

FCC Test Report

Report No.: RWAY202300001B

Applicant: Assemblabs Kft

Address: 27b Pipa utca, Dunakeszi, Peat,Hungary, 2120

Product Name: 4.0MP Wireless IP Camera

Product Model: OC1

Multiple Models: N/A

Trade Mark: Remootio

FCC ID: 2A6T6OC1

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

Test Result: Complied

Issue Date: 21 November, 2023

Reviewed by:

Abel chen

Approved by:

Jacob Kong

Abel Chen
Project Engineer

Jacob Kong
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Prepared by:

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Revision History

Version No.	Issued Date	Description
00	21 November, 2023	Original

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1 General Information

1.1 Client Information

Applicant:	Assemblabs Kft
Address:	27b Pipa utca, Dunakeszi, Peat, Hungary, 2120
Manufacturer:	Assemblabs Kft
Address:	27b Pipa utca, Dunakeszi, Peat, Hungary, 2120

1.2 Product Description of EUT

The EUT is 4.0MP Wireless IP Camera that contains 2.4G and 5G WLAN radios, this report covers the full testing of the 5G WLAN radio.

Sample Serial number	2DDC-3 for CE&RE test, 2DDC-6 for RF test conducted test (assigned by WATC)
Sample Received Date	2023-11-05
Sample Status	Good Condition
Frequency Range	5725 MHz - 5850MHz
Maximum Conducted Output Power	14.93 dBm
Modulation Technology	OFDM
Spatial Streams	MIMO (2TX, 2RX)
Antenna Gain [#]	0dBi
Power Supply	DC 12V, 1000mA from adapter
Operating temperature [#]	-20 deg.C to +50 deg.C
Adapter Information	Model: SAW15A-120-1000UD Input: AC100-240V, 50/60Hz, 0.5A Output: DC 12V/1000mA,
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 internal antenna which cannot replace by end-user. Please see the product internal photos for details.	

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DTS, FCC ID: 2A6T6OC1

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
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

KDB 662911 D01 Multiple Transmitter Output 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	155	5775	161	5805
151	5755	157	5785	165	5825
153	5765	159	5795	/	/
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, 802.11ac-VHT20					
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, 802.11ac-VHT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
151	5755	/	/	159	5795
802.11ac-VHT80					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
/	/	155	5775	/	/

Test Mode:				
Transmitting mode:		Keep the EUT in continuous transmitting with modulation		
Exercise software [#] :		SecureCRT		
Mode	Data rate	Power Level Setting [#]		
		Low Channel	Middle Channel	High Channel
802.11a	6Mbps	36	36	36
802.11n-HT20	MCS0	36	36	36
802.11n-HT40	MCS0	36	/	36
802.11ac-VHT80	MCS0	/	36	/
The exercise software and the maximum power setting that provided by manufacturer.				

Worst-Case Configuration:

For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was recorded in report

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.

According to manufacturer, the device support MIMO mode, all modes share the same power level setting under the same modulation. So the worst mode MIMO was selected to test

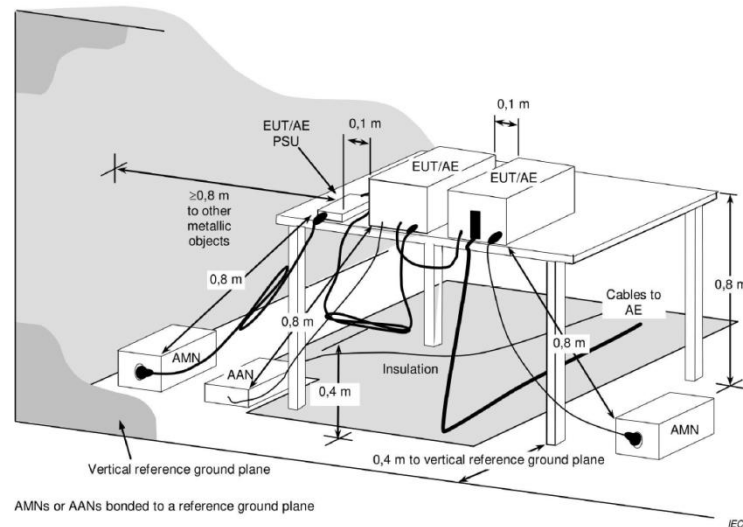
The ac vht20/ac vht40 were reduced test since the identical parameters with n-ht20/n-ht40.

2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

2.3 Test Setup

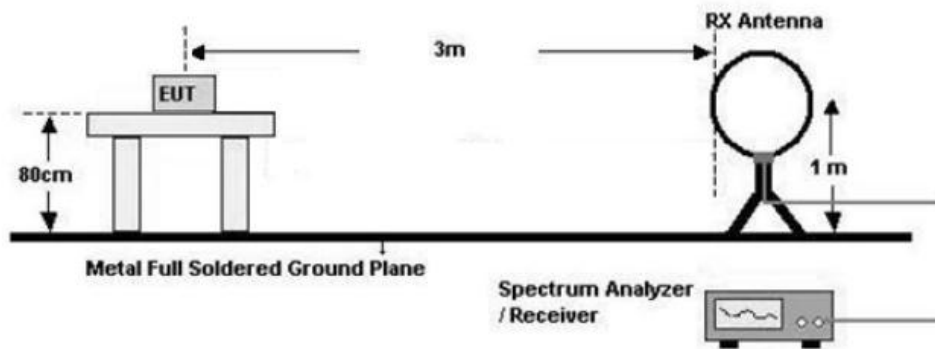
1) Conducted emission measurement:



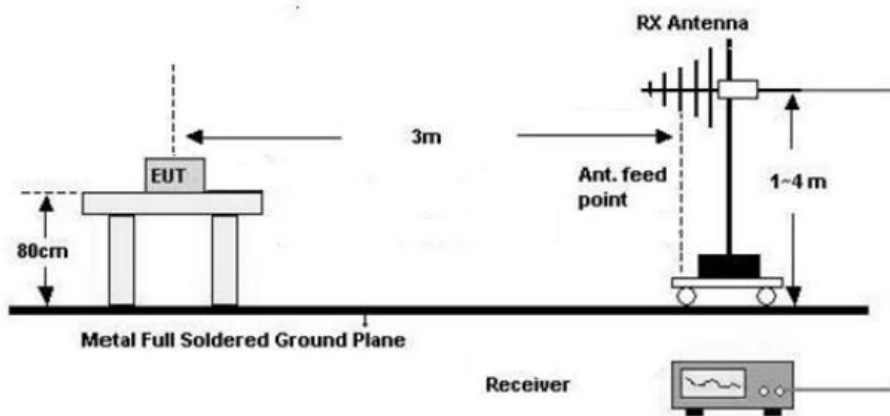
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

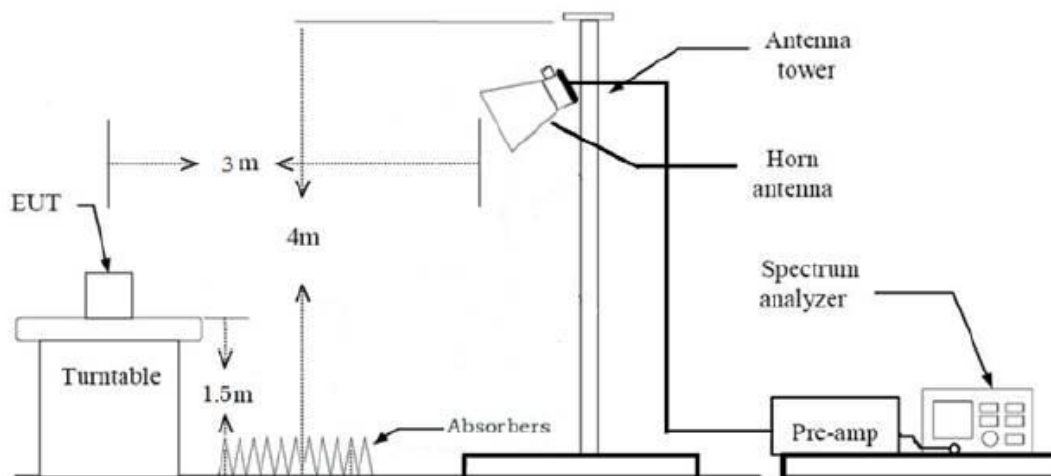
Below 30MHz (3m SAC)

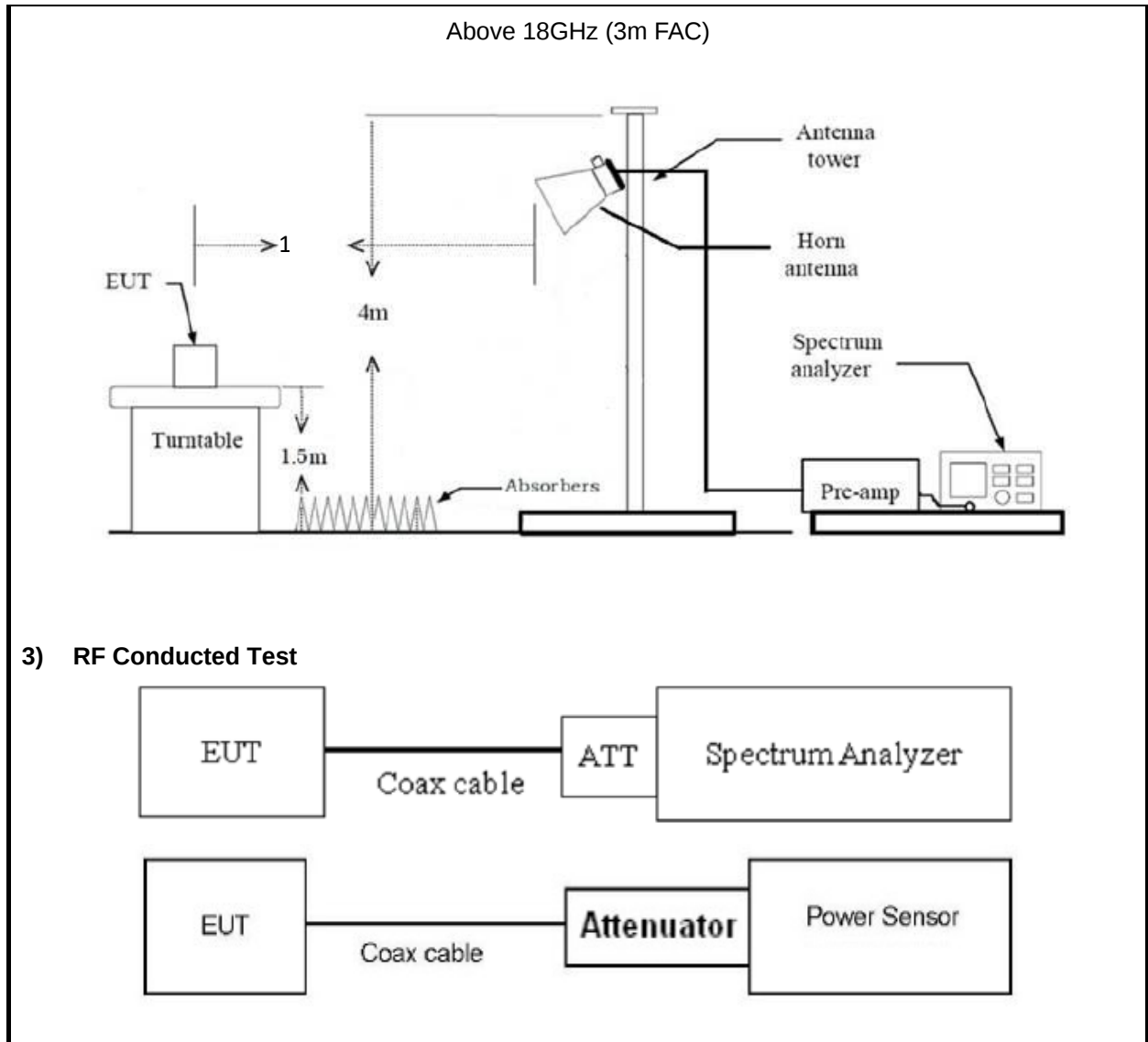


0MHz-1GHz (3m SAC)



1GHz-18GHz(3m FAC)





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 7.0dB (including 6.0 dB Attenuator and 1.0 dB 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 1.0dB 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	2023/7/3	2024/7/2
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 Antenna	6512	29604	2023/7/7	2024/7/6
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-2400-248 3.5-50N	OE02103119	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

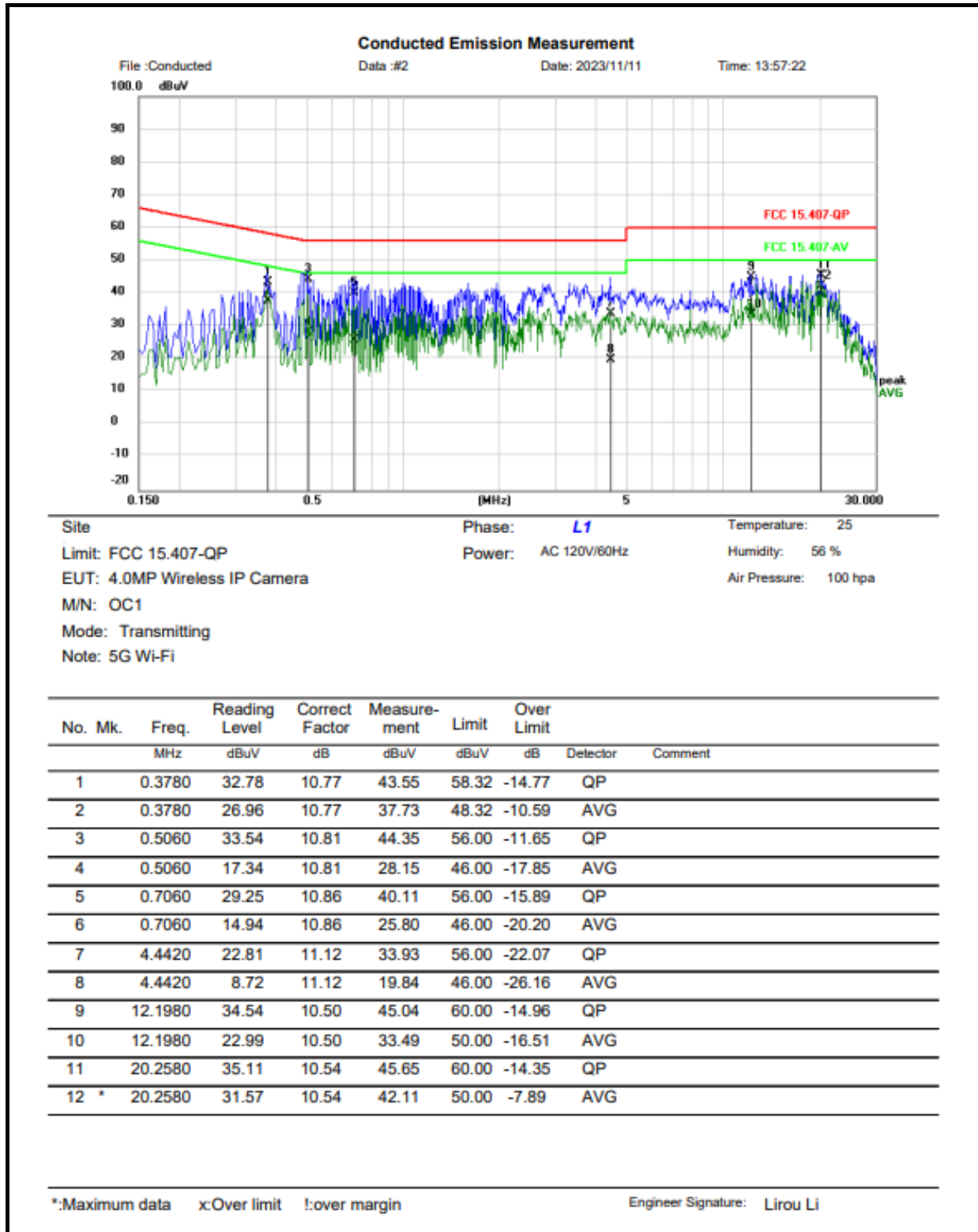
FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207 (a) §15.407 (b)(9)	AC Line Conducted Emissions	Compliance
§15.407 (a)(3)(i)	Conducted Peak Output Power Power Spectral Density	Compliance
§15.407 (a)(12)	99% Occupied Bandwidth	Compliance
§15.407 (e)	6 dB Emission Bandwidth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

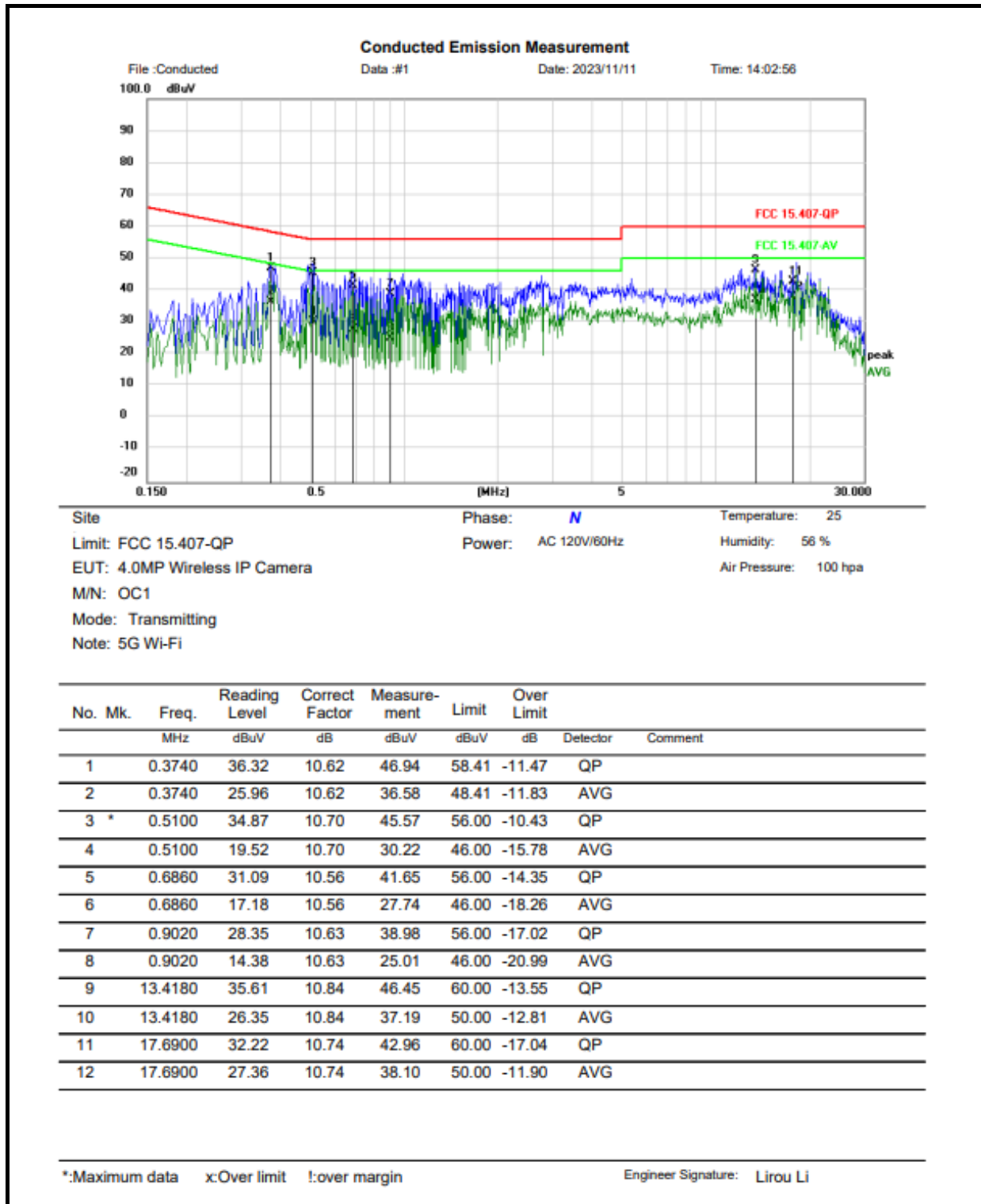
3.2 Limit

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.

3.3 AC Line Conducted Emissions Test Data

Test Date:	2023-11-11	Test By:	Lirou Li
Environment condition:	Temperature: 25°C; Relative Humidity:56%; ATM Pressure: 100kPa		





Remark:

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

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

Over = Measurement – Limit

3.4 Radiated emission Test Data

9 kHz-30MHz:

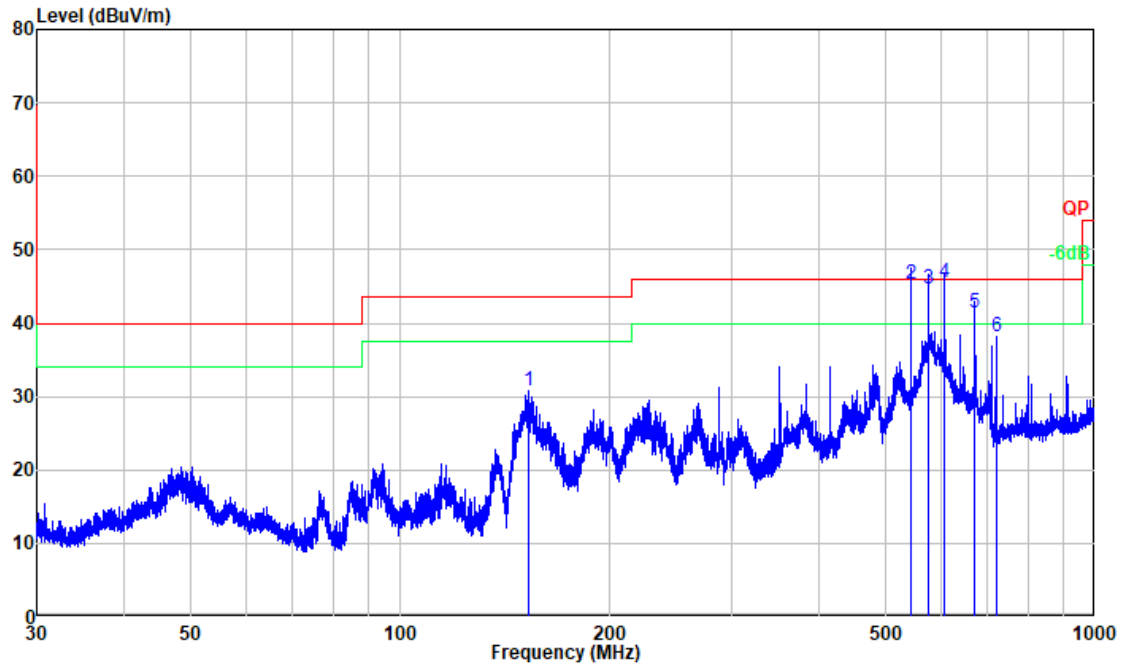
Test Date:	2023-11-14	Test By:	Luke Li
Environment condition:	Temperature: 24°C; Relative Humidity:63%; ATM Pressure: 101kPa		

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

30MHz-1GHz:

Test Date:	2023-11-14	Test By:	Luke Li
Environment condition:	Temperature: 24°C; Relative Humidity:63%; ATM Pressure: 101kPa		

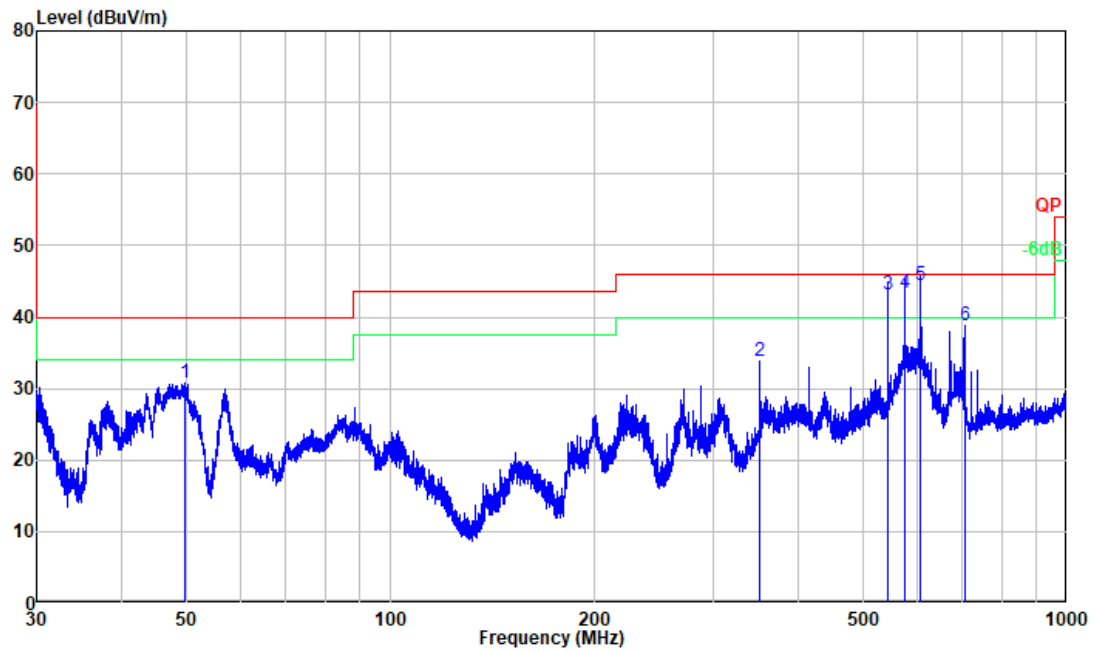
Test Mode : Transmitting
Test Voltage : 120V/60Hz
Temp/Humi : 24°C/63%
Tested by : Luke Li
Polarization : 3M Horizontal
Remark : 5G Wi-Fi



--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	153.030	47.90	-17.11	30.79	43.50	12.71	Peak
2	544.186	51.50	-6.09	45.41	46.00	0.59	QP
3	576.099	50.11	-5.40	44.71	46.00	1.29	QP
4	608.015	49.99	-4.44	45.55	46.00	0.45	QP
5	672.222	45.21	-3.71	41.50	46.00	4.50	QP
6	722.963	41.23	-2.97	38.26	46.00	7.74	Peak

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

Test Mode : Transmitting
Test Voltage : 120V/60Hz
Temp/Humi : 24°C/63%
Tested by : Luke Li
Polarization : 3M Vertical
Remark : 5G Wi-Fi



--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	49.754	42.84	-11.97	30.87	40.00	9.13	Peak
2	351.970	43.13	-9.33	33.80	46.00	12.20	Peak
3	544.186	49.25	-6.09	43.16	46.00	2.84	QP
4	576.099	48.84	-5.40	43.44	46.00	2.56	QP
5	608.015	48.89	-4.44	44.45	46.00	1.55	QP
6	705.431	42.12	-3.41	38.71	46.00	7.29	Peak

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

Remark:

Level = Reading + Factor

Factor = Antenna factor + Cable loss – Amplifier gain

Margin = Level – Limit

Above 1GHz:

Test Date:	2023-11-14	Test By:	Luke Li
Environment condition:	Temperature: 24°C; Relative Humidity:63%; ATM Pressure: 101kPa		

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							
5609.209	48.96	vertical	11.30	60.26	68.20	-7.94	Peak
5696.497	48.92	vertical	11.48	60.40	102.62	-42.22	Peak
5716.316	49.00	vertical	11.54	60.54	109.77	-49.23	Peak
5724.725	53.94	vertical	11.56	65.50	121.57	-56.07	Peak
5618.218	49.41	horizontal	11.31	60.72	68.20	-7.48	Peak
5658.458	49.28	horizontal	11.37	60.65	74.48	-13.83	Peak
5717.518	48.23	horizontal	11.55	59.78	110.11	-50.33	Peak
5723.523	48.49	horizontal	11.56	60.05	118.83	-58.78	Peak
11490.000	32.53	vertical	7.10	39.63	54.00	-14.37	Average
11490.000	42.79	vertical	7.10	49.89	74.00	-24.11	Peak
11490.000	32.09	horizontal	7.10	39.19	54.00	-14.81	Average
11490.000	42.94	horizontal	7.10	50.04	74.00	-23.96	Peak
Middle Channel							
11570.000	32.42	vertical	7.15	39.57	54.00	-14.43	Average
11570.000	43.75	vertical	7.15	50.90	74.00	-23.10	Peak
11570.000	32.74	horizontal	7.15	39.89	54.00	-14.11	Average
11570.000	45.21	horizontal	7.15	52.36	74.00	-21.64	Peak
High Channel							
5852.252	50.17	vertical	11.79	61.96	117.06	-55.10	Peak
5868.468	49.27	vertical	11.79	61.06	107.03	-45.97	Peak
5878.153	49.12	vertical	11.79	60.91	102.86	-41.95	Peak
5941.441	49.03	vertical	11.87	60.90	68.20	-7.30	Peak
5850.225	47.72	horizontal	11.79	59.51	121.69	-62.18	Peak
5871.171	48.46	horizontal	11.79	60.25	106.27	-46.02	Peak
5917.567	49.12	horizontal	11.83	60.95	73.68	-12.73	Peak
5951.577	48.77	horizontal	11.89	60.66	68.20	-7.54	Peak
11650.000	32.45	vertical	7.17	39.62	54.00	-14.38	Average
11650.000	44.17	vertical	7.17	51.34	74.00	-22.66	Peak

11650.000	32.45	vertical	7.17	39.62	54.00	-14.38	Average
11650.000	44.17	vertical	7.17	51.34	74.00	-22.66	Peak
802.11n20							
Low Channel							
5633.434	48.79	vertical	11.32	60.11	68.20	-8.09	Peak
5682.683	48.99	vertical	11.44	60.43	92.42	-31.99	Peak
5710.911	49.68	vertical	11.52	61.20	108.26	-47.06	Peak
5722.322	55.52	vertical	11.55	67.07	116.10	-49.03	Peak
5610.611	49.07	horizontal	11.30	60.37	68.20	-7.83	Peak
5684.685	48.83	horizontal	11.44	60.27	93.90	-33.63	Peak
5705.505	48.86	horizontal	11.51	60.37	106.74	-46.37	Peak
5723.323	50.54	horizontal	11.56	62.10	118.38	-56.28	Peak
11490.000	32.37	vertical	7.10	39.47	54.00	-14.53	Average
11490.000	42.63	vertical	7.10	49.73	74.00	-24.27	Peak
11490.000	32.86	horizontal	7.10	39.96	54.00	-14.04	Average
11490.000	43.09	horizontal	7.10	50.19	74.00	-23.81	Peak
Middle Channel							
11570.000	33.04	vertical	7.15	40.19	54.00	-13.81	Average
11570.000	46.70	vertical	7.15	53.85	74.00	-20.15	Peak
11570.000	32.95	horizontal	7.15	40.10	54.00	-13.90	Average
11570.000	47.75	horizontal	7.15	54.90	74.00	-19.10	Peak
High Channel							
5853.153	49.93	vertical	11.78	61.71	115.01	-53.30	Peak
5867.793	48.94	vertical	11.79	60.73	107.22	-46.49	Peak
5883.333	49.48	vertical	11.78	61.26	99.01	-37.75	Peak
5939.415	49.92	vertical	11.87	61.79	68.20	-6.41	Peak
5850.451	49.00	horizontal	11.79	60.79	121.17	-60.38	Peak
5861.486	49.65	horizontal	11.79	61.44	108.98	-47.54	Peak
5920.496	50.00	horizontal	11.83	61.83	71.52	-9.69	Peak
5938.739	49.25	horizontal	11.87	61.12	68.20	-7.08	Peak
11650.000	32.42	vertical	7.17	39.59	54.00	-14.41	Average
11650.000	45.57	vertical	7.17	52.74	74.00	-21.26	Peak
11650.000	32.36	horizontal	7.17	39.53	54.00	-14.47	Average
11650.000	44.81	horizontal	7.17	51.98	74.00	-22.02	Peak
802.11n40							
Low Channel							
5606.006	48.86	vertical	11.30	60.16	68.20	-8.04	Peak
5684.685	49.18	vertical	11.44	60.62	93.90	-33.28	Peak

5713.514	53.50	vertical	11.53	65.03	108.99	-43.96	Peak
5723.724	53.15	vertical	11.56	64.71	119.29	-54.58	Peak
5631.632	48.56	horizontal	11.32	59.88	68.20	-8.32	Peak
5697.498	48.92	horizontal	11.48	60.40	103.36	-42.96	Peak
5713.714	48.91	horizontal	11.53	60.44	109.04	-48.60	Peak
5725.000	49.19	horizontal	11.56	60.75	122.20	-61.45	Peak
11510.000	31.62	vertical	7.10	38.72	54.00	-15.28	Average
11510.000	43.77	vertical	7.10	50.87	74.00	-23.13	Peak
11510.000	31.92	horizontal	7.10	39.02	54.00	-14.98	Average
11510.000	42.98	horizontal	7.10	50.08	74.00	-23.92	Peak
High Channel							
5850.225	51.03	vertical	11.79	62.82	121.69	-58.87	Peak
5859.009	50.82	vertical	11.79	62.61	109.68	-47.07	Peak
5893.468	49.54	vertical	11.78	61.32	91.50	-30.18	Peak
5958.784	49.46	vertical	11.89	61.35	68.20	-6.85	Peak
5853.153	48.66	horizontal	11.78	60.44	115.01	-54.57	Peak
5869.144	48.88	horizontal	11.79	60.67	106.84	-46.17	Peak
5888.288	49.36	horizontal	11.79	61.15	95.34	-34.19	Peak
5949.324	49.57	horizontal	11.89	61.46	68.20	-6.74	Peak
11590.000	31.86	vertical	7.17	39.03	54.00	-14.97	Average
11590.000	45.15	vertical	7.17	52.32	74.00	-21.68	Peak
11590.000	32.14	horizontal	7.17	39.31	54.00	-14.69	Average
11590.000	45.00	horizontal	7.17	52.17	74.00	-21.83	Peak
802.11ac80							
5649.249	48.90	vertical	11.34	60.24	68.20	-7.96	Peak
5695.279	48.70	vertical	11.48	60.18	101.72	-41.54	Peak
5719.420	51.53	vertical	11.55	63.08	110.64	-47.56	Peak
5723.605	50.31	vertical	11.56	61.87	119.02	-57.15	Peak
5644.595	49.03	horizontal	11.33	60.36	68.20	-7.84	Peak
5696.622	48.80	horizontal	11.48	60.28	102.71	-42.43	Peak
5710.360	49.15	horizontal	11.52	60.67	108.10	-47.43	Peak
5723.423	48.68	horizontal	11.56	60.24	118.61	-58.37	Peak
5850.876	49.47	vertical	11.79	61.26	120.20	-58.94	Peak
5867.643	49.07	vertical	11.79	60.86	107.26	-46.40	Peak
5891.166	49.75	vertical	11.79	61.54	93.20	-31.66	Peak
5931.707	49.11	vertical	11.85	60.96	68.20	-7.24	Peak
5852.878	48.68	horizontal	11.78	60.46	115.64	-55.18	Peak
5866.892	49.32	horizontal	11.80	61.12	107.47	-46.35	Peak

5919.695	49.76	horizontal	11.83	61.59	72.11	-10.52	Peak
5956.732	48.95	horizontal	11.90	60.85	68.20	-7.35	Peak
11550.000	31.64	vertical	7.13	38.77	54.00	-15.23	Average
11550.000	43.41	vertical	7.13	50.54	74.00	-23.46	Peak
11550.000	31.41	horizontal	7.13	38.54	54.00	-15.46	Average
11550.000	43.98	horizontal	7.13	51.11	74.00	-22.89	Peak

Remark:

Corrected Amplitude= Reading level + corrected Factor

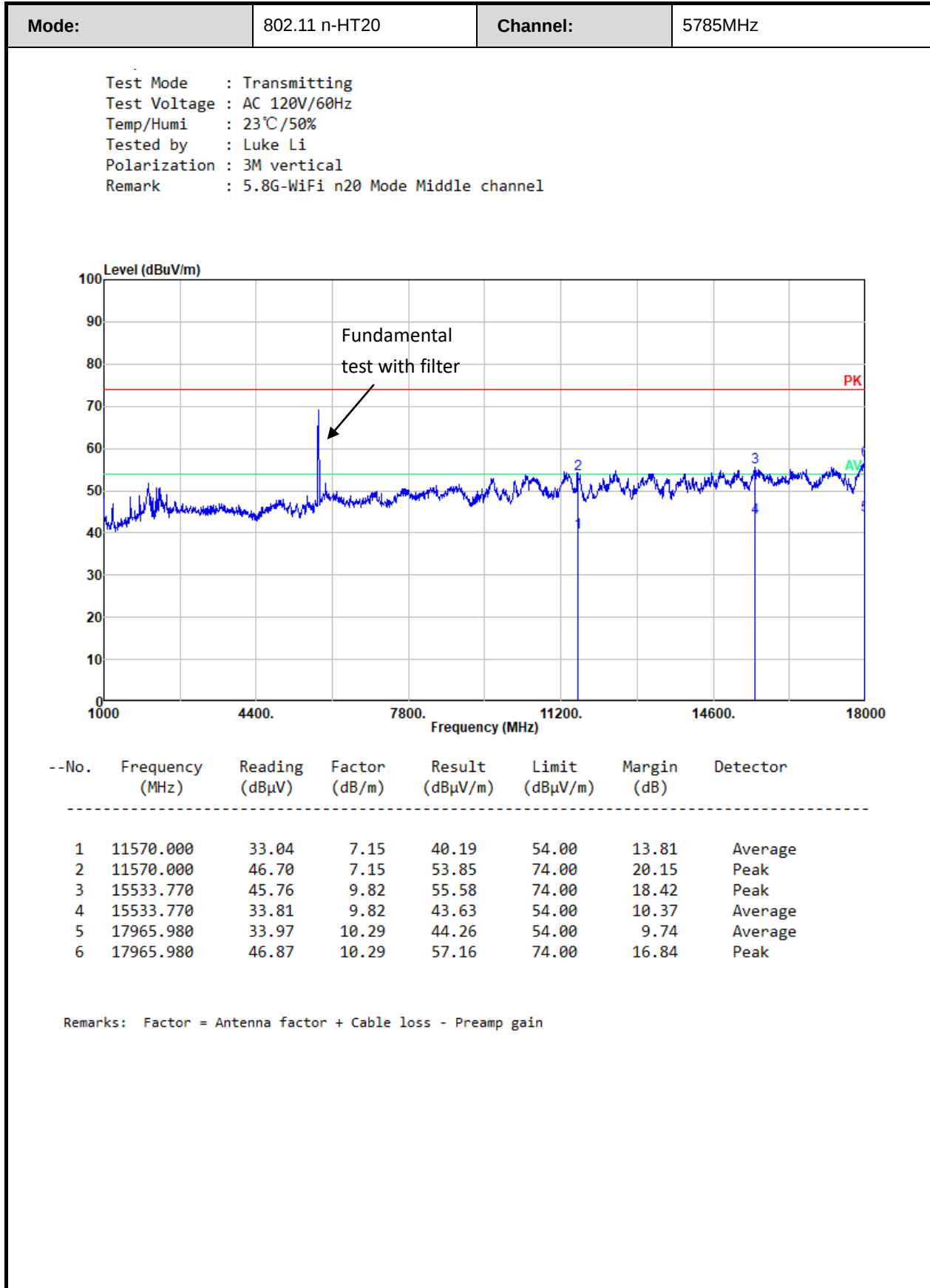
Corrected Factor = Antenna factor + Cable loss – Amplifier gain

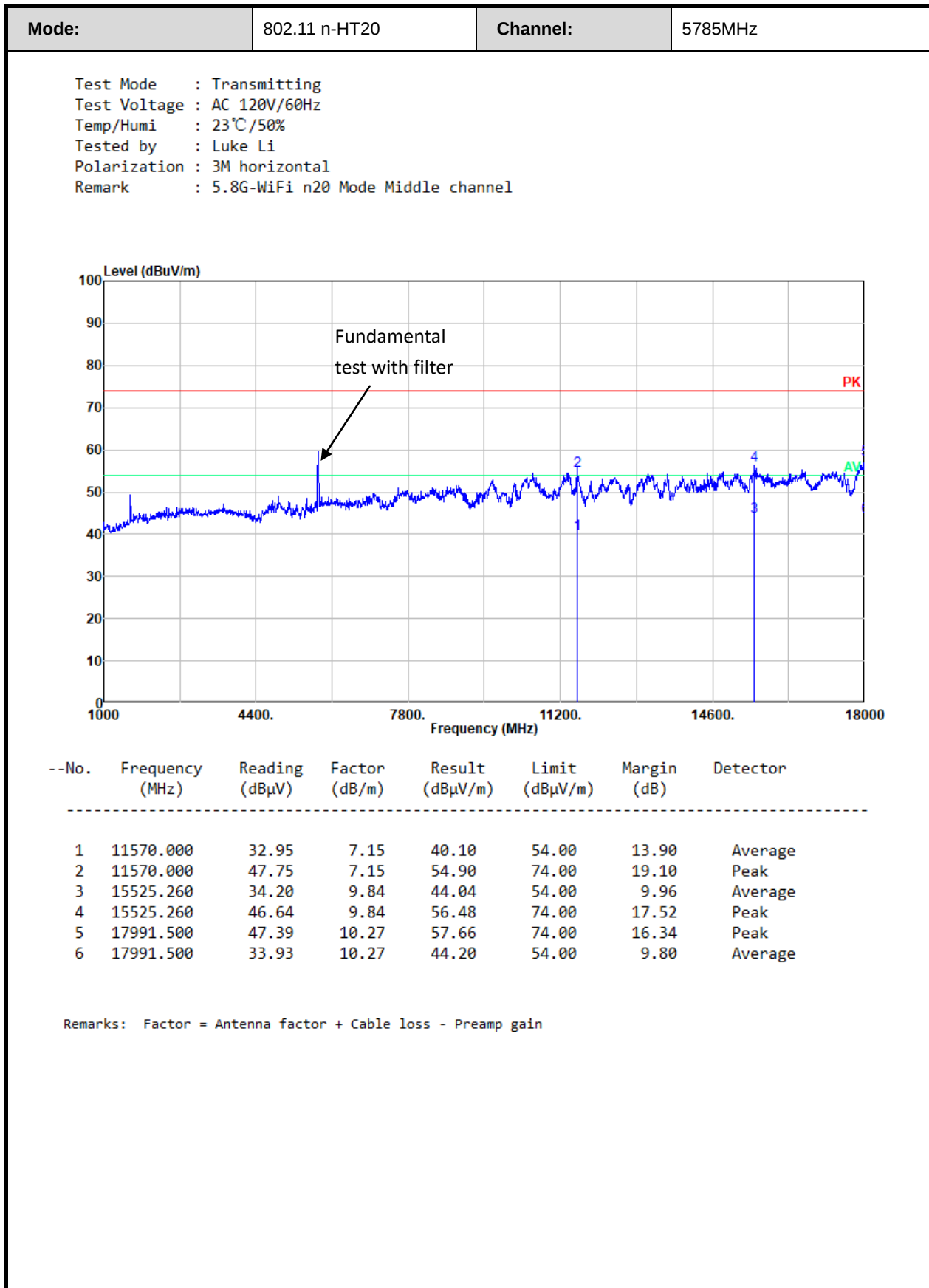
Margin = Corrected Amplitude – Limit

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:	2023-11-13	Test By:	Baylor Li
Environment condition:	Temperature: 23.5°C; Relative Humidity:55%; ATM Pressure: 103.1kPa		

3.5.1 6dB Emission Bandwidth and 99% Occupied Bandwidth

Test Mode	Antenna	Channel	6dB BW	99%	6dB BW	Verdict
802.11a	Ant1	5745	16.500	16.474	0.5	pass
		5785	16.474	16.474	0.5	pass
		5825	16.141	16.410	0.5	pass
802.11n HT20	Ant1	5745	17.410	17.628	0.5	pass
		5785	17.603	17.628	0.5	pass
		5825	17.026	17.628	0.5	pass
802.11n HT40	Ant1	5755	35.333	36.026	0.5	pass
		5795	35.333	36.282	0.5	pass
802.11ac VHT80	Ant1	5775	75.487	75.128	0.5	pass

Note: test only performed on antenna 1.

3.5.2 Maximum conducted output power

Test Mode	Antenna	Channel [MHz]	Result [dBm]	Limit [dBm]	Verdict
802.11a	Ant1	5745	10.95	30	Pass
		5785	10.10	30	Pass
		5825	9.51	30	Pass
	Ant2	5745	12.46	30	Pass
		5785	12.27	30	Pass
		5825	12.08	30	Pass
	Total	5745	14.78	30	Pass
		5785	14.33	30	Pass
		5825	13.99	30	Pass
802.11n HT20	Ant1	5745	10.97	30	Pass
		5785	10.07	30	Pass
		5825	9.46	30	Pass
	Ant2	5745	12.70	30	Pass
		5785	12.21	30	Pass
		5825	12.03	30	Pass
	Total	5745	14.93	30	Pass
		5785	14.28	30	Pass
		5825	13.94	30	Pass
802.11n HT40	Ant1	5755	10.73	30	Pass

	Ant2	5795	9.73	30	Pass
		5755	12.60	30	Pass
		5795	11.96	30	Pass
	Total	5755	14.78	30	Pass
		5795	14.00	30	Pass
802.11ac VHT80	Ant1	5775	11.35	30	Pass
	Ant2	5775	12.37	30	Pass
	Total	5775	14.90	30	Pass

3.5.3 Power Spectral Density

Test Mode	Antenna	Channel [MHz]	Result [dBm/500kHz]	Limit [dBm/500kHz]	Verdict
802.11a	Ant1	5745	0.28	30	Pass
		5785	-0.18	30	Pass
		5825	0.15	30	Pass
	Ant2	5745	2.72	30	Pass
		5785	2.8	30	Pass
		5825	2.4	30	Pass
	Total	5745	4.68	30	Pass
		5785	4.57	30	Pass
		5825	4.43	30	Pass
802.11n HT20	Ant1	5745	2.03	30	Pass
		5785	0.98	30	Pass
		5825	0.57	30	Pass
	Ant2	5745	2.69	30	Pass
		5785	2.23	30	Pass
		5825	1.63	30	Pass
	Total	5745	5.38	30	Pass
		5785	4.66	30	Pass
		5825	4.14	30	Pass
802.11n HT40	Ant1	5755	-2	30	Pass
		5795	-2.47	30	Pass
	Ant2	5755	-0.03	30	Pass
		5795	-1.28	30	Pass
	Total	5755	2.11	30	Pass
		5795	1.18	30	Pass
802.11ac VHT80	Ant1	5775	-5.09	30	Pass
	Ant2	5775	-3.62	30	Pass
	Total	5775	-1.28	30	Pass

3.5.4 Duty Cycle

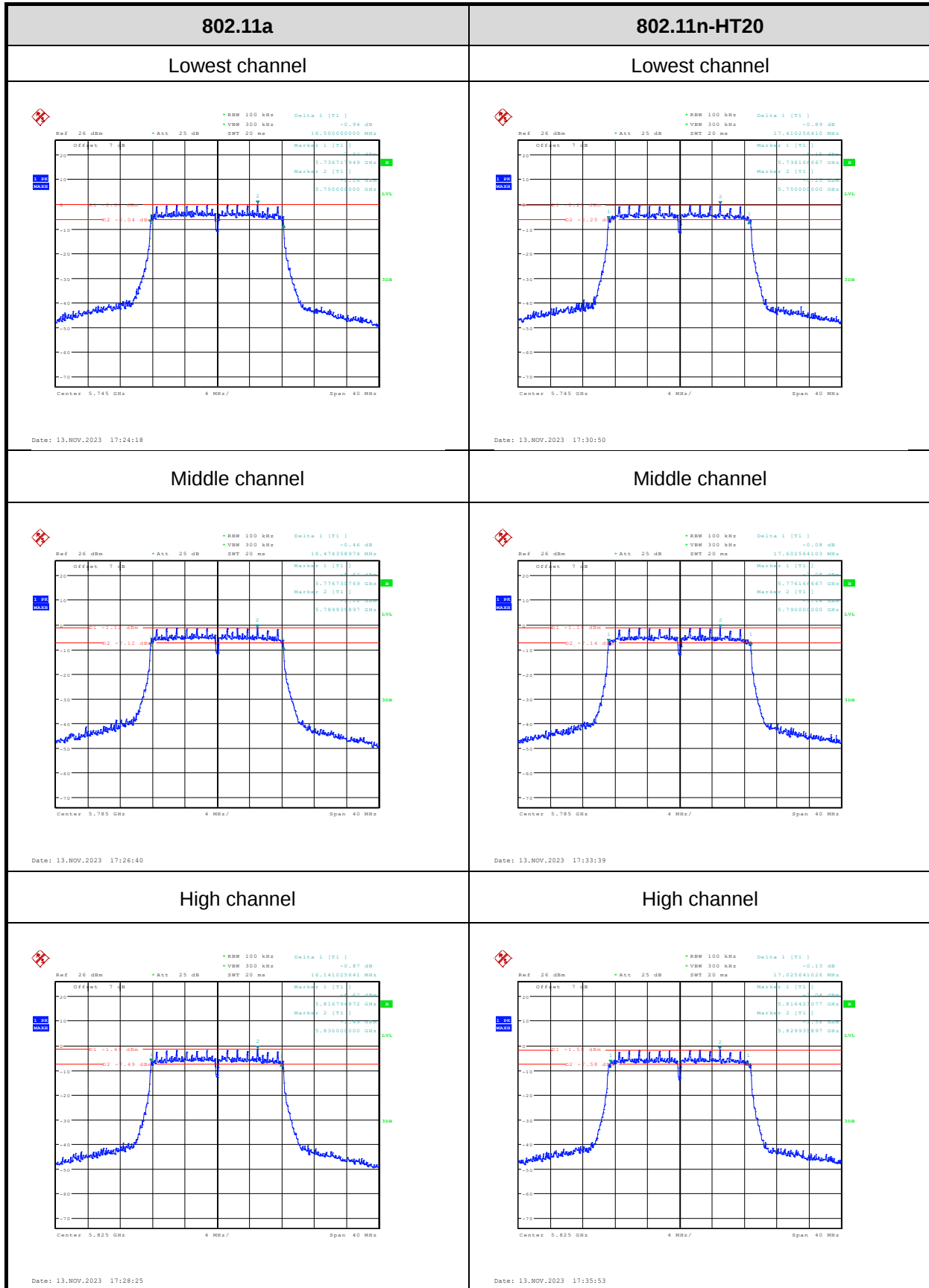
Test Mode	Antenna	Channel (MHz)	Ton (ms)	Ton+off (ms)	Duty Cycle [%]	1/T	Duty Cycle Factor[%]	VBW setting* [Hz]
802.11a	Ant1	5785	2.099	/	Not constant	0.476	/	500
802.11n HT20	Ant1	5785	1.955	/	Not constant	0.512	/	1000
802.11n HT40	Ant1	5755	0.955	/	Not constant	1.047	/	2000
802.11ac VHT80	Ant1	5775	0.479	/	Not constant	2.088	/	3000

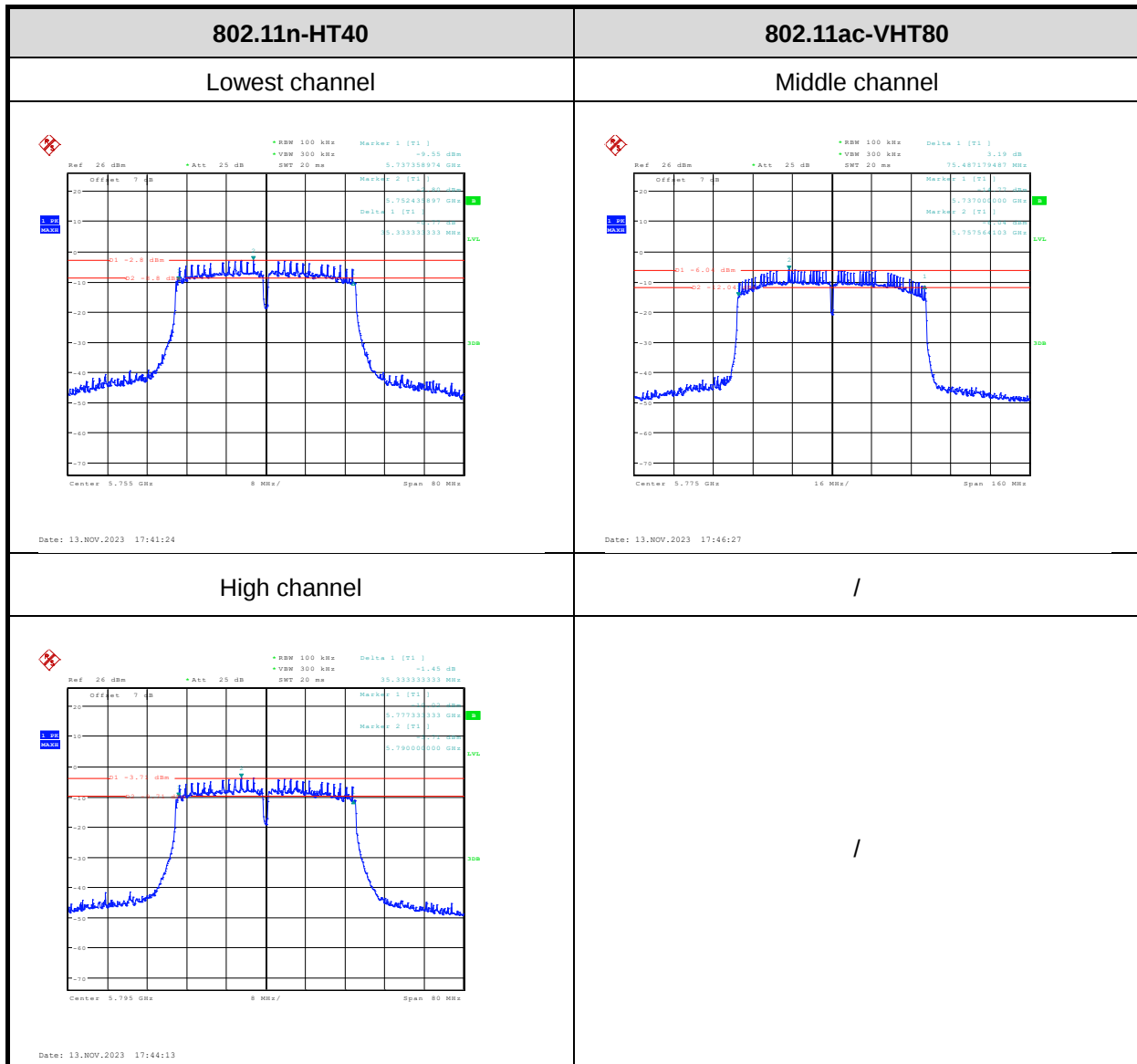
Note: test only performed on antenna 1.

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

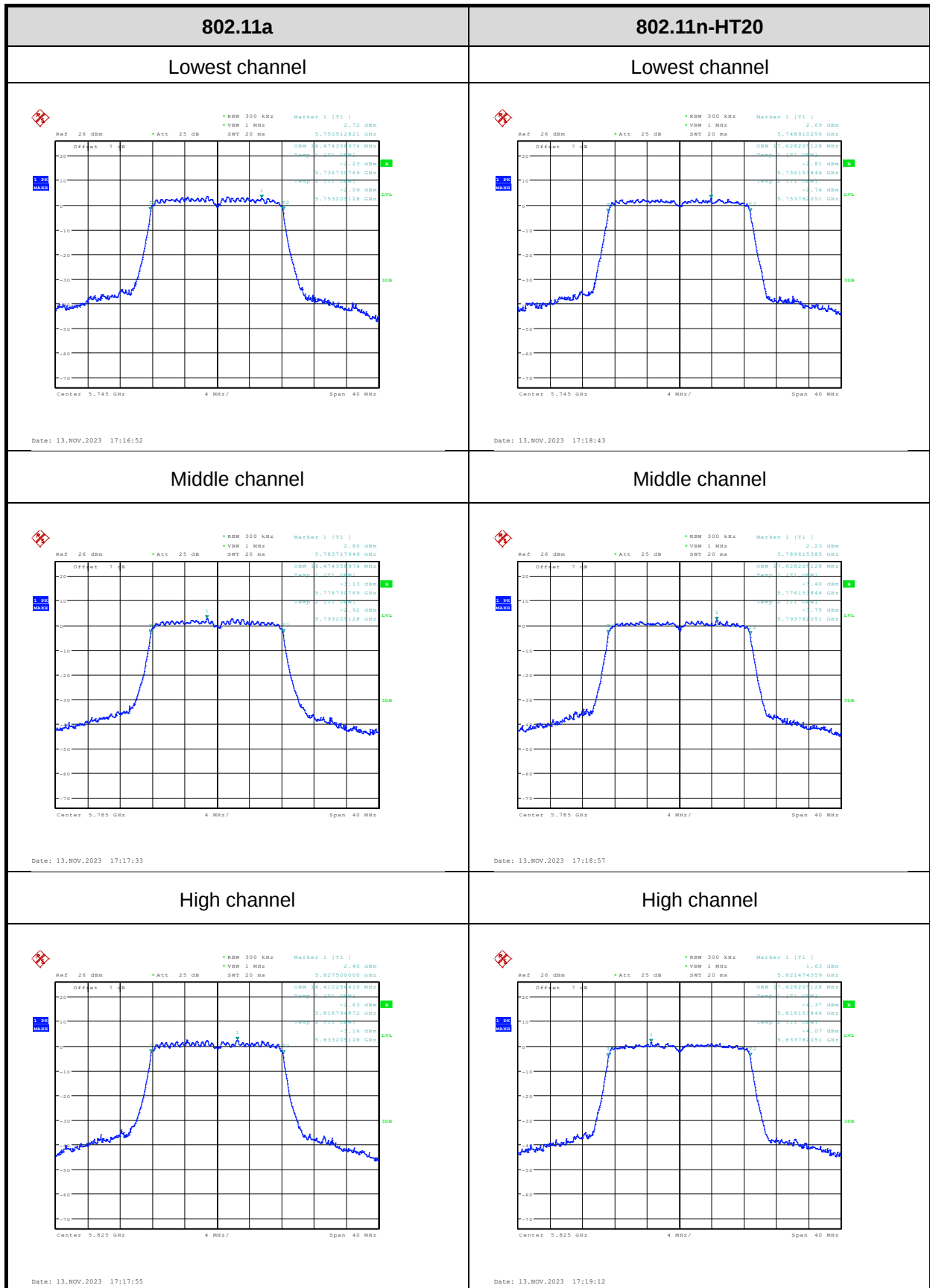
Test Plots:

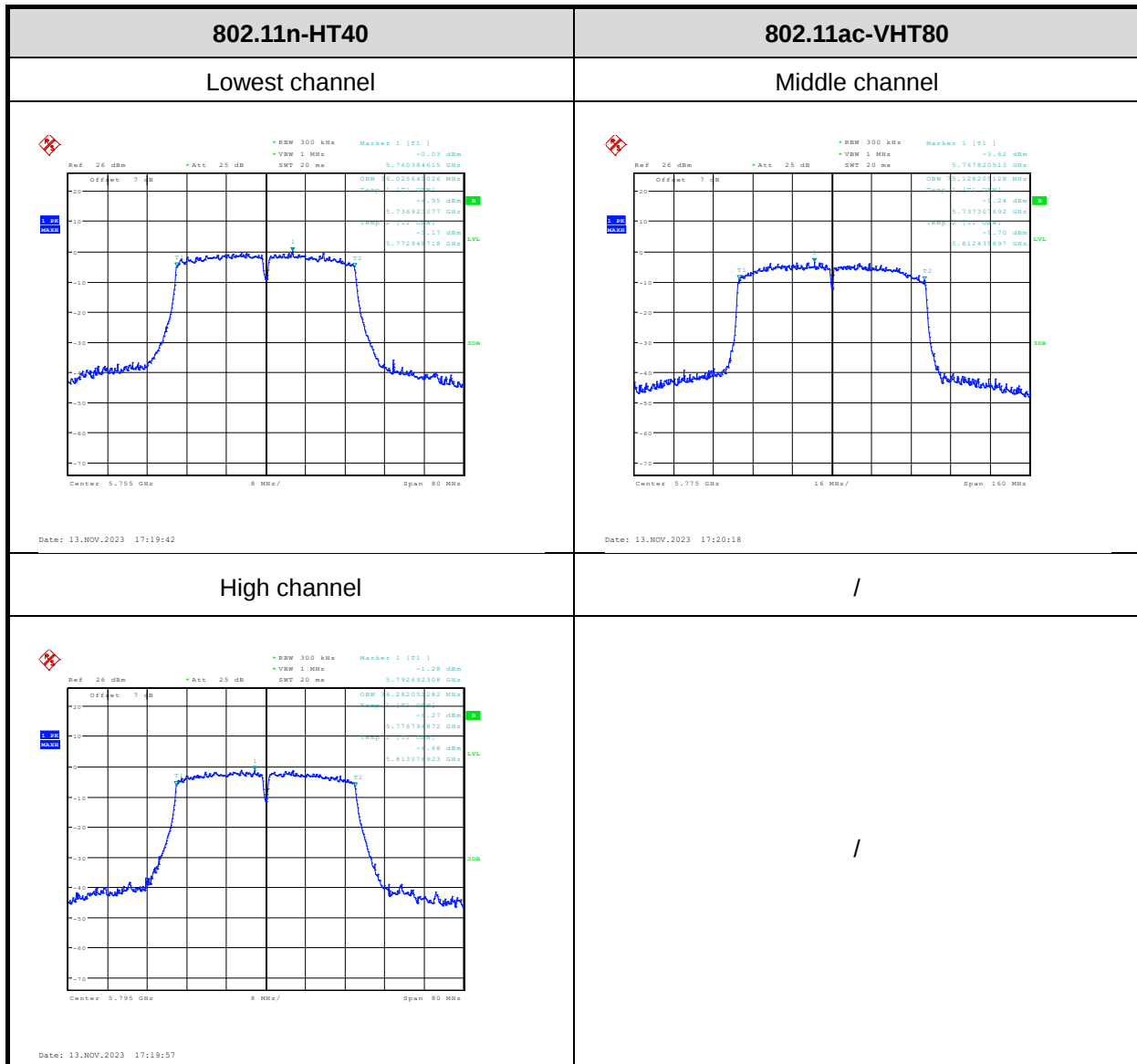
6dB Emission Bandwidth



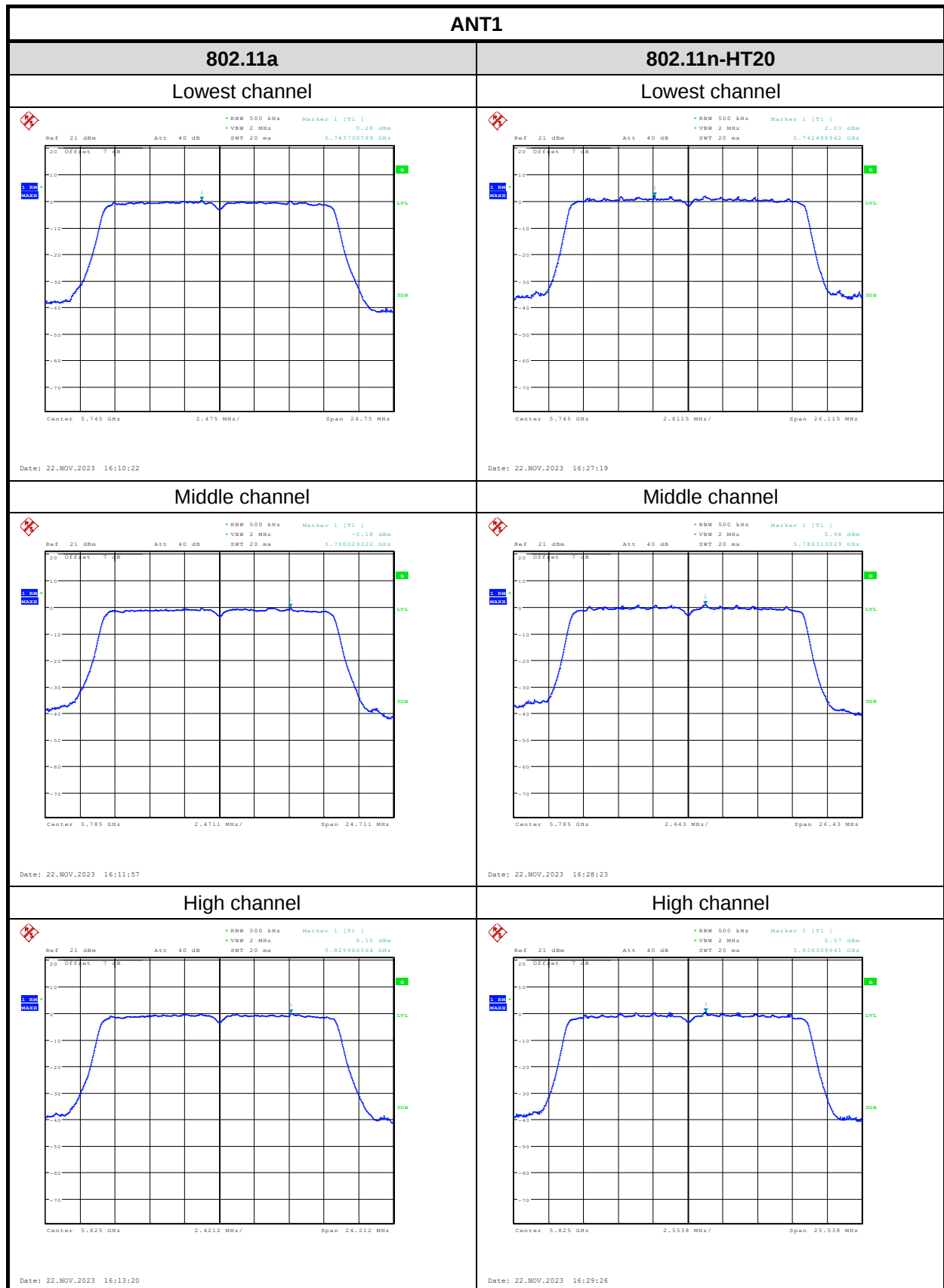


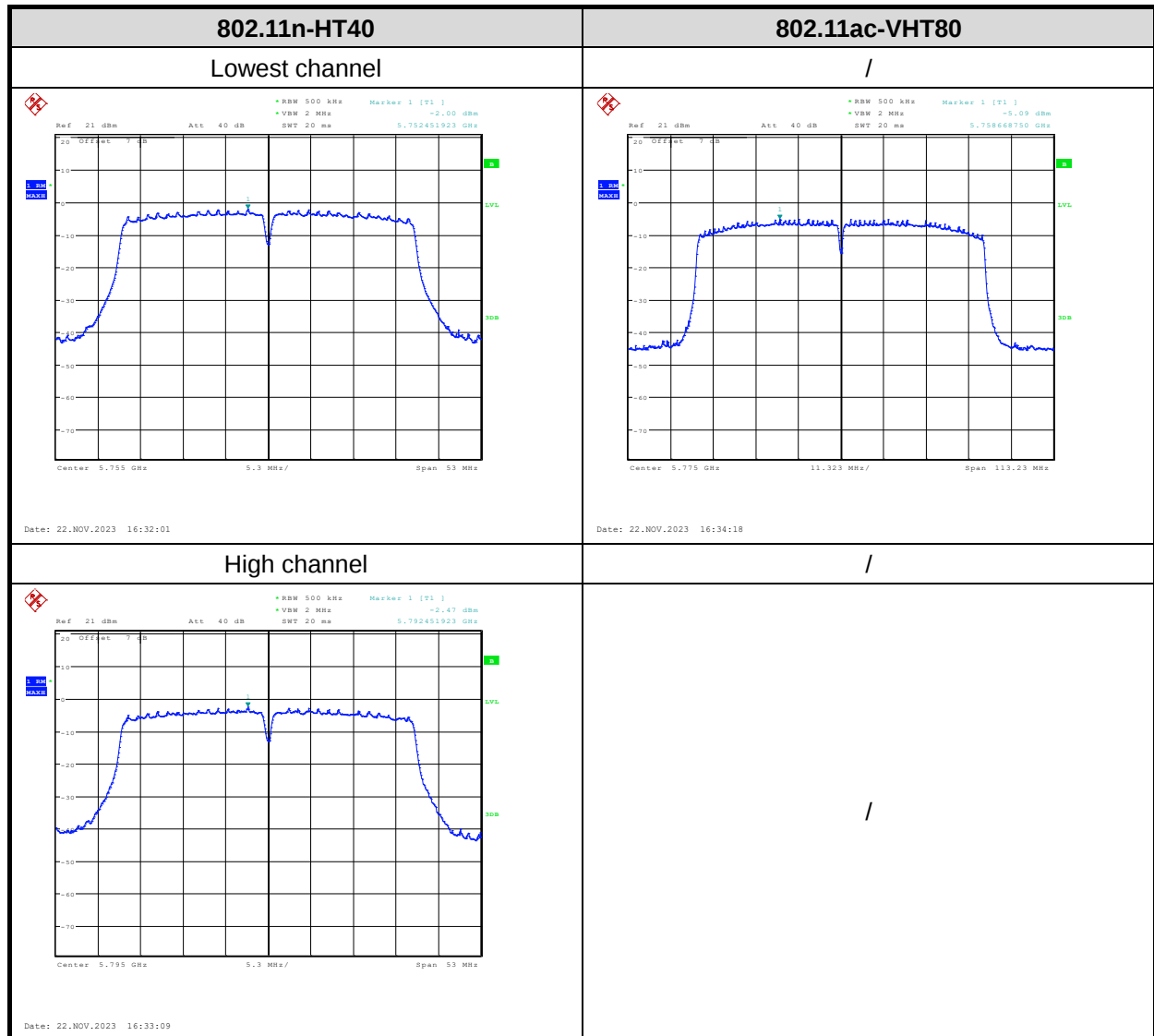
99% Occupied Bandwidth

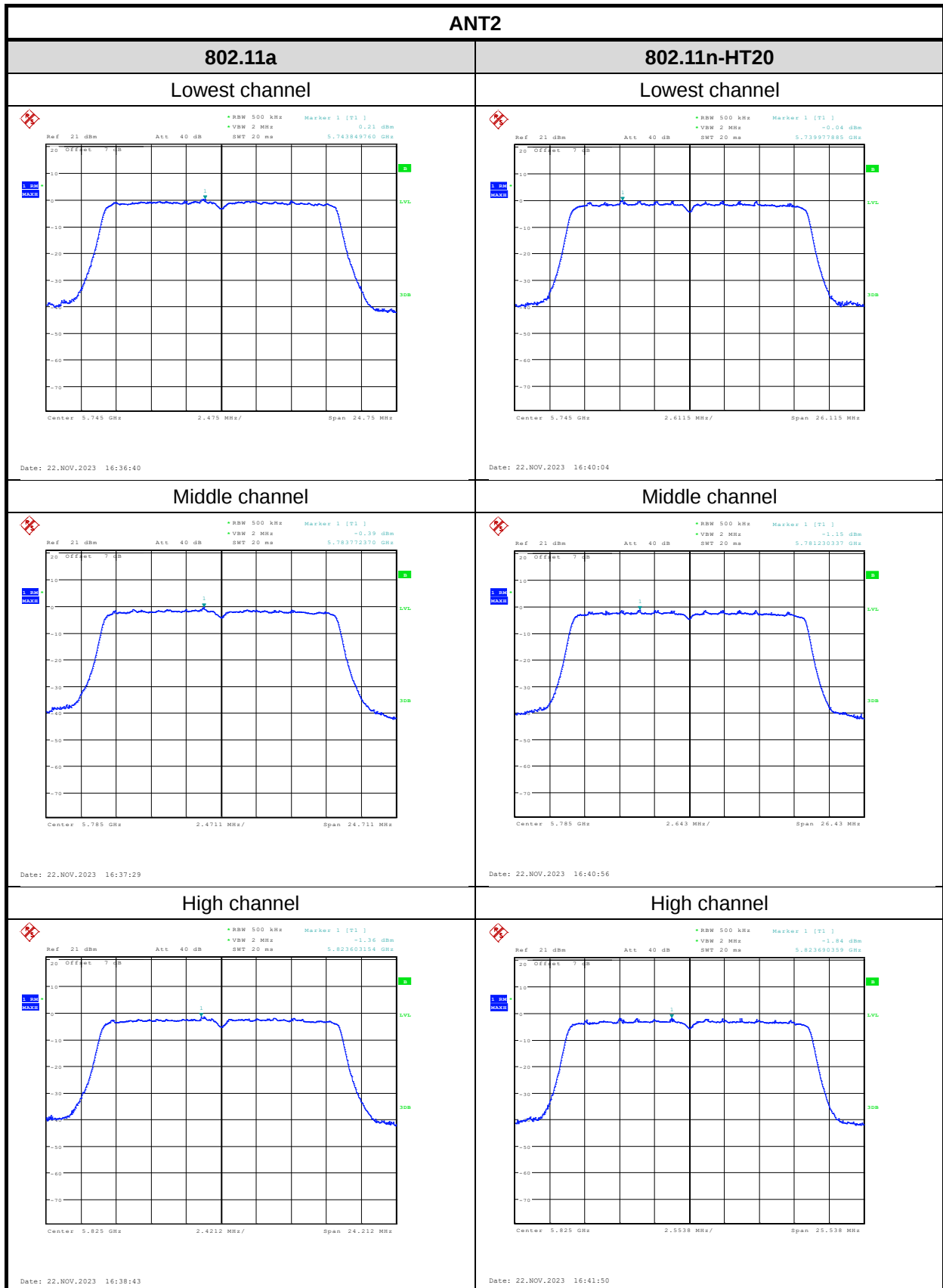


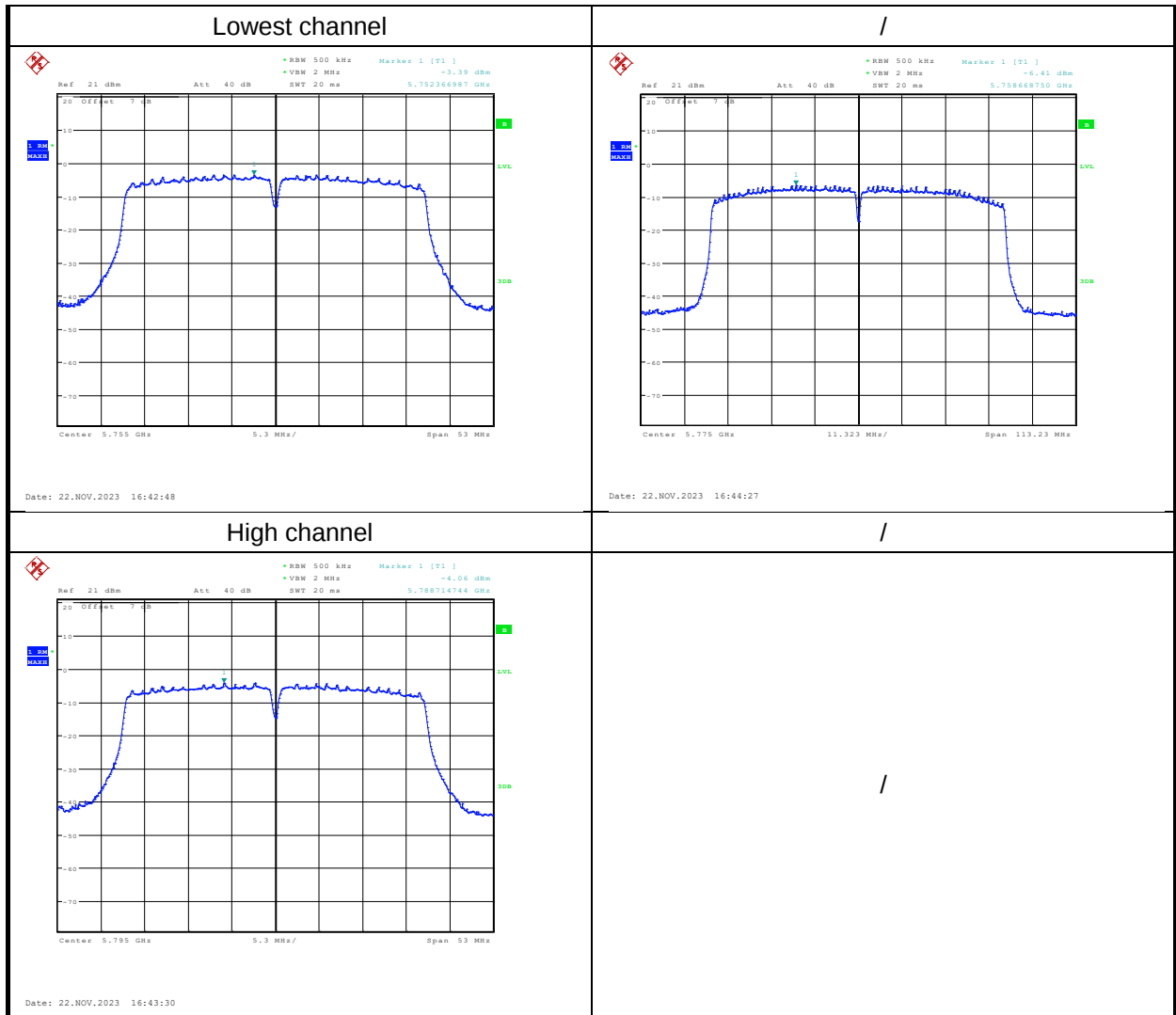


Power Spectral Density

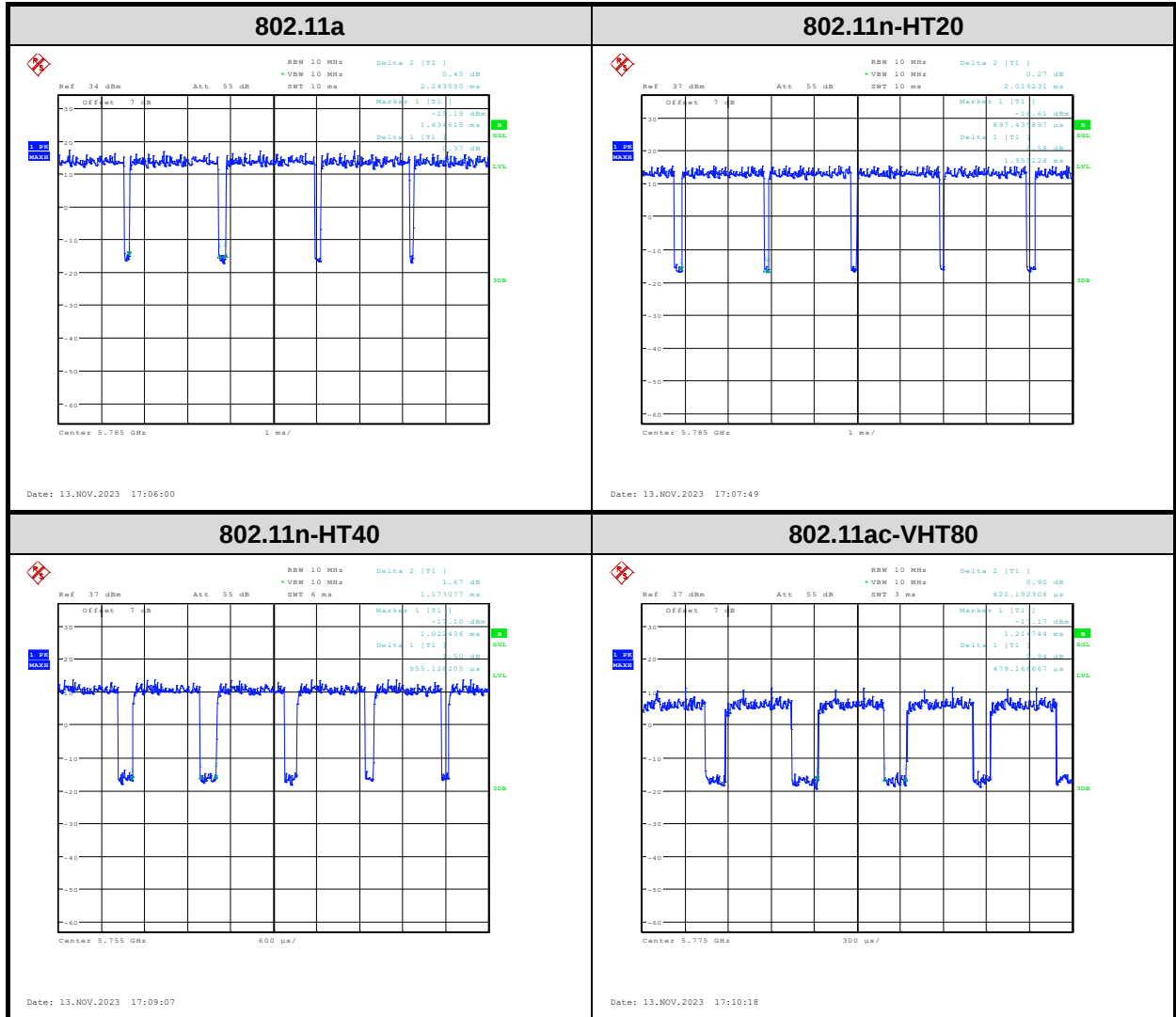








Duty Cycle



4 Test Setup Photo

Please refer to the attachment.

5 E.U.T Photo

Please refer to the attachment.

---End of Report---