

HT-880BEI -Antenna Passive Report

V1.1

Report Change List



Version	Change description	Author	Date
V1.0	First version	Qin	2024.01.21
V1.1	Correct some mistakes	Wen	2025.07.21

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

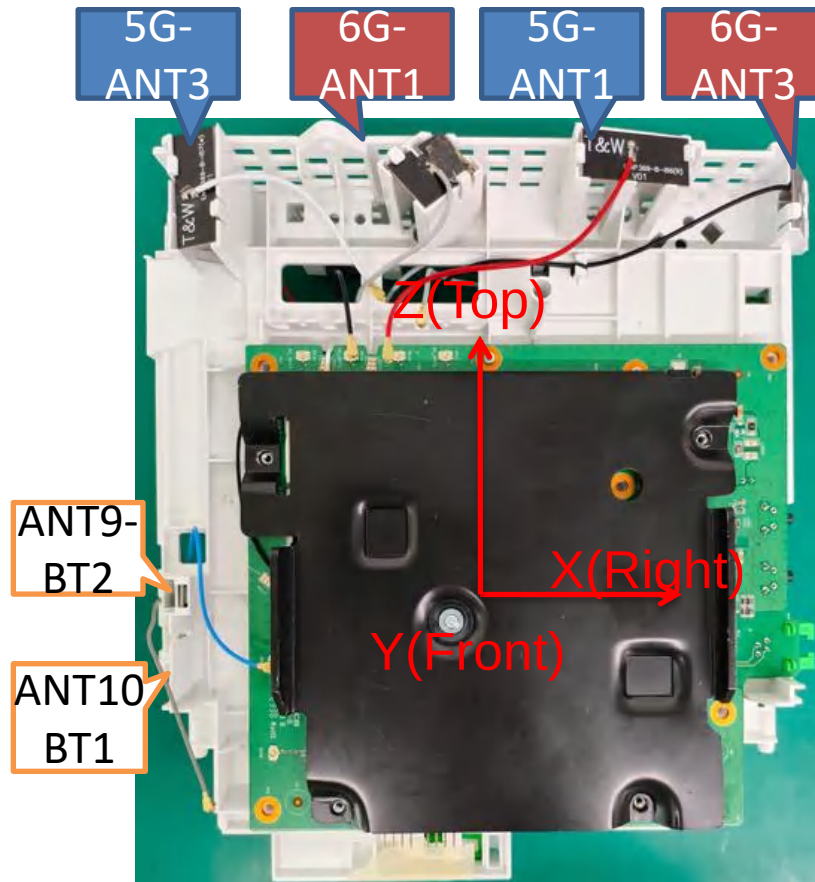
Purpose

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

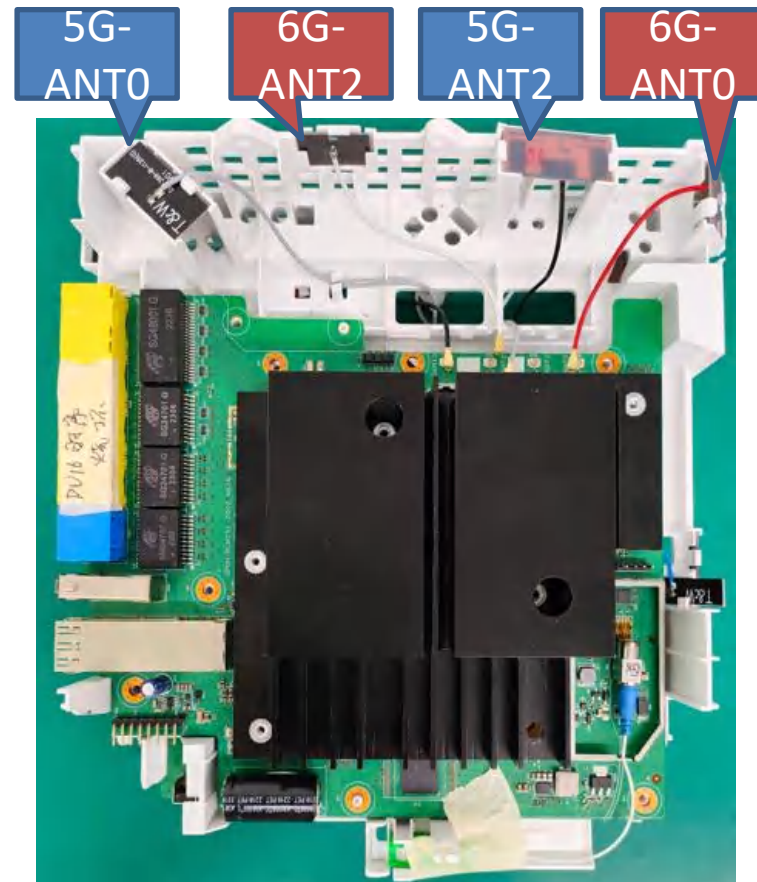
Environment

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

DUT Antenna



ANT	NO.	Frequency (GHz)
ANT1	5G-ANT3	2.4-2.5&5.15-5.85
ANT2	6G-ANT1	5.9-7.125
ANT3	5G-ANT1	2.4-2.5&5.15-5.85
ANT4	6G-ANT3	5.9-7.125
ANT5	5G-ANT0	2.4-2.5&5.15-5.85
ANT6	6G-ANT2	5.9-7.125



ANT	NO.	Frequency (GHz)
ANT7	5G-ANT2	2.4-2.5&5.15-5.85
ANT8	6G-ANT0	5.9-7.125
ANT9	ANT9-BT2	2.4-2.5
ANT10	ANT10-BT1	2.4-2.5

Antenna manufacturer :

Shenzhen Be-Comfortable Technology Co.Ltd

Antenna manufacturer's address:

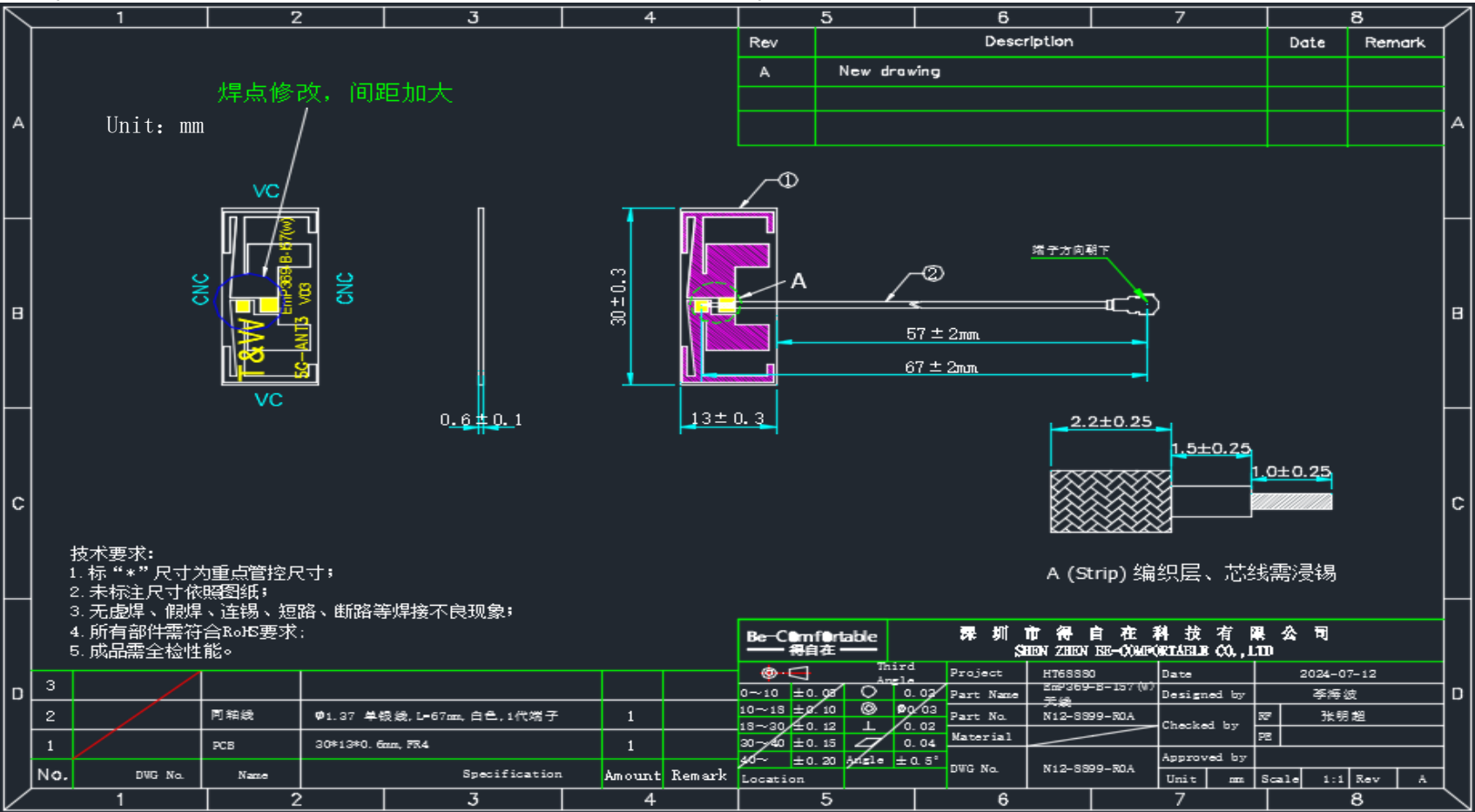
1603, Comprehensive Building C6, Hengfeng Industrial City, No.
739 Zhoushi Road, Hezhou Community, Hangcheng Street, Bao'an
District, Shenzhen

DUT Antenna



ANT1

Antenna dimension:5G-ANT0
(Remark: for White, the RF cable is 67mm)



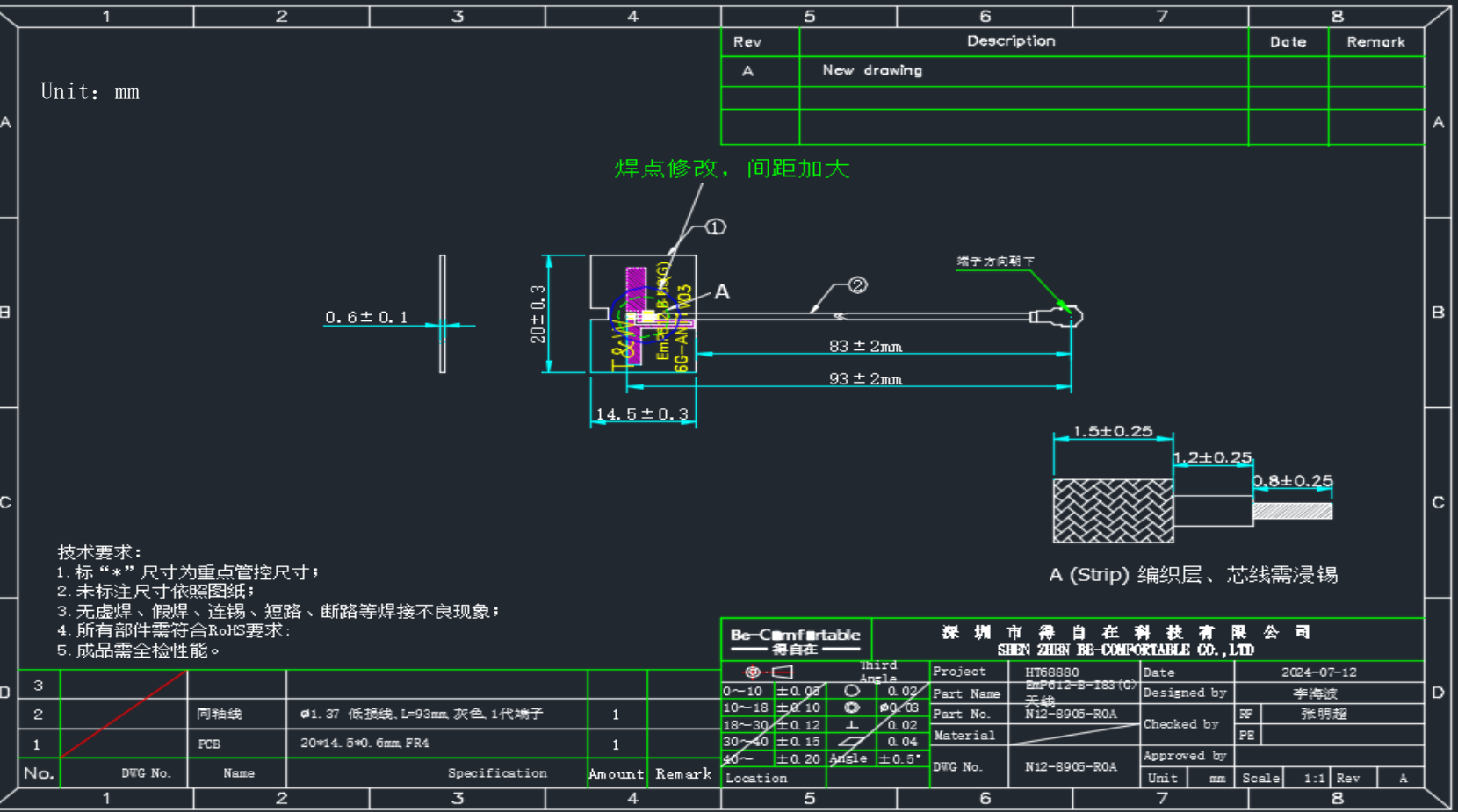
(Unit:mm)

DUT Antenna



ANT2

Antenna dimension:6G-ANT1
(Remark: for Gray, the RF cable is 93mm)



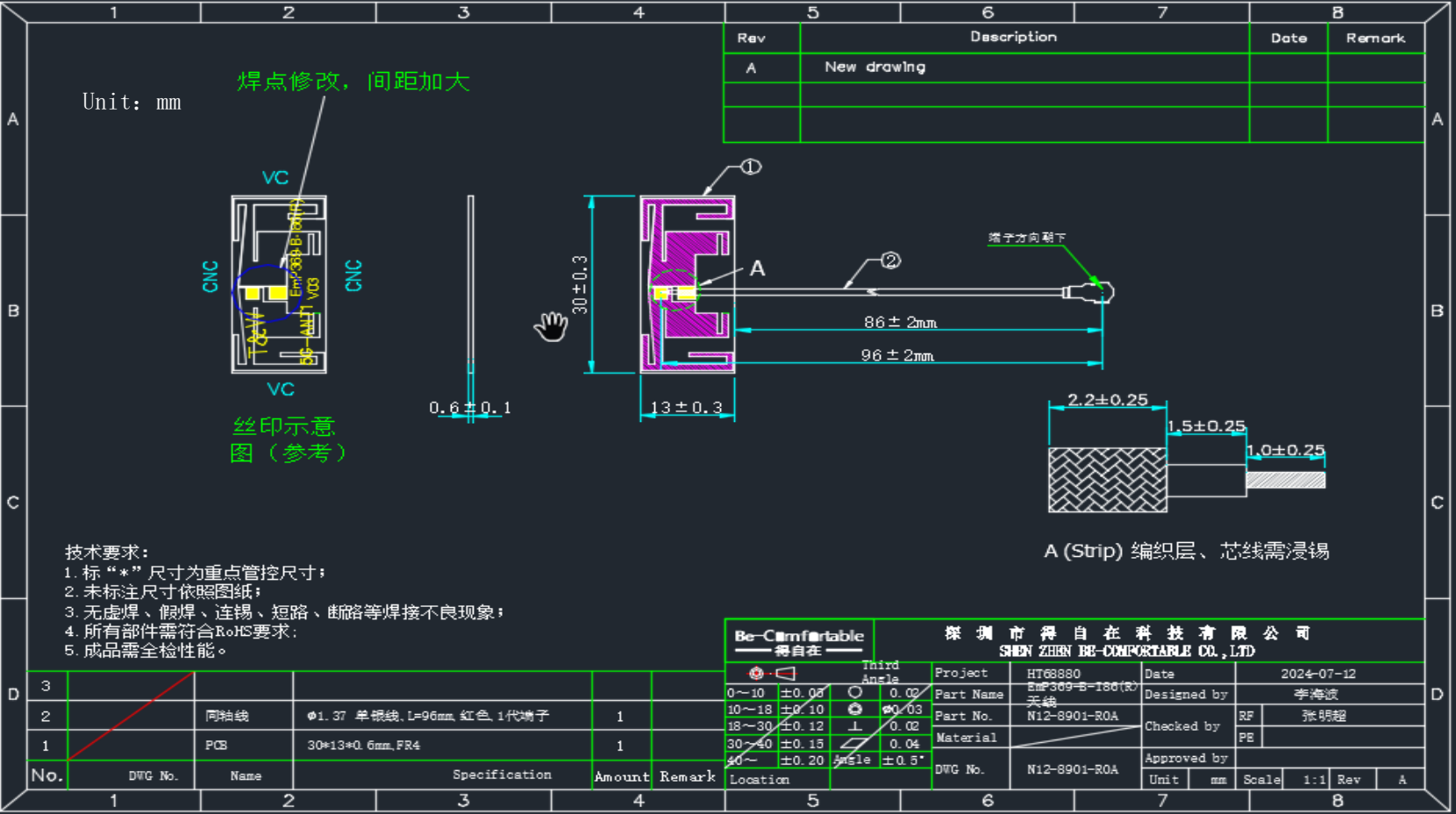
(Unit:mm)

DUT Antenna



ANT3

Antenna dimension:5G-ANT1
(Remark: for Red, the RF cable is 96mm)



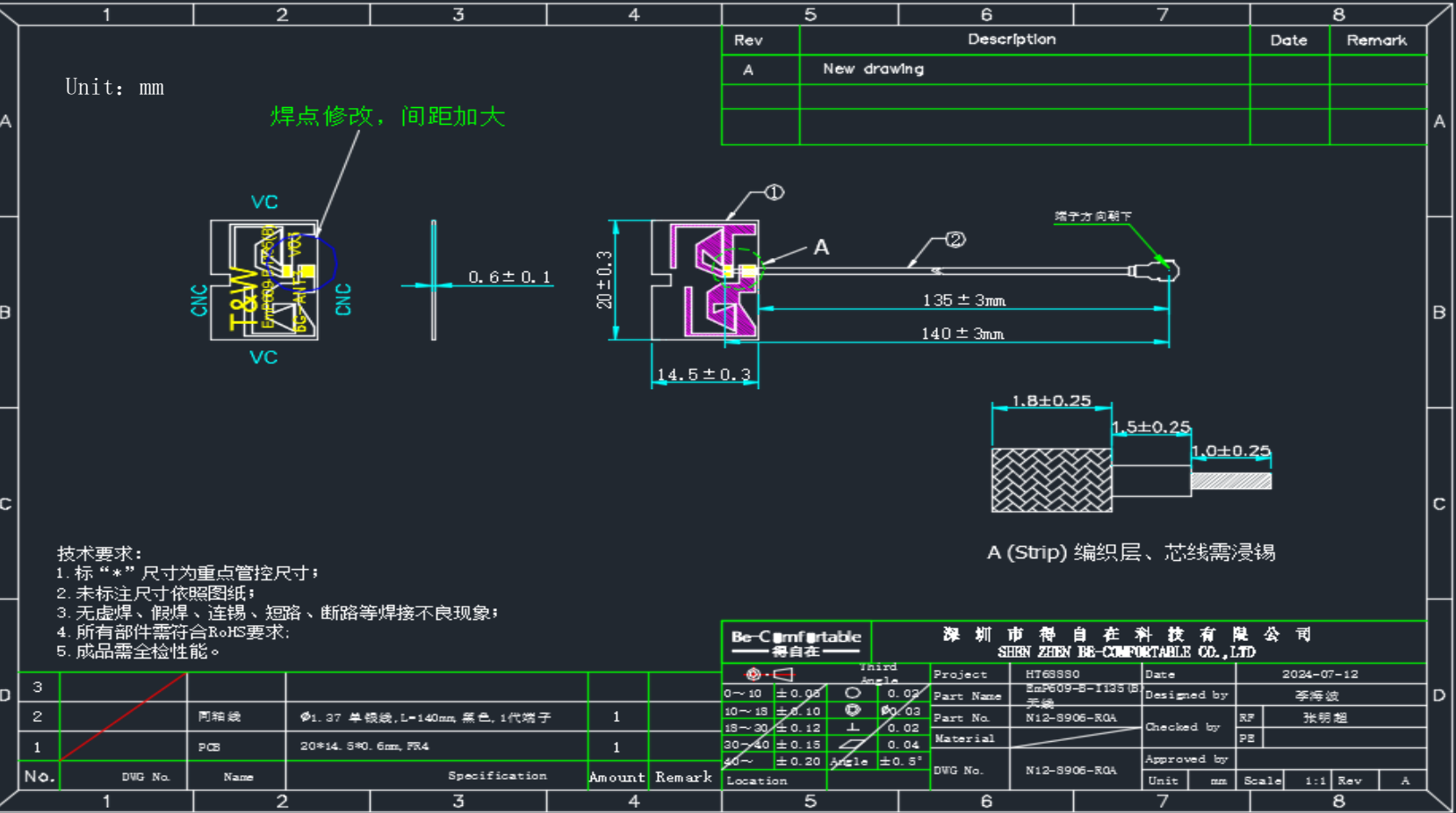
(Unit:mm)

DUT Antenna



ANT4

Antenna dimension:6G-ANT3
(Remark: for Black, the RF cable is 140mm)



(Unit:mm)

T&W

(Remark: for Gray, the RF cable is 135mm)

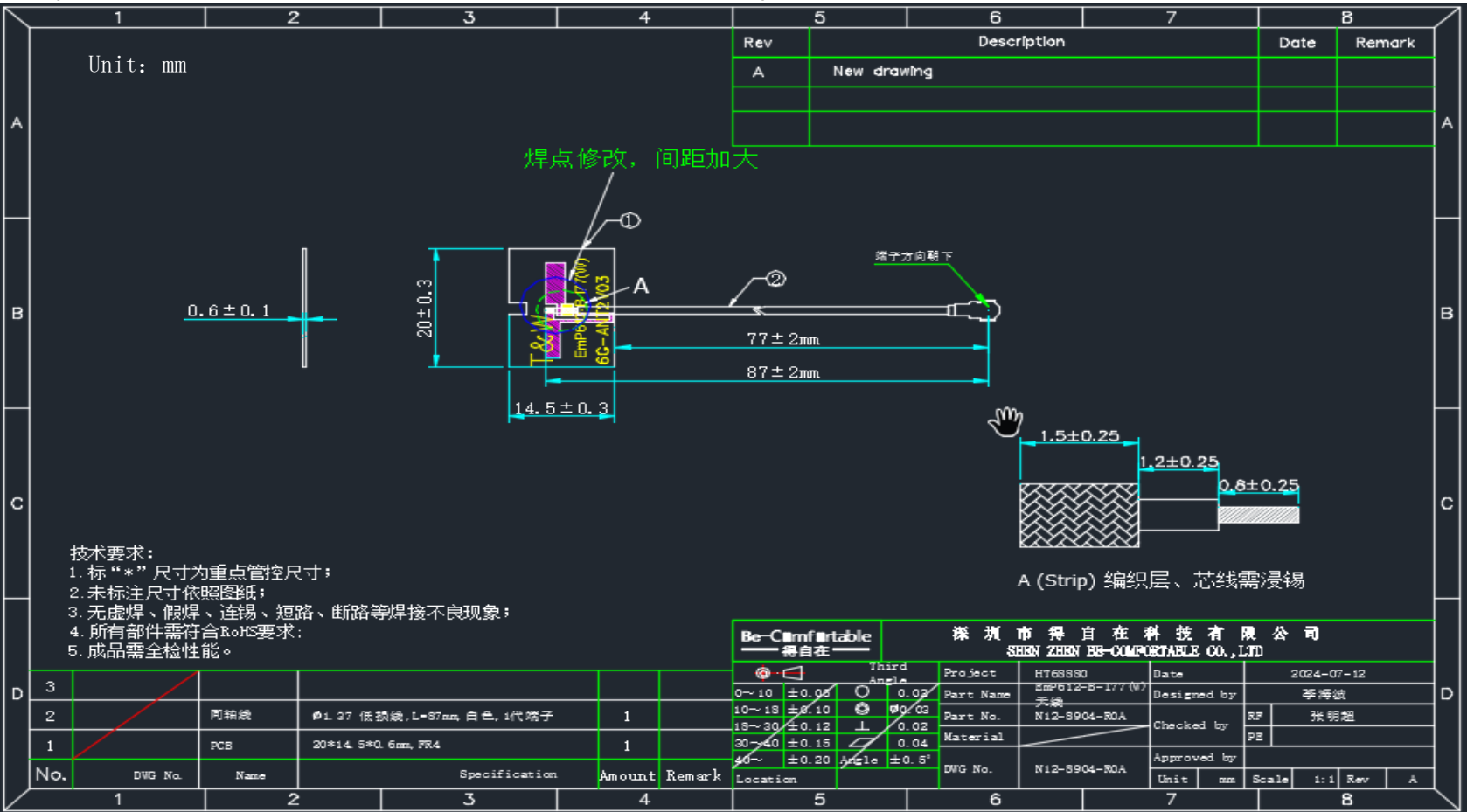


DUT Antenna



ANT6

Antenna dimension:6G-ANT2
(Remark: for White, the RF cable is 87mm)



(Unit:mm)

T&W

(Remark: for Black, the RF cable is 88mm)



T&W

Antenna dimension:6G-ANT0

Unit: mm

焊点修改，间距加大

VC

CNC

T&W

Emplace 1/27(N)

85-4115 W3

CNC

VC

0.6 ± 0.1

20 ± 0.3

14.5 ± 0.3

①

A

②

67 ± 2mm

72 ± 2mm

端子方向朝下

1.8 ± 0.25

1.5 ± 0.25

1.0 ± 0.25

A (Strip) 编织层、芯线需浸锡

技术要求:

1. 标“*”尺寸为重点管控尺寸;
2. 未标注尺寸依照图纸;
3. 无虚焊、假焊、连锡、短路、断路等焊接不良现象;
4. 所有部件需符合RoHS要求;
5. 成品需全检性能。

No.	DWG No.	Name	Specification	Amount	Remark
3					
2		同轴线	Ø1.37 单根线, L=72mm, 红色, 1代端子	1	
1		PCB	20*14.5*0.6mm, F54	1	

Be-Comfortable 得自在		深圳市得自在科技有限公司 SHEN ZHEN DE-COMFORTABLE CO., LTD			
Third Angle	Project	Part Name	Part No.	Material	DWG No.
0~10 ±0.05	HT68890	Emplace-8-167 (R)	N12-S903-RQA		
10~18 ±0.10					
18~30 ±0.12					
30~40 ±0.15					
40~ ±0.20					
Angle ±0.5°					
Location					

Rev	Description	Date	Remark
A	New drawing		

Unit	mm	Scale	1:1	Rev	A

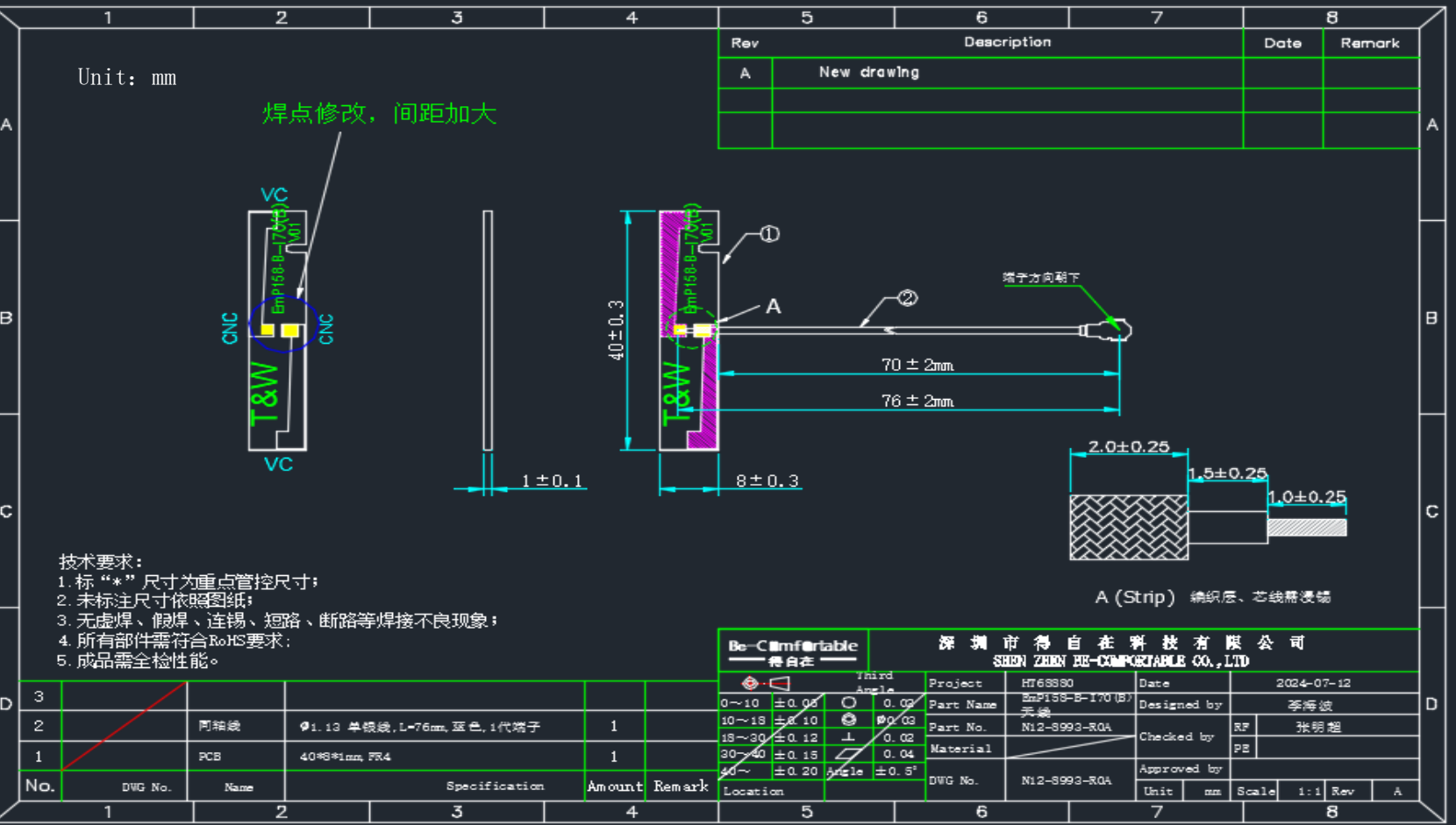
(Unit:mm)

DUT Antenna



ANT9

Antenna dimension:EmP158-B
(Remark: for Blue, the RF cable is 76mm)



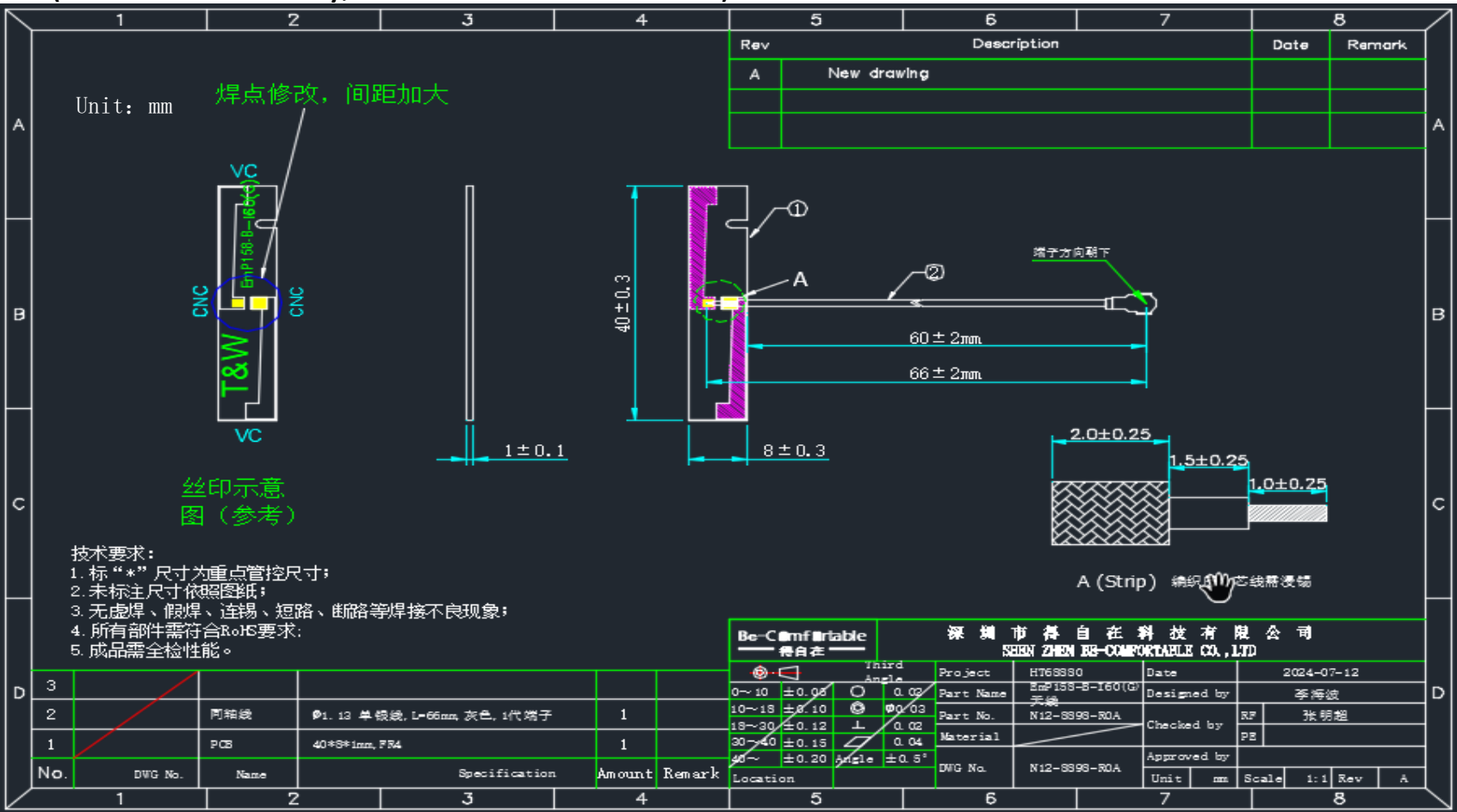
(Unit:mm)

DUT Antenna



ANT10

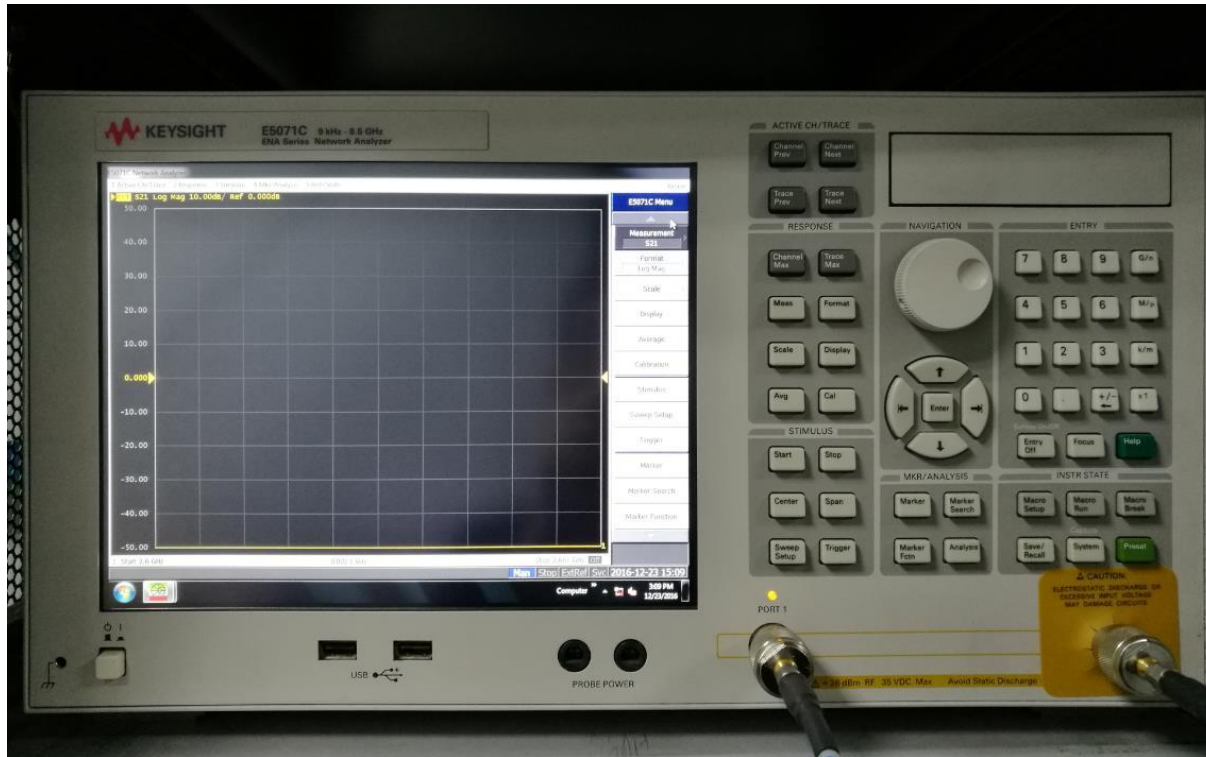
Antenna dimension:EmP158-B
(Remark: for Gray, the RF cable is 66mm)



(Unit:mm)

Return Loss and Isolation

Measurement Condition

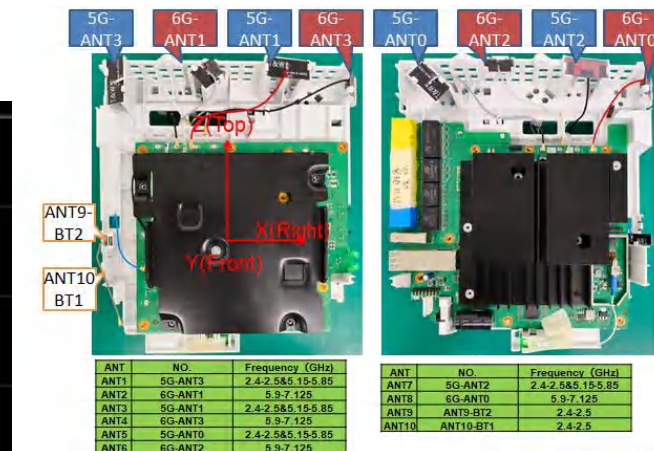
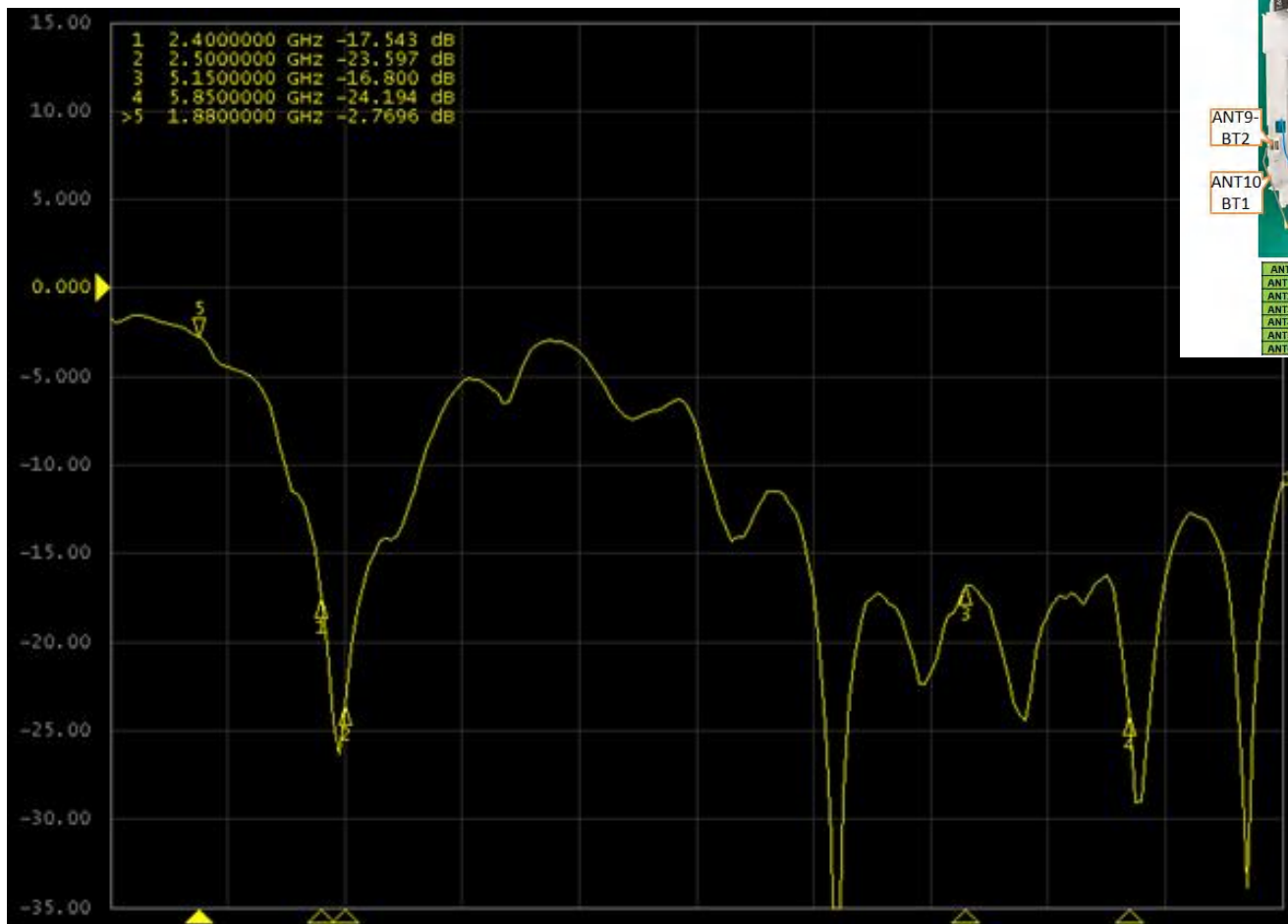


The network Analyzer

Return Loss

Ant1-2G&5G

S11

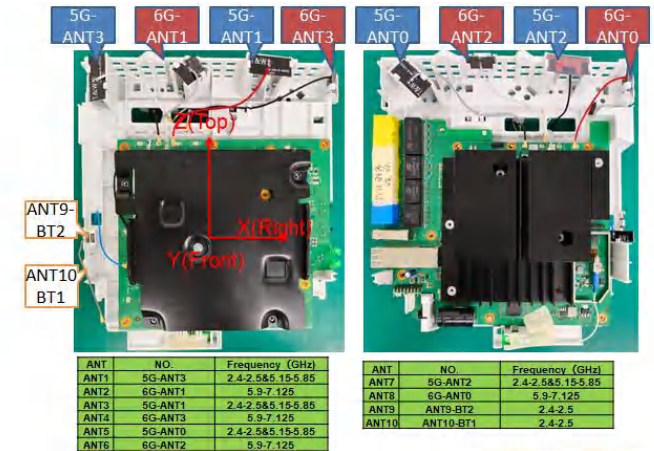
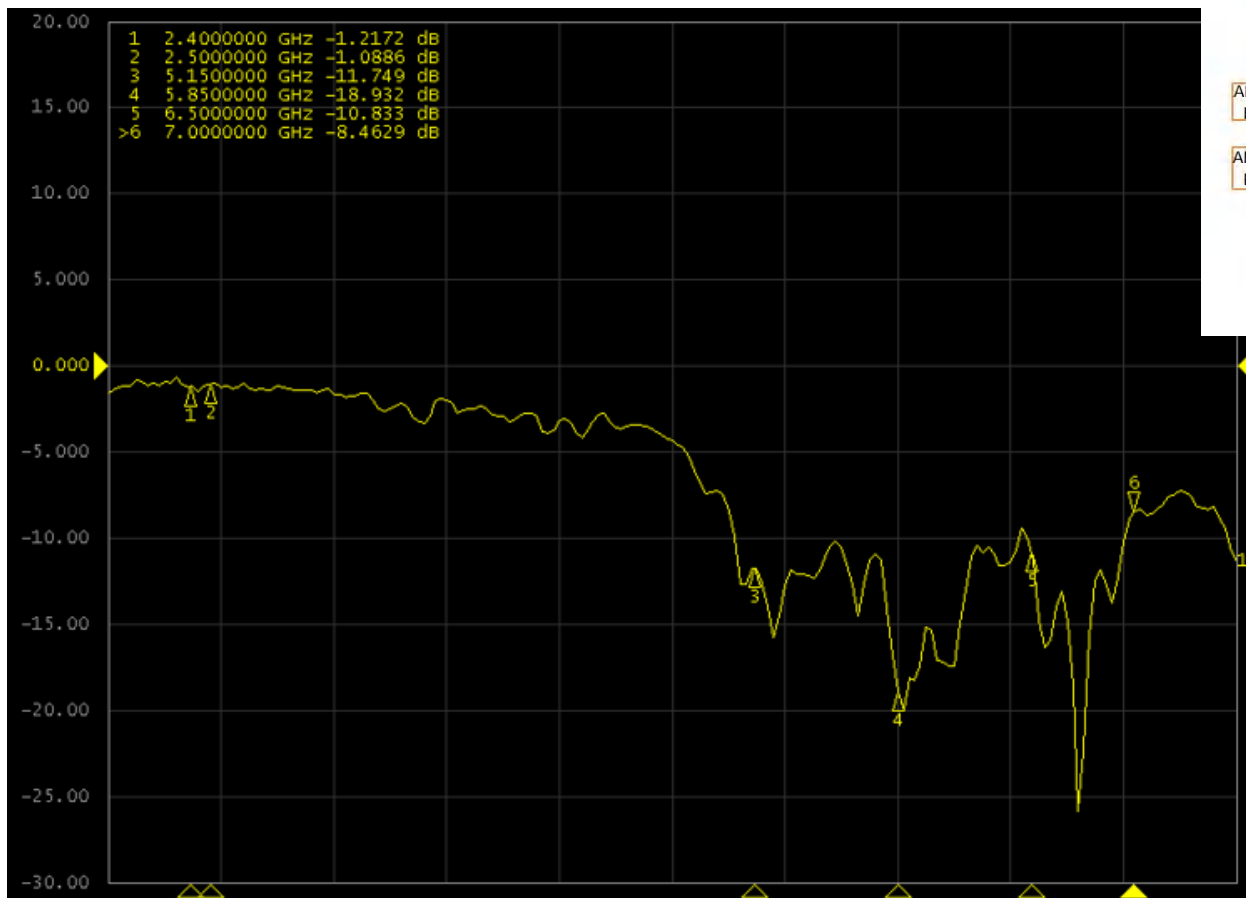


Return loss:
 $2.4\text{G} < -17.5\text{dB}$; $5\text{G} < -16.8\text{dB}$

Return Loss

Ant2-6G

S22



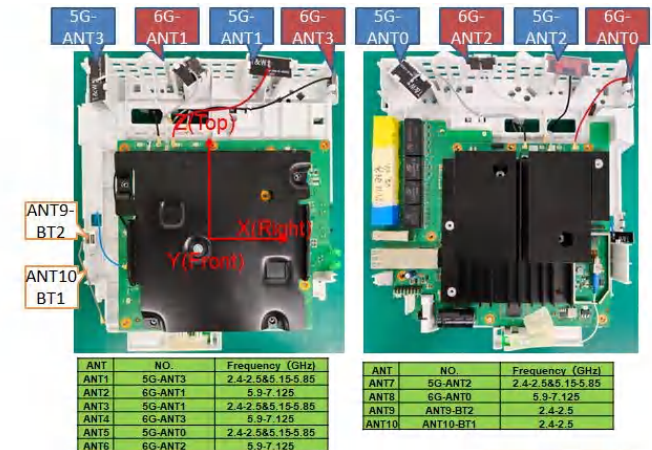
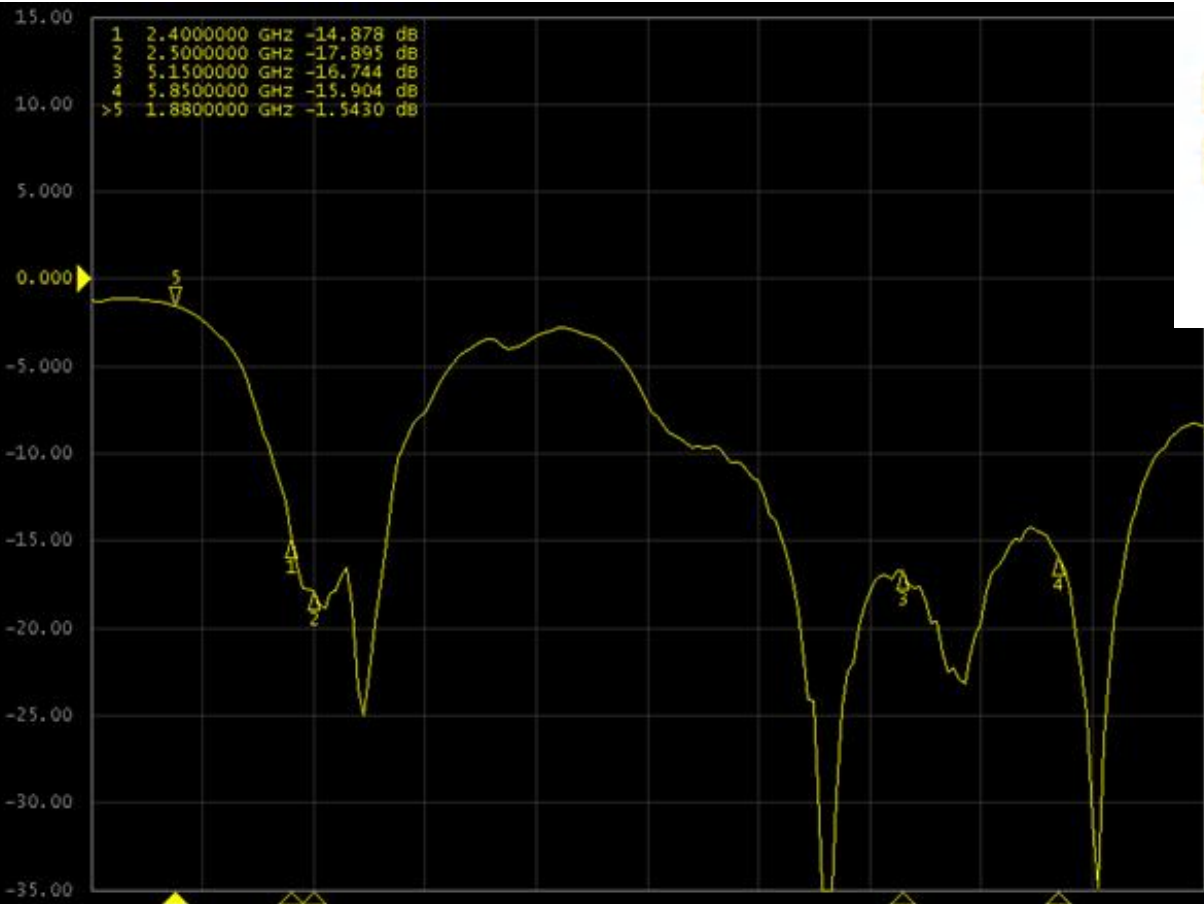
Return loss:
6G < -10.8dB

Return Loss

Ant3-2G&5G

S33

T&W



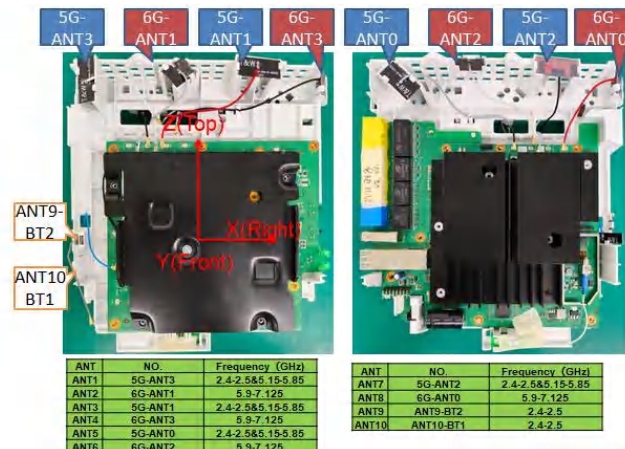
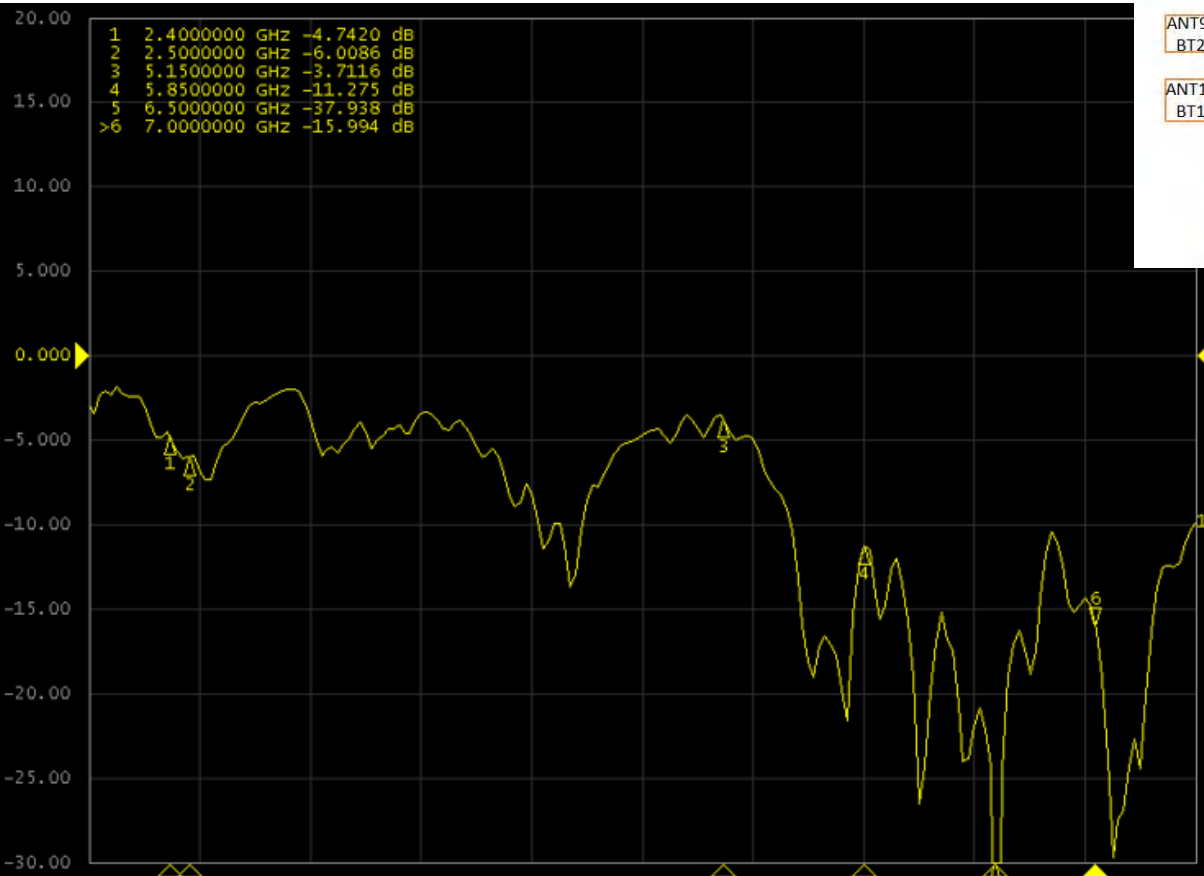
Return loss:
 $2.4\text{G} < -14.8\text{dB}$; $5\text{G} < -15.6\text{dB}$

Return Loss

T&W

Ant4-6G

S44



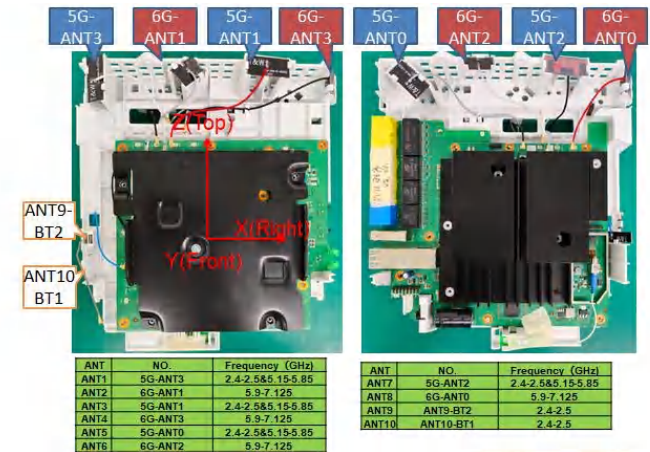
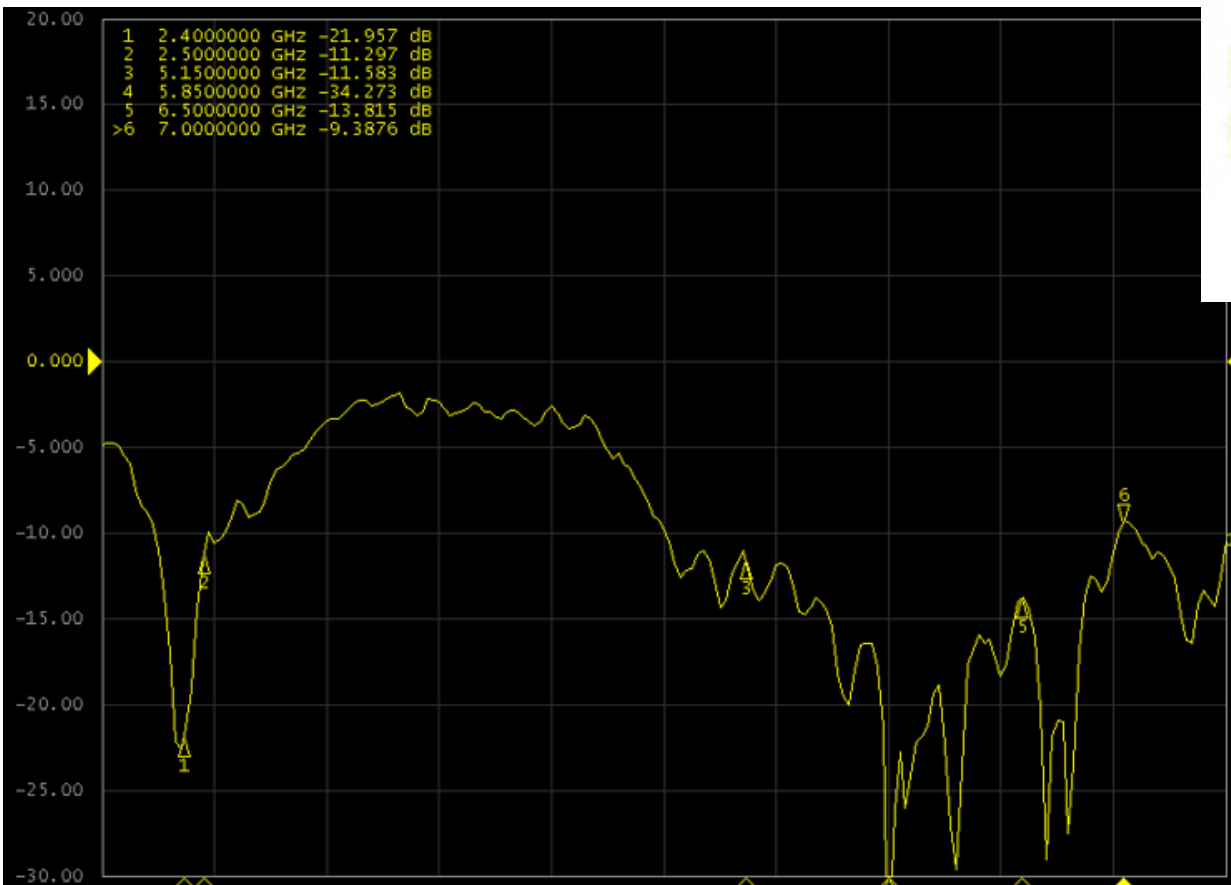
Return loss:
6G < -11.2dB

Return Loss

Ant5-2&5G

S55

T&W

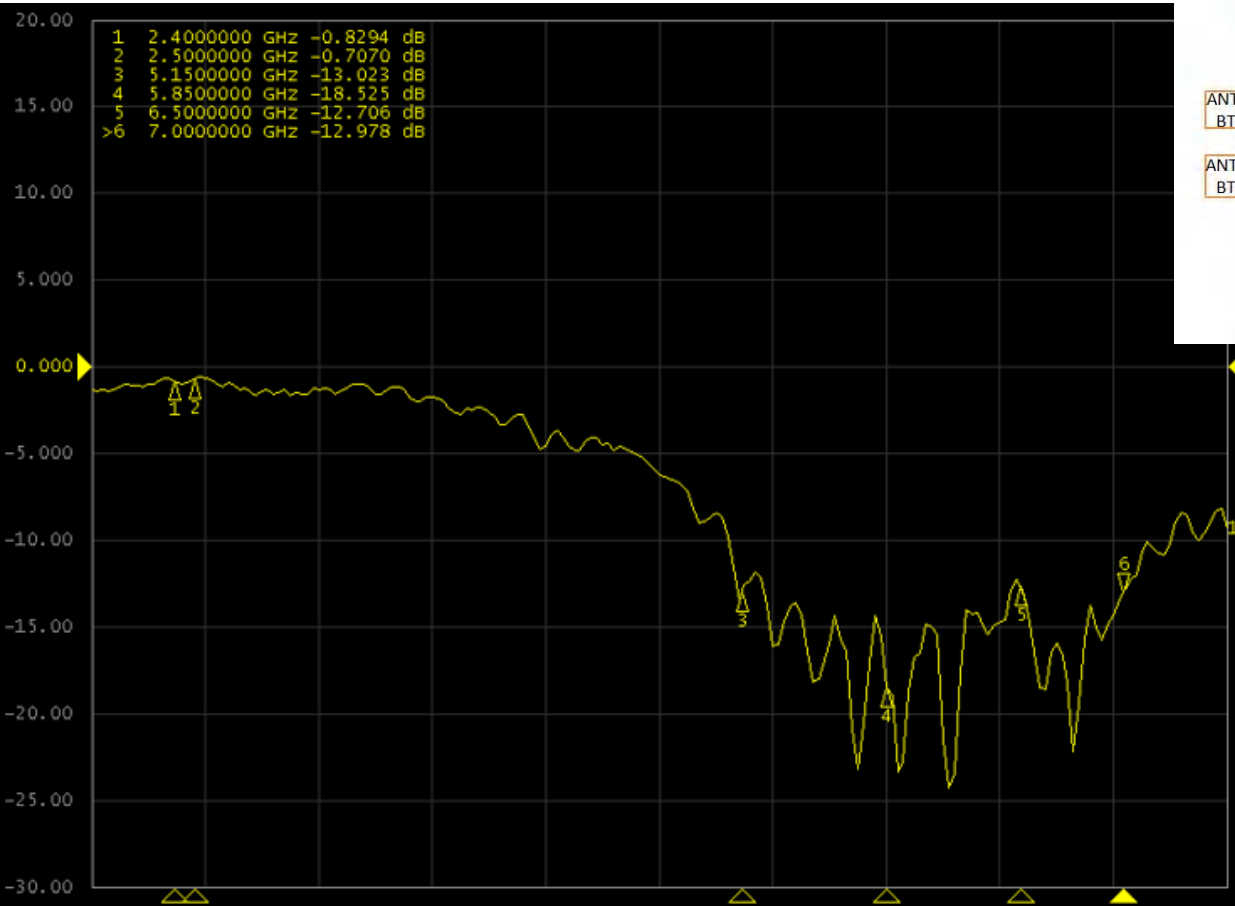
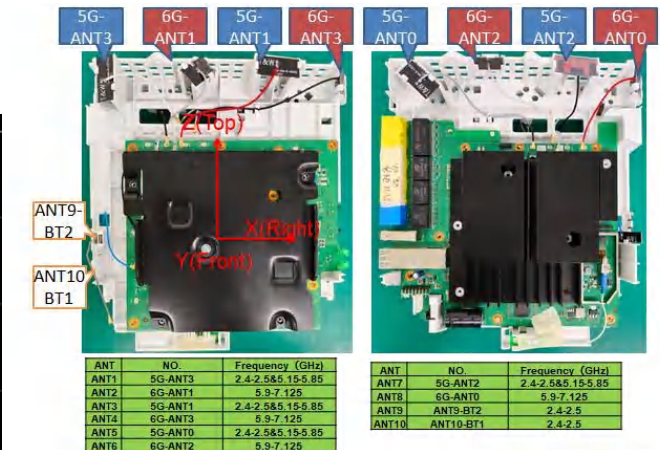


Return loss:
2.4G < -11.2dB; 5G < -13.8dB

Return Loss

Ant6-6G

S66

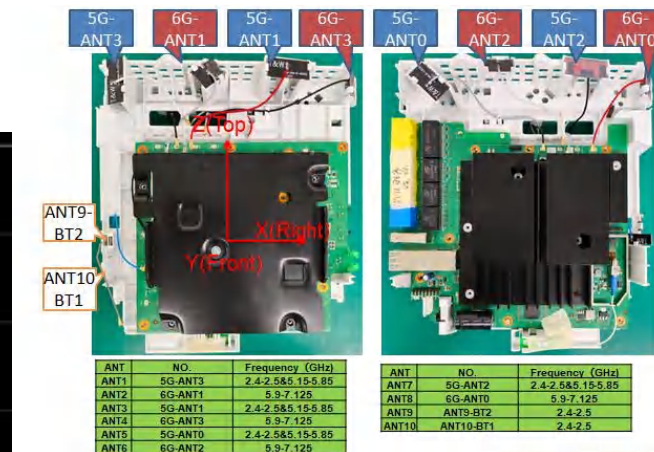
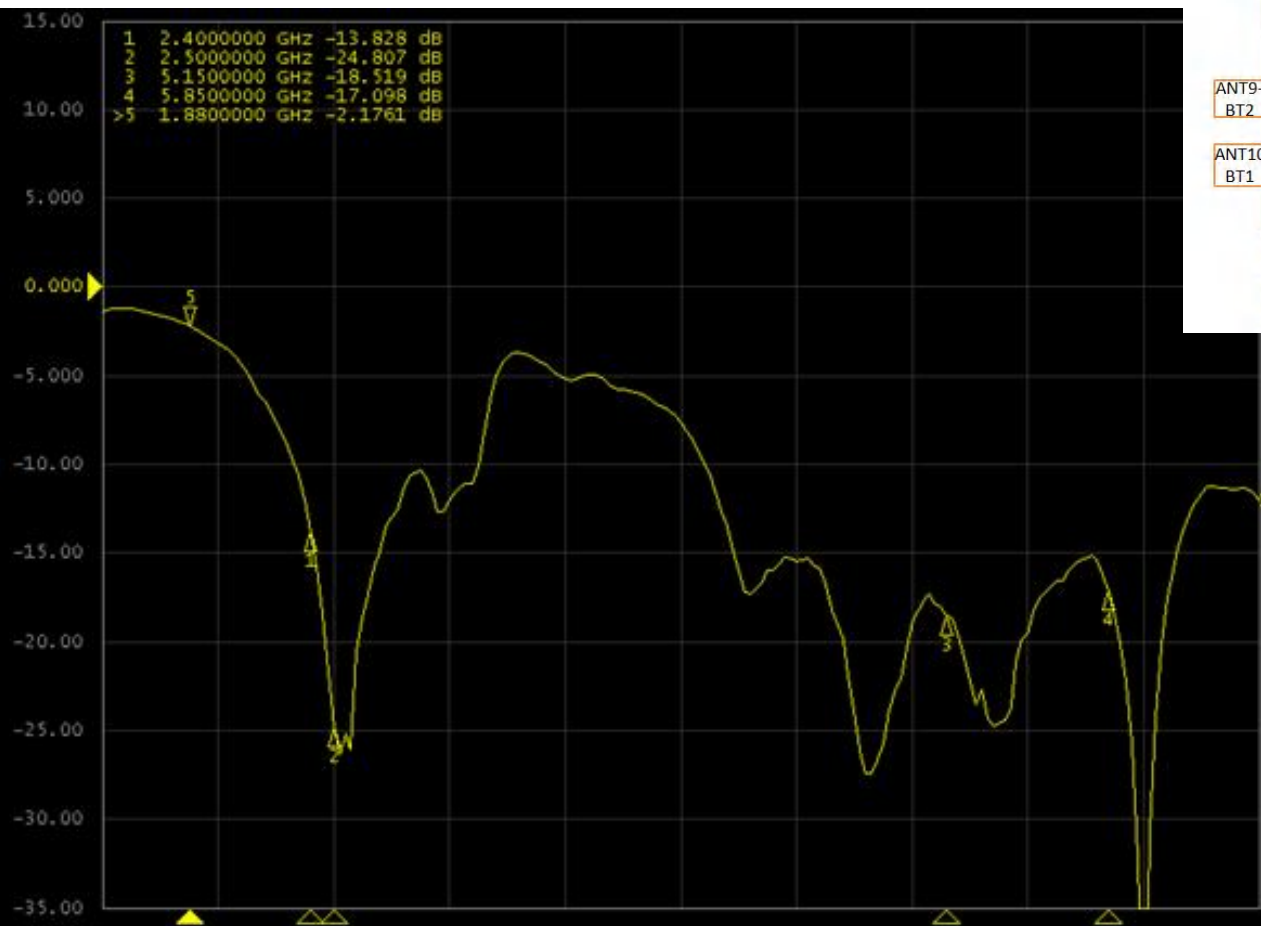


Return loss:
6G < -12.7dB

Return Loss

Ant7-2&5G

S77



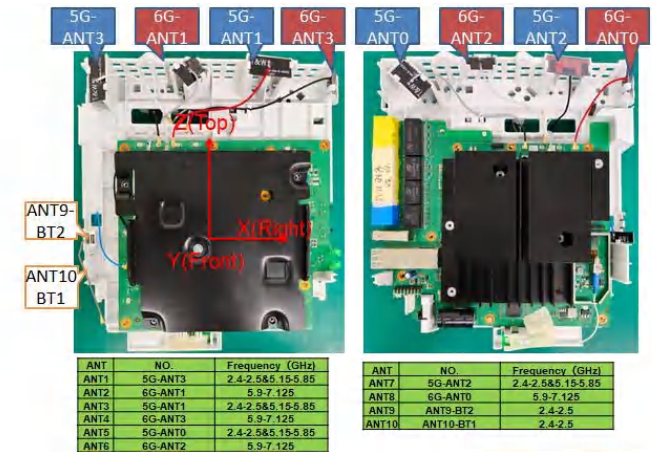
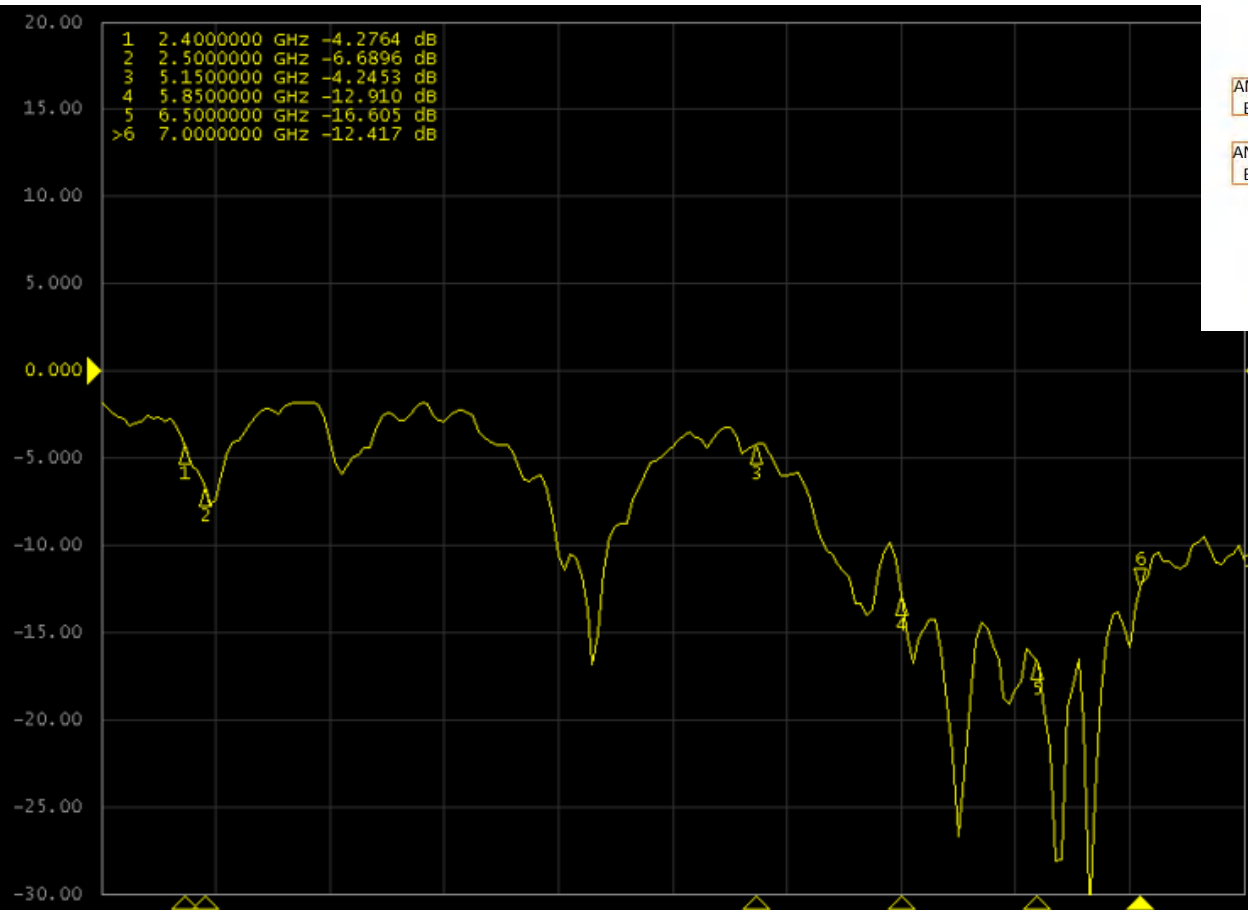
Return loss:
 $2.4\text{G} < -13.8\text{dB}$; $5\text{G} < -17\text{dB}$

Return Loss

Ant8-6G

S88

T&W



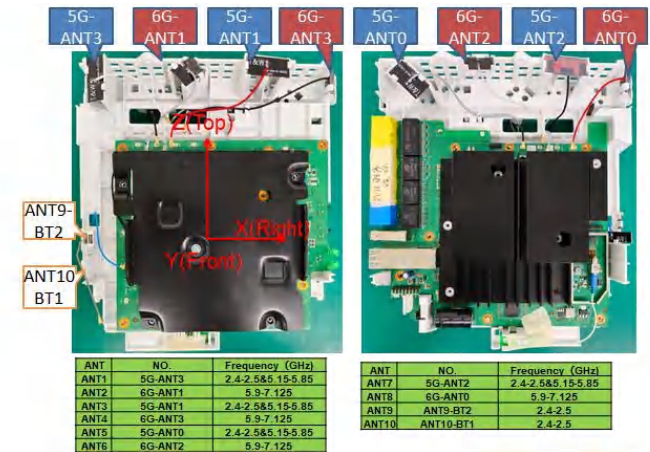
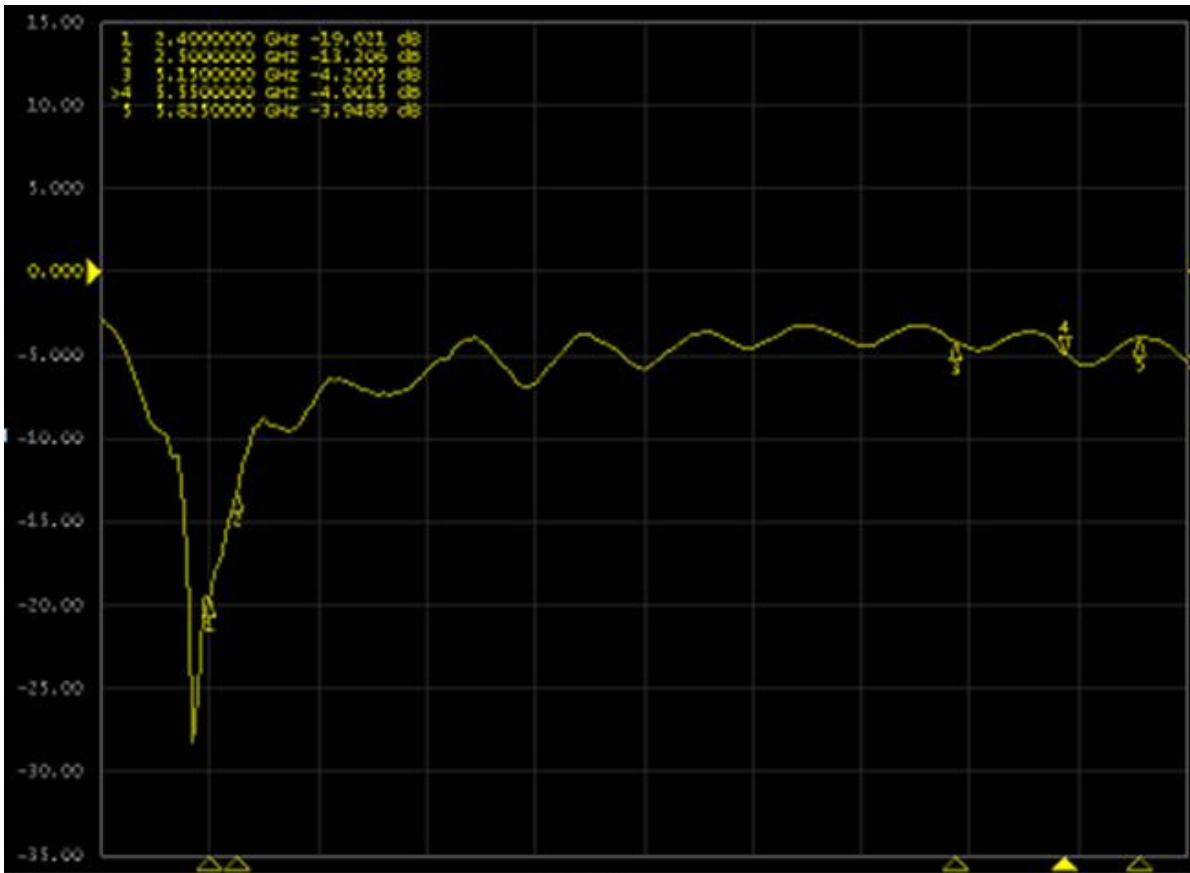
Return loss:
6G < -12dB

Return Loss

Ant9-2G

S99

T&W



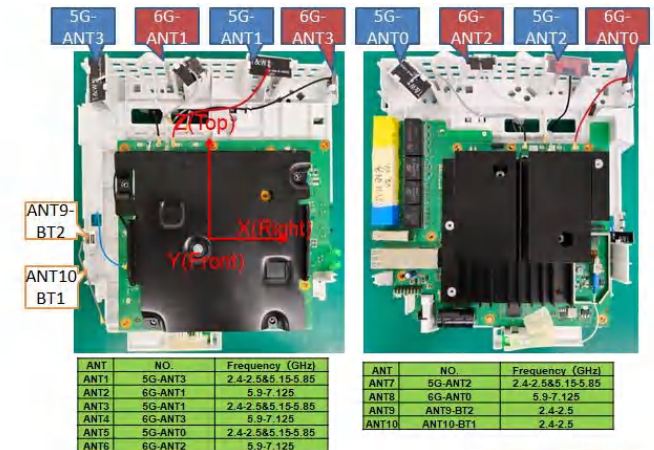
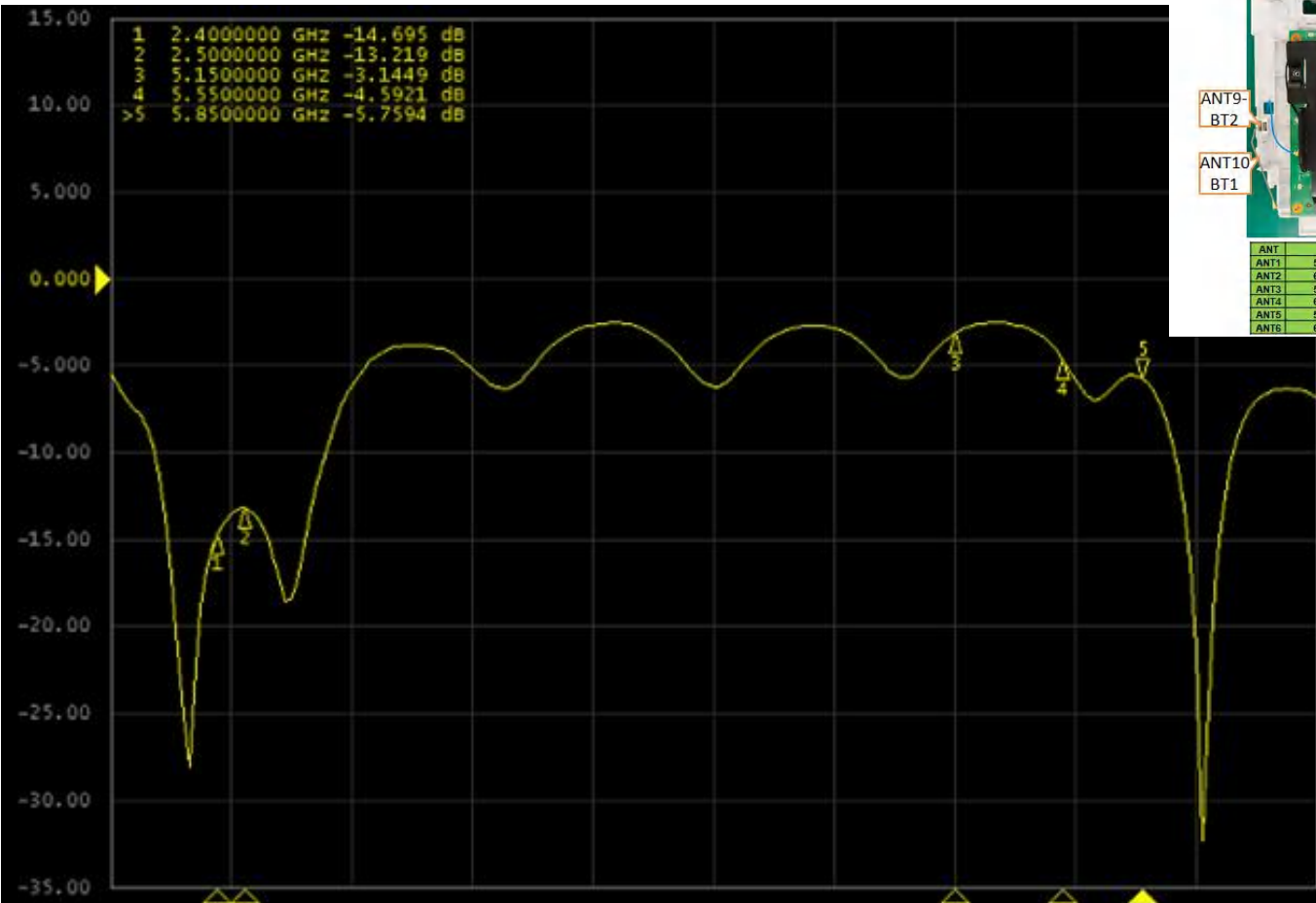
Return loss:
2.4G < -13dB

Return Loss

Ant10-2G

S1010

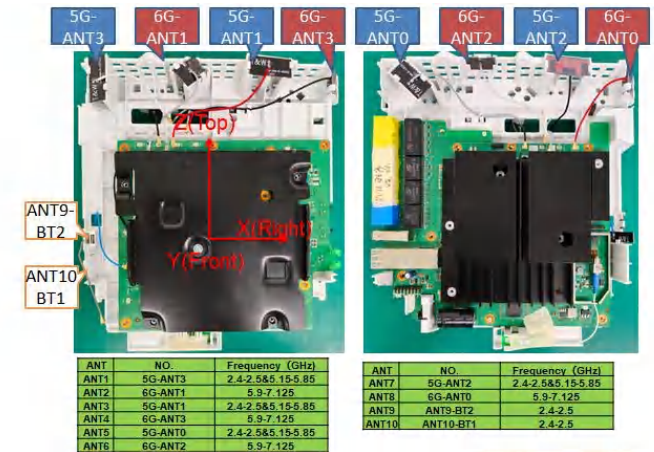
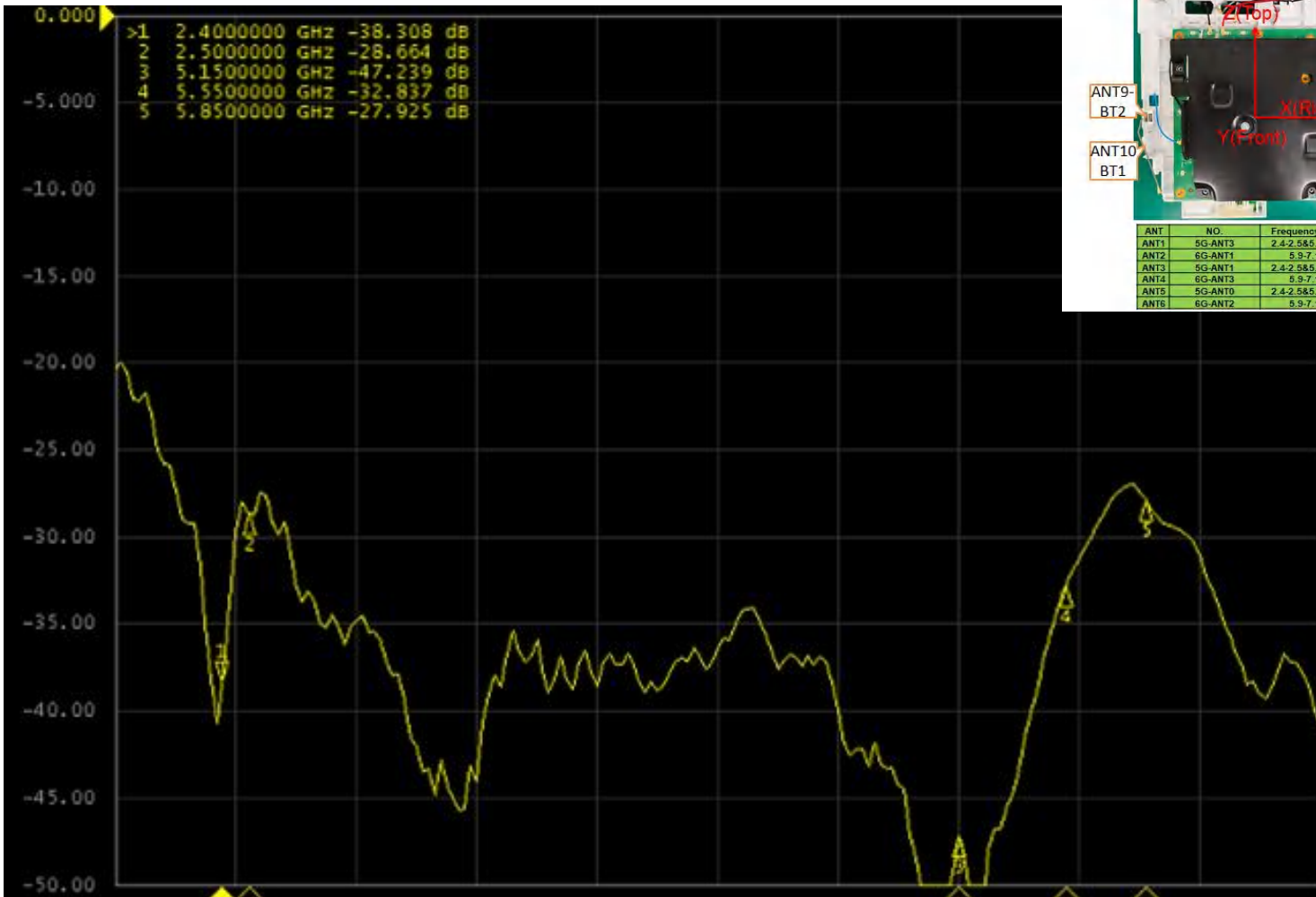
T&W



Return loss:
2.4G < -13.28dB

Isolation

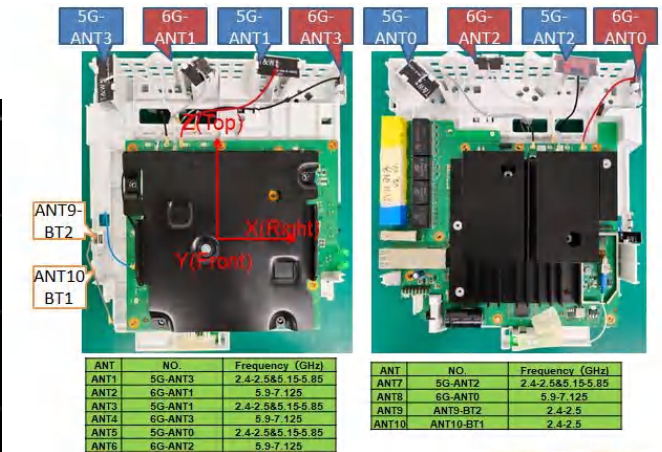
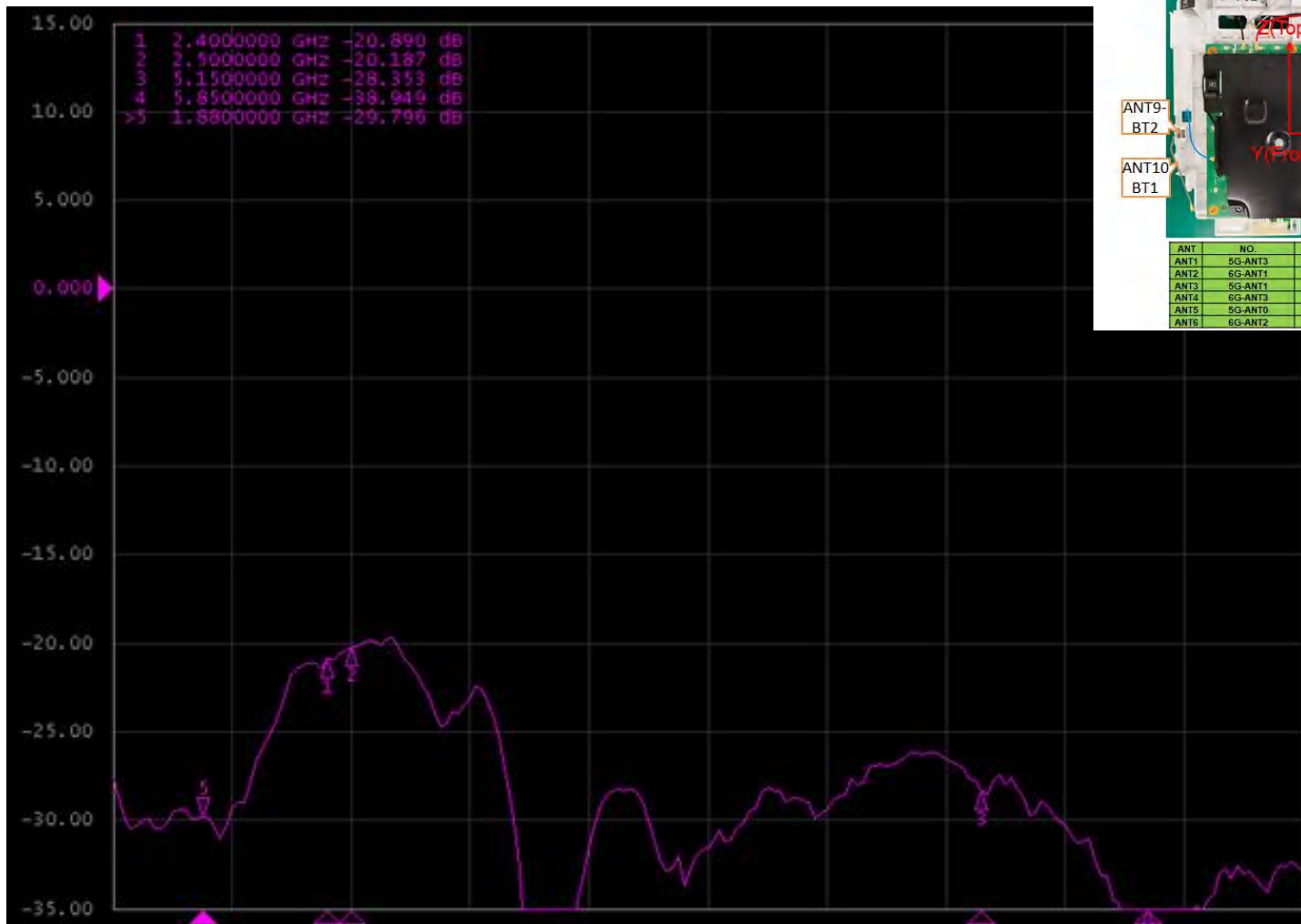
ANT1&2



Isolation

ANT1&3

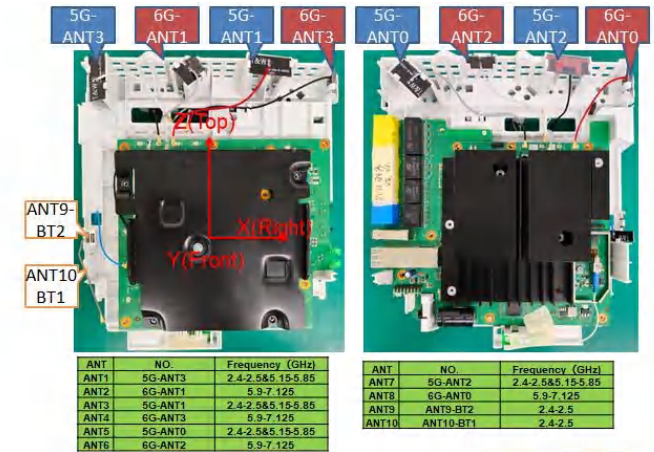
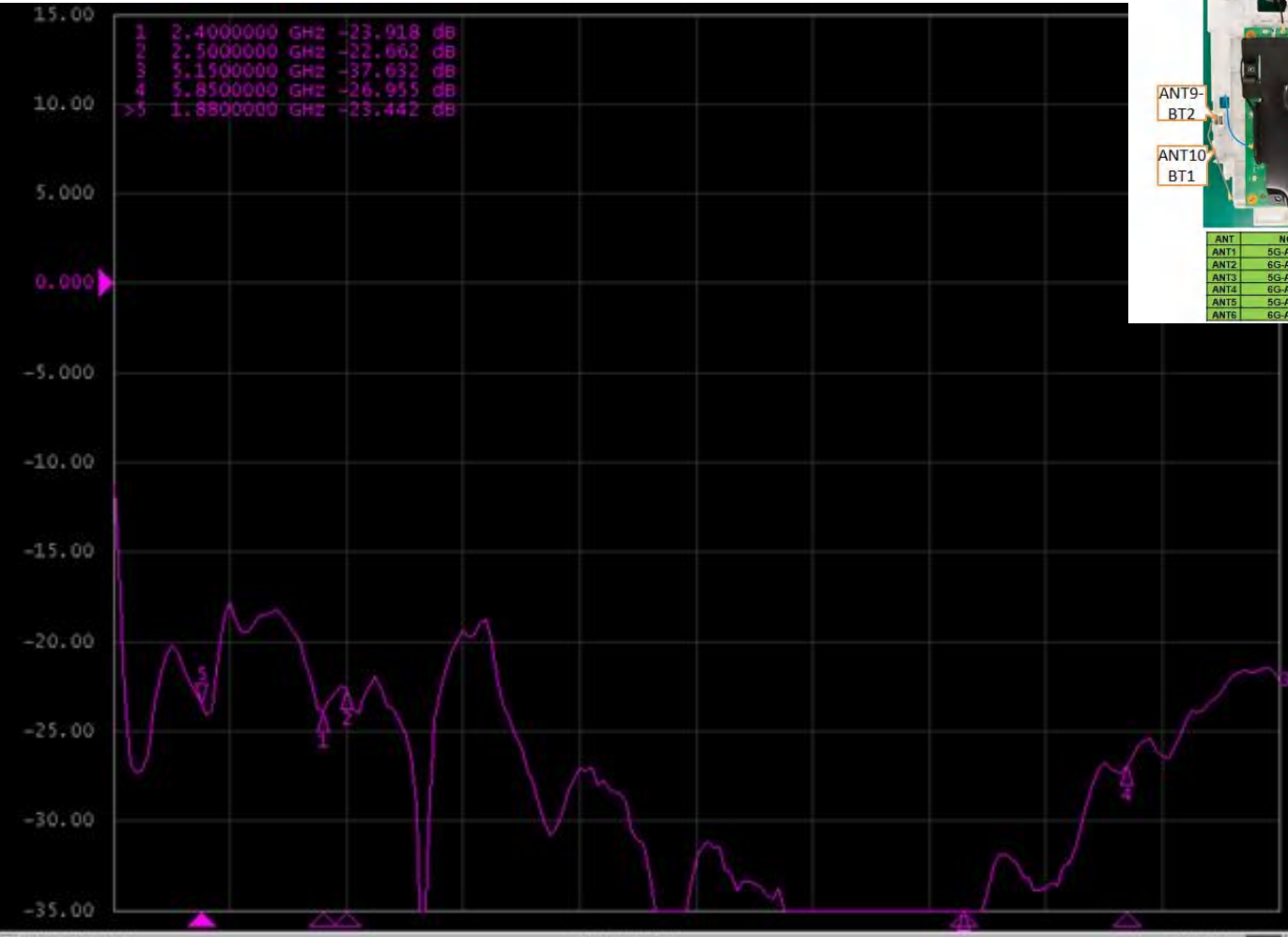
T&W



Isolation

ANT1&4

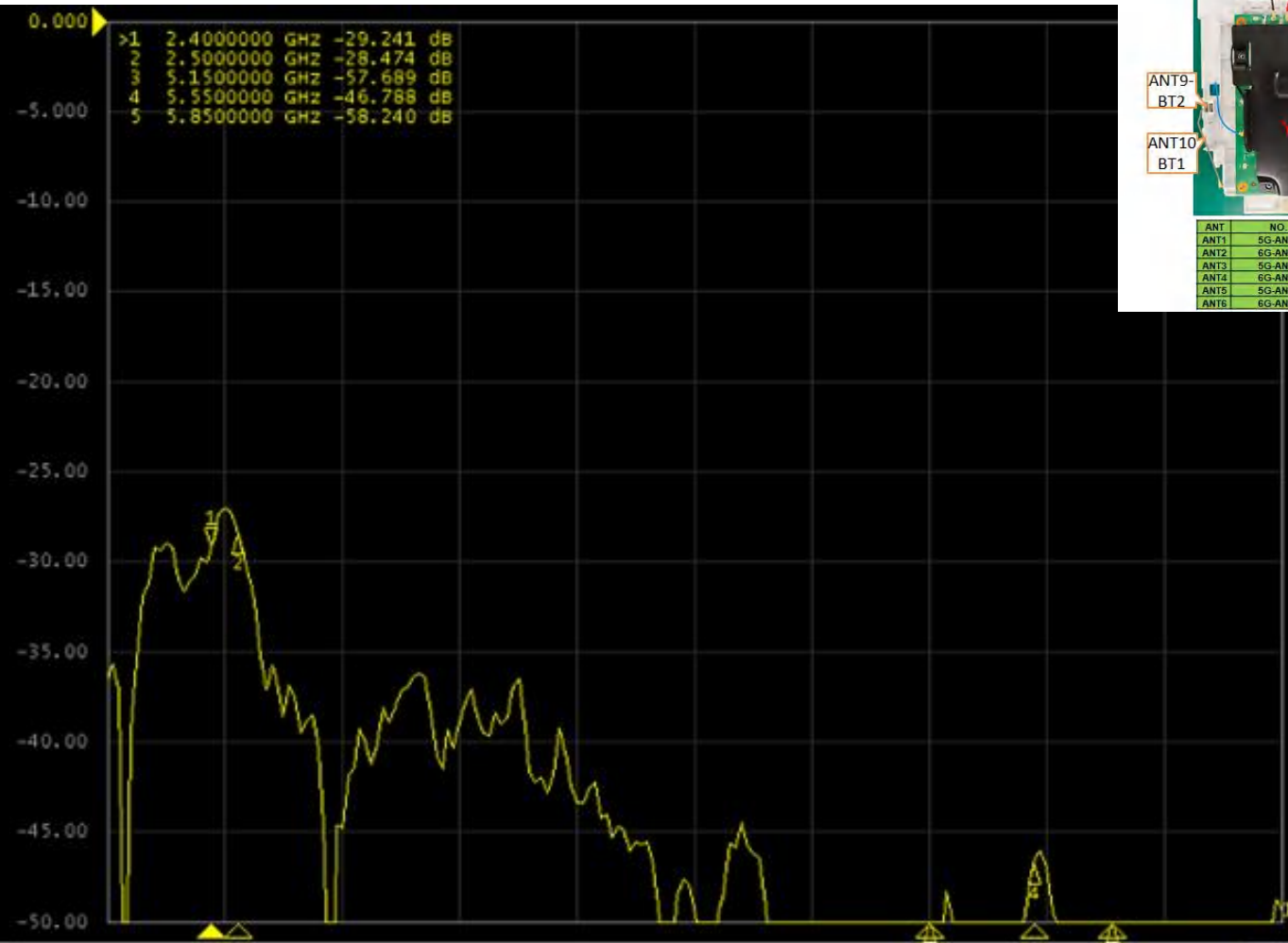
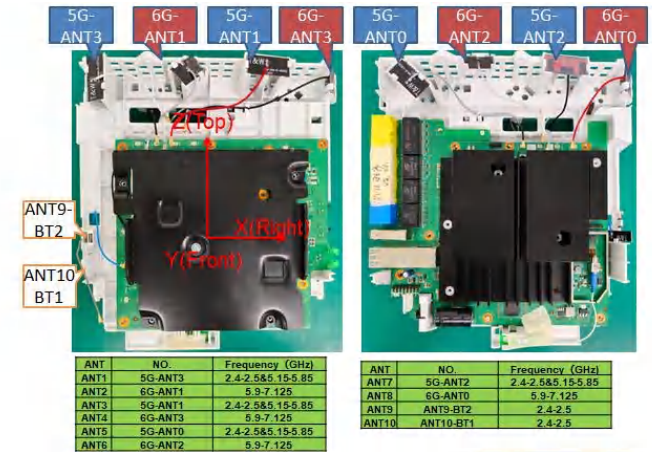
T&W



Isolation

ANT1&5

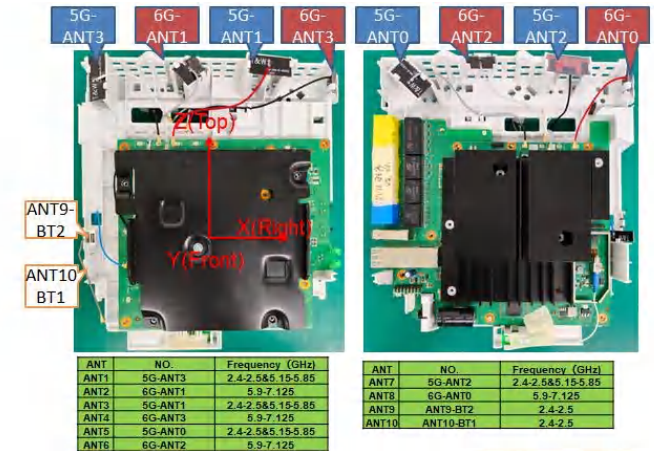
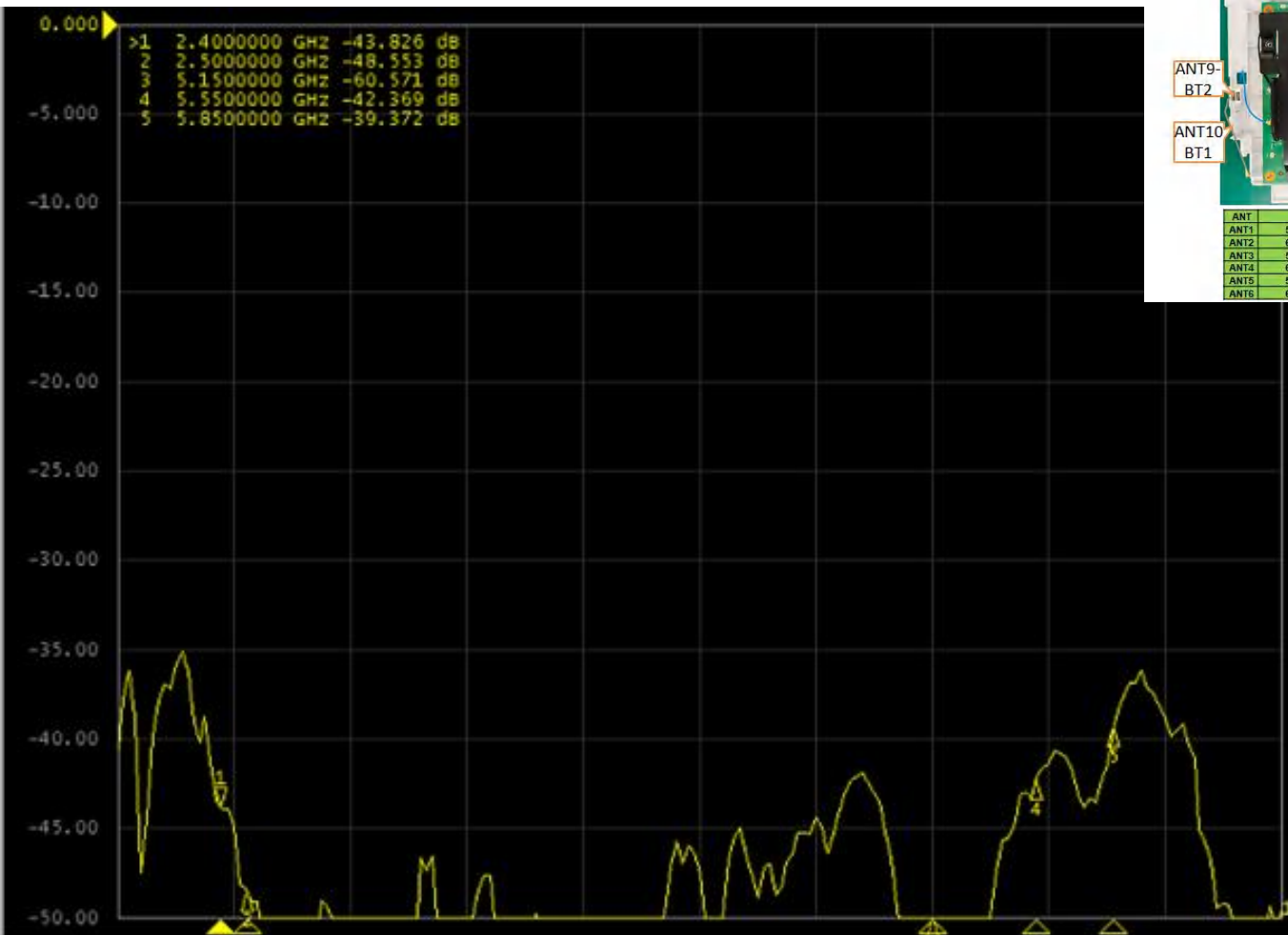
T&W



Isolation

ANT1&6

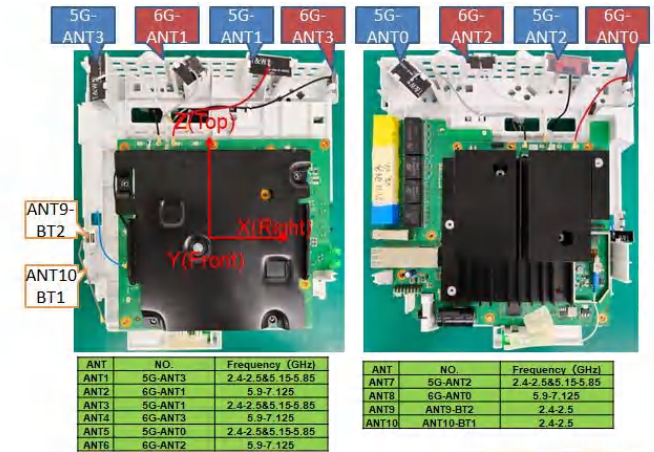
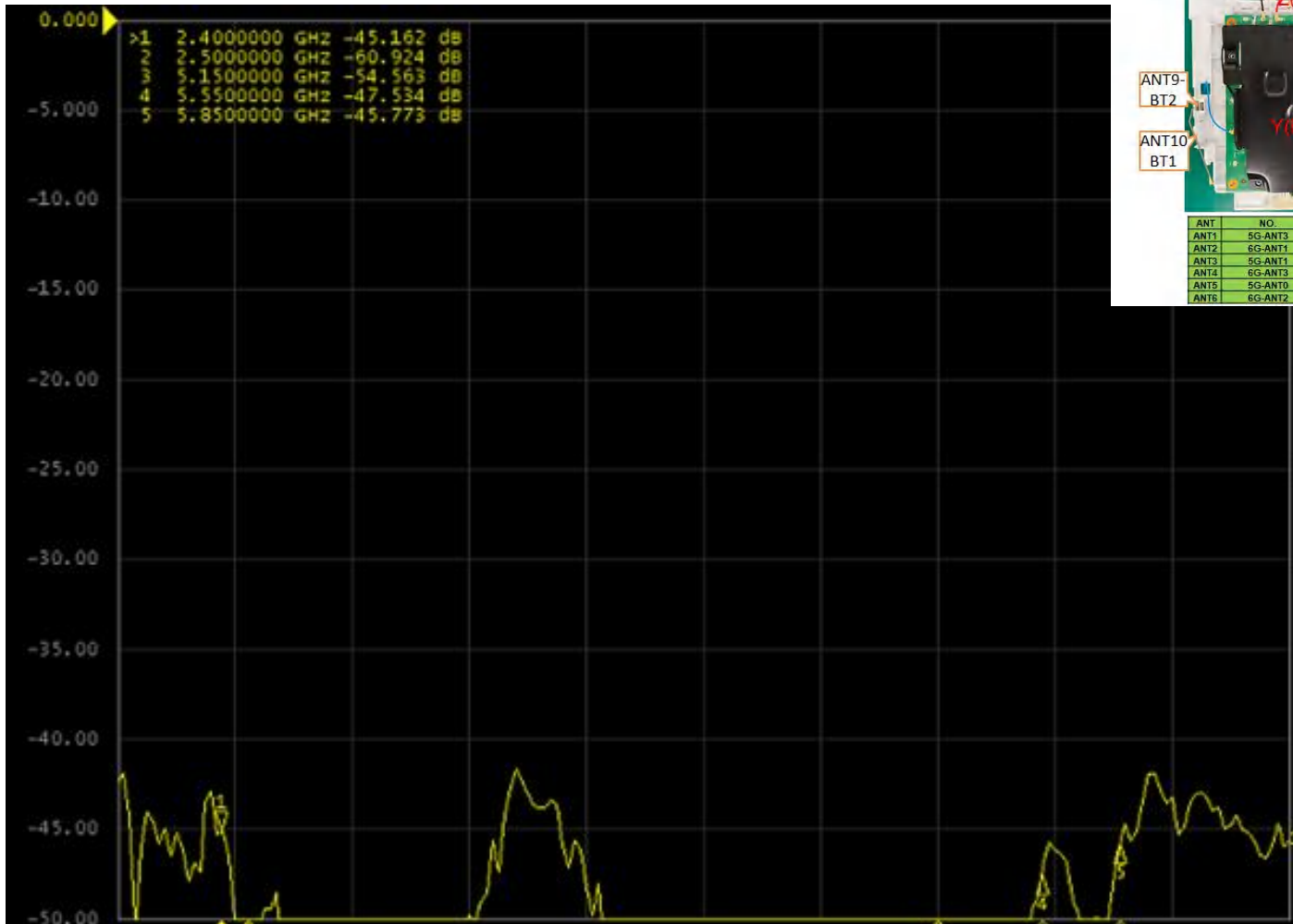
T&W



Isolation

ANT1&7

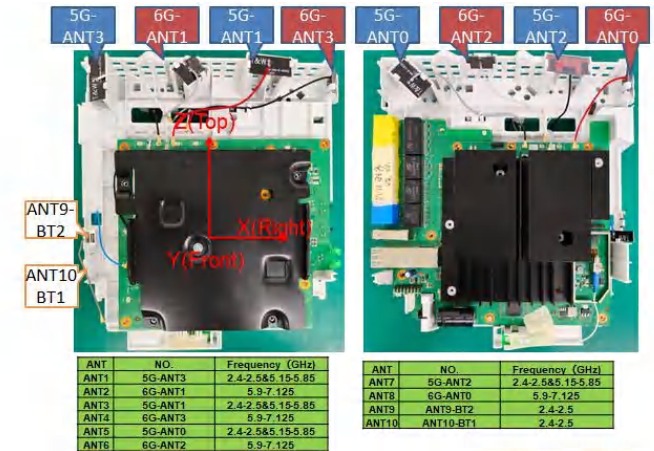
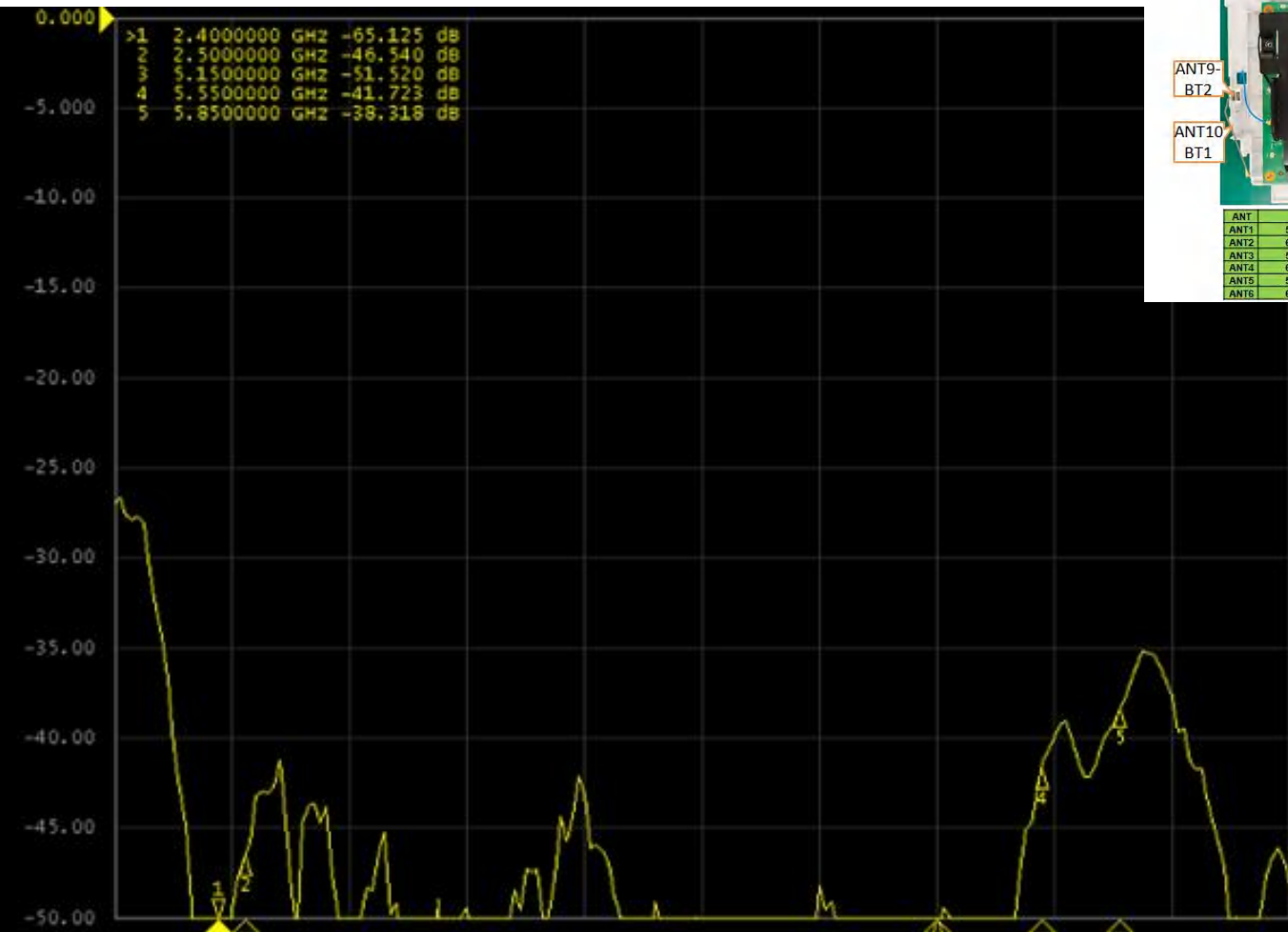
T&W



Isolation

ANT1&8

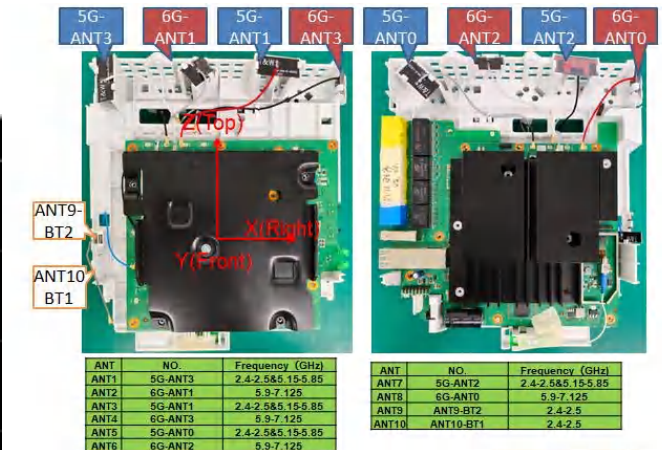
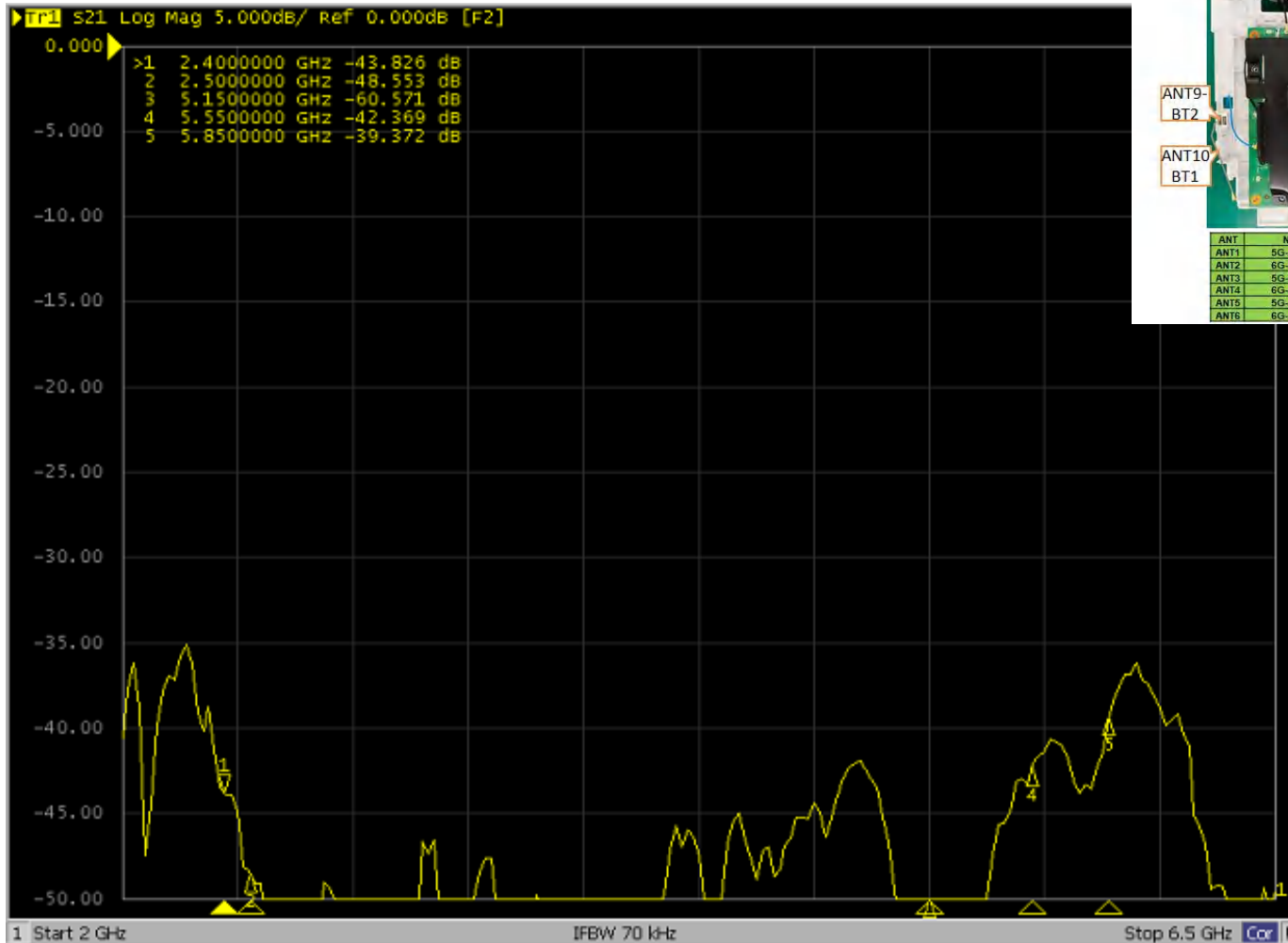
T&W



Isolation

ANT1&9

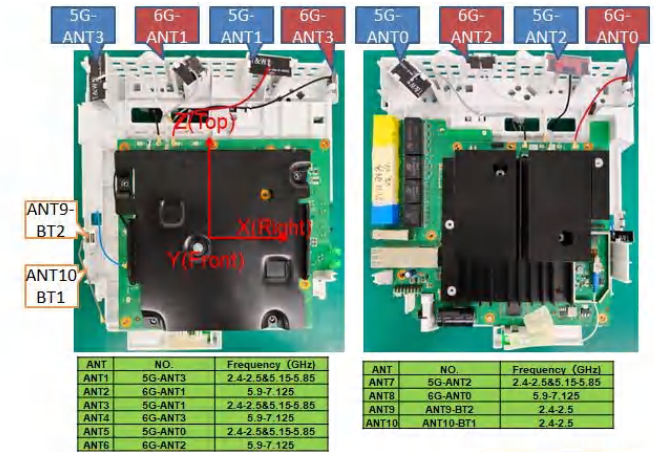
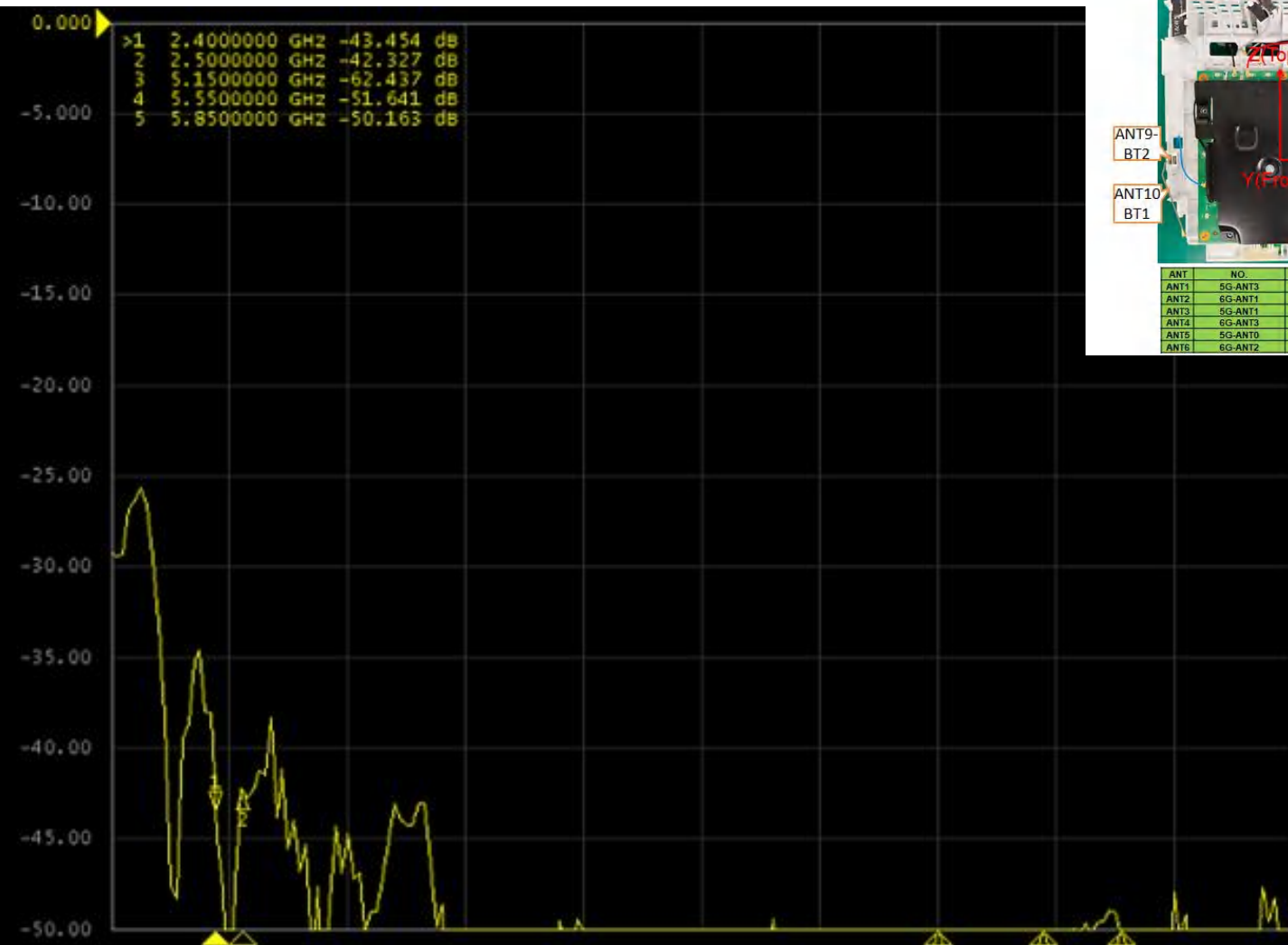
T&W



Isolation

ANT1&10

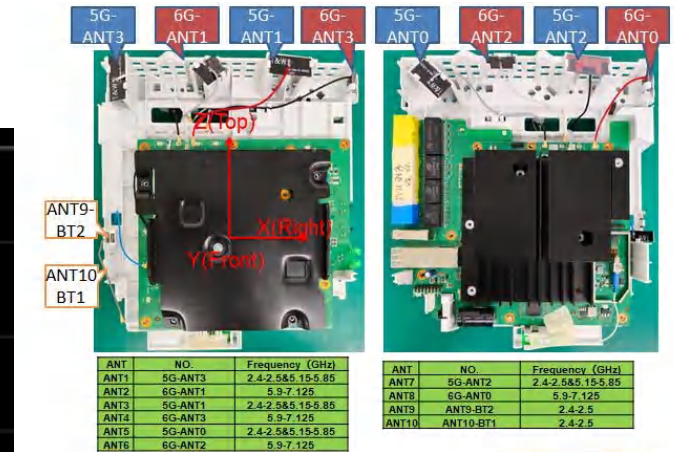
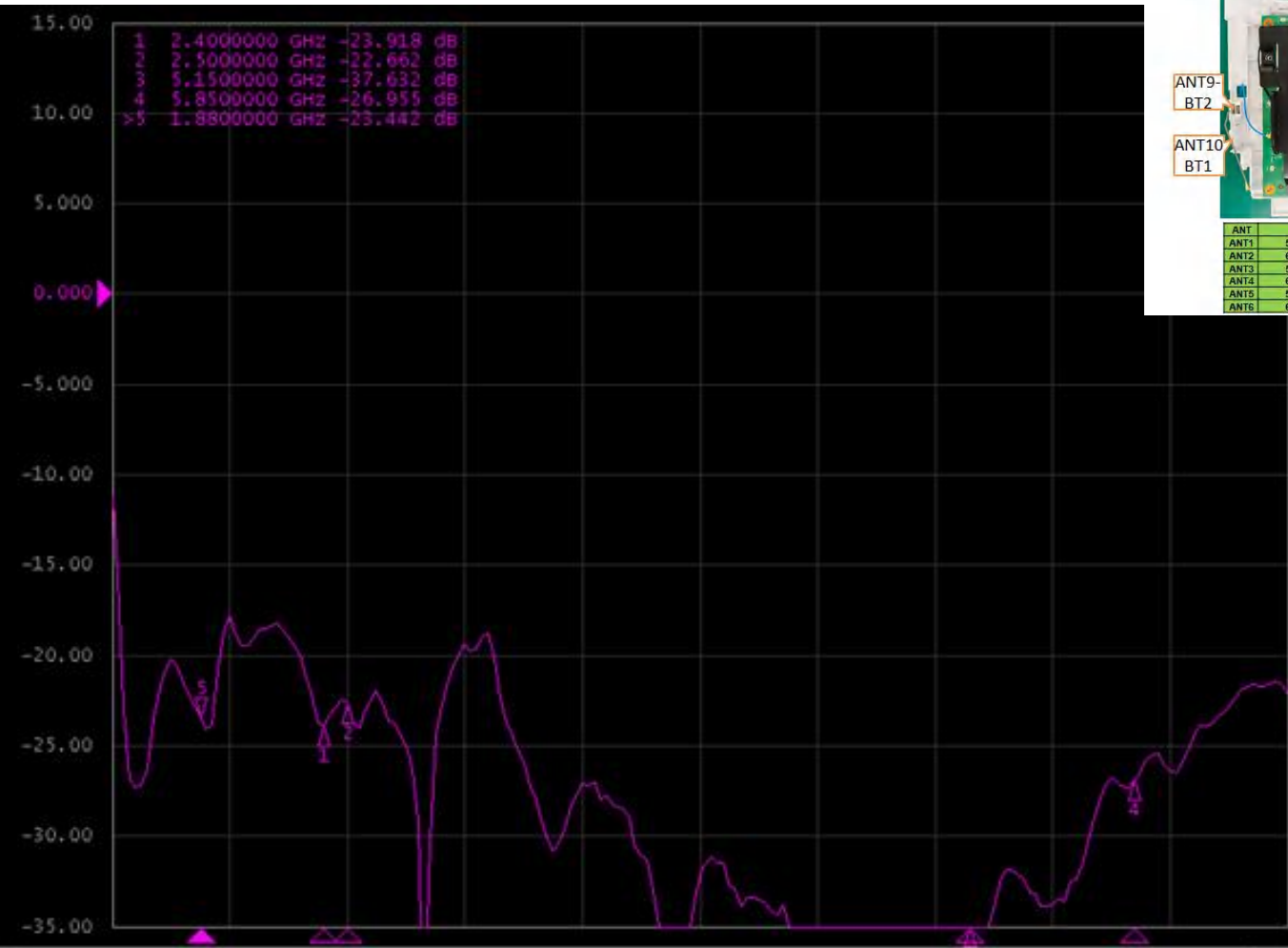
T&W



Isolation

ANT2&3

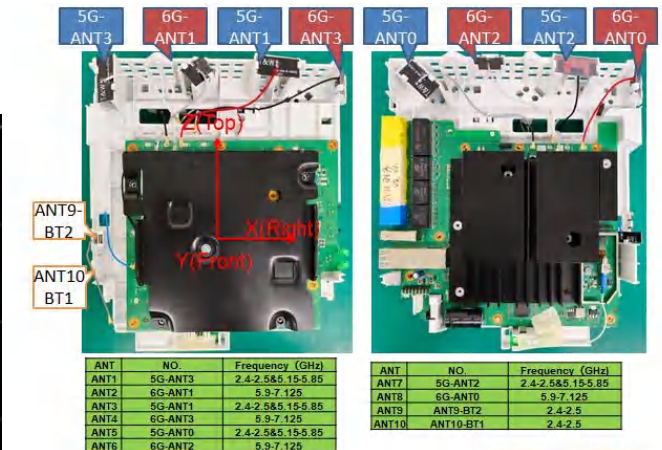
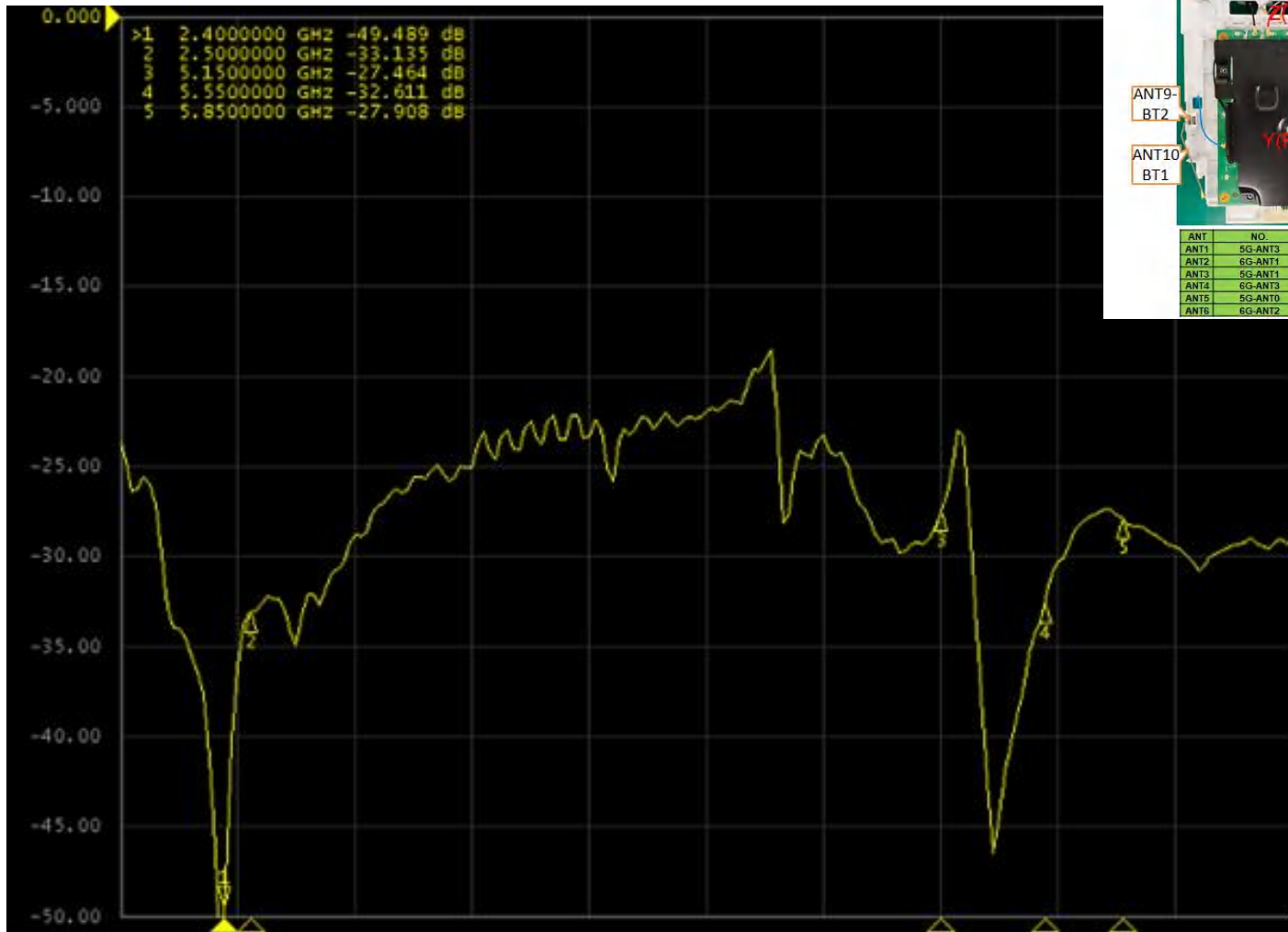
T&W



Isolation

ANT2&4

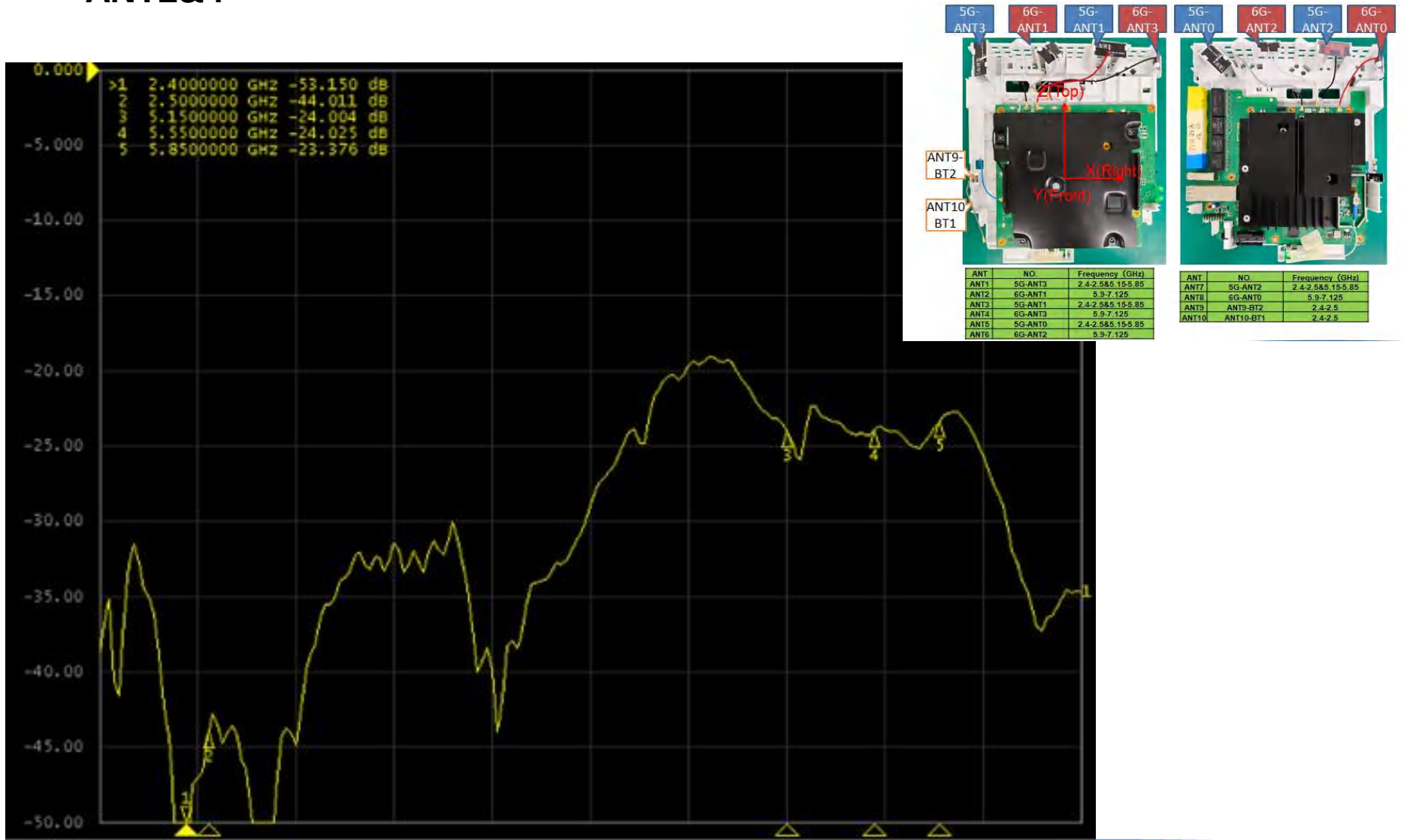
T&W



Isolation

ANT2&4

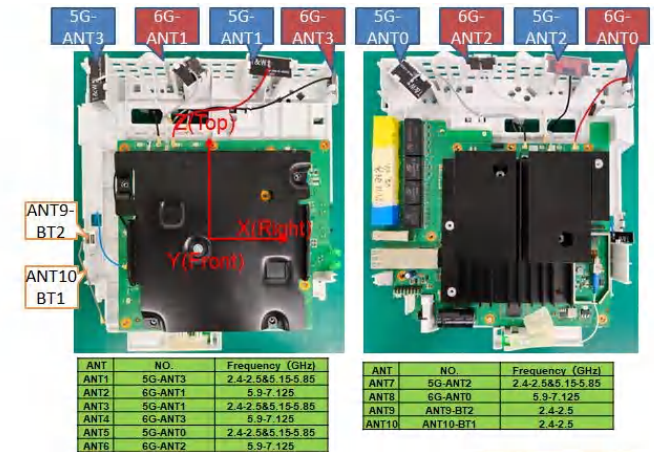
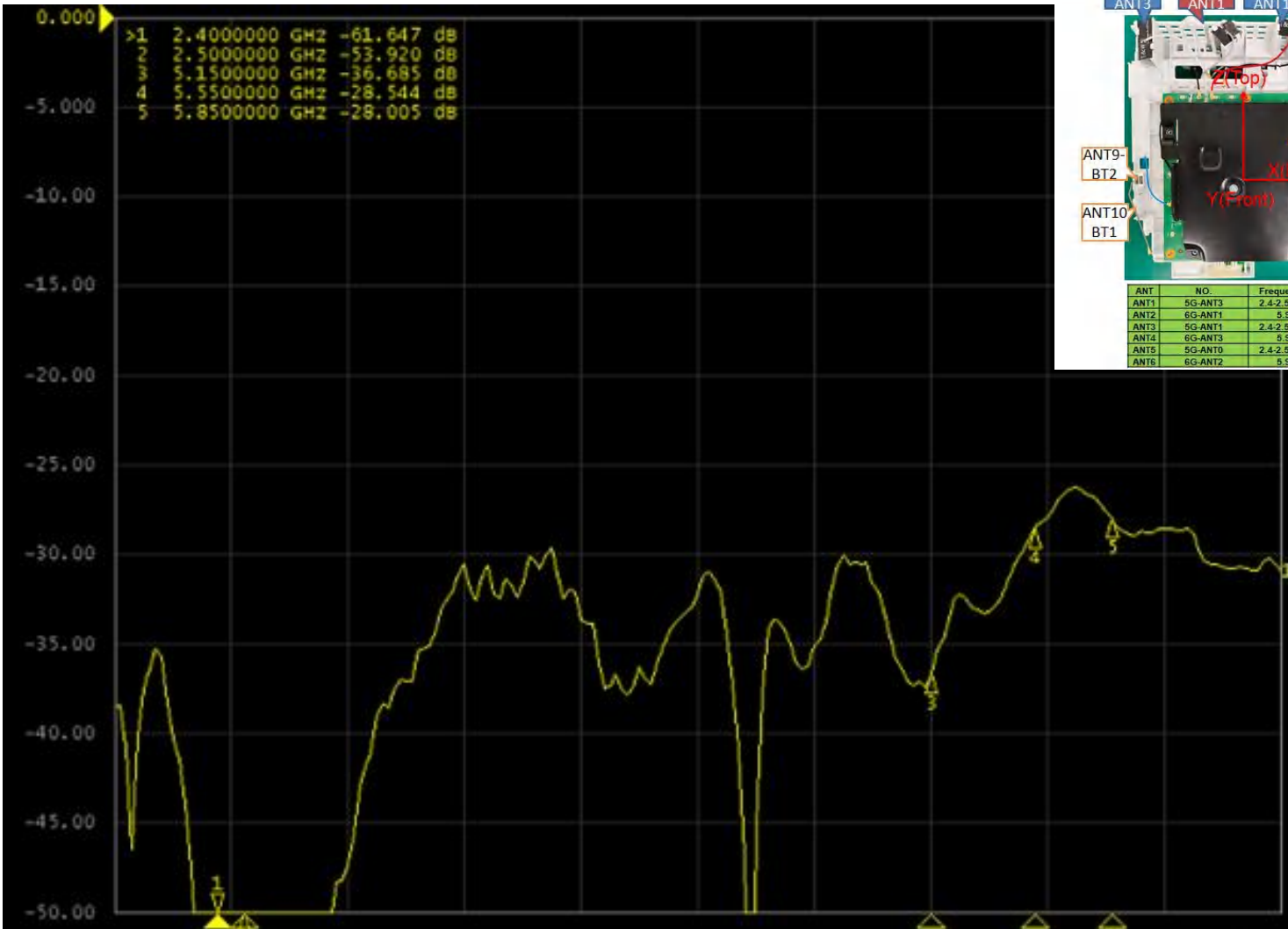
T&W



Isolation

ANT2&5

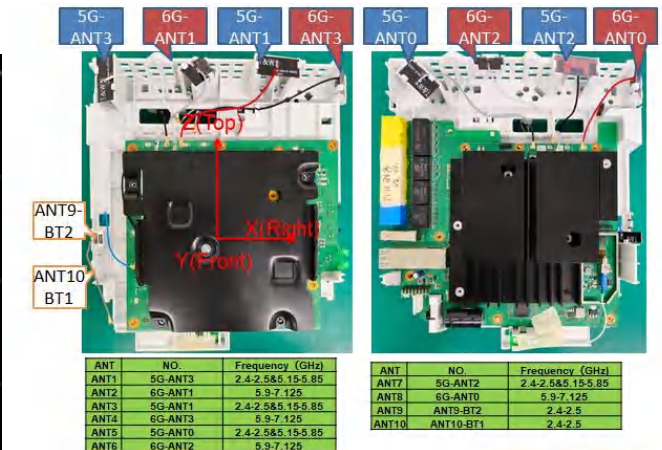
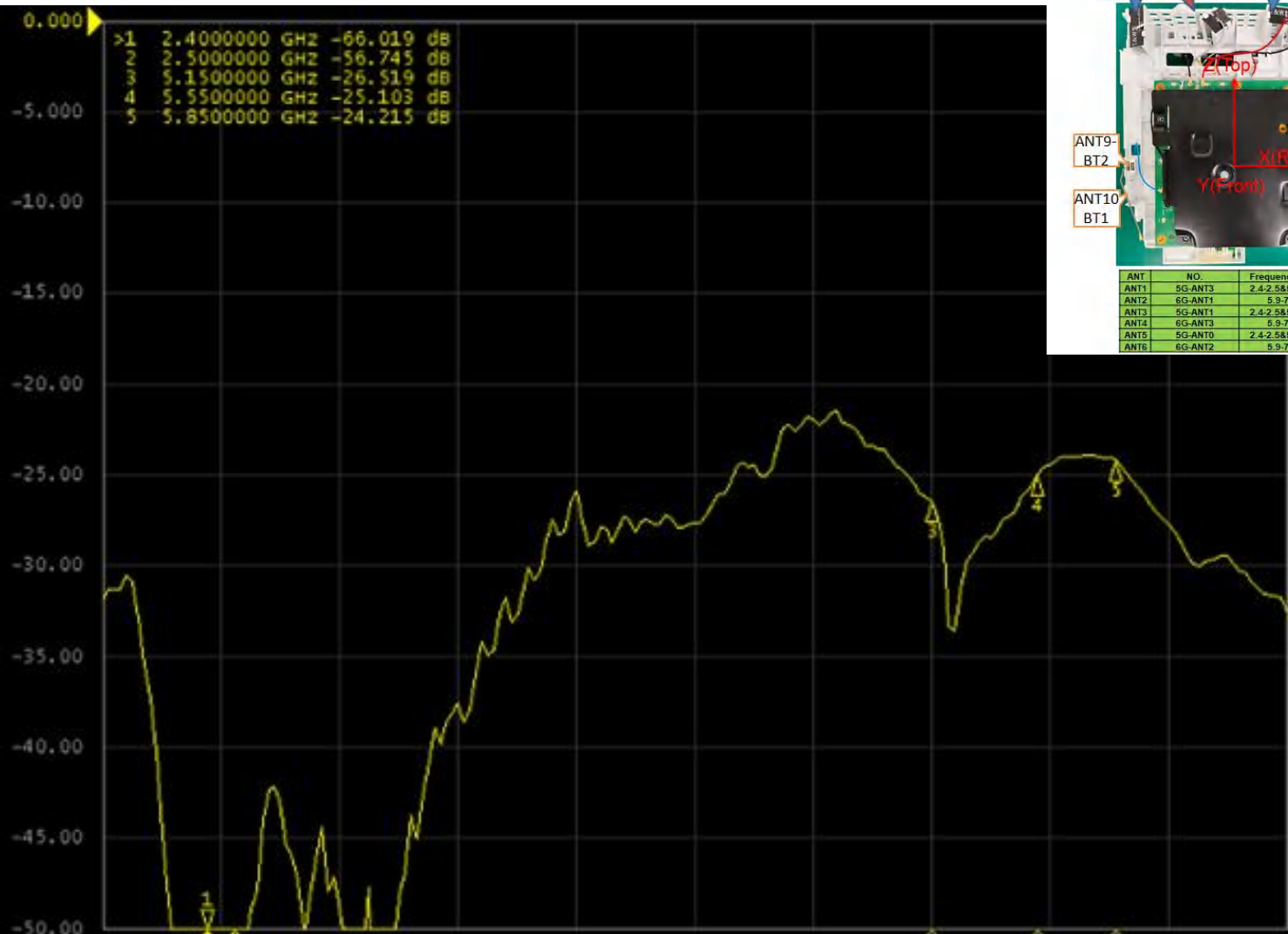
T&W



Isolation

ANT2&6

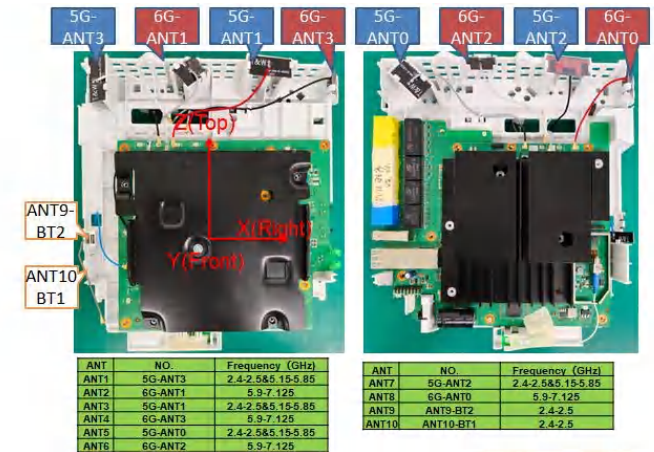
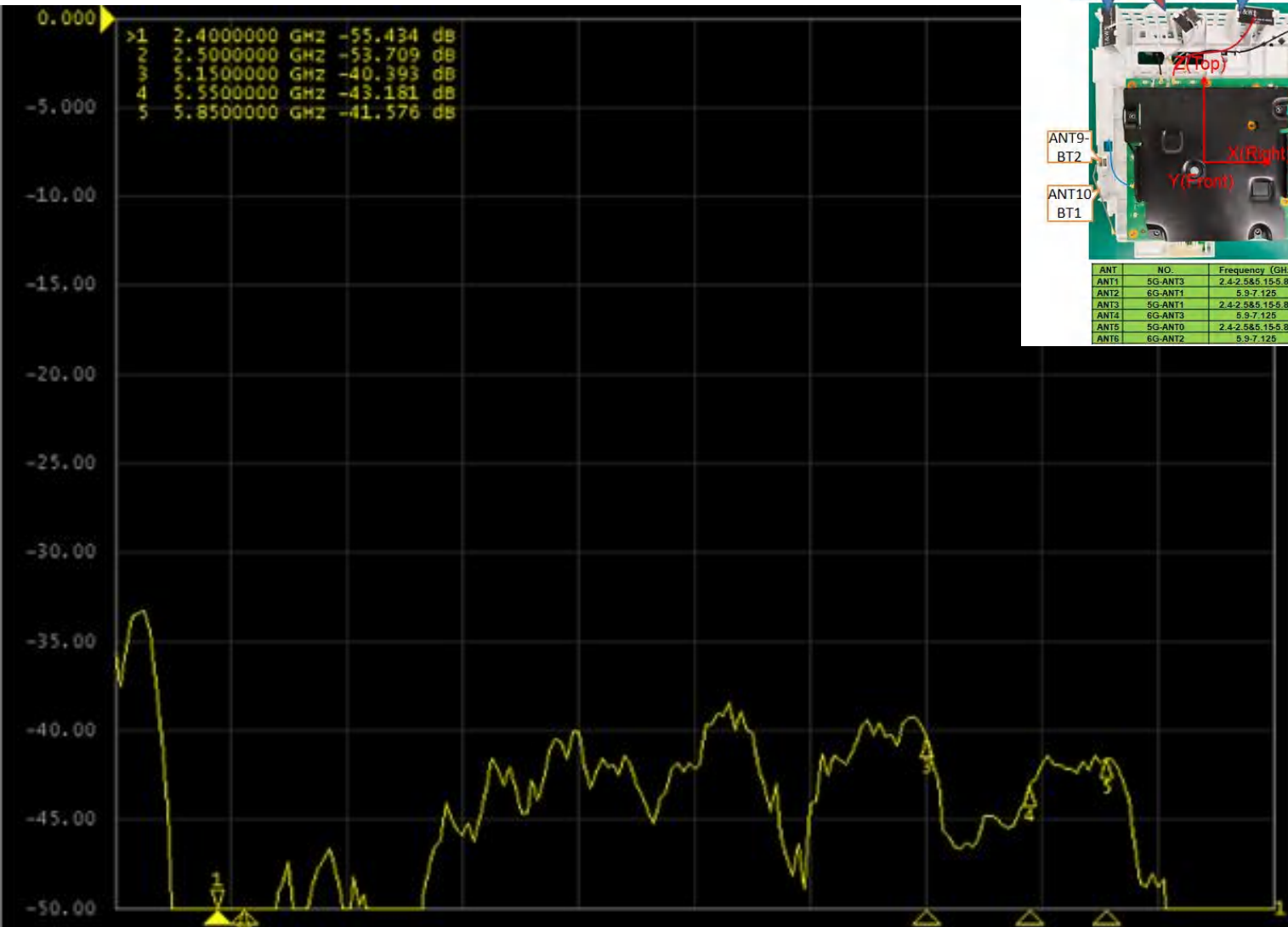
T&W



Isolation

ANT2&7

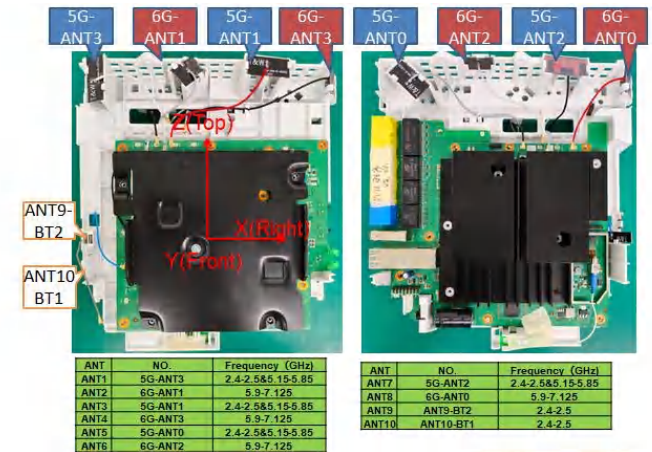
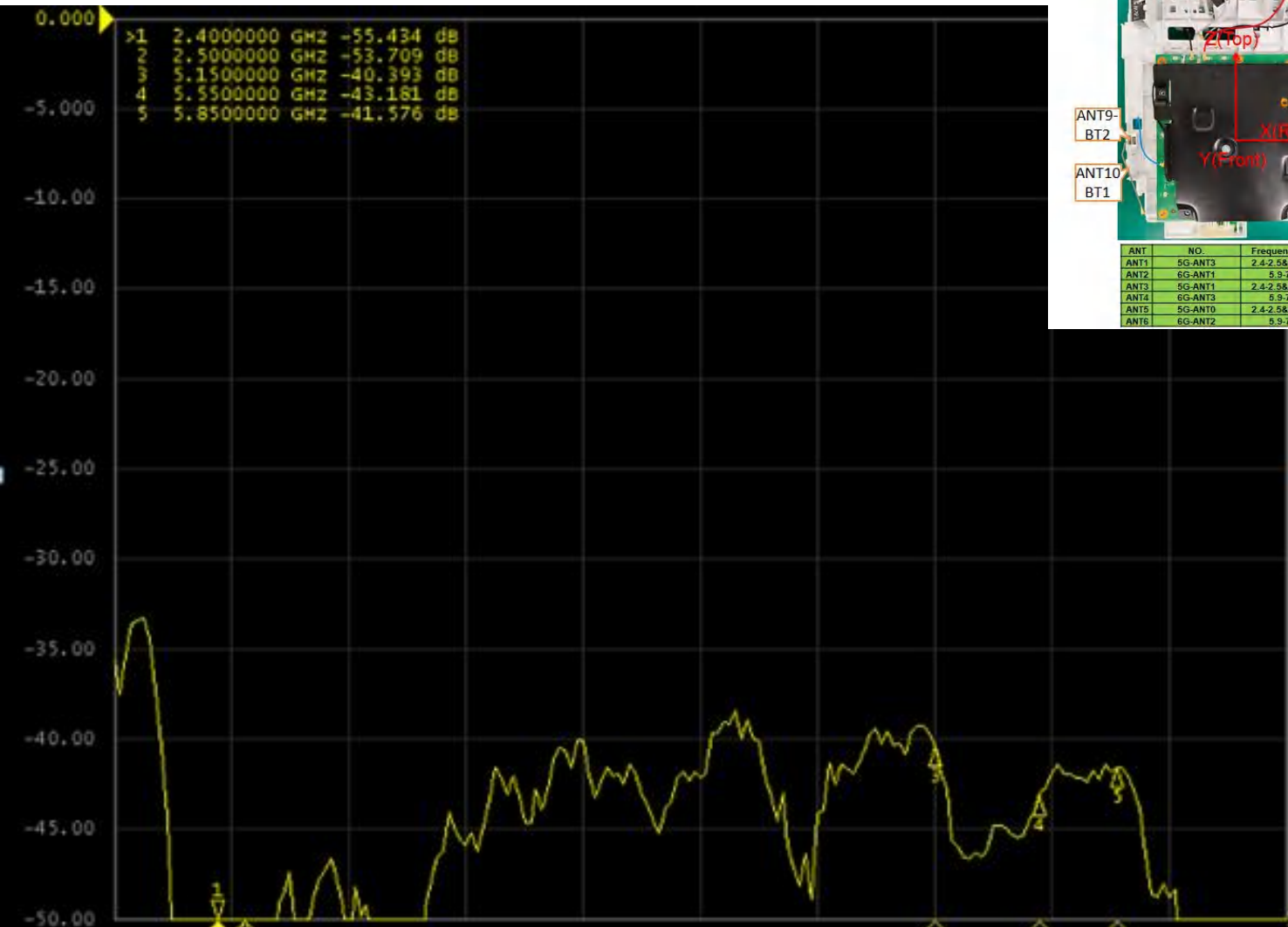
T&W



Isolation

ANT2&8

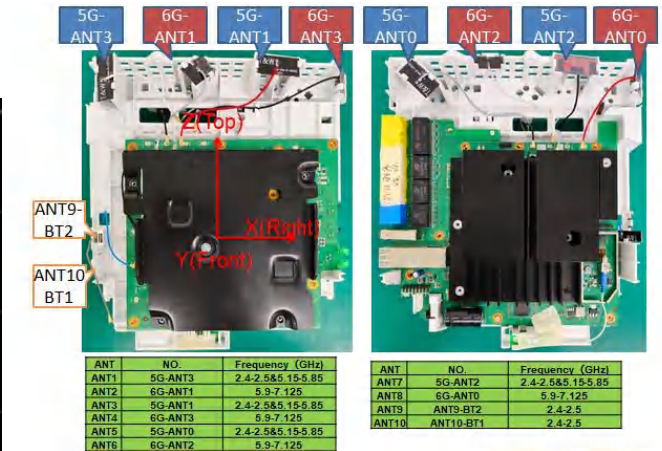
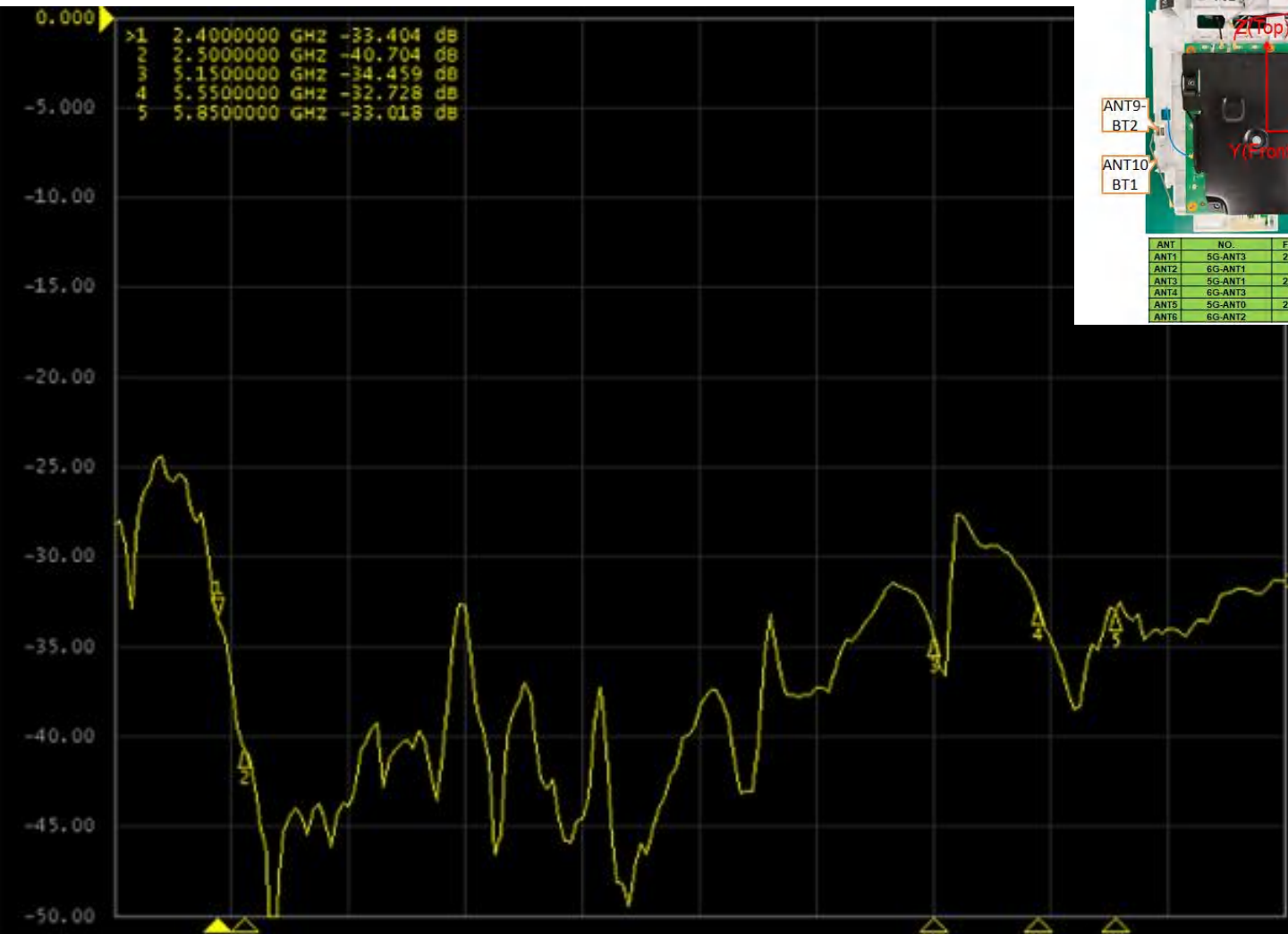
T&W



Isolation

ANT2&9

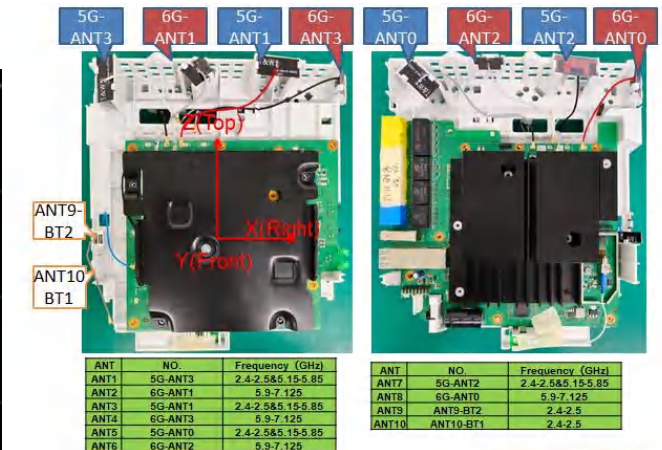
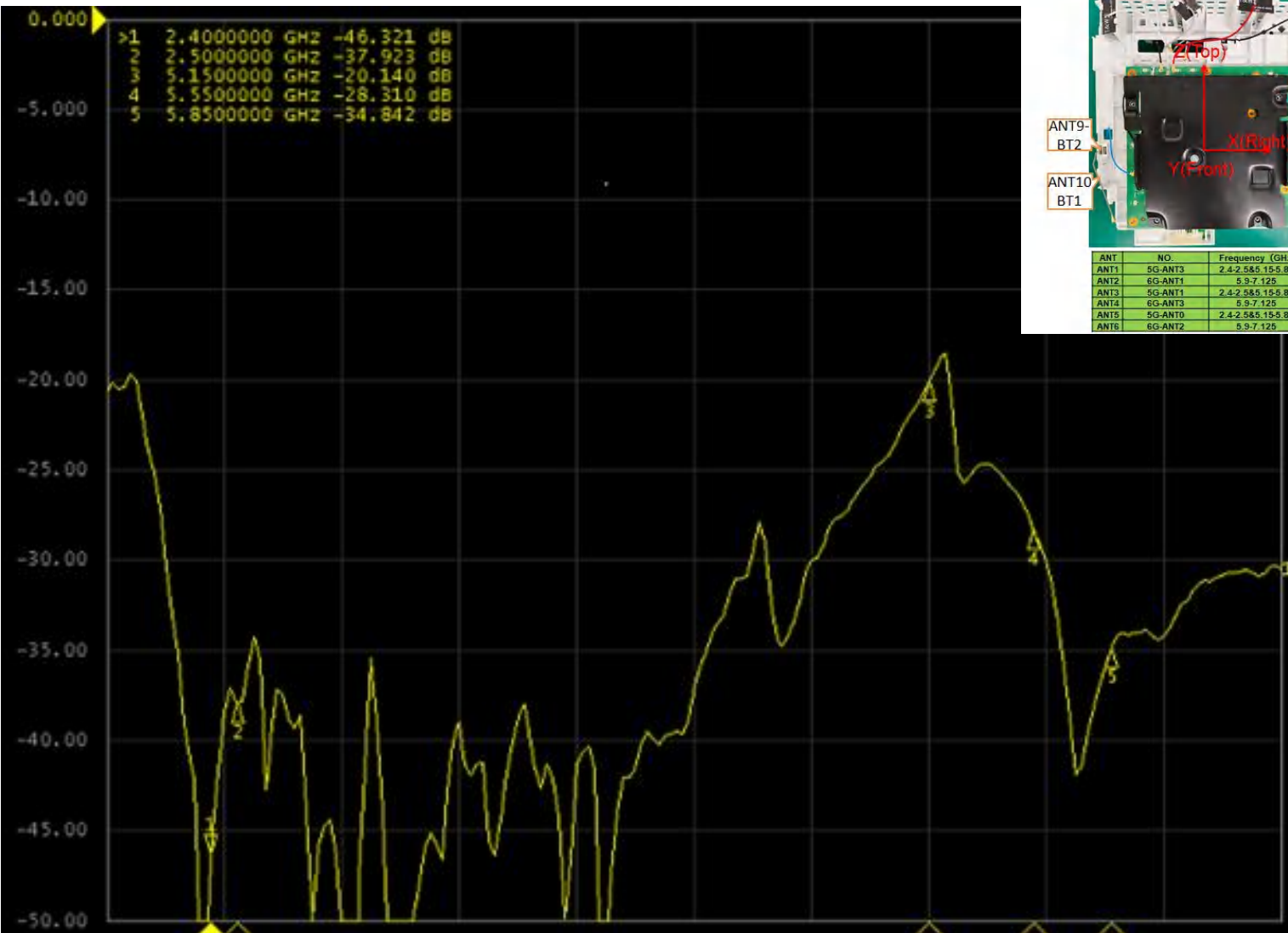
T&W



Isolation

ANT2&10

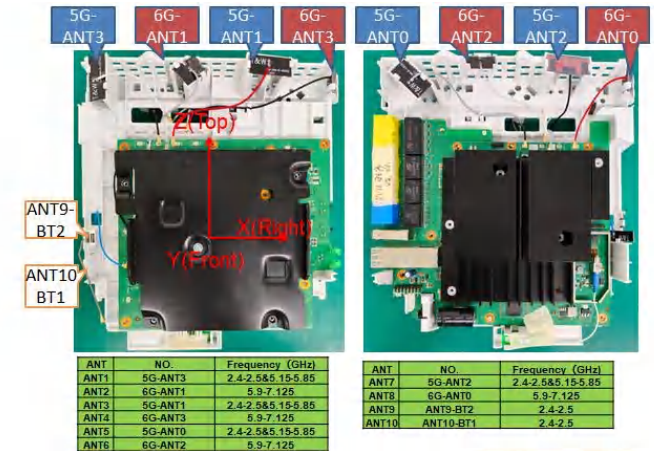
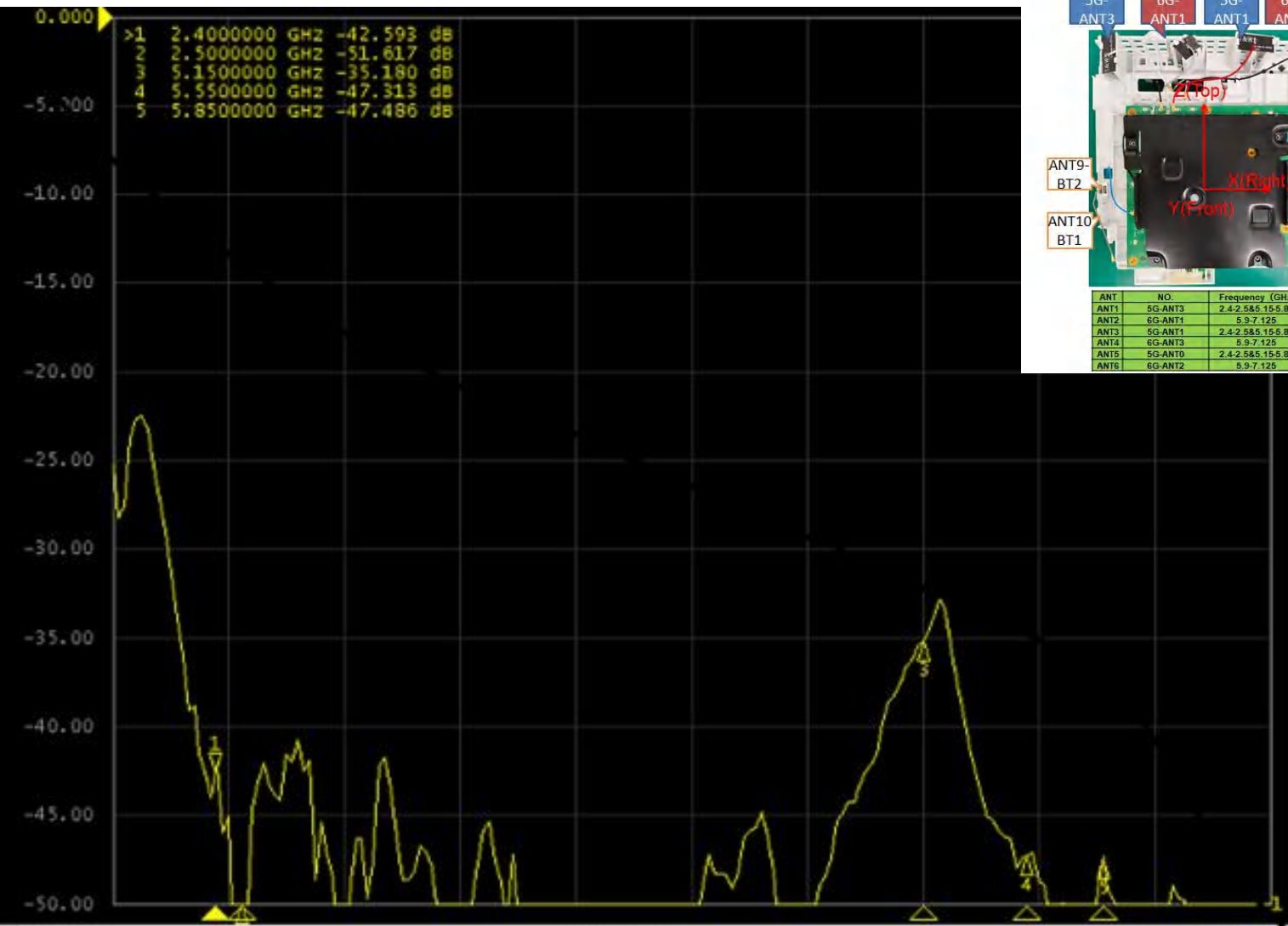
T&W



Isolation

ANT3&4

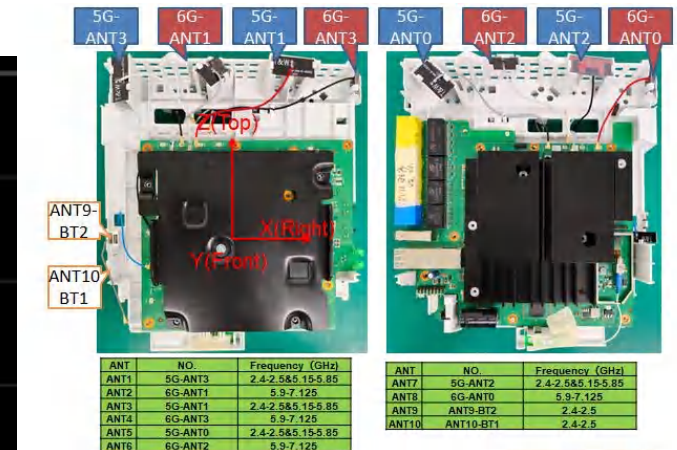
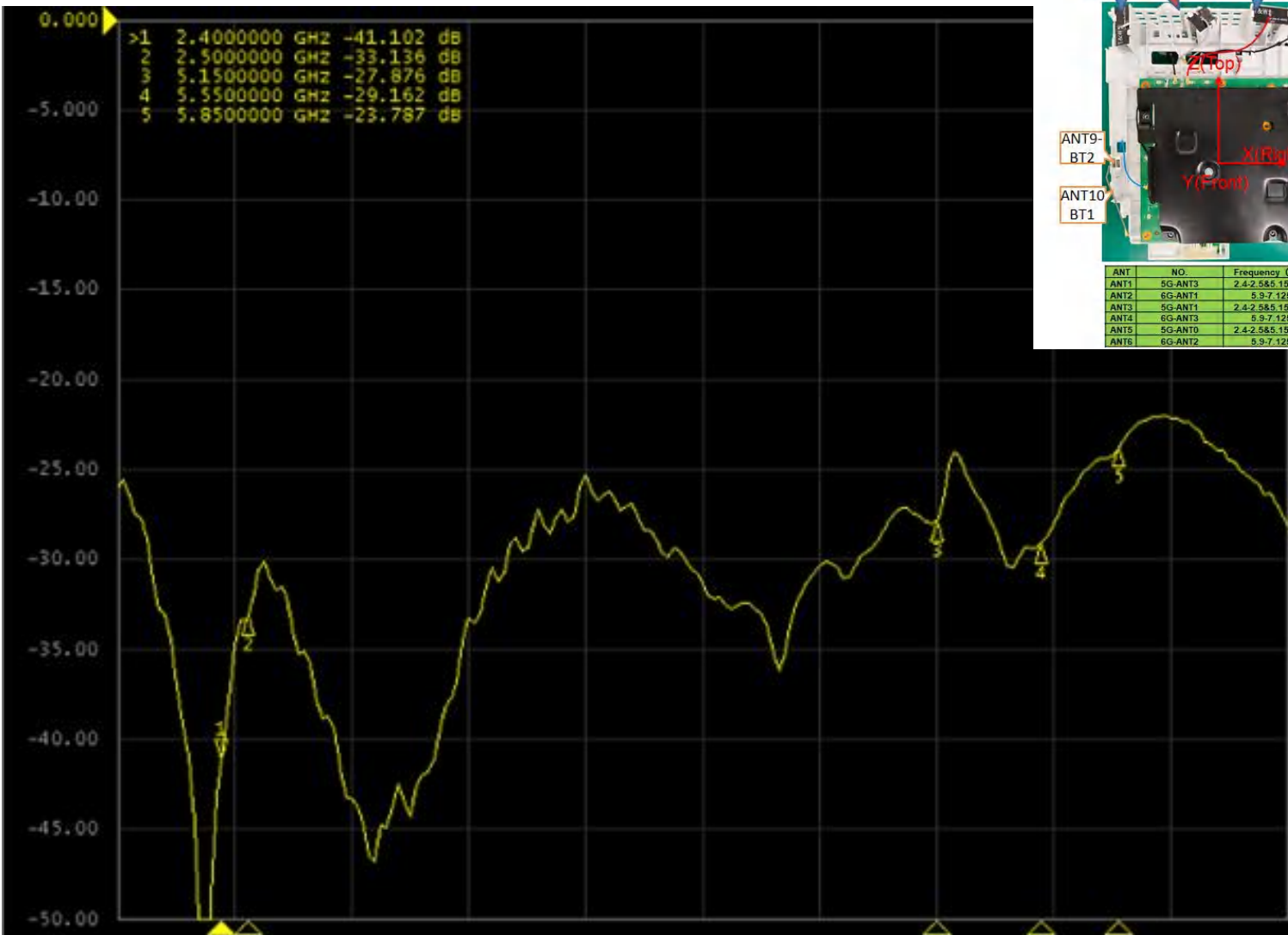
T&W



Isolation

ANT3&5

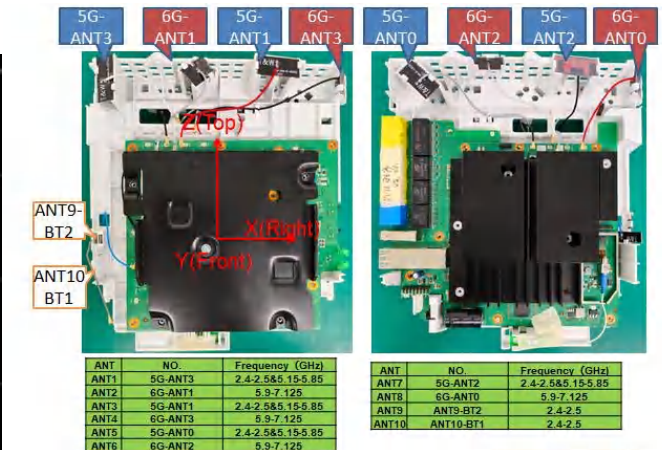
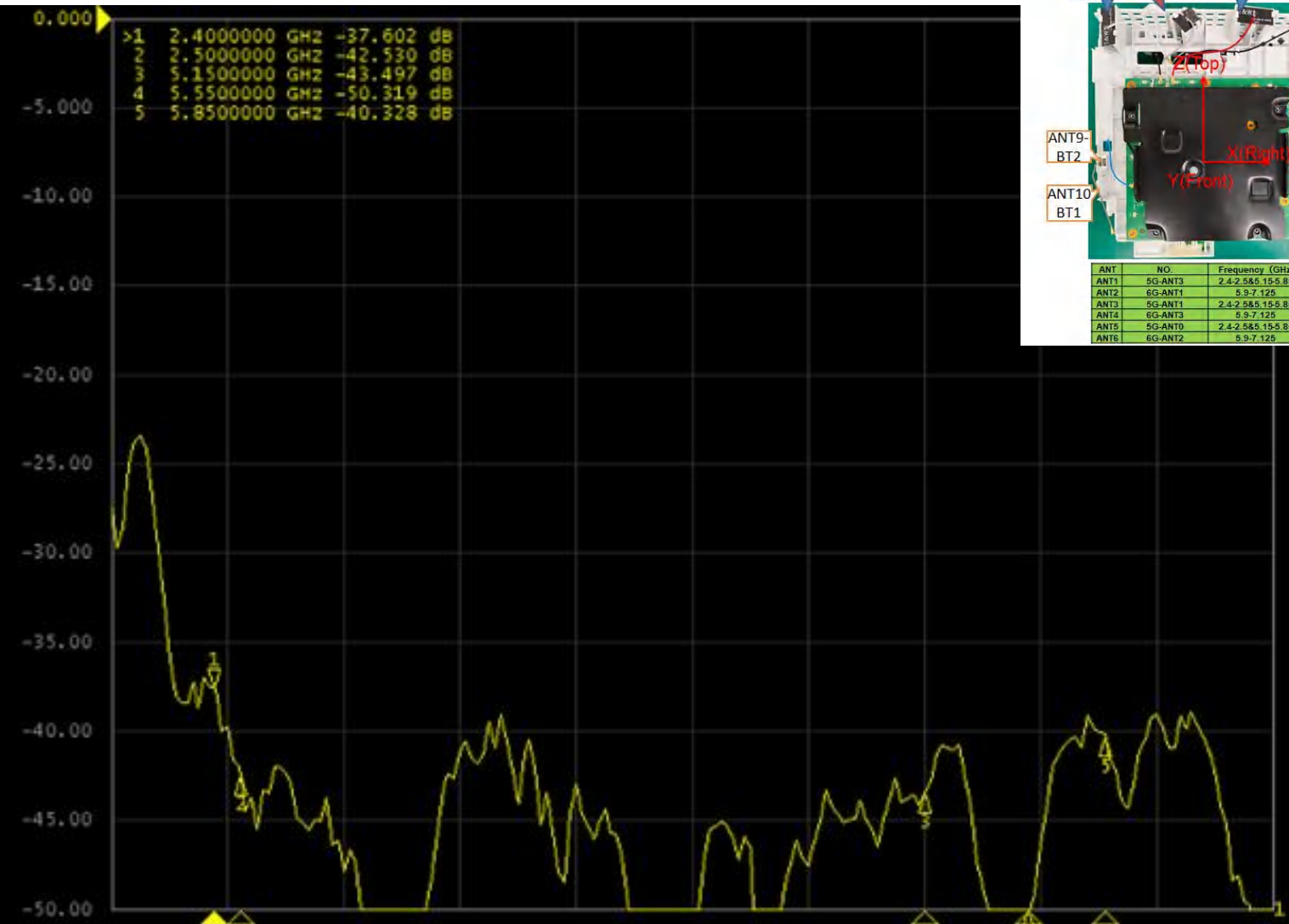
T&W



Isolation

ANT3&6

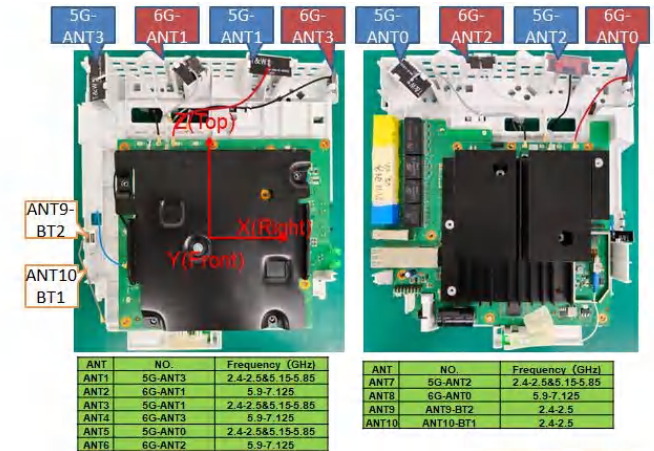
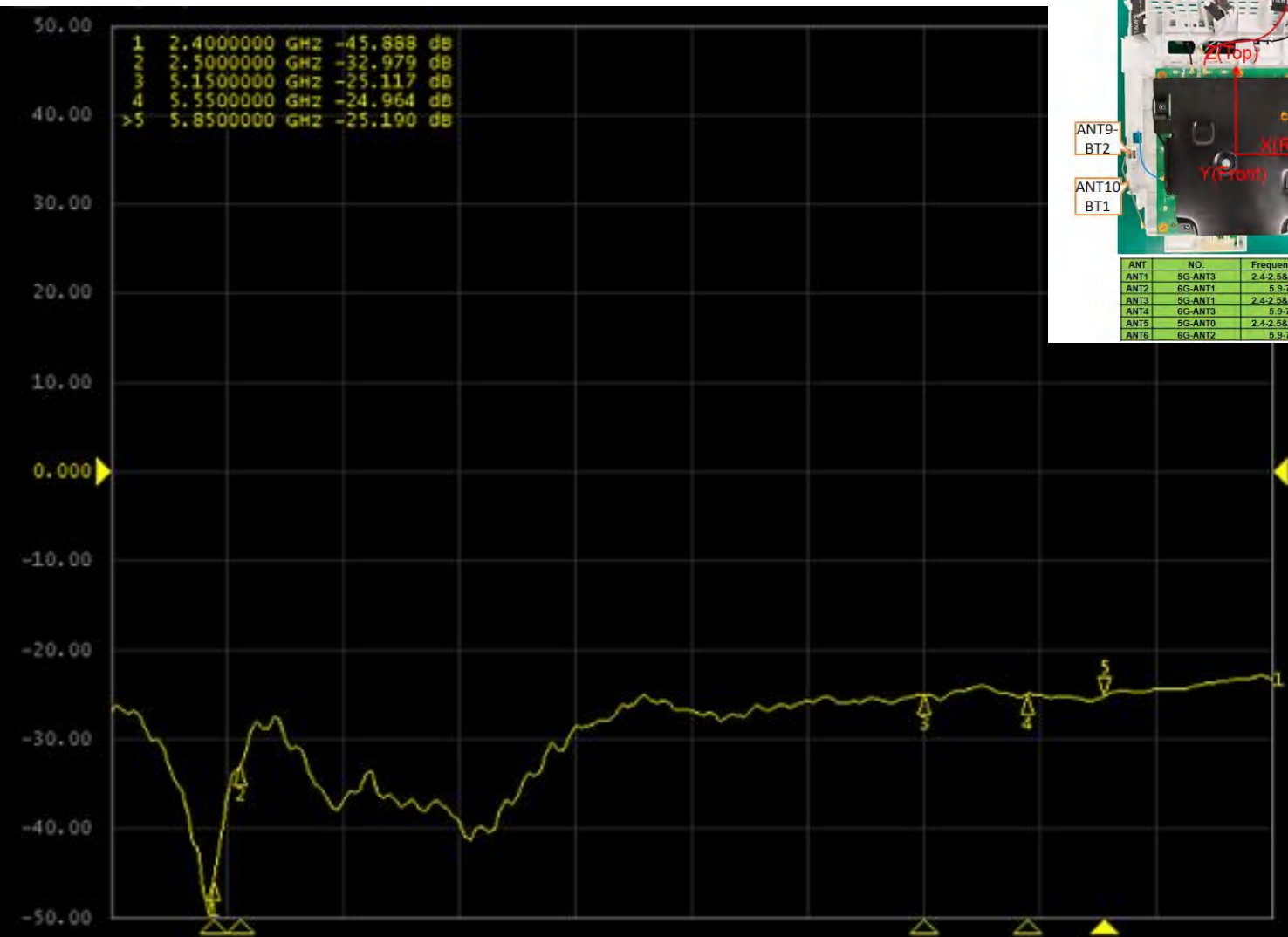
T&W



Isolation

ANT3&7

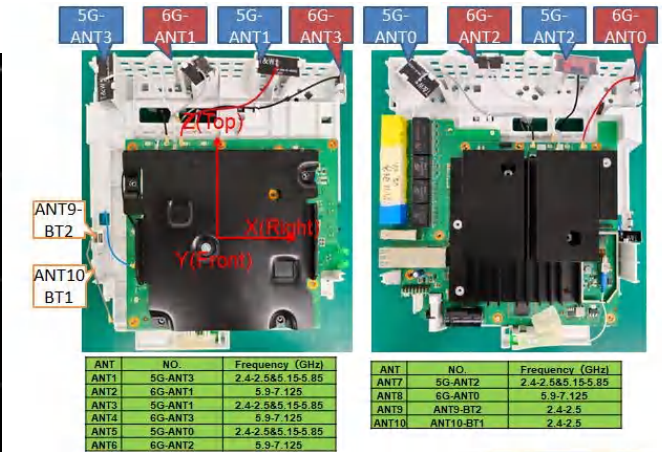
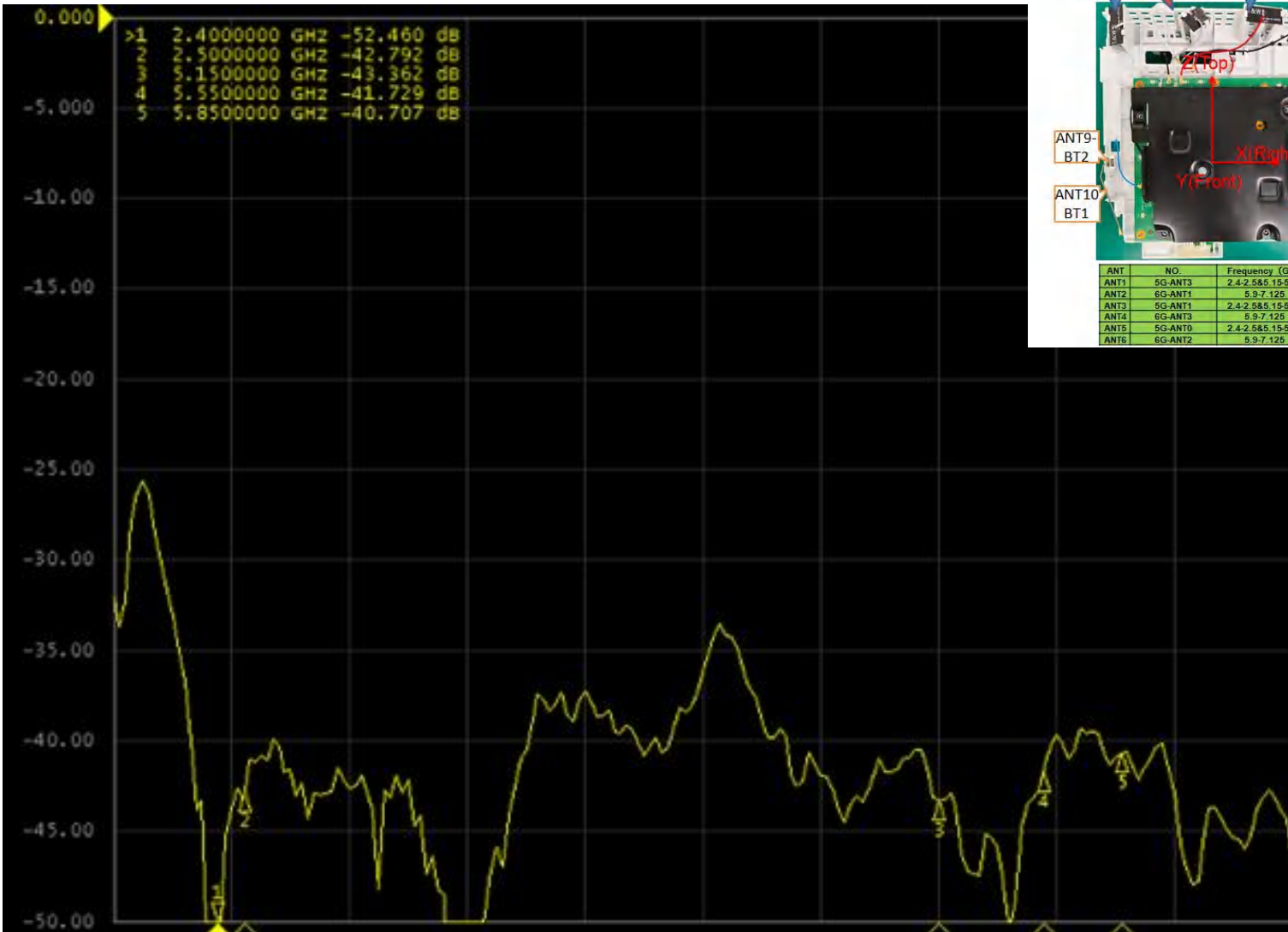
T&W



Isolation

ANT3&8

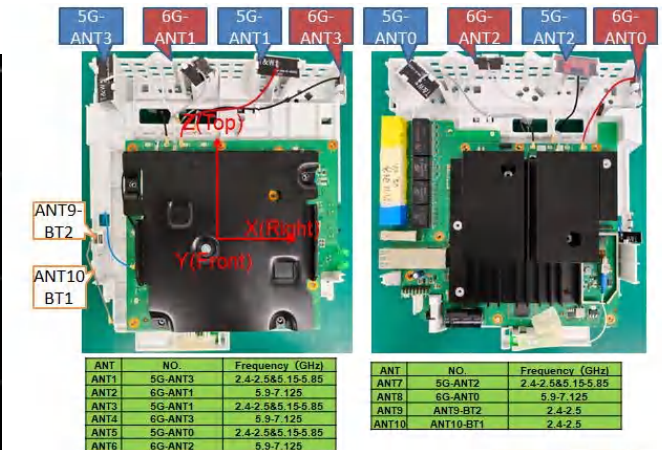
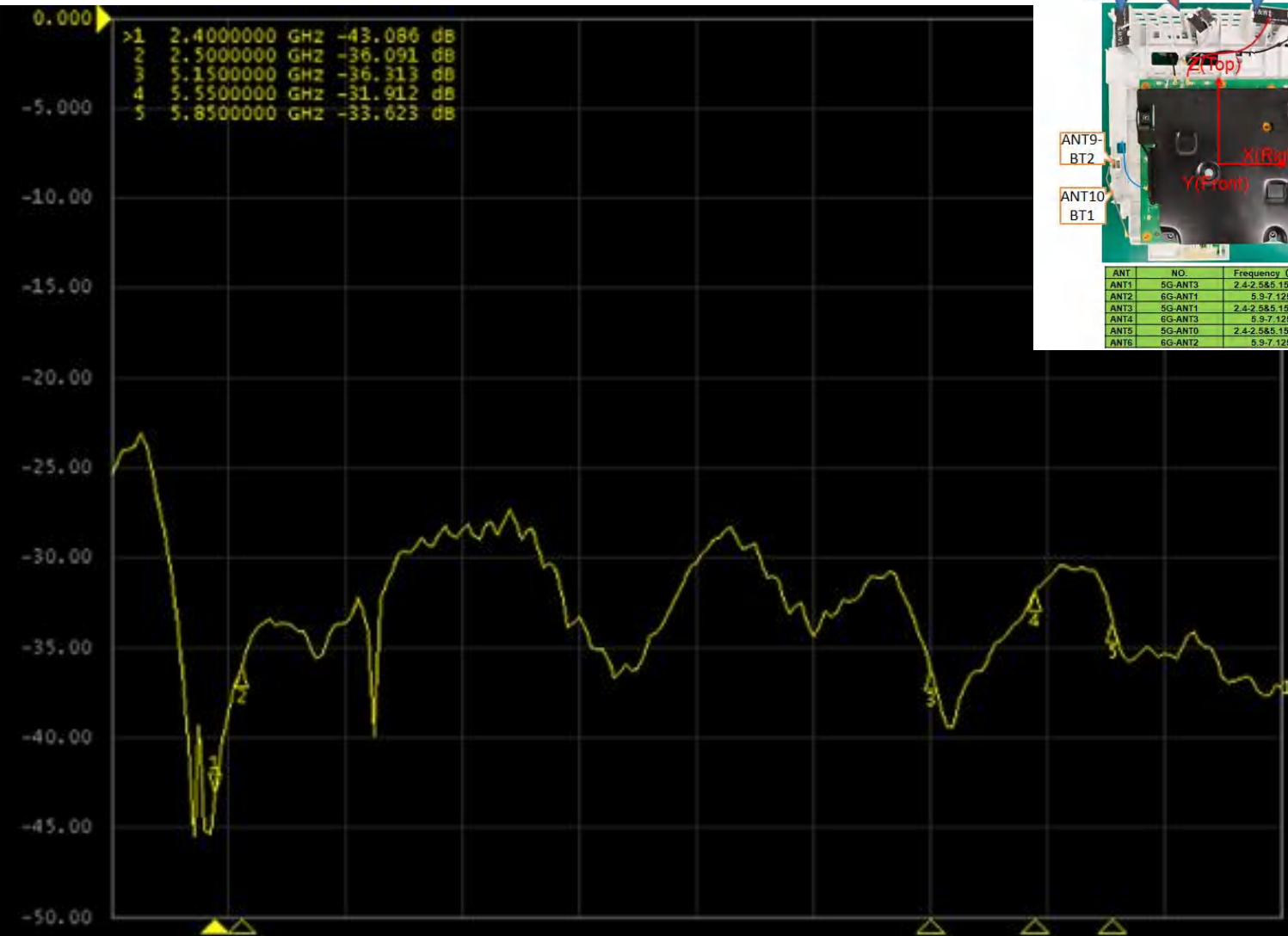
T&W



Isolation

ANT3&9

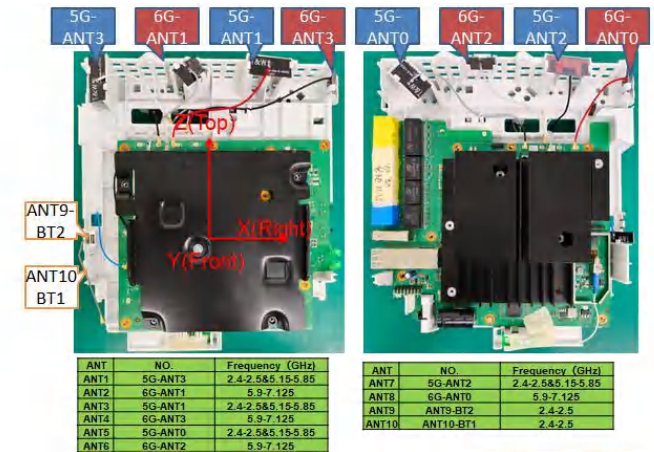
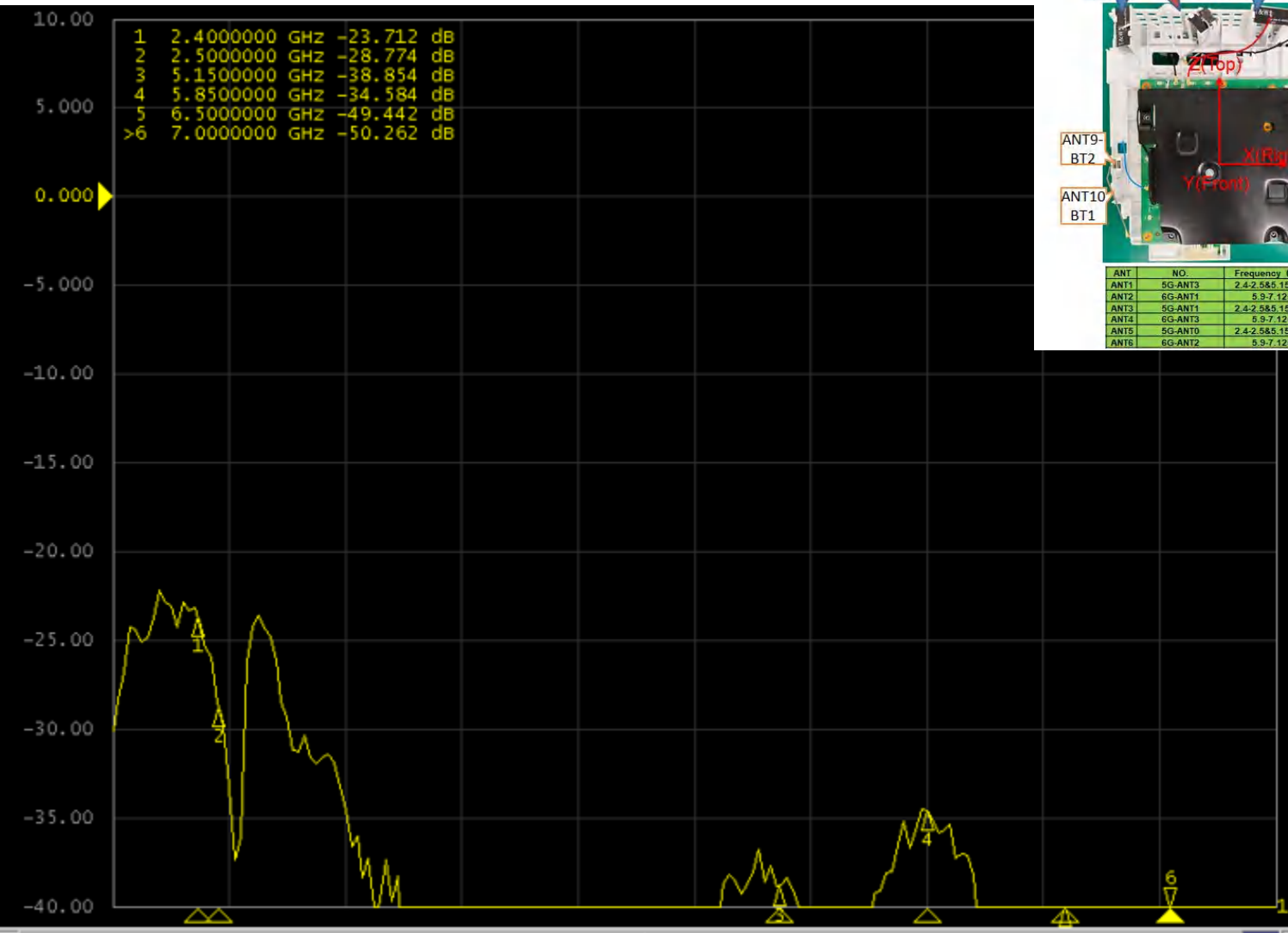
T&W



Isolation

ANT3&10

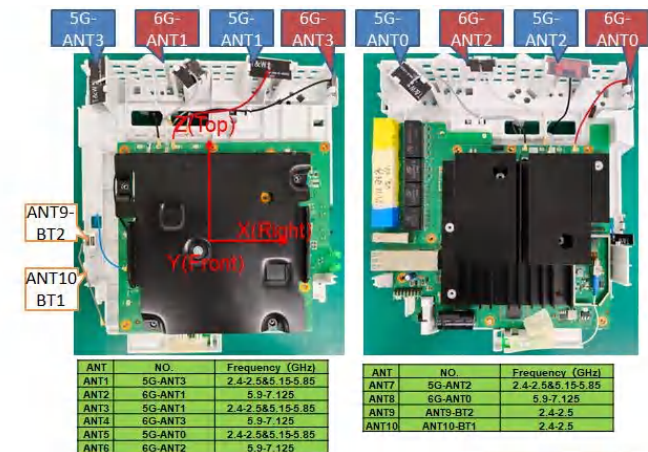
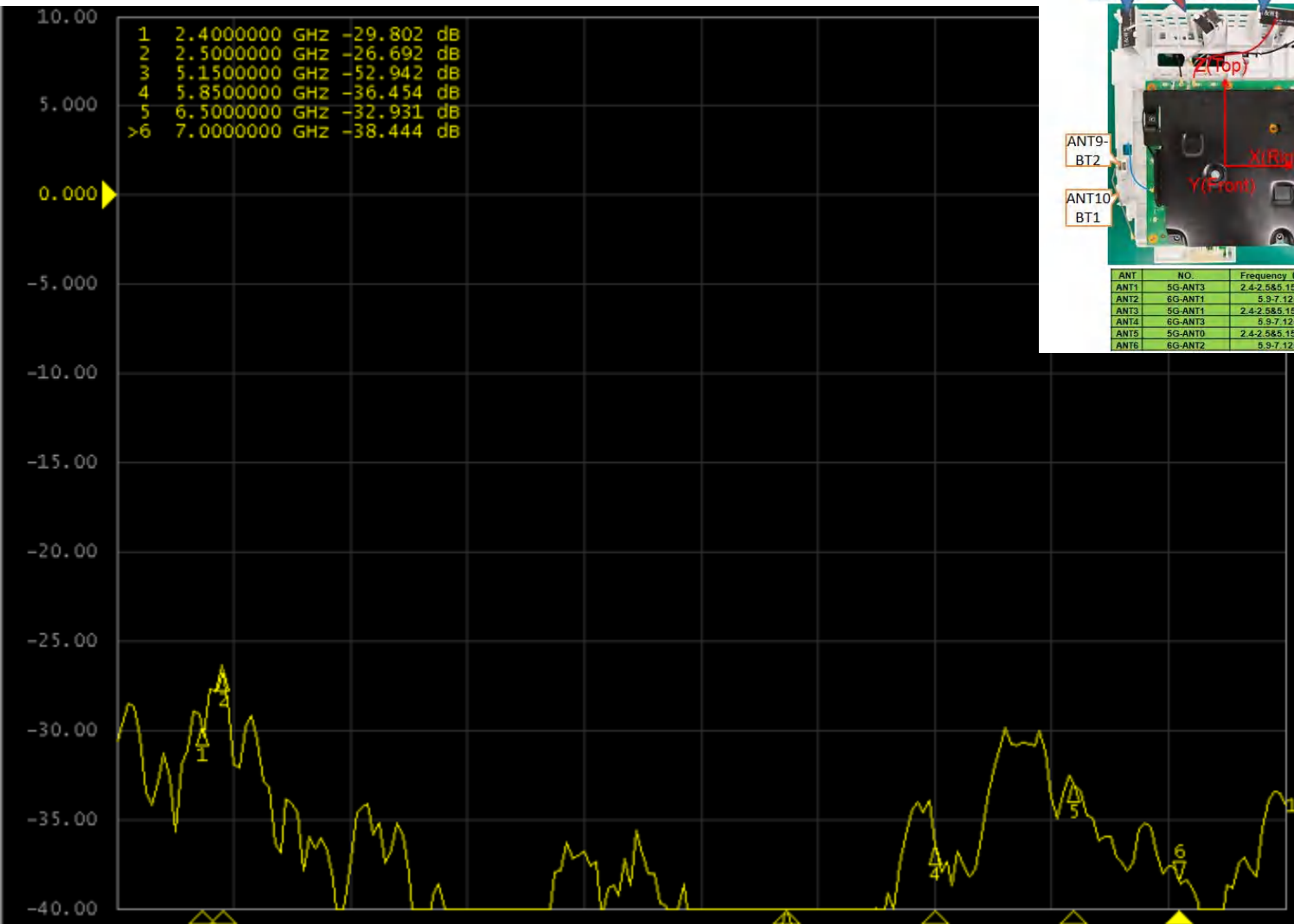
T&W



Isolation

ANT4&5

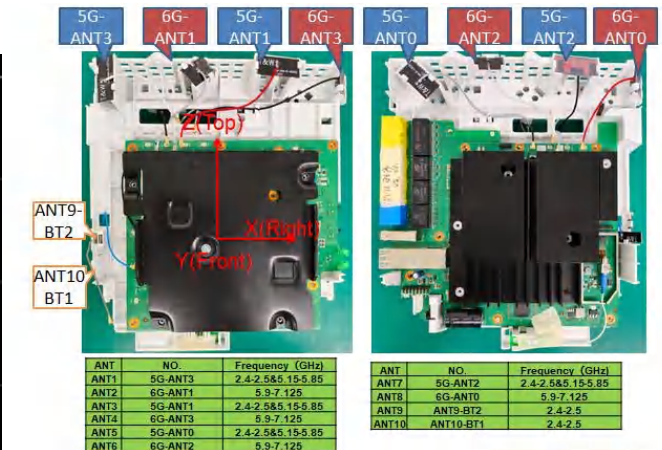
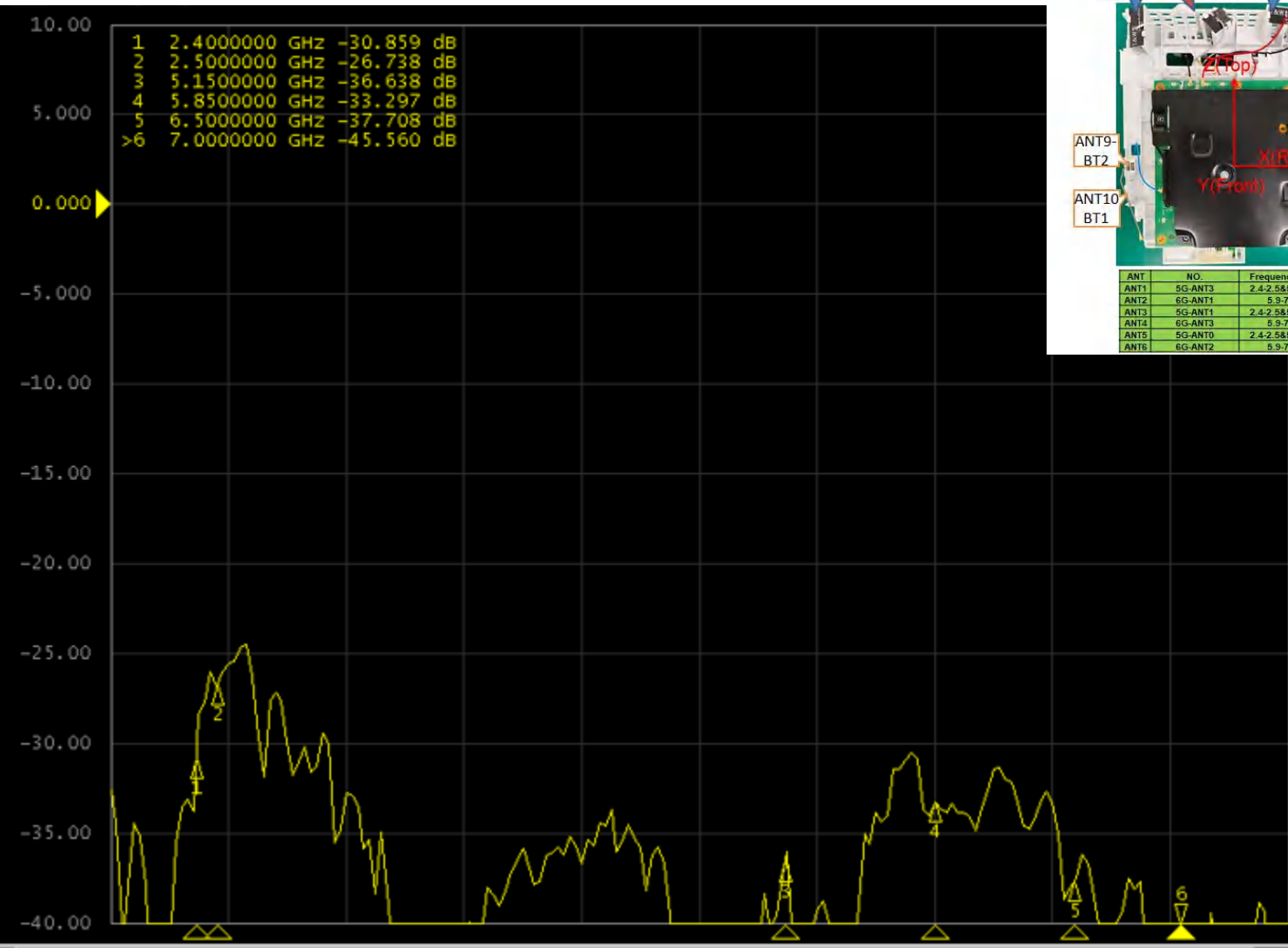
T&W



Isolation

ANT4&6

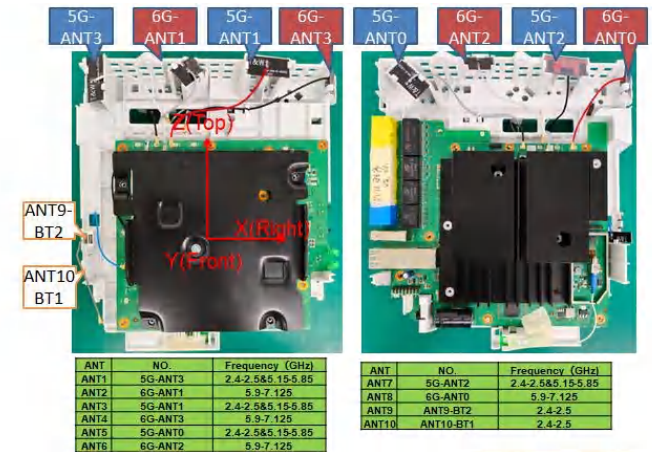
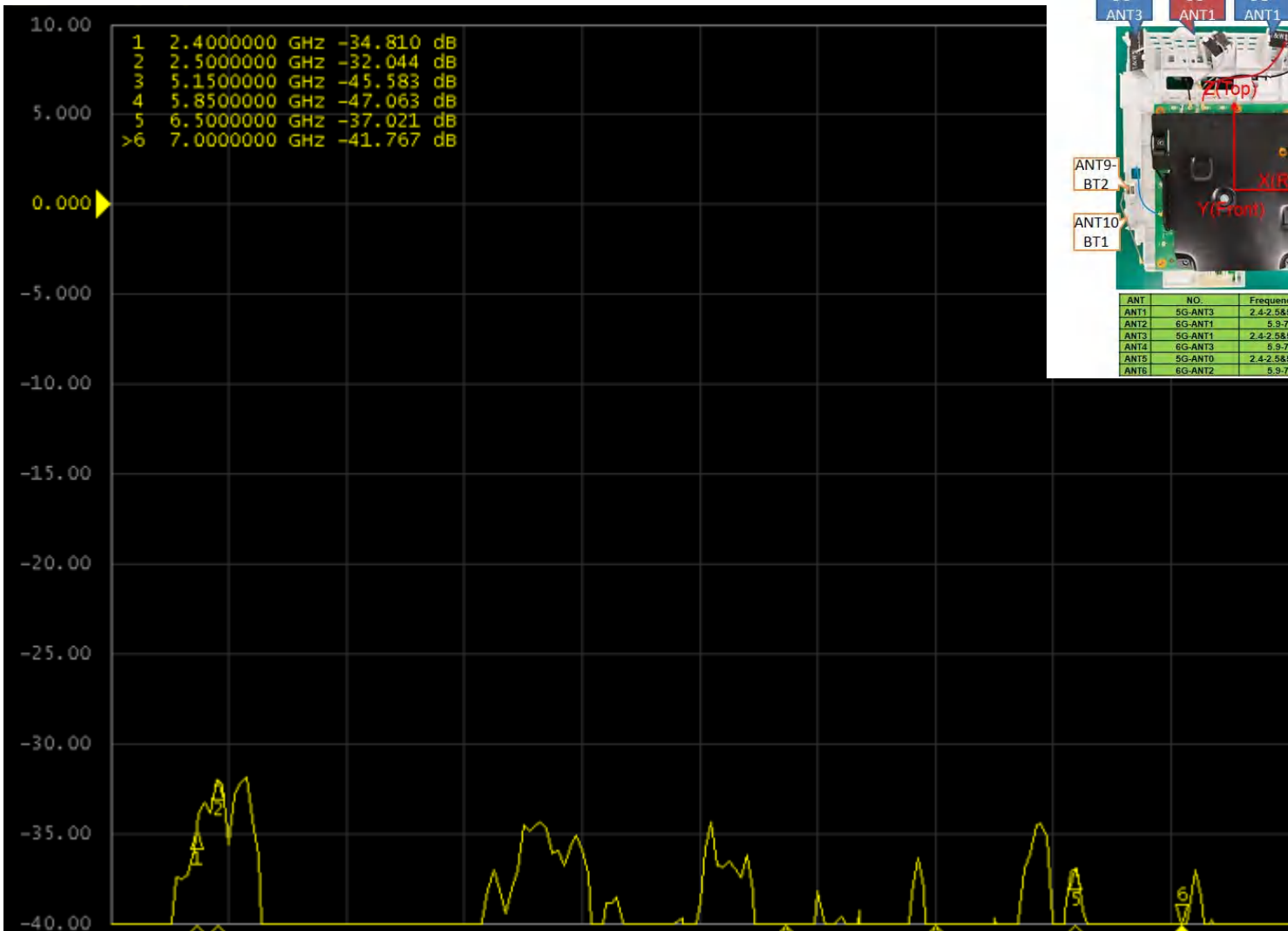
T&W



Isolation

ANT4&7

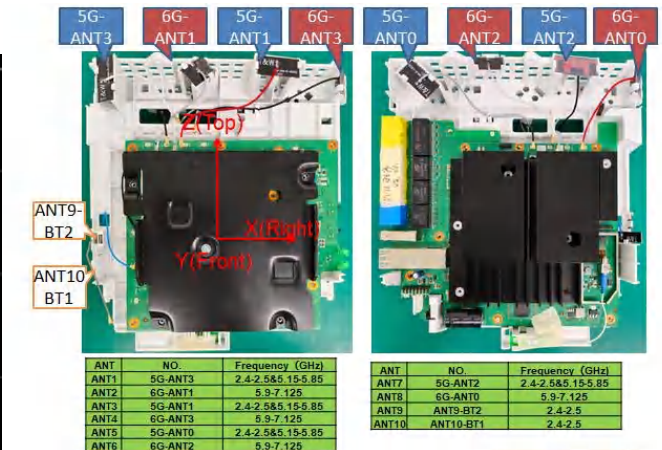
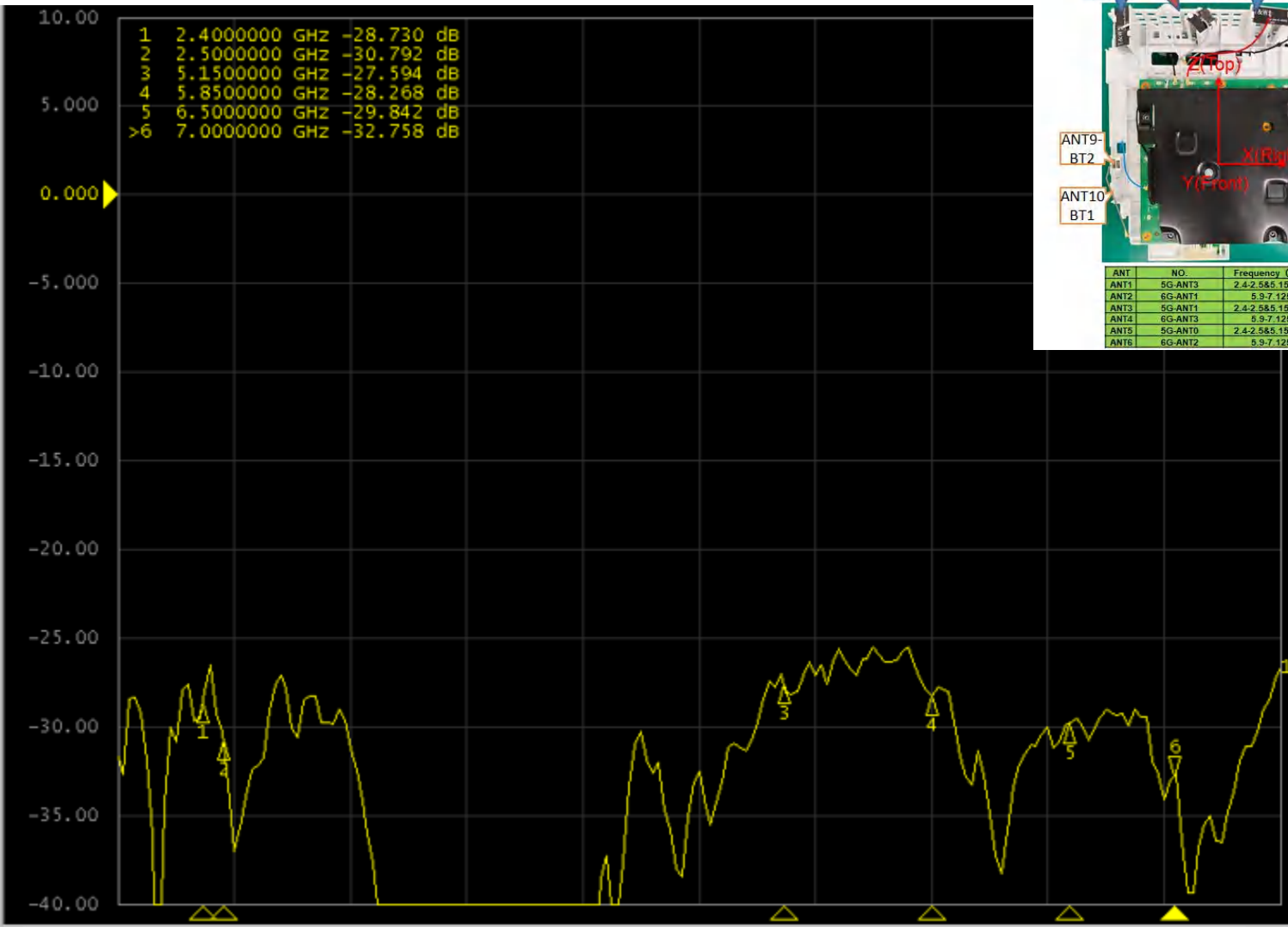
T&W



Isolation

ANT4&8

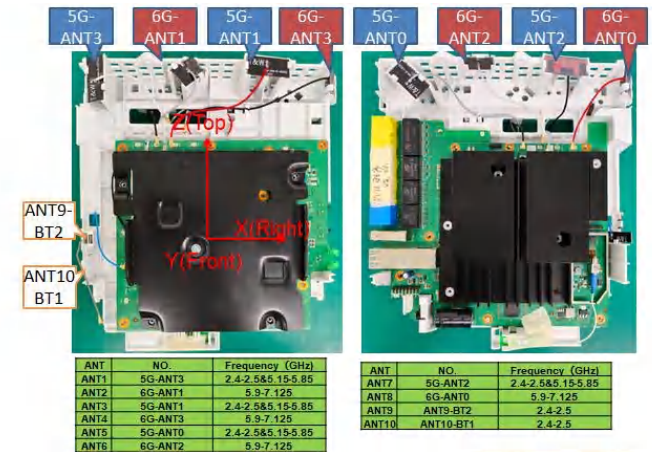
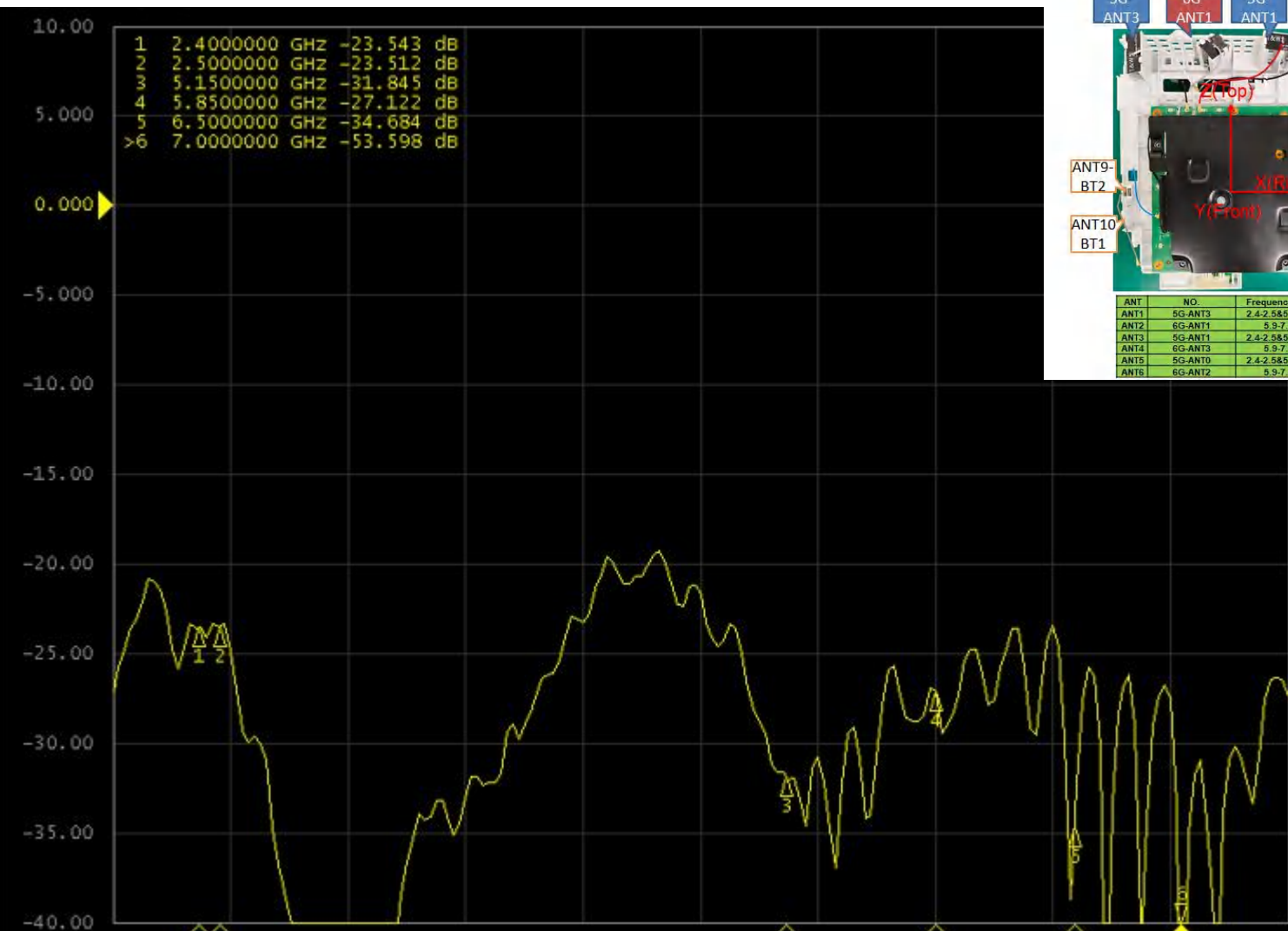
T&W



Isolation

ANT4&9

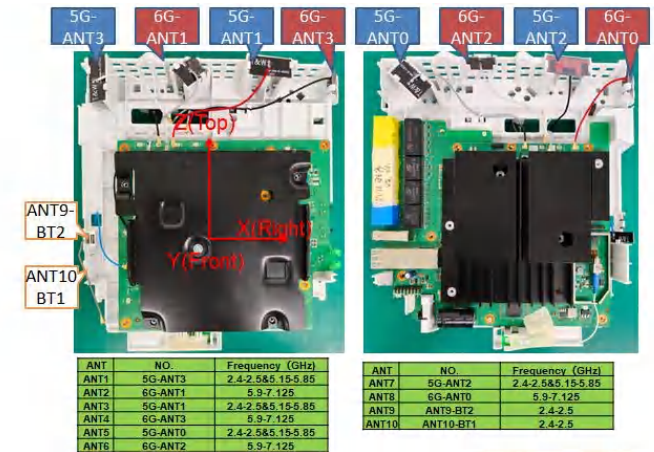
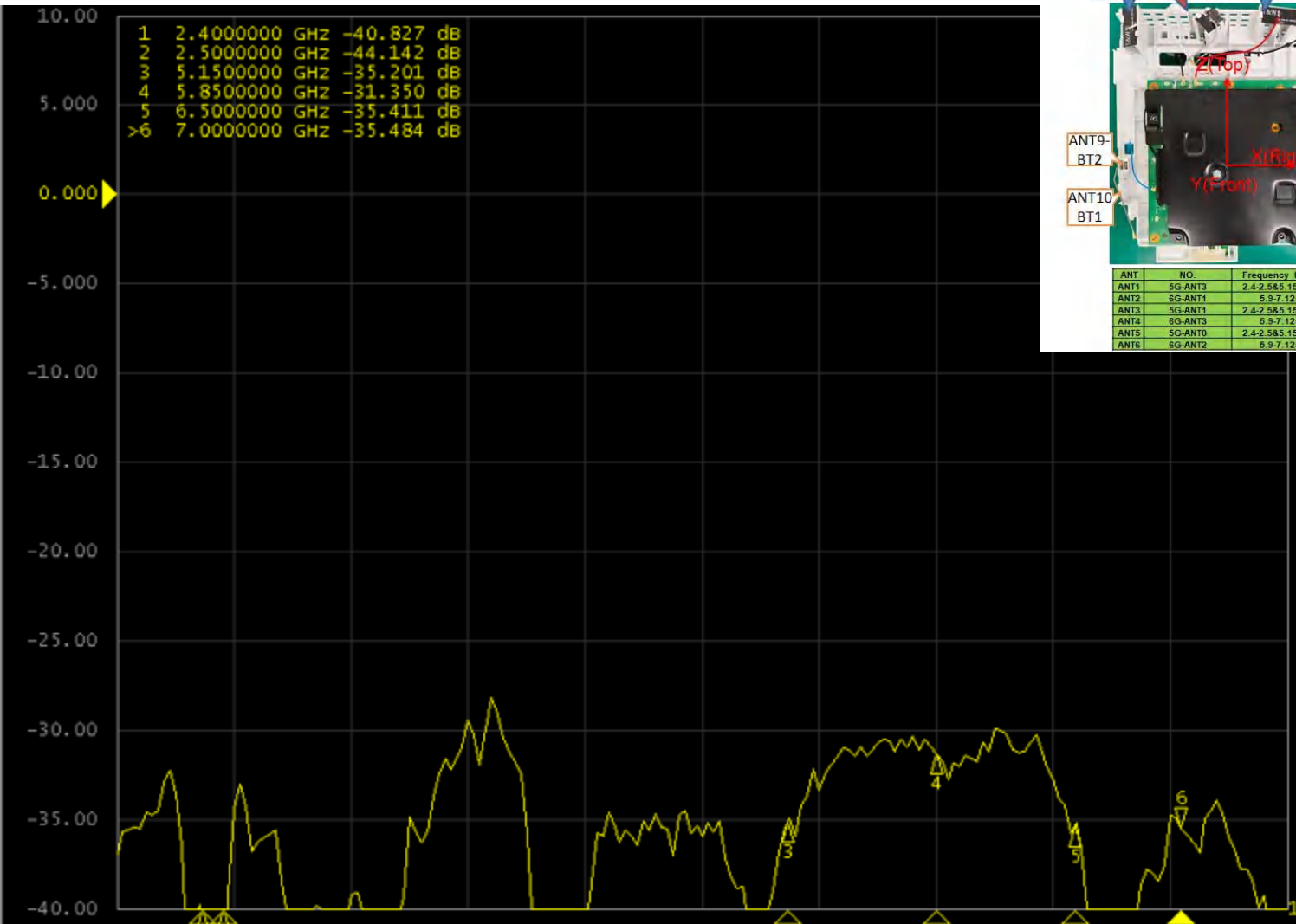
T&W



Isolation

ANT4&10

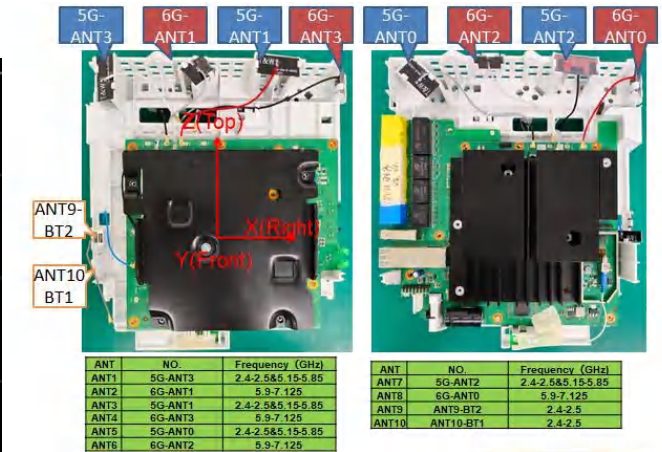
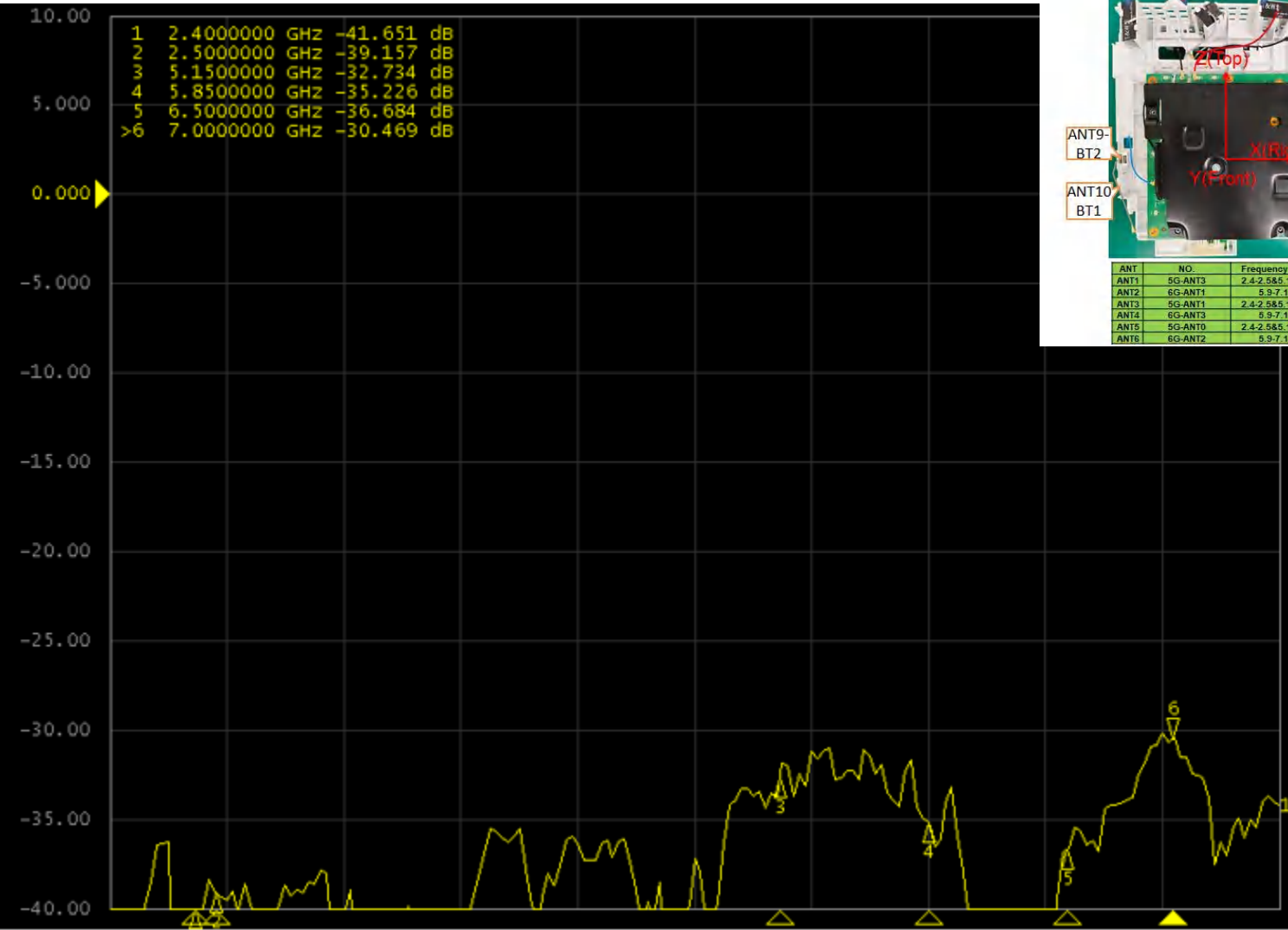
T&W



Isolation

ANT5&6

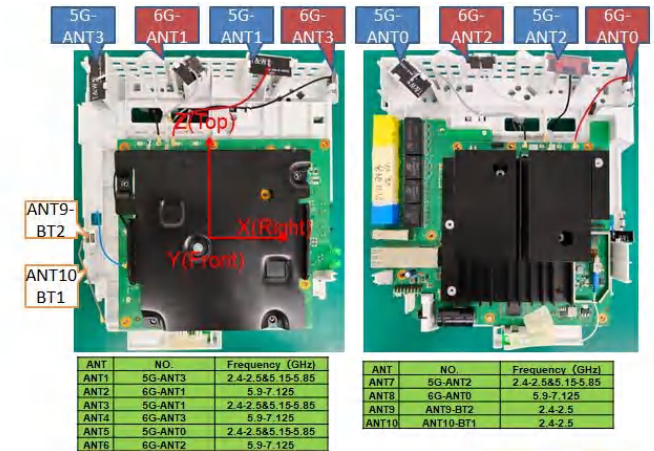
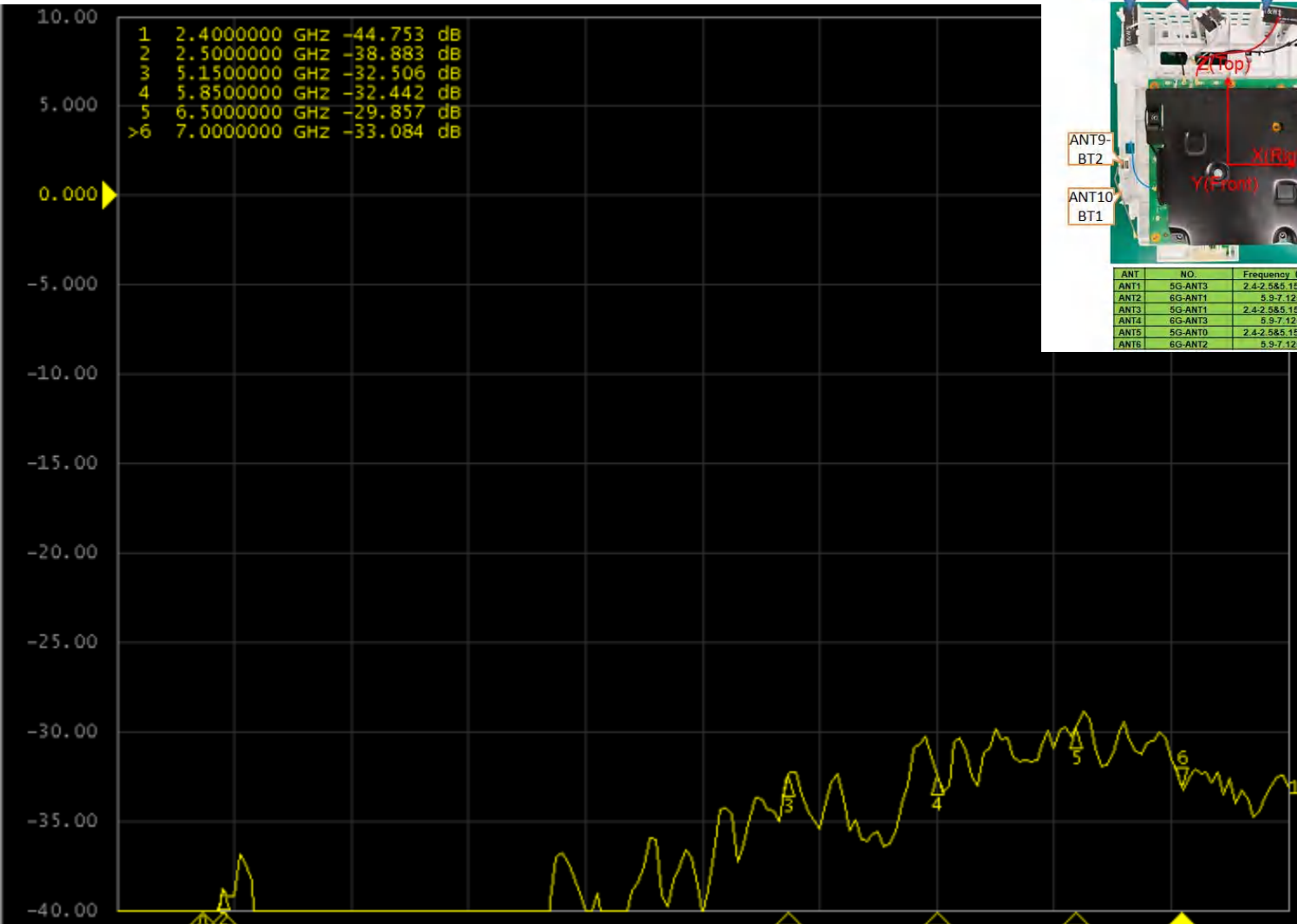
T&W



Isolation

ANT5&7

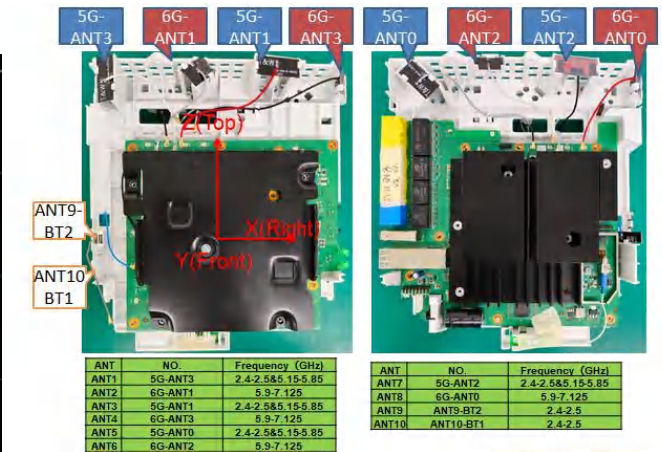
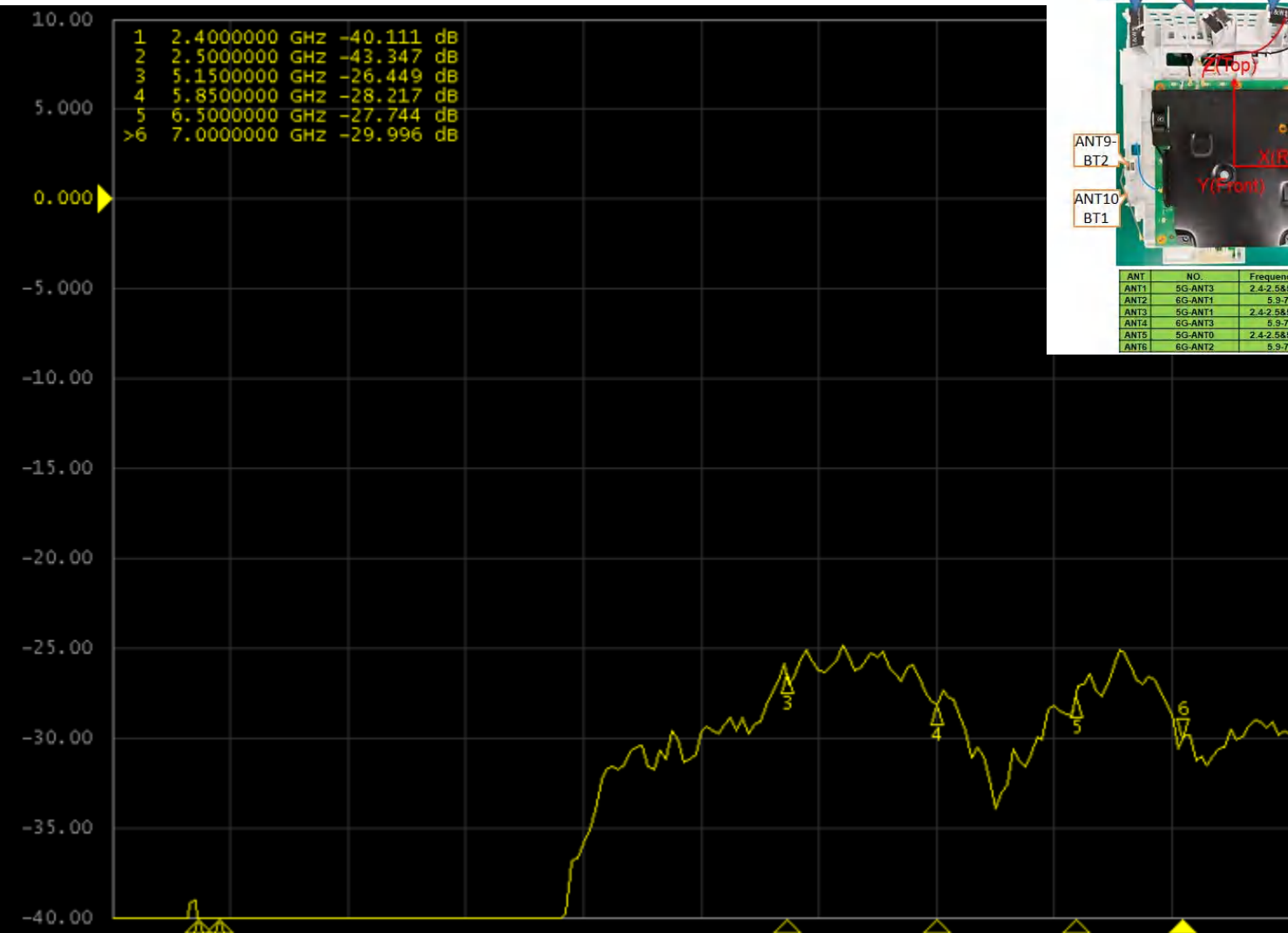
T&W



Isolation

ANT5&8

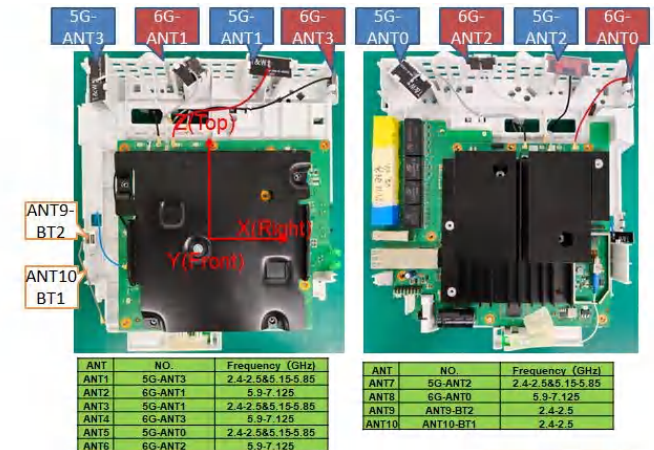
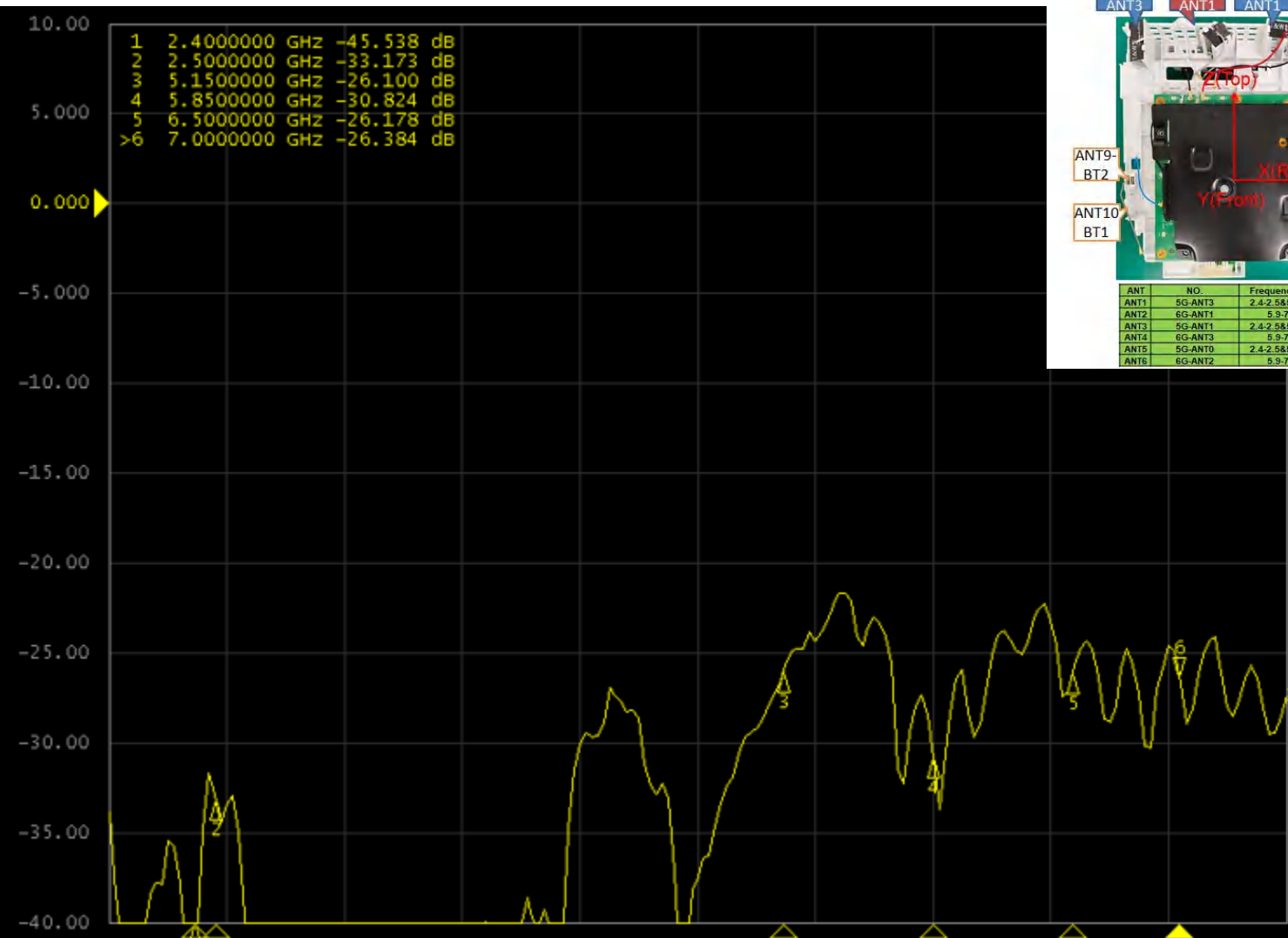
T&W



Isolation

ANT5&9

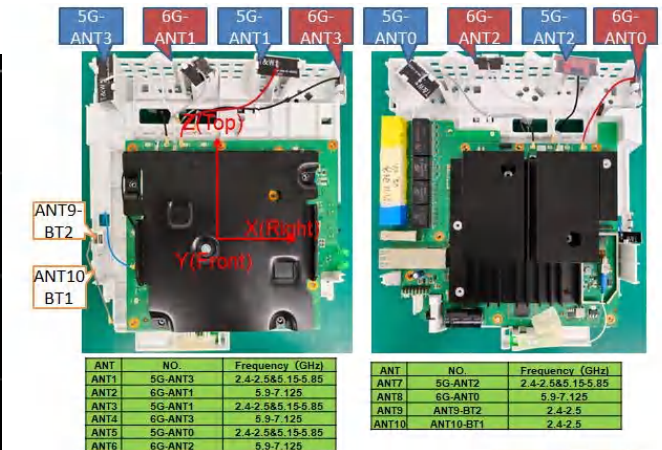
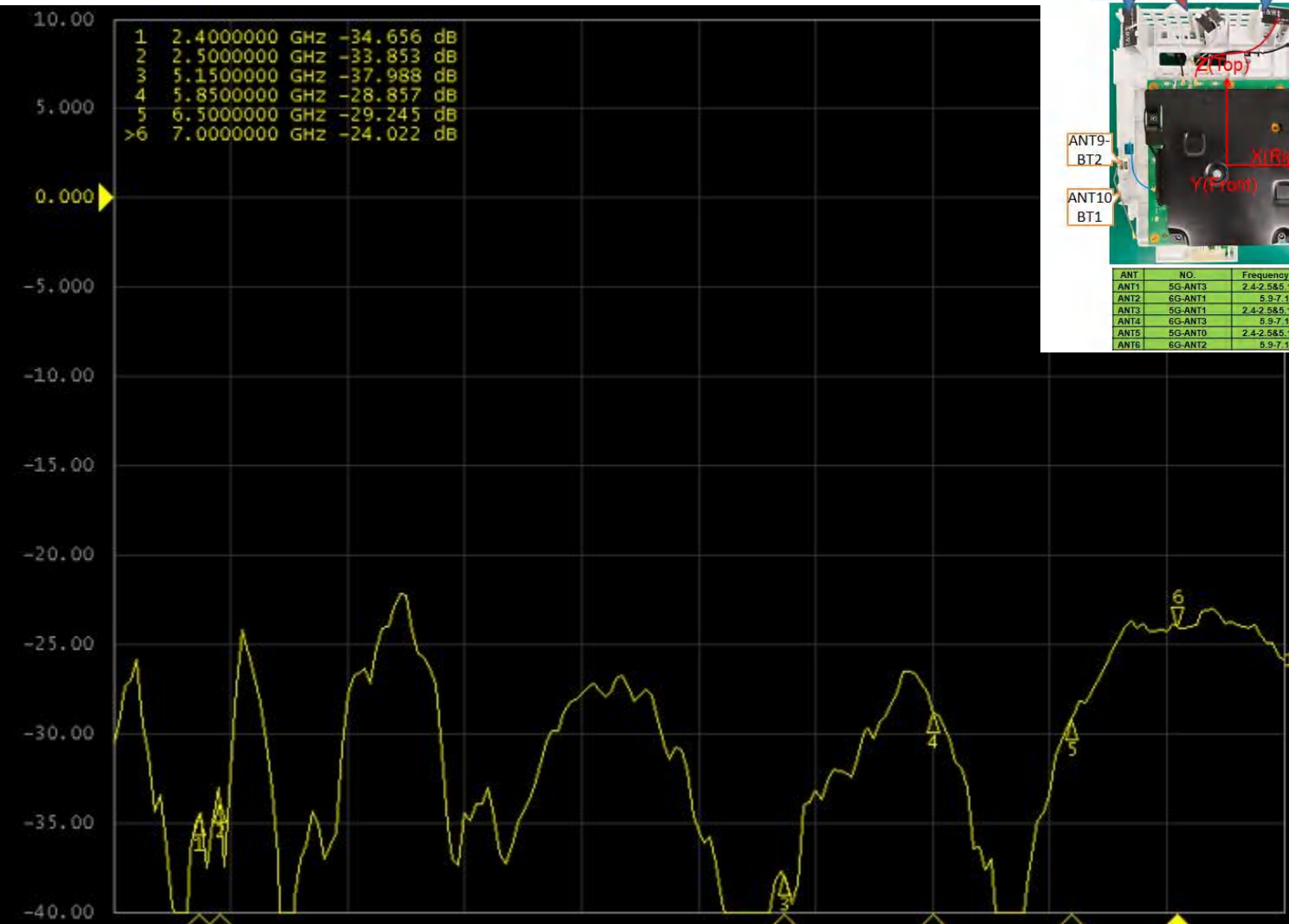
T&W



Isolation

ANT5&10

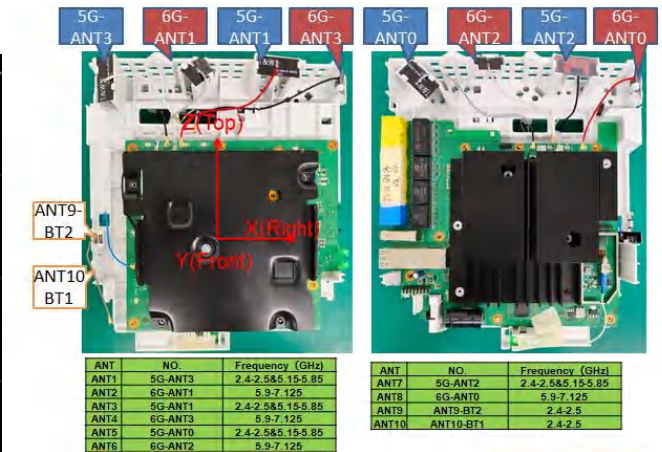
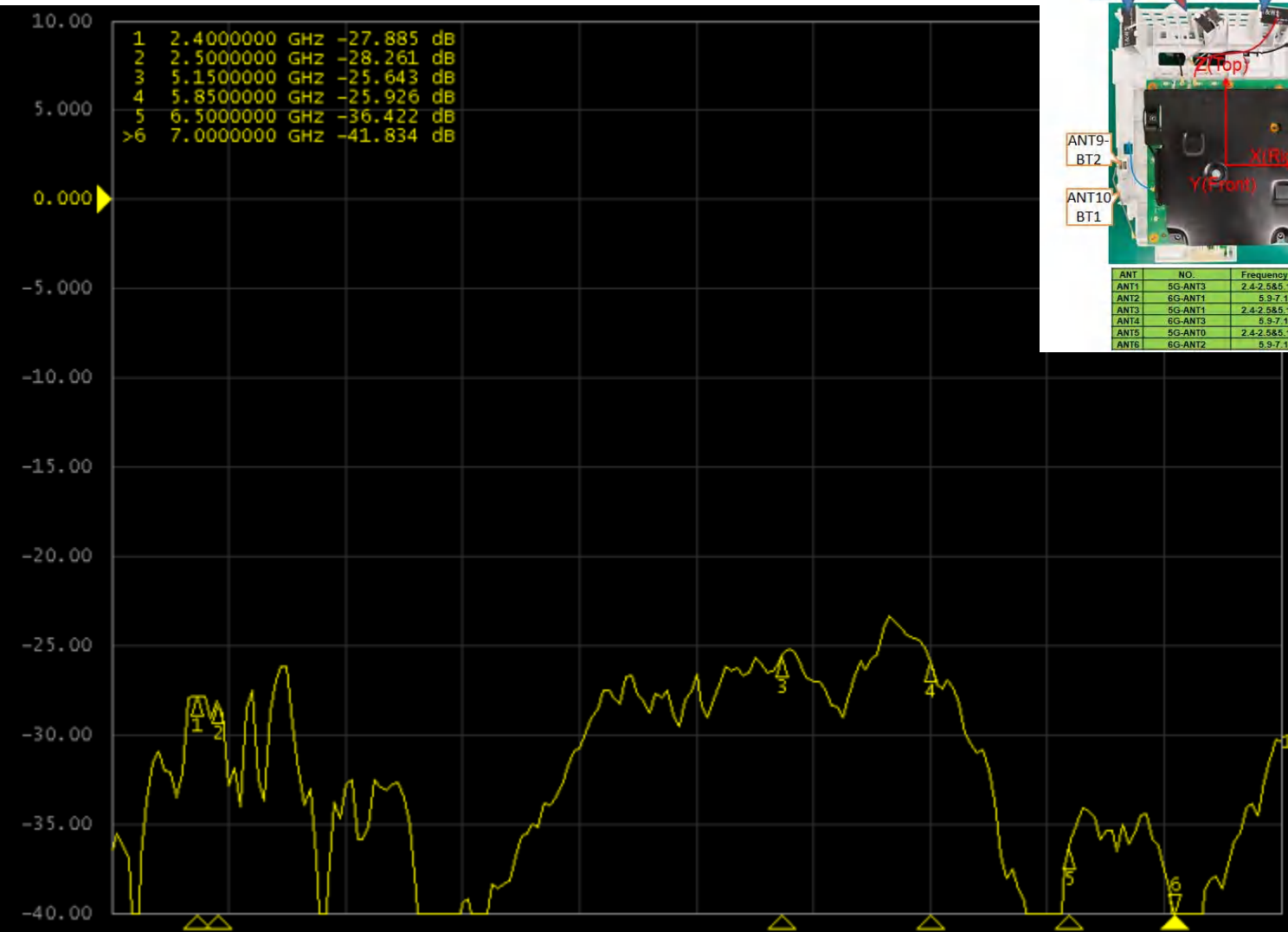
T&W



Isolation

ANT6&7

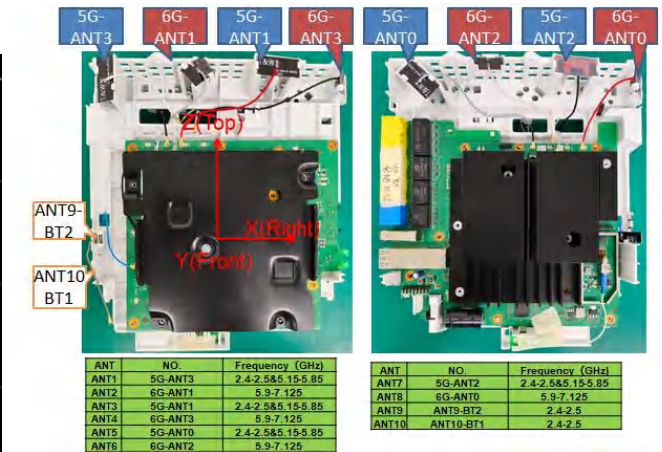
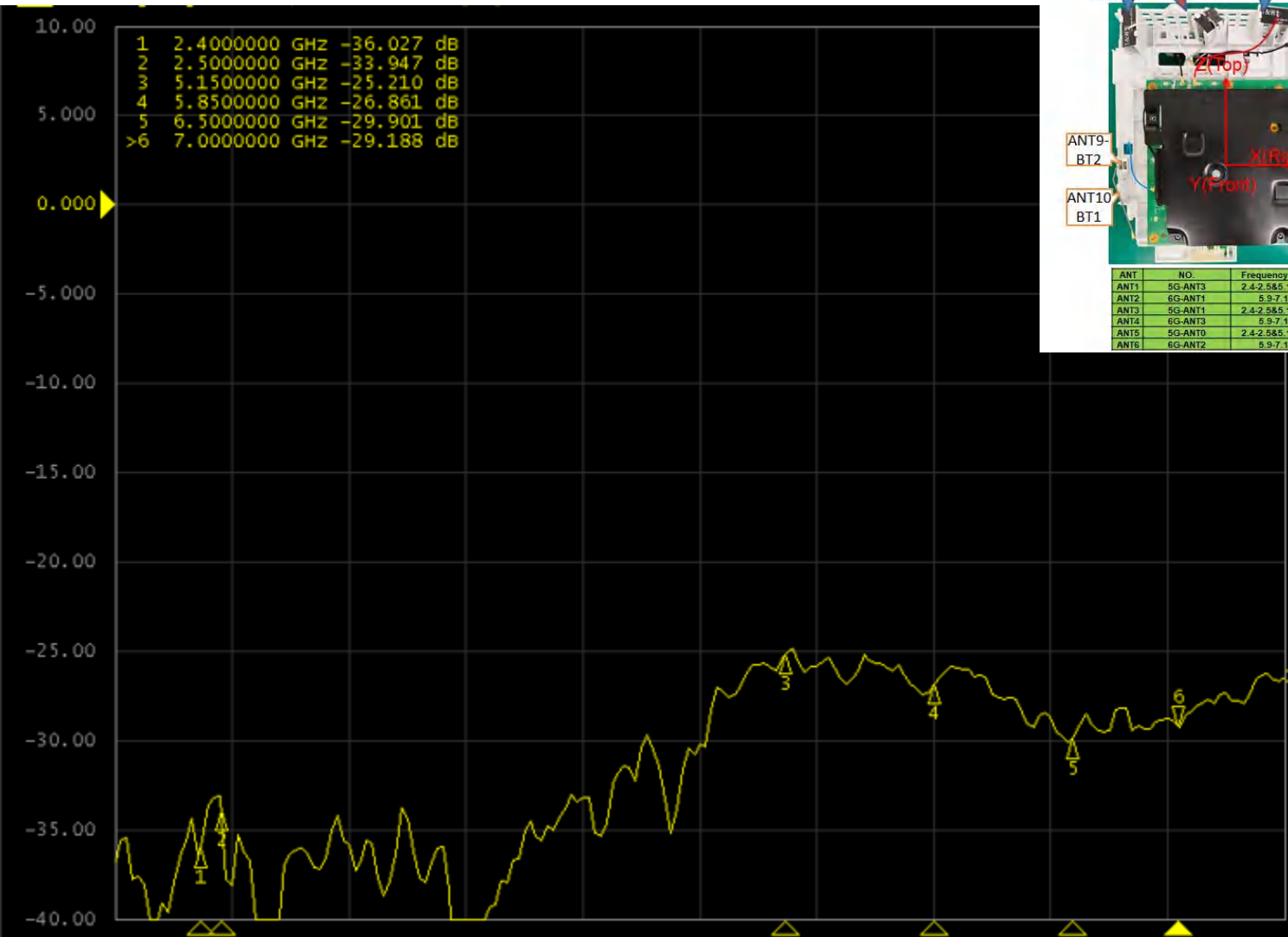
T&W



Isolation

ANT6&8

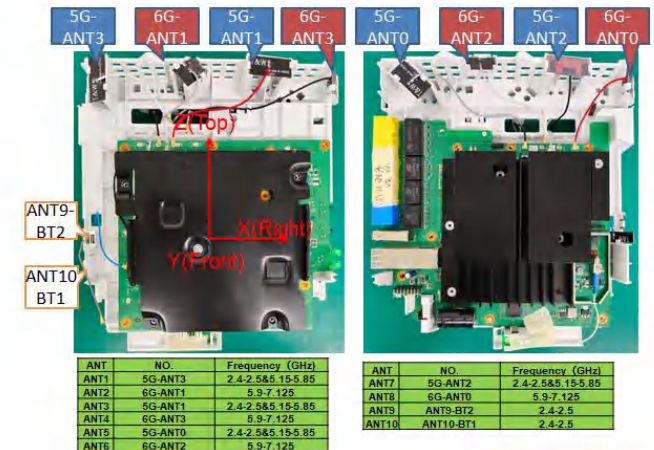
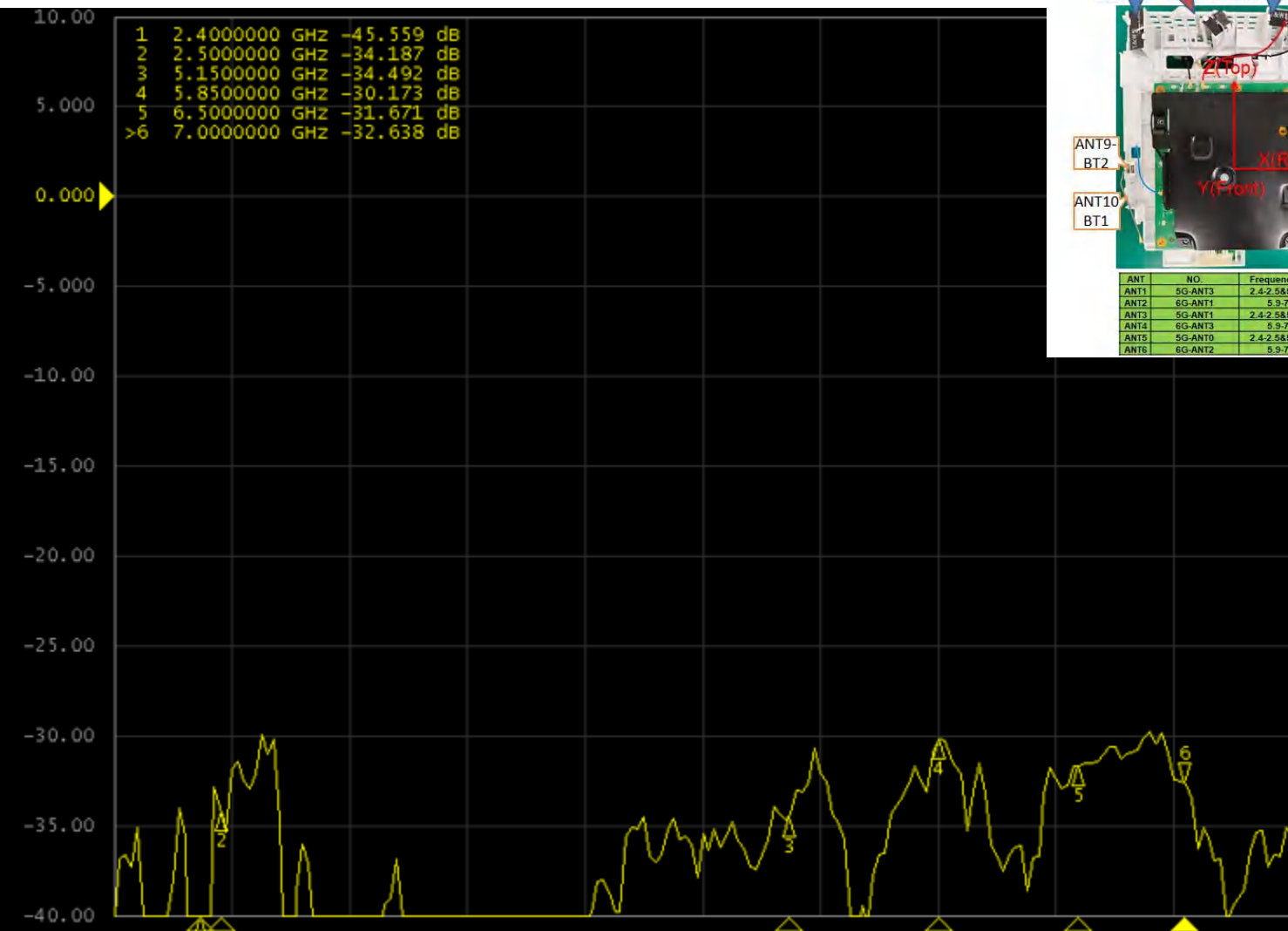
T&W



Isolation

ANT6&9

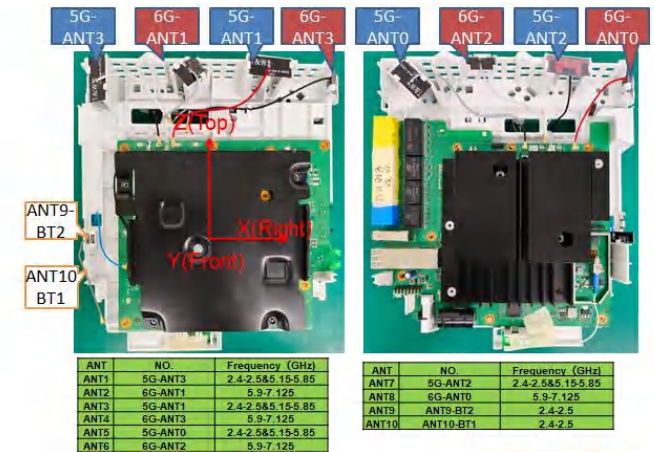
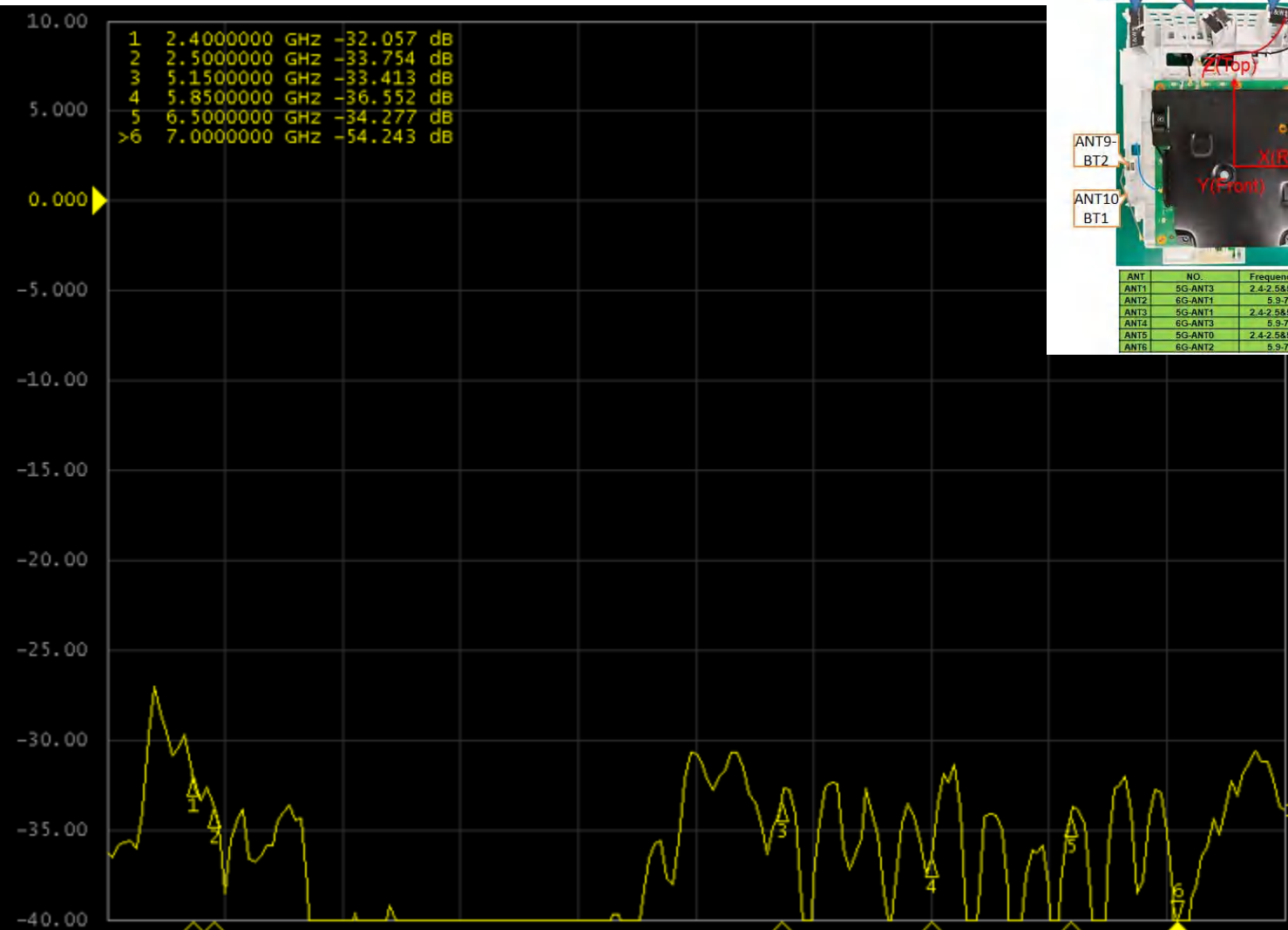
T&W



Isolation

ANT6&10

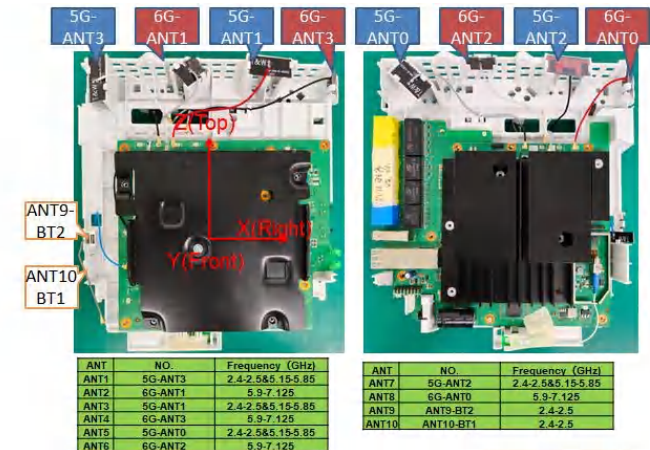
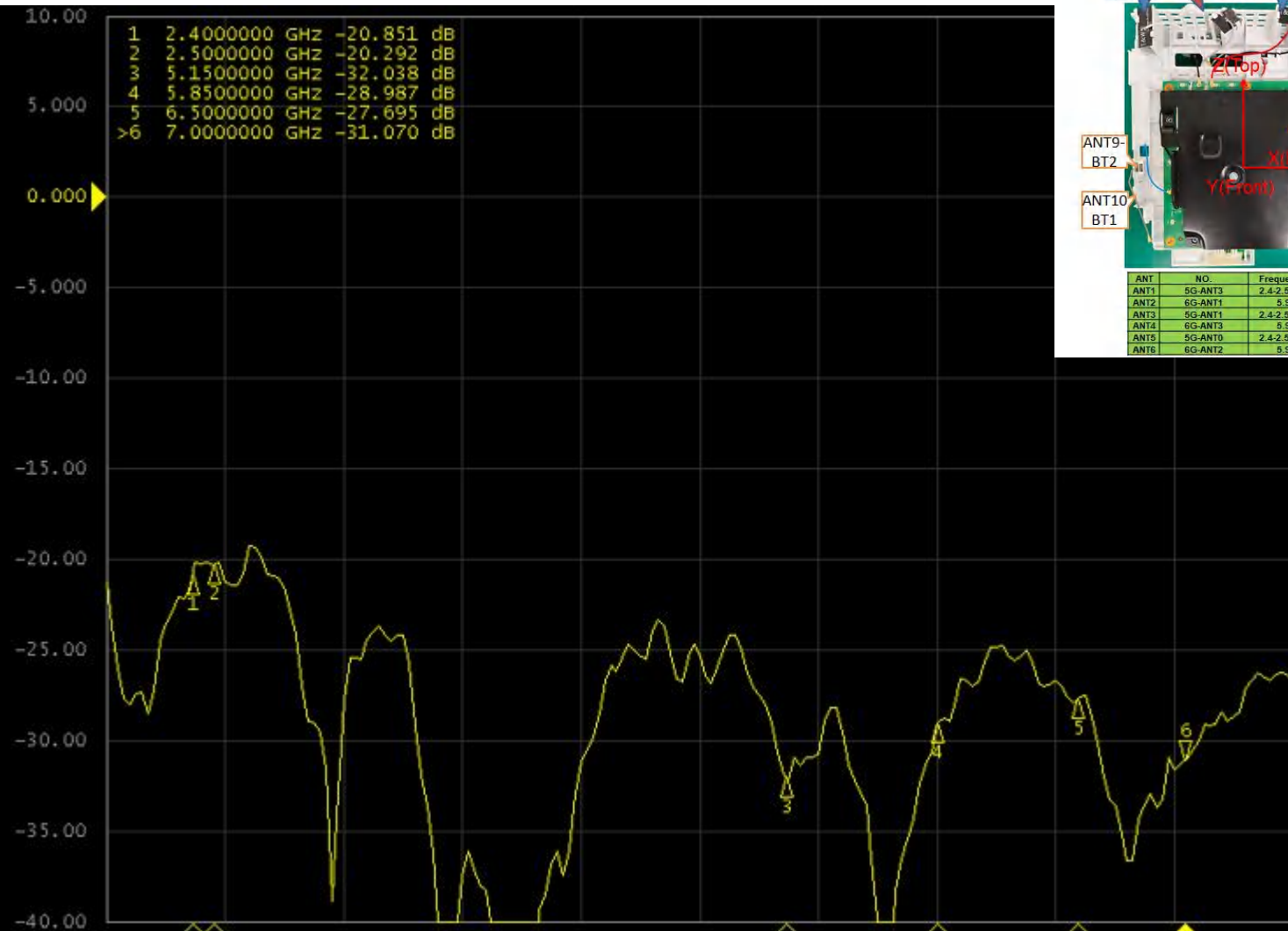
T&W



Isolation

ANT7&8

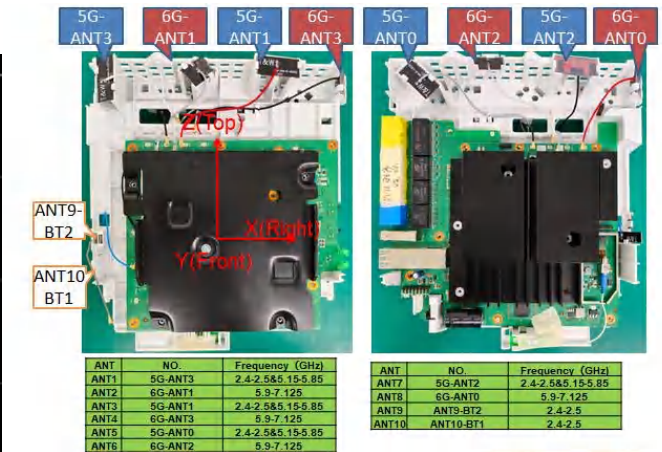
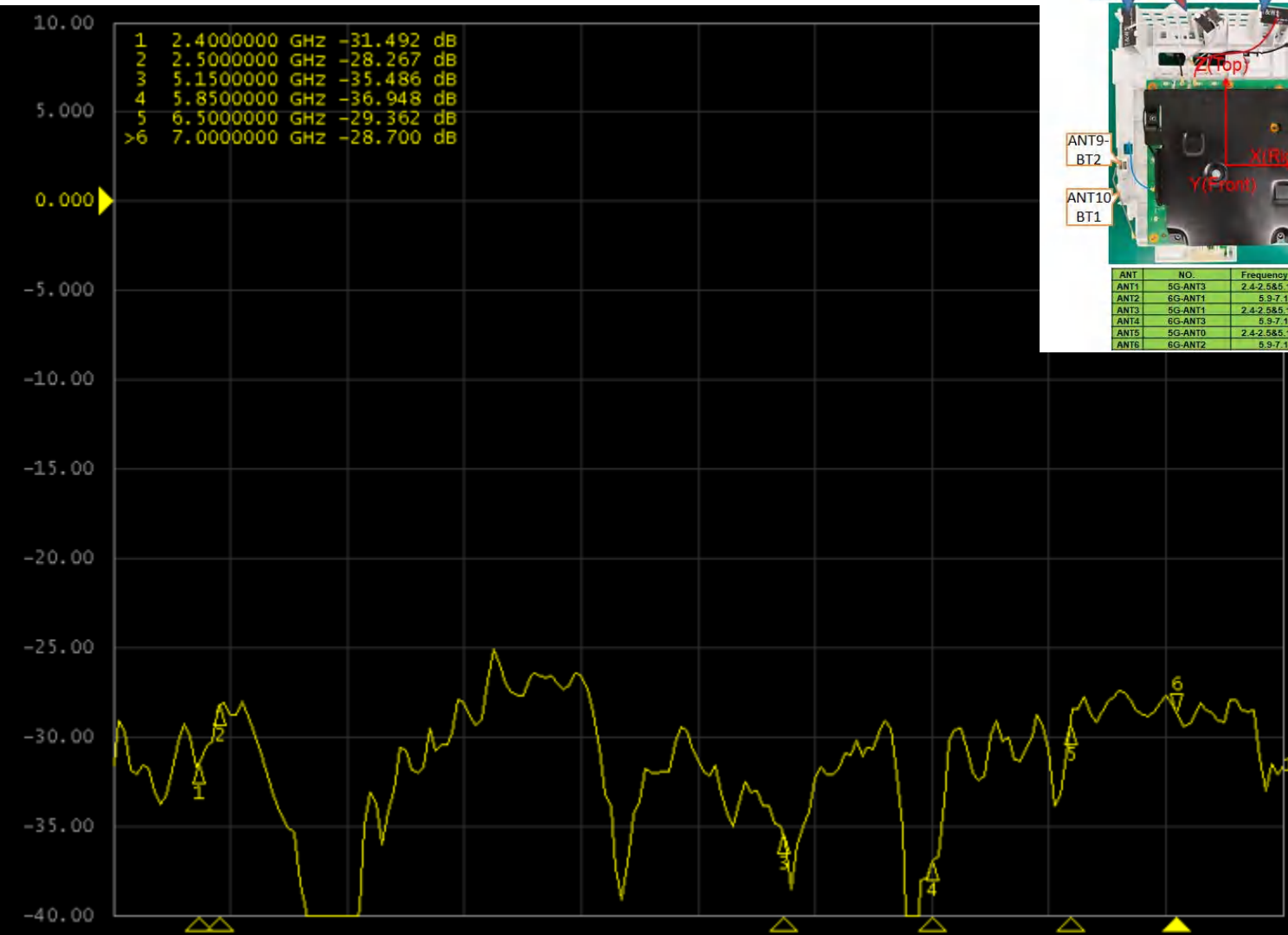
T&W



Isolation

ANT7&9

T&W



Isolation

ANT7&10

T&W

1	2.4000000	GHZ	-40.325	dB
2	2.5000000	GHZ	-36.651	dB
3	5.1500000	GHZ	-38.987	dB
4	5.8500000	GHZ	-42.599	dB
5	6.5000000	GHZ	-32.912	dB
>6	7.0000000	GHZ	-29.167	dB

0.000

-5.000

-10.00

-15.00

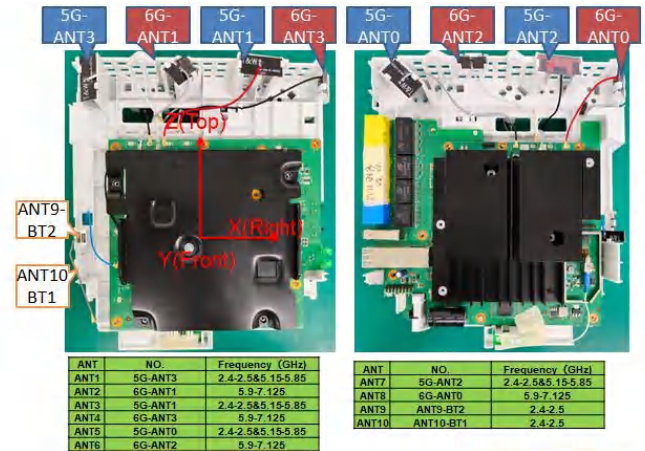
-20.00

-25.00

-30.00

-35.00

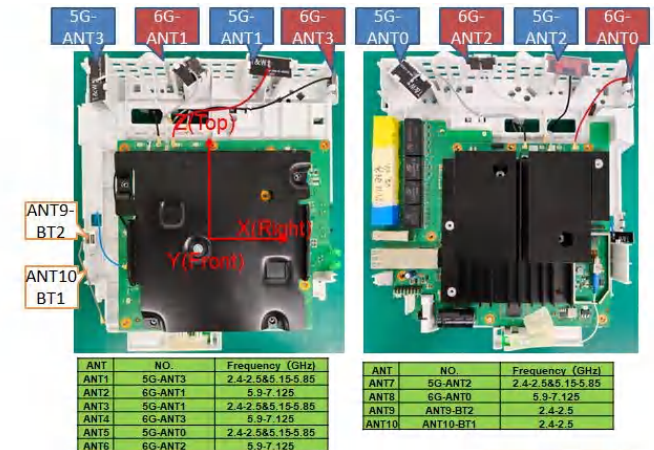
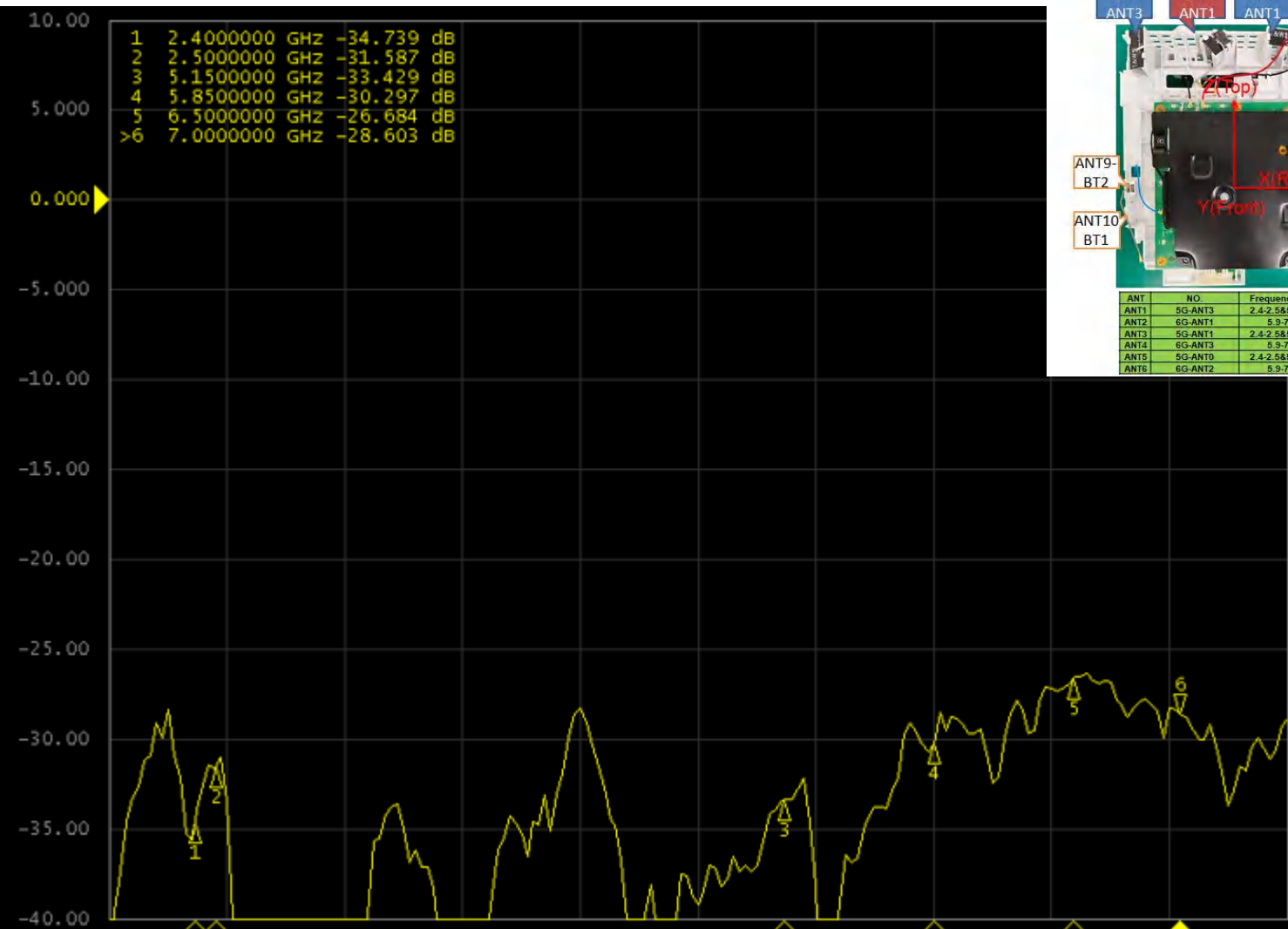
-40.00



Isolation

ANT8&9

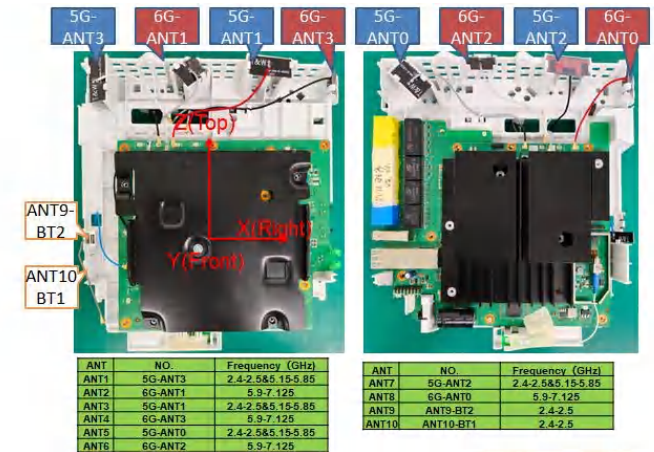
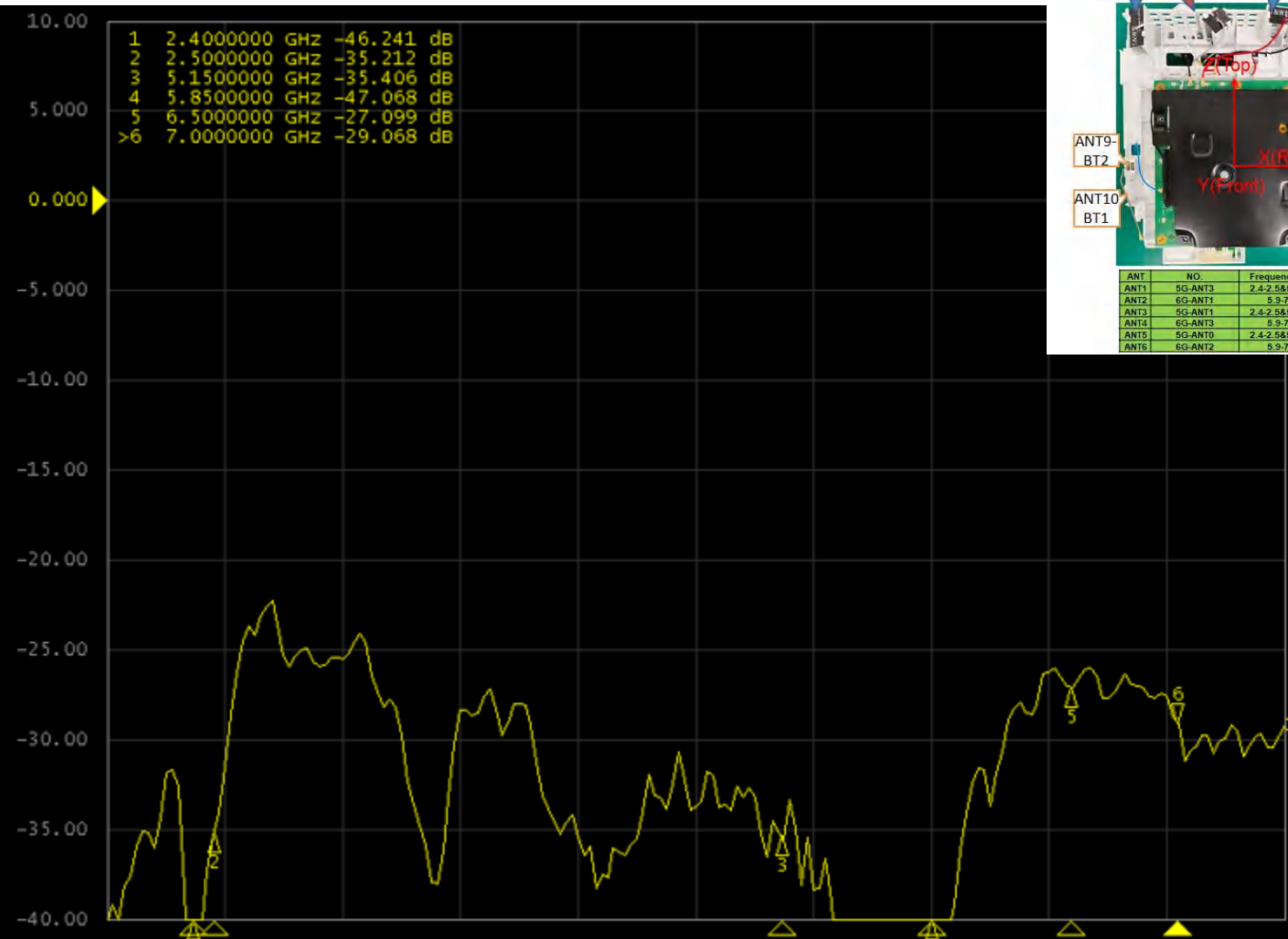
T&W



Isolation

ANT8&10

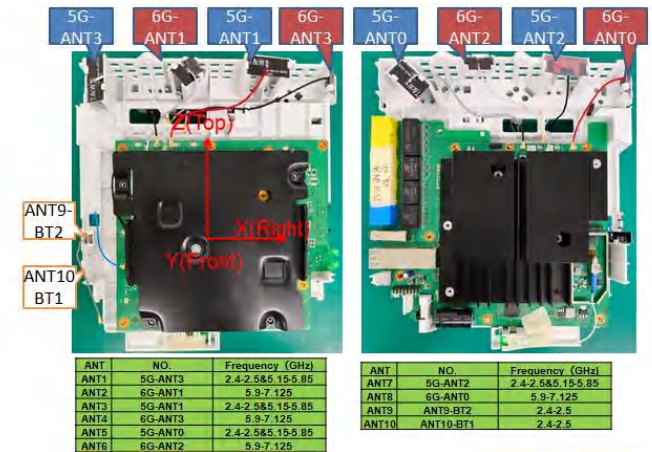
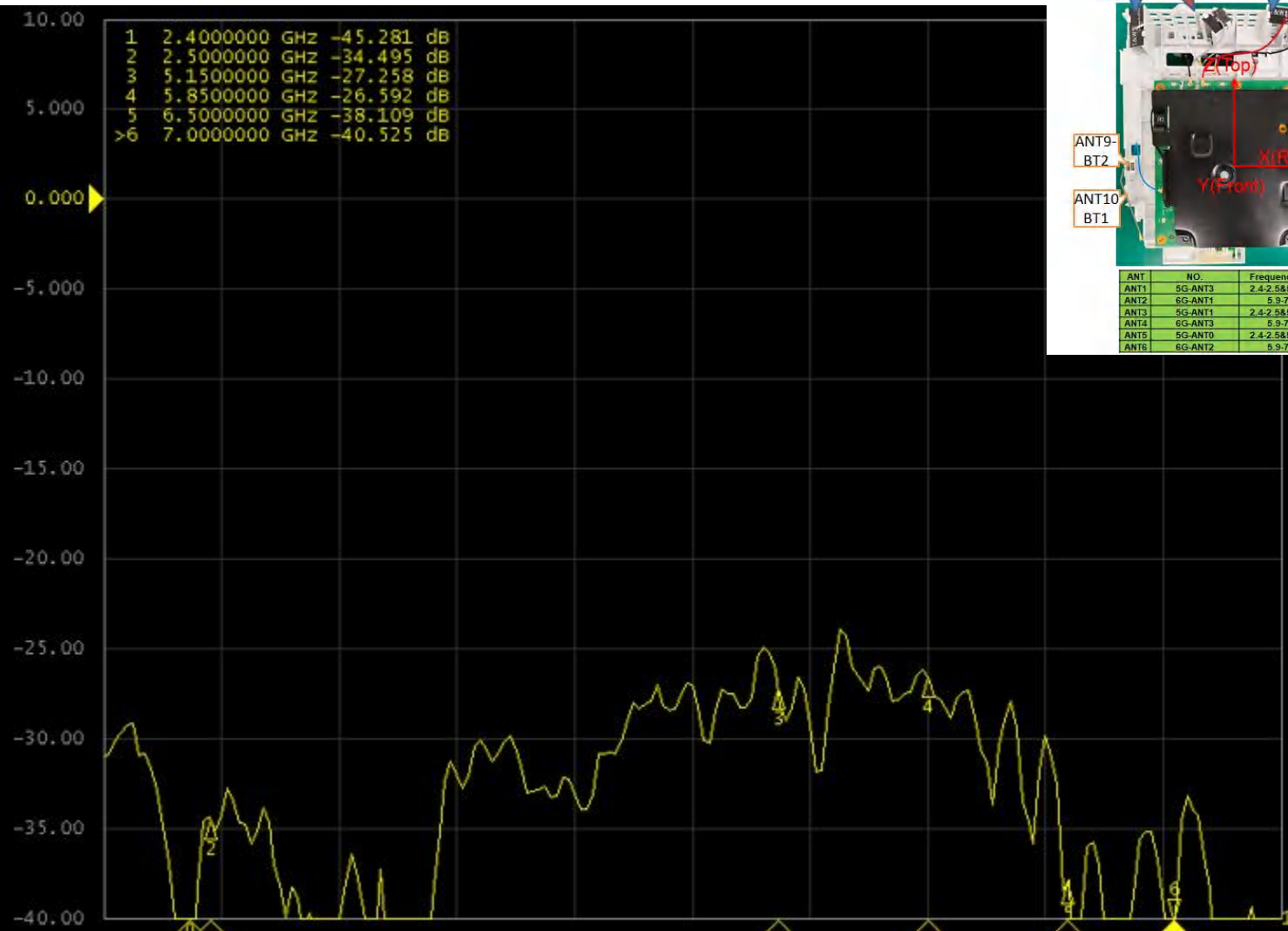
T&W



Isolation

ANT9&10

T&W



S parameter Test Result- Return loss

	2. 4GHz	2. 5GHz	5. 15GHz	5. 55G	5. 85GHz	5. 9125GHz	6. 5GHz	7. 125GHz
Ant1-2. 4&5G	-17. 5dB	-16. 8dB	-13. 5dB	-31. 8dB	-10. 8dB			
Ant2-6G						-18. 9dB	-10. 8dB	-10. 2dB
Ant3-2. 4&5G	-12dB	-18dB	-12dB	-13dB	-22dB			
Ant4-6G						-11. 2dB	-37. 9dB	-15. 9dB
Ant5-2. 4&5G	-25. 5dB	-17dB	-11dB	-14dB	-9. 9dB			
Ant6-6G						-18. 5dB	-13. 3dB	-12. 9dB
Ant7-2. 4&5G	-21dB	-11dB	-11dB	-34dB	-13dB			
Ant8-6G						-12dB	-16dB	-12dB
BT Ant9-2. 4G	-19dB	-13dB						
BT Ant10-2. 4G	-14dB	-13dB						

T&W

[illegible]

Measurement Condition

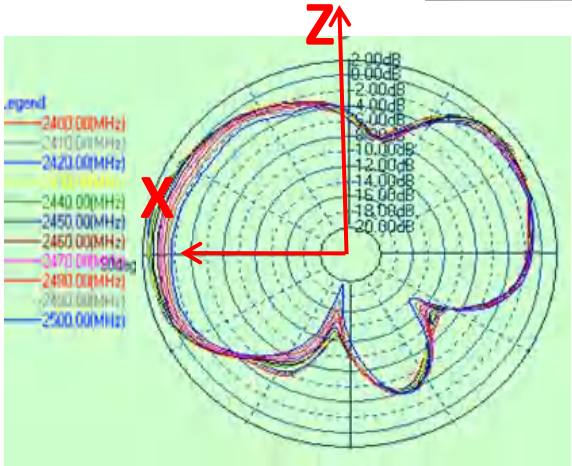
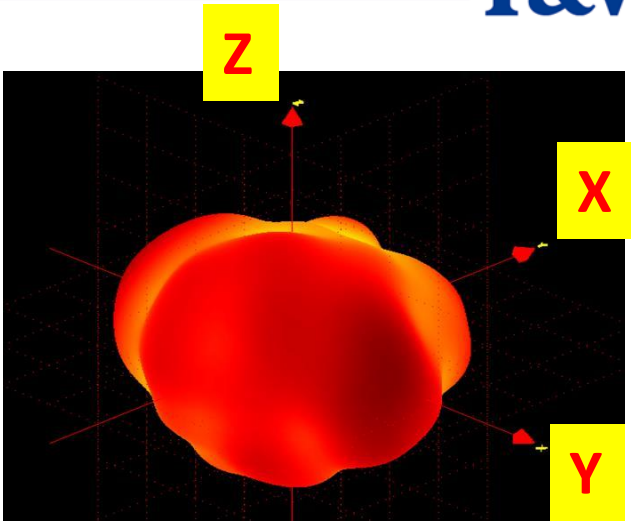
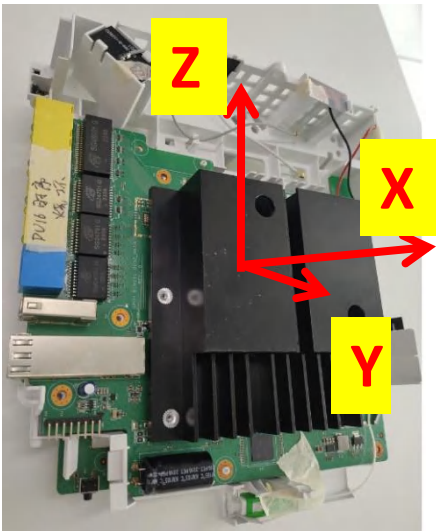


Microwave anechoic chamber

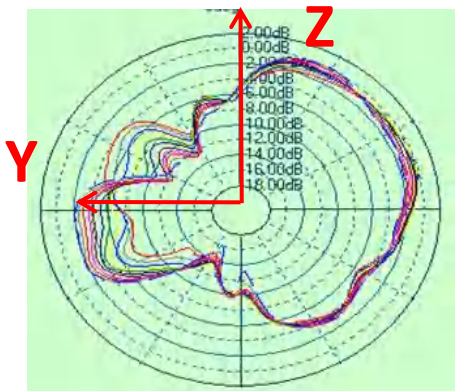
2D/3D Radiation Pattern



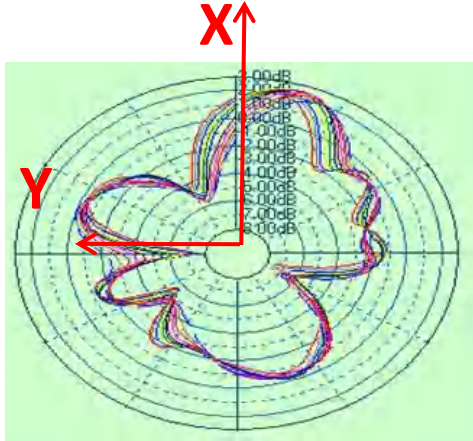
Ant1-2.4G



E1 (Phi=0)



E2 (Phi=90)

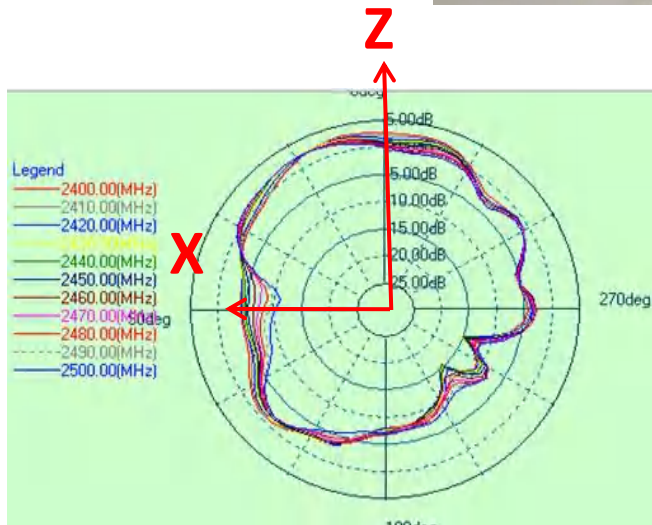
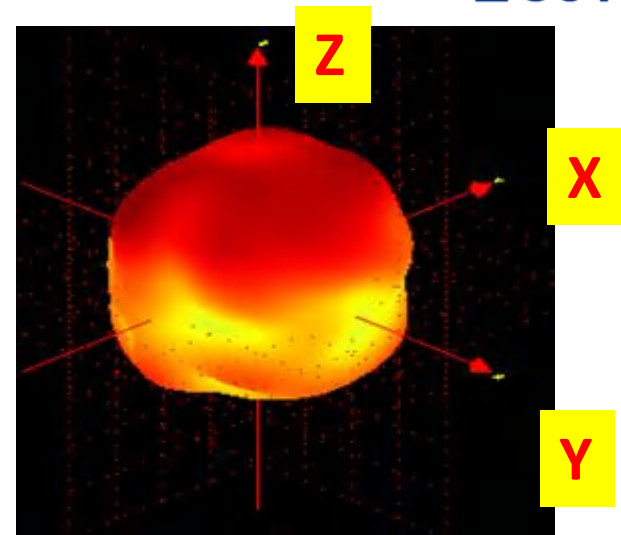
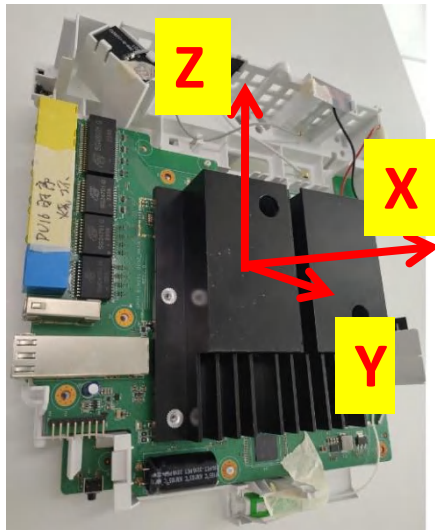


H (Theta=90)

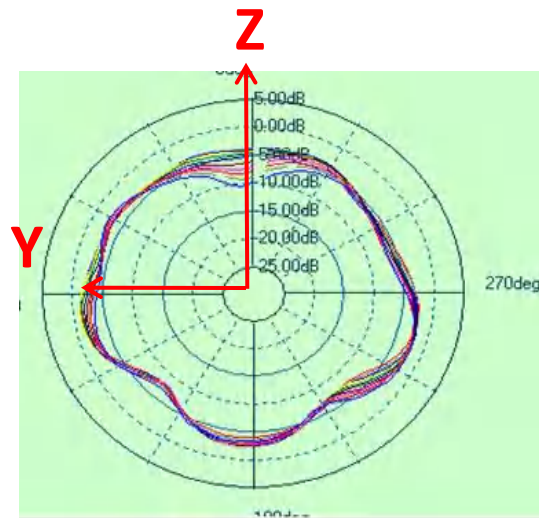
2D/3D Radiation Pattern

T&W

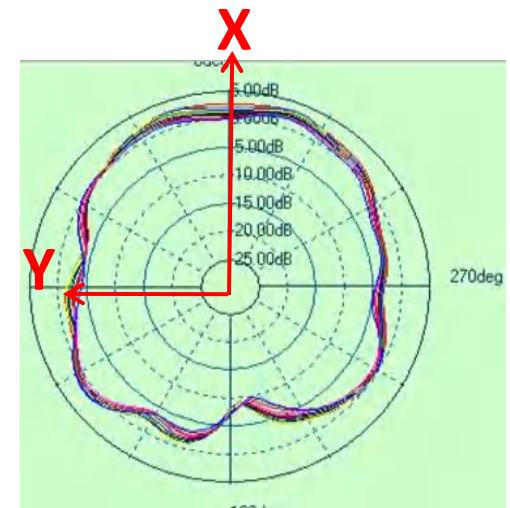
Ant3-2.4G



E1 ($\Phi=0$)



E1 ($\Phi=90$)

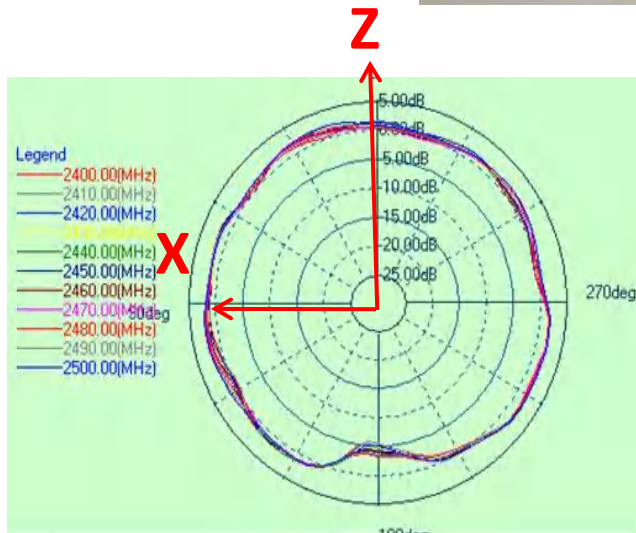
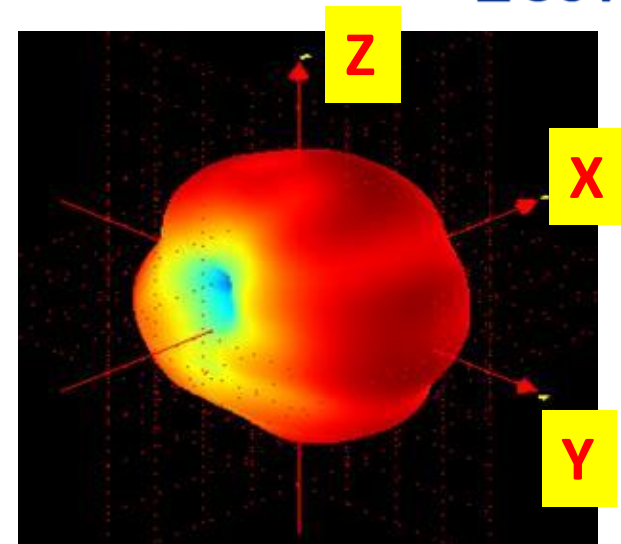
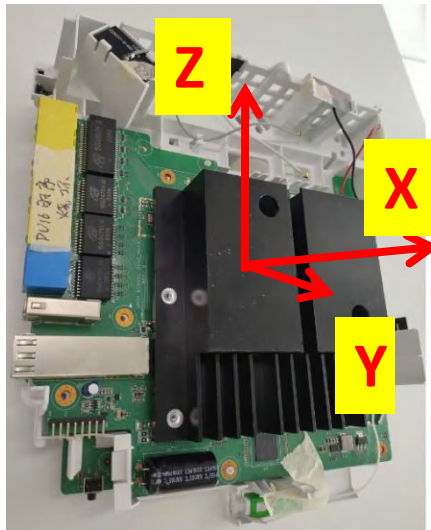


H ($\Theta=90$)

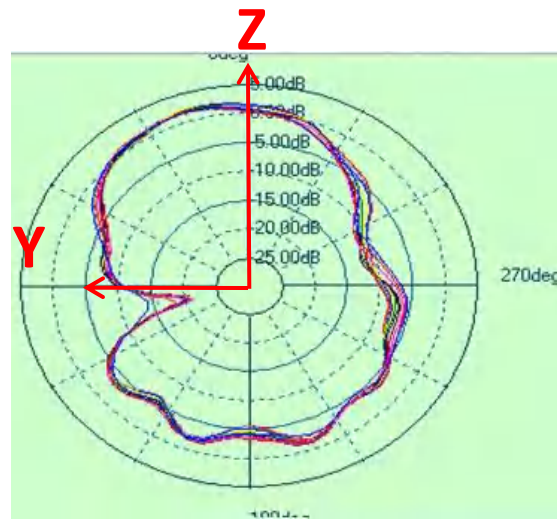
2D/3D Radiation Pattern

T&W

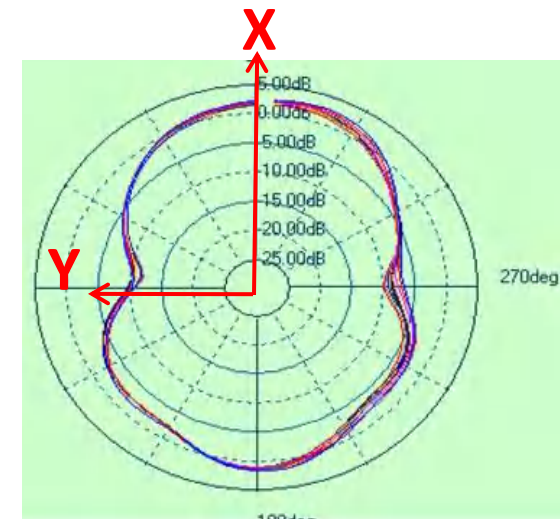
Ant5-2.4G



E1 ($\Phi=0$)



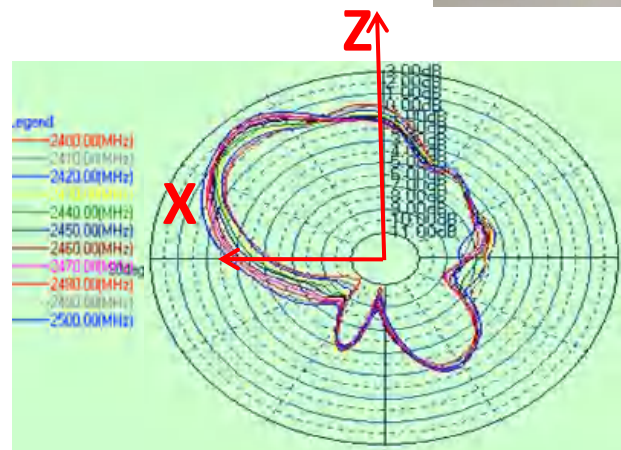
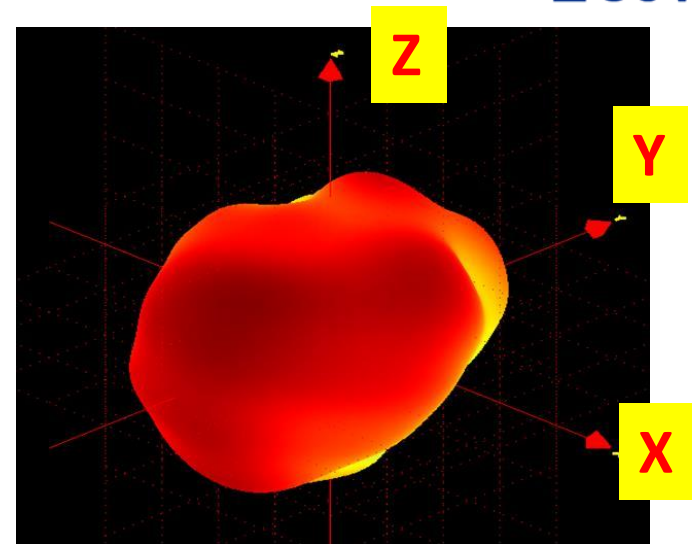
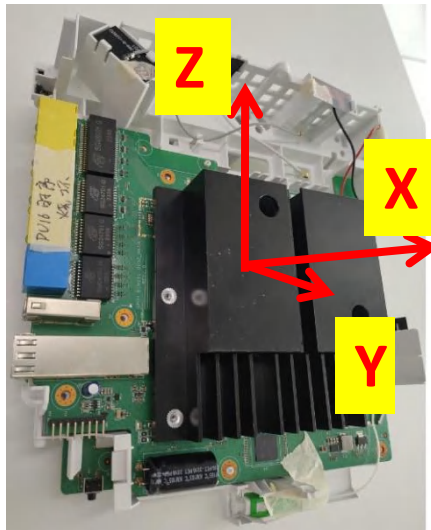
E1 ($\Phi=90$)



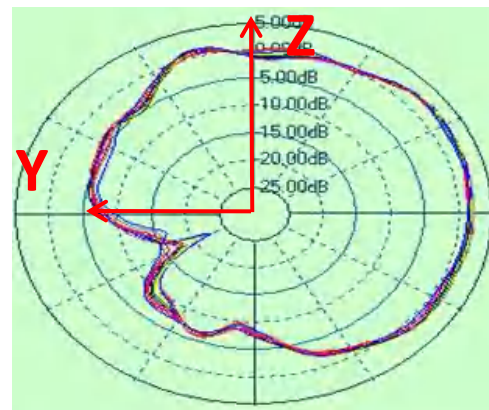
H ($\Theta=90$)

2D/3D Radiation Pattern

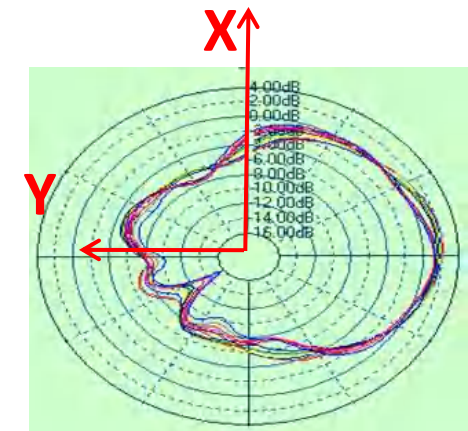
Ant7-2.4G



E1 ($\Phi=0$)



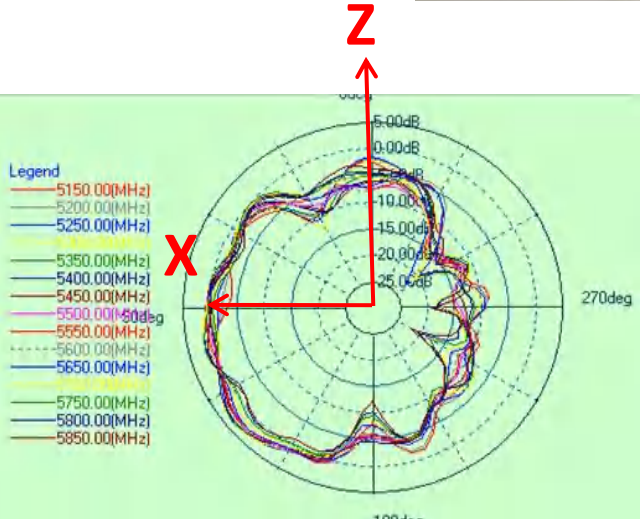
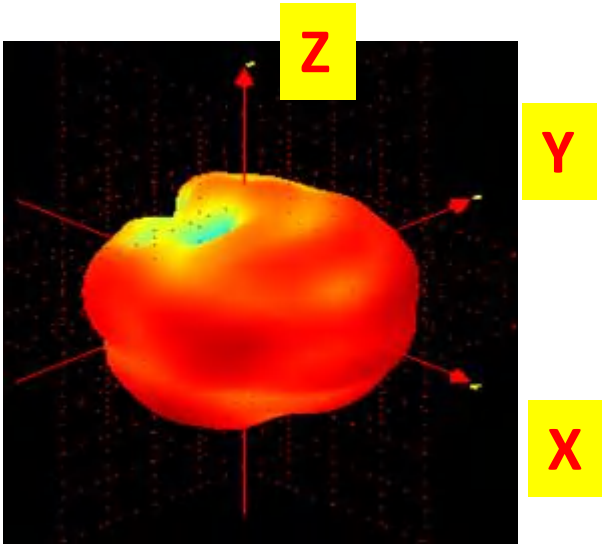
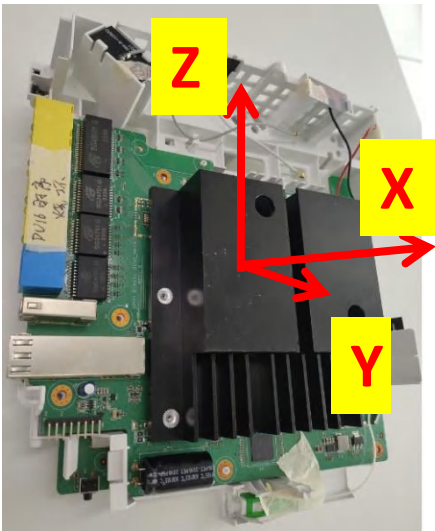
E2 ($\Phi=90$)



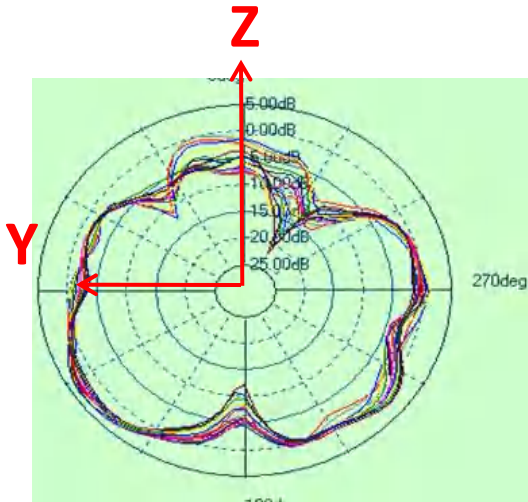
H ($\Theta=90$)

2D/3D Radiation Pattern

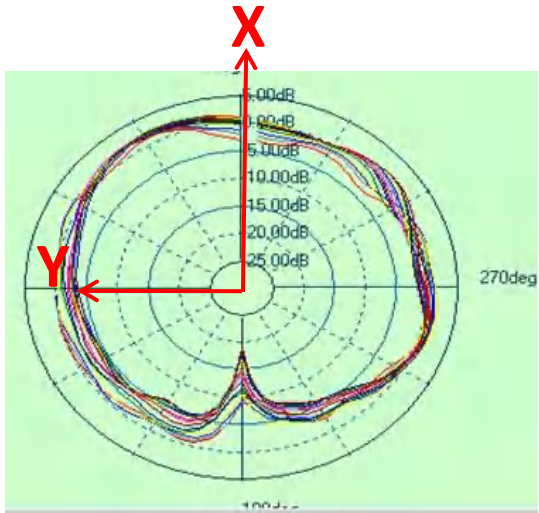
Ant1-5G



E1 (Phi=0)



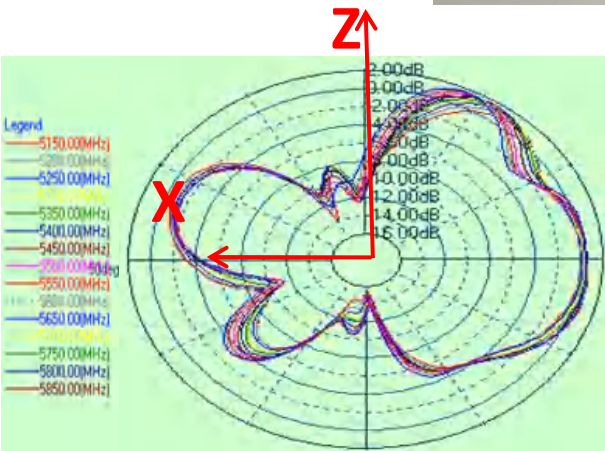
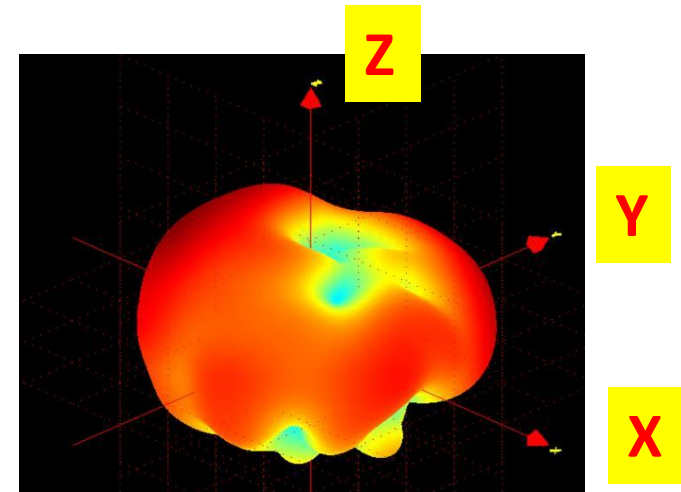
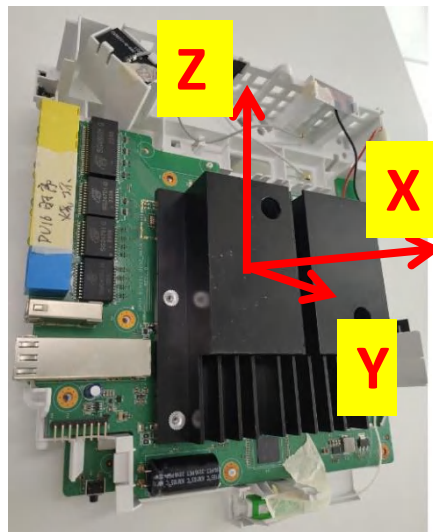
E1 (Phi=90)



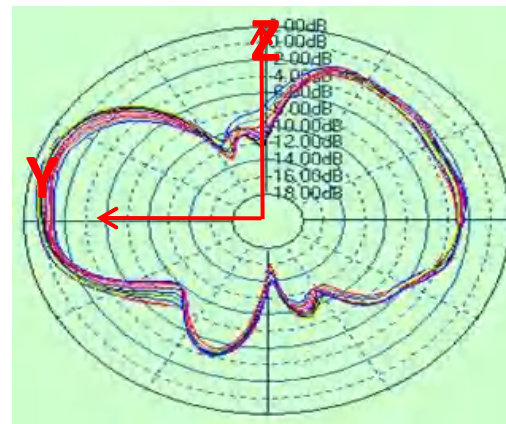
H (Theta=90)

2D/3D Radiation Pattern

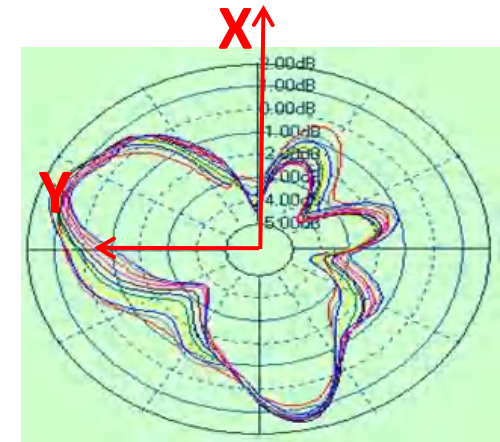
Ant3-5G



E1 (Phi=0)



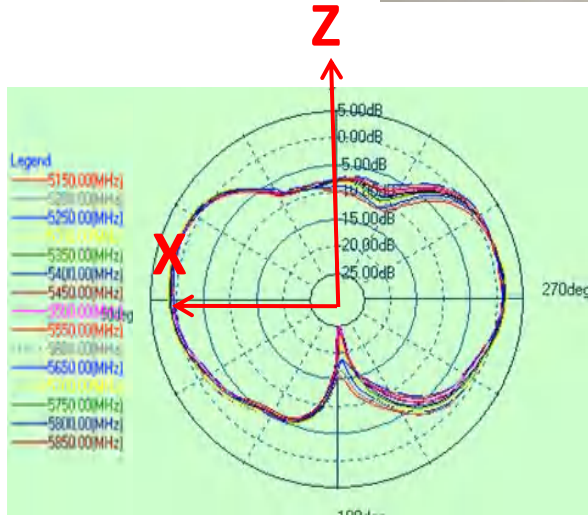
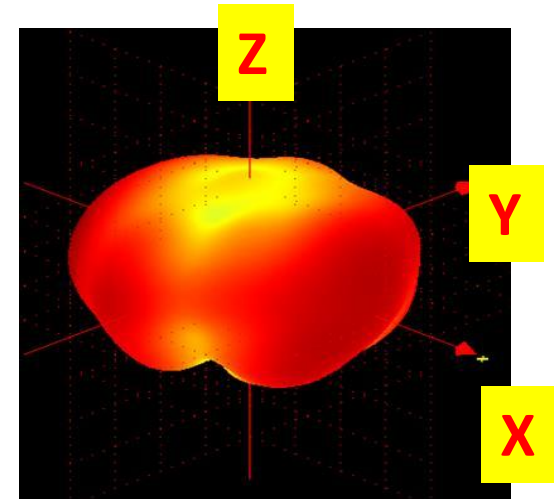
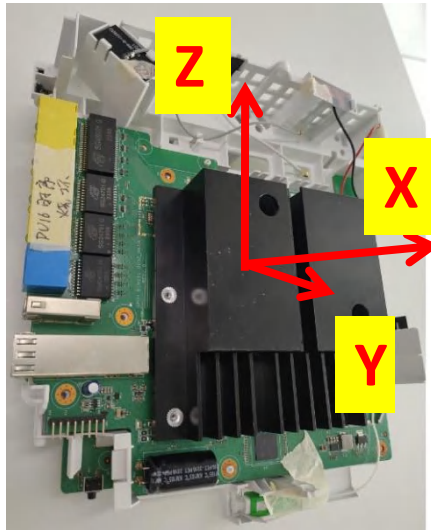
E2 (Phi=90)



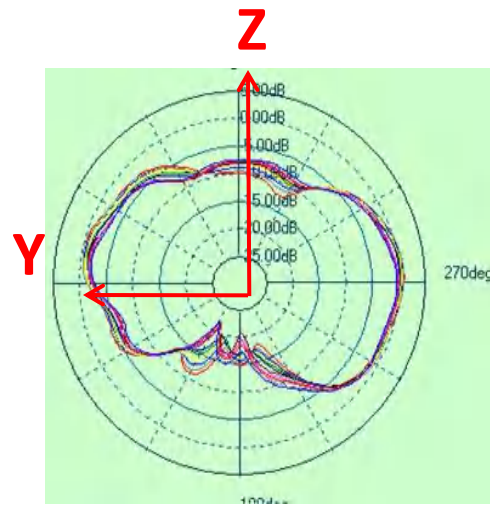
H (Theta=90)

2D/3D Radiation Pattern

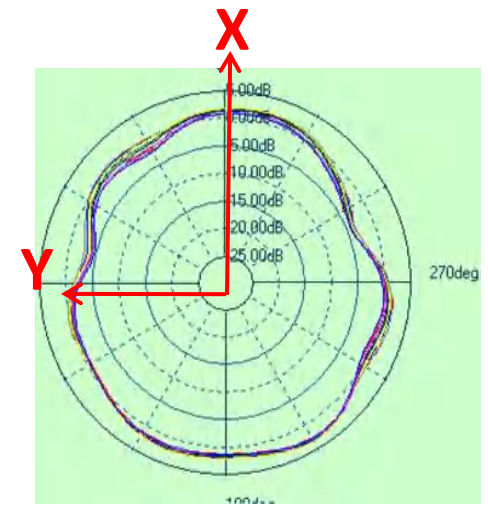
Ant5-5G



E1 (Phi=0)



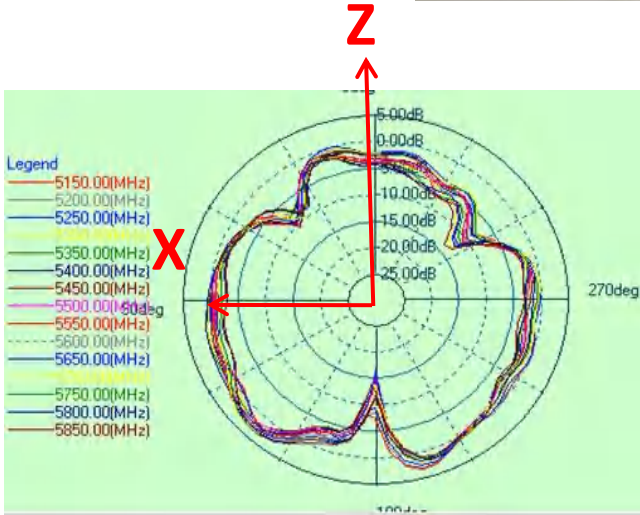
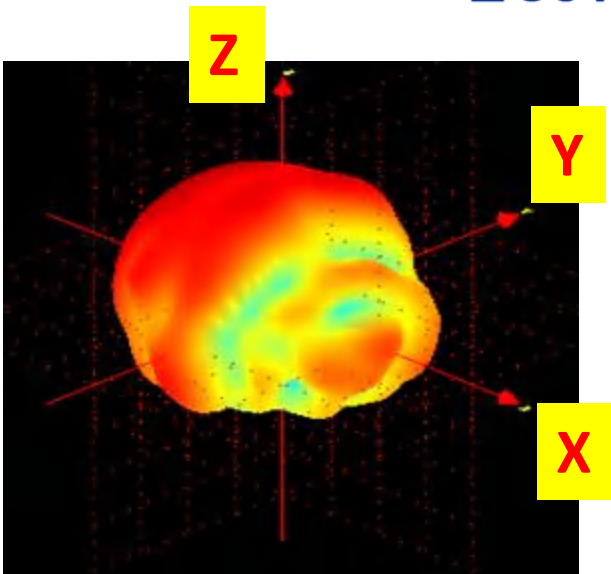
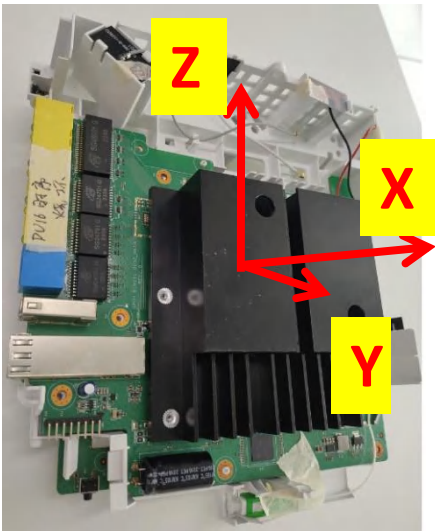
E1 (Phi=90)



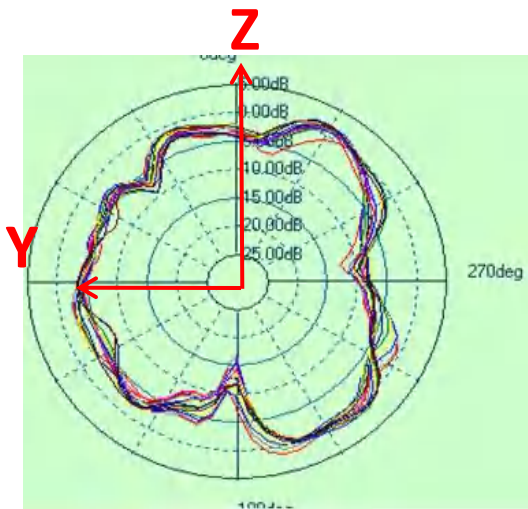
H (Theta=90)

2D/3D Radiation Pattern

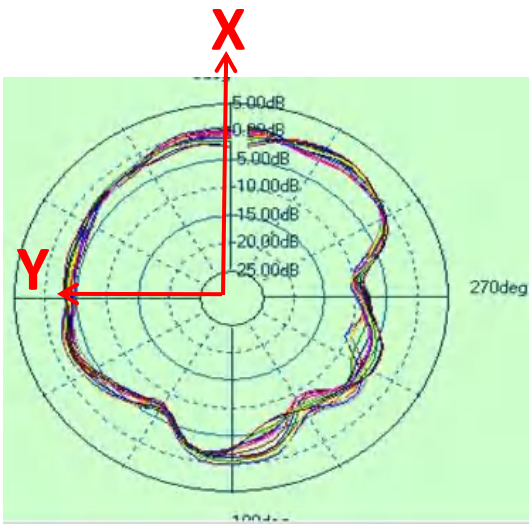
Ant7-5G



E1 ($\Phi=0$)



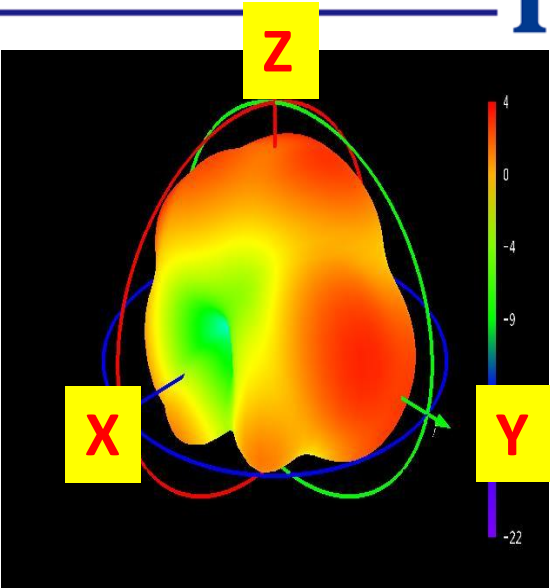
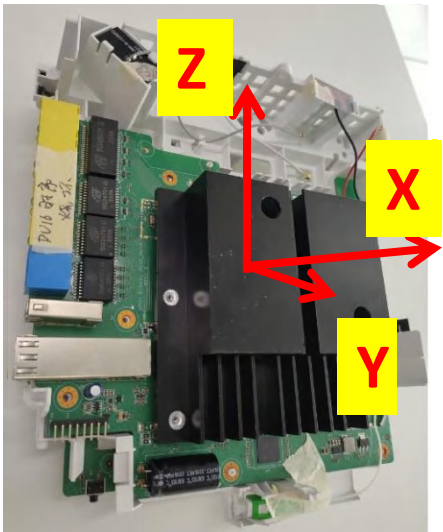
E1 ($\Phi=90$)



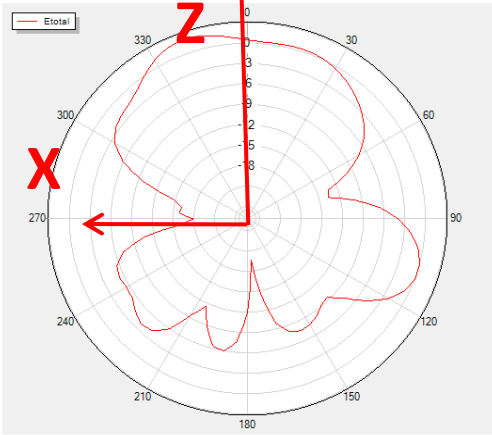
H ($\Theta=90$)

2D/3D Radiation Pattern

Ant2-6G

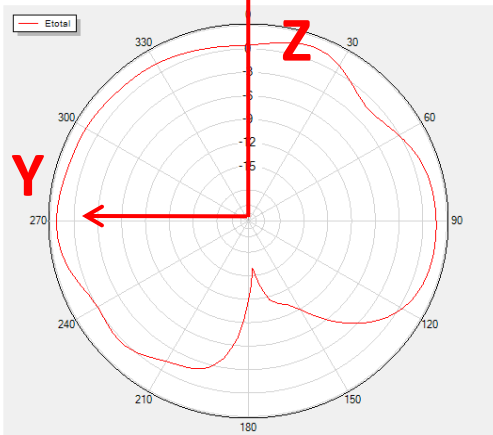


Phi=0 Freq=6525MHz



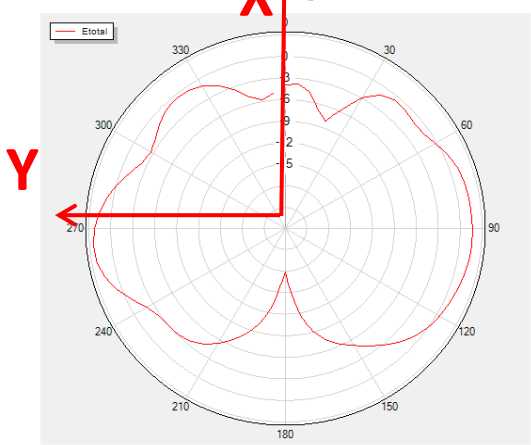
E1 (Phi=0)

Phi=90 Freq=6525MHz



E2 (Phi=90)

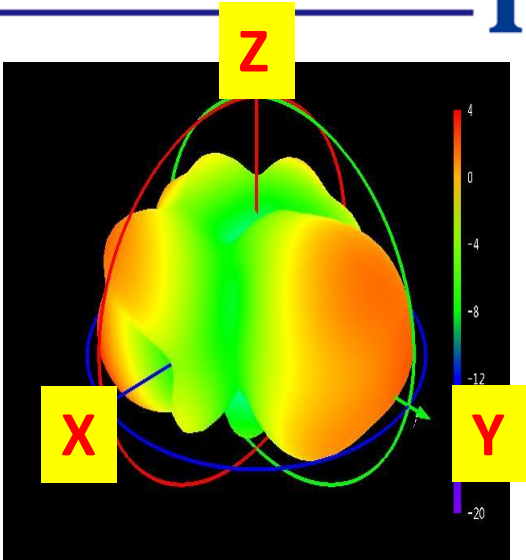
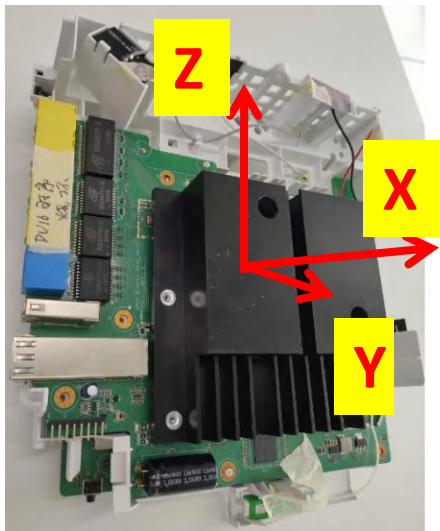
Theta=90 Freq=6525MHz



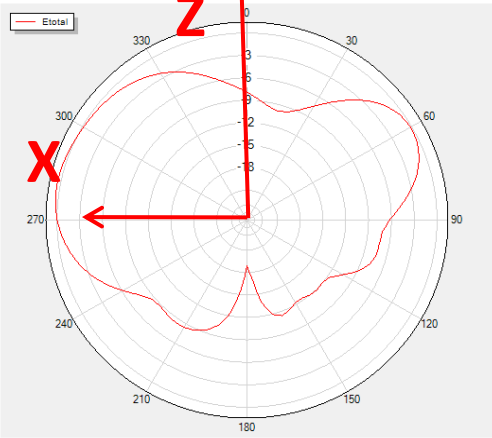
H (Theta=90)

2D/3D Radiation Pattern

Ant4-6G

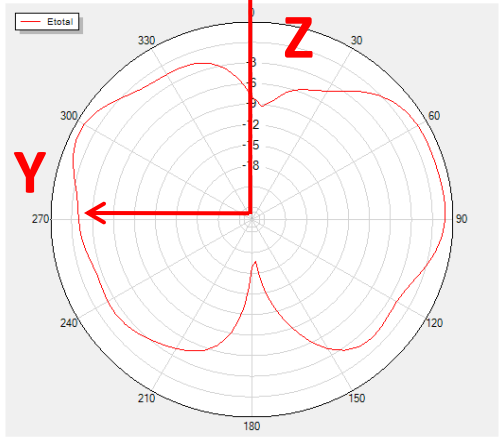


Phi=0 Freq=6525MHz



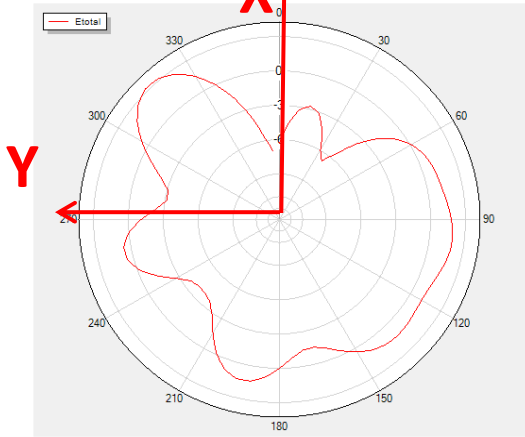
E1 (Phi=0)

Phi=90 Freq=6525MHz



E2 (Phi=90)

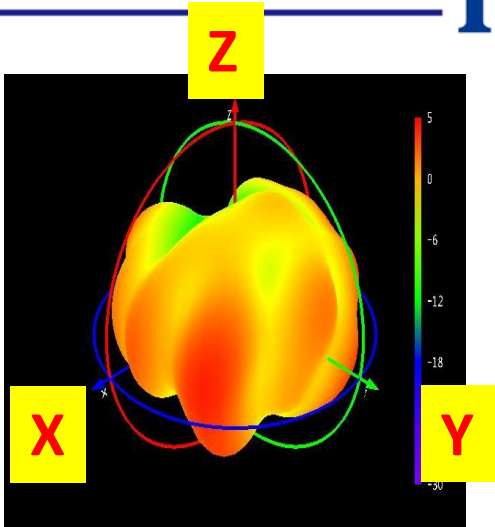
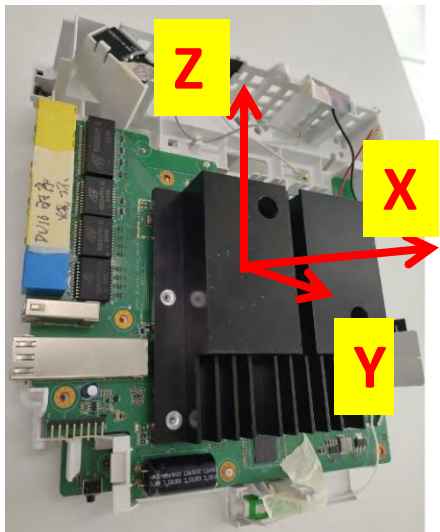
Theta=90 Freq=6525MHz



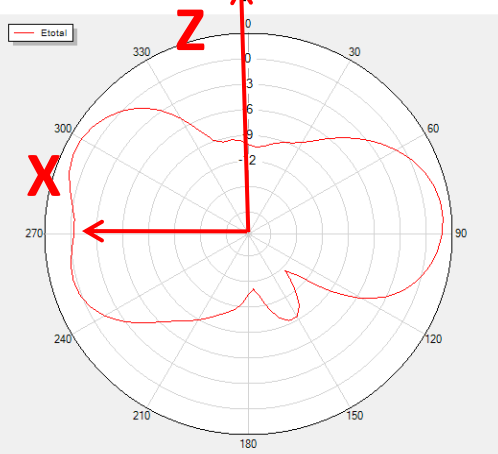
H (Theta=90)

2D/3D Radiation Pattern

Ant6-6G

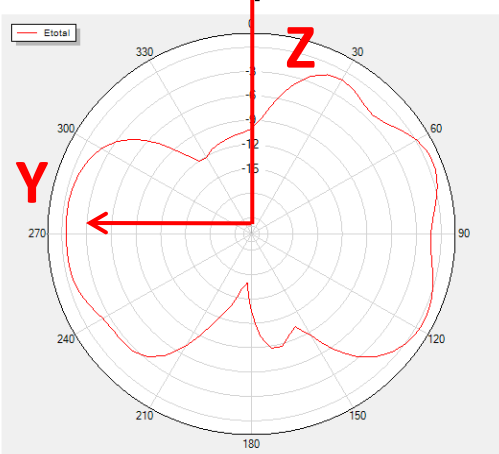


Phi=0 Freq=6525MHz



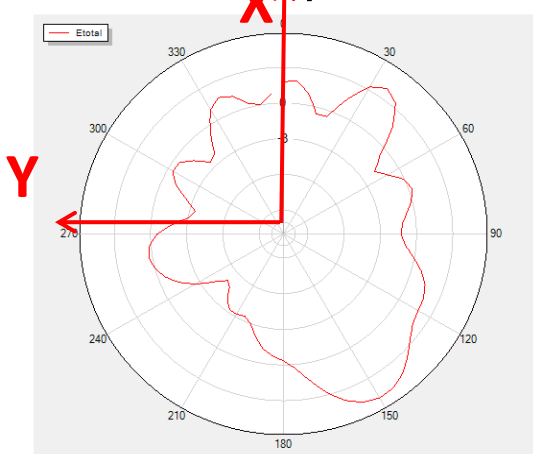
E1 (Phi=0)

Phi=90 Freq=6525MHz



E2 (Phi=90)

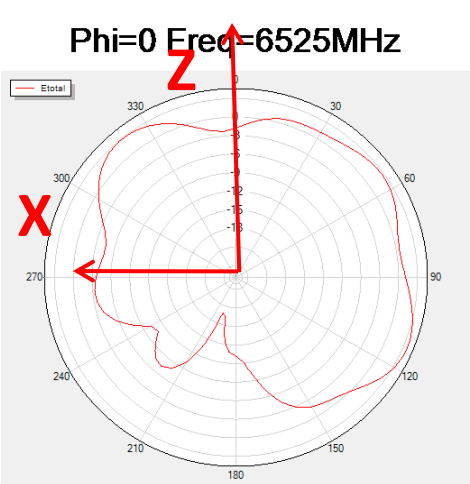
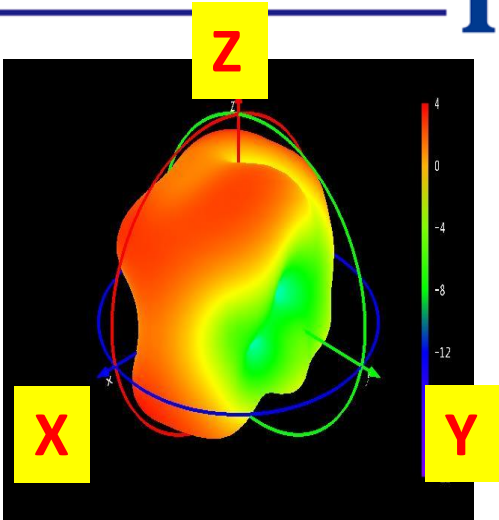
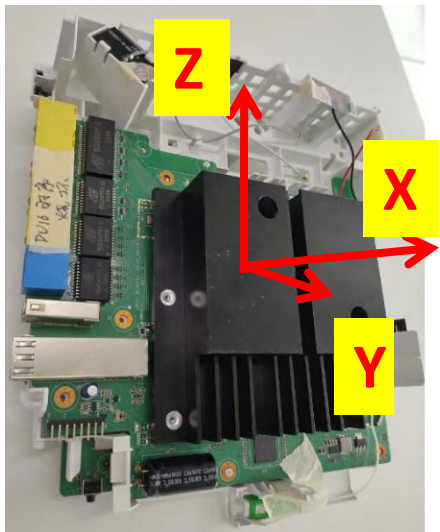
Theta=90 Freq=6525MHz



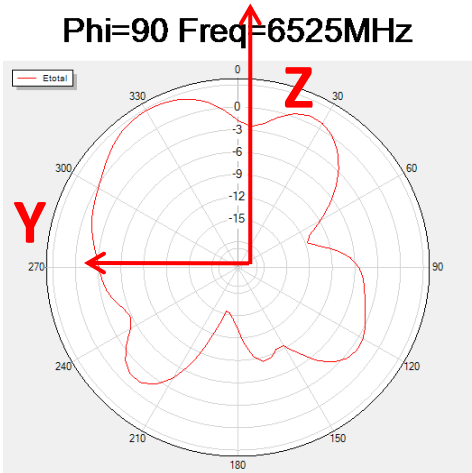
H (Theta=90)

Radiation Pattern

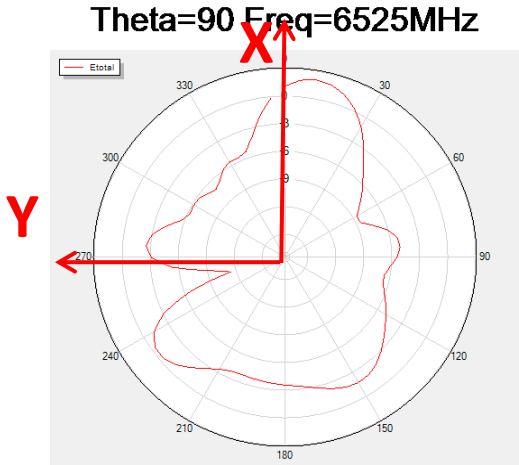
Ant8-6G



E1 (Phi=0)



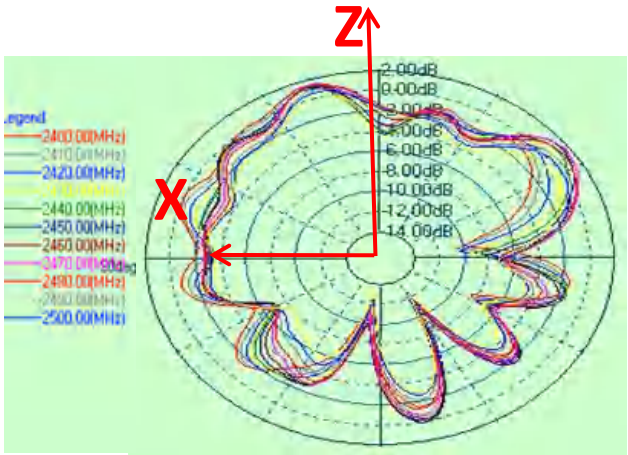
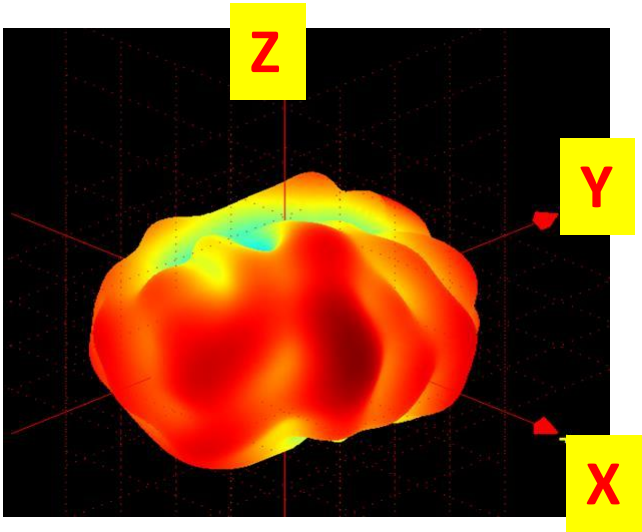
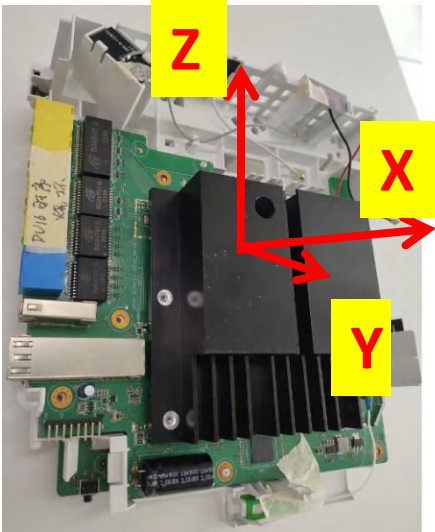
E2 (Phi=90)



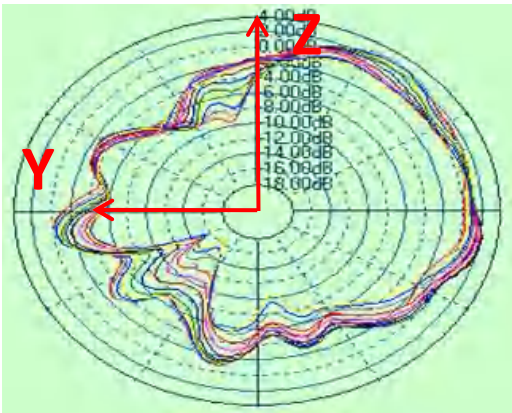
H (Theta=90)

2D/3D Radiation Pattern

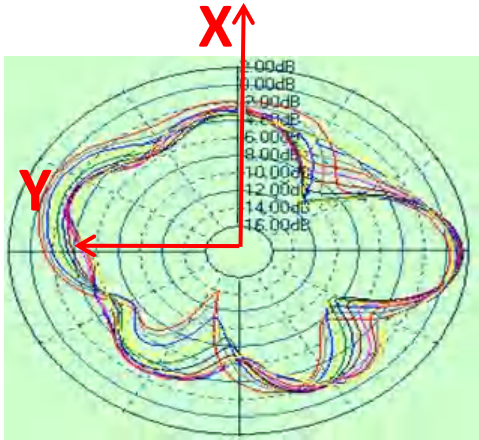
BT ANT9-2.4G



E1 (Phi=0)



E2 (Phi=90)

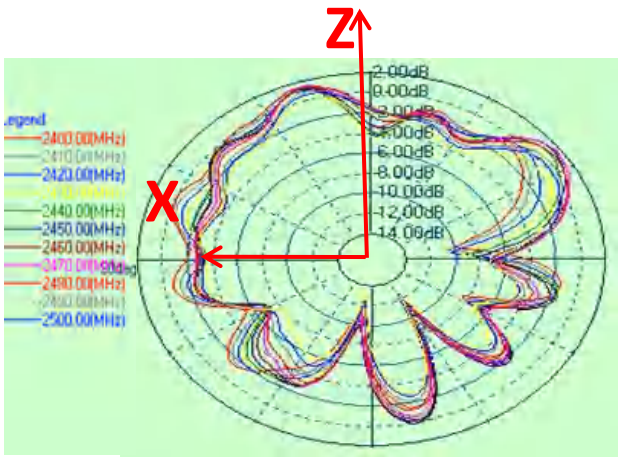
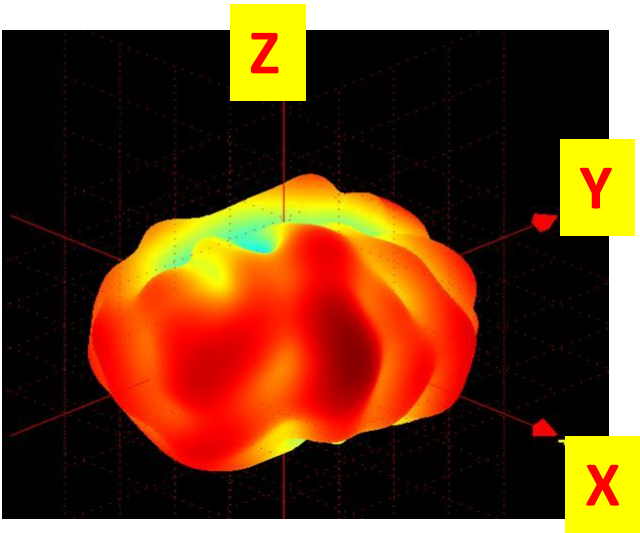
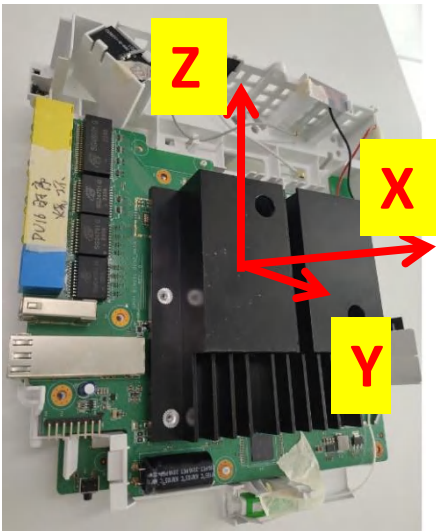


H (Theta=90)

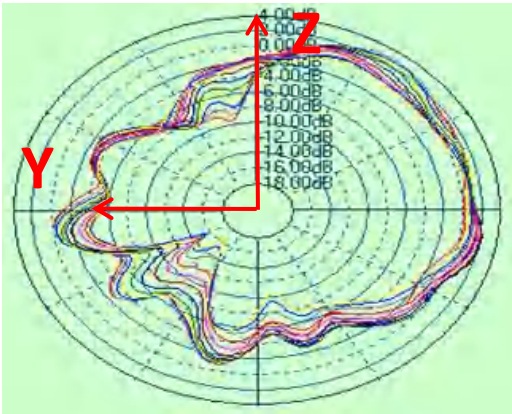
2D/3D Radiation Pattern



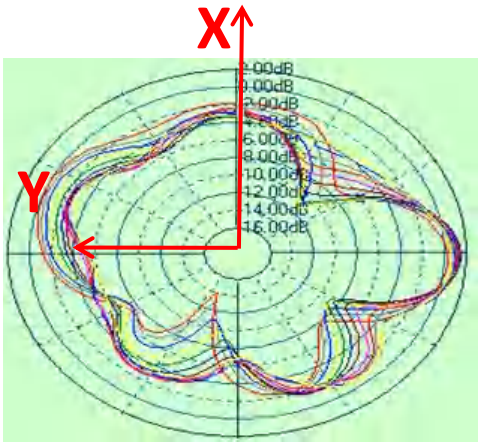
BT ANT10-2.4G



E1 (Phi=0)



E2 (Phi=90)



H (Theta=90)

Efficiency and Peak Gain



Test Result

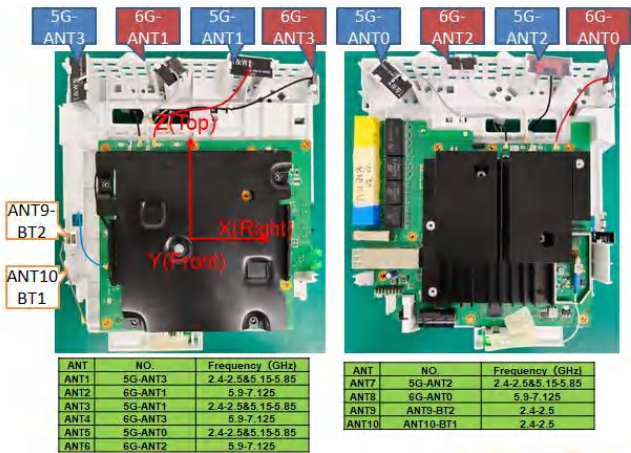
ANT	Frequency (GHz)	Gain (dBi)	Efficiency
ANT1	2.45	1.22	74.8%
	5.5	1.03	66.4%
ANT2	6.5	1.1	67%
ANT3	2.45	1.31	73.6%
	5.5	1.15	67.8%
ANT4	6.5	1.09	63.2%
ANT5	2.45	1.28	69.9%
	5.5	1.18	64.1%
ANT6	6.5	1.06	69.2%
ANT7	2.45	1.32	74.6%
	5.5	1.19	68.4%
ANT8	6.5	1.17	68.8%
ANT9	2.45	1.25	73.5%
ANT10	2.45	1.17	75.3%

Uncorrelated Directional Gain(4S4T)

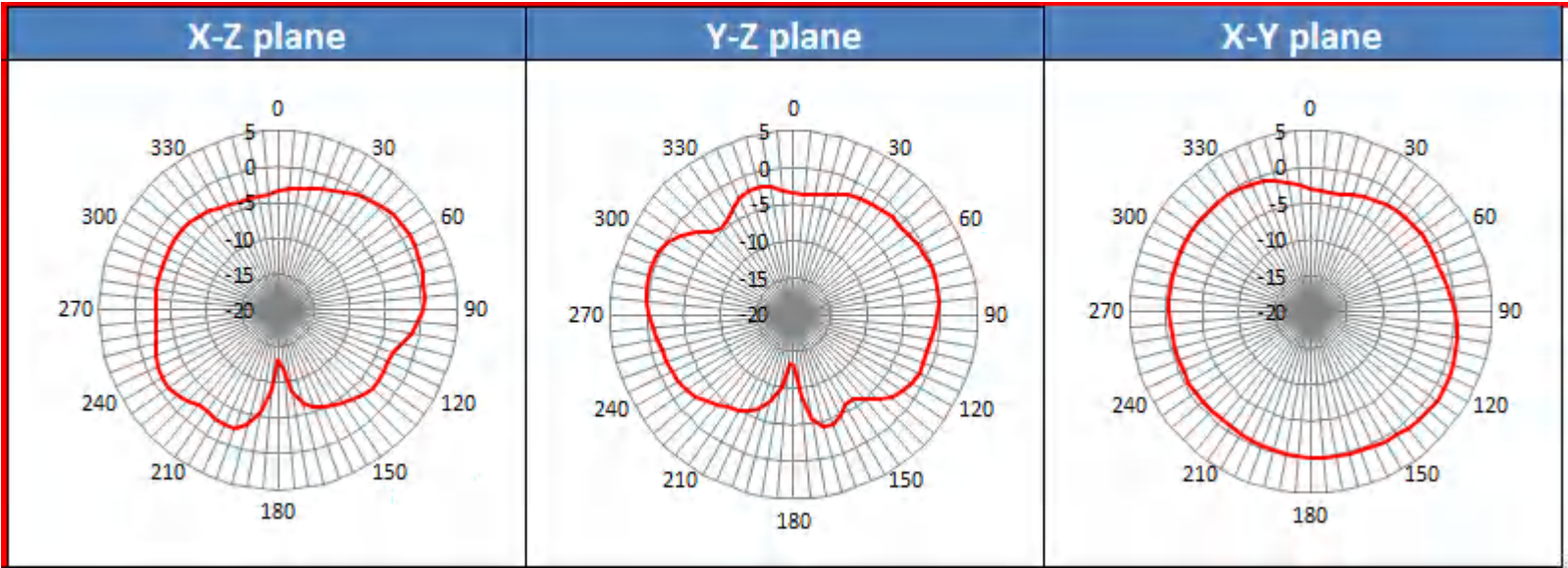


Uncorrelated Directional Gain(4S4T)@2.45GHz

	Peak Gain(dBi)
Unco DG(4S4T) Total	1.28



2D Radiation Pattern:

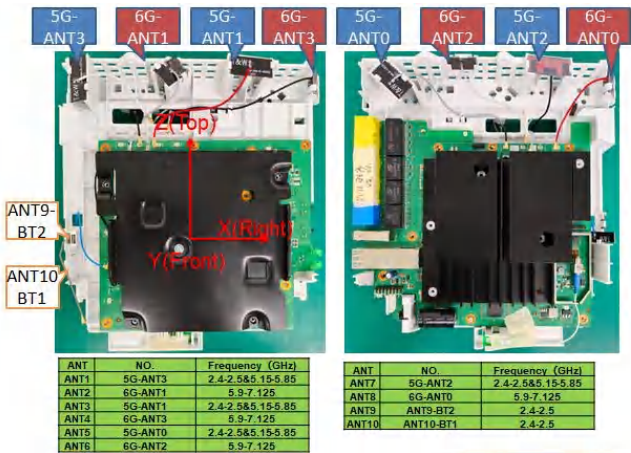


Uncorrelated Directional Gain(4S4T)

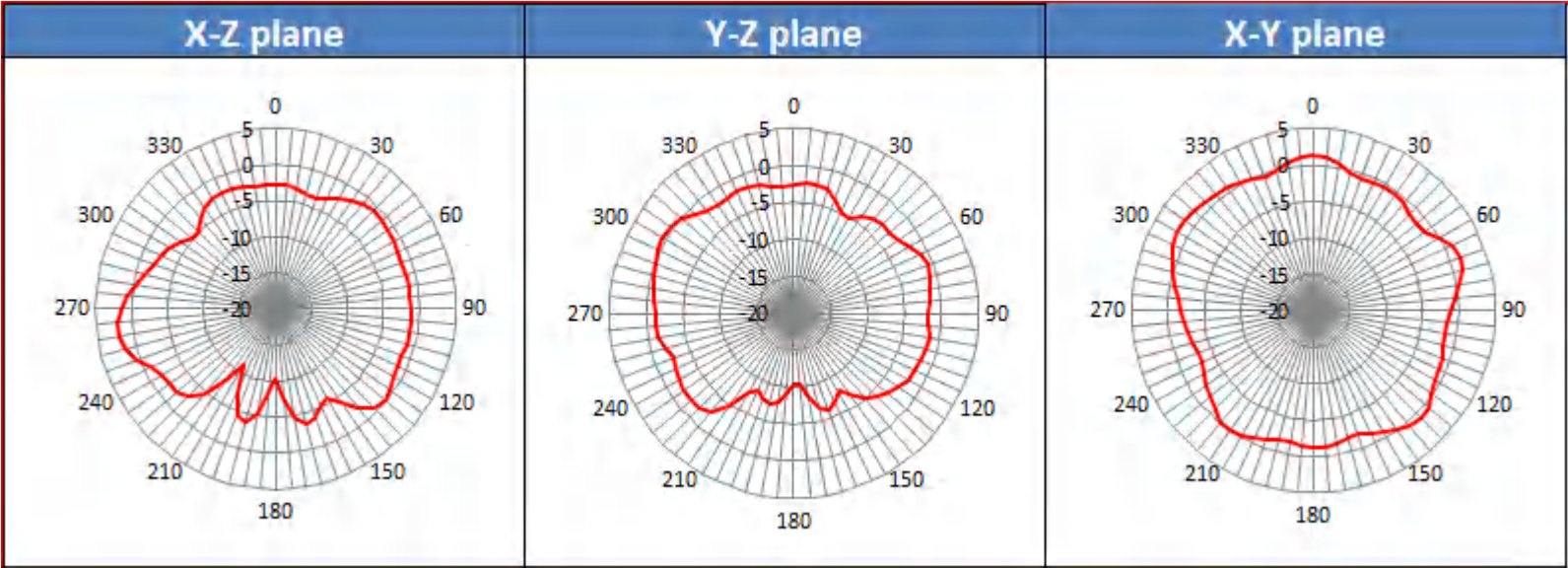


Uncorrelated Directional Gain(4S4T)@5.5GHz

	Peak Gain(dBi)
Unco DG(4S4T) Total	1.14



2D Radiation Pattern:

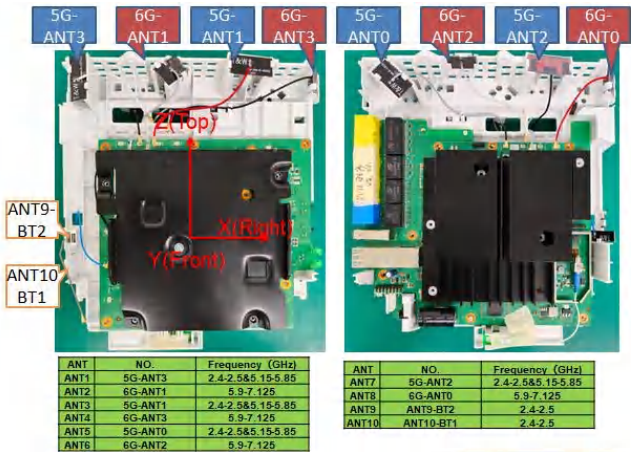


Uncorrelated Directional Gain(4S4T)

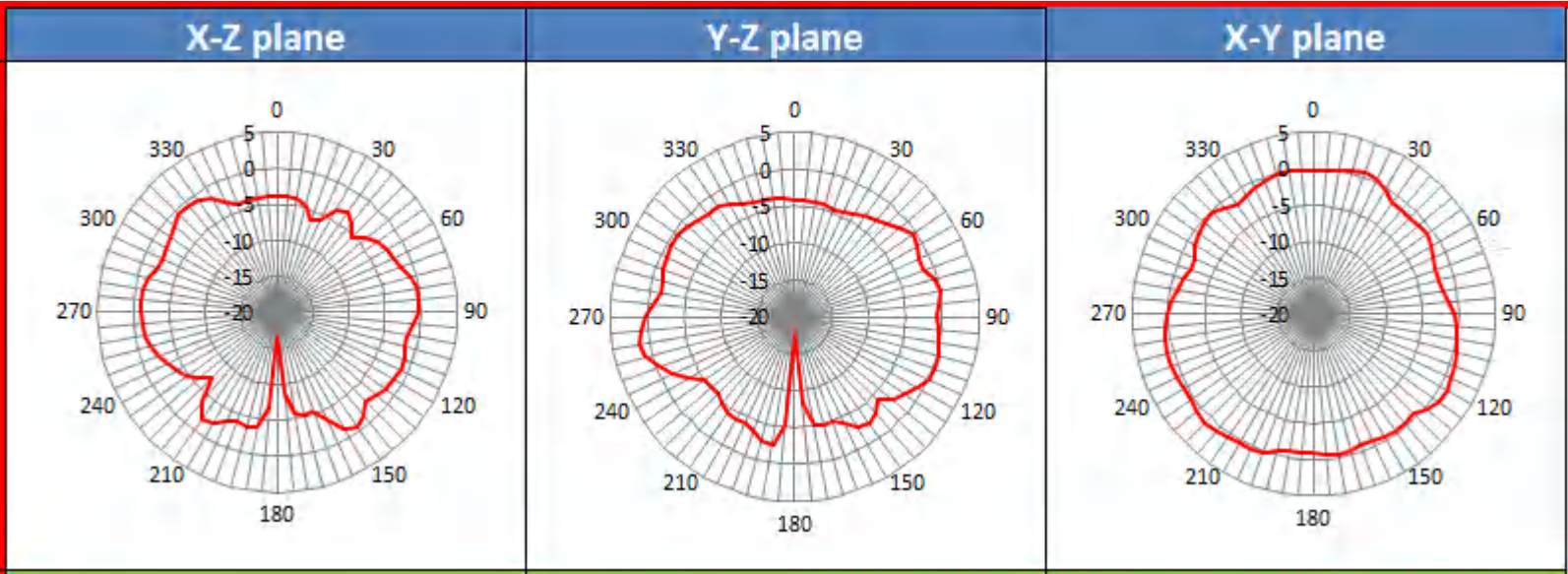


Uncorrelated Directional Gain(4S4T)@6.5GHz

	Peak Gain(dBi)
Unco DG(4S4T) Total	1.11



2D Radiation Pattern:



Directional Gain



ANT	NO.	GAIN	Angle	Frequency(GHz)	Correlated	Uncorrelated
2G	ANT1	1.087dBi	Phi35° Theta 215°	2.45	3.87	1.28
	ANT3	-3.104dBi				
	ANT5	-3.897dBi				
	ANT7	-3.695dBi				
5G	ANT1	-2.107dBi	Phi15° Theta 305°	5.5	5.31	1.14
	ANT3	1.114dB				
	ANT5	0.417dBi				
	ANT7	-2.925dBi				
6G	ANT2	1.321dBi	Phi90° Theta 65°	6.5	5.42	1.11
	ANT4	-1.204dBi				
	ANT6	-0.897dBi				
	ANT8	-1.995dBi				

1、 Correlated Directional Gain(Beamforming Gains)

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$ dBi

2、 Uncorrelated Directional Gain

Directional gain = $10 \log[(10^{G1/10} + 10^{G2/10} + \dots + 10^{GN/10})/N_{ANT}]$ dBi

Note1: For correlated directional gain caculation,the angles value in above form are for beamforming Angle values corresponding to the maximum value of the actual simulated beamforming gain,and the gains of each antenna are the actual antenna gain values at that Angle.

Note2: For uncorrelated directional gain caculation,the gains value are the max gains for every ANT.

Thanks!

