

ADT Pro Hub antenna measurement report (Remove Zigbee)

2024/10/25



Summary

- There are 9 antennas in this product including LTE x2, Z-wave, Dect x2, WiFi Dual x2, Bluetooth
- Antenna performance
 - VSWR
 - LTE (B2,B4,B5,B12,B13,B14,B29,B30,B46,B48,B66) < 3
 - Others < 2
 - Isolation
 - LTE band: to Z-wave > 20dB
 - Z-wave band: to LTE > 20dB
 - Dect band: to others > 20dB
 - WiFi Band: to others > 20dB
 - BT band: to others > 20dB



Antenna Configuration



➤ Product size: 145mm x 115Ø



Efficiency

		699	716	746	824	849	894	Avg.	1710	1910	2155	2200	2360	2500	2650	Avg.
Main	Eff.	52%	51%	56%	58%	57%	56%	55%	62%	67%	63%	67%	69%	58%	58%	64%
	Avg. Gain	-2.86	-2.90	-2.49	-2.35	-2.46	-2.55		-2.05	-1.72	-1.99	-1.72	-1.60	-2.40	-2.34	
	Peak Gain	-0.02	-0.62	0.45	1.13	1.08	-0.12		2.35	3.21	3.16	2.27	2.47	2.84	1.63	
Aux	Eff.	51%	52%	54%	53%	53%	51%	52%	59%	61%	60%	61%	61%	61%	62%	61%
	Avg. Gain	-2.93	-2.83	-2.66	-2.76	-2.77	-2.96		-2.26	-2.15	-2.20	-2.17	-2.16	-2.14	-2.08	
	Peak Gain	-1.16	-0.05	0.29	1.32	1.00	1.03		2.61	1.75	4.15	4.07	3.98	6.09	6.02	

		1920	1925	1930	Avg.
DECT1	Eff.	64%	64%	64%	64%
	Avg. Gain	-1.95	-1.94	-1.97	
	Peak Gain	4.34	4.32	4.27	
DECT2	Eff.	68%	69%	67%	68%
	Avg. Gain	-1.67	-1.59	-1.73	
	Peak Gain	4.84	4.96	5.05	

		2400	2450	2500	Avg.
Bluetooth	Eff.	66%	65%	65%	65%
	Avg. Gain	-1.84	-1.87	-1.88	
	Peak Gain	4.26	4.19	2.70	

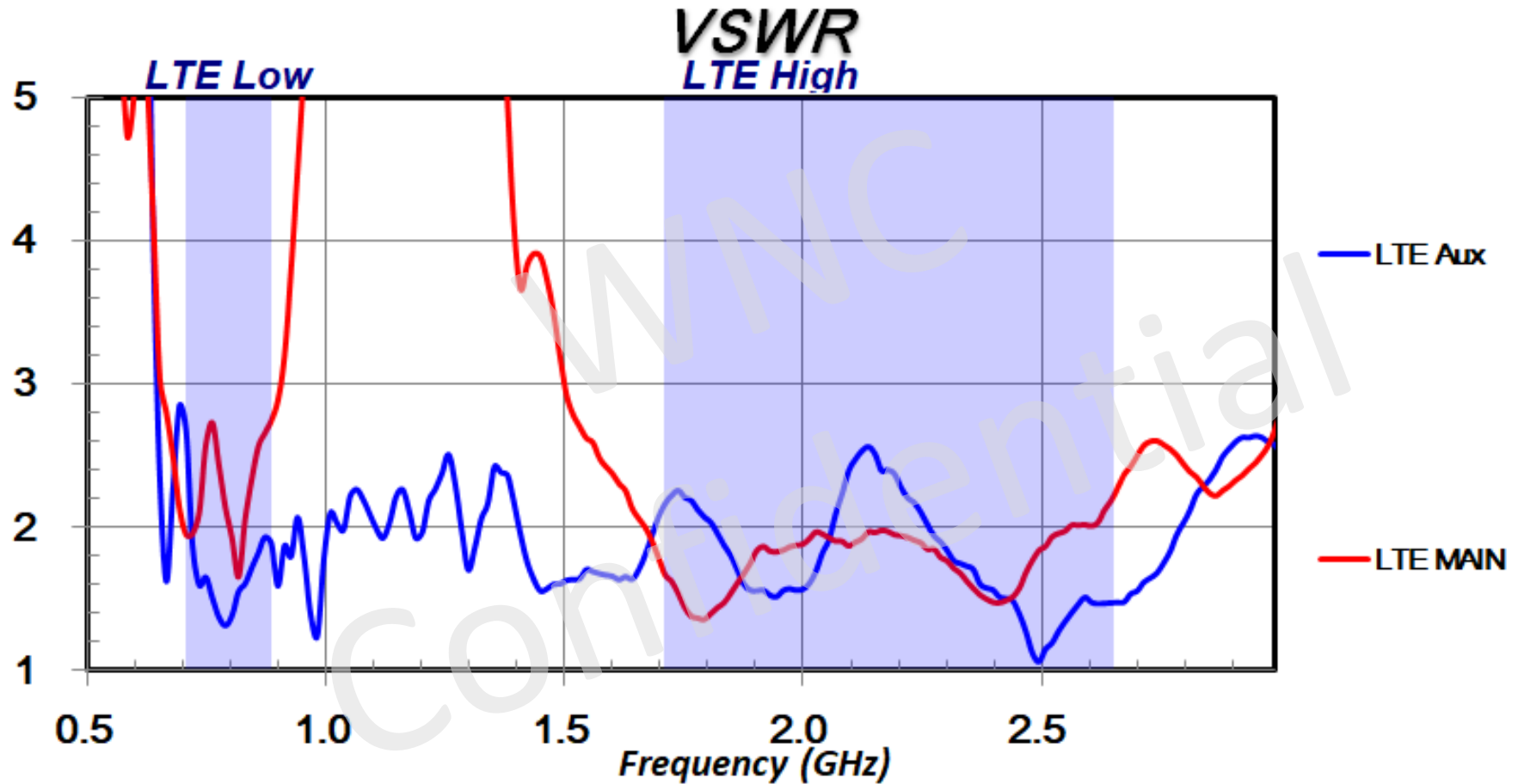
		2400	2450	2500	Avg.	5150	5350	5550	5725	5785	5850	Avg.
WiFi1	Eff.	66%	69%	66%	67%	66%	64%	65%	64%	64%	63%	64%
	Avg. Gain	-1.81	-1.62	-1.80		-1.79	-1.96	-1.86	-1.96	-1.93	-1.98	
	Peak Gain	4.92	5.19	4.71		5.36	4.68	4.21	4.22	4.15	4.83	
WiFi2	Eff.	67%	69%	64%	67%	65%	63%	68%	71%	69%	71%	68%
	Avg. Gain	-1.74	-1.62	-1.93		-1.88	-1.98	-1.70	-1.49	-1.59	-1.49	
	Peak Gain	3.84	3.47	4.05		5.56	5.36	5.54	5.52	5.35	5.48	

		908	912	916	Avg.
ZWAVE	Eff.	65%	66%	63%	65%
	Avg. Gain	-1.86	-1.78	-1.98	
	Peak Gain	3.03	3.04	3.03	

Unit, Avg. Gain [dBi], Peak Gain [dBi]



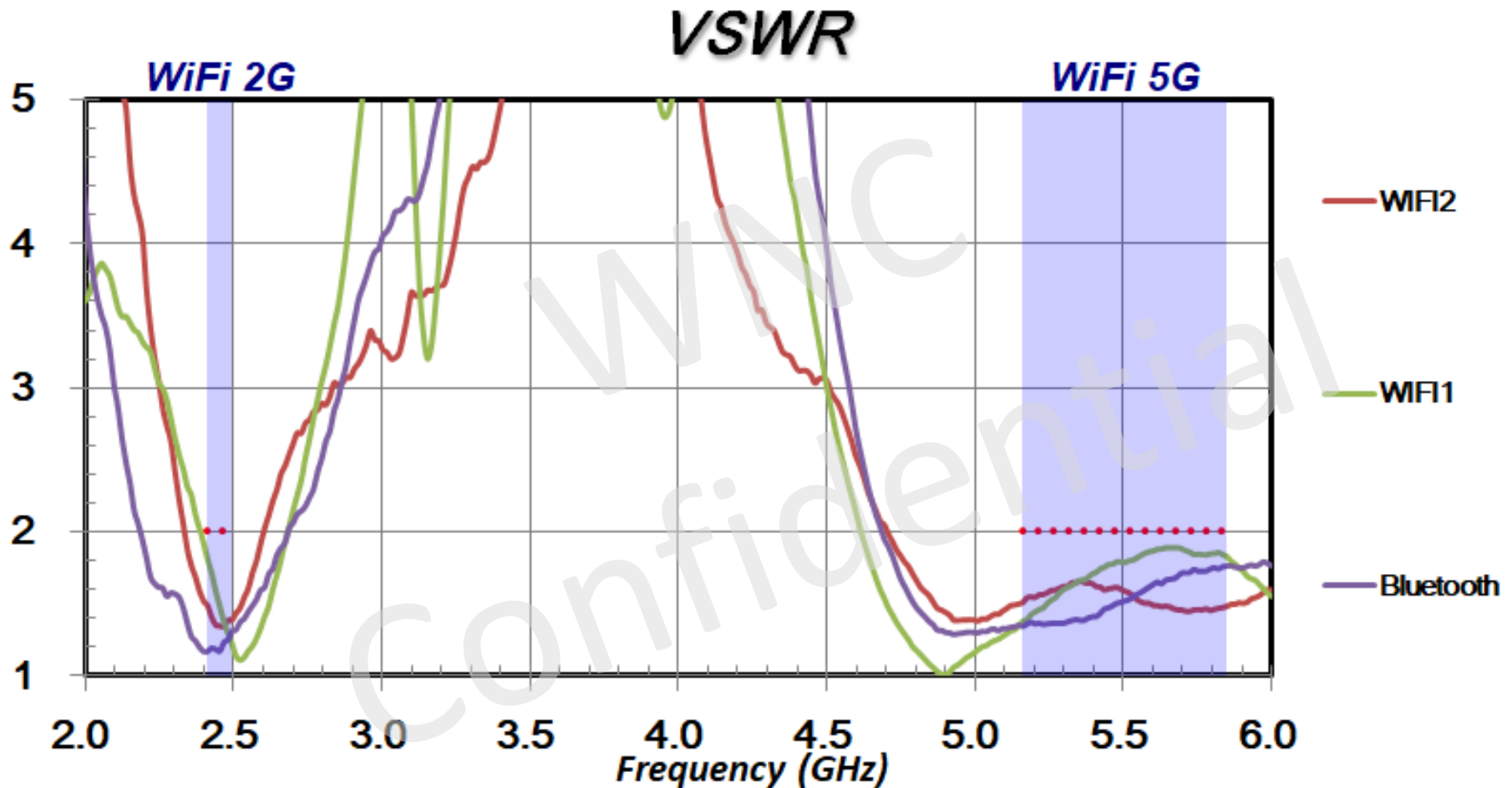
Antenna VSWR – LTE Main & AUX



Maximum VSWR is 3 : 1 for LTE antennas



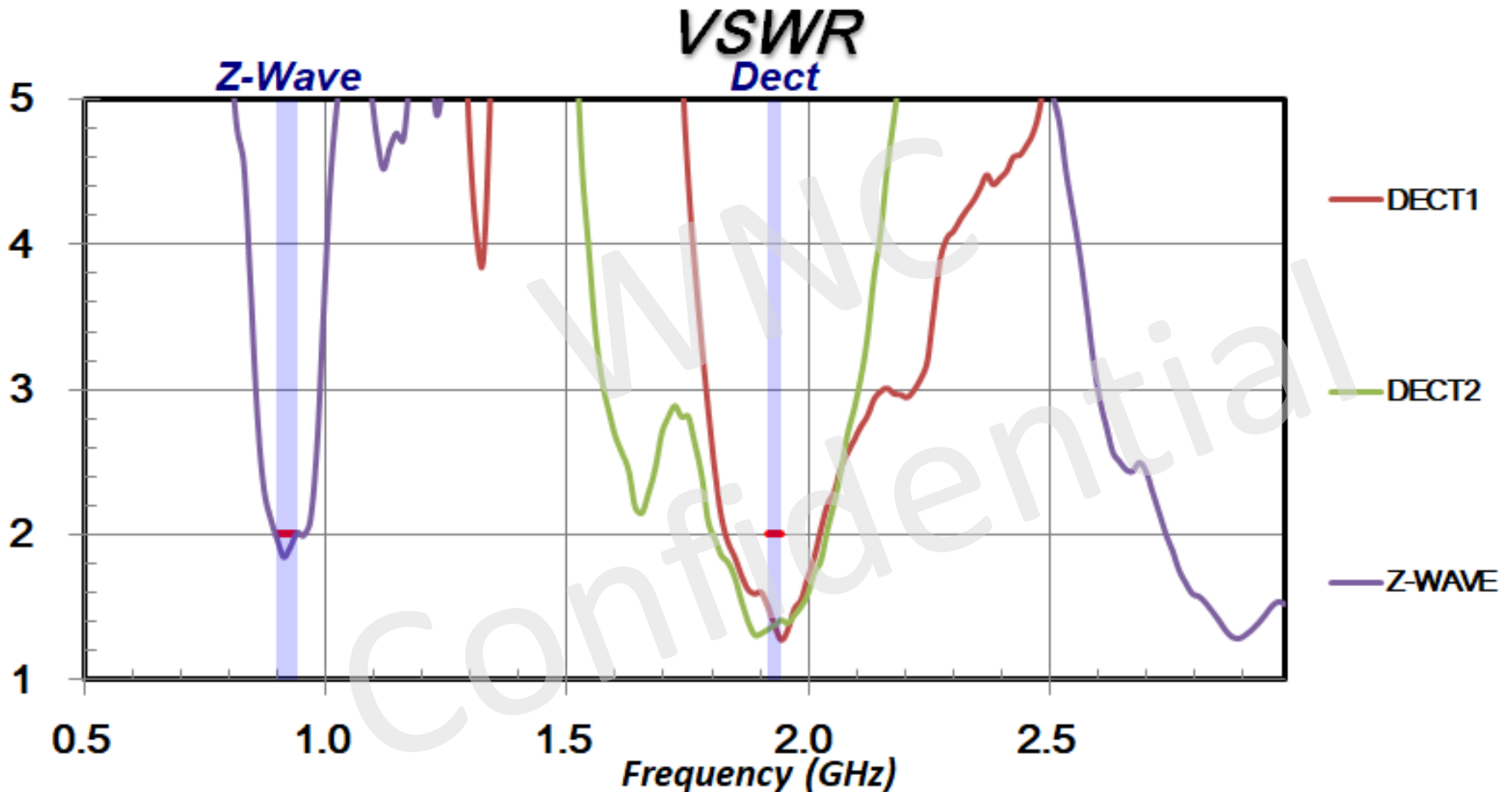
Antenna VSWR – WiFi 1 & 2



Maximum VSWR is 2 : 1 for WIFI antennas



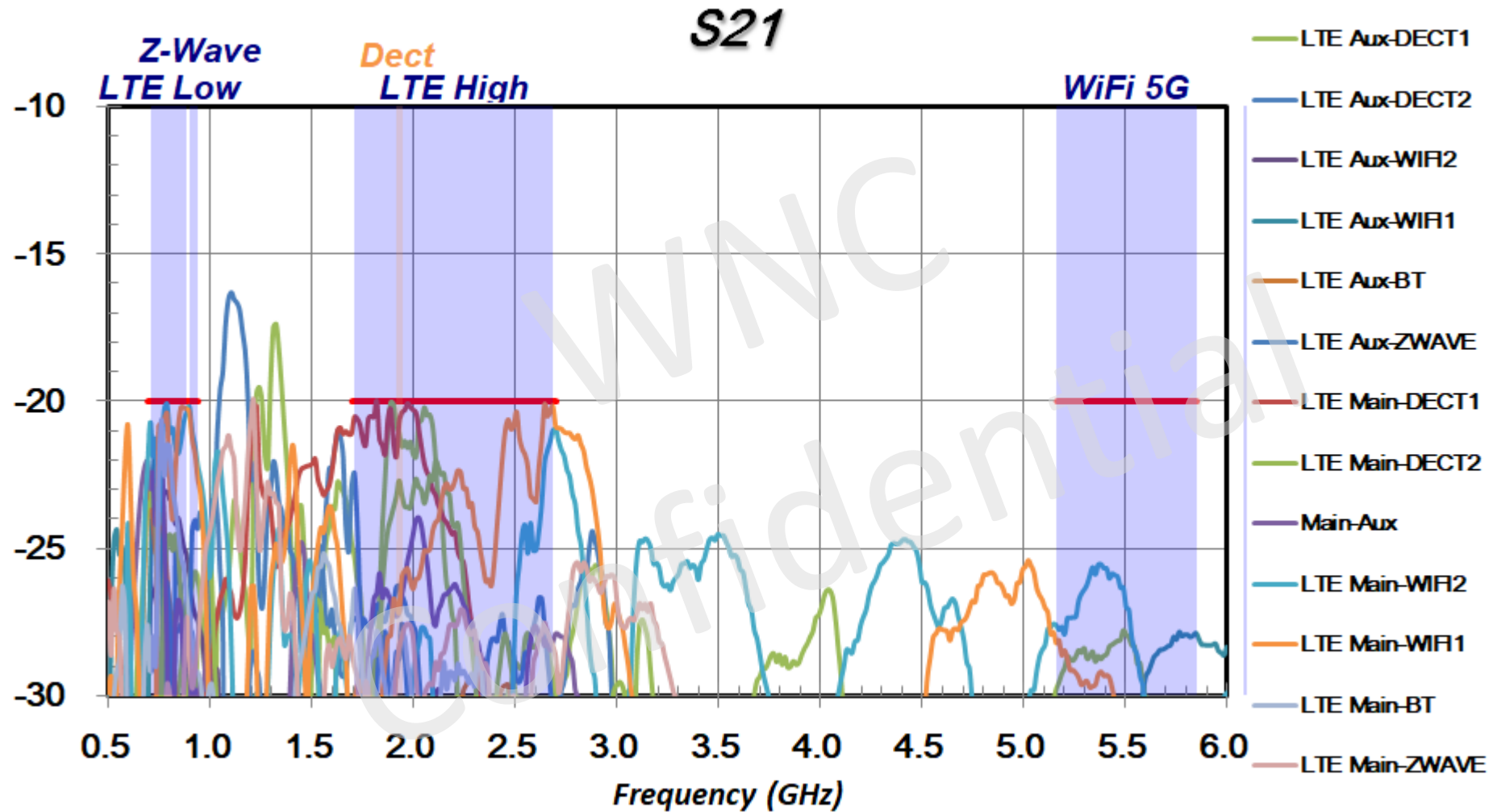
Antenna VSWR – DECT & Z-WAVE



Maximum VSWR is 2 : 1 for all antennas



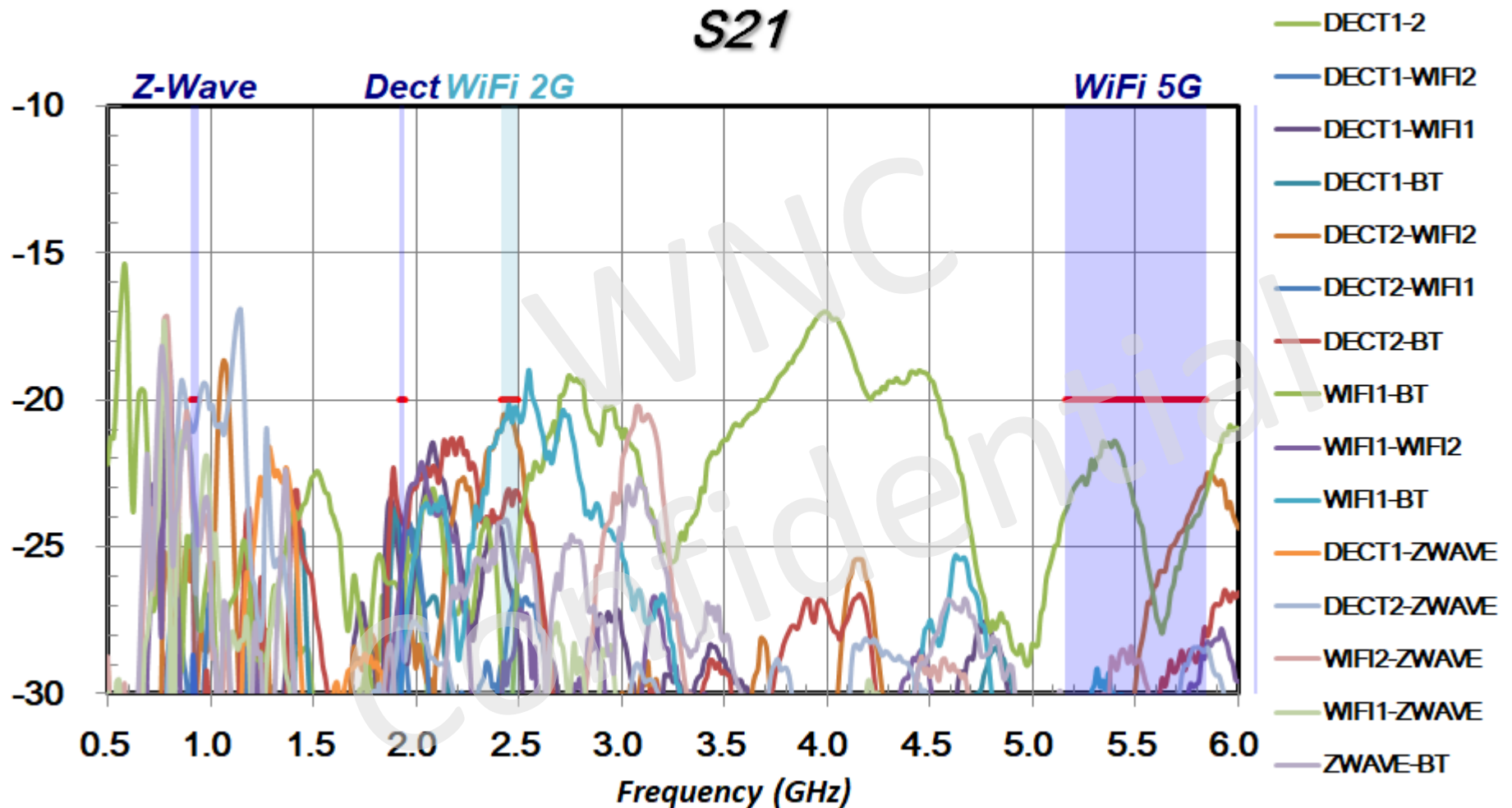
Isolation – LTE



Isolation more than 20dB among all antennas



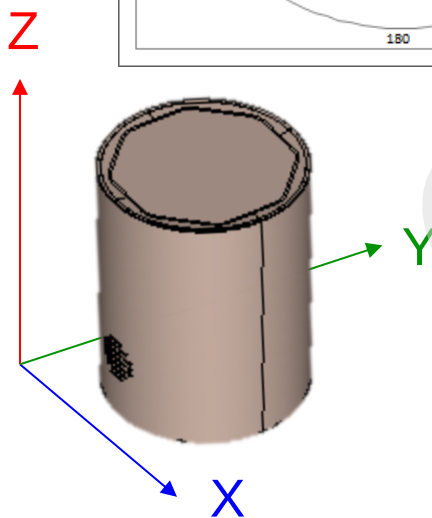
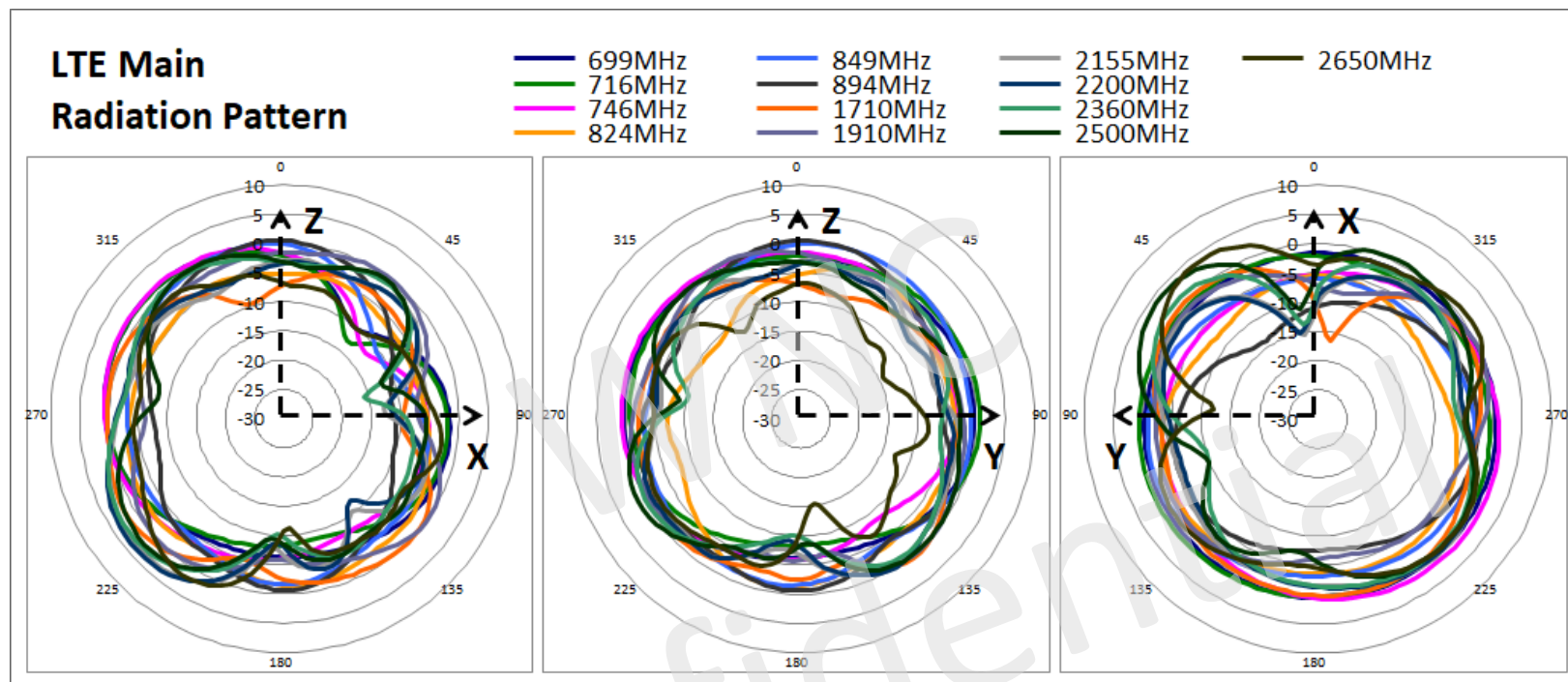
Isolation – WiFi



Isolation more than 20dB among all antennas



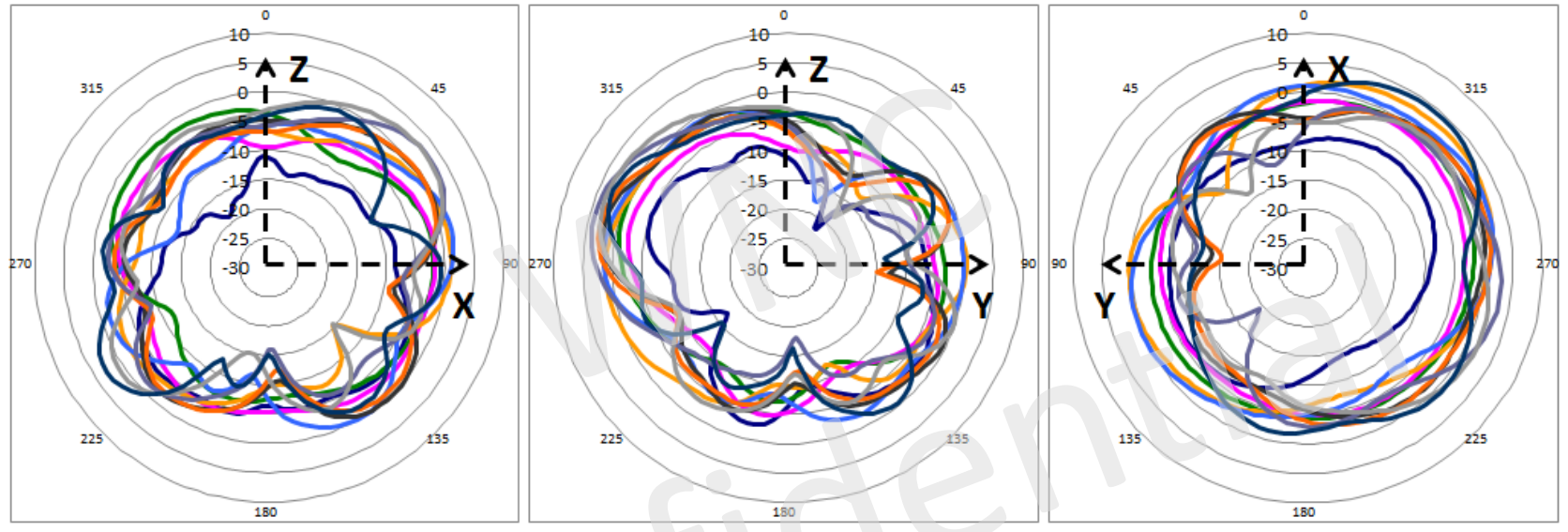
Antenna pattern – LTE Main



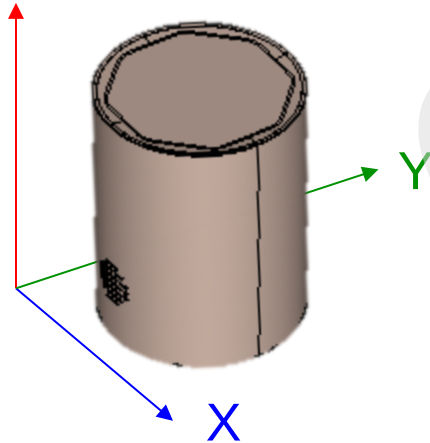
Antenna pattern – LTE Aux

LTE Aux

Radiation Pattern



Z



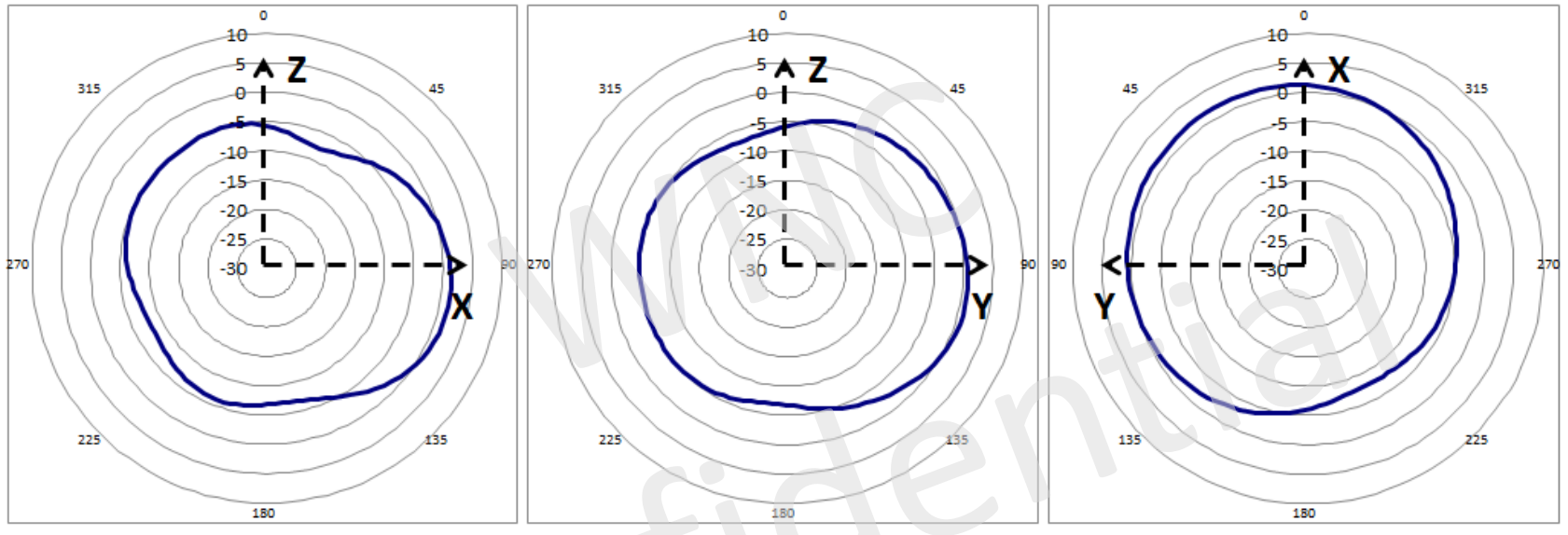
Confidential



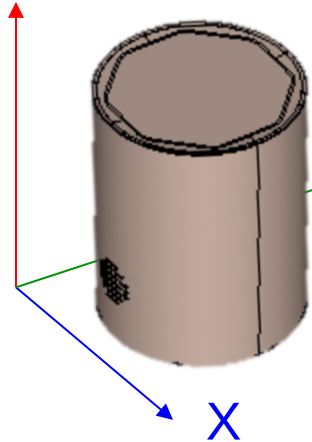
Antenna pattern – ZWAVE

ZWAVE Radiation Pattern

— 912MHz



Z

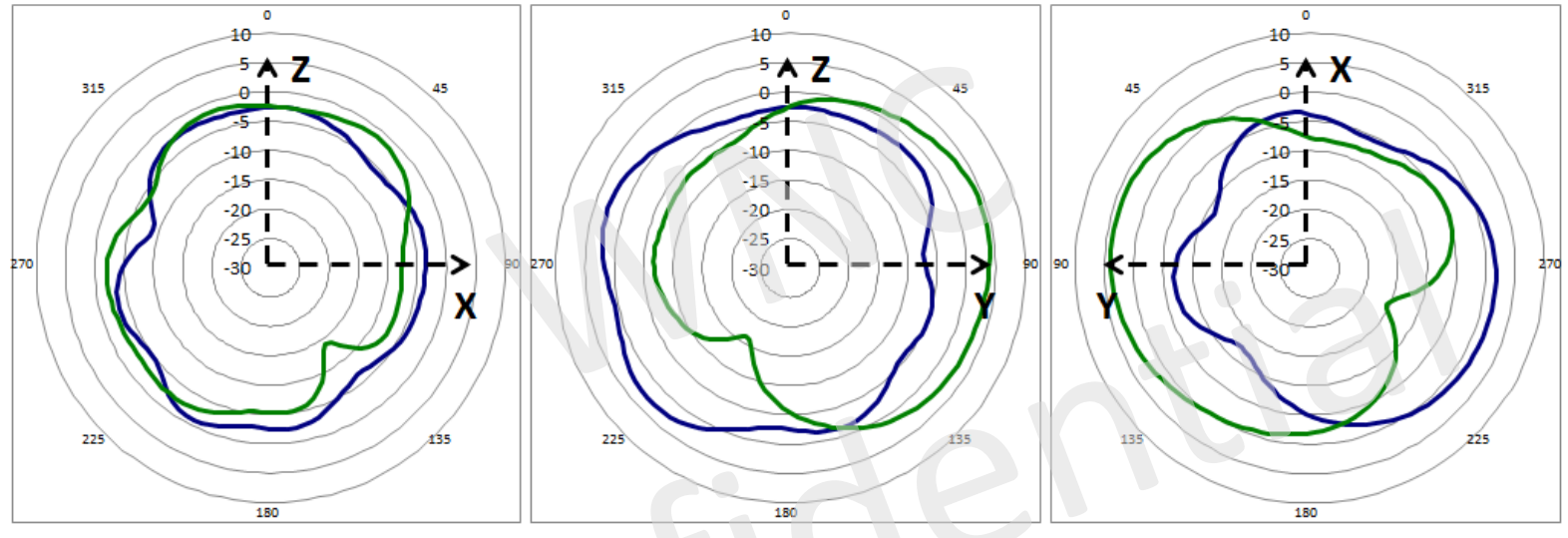


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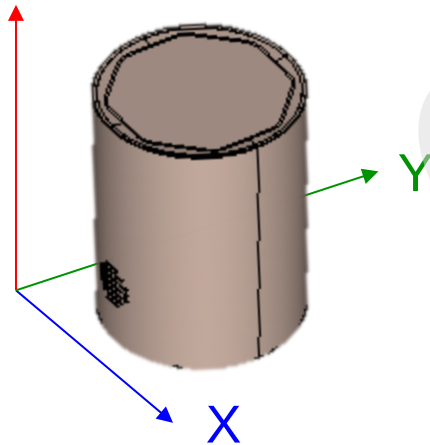
Antenna pattern – DECT

1925 MHz
Radiation Pattern

— DECT1
— DECT2



Z



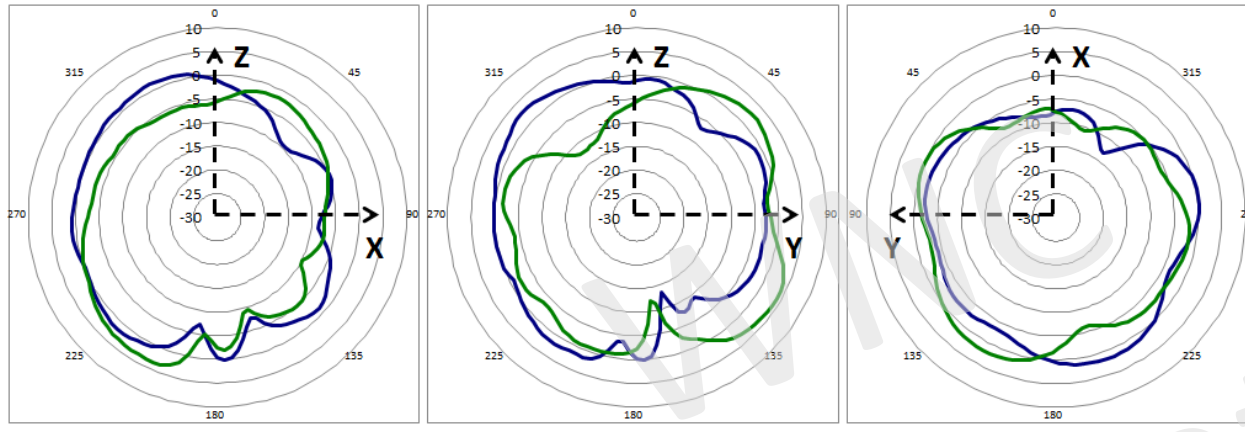
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Antenna pattern – WIFI

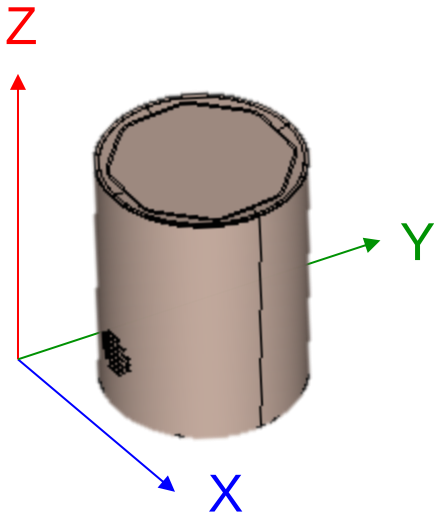
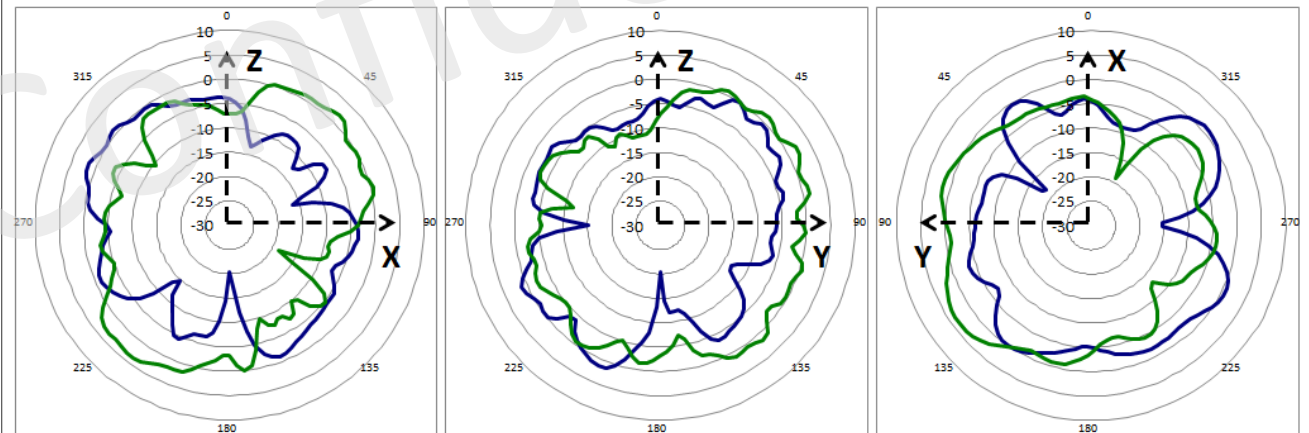
**2450 MHz
Radiation Pattern**

— WIFI1
— WIFI2



**5550 MHz
Radiation Pattern**

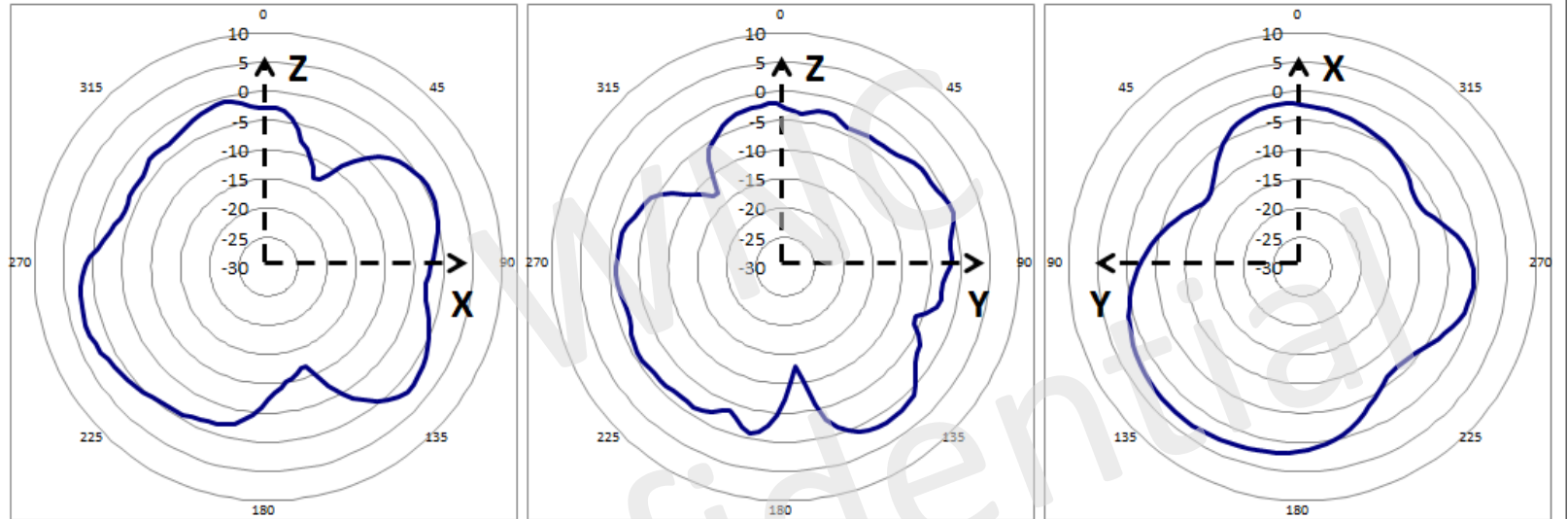
— WIFI1
— WIFI2



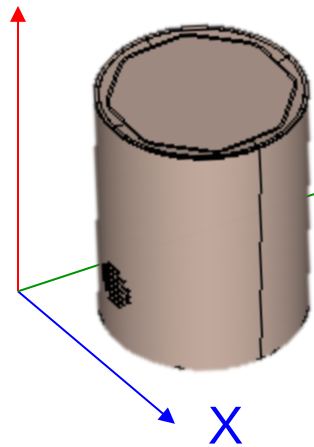
Antenna pattern – Bluetooth

**BT
Radiation Pattern**

— 2450MHz



Z



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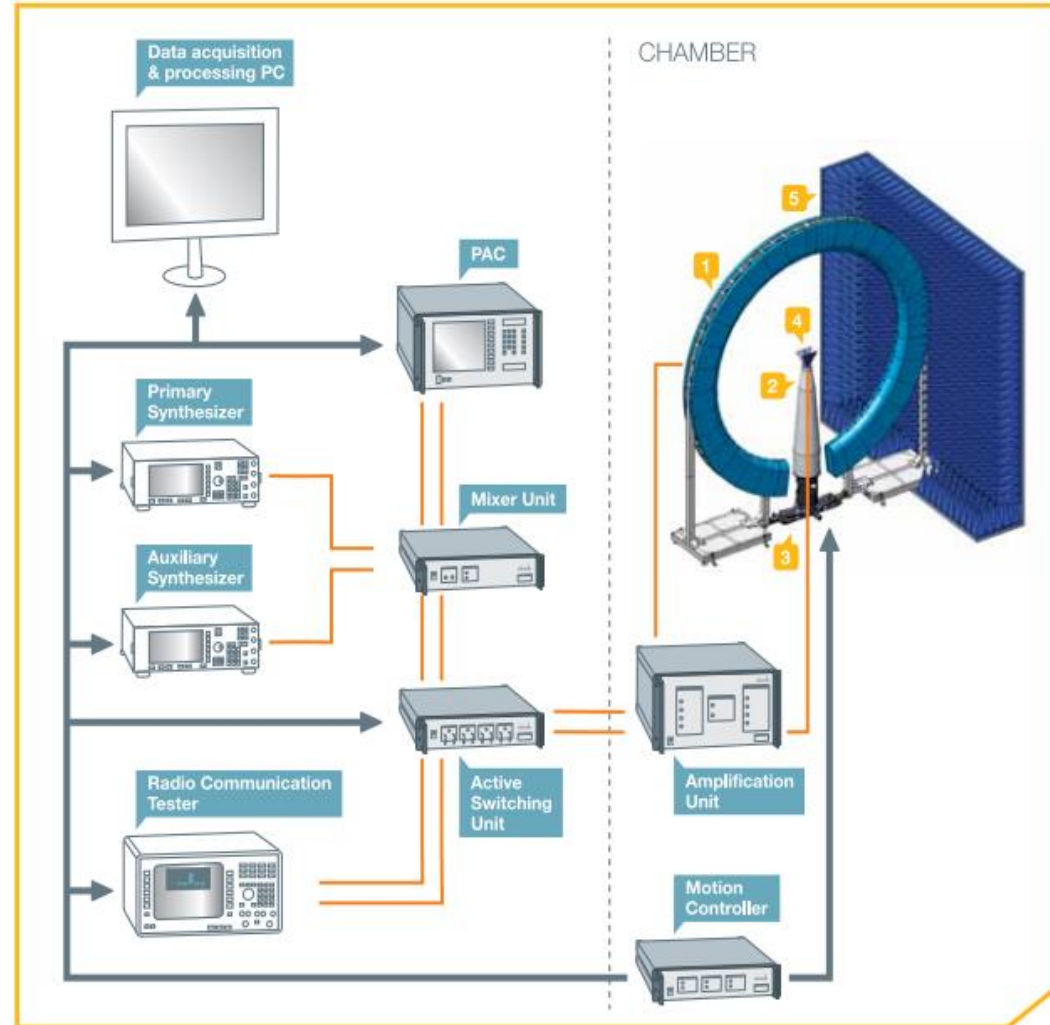
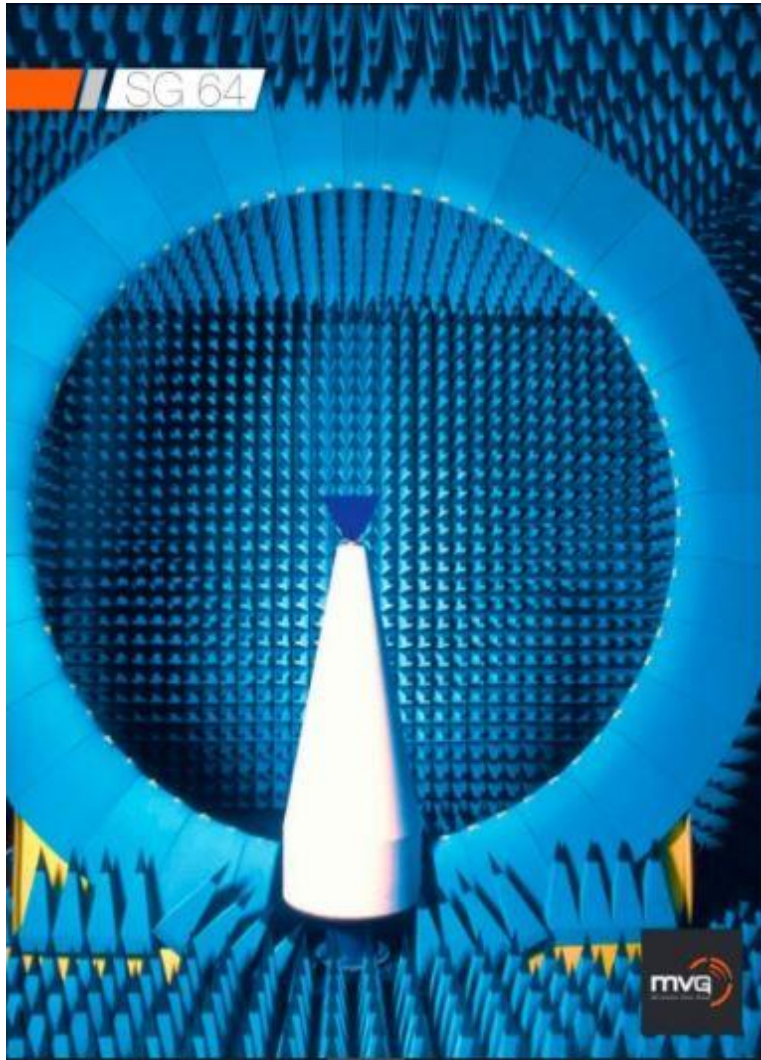


Appendix – Measured site information

- Vendor: Wistron NeWeb Corporation
- Address: 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.
- Measurement: antenna passive, Satimo
- Operator: Yun Chi (Yun.Chi@wnc.com.tw)
- Date: 2024/10/24
- Photo:



Appendix – Passive test chamber



Appendix – Measurement Procedure

- **Test Program : NPAC Spherical Measurement**
- **Converter Program : SatEnv**
- **Measurement Procedures :**
 - **1.setup DUT**
 - **2.Open NPAC Spherical Measurement Program and select test frequencies, then press Start.**
 - **3Open SatEnv to create new file and folder.**
 - **4.After measurement complete, enter Export and output test data to new folder under SatEnv program.**
 - **5.Excuse post processing**
 - **6.After complete file converter, export NF to FF transform Efficiency to get efficiency value.**



Appendix – Passive test chamber

MVG SG64 Measurement System						
Item	Device	Type/Model	Serial#	Manufacturer	Cal.Date	Cal.Due Date
1	SG64 Chamber	Standard	SG64	MVG	2024/8/15	2025/8/15
2	Turn Table	Customization	-	Machinery Dept.	N/A	N/A
3	New Probe Array Controller	N/A	1102341-4535	MVG	N/A	N/A
4	Power Supply Unit	N/A	1103211-13204	MVG	N/A	N/A
5	Active Switching Unit	N/A	1102347-7214	MVG	N/A	N/A
6	TX Amplification Unit	N/A	1102527-5909	MVG	N/A	N/A
7	RX Amplification Unit	N/A	1102536-3823	MVG	N/A	N/A
8	Transfer Switching Unit	N/A	1102183-3351	MVG	N/A	N/A
9	Mixer Unit	N/A	1102545-7208	MVG	N/A	N/A
10	Power And Control Unit	N/A	1102706-7209	MVG	N/A	N/A
11	Cable 13.7m - 400MHz to 18GHz	SS402	00100A1F5A1XX S	Woken	2024/6/15	2025/6/15
12	Temperature & Humidity Meter	HTC-01	-	Metraavi	N/A	N/A



WNC

Wistron NeWeb Corp.

