FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

Humidifier

Model No.: PRO-3, PRO-4, PRO-5, PRO-6

FCC ID: 2ATIZ-PRO-4

Trade Mark: N/A

Report No.: ES190904020W

Issue Date: November 19, 2019

Prepared for

Zhongshan Invitop Electrical Co.,Ltd.

B-6F, NO.6, Xinhua Road, Sanjiao Town, Zhongshan, Guandong P.R.C

Prepared by

EMTEK(SHENZHEN) CO., LTD.
Bldg 69, Majialong Industry Zone, Nanshan District,
Shenzhen, Guangdong, China
TEL: 86-755-26954280
FAX: 86-755-26954282

TABLE OF CONTENTS

1 TEST RESULT CERTIFICATION **3**

2 EUT TECHNICAL DESCRIPTION **5**

3 SUMMARY OF TEST RESULT **6**

4 TEST METHODOLOGY **7**

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS 7
4.2 MEASUREMENT EQUIPMENT USED 7
4.3 DESCRIPTION OF TEST MODES 8

5 FACILITIES AND ACCREDITATIONS **9**

5.1 FACILITIES 9
5.2 LABORATORY ACCREDITATIONS AND LISTINGS 9

6 TEST SYSTEM UNCERTAINTY **10**

7 SETUP OF EQUIPMENT UNDER TEST **11**

7.1 RADIO FREQUENCY TEST SETUP 1 11
7.2 RADIO FREQUENCY TEST SETUP 2 11
7.3 CONDUCTED EMISSION TEST SETUP 12
7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM 13
7.5 SUPPORT EQUIPMENT 13

8 TEST REQUIREMENTS **14**

8.1 DTS (6DB) BANDWIDTH 14
8.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER 20
8.3 MAXIMUM POWER SPECTRAL DENSITY 21
8.4 UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS 27
8.5 RADIATED SPURIOUS EMISSION 32
8.6 CONDUCTED EMISSIONS TEST 44
8.7 ANTENNA APPLICATION 47

1 TEST RESULT CERTIFICATION

Applicant : Zhongshan Invitop Electrical Co.,Ltd.
Address : B-6F, NO.6, Xinhua Road, Sanjiao Town, Zhongshan, Guandong P.R.C

Manufacture : Zhongshan Invitop Electrical Co.,Ltd.
Address : B-6F, NO.6, Xinhua Road, Sanjiao Town, Zhongshan, Guandong P.R.C

EUT : Humidifier

Model : PRO-3, PRO-4, PRO-5, PRO-6

Trademark : N/A

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 2 , Subpart J FCC 47 CFR Part 15 , Subpart C	**PASS**

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.247
The test results of this report relate only to the tested sample identified in this report.

Date of Test : September 05, 2019 to November 18, 2019

Prepared by : Mill Chen /Editor

Reviewer : Sewen Guo /Supervisor

Approve & Authorized Signer : Lisa Wang/Manager

EMTEK (SHENZHEN) CO., LTD. TESTING

Modified History

Version	Report No.	Revision Date	Summary
Ver.1.0	ES190904020W	/	Original Report

2 EUT TECHNICAL DESCRIPTION

Characteristics	Description
IEEE 802.11 WLAN Mode Supported	☒ 802.11b ☒ 802.11g ☒ 802.11n(20MHz channel bandwidth) ☐ 802.11n(40MHz channel bandwidth)
Data Rate	802.11 b:1,2,5.5,11Mbps; 802.11 g:6,9,12,18,24,36,48,54Mbps; 802.11n(HT20): 6.5M,13M,19.5M,26M,39M,52M,58.5M,65M;
Modulation	DSSS with DBPSK/DQPSK/CCK for 802.11b OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n
Operating Frequency Range	2412-2462MHz for 802.11b/g/n(HT20)
Number of Channels	11 channels for 802.11b/g n(HT20)
Transmit Power Max	☒ 802.11b: 15.71 dBm ☒ 802.11g: 13.82 dBm ☒ 802.11n (20MHz): 13.71 dBm
Antenna:	PCB Antenna
Antenna Gain:	3 dBi
Power Supply:	AC100V-240V, 50/60Hz, 21W
Temperature Range:	-10°C ~ +50°C

Note: for more details, please refer to the User's manual of the EUT.

3 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.247(a)(2)	DTS (6dB) Bandwidth	PASS	
15.247(b)(3)	Maximum Peak Conducted Output Power	PASS	
15.247(e)	Maximum Power Spectral Density Level	PASS	
15.247(d)	Unwanted Emission Into Non-Restricted Frequency Bands	PASS	
15.247(d) 15.209	Unwanted Emission Into Restricted Frequency Bands (conducted)	PASS	
15.247(d) 15.209	Radiated Spurious Emission	PASS	
15.207	Conducted Emission Test	PASS	
15.247(b)	Antenna Application	PASS	
	NOTE1: N/A (Not Applicable) NOTE2: According to FCC OET KDB 558074, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.		

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: 2ATIZ-PRO-4 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart C
FCC KDB 558074 D01 15.247 Meas Guidance v05r02

4.2 MEASUREMENT EQUIPMENT USED

4.2.1 Conducted Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	DUE CAL.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 19, 2019	May 18, 2020
L.I.S.N.	Schwarzbeck	NNLK8129	8129203	May 19, 2019	May 18, 2020
50Ω Coaxial Switch	Anritsu	MP59B	M20531	May 19, 2019	May 18, 2020
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 19, 2019	May 18, 2020
Voltage Probe	Rohde & Schwarz	TK9416	N/A	May 19, 2019	May 18, 2020
I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	May 19, 2019	May 18, 2020

4.2.2 Radiated Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	DUE CAL.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 19, 2019	May 18, 2020
Pre-Amplifier	HP	8447D	2944A07999	May 19, 2019	May 18, 2020
Bilog Antenna	Schwarzbeck	VULB9163	142	May 19, 2019	May 18, 2020
Loop Antenna	ARA	PLA-1030/B	1029	May 19, 2019	May 18, 2020
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 19, 2019	May 18, 2020
Horn Antenna	Schwarzbeck	BBHA 9120	D143	May 19, 2019	May 18, 2020
Cable	Schwarzbeck	AK9513	ACRX1	May 19, 2019	May 18, 2020
Cable	Rosenberger	N/A	FP2RX2	May 19, 2019	May 18, 2020
Cable	Schwarzbeck	AK9513	CRPX1	May 19, 2019	May 18, 2020
Cable	Schwarzbeck	AK9513	CRRX2	May 19, 2019	May 18, 2020

4.2.3 Radio Frequency Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	DUE CAL.
Spectrum Analyzer	Agilent	E4407B	88156318	May 19, 2019	May 18, 2020
Signal Analyzer	Agilent	N9010A	My53470879	May 19, 2019	May 18, 2020
Power meter	Anritsu	ML2495A	0824006	May 19, 2019	May 18, 2020
Power sensor	Anritsu	MA2411B	0738172	May 19, 2019	May 18, 2020
Spectrum Analyzer	Rohde & Schwarz	FSV40	100967	May 19, 2019	May 18, 2020

Remark: *Each piece of equipment is scheduled for calibration once a year.*

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.
The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11b: 1 Mbps; 802.11g: 6 Mbps; 802.11n (HT20) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list for 802.11 b/g/n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447		

Test Frequency and Channel for 802.11 b/g/n (HT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	6	2437	11	2462

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.	:	Accredited by CNAS, 2018.11.30 The certificate is valid until 2022.10.28 The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2017) The Certificate Registration Number is L2291 Accredited by TUV Rheinland Shenzhen 2018.3.30 The Laboratory has been assessed according to the requirements ISO/IEC 17025 Accredited by FCC, August 09, 2018 Designation Number: CN1204 Test Firm Registration Number: 882943 Accredited by A2LA, August 08, 2018 The Certificate Registration Number is 4321.01 Accredited by Industry Canada, November 09, 2018 The Certificate Registration Number is CN0008
Name of Firm	:	EMTEK(SHENZHEN) CO., LTD.
Site Location	:	Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

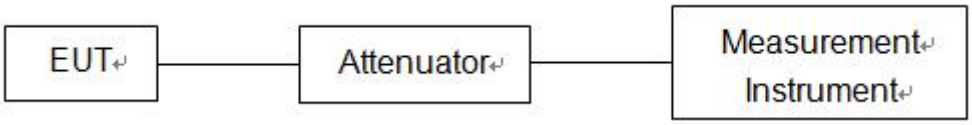
Parameter	Uncertainty
Radio Frequency	±1x10^-5
Maximum Peak Output Power Test	±1.0dB
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Power Density	±2.0dB
Occupied Bandwidth Test	±1.0dB
Band Edge Test	±3dB
All emission, radiated	±3dB
Antenna Port Emission	±3dB
Temperature	±0.5℃
Humidity	±3%

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP 1

The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz：

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

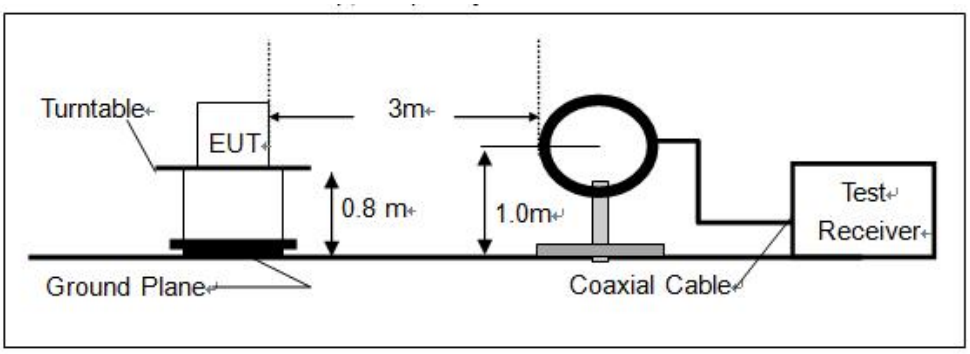
30MHz-1GHz：

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

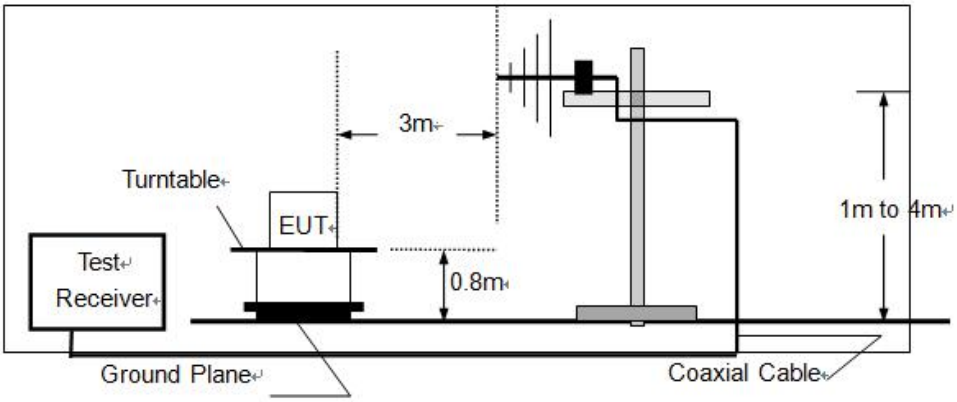
Above 1GHz：

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

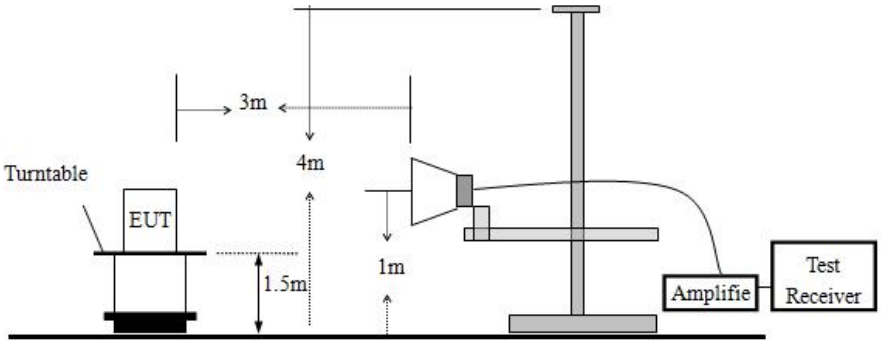
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

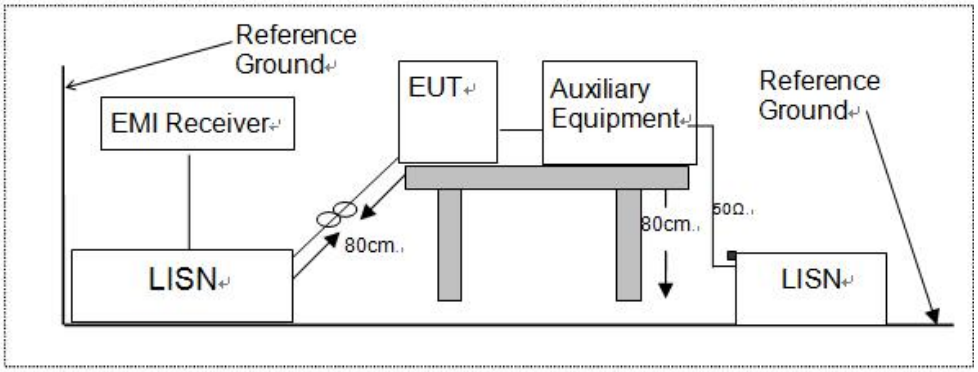


7.3 CONDUCTED EMISSION TEST SETUP

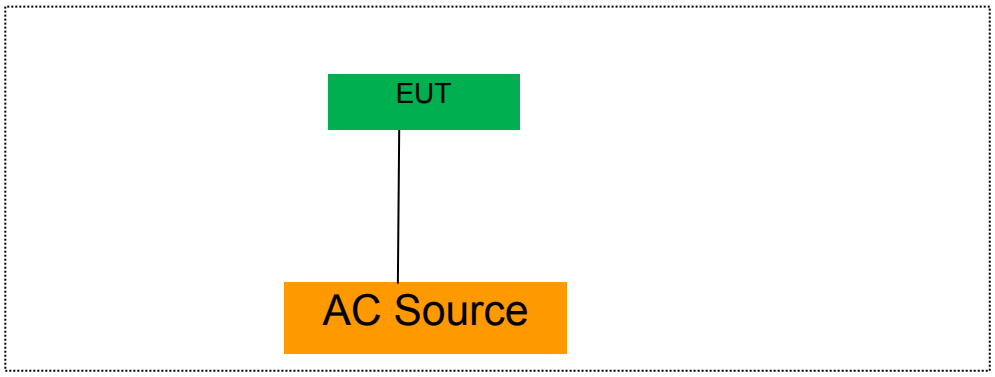
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

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

Auxiliary Cable List and Details					
Cable Description	Length (m)	Shielded /Unshielded	With / Without Ferrite	Supplied by	Certification
/	/	/	/	/	/

Auxiliary Equipment List and Details					
Description	Manufacturer	Model	Serial Number	Supplied by	Certification
/	/	/	/	/	/
/	/	/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8 TEST REQUIREMENTS

8.1 DTS (6DB) BANDWIDTH

8.1.1 Applicable Standard

According to FCC Part 15.247(a)(2) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.1.2 Conformance Limit

The minimum -6 dB bandwidth shall be at least 500 kHz.

8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.1.4 Test Procedure

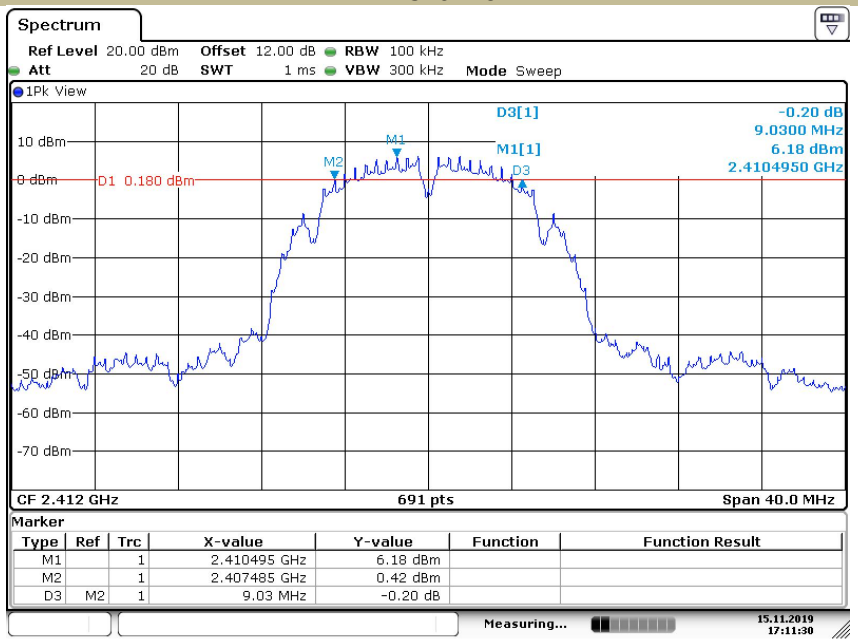
The EUT was operating in IEEE 802.11b/g/n mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.
The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
Set to the maximum power setting and enable the EUT transmit continuously
Set RBW = 100 kHz.
Set the video bandwidth (VBW) =300 kHz.
Set Span=2 times OBW
Set Detector = Peak.
Set Trace mode = max hold.
Set Sweep = auto couple.
Allow the trace to stabilize.
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 6 dB relative to the maximum level measured in the fundamental emission.
Measure and record the results in the test report.

8.1.5 Test Results

Temperature:	25°C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

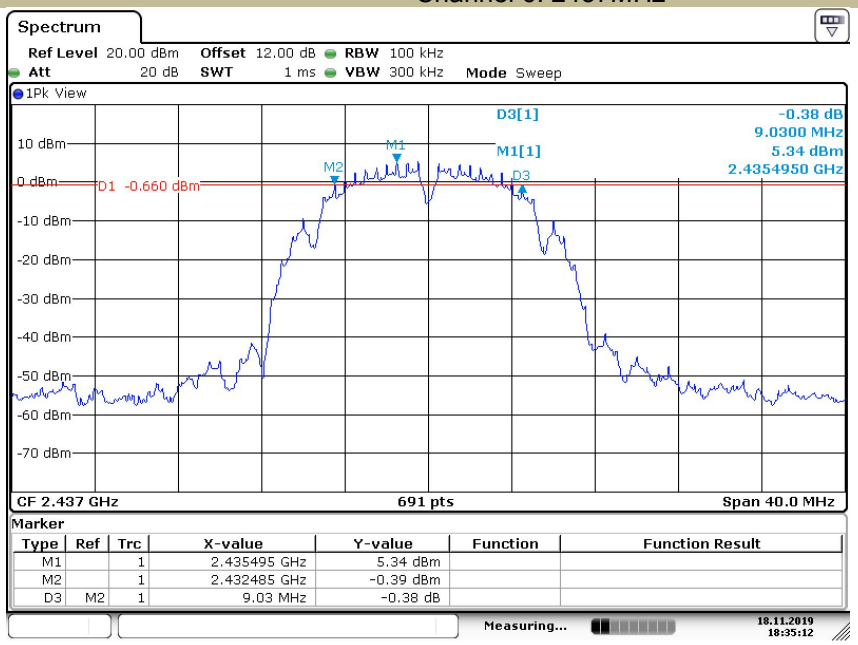
Operation Mode	Channel Number	Channel Frequency (MHz)	6 dB Bandwidth MHz	Limit (kHz)	Verdict
802.11b	1	2412	9.030	>500	PASS
	6	2437	9.030	>500	PASS
	11	2462	8.973	>500	PASS
802.11g	1	2412	15.687	>500	PASS
	6	2437	15.456	>500	PASS
	11	2462	15.514	>500	PASS
802.11n (HT20)	1	2412	15.687	>500	PASS
	6	2437	15.398	>500	PASS
	11	2462	15.630	>500	PASS

Test Model	DTS (6dB) Bandwidth 802.11b Channel 1: 2412MHz



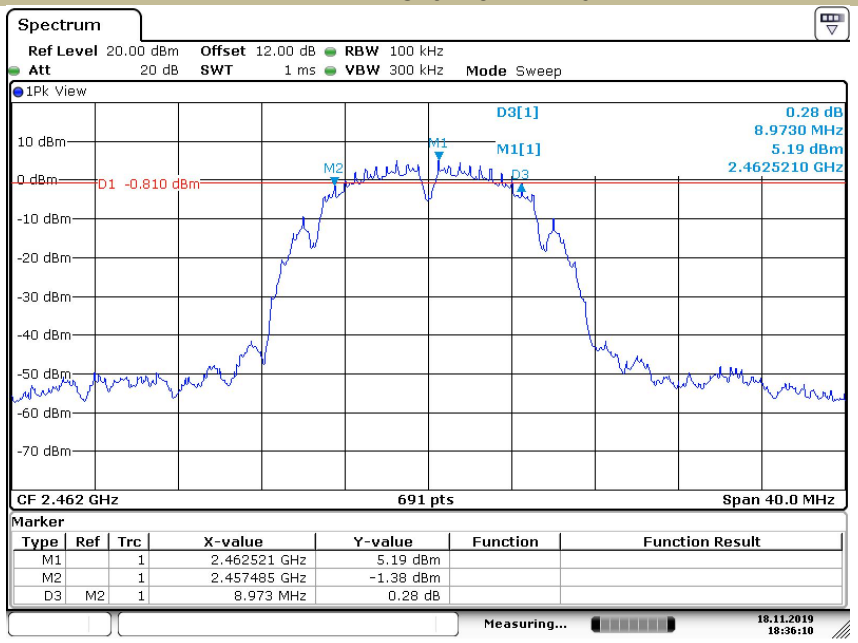
Date: 15.NOV.2019 17:11:30

Test Model	DTS (6dB) Bandwidth 802.11b Channel 6: 2437MHz



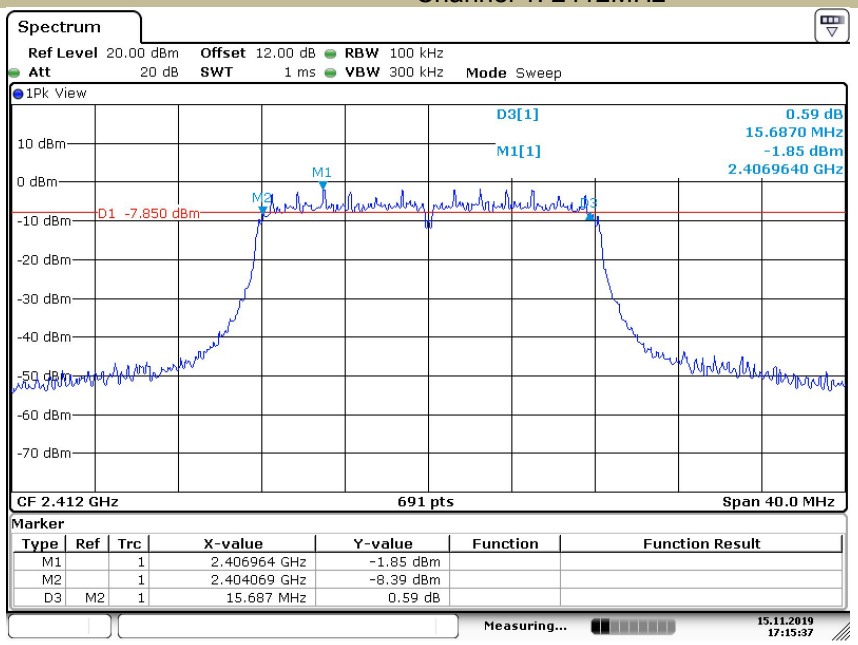
Date: 18.NOV.2019 18:35:13

Test Model	DTS (6dB) Bandwidth 802.11b Channel 11: 2462MHz



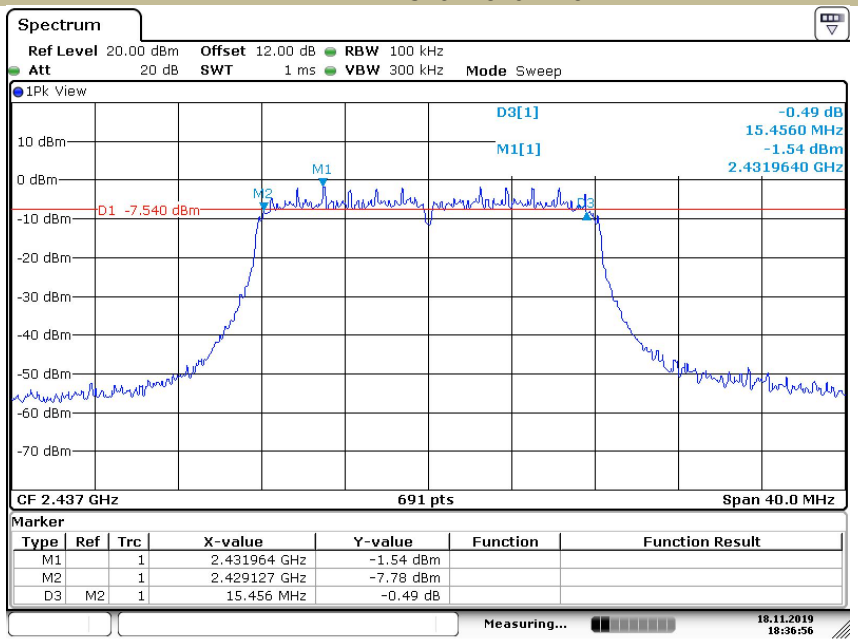
Date: 18.NOV.2019 18:36:10

Test Model	DTS (6dB) Bandwidth 802.11g Channel 1: 2412MHz



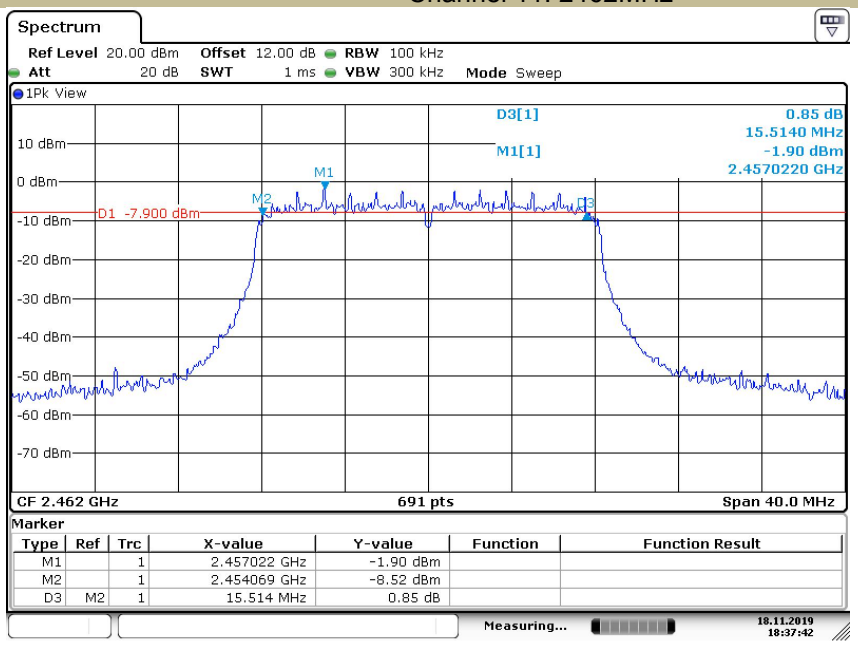
Date: 15.NOV.2019 17:15:37

Test Model	DTS (6dB) Bandwidth 802.11g Channel 6: 2437MHz



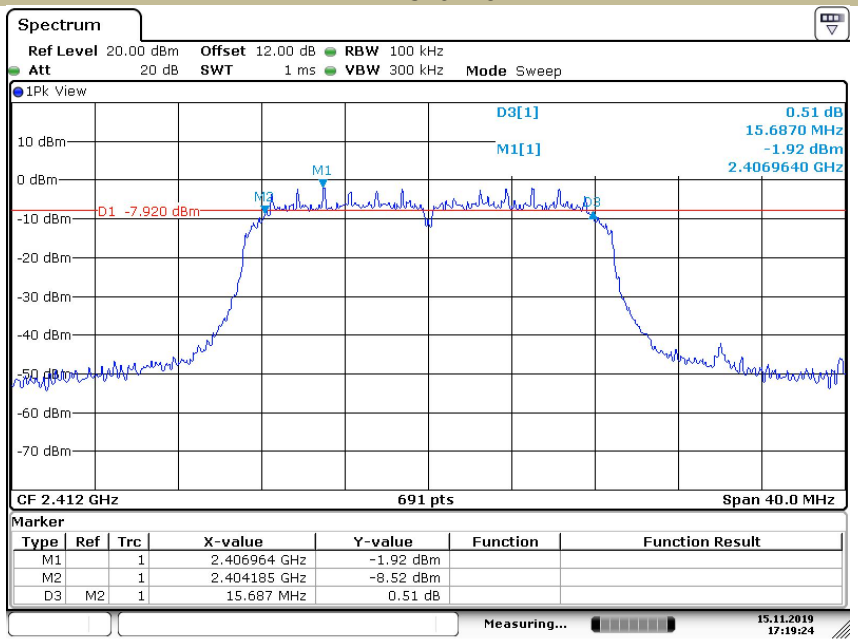
Date: 18.NOV.2019 18:36:55

Test Model	DTS (6dB) Bandwidth 802.11g Channel 11: 2462MHz



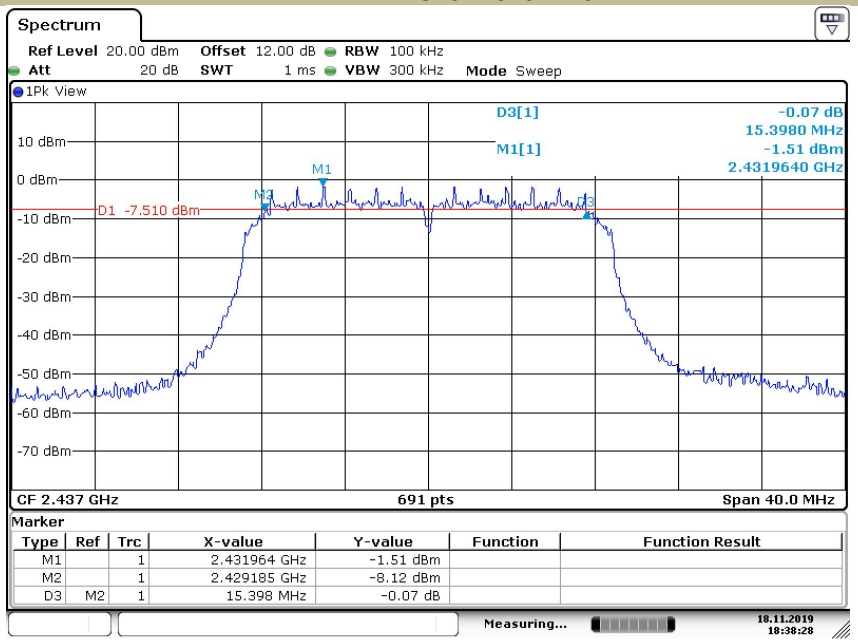
Date: 18.NOV.2019 18:37:41

Test Model	DTS (6dB) Bandwidth 802.11n (HT20) Channel 1: 2412MHz



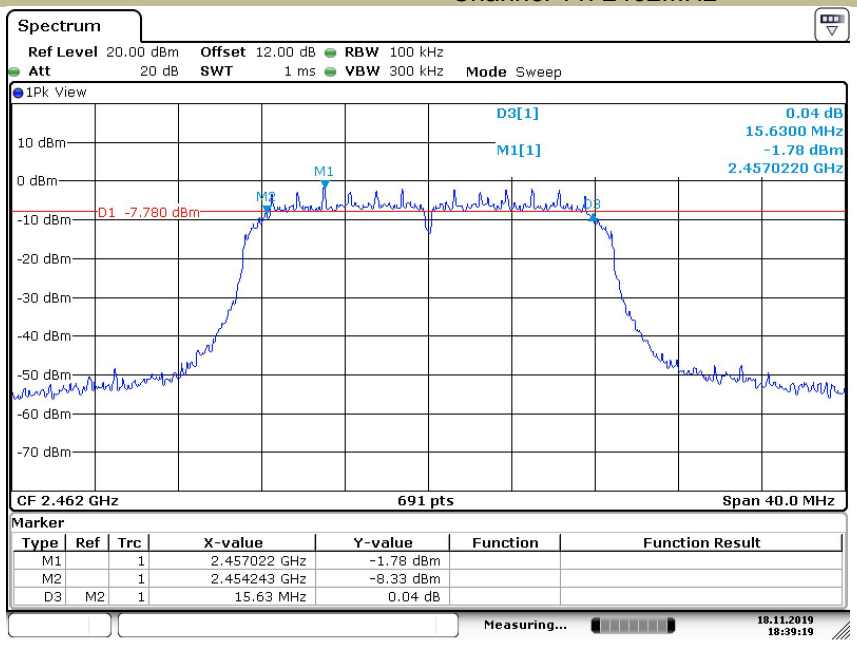
Date: 15.NOV.2019 17:19:24

Test Model	DTS (6dB) Bandwidth 802.11n (HT20) Channel 6: 2437MHz



Date: 18.NOV.2019 18:38:28

Test Model	DTS (6dB) Bandwidth 802.11n (HT20) Channel 11: 2462MHz



Date: 18.NOV.2019 18:39:18

8.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER

8.2.1 Applicable Standard

According to FCC Part 15.247(b)(3) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.2.2 Conformance Limit

The maximum peak conducted output power of the intentional radiator for systems using digital modulation in the 2400 - 2483.5 MHz bands shall not exceed: 1 Watt (30dBm).

8.2.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.2.4 Test Procedure

■ According to FCC Part15.247(b)(3)
The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.
The RF output of EUT was connected to the power meter by RF cable and attnuator. The path loss was compensated to the results for each measurement.
Set to the maximum output power setting and enable the EUT transmit continuously.
Measure the conducted output power with cable loss and record the results in the test report.
Measure and record the results in the report.

■ According to FCC Part 15.247(b)(4):
Conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
Note: If antenna Gain exceeds 6 dBi, then Output power Limit=30-(Gain - 6)

8.2.5 Test Results

Temperature:	26°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
802.11b	1	2412	15.71	30	PASS
	6	2437	15.07	30	PASS
	11	2462	14.97	30	PASS
802.11g	1	2412	13.54	30	PASS
	6	2437	13.82	30	PASS
	11	2462	13.47	30	PASS
802.11n (HT20)	1	2412	13.28	30	PASS
	6	2437	13.68	30	PASS
	11	2462	13.23	30	PASS

8.3 MAXIMUM POWER SPECTRAL DENSITY

8.3.1 Applicable Standard

According to FCC Part 15.247(e) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.3.2 Conformance Limit

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.3.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.3.4 Test Procedure

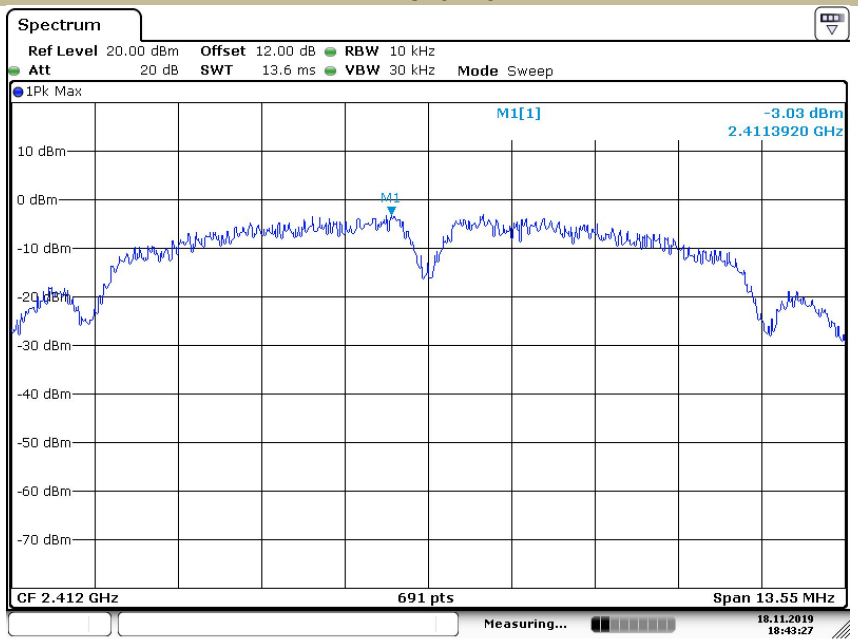
This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance
The transmitter output (antenna port) was connected to the spectrum analyzer
Set analyzer center frequency to DTS channel center frequency.
Set the span to 1.5 times the DTS bandwidth.
Set the RBW to: 3 kHz
Set the VBW to: 10 kHz.
Set Detector = peak.
Set Sweep time = auto couple.
Set Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum amplitude level within the RBW.
Note: If antenna Gain exceeds 6 dBi, then PSD Limit=8-(Gain - 6)

8.3.5 Test Results

Temperature:	26°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

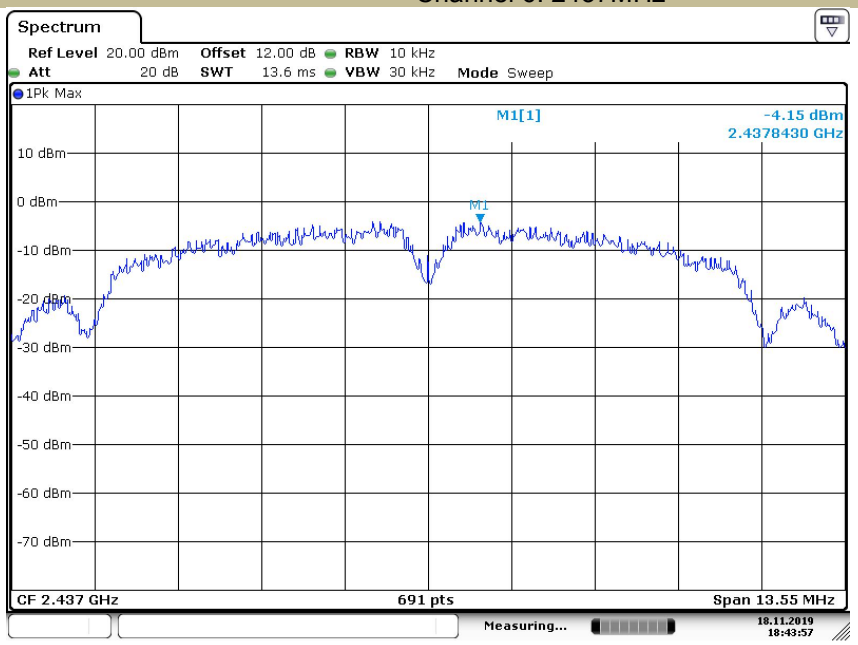
Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
802.11b	1	2412	-3.03	8	PASS
	6	2437	-4.15	8	PASS
	11	2462	-4.17	8	PASS
802.11g	1	2412	-10.71	8	PASS
	6	2437	-10.24	8	PASS
	11	2462	-11.47	8	PASS
802.11n (HT20)	1	2412	-10.66	8	PASS
	6	2437	-11.33	8	PASS
	11	2462	-11.52	8	PASS

Test Model	Power Spectral Density 802.11b Channel 1: 2412MHz



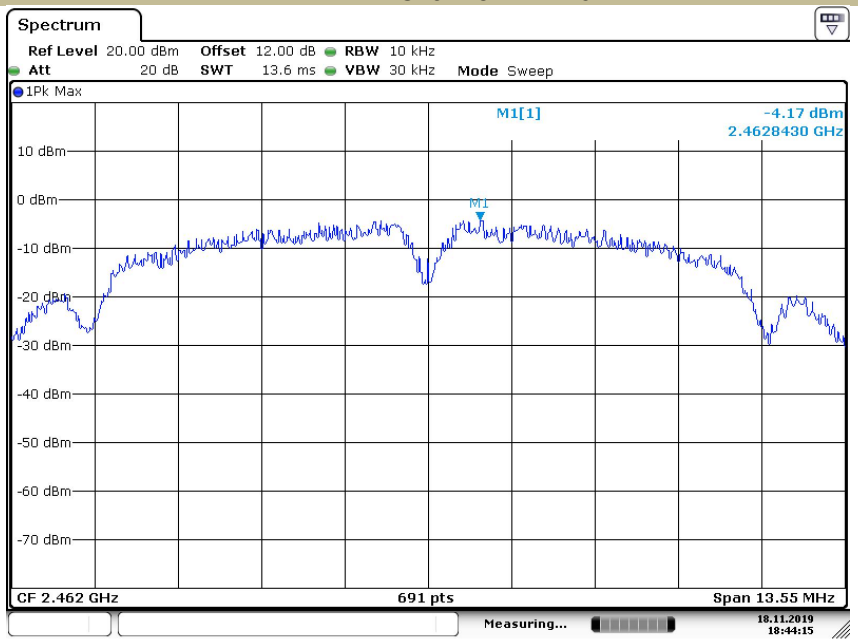
Date: 18.NOV.2019 18:43:27

Test Model	Power Spectral Density 802.11b Channel 6: 2437MHz



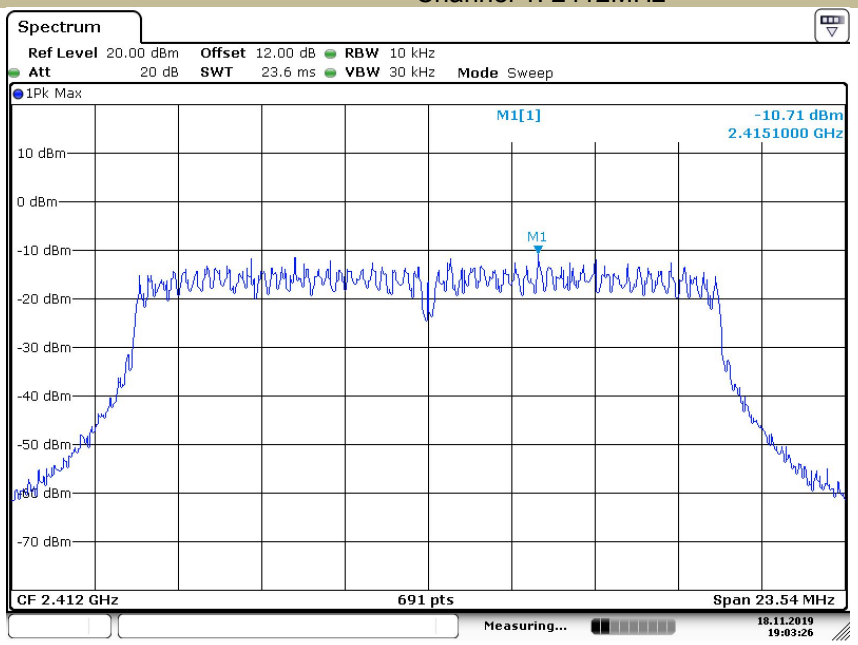
Date: 18.NOV.2019 18:43:57

Test Model	Power Spectral Density 802.11b Channel 11: 2462MHz



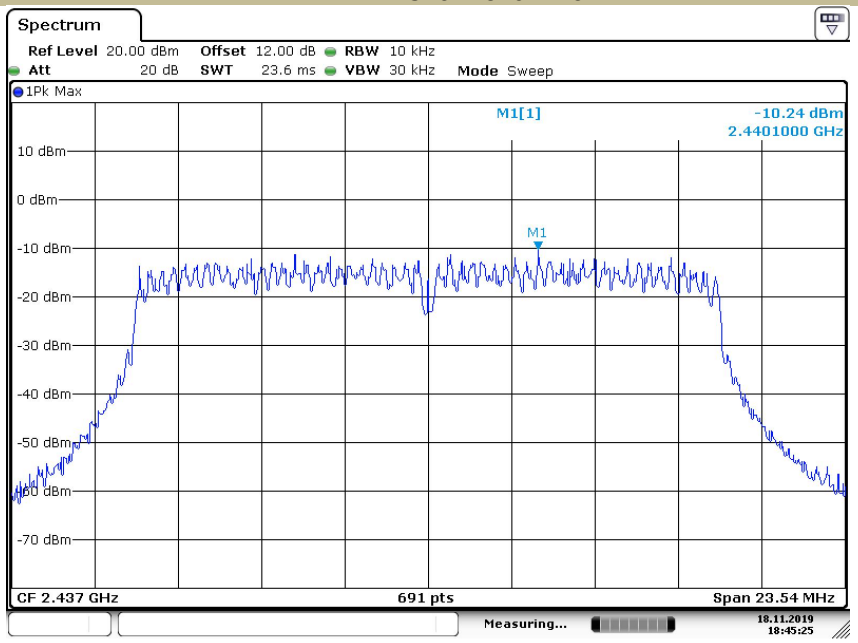
Date: 18.NOV.2019 18:44:15

Test Model	Power Spectral Density 802.11g Channel 1: 2412MHz



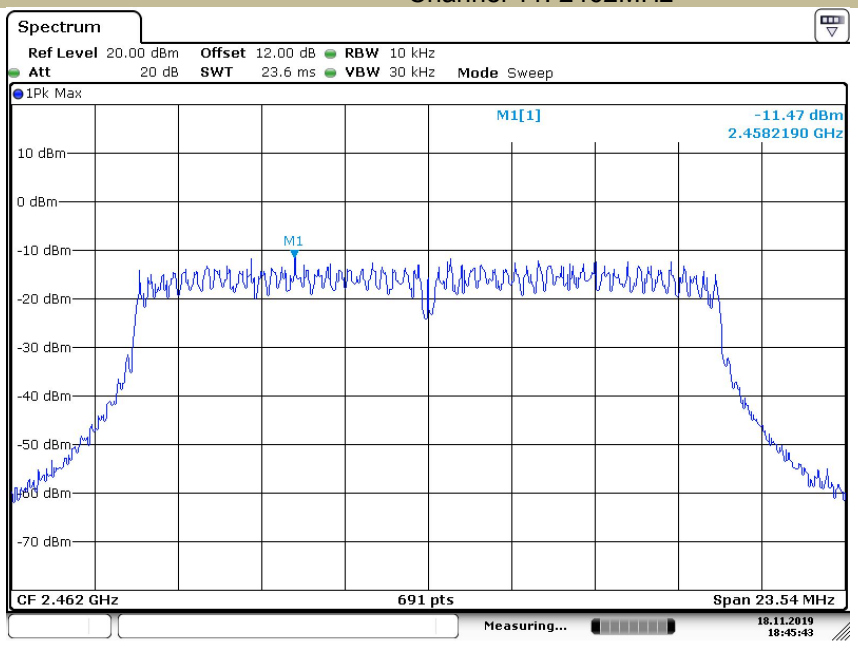
Date: 18.NOV.2019 19:03:26

Test Model	Power Spectral Density 802.11g Channel 6: 2437MHz



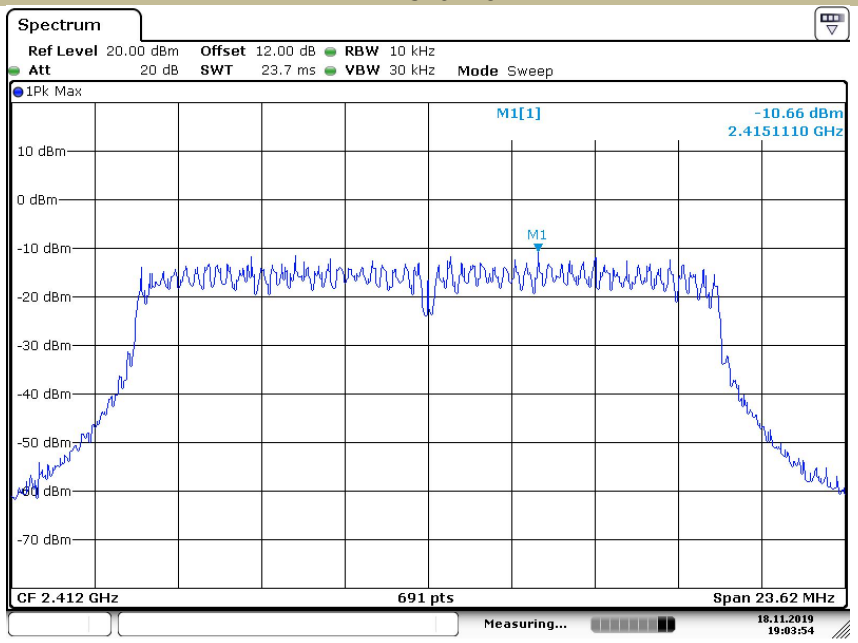
Date: 18.NOV.2019 18:45:26

Test Model	Power Spectral Density 802.11g Channel 11: 2462MHz



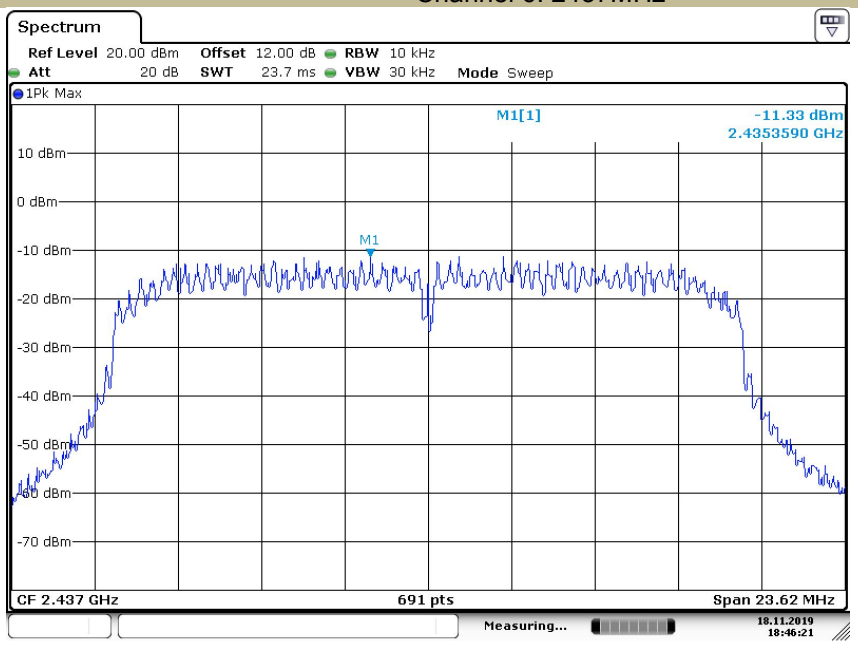
Date: 18.NOV.2019 18:45:43

Test Model	Power Spectral Density 802.11n (HT20) Channel 1: 2412MHz



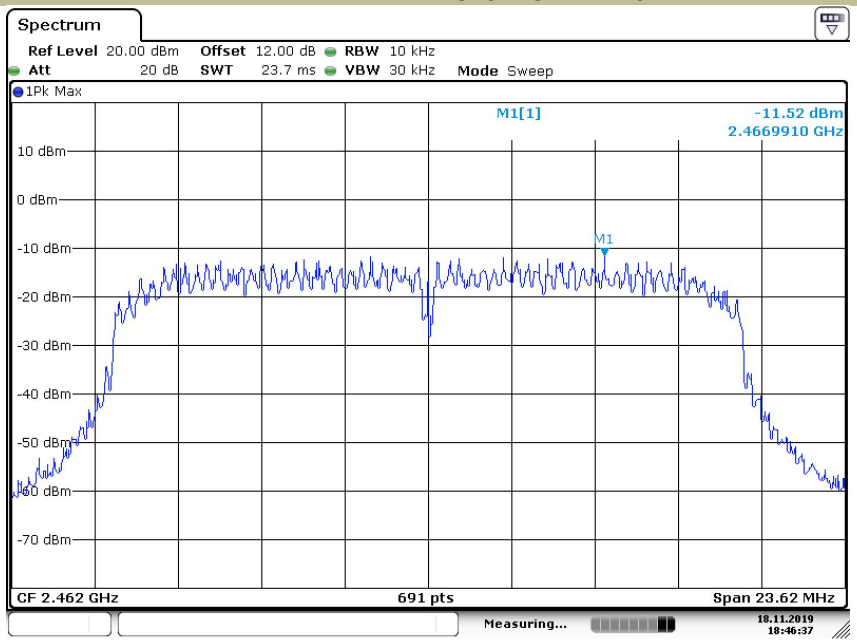
Date: 18.NOV.2019 19:03:54

Test Model	Power Spectral Density 802.11n (HT20) Channel 6: 2437MHz



Date: 18.NOV.2019 18:46:21

Test Model	Power Spectral Density 802.11n (HT20) Channel 11: 2462MHz



Date: 18.NOV.2019 18:46:37

8.4 UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

8.4.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.4.2 Conformance Limit

According to FCC Part 15.247(d):
In any 100 kHz 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 20 dB below that in the 100 kHz 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 30 dB instead of 20 dB.

8.4.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.4.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

- **Reference level measurement**

Establish a reference level by using the following procedure:
Set instrument center frequency to DTS channel center frequency.
Set the span to ≥ 1.5 times the DTS bandwidth.
Set the RBW = 100 kHz.
Set the VBW ≥ 3 x RBW.
Set Detector = peak.
Set Sweep time = auto couple.
Set Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum PSD level.
Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

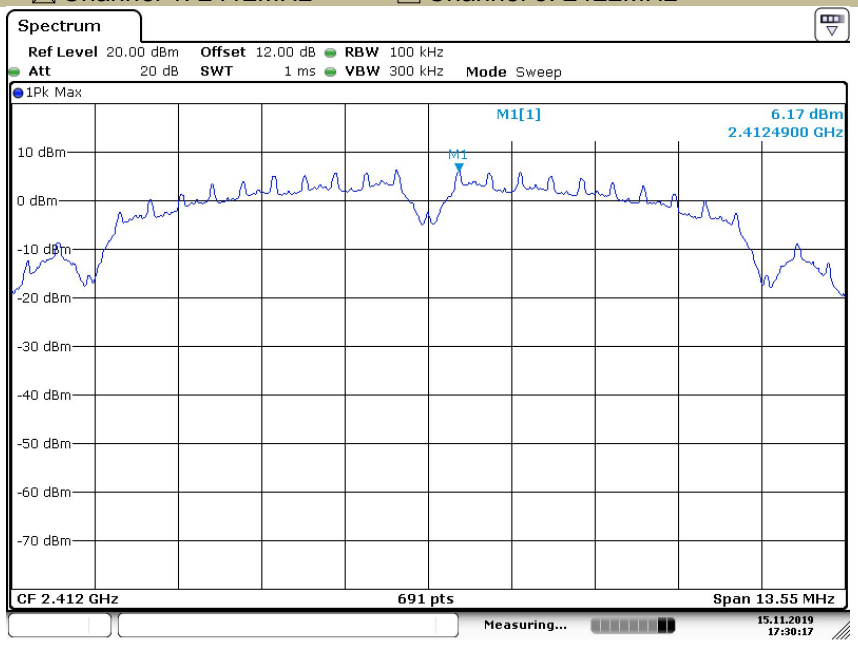
- **Emission level measurement**

Set the center frequency and span to encompass frequency range to be measured.
Set the RBW = 100 kHz.
Set the VBW =300 kHz.
Set Detector = peak
Sweep time = auto couple.
Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum amplitude level.
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 . Report the three highest emissions relative to the limit.

8.4.5 Test Results

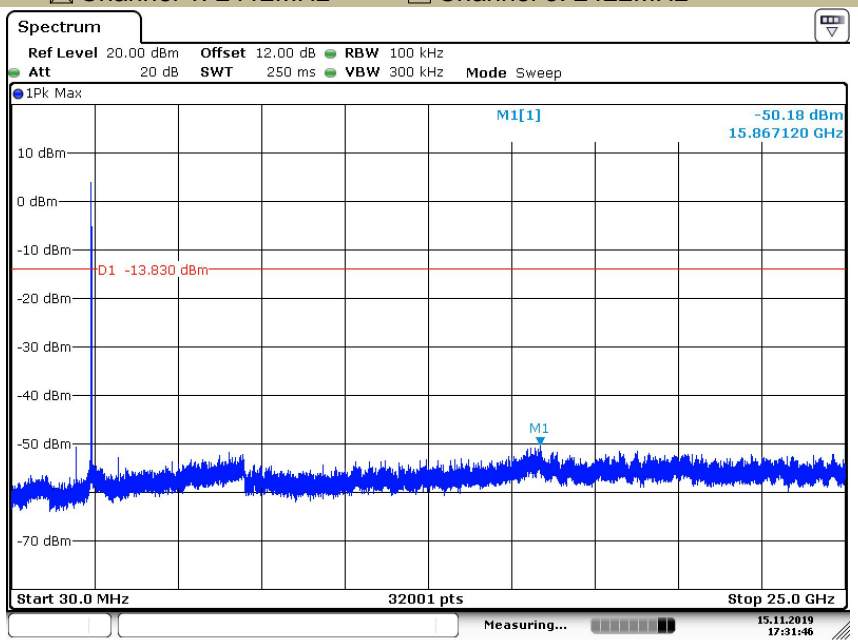
All the modulation modes were tested, the data of the worst mode are described in the following table.

Test Model	PSD(Power Spectral Density) RBW=100kHz ☒802.11b ☐802.11g ☐802.11n(HT20) ☐802.11n(HT40) ☒Channel 1: 2412MHz ☐Channel 3: 2422MHz



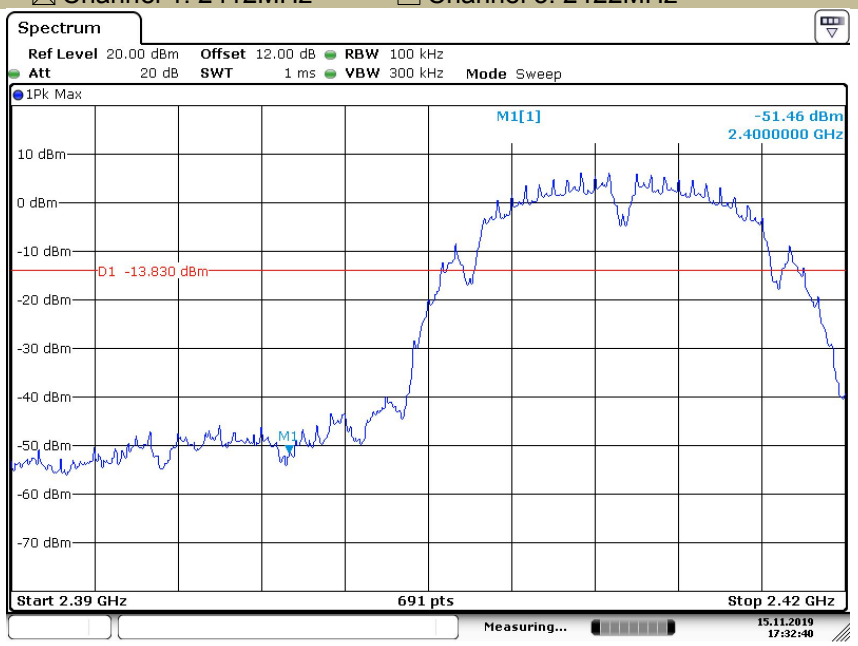
Date: 15.NOV.2019 17:30:17

Test Model	Unwanted Emissions in non-restricted frequency bands ☒802.11b ☐802.11g ☐802.11n(HT20) ☐802.11n(HT40) ☒Channel 1: 2412MHz ☐Channel 3: 2422MHz



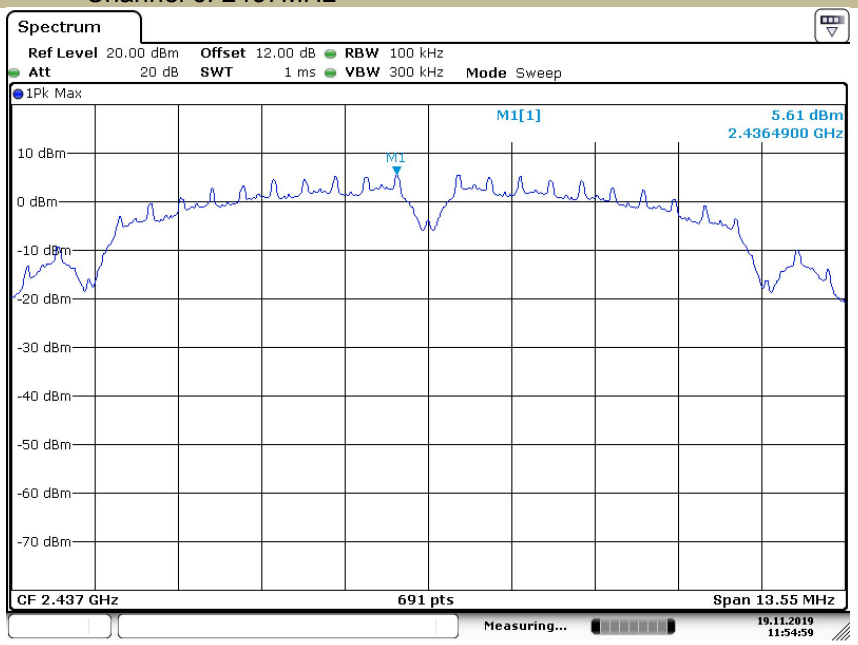
Date: 15.NOV.2019 17:31:46

Band edge				
Test Model	☒802.11b	☐802.11g	☐802.11n(HT20)	☐802.11n(HT40)
	☒Channel 1: 2412MHz	☐Channel 3: 2422MHz		



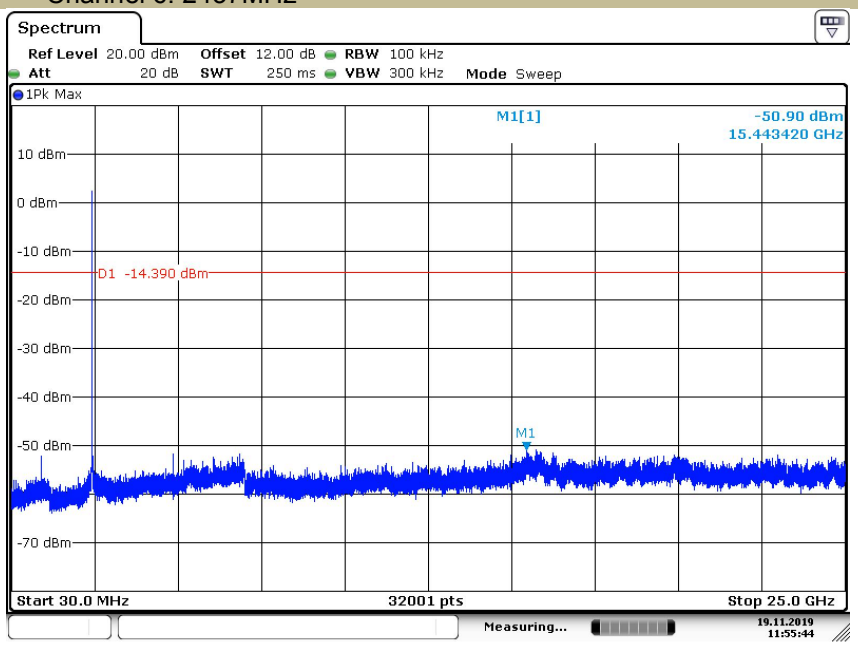
Date: 15.NOV.2019 17:32:40

PSD(Power Spectral Density) RBW=100kHz				
Test Model	☒802.11b	☐802.11g	☐802.11n(HT20)	☐802.11n(HT40)
	Channel 6: 2437MHz			



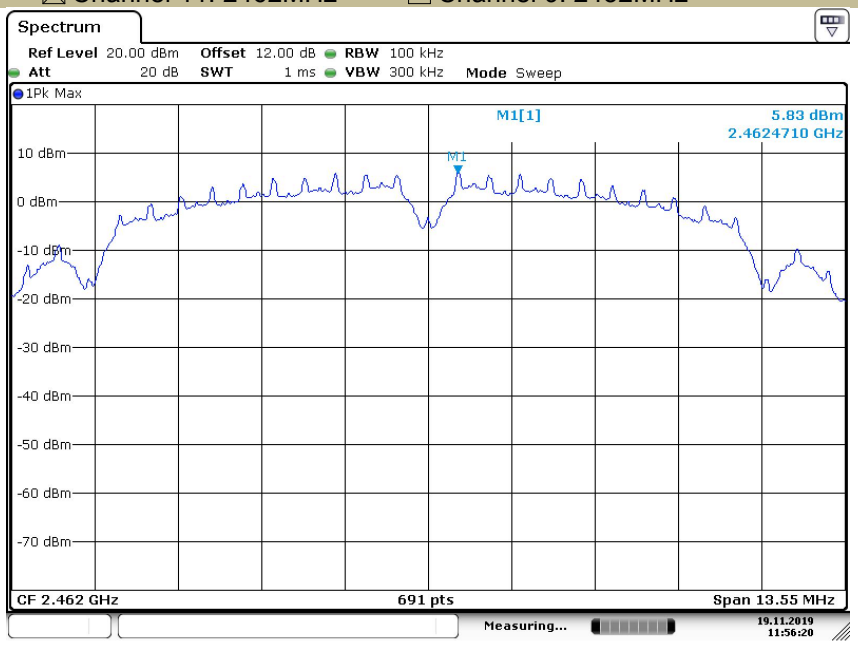
Date: 19.NOV.2019 11:54:58

Unwanted Emissions In Non-Restricted Frequency Bands				
Test Model	☒802.11b	☐802.11g	☐802.11n(HT20)	☐802.11n(HT40)
	Channel 6: 2437MHz			



Date: 19.NOV.2019 11:55:44

PSD(Power Spectral Density) RBW=100kHz				
Test Model	☒802.11b	☐802.11g	☐802.11n(HT20)	☐802.11n(HT40)
	☒Channel 11: 2462MHz	☐Channel 9: 2452MHz		



Date: 19.NOV.2019 11:56:20