

# FCC Test Report

**FCC ID** : IPH-03958  
**Equipment** : Smart Watch  
**Model No.** : A03958  
**Brand Name** : GARMIN  
**Applicant** : Garmin International, Inc.  
**Address** : 1200 E. 151st Street Olathe, KS 66062 United States  
**Standard** : 47 CFR FCC Part 15.247  
**Received Date** : Apr. 30, 2020  
**Tested Date** : Mar. 27 ~ Jun. 09, 2020

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.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

Reviewed by:

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

Approved by:

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



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## Release Record

Report No.	Version	Description	Issued Date
FR051401AC	Rev. 01	Initial issue	Jul. 01, 2020

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.763MHz 25.51 (Margin -20.49dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz 71.22 (Margin -2.78dB) - PK	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 20.30	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 <sub>TX</sub> )	Data Rate / MCS
2400-2483.5	b	2412-2462	1-11 [11]	1	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	1	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	1	MCS 0-7

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.	Type	Connector	Gain (dBi)
1	Slot	No	-2.13

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

<b>Power Supply Type</b>	5Vdc from host 3.87Vdc from battery
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### 1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	Battery	Brand: GARMIN Model: 361-00136-10 Rating: 3.87Vdc, 195mAh
2	USB cable	Brand: GARMIN Model: 320-01069-10 Power line: 0.52m shielded without core

### 1.1.5 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

### 1.1.6 Test Tool and Duty Cycle

Test Tool	Hardware control, V2.6		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11b	100.00%	0.00
	11g	100.00%	0.00
	HT20	100.00%	0.00

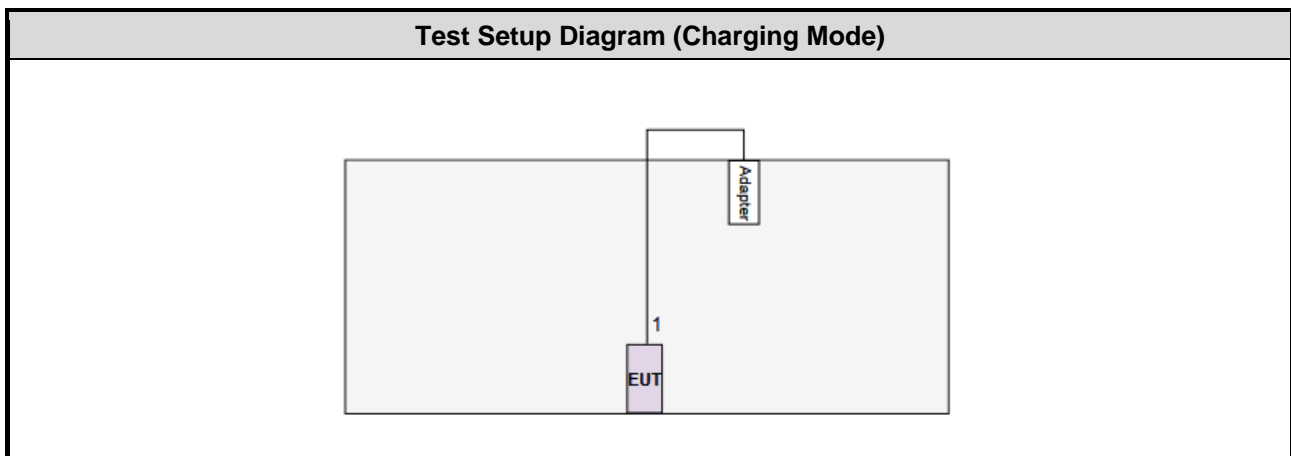
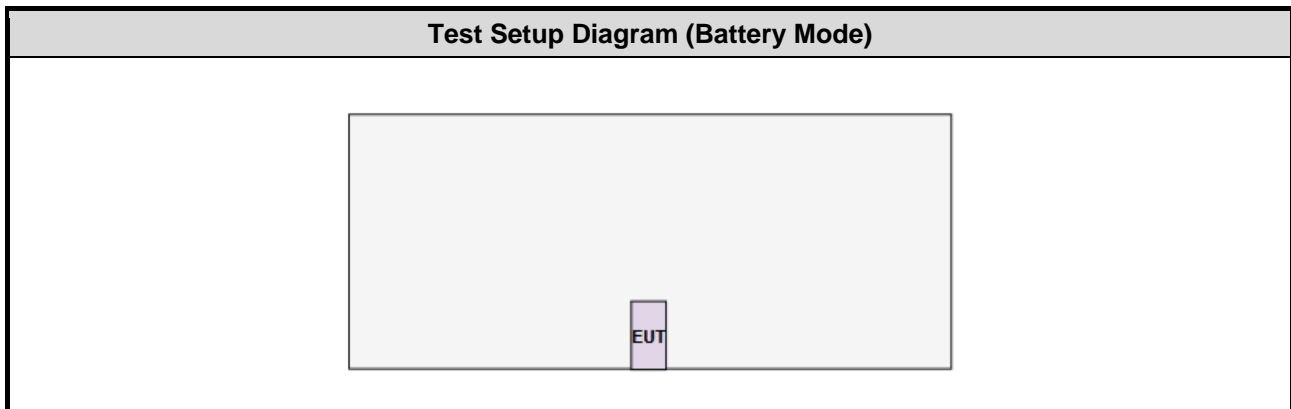
### 1.1.7 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	default
11b	2437	default
11b	2462	default
11g	2412	default
11g	2437	default
11g	2462	default
HT20	2412	default
HT20	2437	default
HT20	2462	default

## 1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Adapter	Samsung	ETA-U90JWS	---	---

## 1.3 Test Setup Chart



No.	Signal cable / Length (m)
1	USB, 0.52m shielded.

## 1.4 The Equipment List

<b>Test Item</b>	Conducted Emission				
<b>Test Site</b>	Conduction room 1 / (CO01-WS)				
<b>Tested Date</b>	Jun. 09, 2020				
<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	101658	Dec. 12, 2019	Dec. 11, 2020
LISN	R&S	ENV216	101579	Mar. 12, 2020	Mar. 11, 2021
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 22, 2019	Oct. 21, 2020
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 chamber1 / (03CH01-WS)				
<b>Tested Date</b>	May 27 ~ Jun. 01, 2020				
<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	101498	Dec. 17, 2019	Dec. 16, 2020
Receiver	R&S	ESR3	101657	Feb. 14, 2020	Feb. 13, 2021
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. 12, 2019	Dec. 11, 2020
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2019	Nov. 14, 2020
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 13, 2019	Nov. 12, 2020
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 07, 2019	Oct. 06, 2020
Preamplifier	EMC	EMC02325	980225	Jul. 09, 2019	Jul. 08, 2020
Preamplifier	Agilent	83017A	MY39501308	Oct. 08, 2019	Oct. 07, 2020
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF Cable	EMC	EMC104-SM-SM-8000	181106	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 07, 2019	Oct. 06, 2020
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	160502	Oct. 07, 2019	Oct. 06, 2020
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 07, 2019	Oct. 06, 2020
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Oct. 07, 2019	Oct. 06, 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>	Jun. 02, 2020				
<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. 30, 2020	Apr. 29, 2021
Power Meter	Anritsu	ML2495A	1241002	Oct. 23, 2019	Oct. 22, 2020
Power Sensor	Anritsu	MA2411B	1207366	Oct. 23, 2019	Oct. 22, 2020
DC POWER SOURCE	GW INSTRON	GPC-6030D	GES855395	Oct. 29, 2019	Oct. 28, 2020
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 02, 2019	Dec. 01, 2020
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

## 1.5 Test Standards

47 CFR FCC Part 15.247  
ANSI C63.10-2013

## 1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

## 1.7 Deviation from Test Standard and Measurement Procedure

None

## 1.8 Measurement Uncertainty

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

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±34.130 Hz
Conducted power	±0.808 dB
Power density	±0.583 dB
Conducted emission	±2.715 dB
AC conducted emission	±2.92 dB
Radiated emission ≤ 1GHz	±3.41 dB
Radiated emission > 1GHz	±4.59 dB

## 2 Test Configuration

### 2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	21°C / 56%	Alex Tsai
Radiated Emissions	03CH01-WS	24-25°C / 64-65%	Akun Chung Brad Wu
RF Conducted	TH01-WS	25°C / 67%	Aska Huang

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

### 2.2 Testing Facility

<b>Test Laboratory</b>	International Certification Corp.
<b>Test Site</b>	CO01-WS, 03CH01-WS, TH01-WS
<b>Address of Test Site</b>	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

### 2.3 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	Charging	---	---	1
Radiated Emissions ≤1GHz	11g	2412	6 Mbps	2
	Charging	---	---	1
Radiated Emissions >1GHz				
Maximum Output Power	11b	2412 / 2437 / 2462	1 Mbps	2
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 **Z-plane** result was found as the worst case and was shown in this report.
2. The test configurations are listed as follows:  
 Test Configuration 1: Charging mode  
 Test Configuration 2: Battery mode

## 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

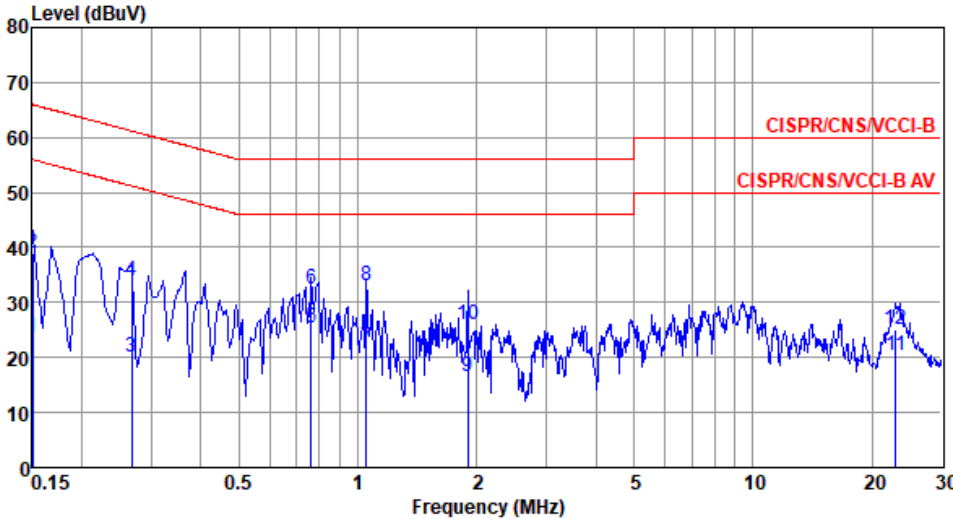


- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

### 3.1.4 Test Result of Conducted Emissions

Modulation Mode	Charging	Test Freq. (MHz)	---
Power Phase	Line		

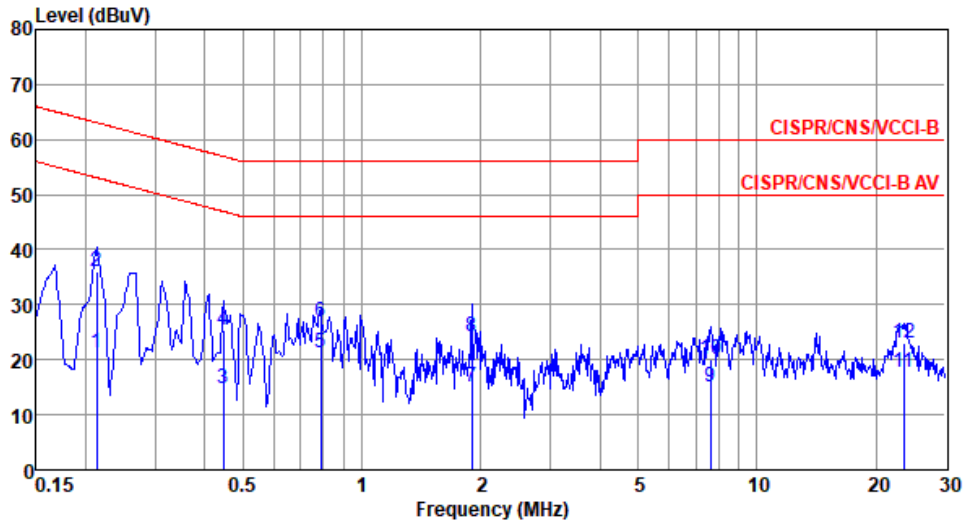
  



	Freq	Level	Limit	Over	Read	LISN	cable	Remark
	MHz	dBuV	Line	Limit	Level	factor	loss	
			dBuV	dB	dBuV	dB	dB	
1	0.150	23.76	56.00	-32.24	13.91	9.64	0.05	Average
2	0.150	39.00	66.00	-27.00	29.15	9.64	0.05	QP
3	0.267	20.03	51.20	-31.17	10.12	9.63	0.07	Average
4	0.267	34.03	61.20	-27.17	24.12	9.63	0.07	QP
5*	0.763	25.51	46.00	-20.49	15.47	9.63	0.11	Average
6	0.763	32.57	56.00	-23.43	22.53	9.63	0.11	QP
7	1.053	21.75	46.00	-24.25	11.68	9.63	0.12	Average
8	1.053	33.20	56.00	-22.80	23.13	9.63	0.12	QP
9	1.898	16.40	46.00	-29.60	6.24	9.64	0.18	Average
10	1.898	25.94	56.00	-30.06	15.78	9.64	0.18	QP
11	23.018	20.44	50.00	-29.56	9.39	9.69	0.69	Average
12	23.018	25.16	60.00	-34.84	14.11	9.69	0.69	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 Mode</b>	Charging	<b>Test Freq. (MHz)</b>	---
<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	0.213	21.30	53.10	-31.80	11.44	9.65	0.06	Average
2	0.213	35.94	63.10	-27.16	26.08	9.65	0.06	QP
3	0.447	14.89	46.93	-32.04	4.99	9.65	0.08	Average
4	0.447	25.49	56.93	-31.44	15.59	9.65	0.08	QP
5*	0.788	21.18	46.00	-24.82	11.23	9.65	0.11	Average
6	0.788	26.73	56.00	-29.27	16.78	9.65	0.11	QP
7	1.898	14.98	46.00	-31.02	4.88	9.66	0.18	Average
8	1.898	24.14	56.00	-31.86	14.04	9.66	0.18	QP
9	7.646	14.96	50.00	-35.04	4.58	9.71	0.36	Average
10	7.646	19.97	60.00	-40.03	9.59	9.71	0.36	QP
11	23.511	17.60	50.00	-32.40	6.46	9.81	0.70	Average
12	23.511	22.99	60.00	-37.01	11.85	9.81	0.70	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

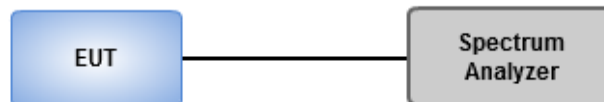
#### 6dB Bandwidth

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)_1TX	12.174M	13.965M	14M0G1D	12.029M	13.965M
802.11g_Nss1,(6Mbps)_1TX	16.449M	16.715M	16M7D1D	16.449M	16.643M
802.11n HT20_Nss1,(MCS0)_1TX	17.754M	17.728M	17M7D1D	17.681M	17.728M

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

#### Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	12.101M	13.965M
2437MHz	Pass	500k	12.174M	13.965M
2462MHz	Pass	500k	12.029M	13.965M
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	16.449M	16.643M
2437MHz	Pass	500k	16.449M	16.715M
2462MHz	Pass	500k	16.449M	16.715M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
2412MHz	Pass	500k	17.681M	17.728M
2437MHz	Pass	500k	17.754M	17.728M
2462MHz	Pass	500k	17.754M	17.728M

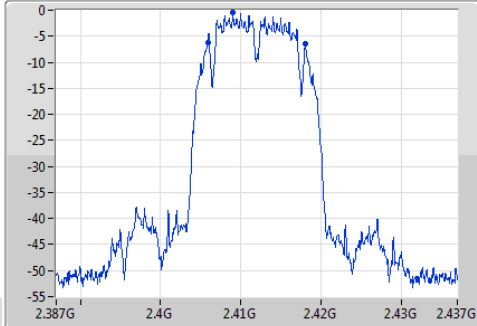
**Port X-N dB** = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

### 802.11b\_Nss1,(1Mbps)\_1TX

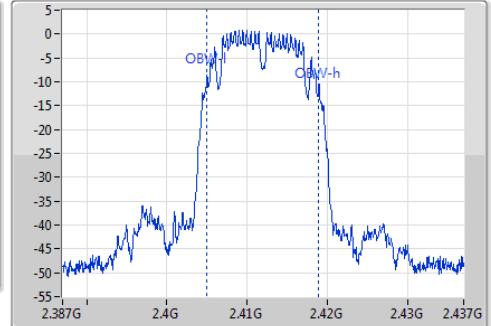
EBW

2412MHz

CF  
2.412GHz  
Span  
50MHz  
RBW  
100kHz  
VBW  
300kHz  
Sweep Time  
1.08ms  
Detector Type  
Peak



CF  
2.412GHz  
Span  
50MHz  
RBW  
200kHz  
VBW  
1MHz  
Sweep Time  
1.02ms  
Detector Type  
Sample



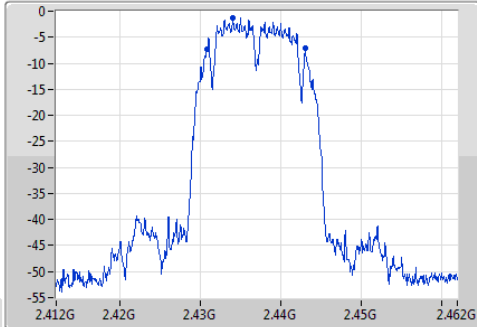
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
12.101M	2.405913G	2.418014G	13.965M	2.404909G	2.418874G	500k	1

### 802.11b\_Nss1,(1Mbps)\_1TX

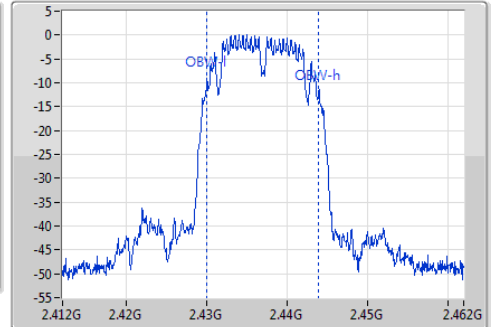
EBW

2437MHz

CF  
2.437GHz  
Span  
50MHz  
RBW  
100kHz  
VBW  
300kHz  
Sweep Time  
1.08ms  
Detector Type  
Peak



CF  
2.437GHz  
Span  
50MHz  
RBW  
200kHz  
VBW  
1MHz  
Sweep Time  
1.02ms  
Detector Type  
Sample



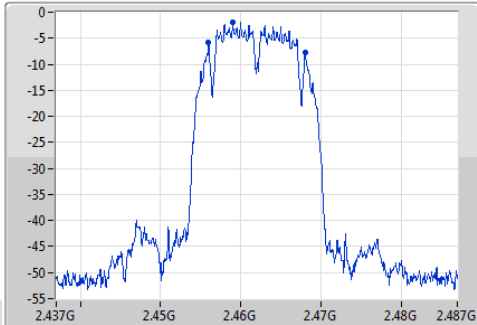
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
12.174M	2.430841G	2.443014G	13.965M	2.429909G	2.443874G	500k	1

### 802.11b\_Nss1,(1Mbps)\_1TX

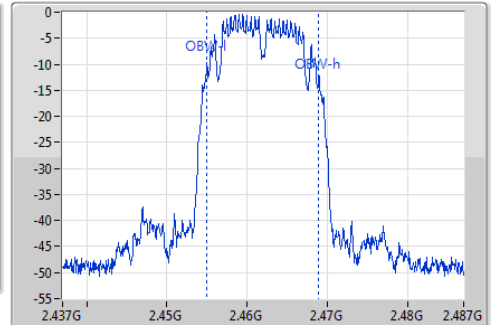
EBW

2462MHz

CF  
2.462GHz  
Span  
50MHz  
RBW  
100kHz  
VBW  
300kHz  
Sweep Time  
1.08ms  
Detector Type  
Peak



CF  
2.462GHz  
Span  
50MHz  
RBW  
200kHz  
VBW  
1MHz  
Sweep Time  
1.02ms  
Detector Type  
Sample



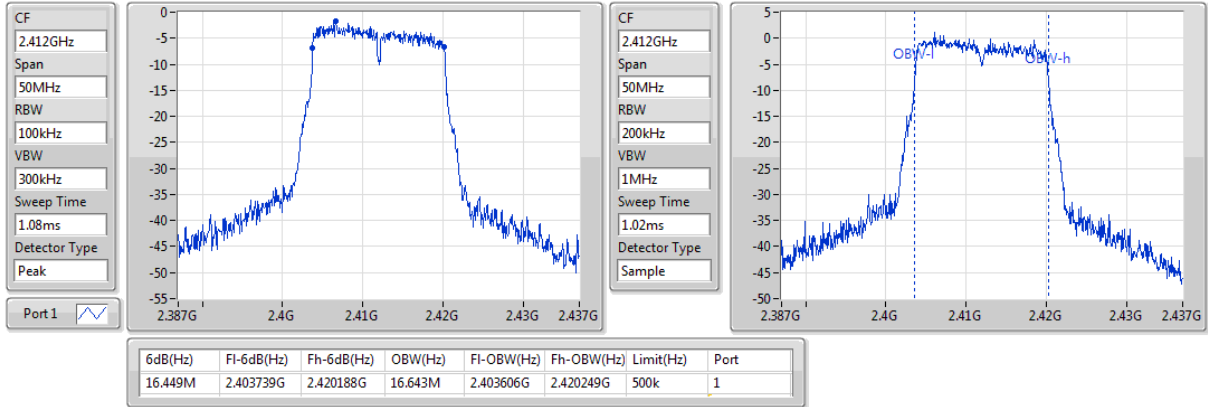
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
12.029M	2.455986G	2.468014G	13.965M	2.454909G	2.468874G	500k	1



### 802.11g\_Nss1,(6Mbps)\_1TX

EBW

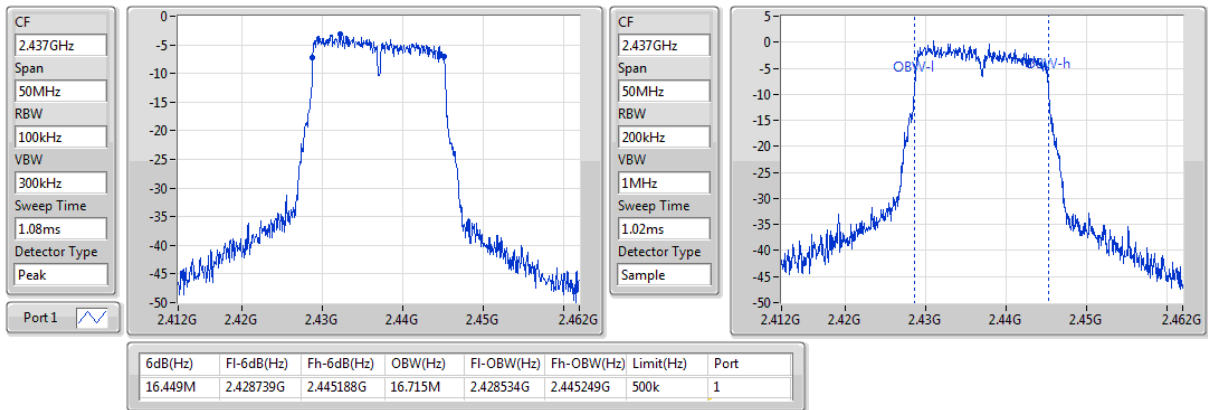
2412MHz



### 802.11g\_Nss1,(6Mbps)\_1TX

EBW

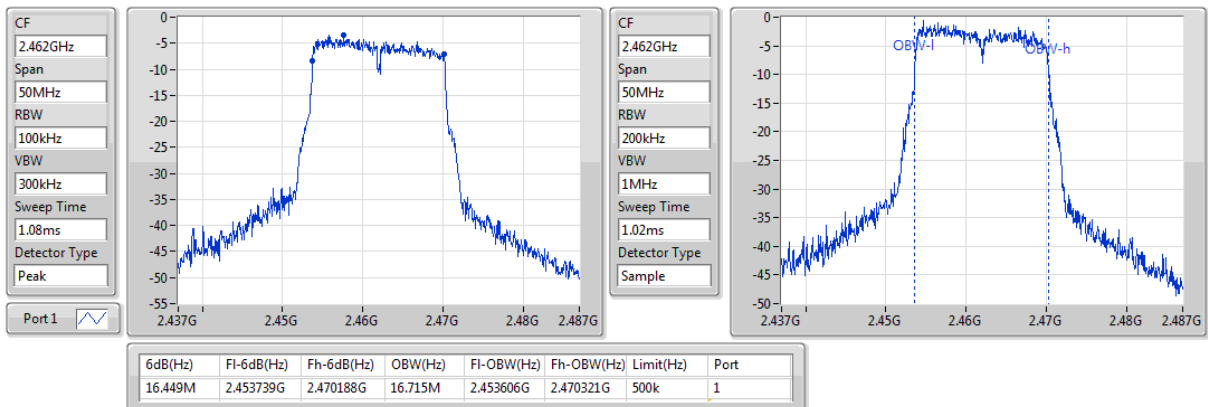
2437MHz



### 802.11g\_Nss1,(6Mbps)\_1TX

EBW

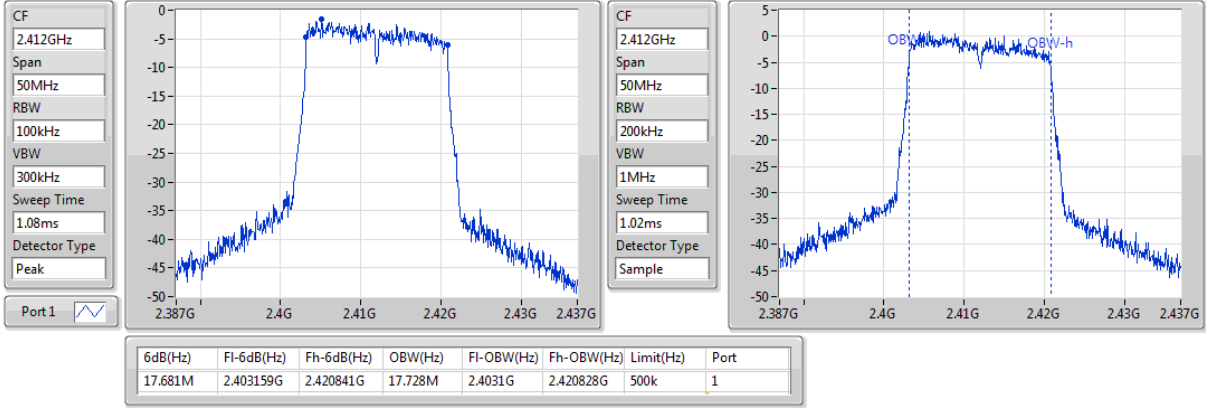
2462MHz



### 802.11n HT20\_Nss1,(MCS0)\_1TX

EBW

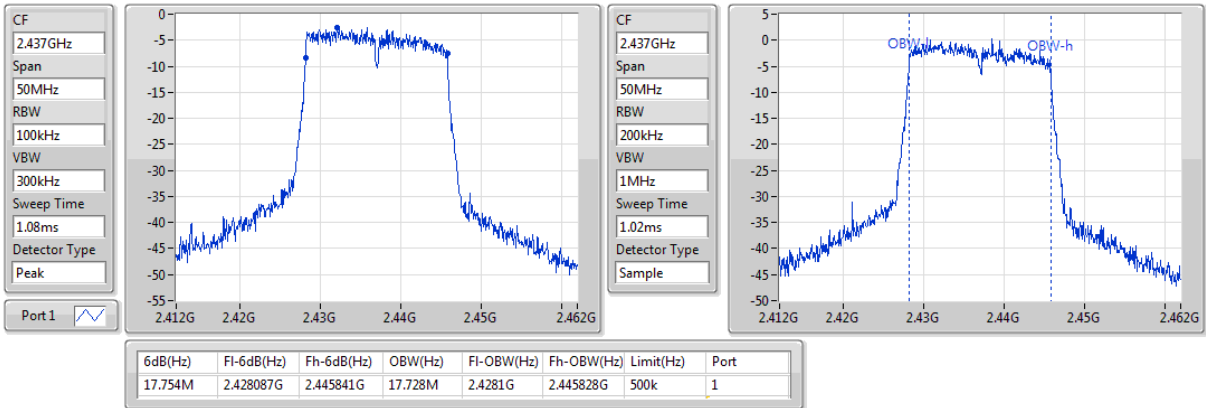
2412MHz



### 802.11n HT20\_Nss1,(MCS0)\_1TX

EBW

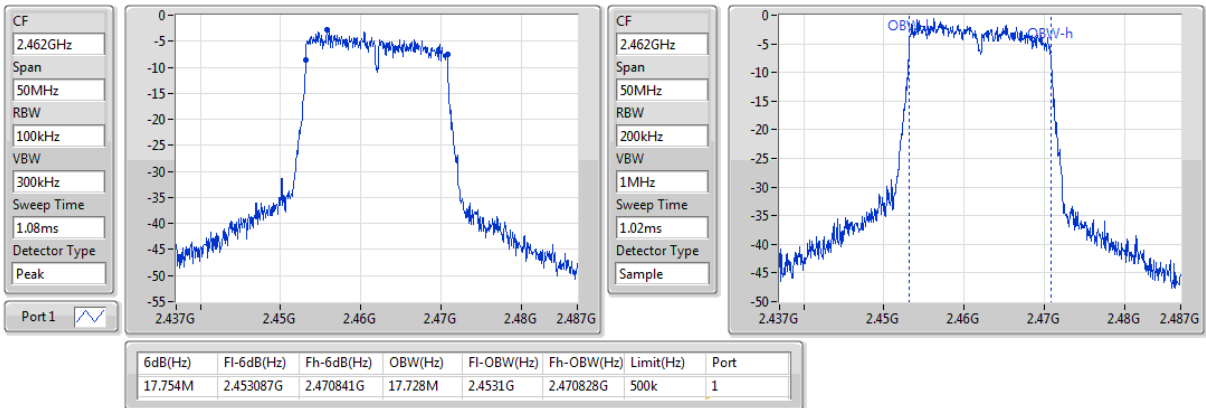
2437MHz



### 802.11n HT20\_Nss1,(MCS0)\_1TX

EBW

2462MHz



### 3.3 RF Output Power

#### 3.3.1 Limit of RF Output Power

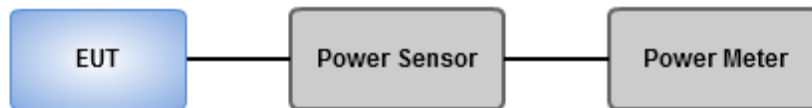
Conducted power shall not exceed 1Watt.

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

#### 3.3.2 Test Procedures

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

#### 3.3.3 Test Setup



### 3.3.4 Test Result of Maximum Output Power

#### Summary of Peak Conducted Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	13.05	0.02018
802.11g_Nss1,(6Mbps)_1TX	20.30	0.10715
802.11n HT20_Nss1,(MCS0)_1TX	20.13	0.10304

#### Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	-2.13	13.05	13.05	30.00	10.92	36.00
2437MHz	Pass	-2.13	12.60	12.60	30.00	10.47	36.00
2462MHz	Pass	-2.13	12.15	12.15	30.00	10.02	36.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	-2.13	20.30	20.30	30.00	18.17	36.00
2437MHz	Pass	-2.13	20.21	20.21	30.00	18.08	36.00
2462MHz	Pass	-2.13	19.53	19.53	30.00	17.40	36.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	-2.13	20.13	20.13	30.00	18.00	36.00
2437MHz	Pass	-2.13	19.95	19.95	30.00	17.82	36.00
2462MHz	Pass	-2.13	19.47	19.47	30.00	17.34	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)_1TX	10.55	0.01135
802.11g_Nss1,(6Mbps)_1TX	11.33	0.01358
802.11n HT20_Nss1,(MCS0)_1TX	11.25	0.01334

### Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	-2.13	10.55	10.55	-	8.42	-
2437MHz	Pass	-2.13	10.04	10.04	-	7.91	-
2462MHz	Pass	-2.13	9.33	9.33	-	7.20	-
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	-2.13	11.33	11.33	-	9.20	-
2437MHz	Pass	-2.13	10.85	10.85	-	8.72	-
2462MHz	Pass	-2.13	10.32	10.32	-	8.19	-
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	-2.13	11.25	11.25	-	9.12	-
2437MHz	Pass	-2.13	10.77	10.77	-	8.64	-
2462MHz	Pass	-2.13	10.21	10.21	-	8.08	-

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

**Note** : Conducted average output power is for reference only

## 3.4 Power Spectral Density

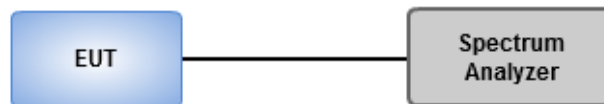
### 3.4.1 Limit of Power Spectral Density

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

### 3.4.2 Test Procedures

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

### 3.4.3 Test Setup



### 3.4.4 Test Result of Power Spectral Density

#### Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_1TX	-15.78
802.11g_Nss1,(6Mbps)_1TX	-11.29
802.11n HT20_Nss1,(MCS0)_1TX	-14.58

#### Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	-2.13	-15.78	-15.78	8.00
2437MHz	Pass	-2.13	-16.76	-16.76	8.00
2462MHz	Pass	-2.13	-16.82	-16.82	8.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	-2.13	-11.29	-11.29	8.00
2437MHz	Pass	-2.13	-14.14	-14.14	8.00
2462MHz	Pass	-2.13	-14.86	-14.86	8.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
2412MHz	Pass	-2.13	-14.58	-14.58	8.00
2437MHz	Pass	-2.13	-15.38	-15.38	8.00
2462MHz	Pass	-2.13	-14.84	-14.84	8.00

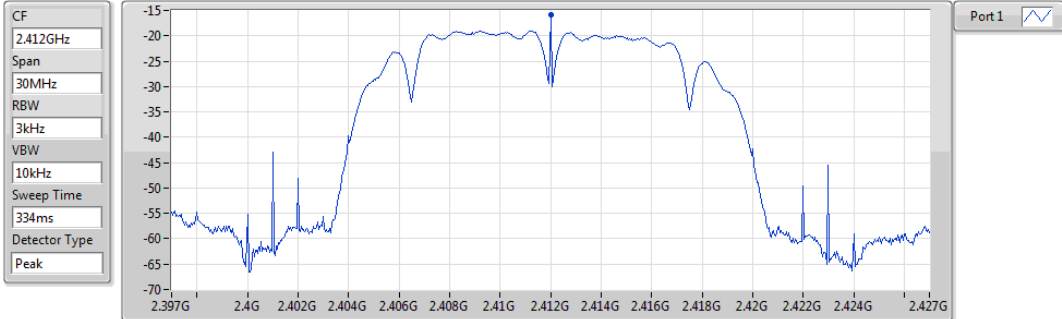
**DG** = Directional Gain;

**PD** = power density; **Port X** = Port X power density;

### 802.11b\_Nss1,(1Mbps)\_1TX

PSD

#### 2412MHz

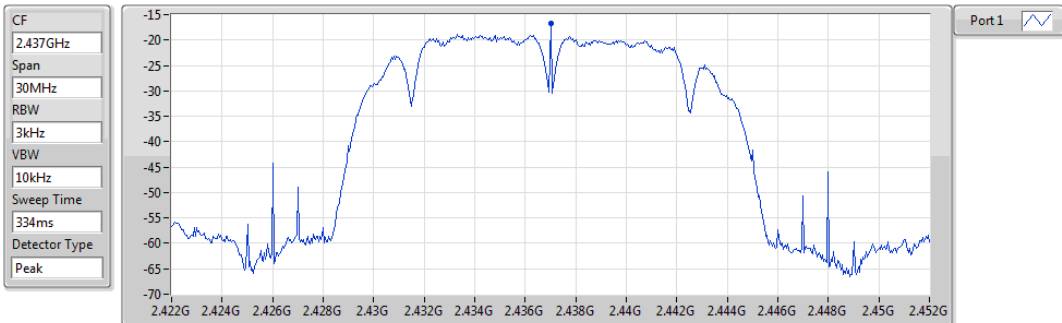


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-15.78	-15.78	-15.78

### 802.11b\_Nss1,(1Mbps)\_1TX

PSD

#### 2437MHz

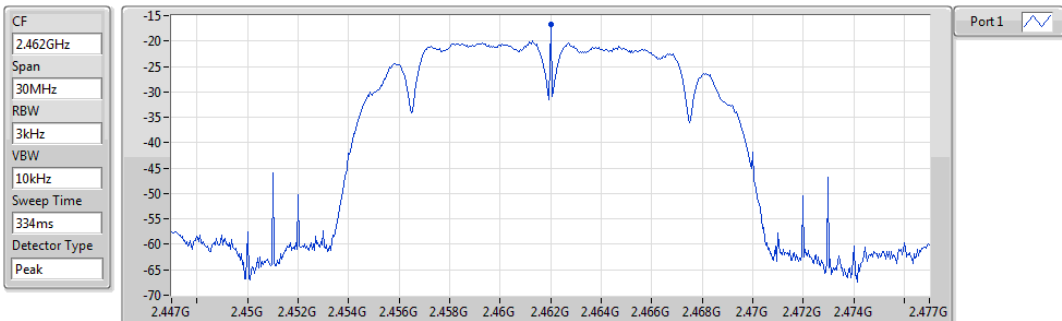


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-16.76	-16.76	-16.76

### 802.11b\_Nss1,(1Mbps)\_1TX

PSD

#### 2462MHz



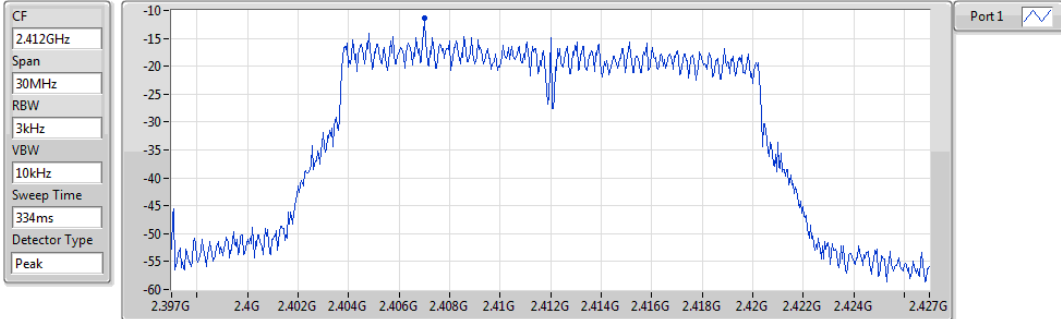
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-16.82	-16.82	-16.82



### 802.11g\_Nss1,(6Mbps)\_1TX

PSD

2412MHz

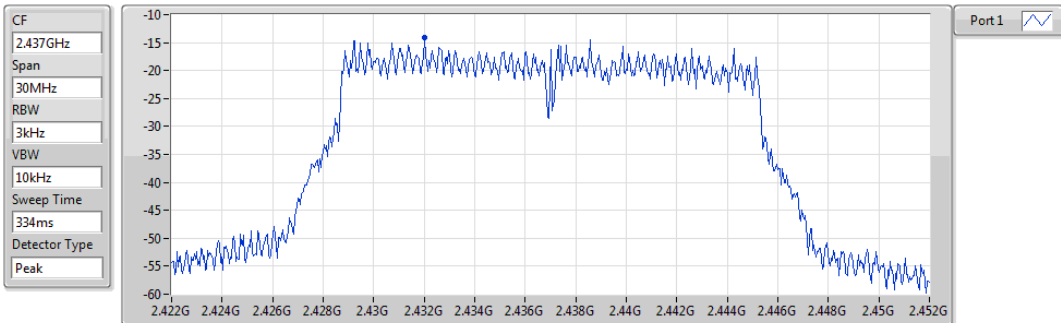


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-11.29	-11.29	-11.29

### 802.11g\_Nss1,(6Mbps)\_1TX

PSD

2437MHz

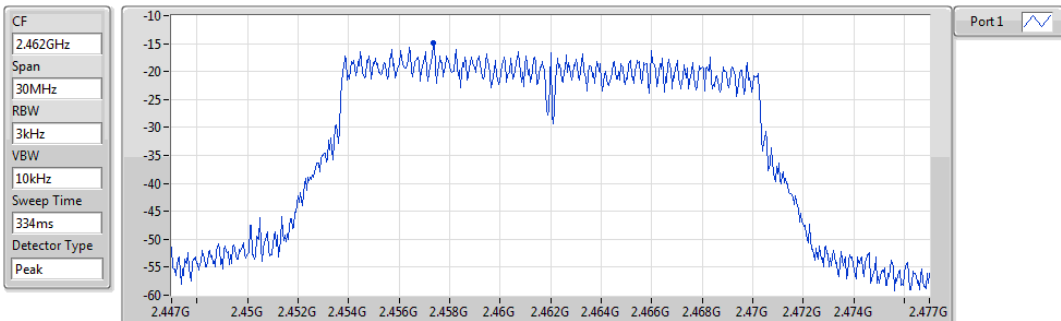


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.14	-14.14	-14.14

### 802.11g\_Nss1,(6Mbps)\_1TX

PSD

2462MHz

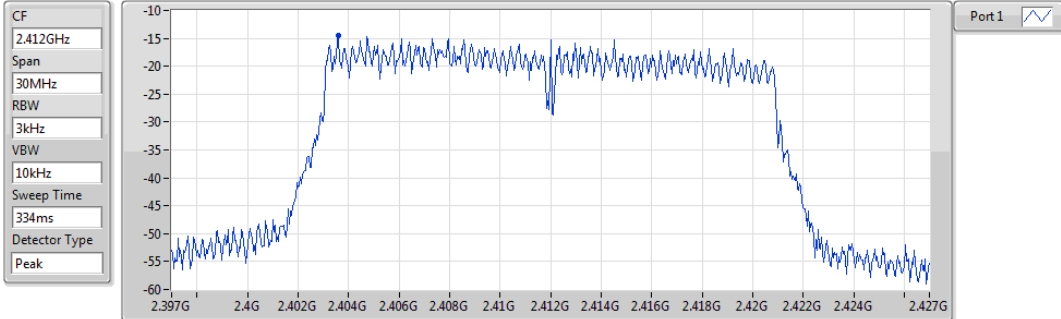


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.86	-14.86	-14.86

### 802.11n HT20\_Nss1,(MCS0)\_1TX

PSD

2412MHz

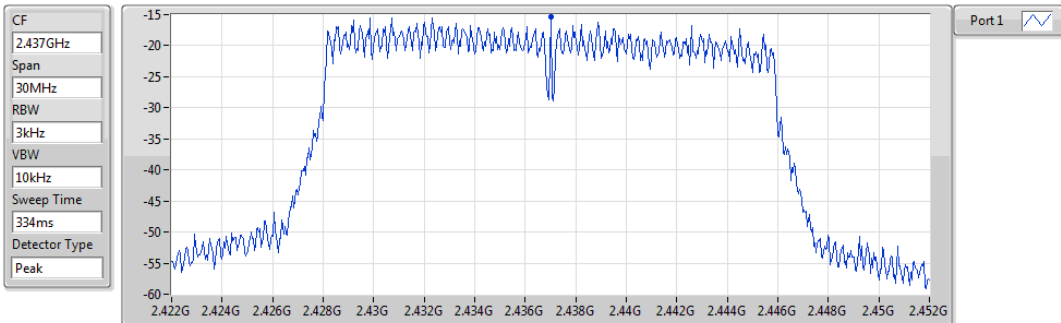


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.58	-14.58	-14.58

### 802.11n HT20\_Nss1,(MCS0)\_1TX

PSD

2437MHz

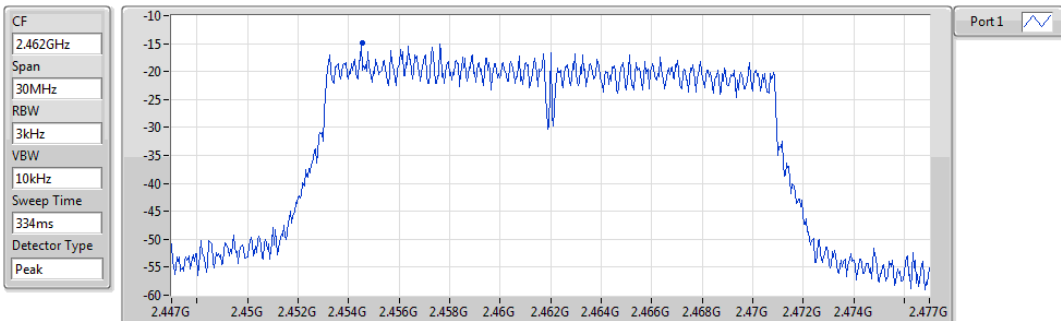


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-15.38	-15.38	-15.38

### 802.11n HT20\_Nss1,(MCS0)\_1TX

PSD

2462MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.84	-14.84	-14.84

## 3.5 Unwanted Emissions into Restricted Frequency Bands

### 3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

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

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

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

### 3.5.2 Test Procedures

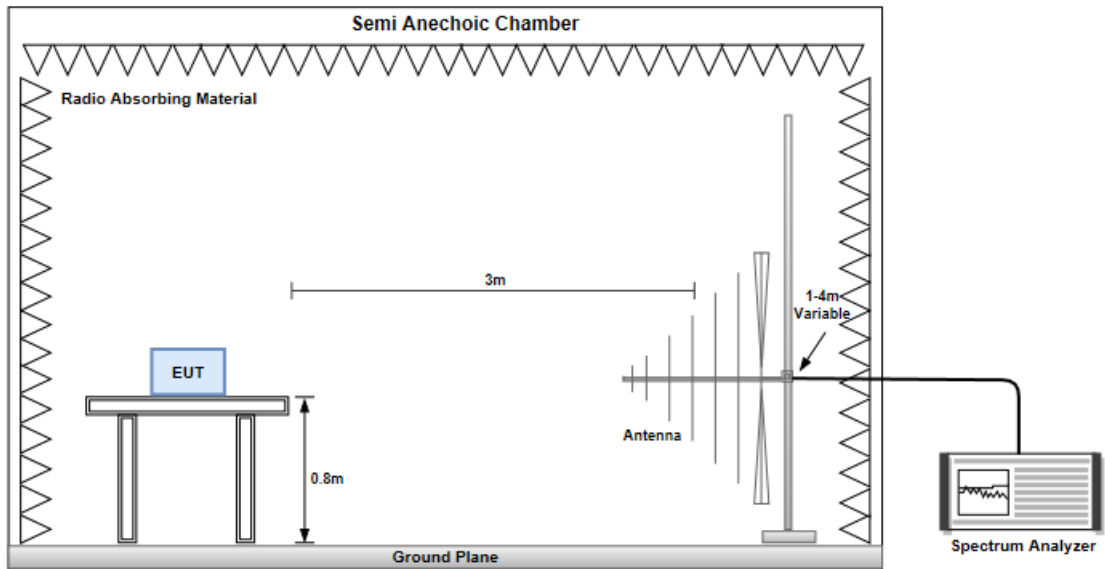
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

Note:

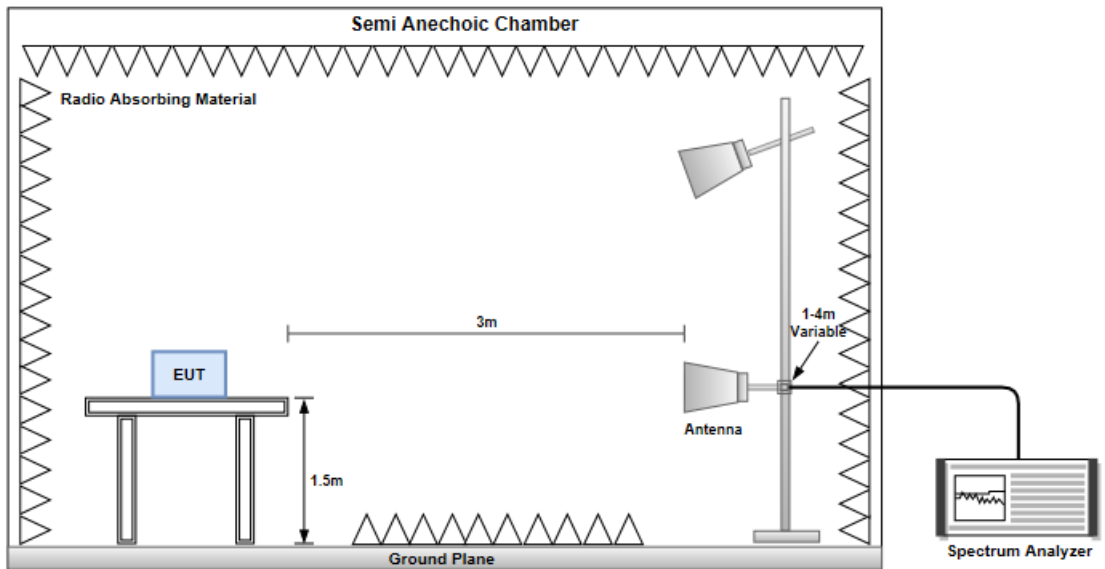
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

### 3.5.3 Test Setup

#### Radiated Emissions below 1 GHz



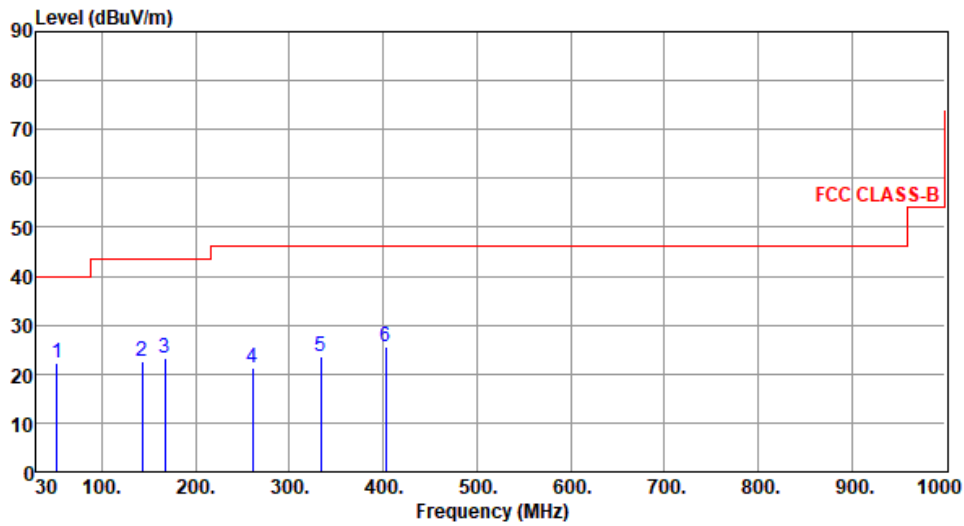
#### Radiated Emissions above 1 GHz



**Test Configuration 1: Charging mode.**

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

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2412
<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	52.31	22.12	40.00	-17.88	30.58	-8.46	Peak	---	---
2	142.52	22.48	43.50	-21.02	31.18	-8.70	Peak	---	---
3	166.77	23.20	43.50	-20.30	31.90	-8.70	Peak	---	---
4	260.86	21.20	46.00	-24.80	30.77	-9.57	Peak	---	---
5	333.61	23.71	46.00	-22.29	30.85	-7.14	Peak	---	---
6	402.48	25.42	46.00	-20.58	30.92	-5.50	Peak	---	---

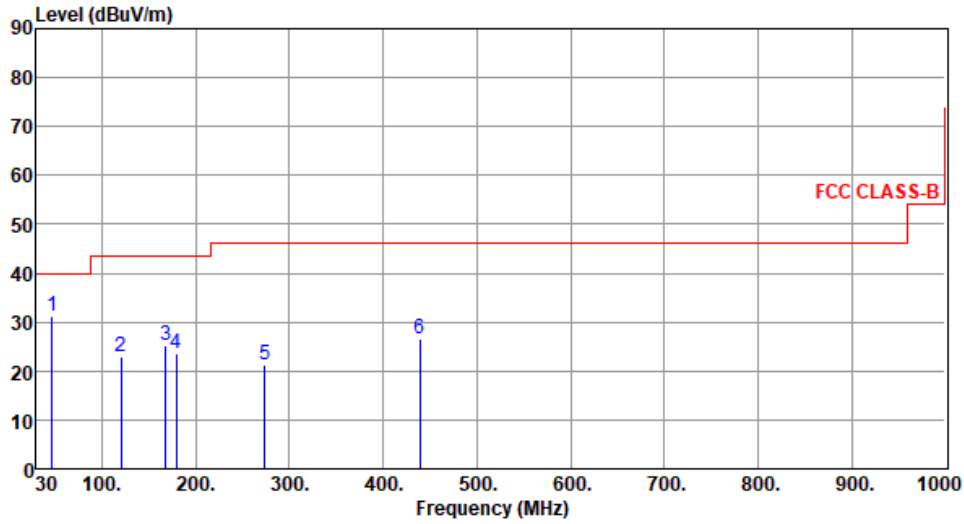
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*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>	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	46.49	31.27	40.00	-8.73	39.63	-8.36	Peak	---	---
2	120.21	22.93	43.50	-20.57	33.52	-10.59	Peak	---	---
3	167.74	25.18	43.50	-18.32	33.88	-8.70	Peak	---	---
4	179.38	23.47	43.50	-20.03	33.28	-9.81	Peak	---	---
5	273.47	21.27	46.00	-24.73	30.14	-8.87	Peak	---	---
6	439.34	26.56	46.00	-19.44	30.90	-4.34	Peak	---	---

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

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

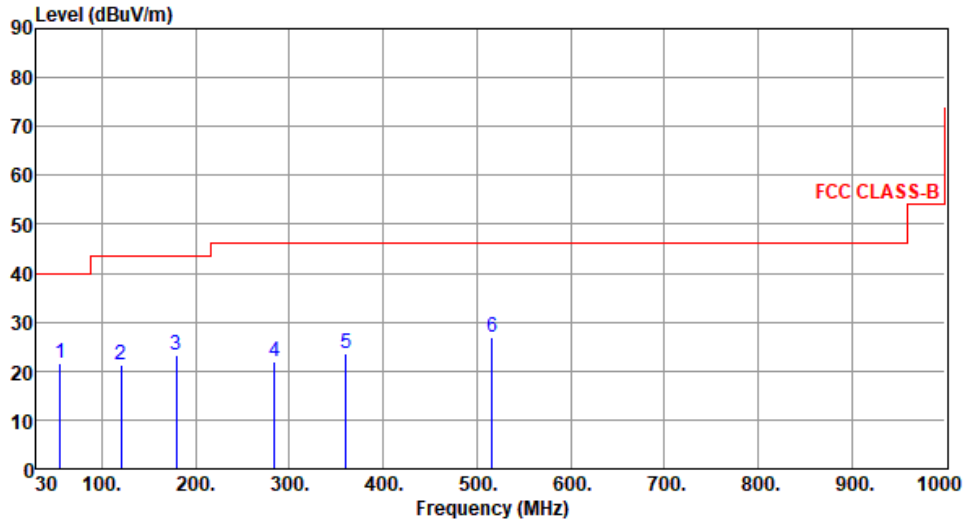
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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

**Test Configuration 2: Battery mode**

**3.5.5 Transmitter Radiated Unwanted Emissions (Below 1GHz)**

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2412
<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	55.22	21.46	40.00	-18.54	30.13	-8.67	Peak	---	---
2	120.21	21.17	43.50	-22.33	31.76	-10.59	Peak	---	---
3	179.38	23.09	43.50	-20.41	32.90	-9.81	Peak	---	---
4	284.14	22.03	46.00	-23.97	30.50	-8.47	Peak	---	---
5	360.77	23.48	46.00	-22.52	30.06	-6.58	Peak	---	---
6	515.97	27.04	46.00	-18.96	29.85	-2.81	Peak	---	---

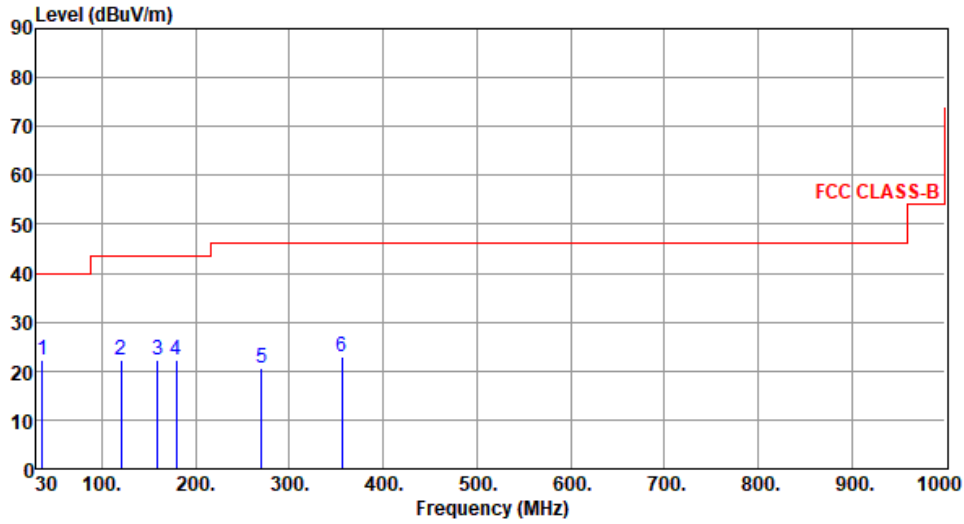
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*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>	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	36.79	22.32	40.00	-17.68	31.39	-9.07	Peak	---	---
2	120.21	22.13	43.50	-21.37	32.72	-10.59	Peak	---	---
3	159.01	22.24	43.50	-21.26	30.56	-8.32	Peak	---	---
4	179.38	22.29	43.50	-21.21	32.10	-9.81	Peak	---	---
5	270.56	20.52	46.00	-25.48	29.57	-9.05	Peak	---	---
6	355.92	22.78	46.00	-23.22	29.50	-6.72	Peak	---	---

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

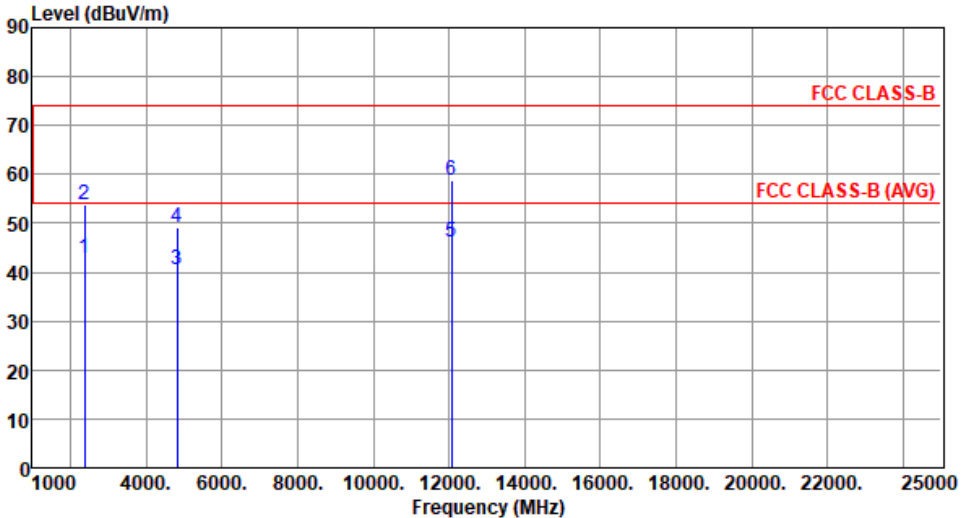
\*Factor includes antenna factor , cable loss and amplifier gain

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

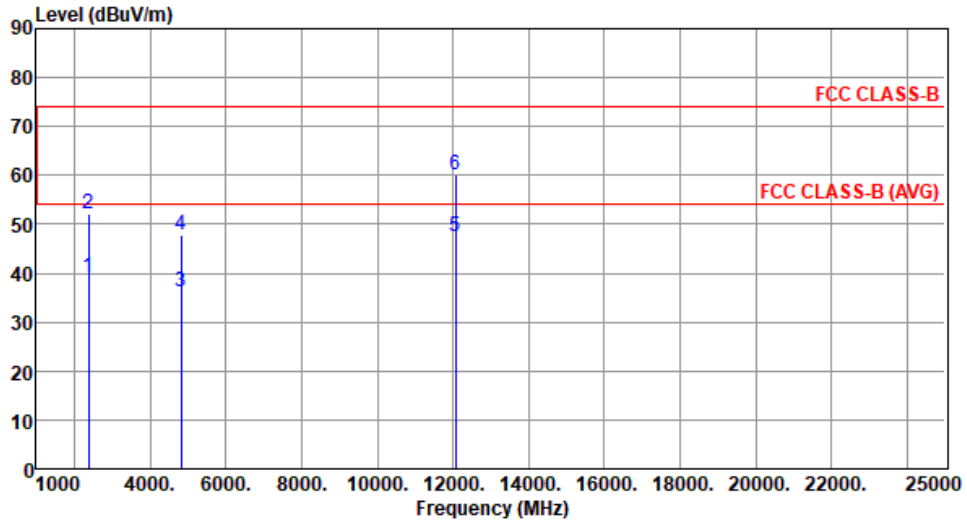
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



### 3.5.6 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	42.94	54.00	-11.06	45.74	-2.80	Average	166	176
2	2390.00	53.76	74.00	-20.24	56.56	-2.80	Peak	166	176
3	4824.00	40.57	54.00	-13.43	36.97	3.60	Average	100	191
4	4824.00	49.01	74.00	-24.99	45.41	3.60	Peak	100	191
5	12060.00	46.14	54.00	-7.86	32.29	13.85	Average	100	182
6	12060.00	58.87	74.00	-15.13	45.02	13.85	Peak	100	182
<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>	11b	<b>Test Freq. (MHz)</b>	2412
<b>Polarization</b>	Vertical		



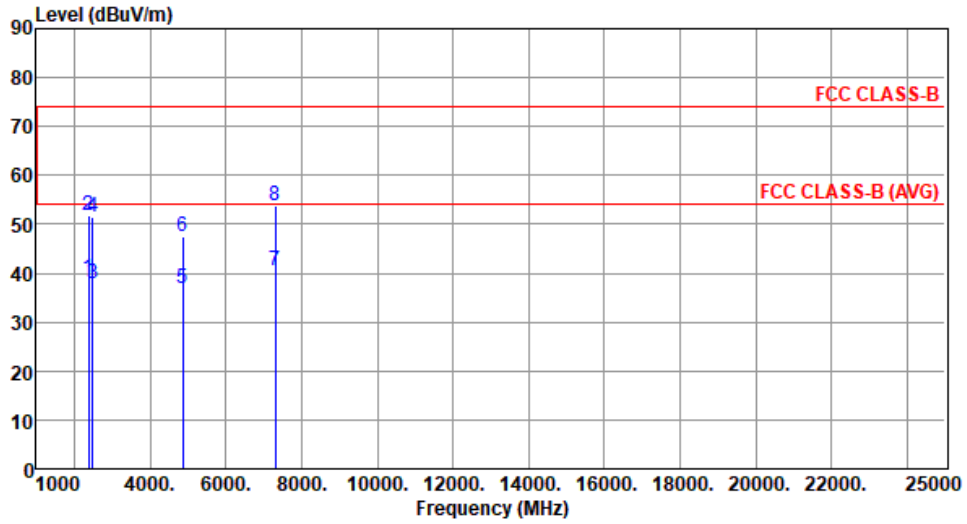
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.26	54.00	-14.74	42.06	-2.80	Average	102	226
2	2390.00	52.06	74.00	-21.94	54.86	-2.80	Peak	102	226
3	4824.00	36.17	54.00	-17.83	32.57	3.60	Average	106	209
4	4824.00	47.71	74.00	-26.29	44.11	3.60	Peak	106	209
5	12060.00	47.48	54.00	-6.52	33.63	13.85	Average	186	256
6	12060.00	60.26	74.00	-13.74	46.41	13.85	Peak	186	256

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		



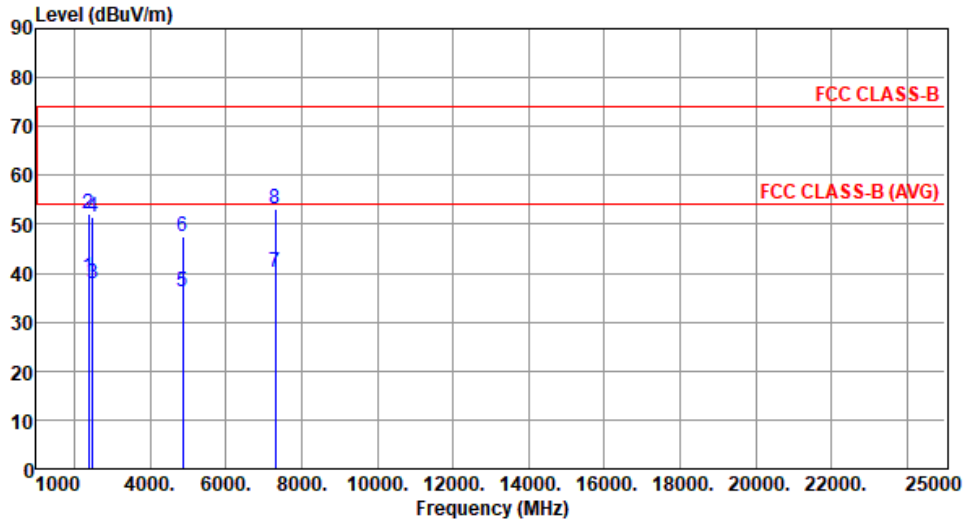
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.01	54.00	-14.99	41.81	-2.80	Average	138	180
2	2390.00	51.96	74.00	-22.04	54.76	-2.80	Peak	138	180
3	2483.50	37.89	54.00	-16.11	40.92	-3.03	Average	138	180
4	2483.50	51.61	74.00	-22.39	54.64	-3.03	Peak	138	180
5	4874.00	36.78	54.00	-17.22	33.14	3.64	Average	100	196
6	4874.00	47.49	74.00	-26.51	43.85	3.64	Peak	100	196
7	7311.00	40.62	54.00	-13.38	31.35	9.27	Average	100	15
8	7311.00	53.85	74.00	-20.15	44.58	9.27	Peak	100	15

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		



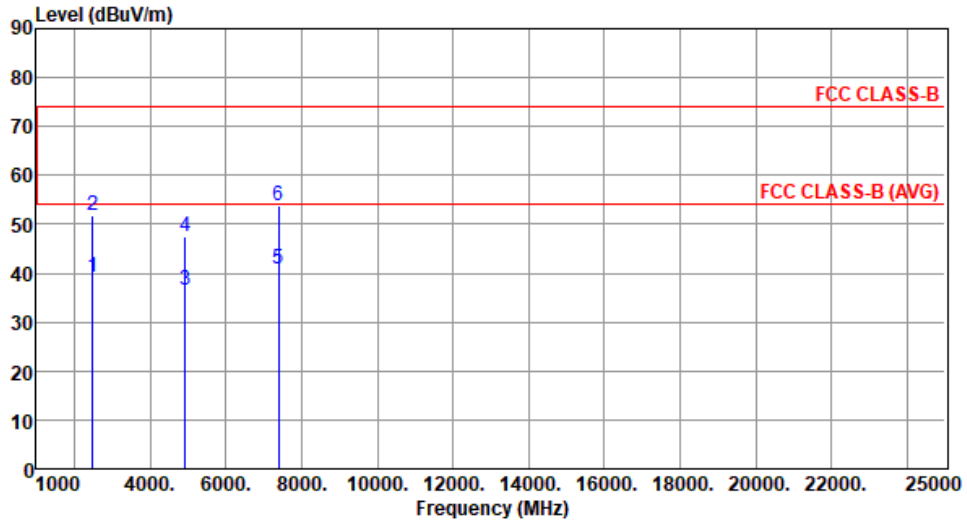
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.14	54.00	-14.86	41.94	-2.80	Average	102	224
2	2390.00	51.98	74.00	-22.02	54.78	-2.80	Peak	102	224
3	2483.50	37.88	54.00	-16.12	40.91	-3.03	Average	102	224
4	2483.50	51.56	74.00	-22.44	54.59	-3.03	Peak	102	224
5	4874.00	36.05	54.00	-17.95	32.41	3.64	Average	105	212
6	4874.00	47.41	74.00	-26.59	43.77	3.64	Peak	105	212
7	7311.00	40.32	54.00	-13.68	31.05	9.27	Average	102	14
8	7311.00	53.12	74.00	-20.88	43.85	9.27	Peak	102	14

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		



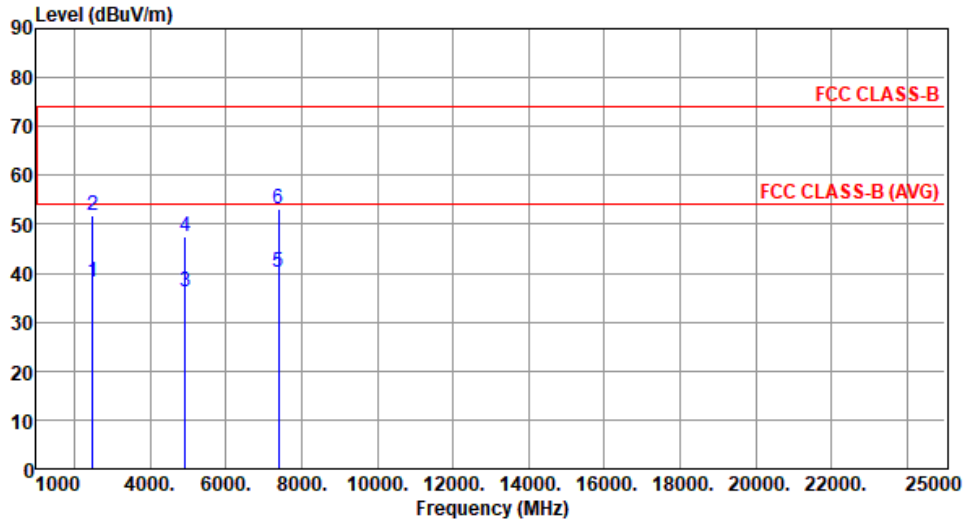
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.12	54.00	-14.88	42.15	-3.03	Average	124	178
2	2483.50	51.96	74.00	-22.04	54.99	-3.03	Peak	124	178
3	4924.00	36.69	54.00	-17.31	33.00	3.69	Average	100	194
4	4924.00	47.42	74.00	-26.58	43.73	3.69	Peak	100	194
5	7386.00	40.81	54.00	-13.19	31.74	9.07	Average	100	22
6	7386.00	53.89	74.00	-20.11	44.82	9.07	Peak	100	22

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		



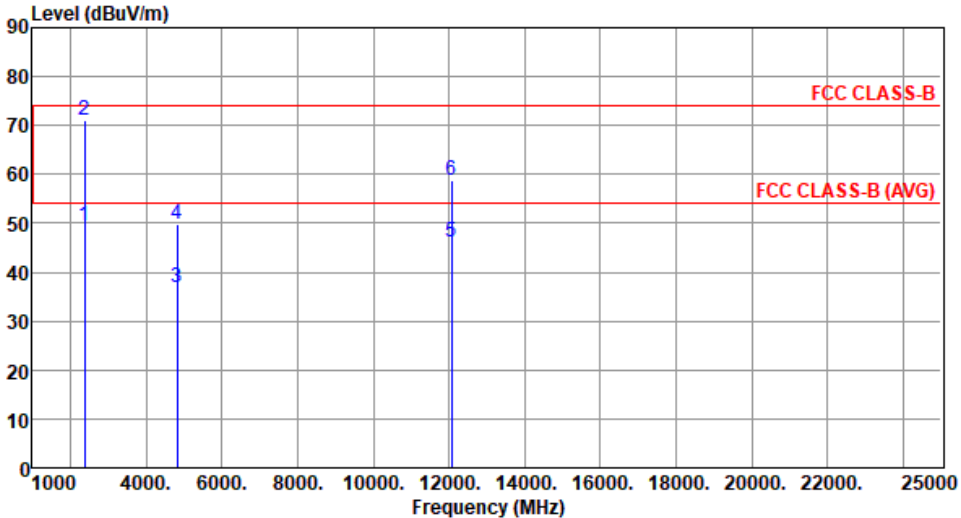
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	38.29	54.00	-15.71	41.32	-3.03	Average	102	226
2	2483.50	51.82	74.00	-22.18	54.85	-3.03	Peak	102	226
3	4924.00	36.14	54.00	-17.86	32.45	3.69	Average	100	216
4	4924.00	47.52	74.00	-26.48	43.83	3.69	Peak	100	216
5	7386.00	40.26	54.00	-13.74	31.19	9.07	Average	106	19
6	7386.00	53.08	74.00	-20.92	44.01	9.07	Peak	106	19

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

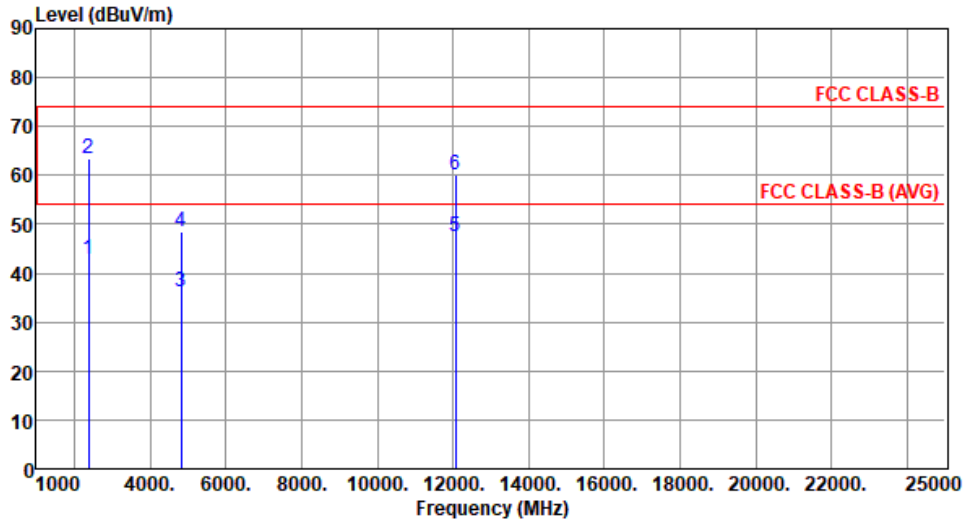
\*Factor includes antenna factor , cable loss and amplifier gain

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

### 3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 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	49.58	54.00	-4.42	52.38	-2.80	Average	192	179
2	2390.00	71.04	74.00	-2.96	73.84	-2.80	Peak	192	179
3	4824.00	36.81	54.00	-17.19	33.21	3.60	Average	100	191
4	4824.00	49.89	74.00	-24.11	46.29	3.60	Peak	100	191
5	12060.00	46.13	54.00	-7.87	32.28	13.85	Average	100	182
6	12060.00	58.92	74.00	-15.08	45.07	13.85	Peak	100	182
<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>	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	42.85	54.00	-11.15	45.65	-2.80	Average	104	226
2	2390.00	63.35	74.00	-10.65	66.15	-2.80	Peak	104	226
3	4824.00	36.25	54.00	-17.75	32.65	3.60	Average	103	114
4	4824.00	48.34	74.00	-25.66	44.74	3.60	Peak	103	114
5	12060.00	47.52	54.00	-6.48	33.67	13.85	Average	168	241
6	12060.00	60.24	74.00	-13.76	46.39	13.85	Peak	168	241

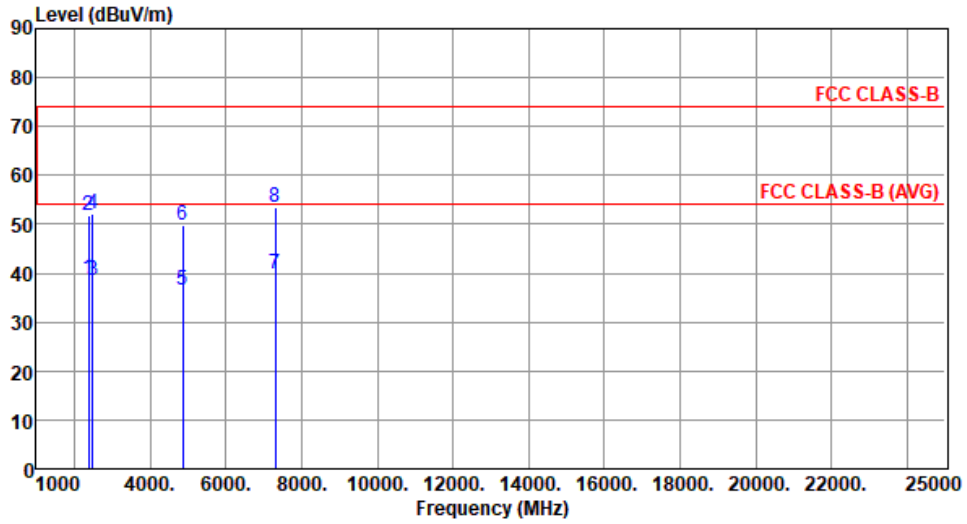
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*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		



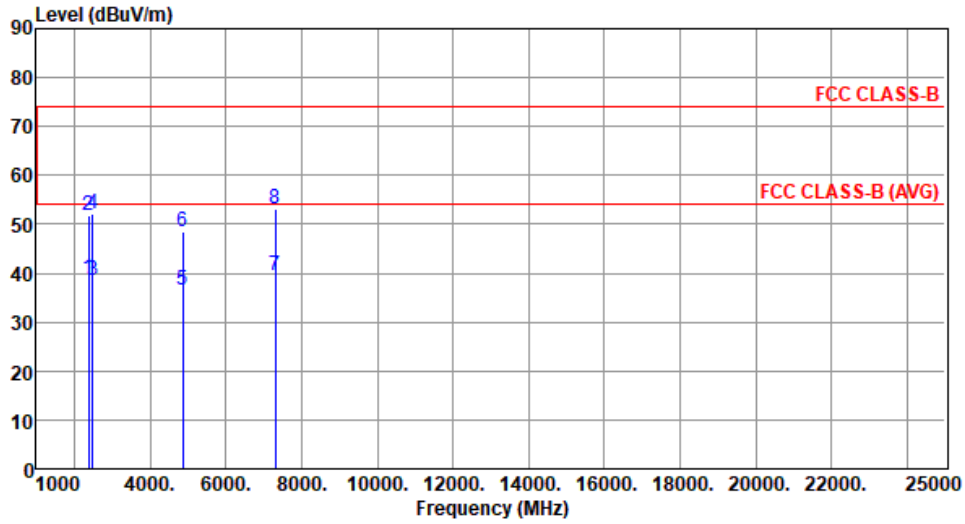
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.86	54.00	-15.14	41.66	-2.80	Average	133	181
2	2390.00	51.69	74.00	-22.31	54.49	-2.80	Peak	133	181
3	2483.50	38.66	54.00	-15.34	41.69	-3.03	Average	133	181
4	2483.50	52.19	74.00	-21.81	55.22	-3.03	Peak	133	181
5	4874.00	36.64	54.00	-17.36	33.00	3.64	Average	101	189
6	4874.00	49.81	74.00	-24.19	46.17	3.64	Peak	101	189
7	7311.00	39.84	54.00	-14.16	30.57	9.27	Average	101	203
8	7311.00	53.52	74.00	-20.48	44.25	9.27	Peak	101	203

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		



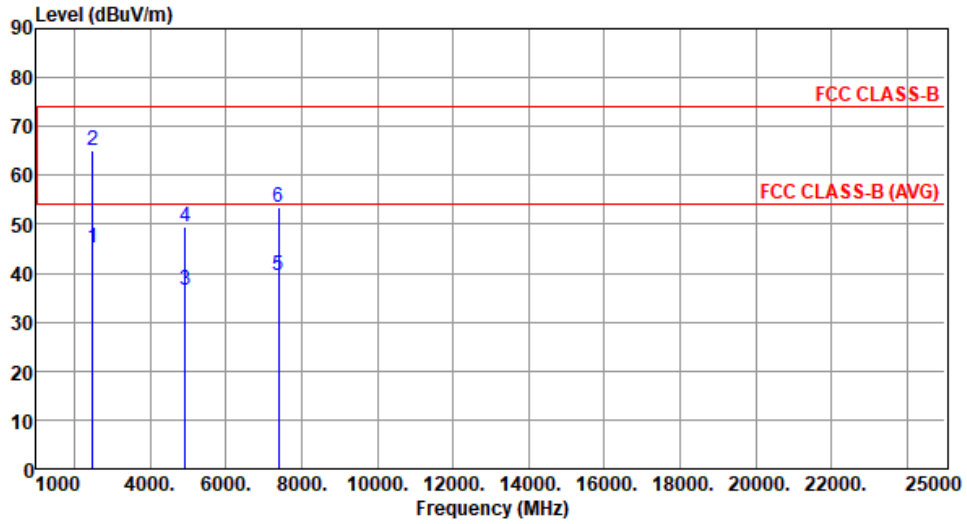
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.75	54.00	-15.25	41.55	-2.80	Average	105	234
2	2390.00	51.68	74.00	-22.32	54.48	-2.80	Peak	105	234
3	2483.50	38.61	54.00	-15.39	41.64	-3.03	Average	105	234
4	2483.50	52.14	74.00	-21.86	55.17	-3.03	Peak	105	234
5	4874.00	36.42	54.00	-17.58	32.78	3.64	Average	105	203
6	4874.00	48.45	74.00	-25.55	44.81	3.64	Peak	105	203
7	7311.00	39.42	54.00	-14.58	30.15	9.27	Average	100	35
8	7311.00	53.16	74.00	-20.84	43.89	9.27	Peak	100	35

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		



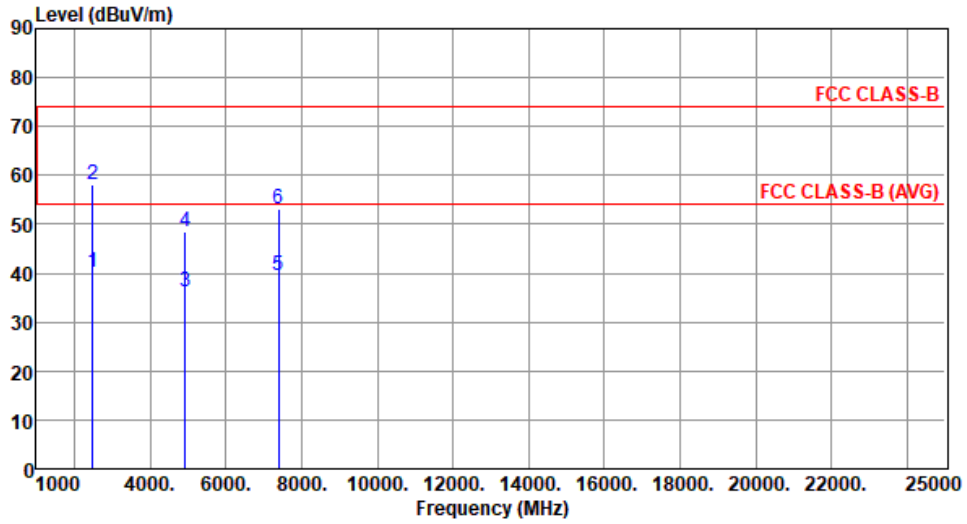
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	45.02	54.00	-8.98	48.05	-3.03	Average	121	180
2	2483.50	64.98	74.00	-9.02	68.01	-3.03	Peak	121	180
3	4924.00	36.52	54.00	-17.48	32.83	3.69	Average	100	64
4	4924.00	49.64	74.00	-24.36	45.95	3.69	Peak	100	64
5	7386.00	39.68	54.00	-14.32	30.61	9.07	Average	106	211
6	7386.00	53.42	74.00	-20.58	44.35	9.07	Peak	106	211

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		



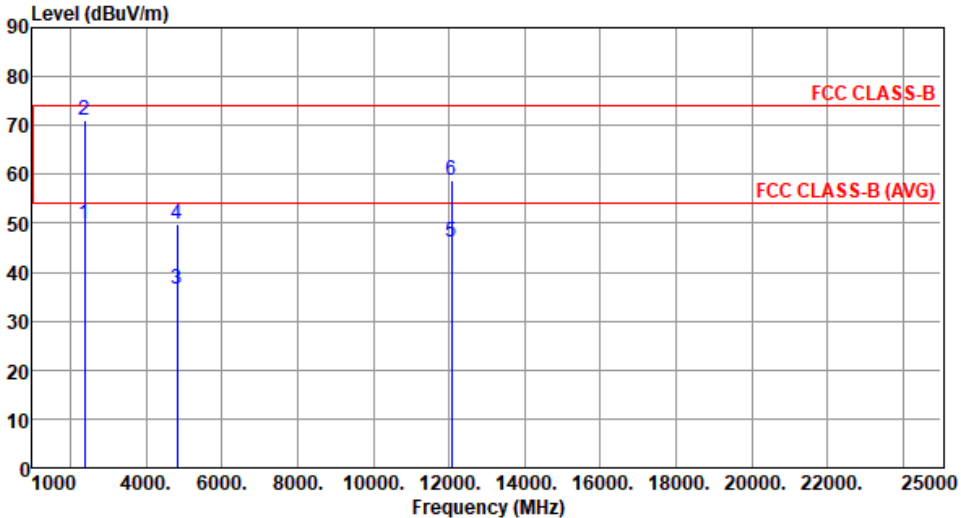
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	40.15	54.00	-13.85	43.18	-3.03	Average	105	236
2	2483.50	58.09	74.00	-15.91	61.12	-3.03	Peak	105	236
3	4924.00	36.28	54.00	-17.72	32.59	3.69	Average	105	211
4	4924.00	48.33	74.00	-25.67	44.64	3.69	Peak	105	211
5	7386.00	39.36	54.00	-14.64	30.29	9.07	Average	100	28
6	7386.00	53.09	74.00	-20.91	44.02	9.07	Peak	100	28

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

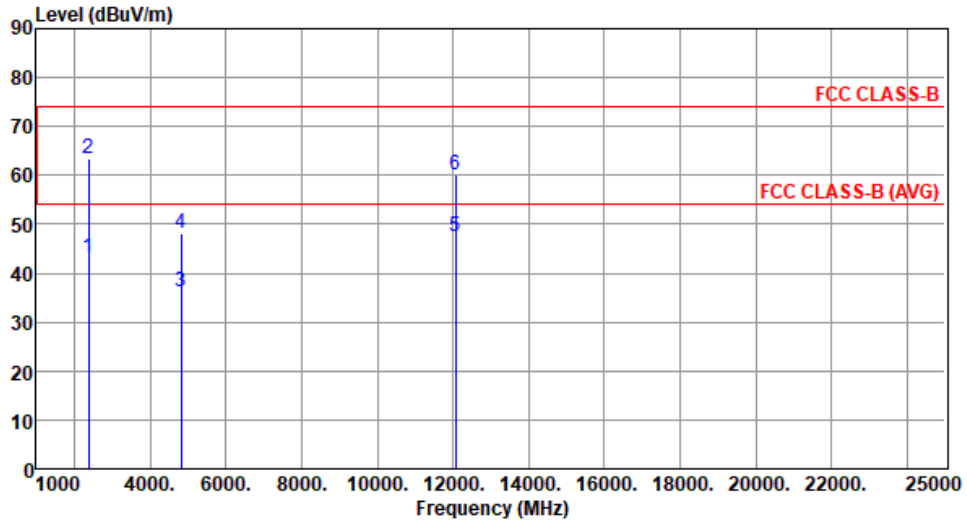
\*Factor includes antenna factor , cable loss and amplifier gain

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

### 3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

Modulation	HT20	Test Freq. (MHz)	2412																																																																						
Polarization	Horizontal																																																																								
																																																																									
<table border="1"> <thead> <tr> <th></th> <th>Freq. MHz</th> <th>Emission level dBuV/m</th> <th>Limit dBuV/m</th> <th>Margin dB</th> <th>SA reading dBuV</th> <th>Factor dB</th> <th>Remark</th> <th>ANT High cm</th> <th>Turn Table deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2390.00</td> <td>49.66</td> <td>54.00</td> <td>-4.34</td> <td>52.46</td> <td>-2.80</td> <td>Average</td> <td>195</td> <td>179</td> </tr> <tr> <td>2</td> <td>2390.00</td> <td>71.22</td> <td>74.00</td> <td>-2.78</td> <td>74.02</td> <td>-2.80</td> <td>Peak</td> <td>195</td> <td>179</td> </tr> <tr> <td>3</td> <td>4824.00</td> <td>36.63</td> <td>54.00</td> <td>-17.37</td> <td>33.03</td> <td>3.60</td> <td>Average</td> <td>105</td> <td>193</td> </tr> <tr> <td>4</td> <td>4824.00</td> <td>49.81</td> <td>74.00</td> <td>-24.19</td> <td>46.21</td> <td>3.60</td> <td>Peak</td> <td>105</td> <td>193</td> </tr> <tr> <td>5</td> <td>12060.00</td> <td>46.05</td> <td>54.00</td> <td>-7.95</td> <td>32.20</td> <td>13.85</td> <td>Average</td> <td>100</td> <td>179</td> </tr> <tr> <td>6</td> <td>12060.00</td> <td>58.84</td> <td>74.00</td> <td>-15.16</td> <td>44.99</td> <td>13.85</td> <td>Peak</td> <td>100</td> <td>179</td> </tr> </tbody> </table>					Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	2390.00	49.66	54.00	-4.34	52.46	-2.80	Average	195	179	2	2390.00	71.22	74.00	-2.78	74.02	-2.80	Peak	195	179	3	4824.00	36.63	54.00	-17.37	33.03	3.60	Average	105	193	4	4824.00	49.81	74.00	-24.19	46.21	3.60	Peak	105	193	5	12060.00	46.05	54.00	-7.95	32.20	13.85	Average	100	179	6	12060.00	58.84	74.00	-15.16	44.99	13.85	Peak	100	179
	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	49.66	54.00	-4.34	52.46	-2.80	Average	195	179																																																																
2	2390.00	71.22	74.00	-2.78	74.02	-2.80	Peak	195	179																																																																
3	4824.00	36.63	54.00	-17.37	33.03	3.60	Average	105	193																																																																
4	4824.00	49.81	74.00	-24.19	46.21	3.60	Peak	105	193																																																																
5	12060.00	46.05	54.00	-7.95	32.20	13.85	Average	100	179																																																																
6	12060.00	58.84	74.00	-15.16	44.99	13.85	Peak	100	179																																																																
<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>	HT20	<b>Test Freq. (MHz)</b>	2412
<b>Polarization</b>	Vertical		



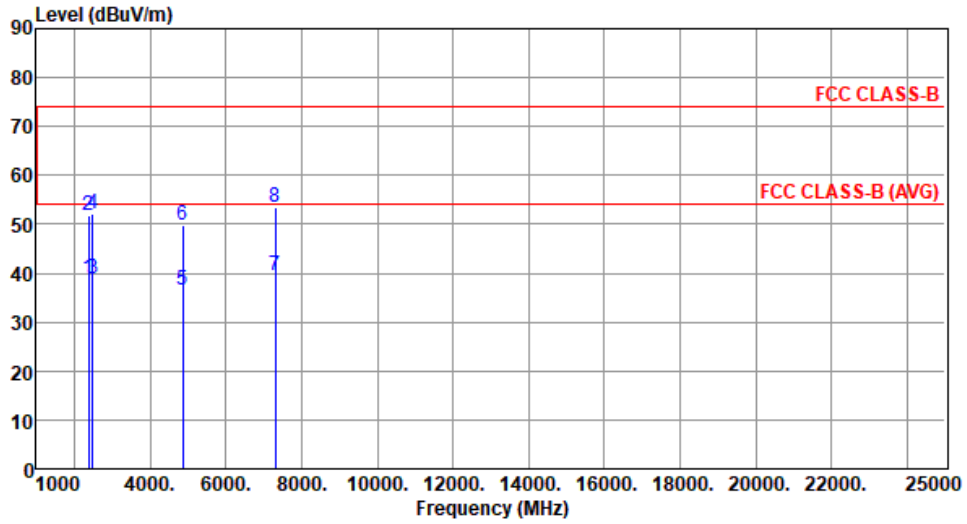
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.03	54.00	-10.97	45.83	-2.80	Average	104	225
2	2390.00	63.41	74.00	-10.59	66.21	-2.80	Peak	104	225
3	4824.00	36.16	54.00	-17.84	32.56	3.60	Average	106	212
4	4824.00	48.22	74.00	-25.78	44.62	3.60	Peak	106	212
5	12060.00	47.41	54.00	-6.59	33.56	13.85	Average	175	244
6	12060.00	60.15	74.00	-13.85	46.30	13.85	Peak	175	244

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		



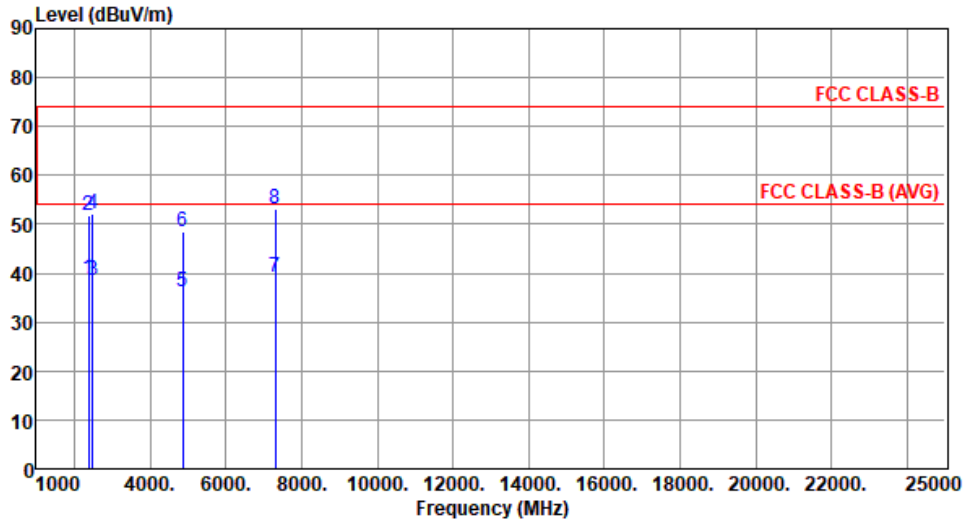
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.98	54.00	-15.02	41.78	-2.80	Average	136	178
2	2390.00	51.83	74.00	-22.17	54.63	-2.80	Peak	136	178
3	2483.50	38.73	54.00	-15.27	41.76	-3.03	Average	136	178
4	2483.50	52.28	74.00	-21.72	55.31	-3.03	Peak	136	178
5	4874.00	36.58	54.00	-17.42	32.94	3.64	Average	101	184
6	4874.00	49.74	74.00	-24.26	46.10	3.64	Peak	101	184
7	7311.00	39.65	54.00	-14.35	30.38	9.27	Average	103	204
8	7311.00	53.48	74.00	-20.52	44.21	9.27	Peak	103	204

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	38.84	54.00	-15.16	41.64	-2.80	Average	105	229
2	2390.00	51.76	74.00	-22.24	54.56	-2.80	Peak	105	229
3	2483.50	38.69	54.00	-15.31	41.72	-3.03	Average	105	229
4	2483.50	52.21	74.00	-21.79	55.24	-3.03	Peak	105	229
5	4874.00	36.25	54.00	-17.75	32.61	3.64	Average	110	209
6	4874.00	48.34	74.00	-25.66	44.70	3.64	Peak	110	209
7	7311.00	39.26	54.00	-14.74	29.99	9.27	Average	100	21
8	7311.00	53.08	74.00	-20.92	43.81	9.27	Peak	100	21

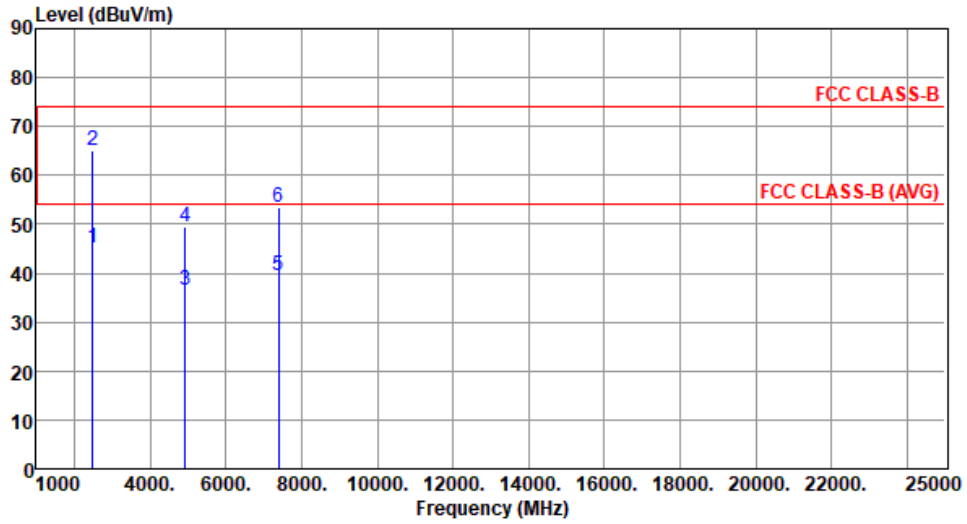
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*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		



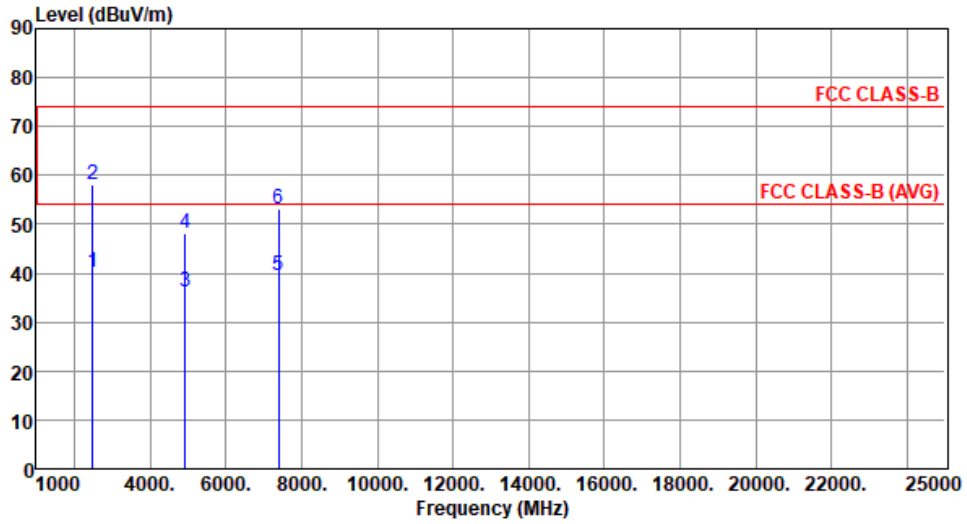
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	45.13	54.00	-8.87	48.16	-3.03	Average	123	184
2	2483.50	65.05	74.00	-8.95	68.08	-3.03	Peak	123	184
3	4924.00	36.45	54.00	-17.55	32.76	3.69	Average	100	59
4	4924.00	49.58	74.00	-24.42	45.89	3.69	Peak	100	59
5	7386.00	39.52	54.00	-14.48	30.45	9.07	Average	103	208
6	7386.00	53.38	74.00	-20.62	44.31	9.07	Peak	103	208

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	40.26	54.00	-13.74	43.29	-3.03	Average	105	231
2	2483.50	58.14	74.00	-15.86	61.17	-3.03	Peak	105	231
3	4924.00	36.15	54.00	-17.85	32.46	3.69	Average	105	212
4	4924.00	48.29	74.00	-25.71	44.60	3.69	Peak	105	212
5	7386.00	39.41	54.00	-14.59	30.34	9.07	Average	100	25
6	7386.00	53.15	74.00	-20.85	44.08	9.07	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).

## 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

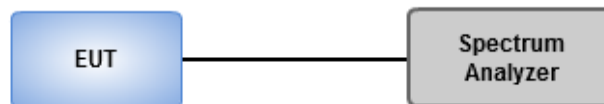
#### Reference level measurement

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

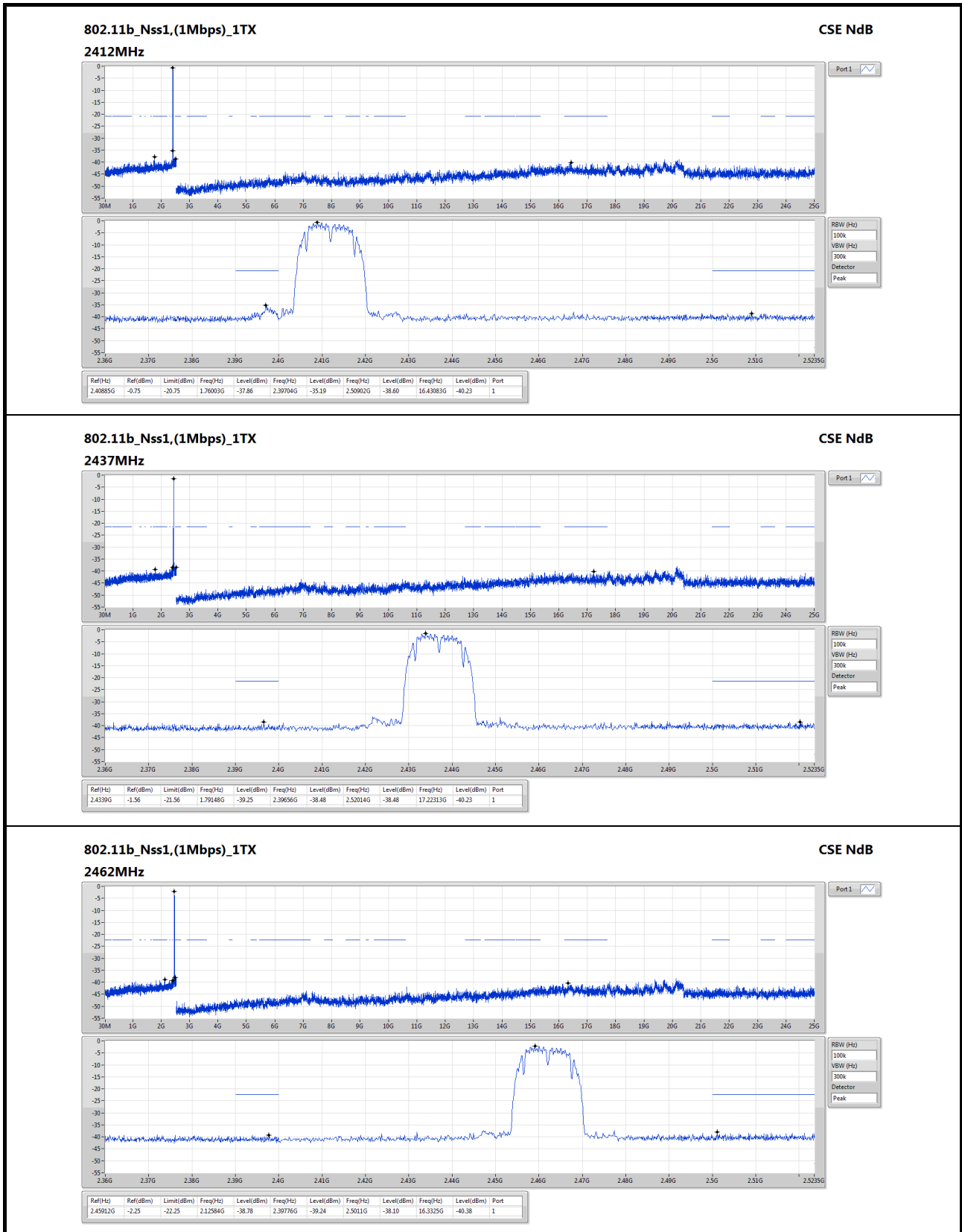
#### Emission level measurement

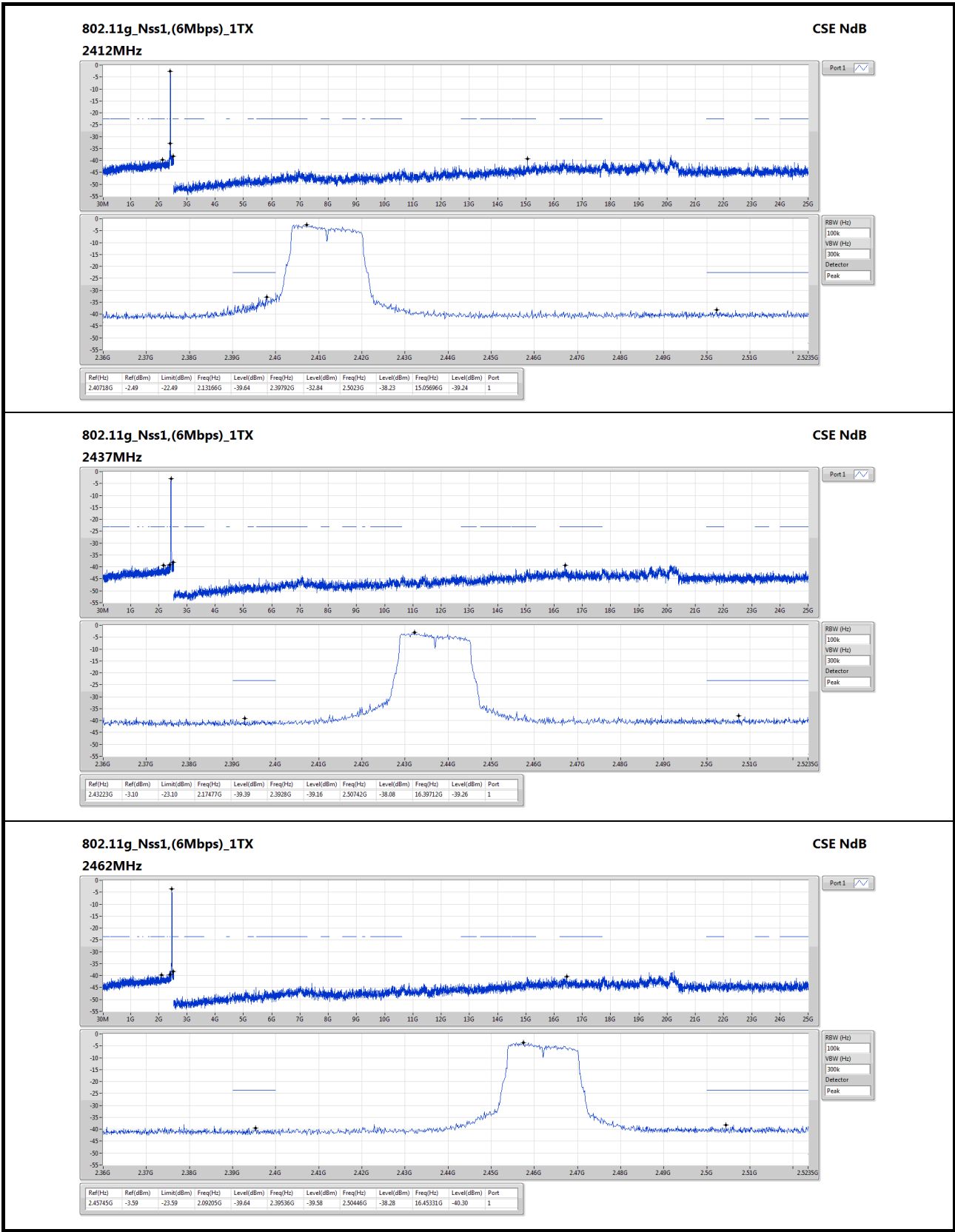
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

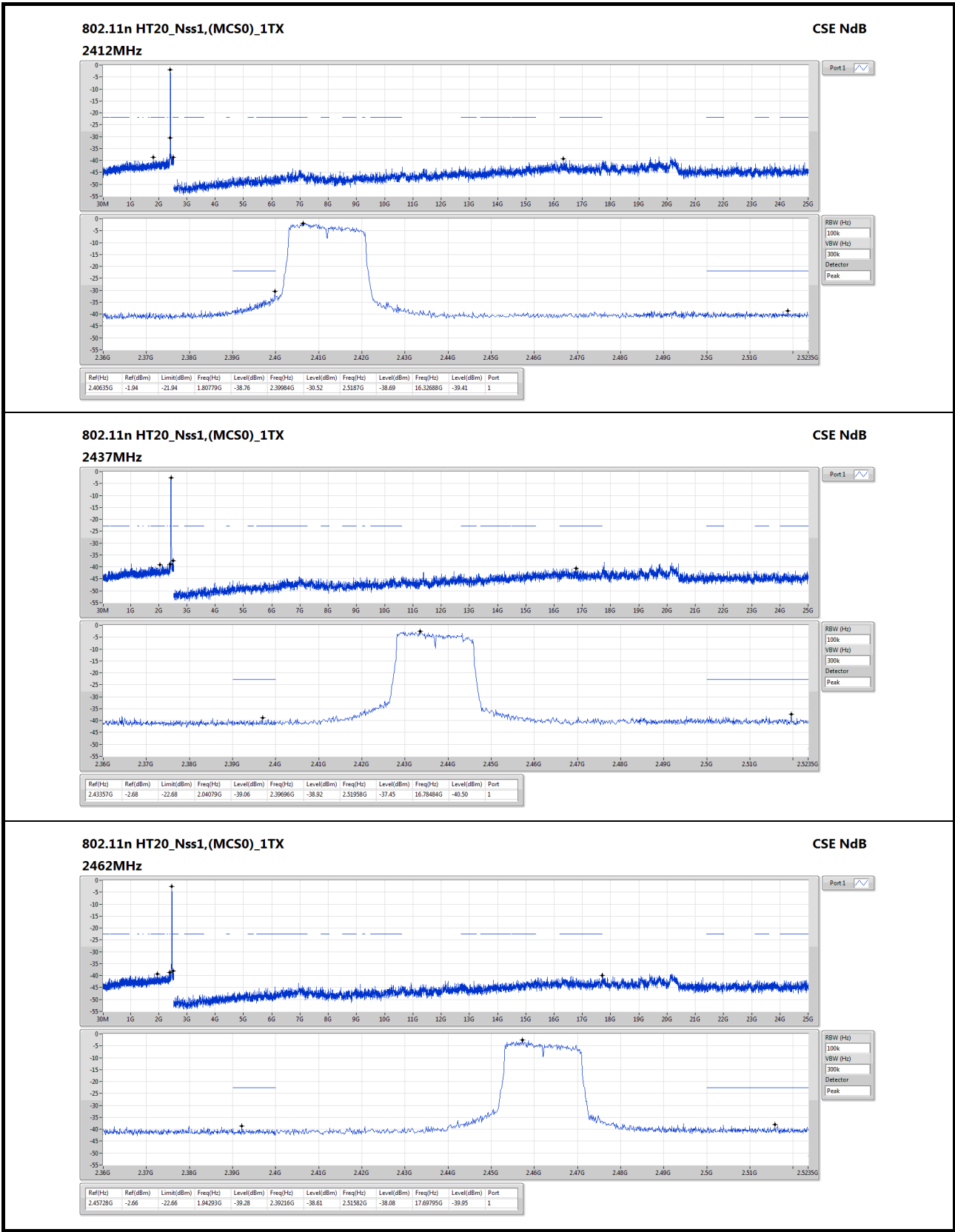
### 3.6.3 Test Setup



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







## 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>.

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

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