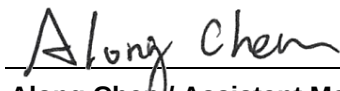


FCC Test Report

FCC ID : ACQ-VIP7802
Equipment : WiFi Set Top Box
Model No. : VIP7802
Brand Name : ARRIS
Applicant : ARRIS Group, Inc.
Address : 101 Tournament Drive, Horsham, Pennsylvania,
United States 19044
Standard : 47 CFR FCC Part 15.247
Received Date : Feb. 03, 2021
Tested Date : Feb. 19 ~ Mar. 29, 2021

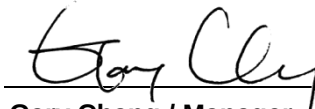
We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:



Along Chen / Assistant Manager

Approved by:



Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR120304AC	Rev. 01	Initial issue	May 04, 2021

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.582MHz 36.15 (Margin -9.85dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz 53.34 (Margin -0.66dB) – AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: <i>Non-beamforming mode</i> 27.85 <i>Beamforming mode</i> 24.65	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
2400-2483.5	b	2412-2462	1-11 [11]	2	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	2	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	MCS 0-15
2400-2483.5	ac (VHT20)	2412-2462	1-11 [11]	2	MCS 0-9
2400-2483.5	ax (HE20)	2412-2462	1-11 [11]	2	MCS 0-11
Note 1: RF output power specifies that Maximum Peak Conducted Output Power. Note 2: DSSS-DBPSK, DQPSK, CCK modulation OFDM/OFDMA- BPSK, QPSK, 16QAM, 64QAM, 256QAM and 1024QAM modulation. Note 3: 802.11ax supports beamforming function. Note 4: 802.11ax supports full and partial loaded RU configuration.					

1.1.2 Antenna Details

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	Ant 1	Dipole	U.FL	3	3	3.1	4.4	4.3
2	Ant 2	Dipole	U.FL	3.2	3.2	3.6	4.5	4.6

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	5Vdc from adapter
-------------------	-------------------

1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	Adapter	Brand: NeBit Model: NBS12F050200VU Power Rating: I/P: 100-240Vac, 50/60Hz, 0.3A O/P: 5Vdc, 2A Power Line: 0.75m non-shielded without core
2	Remote control	Brand: Bell Model: 2855-001
3	HDMI	1.83m shielded without core
4	SD card	Brand: SanDisk Model: SDSDQEC-008G Capacity: 8GB

1.1.5 Channel List

Frequency band (MHz)	2400~2483.5
802.11bg / n HT20 / ac VHT20 / ax HE20	
Channel	Frequency(MHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

1.1.6 Test Tool and Duty Cycle

Test Tool	accessMTool, Version: 3.1.0.2		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11b	96.11%	0.17
	11g	96.29%	0.16
	ax (HE20)	98.86%	0.05

1.1.7 Power Index of Test Tool

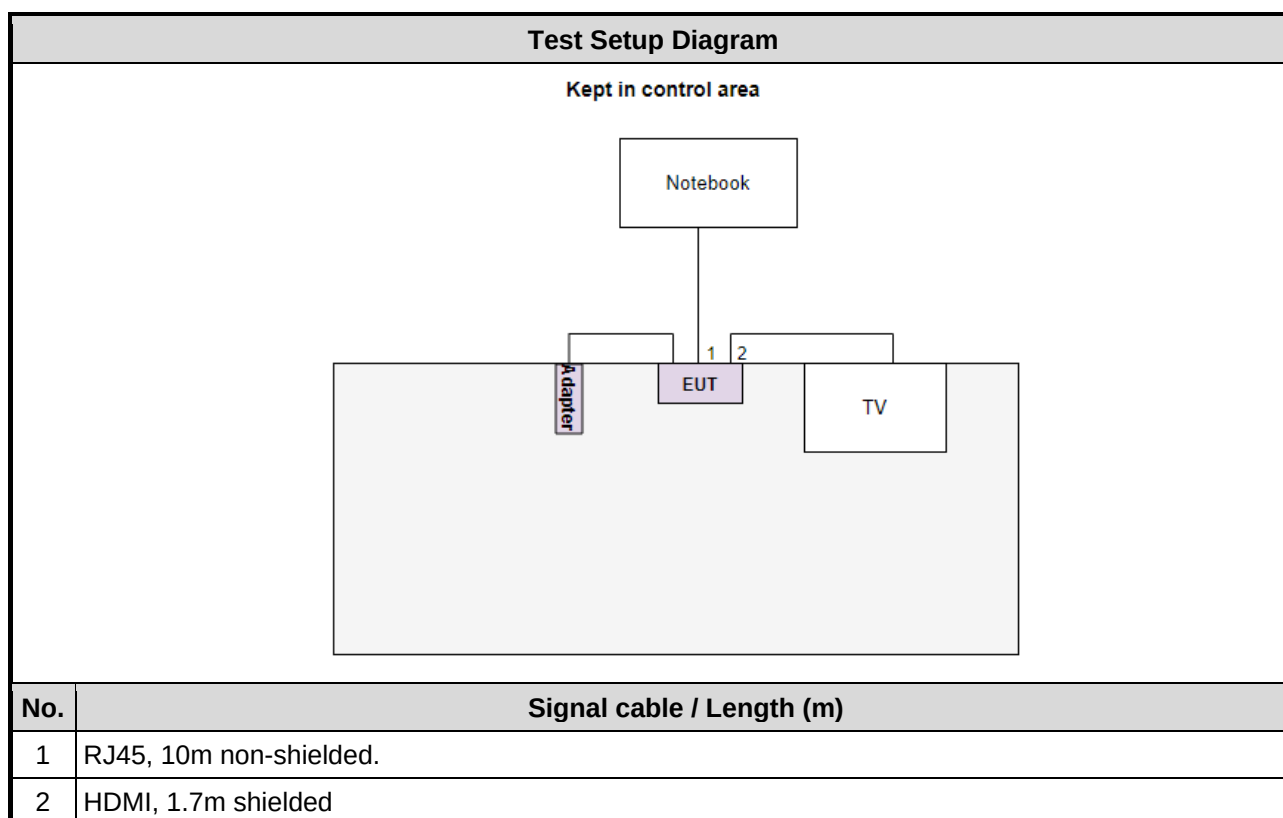
Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	88
11b	2437	86
11b	2462	86
11g	2412	58
11g	2437	76
11g	2462	56
ax (HE20)	2412	50
ax (HE20)	2437	64
ax (HE20)	2462	48

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5470	DoC	---
2	RJ45	ICC	RJ45-10m	---	---
3	TV	CHIMEI	TL-24LF500D	---	---
4	Fixture	ARRIS	240684-125 REV:1	---	Provided by applicant.
5	RS232	---	---	---	Provided by applicant.
6	USB cable	---	---	---	Provided by applicant.
7	Notebook	DELL	Latitude E5470	DoC	---

Note: The fixture (No.4), RS232 (No.5), USB cable (No.6) and notebook (No.7) are disconnected from EUT and removed from test table when EUT is set to transmit continuously.

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Test Date	Mar. 08, 2021				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 08, 2021	Feb. 07, 2022
LISN	R&S	ENV216	100003	Dec. 15, 2020	Dec. 14, 2021
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127-666	Dec. 29, 2020	Dec. 28, 2021
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 21, 2020	Oct. 20, 2021
50 ohm terminal (Support Unit)	NA	50	04	Jun. 05, 2020	Jun. 04, 2021
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber3 / (03CH03-WS)				
Test Date	Feb. 19 ~ Feb. 23, 2021				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 08, 2021	Feb. 07, 2022
Spectrum Analyzer	R&S	FSV40	101498	Dec. 04, 2020	Dec. 03, 2021
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 17, 2020	Nov. 16, 2021
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 29, 2020	Apr. 28, 2021
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Dec. 22, 2020	Dec. 21, 2021
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 06, 2020	Nov. 05, 2021
Preamplifier	EMC	EMC02325	980187	Aug. 05, 2020	Aug. 04, 2021
Preamplifier	Agilent	83017A	MY39501309	Sep. 02, 2020	Sep. 01, 2021
Preamplifier	EMC	EMC184045B	980192	Jul. 21, 2020	Jul. 20, 2021
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 06, 2020	Oct. 05, 2021
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Sep. 26, 2020	Sep. 25, 2021
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Sep. 26, 2020	Sep. 25, 2021
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Sep. 26, 2020	Sep. 25, 2021
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Sep. 26, 2020	Sep. 25, 2021
RF cable-8M	EMC	EMC104-SM-SM-8000	181107	Sep. 26, 2020	Sep. 25, 2021
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Test Date	Mar. 29, 2021				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Apr. 30, 2020	Apr. 29, 2021
Power Meter	Anritsu	ML2495A	1241002	Nov. 04, 2020	Nov. 03, 2021
Power Sensor	Anritsu	MA2411B	1207366	Nov. 04, 2020	Nov. 03, 2021
Measurement Software	-	SENSE-15247_DTS	V5.10	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.247
ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±34.130 Hz
Conducted power	±0.808 dB
Power density	±0.583 dB
Conducted emission	±2.715 dB
AC conducted emission	±2.92 dB
Radiated emission ≤ 1GHz	±3.96 dB
Radiated emission > 1GHz	±4.51 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)
Test Site	03CH03-WS
Address of Test Site	No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 333, Taiwan (R.O.C.)

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- ISSED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	11g	2437	6 Mbps	Non-Beamforming
Radiated Emissions ≤1GHz	11g	2437	6 Mbps	Non-Beamforming
Maximum Output Power	11b 11g ax HE20	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462	1 Mbps 6 Mbps MCS 0	Non-Beamforming
Maximum Output Power	ax HE20	2412 / 2437 / 2462	MCS 0	Beamforming
Radiated Emissions >1GHz 6dB bandwidth Power spectral density	11b 11g ax HE20	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462	1 Mbps 6 Mbps MCS 0	Non-Beamforming

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

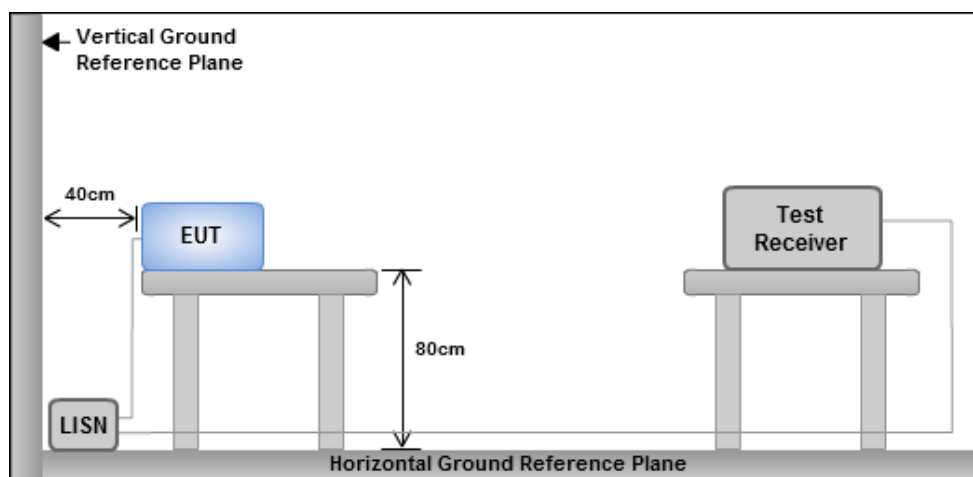
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.1.2 Test Procedures

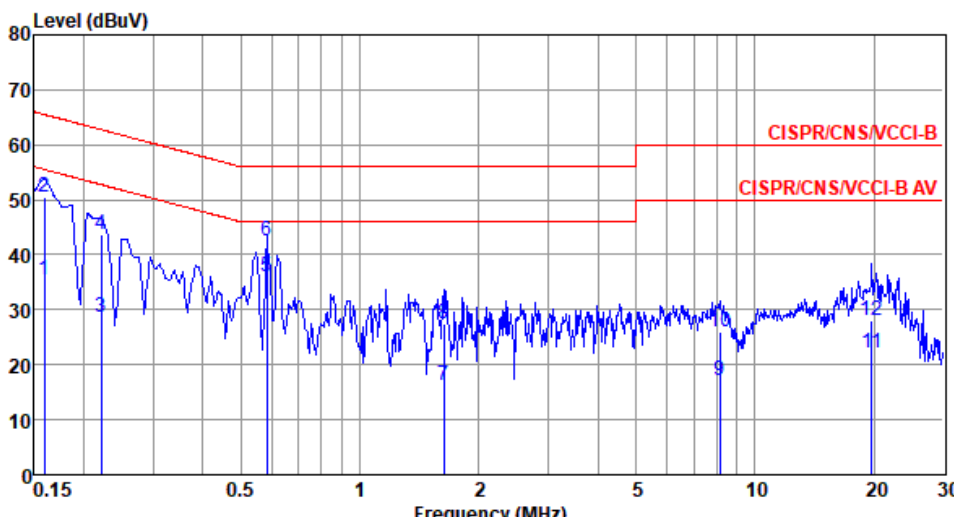
1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V / 60Hz.

3.1.3 Test Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

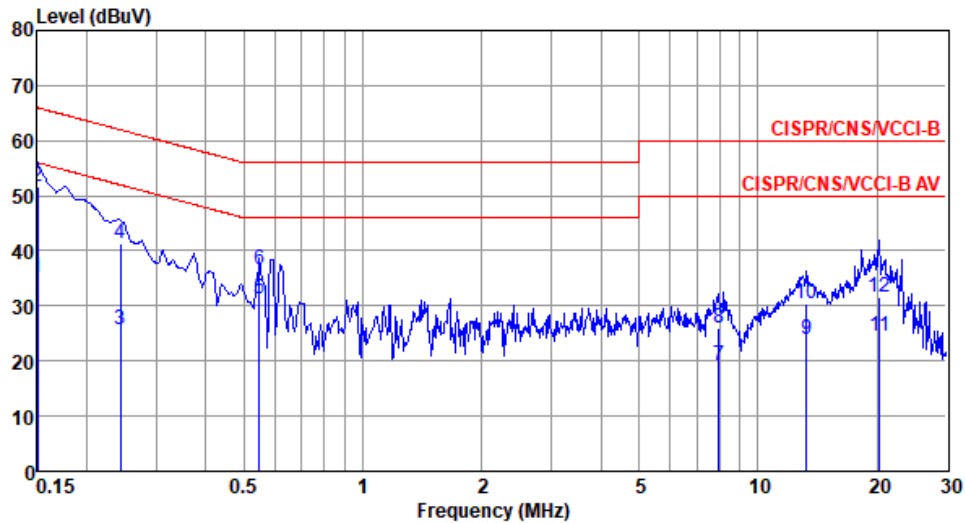
Modulation	11g	Test Freq. (MHz)	2437																																																																																																																					
Power Phase	Line																																																																																																																							
Test by : Alex Tsai Temperature: 23°C Humidity: 63%																																																																																																																								
Level (dBUV)  <table><thead><tr><th></th><th>Freq MHz</th><th>Level dBUV</th><th>Limit Line dBUV</th><th>Over Limit dB</th><th>Read Level dBUV</th><th>Factor dB</th><th>Cable loss dB</th><th>Remark</th></tr></thead><tbody><tr><td>1</td><td>0.159</td><td>35.29</td><td>55.52</td><td>-20.23</td><td>25.43</td><td>9.81</td><td>0.05</td><td>Average</td></tr><tr><td>2</td><td>0.159</td><td>50.41</td><td>65.52</td><td>-15.11</td><td>40.55</td><td>9.81</td><td>0.05</td><td>QP</td></tr><tr><td>3</td><td>0.222</td><td>28.51</td><td>52.74</td><td>-24.23</td><td>18.62</td><td>9.83</td><td>0.06</td><td>Average</td></tr><tr><td>4</td><td>0.222</td><td>43.73</td><td>62.74</td><td>-19.01</td><td>33.84</td><td>9.83</td><td>0.06</td><td>QP</td></tr><tr><td>5*</td><td>0.582</td><td>36.15</td><td>46.00</td><td>-9.85</td><td>26.13</td><td>9.92</td><td>0.10</td><td>Average</td></tr><tr><td>6</td><td>0.582</td><td>42.65</td><td>56.00</td><td>-13.35</td><td>32.63</td><td>9.92</td><td>0.10</td><td>QP</td></tr><tr><td>7</td><td>1.628</td><td>16.27</td><td>46.00</td><td>-29.73</td><td>6.13</td><td>9.98</td><td>0.16</td><td>Average</td></tr><tr><td>8</td><td>1.628</td><td>27.31</td><td>56.00</td><td>-28.69</td><td>17.17</td><td>9.98</td><td>0.16</td><td>QP</td></tr><tr><td>9</td><td>8.148</td><td>17.10</td><td>50.00</td><td>-32.90</td><td>6.65</td><td>10.07</td><td>0.38</td><td>Average</td></tr><tr><td>10</td><td>8.148</td><td>25.94</td><td>60.00</td><td>-34.06</td><td>15.49</td><td>10.07</td><td>0.38</td><td>QP</td></tr><tr><td>11</td><td>19.740</td><td>22.22</td><td>50.00</td><td>-27.78</td><td>11.25</td><td>10.30</td><td>0.67</td><td>Average</td></tr><tr><td>12</td><td>19.740</td><td>27.96</td><td>60.00</td><td>-32.04</td><td>16.99</td><td>10.30</td><td>0.67</td><td>QP</td></tr></tbody></table> Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB). 2: Over Limit (dB) = Level (dBUV) – Limit Line (dBUV).					Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Remark	1	0.159	35.29	55.52	-20.23	25.43	9.81	0.05	Average	2	0.159	50.41	65.52	-15.11	40.55	9.81	0.05	QP	3	0.222	28.51	52.74	-24.23	18.62	9.83	0.06	Average	4	0.222	43.73	62.74	-19.01	33.84	9.83	0.06	QP	5*	0.582	36.15	46.00	-9.85	26.13	9.92	0.10	Average	6	0.582	42.65	56.00	-13.35	32.63	9.92	0.10	QP	7	1.628	16.27	46.00	-29.73	6.13	9.98	0.16	Average	8	1.628	27.31	56.00	-28.69	17.17	9.98	0.16	QP	9	8.148	17.10	50.00	-32.90	6.65	10.07	0.38	Average	10	8.148	25.94	60.00	-34.06	15.49	10.07	0.38	QP	11	19.740	22.22	50.00	-27.78	11.25	10.30	0.67	Average	12	19.740	27.96	60.00	-32.04	16.99	10.30	0.67	QP
	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Remark																																																																																																																
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Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Neutral		

Test by : Alex Tsai

Temperature: 23°C

Humidity: 63%



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Remark
1	0.150	35.28	56.00	-20.72	25.44	9.79	0.05	Average
2*	0.150	51.59	66.00	-14.41	41.75	9.79	0.05	QP
3	0.243	25.68	52.00	-26.32	15.80	9.81	0.07	Average
4	0.243	41.35	62.00	-20.65	31.47	9.81	0.07	QP
5	0.546	31.39	46.00	-14.61	21.46	9.84	0.09	Average
6	0.546	36.68	56.00	-19.32	26.75	9.84	0.09	QP
7	7.977	19.30	50.00	-30.70	8.90	10.03	0.37	Average
8	7.977	26.04	60.00	-33.96	15.64	10.03	0.37	QP
9	13.267	23.85	50.00	-26.15	13.18	10.13	0.54	Average
10	13.267	30.49	60.00	-29.51	19.82	10.13	0.54	QP
11	20.270	24.57	50.00	-25.43	13.57	10.33	0.67	Average
12	20.270	31.51	60.00	-28.49	20.51	10.33	0.67	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).

Note 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 6dB and Occupied Bandwidth

3.2.1 Limit of 6dB Bandwidth

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

3.2.2 Test Procedures

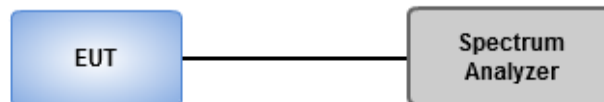
6dB Bandwidth

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

1. Set resolution bandwidth (RBW) = 1% ~ 5 % of OBW, Video bandwidth = 3 x RBW
2. Detector = Sample, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

Ambient Condition	25°C / 66%	Tested By	Aska Huang
-------------------	------------	-----------	------------

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	8.043M	13.603M	13M6G1D	7.101M	13.025M
802.11g_Nss1,(6Mbps)_2TX	16.377M	18.307M	18M3D1D	16.304M	16.425M
802.11ax HEW20_Nss1,(MCS0)_2TX	18.986M	19.103M	19M1D1D	18.043M	18.886M

Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

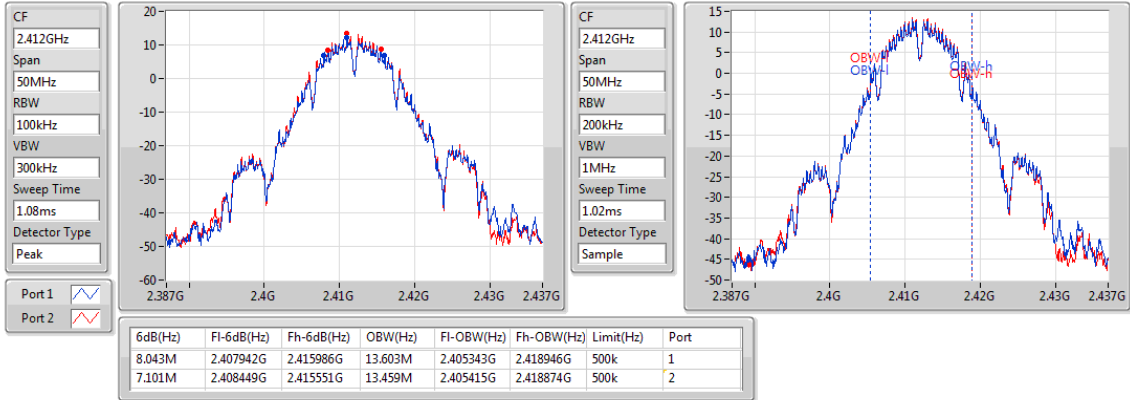
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	8.043M	13.603M	7.101M	13.459M
2437MHz	Pass	500k	7.101M	13.097M	7.536M	13.025M
2462MHz	Pass	500k	7.101M	13.242M	7.101M	13.097M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.377M	16.57M	16.377M	16.498M
2437MHz	Pass	500k	16.377M	17.945M	16.377M	18.307M
2462MHz	Pass	500k	16.304M	16.57M	16.377M	16.425M
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	18.768M	18.886M	18.696M	18.886M
2437MHz	Pass	500k	18.913M	19.03M	18.986M	19.103M
2462MHz	Pass	500k	18.043M	18.886M	18.696M	18.886M

Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

802.11b_Nss1,(1Mbps)_2TX

EBW

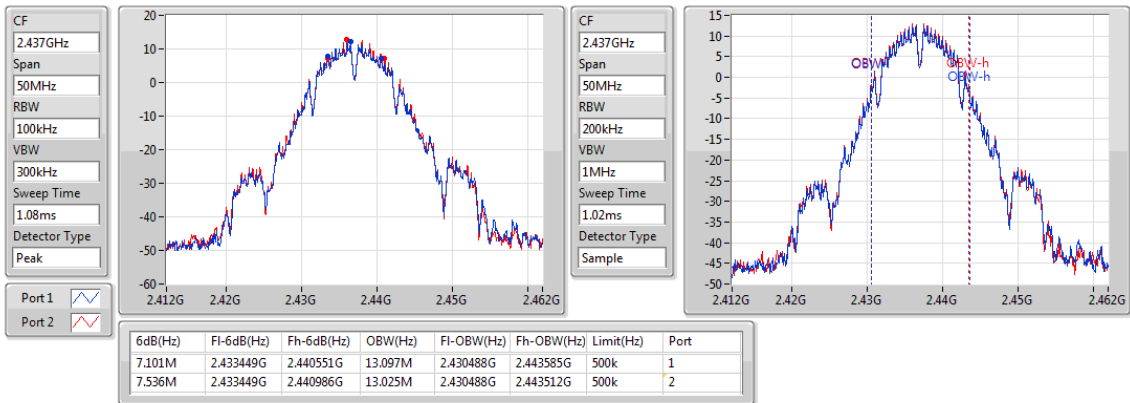
2412MHz



802.11b_Nss1,(1Mbps)_2TX

EBW

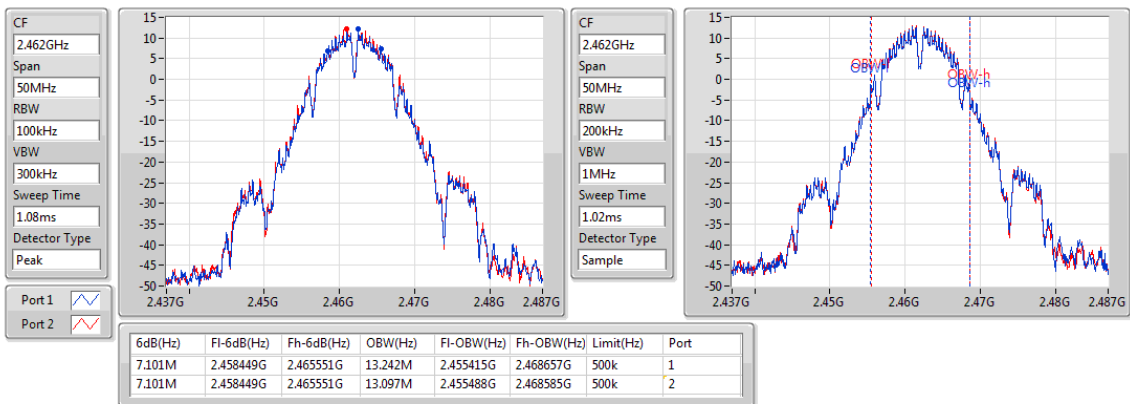
2437MHz



802.11b_Nss1,(1Mbps)_2TX

EBW

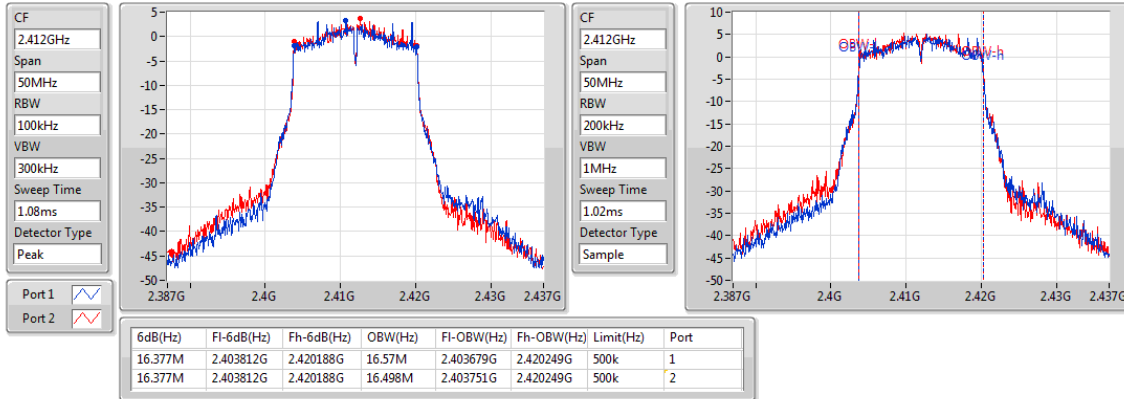
2462MHz



802.11g_Nss1,(6Mbps)_2TX

EBW

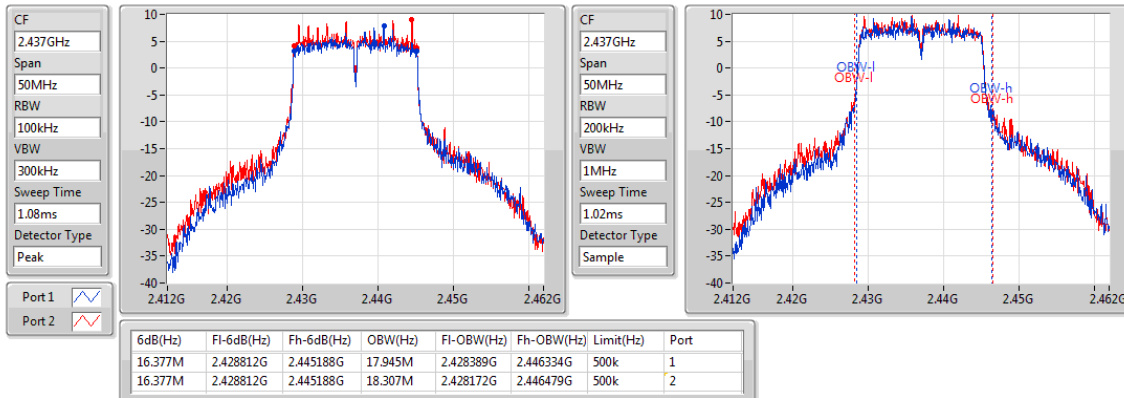
2412MHz



802.11g_Nss1,(6Mbps)_2TX

EBW

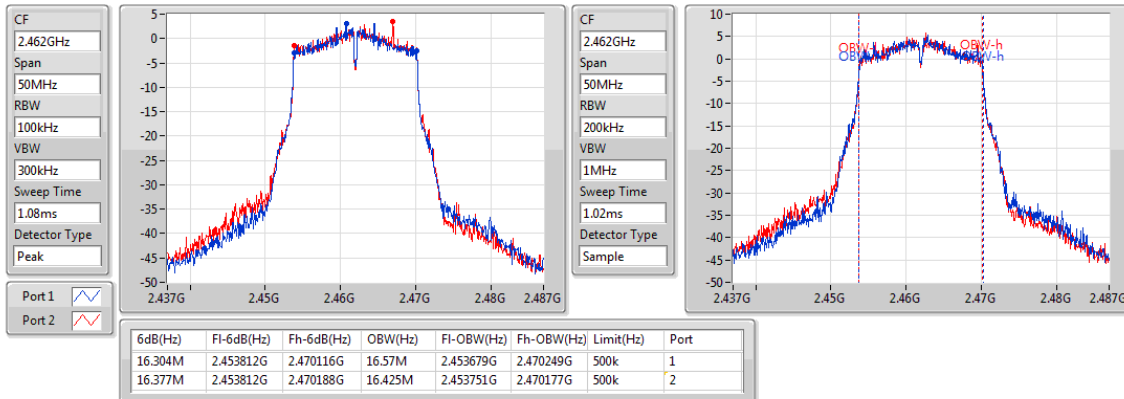
2437MHz



802.11g_Nss1,(6Mbps)_2TX

EBW

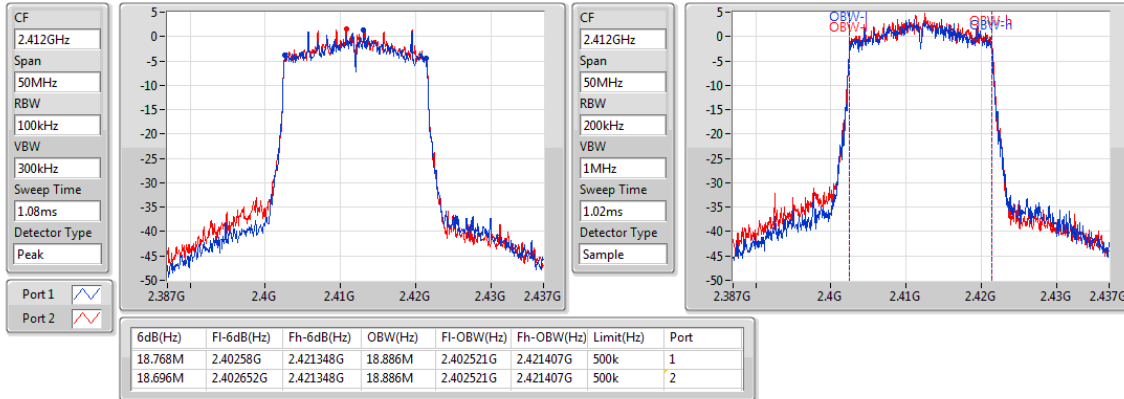
2462MHz



802.11ax HEW20_Nss1,(MCS0)_2TX

EBW

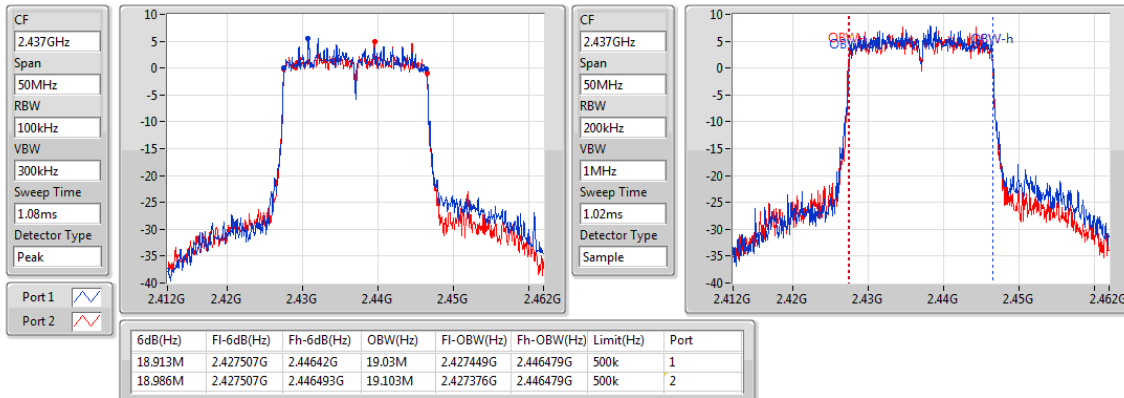
2412MHz



802.11ax HEW20_Nss1,(MCS0)_2TX

EBW

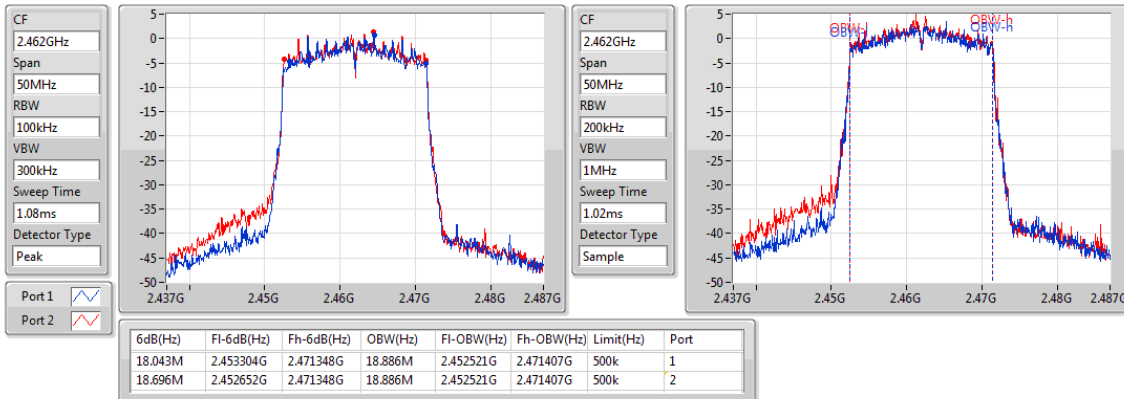
2437MHz



802.11ax HEW20_Nss1,(MCS0)_2TX

EBW

2462MHz



3.3 RF Output Power

3.3.1 Limit of RF Output Power

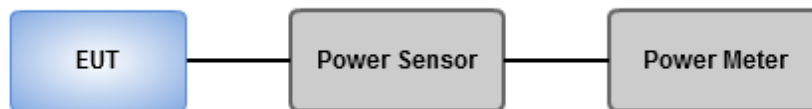
Conducted power shall not exceed 1Watt.

Antenna gain $\leq 6\text{dBi}$, no any corresponding reduction is in output power limit.

3.3.2 Test Procedures

A broadband RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.3.3 Test Setup



3.3.4 Test Result of Maximum Output Power

Ambient Condition	25°C / 66%	Tested By	Aska Huang
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Non-beamforming mode

Summary of Peak Conducted Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_2TX	26.14	0.41115
802.11g_Nss1,(6Mbps)_2TX	27.85	0.60954
802.11ax HEW20_Nss1,(MCS0)_2TX	27.66	0.58345

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.20	22.92	23.33	26.14	30.00	29.34	36.00
2437MHz	Pass	3.20	22.61	23.02	25.83	30.00	29.03	36.00
2462MHz	Pass	3.20	22.69	23.06	25.89	30.00	29.09	36.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.20	23.26	24.32	26.83	30.00	30.03	36.00
2437MHz	Pass	3.20	24.66	25.01	27.85	30.00	31.05	36.00
2462MHz	Pass	3.20	23.3	23.72	26.53	30.00	29.73	36.00
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.20	22.66	23.42	26.07	30.00	29.27	36.00
2437MHz	Pass	3.20	24.58	24.72	27.66	30.00	30.86	36.00
2462MHz	Pass	3.20	21.93	23.56	25.83	30.00	29.03	36.00

DG = Directional Gain; Port X = Port X output power

Summary of Conducted (Average) Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_2TX	23.84	0.24210
802.11g_Nss1,(6Mbps)_2TX	23.02	0.20045
802.11ax HEW20_Nss1,(MCS0)_2TX	20.55	0.11350

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.20	20.62	21.03	23.84	-	27.04	-
2437MHz	Pass	3.20	20.26	20.75	23.52	-	26.72	-
2462MHz	Pass	3.20	20.36	20.67	23.53	-	26.73	-
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.20	15.15	15.62	18.40	-	21.60	-
2437MHz	Pass	3.20	19.83	20.19	23.02	-	26.22	-
2462MHz	Pass	3.20	14.75	14.95	17.86	-	21.06	-
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.20	13.17	13.73	16.47	-	19.67	-
2437MHz	Pass	3.20	17.32	17.74	20.55	-	23.75	-
2462MHz	Pass	3.20	12.51	13.26	15.91	-	19.11	-

DG = Directional Gain; Port X = Port X output power

Note: Conducted average output power is for reference only

Beamforming mode

Summary of Peak Conducted Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	24.65	0.29174

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	6.11	19.65	20.41	23.06	29.89	29.17	36.00
2437MHz	Pass	6.11	21.57	21.71	24.65	29.89	30.76	36.00
2462MHz	Pass	6.11	18.92	20.55	22.82	29.89	28.93	36.00

DG = Directional Gain; Port X = Port X output power

Summary of Conducted (Average) Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	17.54	0.05675

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	6.11	10.16	10.72	13.46	-	19.57	-
2437MHz	Pass	6.11	14.31	14.73	17.54	-	23.65	-
2462MHz	Pass	6.11	9.50	10.25	12.90	-	19.01	-

DG = Directional Gain;

Directional gain = $10 * \log((10^{3/20} + 10^{3.2/20})^2 / 2) = 6.11$ dBi

Port X = Port X output power

Note: Conducted average output power is for reference only

3.4 Power Spectral Density

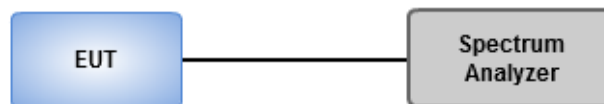
3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.4.2 Test Procedures

1. Set the RBW = 3 kHz, VBW = 10 kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.4.3 Test Setup



3.4.4 Test Result of Power Spectral Density

Ambient Condition	25°C / 66%	Tested By	Aska Huang
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Summary

Mode	PD (dBm/3kHz)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_2TX	1.90
802.11g_Nss1,(6Mbps)_2TX	-2.75
802.11ax HEW20_Nss1,(MCS0)_2TX	-6.87

Result

Mode	Result	DG (dBi)	Port 1 (dBm/3kHz)	Port 2 (dBm/3kHz)	PD (dBm/3kHz)	PD Limit (dBm/3kHz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	6.11	-0.27	-1.20	1.90	7.89
2437MHz	Pass	6.11	-2.10	-1.80	0.79	7.89
2462MHz	Pass	6.11	-2.29	-1.70	0.37	7.89
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	6.11	-8.20	-8.82	-5.74	7.89
2437MHz	Pass	6.11	-5.83	-4.98	-2.75	7.89
2462MHz	Pass	6.11	-8.75	-9.67	-6.43	7.89
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	6.11	-12.66	-11.25	-9.14	7.89
2437MHz	Pass	6.11	-8.36	-8.51	-6.87	7.89
2462MHz	Pass	6.11	-13.11	-11.96	-10.07	7.89

DG = Directional Gain;

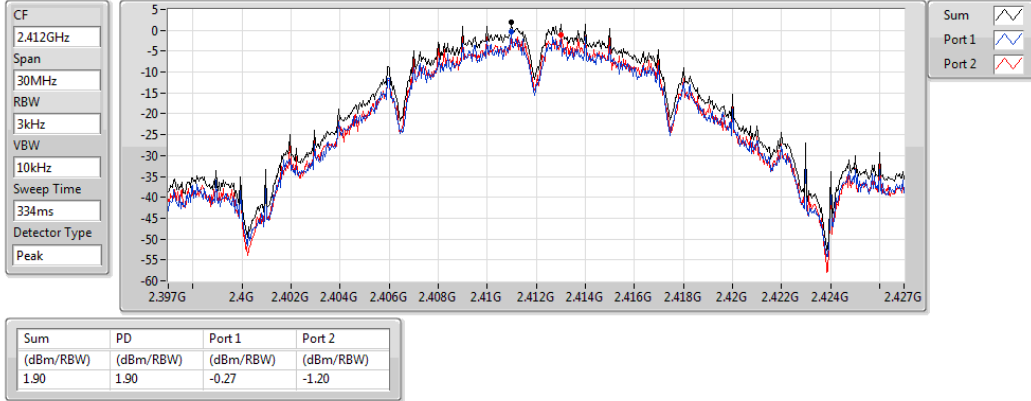
Directional gain = $10 * \log((10^{3/20} + 10^{3.2/20})^2 / 2) = 6.11$ dBi

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

802.11b_Nss1,(1Mbps)_2TX

PSD

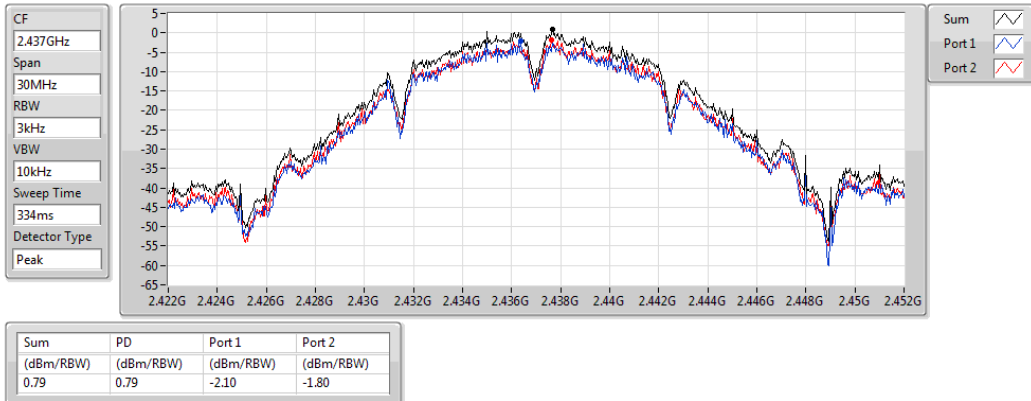
2412MHz



802.11b_Nss1,(1Mbps)_2TX

PSD

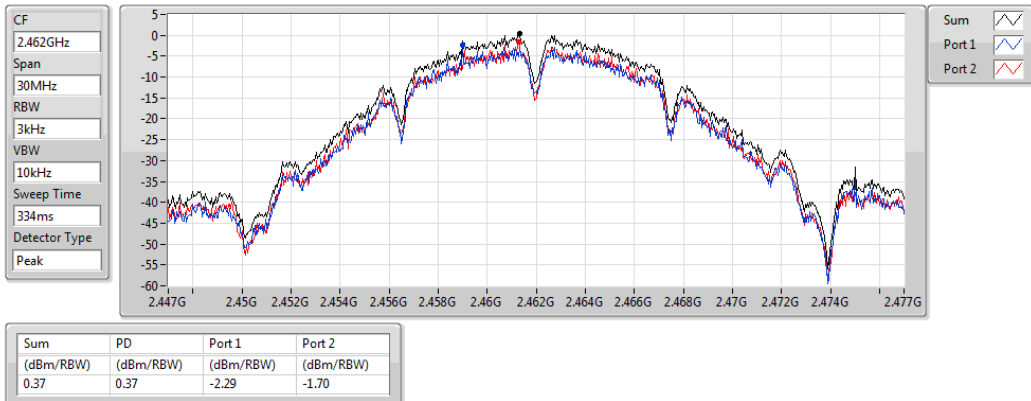
2437MHz



802.11b_Nss1,(1Mbps)_2TX

PSD

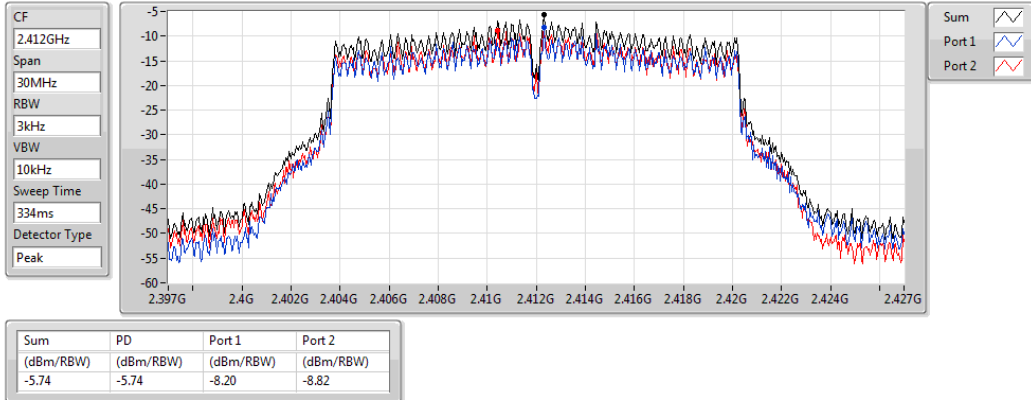
2462MHz



802.11g_Nss1,(6Mbps)_2TX

PSD

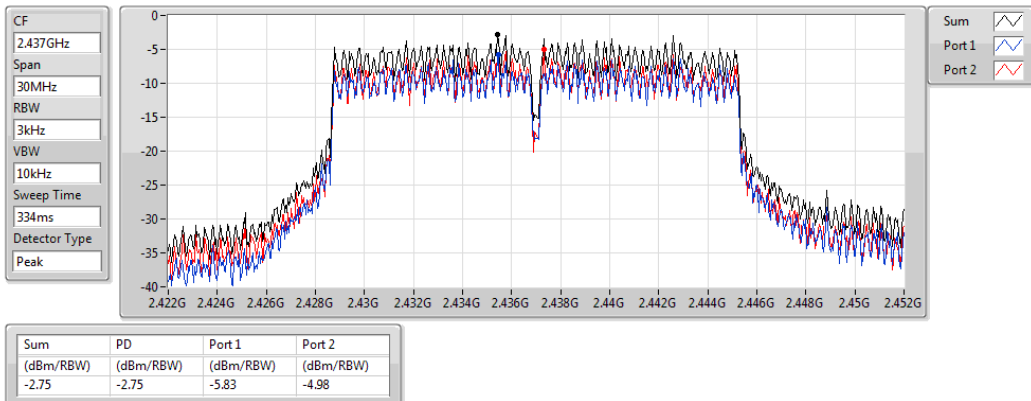
2412MHz



802.11g_Nss1,(6Mbps)_2TX

PSD

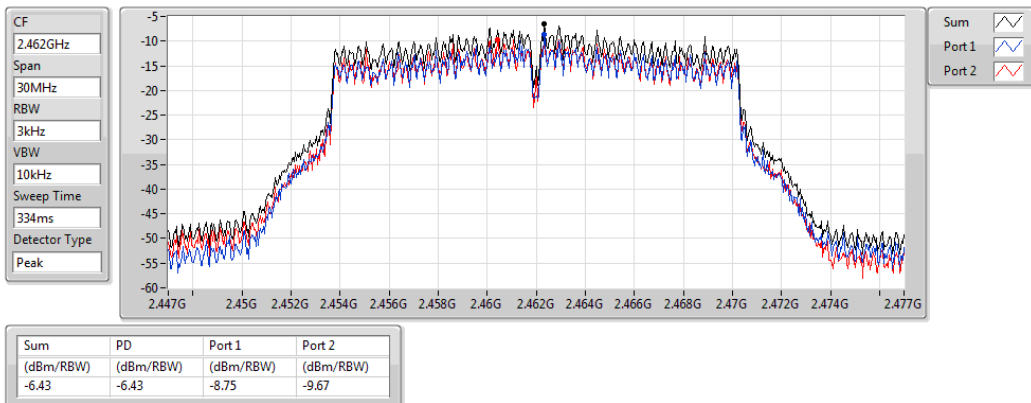
2437MHz



802.11g_Nss1,(6Mbps)_2TX

PSD

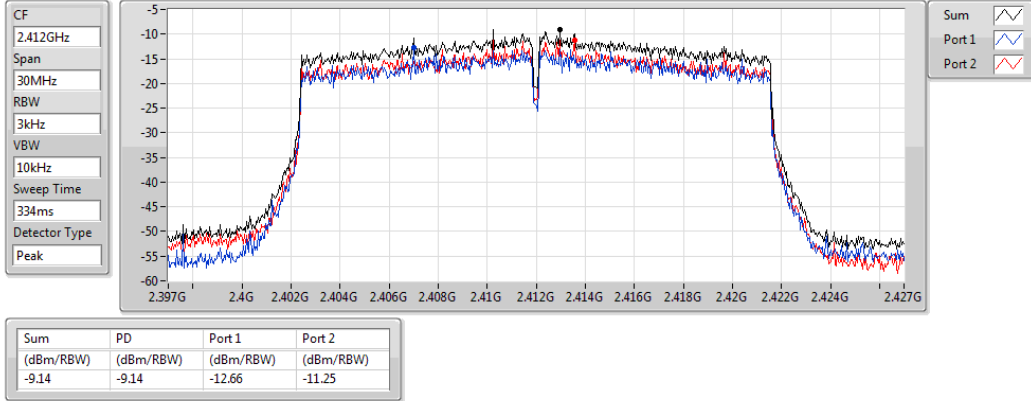
2462MHz



802.11ax HEW20_Nss1,(MCS0)_2TX

PSD

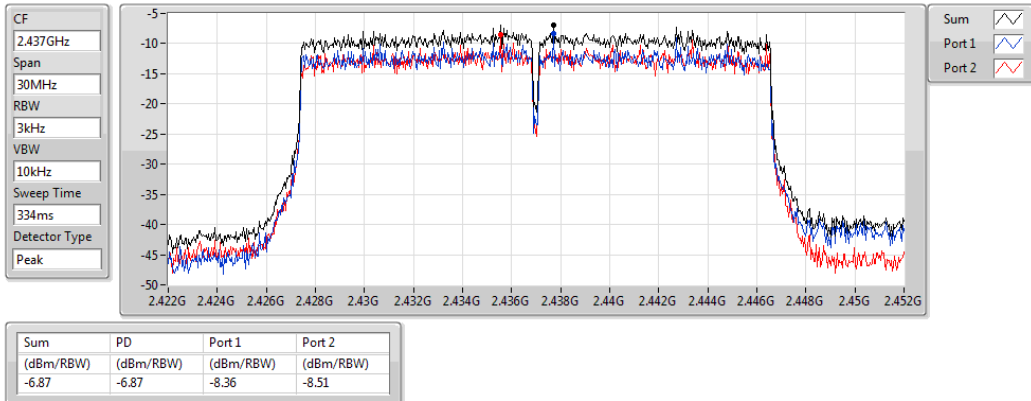
2412MHz



802.11ax HEW20_Nss1,(MCS0)_2TX

PSD

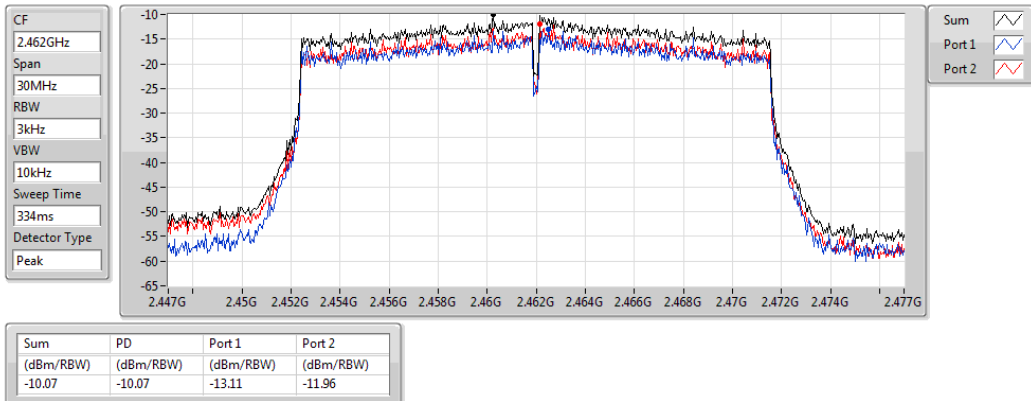
2437MHz



802.11ax HEW20_Nss1,(MCS0)_2TX

PSD

2462MHz



3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.5.2 Test Procedures

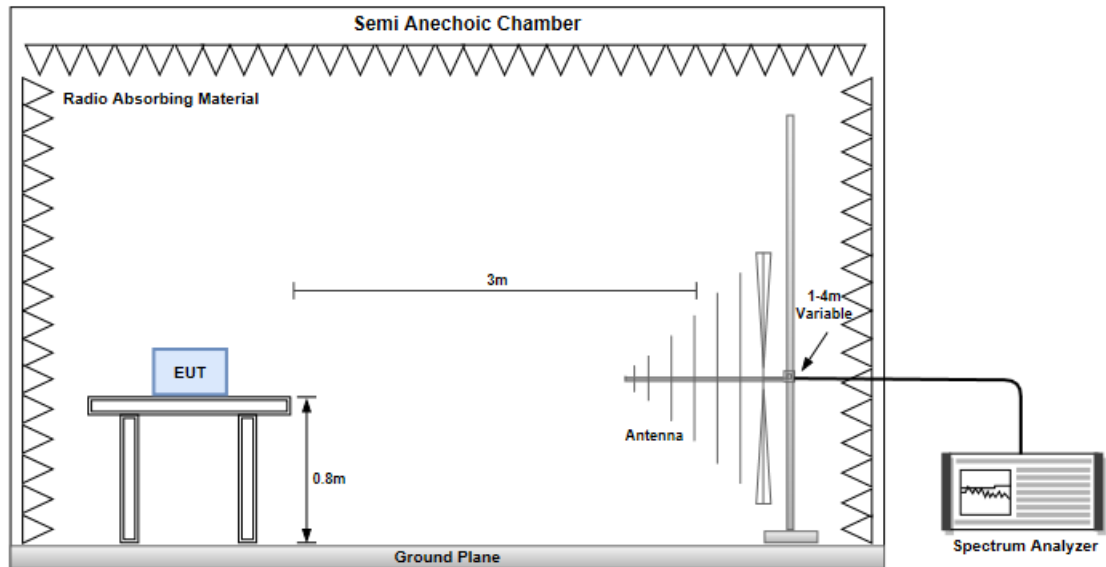
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

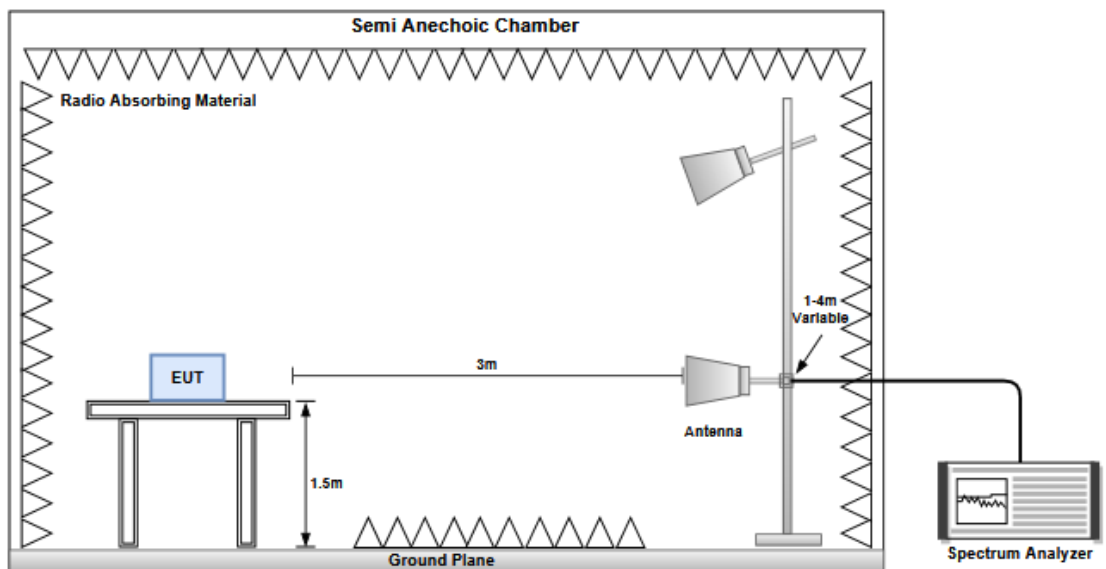
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.5.3 Test Setup

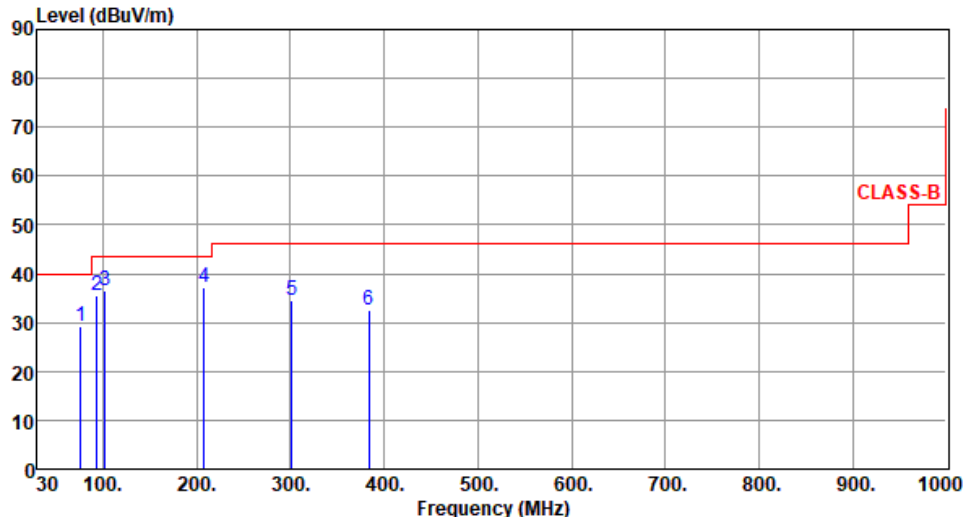
Radiated Emissions below 1 GHz

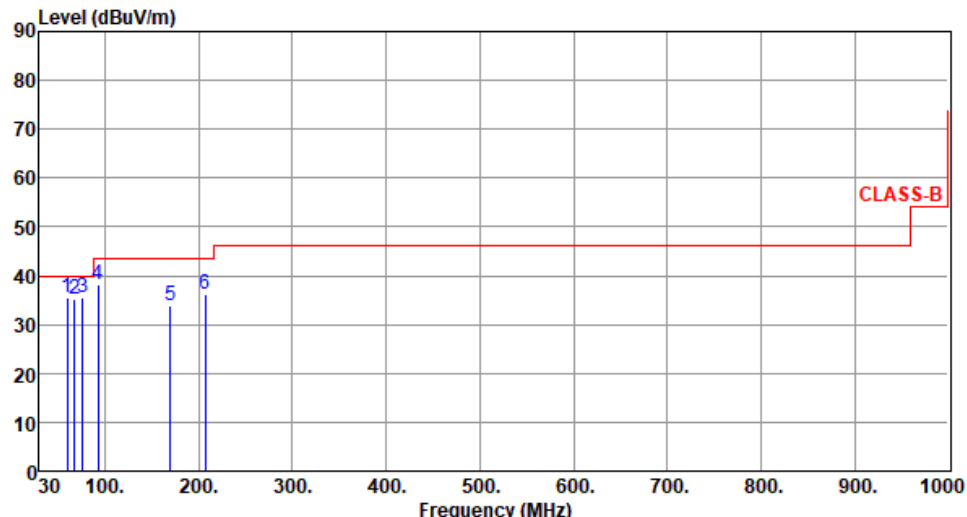


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

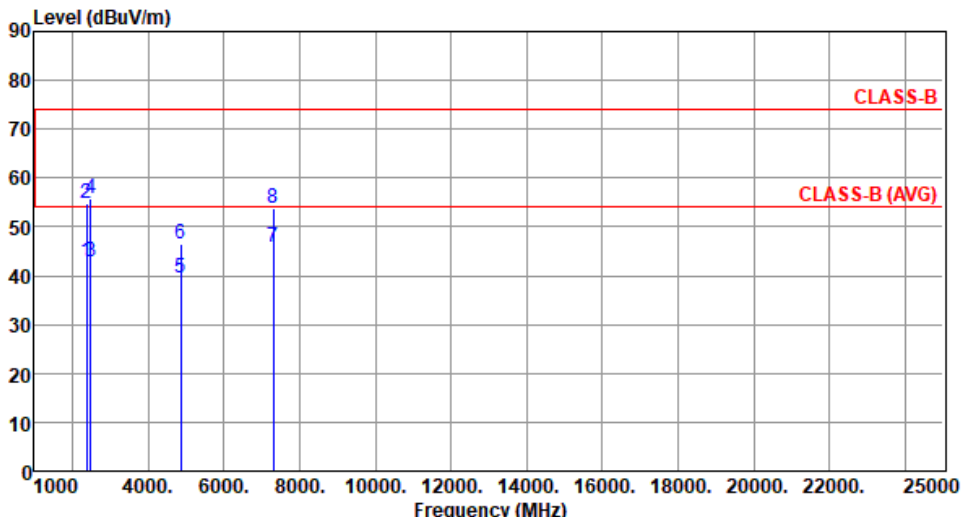
Modulation	11g	Test Freq. (MHz)	2437																																																																						
Polarization	Horizontal																																																																								
Test By :Roger Lu Temperature(°C):23 Humidity(%):65																																																																									
Level (dBuV/m)  <table><tr><th></th><th>Freq. MHz</th><th>Emission level dBuV/m</th><th>Limit dBuV/m</th><th>Margin dB</th><th>SA reading dBuV</th><th>Factor dB</th><th>Remark</th><th>ANT High cm</th><th>Turn Table deg</th></tr><tr><td>1</td><td>76.24</td><td>29.36</td><td>40.00</td><td>-10.64</td><td>41.85</td><td>-12.49</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>2</td><td>93.24</td><td>35.46</td><td>43.50</td><td>-8.04</td><td>50.11</td><td>-14.65</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>3</td><td>101.85</td><td>36.42</td><td>43.50</td><td>-7.08</td><td>49.78</td><td>-13.36</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>4</td><td>208.04</td><td>37.14</td><td>43.50</td><td>-6.36</td><td>49.34</td><td>-12.20</td><td>QP</td><td>125</td><td>248</td></tr><tr><td>5</td><td>301.26</td><td>34.59</td><td>46.00</td><td>-11.41</td><td>43.16</td><td>-8.57</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>6</td><td>383.95</td><td>32.46</td><td>46.00</td><td>-13.54</td><td>38.65</td><td>-6.19</td><td>Peak</td><td>---</td><td>---</td></tr></table>					Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	76.24	29.36	40.00	-10.64	41.85	-12.49	Peak	---	---	2	93.24	35.46	43.50	-8.04	50.11	-14.65	Peak	---	---	3	101.85	36.42	43.50	-7.08	49.78	-13.36	Peak	---	---	4	208.04	37.14	43.50	-6.36	49.34	-12.20	QP	125	248	5	301.26	34.59	46.00	-11.41	43.16	-8.57	Peak	---	---	6	383.95	32.46	46.00	-13.54	38.65	-6.19	Peak	---	---
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg																																																																
1	76.24	29.36	40.00	-10.64	41.85	-12.49	Peak	---	---																																																																
2	93.24	35.46	43.50	-8.04	50.11	-14.65	Peak	---	---																																																																
3	101.85	36.42	43.50	-7.08	49.78	-13.36	Peak	---	---																																																																
4	208.04	37.14	43.50	-6.36	49.34	-12.20	QP	125	248																																																																
5	301.26	34.59	46.00	-11.41	43.16	-8.57	Peak	---	---																																																																
6	383.95	32.46	46.00	-13.54	38.65	-6.19	Peak	---	---																																																																
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m). Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.																																																																									

Modulation	11g	Test Freq. (MHz)	2437																																																																						
Polarization	Vertical																																																																								
Test By :Roger Lu Temperature(°C):23 Humidity(%):65																																																																									
Level (dBuV/m)  <table><tr><th></th><th>Freq. MHz</th><th>Emission level dBuV/m</th><th>Limit dBuV/m</th><th>Margin dB</th><th>SA reading dBuV</th><th>Factor dB</th><th>Remark</th><th>ANT High cm</th><th>Turn Table deg</th></tr><tr><td>1</td><td>59.46</td><td>35.61</td><td>40.00</td><td>-4.39</td><td>44.80</td><td>-9.19</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>2</td><td>67.24</td><td>35.21</td><td>40.00</td><td>-4.79</td><td>45.58</td><td>-10.37</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>3</td><td>75.92</td><td>35.44</td><td>40.00</td><td>-4.56</td><td>47.78</td><td>-12.34</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>4</td><td>92.81</td><td>38.25</td><td>43.50</td><td>-5.25</td><td>52.94</td><td>-14.69</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>5</td><td>170.22</td><td>33.85</td><td>43.50</td><td>-9.65</td><td>43.06</td><td>-9.21</td><td>Peak</td><td>---</td><td>---</td></tr><tr><td>6</td><td>207.22</td><td>36.21</td><td>43.50</td><td>-7.29</td><td>48.41</td><td>-12.20</td><td>Peak</td><td>---</td><td>---</td></tr></table>					Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	59.46	35.61	40.00	-4.39	44.80	-9.19	Peak	---	---	2	67.24	35.21	40.00	-4.79	45.58	-10.37	Peak	---	---	3	75.92	35.44	40.00	-4.56	47.78	-12.34	Peak	---	---	4	92.81	38.25	43.50	-5.25	52.94	-14.69	Peak	---	---	5	170.22	33.85	43.50	-9.65	43.06	-9.21	Peak	---	---	6	207.22	36.21	43.50	-7.29	48.41	-12.20	Peak	---	---
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg																																																																
1	59.46	35.61	40.00	-4.39	44.80	-9.19	Peak	---	---																																																																
2	67.24	35.21	40.00	-4.79	45.58	-10.37	Peak	---	---																																																																
3	75.92	35.44	40.00	-4.56	47.78	-12.34	Peak	---	---																																																																
4	92.81	38.25	43.50	-5.25	52.94	-14.69	Peak	---	---																																																																
5	170.22	33.85	43.50	-9.65	43.06	-9.21	Peak	---	---																																																																
6	207.22	36.21	43.50	-7.29	48.41	-12.20	Peak	---	---																																																																
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m). Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.																																																																									

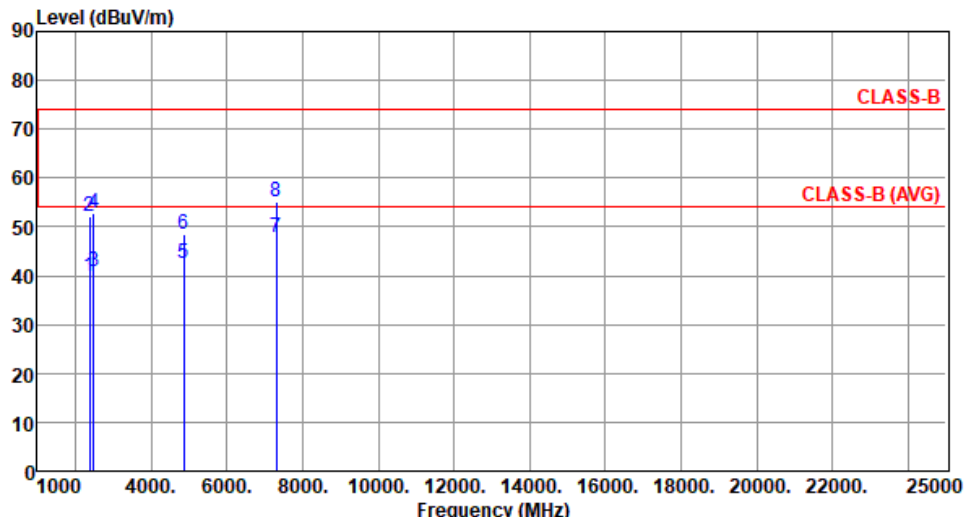
3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11b

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :BRAD WU Temperature(°C):23 Humidity(%):65			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		
Test By :BRAD WU Temperature(°C):23 Humidity(%):65			
Level (dBuV/m)			

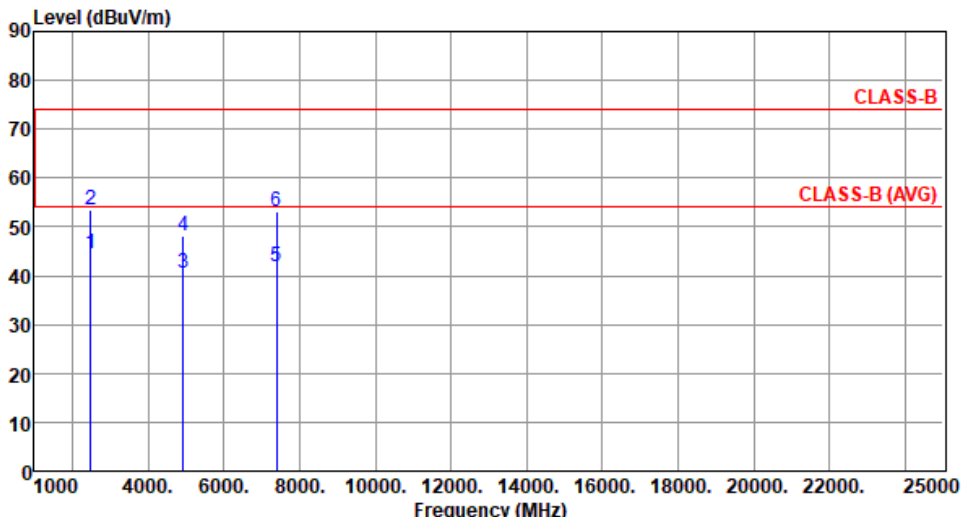
Modulation	11b	Test Freq. (MHz)	2437						
Polarization	Horizontal								
Test By :BRAD WU Temperature(°C):23 Humidity(%):65									
Level (dBUV/m)  Frequency (MHz)									
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.84	54.00	-11.16	44.50	-1.66	Average	100	310
2	2390.00	54.81	74.00	-19.19	56.47	-1.66	Peak	100	310
3	2483.50	42.76	54.00	-11.24	44.62	-1.86	Average	100	310
4	2483.50	55.75	74.00	-18.25	57.61	-1.86	Peak	100	310
5	4874.00	39.52	54.00	-14.48	34.45	5.07	Average	110	124
6	4874.00	46.59	74.00	-27.41	41.52	5.07	Peak	110	124
7	7311.00	45.77	54.00	-8.23	35.39	10.38	Average	100	62
8	7311.00	53.92	74.00	-20.08	43.54	10.38	Peak	100	62

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	11b	Test Freq. (MHz)	2437						
Polarization	Vertical								
Test By :BRAD WU Temperature(°C):23 Humidity(%):65									
Level (dBUV/m)  Frequency (MHz)									
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.71	54.00	-14.29	41.37	-1.66	Average	100	168
2	2390.00	52.29	74.00	-21.71	53.95	-1.66	Peak	100	168
3	2483.50	40.89	54.00	-13.11	42.75	-1.86	Average	100	168
4	2483.50	52.76	74.00	-21.24	54.62	-1.86	Peak	100	168
5	4874.00	42.48	54.00	-11.52	37.41	5.07	Average	100	231
6	4874.00	48.56	74.00	-25.44	43.49	5.07	Peak	100	231
7	7311.00	47.77	54.00	-6.23	37.39	10.38	Average	113	207
8	7311.00	55.08	74.00	-18.92	44.70	10.38	Peak	113	207

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

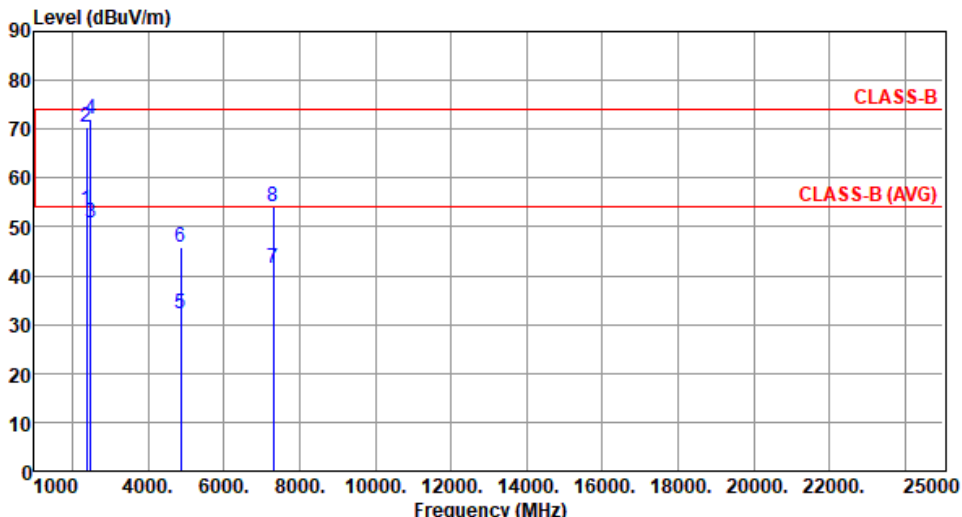
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :BRAD WU Temperature(°C):23 Humidity(%):65			
Level (dBUV/m)			

Modulation	11b	Test Freq. (MHz)	2462						
Polarization	Vertical								
Test By :BRAD WU Temperature(°C):23 Humidity(%):65									
Level (dBUV/m)  Frequency (MHz)									
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	44.47	54.00	-9.53	46.33	-1.86	Average	102	136
2	2483.50	53.40	74.00	-20.60	55.26	-1.86	Peak	102	136
3	4924.00	40.50	54.00	-13.50	35.33	5.17	Average	106	234
4	4924.00	48.16	74.00	-25.84	42.99	5.17	Peak	106	234
5	7386.00	41.74	54.00	-12.26	31.66	10.08	Average	121	206
6	7386.00	53.01	74.00	-20.99	42.93	10.08	Peak	121	206
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).									

3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :BRAD WU Temperature(°C):23 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		
Test By :BRAD WU Temperature(°C):23 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2437																																																																																										
Polarization	Horizontal																																																																																												
Test By :BRAD WU Temperature(°C):23 Humidity(%):65																																																																																													
Level (dBUV/m)  Frequency (MHz)																																																																																													
<table><tr><th></th><th>Freq. MHz</th><th>Emission level dBUV/m</th><th>Limit dBUV/m</th><th>Margin dB</th><th>SA reading dBUV</th><th>Factor dB</th><th>Remark</th><th>ANT High cm</th><th>Turn Table deg</th></tr><tr><td>1</td><td>2390.00</td><td>53.34</td><td>54.00</td><td>-0.66</td><td>55.00</td><td>-1.66</td><td>Average</td><td>100</td><td>308</td></tr><tr><td>2</td><td>2390.00</td><td>70.41</td><td>74.00</td><td>-3.59</td><td>72.07</td><td>-1.66</td><td>Peak</td><td>100</td><td>308</td></tr><tr><td>3</td><td>2483.50</td><td>50.83</td><td>54.00</td><td>-3.17</td><td>52.69</td><td>-1.86</td><td>Average</td><td>100</td><td>308</td></tr><tr><td>4</td><td>2483.50</td><td>71.95</td><td>74.00</td><td>-2.05</td><td>73.81</td><td>-1.86</td><td>Peak</td><td>100</td><td>308</td></tr><tr><td>5</td><td>4874.00</td><td>32.15</td><td>54.00</td><td>-21.85</td><td>27.08</td><td>5.07</td><td>Average</td><td>109</td><td>122</td></tr><tr><td>6</td><td>4874.00</td><td>45.76</td><td>74.00</td><td>-28.24</td><td>40.69</td><td>5.07</td><td>Peak</td><td>109</td><td>122</td></tr><tr><td>7</td><td>7311.00</td><td>41.55</td><td>54.00</td><td>-12.45</td><td>31.17</td><td>10.38</td><td>Average</td><td>102</td><td>64</td></tr><tr><td>8</td><td>7311.00</td><td>54.25</td><td>74.00</td><td>-19.75</td><td>43.87</td><td>10.38</td><td>Peak</td><td>102</td><td>64</td></tr></table>					Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg	1	2390.00	53.34	54.00	-0.66	55.00	-1.66	Average	100	308	2	2390.00	70.41	74.00	-3.59	72.07	-1.66	Peak	100	308	3	2483.50	50.83	54.00	-3.17	52.69	-1.86	Average	100	308	4	2483.50	71.95	74.00	-2.05	73.81	-1.86	Peak	100	308	5	4874.00	32.15	54.00	-21.85	27.08	5.07	Average	109	122	6	4874.00	45.76	74.00	-28.24	40.69	5.07	Peak	109	122	7	7311.00	41.55	54.00	-12.45	31.17	10.38	Average	102	64	8	7311.00	54.25	74.00	-19.75	43.87	10.38	Peak	102	64
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg																																																																																				
1	2390.00	53.34	54.00	-0.66	55.00	-1.66	Average	100	308																																																																																				
2	2390.00	70.41	74.00	-3.59	72.07	-1.66	Peak	100	308																																																																																				
3	2483.50	50.83	54.00	-3.17	52.69	-1.86	Average	100	308																																																																																				
4	2483.50	71.95	74.00	-2.05	73.81	-1.86	Peak	100	308																																																																																				
5	4874.00	32.15	54.00	-21.85	27.08	5.07	Average	109	122																																																																																				
6	4874.00	45.76	74.00	-28.24	40.69	5.07	Peak	109	122																																																																																				
7	7311.00	41.55	54.00	-12.45	31.17	10.38	Average	102	64																																																																																				
8	7311.00	54.25	74.00	-19.75	43.87	10.38	Peak	102	64																																																																																				
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).																																																																																													

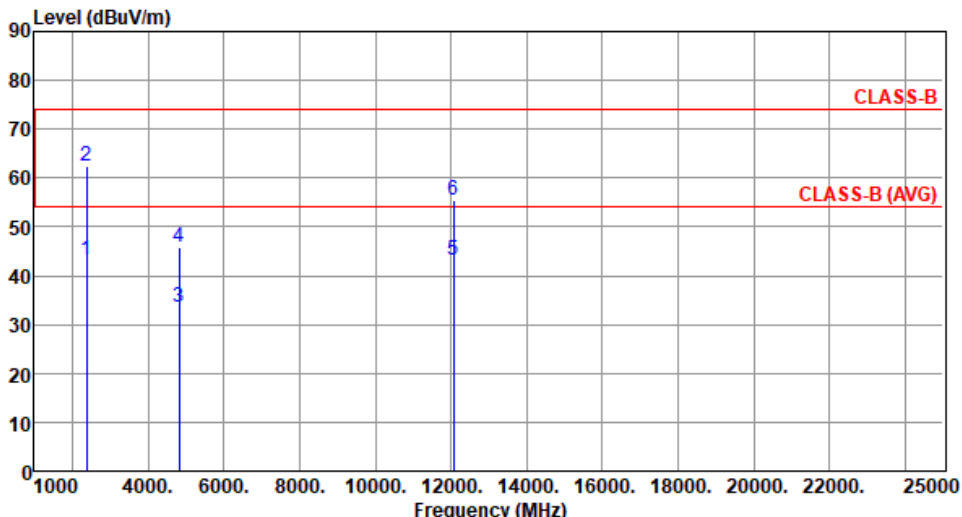
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :BRAD WU Temperature(°C):23 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :BRAD WU Temperature(°C):23 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :BRAD WU Temperature(°C):23 Humidity(%):65			
Level (dBUV/m)			

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for ax HE20

Modulation	ax HE20	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :BRAD WU Temperature(°C):23 Humidity(%):63			
Level (dBuV/m)			

Modulation	ax HE20	Test Freq. (MHz)	2412						
Polarization	Vertical								
Test By :BRAD WU Temperature(°C):23 Humidity(%):63									
Level (dBUV/m)  Frequency (MHz)									
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.21	54.00	-10.79	44.87	-1.66	Average	100	138
2	2390.00	62.58	74.00	-11.42	64.24	-1.66	Peak	100	138
3	4824.00	33.65	54.00	-20.35	28.62	5.03	Average	100	236
4	4824.00	45.71	74.00	-28.29	40.68	5.03	Peak	100	236
5	12060.00	43.15	54.00	-10.85	28.38	14.77	Average	100	239
6	12060.00	55.46	74.00	-18.54	40.69	14.77	Peak	100	239
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).									

Modulation	ax HE20	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :BRAD WU Temperature(°C):23 Humidity(%):63			
Level (dBUV/m) <			

Modulation	ax HE20	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :BRAD WU Temperature(°C):23 Humidity(%):63			
Level (dBUV/m) </			

Modulation	ax HE20	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :BRAD WU Temperature(°C):23 Humidity(%):63			
Level (dBUV/m)			

Modulation	ax HE20	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :BRAD WU Temperature(°C):23 Humidity(%):63			
Level (dBUV/m)			

3.6 Emissions in Non-Restricted Frequency Bands

3.6.1 Emissions in Non-Restricted Frequency Bands Limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.6.2 Test Procedures

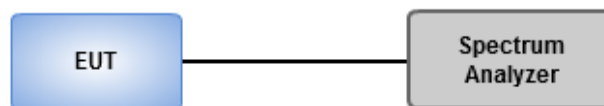
Reference level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

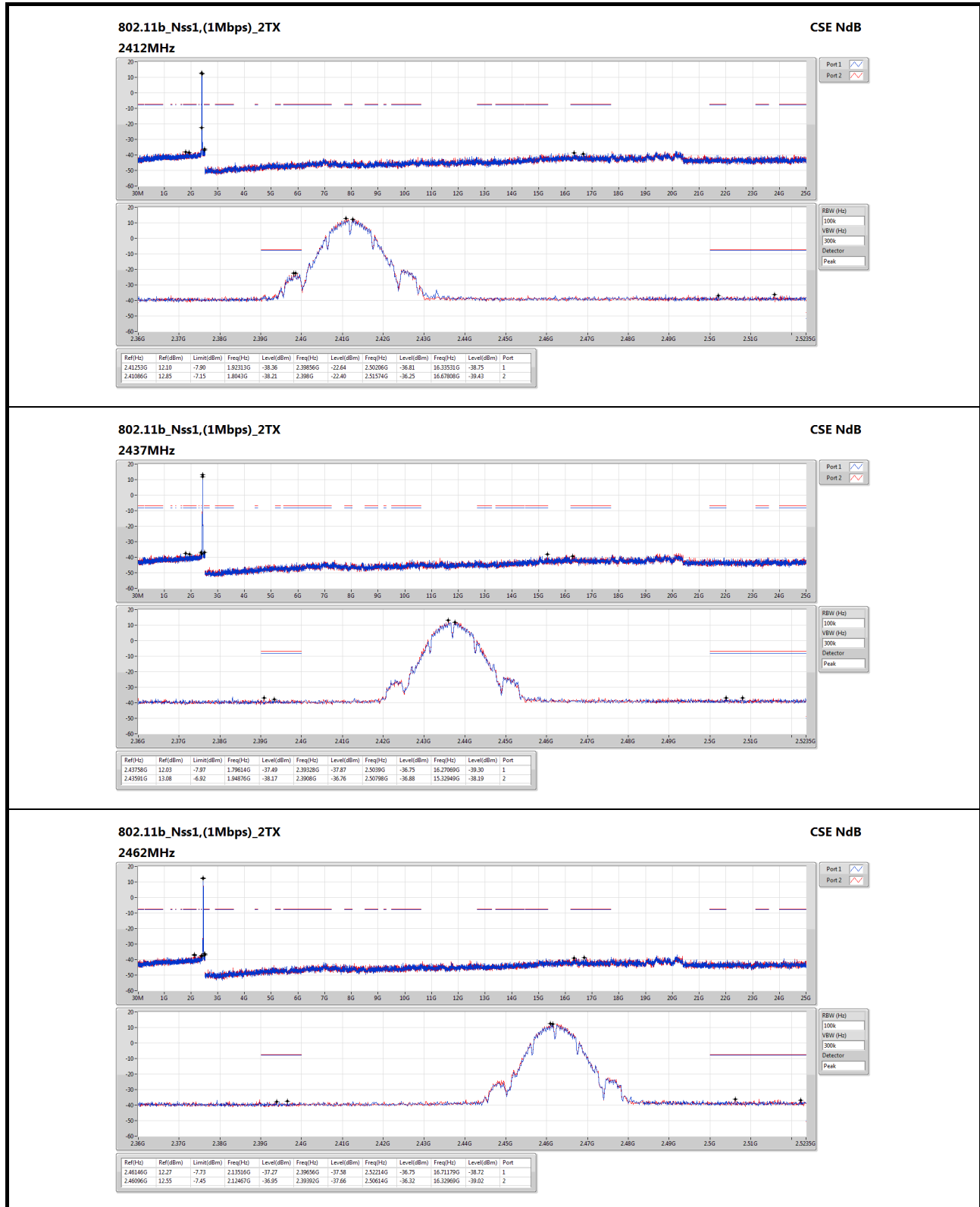
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.6.3 Test Setup



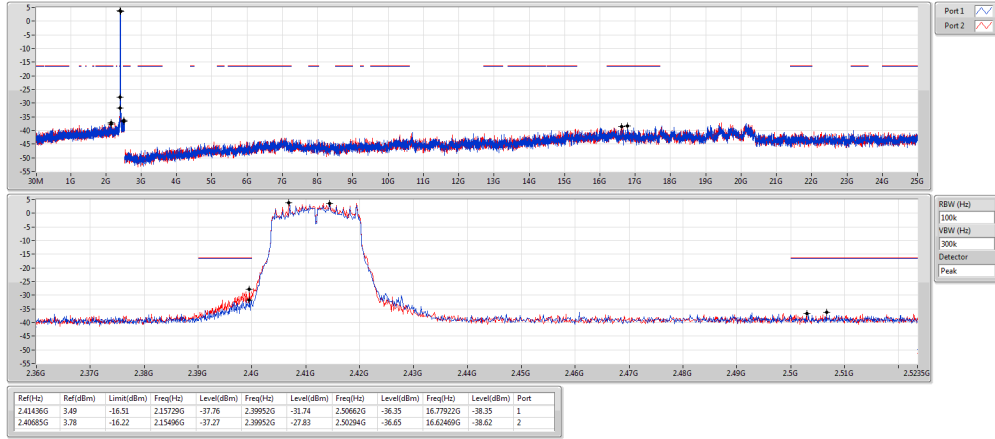
3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands

Ambient Condition	25°C / 66%	Tested By	Aska Huang
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802.11g_Nss1,(6Mbps)_2TX
2412MHz

CSE NdB



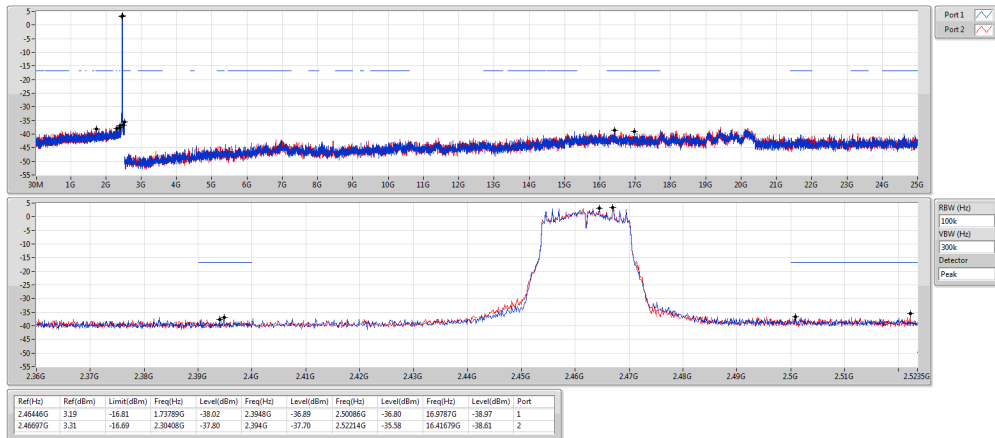
802.11g_Nss1,(6Mbps)_2TX
2437MHz

CSE NdB



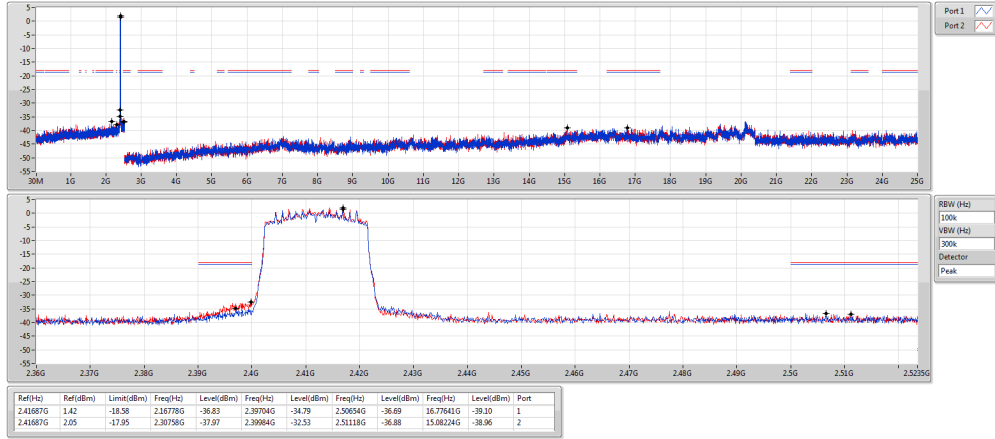
802.11g_Nss1,(6Mbps)_2TX
2462MHz

CSE NdB



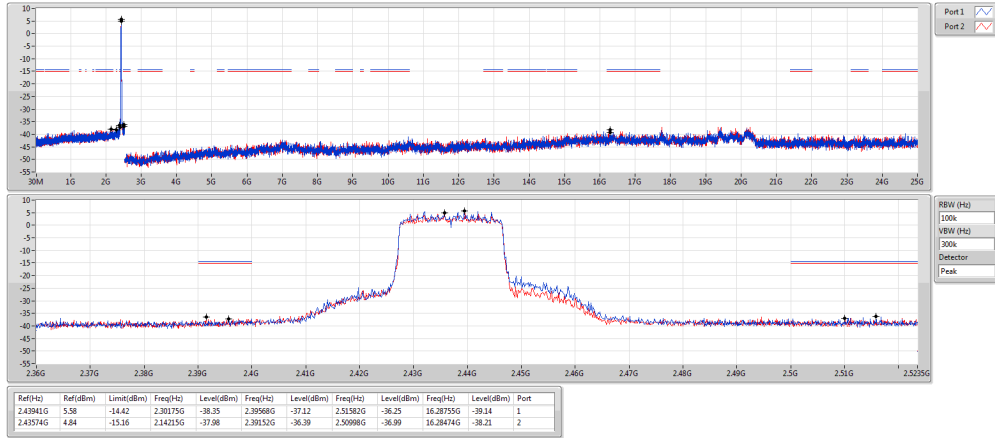
802.11ax HEW20_Nss1,(MCS0)_2TX
2412MHz

CSE NdB



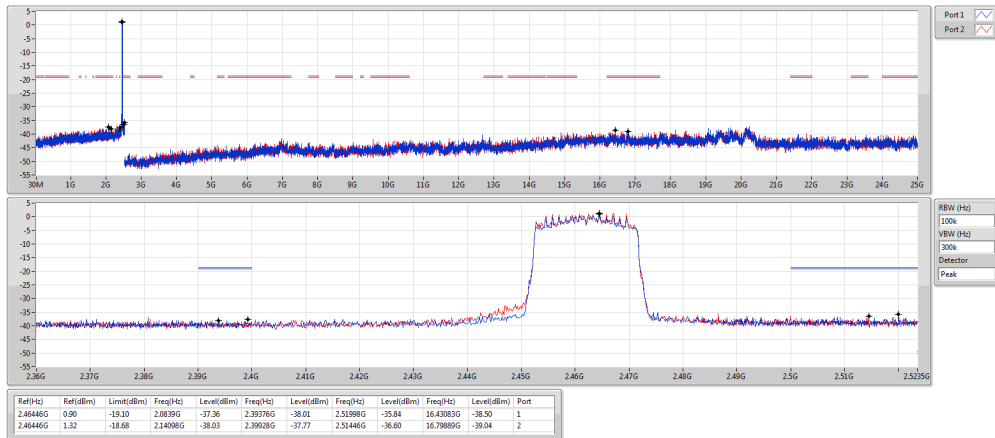
802.11ax HEW20_Nss1,(MCS0)_2TX
2437MHz

CSE NdB



802.11ax HEW20_Nss1,(MCS0)_2TX
2462MHz

CSE NdB



4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan
(R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 333, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==