

TEST REPORT

Reference No...... : WTX22X12264635W006
FCC ID : 2A96I-UA100
Applicant : Shanghai UniOne Science&Technology CO., Ltd.
Address..... : Building 4, No.651 Wanfang Road, Pujiang Town, Minhang District, Shanghai
Manufacturer : The same as Applicant
Address..... : The same as Applicant
Product Name : Rugged Android Tablet
Model No...... : UA100 (Scan)
Standards : FCC Part 15.247
Date of Receipt sample : 2022-12-30
Date of Test..... : 2022-12-30 to 2023-05-09
Date of Issue : 2023-05-10
Test Report Form No. : WTX_Part 15_247W
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:

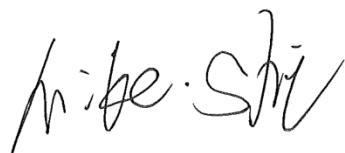
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Report version

Version No.	Date of issue	Description
Rev.00	2023-05-10	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Rugged Android Tablet
Trade Name:	/
Model No.:	UA100 (Scan)
Adding Model(s):	UA100(Standard)
Rated Voltage:	DC3.8V
Battery:	9200mAh
Adapter Model:	/
<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 UA100 (Scan), but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20) 2422-2452MHz for 802.11n(HT40)
RF Output Power:	Antenna 1: 16.48dBm (Conducted) Antenna 2: 15.29dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Quantity of Channels:	11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	FPC Antenna
Antenna Gain:	Antenna 1: 1.36dBi Antenna 2: -4.56dBi

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

558074 D01 15.247 Meas Guidance v05r02: Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under section 15.247 of the Fcc rules.

662911 D01 Multiple Transmitter Output v02r01: Emissions Testing of Transmitters with Multiple Outputs in the Same Band.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

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, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 662911 D01 Multiple Transmitter Output 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 Test Facility

Address of the test laboratory

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

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

FCC – Registration No.: 125990

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

Industry Canada (IC) Registration No.: 11464A

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

1.5 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	802.11b	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM2	802.11g	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM3	802.11n-HT20	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM4	802.11n-HT40	Low:2422MHz, Middle:2437MHz,High:2452MHz
Note: The 2.4GHz WIFI has two antennas and support Multiple Outputs for 802.11n mode for this report; Antenna 1 Gain is 1.36dBi; Antenna 2 Gain is -4.56dBi; For this function is belong to Correlated Categorization equipment. According to KDB 662911, Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$ dBi = 1.91 dBi		

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

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

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

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Computer	Lenovo	L13 Yoga	/
Adapter	/	ASUC71w-050912300	/

1.6 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 $\pm 3.84\text{dB}$
		6-26GHz $\pm 3.92\text{dB}$

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
SEMT-1075	Communication Tester	Rohde & Schwarz	CMW500	148650	2022-03-22	2023-03-21
SEMT-1063	GSM Tester	Rohde & Schwarz	CMU200	114403	2022-03-22	2023-03-21
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2022-03-25	2023-03-24
SEMT-1079	Spectrum Analyzer	Agilent	N9020A	US47140102	2022-03-22	2023-03-21
SMET-1313	Spectrum Analyzer	Agilent	N9020A	MY54320548	2022-03-22	2023-03-21
SEMT-1080	Signal Generator	Agilent	83752A	3610A01453	2022-03-22	2023-03-21
SEMT-1081	Vector Signal Generator	Agilent	N5182A	MY47070202	2022-03-22	2023-03-21
SEMT-1028	Power Divider	Weinschel	1506A	PM204	2022-03-22	2023-03-21
SEMT-1082	Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2022-03-22	2023-03-21
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	2022-03-22	2023-03-21
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2022-03-22	2023-03-21
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2022-01-07	2023-01-06
					2022-12-30	2023-12-29
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2023-03-19
SEMT-1068	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2021-03-20	2023-03-19
☒ Chamber A: Above 1GHz						
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2022-03-22	2023-03-21

SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2022-03-22	2023-03-21
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2022-03-22	2023-03-21
SEMT-1042	Horn Antenna	ETS	3117	00086197	2021-03-19	2023-03-18
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2021-04-27	2023-04-26
SEMT-1216	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2022-03-25	2023-03-24
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2022-03-22	2023-03-21
☐ 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	2022-03-22	2023-03-21
SEMT-1066	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2022-03-22	2023-03-21
☐ Chamber C:Below 1GHz						
SEMT-1319	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2022-01-07	2023-01-06
					2022-12-30	2023-12-29
SEMT-1343	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2023-05-27
SEMT-1333	Amplifier	HP	8447F	2944A03869	2022-03-22	2023-03-21
☒ Conducted Room 1#						
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2022-03-21	2023-03-20
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2022-03-25	2023-03-24
SEMT-1003	AC LISN	Schwarz beck	NSLK8126	8126-224	2022-03-22	2023-03-21
☐ Conducted Room 2#						
SEMT-1334	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2022-03-22	2023-03-21
SEMT-1336	LISN	Rohde & Schwarz	ENV 216	100097	2022-03-22	2023-03-21

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24

WTXE1005A 1005	Spectrum Analyzer	Agilent	N9020A	US471401 02	2023-02-25	2024-02-24
WTXE1084A 1001	Spectrum Analyzer	Agilent	N9020A	MY543205 48	2023-02-25	2024-02-24
WTXE1004A 1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
☒ Chamber A: Below 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007A 1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1007A 1001	Amplifier	HP	8447F	2805A034 75	2023-02-25	2024-02-24
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1010A 1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☒ Chamber A: Above 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007A 1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1065A 1001	Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
WTXE1010A 1005	Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐ Chamber B:Below 1GHz						
WTXE1010A 1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
WTXE1038A 1001	Amplifier	Agilent	8447D	2944A101 79	2023-02-25	2024-02-24
WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☐ Chamber C:Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1010A	Trilog	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27

Reference No.: WTX22X12264635W006

1013-1	Broadband Antenna					
WTXE1007A 1002	Amplifier	HP	8447F	2944A038 69	2023-02-25	2024-02-24
☐ Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1103A 1005	Horn Antenna	POAM	RTF-11A	LP228060 221	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2023-02-25	2024-02-24
☒ Conducted Room 1#						
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
WTXE1002A 1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
WTXE1003A 1001	AC LISN	Schwarz beck	NSLK8126	8126-224	2023-02-25	2024-02-24
☐ Conducted Room 2#						
WTXE1001A 1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24
WTXE1003A 1003	LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24

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; §15.247(b)(4)(i)	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§15.207(a)	Conducted Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.247(a)(2)	DTS Bandwidth	Compliant
§15.247(b)(3)	RF Output Power	Compliant
§15.209(a)	Radiated Emission	Compliant
§15.247(d)	Band Edge (Out of Band Emissions)	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

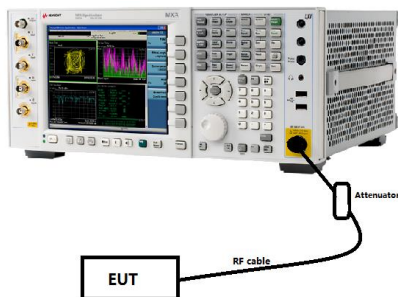
This product has two FPC Antennas, fulfill the requirement of this section.

4. Power Spectral Density

4.1 Standard Applicable

According to 15.247(a)(1)(iii), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

4.2 Test Setup Block Diagram



4.3 Test Procedure

According to the KDB 558074 D01 v05r02 Subclause 8.4 and ANSI C63.10-2013 Subclause 11.10.3, such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. The test method of power spectral density as below:

- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$.
- Set VBW $\geq 3 \times \text{RBW}$.
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- Sweep time = auto couple.
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.
- If measured value exceeds limit, reduce RBW (no less than 3kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

4.4 Summary of Test Results/Plots

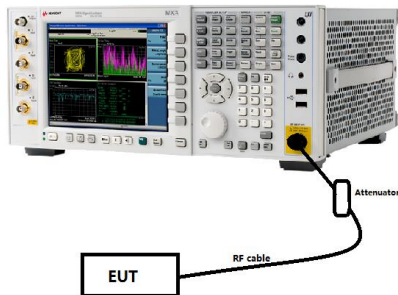
Please refer to Appendix A

5. DTS Bandwidth

5.1 Standard Applicable

According to 15.247(a)(2), systems using digital modulation techniques may operate in the 902–928MHz, 2400–2483.5MHz, and 5725–5850MHz bands. The minimum 6dB bandwidth shall be at least 500kHz.

5.2 Test Setup Block Diagram



5.3 Test Procedure

According to the KDB 558074 D01 v05r02 Subclause 8.2 and ANSI C63.10-2013 Subclause 11.8.1, the test method of DTS Bandwidth as below:

- a) Set RBW = 100kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

5.4 Summary of Test Results/Plots

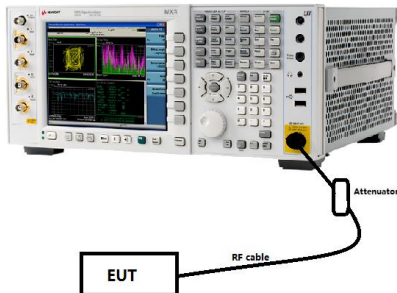
Please refer to Appendix B

6. RF Output Power

6.1 Standard Applicable

According to 15.247(b)(3), for systems using digital modulation in the 902–928MHz, 2400–2483.5MHz, and 5725–5850MHz bands: 1 Watt.

6.2 Test Setup Block Diagram



6.3 Test Procedure

According to the KDB-558074 D01 v05r02 Subclause 8.3.2.2 and ANSI C63.10-2013 Subclause 11.9.2.2, when this option is exercised, the measured power is to be referenced to the OBW rather than the DTS bandwidth

- Set span to at least 1.5 times the OBW.
- Set RBW = 1-5% of the OBW, not to exceed 1MHz.
- Set VBW $\geq 3 \times$ RBW.
- Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This gives bin-to-bin spacing $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto.
- Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- If transmit duty cycle $< 98\%$, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall 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 $\geq 98\%$, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
- Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

6.4 Summary of Test Results/Plots

Please refer to Appendix C

7. Field Strength of Spurious Emissions

7.1 Standard Applicable

According to §15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

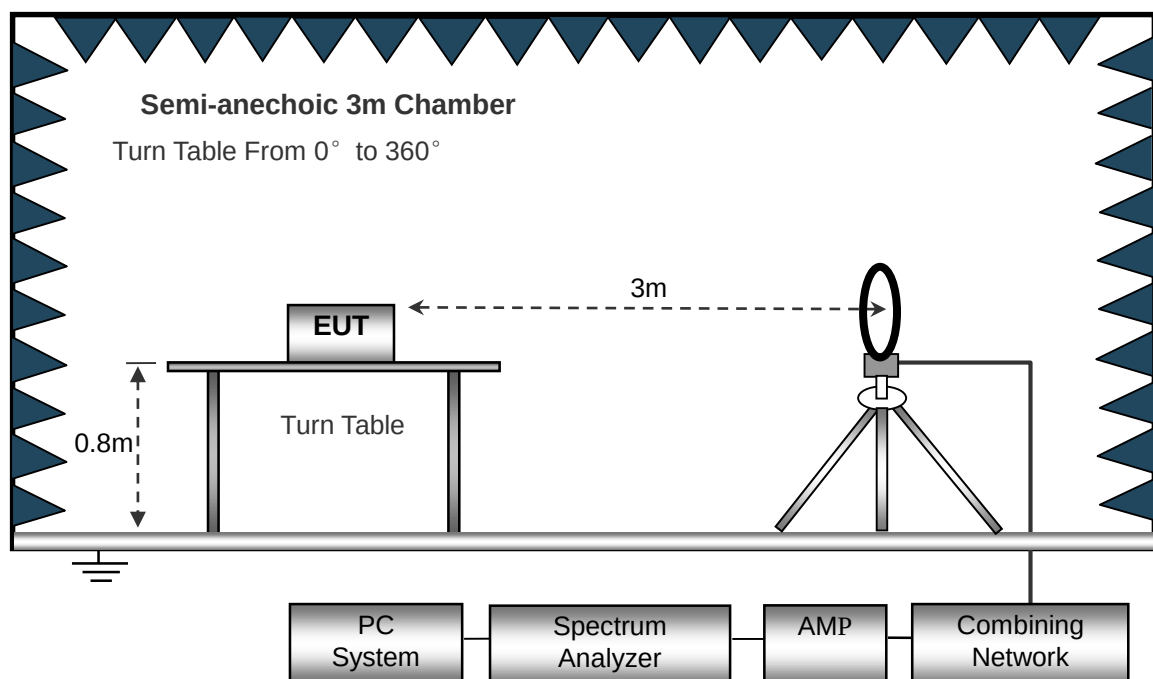
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

7.2 Test Procedure

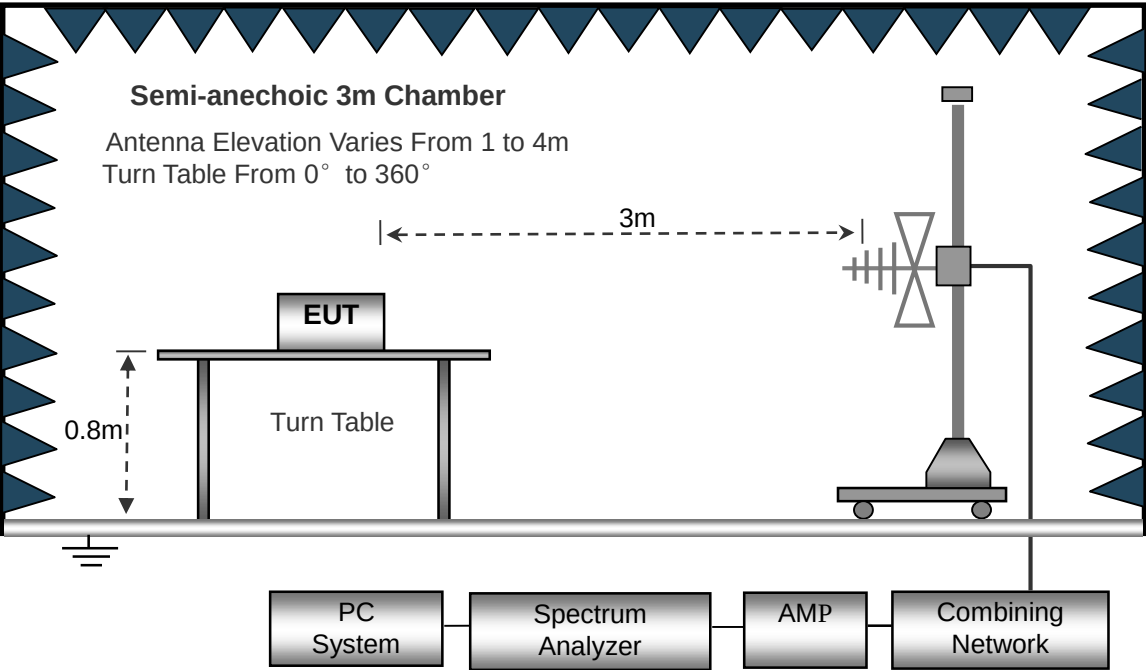
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.

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.

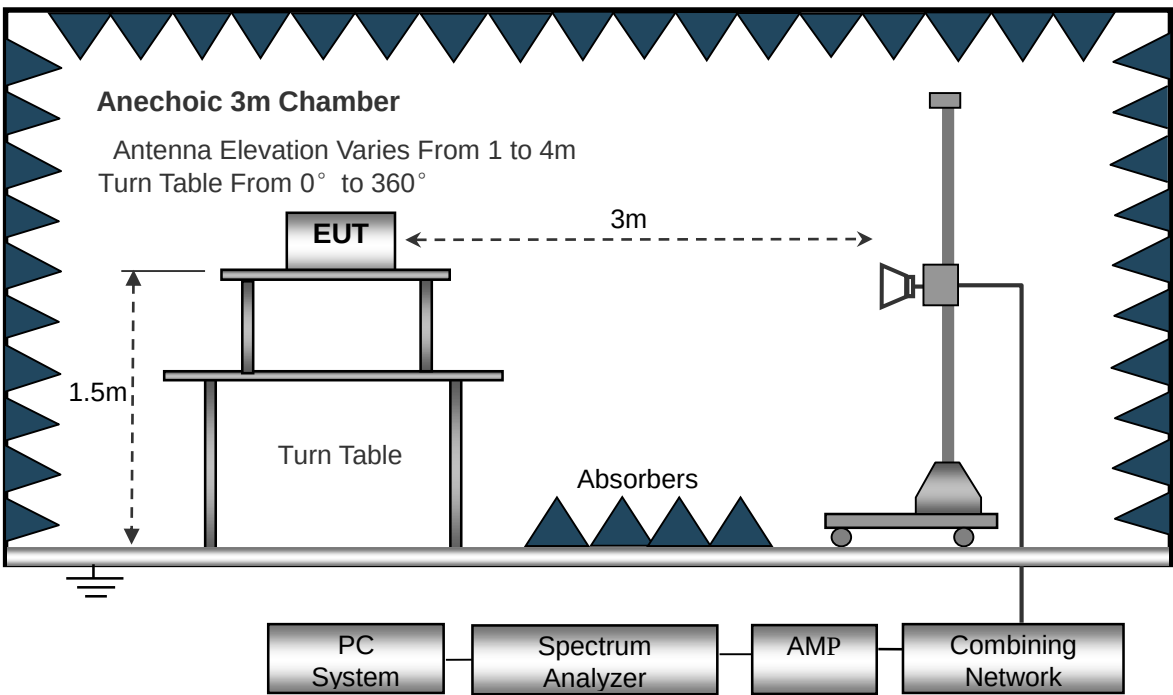
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1GHz.



Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

7.3 Corrected Amplitude & Margin Calculation

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

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

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

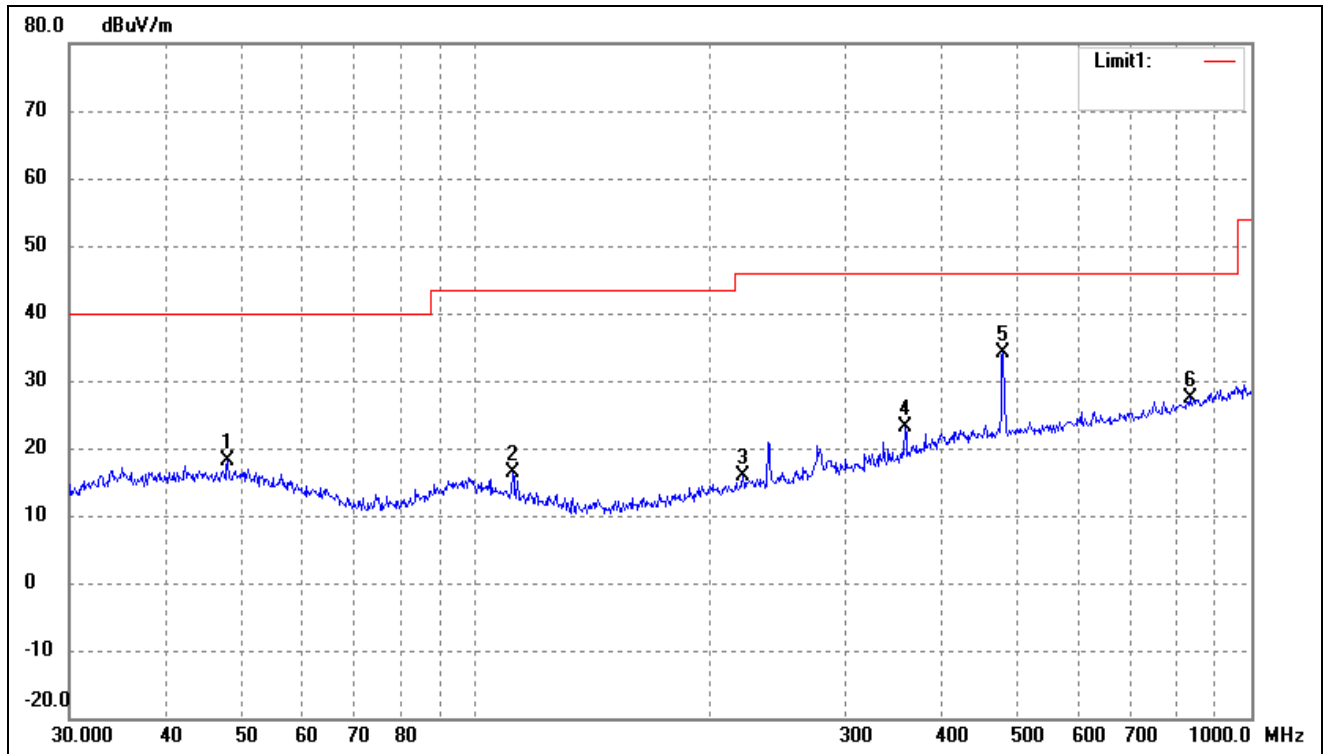
$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

7.4 Summary of Test Results/Plots

*Note: 1.This EUT was tested in 3 orthogonal positions and the worst case position data was reported.
All test modes (different data rate and different modulation) are performed, but only the worst case(802.11b_11Mbps) is recorded in this report.*

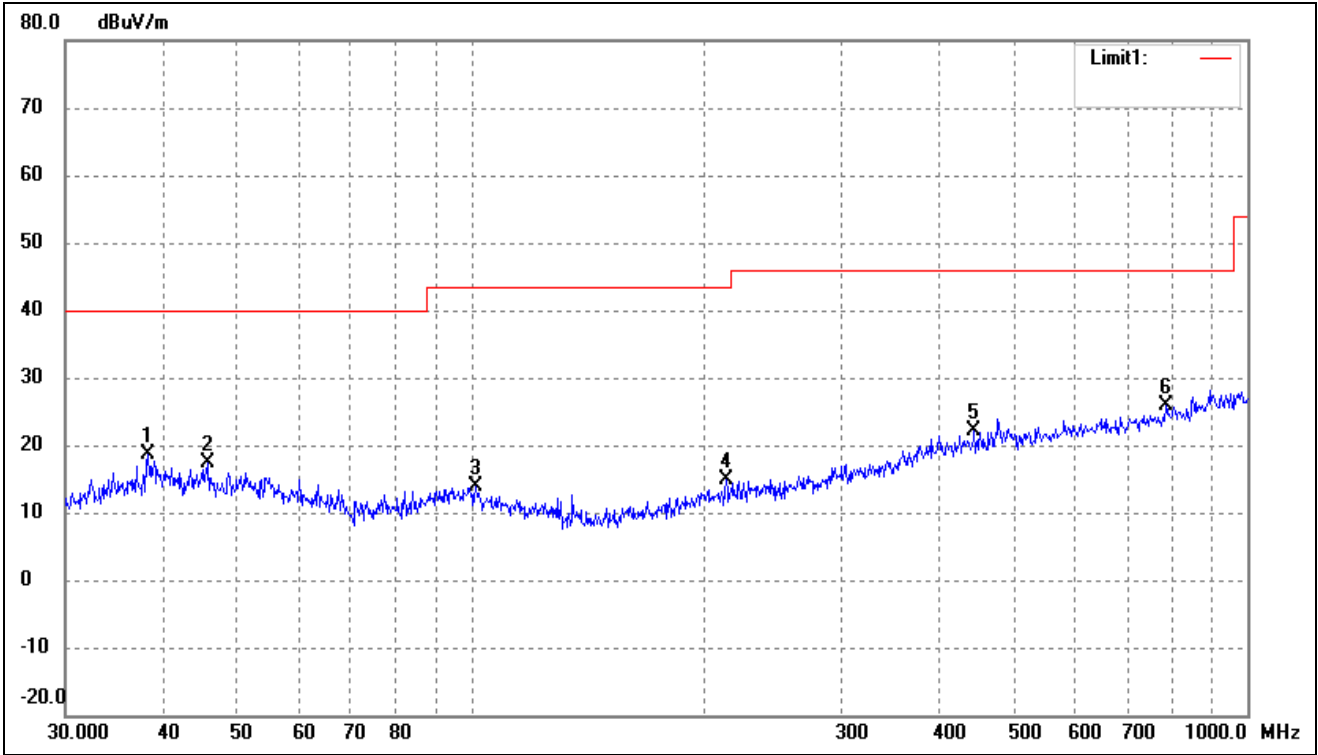
- Spurious Emissions Below 1GHz
- Worst case Antenna 1

802.11b_11Mbps			
Test Channel	Low	Polarity:	Horizontal



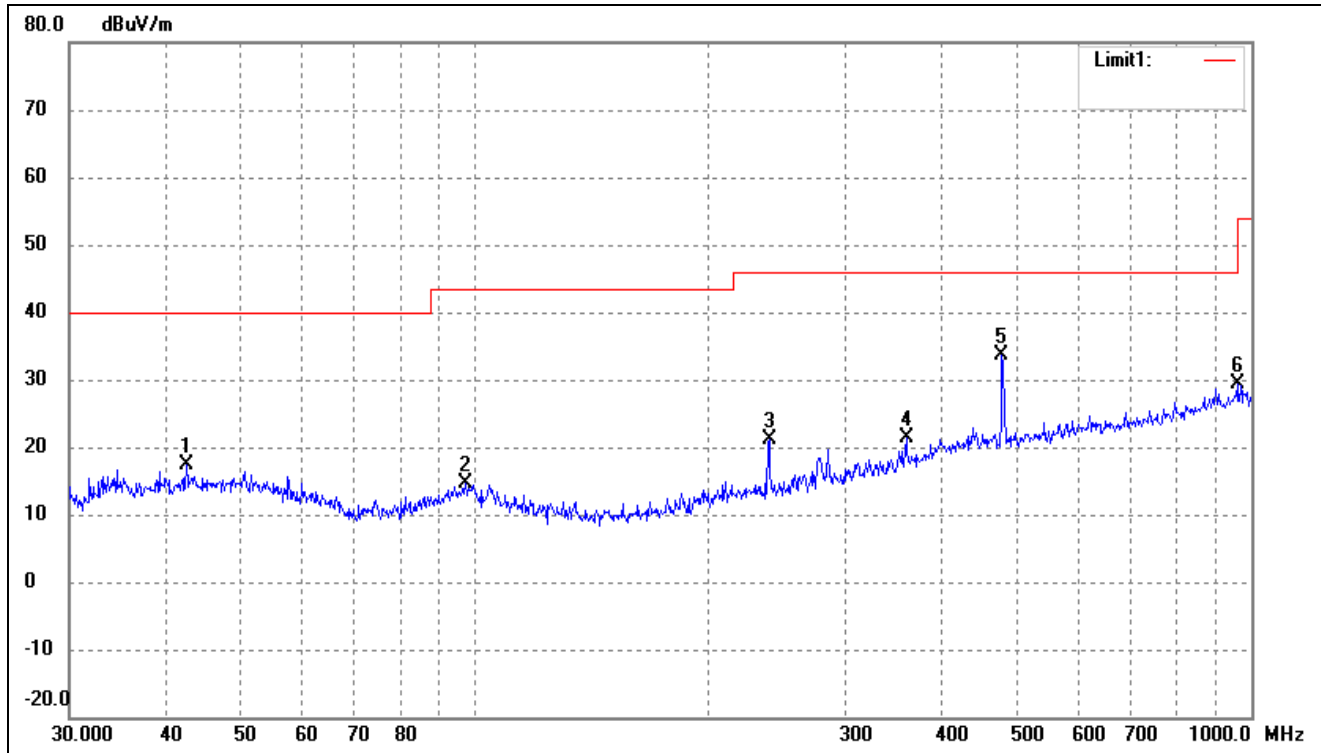
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	47.9940	29.13	-10.89	18.24	40.00	-21.76	-	-	peak
2	111.7380	29.21	-12.83	16.38	43.50	-27.12	-	-	peak
3	221.3921	27.66	-11.77	15.89	46.00	-30.11	-	-	peak
4	357.9287	30.68	-7.59	23.09	46.00	-22.91	-	-	peak
5	478.8456	39.25	-5.23	34.02	46.00	-11.98	-	-	peak
6	833.3171	28.12	-0.80	27.32	46.00	-18.68	-	-	peak

802.11b_11Mbps			
Test Channel	Low	Polarity:	Vertical



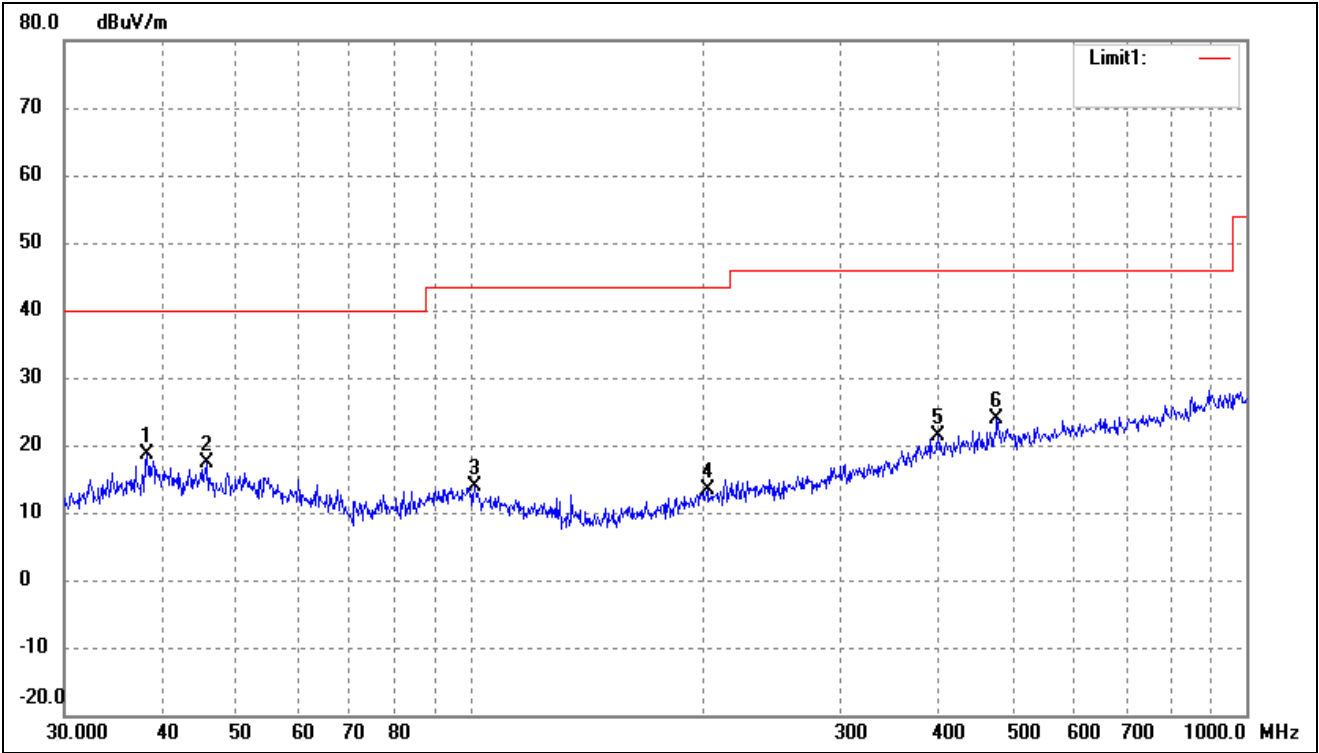
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	38.3462	29.90	-11.20	18.70	40.00	-21.30	-	-	peak
2	45.8553	28.27	-10.89	17.38	40.00	-22.62	-	-	peak
3	101.2885	25.97	-12.15	13.82	43.50	-29.68	-	-	peak
4	213.0151	26.95	-12.01	14.94	43.50	-28.56	-	-	peak
5	444.8514	27.59	-5.39	22.20	46.00	-23.80	-	-	peak
6	785.0935	27.41	-1.64	25.77	46.00	-20.23	-	-	peak

802.11b_11Mbps			
Test Channel	Middle	Polarity:	Horizontal



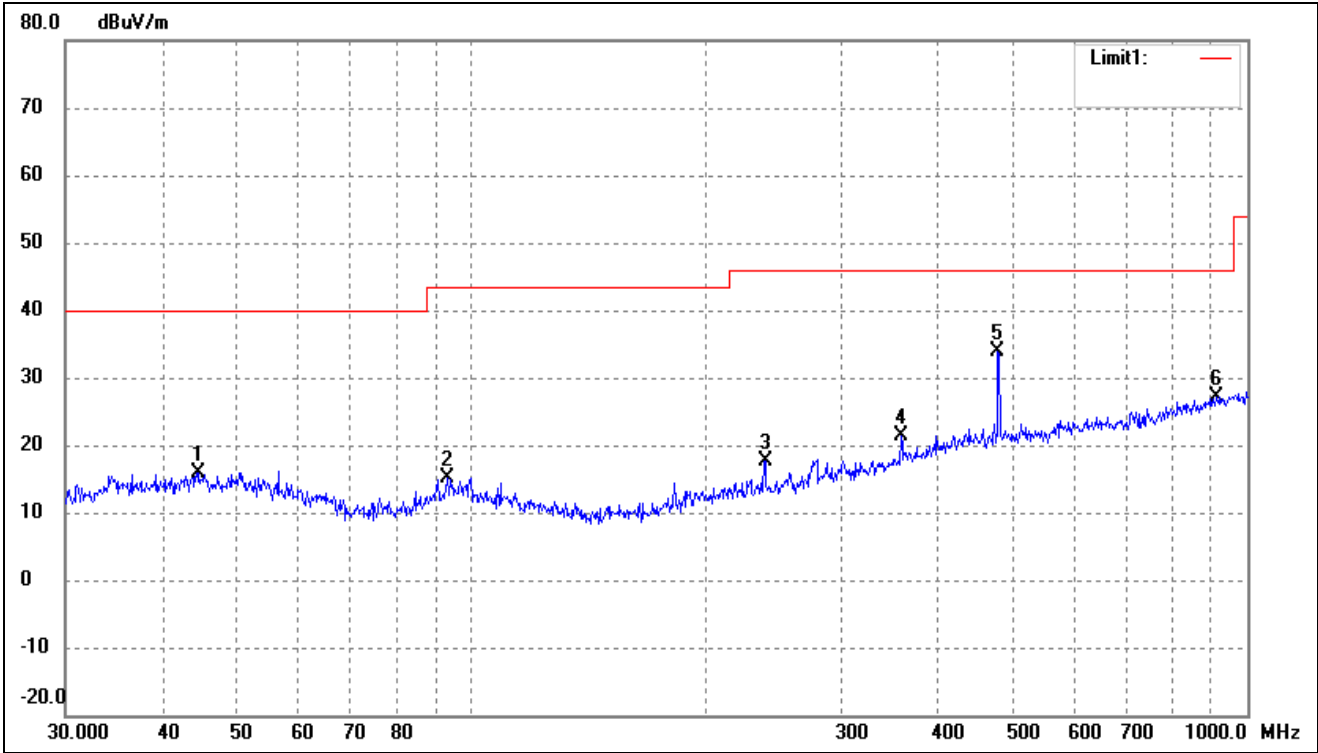
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	42.4508	28.19	-10.90	17.29	40.00	-22.71	-	-	peak
2	97.1148	26.99	-12.26	14.73	43.50	-28.77	-	-	peak
3	239.1473	32.42	-11.23	21.19	46.00	-24.81	-	-	peak
4	359.1860	28.89	-7.55	21.34	46.00	-24.66	-	-	peak
5	477.1694	38.96	-5.26	33.70	46.00	-12.30	-	-	peak
6	958.7943	28.49	1.00	29.49	46.00	-16.51	-	-	peak

802.11b_11Mbps			
Test Channel	Middle	Polarity:	Vertical



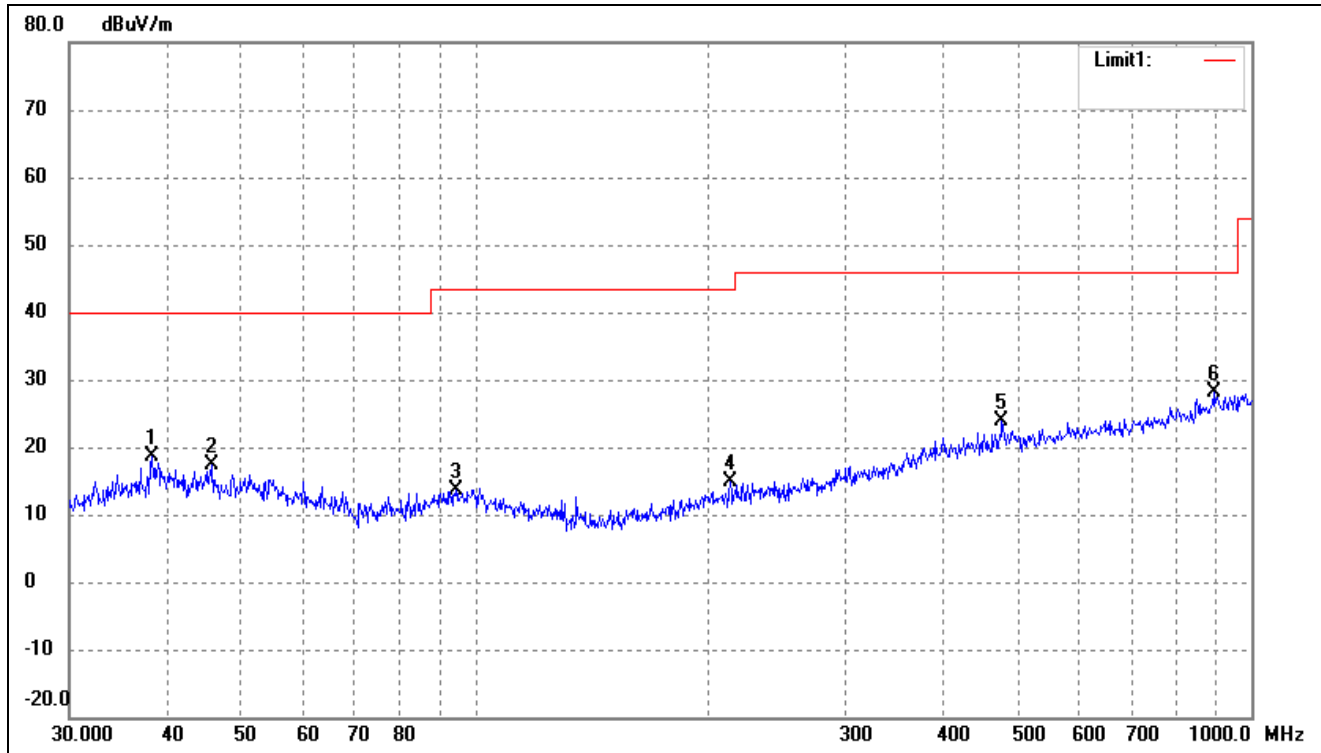
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	38.3462	29.90	-11.20	18.70	40.00	-21.30	-	-	peak
2	45.8553	28.27	-10.89	17.38	40.00	-22.62	-	-	peak
3	101.2885	25.97	-12.15	13.82	43.50	-29.68	-	-	peak
4	202.1005	25.82	-12.33	13.49	43.50	-30.01	-	-	peak
5	400.4319	27.52	-6.24	21.28	46.00	-24.72	-	-	peak
6	477.1694	29.15	-5.26	23.89	46.00	-22.11	-	-	peak

802.11b_11Mbps			
Test Channel	High	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	44.5868	26.83	-10.89	15.94	40.00	-24.06	-	-	peak
2	93.1132	27.77	-12.57	15.20	43.50	-28.30	-	-	peak
3	239.1473	28.95	-11.23	17.72	46.00	-28.28	-	-	peak
4	357.9287	28.92	-7.59	21.33	46.00	-24.67	-	-	peak
5	477.1694	39.06	-5.26	33.80	46.00	-12.20	-	-	peak
6	912.8620	26.55	0.59	27.14	46.00	-18.86	-	-	peak

802.11b_11Mbps			
Test Channel	High	Polarity:	Vertical

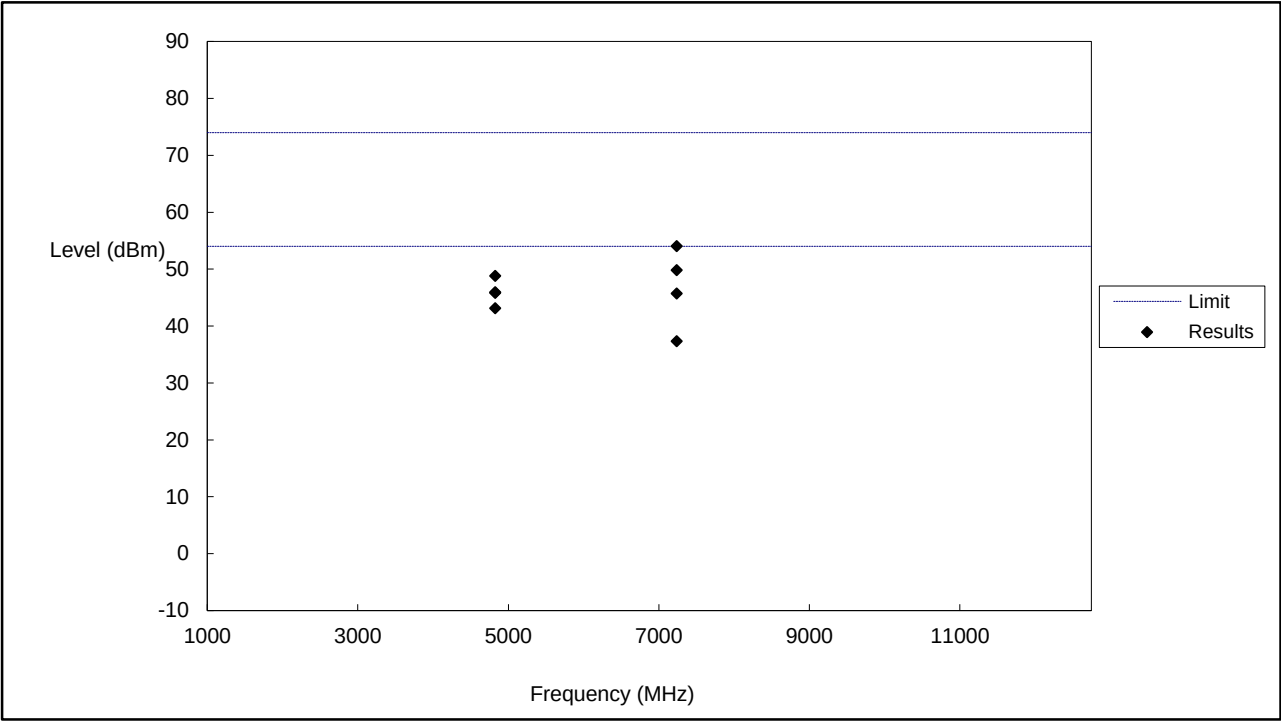


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	38.3462	29.90	-11.20	18.70	40.00	-21.30	-	-	peak
2	45.8553	28.27	-10.89	17.38	40.00	-22.62	-	-	peak
3	94.4284	26.01	-12.44	13.57	43.50	-29.93	-	-	peak
4	213.0151	26.95	-12.01	14.94	43.50	-28.56	-	-	peak
5	477.1694	29.15	-5.26	23.89	46.00	-22.11	-	-	peak
6	893.8567	27.86	0.37	28.23	46.00	-17.77	-	-	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.

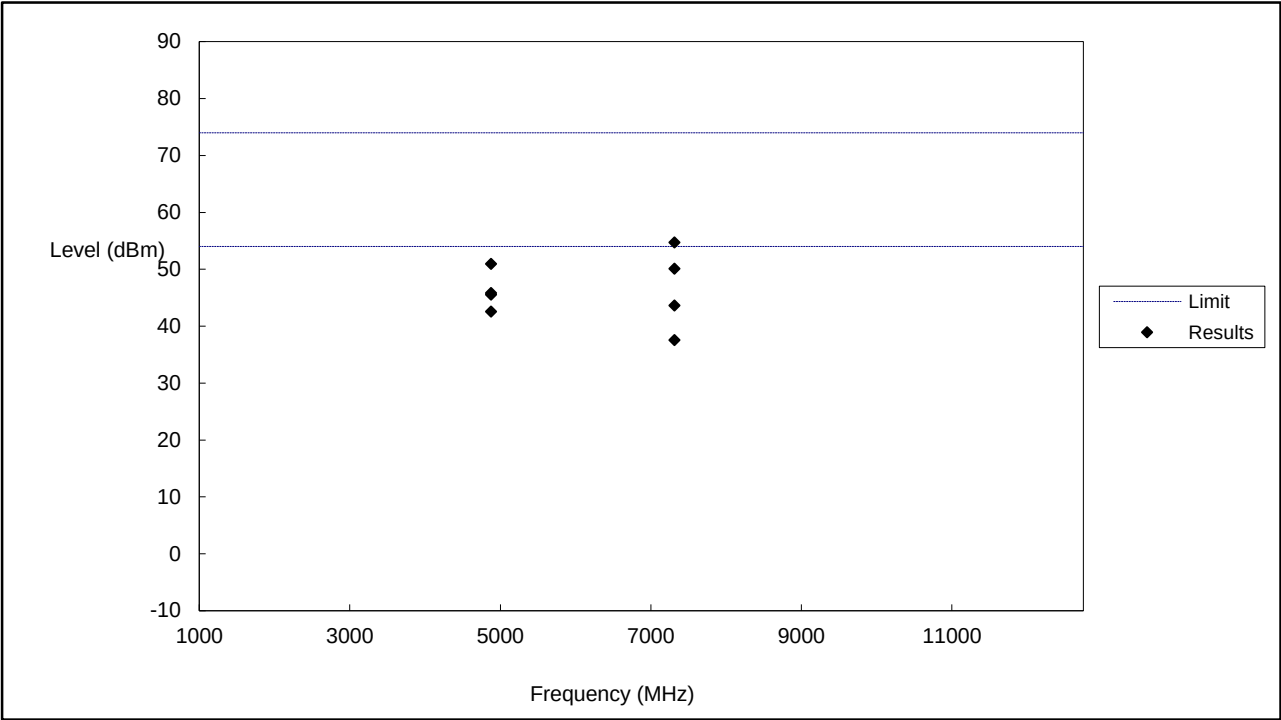
- Spurious Emissions Above 1GHz
- Worst case Antenna 1
- Test Mode: 802.11b_11Mbps(Worst case)

Low Channel-2412MHz



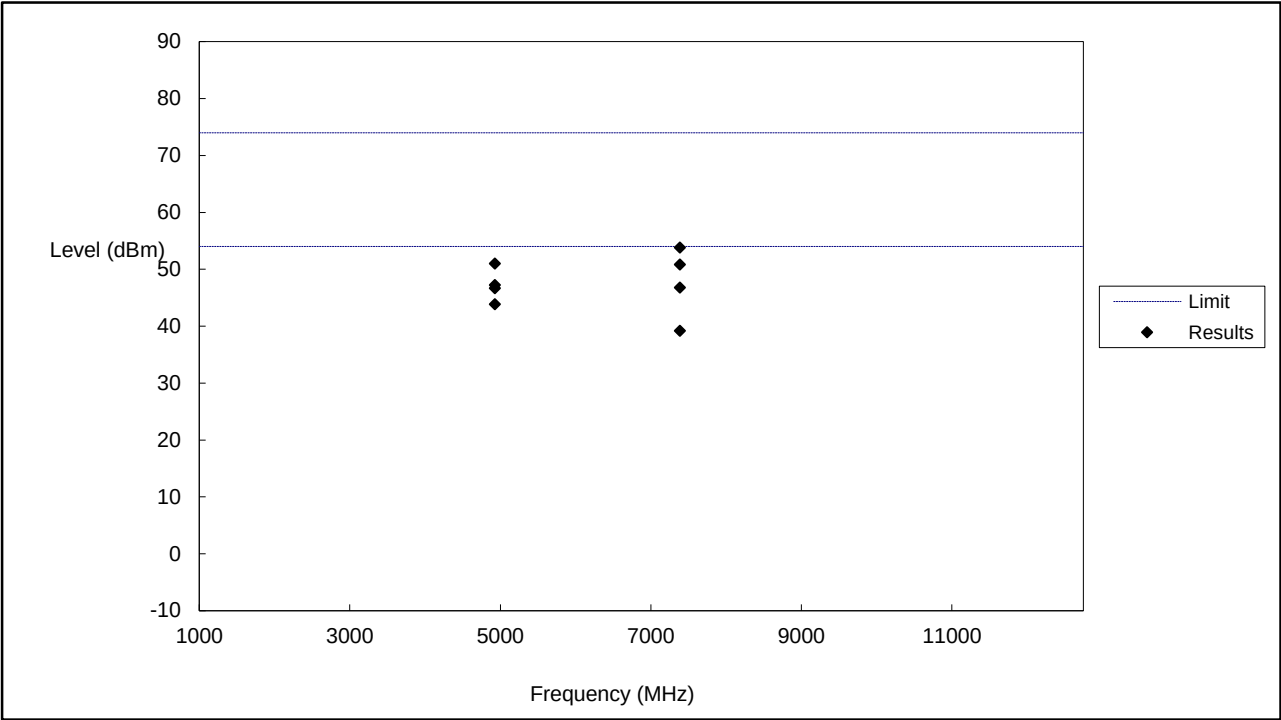
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	4824.000	48.84	74	-25.16	H	RMS
2	4824.000	45.97	54	-8.03	H	RMS
3	7236.000	49.83	74	-24.17	H	RMS
4	7236.000	37.36	54	-16.64	H	RMS
1	4824.000	45.87	74	-28.13	V	RMS
2	4824.000	43.17	54	-10.83	V	RMS
3	7236.000	54.07	74	-19.93	V	RMS
4	7236.000	45.77	54	-8.23	V	RMS

Middle Channel-2437MHz



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	4874.000	50.96	74	-23.04	H	RMS
2	4874.000	45.58	54	-8.42	H	RMS
3	7311.000	50.14	74	-23.86	H	RMS
4	7311.000	37.60	54	-16.40	H	RMS
1	4874.000	45.88	74	-28.12	V	RMS
2	4874.000	42.58	54	-11.42	V	RMS
3	7311.000	54.76	74	-19.24	V	RMS
4	7311.000	43.66	54	-10.34	V	RMS

High Channel-2462MHz



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	4924.000	51.02	74	-22.98	H	RMS
2	4924.000	47.28	54	-6.72	H	RMS
3	7386.000	50.89	74	-23.11	H	RMS
4	7386.000	39.22	54	-14.78	H	RMS
1	4924.000	46.72	74	-27.28	V	RMS
2	4924.000	43.88	54	-10.12	V	RMS
3	7386.000	53.83	74	-20.17	V	RMS
4	7386.000	46.82	54	-7.18	V	RMS

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, 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.

8. Out of Band Emissions

8.1 Standard Applicable

According to §15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

8.2 Test Procedure

According to the KDB 558074D01 v05r02 Subclause 8.4 and ANSI C63.10-2013 Subclause 11.11, the Emissions in nonrestricted frequency bands test method as follows:

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100kHz.
- c) Set the VBW $\geq [3 \times \text{RBW}]$.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

According to the KDB 558074 D01 v05r02 Subclause 8.5 and ANSI C63.10-2013 Subclause 11.12, the Emissions in restricted frequency bands test method as follows:

A. Radiated emission measurements:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)

RBW = 1MHz, VBW = 1MHz for peak value measured

RBW = 1MHz, VBW = 10Hz for average value measured

Sweep = auto; Detector function = peak/average; Trace = max hold

All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission

must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

B. Antenna-port conducted measurements

Peak emission levels are measured by setting the instrument as follows:

- a) RBW = as specified in Table 9.
- b) VBW $\geq [3 \times \text{RBW}]$.
- c) Detector = peak.
- d) Sweep time = auto.
- e) Trace mode = max hold.
- f) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be lengthened for low-duty-cycle applications.)

Table 9—RBW as a function of frequency

Frequency	RBW
9 kHz to 150 kHz	200 Hz to 300 Hz
0.15 MHz to 30 MHz	9 kHz to 10 kHz
30 MHz to 1000 MHz	100 kHz to 120 kHz
>1000 MHz	1 MHz

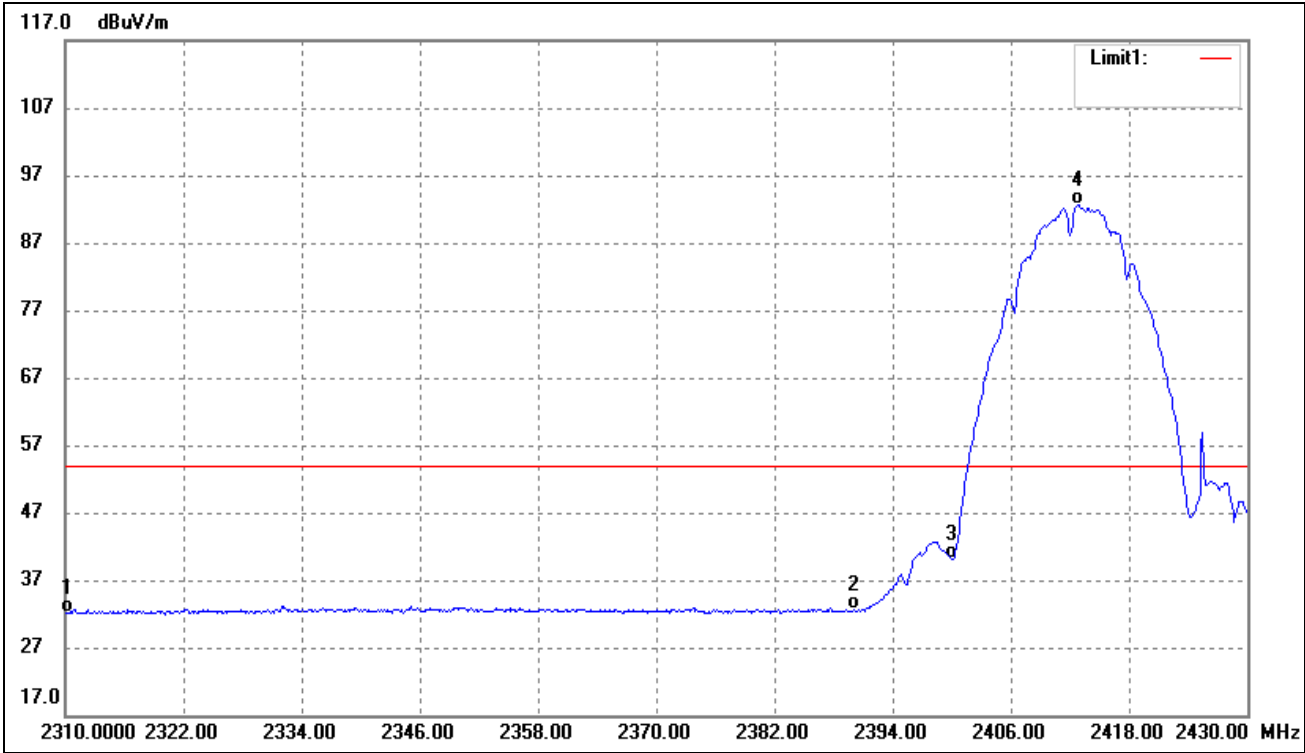
If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

8.3 Summary of Test Results/Plots

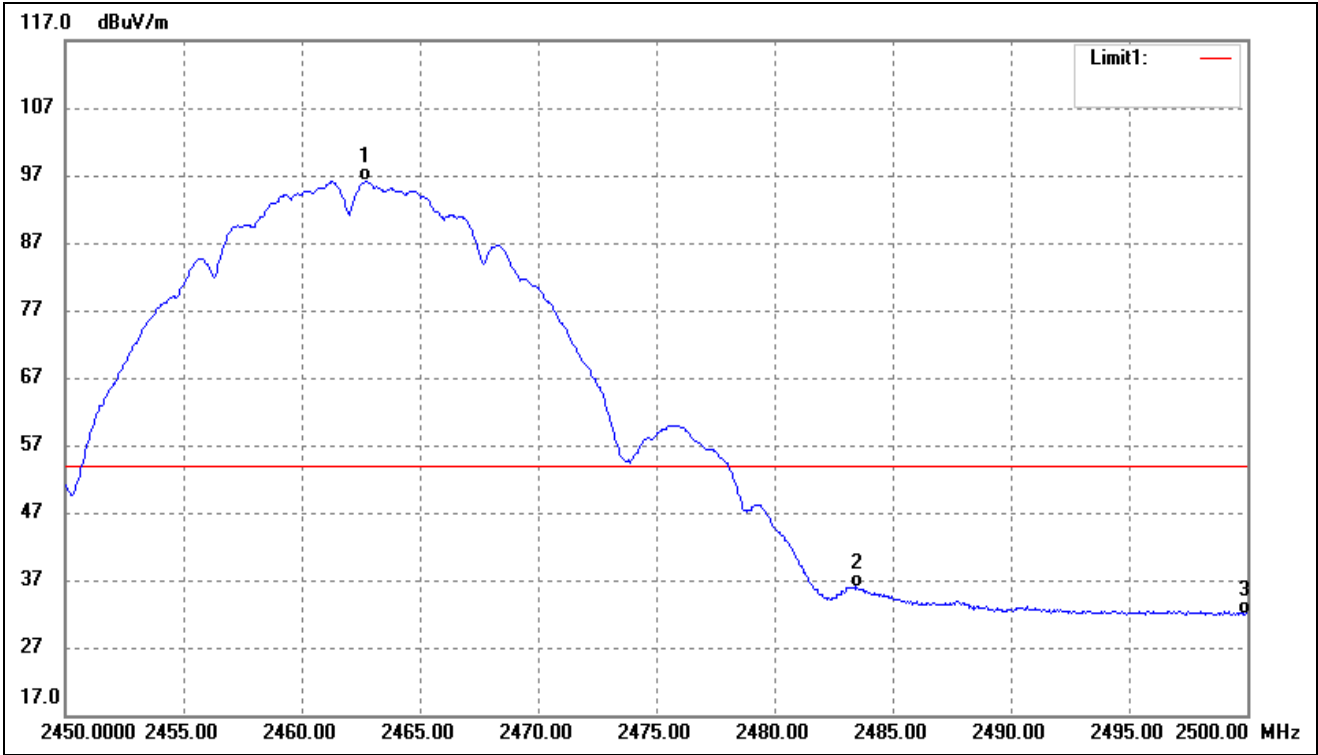
- Radiated test
- Antenna 1(worst case)

802.11b_11Mbps			
Test Channel	Low	Polarity:	Horizontal(worst case)



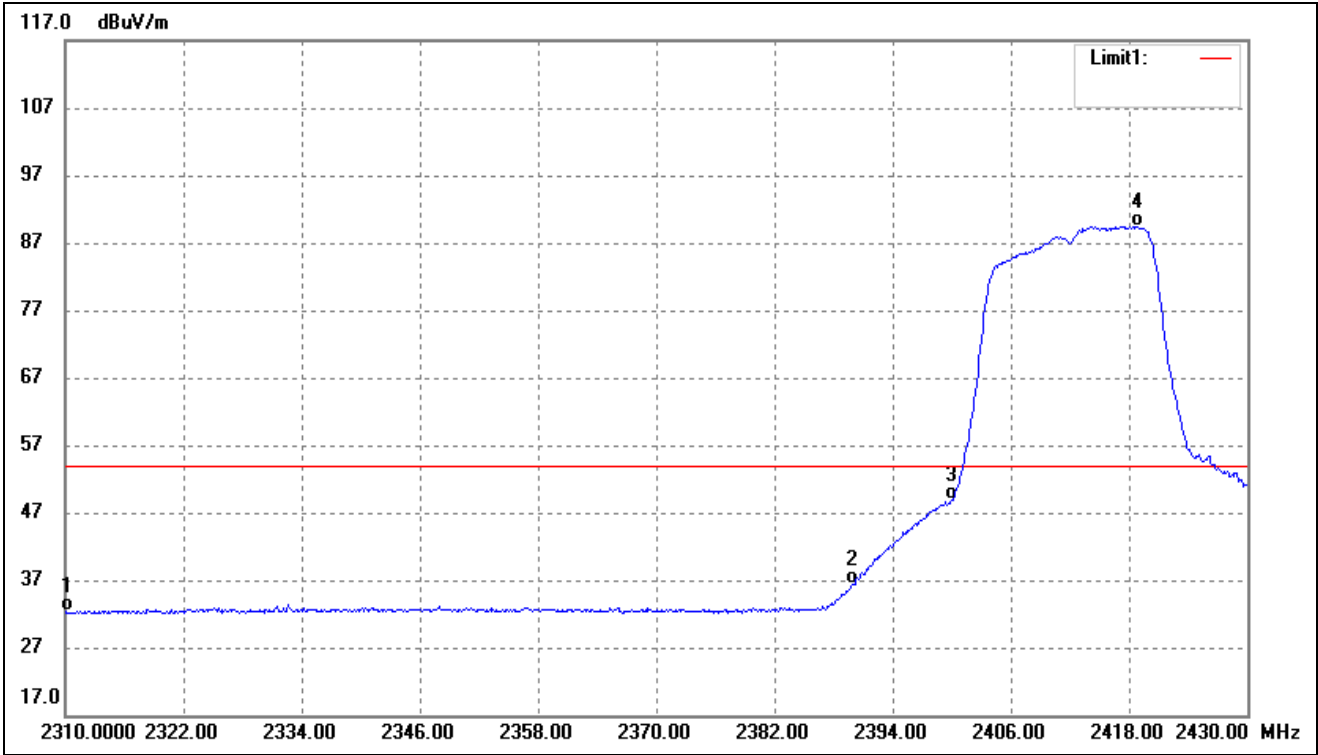
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	40.80	-8.78	32.02	54.00	-21.98	Average Detector
	2310.000	53.44	-8.78	44.66	74.00	-29.34	Peak Detector
2	2390.000	41.01	-8.48	32.53	54.00	-21.47	Average Detector
	2390.000	53.97	-8.48	45.49	74.00	-28.51	Peak Detector
3	2400.000	48.57	-8.45	40.12	54.00	-13.88	Average Detector
	2400.000	59.93	-8.45	51.48	74.00	-22.52	Peak Detector
4	2412.840	100.97	-8.39	92.58	/	/	Average Detector
	2413.560	106.88	-8.39	98.49	/	/	Peak Detector

802.11b_11Mbps			
Test Channel	High	Polarity:	Horizontal(worst case)



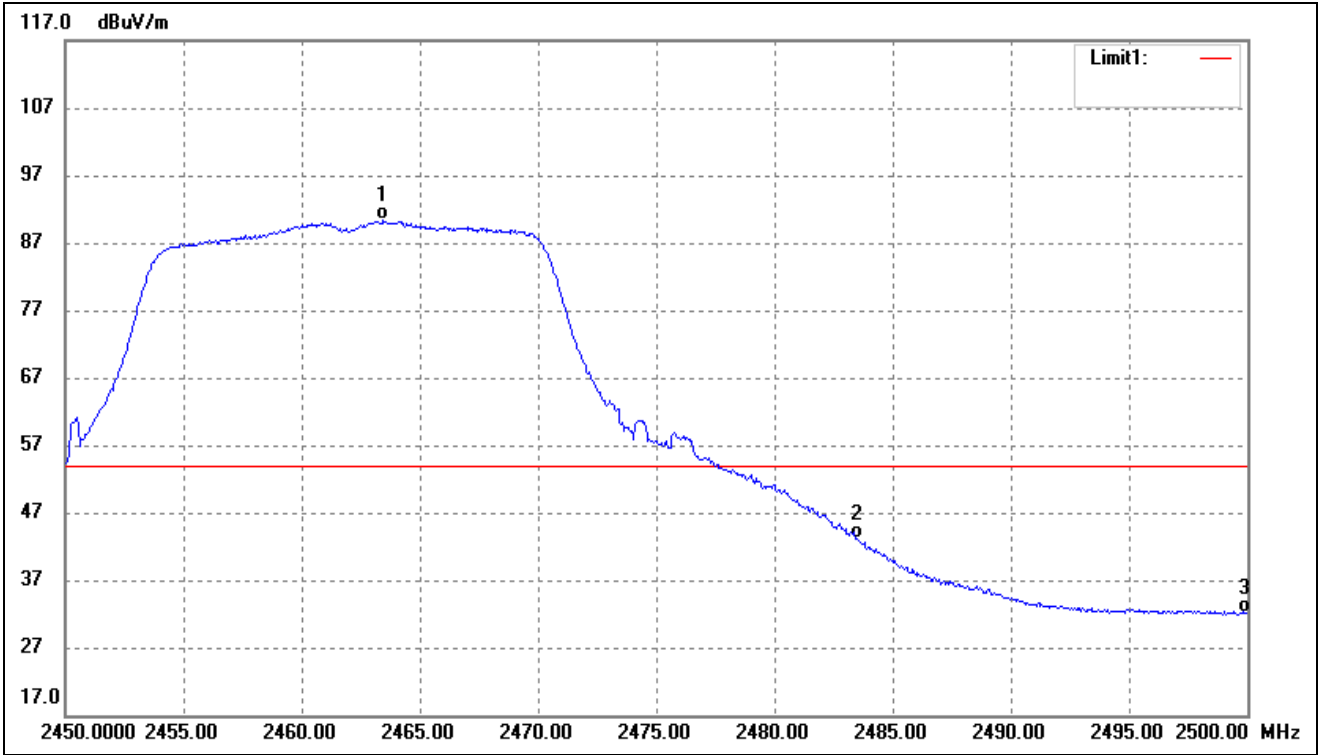
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2462.700	104.23	-8.21	96.02	/	/	Average Detector
	2463.050	108.60	-8.21	100.39	/	/	Peak Detector
2	2483.500	44.08	-8.14	35.94	54.00	-18.06	Average Detector
	2483.500	54.21	-8.14	46.07	74.00	-27.93	Peak Detector
3	2500.000	40.00	-8.08	31.92	54.00	-22.08	Average Detector
	2500.000	51.66	-8.08	43.58	74.00	-30.42	Peak Detector

802.11g_54Mbps			
Test Channel	Low	Polarity:	Horizontal(worst case)



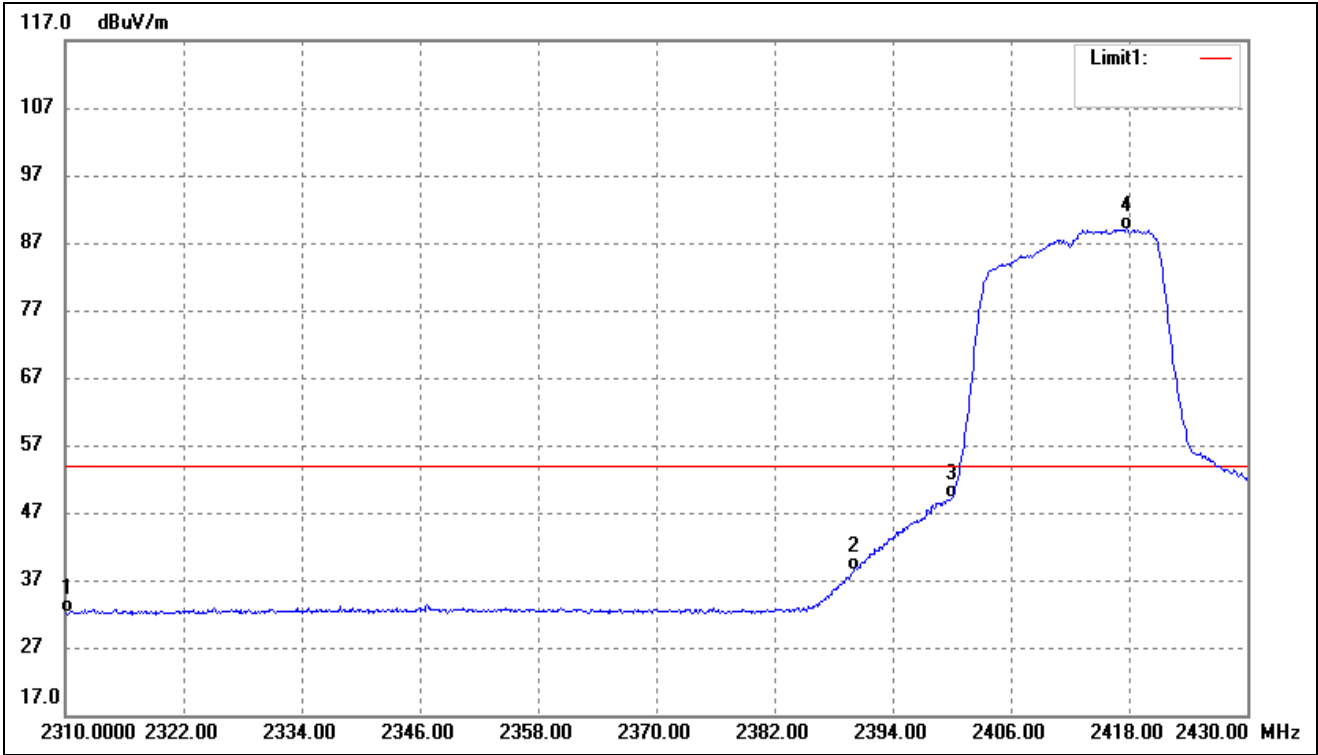
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	41.16	-8.78	32.38	54.00	-21.62	Average Detector
	2310.000	52.81	-8.78	44.03	74.00	-29.97	Peak Detector
2	2390.000	44.83	-8.48	36.35	54.00	-17.65	Average Detector
	2390.000	61.45	-8.48	52.97	74.00	-21.03	Peak Detector
3	2400.000	57.35	-8.45	48.90	54.00	-5.10	Average Detector
	2400.000	68.73	-8.45	60.28	74.00	-13.72	Peak Detector
4	2418.840	97.85	-8.38	89.47	/	/	Average Detector
	2415.120	108.99	-8.39	100.60	/	/	Peak Detector

802.11g_54Mbps			
Test Channel	High	Polarity:	Horizontal(worst case)



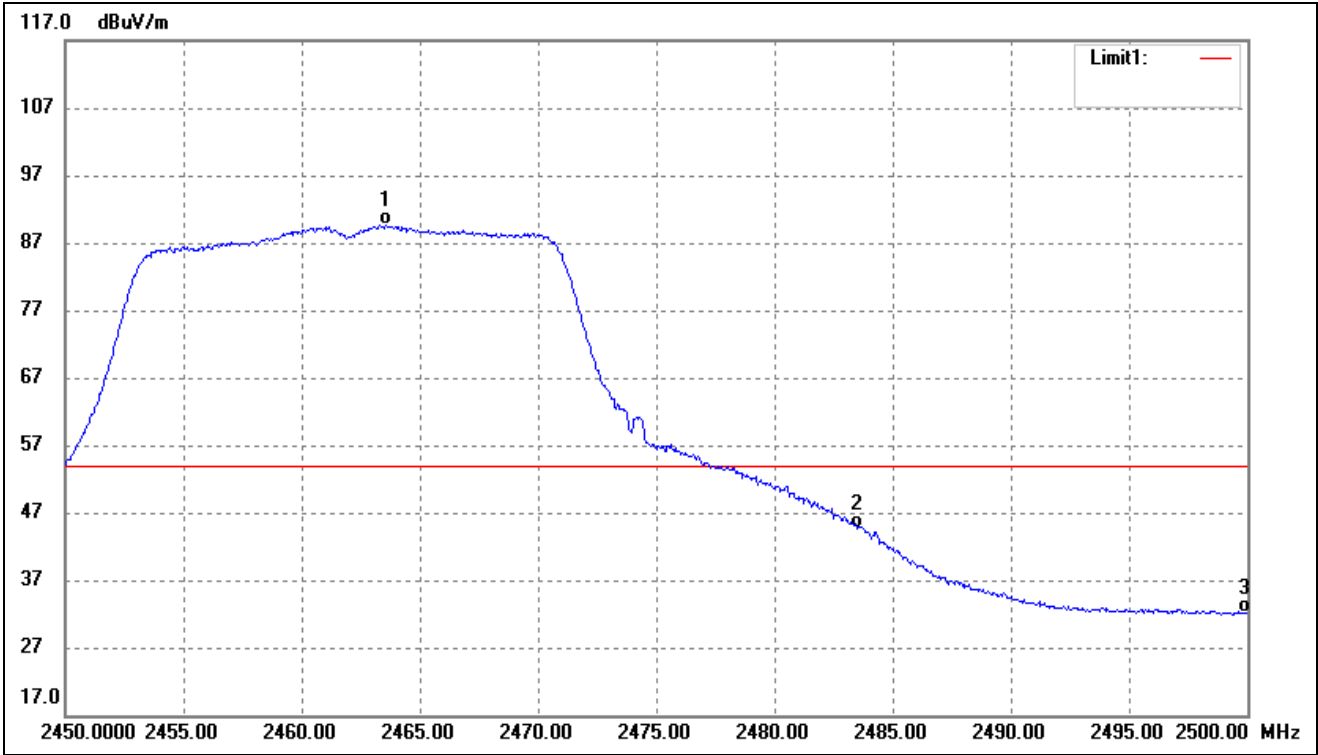
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.450	98.49	-8.21	90.28	/	/	Average Detector
	2463.350	109.35	-8.21	101.14	/	/	Peak Detector
2	2483.500	51.19	-8.14	43.05	54.00	-10.95	Average Detector
	2483.500	66.58	-8.14	58.44	74.00	-15.56	Peak Detector
3	2500.000	40.20	-8.08	32.12	54.00	-21.88	Average Detector
	2500.000	52.02	-8.08	43.94	74.00	-30.06	Peak Detector

802.11n-HT20_MCS7			
Test Channel	Low	Polarity:	Horizontal(worst case)



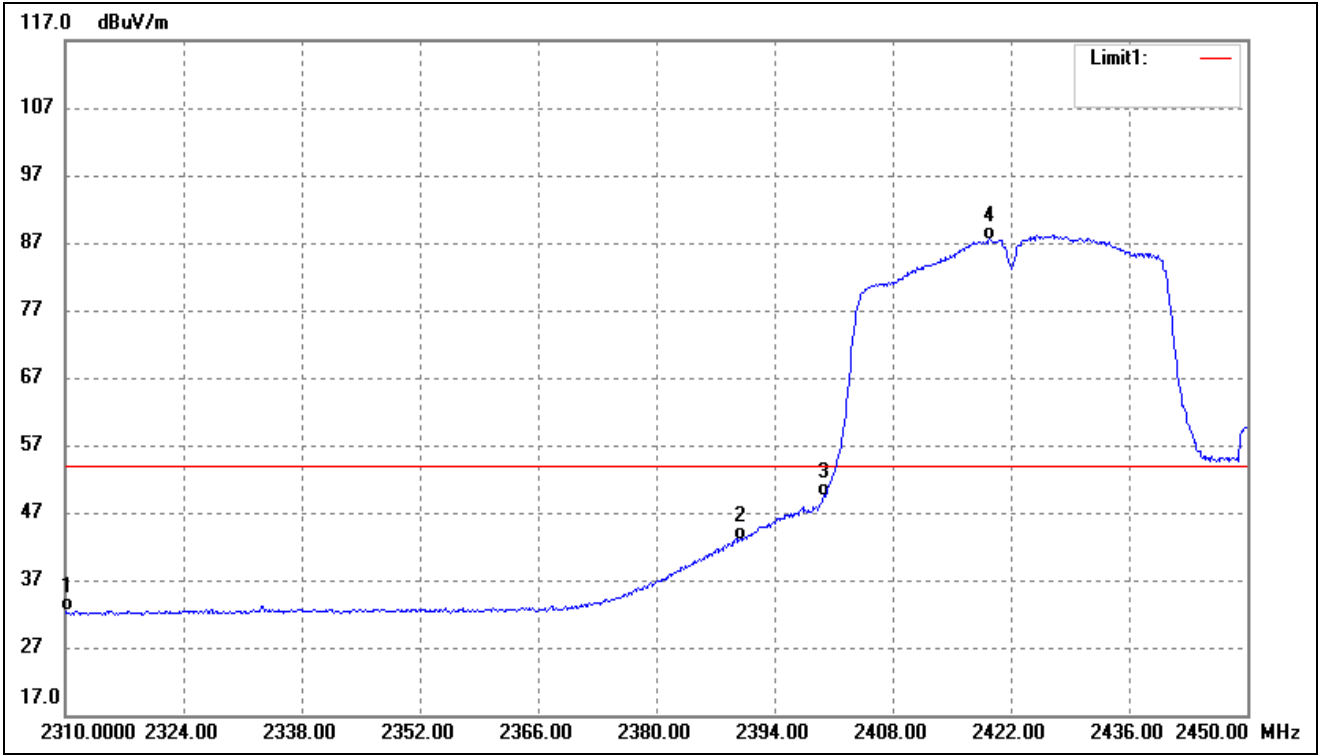
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	40.95	-8.78	32.17	54.00	-21.83	Average Detector
	2310.000	52.47	-8.78	43.69	74.00	-30.31	Peak Detector
2	2390.000	46.81	-8.48	38.33	54.00	-15.67	Average Detector
	2390.000	59.47	-8.48	50.99	74.00	-23.01	Peak Detector
3	2400.000	57.60	-8.45	49.15	54.00	-4.85	Average Detector
	2400.000	69.48	-8.45	61.03	74.00	-12.97	Peak Detector
4	2417.760	97.38	-8.38	89.00	/	/	Average Detector
	2416.560	108.01	-8.39	99.62	/	/	Peak Detector

802.11n-HT20_MCS7			
Test Channel	High	Polarity:	Horizontal(worst case)



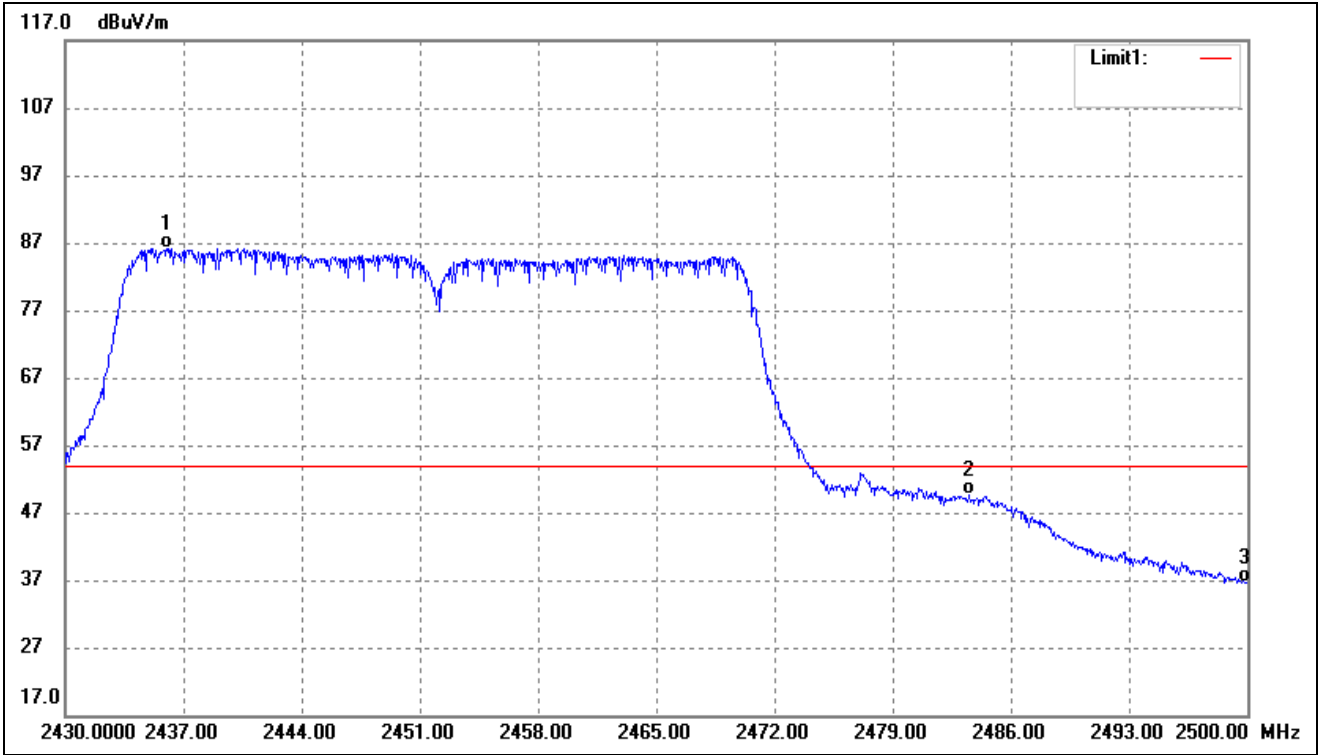
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.550	97.79	-8.21	89.58	/	/	Average Detector
	2463.850	108.90	-8.21	100.69	/	/	Peak Detector
2	2483.500	52.85	-8.14	44.71	54.00	-9.29	Average Detector
	2483.500	67.66	-8.14	59.52	74.00	-14.48	Peak Detector
3	2500.000	40.10	-8.08	32.02	54.00	-21.98	Average Detector
	2500.000	51.67	-8.08	43.59	74.00	-30.41	Peak Detector

802.11n-HT40_MCS7			
Test Channel	Low	Polarity:	Horizontal(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	41.19	-8.78	32.41	54.00	-21.59	Average Detector
	2310.000	53.01	-8.78	44.23	74.00	-29.77	Peak Detector
2	2390.000	51.33	-8.48	42.85	54.00	-11.15	Average Detector
	2390.000	64.10	-8.48	55.62	74.00	-18.38	Peak Detector
3	2400.000	57.91	-8.45	49.46	54.00	-4.54	Average Detector
	2400.000	71.06	-8.45	62.61	74.00	-11.39	Peak Detector
4	2419.480	95.88	-8.38	87.50	/	/	Average Detector
	2428.580	107.56	-8.35	99.21	/	/	Peak Detector

802.11n-HT40_MCS7			
Test Channel	High	Polarity:	Horizontal(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2436.020	94.43	-8.32	86.11	/	/	Average Detector
	2441.900	106.02	-8.29	97.73	/	/	Peak Detector
2	2483.500	57.78	-8.14	49.64	54.00	-4.36	Average Detector
	2483.500	68.93	-8.14	60.79	74.00	-13.21	Peak Detector
3	2500.000	44.78	-8.08	36.70	54.00	-17.30	Average Detector
	2500.000	58.42	-8.08	50.34	74.00	-23.66	Peak Detector

➤ Conducted test
Please refer to Appendix D

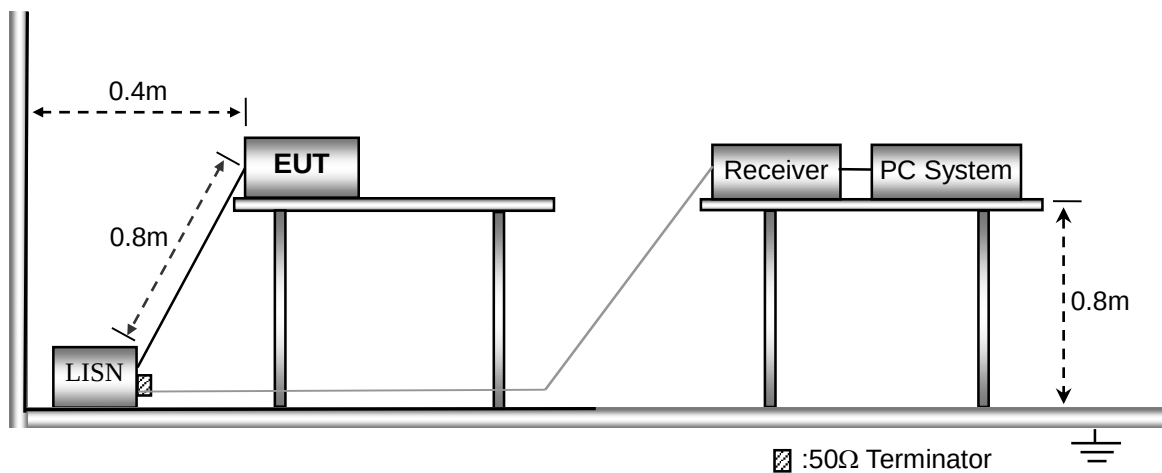
9. Conducted Emissions

9.1 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.

9.2 Basic Test Setup Block Diagram



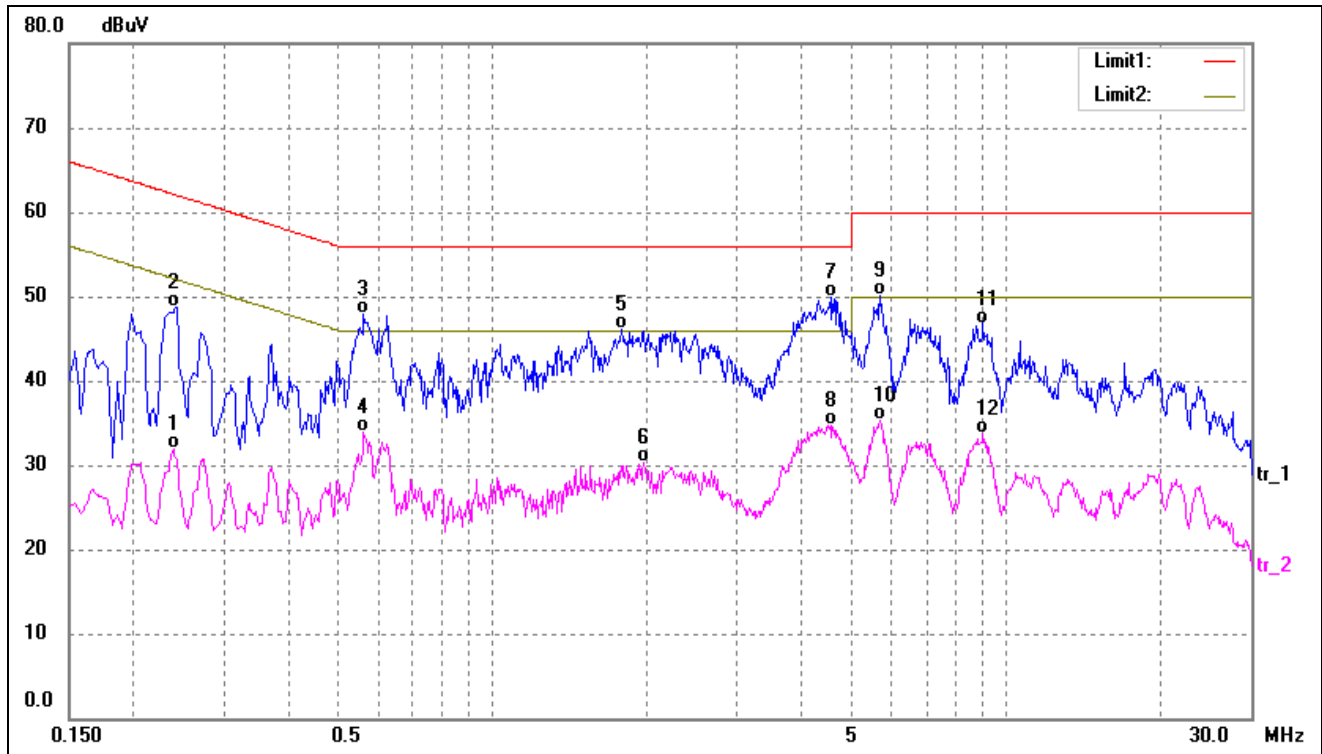
9.3 Test Receiver Setup

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

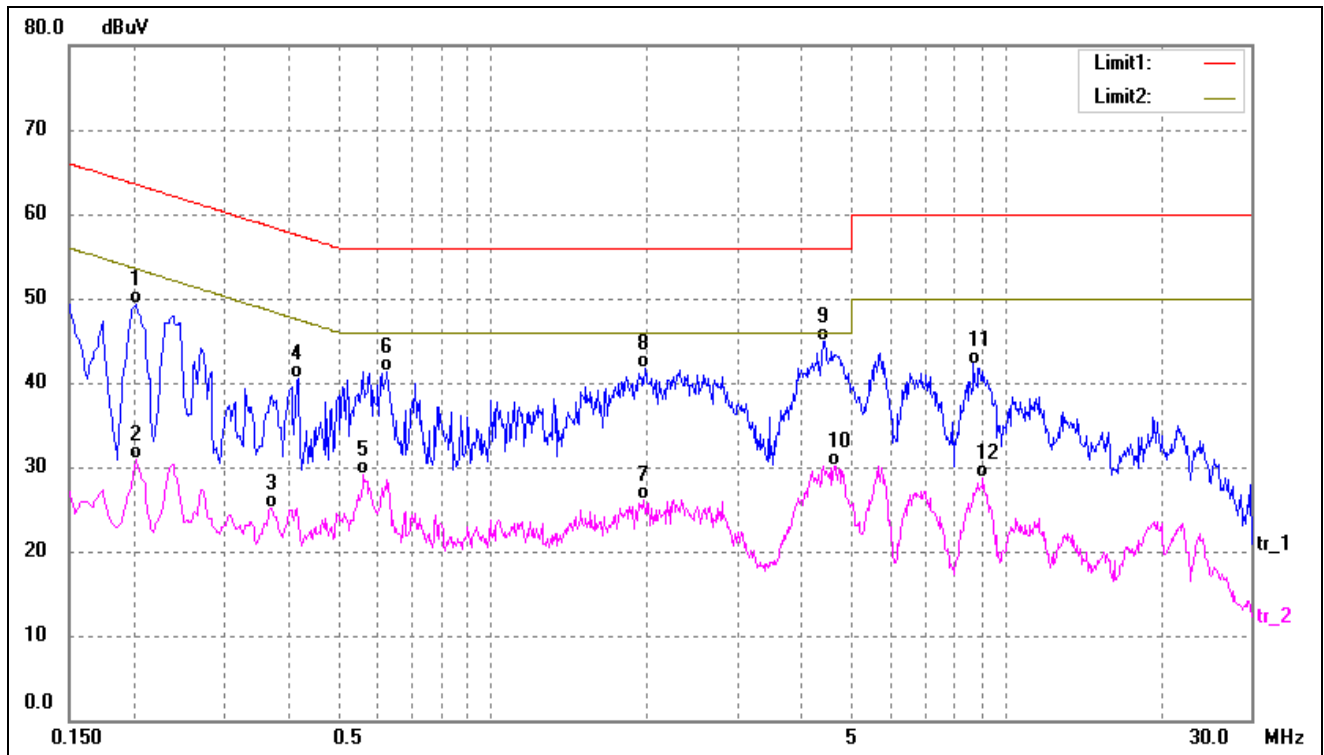
9.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral
-----------	---------------	-------------	-----------	---------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2380	21.64	10.27	31.91	52.16	-20.25	AVG
2	0.2420	38.49	10.27	48.76	62.02	-13.26	QP
3	0.5620	37.60	10.21	47.81	56.00	-8.19	QP
4	0.5620	23.77	10.21	33.98	46.00	-12.02	AVG
5	1.7900	35.81	10.23	46.04	56.00	-9.96	QP
6	1.9780	20.03	10.25	30.28	46.00	-15.72	AVG
7*	4.5660	39.51	10.32	49.83	56.00	-6.17	QP
8	4.5660	24.43	10.32	34.75	46.00	-11.25	AVG
9	5.6979	39.87	10.33	50.20	60.00	-9.80	QP
10	5.6979	25.04	10.33	35.37	50.00	-14.63	AVG
11	9.0140	36.45	10.35	46.80	60.00	-13.20	QP
12	9.0140	23.44	10.35	33.79	50.00	-16.21	AVG

Test Mode	Communication	AC120V 60Hz	Polarity:	Line
-----------	---------------	-------------	-----------	------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2020	39.01	10.30	49.31	63.52	-14.21	QP
2	0.2020	20.67	10.30	30.97	53.52	-22.55	AVG
3	0.3700	14.97	10.23	25.20	48.50	-23.30	AVG
4	0.4180	30.32	10.22	40.54	57.49	-16.95	QP
5	0.5620	18.89	10.21	29.10	46.00	-16.90	AVG
6	0.6260	31.15	10.20	41.35	56.00	-14.65	QP
7	1.9780	15.94	10.25	26.19	46.00	-19.81	AVG
8	1.9820	31.36	10.25	41.61	56.00	-14.39	QP
9*	4.4420	34.68	10.31	44.99	56.00	-11.01	QP
10	4.6300	19.86	10.32	30.18	46.00	-15.82	AVG
11	8.6380	31.86	10.34	42.20	60.00	-17.80	QP
12	9.0140	18.31	10.35	28.66	50.00	-21.34	AVG

APPENDIX SUMMARY

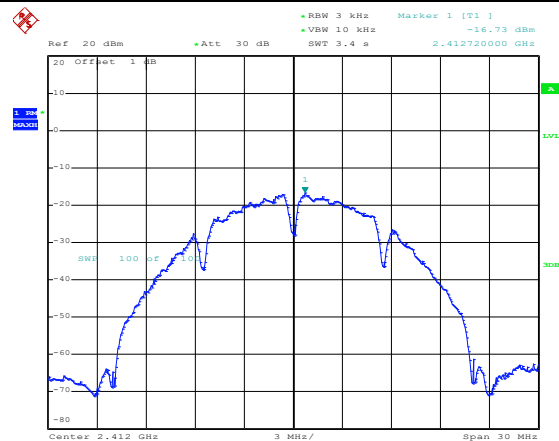
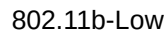
Project No.	WTX22X12264635W	Test Engineer	BAldi Zhong
Start date	2023/02/23	Finish date	2023/02/24
Temperature	25℃	Humidity	46%
RF specifications	WIFI-2.4G		

APPENDIX	Description of Test Item	Result
A	Power Spectral Density	Compliant
B	DTS Bandwidth	Compliant
C	RF Output Power	Compliant
D	Conducted Out of Band Emissions	Compliant

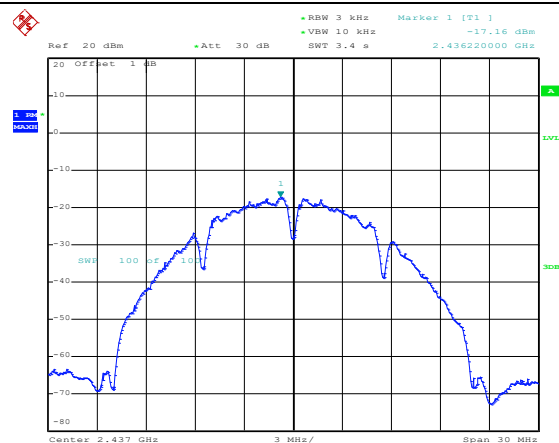
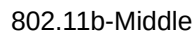
APPENDIX A

Power Spectral Density							
Test Mode	Test Channel MHz	Test Result				Total dBm	Limit dBm/3kHz
		Antenna 1 (dBm/3kHz)	Antenna 2 (dBm/30kHz)	Factor	Antenna 2 (dBm/3kHz)		
802.11b_1Mbps	2412	-16.73	-3.19	10	-13.19	/	8
	2437	-17.16	-3.24	10	-13.24	/	8
	2462	-18.06	-6.15	10	-16.15	/	8
802.11g_6Mbps	2412	-21.42	-8.24	10	-18.24	/	8
	2437	-21.67	-8.65	10	-18.65	/	8
	2462	-23.57	-10.02	10	-20.02	/	8
802.11n-HT20_MC S0	2412	-22.47	-9.37	10	-19.37	-17.64	8
	2437	-23.16	-8.54	10	-18.54	-17.25	8
	2462	-24.67	-10.68	10	-20.68	-19.22	8
802.11n-HT40_MC S0	2422	-26.25	-14.12	10	-24.12	-22.05	8
	2437	-28.40	-13.66	10	-23.66	-22.40	8
	2452	-29.21	-13.98	10	-23.98	-22.84	8
Note: Factor=10*log(30kHz/3kHz)=10							

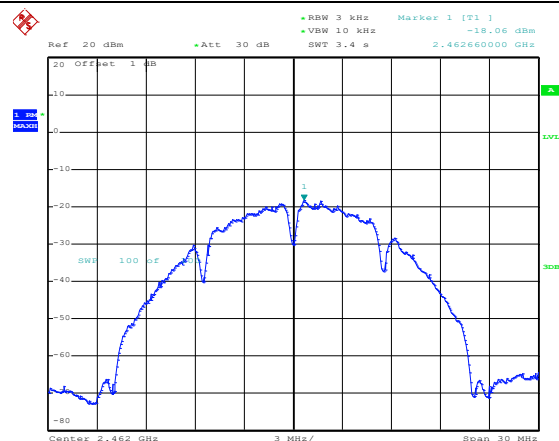
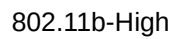
Antenna 1



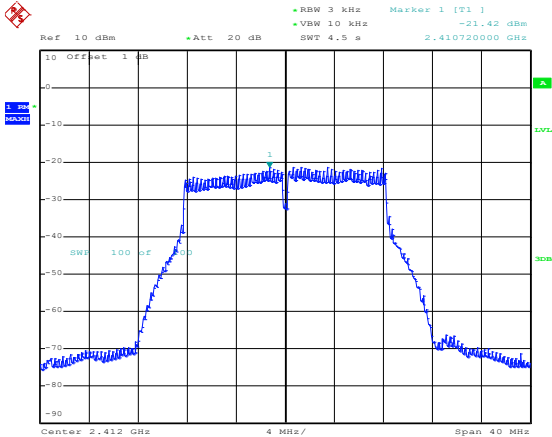
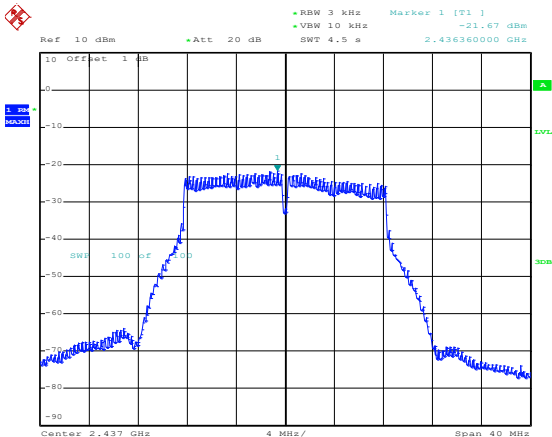
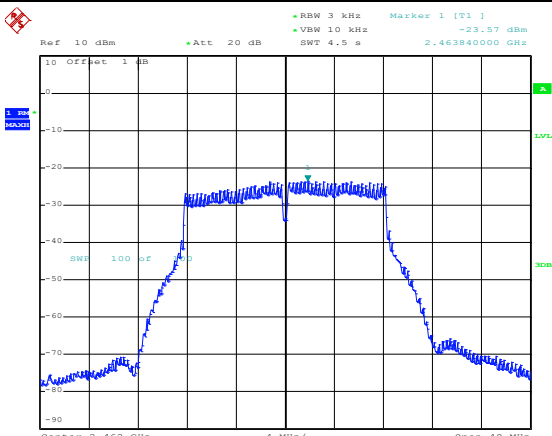
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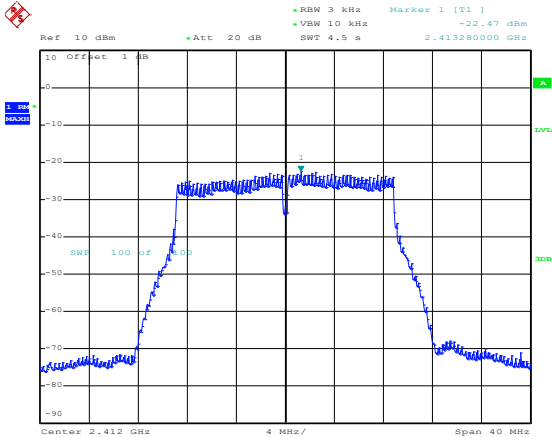
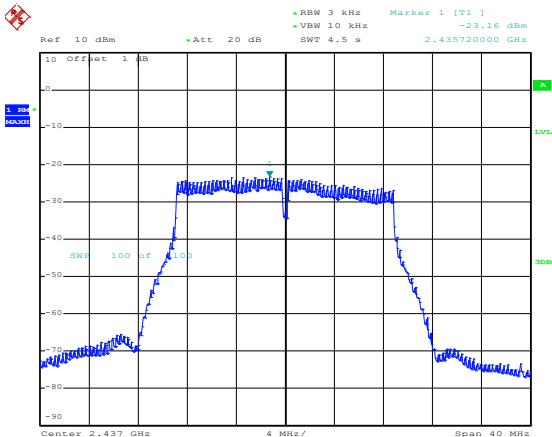
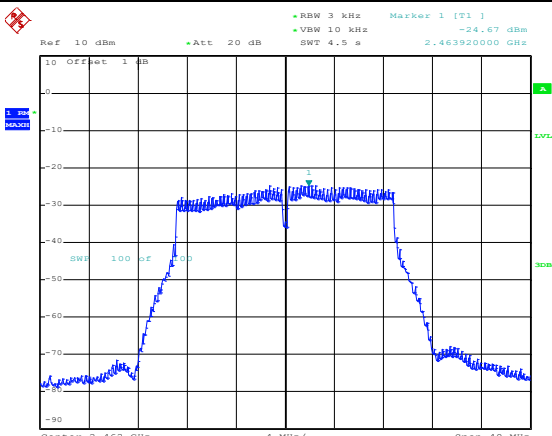


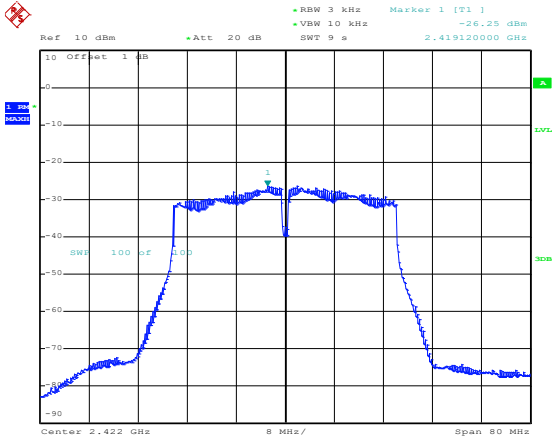
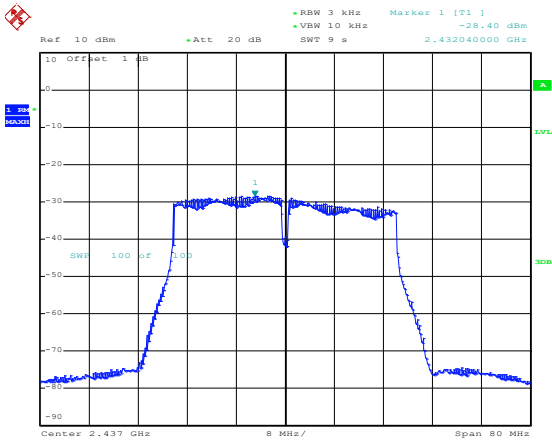
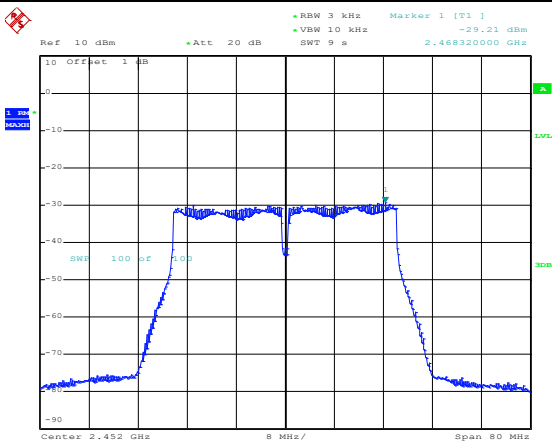
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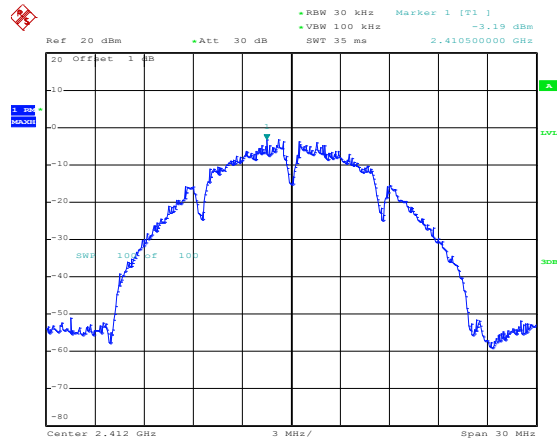
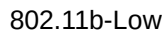
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802.11g-Low	 Ref 10 dBm Att 20 dB RBW 3 kHz Marker 1 [T1] -21.42 dBm VSW 10 kHz SWT 4.5 s 2.410720000 GHz 10 Offset 1 dB Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 16:40:02
802.11g-Middle	 Ref 10 dBm Att 20 dB RBW 3 kHz Marker 1 [T1] -21.67 dBm VSW 10 kHz SWT 4.5 s 2.436360000 GHz 10 Offset 1 dB Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 16:50:49
802.11g-High	 Ref 10 dBm Att 20 dB RBW 3 kHz Marker 1 [T1] -23.57 dBm VSW 10 kHz SWT 4.5 s 2.463840000 GHz 10 Offset 1 dB Center 2.462 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 17:02:50

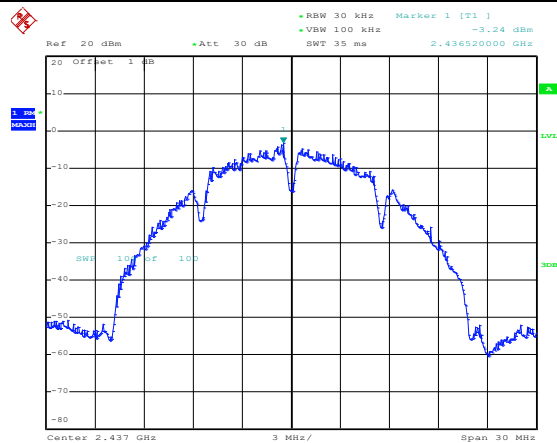
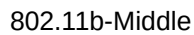
802.11n-HT20-Low	 Ref 10 dBm Att 20 dB RBW 3 kHz Marker 1 [T1] -22.47 dBm VSW 10 kHz SWT 4.5 s 2.413280000 GHz 10 Offset 1 dB SWT 100 kHz Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 17:11:38
802.11n-HT20-Middle	 Ref 10 dBm Att 20 dB RBW 3 kHz Marker 1 [T1] -23.16 dBm VSW 10 kHz SWT 4.5 s 2.435720000 GHz 10 Offset 1 dB SWT 100 kHz Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 24.FEB.2023 08:36:04
802.11n-HT20-High	 Ref 10 dBm Att 20 dB RBW 3 kHz Marker 1 [T1] -24.67 dBm VSW 10 kHz SWT 4.5 s 2.463920000 GHz 10 Offset 1 dB SWT 100 kHz Center 2.462 GHz 4 MHz/ Span 40 MHz Date: 24.FEB.2023 08:43:48

802.11n-HT40-Low	 Ref 10 dBm Att 20 dB RBW 3 kHz Marker 1 [T1] -26.25 dBm VSW 10 kHz SWT 9 s 2.419120000 GHz 10 Offset 1 dB Center 2.422 GHz 8 MHz/ Span 80 MHz Date: 24.FEB.2023 08:59:57
802.11n-HT40-Middle	 Ref 10 dBm Att 20 dB RBW 3 kHz Marker 1 [T1] -28.40 dBm VSW 10 kHz SWT 9 s 2.432040000 GHz 10 Offset 1 dB Center 2.437 GHz 8 MHz/ Span 80 MHz Date: 24.FEB.2023 09:16:20
802.11n-HT40-High	 Ref 10 dBm Att 20 dB RBW 3 kHz Marker 1 [T1] -29.21 dBm VSW 10 kHz SWT 9 s 2.468320000 GHz 10 Offset 1 dB Center 2.452 GHz 8 MHz/ Span 80 MHz Date: 24.FEB.2023 09:31:44

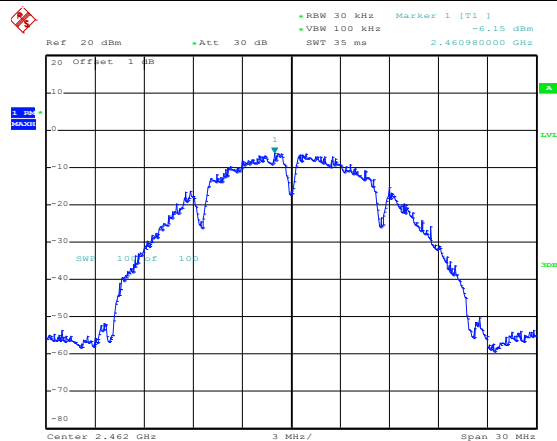
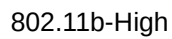
Antenna 2



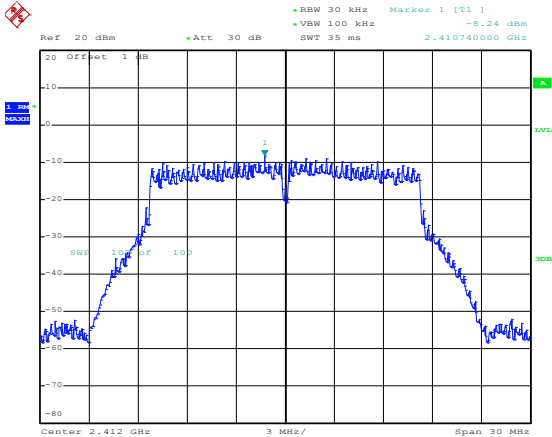
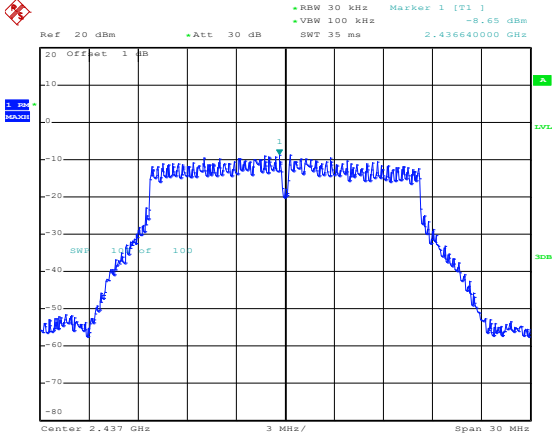
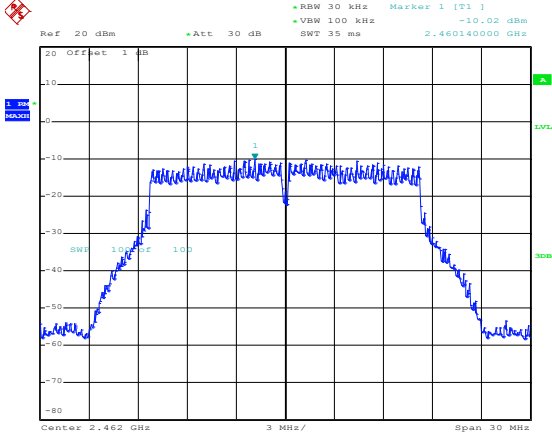
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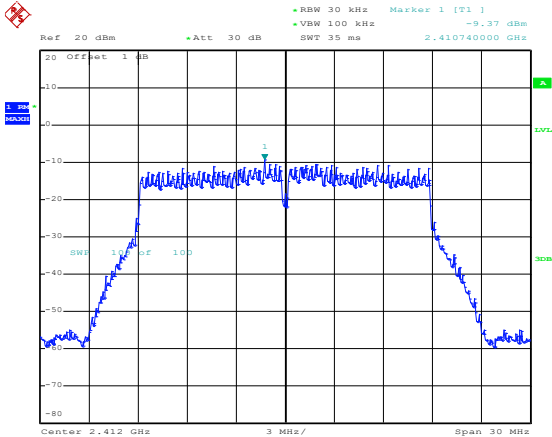
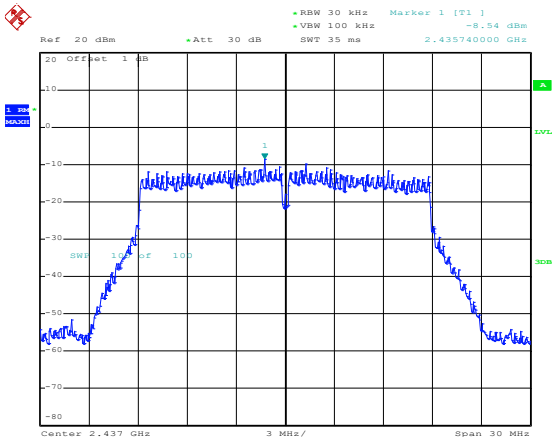
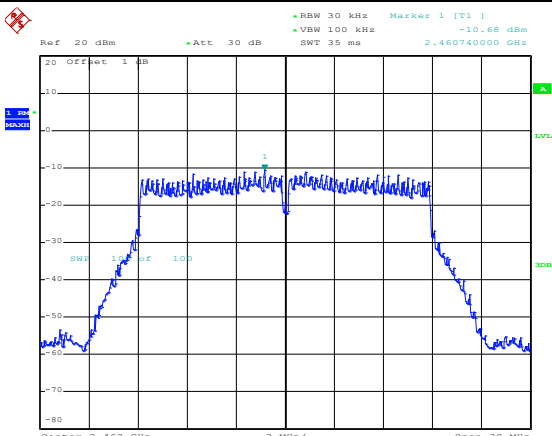


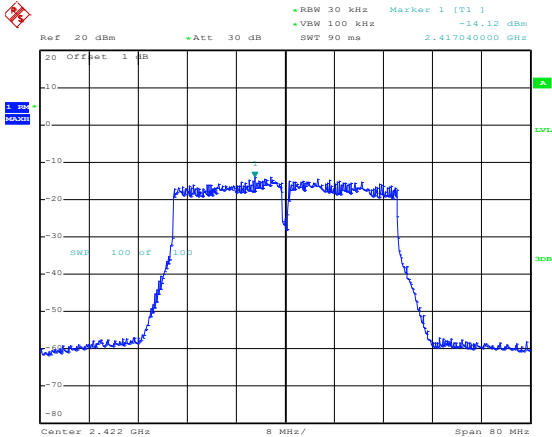
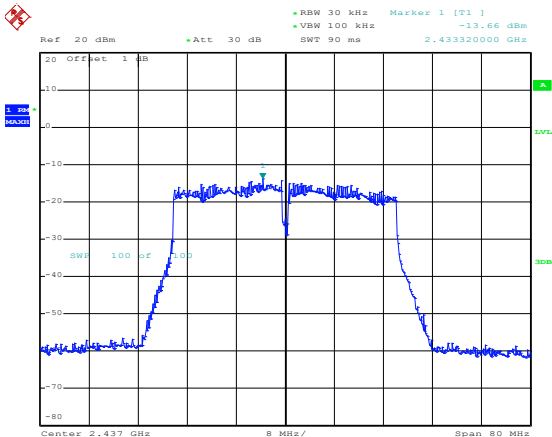
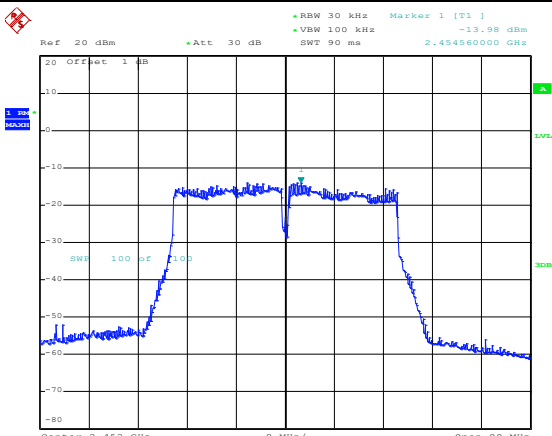
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Date: 24.FEB.2023 10:07:09

802.11g-Low	 Ref 20 dBm •Att 30 dB •RBW 30 kHz Marker 1 [T1] -8.24 dBm •VBW 100 kHz SWT 35 ms 2.410740000 GHz 20 Offset 1 dB 10 0 -10 -20 -30 -40 -50 -60 -70 -80 SWF 100 Hz 100 1 10V 30B Center 2.412 GHz 3 MHz/ Span 30 MHz Date: 24.FEB.2023 10:07:33
802.11g-Middle	 Ref 20 dBm •Att 30 dB •RBW 30 kHz Marker 1 [T1] -8.65 dBm •VBW 100 kHz SWT 35 ms 2.436640000 GHz 20 Offset 1 dB 10 0 -10 -20 -30 -40 -50 -60 -70 -80 SWF 100 Hz 100 1 10V 30B Center 2.437 GHz 3 MHz/ Span 30 MHz Date: 24.FEB.2023 10:07:51
802.11g-High	 Ref 20 dBm •Att 30 dB •RBW 30 kHz Marker 1 [T1] -10.02 dBm •VBW 100 kHz SWT 35 ms 2.460140000 GHz 20 Offset 1 dB 10 0 -10 -20 -30 -40 -50 -60 -70 -80 SWF 100 Hz 100 1 10V 30B Center 2.462 GHz 3 MHz/ Span 30 MHz Date: 24.FEB.2023 10:08:14

802.11n-HT20-Low	 Ref 20 dBm Att 30 dB RBW 30 kHz Marker 1 [T1] -9.37 dBm VSW 100 kHz SWT 35 ms 2.410740000 GHz Center 2.412 GHz 3 MHz/ Span 30 MHz Date: 24.FEB.2023 10:08:39
802.11n-HT20-Middle	 Ref 20 dBm Att 30 dB RBW 30 kHz Marker 1 [T1] -8.54 dBm VSW 100 kHz SWT 35 ms 2.435740000 GHz Center 2.437 GHz 3 MHz/ Span 30 MHz Date: 24.FEB.2023 10:08:59
802.11n-HT20-High	 Ref 20 dBm Att 30 dB RBW 30 kHz Marker 1 [T1] -10.68 dBm VSW 100 kHz SWT 35 ms 2.460740000 GHz Center 2.462 GHz 3 MHz/ Span 30 MHz Date: 24.FEB.2023 10:09:33

802.11n-HT40-Low	 Date: 24.FEB.2023 10:10:43
802.11n-HT40-Middle	 Date: 24.FEB.2023 10:11:09
802.11n-HT40-High	 Date: 24.FEB.2023 10:14:11

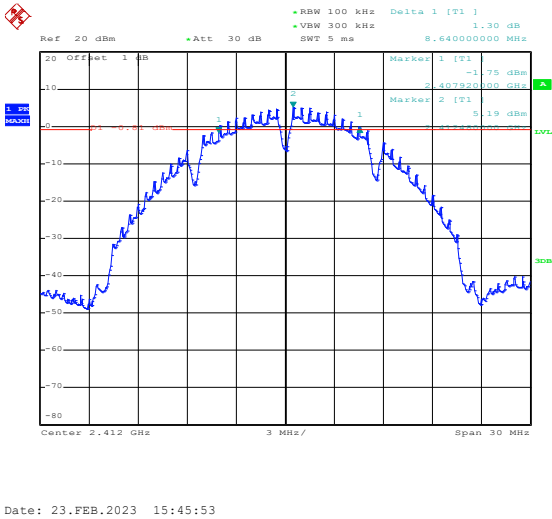
APPENDIX B

DTS Bandwidth				
Test Mode	Test Channel MHz	Test Result(MHz)		Limit kHz
		Antenna 1	Antenna 2	
802.11b_1Mbps	2412	8.64	9.12	≥500
	2437	9.48	9.06	≥500
	2462	9.48	9.06	≥500
802.11g_6Mbps	2412	15.84	15.84	≥500
	2437	15.92	16.32	≥500
	2462	15.92	16.32	≥500
802.11n-HT20_MCS0	2412	16.48	17.04	≥500
	2437	16.56	17.20	≥500
	2462	16.56	17.20	≥500
802.11n-HT40_MCS0	2422	35.52	35.84	≥500
	2437	36.00	36.00	≥500
	2452	36.00	36.00	≥500

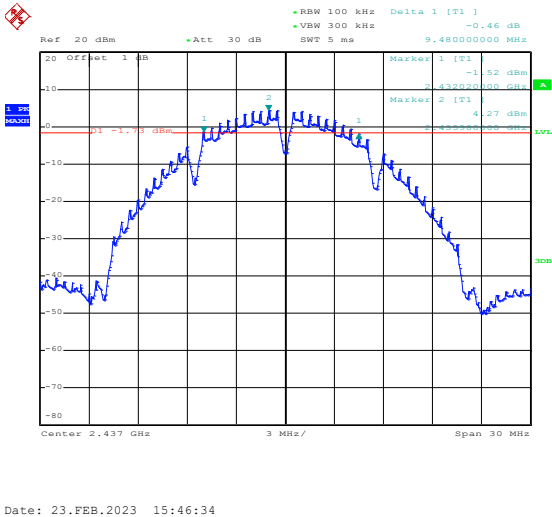
Antenna 1

DTS Bandwidth

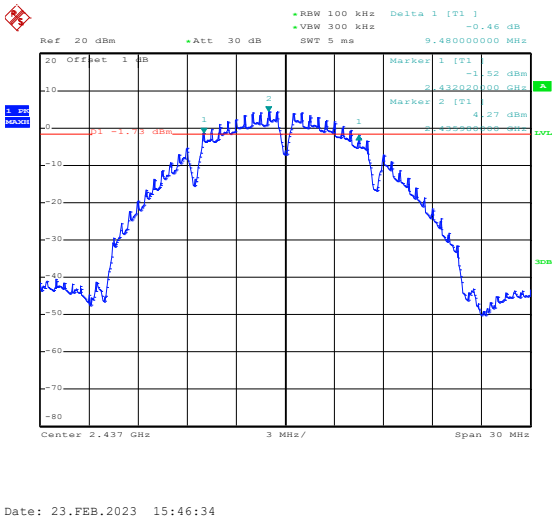
802.11b-Low

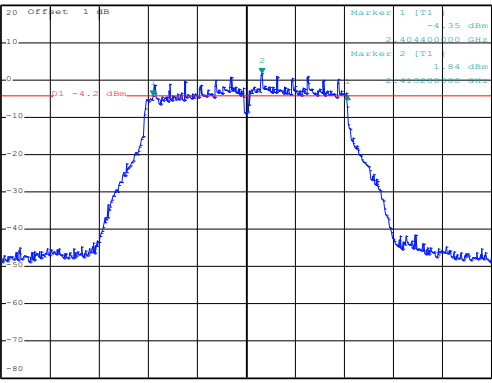
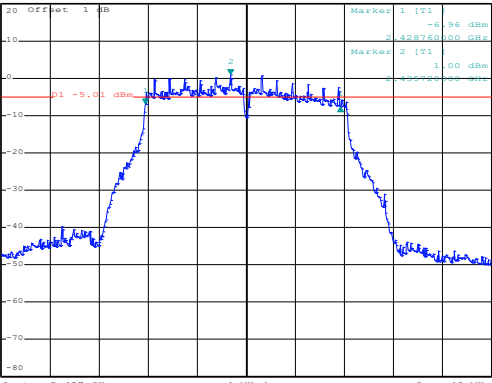
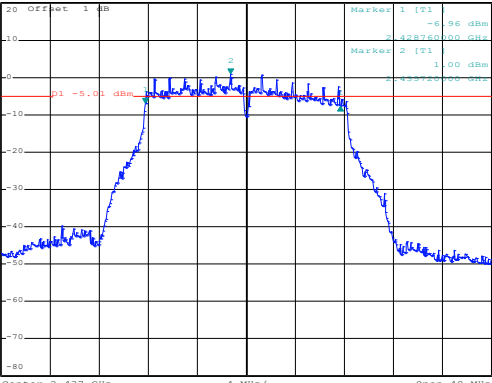


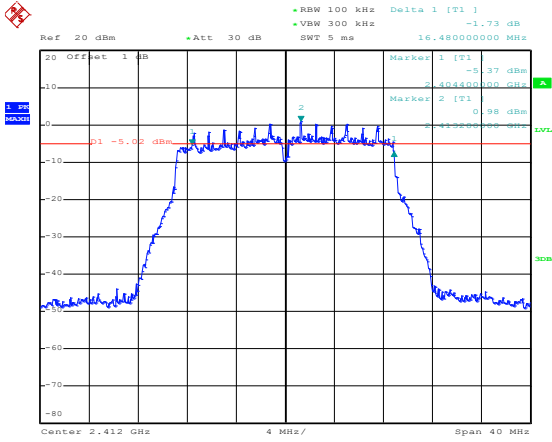
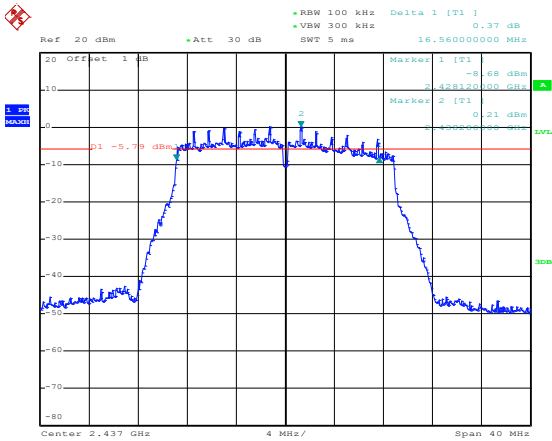
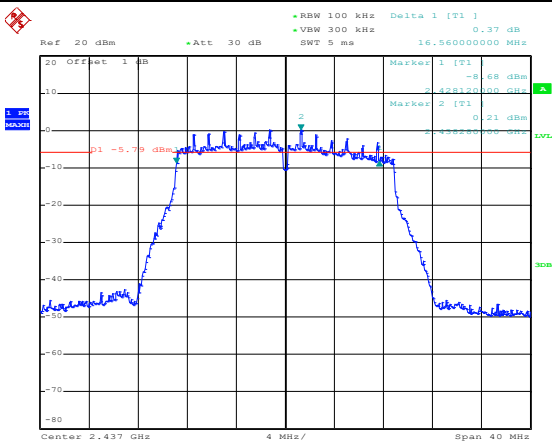
802.11b-Middle

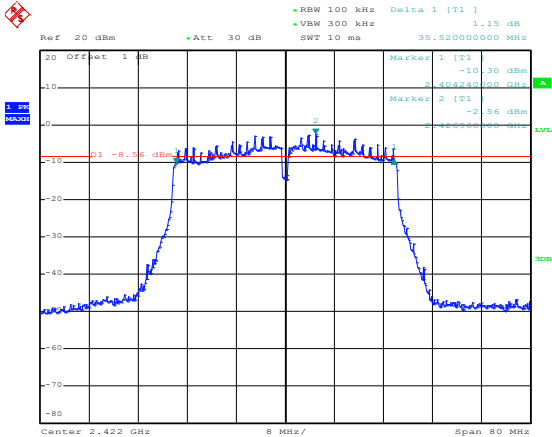
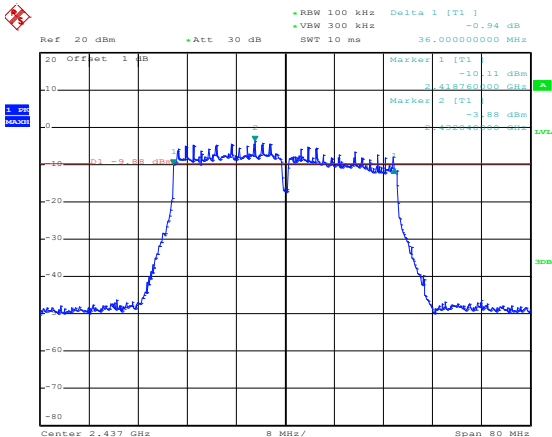
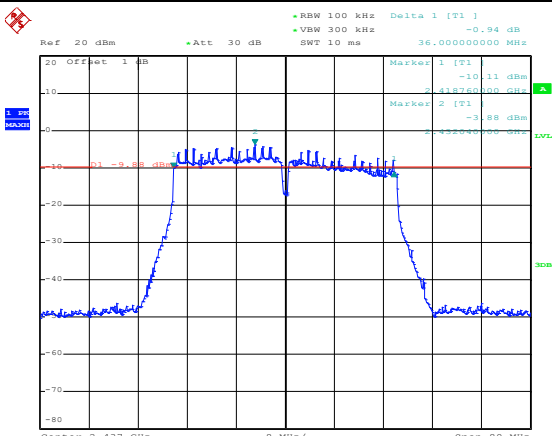


802.11b-High



802.11g-Low	 Ref 20 dBm Att 30 dB RBW 100 kHz Delta 1 [T1] 0.38 dB VSW 300 kHz SWT 5 ms 15.940000000 MHz Marker 1 [T1] -4.35 dBm Marker 2 [T1] -4.35 dBm Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 15:48:35
802.11g-Middle	 Ref 20 dBm Att 30 dB RBW 100 kHz Delta 1 [T1] -0.64 dB VSW 300 kHz SWT 5 ms 15.920000000 MHz Marker 1 [T1] -6.96 dBm Marker 2 [T1] -1.00 dBm Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 15:49:09
802.11g-High	 Ref 20 dBm Att 30 dB RBW 100 kHz Delta 1 [T1] -0.64 dB VSW 300 kHz SWT 5 ms 15.920000000 MHz Marker 1 [T1] -6.96 dBm Marker 2 [T1] -1.00 dBm Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 15:49:09

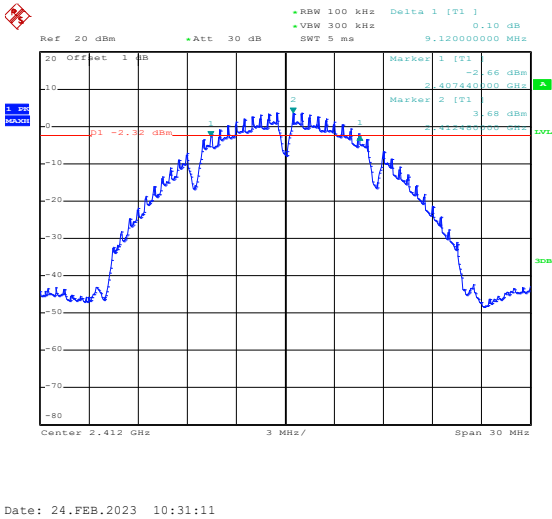
802.11n-HT20-Low	 Ref 20 dBm •Att 30 dB •RBW 100 kHz Delta 1 [T1] -1.73 dB •VBW 300 kHz SWT 5 ms 16.480000000 MHz Marker 1 [T1] -5.37 dBm 2.404000000 GHz A Marker 2 [T1] 0.98 dBm 2.412000000 GHz LVL D1 -5.02 dBm Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 15:51:34
802.11n-HT20-Middle	 Ref 20 dBm •Att 30 dB •RBW 100 kHz Delta 1 [T1] 0.37 dB •VBW 300 kHz SWT 5 ms 16.560000000 MHz Marker 1 [T1] -8.68 dBm 2.428120000 GHz A Marker 2 [T1] 0.21 dBm 2.437000000 GHz LVL D1 -5.79 dBm Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 15:52:35
802.11n-HT20-High	 Ref 20 dBm •Att 30 dB •RBW 100 kHz Delta 1 [T1] 0.37 dB •VBW 300 kHz SWT 5 ms 16.560000000 MHz Marker 1 [T1] -8.68 dBm 2.428120000 GHz A Marker 2 [T1] 0.21 dBm 2.437000000 GHz LVL D1 -5.79 dBm Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 23.FEB.2023 15:52:35

802.11n-HT40-Low	 Ref 20 dBm +Att 30 dB RBW 100 kHz Delta 1 [T1] 1.15 dB VSW 300 kHz SWT 10 ms 35.520000000 MHz Marker 1 [T1] -10.30 dBm 2.422000000 GHz Marker 2 [T1] -2.56 dBm 2.422000000 GHz Center 2.422 GHz 8 MHz/ Span 80 MHz Date: 23.FEB.2023 15:55:00
802.11n-HT40-Middle	 Ref 20 dBm +Att 30 dB RBW 100 kHz Delta 1 [T1] -0.94 dB VSW 300 kHz SWT 10 ms 36.000000000 MHz Marker 1 [T1] -10.11 dBm 2.437600000 GHz Marker 2 [T1] -3.88 dBm 2.437600000 GHz Center 2.437 GHz 8 MHz/ Span 80 MHz Date: 23.FEB.2023 15:55:43
802.11n-HT40-High	 Ref 20 dBm +Att 30 dB RBW 100 kHz Delta 1 [T1] -0.94 dB VSW 300 kHz SWT 10 ms 36.000000000 MHz Marker 1 [T1] -10.11 dBm 2.437600000 GHz Marker 2 [T1] -3.88 dBm 2.437600000 GHz Center 2.437 GHz 8 MHz/ Span 80 MHz Date: 23.FEB.2023 15:55:43

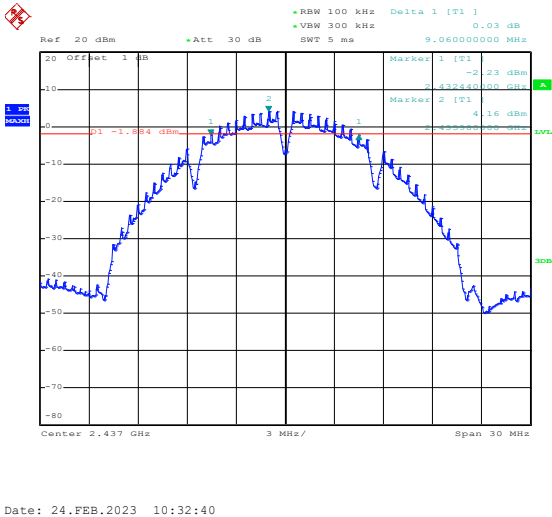
Antenna 2

DTS Bandwidth

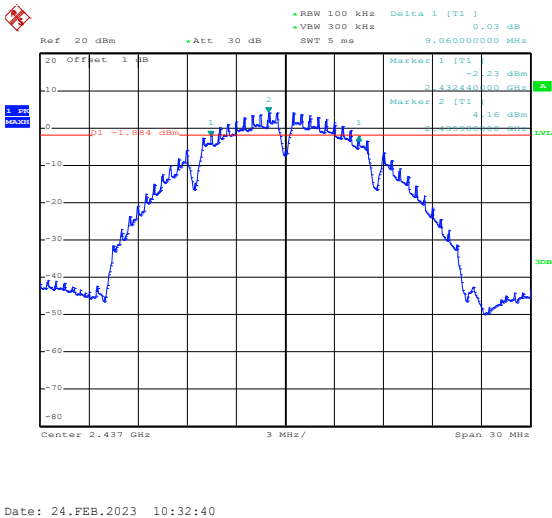
802.11b-Low

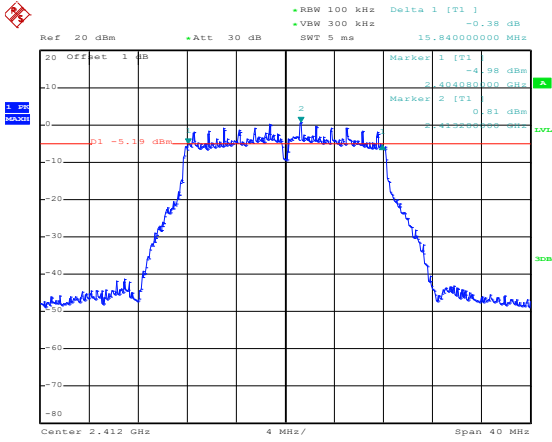
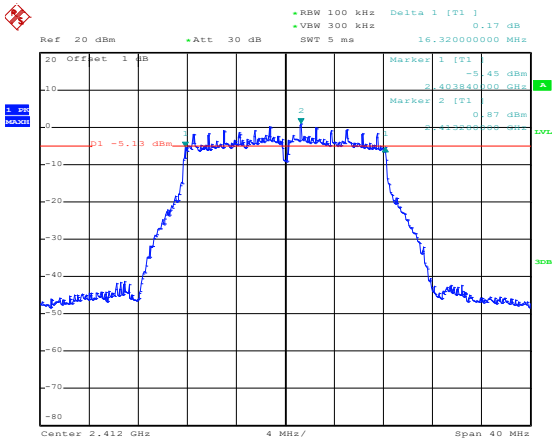
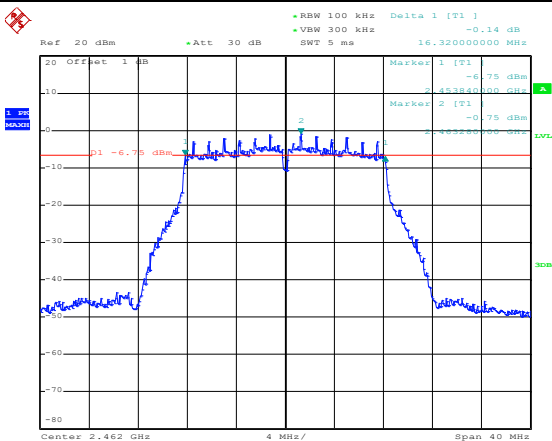


802.11b-Middle



802.11b-High



802.11g-Low	 Ref 20 dBm +Att 30 dB RBW 100 kHz Delta 1 [T1] -0.38 dB VSW 300 kHz SWT 5 ms 15.840000000 MHz Marker 1 [T1] -4.98 dBm 2.403800000 GHz Marker 2 [T1] 0.81 dBm 2.413800000 GHz 1st -5.19 dBm Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 24.FEB.2023 11:04:00
802.11g-Middle	 Ref 20 dBm +Att 30 dB RBW 100 kHz Delta 1 [T1] 0.17 dB VSW 300 kHz SWT 5 ms 16.320000000 MHz Marker 1 [T1] -5.45 dBm 2.403800000 GHz Marker 2 [T1] 0.87 dBm 2.413800000 GHz 1st -5.13 dBm Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 24.FEB.2023 12:41:31
802.11g-High	 Ref 20 dBm +Att 30 dB RBW 100 kHz Delta 1 [T1] -0.14 dB VSW 300 kHz SWT 5 ms 16.320000000 MHz Marker 1 [T1] -6.75 dBm 2.453800000 GHz Marker 2 [T1] -0.75 dBm 2.463800000 GHz 1st -6.75 dBm Center 2.462 GHz 4 MHz/ Span 40 MHz Date: 24.FEB.2023 12:42:49

802.11n-HT20-Low

Ref 20 dBm Att 30 dB RBW 100 kHz Delta 1 [T1] -0.15 dB
VBW 300 kHz
SWT 5 ms 17.04000000 MHz

Marker 1 [T1] -6.76 dBm
Marker 2 [T1] -0.16 dBm

2.403440000 GHz

2.412 GHz 4 MHz/ Span 40 MHz

Date: 24.FEB.2023 12:44:50

802.11n-HT20-Middle

Ref 20 dBm Att 30 dB RBW 100 kHz Delta 1 [T1] -0.14 dB
VBW 300 kHz
SWT 5 ms 17.20000000 MHz

Marker 1 [T1] -6.93 dBm
Marker 2 [T1] -0.72 dBm

2.428200000 GHz

2.437 GHz 4 MHz/ Span 40 MHz

Date: 24.FEB.2023 12:46:31

802.11n-HT20-High

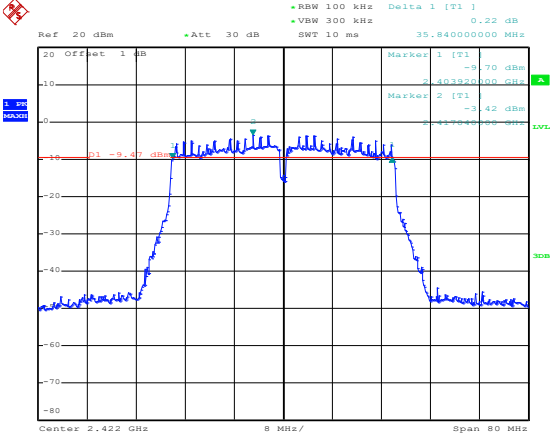
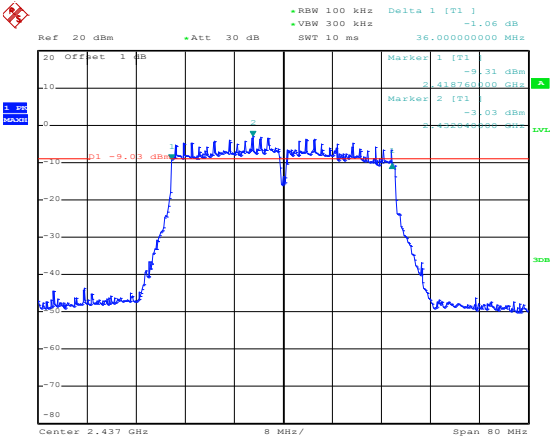
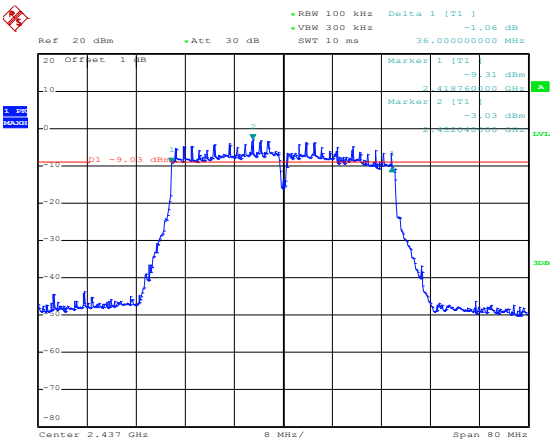
Ref 20 dBm Att 30 dB RBW 100 kHz Delta 1 [T1] -0.14 dB
VBW 300 kHz
SWT 5 ms 17.20000000 MHz

Marker 1 [T1] -6.93 dBm
Marker 2 [T1] -0.72 dBm

2.428200000 GHz

2.437 GHz 4 MHz/ Span 40 MHz

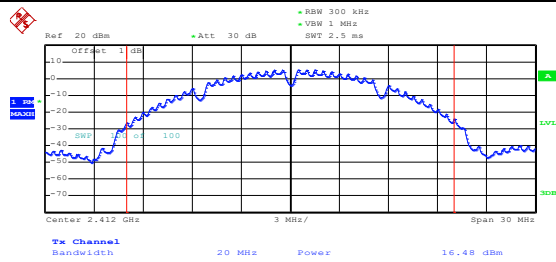
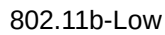
Date: 24.FEB.2023 12:46:31

802.11n-HT40-Low	 Date: 24.FEB.2023 12:49:34
802.11n-HT40-Middle	 Date: 24.FEB.2023 12:50:30
802.11n-HT40-High	 Date: 24.FEB.2023 12:50:30

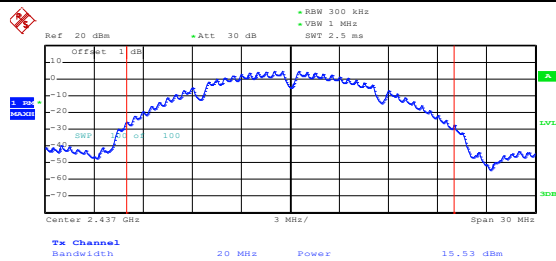
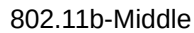
APPENDIX C

RF Output Power					
Test Mode	Frequency MHz	Antenna 1 dBm	Antenna 2 dBm	Total Power dBm	Limit dBm
802.11b _1Mbps	2412	16.48	15.29	/	30.00
	2437	15.53	15.03	/	30.00
	2462	16.12	13.59	/	30.00
802.11g _6Mbps	2412	14.89	14.66	/	30.00
	2437	14.88	14.53	/	30.00
	2462	13.72	13.39	/	30.00
802.11n HT20_MCS0	2412	13.78	13.09	16.46	30.00
	2437	13.38	13.31	16.36	30.00
	2462	12.39	12.37	15.39	30.00
802.11n HT40_MCS0	2422	12.41	11.86	15.15	30.00
	2437	12.14	11.92	15.04	30.00
	2452	11.23	11.68	14.47	30.00

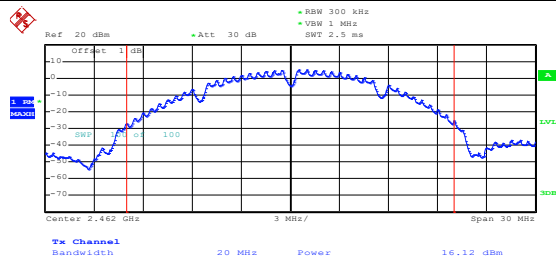
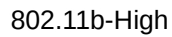
Antenna 1



Date: 23.FEB.2023 14:46:24

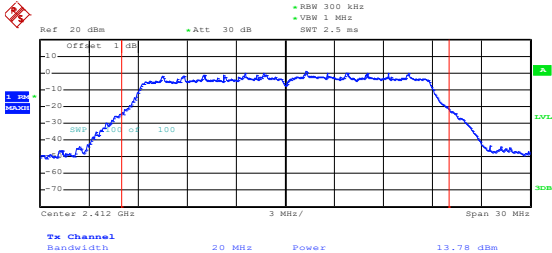
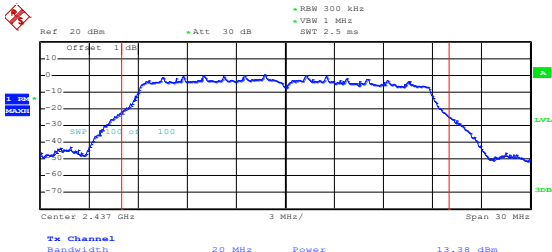
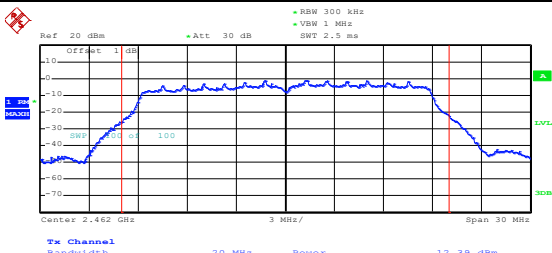


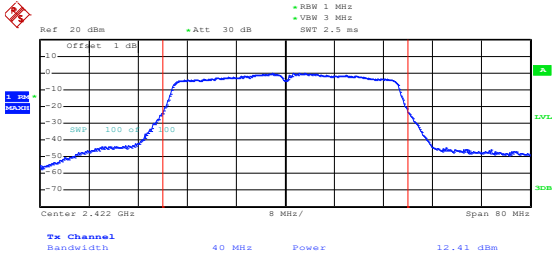
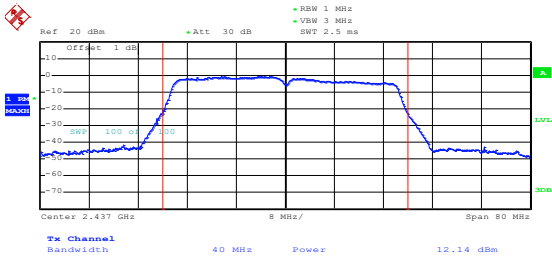
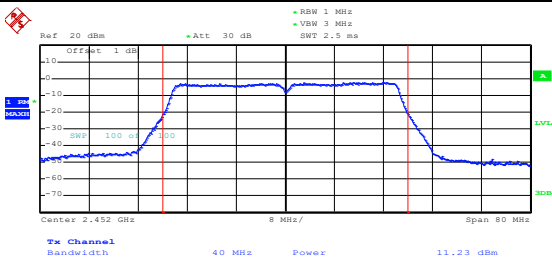
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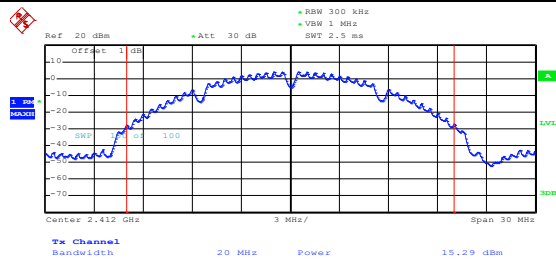
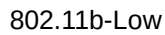
Date: 23.FEB.2023 14:47:10

802.11g-Low	Date: 23.FEB.2023 14:49:39
802.11g-Middle	Date: 23.FEB.2023 14:50:08
802.11g-High	Date: 23.FEB.2023 14:50:32

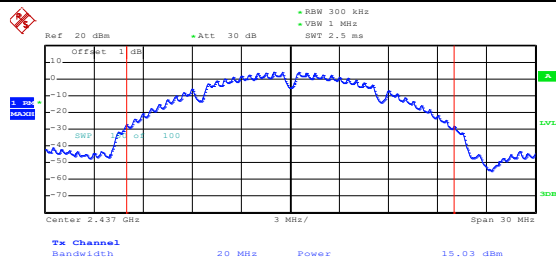
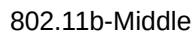
802.11n-HT20-Low	 Date: 23.FEB.2023 14:51:47
802.11n-HT20-Middle	 Date: 23.FEB.2023 14:52:19
802.11n-HT20-High	 Date: 23.FEB.2023 14:52:58

802.11n-HT40-Low	 Ref: 20 dBm • Att: 30 dB • RBW: 1 MHz • VBW: 3 MHz • SWT: 2.5 ms Offset: 1 dB Center: 2.422 GHz 8 MHz/ Span: 80 MHz Tx Channel Bandwidth: 40 MHz Power: 12.41 dBm Date: 23.FEB.2023 14:54:59
802.11n-HT40-Middle	 Ref: 20 dBm • Att: 30 dB • RBW: 1 MHz • VBW: 3 MHz • SWT: 2.5 ms Offset: 1 dB Center: 2.437 GHz 8 MHz/ Span: 80 MHz Tx Channel Bandwidth: 40 MHz Power: 12.14 dBm Date: 23.FEB.2023 14:56:34
802.11n-HT40-High	 Ref: 20 dBm • Att: 30 dB • RBW: 1 MHz • VBW: 3 MHz • SWT: 2.5 ms Offset: 1 dB Center: 2.452 GHz 8 MHz/ Span: 80 MHz Tx Channel Bandwidth: 40 MHz Power: 11.23 dBm Date: 23.FEB.2023 14:57:14

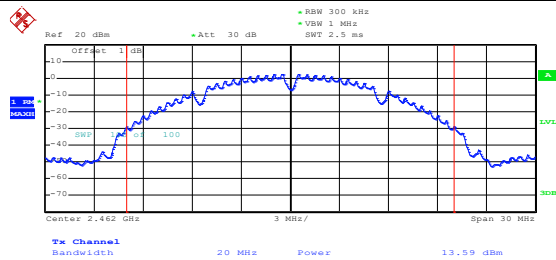
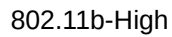
Antenna 2



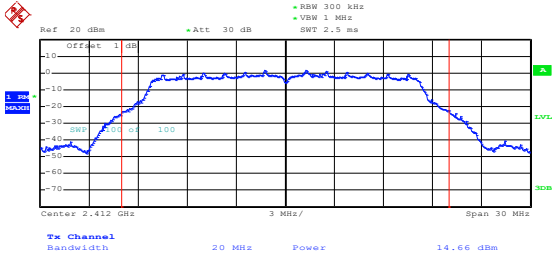
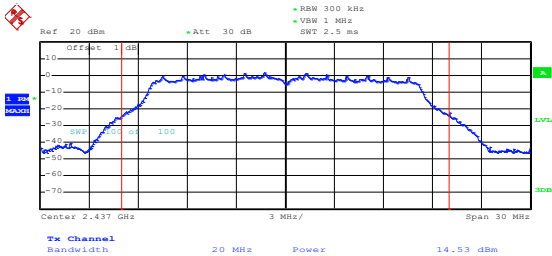
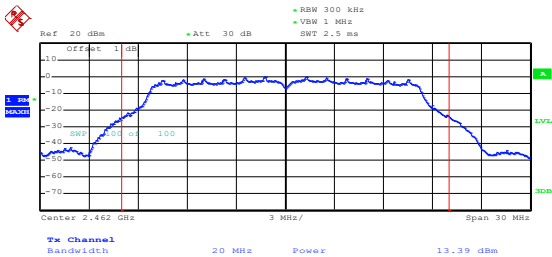
Date: 24.FEB.2023 10:04:30

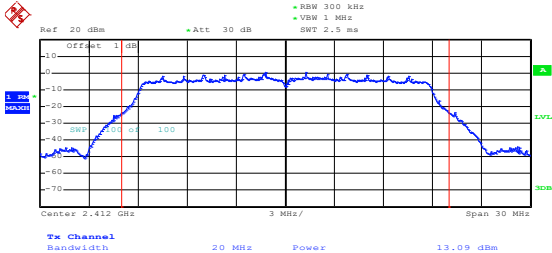
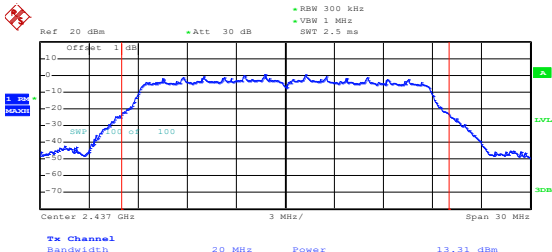
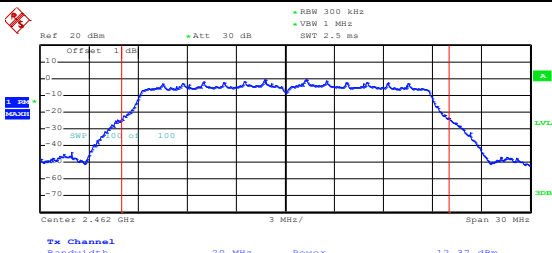


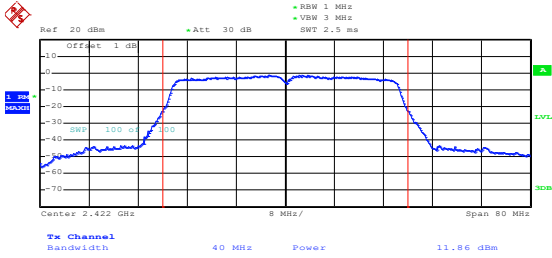
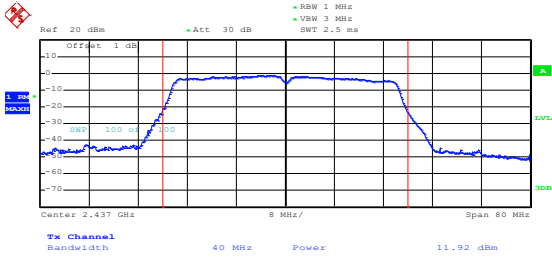
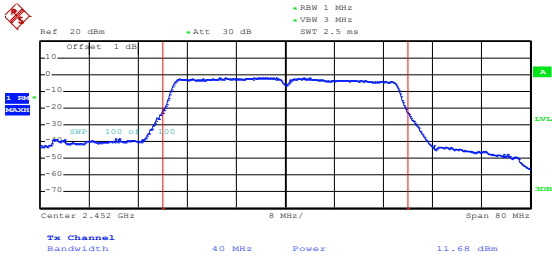
Date: 24.FEB.2023 10:04:48



Date: 24.FEB.2023 10:05:07

802.11g-Low	 Ref: 20 dBm • Att: 30 dB • RBW: 300 kHz • VBW: 1 MHz • SWT: 2.5 ms Offset: 1 dB Center: 2.412 GHz 3 MHz/ Span: 30 MHz Ts Channel Bandwidth: 20 MHz Power: 14.66 dBm Date: 24.FEB.2023 10:02:20
802.11g-Middle	 Ref: 20 dBm • Att: 30 dB • RBW: 300 kHz • VBW: 1 MHz • SWT: 2.5 ms Offset: 1 dB Center: 2.437 GHz 3 MHz/ Span: 30 MHz Ts Channel Bandwidth: 20 MHz Power: 14.53 dBm Date: 24.FEB.2023 10:02:52
802.11g-High	 Ref: 20 dBm • Att: 30 dB • RBW: 300 kHz • VBW: 1 MHz • SWT: 2.5 ms Offset: 1 dB Center: 2.462 GHz 3 MHz/ Span: 30 MHz Ts Channel Bandwidth: 20 MHz Power: 13.39 dBm Date: 24.FEB.2023 10:03:55

802.11n-HT20-Low	 Ref: 20 dBm • Att: 30 dB • RBW: 300 kHz • VBW: 1 MHz • SWT: 2.5 ms Offset: 1 dB Center: 2.412 GHz 3 MHz/ Span: 30 MHz Tx Channel Bandwidth: 20 MHz Power: 13.09 dBm Date: 24.FEB.2023 10:00:27
802.11n-HT20-Middle	 Ref: 20 dBm • Att: 30 dB • RBW: 300 kHz • VBW: 1 MHz • SWT: 2.5 ms Offset: 1 dB Center: 2.437 GHz 3 MHz/ Span: 30 MHz Tx Channel Bandwidth: 20 MHz Power: 13.31 dBm Date: 24.FEB.2023 10:00:51
802.11n-HT20-High	 Ref: 20 dBm • Att: 30 dB • RBW: 300 kHz • VBW: 1 MHz • SWT: 2.5 ms Offset: 1 dB Center: 2.462 GHz 3 MHz/ Span: 30 MHz Tx Channel Bandwidth: 20 MHz Power: 12.37 dBm Date: 24.FEB.2023 10:01:28

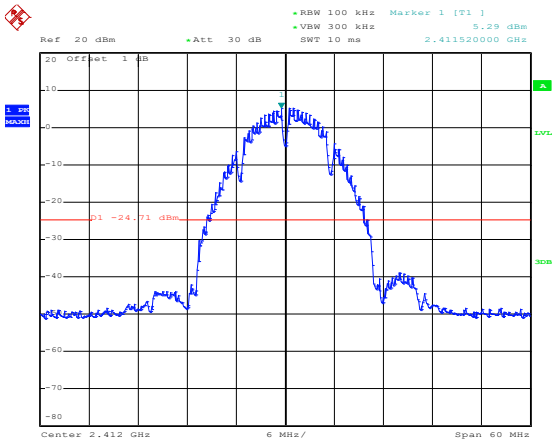
802.11n-HT40-Low	 Ref: 20 dBm Offset: 1 dB Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 2.5 ms Center: 2.422 GHz Span: 80 MHz 8 MHz/ Ts Channel Bandwidth: 40 MHz Power: 11.86 dBm Date: 24.FEB.2023 09:58:59
802.11n-HT40-Middle	 Ref: 20 dBm Offset: 1 dB Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 2.5 ms Center: 2.437 GHz Span: 80 MHz 8 MHz/ Ts Channel Bandwidth: 40 MHz Power: 11.92 dBm Date: 24.FEB.2023 09:59:25
802.11n-HT40-High	 Ref: 20 dBm Offset: 1 dB Att: 30 dB RBW: 1 MHz VBW: 3 MHz SWT: 2.5 ms Center: 2.452 GHz Span: 80 MHz 8 MHz/ Ts Channel Bandwidth: 40 MHz Power: 11.68 dBm Date: 24.FEB.2023 09:59:50

APPENDIX D

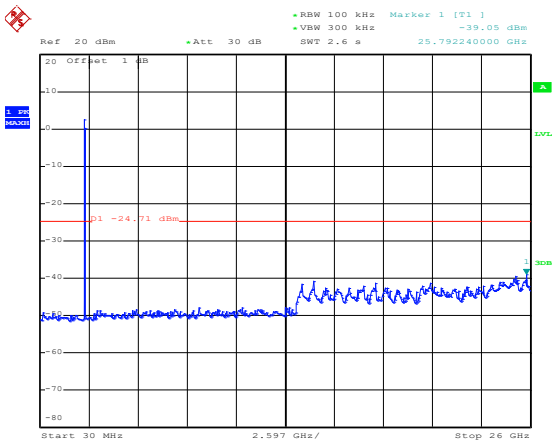
Conducted Out of Band Emissions

Antenna 1

802.11b-Low

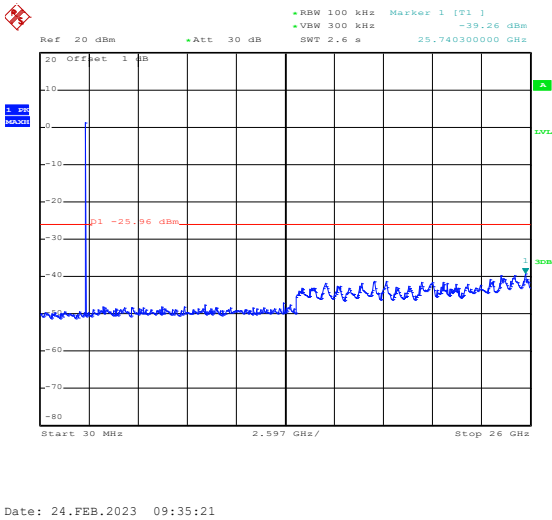
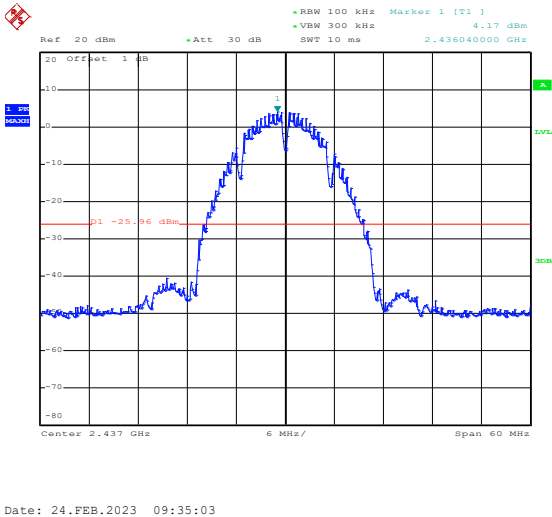


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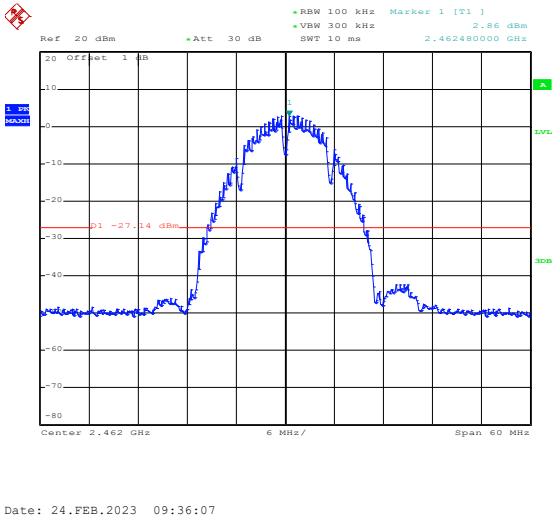


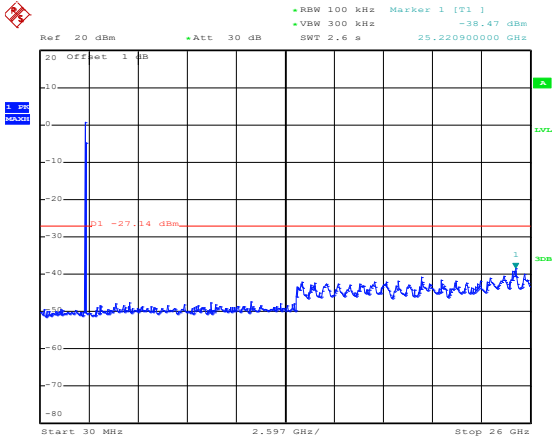
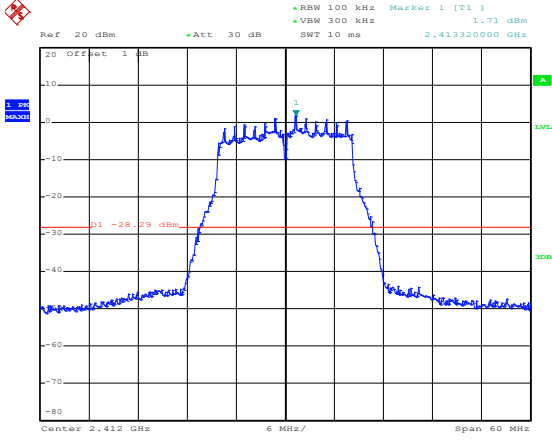
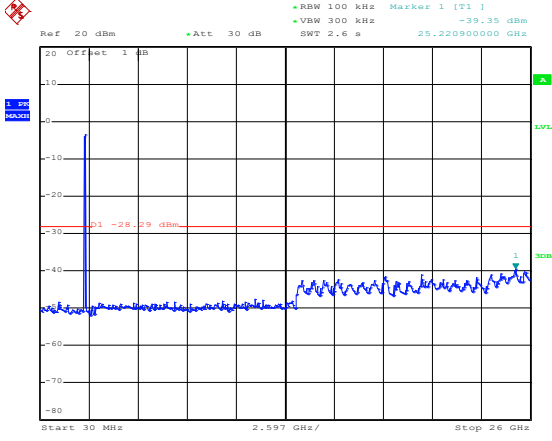
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802.11b-Middle

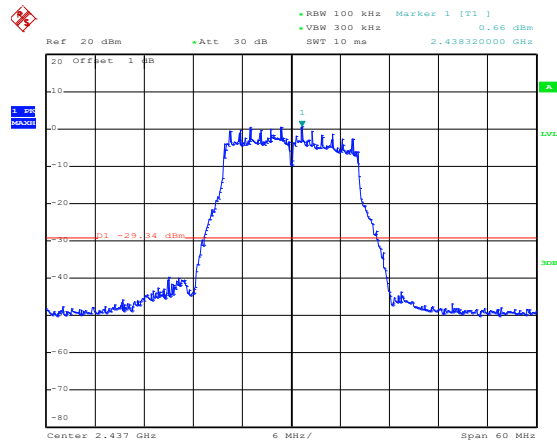


802.11b-High

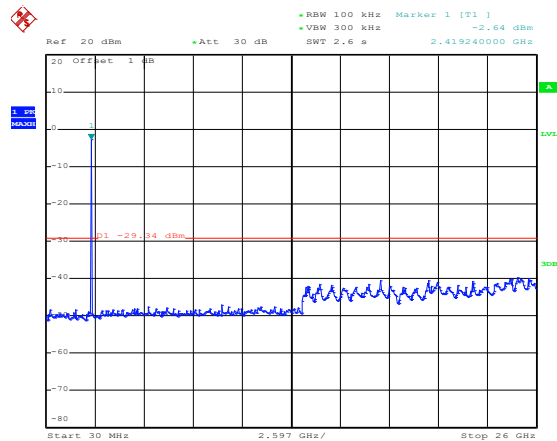


	 Date: 24.FEB.2023 09:36:26
802.11g-Low	 Date: 24.FEB.2023 09:37:16
	 Date: 24.FEB.2023 09:37:31

802.11g-Middle

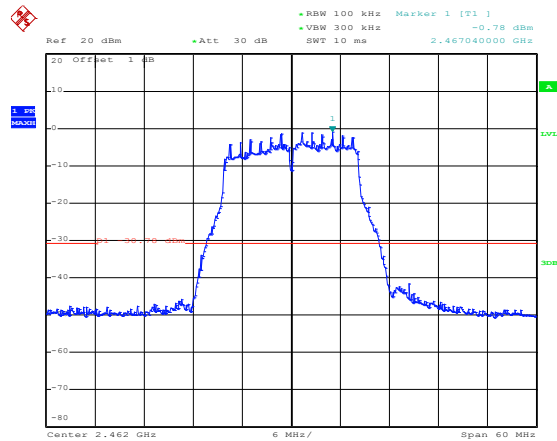


Date: 24.FEB.2023 09:38:14

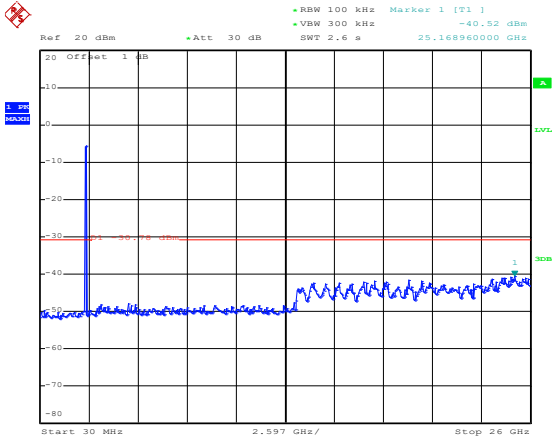
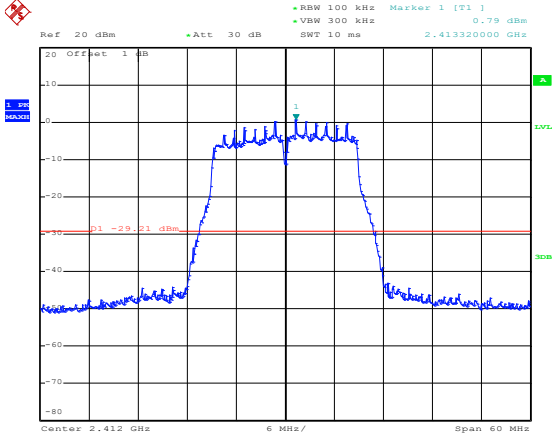
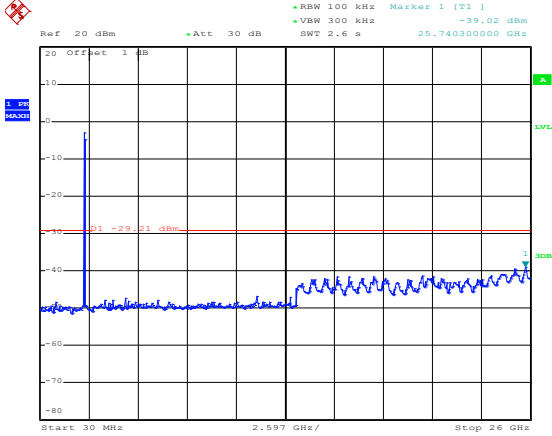


Date: 24.FEB.2023 09:38:42

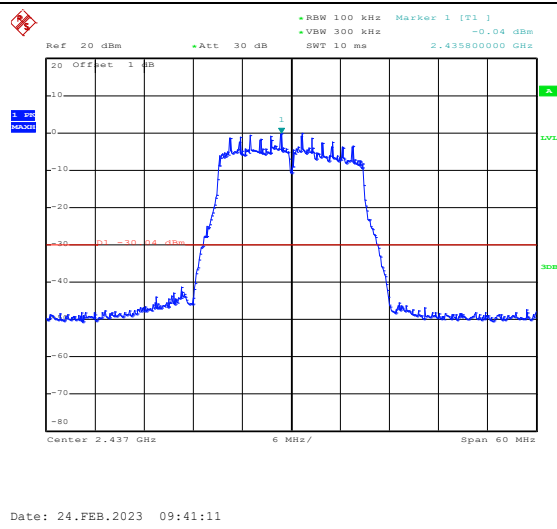
802.11g-High



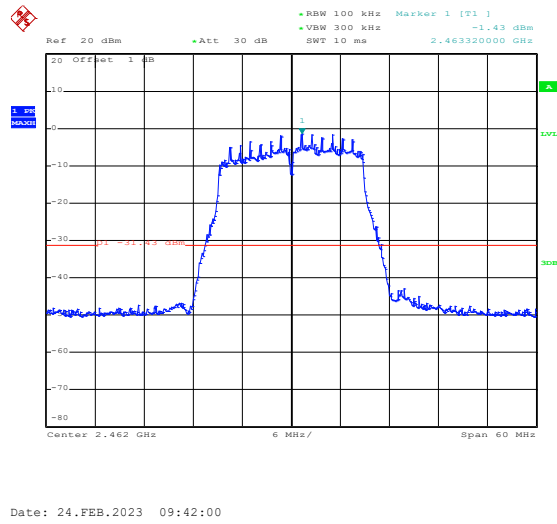
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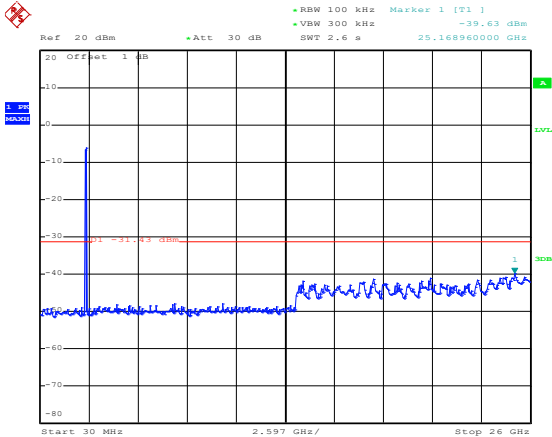
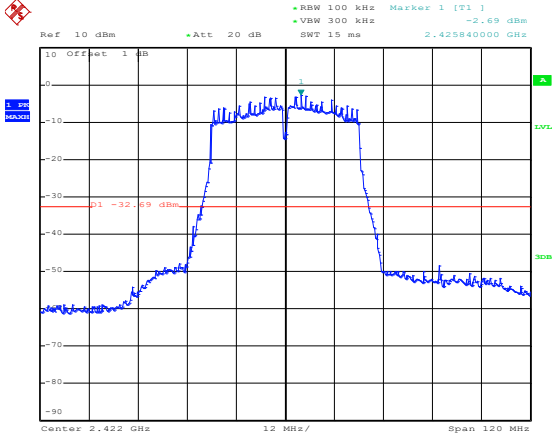
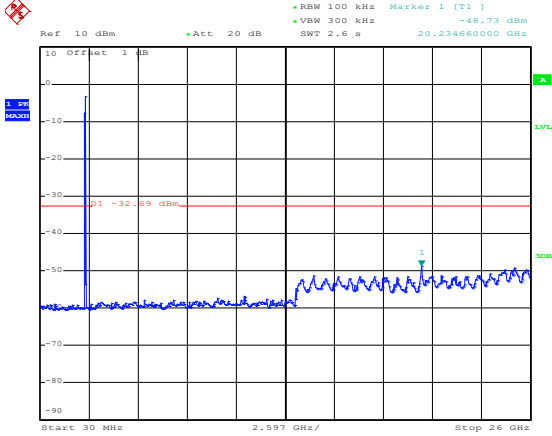
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802.11n-HT20-Low	 Date: 24.FEB.2023 09:40:12
	 Date: 24.FEB.2023 09:40:33

802.11n-HT20-Middle

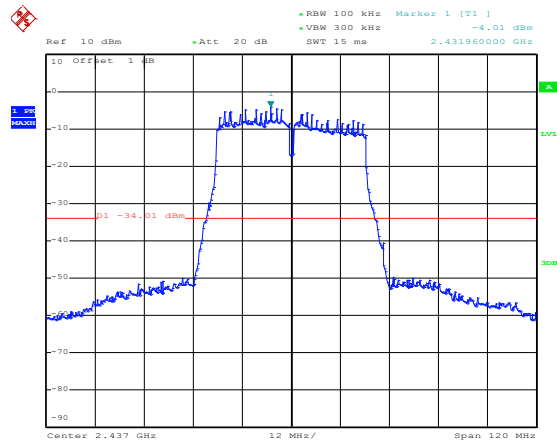


802.11n-HT20-High

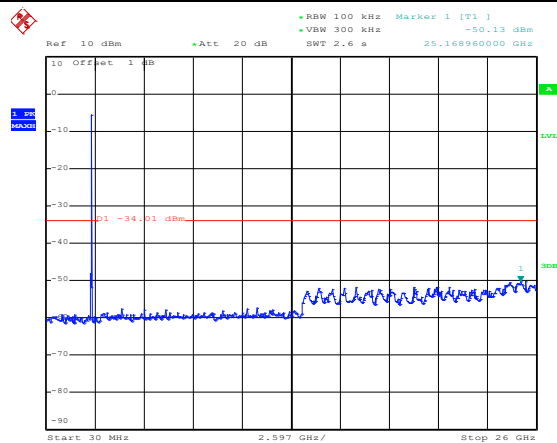


	 Date: 24.FEB.2023 09:42:14
802.11n-HT40-Low	 Date: 24.FEB.2023 09:43:07
	 Date: 24.FEB.2023 09:43:54

802.11n-HT40-Middle

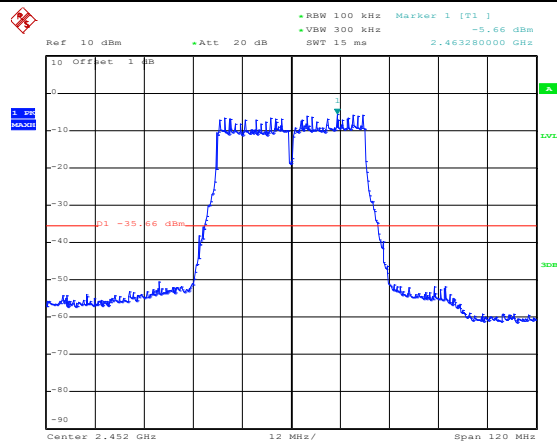


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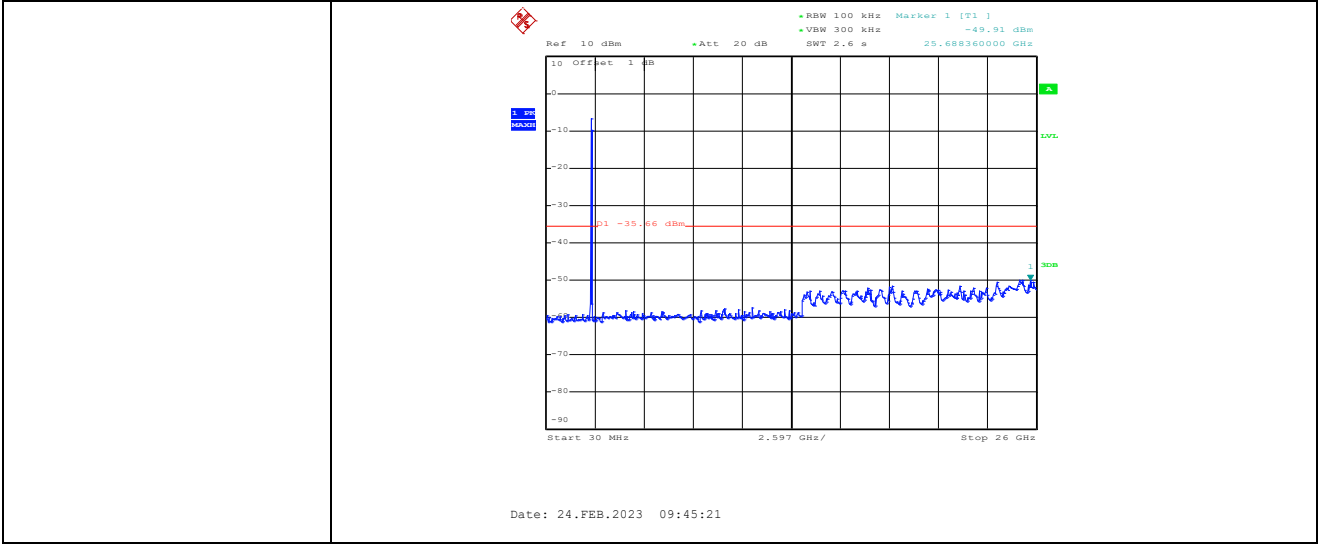


Date: 24.FEB.2023 09:44:36

802.11n-HT40-High

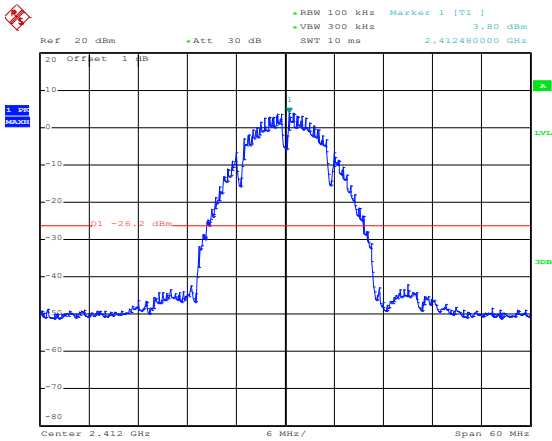


Date: 24.FEB.2023 09:45:05

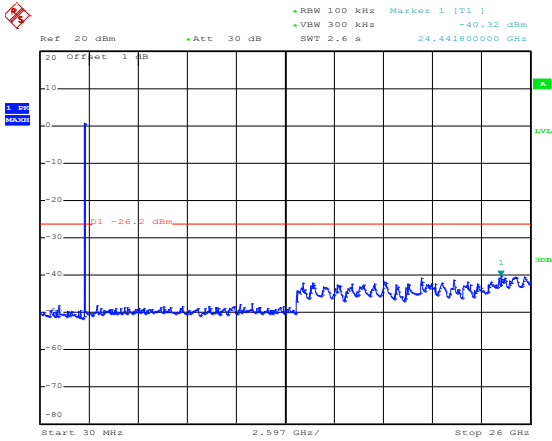


Antenna 2

802.11b-Low

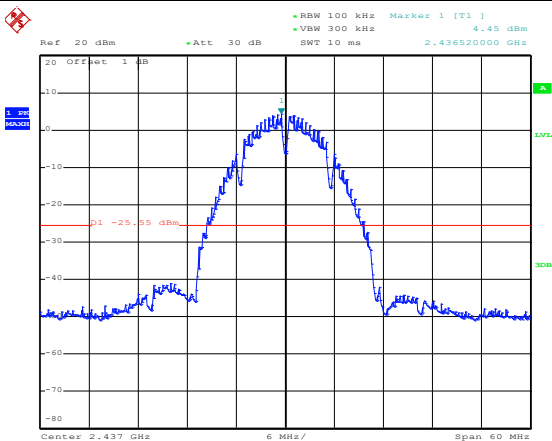


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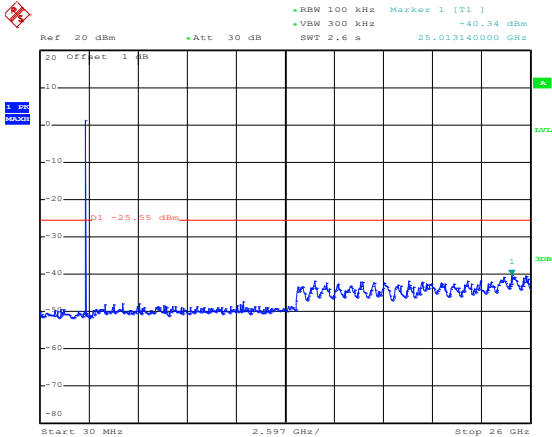
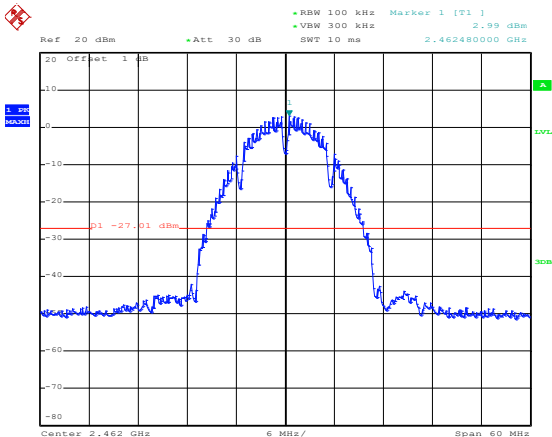
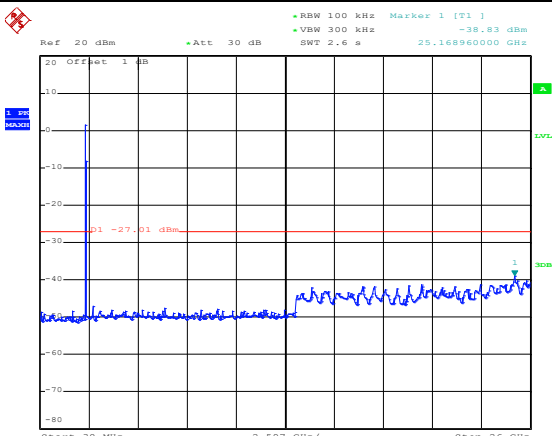


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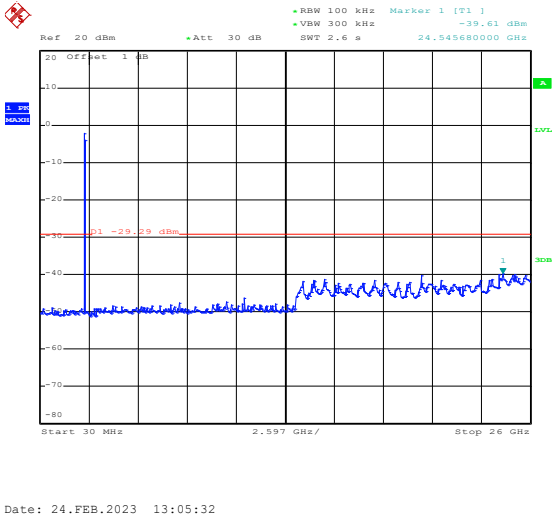
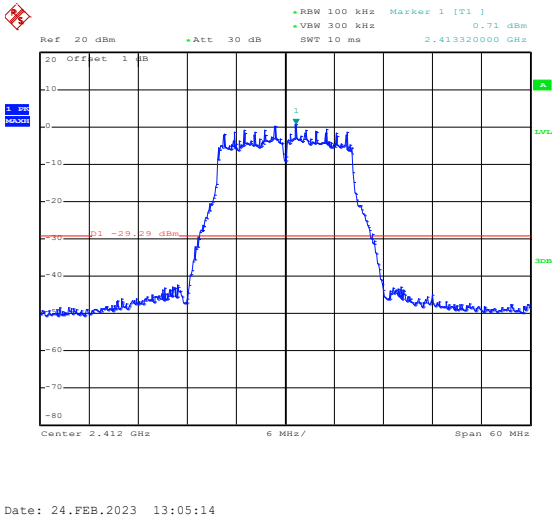
802.11b-Middle



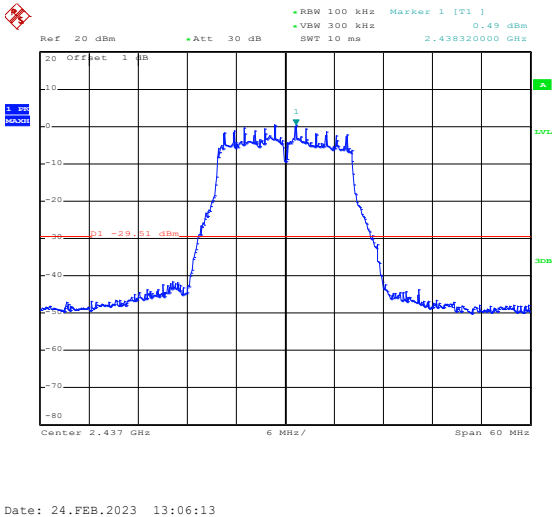
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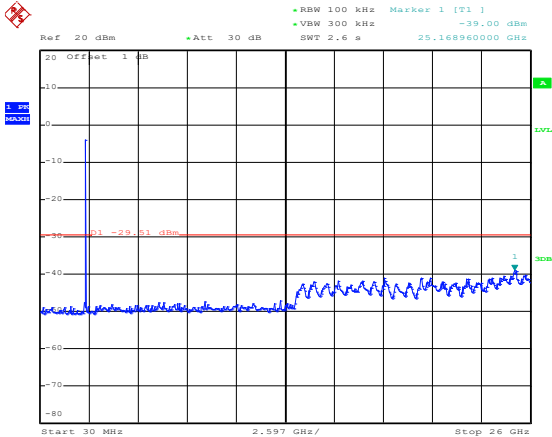
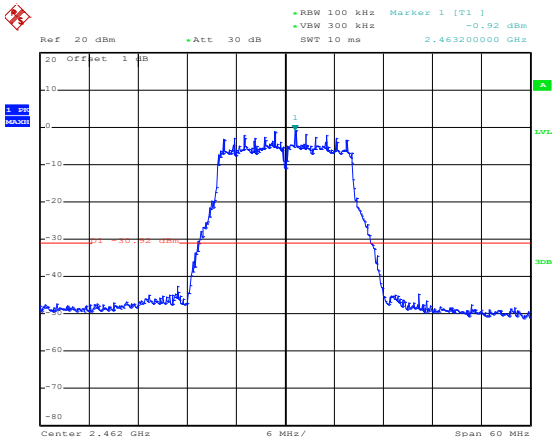
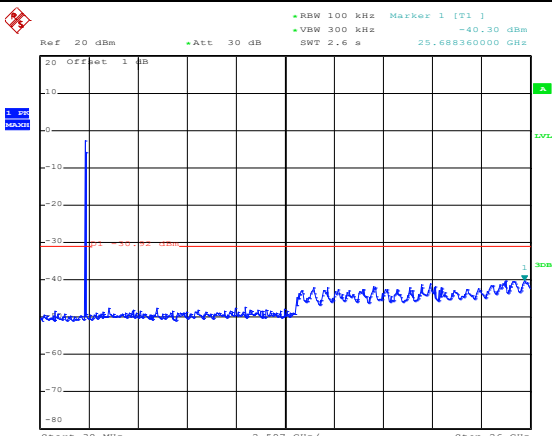
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	 Date: 24.FEB.2023 13:04:27

802.11g-Low

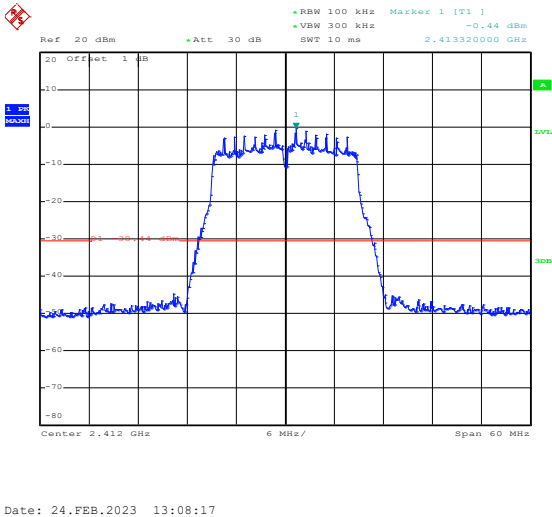


802.11g-Middle

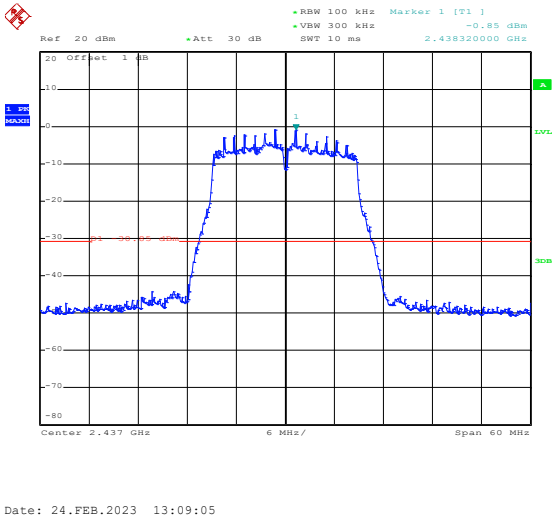


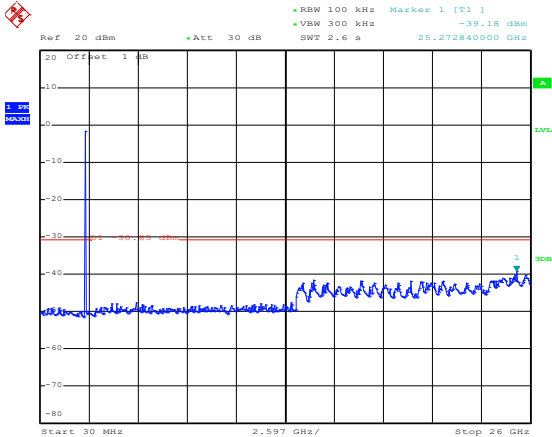
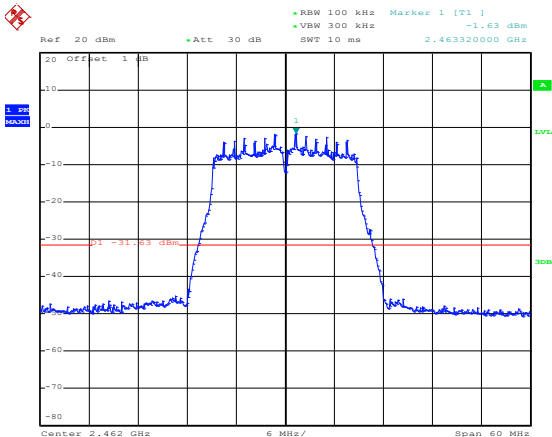
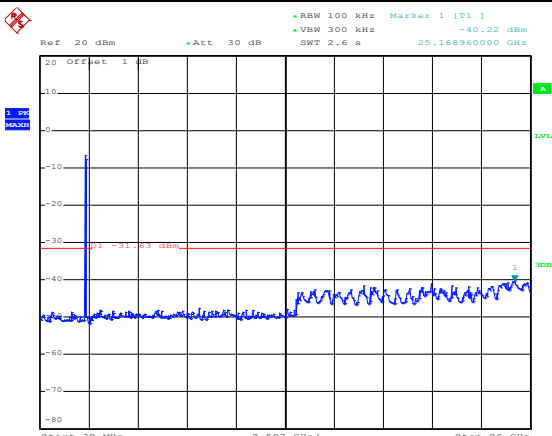
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	 Date: 24.FEB.2023 13:07:36

802.11n-HT20-Low

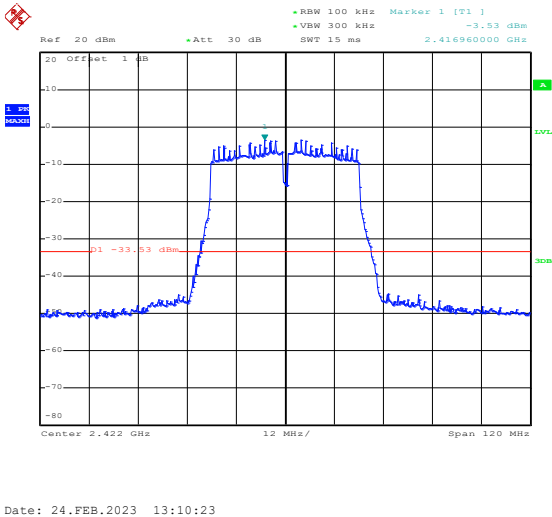


802.11n-HT20-Middle

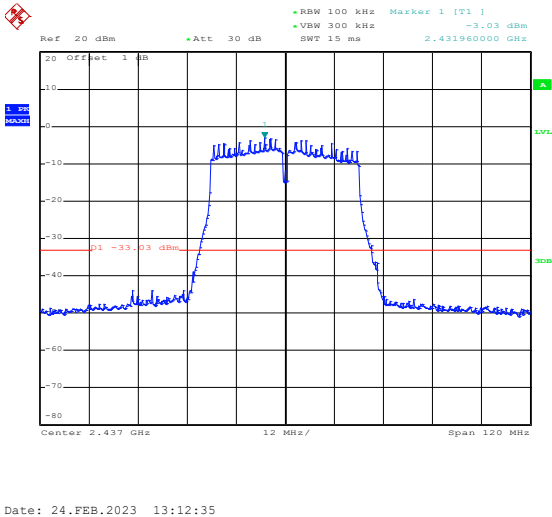


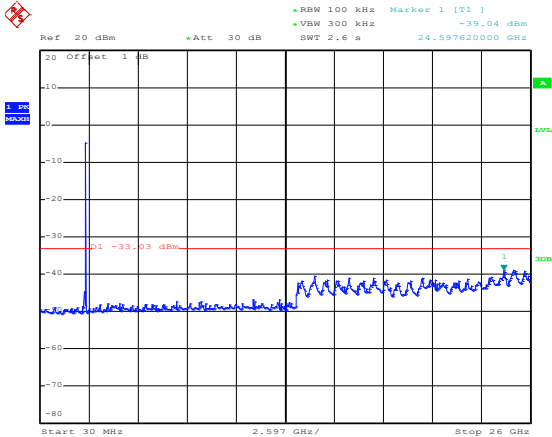
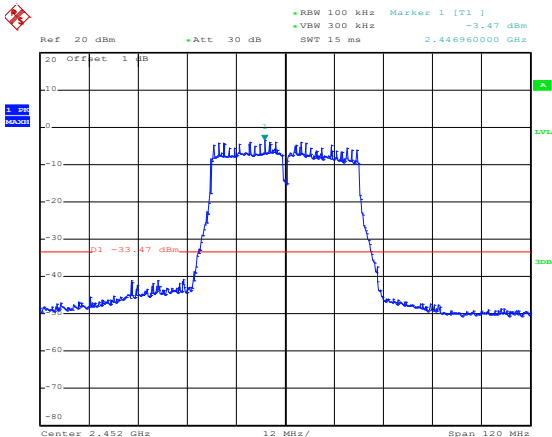
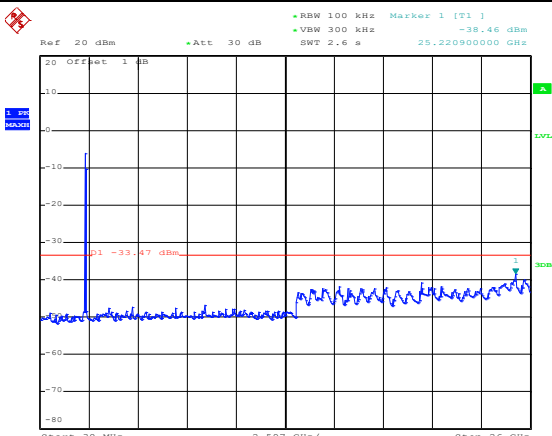
	 Date: 24.FEB.2023 13:09:22
802.11n-HT20-High	 Date: 24.FEB.2023 13:15:19
	 Date: 24.FEB.2023 13:15:34

802.11n-HT40-Low



802.11n-HT40-Middle



	 Date: 24.FEB.2023 13:13:18
802.11n-HT40-High	 Date: 24.FEB.2023 13:17:02
	 Date: 24.FEB.2023 13:17:17

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

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