

TEST REPORT

Product Name : AX3000 WIFI6 Mesh Router

Brand Name : N/A

Model : WS-WN588HX3

Series Model : WS-WN589HX3, WS-WN573HP3, WS-WN553X1,
WL-WN588HX3, WS-WN589HX3, WL-WN573HP3,
WL-WN553X1, AERIAL HD9S

FCC ID : NZ3-WN0009

Applicant : **Winstars Technology Limited**

Address : 1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang
Street, Longhua District, Shenzhen, China

Manufacturer : **Winstars Technology Limited**

Address : 1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang
Street, Longhua District, Shenzhen, China

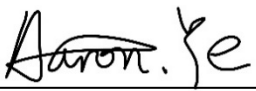
Standard(s) : FCC CFR Title 47 Part 15 Subpart C Section 15.247

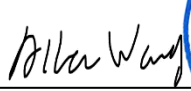
Date of Receipt : Sep. 17, 2025

Date of Test : Sep. 18, 2025~ Oct. 24, 2025

Issued Date : Oct. 25, 2025

Issued By: **Guangdong Asia Hongke Test Technology Limited**
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Reviewed by: 
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Note: This device has been tested and found to comply with the standard(s) listed, this test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory. This report shall not be reproduced except in full, without the written approval of Guangdong Asia Hongke Test Technology Limited. If there is a need to alter or revise this document, the right belongs to Guangdong Asia Hongke Test Technology Limited, and it should give a prior written notice of the revision document. This test report must not be used by the client to claim product endorsement.



Report Revise Record

Report Version	Issued Date	Notes
M0	Oct. 25, 2025	Initial Release

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1 TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

[ANSI C63.10: 2020](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB558074 D01 15.247 Meas Guidance v05r02](#): Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under Section 15.247 of the FCC Rules

[KDB 662911 D01 Multiple Transmitter Output v02r01](#) is required to be used for this kind of FCC 15.407 Ull device.

1.2 Test Summary

Test Item	Section in 47 CFR	Result
Antenna requirement	§15.203	Pass
On Time and Duty Cycle	/	/
AC Power Line Conducted Emission	§ 15.207(a)	Pass
Maximum Conducted Peak Output Power	§15.247 (b)(3)	Pass
-6dB Bandwidth	§15.247 (a)(2)	Pass
Power Spectral Density	§15.247 (e)	Pass
Transmitter Radiated Spurious Emission	§15.205/15.209	Pass
Restricted Bands	§15.205/15.209	Pass
Conducted Unwanted emissions and Bandedge	§15.205, §15.247(d)	Pass

1.3 Test Facility

Test Laboratory:

Guangdong Asia Hongke Test Technology Limited

B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

The test facility is recognized, certified or accredited by the following organizations:

FCC-Registration No.: 251906 Designation Number: CN1376

Guangdong Asia Hongke Test Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC —Registration No.: 31737 CAB identifier: CN0165

The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01

Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.4 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Guangdong Asia Hongke Test Technology Limited's quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Asia Hongke laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	150KHz~30MHz ± 1.20 dB	(1)
Radiated Emission	9KHz~30Hz ± 3.10 dB	(1)
Radiated Emission	9KHz~1GHz ± 3.75 dB	(1)
Radiated Emission	1GHz~18GHz ± 3.88 dB	(1)
Radiated Emission	18GHz~40GHz ± 3.88 dB	(1)
RF power, conducted	30MHz~6GHz ± 0.16 dB	(1)
RF power density, conducted	± 0.24 dB	(1)
Spurious emissions, conducted	± 0.21 dB	(1)
Temperature	$\pm 1^{\circ}\text{C}$	(1)
Humidity	$\pm 3\%$	(1)
DC and low frequency voltages	$\pm 1.5\%$	(1)
Time	$\pm 2\%$	(1)
Duty cycle	$\pm 2\%$	(1)

The report uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%

2 GENERAL INFORMATION

2.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2 General Description of EUT

Product Name:	AX3000 WIFI6 Mesh Router
Model/Type reference:	WS-WN588HX3
Serial Model:	WS-WN589HX3, WS-WN573HP3, WS-WN553X1, WL-WN588HX3, WS-WN589HX3, WL-WN573HP3, WL-WN553X1, AERIAL HD9S
Model difference:	PCB board, circuit, structure and internal of these model(s) are the same, only model name and appearance color is different for these model.
Power Rating:	DC 54.0V from adapter
Adapter information:	Model: TDX18-5400300U Input: 100-240V~ 50/60Hz 0.6A Output: 54.0V=0.3A
Hardware Version:	WS-WN588HX3-B
Software Version:	M88HX3_V250625
Sample(s) Status:	AiTSZ-250917061-1(Normal sample) AiTSZ-250917061-2(Engineer sample)

2.4G WIFI:

Supported type:	802.11b/g/n(H20)/n(H40)/ax(HE20)/ax(HE40)
Modulation:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Operation frequency:	802.11b/g/n(H20)/ax(HE20): 2412MHz~2472MHz 802.11n(H40)/ax(HE40):2422MHz~2462MHz
Channel number:	802.11b/g/n(H20)/ax(HE20): 11 802.11n(H40)/ax(HE40):7
Channel separation:	5MHz
Antenna type:	External Antenna MIMO 2*2
Antenna gain:	Antenna 1:6.68dBi, Antenna 2: 6.68dBi
Directional gain:	9.69dBi

Remark:

1. Directional gain = $G_{ANT\ MAX} + 10 \log(N_{ANT}/N_{SS})$ dBi, where N_{SS} = the number of independent spatial streams of data and $G_{ANT\ MAX}$ is the gain of the antenna having the highest gain (in dBi). For this devices $N_{SS} = 1$.
2. WIFI 802.11ax mode only Support Full RU.
3. The above DUT's information was declared by manufacturer. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.3 Description of Test Modes and Test Frequency

There are 11 channels provided to the EUT for 20MHz protocol and 7 channels for 40 MHz protocol. Channel 01/06/11 were selected for 20MHz protocol mode test and channel 03/06/09 were selected for 40MHz protocol mode test.

.Operation Frequency List:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2442		

Note: The line display in grey were the channel selected for testing

Exploratory testing was performed under each mode combination test channel; only the final measurement of the worst combination was made and recorded in this report.

Test case	Exploratory measurement			Final measurement Recorded In Report		
	Mode	Date rate	Channel	Mode	Date rate	Channel
Maximum output power	802.11b	1~11Mbps	☒ Lowest ☒ Middle ☒ Highest	802.11b	1Mbps	☒ Lowest ☒ Middle ☒ Highest
	802.11g	6~54Mbps		802.11g	6Mbps	
	802.11n(HT20)	MCS0~MCS15		802.11n(HT20)	MCS0	
	802.11n(HT40)	MCS0~MCS15		802.11n(HT40)	MCS0	
	802.11ax(HE20)	MCS0~MCS11		802.11ax(HE20)	MCS0	
	802.11ax(HE40)	MCS0~MCS11		802.11ax(HE40)	MCS0	
Power spectral density	802.11b	1~11Mbps	☒ Lowest ☒ Middle ☒ Highest	802.11b	1Mbps	☒ Lowest ☒ Middle ☒ Highest
	802.11g	6~54Mbps		802.11g	6Mbps	
	802.11n(HT20)	MCS0~MCS15		802.11n(HT20)	MCS0	
	802.11n(HT40)	MCS0~MCS15		802.11n(HT40)	MCS0	
	802.11ax(HE20)	MCS0~MCS11		802.11ax(HE20)	MCS0	
	802.11ax(HE40)	MCS0~MCS11		802.11ax(HE40)	MCS0	
-6dB bandwidth	802.11b	1~11Mbps	☒ Lowest ☒ Middle ☒ Highest	802.11b	1Mbps	☒ Lowest ☒ Middle ☒ Highest
	802.11g	6~54Mbps		802.11g	6Mbps	
	802.11n(HT20)	MCS0~MCS15		802.11n(HT20)	MCS0	
	802.11n(HT40)	MCS0~MCS15		802.11n(HT40)	MCS0	
	802.11ax(HE20)	MCS0~MCS11		802.11ax(HE20)	MCS0	
	802.11ax(HE40)	MCS0~MCS11		802.11ax(HE40)	MCS0	
Conducted Spurious Emissions	802.11b	1~11Mbps	☒ Lowest ☒ Middle ☒ Highest	802.11b	1Mbps	☒ Lowest ☒ Middle ☒ Highest
	802.11g	6~54Mbps		802.11g	6Mbps	
	802.11n(HT20)	MCS0~MCS15		802.11n(HT20)	MCS0	
	802.11n(HT40)	MCS0~MCS15		802.11n(HT40)	MCS0	
	802.11ax(HE20)	MCS0~MCS11		802.11ax(HE20)	MCS0	
	802.11ax(HE40)	MCS0~MCS11		802.11ax(HE40)	MCS0	
Conducted Band edge	802.11b	1~11Mbps	☒ Lowest ☒ Highest	802.11b	1Mbps	☒ Lowest ☒ Highest
	802.11g	6~54Mbps		802.11g	6Mbps	
	802.11n(HT20)	MCS0~MCS15		802.11n(HT20)	MCS0	
	802.11n(HT40)	MCS0~MCS15		802.11n(HT40)	MCS0	
	802.11ax(HE20)	MCS0~MCS11		802.11ax(HE20)	MCS0	
	802.11ax(HE40)	MCS0~MCS11		802.11ax(HE40)	MCS0	

Radiated Band edge	802.11b 802.11g 802.11n(HT20) 802.11n(HT40) 802.11ax(HE20) 802.11ax(HE40)	1~11Mbps 6~54Mbps MCS0~MCS15 MCS0~MCS15 MCS0~MCS11 MCS0~MCS11	☒ Lowest ☒ Highest	802.11ax(HE40)	MCS0	☒ Lowest ☒ Highest
Radiated Emissions Above 1GHz	802.11b 802.11g 802.11n(HT20) 802.11n(HT40) 802.11ax(HE20) 802.11ax(HE40)	1~11Mbps 6~54Mbps MCS0~MCS15 MCS0~MCS15 MCS0~MCS11 MCS0~MCS11	☒ Lowest ☒ Middle ☒ Highest	802.11b	1Mbps	☒ Lowest ☒ Middle ☒ Highest
Radiated Emissions Below 1GHz	802.11b 802.11g 802.11n(HT20) 802.11n(HT40) 802.11ax(HE20) 802.11ax(HE40)	1~11Mbps 6~54Mbps MCS0~MCS15 MCS0~MCS15 MCS0~MCS11 MCS0~MCS11	☒ Lowest ☒ Middle ☒ Highest	802.11b	1Mbps	☒ Middle
Conducted Emissions 9KHz-30 MHz	802.11b 802.11g 802.11n(HT20) 802.11n(HT40) 802.11ax(HE20) 802.11ax(HE40)	1~11Mbps 6~54Mbps MCS0~MCS15 MCS0~MCS15 MCS0~MCS11 MCS0~MCS11	☒ Lowest ☒ Middle ☒ Highest	802.11b	1Mbps	☒ Middle

Power setting during the test:

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters:

Test Software Version	QATool_Dbg.exe		
Frequency	2412/2422MHz	2437MHz	2452/2462MHz
802.11b	Default	Default	Default
802.11g	Default	Default	Default
802.11n(HT20)	Default	Default	Default
802.11n(HT40)	Default	Default	Default
802.11ax(HE20)	Default	Default	Default
802.11ax(HE40)	Default	Default	Default

2.4 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Serial No.	Provided by	Other
/	/	/	/	/	/
/	/	/	/	/	/

2.5 Equipment List for the Test

Conducted Emission measurement							
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Pre.Cal. Date	New Cal. Date	Cal.Due
☒ 1	EMI Test Receiver	R&S	ESPI	100771	2024.09.25	2025.09.23	2026.09.22
☒ 2	LISN	R&S	NNLK 8129	8130179	2024.09.24	2025.09.23	2026.09.22
☒ 3	ISN	TESEQ	T800	29429	2024.09.26	2025.09.23	2026.09.22
☒ 4	Pulse Limiter	R&S	ESH3-Z2	102789	2024.09.24	2025.09.23	2026.09.22
☒ 5	CE Software	EZ	EZ-EMC_CE	Ver.AIT-03A	N/A	N/A	N/A

Radiation Emission measurement							
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Pre.Cal. Date	New Cal. Date	Cal.Due
☒ 1	EMI Measuring Receiver	R&S	ESR	101160	2024.09.25	2025.09.23	2026.09.22
☒ 2	Low Noise Pre Amplifier	SCHWARZBECK	BBV 9745	00282	2024.09.25	2025.09.23	2026.09.22
☒ 3	Low Noise Pre Amplifier	CESHENG	CSKJLNA23 1016A	CSKJLNA23 1016A	2024.09.25	2025.09.23	2026.09.22
☒ 4	Spectrum Analyzer	R&S	FSV40	101470	2024.09.23	2025.09.23	2026.09.22
☒ 5	Passive Loop	ETS	6512	00165355	2024.08.29	/	2026.08.28
☒ 6	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9168	01434	2024.08.29	/	2027.08.28
☒ 7	Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	452	2024.08.29	/	2027.08.28
☒ 8	Horn Antenna 15-40GHz	SCHWARZBECK	BBHA9170	BBHA91703 67	2024.08.28	/	2027.08.27
☒ 9	6dB Attenuator	JFW	50FPE-006	4360846-949-1	2024.09.24	2025.09.23	2026.09.22
☒ 10	RE Software	EZ	EZ-EMC_RE	Ver.AIT-03A	N/A	N/A	N/A

RF Conducted measurement							
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Pre.Cal. Date	New Cal. Date	Cal.Due
☒ 1	Spectrum Analyzer	Agilent	N9020A	MY5342157 0	2024.09.25	2025.09.23	2026.09.22
☒ 2	Power Sensor	Agilent	U2021XA	MY5411000 7	2024.09.25	2025.09.23	2026.09.22
☐ 3	Vector Signal Generator	Agilent	N5182A	MY5014300 9	2024.09.25	2025.09.23	2026.09.22
☐ 4	Analog signal generator	Agilent	E8257	MY5155425 6	2024.09.25	2025.09.23	2026.09.22
☒ 5	Const Temp. & Humidity Chamber	Eastlab	YH-HW-408L	23051109	2024.09.24	2025.09.23	2026.09.22
☐ 6	Wideband Radio communication tester	R&S	CMW500	1201.0002K 50	2024.09.24	2025.09.23	2026.09.22
☒ 7	DC power supply	ZHAOXIN	RXN-305D-2	2807000255 9	2024.09.24	2025.09.23	2026.09.22
☒ 8	RF Test box	TST	TSTPASS	21033016	2024.09.25	2025.09.23	2026.09.22
☒ 9	RF Software	TST	TSTPASS	Version 2.0	N/A	N/A	N/A
☐ 10	RF Software	Cesheng	WCN Regulary	Ver 25.03.2901	N/A	N/A	N/A

Note: ☐ is not applicable in this Test Report. ☒ is applicable in this Test Report.

3 TEST CONDITIONS AND RESULTS

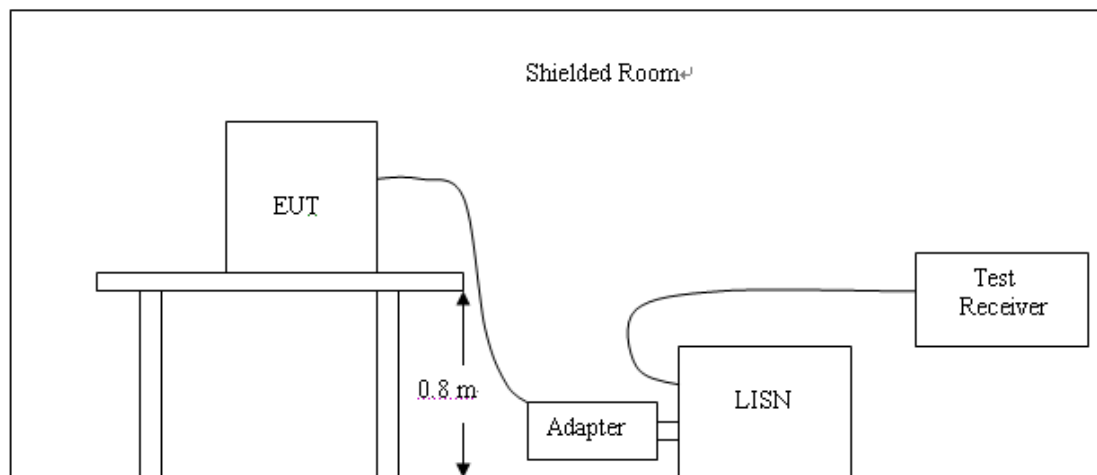
3.1 Conducted Emissions Test

LIMIT

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION

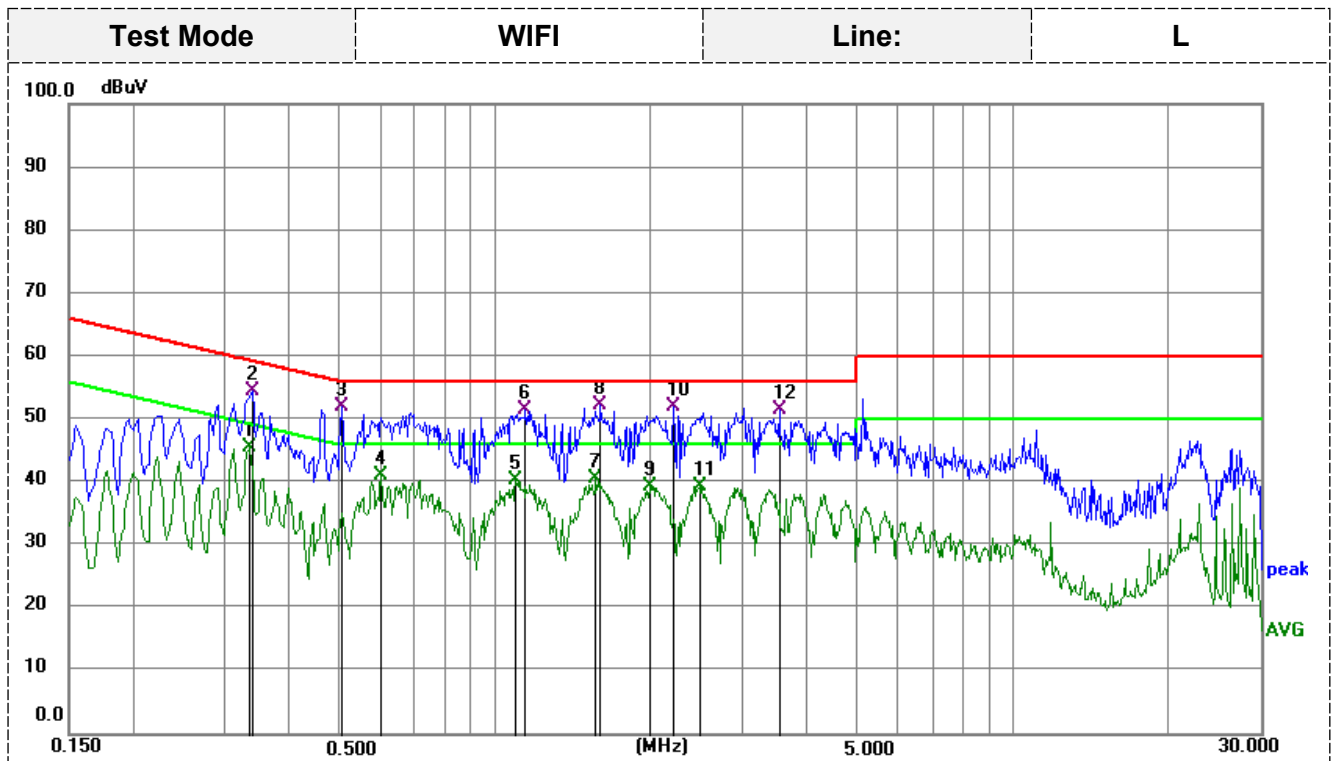


TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2020.
2. Support equipment, if needed, was placed as per ANSI C63.10:2020.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2020.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

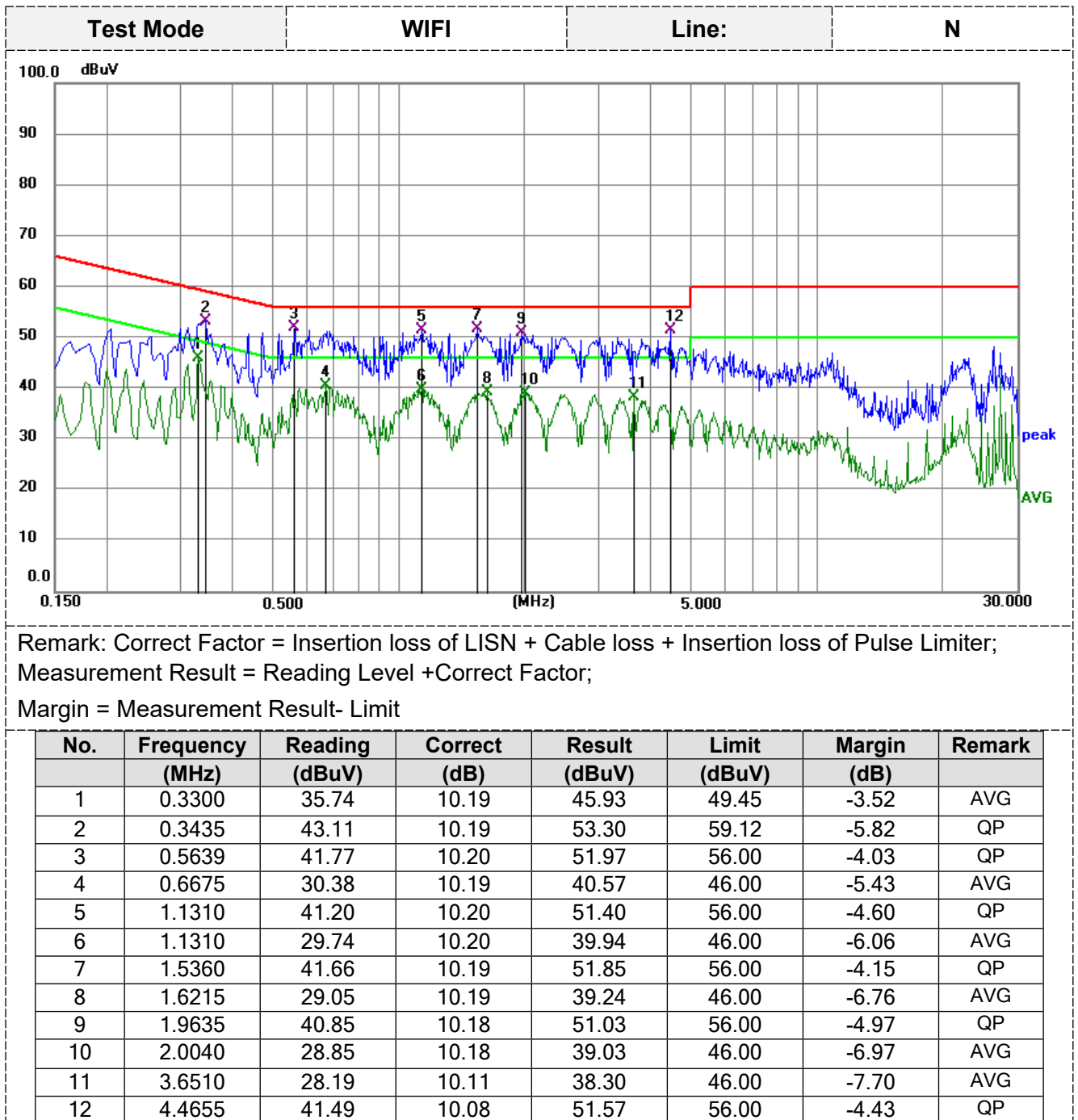
TEST RESULTS

Remark: Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:



Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;
Measurement Result = Reading Level + Correct Factor;
Margin = Measurement Result - Limit

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3345	35.20	10.26	45.46	49.34	-3.88	AVG
2	0.3390	44.11	10.26	54.37	59.23	-4.86	QP
3	0.5054	41.63	10.26	51.89	56.00	-4.11	QP
4	0.6000	30.86	10.24	41.10	46.00	-4.90	AVG
5	1.0950	29.94	10.27	40.21	46.00	-5.79	AVG
6	1.1445	41.12	10.27	51.39	56.00	-4.61	QP
7	1.5630	30.34	10.25	40.59	46.00	-5.41	AVG
8	1.5990	42.04	10.25	52.29	56.00	-3.71	QP
9	1.9860	29.07	10.24	39.31	46.00	-6.69	AVG
10	2.2065	41.82	10.23	52.05	56.00	-3.95	QP
11	2.4765	29.17	10.22	39.39	46.00	-6.61	AVG
12	3.5384	41.37	10.18	51.55	56.00	-4.45	QP



3.2 Radiated Emissions and Band Edge

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

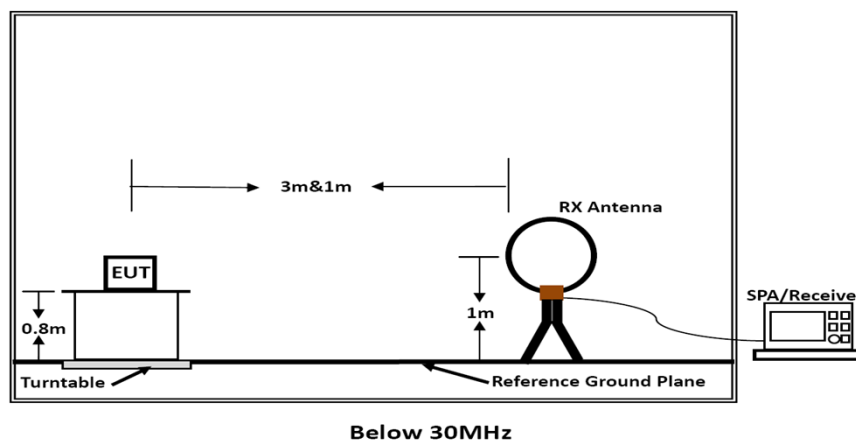
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

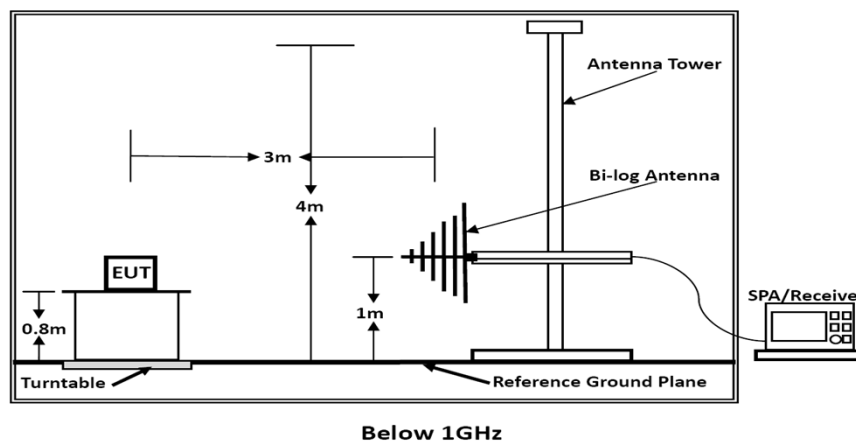
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

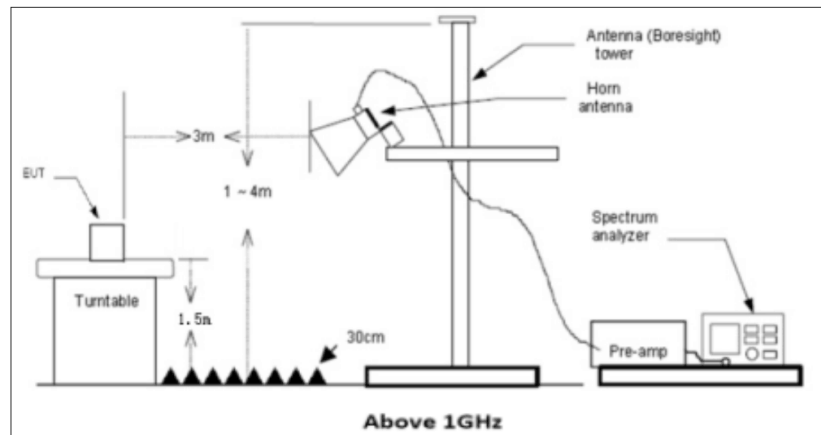
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed.
- Radiated emission test frequency band from 9KHz to 25GHz.
- The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3
1GHz-18GHz	Horn Antenna	3
18GHz-25GHz	Horn Antenna	1

- Setting test receiver/spectrum as following table states:

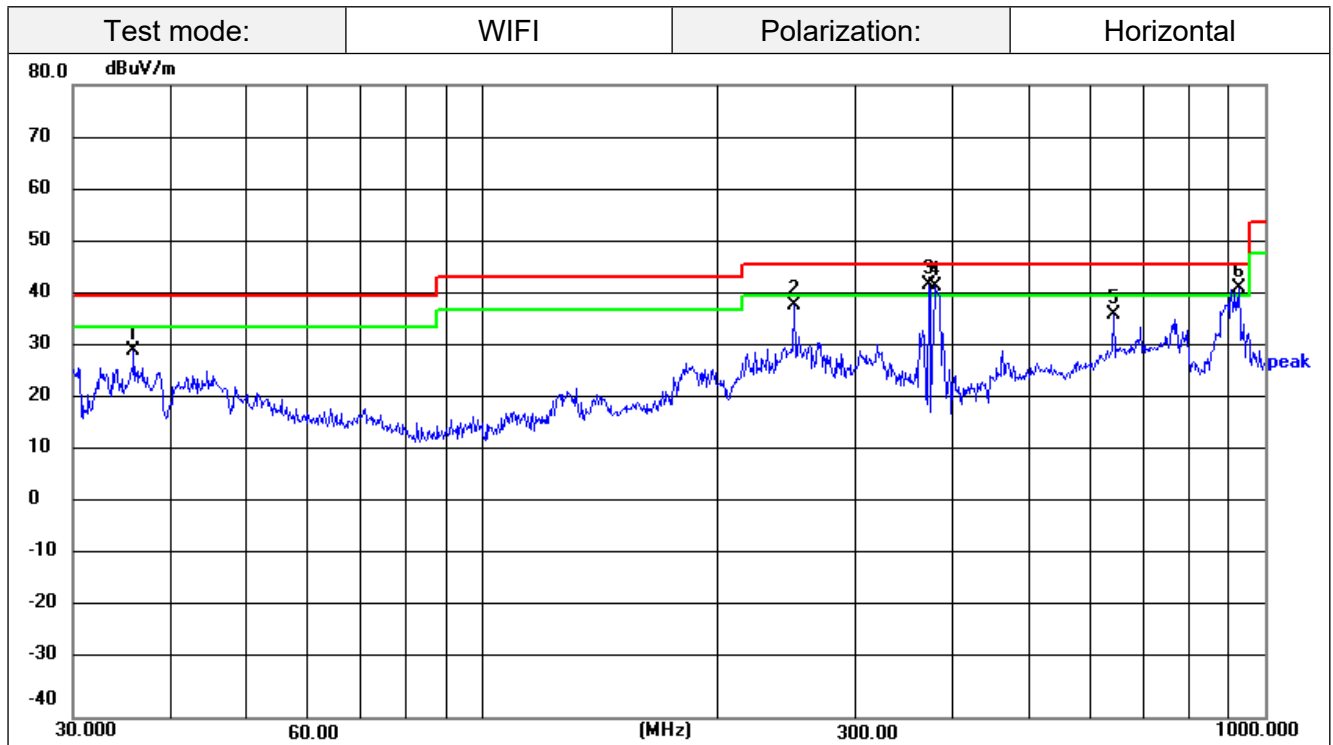
Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz, Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz, Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz, Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

TEST RESULTS

Remark:

1. Pre-scan all operation modes for below 1GHz test, only the worst case 802.11b ANT1 Middle Channel was recorded.
2. Pre-scan all operation modes for above 1GHz test, only the worst case 802.11b ANT1 was recorded.
3. Pre-scan all operation modes for bandedge test, only the worst case of 802.11ax(HE40) MIMO mode was recorded.
4. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz



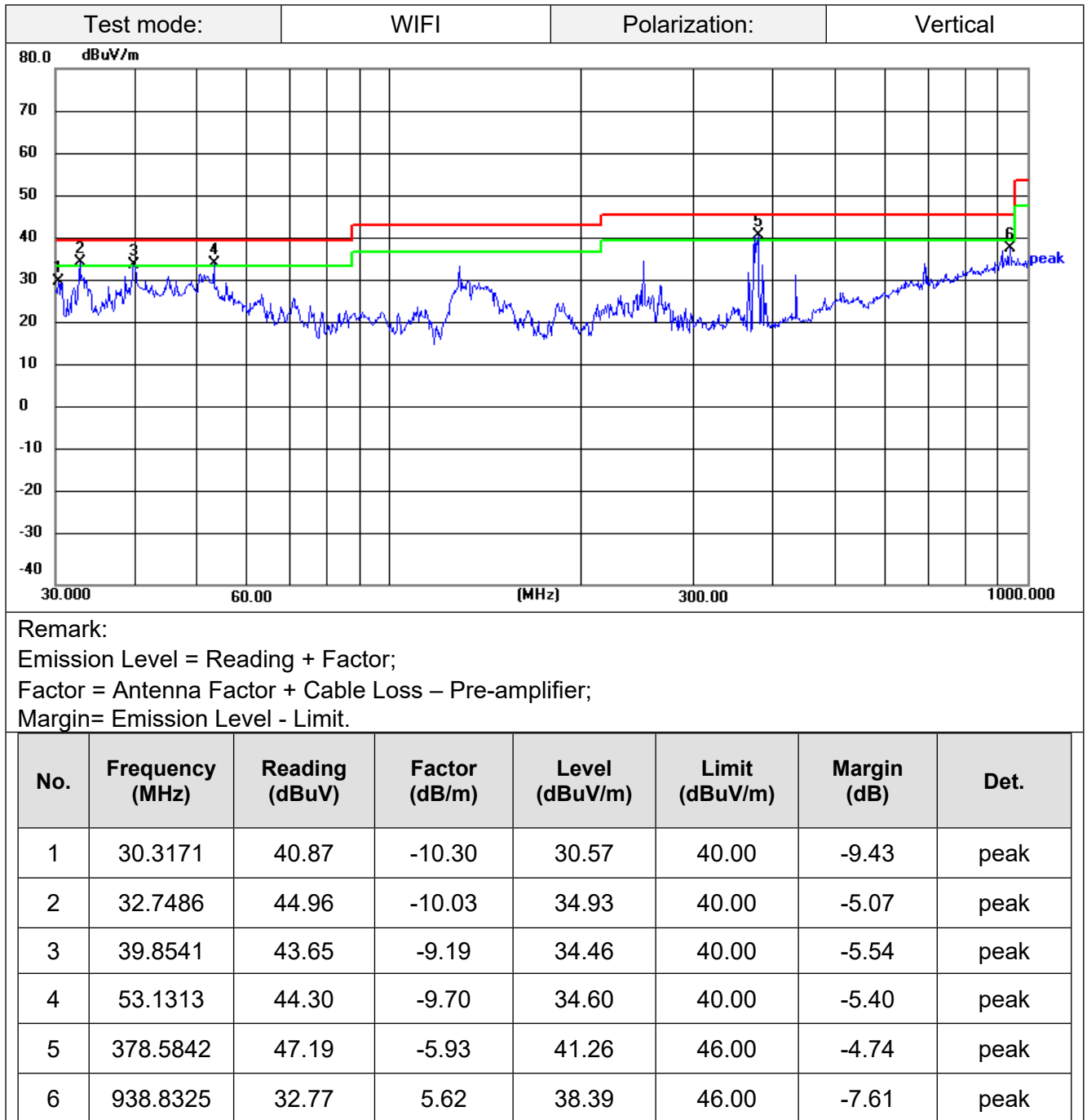
Remark:

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	35.8746	39.54	-9.75	29.79	40.00	-10.21	peak
2	250.3010	47.64	-9.38	38.26	46.00	-7.74	peak
3	372.0045	48.12	-6.04	42.08	46.00	-3.92	peak
4	378.5842	47.69	-5.93	41.76	46.00	-4.24	peak
5	640.6110	35.74	0.62	36.36	46.00	-9.64	peak
6	925.7562	36.36	5.27	41.63	46.00	-4.37	peak



For 1GHz to 25GHz
802.11b (above 1GHz)

Frequency(MHz):		2412		Polarity:	Horizontal	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
4824.25	61.51	-7.34	54.17	74	-19.83	PEAK
4824.25	55.73	-7.34	48.39	54	-5.61	AVG
7235.40	51.73	-1.34	50.39	74	-23.61	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		2412		Polarity:	VERTICAL	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
4824.25	61.98	-7.34	54.64	74	-19.36	PEAK
4824.25	56.41	-7.34	49.07	54	-4.93	AVG
7235.40	52.76	-1.34	51.42	74	-22.58	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		2437		Polarity:	Horizontal	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
4873.70	62.23	-6.82	55.41	74	-18.59	PEAK
4873.70	55.18	-6.82	48.36	54	-5.64	AVG
7311.00	51.87	-0.61	51.26	74	-22.74	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		2437		Polarity:	VERTICAL	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
4873.70	62.32	-6.82	55.50	74	-18.50	PEAK
4873.70	55.90	-6.82	49.08	54	-4.92	AVG
7311.00	52.51	-0.61	51.90	74	-22.10	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		2462		Polarity:	Horizontal	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
4924.75	47.02	-6.23	58.19	74	-15.81	PEAK
4924.75	55.56	-6.23	49.33	54	-4.67	AVG
7386.00	46.47	0.05	50.50	74	-23.50	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		2462		Polarity:	VERTICAL	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
4924.75	45.63	-6.23	59.25	74	-14.75	PEAK
4924.75	53.88	-6.23	47.65	54	-6.35	AVG
7386.00	45.02	0.05	51.36	74	-22.64	PEAK
--	--	--	--	--	--	AVG

REMARKS:

1. Emission level (dBuV/m) = Reading (dBuV)+ Factor (dB/m)
2. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Emission level- Limit value.
4. -- Mean the PK detector measured value is below average limit.
5. Other emission levels are attenuated 20dB below the limit and not recorded in report.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

Radiation Restricted band
802.11ax(HE40) MIMO mode

Frequency(MHz):		2422		Polarity:	Horizontal	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
2389.67	62.57	-4.09	58.48	74	-15.52	PEAK
2389.67	53.99	-4.09	49.90	54	-4.10	AVG
2390.00	40.62	-4.10	56.97	74	-17.03	PEAK
2390.00	51.91	-4.10	47.81	54	-6.19	AVG

Frequency(MHz):		2422		Polarity:	Vertical	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
2388.94	63.37	-4.08	59.29	74	-14.71	PEAK
2388.94	54.84	-4.08	50.76	54	-3.24	AVG
2390.00	62.24	-4.10	58.14	74	-15.86	PEAK
2390.00	55.03	-4.10	50.93	54	-3.07	AVG

Frequency(MHz):		2452		Polarity:	Horizontal	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	58.14	-3.09	55.05	74	-18.95	PEAK
2483.50	51.39	-3.09	48.30	54	-5.70	AVG
2485.88	58.88	-3.06	55.82	74	-18.18	PEAK
2485.88	50.95	-3.06	47.89	54	-6.11	AVG

Frequency(MHz):		2452		Polarity:	Vertical	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	59.06	-3.09	55.97	74	-18.03	PEAK
2483.50	52.50	-3.09	49.41	54	-4.59	AVG
2486.03	59.71	-3.06	56.65	74	-17.35	PEAK
2486.03	51.84	-3.06	48.78	54	-5.22	AVG

REMARKS:

1. Emission level (dBuV/m) = Reading (dBuV)+ Factor (dB/m)
2. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Emission level- Limit value.
4. -- Mean the PK detector measured value is below average limit.
5. Other emission levels are attenuated 20dB below the limit and not recorded in report.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

3.3 Maximum Peak Conducted Output Power

Limit

The maximum peak conducted output power shall not exceed 1.0 W.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power Meter.

PKPM1 Peak power meter method described in ANSI C63.10-2020 section 11.9.1.2 is used to measure the Conducted Output Power.

Test Configuration



Note: For Conducted Measurement the final Conducted value (dBm) = Measurement value (dBm) + RF cable loss (dB)(the short RF cable connect EUT antenna port to the test equipment)

For example: the measurement value is 10 dBm and the short RF cable loss 0.5dB used (Provided by Applicant), then the final result of EUT: Conducted value (dBm) = 10 dBm + 0.5 dB = 10.5 dBm

Input the cable Compensation value to the test software before test, then the software will calculate the final result automatically.

Test Results

☒ **Pass** ☐ **Not Applicable**

Note:

For test data, please refer to Appendix RF test data for WIFI2.4G.

3.4 Power Spectral Density

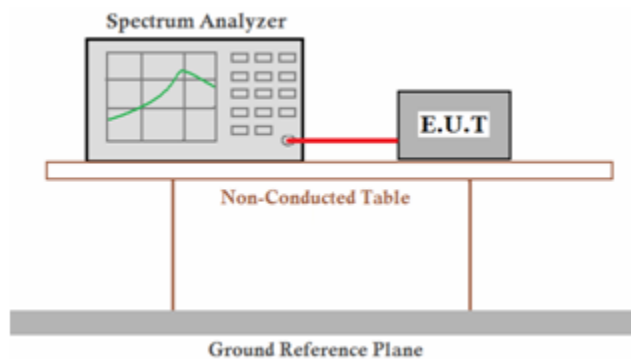
Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW ≥ 3 kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Set the span to 1.5 times the DTS channel bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be 8dBm.

Test Configuration



Test Results

☒ Pass ☐ Not Applicable

Note:

For test data, please refer to Appendix RF test data for WIFI2.4G.

3.5 6dB Bandwidth

Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz

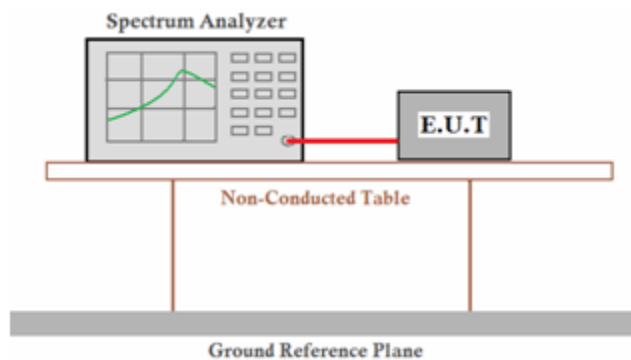
Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer. Set EUT in transmitting mode.

- Set Spectrum Analyzer to OBW measurement mode and set bandwidth mode with X set to 6 dB.
- Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
- Set the VBW $\geq [3 \times \text{RBW}]$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.

Allow trace to fully stabilize

Test Configuration



Test Results

☒ Pass ☐ Not Applicable

Note:

For test data, please refer to Appendix RF test data for WIFI2.4G.

3.6 Out-of-band Emissions

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer. Place the EUT on the table and set it in transmitting mode.

Step 1: Reference level measurement using the following procedure:

- g) Set instrument center frequency to DTS channel center frequency.
- h) Set the span to ≥ 1.5 times the DTS bandwidth.
- i) Set the RBW = 100 kHz.
- j) Set the VBW $\geq [3 \times \text{RBW}]$.
- k) Detector = peak.
- l) Sweep time = auto couple.
- m) Trace mode = max hold.
- n) Allow trace to fully stabilize.
- o) Use the peak marker function to determine the maximum PSD level.

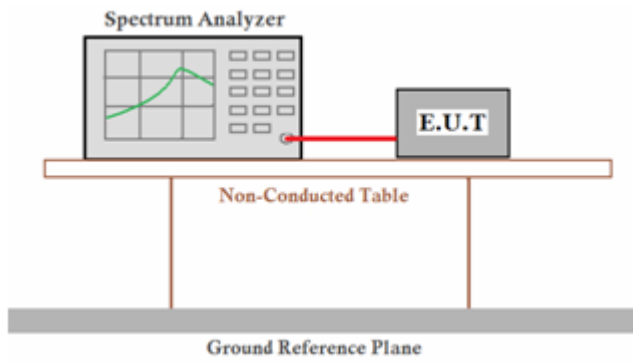
Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Step 2: Emission level measurement using the following procedure:

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW $\geq [3 \times \text{RBW}]$.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements of PSD level measured in step 1 Reference level measurement.

Test Configuration



Test Results

☒ **Pass**

 ☐ **Not Applicable**

Note:

For test data, please refer to Appendix RF test data for WIFI2.4G.

3.7 Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

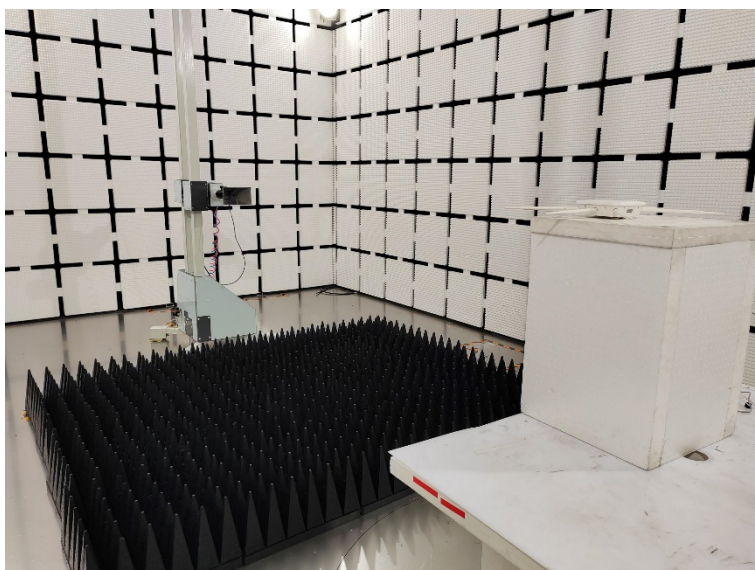
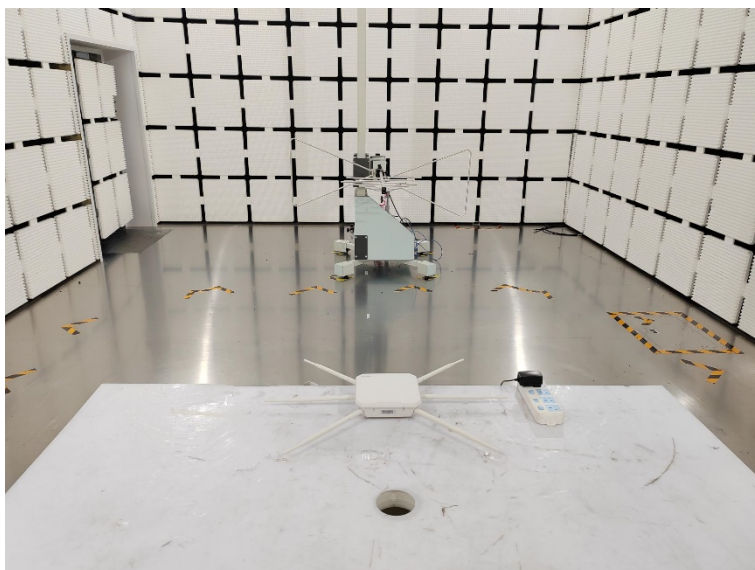
FCC CFR Title 47 Part 15 Subpart C Section 15.247(b) (4):

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Result

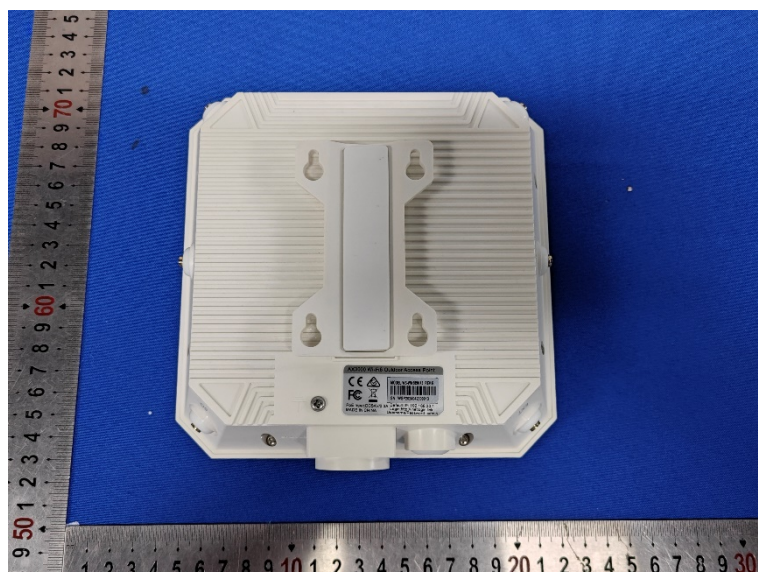
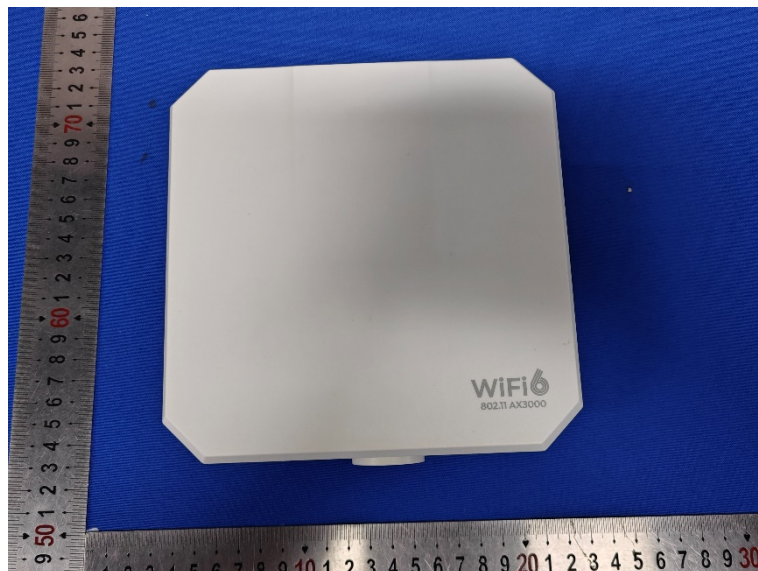
The device used two reversed SMA external, the maximum gain of antenna 1 and antenna 2 is 6.68dBi with directional gain 9.69dBi. There is no consideration of replacement the antenna.

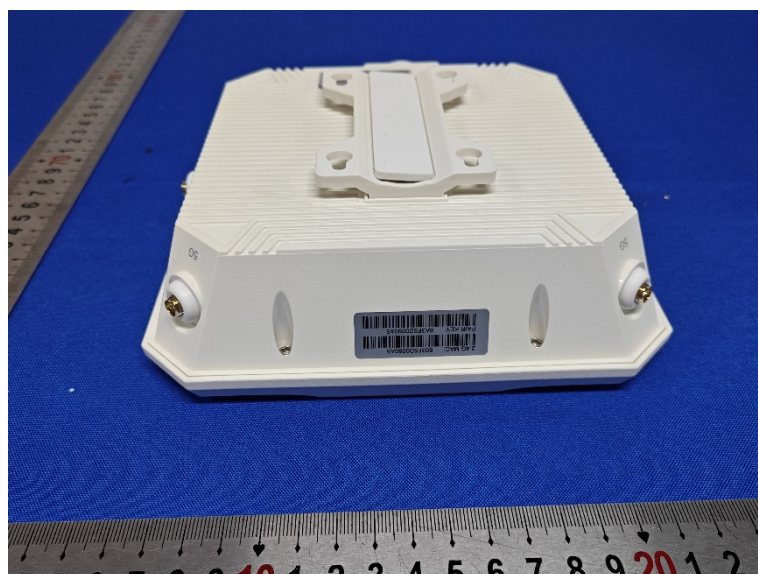
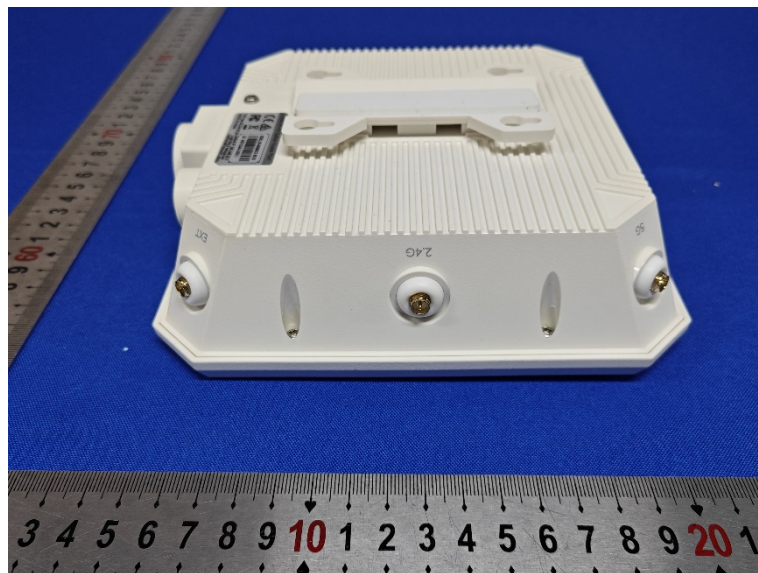
4 Test Setup Photographs of EUT

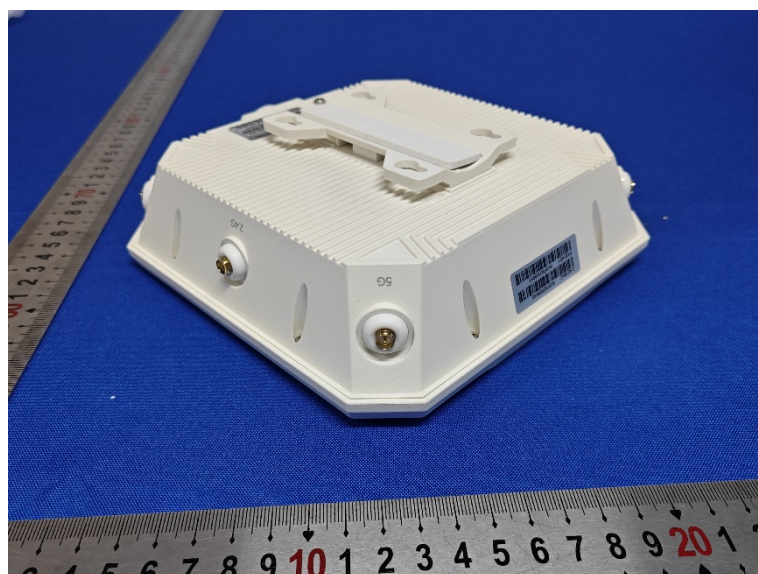
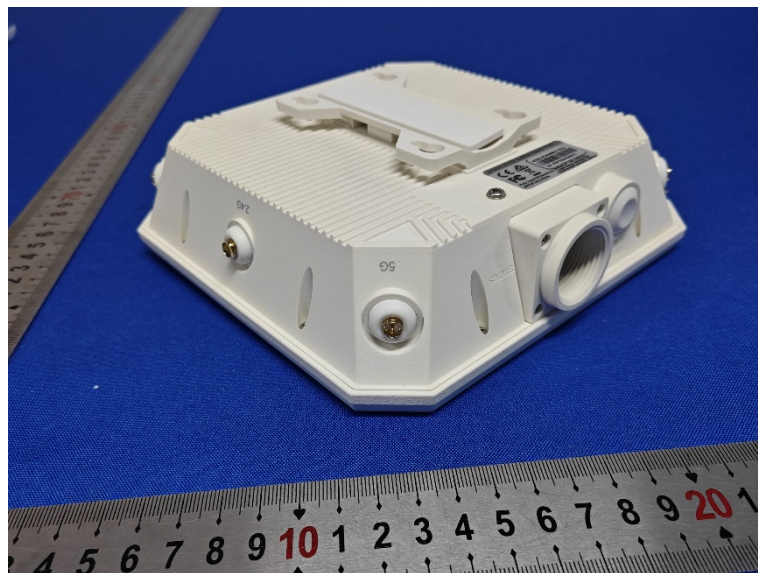
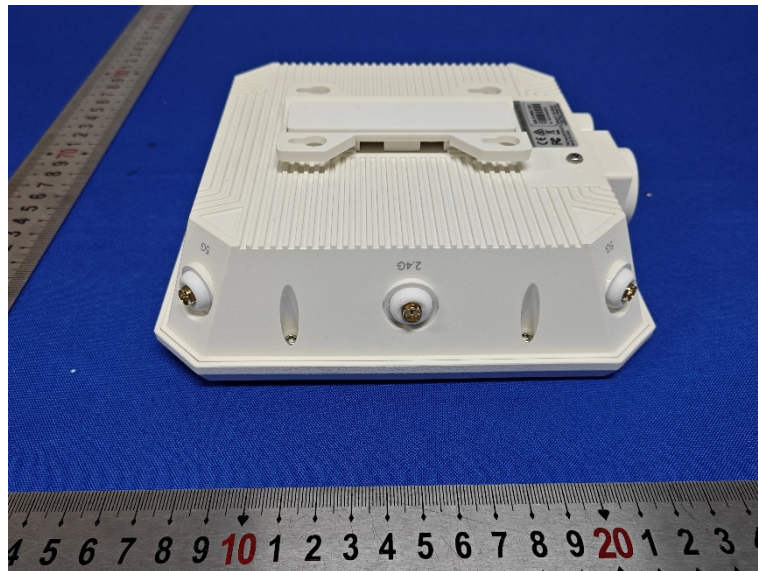


5 Photos of EUT

External Photos

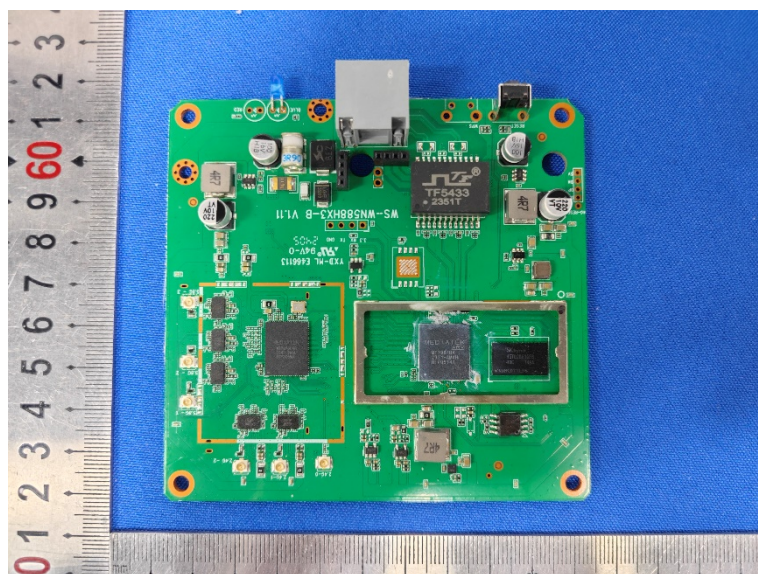
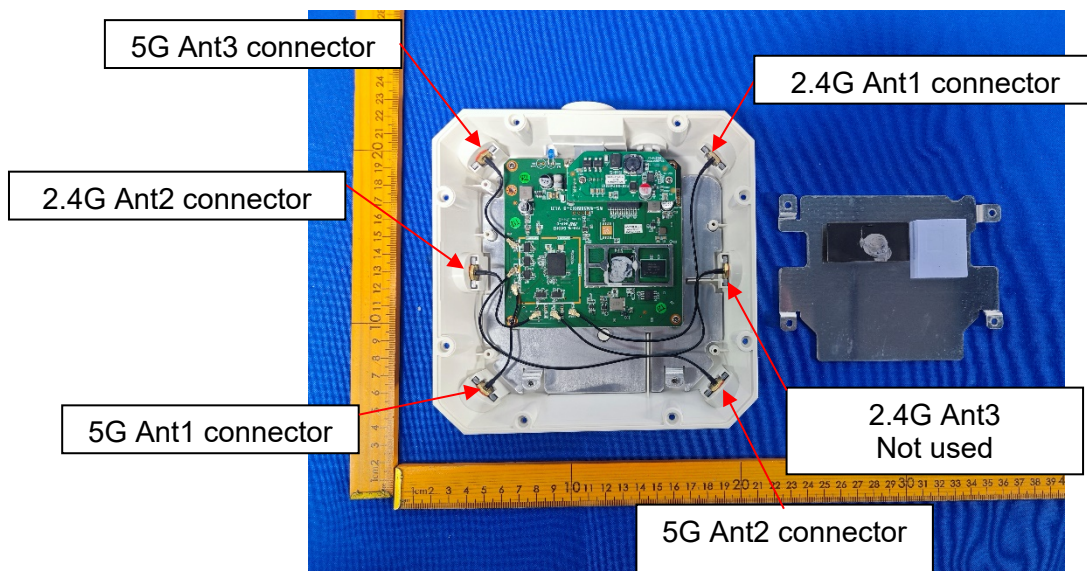
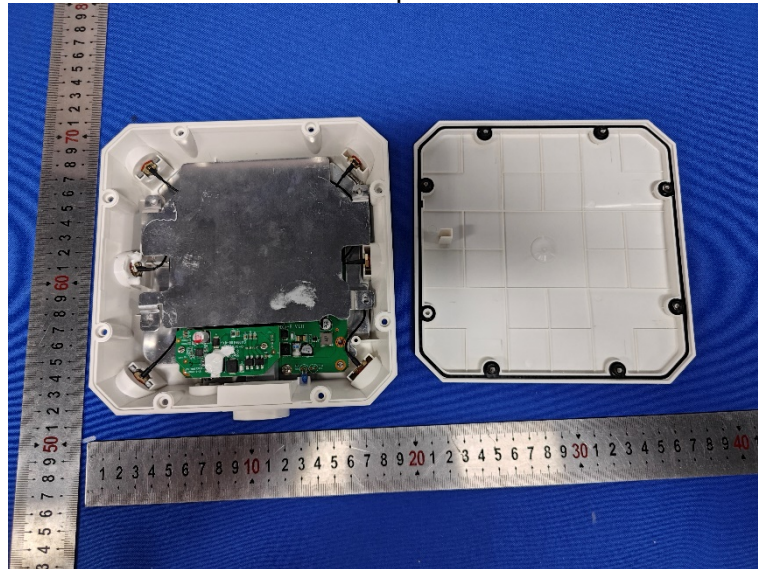


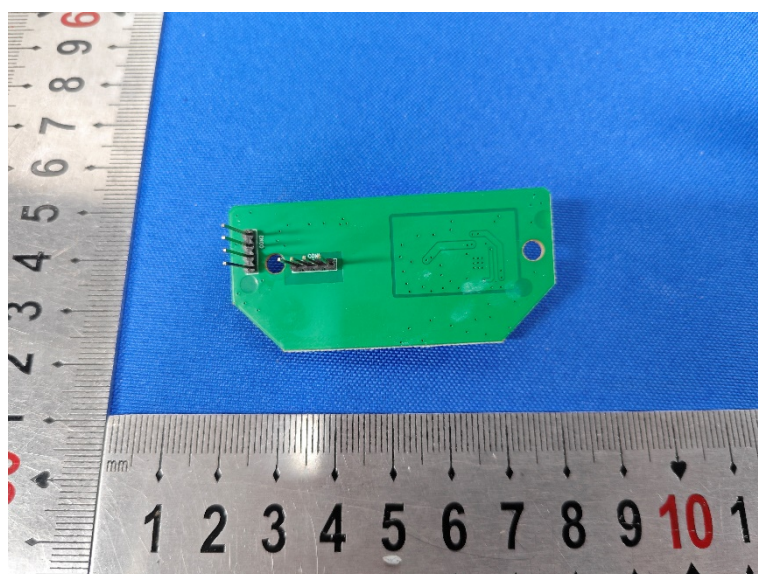
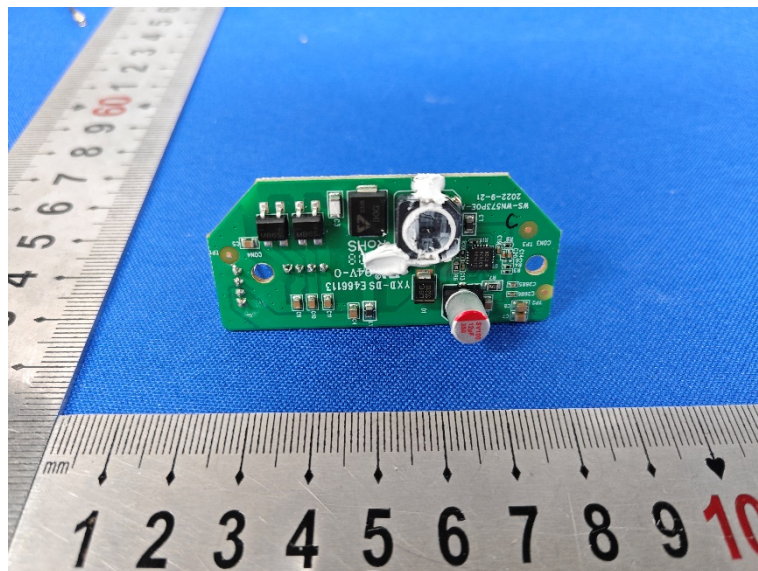
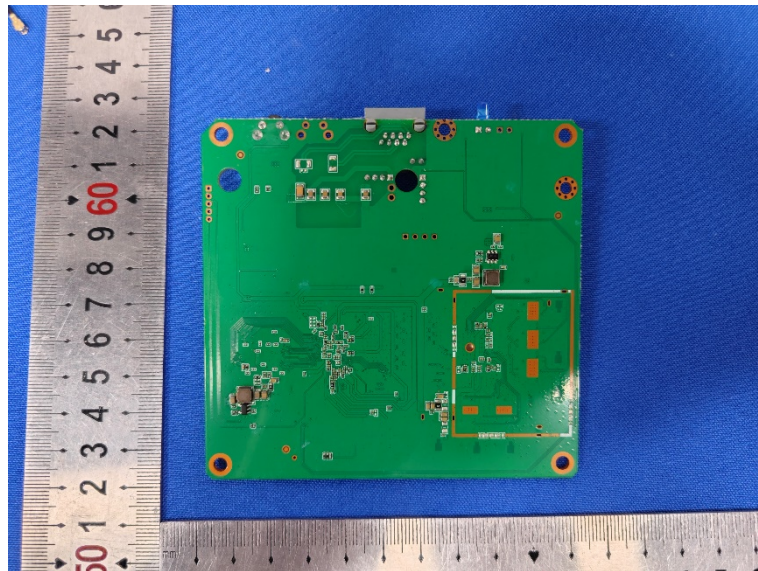






Internal photos





***** End of Report *****