

# **FCC Test Report**

FCC ID : E52-K778

Equipment : WLAN (11b/g/n 1x1) USB module

Model No. : DHUA-K77-8

Brand Name : KYOCERA

Applicant : KYOCERA Document Solutions Inc.

Address : 2-28, 1-chome, Tamatsukuri, Chuo-Ku, Osaka,

540-8585 JAPAN

Standard : 47 CFR FCC Part 15.247

Received Date : Oct. 03, 2019

Tested Date : Oct. 16 ~ Oct. 31, 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 Cheid/ Assistant Manager Gary Chang / Manager

Testing Laboratory

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## **Release Record**

Report No.	Version	Description	Issued Date
FR900202AC	Rev. 01	Initial issue	Dec. 06, 2019

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## **Summary of Test Results**

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.476MHz 37.51 (Margin -18.90dB) - QP	Pass
15.247(d)	Radiated Emissions	[dBuV/m at 3m]: 2341.00MHz	Pass
15.209	Natiated Liffissions	53.65 (Margin -0.35dB) - AV	rass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 23.21	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.

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## 1 General Description

### 1.1 Information

This report is issued as a supplementary report to original ICC report no. FR9O0201AC. The difference is concerned with following items:

- Wi-Fi 5G function is disabled by software setting
- Changing the product name, model name and FCC ID

Due to no affect any test items, all test results remain unchanged.

### 1.1.1 Specification of the Equipment under Test (EUT)

RF General Information							
Frequency Range (MHz) IEEE Std. Ch. Freq. (MHz) Channel Transmit Data Rate Number Chains (N <sub>TX</sub> ) 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 Conducted (Average) Output Power.

Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.

Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

#### 1.1.2 Antenna Details

Ant. No.	Model	Туре	Connector	Gain (dBi)	Remarks
1	ANT-0	PCB printed ANT	N/A	2.69	

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

Power Supply Type	5Vdc from host
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### 1.1.4 Accessories

N/A

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## 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	QRCT, Version: 3.0.187.0				
	Mode	Duty Cycle (%)	Duty Factor (dB)		
Duty Cycle and Duty Footor	11b	100.00	0.00		
Duty Cycle and Duty Factor	11g	96.78	0.14		
	HT20	97.13	0.13		

## 1.1.7 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	23
11b	2437	23
11b	2462	21
11g	2412	18
11g	2437	23
11g	2462	14
HT20	2412	16
HT20	2437	23
HT20	2462	15

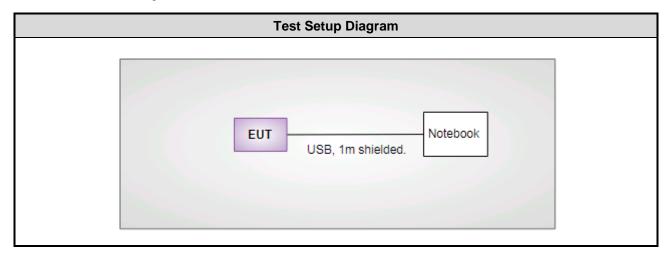
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## 1.2 Local Support Equipment List

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

## 1.3 Test Setup Chart



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## 1.4 The Equipment List

Test Item	Conducted Emission	Conducted Emission					
Test Site	Conduction room 1 / (	CO01-WS)					
Tested Date	Oct. 31, 2019						
Instrument	Manufacturer Model No. Serial No. Calibration Date Calibration Until						
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. 22, 2019	Oct. 21, 2020		
Measurement Software	nt AUDIX e3 6.120210k NA NA						
Note: Calibration Int	Note: Calibration Interval of instruments listed above is one year.						

Test Item	Radiated Emission						
Test Site	966 chamber 3 / (03CH03-WS)						
Tested Date	Oct. 16, 2019						
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until		
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. 07, 2019	Oct. 06, 2020		
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/ <b>4</b>	Sep. 27, 2019	Sep. 26, 2020		
RF cable-8M	EMC	EMC104-SM-SM-80 00	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-300 0	131103	Sep. 27, 2019	Sep. 26, 2020		
LF cable-13M	EMC	EMC8D-NM-NM-130 00	131104	Sep. 27, 2019	Sep. 26, 2020		
Measurement Software	AUDIX	e3	6.120210g	NA	NA		
Note: Calibration Inter	val of instruments liste	d above is one year.					

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Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Oct. 30, 2019				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Apr. 17, 2019	Apr. 16, 2020
Power Meter	Anritsu	ML2495A	1241001	Aug. 01, 2019	Jul. 31, 2020
Power Sensor	Anritsu	MA2411B	1207362	Aug. 01, 2019	Jul. 31, 2020
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Inter	rval of instruments liste	d 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

## 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 Uncertain				
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			

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## 2 Test Configuration

## 2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 58%	Akun Chung
Radiated Emissions	03CH03-WS	25°C / 66%	Akun Chung Roger Lu
RF Conducted	TH01-WS	21°C / 63%	Brad Wu

FCC Designation No.: TW0009FCC 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	11b	2412	1 Mbps	
Radiated Emissions ≤1GHz	11b	2412	1 Mbps	
Radiated Emissions >1GHz Maximum Output Power 6dB bandwidth Power spectral density	11b 11g HT20	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462	1 Mbps 6 Mbps MCS 0	

#### NOTE:

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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

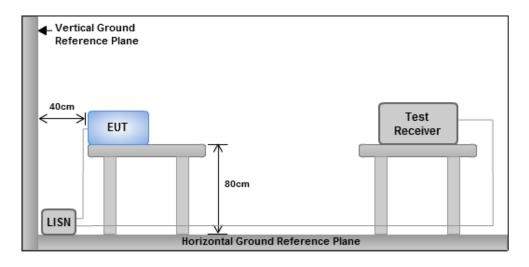
#### 3.1.1 Limit of Conducted Emissions

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



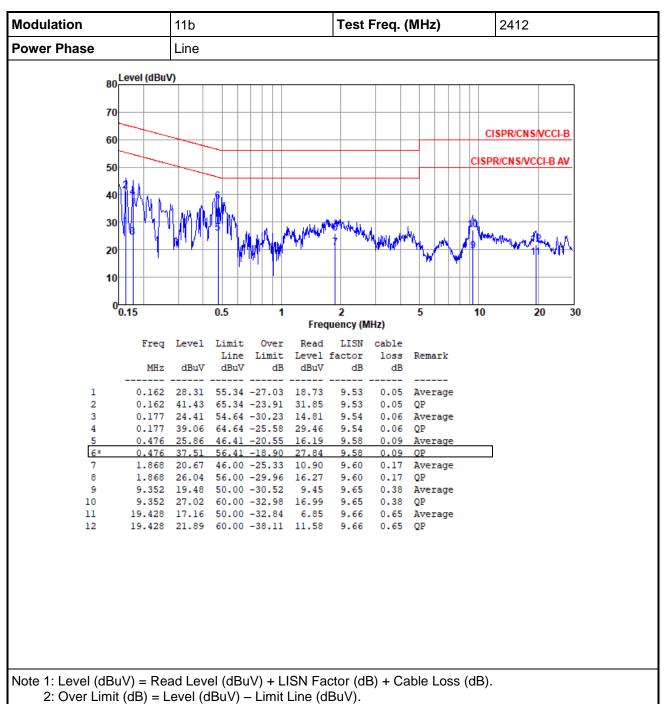
Note: 1. Support units were connected to second LISN.

Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

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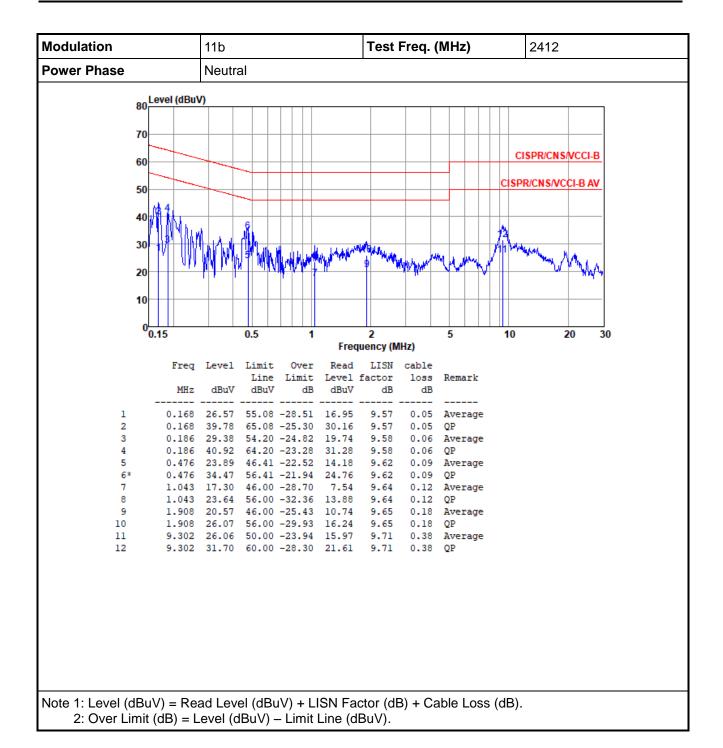


#### 3.1.4 Test Result of Conducted Emissions



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## 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

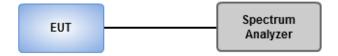
#### 6dB Bandwidth

- 1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
- 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**

- 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



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## 3.2.4 Test Result of 6dB and Occupied Bandwidth

**Summary** 

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_1T X	8.116M	14.472M	14M5G1D	7.609M	13.531M
802.11g_Nss1,(6Mbps)_1T X	15.507M	19.899M	19M9D1D	14.783M	16.281M
802.11n HT20_Nss1,(MCS0)_1TX	15.145M	19.682M	19M7D1D	14.058M	17.366M

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;

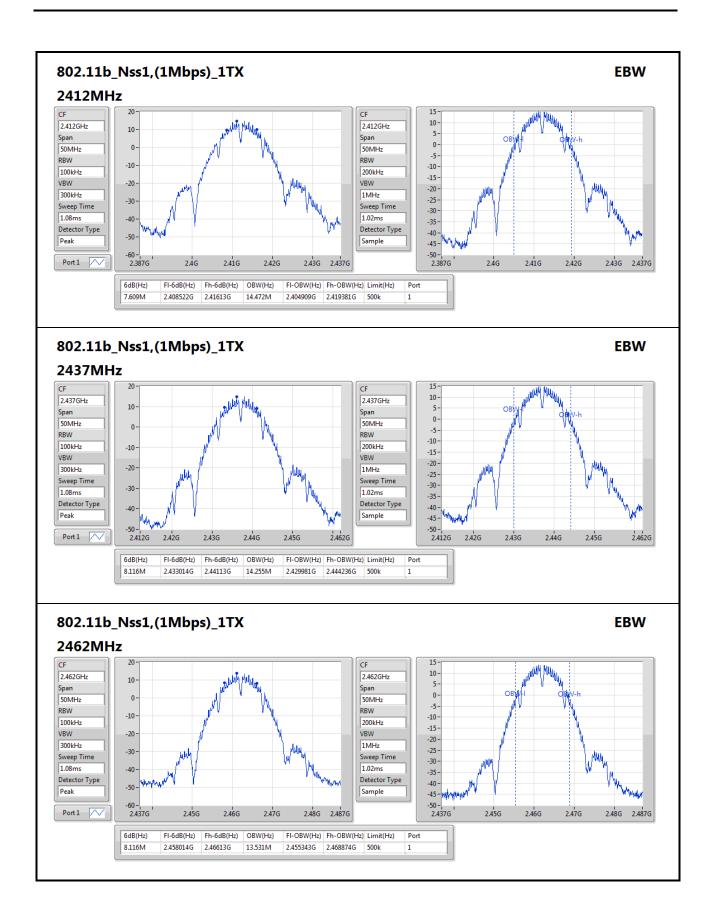
#### Result

Mode	Result	Limit	Port 1-N dB	Port 1-OBW
		(Hz)	(Hz)	(Hz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	7.609M	14.472M
2437MHz	Pass	500k	8.116M	14.255M
2462MHz	Pass	500k	8.116M	13.531M
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	14.783M	16.281M
2437MHz	Pass	500k	15.507M	19.899M
2462MHz	Pass	500k	15.507M	16.281M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
2412MHz	Pass	500k	14.058M	17.366M
2437MHz	Pass	500k	15.145M	19.682M
2462MHz	Pass	500k	15.145M	17.438M

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

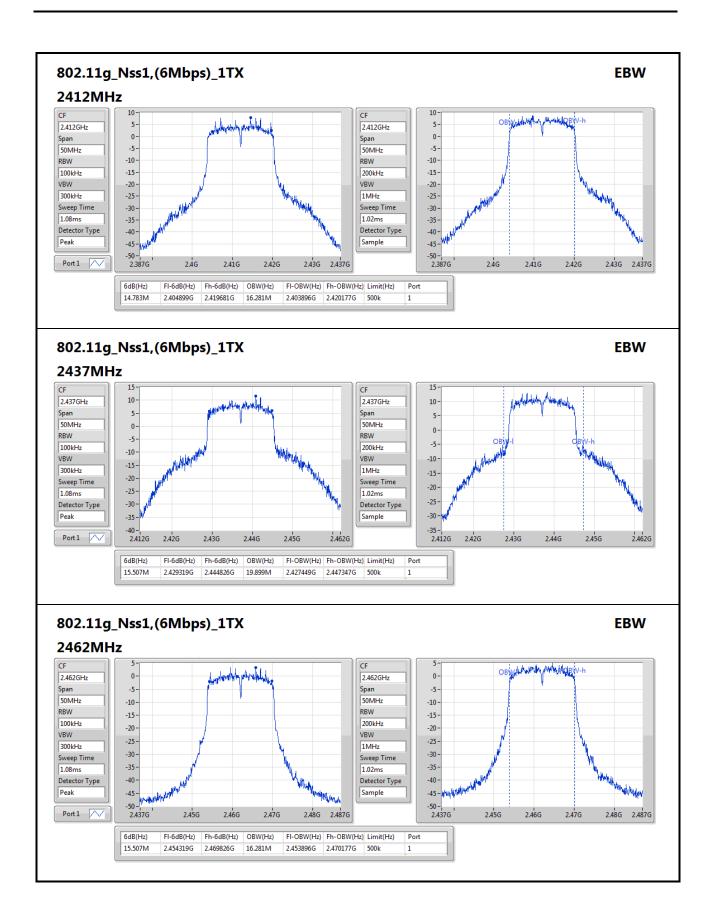
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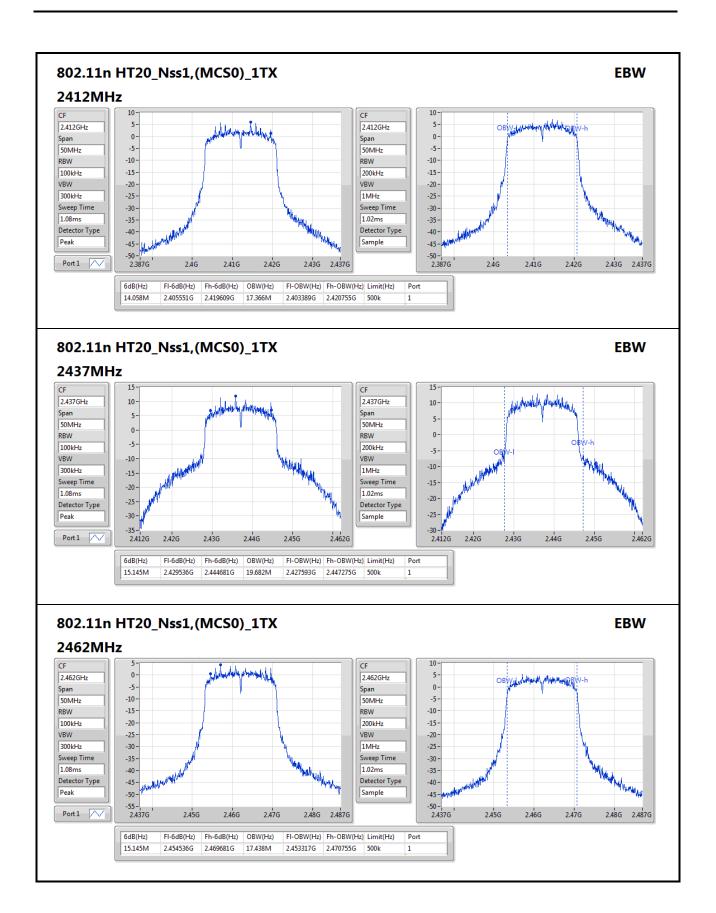
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## 3.3 RF Output Power

## 3.3.1 Limit of RF Output Power

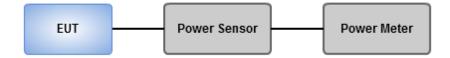
Conducted power shall not exceed 1Watt.

Antenna gain <= 6dBi, 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



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## 3.3.4 Test Result of Maximum Output Power

**Summary** 

Mode	Total Power	Total Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	23.21	0.20941
802.11g_Nss1,(6Mbps)_1TX	22.51	0.17824
802.11n HT20_Nss1,(MCS0)_1TX	22.42	0.17458

#### Result

Mode	Resu It	DG	Port 1	Total Power	Power Limit	EIRP	EIRP Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	2.69	23.21	23.21	30.00	25.90	36.00
2437MHz	Pass	2.69	22.88	22.88	30.00	25.57	36.00
2462MHz	Pass	2.69	21.66	21.66	30.00	24.35	36.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	2.69	18.63	18.63	30.00	21.32	36.00
2437MHz	Pass	2.69	22.51	22.51	30.00	25.20	36.00
2462MHz	Pass	2.69	14.81	14.81	30.00	17.50	36.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	2.69	16.64	16.64	30.00	19.33	36.00
2437MHz	Pass	2.69	22.42	22.42	30.00	25.11	36.00
2462MHz	Pass	2.69	15.58	15.58	30.00	18.27	36.00

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

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## 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 = 30 kHz, VBW = 100 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.

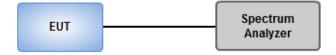
#### Average PSD, duty cycle ≥ 98%

- 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.
- 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



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## 3.4.4 Test Result of Power Spectral Density

**Summary** 

Mode	PD
	(dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_1TX	1.86
802.11g_Nss1,(6Mbps)_1TX	-2.03
802.11n HT20_Nss1,(MCS0)_1TX	-2.17

RBW=30 kHz

### Result

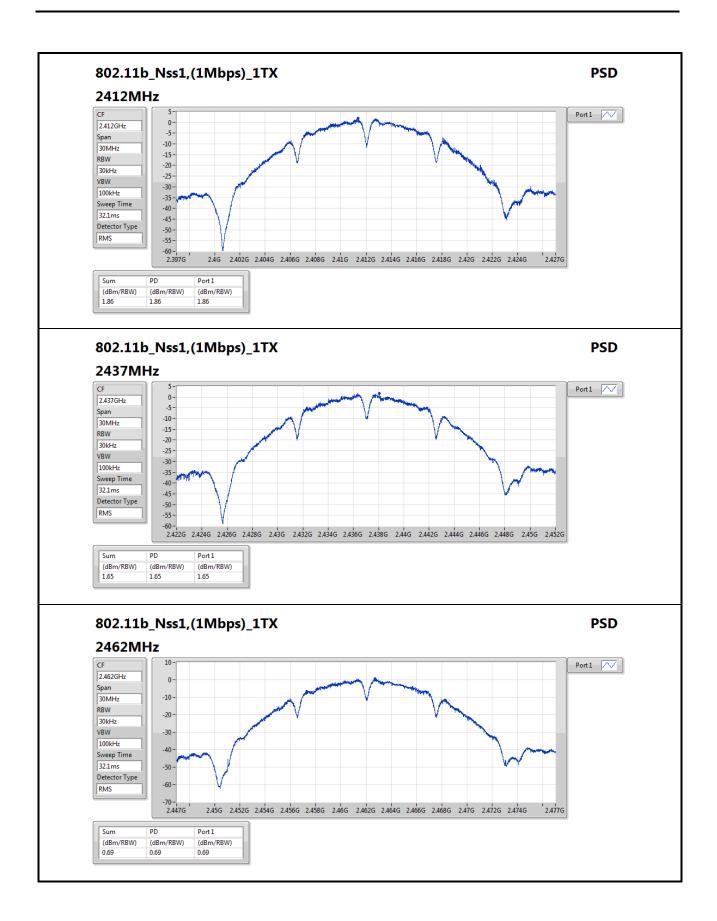
Mode	Result	DG	Port 1	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	2.69	1.86	1.86	8.00
2437MHz	Pass	2.69	1.65	1.65	8.00
2462MHz	Pass	2.69	0.69	0.69	8.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	2.69	-5.94	-5.94	8.00
2437MHz	Pass	2.69	-2.03	-2.03	8.00
2462MHz	Pass	2.69	-9.99	-9.99	8.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
2412MHz	Pass	2.69	-8.07	-8.07	8.00
2437MHz	Pass	2.69	-2.17	-2.17	8.00
2462MHz	Pass	2.69	-9.20	-9.20	8.00

**DG** = Directional Gain;

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

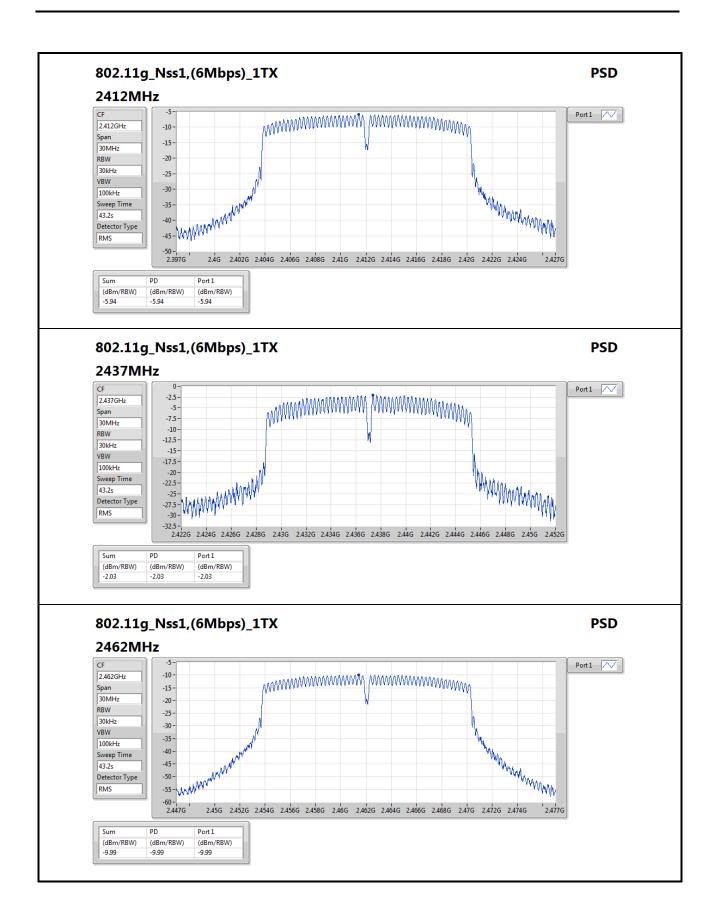
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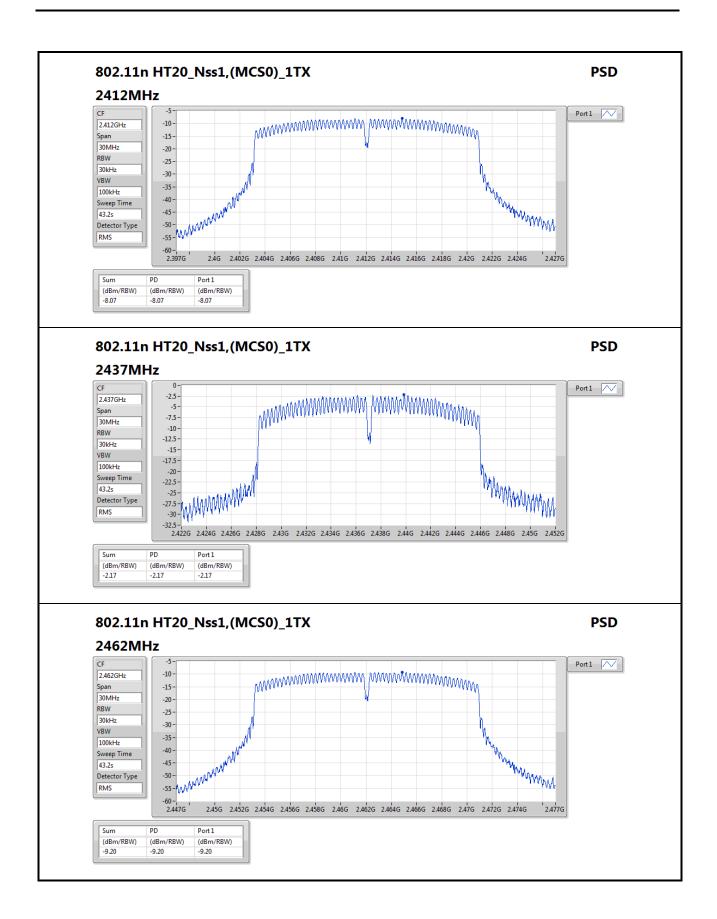
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## 3.5 Unwanted Emissions into Restricted Frequency Bands

### 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.

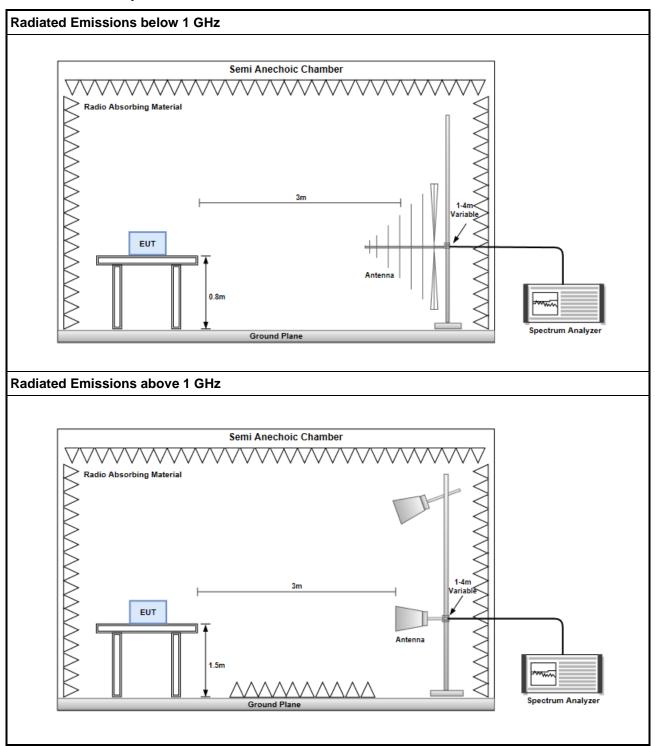
#### Note:

- 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.
- RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

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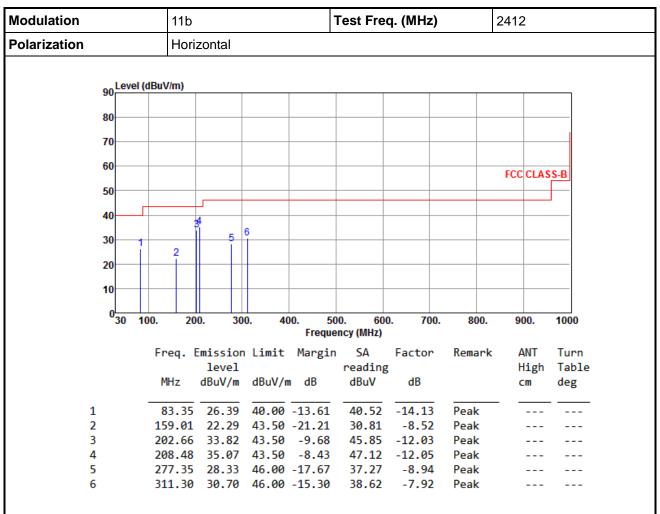
## 3.5.3 Test Setup



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



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

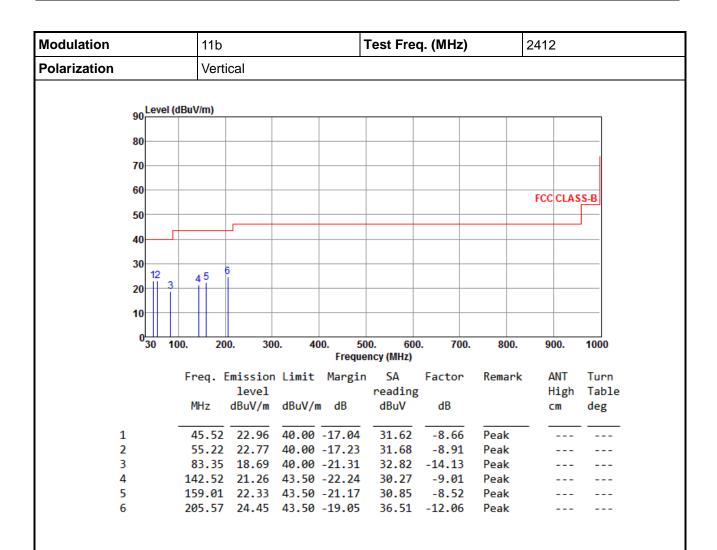
\*Factor includes antenna factor, cable loss and amplifier gain

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.

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

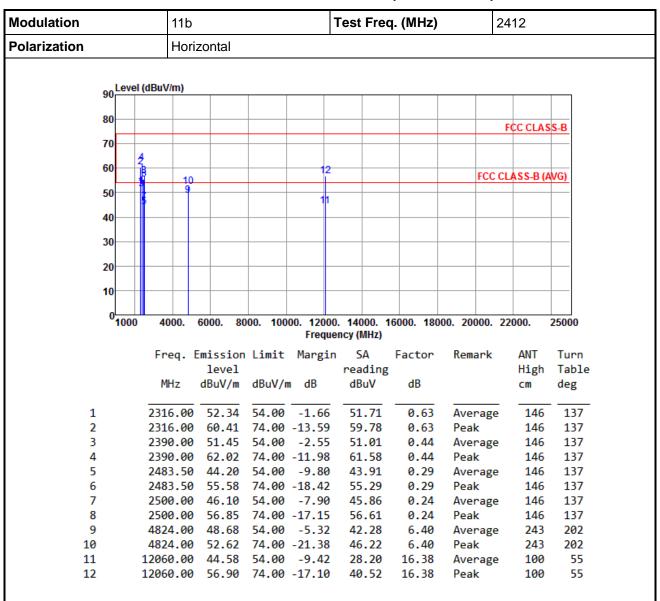
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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

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



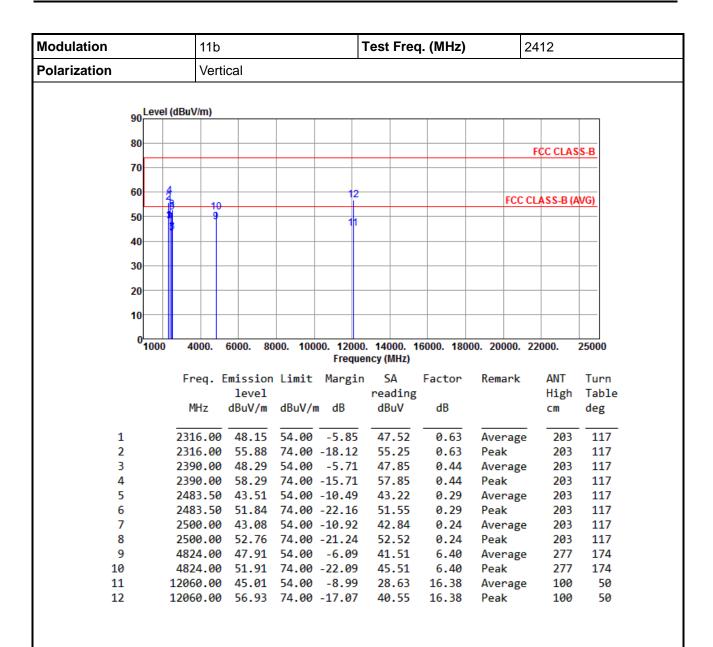
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

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

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

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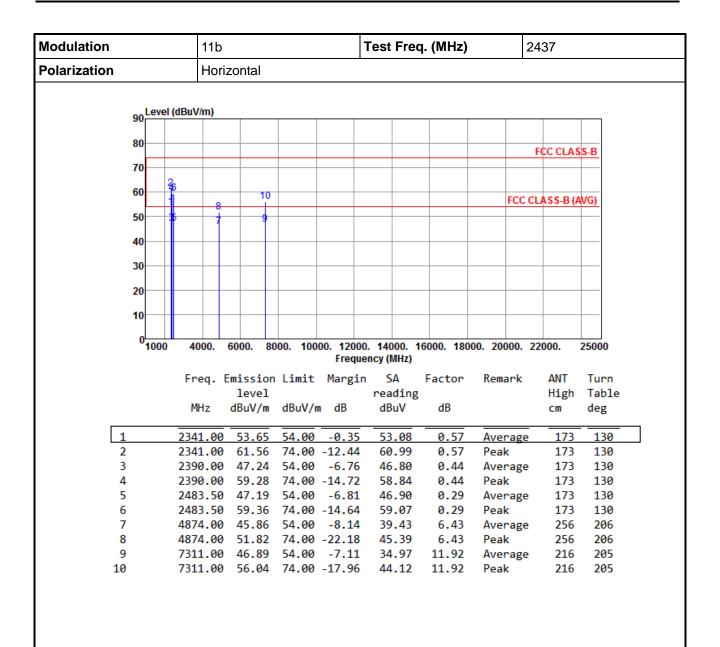


\*Factor includes antenna factor, cable loss and amplifier gain

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

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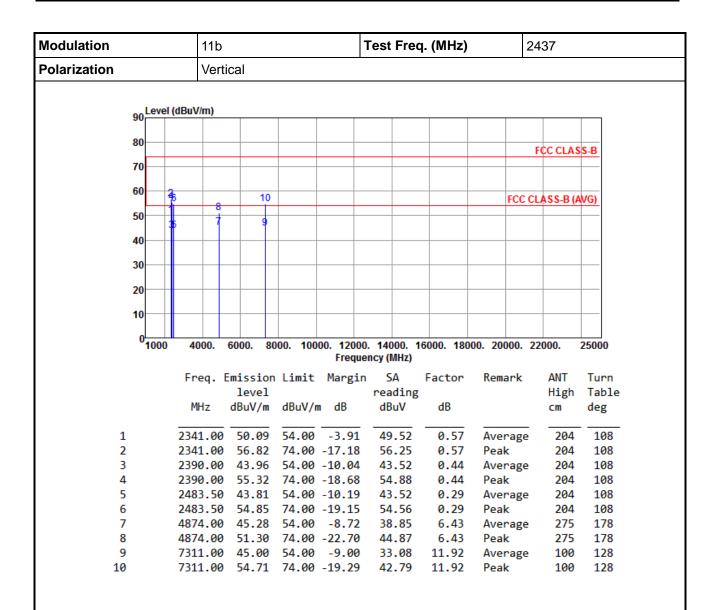


\*Factor includes antenna factor, cable loss and amplifier gain

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

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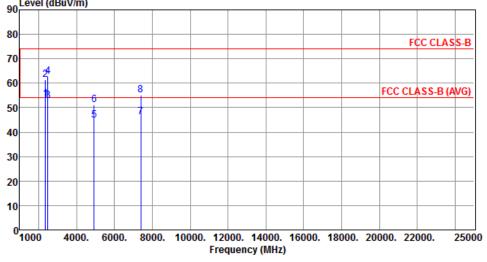
\*Factor includes antenna factor, cable loss and amplifier gain

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

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Modulation	11b			Test	Test Freq. (MHz)			24	2462		
Polarization	Horizontal										
on.	//m)										
80											



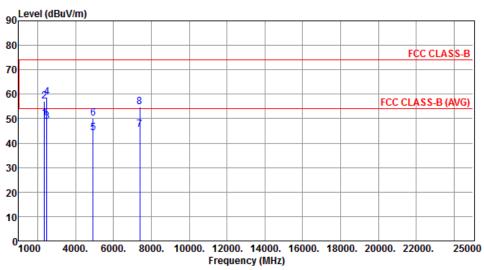
	Freq.   MHz	Emission level dBuV/m	Limit dBuV/m	Ü	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2366.00	53.62	54.00	-0.38	53.12	0.50	Average	241	129
2	2366.00	61.35	74.00	-12.65	60.85	0.50	Peak	241	129
3	2483.50	52.68	54.00	-1.32	52.39	0.29	Average	241	129
4	2483.50	62.81	74.00	-11.19	62.52	0.29	Peak	241	129
5	4924.00	44.96	54.00	-9.04	38.45	6.51	Average	255	212
6	4924.00	51.12	74.00	-22.88	44.61	6.51	Peak	255	212
7	7386.00	46.30	54.00	-7.70	34.56	11.74	Average	211	207
8	7386.00	55.27	74.00	-18.73	43.53	11.74	Peak	211	207

\*Factor includes antenna factor, cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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



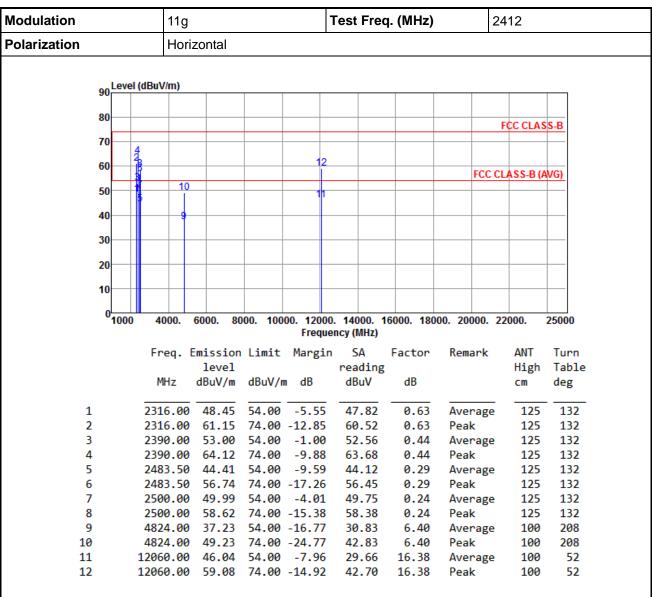
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Ü	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2366.00	50.03	54.00	-3.97	49.53	0.50	Average	206	115
2	2366.00	57.08	74.00	-16.92	56.58	0.50	Peak	206	115
3	2483.50	48.70	54.00	-5.30	48.41	0.29	Average	206	115
4	2483.50	58.80	74.00	-15.20	58.51	0.29	Peak	206	115
5	4924.00	44.03	54.00	-9.97	37.52	6.51	Average	271	175
6	4924.00	50.09	74.00	-23.91	43.58	6.51	Peak	271	175
7	7386.00	45.45	54.00	-8.55	33.71	11.74	Average	212	205
8	7386.00	54.72	74.00	-19.28	42.98	11.74	Peak	212	205

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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



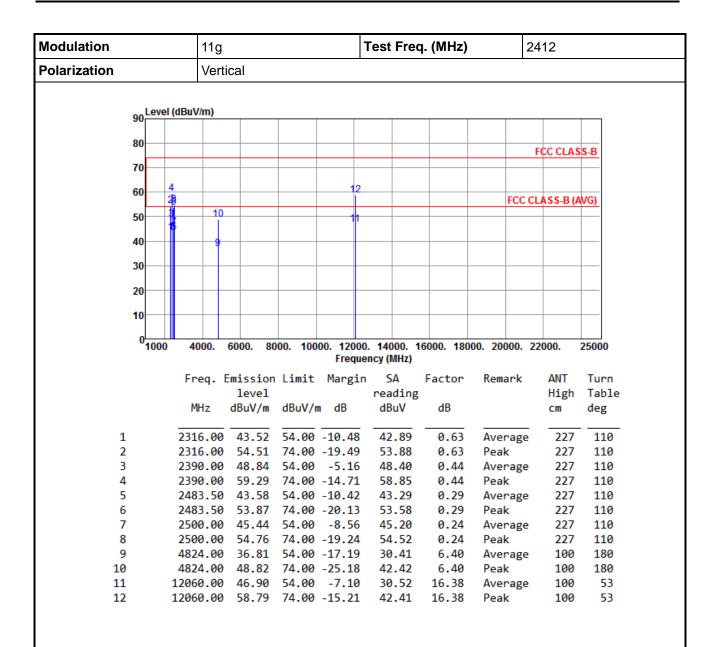
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

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

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

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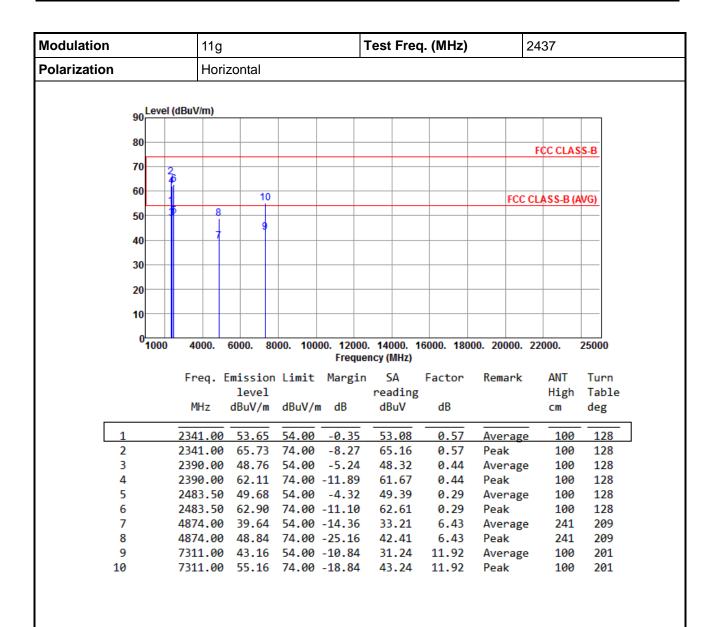


\*Factor includes antenna factor, cable loss and amplifier gain

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

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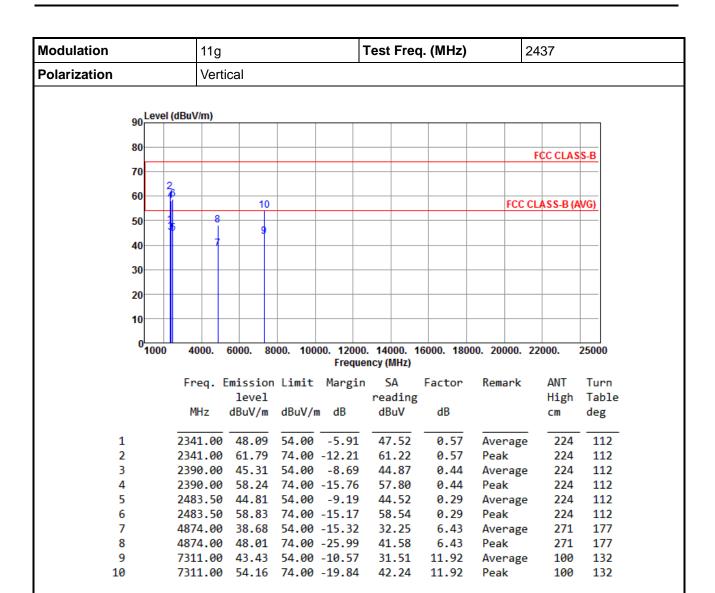


\*Factor includes antenna factor, cable loss and amplifier gain

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

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

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

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Modulation			11g	11g			Test Fred	q. (MHz)	2	2462		
Polarization			Horizontal									
			•									
	90.	Level	(dBuV/m)									
	80									FCC CLAS	S-B	
	70		4									
		9										
	60			8					FCC (	CLASS-B (A	(VG)	
	50	- 1	6									
				1 7								
	40		1									
	30											
	20											
	10											
	0,	1000	4000.	6000. 8	000. 100	00. 12000	. 14000. 1	6000. 180	00. 20000. 2	22000.	25000	
						Freque	ency (MHz)					
			Freq.		limit	Margin	SA	Factor	Remark	ANT	Turn	
				level			reading			High	Table	
			MHz	dBuV/m	dBuV/ı	m dB	dBuV	dB		cm	deg	
	1		2366.00	48.59	54 00	-5.41	48.09	0.50	Average	178	124	
	2		2366.00			-13.55	59.95	0.50	Peak	178	124	
	3			52.04		-1.96	51.75	0.29	Average	178	124	
	4			67.19			66.90	0.29	Peak	178	124	
	5			38.26			31.75	6.51	Average	100	201	
	_											

42.88

6.51

11.74

11.74

Peak

Peak

Average

100

100

100

201

203

203

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB) \*Factor includes antenna factor , cable loss and amplifier gain

4924.00 49.39 74.00 -24.61

7386.00 42.52 54.00 -11.48 30.78

7386.00 54.50 74.00 -19.50 42.76

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

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Modulation				11g				Test Fred	q. (MHz)		2462		
Polarization			,	Verti	cal		•			•			
	90	Level	(dBuV/	m)								$\overline{}$	
	80												
	00										FCC CLAS	SS-B	
	70		_										
	60		4										
		- 1		6	8					FCC	CLASS-B (A	WG)	
	50	<u> </u>		Ĭ	1								
	40			- 5								-	
	30												
	30												
	20												
	10												
	0	1000	40	00.	6000. 8	000. 100			16000. 180	00. 20000.	22000.	25000	
								ency (MHz)					
			Fre	eq. E			Margir		Factor	Remark	ANT	Turn	
			MH	1-	level	dBuV/	m dB	reading dBuV	dB		High cm	Table deg	
			ru	12	ubuv/III	ubuv/	III UD	ubuv	ub		CIII	ueg	
	1		2366	5.00	45.05	54.00	-8.95	44.55	0.50	Average	241	108	
	2		2366		55.61		-18.39	55.11	0.50	Peak	241	108	
	3						-5.86	47.85	0.29	Average		108	
	4						-11.86	61.85	0.29	Peak	241	108	
	5		4924	1.00	36.73	54.00	-17.27	30.22	6.51	Average	100	172	

30.25

6.51

11.74

11.74

Average

Peak

Peak

100

100

100

172

131

131

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB) \*Factor includes antenna factor, cable loss and amplifier gain

4924.00 48.91 74.00 -25.09 42.40 7386.00 41.99 54.00 -12.01 30.25

7386.00 54.15 74.00 -19.85 42.41

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

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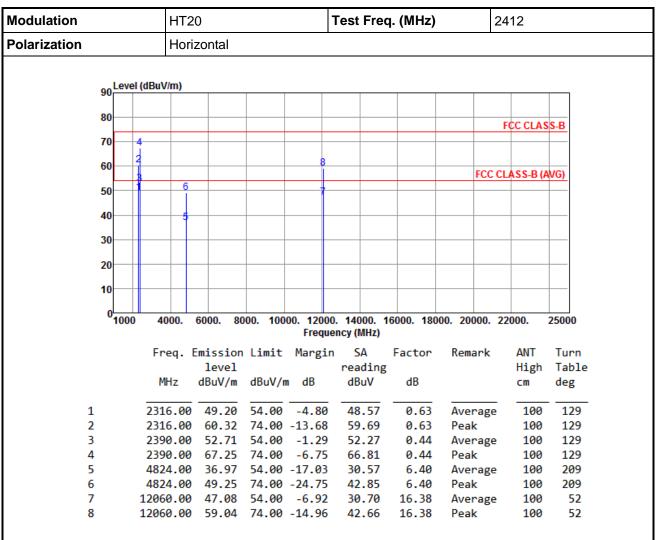
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# 3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20



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

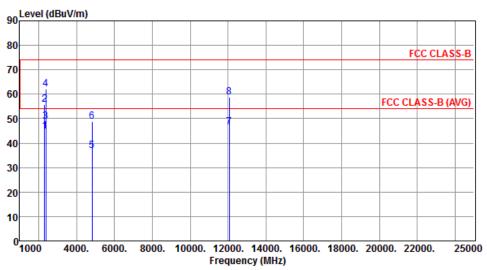
\*Factor includes antenna factor, cable loss and amplifier gain

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

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Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		

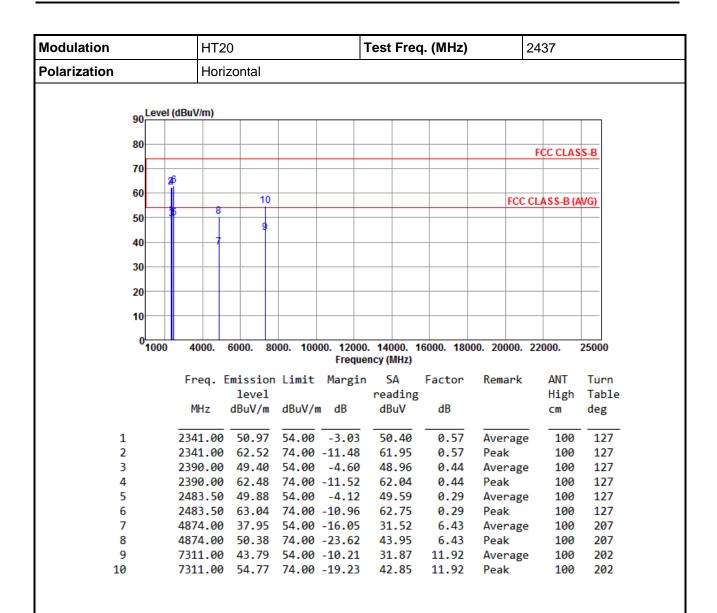


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Ū	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2316.00	44.86	54.00	-9.14	44.23	0.63	Average	228	110
2	2316.00	55.83	74.00	-18.17	55.20	0.63	Peak	228	110
3	2390.00	48.75	54.00	-5.25	48.31	0.44	Average	228	110
4	2390.00	62.00	74.00	-12.00	61.56	0.44	Peak	228	110
5	4824.00	36.81	54.00	-17.19	30.41	6.40	Average	100	178
6	4824.00	48.80	74.00	-25.20	42.40	6.40	Peak	100	178
7	12060.00	46.49	54.00	-7.51	30.11	16.38	Average	100	56
8	12060.00	58.94	74.00	-15.06	42.56	16.38	Peak	100	56

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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

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

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Modulation				HT20				Te	est Fre	q. (M	Hz)		2	2437		
Polarization				Vertical												
	90	Level	(dBu\	//m)												
	80														FCC CLAS	SS-B
	70															
	60		26													
	00		Ĭ.			10								FCC C	LASS-B (	AVG)
	50			8												-
	40			1		_										
				1												
	30															
	20			-												
	10															
	0	1000	4	000.	6000.	80	00. 100	00. 120	000.	14000.	16000.	180	000. 20	0000. 2	2000.	25000
								Fred	quenc	y (MHz)						
			Fr	eq.			Limit	Marg	in	SA	Fac	tor	Ren	nark	ANT	Turn
					leve				1	reading	•				High	
			М	Hz	dBuV,	/m	dBuV/ı	n dB		dBuV	d	В			cm	deg
	1		234	1.00	47.	12	54.00	-6.8	 8	46.55	0	.57	Ave	erage	229	111
	2		234	1.00	58.0	99	74.00	-15.9	1	57.52		.57	Pea	ak	229	111
	3				44.		54.00			44.25		.44		erage	229	
	4				58.		74.00			57.86		.44	Pea		229	
	5						54.00			45.25		.29		erage	229	
	6						74.00			58.30		.29	Pea		229	
	7			4.00			54.00			31.25		.43		erage	100	
	8		48/	4.00	49.	2	74.00	-24.3	/	43.20	6	.43	Pea	aK .	100	180

11.92

Average

Peak

100

100

136

136

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

7311.00 43.43 54.00 -10.57 31.51

7311.00 54.43 74.00 -19.57 42.51 11.92

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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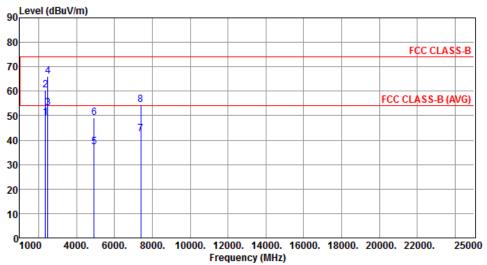
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Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		
90 Level (dBu\	J/m)		



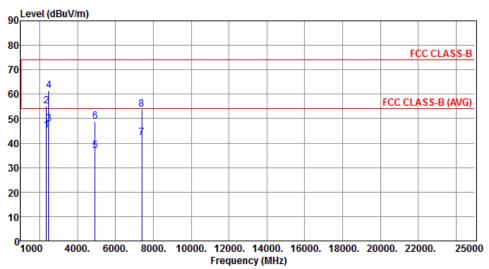
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m		SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2366.00	49.06	54.00	-4.94	48.56	0.50	Average	100	126
2	2366.00	60.40	74.00	-13.60	59.90	0.50	Peak	100	126
3	2483.50	52.99	54.00	-1.01	52.70	0.29	Average	100	128
4	2483.50	66.15	74.00	-7.85	65.86	0.29	Peak	100	128
5	4924.00	37.08	54.00	-16.92	30.57	6.51	Average	100	208
6	4924.00	49.14	74.00	-24.86	42.63	6.51	Peak	100	208
7	7386.00	42.58	54.00	-11.42	30.84	11.74	Average	100	204
8	7386.00	54.53	74.00	-19.47	42.79	11.74	Peak	100	204

\*Factor includes antenna factor, cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Ū	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2366.00	45.02	54.00	-8.98	44.52	0.50	Average	229	109
2	2366.00	55.08	74.00	-18.92	54.58	0.50	Peak	229	109
3	2483.50	47.81	54.00	-6.19	47.52	0.29	Average	229	109
4	2483.50	61.49	74.00	-12.51	61.20	0.29	Peak	229	109
5	4924.00	36.77	54.00	-17.23	30.26	6.51	Average	100	175
6	4924.00	48.93	74.00	-25.07	42.42	6.51	Peak	100	175
7	7386.00	42.07	54.00	-11.93	30.33	11.74	Average	100	136
8	7386.00	53.88	74.00	-20.12	42.14	11.74	Peak	100	136

\*Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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# 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 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

## 3.6.2 Test Procedures

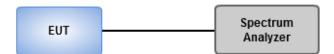
### Reference level measurement

- 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

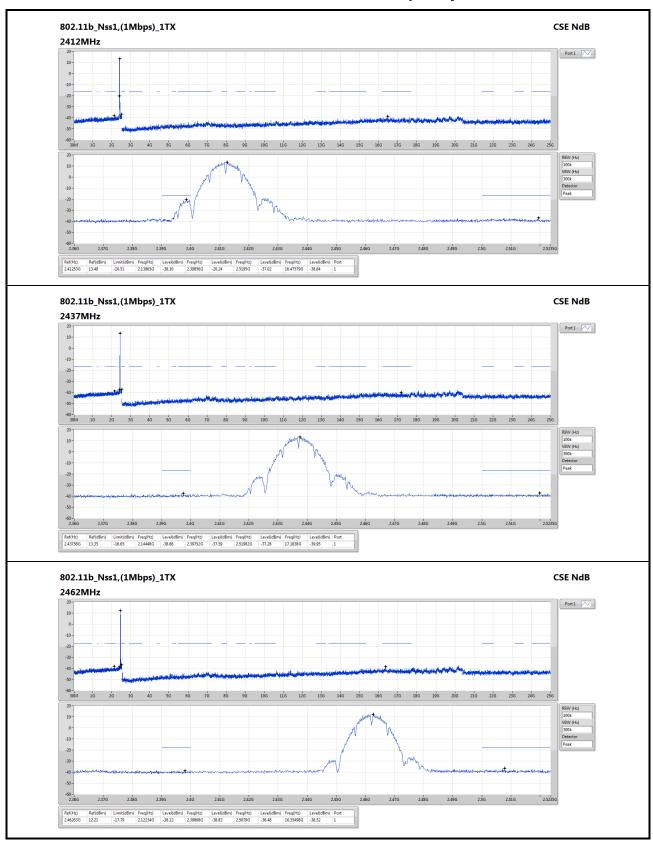
## 3.6.3 Test Setup



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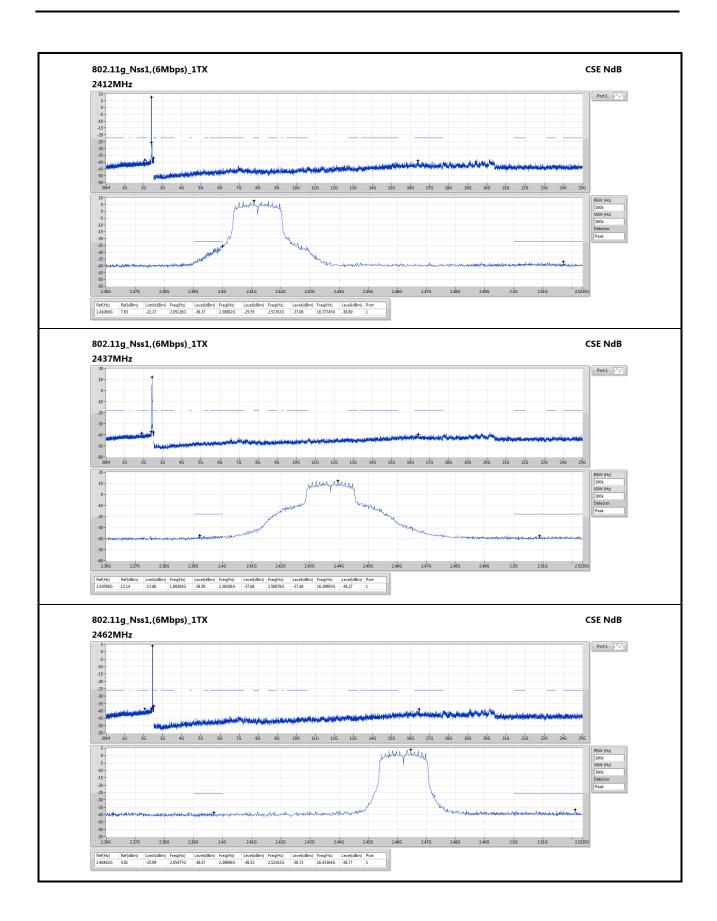


## 3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands



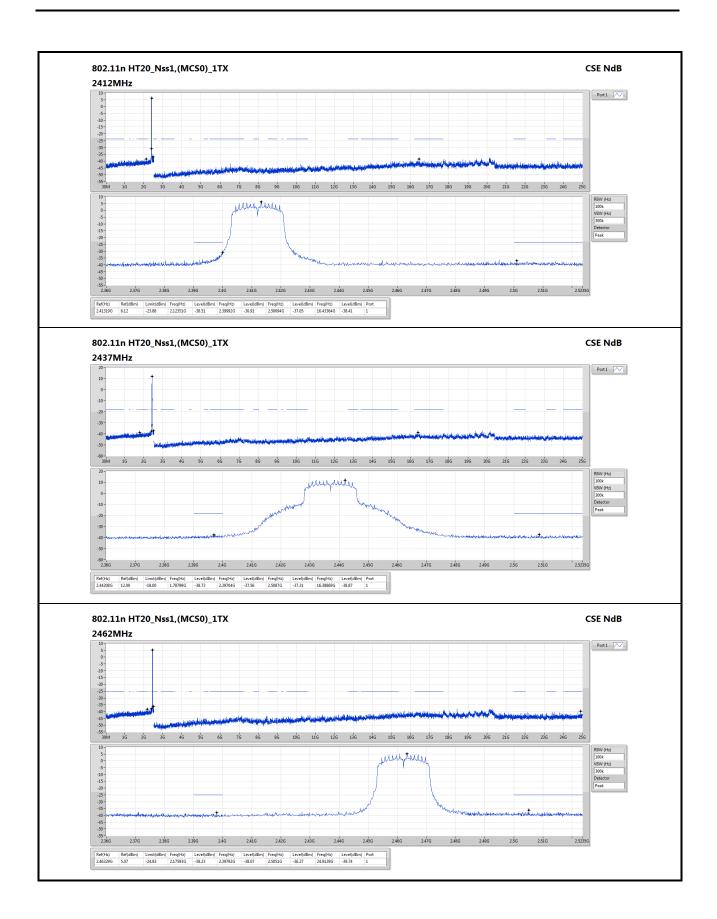
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# 4 Test laboratory information

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 <a href="http://www.icertifi.com.tw">http://www.icertifi.com.tw</a>.

#### Linkou

Tel: 886-2-2601-1640 No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City,

Taiwan, R.O.C.

#### Kwei Shan

Tel: 886-3-271-8666 No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

### Kwei Shan Site II

Tel: 886-3-271-8640

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

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

Tel: 886-3-271-8666 Fax: 886-3-318-0155

Email: ICC\_Service@icertifi.com.tw

==END==

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