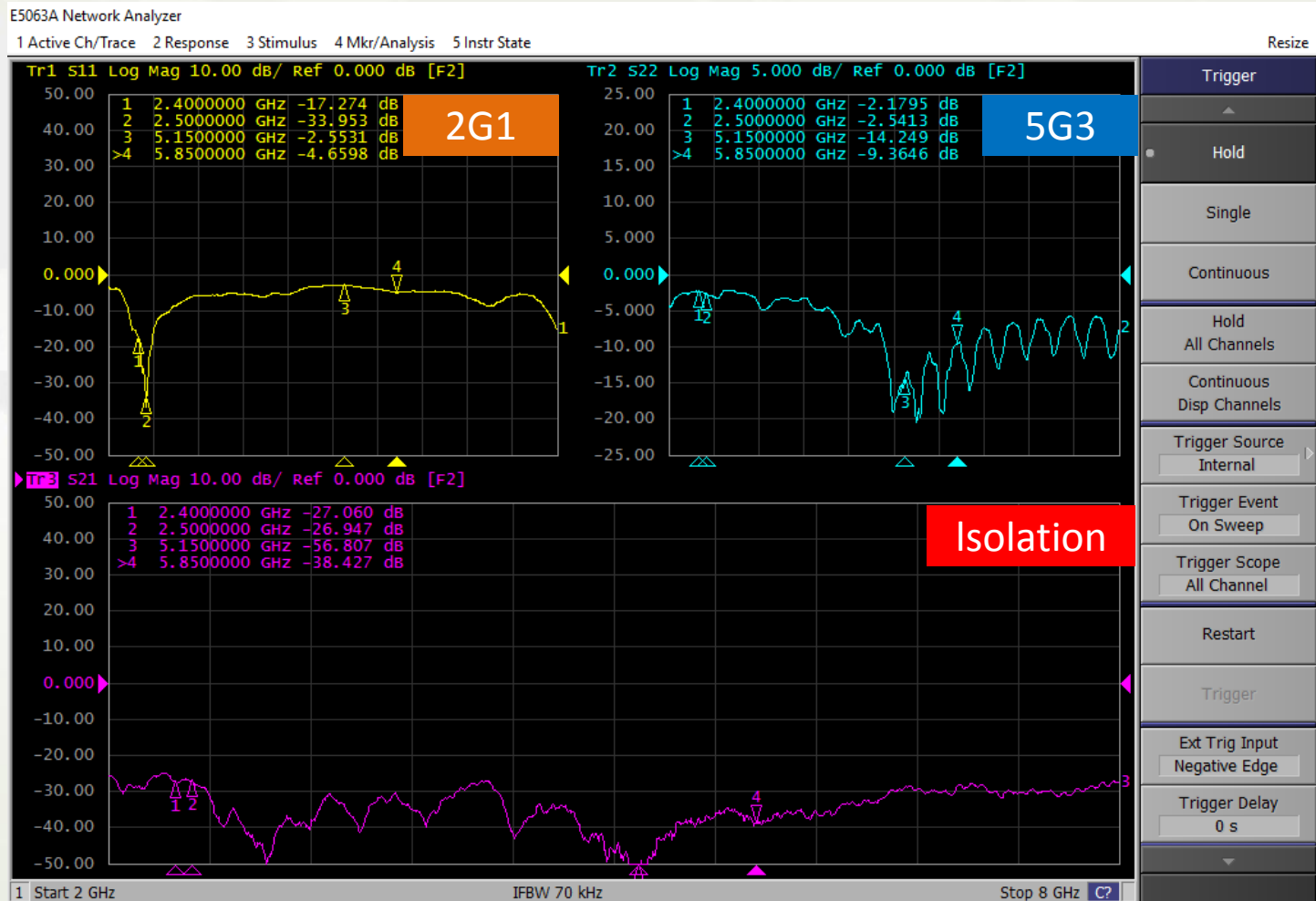
Trigger Delay 0 s



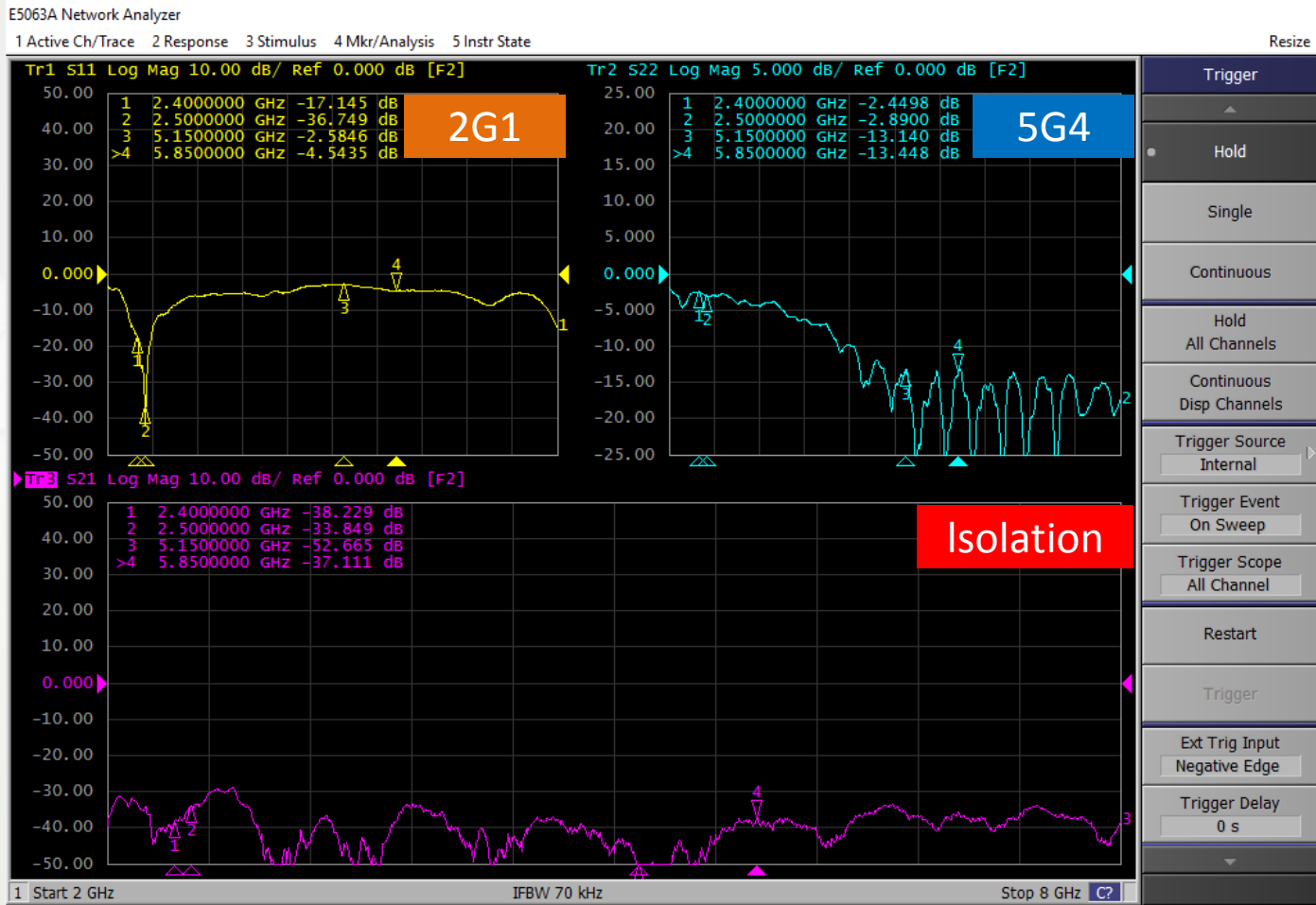
Test Result : Return Loss & Isolation



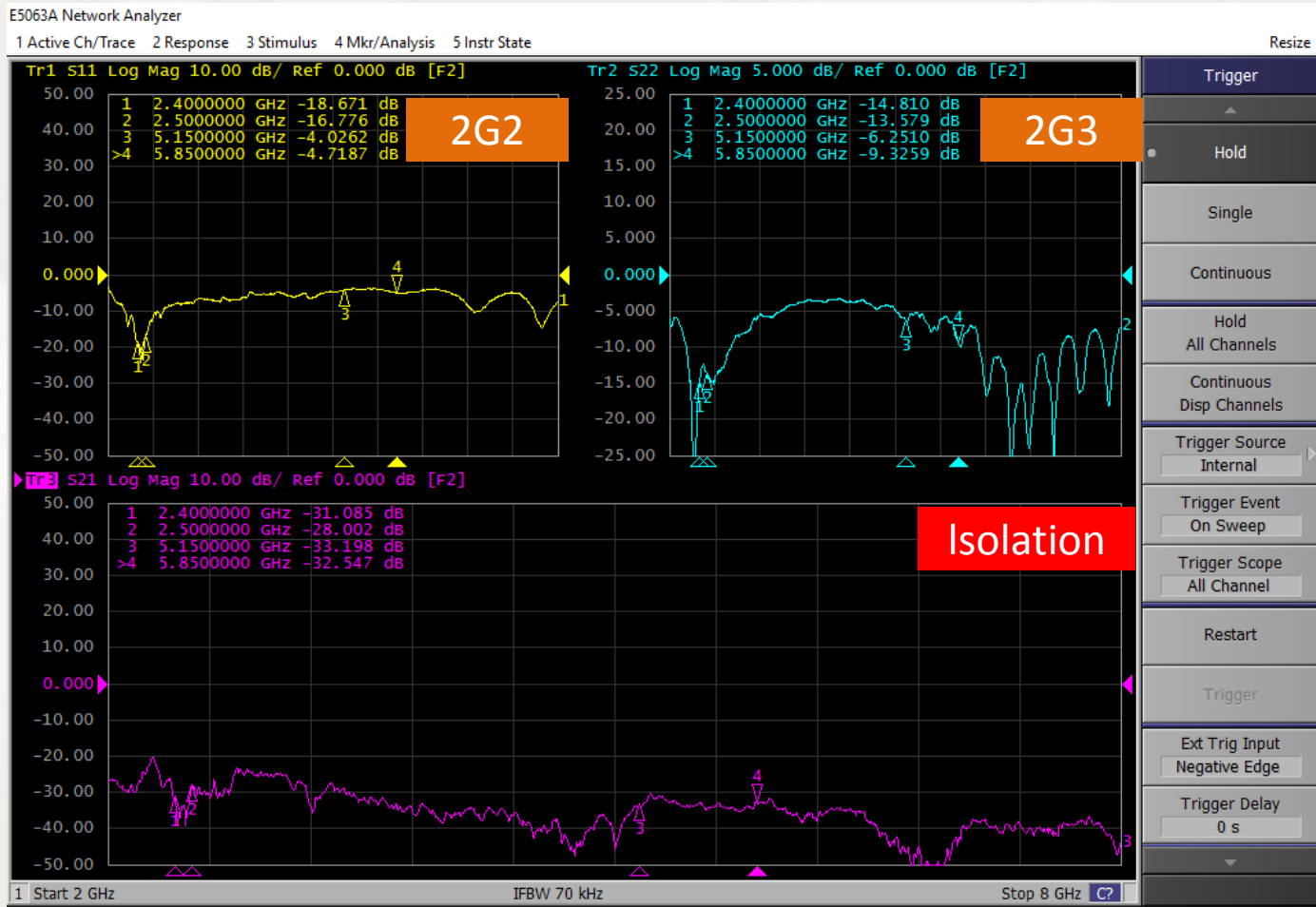
Test Result : Return Loss & Isolation



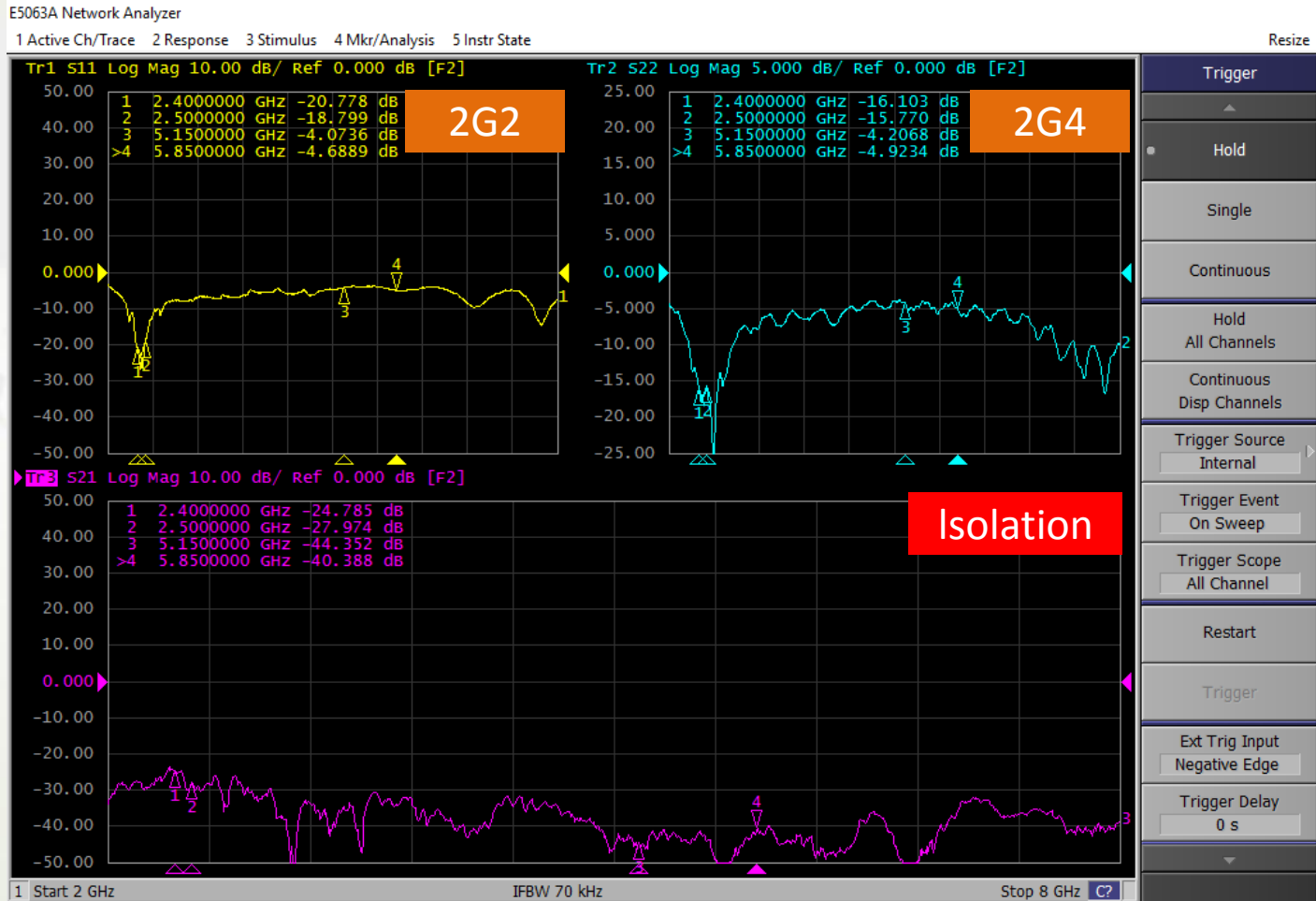
Test Result : Return Loss & Isolation



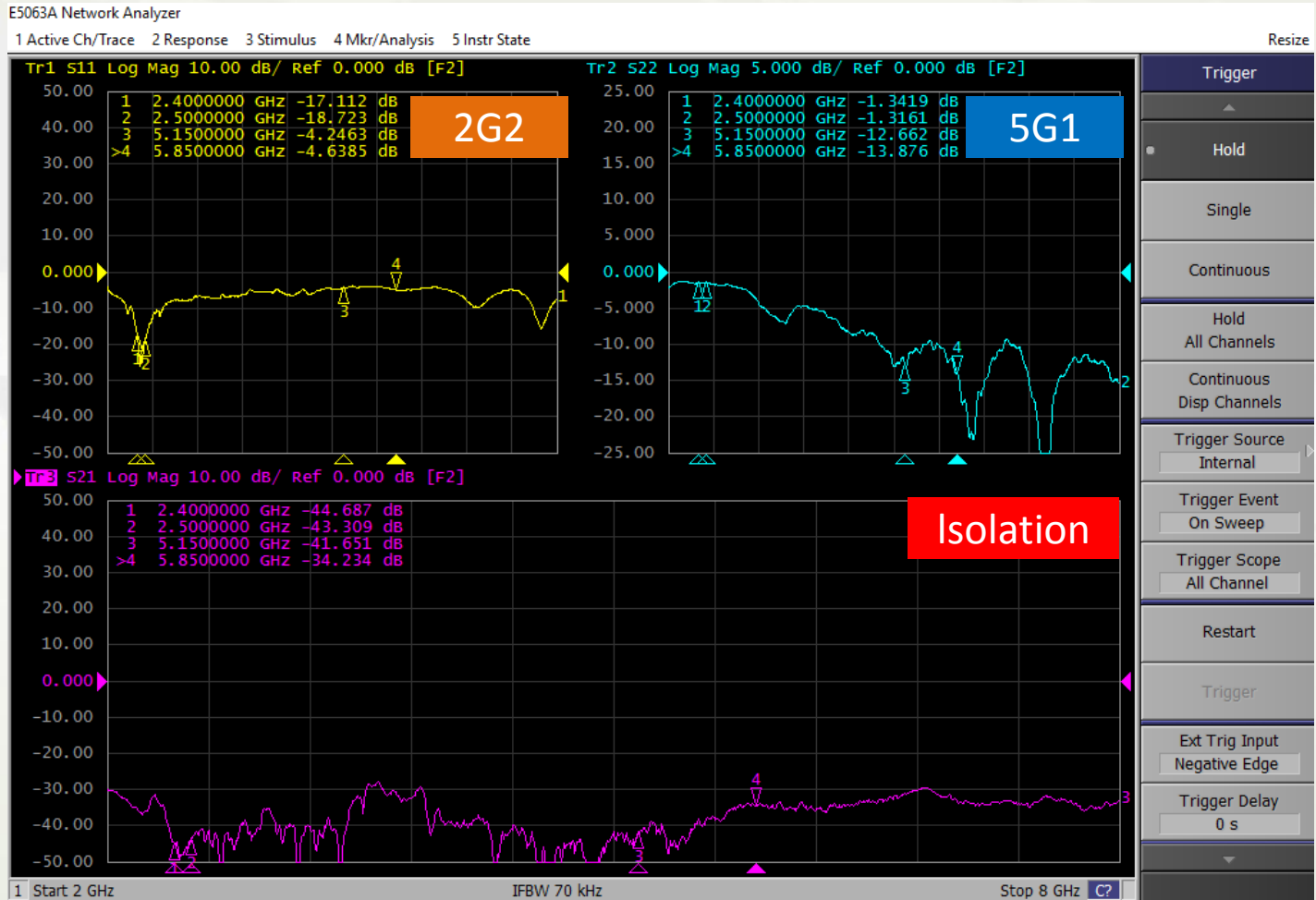
Test Result : Return Loss & Isolation



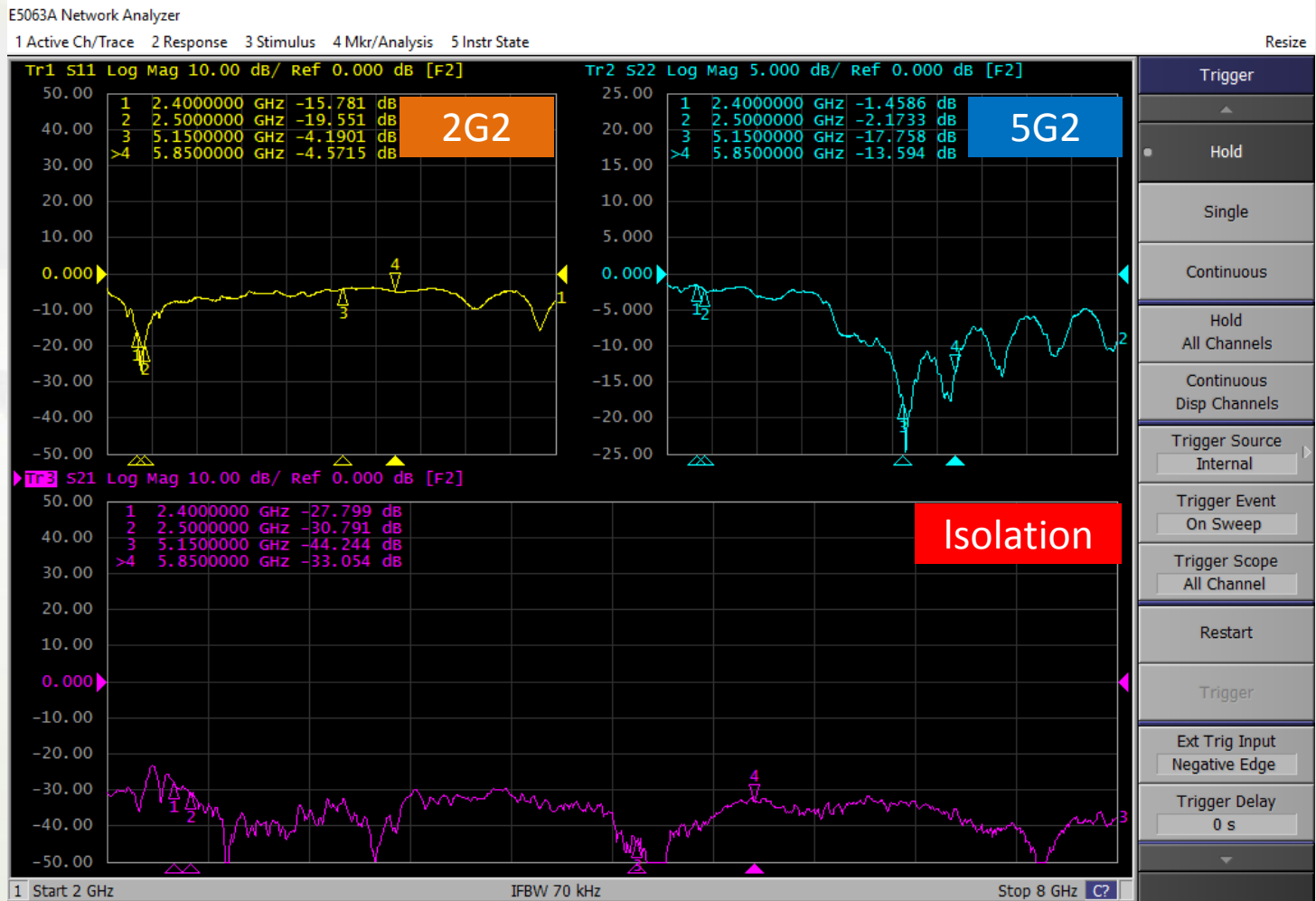
Test Result : Return Loss & Isolation



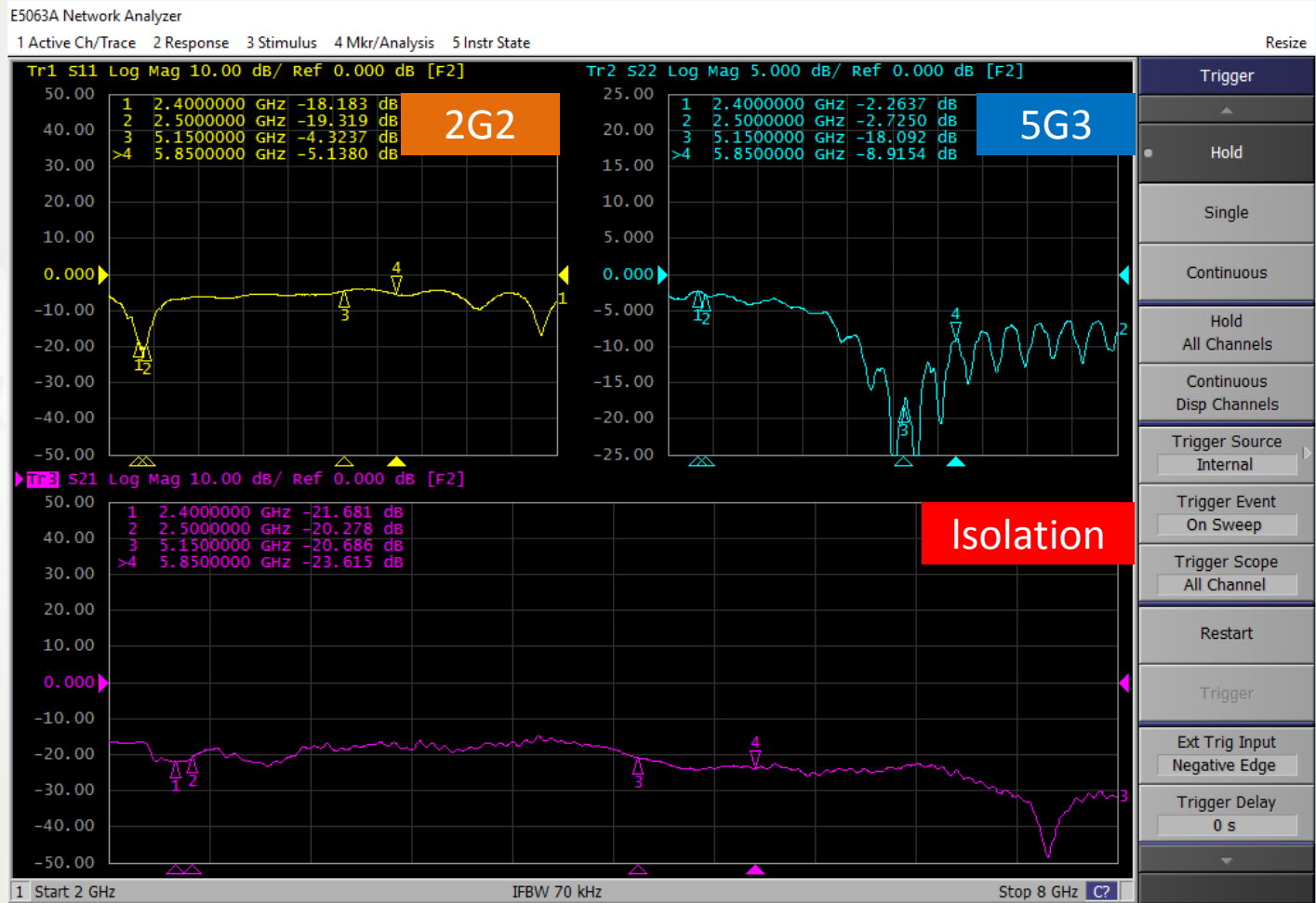
Test Result : Return Loss & Isolation



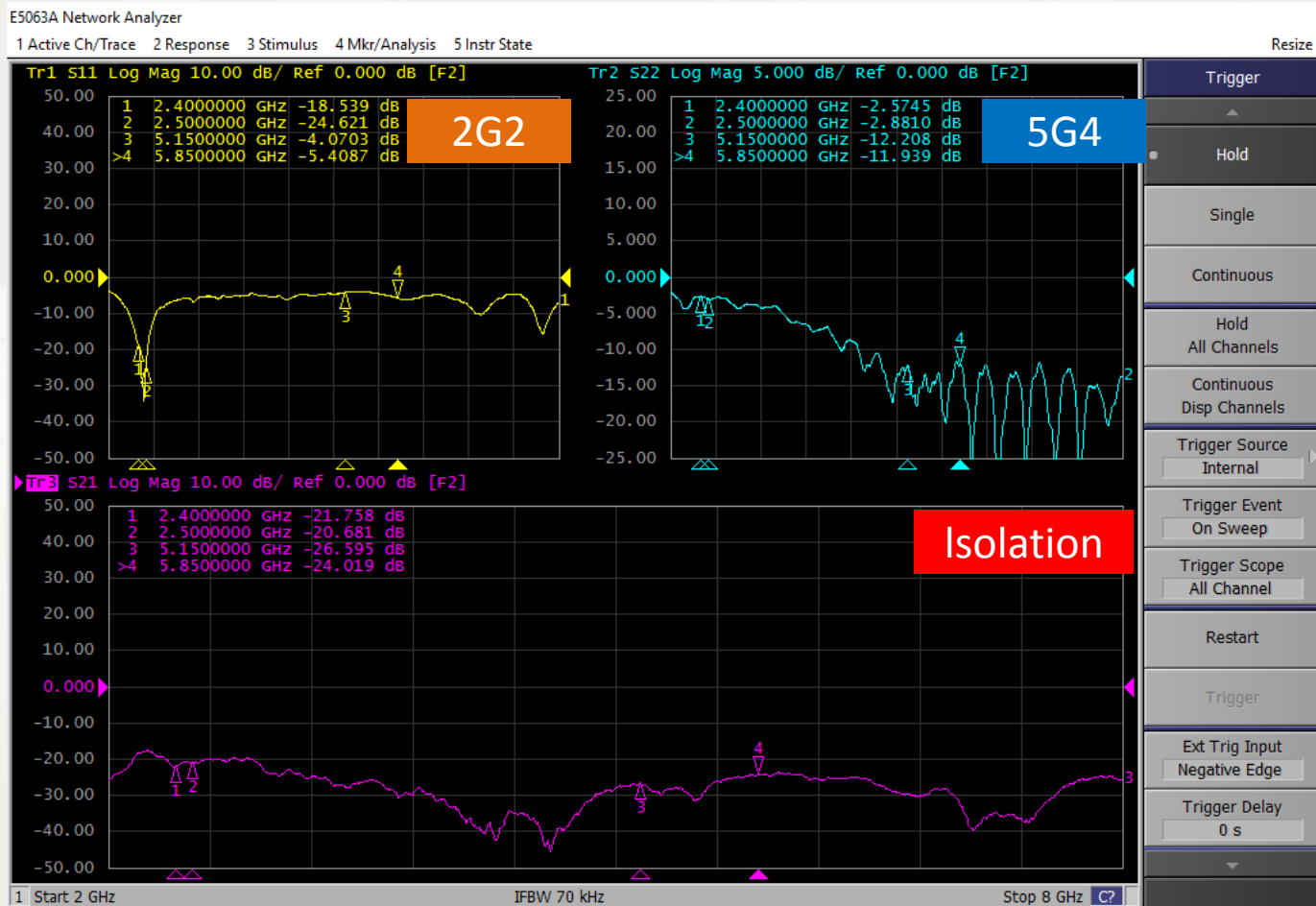
Test Result : Return Loss & Isolation



Test Result : Return Loss & Isolation



Test Result : Return Loss & Isolation



Test Result : Return Loss & Isolation



Resize

Trigger

Hold

Single

Continuous

Hold All Channels

Continuous Disp Channels

Trigger Source Internal

Trigger Event On Sweep

Trigger Scope All Channel

Restart

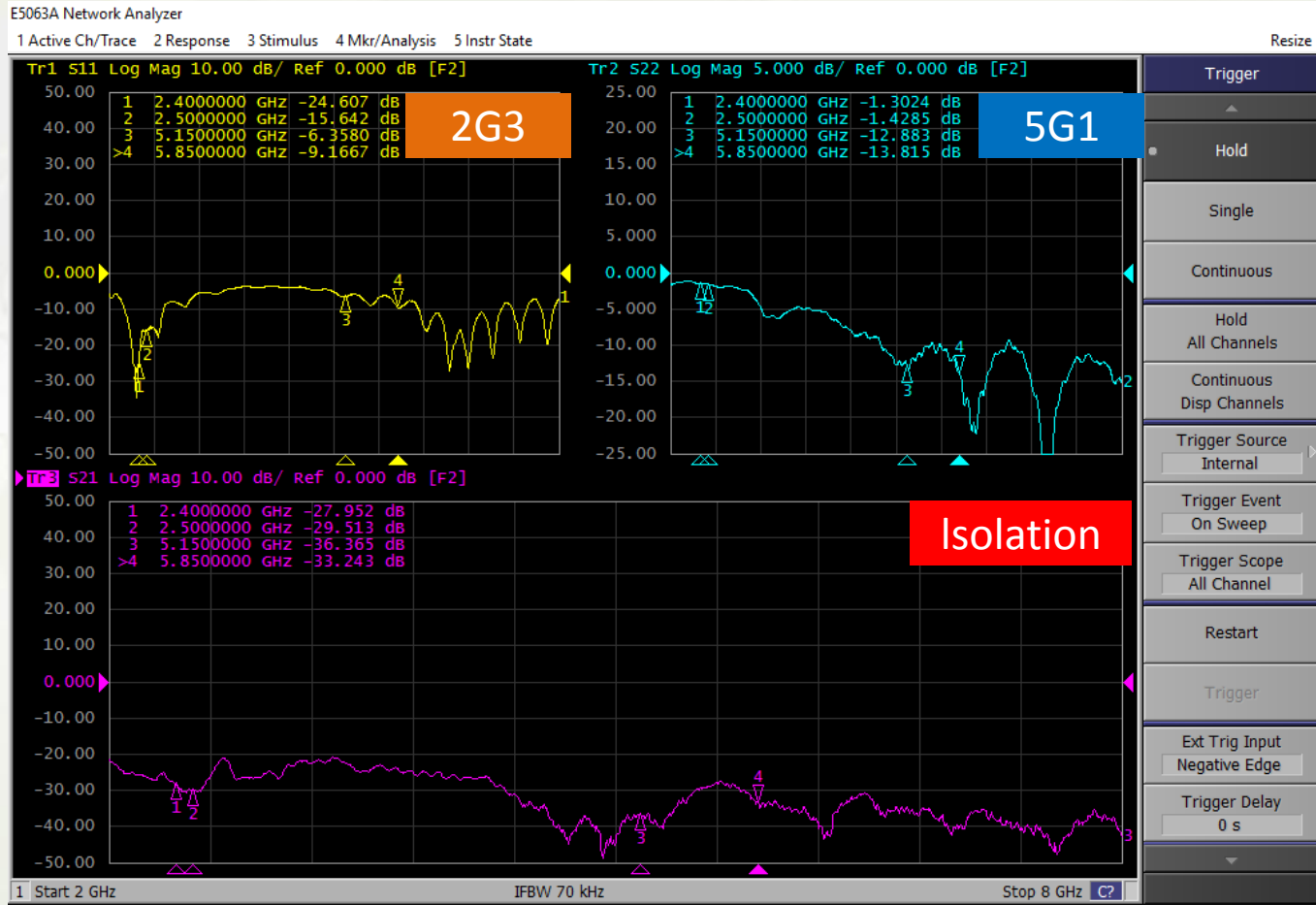
Trigger

Ext Trig Input Negative Edge

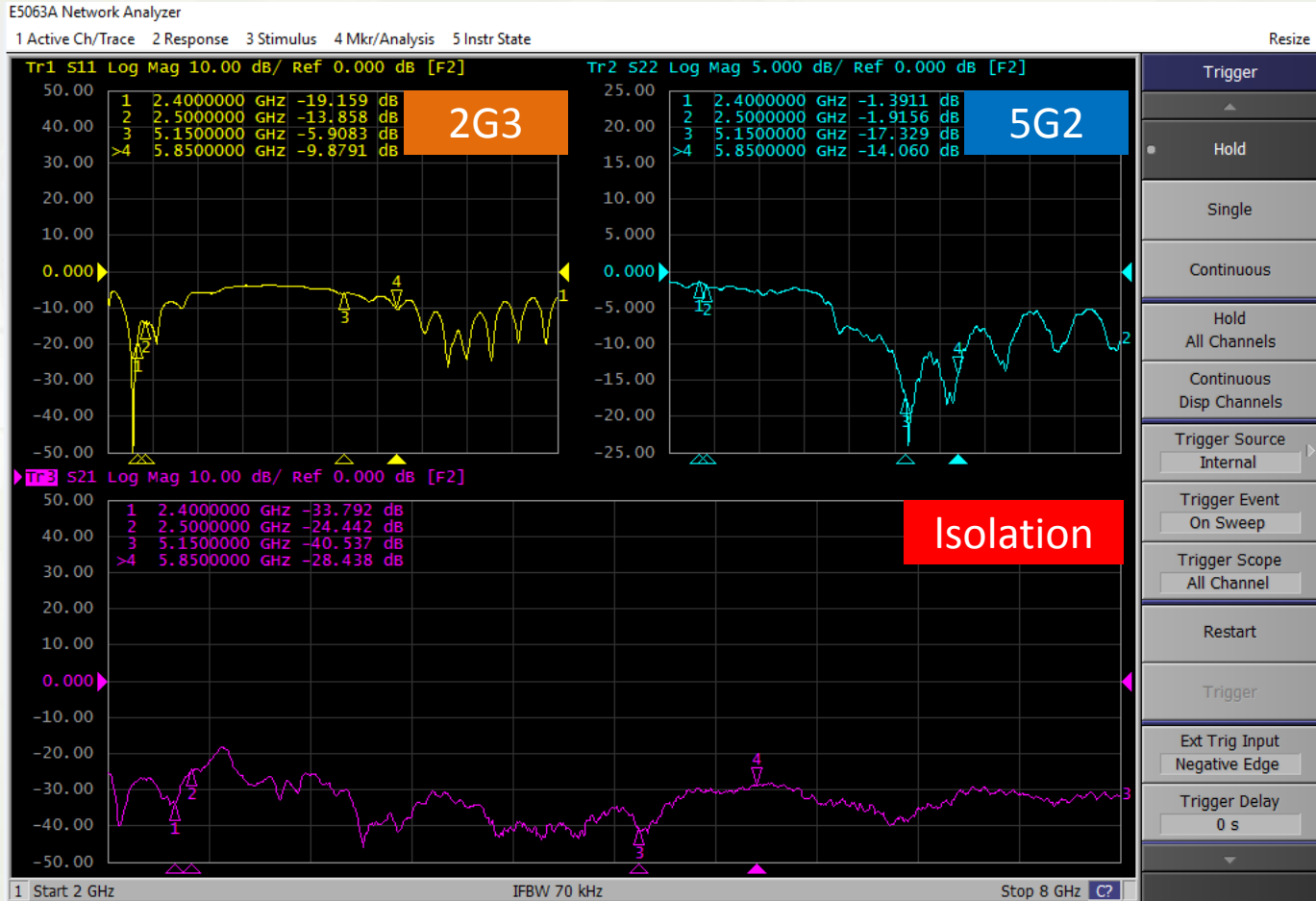
Trigger Delay 0 s



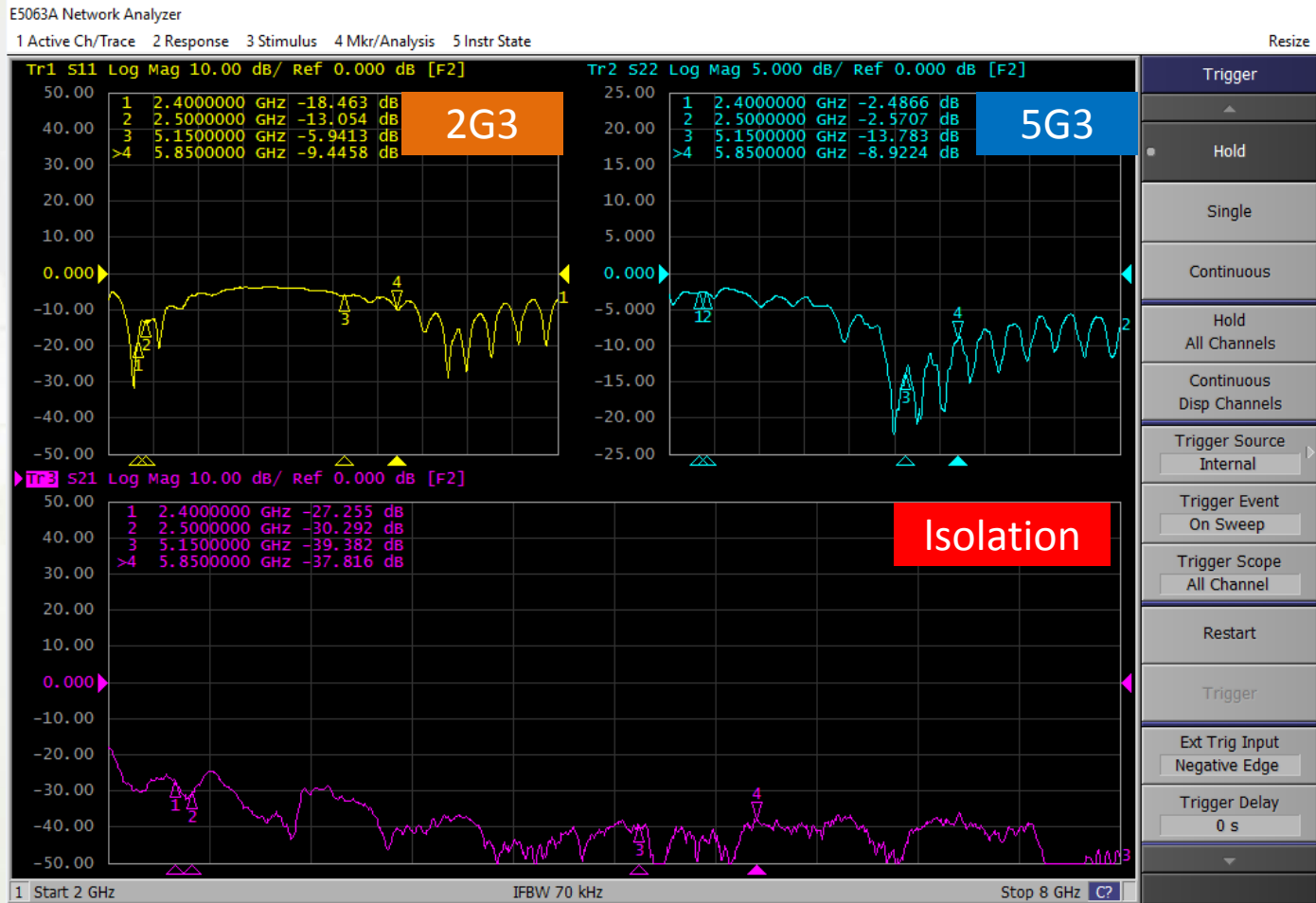
Test Result : Return Loss & Isolation



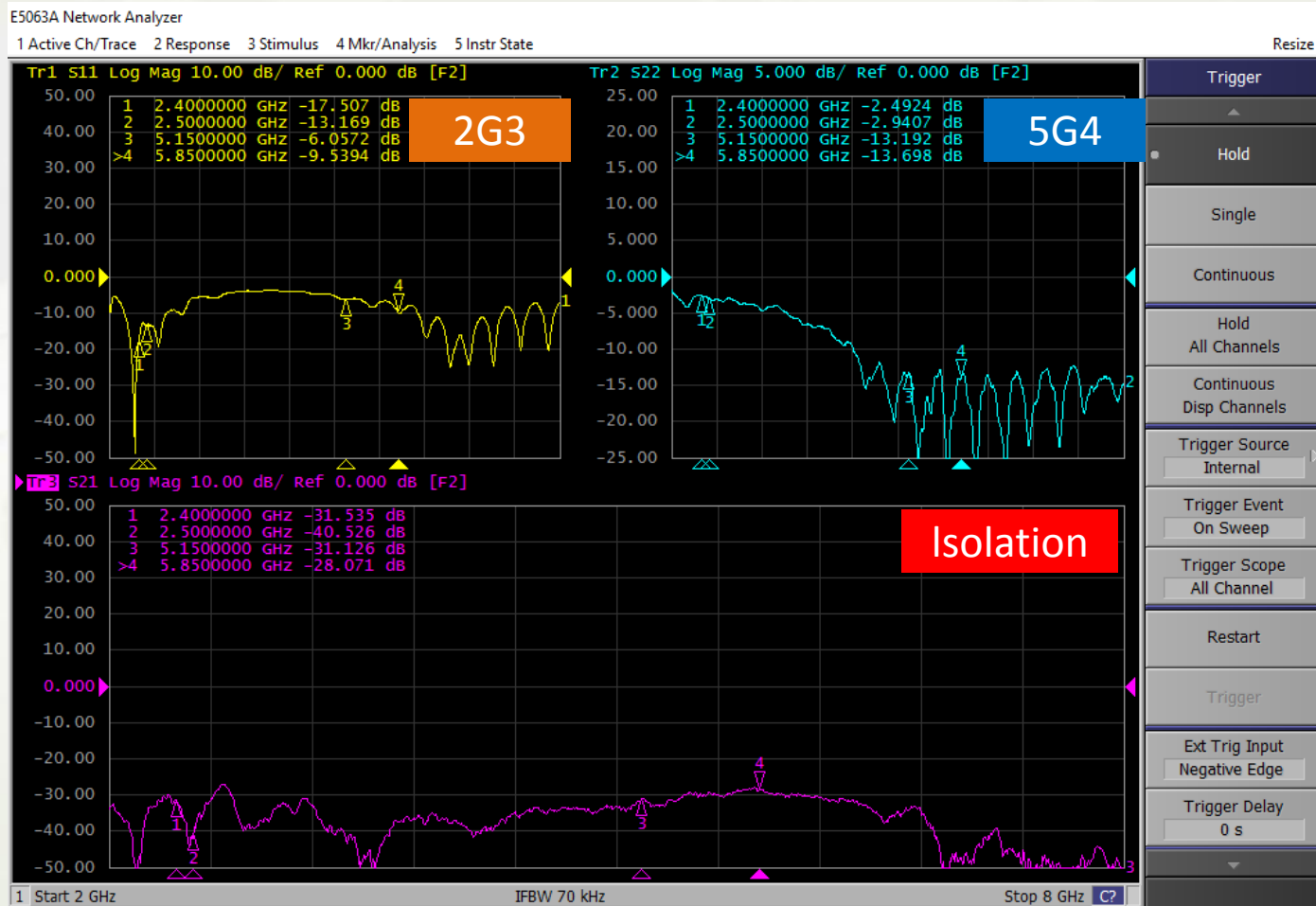
Test Result : Return Loss & Isolation



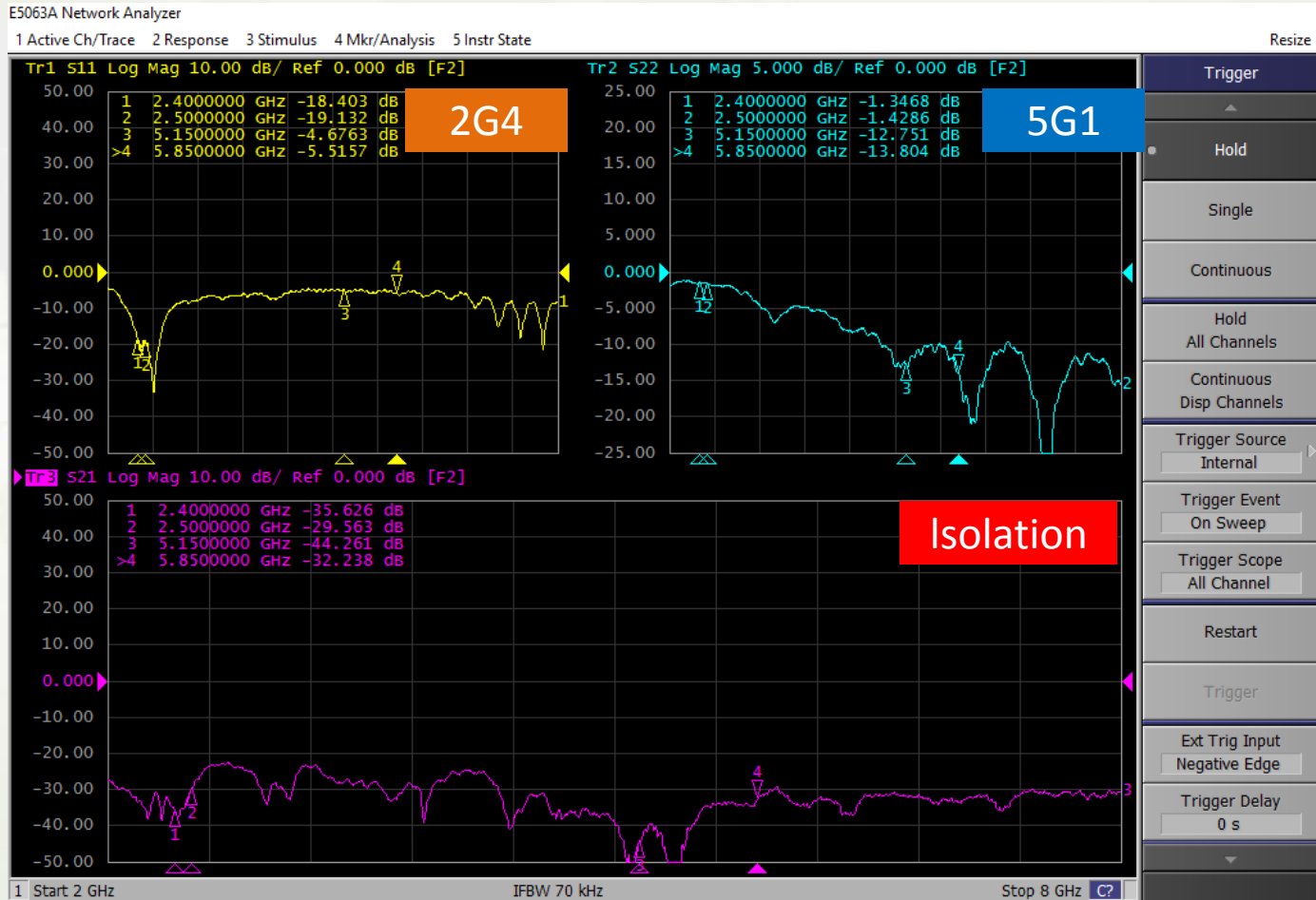
Test Result : Return Loss & Isolation



Test Result : Return Loss & Isolation



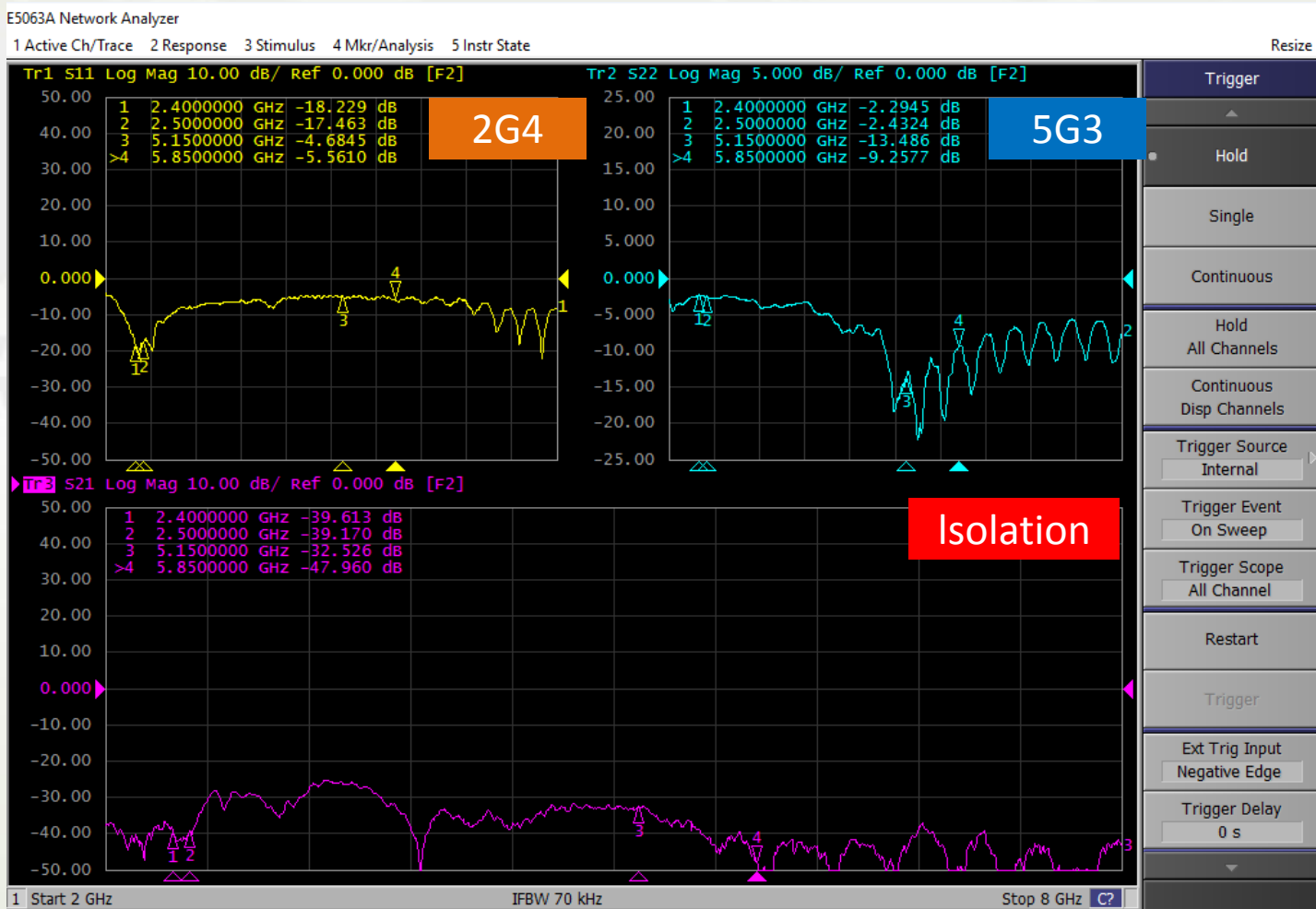
Test Result : Return Loss & Isolation



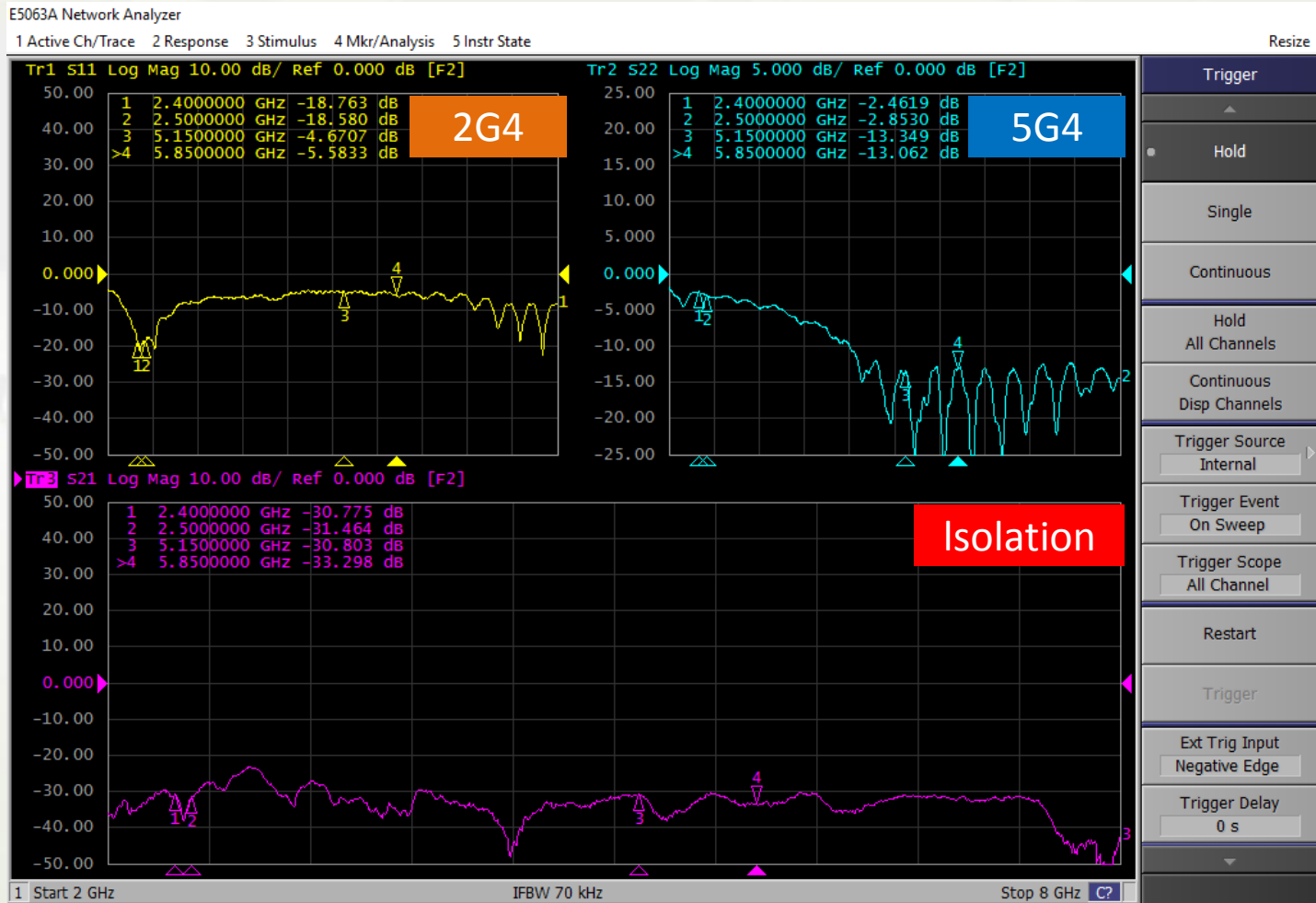
Test Result : Return Loss & Isolation



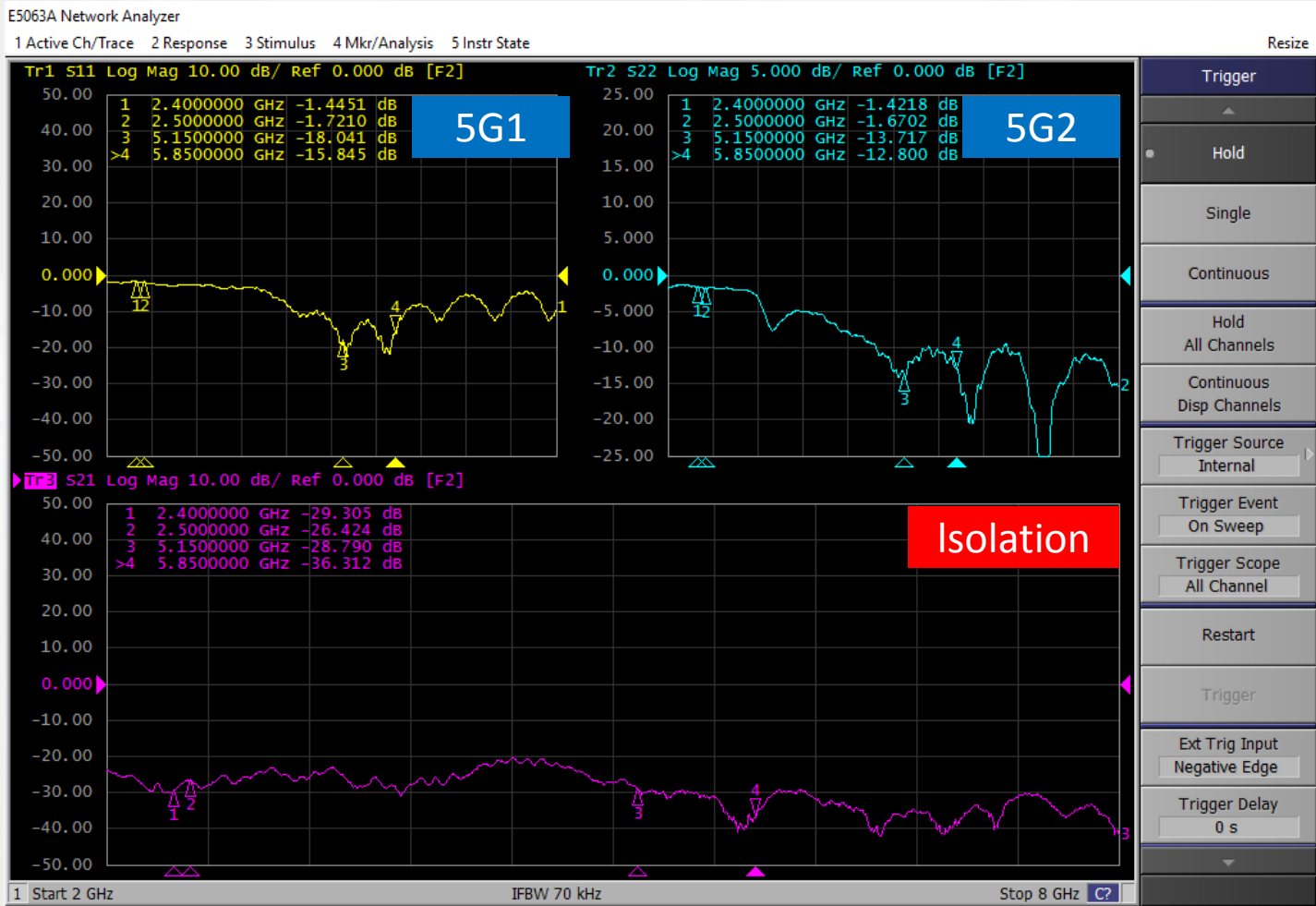
Test Result : Return Loss & Isolation



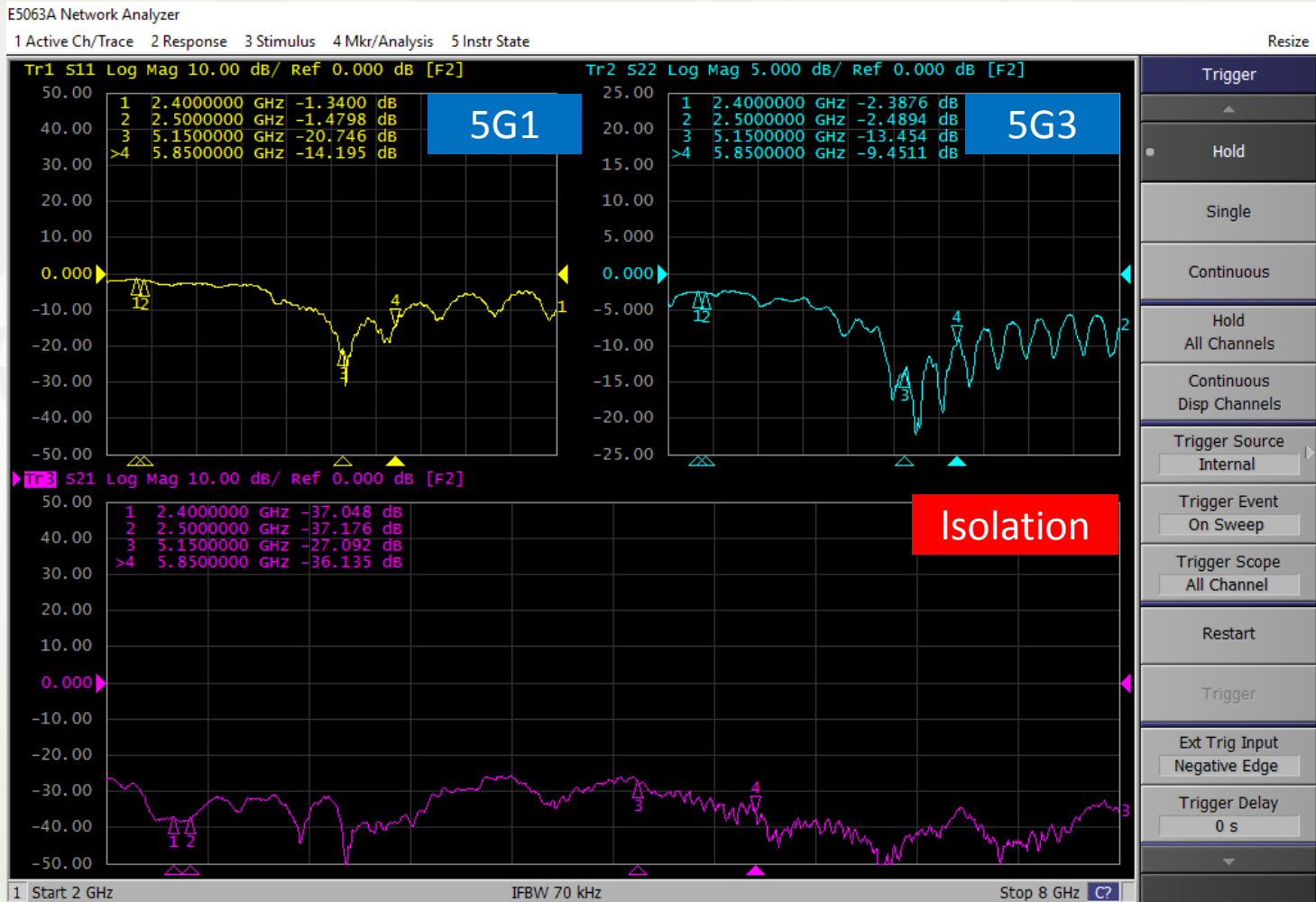
Test Result : Return Loss & Isolation



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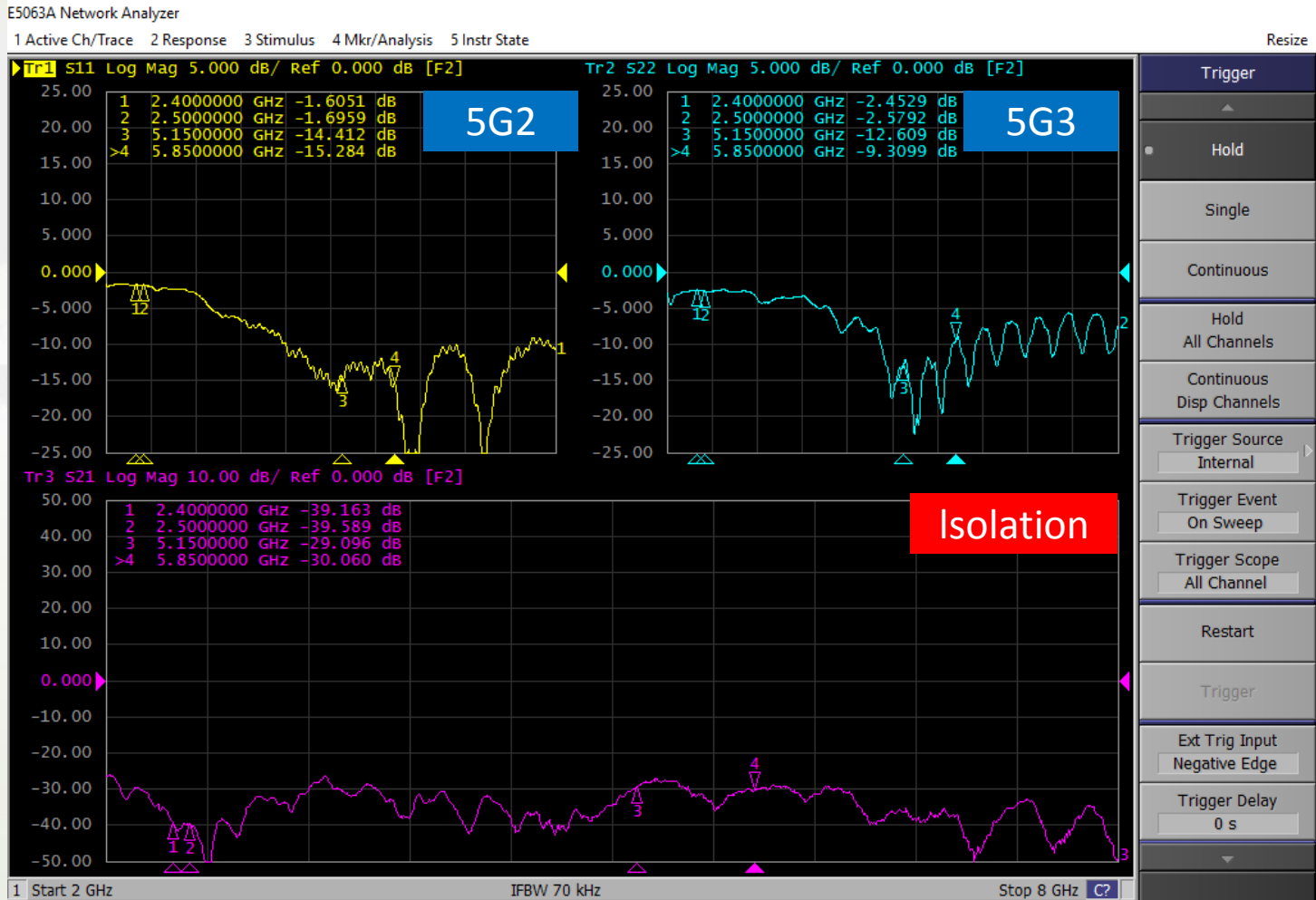
Test Result : Return Loss & Isolation



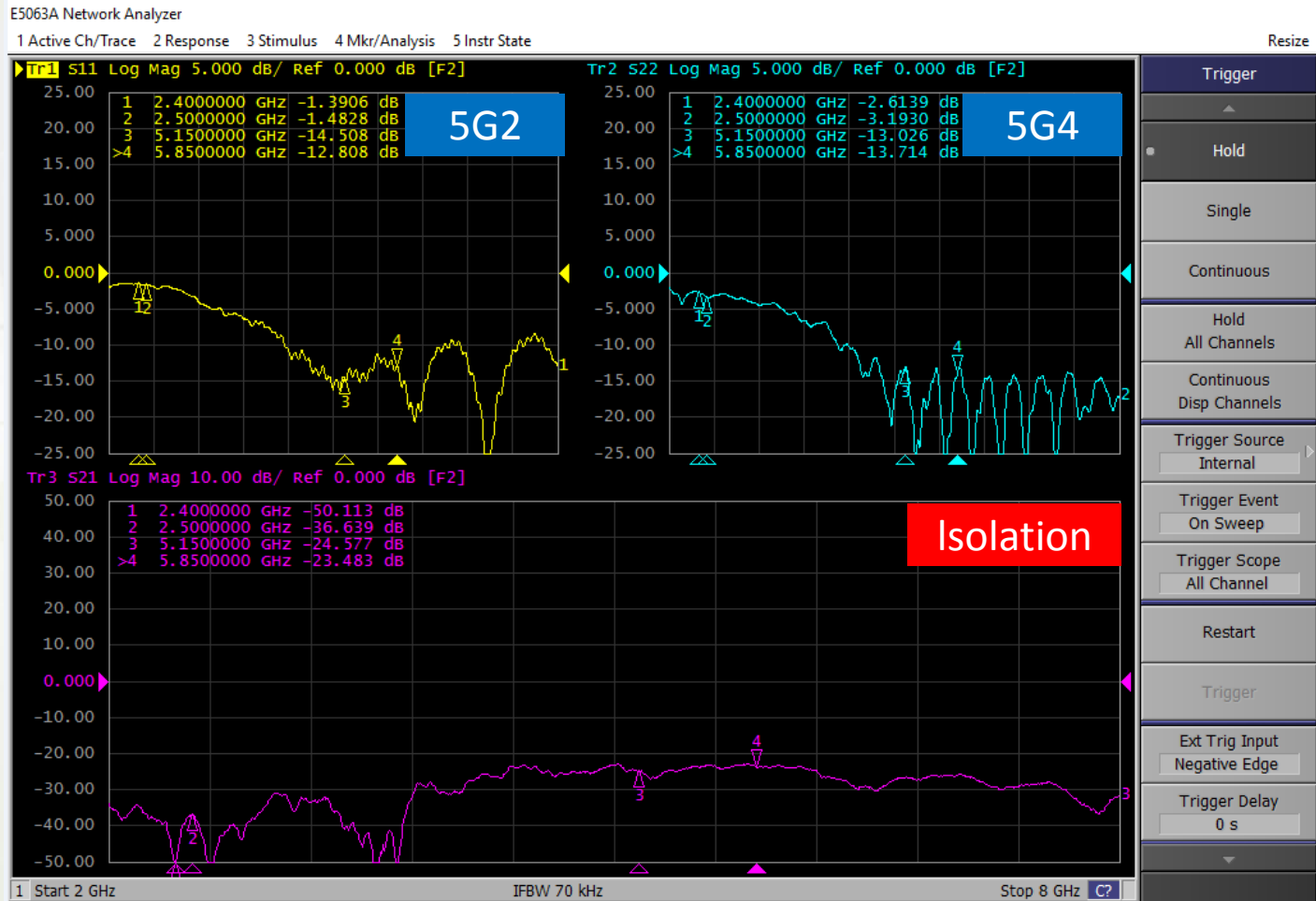
Test Result : Return Loss & Isolation



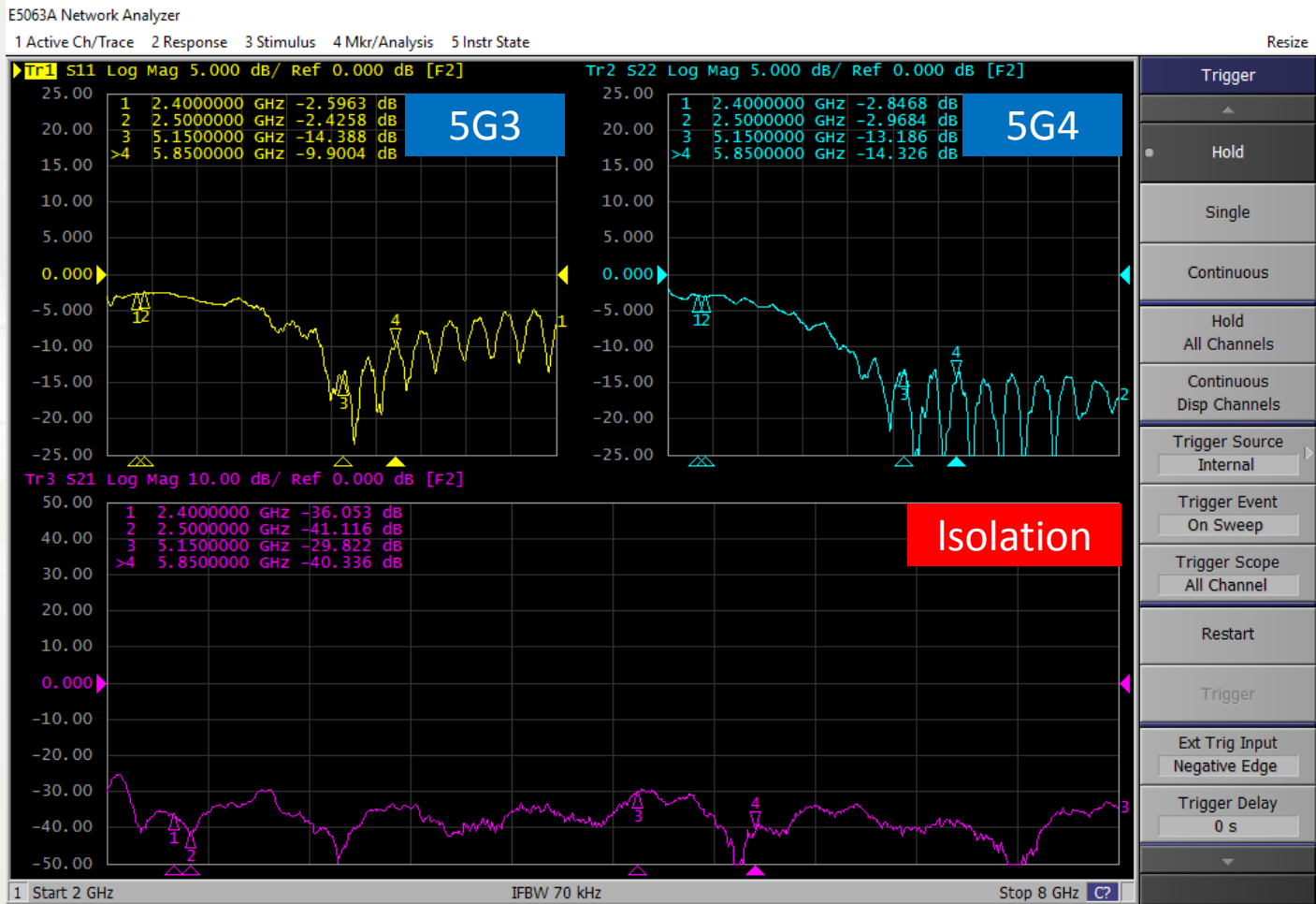
Test Result : Return Loss & Isolation



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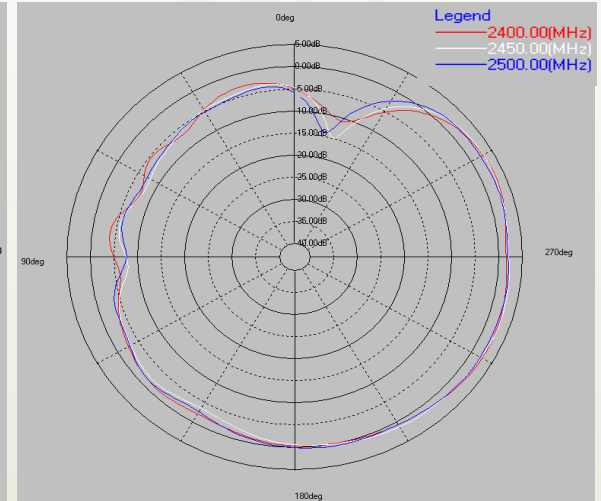
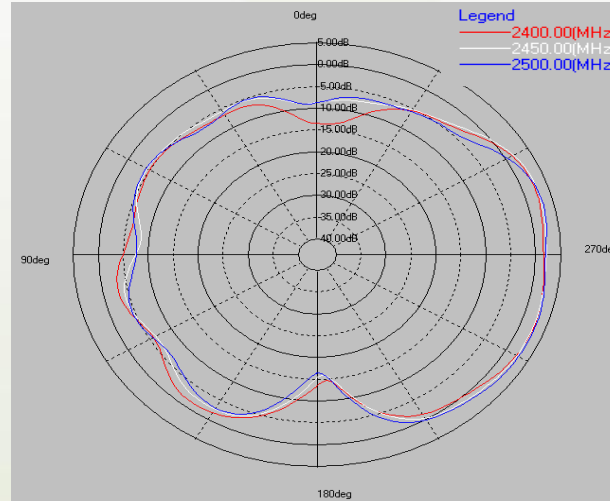
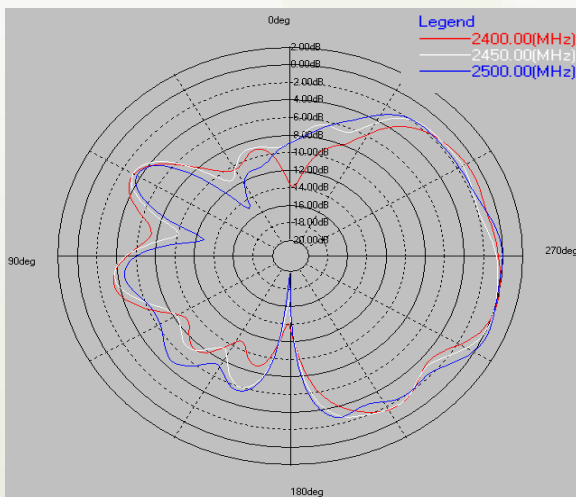
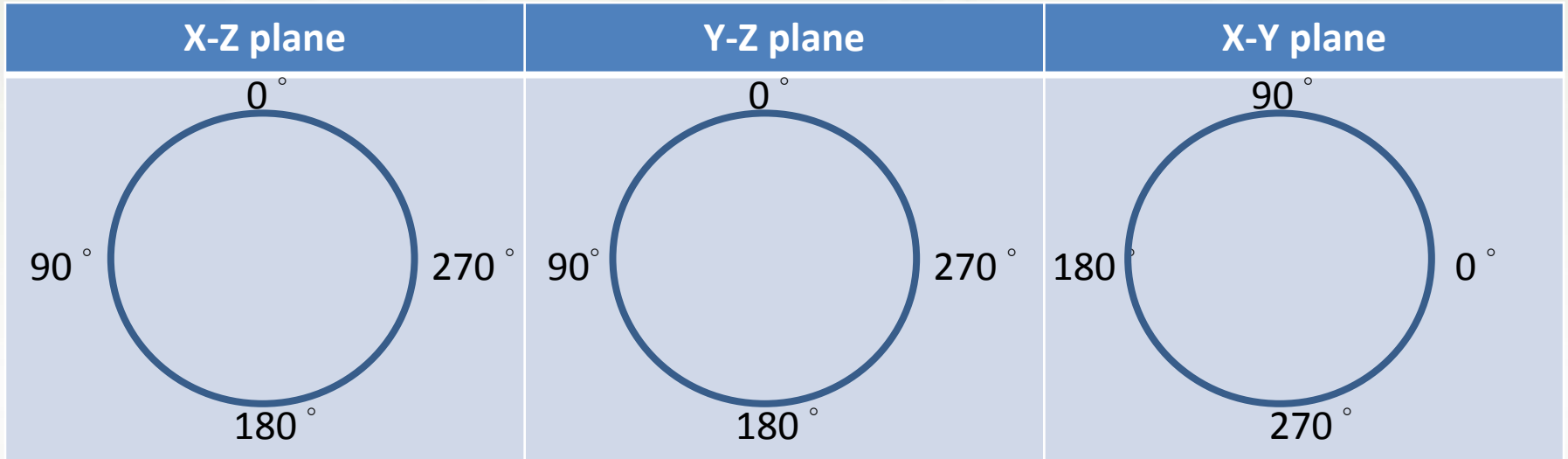


Test Result : Return Loss & Isolation



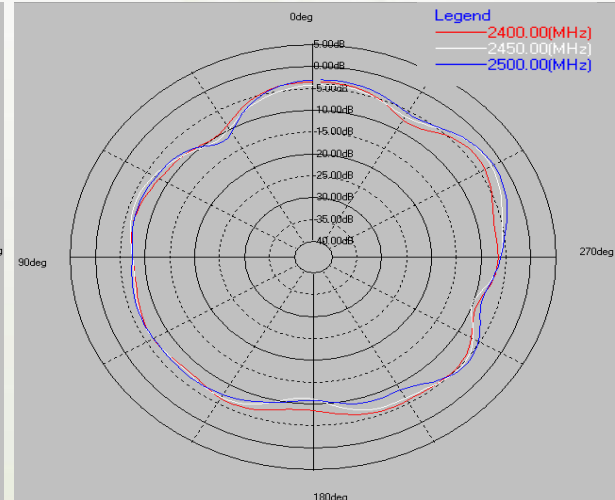
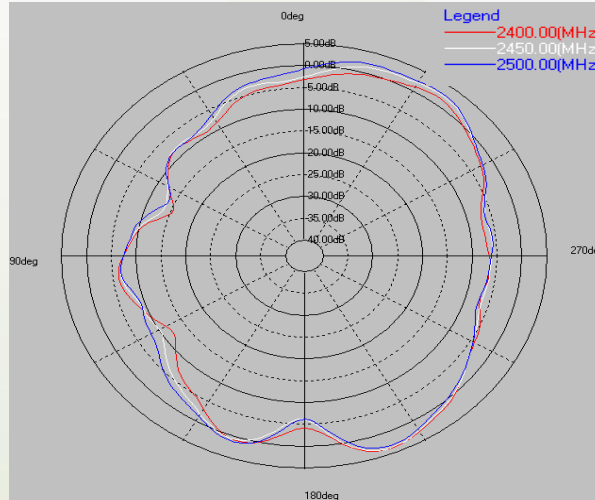
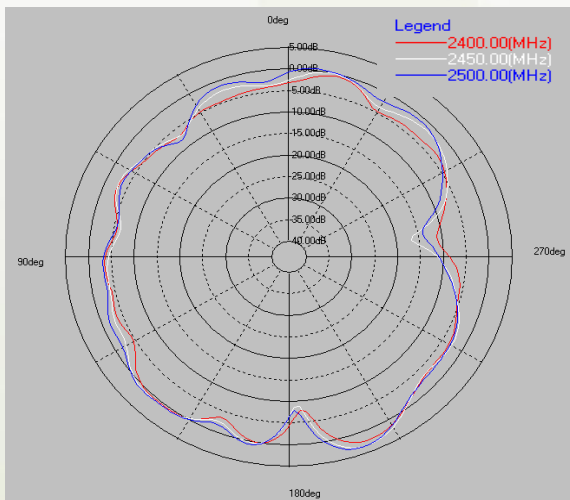
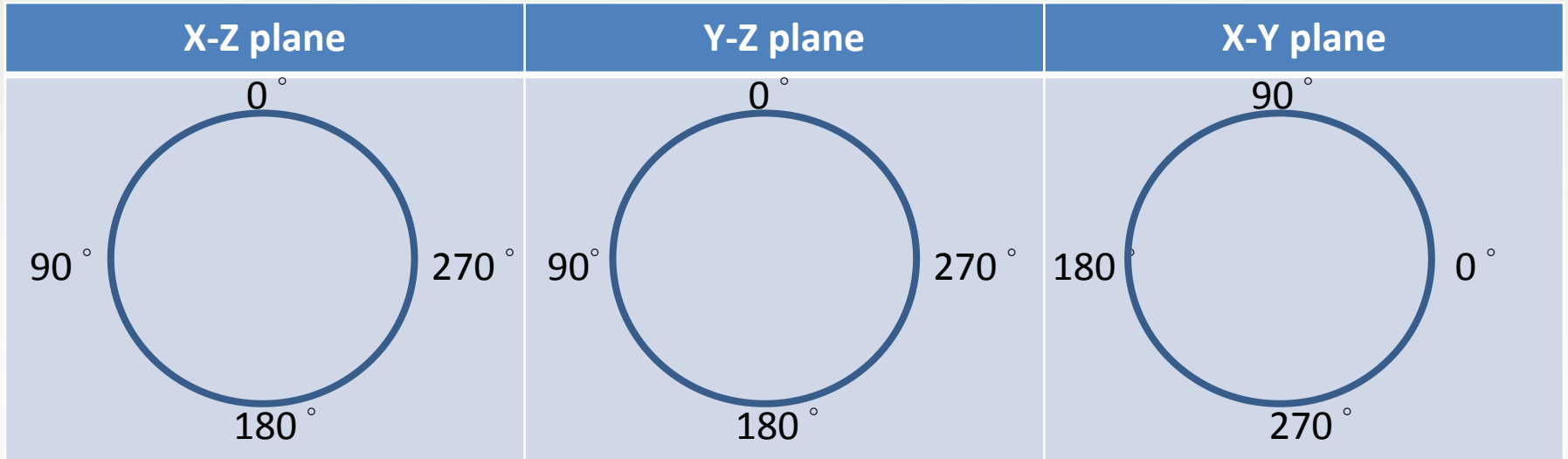
Antenna radiation pattern (2G1)

2400~2500MHZ



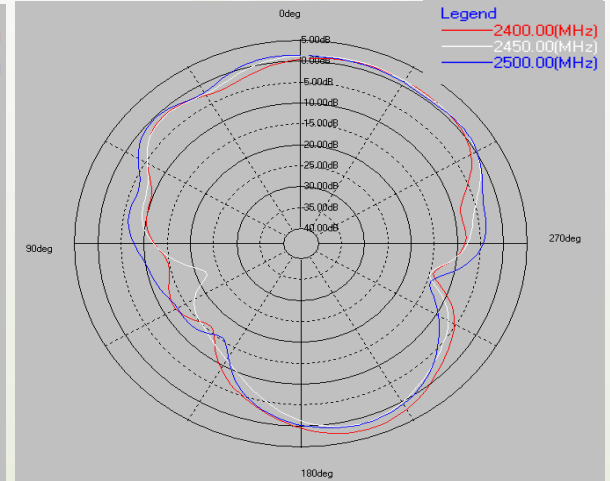
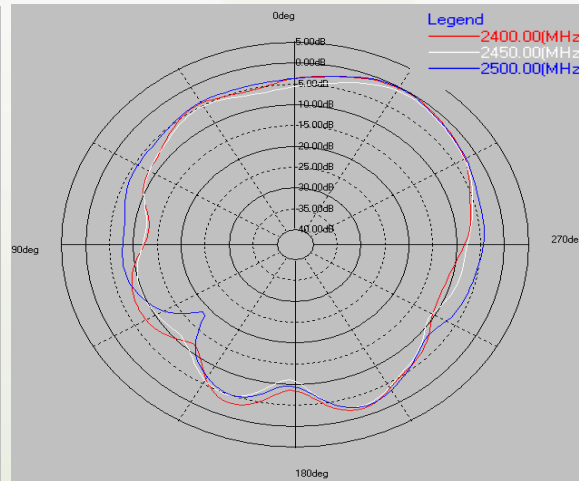
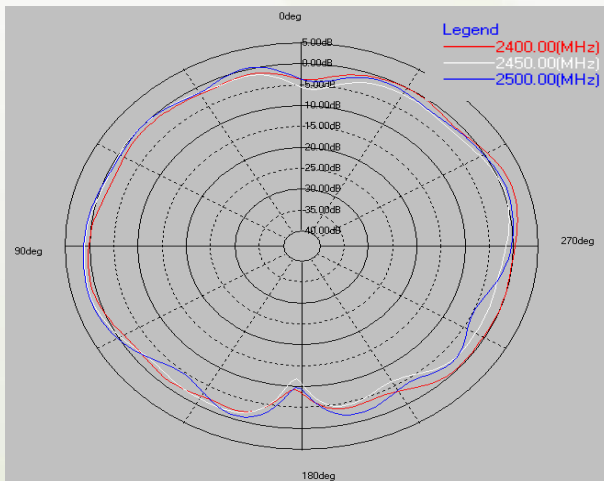
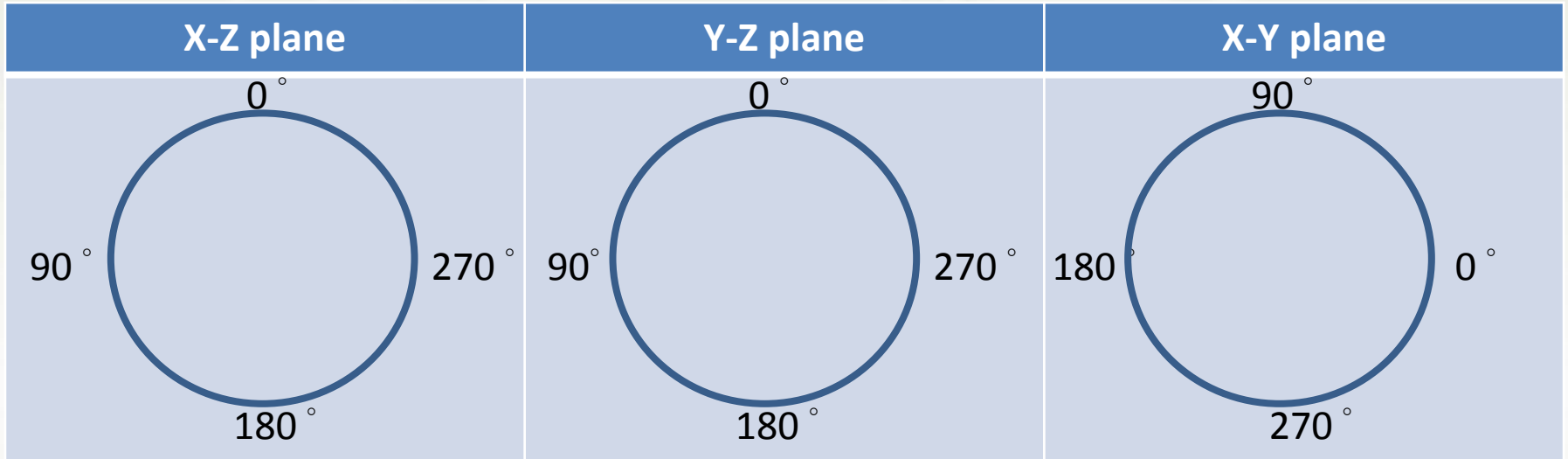
Antenna radiation pattern (2G2)

2400~2500MHZ



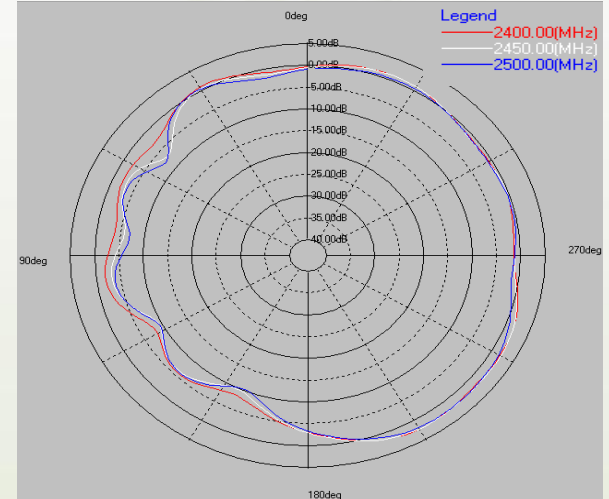
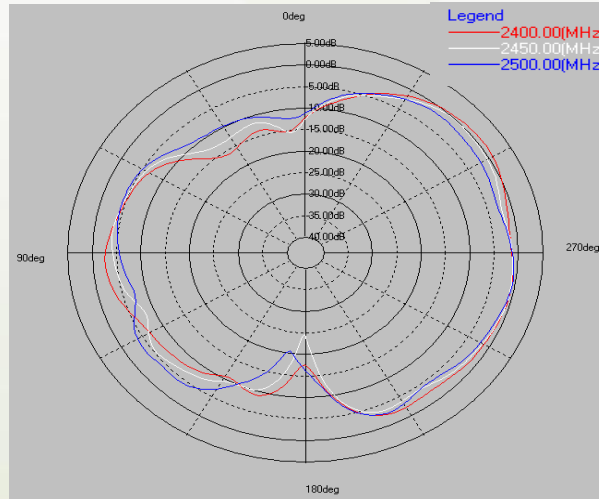
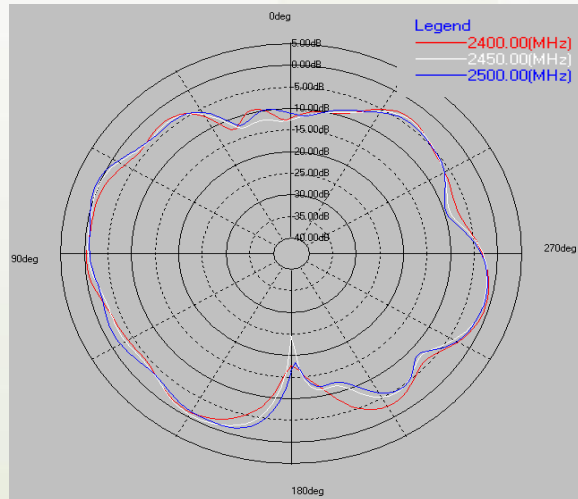
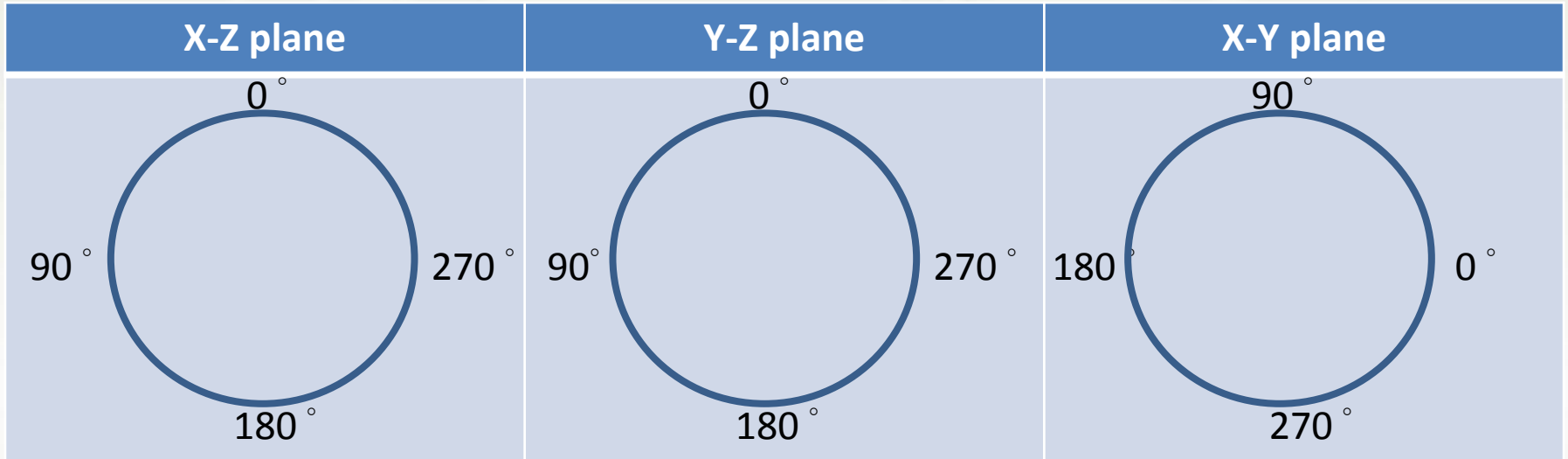
Antenna radiation pattern (2G3)

2400~2500MHZ



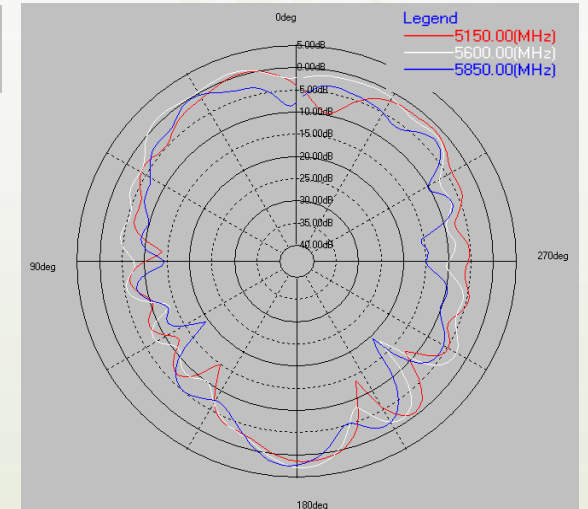
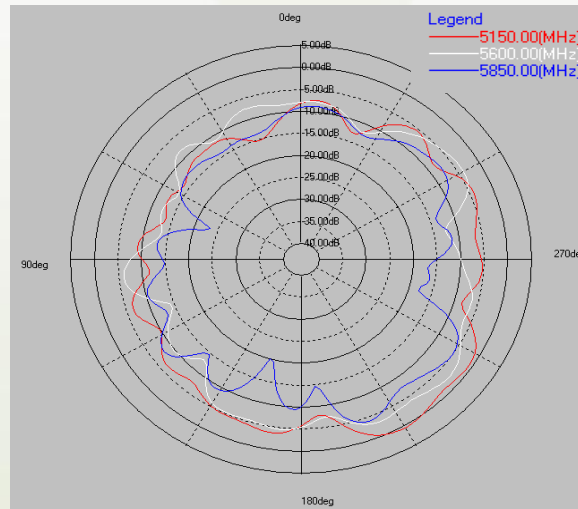
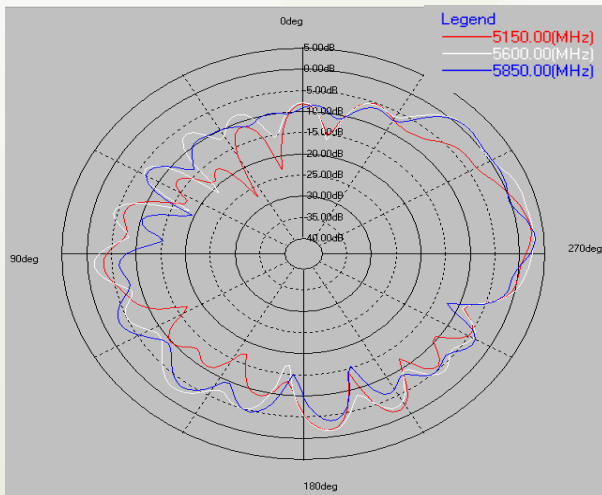
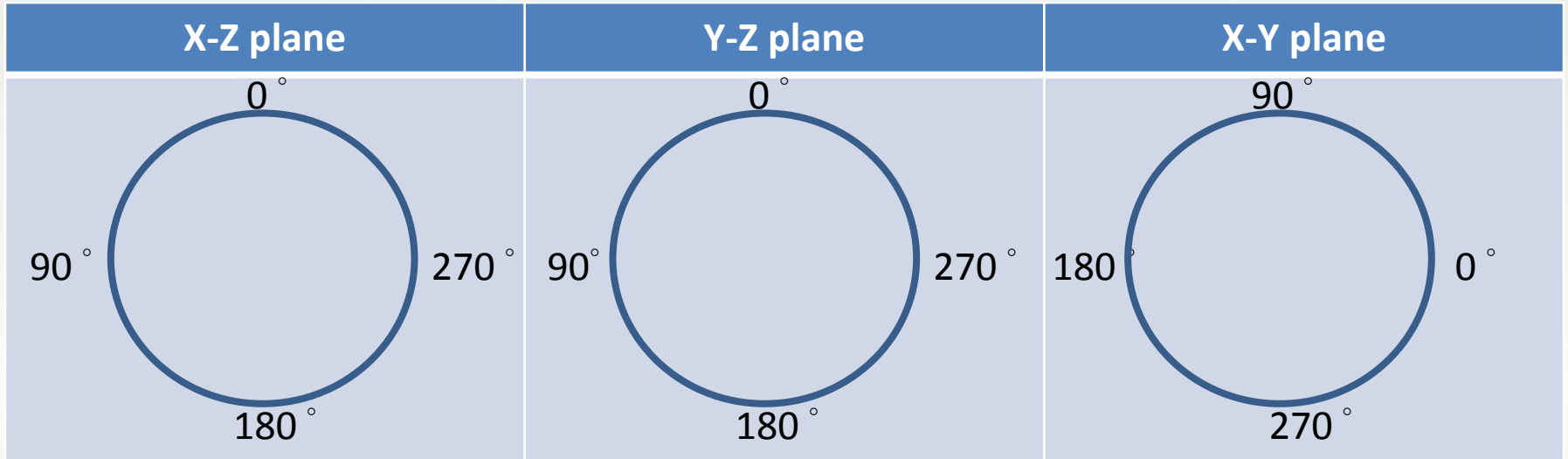
Antenna radiation pattern (2G4)

2400~2500MHZ



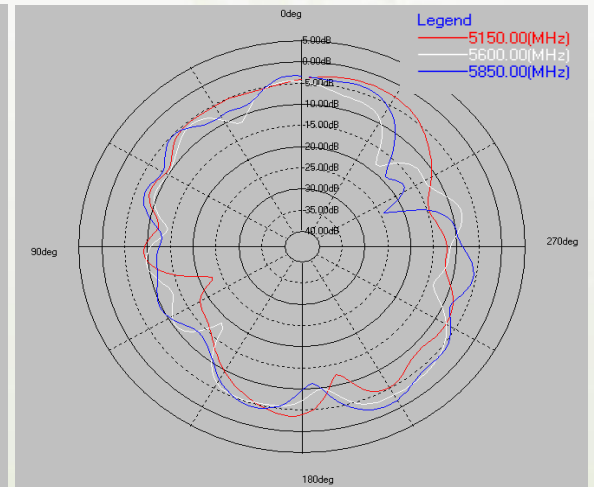
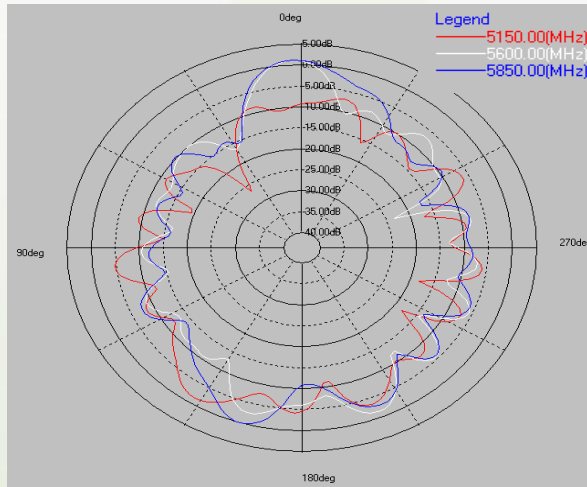
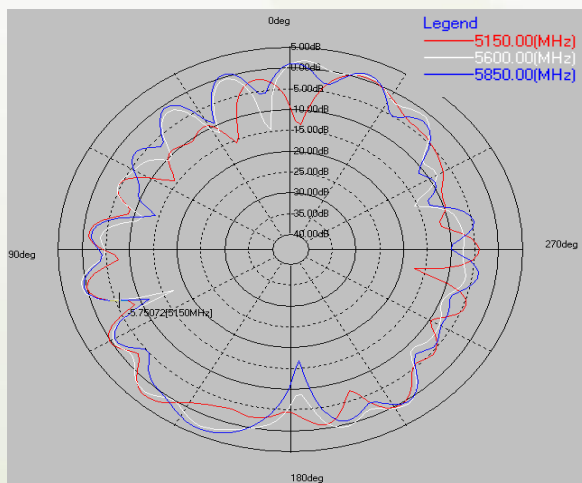
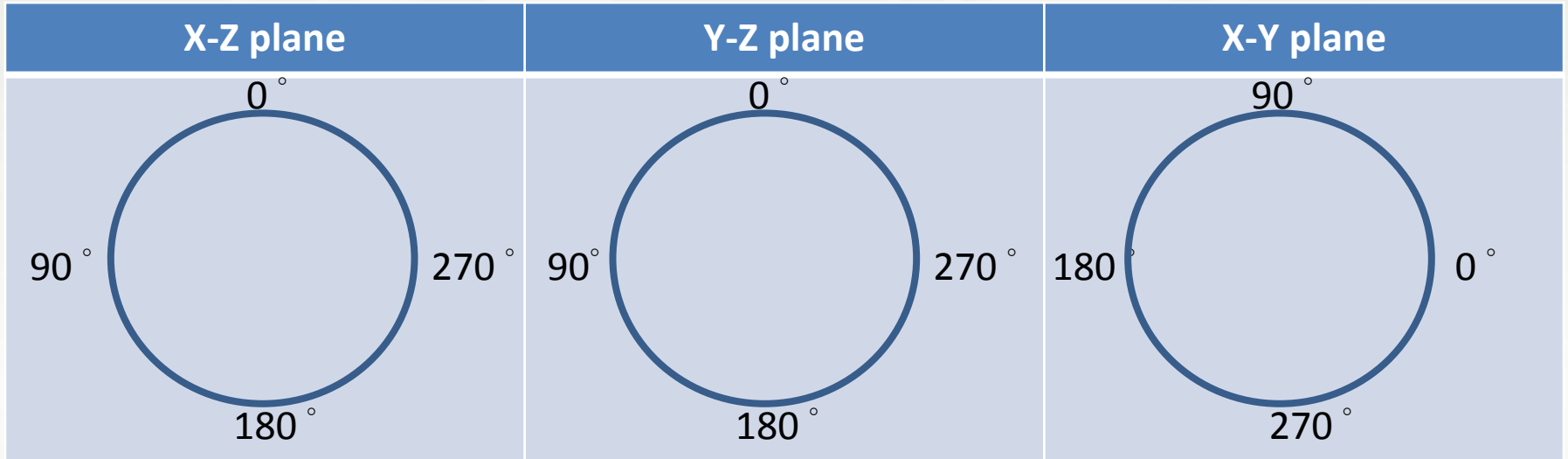
Antenna radiation pattern (5G1)

5150~5850MHZ



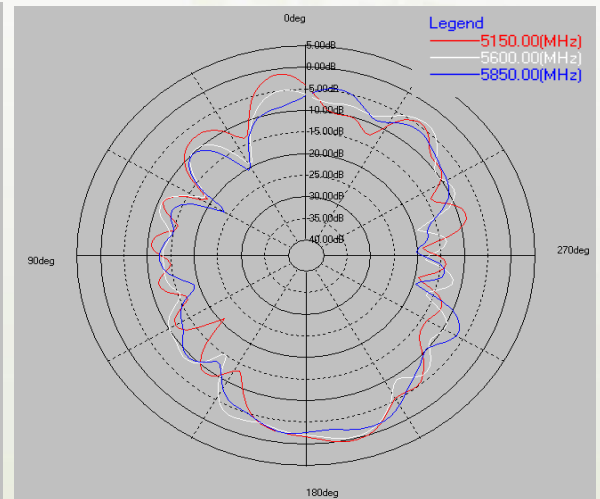
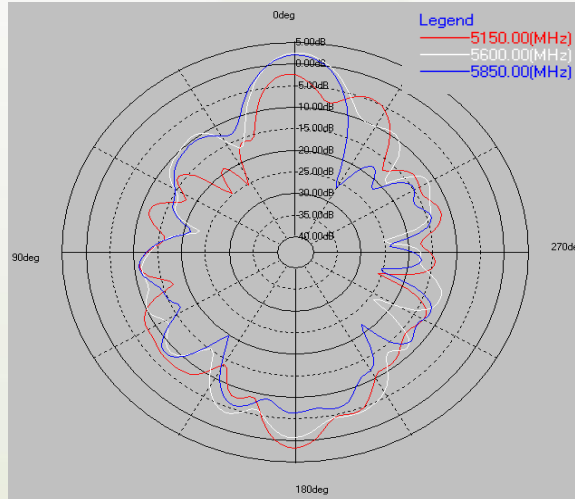
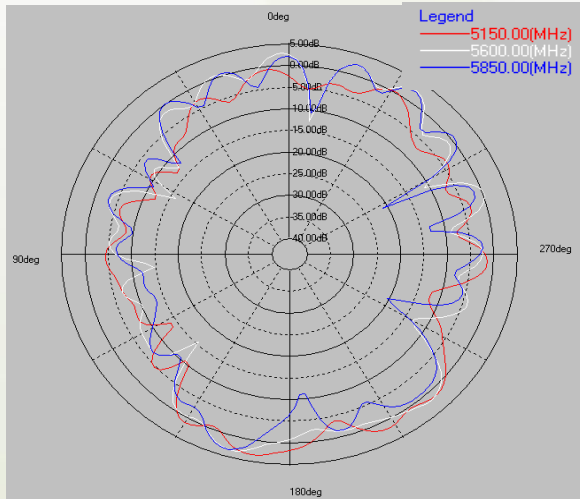
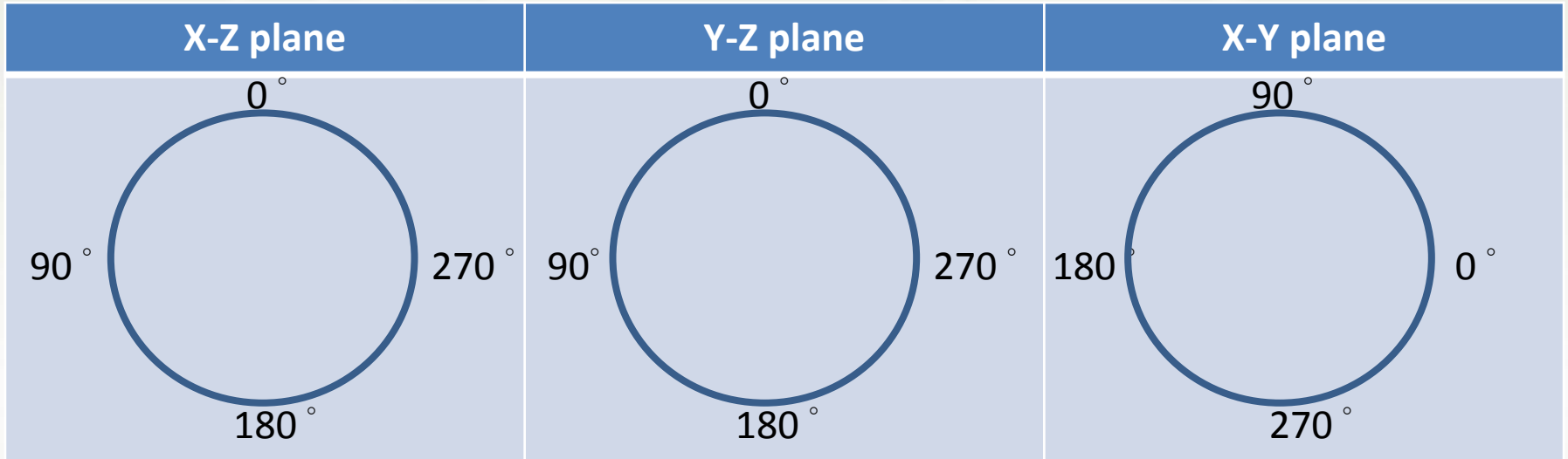
Antenna radiation pattern (5G2)

5150~5850MHZ



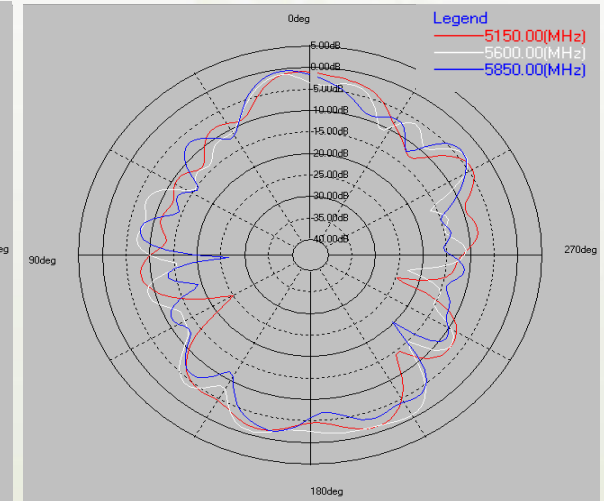
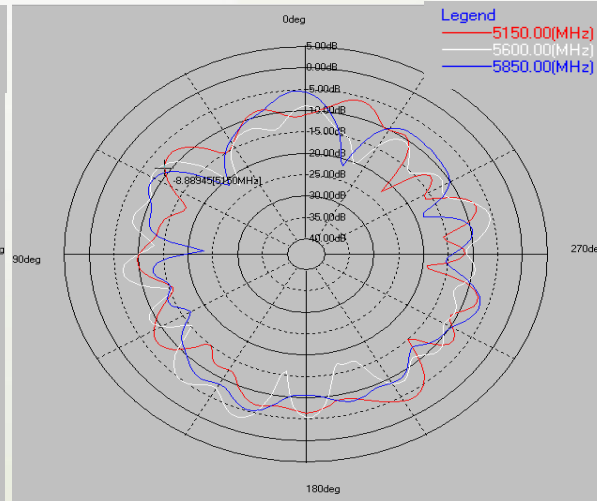
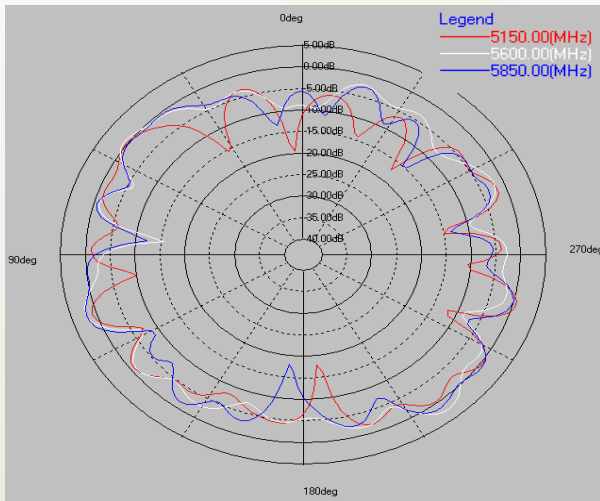
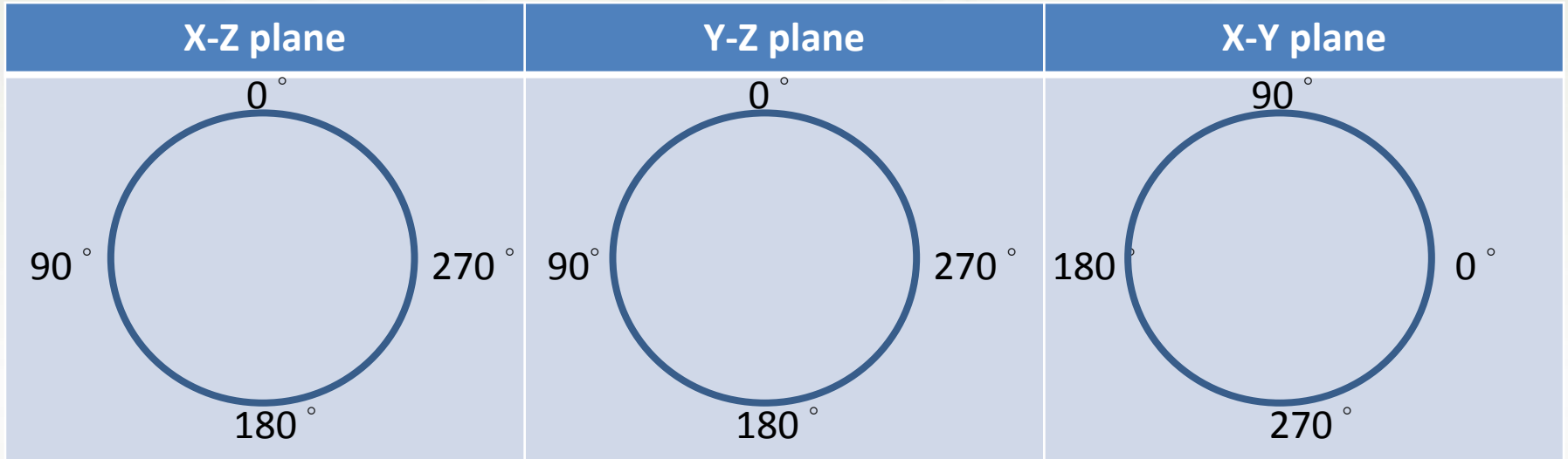
Antenna radiation pattern (5G3)

5150~5850MHZ



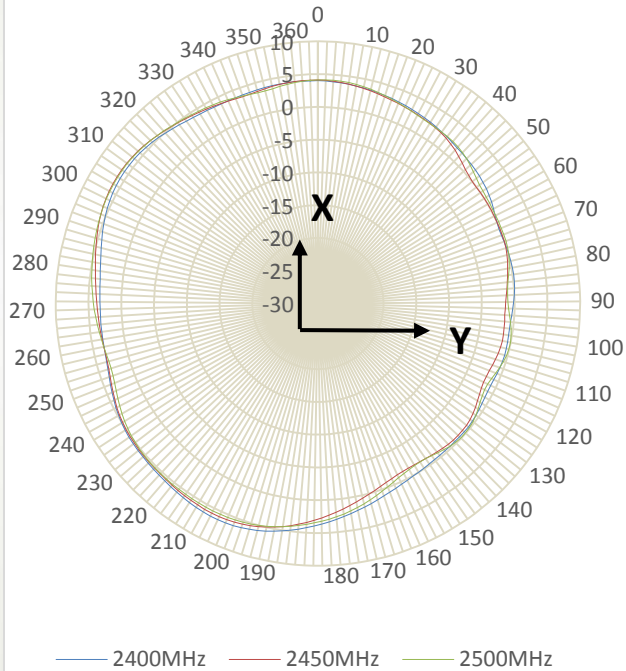
Antenna radiation pattern (5G4)

5150~5850MHZ

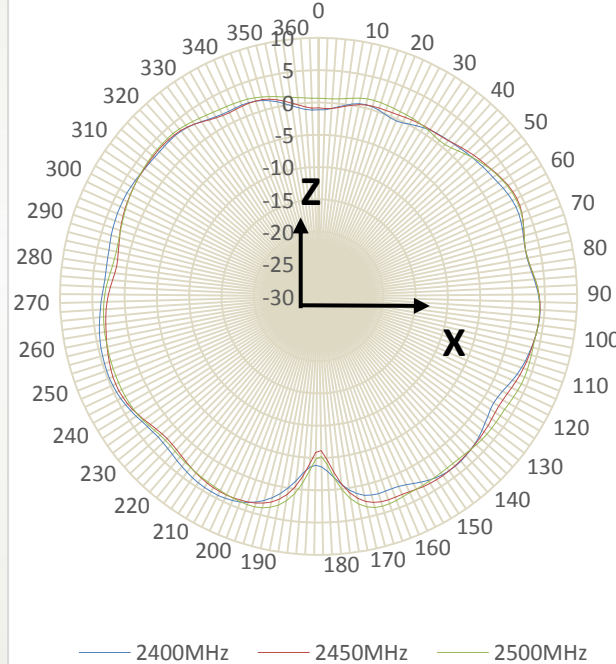


Composite pattern(2G)

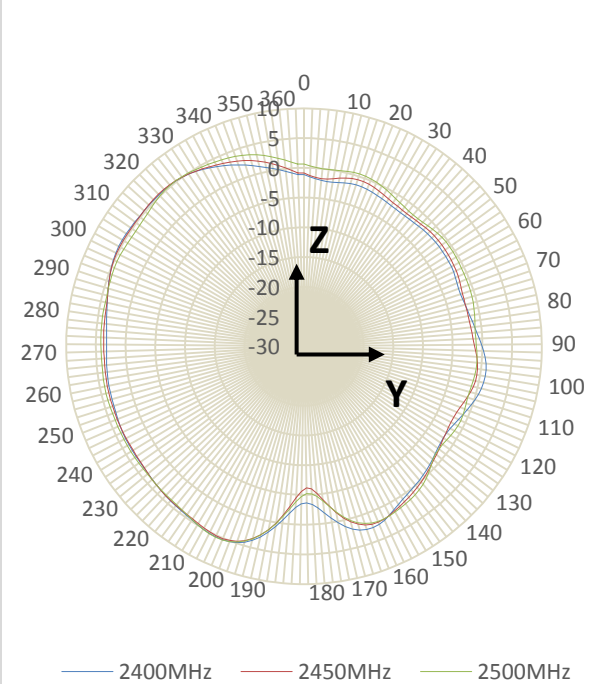
Composite_2G
_Azimuth(XY)



Composite_2G_Side to
Side(XZ)

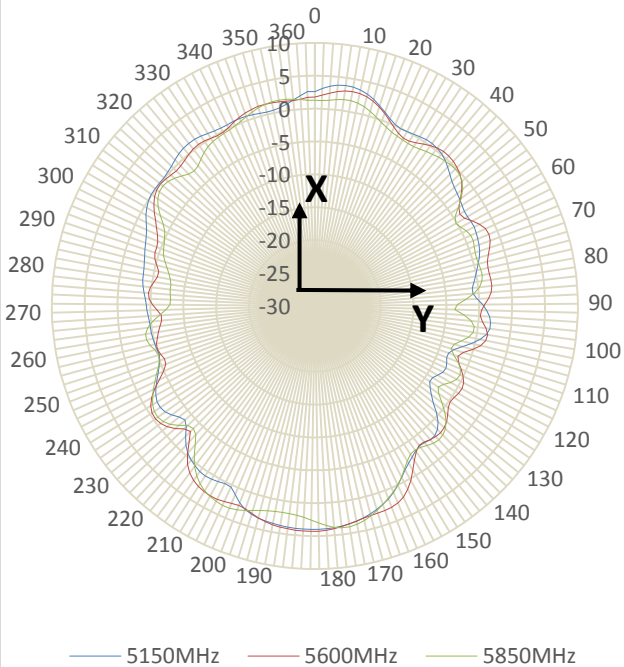


Composite_2G_Front to
Back(YZ)

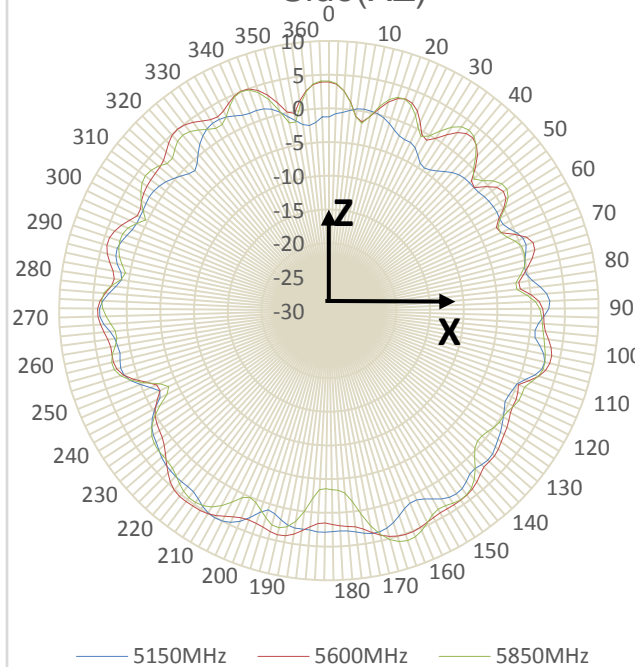


Composite pattern(5G)

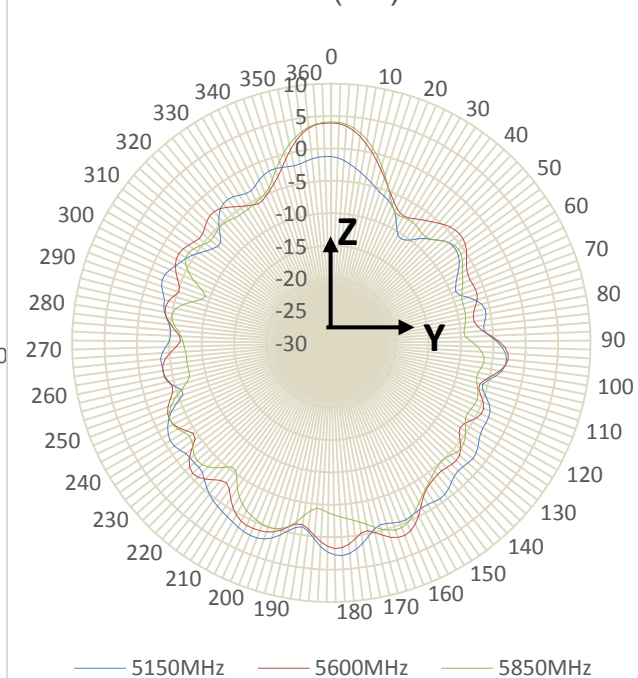
Composite_5G
_Azimuth(XY)



Composite_5G_side_to
Side(XZ)



Composite_5G_Front to
Back(YZ)



Test Result : Gain Table

Frequency (MHz)	2G1		2G2		2G3		2G4	
	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)
2400	60.60%	3.06	63.20%	3.18	61.50%	3.01	62.80%	2.85
2410	61.20%	2.47	63.14%	3.33	63.30%	2.91	62.60%	2.77
2420	63.40%	3.1	62.87%	3.29	63.30%	2.76	64.10%	2.86
2430	62.30%	3.14	61.10%	3.28	62.23%	2.57	63.70%	2.88
2440	64.48%	3.22	64.88%	3.43	63.30%	2.01	62.30%	2.78
2450	65.50%	3.32	62.90%	3.41	64.80%	1.93	61.10%	2.81
2460	63.74%	3.22	62.20%	3.39	64.20%	2.2	62.80%	2.92
2470	63.35%	3.2	63.70%	3.25	62.10%	2.03	64.40%	2.83
2480	61.57%	3.22	65.20%	3.33	62.20%	1.92	64.70%	2.85
2490	61.28%	3.14	63.90%	3.30	62.80%	1.85	63.30%	2.75
2500	62.52%	3.36	61.15%	2.98	63.40%	1.72	62.30%	2.62



Test Result : Gain Table

Frequency (MHz)	5G1		5G2		5G3		5G4	
	Efficiency	Peak Gain	Efficiency	Peak Gain	Efficiency	Peak Gain	Efficiency	Peak Gain
	(%)	(dBi)	(%)	(dBi)	(%)	(dBi)	(%)	(dBi)
5150	62.80%	3.37	62.00%	3.35	63.82%	3.33	61.00%	3.28
5250	65.13%	3.27	63.10%	3.37	61.56%	3.33	63.38%	3.24
5350	63.20%	3.38	63.30%	3.40	62.22%	2.58	64.80%	2.87
5470	62.51%	3.19	64.64%	3.36	63.01%	3.15	62.52%	3.44
5600	64.12%	3.28	61.80%	3.41	64.12%	3.33	63.14%	2.98
5725	62.28%	3.34	62.25%	3.42	64.48%	3.26	63.01%	3.33
5785	65.47%	3.43	63.00%	3.43	61.88%	3.40	62.20%	3.01
5800	64.55%	3.20	64.10%	3.41	64.12%	3.36	62.98%	3.22
5850	63.63%	3.26	62.33%	3.39	62.11%	3.43	62.57%	3.01





Thanks !



泓博通訊

2023/3/15 HONGBO TELECOMMUNICATION