

TEST REPORT

Reference No...... : WTX23X11248714W001
FCC ID : 2A457-RTDCCAM21
Applicant : ReTech Labs, Inc.
Address : 9820 Willow Creek Road, Suite#110, San Diego, CA, USA
Manufacturer : ShenZhen Wasintek Technology Ltd.
Address : 1F 211, Building B, GuoRen Building, No.5, KeJi ZhongSan Road, NanShan
ShenZhen
Product Name : Store Intelligence Camera
Model No...... : RT-DC-CAM2.1
Standards : FCC Part 15.407
Date of Receipt sample : 2023-11-22
Date of Test..... : 2023-11-22 to 2023-12-13
Date of Issue : 2023-12-13
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:

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TABLE OF CONTENTS

1. GENERAL INFORMATION	5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
1.2 TEST STANDARDS.....	6
1.3 TEST METHODOLOGY	6
1.4 TABLE FOR PARAMETERS OF TEST SOFTWARE SETTING.....	6
1.5 EUT OPERATING DURING TEST.....	7
1.6 TEST FACILITY	7
1.7 EUT SETUP AND TEST MODE	8
1.8 MEASUREMENT UNCERTAINTY	9
1.9 TEST EQUIPMENT LIST AND DETAILS	10
2. SUMMARY OF TEST RESULTS.....	13
3. ANTENNA REQUIREMENT	14
3.1 STANDARD APPLICABLE	14
3.2 EVALUATION INFORMATION	14
4. AUTOMATICALLY DISCONTINUE TRANSMISSION	15
4.1 STANDARD APPLICABLE	15
4.2 SUMMARY OF TEST RESULTS.....	15
5. POWER SPECTRAL DENSITY	16
5.1 STANDARD APPLICABLE	16
5.2 TEST PROCEDURE	16
5.3 SUMMARY OF TEST RESULTS/PLOTS.....	17
6. EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH	18
6.1 STANDARD APPLICABLE	18
6.2 TEST PROCEDURE	18
6.3 SUMMARY OF TEST RESULTS/PLOTS.....	20
7. MAXIMUM CONDUCTED OUTPUT POWER	21
7.1 STANDARD APPLICABLE	21
7.2 TEST PROCEDURE	21
7.3 SUMMARY OF TEST RESULTS/PLOTS.....	22
8. RADIATED SPURIOUS EMISSIONS	23
8.1 STANDARD APPLICABLE	23
8.2 TEST PROCEDURE	23
8.3 TEST RECEIVER SETUP	25
8.4 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	25
8.5 SUMMARY OF TEST RESULTS/PLOTS.....	25
9. FREQUENCY STABILITY	34
9.1 STANDARD APPLICABLE	34
9.2 TEST PROCEDURE	34
9.3 SUMMARY OF TEST RESULTS/PLOTS.....	34
10. CONDUCTED EMISSIONS	35
10.1 TEST PROCEDURE.....	35
10.2 BASIC TEST SETUP BLOCK DIAGRAM	35
10.3 TEST RECEIVER SETUP	35
10.4 SUMMARY OF TEST RESULTS/PLOTS	35
SAPPENDIX SUMMARY	38
APPENDIX A.....	39
APPENDIX B.....	43
APPENDIX C.....	50
APPENDIX D.....	54

APPENDIX PHOTOGRAPHS.....55

Report version

Version No.	Date of issue	Description
Rev.00	2023-12-13	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Store Intelligence Camera
Trade Name:	/
Model No.:	RT-DC-CAM2.1
Adding Model(s):	/
Rated Voltage:	DC 5V
Battery Capacity:	/
Power Adapter:	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n-HT20, 802.11n-HT40, 802.11ac-VHT80
Frequency Range:	5745-5825MHz
Max. RF Output Power:	13.32dBm (Conducted)
Type of Modulation:	QPSK, 16QAM, 64QAM
Type of Antenna:	Integral Antenna
Antenna Gain:	1.19dBi
<i>Note The Antenna Gain is provided by the customer and can affect the validity of results.</i>	

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

Enter instructions through the SecureCRT tool, you can start to test. During testing, Channel and Power Controlling instruct provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5745	5785	5825										
802.11a 6Mbps	20	20	20										
802.11n-HT20 MCS0	19	19	19										
Mode	NCB: 40MHz												
	5755	5795											
802.11n-HT40 MCS0	19	19											
Mode	NCB: 80MHz												
	5775												
802.11ac-VHT80 MCS0/Nss2	19												

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 maintained 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	802.11n-HT40	5755MHz, 5795MHz
TM4	802.11ac-VHT80	5775MHz
Note: 802.11ac-VHT20, 802.11ac-VHT40 covered by 802.11n-HT20 and 802.11n-HT40.		

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	45~55 %.
ATM Pressure:	1019 mbar

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

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	0.8	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Adapter	Mediacom	BOS050200-02A	/

1.8 Measurement Uncertainty

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

1.9 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A 1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
WTXE1022A 1002	GSM Tester	Rohde & Schwarz	CMU200	114403	2023-02-25	2024-02-24
WTXE1005A 1005	Spectrum Analyzer	Agilent	N9020A	US471401 02	2023-02-25	2024-02-24
WTXE1084A 1001	Spectrum Analyzer	Agilent	N9020A	MY543205 48	2023-02-25	2024-02-24
WTXE1044A 1001	Signal Generator	Agilent	83752A	3610A014 53	2023-02-25	2024-02-24
WTXE1045A 1001	Vector Signal Generator	Agilent	N5182A	MY470702 02	2023-02-25	2024-02-24
WTXE1018A 1001	Power Divider	Weinschel	1506A	PM204	2023-02-25	2024-02-24
WTXE1045A 1001	Power Divider	RF-Lambda	RFLT4W5M18G	14110400 027	2023-02-25	2024-02-24
☐ Chamber A: Below 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007A 1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1007A 1001	Amplifier	HP	8447F	2805A034 75	2023-02-25	2024-02-24
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1010A 1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☐ Chamber A: Above 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007A 1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1065A 1001	Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
WTXE1010A 1005	Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18

WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐ Chamber B:Below 1GHz						
WTXE1010A 1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
WTXE1038A 1001	Amplifier	Agilent	8447D	2944A104 57	2023-02-25	2024-02-24
WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☒ Chamber C:Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1010A 1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1007A 1002	Amplifier	HP	8447F	2944A038 69	2023-02-25	2024-02-24
☒ Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1103A 1005	Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2023-02-25	2024-02-24
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐ Conducted Room 1#						
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
WTXE1002A 1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
WTXE1003A 1001	AC LISN	Schwarz beck	NSLK8126	8126-279	2023-02-25	2024-02-24
☒ Conducted Room 2#						
WTXE1001A 1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24
WTXE1003A	LISN	Rohde &	ENV 216	100097	2023-02-25	2024-02-24

Reference No.: WTX23X11248714W001

1003		Schwarz				
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Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 1#)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 2#)*	SKET	EMC-I	V2.0

*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 integral 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 $11 \text{ dBm} + 10 \log B$, 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 ($< 1\text{MHz}$, or $< 500\text{kHz}$) and integrated over 1 MHz, or 500kHz bandwidth, the following adjustments to the procedures apply:

- a) Set $\text{RBW} \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $\text{VBW} \geq 3 \text{ RBW}$.
- c) If measurement bandwidth of Maximum PSD is specified in 500kHz, add $10\log(500\text{kHz}/\text{RBW})$ to the measured result, whereas $\text{RBW} (< 500\text{kHz})$ 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 $10\log(1\text{MHz}/\text{RBW})$ to the measured result, whereas $\text{RBW} (< 1\text{MHz})$ 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 $\text{RBW}=100\text{kHz}$ 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 $11\text{dBm} + 10 \log B$, 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.

(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) $\geq 3 \times$ 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 $\geq 3 \times$ 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.

Reference No.: WTX23X11248714W001

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 $11\text{dBm} + 10 \log B$, 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.

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 $\geq$ 3MHz.
- (iv) Number of points in sweep $\geq$ 2 Span / RBW. (This ensures that bin-to-bin spacing is $\leq$ 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 $\geq$ 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.

789033 D02 v02r01 General UNII Test Procedures New Rules v01

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

$$\text{EIRP} = ((E \cdot d)^2) / 30$$

where:

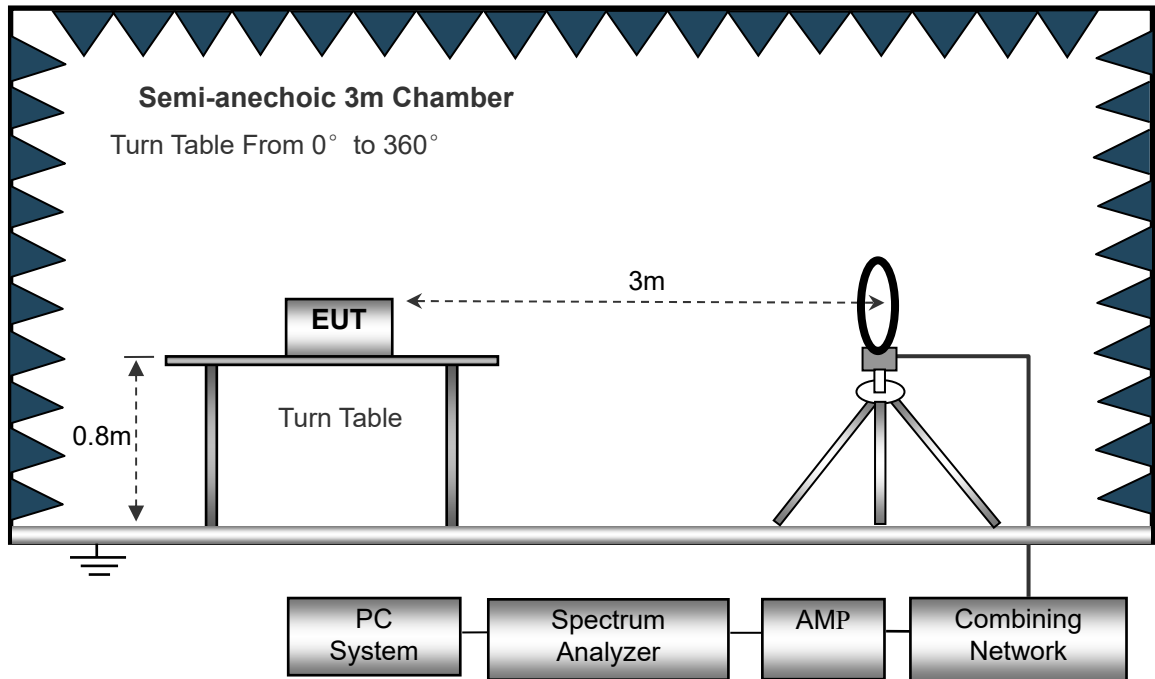
- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

8.2 Test Procedure

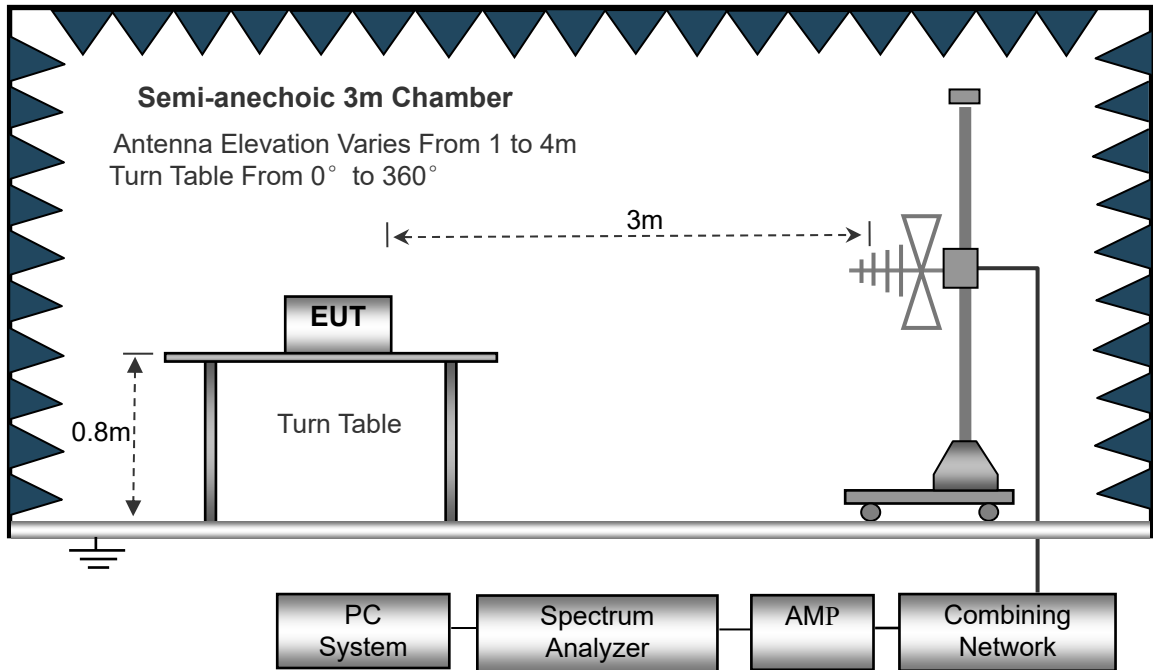
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..

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.

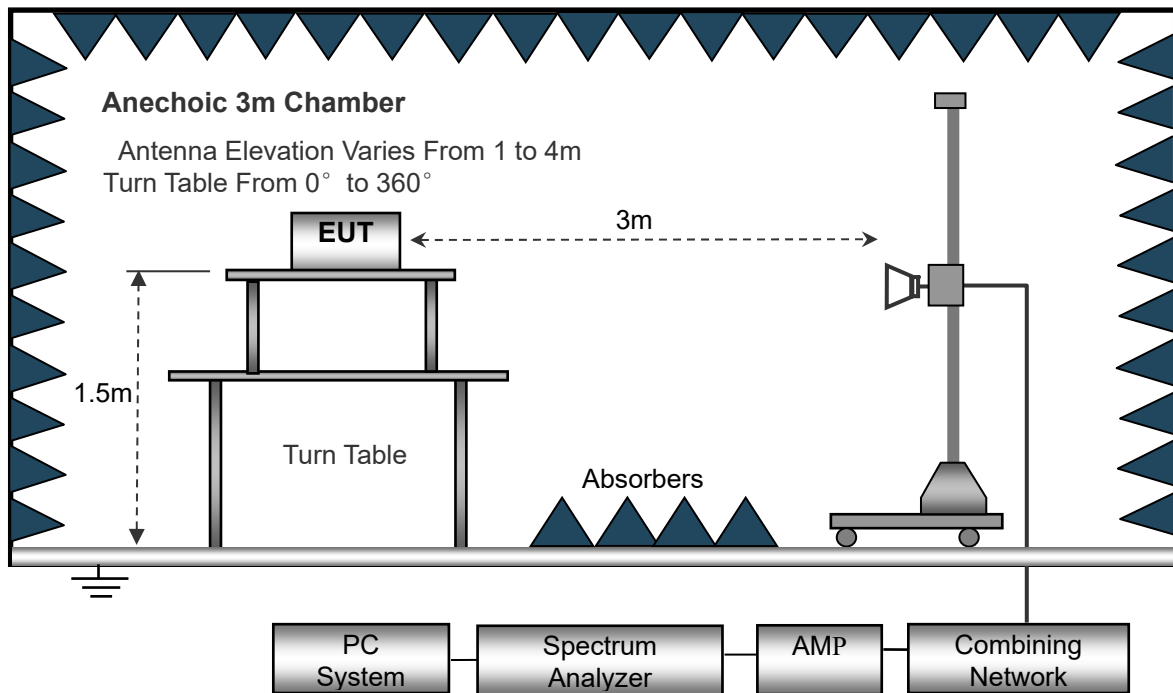
The test setup for emission measurement below 30MHz.



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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

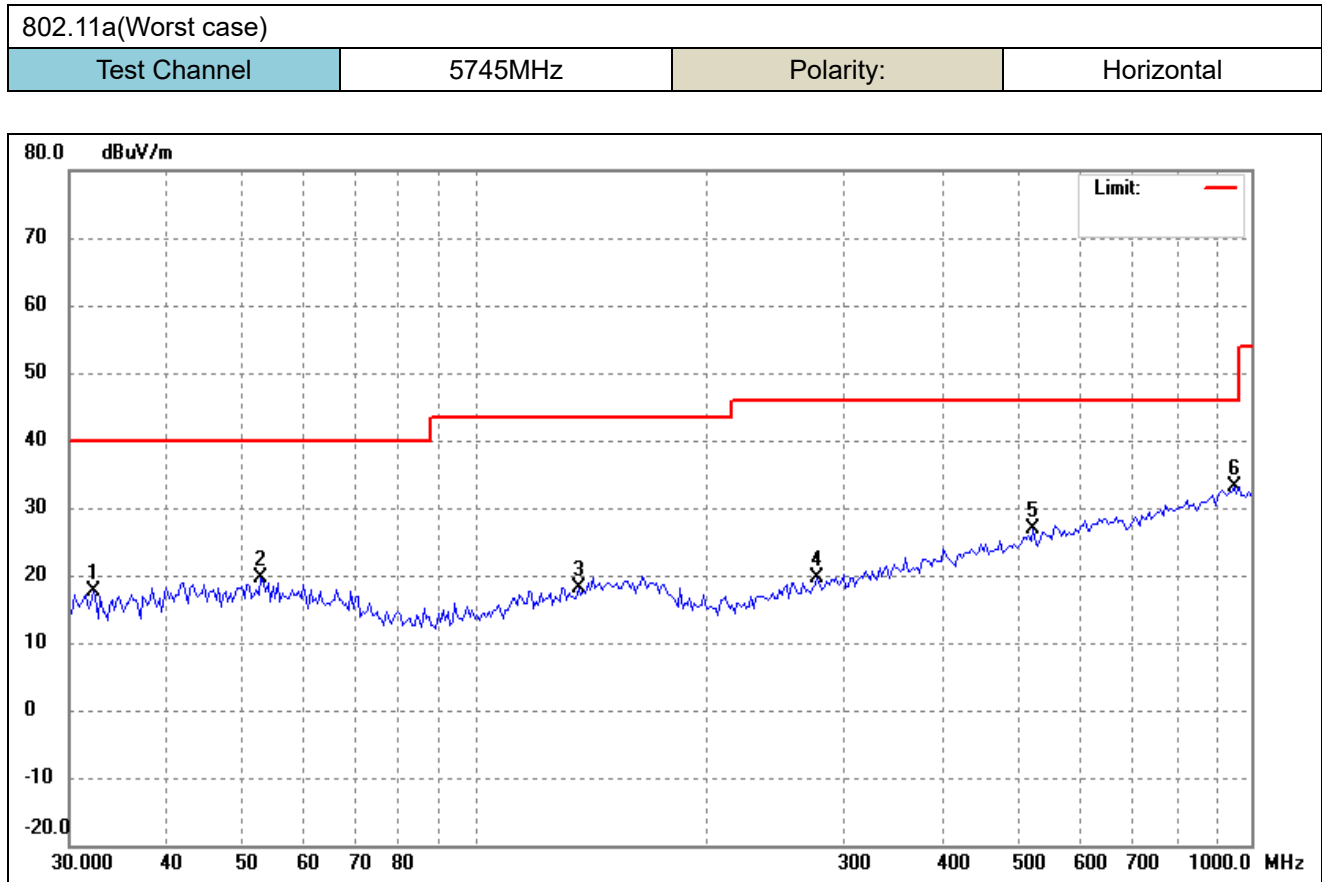
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

8.5 Summary of Test Results/Plots

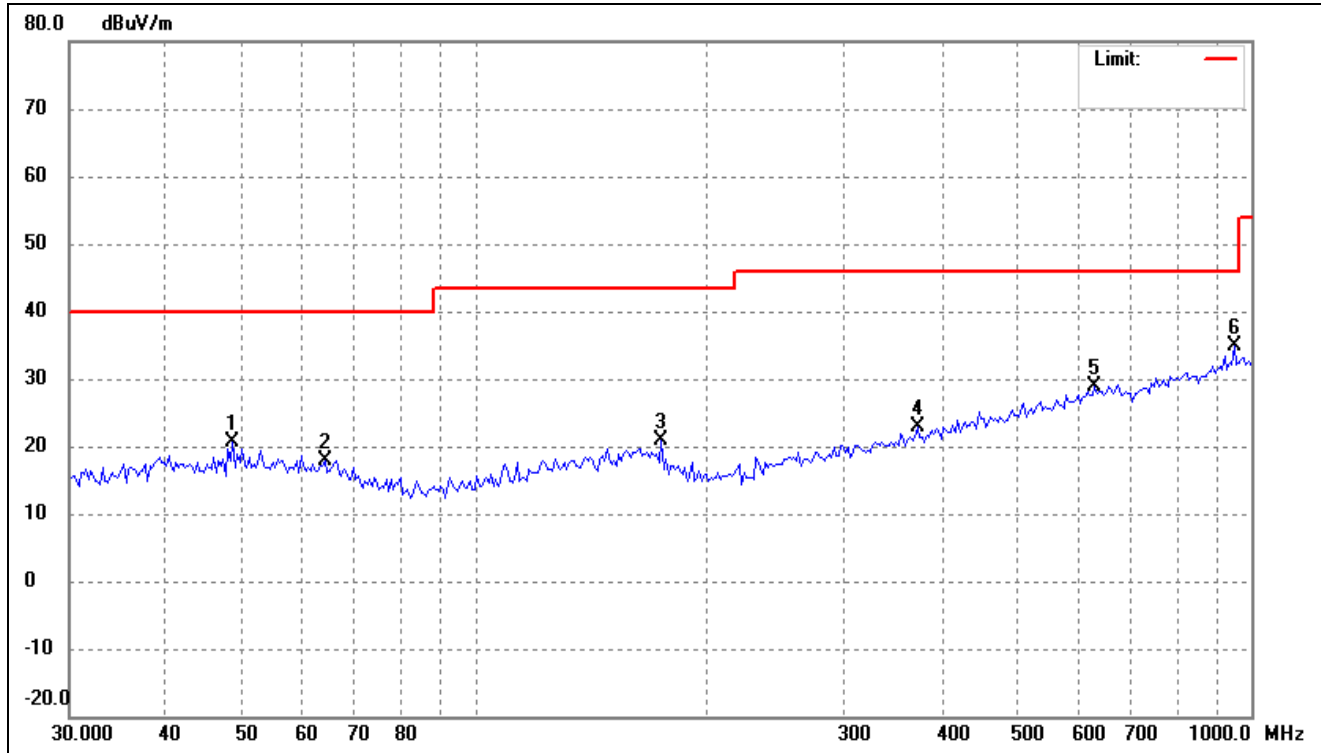
Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

➤ Spurious Emission From 30MHz to 1GHz



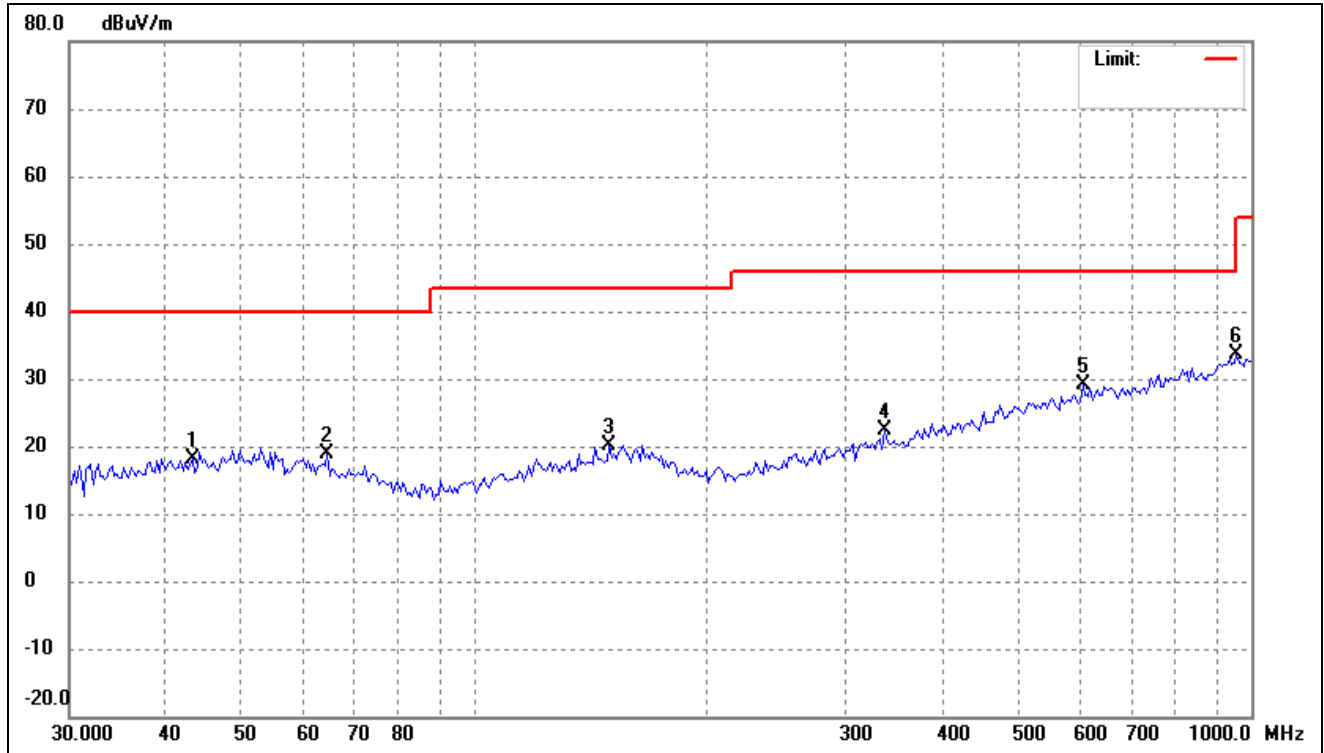
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	32.1839	27.60	-9.91	17.69	40.00	-22.31	-	-	peak
2	53.0056	27.95	-8.41	19.54	40.00	-20.46	-	-	peak
3	135.9162	27.72	-9.61	18.11	43.50	-25.39	-	-	peak
4	276.3817	28.70	-9.06	19.64	46.00	-26.36	-	-	peak
5	523.8763	30.52	-3.53	26.99	46.00	-19.01	-	-	peak
6	952.0000	30.87	2.25	33.12	46.00	-12.88	-	-	peak

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



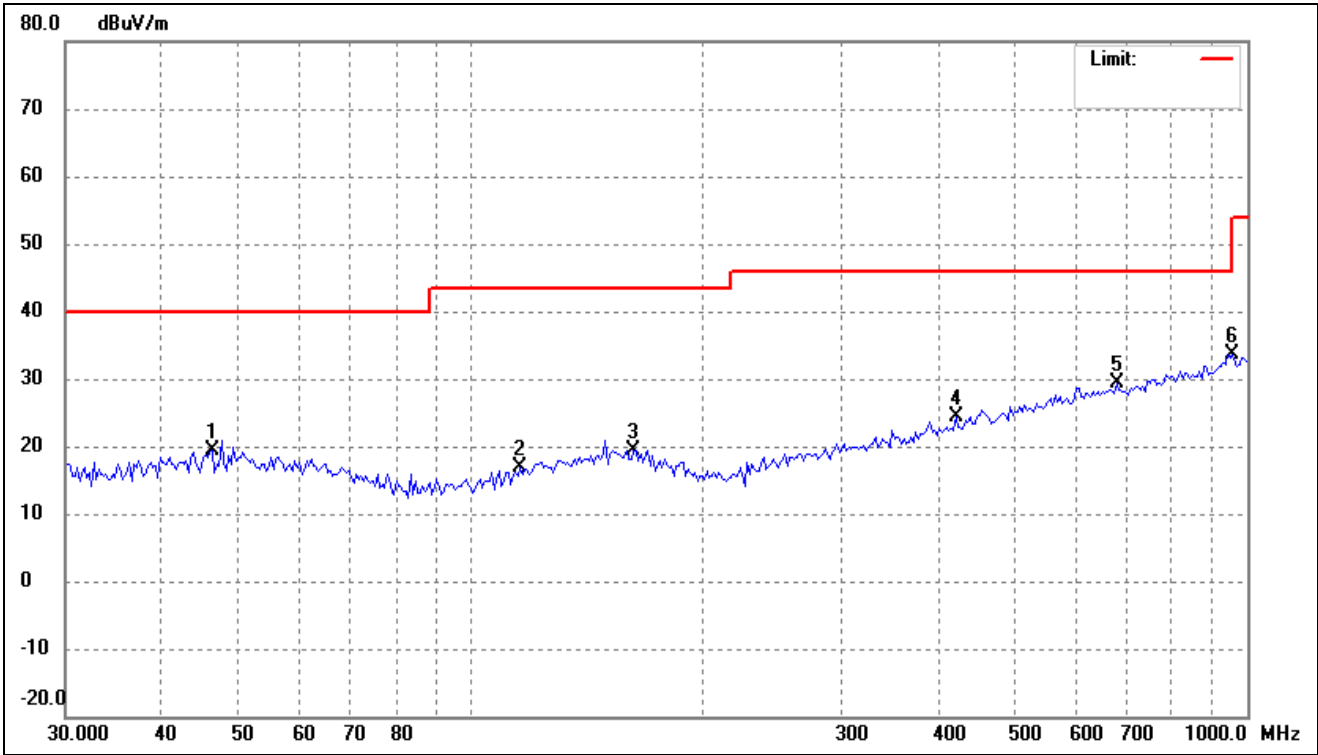
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	48.7191	28.89	-8.18	20.71	40.00	-19.29	-	-	peak
2	64.0799	27.50	-9.68	17.82	40.00	-22.18	-	-	peak
3	173.8147	30.21	-9.42	20.79	43.50	-22.71	-	-	peak
4	371.2680	29.52	-6.57	22.95	46.00	-23.05	-	-	peak
5	628.8935	30.37	-1.38	28.99	46.00	-17.01	-	-	peak
6	952.0000	32.58	2.25	34.83	46.00	-11.17	-	-	peak

802.11a(Worst case)			
Test Channel	5825MHz	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	43.2332	26.55	-8.47	18.08	40.00	-21.92	-	-	peak
2	64.5318	28.69	-9.76	18.93	40.00	-21.07	-	-	peak
3	148.9174	28.87	-8.68	20.19	43.50	-23.31	-	-	peak
4	336.4817	29.66	-7.35	22.31	46.00	-23.69	-	-	peak
5	607.1805	30.79	-1.64	29.15	46.00	-16.85	-	-	peak
6	958.7134	31.45	2.26	33.71	46.00	-12.29	-	-	peak

802.11n-HT20			
Test Channel	5825MHz	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.3806	27.70	-8.37	19.33	40.00	-20.67	-	-	peak
2	115.6321	27.99	-10.99	17.00	43.50	-26.50	-	-	peak
3	162.0197	28.14	-8.66	19.48	43.50	-24.02	-	-	peak
4	421.3287	29.64	-5.38	24.26	46.00	-21.74	-	-	peak
5	679.4345	30.53	-1.23	29.30	46.00	-16.70	-	-	peak
6	958.7134	31.42	2.26	33.68	46.00	-12.32	-	-	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 725-5.850GHz (802.11a)
- 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	57.45	9.45	66.90	74	-7.10	H	PK
11490	38.48	9.45	47.93	54	-6.07	H	AV
11490	58.94	9.45	68.39	74	-5.61	V	PK
11490	38.25	9.45	47.70	54	-6.30	V	AV
Middle Channel (5785MHz)							
11570	56.60	9.62	66.22	74	-7.78	H	PK
11570	41.55	9.62	51.17	54	-2.83	H	AV
11570	56.89	9.62	66.51	74	-7.49	V	PK
11570	39.89	9.62	49.51	54	-4.49	V	AV
High Channel (5825MHz)							
11650	57.17	9.84	67.01	74	-6.99	H	PK
11650	38.97	9.84	48.81	54	-5.19	H	AV
11650	56.00	9.84	65.84	74	-8.16	V	PK
11650	39.54	9.84	49.38	54	-4.62	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-41.68	-27
	5715 to 5725	-38.30	-17
Highest	5850 to 5860	-37.75	-17
	Above 5860	-42.49	-27

Note: the data just list the worst cases

- 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	56.67	9.45	66.12	74	-7.88	H	PK
11490	38.08	9.45	47.53	54	-6.47	H	AV
11490	58.62	9.45	68.07	74	-5.93	V	PK
11490	41.26	9.45	50.71	54	-3.29	V	AV
Middle Channel (5785MHz)							
11570	57.75	9.62	67.37	74	-6.63	H	PK
11570	40.49	9.62	50.11	54	-3.89	H	AV
11570	58.03	9.62	67.65	74	-6.35	V	PK
11570	41.03	9.62	50.65	54	-3.35	V	AV
High Channel (5825MHz)							
11650	55.68	9.84	65.52	74	-8.48	H	PK
11650	39.61	9.84	49.45	54	-4.55	H	AV
11650	55.85	9.84	65.69	74	-8.31	V	PK
11650	39.44	9.84	49.28	54	-4.72	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-42.57	-27
	5715 to 5725	-38.69	-17
Highest	5850 to 5860	-37.69	-17
	Above 5860	-38.61	-27

Note: the data just list the worst cases

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	55.71	9.45	65.16	74	-8.84	H	PK
11510	38.89	9.45	48.34	54	-5.66	H	AV
11510	58.92	9.45	68.37	74	-5.63	V	PK
11510	40.60	9.45	50.05	54	-3.95	V	AV
High Channel (5795MHz)							
11590	56.58	9.27	65.85	74	-8.15	H	PK
11590	41.59	9.27	50.86	54	-3.14	H	AV
11590	57.00	9.27	66.27	74	-7.73	V	PK
11590	39.46	9.27	48.73	54	-5.27	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-39.62	-27
	5715 to 5725	-38.57	-17
Highest	5850 to 5860	-35.39	-17
	Above 5860	-42.51	-27
Note: the data just list the worst cases			

Reference No.: WTX23X11248714W001

- For the frequency band 5.725-5.850GHz (802.11ac-VHT80)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
5775MHz							
11550	56.70	9.93	66.63	74	-7.37	H	PK
11550	39.58	9.93	49.51	54	-4.49	H	AV
11550	56.54	9.93	66.47	74	-7.53	V	PK
11550	39.37	9.93	49.30	54	-4.70	V	AV

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-37.59	-27
	5715 to 5725	-35.33	-17
Highest	5850 to 5860	-35.68	-17
	Above 5860	-40.27	-27
Note: the data just list the worst cases			

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

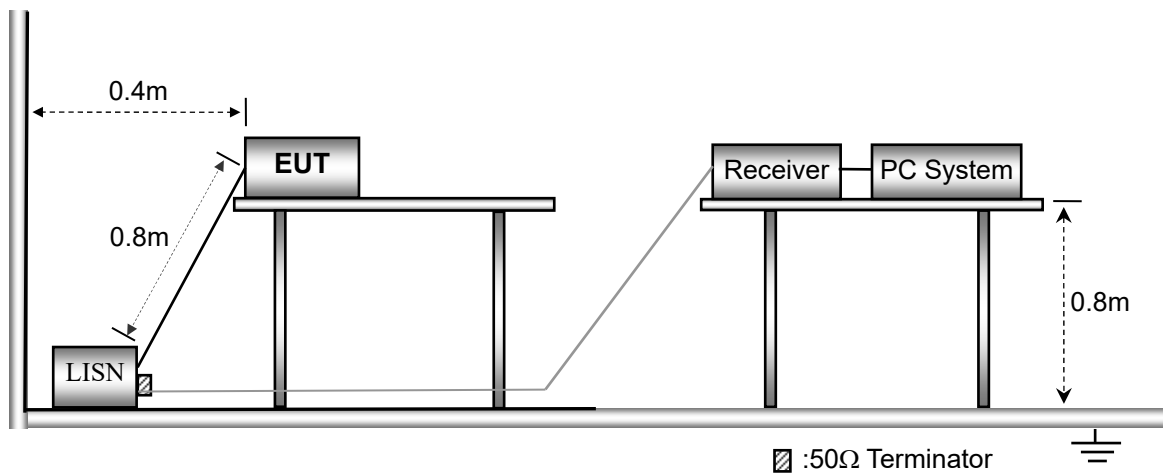
10. Conducted Emissions

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



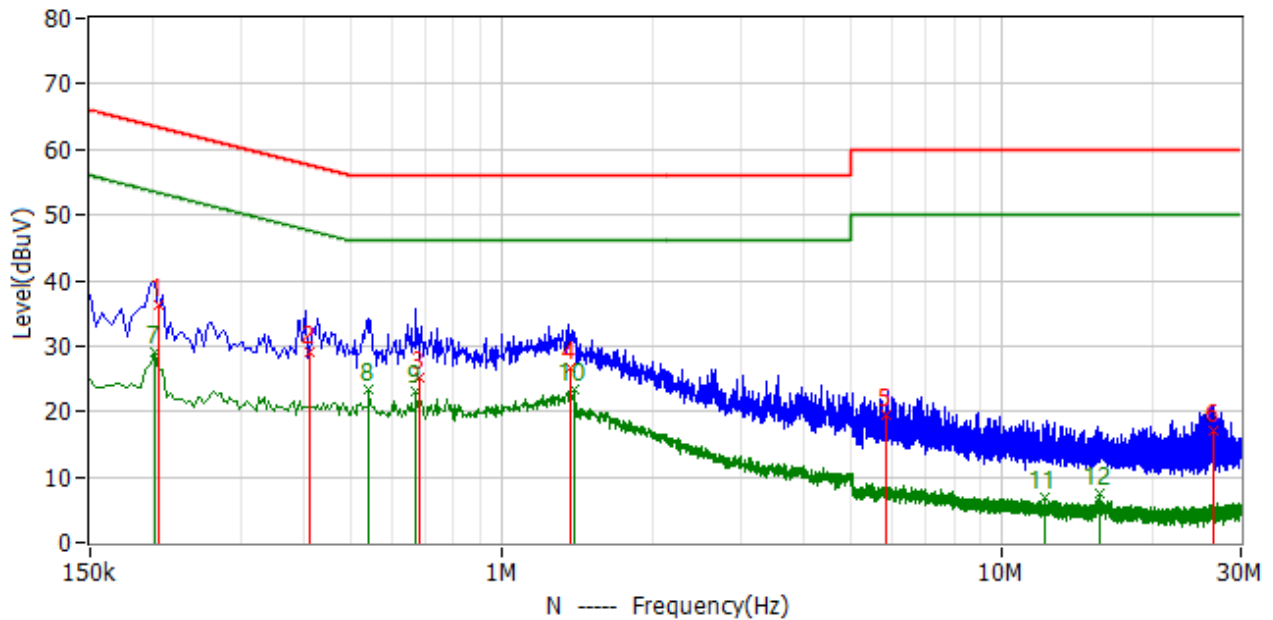
10.3 Test Receiver Setup

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

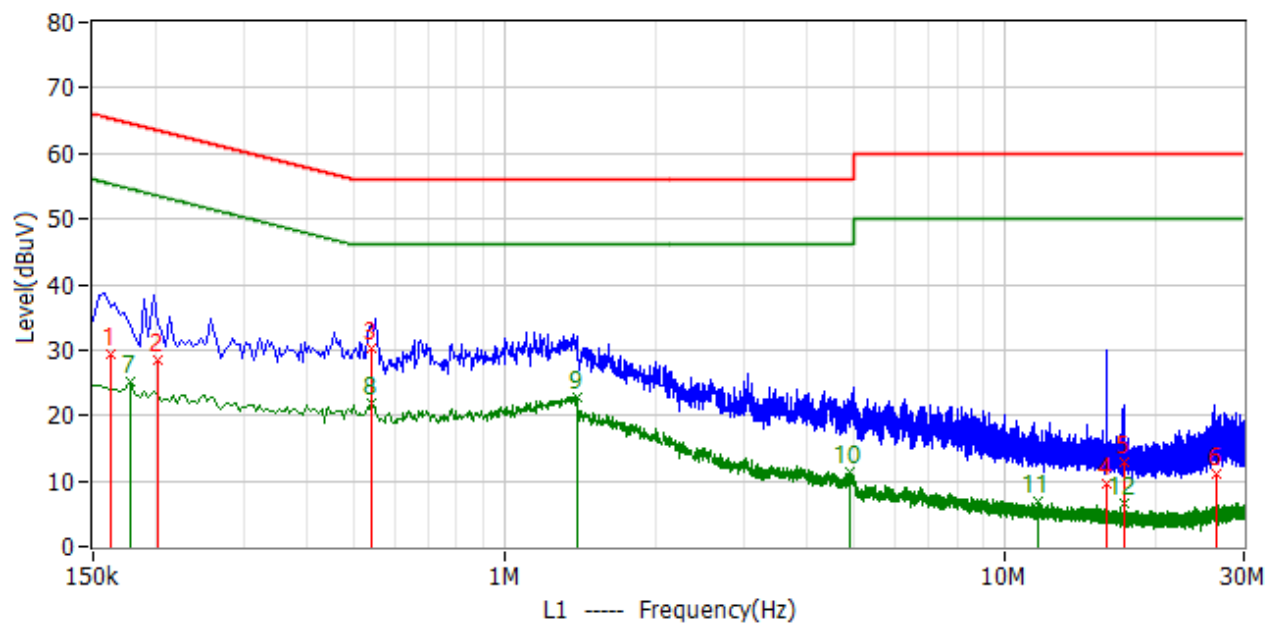
10.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral
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No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	206.000kHz	15.8	20.6	36.4	63.4	-27.0	QP
2	414.000kHz	8.3	20.8	29.1	57.6	-28.4	QP
3	682.000kHz	4.4	20.7	25.1	56.0	-30.9	QP
4	1.366MHz	5.9	20.8	26.7	56.0	-29.3	QP
5	5.874MHz	-1.3	20.8	19.5	60.0	-40.5	QP
6	26.450MHz	-3.1	20.3	17.2	60.0	-42.8	QP
7*	202.000kHz	8.6	20.6	29.2	53.5	-24.4	AV
8*	542.000kHz	2.7	20.7	23.4	46.0	-22.6	AV
9*	674.000kHz	2.5	20.7	23.2	46.0	-22.8	AV
10*	1.398MHz	2.6	20.8	23.4	46.0	-22.6	AV
11*	12.190MHz	-14.0	20.8	6.8	50.0	-43.2	AV
12*	15.702MHz	-13.1	20.6	7.5	50.0	-42.5	AV

Test Mode	Communication	AC120V 60Hz	Polarity:	Line
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No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	162.000kHz	8.6	20.9	29.5	65.4	-35.8	QP
2	202.000kHz	7.8	20.6	28.4	63.5	-35.1	QP
3	542.000kHz	9.7	20.7	30.4	56.0	-25.6	QP
4	15.942MHz	-11.1	20.6	9.5	60.0	-50.5	QP
5	17.270MHz	-7.5	20.4	12.9	60.0	-47.1	QP
6	26.338MHz	-9.3	20.3	11.0	60.0	-49.0	QP
7*	178.000kHz	4.3	20.8	25.1	54.6	-29.5	AV
8*	538.000kHz	1.2	20.7	21.9	46.0	-24.1	AV
9*	1.398MHz	2.1	20.8	22.9	46.0	-23.1	AV
10*	4.906MHz	-9.6	20.9	11.3	46.0	-34.7	AV
11*	11.614MHz	-13.9	20.8	6.9	50.0	-43.1	AV
12*	17.370MHz	-13.7	20.4	6.7	50.0	-43.3	AV

SAPPENDIX SUMMARY

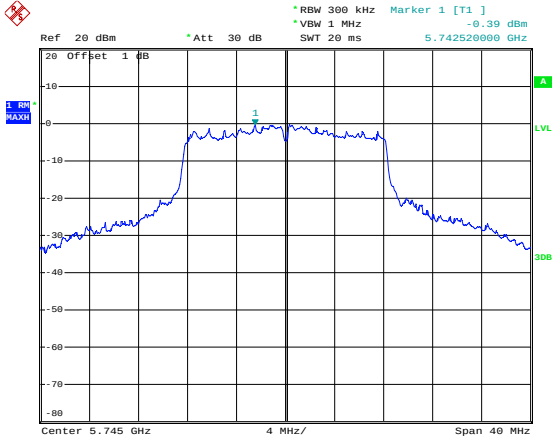
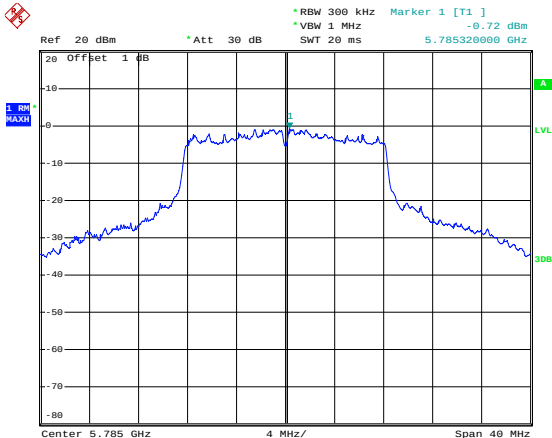
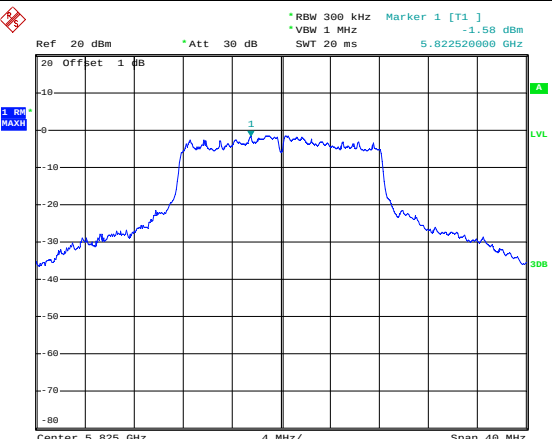
Project No.	WTX23X11248714W	Test Engineer	BAldi Zhong
Start date	2023/11/28	Finish date	2023/12/6
Temperature	24.4℃	Humidity	45%
RF specifications	U-NII		

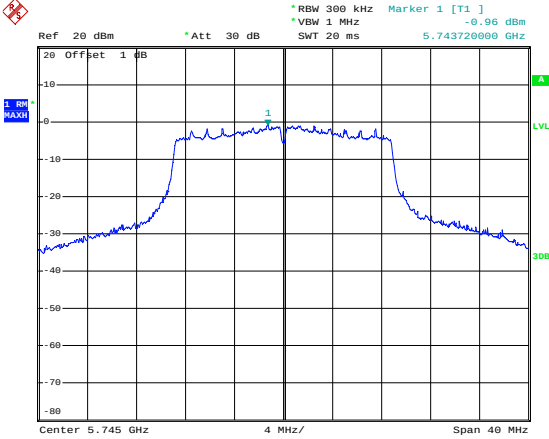
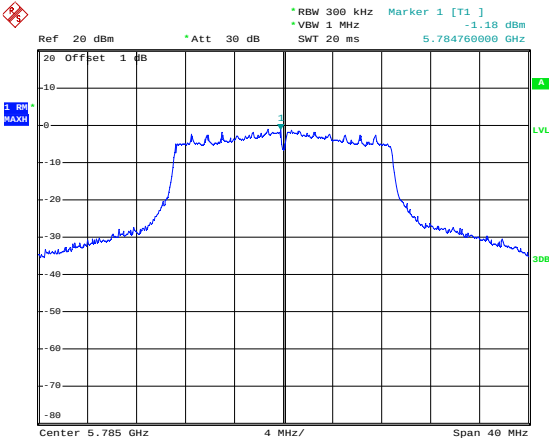
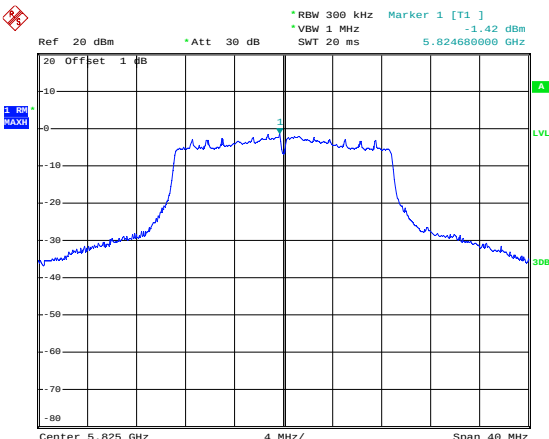
APPENDIX	Description of Test Item	Result
A	Power Spectral Density	Compliant
B	Emission Bandwidth and Occupied Bandwidth	Compliant
C	Maximum Conducted Output Power	Compliant
D	Frequency Stability	Compliant

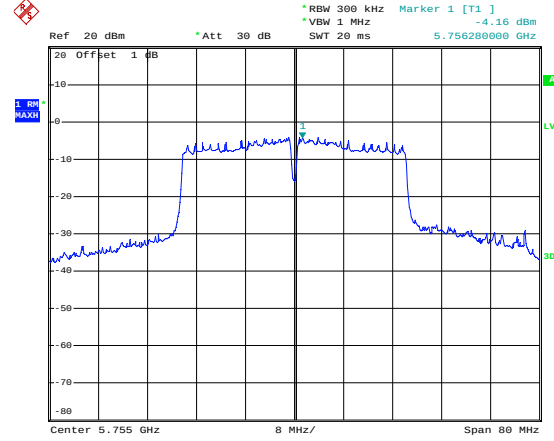
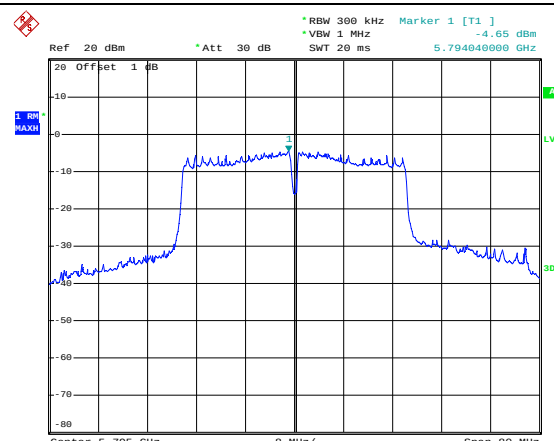
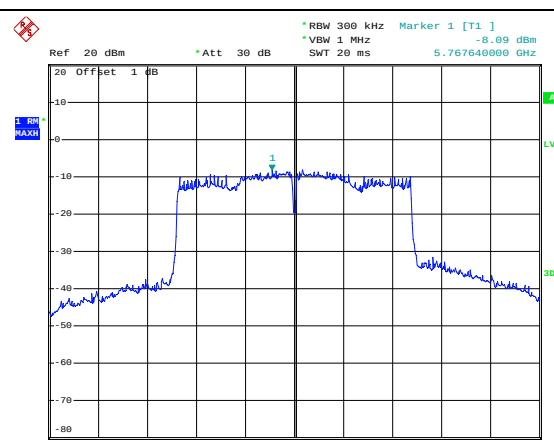
APPENDIX A

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	-0.39	2.22	1.83	30
	5785	-0.72	2.22	1.5	30
	5825	-1.58	2.22	0.64	30
802.11n-HT20	5745	-0.96	2.22	1.26	30
	5785	-1.18	2.22	1.04	30
	5825	-1.42	2.22	0.8	30
802.11n HT40	5755	-4.16	2.22	-1.94	30
	5795	-4.65	2.22	-2.43	30
802.11ac-VHT80	5775	-8.09	2.22	-5.87	30
*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22					

5725-5850MHz

802.11a-Low	 Ref 20 dBm *Att 30 dB RBW 300 kHz Marker 1 [T1] -0.39 dBm VBW 1 MHz SWT 20 ms 5.742520000 GHz 1 dB Offset 1 dB 1 RBW MAX Center 5.745 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:17:31
802.11a-Middle	 Ref 20 dBm *Att 30 dB RBW 300 kHz Marker 1 [T1] -0.72 dBm VBW 1 MHz SWT 20 ms 5.785320000 GHz 1 dB Offset 1 dB 1 RBW MAX Center 5.785 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:18:09
802.11a-High	 Ref 20 dBm *Att 30 dB RBW 300 kHz Marker 1 [T1] -1.58 dBm VBW 1 MHz SWT 20 ms 5.822520000 GHz 1 dB Offset 1 dB 1 RBW MAX Center 5.825 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:19:07

802.11n-HT20-Low	 Ref 20 dBm *Att 30 dB *RBW 300 kHz Marker 1 [T1] -0.96 dBm *VBW 1 MHz SWT 20 ms 5.743720000 GHz Center 5.745 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:20:20
802.11n-HT20-Middle	 Ref 20 dBm *Att 30 dB *RBW 300 kHz Marker 1 [T1] -1.18 dBm *VBW 1 MHz SWT 20 ms 5.784760000 GHz Center 5.785 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:21:06
802.11n-HT20-High	 Ref 20 dBm *Att 30 dB *RBW 300 kHz Marker 1 [T1] -1.42 dBm *VBW 1 MHz SWT 20 ms 5.824680000 GHz Center 5.825 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:22:01

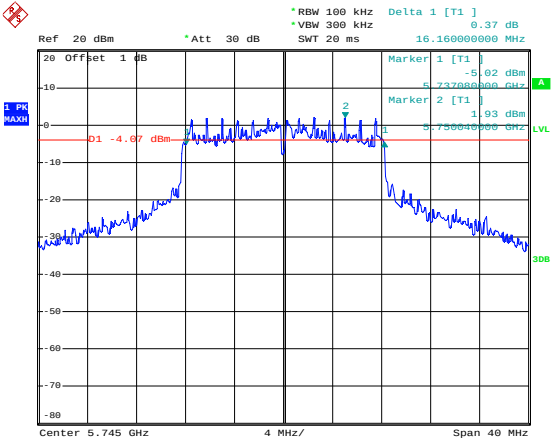
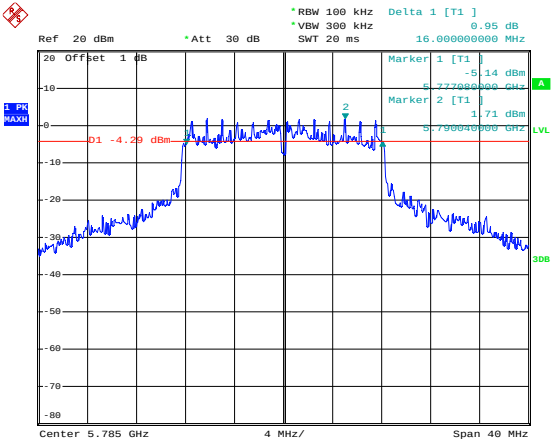
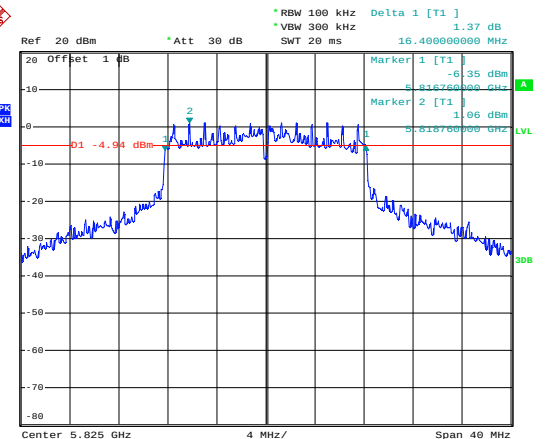
802.11n-HT40-Low	 Ref 20 dBm *Att 30 dB *RBW 300 kHz Marker 1 [T1] -4.16 dBm *VBW 1 MHz SWT 20 ms 5.756280000 GHz 20 Offset 1 dB 1 dBm Center 5.755 GHz 8 MHz/ Span 80 MHz Date: 5.DEC.2023 18:25:02
802.11n-HT40-High	 Ref 20 dBm *Att 30 dB *RBW 300 kHz Marker 1 [T1] -4.65 dBm *VBW 1 MHz SWT 20 ms 5.794940000 GHz 20 Offset 1 dB 1 dBm Center 5.795 GHz 8 MHz/ Span 80 MHz Date: 5.DEC.2023 18:25:31
802.11ac-VHT80-Low	 Ref 20 dBm *Att 30 dB *RBW 300 kHz Marker 1 [T1] -8.09 dBm *VBW 1 MHz SWT 20 ms 5.767640000 GHz 20 Offset 1 dB 1 dBm Center 5.775 GHz 16 MHz/ Span 160 MHz Date: 5.DEC.2023 18:27:06

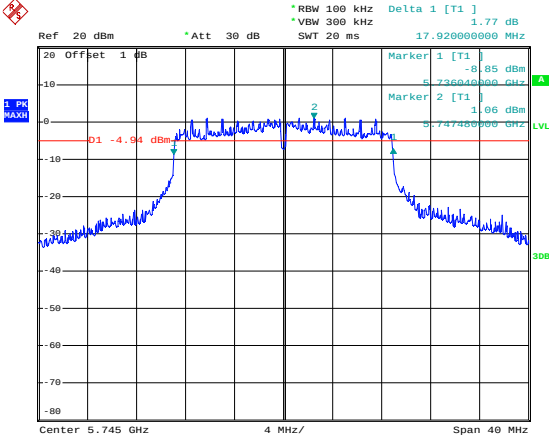
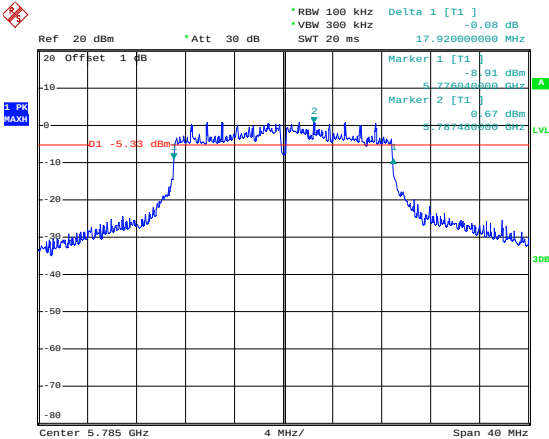
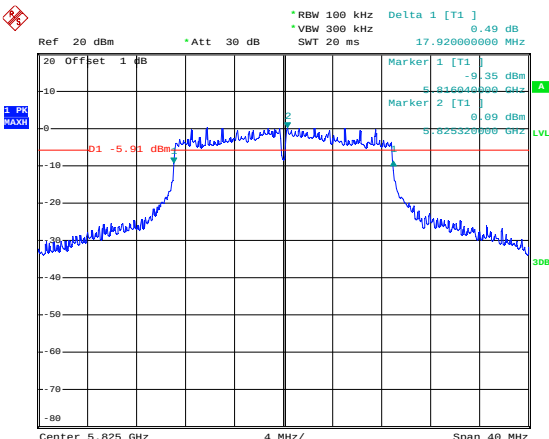
APPENDIX B

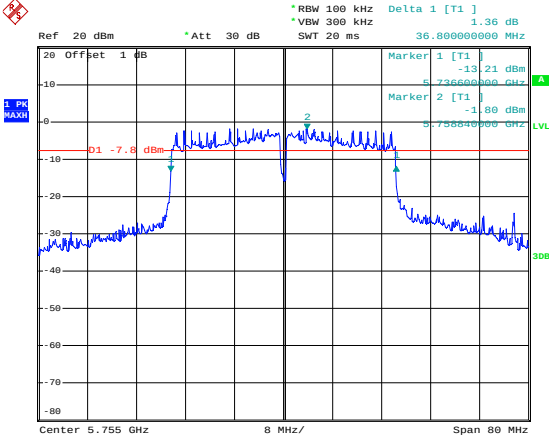
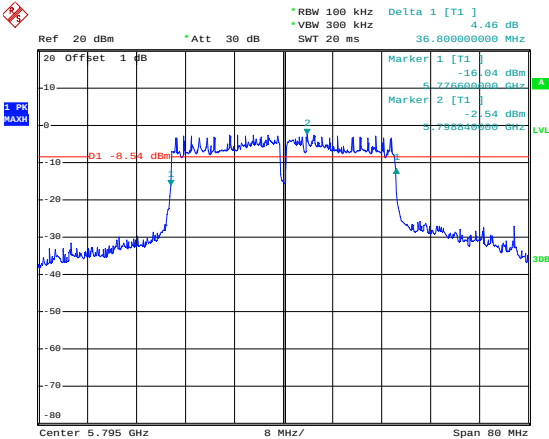
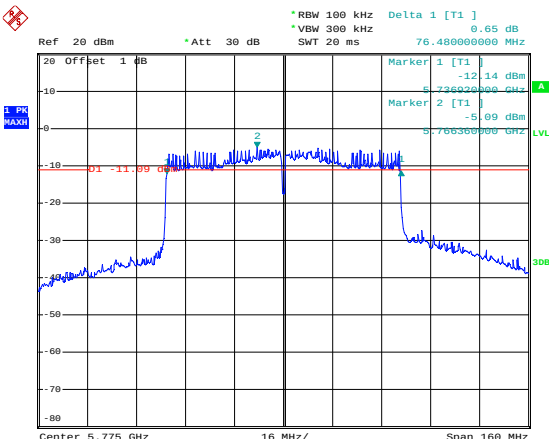
Emission Bandwidth and Occupied Bandwidth

U-NII-3: 5725-5850MHz				
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5745	16.16	17.84	≥500
	5785	16.00	17.92	≥500
	5825	16.40	17.84	≥500
802.11n-HT20	5745	17.92	18.56	≥500
	5785	17.92	18.56	≥500
	5825	17.92	18.56	≥500
802.11n-HT40	5755	36.80	37.76	≥500
	5795	36.80	37.76	≥500
802.11ac-VHT80	5775	76.40	78.40	≥500

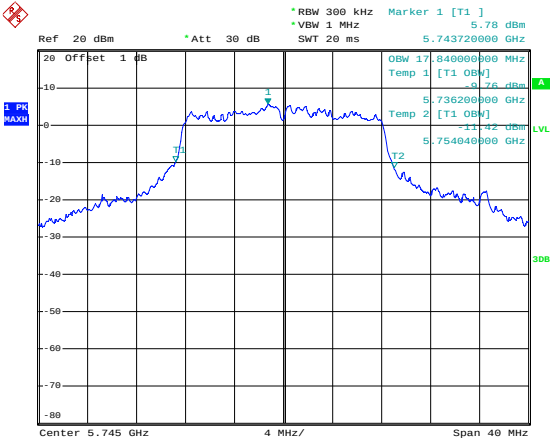
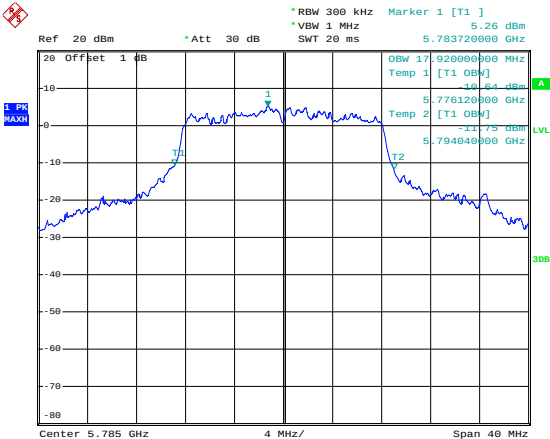
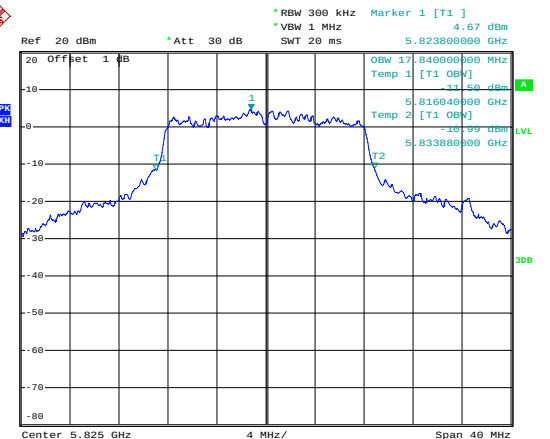
6 dB Bandwidth MHz
5725-5850MHz

802.11a-Low	 Ref 20 dBm *Att 30 dB *RBW 100 kHz Delta 1 [T1] 0.37 dB *VBW 300 kHz SWT 20 ms 16.160000000 MHz Marker 1 [T1] -5.02 dBm Marker 2 [T1] 1.93 dBm D1 -4.07 dBm Center 5.745 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:39:51
802.11a-Middle	 Ref 20 dBm *Att 30 dB *RBW 100 kHz Delta 1 [T1] 0.95 dB *VBW 300 kHz SWT 20 ms 16.000000000 MHz Marker 1 [T1] -5.14 dBm Marker 2 [T1] 1.71 dBm D1 -4.29 dBm Center 5.785 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:40:45
802.11a-High	 Ref 20 dBm *Att 30 dB *RBW 100 kHz Delta 1 [T1] 1.37 dB *VBW 300 kHz SWT 20 ms 16.400000000 MHz Marker 1 [T1] -6.35 dBm Marker 2 [T1] 1.06 dBm D1 -4.94 dBm Center 5.825 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:41:26

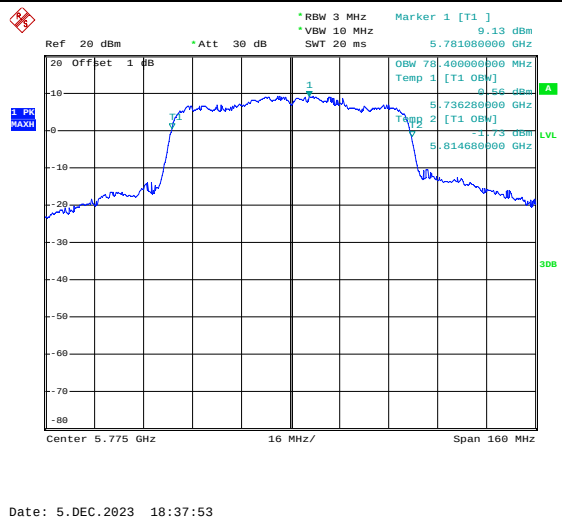
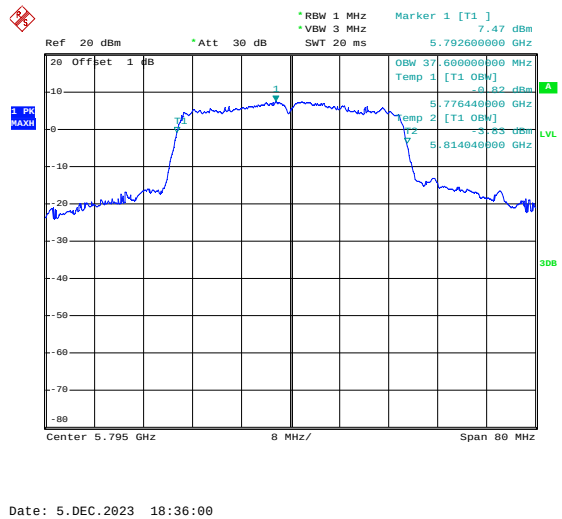
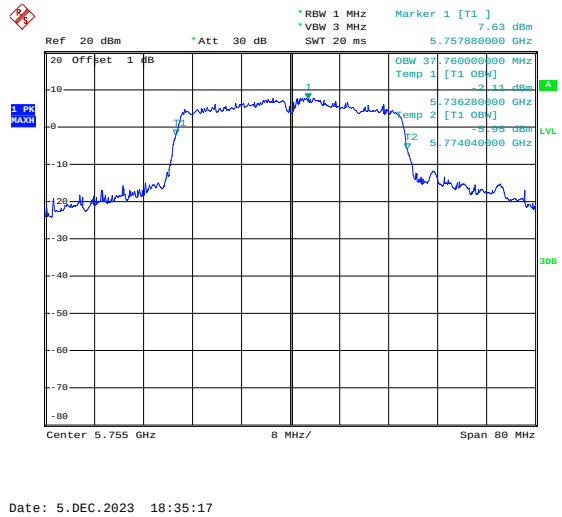
802.11n-HT20-Low	 Date: 5.DEC.2023 18:42:13
802.11n-HT20-Middle	 Date: 5.DEC.2023 18:43:06
802.11n-HT20-High	 Date: 5.DEC.2023 18:46:28

802.11n-HT40-Low	 Ref 20 dBm *Att 30 dB *RBW 100 kHz Delta 1 [T1] 1.36 dB *VBW 300 kHz SWT 20 ms 36.80000000 MHz Marker 1 [T1] -13.21 dBm 5.73660000 GHz Marker 2 [T1] -1.80 dBm 5.75880000 GHz Offset 1 dB 1 PK MAX A LVL 300 Center 5.755 GHz 8 MHz/ Span 80 MHz Date: 5.DEC.2023 18:52:55
802.11n-HT40-High	 Ref 20 dBm *Att 30 dB *RBW 100 kHz Delta 1 [T1] 4.46 dB *VBW 300 kHz SWT 20 ms 36.80000000 MHz Marker 1 [T1] -16.04 dBm 5.77660000 GHz Marker 2 [T1] -2.54 dBm 5.79880000 GHz Offset 1 dB 1 PK MAX A LVL 300 Center 5.795 GHz 8 MHz/ Span 80 MHz Date: 5.DEC.2023 18:53:39
802.11ac-VHT80	 Ref 20 dBm *Att 30 dB *RBW 100 kHz Delta 1 [T1] 0.65 dB *VBW 300 kHz SWT 20 ms 76.48000000 MHz Marker 1 [T1] -12.14 dBm 5.73660000 GHz Marker 2 [T1] -5.09 dBm 5.75880000 GHz Offset 1 dB 1 PK MAX A LVL 300 Center 5.775 GHz 16 MHz/ Span 160 MHz Date: 5.DEC.2023 18:58:40

6 dB Bandwidth MHz
5725-5850MHz

802.11a-Low	 Ref 20 dBm *Att 30 dB *RBW 300 kHz Marker 1 [T1] 5.78 dBm *VBW 1 MHz SWT 20 ms 5.743720000 GHz OBW 17.840000000 MHz Temp 1 [T1 OBW] -10.76 dBm 5.736200000 GHz Temp 2 [T1 OBW] -11.42 dBm 5.754040000 GHz Center 5.745 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:29:16
802.11a-Middle	 Ref 20 dBm *Att 30 dB *RBW 300 kHz Marker 1 [T1] 5.26 dBm *VBW 1 MHz SWT 20 ms 5.783720000 GHz OBW 17.920000000 MHz Temp 1 [T1 OBW] -10.64 dBm 5.776120000 GHz Temp 2 [T1 OBW] -11.75 dBm 5.794040000 GHz Center 5.785 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:29:51
802.11a-High	 Ref 20 dBm *Att 30 dB *RBW 300 kHz Marker 1 [T1] 4.67 dBm *VBW 1 MHz SWT 20 ms 5.823800000 GHz OBW 17.840000000 MHz Temp 1 [T1 OBW] -11.50 dBm 5.816040000 GHz Temp 2 [T1 OBW] -10.50 dBm 5.833800000 GHz Center 5.825 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:31:14

802.11n-HT20-Low	Ref 20 dBm *Att 30 dB RBW 300 kHz Marker 1 [T1] 5.43 dBm *VBW 1 MHz SWT 20 ms 5.744120000 GHz OBW 18.560000000 MHz Temp 1 [T1 OBW] -4.55 dBm 5.735800000 GHz Temp 2 [T1 OBW] -6.00 dBm 5.754360000 GHz Center 5.745 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:31:43
802.11n-HT20-Middle	Ref 20 dBm *Att 30 dB RBW 300 kHz Marker 1 [T1] 5.17 dBm *VBW 1 MHz SWT 20 ms 5.783400000 GHz OBW 18.560000000 MHz Temp 1 [T1 OBW] -4.71 dBm 5.775800000 GHz Temp 2 [T1 OBW] -6.54 dBm 5.794360000 GHz Center 5.785 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:32:12
802.11n-HT20-High	Ref 20 dBm *Att 30 dB RBW 300 kHz Marker 1 [T1] 4.72 dBm *VBW 1 MHz SWT 20 ms 5.824440000 GHz OBW 18.560000000 MHz Temp 1 [T1 OBW] -7.04 dBm 5.815800000 GHz Temp 2 [T1 OBW] -8.22 dBm 5.834360000 GHz Center 5.825 GHz 4 MHz/ Span 40 MHz Date: 5.DEC.2023 18:32:37

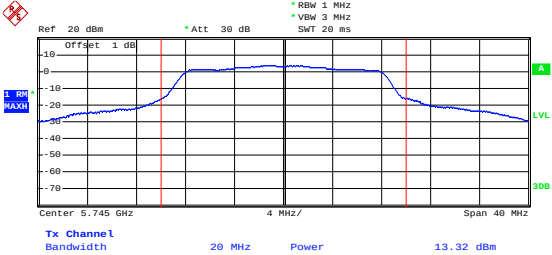
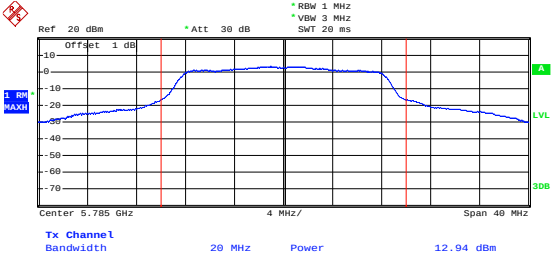
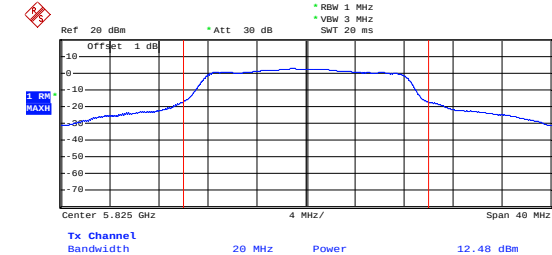


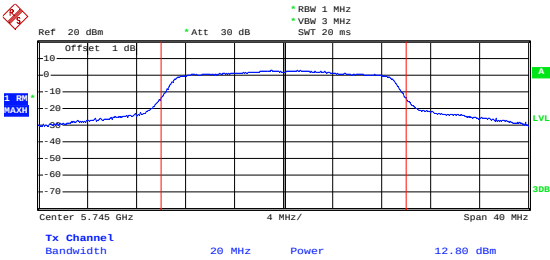
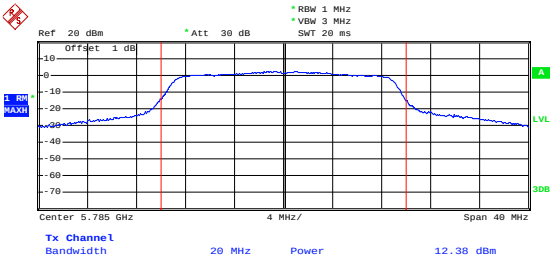
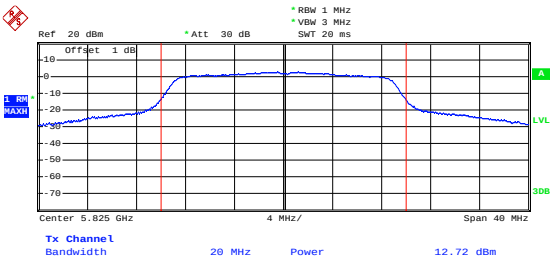
APPENDIX C

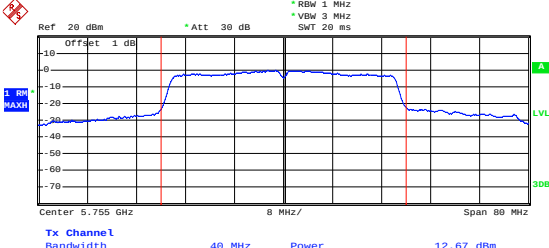
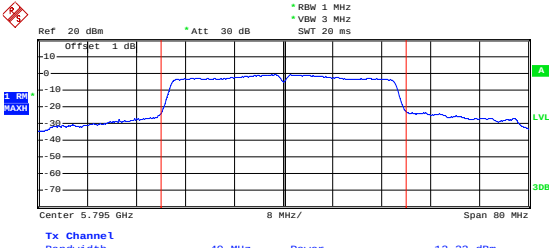
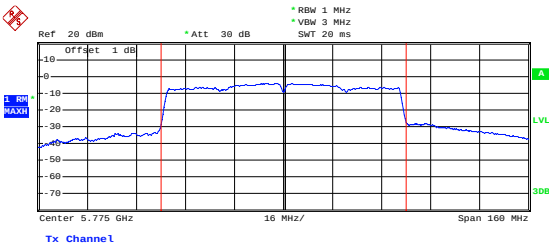
Maximum Conducted Output Power

U-NII-3: 5725-5850MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5745	13.32	30.00
	5785	12.94	30.00
	5825	12.48	30.00
802.11n-HT20	5745	12.80	30.00
	5785	12.38	30.00
	5825	12.72	30.00
802.11n-HT40	5755	12.67	30.00
	5795	12.23	30.00
802.11ac-VHT80	5775	11.87	30.00

5725-5850MHz

802.11a-Low	 Ref 20 dBm * Att 30 dB * RBW 1 MHz * VBW 3 MHz SWT 20 ms Offset 1 dB Center 5.745 GHz 4 MHz/ Span 40 MHz Tx Channel Bandwidth 20 MHz Power 13.32 dBm Date: 5.DEC.2023 18:03:02
802.11a-Middle	 Ref 20 dBm * Att 30 dB * RBW 1 MHz * VBW 3 MHz SWT 20 ms Offset 1 dB Center 5.785 GHz 4 MHz/ Span 40 MHz Tx Channel Bandwidth 20 MHz Power 12.94 dBm Date: 5.DEC.2023 18:03:20
802.11a-High	 Ref 20 dBm * Att 30 dB * RBW 1 MHz * VBW 3 MHz SWT 20 ms Offset 1 dB Center 5.825 GHz 4 MHz/ Span 40 MHz Tx Channel Bandwidth 20 MHz Power 12.48 dBm Date: 5.DEC.2023 18:04:03

802.11n-HT20-Low	 Date: 5.DEC.2023 18:04:32
802.11n-HT20-Middle	 Date: 5.DEC.2023 18:05:01
802.11n-HT20-High	 Date: 5.DEC.2023 18:05:56

802.11n-HT40-Low	 Ref 20 dBm * Att 30 dB * RBW 1 MHz * VBW 3 MHz SMT 20 ms Offset 1 dB 1 RBW MAX Center 5.755 GHz 8 MHz/ Span 80 MHz Tx Channel Bandwidth 40 MHz Power 12.67 dBm Date: 5.DEC.2023 18:09:16
802.11n-HT40-High	 Ref 20 dBm * Att 30 dB * RBW 1 MHz * VBW 3 MHz SMT 20 ms Offset 1 dB 1 RBW MAX Center 5.795 GHz 8 MHz/ Span 80 MHz Tx Channel Bandwidth 40 MHz Power 12.23 dBm Date: 5.DEC.2023 18:10:07
802.11ac-VHT80-Low	 Ref 20 dBm * Att 30 dB * RBW 1 MHz * VBW 3 MHz SMT 20 ms Offset 1 dB 1 RBW MAX Center 5.775 GHz 16 MHz/ Span 160 MHz Tx Channel Bandwidth 80 MHz Power 11.87 dBm Date: 5.DEC.2023 18:13:39

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%	5.0	-30	595	0.103
100%		-20	534	0.092
100%		-10	526	0.091
100%		0	562	0.097
100%		+10	571	0.099
100%		+20	539	0.093
100%		+30	533	0.092
100%		+40	524	0.091
100%		+50	545	0.094
Low Battery power	4.0	+20	521	0.090
High Battery power	6.0	+20	546	0.094

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

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