

FCC Test Report

Report No.: RWAZ202300087E

Applicant: Shenzhen jinnaibo Electronic Co., Ltd.

Address: Floor 3, building L, Shasi hi tech park, Shasi Community, Shajing street, Baoan Shenzhen

Product Name: Car Navigation System

Product Model: XT892C

Multiple Models: XT891, XT811, XT892, XT812, XT891C, XT811C, XT812C, XT892SC, XT812SC, XT592, XT512, XT594, XT514, XT596, XT516, XTMGN272C, XTLY72C, XTF15072C, XTA372C, XTDA72C, XTTR72C, XTVW72C, XTJE72C, XTGMC72C, XTPG72C, XTPB72C, XTPS72C, XTB20072C, XTW21172C, XTW20372C, XTW20972C, XTE4672C, XTE9072C, XTE3972C, XTFC72C, XTFD72C, XTFYT50072C, XTPANDA72C, XTPUNTO72C, XTVW92C, XTB20082C, XTVW82C, MS92NV, MS12NV, MS94NV, MS14NV, MS96NV, MS16NV, MS94, MS14, MS98, MS18, MS9256, MS1256, BW3E9014, X5CCC14, B2B3NBT4, E60CIC84, E60CCC84, HPA584.GP, HPQ514.GP, GBZA14-15, GQ514L-917, GA4A514H-916, DW8114, DW8134, SPAccrodDW894, DW4Runner4.G, DW4Runner4.S, M3VWMT, M3B, GT694, GT614, GT698, GT618, GT698S, GT618S, DW8RUNNER12, DW9RUNNER14, DW8RAM14, DW9RAM14, DW9F15024-314, DW9F15024-521

Trade Mark: N/A

FCC ID: 2BBNO-XT892C

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

Test Date: 2023-12-29 to 2024-01-19

Test Result: Complied

Issue Date: 2024-01-23

Reviewed by:

Frank Yin

Frank Yin
Project Engineer

Approved by:

Jacob Kong

Jacob Kong
Manager

Prepared by:

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

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Guangdong, People's Republic of China



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Revision History

Version No.	Issued Date	Description
00	2024-01-23	Original

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1 General Information

1.1 Client Information

Applicant:	Shenzhen jinnaibo Electronic Co., Ltd.
Address:	Floor 3, building L, Shasi hi tech park, Shasi Community, Shajing street, Baoan Shenzhen
Manufacturer:	Shenzhen jinnaibo Electronic Co., Ltd.
Address:	Floor 3, building L, Shasi hi tech park, Shasi Community, Shajing street, Baoan Shenzhen

1.2 Product Description of EUT

The EUT is Car Navigation System that contains Classical Bluetooth(BDR/EDR), BLE, 2.4G and 5G WLAN radios, this report covers the full testing of the 5G WLAN radio.

Sample Serial number	1P-1,1Q-1,1R-1RE test,1P-1 for RF test conducted test (assigned by WATC)
Sample Received Date	2023-12-22
Sample Status	Good Condition
Frequency Range	5150MHz-5250MHz, 5725 MHz - 5850MHz
Maximum Conducted Output Power	5150 MHz - 5250MHz: 13.12dBm 5725 MHz - 5850MHz: 6.61dBm
Modulation Technology	OFDM
Spatial Streams	SISO (1TX, 1RX)
Antenna Gain [#]	5150 MHz - 5250MHz: -1.44dBi 5725 MHz - 5850MHz: -0.43dBi
Power Supply	DC 12V
Adapter Information	N/A
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 which uses a unique antenna connector. Please see product external photos for details.	

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DSS, FCC ID: 2BBNOXT892C
FCC Part 15, Subpart E, Equipment Class: DTS, FCC ID: 2BBNOXT892C

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: (5150-5250MHz)					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
36	5180	40	5200	46	5230
38	5190	44	5220	48	5240
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)
36	5180	40	5200	48	5240
802.11n-HT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
38	5190	/	/	46	5230

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 [#] :		SP_META V2.2052.0		
5150-5250MHz Band				
Mode	Data rate	Powel Level Setting [#]		
		Low Channel	Middle Channel	High Channel
802.11a	6Mbps	16	16	16
802.11n-HT20	MCS0	16	16	16
802.11n-HT40	MCS0	13	/	13
5725-5850MHz Band				
Mode	Data rate	Powel Level Setting [#]		
		Low Channel	Middle Channel	High Channel
802.11a	6Mbps	18	18	18
802.11n-HT20	MCS0	18	18	18
802.11n-HT40	MCS0	18	/	18
The exercise software and the maximum power setting that provided by manufacturer.				

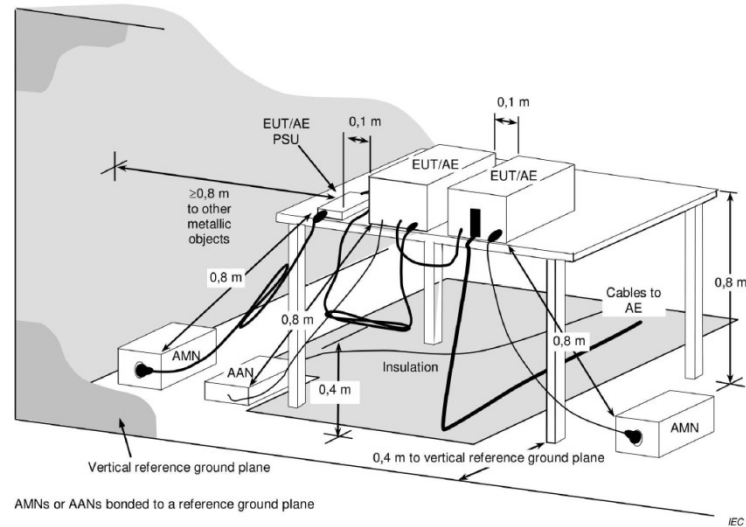
Worst-Case Configuration:
For radiated emission 9kHz-1GHz and above 18GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario.
For EUT model: XT892C, XT812C, XTGMC72C, they use the same main board, but have difference appearance and a connector board, model XT892C was selected to full test, other two models was additional test radiated emissions below 1GHz.

2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
UNI-TREND Technology (CHINA) Co., Ltd.	DC Power Supply	UTP1310S	C221286498

2.3 Test Setup

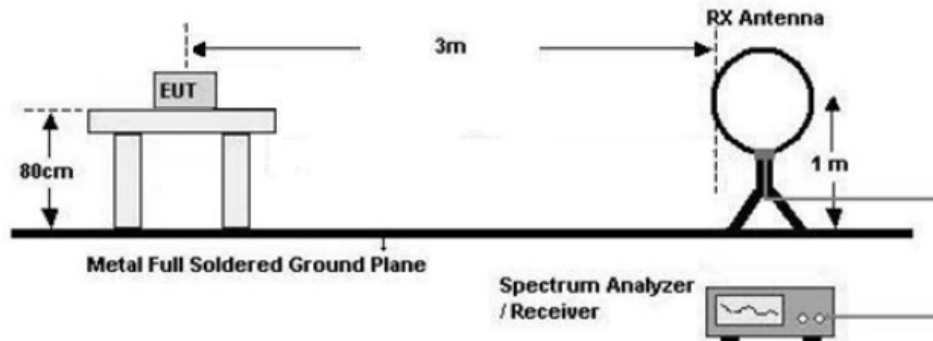
1) Conducted emission measurement:



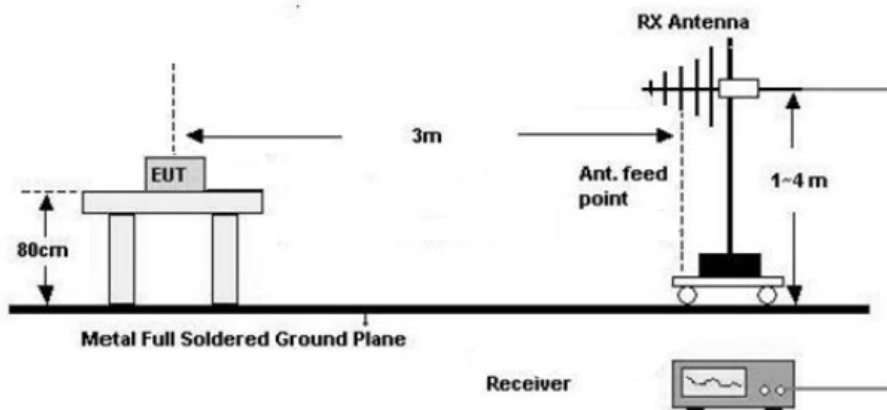
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

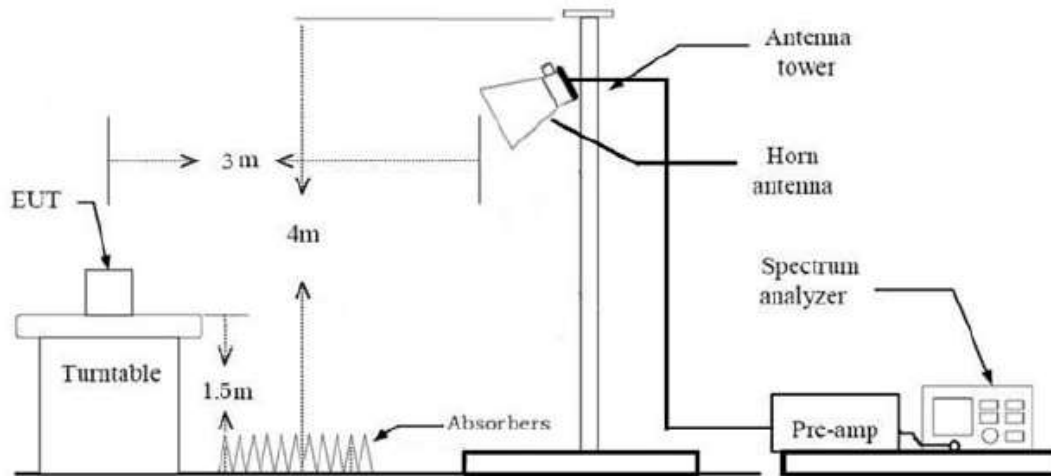
Below 30MHz (3m SAC)



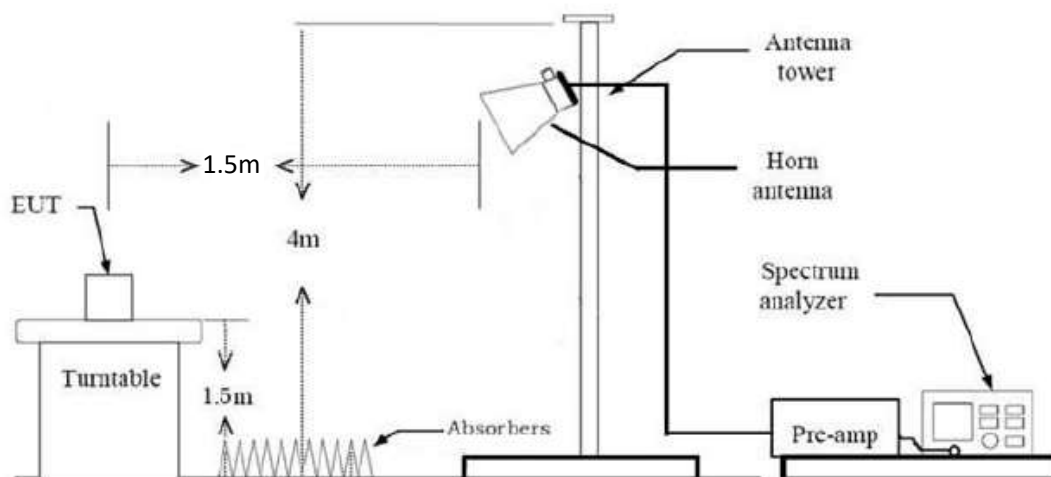
0MHz-1GHz (3m SAC)



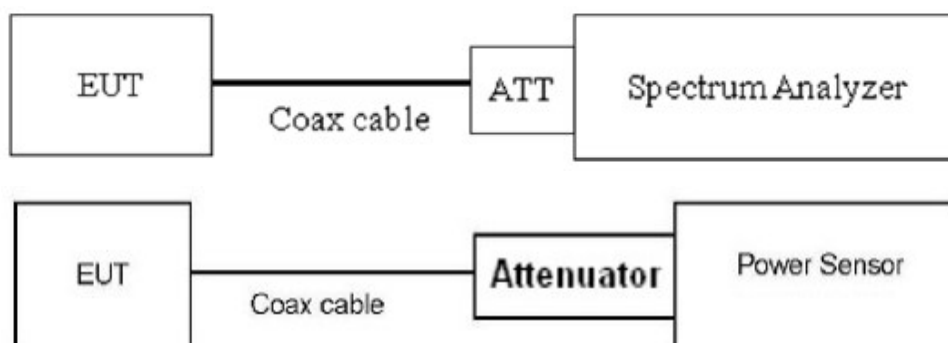
1GHz-18GHz(3m FAC)



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
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-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	N/A
§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 (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	For the band 5.150-5.250 GHz Band: For client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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. For the band 5.725-5.895 GHz Band: 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.
Power Spectral Density	
26dB Emission Bandwidth	N/A
99% Occupied Bandwidth	
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	Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209 For the band 5.150-5.250 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 the band 5.725-5.895 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.
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3.3 AC Line Conducted Emissions Test Data

Not Applicable, the device is intended for vehicle use.

3.4 Radiated emission Test Data

9 kHz-30MHz:

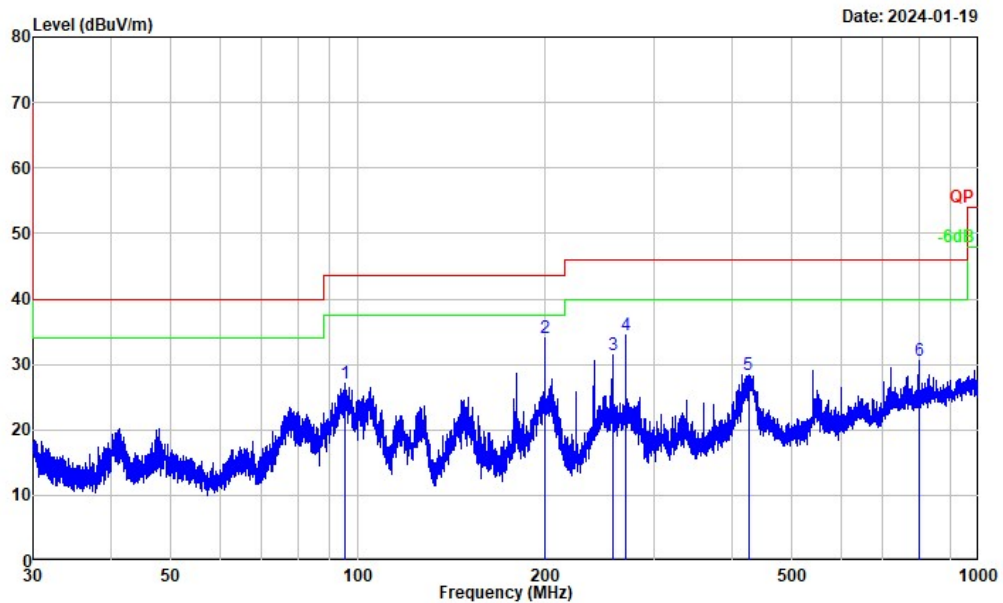
Test Date:	2024-01-19	Test By:	Bard Huang
Environment condition:	Temperature: 24.1°C; Relative Humidity:60%; ATM Pressure: 100.9kPa		

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

30MHz-1GHz:

Test Date:	2024-01-19	Test By:	Bard Huang
Environment condition:	Temperature: 24.1°C; Relative Humidity:60%; ATM Pressure: 100.9kPa		

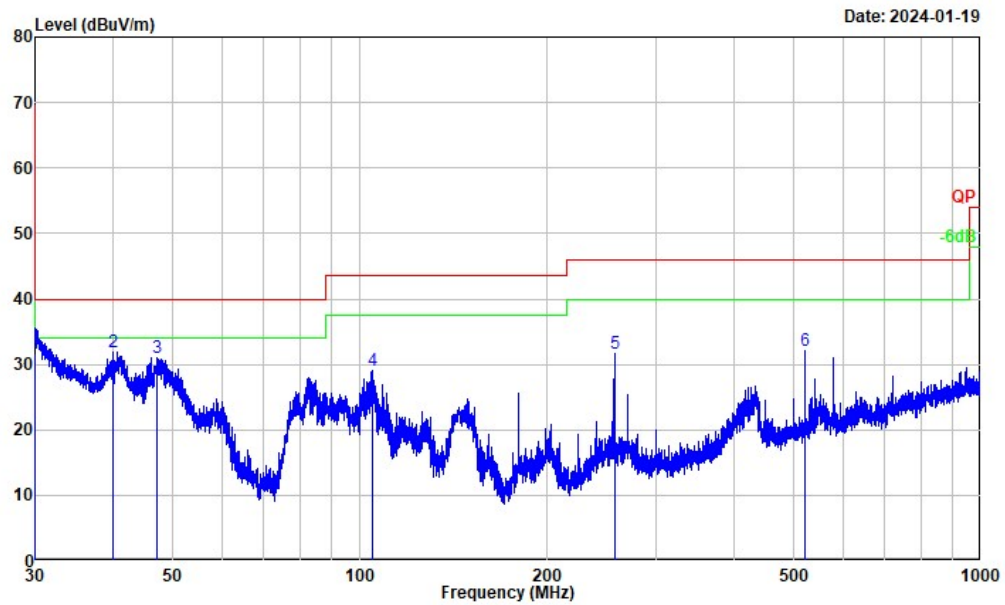
Model: XT892C



Project No. : RWAZ202300087
Test Mode : Transmitting
Test Voltage : DC 12V
Environment : 24.1°C/60%R.H./100.9kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11a 5200MHz

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	95.511	41.84	-14.74	27.10	43.50	-16.40	Peak
2	199.986	47.76	-13.81	33.95	43.50	-9.55	Peak
3	257.309	43.75	-12.28	31.47	46.00	-14.53	Peak
4	270.020	46.45	-12.03	34.42	46.00	-11.58	Peak
5	425.587	36.61	-8.27	28.34	46.00	-17.66	Peak
6	800.031	32.60	-1.98	30.62	46.00	-15.38	Peak

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

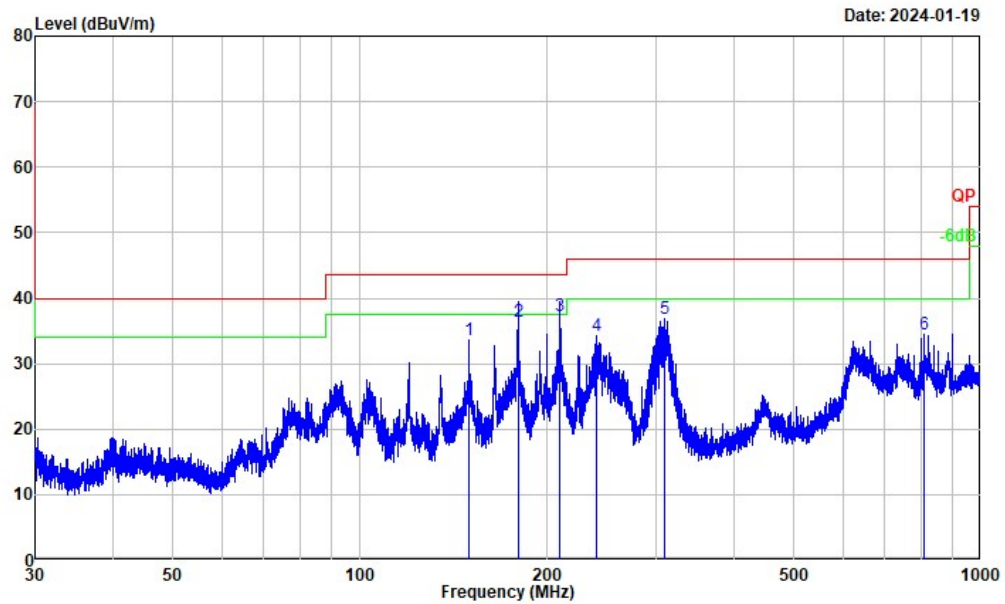


Project No. : RWAZ202300087
Test Mode : Transmitting
Test Voltage : DC 12V
Environment : 24.1°C/60%R.H./100.9kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11a 5200MHz

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	30.053	46.60	-15.02	31.58	40.00	-8.42	QP
2	40.047	44.99	-13.11	31.88	40.00	-8.12	Peak
3	47.222	43.27	-12.18	31.09	40.00	-8.91	Peak
4	104.765	43.00	-13.96	29.04	43.50	-14.46	Peak
5	257.309	43.91	-12.28	31.63	46.00	-14.37	Peak
6	519.976	39.02	-6.86	32.16	46.00	-13.84	Peak

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

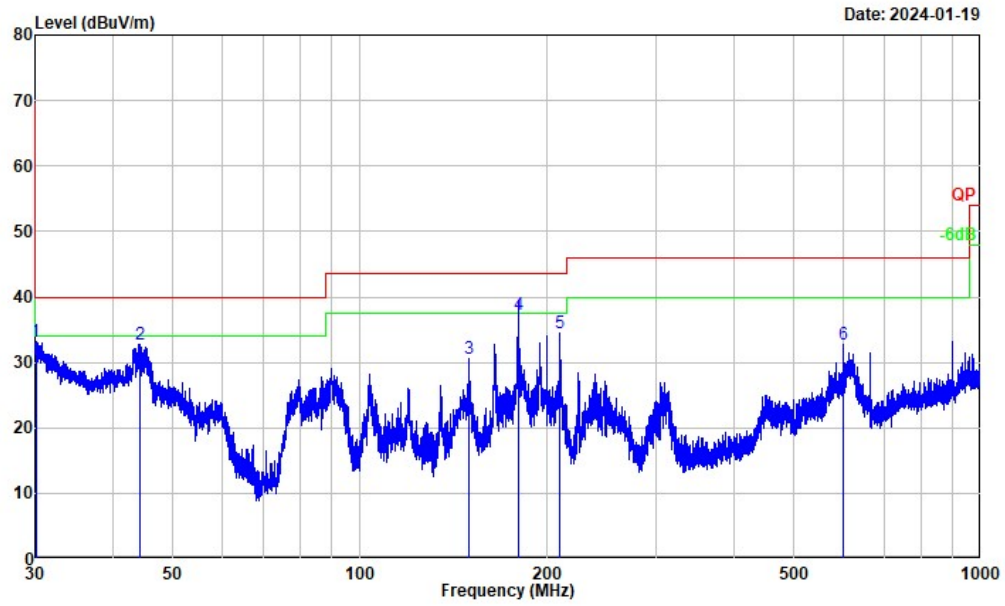
Model: XT812C



Project No. : RWAZ202300087
Test Mode : Transmitting
Test Voltage : DC 12V
Environment : 24.1°C/60%R.H./100.9kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11a 5200MHz

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	149.879	51.09	-17.46	33.63	43.50	-9.87	Peak
2	179.938	52.20	-15.71	36.49	43.50	-7.01	QP
3	210.140	51.30	-13.92	37.38	43.50	-6.12	QP
4	240.514	46.91	-12.68	34.23	46.00	-11.77	Peak
5	308.913	47.87	-11.11	36.76	46.00	-9.24	Peak
6	809.910	36.31	-1.82	34.49	46.00	-11.51	Peak

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

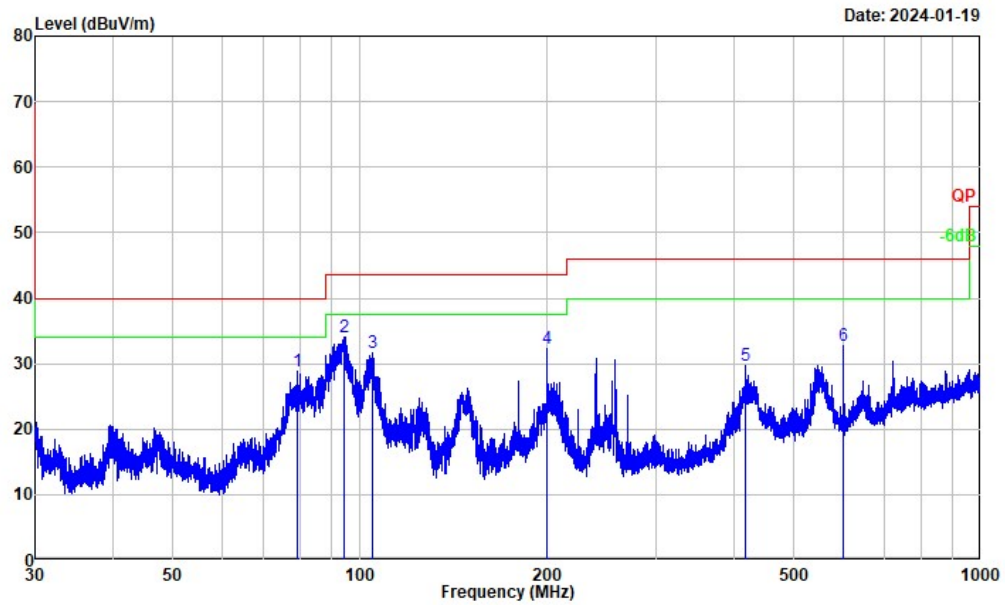


Project No. : RWAZ202300087
 Test Mode : Transmitting
 Test Voltage : DC 12V
 Environment : 24.1°C/60%R.H./100.9kPa
 Tested by : Bard Huang
 Polarization : vertical
 Remark : 802.11a 5200MHz

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	30.079	48.24	-15.02	33.22	40.00	-6.78	Peak
2	44.217	44.99	-12.28	32.71	40.00	-7.29	Peak
3	149.945	48.00	-17.46	30.54	43.50	-12.96	Peak
4	180.017	52.90	-15.71	37.19	43.50	-6.31	QP
5	209.956	48.33	-13.92	34.41	43.50	-9.09	Peak
6	600.110	37.69	-5.05	32.64	46.00	-13.36	Peak

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

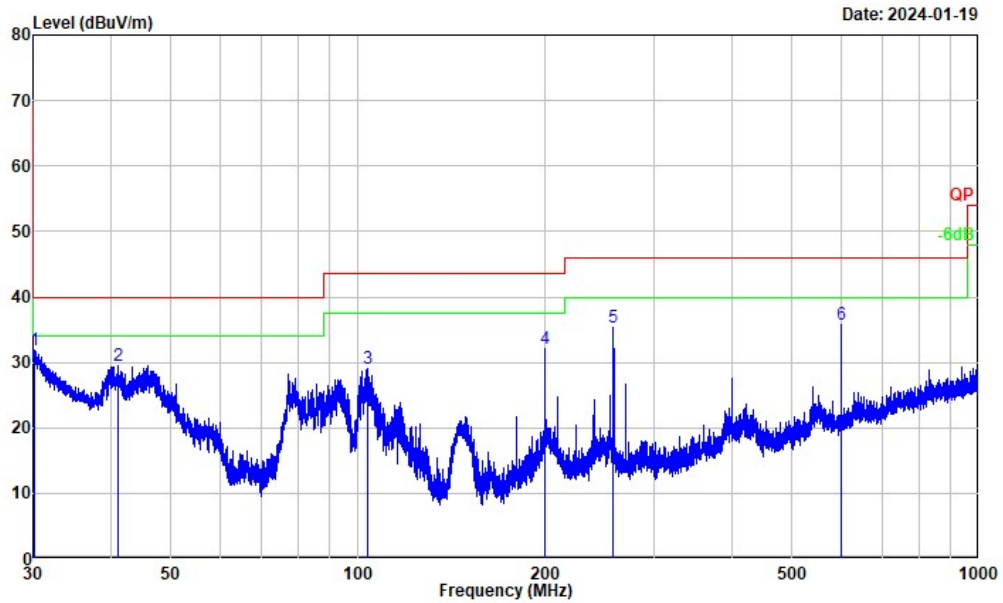
Model: XTGMC72C



Project No. : RWAZ202300087
Test Mode : Transmitting
Test Voltage : DC 12V
Environment : 24.1°C/60%R.H./100.9kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11a 5200MHz

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	79.416	46.92	-18.14	28.78	40.00	-11.22	Peak
2	94.387	49.04	-14.91	34.13	43.50	-9.37	Peak
3	104.628	45.52	-13.96	31.56	43.50	-11.94	Peak
4	199.986	46.13	-13.81	32.32	43.50	-11.18	Peak
5	417.824	38.03	-8.36	29.67	46.00	-16.33	Peak
6	600.110	37.79	-5.05	32.74	46.00	-13.26	Peak

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



Project No. : RWAZ202300087
Test Mode : Transmitting
Test Voltage : DC 12V
Environment : 24.1°C/60%R.H./100.9kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11a 5200MHz

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	30.119	47.01	-15.04	31.97	40.00	-8.03	Peak
2	41.114	42.23	-12.78	29.45	40.00	-10.55	Peak
3	103.806	43.02	-13.99	29.03	43.50	-14.47	Peak
4	199.986	45.83	-13.81	32.02	43.50	-11.48	Peak
5	258.100	47.61	-12.27	35.34	46.00	-10.66	Peak
6	600.110	40.77	-5.05	35.72	46.00	-10.28	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:	2023-12-30	Test By:	Bard Huang
Environment condition:	Temperature: 24.5°C; Relative Humidity:53%; ATM Pressure: 101.5kPa		

5150-5250MHz Band:

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							
5139.420	37.64	horizontal	11.53	49.17	54.00	-4.83	Average
5139.420	50.60	horizontal	11.53	62.13	74.00	-11.87	Peak
5150.000	39.83	vertical	11.57	51.40	54.00	-2.60	Average
5150.000	52.54	vertical	11.57	64.11	74.00	-9.89	Peak
15540.000	36.53	horizontal	8.11	44.64	54.00	-9.36	Average
15540.000	48.31	horizontal	8.11	56.42	74.00	-17.58	Peak
15540.000	38.13	vertical	8.11	46.24	54.00	-7.76	Average
15540.000	51.52	vertical	8.11	59.63	74.00	-14.37	Peak
Middle Channel							
15600.000	37.18	horizontal	8.10	45.28	54.00	-8.72	Average
15600.000	48.69	horizontal	8.10	56.79	74.00	-17.21	Peak
15600.000	37.79	vertical	8.10	45.89	54.00	-8.11	Average
15600.000	49.01	vertical	8.10	57.11	74.00	-16.89	Peak
High Channel							
5350.000	35.96	horizontal	11.44	47.40	54.00	-6.60	Average
5350.000	48.39	horizontal	11.44	59.83	74.00	-14.17	Peak
5350.000	36.03	vertical	11.44	47.47	54.00	-6.53	Average
5350.000	47.68	vertical	11.44	59.12	74.00	-14.88	Peak
15720.000	37.65	horizontal	7.69	45.34	54.00	-8.66	Average
15720.000	48.51	horizontal	7.69	56.20	74.00	-17.80	Peak
15720.000	39.64	vertical	7.69	47.33	54.00	-6.67	Average
15720.000	48.60	vertical	7.69	56.29	74.00	-17.71	Peak
802.11n20							
Low Channel							
5150.000	38.62	horizontal	11.57	50.19	54.00	-3.81	Average
5150.000	49.18	horizontal	11.57	60.75	74.00	-13.25	Peak
5150.000	40.12	vertical	11.57	51.69	54.00	-2.31	Average

5150.000	52.50	vertical	11.57	64.07	74.00	-9.93	Peak
15540.000	37.09	horizontal	8.11	45.20	54.00	-8.80	Average
15540.000	48.67	horizontal	8.11	56.78	74.00	-17.22	Peak
15540.000	38.49	vertical	8.11	46.60	54.00	-7.40	Average
15540.000	48.40	vertical	8.11	56.51	74.00	-17.49	Peak
Middle Channel							
15600.000	37.13	horizontal	8.10	45.23	54.00	-8.77	Average
15600.000	49.27	horizontal	8.10	57.37	74.00	-16.63	Peak
15600.000	37.62	vertical	8.10	45.72	54.00	-8.28	Average
15600.000	48.92	vertical	8.10	57.02	74.00	-16.98	Peak
High Channel							
5350.000	36.39	horizontal	11.44	47.83	54.00	-6.17	Average
5350.000	48.46	horizontal	11.44	59.90	74.00	-14.10	Peak
5350.000	36.50	vertical	11.44	47.94	54.00	-6.06	Average
5350.000	48.40	vertical	11.44	59.84	74.00	-14.16	Peak
15720.000	37.78	horizontal	7.69	45.47	54.00	-8.53	Average
15720.000	47.29	horizontal	7.69	54.98	74.00	-19.02	Peak
15720.000	39.18	vertical	7.69	46.87	54.00	-7.13	Average
15720.000	48.59	vertical	7.69	56.28	74.00	-17.72	Peak
802.11n40							
Low Channel							
5150.000	37.12	horizontal	11.57	48.69	54.00	-5.31	Average
5150.000	48.71	horizontal	11.57	60.28	74.00	-13.72	Peak
5150.000	38.91	vertical	11.57	50.48	54.00	-3.52	Average
5150.000	52.26	vertical	11.57	63.83	74.00	-10.17	Peak
15570.000	36.81	horizontal	8.11	44.92	54.00	-9.08	Average
15570.000	47.99	horizontal	8.11	56.10	74.00	-17.90	Peak
15570.000	36.79	vertical	8.11	44.90	54.00	-9.10	Average
15570.000	47.84	vertical	8.11	55.95	74.00	-18.05	Peak
High Channel							
5350.000	37.32	horizontal	11.44	48.76	54.00	-5.24	Average
5350.000	48.91	horizontal	11.44	60.35	74.00	-13.65	Peak
5350.000	37.12	vertical	11.44	48.56	54.00	-5.44	Average
5350.000	48.56	vertical	11.44	60.00	74.00	-14.00	Peak
15690.000	36.59	horizontal	7.74	44.33	54.00	-9.67	Average
15690.000	47.56	horizontal	7.74	55.30	74.00	-18.70	Peak
15690.000	36.76	vertical	7.74	44.50	54.00	-9.50	Average
15690.000	47.72	vertical	7.74	55.46	74.00	-18.54	Peak

5725-5850MHz Band:

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							
5602.321	50.70	horizontal	11.91	62.61	68.20	-5.59	Peak
5690.045	50.92	horizontal	11.98	62.90	97.86	-34.96	Peak
5716.138	54.90	horizontal	12.03	66.93	109.72	-42.79	Peak
5722.941	59.12	horizontal	12.03	71.15	117.51	-46.36	Peak
5602.961	50.89	vertical	11.91	62.80	68.20	-5.40	Peak
5690.925	50.49	vertical	11.98	62.47	98.51	-36.04	Peak
5716.538	55.38	vertical	12.03	67.41	109.83	-42.42	Peak
5723.582	59.73	vertical	12.03	71.76	118.97	-47.21	Peak
11490.000	34.63	horizontal	6.46	41.09	54.00	-12.91	Average
11490.000	45.84	horizontal	6.46	52.30	74.00	-21.70	Peak
11490.000	34.79	vertical	6.46	41.25	54.00	-12.75	Average
11490.000	46.04	vertical	6.46	52.50	74.00	-21.50	Peak
Middle Channel							
11570.000	37.09	horizontal	6.52	43.61	54.00	-10.39	Average
11570.000	46.55	horizontal	6.52	53.07	74.00	-20.93	Peak
11570.000	38.08	vertical	6.52	44.60	54.00	-9.40	Average
11570.000	48.01	vertical	6.52	54.53	74.00	-19.47	Peak
High Channel							
5851.353	53.52	horizontal	12.31	65.83	119.11	-53.28	Peak
5857.131	50.48	horizontal	12.34	62.82	110.20	-47.38	Peak
5894.192	50.37	horizontal	12.45	62.82	90.96	-28.14	Peak
5967.324	50.35	horizontal	12.36	62.71	68.20	-5.49	Peak
5851.023	52.49	vertical	12.31	64.80	119.87	-55.07	Peak
5857.626	51.23	vertical	12.33	63.56	110.06	-46.50	Peak
5896.338	50.09	vertical	12.46	62.55	89.37	-26.82	Peak
5935.132	50.56	vertical	12.43	62.99	68.20	-5.21	Peak
11650.000	37.81	horizontal	6.55	44.36	54.00	-9.64	Average
11650.000	47.36	horizontal	6.55	53.91	74.00	-20.09	Peak
11650.000	40.04	vertical	6.55	46.59	54.00	-7.41	Average
11650.000	49.38	vertical	6.55	55.93	74.00	-18.07	Peak
802.11n20							
Low Channel							
5615.848	50.18	horizontal	11.91	62.09	68.20	-6.11	Peak

5689.645	50.84	horizontal	11.98	62.82	97.56	-34.74	Peak
5719.980	56.24	horizontal	12.03	68.27	110.79	-42.52	Peak
5723.982	63.55	horizontal	12.03	75.58	119.88	-44.30	Peak
5621.691	50.23	vertical	11.91	62.14	68.20	-6.06	Peak
5681.881	50.64	vertical	11.96	62.60	91.83	-29.23	Peak
5717.419	54.87	vertical	12.03	66.90	110.08	-43.18	Peak
5723.422	62.64	vertical	12.03	74.67	118.60	-43.93	Peak
11490.000	34.70	horizontal	6.46	41.16	54.00	-12.84	Average
11490.000	44.79	horizontal	6.46	51.25	74.00	-22.75	Peak
11490.000	35.18	vertical	6.46	41.64	54.00	-12.36	Average
11490.000	46.04	vertical	6.46	52.50	74.00	-21.50	Peak
Middle Channel							
11570.000	36.25	horizontal	6.52	42.77	54.00	-11.23	Average
11570.000	47.42	horizontal	6.52	53.94	74.00	-20.06	Peak
11570.000	38.56	vertical	6.52	45.08	54.00	-8.92	Average
11570.000	47.44	vertical	6.52	53.96	74.00	-20.04	Peak
High Channel							
5849.950	55.33	horizontal	12.30	67.63	125.20	-57.57	Peak
5861.671	51.66	horizontal	12.35	64.01	108.93	-44.92	Peak
5908.224	50.45	horizontal	12.46	62.91	80.58	-17.67	Peak
5949.412	50.18	horizontal	12.41	62.59	68.20	-5.61	Peak
5850.528	53.74	vertical	12.31	66.05	121.00	-54.95	Peak
5858.699	50.27	vertical	12.33	62.60	109.76	-47.16	Peak
5920.605	50.22	vertical	12.44	62.66	71.44	-8.78	Peak
5944.625	50.71	vertical	12.41	63.12	68.20	-5.08	Peak
11650.000	38.55	horizontal	6.55	45.10	54.00	-8.90	Average
11650.000	48.11	horizontal	6.55	54.66	74.00	-19.34	Peak
11650.000	39.14	vertical	6.55	45.69	54.00	-8.31	Average
11650.000	47.60	vertical	6.55	54.15	74.00	-19.85	Peak
802.11n40							
Low Channel							
5648.534	50.57	horizontal	11.91	62.48	68.20	-5.72	Peak
5697.969	52.04	horizontal	12.00	64.04	103.70	-39.66	Peak
5718.319	62.35	horizontal	12.03	74.38	110.33	-35.95	Peak
5724.982	65.91	horizontal	12.03	77.94	122.16	-44.22	Peak
5642.321	50.40	vertical	11.90	62.30	68.20	-5.90	Peak
5697.339	51.92	vertical	11.99	63.91	103.24	-39.33	Peak
5718.589	61.19	vertical	12.03	73.22	110.41	-37.19	Peak

5724.712	64.12	vertical	12.03	76.15	121.54	-45.39	Peak
11510.000	35.26	horizontal	6.48	41.74	54.00	-12.26	Average
11510.000	46.63	horizontal	6.48	53.11	74.00	-20.89	Peak
11510.000	35.75	vertical	6.48	42.23	54.00	-11.77	Average
11510.000	48.20	vertical	6.48	54.68	74.00	-19.32	Peak
High Channel							
5851.323	51.31	horizontal	12.31	63.62	119.18	-55.56	Peak
5858.091	50.53	horizontal	12.33	62.86	109.93	-47.07	Peak
5915.828	50.68	horizontal	12.45	63.13	74.96	-11.83	Peak
5948.336	50.75	horizontal	12.41	63.16	68.20	-5.04	Peak
5850.708	51.53	vertical	12.31	63.84	120.59	-56.75	Peak
5860.758	49.87	vertical	12.34	62.21	109.19	-46.98	Peak
5880.653	50.16	vertical	12.41	62.57	101.00	-38.43	Peak
5934.492	50.50	vertical	12.42	62.92	68.20	-5.28	Peak
11590.000	37.10	horizontal	6.53	43.63	54.00	-10.37	Average
11590.000	47.23	horizontal	6.53	53.76	74.00	-20.24	Peak
11590.000	38.34	vertical	6.53	44.87	54.00	-9.13	Average
11590.000	47.97	vertical	6.53	54.50	74.00	-19.50	Peak

Remark:

Corrected Amplitude= Reading level + corrected Factor

Corrected Factor = Antenna factor + Cable loss – Amplifier gain

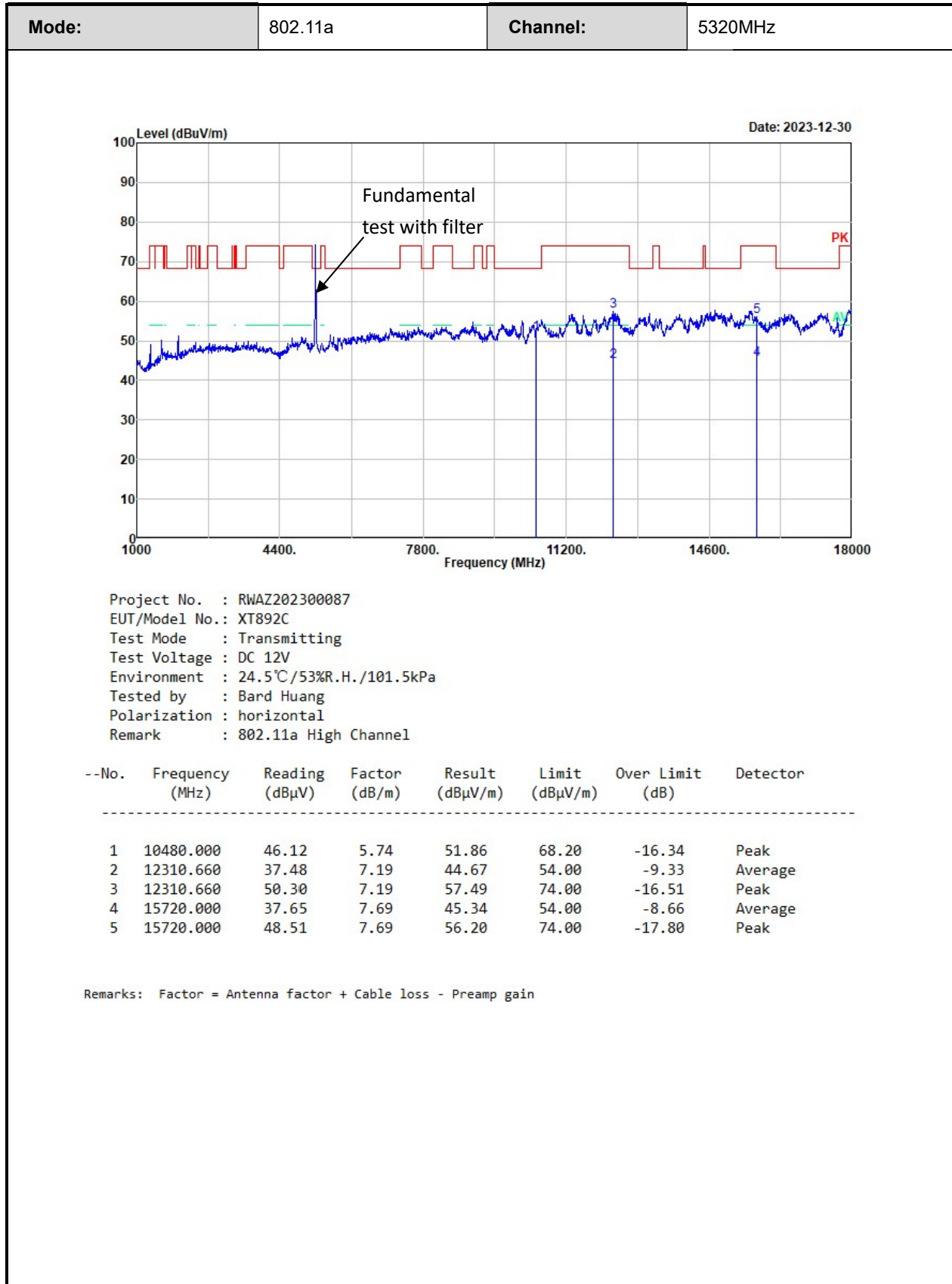
Margin = Corrected Amplitude – Limit

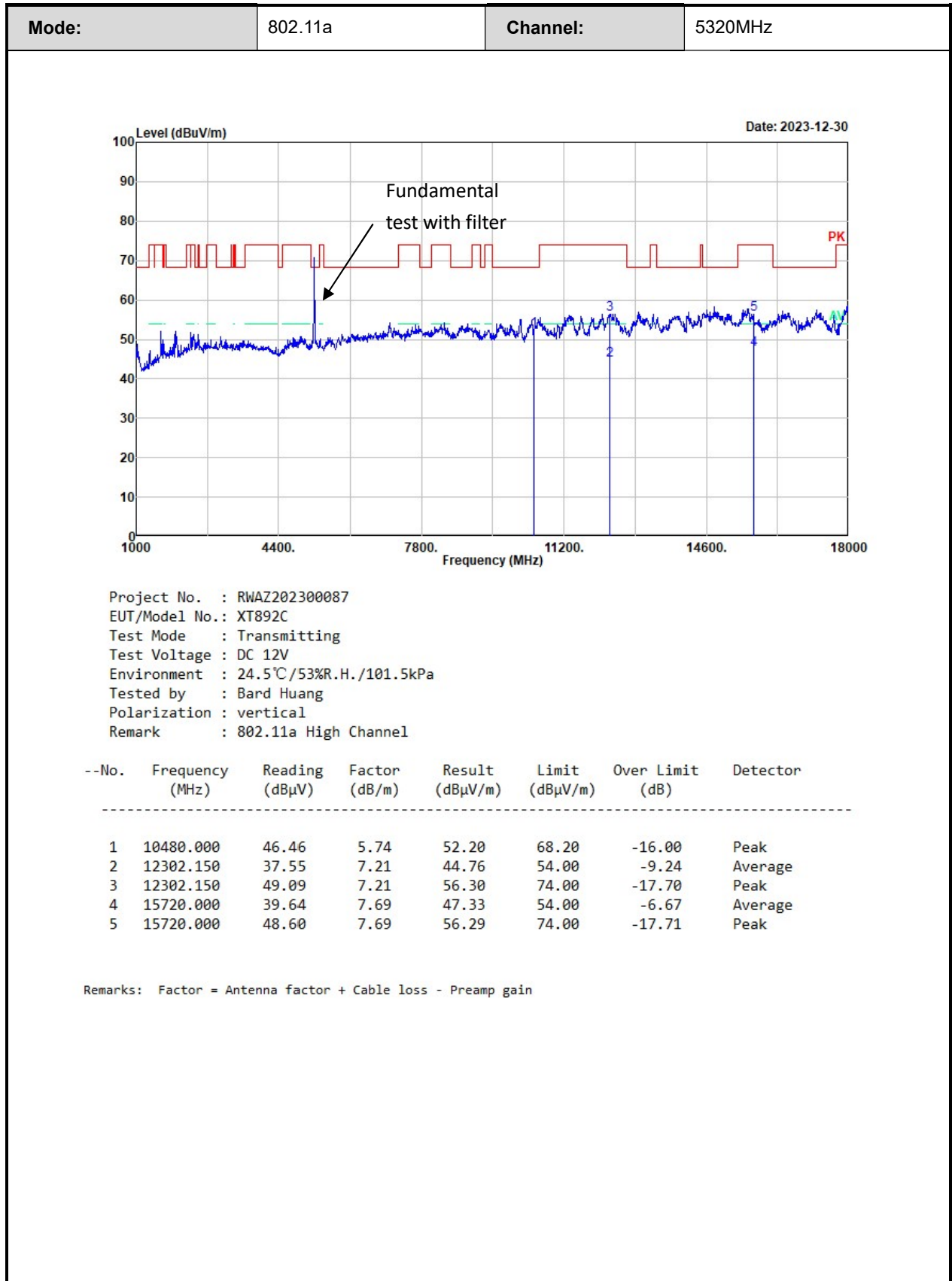
The emission levels of other frequencies that were lower than the limit 20dB, not show in test report.

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

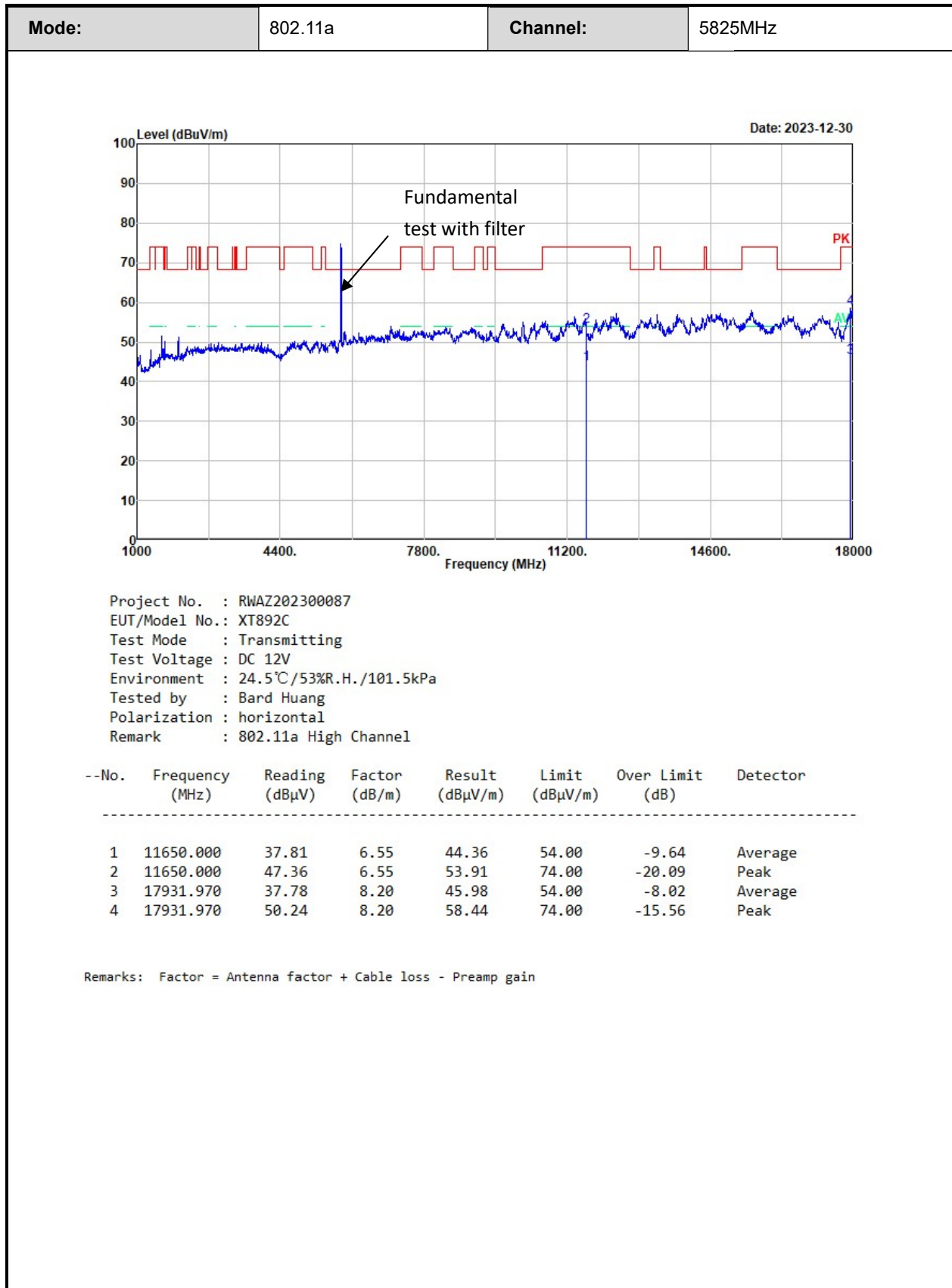
Test plot for example as below:

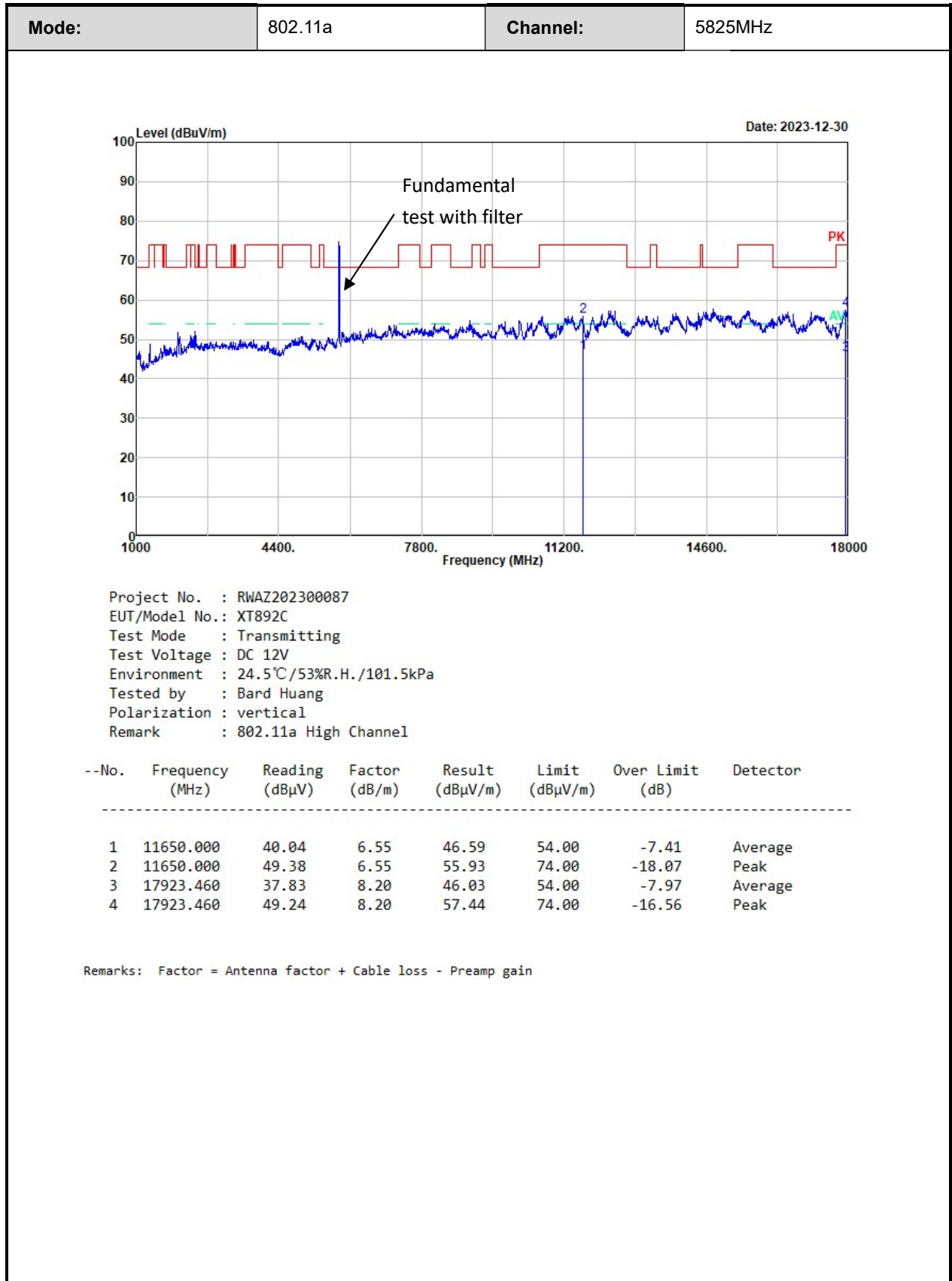
5.2G Band:





5.8G Band:





3.5 RF Conducted Test Data

Test Date:	2024-01-02~2024-01-03	Test By:	Ryan Zhang
Environment condition:	Temperature: 20.5~22.3°C; Relative Humidity: 42~44.6%; ATM Pressure: 101.3~101.5kPa		

3.5.1 26dB/6dB Emission Bandwidth and 99% Occupied Bandwidth

Test Mode	Antenna	Channel[MHz]	26dB BW [MHz]	99% OBW [MHz]
802.11a	Ant1	5180	21.360	16.960
		5200	20.080	17.040
		5240	20.240	16.880
802.11n HT20	Ant1	5180	20.400	17.840
		5200	22.000	17.840
		5240	20.560	17.840
802.11n HT40	Ant1	5190	40.160	36.480
		5230	40.160	36.480

Note: the device not operate with any part of OBW with U-NII 2A Band.

Test Mode	Antenna	Channel [MHz]	6dB BW [MHz]	99% OBW [MHz]	6dB BW Limit [MHz]	Verdict
802.11a	Ant1	5745	16.480	16.880	0.5	pass
		5785	16.480	17.040	0.5	pass
		5825	16.480	17.040	0.5	pass
802.11n HT20	Ant1	5745	17.520	17.840	0.5	pass
		5785	17.440	17.840	0.5	pass
		5825	15.040	17.840	0.5	pass
802.11n HT40	Ant1	5755	36.480	36.320	0.5	pass
		5795	36.480	36.320	0.5	pass

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

3.5.2 Maximum conducted output power

Test Mode	Antenna	Channel [MHz]	Result [dBm]	Limit [dBm]	Verdict
802.11a	Ant1	5180	12.89	24	Pass
		5200	13.12	24	Pass
		5240	11.77	24	Pass
802.11n HT20	Ant1	5180	12.27	24	Pass
		5200	12.23	24	Pass
		5240	11.80	24	Pass
802.11n HT40	Ant1	5190	7.14	24	Pass
		5230	6.93	24	Pass

Test Mode	Antenna	Channel [MHz]	Result [dBm]	Limit [dBm]	Verdict
802.11a	Ant1	5745	4.98	30	Pass
		5785	5.74	30	Pass
		5825	6.40	30	Pass
802.11n HT20	Ant1	5745	5.05	30	Pass
		5785	6.07	30	Pass
		5825	6.61	30	Pass
802.11n HT40	Ant1	5755	5.88	30	Pass
		5795	6.32	30	Pass

3.5.3 Power Spectral Density

Test Modes	Antenna	Test Frequency(MHz)	Reading(dBm/MHz)	Duty Cycle Factor(dB)	Maximum Power Spectral Density(dBm/MHz)	
					Result	Limit
802.11a	Ant1	5180	2.64	0	2.64	11
		5200	2.43	0	2.43	11
		5240	1.85	0	1.85	11
802.11n HT20	Ant1	5180	2.13	0	2.13	11
		5200	2.17	0	2.17	11
		5240	1.69	0	1.69	11
802.11n HT40	Ant1	5190	-6.75	0	-6.75	11
		5230	-7.12	0	-7.12	11

Test Modes	Antenna	Test Frequency(MHz)	Reading(dBm/500kHz)	Duty Cycle Factor(dB)	Maximum Power Spectral Density(dBm/500kHz)	
					Result	Limit
802.11a	Ant1	5745	-7.75	0	-7.75	30
		5785	-6.81	0	-6.81	30
		5825	-6.43	0	-6.43	30
802.11n HT20	Ant1	5745	-8.05	0	-8.05	30
		5785	-7.30	0	-7.30	30
		5825	-6.71	0	-6.71	30
802.11n HT40	Ant1	5755	-11.22	0	-11.22	30
		5795	-10.48	0	-10.48	30

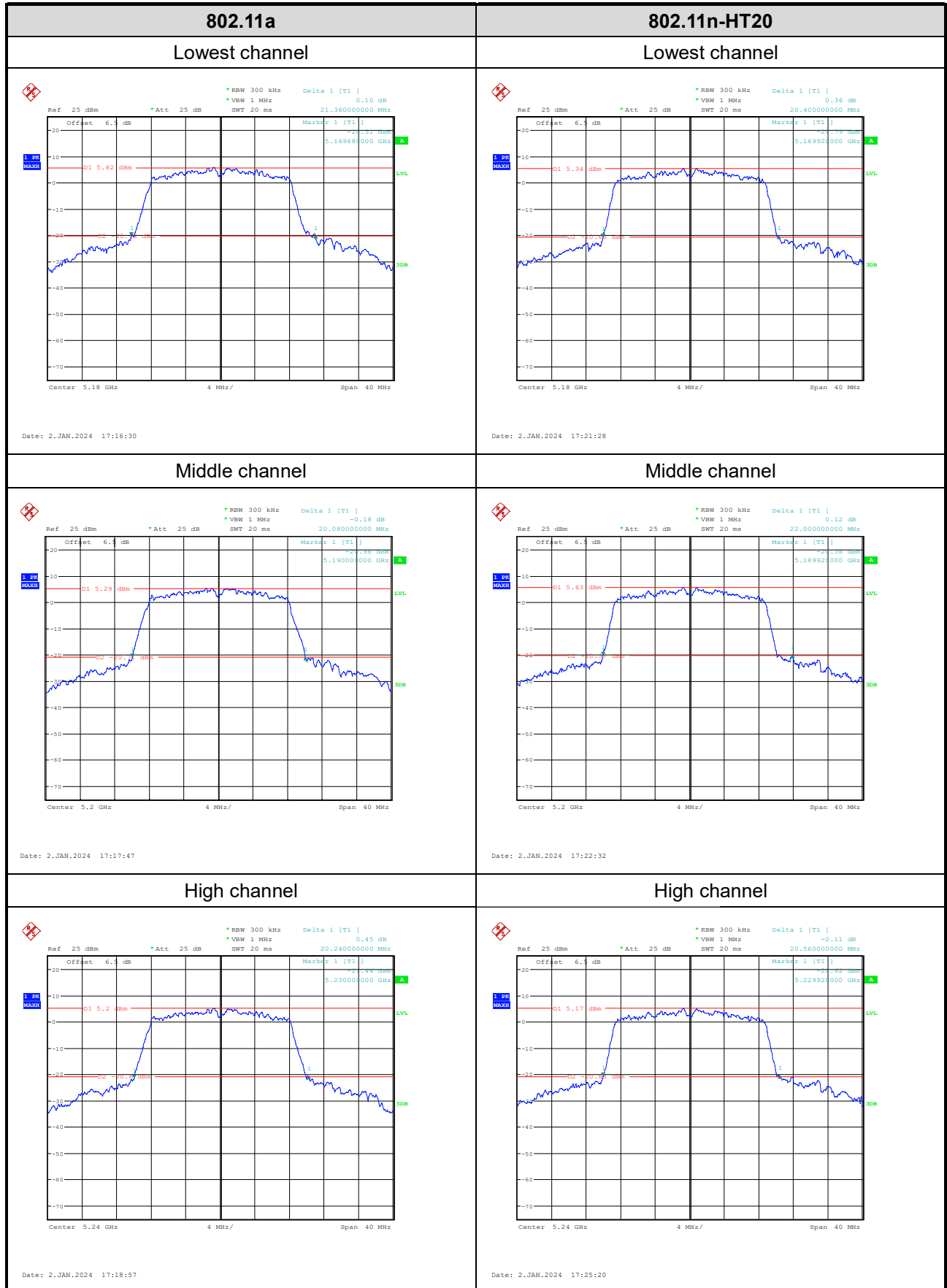
3.5.4 Duty Cycle

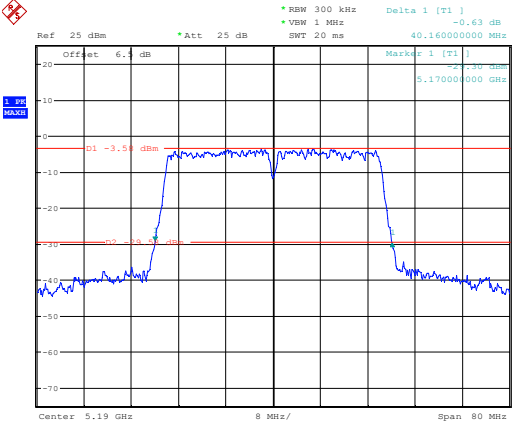
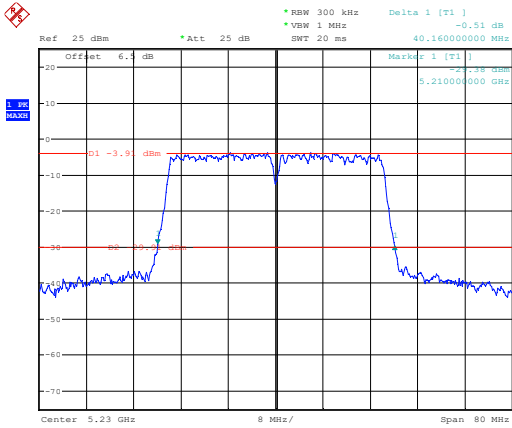
Test Modes	Antenna	Ton (ms)	Ton+off (ms)	Duty cycle (%)	Duty Cycle Factor (dB)	1/T (KHz)	VBW Setting (Hz)
802.11a	Ant1	100	100	100	/	/	10
802.11n HT20	Ant1	100	100	100	/	/	10
802.11n HT40	Ant1	100	100	100	/	/	10

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

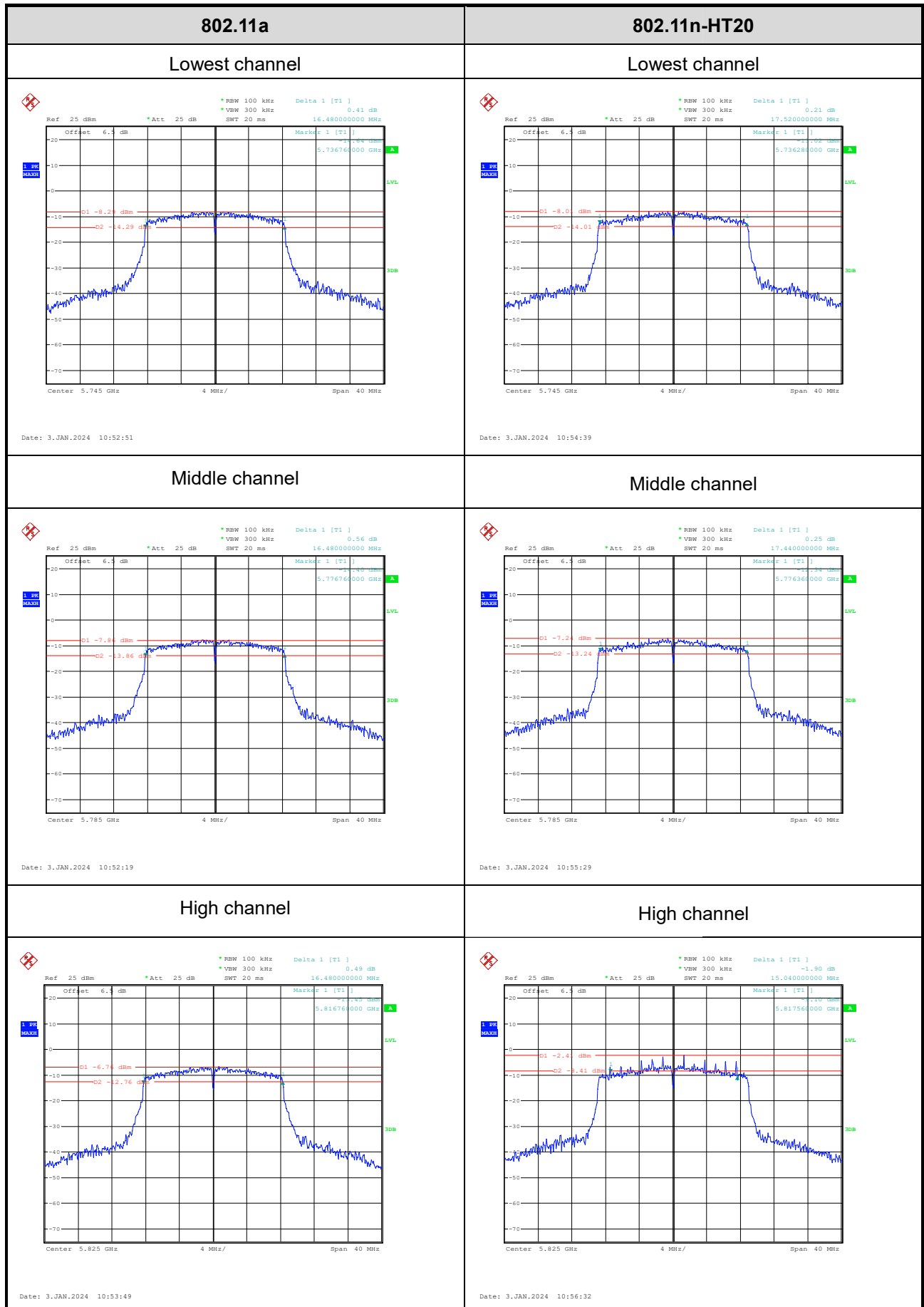
Test Plots:

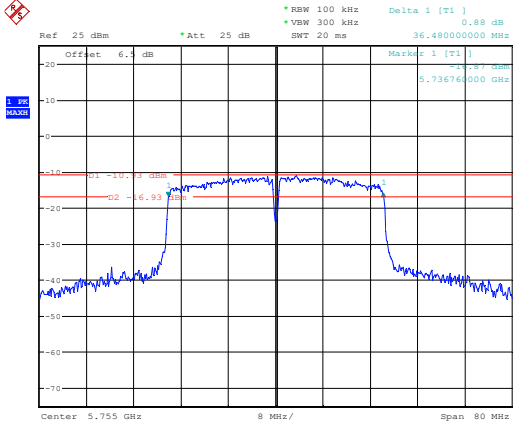
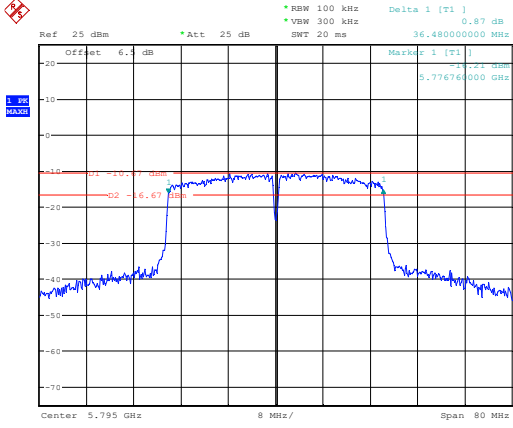
26dB Emission Bandwidth



802.11n-HT40	/
Lowest channel	/
 Date: 2.JAN.2024 17:26:27	/
High channel	/
 Date: 2.JAN.2024 17:28:09	/

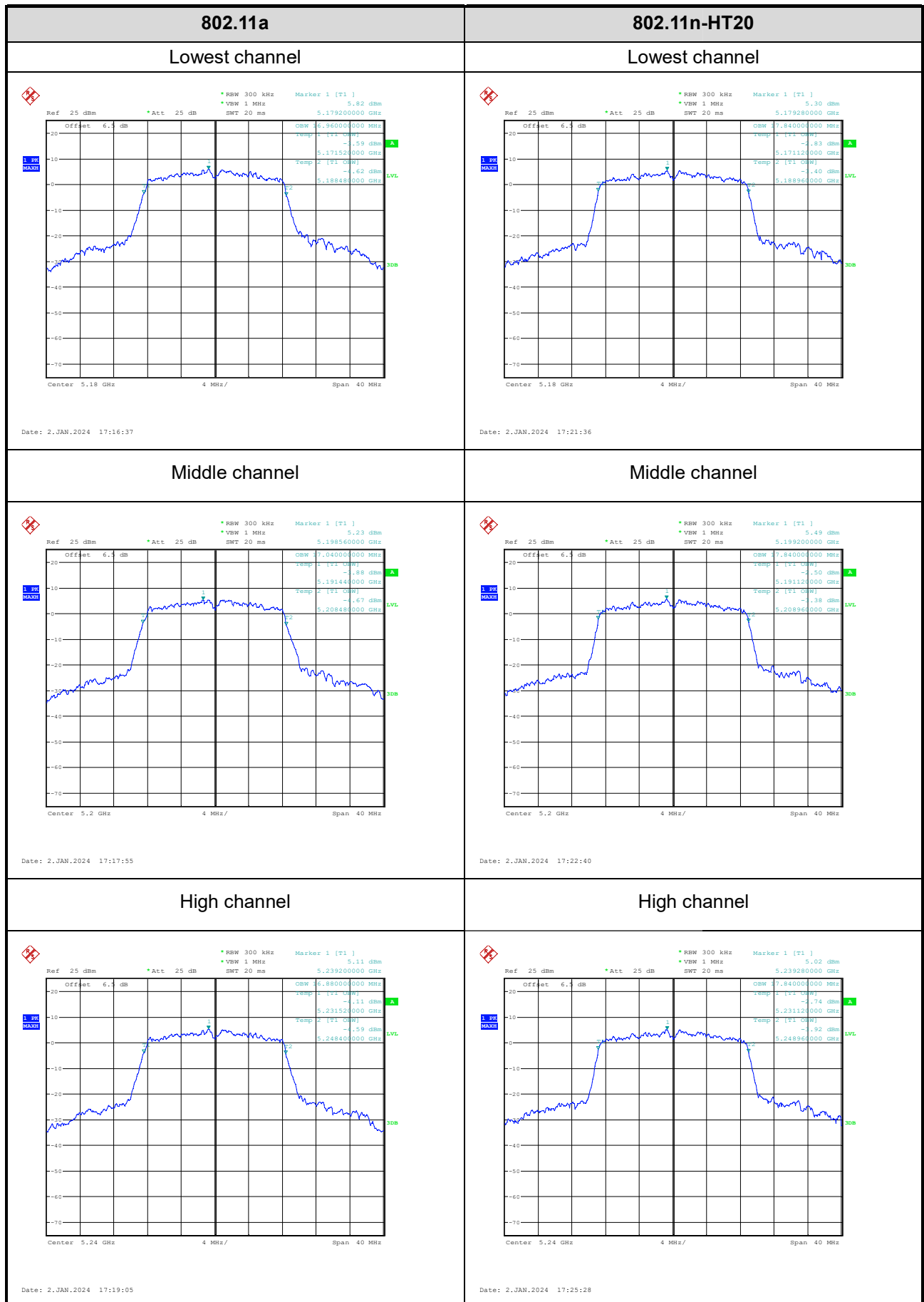
6dB Emission Bandwidth

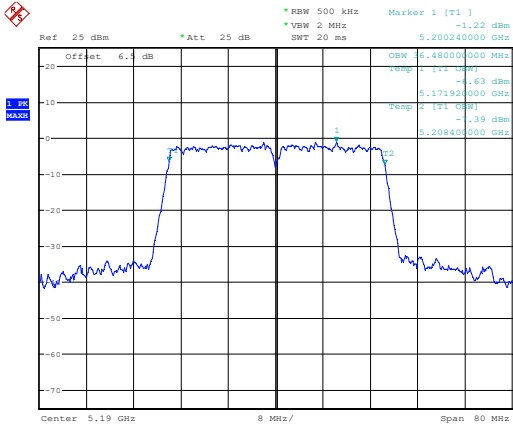
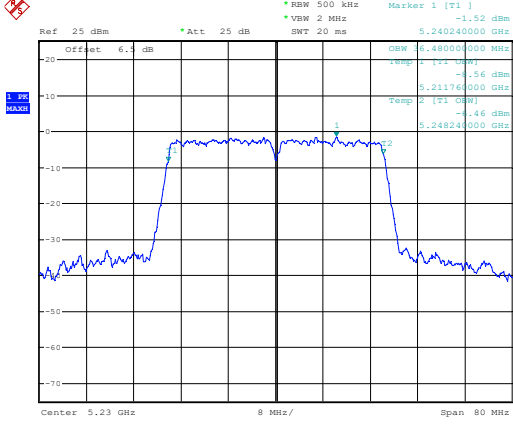


802.11n-HT40	/
Lowest channel	/
 Date: 3.JAN.2024 10:57:12	/
High channel	/
 Date: 3.JAN.2024 10:58:06	/

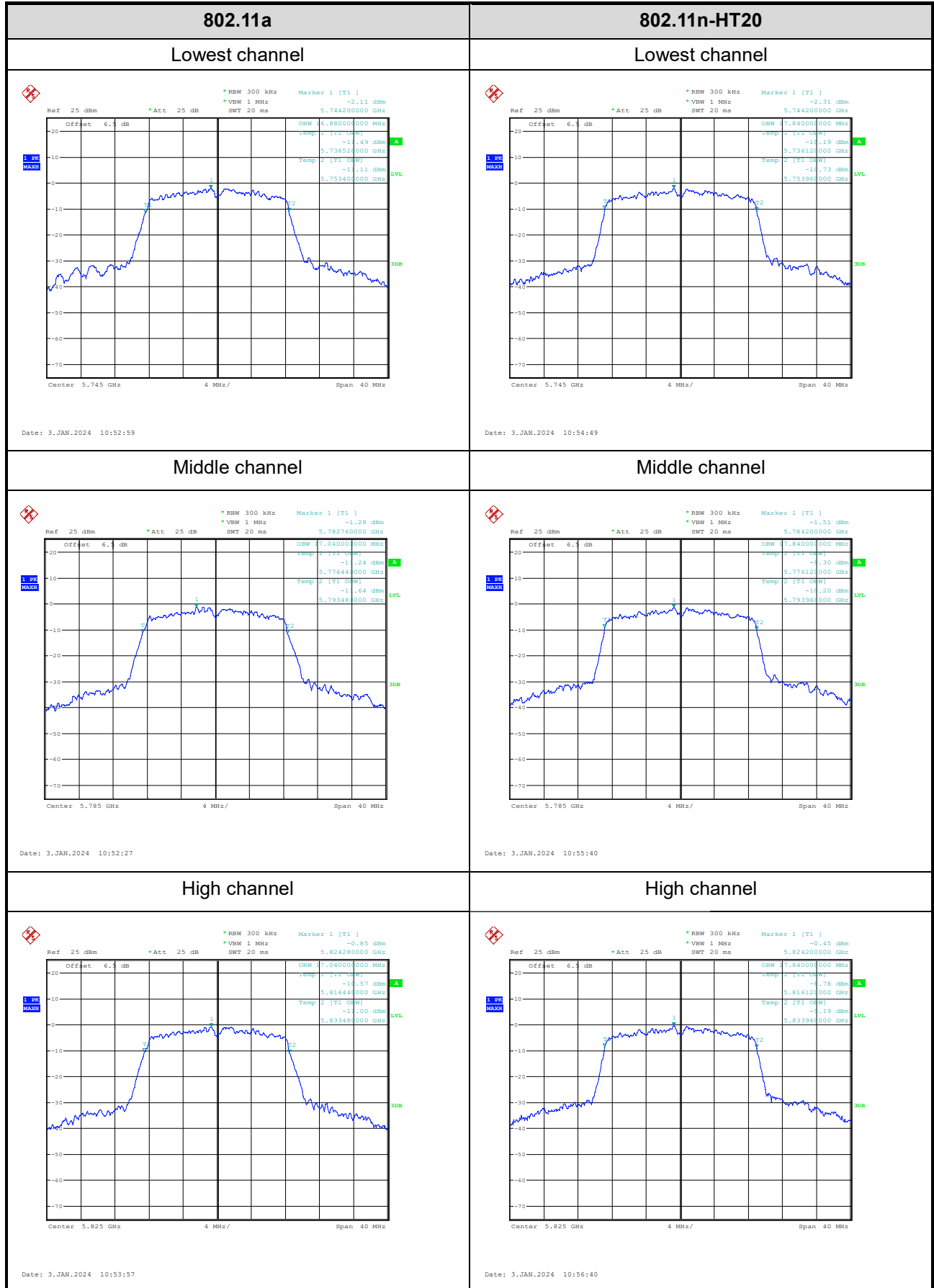
99% Occupied Bandwidth

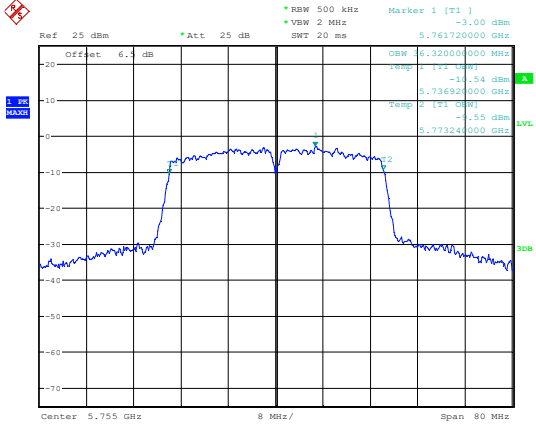
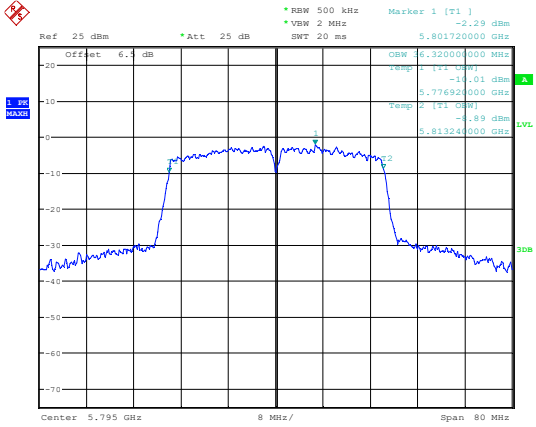
5150-5250MHz Band:



802.11n-HT40	/
Lowest channel	/
 Date: 2.JAN.2024 17:26:38	/
High channel	/
 Date: 2.JAN.2024 17:28:20	/

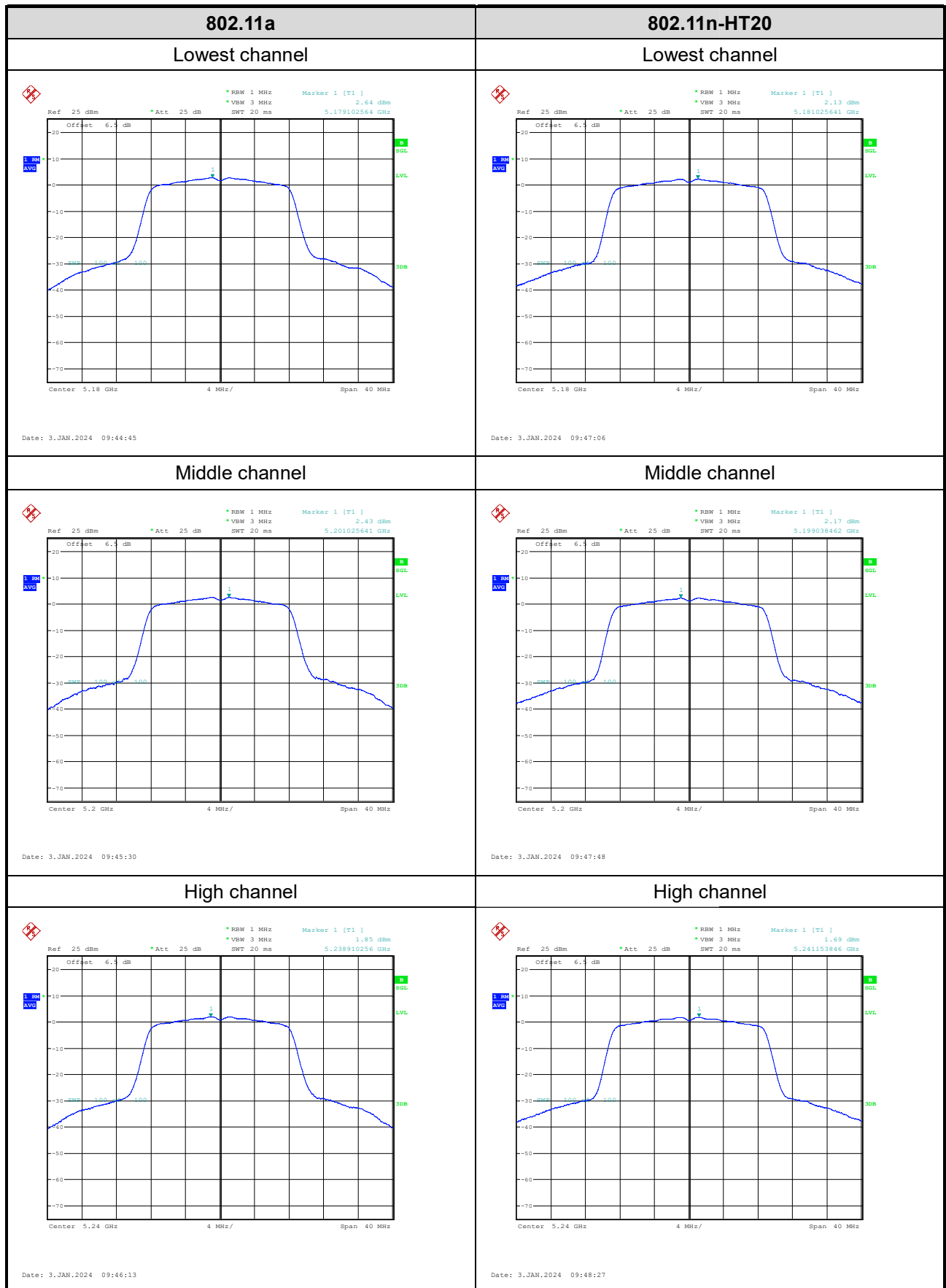
5725-5850MHz Band:

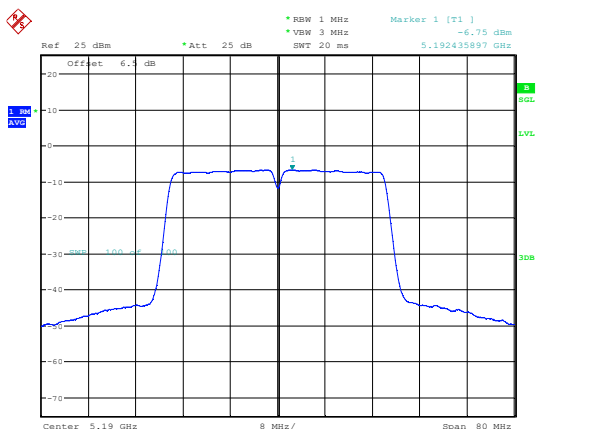
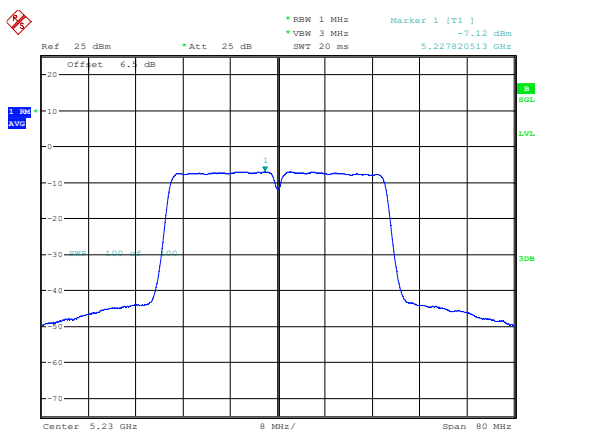


802.11n-HT40	/
Lowest channel	/
 Ref: 25 dBm *Att: 25 dB *RBW: 500 kHz Marker 1 [T1] -3.00 dBm *VBW: 2 MHz SMT: 20 ms 5.761720000 GHz Offset: 6.5 dB GRW: 16.320000000 MHz Temp: 1 [T1] -10.54 dBm 5.736920000 GHz Temp: 2 [T1] -1.55 dBm 5.773240000 GHz LVL Center: 5.755 GHz 8 MHz/ Span: 80 MHz Date: 3.JAN.2024 10:57:23	/
High channel	/
 Ref: 25 dBm *Att: 25 dB *RBW: 500 kHz Marker 1 [T1] -2.29 dBm *VBW: 2 MHz SMT: 20 ms 5.801720000 GHz Offset: 6.5 dB GRW: 16.320000000 MHz Temp: 1 [T1] -14.01 dBm 5.776920000 GHz Temp: 2 [T1] -1.89 dBm 5.813240000 GHz LVL Center: 5.795 GHz 8 MHz/ Span: 80 MHz Date: 3.JAN.2024 10:58:14	/

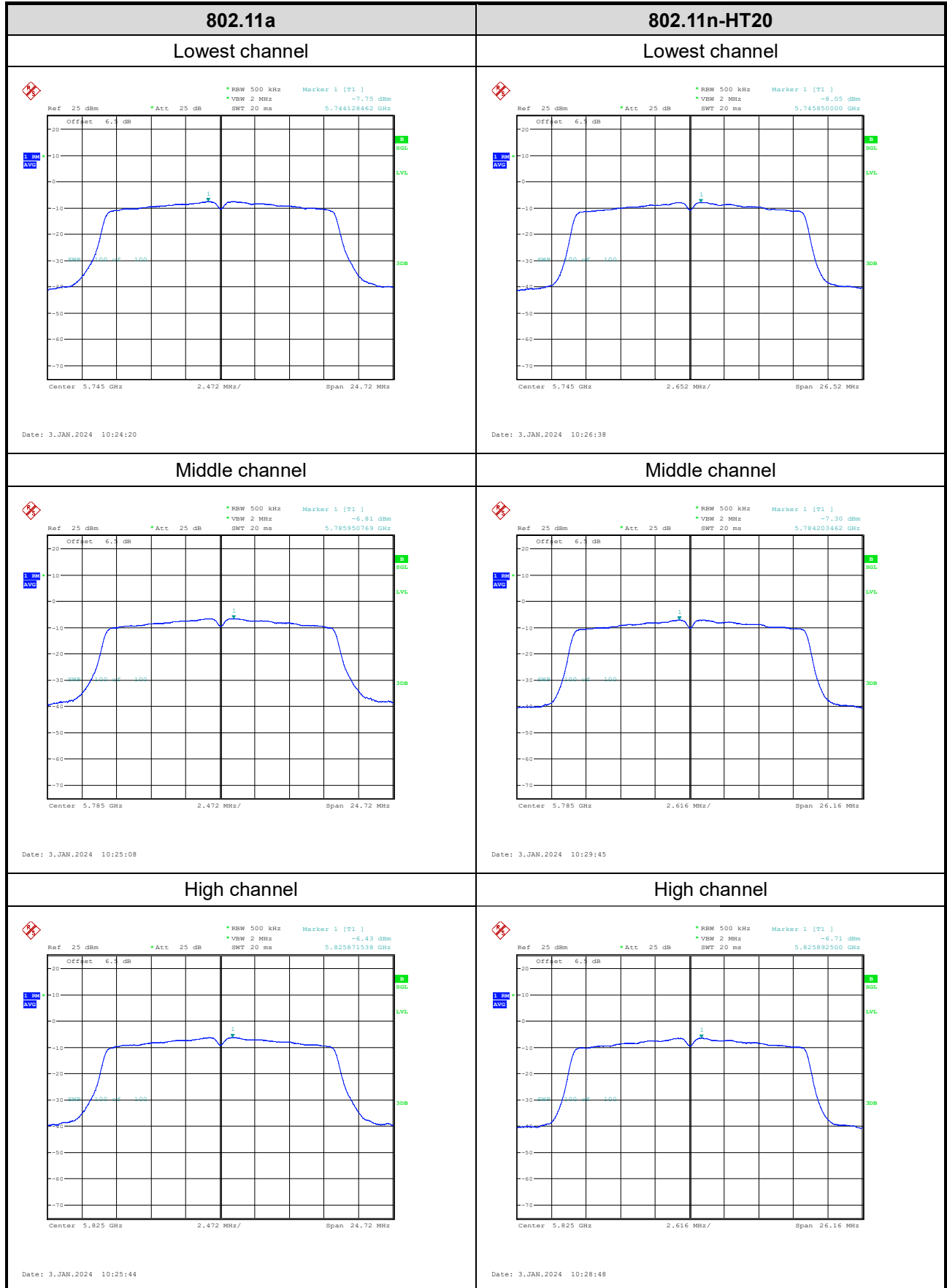
Power Spectral Density

5150-5250MHz Band:



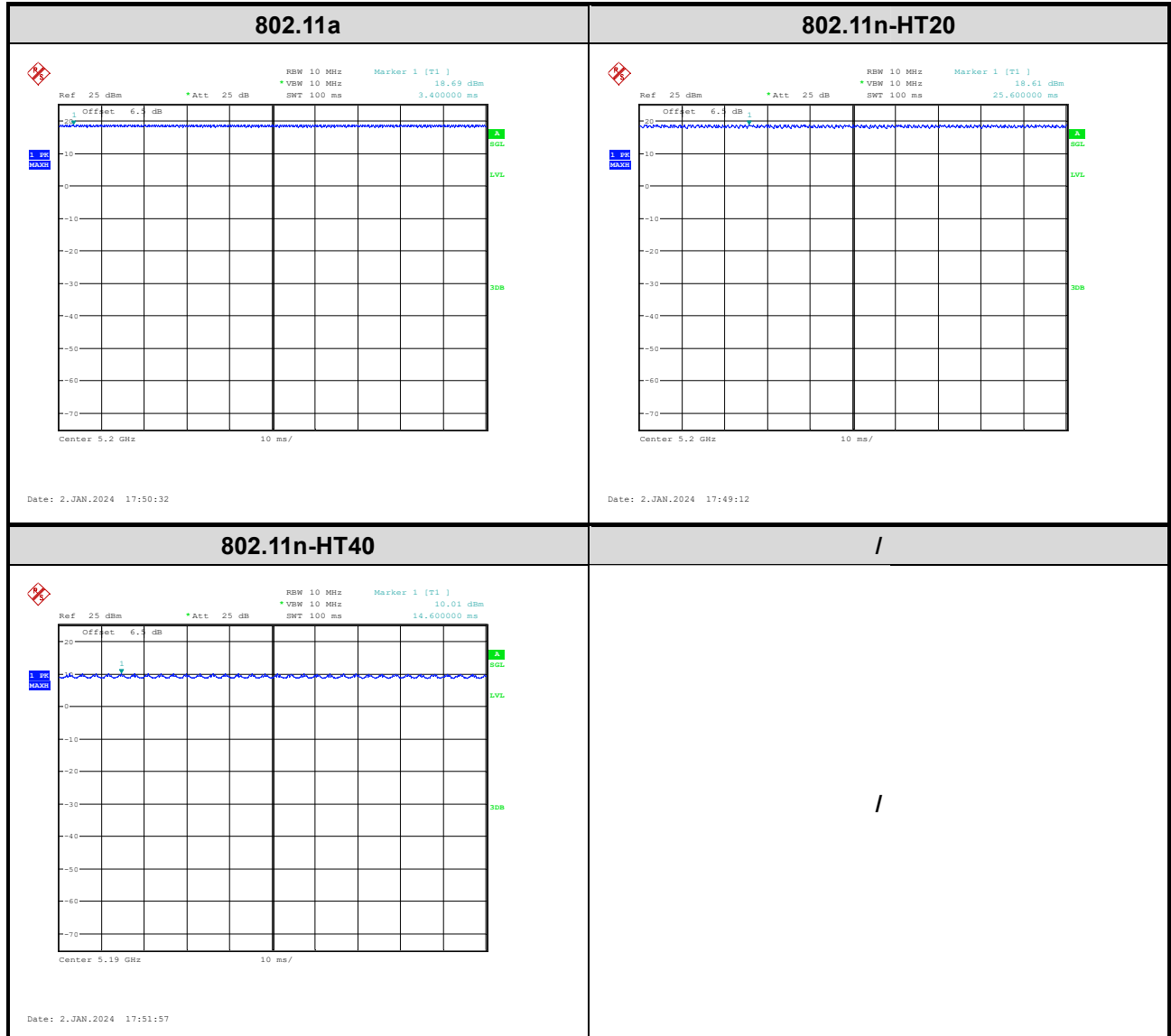
802.11n-HT40	/
Lowest channel  Date: 3.JAN.2024 09:49:23	/
High channel  Date: 3.JAN.2024 09:50:07	/

5725-5850MHz Band:



802.11n-HT40	/
Lowest channel	/
Ref 25 dBm *Att 25 dB Offset 6.3 dB Marker 1 [T1] -11.22 dBm RBW 500 kHz VBW 2 MHz SMT 20 ms Center 5.755 GHz Span 54.48 MHz	/
High channel	/
Ref 25 dBm *Att 25 dB Offset 6.3 dB Marker 1 [T1] -10.48 dBm RBW 500 kHz VBW 2 MHz SMT 20 ms Center 5.795 GHz Span 54.72 MHz	/

Duty Cycle



4 Test Setup Photo

Please refer to the attachment RWAZ202300087 Test Setup photo.

5 E.U.T Photo

Please refer to the attachment

- (1) RWAZ202300087 XT892C External photo;
- (2) RWAZ202300087 XT892C Internal photo;
- (3) RWAZ202300087 XT812C External photo;
- (4) RWAZ202300087 XT812C Internal photo;
- (5) RWAZ202300087 XTGMC72C External photo;
- (6) RWAZ202300087 XTGMC72C Internal photo

---End of Report---