

TEST REPORT

Reference No..... : WTX22X01001671W-1
FCC ID : 2AOTB-ZULWCUSI
Applicant : Rachio, Inc.
Address : 1400 16th Street, Suite 400, Denver, Colorado, 80202
Manufacturer : The same as Applicant
Address : The same as Applicant
Product Name : R3 USI
Model No..... : 16ZULWCUSI
Standards : FCC Part 15.407
Date of Receipt sample : 2022-01-05
Date of Test..... : 2022-01-05 to 2022-03-23
Date of Issue : 2022-03-23
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:

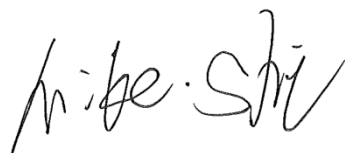
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Report version

Version No.	Date of issue	Description
Rev.00	2022-03-23	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	R3 USI
Trade Name:	/
Model No.:	16ZULWCUSI
Adding Model(s):	4ZULWCUSI, 6ZULWCUSI, 8ZULWCUSI, 12ZULWCUSI, 8ZULWCUSI-PS, 16ZULWCUSI-PS
Rated Voltage:	24VAC
Battery Capacity:	/
Power Adapter:	MODEL: Number: ILA48-241000 INPUT: AC120V, 60Hz 300mA MAX OUTPUT: 24VAC, 1000mA
<i>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 16ZULWCUSI, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n(HT20) , 802.11n-HT40
Frequency Range:	5150-5250MHz, 5250-5350MHz, 5470-5725MHz, 5725-5850MHz
RF Output Power:	8.93dBm (Conducted)
Type of Modulation:	BPSK, QPSK, 16QAM, 64QAM
Type of Antenna:	PCB Antenna
Antenna Gain:	1.2dBi
<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

Run 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												
	5180	5200	5240	5260	5280	5320	5500	5600	5700	5720	5745	5785	5825
802.11a 6Mbps	default	default	default	default	default	default	default	default	default	/	default	default	default
802.11n-HT20 MCS0	default	default	default	default	default	default	default	default	default	/	default	default	default
Mode	NCB: 40MHz												
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795			
802.11n-HT40 MCS0	default	default	default	default	default	default	default	default	/	default	default		

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.

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	5180MHz,5200MHz,5240MHz,5260MHz,5280MHz,5320MHz,5500MHz,5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz,5260MHz,5280MHz,5320MHz,5500MHz,5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM3	802.11n-HT40	5190MHz,5230MHz,5270MHz,5310MHz,5510MHz,5590MHz,5670MHz,5755MHz,5795MHz

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
DC CABLE	1.8	Unshielded	Without Ferrite

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

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

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

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
SEMT-1075	Communication Tester	Rohde & Schwarz	CMW500	148650	2021-03-27	2022-03-26
SEMT-1063	GSM Tester	Rohde & Schwarz	CMU200	114403	2021-03-27	2022-03-26
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2021-03-27	2022-03-26
SEMT-1079	Spectrum Analyzer	Agilent	N9020A	US47140102	2021-03-27	2022-03-26
SEMT-1080	Signal Generator	Agilent	83752A	3610A01453	2021-03-27	2022-03-26
SEMT-1081	Vector Signal Generator	Agilent	N5182A	MY47070202	2021-03-27	2022-03-26
SEMT-1028	Power Divider	Weinschel	1506A	PM204	2021-03-27	2022-03-26
SEMT-1082	Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2021-03-27	2022-03-26
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	/	/
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	/	/
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	/	/
SEMT-C004	Cable	Zheng DI	2M0RFC	/	/	/
SEMT-C005	Cable	Zheng DI	1M0RFC	/	/	/
SEMT-C006	Cable	Zheng DI	1M0RFC	/	/	/
☒ Chamber A: Below 1GHz						
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2021-03-27	2022-03-26
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2021-03-27	2022-03-26
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2021-04-12	2022-04-11
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-19	2023-03-18
SEMT-1068	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2021-03-19	2023-03-18
☒ Chamber A: Above 1GHz						
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2021-03-27	2022-03-26
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2021-03-27	2022-03-26
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2021-04-12	2022-04-11
SEMT-1042	Horn Antenna	ETS	3117	00086197	2021-03-19	2023-03-18
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA91705	2021-04-27	2023-04-26

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SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2021-04-27	2022-04-26
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2021-03-27	2022-03-26
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2021-03-27	2022-03-26
☐ Chamber B:Below 1GHz						
SEMT-1068	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2023-04-08
SEMT-1067	Amplifier	Agilent	8447D	2944A10179	2021-04-12	2022-04-11
SEMT-1066	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2021-05-06	2022-05-05
☐ Chamber C:Below 1GHz						
SEMT-1319	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2021-12-03	2022-12-02
SEMT-1343	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2023-05-27
SEMT-1333	Amplifier	HP	8447F	2944A03869	2021-04-15	2022-04-14
☒ Conducted Room 1#						
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2021-04-12	2022-04-11
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2021-04-15	2022-04-14
SEMT-1003	AC LISN	Schwarz beck	NSLK8126	8126-224	2021-04-12	2022-04-11
☐ Conducted Room 2#						
SEMT-1334	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2021-04-12	2022-04-11
SEMT-1336	LISN	Rohde & Schwarz	ENV 216	100097	2021-04-12	2022-04-11

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*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 a PCB 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.1.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 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 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 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 $11\text{dBm} + 10 \log B$, 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) $\geq 3 \times \text{RBW}$.
- 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 $\geq 3 * \text{RBW}$
- 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 $11\text{dBm} + 10 \log B$, 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.

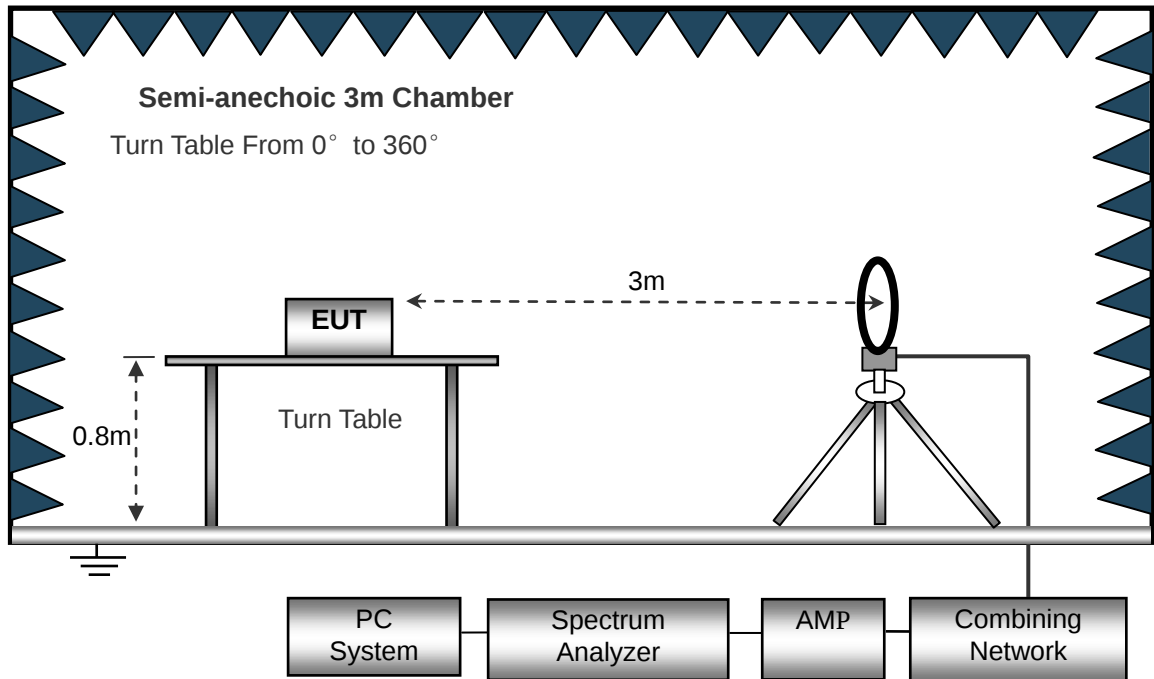
8.2 Test Procedure

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..

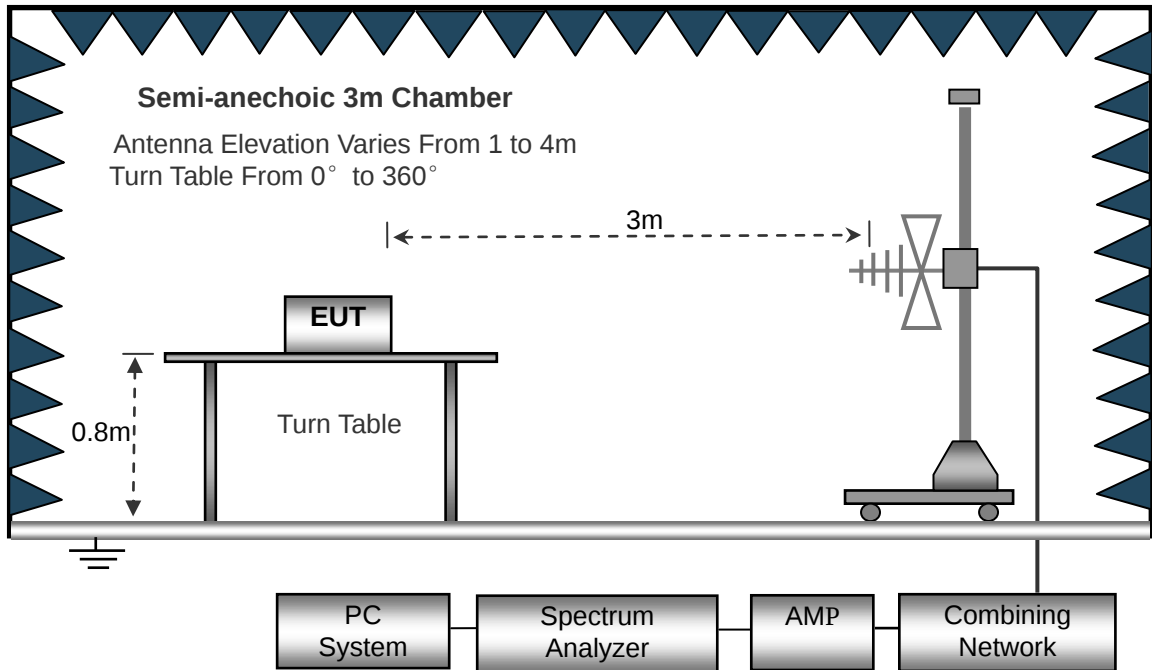
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

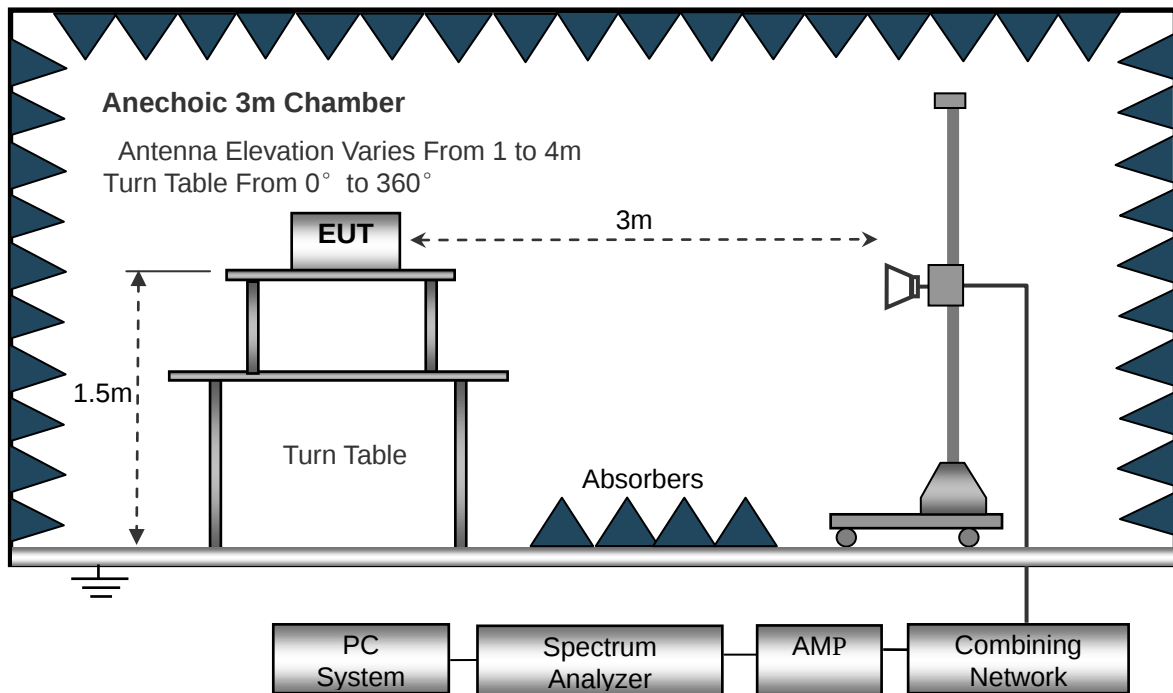
The test setup for emission measurement below 30MHz.



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 -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

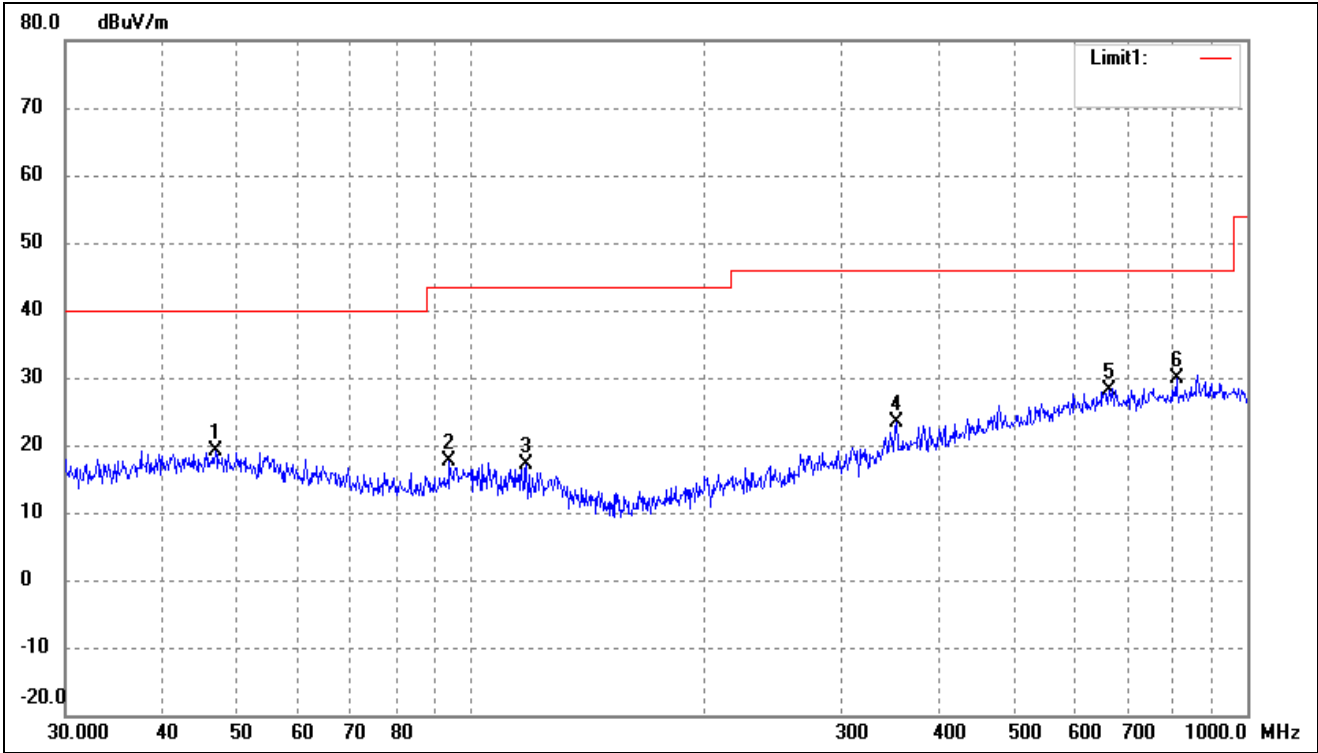
$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

8.5 Summary of Test Results/Plots

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

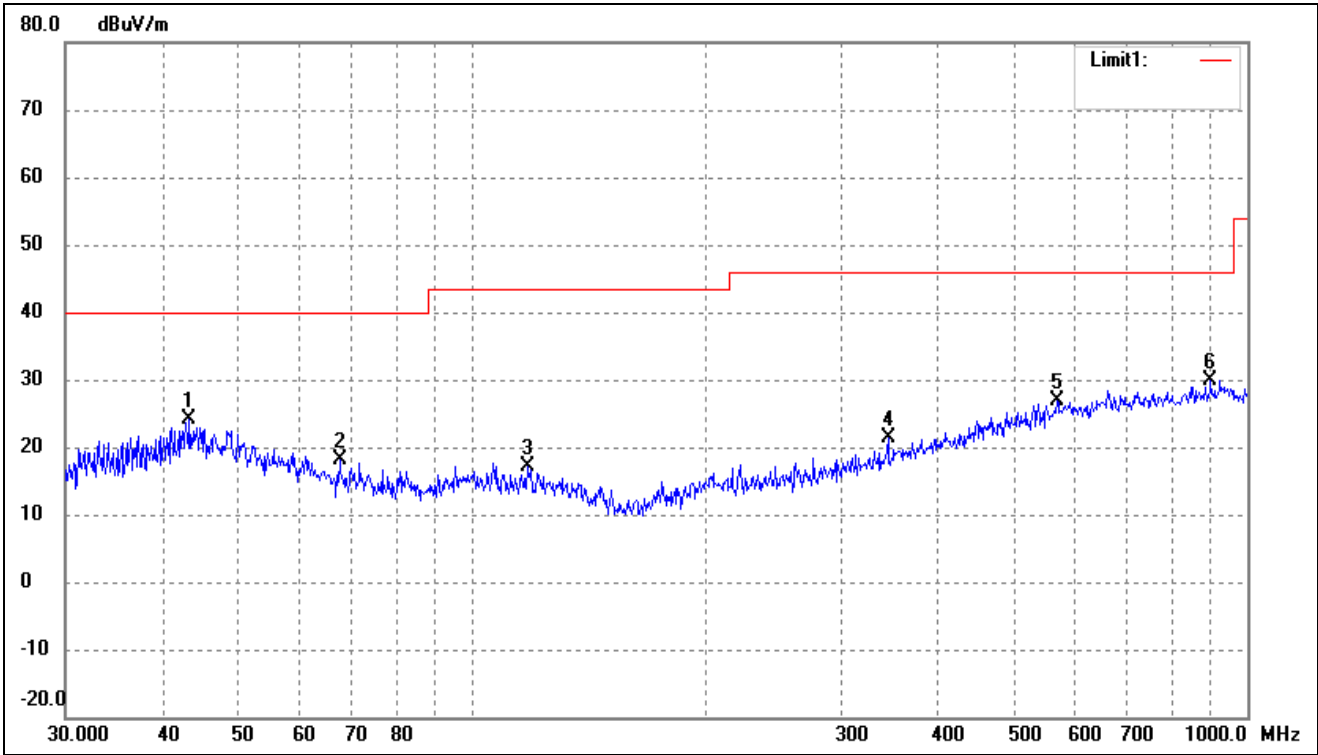
- Spurious Emission From 30MHz to 1GHz
- 5150-5250MHz

802.11a(Worst case)			
Test Channel	5180MHz(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	46.8303	26.21	-6.96	19.25	40.00	-20.75	-	-	peak
2	93.7685	27.45	-9.88	17.57	43.50	-25.93	-	-	peak
3	117.7725	26.48	-9.43	17.05	43.50	-26.45	-	-	peak
4	352.9434	28.79	-5.31	23.48	46.00	-22.52	-	-	peak
5	663.4729	27.00	1.06	28.06	46.00	-17.94	-	-	peak
6	810.2654	27.71	2.16	29.87	46.00	-16.13	-	-	peak

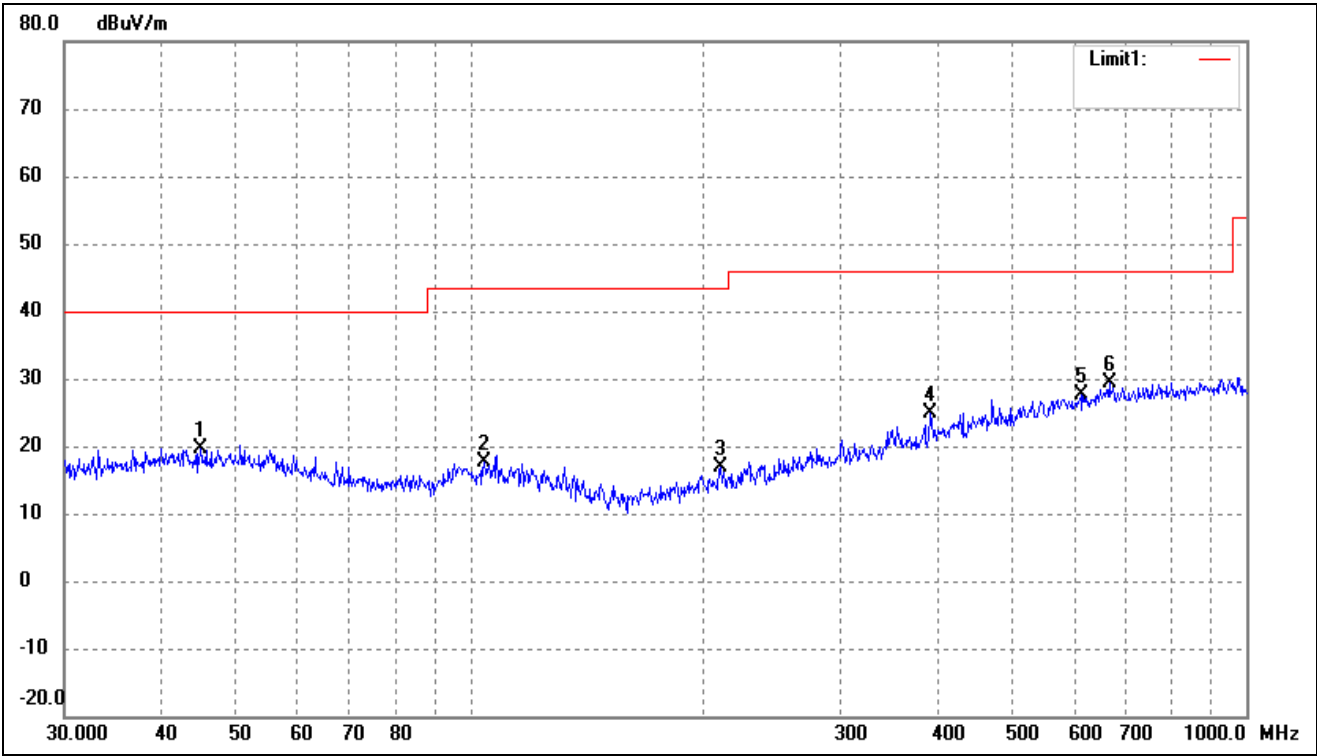
802.11a(Worst case)			
Test Channel	5180MHz(Worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	43.3534	31.16	-6.98	24.18	40.00	-15.82	-	-	peak
2	67.6751	27.96	-9.77	18.19	40.00	-21.81	-	-	peak
3	118.1862	26.48	-9.47	17.01	43.50	-26.49	-	-	peak
4	344.3855	27.06	-5.57	21.49	46.00	-24.51	-	-	peak
5	568.6127	26.95	-0.15	26.80	46.00	-19.20	-	-	peak
6	896.9965	27.22	2.73	29.95	46.00	-16.05	-	-	peak

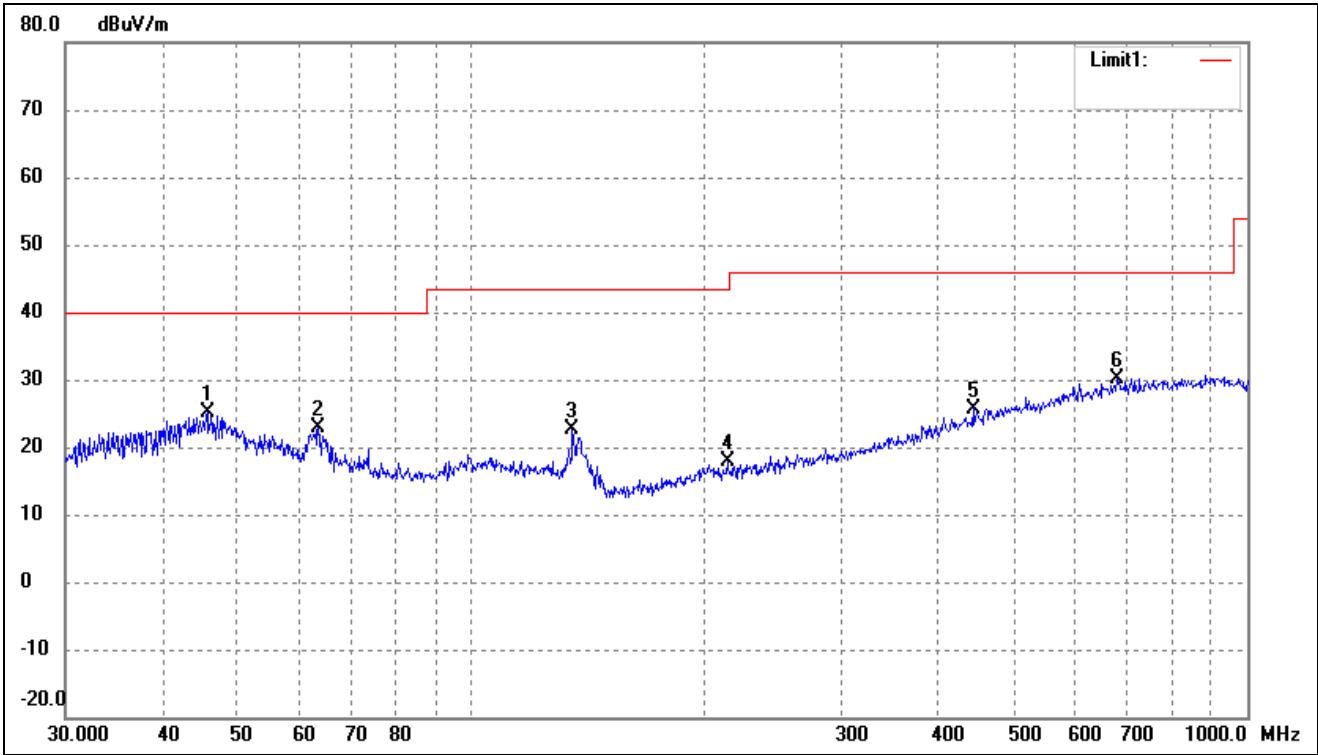
➤ 5250-5350MHz

802.11a(worst case)			
Test Channel	5260MHz(worst case)	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	44.9006	26.62	-6.98	19.64	40.00	-20.36	-	-	peak
2	104.1701	26.52	-8.78	17.74	43.50	-25.76	-	-	peak
3	210.0482	26.24	-9.43	16.81	43.50	-26.69	-	-	peak
4	392.0951	28.96	-4.13	24.83	46.00	-21.17	-	-	peak
5	612.0642	27.14	0.50	27.64	46.00	-18.36	-	-	peak
6	665.8035	28.28	1.08	29.36	46.00	-16.64	-	-	peak

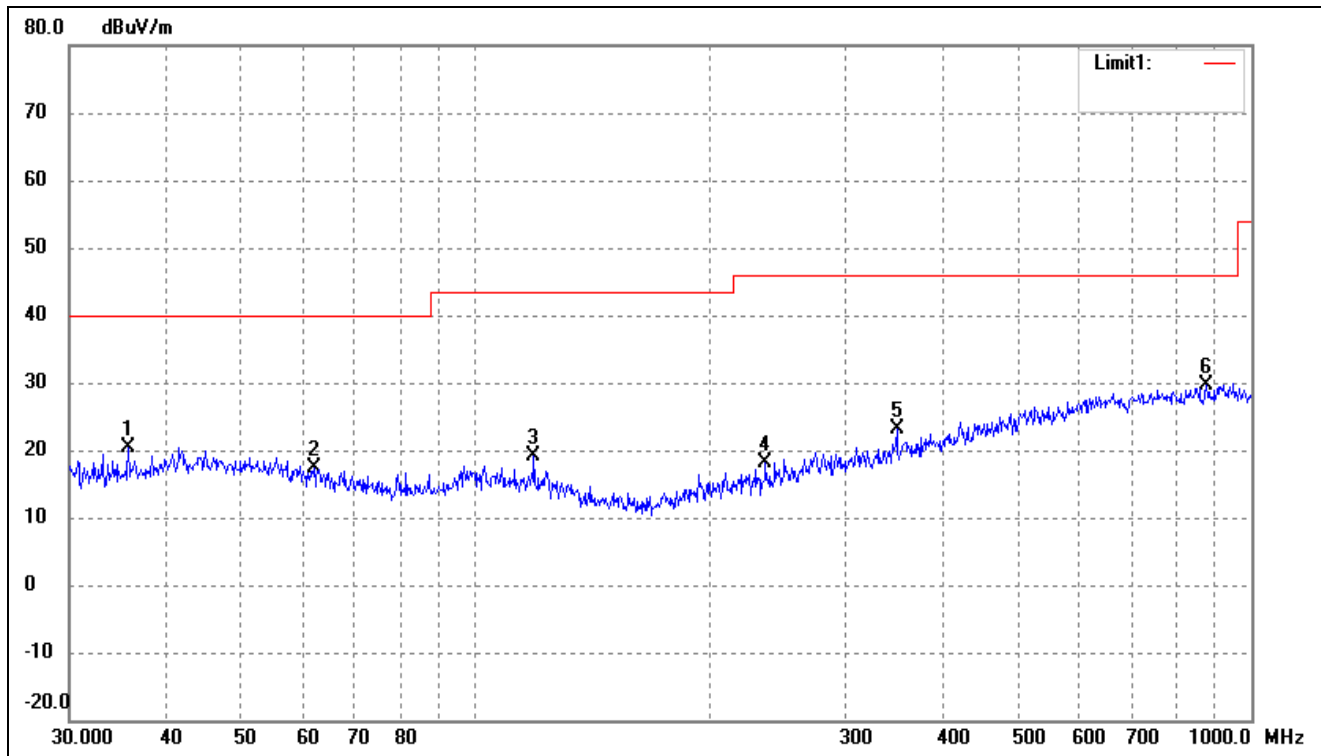
802.11a(worst case)			
Test Channel	5260MHz(worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.6948	32.03	-6.98	25.05	40.00	-14.95	-	-	peak
2	63.5356	31.99	-9.04	22.95	40.00	-17.05	-	-	peak
3	135.0319	34.47	-11.85	22.62	43.50	-20.88	-	-	peak
4	213.7634	27.29	-9.32	17.97	43.50	-25.53	-	-	peak
5	443.2943	28.49	-2.74	25.75	46.00	-20.25	-	-	peak
6	679.9600	28.98	1.23	30.21	46.00	-15.79	-	-	peak

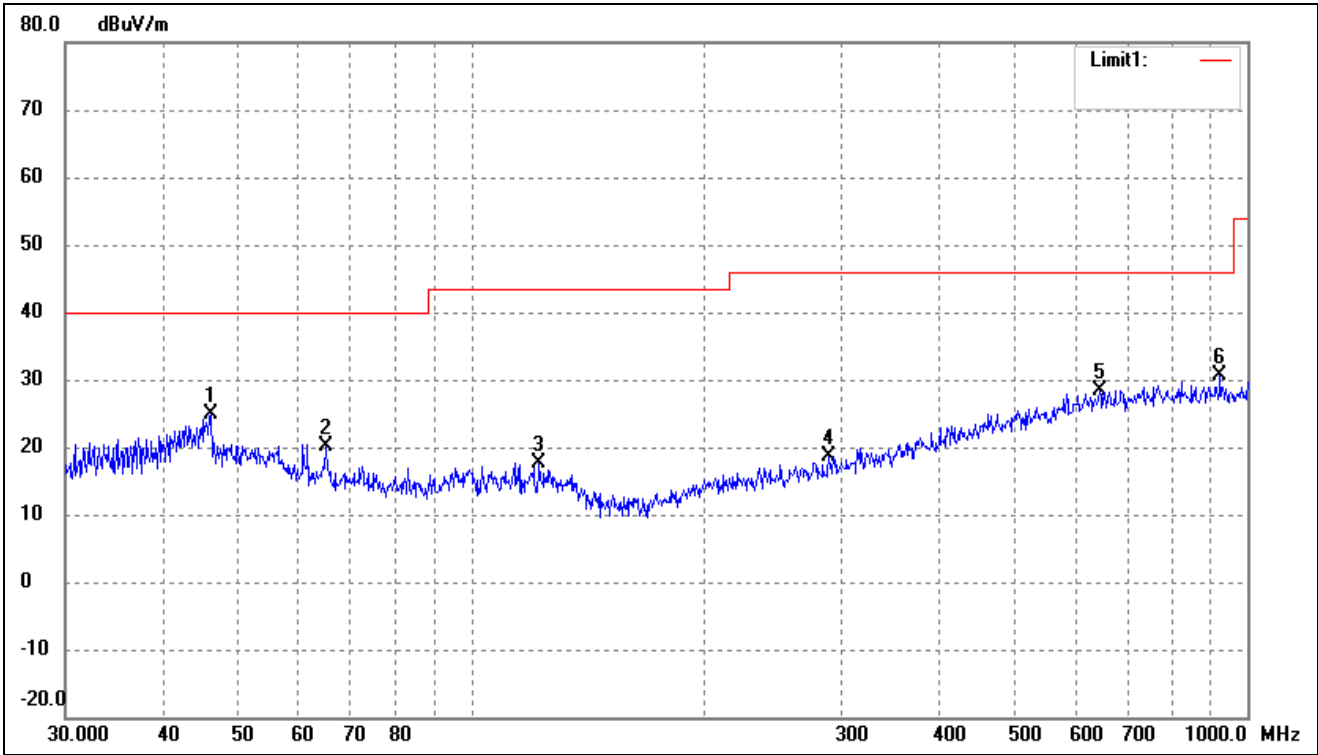
➤ 5470-5725MHz

802.11a(worst case)			
Test Channel	5500MHz(worst case)	Polarity:	Horizontal



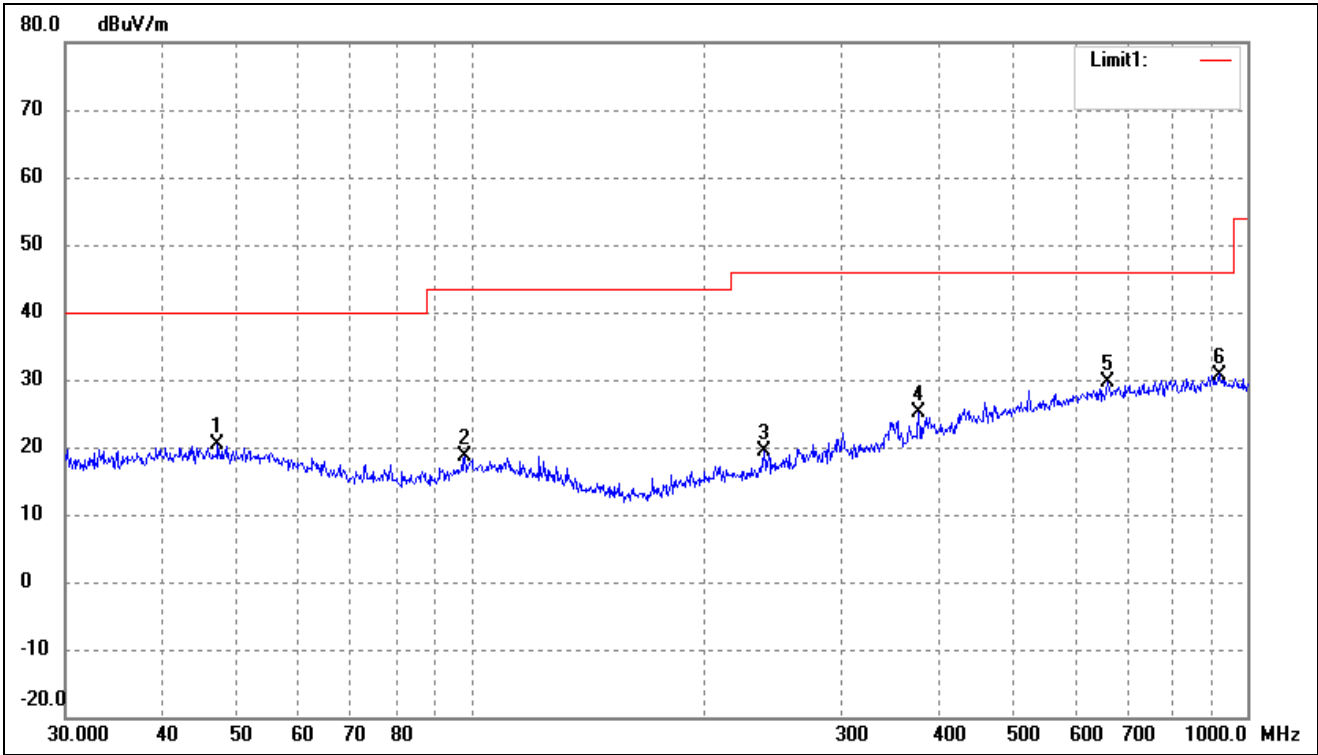
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	35.7491	28.50	-8.04	20.46	40.00	-19.54	-	-	peak
2	61.9951	26.25	-8.78	17.47	40.00	-22.53	-	-	peak
3	119.0180	28.71	-9.53	19.18	43.50	-24.32	-	-	peak
4	236.6447	26.80	-8.68	18.12	46.00	-27.88	-	-	peak
5	349.2500	28.54	-5.42	23.12	46.00	-22.88	-	-	peak
6	875.2470	26.97	2.57	29.54	46.00	-16.46	-	-	peak

802.11a			
Test Channel	5500MHz(worst case)	Polarity:	Vertical



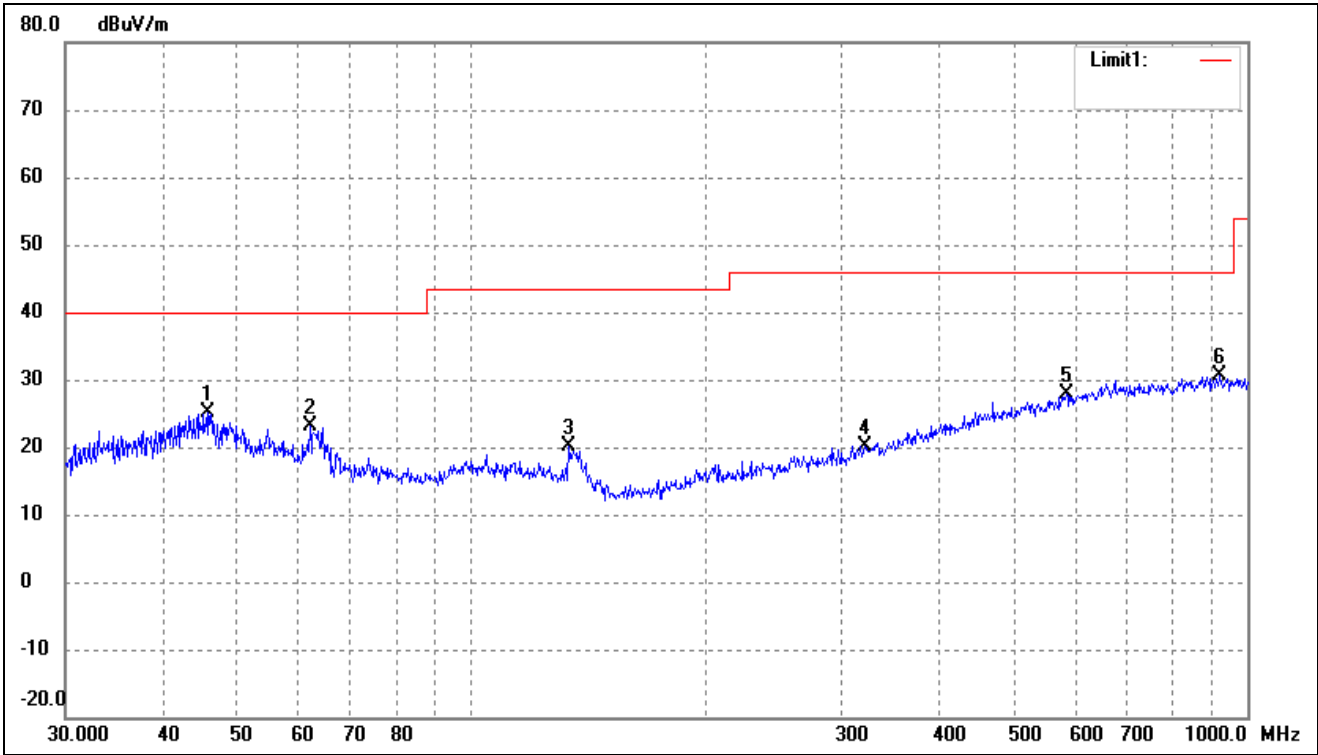
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.1780	31.79	-6.98	24.81	40.00	-15.19	-	-	peak
2	64.8865	29.36	-9.28	20.08	40.00	-19.92	-	-	peak
3	122.4040	27.74	-10.05	17.69	43.50	-25.81	-	-	peak
4	289.0021	25.89	-7.24	18.65	46.00	-27.35	-	-	peak
5	645.1195	27.59	0.87	28.46	46.00	-17.54	-	-	peak
6	922.5157	27.97	2.67	30.64	46.00	-15.36	-	-	peak

802.11a(worst case)			
Test Channel	5700MHz(worst case)	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	47.1599	27.24	-6.97	20.27	40.00	-19.73	-	-	peak
2	98.1419	27.74	-9.07	18.67	43.50	-24.83	-	-	peak
3	238.3102	28.13	-8.64	19.49	46.00	-26.51	-	-	peak
4	377.2591	29.77	-4.58	25.19	46.00	-20.81	-	-	peak
5	661.1505	28.69	1.04	29.73	46.00	-16.27	-	-	peak
6	919.2866	28.06	2.69	30.75	46.00	-15.25	-	-	peak

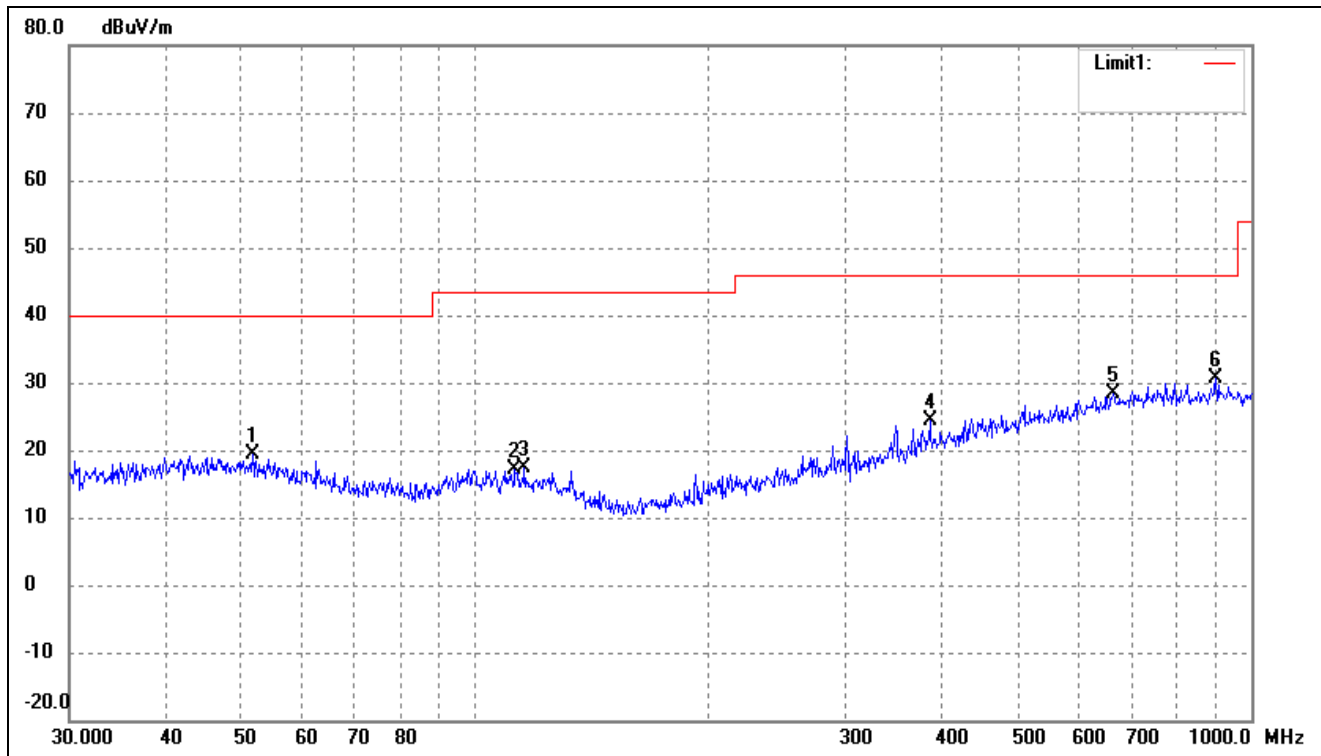
802.11a(worst case)			
Test Channel	5700MHz(worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.6948	32.21	-6.98	25.23	40.00	-14.77	-	-	peak
2	61.9951	31.87	-8.78	23.09	40.00	-16.91	-	-	peak
3	133.6188	31.77	-11.74	20.03	43.50	-23.47	-	-	peak
4	321.0608	26.53	-6.30	20.23	46.00	-25.77	-	-	peak
5	584.7895	27.84	0.11	27.95	46.00	-18.05	-	-	peak
6	922.5157	27.97	2.67	30.64	46.00	-15.36	-	-	peak

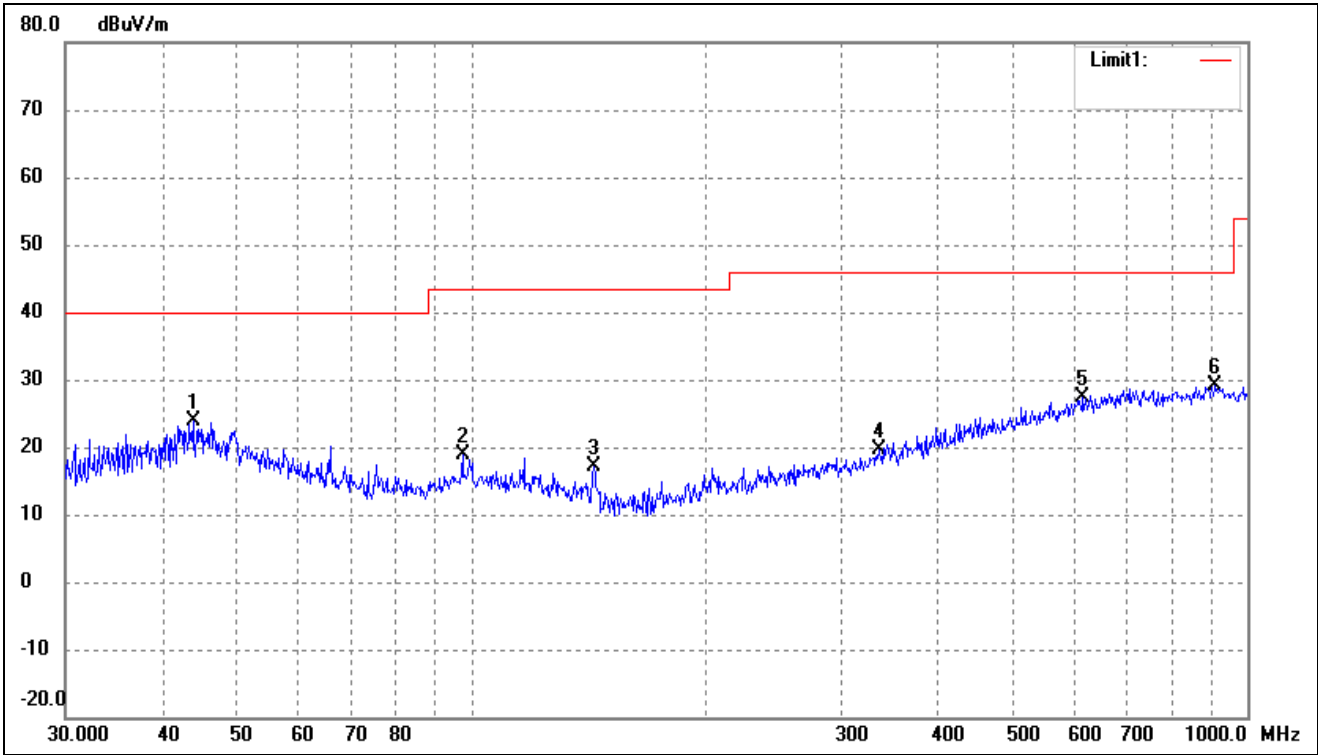
➤ 5725-5850MHz

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



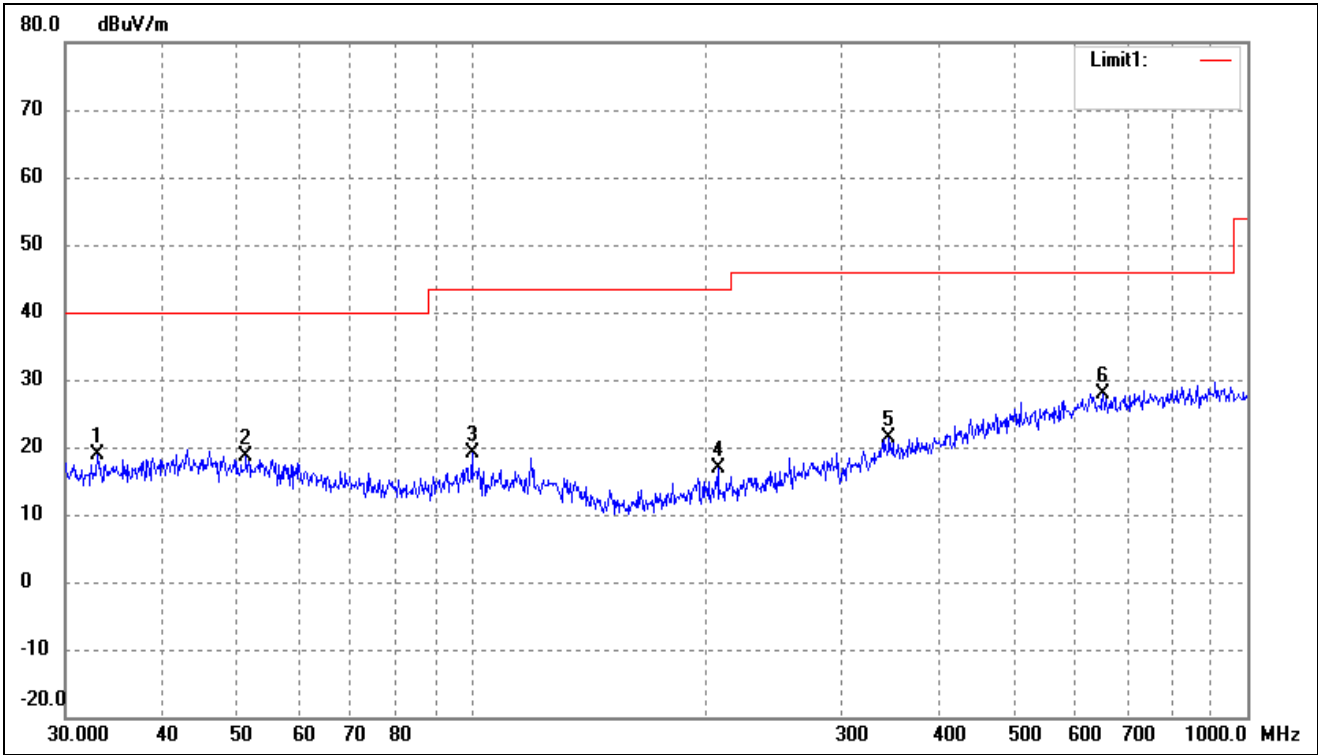
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.6616	26.59	-7.20	19.39	40.00	-20.61	-	-	peak
2	112.5244	26.23	-9.05	17.18	43.50	-26.32	-	-	peak
3	115.7256	26.69	-9.29	17.40	43.50	-26.10	-	-	peak
4	385.2805	28.80	-4.33	24.47	46.00	-21.53	-	-	peak
5	663.4729	27.24	1.06	28.30	46.00	-17.70	-	-	peak
6	900.1474	27.77	2.75	30.52	46.00	-15.48	-	-	peak

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



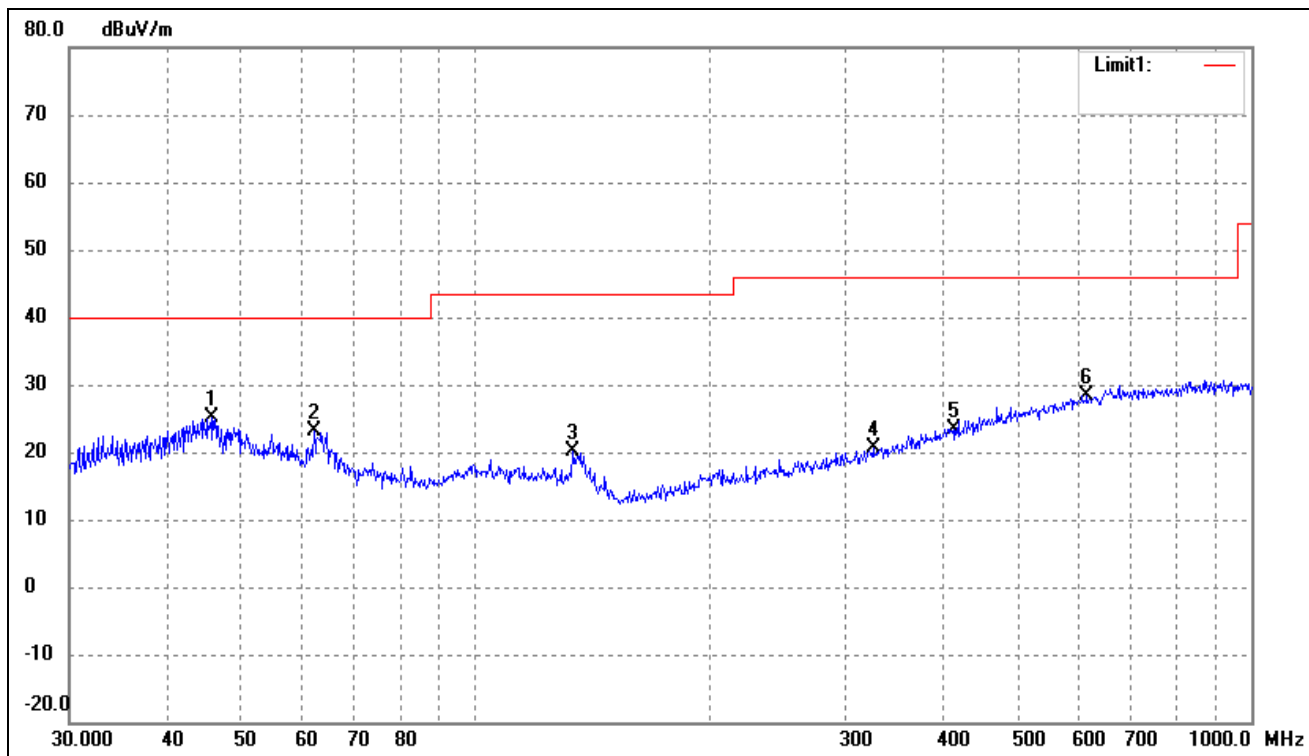
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	43.8119	30.94	-6.98	23.96	40.00	-16.04	-	-	peak
2	97.4560	28.00	-9.20	18.80	43.50	-24.70	-	-	peak
3	143.8295	29.62	-12.40	17.22	43.50	-26.28	-	-	peak
4	334.8589	25.44	-5.87	19.57	46.00	-26.43	-	-	peak
5	614.2142	26.83	0.53	27.36	46.00	-18.64	-	-	peak
6	909.6667	26.47	2.72	29.19	46.00	-16.81	-	-	peak

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



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	32.9791	27.51	-8.72	18.79	40.00	-21.21	-	-	peak
2	51.3005	25.79	-7.15	18.64	40.00	-21.36	-	-	peak
3	100.2286	27.79	-8.73	19.06	43.50	-24.44	-	-	peak
4	207.8501	26.41	-9.48	16.93	43.50	-26.57	-	-	peak
5	345.5952	26.97	-5.54	21.43	46.00	-24.57	-	-	peak
6	651.9417	27.02	0.94	27.96	46.00	-18.04	-	-	peak

802.11a(worst case)			
Test Channel	5825MHz(worst case)	Polarity:	Vertical

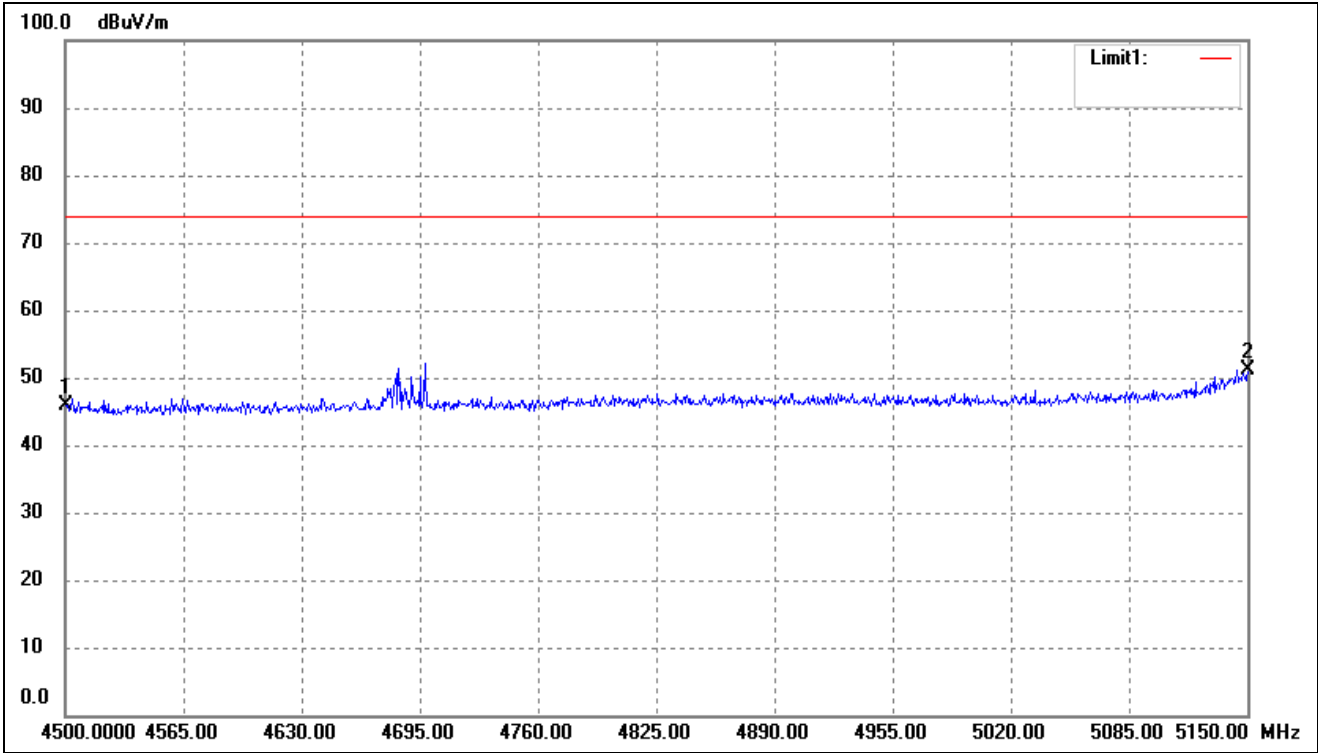


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.6948	32.21	-6.98	25.23	40.00	-14.77	-	-	peak
2	61.9951	31.87	-8.78	23.09	40.00	-16.91	-	-	peak
3	133.6188	31.77	-11.74	20.03	43.50	-23.47	-	-	peak
4	325.5958	26.90	-6.17	20.73	46.00	-25.27	-	-	peak
5	413.2706	26.99	-3.54	23.45	46.00	-22.55	-	-	peak
6	614.2142	27.82	0.53	28.35	46.00	-17.65	-	-	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.

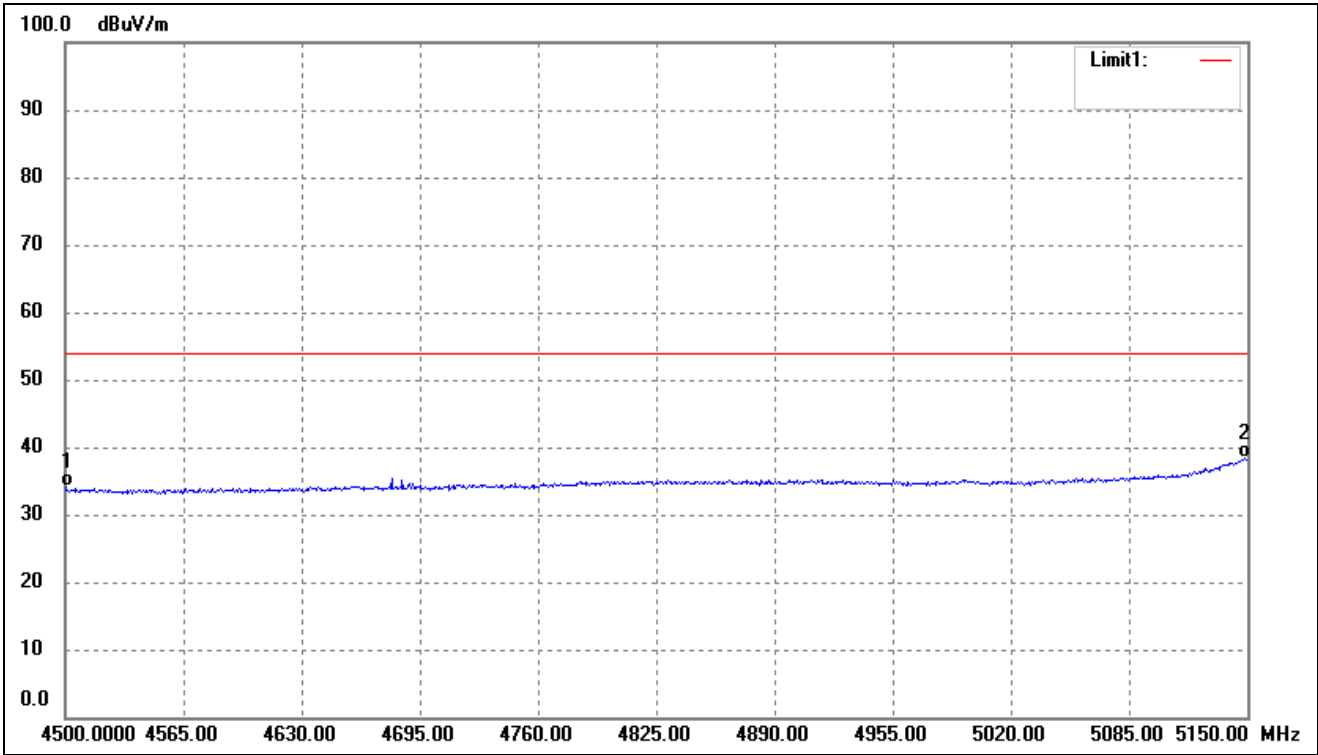
➤ Spurious Emission above 1GHz

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.50-5.15GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	()	(cm)	
1	4500.000	52.75	-6.92	45.83	74.00	-28.17	-	-	peak
2	5150.000	56.49	-5.33	51.16	74.00	-22.84	-	-	peak

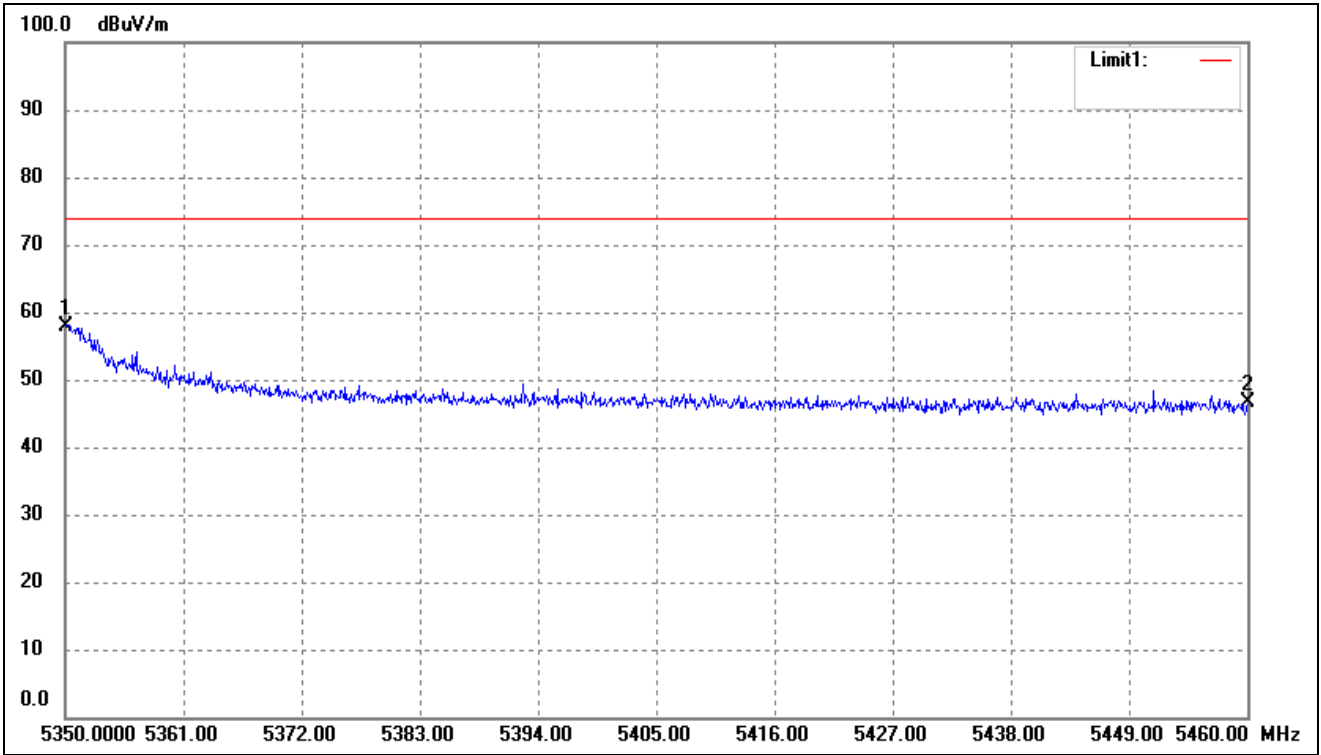
802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.50-5.15GHz	Polarity:	Horizontal (worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	40.93	-6.92	34.01	54.00	-19.99	-	-	AVG
2	5150.000	43.73	-5.33	38.40	54.00	-15.60	-	-	AVG

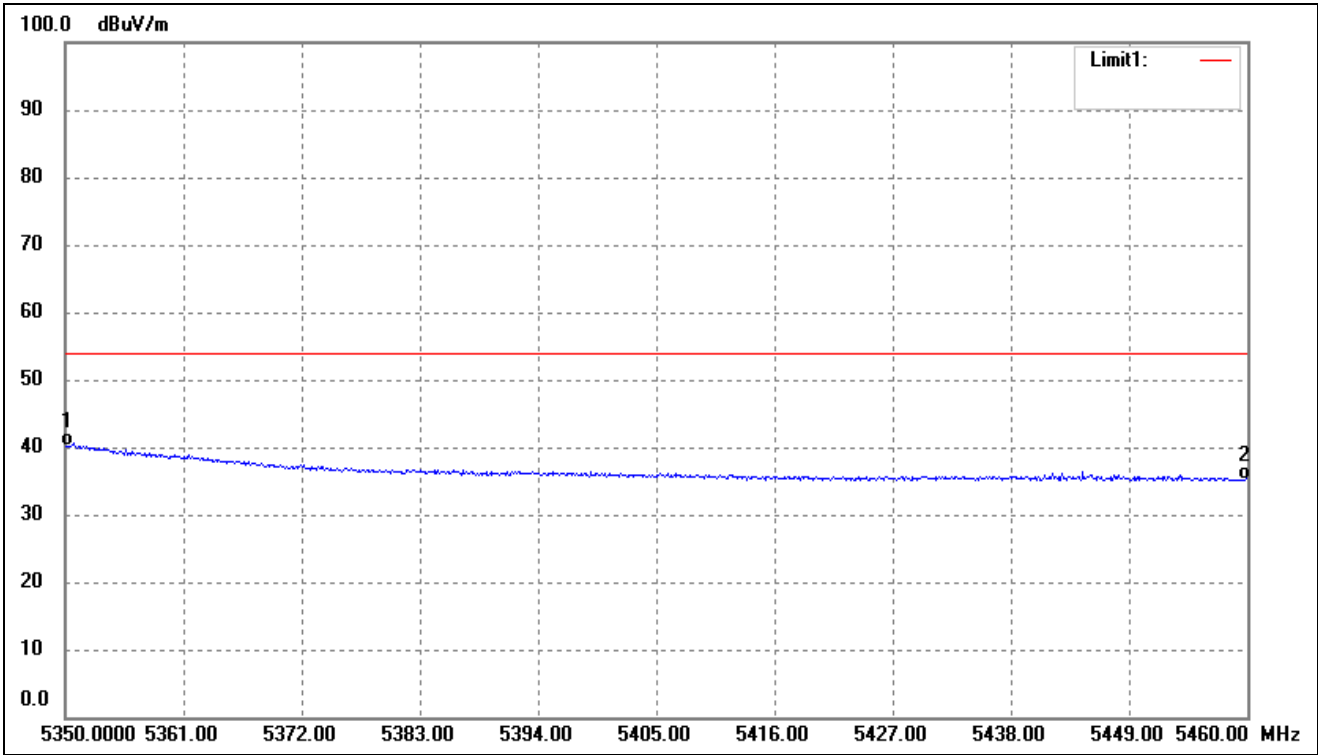
5250-5350MHz

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5350.000	62.88	-4.97	57.91	74.00	-16.09	-	-	peak
2	5460.000	51.29	-4.77	46.52	74.00	-27.48	-	-	peak

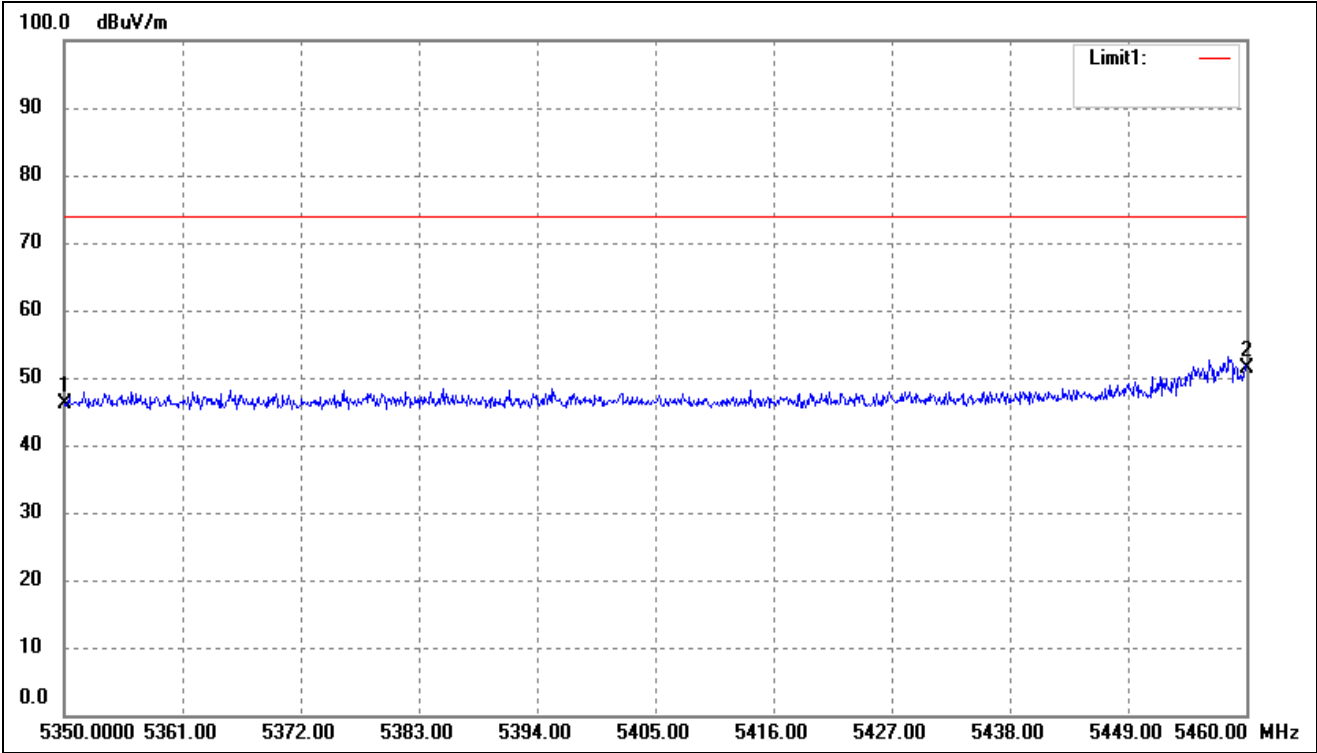
802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5350.000	45.21	-4.97	40.24	54.00	-13.76	-	-	AVG
2	5460.000	40.01	-4.77	35.24	54.00	-18.76	-	-	AVG

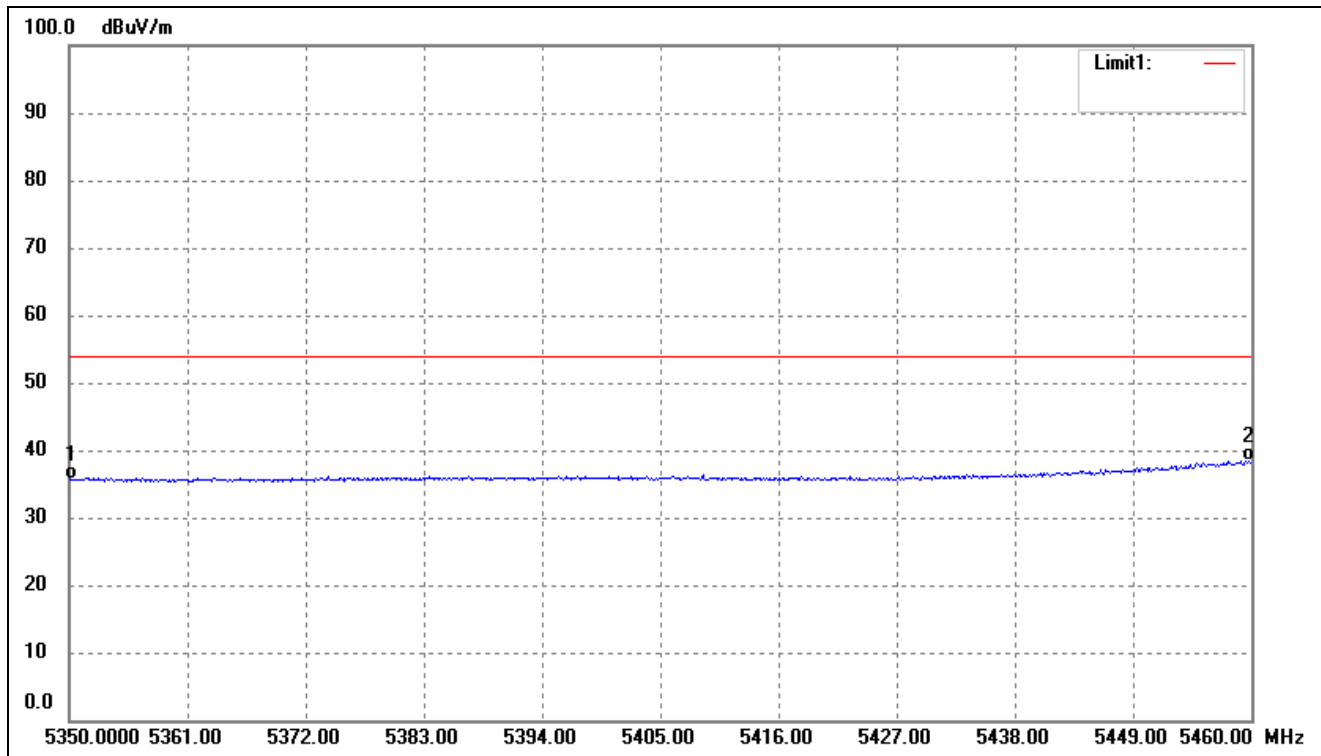
5470-5725MHz

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5350.000	50.98	-4.97	46.01	74.00	-27.99	-	-	peak
2	5460.000	56.23	-4.77	51.46	74.00	-22.54	-	-	peak

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5350.000	40.59	-4.97	35.62	54.00	-18.38	-	-	AVG
2	5460.000	43.15	-4.77	38.38	54.00	-15.62	-	-	AVG

Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.

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

- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (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 (5180MHz)							
10360	58.94	7.11	66.05	74	-7.95	H	PK
15540	39.53	8.22	47.75	54	-6.25	H	AV
10360	59.96	7.11	67.07	74	-6.93	V	PK
15540	37.75	8.22	45.97	54	-8.03	V	AV
Middle Channel (5200MHz)							
10400	58.89	7.22	66.11	74	-7.89	H	PK
15600	35.87	8.67	44.54	54	-9.46	H	AV
10400	58.13	7.22	65.35	74	-8.65	V	PK
15600	36.45	8.67	45.12	54	-8.88	V	AV
High Channel (5240MHz)							
10480	57.31	7.69	65.00	74	-9.00	H	PK
15720	35.06	8.93	43.99	54	-10.01	H	AV
10480	57.58	7.69	65.27	74	-8.73	V	PK
15720	38.90	8.93	47.83	54	-6.17	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5260MHz)							
10520	56.36	7.96	64.32	74	-9.68	H	PK
15780	37.55	9.02	46.57	54	-7.43	H	AV
10520	56.77	7.96	64.73	74	-9.27	V	PK
15780	37.85	9.02	46.87	54	-7.13	V	AV
Middle Channel (5280MHz)							
10560	58.74	8.02	66.76	74	-7.24	H	PK
15840	36.65	9.42	46.07	54	-7.93	H	AV
10560	57.96	8.02	65.98	74	-8.02	V	PK
15840	36.18	9.42	45.60	54	-8.40	V	AV
High Channel (5320MHz)							
10640	56.48	8.35	64.83	74	-9.17	H	PK
15960	34.67	9.63	44.30	54	-9.70	H	AV
10640	57.90	8.35	66.25	74	-7.75	V	PK
15960	36.38	9.63	46.01	54	-7.99	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5500MHz)							
11000	56.09	8.82	64.91	74	-9.09	H	PK
16500	37.05	9.88	46.93	54	-7.07	H	AV
11000	56.69	8.82	65.51	74	-8.49	V	PK
16500	35.70	9.88	45.58	54	-8.42	V	AV
Middle Channel (5600MHz)							
11200	58.10	8.92	67.02	74	-6.98	H	PK
16800	36.33	10.03	46.36	54	-7.64	H	AV
11200	56.68	8.92	65.60	74	-8.40	V	PK
16800	36.53	10.03	46.56	54	-7.44	V	AV
High Channel (5700MHz)							
11400	56.35	9.36	65.71	74	-8.29	H	PK
17100	35.30	10.25	45.55	54	-8.45	H	AV
11400	56.72	9.36	66.08	74	-7.92	V	PK
17100	35.00	10.25	45.25	54	-8.75	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	57.14	9.45	66.59	74	-7.41	H	PK
17235	37.03	10.36	47.39	54	-6.61	H	AV
11490	54.56	9.45	64.01	74	-9.99	V	PK
17235	35.33	10.36	45.69	54	-8.31	V	AV
Middle Channel (5785MHz)							
11570	58.28	9.62	67.90	74	-6.10	H	PK
17355	36.46	10.67	47.13	54	-6.87	H	AV
11570	54.52	9.62	64.14	74	-9.86	V	PK
17355	35.43	10.67	46.10	54	-7.90	V	AV
High Channel (5825MHz)							
11650	55.46	9.84	65.30	74	-8.70	H	PK
17475	34.51	10.95	45.46	54	-8.54	H	AV
11650	56.82	9.84	66.66	74	-7.34	V	PK
17475	34.22	10.95	45.17	54	-8.83	V	AV

➤ Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-37.59	-27
Highest	Above 5350	-42.92	-27
Note: the data just list the worst cases			

➤ Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-31.66	-27
Highest	Above 5350	-37.83	-27
Note: the data just list the worst cases			

➤ Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-36.39	-27
Highest	Above 5725	-33.80	-27
Note: the data just list the worst cases			

➤ Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-33.86	-27
	5715 to 5725	-40.13	-17
Highest	5850 to 5860	-41.70	-17
	Above 5860	-44.34	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 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 (5180MHz)							
10360	58.98	7.11	66.09	74	-7.91	H	PK
15540	39.73	8.22	47.95	54	-6.05	H	AV
10360	59.03	7.11	66.14	74	-7.86	V	PK
15540	39.40	8.22	47.62	54	-6.38	V	AV
Middle Channel (5200MHz)							
10400	59.73	7.22	66.95	74	-7.05	H	PK
15600	35.53	8.67	44.20	54	-9.80	H	AV
10400	58.49	7.22	65.71	74	-8.29	V	PK
15600	37.15	8.67	45.82	54	-8.18	V	AV
High Channel (5240MHz)							
10480	58.02	7.69	65.71	74	-8.29	H	PK
15720	40.04	8.93	48.97	54	-5.03	H	AV
10480	58.86	7.69	66.55	74	-7.45	V	PK
15720	36.32	8.93	45.25	54	-8.75	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5260MHz)							
10520	58.64	7.96	66.60	74	-7.40	H	PK
15780	36.10	9.02	45.12	54	-8.88	H	AV
10520	59.71	7.96	67.67	74	-6.33	V	PK
15780	37.76	9.02	46.78	54	-7.22	V	AV
Middle Channel (5280MHz)							
10560	57.84	8.02	65.86	74	-8.14	H	PK
15840	35.42	9.42	44.84	54	-9.16	H	AV
10560	58.45	8.02	66.47	74	-7.53	V	PK
15840	36.57	9.42	45.99	54	-8.01	V	AV
High Channel (5320MHz)							
10640	56.69	8.35	65.04	74	-8.96	H	PK
15960	34.53	9.63	44.16	54	-9.84	H	AV
10640	58.20	8.35	66.55	74	-7.45	V	PK
15960	36.44	9.63	46.07	54	-7.93	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5500MHz)							
11000	55.62	8.82	64.44	74	-9.56	H	PK
16500	38.53	9.88	48.41	54	-5.59	H	AV
11000	57.07	8.82	65.89	74	-8.11	V	PK
16500	34.35	9.88	44.23	54	-9.77	V	AV
Middle Channel (5600MHz)							
11200	58.58	8.92	67.50	74	-6.50	H	PK
16800	38.93	10.03	48.96	54	-5.04	H	AV
11200	55.19	8.92	64.11	74	-9.89	V	PK
16800	36.02	10.03	46.05	54	-7.95	V	AV
High Channel (5700MHz)							
11400	54.86	9.36	64.22	74	-9.78	H	PK
17100	36.39	10.25	46.64	54	-7.36	H	AV
11400	55.71	9.36	65.07	74	-8.93	V	PK
17100	34.38	10.25	44.63	54	-9.37	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	57.51	9.45	66.96	74	-7.04	H	PK
17235	36.08	10.36	46.44	54	-7.56	H	AV
11490	58.07	9.45	67.52	74	-6.48	V	PK
17235	35.75	10.36	46.11	54	-7.89	V	AV
Middle Channel (5785MHz)							
11570	57.91	9.62	67.53	74	-6.47	H	PK
17355	35.51	10.67	46.18	54	-7.82	H	AV
11570	56.05	9.62	65.67	74	-8.33	V	PK
17355	36.15	10.67	46.82	54	-7.18	V	AV
High Channel (5825MHz)							
11650	57.22	9.84	67.06	74	-6.94	H	PK
17475	35.35	10.95	46.30	54	-7.70	H	AV
11650	54.64	9.84	64.48	74	-9.52	V	PK
17475	33.29	10.95	44.24	54	-9.76	V	AV

➤ Out of Band edge 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-32.27	-27
Highest	Above 5350	-38.55	-27
Note: the data just list the worst cases			

➤ Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-35.05	-27
Highest	Above 5350	-37.19	-27
Note: the data just list the worst cases			

➤ Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-37.48	-27
Highest	Above 5725	-38.40	-27
Note: the data just list the worst cases			

➤ Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-43.97	-27
	5715 to 5725	-33.55	-17
Highest	5850 to 5860	-36.02	-17
	Above 5860	-40.68	-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 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 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 (5190MHz)							
10380	57.20	7.25	64.45	74	-9.55	H	PK
15570	37.40	8.33	45.73	54	-8.27	H	AV
10380	56.13	7.25	63.38	74	-10.62	V	PK
15570	37.29	8.33	45.62	54	-8.38	V	AV
High Channel (5230MHz)							
10460	55.67	7.54	63.21	74	-10.79	H	PK
15690	35.40	8.86	44.26	54	-9.74	H	AV
10460	58.52	7.54	66.06	74	-7.94	V	PK
15690	34.82	8.86	43.68	54	-10.32	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5270MHz)							
10540	56.94	8.12	65.06	74	-8.94	H	PK
15810	34.41	9.24	43.65	54	-10.35	H	AV
10540	56.21	8.12	64.33	74	-9.67	V	PK
15810	34.48	9.24	43.72	54	-10.28	V	AV
High Channel (5310MHz)							
10620	57.80	8.30	66.10	74	-7.90	H	PK
15930	37.05	9.45	46.50	54	-7.50	H	AV
10620	55.71	8.30	64.01	74	-9.99	V	PK
15930	34.44	9.45	43.89	54	-10.11	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5510MHz)							
11020	55.58	8.95	64.53	74	-9.47	H	PK
16530	36.07	9.99	46.06	54	-7.94	H	AV
11020	54.72	8.95	63.67	74	-10.33	V	PK
16530	35.60	9.99	45.59	54	-8.41	V	AV
Middle Channel (5590MHz)							
11180	57.37	9.12	66.49	74	-7.51	H	PK
16770	35.78	10.12	45.90	54	-8.10	H	AV
11180	57.39	9.12	66.51	74	-7.49	V	PK
16770	36.17	10.12	46.29	54	-7.71	V	AV
High Channel (5670MHz)							
11340	55.26	9.39	64.65	74	-9.35	H	PK
17010	34.58	10.22	44.80	54	-9.20	H	AV
11340	54.08	9.39	63.47	74	-10.53	V	PK
17010	35.37	10.22	45.59	54	-8.41	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5755MHz)							
11510	55.98	9.65	65.63	74	-8.37	H	PK
17265	32.39	10.87	43.26	54	-10.74	H	AV
11510	56.33	9.65	65.98	74	-8.02	V	PK
17265	31.59	10.87	42.46	54	-11.54	V	AV
High Channel (5795MHz)							
11590	55.79	9.81	65.60	74	-8.40	H	PK
17385	33.40	10.89	44.29	54	-9.71	H	AV
11590	54.63	9.81	64.44	74	-9.56	V	PK
17385	35.63	10.89	46.52	54	-7.48	V	AV

➤ Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-38.44	-27
Highest	Above 5350	-43.75	-27
Note: the data just list the worst cases			

➤ Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-36.40	-27
Highest	Above 5350	-37.56	-27
Note: the data just list the worst cases			

➤ Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-36.43	-27
Highest	Above 5725	-43.12	-27
Note: the data just list the worst cases			

➤ Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-40.67	-27
	5715 to 5725	-41.23	-17
Highest	5850 to 5860	-45.88	-17
	Above 5860	-38.26	-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

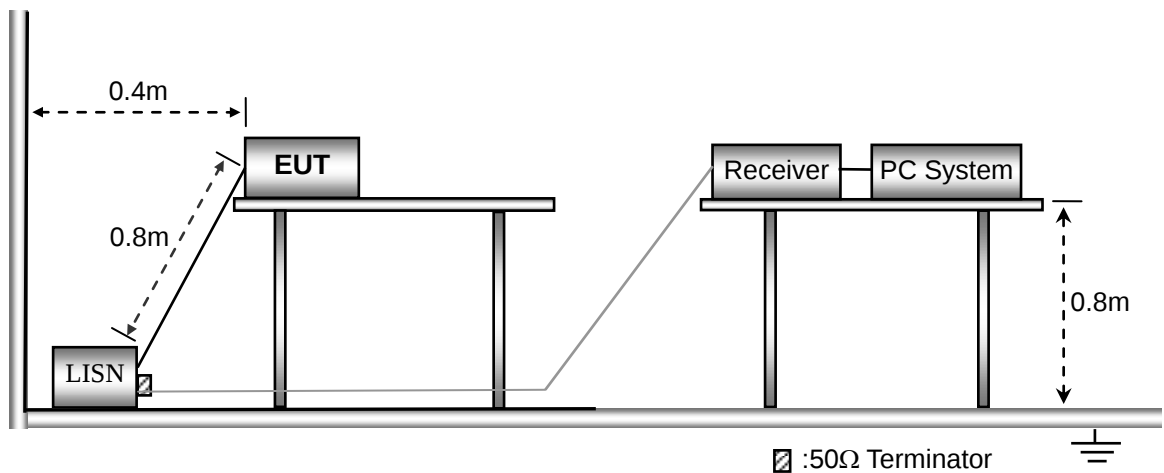
10. Conducted Emissions

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



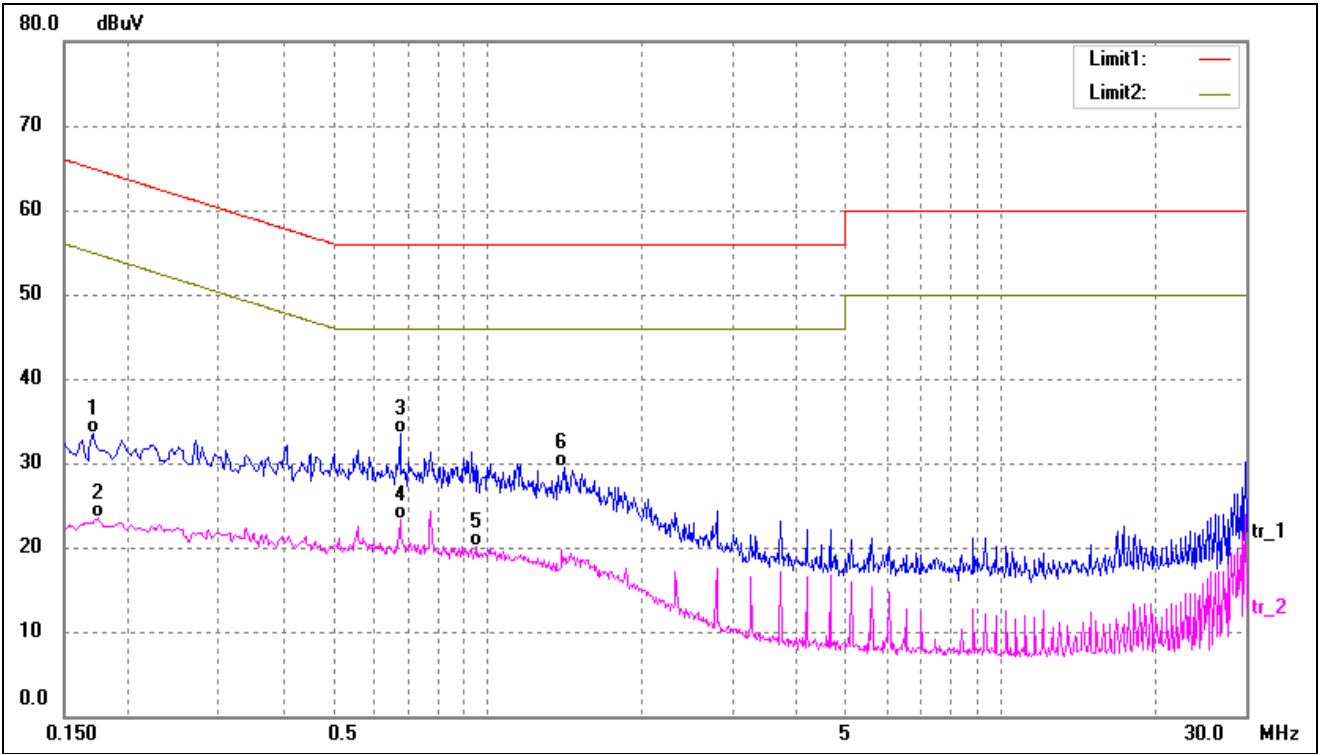
10.3 Test Receiver Setup

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

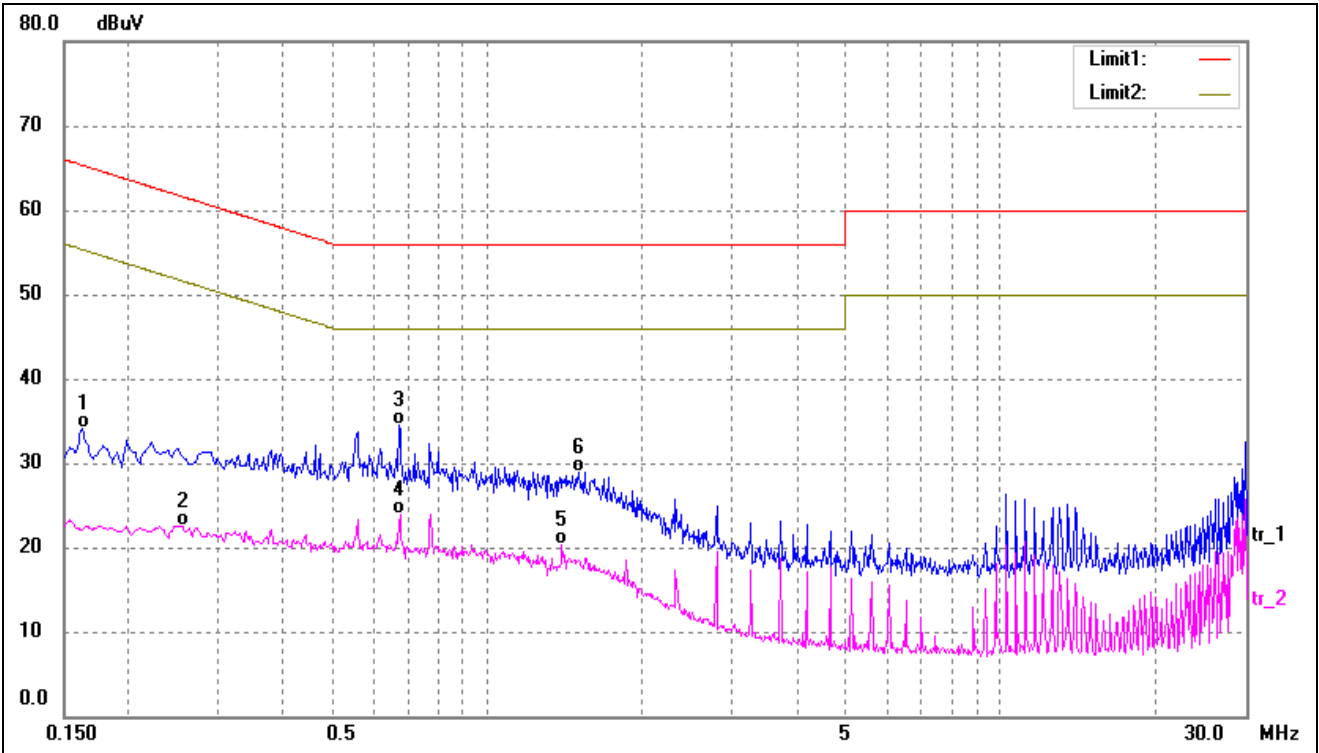
10.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1700	23.22	10.37	33.59	64.96	-31.37	QP
2	0.1740	13.16	10.37	23.53	54.77	-31.24	AVG
3*	0.6780	23.20	10.37	33.57	56.00	-22.43	QP
4	0.6780	12.98	10.37	23.35	46.00	-22.65	AVG
5	0.9540	9.52	10.53	20.05	46.00	-25.95	AVG
6	1.4140	19.17	10.38	29.55	56.00	-26.45	QP

Test Mode	Communication	AC120V 60Hz	Polarity:	Line
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1620	23.81	10.37	34.18	65.36	-31.18	QP
2	0.2540	12.22	10.35	22.57	51.63	-29.06	AVG
3*	0.6740	24.21	10.36	34.57	56.00	-21.43	QP
4	0.6780	13.60	10.37	23.97	46.00	-22.03	AVG
5	1.3980	9.91	10.39	20.30	46.00	-25.70	AVG
6	1.5100	18.59	10.34	28.93	56.00	-27.07	QP

APPENDIX SUMMARY

Project No.	WTX22X01001671W	Test Engineer	Dashan
Start date	2022/01/25	Finish date	2022/01/26
Temperature	23.5℃	Humidity	48%
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

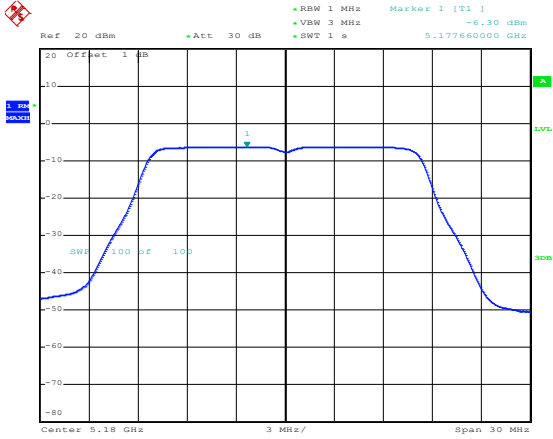
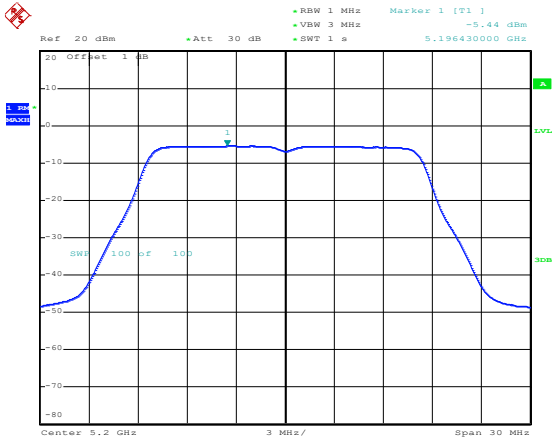
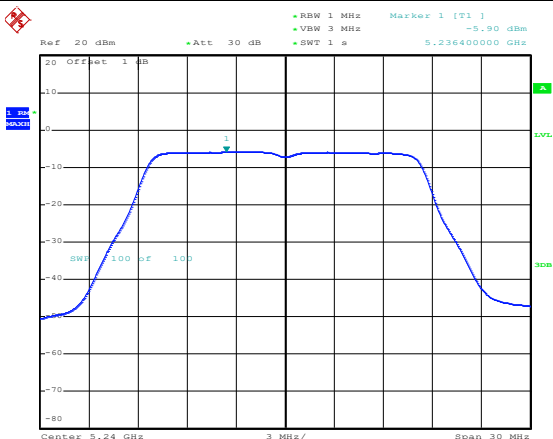
Power Spectral Density			
U-NII-1:5150-5250MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5180	-6.30	11
	5200	-5.44	11
	5240	-5.90	11
802.11n-HT20	5180	-5.45	11
	5200	-5.85	11
	5240	-6.22	11
802.11n-HT40	5190	-8.61	11
	5230	-9.29	11

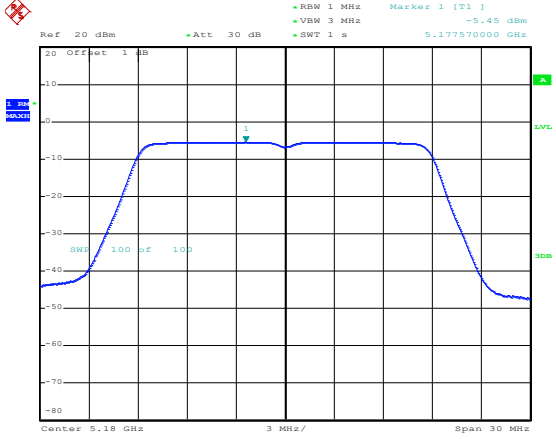
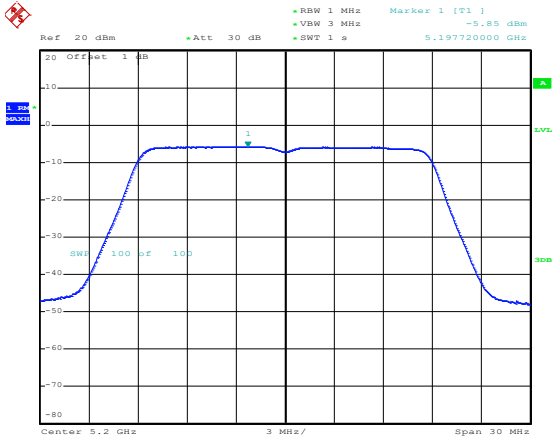
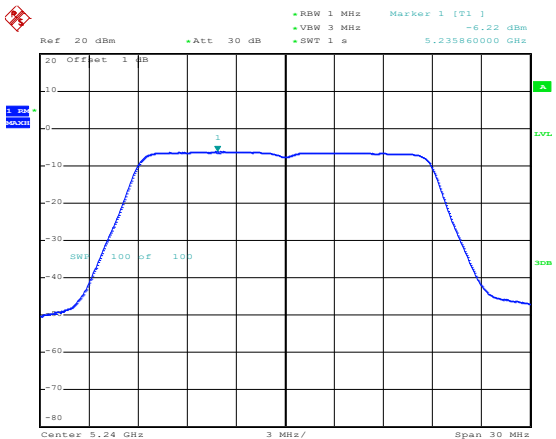
U-NII-2A: 5250-5350MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5260	-5.70	11
	5280	-5.84	11
	5320	-6.56	11
802.11n-HT20	5260	-6.01	11
	5280	-6.15	11
	5320	-6.93	11
802.11n-HT40	5270	-9.41	11
	5310	-9.89	11

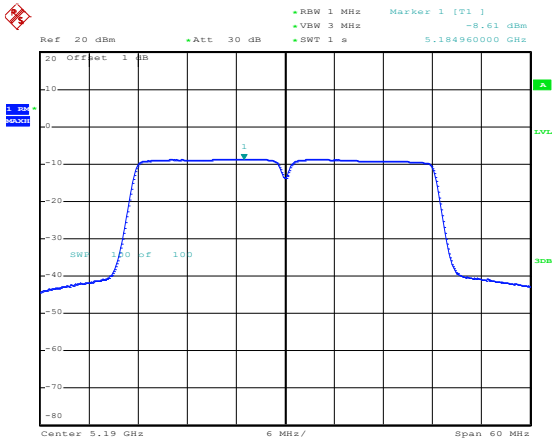
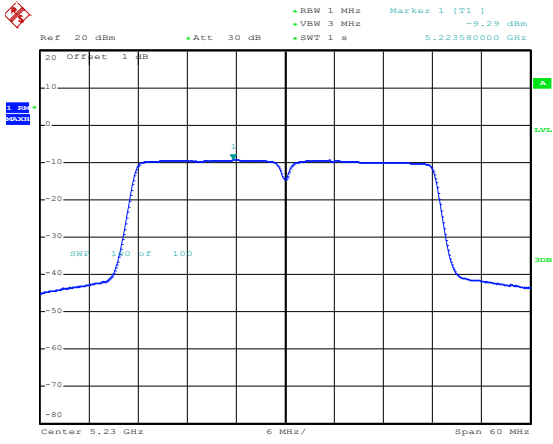
U-NII-2C: 5470-5725MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5500	-5.38	11
	5600	-4.47	11
	5700	-4.02	11
802.11n-HT20	5500	-4.98	11
	5600	-4.35	11
	5700	-4.26	11
802.11n-HT40	5510	-8.08	11
	5590	-6.85	11
	5670	-6.98	11

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	-10.71	2.22	-8.49	30
	5785	-9.870	2.22	-7.65	30
	5825	-11.25	2.22	-9.03	30
802.11n-HT20	5745	-9.470	2.22	-7.25	30
	5785	-10.50	2.22	-8.28	30
	5825	-12.03	2.22	-9.81	30
802.11n HT40	5755	-12.18	2.22	-9.96	30
	5795	-13.18	2.22	-10.96	30
*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22					

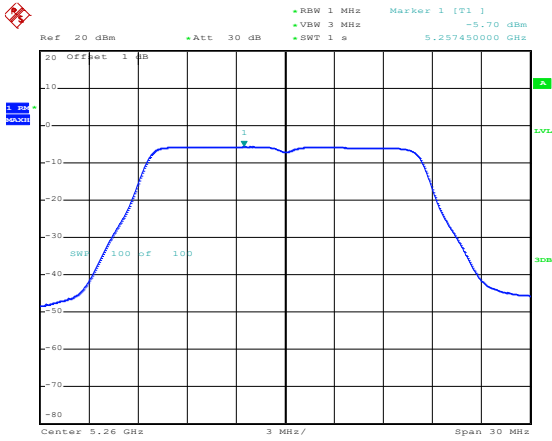
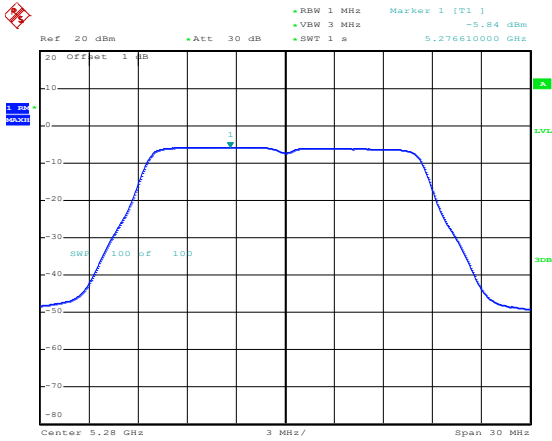
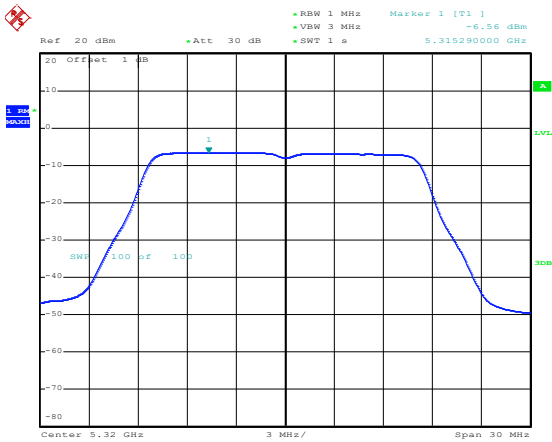
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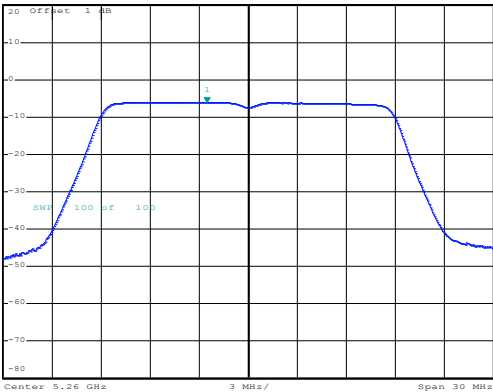
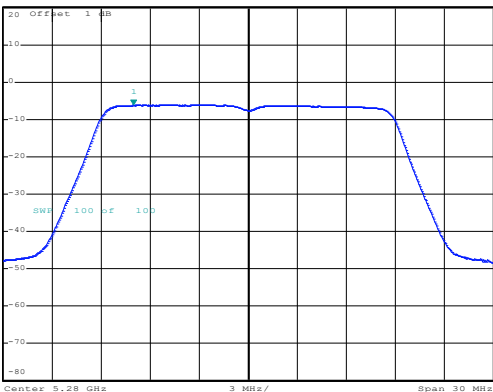
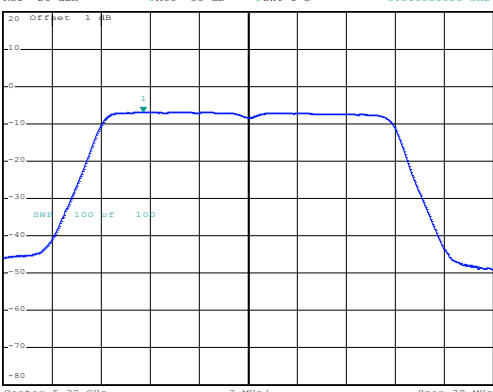
802.11a-Low	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -6.30 dBm 5.17766000 GHz Center: 5.18 GHz Span: 30 MHz Date: 24.JAN.2022 09:48:25
802.11a-Middle	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -5.44 dBm 5.19643000 GHz Center: 5.2 GHz Span: 30 MHz Date: 24.JAN.2022 09:50:59
802.11a-High	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -5.90 dBm 5.23640000 GHz Center: 5.24 GHz Span: 30 MHz Date: 24.JAN.2022 09:53:11

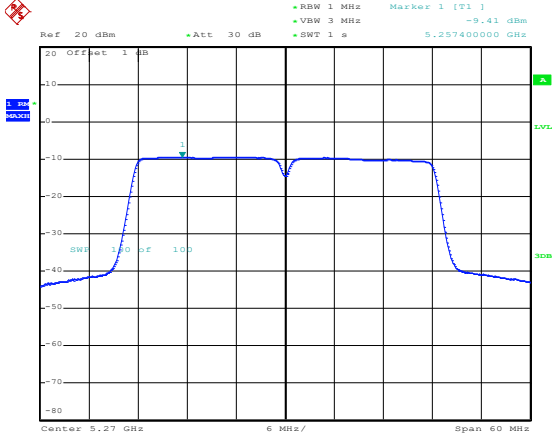
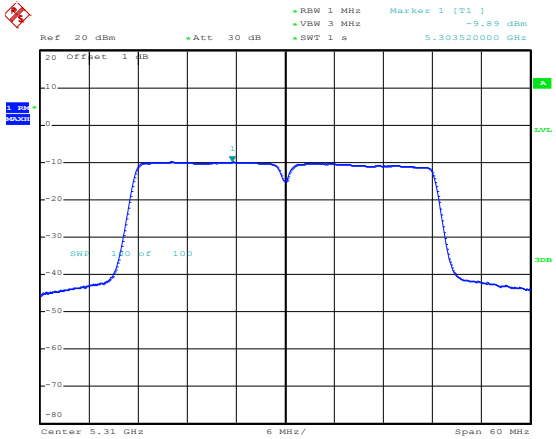
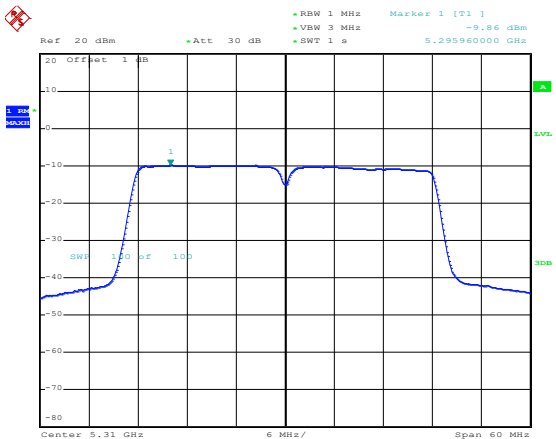
802.11n-HT20-Low	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -5.45 dBm 5.177570000 GHz Center 5.18 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:02:50
802.11n-HT20-Middle	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -5.85 dBm 5.197720000 GHz Center 5.2 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:05:07
802.11n-HT20-High	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -6.22 dBm 5.235860000 GHz Center 5.24 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:07:28

802.11n-HT40-Low	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -8.61 dBm 5.184960000 GHz Center 5.19 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 16:06:12
802.11n-HT40-High	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -9.29 dBm 5.223580000 GHz Center 5.23 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 16:13:12

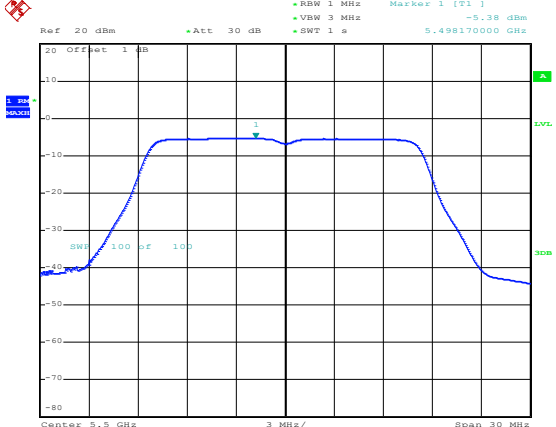
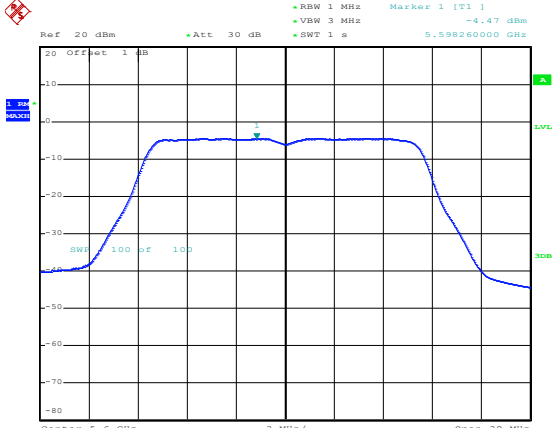
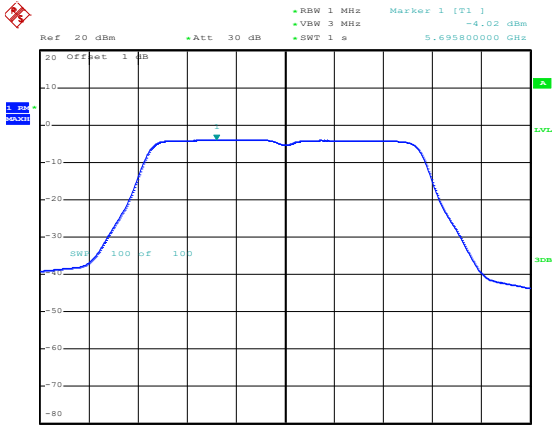
5250-5350MHz

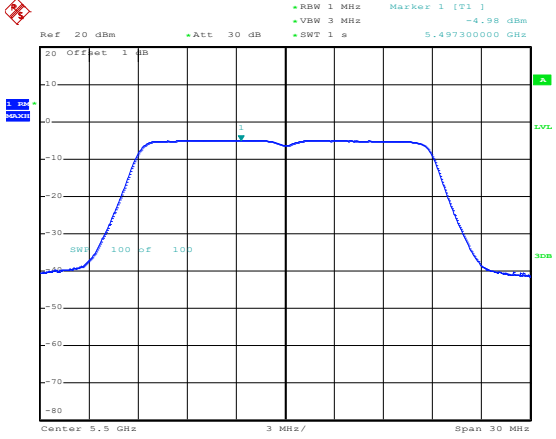
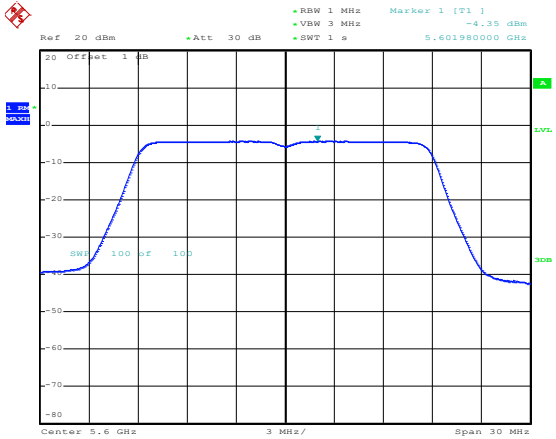
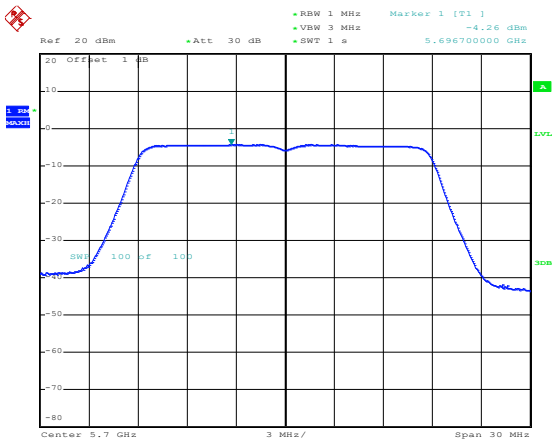
802.11a-Low	 Date: 24.JAN.2022 14:19:16
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802.11a-High	 Date: 24.JAN.2022 14:24:09

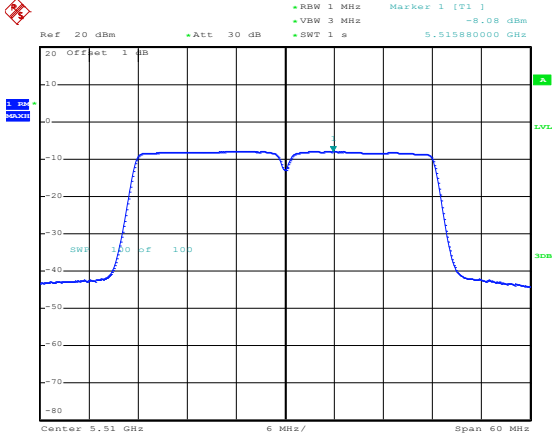
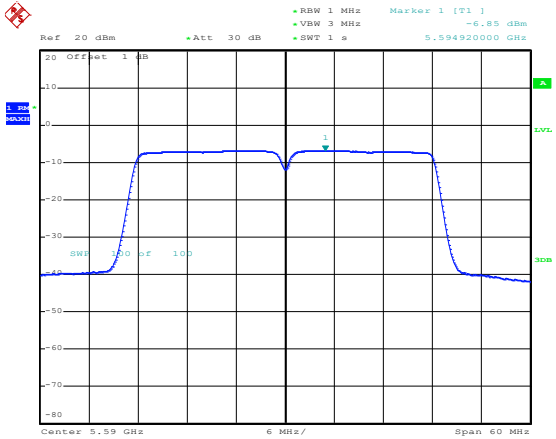
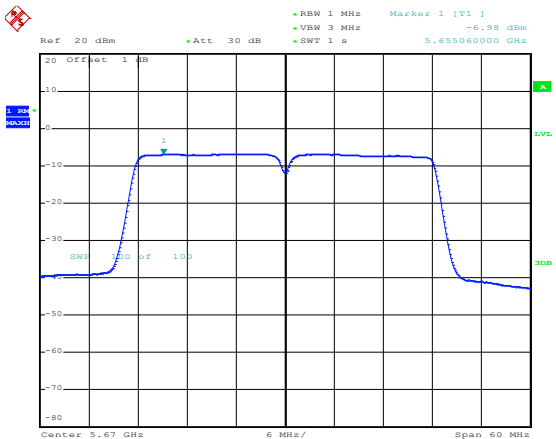
802.11n-HT20-Low	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1]: -6.01 dBm 5.257450000 GHz Center 5.26 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:32:46
802.11n-HT20-Middle	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1]: -6.15 dBm 5.272980000 GHz Center 5.28 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:34:55
802.11n-HT20-High	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1]: -6.93 dBm 5.313580000 GHz Center 5.32 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:37:00

802.11n-HT40-Low	 Ref: 20 dBm Att: 30 dB Marker 1 [T1] -9.41 dBm RBW 1 MHz VBW 3 MHz SWT 1 s 5.25740000 GHz Center 5.27 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 16:33:43
802.11n-HT40-High	 Ref: 20 dBm Att: 30 dB Marker 1 [T1] -9.89 dBm RBW 1 MHz VBW 3 MHz SWT 1 s 5.30352000 GHz Center 5.31 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 16:29:32
802.11ac-HT40-High	 Ref: 20 dBm Att: 30 dB Marker 1 [T1] -9.86 dBm RBW 1 MHz VBW 3 MHz SWT 1 s 5.29596000 GHz Center 5.31 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 16:31:34

5470-5725MHz

802.11a-Low	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -5.38 dBm 5.498170000 GHz Center 5.5 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 15:12:11
802.11a-Middle	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -4.47 dBm 5.598260000 GHz Center 5.6 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 15:15:22
802.11a-High	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -4.02 dBm 5.695800000 GHz Center 5.7 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 15:17:37

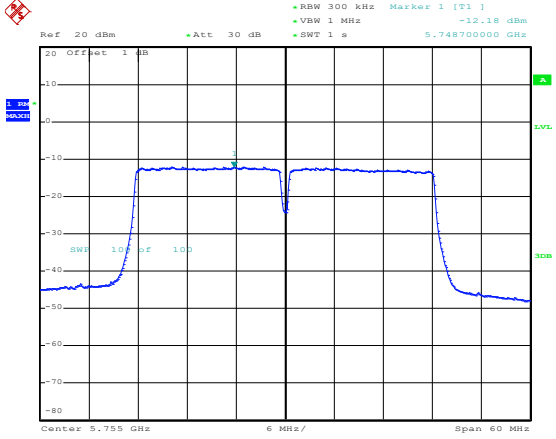
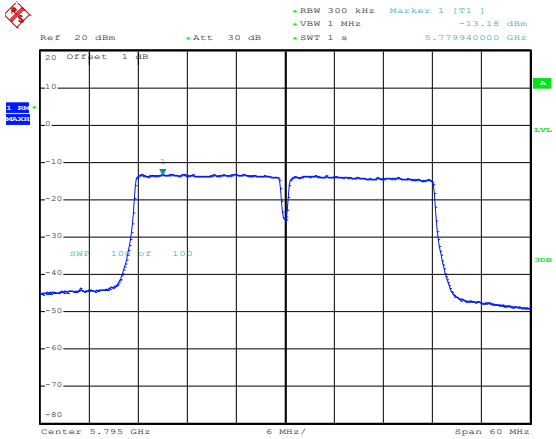
802.11n-HT20-Low	 Ref: 20 dBm Att: 30 dB Marker 1 [T1] -4.98 dBm 5.497300000 GHz Center 5.5 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 15:27:12
802.11n-HT20-Middle	 Ref: 20 dBm Att: 30 dB Marker 1 [T1] -4.35 dBm 5.601980000 GHz Center 5.6 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 15:32:13
802.11n-HT20-High	 Ref: 20 dBm Att: 30 dB Marker 1 [T1] -4.26 dBm 5.696700000 GHz Center 5.7 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 15:35:42

802.11n-HT40-Low	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -8.08 dBm 5.515880000 GHz Center 5.51 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 16:45:37
802.11n-HT40- Middle	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -6.85 dBm 5.594920000 GHz Center 5.59 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 16:49:50
802.11n-HT40-High	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 1 s Marker 1 [T1] -6.98 dBm 5.655060000 GHz Center 5.67 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 16:52:39

5725-5850MHz

802.11a-Low	Date: 24.JAN.2022 18:09:56
802.11a-Middle	Date: 24.JAN.2022 18:12:49
802.11a-High	Date: 24.JAN.2022 18:15:16

802.11n-HT20-Low	Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 1 s Marker 1 [T1] -9.47 dBm 5.742780000 GHz Center 5.745 GHz 3 MHz/ Span 30 MHz Date: 25.JAN.2022 09:05:10
802.11n-HT20-Middle	Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 1 s Marker 1 [T1] -10.50 dBm 5.780620000 GHz Center 5.785 GHz 3 MHz/ Span 30 MHz Date: 25.JAN.2022 09:07:04
802.11n-HT20-High	Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 1 s Marker 1 [T1] -12.03 dBm 5.820620000 GHz Center 5.825 GHz 3 MHz/ Span 30 MHz Date: 25.JAN.2022 09:09:18

802.11n-HT40-Low	 Ref 20 dBm Att 30 dB RBW 300 kHz Marker 1 [T1] -12.18 dBm VBW 1 MHz SWT 1 s 5.748700000 GHz 20 Offset 1 dB SWR 100 dB 100 Center 5.755 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 18:06:09
802.11n-HT40-High	 Ref 20 dBm Att 30 dB RBW 300 kHz Marker 1 [T1] -13.18 dBm VBW 1 MHz SWT 1 s 5.779940000 GHz 20 Offset 1 dB SWR 100 dB 100 Center 5.795 GHz 6 MHz/ Span 60 MHz Date: 24.JAN.2022 18:03:49

APPENDIX B

Emission Bandwidth and Occupied Bandwidth

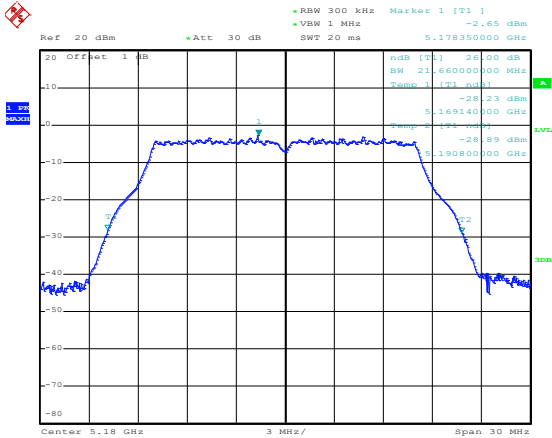
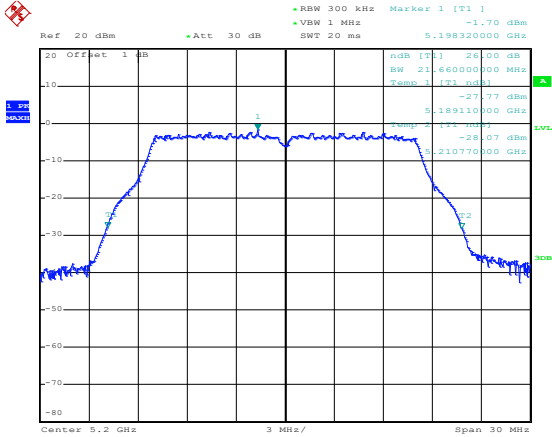
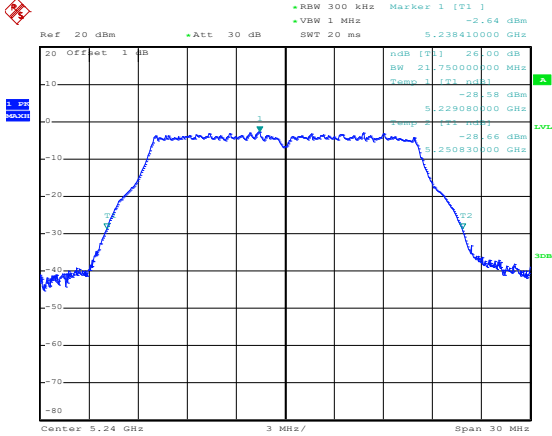
U-NII-1:5150-5250MHz				
Test Mode	Test Channel MHz	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5180	21.66	17.31	Pass
	5200	21.66	17.28	Pass
	5240	21.75	17.28	Pass
802.11n-HT20	5180	21.96	18.36	Pass
	5200	22.02	18.36	Pass
	5240	21.99	18.36	Pass
802.11n-HT40	5190	41.64	37.08	Pass
	5230	41.88	37.14	Pass

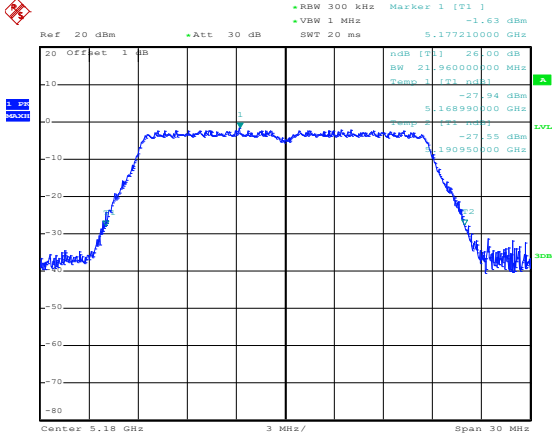
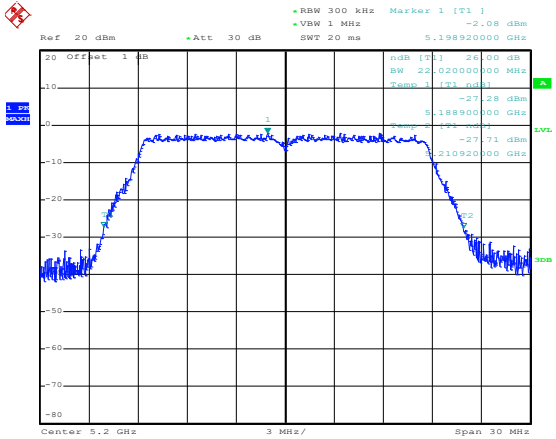
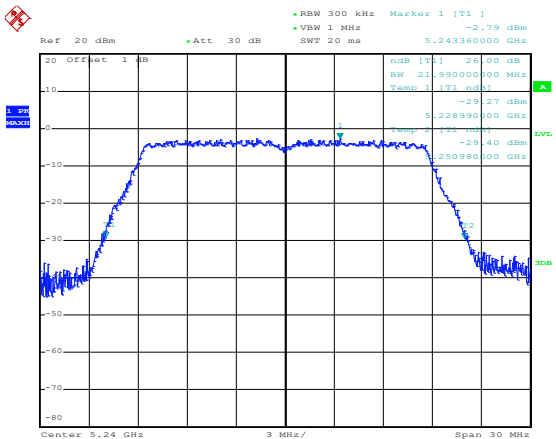
U-NII-2A: 5250-5350MHz				
Test Mode	Test Channel MHz	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5260	21.72	17.31	Pass
	5280	21.69	17.31	Pass
	5320	21.69	17.34	Pass
802.11n-HT20	5260	22.08	18.36	Pass
	5280	21.96	18.36	Pass
	5320	22.17	18.42	Pass
802.11n-HT40	5270	41.88	37.20	Pass
	5310	42.06	37.26	Pass

U-NII-2C: 5470-5725MHz				
Test Mode	Test Channel MHz	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5500	21.78	17.31	Pass
	5600	21.90	17.4	Pass
	5700	21.87	17.31	Pass
802.11n-HT20	5500	21.96	18.36	Pass
	5600	22.11	18.33	Pass
	5700	21.99	18.30	Pass
802.11n-HT40	5510	46.68	37.20	Pass
	5590	46.56	37.26	Pass
	5670	46.62	37.20	Pass

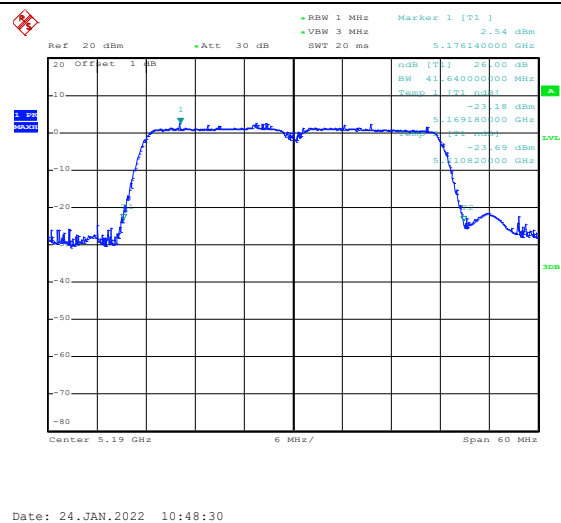
U-NII-3: 5725-5850MHz				
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5745	16.44	17.37	≥500
	5785	16.44	17.37	≥500
	5825	16.56	17.37	≥500
802.11n-HT20	5745	17.70	18.42	≥500
	5785	17.70	18.39	≥500
	5825	17.70	18.39	≥500
802.11n-HT40	5755	36.56	37.08	≥500
	5795	36.60	37.14	≥500

26 dB Bandwidth
5150-5250MHz

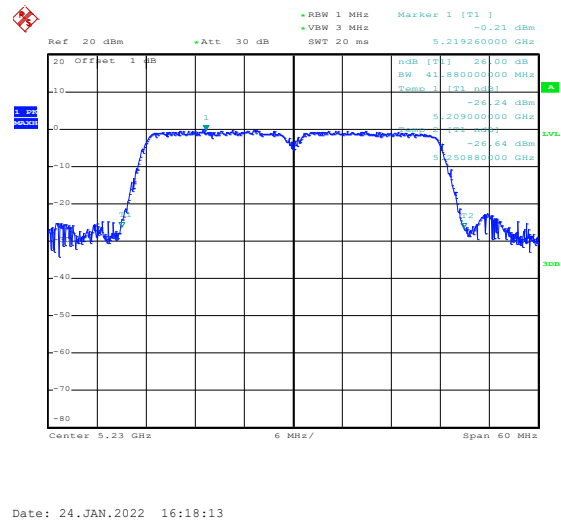
802.11a-Low	 Ref: 20 dBm Att: 30 dB RBW 300 kHz Marker 1 [T1] -2.65 dBm VSW 1 MHz SWT 20 ms 5.178350000 GHz 20 Offset 1 dB ndB [T1] -26.00 dB BW 21.66000000 MHz Temp 1 [T1] ndB -28.23 dBm 5.169140000 GHz Temp 2 [T2] ndB -28.89 dBm 5.190800000 GHz Center 5.18 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:50:46
802.11a-Middle	 Ref: 20 dBm Att: 30 dB RBW 300 kHz Marker 1 [T1] -1.70 dBm VSW 1 MHz SWT 20 ms 5.198320000 GHz 20 Offset 1 dB ndB [T1] -26.00 dB BW 21.66000000 MHz Temp 1 [T1] ndB -27.77 dBm 5.189110000 GHz Temp 2 [T2] ndB -28.07 dBm 5.219770000 GHz Center 5.2 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:51:17
802.11a-High	 Ref: 20 dBm Att: 30 dB RBW 300 kHz Marker 1 [T1] -2.64 dBm VSW 1 MHz SWT 20 ms 5.238410000 GHz 20 Offset 1 dB ndB [T1] -26.00 dB BW 21.75000000 MHz Temp 1 [T1] ndB -28.58 dBm 5.229080000 GHz Temp 2 [T2] ndB -28.65 dBm 5.250830000 GHz Center 5.24 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:51:58

802.11n-HT20-Low	 Ref 20 dBm Att 30 dB RBW 300 kHz VBW 1 MHz SWT 20 ms Marker 1 [T1] -1.63 dBm 5.177210000 GHz 20 Offset 1 dB 10 0 -10 -20 -30 -40 -50 -60 -70 -80 Center 5.18 GHz 3 MHz/ Span 30 MHz ndB [T1] -27.00 dB BW 21.96000000 MHz Temp 1 [T1] ndB -27.94 dBm 5.168990000 GHz -27.55 dBm 5.198990000 GHz 3dB 1dB 0dB 10dB 20dB 30dB 40dB 50dB 60dB 70dB 80dB 90dB 100dB 110dB 120dB 130dB 140dB 150dB 160dB 170dB 180dB 190dB 200dB 210dB 220dB 230dB 240dB 250dB 260dB 270dB 280dB 290dB 300dB 310dB 320dB 330dB 340dB 350dB 360dB 370dB 380dB 390dB 400dB 410dB 420dB 430dB 440dB 450dB 460dB 470dB 480dB 490dB 500dB 510dB 520dB 530dB 540dB 550dB 560dB 570dB 580dB 590dB 600dB 610dB 620dB 630dB 640dB 650dB 660dB 670dB 680dB 690dB 700dB 710dB 720dB 730dB 740dB 750dB 760dB 770dB 780dB 790dB 800dB 810dB 820dB 830dB 840dB 850dB 860dB 870dB 880dB 890dB 900dB 910dB 920dB 930dB 940dB 950dB 960dB 970dB 980dB 990dB 1000dB 1010dB 1020dB 1030dB 1040dB 1050dB 1060dB 1070dB 1080dB 1090dB 1100dB 1110dB 1120dB 1130dB 1140dB 1150dB 1160dB 1170dB 1180dB 1190dB 1200dB 1210dB 1220dB 1230dB 1240dB 1250dB 1260dB 1270dB 1280dB 1290dB 1300dB 1310dB 1320dB 1330dB 1340dB 1350dB 1360dB 1370dB 1380dB 1390dB 1400dB 1410dB 1420dB 1430dB 1440dB 1450dB 1460dB 1470dB 1480dB 1490dB 1500dB 1510dB 1520dB 1530dB 1540dB 1550dB 1560dB 1570dB 1580dB 1590dB 1600dB 1610dB 1620dB 1630dB 1640dB 1650dB 1660dB 1670dB 1680dB 1690dB 1700dB 1710dB 1720dB 1730dB 1740dB 1750dB 1760dB 1770dB 1780dB 1790dB 1800dB 1810dB 1820dB 1830dB 1840dB 1850dB 1860dB 1870dB 1880dB 1890dB 1900dB 1910dB 1920dB 1930dB 1940dB 1950dB 1960dB 1970dB 1980dB 1990dB 2000dB 2010dB 2020dB 2030dB 2040dB 2050dB 2060dB 2070dB 2080dB 2090dB 2100dB 2110dB 2120dB 2130dB 2140dB 2150dB 2160dB 2170dB 2180dB 2190dB 2200dB 2210dB 2220dB 2230dB 2240dB 2250dB 2260dB 2270dB 2280dB 2290dB 2300dB 2310dB 2320dB 2330dB 2340dB 2350dB 2360dB 2370dB 2380dB 2390dB 2400dB 2410dB 2420dB 2430dB 2440dB 2450dB 2460dB 2470dB 2480dB 2490dB 2500dB 2510dB 2520dB 2530dB 2540dB 2550dB 2560dB 2570dB 2580dB 2590dB 2600dB 2610dB 2620dB 2630dB 2640dB 2650dB 2660dB 2670dB 2680dB 2690dB 2700dB 2710dB 2720dB 2730dB 2740dB 2750dB 2760dB 2770dB 2780dB 2790dB 2800dB 2810dB 2820dB 2830dB 2840dB 2850dB 2860dB 2870dB 2880dB 2890dB 2900dB 2910dB 2920dB 2930dB 2940dB 2950dB 2960dB 2970dB 2980dB 2990dB 3000dB 3010dB 3020dB 3030dB 3040dB 3050dB 3060dB 3070dB 3080dB 3090dB 3100dB 3110dB 3120dB 3130dB 3140dB 3150dB 3160dB 3170dB 3180dB 3190dB 3200dB 3210dB 3220dB 3230dB 3240dB 3250dB 3260dB 3270dB 3280dB 3290dB 3300dB 3310dB 3320dB 3330dB 3340dB 3350dB 3360dB 3370dB 3380dB 3390dB 3400dB 3410dB 3420dB 3430dB 3440dB 3450dB 3460dB 3470dB 3480dB 3490dB 3500dB 3510dB 3520dB 3530dB 3540dB 3550dB 3560dB 3570dB 3580dB 3590dB 3600dB 3610dB 3620dB 3630dB 3640dB 3650dB 3660dB 3670dB 3680dB 3690dB 3700dB 3710dB 3720dB 3730dB 3740dB 3750dB 3760dB 3770dB 3780dB 3790dB 3800dB 3810dB 3820dB 3830dB 3840dB 3850dB 3860dB 3870dB 3880dB 3890dB 3900dB 3910dB 3920dB 3930dB 3940dB 3950dB 3960dB 3970dB 3980dB 3990dB 4000dB 4010dB 4020dB 4030dB 4040dB 4050dB 4060dB 4070dB 4080dB 4090dB 4100dB 4110dB 4120dB 4130dB 4140dB 4150dB 4160dB 4170dB 4180dB 4190dB 4200dB 4210dB 4220dB 4230dB 4240dB 4250dB 4260dB 4270dB 4280dB 4290dB 4300dB 4310dB 4320dB 4330dB 4340dB 4350dB 4360dB 4370dB 4380dB 4390dB 4400dB 4410dB 4420dB 4430dB 4440dB 4450dB 4460dB 4470dB 4480dB 4490dB 4500dB 4510dB 4520dB 4530dB 4540dB 4550dB 4560dB 4570dB 4580dB 4590dB 4600dB 4610dB 4620dB 4630dB 4640dB 4650dB 4660dB 4670dB 4680dB 4690dB 4700dB 4710dB 4720dB 4730dB 4740dB 4750dB 4760dB 4770dB 4780dB 4790dB 4800dB 4810dB 4820dB 4830dB 4840dB 4850dB 4860dB 4870dB 4880dB 4890dB 4900dB 4910dB 4920dB 4930dB 4940dB 4950dB 4960dB 4970dB 4980dB 4990dB 5000dB 5010dB 5020dB 5030dB 5040dB 5050dB 5060dB 5070dB 5080dB 5090dB 5100dB 5110dB 5120dB 5130dB 5140dB 5150dB 5160dB 5170dB 5180dB 5190dB 5200dB 5210dB 5220dB 5230dB 5240dB 5250dB 5260dB 5270dB 5280dB 5290dB 5300dB 5310dB 5320dB 5330dB 5340dB 5350dB 5360dB 5370dB 5380dB 5390dB 5400dB 5410dB 5420dB 5430dB 5440dB 5450dB 5460dB 5470dB 5480dB 5490dB 5500dB 5510dB 5520dB 5530dB 5540dB 5550dB 5560dB 5570dB 5580dB 5590dB 5600dB 5610dB 5620dB 5630dB 5640dB 5650dB 5660dB 5670dB 5680dB 5690dB 5700dB 5710dB 5720dB 5730dB 5740dB 5750dB 5760dB 5770dB 5780dB 5790dB 5800dB 5810dB 5820dB 5830dB 5840dB 5850dB 5860dB 5870dB 5880dB 5890dB 5900dB 5910dB 5920dB 5930dB 5940dB 5950dB 5960dB 5970dB 5980dB 5990dB 6000dB 6010dB 6020dB 6030dB 6040dB 6050dB 6060dB 6070dB 6080dB 6090dB 6100dB 6110dB 6120dB 6130dB 6140dB 6150dB 6160dB 6170dB 6180dB 6190dB 6200dB 6210dB 6220dB 6230dB 6240dB 6250dB 6260dB 6270dB 6280dB 6290dB 6300dB 6310dB 6320dB 6330dB 6340dB 6350dB 6360dB 6370dB 6380dB 6390dB 6400dB 6410dB 6420dB 6430dB 6440dB 6450dB 6460dB 6470dB 6480dB 6490dB 6500dB 6510dB 6520dB 6530dB 6540dB 6550dB 6560dB 6570dB 6580dB 6590dB 6600dB 6610dB 6620dB 6630dB 6640dB 6650dB 6660dB 6670dB 6680dB 6690dB 6700dB 6710dB 6720dB 6730dB 6740dB 6750dB 6760dB 6770dB 6780dB 6790dB 6800dB 6810dB 6820dB 6830dB 6840dB 6850dB 6860dB 6870dB 6880dB 6890dB 6900dB 6910dB 6920dB 6930dB 6940dB 6950dB 6960dB 6970dB 6980dB 6990dB 7000dB 7010dB 7020dB 7030dB 7040dB 7050dB 7060dB 7070dB 7080dB 7090dB 7100dB 7110dB 7120dB 7130dB 7140dB 7150dB 7160dB 7170dB 7180dB 7190dB 7200dB 7210dB 7220dB 7230dB 7240dB 7250dB 7260dB 7270dB 7280dB 7290dB 7300dB 7310dB 7320dB 7330dB 7340dB 7350dB 7360dB 7370dB 7380dB 7390dB 7400dB 7410dB 7420dB 7430dB 7440dB 7450dB 7460dB 7470dB 7480dB 7490dB 7500dB 7510dB 7520dB 7530dB 7540dB 7550dB 7560dB 7570dB 7580dB 7590dB 7600dB 7610dB 7620dB 7630dB 7640dB 7650dB 7660dB 7670dB 7680dB 7690dB 7700dB 7710dB 7720dB 7730dB 7740dB 7750dB 7760dB 7770dB 7780dB 7790dB 7800dB 7810dB 7820dB 7830dB 7840dB 7850dB 7860dB 7870dB 7880dB 7890dB 7900dB 7910dB 7920dB 7930dB 7940dB 7950dB 7960dB 7970dB 7980dB 7990dB 8000dB 8010dB 8020dB 8030dB 8040dB 8050dB 8060dB 8070dB 8080dB 8090dB 8100dB 8110dB 8120dB 8130dB 8140dB 8150dB 8160dB 8170dB 8180dB 8190dB 8200dB 8210dB 8220dB 8230dB 8240dB 8250dB 8260dB 8270dB 8280dB 8290dB 8300dB 8310dB 8320dB 8330dB 8340dB 8350dB 8360dB 8370dB 8380dB 8390dB 8400dB 8410dB 8420dB 8430dB 8440dB 8450dB 8460dB 8470dB 8480dB 8490dB 8500dB 8510dB 8520dB 8530dB 8540dB 8550dB 8560dB 8570dB 8580dB 8590dB 8600dB 8610dB 8620dB 8630dB 8640dB 8650dB 8660dB 8670dB 8680dB 8690dB 8700dB 8710dB 8720dB 8730dB 8740dB 8750dB 8760dB 8770dB 8780dB 8790dB 8800dB 8810dB 8820dB 8830dB 8840dB 8850dB 8860dB 8870dB 8880dB 8890dB 8900dB 8910dB 8920dB 8930dB 8940dB 8950dB 8960dB 8970dB 8980dB 8990dB 9000dB 9010dB 9020dB 9030dB 9040dB 9050dB 9060dB 9070dB 9080dB 9090dB 9100dB 9110dB 9120dB 9130dB 9140dB 9150dB 9160dB 9170dB 9180dB 9190dB 9200dB 9210dB 9220dB 9230dB 9240dB 9250dB 9260dB 9270dB 9280dB 9290dB 9300dB 9310dB 9320dB 9330dB 9340dB 9350dB 9360dB 9370dB 9380dB 9390dB 9400dB 9410dB 9420dB 9430dB 9440dB 9450dB 9460dB 9470dB 9480dB 9490dB 9500dB 9510dB 9520dB 9530dB 9540dB 9550dB 9560dB 9570dB 9580dB 9590dB 9600dB 9610dB 9620dB 9630dB 9640dB 9650dB 9660dB 9670dB 9680dB 9690dB 9700dB 9710dB 9720dB 9730dB 9740dB 9750dB 9760dB 9770dB 9780dB 9790dB 9800dB 9810dB 9820dB 9830dB 9840dB 9850dB 9860dB 9870dB 9880dB 9890dB 9900dB 9910dB 9920dB 9930dB 9940dB 9950dB 9960dB 9970dB 9980dB 9990dB 10000dB Date: 24.JAN.2022 10:54:05
802.11n-HT20-Middle	 Ref 20 dBm Att 30 dB RBW 300 kHz VBW 1 MHz SWT 20 ms Marker 1 [T1] -2.08 dBm 5.198920000 GHz 20 Offset 1 dB 10 0 -10 -20 -30 -40 -50 -60 -70 -80 Center 5.2 GHz 3 MHz/ Span 30 MHz ndB [T1] -27.00 dB BW 22.02000000 MHz Temp 1 [T1] ndB -27.28 dBm 5.188900000 GHz -27.71 dBm 5.210920000 GHz 3dB 1dB 0dB 10dB 20dB 30dB 40dB 50dB 60dB 70dB 80dB 90dB 100dB 110dB 120dB 130dB 140dB 150dB 160dB 170dB 180dB 190dB 200dB 210dB 220dB 230dB 240dB 250dB 260dB 270dB 280dB 290dB 300dB 310dB 320dB 330dB 340dB 350dB 360dB 370dB 380dB 390dB 400dB 410dB 420dB 430dB 440dB 450dB 460dB 470dB 480dB 490dB 500dB 510dB 520dB 530dB 540dB 550dB 560dB 570dB 580dB 590dB 600dB 610dB 620dB 630dB 640dB 650dB 660dB 670dB 680dB 690dB 700dB 710dB 720dB 730dB 740dB 750dB 760dB 770dB 780dB 790dB 800dB 810dB 820dB 830dB 840dB 850dB 860dB 870dB 880dB 890dB 900dB 910dB 920dB 930dB 940dB 950dB 960dB 970dB 980dB 990dB 1000dB Date: 24.JAN.2022 10:54:35
802.11n-HT20-High	 Ref 20 dBm Att 30 dB RBW 300 kHz VBW 1 MHz SWT 20 ms Marker 1 [T1] -2.79 dBm 5.243360000 GHz 20 Offset 1 dB 10 0 -10 -20 -30 -40 -50 -60 -70 -80 Center 5.24 GHz 3 MHz/ Span 30 MHz ndB [T1] -27.00 dB BW 21.99000000 MHz Temp 1 [T1] ndB -29.27 dBm 5.228990000 GHz -29.40 dBm 5.250980000 GHz 3dB 1dB 0dB 10dB 20dB 30dB 40dB 50dB 60dB 70dB 80dB 90dB 100dB 110dB 120dB 130dB 140dB 150dB 160dB 170dB 180dB 190dB 200dB 210dB 220dB 230dB 240dB 250dB 260dB 270dB 280dB 290dB 300dB 310dB 320dB 330

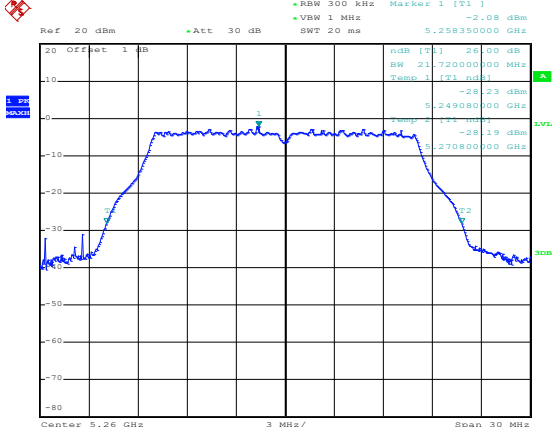
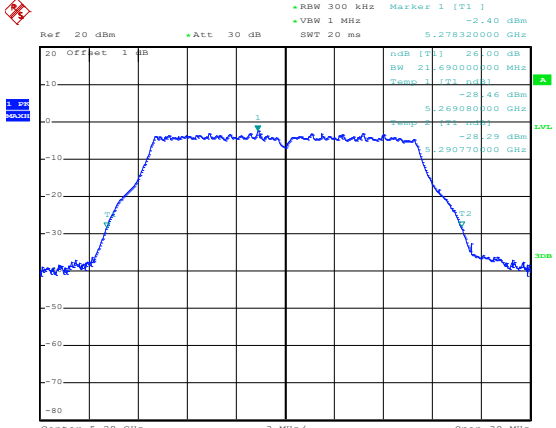
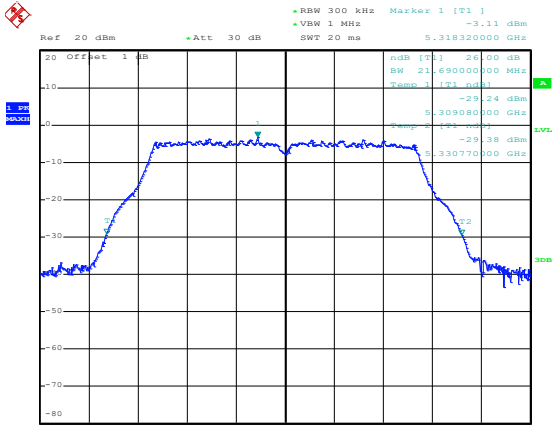
802.11n-HT40-Low

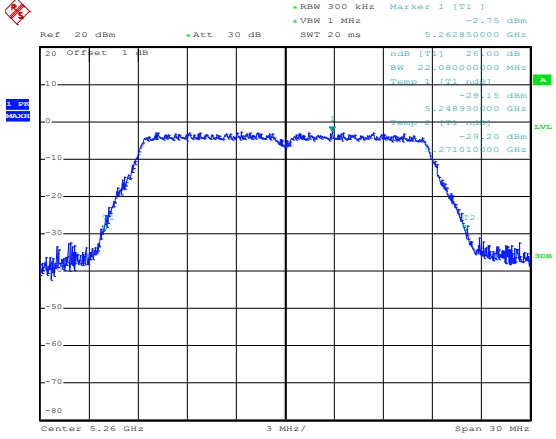
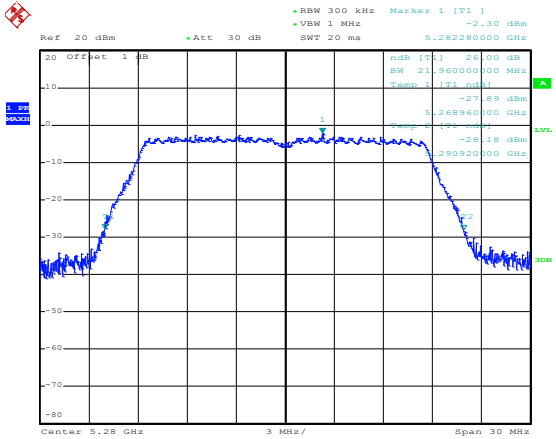
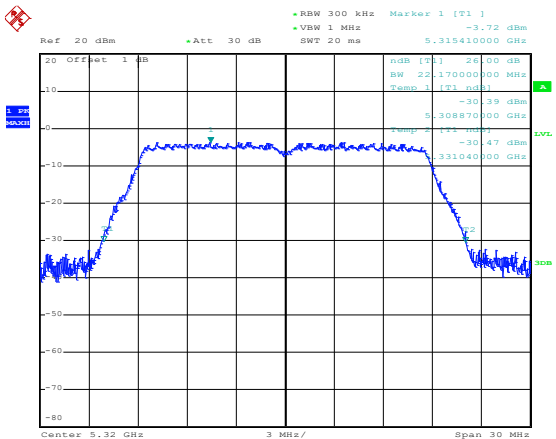


802.11n-HT40-High

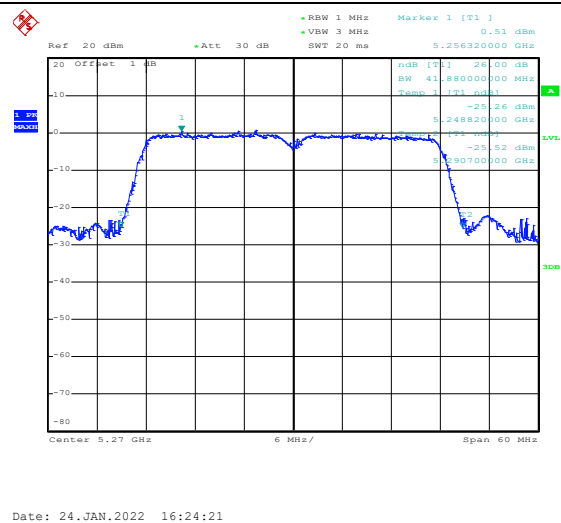


5250-5350MHz

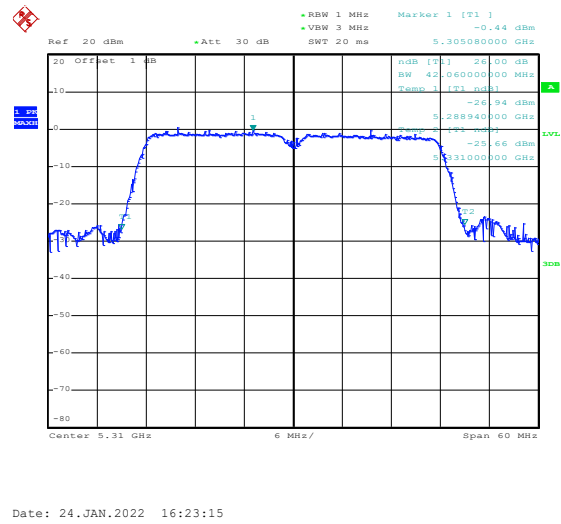
802.11a-Low	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.08 dBm 5.258350000 GHz ndB [T1] 26.00 dB BW 21.720000000 MHz Temp 1 [T1] dBm -28.23 dBm 5.249000000 GHz -28.19 dBm 5.270800000 GHz Center 5.26 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:41:41
802.11a-Middle	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.40 dBm 5.278320000 GHz ndB [T1] 26.00 dB BW 21.690000000 MHz Temp 1 [T1] dBm -28.46 dBm 5.269000000 GHz -28.29 dBm 5.290770000 GHz Center 5.28 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:42:15
802.11a-High	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -3.11 dBm 5.318320000 GHz ndB [T1] 26.00 dB BW 21.690000000 MHz Temp 1 [T1] dBm -29.24 dBm 5.309000000 GHz -29.38 dBm 5.330770000 GHz Center 5.32 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:43:22

802.11n-HT20-Low	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.75 dBm 5.26285000 GHz ndB [T1] -29.00 dB BW 22.08000000 MHz Temp 1 [T1] ndB -29.15 dBm 5.24893000 GHz -29.20 dBm 5.27010000 GHz Center 5.26 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:46:39
802.11n-HT20-Middle	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.30 dBm 5.28228000 GHz ndB [T1] -29.00 dB BW 21.96000000 MHz Temp 1 [T1] ndB -27.89 dBm 5.26896000 GHz -28.18 dBm 5.29092000 GHz Center 5.28 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:47:31
802.11n-HT20-High	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -3.72 dBm 5.31541000 GHz ndB [T1] -29.00 dB BW 22.17000000 MHz Temp 1 [T1] ndB -30.39 dBm 5.30887000 GHz -30.47 dBm 5.33104000 GHz Center 5.32 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:48:17

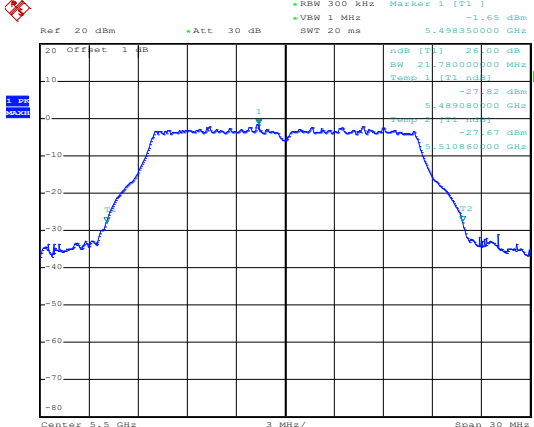
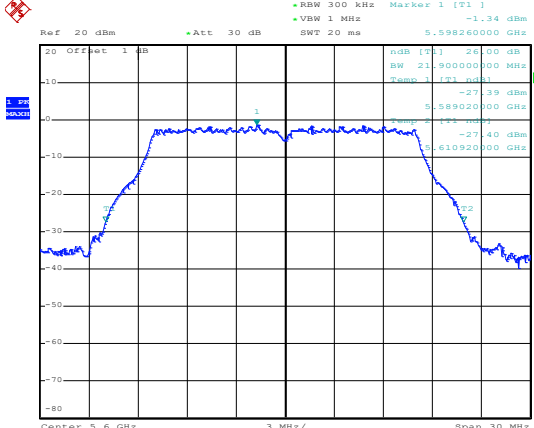
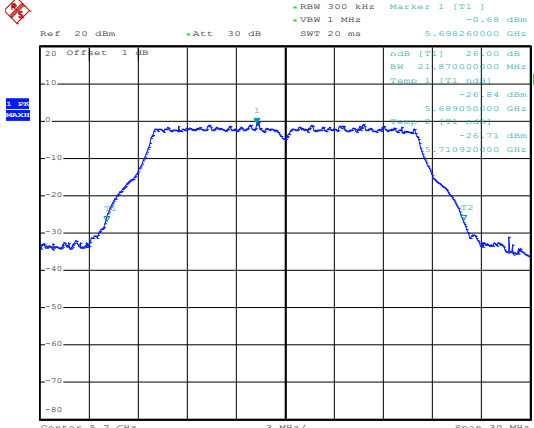
802.11n-HT40-Low



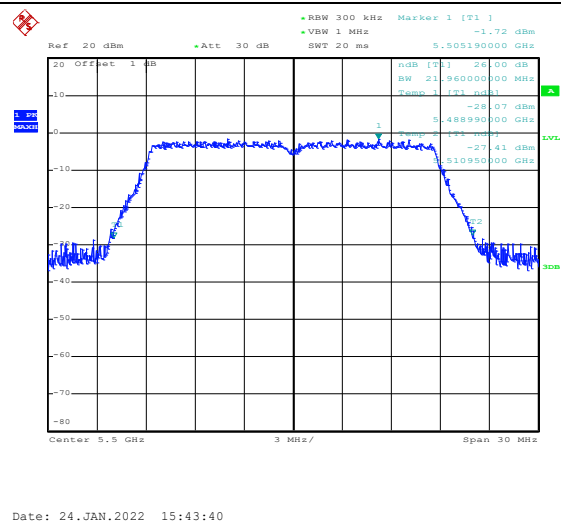
802.11n-HT40-High



5470-5725MHz

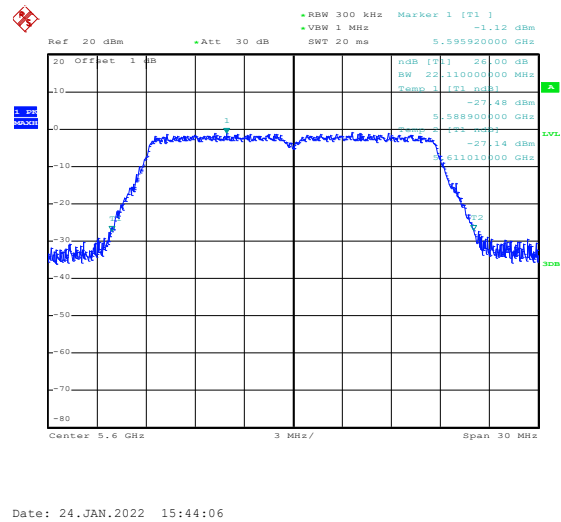
802.11a-Low	 Date: 24.JAN.2022 15:38:21
802.11a-Middle	 Date: 24.JAN.2022 15:38:53
802.11a-High	 Date: 24.JAN.2022 15:40:07

802.11n-HT20-Low



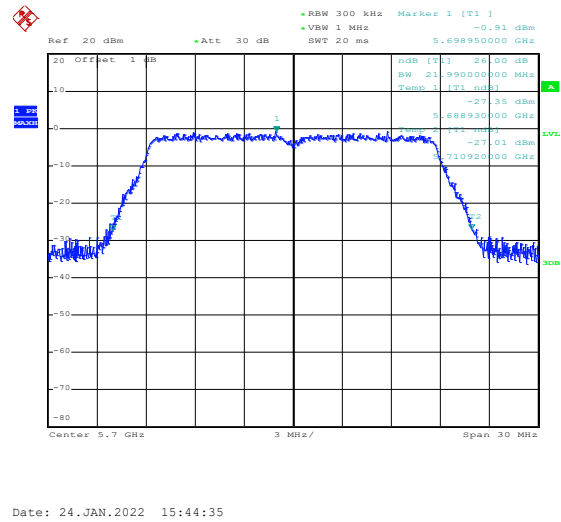
Date: 24.JAN.2022 15:43:40

802.11n-HT20-Middle



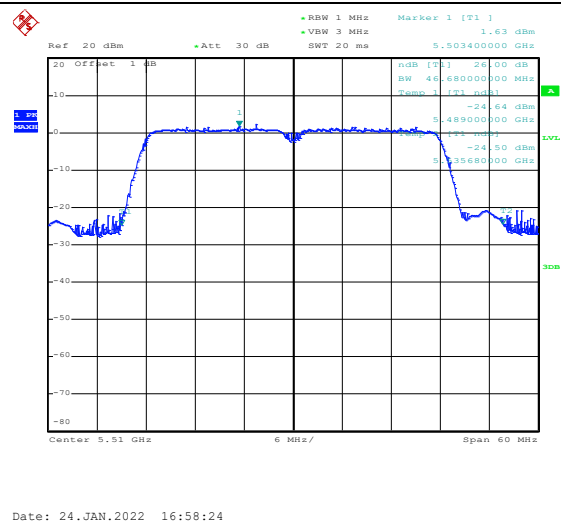
Date: 24.JAN.2022 15:44:06

802.11n-HT20-High

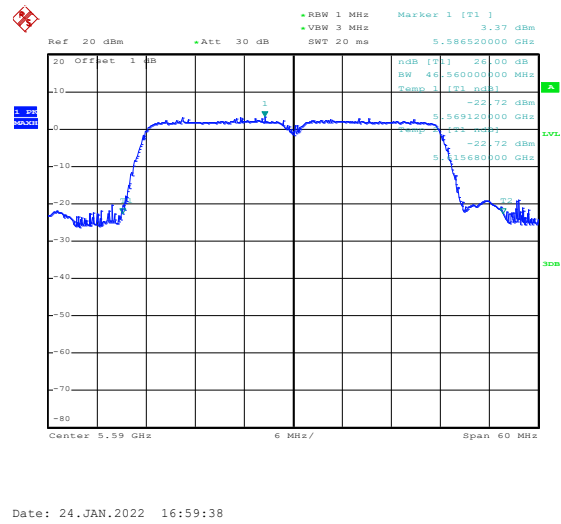


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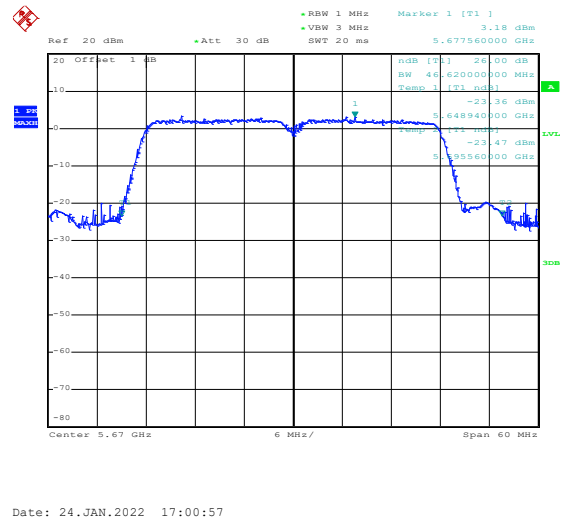
802.11n-HT40-Low



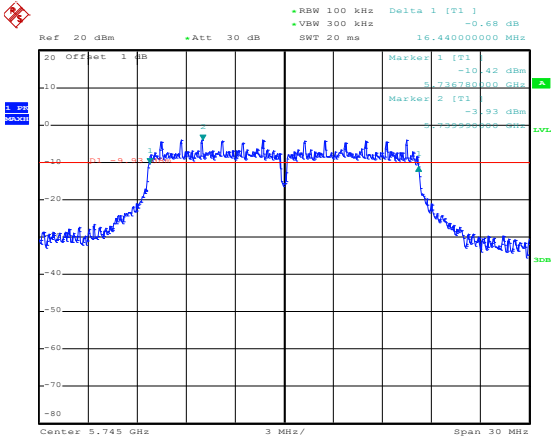
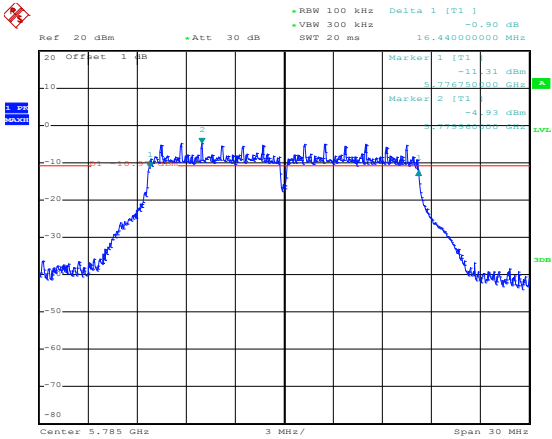
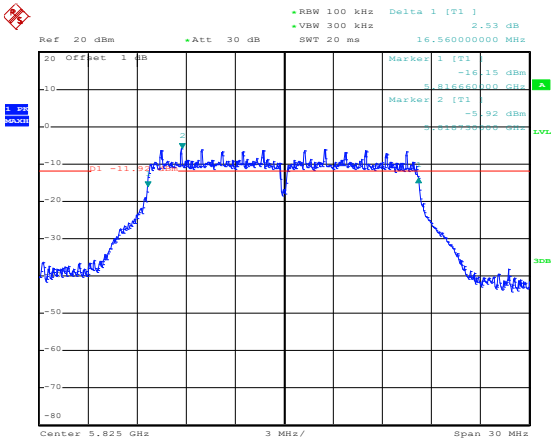
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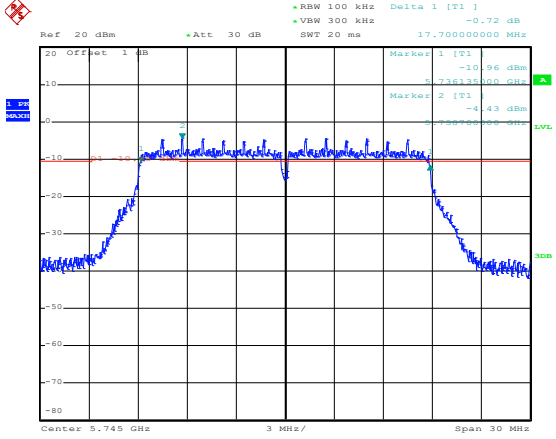
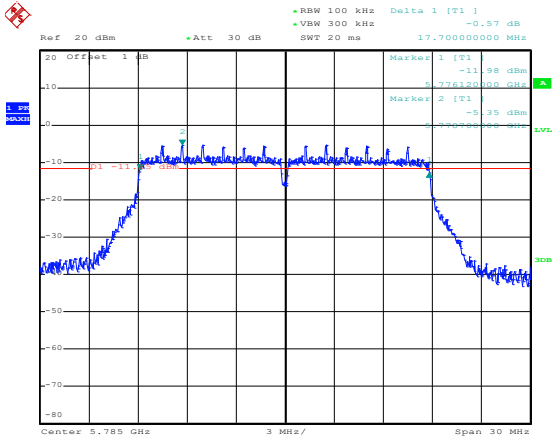
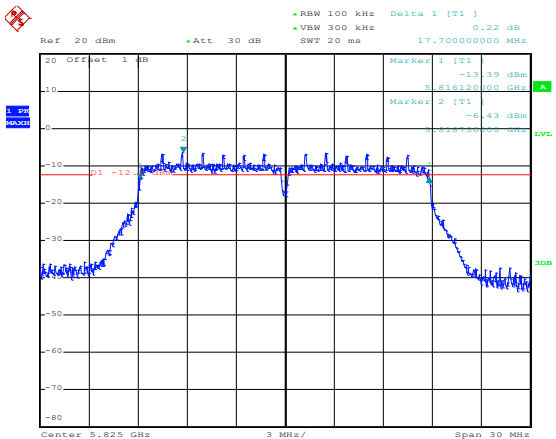


802.11n-HT40-High

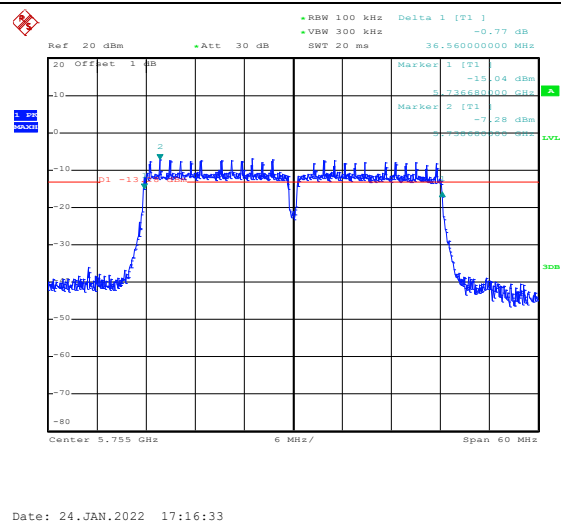


6 dB Bandwidth
5725-5850MHz

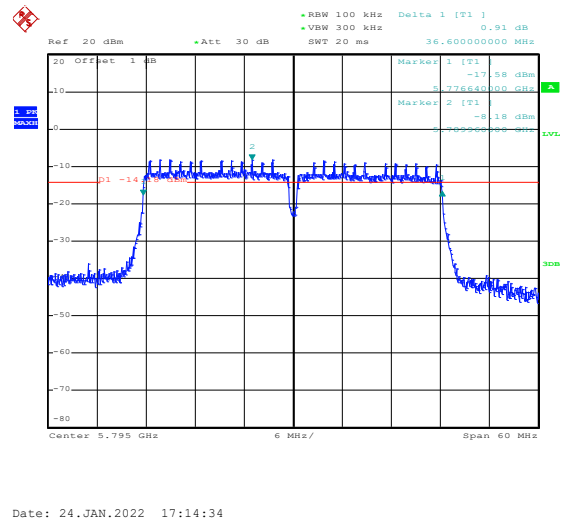
802.11a-Low	 Date: 24.JAN.2022 11:01:35
802.11a-Middle	 Date: 24.JAN.2022 11:05:01
802.11a-High	 Date: 24.JAN.2022 11:11:59

802.11n-HT20-Low	 Date: 24.JAN.2022 11:51:03
802.11n-HT20-Middle	 Date: 24.JAN.2022 11:52:00
802.11n-HT20-High	 Date: 24.JAN.2022 11:53:06

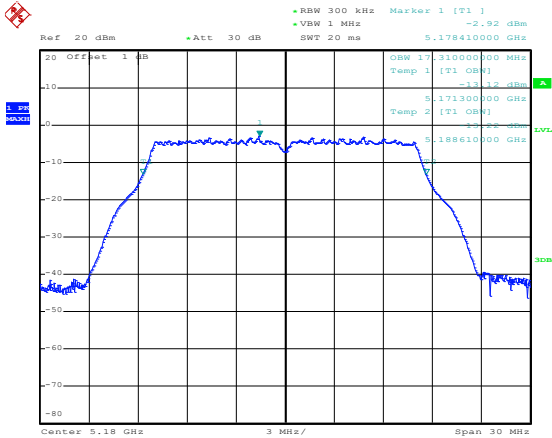
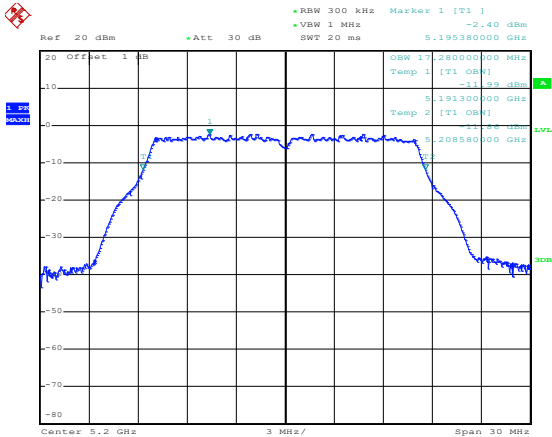
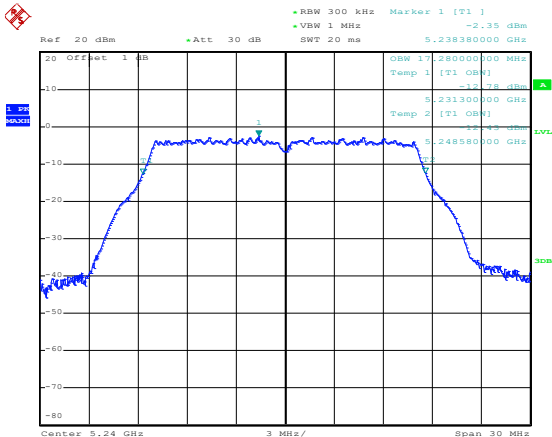
802.11n-HT40-Low

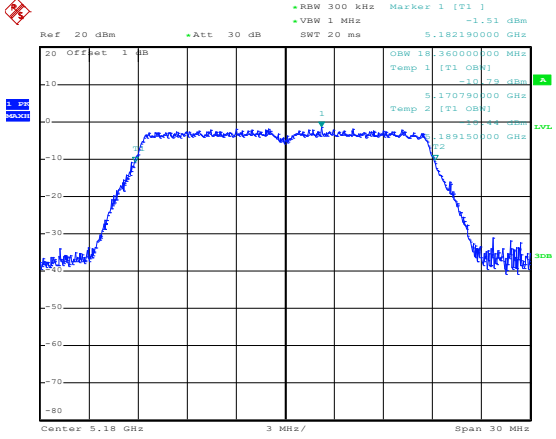
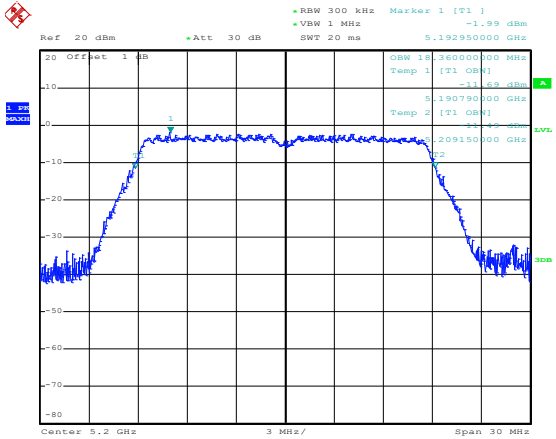
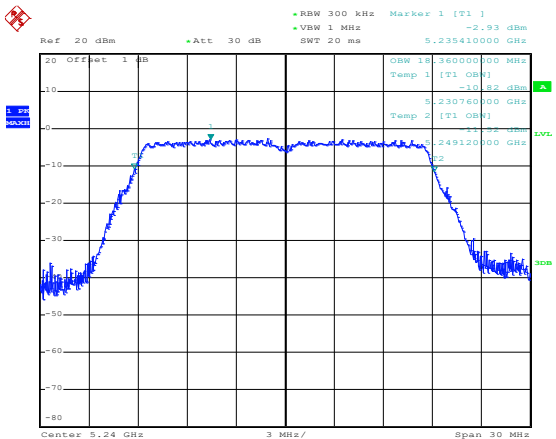


802.11n-HT40-High

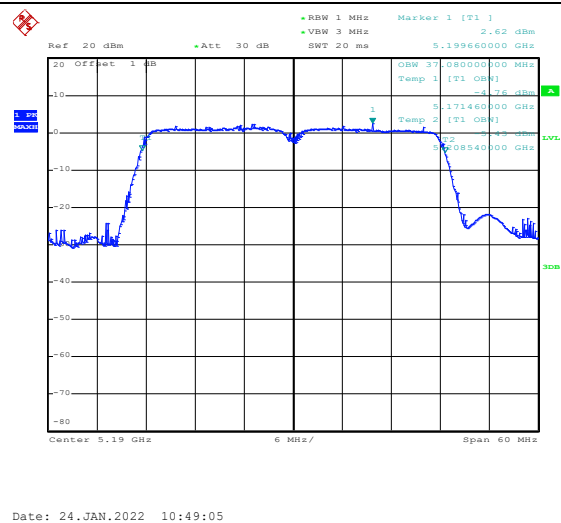


99% Bandwidth
5150-5250MHz

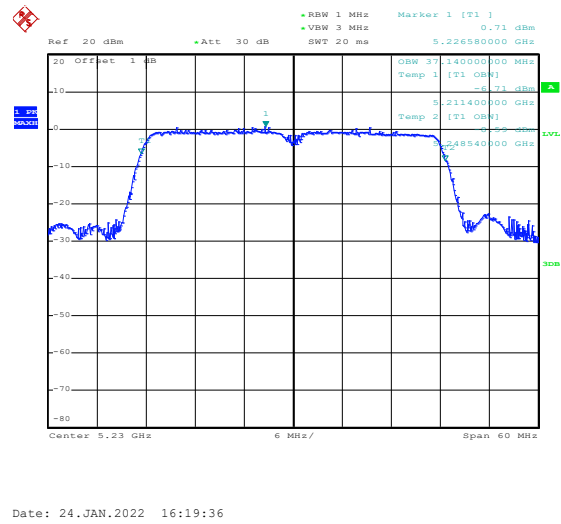
802.11a-Low	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.92 dBm 5.178410000 GHz OBW: 17.310000000 MHz Temp 1 [T1] -33.12 dBm 5.171300000 GHz Temp 2 [T1] -33.12 dBm 5.188610000 GHz Center 5.18 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:37:18
802.11a-Middle	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.40 dBm 5.195380000 GHz OBW: 17.280000000 MHz Temp 1 [T1] -31.89 dBm 5.191300000 GHz Temp 2 [T1] -31.89 dBm 5.208580000 GHz Center 5.2 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:38:06
802.11a-High	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.35 dBm 5.238380000 GHz OBW: 17.280000000 MHz Temp 1 [T1] -32.78 dBm 5.231300000 GHz Temp 2 [T1] -32.78 dBm 5.248580000 GHz Center 5.24 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:38:45

802.11n-HT20-Low	 Ref: 20 dBm •Att: 30 dB •RBW: 300 kHz •VBW: 1 MHz Marker 1 [T1] -1.53 dBm 5.182190000 GHz OSW: 10.36000000 MHz Temp 1 [T1] -10.79 dBm 5.170790000 GHz Temp 2 [T1] -10.44 dBm 5.189150000 GHz Center 5.18 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:41:12
802.11n-HT20-Middle	 Ref: 20 dBm •Att: 30 dB •RBW: 300 kHz •VBW: 1 MHz Marker 1 [T1] -1.99 dBm 5.192950000 GHz OSW: 10.36000000 MHz Temp 1 [T1] -11.69 dBm 5.190790000 GHz Temp 2 [T1] -11.48 dBm 5.209150000 GHz Center 5.2 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:41:43
802.11n-HT20-High	 Ref: 20 dBm •Att: 30 dB •RBW: 300 kHz •VBW: 1 MHz Marker 1 [T1] -2.93 dBm 5.235410000 GHz OSW: 10.36000000 MHz Temp 1 [T1] -10.82 dBm 5.230760000 GHz Temp 2 [T1] -10.82 dBm 5.249120000 GHz Center 5.24 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 10:42:13

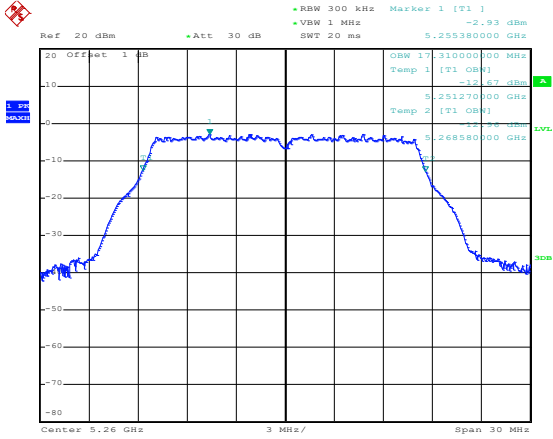
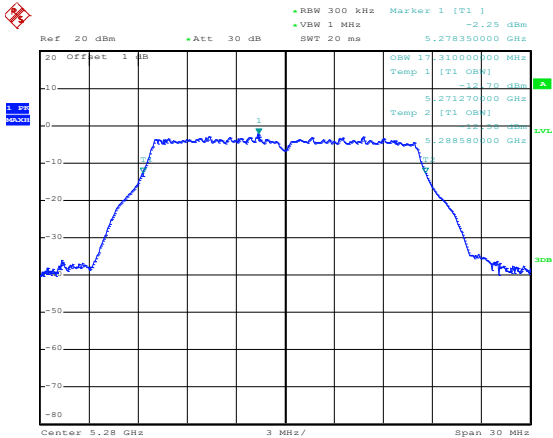
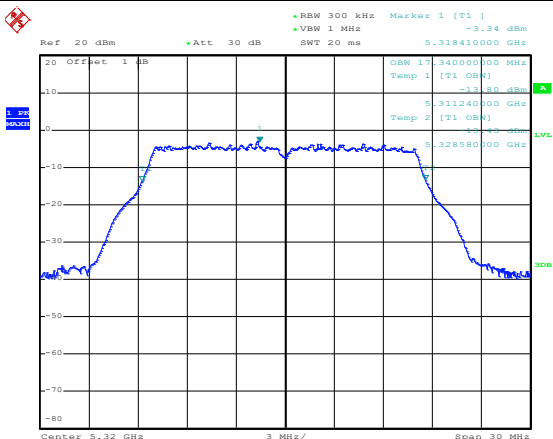
802.11n-HT40-Low

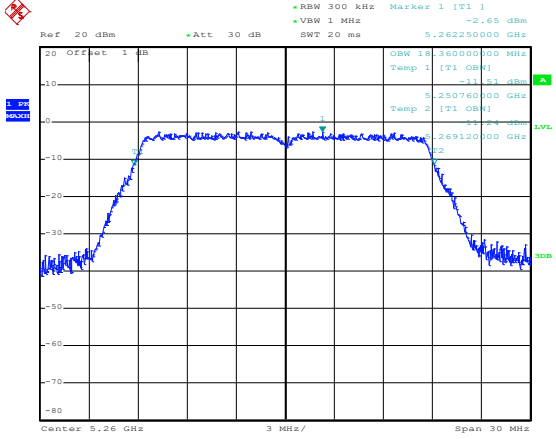
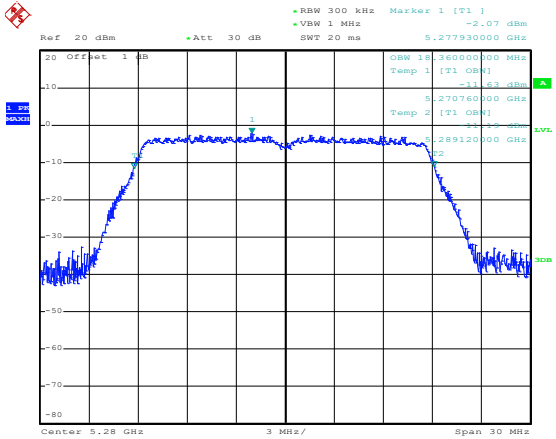
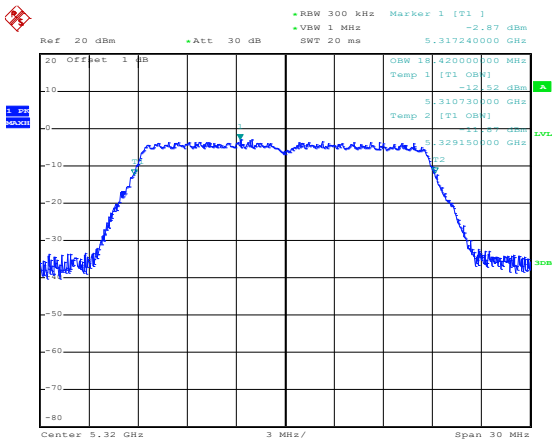


802.11n-HT40-High

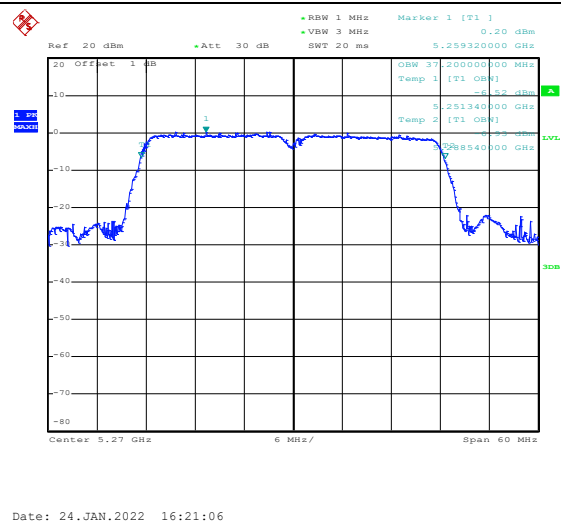


5250-5350MHz

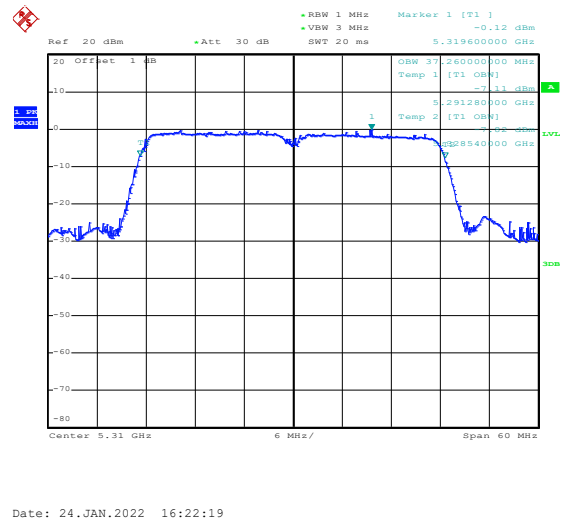
802.11a-Low	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.93 dBm 5.255380000 GHz OSW: 17.310000000 MHz Temp 1 [T1] -32.67 dBm 5.251270000 GHz Temp 2 [T1] -32.67 dBm 5.268580000 GHz Center: 5.26 GHz 3 MHz/ Span: 30 MHz Date: 24.JAN.2022 14:50:56
802.11a-Middle	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.25 dBm 5.278350000 GHz OSW: 17.310000000 MHz Temp 1 [T1] -32.71 dBm 5.271270000 GHz Temp 2 [T1] -32.67 dBm 5.288580000 GHz Center: 5.28 GHz 3 MHz/ Span: 30 MHz Date: 24.JAN.2022 14:51:30
802.11a-High	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -3.24 dBm 5.318430000 GHz OSW: 17.340000000 MHz Temp 1 [T1] -33.60 dBm 5.311240000 GHz Temp 2 [T1] -33.43 dBm 5.328580000 GHz Center: 5.32 GHz 3 MHz/ Span: 30 MHz Date: 24.JAN.2022 14:52:09

802.11n-HT20-Low	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.65 dBm 5.262250000 GHz OSW: 10.36000000 MHz Temp 1 [T1] -11.51 dBm 5.250760000 GHz Temp 2 [T1] -11.54 dBm 5.269120000 GHz Center 5.26 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:54:04
802.11n-HT20-Middle	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.07 dBm 5.277930000 GHz OSW: 10.36000000 MHz Temp 1 [T1] -11.63 dBm 5.270760000 GHz Temp 2 [T1] -11.66 dBm 5.289120000 GHz Center 5.28 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:54:26
802.11n-HT20-High	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -2.87 dBm 5.317240000 GHz OSW: 10.42000000 MHz Temp 1 [T1] -12.52 dBm 5.310730000 GHz Temp 2 [T1] -12.87 dBm 5.329150000 GHz Center 5.32 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 14:55:04

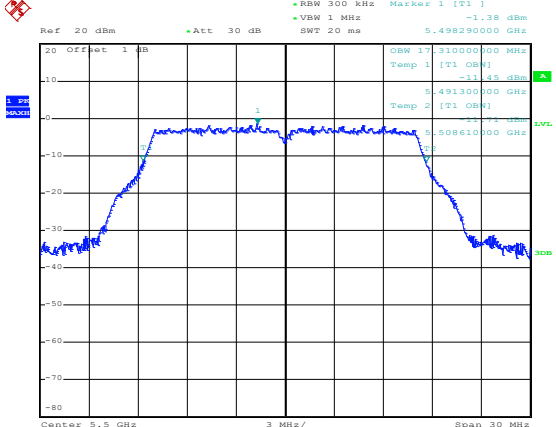
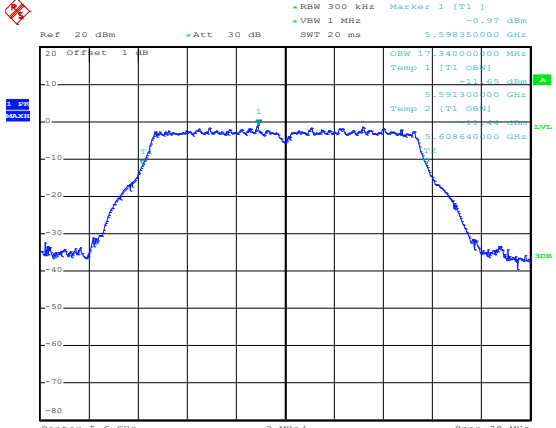
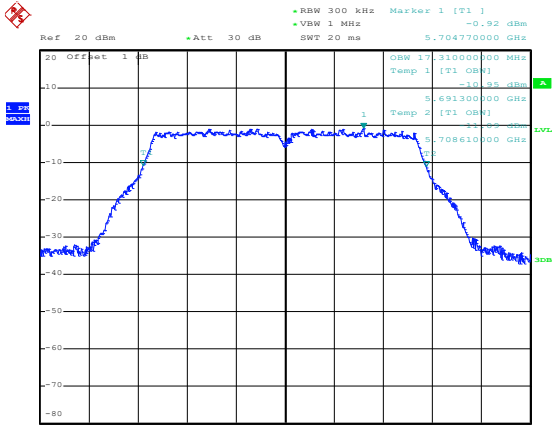
802.11n-HT40-Low

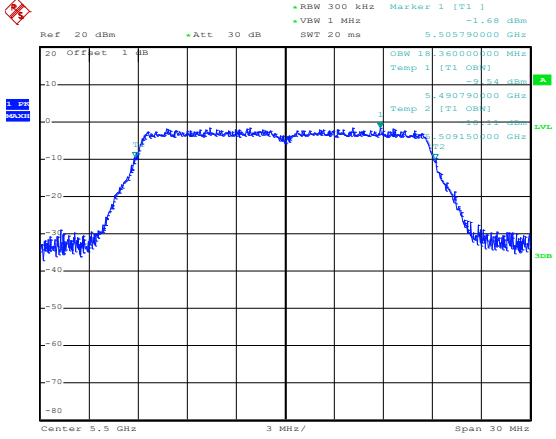
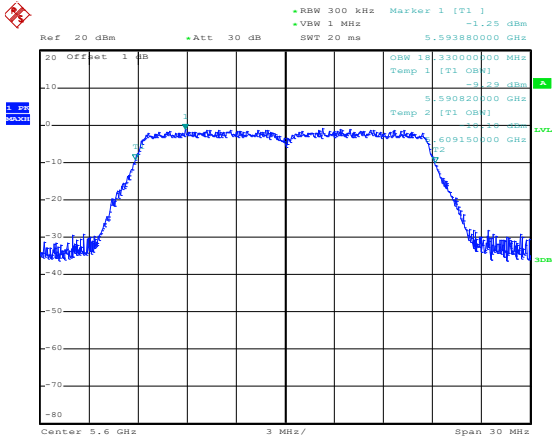
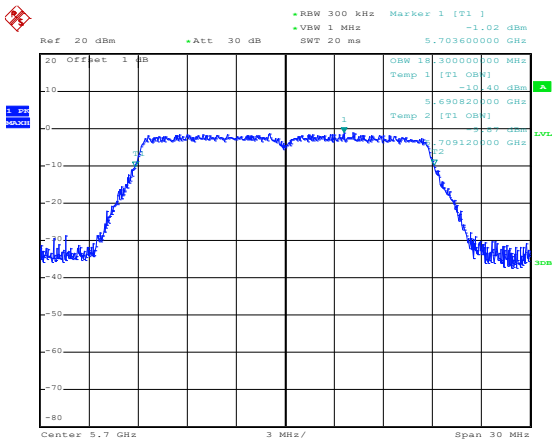


802.11n-HT40-High

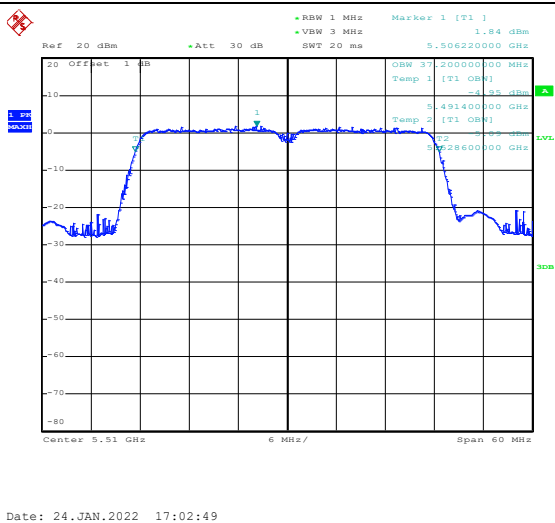


5470-5725MHz

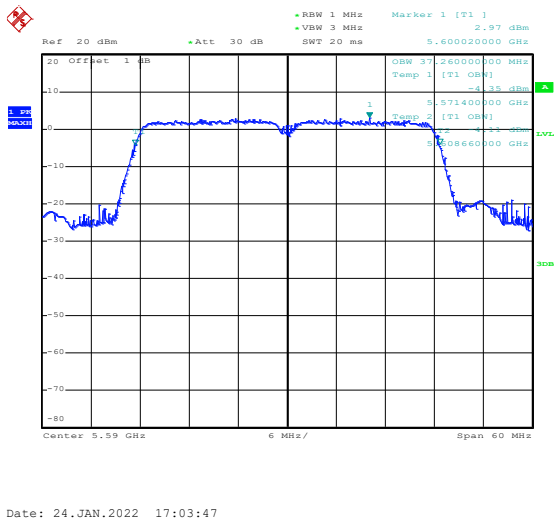
802.11a-Low	 Date: 24.JAN.2022 15:46:00
802.11a-Middle	 Date: 24.JAN.2022 15:46:29
802.11a-High	 Date: 24.JAN.2022 15:46:58

802.11n-HT20-Low	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -1.68 dBm OSW: 10.36000000 MHz Temp 1 [T1] -5.54 dBm 5.49079000 GHz Temp 2 [T1] -5.54 dBm 5.50915000 GHz Center 5.5 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 15:49:01
802.11n-HT20-Middle	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -1.25 dBm OSW: 10.33000000 MHz Temp 1 [T1] -5.22 dBm 5.59082000 GHz Temp 2 [T1] -5.22 dBm 5.60915000 GHz Center 5.6 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 15:49:26
802.11n-HT20-High	 Ref: 20 dBm Att: 30 dB RBW: 300 kHz VBW: 1 MHz SWT: 20 ms Marker 1 [T1] -1.02 dBm OSW: 10.30000000 MHz Temp 1 [T1] -5.40 dBm 5.69082000 GHz Temp 2 [T1] -5.40 dBm 5.70912000 GHz Center 5.7 GHz 3 MHz/ Span 30 MHz Date: 24.JAN.2022 15:49:52

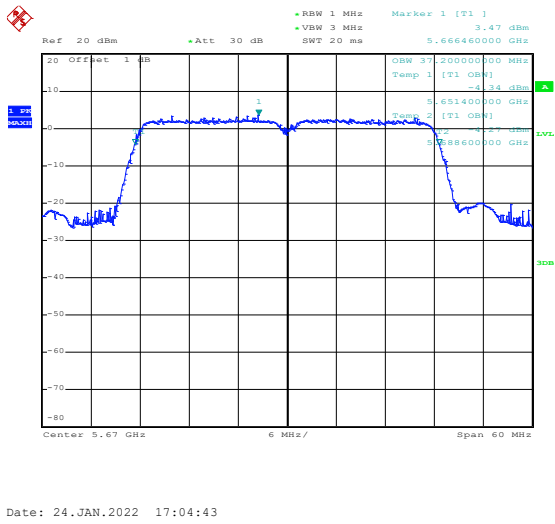
802.11n-HT40-Low



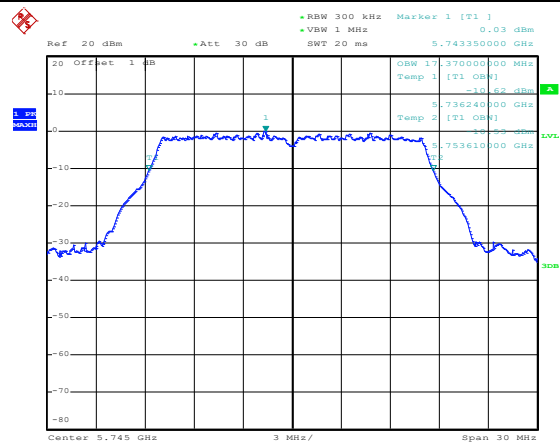
802.11n-HT40- Middle



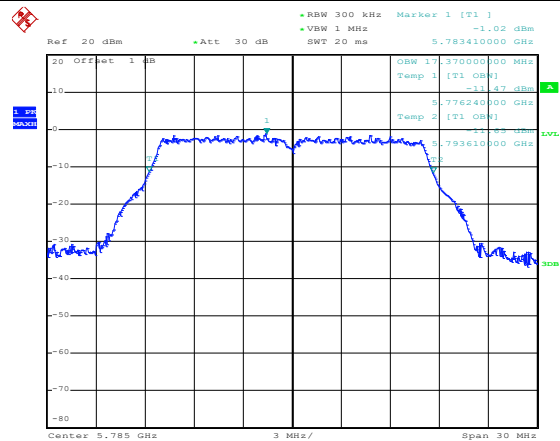
802.11n-HT40-High



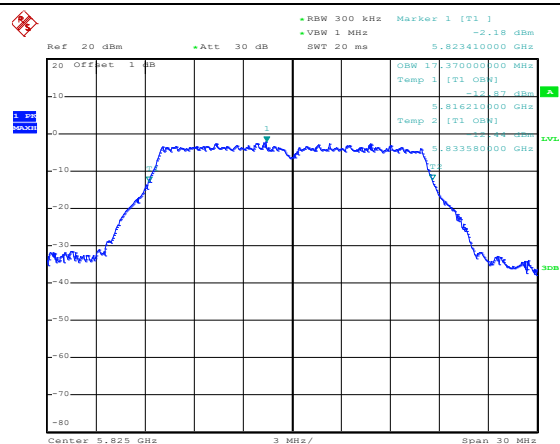
5725-5850MHz



Date: 24.JAN.2022 11:57:45



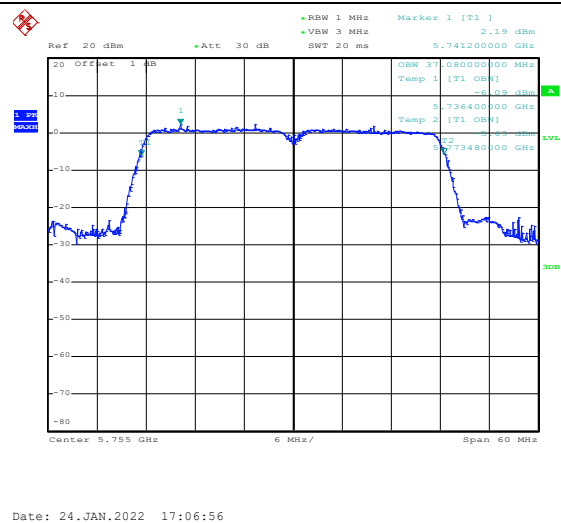
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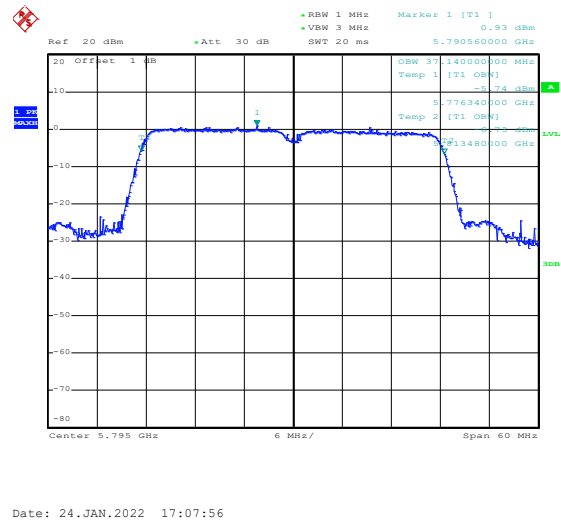
Date: 24.JAN.2022 11:59:13



802.11n-HT40-Low



802.11n-HT40-High



APPENDIX C

Maximum Conducted Output Power

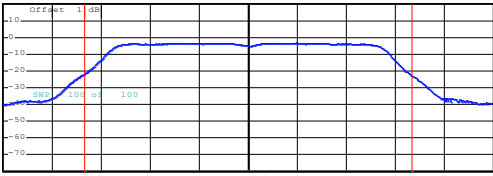
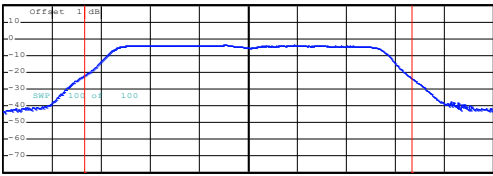
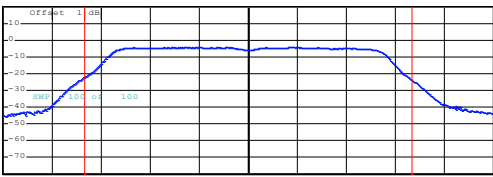
U-NII-1:5150-5250MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5180	7.51	23.98
	5200	7.00	23.98
	5240	6.59	23.98
802.11n-HT20	5180	7.23	23.98
	5200	6.93	23.98
	5240	6.27	23.98
802.11n-HT40	5190	7.03	23.98
	5230	6.29	23.98

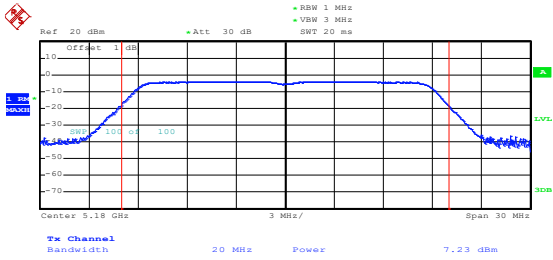
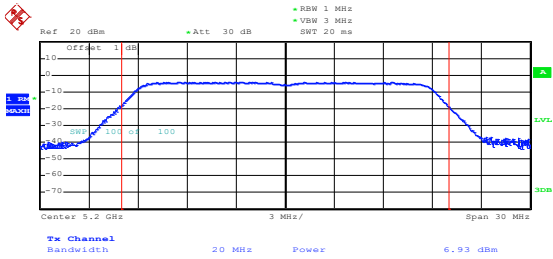
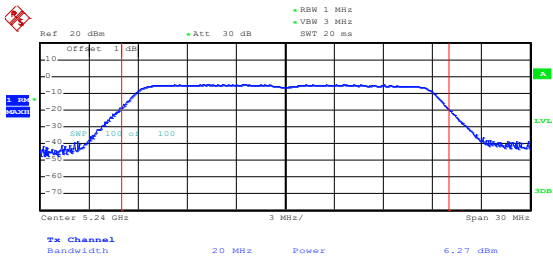
U-NII-2A: 5250-5350MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5260	6.26	23.98
	5280	6.41	23.98
	5320	5.80	23.98
802.11n-HT20	5260	6.26	23.98
	5280	5.83	23.98
	5320	5.38	23.98
802.11n-HT40	5270	6.08	23.98
	5310	5.42	23.98

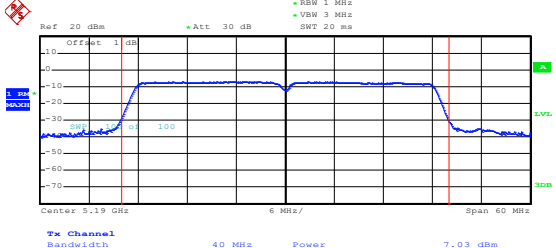
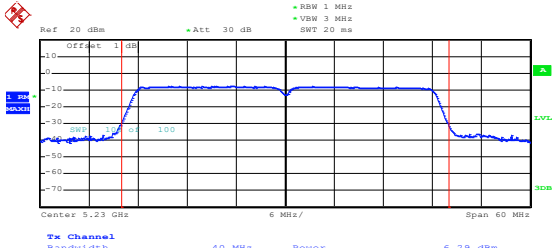
U-NII-2C: 5470-5725MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5500	7.25	23.98
	5600	7.41	23.98
	5700	7.92	23.98
802.11n-HT20	5500	7.15	23.98
	5600	7.79	23.98
	5700	7.80	23.98
802.11n-HT40	5510	7.70	23.98
	5590	8.85	23.98
	5670	8.93	23.98

U-NII-3: 5725-5850MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5745	8.53	30.00
	5785	7.63	30.00
	5825	6.31	30.00
802.11n-HT20	5745	8.36	30.00
	5785	7.50	30.00
	5825	6.57	30.00
802.11n-HT40	5755	8.31	30.00
	5795	7.23	30.00

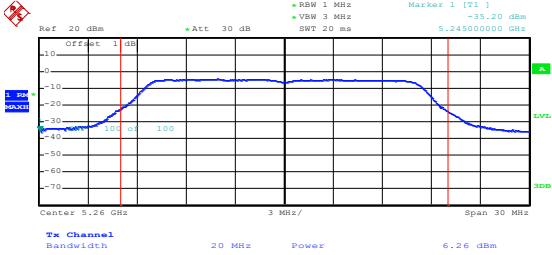
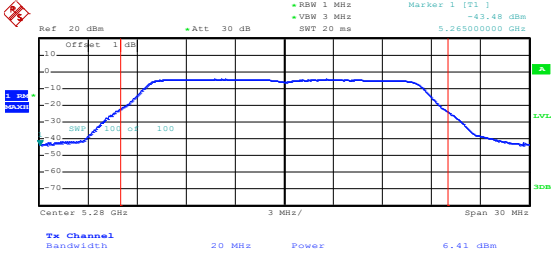
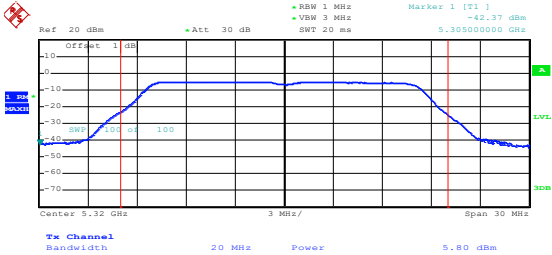
5150-5250MHz

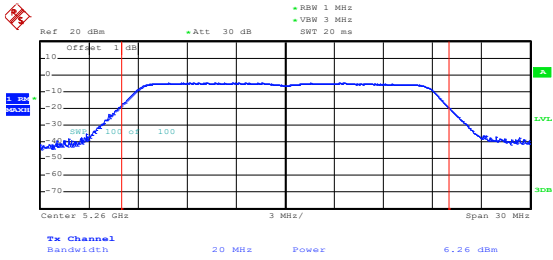
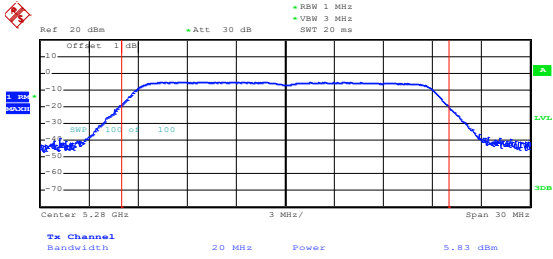
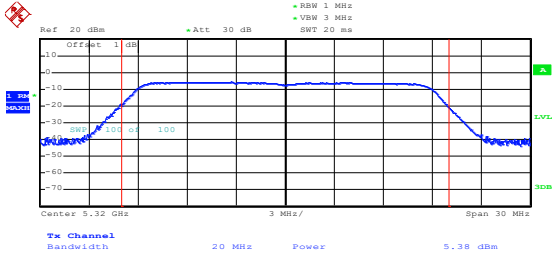
802.11a-Low	 Ref 20 dBm • Att 30 dB • RBW 1 MHz • VSW 3 MHz • SWT 20 ms Offset 1 dB Center 5.18 GHz 3 MHz/ Span 30 MHz Tx Channel Bandwidth 20 MHz Power 7.51 dBm Date: 24.JAN.2022 09:08:44
802.11a-Middle	 Ref 20 dBm • Att 30 dB • RBW 1 MHz • VSW 3 MHz • SWT 20 ms Offset 1 dB Center 5.2 GHz 3 MHz/ Span 30 MHz Tx Channel Bandwidth 20 MHz Power 7.00 dBm Date: 24.JAN.2022 09:10:28
802.11a-High	 Ref 20 dBm • Att 30 dB • RBW 1 MHz • VSW 3 MHz • SWT 20 ms Offset 1 dB Center 5.24 GHz 3 MHz/ Span 30 MHz Tx Channel Bandwidth 20 MHz Power 6.99 dBm Date: 24.JAN.2022 09:11:29

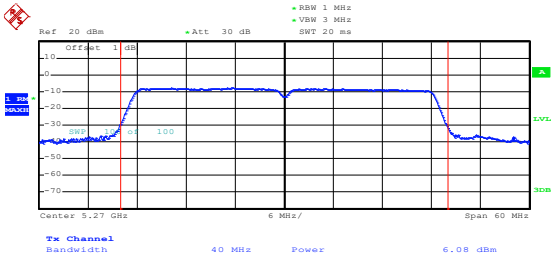
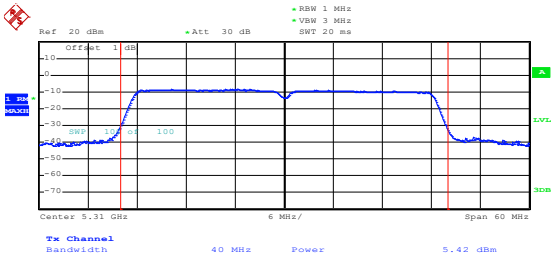
802.11n-HT20-Low	 Ref 20 dBm Att 30 dB RBW 1 MHz VSW 3 MHz SWT 20 ms Offset 1 dB Center 5.18 GHz 3 MHz/ Span 30 MHz Tx Channel Bandwidth 20 MHz Power 7.23 dBm Date: 24.JAN.2022 09:17:37
802.11n-HT20-Middle	 Ref 20 dBm Att 30 dB RBW 1 MHz VSW 3 MHz SWT 20 ms Offset 1 dB Center 5.2 GHz 3 MHz/ Span 30 MHz Tx Channel Bandwidth 20 MHz Power 6.93 dBm Date: 24.JAN.2022 09:18:10
802.11n-HT20-High	 Ref 20 dBm Att 30 dB RBW 1 MHz VSW 3 MHz SWT 20 ms Offset 1 dB Center 5.24 GHz 3 MHz/ Span 30 MHz Tx Channel Bandwidth 20 MHz Power 6.27 dBm Date: 24.JAN.2022 09:18:48

802.11n-HT40-Low	 Date: 24.JAN.2022 15:58:24
802.11n-HT40-High	 Date: 24.JAN.2022 15:57:28

5250-5350MHz

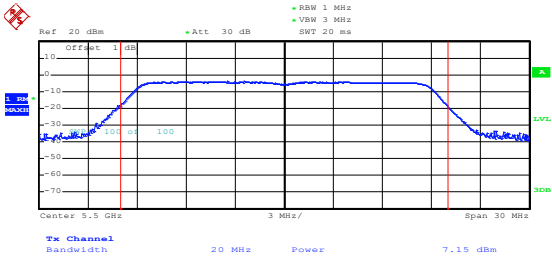
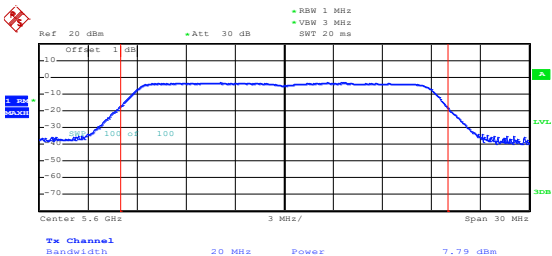
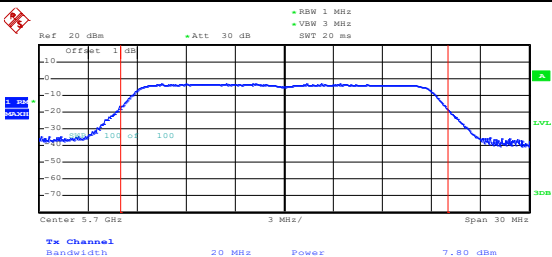
802.11a-Low	 Ref: 20 dBm •Att: 30 dB •RBW 1 MHz •VBW 3 MHz Marker 1 [T1] -35.20 dBm 5.245000000 GHz SWT 20 ms Offset 1 dB Center 5.26 GHz 3 MHz/ Span 30 MHz Tx Channel Bandwidth 20 MHz Power 6.26 dBm Date: 24.JAN.2022 13:56:11
802.11a-Middle	 Ref: 20 dBm •Att: 30 dB •RBW 1 MHz •VBW 3 MHz Marker 1 [T1] -43.48 dBm 5.265000000 GHz SWT 20 ms Offset 1 dB Center 5.28 GHz 3 MHz/ Span 30 MHz Tx Channel Bandwidth 20 MHz Power 6.41 dBm Date: 24.JAN.2022 13:57:18
802.11a-High	 Ref: 20 dBm •Att: 30 dB •RBW 1 MHz •VBW 3 MHz Marker 1 [T1] -42.37 dBm 5.305000000 GHz SWT 20 ms Offset 1 dB Center 5.32 GHz 3 MHz/ Span 30 MHz Tx Channel Bandwidth 20 MHz Power 5.80 dBm Date: 24.JAN.2022 13:58:05

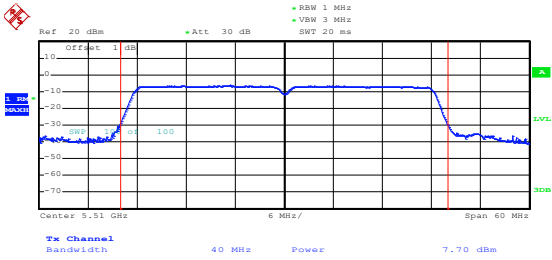
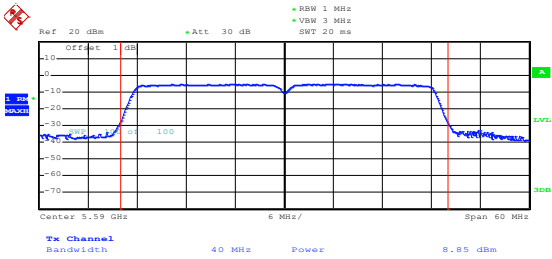
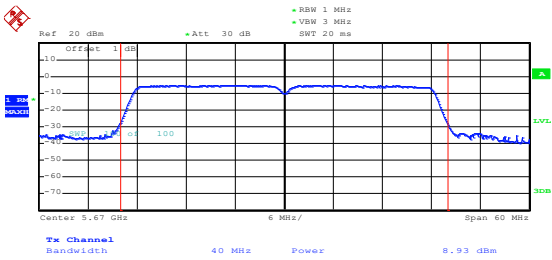
802.11n-HT20-Low	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VSW: 3 MHz SWR: 20 ms Offset: 1 dB Center: 5.26 GHz Span: 30 MHz Tx Channel Bandwidth: 20 MHz Power: 6.26 dBm Date: 24.JAN.2022 14:09:58
802.11n-HT20-Middle	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VSW: 3 MHz SWR: 20 ms Offset: 1 dB Center: 5.28 GHz Span: 30 MHz Tx Channel Bandwidth: 20 MHz Power: 5.83 dBm Date: 24.JAN.2022 14:11:45
802.11n-HT20-High	 Ref: 20 dBm Att: 30 dB RBW: 1 MHz VSW: 3 MHz SWR: 20 ms Offset: 1 dB Center: 5.32 GHz Span: 30 MHz Tx Channel Bandwidth: 20 MHz Power: 5.38 dBm Date: 24.JAN.2022 14:12:24

802.11n-HT40-Low	 Ref 20 dBm Offset 1 dB Att 30 dB RBW 1 MHz VBW 3 MHz SWT 20 ms Center 5.27 GHz 6 MHz/ Span 60 MHz Tx Channel Bandwidth 40 MHz Power 6.08 dBm Date: 24.JAN.2022 16:25:44
802.11n-HT40-High	 Ref 20 dBm Offset 1 dB Att 30 dB RBW 1 MHz VBW 3 MHz SWT 20 ms Center 5.31 GHz 6 MHz/ Span 60 MHz Tx Channel Bandwidth 40 MHz Power 5.42 dBm Date: 24.JAN.2022 16:26:26

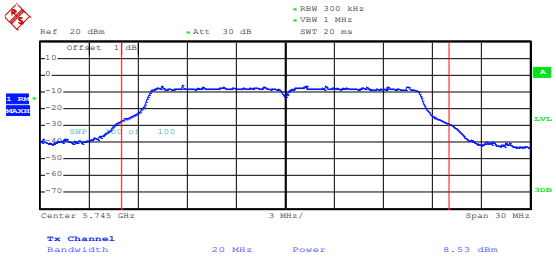
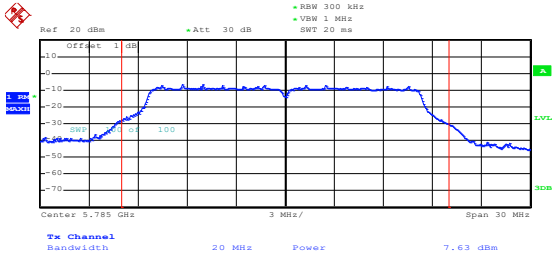
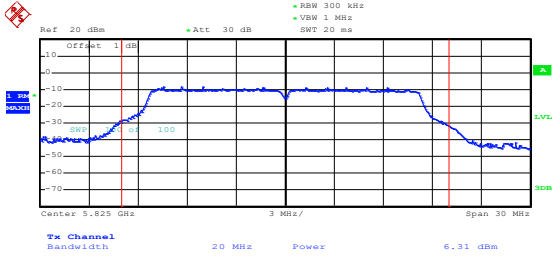
5470-5725MHz

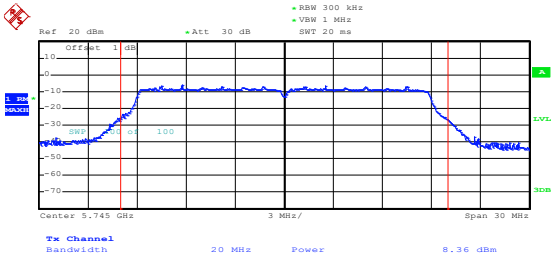
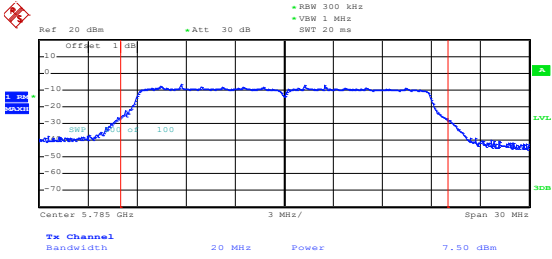
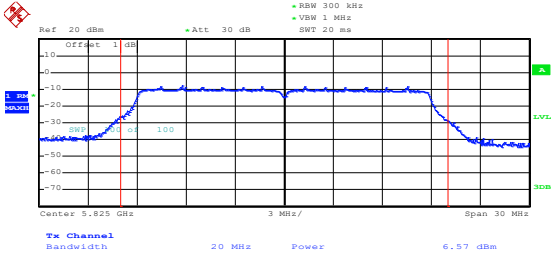
802.11a-Low	Date: 24.JAN.2022 15:04:20
802.11a-Middle	Date: 24.JAN.2022 15:05:04
802.11a-High	Date: 24.JAN.2022 15:05:32

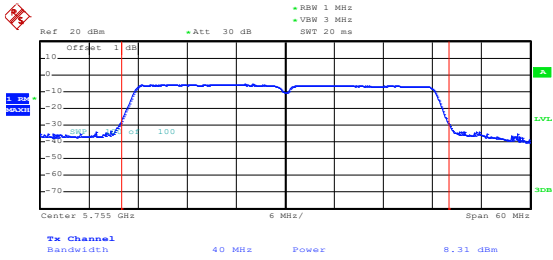
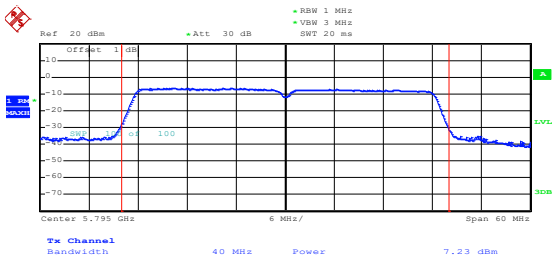
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802.11n-HT20-Middle	 Date: 24.JAN.2022 15:08:14
802.11n-HT20-High	 Date: 24.JAN.2022 15:08:40

802.11n-HT40-Low	 Date: 24.JAN.2022 16:54:05
802.11n-HT40- Middle	 Date: 24.JAN.2022 16:54:49
802.11n-HT40-High	 Date: 24.JAN.2022 16:55:34

5725-5850MHz

802.11a-Low	 Date: 24.JAN.2022 17:52:21
802.11a-Middle	 Date: 24.JAN.2022 17:51:17
802.11a-High	 Date: 24.JAN.2022 17:51:52

802.11n-HT20-Low	 Date: 24.JAN.2022 17:54:38
802.11n-HT20-Middle	 Date: 24.JAN.2022 17:55:45
802.11n-HT20-High	 Date: 24.JAN.2022 17:56:19

802.11n-HT40-Low	 Ref 20 dBm Offset 1 dB Att 30 dB RBW 1 MHz VBW 3 MHz SWT 20 ms Center 5.795 GHz Span 60 MHz Tx Channel Bandwidth 40 MHz Power 8.31 dBm Date: 24.JAN.2022 17:57:47
802.11n-HT40-High	 Ref 20 dBm Offset 1 dB Att 30 dB RBW 1 MHz VBW 3 MHz SWT 20 ms Center 5.795 GHz Span 60 MHz Tx Channel Bandwidth 40 MHz Power 7.23 dBm Date: 24.JAN.2022 17:58:17

APPENDIX D

Frequency Stability

U-NII-1:5150-5250MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VAC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	24	-30	1600	0.3077
100%		-20	1582	0.3042
100%		-10	1600	0.3077
100%		0	1595	0.3067
100%		+10	1588	0.3054
100%		+20	1586	0.3050
100%		+30	1585	0.3048
100%		+40	1597	0.3071
100%		+50	1585	0.3048
Low power	21.6	+20	1600	0.3077
High power	26.4	+20	1582	0.3042

U-NII-2A: 5250-5350MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VAC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	24	-30	1598	0.3027
100%		-20	1582	0.2996
100%		-10	1588	0.3008
100%		0	1589	0.3009
100%		+10	1589	0.3009
100%		+20	1585	0.3002
100%		+30	1592	0.3015
100%		+40	1594	0.3019
100%		+50	1594	0.3019
Low power	21.6	+20	1598	0.3027
High power	26.4	+20	1582	0.2996

U-NII-2C: 5470-5725MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VAC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	24	-30	1596	0.2850
100%		-20	1600	0.2857
100%		-10	1591	0.2841
100%		0	1583	0.2827
100%		+10	1589	0.2838
100%		+20	1581	0.2823
100%		+30	1581	0.2823
100%		+40	1591	0.2841
100%		+50	1593	0.2845
Low power	21.6	+20	1596	0.2850
High power	26.4	+20	1600	0.2857

U-NII-3:5725-5850MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VAC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	24	-30	1589	0.2747
100%		-20	1595	0.2757
100%		-10	1582	0.2735
100%		0	1589	0.2747
100%		+10	1580	0.2731
100%		+20	1599	0.2764
100%		+30	1588	0.2745
100%		+40	1591	0.2750
100%		+50	1580	0.2731
Low power	21.6	+20	1589	0.2747
High power	26.4	+20	1595	0.2757

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

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