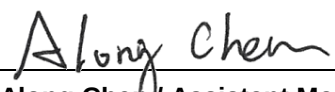


FCC Test Report

FCC ID : NKR-DHURAZ53
Equipment : 11a/b/g/n/ac 1x1 module
Model No. : DHUR-AZ53
Brand Name : Amazon
Applicant : Wistron NeWeb Corporation
Address : 20 Park Avenue II, Hsinchu Science Park,
Hsinchu 308,Taiwan,R.O.C.
Standard : 47 CFR FCC Part 15.247
Received Date : Dec. 16, 2021
Tested Date : Jan. 18 ~ Feb. 16, 2022

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 shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:


Along Chen / Assistant Manager

Approved by:

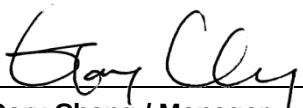

Gary Chang / Manager

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Release Record

Report No.	Version	Description	Issued Date
FR1D1601AC	Rev. 01	Initial issue	Mar. 21, 2022

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.555MHz 31.71 (Margin -14.29dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz 52.99 (Margin -1.01dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 25.95	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]	1	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	1	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	1	MCS 0-7
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	1	MCS 0-7
Note 1: RF output power specifies that Maximum Peak Conducted Output Power. Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation. Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.					

1.1.2 Antenna Details

Ant. No.	Brand	Model	Type	Gain (dBi)	Connector	Remark
1	WNC	WF1_ANT	PIFA	3.16	NA	onboard
2	WNC	81.EK615.GAA	PIFA	2.26	IPEX	---
3	WNC	81.EK615.GAF	PIFA	3.09	IPEX	---

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	5Vdc from host
-------------------	----------------

1.1.4 Accessories

N/A

1.1.5 Channel List

Frequency band (MHz)		2400~2483.5	
802.11 b / g / n HT20		802.11n HT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447	10	2457
9	2452	11	2462
10	2457	---	---
11	2462	---	---
12	2467	---	---
13	2472	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	QA Tool, Version: V0.02.6		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11b	100.00%	0.00
	11g	98.46%	0.07
	HT20	98.34%	0.07
	HT40	95.58%	0.20

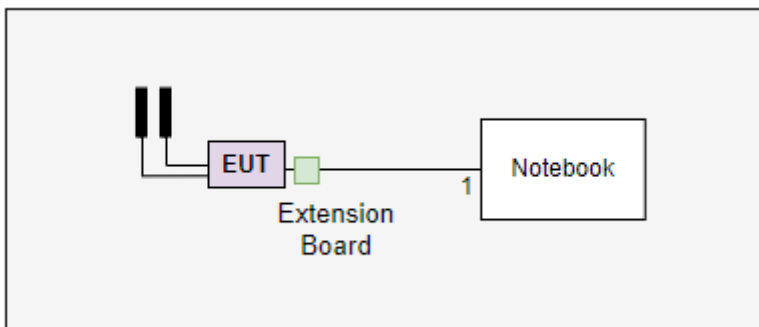
1.1.7 Power Index of Test Tool

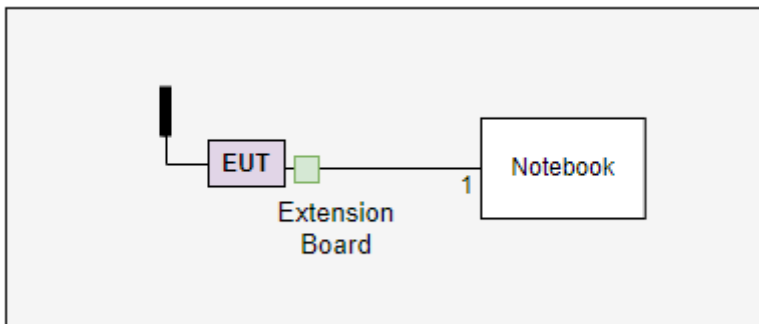
Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	23
11b	2437	23
11b	2462	23
11b	2467	1F
11b	2472	18
11g	2412	22
11g	2437	23
11g	2462	21
11g	2467	1A
11g	2472	16
HT20	2412	22
HT20	2437	23
HT20	2462	21
HT20	2467	19
HT20	2472	13
HT40	2422	21
HT40	2437	22
HT40	2452	20
HT40	2457	18
HT40	2462	12

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5470	---	---
2	USB Cable	ICC	extension	---	
3	Extension Board	---	---	---	Provided by applicant.

1.3 Test Setup Chart

Test Setup Diagram (Wi-Fi: External antenna + Bluetooth: External antenna)	
 The diagram shows a test setup within a light gray rectangular area. On the left, there are two vertical black bars representing external antennas. A line connects them to a pink box labeled 'EUT'. From the 'EUT' box, a line goes to a green box labeled 'Extension Board'. From the 'Extension Board', a line goes to a white box labeled 'Notebook'. A small number '1' is placed on the line connecting the 'Extension Board' to the 'Notebook'.	
No.	Signal cable / Length (m)
1	USB, 1m shielded.

Test Setup Diagram (Wi-Fi: Onboard antenna + Bluetooth: External antenna)	
 The diagram shows a test setup within a light gray rectangular area. On the left, there is a single vertical black bar representing an external antenna. A line connects it to a pink box labeled 'EUT'. From the 'EUT' box, a line goes to a green box labeled 'Extension Board'. From the 'Extension Board', a line goes to a white box labeled 'Notebook'. A small number '1' is placed on the line connecting the 'Extension Board' to the 'Notebook'.	
No.	Signal cable / Length (m)
1	USB, 1m shielded.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Feb. 15, 2022				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 12, 2021	Mar. 11, 2022
LISN	R&S	ENV216	101579	Mar. 17, 2021	Mar. 16, 2022
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127477	Feb. 25, 2021	Feb. 24, 2022
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 19, 2021	Oct. 18, 2022
50 ohm terminal (Support Unit)	NA	50	04	May 25, 2021	May 24, 2022
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 chamber1 / (03CH01-WS)				
Tested Date	Jan. 18 ~ Jan. 27, 2022				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 12, 2021	Mar. 11, 2022
Spectrum Analyzer	R&S	FSV40	101498	Nov. 29, 2021	Nov. 28, 2022
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 08, 2021	Nov. 07, 2022
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jun. 30, 2021	Jun. 29, 2022
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 03, 2021	Dec. 02, 2022
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 04, 2021	Nov. 03, 2022
Preamplifier	EMC	EMC02325	980225	Jun. 29, 2021	Jun. 28, 2022
Preamplifier	Agilent	83017A	MY39501308	Sep. 28, 2021	Sep. 27, 2022
Preamplifier	EMC	EMC184045B	980192	Jul. 14, 2021	Jul. 13, 2022
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 05, 2021	Oct. 04, 2022
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 05, 2021	Oct. 04, 2022
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 05, 2021	Oct. 04, 2022
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 05, 2021	Oct. 04, 2022
RF Cable	EMC	EMC104-35M-35M- 8000	210920	Oct. 05, 2021	Oct. 04, 2022
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 05, 2021	Oct. 04, 2022
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)				
Tested Date	Feb. 16, 2022				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Nov. 29, 2021	Nov. 28, 2022
Power Meter	Anritsu	ML2495A	1241002	Nov. 07, 2021	Nov. 06, 2022
Power Sensor	Anritsu	MA2411B	1207366	Nov. 07, 2021	Nov. 06, 2022
Measurement Software	Sporton	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

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 ≤ 1 GHz	± 3.41 dB
Radiated emission > 1 GHz	± 4.59 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, 03CH01-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.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	11g	2437	6 Mbps	2
Radiated Emissions ≤1GHz	11g	2437	6 Mbps	1, 2
Radiated Emissions >1GHz	11b 11g HT20 HT40	2412 / 2437 / 2462 / 2467 / 2472 2412 / 2437 / 2462 / 2467 / 2472 2412 / 2437 / 2462 / 2467 / 2472 2422 / 2437 / 2452 / 2457 / 2462	1 Mbps 6 Mbps MCS 0 MCS 0	1, 2
Maximum Output Power 6dB bandwidth Power spectral density	11b 11g HT20 HT40	2412 / 2437 / 2462 / 2467 / 2472 2412 / 2437 / 2462 / 2467 / 2472 2412 / 2437 / 2462 / 2467 / 2472 2422 / 2437 / 2452 / 2457 / 2462	1 Mbps 6 Mbps MCS 0 MCS 0	1

NOTE:

- The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **X-plane** results were found as the worst case and were shown in this report.
- The EUT had been tested by following test configurations.
 Test Configuration 1: WiFi external antenna (model: 81.EK615.GAF) + BT external antenna (model: 81.EK615.GAV)
 Test Configuration 2: WiFi onboard (model: WF1_ANT) + BT external antenna (model: 81.EK615.GAV)

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

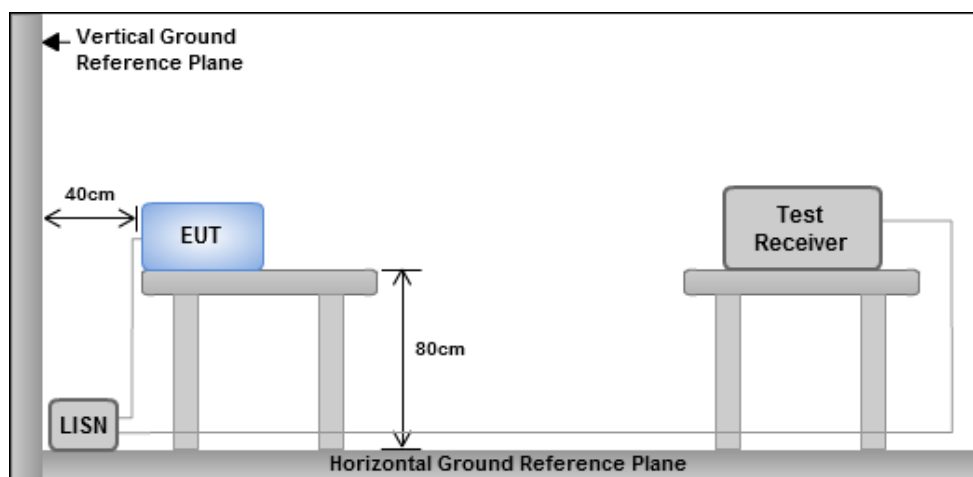
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

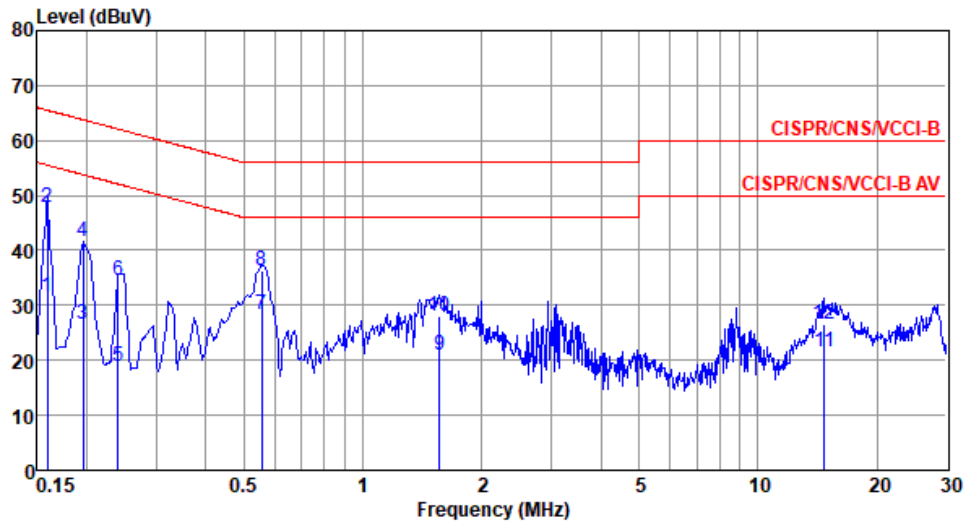
Modulation	11g	Test Freq. (MHz)	2437																																																																																																																																																						
Power Phase	Line																																																																																																																																																								
Test by : Joe Liao Temperature: 16°C Humidity: 60%																																																																																																																																																									
Level (dBuV) Frequency (MHz)																																																																																																																																																									
<table><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>Factor</th><th>Cable</th><th>Aux</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuA</th><th>Line</th><th>Limit</th><th>Level</th><th>dB</th><th>loss</th><th>dB</th><th></th></tr><tr><th></th><th></th><th></th><th>dBuA</th><th>dB</th><th>dBuA</th><th></th><th>dB</th><th></th><th></th></tr><tr><td>1</td><td>0.159</td><td>34.85</td><td>55.52</td><td>-20.67</td><td>25.11</td><td>9.66</td><td>0.08</td><td>0.00</td><td>Average</td></tr><tr><td>2</td><td>0.159</td><td>47.46</td><td>65.52</td><td>-18.06</td><td>37.72</td><td>9.66</td><td>0.08</td><td>0.00</td><td>QP</td></tr><tr><td>3</td><td>0.195</td><td>28.85</td><td>53.80</td><td>-24.95</td><td>19.12</td><td>9.65</td><td>0.08</td><td>0.00</td><td>Average</td></tr><tr><td>4</td><td>0.195</td><td>40.75</td><td>63.80</td><td>-23.05</td><td>31.02</td><td>9.65</td><td>0.08</td><td>0.00</td><td>QP</td></tr><tr><td>5</td><td>0.213</td><td>24.87</td><td>53.10</td><td>-28.23</td><td>15.14</td><td>9.65</td><td>0.08</td><td>0.00</td><td>Average</td></tr><tr><td>6</td><td>0.213</td><td>37.50</td><td>63.10</td><td>-25.60</td><td>27.77</td><td>9.65</td><td>0.08</td><td>0.00</td><td>QP</td></tr><tr><td>7*</td><td>0.555</td><td>31.71</td><td>46.00</td><td>-14.29</td><td>21.96</td><td>9.64</td><td>0.11</td><td>0.00</td><td>Average</td></tr><tr><td>8</td><td>0.555</td><td>40.15</td><td>56.00</td><td>-15.85</td><td>30.40</td><td>9.64</td><td>0.11</td><td>0.00</td><td>QP</td></tr><tr><td>9</td><td>1.123</td><td>22.81</td><td>46.00</td><td>-23.19</td><td>12.99</td><td>9.65</td><td>0.17</td><td>0.00</td><td>Average</td></tr><tr><td>10</td><td>1.123</td><td>29.80</td><td>56.00</td><td>-26.20</td><td>19.98</td><td>9.65</td><td>0.17</td><td>0.00</td><td>QP</td></tr><tr><td>11</td><td>15.388</td><td>21.05</td><td>50.00</td><td>-28.95</td><td>10.79</td><td>9.69</td><td>0.57</td><td>0.00</td><td>Average</td></tr><tr><td>12</td><td>15.388</td><td>25.81</td><td>60.00</td><td>-34.19</td><td>15.55</td><td>9.69</td><td>0.57</td><td>0.00</td><td>QP</td></tr></table>					Freq	Level	Limit	Over	Read	Factor	Cable	Aux	Remark		MHz	dBuA	Line	Limit	Level	dB	loss	dB					dBuA	dB	dBuA		dB			1	0.159	34.85	55.52	-20.67	25.11	9.66	0.08	0.00	Average	2	0.159	47.46	65.52	-18.06	37.72	9.66	0.08	0.00	QP	3	0.195	28.85	53.80	-24.95	19.12	9.65	0.08	0.00	Average	4	0.195	40.75	63.80	-23.05	31.02	9.65	0.08	0.00	QP	5	0.213	24.87	53.10	-28.23	15.14	9.65	0.08	0.00	Average	6	0.213	37.50	63.10	-25.60	27.77	9.65	0.08	0.00	QP	7*	0.555	31.71	46.00	-14.29	21.96	9.64	0.11	0.00	Average	8	0.555	40.15	56.00	-15.85	30.40	9.64	0.11	0.00	QP	9	1.123	22.81	46.00	-23.19	12.99	9.65	0.17	0.00	Average	10	1.123	29.80	56.00	-26.20	19.98	9.65	0.17	0.00	QP	11	15.388	21.05	50.00	-28.95	10.79	9.69	0.57	0.00	Average	12	15.388	25.81	60.00	-34.19	15.55	9.69	0.57	0.00	QP
	Freq	Level	Limit	Over	Read	Factor	Cable	Aux	Remark																																																																																																																																																
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Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).																																																																																																																																																									
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).																																																																																																																																																									

Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Neutral		

Test by : Joe Liao

Temperature: 16°C

Humidity: 60%



	Freq MHz	Level dBuA	Limit Line dBuA	Over Limit dB	Read Level dBuA	Factor dB	Cable loss dB	Aux dB	Remark
1	0.159	31.61	55.52	-23.91	21.84	9.69	0.08	0.00	Average
2	0.159	47.79	65.52	-17.73	38.02	9.69	0.08	0.00	QP
3	0.195	26.65	53.80	-27.15	16.89	9.68	0.08	0.00	Average
4	0.195	41.72	63.80	-22.08	31.96	9.68	0.08	0.00	QP
5	0.240	18.75	52.08	-33.33	8.99	9.68	0.08	0.00	Average
6	0.240	34.43	62.08	-27.65	24.67	9.68	0.08	0.00	QP
7*	0.555	28.48	46.00	-17.52	18.70	9.67	0.11	0.00	Average
8	0.555	36.39	56.00	-19.61	26.61	9.67	0.11	0.00	QP
9	1.560	20.82	46.00	-25.18	10.94	9.69	0.19	0.00	Average
10	1.560	28.04	56.00	-27.96	18.16	9.69	0.19	0.00	QP
11	14.750	21.56	50.00	-28.44	11.21	9.80	0.55	0.00	Average
12	14.750	26.44	60.00	-33.56	16.09	9.80	0.55	0.00	QP

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

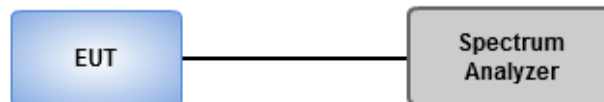
6dB Bandwidth

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	21°C / 66%	Tested By	Aska Huang
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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)_1TX	9.058M	13.531M	13M5G1D	8.043M	13.242M
802.11g_Nss1,(6Mbps)_1TX	16.304M	16.425M	16M4D1D	15M	16.425M
802.11n HT20_Nss1,(MCS0)_1TX	16.594M	17.583M	17M6D1D	14.42M	17.583M
802.11n HT40_Nss1,(MCS0)_1TX	35.072M	36.035M	36M0D1D	31.449M	35.745M

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

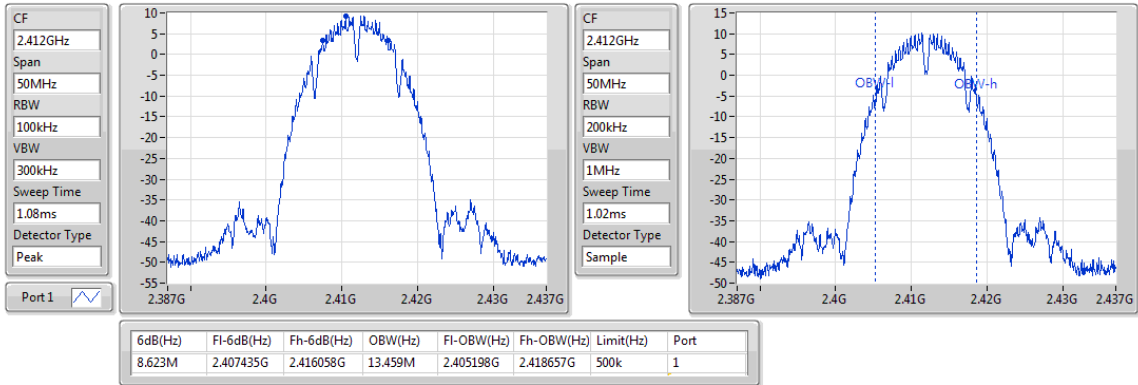
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	8.623M	13.459M
2437MHz	Pass	500k	8.551M	13.386M
2462MHz	Pass	500k	8.043M	13.531M
2467MHz	Pass	500k	9.058M	13.459M
2472MHz	Pass	500k	8.043M	13.242M
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	16.304M	16.425M
2437MHz	Pass	500k	15.072M	16.425M
2462MHz	Pass	500k	16.304M	16.425M
2467MHz	Pass	500k	15M	16.425M
2472MHz	Pass	500k	15.072M	16.425M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
2412MHz	Pass	500k	16.304M	17.583M
2437MHz	Pass	500k	14.42M	17.583M
2462MHz	Pass	500k	16.594M	17.583M
2467MHz	Pass	500k	15.652M	17.583M
2472MHz	Pass	500k	16.304M	17.583M
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-
2422MHz	Pass	500k	32.609M	36.035M
2437MHz	Pass	500k	31.449M	36.035M
2452MHz	Pass	500k	33.913M	36.035M
2457MHz	Pass	500k	31.449M	35.89M
2462MHz	Pass	500k	35.072M	35.745M

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

802.11b_Nss1,(1Mbps)_1TX

EBW

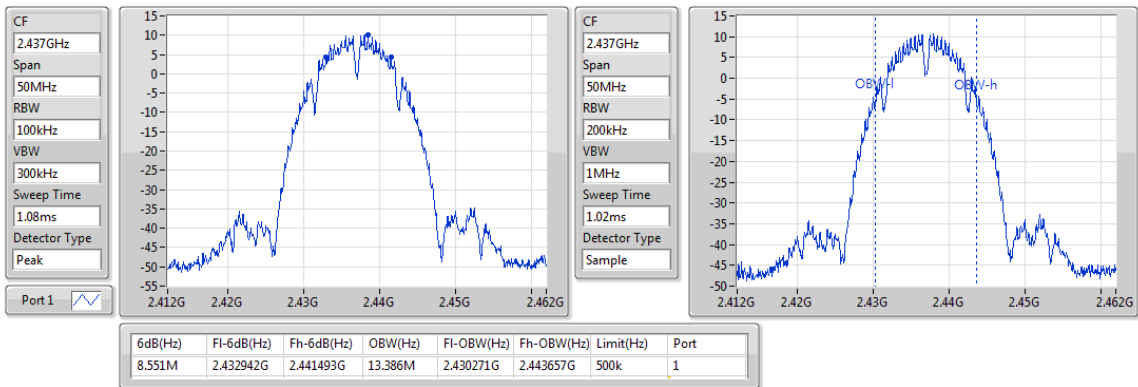
2412MHz



802.11b_Nss1,(1Mbps)_1TX

EBW

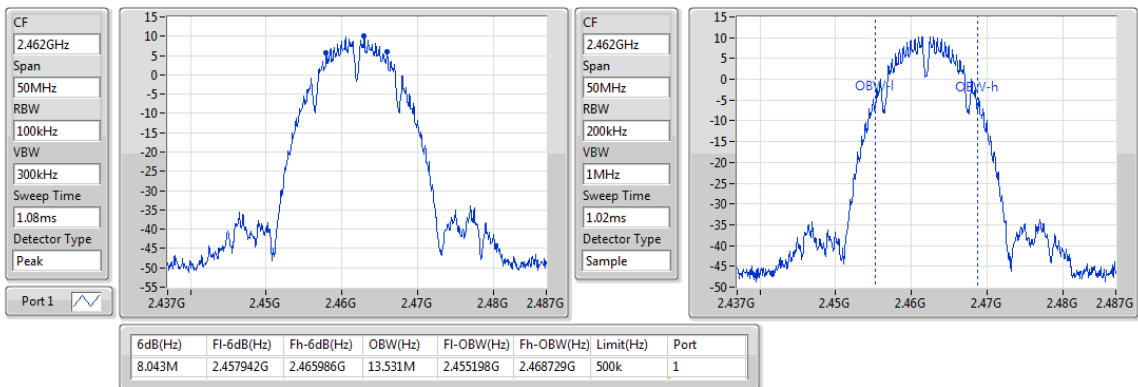
2437MHz



802.11b_Nss1,(1Mbps)_1TX

EBW

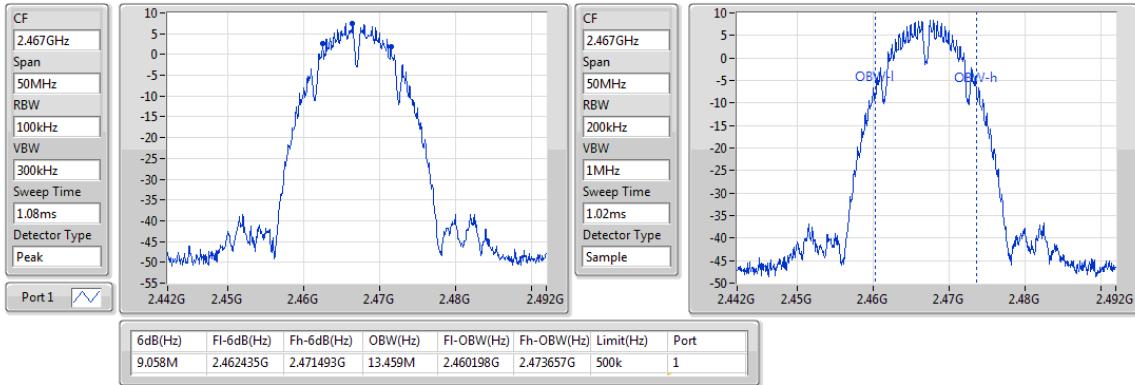
2462MHz



802.11b_Nss1,(1Mbps)_1TX

EBW

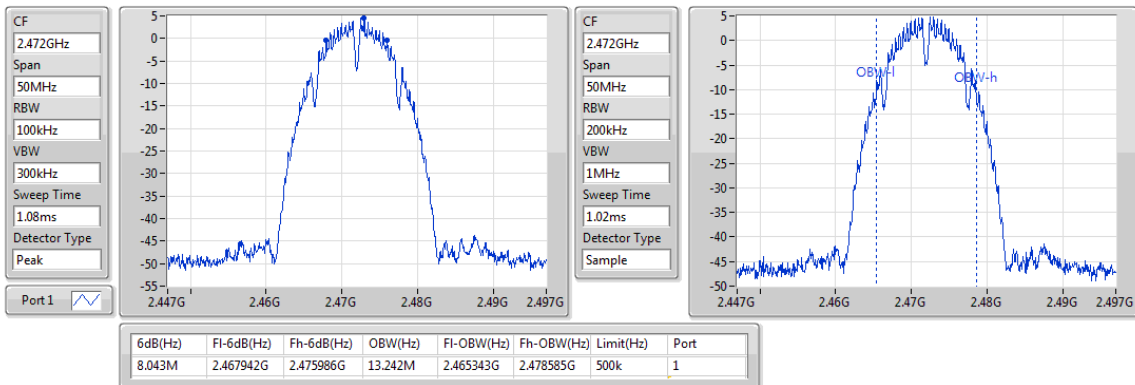
2467MHz



802.11b_Nss1,(1Mbps)_1TX

EBW

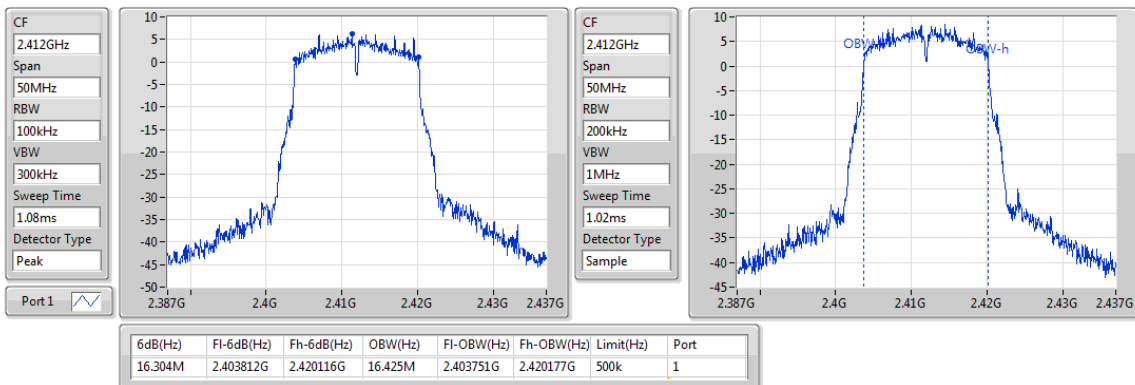
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802.11g_Nss1,(6Mbps)_1TX

EBW

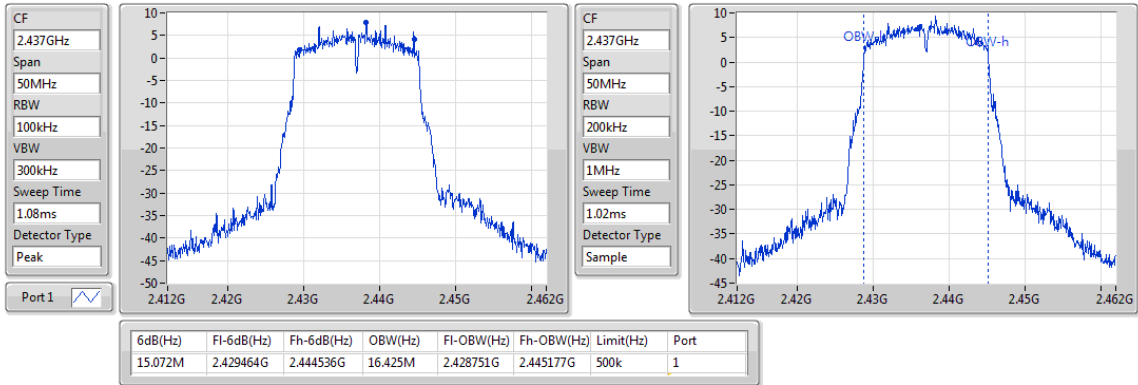
2412MHz



802.11g_Nss1,(6Mbps)_1TX

EBW

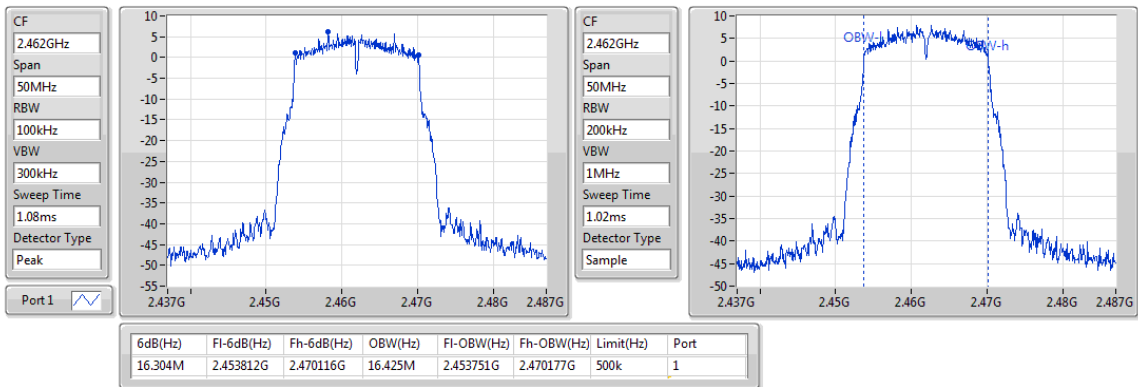
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802.11g_Nss1,(6Mbps)_1TX

EBW

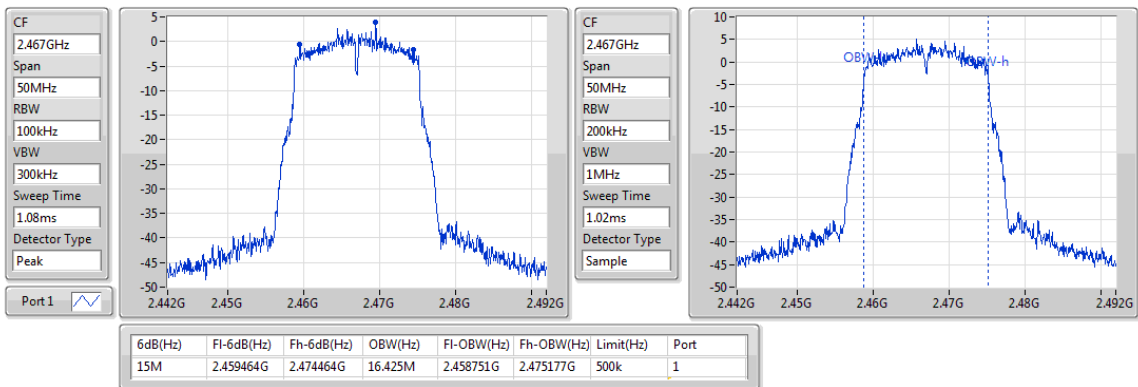
2462MHz



802.11g_Nss1,(6Mbps)_1TX

EBW

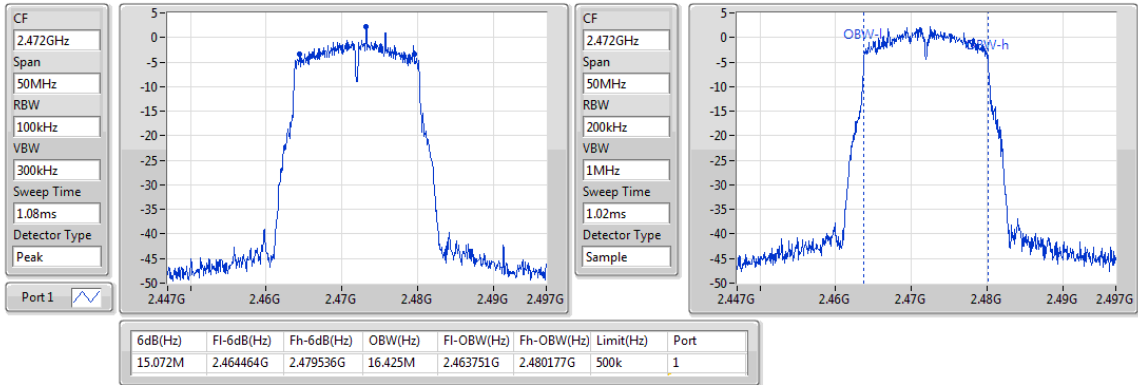
2467MHz



802.11g_Nss1,(6Mbps)_1TX

EBW

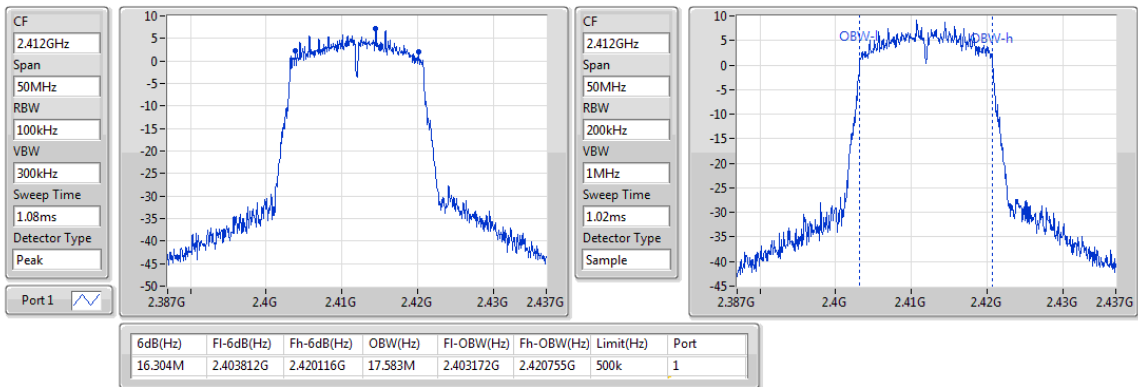
2472MHz



802.11n HT20_Nss1,(MCS0)_1TX

EBW

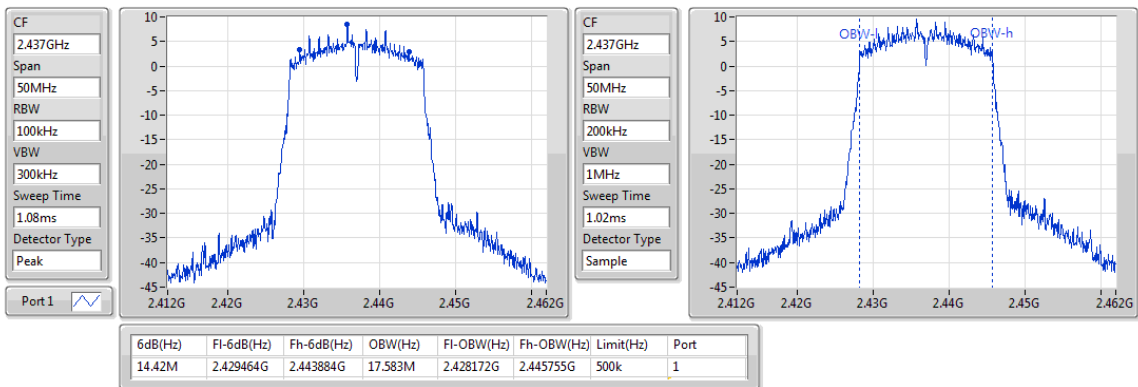
2412MHz



802.11n HT20_Nss1,(MCS0)_1TX

EBW

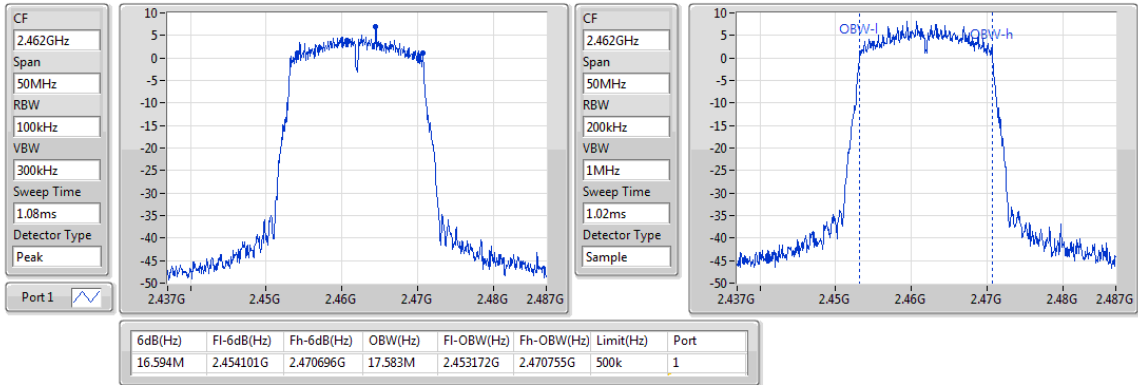
2437MHz



802.11n HT20_Nss1,(MCS0)_1TX

EBW

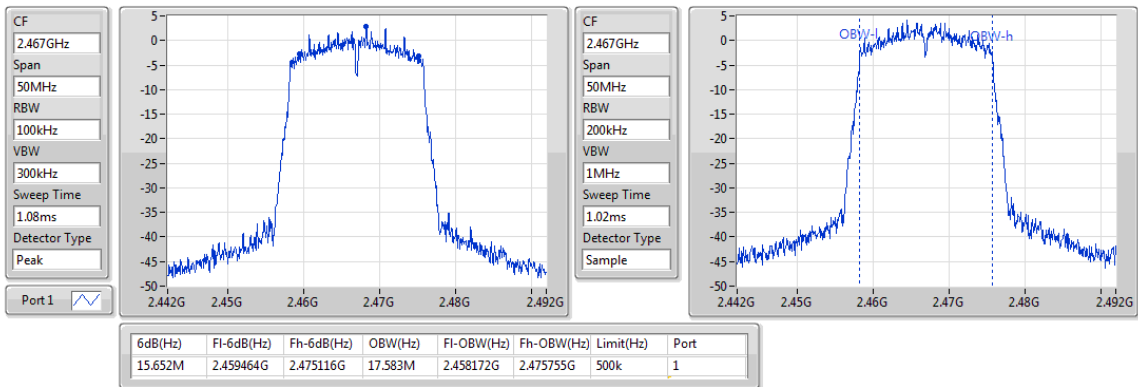
2462MHz



802.11n HT20_Nss1,(MCS0)_1TX

EBW

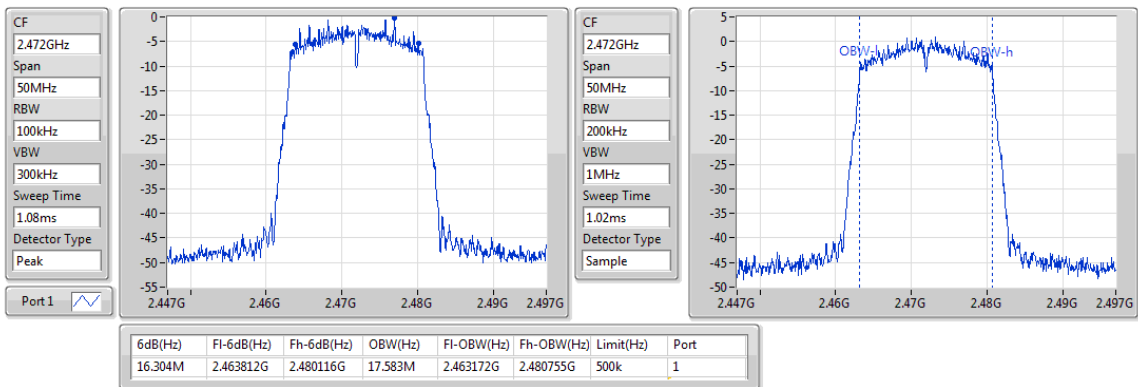
2467MHz



802.11n HT20_Nss1,(MCS0)_1TX

EBW

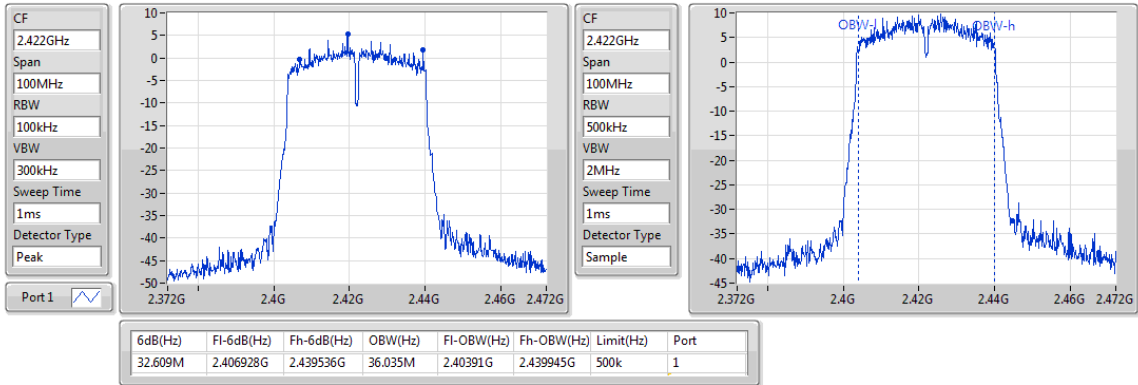
2472MHz



802.11n HT40_Nss1,(MCS0)_1TX

EBW

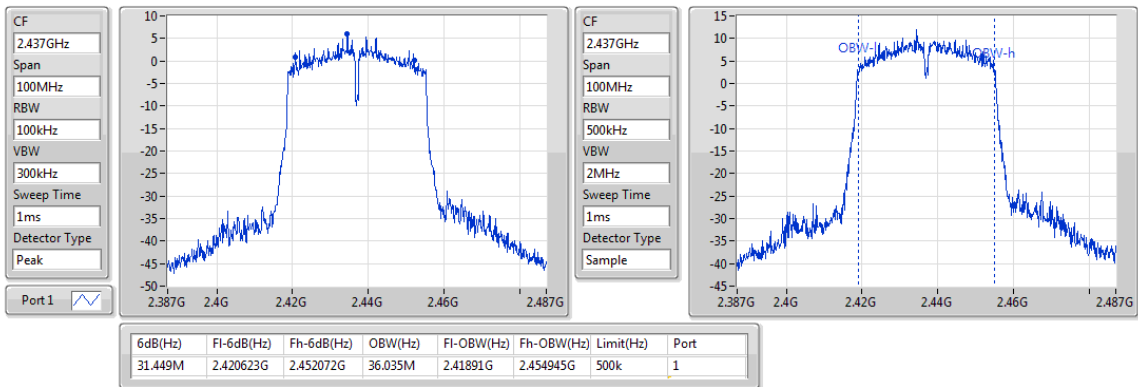
2422MHz



802.11n HT40_Nss1,(MCS0)_1TX

EBW

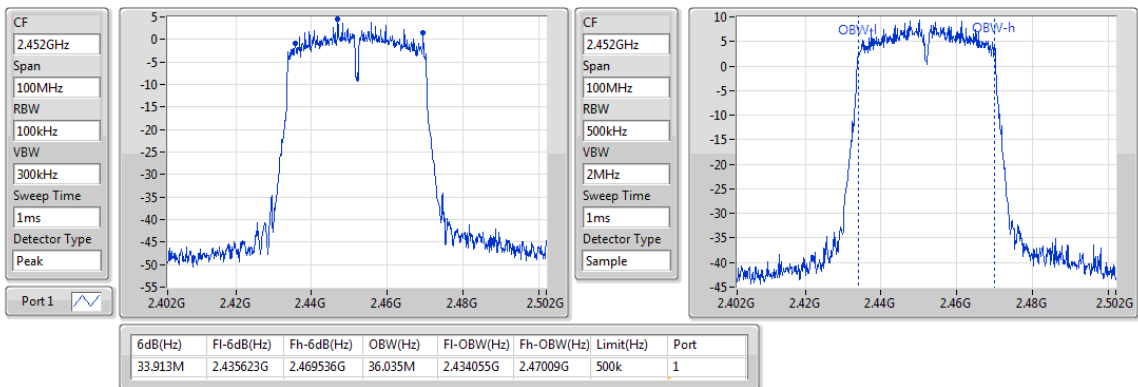
2437MHz



802.11n HT40_Nss1,(MCS0)_1TX

EBW

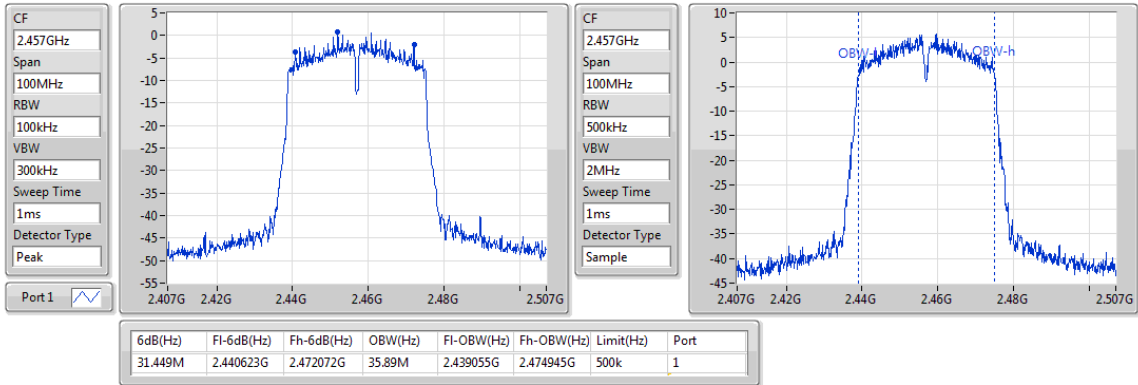
2452MHz



802.11n HT40_Nss1,(MCS0)_1TX

EBW

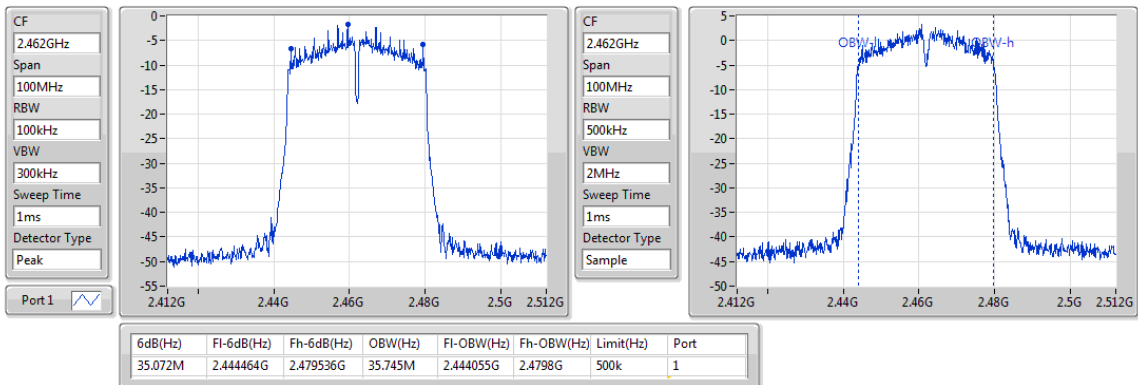
2457MHz



802.11n HT40_Nss1,(MCS0)_1TX

EBW

2462MHz



3.3 RF Output Power

3.3.1 Limit of RF Output Power

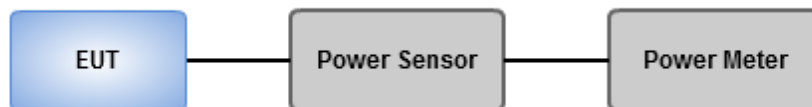
Conducted power shall not exceed 1Watt.

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	21°C / 66%	Tested By	Aska Huang
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Summary of Peak Conducted Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	21.10	0.12882
802.11g_Nss1,(6Mbps)_1TX	25.95	0.39355
802.11n HT20_Nss1,(MCS0)_1TX	25.89	0.38815
802.11n HT40_Nss1,(MCS0)_1TX	25.81	0.38107

Result

Mode	Result	Antenna Gain (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.16	20.92	20.92	30.00	24.08	36.00
2437MHz	Pass	3.16	20.95	20.95	30.00	24.11	36.00
2462MHz	Pass	3.16	21.1	21.10	30.00	24.26	36.00
2467MHz	Pass	3.16	19.01	19.01	30.00	22.17	36.00
2472MHz	Pass	3.16	15.48	15.48	30.00	18.64	36.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.16	25.33	25.33	30.00	28.49	36.00
2437MHz	Pass	3.16	25.95	25.95	30.00	29.11	36.00
2462MHz	Pass	3.16	25.32	25.32	30.00	28.48	36.00
2467MHz	Pass	3.16	22.04	22.04	30.00	25.20	36.00
2472MHz	Pass	3.16	19.87	19.87	30.00	23.03	36.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.16	25.21	25.21	30.00	28.37	36.00
2437MHz	Pass	3.16	25.89	25.89	30.00	29.05	36.00
2462MHz	Pass	3.16	25.16	25.16	30.00	28.32	36.00
2467MHz	Pass	3.16	21.89	21.89	30.00	25.05	36.00
2472MHz	Pass	3.16	18.55	18.55	30.00	21.71	36.00

Mode	Result	Antenna Gain (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2422MHz	Pass	3.16	25.12	25.12	30.00	28.28	36.00
2437MHz	Pass	3.16	25.81	25.81	30.00	28.97	36.00
2452MHz	Pass	3.16	24.78	24.78	30.00	27.94	36.00
2457MHz	Pass	3.16	21.41	21.41	30.00	24.57	36.00
2462MHz	Pass	3.16	19.56	19.56	30.00	22.72	36.00

Summary of Conducted (Average) Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	18.88	0.07727
802.11g_Nss1,(6Mbps)_1TX	18.79	0.07568
802.11n HT20_Nss1,(MCS0)_1TX	18.75	0.07499
802.11n HT40_Nss1,(MCS0)_1TX	18.62	0.07278

Result

Mode	Result	Antenna Gain (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.16	18.67	18.67	-	21.83	-
2437MHz	Pass	3.16	18.81	18.81	-	21.97	-
2462MHz	Pass	3.16	18.88	18.88	-	22.04	-
2467MHz	Pass	3.16	16.82	16.82	-	19.98	-
2472MHz	Pass	3.16	13.23	13.23	-	16.39	-
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.16	18.61	18.61	-	21.77	-
2437MHz	Pass	3.16	18.79	18.79	-	21.95	-
2462MHz	Pass	3.16	18.22	18.22	-	21.38	-
2467MHz	Pass	3.16	14.72	14.72	-	17.88	-
2472MHz	Pass	3.16	12.96	12.96	-	16.12	-
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.16	18.52	18.52	-	21.68	-
2437MHz	Pass	3.16	18.75	18.75	-	21.91	-
2462MHz	Pass	3.16	18.06	18.06	-	21.22	-
2467MHz	Pass	3.16	14.22	14.22	-	17.38	-
2472MHz	Pass	3.16	11.43	11.43	-	14.59	-
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2422MHz	Pass	3.16	17.95	17.95	-	21.11	-
2437MHz	Pass	3.16	18.62	18.62	-	21.78	-
2452MHz	Pass	3.16	17.55	17.55	-	20.71	-
2457MHz	Pass	3.16	13.81	13.81	-	16.97	-
2462MHz	Pass	3.16	11.03	11.03	-	14.19	-

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

Peak PSD

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.

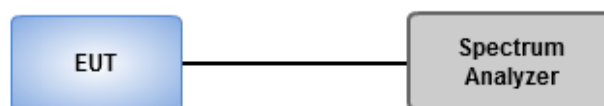
Average PSD, duty cycle $\geq 98\%$

1. Set the RBW = 30 kHz, VBW = 100 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Sweep time = auto couple.
4. Employ trace averaging (RMS) mode over a minimum of 100 traces.
5. Use the peak marker function to determine the maximum amplitude level.

Average PSD, duty cycle $< 98\%$

1. Set the RBW = 30 kHz, VBW = 100 kHz. Detector = RMS.
2. Set the sweep time to: ≥ 10 (number of measurement points in sweep) $\times$ (total on/off period of the transmitted signal).
3. Perform the measurement over a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log (1/x)$, where x is the duty cycle.

3.4.3 Test Setup



3.4.4 Test Result of Power Spectral Density

Ambient Condition	21°C / 66%	Tested By	Aska Huang
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Summary

Mode	PD (dBm/3kHz)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_1TX	-3.98
802.11g_Nss1,(6Mbps)_1TX	-5.89
802.11n HT20_Nss1,(MCS0)_1TX	-6.01
802.11n HT40_Nss1,(MCS0)_1TX	-8.69

Result

Mode	Result	Antenna Gain (dBi)	Port 1 (dBm/3kHz)	PD (dBm/3kHz)	PD Limit (dBm/3kHz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	3.16	-4.21	-4.21	8.00
2437MHz	Pass	3.16	-4.71	-4.71	8.00
2462MHz	Pass	3.16	-3.98	-3.98	8.00
2467MHz	Pass	3.16	-5.45	-5.45	8.00
2472MHz	Pass	3.16	-9.62	-9.62	8.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	3.16	-6.49	-6.49	8.00
2437MHz	Pass	3.16	-6.18	-6.18	8.00
2462MHz	Pass	3.16	-5.89	-5.89	8.00
2467MHz	Pass	3.16	-8.63	-8.63	8.00
2472MHz	Pass	3.16	-11.68	-11.68	8.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
2412MHz	Pass	3.16	-6.89	-6.89	8.00
2437MHz	Pass	3.16	-6.01	-6.01	8.00
2462MHz	Pass	3.16	-6.78	-6.78	8.00
2467MHz	Pass	3.16	-10.68	-10.68	8.00
2472MHz	Pass	3.16	-14.06	-14.06	8.00

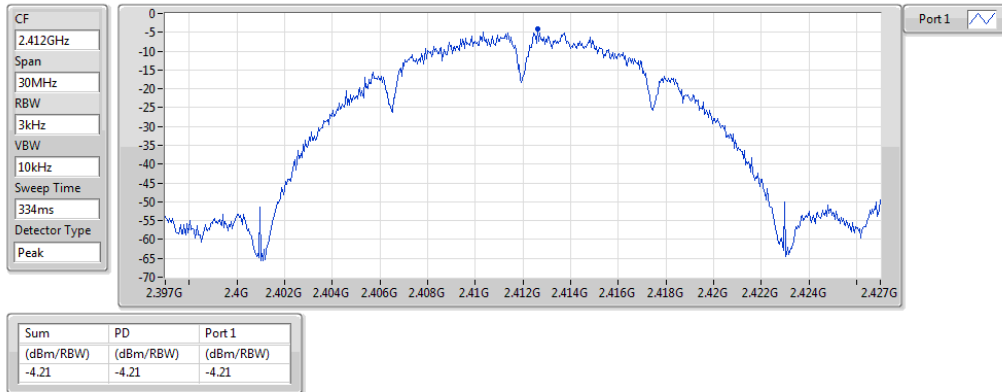
Mode	Result	Antenna Gain (dBi)	Port 1 (dBm/3kHz)	PD (dBm/3kHz)	PD Limit (dBm/3kHz)
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-
2422MHz	Pass	3.16	-9.70	-9.70	8.00
2437MHz	Pass	3.16	-8.69	-8.69	8.00
2452MHz	Pass	3.16	-10.21	-10.21	8.00
2457MHz	Pass	3.16	-12.50	-12.50	8.00
2462MHz	Pass	3.16	-16.08	-16.08	8.00

Port X = Port X power density;

802.11b_Nss1,(1Mbps)_1TX

PSD

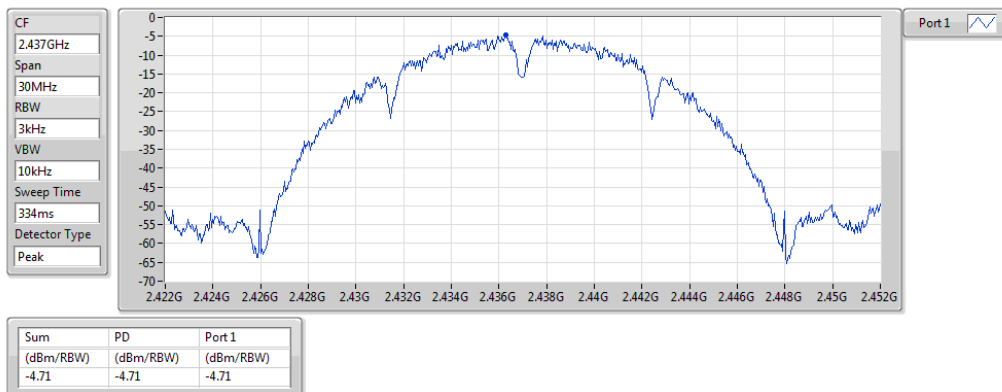
2412MHz



802.11b_Nss1,(1Mbps)_1TX

PSD

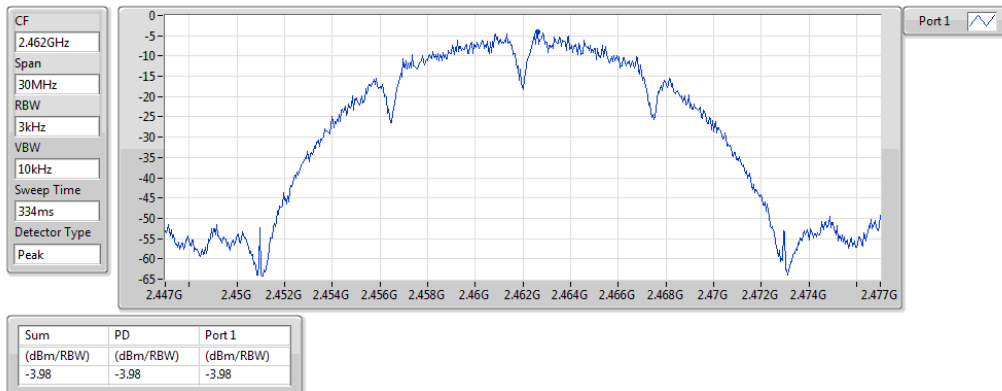
2437MHz



802.11b_Nss1,(1Mbps)_1TX

PSD

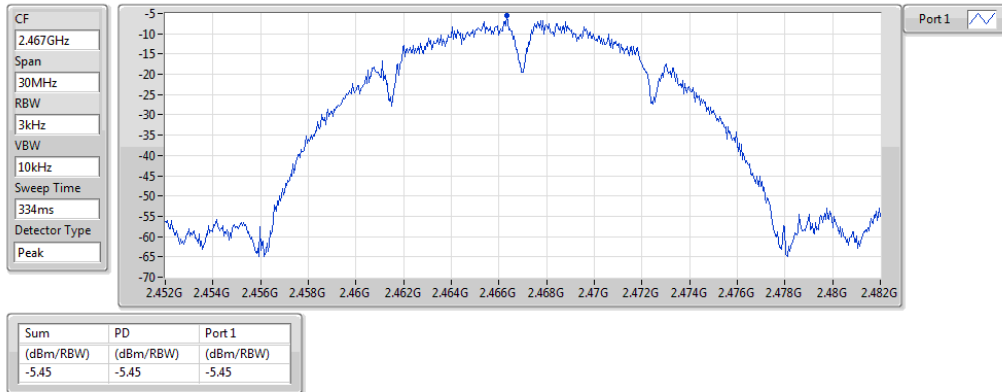
2462MHz



802.11b_Nss1,(1Mbps)_1TX

PSD

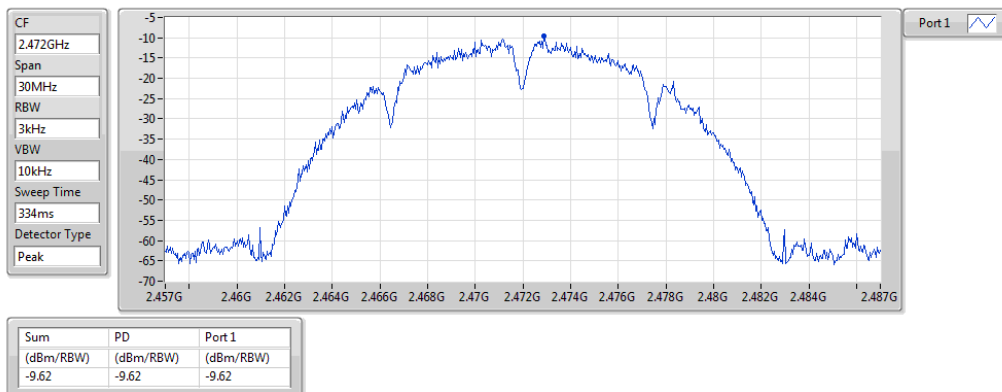
2467MHz



802.11b_Nss1,(1Mbps)_1TX

PSD

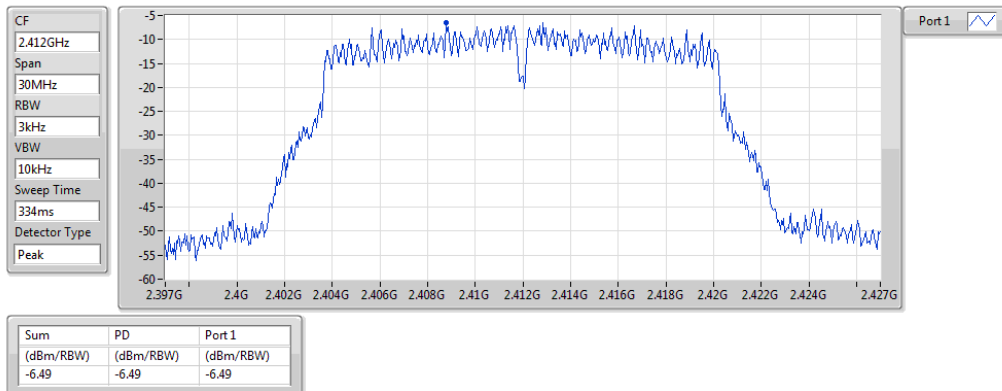
2472MHz



802.11g_Nss1,(6Mbps)_1TX

PSD

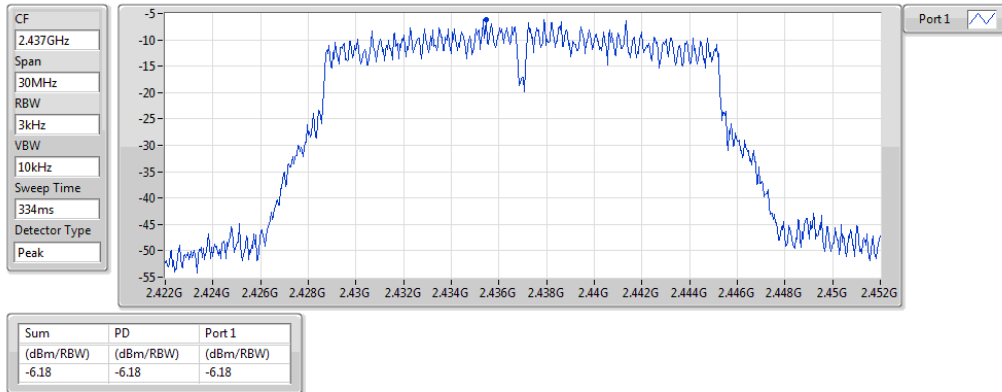
2412MHz



802.11g_Nss1,(6Mbps)_1TX

PSD

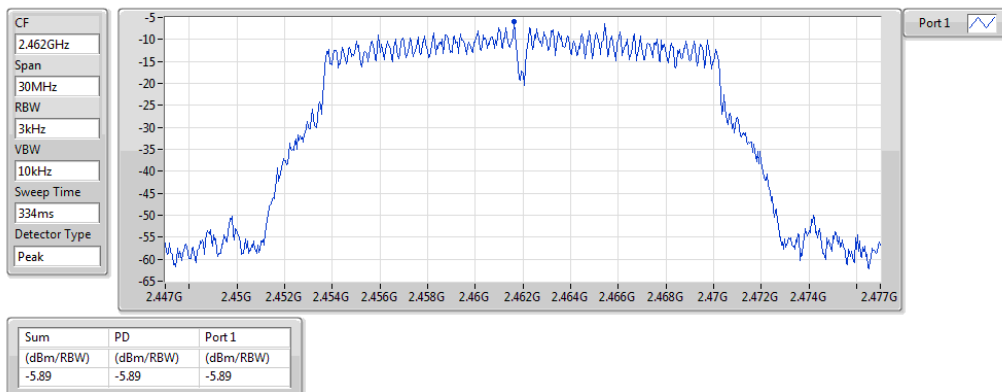
2437MHz



802.11g_Nss1,(6Mbps)_1TX

PSD

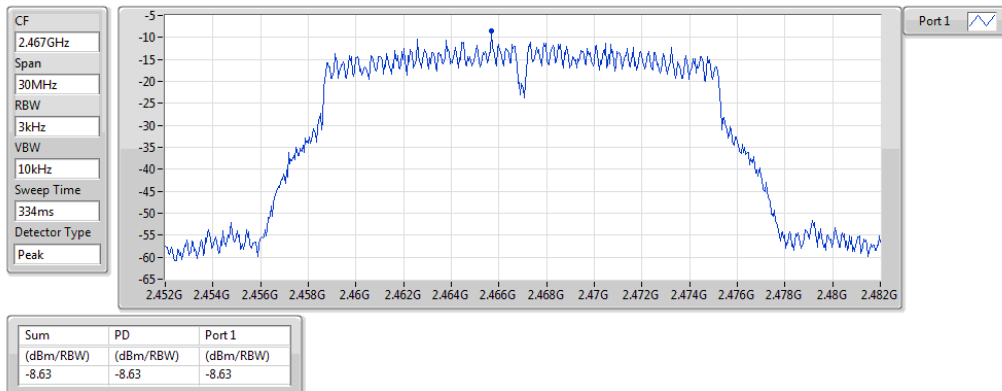
2462MHz



802.11g_Nss1,(6Mbps)_1TX

PSD

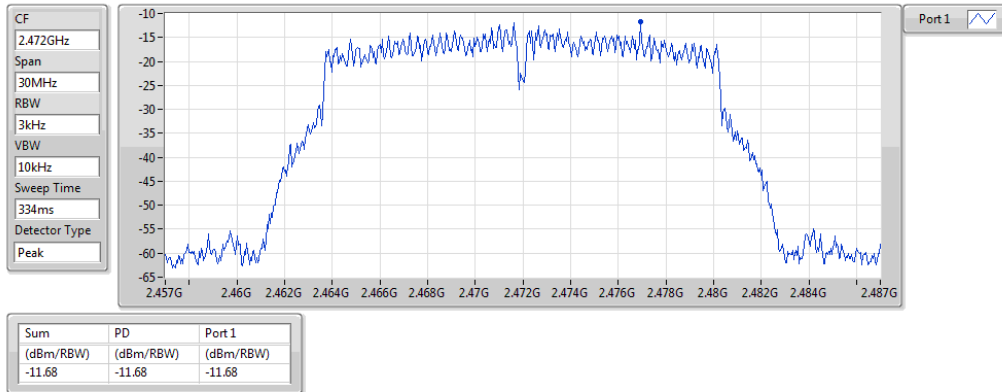
2467MHz



802.11g_Nss1,(6Mbps)_1TX

PSD

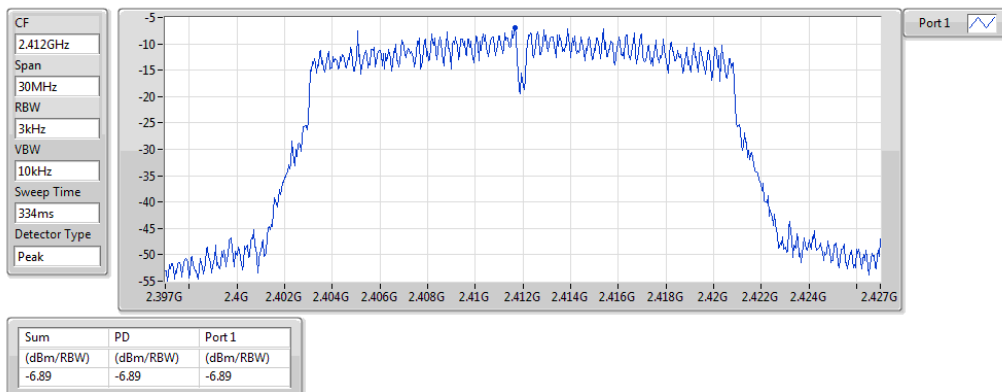
2472MHz



802.11n HT20_Nss1,(MCS0)_1TX

PSD

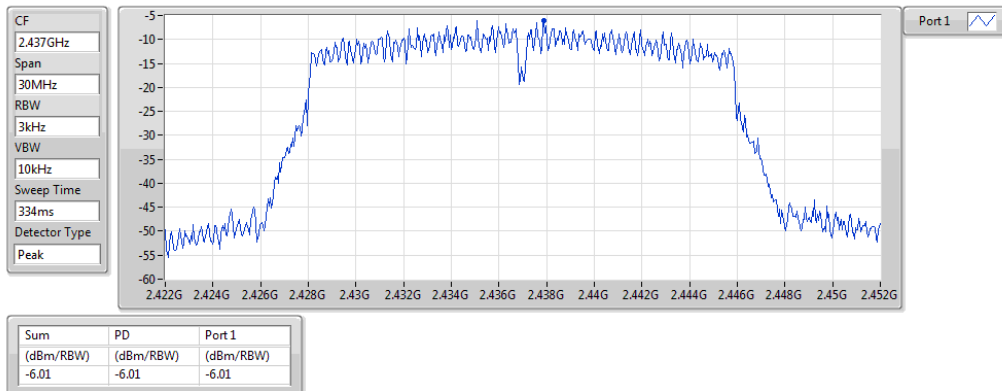
2412MHz



802.11n HT20_Nss1,(MCS0)_1TX

PSD

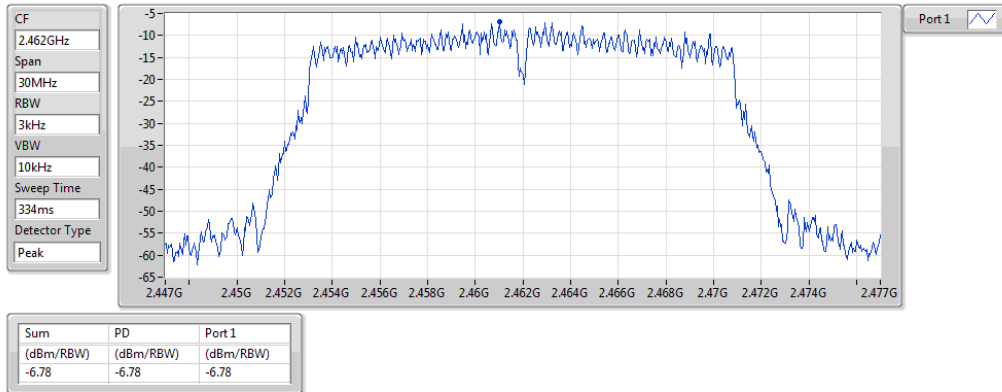
2437MHz



802.11n HT20_Nss1,(MCS0)_1TX

PSD

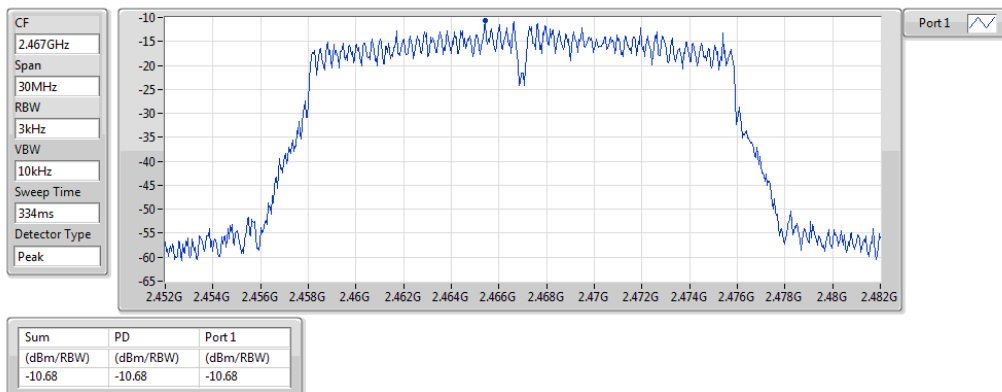
2462MHz



802.11n HT20_Nss1,(MCS0)_1TX

PSD

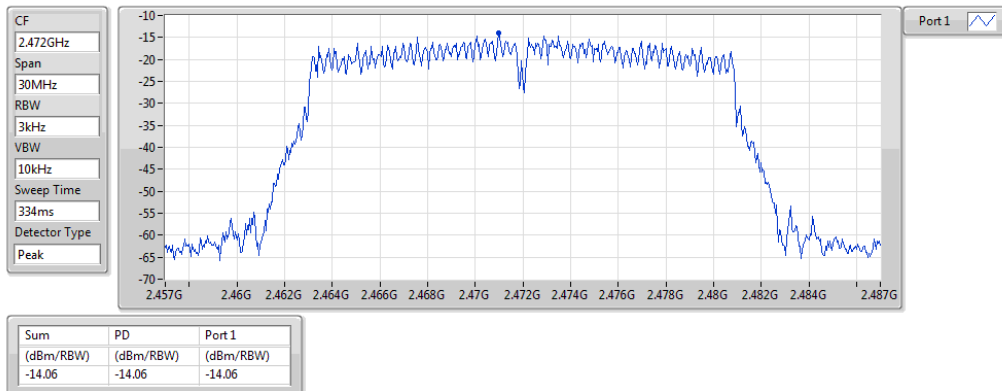
2467MHz



802.11n HT20_Nss1,(MCS0)_1TX

PSD

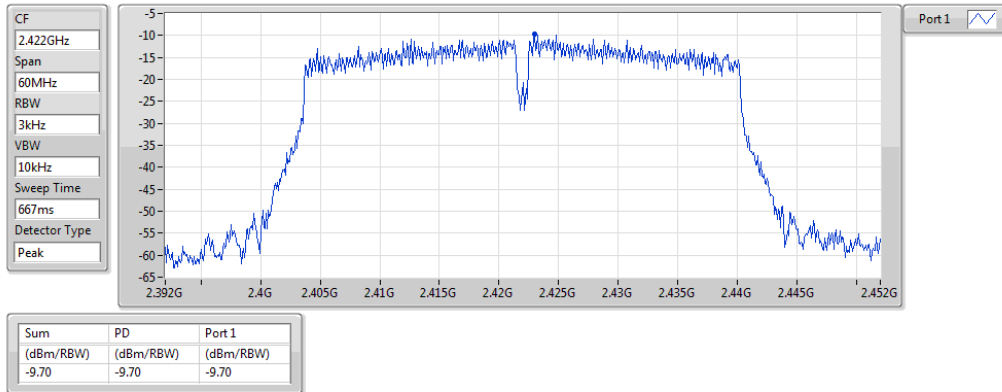
2472MHz



802.11n HT40_Nss1,(MCS0)_1TX

PSD

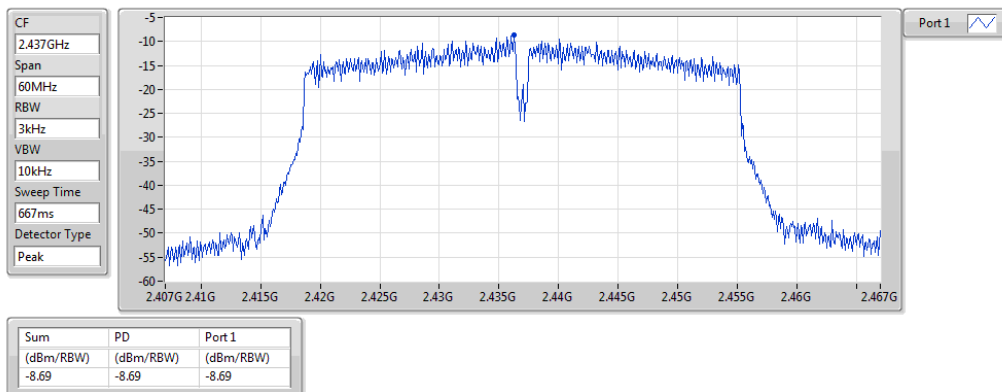
2422MHz



802.11n HT40_Nss1,(MCS0)_1TX

PSD

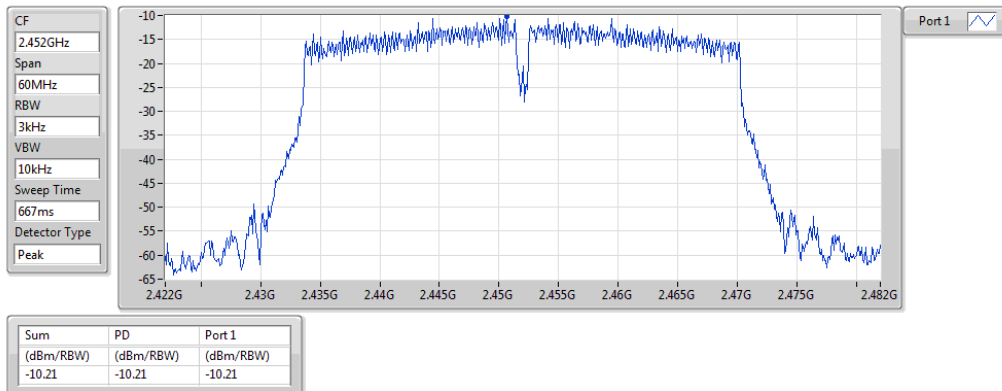
2437MHz



802.11n HT40_Nss1,(MCS0)_1TX

PSD

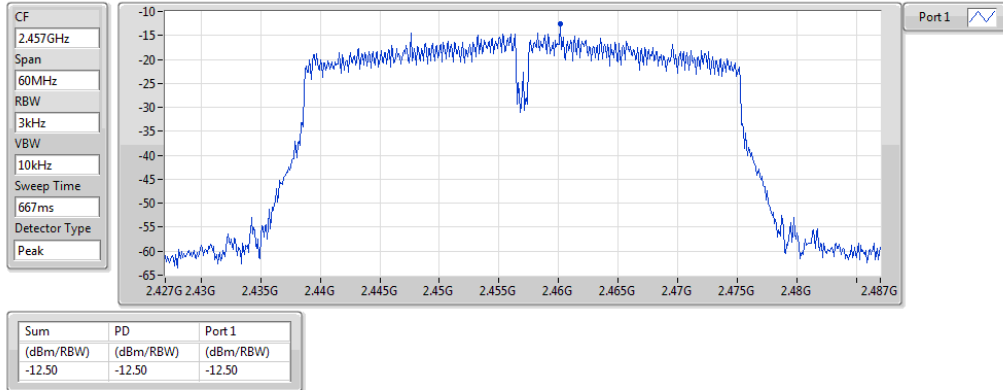
2452MHz



802.11n HT40_Nss1,(MCS0)_1TX

PSD

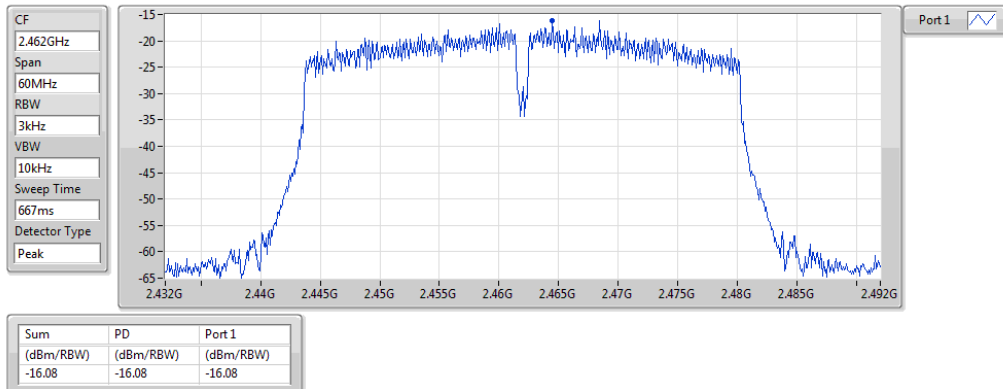
2457MHz



802.11n HT40_Nss1,(MCS0)_1TX

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:
Quasi-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

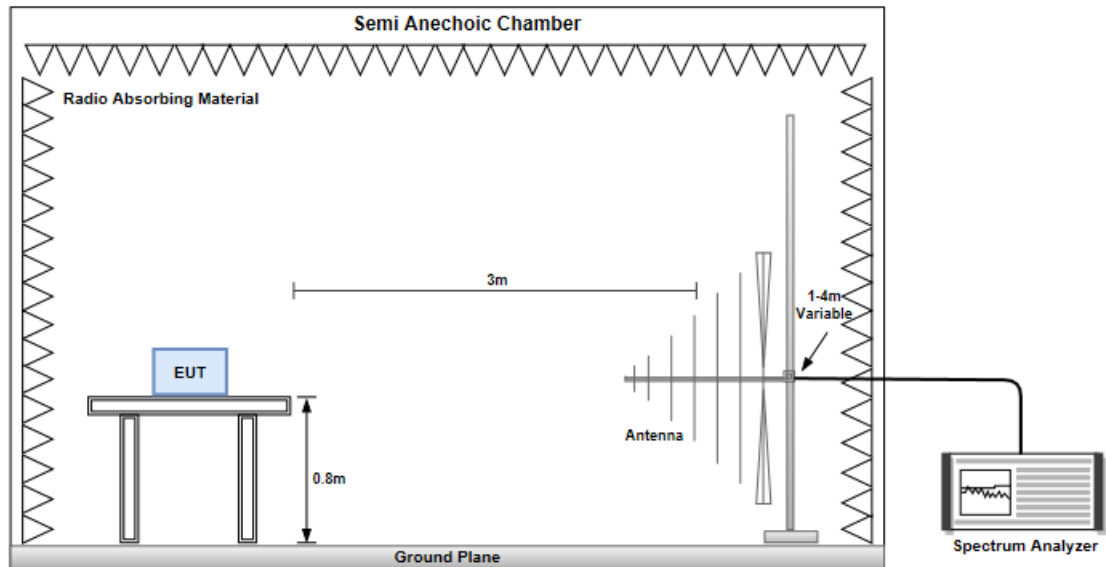
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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:

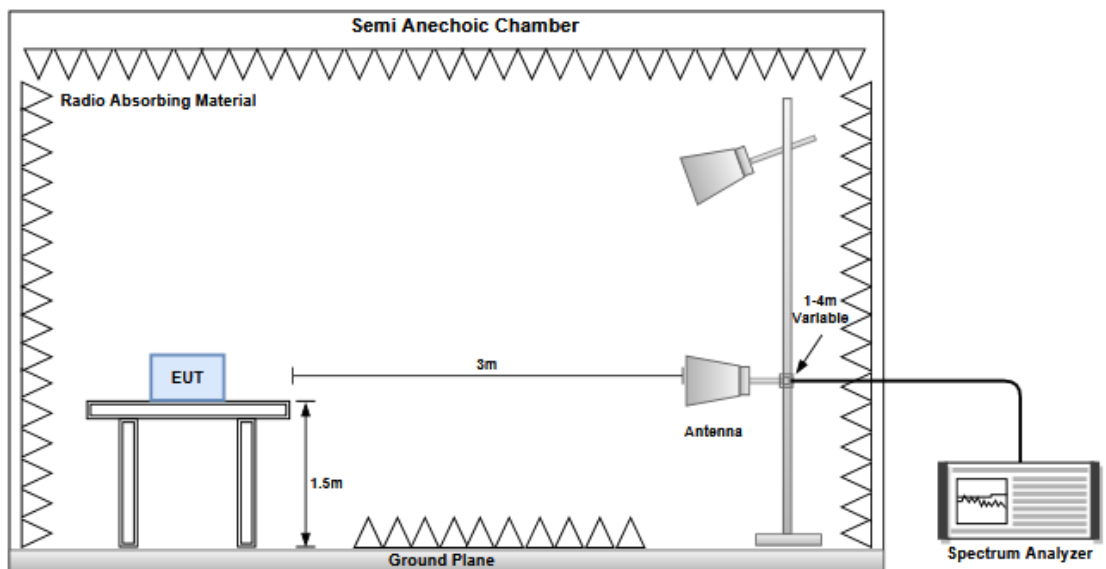
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



Test Configuration 1

3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Brad Wu Temperature(°C):24 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Brad Wu Temperature(°C):24 Humidity(%):65			
Level (dBuV/m)			

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

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m) <			

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2467
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2467
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2472
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

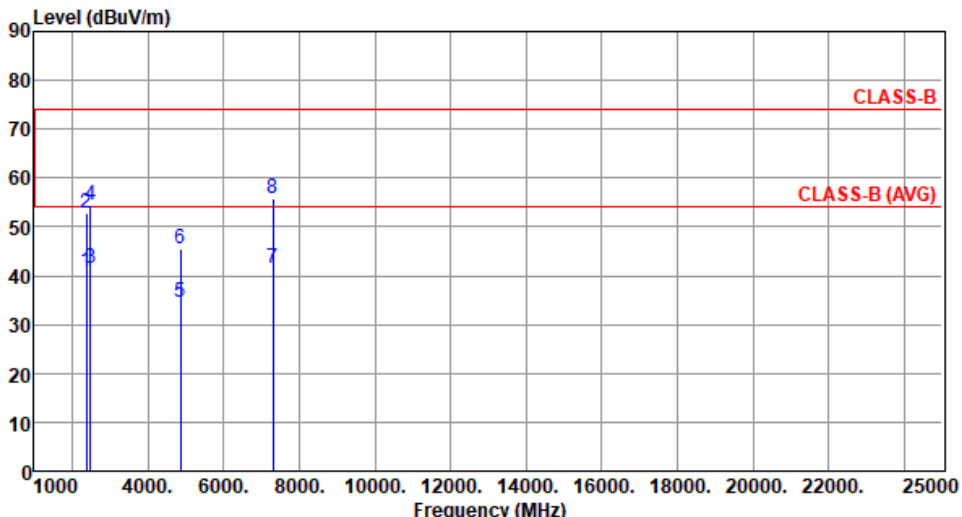
Modulation	11b	Test Freq. (MHz)	2472
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m) <			

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

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	11g	Test Freq. (MHz)	2437																																																																																										
Polarization	Vertical																																																																																												
Test By :Akun Chung Temperature(°C):22 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/m</th><th>Remark</th><th>ANT High cm</th><th>Turn Table deg</th></tr><tr><td>1</td><td>2390.00</td><td>40.81</td><td>54.00</td><td>-13.19</td><td>43.56</td><td>-2.75</td><td>Average</td><td>303</td><td>309</td></tr><tr><td>2</td><td>2390.00</td><td>52.80</td><td>74.00</td><td>-21.20</td><td>55.55</td><td>-2.75</td><td>Peak</td><td>303</td><td>309</td></tr><tr><td>3</td><td>2483.50</td><td>41.51</td><td>54.00</td><td>-12.49</td><td>44.21</td><td>-2.70</td><td>Average</td><td>303</td><td>309</td></tr><tr><td>4</td><td>2483.50</td><td>54.45</td><td>74.00</td><td>-19.55</td><td>57.15</td><td>-2.70</td><td>Peak</td><td>303</td><td>309</td></tr><tr><td>5</td><td>4874.00</td><td>34.38</td><td>54.00</td><td>-19.62</td><td>30.25</td><td>4.13</td><td>Average</td><td>100</td><td>112</td></tr><tr><td>6</td><td>4874.00</td><td>45.42</td><td>74.00</td><td>-28.58</td><td>41.29</td><td>4.13</td><td>Peak</td><td>100</td><td>112</td></tr><tr><td>7</td><td>7311.00</td><td>41.66</td><td>54.00</td><td>-12.34</td><td>32.38</td><td>9.28</td><td>Average</td><td>100</td><td>71</td></tr><tr><td>8</td><td>7311.00</td><td>55.87</td><td>74.00</td><td>-18.13</td><td>46.59</td><td>9.28</td><td>Peak</td><td>100</td><td>71</td></tr></table> Note 1: Emission Level (dBUV/m) = SA Reading (dBUV) + Factor* (dB/m) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).					Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB/m	Remark	ANT High cm	Turn Table deg	1	2390.00	40.81	54.00	-13.19	43.56	-2.75	Average	303	309	2	2390.00	52.80	74.00	-21.20	55.55	-2.75	Peak	303	309	3	2483.50	41.51	54.00	-12.49	44.21	-2.70	Average	303	309	4	2483.50	54.45	74.00	-19.55	57.15	-2.70	Peak	303	309	5	4874.00	34.38	54.00	-19.62	30.25	4.13	Average	100	112	6	4874.00	45.42	74.00	-28.58	41.29	4.13	Peak	100	112	7	7311.00	41.66	54.00	-12.34	32.38	9.28	Average	100	71	8	7311.00	55.87	74.00	-18.13	46.59	9.28	Peak	100	71
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB/m	Remark	ANT High cm	Turn Table deg																																																																																				
1	2390.00	40.81	54.00	-13.19	43.56	-2.75	Average	303	309																																																																																				
2	2390.00	52.80	74.00	-21.20	55.55	-2.75	Peak	303	309																																																																																				
3	2483.50	41.51	54.00	-12.49	44.21	-2.70	Average	303	309																																																																																				
4	2483.50	54.45	74.00	-19.55	57.15	-2.70	Peak	303	309																																																																																				
5	4874.00	34.38	54.00	-19.62	30.25	4.13	Average	100	112																																																																																				
6	4874.00	45.42	74.00	-28.58	41.29	4.13	Peak	100	112																																																																																				
7	7311.00	41.66	54.00	-12.34	32.38	9.28	Average	100	71																																																																																				
8	7311.00	55.87	74.00	-18.13	46.59	9.28	Peak	100	71																																																																																				

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2467
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2467
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

Modulation	HT20		Test Freq. (MHz)		2412	
Polarization	Horizontal					
Test By :Akun Chung Temperature(°C):22 Humidity(%):65						
Level (dBUV/m) <						

Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m) <			

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m) <			

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	HT20	Test Freq. (MHz)	2467
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m) <			

Modulation	HT20	Test Freq. (MHz)	2467
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m) </			

3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40

Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m) <			

Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m) </			

Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m) <			

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	HT40	Test Freq. (MHz)	2457
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Modulation	HT40	Test Freq. (MHz)	2457
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBuV/m)			

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m) </			

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):22 Humidity(%):65			
Level (dBUV/m)			

Test Configuration 2

3.5.9 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Brad Wu Temperature(°C):24 Humidity(%):65			
Level (dBUV/m) <			

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Brad Wu Temperature(°C):24 Humidity(%):65			
Level (dBUV/m)			

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

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m) </			

Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2467
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m) </			

Modulation	11b	Test Freq. (MHz)	2467
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2472
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	11b	Test Freq. (MHz)	2472
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m) <			

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

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Roger Lu Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Roger Lu Temperature(°C):23 Humidity(%):68			
Level (dBUV/m) </			

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2467
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	11g	Test Freq. (MHz)	2467
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

3.5.12 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

Modulation	HT20		Test Freq. (MHz)		2412	
Polarization	Vertical					
Test By :Akun Chung Temperature(°C):23 Humidity(%):68						
Level (dBUV/m)						

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m) </			

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m) <			

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m) <			

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	HT20	Test Freq. (MHz)	2467
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	HT20	Test Freq. (MHz)	2467
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m) <			

Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m)			

3.5.13 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40

Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m) </			

Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m)			

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m) </			

Modulation	HT40	Test Freq. (MHz)	2457
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBUV/m) </			

Modulation	HT40	Test Freq. (MHz)	2457
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m) <			

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
Level (dBuV/m) <			

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):23 Humidity(%):68			
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

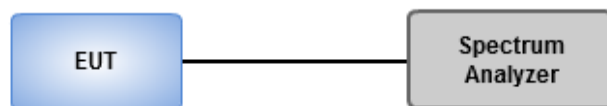
Reference level measurement

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

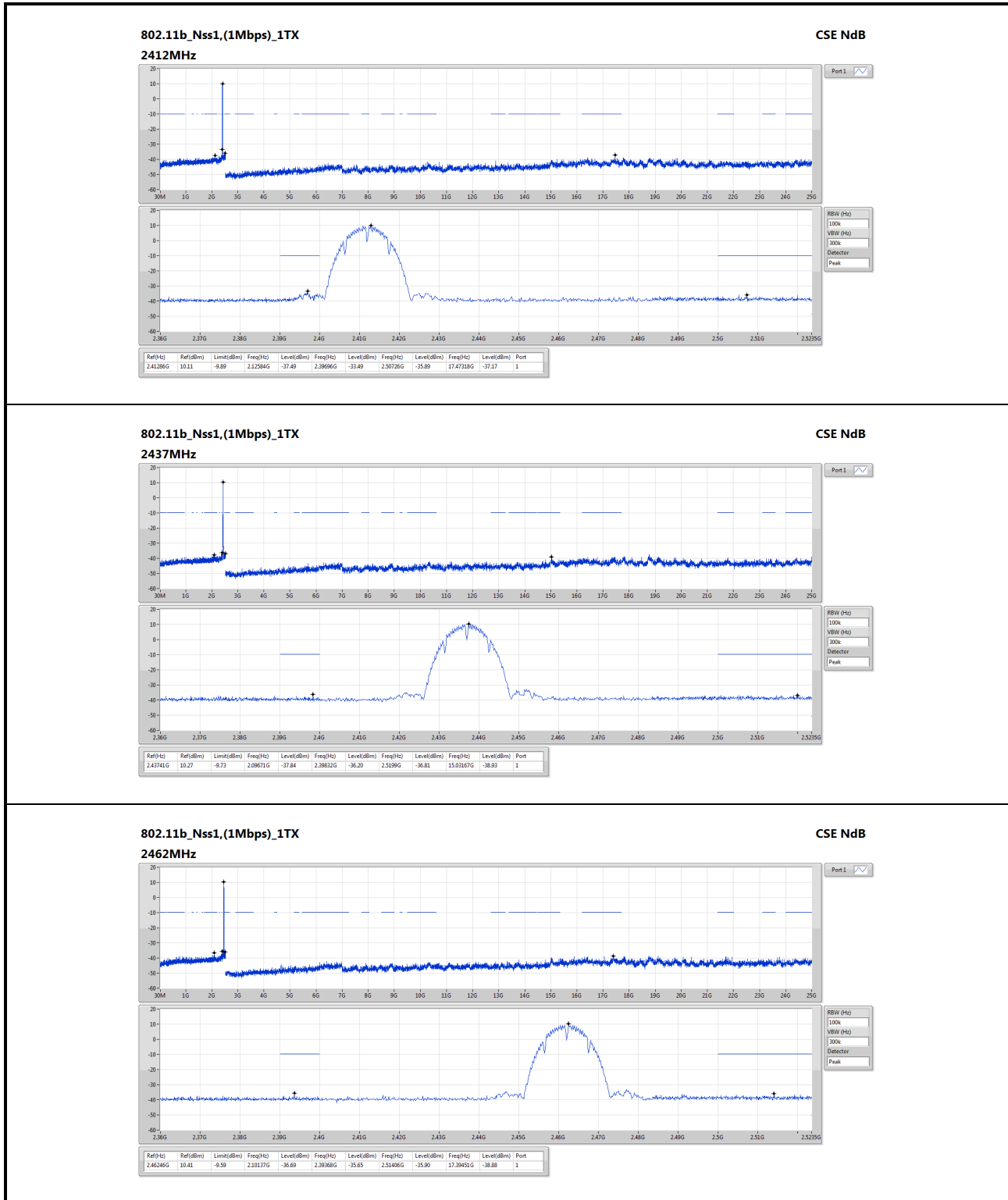
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.6.3 Test Setup



3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands

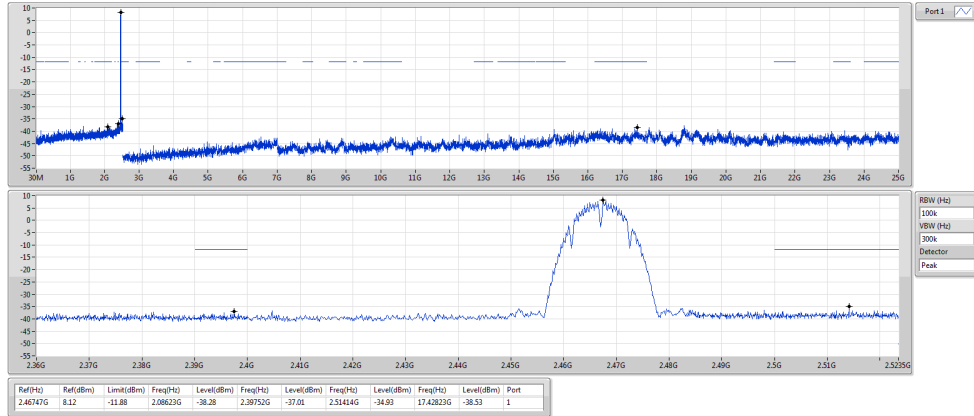
Ambient Condition	21°C / 66%	Tested By	Aska Huang
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802.11b_Nss1,(1Mbps)_1TX

CSE NdB

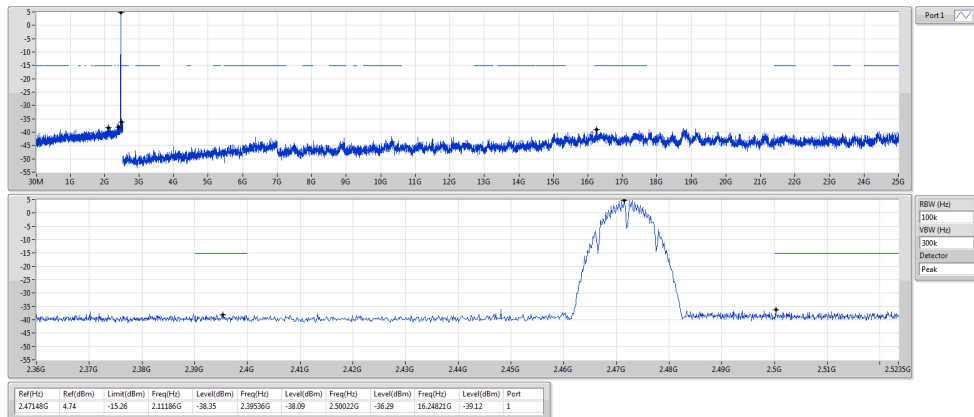
2467MHz



802.11b_Nss1,(1Mbps)_1TX

CSE NdB

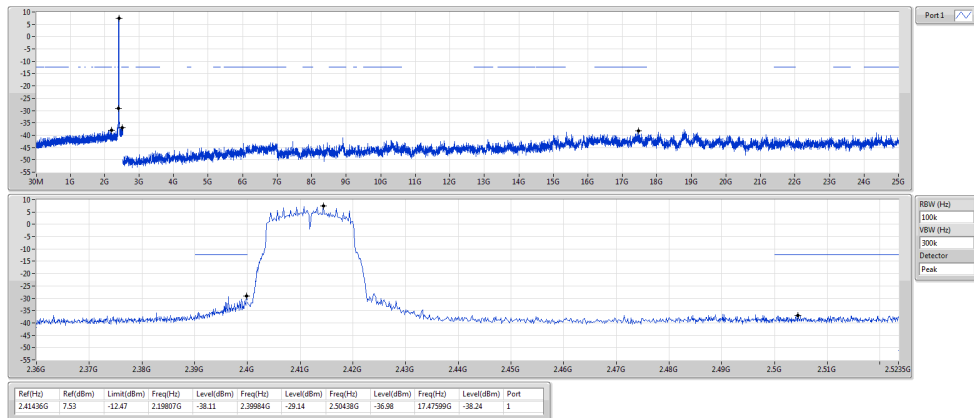
2472MHz



802.11g_Nss1,(6Mbps)_1TX

CSE NdB

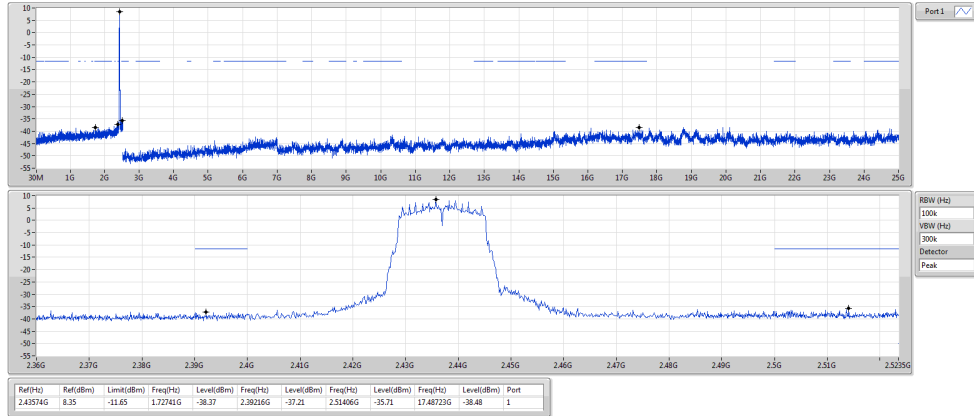
2412MHz



802.11g_Nss1,(6Mbps)_1TX

CSE NdB

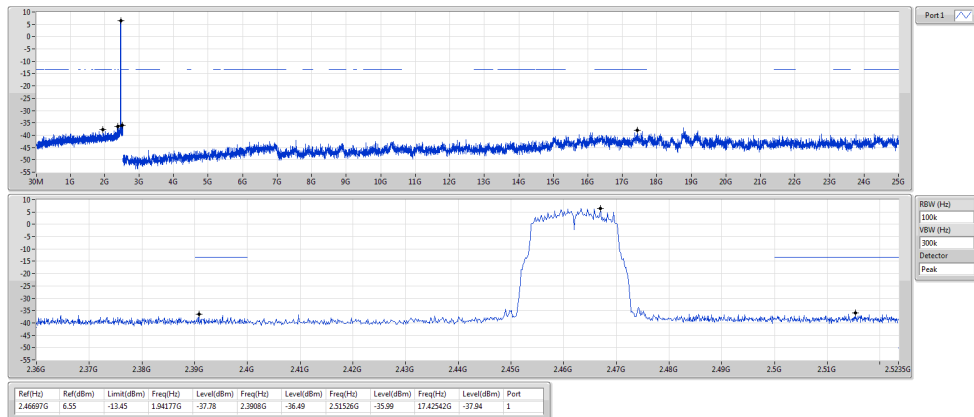
2437MHz



802.11g_Nss1,(6Mbps)_1TX

CSE NdB

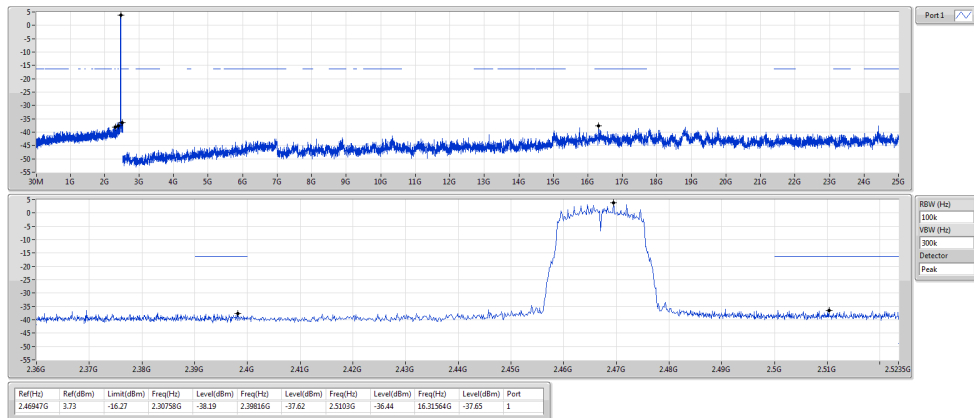
2462MHz



802.11g_Nss1,(6Mbps)_1TX

CSE NdB

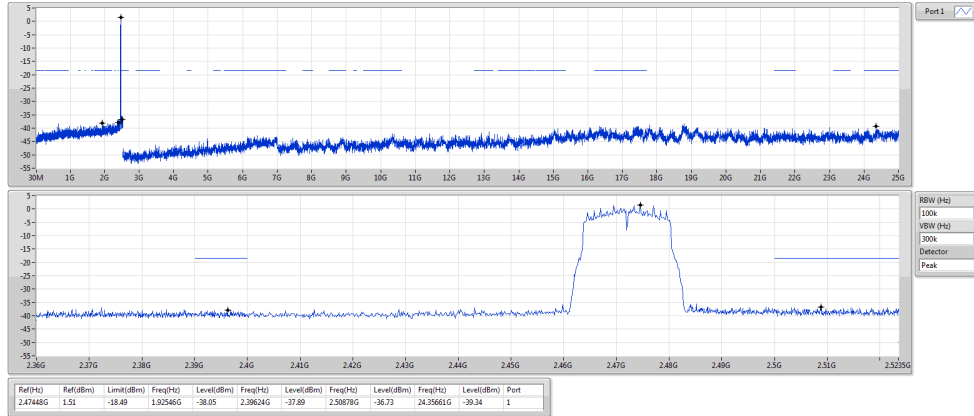
2467MHz



802.11g_Nss1,(6Mbps)_1TX

CSE NdB

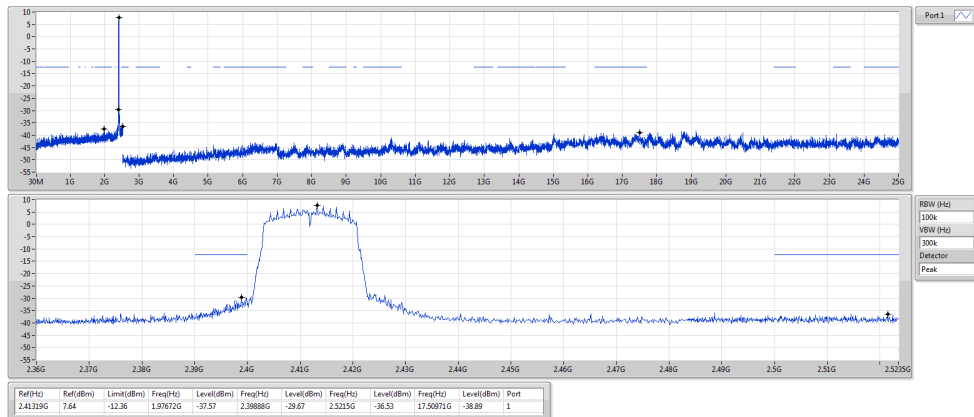
2472MHz



802.11n HT20_Nss1,(MCS0)_1TX

CSE NdB

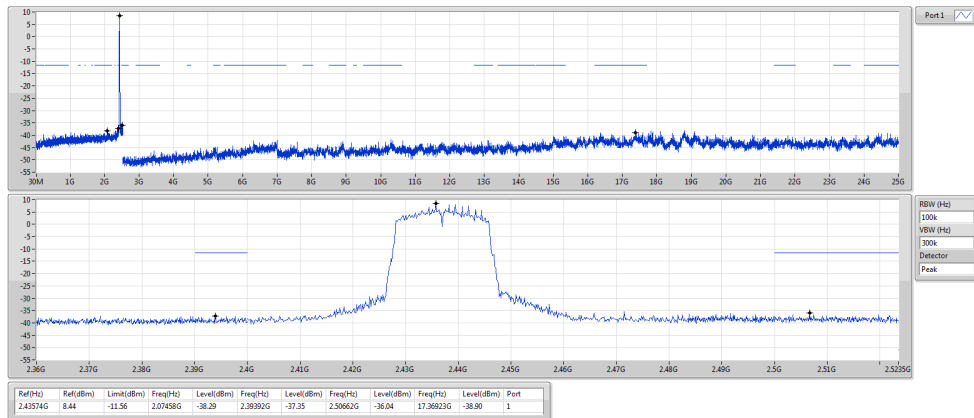
2412MHz



802.11n HT20_Nss1,(MCS0)_1TX

CSE NdB

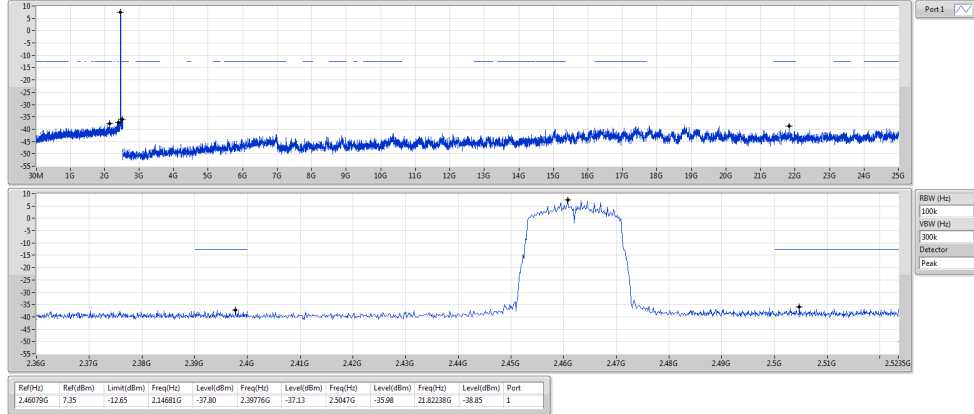
2437MHz



802.11n HT20_Nss1,(MCS0)_1TX

CSE NdB

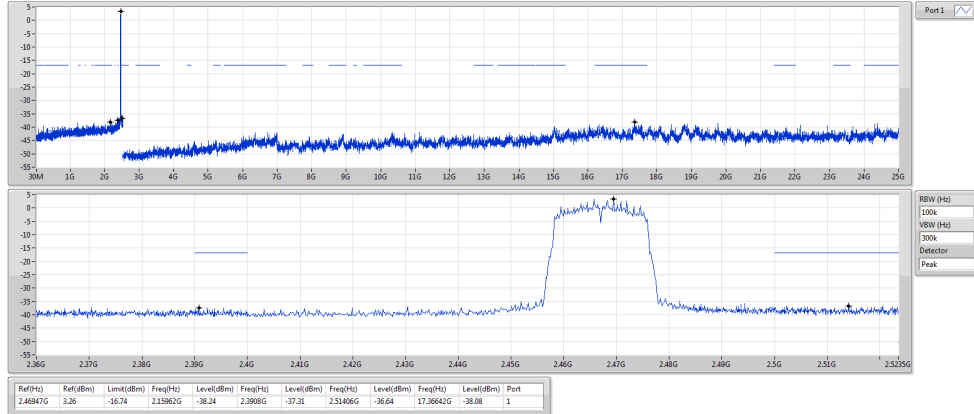
2462MHz



802.11n HT20_Nss1,(MCS0)_1TX

CSE NdB

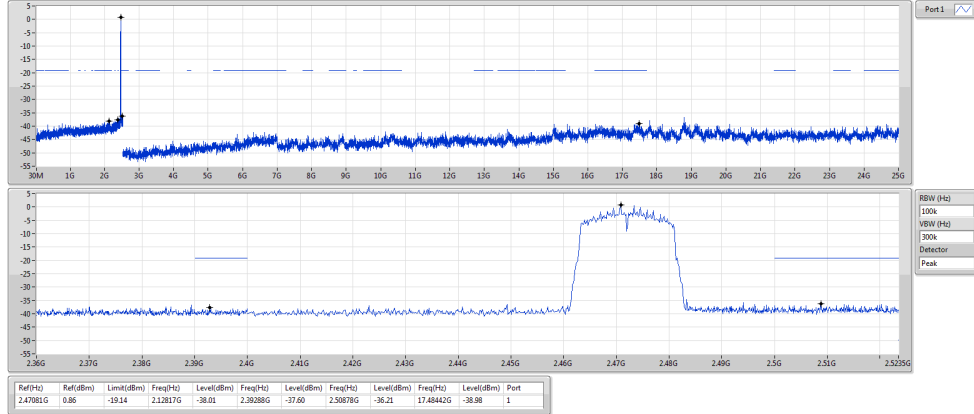
2467MHz



802.11n HT20_Nss1,(MCS0)_1TX

CSE NdB

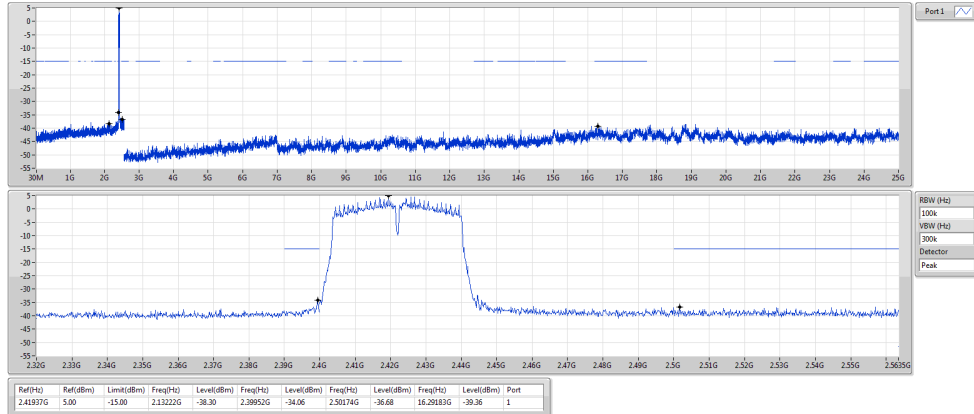
2472MHz



802.11n HT40_Nss1,(MCS0)_1TX

CSE NdB

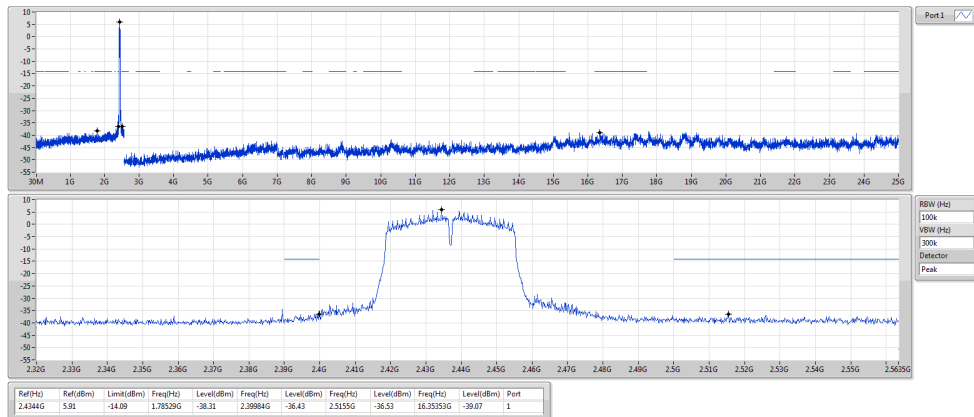
2422MHz



802.11n HT40_Nss1,(MCS0)_1TX

CSE NdB

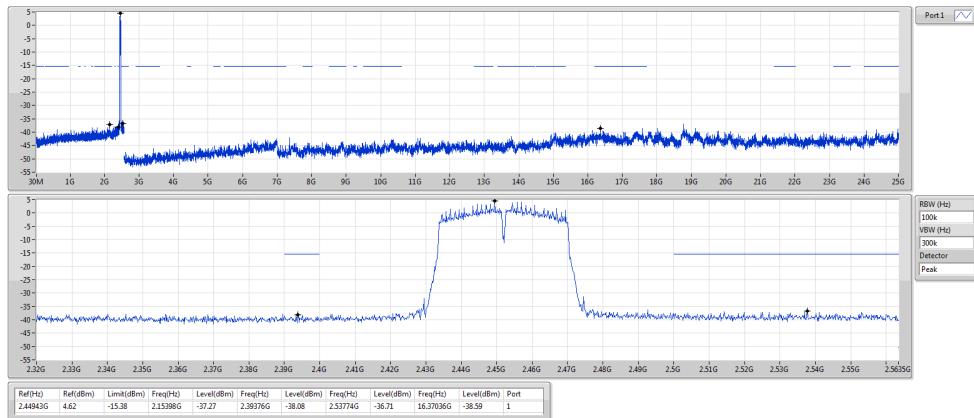
2437MHz



802.11n HT40_Nss1,(MCS0)_1TX

CSE NdB

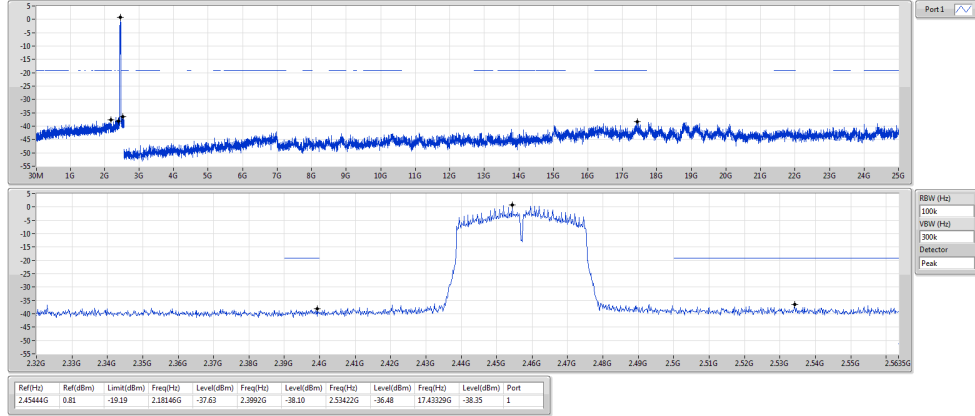
2452MHz



802.11n HT40_Nss1,(MCS0)_1TX

CSE NdB

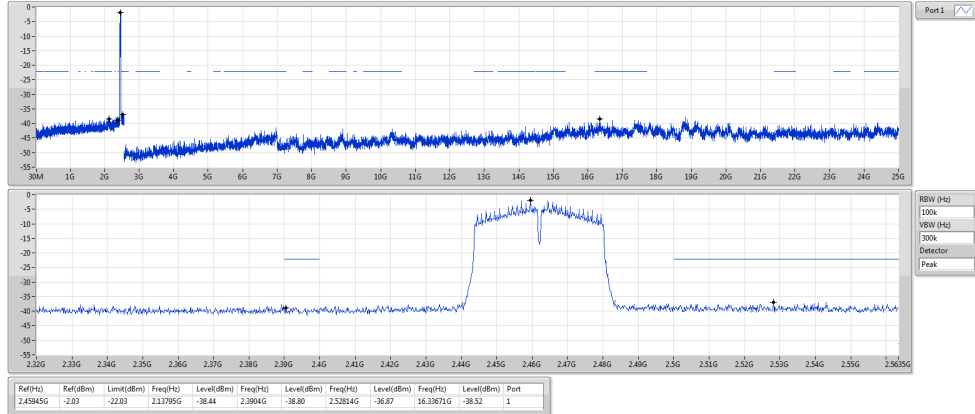
2457MHz



802.11n HT40_Nss1,(MCS0)_1TX

CSE NdB

2462MHz



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.)
No.2-1, 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: 886-3-318-0345

Email: ICC_Service@icertifi.com.tw

==END==