TEST REPORT

Reference No.	:	WTX24X08191416W001
FCC ID	:	2BGU6-VEIDOO
Applicant	:	Shenzhen Veidoo Digital Vision Co.,Ltd
Address	:	4th Floor Block 6, Saitu Technology Park, No. 137 Bulan Road, Jihua Street, Longgang District, Shenzhen, China
Manufacturer	:	The same as Applicant
Address	:	The same as Applicant
Product Name	:	Tablet PC
Model No.	:	VEIDOO T70 PLUS
Standards	:	FCC Part 15.407
Date of Receipt sample	:	2024-08-14
Date of Test	:	2024-08-14 to 2024-10-08
Date of Issue	:	2024-10-08
Test Report Form No.	:	WTX_Part 15_407W
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

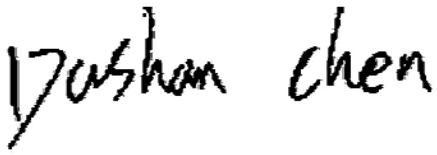
Prepared By:

Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Email: sem@waltek.com.cn

Tested by:



Dashan Chen

Approved by:

Jason Su

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Report version

Version No.	Date of issue	Description
Rev.00	2024-10-08	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Tablet PC
Trade Name:	/
Model No.:	VEIDOO T70 PLUS
Adding Model(s):	VEIDOO T40, T60 PLUS, VEIDOO T70, T50, T30 PLUS, T40 PLUS, VEIDOO T60 PLUS, VEIDOO T80, T80 PLUS, T60
Rated Voltage:	DC3.7V
Battery Capacity:	5000mAh
Power Adapter:	CT-050200UA Input:AC100-240V 50/60Hz 0.3A Output:DC5V2.0A
Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model VEIDOO T70 PLUS, but the circuit and the electronic construction do not change, declared by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n(HT20), 802.11n-HT40, 802.11ac-VHT20/40, 802.11ax-HE20/40
Frequency Range:	5745-5825MHz
Max. RF Output Power:	14.97dBm (Conducted)
Type of Modulation:	QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Type of Antenna:	PIFA Antenna
Antenna Gain:	0.6dBi
Note The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.407: General technical requirements.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
KDB789033 D02 v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-Nii) Devices Part 15, Subparte.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB789033 D02 v02r01
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Table for parameters of Test Software setting

Run adb commands and follow the instructions given by the manufacturer, you can start to test. During testing, Channel and Power Controlling commands provided by the customer was used to control the operating channel as well as the output power level. Test use the customer default power level, and to measure its highest possible emissions level, more detailed description as follows:

Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5745	5785	5825
802.11a 6Mbps	16	16	16
802.11n-HT20 MCS0	15	15	15
802.11ac-HT20 MCS0	15	15	15
802.11ax-HT20 MCS0	15	15	15
Mode	NCB: 40MHz		
	5755	5795	
802.11n-HT40 MCS0	14	14	
802.11ac-HT40 MCS0	14	14	
802.11ax-HT40 MCS0	14	14	

1.5 EUT Operating during test

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Android were executed.

1.6 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is mai ntained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

1.7 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11a	5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5745MHz, 5785MHz,5825MHz
TM3	802.11ac-VHT20	5745MHz, 5785MHz,5825MHz
TM4	802.11ax-HE20	5745MHz, 5785MHz,5825MHz
TM5	802.11n-HT40	5755MHz,5795MHz
TM6	802.11ac-VHT40	5755MHz,5795MHz
TM7	802.11ax-HE40	5755MHz,5795MHz
Note: All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.		

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	45~75 %
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	0.95	Shielded	Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Earphone Cable	1.0	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	TianYi 100-14IBD	PF0F4ABV

1.8 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.9 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2024-02-24	2025-02-23
WTXE1005A1005	Spectrum Analyzer	Agilent	N9020A	US47140102	2024-03-19	2025-03-18
WTXE1084A1001	Spectrum Analyzer	Agilent	N9020A	MY54320548	2024-02-24	2025-02-23
WTXE1004A1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2024-02-27	2025-02-26
☐ Chamber A: Below 1GHz						
WTXE1005A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2024-02-24	2025-02-23
WTXE1001A1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2024-03-19	2025-03-18
WTXE1007A1001	Amplifier	HP	8447F	2805A03475	2024-02-24	2025-02-23
WTXE1010A1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2025-02-25
WTXE1010A1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2024-02-24	2025-02-23
☐ Chamber A: Above 1GHz						
WTXE1005A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2024-02-24	2025-02-23
WTXE1001A1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2024-03-19	2025-03-18
WTXE1065A1001	Amplifier	C&D	PAP-1G18	2002	2024-02-27	2025-02-26
WTXE1010A1005	Horn Antenna	ETS	3117	00086197	2024-02-26	2025-02-25
WTXE1010A1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2025-03-16
WTXE1003A1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2024-02-29	2025-02-28
☐ Chamber B:Below 1GHz						
WTXE1010A1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2024-03-17	2027-03-16
WTXE1038A1001	Amplifier	Agilent	8447D	2944A10457	2024-02-24	2025-02-23

WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2024-02-24	2025-02-23
☒ Chamber C:Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2024-02-27	2025-02-26
WTXE1010A 1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2024-04-18	2027-04-17
WTXE1007A 1002	Amplifier	HP	8447F	2944A03869	2024-02-24	2025-02-23
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2025-02-25
☒ Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2024-02-27	2025-02-26
WTXE1103A 1005	Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806235	2024-02-27	2025-02-26
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2025-03-16
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2024-02-29	2025-02-28
☐ Conducted Room 1#						
WTXE1104A 1029	EMI Test Receiver	Rohde & Schwarz	ESCI	100525	2023-12-12	2024-12-11
WTXE1002A 1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2024-02-24	2025-02-23
WTXE1003A 1001	AC LISN	Schwarz beck	NSLK8126	8126-279	2024-02-24	2025-02-23
☒ Conducted Room 2#						
WTXE1001A 1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2024-02-24	2025-02-23
WTXE1003A 1003	LISN	Rohde & Schwarz	ENV 216	100097	2024-02-24	2025-02-23

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission A)	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission B)	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission C)	Farad	EZ-EMC	RA-03A1-2 (1.1.4.2)
EMI Test Software (Conducted Emission Room 1#)	Farad	EZ-EMC	3A1*CE-RE 1.1.4.3
EMI Test Software (Conducted Emission Room 2#)	Farad	EZ-EMC	3A1*CE-RE 1.1.4.3

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203; §15.405	Antenna Requirement	Compliant
15.407 (c)	Automatically Discontinue Transmission	Compliant
§15.207; §15.407(b)(6)	Conducted Emission	Compliant
§15.407(a)(1),(2)	Power Spectral Density	Compliant
§15.407(e)	Emission Bandwidth and Occupied Bandwidth	Compliant
§15.407(a)(1),(2)	Maximum Conducted Output Power	Compliant
§15.407(b)(1),(2),(3),(4)	Undesirable emission	Compliant
§15.205; §15.407(b)(1),(2),(3)	Radiated Emission	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.407(h)	Dynamic Frequency Selection (DFS)	Compliant

N/A: Not applicable.

3. Antenna Requirement

3.1 Standard Applicable

According to FCC Part 15.203, 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 shall be considered sufficient to comply with the provisions of this section.

3.2 Evaluation Information

This product has an PIFA Antenna, fulfill the requirement of this section.

4. Automatically Discontinue Transmission

4.1 Standard Applicable

According to FCC Part 15.407(c), the device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

4.2 Summary of Test Results

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

5. Power Spectral Density

5.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11 dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi 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.

5.2 Test Procedure

According to 789033 D02 v02r01 General UNII Test Procedures New Rules v02, the following is the measurement procedure.
For devices operating in the bands 5.15-5.25GHz, 5.25-5.35GHz, and 5.47-5.725GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85GHz, the rules specify a measurement bandwidth of 500kHz. Many spectrum analyzers do not have 500kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500kHz, “provided that the measured power is integrated over the full

reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1MHz, or 500kHz). If measurements are performed using a reduced resolution bandwidth (< 1MHz, or < 500kHz) and integrated over 1 MHz, or 500kHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100kHz for the sections 5.c) and 5.d) above, since RBW=100kHZ is available on nearly all spectrum analyzers.

5.3 Summary of Test Results/Plots

Please refer to Appendix A

6. Emission Bandwidth and Occupied Bandwidth

6.1 Standard Applicable

According to 15.407(a) and (e):

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi 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.

(e) Within the 5.725-5.85GHz band, the minimum 6dB bandwidth of U-NII devices shall be at least 500kHz.

6.2 Test Procedure

According to 789033 D02 v02r0r section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.

c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85GHz Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth
The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v02r01 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 * RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency.

The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

6.3 Summary of Test Results/Plots

Please refer to Appendix B

7. Maximum Conducted Output Power

7.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11dBm 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 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi 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.

7.2 Test Procedure

According to KDB789033 D02 v02r01 section E, the following is the measurement procedure.

(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1MHz.

(iii) Set VBW ≥ 3MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that

narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

7.3 Summary of Test Results/Plots

Please refer to Appendix C

8. Radiated Spurious Emissions

8.1 Standard Applicable

According to §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(2) For transmitters operating in the 5.25-5.35GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(3) For transmitters operating in the 5.47-5.725GHz band: All emissions outside of the 5.47-5.725GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(4) For transmitters operating in the 5.725-5.85GHz band:

(i) All emissions shall be limited to a level of −27dBm/MHz at 75MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6dBm/MHz at 5MHz above or below the band edge, and from 5MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

According to §15.407(b)(6), Unwanted emissions below 1GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

According to §15.407(b)(7), The provisions of §15.205 apply to intentional radiators operating under this section.

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If radiated measurements are performed, field strength is then converted to EIRP as follows:

EIRP = ((E*d)^2) / 30

where:

• E is the field strength in V/m;

• d is the measurement distance in meters;

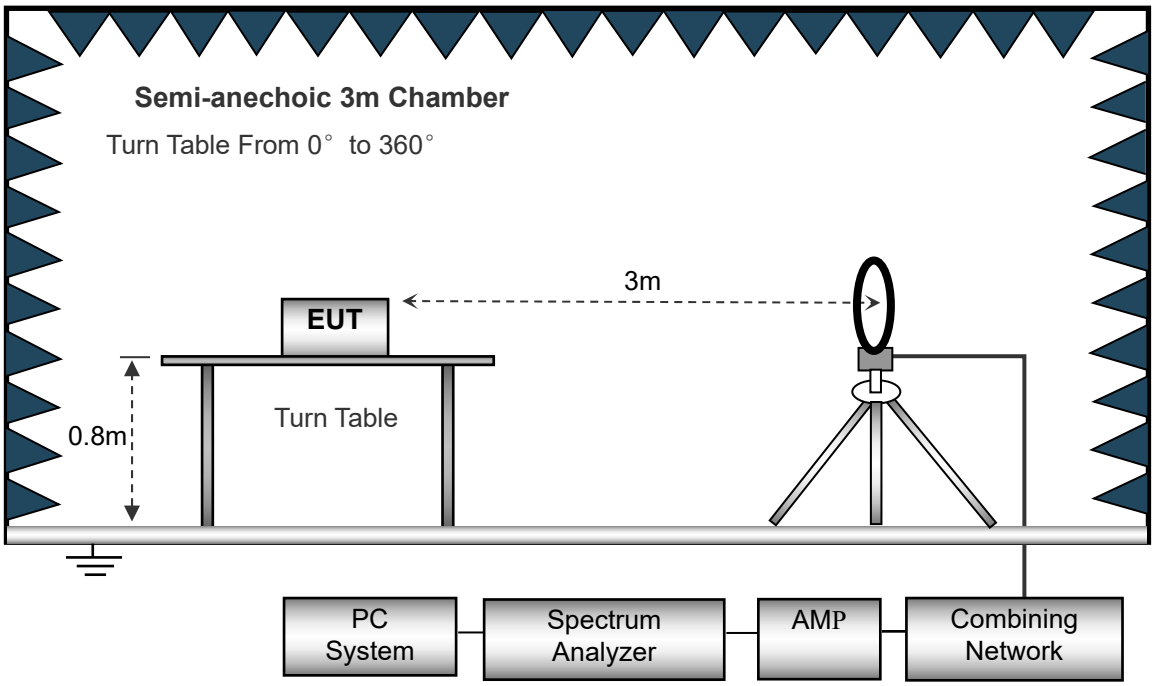
• EIRP is the equivalent isotropically radiated power in watts.

8.2 Test Procedure

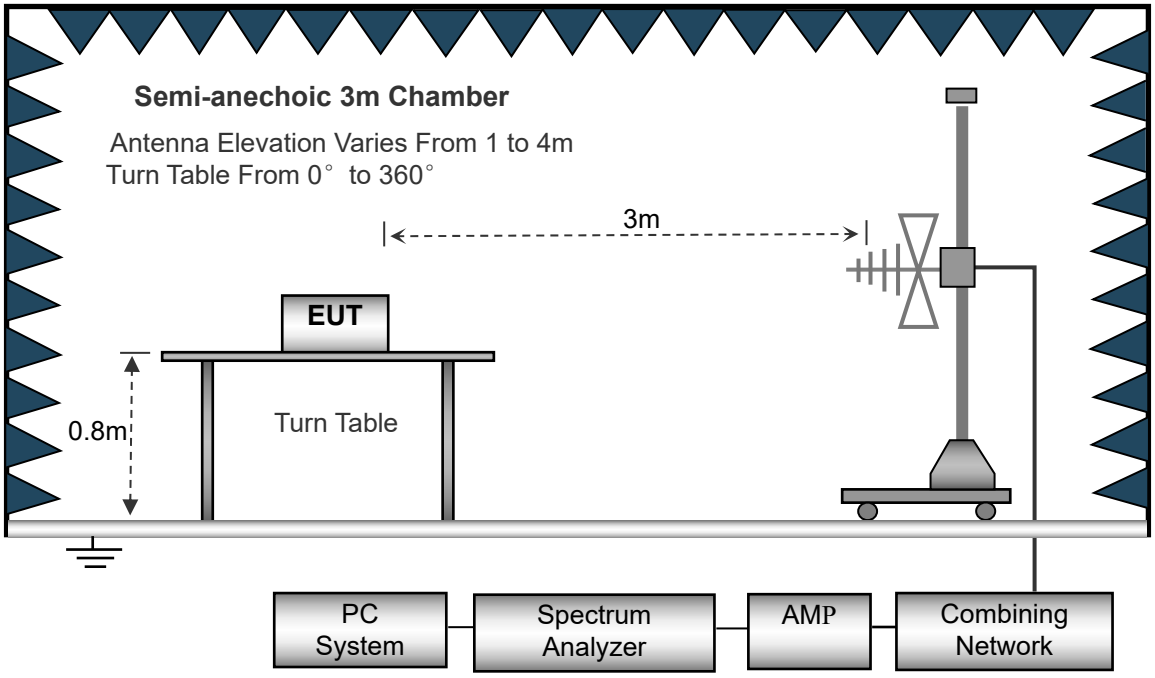
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

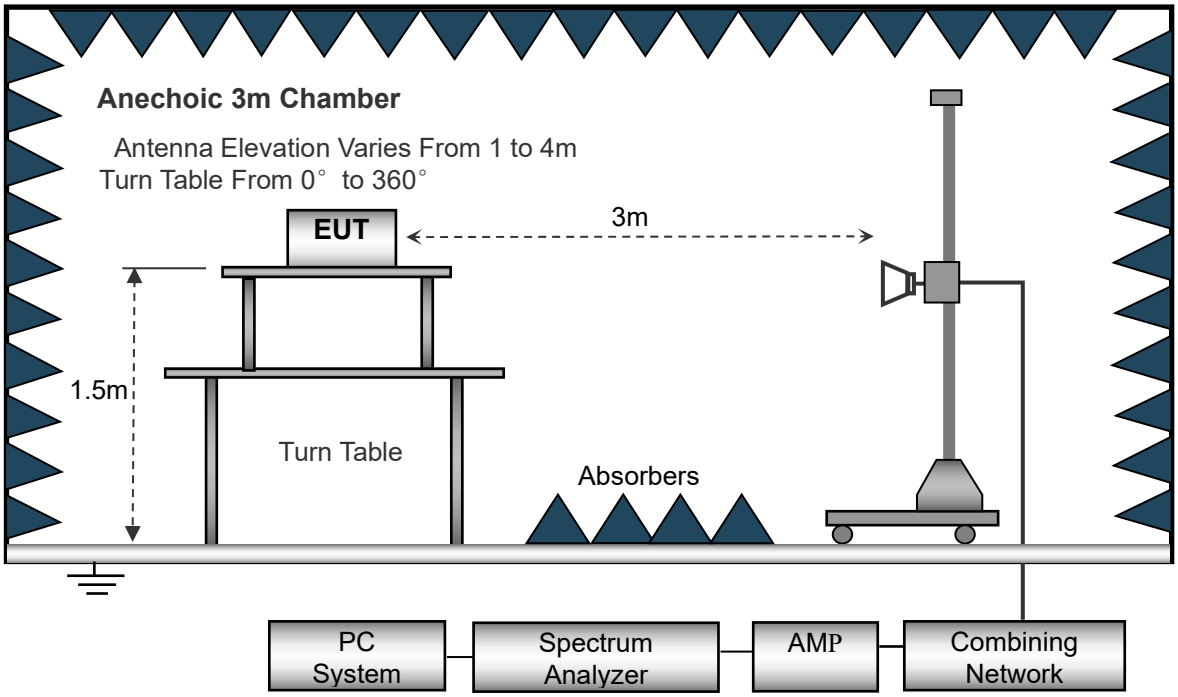
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1GHz.



8.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:
RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:
RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

8.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

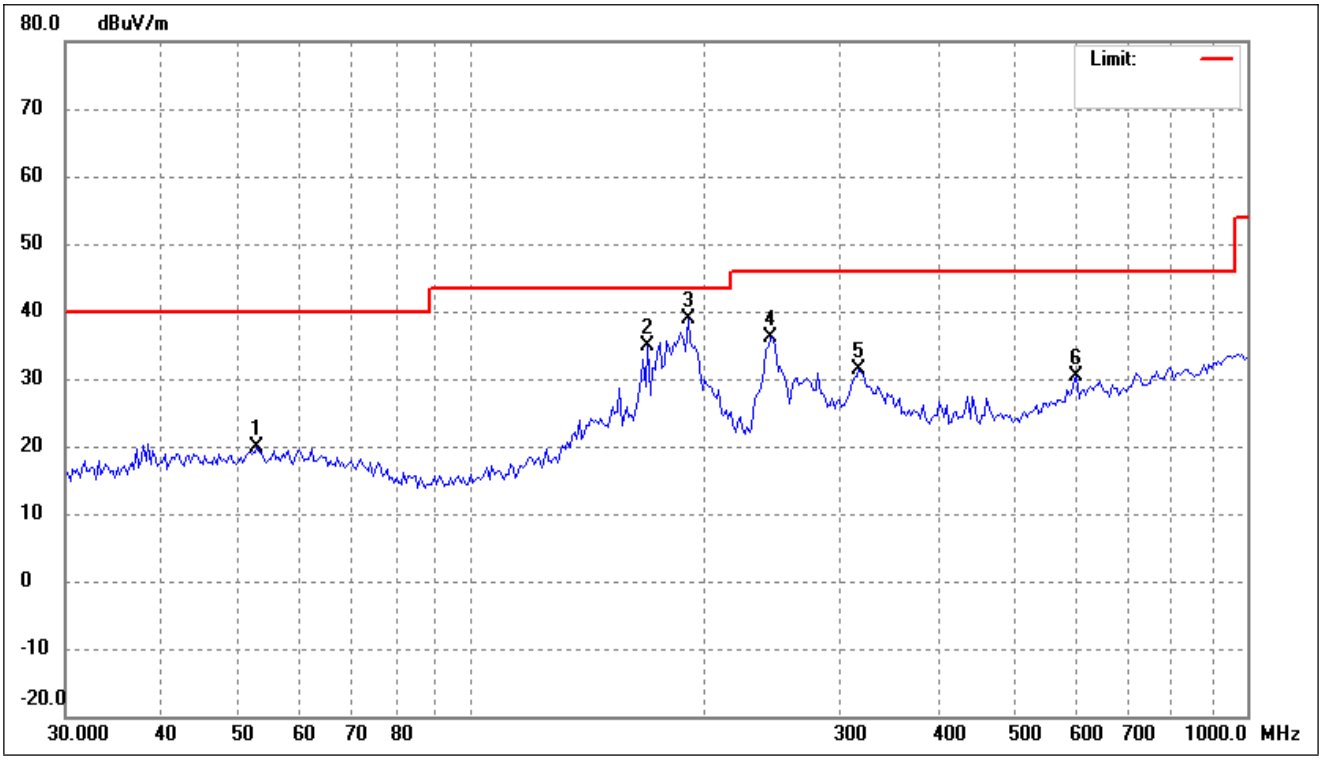
Margin = Corr. Ampl. – FCC Part 15 Limit

8.5 Summary of Test Results/Plots

Note: *this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

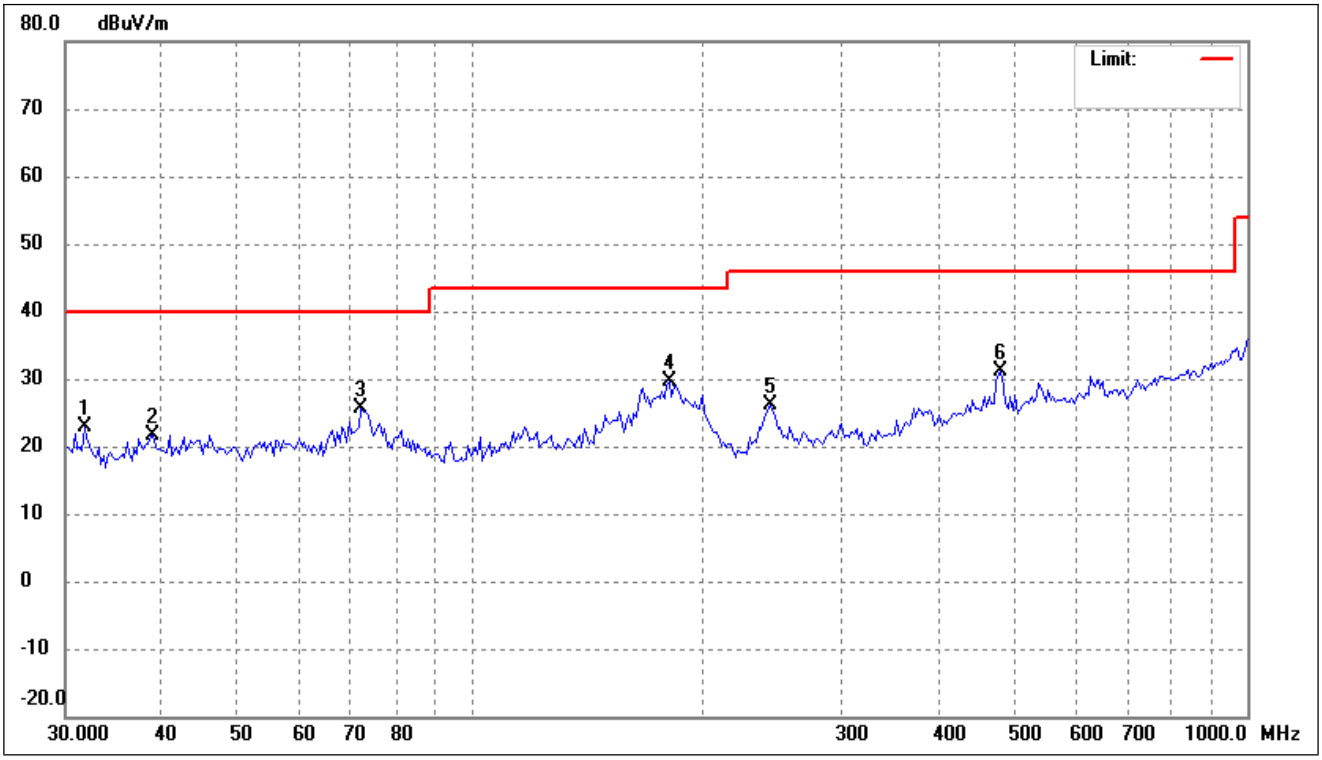
- Spurious Emission From 30MHz to 1GHz
- 5725-5850MHz

802.11a			
Test Channel	5745MHz(worst case)	Polarity:	Horizontal



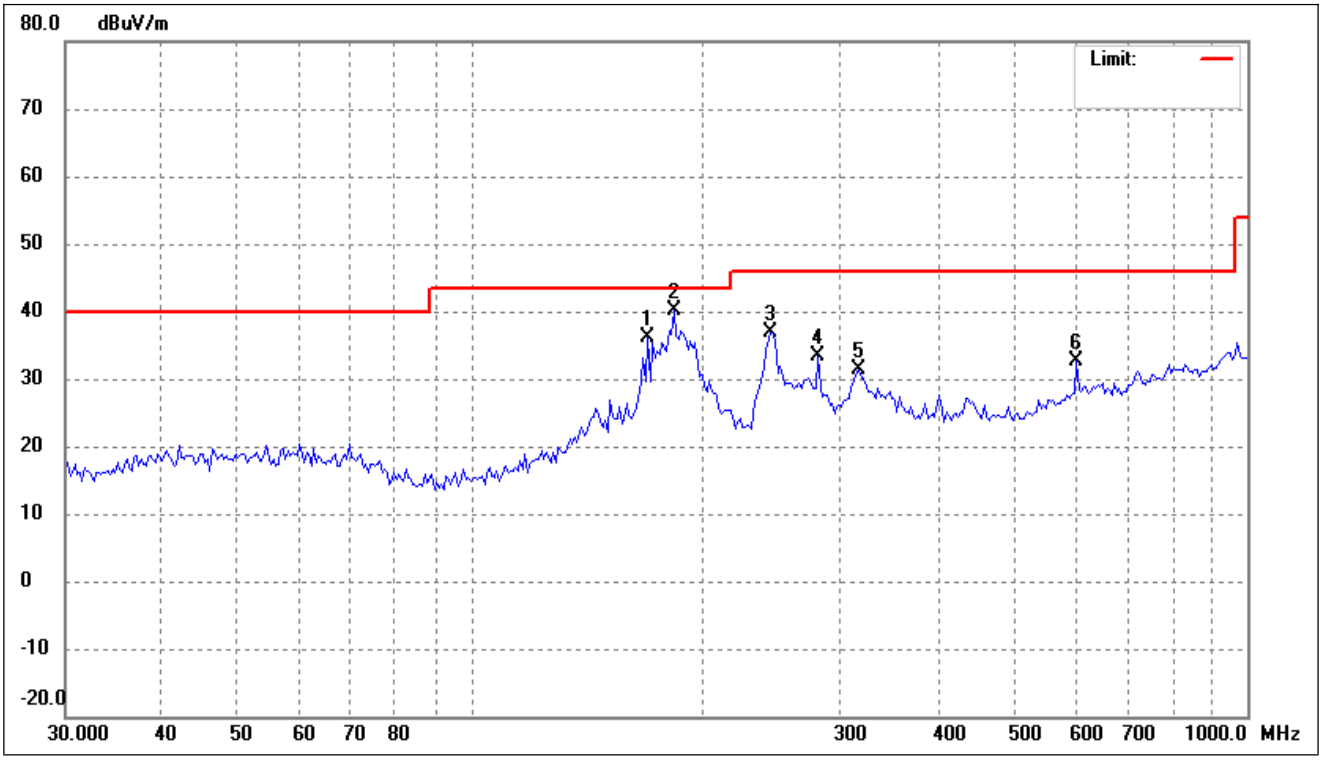
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	53.0056	27.82	-7.91	19.91	40.00	-20.09	-	-	peak
2	168.9970	43.10	-8.29	34.81	43.50	-8.69	-	-	peak
3	190.4411	49.83	-10.86	38.97	43.50	-4.53	-	-	peak
4	243.5431	45.93	-9.90	36.03	46.00	-9.97	-	-	peak
5	315.8599	38.95	-7.52	31.43	46.00	-14.57	-	-	peak
6	602.9287	32.49	-2.19	30.30	46.00	-15.70	-	-	peak

802.11a			
Test Channel	5745MHz(worst case)	Polarity:	Vertical



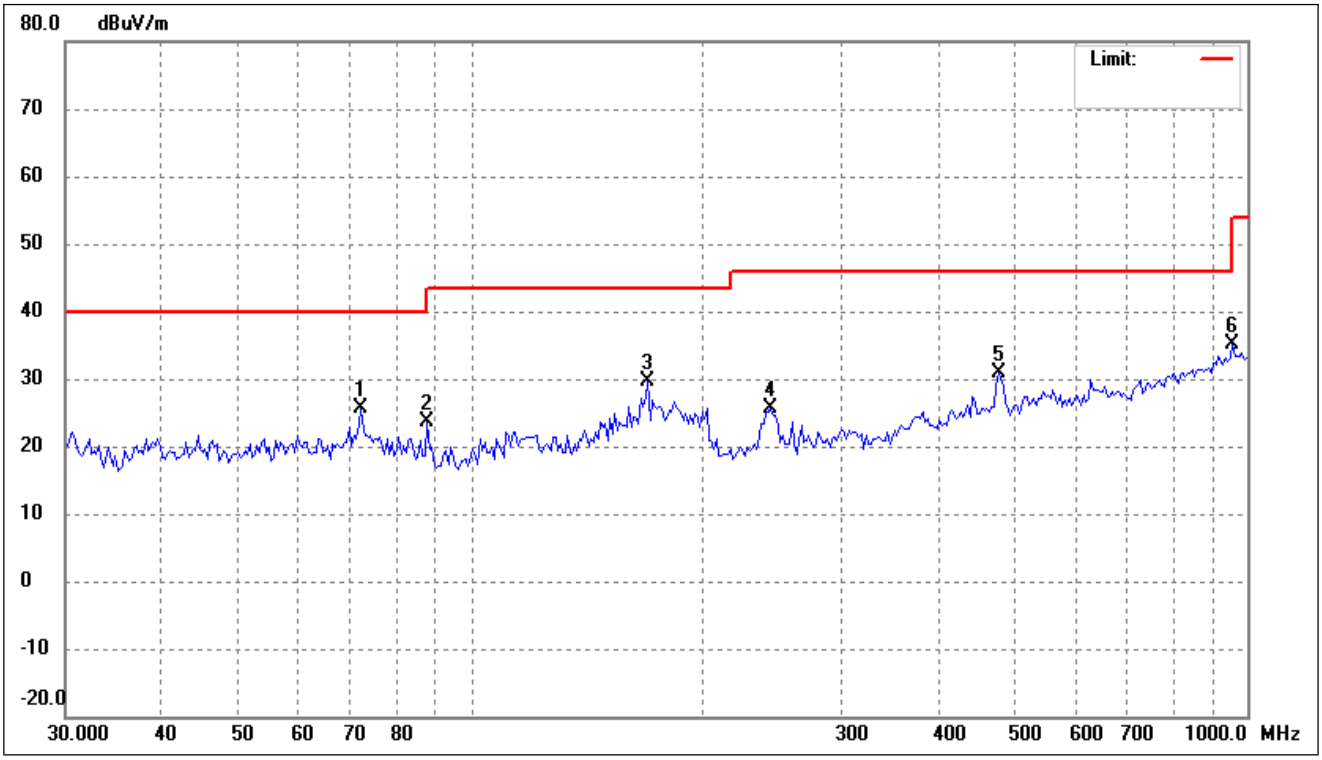
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	31.7348	32.33	-9.43	22.90	40.00	-17.10	-	-	peak
2	38.9081	29.94	-8.19	21.75	40.00	-18.25	-	-	peak
3	72.2111	36.34	-10.74	25.60	40.00	-14.40	-	-	peak
4	180.0304	39.43	-9.74	29.69	43.50	-13.81	-	-	peak
5	243.5431	36.11	-9.90	26.21	46.00	-19.79	-	-	peak
6	481.5112	36.06	-4.94	31.12	46.00	-14.88	-	-	peak

802.11n-HT20			
Test Channel	5745MHz(worst case)	Polarity:	Horizontal



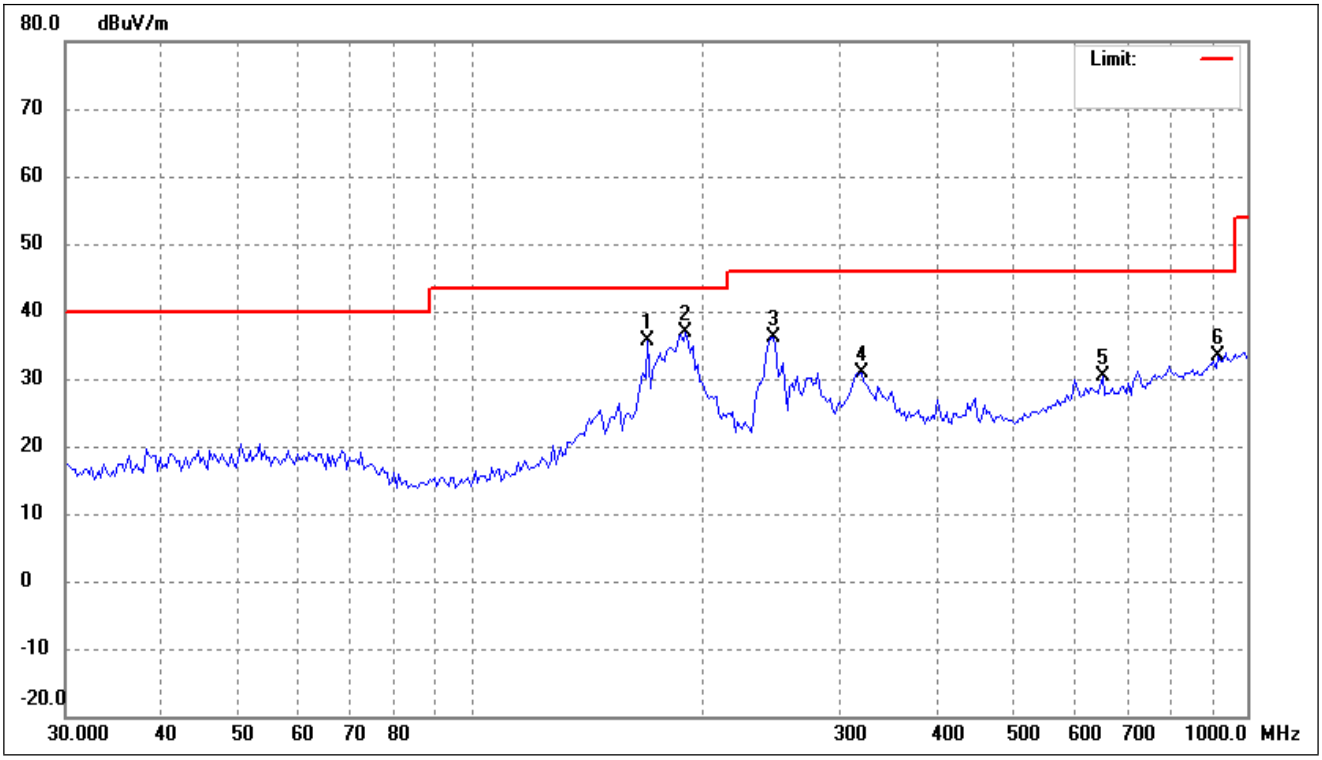
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	168.9970	44.50	-8.29	36.21	43.50	-7.29	-	-	peak
2	182.5785	50.15	-10.02	40.13	43.50	-3.37	-	-	peak
3	243.5431	46.67	-9.90	36.77	46.00	-9.23	-	-	peak
4	280.2936	41.77	-8.49	33.28	46.00	-12.72	-	-	peak
5	315.8601	38.82	-7.52	31.30	46.00	-14.70	-	-	peak
6	602.9287	34.74	-2.19	32.55	46.00	-13.45	-	-	peak

802.11n-HT20			
Test Channel	5745MHz(worst case)	Polarity:	Vertical



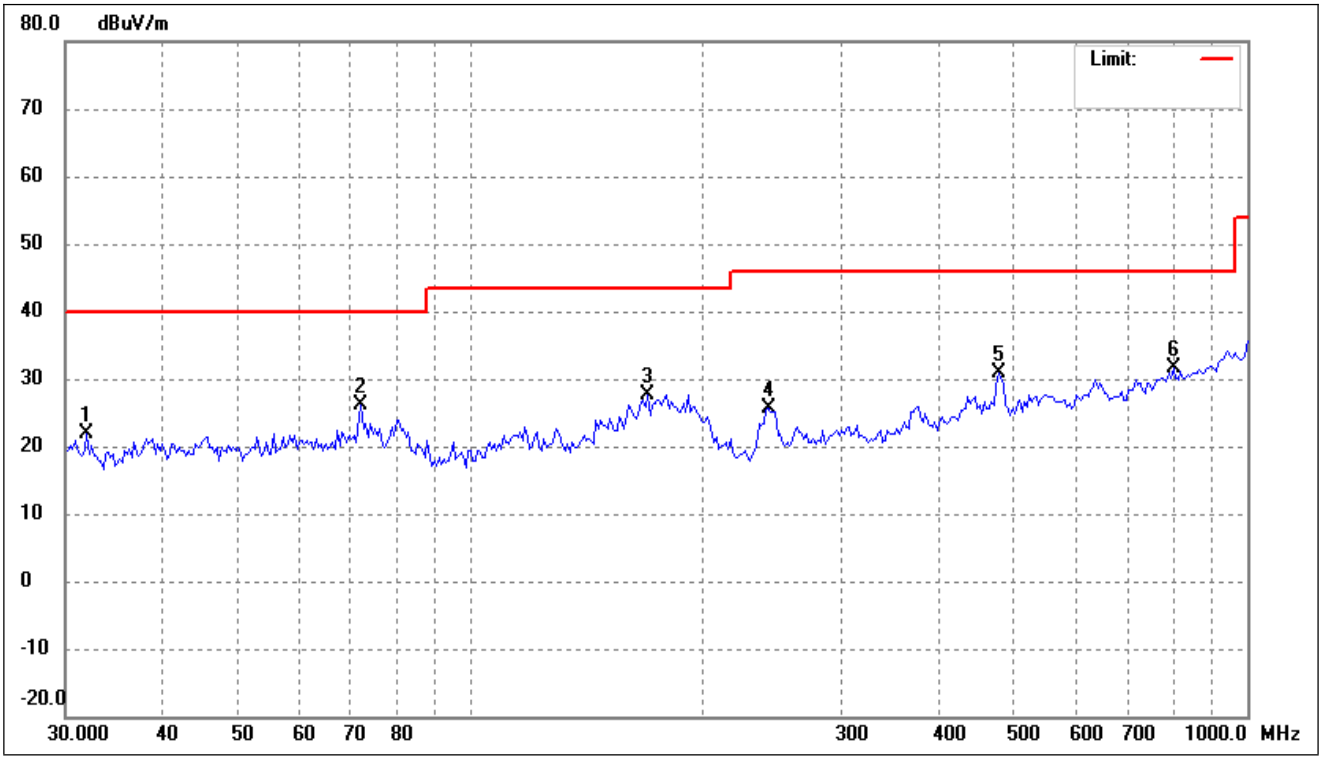
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	72.2111	36.36	-10.74	25.62	40.00	-14.38	-	-	peak
2	87.9136	36.09	-12.56	23.53	40.00	-16.47	-	-	peak
3	168.9970	37.81	-8.29	29.52	43.50	-13.98	-	-	peak
4	243.5431	35.58	-9.90	25.68	46.00	-20.32	-	-	peak
5	478.1394	35.92	-4.97	30.95	46.00	-15.05	-	-	peak
6	958.7135	31.81	3.34	35.15	46.00	-10.85	-	-	peak

802.11ac-VHT20			
Test Channel	5745MHz(worst case)	Polarity:	Horizontal



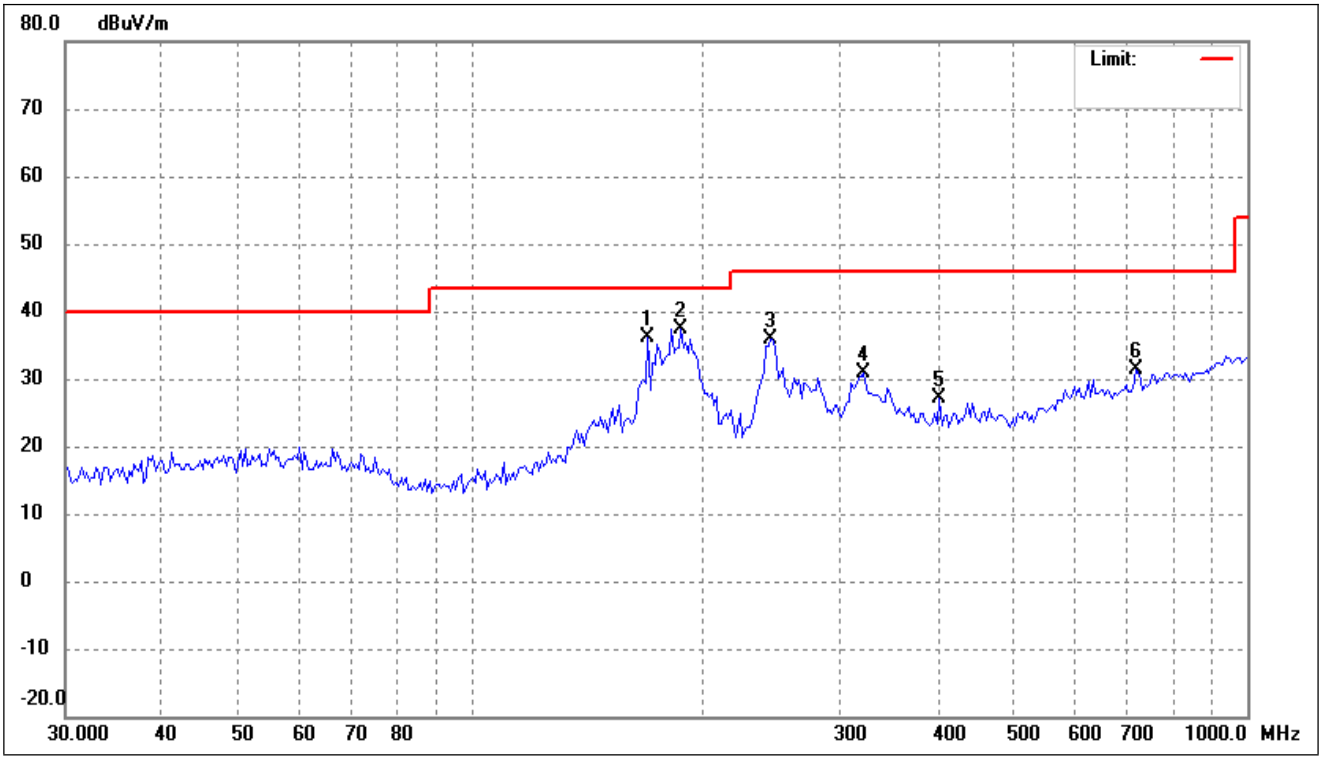
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	168.9970	44.01	-8.29	35.72	43.50	-7.78	-	-	peak
2	189.1076	47.67	-10.73	36.94	43.50	-6.56	-	-	peak
3	245.2606	46.05	-9.85	36.20	46.00	-9.80	-	-	peak
4	318.0875	38.44	-7.47	30.97	46.00	-15.03	-	-	peak
5	651.3831	31.83	-1.54	30.29	46.00	-15.71	-	-	peak
6	919.1315	30.80	2.55	33.35	46.00	-12.65	-	-	peak

802.11ac-VHT20			
Test Channel	5745MHz(worst case)	Polarity:	Vertical



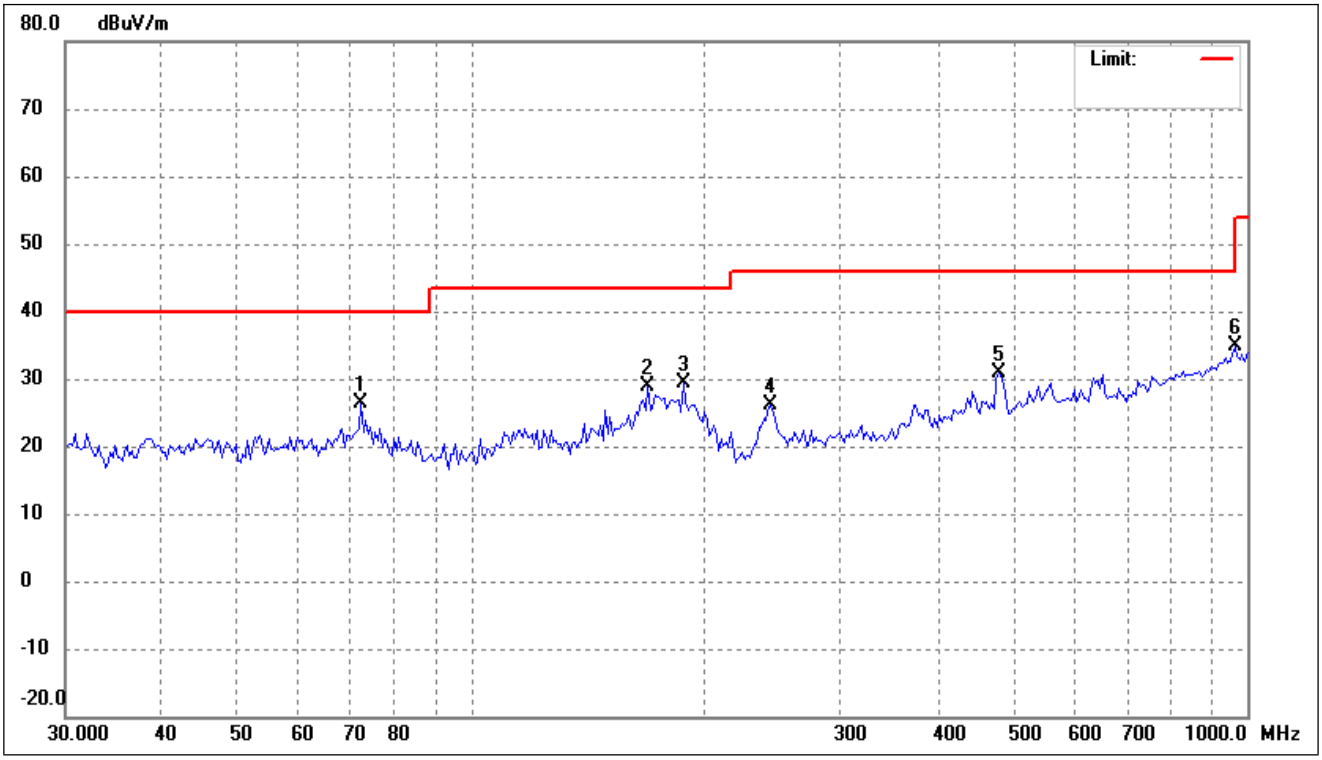
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	31.9586	31.28	-9.39	21.89	40.00	-18.11	-	-	peak
2	72.2111	36.99	-10.74	26.25	40.00	-13.75	-	-	peak
3	168.9970	35.82	-8.29	27.53	43.50	-15.97	-	-	peak
4	241.8377	35.67	-9.97	25.70	46.00	-20.30	-	-	peak
5	478.1394	35.85	-4.97	30.88	46.00	-15.12	-	-	peak
6	804.2523	30.49	1.05	31.54	46.00	-14.46	-	-	peak

802.11ax-HE20			
Test Channel	5745MHz(worst case)	Polarity:	Horizontal



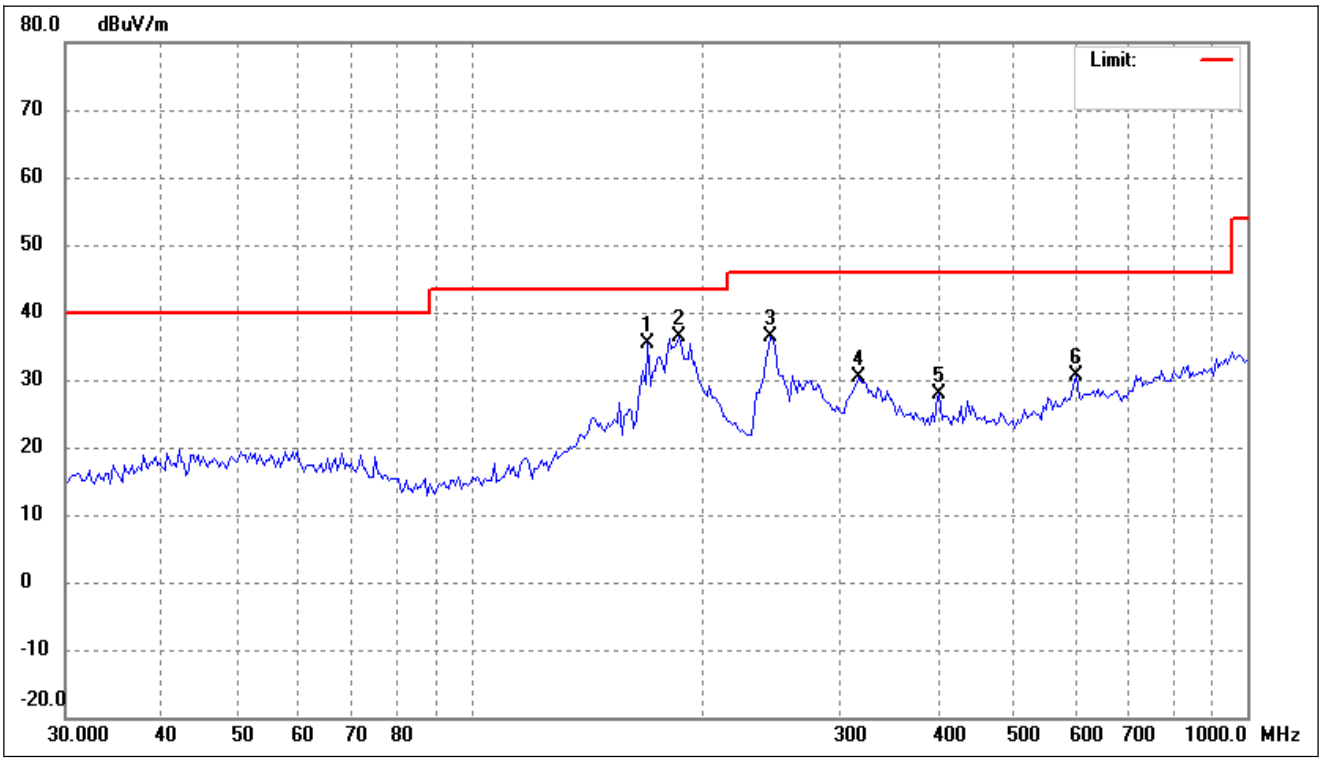
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	168.9970	44.39	-8.29	36.10	43.50	-7.40	-	-	peak
2	186.4684	47.79	-10.45	37.34	43.50	-6.16	-	-	peak
3	243.5431	45.88	-9.90	35.98	46.00	-10.02	-	-	peak
4	320.3306	38.35	-7.42	30.93	46.00	-15.07	-	-	peak
5	401.1050	33.47	-6.24	27.23	46.00	-18.77	-	-	peak
6	718.7246	32.12	-0.62	31.50	46.00	-14.50	-	-	peak

802.11ax-HE20			
Test Channel	5745MHz(worst case)	Polarity:	Vertical



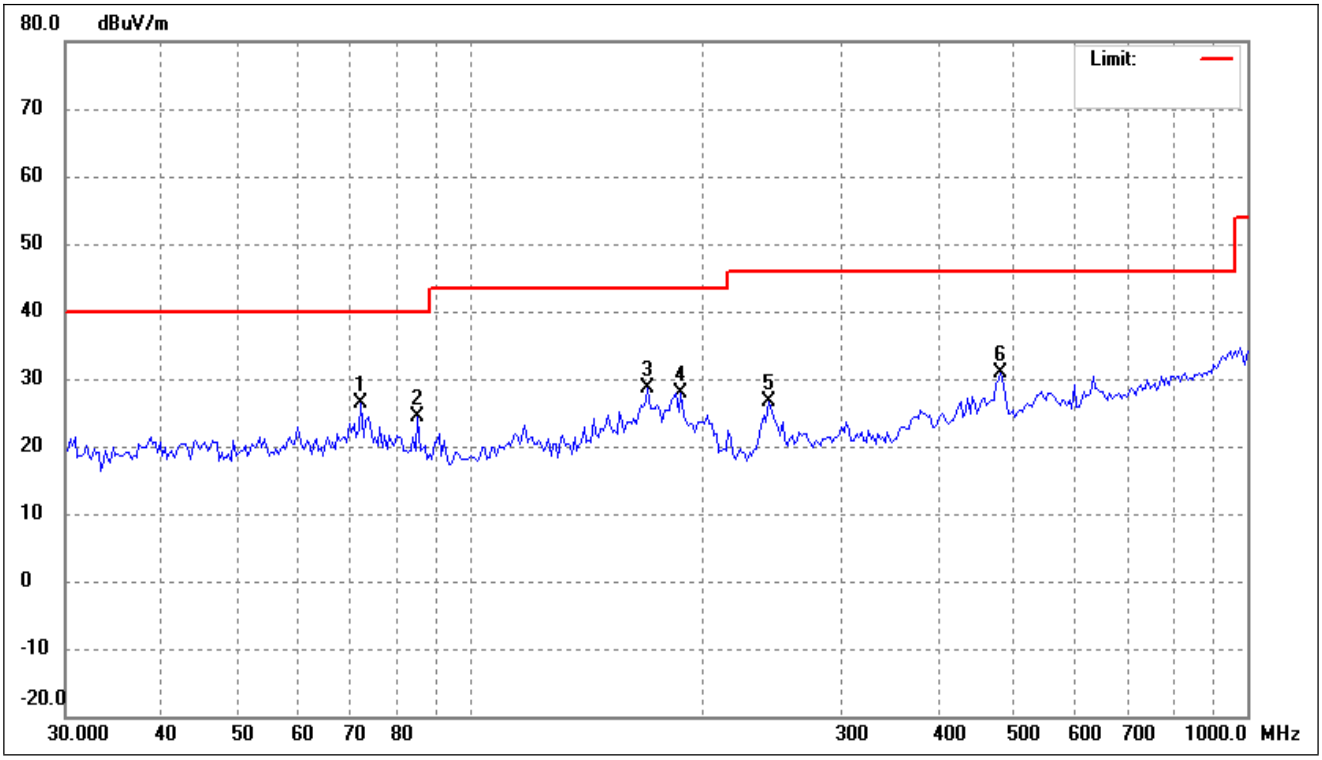
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	72.2111	37.17	-10.74	26.43	40.00	-13.57	-	-	peak
2	168.9970	37.17	-8.29	28.88	43.50	-14.62	-	-	peak
3	187.7833	40.05	-10.59	29.46	43.50	-14.04	-	-	peak
4	243.5431	36.06	-9.90	26.16	46.00	-19.84	-	-	peak
5	478.1394	35.75	-4.97	30.78	46.00	-15.22	-	-	peak
6	965.4742	31.55	3.37	34.92	54.00	-19.08	-	-	peak

802.11n-HT40			
Test Channel	5755MHz(worst case)	Polarity:	Horizontal



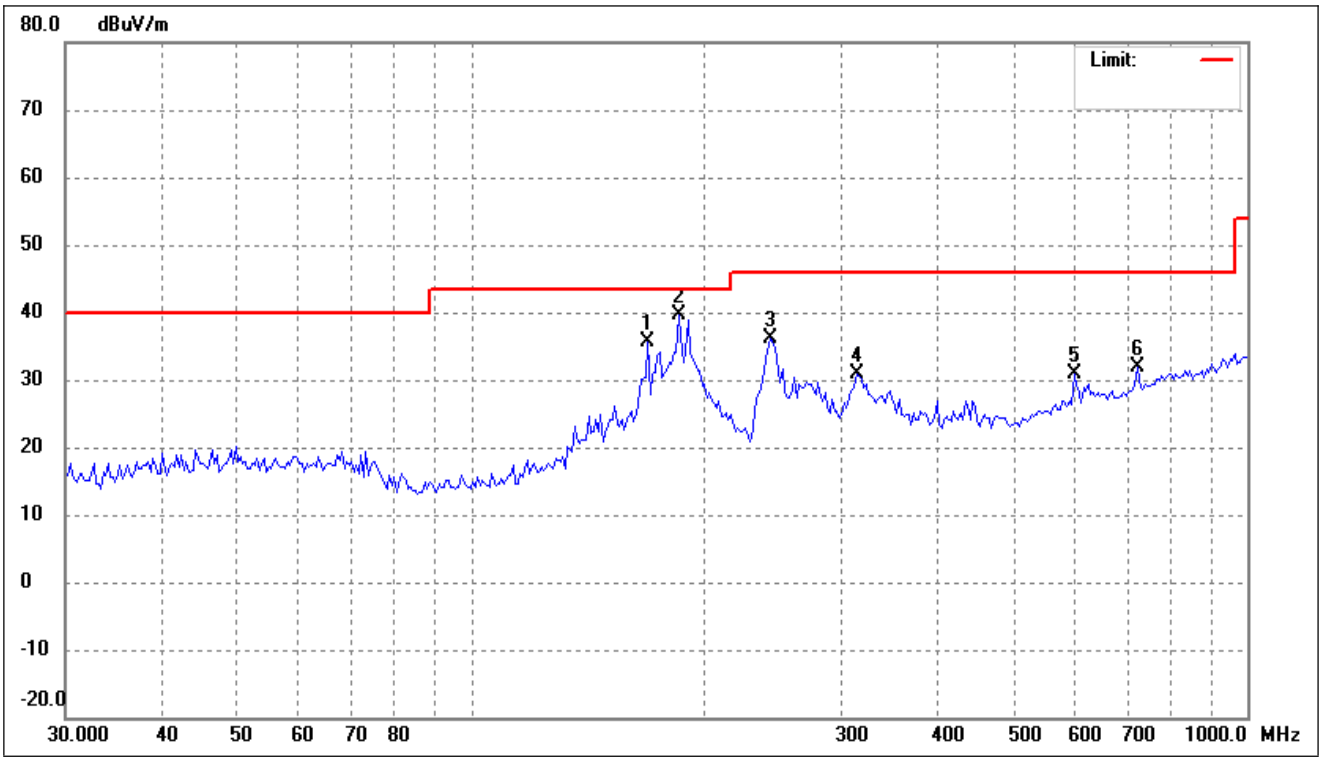
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	168.9970	43.78	-8.29	35.49	43.50	-8.01	-	-	peak
2	185.1626	46.62	-10.30	36.32	43.50	-7.18	-	-	peak
3	243.5431	46.21	-9.90	36.31	46.00	-9.69	-	-	peak
4	315.8601	37.83	-7.52	30.31	46.00	-15.69	-	-	peak
5	401.1050	34.17	-6.24	27.93	46.00	-18.07	-	-	peak
6	602.9287	32.89	-2.19	30.70	46.00	-15.30	-	-	peak

802.11n-HT40			
Test Channel	5755MHz(worst case)	Polarity:	Vertical



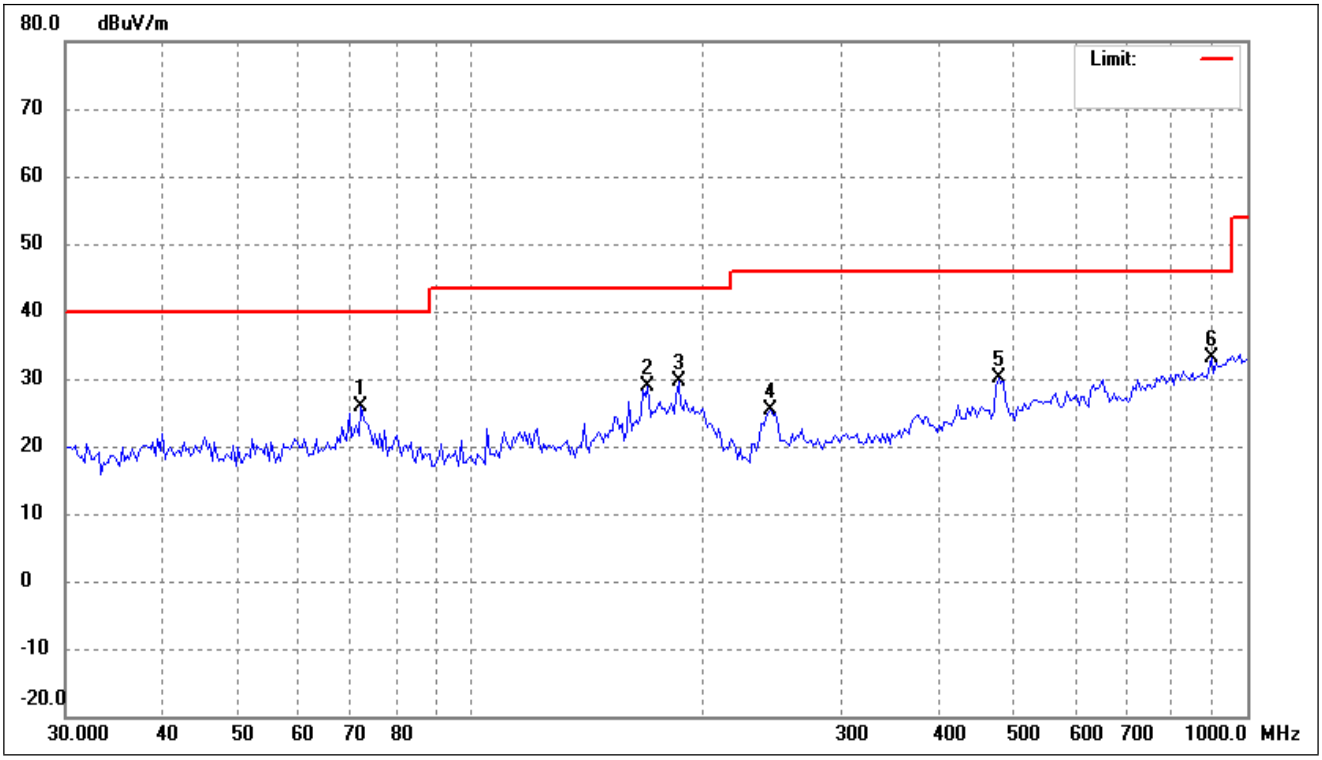
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	72.2111	37.14	-10.74	26.40	40.00	-13.60	-	-	peak
2	85.4769	36.96	-12.53	24.43	40.00	-15.57	-	-	peak
3	168.9970	36.95	-8.29	28.66	43.50	-14.84	-	-	peak
4	186.4684	38.34	-10.45	27.89	43.50	-15.61	-	-	peak
5	241.8377	36.49	-9.97	26.52	46.00	-19.48	-	-	peak
6	481.5112	35.78	-4.94	30.84	46.00	-15.16	-	-	peak

802.11ac-VHT40			
Test Channel	5755MHz(worst case)	Polarity:	Horizontal



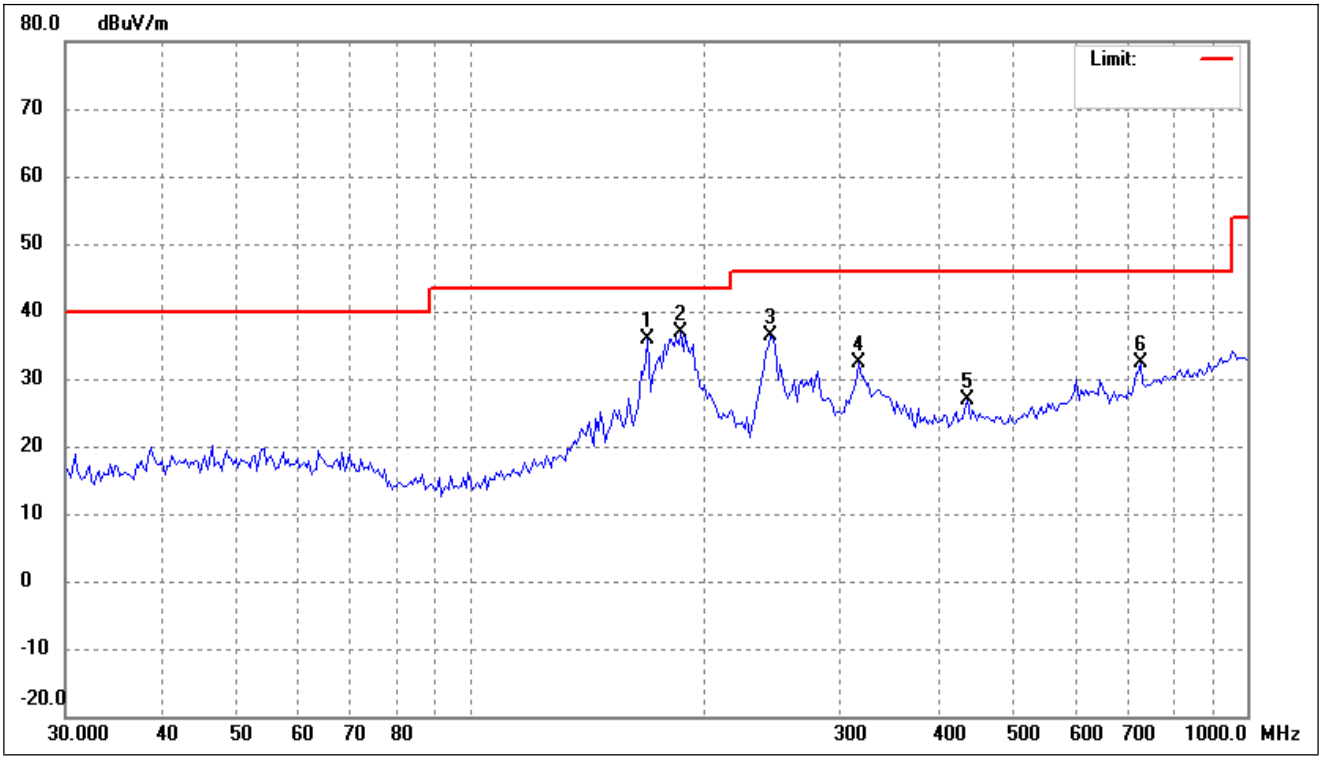
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	168.9970	44.03	-8.29	35.74	43.50	-7.76	-	-	peak
2	185.1626	49.82	-10.30	39.52	43.50	-3.98	-	-	peak
3	243.5431	46.08	-9.90	36.18	46.00	-9.82	-	-	peak
4	313.6482	38.51	-7.57	30.94	46.00	-15.06	-	-	peak
5	598.7067	33.14	-2.28	30.86	46.00	-15.14	-	-	peak
6	723.7930	32.45	-0.49	31.96	46.00	-14.04	-	-	peak

802.11ac-VHT40			
Test Channel	5755MHz(worst case)	Polarity:	Vertical



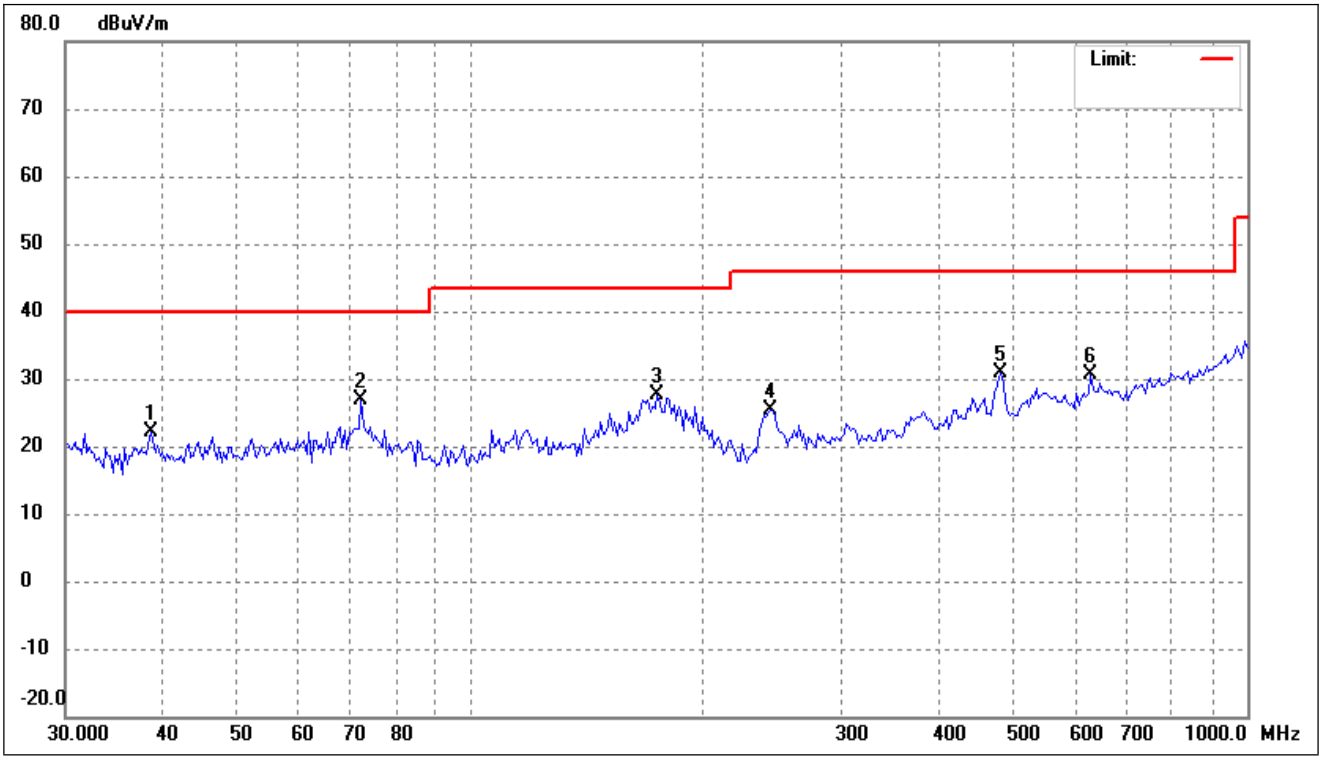
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	72.2111	36.65	-10.74	25.91	40.00	-14.09	-	-	peak
2	168.9970	37.08	-8.29	28.79	43.50	-14.71	-	-	peak
3	185.1626	40.03	-10.30	29.73	43.50	-13.77	-	-	peak
4	243.5431	35.18	-9.90	25.28	46.00	-20.72	-	-	peak
5	478.1394	35.07	-4.97	30.10	46.00	-15.90	-	-	peak
6	899.9577	30.93	2.09	33.02	46.00	-12.98	-	-	peak

802.11ax-HE40			
Test Channel	5755MHz(worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	168.9970	44.29	-8.29	36.00	43.50	-7.50	-	-	peak
2	186.4684	47.44	-10.45	36.99	43.50	-6.51	-	-	peak
3	243.5431	46.35	-9.90	36.45	46.00	-9.55	-	-	peak
4	315.8601	39.92	-7.52	32.40	46.00	-13.60	-	-	peak
5	436.3956	32.44	-5.47	26.97	46.00	-19.03	-	-	peak
6	728.8971	32.82	-0.36	32.46	46.00	-13.54	-	-	peak

802.11ax-HE40			
Test Channel	5755MHz(worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	38.6357	30.47	-8.25	22.22	40.00	-17.78	-	-	peak
2	72.2111	37.59	-10.74	26.85	40.00	-13.15	-	-	peak
3	173.8147	36.39	-8.85	27.54	43.50	-15.96	-	-	peak
4	243.5431	35.31	-9.90	25.41	46.00	-20.59	-	-	peak
5	481.5112	35.75	-4.94	30.81	46.00	-15.19	-	-	peak
6	628.8936	32.29	-1.74	30.55	46.00	-15.45	-	-	peak

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

- For the frequency band 5.725-5.850GHz (802.11a)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5745MHz)							
11490	58.90	9.45	68.35	74	-5.65	H	PK
11490	40.43	9.45	49.88	54	-4.12	H	AV
11490	57.25	9.45	66.70	74	-7.30	V	PK
11490	39.35	9.45	48.80	54	-5.20	V	AV
Middle Channel (5785MHz)							
11570	58.33	9.62	67.95	74	-6.05	H	PK
11570	40.97	9.62	50.59	54	-3.41	H	AV
11570	58.39	9.62	68.01	74	-5.99	V	PK
11570	39.05	9.62	48.67	54	-5.33	V	AV
High Channel (5825MHz)							
11650	58.49	9.84	68.33	74	-5.67	H	PK
11650	40.51	9.84	50.35	54	-3.65	H	AV
11650	57.02	9.84	66.86	74	-7.14	V	PK
11650	41.73	9.84	51.57	54	-2.43	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment MHz	Frequency (MHz)	Reading (dBm)	Correct dB	Result dBm/MHz	Limit dBm/MHz
Lowest	Below 5650	5647.25	-49.42	2.56	-46.86	-27
	5650 to 5700	5659.38	-36.76	2.56	-34.20	-27 to -17
	5700 to 5720	5716.41	-30.25	2.57	-27.68	-17 to 15.6
	5720 to 5725	5723.86	-19.71	2.57	-17.14	15.6 to 27
Highest	5850 to 5855	5852.87	-18.04	3.45	-14.59	27 to 15.6
	5855 to 5875	5859.21	-25.74	3.46	-22.28	15.6 to -17
	5875 to 5925	5886.30	-37.60	3.48	-34.12	-17 to -27
	Above 5925	5926.37	-42.03	3.52	-38.51	-27

- For the frequency band 5.725-5.850GHz (802.11n HT20)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	58.09	9.45	67.54	74	-6.46	H	PK
11490	38.94	9.45	48.39	54	-5.61	H	AV
11490	56.99	9.45	66.44	74	-7.56	V	PK
11490	39.64	9.45	49.09	54	-4.91	V	AV
Middle Channel (5785MHz)							
11570	56.74	9.62	66.36	74	-7.64	H	PK
11570	38.15	9.62	47.77	54	-6.23	H	AV
11570	56.37	9.62	65.99	74	-8.01	V	PK
11570	38.17	9.62	47.79	54	-6.21	V	AV
High Channel (5825MHz)							
11650	56.93	9.84	66.77	74	-7.23	H	PK
11650	38.70	9.84	48.54	54	-5.46	H	AV
11650	56.41	9.84	66.25	74	-7.75	V	PK
11650	41.33	9.84	51.17	54	-2.83	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Frequency	Reading	Correct	Result	Limit
	MHz	(MHz)	(dBm)	dB	dBm/MHz	dBm/MHz
Lowest	Below 5650	5647.82	-49.15	2.56	-46.59	-27
	5650 to 5700	5659.59	-35.92	2.56	-33.36	-27 to -17
	5700 to 5720	5716.34	-29.82	2.57	-27.25	-17 to 15.6
	5720 to 5725	5723.51	-19.91	2.57	-17.34	15.6 to 27
Highest	5850 to 5855	5852.68	-18.21	3.45	-14.76	27 to 15.6
	5855 to 5875	5859.37	-25.24	3.46	-21.78	15.6 to -17
	5875 to 5925	5886.25	-36.77	3.48	-33.29	-17 to -27
	Above 5925	5926.17	-42.36	3.52	-38.84	-27

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

- For the frequency band 5.725-5.850GHz (802.11ac VHT20)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	56.72	9.45	66.17	74	-7.83	H	PK
11490	41.09	9.45	50.54	54	-3.46	H	AV
11490	58.51	9.45	67.96	74	-6.04	V	PK
11490	41.75	9.45	51.20	54	-2.80	V	AV
Middle Channel (5785MHz)							
11570	56.33	9.62	65.95	74	-8.05	H	PK
11570	41.52	9.62	51.14	54	-2.86	H	AV
11570	56.28	9.62	65.90	74	-8.10	V	PK
11570	41.34	9.62	50.96	54	-3.04	V	AV
High Channel (5825MHz)							
11650	57.11	9.84	66.95	74	-7.05	H	PK
11650	40.98	9.84	50.82	54	-3.18	H	AV
11650	55.28	9.84	65.12	74	-8.88	V	PK
11650	38.76	9.84	48.60	54	-5.40	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Frequency	Reading	Correct	Result	Limit
	MHz	(MHz)	(dBm)	dB	dBm/MHz	dBm/MHz
Lowest	Below 5650	5647.72	-50.15	2.56	-47.59	-27
	5650 to 5700	5659.39	-40.92	2.56	-38.36	-27 to -17
	5700 to 5720	5716.21	-29.85	2.57	-27.28	-17 to 15.6
	5720 to 5725	5723.68	-21.08	2.57	-18.51	15.6 to 27
Highest	5850 to 5855	5852.45	-18.07	3.45	-14.62	27 to 15.6
	5855 to 5875	5859.34	-30.80	3.46	-27.34	15.6 to -17
	5875 to 5925	5886.59	-38.05	3.48	-34.57	-17 to -27
	Above 5925	5926.27	-44.74	3.52	-41.22	-27

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

- For the frequency band 5.725-5.850GHz (802.11ax HE20)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	55.50	9.45	64.95	74	-9.05	H	PK
11490	38.40	9.45	47.85	54	-6.15	H	AV
11490	58.16	9.45	67.61	74	-6.39	V	PK
11490	39.82	9.45	49.27	54	-4.73	V	AV
Middle Channel (5785MHz)							
11570	58.80	9.62	68.42	74	-5.58	H	PK
11570	41.98	9.62	51.60	54	-2.40	H	AV
11570	58.63	9.62	68.25	74	-5.75	V	PK
11570	38.15	9.62	47.77	54	-6.23	V	AV
High Channel (5825MHz)							
11650	57.70	9.84	67.54	74	-6.46	H	PK
11650	38.40	9.84	48.24	54	-5.76	H	AV
11650	58.63	9.84	68.47	74	-5.53	V	PK
11650	40.88	9.84	50.72	54	-3.28	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Frequency	Reading	Correct	Result	Limit
	MHz	(MHz)	(dBm)	dB	dBm/MHz	dBm/MHz
Lowest	Below 5650	5647.72	-51.15	2.56	-48.59	-27
	5650 to 5700	5659.39	-39.85	2.56	-37.29	-27 to -17
	5700 to 5720	5716.21	-29.73	2.57	-27.16	-17 to 15.6
	5720 to 5725	5723.68	-21.16	2.57	-18.59	15.6 to 27
Highest	5850 to 5855	5852.45	-18.09	3.45	-14.64	27 to 15.6
	5855 to 5875	5859.34	-30.56	3.46	-27.10	15.6 to -17
	5875 to 5925	5886.59	-37.05	3.48	-33.57	-17 to -27
	Above 5925	5926.27	-45.80	3.52	-42.28	-27

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

- For the frequency band 5.725-5.850GHz (802.11n HT40)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5755MHz)							
11510	56.66	9.45	66.11	74	-7.89	H	PK
11510	41.64	9.45	51.09	54	-2.91	H	AV
11510	58.36	9.45	67.81	74	-6.19	V	PK
11510	38.92	9.45	48.37	54	-5.63	V	AV
High Channel (5795MHz)							
11590	58.85	9.27	68.12	74	-5.88	H	PK
11590	40.39	9.27	49.66	54	-4.34	H	AV
11590	57.61	9.27	66.88	74	-7.12	V	PK
11590	41.15	9.27	50.42	54	-3.58	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Frequency	Reading	Correct	Result	Limit
	MHz	(MHz)	(dBm)	dB	dBm/MHz	dBm/MHz
Lowest	Below 5650	5646.25	-48.81	2.56	-46.25	-27
	5650 to 5700	5658.18	-43.90	2.56	-41.34	-27 to -17
	5700 to 5720	5715.37	-27.75	2.57	-25.18	-17 to 15.6
	5720 to 5725	5723.29	-23.24	2.57	-20.67	15.6 to 27
Highest	5850 to 5855	5852.36	-16.70	3.45	-13.25	27 to 15.6
	5855 to 5875	5859.48	-27.85	3.46	-24.39	15.6 to -17
	5875 to 5925	5886.12	-40.01	3.48	-36.53	-17 to -27
	Above 5925	5926.59	-41.79	3.52	-38.27	-27

- For the frequency band 5.725-5.850GHz (802.11ac VHT40)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5755MHz)							
11510	57.16	9.45	66.61	74	-7.39	H	PK
11510	39.50	9.45	48.95	54	-5.05	H	AV
11510	55.02	9.45	64.47	74	-9.53	V	PK
11510	38.77	9.45	48.22	54	-5.78	V	AV
High Channel (5795MHz)							
11590	56.31	9.27	65.58	74	-8.42	H	PK
11590	41.75	9.27	51.02	54	-2.98	H	AV
11590	56.18	9.27	65.45	74	-8.55	V	PK
11590	41.47	9.27	50.74	54	-3.26	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Frequency	Reading	Correct	Result	Limit
	MHz	(MHz)	(dBm)	dB	dBm/MHz	dBm/MHz
Lowest	Below 5650	5646.83	-45.73	2.56	-43.17	-27
	5650 to 5700	5658.51	-43.15	2.56	-40.59	-27 to -17
	5700 to 5720	5715.29	-27.93	2.57	-25.36	-17 to 15.6
	5720 to 5725	5723.34	-23.39	2.57	-20.82	15.6 to 27
Highest	5850 to 5855	5852.16	-16.19	3.45	-12.74	27 to 15.6
	5855 to 5875	5859.25	-26.99	3.46	-23.53	15.6 to -17
	5875 to 5925	5886.30	-41.08	3.48	-37.60	-17 to -27
	Above 5925	5926.47	-43.23	3.52	-39.71	-27

- For the frequency band 5.725-5.850GHz (802.11ax HE40)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5755MHz)							
11510	57.33	9.45	66.78	74	-7.22	H	PK
11510	38.94	9.45	48.39	54	-5.61	H	AV
11510	57.93	9.45	67.38	74	-6.62	V	PK
11510	40.30	9.45	49.75	54	-4.25	V	AV
High Channel (5795MHz)							
11590	58.53	9.27	67.80	74	-6.20	H	PK
11590	41.91	9.27	51.18	54	-2.82	H	AV
11590	55.54	9.27	64.81	74	-9.19	V	PK
11590	38.44	9.27	47.71	54	-6.29	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Frequency	Reading	Correct	Result	Limit
	MHz	(MHz)	(dBm)	dB	dBm/MHz	dBm/MHz
Lowest	Below 5650	5646.34	-50.72	2.56	-48.16	-27
	5650 to 5700	5658.59	-39.81	2.56	-37.25	-27 to -17
	5700 to 5720	5715.18	-25.91	2.57	-23.34	-17 to 15.6
	5720 to 5725	5723.30	-18.76	2.57	-16.19	15.6 to 27
Highest	5850 to 5855	5852.45	-16.68	3.45	-13.23	27 to 15.6
	5855 to 5875	5859.37	-29.75	3.46	-26.29	15.6 to -17
	5875 to 5925	5886.28	-39.58	3.48	-36.10	-17 to -27
	Above 5925	5926.11	-42.26	3.52	-38.74	-27

Note: Testing is carried out with frequency rang 9kHz to 40Ghz, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

9. Frequency Stability

9.1 Standard Applicable

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

9.2 Test Procedure

According to §2.1055, the following test procedure was performed.
The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.
The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

9.3 Summary of Test Results/Plots

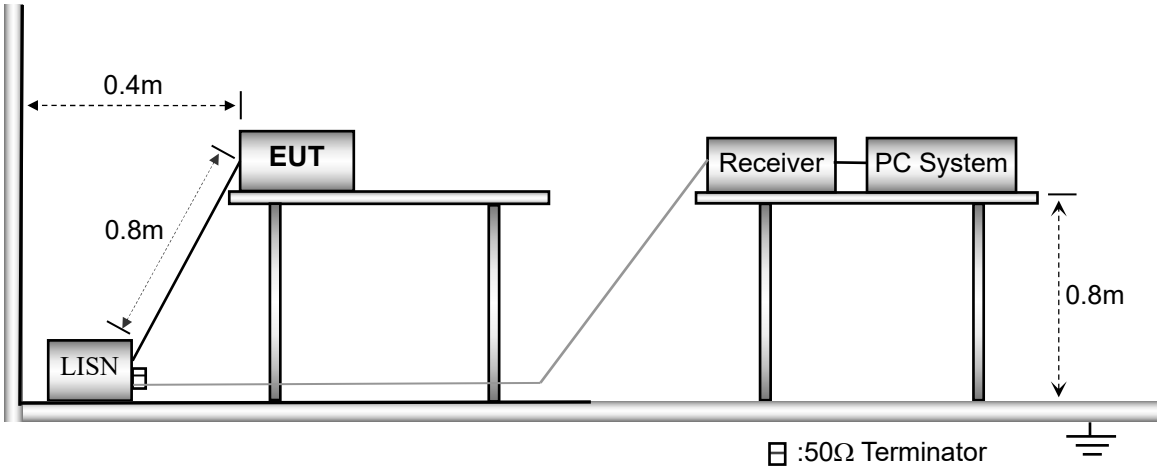
Please refer to Appendix D

10. Conducted Emissions

10.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

10.2 Basic Test Setup Block Diagram



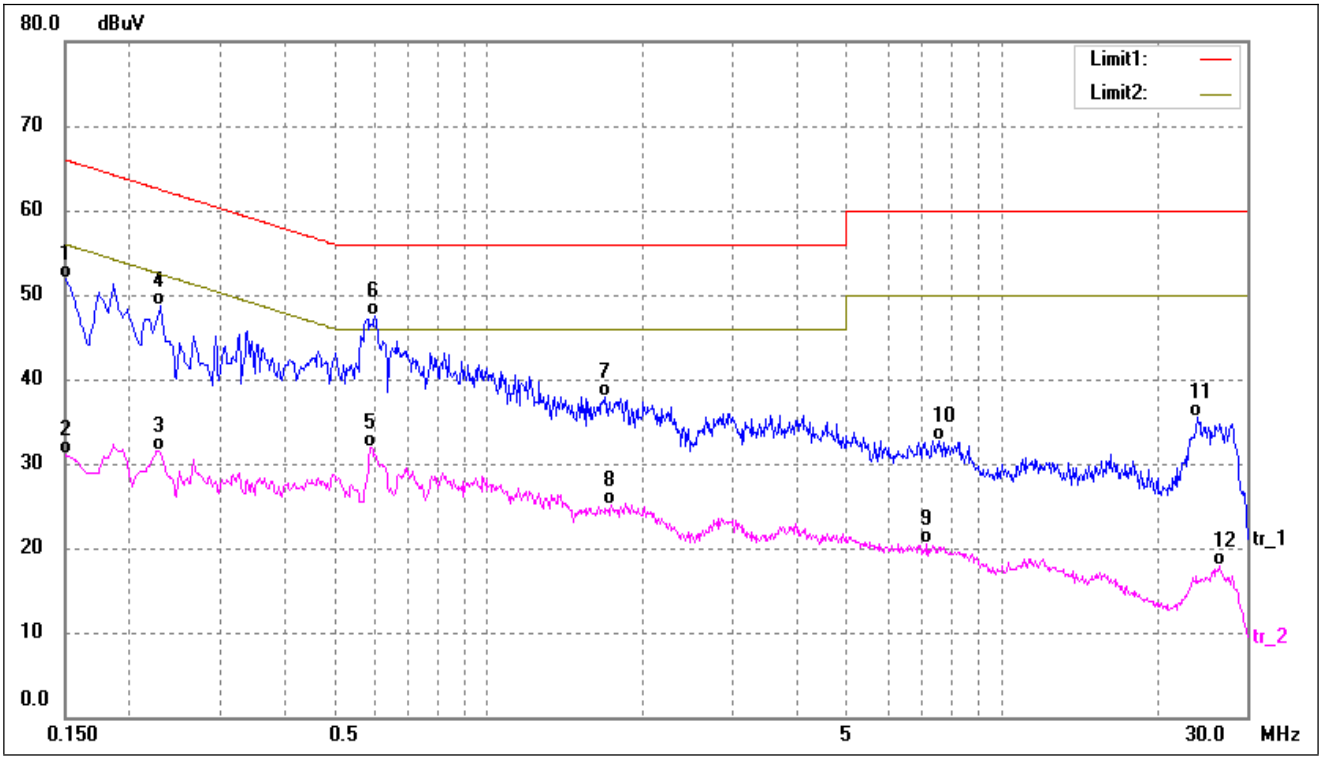
10.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency..... 150kHz
Stop Frequency..... 30MHz
Sweep Speed.....Auto
IF Bandwidth..... 10kHz
Quasi-Peak Adapter Bandwidth..... 9kHz
Quasi-Peak Adapter Mode.....Normal

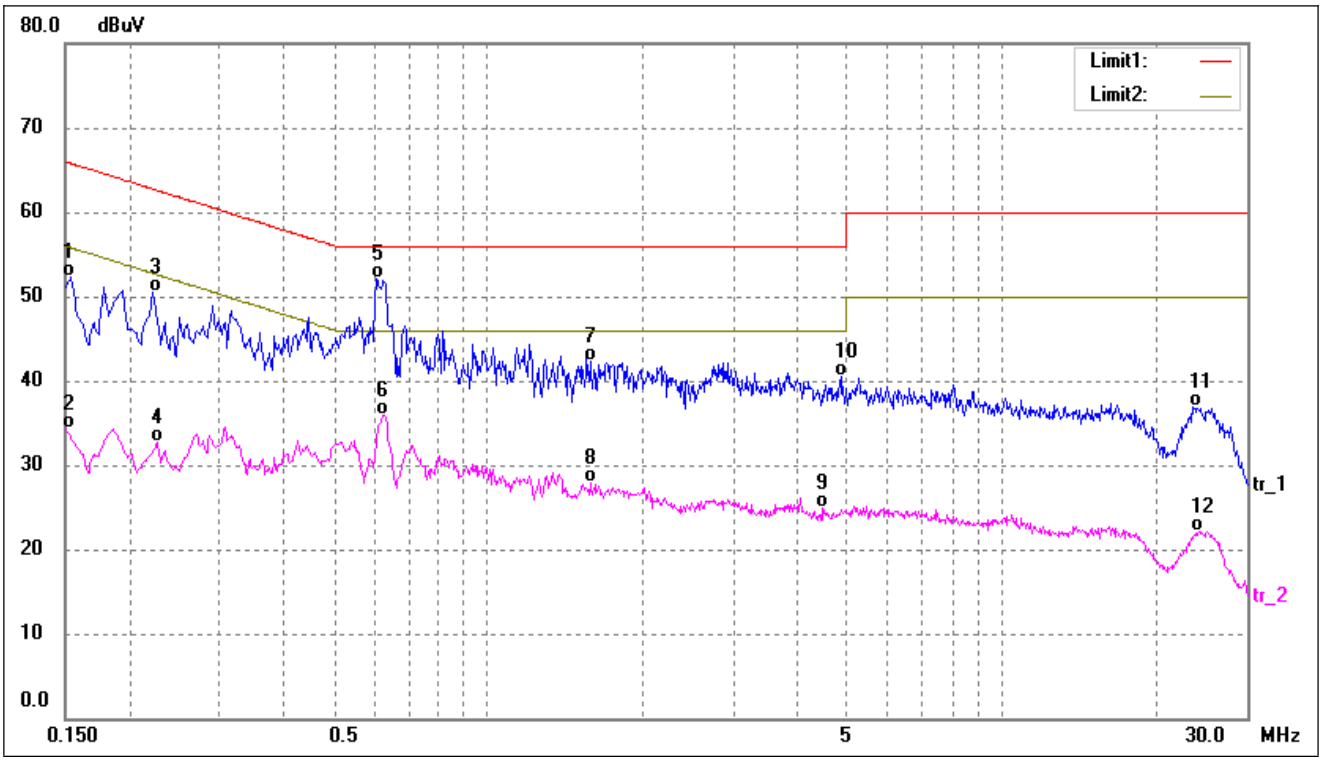
10.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	42.23	9.76	51.99	65.99	-14.00	QP
2	0.1500	21.31	9.76	31.07	55.99	-24.92	AVG
3	0.2260	21.91	9.59	31.50	52.59	-21.09	AVG
4	0.2300	39.03	9.59	48.62	62.45	-13.83	QP
5	0.5899	22.17	9.72	31.89	46.00	-14.11	AVG
6*	0.6020	37.76	9.71	47.47	56.00	-8.53	QP
7	1.6940	28.28	9.64	37.92	56.00	-18.08	QP
8	1.7380	15.53	9.63	25.16	46.00	-20.84	AVG
9	7.1580	10.74	9.79	20.53	50.00	-29.47	AVG
10	7.5260	22.94	9.80	32.74	60.00	-27.26	QP
11	24.1060	25.44	10.10	35.54	60.00	-24.46	QP
12	26.4780	7.85	10.04	17.89	50.00	-32.11	AVG

Test Mode	Communication	AC120V 60Hz	Polarity:	Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1539	42.56	9.75	52.31	65.78	-13.47	QP
2	0.1539	24.61	9.75	34.36	55.78	-21.42	AVG
3	0.2220	40.84	9.59	50.43	62.74	-12.31	QP
4	0.2260	23.09	9.59	32.68	52.59	-19.91	AVG
5*	0.6060	42.36	9.71	52.07	56.00	-3.93	QP
6	0.6260	26.23	9.70	35.93	46.00	-10.07	AVG
7	1.5820	32.66	9.64	42.30	56.00	-13.70	QP
8	1.5820	18.21	9.64	27.85	46.00	-18.15	AVG
9	4.4660	15.20	9.68	24.88	46.00	-21.12	AVG
10	4.8700	30.71	9.71	40.42	56.00	-15.58	QP
11	23.5459	26.71	10.12	36.83	60.00	-23.17	QP
12	24.1820	12.07	10.10	22.17	50.00	-27.83	AVG

APPENDIX SUMMARY

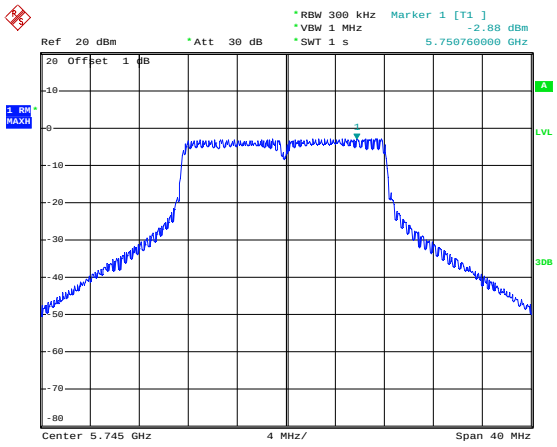
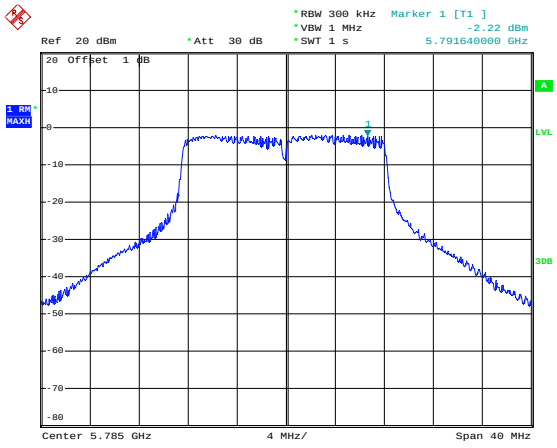
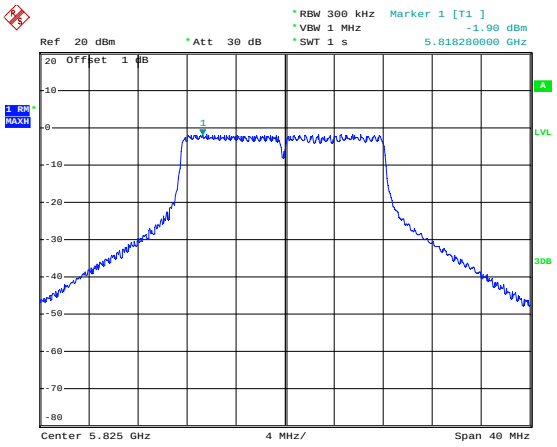
Project No.	WTX24X08191416W	Test Engineer	Timi Huang
Start date	2024/9/14	Finish date	2024/9/14
Temperature	24.5℃	Humidity	62%
RF specifications	U-NII		

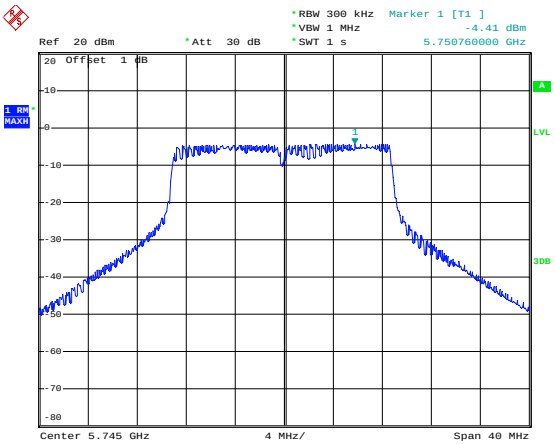
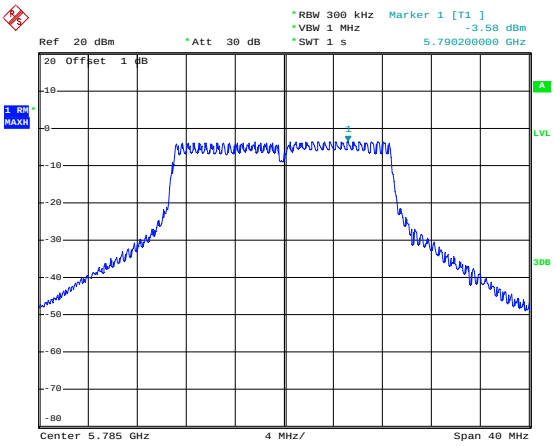
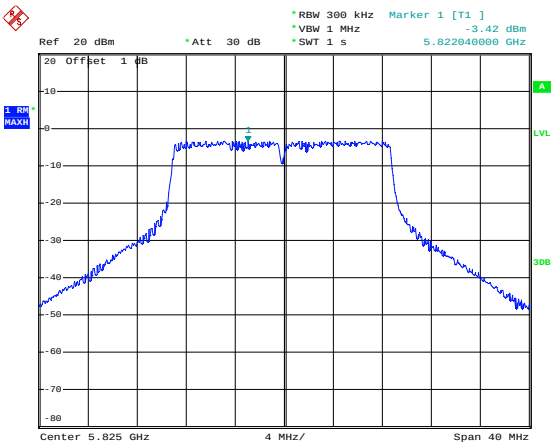
APPENDIX	Description of Test Item	Result
A	Power Spectral Density	Compliant
B	Emission Bandwidth and Occupied Bandwidth	Compliant
C	Maximum Conducted Output Power	Compliant
D	Frequency Stability	Compliant

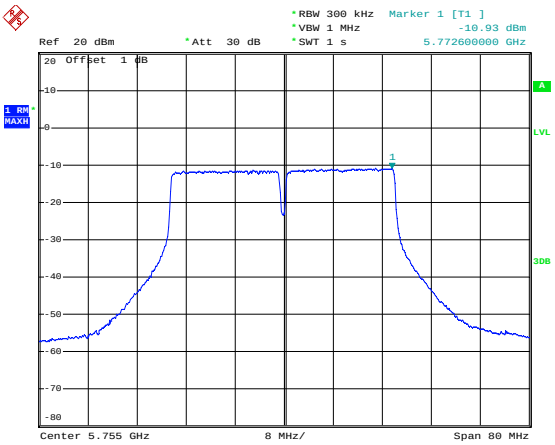
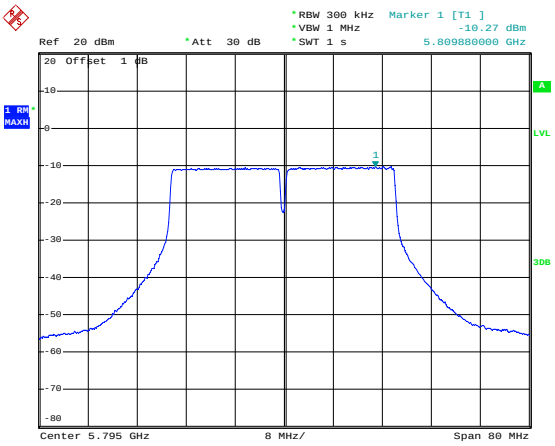
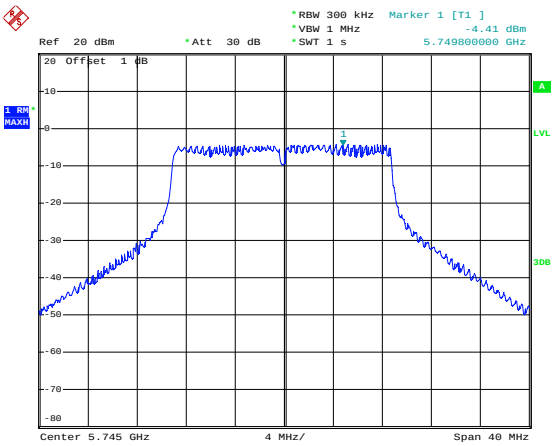
APPENDIX A

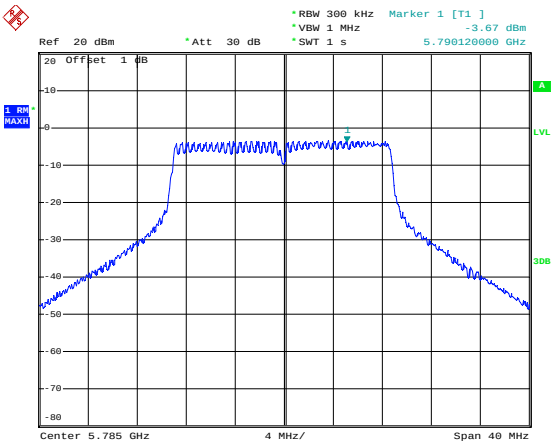
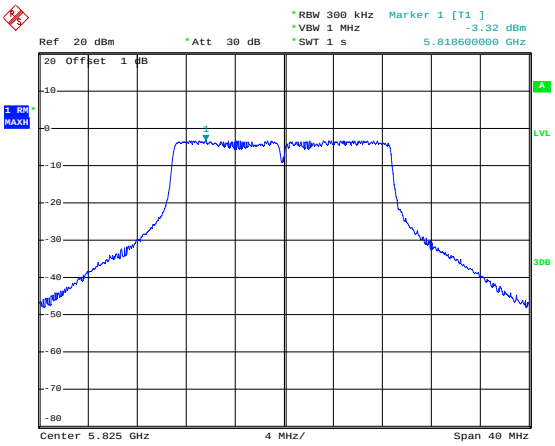
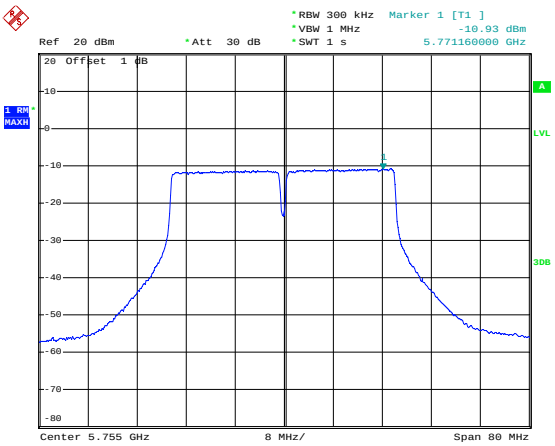
U-NII-3: 5725-5850MHz					
Operating mode	Test Channel	Power Spectral Density dBm/300kHz	Factor	Power Spectral Density* dBm/500kHz	Limit dBm/500kHz
802.11a	5745	-2.88	2.22	-0.66	30
	5785	-2.22	2.22	0	30
	5825	-1.90	2.22	0.32	30
802.11n-HT20	5745	-4.41	2.22	-2.19	30
	5785	-3.58	2.22	-1.36	30
	5825	-3.42	2.22	-1.2	30
802.11n HT40	5755	-10.93	2.22	-8.71	30
	5795	-10.27	2.22	-8.05	30
802.11ac-VHT20	5745	-4.41	2.22	-2.19	30
	5785	-3.67	2.22	-1.45	30
	5825	-3.32	2.22	-1.1	30
802.11ac-VHT40	5755	-10.93	2.22	-8.71	30
	5795	-10.44	2.22	-8.22	30
802.11ax-HE20	5745	-13.97	2.22	-11.75	30
	5785	-13.73	2.22	-11.51	30
	5825	-14.29	2.22	-12.07	30
802.11ax-HE40	5755	-18.84	2.22	-16.62	30
	5795	-19.03	2.22	-16.81	30
*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22					

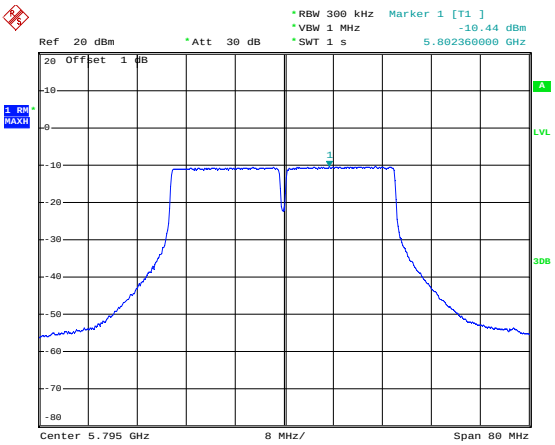
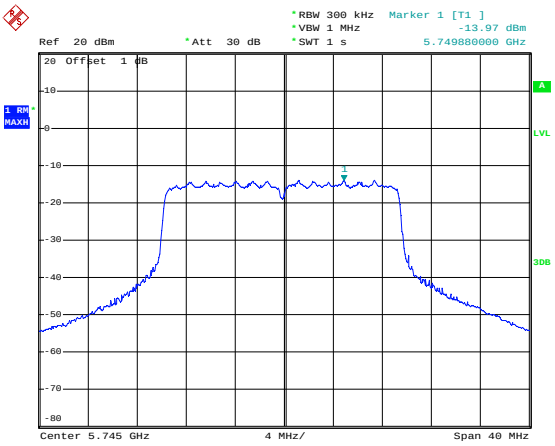
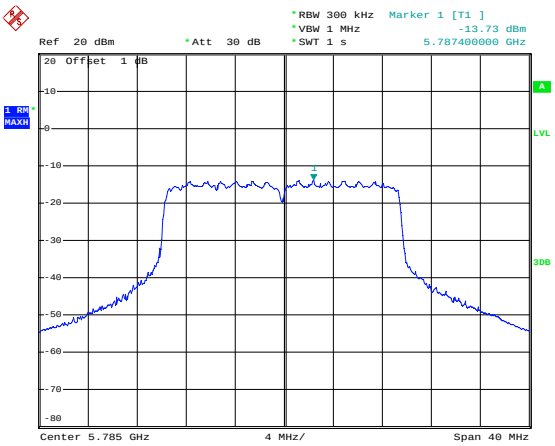
5725-5850MHz

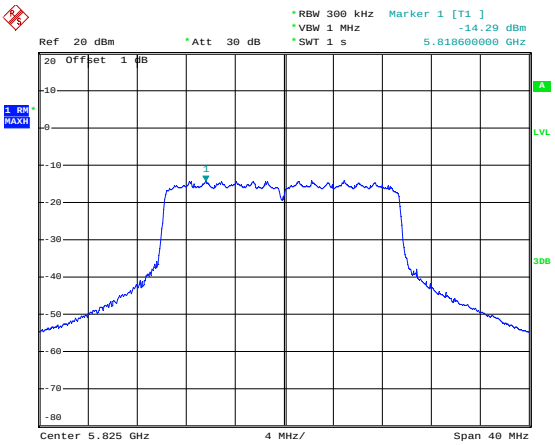
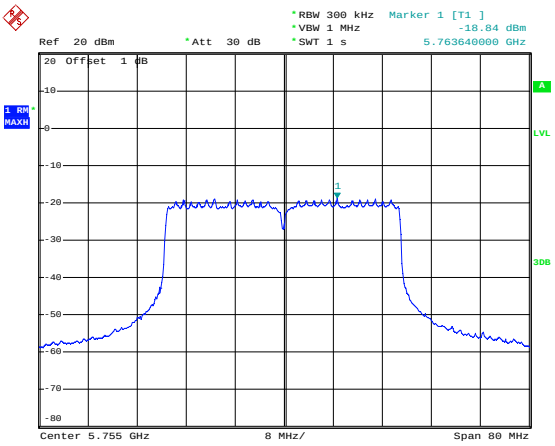
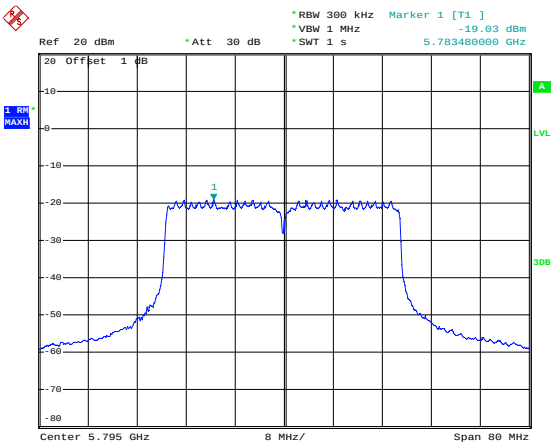
802.11a-Low	
802.11a-Middle	
802.11a-High	

802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-VHT20-Low	

802.11ac-VHT20-Middle	 Date: 14.SEP.2024 09:36:27
802.11ac-VHT20-High	 Date: 14.SEP.2024 09:35:45
802.11ac-VHT40-Low	 Date: 14.SEP.2024 09:30:04

802.11ac-VHT40-High	 Date: 14.SEP.2024 09:29:15
802.11ax-HE20-Low	 Date: 14.SEP.2024 09:33:31
802.11ax-HE20-Middle	 Date: 14.SEP.2024 09:34:13

802.11ax-HE20-High	 Date: 14.SEP.2024 09:34:58
802.11ax-HE40-Low	 Date: 14.SEP.2024 09:27:07
802.11ax-HE40-High	 Date: 14.SEP.2024 09:27:56

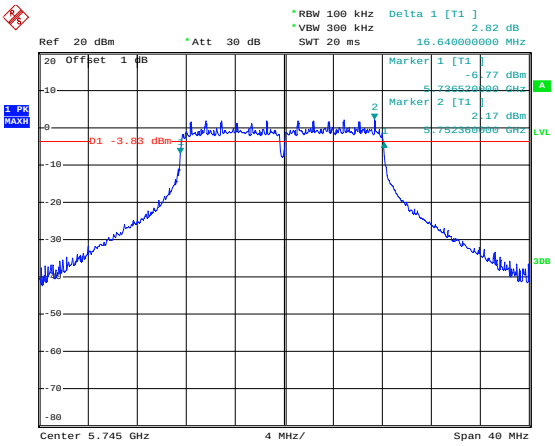
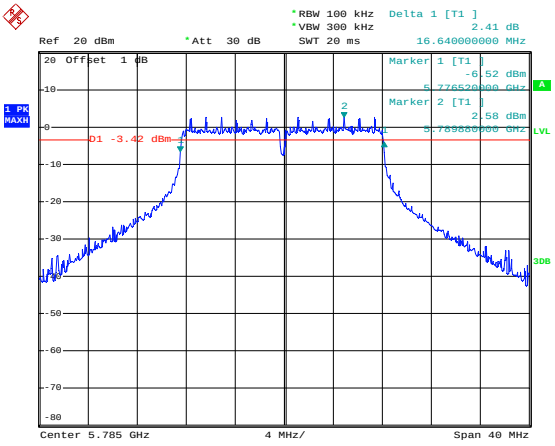
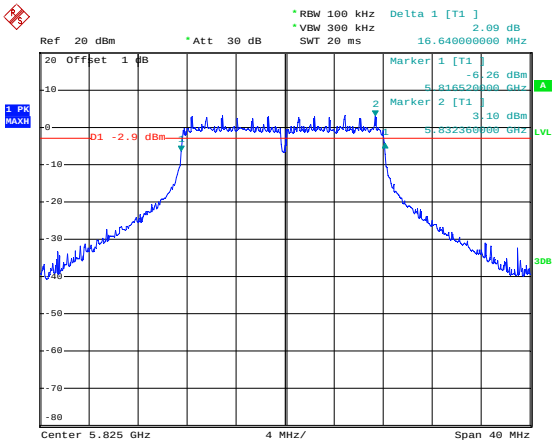
APPENDIX B

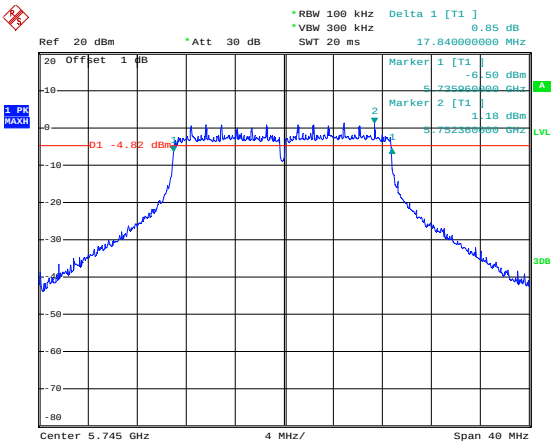
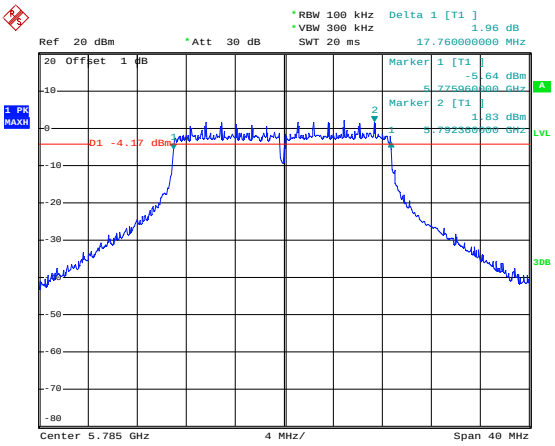
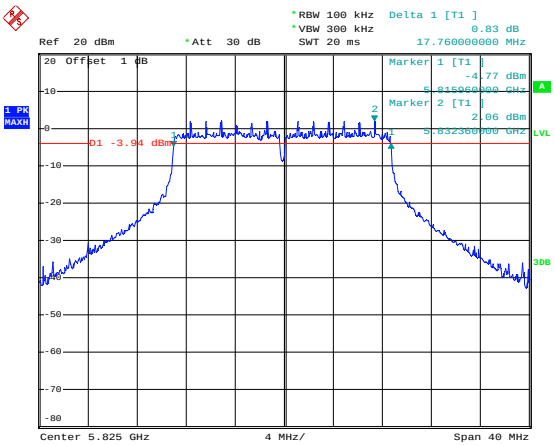
Emission Bandwidth and Occupied Bandwidth

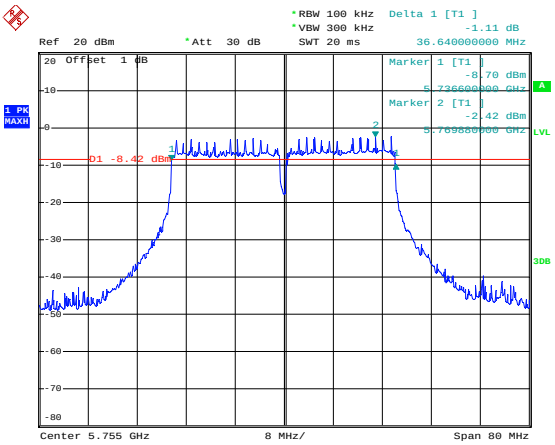
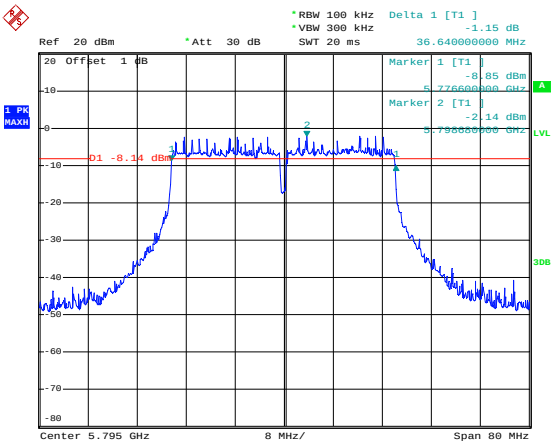
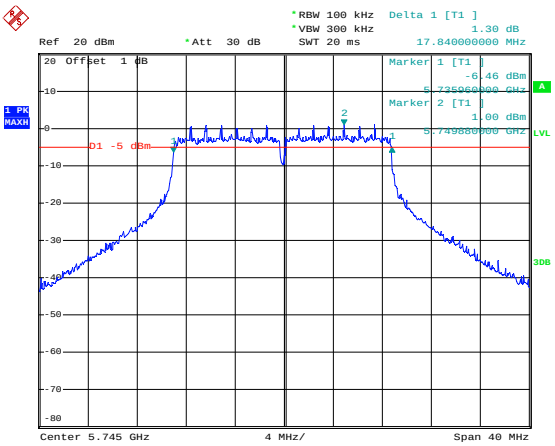
U-NII-3: 5725-5850MHz				
Test Mode	**Test Channel MHz**	**6 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5745	16.64	17.76	≥500
	5785	16.64	17.92	≥500
	5825	16.64	17.92	≥500
802.11n-HT20	5745	17.84	18.96	≥500
	5785	17.76	18.80	≥500
	5825	17.76	18.80	≥500
802.11n-HT40	5755	36.64	39.04	≥500
	5795	36.64	39.20	≥500
802.11ac-VHT20	5745	17.84	18.88	≥500
	5785	17.84	18.80	≥500
	5825	17.76	18.64	≥500
802.11ac-VHT40	5755	36.80	37.92	≥500
	5795	36.64	38.24	≥500
802.11ax-HE20	5745	19.20	19.44	≥500
	5785	19.20	19.52	≥500
	5825	19.20	19.44	≥500
802.11ax-HE40	5755	38.40	38.08	≥500
	5795	38.08	38.24	≥500

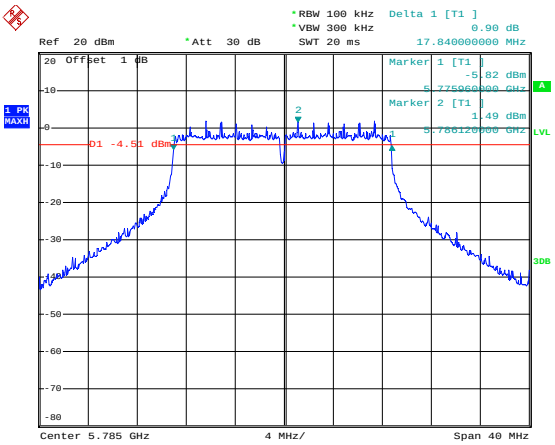
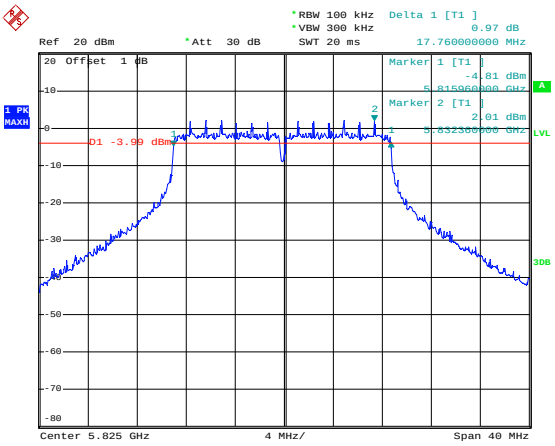
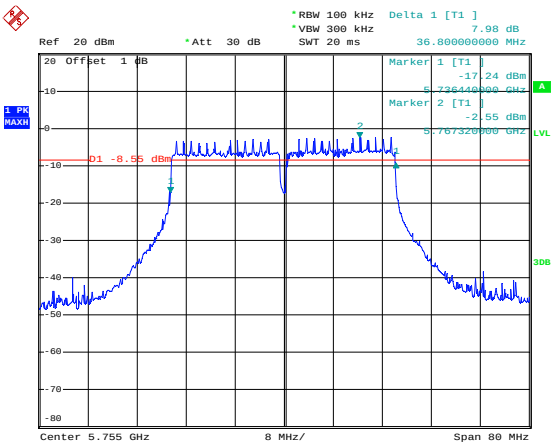
6 dB Bandwidth

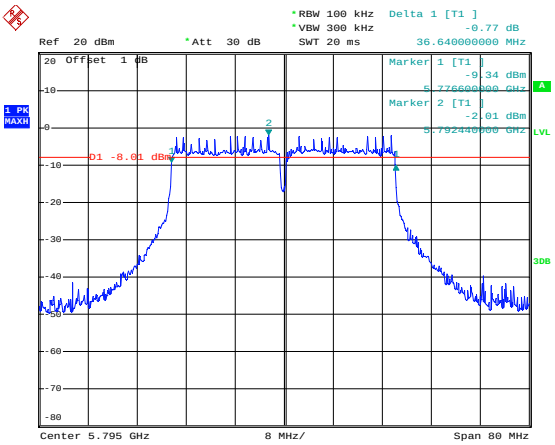
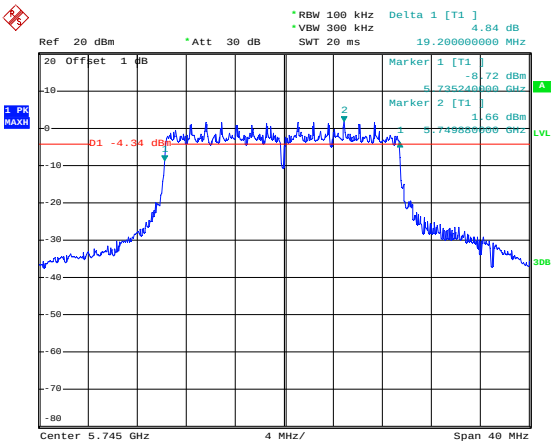
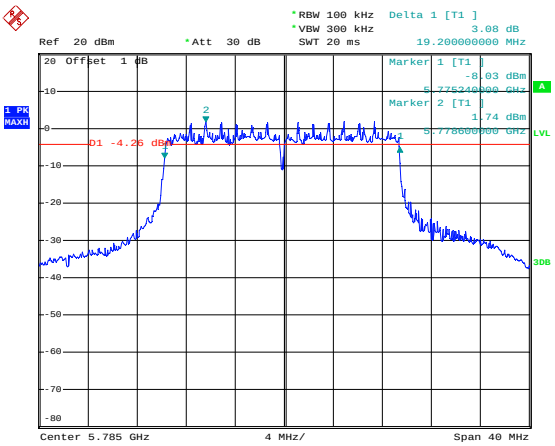
5725-5850MHz

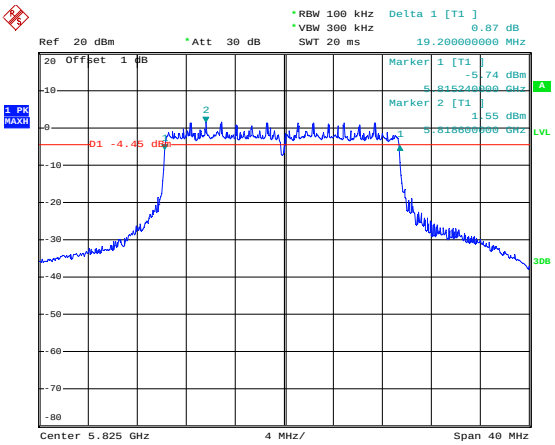
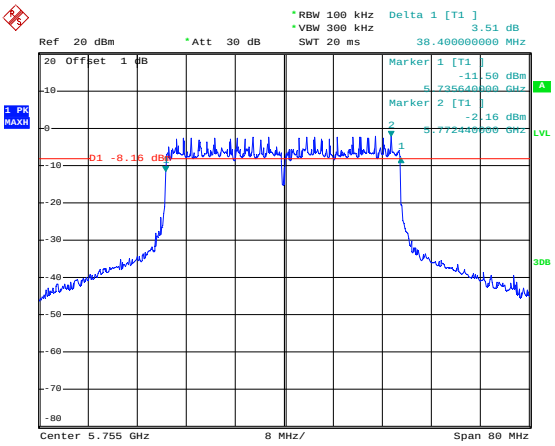
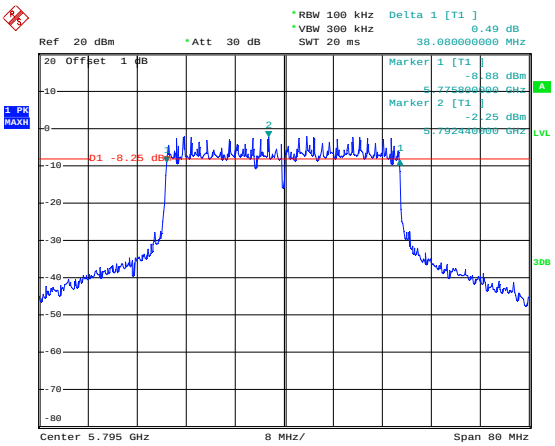
802.11a-Low	 Date: 14.SEP.2024 10:12:02
802.11a-Middle	 Date: 14.SEP.2024 10:13:04
802.11a-High	 Date: 14.SEP.2024 10:14:30

802.11n-HT20-Low	 Date: 14.SEP.2024 10:18:15
802.11n-HT20-Middle	 Date: 14.SEP.2024 10:16:31
802.11n-HT20-High	 Date: 14.SEP.2024 10:15:39

802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-VHT20-Low	

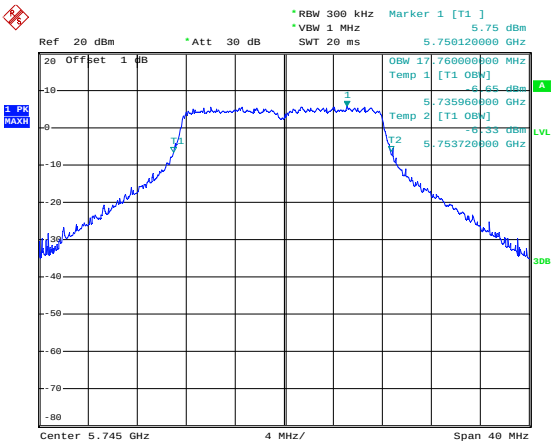
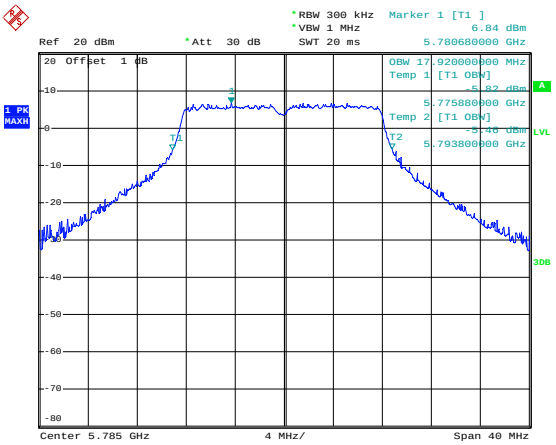
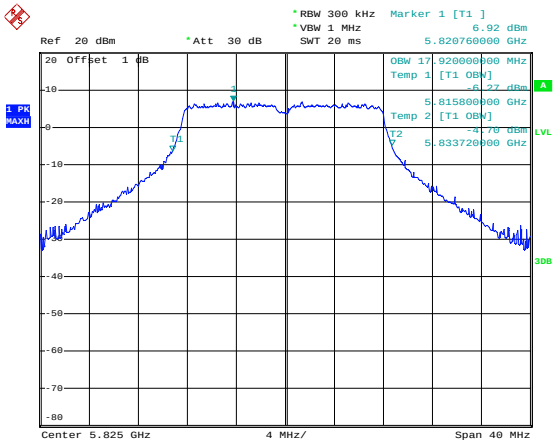
802.11ac-VHT20-Middle	 Date: 14.SEP.2024 10:20:27
802.11ac-VHT20-High	 Date: 14.SEP.2024 10:21:27
802.11ac-VHT40-Low	 Date: 14.SEP.2024 10:56:13

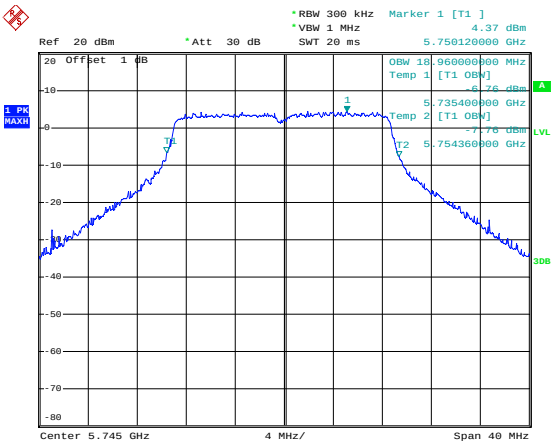
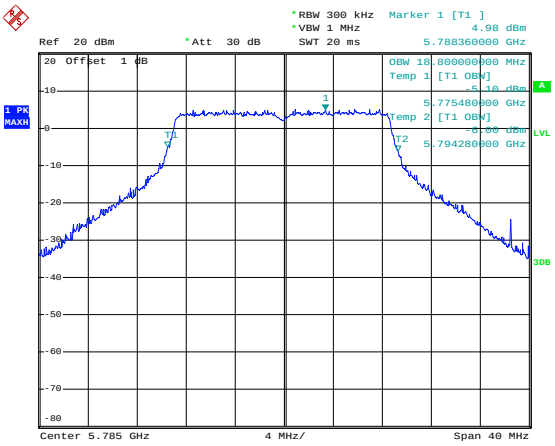
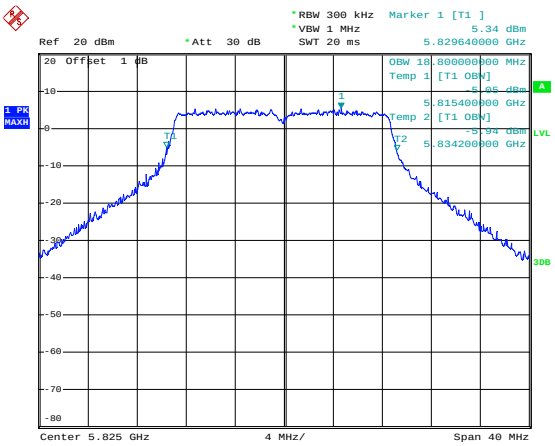
802.11ac-VHT40-High	 Date: 14.SEP.2024 10:57:03
802.11ax-HE20-Low	 Date: 14.SEP.2024 10:25:56
802.11ax-HE20-Middle	 Date: 14.SEP.2024 10:24:49

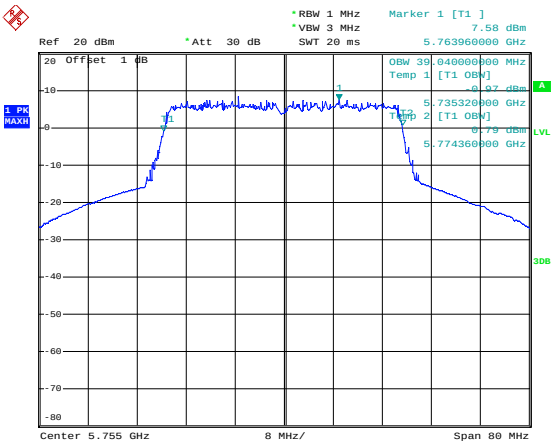
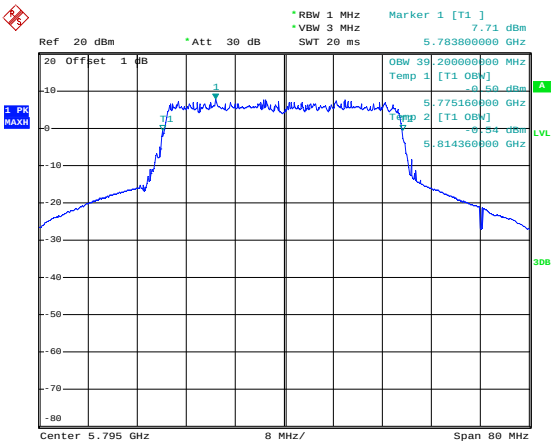
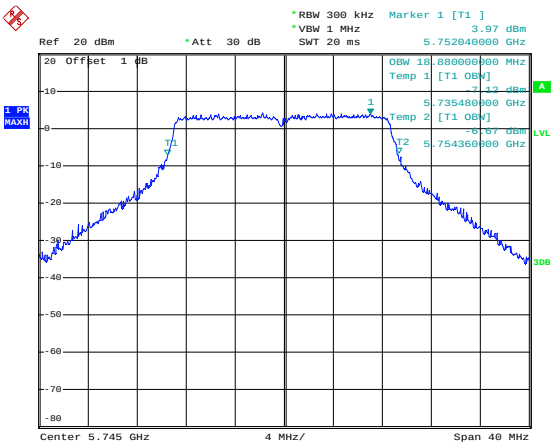
802.11ax-HE20-High	 Date: 14.SEP.2024 10:23:33
802.11ax-HE40-Low	 Date: 14.SEP.2024 10:30:55
802.11ax-HE40-High	 Date: 14.SEP.2024 10:29:18

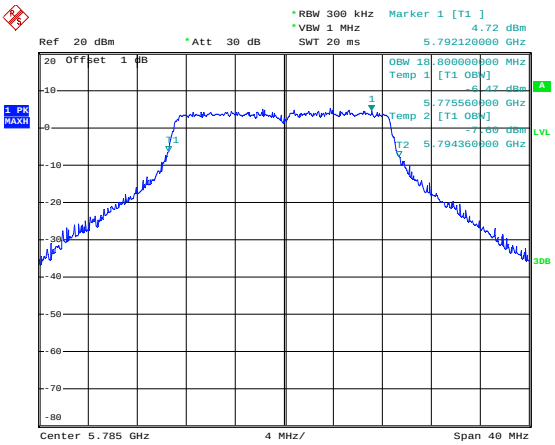
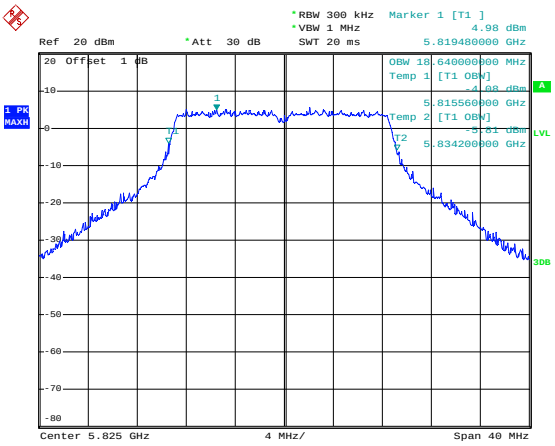
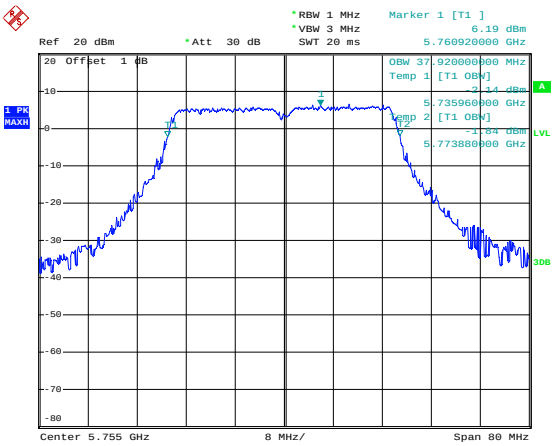
99% Bandwidth

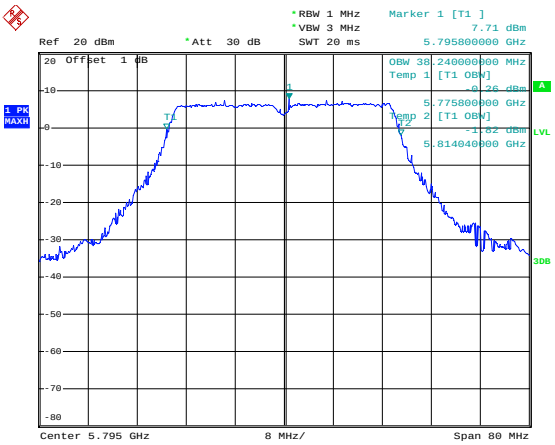
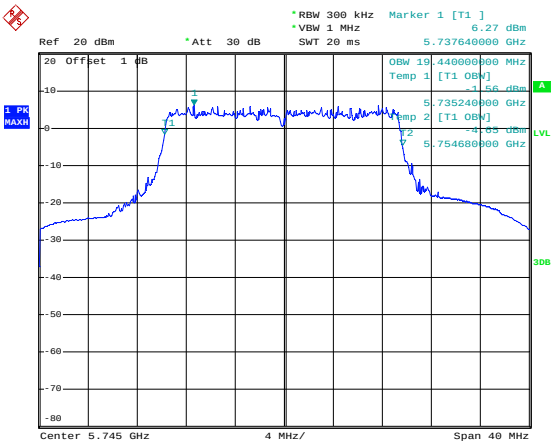
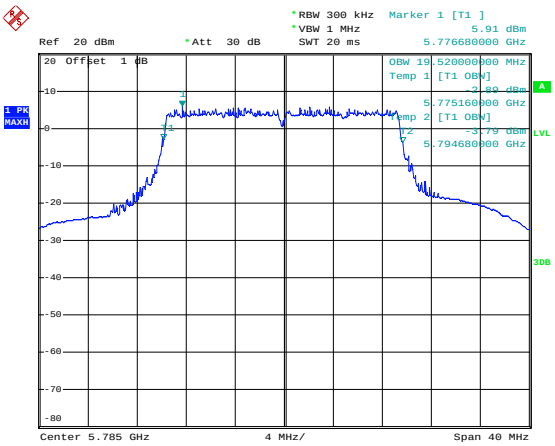
5725-5850MHz

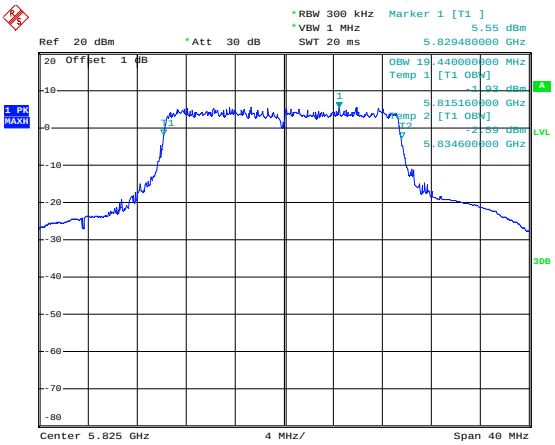
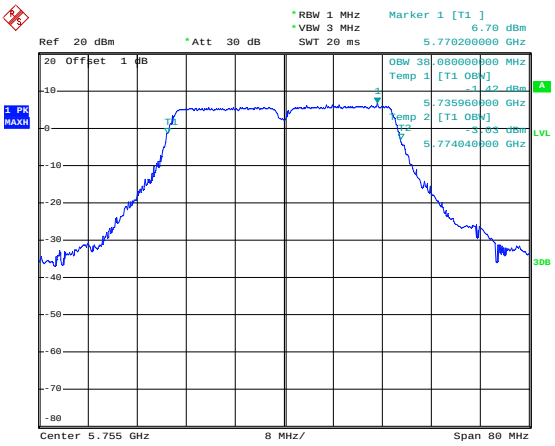
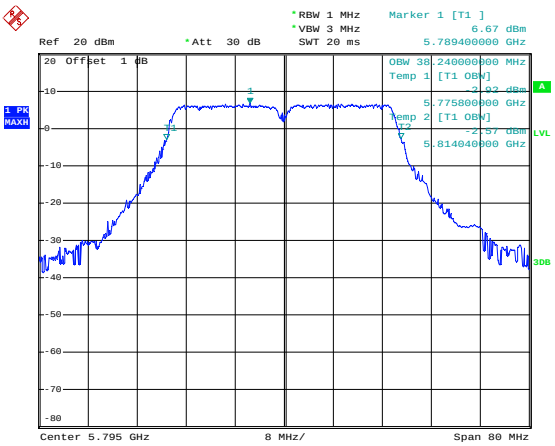
802.11a-Low	
802.11a-Middle	
802.11a-High	

802.11n-HT20-Low	 Date: 14.SEP.2024 09:53:05
802.11n-HT20-Middle	 Date: 14.SEP.2024 09:51:34
802.11n-HT20-High	 Date: 14.SEP.2024 09:50:42

802.11n-HT40-Low	 Date: 14.SEP.2024 10:01:41
802.11n-HT40-High	 Date: 14.SEP.2024 10:03:15
802.11ac-VHT20-Low	 Date: 14.SEP.2024 09:54:05

802.11ac-VHT20-Middle	 Date: 14.SEP.2024 09:54:39
802.11ac-VHT20-High	 Date: 14.SEP.2024 09:55:10
802.11ac-VHT40-Low	 Date: 14.SEP.2024 10:04:40

802.11ac-VHT40-High	 Date: 14.SEP.2024 10:04:05
802.11ax-HE20-Low	 Date: 14.SEP.2024 09:59:42
802.11ax-HE20-Middle	 Date: 14.SEP.2024 09:58:18

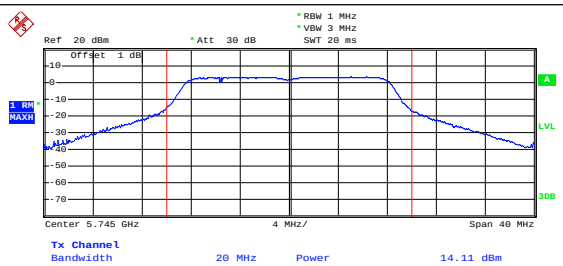
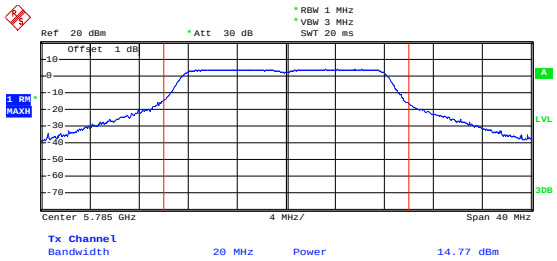
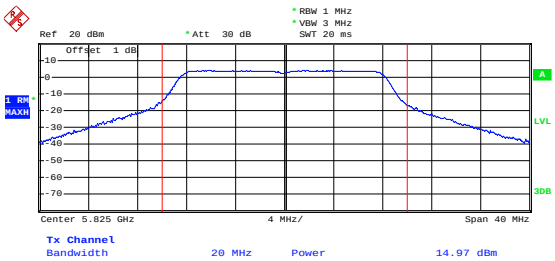
802.11ax-HE20-High	 Date: 14.SEP.2024 09:56:41
802.11ax-HE40-Low	 Date: 14.SEP.2024 10:05:37
802.11ax-HE40-High	 Date: 14.SEP.2024 10:06:21

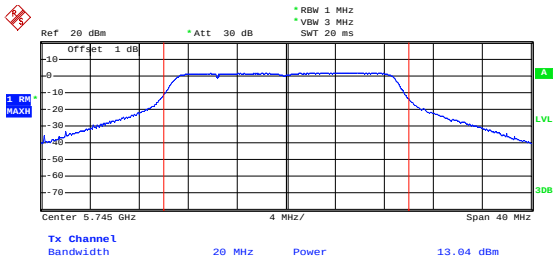
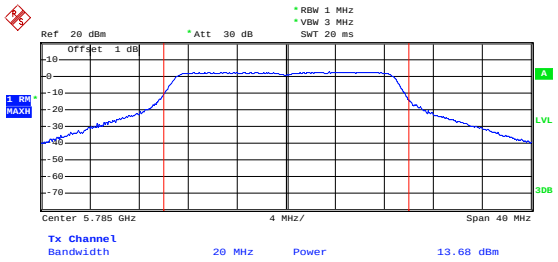
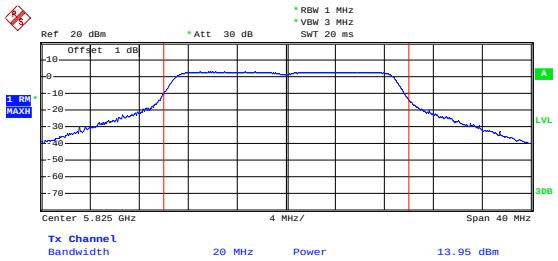
APPENDIX C

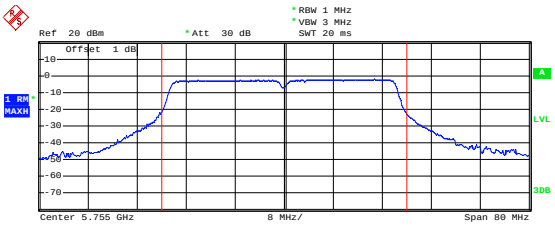
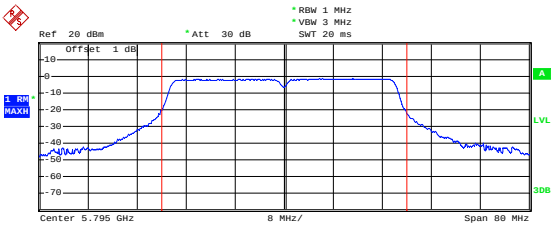
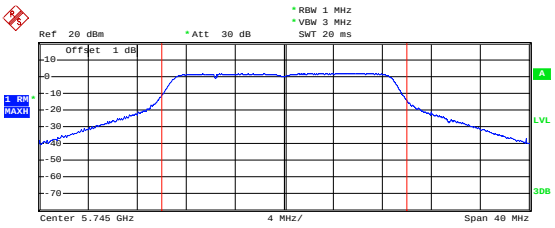
Maximum Conducted Output Power

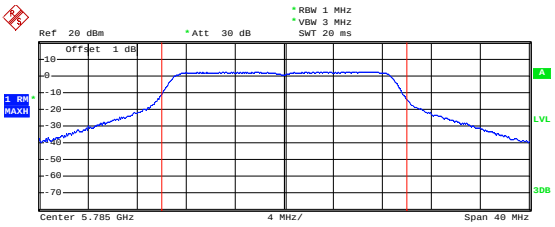
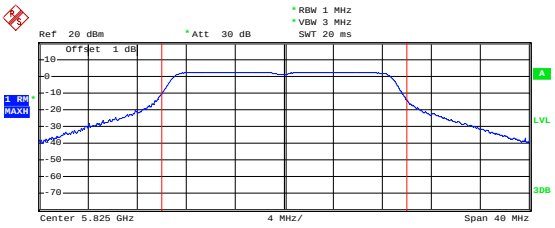
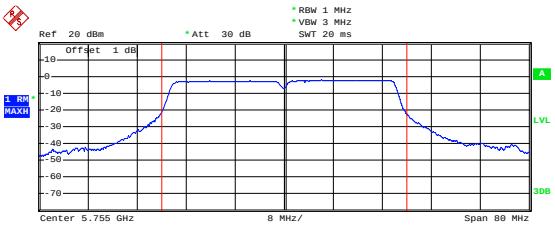
U-NII-3: 5725-5850MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5745	14.11	30.00
	5785	14.77	30.00
	5825	14.97	30.00
802.11n-HT20	5745	13.04	30.00
	5785	13.68	30.00
	5825	13.95	30.00
802.11n-HT40	5755	12.07	30.00
	5795	12.74	30.00
802.11ac-VHT20	5745	13.01	30.00
	5785	13.63	30.00
	5825	13.88	30.00
802.11ac-VHT40	5755	12.05	30.00
	5795	12.84	30.00
802.11ax-HE20	5745	13.39	30.00
	5785	13.53	30.00
	5825	13.19	30.00
802.11ax-HE40	5755	12.32	30.00
	5795	12.49	30.00

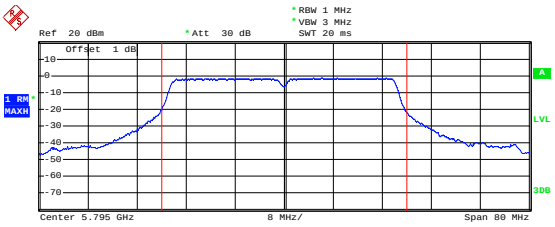
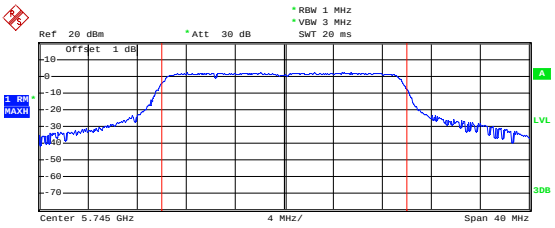
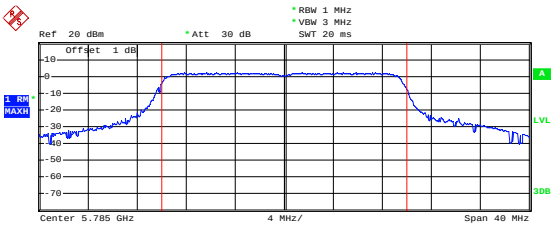
5725-5850MHz

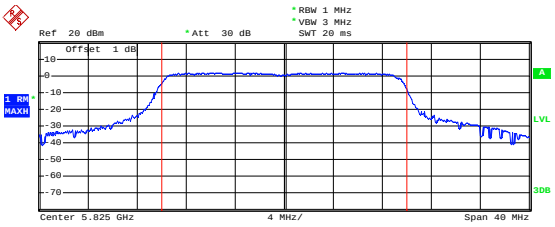
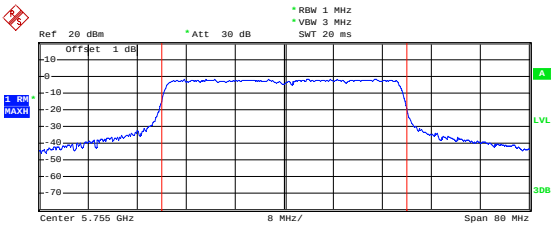
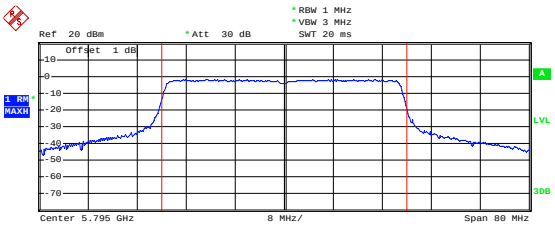
802.11a-Low	 Date: 14.SEP.2024 08:42:30
802.11a-Middle	 Date: 14.SEP.2024 08:43:17
802.11a-High	 Date: 14.SEP.2024 08:44:06

802.11n-HT20-Low	 Date: 14.SEP.2024 08:47:29
802.11n-HT20-Middle	 Date: 14.SEP.2024 08:46:10
802.11n-HT20-High	 Date: 14.SEP.2024 08:45:36

802.11n-HT40-Low	 Date: 14.SEP.2024 08:54:44
802.11n-HT40-High	 Date: 14.SEP.2024 08:55:31
802.11ac-VHT20-Low	 Date: 14.SEP.2024 08:52:00

802.11ac-VHT20-Middle	 Date: 14.SEP.2024 08:52:36
802.11ac-VHT20-High	 Date: 14.SEP.2024 08:53:10
802.11ac-VHT40-Low	 Date: 14.SEP.2024 08:58:41

802.11ac-VHT40-High	 Date: 14.SEP.2024 08:57:23
802.11ax-HE20-Low	 Date: 14.SEP.2024 09:01:57
802.11ax-HE20-Middle	 Date: 14.SEP.2024 09:02:42

802.11ax-HE20-High	 Date: 14.SEP.2024 09:03:26
802.11ax-HE40-Low	 Date: 14.SEP.2024 08:59:50
802.11ax-HE40-High	 Date: 14.SEP.2024 09:00:55

APPENDIX D

Frequency Stability

U-NII-1:5725-5850MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.7	-30	506	0.087
100%		-20	509	0.088
100%		-10	501	0.087
100%		0	498	0.086
100%		+10	503	0.087
100%		+20	505	0.087
100%		+30	491	0.085
100%		+40	496	0.086
100%		+50	493	0.085
Low Battery power	3.15	+20	497	0.086
High Battery power	4.30	+20	502	0.087

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

******* END OF REPORT *******