PSA

佳邦科技股份有限公司

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PASSIVE SYSTEM ALLIANCE

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BR-6886ZXV

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INPAQ Technology Co., Ltd.

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Revision History

Released Date	Version	Record
Feb. 15th, 2023	0.0	Initial Release
Mar. 31th, 2023	1.0	Use real PCBA and test two heatsink
Apr. 27th, 2023	1.1	finetune
Jul. 7th, 2023	2.0	New CASE with new PCB
Sep. 4th, 2023	2.1	Update the content of report
Oct. 6th, 2023	2.2	Increase the performance of frequency 5836-5930MHz

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Requirements of Antenna Design and Measurement

Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
WIFI 2.4G	3	2400-2500MHz	Printed antenna*1 PCB antenna*2
WIFI 5G	2	5150-5930MHz	PCB antenna
WIFI Dual band	2	2400-2500MHz/5150-5930MHz	PCB antenna

Requirements of Measurement

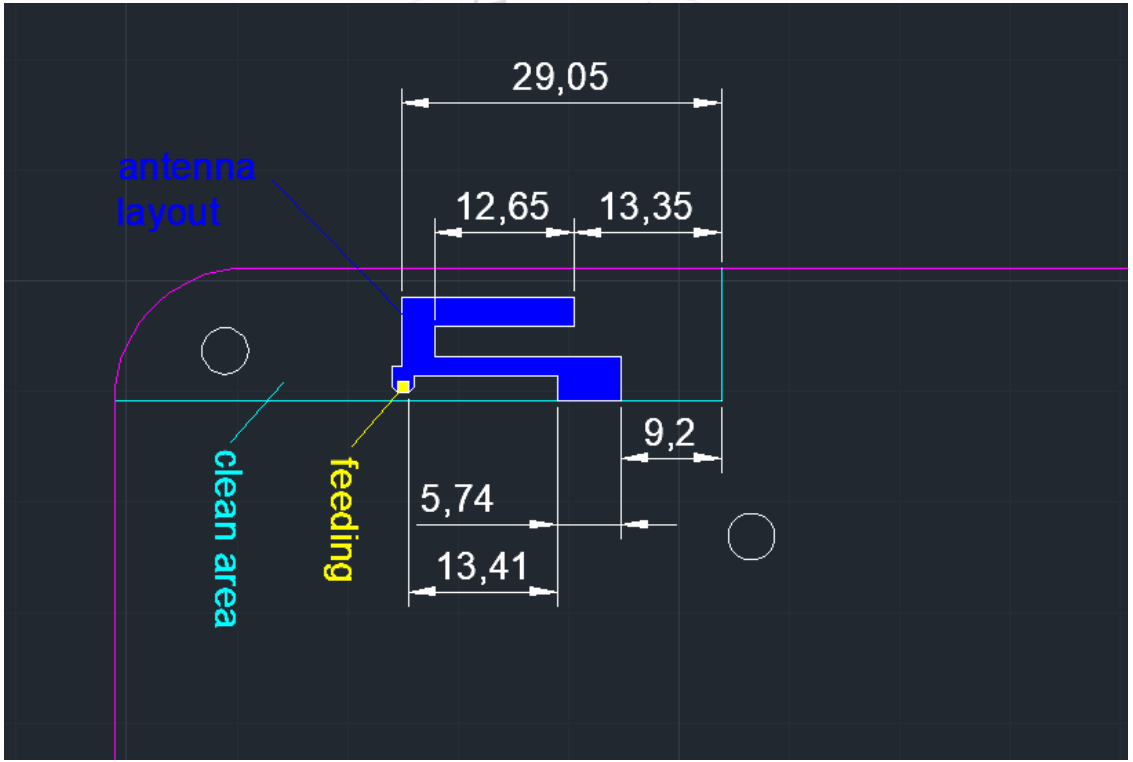
Test Item	Specification	Remark
Peak gain	2G:3dBi. 5G:3-4dBi	
Efficiency	>60%	
Return Loss	>11.7dB	
Isolation	>12dB	
Correlation	Less than 0.2	

Antenna Placement & Solution

Brand name	Antenna	PN	ANT Type	Size (L * W * H)	Cable Type
(PSA/INPAQ)	BT (WIFI 2.4G)	BT	Printed	Clearance area 55*12mm	Microstrip
(PSA/INPAQ)	2G1 (WIFI 2.4G)	WA-P-LA-06-008	PCB	30*13*1mm	165mm/1.13LLS_Red
(PSA/INPAQ)	2G2 (WIFI 2.4G)	WA-P-LA-05-015	PCB	30*13*1mm	115mm/1.13LLS_Blue
(PSA/INPAQ)	5G1 (WIFI 5G)	WA-P-LC-02-086	PCB	20*8*1mm	55mm/1.13LLS_Black
(PSA/INPAQ)	5G2 (WIFI 5G)	WA-P-LC-03-025	PCB	20*8*1mm	45mm/1.13LLS_Gray
(PSA/INPAQ)	DB1 (Dual band)	WA-P-LB-11-003	PCB	31*15*1mm	72mm/1.13LLS_Green
(PSA/INPAQ)	DB2 (Dual band)	WA-P-LB-01-323	PCB	31*15*1mm	77mm/1.13LLS_White

Antenna Placement & Solution

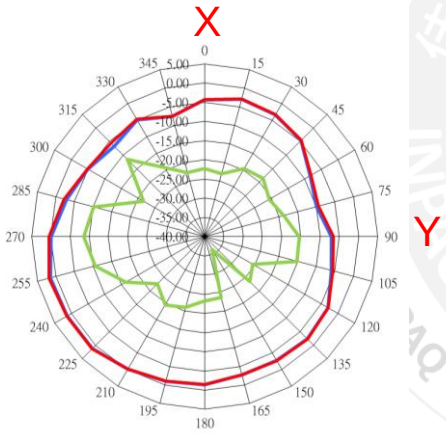
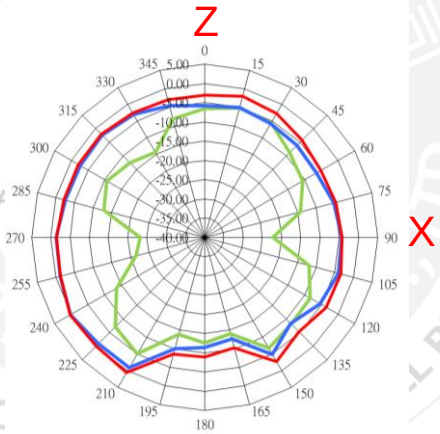
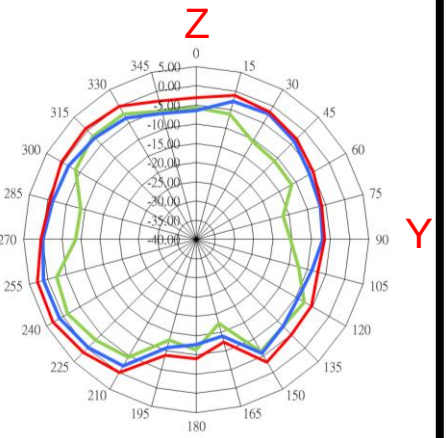
BT



Antenna Placement & Solution

BT – 2450MHz

BT

X-Y plane	X-Z plane	YZ plane
		

Theta Phi Total

Antenna Placement & Solution

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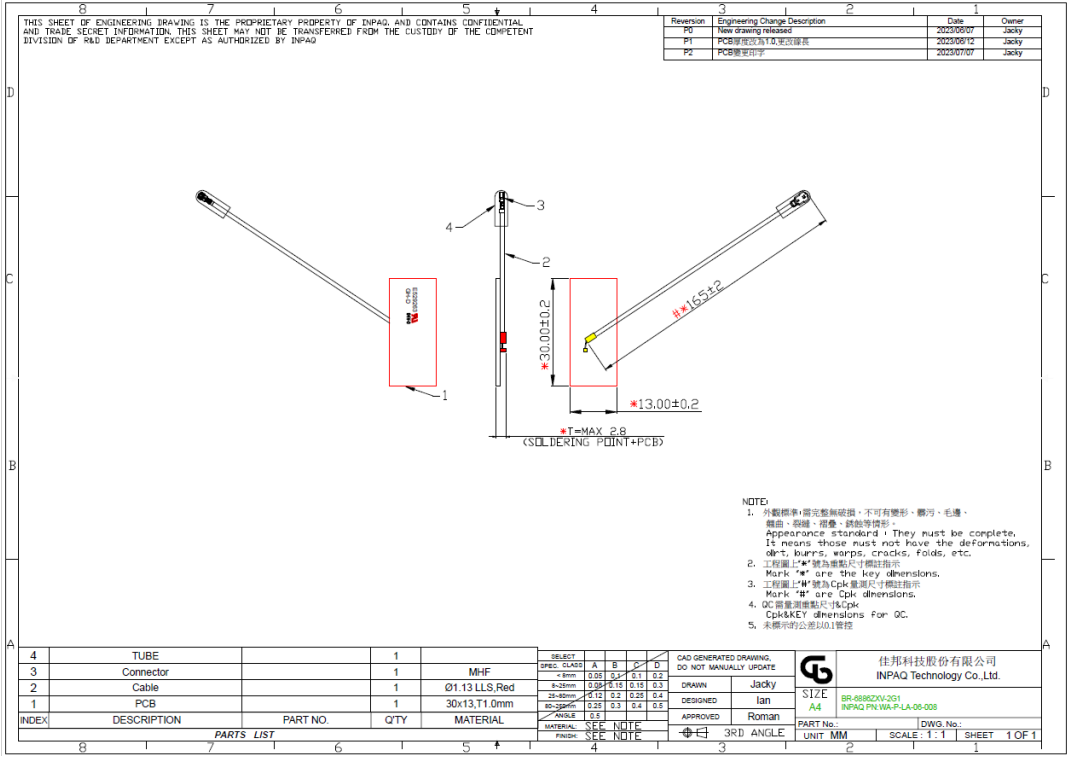
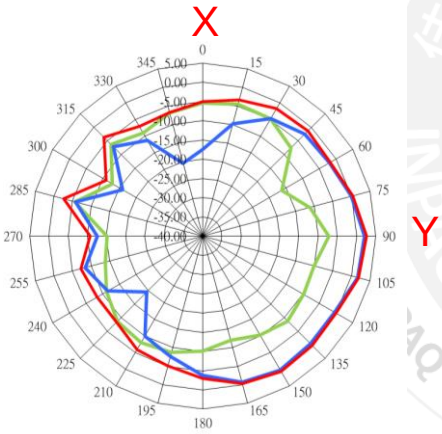
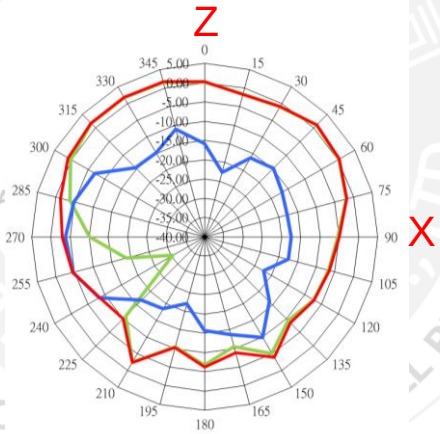
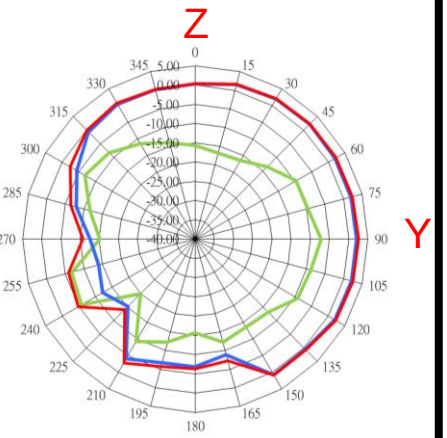


Antenna Placement & Solution

2G1 – 2450MHz

WA-P-LA-06-008_2G1

X-Y plane	X-Z plane	YZ plane
		

Antenna Placement & Solution

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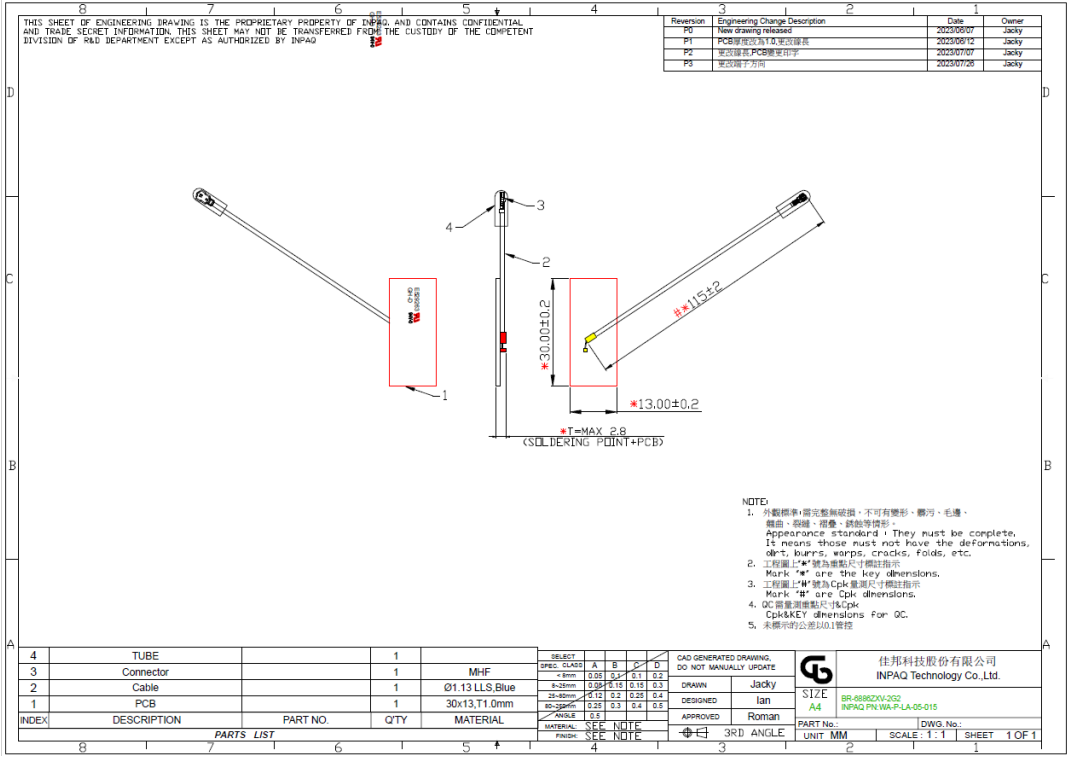

Antenna Placement & Solution

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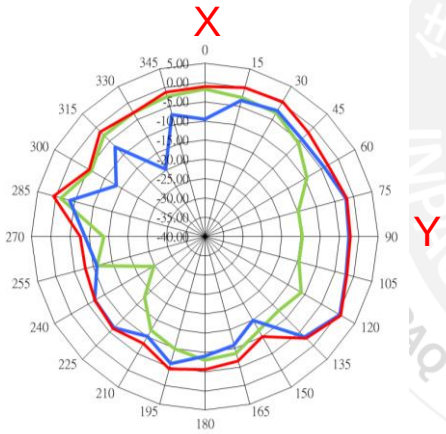
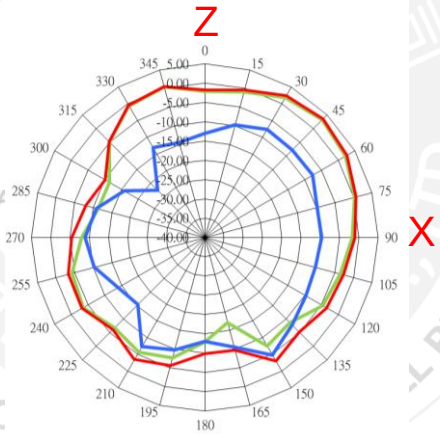
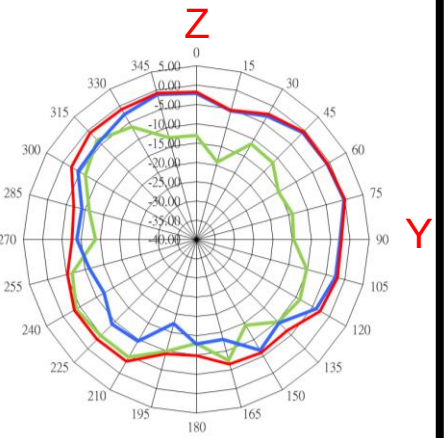
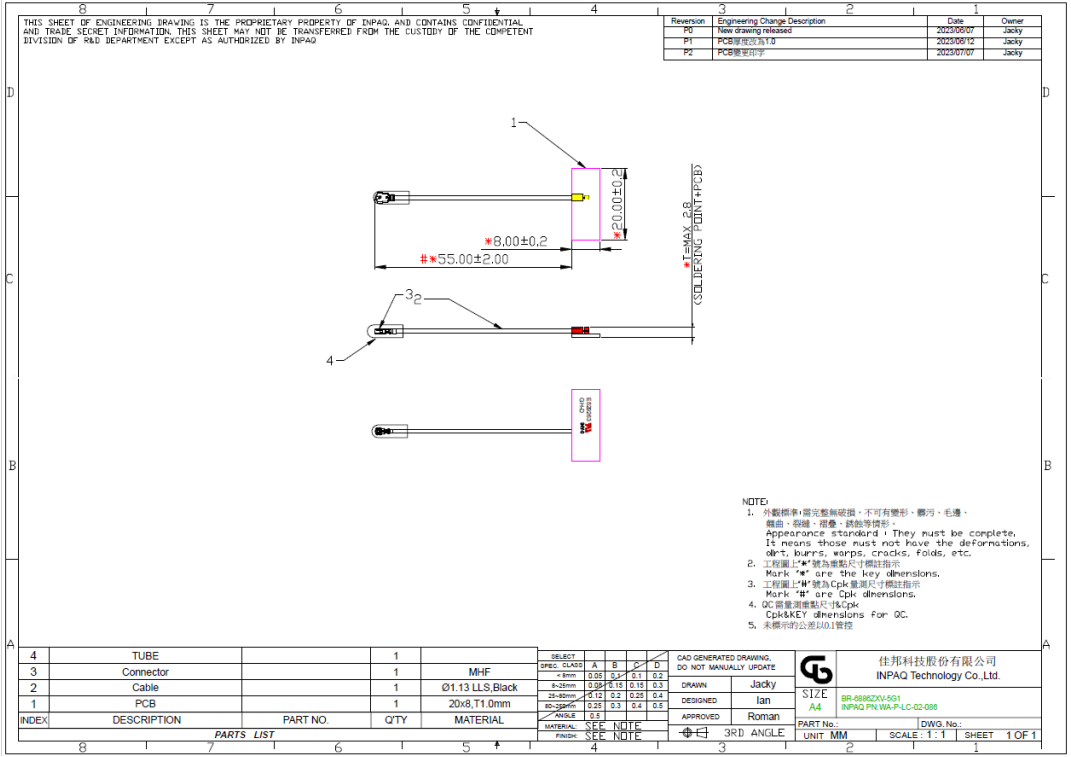
		

Antenna Placement & Solution

WA-P-LC-02-086_5G1



Antenna Placement & Solution

5G1 – 5470MHz

WA-P-LC-02-086_5G1

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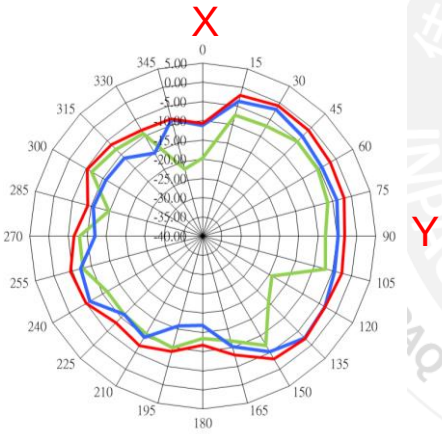	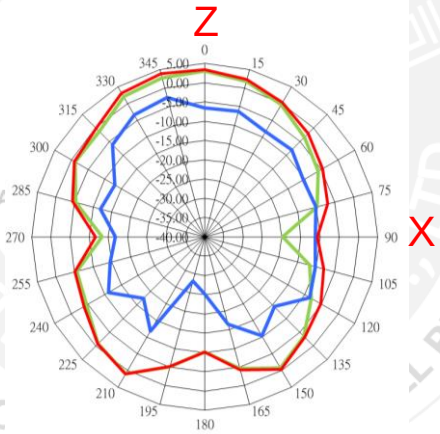	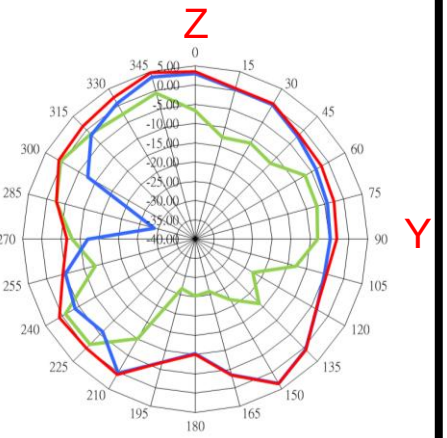

Antenna Placement & Solution

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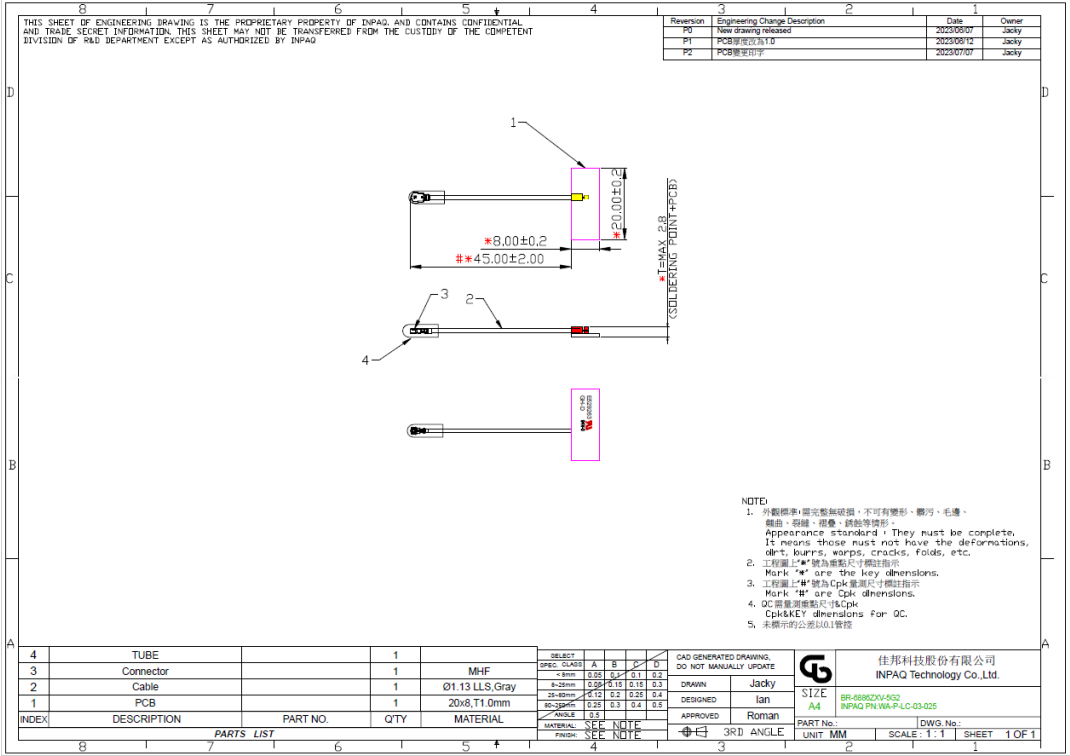
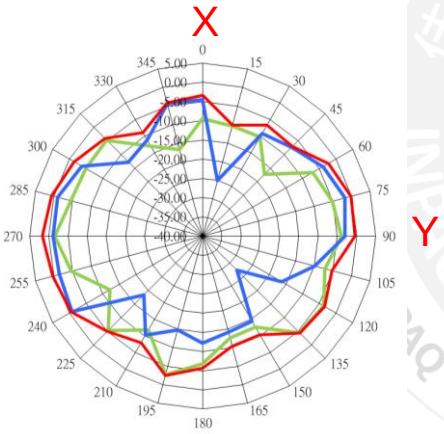
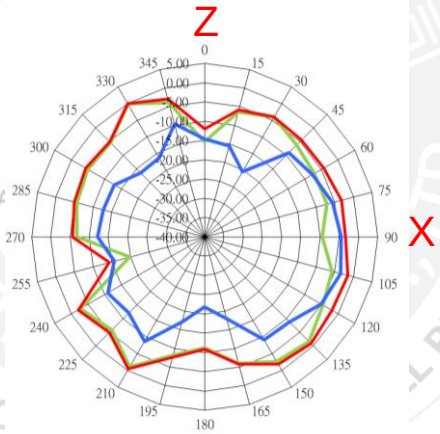
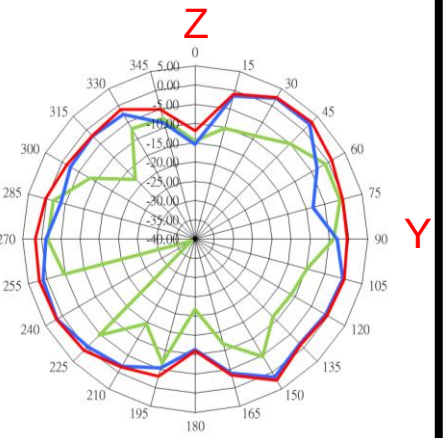


Antenna Placement & Solution

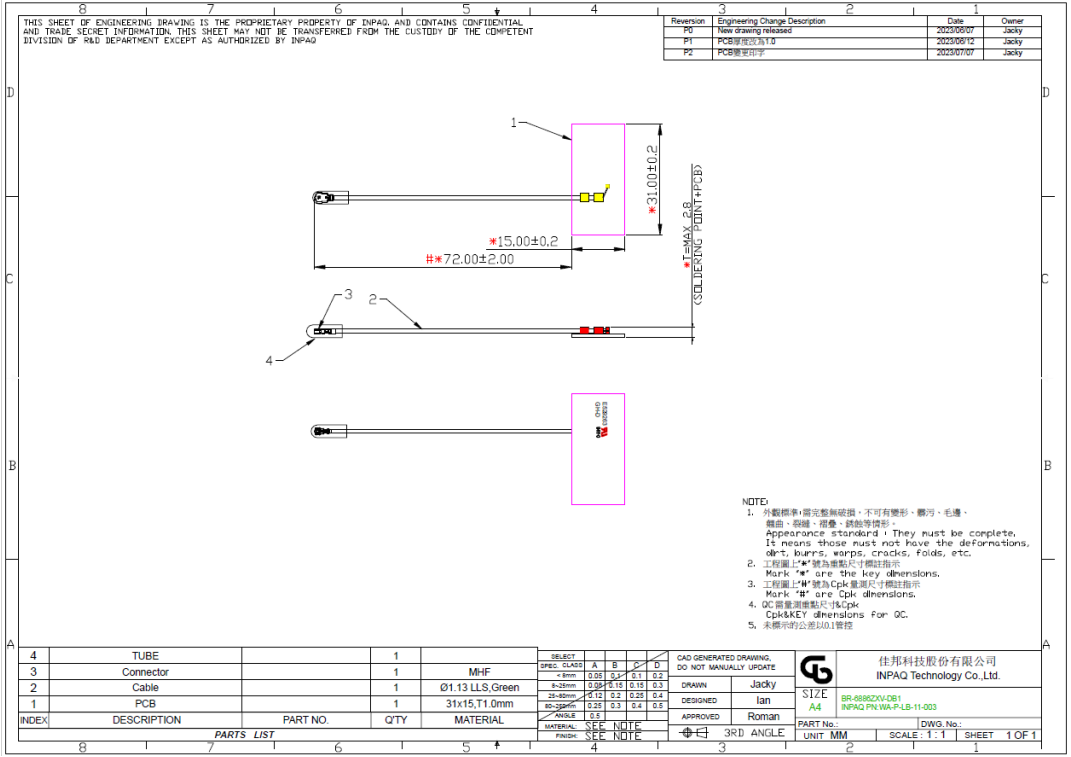
5G2 – 5470MHz

WA-P-LC-03-025_5G2

X-Y plane	X-Z plane	YZ plane
		

Antenna Placement & Solution

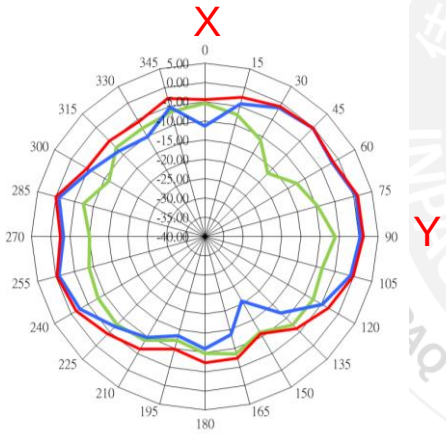
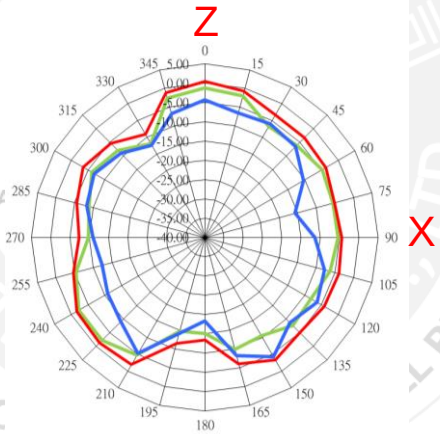
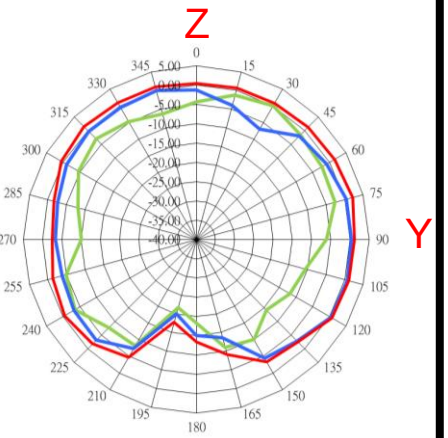
WA-P-LB-11-003_DB1



Antenna Placement & Solution

DB1 – 2450MHz

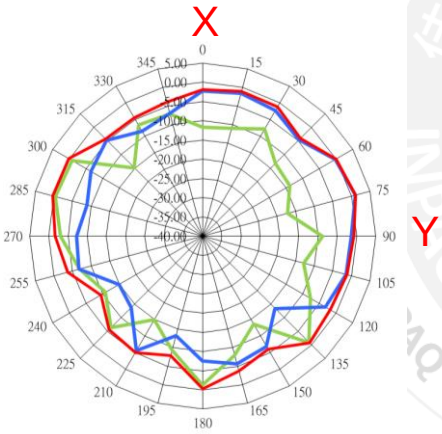
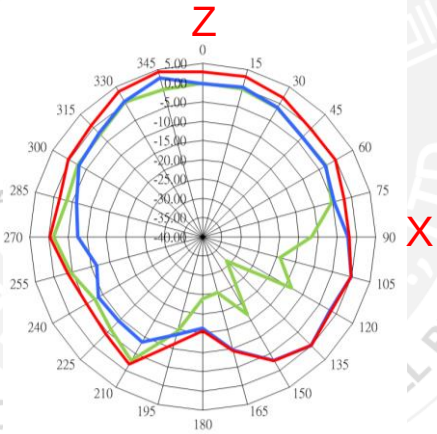
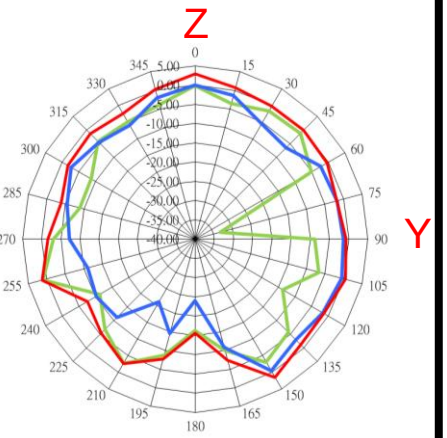
WA-P-LB-11-003_DB1

X-Y plane	X-Z plane	YZ plane
		

Antenna Placement & Solution

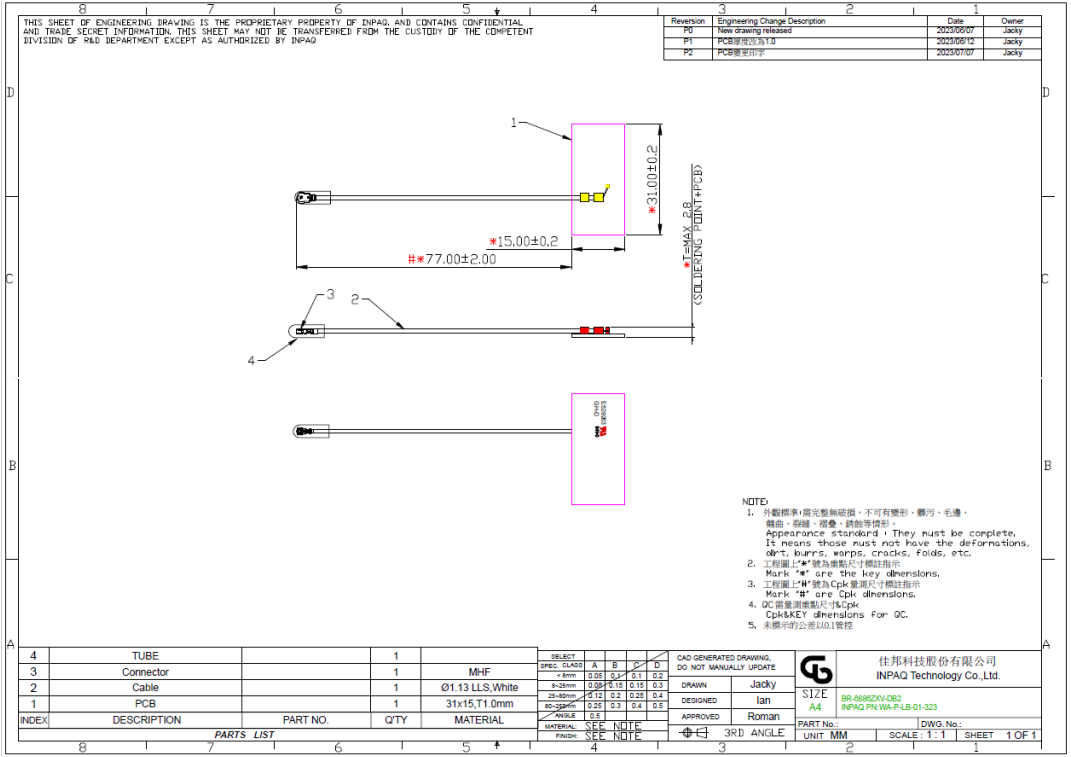
DB1 – 5470MHz

WA-P-LB-11-003_DB1

X-Y plane	X-Z plane	YZ plane
		

Antenna Placement & Solution

WA-P-LB-01-323_DB2



Antenna Placement & Solution

DB2 – 2450MHz

WA-P-LB-01-323_DB2

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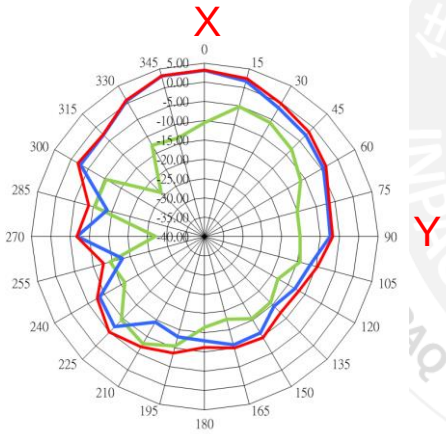	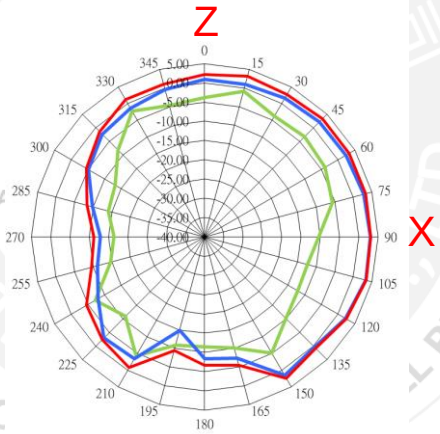	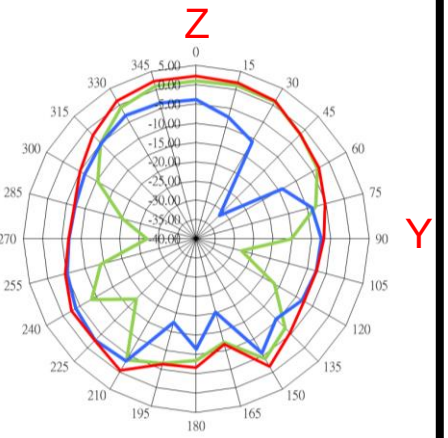

Antenna Placement & Solution

DB2 – 5470MHz

WA-P-LB-01-323_DB2

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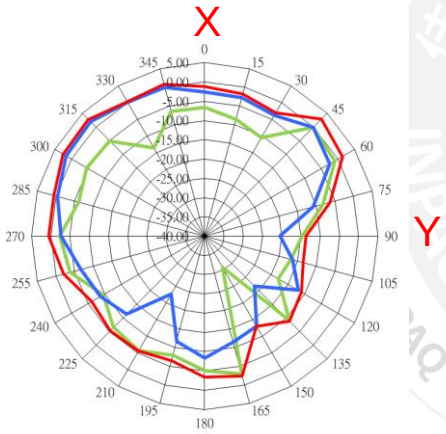
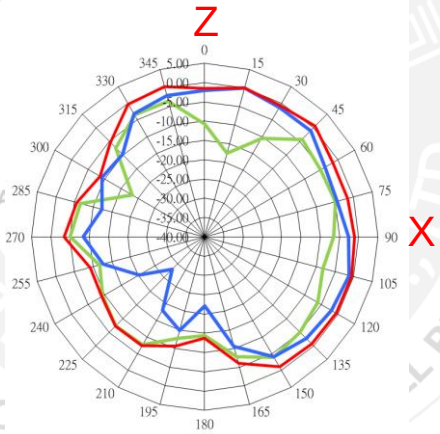
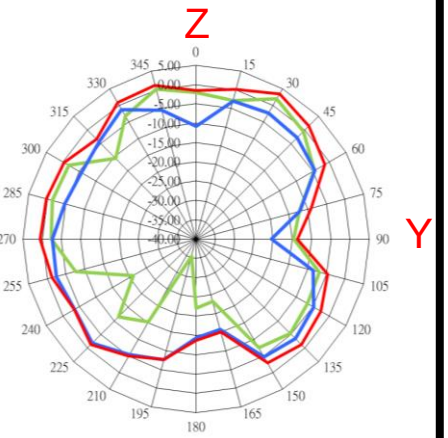
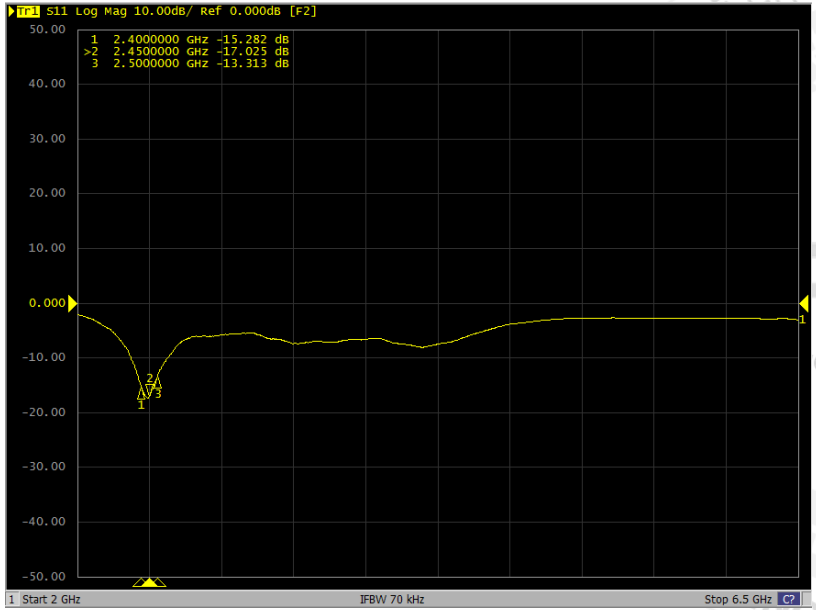
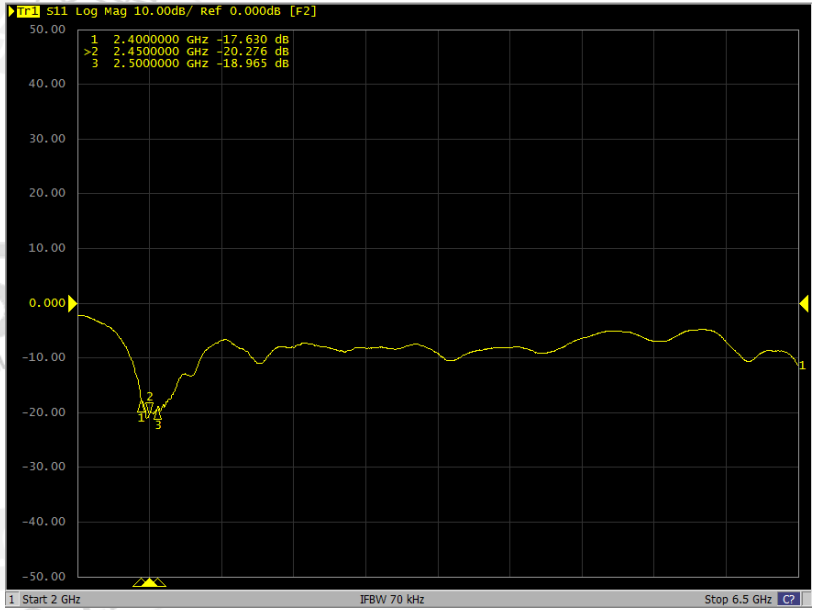
		

Return Loss

BT

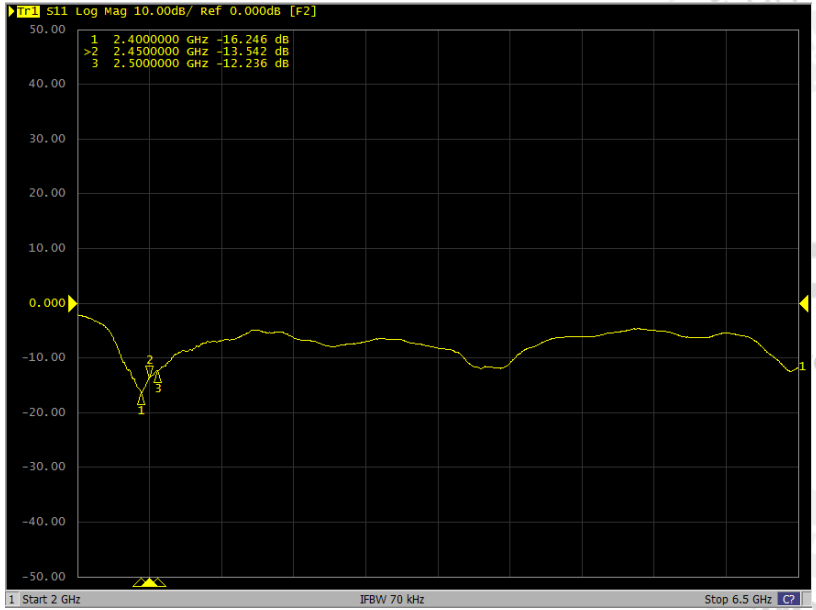


2G1

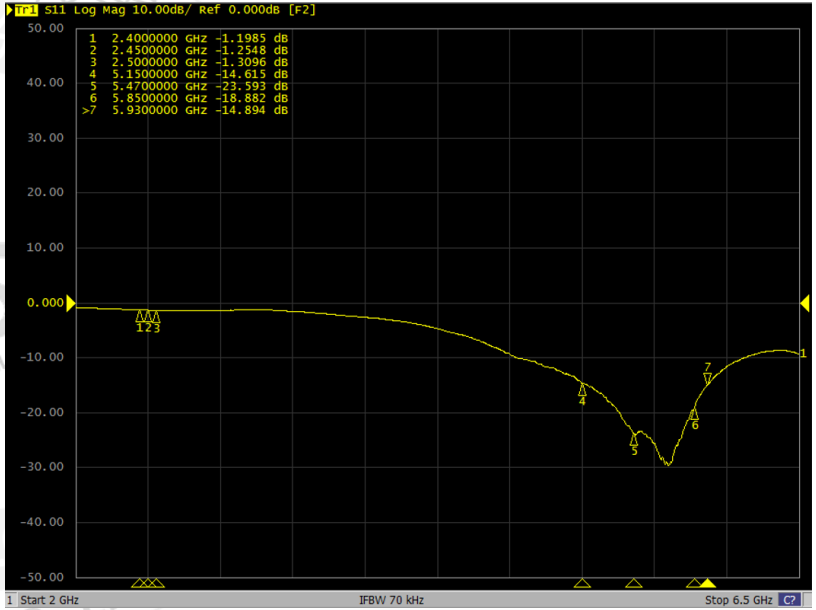


Return Loss

2G2

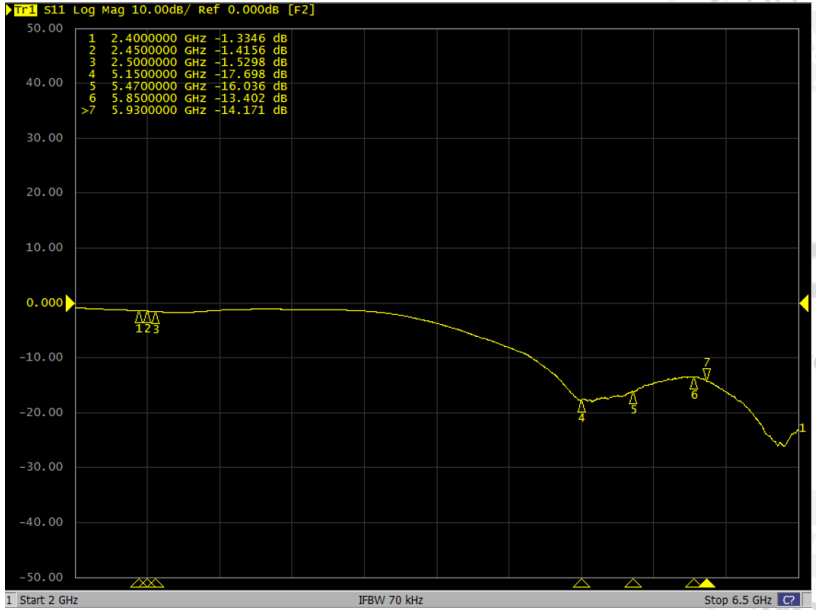


5G1

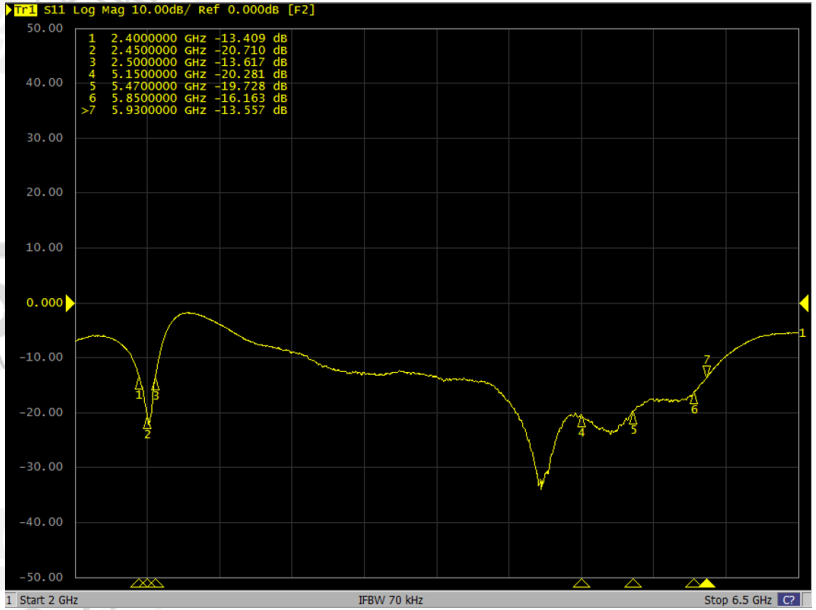


Return Loss

5G2

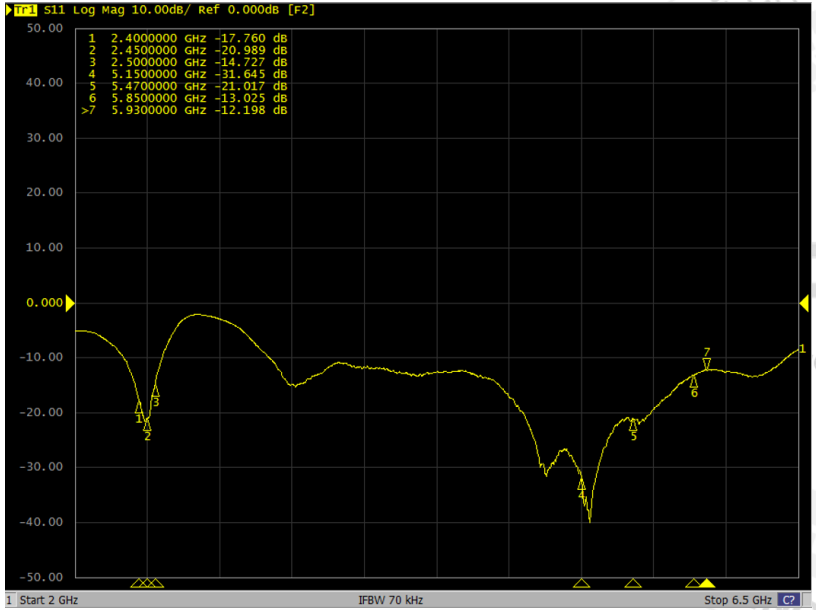


DB1



Return Loss

DB2



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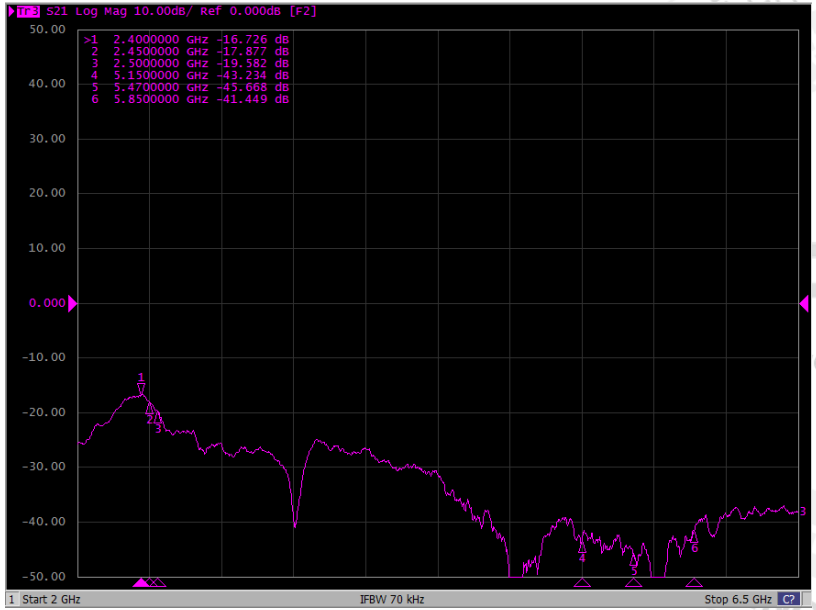
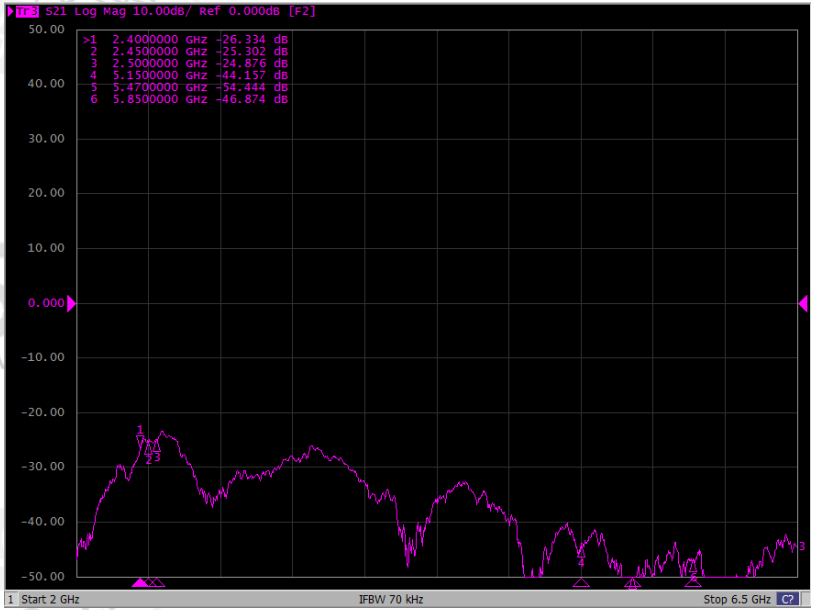
Isolation Results

BT&2G1

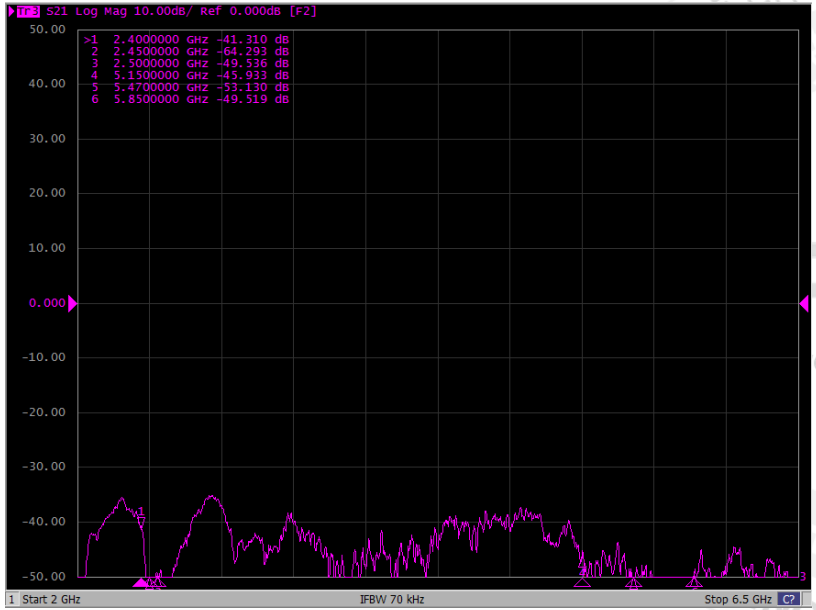


BT&2G2

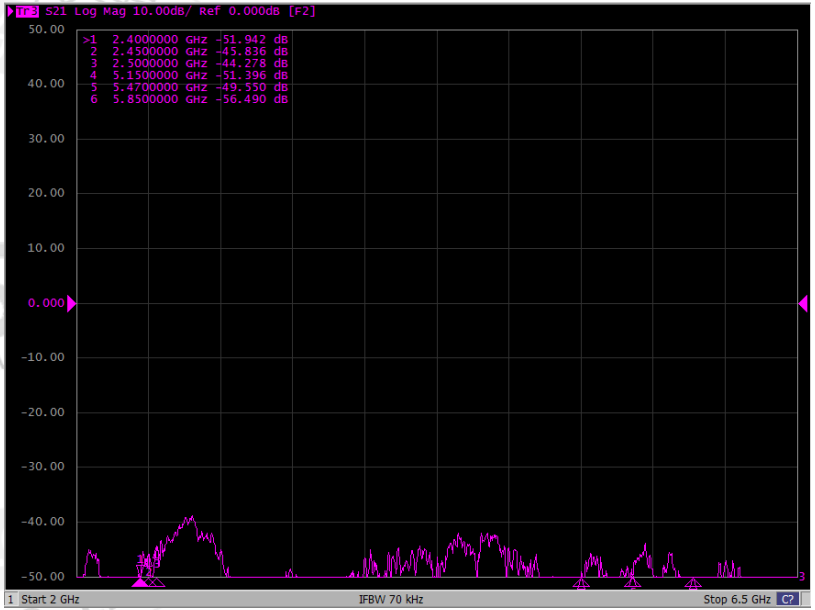


Isolation Results

BT&5G1

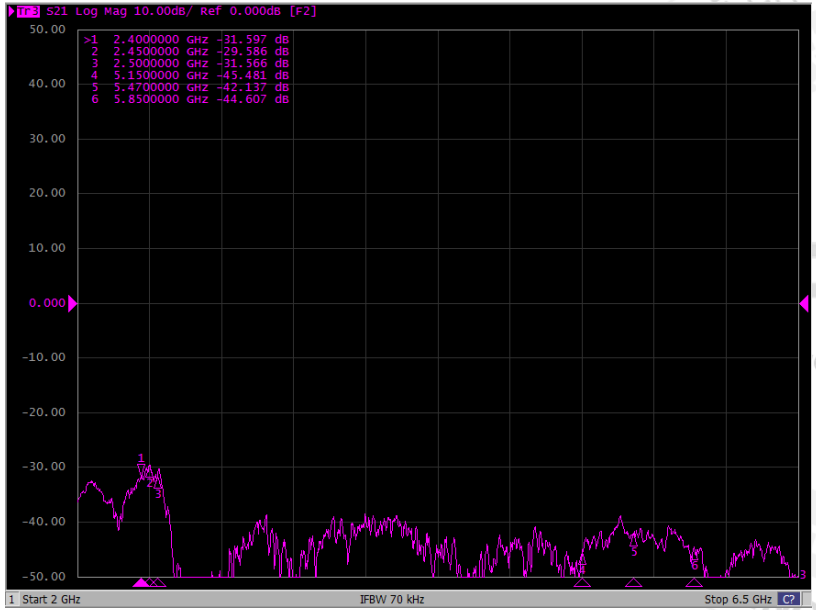


BT&5G2

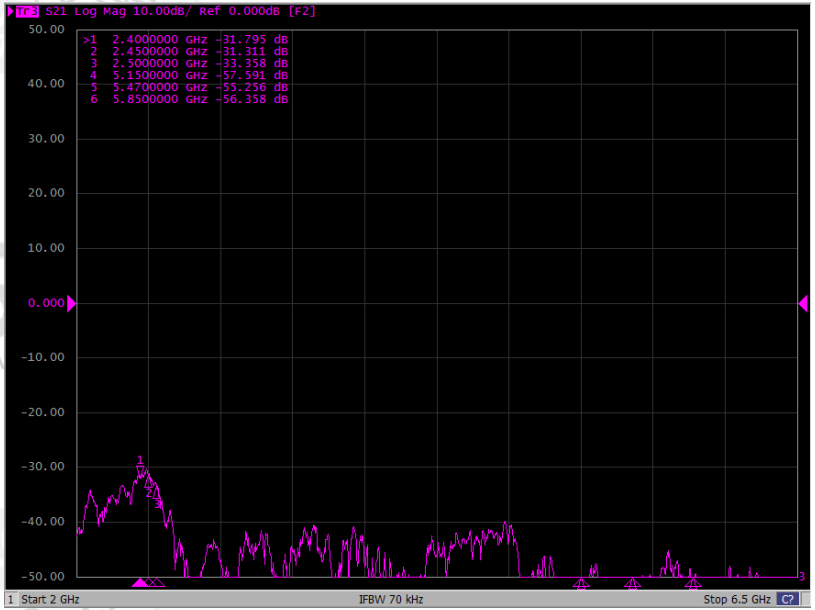


Isolation Results

BT&DB1

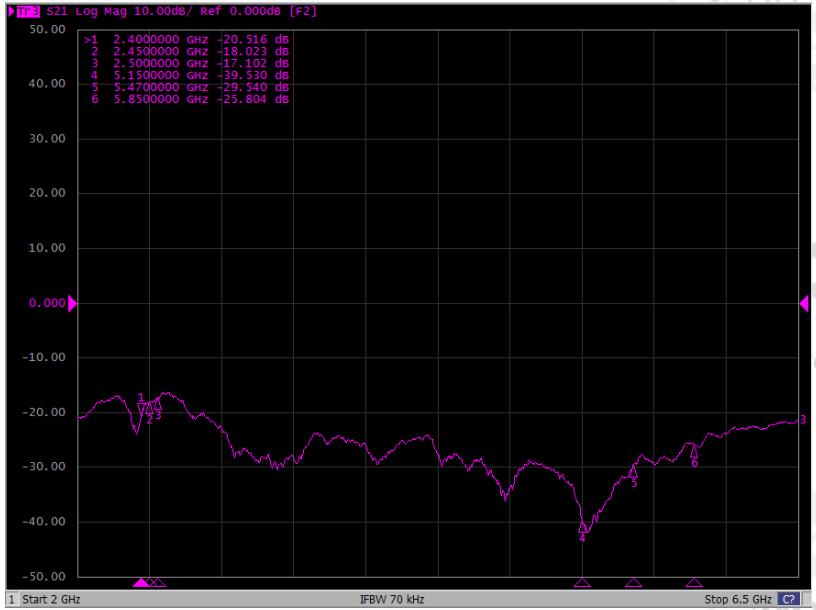


BT&DB2

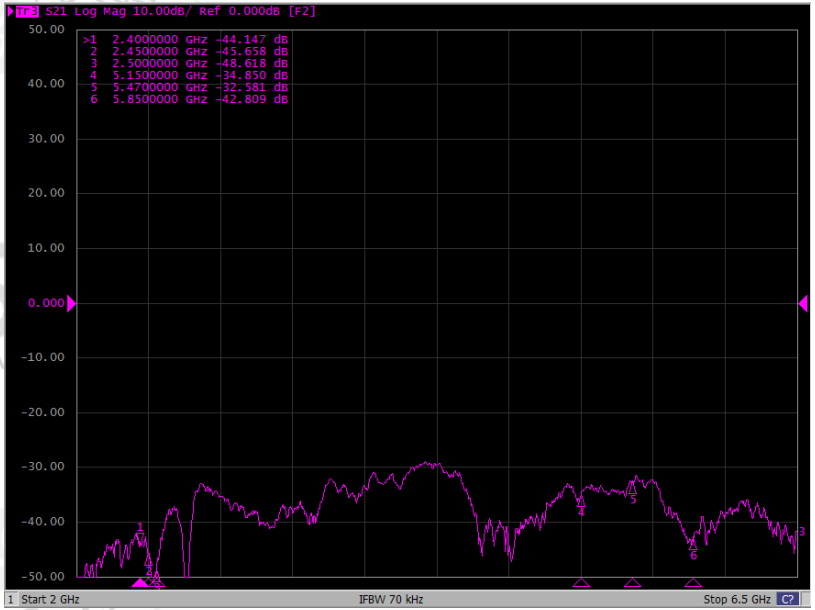


Isolation Results

2G1&2G2

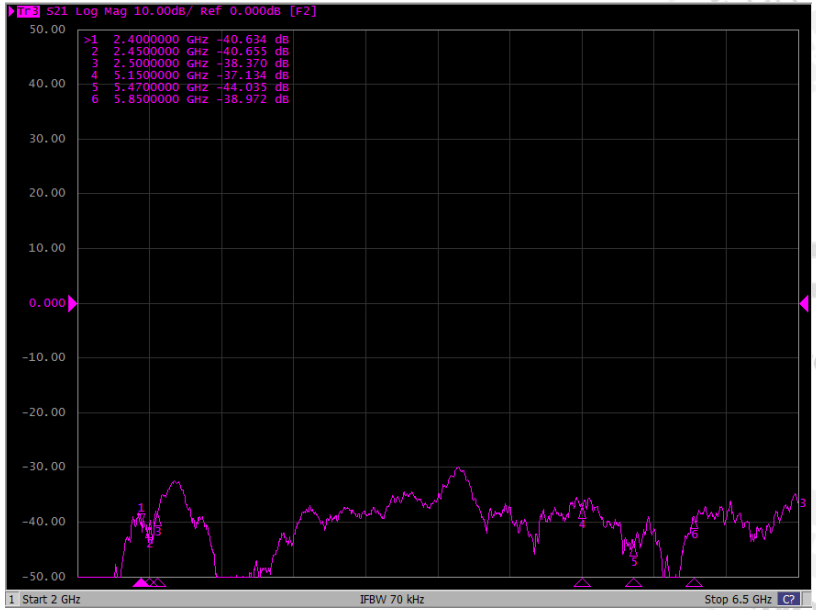


2G1&5G1

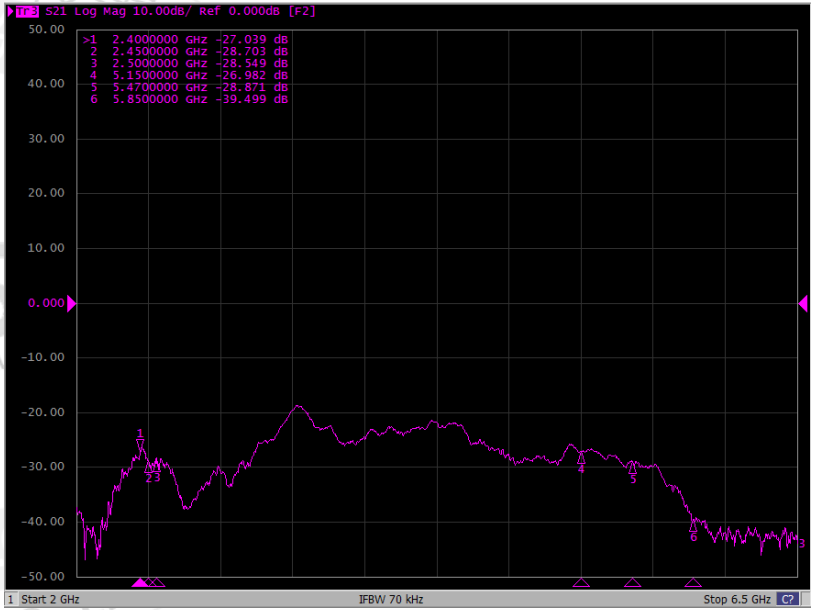


Isolation Results

2G1&5G2

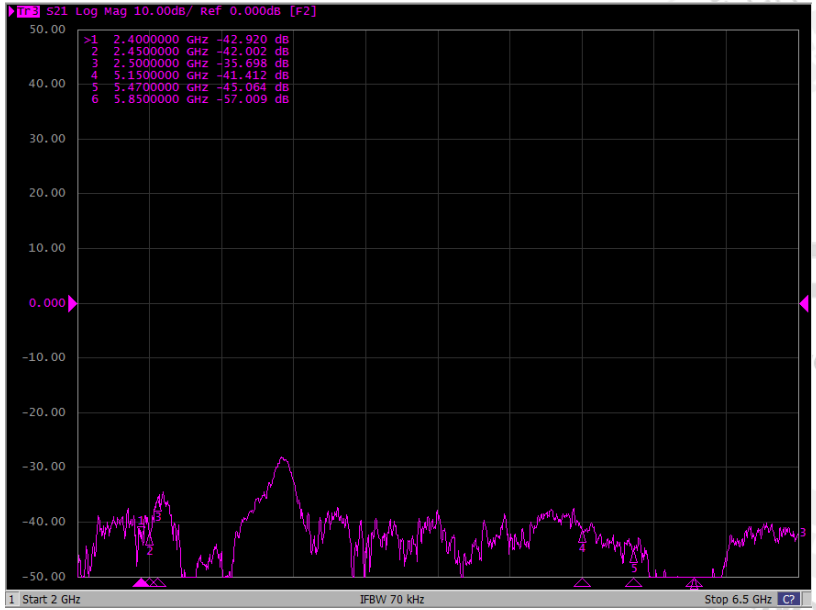


2G1&DB1

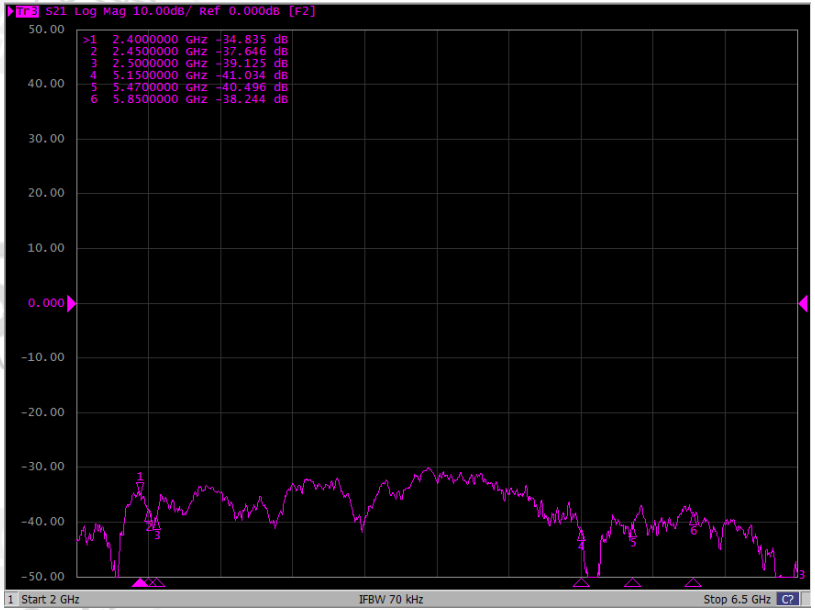


Isolation Results

2G1&DB2

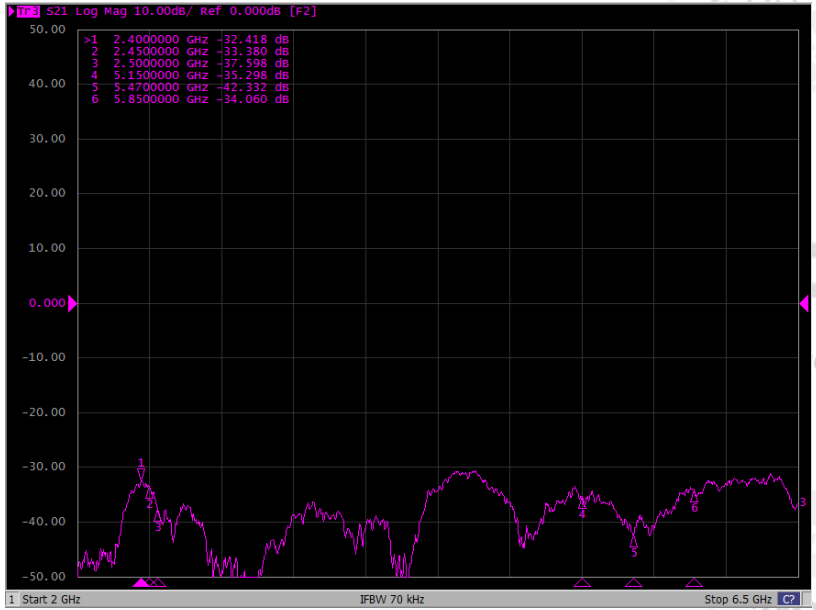


2G2&5G1

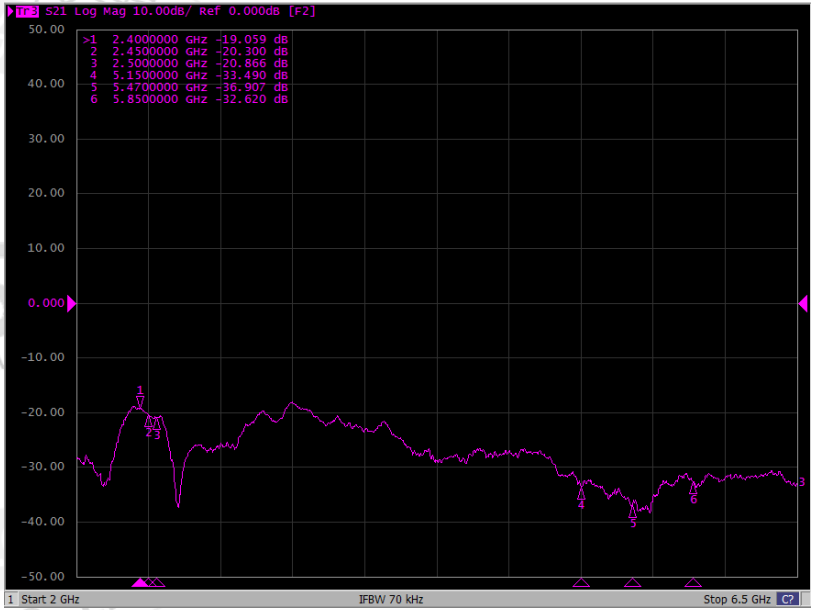


Isolation Results

2G2&5G2

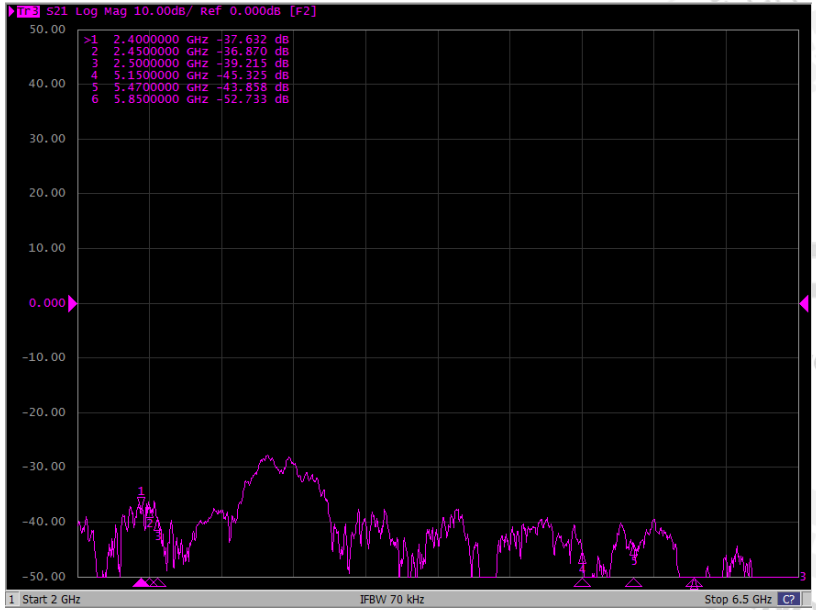


2G2&DB1

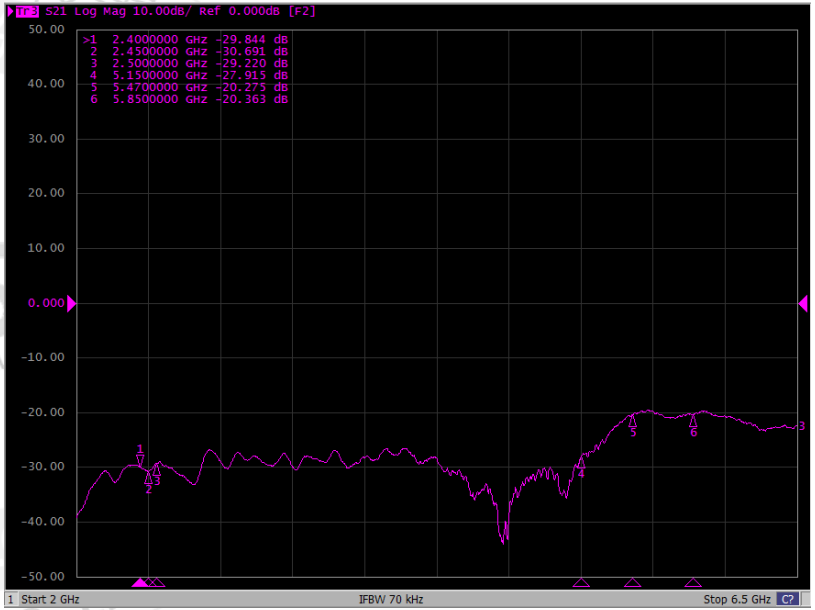


Isolation Results

2G2&DB2

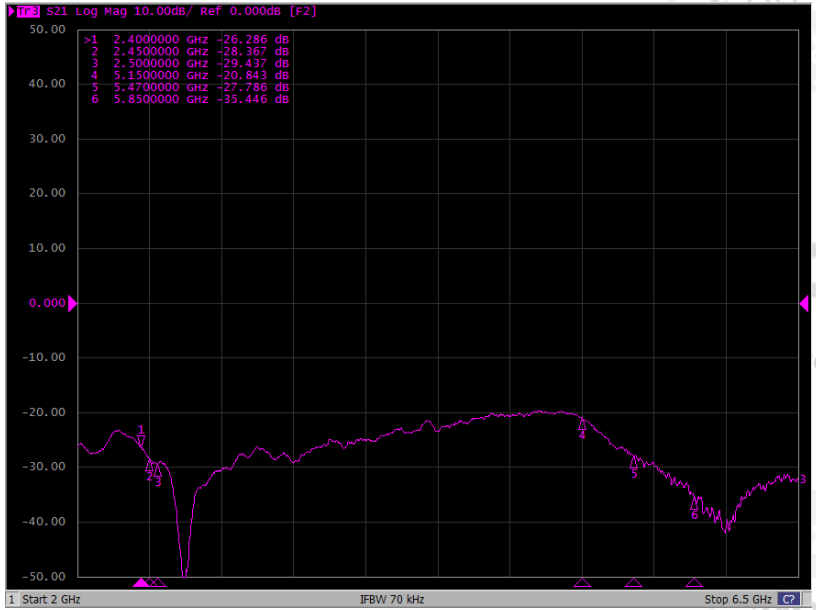


5G1&5G2

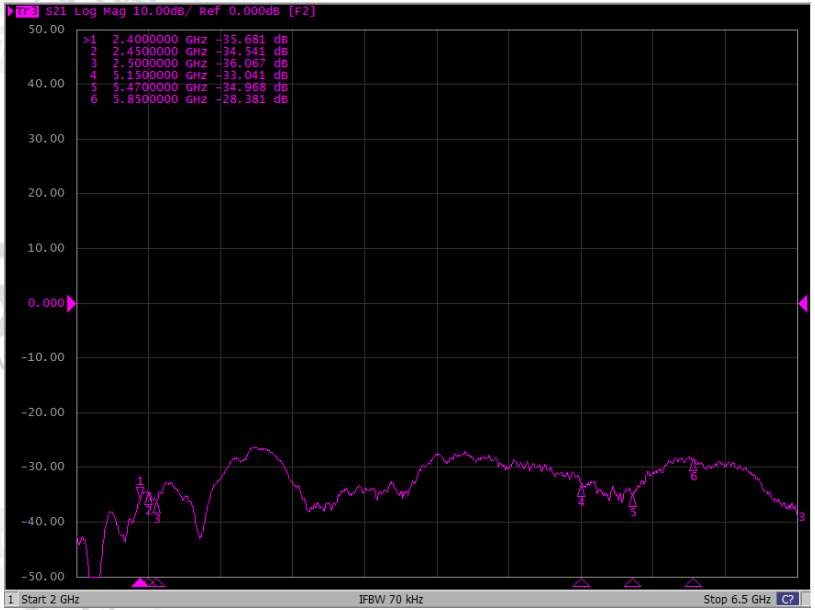


Isolation Results

5G1&DB1

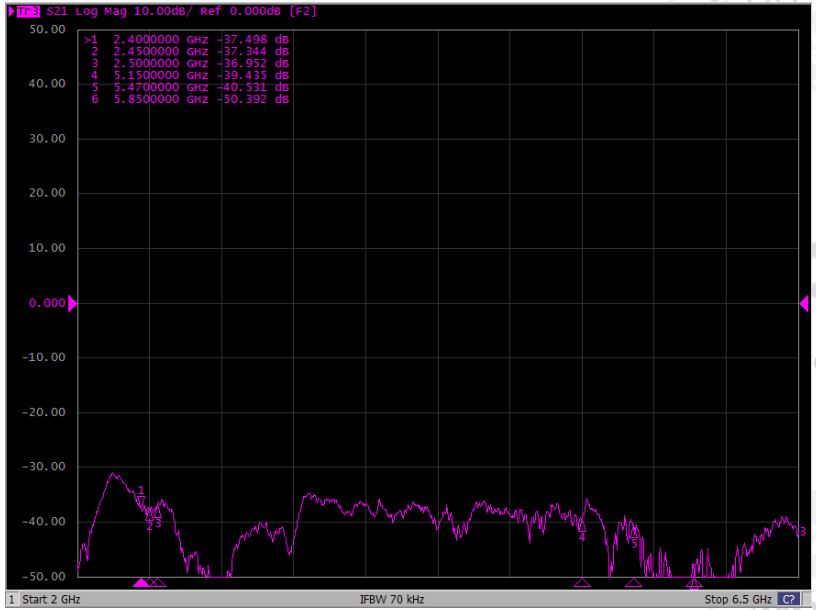


5G1&DB2

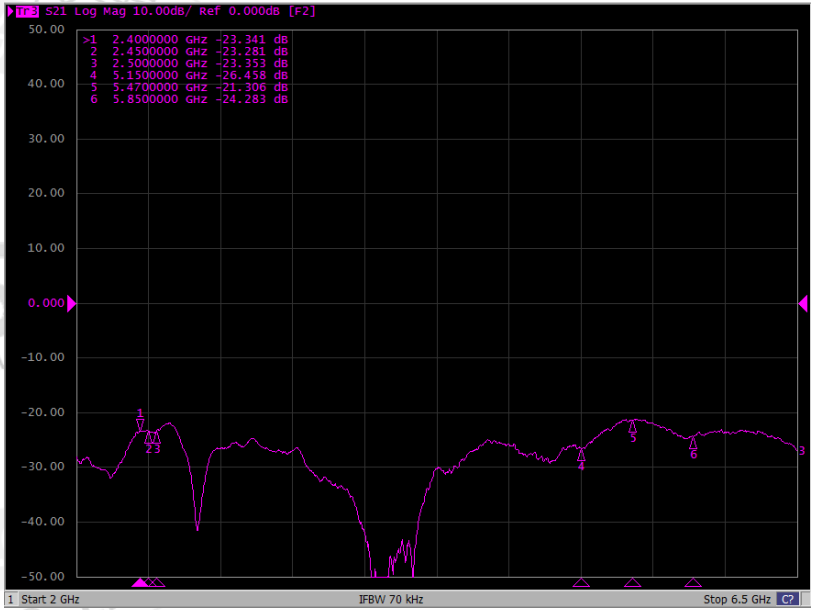


Isolation Results

5G2&DB1

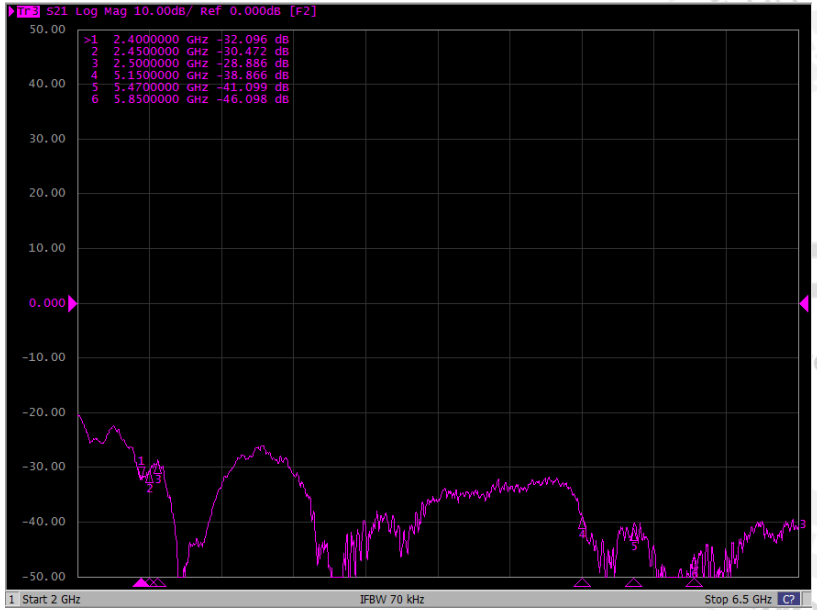


5G2&DB2



Isolation Results

DB1&DB2



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Results Summary

Peak gain & Efficiency – BT

Frequency (MHz)	Peak Gain_H(dBi)	Peak Gain_V(dBi)
2400	0.55	1.93
2450	0.44	1.88
2500	0.78	1.47

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Results Summary

Peak gain & Efficiency – 2G1

Frequency (MHz)	Peak Gain_H(dBi)	Peak Gain_V(dBi)
2400	2.18	2.69
2450	1.93	2.74
2500	2.02	2.50

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Results Summary

Peak gain & Efficiency – 2G2

Frequency (MHz)	Peak Gain_H(dBi)	Peak Gain_V(dBi)
2400	3.60	1.70
2450	3.65	1.87
2500	3.57	1.62

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Results Summary

Peak gain & Efficiency – 5G1

Frequency (MHz)	Peak Gain_H(dBi)	Peak Gain_V(dBi)
5150-5250	4.34	4.46
5251-5300	4.18	4.54
5301-5490	3.63	4.26
5491-5725	3.42	4.07
5726-5835	3.42	4.07
5836-5930	3.40	4.01

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Results Summary

Peak gain & Efficiency – 5G2

Frequency (MHz)	Peak Gain_H(dBi)	Peak Gain_V(dBi)
5150-5250	3.18	4.44
5251-5300	2.94	4.33
5301-5490	2.48	4.26
5491-5725	2.05	4.63
5726-5835	2.08	4.58
5836-5930	2.13	4.61

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Results Summary

Peak gain & Efficiency – DB1

Frequency (MHz)	Peak Gain_H(dBi)	Peak Gain_V(dBi)
2400-2500	3.44	1.97
5150-5250	4.51	3.98
5251-5300	4.60	4.27
5301-5490	4.60	4.27
5491-5725	4.15	4.02
5726-5835	4.23	4.61
5836-5930	4.20	4.57

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Results Summary

Peak gain & Efficiency – DB2

Frequency (MHz)	Peak Gain_H(dBi)	Peak Gain_V(dBi)
2400-2500	2.12	3.61
5150-5250	2.52	4.36
5251-5300	3.60	3.83
5301-5490	3.88	3.19
5491-5725	4.01	3.03
5726-5835	4.38	2.87
5836-5930	4.22	3.00

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Results Summary

Correlation table (ECC) _2G

Frequency (MHz)	BT&2G1	BT&2G2	BT&DB1	BT&DB2	2G1&2G2
2400	0.1579	0.1366	0.1201	0.1164	0.1906
2450	0.1723	0.1457	0.1296	0.1215	0.1932
2500	0.1421	0.1388	0.1177	0.0921	0.1893

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Results Summary

Correlation table (ECC) _2G

Frequency (MHz)	2G1&DB1	2G1&DB2	2G2&DB1	2G2&DB2	DB1&DB2
2400	0.1604	0.0855	0.1624	0.1428	0.1336
2450	0.1523	0.0940	0.1675	0.1359	0.1430
2500	0.1569	0.0842	0.1693	0.1461	0.1256

Results Summary

Correlation table (ECC) _5G

Frequency (MHz)	5G1&5G2	5G1&DB1	5G1&DB2	5G2&DB1	5G2&DB2	DB1&DB2
5150	0.1777	0.0766	0.0498	0.0280	0.1420	0.0523
5470	0.1862	0.0639	0.0321	0.0737	0.1266	0.0952
5850	0.1723	0.0571	0.0262	0.0455	0.1298	0.1177

Conclusion

Antenna Performance Summary

- The report use new case with new PCB and follow the new cable routing.
- The efficiency of BT & 2G1-2G2 & 5G1-5G2 & DB1-DB2 are all higher than 65 %.
- The Correlation data **(ECC)** are all less than 0.2 between 2G& 5G respectively.

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