

FCC Test Report

Report No.: RWA0202400018B

Applicant: ShenZhen Foscam Intelligent Technology Co., Ltd.

Address: Room 902,Building 1B, Shenzhen International Innovation Valley,
Xingke 1st Street, Nanshan Dist, Shenzhen, China, 518055

Product Name: QHD Wireless PTZ Dome IP Camera

Product Model: SD4H

Multiple Models: SD4T,SD4P,SD4V

Trade Mark: FOSCAM

FCC ID: ZDESD4H

Standards: FCC CFR Title 47 Part 15E (§15.407)

Test Date: 2024-1-11 to 2024-01-19

Test Result: Complied

Issue Date: 2024-01-26

Reviewed by:

Frank Yin

Approved by:

Jacob Kong

Frank Yin
Project Engineer

Jacob Kong
Manager

Prepared by:

World Alliance Testing and Certification (Shenzhen) Co., Ltd

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Revision History

Version No.	Issued Date	Description
00	2024-01-26	Original

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1 General Information

1.1 Client Information

Applicant:	ShenZhen Foscam Intelligent Technology Co., Ltd.
Address:	Room 902,Building 1B, Shenzhen International Innovation Valley, Xingke 1st Street, Nanshan Dist, Shenzhen, China, 518055
Manufacturer:	ShenZhen Foscam Intelligent Technology Co., Ltd.
Address:	Room 902,Building 1B, Shenzhen International Innovation Valley, Xingke 1st Street, Nanshan Dist, Shenzhen, China, 518055

1.2 Product Description of EUT

The EUT is QHD Wireless PTZ Dome IP Camera that contains 2.4G and 5G WLAN radios, this report covers the full testing of the 5G WLAN radio.

Sample Serial number	2F-2 for CE&RE test, 2F-1 for RF test conducted test (assigned by WATC)
Sample Received Date	2024-01-10
Sample Status	Good Condition
Frequency Range	5725 MHz - 5850MHz
Maximum Conducted Output Power	5725 MHz - 5850MHz: 12.65dBm
Modulation Technology	OFDM
Spatial Streams	SISO (1TX, 1RX)
Antenna Gain [#]	3.28dBi
Power Supply	DC 12.0V from adapter
Adapter Information	Model:ICP48C-120-4000 Input: AC100-240V, 50/60Hz, 1.3A Output: DC 12.0V/4A
Modification	Sample No Modification by the test lab

1.3 Antenna information

15.203 requirement: 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.	
Device Antenna information:	
The Wi-Fi antenna is an external antenna use the unique antenna connector. Please see product internal photos for details.	

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DTS, FCC ID: ZDESD4H

1.5 Measurement Uncertainty

Parameter		Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
AC Power Lines Conducted Emissions		±3.14dB
Emissions, Radiated	Below 30MHz	±2.78dB
	Below 1GHz	±4.84dB
	Above 1GHz	±5.44dB
Emissions, Conducted		1.75dB
Conducted Power		0.74dB
Frequency Error		150Hz
Bandwidth		0.34%
Power Spectral Density		0.74dB
Note 1: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. Note 2: The Decision Rule is based on simple acceptance with ISO Guide 98-4:2012 Clause 8.2 (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)		

1.6 Laboratory Location

World Alliance Testing and Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: qa@watc.com.cn

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

1.7 Test Methodology

FCC CFR 47 Part 2

FCC CFR 47 Part 15

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10-2020

2 Description of Measurement

2.1 Test Configuration

Operating channels: (5725-5850MHz)					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
149	5745	157	5785	165	5825
151	5755	159	5795	/	/
153	5765	161	5805	/	/
According to ANSI C63.10-2020 chapter 5.6.1 Table 11 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:					
802.11a, 802.11n-HT20					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
149	5745	157	5785	165	5825
802.11n-HT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
151	5755	/	/	159	5795

Test Mode:				
Transmitting mode:		Keep the EUT in continuous transmitting with modulation		
Exercise software [#] :		SecureCRT Version 7.1.1		
Mode	Data rate	Powel Level Setting [#]		
		Low Channel	Middle Channel	High Channel
802.11a	6Mbps	default	default	default
802.11n-HT20	MCS0	default	default	default
802.11n-HT40	MCS0	default	/	default
The exercise software and the maximum power setting that provided by manufacturer.				

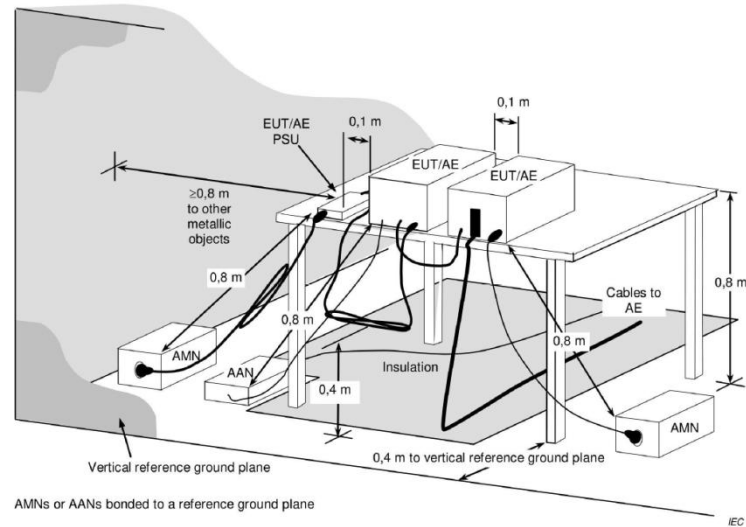
Worst-Case Configuration:
For AC power line conducted emission and radiated emission 9kHz-1GHz and above 18GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario.

2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

2.3 Test Setup

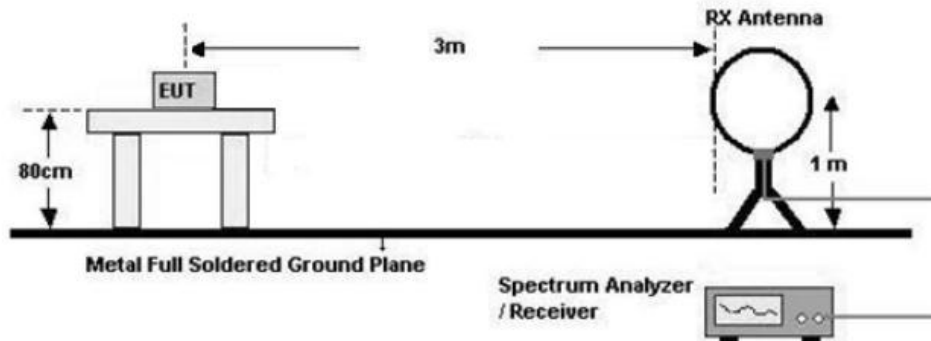
1) Conducted emission measurement:



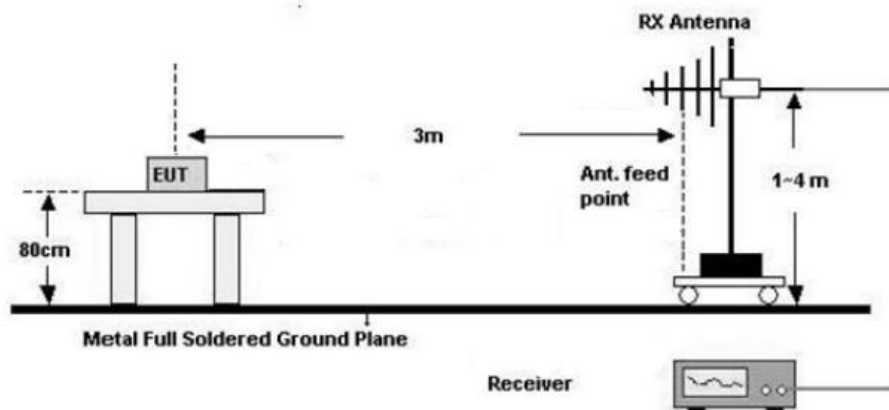
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

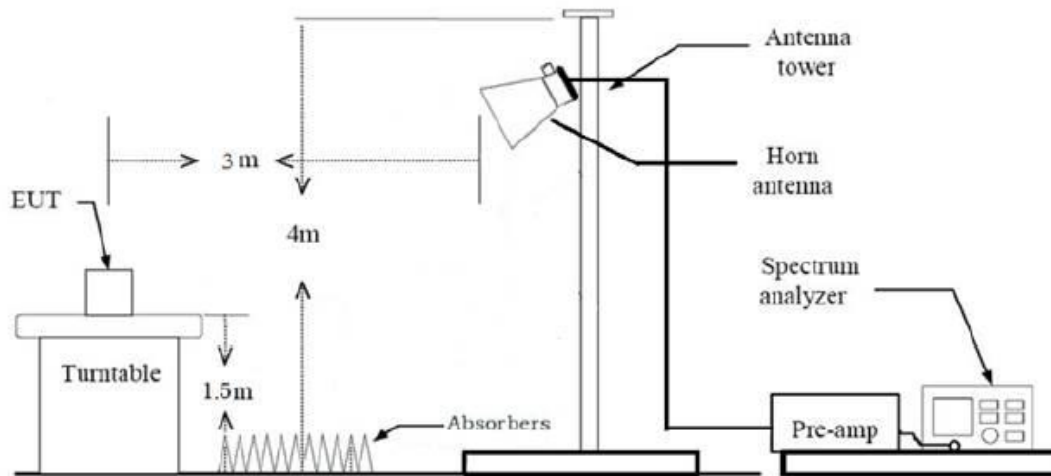
Below 30MHz (3m SAC)



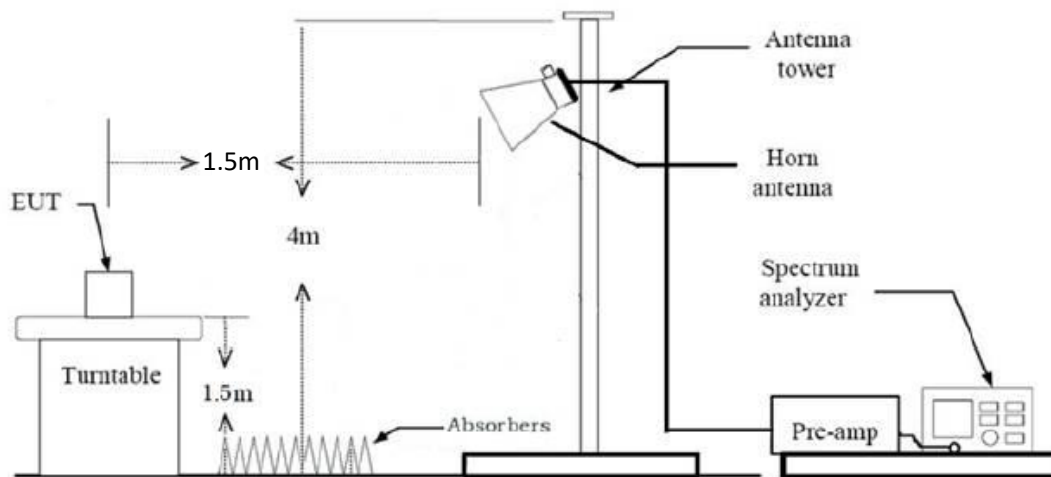
0MHz-1GHz (3m SAC)



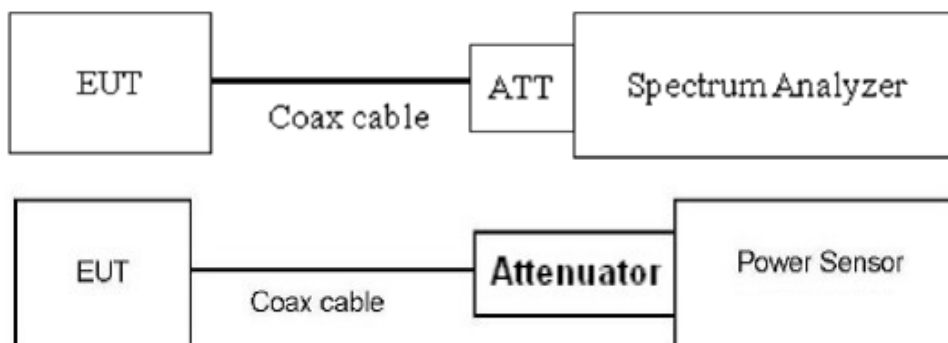
1GHz-18GHz(3m FAC)



Above 18GHz (3m FAC)



3) RF Conducted Test



2.4 Test Procedure

Conducted emission:

1. The E.U.T is placed on a non-conducting table 40cm from the vertical ground plane and 80cm above the horizontal ground plane (Please refer to the block diagram of the test setup and photographs).
2. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
3. Line conducted data is recorded for both Line and Neutral

Radiated Emission Procedure:

a) For below 30MHz

1. All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz- 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were $40 \cdot \log(\text{test distance} / \text{specification distance})$.
2. Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, ground-parallel)

b) For 30MHz-1GHz:

1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.

c) For above 1GHz:

1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m (1-18GHz) and 1.5 m (above 18GHz).
2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
4. Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

RF Conducted Test:

1. The antenna port of EUT was connected to the RF port of the test equipment (Power Meter or

Spectrum analyzer) through Attenuator and RF cable.

2. The cable assembly insertion loss of 6.5dB (including 6.0 dB Attenuator and 0.5dB cable) was entered as an offset in the power meter. Note: Actual cable loss was unavailable at the time of testing, therefore a loss of 0.5dB was assumed as worst case. This was later verified to be true by laboratory. (if the RF cable provided by client, the cable loss declared by client)
3. The EUT is keeping in continuous transmission mode and tested in all modulation modes.

2.5 Measurement Method

Description of Test	Measurement Method
AC Line Conducted Emissions	ANSI C63.10-2020 Section 6.2
Maximum Conducted Output Power	KDB 789033 D02 v02r01 section E.3. b)
Power Spectral Density	KDB 789033 D02 v02r01 section F
26 dB Emission Bandwidth	KDB 789033 D02 v02r01 section C.1
6 dB Emission Bandwidth	KDB 789033 D02 v02r01 section C.2
99% Occupied Bandwidth	KDB 789033 D02 v02r01 section D.
Unwanted Emissions	KDB 789033 D02 v02r01 section G.
Duty Cycle	KDB 789033 D02 v02r01 section B.

2.6 Measurement Equipment

Manufacturer	Description	Model	Management No.	Calibration Date	Calibration Due Date
AC Line Conducted Emission Test					
ROHDE& SCHWARZ	EMI TEST RECEIVER	ESR	101817	2023/7/3	2024/7/2
R&S	LISN	ENV216	101748	2023/8/1	2024/7/30
N/A	Coaxial Cable	NO.12	N/A	2023/7/3	2024/7/2
Farad	Test Software	EZ-EMC	Ver. EMEC-3A1	/	/
Radiated Emission Test					
R&S	EMI test receiver	ESR3	102758	2023/7/3	2024/7/2
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSV40-N	101608	2023/7/3	2024/7/2
SONOMA INSTRUMENT	Low frequency amplifier	310	186014	2023/7/12	2024/7/11
COM-POWER	preamplifier	PAM-118A	18040152	2023/8/21	2024/8/20
COM-POWER	Amplifier	PAM-840A	461306	2023/8/8	2024/8/7
ETS	Passive Loop	6512	29604	2023/7/7	2024/7/6

	Antenna				
SCHWARZBECK	Log - periodic wideband antenna	VULB 9163	9163-872	2023/7/7	2024/7/6
Astro Antenna Ltd	Horn antenna	AHA-118S	3015	2023/7/6	2024/7/5
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2023/7/10	2024/7/9
Ducommun technologies	Horn Antenna	ARH-2823-02	1007726-03	2023/7/10	2024/7/9
Oulitong	Band Reject Filter	OBSF-5150-585 0-S	OE02104371	2023/9/15	2024/9/14
N/A	Coaxial Cable	N/A	NO.9	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.10	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.11	2023/8/8	2024/8/7
Audix	Test Software	E3	191218 V9	/	/
RF Conducted Test					
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSU-26	200680/026	2023/7/12	2024/7/11
ANRITSU	USB Power Sensor	MA24418A	12620	2023/7/12	2024/7/11
narda	6dB attenuator	603-06-1	N/A	2023/7/26	2024/7/25

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

3 Test Results

3.1 Test Summary

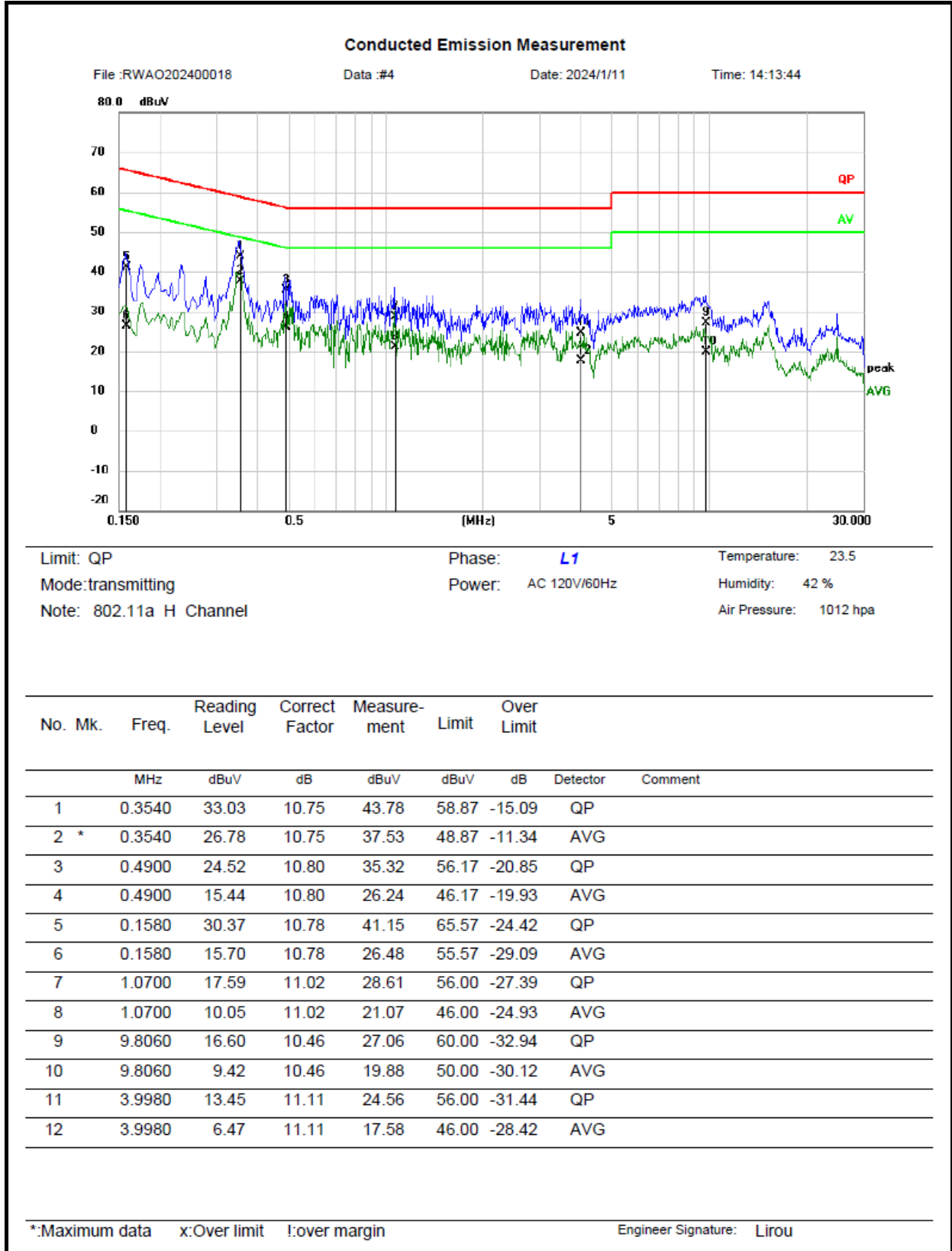
FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207 (a) §15.407 (b)(9)	AC Line Conducted Emissions	Compliance
§15.407 (a)(1)(iv),(3)(i)	Conducted Peak Output Power Power Spectral Density	Compliance
§15.407 (a)(12)	99% Occupied Bandwidth	Compliance
§15.407 (a)	26 dB Emission Bandwidth	Compliance
§15.407 (e)	6 dB Emission Bandwidth	Compliance
§15.205, §15.209, §15.407 (b)(1), (4), (9), (10)	Unwanted Emissions	Compliance
/	Duty Cycle	Report only

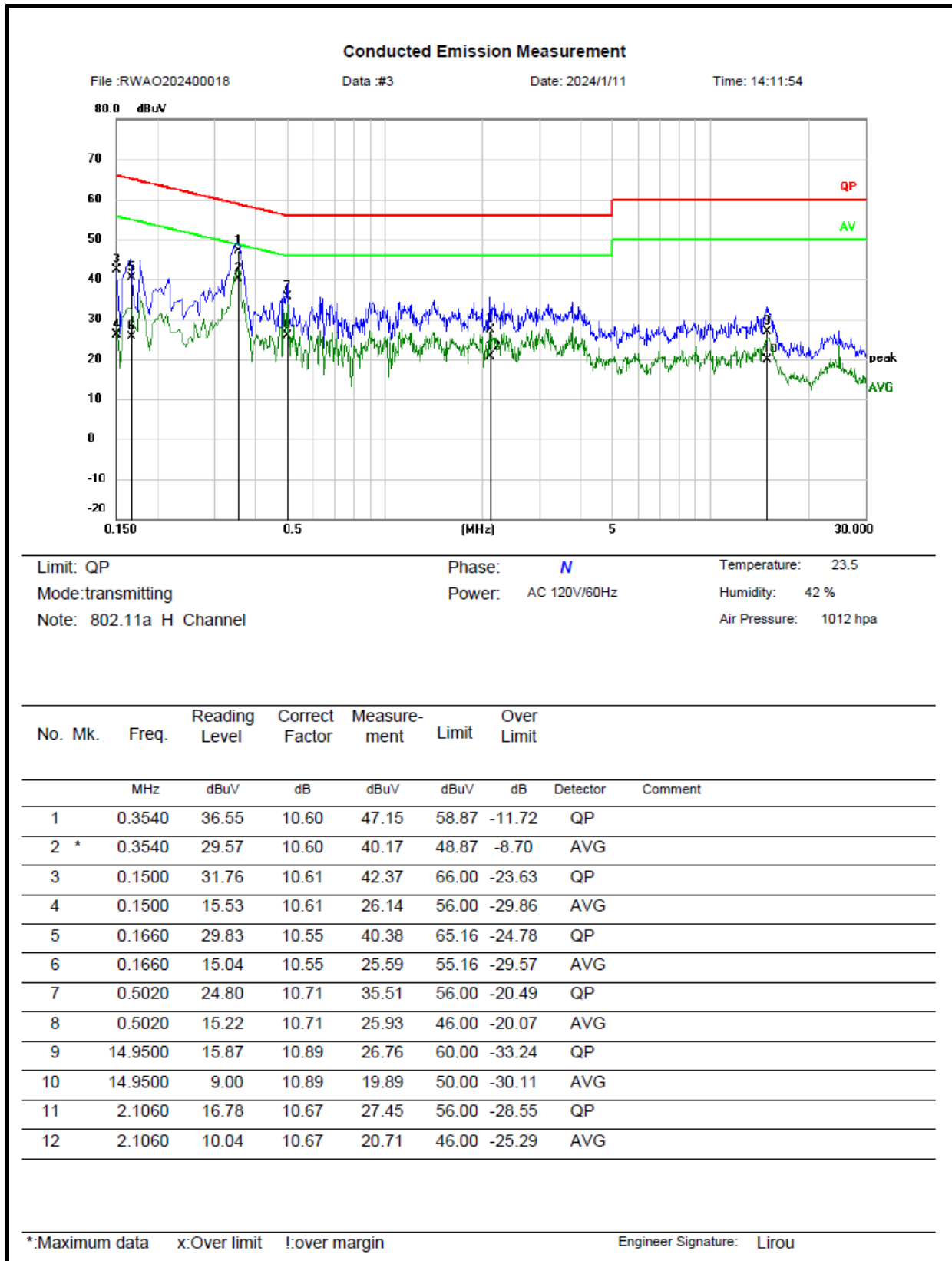
3.2 Limit

Test items	Limit
AC Power Line Conducted Emission	See details §15.207 (a)
Conducted Peak Output Power Power Spectral Density	For the band 5.725-5.895 GHz: For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, Fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
26dB Emission Bandwidth 99% Occupied Bandwidth	N/A
6dB Emission Bandwidth	Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.
Unwanted Emissions	For transmitters operating in the 5.15–5.25 GHz band: All emissions outside of the 5.15–5.35 GHz band shall not exceed an e.i.r.p. of –27 dBm/MHz. For transmitters operating in the 5.25–5.35 GHz band: All emissions outside of the 5.15–5.35 GHz band shall not exceed an e.i.r.p. of –27 dBm/MHz. For transmitters operating in the 5.47–5.725 GHz band: All emissions outside of the 5.47–5.725 GHz band shall not exceed an e.i.r.p. of –27 dBm/MHz. For transmitters operating solely in the 5.725–5.850 GHz band: All emissions shall be limited to a level of –27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. The provisions of § 15.205 apply to intentional radiators operating under this section.

3.3 AC Line Conducted Emissions Test Data

Test Date:	2024-01-11	Test By:	Lirou Li
Environment condition:	Temperature: 23.5°C; Relative Humidity:42%; ATM Pressure: 101.2kPa		





Remark:

Measurement (dBuV)= Reading Level (dBuV) + Correct Factor(dB)

Correct Factor(dB)= LISN Voltage Division Factor (dB)+ Cable loss(dB)

Over Limit = Measurement – Limit

3.4 Radiated emission Test Data

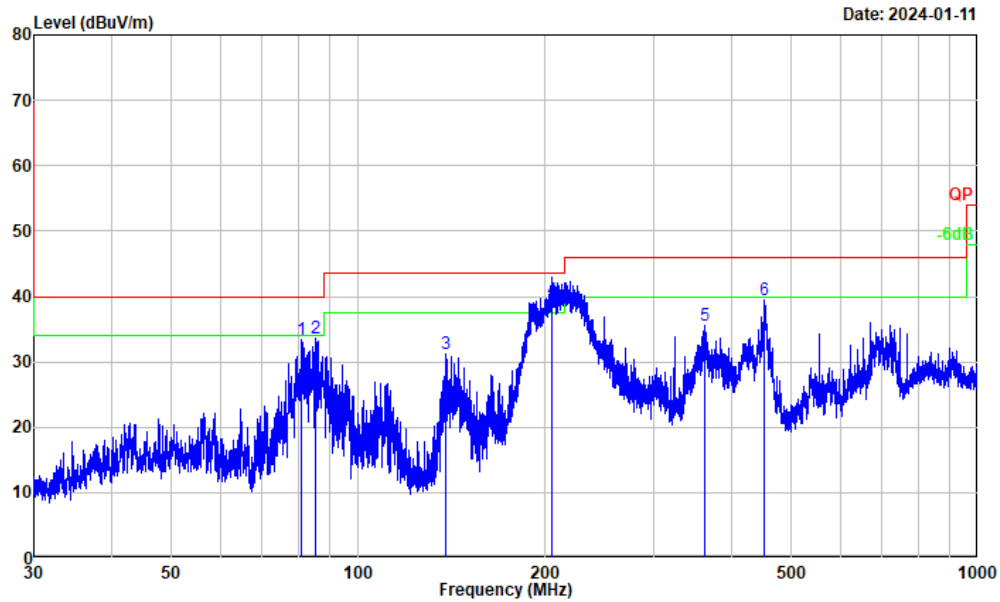
9 kHz-30MHz:

Test Date:	2024-01-11	Test By:	Bard Huang
Environment condition:	Temperature: 24.8°C; Relative Humidity:42%; ATM Pressure: 101.5kPa		

For radiated emissions below 30MHz, there were no emissions found within 20dB of limit.

30MHz-1GHz:

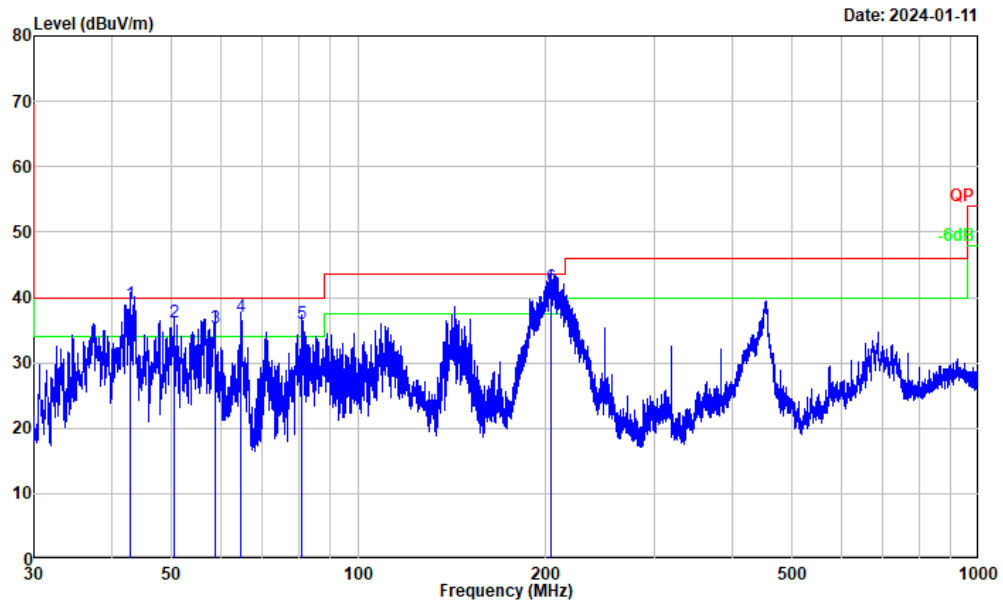
Test Date:	2024-01-11	Test By:	Bard Huang
Environment condition:	Temperature: 24.8°C; Relative Humidity:42%; ATM Pressure: 101.5kPa		



Project No. : RWA0202400018
 Test Mode : Transmitting
 Test Voltage : AC 110V/60Hz
 Environment : 24.8°C/42%R.H./101.5kPa
 Tested by : Bard Huang
 Polarization : horizontal
 Remark : 802.11a High Channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	81.212	51.36	-17.93	33.43	40.00	-6.57	Peak
2	85.485	50.54	-17.04	33.50	40.00	-6.50	Peak
3	138.387	48.83	-17.63	31.20	43.50	-12.30	Peak
4	205.045	53.29	-13.81	39.48	43.50	-4.02	QP
5	362.666	45.03	-9.49	35.54	46.00	-10.46	Peak
6	452.720	47.79	-8.25	39.54	46.00	-6.46	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain



Project No. : RWA0202400018
Test Mode : Transmitting
Test Voltage : AC 110V/60Hz
Environment : 24.8°C/42%R.H./101.5kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11a High Channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	42.937	51.51	-12.42	39.09	40.00	-0.91	QP
2	50.409	48.41	-12.17	36.24	40.00	-3.76	QP
3	58.715	48.90	-13.51	35.39	40.00	-4.61	QP
4	64.773	51.39	-14.38	37.01	40.00	-2.99	QP
5	81.212	53.90	-17.93	35.97	40.00	-4.03	QP
6	204.059	55.41	-13.82	41.59	43.50	-1.91	QP

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

Remark:

Result = Reading + Factor

Factor = Antenna factor + Cable loss – Amplifier gain

Margin = Result – Limit

Above 1GHz:

Test Date:	2024-01-18	Test By:	Luke Li
Environment condition:	Temperature: 23.5 °C; Relative Humidity:57%; ATM Pressure: 101.2kPa		

Frequency (MHz)	Reading level (dBμV)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
802.11a							
Low Channel							
5607.604	50.30	horizontal	11.91	62.21	68.20	-5.99	Peak
5686.843	51.07	horizontal	11.97	63.04	95.50	-32.46	Peak
5719.260	50.70	horizontal	12.03	62.73	110.59	-47.86	Peak
5724.302	53.76	horizontal	12.03	65.79	120.61	-54.82	Peak
5636.738	50.21	vertical	11.91	62.12	68.20	-6.08	Peak
5691.326	50.34	vertical	11.98	62.32	98.80	-36.48	Peak
5717.499	51.49	vertical	12.03	63.52	110.10	-46.58	Peak
5722.701	53.71	vertical	12.03	65.74	116.96	-51.22	Peak
11490.000	45.53	horizontal	6.46	51.99	74.00	-22.01	Peak
11490.000	45.55	vertical	6.46	52.01	74.00	-21.99	Peak
Middle Channel							
11570.000	36.11	horizontal	6.52	42.63	54.00	-11.37	Average
11570.000	47.61	horizontal	6.52	54.13	74.00	-19.87	Peak
11570.000	36.06	vertical	6.52	42.58	54.00	-11.42	Average
11570.000	47.65	vertical	6.52	54.17	74.00	-19.83	Peak
High Channel							
5850.445	53.46	horizontal	12.31	65.77	121.18	-55.41	Peak
5857.379	50.77	horizontal	12.34	63.11	110.13	-47.02	Peak
5904.015	49.93	horizontal	12.46	62.39	83.69	-21.30	Peak
5939.507	49.88	horizontal	12.42	62.30	68.20	-5.90	Peak
5850.363	55.79	vertical	12.31	68.10	121.37	-53.27	Peak
5857.048	51.36	vertical	12.34	63.70	110.23	-46.53	Peak
5911.113	50.35	vertical	12.45	62.80	78.44	-15.64	Peak
5940.663	49.55	vertical	12.42	61.97	68.20	-6.23	Peak
11650.000	46.70	horizontal	6.55	53.25	74.00	-20.75	Peak
11650.000	47.26	vertical	6.55	53.81	74.00	-20.19	Peak
802.11n20							
Low Channel							
5603.042	49.76	horizontal	11.91	61.67	68.20	-6.53	Peak

5674.277	50.27	horizontal	11.95	62.22	86.21	-23.99	Peak
5716.058	50.06	horizontal	12.03	62.09	109.70	-47.61	Peak
5724.542	51.62	horizontal	12.03	63.65	121.16	-57.51	Peak
5633.217	49.70	vertical	11.90	61.60	68.20	-6.60	Peak
5683.242	50.07	vertical	11.97	62.04	92.84	-30.80	Peak
5718.779	50.06	vertical	12.03	62.09	110.46	-48.37	Peak
5722.941	51.32	vertical	12.03	63.35	117.51	-54.16	Peak
11490.000	45.09	horizontal	6.46	51.55	74.00	-22.45	Peak
11490.000	44.87	vertical	6.46	51.33	74.00	-22.67	Peak
Middle Channel							
11570.000	47.04	horizontal	6.52	53.56	74.00	-20.44	Peak
11570.000	46.14	vertical	6.52	52.66	74.00	-21.34	Peak
High Channel							
5850.198	53.13	horizontal	12.31	65.44	121.75	-56.31	Peak
5858.699	49.73	horizontal	12.33	62.06	109.76	-47.70	Peak
5886.516	50.20	horizontal	12.43	62.63	96.65	-34.02	Peak
5937.939	49.73	horizontal	12.42	62.15	68.20	-6.05	Peak
5850.445	52.93	vertical	12.31	65.24	121.18	-55.94	Peak
5857.131	49.50	vertical	12.34	61.84	110.20	-48.36	Peak
5910.865	49.70	vertical	12.46	62.16	78.63	-16.47	Peak
5949.330	49.69	vertical	12.41	62.10	68.20	-6.10	Peak
11650.000	46.05	horizontal	6.55	52.60	74.00	-21.40	Peak
11650.000	46.69	vertical	6.55	53.24	74.00	-20.76	Peak
802.11n40							
Low Channel							
5630.165	49.56	horizontal	11.91	61.47	68.20	-6.73	Peak
5683.922	49.85	horizontal	11.97	61.82	93.34	-31.52	Peak
5712.736	55.31	horizontal	12.02	67.33	108.77	-41.44	Peak
5723.001	57.15	horizontal	12.03	69.18	117.64	-48.46	Peak
5601.621	49.87	vertical	11.91	61.78	68.20	-6.42	Peak
5698.779	50.13	vertical	12.00	62.13	104.30	-42.17	Peak
5719.400	54.21	vertical	12.03	66.24	110.63	-44.39	Peak
5723.632	56.71	vertical	12.03	68.74	119.08	-50.34	Peak
11510.000	46.05	horizontal	6.48	52.53	74.00	-21.47	Peak
11510.000	46.66	vertical	6.48	53.14	74.00	-20.86	Peak
High Channel							
5850.605	49.68	horizontal	12.31	61.99	120.82	-58.83	Peak
5857.681	49.45	horizontal	12.33	61.78	110.05	-48.27	Peak

5917.264	50.06	horizontal	12.45	62.51	73.90	-11.39	Peak
5930.595	49.49	horizontal	12.43	61.92	68.20	-6.28	Peak
5852.144	50.20	vertical	12.31	62.51	117.31	-54.80	Peak
5863.834	49.34	vertical	12.34	61.68	108.32	-46.64	Peak
5912.957	49.52	vertical	12.45	61.97	77.08	-15.11	Peak
5929.877	49.43	vertical	12.43	61.86	68.20	-6.34	Peak
11590.000	47.04	horizontal	6.53	53.57	74.00	-20.43	Peak
11590.000	47.15	vertical	6.53	53.68	74.00	-20.32	Peak

Remark:

Corrected Amplitude= Reading level + corrected Factor

Corrected Factor = Antenna factor + Cable loss – Amplifier gain

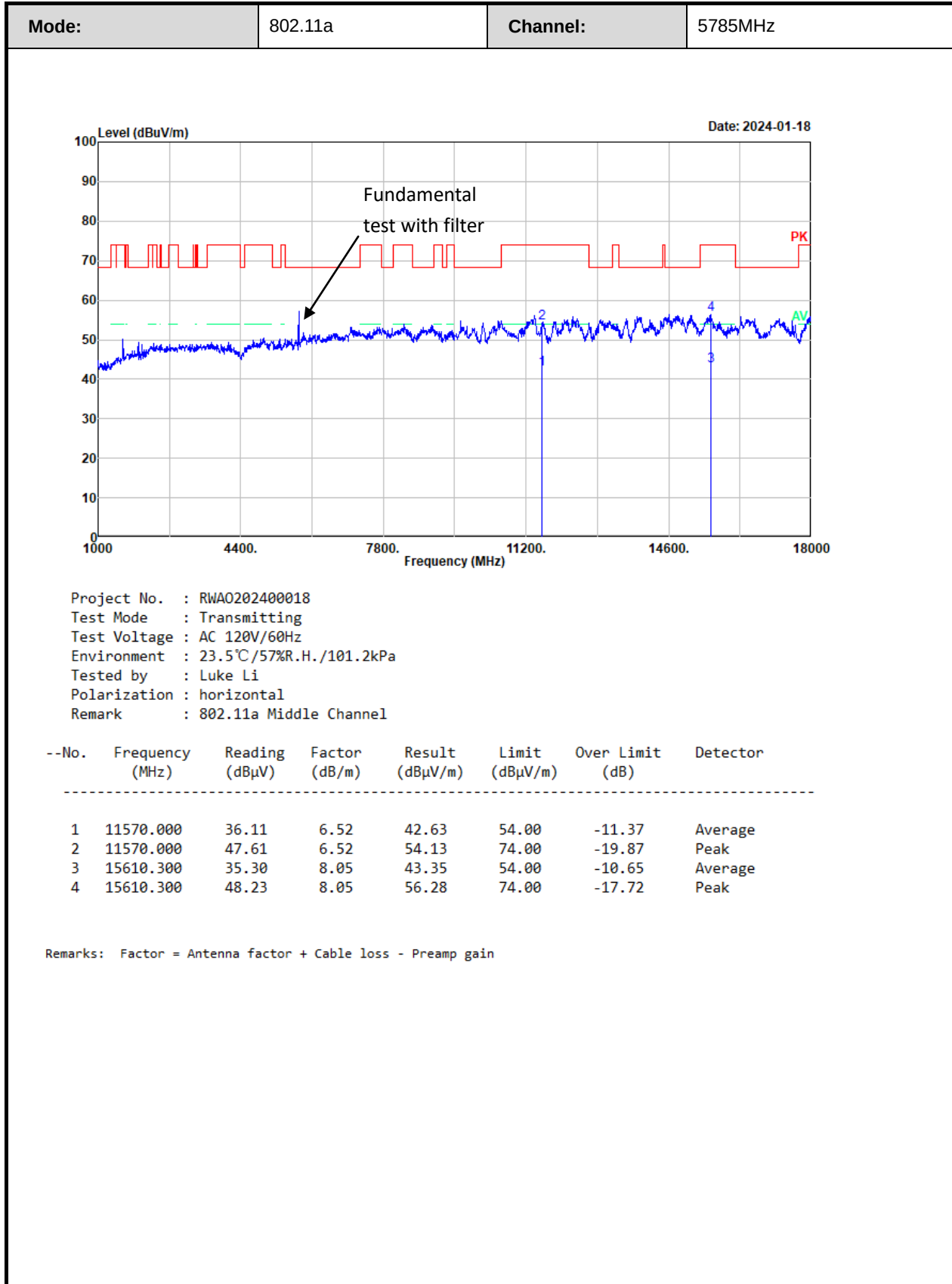
Margin = Corrected Amplitude – Limit

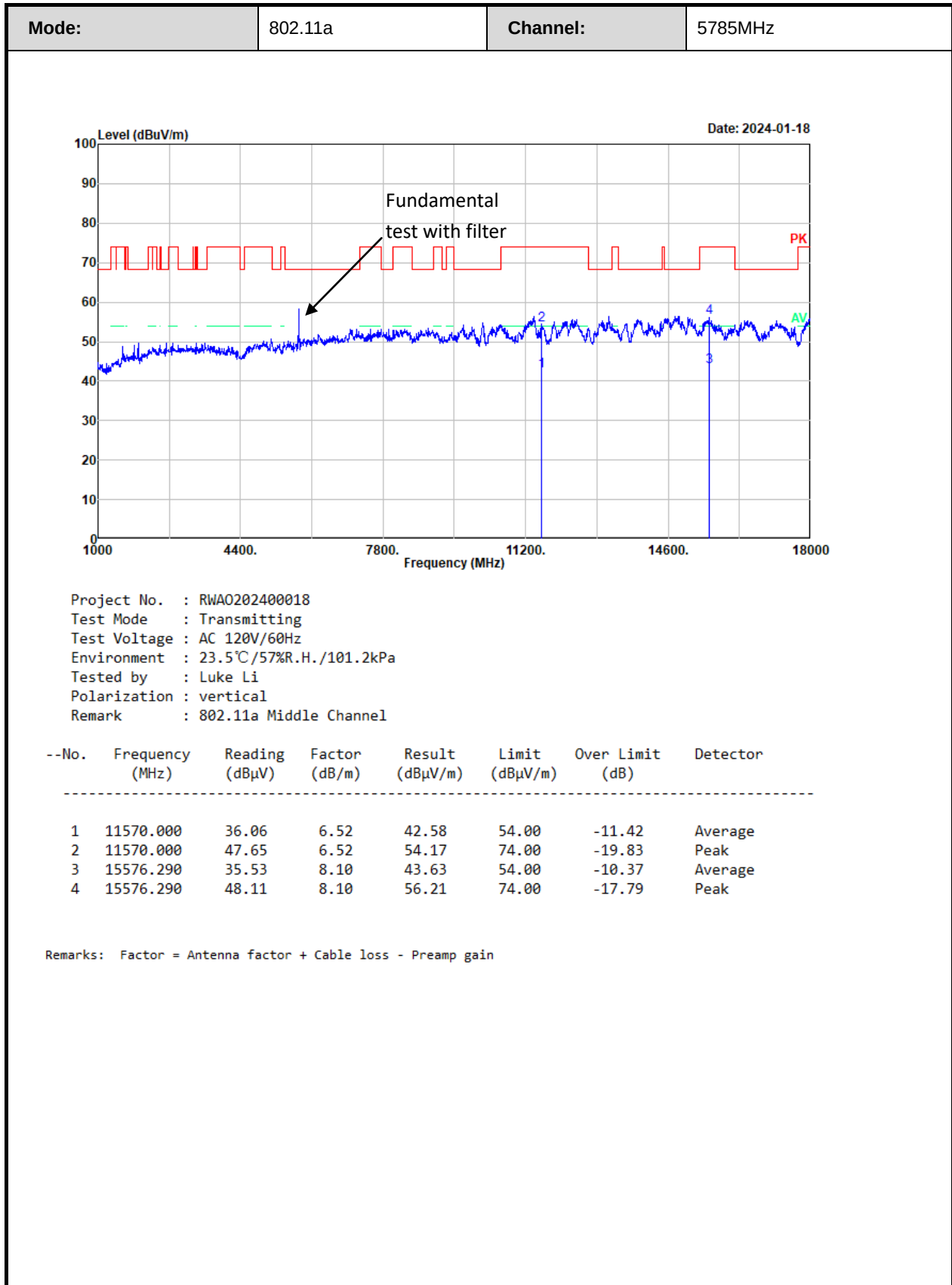
For the test result of Peak below the Peak limit more than 20dB, which can compliance with the average limit, just the Peak level was recorded.

The emission levels of other frequencies that were lower than the limit 20dB, not show in test report.

For emissions in 18GHz-40GHz range, all emissions were investigated and in the noise floor level.

Test plot for example as below:





3.5 RF Conducted Test Data

Test Date:	2024-01-19	Test By:	Ryan zhang
Environment condition:	Temperature: 24.1°C; Relative Humidity:48%; ATM Pressure: 102.1kPa		

3.5.1 6dB Emission Bandwidth and 99% Occupied Bandwidth

Test Mode	Antenna	Channel	6dB BW [MHz]	99% OBW [MHz]	6dB BW Limit [MHz]	Verdict
802.11a	Ant1	5745	15.840	16.560	0.5	Pass
		5785	16.080	16.560	0.5	Pass
		5825	16.000	16.640	0.5	Pass
802.11n HT20	Ant1	5745	17.280	17.920	0.5	Pass
		5785	17.440	18.000	0.5	Pass
		5825	17.280	18.000	0.5	Pass
802.11n HT40	Ant1	5755	35.360	36.160	0.5	Pass
		5795	35.360	36.160	0.5	Pass

Note: the device not operate with any part of OBW fall within U-NII 2C band.

3.5.2 Maximum conducted output power

Test Mode	Antenna	Channel [MHz]	Result [dBm]	Limit [dBm]	Verdict
802.11a	Ant1	5745	12.25	30	Pass
		5785	12.08	30	Pass
		5825	12.65	30	Pass
802.11n HT20	Ant1	5745	11.05	30	Pass
		5785	10.96	30	Pass
		5825	11.45	30	Pass
802.11n HT40	Ant1	5755	10.72	30	Pass
		5795	11.20	30	Pass

3.5.3 Power Spectral Density

Test Mode	Antenna	Channel [MHz]	Result [dBm/500kHz]	Limit [dBm/500kHz]	Verdict
802.11a	Ant1	5745	-0.47	30	Pass
		5785	-0.91	30	Pass
		5825	0.34	30	Pass
802.11n HT20	Ant1	5745	-2.42	30	Pass
		5785	-2.63	30	Pass
		5825	-1.94	30	Pass
802.11n HT40	Ant1	5755	-4.64	30	Pass
		5795	-5.37	30	Pass

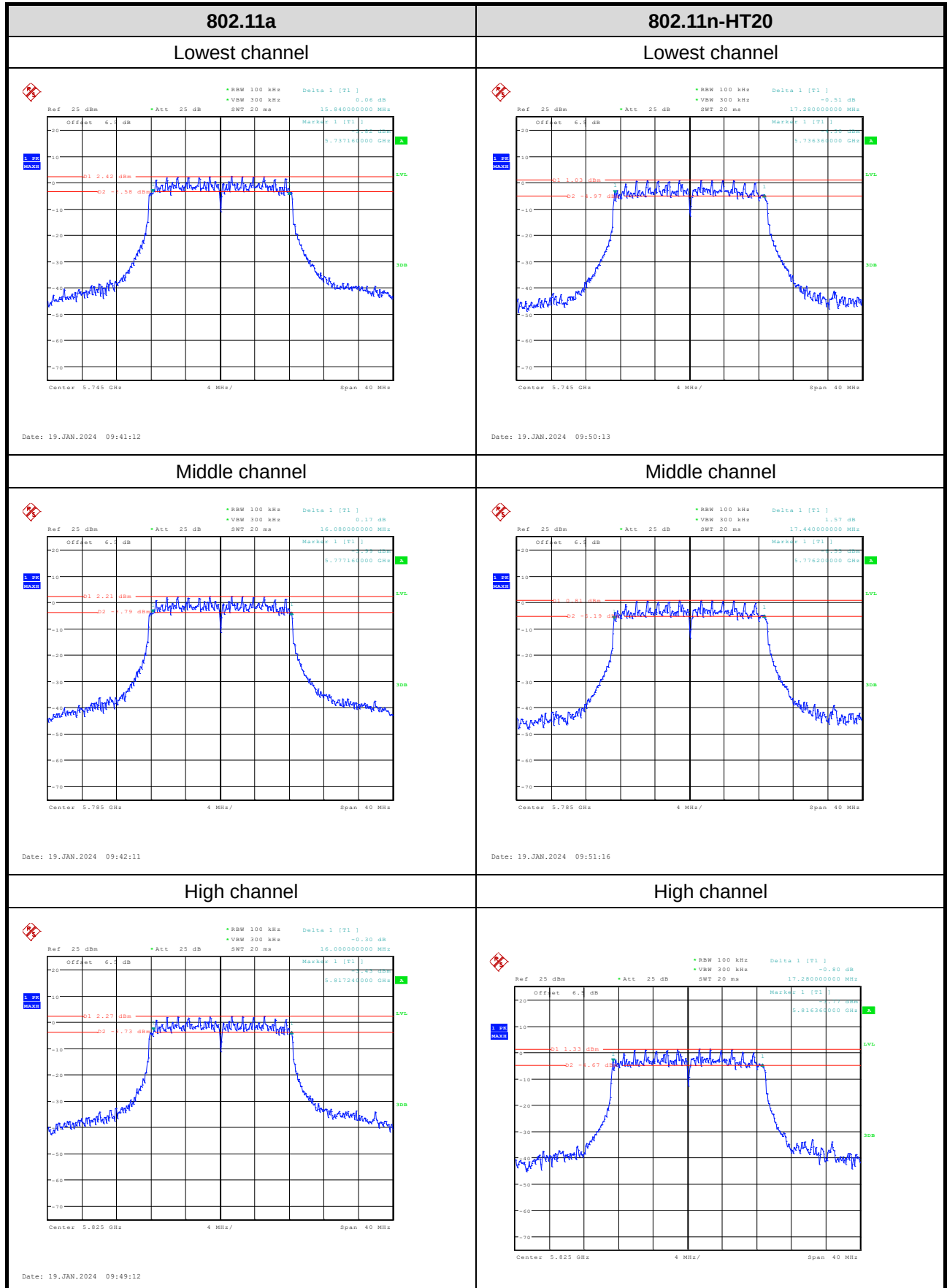
3.5.4 Duty Cycle

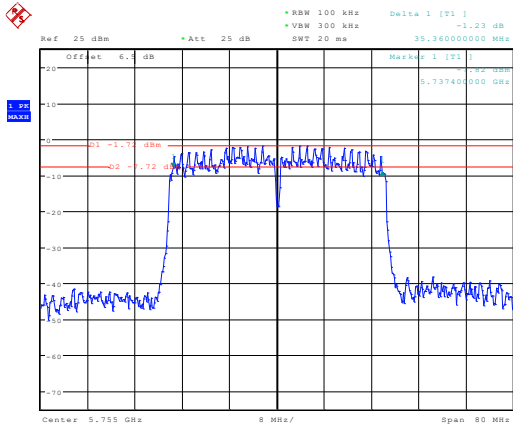
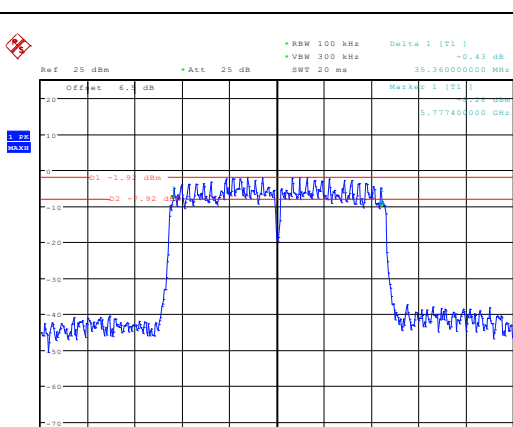
Test Mode	Antenna	Channel (MHz)	Ton (ms)	Ton+off (ms)	Duty Cycle [%]	1/T	VBW setting* [Hz]
802.11a	Ant1	5785	0.178	0.226	78.76	5.618	10000
802.11n T20	Ant1	5785	0.164	0.213	77.00	6.098	10000
802.11n T40	Ant1	5755	0.099	0.148	66.89	10.101	20000

Note*: Radiated emission test with average value, the Spectrum analyzer VBW setting information.

Test Plots:

6dB Emission Bandwidth

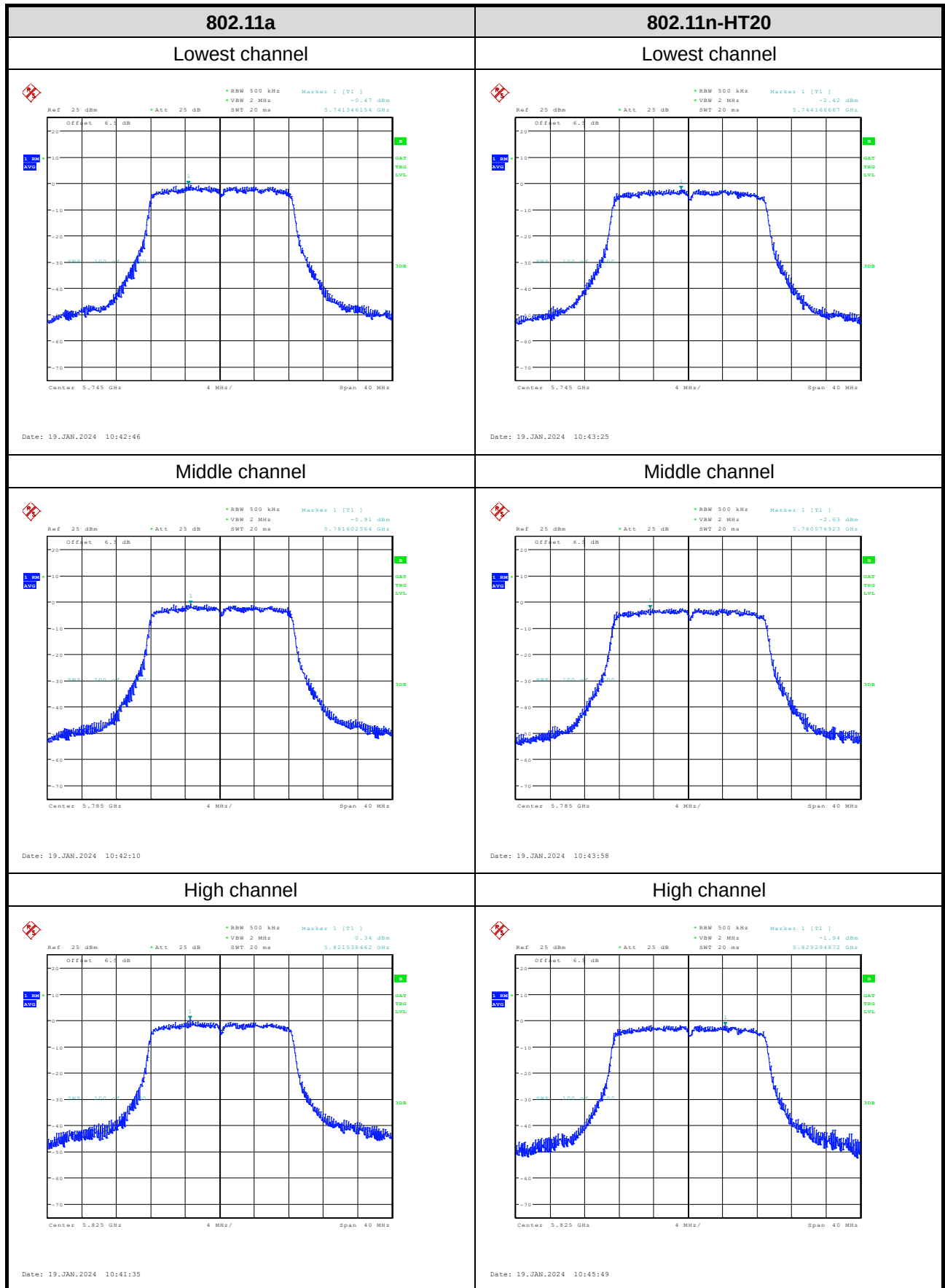


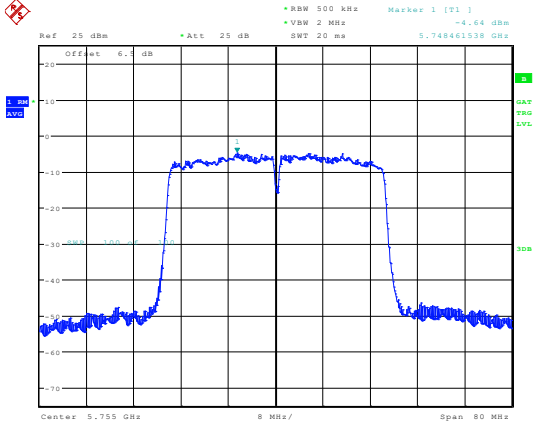
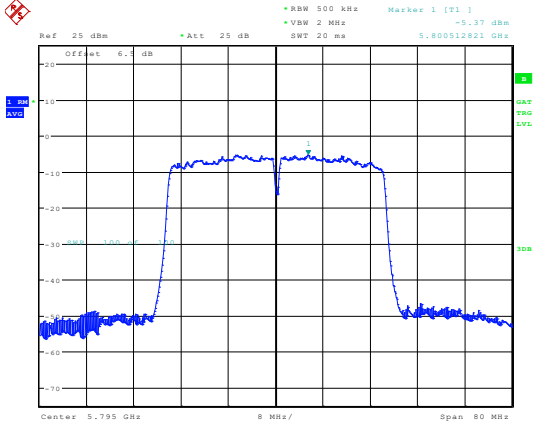
802.11n-HT40	/
Lowest channel	/
 Date: 19.JAN.2024 09:53:29	/
High channel	/
 Date: 19.JAN.2024 09:54:10	/

802.11a	802.11n-HT20
Lowest channel Spectrum plot for 802.11a Lowest channel. The plot shows a signal centered at 5.745 GHz with a span of 40 MHz. The signal is a rectangular pulse with a peak level of approximately 0 dBm. The plot includes a reference level of 25 dBm, an offset of 6.5 dB, and a resolution bandwidth (RBW) of 300 kHz. The signal is labeled with a marker at 5.741240000 GHz and a value of 5.71 dBm. The plot also shows a noise floor of approximately -100 dBm.	Lowest channel Spectrum plot for 802.11n-HT20 Lowest channel. The plot shows a signal centered at 5.745 GHz with a span of 40 MHz. The signal is a rectangular pulse with a peak level of approximately 0 dBm. The plot includes a reference level of 25 dBm, an offset of 6.5 dB, and a resolution bandwidth (RBW) of 300 kHz. The signal is labeled with a marker at 5.742280000 GHz and a value of 3.69 dBm. The plot also shows a noise floor of approximately -100 dBm.
Middle channel Spectrum plot for 802.11a Middle channel. The plot shows a signal centered at 5.785 GHz with a span of 40 MHz. The signal is a rectangular pulse with a peak level of approximately 0 dBm. The plot includes a reference level of 25 dBm, an offset of 6.5 dB, and a resolution bandwidth (RBW) of 300 kHz. The signal is labeled with a marker at 5.779460000 GHz and a value of 5.49 dBm. The plot also shows a noise floor of approximately -100 dBm.	Middle channel Spectrum plot for 802.11n-HT20 Middle channel. The plot shows a signal centered at 5.785 GHz with a span of 40 MHz. The signal is a rectangular pulse with a peak level of approximately 0 dBm. The plot includes a reference level of 25 dBm, an offset of 6.5 dB, and a resolution bandwidth (RBW) of 300 kHz. The signal is labeled with a marker at 5.782280000 GHz and a value of 3.54 dBm. The plot also shows a noise floor of approximately -100 dBm.
High channel Spectrum plot for 802.11a High channel. The plot shows a signal centered at 5.825 GHz with a span of 40 MHz. The signal is a rectangular pulse with a peak level of approximately 0 dBm. The plot includes a reference level of 25 dBm, an offset of 6.5 dB, and a resolution bandwidth (RBW) of 300 kHz. The signal is labeled with a marker at 5.823640000 GHz and a value of 5.44 dBm. The plot also shows a noise floor of approximately -100 dBm.	High channel Spectrum plot for 802.11n-HT20 High channel. The plot shows a signal centered at 5.825 GHz with a span of 40 MHz. The signal is a rectangular pulse with a peak level of approximately 0 dBm. The plot includes a reference level of 25 dBm, an offset of 6.5 dB, and a resolution bandwidth (RBW) of 300 kHz. The signal is labeled with a marker at 5.822280000 GHz and a value of 4.00 dBm. The plot also shows a noise floor of approximately -100 dBm.

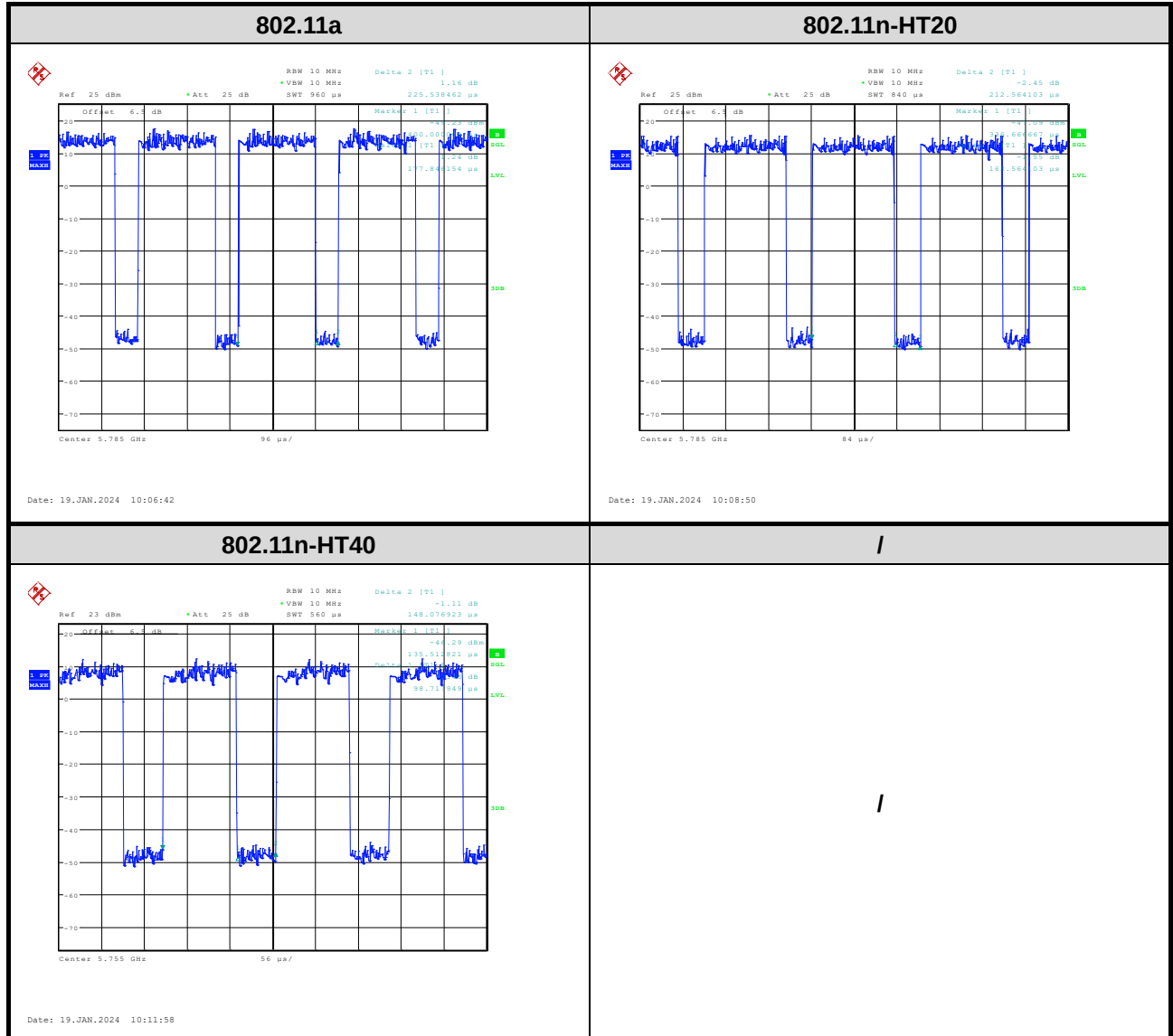
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Power Spectral Density



802.11n-HT40	/
Lowest channel	/
 Date: 19.JAN.2024 10:46:51	
High channel	/
 Date: 19.JAN.2024 10:47:26	/

Duty Cycle



4 Test Setup Photo

Please refer to the attachment RWA0202400018 Test Setup photo.

5 E.U.T Photo

Please refer to the attachment RWAO202400018 External photo and RWAO202400018 Internal photo.

---End of Report---