

PULSE Chip Antenna Measurement for Foxconn – [Handel-P18] Project



Wireless Components
LTCC R&D / Matthew

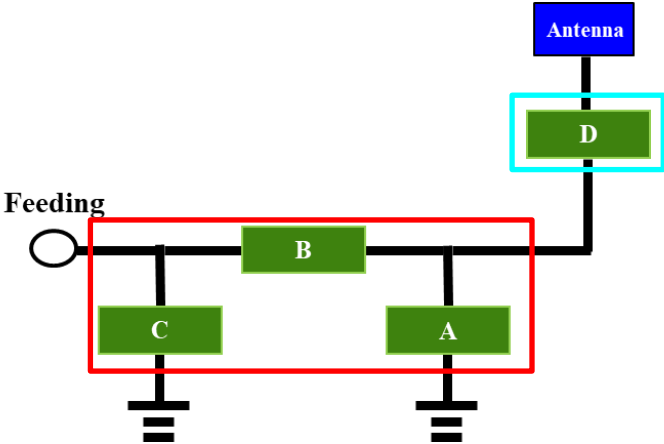
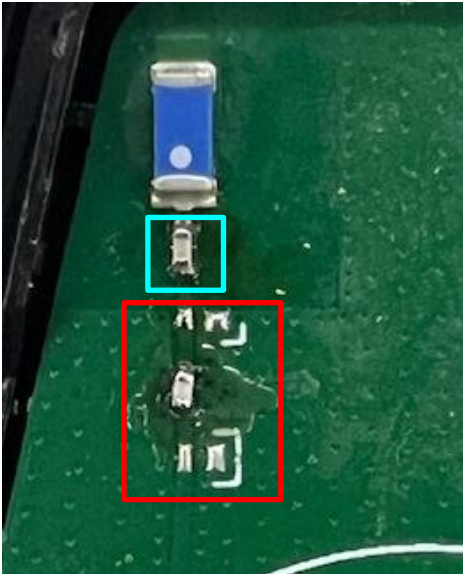
2025/10/20

Project Information

- **Customer : Foxconn**
- **Project Name : Handel-P18 (Glass Fiber)**
- **Application : Remote control**
- **Antenna size :**
 - 3.2x1.6x1.2(mm) BT chip antenna([ANT3216LL00R2400V](#))**
 - 3.2x1.6x0.6(mm) UWB chip antenna([ANT3216LL10R6580V](#))**
- **PCB size : 63.5 x 27.0 (mm)**
- **Report date : 2025/10/20**
- **Version : 3**

Matching Circuit

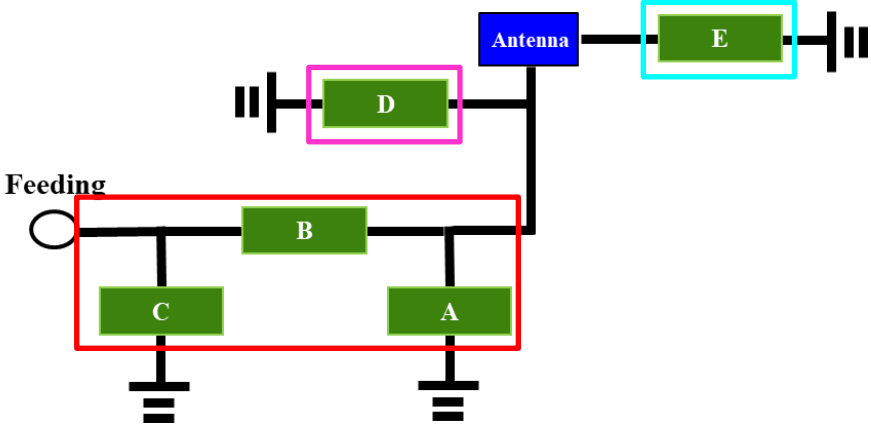
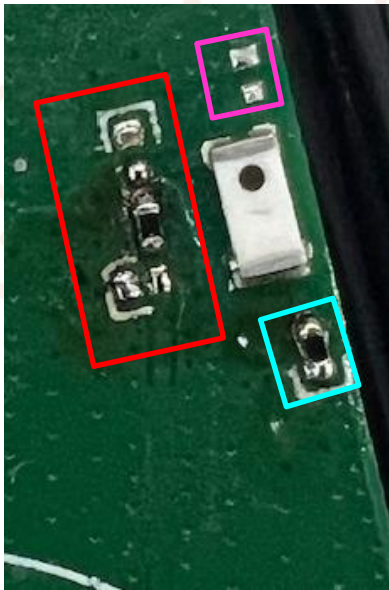
BT



Component		Supplier	Value	PN
D	Cap._0402	YAGEO	2.7 pF	CC0402BRNPO9BN2R7
A			Open	
B	Cap._0402	YAGEO	0.8 pF	CC0402BRNPO9BNR80
C			Open	

Matching Circuit

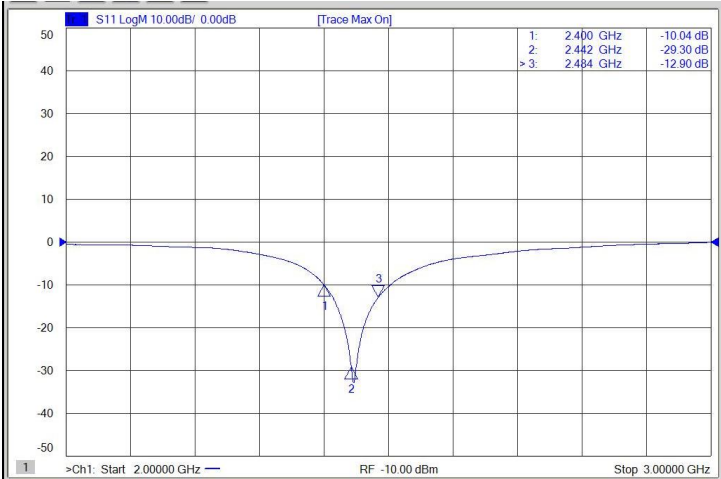
UWB



Component		Supplier	Value	PN
E	Res._0402	YAGEO	0 Ω	RC0402JR-070RP
D			Open	
A			Open	
B	Res._0402	YAGEO	0 Ω	RC0402JR-070RP
C			Open	

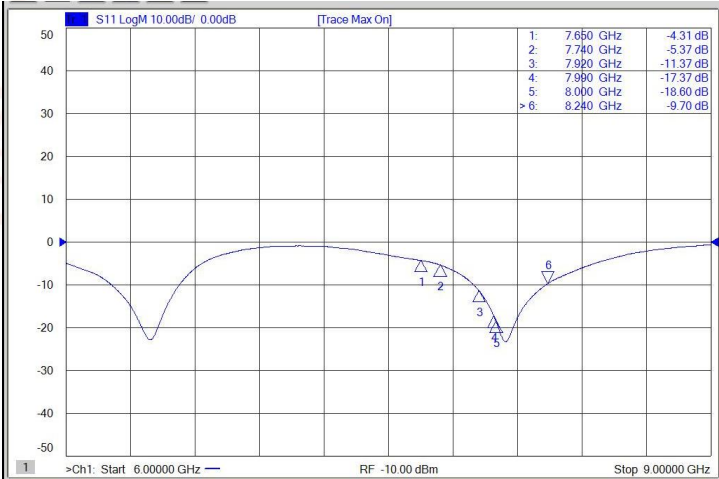
Measurement Data

Condition	Handel-P18_PCBA_V3_BT		
Antenna	PULSE 3216 BT Chip antenna (ANT3216LL00R2400V)		
Frequency (MHz)	2400	2442	2484
R.L. (dB)	-10.0	-29.3	-12.9
Max. Gain (dBi)	-4.4	-3.8	-4.2
Avg. Gain (dB)	-8.0	-7.7	-8.2
Efficiency (%)	15.7	16.9	15.1



Measurement Data

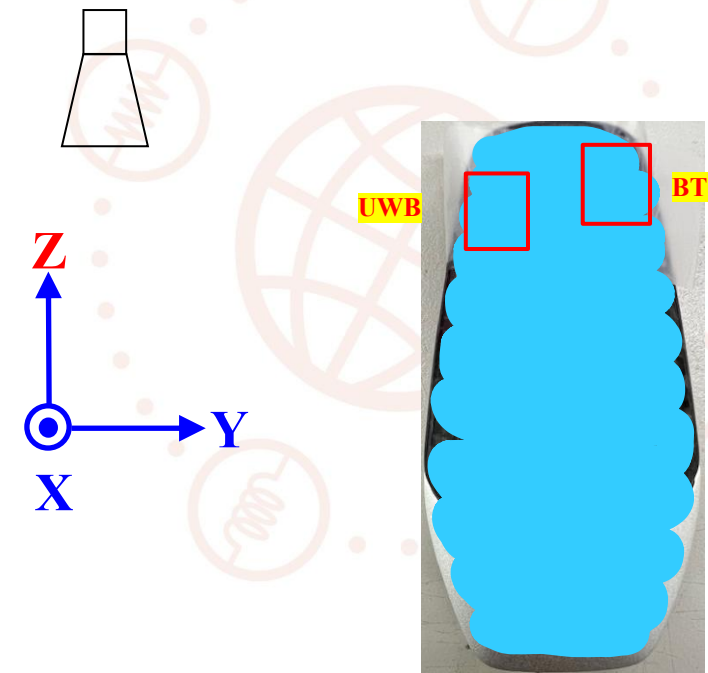
Condition	Handel-P18_PCBA_V3_UWB					
Antenna	PULSE 3216 UWB Chip antenna (ANT3216LL10R6580V)					
Frequency (MHz)	7650	7740	7920	7990	8000	8240
R.L. (dB)	-4.3	-5.4	-11.4	-17.4	-18.6	-9.7
Max. Gain (dBi)	-5.7	-2.9	-2.7	-2.1	-2.1	-3.5
Avg. Gain (dB)	-10.7	-9.4	-8.8	-8.4	-8.5	-9.8
Efficiency (%)	8.6	11.6	13.1	14.6	14.3	10.4



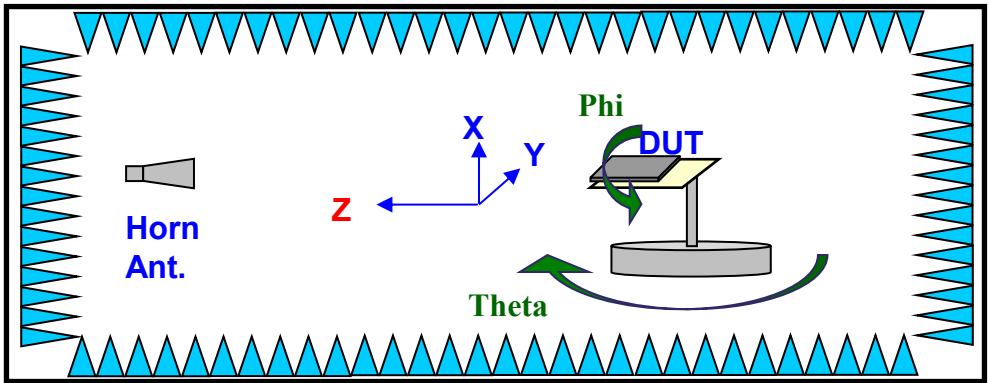
Measurement Configuration

[Direction Definition]

Horn Antenna

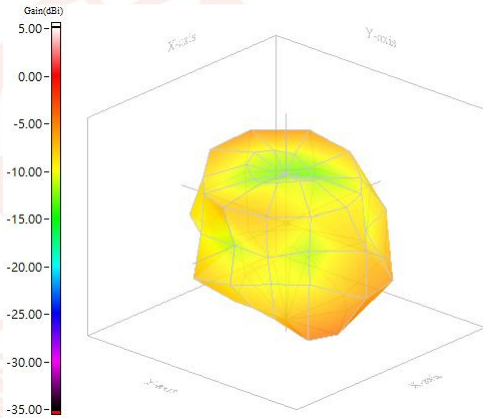
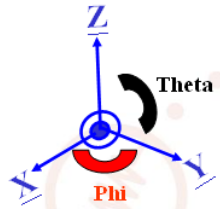


[Anechoic Chamber]

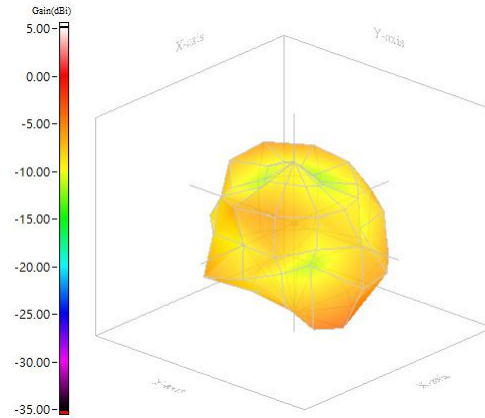


Radiation Pattern (3D)

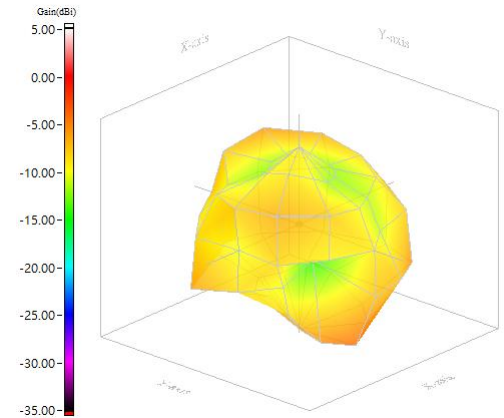
BT



2400MHz



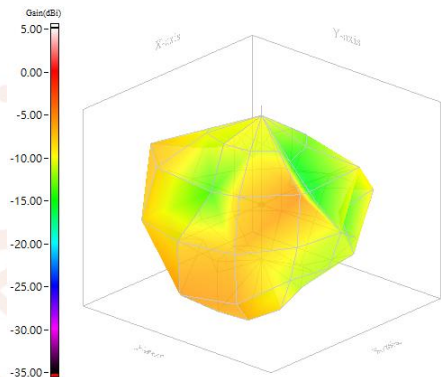
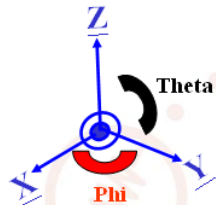
2442MHz



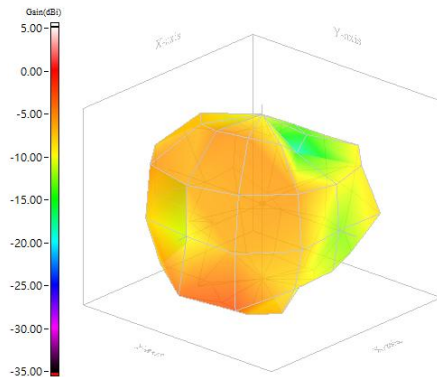
2484MHz

Radiation Pattern (3D)

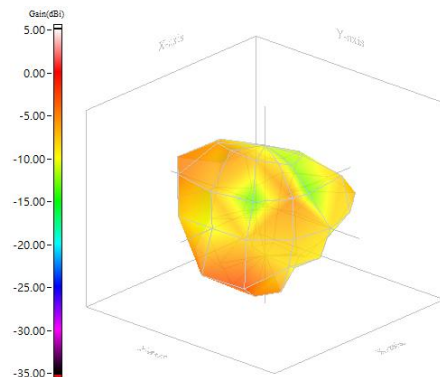
UWB



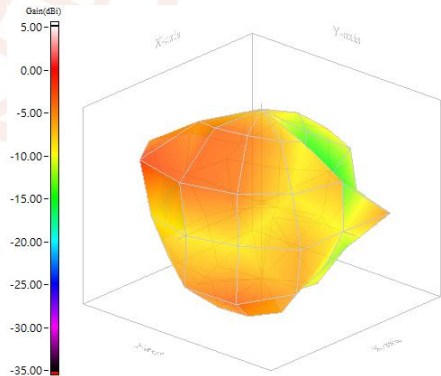
7650MHz



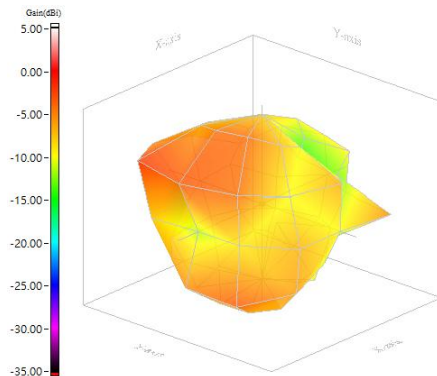
7740MHz



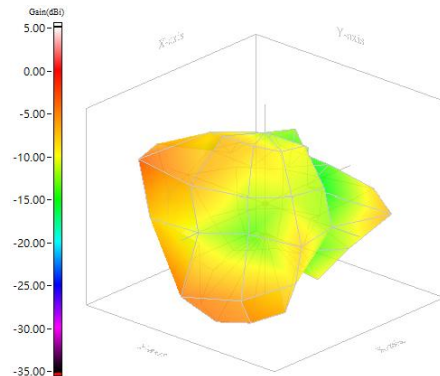
7920MHz



7990MHz



8000MHz

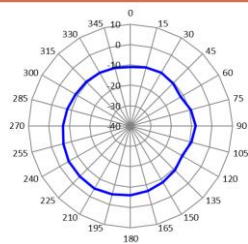


8240MHz

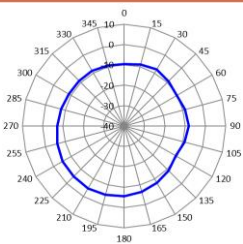
Radiation Pattern (2D)

BT

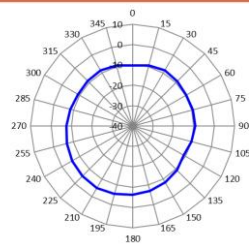
XY-Plane



2400MHz

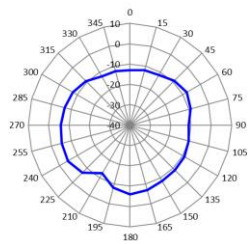


2442MHz

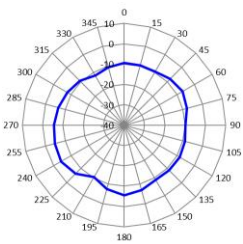


2484MHz

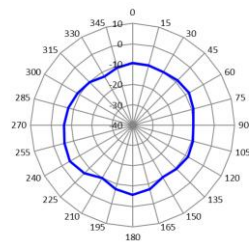
ZX-Plane



2400MHz

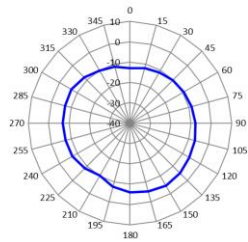


2442MHz

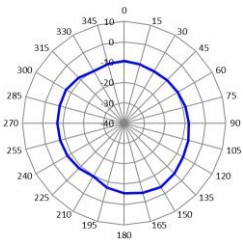


2484MHz

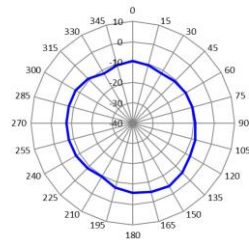
ZY-Plane



2400MHz



2442MHz

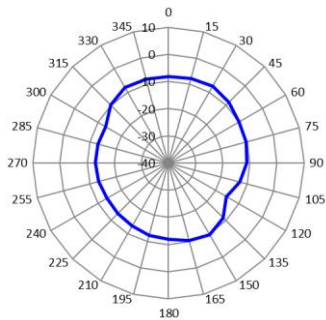


2484MHz

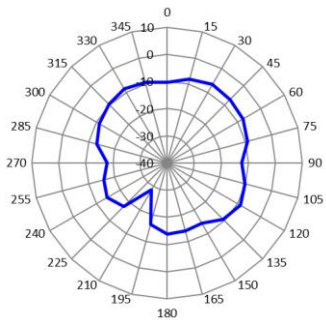
Radiation Pattern (2D)_XY-plane

UWB

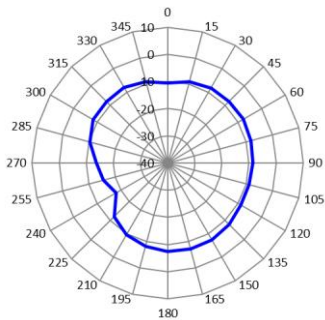
XY-plane:



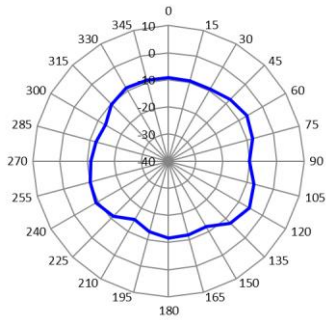
7650MHz



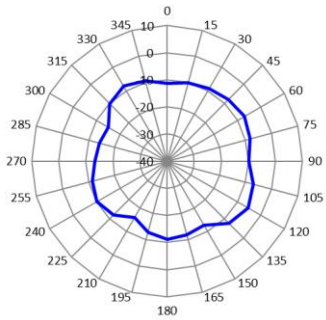
7740MHz



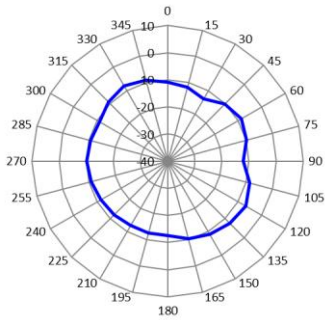
7920MHz



7990MHz



8000MHz

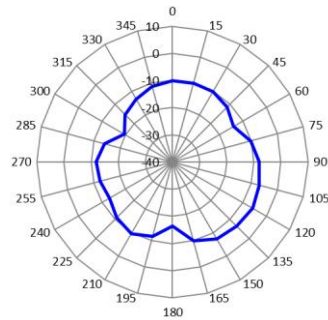


8240MHz

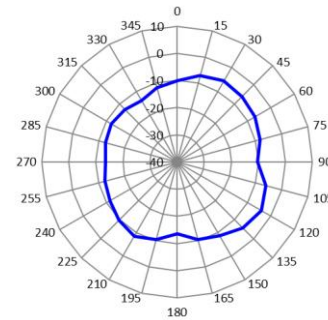
Radiation Pattern (2D)_ZX-plane

UWB

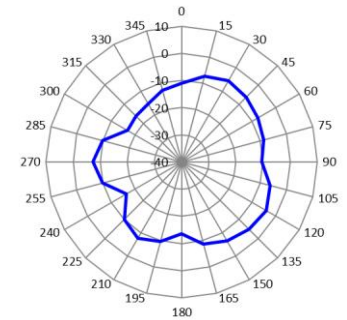
ZX-plane:



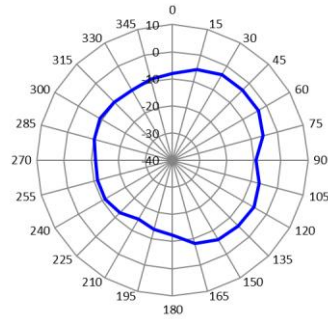
7650MHz



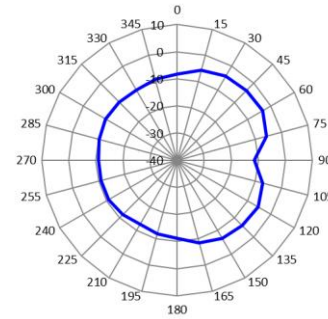
7740MHz



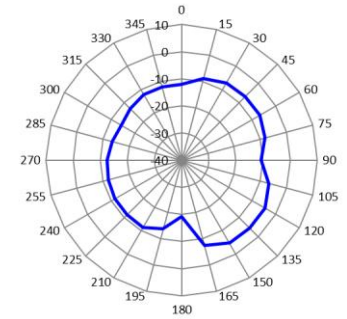
7920MHz



7990MHz



8000MHz

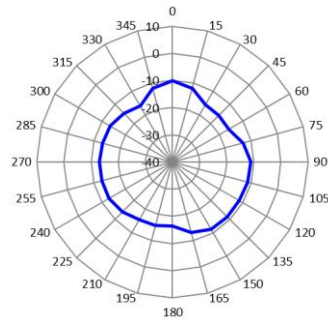


8240MHz

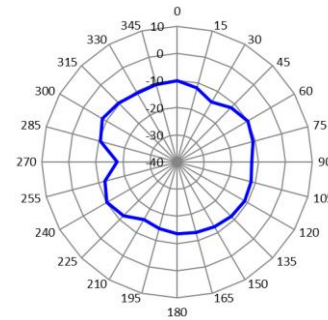
Radiation Pattern (2D)_ZY-plane

UWB

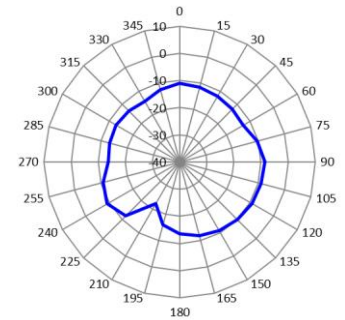
ZY-plane:



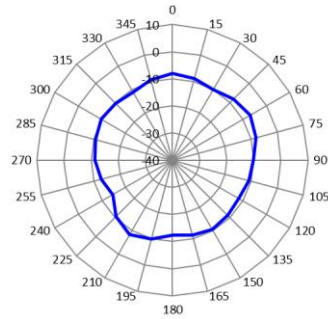
7650MHz



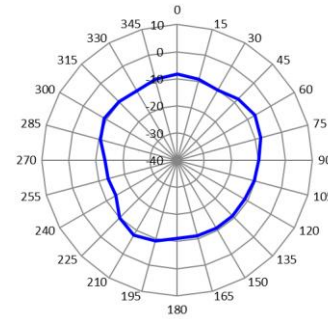
7740MHz



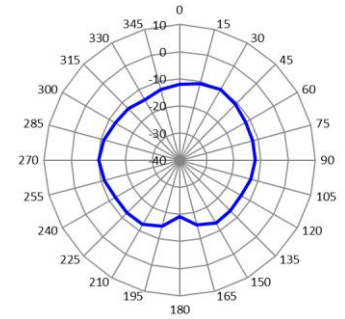
7920MHz



7990MHz



8000MHz



8240MHz

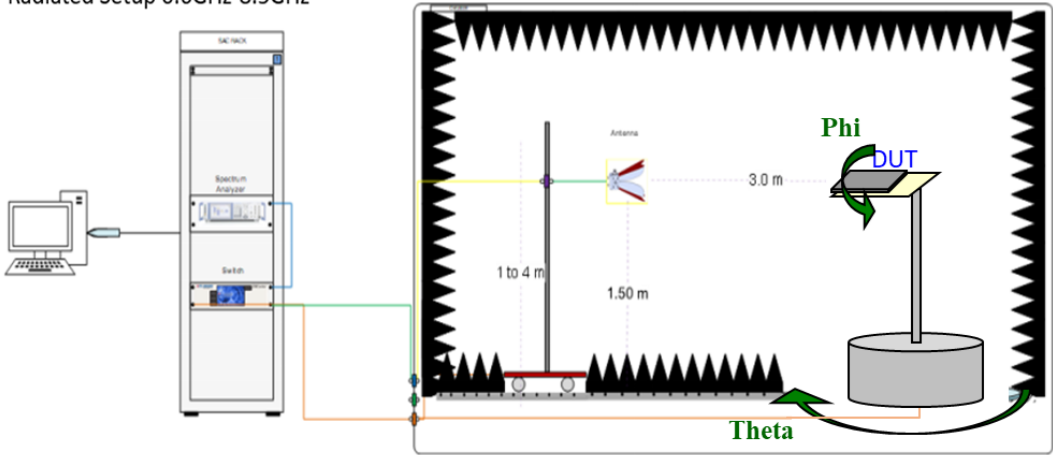
Summary

- BT 效率為 15% ~ 16%。
- UWB 效率為 8% ~ 14%。
- 此次機台的外殼，原先的塑膠外殼的部分，因為終端客戶使用了玻璃纖維+金屬電鍍，天線等同於被全金屬外殼包住，所以兩支天線的效率都有明顯的減弱，尤其是UWB天線受到影響最大。

Antenna Vendor Info & Measurement Setup

- Antenna Vendor: **YAGEO**
- Test Date: **20251020**
- Test Engineer :**MATTHEW KUNG**
- Measurement Setup:

Radiated Setup 0.6GHz-8.5GHz



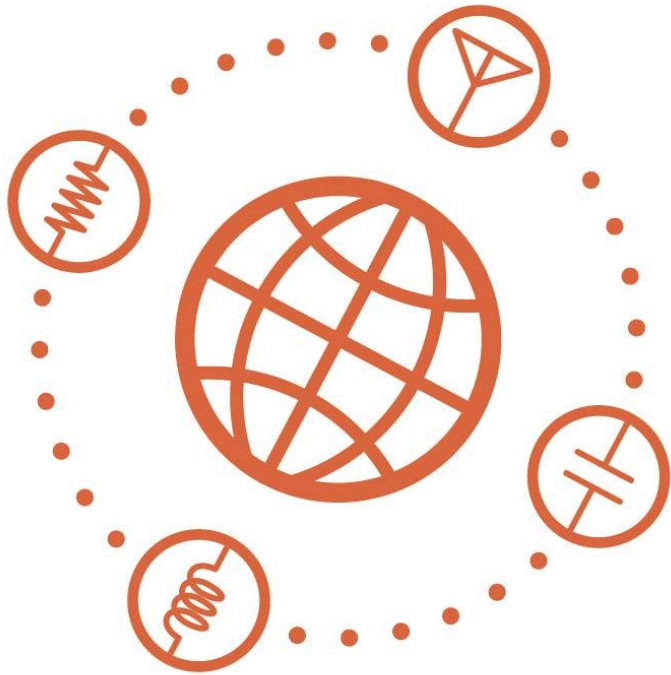
ID#	Device	Type/Model	Serial#	Manufacturer	Cal. Date	Estimated Next Cal. Date
1	Anechoic Chamber	AMS8500	-	ETS-Lindgren	2025-07-13	2026-07-13
2	Turn Table	ETS	-	ETS-Lindgren	N/A	N/A
3	Switch & Positioning system	2090	-	ETS-Lindgren	N/A	N/A
4	Horn Antenna	3164-08	99210	ETS-Lindgren	N/A	N/A
5	Network Analyzer	E5071C	MY46103999	Agilent	2025-07-13	2026-07-13
6	Commercial test software	EMQuest	Version 1.14 Build 10265 SN:1156	ETS-Lindgren	2025-07-13	2026-07-13
7	Test Operator	Matthew Kung		YAGEO		

N/A: Not Applicable

Test Procedure

ETS-Lindgren AMS-8500 system is 3D fully anechoic chamber, it is applied to the “Conical Cut test method”, the detail description is described as below :

- The Conical Cut method requires the ability of the Measurement Antenna to be physically rotated in the theta plane (overhead) of the EUT for implementations using a single Measurement Antenna, thirteen conical cuts are required to capture data at every 15 degrees from the EUT.
- Typically, the EUT will remain affixed to a turntable during the entire measurement process.
- The Measurement Antenna will be positioned at a starting theta angle.
- The EUT will then be rotated around the full 360 degrees of phi rotation.
- The Measurement Antenna will then be positioned at the next theta angle, and the process repeated.
- Finally, the measurement data of all angles are calculated through the EMQuest software to obtain the Peak gain, Average gain, Efficiency... and other data we need.



Thank you!