

TEST REPORT  
On behalf of

Abode Systems, Inc

Product Name: Abode Color Bulb

Model No.: 104062/A

FCC ID: 2ARGFACB

Prepared For: Abode Systems, Inc  
2625 Middlefield Rd. #900 Palo Alto, CA 94306,  
United States

Prepared By: Audix Technology (Shanghai) Co., Ltd.  
3F and 4F, 34Bldg, 680 Guiping Rd.,  
Caohejing Hi-Tech Park,  
Shanghai 200233, China

Tel: +86-21-64955500



File No. : C1D2109042  
Report No. : ACI-F21220  
Date of Test : 2021.09.22-10.15  
Date of Report : 2021.10.21

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.  
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

## TABLE OF CONTENTS

	Page
<b>1 SUMMARY OF STANDARDS AND RESULTS.....</b>	<b>5</b>
1.1 Description of Standards and Results.....	5
<b>2 GENERAL INFORMATION.....</b>	<b>6</b>
2.1 Description of Equipment Under Test.....	6
2.2 EUT Specifications Assessed in Current Report.....	7
2.3 Test Information .....	7
2.4 Sample Description .....	8
2.5 Supported equipment.....	9
2.6 Description of Test Facility.....	9
<b>3 CONDUCTED EMISSION TEST .....</b>	<b>10</b>
3.1 Test Equipment.....	10
3.2 Block Diagram of Test Setup .....	10
3.3 Conducted Emission Limits (§15.207).....	11
3.4 Test Configuration.....	11
3.5 Operating Condition of EUT .....	11
3.6 Test Procedures .....	11
3.7 Test Results .....	12
<b>4 RADIATED EMISSION TEST.....</b>	<b>14</b>
4.1 Test Equipment.....	14
4.2 Block Diagram of Test Setup .....	14
4.3 Radiated Emission Limit (§15.209) .....	15
4.4 Test Configuration.....	15
4.5 Operating Condition of EUT .....	16
4.6 Test Procedures .....	16
4.7 Test Results .....	17
<b>5 6 DB BANDWIDTH MEASUREMENT.....</b>	<b>29</b>
5.1 Test Equipment.....	29
5.2 Block Diagram of Test Setup .....	29
5.3 Specification Limits (§15.247(a)(2)).....	29
5.4 Operating Condition of EUT .....	29
5.5 Test Procedure.....	29
5.6 Test Results .....	30
<b>6 MAXIMUM PEAK OUTPUT POWER MEASUREMENT.....</b>	<b>37</b>
6.1 Test Equipment.....	37
6.2 Block Diagram of Test Setup .....	37
6.3 Specification Limits ((§15.247(b)(3))) .....	37
6.4 Operating Condition of EUT .....	37
6.5 Test Procedure.....	37
6.6 Test Results .....	38
<b>7 EMISSION LIMITATIONS MEASUREMENT.....</b>	<b>45</b>
7.1 Test Equipment.....	45
7.2 Block Diagram of Test Setup .....	45
7.3 Specification Limits (§15.247(d)) .....	45
7.4 Operating Condition of EUT .....	45

7.5 Test Procedure.....	45
7.6 Test Results .....	47
<b>8 BAND EDGES MEASUREMENT .....</b>	<b>72</b>
8.1 Test Equipment.....	72
8.2 Block Diagram of Test Setup .....	72
8.3 Specification Limits (§15.247(d)) .....	72
8.4 Operating Condition of EUT .....	72
8.5 Test Procedure.....	72
8.6 Test Results .....	73
<b>9 POWER SPECTRAL DENSITY MEASUREMENT .....</b>	<b>78</b>
9.1 Test Equipment.....	78
9.2 Block Diagram of Test Setup .....	78
9.3 Specification Limits (§15.247(e)) .....	78
9.4 Operating Condition of EUT .....	78
9.5 Test Procedure.....	78
9.6 Test Results .....	79
<b>10 DEVIATION TO TEST SPECIFICATIONS .....</b>	<b>86</b>
<b>11 MEASUREMENT UNCERTAINTY LIST .....</b>	<b>87</b>

## TEST REPORT

Applicant : Abode Systems, Inc  
EUT Description : Abode Color Bulb  
(A) Model No. : 104062/A  
(B) Power Supply : 120V AC 60Hz  
(C) Test Voltage : 120V/60Hz

### Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART C  
AND ANSI C63.10-2013*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: Refer to Sec2.1), which was tested is technically compliance with the FCC limits.

This report applies to above tested Sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

***The test results for EUT's BLE function are contained in No.AC1-F21218 report.***

Date of Test : 2021.09.22-10.15 Date of Report : 2021.10.21

Producer : Alan He  
ALAN HE / Assistant

Review : Byron Wu  
BYRON WU/ Deputy Assistant Manager

**AUDIX®**  
For and on behalf of  
Audix Technology (Shanghai) Co., Ltd.

Signatory : BYRON KWOK  
BYRON KWOK/Assistant General Manager  
Authorized Signature(s)

# 1 SUMMARY OF STANDARDS AND RESULTS

## 1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
<b>EMISSION</b>			
Conducted Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.207
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.209(a) 15.205(a)(c)
6 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(a)(2)
Maximum Peak Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(b)(3)
Emission Limitations Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)
Band Edge Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)
Power Spectral Density Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(e)
N/A is an abbreviation for Not Applicable.			

## 2 GENERAL INFORMATION

### 2.1 Description of Equipment Under Test

Description : Abode Color Bulb

Type of EUT :  Production  Pre-product  Pro-type

Model Number : 104062/A

Radio Tech : BLE 5.0;  
IEEE 802.11 b/g/n.

Channel Freq. : BLE: 2402MHz-2480MHz;  
802.11b/g/n: 2412MHz-2462MHz.

Modulation : BLE: GFSK;  
802.11b: DSSS (CCK, DQPSK, DBPSK);  
802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK).

Antenna Info. : Antenna Type: Metal Monopole Antenna  
Antenna Gain: 1.33 dBi  
The Antenna was a permanently attached antenna  
that is comply with 15.203 requirement.

Test Mode : The EUT was set at continuous TX during all the test  
in the report.

Applicant : Abode Systems, Inc  
2625 Middlefield Rd. #900 Palo Alto, CA 94306,  
United States

Manufacturer : same as Applicant

## 2.2 EUT Specifications Assessed in Current Report

Mode	Modulation	Data Rate(Mbps)
802.11b	DS (DQPSK, DBPSK, CCK)	Up to 11
802.11g	OFDM (64-QAM, 16-QAM, QPSK, BPSK)	Up to 54
802.11n-HT 20	OFDM (64-QAM, 16-QAM, QPSK, BPSK)	Up to 72.2
802.11n-HT 40	OFDM (64-QAM, 16-QAM, QPSK, BPSK)	Up to 150

Channel List			
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

## 2.3 Test Information

The test software “EspRFTestTool\_v2.6\_Manual.exe” was used to control EUT work in TX mode, Power Attenuation Setting and select test channel.

Modulation	data rate (Mbps)	Power Attenuation Setting	Test Channel		Frequency (MHz)
802.11b	11	20	Low:	1	2412
		20	Middle:	6	2437
		20	High:	11	2462
802.11g	6	0	Low:	1	2412
		0	Middle:	6	2437
		0	High:	11	2462
802.11n20	MCS0	0	Low:	1	2412
		0	Middle:	6	2437
		0	High:	11	2462
802.11n40	MCS0	0	Low:	3	2422
		0	Middle:	6	2437
		0	High:	9	2452

## 2.4 Sample Description

Test Item	Model Number	Sample Number	Date of received
Conducted Emission	104062/A	E21091446-01/01	2021.09.18
Radiated Emission	104062/A	E21091532-01/01	2021.09.30
Conducted RF Test	104062/A	E21091532a-01/01	2021.09.30

## 2.5 Supported equipment

Brand : Acer  
Product Name: Notebook PC  
Model Name : TravelMate P238 series  
Model Number : N15W8

## 2.6 Description of Test Facility

Name of Firm : Audix Technology (Shanghai) Co., Ltd.  
Site Location : 3F and 4F, 34Bldg, 680 Guiping Rd.,  
Caohejing Hi-Tech Park,  
Shanghai 200233, China.  
Accredited by NVLAP, Lab Code : 200371-0  
FCC Designation Number : CN5027  
Test Firm Registration Number : 954668

### 3 CONDUCTED EMISSION TEST

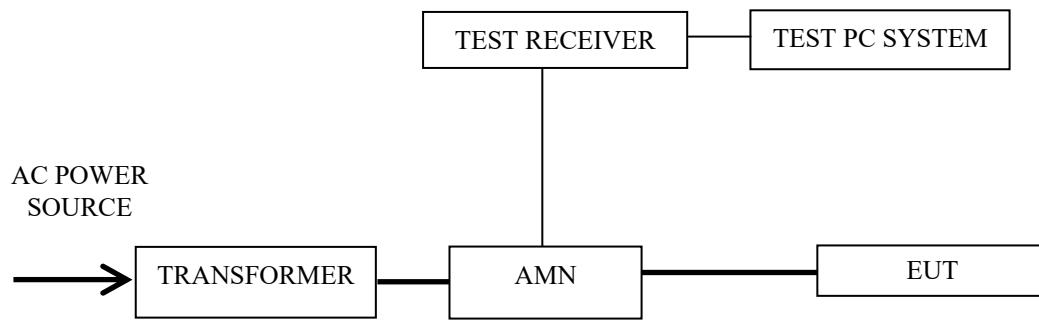
#### 3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESCI	101302	2021.04.26	1 Year
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	2021.06.24	1 Year
3.	Software	Audix	e3	6.2009-1-15	--	--

#### 3.2 Block Diagram of Test Setup

##### 3.2.1 Conducted Disturbance Test Setup



— : Signal Line  
— : Power Line

### 3.3 Conducted Emission Limits (§15.207)

Frequency Range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE 1 – The lower limit shall apply at the transition frequencies.  
 NOTE 2 – The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz

### 3.4 Test Configuration

The EUT (listed in Sec.2.1) was installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner which tends to maximize its emission level in a normal application.

### 3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipment.
- 3.5.3 Turn the EUT on the test mode, and then test.

### 3.6 Test Procedures

The EUT was placed upon a non-metallic table, which is 0.8 m above the horizontal conducting ground plane and 0.4 m from a vertical reference plane. The EUT was connected to the power mains through an Artificial Mains Network (AMN) to provide a  $50 \Omega$  coupling impedance for the measuring equipment. Both sides of AC line (Line & Neutral) were checked to find out the maximum conducted emission according to FCC Part 15 Subpart C and ANSI C63.10: 2013 requirements during conducted disturbance test.

The I.F. bandwidth of Test Receiver ESCI was set at 9 kHz.

The frequency range from 150 kHz to 30 MHz was checked.

Test with a dummy load in lieu of the antenna to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. (According to KDB 174176 D01 Line Conducted FAQ)

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7

### 3.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Worst case emission:

No.	Operation	Modulation	Channel	Frequency (MHz)	Data Page
1.	Transmitting	--	--	--	P13

NOTE 1 – Level = Read Level + AMN Factor + Cable Loss

NOTE 2 – “QP” means “Quasi-Peak” values

NOTE 3 – The emission levels which not reported are too low against the official limit.

**Worst case emission**

EUT :	Abode Color Bulb	Temperature :	22°C
Model No. :	104062/A	Humidity :	51%RH
Test Mode :	Transmitting	Date of Test :	2021.09.22

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	AMN Factor (dB)	Cable Loss (dB)	Emission Level dB ( $\mu$ V)	Limits dB ( $\mu$ V)	Margin (dB)	Remark
Line	0.2185	29.95	10.48	0.03	40.46	62.88	22.42	QP
	0.2185	9.38	10.48	0.03	19.89	52.88	32.99	Average
	0.2589	30.7	10.45	0.03	41.18	61.47	20.29	QP
	0.2589	10.33	10.45	0.03	20.81	51.47	30.66	Average
	0.5155	26.91	10.35	0.04	37.3	56	18.7	QP
	0.5155	7.67	10.35	0.04	18.06	46	27.94	Average
	0.7352	27.87	10.34	0.05	38.26	56	17.74	QP
	0.7352	10.07	10.34	0.05	20.46	46	25.54	Average
	2.309	21.21	10.35	0.08	31.64	56	24.36	QP
	2.309	7.86	10.35	0.08	18.29	46	27.71	Average
Neutral	9.352	16.82	10.34	0.17	27.33	60	32.67	QP
	9.352	4.96	10.34	0.17	15.47	50	34.53	Average
	0.1549	29.55	10.72	0.03	40.3	65.74	25.44	QP
	0.1549	9.33	10.72	0.03	20.08	55.74	35.66	Average
	0.31	26.76	10.59	0.04	37.39	59.97	22.58	QP
	0.31	6.71	10.59	0.04	17.34	49.97	32.63	Average
	<b>0.5731</b>	<b>29.71</b>	<b>10.47</b>	<b>0.04</b>	<b>40.22</b>	<b>56</b>	<b>15.78</b>	<b>QP</b>
	0.5731	11.28	10.47	0.04	21.79	46	24.21	Average
	0.8217	27.43	10.46	0.05	37.94	56	18.06	QP
	0.8217	9.42	10.46	0.05	19.93	46	26.07	Average

TEST ENGINEER: WESKER

## 4 RADIATED EMISSION TEST

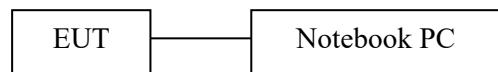
### 4.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

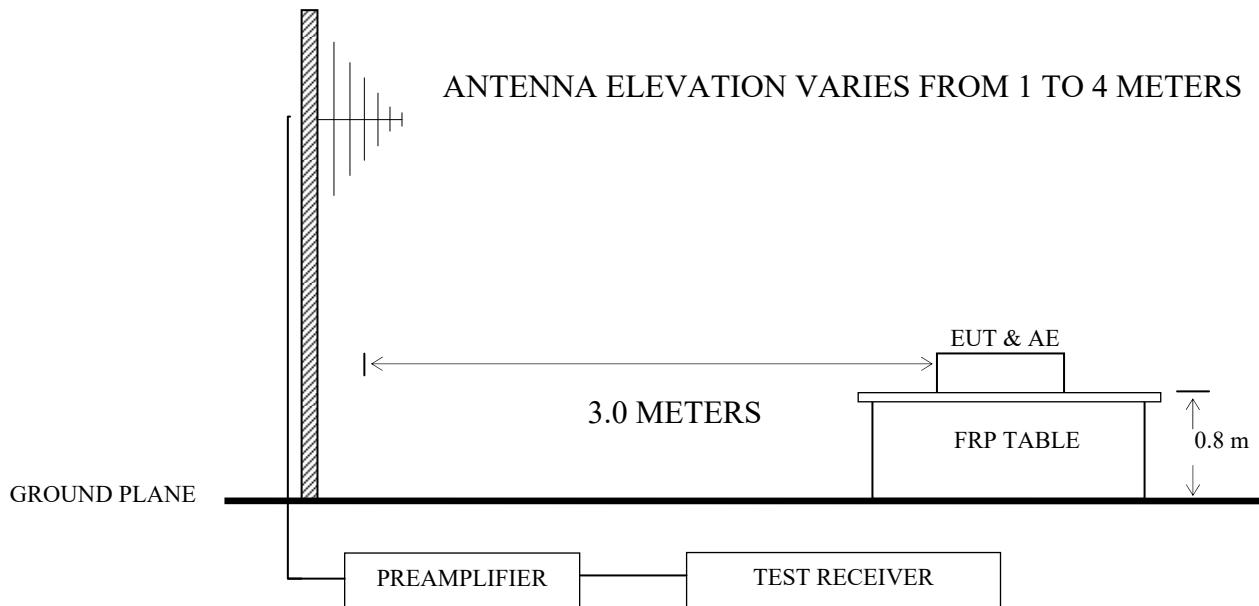
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Preamplifier	Agilent	8447D	2944A10548	2021.03.08	1 Year
2.	Preamplifier	HP	8449B	3008A00864	2021.03.08	1 Year
3.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2021.09.16	1 Year
4.	Test Receiver	R&S	ESCI	101303	2021.03.08	1 Year
5.	Bilog Antenna+6dB Attenuator	Schwarz beck	VULB 9168+EMCI- N-6-06 37	707+AT-N06 37	2021.03.30	1 Year
6.	Horn Antenna	EMCO	3115	9607-4878	2021.07.27	1 Year
7.	Horn Antenna	EMCO	3116	00062643	2021.10.10	1 Year
8.	Cavity Band Rejection Filter	Microwave	WT-A3882-R 10	WT200312-1- 1	2021.09.15	1 Year
9.	Software	Audix	e3	SET00200 9912M295-2	--	--

### 4.2 Block Diagram of Test Setup

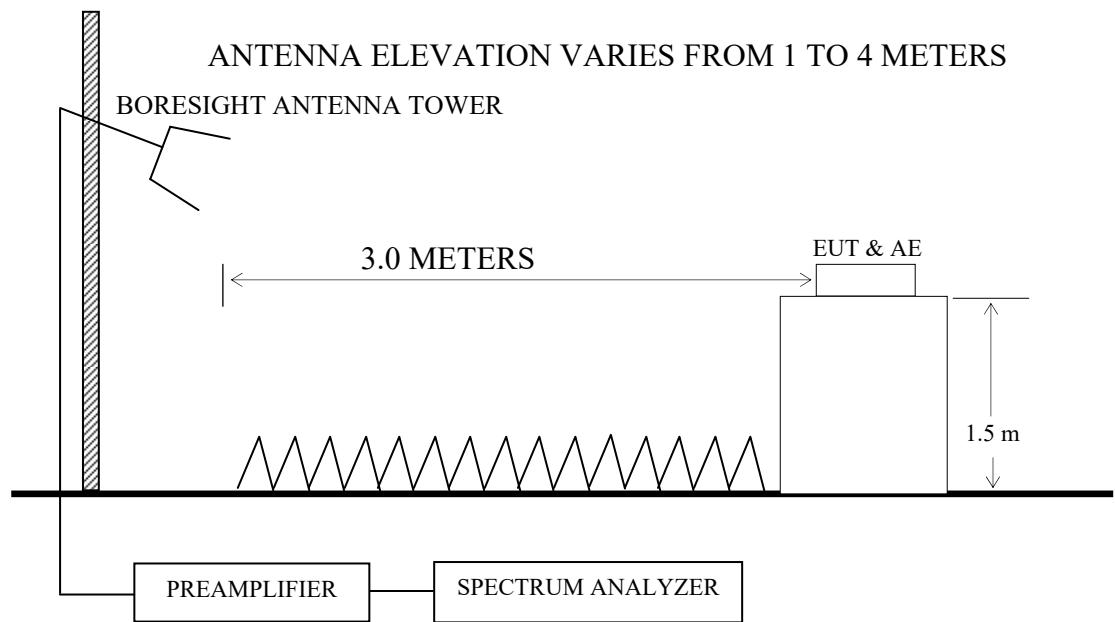
#### 4.2.1 EUT & Peripherals



#### 4.2.2 Below 1GHz



#### 4.2.3 Above 1GHz



#### 4.3 Radiated Emission Limit (§15.209)

Frequency (MHz)	Distance (m)	Field strength limits ( $\mu\text{V}/\text{m}$ )	
		( $\mu\text{V}/\text{m}$ )	( $\mu\text{V}/\text{m}$ )
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level dB ( $\mu\text{V}/\text{m}$ ) = 20 log Emission Level ( $\mu\text{V}/\text{m}$ )

NOTE 2 - The tighter limit applies at the band edges.

NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.

NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT

#### 4.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.4.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

## 4.5 Operating Condition of EUT

- 4.5.1 Setup the EUT as shown in Sec. 4.2.
- 4.5.2 Turn on the power of all equipment.
- 4.5.3 Turn the EUT on the test mode, and then test.

## 4.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable. Below 1 GHz, the table height is 80 cm above the reference ground plane. Above 1 GHz, the table height is 1.5 m. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.10: 2013 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of Agilent N9010A was set at 1MHz for above 1GHz.

The frequency range from 30 MHz to 25 GHz (Up to 10<sup>th</sup> harmonics from fundamental frequency) was checked.

All the test results are listed in Sec.4.7.

## 4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Frequency range: below 1GHz (Worst case emission)

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	Transmitting	802.11b	1	2412 MHz	P19
2.			6	2437 MHz	P19
3.			11	2462 MHz	P20
4.		802.11g	11	2462 MHz	P20
5.		802.11n20	11	2462 MHz	P21
6.		802.11n40	9	2452 MHz	P21

Frequency range: above 1GHz

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	Transmitting	802.11b	1	2412 MHz	P22
2.			6	2437 MHz	P22
3.			11	2462 MHz	P23
4.		802.11g	11	2462 MHz	P23
5.		802.11n20	11	2462 MHz	P24
6.		802.11n40	9	2452 MHz	P24

Restricted bands:

No.	Operation	Modulation	Channel	Frequency	Data Page
1.	Transmitting	802.11b	1	2412 MHz	P25
2.			11	2462 MHz	P25
3.		802.11g	1	2412 MHz	P26
4.			11	2462 MHz	P26
5.		802.11n20	1	2412 MHz	P27
6.			11	2462 MHz	P27
7.		802.11n40	3	2422 MHz	P28
8,			9	2452 MHz	P28

NOTE 1 – Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

NOTE 2 – “QP” means “Quasi-Peak” values

NOTE 3 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 4 – The emission levels which not reported are too low against the official limit.

NOTE 5 – The emission levels recorded below is data of EUT configured in Standing direction, for Standing direction was the maximum emission direction during the test. The data of Side & Lying direction are too low against the official limit to be reported.

NOTE 6 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

NOTE 7 – The frequency range 2310-2390MHz & 2483.5-2500MHz were tested for Restricted bands.

**Worst case emission < 1GHz**

EUT : Abode Color Bulb      Temperature : 22°C

Model No. : 104062/A      Humidity : 51%RH

Test Mode : Transmitting      Date of Test : 2021.10.15

**802.11b CH2412MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	47.492	23.46	19.55	0.73	28.21	15.53	40	24.47	QP
	169.6	21.46	18.65	1.39	27.66	13.84	43.5	29.66	QP
	248.55	29.9	17.47	1.68	27.16	21.89	46	24.11	QP
	284.98	28.52	18.7	1.84	27.07	21.99	46	24.01	QP
	432.55	28.4	22.1	2.24	27.73	25.01	46	20.99	QP
	866.09	21.83	28.1	3.24	26.5	26.67	46	19.33	QP
Vertical	54.643	23.79	19.66	0.79	28.18	16.06	40	23.94	QP
	151.07	23.22	19	1.32	27.79	15.75	43.5	27.75	QP
	282	24.02	18.58	1.84	27.09	17.35	46	28.65	QP
	419.11	28.69	21.65	2.22	27.67	24.89	46	21.11	QP
	661.15	22.35	26	2.77	27.55	23.57	46	22.43	QP
	890.73	21.98	28.2	3.31	26.35	27.14	46	18.86	QP

**802.11b CH2437MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	47.994	23.12	19.5	0.73	28.21	15.14	40	24.86	QP
	169.01	21.79	18.7	1.39	27.66	14.22	43.5	29.28	QP
	248.55	27.67	17.47	1.68	27.16	19.66	46	26.34	QP
	338.4	26.81	19.9	1.98	27.24	21.45	46	24.55	QP
	438.66	29.22	22.33	2.26	27.75	26.06	46	19.94	QP
	878.32	22.27	28.3	3.28	26.4	27.45	46	18.55	QP
Vertical	55.221	23.34	19.66	0.8	28.18	15.62	40	24.38	QP
	150.54	22.84	18.95	1.31	27.8	15.3	43.5	28.2	QP
	280.02	24.42	18.5	1.82	27.1	17.64	46	28.36	QP
	394.86	28.03	21.1	2.15	27.56	23.72	46	22.28	QP
	574.63	24.26	24.3	2.65	27.84	23.37	46	22.63	QP
	818.83	22.46	28	3.12	26.8	26.78	46	19.22	QP

**802.11b CH2462MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	47.492	22.49	19.55	0.73	28.21	14.56	40	25.44	QP
	159.78	22.2	19	1.35	27.73	14.82	43.5	28.68	QP
	240.83	27.52	17.23	1.66	27.2	19.21	46	26.79	QP
	319.94	25.39	19.6	1.95	27.13	19.81	46	26.19	QP
	429.52	30.23	22	2.24	27.72	26.75	46	19.25	QP
	875.25	22.01	28.3	3.28	26.45	27.14	46	18.86	QP
Vertical	49.359	23.21	19.5	0.74	28.2	15.25	40	24.75	QP
	162.61	22.64	18.95	1.37	27.71	15.25	43.5	28.25	QP
	248.55	24.72	17.47	1.68	27.16	16.71	46	29.29	QP
	416.18	27.89	21.55	2.2	27.67	23.97	46	22.03	QP
	651.94	22.23	25.85	2.75	27.6	23.23	46	22.77	QP
	890.73	22.25	28.2	3.31	26.35	27.41	46	18.59	QP

**802.11g CH2462MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	47.492	24.25	19.55	0.73	28.21	16.32	40	23.68	QP
	159.78	22.6	19	1.35	27.73	15.22	43.5	28.28	QP
	248.55	27.77	17.47	1.68	27.16	19.76	46	26.24	QP
	338.4	28.12	19.9	1.98	27.24	22.76	46	23.24	QP
	440.2	28.33	22.4	2.26	27.77	25.22	46	20.78	QP
	839.18	22.59	28	3.17	26.65	27.11	46	18.89	QP
Vertical	47.659	24.01	19.53	0.73	28.21	16.06	40	23.94	QP
	153.74	22.89	19	1.33	27.77	15.45	43.5	28.05	QP
	282	24.33	18.58	1.84	27.09	17.66	46	28.34	QP
	423.54	27.65	21.83	2.23	27.7	24.01	46	21.99	QP
	620.71	22.32	25.6	2.76	27.71	22.97	46	23.03	QP
	890.73	22.26	28.2	3.31	26.35	27.42	46	18.58	QP

**802.11n20 CH2462MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	47.994	22.82	19.5	0.73	28.21	14.84	40	25.16	QP
	167.24	22.27	18.8	1.39	27.67	14.79	43.5	28.71	QP
	248.55	28.35	17.47	1.68	27.16	20.34	46	25.66	QP
	345.6	28.4	19.8	2	27.28	22.92	46	23.08	QP
	426.52	30.25	21.93	2.23	27.7	26.71	46	19.29	QP
	839.18	23.57	28	3.17	26.65	28.09	46	17.91	QP
Vertical	47.994	24.39	19.5	0.73	28.21	16.41	40	23.59	QP
	158.67	22.16	19.1	1.35	27.74	14.87	43.5	28.63	QP
	279.04	23.44	18.46	1.82	27.1	16.62	46	29.38	QP
	400.43	28.4	21.1	2.17	27.6	24.07	46	21.93	QP
	642.86	23.35	25.95	2.75	27.62	24.43	46	21.57	QP
	872.18	22.25	28.3	3.24	26.45	27.34	46	18.66	QP

**802.11n40 CH2452MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	50.942	22.72	19.6	0.76	28.2	14.88	40	25.12	QP
	162.04	21.93	19	1.36	27.72	14.57	43.5	28.93	QP
	263.82	28.94	17.84	1.74	27.1	21.42	46	24.58	QP
	341.98	26.82	19.86	1.99	27.26	21.41	46	24.59	QP
	431.03	30.09	22.05	2.24	27.72	26.66	46	19.34	QP
	798.98	23.44	27.8	3.06	26.9	27.4	46	18.6	QP
Vertical	48.502	24.19	19.5	0.74	28.21	16.22	40	23.78	QP
	162.04	22.58	19	1.36	27.72	15.22	43.5	28.28	QP
	303.54	23.76	19.1	1.93	27.02	17.77	46	28.23	QP
	397.63	30.51	21.1	2.15	27.58	26.18	46	19.82	QP
	599.32	23.91	25.2	2.73	27.8	24.04	46	21.96	QP
	833.32	23.04	27.9	3.14	26.7	27.38	46	18.62	QP

TEST ENGINEER: AVALON

**Radiated Emission > 1GHz**

EUT : Abode Color Bulb      Temperature : 22°C

Model No. : 104062/A      Humidity : 51%RH

Test Mode : Transmitting      Date of Test : 2021.10.15

**802.11b CH2412MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	2611	44.45	28.88	5.57	35.64	43.26	74	30.74	Peak
	4824	43.7	33.26	7.55	34.75	49.76	74	24.24	Peak
	4824	40.21	33.26	7.55	34.75	46.27	54	7.73	Average
	6076	38.39	34.31	8.43	34.71	46.42	74	27.58	Peak
	7831	36.29	37.41	10.11	34.8	49.01	74	24.99	Peak
	9640	36.18	38.33	11.15	34.64	51.02	74	22.98	Peak
Vertical	3493	41.67	31.3	6.36	35.14	44.19	74	29.81	Peak
	4824	46.37	33.26	7.55	34.75	52.43	74	21.57	Peak
	4824	44.78	33.26	7.55	34.75	50.84	54	3.16	Average
	7236	41.44	36.2	9.47	34.8	52.31	74	21.69	Peak
	7236	36.41	36.2	9.47	34.8	47.28	54	6.72	Average
	9766	36.9	38.35	11.24	34.62	51.87	74	22.13	Peak

**802.11b CH2437MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	3187	43.79	30.58	6.09	35.24	45.22	74	28.78	Peak
	4872	44.6	33.49	7.61	34.74	50.96	74	23.04	Peak
	4872	42.89	33.49	7.61	34.74	49.25	54	4.75	Average
	6499	37.94	34.4	8.85	34.75	46.44	74	27.56	Peak
	8209	36.17	38.09	10.34	34.78	49.82	74	24.18	Peak
	9703	36.86	38.34	11.15	34.63	51.72	74	22.28	Peak
Vertical	3178	43.75	30.55	6.05	35.24	45.11	74	28.89	Peak
	4874	47.36	33.49	7.61	34.74	53.72	74	20.28	Peak
	4874	46.54	33.49	7.61	34.74	52.9	54	1.1	Average
	7309	39.13	36.35	9.58	34.8	50.26	74	23.74	Peak
	8569	36.58	38.54	10.52	34.74	50.9	74	23.1	Peak
	9424	36.58	38.28	10.97	34.65	51.18	74	22.82	Peak

**802.11b CH2462MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	3430	42.27	31.14	6.31	35.16	44.56	74	29.44	Peak
	4924	46.57	33.72	7.67	34.72	53.24	74	20.76	Peak
	4924	43.72	33.72	7.67	34.72	50.39	54	3.61	Average
	6580	37.19	34.59	8.93	34.76	45.95	74	28.05	Peak
	8245	36.17	38.17	10.34	34.77	49.91	74	24.09	Peak
	9559	36.99	38.31	11.06	34.64	51.72	74	22.28	Peak
Vertical	2998	43.37	30.1	5.89	35.3	44.06	74	29.94	Peak
	4924	49.68	33.72	7.67	34.72	56.35	74	17.65	Peak
	<b>4924</b>	<b>46.96</b>	<b>33.72</b>	<b>7.67</b>	<b>34.72</b>	<b>53.63</b>	<b>54</b>	<b>0.37</b>	Average
	6814	36.7	35.17	9.09	34.78	46.18	74	27.82	Peak
	8443	35.96	38.51	10.46	34.75	50.18	74	23.82	Peak
	9568	36.2	38.31	11.06	34.64	50.93	74	23.07	Peak

**802.11g CH2462MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	4924	51.69	33.72	7.67	34.72	58.36	74	15.64	Peak
	4924	42.28	33.72	7.67	34.72	48.95	54	5.05	Average
	7372	40.84	36.5	9.58	34.8	52.12	74	21.88	Peak
	7372	32.48	36.5	9.58	34.8	43.76	54	10.24	Average
	9847	38.63	38.37	11.24	34.62	53.62	74	20.38	Peak
	9847	26.46	38.37	11.24	34.62	41.45	54	12.55	Average
Vertical	3340	42.29	30.94	6.23	35.19	44.27	74	29.73	Peak
	4924	50.92	33.72	7.67	34.72	57.59	74	16.41	Peak
	4924	43.24	33.72	7.67	34.72	49.91	54	4.09	Average
	7386	46.65	36.55	9.69	34.8	58.09	74	15.91	Peak
	7386	37.21	36.55	9.69	34.8	48.65	54	5.35	Average
	9838	37.34	38.37	11.24	34.62	52.33	74	21.67	Peak

**802.11n20 CH2462MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	3196	42.67	30.6	6.09	35.23	44.13	74	29.87	Peak
	4924	48.25	33.72	7.67	34.72	54.92	74	19.08	Peak
	4924	39.46	33.72	7.67	34.72	46.13	54	7.87	Average
	7372	37.89	36.5	9.58	34.8	49.17	74	24.83	Peak
	8902	36.02	38.28	10.64	34.71	50.23	74	23.77	Peak
	9865	35.33	38.37	11.33	34.62	50.41	74	23.59	Peak
Vertical	4924	48.72	33.72	7.67	34.72	55.39	74	18.61	Peak
	4924	41.5	33.72	7.67	34.72	48.17	54	5.83	Average
	7386	43.24	36.55	9.69	34.8	54.68	74	19.32	Peak
	7386	35.95	36.55	9.69	34.8	47.39	54	6.61	Average
	9856	39.93	38.37	11.24	34.62	54.92	74	19.08	Peak
	9856	28.6	38.37	11.24	34.62	43.59	54	10.41	Average

**802.11n40 CH2452MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	3187	42.23	30.58	6.09	35.24	43.66	74	30.34	Peak
	4906	45.82	33.6	7.61	34.73	52.3	74	21.7	Peak
	4906	37.47	33.6	7.61	34.73	43.95	54	10.05	Average
	7363	39.17	36.5	9.58	34.8	50.45	74	23.55	Peak
	7363	32.52	36.5	9.58	34.8	43.8	74	30.2	Peak
	9739	35.76	38.34	11.24	34.62	50.72	74	23.28	Peak
Vertical	3178	44.44	30.55	6.05	35.24	45.8	74	28.2	Peak
	4906	46.65	33.6	7.61	34.73	53.13	74	20.87	Peak
	4906	38.37	33.6	7.61	34.73	44.85	54	9.15	Average
	7363	42.7	36.5	9.58	34.8	53.98	74	20.02	Peak
	7363	33.37	36.5	9.58	34.8	44.65	54	9.35	Average
	9784	36.92	38.36	11.24	34.62	51.9	74	22.1	Peak

TEST ENGINEER: AVALON

**Emissions in restricted frequency bands:**

EUT	:	Abode Color Bulb	Temperature :	22°C
Model No.	:	104062/A	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2021.10.15

**802.11b CH2412MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	2337.2	50.18	28.08	5.29	35.92	47.63	74	26.37	Peak
	2337.2	38.32	28.08	5.29	35.92	35.77	54	18.23	Average
	2363.6	50.69	28.15	5.32	35.89	48.27	74	25.73	Peak
	2363.6	38.47	28.15	5.32	35.89	36.05	54	17.95	Average
	2390	57.65	28.21	5.36	35.86	55.36	74	18.64	Peak
	2390	40.36	28.21	5.36	35.86	38.07	54	15.93	Average
Vertical	2332	51.48	28.06	5.29	35.93	48.9	74	25.1	Peak
	2332	38.36	28.06	5.29	35.93	35.78	54	18.22	Average
	2371	51.33	28.17	5.32	35.89	48.93	74	25.07	Peak
	2371	39.24	28.17	5.32	35.89	36.84	54	17.16	Average
	2390.1	56.32	28.21	5.36	35.86	54.03	74	19.97	Peak
	2390.1	42.43	28.21	5.36	35.86	40.14	54	13.86	Average

**802.11b CH2462MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	2483.5	50.77	28.46	5.43	35.76	48.9	74	25.1	Peak
	2483.5	39.48	28.46	5.43	35.76	37.61	54	16.39	Average
	2489	52.25	28.46	5.47	35.76	50.42	74	23.58	Peak
	2489	40.32	28.46	5.47	35.76	38.49	54	15.51	Average
	2497.6	51.34	28.5	5.47	35.76	49.55	74	24.45	Peak
	2497.6	39.53	28.5	5.47	35.76	37.74	54	16.26	Average
Vertical	2483.5	54.31	28.46	5.43	35.76	52.44	74	21.56	Peak
	2483.5	43.53	28.46	5.43	35.76	41.66	54	12.34	Average
	2487.9	55.24	28.46	5.47	35.76	53.41	74	20.59	Peak
	2487.9	45.42	28.46	5.47	35.76	43.59	54	10.41	Average
	2496.3	53.53	28.48	5.47	35.76	51.72	74	22.28	Peak
	2496.3	41.35	28.48	5.47	35.76	39.54	54	14.46	Average

**802.11g CH2412MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	2321	49.95	28.03	5.29	35.93	47.34	74	26.66	Peak
	2321	36.49	28.03	5.29	35.93	33.88	54	20.12	Average
	2355.5	49.1	28.12	5.32	35.9	46.64	74	27.36	Peak
	2355.5	36.21	28.12	5.32	35.9	33.75	54	20.25	Average
	2390	61.72	28.21	5.36	35.86	59.43	74	14.57	Peak
	2390	44.37	28.21	5.36	35.86	42.08	54	11.92	Average
Vertical	2332.1	49.54	28.06	5.29	35.93	46.96	74	27.04	Peak
	2332.1	37.26	28.06	5.29	35.93	34.68	54	19.32	Average
	2371.4	53.14	28.17	5.32	35.89	50.74	74	23.26	Peak
	2371.4	41.43	28.17	5.32	35.89	39.03	54	14.97	Average
	2390	69.05	28.21	5.36	35.86	66.76	74	7.24	Peak
	2390	50.3	28.21	5.36	35.86	48.01	54	5.99	Average

**802.11g CH2462MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	2483.5	62.96	28.46	5.43	35.76	61.09	74	12.91	Peak
	2483.5	46.8	28.46	5.43	35.76	44.93	54	9.07	Average
	2491.3	51.62	28.48	5.47	35.76	49.81	74	24.19	Peak
	2491.3	38.46	28.48	5.47	35.76	36.65	54	17.35	Average
	2498.2	50.39	28.5	5.47	35.76	48.6	74	25.4	Peak
	2498.2	38.24	28.5	5.47	35.76	36.45	54	17.55	Average
Vertical	2483.5	70.64	28.46	5.43	35.76	68.77	74	5.23	Peak
	2483.5	53.36	28.46	5.43	35.76	51.49	54	2.51	Average
	2489.6	57.18	28.48	5.47	35.76	55.37	74	18.63	Peak
	2489.6	44.41	28.48	5.47	35.76	42.6	54	11.4	Average
	2496.2	54.72	28.48	5.47	35.76	52.91	74	21.09	Peak
	2496.2	43.47	28.48	5.47	35.76	41.66	54	12.34	Average

**802.11n20 CH2412MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	2336.1	49.67	28.08	5.29	35.92	47.12	74	26.88	Peak
	2336.1	37.37	28.08	5.29	35.92	34.82	54	19.18	Average
	2362.3	49.79	28.14	5.32	35.89	47.36	74	26.64	Peak
	2362.3	37.58	28.14	5.32	35.89	35.15	54	18.85	Average
	2390	59.73	28.21	5.36	35.86	57.44	74	16.56	Peak
	2390	43.57	28.21	5.36	35.86	41.28	54	12.72	Average
Vertical	2322.8	50.76	28.05	5.29	35.93	48.17	74	25.83	Peak
	2322.8	37.47	28.05	5.29	35.93	34.88	54	19.12	Average
	2369.7	52.07	28.15	5.32	35.89	49.65	74	24.35	Peak
	2369.7	40.22	28.15	5.32	35.89	37.8	54	16.2	Average
	2390	67.26	28.21	5.36	35.86	64.97	74	9.03	Peak
	2390	50.52	28.21	5.36	35.86	48.23	54	5.77	Average

**802.11n20 CH2462MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	2483.5	66.01	28.46	5.43	35.76	64.14	74	9.86	Peak
	2483.5	46.3	28.46	5.43	35.76	44.43	54	9.57	Average
	2490.6	50.04	28.48	5.47	35.76	48.23	74	25.77	Peak
	2490.6	38.4	28.48	5.47	35.76	36.59	54	17.41	Average
	2496.2	49.91	28.48	5.47	35.76	48.1	74	25.9	Peak
	2496.2	38.29	28.48	5.47	35.76	36.48	54	17.52	Average
Vertical	2483.5	71.79	28.46	5.43	35.76	69.92	74	4.08	Peak
	2483.5	51.48	28.46	5.43	35.76	49.61	54	4.39	Average
	2490.6	54.96	28.48	5.47	35.76	53.15	74	20.85	Peak
	2490.6	43.59	28.48	5.47	35.76	41.78	54	12.22	Average
	2496.5	53.99	28.5	5.47	35.76	52.2	74	21.8	Peak
	2496.5	42.23	28.5	5.47	35.76	40.44	54	13.56	Average

**802.11n40 CH2422MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	2354.2	49.64	28.12	5.32	35.9	47.18	74	26.82	Peak
	2354.2	37.37	28.12	5.32	35.9	34.91	54	19.09	Average
	2384.6	61.72	28.21	5.36	35.87	59.42	74	14.58	Peak
	2384.6	43.47	28.21	5.36	35.87	41.17	54	12.83	Average
	2390	59.26	28.21	5.36	35.86	56.97	74	17.03	Peak
	2390	44.42	28.21	5.36	35.86	42.13	54	11.87	Average
Vertical	2349.4	50.4	28.12	5.32	35.9	47.94	74	26.06	Peak
	2349.4	39.54	28.12	5.32	35.9	37.08	54	16.92	Average
	2387.3	69.9	28.21	5.36	35.86	67.61	74	6.39	Peak
	2387.3	50.39	28.21	5.36	35.86	48.1	54	5.9	Average
	2390	65.72	28.21	5.36	35.86	63.43	74	10.57	Peak
	2390	51.47	28.21	5.36	35.86	49.18	54	4.82	Average

**802.11n40 CH2452MHz**

Polarization	Frequency (MHz)	Meter Reading dB ( $\mu$ V)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Margin (dB)	Remark
Horizontal	2483.5	61.96	28.46	5.43	35.76	60.09	74	13.91	Peak
	2483.5	49.7	28.46	5.43	35.76	47.83	54	6.17	Average
	2489.9	60.83	28.48	5.47	35.76	59.02	74	14.98	Peak
	2489.9	46.68	28.48	5.47	35.76	44.87	54	9.13	Average
	2495.7	57.24	28.48	5.47	35.76	55.43	74	18.57	Peak
	2495.7	43.43	28.48	5.47	35.76	41.62	54	12.38	Average
Vertical	2483.5	70.38	28.46	5.43	35.76	68.51	74	5.49	Peak
	2483.5	55.24	28.46	5.43	35.76	53.37	54	0.63	Average
	2489.7	70.18	28.48	5.47	35.76	68.37	74	5.63	Peak
	2489.7	53.21	28.48	5.47	35.76	51.4	54	2.6	Average
	2497.7	64	28.5	5.47	35.76	62.21	74	11.79	Peak
	2497.7	48.63	28.5	5.47	35.76	46.84	54	7.16	Average

TEST ENGINEER: AVALON

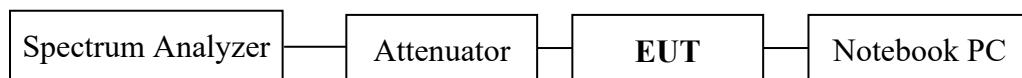
## 5 6 dB BANDWIDTH MEASUREMENT

### 5.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
4.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2021.09.15	1 Year
5.	Coaxial Cable	WOKEN	SFL402-105F LEX	F02-150819-0 45	2021.03.08	1 Year
6.	20 dB Attenuator	Mini-Circuits	VAT-20+	001	2021.08.06	1 Year

### 5.2 Block Diagram of Test Setup



### 5.3 Specification Limits (§15.247(a)(2))

The minimum 6 dB bandwidth shall be at least 500 kHz.

### 5.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

### 5.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with settings: RBW = 100kHz, VBW  $\geq 3 \times$  RBW.

The 6 dB bandwidth is defined as the total spectrum the power of which is lower than peak power minus 6 dB .

The test procedure is defined in ANSI C63.10-2013 (the 11.8.2 Measurement Procedure “Option 2” was used).

## 5.6 Test Results

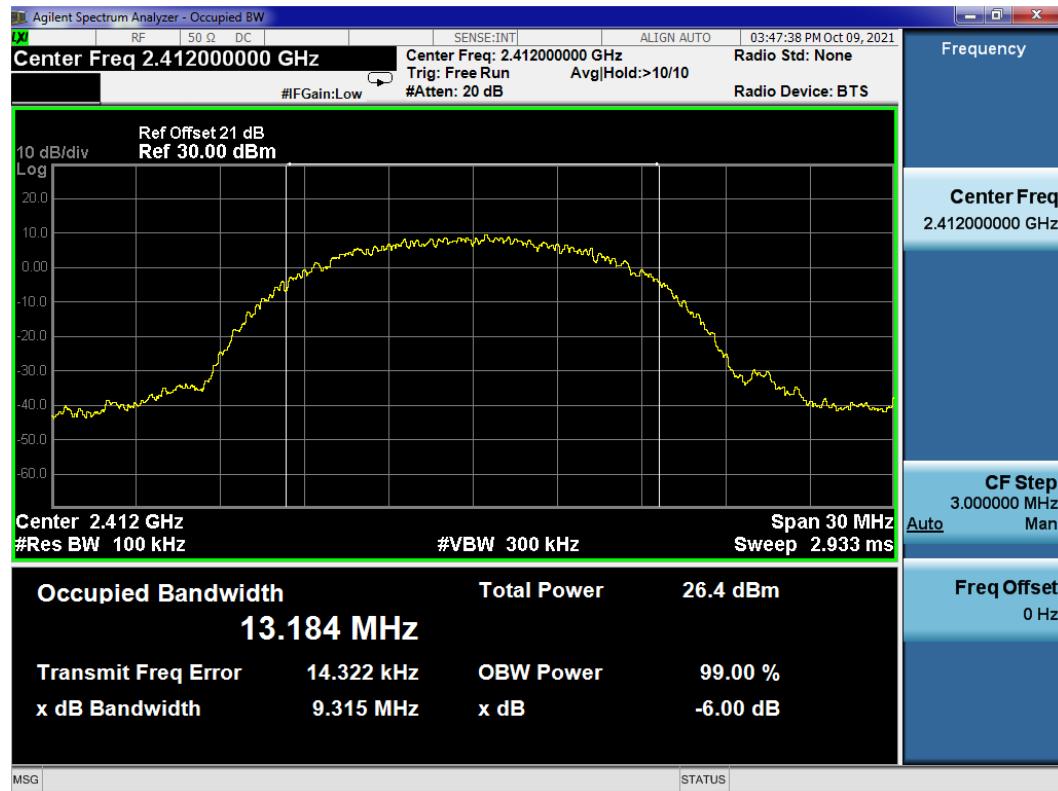
**PASSED.**

All the test results are attached in next pages.

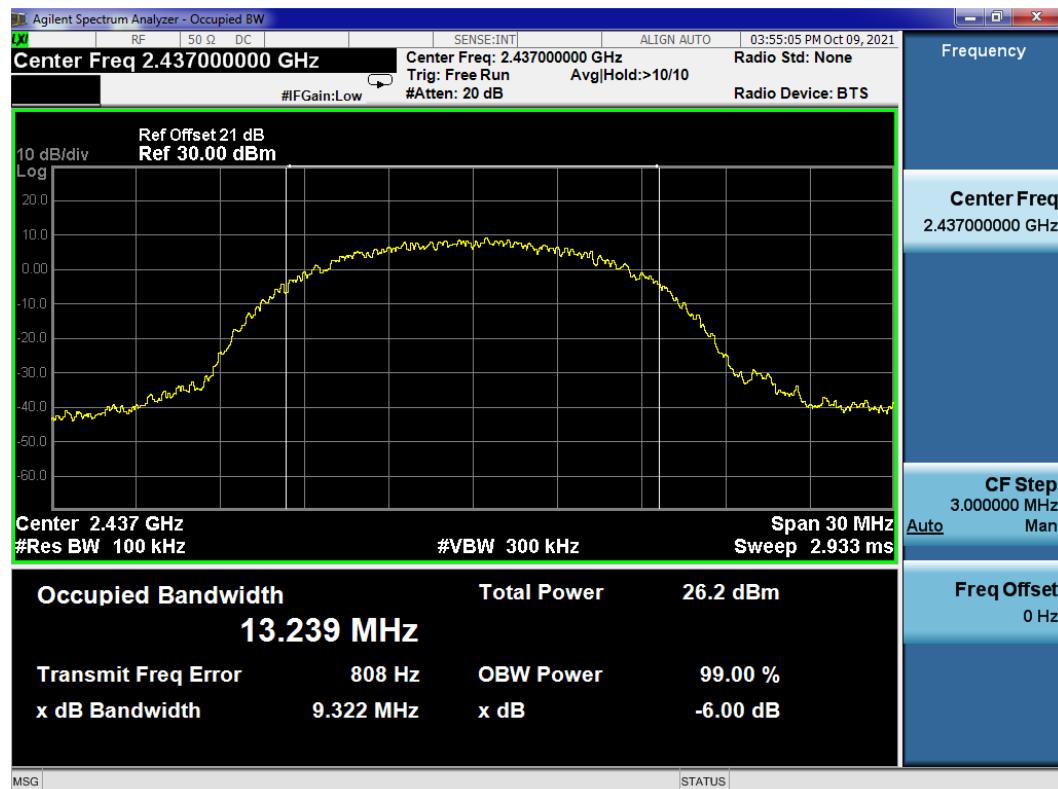
(Test Date: 2021.10.09 Temperature: 23°C Humidity: 51 %)

Modulation	Channel	Frequency (MHz)	<b>6dB Bandwidth (MHz)</b>	Limit
802.11b	1	2412	<b>9.315</b>	500 kHz
	6	2437	<b>9.322</b>	500 kHz
	11	2462	<b>9.314</b>	500 kHz
802.11g	1	2412	<b>16.36</b>	500 kHz
	6	2437	<b>16.35</b>	500 kHz
	11	2462	<b>16.36</b>	500 kHz
802.11n20	1	2412	<b>17.57</b>	500 kHz
	6	2437	<b>17.57</b>	500 kHz
	11	2462	<b>17.57</b>	500 kHz
802.11n40	3	2422	<b>35.56</b>	500 kHz
	6	2437	<b>35.56</b>	500 kHz
	9	2452	<b>35.56</b>	500 kHz

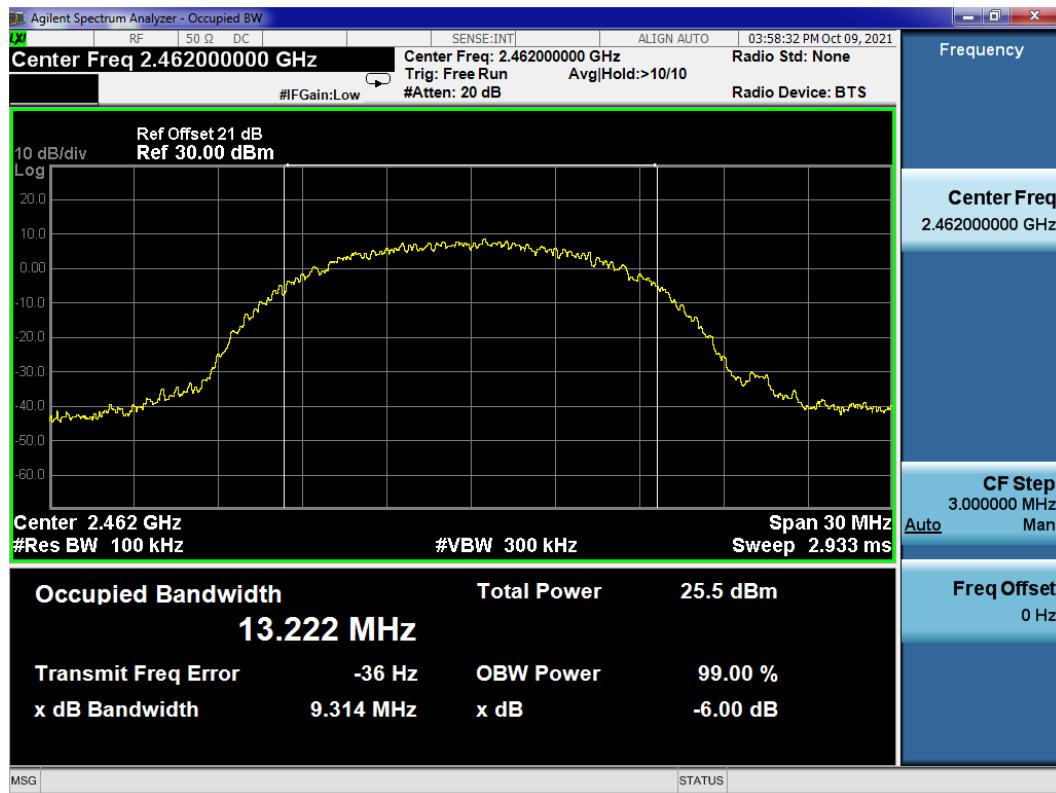
## 802.11b CH2412MHz



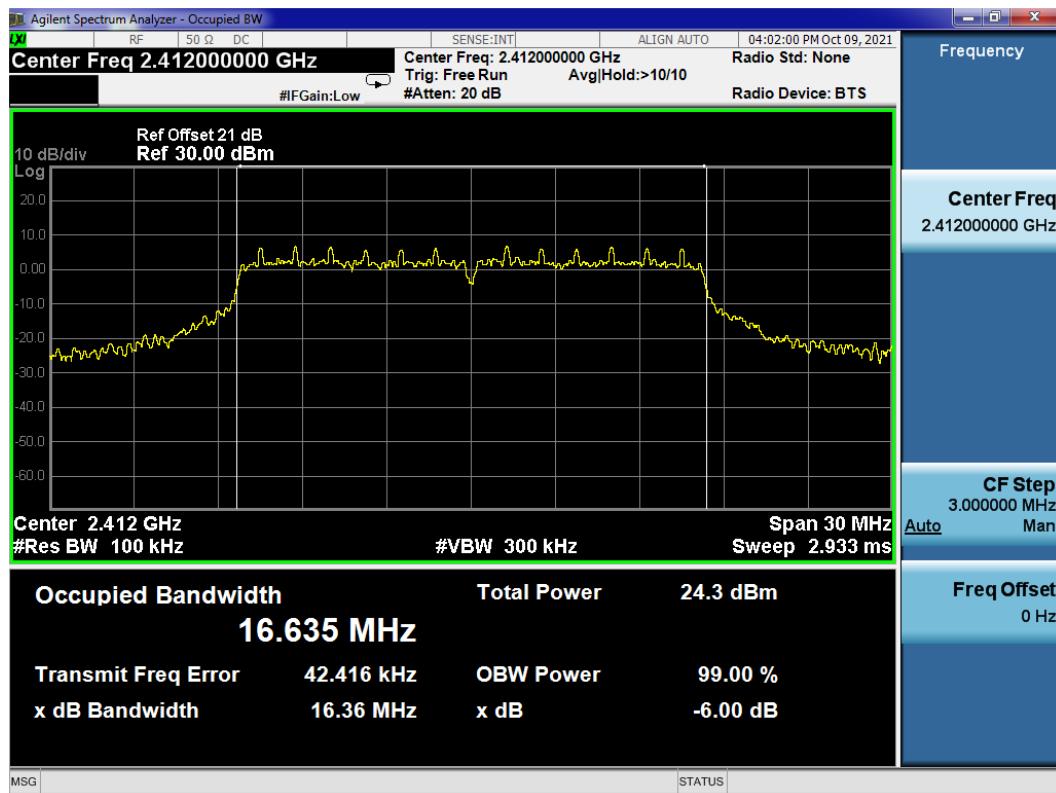
## 802.11b CH2437MHz



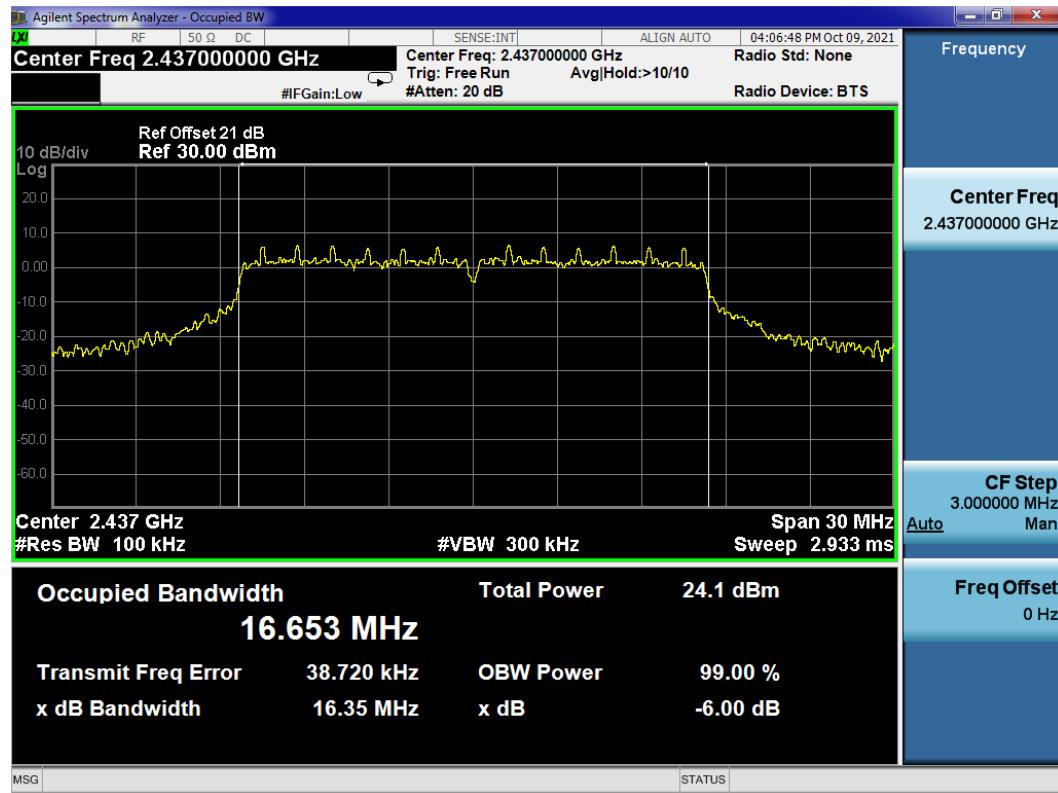
## 802.11b CH2462MHz



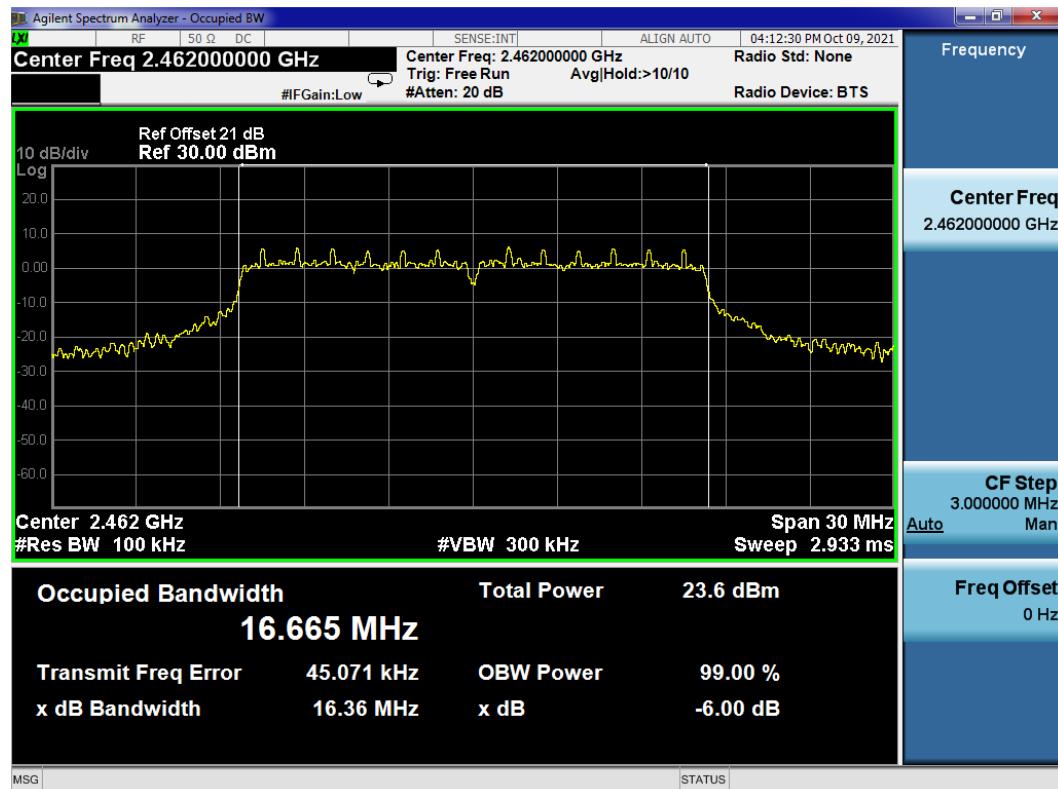
## 802.11g CH2412MHz

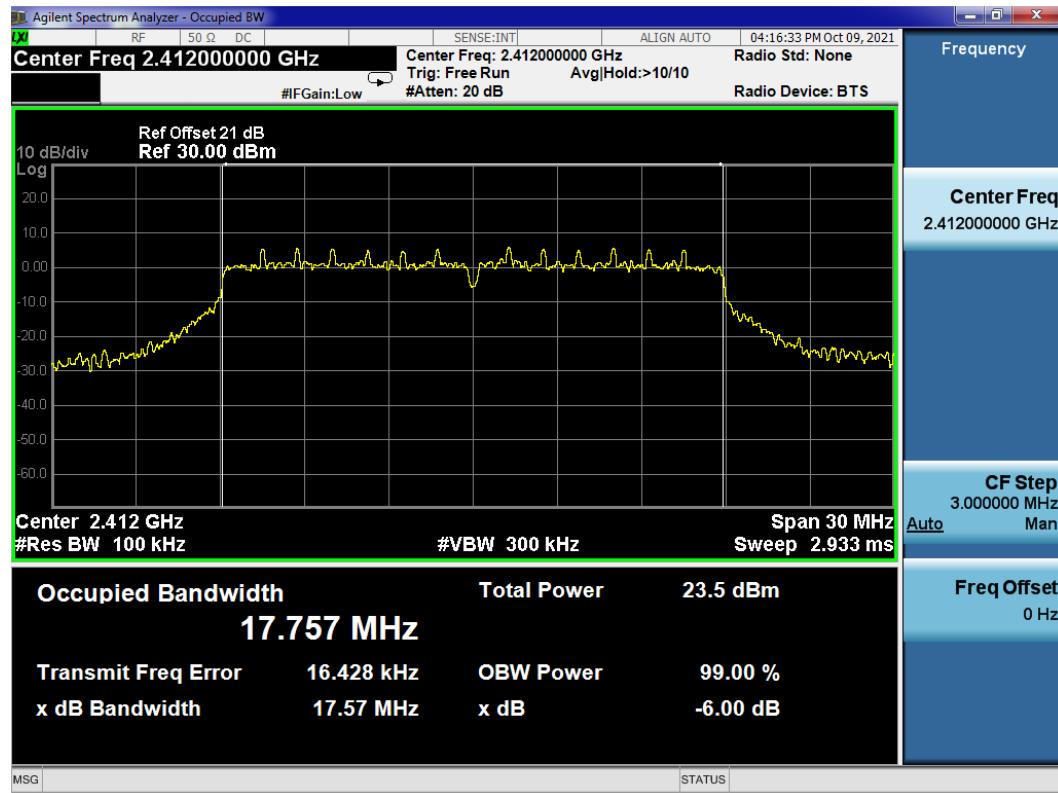
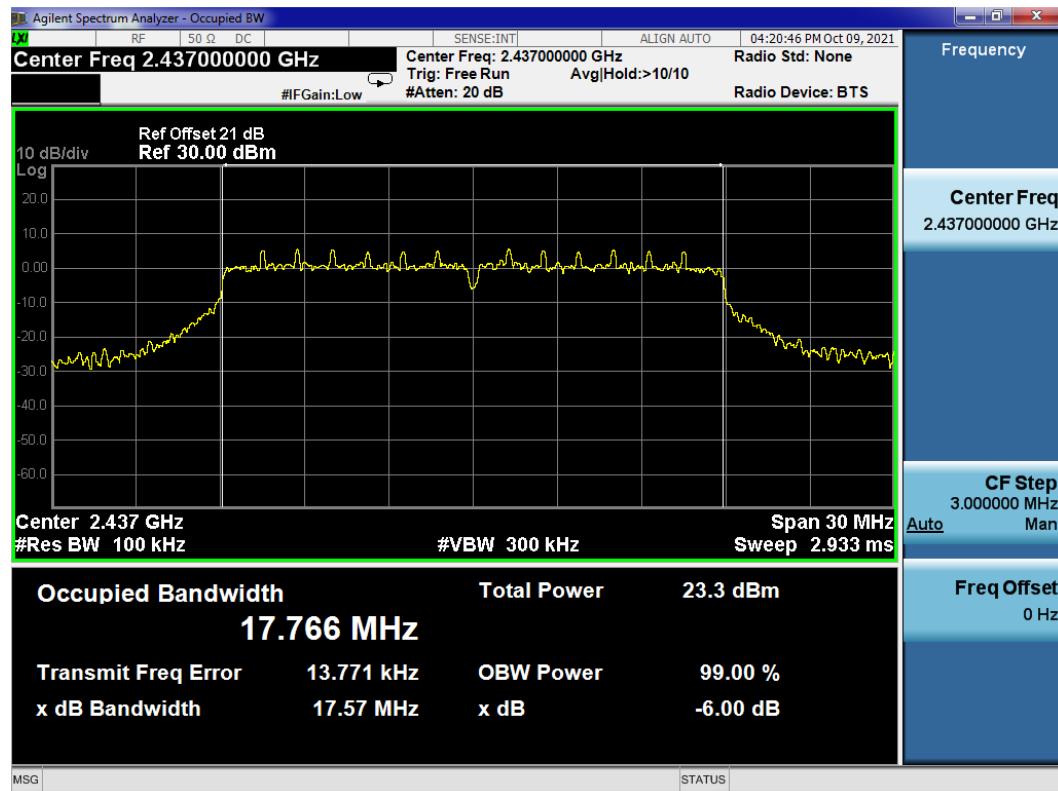


## 802.11g CH2437MHz

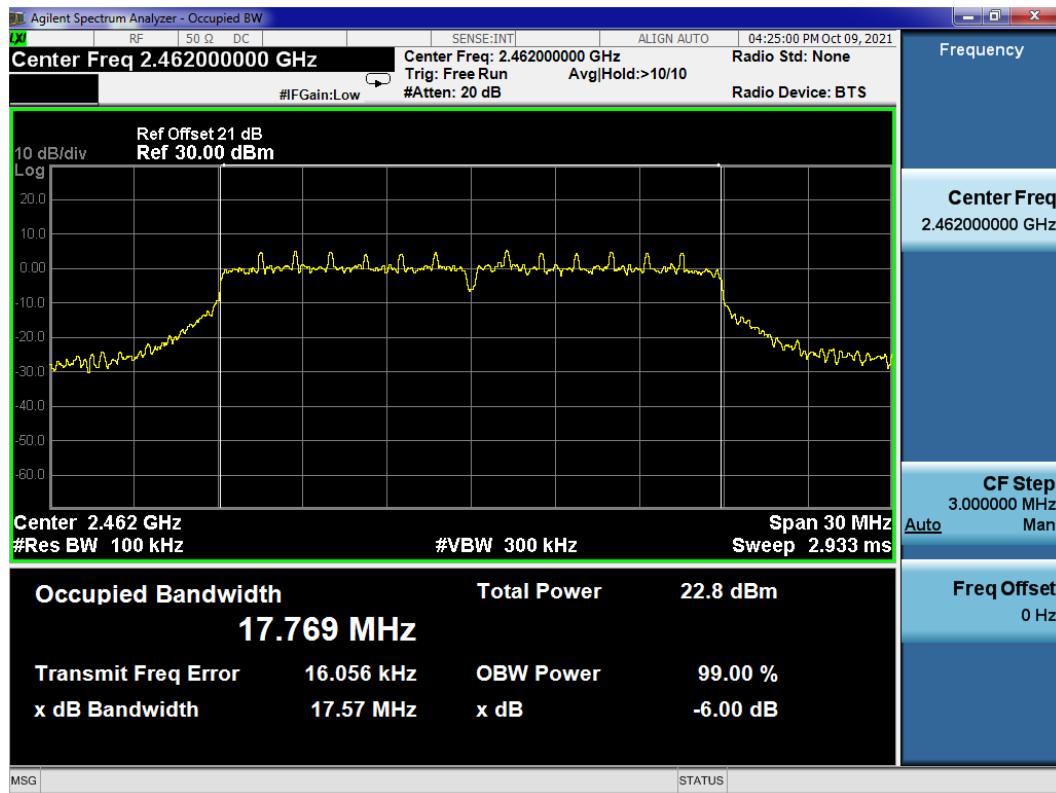


## 802.11g CH2462MHz

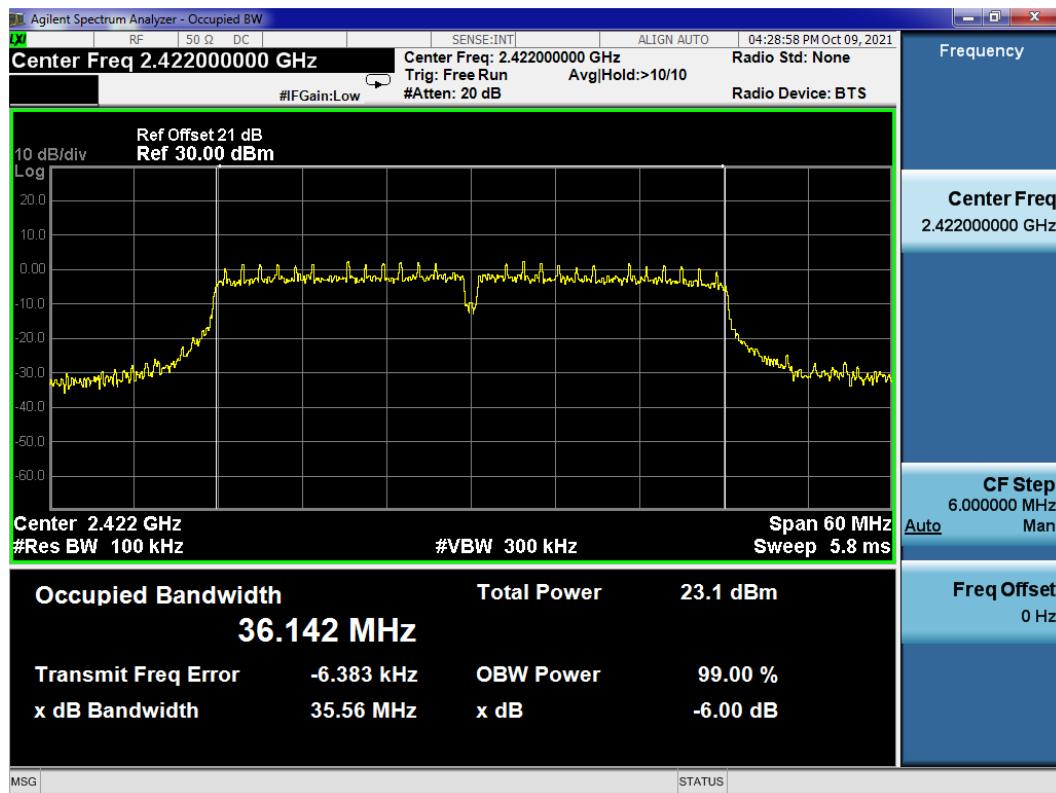


**802.11n20 CH2412MHz****802.11n20 CH2437MHz**

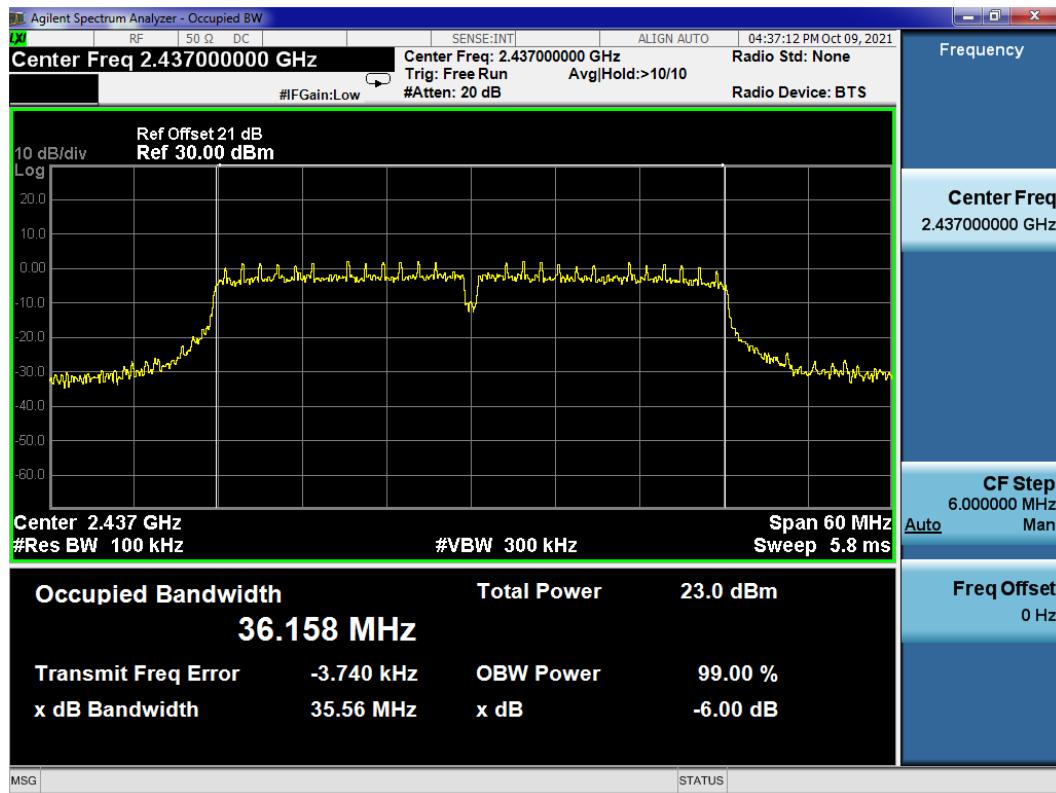
## 802.11n20 CH2462MHz



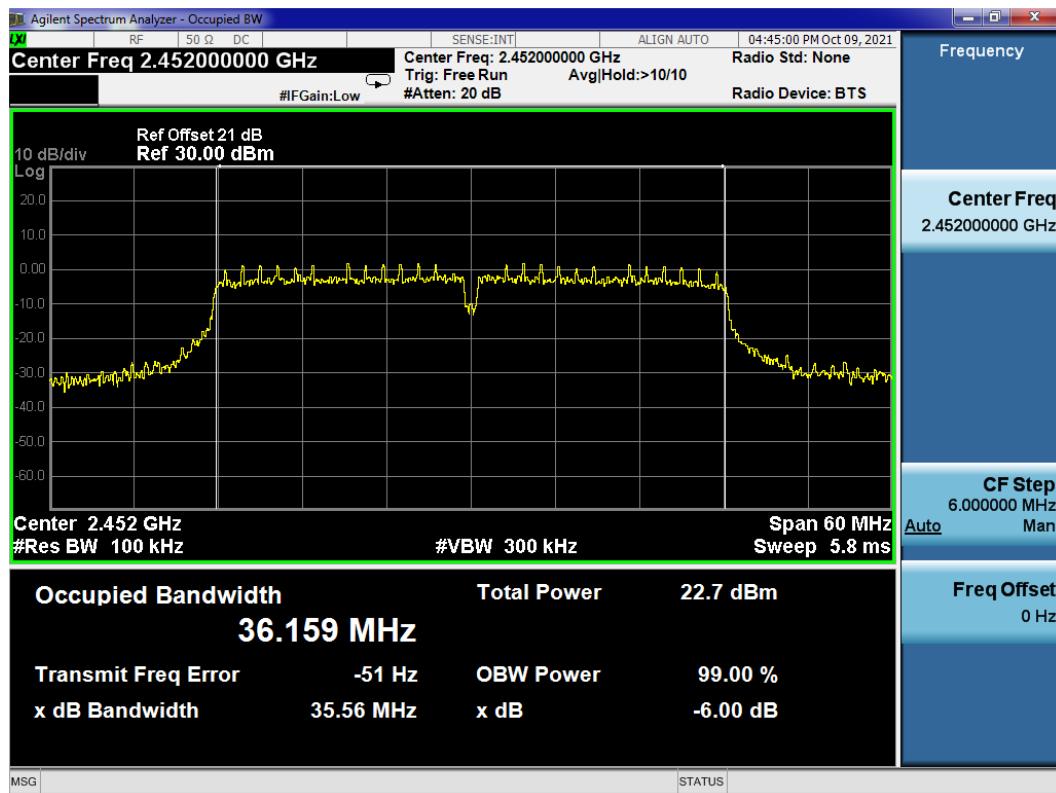
## 802.11n40 CH2422MHz



## 802.11n40 CH2437MHz



## 802.11n40 CH2452MHz



## 6 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

### 6.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2021.09.15	1 Year
2.	Coaxial Cable	WOKEN	SFL402-105F LEX	F02-150819-0 45	2021.03.08	1 Year
3.	20 dB Attenuator	Mini-Circuits	VAT-20+	001	2021.08.06	1 Year

### 6.2 Block Diagram of Test Setup

The Same as Section. 5.2.

### 6.3 Specification Limits ((§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5 MHz is: 1 Watt. (30 dBm)

### 6.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

### 6.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

The following procedure can be used when the maximum available RBW of the instrument is less than the DTS bandwidth:

- a) Set the RBW = 1 MHz.
- b) Set the VBW  $\geq$  [3 RBW].
- c) Set the span  $\geq$  [1.5 DTS bandwidth].
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector). If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS channel bandwidth

The test procedure is defined in ANSI C63.10-2013 ( 11.9.1.2 Measurement Procedure “ Integrated band power method” was used).

## 6.6 Test Results

**PASSED.**

All the test results are listed below.

(Test Date: 2021.10.15 Temperature: 23°C Humidity: 51 %)

Modulation	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit
802.11b	1	2412	<b>18.95</b>	30 dBm
	6	2437	<b>19.19</b>	30 dBm
	11	2462	<b>18.24</b>	30 dBm
802.11g	1	2412	<b>24.82</b>	30 dBm
	6	2437	<b>24.54</b>	30 dBm
	11	2462	<b>24.07</b>	30 dBm
802.11n20	1	2412	<b>24.04</b>	30 dBm
	6	2437	<b>23.8</b>	30 dBm
	11	2462	<b>23.29</b>	30 dBm
802.11n40	3	2422	<b>23.47</b>	30 dBm
	6	2437	<b>23.34</b>	30 dBm
	9	2452	<b>23.15</b>	30 dBm

## 802.11b CH2412MHz



## 802.11b CH2437MHz



## 802.11b CH2462MHz



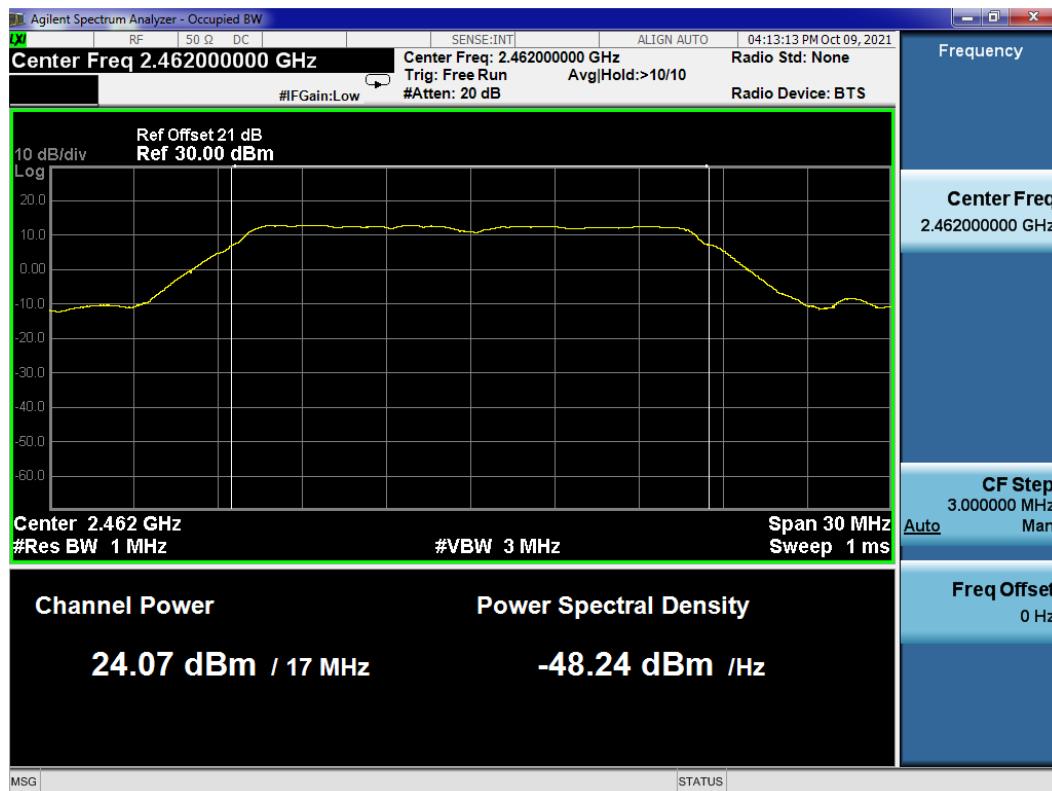
## 802.11g CH2412MHz

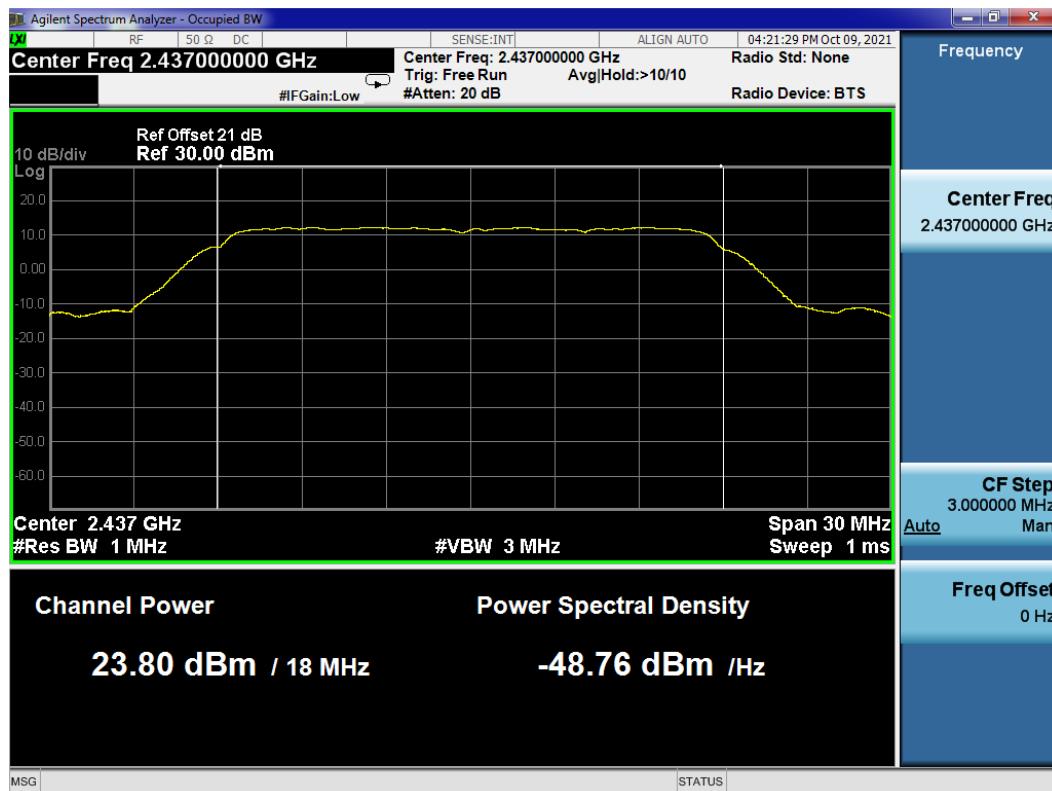


## 802.11g CH2437MHz



## 802.11g CH2462MHz



**802.11n20 CH2412MHz****802.11n20 CH2437MHz**

**802.11n20 CH2462MHz****802.11n40 CH2422MHz**

**802.11n40 CH2437MHz****802.11n40 CH2452MHz**