

FCC Test Report

Report No.: RWAZ202300123D

Applicant: Shenzhen Youmi Intelligent Technology Co., Ltd.

Address: 406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China

Product Name: Smart phone

Product Model: PG3NBG7YA

Multiple Models: N/A

Trade Mark: UMIDIGI

FCC ID: 2ATZ4-G7

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

Test Date: 2024-01-12~2024-03-12

Test Result: Complied

Issue Date: 2024-03-12

Reviewed by: *Abel chen*

Approved by: *Jacob Kong*

Abel Chen
Project Engineer

Jacob Kong
Manager

Prepared by:

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



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Revision History

Version No.	Issued Date	Description
00	2024-03-12	Original

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1 General Information

1.1 Client Information

Applicant:	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address:	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Manufacturer:	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address:	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China

1.2 Product Description of EUT

The EUT is Smart phone that contains Classic Bluetooth(BDR/EDR), BLE, 2.4G/5G WLAN, GSM/GPRS/WCDMA/LTE and NFC radios, this report covers the full testing of the 5G WLAN radio.

Sample Serial number	36-2 for CE&RE test, 36-1 for RF test conducted test (assigned by WATC)
Sample Received Date	2023-12-15
Sample Status	Good Condition
Frequency Range	5150 MHz - 5250MHz 5725 MHz - 5850MHz
Maximum Conducted Output Power	5150 MHz - 5250MHz: 8.98dBm 5725 MHz - 5850MHz: 8.36dBm
Modulation Technology	OFDM
Spatial Streams	SISO
Antenna Gain [#]	Band1:1.2dBi; Band 4 :1.2dBi
Power Supply	DC 3.87V from battery or DC 5V from adapter
Adapter 1 Information	Model: HF-0502000U Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5.0V, 2.0A
Adapter 2 Information	Model: HJ-0502000W2-US Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5.0V, 2.0A
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: DSS, FCC ID: 2ATZ4-G7
FCC Part 15, Subpart C, Equipment Class: DXX, FCC ID: 2ATZ4-G7
FCC Part 15, Subpart C, Equipment Class: DTS, FCC ID: 2ATZ4-G7
FCC Part 22H/24E/27, Equipment Class: PCE, FCC ID: 2ATZ4-G7

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	42	5210	48	5240
38	5190	44	5220	/	/
40	5200	46	5230	/	/
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)
36	5180	40	5200	48	5240
802.11n-HT40, 802.11ac-VHT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
38	5190	/	/	46	5230
802.11ac-VHT80					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
/	/	42	5210	/	/

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 [#] :		Engineering mode		
Mode	Data rate	Powel Level Setting [#]		
		Low Channel	Middle Channel	High Channel
5150-5250MHz Band				
802.11a	6Mbps	15	15	15
802.11ac-HT20	MCS0	15	15	15
802.11ac-HT40	MCS0	16	16	16
802.11ac-VHT80	MCS0	16	16	16
5725-5850MHz Band				
802.11a	6Mbps	11	11	11
802.11ac-HT20	MCS0	11	11	11
802.11ac-HT40	MCS0	12	12	12
802.11ac-VHT80	MCS0	13	13	13
The exercise software and the maximum power setting that provided by manufacturer.				

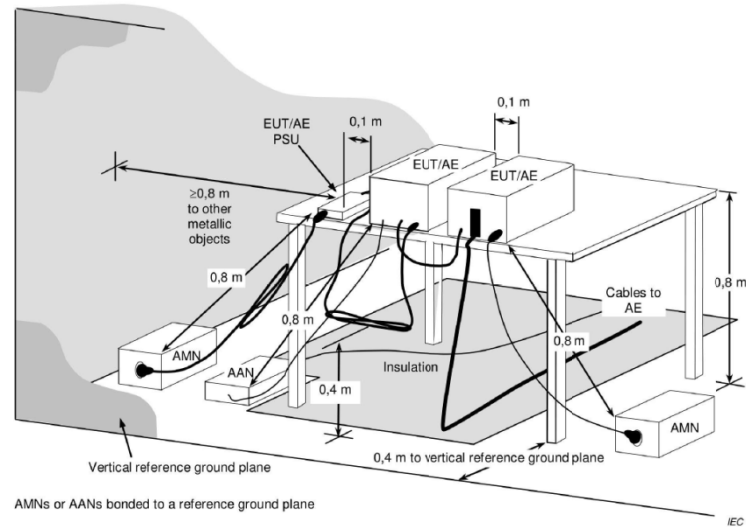
Worst-Case Configuration:
For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was recorded in report
For AC power line conducted emission and radiated emission 9kHz-1GHz and above 18GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario.
The n-ht20/n-ht40 were reduced test since the identical parameters with ac vht20/ac vht40.
For radiated emission below 1GHz, according to the test result of BT report, the worst case adapter HF-0502000U was select to test.

2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

2.3 Test Setup

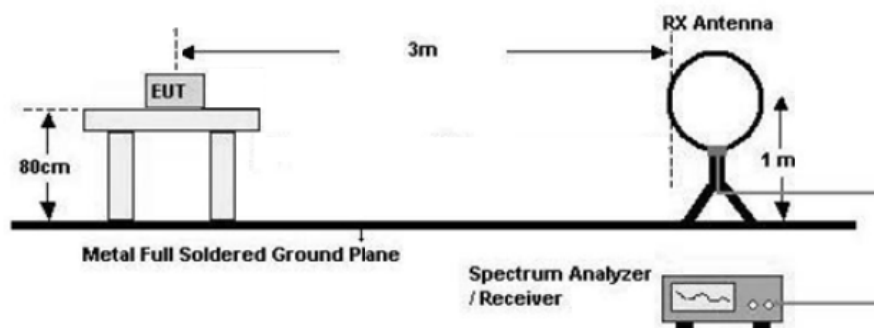
1) Conducted emission measurement:



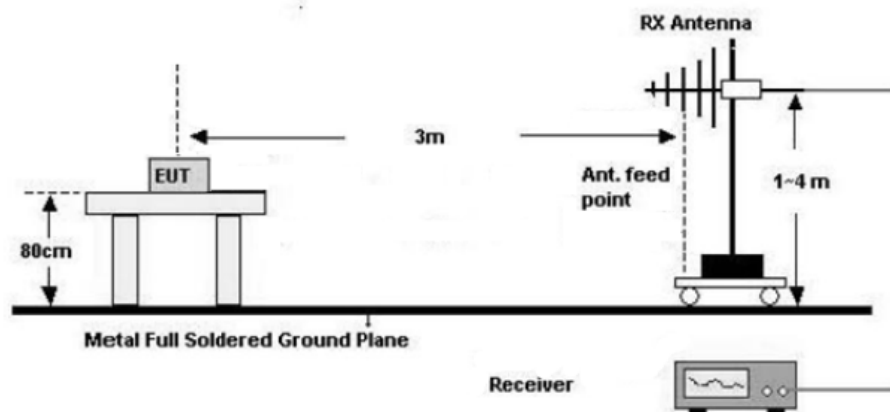
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

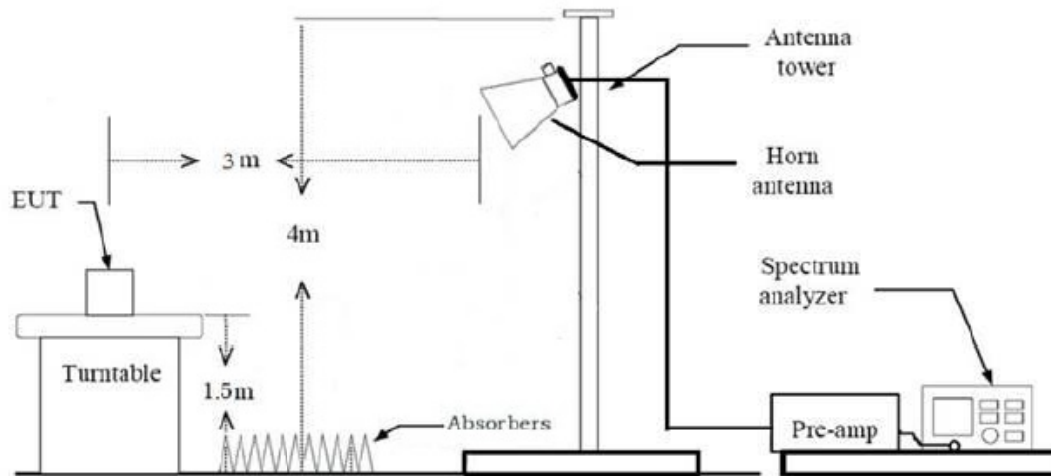
Below 30MHz (3m SAC)



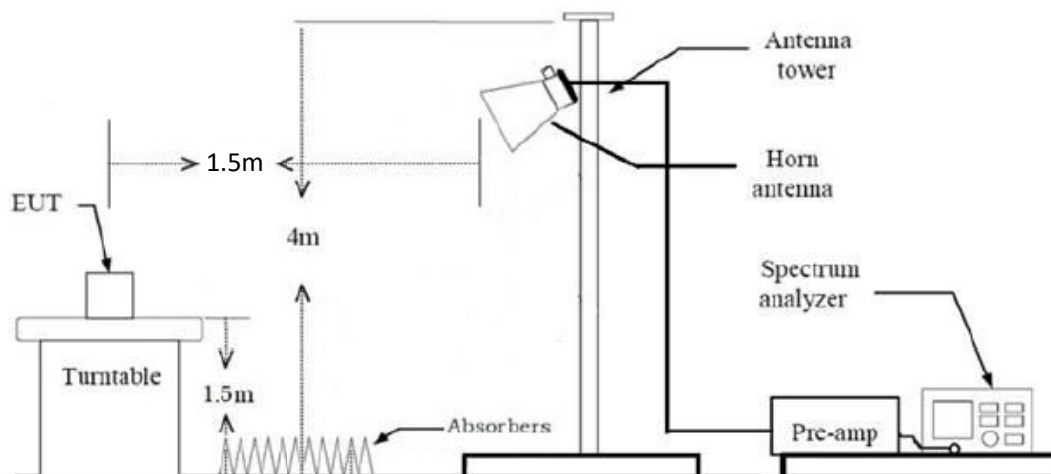
30MHz-1GHz (3m SAC)



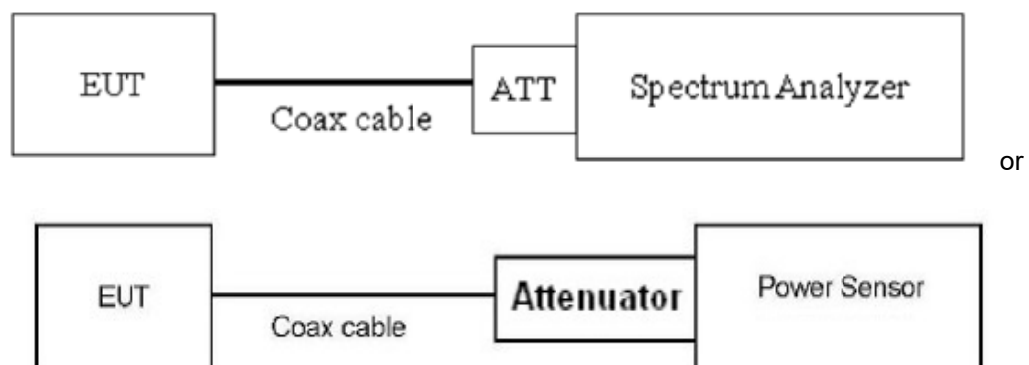
1GHz-18GHz(3m FAC)



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 10.5dB (including 10.0 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 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					
R&S	Spectrum Analyzer	FSV40	101419	2023/9/12	2024/9/11
R&S	Sepctrum Analyzer	FSU	200982	2023/10/25	2024/10/24
MARCONI	10dB Attenuator	1692595	2942	2023/10/25	2024/10/24
ANRITSU	USB Power Sensor	MA24418A	12620	2023/7/12	2024/7/11

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

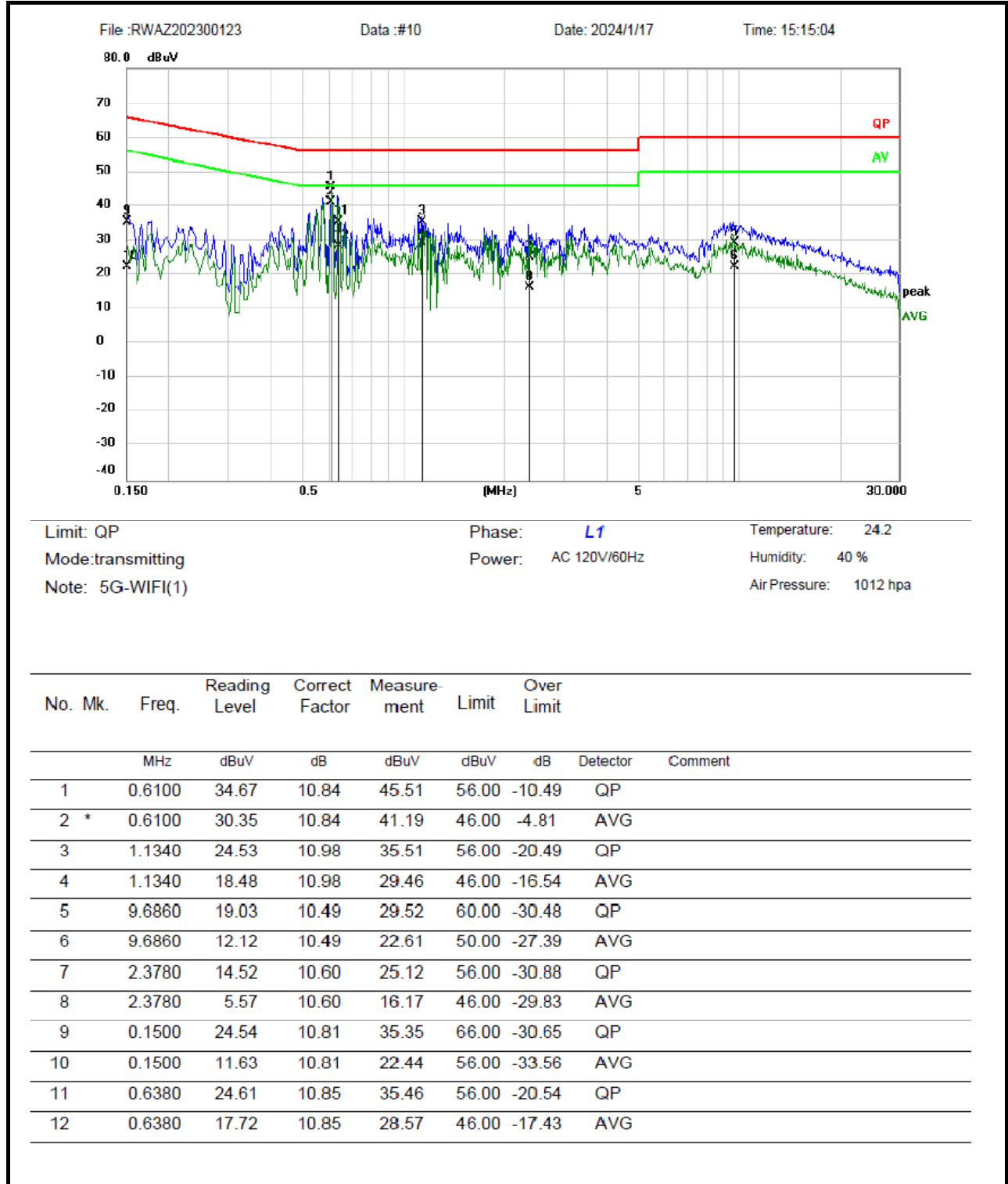
Test items	Limit
AC Power Line Conducted Emission	See details §15.207 (a)
Conducted Peak Output Power	For the band 5.150-5.250 GHz Band: For client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna 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 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	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

Test Date:	2024-1-17	Test By:	Lirou Li
Environment condition:	Temperature: 24.2°C; Relative Humidity:40%; ATM Pressure: 101.2kPa		

Adapter HF-0502000U

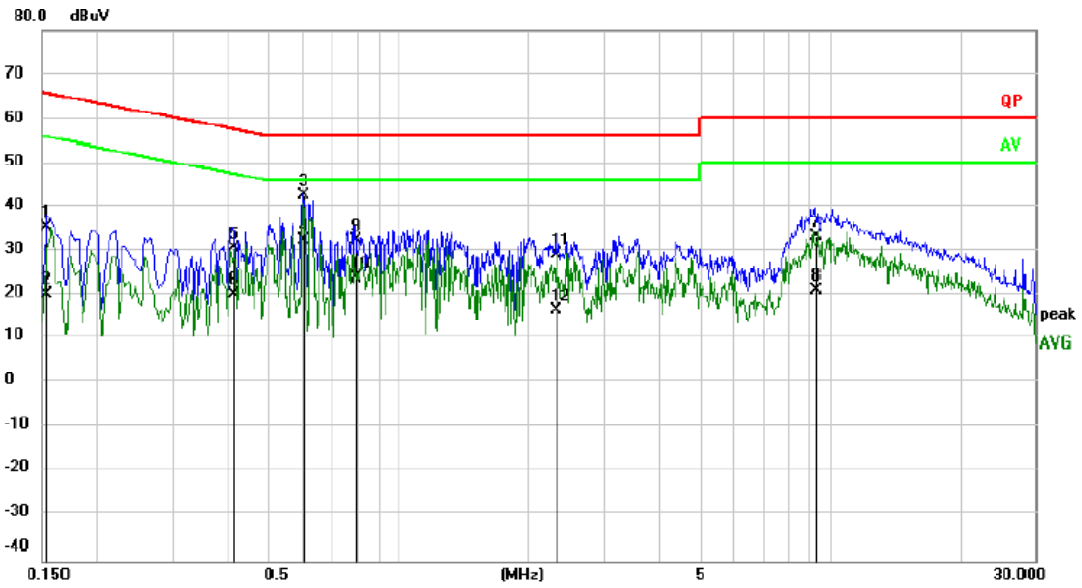


File :RWAZ202300123

Data :#9

Date: 2024/1/17

Time: 15:09:15



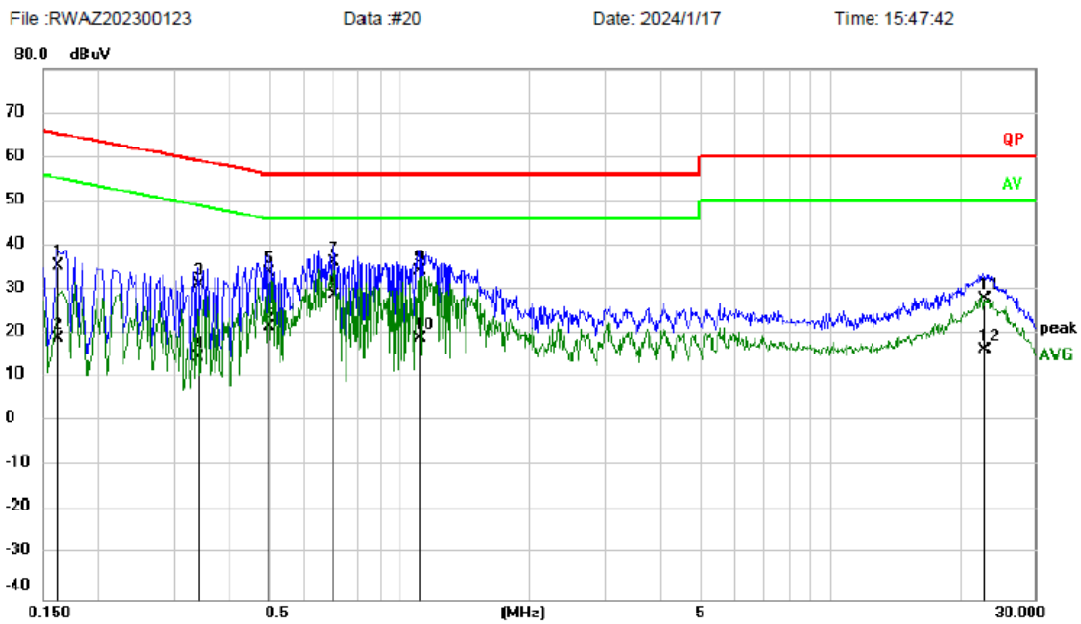
Limit: QP
Mode:transmitting
Note: 5G-WIFI(1)

Phase: **N**
Power: AC 120V/60Hz

Temperature: 24.2
Humidity: 40 %
Air Pressure: 1012 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	24.85	10.59	35.44	65.79	-30.35	QP	
2		0.1539	9.69	10.59	20.28	55.79	-35.51	AVG	
3	*	0.6020	31.98	10.64	42.62	56.00	-13.38	QP	
4		0.6020	21.83	10.64	32.47	46.00	-13.53	AVG	
5		0.4140	19.90	10.65	30.55	57.57	-27.02	QP	
6		0.4140	9.63	10.65	20.28	47.57	-27.29	AVG	
7		9.3020	22.49	10.72	33.21	60.00	-26.79	QP	
8		9.3020	10.29	10.72	21.01	50.00	-28.99	AVG	
9		0.7940	21.99	10.60	32.59	56.00	-23.41	QP	
10		0.7940	13.27	10.60	23.87	46.00	-22.13	AVG	
11		2.3179	18.47	10.64	29.11	56.00	-26.89	QP	
12		2.3179	5.99	10.64	16.63	46.00	-29.37	AVG	

Adapter HJ-0502000W2-US

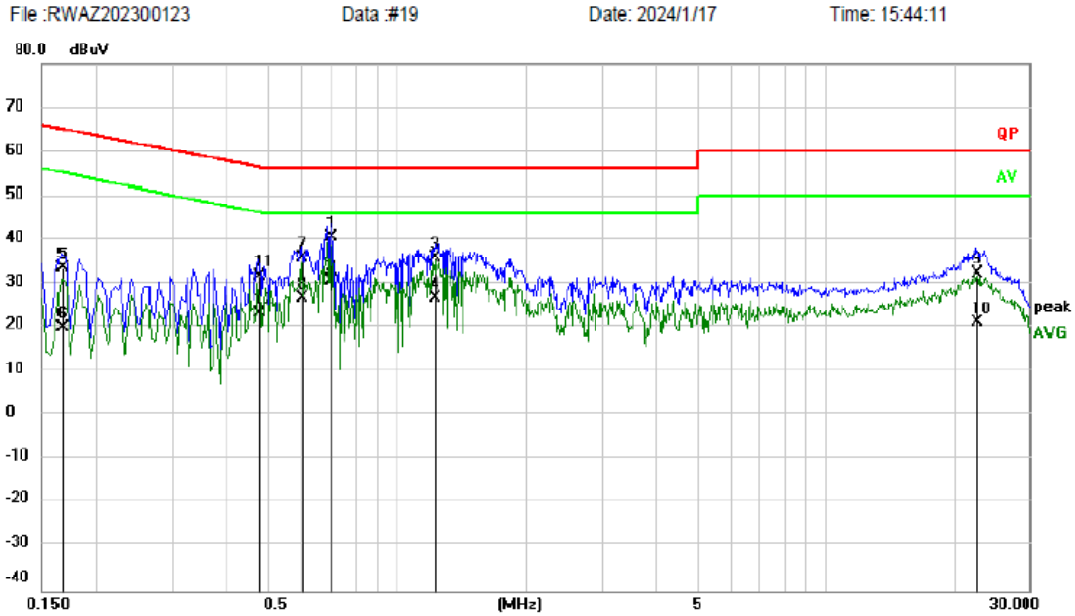


Limit: QP
Mode:transmitting
Note: 5G-WIFI(2)

Phase: L1
Power: AC 120V/60Hz

Temperature: 24.2
Humidity: 40 %
Air Pressure: 1012 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	24.80	10.76	35.56	65.36	-29.80	QP	
2		0.1620	8.08	10.76	18.84	55.36	-36.52	AVG	
3		0.3420	20.51	10.73	31.24	59.15	-27.91	QP	
4		0.3420	3.58	10.73	14.31	49.15	-34.84	AVG	
5		0.4980	23.17	10.81	33.98	56.03	-22.05	QP	
6		0.4980	10.90	10.81	21.71	46.03	-24.32	AVG	
7		0.7060	25.57	10.86	36.43	56.00	-19.57	QP	
8	*	0.7060	18.05	10.86	28.91	46.00	-17.09	AVG	
9		1.1140	23.37	10.99	34.36	56.00	-21.64	QP	
10		1.1140	8.05	10.99	19.04	46.00	-26.96	AVG	
11		22.7260	17.35	10.52	27.87	60.00	-32.13	QP	
12		22.7260	5.66	10.52	16.18	50.00	-33.82	AVG	



Limit: QP Phase: N Temperature: 24.2
 Mode: transmitting Power: AC 120V/60Hz Humidity: 40 %
 Note: 5G-WIFI(2) Air Pressure: 1012 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over Limit	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector Comment
1		0.7060	29.88	10.56	40.44	56.00	-15.56	QP
2	*	0.7060	20.24	10.56	30.80	46.00	-15.20	AVG
3		1.2260	25.08	10.67	35.75	56.00	-20.25	QP
4		1.2260	16.23	10.67	26.90	46.00	-19.10	AVG
5		0.1660	22.85	10.55	33.40	65.16	-31.76	QP
6		0.1660	9.25	10.55	19.80	55.16	-35.36	AVG
7		0.6020	25.24	10.64	35.88	56.00	-20.12	QP
8		0.6020	16.05	10.64	26.69	46.00	-19.31	AVG
9		22.5100	21.47	10.69	32.16	60.00	-27.84	QP
10		22.5100	10.26	10.69	20.95	50.00	-29.05	AVG
11		0.4780	20.82	10.70	31.52	56.37	-24.85	QP
12		0.4780	12.31	10.70	23.01	46.37	-23.36	AVG

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

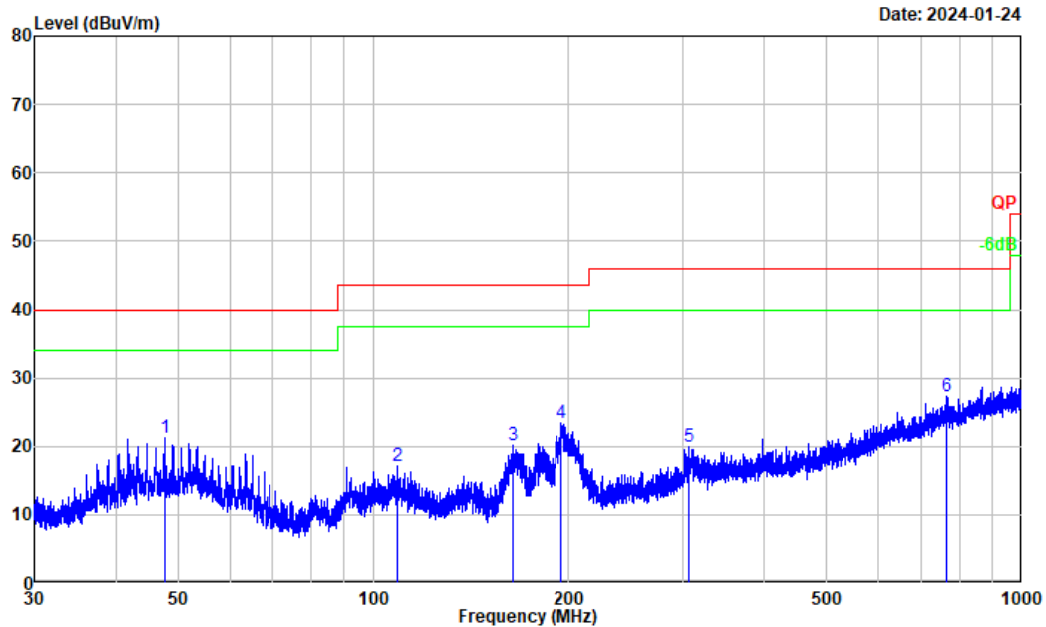
9 kHz-30MHz:

Test Date:	2024-02-02	Test By:	Bard Huang
Environment condition:	Temperature: 23.7°C; Relative Humidity:72%; ATM Pressure: 100.9kPa		

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

30MHz-1GHz:

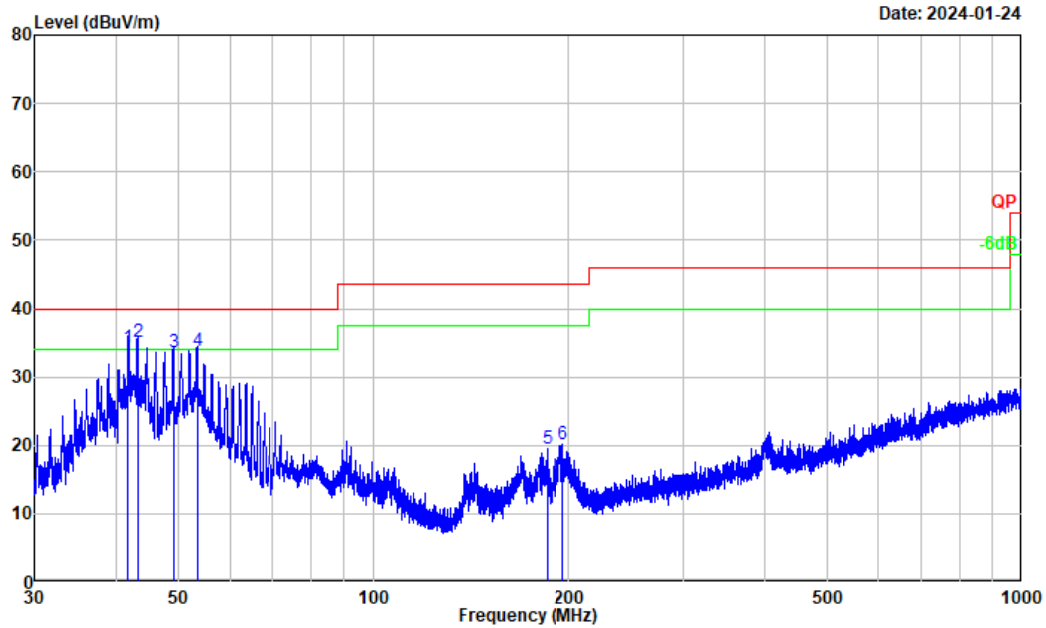
Test Date:	2024-01-24	Test By:	Bard Huang
Environment condition:	Temperature: 22.4°C; Relative Humidity:28%; ATM Pressure: 102kPa		



Project No. : RWAY2023000123
 Test Mode : Transmitting
 Test Voltage : AC 120V/60Hz
 Environment : 22.4°C/28%R.H./102.0kPa
 Tested by : Bard Huang
 Polarization : horizontal
 Remark : 5G

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	47.575	33.39	-12.18	21.21	40.00	-18.79	Peak
2	108.599	31.31	-14.09	17.22	43.50	-26.28	Peak
3	163.755	36.80	-16.68	20.12	43.50	-23.38	Peak
4	195.393	37.52	-14.08	23.44	43.50	-20.06	Peak
5	306.216	31.23	-11.20	20.03	46.00	-25.97	Peak
6	763.710	29.67	-2.26	27.41	46.00	-18.59	Peak

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



Project No. : RWAY2023000123
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.4°C/28%R.H./102.0kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 5G

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector

1	41.860	46.90	-12.55	34.35	40.00	-5.65	QP
2	43.334	47.61	-12.38	35.23	40.00	-4.77	QP
3	49.122	45.80	-12.17	33.63	40.00	-6.37	QP
4	53.365	46.10	-12.36	33.74	40.00	-6.26	QP
5	184.571	34.69	-15.22	19.47	43.50	-24.03	Peak
6	196.166	34.06	-14.00	20.06	43.50	-23.44	Peak

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

Remark:

Result = Reading + Factor

Factor = Antenna factor + Cable loss – Amplifier gain

Over Limit = Result – Limit

Above 1GHz:

Test Date:	2024-02-02	Test By:	Bard Huang
Environment condition:	Temperature: 23.7°C; Relative Humidity:72%; ATM Pressure: 100.9kPa		

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							
5053.263	49.81	Horizontal	11.33	61.14	74	-12.86	Peak
5053.263	37.14	Horizontal	11.33	48.47	54	-5.53	Average
5146.013	49.27	Vertical	11.57	60.84	74	-13.16	Peak
5146.013	36.51	Vertical	11.57	48.08	54	-5.92	Average
10360	59.46	Horizontal	5.5	64.96	68.2	-3.24	Peak
10360	58.92	Vertical	5.5	64.42	68.2	-3.78	Peak
Middle Channel							
10400	58.87	Horizontal	5.7	64.57	68.2	-3.63	Peak
10400	58.24	Vertical	5.7	63.94	68.2	-4.26	Peak
High Channel							
5442.482	49.98	Horizontal	11.49	61.47	74	-12.53	Peak
5442.482	37.14	Horizontal	11.49	48.63	54	-5.37	Average
5441.248	50.46	Vertical	11.49	61.95	74	-12.05	Peak
5441.248	36.71	Vertical	11.49	48.2	54	-5.8	Average
10480	58.79	Horizontal	5.74	64.53	68.2	-3.67	Peak
10480	58.2	Vertical	5.74	63.94	68.2	-4.26	Peak
802.11ac20							
Low Channel							
5109.175	55.64	Horizontal	11.49	67.13	74	-6.87	Peak
5109.175	36.23	Horizontal	11.49	47.72	54	-6.28	Average
4848.513	54.05	Vertical	10.3	64.35	74	-9.65	Peak
4848.513	37.32	Vertical	10.3	47.62	54	-6.38	Average
10360	59.16	Horizontal	5.5	64.66	68.2	-3.54	Peak
10360	58.59	Vertical	5.5	64.09	68.2	-4.11	Peak
Middle Channel							
10400	58.67	Horizontal	5.7	64.37	68.2	-3.83	Peak
10400	58	Vertical	5.7	63.7	68.2	-4.5	Peak
High Channel							
5437.9	49.83	Horizontal	11.49	61.32	74	-12.68	Peak

5437.9	37.21	Horizontal	11.49	48.7	54	-5.3	Average
5376.31	50.52	Vertical	11.43	61.95	74	-12.05	Peak
5376.31	36.63	Vertical	11.43	48.06	54	-5.94	Average
10480	58.56	Horizontal	5.74	64.3	68.2	-3.9	Peak
10480	57.97	Vertical	5.74	63.71	68.2	-4.49	Peak
802.11ac40							
Low Channel							
5147.763	56.22	Horizontal	11.57	67.79	74	-6.21	Peak
5147.763	36.97	Horizontal	11.57	48.54	54	-5.46	Average
5147.15	51.26	Vertical	11.57	62.83	74	-11.17	Peak
5147.15	37.41	Vertical	11.57	48.98	54	-5.02	Average
10380	58.67	Horizontal	5.6	64.27	68.2	-3.93	Peak
10380	57.86	Vertical	5.6	63.46	68.2	-4.74	Peak
High Channel							
5429.092	50.16	Horizontal	11.47	61.63	74	-12.37	Peak
5429.092	37.2	Horizontal	11.47	48.67	54	-5.33	Average
5411.607	49.96	Vertical	11.43	61.39	74	-12.61	Peak
5411.607	36.95	Vertical	11.43	48.38	54	-5.62	Average
10460	59.39	Horizontal	5.73	65.12	68.2	-3.08	Peak
10460	58.68	Vertical	5.73	64.41	68.2	-3.79	Peak
802.11ac80							
Middle Channel							
5149.163	55.57	Horizontal	11.57	67.14	74	-6.86	Peak
5149.163	38.37	Horizontal	11.57	49.94	54	-4.06	Average
5145.313	54.2	Vertical	11.57	65.77	74	-8.23	Peak
5145.313	37.81	Vertical	11.57	49.38	54	-4.62	Average
5351.092	50.14	Horizontal	11.44	61.58	74	-12.42	Peak
5351.092	36.94	Horizontal	11.44	48.38	54	-5.62	Average
5432.7	50.01	Vertical	11.44	61.45	74	-12.55	Peak
5432.7	36.86	Vertical	11.44	48.3	54	-5.7	Average
10420	58.09	Horizontal	5.71	63.8	68.2	-4.4	Peak
10420	57.64	Vertical	5.71	63.35	68.2	-4.85	Peak

Remark:

Corrected Amplitude= Reading level + corrected Factor

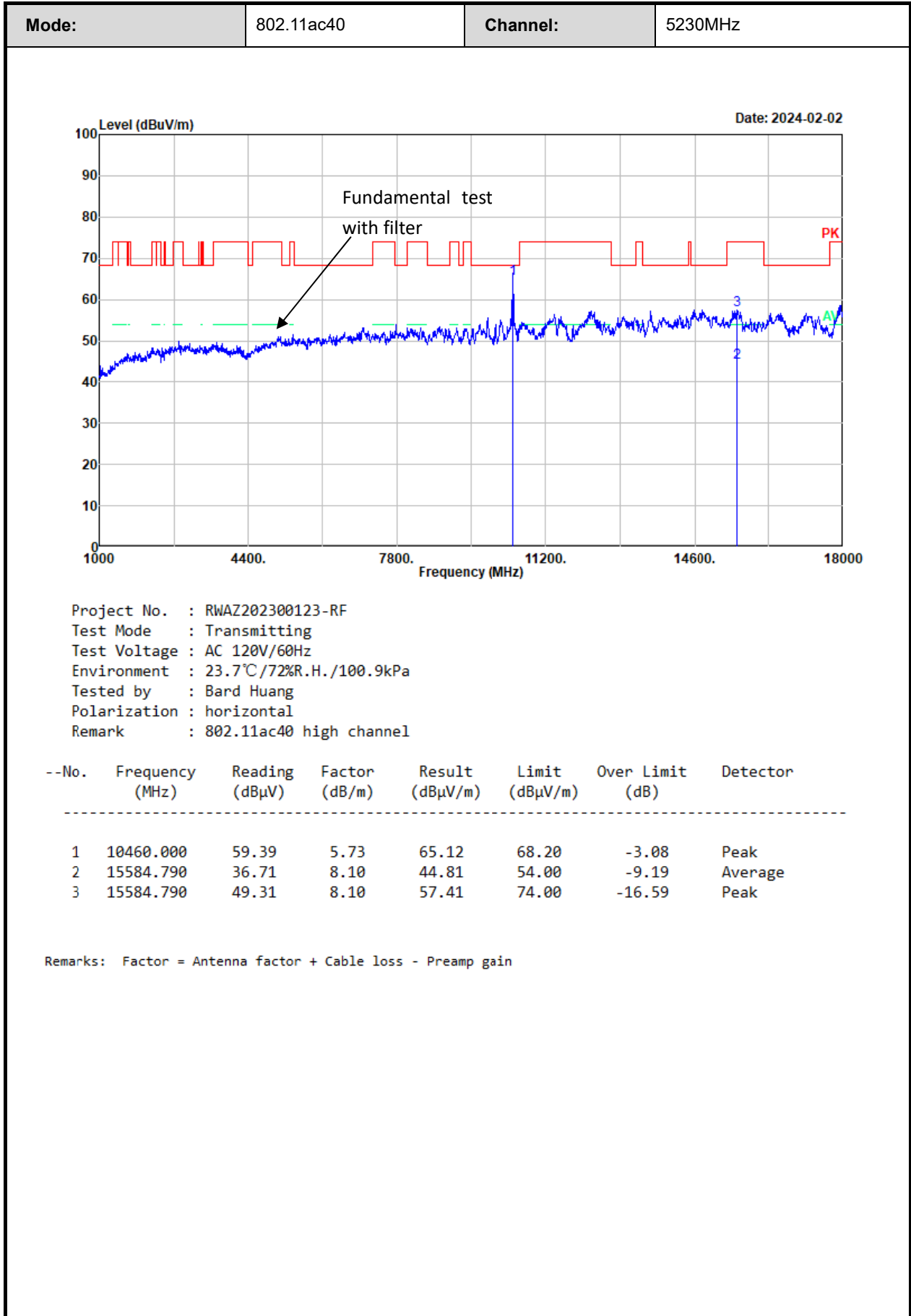
Corrected Factor = Antenna factor + Cable loss – Amplifier gain

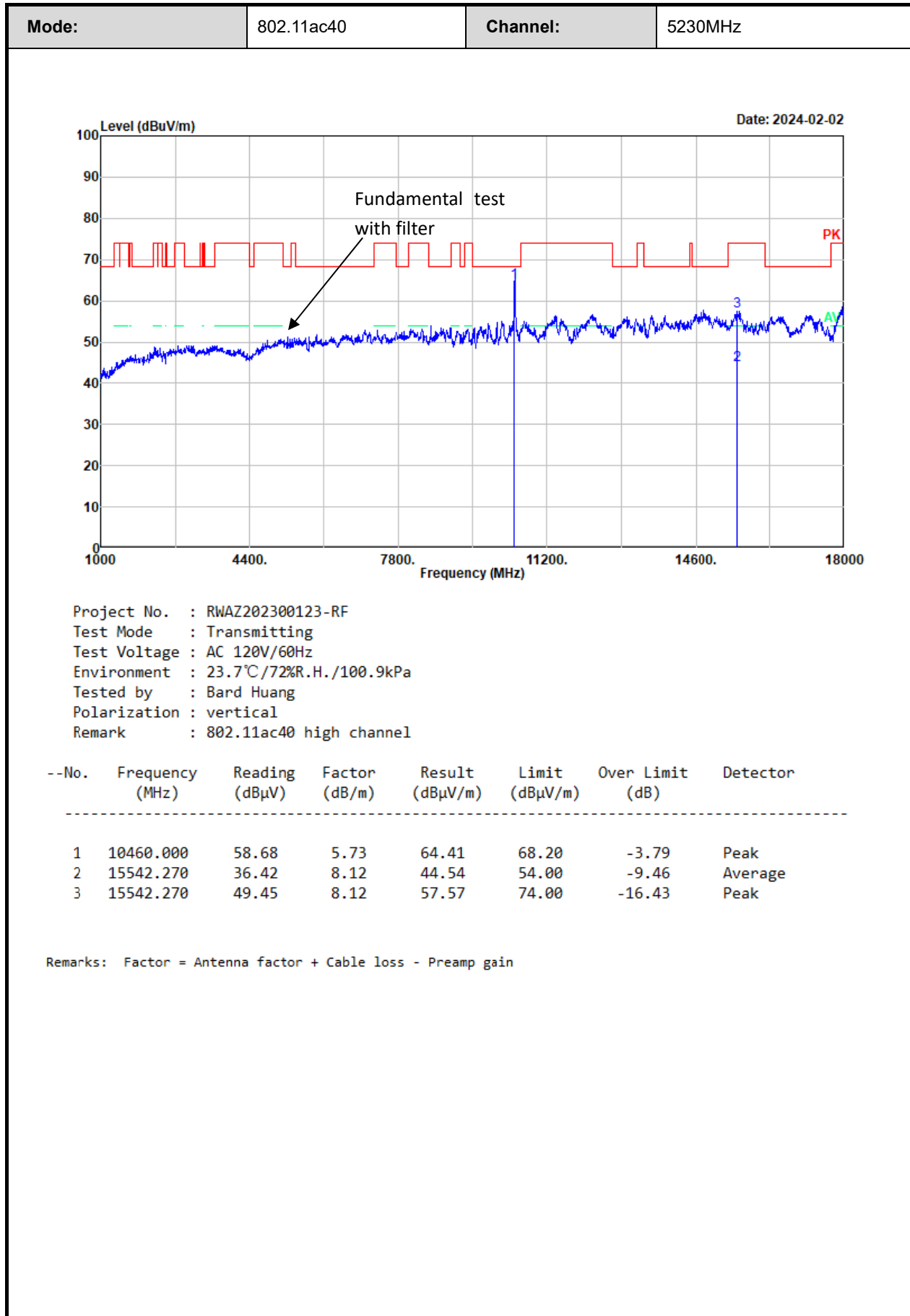
Margin = Corrected Amplitude – Limit

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:





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							
5644.955	48.84	Horizontal	11.9	60.74	68.2	-7.46	Peak
5677.369	49.44	Horizontal	11.95	61.39	89.42	-28.03	Peak
5710.055	49.57	Horizontal	12.02	61.59	109.61	-48.02	Peak
5722.261	49.57	Horizontal	12.03	61.6	119.61	-58.01	Peak
5625.522	48.84	Vertical	11.9	60.74	68.2	-7.46	Peak
5676.188	49.4	Vertical	11.99	61.39	101.42	-40.03	Peak
5714.996	49.56	Vertical	12.03	61.59	110.46	-48.87	Peak
5720.614	50.57	Vertical	12.03	62.6	120.59	-57.99	Peak
11490	56.29	Horizontal	6.46	62.75	74	-11.25	Peak
11490	42.21	Horizontal	6.46	48.67	54	-5.33	Average
11490	56.93	Vertical	6.46	63.39	74	-10.61	Peak
11490	42.82	Vertical	6.46	49.28	54	-4.72	Average
Middle Channel							
11570	57	Horizontal	6.52	63.52	74	-10.48	Peak
11570	42.88	Horizontal	6.52	49.4	54	-4.6	Average
11570	57.66	Vertical	6.52	64.18	74	-9.82	Peak
11570	43.57	Vertical	6.52	50.09	54	-3.91	Average
High Channel							
5850.18	49.16	Horizontal	12.31	61.47	119.24	-57.77	Peak
5868.28	49.51	Horizontal	12.32	61.83	110.48	-48.65	Peak
5885.18	49.08	Horizontal	12.41	61.49	100.21	-38.72	Peak
5926.04	48.94	Horizontal	12.42	61.36	68.2	-6.84	Peak
5850.9	49.83	Vertical	12.31	62.14	120.03	-57.89	Peak
5864.6	48.71	Vertical	12.32	61.03	110.5	-49.47	Peak
5910.2	49.1	Vertical	12.39	61.49	102.81	-41.32	Peak
5946.72	49.18	Vertical	12.41	61.59	68.2	-6.61	Peak
11650	57.37	Horizontal	6.55	63.92	74	-10.08	Peak
11650	43.16	Horizontal	6.55	49.71	54	-4.29	Average
11650	57.8	Vertical	6.55	64.35	74	-9.65	Peak
11650	44.01	Vertical	6.55	50.56	54	-3.44	Average
802.11ac20							
Low Channel							
5621.163	49.6	Horizontal	11.9	61.5	68.2	-6.7	Peak
5652.996	49.56	Horizontal	11.98	61.54	91.04	-29.5	Peak

5714.124	49.29	Horizontal	12.02	61.31	110.08	-48.77	Peak
5724.761	49.27	Horizontal	12.03	61.3	121.21	-59.91	Peak
5642.882	49.45	Vertical	11.91	61.36	68.2	-6.84	Peak
5655.824	49.36	Vertical	12	61.36	104.19	-42.83	Peak
5705.114	49.74	Vertical	12.03	61.77	110.46	-48.69	Peak
5724.703	49.13	Vertical	12.03	61.16	120.59	-59.43	Peak
11490	56.99	Horizontal	6.46	63.45	74	-10.55	Peak
11490	42.4	Horizontal	6.46	48.86	54	-5.14	Average
11490	57.78	Vertical	6.46	64.24	74	-9.76	Peak
11490	42.72	Vertical	6.46	49.18	54	-4.82	Average
Middle Channel							
11570	57.73	Horizontal	6.52	64.25	74	-9.75	Peak
11570	43.15	Horizontal	6.52	49.67	54	-4.33	Average
11570	58.59	Vertical	6.52	65.11	74	-8.89	Peak
11570	43.84	Vertical	6.52	50.36	54	-3.64	Average
High Channel							
5851.08	49.19	Horizontal	12.31	61.5	118.76	-57.26	Peak
5873.06	49.02	Horizontal	12.32	61.34	110.56	-49.22	Peak
5910.18	49.01	Horizontal	12.41	61.42	101.62	-40.2	Peak
5927.36	48.78	Horizontal	12.42	61.2	68.2	-7	Peak
5852.54	49.26	Vertical	12.31	61.57	120.03	-58.46	Peak
5872.8	49.64	Vertical	12.32	61.96	110.48	-48.52	Peak
5905.72	49.34	Vertical	12.39	61.73	104.19	-42.46	Peak
5929.96	49.36	Vertical	12.41	61.77	68.2	-6.43	Peak
11650	57.93	Horizontal	6.55	64.48	74	-9.52	Peak
11650	43.38	Horizontal	6.55	49.93	54	-4.07	Average
11650	58.85	Vertical	6.55	65.40	74	-8.60	Peak
11650	44.32	Vertical	6.55	50.87	54	-3.13	Average
802.11ac40							
Low Channel							
5641.584	49.97	Horizontal	11.9	61.87	68.2	-6.33	Peak
5655.379	49.71	Horizontal	12	61.71	100.47	-38.76	Peak
5719.2	49.71	Horizontal	12.01	61.72	109.28	-47.56	Peak
5723.308	49.31	Horizontal	12.03	61.34	120.09	-58.75	Peak
5625.038	49.14	Vertical	11.9	61.04	68.2	-7.16	Peak
5680.935	49.64	Vertical	12	61.64	103.72	-42.08	Peak
5705.308	49.89	Vertical	12.01	61.9	110.07	-48.17	Peak
5720.479	49.55	Vertical	12.03	61.58	121.64	-60.06	Peak

11510	55.84	Horizontal	6.48	62.32	74	-11.68	Peak
11510	42.53	Horizontal	6.48	49.01	54	-4.99	Average
11510	56.6	Vertical	6.48	63.08	74	-10.92	Peak
11510	43.29	Vertical	6.48	49.77	54	-4.23	Average
High Channel							
5853.48	49.73	Horizontal	12.31	62.04	119.19	-57.15	Peak
5861.8	49.37	Horizontal	12.32	61.69	110.31	-48.62	Peak
5884.94	48.73	Horizontal	12.39	61.12	104.04	-42.92	Peak
5930.38	49.95	Horizontal	12.41	62.36	68.2	-5.84	Peak
5851.98	49.88	Vertical	12.31	62.19	112.9	-50.71	Peak
5864.18	50.5	Vertical	12.32	62.82	109.33	-46.51	Peak
5876.04	49.15	Vertical	12.39	61.54	102.29	-40.75	Peak
5954.46	50.54	Vertical	12.4	62.94	68.2	-5.26	Peak
11590	56.75	Horizontal	6.53	63.28	74	-10.72	Peak
11590	43.54	Horizontal	6.53	50.07	54	-3.93	Average
11590	57.29	Vertical	6.53	63.82	74	-10.18	Peak
11590	44.12	Vertical	6.53	50.65	54	-3.35	Average
802.11ac80							
Middle Channel							
5628.389	50.09	Horizontal	11.9	61.99	68.2	-6.21	Peak
5685.41	49.9	Horizontal	12	61.9	103.58	-41.68	Peak
5703.739	50.21	Horizontal	12.02	62.23	108.84	-46.61	Peak
5723.695	49.48	Horizontal	12.03	61.51	118.28	-56.77	Peak
5635.384	49.6	Horizontal	12.32	61.92	112.2	-50.28	Peak
5685.875	50.09	Horizontal	12.38	62.47	106.62	-44.15	Peak
5714.569	49.05	Horizontal	12.4	61.45	102.31	-40.86	Peak
5724.703	49.28	Horizontal	12.41	61.69	68.2	-6.51	Peak
5850.5	49.11	Vertical	11.9	61.01	68.2	-7.19	Peak
5867.36	48.2	Vertical	12	60.2	103.44	-43.24	Peak
5882.74	47.21	Vertical	12.02	59.23	108.83	-49.6	Peak
5926.9	46.33	Vertical	12.03	58.36	118.43	-60.07	Peak
5853.62	47.82	Vertical	12.32	60.14	112.2	-52.06	Peak
5869.44	49.04	Vertical	12.32	61.36	110.57	-49.21	Peak
5894.76	46.69	Vertical	12.39	59.08	102.31	-43.23	Peak
5931.84	46.17	Vertical	12.41	58.58	68.2	-9.62	Peak
11550	55.94	Horizontal	6.5	62.44	74	-11.56	Peak
11550	43.6	Horizontal	6.5	50.1	54	-3.9	Average
11550	56.47	Vertical	6.5	62.97	74	-11.03	Peak

11550	44.31	Vertical	6.5	50.81	54	-3.19	Average
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Remark:

Corrected Amplitude= Reading level + corrected Factor

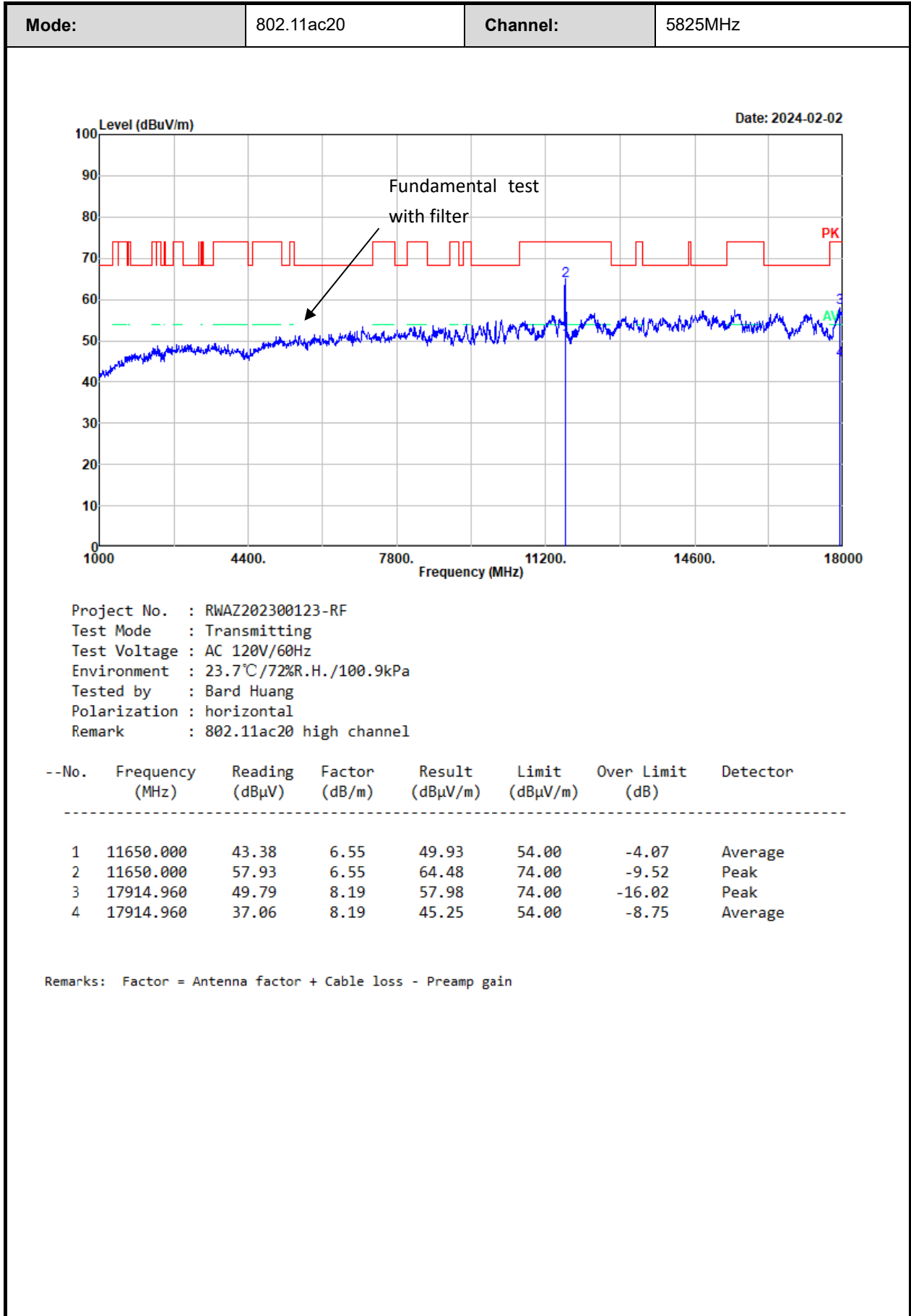
Corrected Factor = Antenna factor + Cable loss – Amplifier gain

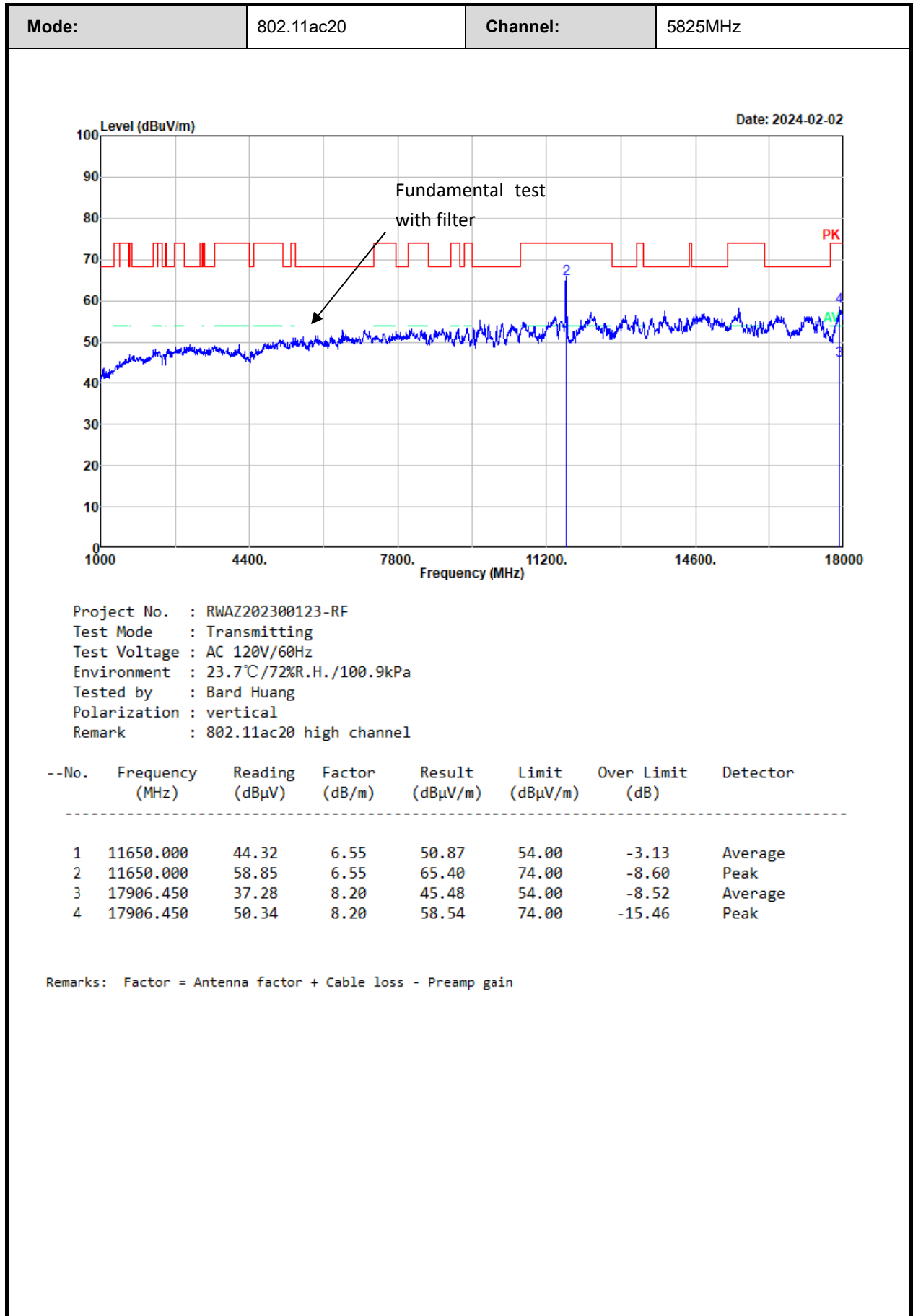
Margin = Corrected Amplitude – Limit

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:	2024-01-12~2024-03-12	Test By:	Ryan Zhang
Environment condition:	Temperature: 24-28°C; Relative Humidity: 34-46%; ATM Pressure: 101.0-102kPa		

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

5150-5250MHz

Test Modes	Test Frequency (MHz)	26 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180	20.40	16.75
	5200	20.48	16.78
	5240	20.60	16.90
802.11ac vht20	5180	20.72	17.82
	5200	20.80	17.86
	5240	20.75	17.86
802.11ac vht40	5190	41.36	36.20
	5230	41.40	36.28
802.11ac vht80	5210	81.77	75.28

Note: the 99% Occupied Bandwidth have not fall into the band 5250-5350MHz, please refer to the test plots of 99% occupied bandwidth.

5725-5850MHz

Test Modes	Test Frequency (MHz)	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	6dB BW Limit (MHz)	Verdict
802.11a	5745	16.44	16.78	0.5	pass
	5785	16.44	16.90	0.5	pass
	5825	16.44	16.83	0.5	pass
802.11ac vht20	5745	17.64	17.86	0.5	pass
	5785	17.64	17.82	0.5	pass
	5825	17.64	17.82	0.5	pass
802.11ac vht40	5755	36.24	36.20	0.5	pass
	5795	35.92	36.20	0.5	pass
802.11ac vht80	5775	76.56	75.44	0.5	pass

Note: the 99% Occupied Bandwidth have not fall into the band 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.

3.5.2 Maximum conducted output power

5150-5250MHz

Test Modes	Test Frequency (MHz)	Max. Conducted Average Output Power (dBm)		Verdict
		Result	Limit	
802.11a	5180	8.81	24	pass
	5200	8.98	24	pass
	5240	8.41	24	pass
802.11ac vht20	5180	8.37	24	pass
	5200	8.96	24	pass
	5240	8.26	24	pass
802.11ac vht40	5190	8.87	24	pass
	5230	8.13	24	pass
802.11ac vht80	5210	8.57	24	pass

Note:

The device is a client device.

5725-5850MHz

Test Modes	Test Frequency (MHz)	Max. Conducted Average Output Power (dBm)		Verdict
		Result	Limit	
802.11a	5745	8.12	30	pass
	5785	8.36	30	pass
	5825	8.02	30	pass
802.11ac vht20	5745	8.30	30	pass
	5785	7.84	30	pass
	5825	7.89	30	pass
802.11ac vht40	5755	7.82	30	pass
	5795	7.85	30	pass
802.11ac vht80	5775	7.66	30	pass

3.5.3 Power Spectral Density

5150-5250MHz

Test Modes	Test Frequency (MHz)	Reading (dBm/MHz)	Duty Cycle Factor (dB)	Maximum Power Spectral Density (dBm/MHz)		Verdict
				Result	Limit	
802.11a	5180	-2.14	/	-2.14	11	pass
	5200	-1.78	/	-1.78	11	pass
	5240	-1.97	/	-1.97	11	pass
802.11ac vht20	5180	-1.98	/	-1.98	11	pass
	5200	-1.50	/	-1.50	11	pass
	5240	-1.75	/	-1.75	11	pass
802.11ac vht40	5190	-4.22	/	-4.22	11	pass
	5230	-5.30	/	-5.30	11	pass
802.11ac vht80	5210	-7.75	/	-7.75	11	pass

Note:

The device is a client device.

Duty cycle $\geq 98\%$, method ANSI C63.10-2013 Section 12.3.2.2 was used.

5725-5850 MHz

Test Modes	Test Frequency (MHz)	Reading (dBm/500kHz)	Duty Cycle Factor (dB)	Maximum Power Spectral Density (dBm/500kHz)		Verdict
				Result	Limit	
802.11a	5745	-4.83	/	-4.83	30	pass
	5785	-4.65	/	-4.65	30	pass
	5825	-5.01	/	-5.01	30	pass
802.11ac vht20	5745	-5.05	/	-5.05	30	pass
	5785	-4.92	/	-4.92	30	pass
	5825	-5.90	/	-5.90	30	pass
802.11ac vht40	5755	-8.32	/	-8.32	30	pass
	5795	-8.27	/	-8.27	30	pass
802.11ac vht80	5775	-12.03	/	-12.03	30	pass

Note

Duty cycle $\geq 98\%$, method ANSI C63.10-2013 Section 12.3.2.2 was used.

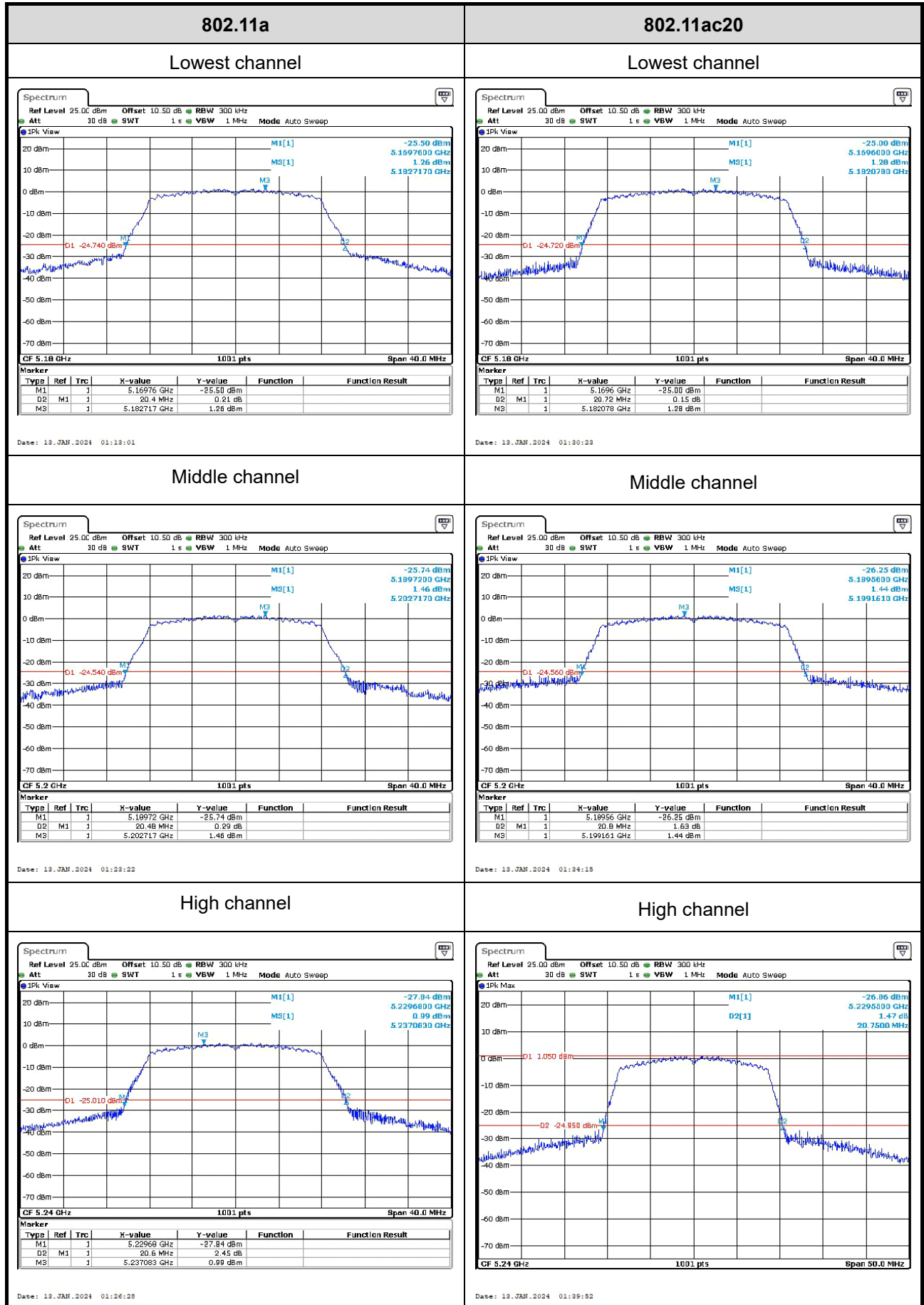
3.5.4 Duty Cycle

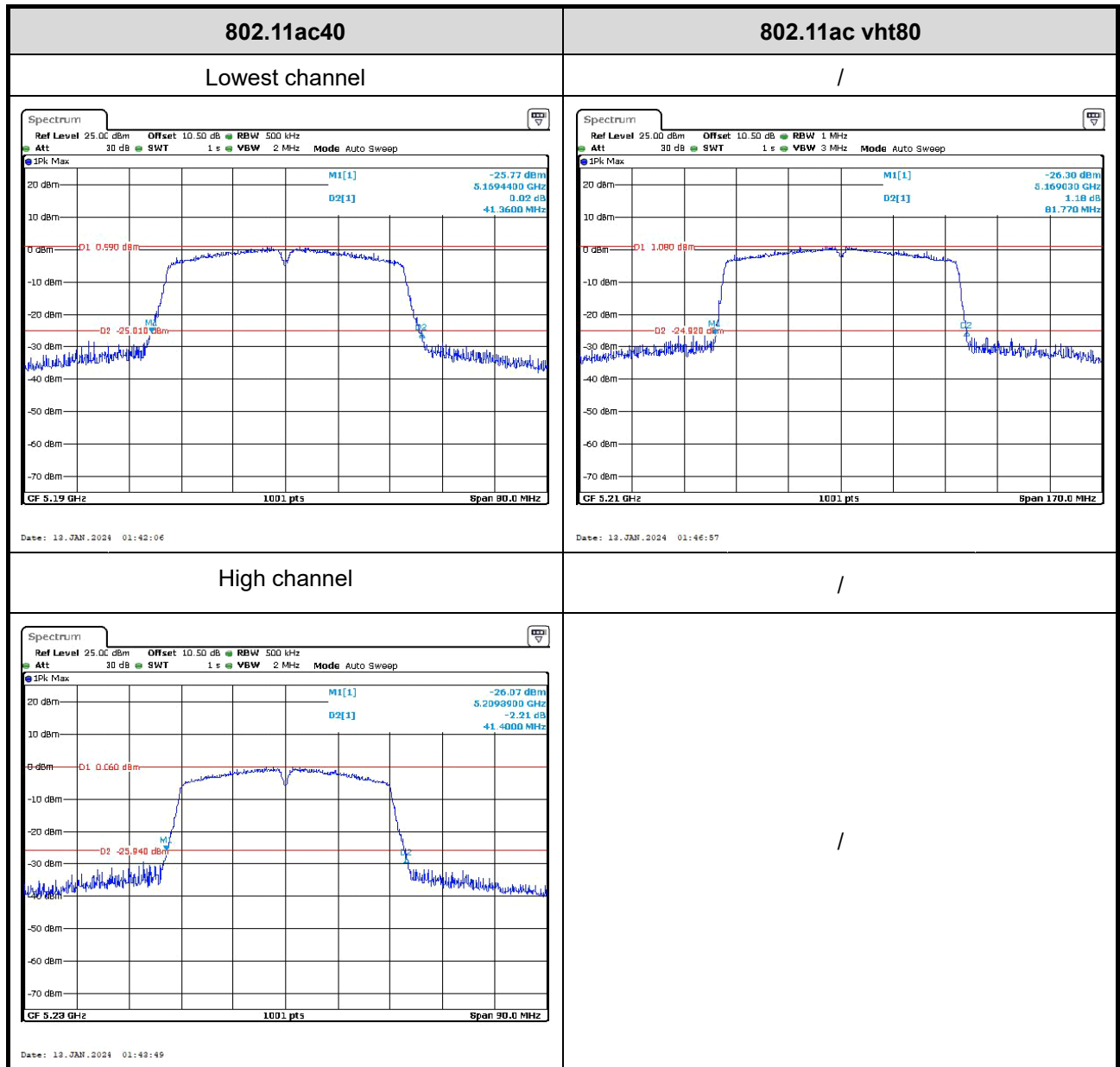
Test Mode	Ton (ms)	Ton+off (ms)	Duty Cycle [%]	Duty Cycle Factor[%]	1/T [Hz]	VBW setting* [Hz]
802.11a	100	100	100	/	/	10
802.11ac vht20	100	100	100	/	/	10
802.11ac vht40	100	100	100	/	/	10
802.11ac vht80	100	100	100	/	/	10

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

Test Plots:

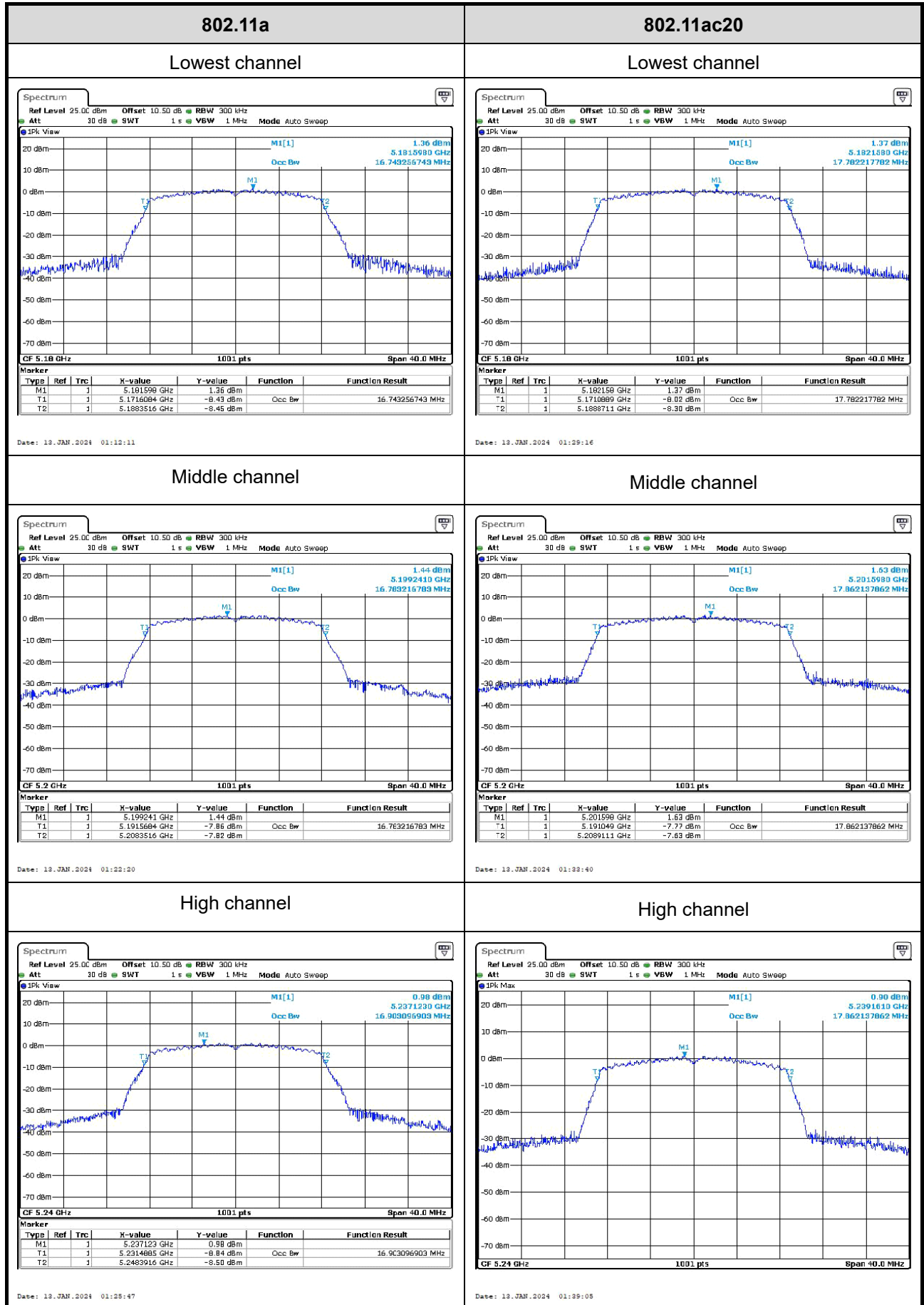
26dB Emission Bandwidth

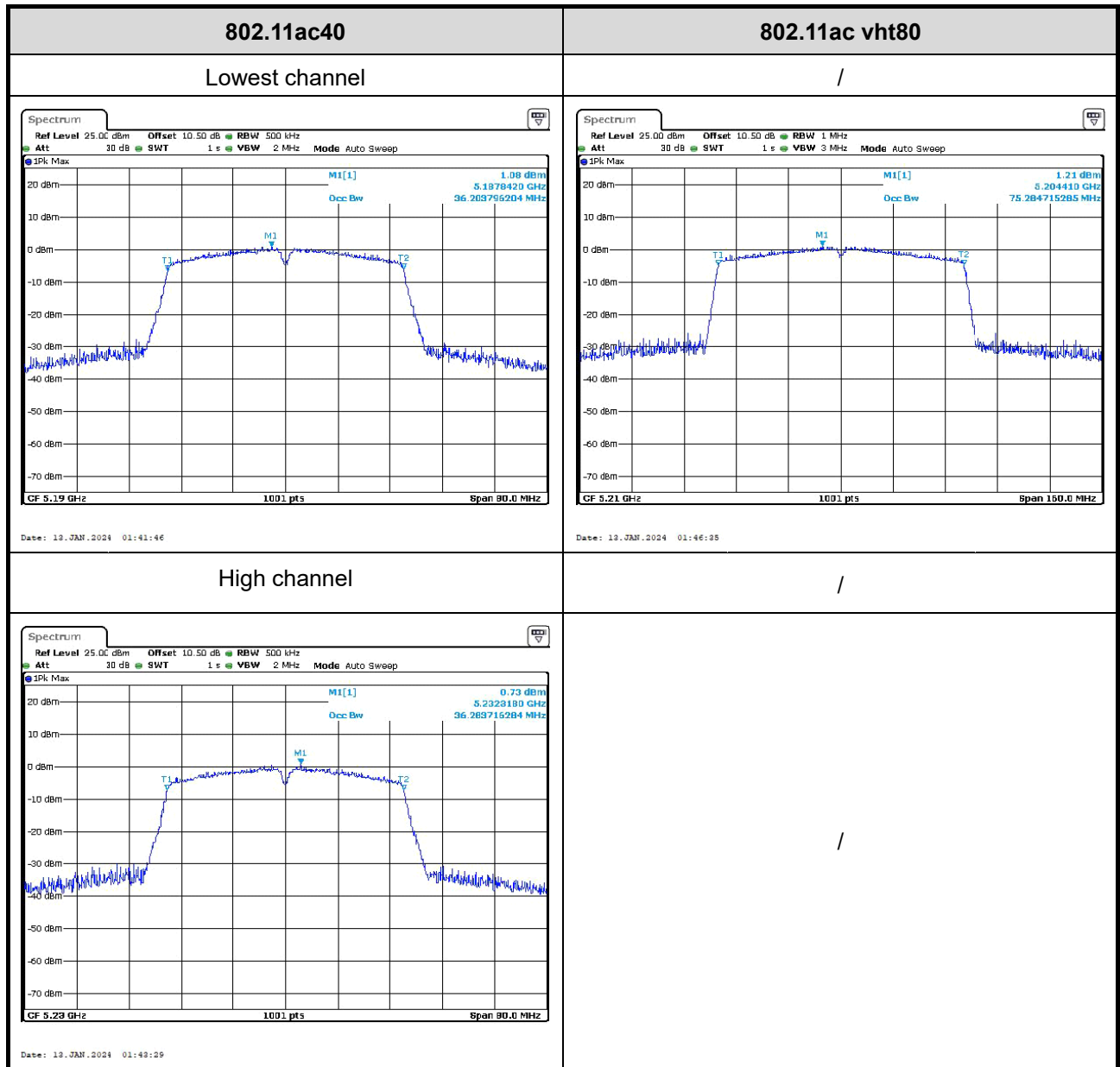




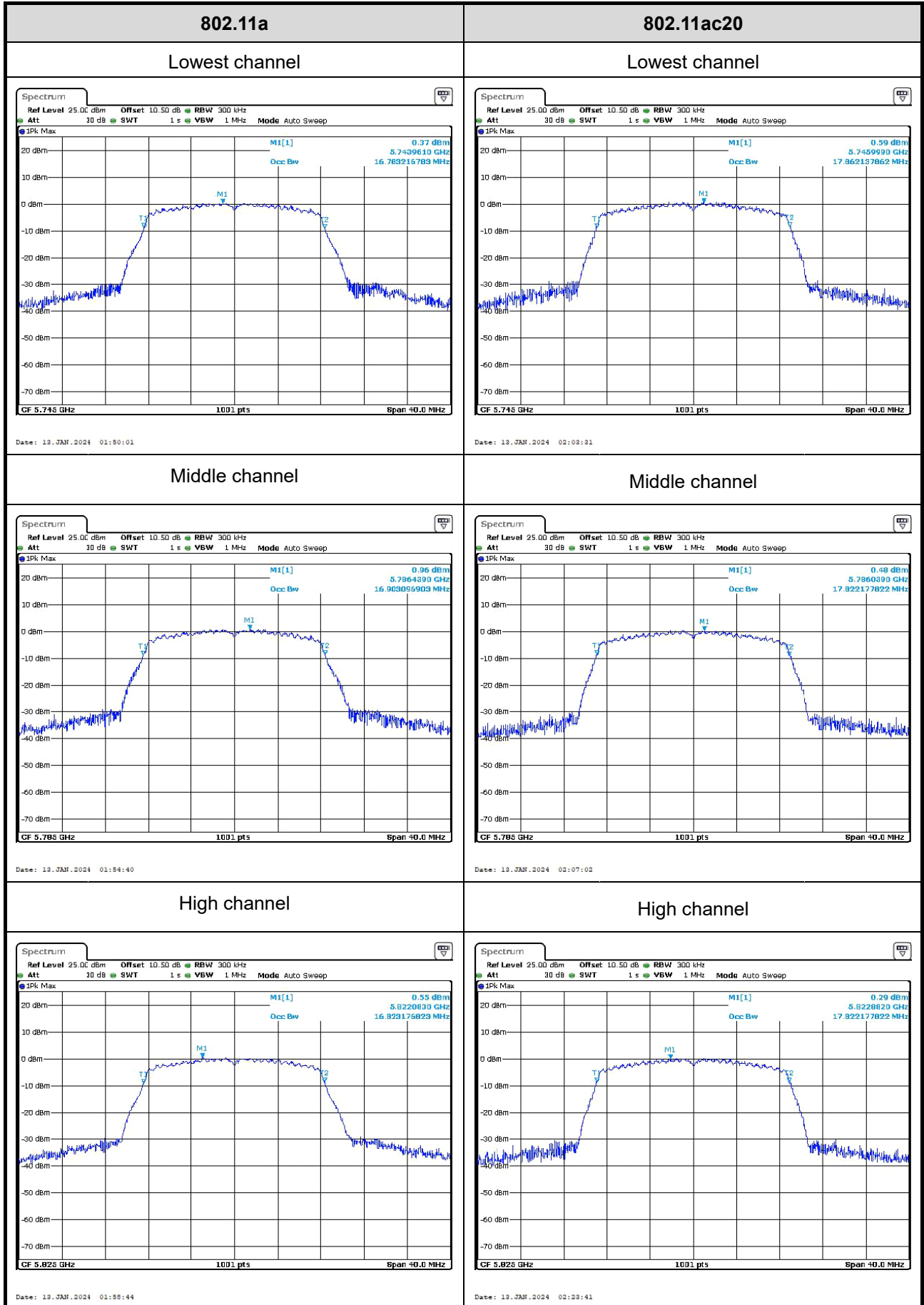
99% Occupied Bandwidth

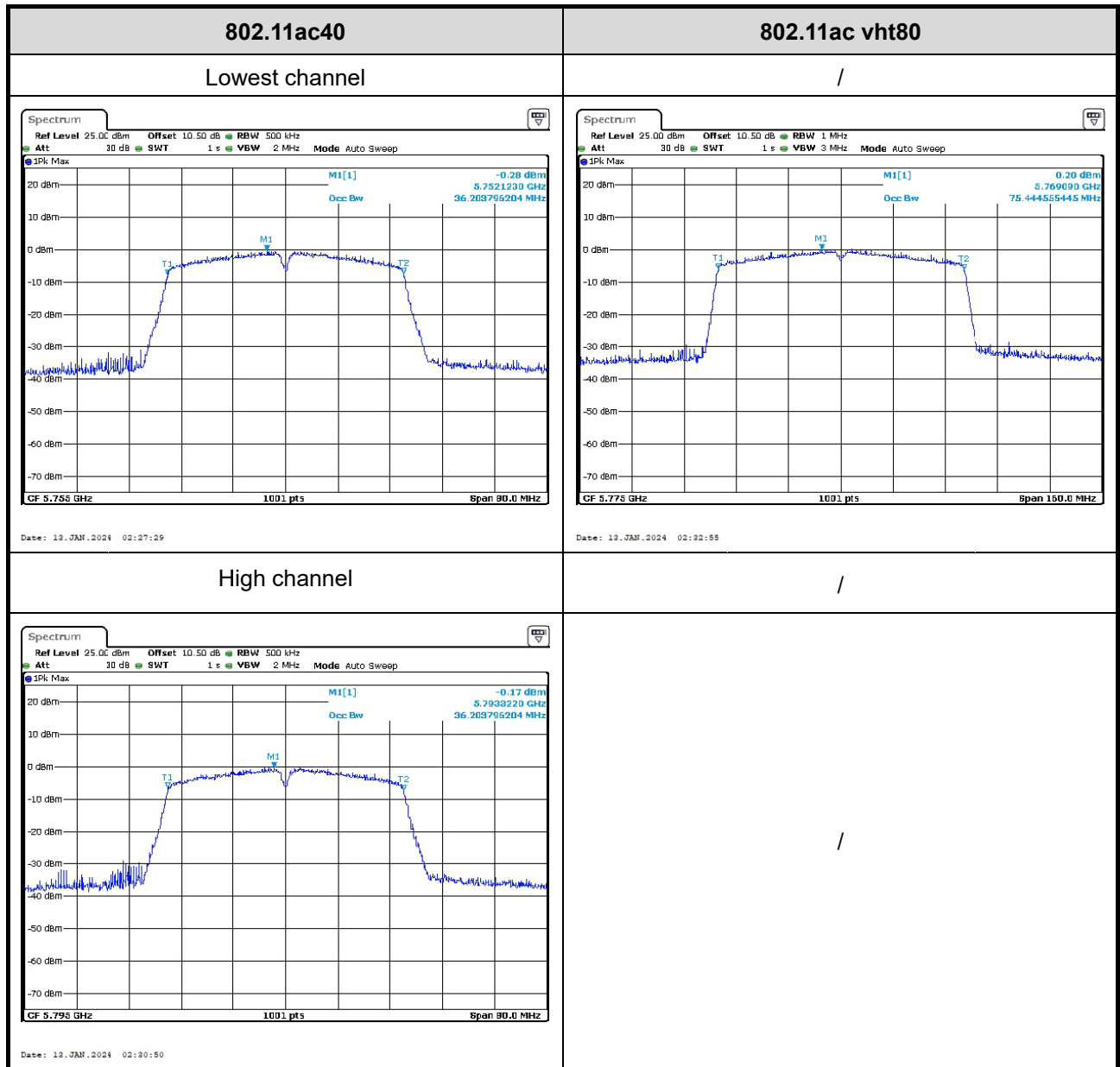
5150-5250MHz Band:



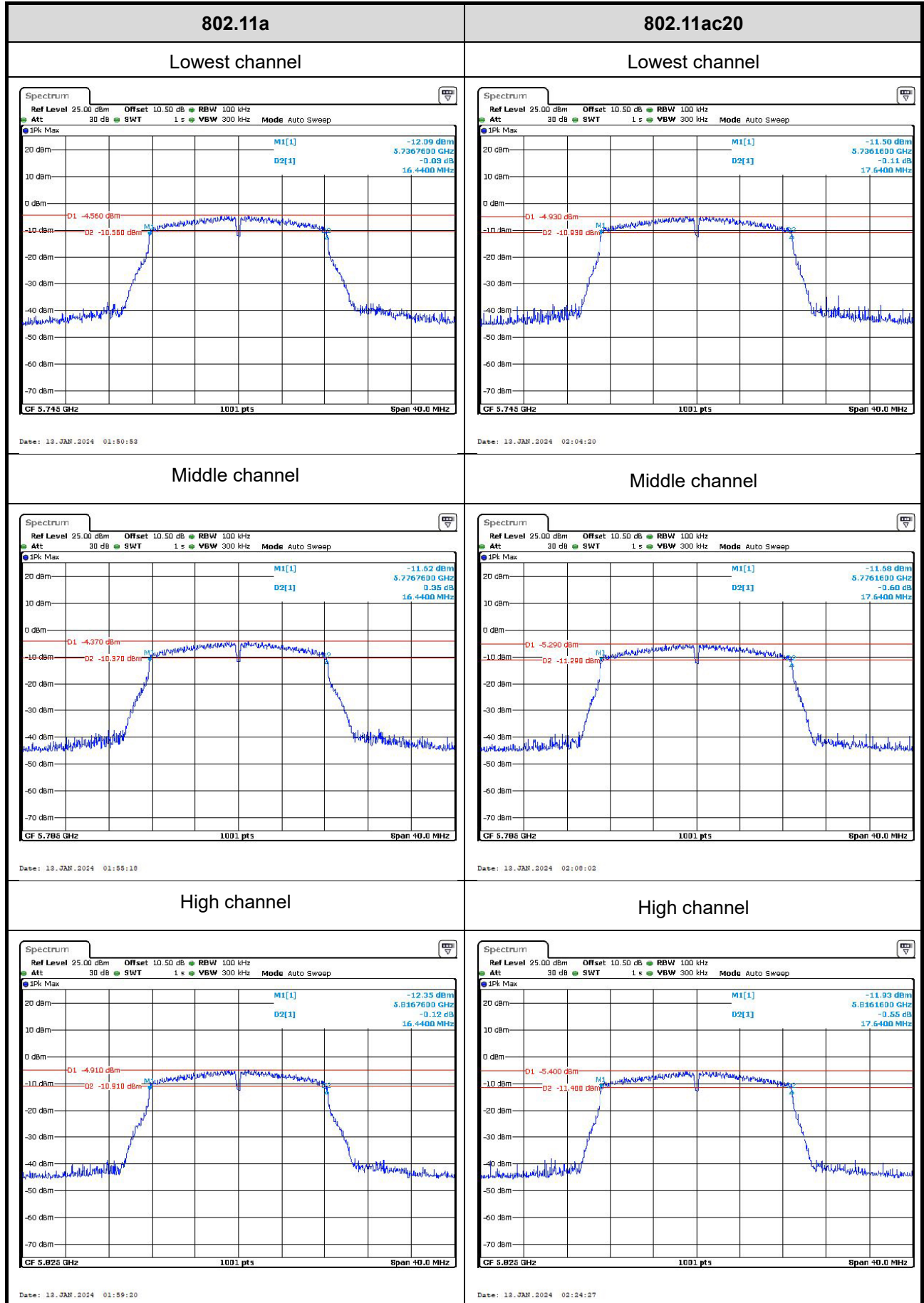


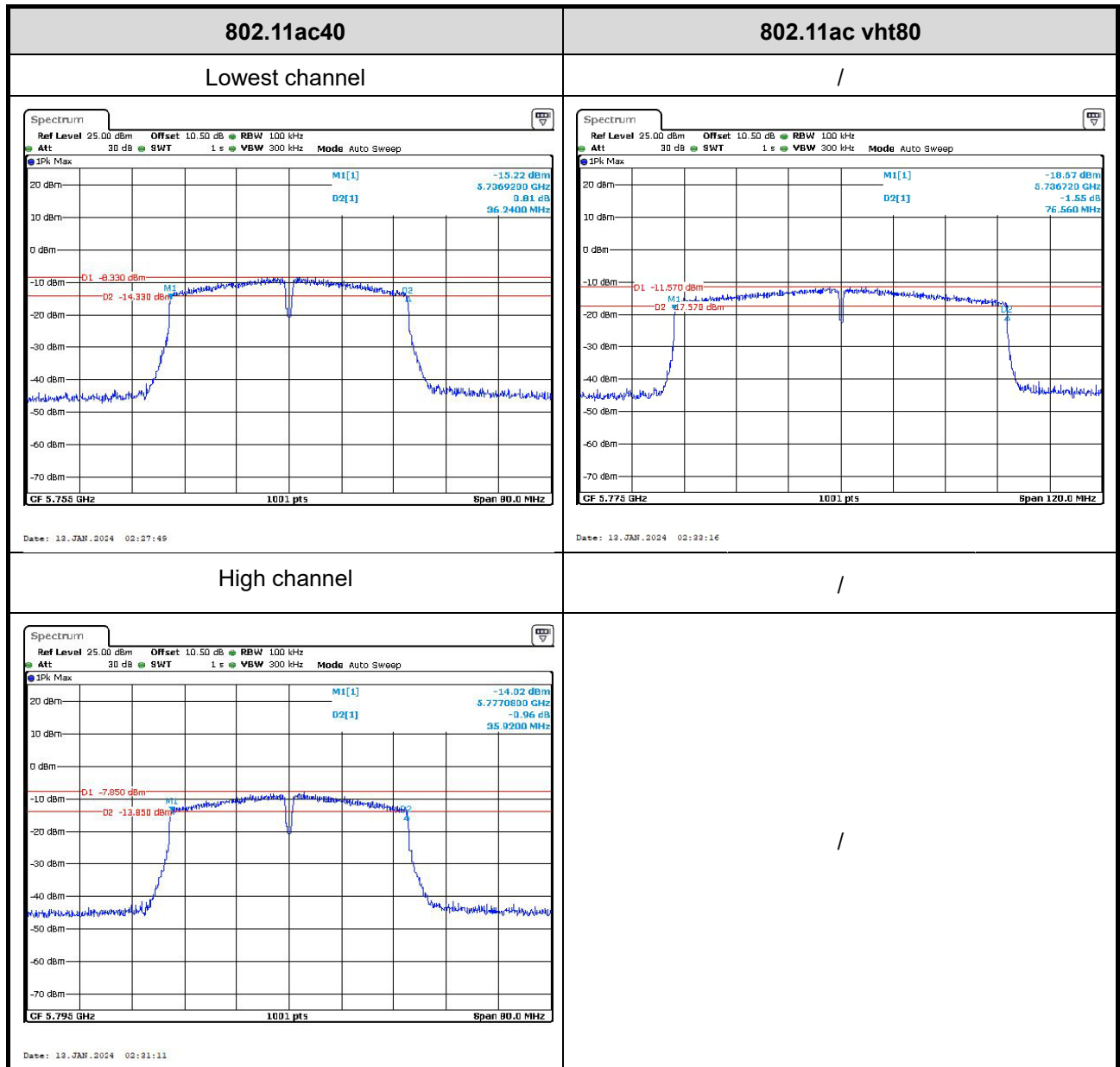
5725-5850MHz Band:





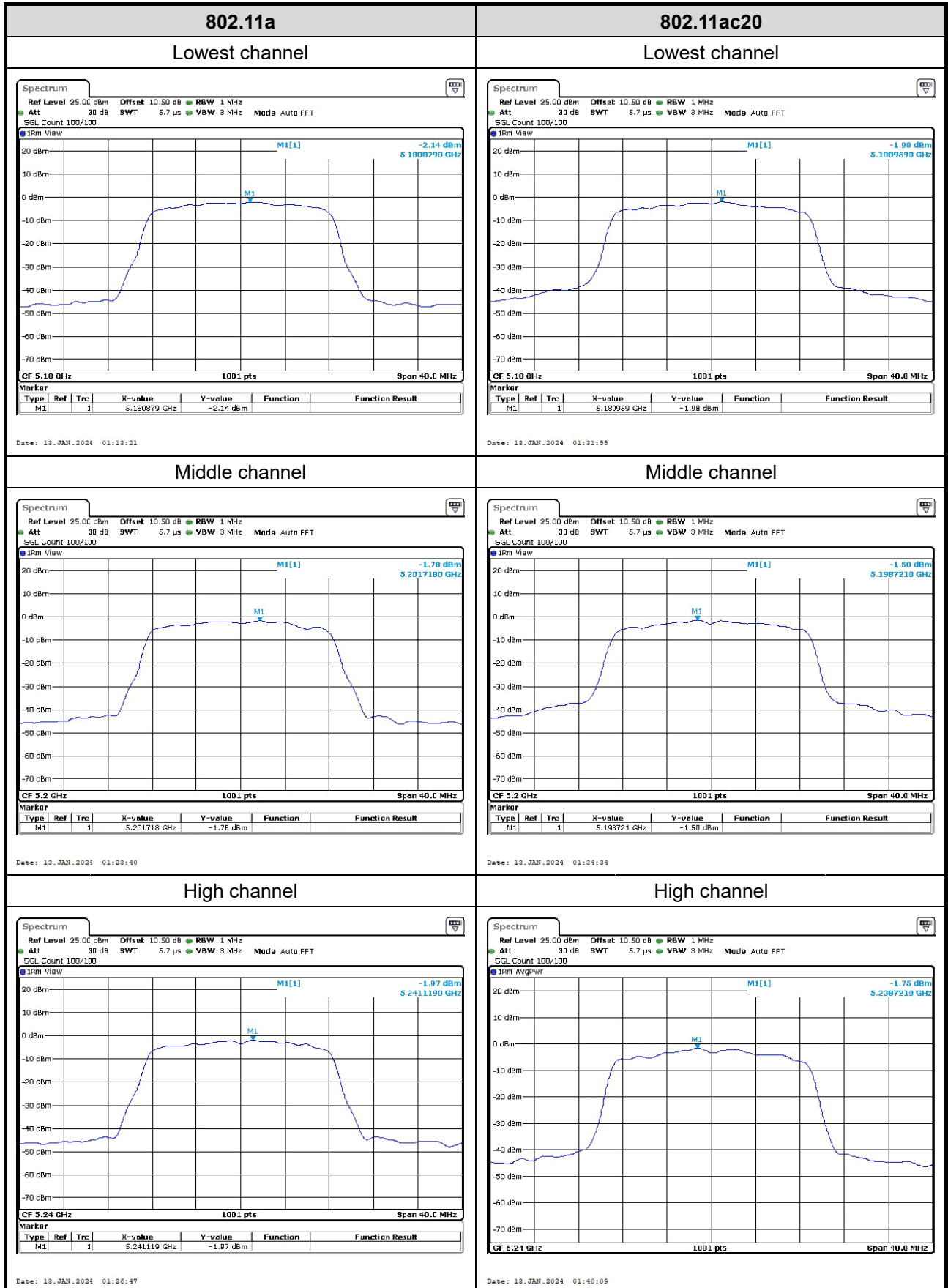
6dB Emission Bandwidth

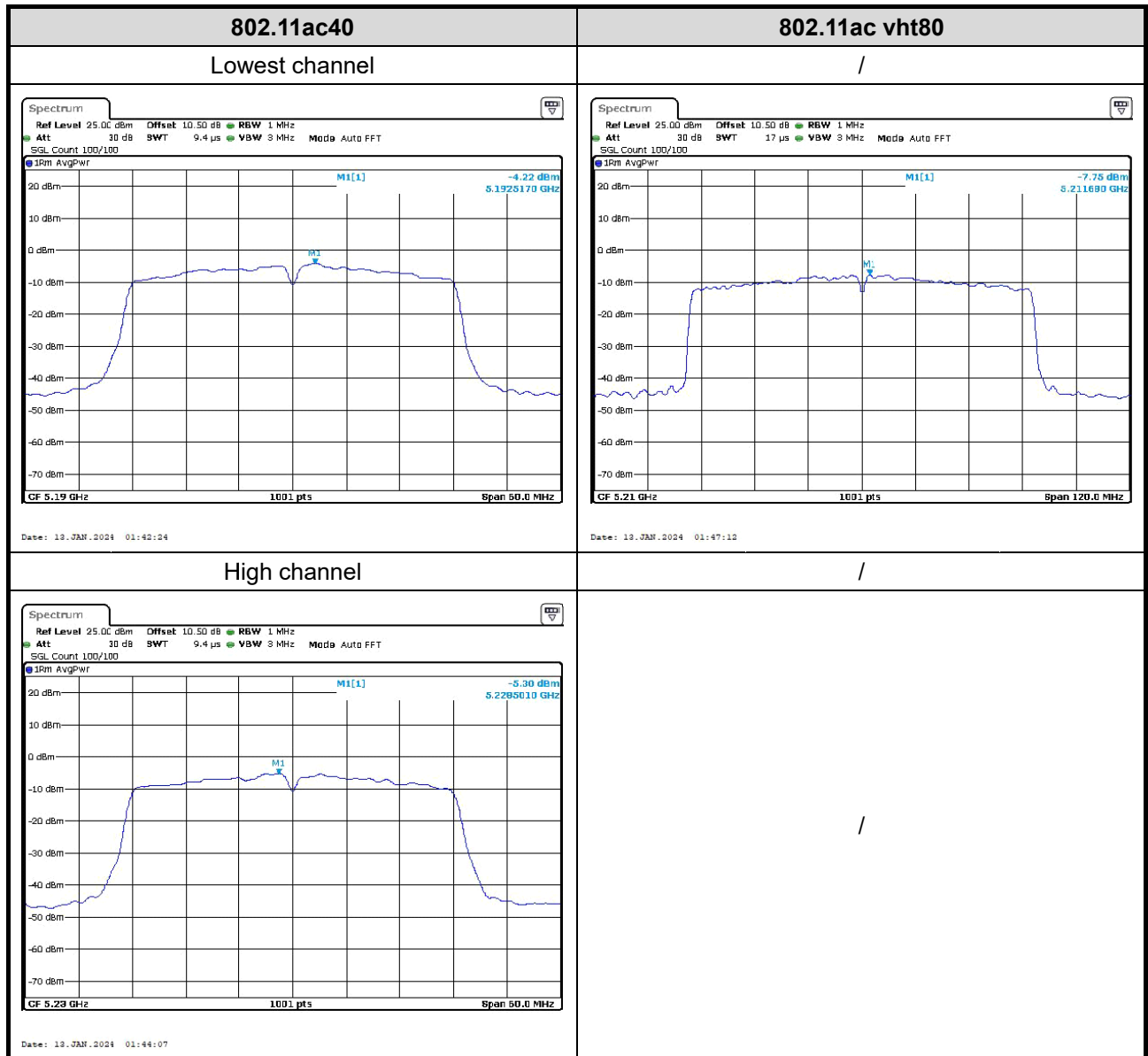




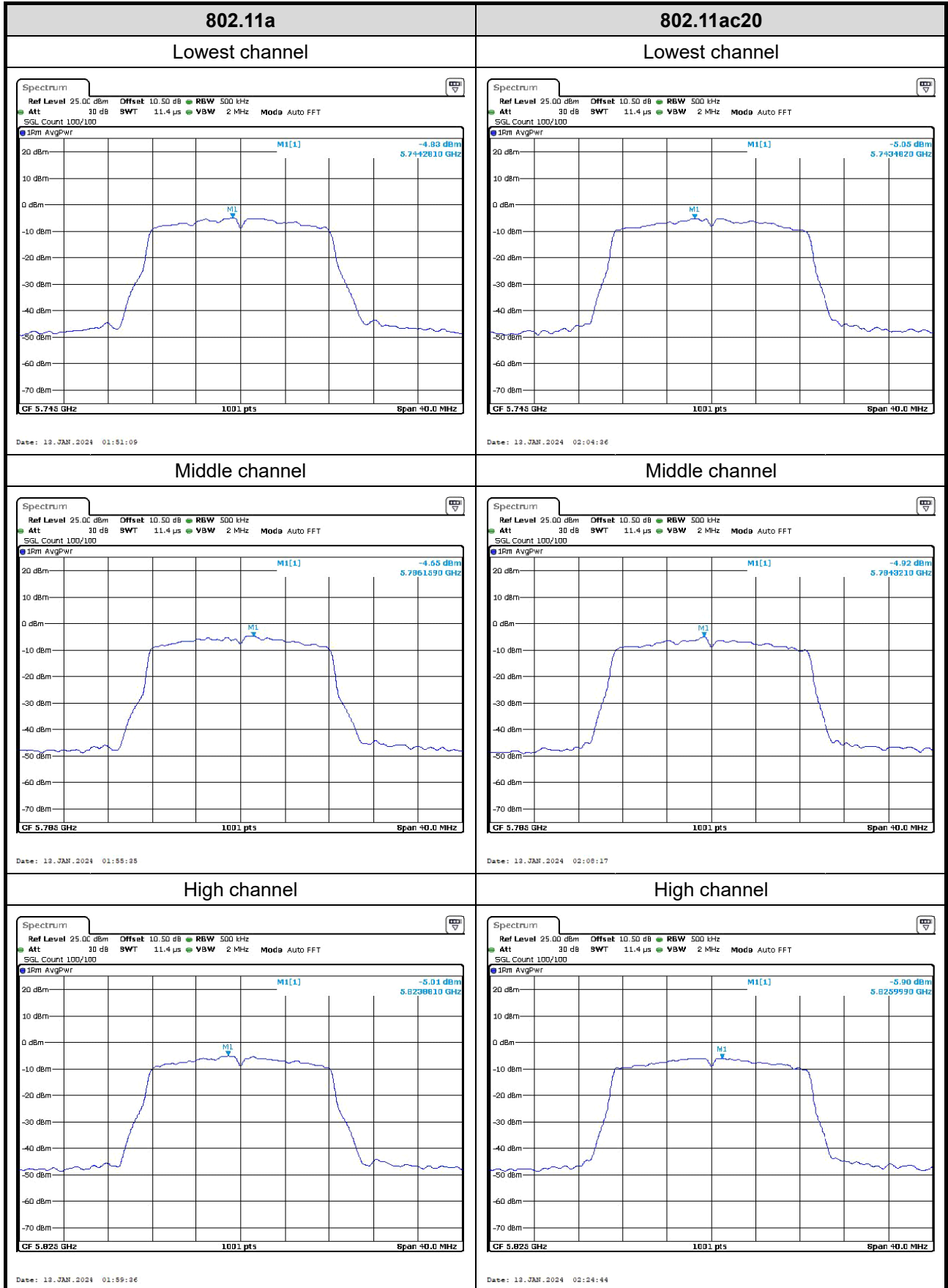
Power Spectral Density

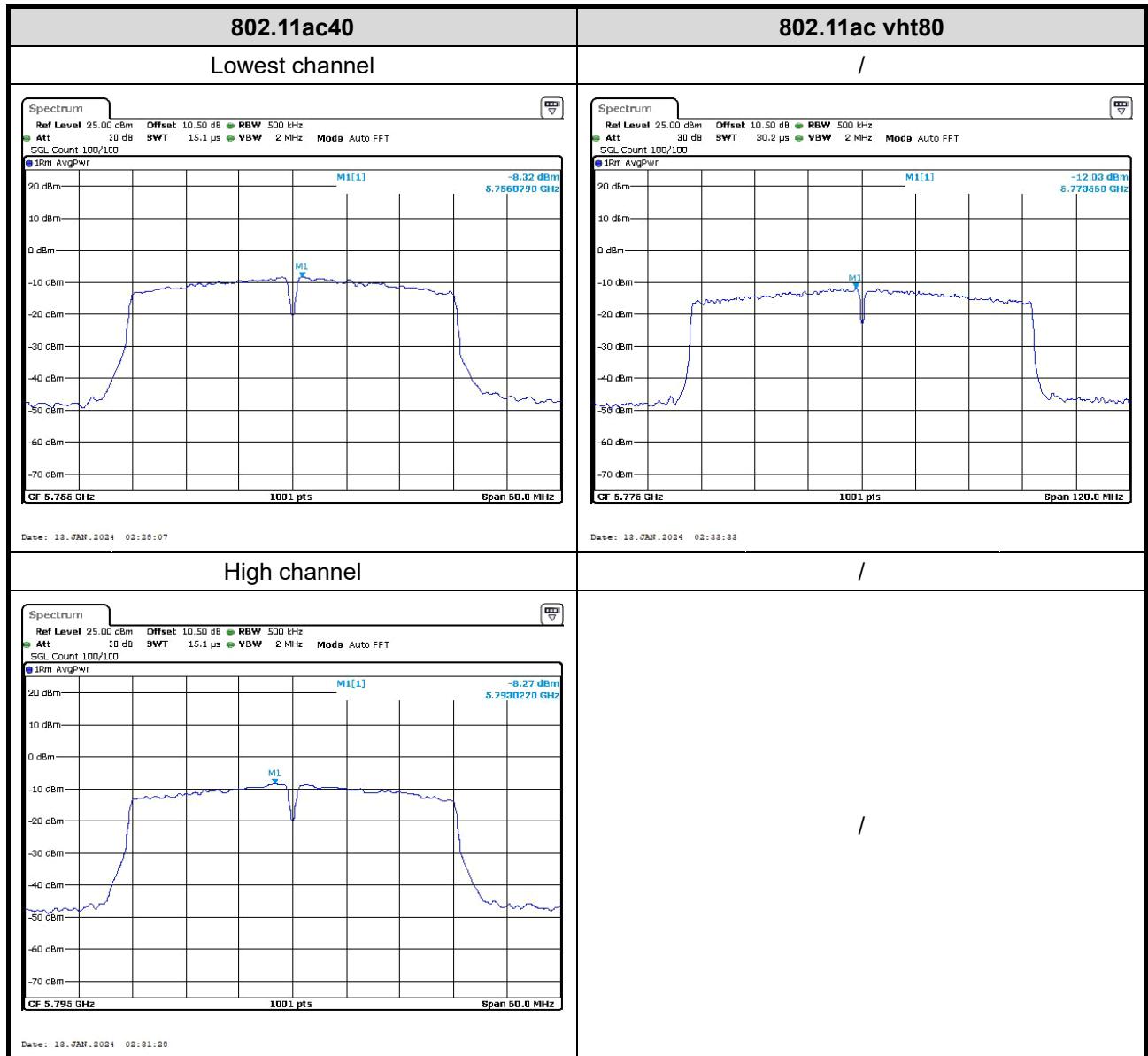
5150-5250MHz Band:



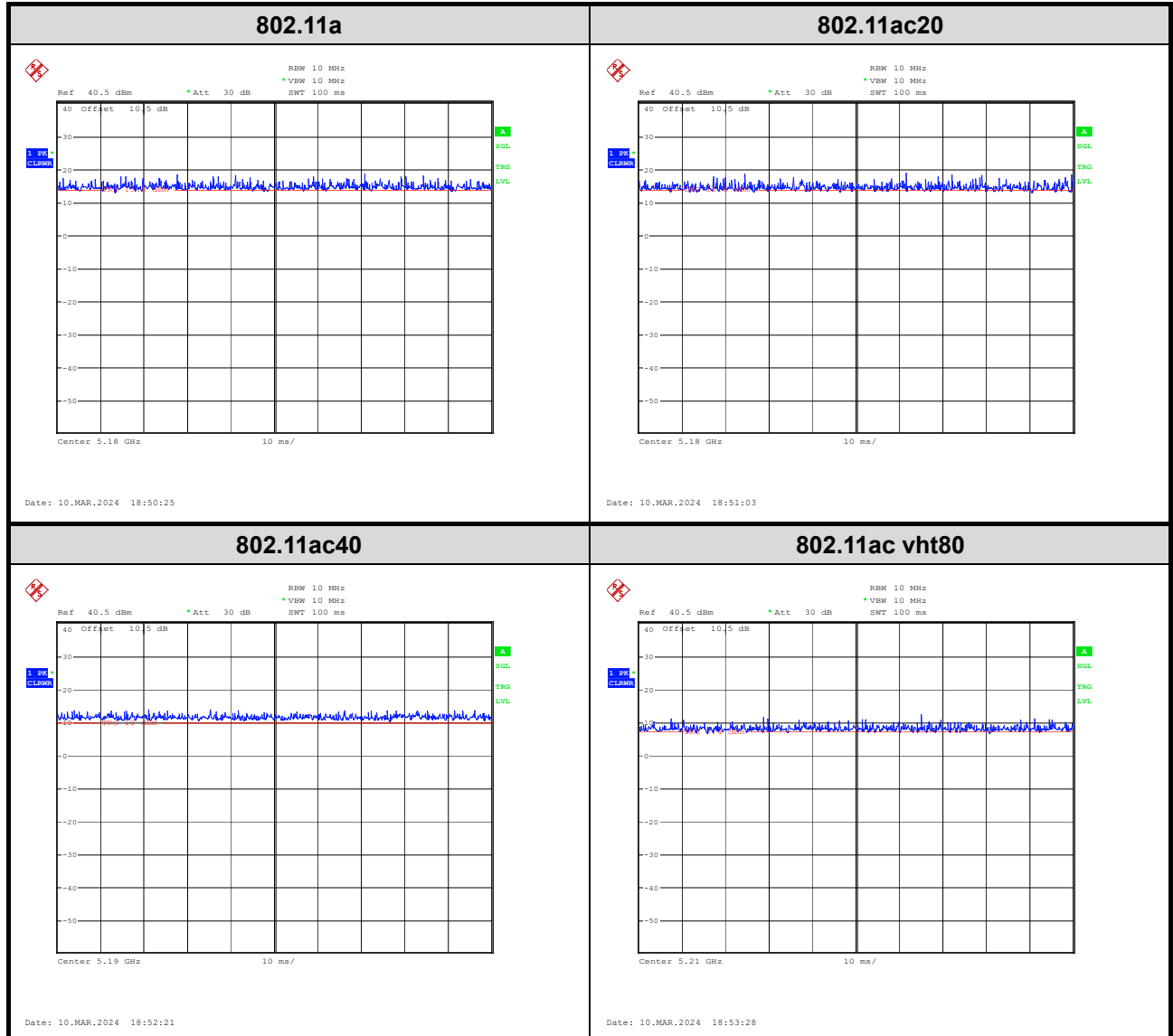


5725-5850MHz Band:





Duty Cycle



4 Test Setup Photo

Please refer to the attachment RWAZ202300123 Test Setup photo.

5 E.U.T Photo

Please refer to the attachment RWAZ202300123 External photo and RWAZ202300123 Internal photo.

---End of Report---