FCC Test Report

Report No.: RWAY202300020E

Applicant: SPACE

Address: 788 Shrewsbury Ave, Suite 2251, Tinton Falls, NJ 07724, USA

Product Name: The Space Safe

Product Model: TSS

Multiple Models: N/A

Trade Mark: SPACE

FCC ID: 2BEAZ-TSS1

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

Test Date: 2023-11-29 to 2024-01-03

Test Result: Complied

Issue Date: 2024-01-31

Reviewed by: Abel Chen

Abel Chen
Project Engineer

Approved by: Jacob Kong

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

NVLAP TESTING
NVLAP LAB CODE 600335-0

This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★"

Announcement

1. This test report shall not be reproduced in full or partial, without the written approval of World Alliance Testing and Certification (Shenzhen) Co., Ltd

2. The results in this report apply only to the sample tested.

3. This sample tested is in compliance with the limits of the above regulation.

4. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

5. The information marked "#" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

Revision History

Version No.	Issued Date	Description
00	2024-01-31	*Original*

Contents

1 General Information 4
1.1 Client Information 4
1.2 Product Description of EUT 4
1.3 Antenna information 4
1.4 Related Submittal(s)/Grant(s) 5
1.5 Measurement Uncertainty 5
1.6 Laboratory Location 5
1.7 Test Methodology 5
2 Description of Measurement 6
2.1 Test Configuration 6
2.2 Test Auxiliary Equipment 9
2.3 Test Setup 10
2.4 Test Procedure 12
2.5 Measurement Method 13
2.6 Measurement Equipment 13
3 Test Results 15
3.1 Test Summary 15
3.2 Limit 16
3.3 AC Line Conducted Emissions Test Data 17
3.4 Radiated emission Test Data 19
3.5 RF Conducted Test Data 39
3.5.1 26dB/6dB Emission Bandwidth and 99% Occupied Bandwidth 39
3.5.2 Maximum conducted output power 40
3.5.3 Power Spectral Density 42
3.5.4 Duty Cycle 43
4 Test Setup Photo 69
5 E.U.T Photo 70

1 General Information

1.1 Client Information

Applicant:	SPACE
Address:	788 Shrewsbury Ave, Suite 2251, Tinton Falls, NJ 07724, USA
Manufacturer:	SPACE
Address:	788 Shrewsbury Ave, Suite 2251, Tinton Falls, NJ 07724, USA

1.2 Product Description of EUT

The EUT is The Space Safe that contains Classic Bluetooth, BLE, 2.4G and 5G WLAN radios, this report covers the full testing of the 5G WLAN radio.

Sample Serial number	D-1 for CE&RE test, 1X-1 for RF conducted test (assigned by WATC)
Sample Received Date	2023-11-29
Sample Status	Good Condition
Frequency Range	5150 MHz -5250MHz 5250 MHz -5350MHz 5470 MHz -5725MHz 5725 MHz - 5850MHz
Maximum Conducted Output Power	5150 MHz -5250MHz: 13.70dBm 5250 MHz -5350MHz: 11.02dBm 5470 MHz -5725MHz: 10.90dBm 5725 MHz -5850MHz: 13.50dBm
Modulation Technology	OFDM
Spatial Streams	SISO (1TX, 1RX)
Antenna Gain#	0.52dBi
Power Supply	DC 5V from adapter or DC3.7V from battery
Operating temperature#	-20 deg.C to +40 deg.C
Adapter Information	Model: GS-552 Input: AC100-240V, 50/60Hz, 0.6A Output: DC 5V/3A, 9V/2A, 12V/1.2A
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, 2BEAZ-TSS1

FCC Part 15, Subpart C, Equipment Class: DTS, 2BEAZ-TSS1

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: (5250-5350MHz)					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
52	5260	58	5290	64	5320
54	5270	60	5300	/	/
56	5280	62	5310	/	/
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)

52	5260	56	5280	64	5320
802.11n-HT40, 802.11ac-VHT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
54	5270	/	/	62	5310
802.11ac-VHT80					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
/	/	58	5290	/	/

Operating channels: (5470-5725MHz)					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
100	5500	112	5560	126	5630
102	5510	116	5580	128	5640
104	5520	118	5590	132	5660
106	5530	120	5600	134	5670
108	5540	122	5610	136	5680
110	5550	124	5620	140	5700
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)
100	5500	116	5580	140	5700
802.11n-HT40, 802.11ac-VHT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
102	5510	110	5550	134	5670
802.11ac-VHT80					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
106	5530	/	/	122	5610

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#:	Engineer mode

Mode	Data rate	Power Level Setting#		
		Low Channel	Middle Channel	High Channel
5150-5250MHz				
802.11a	6Mbps	16	16	16
802.11n-HT20	MCS0	16	16	16
802.11n-HT40	MCS0	16	16	16
802.11ac-VHT80	MCS0	12	12	12
The exercise software and the maximum power setting that provided by manufacturer.				
5250-5350MHz				
802.11a	6Mbps	13	13	13
802.11n-HT20	MCS0	13	13	13
802.11n-HT40	MCS0	13	13	13
802.11ac-VHT80	MCS0	13	13	13
The exercise software and the maximum power setting that provided by manufacturer.				
5470-5725MHz				
802.11a	6Mbps	13	13	13

802.11n-HT20	MCS0	13	13	13
802.11n-HT40	MCS0	13	13	13
802.11ac-VHT80	MCS0	13	13	13
The exercise software and the maximum power setting that provided by manufacturer.				
5725-5850MHz				
802.11a	6Mbps	16	16	16
802.11n-HT20	MCS0	16	16	16
802.11n-HT40	MCS0	16	16	16
802.11ac-VHT80	MCS0	16	16	16
The exercise software and the maximum power setting that provided by manufacturer.				

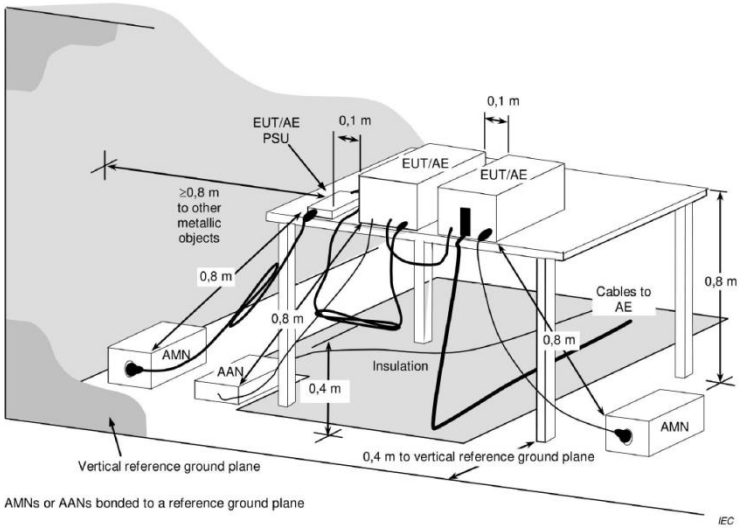
Worst-Case Configuration:
For AC power line conducted emission and radiated emission 9kHz-1GHz and above 18GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario. The ac vht20/ac vht40 were reduced test since the identical parameters with n-ht20/n-ht40.

2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

2.3 Test Setup

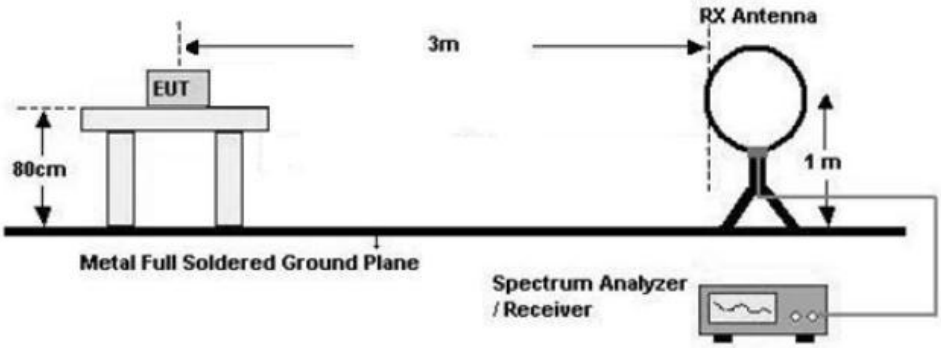
1) Conducted emission measurement:



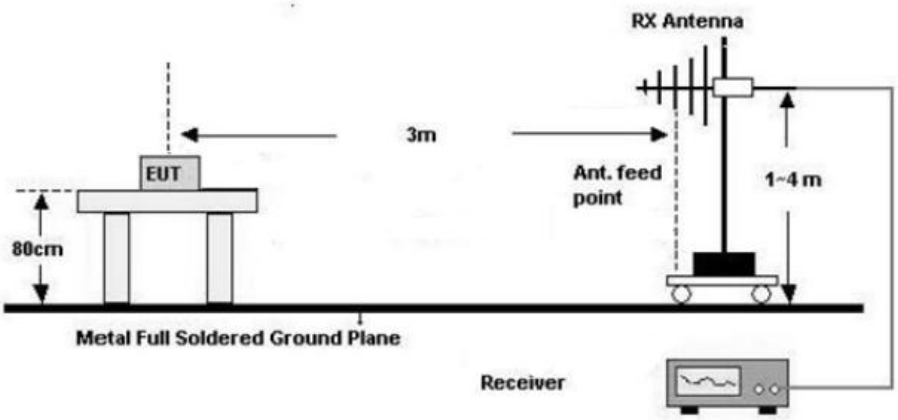
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

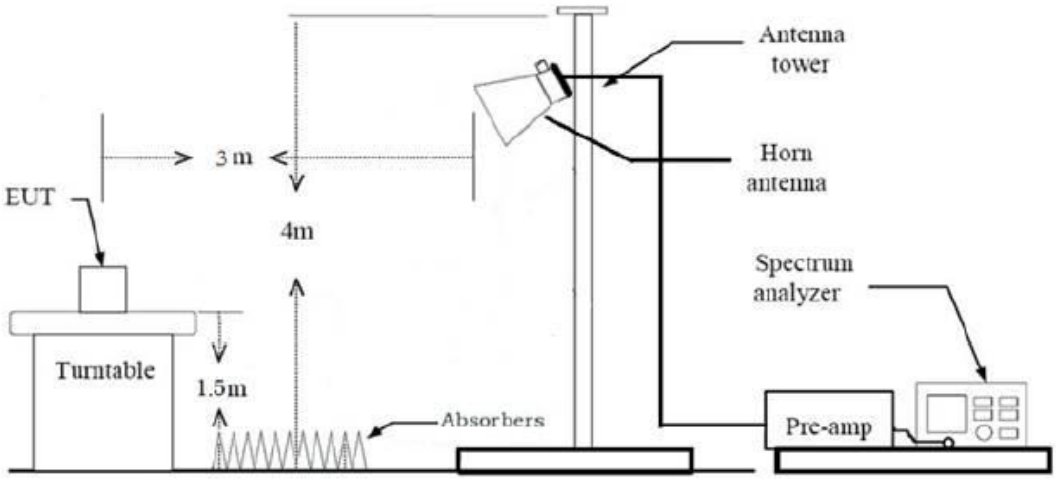
Below 30MHz (3m SAC)



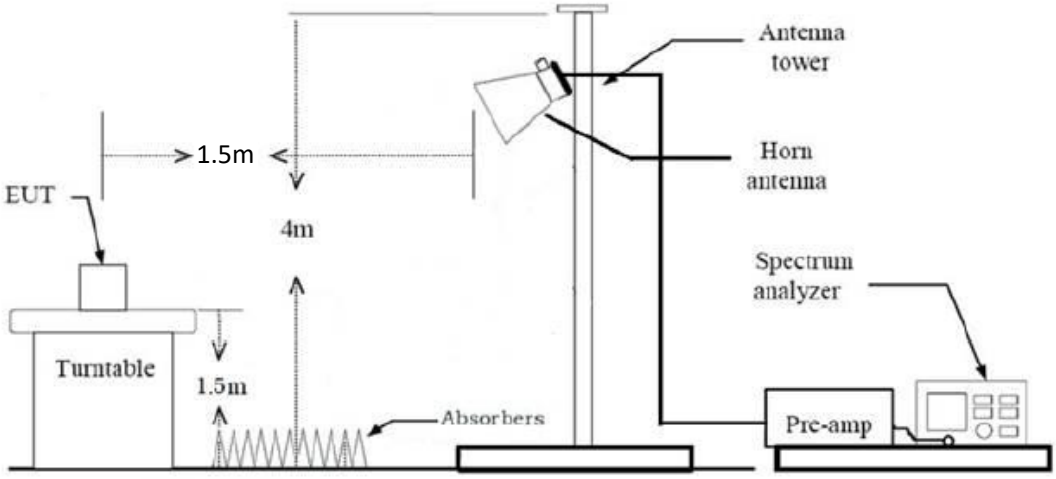
0MHz-1GHz (3m SAC)



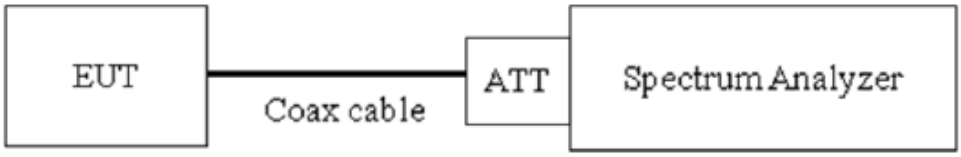
1GHz-18GHz(3m FAC)



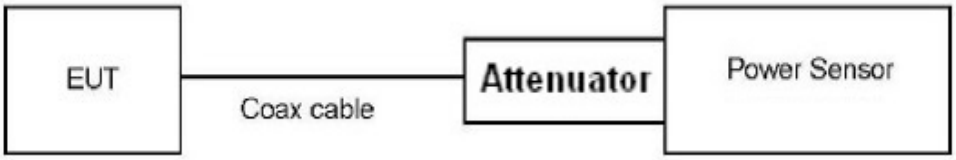
Above 18GHz (3m FAC)



3) RF Conducted Test



or



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*Log (test distance / specification distance).
2. Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, gound-parallel)

b) For 30MHz-1GHz:

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

c) For above 1GHz:

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

RF Conducted Test:

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

Spectrum analyzer) through Attenuator and RF cable.

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

2.5 Measurement Method

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

2.6 Measurement Equipment

Manufacturer	Description	Model	Management No.	Calibration Date	Calibration Due Date
AC Line Conducted Emission Test					
ROHDE& SCHWARZ	EMI TEST RECEIVER	ESR	101817	2023/7/3	2024/7/2
R&S	LISN	ENV216	101748	2023/8/1	2024/7/31
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-5150-5850-S	OE02104371	2023/9/15	2024/9/14
N/A	Coaxial Cable	N/A	NO.9	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.10	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.11	2023/8/8	2024/8/7
Audix	Test Software	E3	191218 V9	/	/
RF Conducted Test					
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSU-26	200680/026	2023/7/12	2024/7/11
ANRITSU	USB Power Sensor	MA24418A	12620	2023/7/12	2024/7/11
narda	6dB attenuator	603-06-1	N/A	2023/7/26	2024/7/25

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

3 Test Results

3.1 Test Summary

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

3.2 Limit

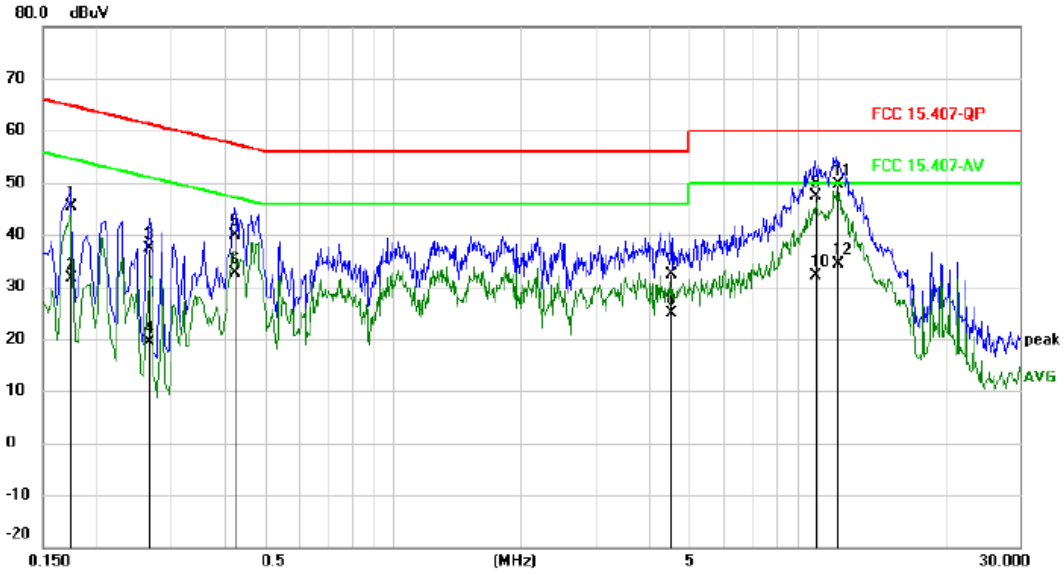
Test items	Limit
AC Power Line Conducted Emission	See details §15.207 (a)
Conducted Peak Output Power Power Spectral Density	**For the band 5.725-5.895 GHz:** For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas ofdirectional 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 withoutany corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipointsystems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. Theoperator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
26dB Emission Bandwidth 99% Occupied Bandwidth	N/A
6dB Emission Bandwidth	Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.
Unwanted Emissions	For transmitters operating in the 5.15–5.25 GHz band: All emissions outside of the 5.15–5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.25–5.35 GHz band: All emissions outside of the 5.15–5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.47–5.725 GHz band: All emissions outside of the 5.47–5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating solely in the 5.725–5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. The provisions of § 15.205 apply to intentional radiators operating under this section.

3.3 AC Line Conducted Emissions Test Data

Test Date:	2023-11-29	Test By:	Lirou Li
Environment condition:	Temperature: 26.8°C; Relative Humidity:55%; ATM Pressure: 100.2kPa		

Conducted Emission Measurement

File :RWAY202300020 Data :#10 Date: 2023/11/29 Time: 15:23:07



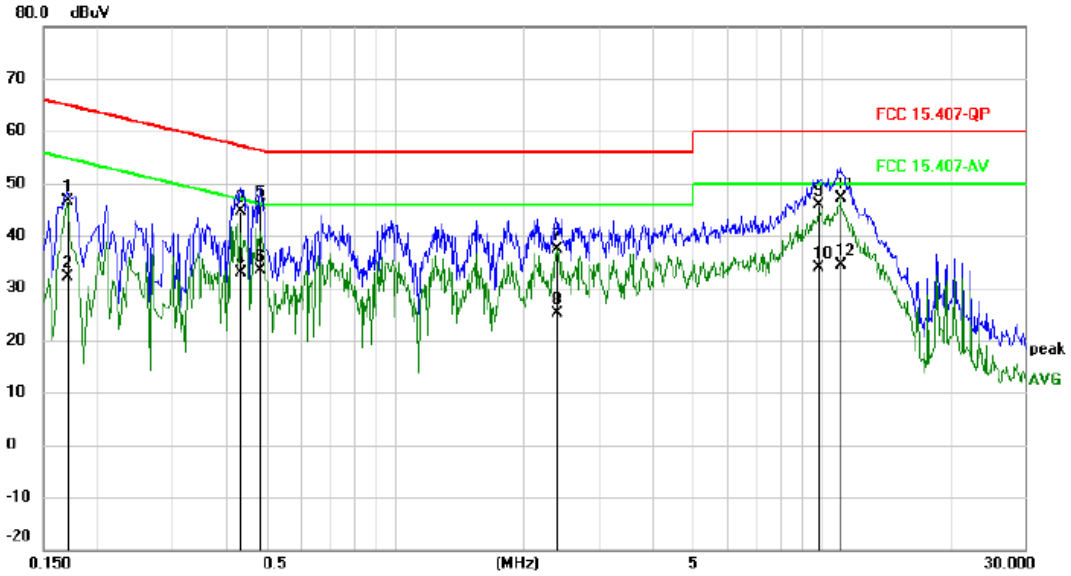
Limit: FCC 15.407-QP Phase: L1 Temperature: 26.8
Mode:transmit Power: AC 120V/60Hz Humidity: 55 %
Note: U-NII-1 802.11a middle channel Air Pressure: 1002 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1740	34.57	10.71	45.28	64.77	-19.49	QP	
2		0.1740	20.87	10.71	31.58	54.77	-23.19	AVG	
3		0.2660	26.66	10.67	37.33	61.24	-23.91	QP	
4		0.2660	8.72	10.67	19.39	51.24	-31.85	AVG	
5		0.4220	29.05	10.79	39.84	57.41	-17.57	QP	
6		0.4220	21.96	10.79	32.75	47.41	-14.66	AVG	
7		4.5060	21.24	11.13	32.37	56.00	-23.63	QP	
8		4.5060	13.81	11.13	24.94	46.00	-21.06	AVG	
9		9.8620	36.84	10.44	47.28	60.00	-12.72	QP	
10		9.8620	21.80	10.44	32.24	50.00	-17.76	AVG	
11	*	11.1620	39.12	10.45	49.57	60.00	-10.43	QP	
12		11.1620	23.86	10.45	34.31	50.00	-15.69	AVG	

*:Maximum data x:Over limit !:over margin Engineer Signature: Lirou

Conducted Emission Measurement

File :RWAY202300020 Data :#9 Date: 2023/11/29 Time: 15:20:56



Limit: FCC 15.407-QP Phase: N Temperature: 26.8
Mode: transmit Power: AC 120V/60Hz Humidity: 55 %
Note: U-NII-1 802.11a middle channel Air Pressure: 1002 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1700	36.12	10.53	46.65	64.96	-18.31	QP	
2		0.1700	21.67	10.53	32.20	54.96	-22.76	AVG	
3		0.4340	33.93	10.67	44.60	57.18	-12.58	QP	
4		0.4340	22.18	10.67	32.85	47.18	-14.33	AVG	
5	*	0.4820	34.98	10.70	45.68	56.30	-10.62	QP	
6		0.4820	22.80	10.70	33.50	46.30	-12.80	AVG	
7		2.3940	26.81	10.63	37.44	56.00	-18.56	QP	
8		2.3940	14.57	10.63	25.20	46.00	-20.80	AVG	
9		9.8139	35.18	10.71	45.89	60.00	-14.11	QP	
10		9.8139	23.07	10.71	33.78	50.00	-16.22	AVG	
11		11.1260	36.49	10.74	47.23	60.00	-12.77	QP	
12		11.1260	23.54	10.74	34.28	50.00	-15.72	AVG	

*:Maximum data x:Over limit !:over margin Engineer Signature: Lirou

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

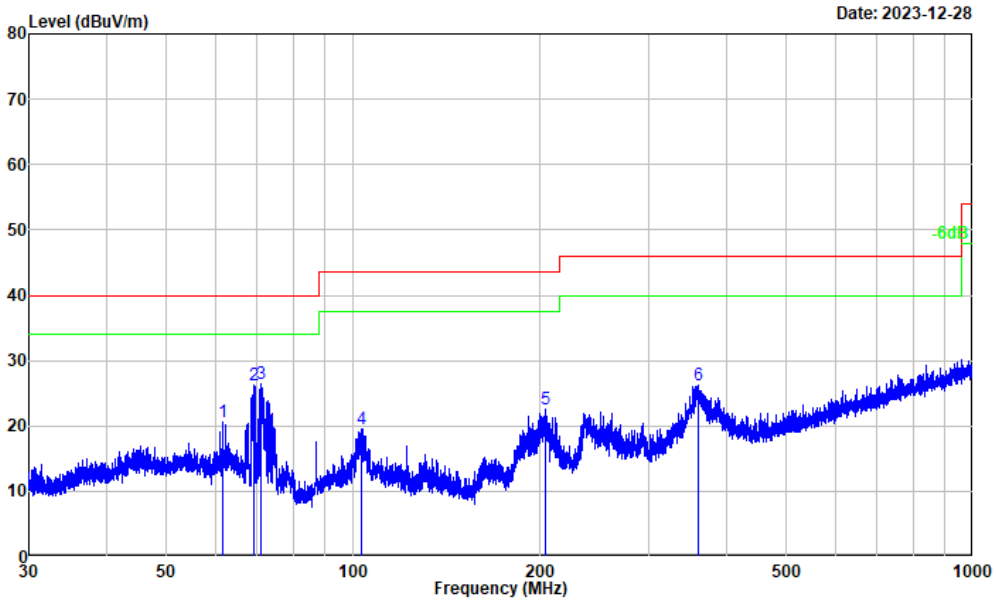
9 kHz-30MHz:

Test Date:	2023-12-28	**Test By:**	Luke Li
Environment condition:	Temperature: 23.6°C; Relative Humidity:43%; ATM Pressure: 101.7kPa		

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

30MHz-1GHz:

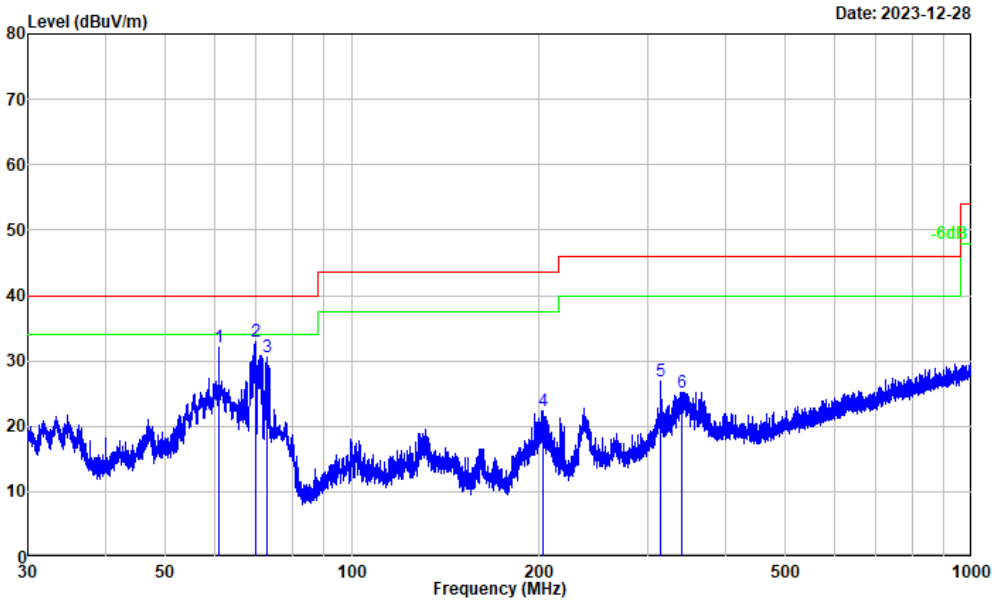
Test Date:	2023-12-28	Test By:	Luke Li
Environment condition:	Temperature: 23.6°C; Relative Humidity:43%; ATM Pressure: 101.7kPa		



Project No. : RWAY202300020
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.6℃/43%R.H./101.7kPa
Tested by : Luke Li
Polarization : horizontal
Remark : 5.2G a mode Middle Channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	61.697	34.11	-13.60	20.51	40.00	-19.49	Peak
2	69.144	41.85	-15.72	26.13	40.00	-13.87	Peak
3	71.143	43.04	-16.52	26.52	40.00	-13.48	Peak
4	103.306	33.37	-13.75	19.62	43.50	-23.88	Peak
5	204.059	36.21	-13.61	22.60	43.50	-20.90	Peak
6	360.606	35.50	-9.25	26.25	46.00	-19.75	Peak

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



Project No. : RWAY202300020
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.6℃/43%R.H./101.7kPa
Tested by : Luke Li
Polarization : vertical
Remark : 5.2G a mode Middle Channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	61.105	45.52	-13.54	31.98	40.00	-8.02	Peak
2	70.029	49.06	-16.07	32.99	40.00	-7.01	Peak
3	72.943	47.81	-17.14	30.67	40.00	-9.33	Peak
4	203.077	35.89	-13.61	22.28	43.50	-21.22	Peak
5	315.066	37.60	-10.75	26.85	46.00	-19.15	Peak
6	340.036	34.94	-9.70	25.24	46.00	-20.76	Peak

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

Remark:

Result = Reading + Factor

Factor = Antenna factor + Cable loss – Amplifier gain

Margin = Result – Limit

Above 1GHz:

Test Date:	2023-12-14~2024-01-02	**Test By:**	Bard Huang
Environment condition:	Temperature: 22.1~23.8°C; Relative Humidity:52~60%; ATM Pressure: 101.3kPa		

Frequency (MHz)	**Reading level (dBμV)**	**Polar (H/V)**	**Corrected Factor (dB/m)**	**Corrected Amplitude (dBμV/m)**	**Limit (dBμV/m)**	**Margin (dB)**	**Remark**
5150-5250MHz Band							
802.11a							
Low Channel							
5149.925	37.53	horizontal	11.56	49.09	54.00	-4.91	Average
5149.925	48.00	horizontal	11.56	59.56	74.00	-14.44	Peak
5149.925	38.32	vertical	11.56	49.88	54.00	-4.12	Average
5149.925	50.60	vertical	11.56	62.16	74.00	-11.84	Peak
10360.000	48.78	horizontal	5.50	54.28	68.20	-13.92	Peak
10360.000	47.61	vertical	5.50	53.11	68.20	-15.09	Peak
Middle Channel							
10400.000	48.13	horizontal	5.70	53.83	68.20	-14.37	Peak
10400.000	48.37	vertical	5.70	54.07	68.20	-14.13	Peak
High Channel							
5350.000	36.57	horizontal	11.44	48.01	54.00	-5.99	Average
5350.000	48.24	horizontal	11.44	59.68	74.00	-14.32	Peak
5350.000	36.71	vertical	11.44	48.15	54.00	-5.85	Average
5350.000	47.57	vertical	11.44	59.01	74.00	-14.99	Peak
10480.000	46.91	horizontal	5.74	52.65	68.20	-15.55	Peak
10480.000	47.95	vertical	5.74	53.69	68.20	-14.51	Peak
802.11n20							
Low Channel							
5150.000	36.78	horizontal	11.57	48.35	54.00	-5.65	Average
5150.000	47.54	horizontal	11.57	59.11	74.00	-14.89	Peak
5146.073	37.97	vertical	11.56	49.53	54.00	-4.47	Average
5146.073	55.12	vertical	11.56	66.68	74.00	-7.32	Peak
10360.000	47.76	horizontal	5.50	53.26	68.20	-14.94	Peak
10360.000	48.18	vertical	5.50	53.68	68.20	-14.52	Peak
Middle Channel							
10400.000	48.22	horizontal	5.70	53.92	68.20	-14.28	Peak
10400.000	48.61	vertical	5.70	54.31	68.20	-13.89	Peak
High Channel							

5350.000	36.93	horizontal	11.44	48.37	54.00	-5.63	Average
5350.000	48.04	horizontal	11.44	59.48	74.00	-14.52	Peak
5350.000	36.71	vertical	11.44	48.15	54.00	-5.85	Average
5350.000	48.84	vertical	11.44	60.28	74.00	-13.72	Peak
10480.000	48.76	horizontal	5.74	54.50	68.20	-13.70	Peak
10480.000	47.16	vertical	5.74	52.90	68.20	-15.30	Peak
802.11n40							
Low Channel							
5150.000	38.92	horizontal	11.57	50.49	54.00	-3.51	Average
5150.000	53.02	horizontal	11.57	64.59	74.00	-9.41	Peak
5150.000	38.74	vertical	11.57	50.31	54.00	-3.69	Average
5150.000	58.86	vertical	11.57	70.43	74.00	-3.57	Peak
10380.000	47.37	horizontal	5.60	52.97	68.20	-15.23	Peak
10380.000	48.69	vertical	5.60	54.29	68.20	-13.91	Peak
High Channel							
5350.000	37.00	horizontal	11.44	48.44	54.00	-5.56	Average
5350.000	47.68	horizontal	11.44	59.12	74.00	-14.88	Peak
5350.000	36.87	vertical	11.44	48.31	54.00	-5.69	Average
5350.000	47.93	vertical	11.44	59.37	74.00	-14.63	Peak
10460.000	47.86	horizontal	5.73	53.59	68.20	-14.61	Peak
10460.000	46.28	vertical	5.73	52.01	68.20	-16.19	Peak
802.11ac80							
5139.860	38.06	horizontal	11.54	49.60	54.00	-4.40	Average
5139.860	53.33	horizontal	11.54	64.87	74.00	-9.13	Peak
5131.496	38.89	vertical	11.52	50.41	54.00	-3.59	Average
5131.496	58.71	vertical	11.52	70.23	74.00	-3.77	Peak
5350.000	37.02	horizontal	11.44	48.46	54.00	-5.54	Average
5350.000	47.84	horizontal	11.44	59.28	74.00	-14.72	Peak
5350.000	36.87	vertical	11.44	48.31	54.00	-5.69	Average
5350.000	48.22	vertical	11.44	59.66	74.00	-14.34	Peak
10420.000	48.13	horizontal	5.71	53.84	68.20	-14.36	Peak
10420.000	47.76	vertical	5.71	53.47	68.20	-14.73	Peak
5250-5350MHz Band							
802.11a							
Low Channel							
5150.000	35.53	horizontal	11.57	47.10	54.00	-6.90	Average
5150.000	49.46	horizontal	11.57	61.03	74.00	-12.97	Peak
5150.000	35.76	vertical	11.57	47.33	54.00	-6.67	Average

5150.000	48.64	vertical	11.57	60.21	74.00	-13.79	Peak
10520.000	47.81	horizontal	5.78	53.59	68.20	-14.61	Peak
10520.000	48.05	vertical	5.78	53.83	68.20	-14.37	Peak
Middle Channel							
10560.000	47.15	horizontal	5.84	52.99	68.20	-15.21	Peak
10560.000	46.87	vertical	5.84	52.71	68.20	-15.49	Peak
High Channel							
5350.000	35.30	horizontal	11.44	46.74	54.00	-7.26	Average
5350.000	47.92	horizontal	11.44	59.36	74.00	-14.64	Peak
5350.000	36.28	vertical	11.44	47.72	54.00	-6.28	Average
5350.000	49.92	vertical	11.44	61.36	74.00	-12.64	Peak
10640.000	47.75	horizontal	5.92	53.67	74.00	-20.33	Peak
10640.000	47.95	vertical	5.92	53.87	74.00	-20.13	Peak
802.11n20							
Low Channel							
5150.000	35.60	horizontal	11.57	47.17	54.00	-6.83	Average
5150.000	48.22	horizontal	11.57	59.79	74.00	-14.21	Peak
5150.000	35.87	vertical	11.57	47.44	54.00	-6.56	Average
5150.000	47.49	vertical	11.57	59.06	74.00	-14.94	Peak
10520.000	48.03	horizontal	5.78	53.81	68.20	-14.39	Peak
10520.000	47.37	vertical	5.78	53.15	68.20	-15.05	Peak
Middle Channel							
10560.000	47.24	horizontal	5.84	53.08	68.20	-15.12	Peak
10560.000	47.61	vertical	5.84	53.45	68.20	-14.75	Peak
High Channel							
5350.000	35.34	horizontal	11.44	46.78	54.00	-7.22	Average
5350.000	48.16	horizontal	11.44	59.60	74.00	-14.40	Peak
5350.000	36.34	vertical	11.44	47.78	54.00	-6.22	Average
5350.000	48.88	vertical	11.44	60.32	74.00	-13.68	Peak
10640.000	37.26	horizontal	5.92	43.18	54.00	-10.82	Average
10640.000	48.72	horizontal	5.92	54.64	74.00	-19.36	Peak
10640.000	37.51	vertical	5.92	43.43	54.00	-10.57	Average
10640.000	48.34	vertical	5.92	54.26	74.00	-19.74	Peak
802.11n40							
Low Channel							
5150.000	35.55	horizontal	11.57	47.12	54.00	-6.88	Average
5150.000	48.66	horizontal	11.57	60.23	74.00	-13.77	Peak
5150.000	35.85	vertical	11.57	47.42	54.00	-6.58	Average

5150.000	48.56	vertical	11.57	60.13	74.00	-13.87	Peak
10540.000	48.38	horizontal	5.80	54.18	68.20	-14.02	Peak
10540.000	48.47	vertical	5.80	54.27	68.20	-13.93	Peak
High Channel							
5350.000	35.39	horizontal	11.44	46.83	54.00	-7.17	Average
5350.000	47.90	horizontal	11.44	59.34	74.00	-14.66	Peak
5350.000	36.64	vertical	11.44	48.08	54.00	-5.92	Average
5350.000	49.69	vertical	11.44	61.13	74.00	-12.87	Peak
10620.000	37.71	horizontal	5.90	43.61	54.00	-10.39	Average
10620.000	48.34	horizontal	5.90	54.24	74.00	-19.76	Peak
10620.000	37.41	vertical	5.90	43.31	54.00	-10.69	Average
10620.000	48.96	vertical	5.90	54.86	74.00	-19.14	Peak
802.11ac80							
5150.000	35.58	horizontal	11.57	47.15	54.00	-6.85	Average
5150.000	48.43	horizontal	11.57	60.00	74.00	-14.00	Peak
5150.000	35.85	vertical	11.57	47.42	54.00	-6.58	Average
5150.000	48.51	vertical	11.57	60.08	74.00	-13.92	Peak
5350.000	35.44	horizontal	11.44	46.88	54.00	-7.12	Average
5350.000	48.02	horizontal	11.44	59.46	74.00	-14.54	Peak
5351.386	39.40	vertical	11.45	50.85	54.00	-3.15	Average
5351.386	51.94	vertical	11.45	63.39	74.00	-10.61	Peak
10580.000	47.64	vertical	5.86	53.50	68.20	-14.70	Peak
10580.000	47.69	horizontal	5.86	53.55	68.20	-14.65	Peak
5470-5725MHz Band							
802.11a							
Low Channel							
5460.000	37.58	horizontal	1.55	39.13	54.00	-14.87	Average
5460.000	48.36	horizontal	1.55	49.91	74.00	-24.09	Peak
5460.000	37.72	vertical	1.55	39.27	54.00	-14.73	Average
5460.000	48.10	vertical	1.55	49.65	74.00	-24.35	Peak
11000.000	43.55	horizontal	6.37	49.92	74.00	-24.08	Peak
11000.000	44.29	vertical	6.37	50.66	74.00	-23.34	Peak
Middle Channel							
11160.000	45.48	horizontal	6.60	52.08	74.00	-21.92	Peak
11160.000	45.14	vertical	6.60	51.74	74.00	-22.26	Peak
High Channel							
5725.000	47.49	horizontal	2.03	49.52	68.20	-18.68	Peak
5725.000	47.95	vertical	2.03	49.98	68.20	-18.22	Peak

11400.000	37.65	horizontal	6.35	44.00	54.00	-10.00	Average
11400.000	49.67	horizontal	6.35	56.02	74.00	-17.98	Peak
11400.000	37.83	vertical	6.35	44.18	54.00	-9.82	Average
11400.000	49.02	vertical	6.35	55.37	74.00	-18.63	Peak
802.11n20							
Low Channel							
5460.000	37.18	horizontal	1.55	38.73	54.00	-15.27	Average
5460.000	48.00	horizontal	1.55	49.55	74.00	-24.45	Peak
5460.000	37.42	vertical	1.55	38.97	54.00	-15.03	Average
5460.000	48.70	vertical	1.55	50.25	74.00	-23.75	Peak
11000.000	44.78	horizontal	6.37	51.15	74.00	-22.85	Peak
11000.000	43.73	vertical	6.37	50.10	74.00	-23.90	Peak
Middle Channel							
11160.000	45.74	horizontal	6.60	52.34	74.00	-21.66	Peak
11160.000	45.26	vertical	6.60	51.86	74.00	-22.14	Peak
High Channel							
5725.000	47.74	horizontal	2.03	49.77	68.20	-18.43	Peak
5725.000	49.08	vertical	2.03	51.11	68.20	-17.09	Peak
11400.000	37.68	horizontal	6.35	44.03	54.00	-9.97	Average
11400.000	49.36	horizontal	6.35	55.71	74.00	-18.29	Peak
11400.000	37.81	vertical	6.35	44.16	54.00	-9.84	Average
11400.000	48.55	vertical	6.35	54.90	74.00	-19.10	Peak
802.11n40							
Low Channel							
5450.000	37.74	horizontal	1.52	39.26	54.00	-14.74	Average
5450.000	47.62	horizontal	1.52	49.14	74.00	-24.86	Peak
5460.000	37.80	vertical	1.55	39.35	54.00	-14.65	Average
5460.000	48.78	vertical	1.55	50.33	74.00	-23.67	Peak
11020.000	44.21	horizontal	6.39	50.60	74.00	-23.40	Peak
11020.000	44.24	vertical	6.39	50.63	74.00	-23.37	Peak
Middle Channel							
11180.000	46.77	horizontal	6.66	53.43	74.00	-20.57	Peak
11180.000	45.55	vertical	6.66	52.21	74.00	-21.79	Peak
High Channel							
5725.000	48.06	horizontal	2.03	50.09	68.20	-18.11	Peak
5725.000	53.24	vertical	2.03	55.27	68.20	-12.93	Peak
11340.000	37.61	horizontal	6.49	44.10	54.00	-9.90	Average
11340.000	49.03	horizontal	6.49	55.52	74.00	-18.48	Peak

11340.000	37.57	vertical	6.49	44.06	54.00	-9.94	Average
11340.000	48.65	vertical	6.49	55.14	74.00	-18.86	Peak
802.11ac80							
Low Channel							
5460.000	37.35	horizontal	1.55	38.90	54.00	-15.10	Average
5460.000	47.89	horizontal	1.55	49.44	74.00	24.56	Peak
5455.968	38.86	vertical	1.53	40.39	54.00	-13.61	Average
5455.968	54.46	vertical	1.53	55.99	74.00	-18.01	Peak
11060.000	46.26	horizontal	6.42	52.68	74.00	-21.32	Peak
11060.000	46.02	vertical	6.42	52.44	74.00	-21.56	Peak
High Channel							
5725.000	46.54	horizontal	2.03	48.57	68.20	-19.63	Peak
5725.000	48.07	vertical	2.03	50.10	68.20	-18.10	Peak
11220.000	46.71	horizontal	6.68	53.39	74.00	-20.61	Peak
11220.000	46.65	vertical	6.68	53.33	74.00	-20.67	Peak
5725-5850MHz Band							
802.11a							
Low Channel							
5634.617	49.76	horizontal	11.90	61.66	68.20	-6.54	Peak
5653.527	49.14	horizontal	11.91	61.05	70.82	-9.77	Peak
5704.752	50.36	horizontal	12.00	62.36	106.53	-44.17	Peak
5723.662	50.61	horizontal	12.03	62.64	119.15	-56.51	Peak
5639.920	49.94	vertical	11.91	61.85	68.20	-6.35	Peak
5652.526	49.67	vertical	11.91	61.58	70.08	-8.50	Peak
5718.659	57.28	vertical	12.03	69.31	110.43	-41.12	Peak
5724.662	63.70	vertical	12.03	75.73	121.43	-45.70	Peak
11490.000	44.11	horizontal	6.46	50.57	74.00	-23.43	Peak
11490.000	43.66	vertical	6.46	50.12	74.00	-23.88	Peak
Middle Channel							
11570.000	37.96	horizontal	6.52	44.48	54.00	-9.52	Average
11570.000	47.83	horizontal	6.52	54.35	74.00	-19.65	Peak
11570.000	38.62	vertical	6.52	45.14	54.00	-8.86	Average
11570.000	48.07	vertical	6.52	54.59	74.00	-19.41	Peak
High Channel							
5853.939	49.42	horizontal	12.31	61.73	113.22	-51.49	Peak
5873.474	48.75	horizontal	12.38	61.13	105.63	-44.50	Peak
5923.549	49.10	horizontal	12.44	61.54	69.27	-7.73	Peak
5934.142	50.16	horizontal	12.42	62.58	68.20	-5.62	Peak

5851.601	59.65	vertical	12.31	71.96	118.55	-46.59	Peak
5873.750	49.24	vertical	12.38	61.62	105.55	-43.93	Peak
5922.036	49.77	vertical	12.44	62.21	70.38	-8.17	Peak
5941.708	49.80	vertical	12.41	62.21	68.20	-5.99	Peak
11650.000	44.88	horizontal	6.55	51.43	74.00	-22.57	Peak
11650.000	45.50	vertical	6.55	52.05	74.00	-21.95	Peak
802.11n20							
Low Channel							
5648.625	49.78	horizontal	11.91	61.69	68.20	-6.51	Peak
5651.926	48.97	horizontal	11.90	60.87	69.63	-8.76	Peak
5700.851	49.54	horizontal	12.00	61.54	105.44	-43.90	Peak
5724.563	56.99	horizontal	12.03	69.02	121.20	-52.18	Peak
5646.723	50.80	vertical	11.91	62.71	68.20	-5.49	Peak
5652.126	49.73	vertical	11.90	61.63	69.78	-8.15	Peak
5718.459	60.98	vertical	12.03	73.01	110.37	-37.36	Peak
5724.362	65.73	vertical	12.03	77.76	120.75	-42.99	Peak
11490.000	44.13	horizontal	6.46	50.59	74.00	-23.41	Peak
11490.000	43.45	vertical	6.46	49.91	74.00	-24.09	Peak
Middle Channel							
11570.000	36.89	horizontal	6.52	43.41	54.00	-10.59	Average
11570.000	47.50	horizontal	6.52	54.02	74.00	-19.98	Peak
11570.000	37.60	vertical	6.52	44.12	54.00	-9.88	Average
11570.000	47.95	vertical	6.52	54.47	74.00	-19.53	Peak
High Channel							
5852.151	49.92	horizontal	12.31	62.23	117.29	-55.06	Peak
5874.437	49.10	horizontal	12.38	61.48	105.36	-43.88	Peak
5924.237	50.34	horizontal	12.43	62.77	68.76	-5.99	Peak
5930.015	49.51	horizontal	12.43	61.94	68.20	-6.26	Peak
5852.564	57.91	vertical	12.31	70.22	116.35	-46.13	Peak
5859.029	55.15	vertical	12.33	67.48	109.67	-42.19	Peak
5921.348	49.51	vertical	12.44	61.95	70.89	-8.94	Peak
5930.015	49.39	vertical	12.43	61.82	68.20	-6.38	Peak
11650.000	45.16	horizontal	6.55	51.71	74.00	-22.29	Peak
11650.000	45.30	vertical	6.55	51.85	74.00	-22.15	Peak
802.11n40							
Low Channel							
5643.922	50.04	horizontal	11.90	61.94	68.20	-6.26	Peak
5652.826	49.16	horizontal	11.91	61.07	70.30	-9.23	Peak

5718.859	59.42	horizontal	12.03	71.45	110.48	-39.03	Peak
5722.461	61.25	horizontal	12.03	73.28	116.41	-43.13	Peak
5649.225	49.85	vertical	11.91	61.76	68.20	-6.44	Peak
5667.934	52.93	vertical	11.95	64.88	81.51	-16.63	Peak
5719.360	68.62	vertical	12.03	80.65	110.62	-29.97	Peak
5722.861	70.17	vertical	12.03	82.20	117.33	-35.13	Peak
11510.000	45.89	horizontal	6.48	52.37	74.00	-21.63	Peak
11510.000	45.50	vertical	6.48	51.98	74.00	-22.02	Peak
High Channel							
5854.627	48.51	horizontal	12.31	60.82	111.65	-50.83	Peak
5873.062	48.63	horizontal	12.37	61.00	105.74	-44.74	Peak
5923.549	48.40	horizontal	12.44	60.84	69.27	-8.43	Peak
5942.121	50.03	horizontal	12.41	62.44	68.20	-5.76	Peak
5850.913	52.30	vertical	12.31	64.61	120.12	-55.51	Peak
5856.829	51.93	vertical	12.33	64.26	110.29	-46.03	Peak
5922.311	49.40	vertical	12.44	61.84	70.18	-8.34	Peak
5944.322	49.65	vertical	12.41	62.06	68.20	-6.14	Peak
11590.000	38.62	horizontal	6.53	45.15	54.00	-8.85	Average
11590.000	47.87	horizontal	6.53	54.40	74.00	-19.60	Peak
11590.000	47.02	vertical	6.53	53.55	74.00	-20.45	Peak
802.11ac80							
5648.774	48.87	horizontal	11.91	60.78	68.20	-7.42	Peak
5693.046	51.78	horizontal	11.99	63.77	100.07	-36.30	Peak
5719.122	53.01	horizontal	12.03	65.04	110.55	-45.51	Peak
5724.563	53.59	horizontal	12.03	65.62	121.20	-55.58	Peak
5605.628	51.29	vertical	11.91	63.20	68.20	-5.00	Peak
5653.652	52.55	vertical	11.91	64.46	70.91	-6.45	Peak
5703.177	58.25	vertical	12.00	70.25	106.09	-35.84	Peak
5722.687	63.90	vertical	12.03	75.93	116.93	-41.00	Peak
5854.565	49.03	horizontal	12.31	61.34	111.79	-50.45	Peak
5874.450	47.74	horizontal	12.38	60.12	105.35	-45.23	Peak
5924.350	47.90	horizontal	12.43	60.33	68.68	-8.35	Peak
5948.924	49.46	horizontal	12.41	61.87	68.20	-6.33	Peak
5852.876	56.82	vertical	12.31	69.13	115.64	-46.51	Peak
5856.065	60.59	vertical	12.33	72.92	110.50	-37.58	Peak
5880.453	53.25	vertical	12.41	65.66	101.15	-35.49	Peak
5939.545	50.29	vertical	12.42	62.71	68.20	-5.49	Peak
11550.000	37.86	horizontal	6.50	44.36	54.00	-9.64	Average

11550.000	47.71	horizontal	6.50	54.21	74.00	-19.79	Peak
11550.000	38.21	vertical	6.50	44.71	54.00	-9.29	Average
11550.000	48.70	vertical	6.50	55.20	74.00	-18.80	Peak

Remark:

Corrected Amplitude= Reading level + corrected Factor

Corrected Factor = Antenna factor + Cable loss – Amplifier gain

Margin = Corrected Amplitude – Limit

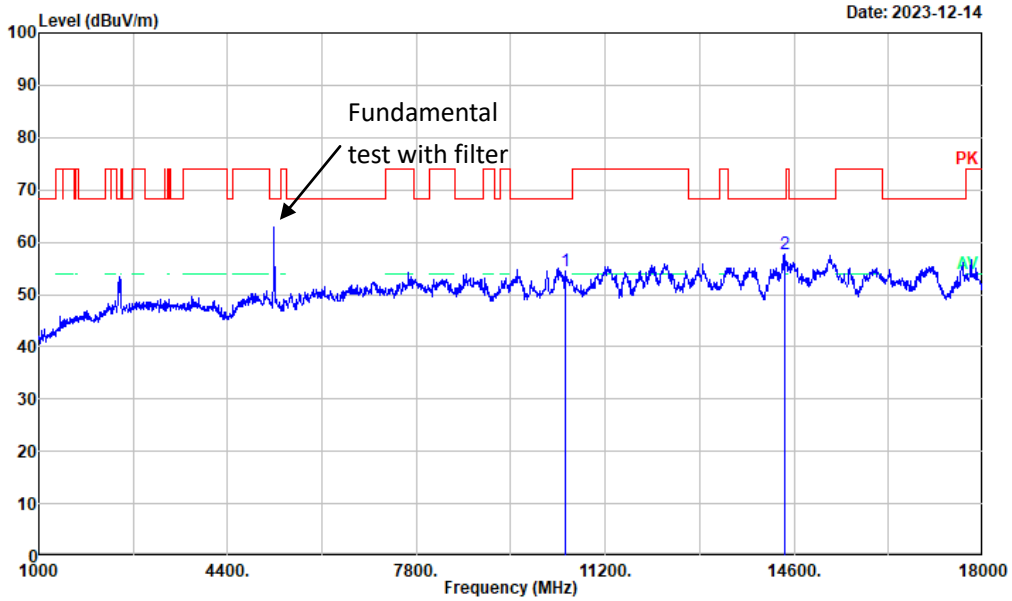
The emission levels of other frequencies that were lower than the limit 20dB, not show in test report.

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

Test plot for example as below:

5150-5250MHz Band:

Mode:	802.11 n-HT20	**Channel:**	5240MHz

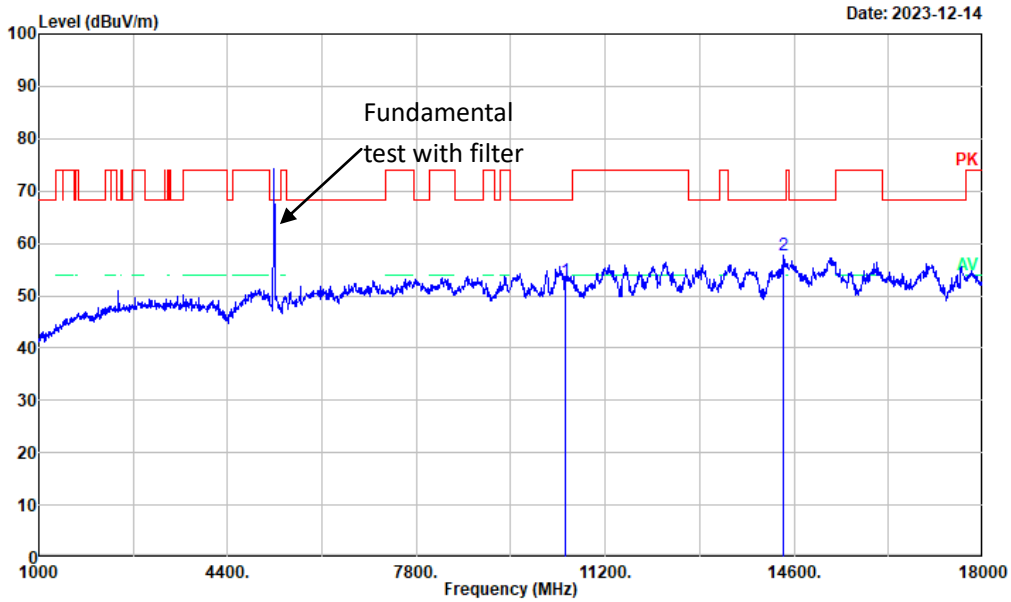



```
Project No.   : RWAY202300020
Test Mode     : Transmitting
Test Voltage  : AC 120V/60Hz
Environment   : 22.1℃/60%R.H./101.3kPa
Tested by     : Bard Huang
Polarization  : horizontal
Remark        : 5.2G n20 mode High
```

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	10480.000	48.76	5.74	54.50	68.20	-13.70	Peak
2	14436.720	48.31	9.31	57.62	68.20	-10.58	Peak

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

Mode:	802.11 n-HT20	Channel:	5240MHz



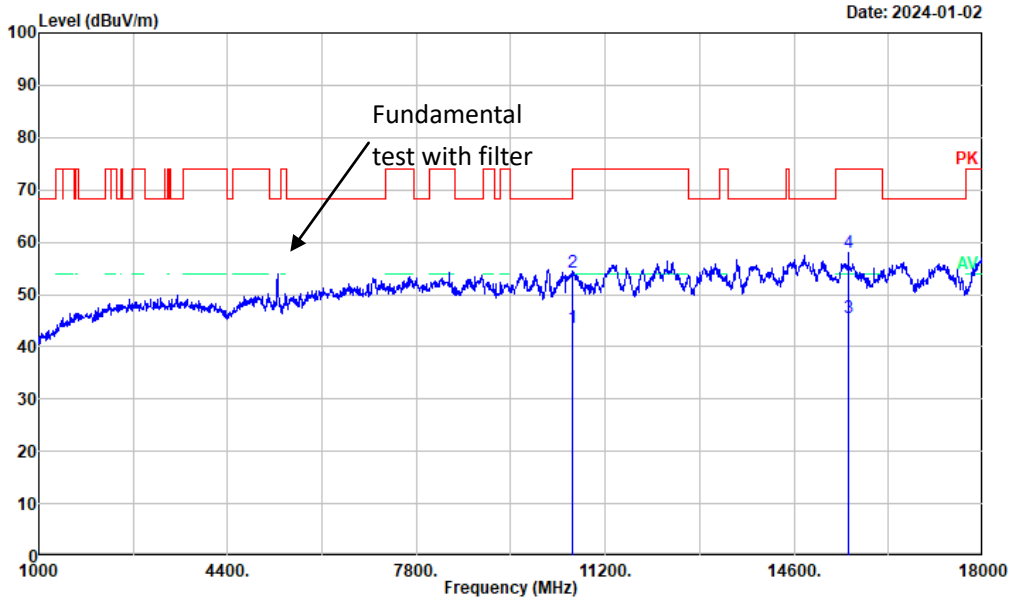
Project No. : RWAY202300020
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.1℃/60%R.H./101.3kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 5.2G n20 mode High

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	10480.000	47.16	5.74	52.90	68.20	-15.30	Peak
2	14411.210	48.38	9.25	57.63	68.20	-10.57	Peak

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

5250-5350MHz Band:

Mode:	802.11n40	Channel:	5310MHz

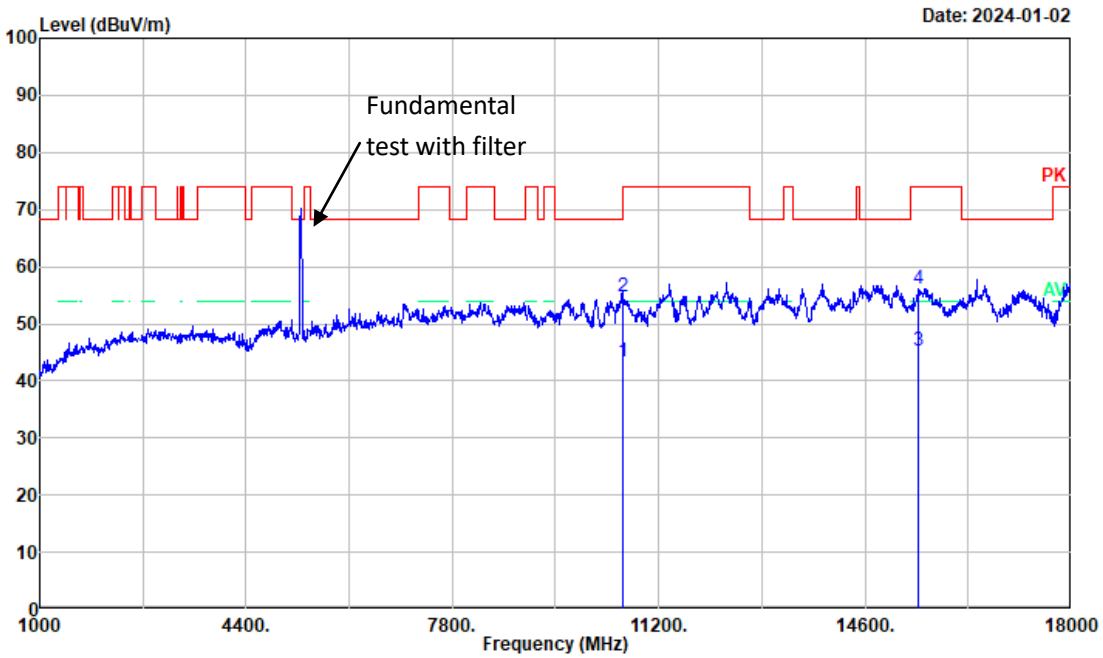


Project No. : RWAY202300020
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.8℃/52%R.H./101.3kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 5GWiFi-b2 n40 Mode High Channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	10620.000	37.71	5.90	43.61	54.00	-10.39	Average
2	10620.000	48.34	5.90	54.24	74.00	-19.76	Peak
3	15576.290	37.49	8.10	45.59	54.00	-8.41	Average
4	15576.290	49.82	8.10	57.92	74.00	-16.08	Peak

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

Mode:	802.11n40	Channel:	5270MHz



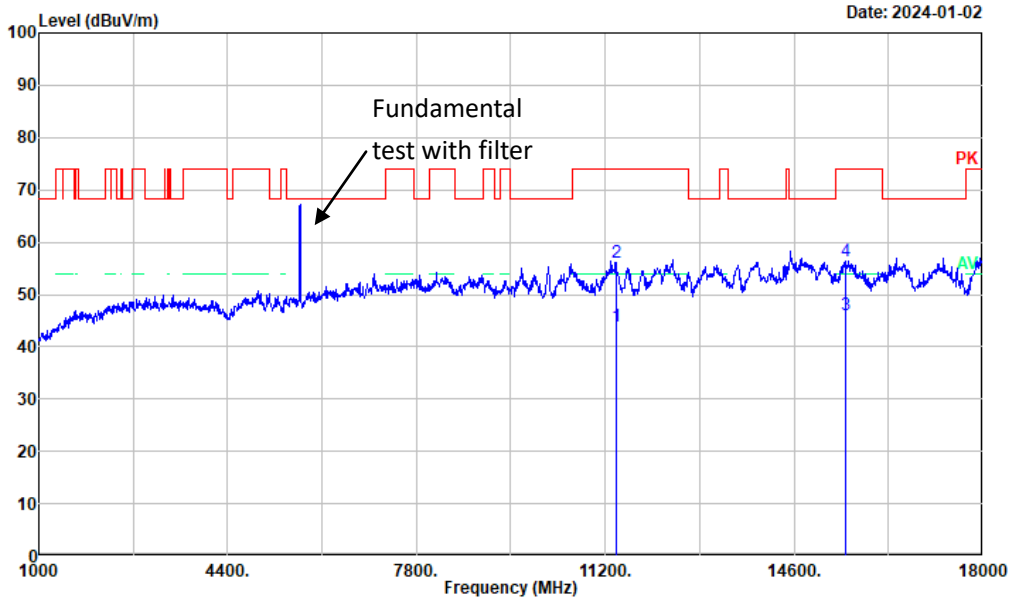
Project No. : RWAY202300020
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.8℃/52%R.H./101.3kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 5GWiFi-b2 n40 Mode High Channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	10620.000	37.41	5.90	43.31	54.00	-10.69	Average
2	10620.000	48.96	5.90	54.86	74.00	-19.14	Peak
3	15482.740	37.17	8.22	45.39	54.00	-8.61	Average
4	15482.740	47.95	8.22	56.17	74.00	-17.83	Peak

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

5470-5725MHz:

Mode:	802.11a	Channel:	5700MHz

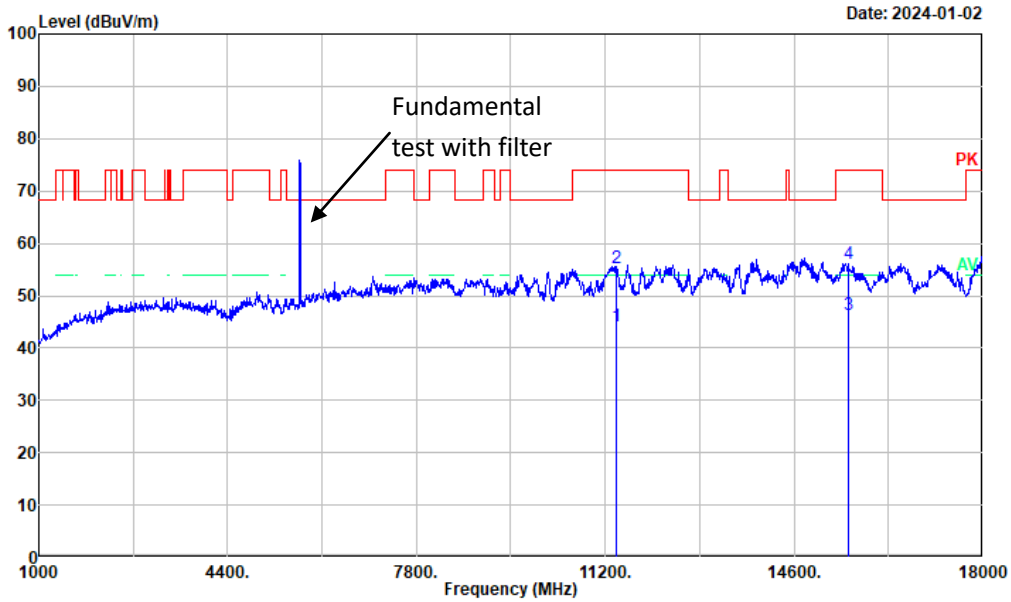


Project No. : RWAY202300020
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.8℃/52%R.H./101.3kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 5GWiFi-b3 a Mode High Channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	11400.000	37.65	6.35	44.00	54.00	-10.00	Average
2	11400.000	49.67	6.35	56.02	74.00	-17.98	Peak
3	15516.760	37.95	8.12	46.07	54.00	-7.93	Average
4	15516.760	48.34	8.12	56.46	74.00	-17.54	Peak

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

Mode:	802.11a	Channel:	5700MHz



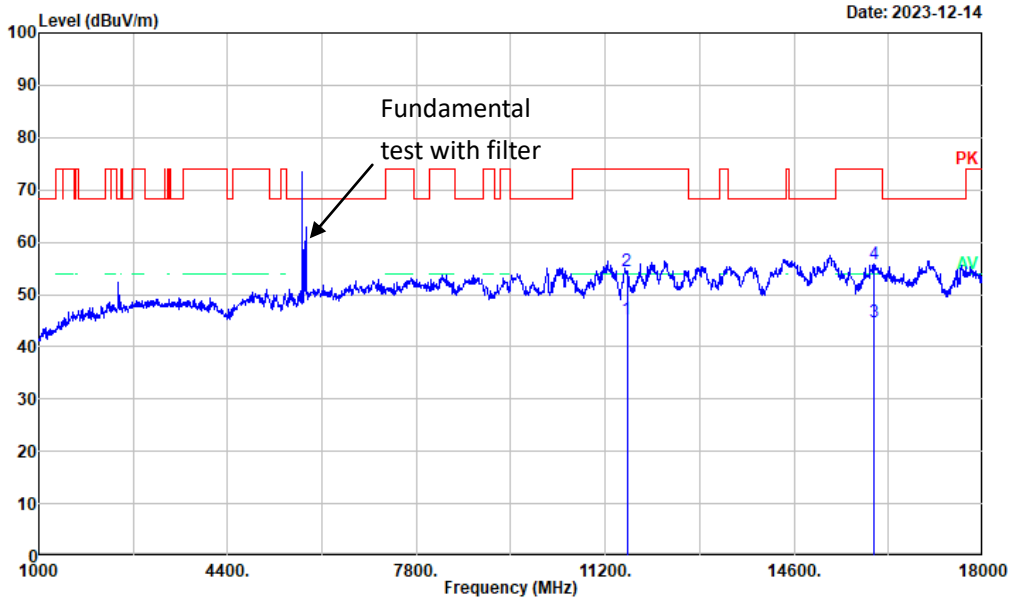
Project No. : RWAY202300020
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.8℃/52%R.H./101.3kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 5GWiFi-b3 a Mode High Channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	11400.000	37.83	6.35	44.18	54.00	-9.82	Average
2	11400.000	49.02	6.35	55.37	74.00	-18.63	Peak
3	15576.290	38.19	8.10	46.29	54.00	-7.71	Average
4	15576.290	48.11	8.10	56.21	74.00	-17.79	Peak

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

5725-5850MHz Band:

Mode:	802.11n40	Channel:	5795MHz

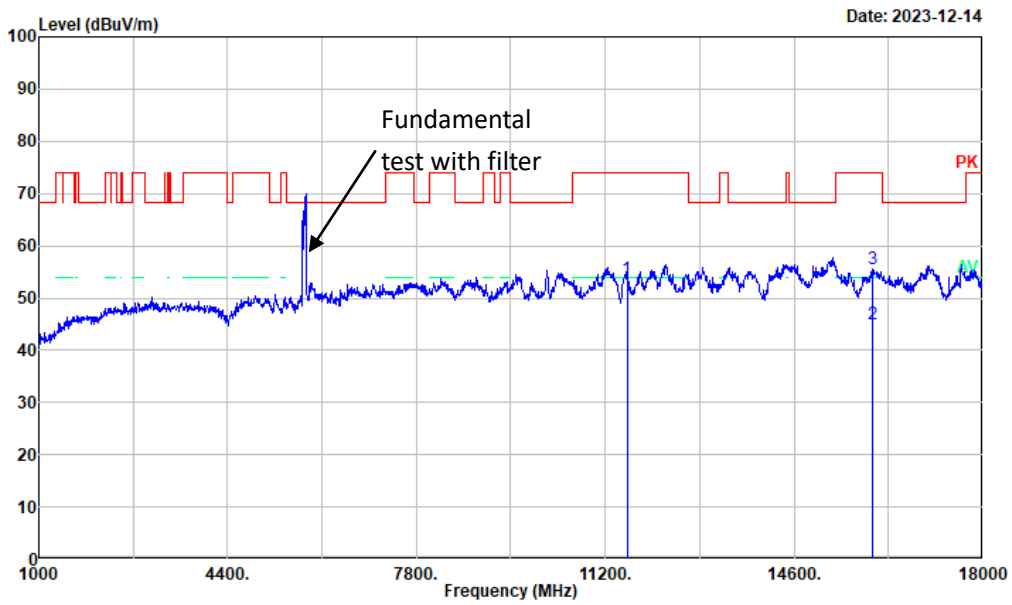


Project No. : RWAY202300020
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.1℃/60%R.H./101.3kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 5GWiFi-b4 n40mode High

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	11590.000	38.62	6.53	45.15	54.00	-8.85	Average
2	11590.000	47.87	6.53	54.40	74.00	-19.60	Peak
3	16027.010	36.72	8.02	44.74	54.00	-9.26	Average
4	16027.010	47.71	8.02	55.73	74.00	-18.27	Peak

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

Mode:	802.11n40	Channel:	5795MHz



Project No. : RWAY202300020
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.1℃/60%R.H./101.3kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 5GWiFi-b4 n40mode High

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	11590.000	47.02	6.53	53.55	74.00	-20.45	Peak
2	16010.000	36.80	8.09	44.89	54.00	-9.11	Average
3	16010.000	47.59	8.08	55.67	74.00	-18.33	Peak

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

3.5 RF Conducted Test Data

Test Date:	2023-12-26~2024-01-03	Test By:	Ryan Zhang
Environment condition:	Temperature: 20.8~21.0°C; Relative Humidity: 50~53%; ATM Pressure: 101.8~102.1kPa		

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

5150-5250MHz:

Test Mode	Antenna	Channel[MHz]	26dB BW [MHz]	99% OBW [MHz]
802.11a	Ant1	5180	20.400	16.960
		5200	20.400	16.880
		5240	20.400	16.880
802.11n HT20	Ant1	5180	20.640	17.840
		5200	20.720	17.920
		5240	20.720	17.920
802.11n HT40	Ant1	5190	40.320	36.480
		5230	40.640	36.480
802.11ac VHT80	Ant1	5210	81.920	75.520

5250-5350MHz:

Test Mode	Antenna	Channel[MHz]	26dB BW [MHz]	99% OBW [MHz]
802.11a	Ant1	5260	20.400	16.800
		5280	20.240	16.800
		5320	20.400	16.800
802.11n HT20	Ant1	5260	20.640	17.760
		5280	20.560	17.760
		5320	20.640	17.760
802.11n HT40	Ant1	5270	40.160	36.320
		5310	40.480	36.160
802.11ac VHT80	Ant1	5290	81.920	75.520

5470-5725MHz:

Test Mode	Antenna	Channel[MHz]	26dB BW [MHz]	99% OBW [MHz]
802.11a	Ant1	5500	20.320	16.880
		5580	20.320	16.800
		5700	20.480	16.800
802.11n HT20	Ant1	5500	20.640	17.760
		5580	20.720	17.760
		5700	20.560	17.840

802.11n HT40	Ant1	5510	40.320	36.160
		5590	40.641	36.667
		5670	40.480	36.160
802.11ac VHT80	Ant1	5530	81.280	75.520
		5610	81.795	75.385

5725-5850MHz:

Test Mode	Antenna	Channel[MHz]	6dB BW [MHz]	99% OBW [MHz]	6dB BW Limit [MHz]	Verdict
802.11a	Ant1	5745	15.520	16.880	0.5	Pass
		5785	15.360	16.880	0.5	Pass
		5825	15.520	16.880	0.5	Pass
802.11n HT20	Ant1	5745	15.200	17.840	0.5	Pass
		5785	15.360	17.920	0.5	Pass
		5825	15.360	17.840	0.5	Pass
802.11n HT40	Ant1	5755	35.360	36.320	0.5	Pass
		5795	35.360	36.320	0.5	Pass
802.11ac VHT80	Ant1	5775	75.840	75.520	0.5	Pass

3.5.2 Maximum conducted output power

5150-5250MHz:

Test Modes	Antenna	Test Frequency (MHz)	Max. Conducted Average Output Power(dBm)		Verdict
			Result	Limit	
802.11a	Ant1	5180	13.70	24	Pass
		5200	13.72	24	Pass
		5240	13.68	24	Pass
802.11n HT20	Ant1	5180	13.61	24	Pass
		5200	13.65	24	Pass
		5240	13.60	24	Pass
802.11n HT40	Ant1	5190	13.62	24	Pass
		5230	13.62	24	Pass
802.11ac VHT80	Ant1	5210	10.46	24	Pass

5250-5350MHz:

Test Modes	Antenna	Test Frequency (MHz)	Max. Conducted Average Output Power(dBm)		Verdict
			Result	Limit	
802.11a	Ant1	5260	10.27	24	Pass
		5280	10.31	24	Pass
		5320	10.35	24	Pass
802.11n HT20	Ant1	5260	10.22	24	Pass
		5280	10.16	24	Pass
		5320	10.25	24	Pass
802.11n HT40	Ant1	5270	10.20	24	Pass
		5310	10.17	24	Pass
802.11ac VHT80	Ant1	5290	11.02	24	Pass

5470-5725MHz:

Test Modes	Antenna	Test Frequency (MHz)	Max. Conducted Average Output Power(dBm)		Verdict
			Result	Limit	
802.11a	Ant1	5500	10.23	24	Pass
		5580	9.64	24	Pass
		5700	9.69	24	Pass
802.11n HT20	Ant1	5500	10.16	24	Pass
		5580	9.49	24	Pass
		5700	9.62	24	Pass
802.11n HT40	Ant1	5510	10.21	24	Pass
		5590	9.81	24	Pass
		5670	9.79	24	Pass
802.11ac VHT80	Ant1	5530	10.90	24	Pass
		5610	10.68	24	Pass

5725-5850MHz:

Test Modes	Antenna	Test Frequency (MHz)	Max. Conducted Average Output Power(dBm)		
			Result	Limit	
802.11a	Ant1	5745	13.02	30	Pass
		5785	13.32	30	Pass
		5825	13.50	30	Pass
802.11n HT20	Ant1	5745	12.89	30	Pass
		5785	13.19	30	Pass
		5825	13.37	30	Pass
802.11n HT40	Ant1	5755	13.02	30	Pass
		5795	13.29	30	Pass
802.11ac VHT80	Ant1	5775	13.20	30	Pass

3.5.3 Power Spectral Density

5150-5250MHz:

Test Mode	Antenna	Channel [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Verdict
802.11a	Ant1	5180	8.22	11	Pass
		5200	8.02	11	Pass
		5240	8.29	11	Pass
802.11n HT20	Ant1	5180	7.70	11	Pass
		5200	7.93	11	Pass
		5240	7.96	11	Pass
802.11n HT40	Ant1	5190	4.98	11	Pass
		5230	5.07	11	Pass
802.11ac VHT80	Ant1	5210	1.56	11	Pass

5250-5350MHz:

Test Mode	Antenna	Channel [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Verdict
802.11a	Ant1	5260	5.77	11	Pass
		5280	5.16	11	Pass
		5320	5.37	11	Pass
802.11n HT20	Ant1	5260	4.94	11	Pass
		5280	4.81	11	Pass
		5320	4.99	11	Pass
802.11n HT40	Ant1	5270	2.20	11	Pass
		5310	2.13	11	Pass
802.11ac VHT80	Ant1	5290	-1.35	11	Pass

5470-5725MHz:

Test Mode	Antenna	Channel [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Verdict
802.11a	Ant1	5500	4.71	11	Pass
		5580	4.34	11	Pass
		5700	3.90	11	Pass
802.11n HT20	Ant1	5500	4.33	11	Pass
		5580	4.28	11	Pass
		5700	3.81	11	Pass
802.11n HT40	Ant1	5510	1.46	11	Pass
		5590	1.74	11	Pass
		5670	0.97	11	Pass
802.11ac VHT80	Ant1	5530	-1.68	11	Pass
		5610	-1.90	11	Pass

5470-5725MHz:

Test Mode	Antenna	Channel [MHz]	Result [dBm/500kHz]	Limit [dBm/500kHz]	Verdict
802.11a	Ant1	5745	4.42	30	Pass
		5785	4.72	30	Pass
		5825	5.19	30	Pass
802.11n HT20	Ant1	5745	3.91	30	Pass
		5785	4.20	30	Pass
		5825	4.63	30	Pass
802.11n HT40	Ant1	5755	1.09	30	Pass
		5795	1.40	30	Pass
802.11ac VHT80	Ant1	5775	-1.54	30	Pass

3.5.4 Duty Cycle

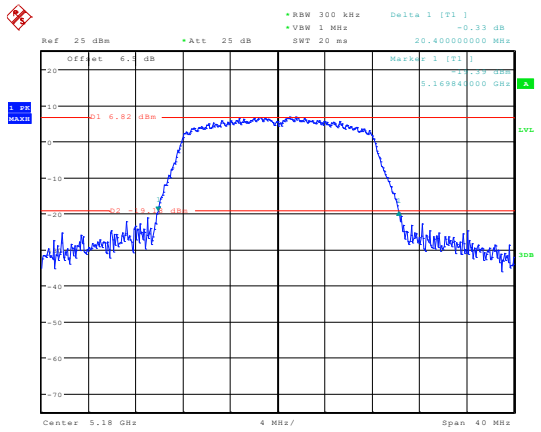
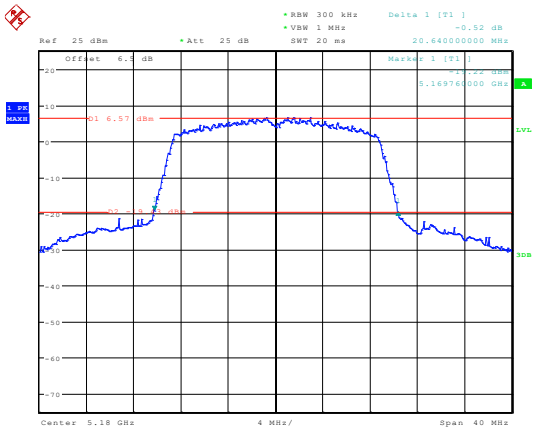
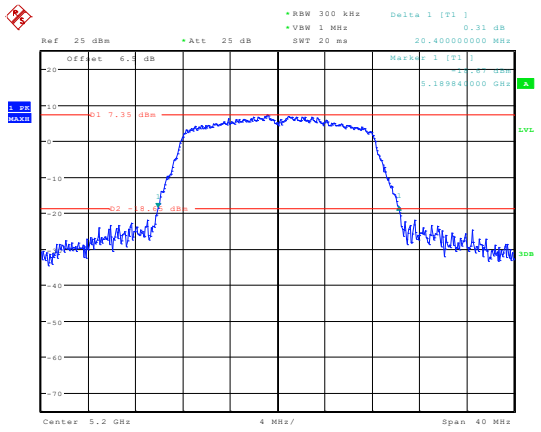
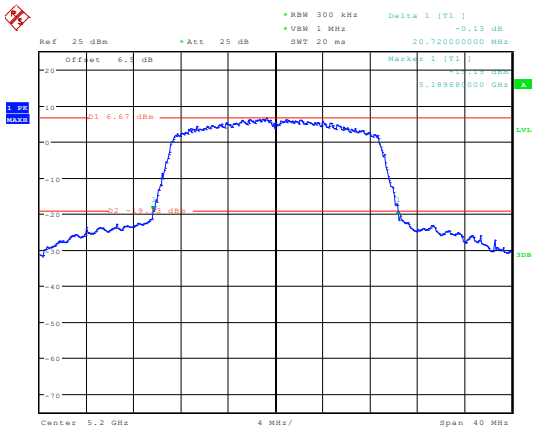
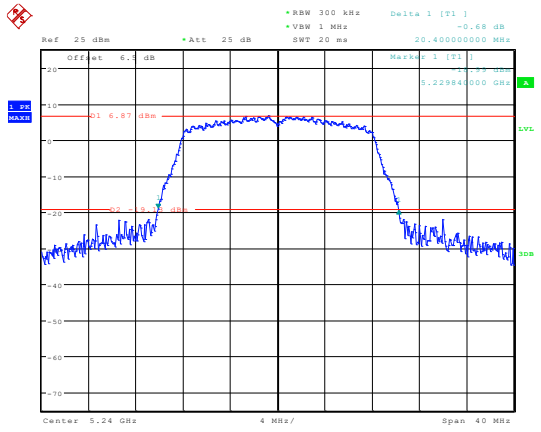
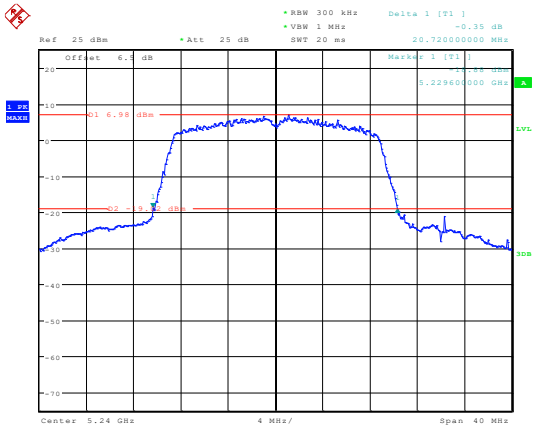
Test Mode	Antenna	Ton (ms)	Ton+off (ms)	Duty Cycle [%]	1/T[Hz]	Duty Cycle Factor[%]	VBW setting* [Hz]
802.11a	Ant1	100	100	100	/	/	10
802.11n HT20	Ant1	100	100	100	/	/	10
802.11n HT40	Ant1	100	100	100	/	/	10
802.11ac VHT80	Ant1	100	100	100	/	/	10

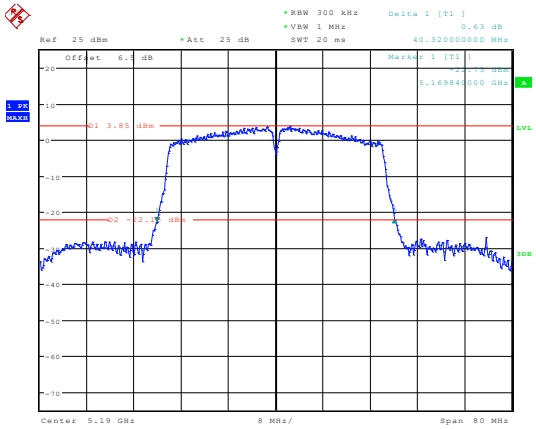
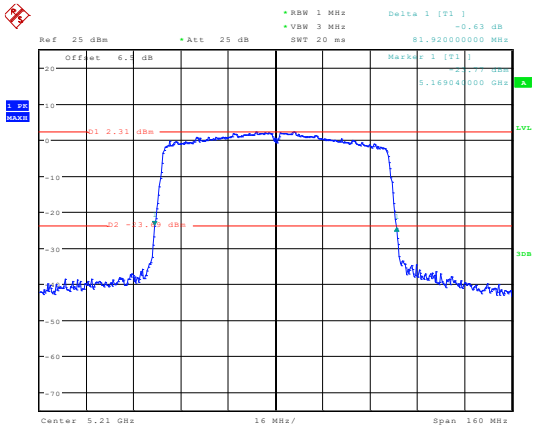
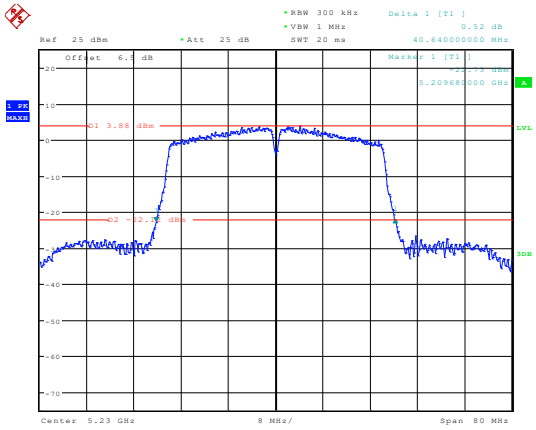
Note*: Radiated emission test with average value, the Spectrum analyzer VBW setting information.

Test Plots:

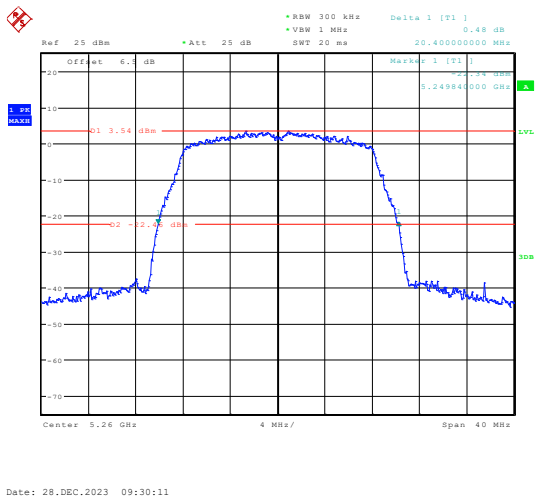
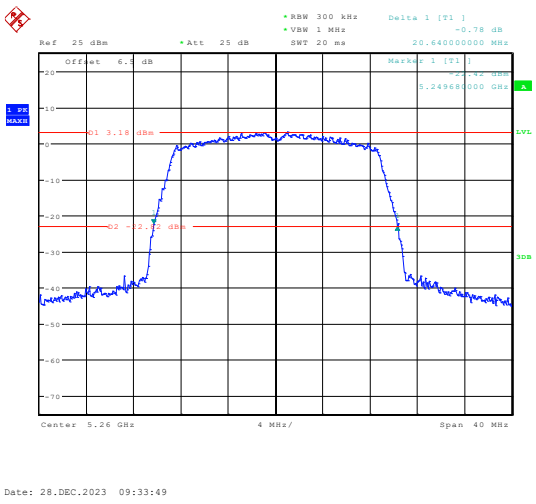
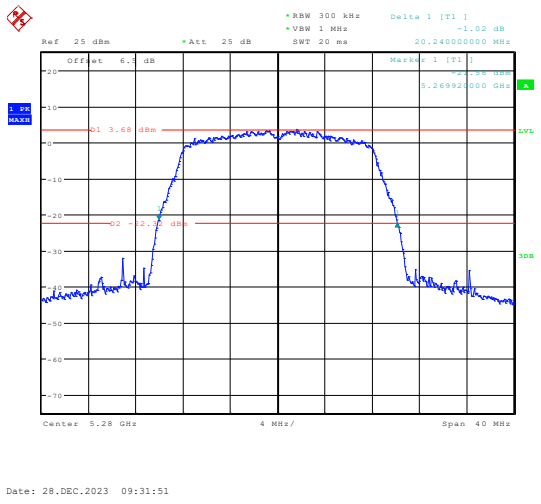
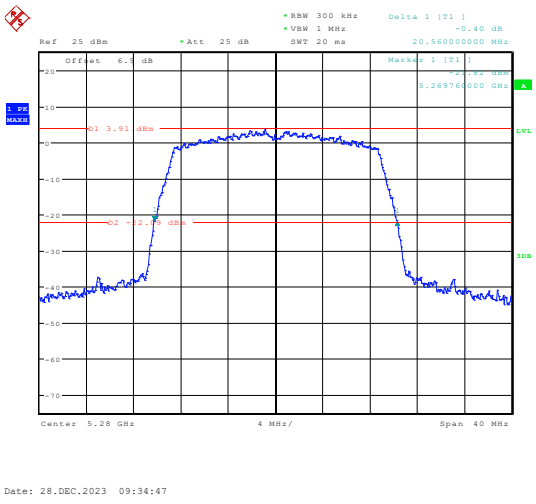
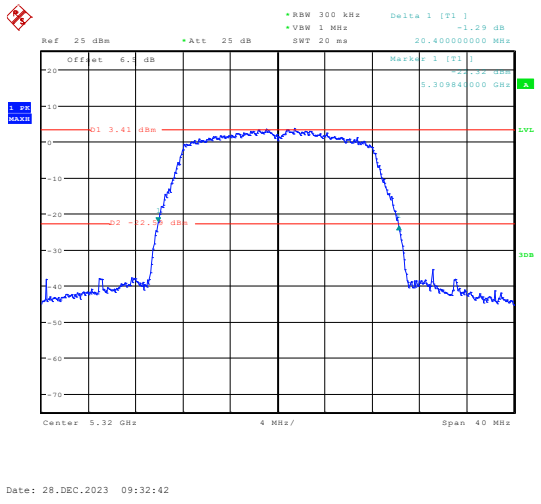
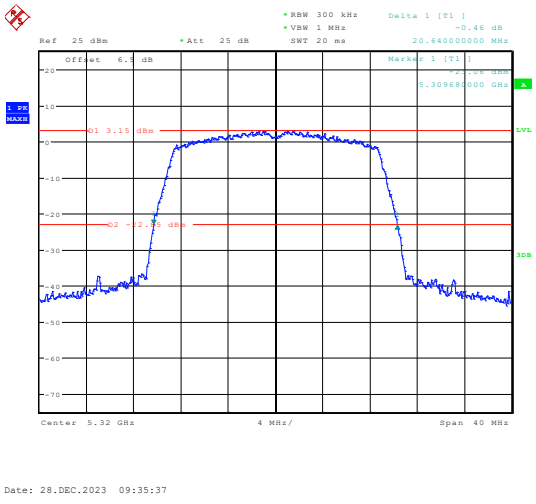
26dB Emission Bandwidth:

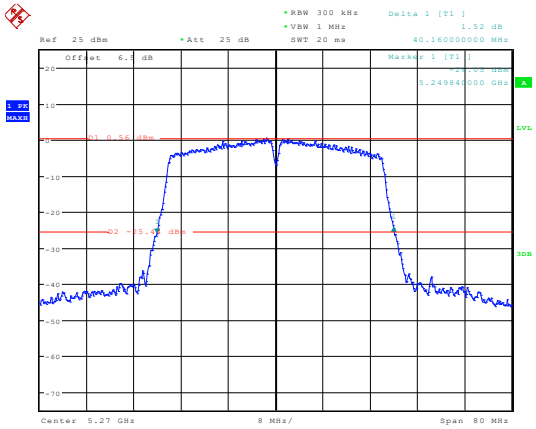
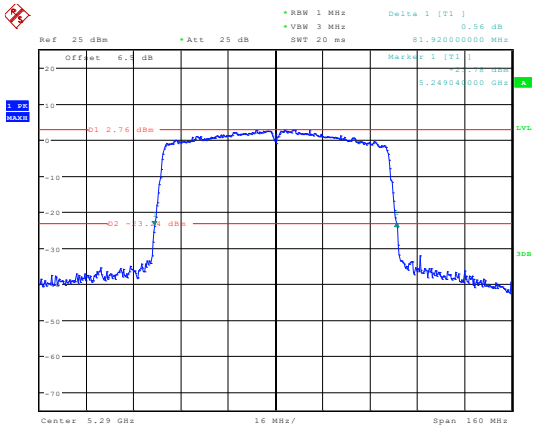
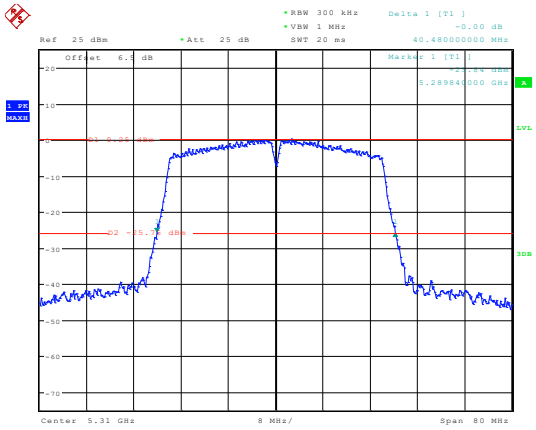
5150-5250MHz:

802.11a	802.11n-HT20
Lowest channel	Lowest channel
 Date: 26.DEC.2023 14:50:24	 Date: 26.DEC.2023 14:54:30
Middle channel	Middle channel
 Date: 26.DEC.2023 14:51:40	 Date: 26.DEC.2023 14:55:41
High channel	High channel
 Date: 26.DEC.2023 14:52:47	 Date: 26.DEC.2023 14:56:24

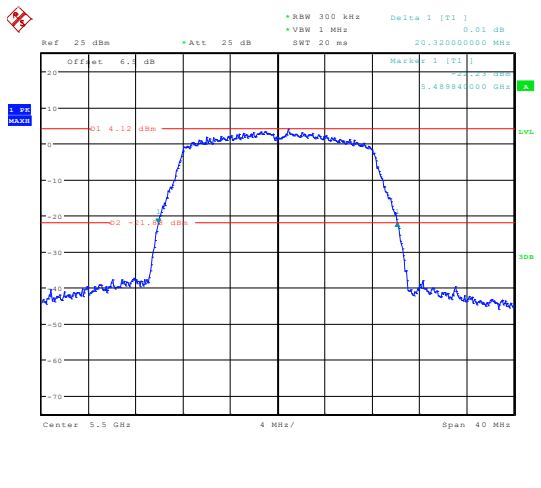
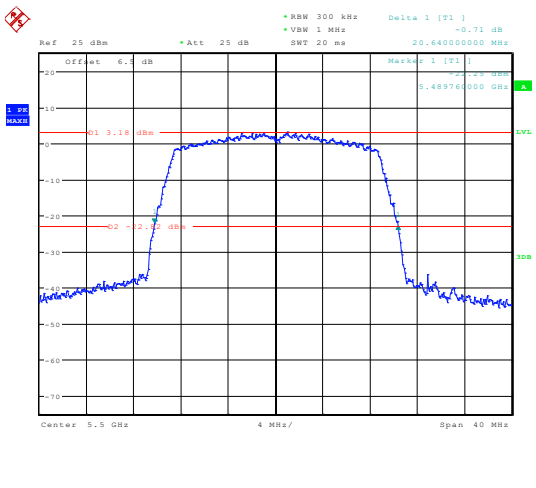
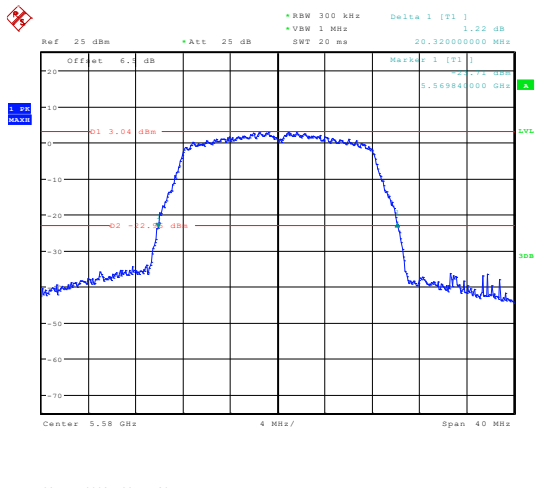
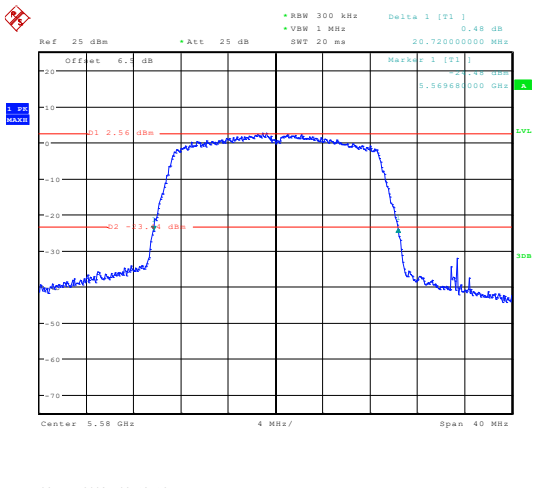
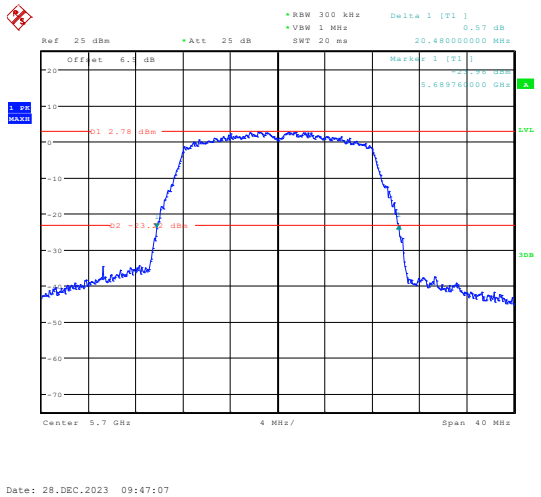
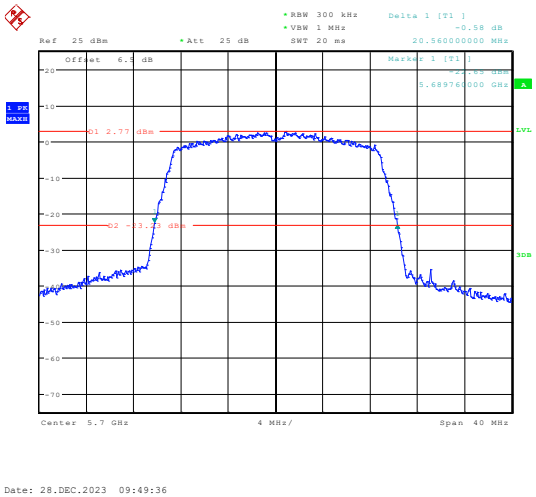
802.11n-HT40	802.11ac-VHT80
Lowest channel	Lowest channel
	
High channel	/
	/

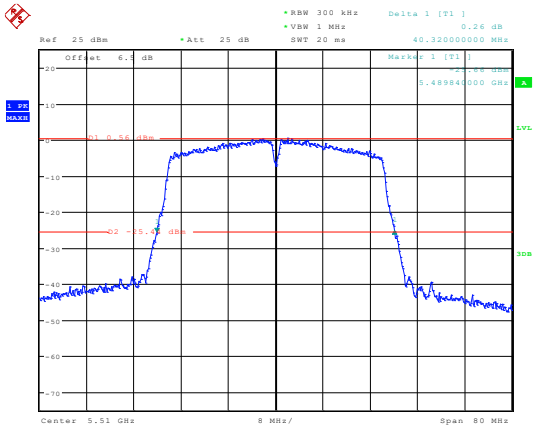
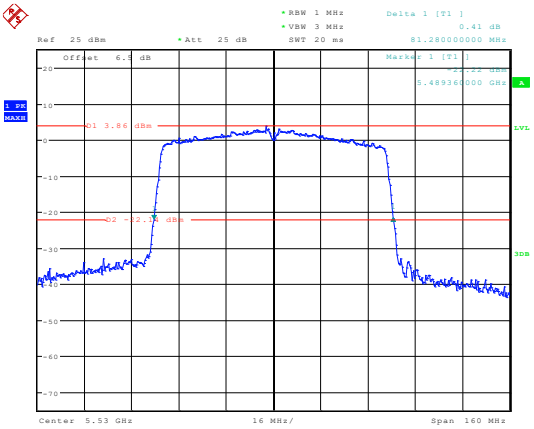
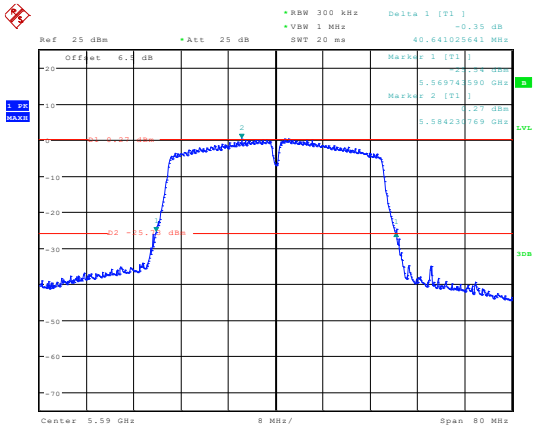
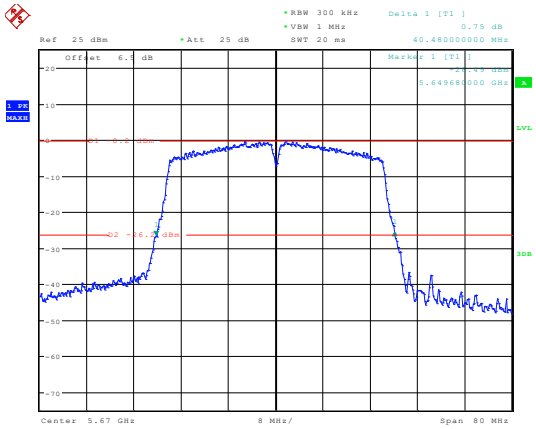
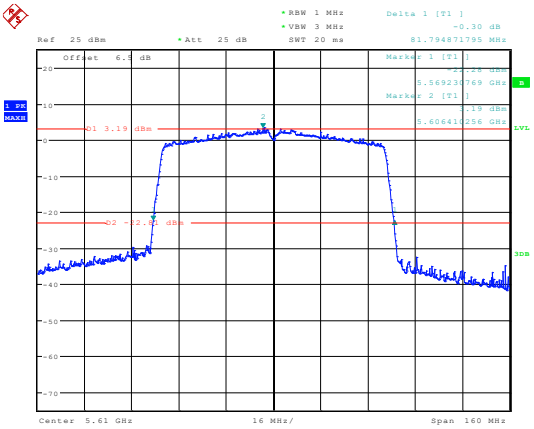
5250-5350MHz:

802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Date: 28.DEC.2023 09:30:11	Date: 28.DEC.2023 09:33:49
Middle channel	Middle channel
	
Date: 28.DEC.2023 09:31:51	Date: 28.DEC.2023 09:34:47
High channel	High channel
	
Date: 28.DEC.2023 09:32:42	Date: 28.DEC.2023 09:35:37

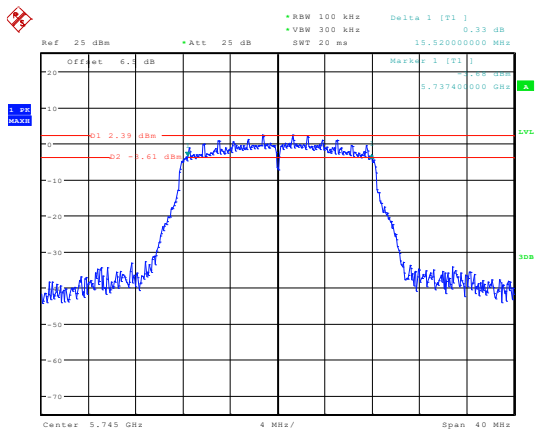
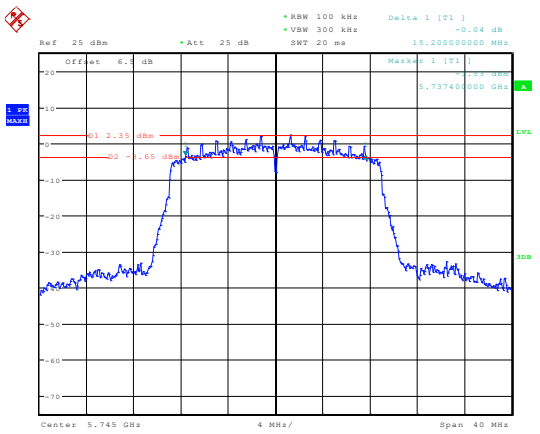
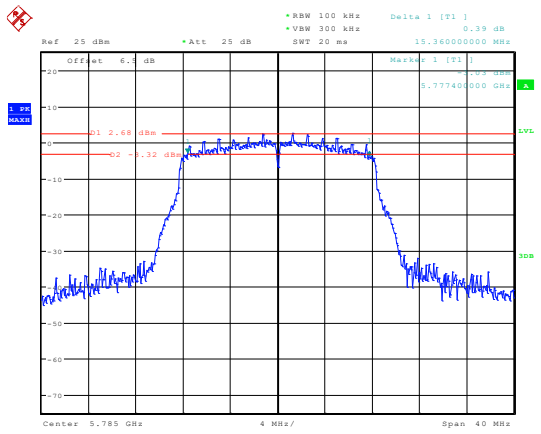
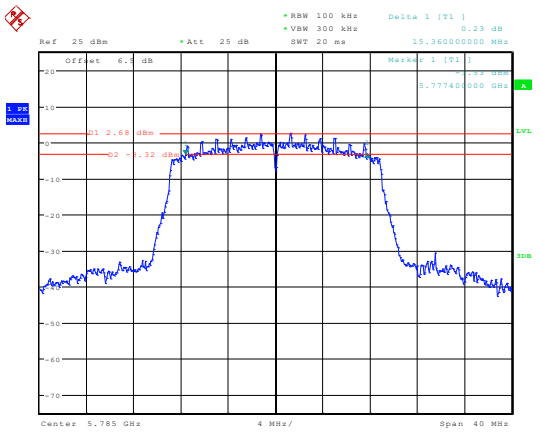
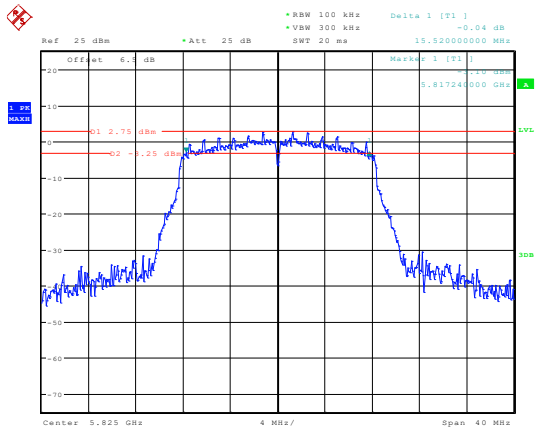
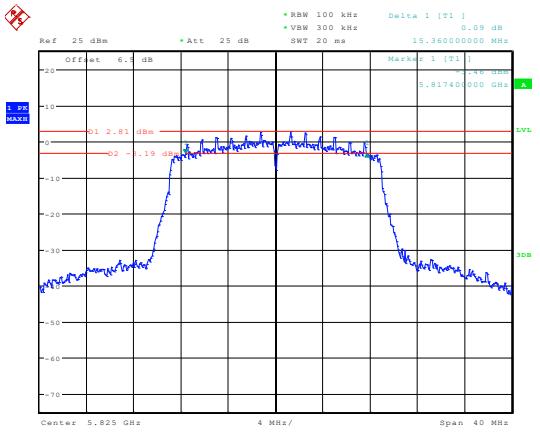
802.11n-HT40	802.11ac-VHT80
Lowest channel	Lowest channel
	
High channel	/
	/

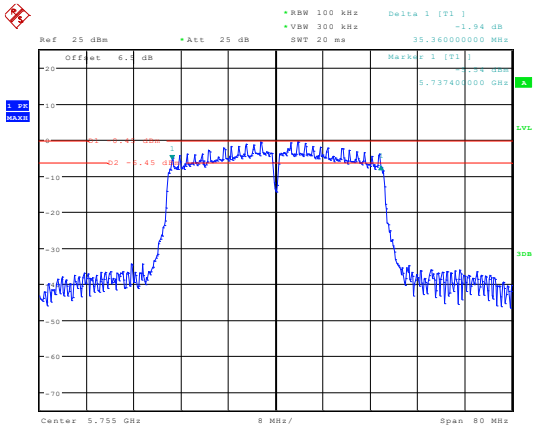
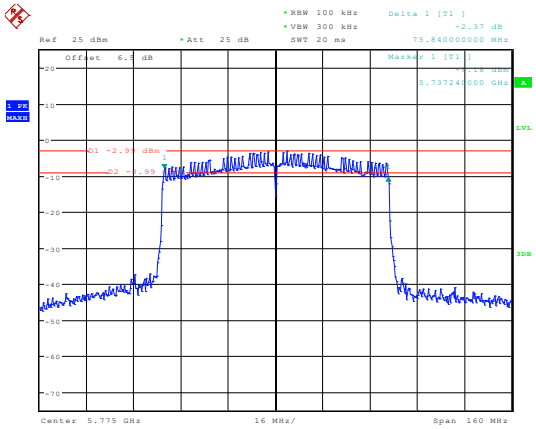
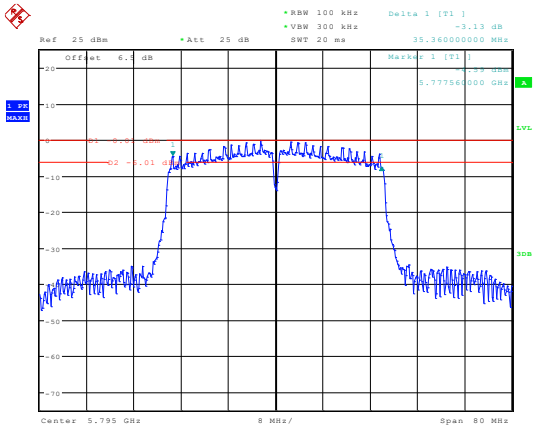
5470-5725MHz:

802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Date: 28.DEC.2023 09:43:10	Date: 28.DEC.2023 09:47:49
Middle channel	Middle channel
	
Date: 28.DEC.2023 09:44:30	Date: 28.DEC.2023 09:48:46
High channel	High channel
	
Date: 28.DEC.2023 09:47:07	Date: 28.DEC.2023 09:49:36

802.11n-HT40	802.11ac VHT80
Lowest channel	Lowest channel
	
Middle channel	/
	/
High channel	High channel
	

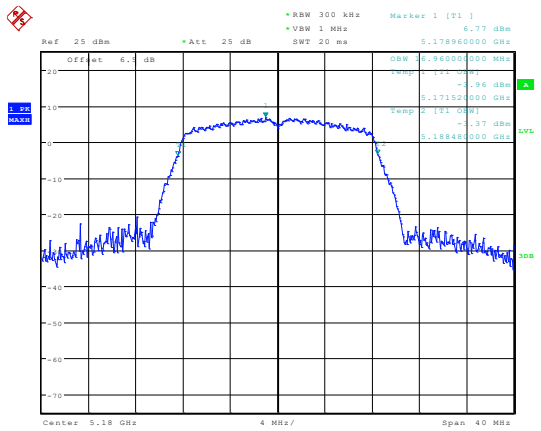
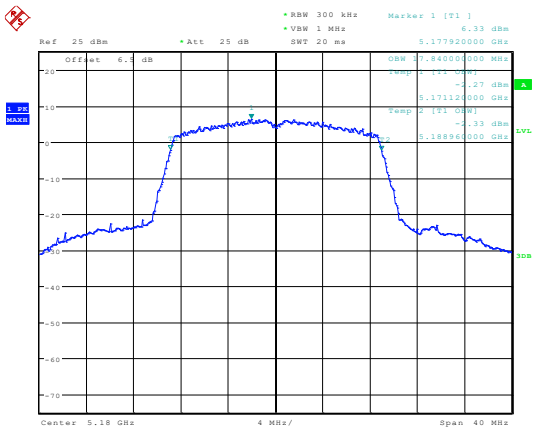
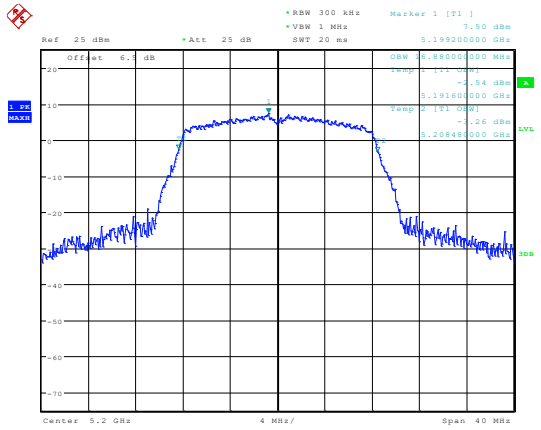
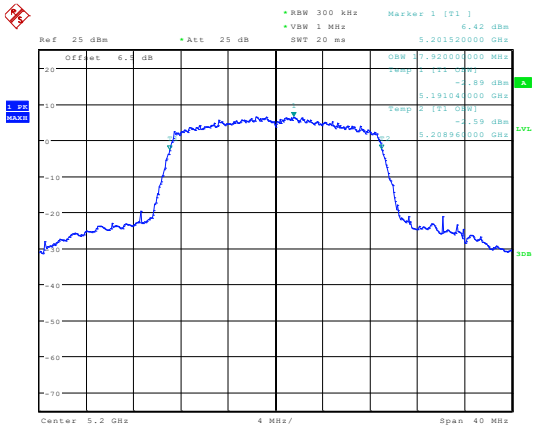
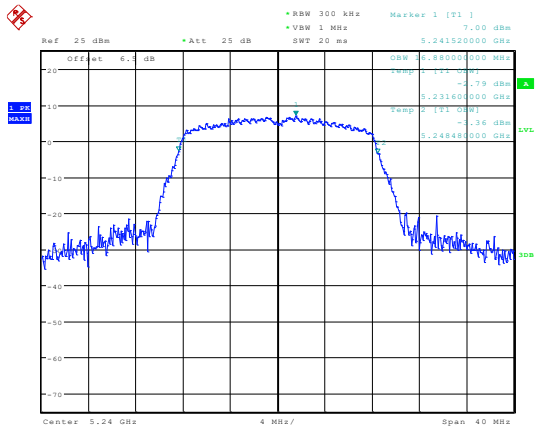
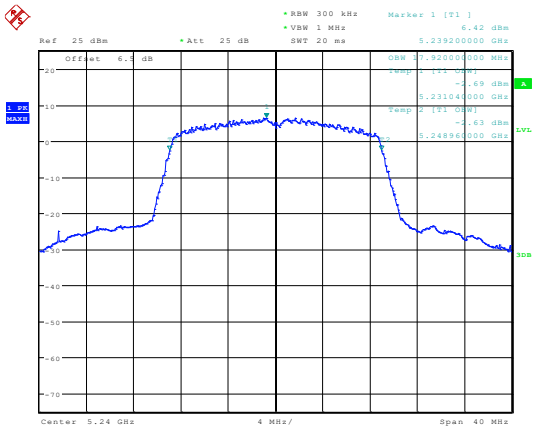
6dB Emission Bandwidth:

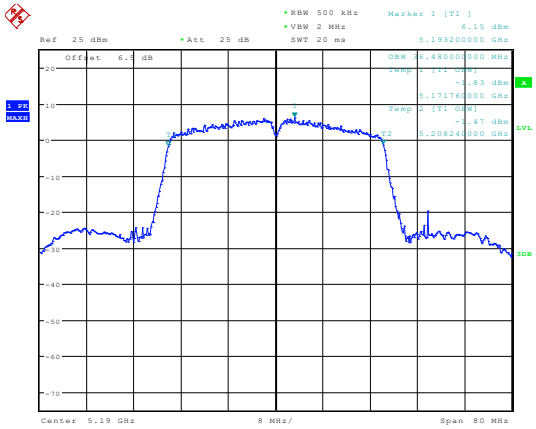
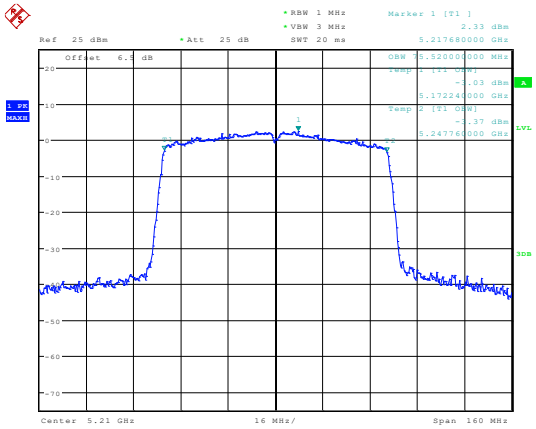
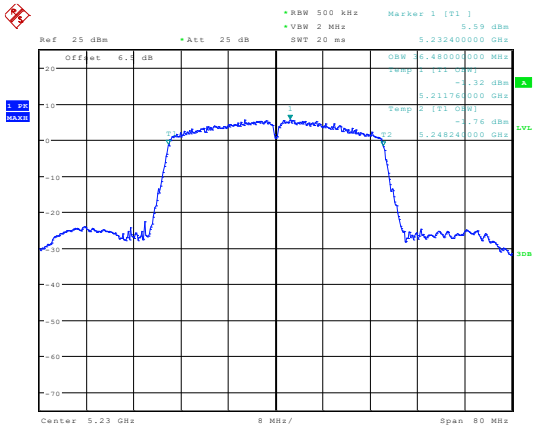
802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

802.11n-HT40	802.11ac-VHT80
Lowest channel	Lowest channel
	
High channel	/
	/

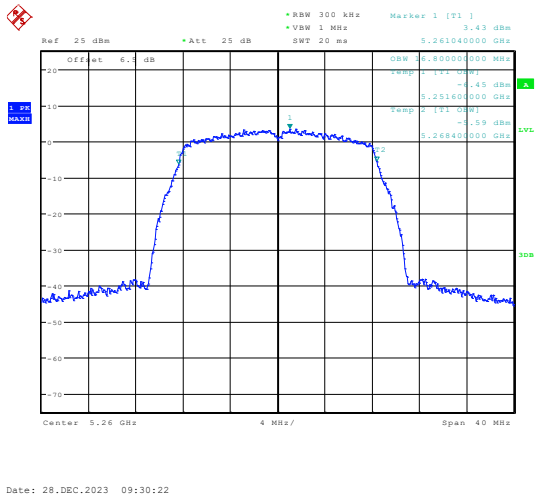
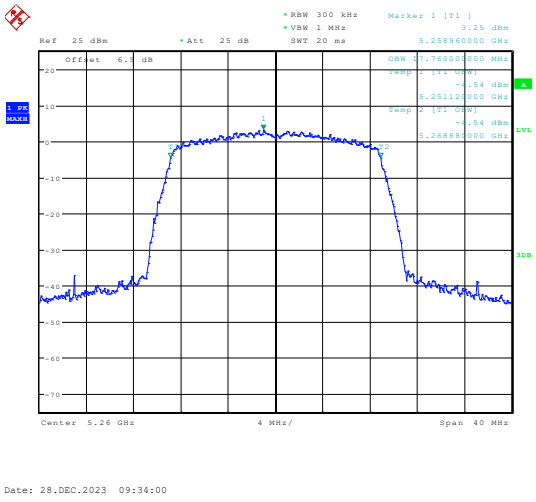
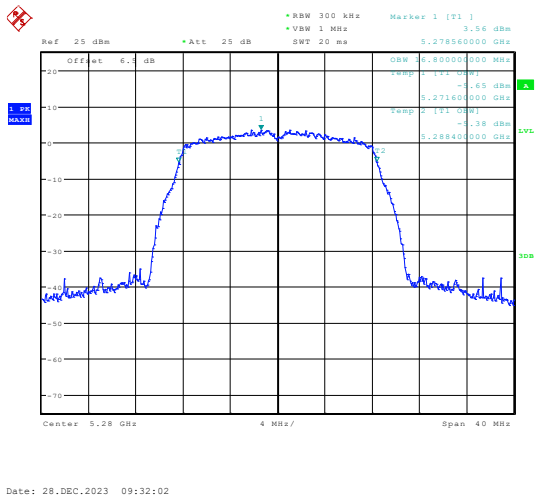
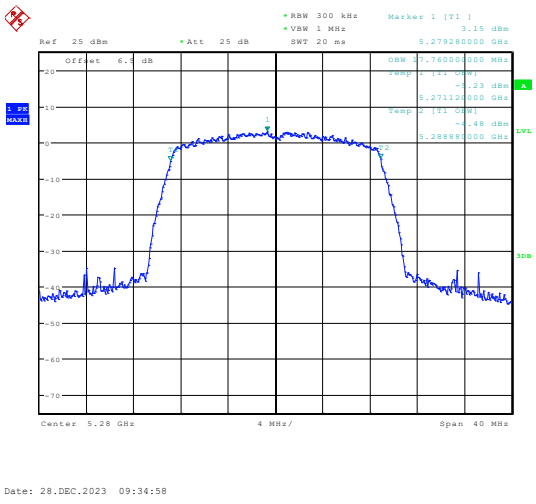
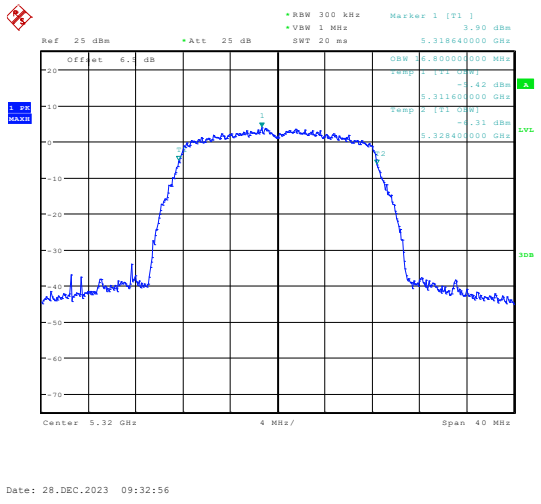
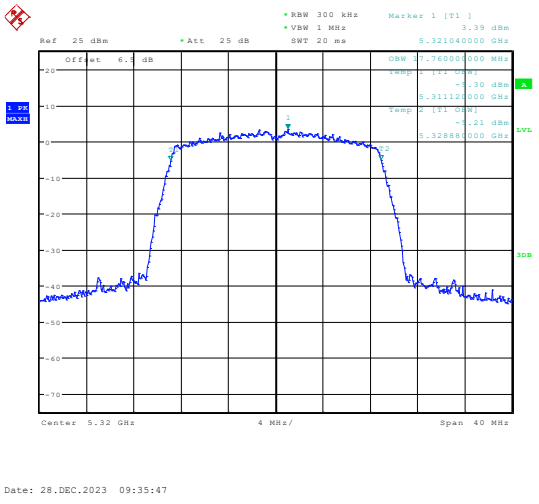
99% Occupied Bandwidth

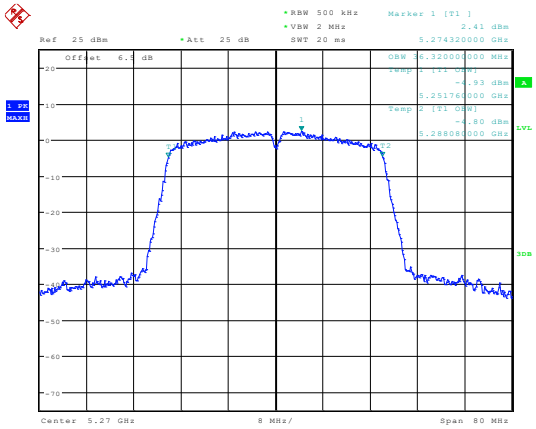
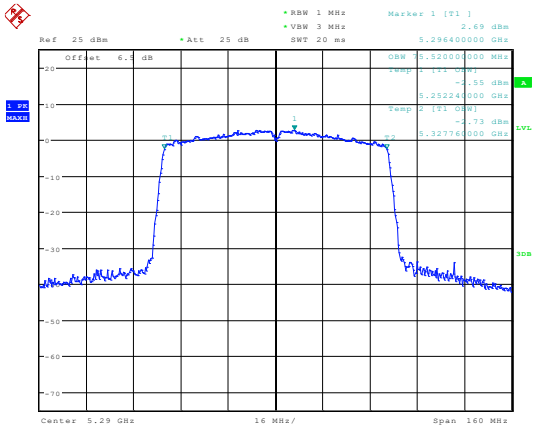
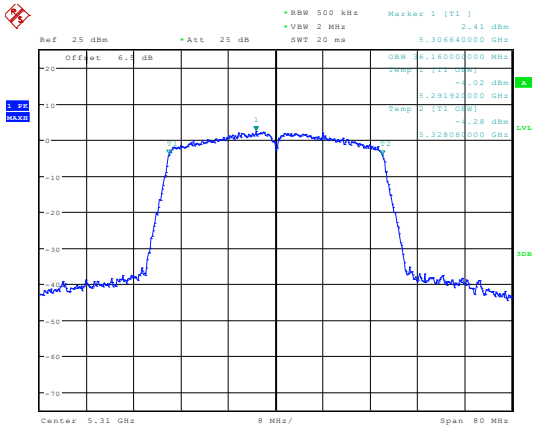
5150-5250MHz

802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Date: 26.DEC.2023 14:50:41	Date: 26.DEC.2023 14:54:41
Middle channel	Middle channel
	
Date: 26.DEC.2023 14:51:57	Date: 26.DEC.2023 14:55:52
High channel	High channel
	
Date: 26.DEC.2023 14:53:01	Date: 26.DEC.2023 14:56:35

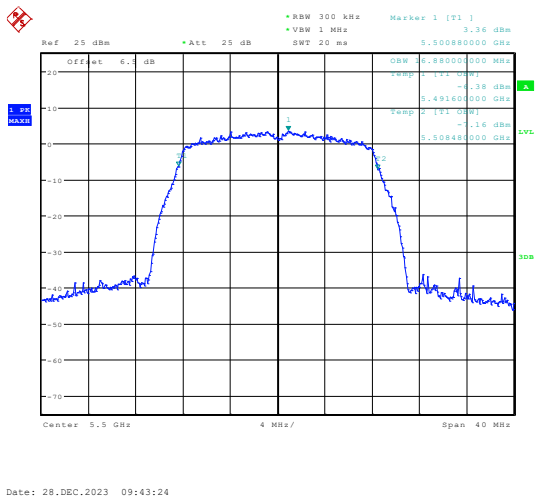
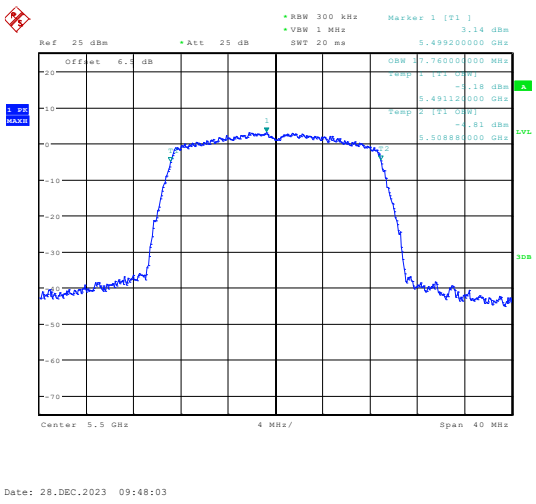
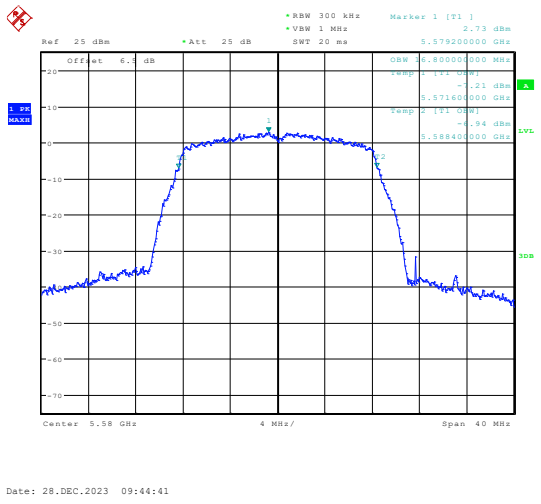
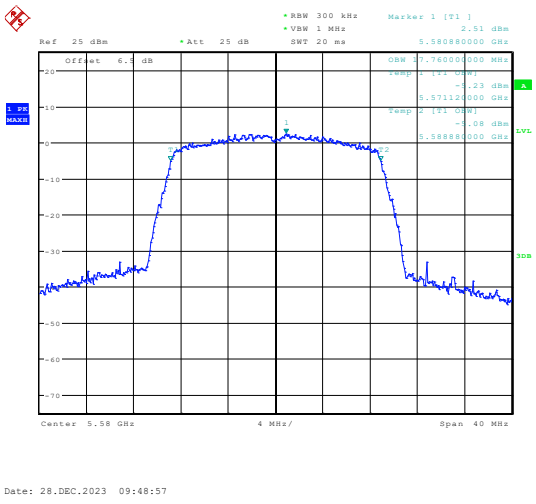
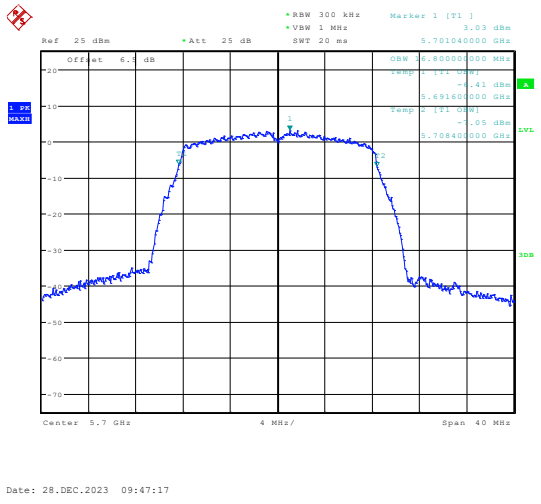
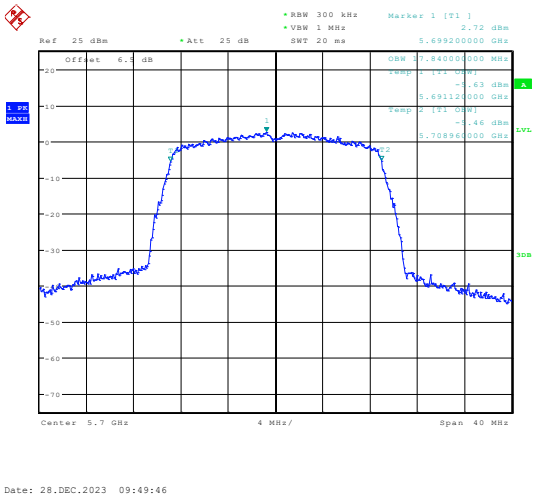
802.11n-HT40	802.11ac-VHT80
Lowest channel	Lowest channel
	
High channel	/
	/

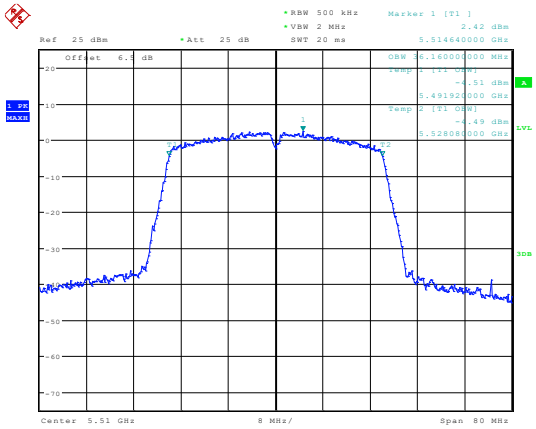
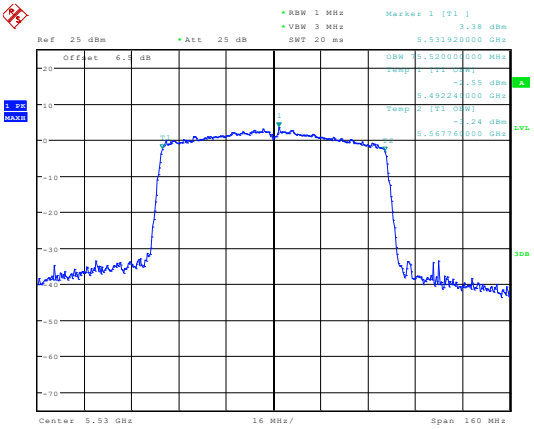
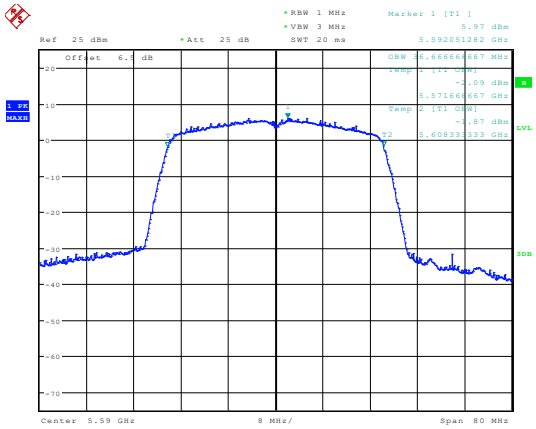
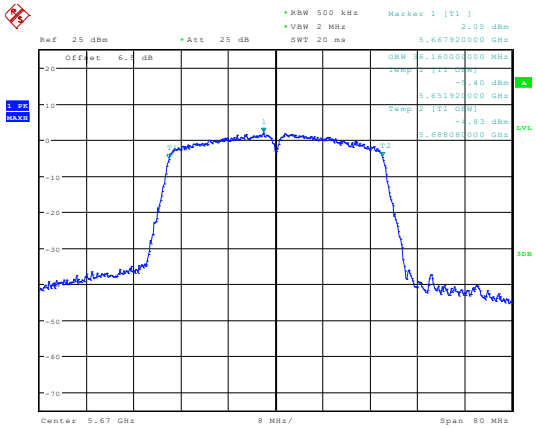
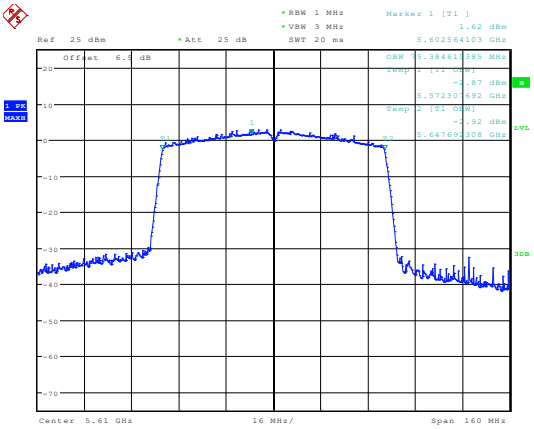
5250-5350MHz:

802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Date: 28.DEC.2023 09:30:22	Date: 28.DEC.2023 09:34:00
Middle channel	Middle channel
	
Date: 28.DEC.2023 09:32:02	Date: 28.DEC.2023 09:34:58
High channel	High channel
	
Date: 28.DEC.2023 09:32:56	Date: 28.DEC.2023 09:35:47

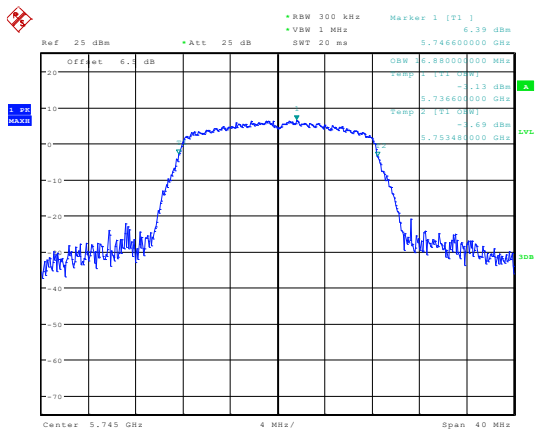
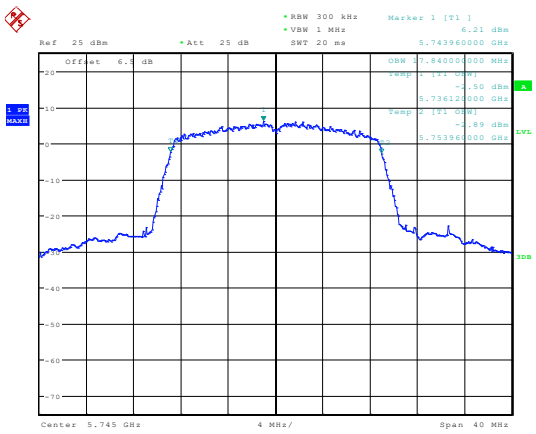
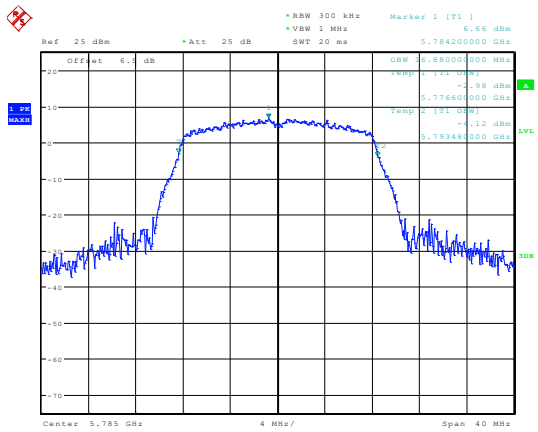
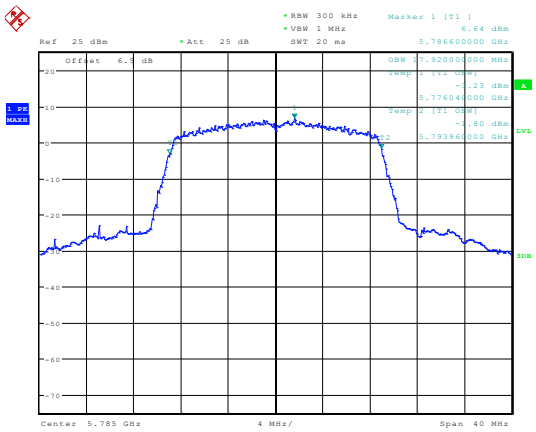
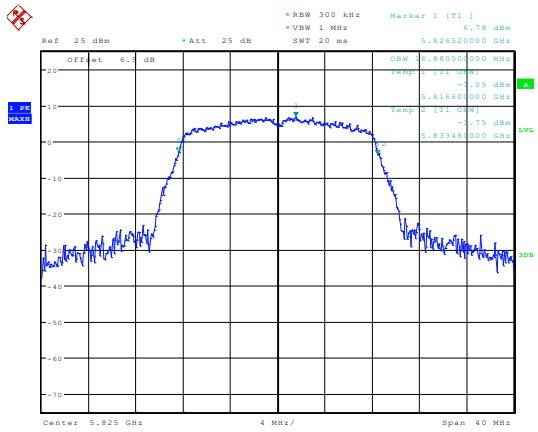
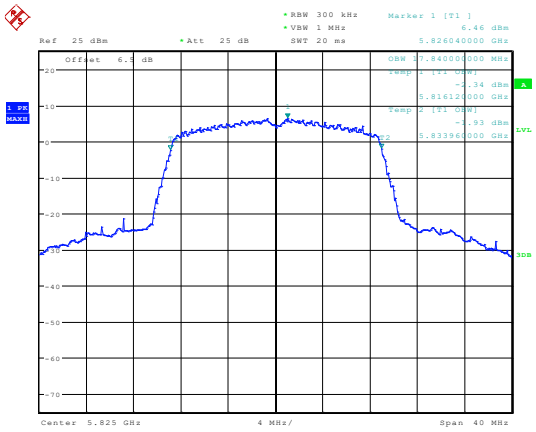
802.11n-HT40	802.11ac-VHT80
Lowest channel	Lowest channel
	
High channel	/
	/

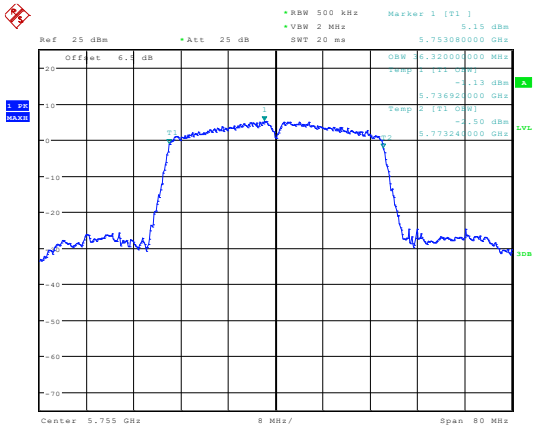
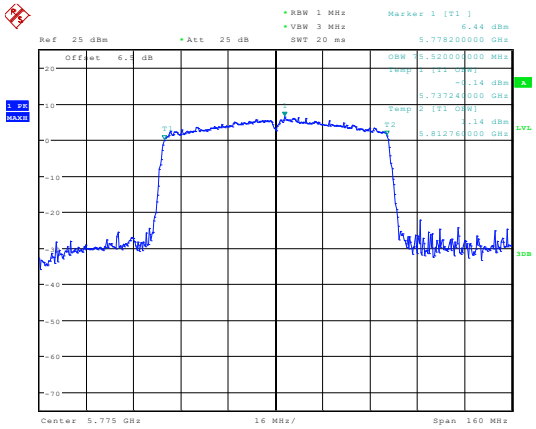
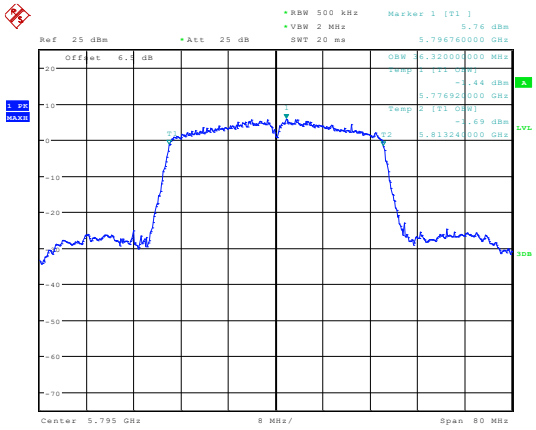
5470-5725MHz:

802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

802.11n-HT40	802.11ac-VHT80
Lowest channel	Lowest channel
	
Middle channel	/
	/
High channel	High channel
	

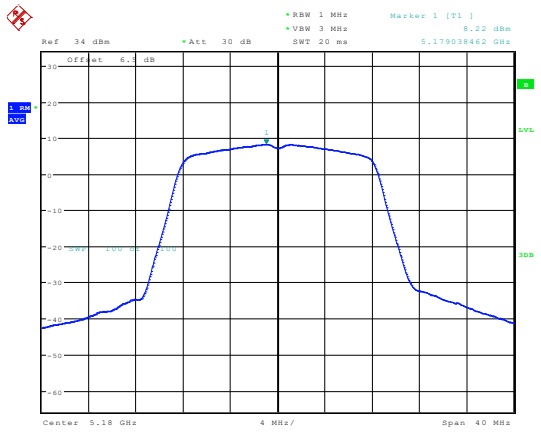
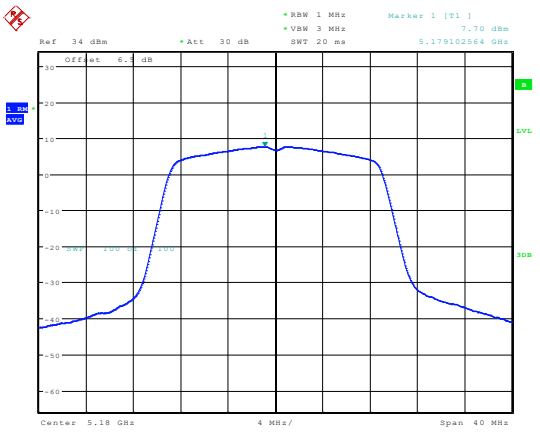
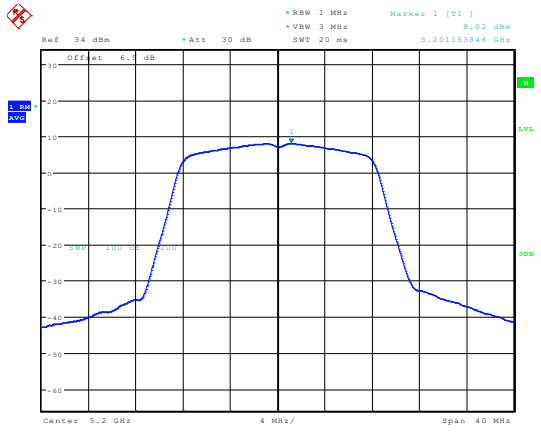
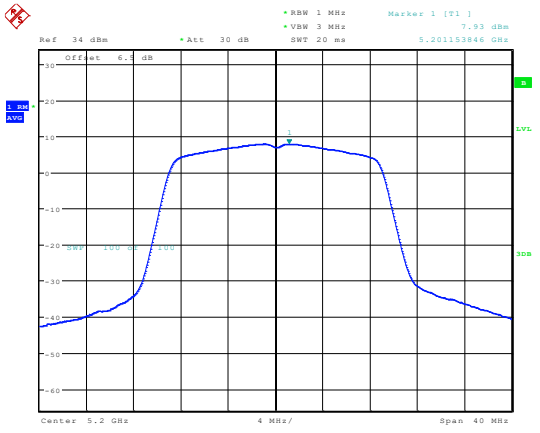
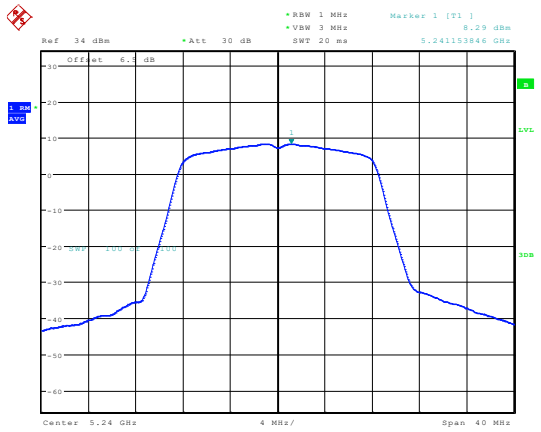
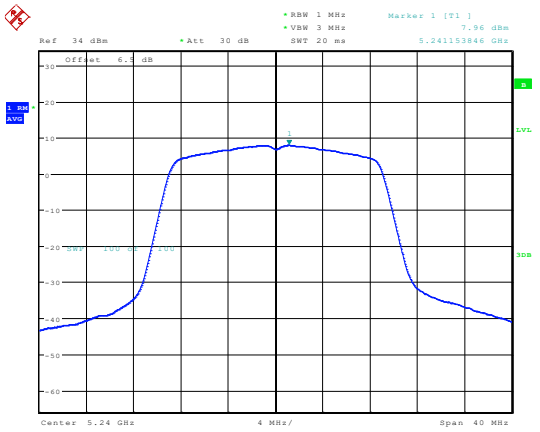
5725-5850MHz:

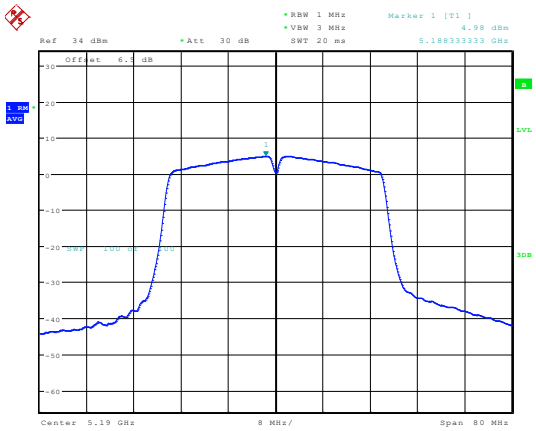
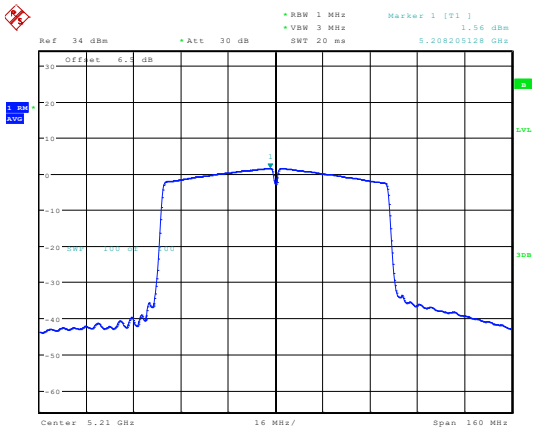
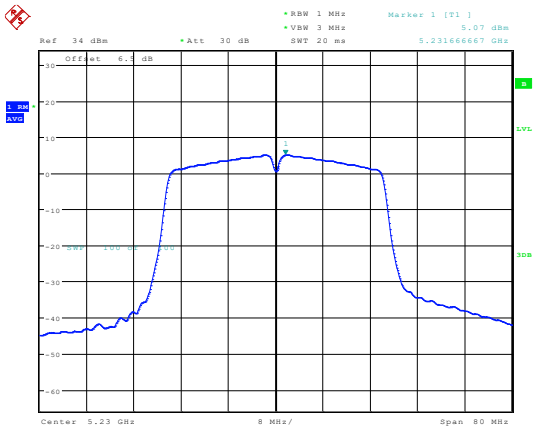
802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Date: 26.DEC.2023 15:57:12	Date: 26.DEC.2023 16:00:38
Middle channel	Middle channel
	
Date: 26.DEC.2023 15:58:16	Date: 26.DEC.2023 16:01:49
High channel	High channel
	
Date: 26.DEC.2023 15:59:37	Date: 26.DEC.2023 16:03:17

802.11n-HT40	802.11ac-VHT80
Lowest channel	Lowest channel
	
High channel	/
	/

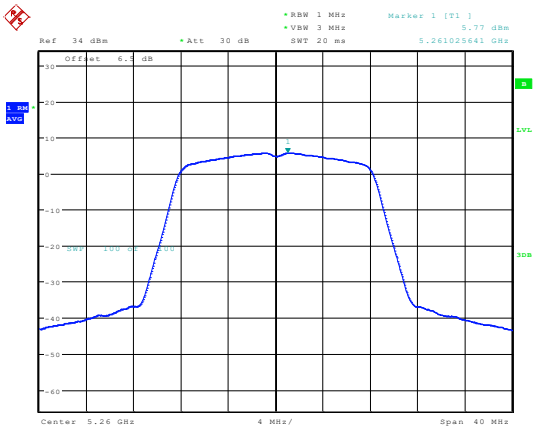
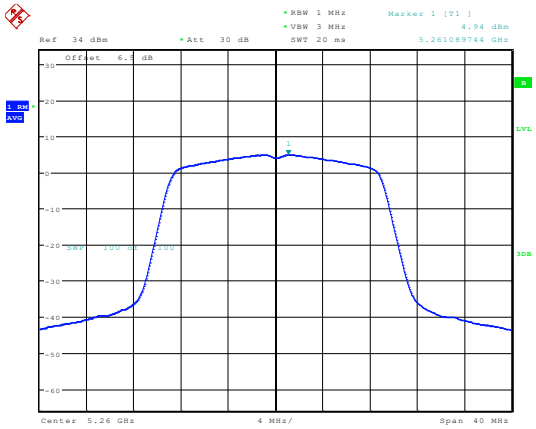
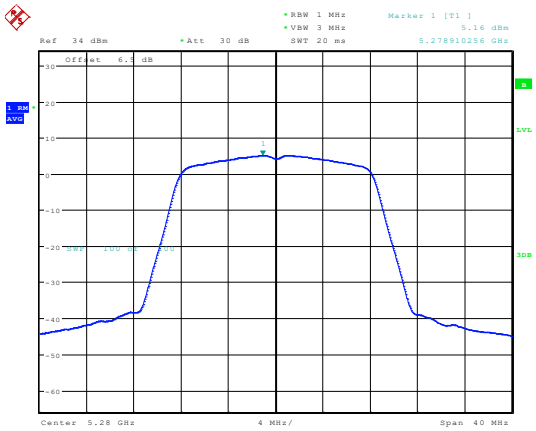
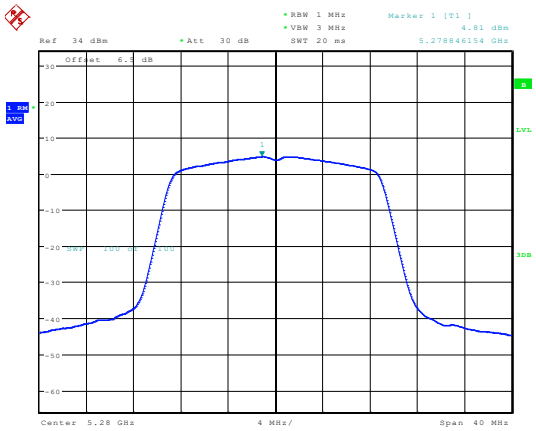
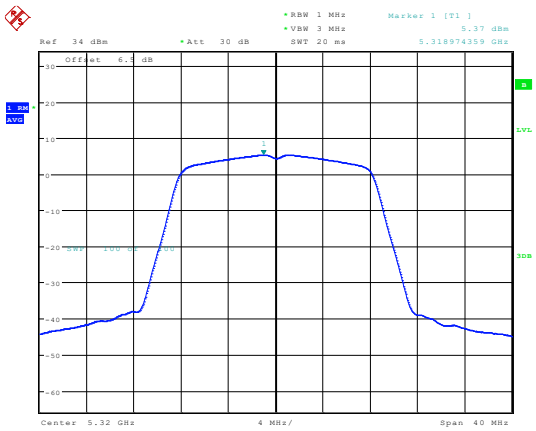
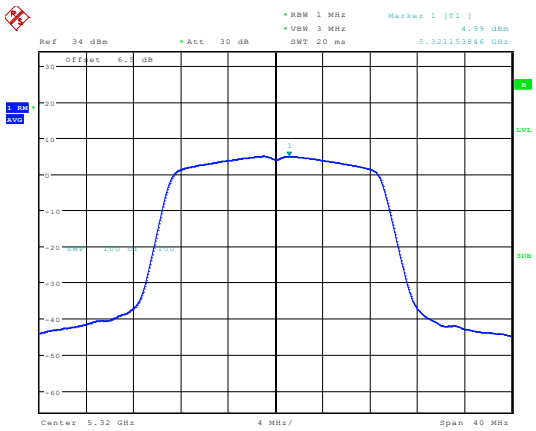
Power Spectral Density

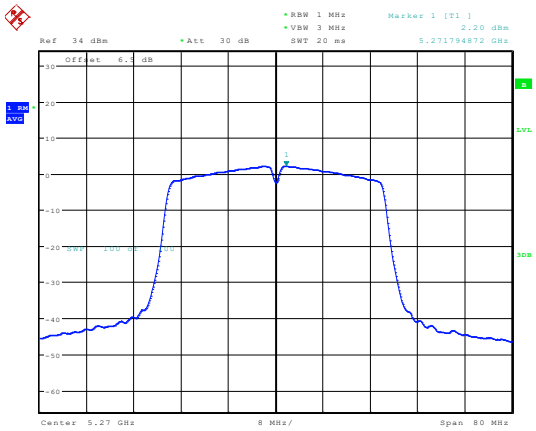
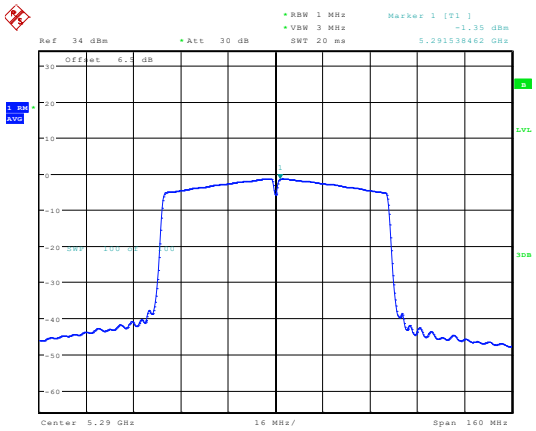
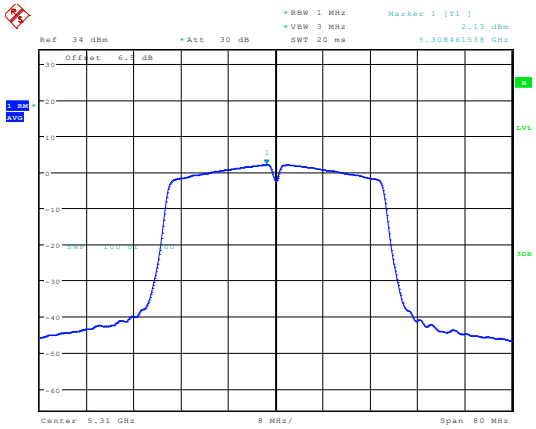
5150-5250MHz:

802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

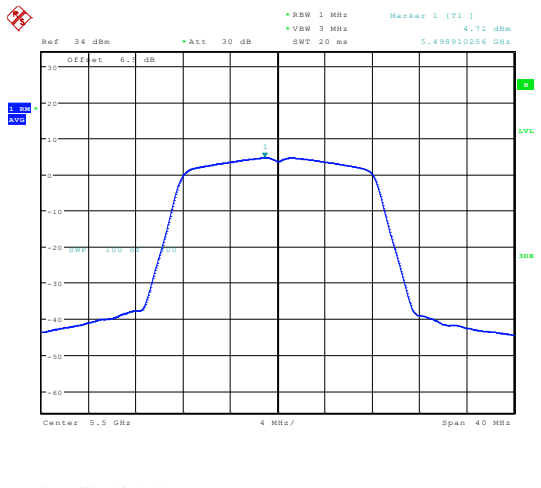
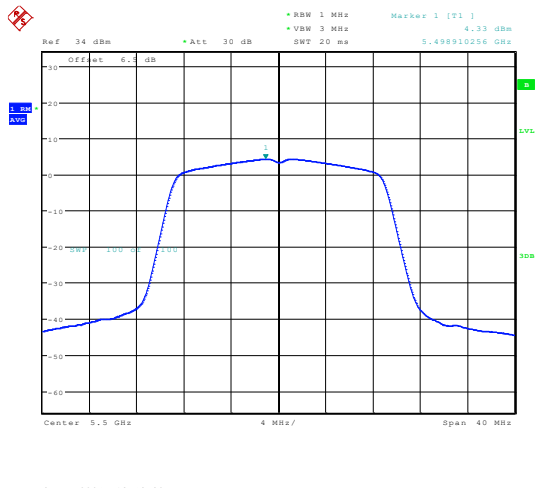
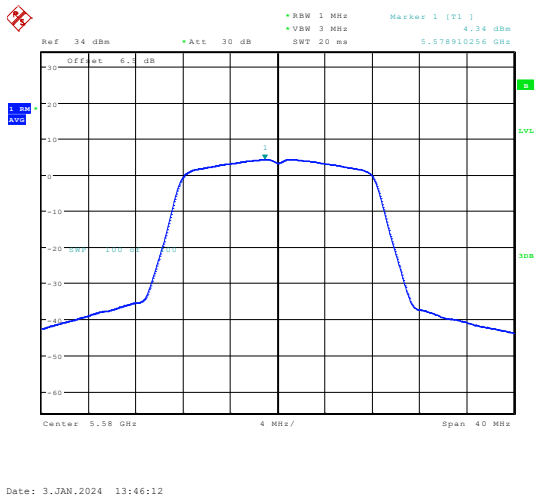
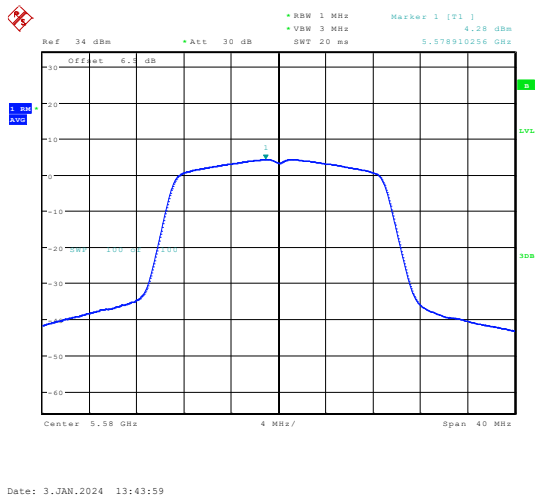
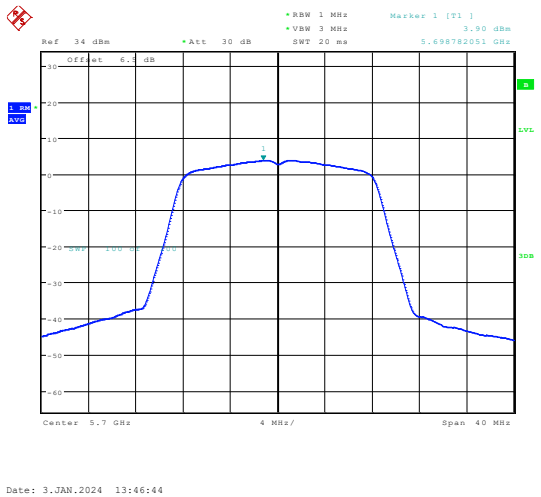
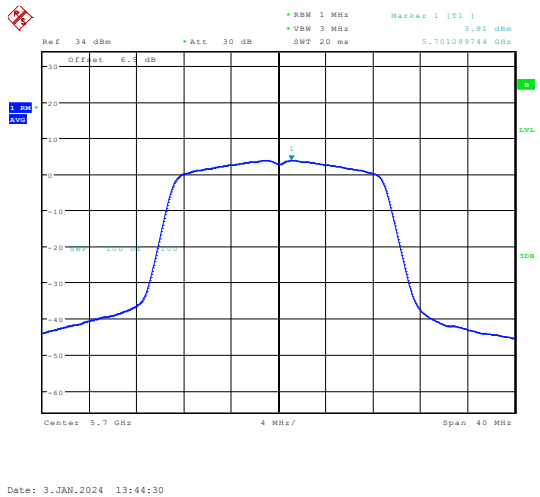
802.11n-HT40	802.11ac-VHT80
Lowest channel	/
	
High channel	/
	/

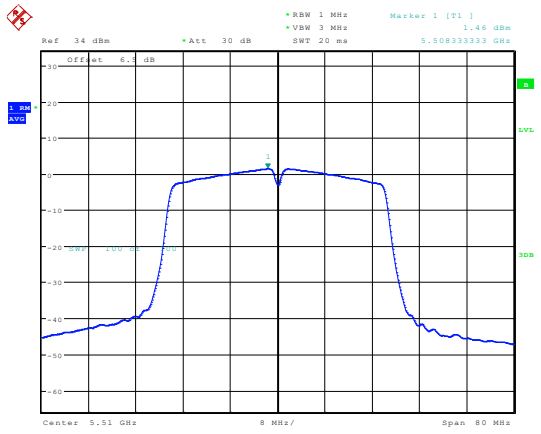
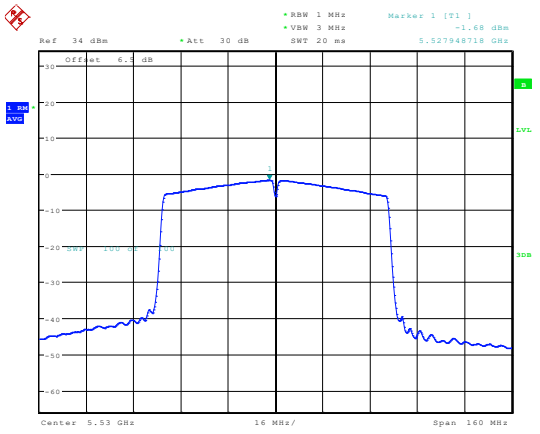
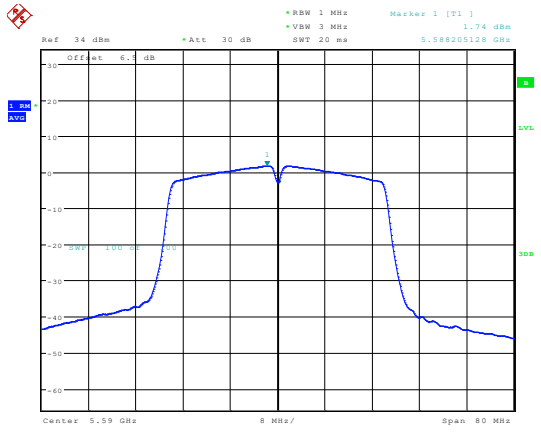
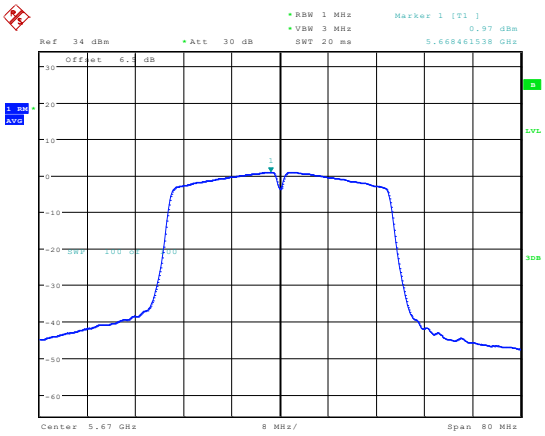
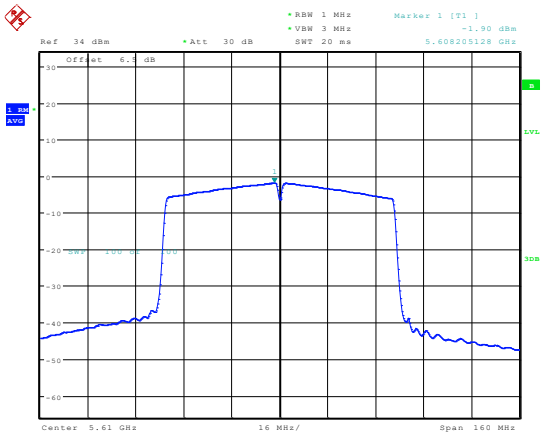
5250-5350MHz:

802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

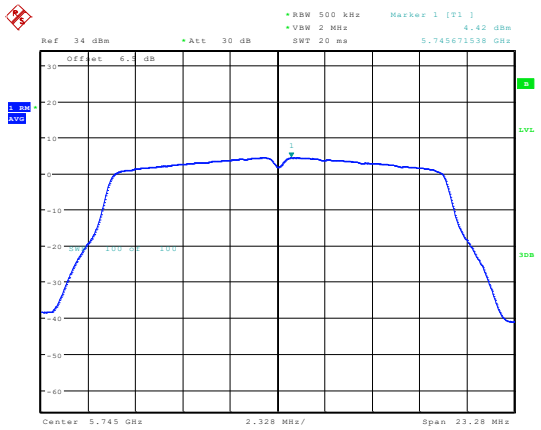
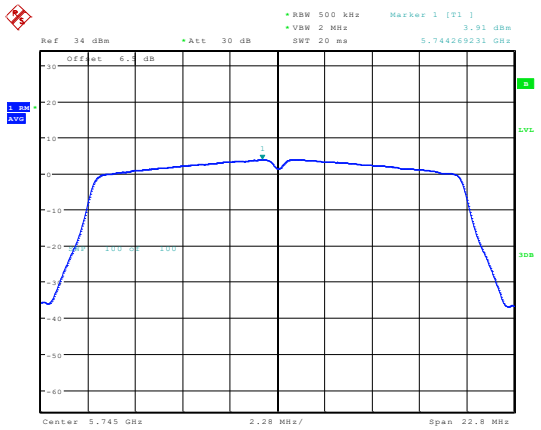
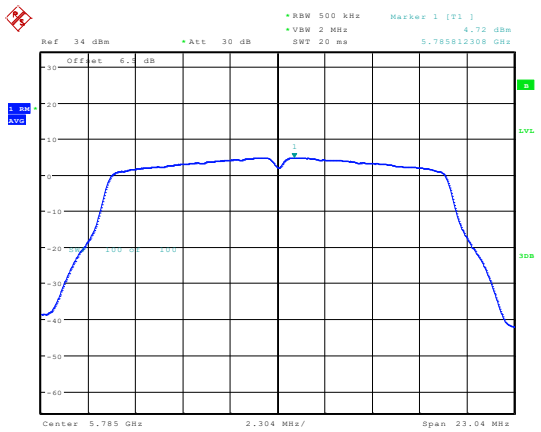
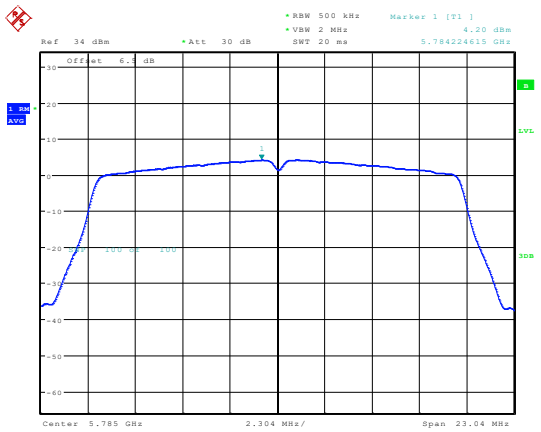
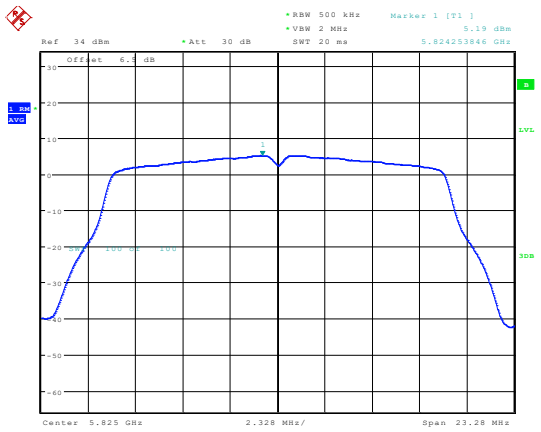
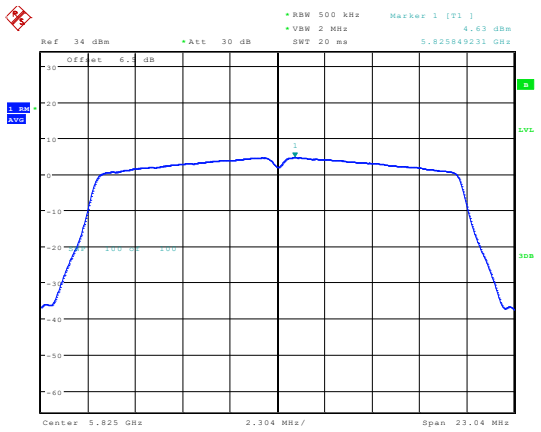
802.11n-HT40	802.11ac-VHT80
Lowest channel	/
	
High channel	/
	/

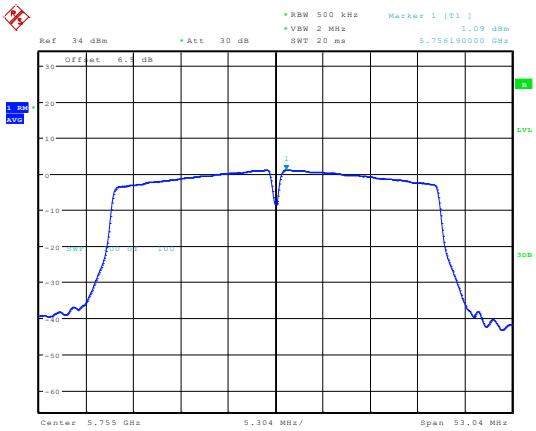
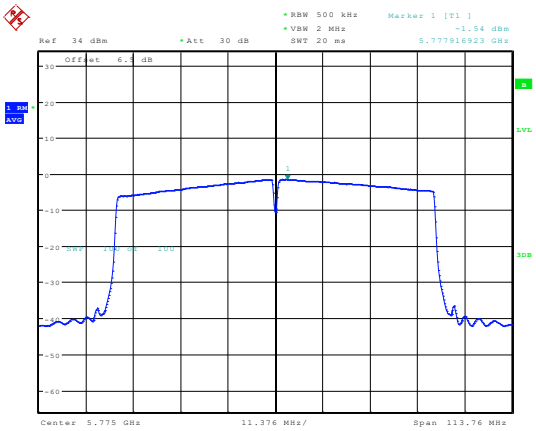
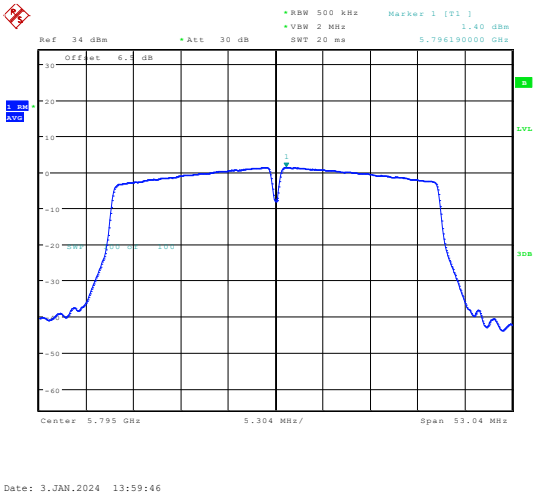
5470-5725MHz:

802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

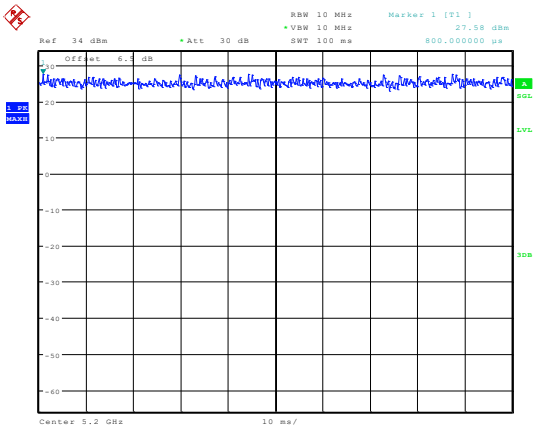
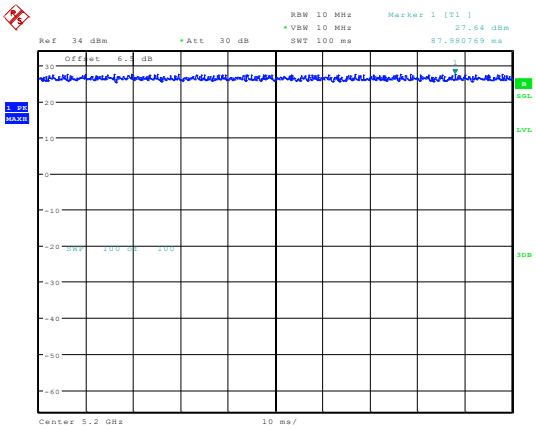
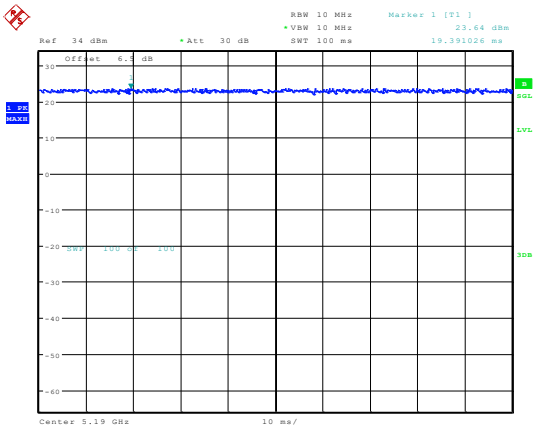
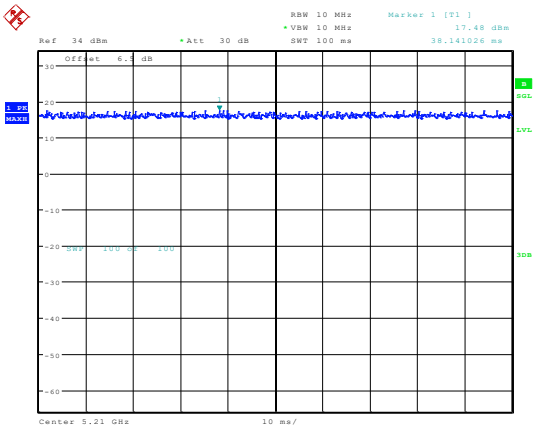
802.11n-HT40	802.11ac-VHT80
Lowest channel	Lowest channel
	
Middle channel	/
	/
High channel	High channel
	

5725-5850MHz:

802.11a	802.11n-HT20
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

802.11n-HT40	802.11ac-VHT80
Lowest channel	/
	
High channel	/
	/

Duty Cycle:

802.11a	802.11n-HT20
 Date: 3.JAN.2024 12:01:25	 Date: 3.JAN.2024 13:10:19
802.11n-HT40	**802.11ac-VHT80**
 Date: 3.JAN.2024 13:12:45	 Date: 3.JAN.2024 13:14:01

4 Test Setup Photo

Please refer to the attachment RWAY202300020 Test Setup photo.

.

5 E.U.T Photo

Please refer to the attachment RWAY202300020 External photo and RWAY202300020 Internal photo.

.

---End of Report---