

FCC Test Report

FCC ID : AK8DHUKSY22
Equipment : WLAN/BT Module
Model No. : DHUK-SY22
Brand Name : Wistron NeWeb Corporation
Applicant : Sony Corporation
Address : 1-7-1 Konan Minato-ku, Tokyo ,108-0075 Japan
Standard : 47 CFR FCC Part 15.247
Received Date : Jul. 26, 2019
Tested Date : Aug. 13 ~ Sep. 27, 2019

We, International Certification Corp., 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
FR972601AC	Rev. 01	Initial issue	Oct. 22, 2019

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.189MHz 50.27 (Margin -13.79dB) - QP	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz 53.71 (Margin -0.29dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 27.02	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

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.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	ANT 0	PIFA	No	-0.52	3.96	4.24	4.21	3.74
	ANT 1	PIFA	No	2.82	1.71	1.91	1.91	1.89

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	3.3Vdc from host
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1.1.4 Channel List

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

1.1.5 Test Tool and Duty Cycle

Test Tool	Realtek, Ver. 0.0006.00.20180227		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11b	99.99%	0.00
	11g	97.13%	0.13
	HT20	96.72%	0.14

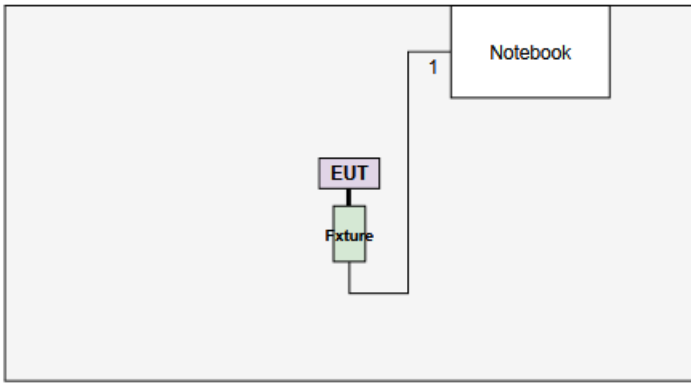
1.1.6 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	56/55
11b	2437	59/59
11b	2462	63/63
11g	2412	56/55
11g	2437	63/63
11g	2462	54/54
HT20	2412	54/53
HT20	2437	63/63
HT20	2462	51/51

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E6430	DoC	---
2	Fixture	---	---	---	Provided by applicant

1.3 Test Setup Chart

Test Setup Diagram	
	
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)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Jan. 08, 2019	Jan. 07, 2020
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 05, 2018	Nov. 04, 2019
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 23, 2018	Oct. 23, 2019
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)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Dec. 27, 2018	Dec. 26, 2019
Receiver	R&S	ESR3	101658	Dec. 11, 2018	Dec. 10, 2019
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 12, 2019	Jul. 11, 2020
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 18, 2018	Dec. 17, 2019
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2018	Nov. 14, 2019
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 09, 2018	Nov. 08, 2019
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 08, 2018	Oct. 07, 2019
Preamplifier	EMC	EMC02325	980225	Jul. 09, 2019	Jul. 08, 2020
Preamplifier	Agilent	83017A	MY39501308	Oct. 04, 2018	Oct. 03, 2019
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF Cable	EMC	EMC105-SM-SM-8000	180512	Oct. 22, 2018	Oct. 21, 2019
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Oct. 22, 2018	Oct. 21, 2019
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16015/4	Oct. 22, 2018	Oct. 21, 2019
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-003	Oct. 22, 2018	Oct. 21, 2019
LF cable 10M	EMCC	CFD400-E	CFD400-001	Oct. 22, 2018	Oct. 21, 2019
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)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Apr. 17, 2019	Apr. 16, 2020
Power Meter	Anritsu	ML2495A	1241002	Oct. 09, 2018	Oct. 08, 2019
Power Sensor	Anritsu	MA2411B	1207366	Oct. 09, 2018	Oct. 08, 2019
DC POWER SOURCE	GW INSTRON	GPC-6030D	EM892433	Oct. 25, 2018	Oct. 24, 2019
Measurement Software	SENSE-15407_NII	SENSE-15407_NII	V5.10	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247

ANSI C63.10-2013

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.6 Deviation from Test Standard and Measurement Procedure

None

1.7 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. 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 Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	23°C / 60%	Alex Tsai
Radiated Emissions	03CH01-WS	25-26°C / 6-66%	Akun Chung Roger Lu
RF Conducted	TH01-WS	22°C / 63%	Brad Wu

- 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	HT20	2437	MCS 0	---
Radiated Emissions ≤1GHz	HT20	2437	MCS 0	---
Radiated Emissions >1GHz				
Maximum Output Power	11b	2412 / 2437 / 2462	1 Mbps	---
6dB bandwidth	11g	2412 / 2437 / 2462	6 Mbps	
Power spectral density	HT20	2412 / 2437 / 2462	MCS 0	

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.

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.

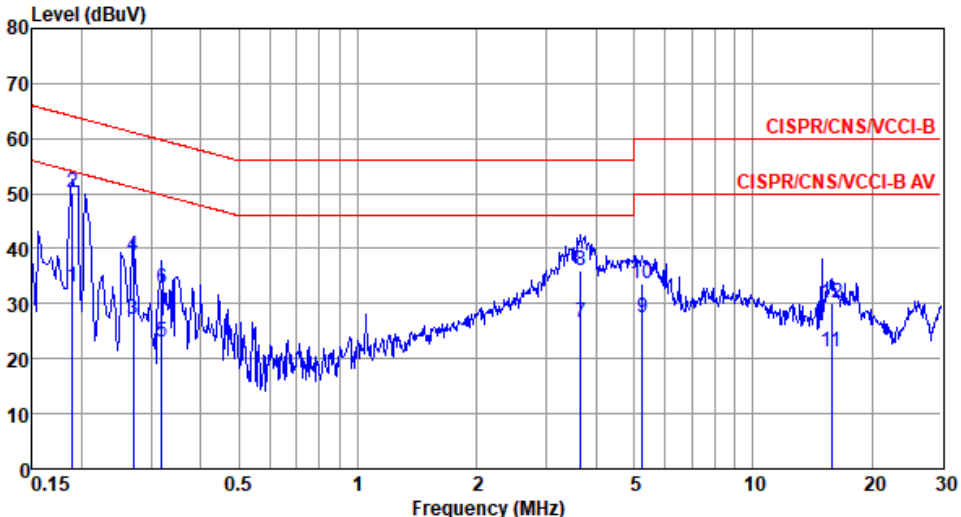
3.1.3 Test Setup



- 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

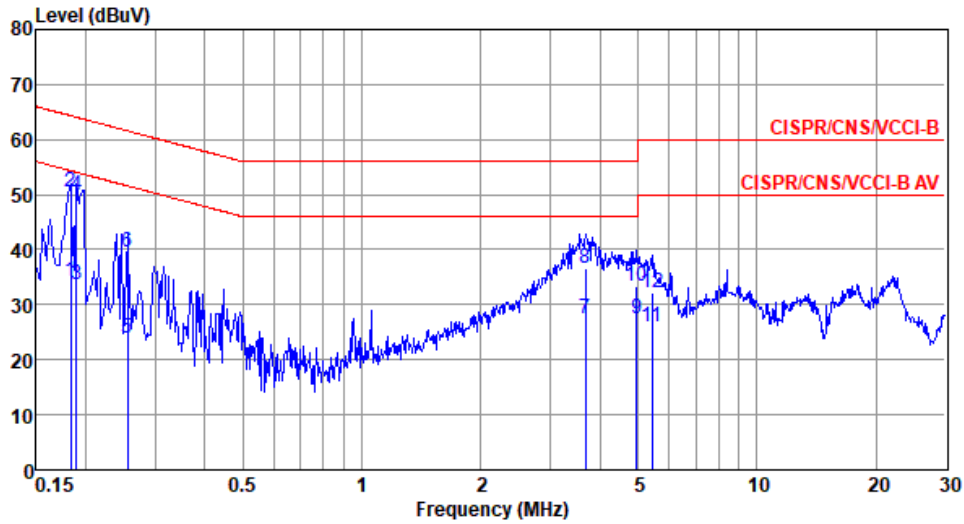
Modulation	HT20	Test Freq. (MHz)	2437
Power Phase	Line		



	Freq MHz	Level dBuA	Limit Line dBuA	Over Limit dB	Read Level dBuA	LISN factor dB	cable loss dB	Remark
1	0.189	33.21	54.06	-20.85	23.60	9.54	0.07	Average
2*	0.189	50.27	64.06	-13.79	40.66	9.54	0.07	QP
3	0.270	27.15	51.12	-23.97	17.53	9.55	0.07	Average
4	0.270	38.78	61.12	-22.34	29.16	9.55	0.07	QP
5	0.318	22.89	49.75	-26.86	13.25	9.56	0.08	Average
6	0.318	32.83	59.75	-26.92	23.19	9.56	0.08	QP
7	3.661	26.50	46.00	-19.50	16.63	9.61	0.26	Average
8	3.661	35.95	56.00	-20.05	26.08	9.61	0.26	QP
9	5.249	27.41	50.00	-22.59	17.46	9.62	0.33	Average
10	5.249	33.77	60.00	-26.23	23.82	9.62	0.33	QP
11	15.801	21.19	50.00	-28.81	10.96	9.66	0.57	Average
12	15.801	30.01	60.00	-29.99	19.78	9.66	0.57	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 Note 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation	HT20	Test Freq. (MHz)	2437
Power Phase	Neutral		



	Freq MHz	Level dBuA	Limit Line dBuA	Over Limit dB	Read Level dBuA	LISN factor dB	cable loss dB	Remark
1	0.183	34.12	54.33	-20.21	24.48	9.58	0.06	Average
2*	0.183	50.38	64.33	-13.95	40.74	9.58	0.06	QP
3	0.189	33.60	54.06	-20.46	23.95	9.58	0.07	Average
4	0.189	49.82	64.06	-14.24	40.17	9.58	0.07	QP
5	0.255	23.77	51.60	-27.83	14.11	9.59	0.07	Average
6	0.255	39.58	61.60	-22.02	29.92	9.59	0.07	QP
7	3.681	27.50	46.00	-18.50	17.58	9.66	0.26	Average
8	3.681	36.59	56.00	-19.41	26.67	9.66	0.26	QP
9	4.952	27.54	46.00	-18.46	17.55	9.67	0.32	Average
10	4.952	33.29	56.00	-22.71	23.30	9.67	0.32	QP
11	5.419	25.86	50.00	-24.14	15.85	9.68	0.33	Average
12	5.419	32.13	60.00	-27.87	22.12	9.68	0.33	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

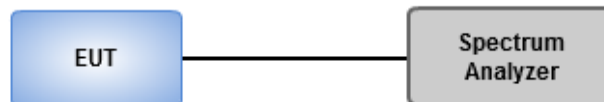
6dB Bandwidth

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

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	10M	14.616M	14M6G1D	8.623M	13.748M
802.11g_Nss1,(6Mbps)_2TX	16.377M	17.511M	17M5D1D	15.797M	16.643M
802.11n HT20_Nss1,(MCS0)_2TX	17.319M	18.307M	18M3D1D	16.304M	17.583M

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

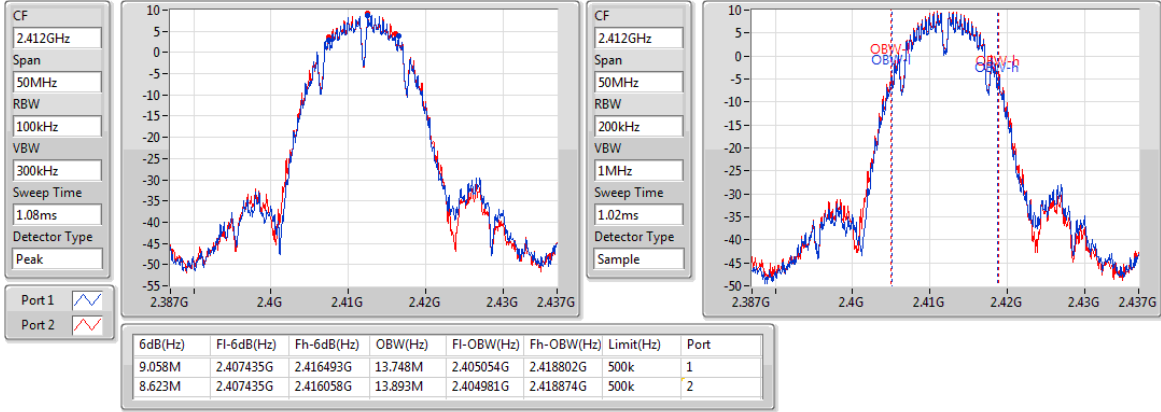
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	9.058M	13.748M	8.623M	13.893M
2437MHz	Pass	500k	9.565M	14.038M	9.058M	14.038M
2462MHz	Pass	500k	10M	14.616M	10M	14.399M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.377M	16.643M	16.377M	16.643M
2437MHz	Pass	500k	16.304M	17.511M	15.797M	17.149M
2462MHz	Pass	500k	16.304M	16.643M	16.377M	16.643M
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.957M	17.656M	16.594M	17.583M
2437MHz	Pass	500k	16.739M	18.307M	16.304M	18.09M
2462MHz	Pass	500k	17.319M	17.656M	16.957M	17.583M

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

802.11b_Nss1,(1Mbps)_2TX

EBW

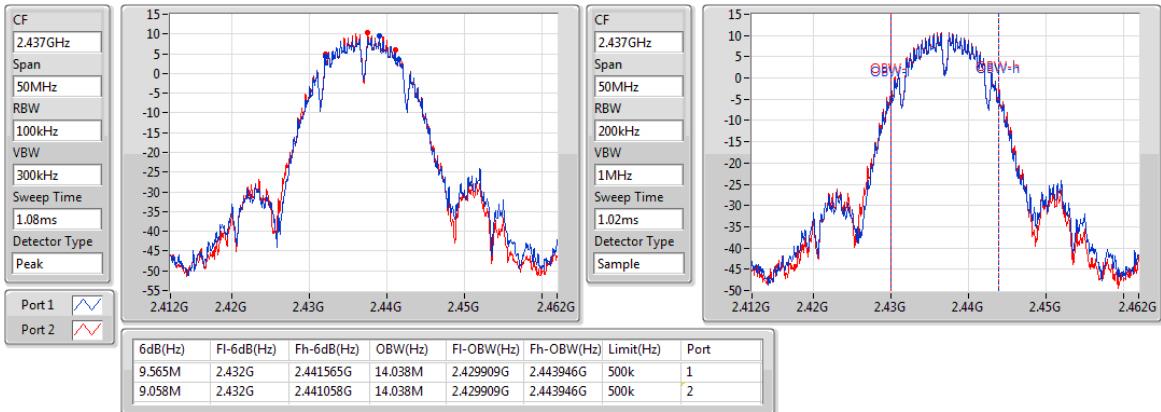
2412MHz



802.11b_Nss1,(1Mbps)_2TX

EBW

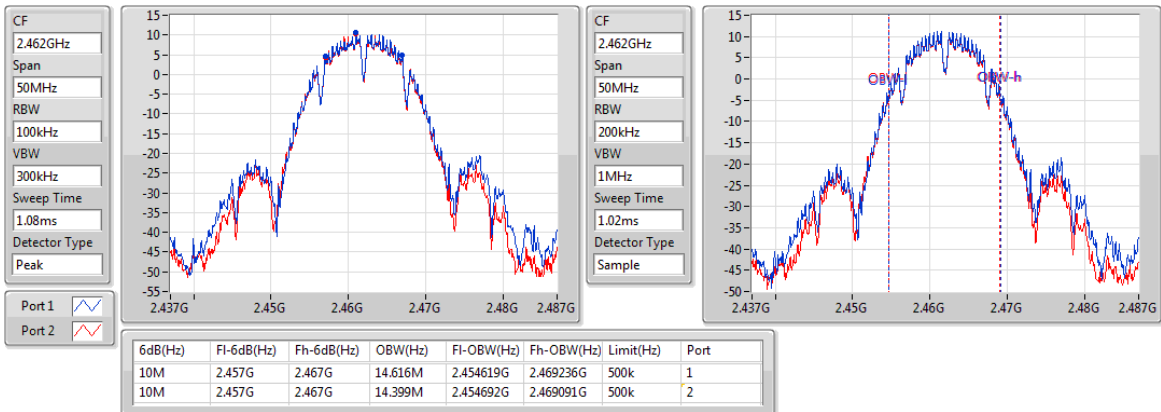
2437MHz



802.11b_Nss1,(1Mbps)_2TX

EBW

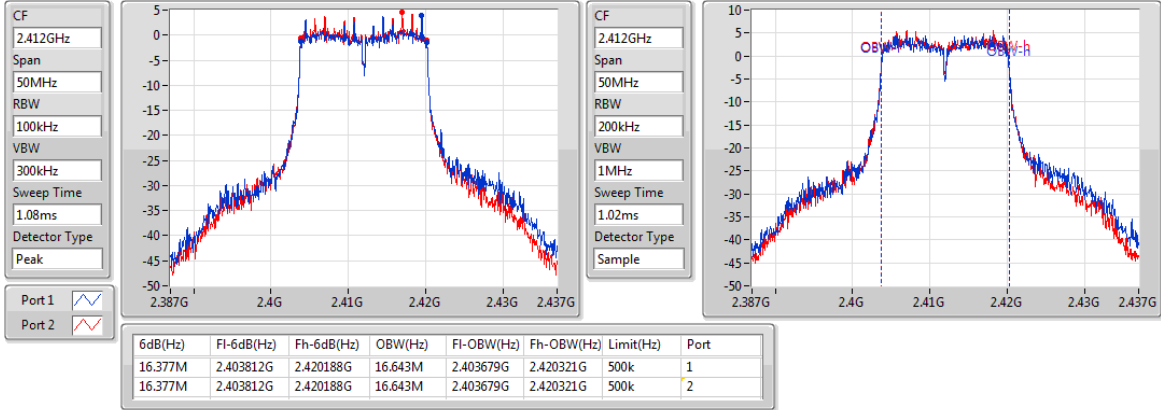
2462MHz



802.11g_Nss1,(6Mbps)_2TX

EBW

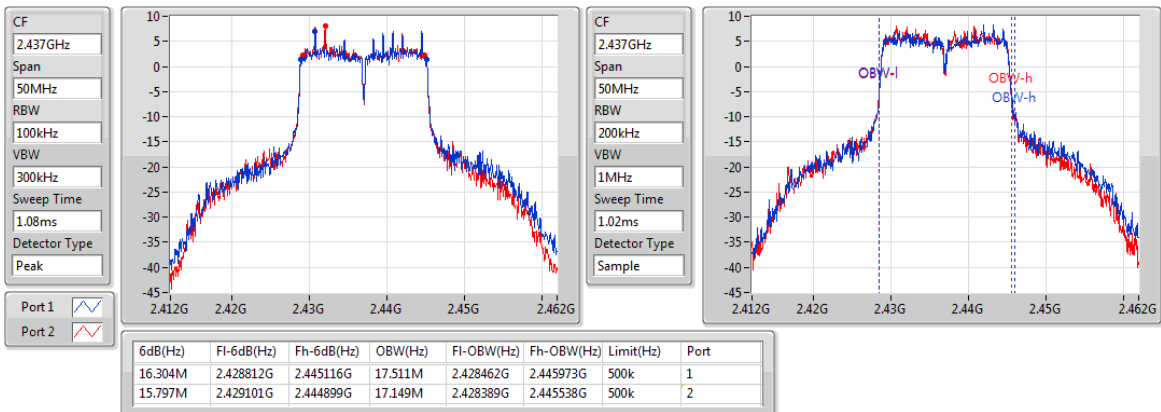
2412MHz



802.11g_Nss1,(6Mbps)_2TX

EBW

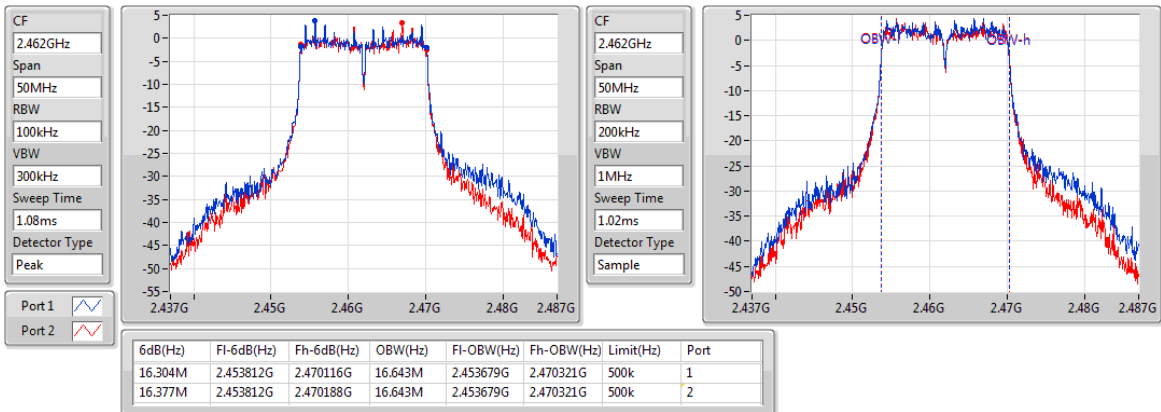
2437MHz



802.11g_Nss1,(6Mbps)_2TX

EBW

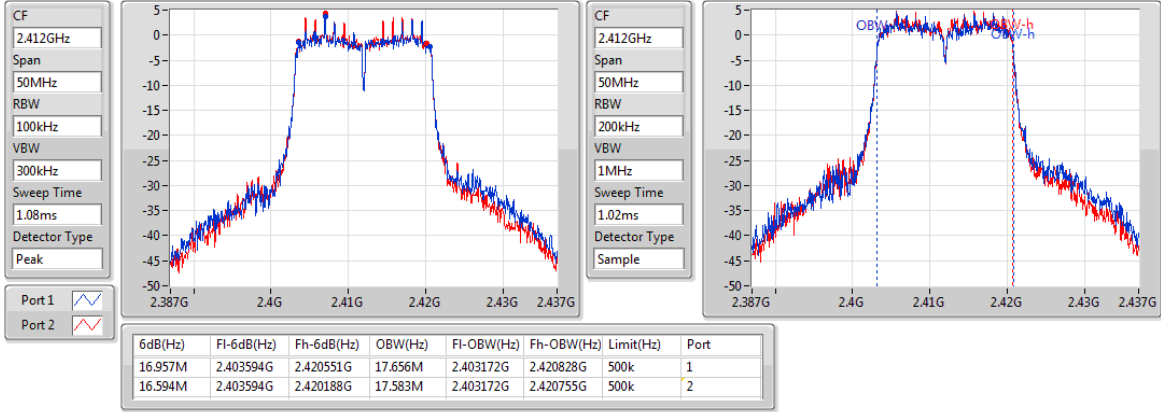
2462MHz



802.11n HT20_Nss1,(MCS0)_2TX

EBW

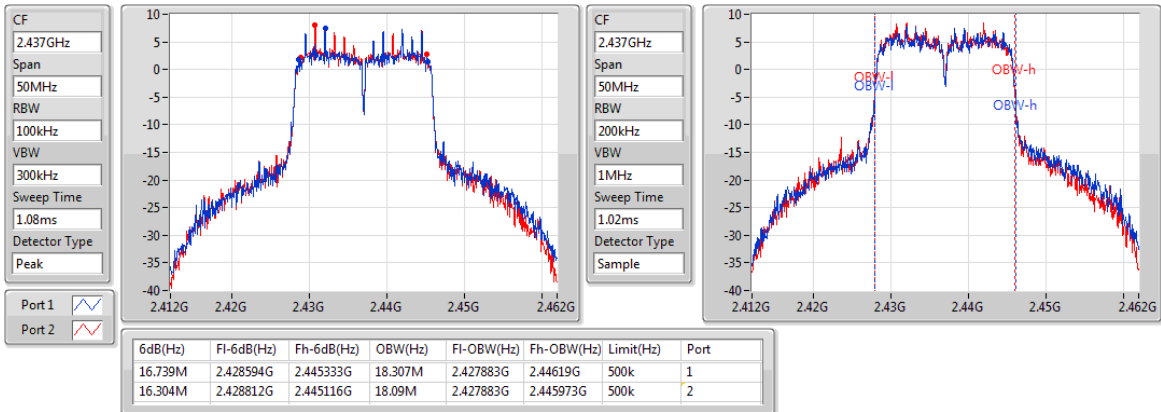
2412MHz



802.11n HT20_Nss1,(MCS0)_2TX

EBW

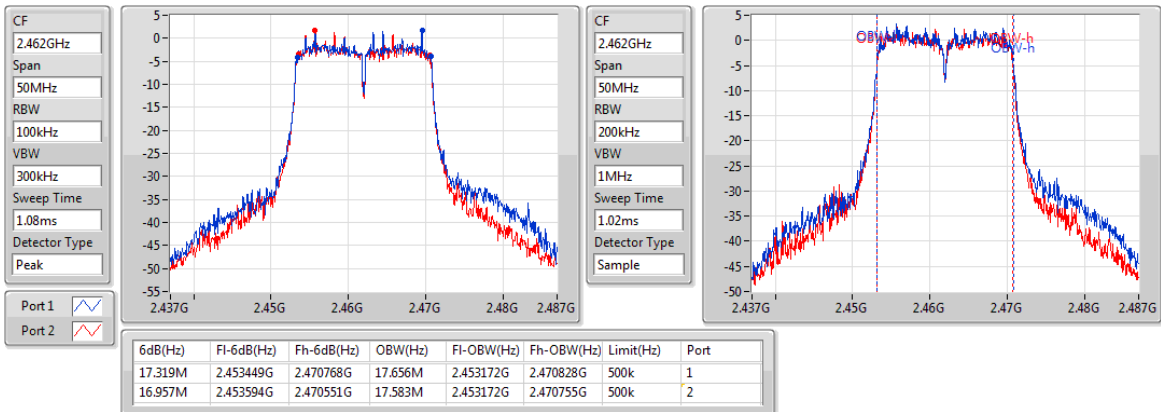
2437MHz



802.11n HT20_Nss1,(MCS0)_2TX

EBW

2462MHz



3.3 RF Output Power

3.3.1 Limit of RF Output Power

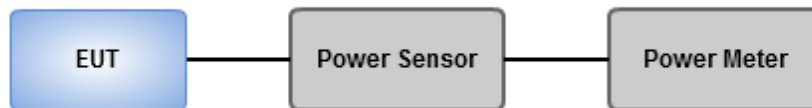
Conducted power shall not exceed 1Watt.

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

Summary of Peak Conducted Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_2TX	26.63	0.46026
802.11g_Nss1,(6Mbps)_2TX	26.96	0.49659
802.11n HT20_Nss1,(MCS0)_2TX	27.02	0.50350

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	2.82	23.94	23.28	26.63	30.00	29.45	36.00
2437MHz	Pass	2.82	23.19	23.04	26.13	30.00	28.95	36.00
2462MHz	Pass	2.82	22.84	22.87	25.87	30.00	28.69	36.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.82	23.94	23.96	26.96	30.00	29.78	36.00
2437MHz	Pass	2.82	23.98	23.91	26.96	30.00	29.78	36.00
2462MHz	Pass	2.82	23.94	23.84	26.90	30.00	29.72	36.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.82	23.89	23.95	26.93	30.00	29.75	36.00
2437MHz	Pass	2.82	23.94	24.07	27.02	30.00	29.84	36.00
2462MHz	Pass	2.82	23.91	23.78	26.86	30.00	29.68	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	23.01	0.19999
802.11g_Nss1,(6Mbps)_2TX	21.61	0.14488
802.11n HT20_Nss1,(MCS0)_2TX	21.30	0.13490

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	2.82	18.54	18.62	21.59		24.41	
2437MHz	Pass	2.82	19.21	19.47	22.35		25.17	
2462MHz	Pass	2.82	20.10	19.89	23.01		25.83	
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-		-	
2412MHz	Pass	2.82	16.02	16.11	19.08		21.90	
2437MHz	Pass	2.82	18.47	18.72	21.61		24.43	
2462MHz	Pass	2.82	15.07	14.75	17.92		20.74	
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-		-	
2412MHz	Pass	2.82	14.78	14.88	17.84		20.66	
2437MHz	Pass	2.82	18.23	18.35	21.30		24.12	
2462MHz	Pass	2.82	13.42	13.31	16.38		19.20	

DG = Directional Gain; 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

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.

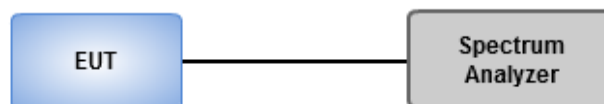
Average PSD, duty cycle \geq 98%

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) x (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

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_2TX	-1.34
802.11g_Nss1,(6Mbps)_2TX	-5.25
802.11n HT20_Nss1,(MCS0)_2TX	-3.87

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.32	-5.41	-5.28	-2.63	8.00
2437MHz	Pass	4.32	-4.21	-4.49	-1.34	8.00
2462MHz	Pass	4.32	-3.47	-4.68	-1.42	8.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.32	-10.56	-9.73	-7.37	8.00
2437MHz	Pass	4.32	-8.51	-7.89	-5.25	8.00
2462MHz	Pass	4.32	-11.32	-10.96	-8.43	8.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.32	-10.07	-11.13	-7.75	8.00
2437MHz	Pass	4.32	-6.55	-7.23	-3.87	8.00
2462MHz	Pass	4.32	-11.37	-12.42	-9.08	8.00

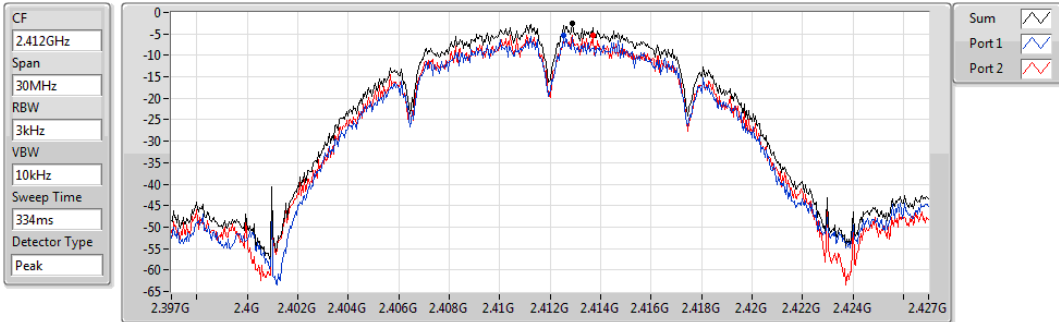
DG = Directional Gain;

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

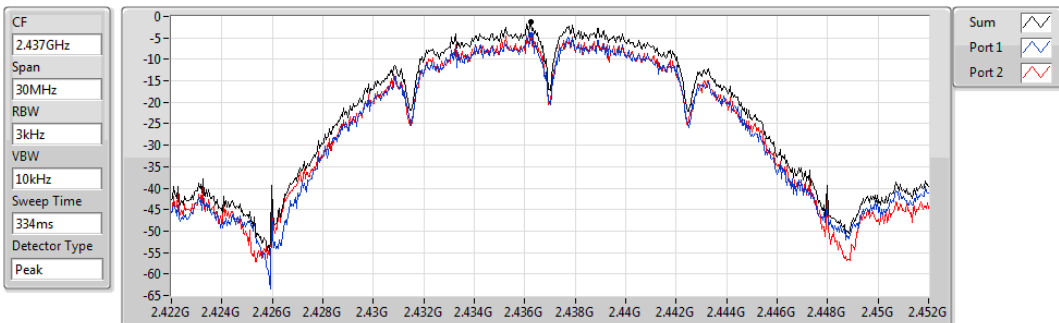


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.63	-2.63	-5.41	-5.28

802.11b_Nss1,(1Mbps)_2TX

PSD

2437MHz

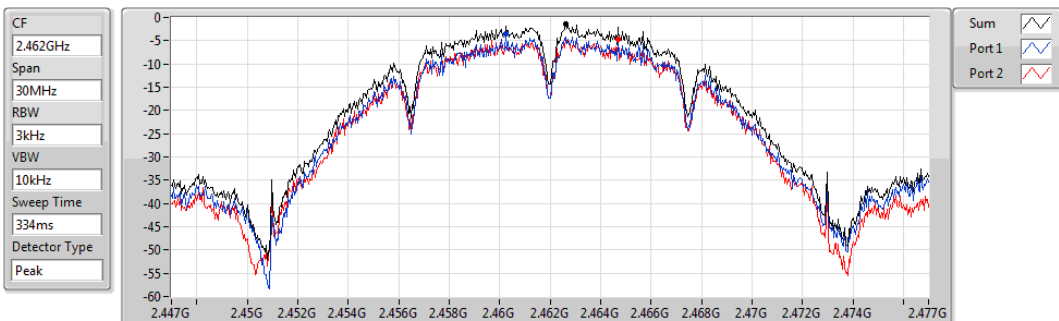


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-1.34	-1.34	-4.21	-4.49

802.11b_Nss1,(1Mbps)_2TX

PSD

2462MHz

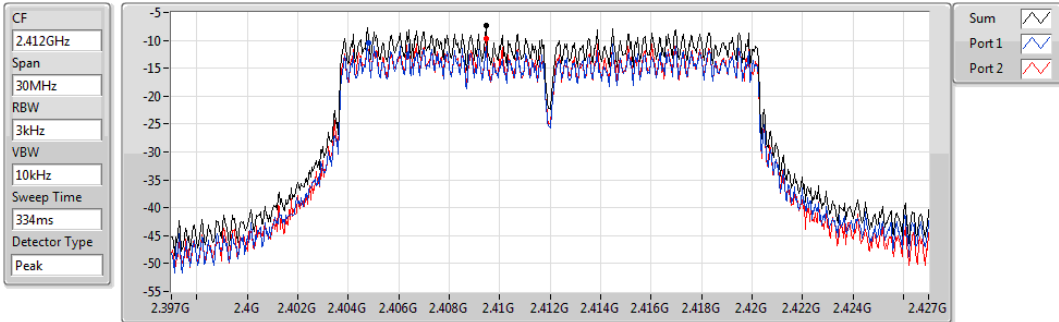


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-1.42	-1.42	-3.47	-4.68

802.11g_Nss1,(6Mbps)_2TX

PSD

2412MHz

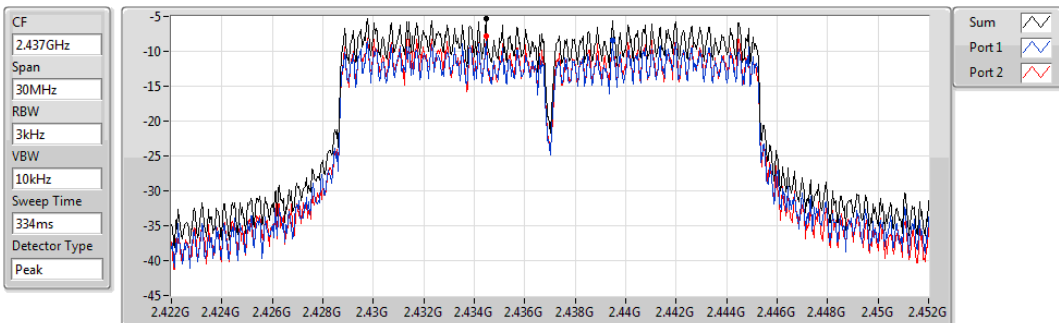


Sum	PD	Port 1	Port 2
(dBm/100kHz)	(dBm/100kHz)	(dBm/100kHz)	(dBm/100kHz)
-7.37	-7.37	-10.56	-9.73

802.11g_Nss1,(6Mbps)_2TX

PSD

2437MHz

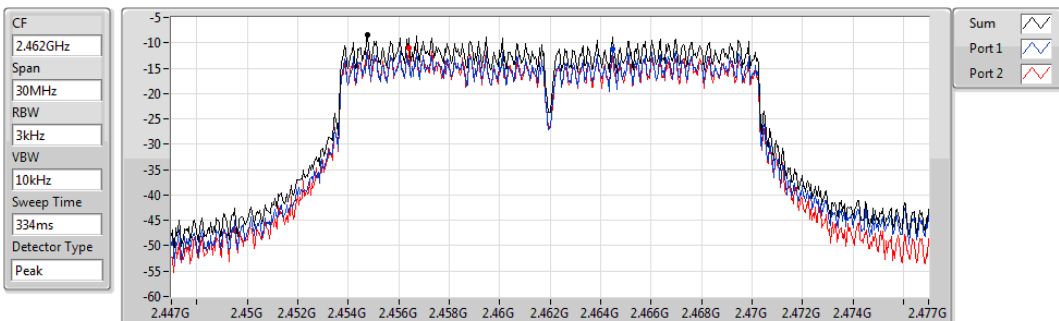


Sum	PD	Port 1	Port 2
(dBm/100kHz)	(dBm/100kHz)	(dBm/100kHz)	(dBm/100kHz)
-5.25	-5.25	-8.51	-7.89

802.11g_Nss1,(6Mbps)_2TX

PSD

2462MHz

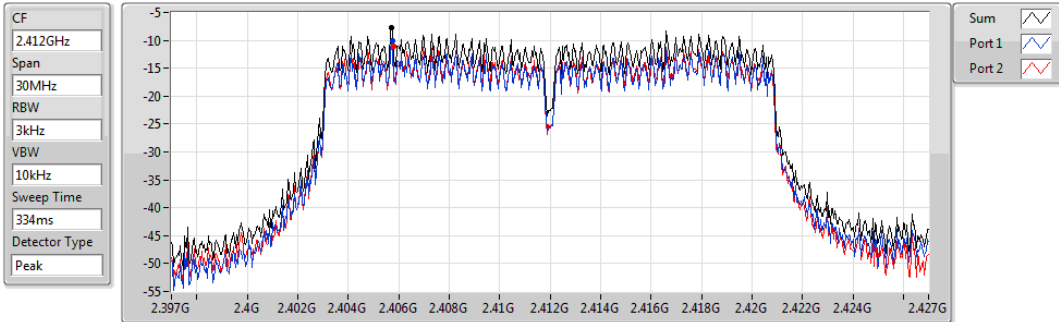


Sum	PD	Port 1	Port 2
(dBm/100kHz)	(dBm/100kHz)	(dBm/100kHz)	(dBm/100kHz)
-8.43	-8.43	-11.32	-10.96

802.11n HT20_Nss1,(MCS0)_2TX

PSD

2412MHz

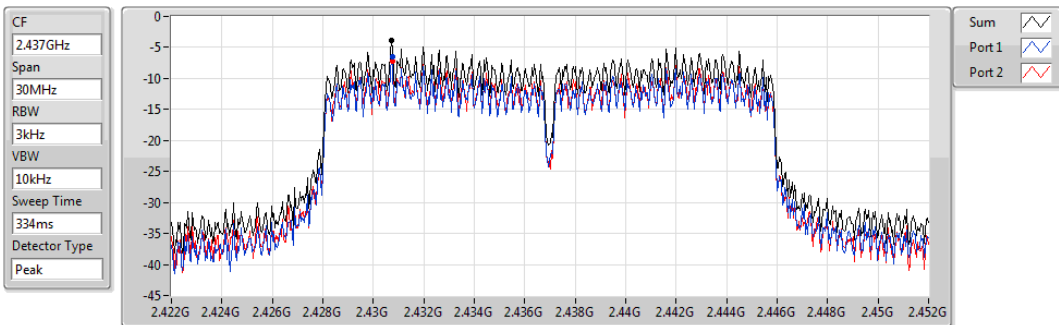


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.75	-7.75	-10.07	-11.13

802.11n HT20_Nss1,(MCS0)_2TX

PSD

2437MHz

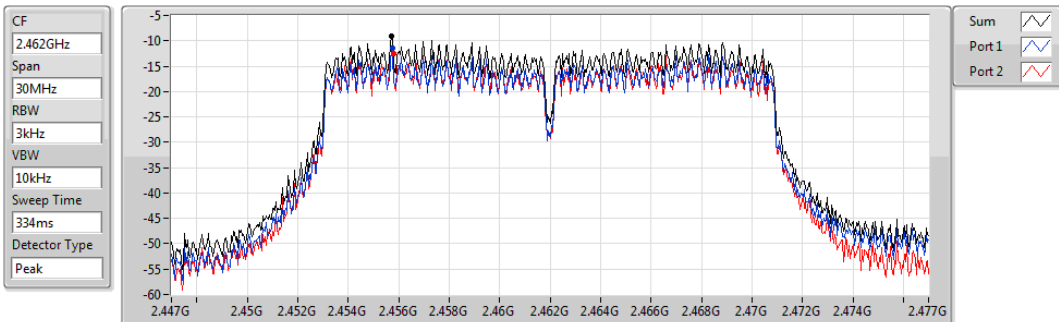


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.87	-3.87	-6.55	-7.23

802.11n HT20_Nss1,(MCS0)_2TX

PSD

2462MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.08	-9.08	-11.37	-12.42

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

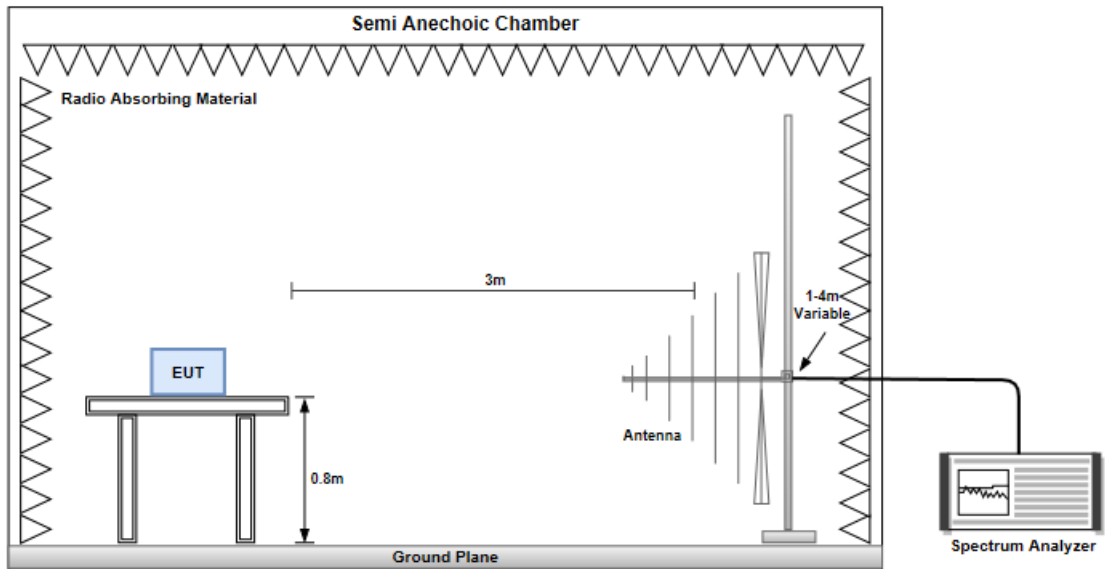
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

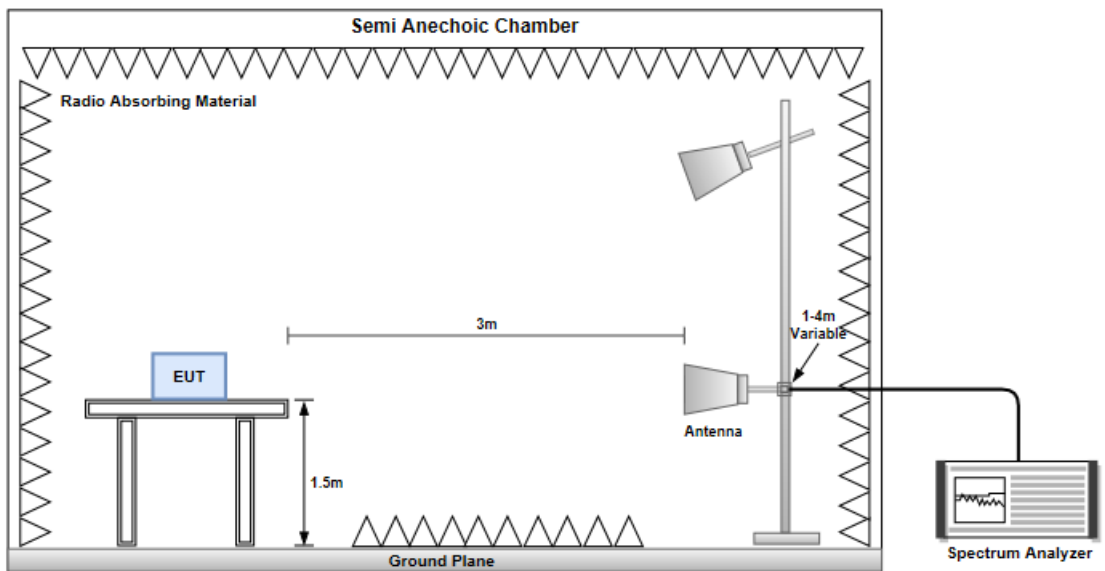
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

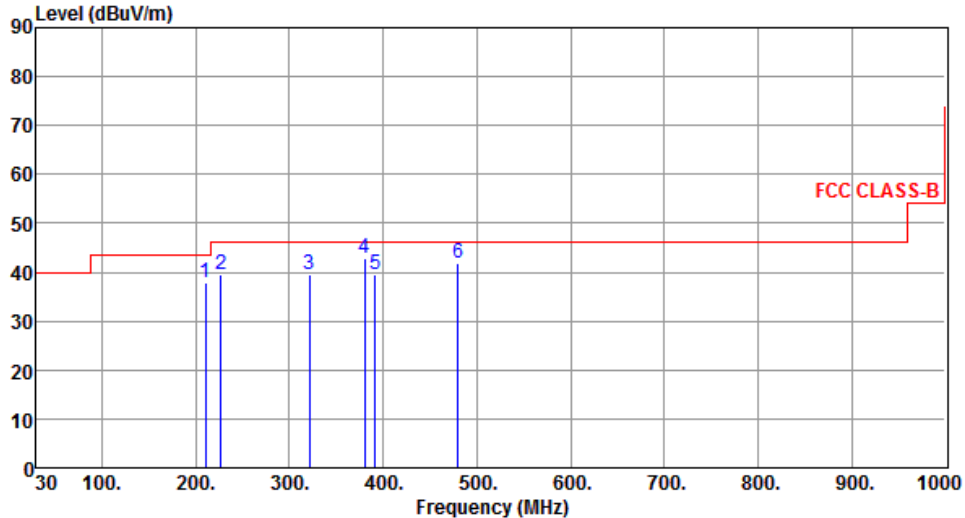
Radiated Emissions below 1 GHz



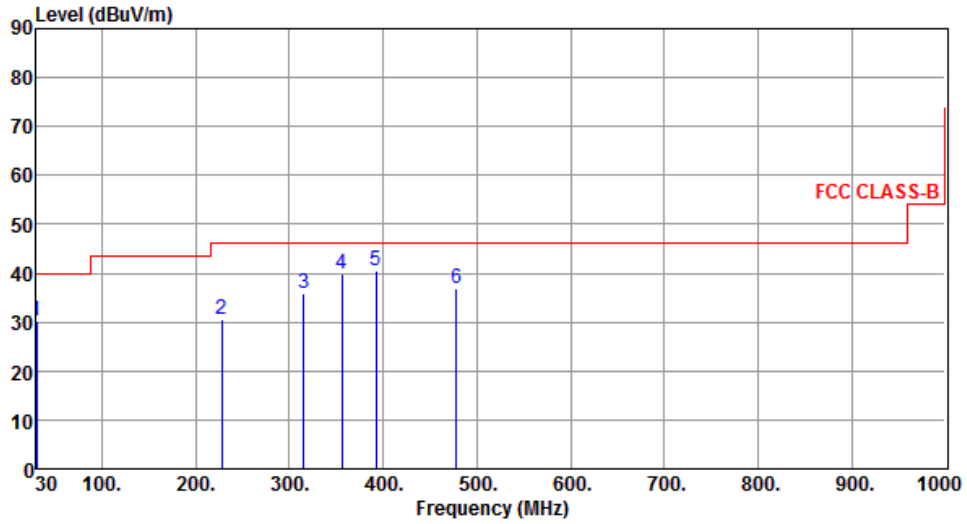
Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	HT20	Test Freq. (MHz)	2437																																																																																
Polarization	Horizontal																																																																																		
 <p>The graph plots Level (dBuV/m) on the y-axis (0 to 90) against Frequency (MHz) on the x-axis (30 to 1000). A red line represents the FCC CLASS-B limit, which is constant at 46 dBuV/m from 100 MHz to 1000 MHz. Six blue vertical lines indicate emission peaks labeled 1 through 6, with their respective SA readings and factors listed in the table below.</p>																																																																																			
<table border="1"> <thead> <tr> <th></th> <th>Freq.</th> <th>Emission level</th> <th>Limit</th> <th>Margin</th> <th>SA reading</th> <th>Factor</th> <th>Remark</th> <th>ANT High</th> <th>Turn Table</th> </tr> <tr> <th></th> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB</th> <th></th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>210.42</td> <td>37.81</td> <td>43.50</td> <td>-5.69</td> <td>49.99</td> <td>-12.18</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>2</td> <td>226.91</td> <td>39.66</td> <td>46.00</td> <td>-6.34</td> <td>51.62</td> <td>-11.96</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>3</td> <td>321.00</td> <td>39.63</td> <td>46.00</td> <td>-6.37</td> <td>47.03</td> <td>-7.40</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>4</td> <td>380.17</td> <td>42.80</td> <td>46.00</td> <td>-3.20</td> <td>48.76</td> <td>-5.96</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> <tr> <td>5</td> <td>391.31</td> <td>39.52</td> <td>46.00</td> <td>-6.48</td> <td>45.20</td> <td>-5.68</td> <td>QP</td> <td>224</td> <td>214</td> </tr> <tr> <td>6</td> <td>480.08</td> <td>42.00</td> <td>46.00</td> <td>-4.00</td> <td>45.57</td> <td>-3.57</td> <td>Peak</td> <td>---</td> <td>---</td> </tr> </tbody> </table>					Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table		MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg	1	210.42	37.81	43.50	-5.69	49.99	-12.18	Peak	---	---	2	226.91	39.66	46.00	-6.34	51.62	-11.96	Peak	---	---	3	321.00	39.63	46.00	-6.37	47.03	-7.40	Peak	---	---	4	380.17	42.80	46.00	-3.20	48.76	-5.96	Peak	---	---	5	391.31	39.52	46.00	-6.48	45.20	-5.68	QP	224	214	6	480.08	42.00	46.00	-4.00	45.57	-3.57	Peak	---	---
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table																																																																										
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg																																																																										
1	210.42	37.81	43.50	-5.69	49.99	-12.18	Peak	---	---																																																																										
2	226.91	39.66	46.00	-6.34	51.62	-11.96	Peak	---	---																																																																										
3	321.00	39.63	46.00	-6.37	47.03	-7.40	Peak	---	---																																																																										
4	380.17	42.80	46.00	-3.20	48.76	-5.96	Peak	---	---																																																																										
5	391.31	39.52	46.00	-6.48	45.20	-5.68	QP	224	214																																																																										
6	480.08	42.00	46.00	-4.00	45.57	-3.57	Peak	---	---																																																																										
<p>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.</p>																																																																																			

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	30.00	30.31	40.00	-9.69	40.03	-9.72	Peak	---	---
2	227.88	30.67	46.00	-15.33	42.55	-11.88	Peak	---	---
3	315.18	35.94	46.00	-10.06	43.48	-7.54	Peak	---	---
4	355.92	39.69	46.00	-6.31	46.44	-6.75	Peak	---	---
5	392.17	40.64	46.00	-5.36	46.30	-5.66	QP	109	105
6	478.14	36.90	46.00	-9.10	40.51	-3.61	Peak	---	---

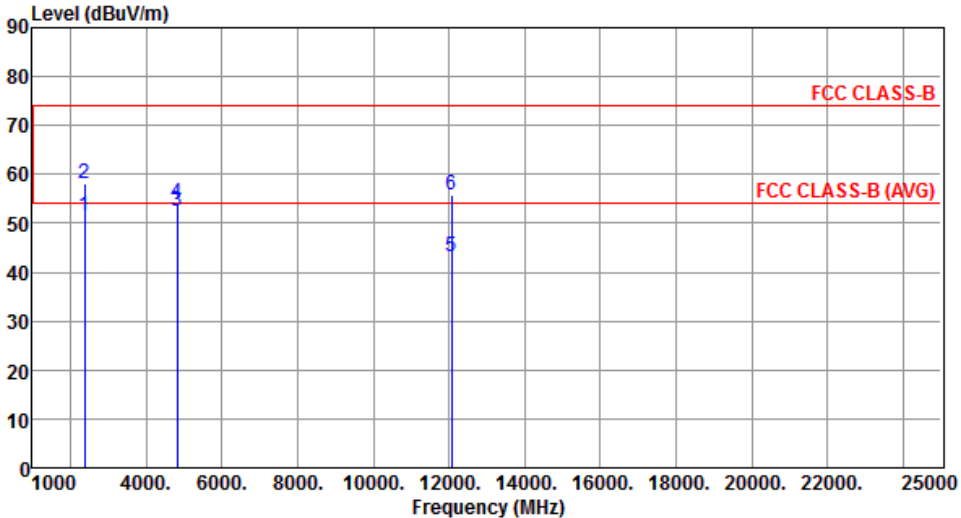
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

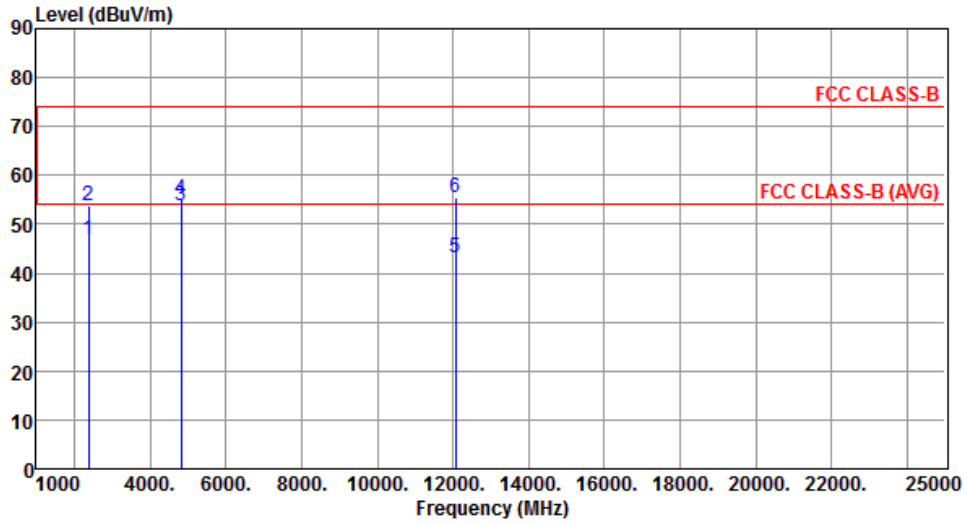
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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								
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2390.00	51.33	54.00	-2.67	54.40	-3.07	Average	243	316
2	2390.00	58.12	74.00	-15.88	61.19	-3.07	Peak	243	316
3	4824.00	52.46	54.00	-1.54	48.93	3.53	Average	162	349
4	4824.00	53.98	74.00	-20.02	50.45	3.53	Peak	162	349
5	12060.00	43.16	54.00	-10.84	29.89	13.27	Average	100	40
6	12060.00	55.63	74.00	-18.37	42.36	13.27	Peak	100	40
<p>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).</p>									

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



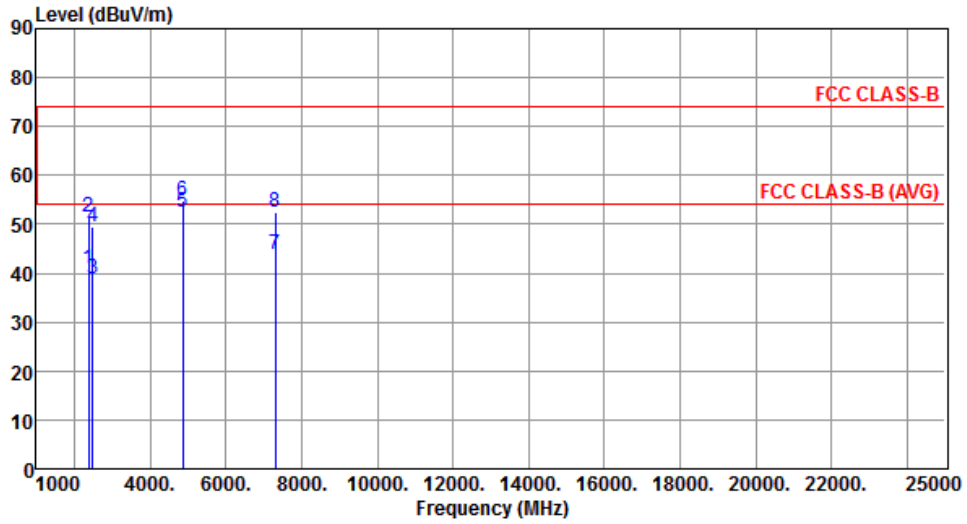
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	46.72	54.00	-7.28	49.79	-3.07	Average	180	318
2	2390.00	53.86	74.00	-20.14	56.93	-3.07	Peak	180	318
3	4824.00	53.68	54.00	-0.32	50.15	3.53	Average	189	347
4	4824.00	55.21	74.00	-18.79	51.68	3.53	Peak	189	347
5	12060.00	43.13	54.00	-10.87	29.86	13.27	Average	100	50
6	12060.00	55.59	74.00	-18.41	42.32	13.27	Peak	100	50

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	Horizontal		



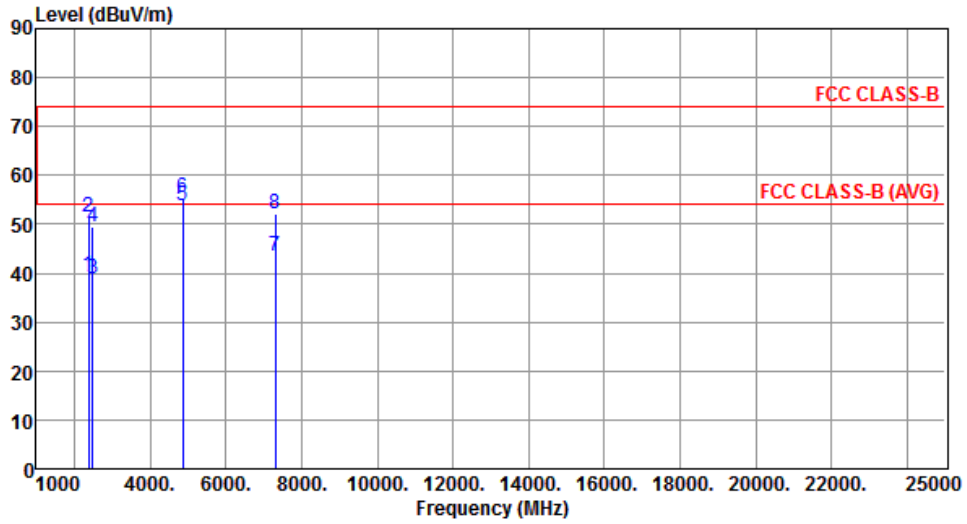
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	40.79	54.00	-13.21	43.86	-3.07	Average	218	327
2	2390.00	51.44	74.00	-22.56	54.51	-3.07	Peak	218	327
3	2483.50	38.90	54.00	-15.10	42.12	-3.22	Average	218	327
4	2483.50	49.32	74.00	-24.68	52.54	-3.22	Peak	218	327
5	4874.00	52.62	54.00	-1.38	49.02	3.60	Average	157	331
6	4874.00	54.96	74.00	-19.04	51.36	3.60	Peak	157	331
7	7311.00	43.88	54.00	-10.12	35.06	8.82	Average	124	167
8	7311.00	52.42	74.00	-21.58	43.60	8.82	Peak	124	167

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		



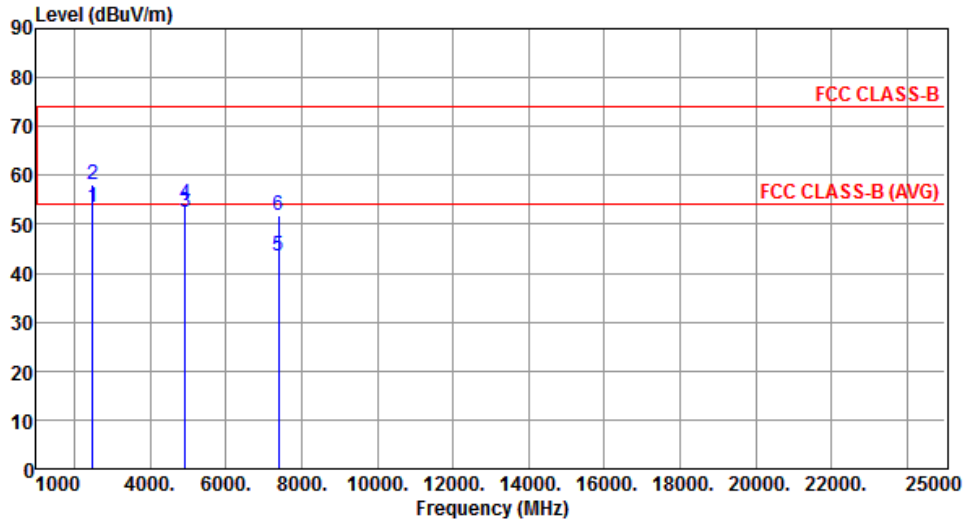
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.44	54.00	-14.56	42.51	-3.07	Average	182	321
2	2390.00	51.47	74.00	-22.53	54.54	-3.07	Peak	182	321
3	2483.50	39.02	54.00	-14.98	42.24	-3.22	Average	182	321
4	2483.50	49.58	74.00	-24.42	52.80	-3.22	Peak	182	321
5	4874.00	53.64	54.00	-0.36	50.04	3.60	Average	174	345
6	4874.00	55.33	74.00	-18.67	51.73	3.60	Peak	174	345
7	7311.00	43.51	54.00	-10.49	34.69	8.82	Average	100	340
8	7311.00	52.24	74.00	-21.76	43.42	8.82	Peak	100	340

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		



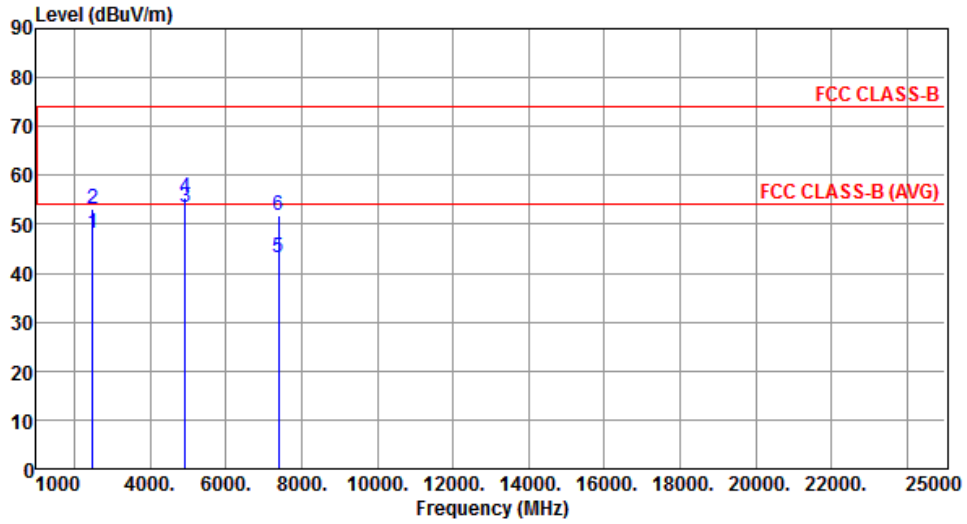
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.32	54.00	-0.68	56.54	-3.22	Average	195	316
2	2483.50	58.19	74.00	-15.81	61.41	-3.22	Peak	195	316
3	4924.00	52.39	54.00	-1.61	48.68	3.71	Average	156	356
4	4924.00	54.25	74.00	-19.75	50.54	3.71	Peak	156	356
5	7386.00	43.34	54.00	-10.66	34.79	8.55	Average	120	165
6	7386.00	51.80	74.00	-22.20	43.25	8.55	Peak	120	165

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	Vertical		



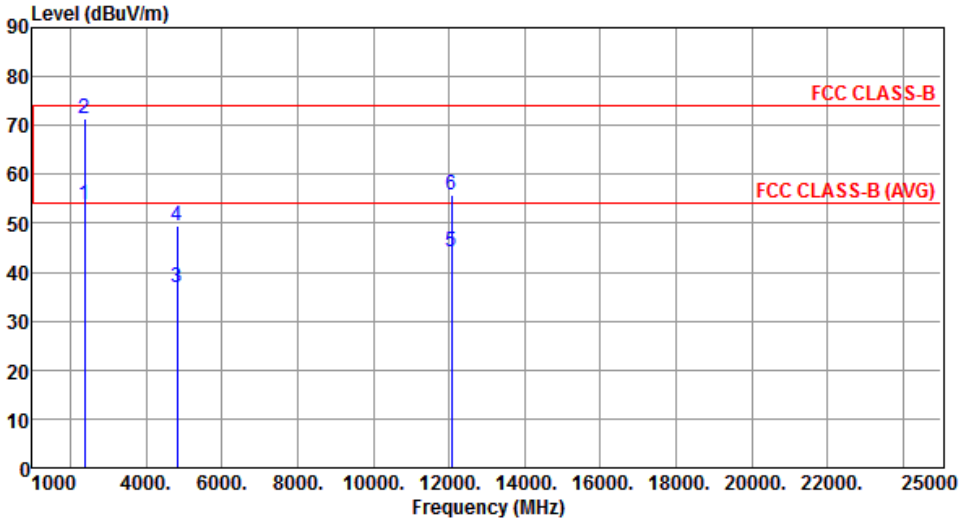
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	48.06	54.00	-5.94	51.28	-3.22	Average	186	318
2	2483.50	53.17	74.00	-20.83	56.39	-3.22	Peak	186	318
3	4924.00	53.53	54.00	-0.47	49.82	3.71	Average	174	346
4	4924.00	55.35	74.00	-18.65	51.64	3.71	Peak	174	346
5	7386.00	43.27	54.00	-10.73	34.72	8.55	Average	100	332
6	7386.00	51.70	74.00	-22.30	43.15	8.55	Peak	100	332

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

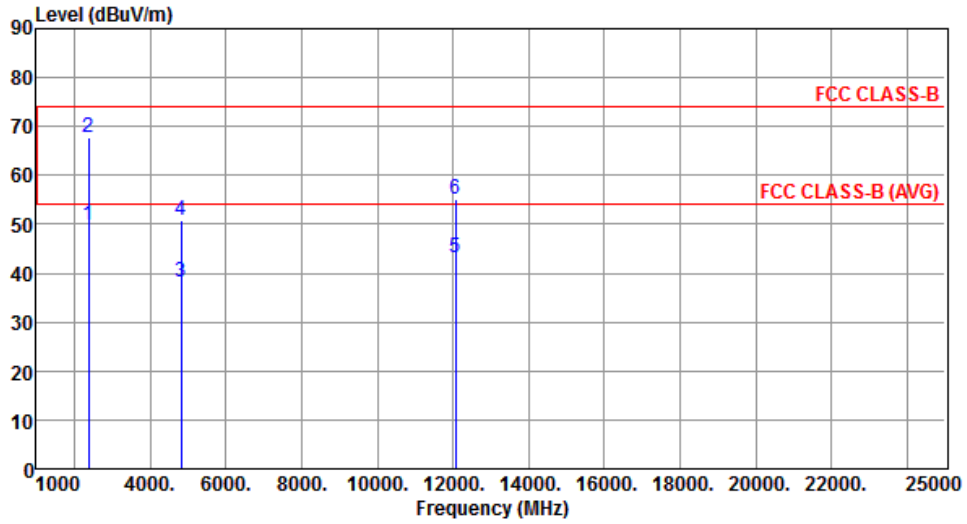
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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

Modulation	11g	Test Freq. (MHz)	2412						
Polarization	Horizontal								
									
Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table	
MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg	
1	2390.00	53.71	54.00	-0.29	56.78	-3.07	Average	216	329
2	2390.00	71.55	74.00	-2.45	74.62	-3.07	Peak	216	329
3	4824.00	36.77	54.00	-17.23	33.24	3.53	Average	152	344
4	4824.00	49.39	74.00	-24.61	45.86	3.53	Peak	152	344
5	12060.00	44.07	54.00	-9.93	30.80	13.27	Average	100	350
6	12060.00	55.87	74.00	-18.13	42.60	13.27	Peak	100	350

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)	2412
Polarization	Vertical		



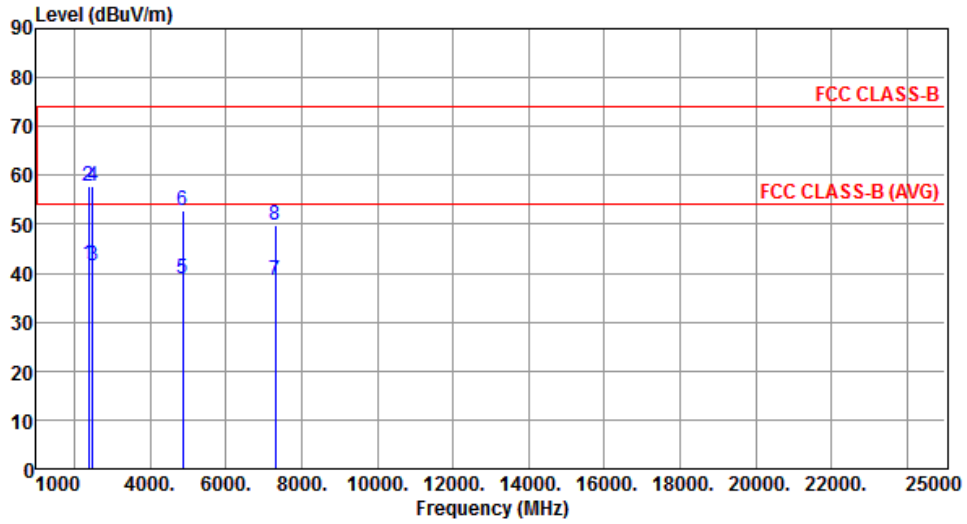
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.77	54.00	-4.23	52.84	-3.07	Average	177	306
2	2390.00	67.78	74.00	-6.22	70.85	-3.07	Peak	177	306
3	4824.00	38.13	54.00	-15.87	34.60	3.53	Average	175	344
4	4824.00	50.98	74.00	-23.02	47.45	3.53	Peak	175	344
5	12060.00	43.16	54.00	-10.84	29.89	13.27	Average	100	30
6	12060.00	55.24	74.00	-18.76	41.97	13.27	Peak	100	30

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	Horizontal		



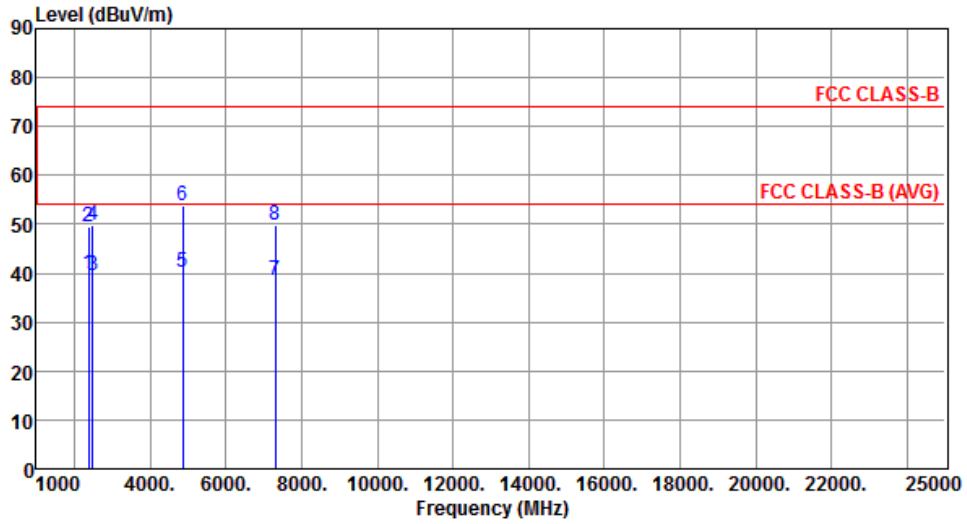
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	41.75	54.00	-12.25	44.82	-3.07	Average	200	314
2	2390.00	57.81	74.00	-16.19	60.88	-3.07	Peak	200	314
3	2483.50	41.68	54.00	-12.32	44.90	-3.22	Average	200	314
4	2483.50	57.79	74.00	-16.21	61.01	-3.22	Peak	200	314
5	4874.00	39.00	54.00	-15.00	35.40	3.60	Average	162	342
6	4874.00	52.73	74.00	-21.27	49.13	3.60	Peak	162	342
7	7311.00	38.48	54.00	-15.52	29.66	8.82	Average	100	165
8	7311.00	49.95	74.00	-24.05	41.13	8.82	Peak	100	165

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		



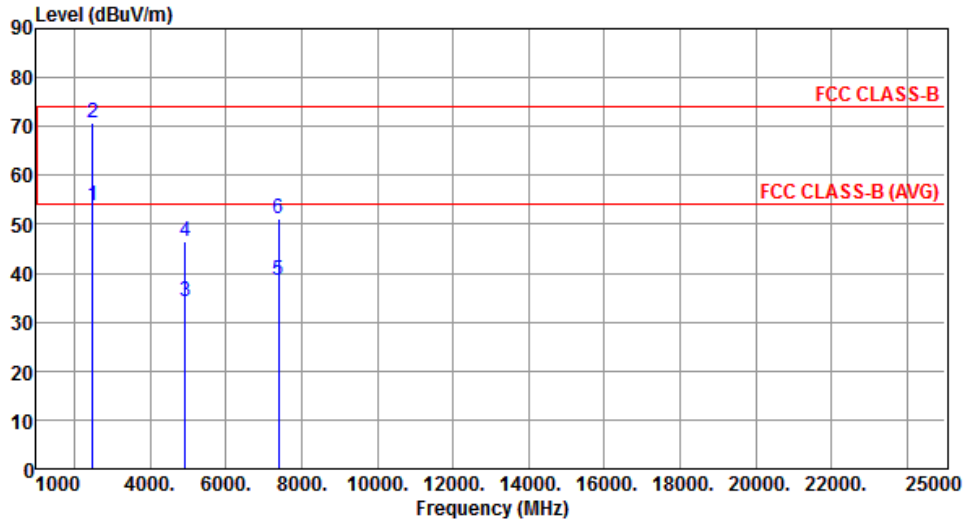
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.77	54.00	-14.23	42.84	-3.07	Average	206	321
2	2390.00	49.57	74.00	-24.43	52.64	-3.07	Peak	206	321
3	2483.50	39.67	54.00	-14.33	42.89	-3.22	Average	206	321
4	2483.50	49.74	74.00	-24.26	52.96	-3.22	Peak	206	321
5	4874.00	40.16	54.00	-13.84	36.56	3.60	Average	178	342
6	4874.00	53.78	74.00	-20.22	50.18	3.60	Peak	178	342
7	7311.00	38.56	54.00	-15.44	29.74	8.82	Average	100	330
8	7311.00	49.90	74.00	-24.10	41.08	8.82	Peak	100	330

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)	2462
Polarization	Horizontal		



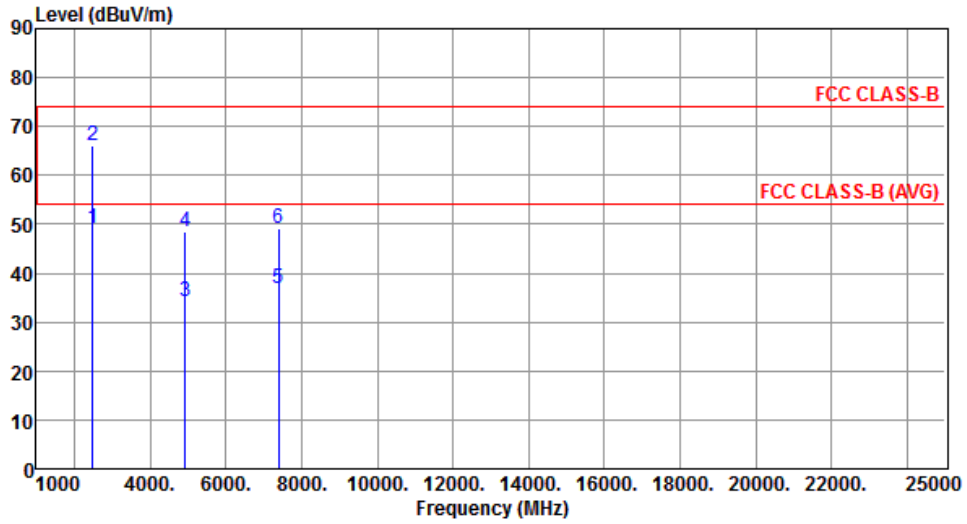
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.66	54.00	-0.34	56.88	-3.22	Average	230	332
2	2483.50	70.76	74.00	-3.24	73.98	-3.22	Peak	230	332
3	4924.00	34.23	54.00	-19.77	30.52	3.71	Average	152	331
4	4924.00	46.56	74.00	-27.44	42.85	3.71	Peak	152	331
5	7386.00	38.49	54.00	-15.51	29.94	8.55	Average	100	162
6	7386.00	51.09	74.00	-22.91	42.54	8.55	Peak	100	162

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)	2462
Polarization	Vertical		



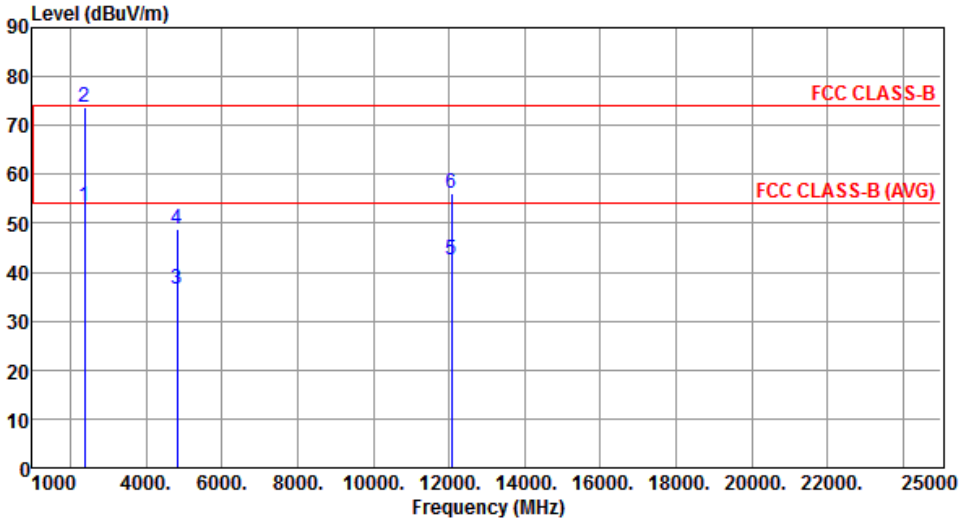
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	49.19	54.00	-4.81	52.41	-3.22	Average	186	305
2	2483.50	65.99	74.00	-8.01	69.21	-3.22	Peak	186	305
3	4924.00	34.23	54.00	-19.77	30.52	3.71	Average	175	344
4	4924.00	48.50	74.00	-25.50	44.79	3.71	Peak	175	344
5	7386.00	36.78	54.00	-17.22	28.23	8.55	Average	100	40
6	7386.00	49.08	74.00	-24.92	40.53	8.55	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

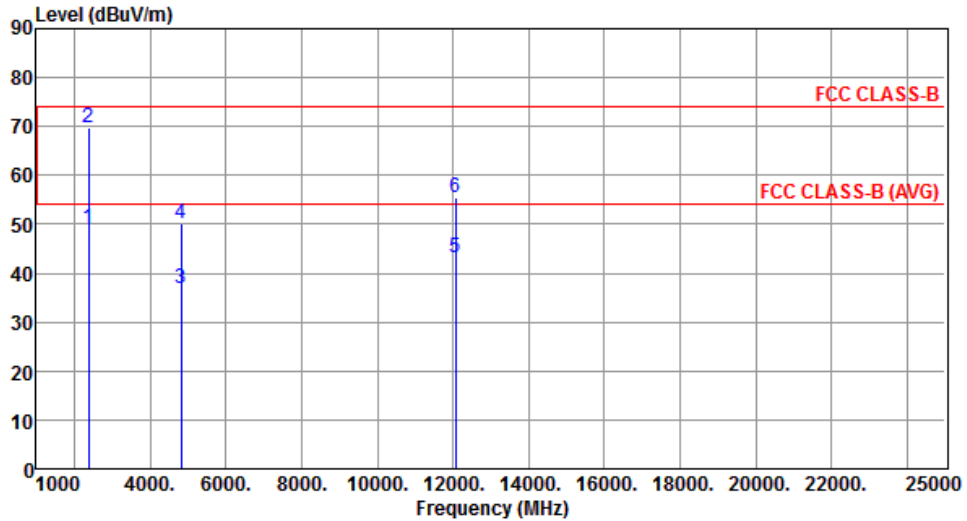
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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

Modulation	HT20	Test Freq. (MHz)	2412						
Polarization	Horizontal								
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2390.00	53.56	54.00	-0.44	56.63	-3.07	Average	236	311
2	2390.00	73.66	74.00	-0.34	76.73	-3.07	Peak	236	311
3	4824.00	36.47	54.00	-17.53	32.94	3.53	Average	154	342
4	4824.00	48.75	74.00	-25.25	45.22	3.53	Peak	154	342
5	12060.00	42.67	54.00	-11.33	29.40	13.27	Average	100	156
6	12060.00	56.21	74.00	-17.79	42.94	13.27	Peak	100	156

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	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



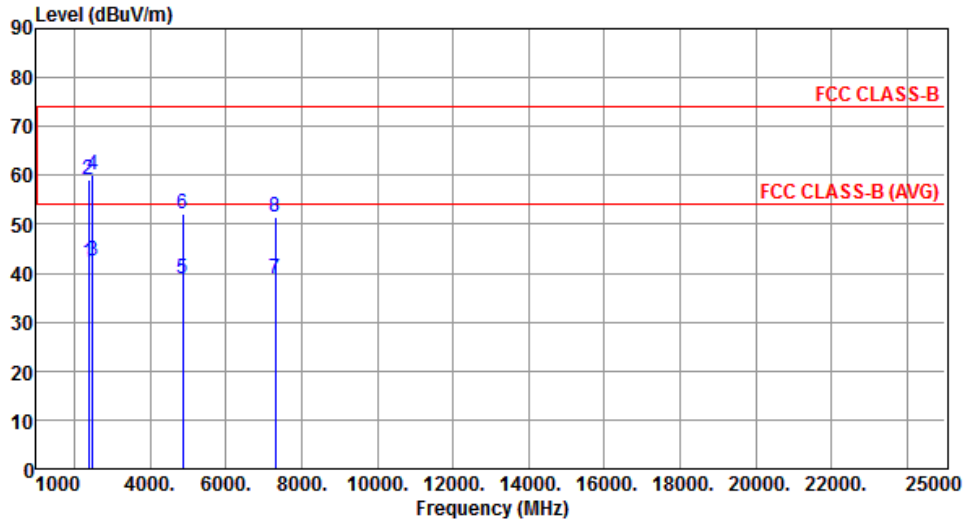
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.07	54.00	-4.93	52.14	-3.07	Average	183	312
2	2390.00	69.77	74.00	-4.23	72.84	-3.07	Peak	183	312
3	4824.00	36.97	54.00	-17.03	33.44	3.53	Average	177	345
4	4824.00	50.08	74.00	-23.92	46.55	3.53	Peak	177	345
5	12060.00	43.12	54.00	-10.88	29.85	13.27	Average	100	30
6	12060.00	55.59	74.00	-18.41	42.32	13.27	Peak	100	30

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	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



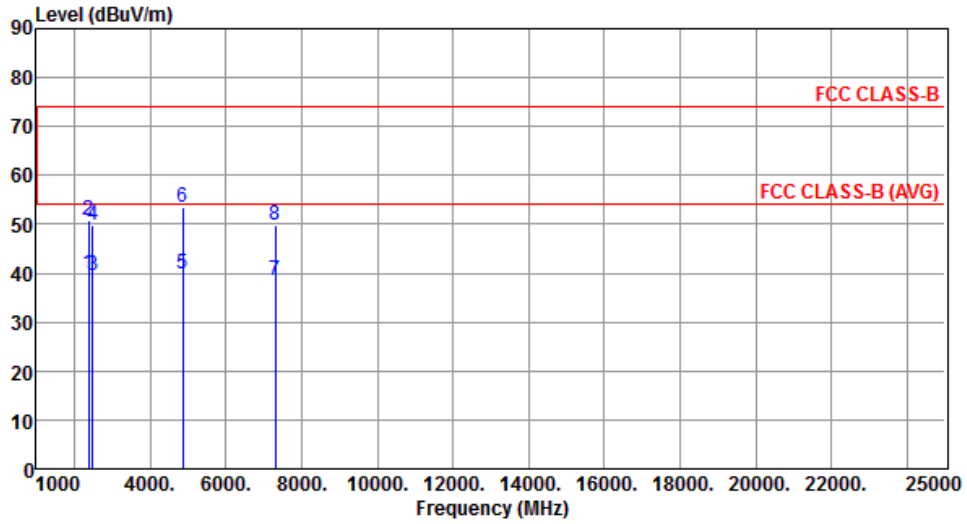
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.16	54.00	-11.84	45.23	-3.07	Average	196	314
2	2390.00	58.96	74.00	-15.04	62.03	-3.07	Peak	196	314
3	2483.50	42.36	54.00	-11.64	45.58	-3.22	Average	196	314
4	2483.50	60.07	74.00	-13.93	63.29	-3.22	Peak	196	314
5	4874.00	38.77	54.00	-15.23	35.17	3.60	Average	199	325
6	4874.00	52.11	74.00	-21.89	48.51	3.60	Peak	199	325
7	7311.00	39.02	54.00	-14.98	30.20	8.82	Average	100	147
8	7311.00	51.62	74.00	-22.38	42.80	8.82	Peak	100	147

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	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



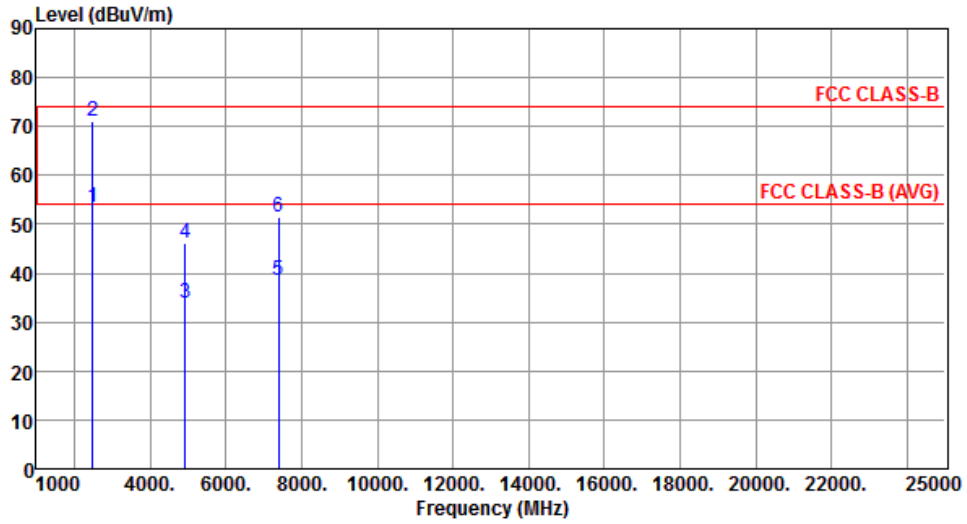
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.77	54.00	-14.23	42.84	-3.07	Average	192	302
2	2390.00	50.77	74.00	-23.23	53.84	-3.07	Peak	192	302
3	2483.50	39.68	54.00	-14.32	42.90	-3.22	Average	192	302
4	2483.50	49.72	74.00	-24.28	52.94	-3.22	Peak	192	302
5	4874.00	39.98	54.00	-14.02	36.38	3.60	Average	176	342
6	4874.00	53.52	74.00	-20.48	49.92	3.60	Peak	176	342
7	7311.00	38.49	54.00	-15.51	29.67	8.82	Average	100	335
8	7311.00	49.95	74.00	-24.05	41.13	8.82	Peak	100	335

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	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



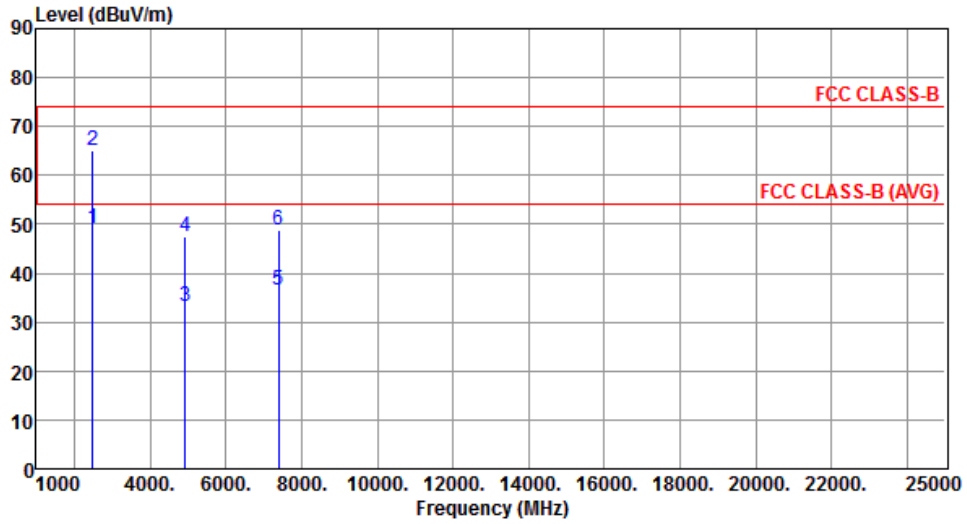
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.52	54.00	-0.48	56.74	-3.22	Average	230	334
2	2483.50	71.18	74.00	-2.82	74.40	-3.22	Peak	230	334
3	4924.00	33.72	54.00	-20.28	30.01	3.71	Average	100	327
4	4924.00	46.13	74.00	-27.87	42.42	3.71	Peak	100	327
5	7386.00	38.49	54.00	-15.51	29.94	8.55	Average	100	156
6	7386.00	51.49	74.00	-22.51	42.94	8.55	Peak	100	156

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	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		



	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	49.19	54.00	-4.81	52.41	-3.22	Average	186	321
2	2483.50	64.99	74.00	-9.01	68.21	-3.22	Peak	186	321
3	4924.00	33.31	54.00	-20.69	29.60	3.71	Average	177	345
4	4924.00	47.43	74.00	-26.57	43.72	3.71	Peak	177	345
5	7386.00	36.68	54.00	-17.32	28.13	8.55	Average	100	30
6	7386.00	48.75	74.00	-25.25	40.20	8.55	Peak	100	30

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).

3.6 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

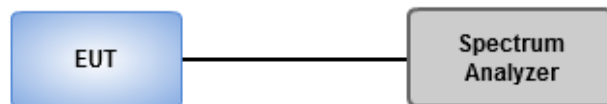
Reference level measurement

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

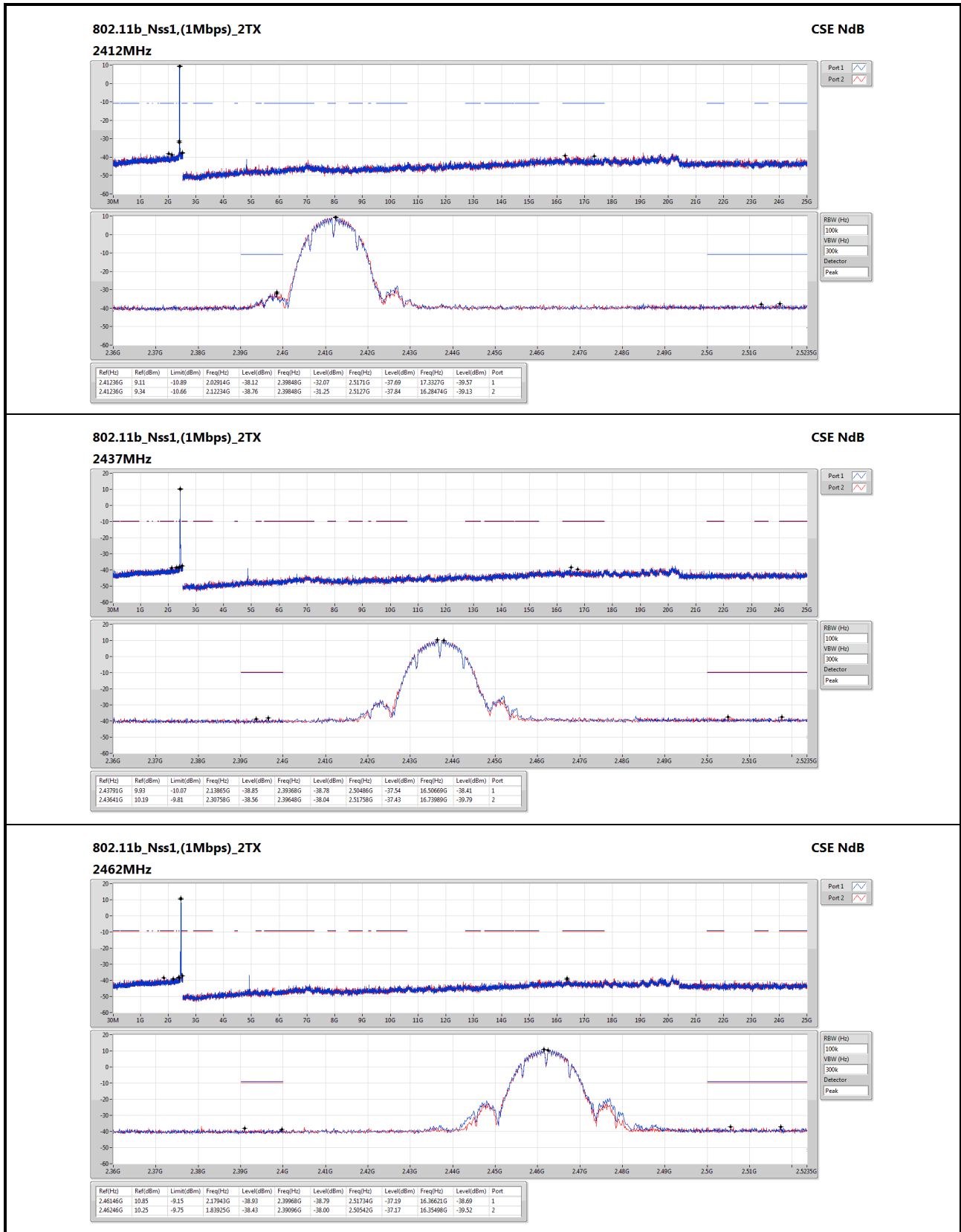
Emission level measurement

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

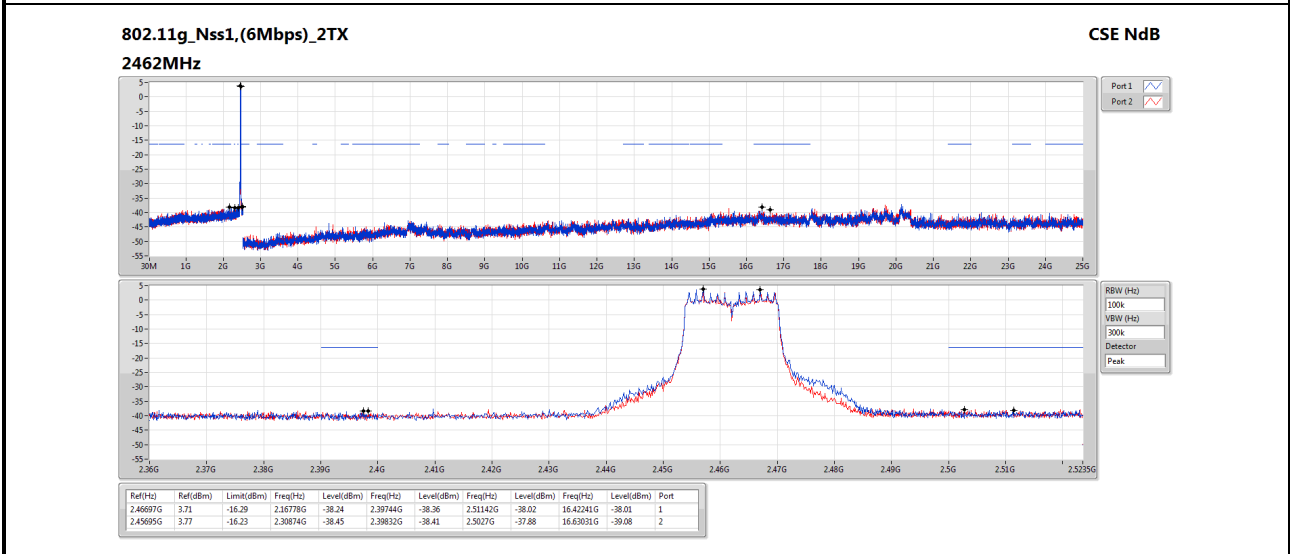
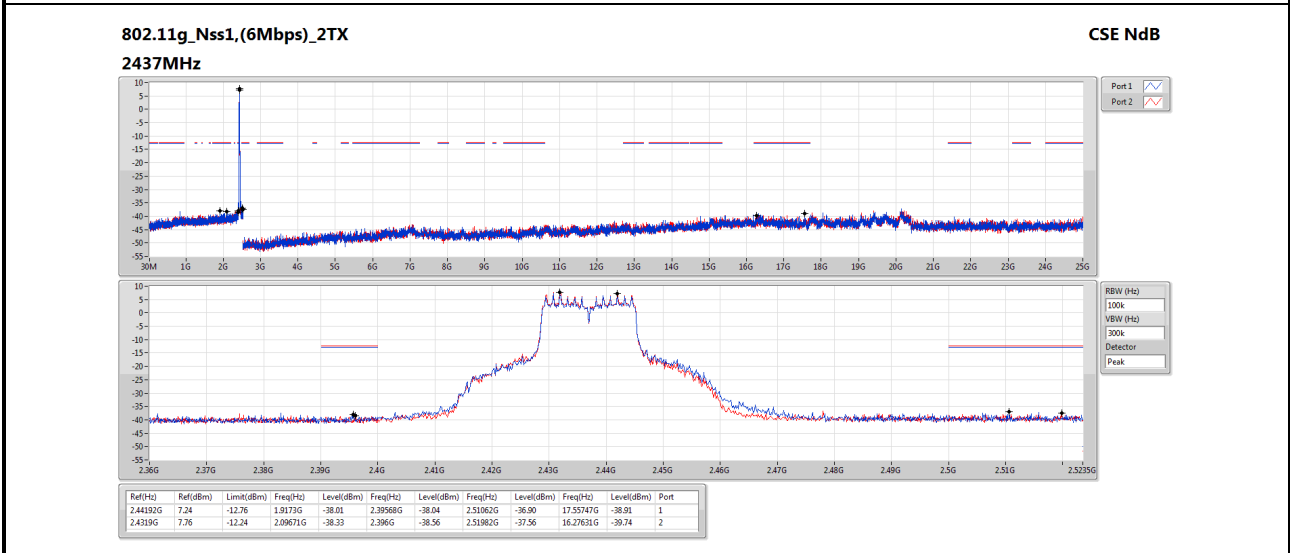
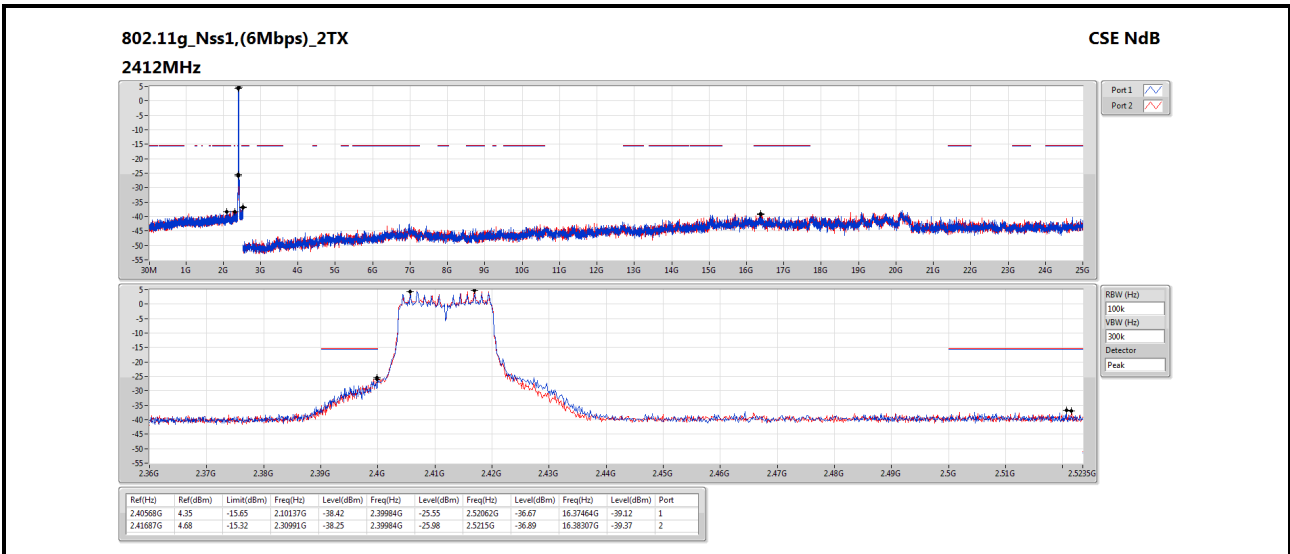
3.6.3 Test Setup

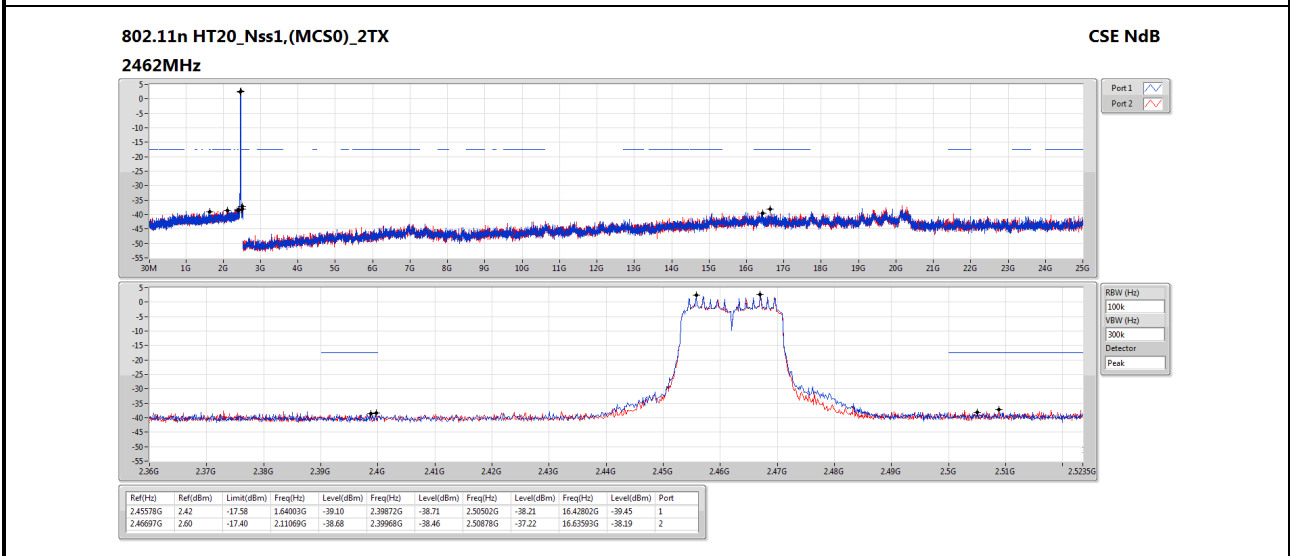
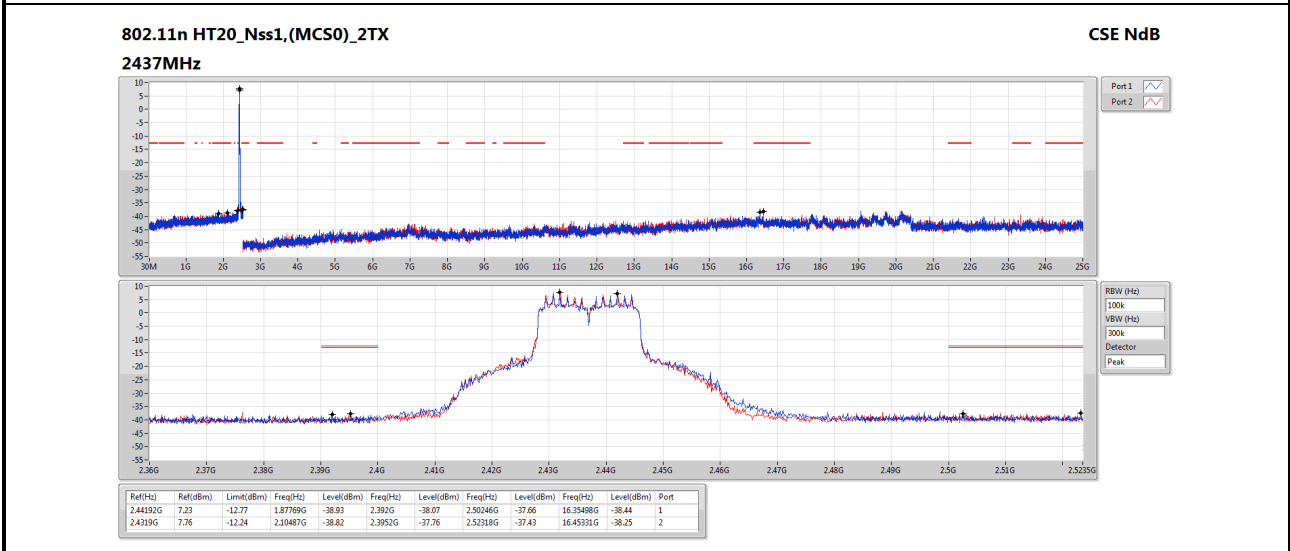
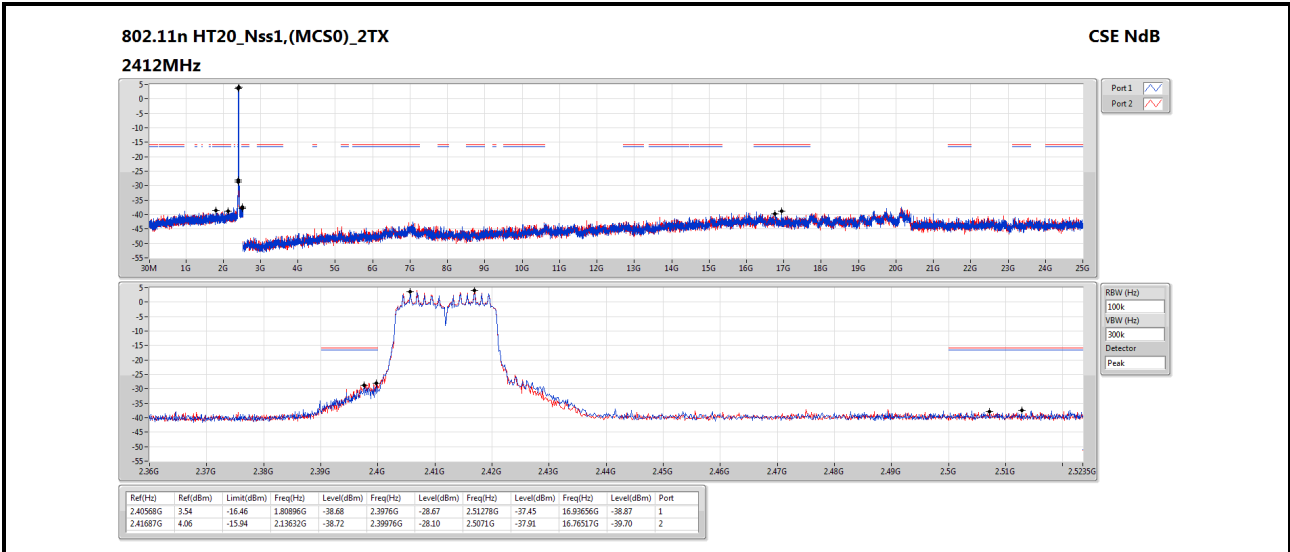


3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands


802.11b_Nss1,(1Mbps)_2TX
CSE NdB
2462MHz
Port 1
Port 2

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
246146G	10.85	-9.15	2.17943G	-38.93	2.39998G	-38.79	2.51734G	-37.19	16.36621G	-38.69	1
246246G	10.25	-9.75	1.83925G	-38.43	2.39096G	-38.00	2.50542G	-37.17	16.35498G	-39.52	2





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 Corp (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 District, Tao Yuan City
333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd
St., Kwei Shan District, 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==