

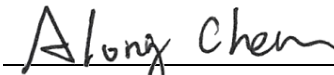
# FCC Test Report

**FCC ID** : P27RP324  
**Equipment** : AC2100 Wi-Fi Mesh Extender  
**Model No.** : RP324  
**Multiple Listing** : Refer to item 1.1.1 for more details.  
**Brand Name** : Sercomm  
**Applicant** : Sercomm Corporation  
**Address** : 8F, No. 3-1, YuanQu St., NanKang, Taipei 115,  
Taiwan, R.O.C.  
**Standard** : 47 CFR FCC Part 15.247  
**Received Date** : Oct. 02, 2019  
**Tested Date** : Oct. 05 ~ Nov. 12, 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:

Approved by:

  
\_\_\_\_\_  
Along Chen / Assistant Manager

  
\_\_\_\_\_  
Gary Chang / Manager



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## Release Record

Report No.	Version	Description	Issued Date
FR9O0208AC	Rev. 01	Initial issue	Dec. 09, 2019

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.375MHz 43.50 (Margin -4.89dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz 52.94 (Margin -1.06dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 27.43	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 Product Details

The following models are provided to this EUT.

Model Name	Description
RP324	Main tested model.
RP324XX	the 1st X should be "blank" or "-"; the rest X could be 0 to 9, A to Z, "blank" or "-", for marketing purpose.
† All models are electrically identical, different model names are for marketing purpose.	

### 1.1.2 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 <sub>TX</sub> )	Data Rate / MCS
2400-2483.5	b	2412-2462	1-11 [11]	2	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	2	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	MCS 0-15
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	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.					

### 1.1.3 Antenna Details

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)		
				2400~2483.5	5150~5250	5725~5850
1	RP324	Dipole	i-pex	2.37	2.38	2.3
2	RP324	Dipole	i-pex	3.14	3.25	3.14
3	RP324	PIFA	NA	--	3.04	3.13
4	RP324	PIFA	NA	--	3.14	3.2

### 1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12V/1A
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### 1.1.5 Accessories

N/A

### 1.1.6 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	---	---
9	2452	---	---
10	2457	---	---
11	2462	---	---

### 1.1.7 Test Tool and Duty Cycle

Test Tool	MT7615 QA, V0.0.2.0		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11b	100.00%	0.00
	11g	97.07%	0.13
	HT20	95.78%	0.19
	HT40	90.57%	0.43

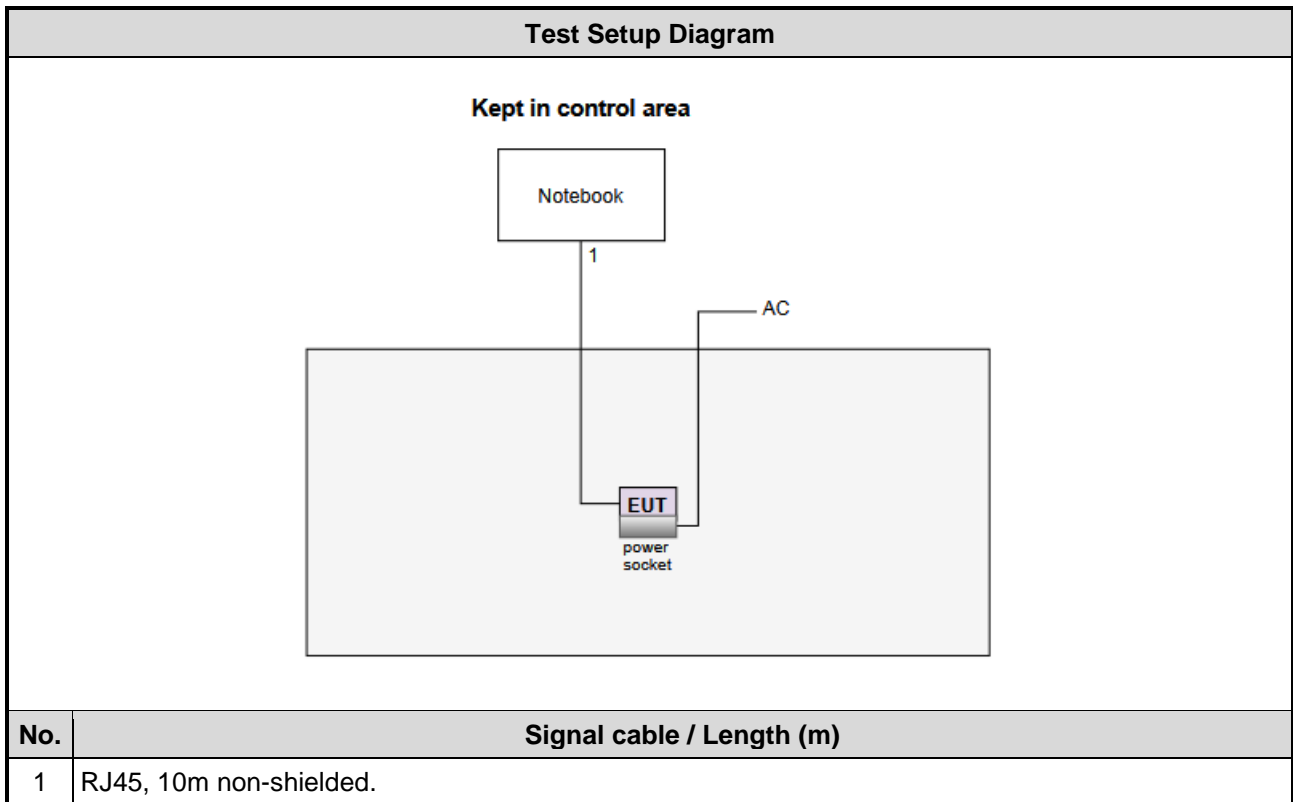
### 1.1.8 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	21/1F
11b	2437	24/22
11b	2462	24/22
11g	2412	1C/1A
11g	2437	24/22
11g	2462	1E/1C
HT20	2412	1A/18
HT20	2437	24/22
HT20	2462	1C/1A
HT40	2422	15/13
HT40	2437	1E/1C
HT40	2452	18/16

## 1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E6430	DoC	---

## 1.3 Test Setup Chart





## 1.4 The Equipment List

<b>Test Item</b>	Conducted Emission				
<b>Test Site</b>	Conduction room 1 / (CO01-WS)				
<b>Tested Date</b>	Oct. 21, 2019				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Receiver	R&S	ESR3	101657	Jan. 08, 2019	Jan. 07, 2020
LISN	R&S	ENV216	101579	Mar. 08, 2019	Mar. 07, 2020
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 23, 2018	Oct. 22, 2019
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	Radiated Emission				
<b>Test Site</b>	966 chamber 3 / (03CH03-WS)				
<b>Tested Date</b>	Oct. 05 ~ Oct. 07, 2019				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Spectrum Analyzer	R&S	FSV40	101499	Jan. 07, 2019	Jan. 06, 2020
Receiver	R&S	ESR3	101658	Dec. 11, 2018	Dec. 10, 2019
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 17, 2019	Apr. 16, 2020
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Jan. 07, 2019	Jan. 06, 2020
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	980187	Aug. 14, 2019	Aug. 13, 2020
Preamplifier	Agilent	83017A	MY53270014	Aug. 07, 2019	Aug. 06, 2020
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Sep. 27, 2019	Sep. 26, 2020
RF cable-8M	EMC	EMC104-SM-SM-8000	181107	Sep. 27, 2019	Sep. 26, 2020
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Sep. 27, 2019	Sep. 26, 2020
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Sep. 27, 2019	Sep. 26, 2020
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Sep. 27, 2019	Sep. 26, 2020
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Sep. 27, 2019	Sep. 26, 2020
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	RF Conducted				
<b>Test Site</b>	(TH01-WS)				
<b>Tested Date</b>	Nov. 12, 2019				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Spectrum Analyzer	R&S	FSV40	101063	Apr. 17, 2019	Apr. 16, 2020
Power Meter	Anritsu	ML2495A	1241002	Oct. 23, 2019	Oct. 22, 2020
Power Sensor	Anritsu	MA2411B	1207366	Oct. 23, 2019	Oct. 22, 2020
AC POWER SOURCE	APC	AFC-500W	F312060012	Nov. 29, 2018	Nov. 28, 2019
Measurement Software	Sporton	Sporton_1	1.3.30	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 ≤ 1GHz	±3.96 dB
Radiated emission > 1GHz	±4.51 dB

## 2 Test Configuration

### 2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	24°C / 58%	Alex Tsai
Radiated Emissions	03CH03-WS	24-25°C / 61-63%	Roger Lu
RF Conducted	TH01-WS	21°C / 63%	Brad Wu

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- 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	
	HT20	2412 / 2437 / 2462	MCS 0	
Power spectral density	HT40	2422 / 2437 / 2452	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 **X-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  $\Omega$  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

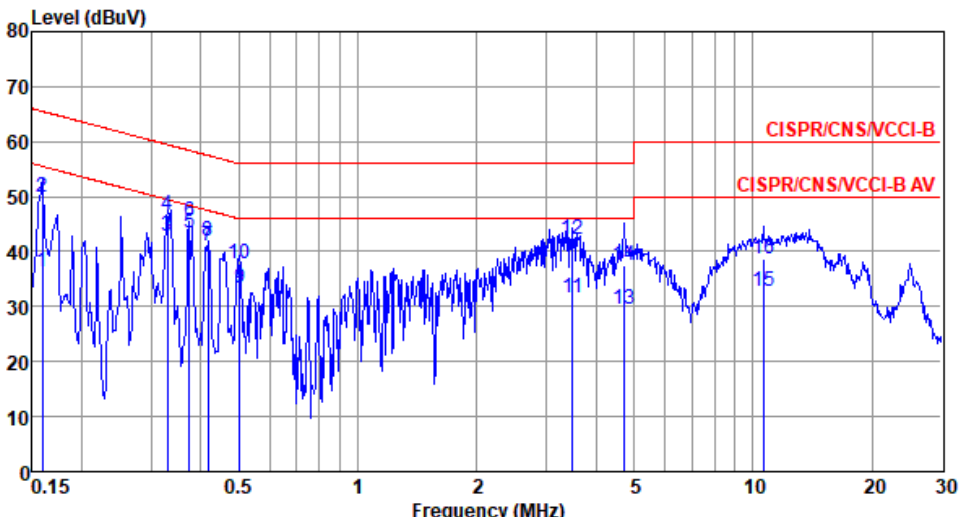


- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

### 3.1.4 Test Result of Conducted Emissions

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2437
<b>Power Phase</b>	Line		

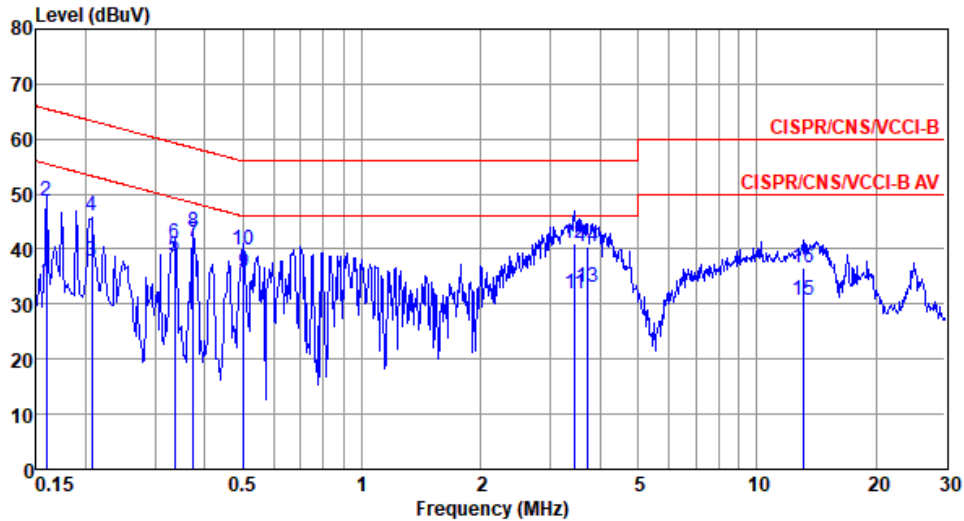
  



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	36.20	55.52	-19.32	26.49	9.53	0.05	Average
2	0.159	49.81	65.52	-15.71	40.10	9.53	0.05	QP
3	0.330	42.79	49.44	-6.65	32.91	9.56	0.08	Average
4	0.330	46.76	59.44	-12.68	36.88	9.56	0.08	QP
5*	0.375	43.50	48.39	-4.89	33.60	9.57	0.08	Average
6	0.375	45.53	58.39	-12.86	35.63	9.57	0.08	QP
7	0.417	40.95	47.51	-6.56	31.04	9.57	0.08	Average
8	0.417	41.99	57.51	-15.52	32.08	9.57	0.08	QP
9	0.502	33.46	46.00	-12.54	23.53	9.58	0.08	Average
10	0.502	37.83	56.00	-18.17	27.90	9.58	0.08	QP
11	3.491	31.65	46.00	-14.35	21.40	9.61	0.26	Average
12	3.491	42.19	56.00	-13.81	31.94	9.61	0.26	QP
13	4.721	29.42	46.00	-16.58	19.11	9.62	0.31	Average
14	4.721	37.44	56.00	-18.56	27.13	9.62	0.31	QP
15	10.620	32.81	50.00	-17.19	22.29	9.65	0.46	Average
16	10.620	38.81	60.00	-21.19	28.29	9.65	0.46	QP

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

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2437
<b>Power Phase</b>	Neutral		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	33.83	55.52	-21.69	24.09	9.57	0.05	Average
2	0.159	48.78	65.52	-16.74	39.04	9.57	0.05	QP
3	0.207	37.65	53.32	-15.67	27.86	9.58	0.07	Average
4	0.207	45.93	63.32	-17.39	36.14	9.58	0.07	QP
5	0.336	38.80	49.31	-10.51	28.99	9.60	0.08	Average
6	0.336	40.93	59.31	-18.38	31.12	9.60	0.08	QP
7*	0.375	41.41	48.39	-6.98	31.60	9.61	0.08	Average
8	0.375	43.13	58.39	-15.26	33.32	9.61	0.08	QP
9	0.502	35.64	46.00	-10.36	25.79	9.62	0.08	Average
10	0.502	39.86	56.00	-16.14	30.01	9.62	0.08	QP
11	3.454	31.79	46.00	-14.21	21.62	9.66	0.25	Average
12	3.454	41.09	56.00	-14.91	30.92	9.66	0.25	QP
13	3.720	32.95	46.00	-13.05	22.76	9.66	0.27	Average
14	3.720	40.40	56.00	-15.60	30.21	9.66	0.27	QP
15	13.057	30.77	50.00	-19.23	20.18	9.75	0.52	Average
16	13.057	36.65	60.00	-23.35	26.06	9.75	0.52	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).  
 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	9.493M	14.544M	14M5G1D	8.623M	14.255M
802.11g_Nss1,(6Mbps)_2TX	15.072M	16.57M	16M6D1D	13.768M	16.353M
802.11n HT20_Nss1,(MCS0)_2TX	15.072M	17.728M	17M7D1D	13.333M	17.511M
802.11n HT40_Nss1,(MCS0)_2TX	35.072M	36.179M	36M2D1D	32.609M	35.89M

**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	9.493M	14.255M	8.986M	14.399M
2437MHz	Pass	500k	9.058M	14.399M	8.623M	14.544M
2462MHz	Pass	500k	9.493M	14.399M	9.13M	14.472M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	15.072M	16.353M	13.913M	16.353M
2437MHz	Pass	500k	13.768M	16.57M	14.42M	16.57M
2462MHz	Pass	500k	13.768M	16.425M	13.841M	16.425M
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	15.072M	17.511M	15.072M	17.511M
2437MHz	Pass	500k	15.072M	17.728M	13.333M	17.728M
2462MHz	Pass	500k	15.072M	17.511M	14.13M	17.511M
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	35.072M	35.89M	33.768M	35.89M
2437MHz	Pass	500k	32.609M	36.179M	32.609M	36.035M
2452MHz	Pass	500k	33.768M	36.035M	32.609M	35.89M

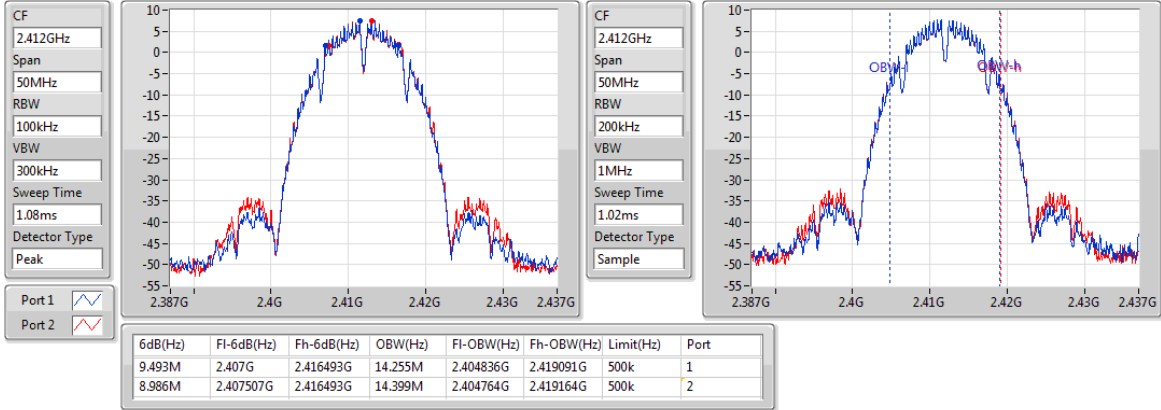
**Port X-N dB** = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;



### 802.11b\_Nss1,(1Mbps)\_2TX

EBW

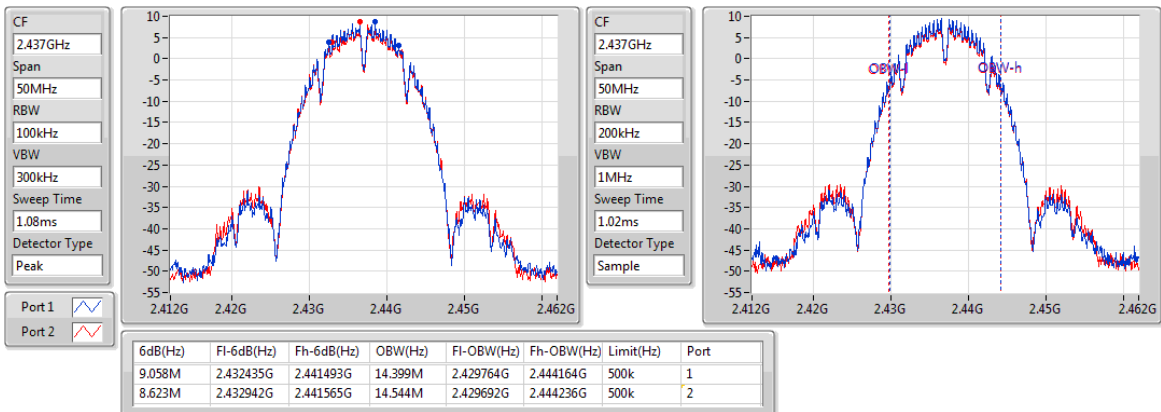
#### 2412MHz



### 802.11b\_Nss1,(1Mbps)\_2TX

EBW

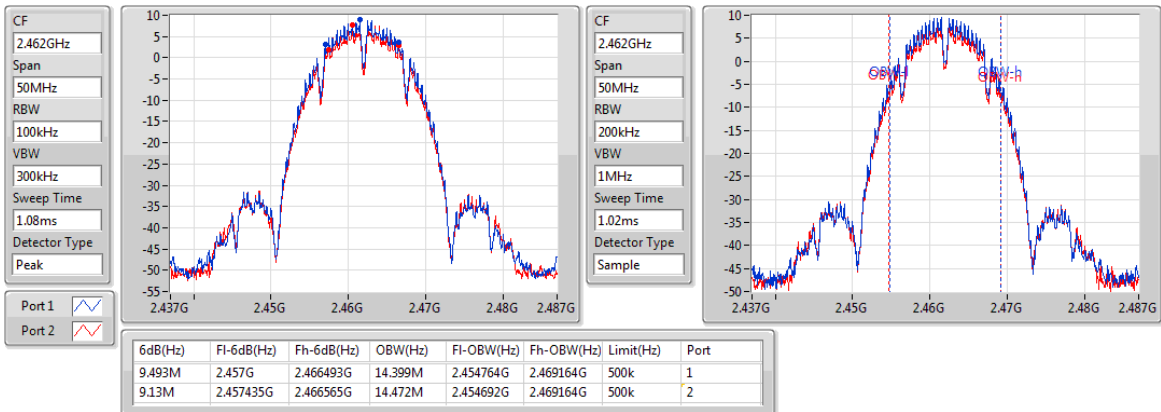
#### 2437MHz



### 802.11b\_Nss1,(1Mbps)\_2TX

EBW

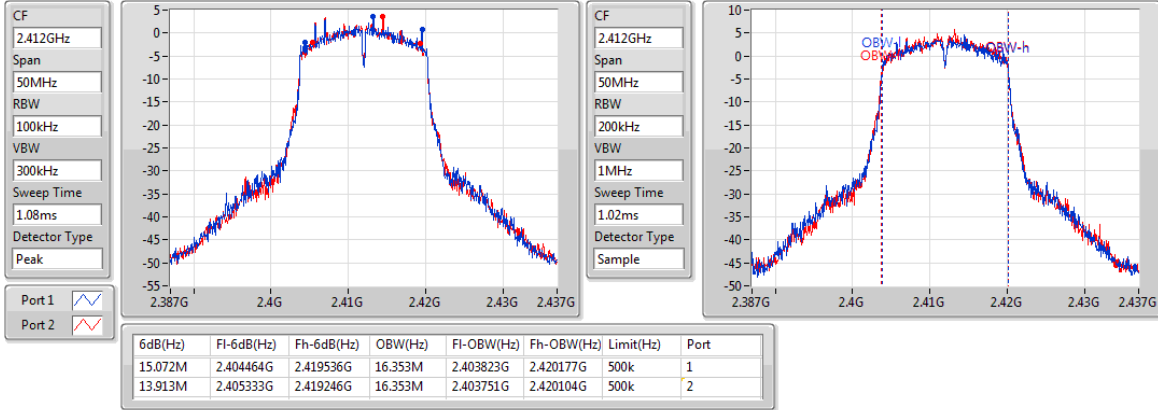
#### 2462MHz



### 802.11g\_Nss1,(6Mbps)\_2TX

EBW

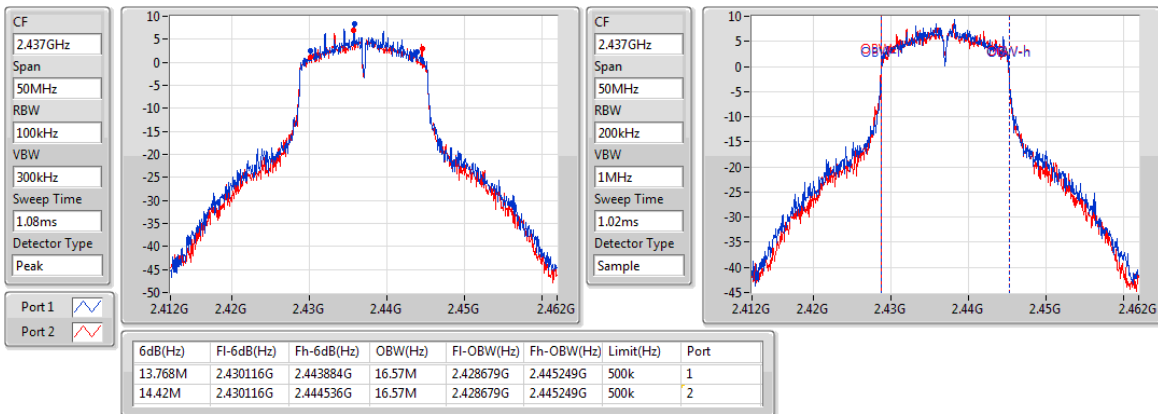
2412MHz



### 802.11g\_Nss1,(6Mbps)\_2TX

EBW

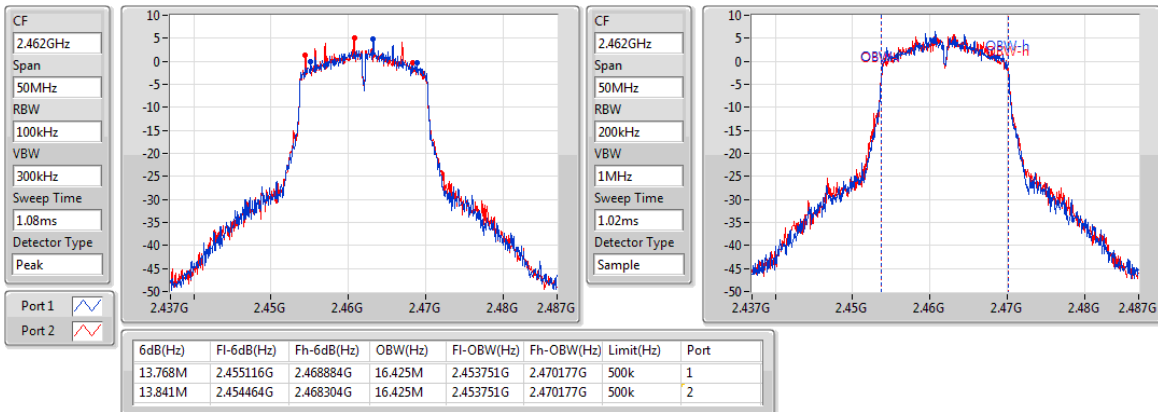
2437MHz



### 802.11g\_Nss1,(6Mbps)\_2TX

EBW

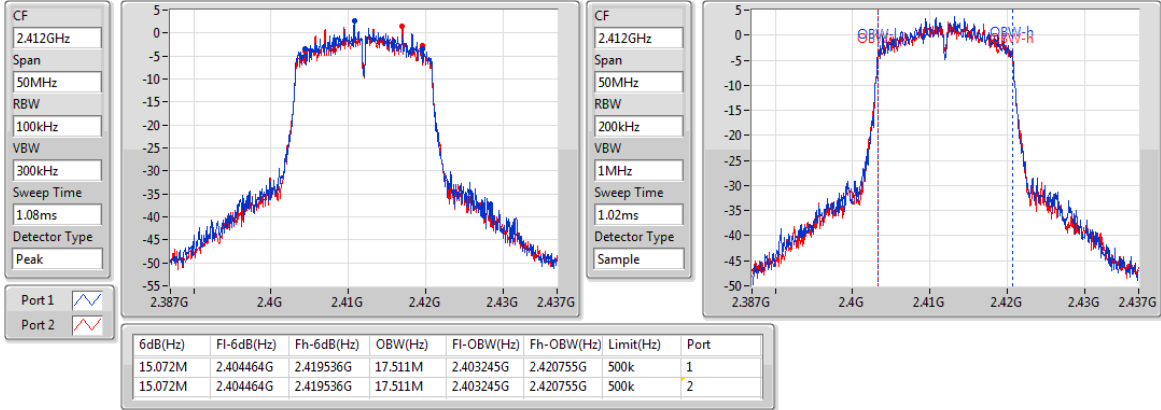
2462MHz



### 802.11n HT20\_Nss1,(MCS0)\_2TX

EBW

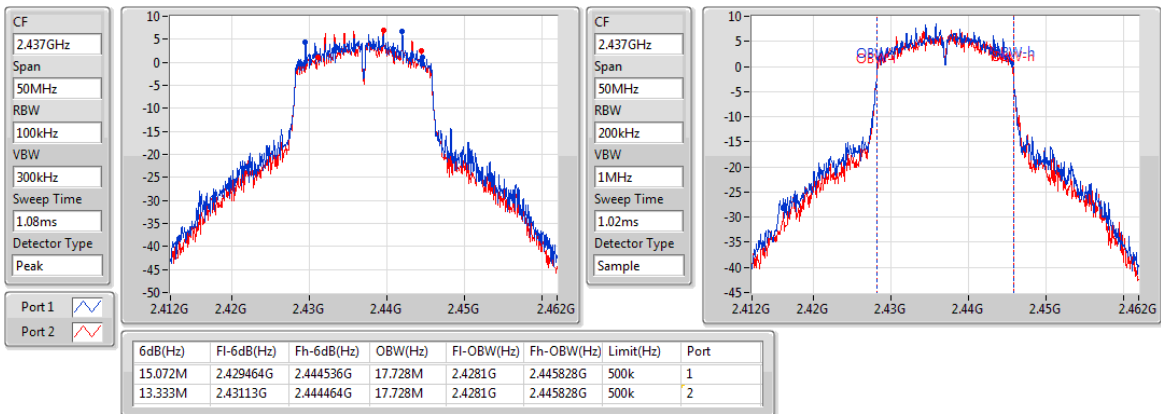
2412MHz



### 802.11n HT20\_Nss1,(MCS0)\_2TX

EBW

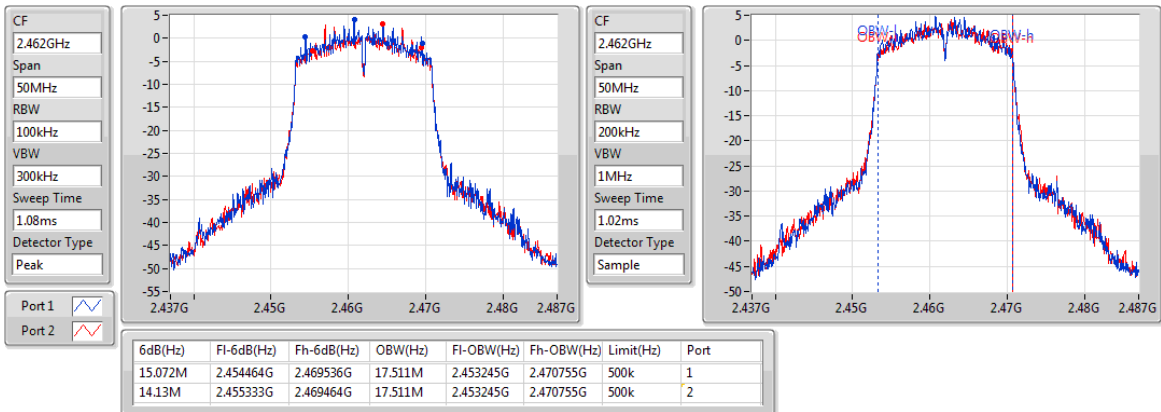
2437MHz



### 802.11n HT20\_Nss1,(MCS0)\_2TX

EBW

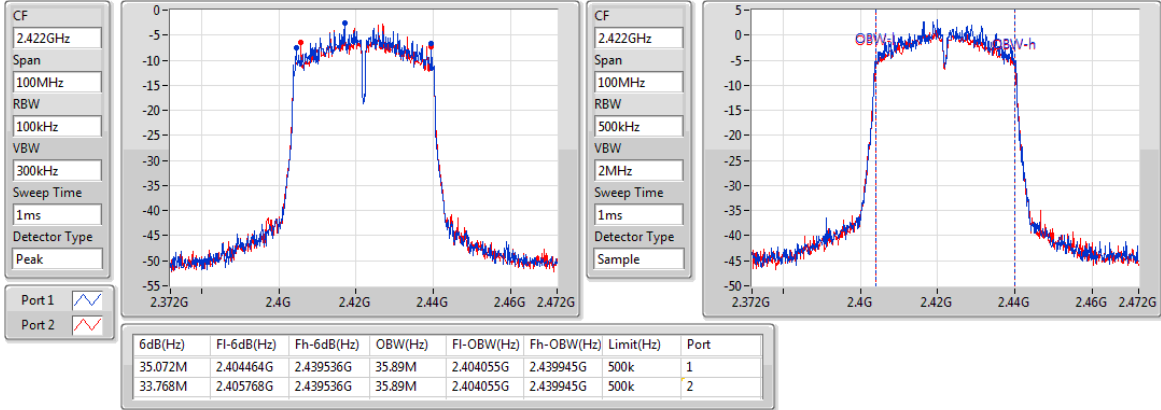
2462MHz



### 802.11n HT40\_Nss1,(MCS0)\_2TX

EBW

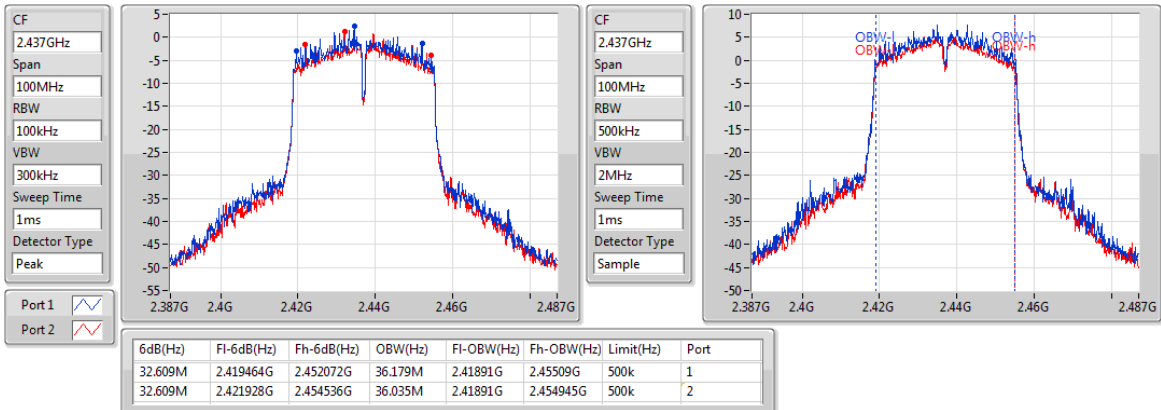
2422MHz



### 802.11n HT40\_Nss1,(MCS0)\_2TX

EBW

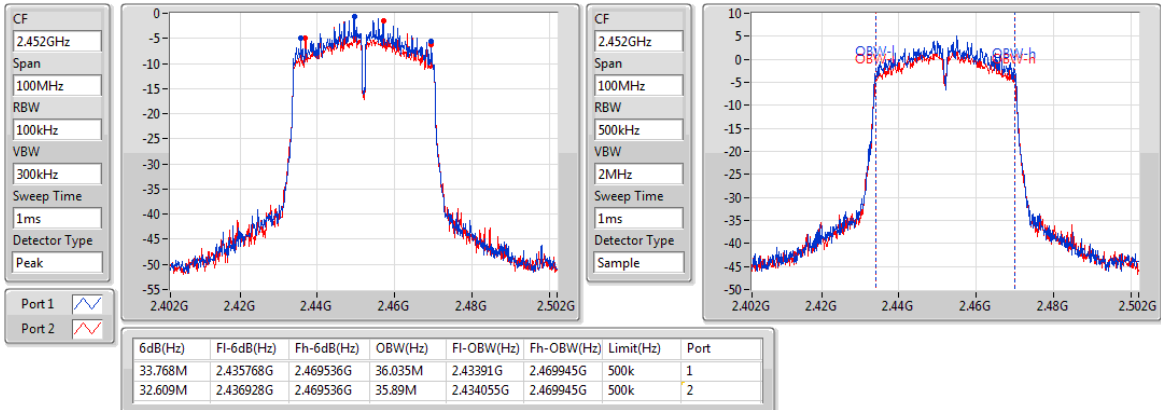
2437MHz



### 802.11n HT40\_Nss1,(MCS0)\_2TX

EBW

2452MHz



### 3.3 RF Output Power

#### 3.3.1 Limit of RF Output Power

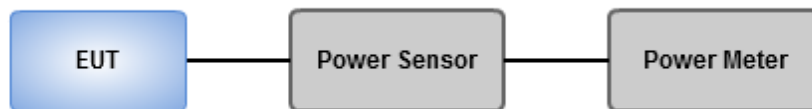
Conducted power shall not exceed 1Watt.

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	23.88	0.24434
802.11g_Nss1,(6Mbps)_2TX	27.38	0.54702
802.11n HT20_Nss1,(MCS0)_2TX	27.43	0.55335
802.11n HT40_Nss1,(MCS0)_2TX	26.15	0.41210

#### Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.14	19.18	19.74	22.48	30.00	25.62	36.00
2437MHz	Pass	3.14	20.84	20.06	23.48	30.00	26.62	36.00
2462MHz	Pass	3.14	20.77	20.96	23.88	30.00	27.02	36.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.14	22.91	23.16	26.05	30.00	29.19	36.00
2437MHz	Pass	3.14	24.14	24.59	27.38	30.00	30.52	36.00
2462MHz	Pass	3.14	23.53	23.66	26.61	30.00	29.75	36.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.14	22.06	22.15	25.12	30.00	28.26	36.00
2437MHz	Pass	3.14	24.22	24.62	27.43	30.00	30.57	36.00
2462MHz	Pass	3.14	23.03	22.75	25.90	30.00	29.04	36.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2422MHz	Pass	3.14	19.38	19.54	22.47	30.00	25.61	36.00
2437MHz	Pass	3.14	23.29	22.98	26.15	30.00	29.29	36.00
2452MHz	Pass	3.14	20.82	20.31	23.58	30.00	26.72	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	22.02	0.15922
802.11g_Nss1,(6Mbps)_2TX	22.77	0.18923
802.11n HT20_Nss1,(MCS0)_2TX	22.57	0.18072
802.11n HT40_Nss1,(MCS0)_2TX	19.05	0.08035

### Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.14	17.22	17.94	20.61	-	23.75	-
2437MHz	Pass	3.14	19.03	18.24	21.66	-	24.80	-
2462MHz	Pass	3.14	18.88	19.13	22.02	-	25.16	-
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.14	15.64	15.61	18.64	-	21.78	-
2437MHz	Pass	3.14	19.83	19.68	22.77	-	25.91	-
2462MHz	Pass	3.14	16.52	16.48	19.51	-	22.65	-
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	3.14	14.61	14.41	17.52	-	20.66	-
2437MHz	Pass	3.14	19.76	19.35	22.57	-	25.71	-
2462MHz	Pass	3.14	15.54	15.26	18.41	-	21.55	-
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2422MHz	Pass	3.14	11.55	11.75	14.66	-	17.80	-
2437MHz	Pass	3.14	16.26	15.8	19.05	-	22.19	-
2452MHz	Pass	3.14	13.24	12.55	15.92	-	19.06	-

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.

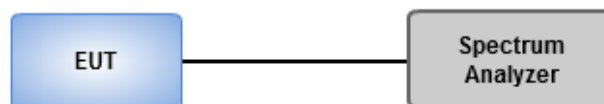
#### Average PSD, duty cycle $\geq$ 98%

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:  $\geq 10$  (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

#### Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_2TX	-3.01
802.11g_Nss1,(6Mbps)_2TX	-4.21
802.11n HT20_Nss1,(MCS0)_2TX	-6.64
802.11n HT40_Nss1,(MCS0)_2TX	-11.96

#### 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	5.77	-5.93	-6.46	-3.77	8.00
2437MHz	Pass	5.77	-5.21	-6.39	-3.18	8.00
2462MHz	Pass	5.77	-5.25	-5.05	-3.01	8.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.77	-11.34	-10.14	-7.69	8.00
2437MHz	Pass	5.77	-7.87	-6.65	-4.21	8.00
2462MHz	Pass	5.77	-10.17	-10.25	-7.49	8.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.77	-13.18	-13.60	-10.82	8.00
2437MHz	Pass	5.77	-8.78	-8.26	-6.64	8.00
2462MHz	Pass	5.77	-11.37	-13.19	-9.64	8.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	5.77	-18.46	-18.83	-15.98	8.00
2437MHz	Pass	5.77	-14.52	-14.76	-11.96	8.00
2452MHz	Pass	5.77	-17.02	-17.38	-14.69	8.00

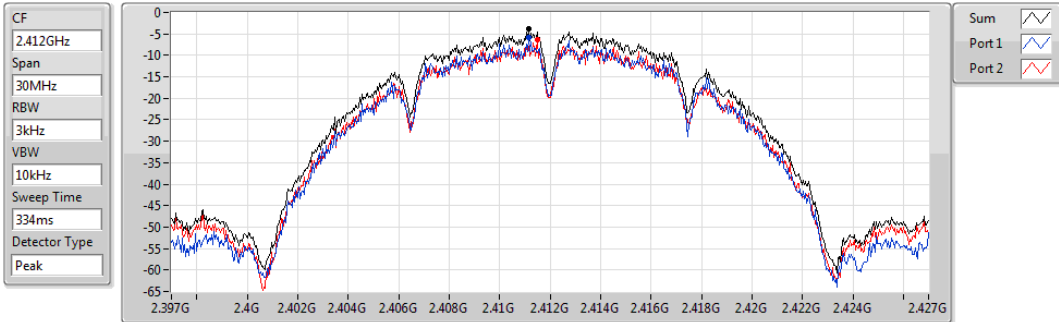
DG = Directional Gain=  $10 * \log((10^{2.47/20} + 10^{3.14/20})^2 / 2) = 5.77$  dBi;

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

### 802.11b\_Nss1,(1Mbps)\_2TX

PSD

2412MHz

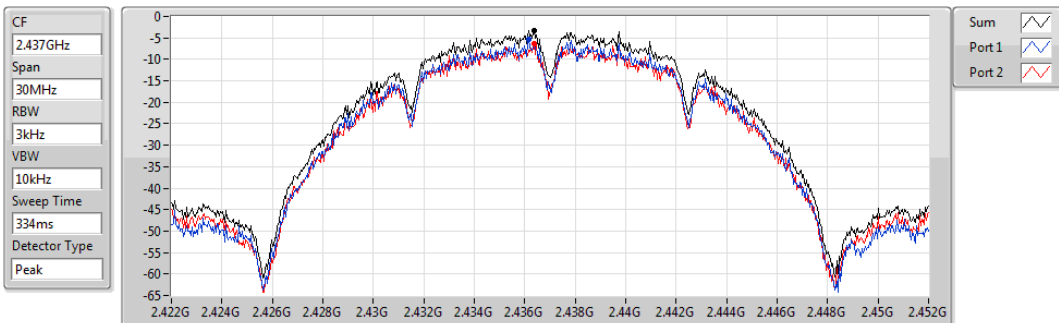


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.77	-3.77	-5.93	-6.46

### 802.11b\_Nss1,(1Mbps)\_2TX

PSD

2437MHz

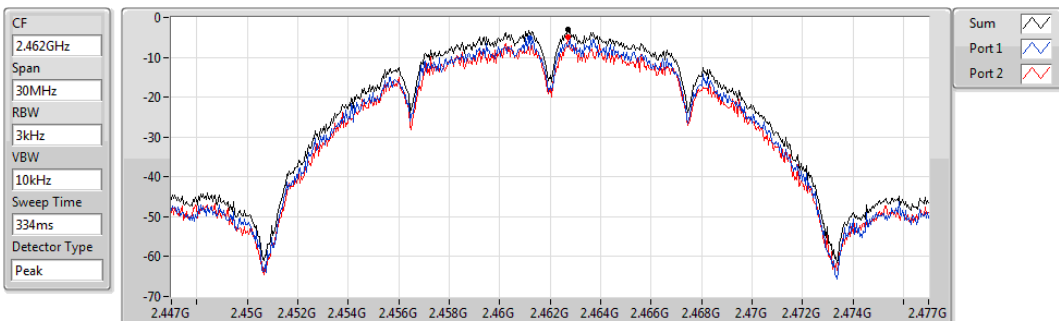


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.18	-3.18	-5.21	-6.39

### 802.11b\_Nss1,(1Mbps)\_2TX

PSD

2462MHz

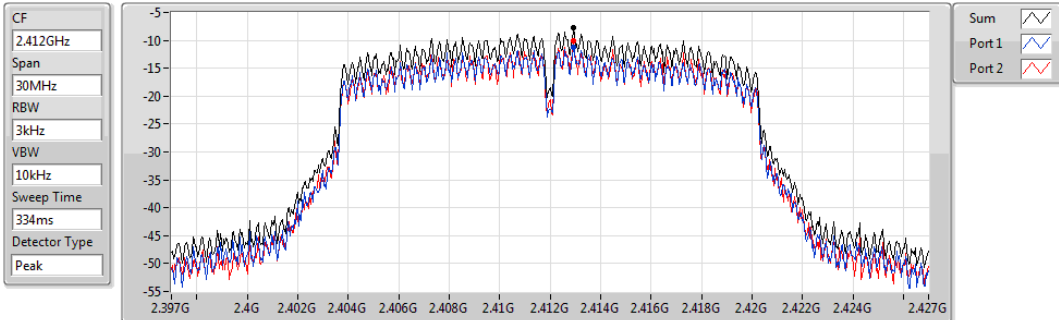


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.01	-3.01	-5.25	-5.05

### 802.11g\_Nss1,(6Mbps)\_2TX

PSD

2412MHz

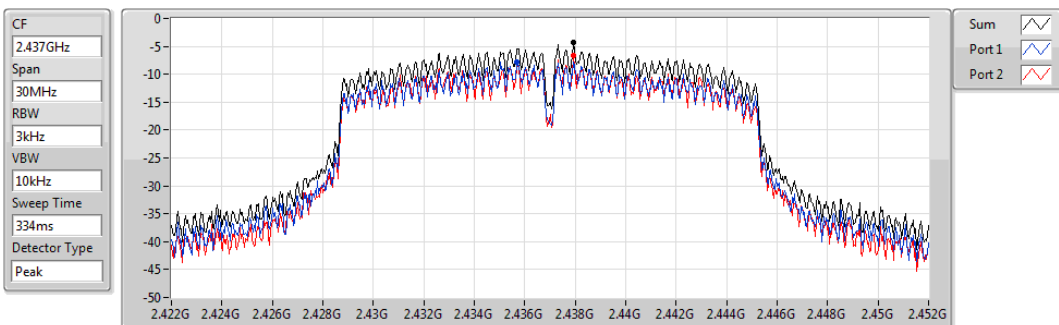


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.69	-7.69	-11.34	-10.14

### 802.11g\_Nss1,(6Mbps)\_2TX

PSD

2437MHz

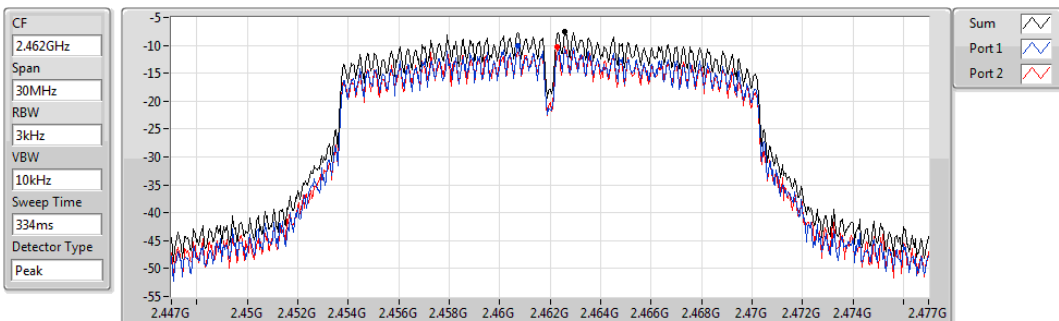


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-4.21	-4.21	-7.87	-6.65

### 802.11g\_Nss1,(6Mbps)\_2TX

PSD

2462MHz

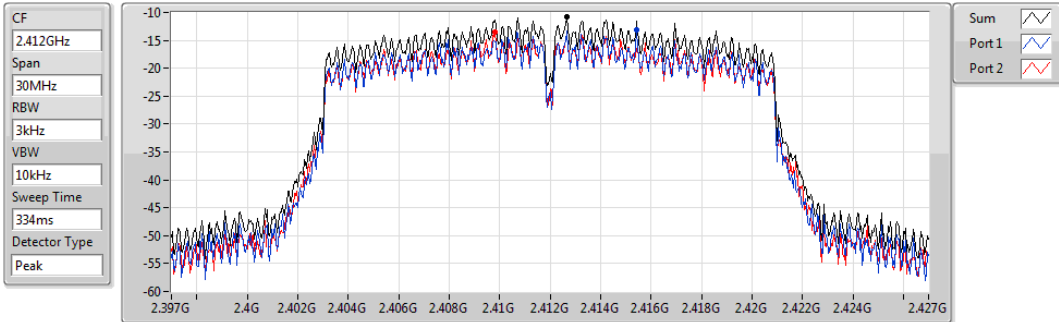


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.49	-7.49	-10.17	-10.25

### 802.11n HT20\_Nss1,(MCS0)\_2TX

PSD

2412MHz

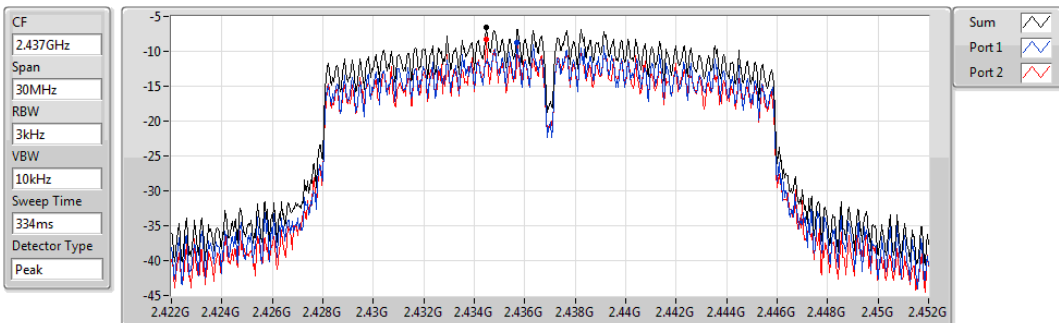


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.82	-10.82	-13.18	-13.60

### 802.11n HT20\_Nss1,(MCS0)\_2TX

PSD

2437MHz

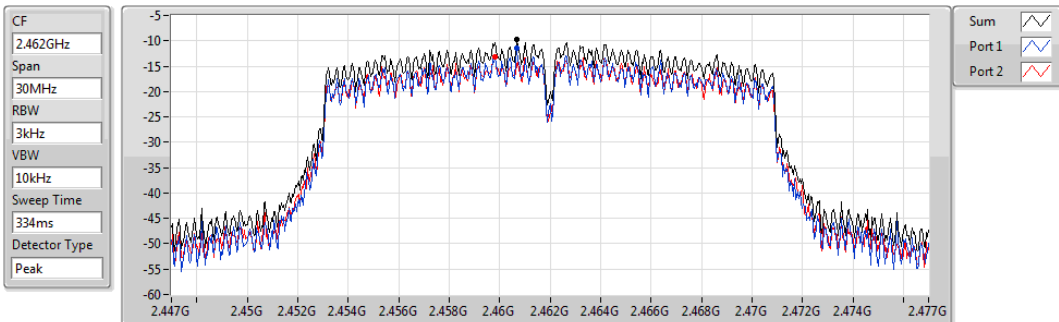


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.64	-6.64	-8.78	-8.26

### 802.11n HT20\_Nss1,(MCS0)\_2TX

PSD

2462MHz

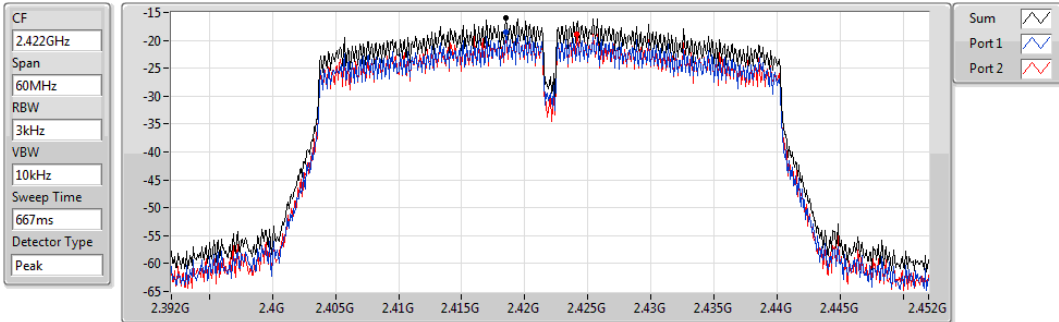


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.64	-9.64	-11.37	-13.19

### 802.11n HT40\_Nss1,(MCS0)\_2TX

PSD

2422MHz

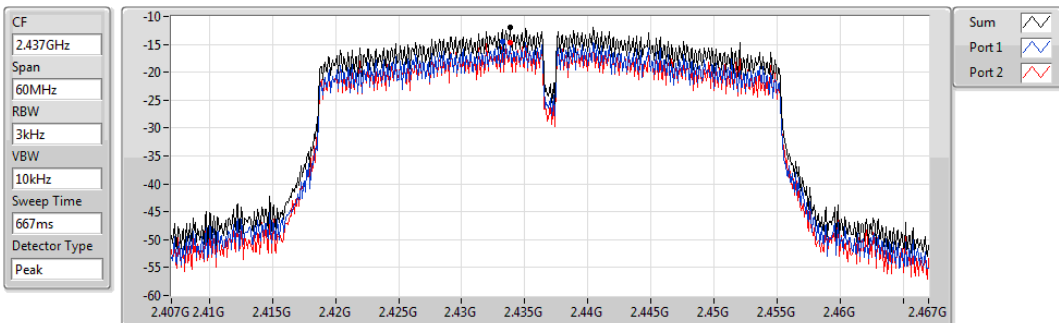


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-15.98	-15.98	-18.46	-18.83

### 802.11n HT40\_Nss1,(MCS0)\_2TX

PSD

2437MHz

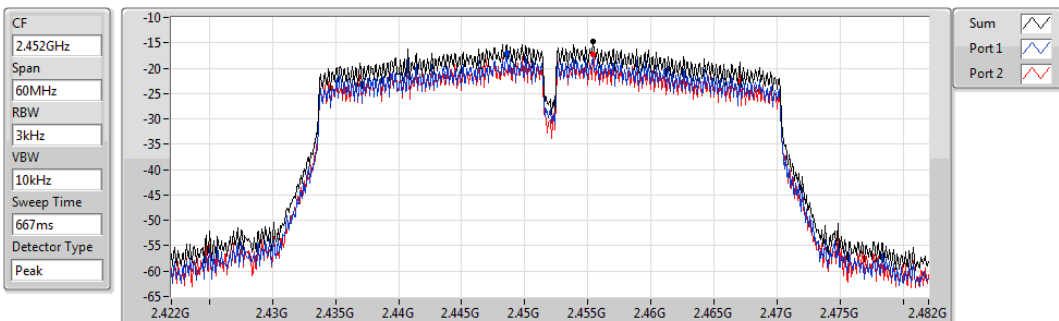


Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-11.96	-11.96	-14.52	-14.76

### 802.11n HT40\_Nss1,(MCS0)\_2TX

PSD

2452MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.69	-14.69	-17.02	-17.38

## 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:

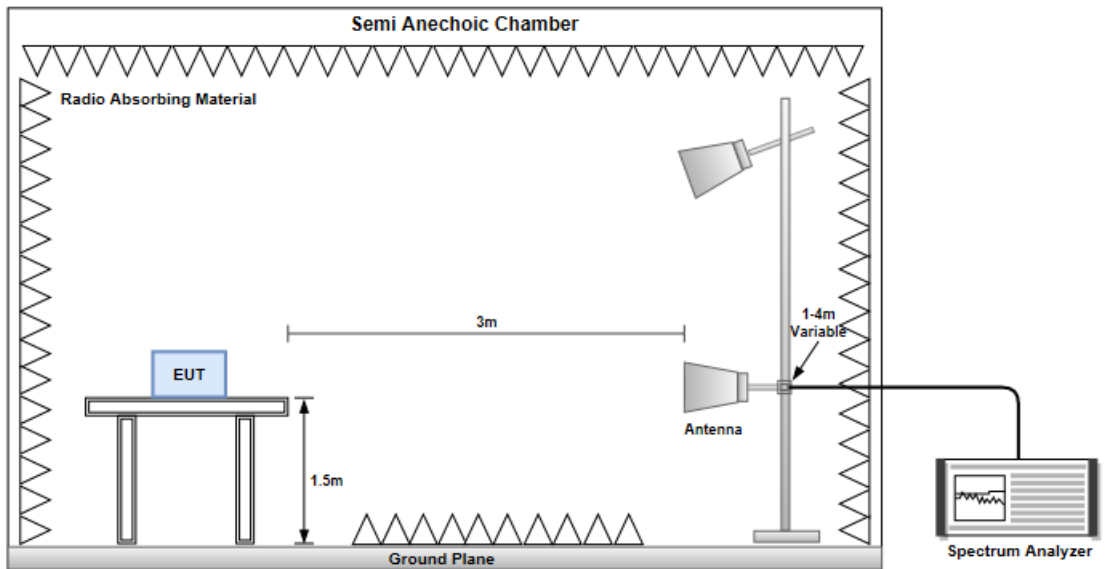
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

### 3.5.3 Test Setup

#### Radiated Emissions below 1 GHz

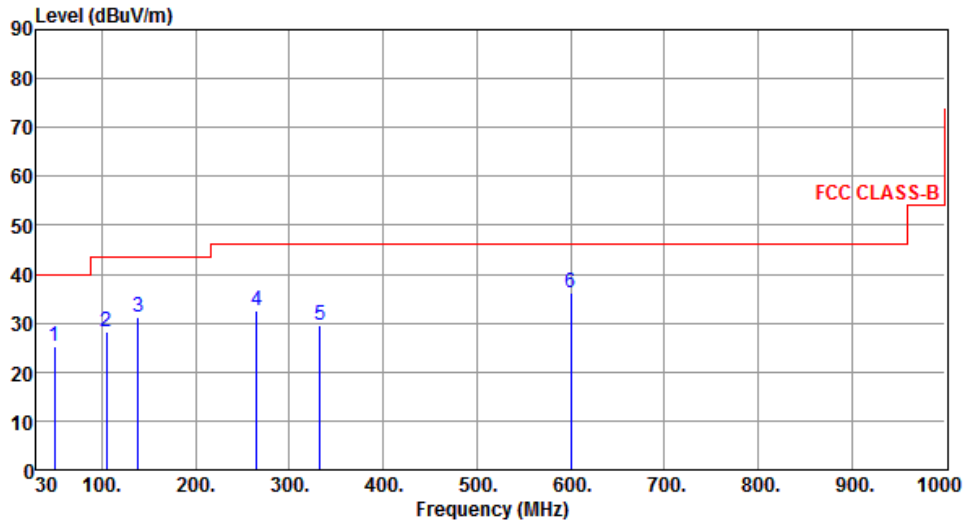


#### Radiated Emissions above 1 GHz



### 3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	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	49.36	25.25	40.00	-14.75	33.83	-8.58	Peak	---	---
2	104.55	28.22	43.50	-15.28	41.00	-12.78	Peak	---	---
3	138.59	31.25	43.50	-12.25	40.56	-9.31	Peak	---	---
4	264.66	32.61	46.00	-13.39	42.20	-9.59	Peak	---	---
5	332.59	29.48	46.00	-16.52	36.68	-7.20	Peak	---	---
6	600.42	36.28	46.00	-9.72	36.86	-0.58	Peak	---	---

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

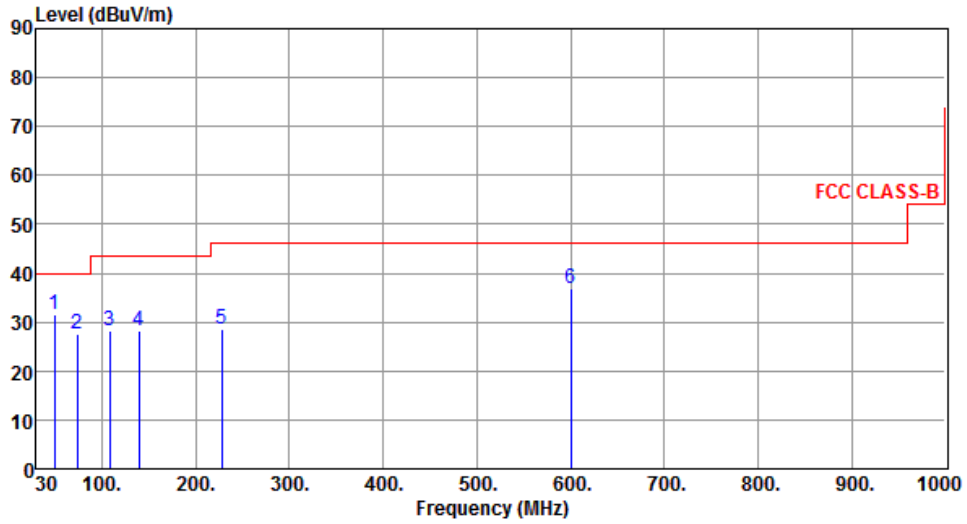
\*Factor includes antenna factor , cable loss and amplifier gain

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.



<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	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	49.36	31.68	40.00	-8.32	40.26	-8.58	Peak	---	---
2	73.59	27.49	40.00	-12.51	39.21	-11.72	Peak	---	---
3	108.49	28.33	43.50	-15.17	40.57	-12.24	Peak	---	---
4	139.59	28.37	43.50	-15.13	37.64	-9.27	Peak	---	---
5	227.79	28.68	46.00	-17.32	40.54	-11.86	Peak	---	---
6	600.36	36.81	46.00	-9.19	37.40	-0.59	Peak	---	---

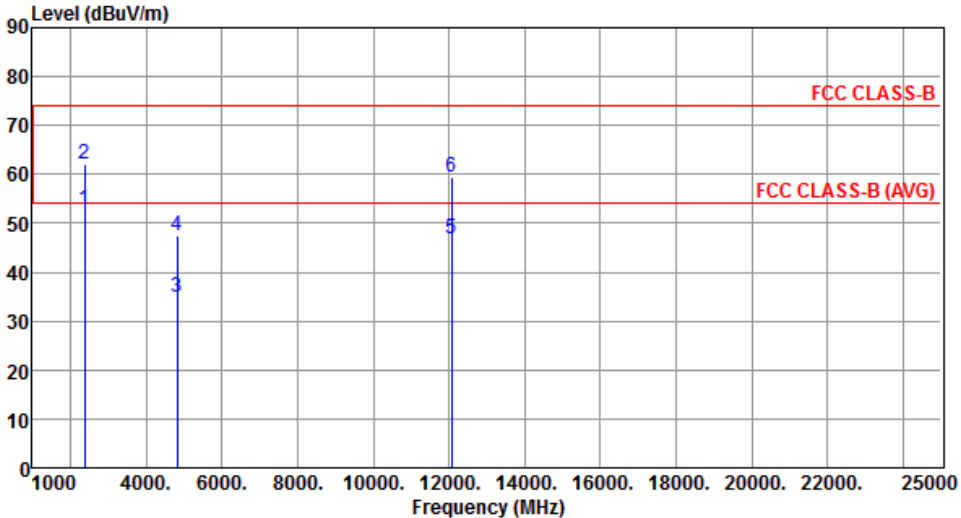
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

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

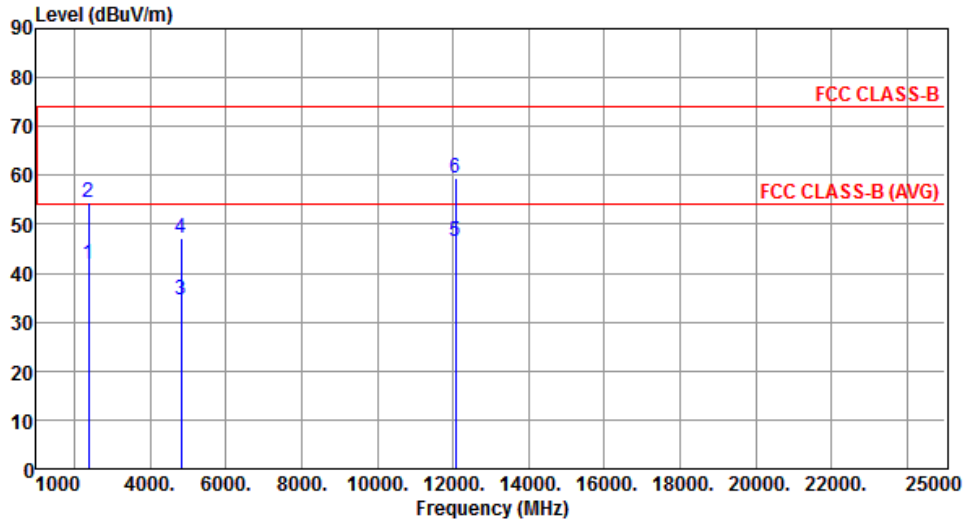
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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

Modulation	11b	Test Freq. (MHz)	2412						
Polarization	Horizontal								
									
Freq. 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	52.94	54.00	-1.06	52.50	0.44	Average	232	219
2	2390.00	62.09	74.00	-11.91	61.65	0.44	Peak	232	219
3	4824.00	34.90	54.00	-19.10	28.50	6.40	Average	100	285
4	4824.00	47.62	74.00	-26.38	41.22	6.40	Peak	100	285
5	12060.00	46.71	54.00	-7.29	30.33	16.38	Average	100	50
6	12060.00	59.52	74.00	-14.48	43.14	16.38	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).

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



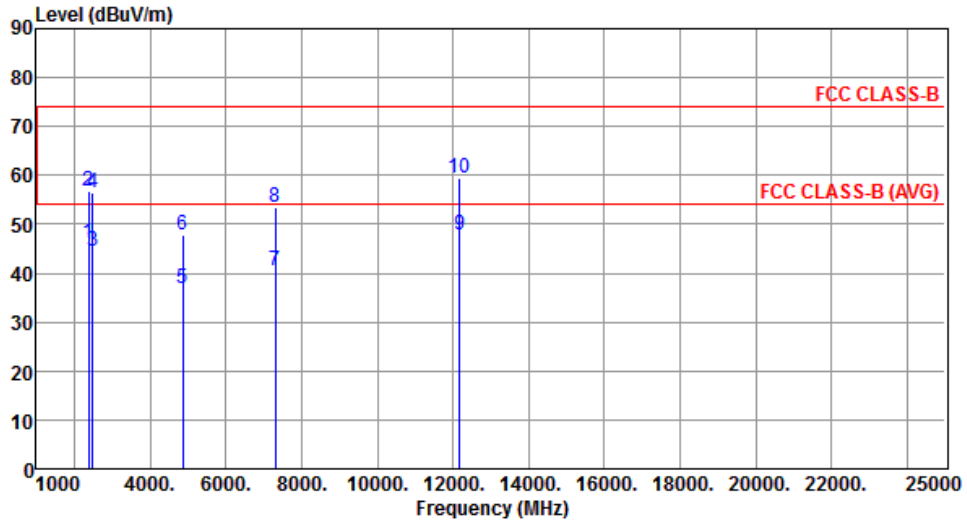
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.00	54.00	-12.00	41.56	0.44	Average	276	135
2	2390.00	54.56	74.00	-19.44	54.12	0.44	Peak	276	135
3	4824.00	34.51	54.00	-19.49	28.11	6.40	Average	100	30
4	4824.00	47.08	74.00	-26.92	40.68	6.40	Peak	100	30
5	12060.00	46.59	54.00	-7.41	30.21	16.38	Average	100	60
6	12060.00	59.49	74.00	-14.51	43.11	16.38	Peak	100	60

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).

<b>Modulation</b>	11b	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Horizontal		



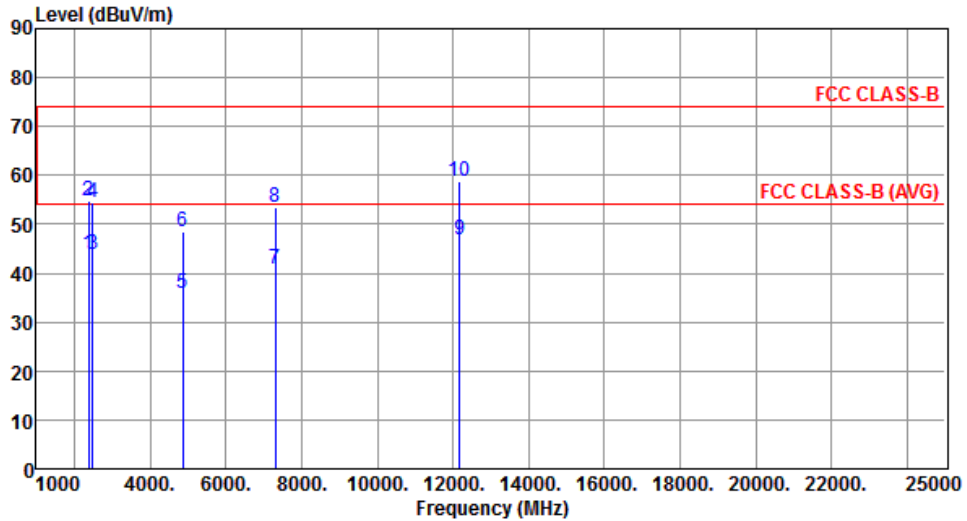
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	46.07	54.00	-7.93	45.63	0.44	Average	277	229
2	2390.00	56.70	74.00	-17.30	56.26	0.44	Peak	277	229
3	2483.50	44.64	54.00	-9.36	44.35	0.29	Average	277	229
4	2483.50	56.58	74.00	-17.42	56.29	0.29	Peak	277	229
5	4874.00	36.75	54.00	-17.25	30.32	6.43	Average	213	287
6	4874.00	47.89	74.00	-26.11	41.46	6.43	Peak	213	287
7	7311.00	40.60	54.00	-13.40	28.68	11.92	Average	100	40
8	7311.00	53.44	74.00	-20.56	41.52	11.92	Peak	100	40
9	12185.00	47.68	54.00	-6.32	31.34	16.34	Average	100	139
10	12185.00	59.44	74.00	-14.56	43.10	16.34	Peak	100	139

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).

<b>Modulation</b>	11b	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Vertical		



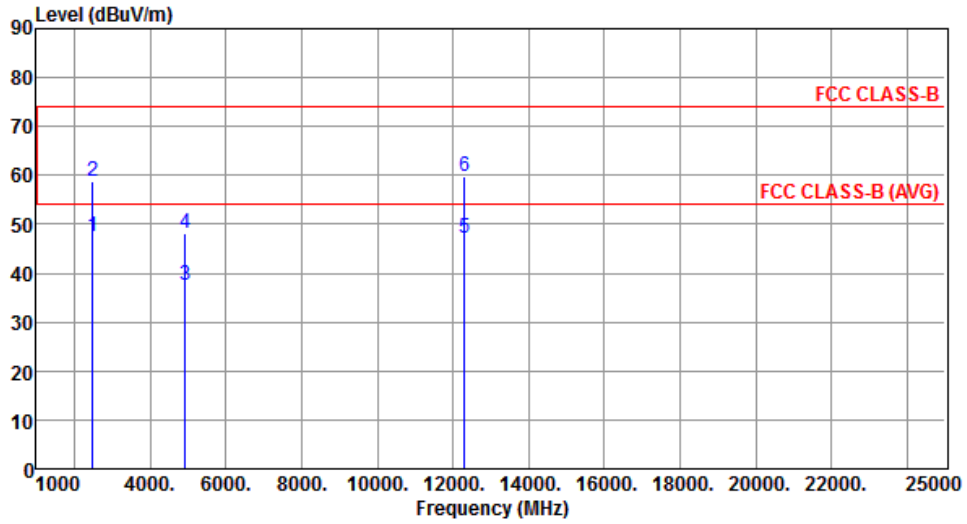
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.95	54.00	-10.05	43.51	0.44	Average	271	134
2	2390.00	54.70	74.00	-19.30	54.26	0.44	Peak	271	134
3	2483.50	43.83	54.00	-10.17	43.54	0.29	Average	271	134
4	2483.50	54.57	74.00	-19.43	54.28	0.29	Peak	271	134
5	4874.00	35.95	54.00	-18.05	29.52	6.43	Average	217	175
6	4874.00	48.44	74.00	-25.56	42.01	6.43	Peak	217	175
7	7311.00	40.80	54.00	-13.20	28.88	11.92	Average	100	30
8	7311.00	53.51	74.00	-20.49	41.59	11.92	Peak	100	30
9	12185.00	46.72	54.00	-7.28	30.38	16.34	Average	100	45
10	12185.00	58.80	74.00	-15.20	42.46	16.34	Peak	100	45

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).

<b>Modulation</b>	11b	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	Horizontal		



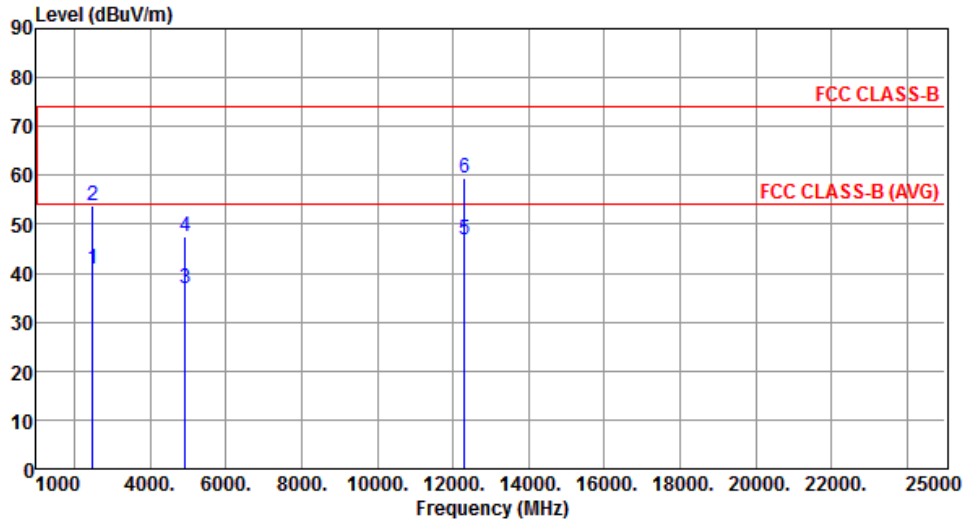
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	47.41	54.00	-6.59	47.12	0.29	Average	238	226
2	2483.50	58.94	74.00	-15.06	58.65	0.29	Peak	238	226
3	4924.00	37.62	54.00	-16.38	31.11	6.51	Average	210	284
4	4924.00	48.09	74.00	-25.91	41.58	6.51	Peak	210	284
5	12310.00	47.22	54.00	-6.78	31.10	16.12	Average	100	124
6	12310.00	59.72	74.00	-14.28	43.60	16.12	Peak	100	124

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).

<b>Modulation</b>	11b	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	Vertical		



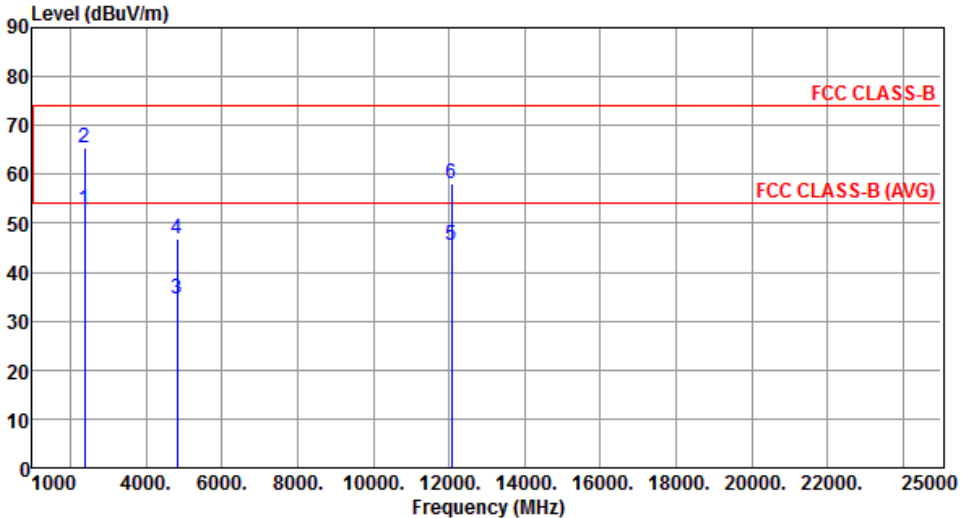
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	40.94	54.00	-13.06	40.65	0.29	Average	275	139
2	2483.50	53.88	74.00	-20.12	53.59	0.29	Peak	275	139
3	4924.00	36.72	54.00	-17.28	30.21	6.51	Average	215	176
4	4924.00	47.63	74.00	-26.37	41.12	6.51	Peak	215	176
5	12310.00	46.71	54.00	-7.29	30.59	16.12	Average	100	50
6	12310.00	59.37	74.00	-14.63	43.25	16.12	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).

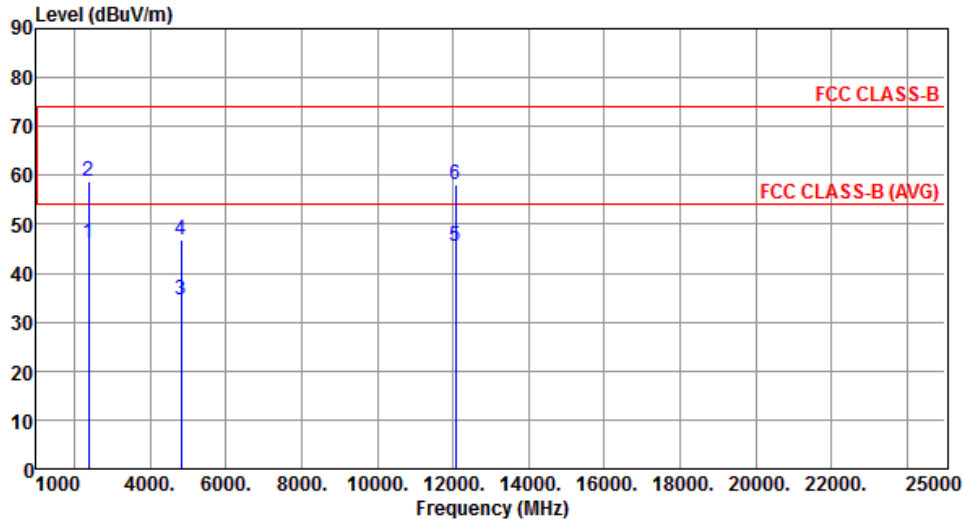
### 3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g

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	52.94	54.00	-1.06	52.50	0.44	Average	252	229
2	2390.00	65.48	74.00	-8.52	65.04	0.44	Peak	252	229
3	4824.00	34.51	54.00	-19.49	28.11	6.40	Average	100	30
4	4824.00	46.89	74.00	-27.11	40.49	6.40	Peak	100	30
5	12060.00	45.61	54.00	-8.39	29.23	16.38	Average	100	60
6	12060.00	57.96	74.00	-16.04	41.58	16.38	Peak	100	60

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).



<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2412
<b>Polarization</b>	Vertical		



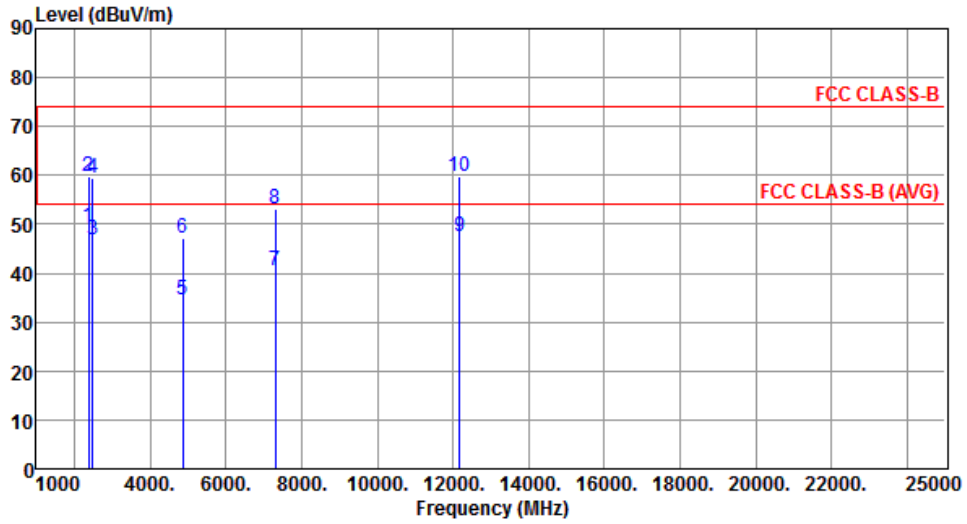
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	46.06	54.00	-7.94	45.62	0.44	Average	143	226
2	2390.00	58.65	74.00	-15.35	58.21	0.44	Peak	143	226
3	4824.00	34.60	54.00	-19.40	28.20	6.40	Average	100	40
4	4824.00	46.98	74.00	-27.02	40.58	6.40	Peak	100	40
5	12060.00	45.53	54.00	-8.47	29.15	16.38	Average	100	50
6	12060.00	58.04	74.00	-15.96	41.66	16.38	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).

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Horizontal		



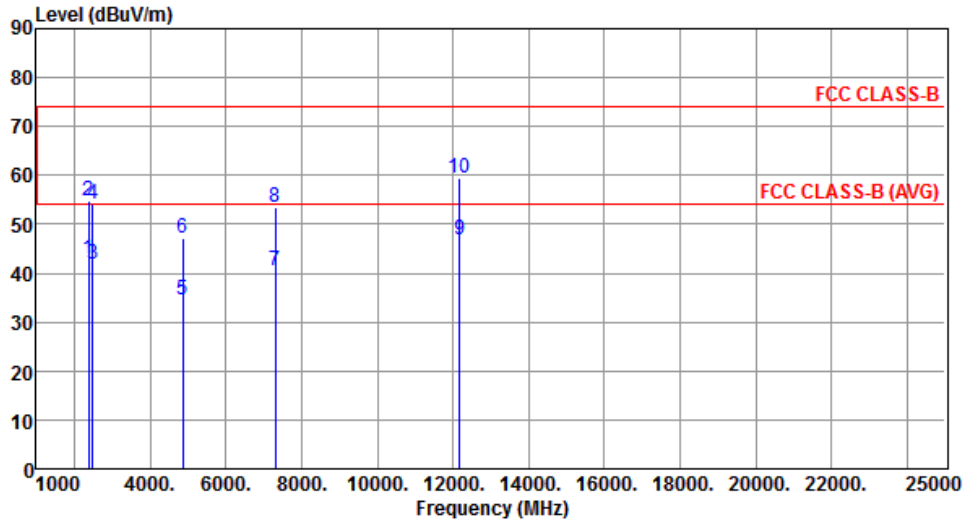
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.46	54.00	-4.54	49.02	0.44	Average	245	235
2	2390.00	59.86	74.00	-14.14	59.42	0.44	Peak	245	235
3	2483.50	46.74	54.00	-7.26	46.45	0.29	Average	245	235
4	2483.50	59.40	74.00	-14.60	59.11	0.29	Peak	245	235
5	4874.00	34.68	54.00	-19.32	28.25	6.43	Average	100	30
6	4874.00	47.01	74.00	-26.99	40.58	6.43	Peak	100	30
7	7311.00	40.56	54.00	-13.44	28.64	11.92	Average	100	50
8	7311.00	53.14	74.00	-20.86	41.22	11.92	Peak	100	50
9	12185.00	47.46	54.00	-6.54	31.12	16.34	Average	100	144
10	12185.00	59.89	74.00	-14.11	43.55	16.34	Peak	100	144

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).

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Vertical		



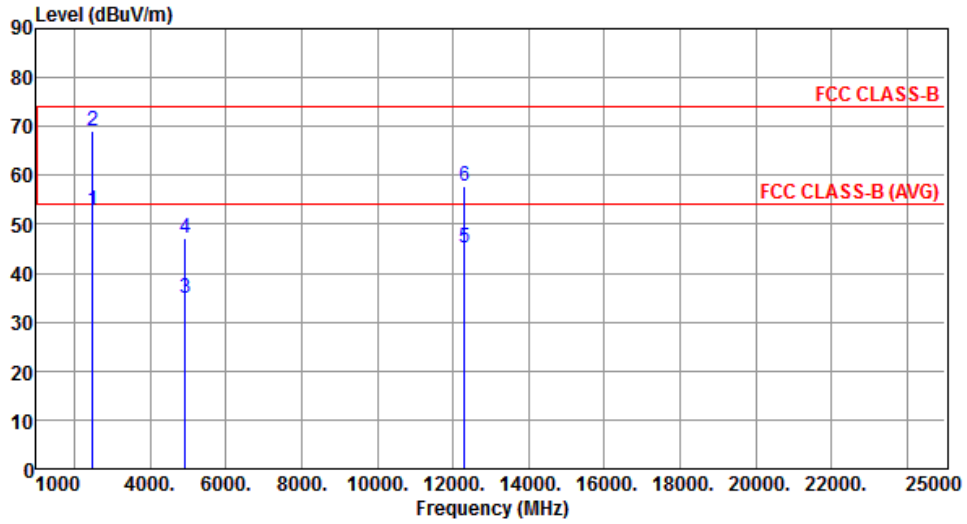
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.70	54.00	-11.30	42.26	0.44	Average	145	225
2	2390.00	54.69	74.00	-19.31	54.25	0.44	Peak	145	225
3	2483.50	41.71	54.00	-12.29	41.42	0.29	Average	145	225
4	2483.50	53.98	74.00	-20.02	53.69	0.29	Peak	145	225
5	4874.00	34.55	54.00	-19.45	28.12	6.43	Average	100	25
6	4874.00	47.08	74.00	-26.92	40.65	6.43	Peak	100	25
7	7311.00	40.48	54.00	-13.52	28.56	11.92	Average	100	40
8	7311.00	53.48	74.00	-20.52	41.56	11.92	Peak	100	40
9	12185.00	46.99	54.00	-7.01	30.65	16.34	Average	100	50
10	12185.00	59.59	74.00	-14.41	43.25	16.34	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).

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	Horizontal		



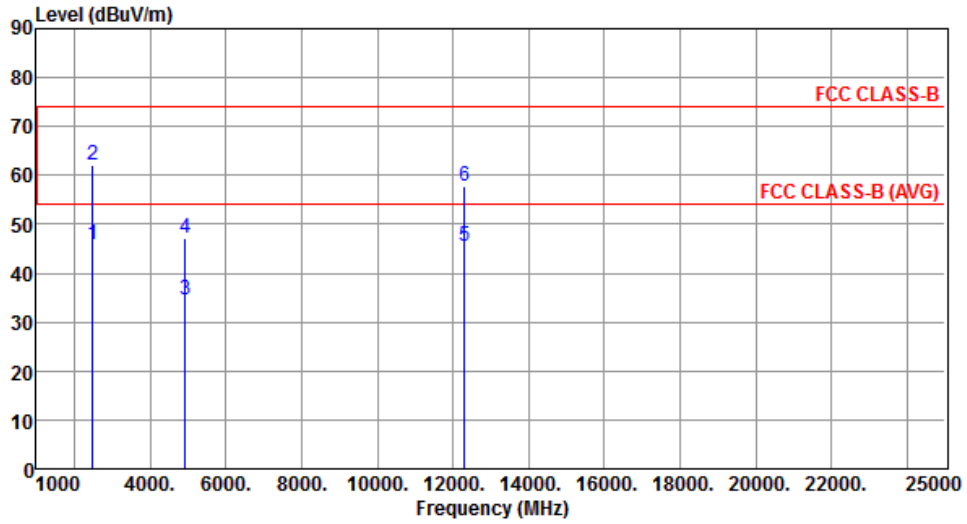
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.89	54.00	-1.11	52.60	0.29	Average	248	233
2	2483.50	69.16	74.00	-4.84	68.87	0.29	Peak	248	233
3	4924.00	34.75	54.00	-19.25	28.24	6.51	Average	100	10
4	4924.00	47.06	74.00	-26.94	40.55	6.51	Peak	100	10
5	12310.00	45.27	54.00	-8.73	29.15	16.12	Average	100	70
6	12310.00	57.67	74.00	-16.33	41.55	16.12	Peak	100	70

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).

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	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	45.98	54.00	-8.02	45.69	0.29	Average	146	221
2	2483.50	61.95	74.00	-12.05	61.66	0.29	Peak	146	221
3	4924.00	34.69	54.00	-19.31	28.18	6.51	Average	100	50
4	4924.00	47.19	74.00	-26.81	40.68	6.51	Peak	100	50
5	12310.00	45.34	54.00	-8.66	29.22	16.12	Average	100	20
6	12310.00	57.80	74.00	-16.20	41.68	16.12	Peak	100	20

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

\*Factor includes antenna factor , cable loss and amplifier gain

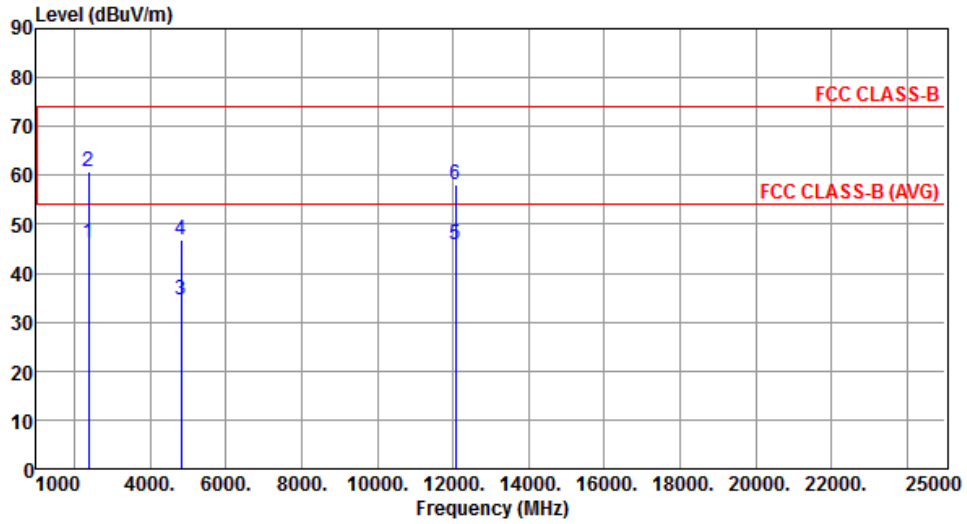
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

### 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	52.88	54.00	-1.12	52.44	0.44	Average	233	224
2	2390.00	66.88	74.00	-7.12	66.44	0.44	Peak	233	224
3	4824.00	34.61	54.00	-19.39	28.21	6.40	Average	100	100
4	4824.00	47.04	74.00	-26.96	40.64	6.40	Peak	100	100
5	12060.00	45.65	54.00	-8.35	29.27	16.38	Average	100	30
6	12060.00	57.93	74.00	-16.07	41.55	16.38	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).

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2412
<b>Polarization</b>	Vertical		



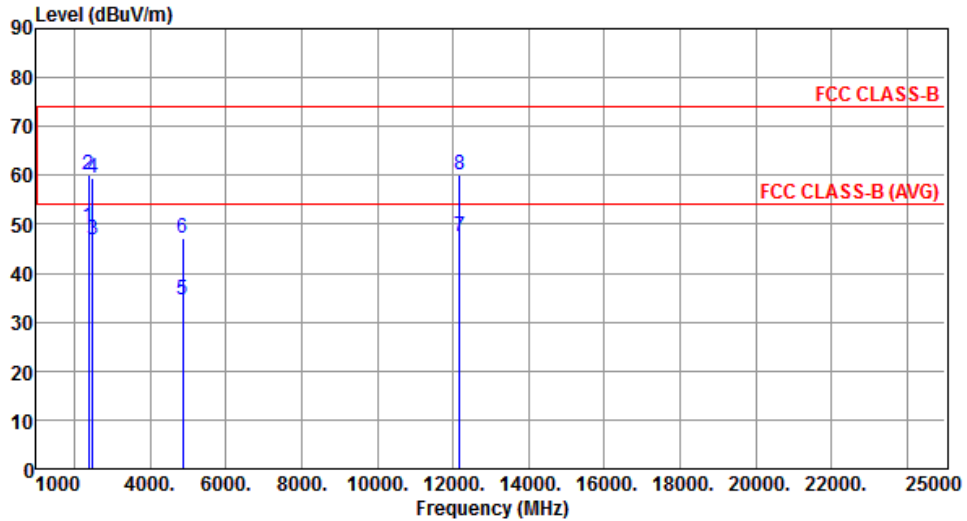
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	46.09	54.00	-7.91	45.65	0.44	Average	142	228
2	2390.00	60.65	74.00	-13.35	60.21	0.44	Peak	142	228
3	4824.00	34.51	54.00	-19.49	28.11	6.40	Average	100	30
4	4824.00	46.97	74.00	-27.03	40.57	6.40	Peak	100	30
5	12060.00	45.69	54.00	-8.31	29.31	16.38	Average	100	25
6	12060.00	58.06	74.00	-15.94	41.68	16.38	Peak	100	25

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).

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	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	49.57	54.00	-4.43	49.13	0.44	Average	241	230
2	2390.00	60.13	74.00	-13.87	59.69	0.44	Peak	241	230
3	2483.50	46.97	54.00	-7.03	46.68	0.29	Average	241	230
4	2483.50	59.50	74.00	-14.50	59.21	0.29	Peak	241	230
5	4874.00	34.64	54.00	-19.36	28.21	6.43	Average	100	20
6	4874.00	47.05	74.00	-26.95	40.62	6.43	Peak	100	20
7	12185.00	47.60	54.00	-6.40	31.26	16.34	Average	100	145
8	12185.00	60.02	74.00	-13.98	43.68	16.34	Peak	100	145

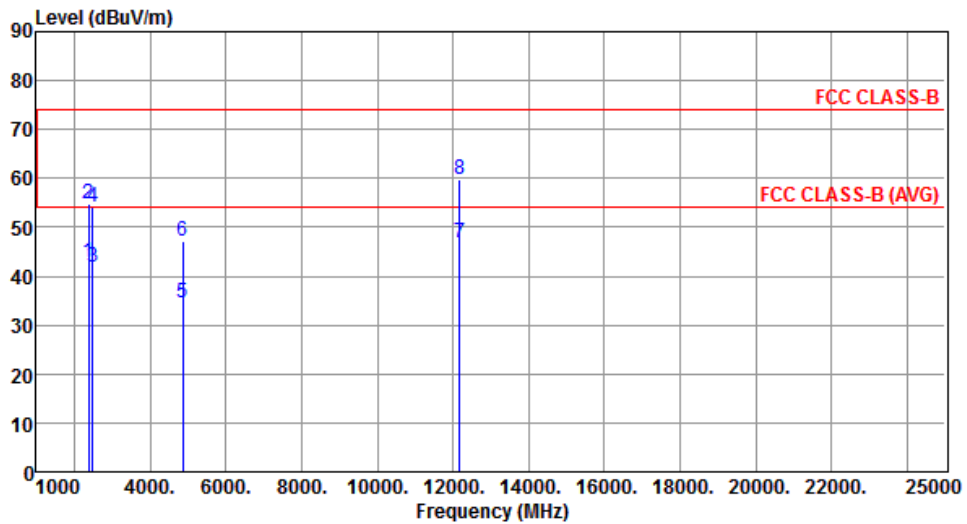
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

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



<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Vertical		



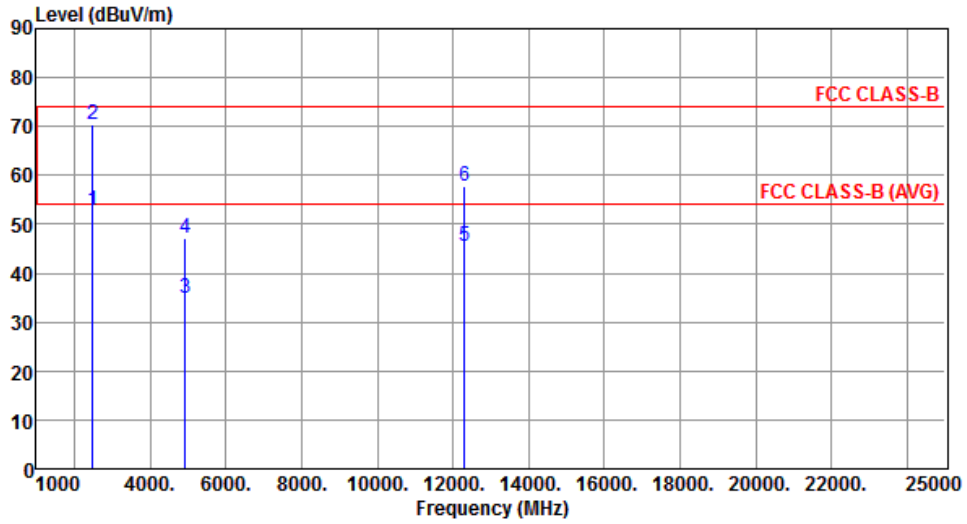
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.70	54.00	-11.30	42.26	0.44	Average	144	223
2	2390.00	54.73	74.00	-19.27	54.29	0.44	Peak	144	223
3	2483.50	41.88	54.00	-12.12	41.59	0.29	Average	144	223
4	2483.50	53.98	74.00	-20.02	53.69	0.29	Peak	144	223
5	4874.00	34.61	54.00	-19.39	28.18	6.43	Average	100	50
6	4874.00	47.28	74.00	-26.72	40.85	6.43	Peak	100	50
7	12185.00	46.93	54.00	-7.07	30.59	16.34	Average	100	49
8	12185.00	59.62	74.00	-14.38	43.28	16.34	Peak	100	49

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).

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	Horizontal		



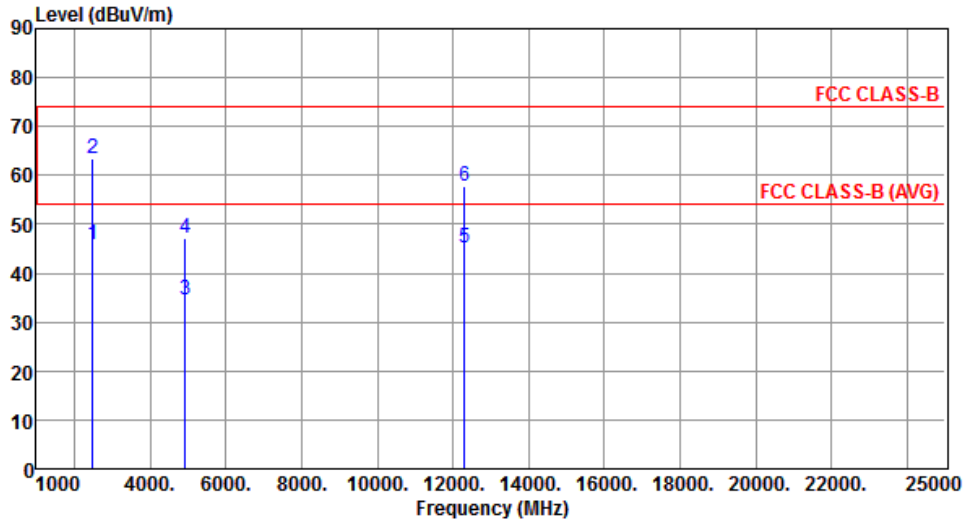
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.75	54.00	-1.25	52.46	0.29	Average	242	245
2	2483.50	70.47	74.00	-3.53	70.18	0.29	Peak	242	245
3	4924.00	34.73	54.00	-19.27	28.22	6.51	Average	100	80
4	4924.00	47.04	74.00	-26.96	40.53	6.51	Peak	100	80
5	12310.00	45.37	54.00	-8.63	29.25	16.12	Average	100	70
6	12310.00	57.79	74.00	-16.21	41.67	16.12	Peak	100	70

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).

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	Vertical		



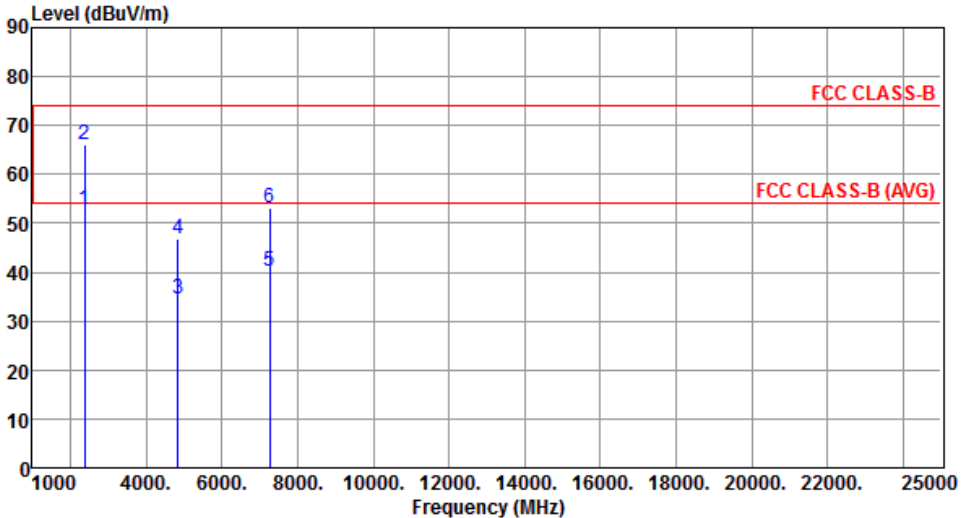
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	45.94	54.00	-8.06	45.65	0.29	Average	147	222
2	2483.50	63.51	74.00	-10.49	63.22	0.29	Peak	147	222
3	4924.00	34.68	54.00	-19.32	28.17	6.51	Average	100	40
4	4924.00	47.12	74.00	-26.88	40.61	6.51	Peak	100	40
5	12310.00	45.30	54.00	-8.70	29.18	16.12	Average	100	60
6	12310.00	57.69	74.00	-16.31	41.57	16.12	Peak	100	60

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

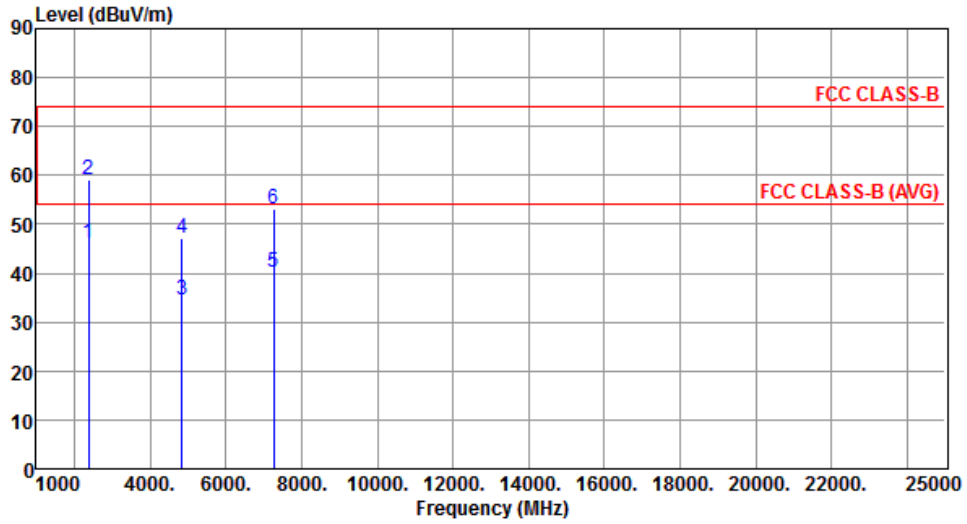
\*Factor includes antenna factor , cable loss and amplifier gain

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

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

Modulation	HT40	Test Freq. (MHz)	2422						
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	52.89	54.00	-1.11	52.45	0.44	Average	233	214
2	2390.00	66.06	74.00	-7.94	65.62	0.44	Peak	233	214
3	4844.00	34.60	54.00	-19.40	28.15	6.45	Average	100	30
4	4844.00	46.96	74.00	-27.04	40.51	6.45	Peak	100	30
5	7266.00	40.22	54.00	-13.78	28.27	11.95	Average	100	40
6	7266.00	53.27	74.00	-20.73	41.32	11.95	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>									

<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2422
<b>Polarization</b>	Vertical		



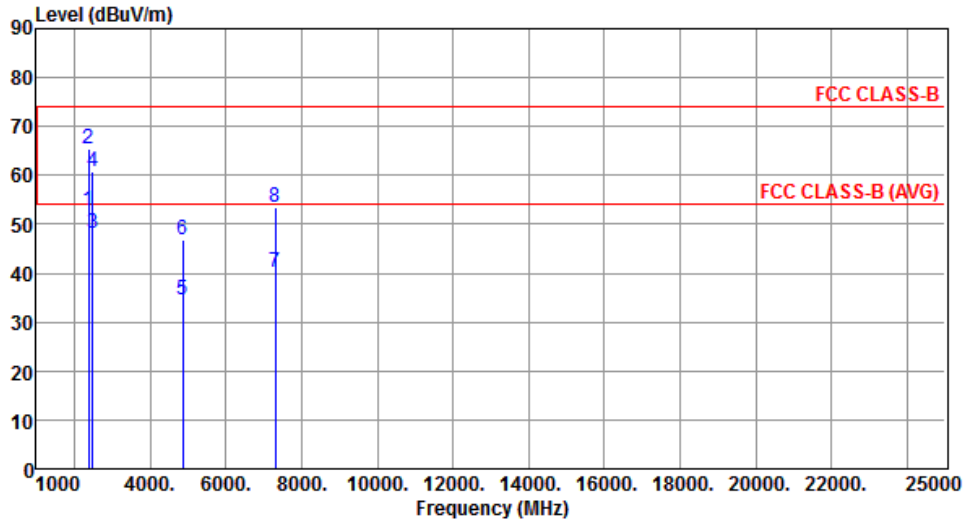
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	46.05	54.00	-7.95	45.61	0.44	Average	141	225
2	2390.00	59.01	74.00	-14.99	58.57	0.44	Peak	141	225
3	4844.00	34.65	54.00	-19.35	28.20	6.45	Average	100	70
4	4844.00	47.07	74.00	-26.93	40.62	6.45	Peak	100	70
5	7266.00	40.29	54.00	-13.71	28.34	11.95	Average	100	30
6	7266.00	53.19	74.00	-20.81	41.24	11.95	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).

<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Horizontal		



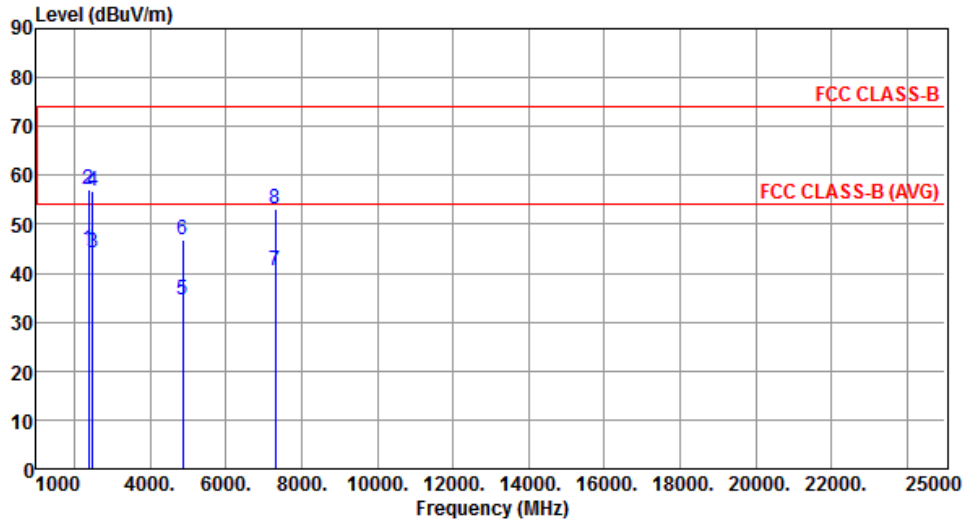
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.80	54.00	-1.20	52.36	0.44	Average	233	217
2	2390.00	65.49	74.00	-8.51	65.05	0.44	Peak	233	217
3	2483.50	48.29	54.00	-5.71	48.00	0.29	Average	252	217
4	2483.50	60.93	74.00	-13.07	60.64	0.29	Peak	252	217
5	4874.00	34.66	54.00	-19.34	28.23	6.43	Average	100	50
6	4874.00	46.98	74.00	-27.02	40.55	6.43	Peak	100	50
7	7311.00	40.27	54.00	-13.73	28.35	11.92	Average	100	40
8	7311.00	53.48	74.00	-20.52	41.56	11.92	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).

<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Vertical		



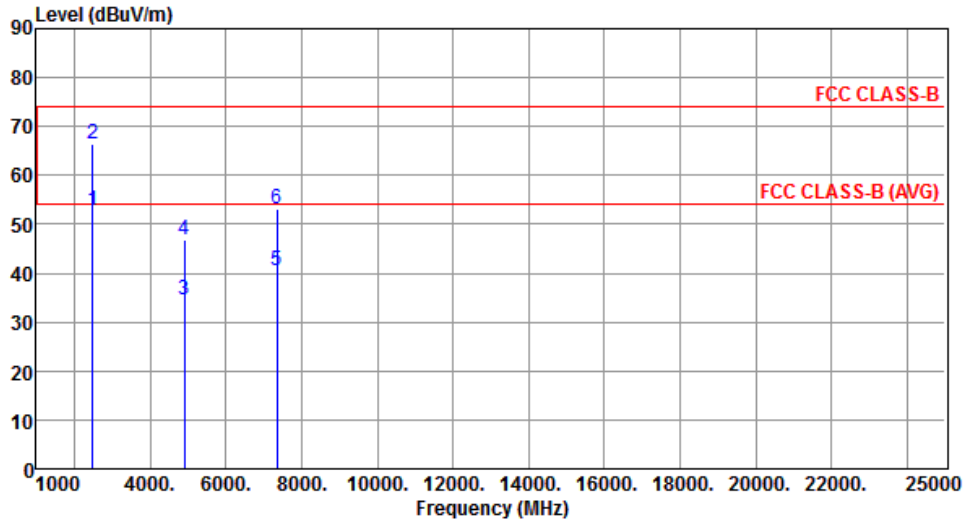
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	44.72	54.00	-9.28	44.28	0.44	Average	123	223
2	2390.00	56.98	74.00	-17.02	56.54	0.44	Peak	123	223
3	2483.50	44.20	54.00	-9.80	43.91	0.29	Average	144	223
4	2483.50	56.64	74.00	-17.36	56.35	0.29	Peak	144	223
5	4874.00	34.67	54.00	-19.33	28.24	6.43	Average	100	90
6	4874.00	46.96	74.00	-27.04	40.53	6.43	Peak	100	90
7	7311.00	40.47	54.00	-13.53	28.55	11.92	Average	100	40
8	7311.00	53.19	74.00	-20.81	41.27	11.92	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).

<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2452
<b>Polarization</b>	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	52.88	54.00	-1.12	52.59	0.29	Average	241	223
2	2483.50	66.39	74.00	-7.61	66.10	0.29	Peak	241	223
3	4904.00	34.69	54.00	-19.31	28.27	6.42	Average	100	10
4	4904.00	46.75	74.00	-27.25	40.33	6.42	Peak	100	10
5	7356.00	40.37	54.00	-13.63	28.56	11.81	Average	100	20
6	7356.00	53.05	74.00	-20.95	41.24	11.81	Peak	100	20

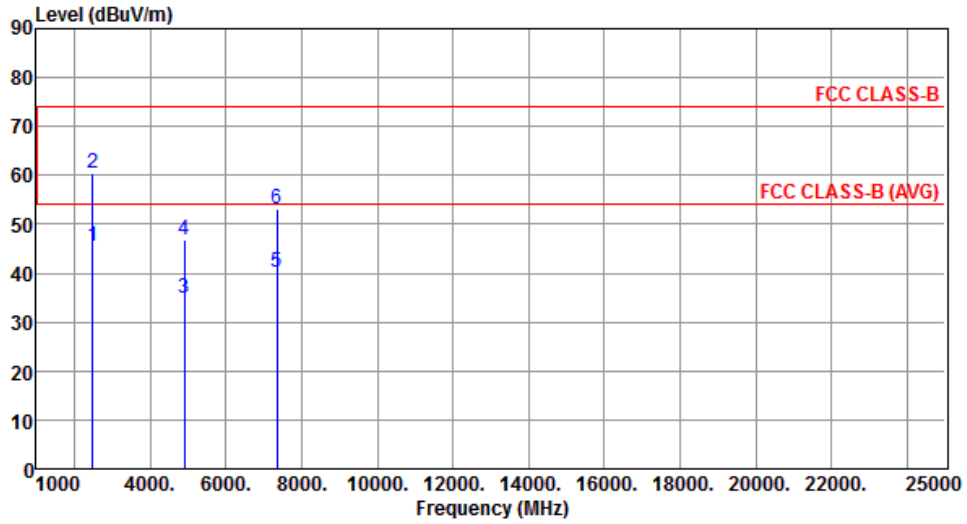
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

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



<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2452
<b>Polarization</b>	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	45.64	54.00	-8.36	45.35	0.29	Average	141	226
2	2483.50	60.52	74.00	-13.48	60.23	0.29	Peak	141	226
3	4904.00	34.75	54.00	-19.25	28.33	6.42	Average	100	20
4	4904.00	46.96	74.00	-27.04	40.54	6.42	Peak	100	20
5	7356.00	40.27	54.00	-13.73	28.46	11.81	Average	100	40
6	7356.00	53.12	74.00	-20.88	41.31	11.81	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).

## 3.6 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

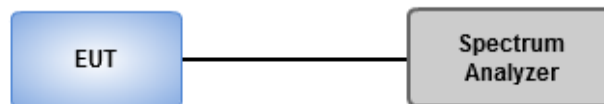
#### Reference level measurement

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

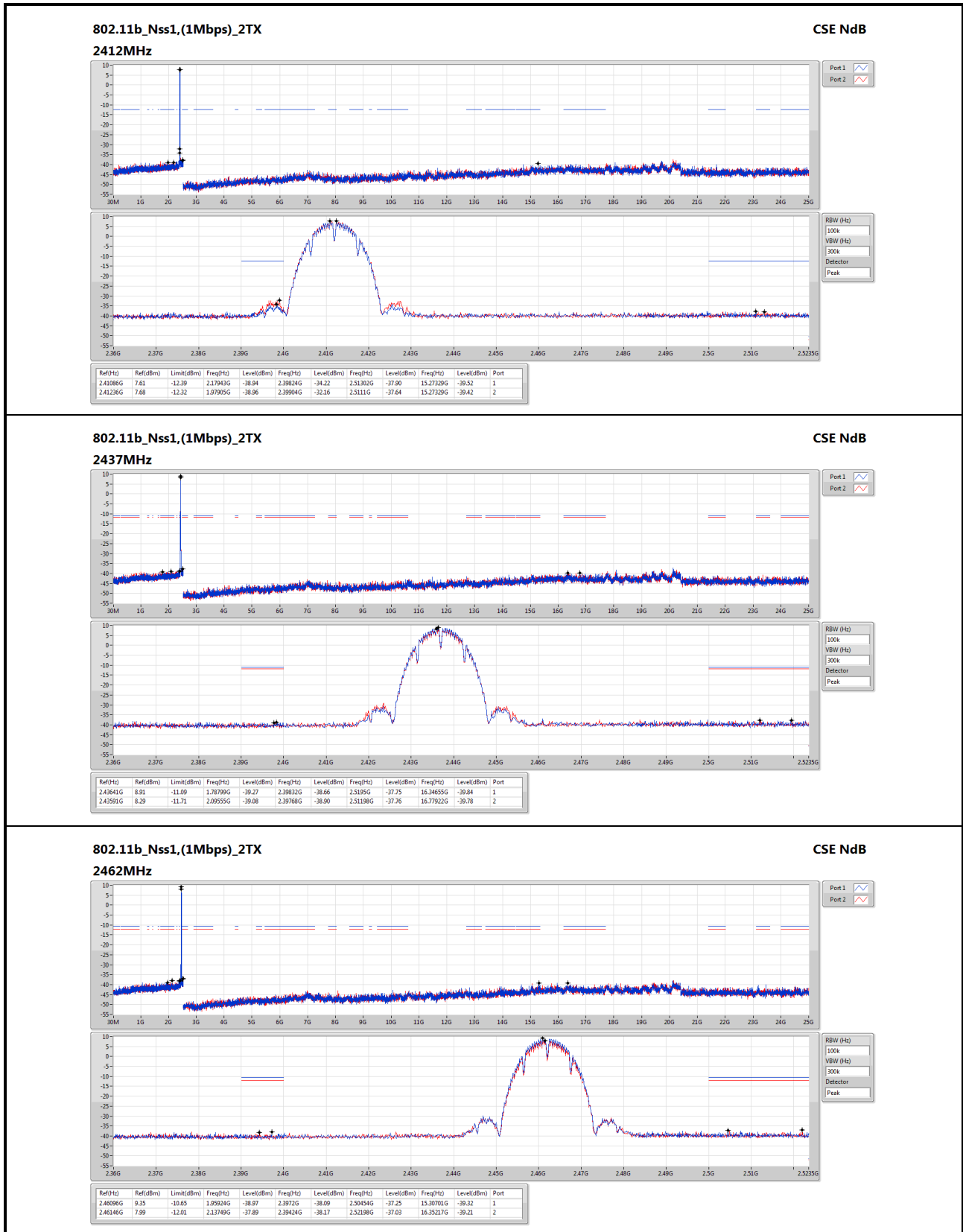
#### Emission level measurement

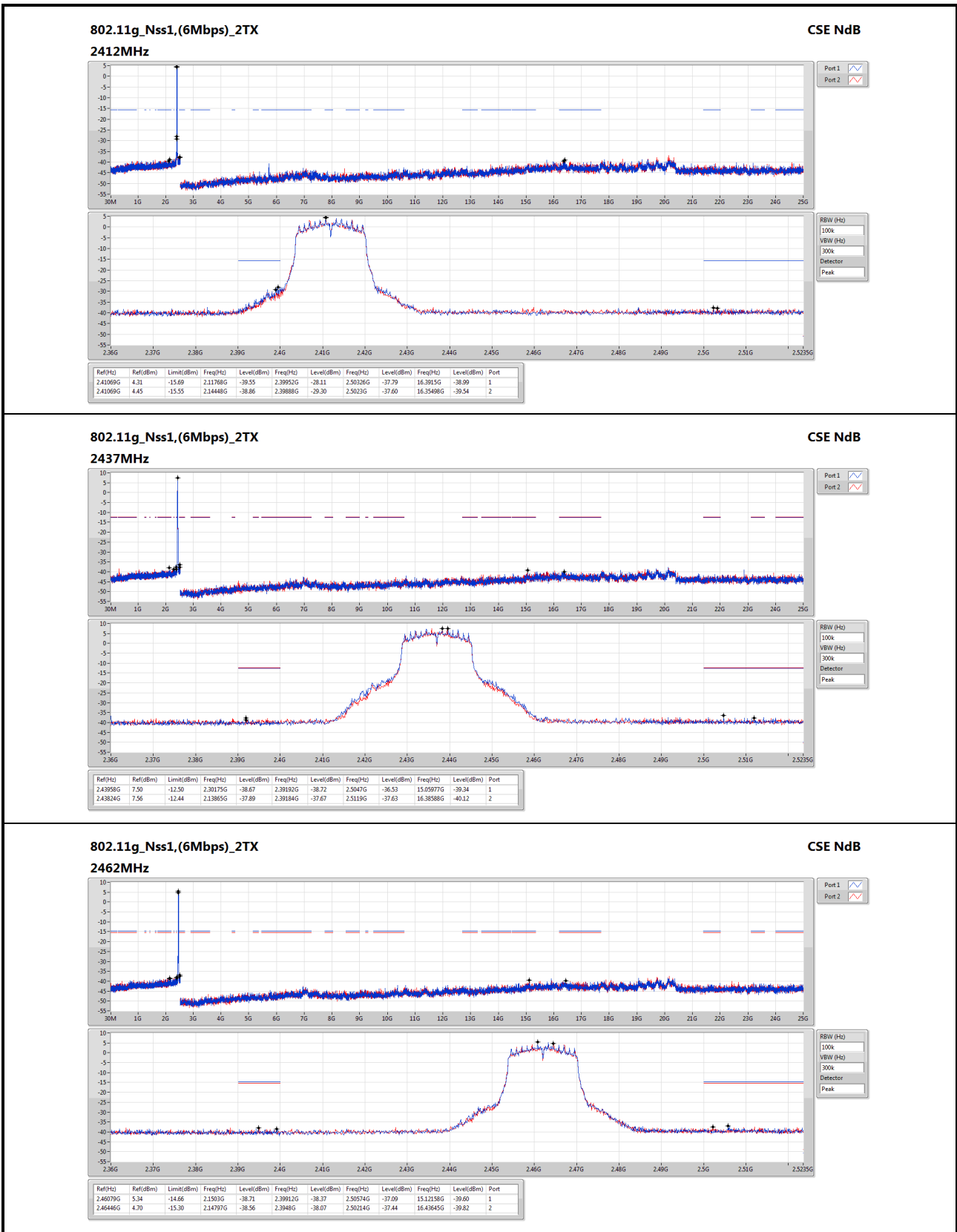
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

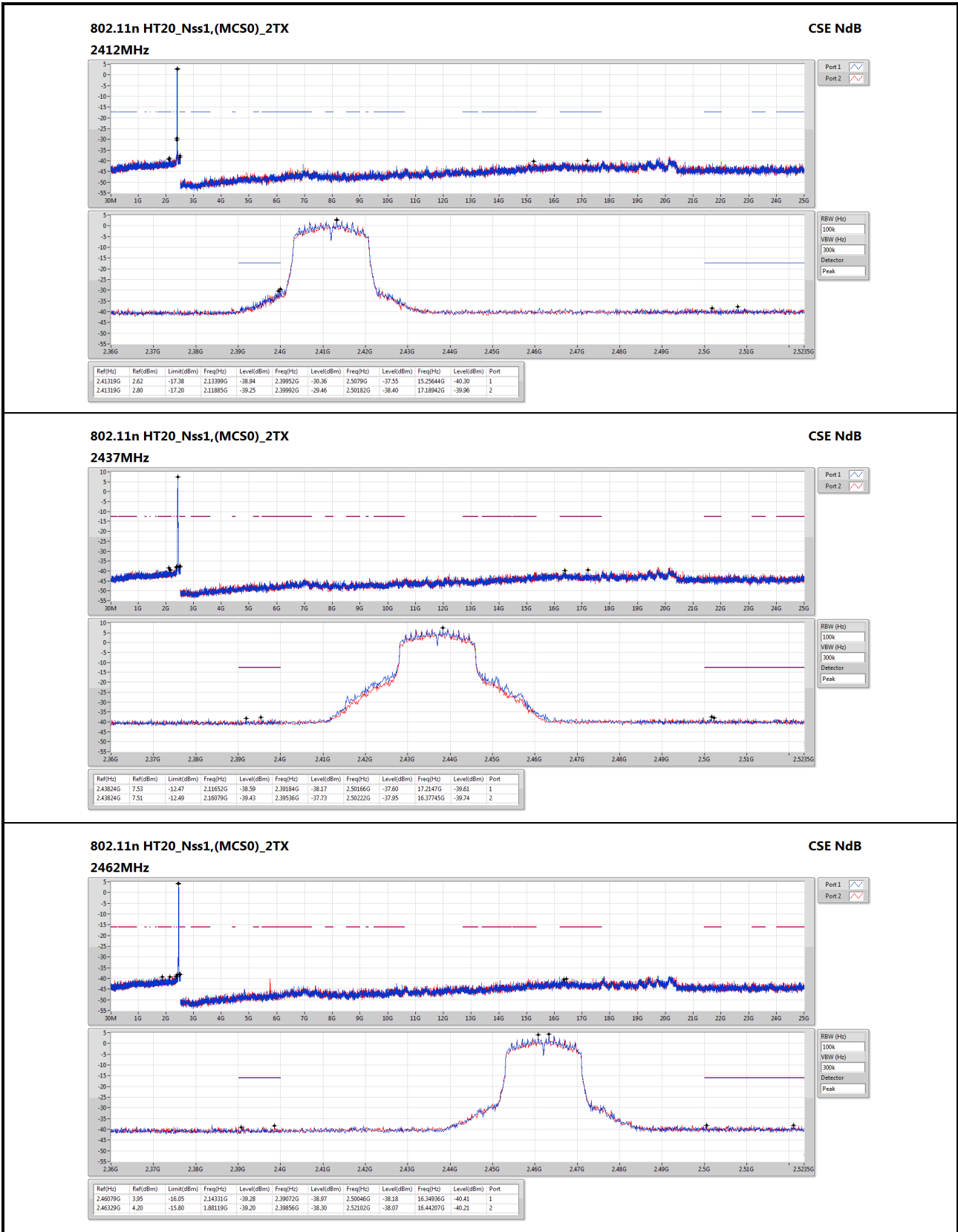
### 3.6.3 Test Setup

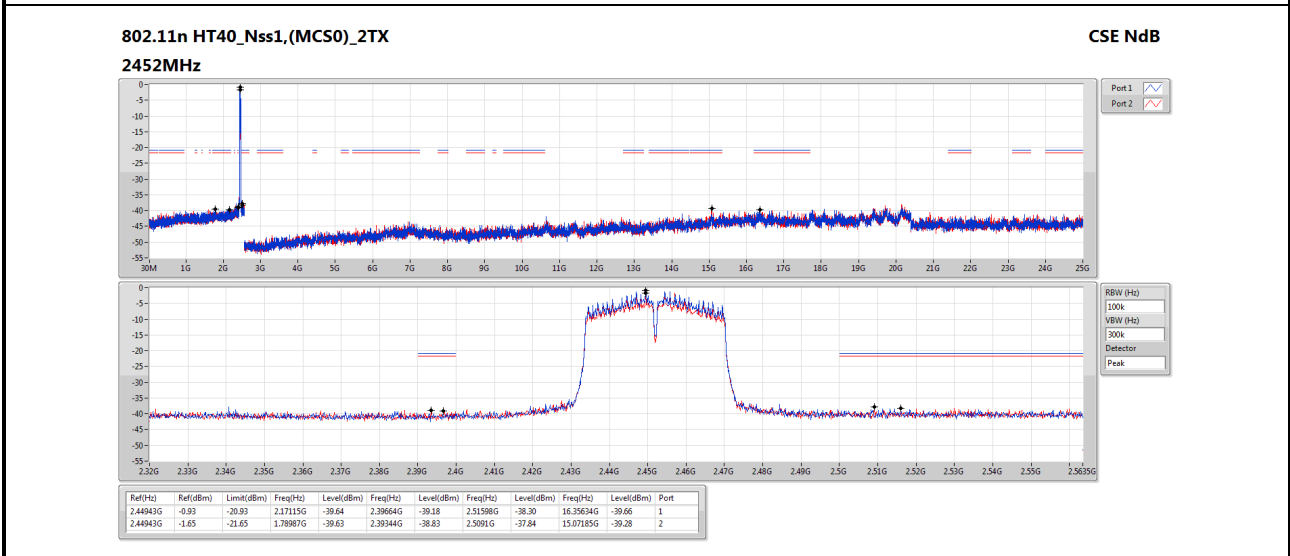
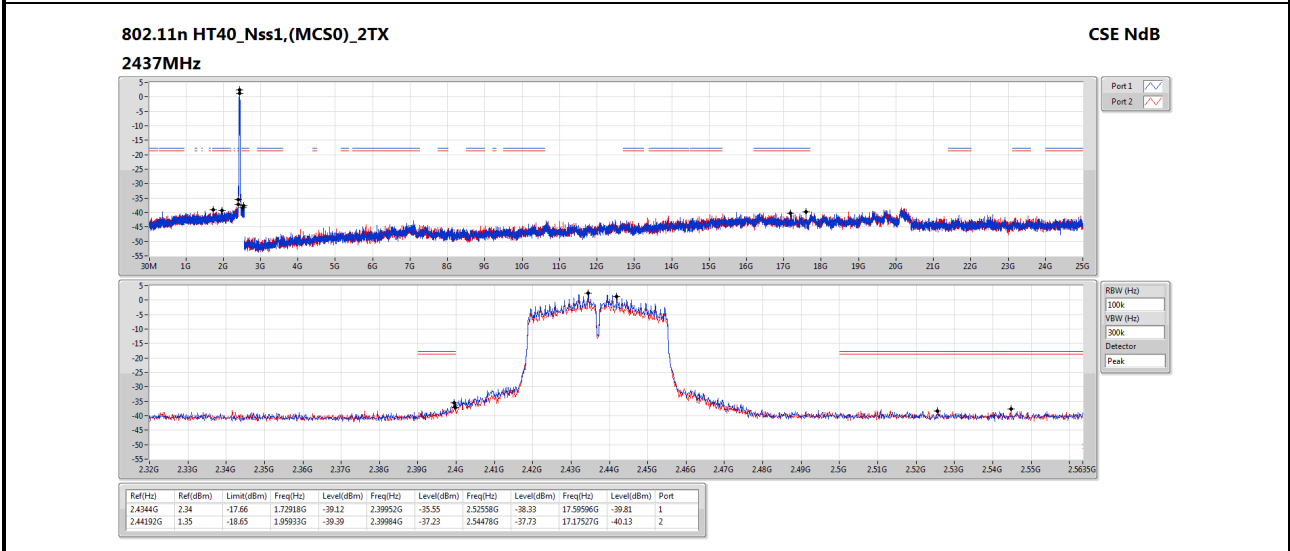
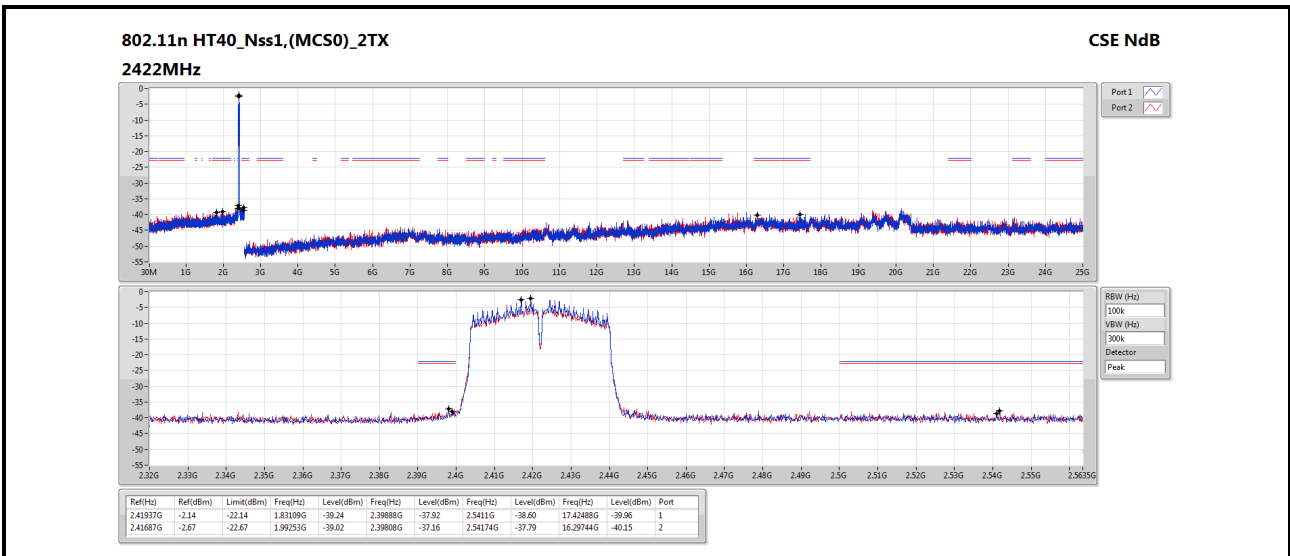


### 3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands


**802.11b\_Nss1,(1Mbps)\_2TX**
**CSE NdB**







## 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

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Kou District, New Taipei City,  
Taiwan, R.O.C.

### **Kwei Shan**

Tel: 886-3-271-8666

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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.

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Fax: 886-3-318-0155

Email: ICC\_Service@icertifi.com.tw

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