

# FCC Radio Test Report

## FCC ID: 2ANYB-SCORE7

### Original Grant

**Report No.** : TB-FCC169869

**Applicant** : Advanced Technologies Group, LLC

#### Equipment Under Test (EUT)

**EUT Name** : SCORE 7

**Model No.** : ATG 708

**Series Model No.** : ---

**Brand Name** : SCORE 7

**Receipt Date** : 2019-10-24

**Test Date** : 2019-10-25 to 2019-11-20

**Issue Date** : 2019-11-21

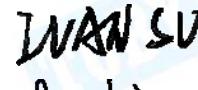
**Standards** : FCC Part 15, Subpart C (15.247:2019)

**Test Method** : ANSI C63.10: 2013

**Conclusions** : **PASS**

In the configuration tested, the EUT complied with the standards specified above,  
The EUT technically complies with the FCC and IC requirements

**Test/Witness Engineer** :  **Jack Deng**

**Test/Witness Engineer** :  **Ivan Su**

**Approved& Authorized** :  **Ray Lai**



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

**TB-RF-074-1.0**

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## Revision History

Report No.	Version	Description	Issued Date
TB-FCC169869	Rev.01	Initial issue of report	2019-11-21

# 1. General Information about EUT

## 1.1 Client Information

<b>Applicant</b>	:	Advanced Technologies Group, LLC
<b>Address</b>	:	1601 48th St #220, West Des Moines, IA 50266, USA
<b>Manufacturer</b>	:	Shenzhen Poyer Electronics Co., Ltd
<b>Address</b>	:	Building 8, Dongfang Jianfu Yusheng Industrial Park, Gushu, Xixiang, Baoan District, Shenzhen, 518000, China.

## 1.2 General Description of EUT (Equipment Under Test)

<b>EUT Name</b>	:	SCORE 7
<b>Models No.</b>	:	ATG 708
<b>Model Different</b>	:	N/A
<b>Product Description</b>	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
	Number of Channel:	802.11b/g/n(HT20):11 channels <b>see note(3)</b> 802.11n(HT40): 7 channels <b>see note(3)</b>
	RF Output Power:	802.11b:9.10dBm 802.11g: 8.80dBm 802.11n (HT20): 7.56dBm 802.11n (HT40): 7.57dBm
	Antenna Gain:	1.46dBi PIFA antenna
	Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n:OFDM(BPSK,QPSK,16QAM,64QAM)
	Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
<b>Power Rating</b>	:	Input: DC 4V 1.5A Output: DC 5V 200Ma DC 3.7V by 4000mAh Li-ion battery
<b>Software Version</b>	:	V01
<b>Hardware Version</b>	:	V02
<b>Connecting I/O Port(S)</b>	:	Please refer to the User's Manual

### Note:

(1) This Test Report is FCC Part 15.247 for 802.11b/g/n, the test procedure follows the FCC

KDB 558074 D01 v05r02 and KDB 662911 D01 Multiple Transmitter Output v02r01.

(2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(3) Channel List:

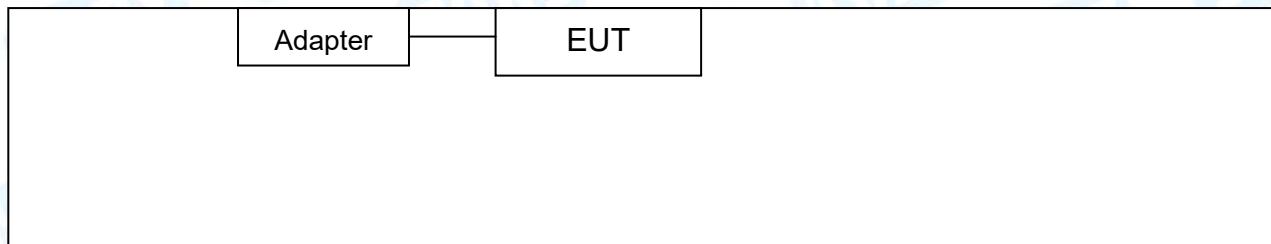
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	<b>2412</b>	05	2432	09	2452
02	2417	<b>06</b>	<b>2437</b>	10	2457
03	2422	07	2442	<b>11</b>	<b>2462</b>
04	2427	08	2447		

**Note: CH 01~CH 11 for 802.11b/g/n(HT20)**  
**CH 03~CH 09 for 802.11n(HT40)**

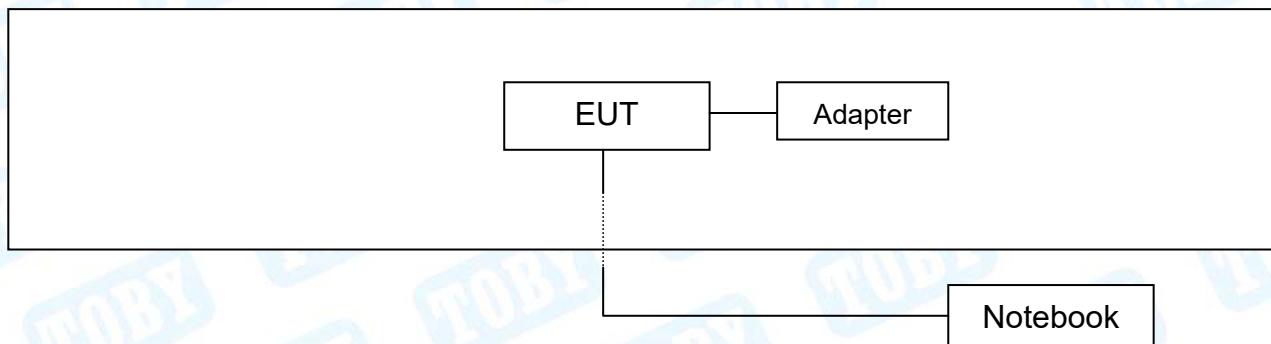
(4) The Antenna information about the equipment is provided by the applicant.

### 1.3 Block Diagram Showing the Configuration of System Tested

#### Conducted Test



#### Radiated Test



### 1.4 Description of Support Units

Name	Model	S/N	Manufacturer	Used “√”
Notebook	161301-CN	15987/00203076	Xiaomi	√

## 1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Test	
Final Test Mode	Description
Mode 1	Charging with TX B Mode

For Radiated Test	
Final Test Mode	Description
Mode 2	TX Mode B Mode Channel 01/06/11
Mode 3	TX Mode G Mode Channel 01/06/11
Mode 4	TX Mode N(HT20) Mode Channel 01/06/11
Mode 5	TX Mode N(HT40) Mode Channel 03/06/09

### Note:

- (1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.  
According to ANSI C63.10 standards, the measurements are performed at the highest, Middle, lowest available channels, and the worst case data rate as follows:  
802.11b Mode: CCK (1 Mbps)  
802.11g Mode: OFDM (6 Mbps)  
802.11n (HT20) Mode: MCS 0 (6.5 Mbps)  
802.11n (HT40) Mode: MCS 0 (30 Mbps)
- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a Mobile unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

## 1.6 Description of Test Software Setting

During testing channel & Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN.

Test Software Version	CMD.exe		
Channel	CH 01	CH 06	CH 11
IEEE 802.11b DSSS	DEF	DEF	DEF
IEEE 802.11g OFDM	DEF	DEF	DEF
IEEE 802.11n (HT20)	DEF	DEF	DEF
Channel	CH 03	CH 06	CH 09
IEEE 802.11n (HT40)	DEF	DEF	DEF

## 1.7 Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty ( $U_{Lab}$ )
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	$\pm 3.42$ dB $\pm 3.42$ dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	$\pm 4.60$ dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	$\pm 4.40$ dB
Radiated Emission	Level Accuracy: Above 1000MHz	$\pm 4.20$ dB

## 1.8 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at: 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

### **CNAS (L5813)**

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

### **A2LA Certificate No.: 4750.01**

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.FCC Accredited Test Site Number: 854351.

### **IC Registration No.: (11950A-1)**

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

## 2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 2				
Standard Section		Test Item	Judgment	Remark
FCC	IC			
15.203	/	Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.4	Conducted Emission	PASS	N/A
15.205	RSS-GEN 7.2.2	Restricted Bands	PASS	N/A
15.247(a)(2)	RSS 247 5.2 (1)	6dB Bandwidth	PASS	N/A
15.247(b)	RSS 247 5.4 (4)	Peak Output Power	PASS	N/A
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	PASS	N/A
15.247(d)	RSS 247 5.5	Band Edge	PASS	N/A
15.247(d)& 15.209	RSS 247 5.5	Transmitter Radiated Spurious Emission	PASS	N/A

**Note:** "/" for no requirement for this test item.  
N/A is an abbreviation for Not Applicable.

### 3. Test Equipment

Conducted Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 13, 2019	Jul. 12, 2020
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 13, 2019	Jul. 12, 2020
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 13, 2019	Jul. 12, 2020
LISN	Rohde & Schwarz	ENV216	101131	Jul. 13, 2019	Jul. 12, 2020
Radiation Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 13, 2019	Jul. 12, 2020
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 13, 2019	Jul. 12, 2020
Spectrum Analyzer	Rohde & Schwarz	FSVR	1311.006K40-10 0945-DH	Feb. 10, 2019	Feb. 09, 2020
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Jan. 27, 2019	Jan. 26, 2020
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Jan. 27, 2019	Jan. 26, 2020
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.03, 2019	Mar. 02, 2020
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar.03, 2019	Mar. 02, 2020
Horn Antenna	ETS-LINDGREN	BBHA 9170	BBHA9170582	Mar.03, 2019	Mar. 02, 2020
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 13, 2019	Jul. 12, 2020
Pre-amplifier	Sonoma	310N	185903	Mar.04, 2019	Mar. 03, 2020
Pre-amplifier	HP	8449B	3008A00849	Mar.03, 2019	Mar. 02, 2020
Pre-amplifier	EMCI	EMC02325	980217	Mar.03, 2019	Mar. 02, 2020
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.03, 2019	Mar. 02, 2020
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna Conducted Emission					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 13, 2019	Jul. 12, 2020
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul. 13, 2019	Jul. 12, 2020
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Sep. 16, 2019	Sep. 15, 2020
Vector Signal Generator	Agilent	N5182A	MY50141294	Sep. 16, 2019	Sep. 15, 2020
Analog Signal Generator	Agilent	N5181A	MY50141953	Sep. 16, 2019	Sep. 15, 2020
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO26	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO29	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO31	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO33	Sep. 16, 2019	Sep. 15, 2020

## 4. Conducted Emission Test

#### 4.1 Test Standard and Limit

#### 4.1.1 Test Standard

FCC Part 15.207

#### 4.1.2 Test Limit

## Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB $\mu$ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

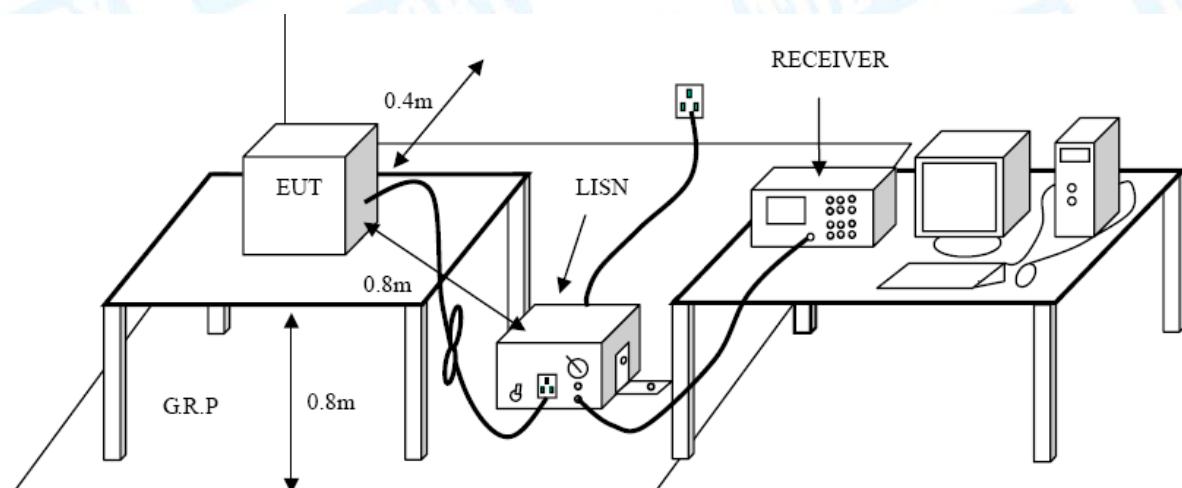
## Notes:

(1) \*Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

## 4.2 Test Setup



#### 4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

#### 4.4 EUT Operating Mode

Please refer to the description of test mode.

#### 4.5 Test Data

Please refer to the Attachment A.

## 5. Radiated Emission Test

### 5.1 Test Standard and Limit

5.1.1 Test Standard  
FCC Part 15.209

5.1.2 Test Limit

#### Radiated Emission Limits ( 9 kHz~1000 MHz)

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

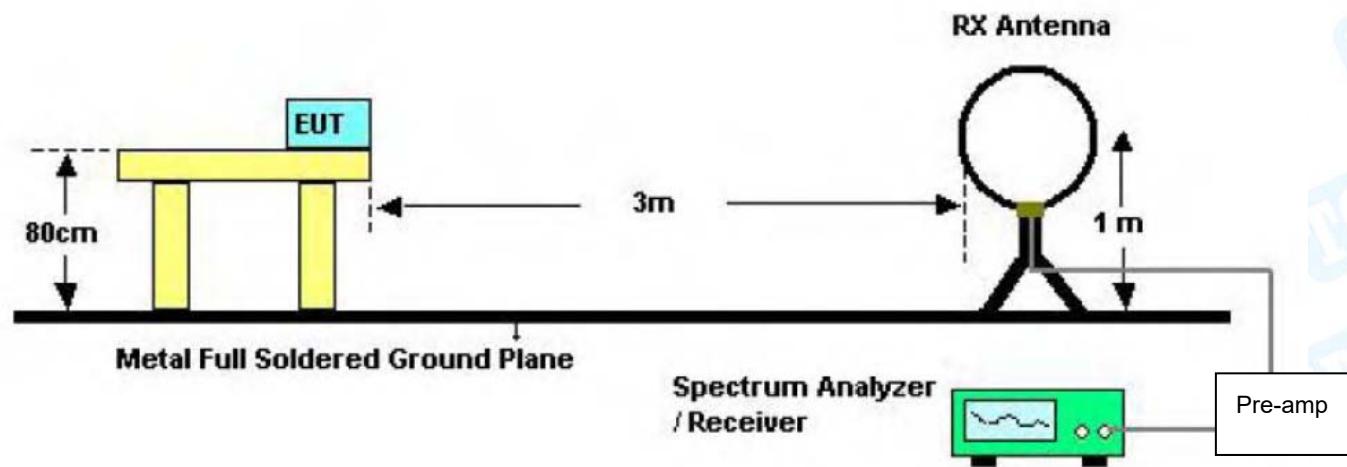
#### Radiated Emission Limit (Above 1000MHz)

Frequency (MHz)	Distance of 3m (dBuV/m)	
	Peak	Average
Above 1000	74	54

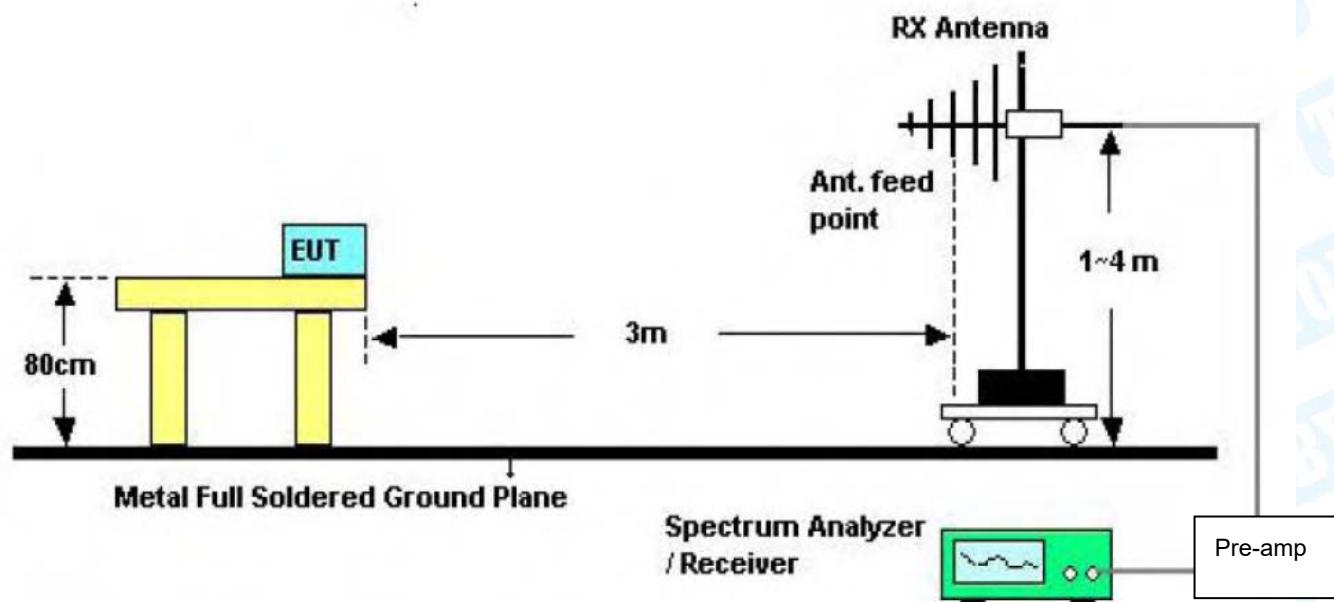
**Note:**

- (1) The tighter limit applies at the band edges.
- (2) Emission Level(dBuV/m)=20log Emission Level(uV/m)

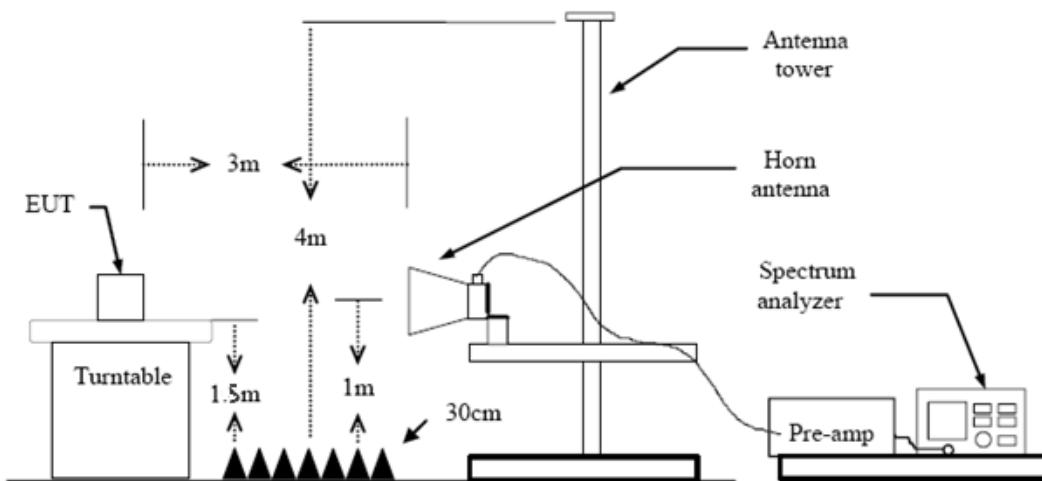
## 5.2 Test Setup



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

### 5.3 Test Procedure

- (1) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency Below 1GHz. The EUT was placed on a rotating 0.8m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Below 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use  $VBW=120$  kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use  $RBW=1$  MHz and  $VBW=3$  MHz with Peak Detector for Peak Values, and use  $RBW=1$  MHz and  $VBW=10$  Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

## 5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

## 5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Please refer to the Attachment B.

## 6. Restricted Bands Requirement

### 6.1 Test Standard and Limit

#### 6.1.1 Test Standard

FCC Part 15.247(d)

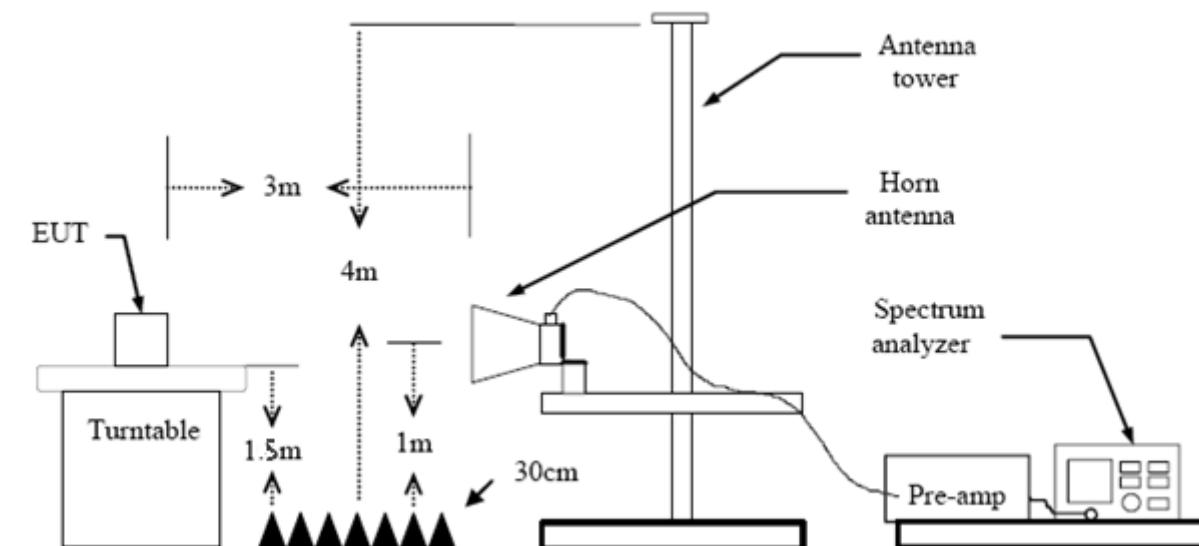
FCC Part 15.209

FCC Part 15.205

#### 6.1.2 Test Limit

Restricted Frequency Band (MHz)	Distance of 3m (dBuV/m)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

### 6.2 Test Setup



### 6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency Below 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Below 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

### 6.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

### 6.5 Test Data

Please refer to the Attachment C.

## 7. Bandwidth Test

### 7.1 Test Standard and Limit

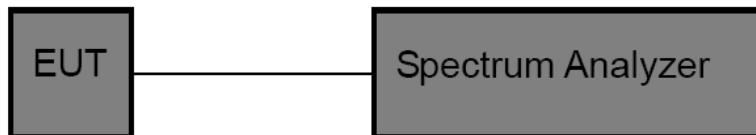
#### 7.1.1 Test Standard

FCC Part 15.247 (a)(2)

#### 7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range(MHz)
Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5

### 7.2 Test Setup



### 7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst -case (i.e the widest) bandwidth.
- (3) Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:100 kHz, and Video Bandwidth:300 kHz, Detector: Peak, Sweep Time set auto.

### 7.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, Digital photo framesle and high channel for the test.

### 7.5 Test Data

Please refer to the Attachment D.

## 8. Peak Output Power Test

### 8.1 Test Standard and Limit

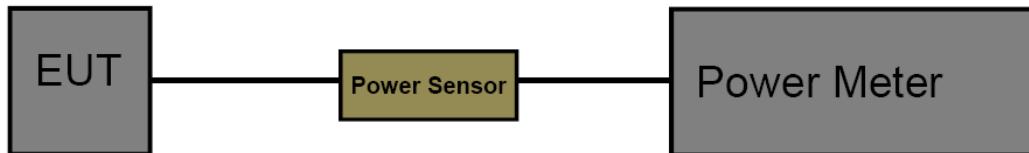
#### 8.1.1 Test Standard

FCC Part 15.247 (b)

#### 8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range(MHz)
Peak Output Power	1 Watt or 30 dBm	2400~2483.5

### 8.2 Test Setup



### 8.3 Test Procedure

The measurement is according to section 9.1.2 of KDB 558074 D01 v05r02.

The EUT was connected to RF power meter via a broadband power sensor as show the block above. The power sensor video bandwidth is greater than or equal to the DTS bandwidth of the equipment.

### 8.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

### 8.5 Test Data

Please refer to the Attachment E.

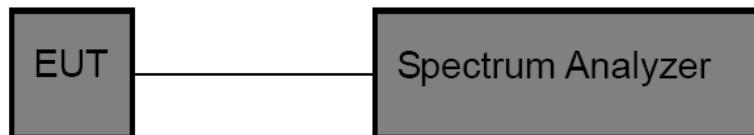
## 9. Power Spectral Density Test

### 9.1 Test Standard and Limit

- 9.1.1 Test Standard  
FCC Part 15.247 (e)
- 9.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

### 9.2 Test Setup



### 9.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 D01 v05r02.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyser centre frequency to DTS channel centre frequency.
- (3) Set the span to 1.5 times the DTS bandwidth.
- (4) Set the RBW to: 3 kHz
- (5) Set the VBW to: 10 kHz
- (6) Detector: peak
- (7) Sweep time: auto
- (8) Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

### 9.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, Digital photo framesdle and high channel for the test.

### 9.5 Test Data

Please refer to the Attachment F.

## 10. Antenna Requirement

### 10.1 Standard Requirement

#### 10.1.1 Standard

FCC Part 15.203

#### 10.1.2 Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

### 10.2 Antenna Connected Construction

The gains of the antenna used for transmitting is 1.46 dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

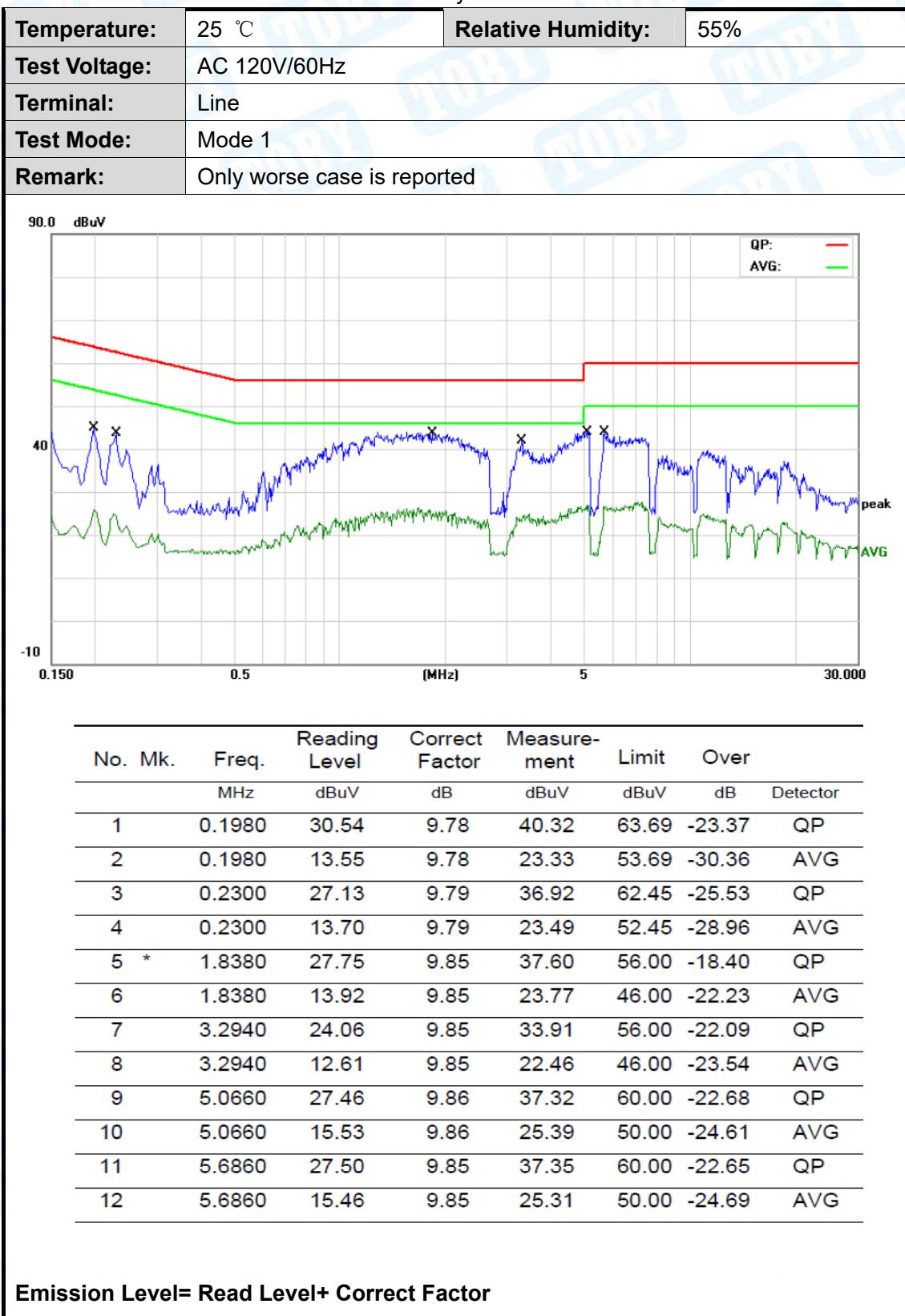
#### Result

The EUT antenna is a PIFA Antenna. It complies with the standard requirement.

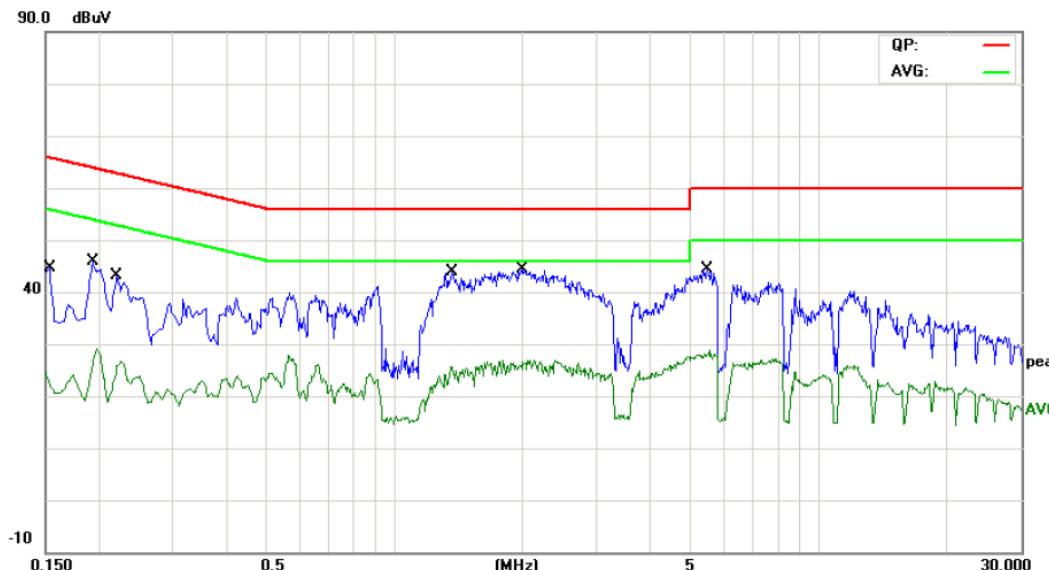
Antenna Type
<input type="checkbox"/> Permanent attached antenna
<input checked="" type="checkbox"/> Unique connector antenna
<input type="checkbox"/> Professional installation antenna

## Attachment A-- Conducted Emission Test Data

Remark: All channels have been tested and Shows only the worst channels.



Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Terminal:	Neutral		
Test Mode:	Mode 1		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
		MHz	dBuV	dB	dBuV	dBuV	dB
1	0.1539	22.55	9.60	32.15	65.78	-33.63	QP
2	0.1539	9.31	9.60	18.91	55.78	-36.87	AVG
3	0.1940	30.88	9.57	40.45	63.86	-23.41	QP
4	0.1940	16.45	9.57	26.02	53.86	-27.84	AVG
5	0.2220	28.08	9.62	37.70	62.74	-25.04	QP
6	0.2220	15.50	9.62	25.12	52.74	-27.62	AVG
7 *	1.3700	29.56	9.73	39.29	56.00	-16.71	QP
8	1.3700	14.71	9.73	24.44	46.00	-21.56	AVG
9	1.9980	29.20	9.86	39.06	56.00	-16.94	QP
10	1.9980	15.24	9.86	25.10	46.00	-20.90	AVG
11	5.4500	27.90	9.83	37.73	60.00	-22.27	QP
12	5.4500	17.37	9.83	27.20	50.00	-22.80	AVG

Emission Level= Read Level+ Correct Factor

## Attachment B-- Radiated Emission Test Data

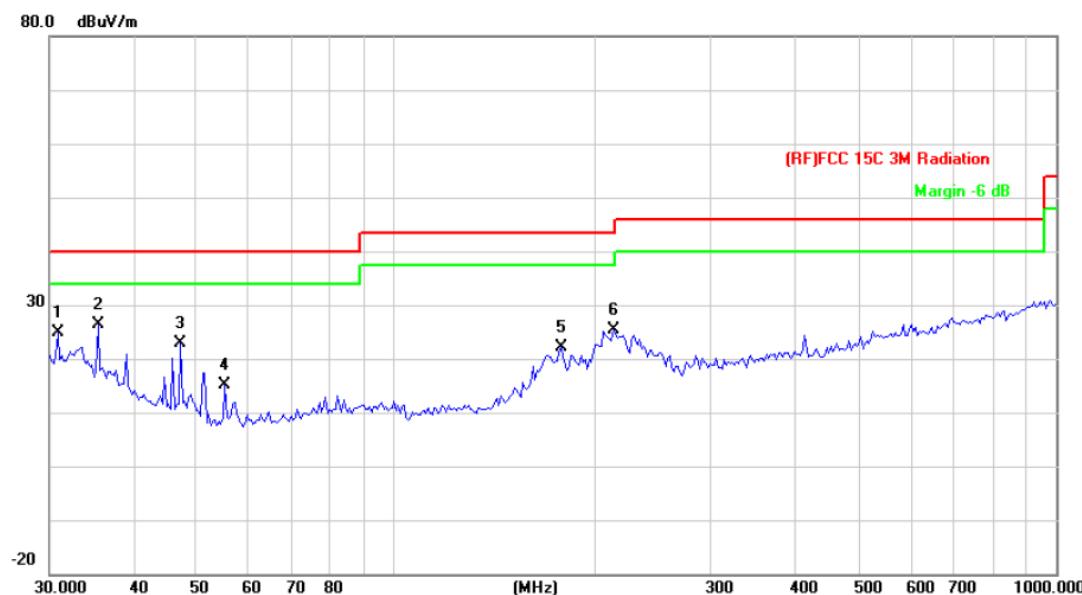
### 9KHz~30MHz

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

### 30MHz~1GHz

Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported.		

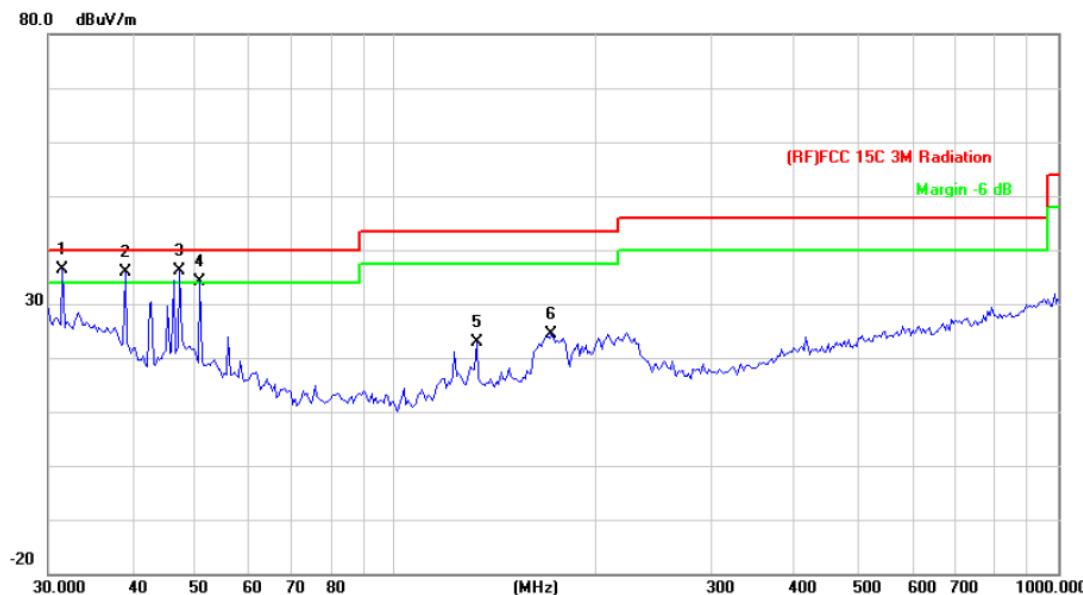


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dB	Detector
1		30.8535	38.54	-13.64	24.90	40.00	-15.10 QP
2	*	35.4993	43.48	-17.03	26.45	40.00	-13.55 QP
3		47.3255	45.39	-22.45	22.94	40.00	-17.06 QP
4		55.2207	39.03	-23.92	15.11	40.00	-24.89 QP
5		178.1327	42.31	-20.20	22.11	43.50	-21.39 QP
6		213.7634	44.46	-19.11	25.35	43.50	-18.15 QP

\*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported.		



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	31.5095	50.53	-14.15	36.38	40.00	-3.62
2	!	39.1616	54.64	-18.78	35.86	40.00	-4.14
3	!	47.3255	58.46	-22.45	36.01	40.00	-3.99
4	!	50.7637	57.52	-23.43	34.09	40.00	-5.91
5		132.6850	45.39	-22.46	22.93	43.50	-20.57
6		171.9946	44.71	-20.42	24.29	43.50	-19.21

\*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

**Above 1GHz**

<b>Temperature:</b>	25 °C	<b>Relative Humidity:</b>	55%
<b>Test Voltage:</b>	AC 120V/60 Hz		
<b>Ant. Pol.</b>	Horizontal		
<b>Test Mode:</b>	TX B Mode 2412MHz		
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case		
Emission Level= Read Level+ Correct Factor			

<b>Temperature:</b>	25 °C	<b>Relative Humidity:</b>	55%
<b>Temperature:</b>	25 °C	<b>Relative Humidity:</b>	55%
<b>Test Voltage:</b>	AC 120V/60 Hz		
<b>Ant. Pol.</b>	Horizontal		
<b>Test Mode:</b>	TX B Mode 2437MHz		
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case		
Emission Level= Read Level+ Correct Factor			

<b>Temperature:</b>	25 °C	<b>Relative Humidity:</b>	55%																													
<b>Test Voltage:</b>	AC 120V/60 Hz																															
<b>Ant. Pol.</b>	Horizontal																															
<b>Test Mode:</b>	TX B Mode 2462MHz																															
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No.</th> <th>Mk.</th> <th>Freq.</th> <th>Reading Level</th> <th>Correct Factor</th> <th>Measure- ment</th> <th>Limit</th> <th>Over</th> </tr> <tr> <th></th> <th></th> <th>MHz</th> <th>dBuV</th> <th>dB/m</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>4923.910</td> <td>45.81</td> <td>13.15</td> <td>58.96</td> <td>74.00</td> <td>-15.04 peak</td> </tr> <tr> <td>2</td> <td>*</td> <td>4924.684</td> <td>36.20</td> <td>13.15</td> <td>49.35</td> <td>54.00</td> <td>-4.65 AVG</td> </tr> </tbody> </table>				No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	1		4923.910	45.81	13.15	58.96	74.00	-15.04 peak	2	*	4924.684	36.20	13.15
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over																									
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB																									
1		4923.910	45.81	13.15	58.96	74.00	-15.04 peak																									
2	*	4924.684	36.20	13.15	49.35	54.00	-4.65 AVG																									
<b>Emission Level= Read Level+ Correct Factor</b>																																

<b>Temperature:</b>	25 °C	<b>Relative Humidity:</b>	55%																													
<b>Test Voltage:</b>	AC 120V/60 Hz																															
<b>Ant. Pol.</b>	Horizontal																															
<b>Test Mode:</b>	TX G Mode 2412MHz																															
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case.																															
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over																									
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB																									
1		4824.072	46.11	12.54	58.65	74.00	-15.35 peak																									
2	*	4824.078	30.13	12.54	42.67	54.00	-11.33 AVG																									
<b>Emission Level= Read Level+ Correct Factor</b>																																

<b>Temperature:</b>	25 °C		<b>Relative Humidity:</b>	55%																																		
<b>Test Voltage:</b>	AC 120V/60 Hz																																					
<b>Ant. Pol.</b>	Horizontal																																					
<b>Test Mode:</b>	TX G Mode 2437MHz.																																					
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case.																																					
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over																															
		MHz	dBuV	dB/m	dBuV/m	dB	Detector																															
1	*	4872.500	30.84	12.84	43.68	54.00	-10.32 AVG																															
2		4875.452	43.99	12.86	56.85	74.00	-17.15 peak																															
<b>Emission Level= Read Level+ Correct Factor</b>																																						

<b>Temperature:</b>	25 °C		<b>Relative Humidity:</b>	55%																																		
<b>Test Voltage:</b>	AC 120V/60 Hz																																					
<b>Ant. Pol.</b>	Horizontal																																					
<b>Test Mode:</b>	TX G Mode 2462MHz .																																					
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case.																																					
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over																															
		MHz	dBuV	dB/m	dBuV/m	dB	Detector																															
1	*	4923.448	30.54	13.15	43.69	54.00	-10.31 AVG																															
2		4924.966	42.43	13.16	55.59	74.00	-18.41 peak																															
<b>Emission Level= Read Level+ Correct Factor</b>																																						

<b>Temperature:</b>	25 °C		<b>Relative Humidity:</b>	55%					
<b>Test Voltage:</b>	AC 120V/60 Hz								
<b>Ant. Pol.</b>	Horizontal								
<b>Test Mode:</b>	TX n(HT20) Mode 2412MHz								
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case.								
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dB	Detector		
1		4823.598	46.01	12.54	58.55	74.00	-15.45 peak		
2	*	4823.604	29.80	12.54	42.34	54.00	-11.66 AVG		
<b>Emission Level= Read Level+ Correct Factor</b>									

<b>Temperature:</b>	25 °C		<b>Relative Humidity:</b>	55%					
<b>Test Voltage:</b>	AC 120V/60 Hz								
<b>Ant. Pol.</b>	Horizontal								
<b>Test Mode:</b>	TX n(HT20) Mode 2437MHz								
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case.								
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dB	Detector		
1	*	4872.500	31.84	12.84	44.68	54.00	-9.32 AVG		
2		4873.610	43.88	12.85	56.73	74.00	-17.27 peak		
<b>Emission Level= Read Level+ Correct Factor</b>									

<b>Temperature:</b>	25 °C		<b>Relative Humidity:</b>	55%					
<b>Test Voltage:</b>	AC 120V/60 Hz								
<b>Ant. Pol.</b>	Vertical								
<b>Test Mode:</b>	TX n(HT20) Mode 2462MHz								
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case.								
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dB	Detector		
1	*	4824.078	30.71	12.54	43.25	54.00	-10.75 AVG		
2		4824.084	44.03	12.54	56.57	74.00	-17.43 peak		
<b>Emission Level= Read Level+ Correct Factor</b>									

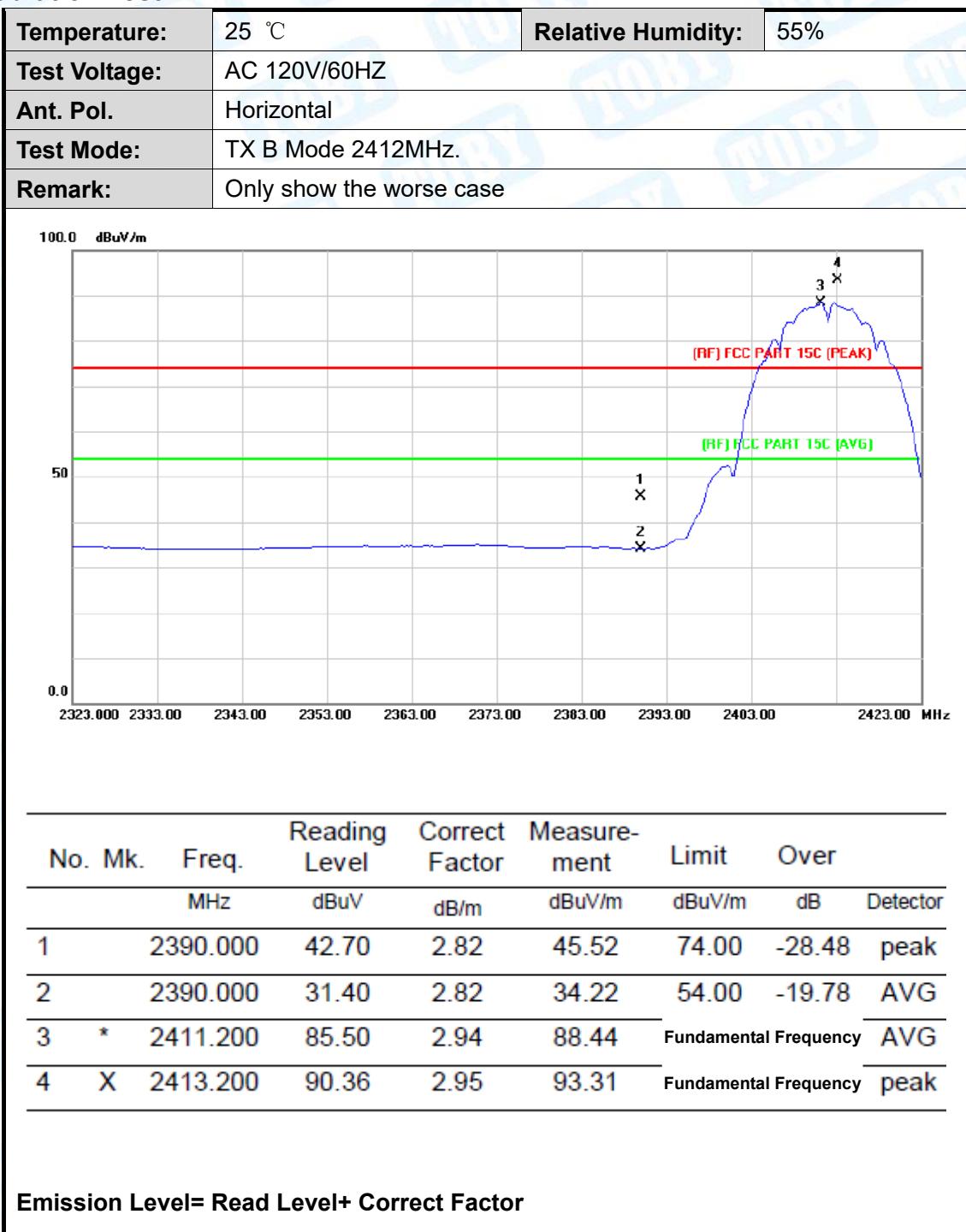
<b>Temperature:</b>	25 °C		<b>Relative Humidity:</b>	55%					
<b>Test Voltage:</b>	AC 120V/60 Hz								
<b>Ant. Pol.</b>	Horizontal								
<b>Test Mode:</b>	TX n(HT40) Mode 2422MHz								
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case.								
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dB	Detector		
1	*	4842.500	28.95	15.73	44.68	54.00	-9.32 AVG		
2		4845.404	41.60	15.75	57.35	74.00	-16.65 peak		
<b>Emission Level= Read Level+ Correct Factor</b>									

<b>Temperature:</b>	25 °C		<b>Relative Humidity:</b>	55%														
<b>Test Voltage:</b>	AC 120V/60 Hz																	
<b>Ant. Pol.</b>	Vertical																	
<b>Test Mode:</b>	TX n(HT40) Mode 2437MHz																	
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case.																	
<b>Emission Level= Read Level+ Correct Factor</b>																		

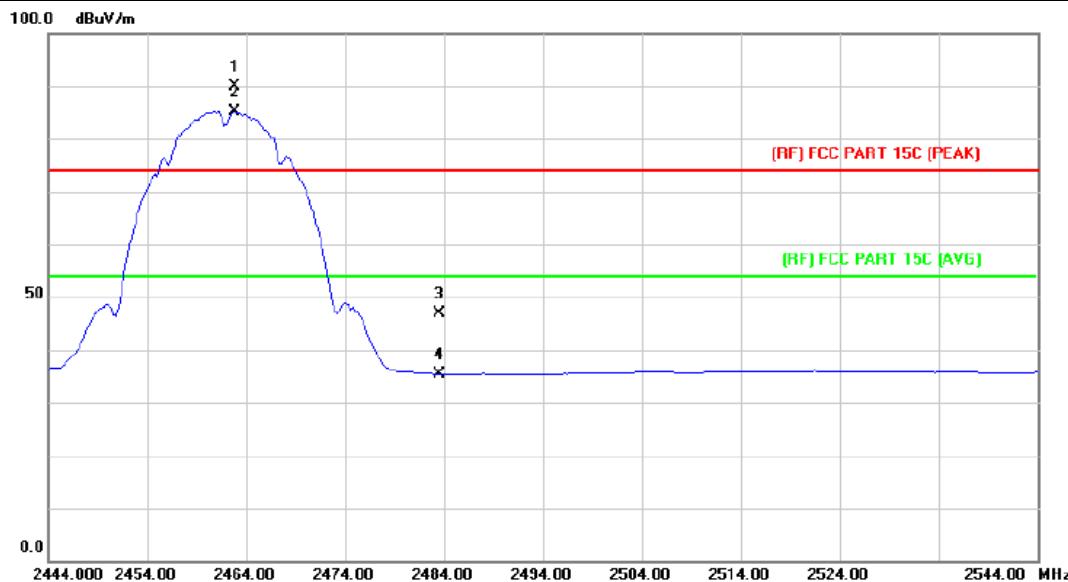
<b>Temperature:</b>	25 °C		<b>Relative Humidity:</b>	55%														
<b>Test Voltage:</b>	AC 120V/60 Hz																	
<b>Ant. Pol.</b>	Horizontal																	
<b>Test Mode:</b>	TX n(HT40) Mode 2452MHz																	
<b>Remark:</b>	No report for the emission which more than 15dB below the prescribed limit. Only show the worse case.																	
<b>Emission Level= Read Level+ Correct Factor</b>																		

## Attachment C-- Restricted Bands Requirement and Band-edge Test Data

### (1) Radiation Test



Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2462MHz		
Remark:	Only show the worse case		



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	X	2462.800	86.62	3.27	89.89	Fundamental Frequency	peak
2	*	2462.800	81.95	3.27	85.22	Fundamental Frequency	AVG
3		2483.500	43.40	3.41	46.81	74.00	-27.19 peak
4		2483.500	31.96	3.41	35.37	54.00	-18.63 AVG

Emission Level= Read Level+ Correct Factor

Temperature: 25 °C

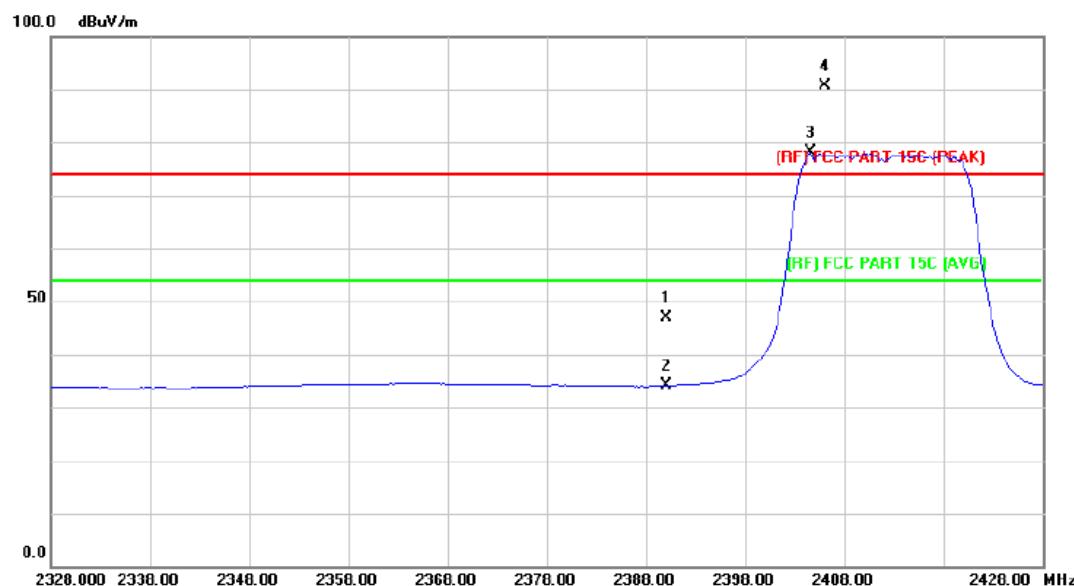
Relative Humidity: 55%

Test Voltage: AC 120V/60HZ

Ant. Pol. Horizontal

Test Mode: TX G Mode 2412MHz.

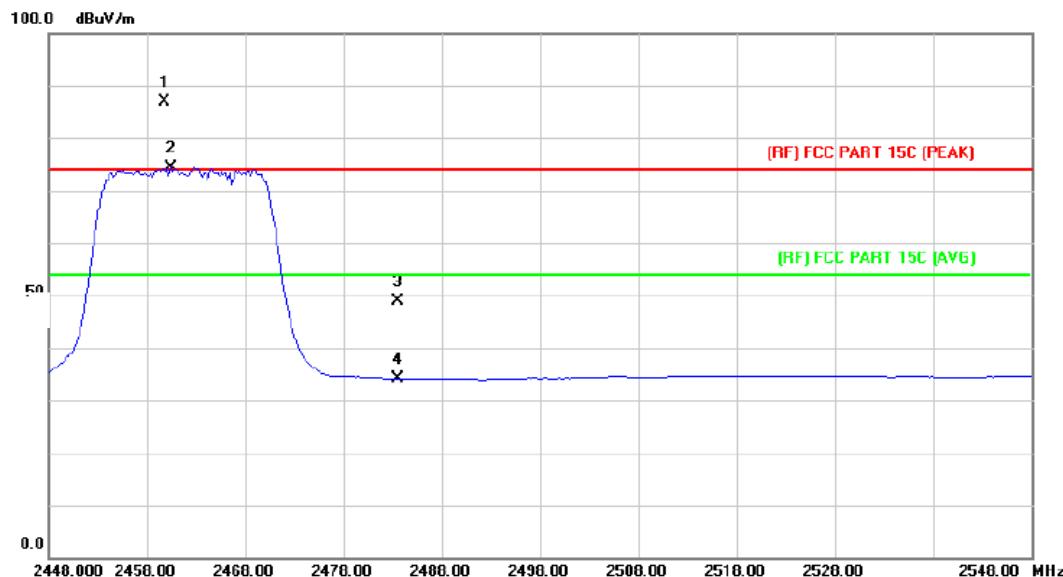
Remark: Only show the worse case.



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dB	Detector
1		2390.000	44.14	2.82	46.96	74.00	-27.04 peak
2		2390.000	31.35	2.82	34.17	54.00	-19.83 AVG
3	*	2404.600	75.29	2.88	78.17	Fundamental Frequency	AVG
4	X	2406.000	87.83	2.90	90.73	Fundamental Frequency	peak

Emission Level= Read Level+ Correct Factor

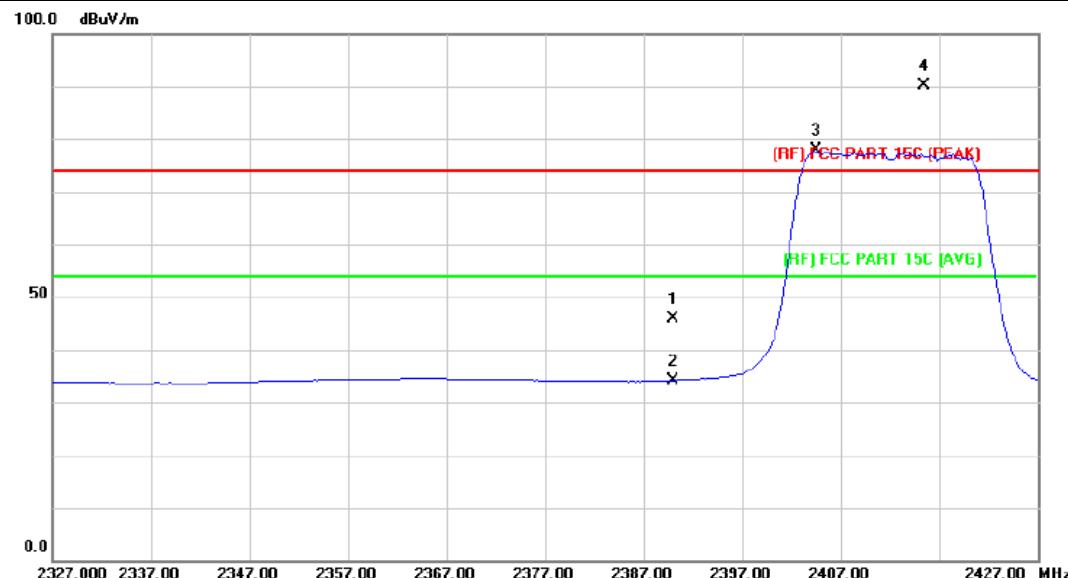
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2462MHz.		
Remark:	Only show the worse case.		



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
			Level	Factor	ment			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2459.800	83.57	3.26	86.83	Fundamental Frequency		peak
2	*	2460.400	71.02	3.26	74.28	Fundamental Frequency		AVG
3		2483.500	45.56	3.41	48.97	74.00	-25.03	peak
4		2483.500	30.67	3.41	34.08	54.00	-19.92	AVG

Emission Level= Read Level+ Correct Factor

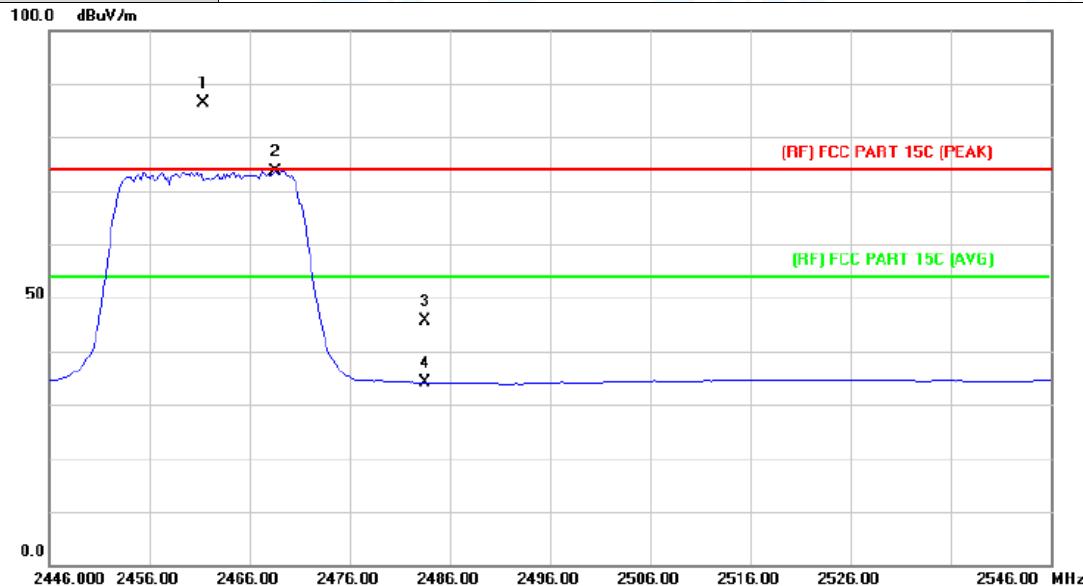
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1		2390.000	43.01	2.82	45.83	74.00	-28.17 peak
2		2390.000	31.41	2.82	34.23	54.00	-19.77 AVG
3	*	2404.600	74.96	2.88	77.84	Fundamental Frequency	AVG
4	X	2415.400	87.06	2.96	90.02	Fundamental Frequency	peak

Emission Level= Read Level+ Correct Factor

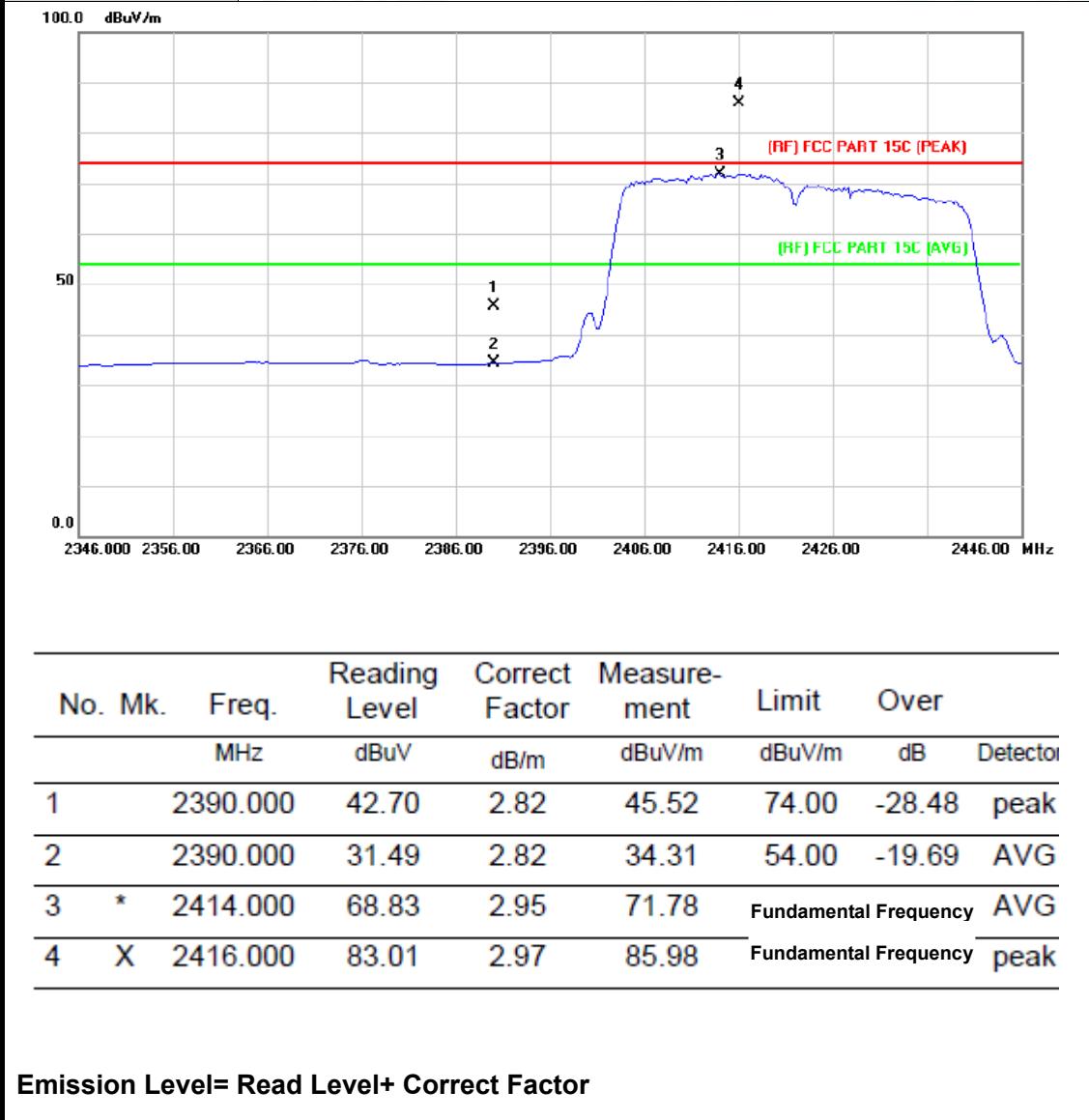
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	N/A		



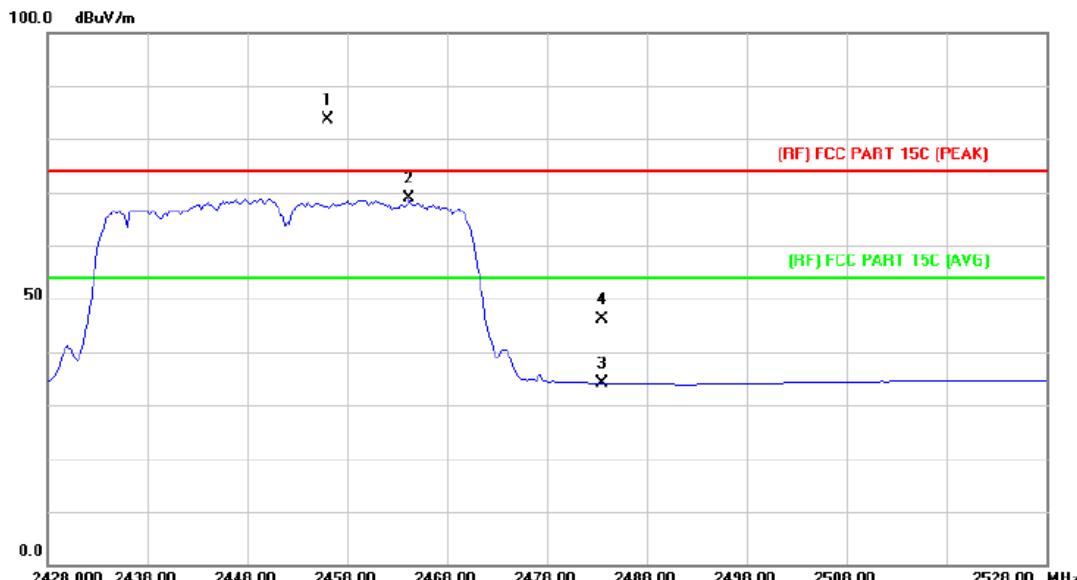
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	X	2461.400	83.23	3.27	86.50	Fundamental Frequency	peak
2	*	2468.600	70.43	3.31	73.74	Fundamental Frequency	AVG
3		2483.500	42.31	3.41	45.72	74.00	-28.28 peak
4		2483.500	30.66	3.41	34.07	54.00	-19.93 AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT40) Mode 2422MHz		
Remark:	N/A		



Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT40) Mode 2452MHz		
Remark:	N/A		

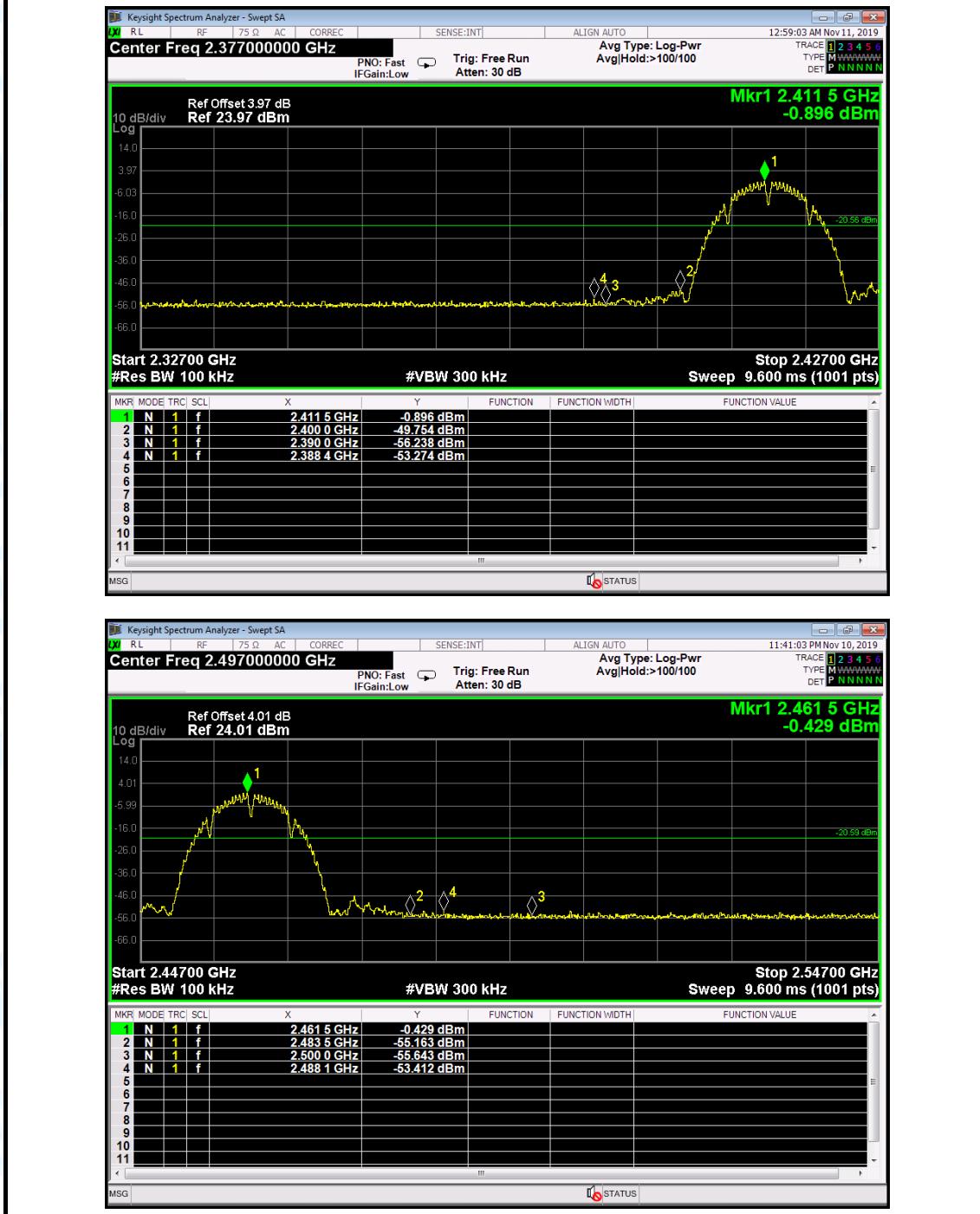


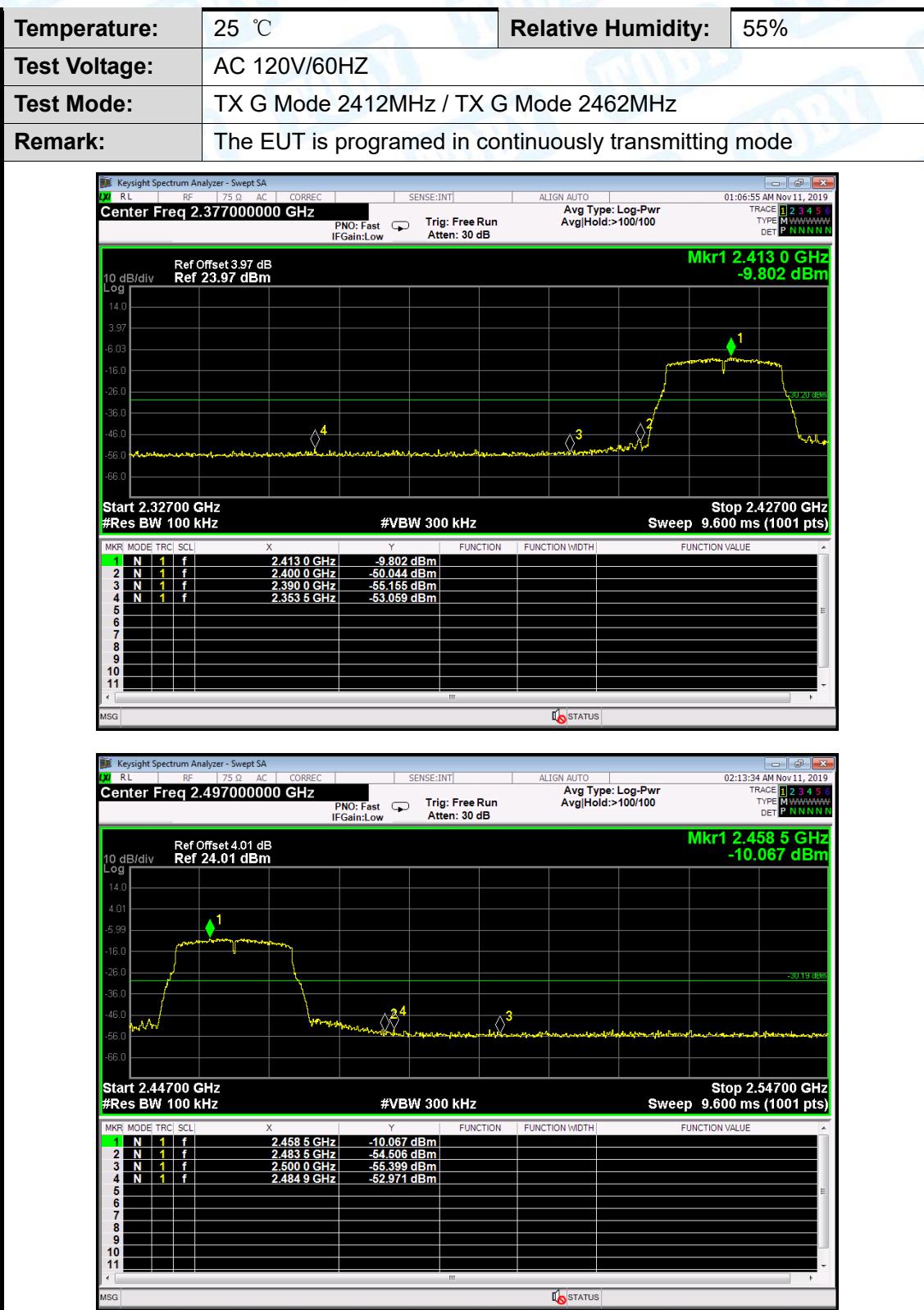
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	2456.000	80.37	3.23	83.60	Fundamental Frequency	peak
2		2464.200	65.61	3.28	68.89	Fundamental Frequency	AVG
3		2483.500	30.68	3.41	34.09	54.00	-19.91
4		2483.500	42.60	3.41	46.01	74.00	-27.99

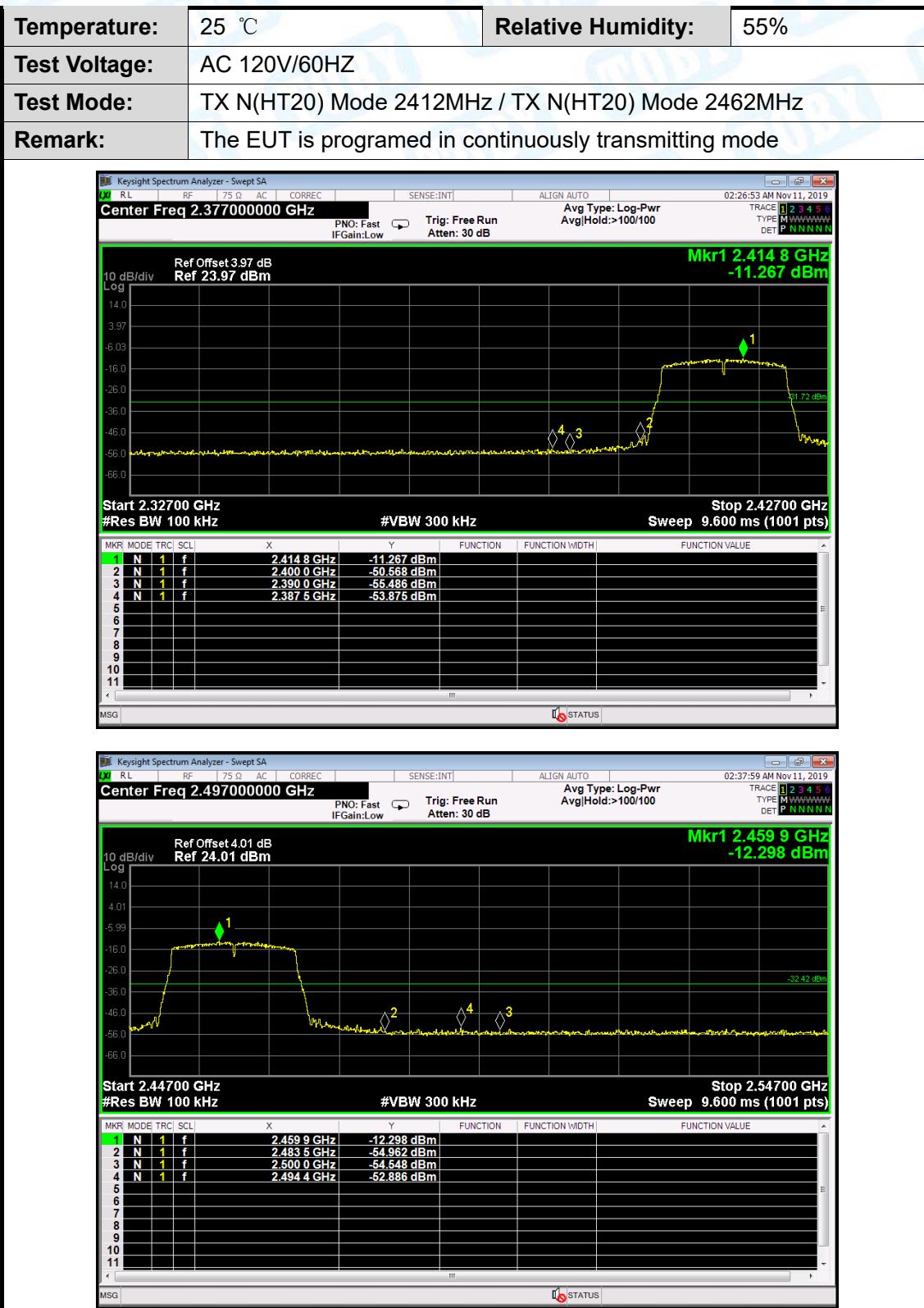
Emission Level= Read Level+ Correct Factor

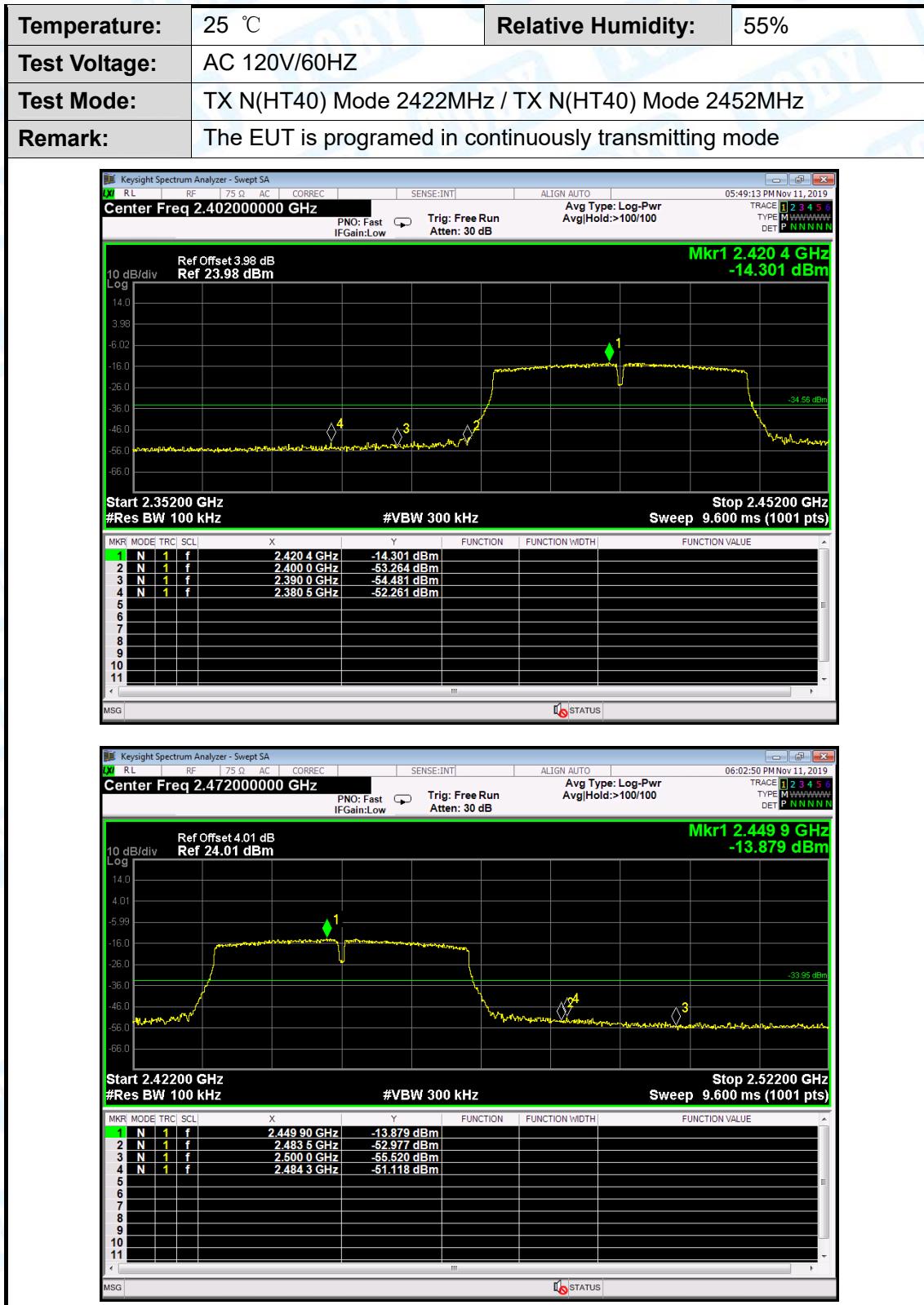
## (2) Conducted Test

Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Test Mode:	TX B Mode 2412MHz / TX B Mode 2462MHz		
Remark:	The EUT is programed in continuously transmitting mode		

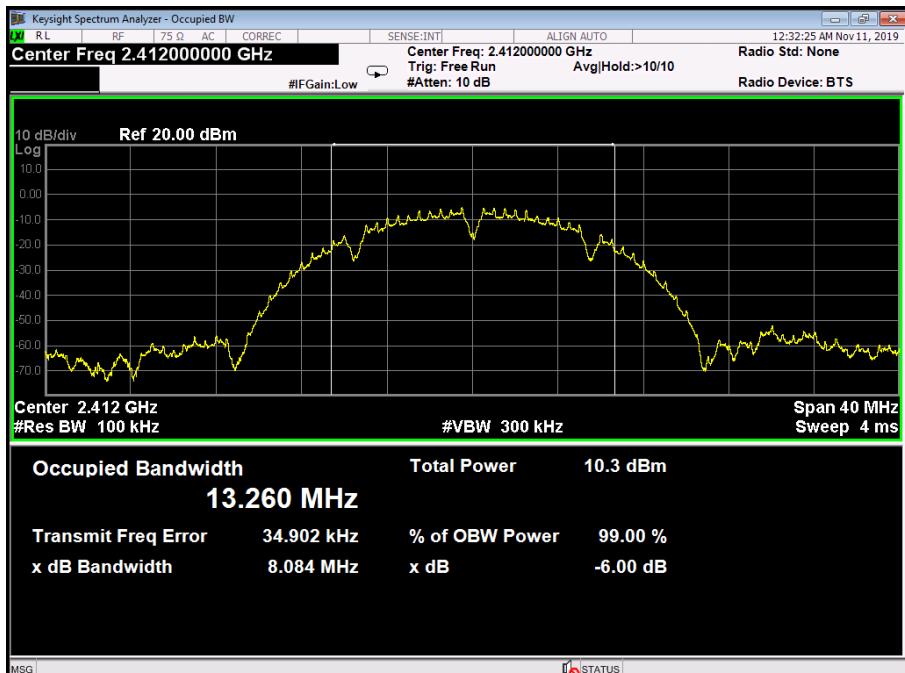






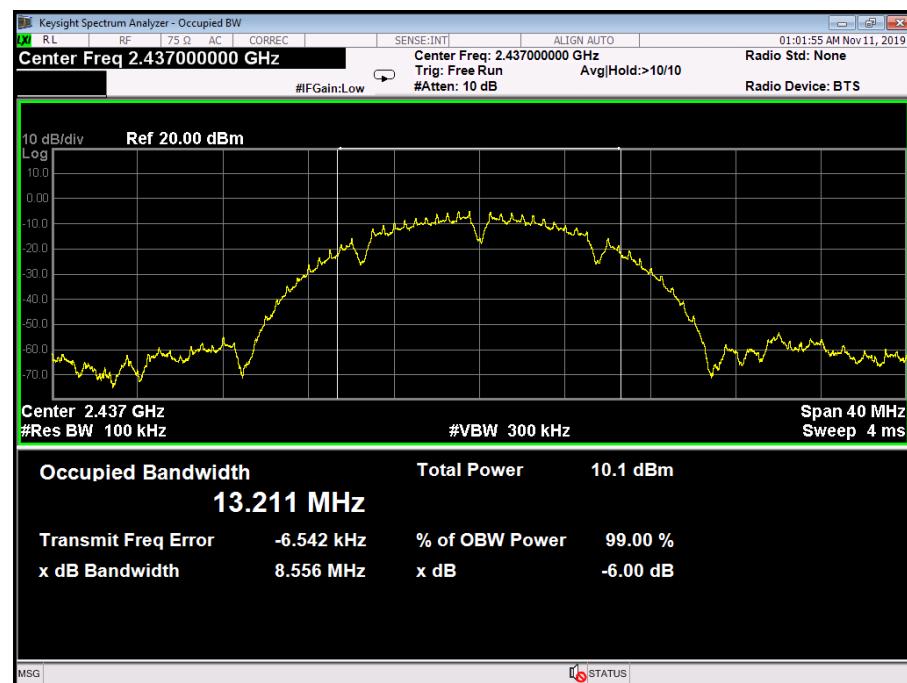


## Attachment D-- Bandwidth Test Data

Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Test Mode:	TX 802.11B Mode		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	8.084	13.260	
2437	8.556	13.211	>=0.5
2462	8.089	13.167	
<b>802.11B Mode</b>			
<b>2412 MHz</b>			
			
<b>13.260 MHz</b>			
Transmit Freq Error	34.902 kHz	% of OBW Power	99.00 %
x dB Bandwidth	8.084 MHz	x dB	-6.00 dB

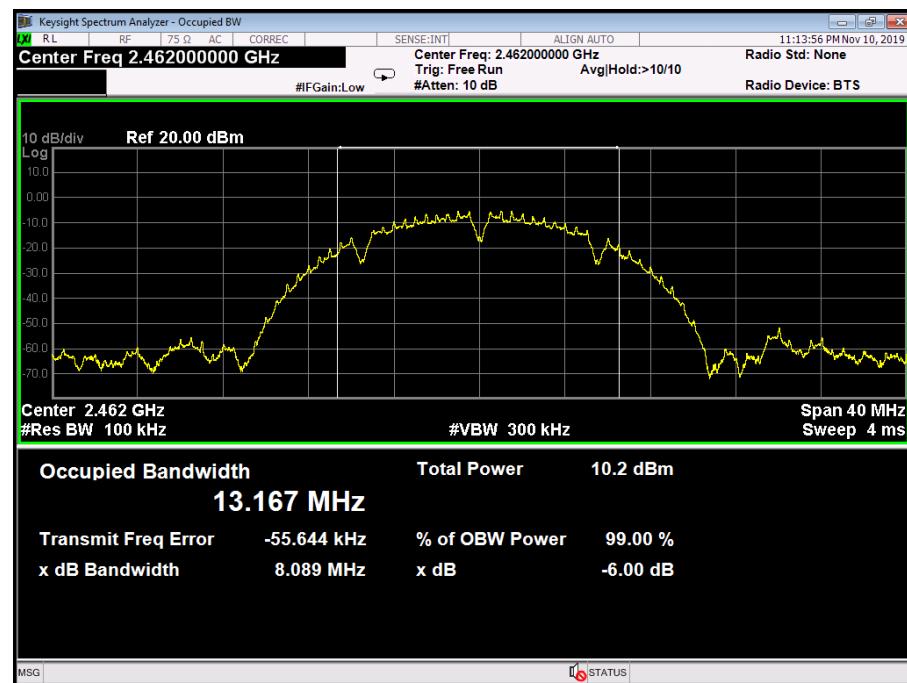
## 802.11B Mode

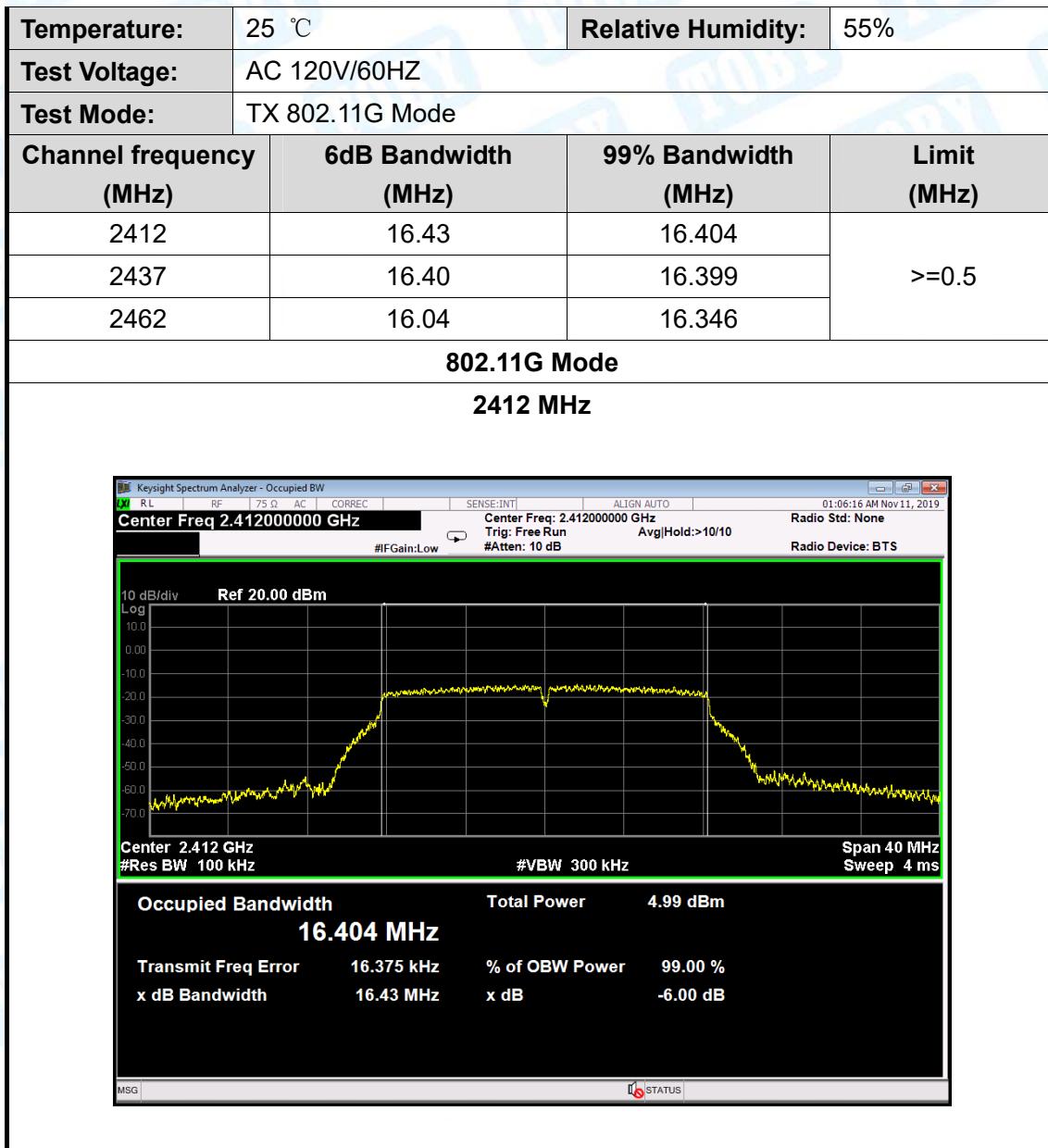
2437 MHz



## 802.11B Mode

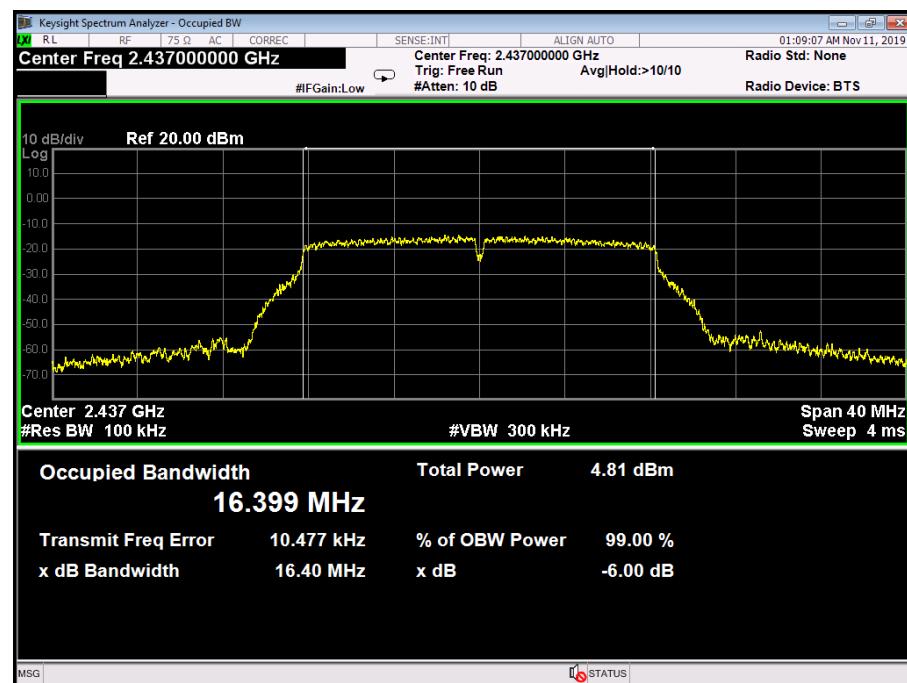
2462 MHz





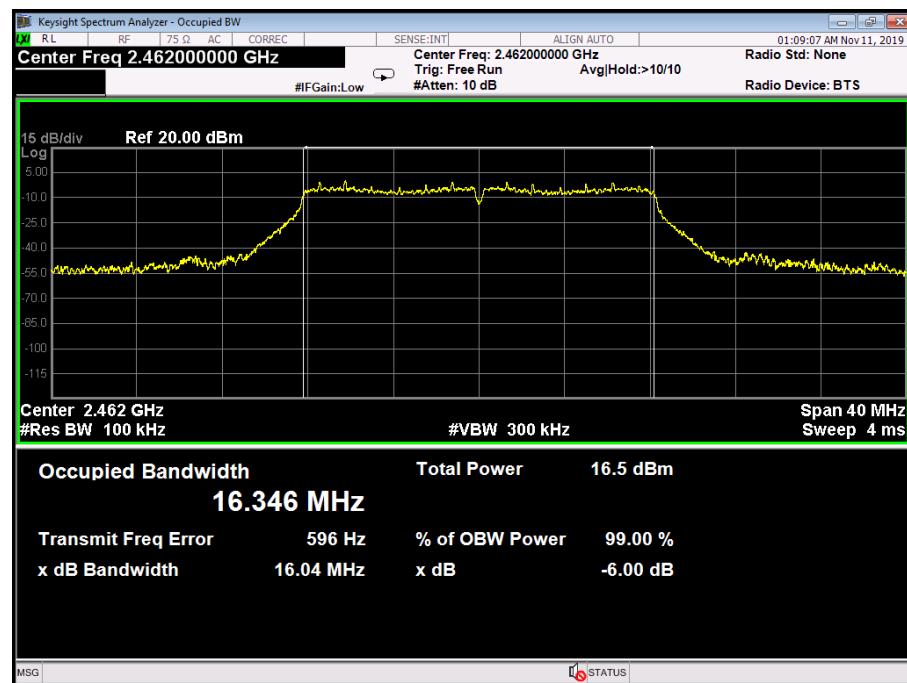
## 802.11G Mode

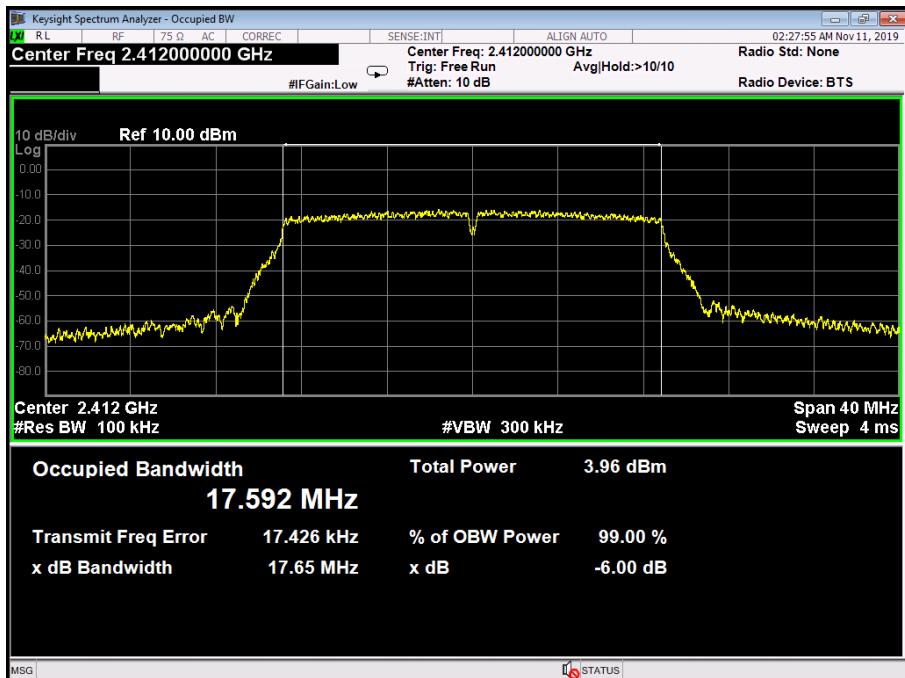
2437 MHz



## 802.11G Mode

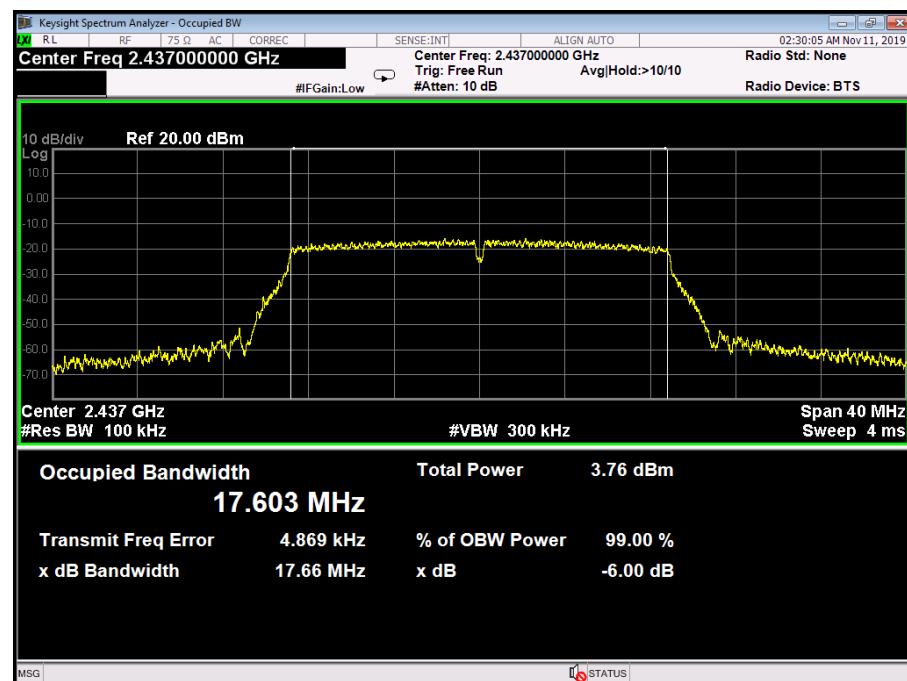
2462 MHz



<b>Temperature:</b>	25 °C	<b>Relative Humidity:</b>	55%
<b>Test Voltage:</b>	AC 120V/60HZ		
<b>Test Mode:</b>	TX 802.11N(HT20) Mode		
<b>Channel frequency (MHz)</b>	<b>6dB Bandwidth (MHz)</b>	<b>99% Bandwidth (MHz)</b>	<b>Limit (MHz)</b>
2412	17.65	17.592	
2437	17.66	17.603	>=0.5
2462	17.70	17.606	
<b>802.11N(HT20) Mode</b>			
<b>2412 MHz</b>			
			

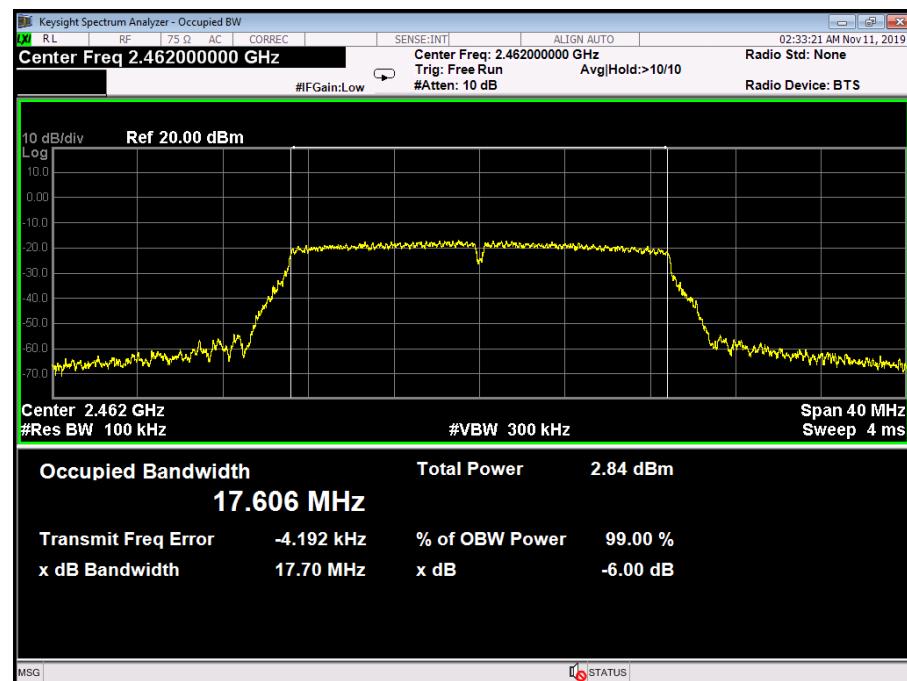
## 802.11N(HT20) Mode

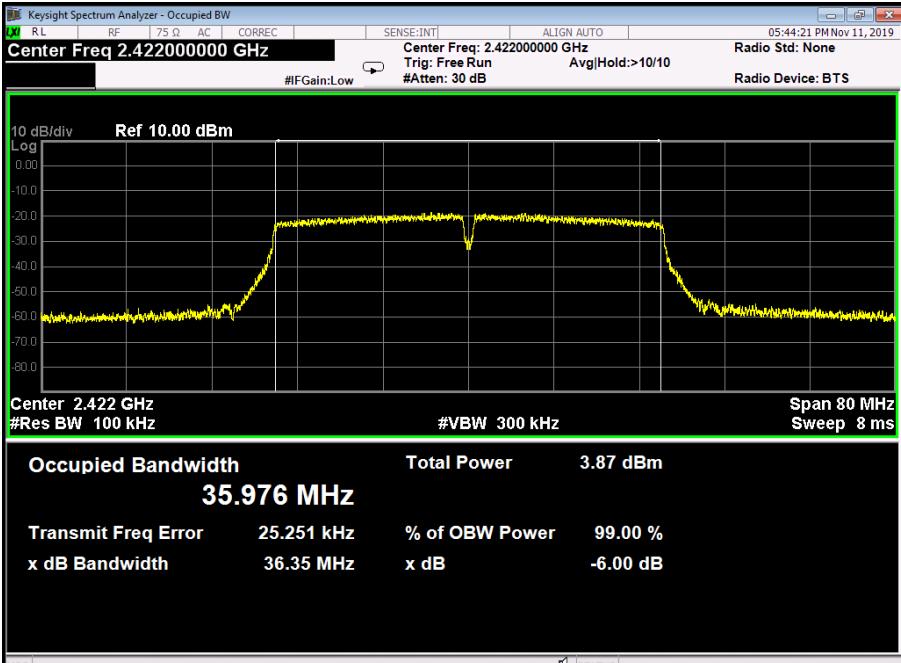
2437 MHz



## 802.11N(HT20) Mode

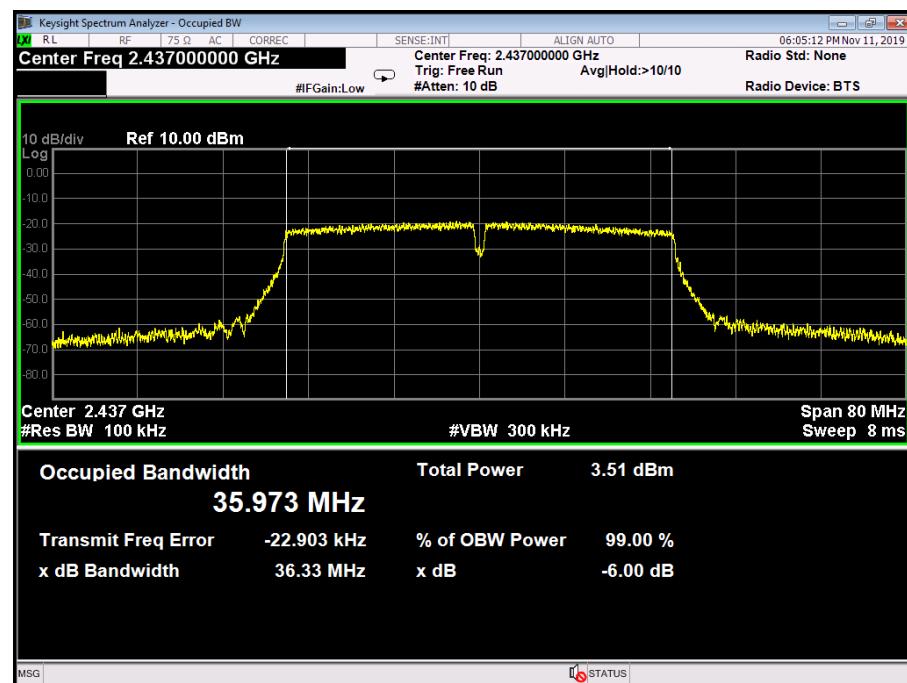
2462 MHz



<b>Temperature:</b>	25 °C	<b>Relative Humidity:</b>	55%
<b>Test Voltage:</b>	AC 120V/60HZ		
<b>Test Mode:</b>	TX 802.11N(HT40) Mode		
<b>Channel frequency (MHz)</b>	<b>6dB Bandwidth (MHz)</b>	<b>99% Bandwidth (MHz)</b>	<b>Limit (MHz)</b>
2422	36.35	35.976	
2437	36.33	35.973	>=0.5
2452	36.35	35.963	
<b>802.11N(HT40) Mode</b>			
<b>2422 MHz</b>			
			

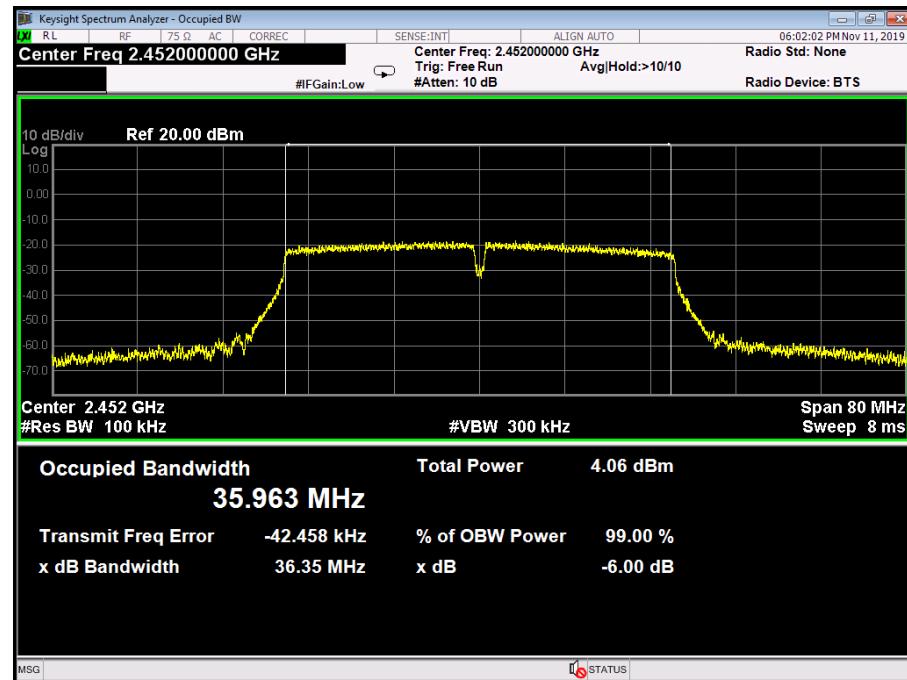
## 802.11N(HT40) Mode

2437 MHz



## 802.11N(HT40) Mode

2452 MHz



## Attachment E-- Peak Output Power Test Data

Conducted Power				
802.11b Power				
Channel	Frequency	Conducted Power (dBm)		Max. Limit (dBm)
		ANT. A.	Total	
1	2412 MHz	9.10	---	30
6	2437 MHz	8.90	---	
11	2462 MHz	9.04	---	
802.11g Power				
Channel	Frequency	Conducted Power (dBm)		Max. Limit (dBm)
		ANT. A.	Total	
1	2412 MHz	8.60	---	30
6	2437 MHz	8.42	---	
11	2462 MHz	8.80	---	
802.11n(HT20) Power				
Channel	Frequency	Conducted Power (dBm)		Max. Limit (dBm)
		ANT. A.	Total	
1	2412 MHz	7.56	---	30
6	2437 MHz	7.37	---	
11	2462 MHz	6.53	---	
802.11n(HT40) Power				
Channel	Frequency	Conducted Power (dBm)		Max. Limit (dBm)
		ANT. A.	Total	
3	2422 MHz	7.22	---	30
6	2437 MHz	6.99	---	
9	2452 MHz	7.57	---	

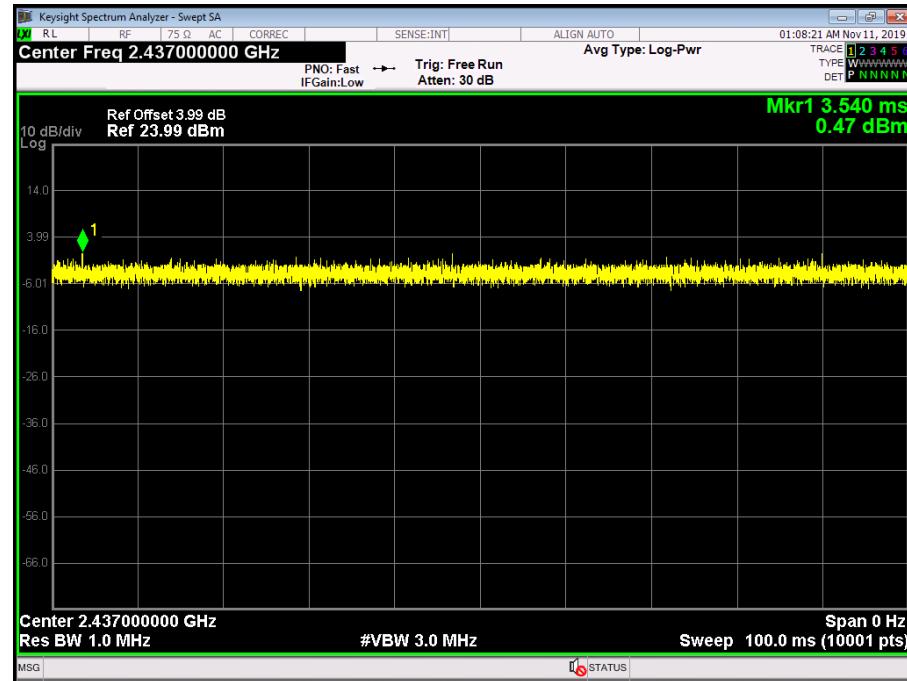
Duty Cycle		
Mode	Channel frequency (MHz)	Test Result
802.11b	2412	
	2437	
	2462	
802.11g	2412	
	2437	
	2462	
802.11n (HT20)	2412	>98%
	2437	
	2462	
802.11n (HT40)	2422	
	2437	
	2452	

Please see below plots

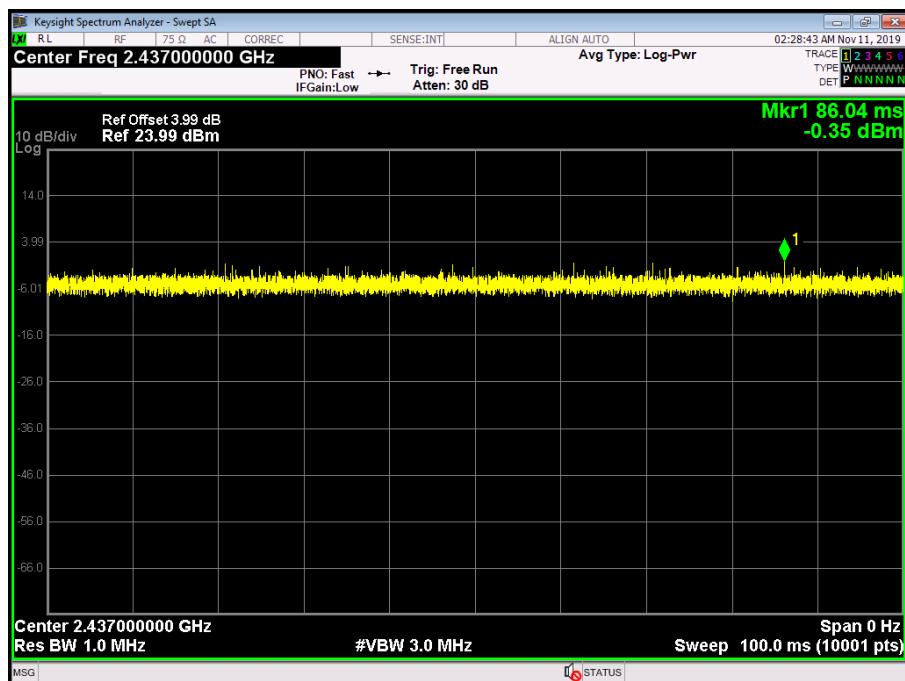
## 802.11 B Mode 2437 MHz



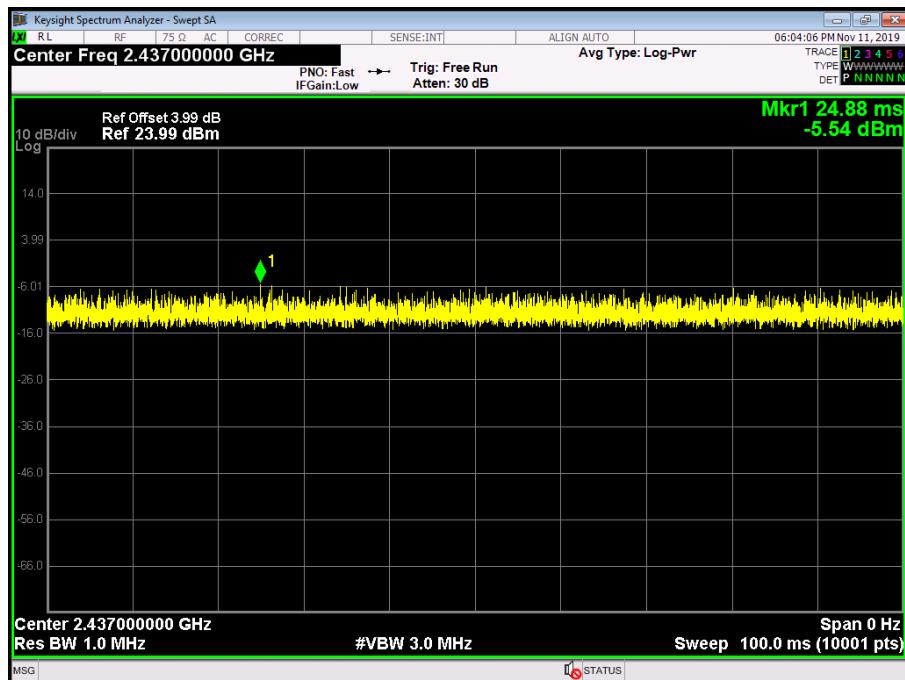
## 802.11 G Mode 2437 MHz



## 802.11 N(HT20) Mode 2437 MHz



## 802.11 N(HT40) Mode 2437 MHz



## Attachment F-- Power Spectral Density Test Data

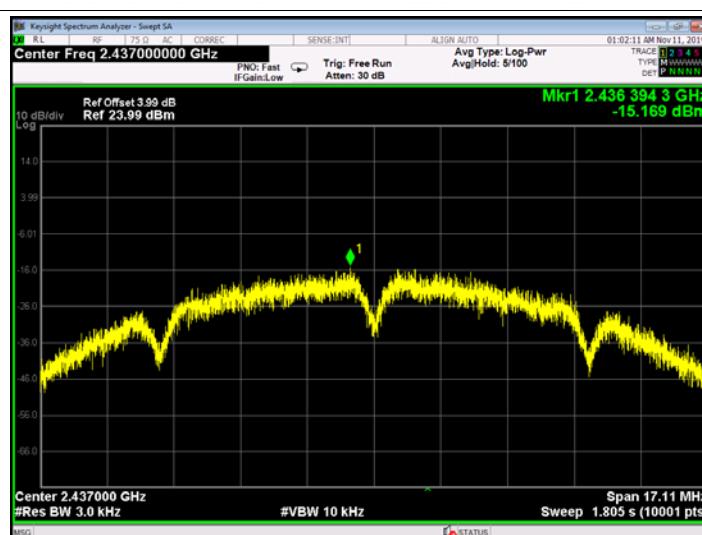
802.11b Mode				
Channel	Frequency	Conducted Power (dBm/3KHz)		Max. Limit (dBm/3KHz)
		Ant. A	Total	
1	2412 MHz	-14.390	---	8
6	2437 MHz	-15.169	---	
11	2462 MHz	-14.837	---	
802.11g Mode				
Channel	Frequency	Conducted Power (dBm/3KHz)		Max. Limit (dBm/3KHz)
		Ant. A	Total	
1	2412 MHz	-21.419	---	8
6	2437 MHz	-21.401	---	
11	2462 MHz	-20.773	---	
802.11n(HT20) Mode				
Channel	Frequency	Conducted Power (dBm/3KHz)		Max. Limit (dBm/3KHz)
		Ant. A	Total	
1	2412 MHz	-23.543	---	7.99
6	2437 MHz	-22.672	---	
11	2462 MHz	-23.774	---	
802.11n(HT40) Mode				
Channel	Frequency	Conducted Power (dBm/3KHz)		Max. Limit (dBm/3KHz)
		Ant. A	Total	
3	2422 MHz	-26.915	---	7.99
6	2437 MHz	-26.869	---	
9	2452 MHz	-26.287	---	

Test plots please refer to below pages:

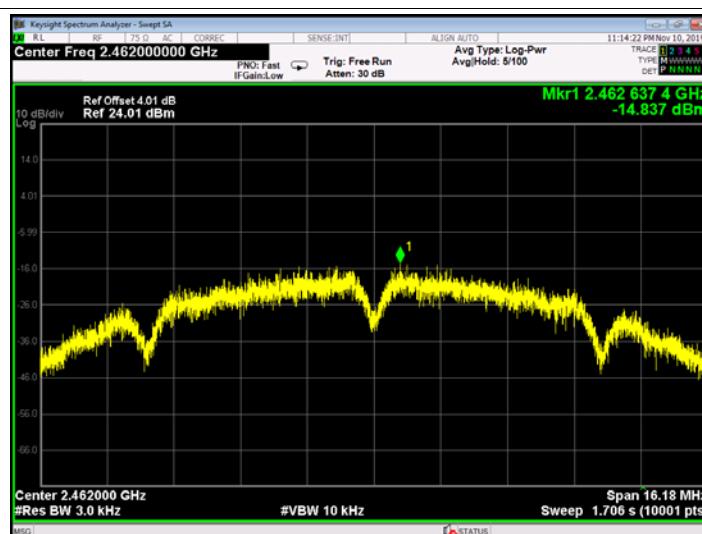
## 802.11 b 2412 MHz



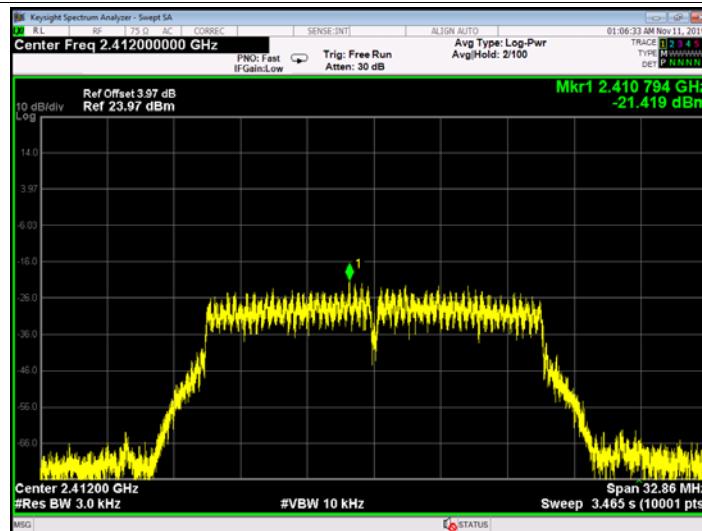
## 802.11 b 2437 MHz



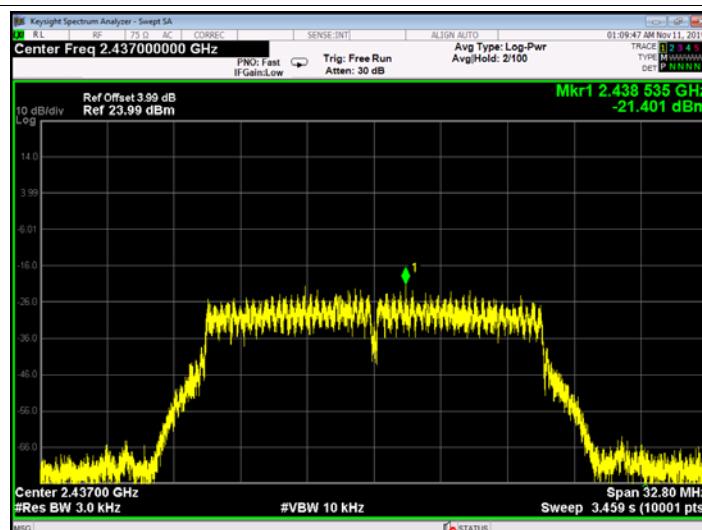
## 802.11 b 2462MHz



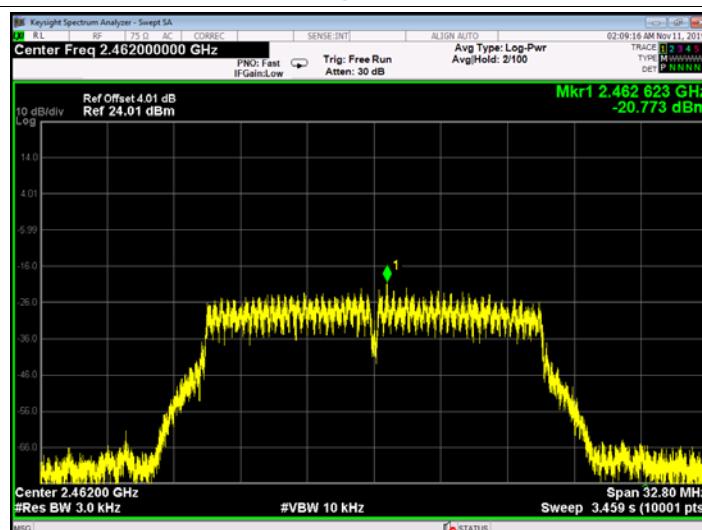
## 802.11 g 2412 MHz

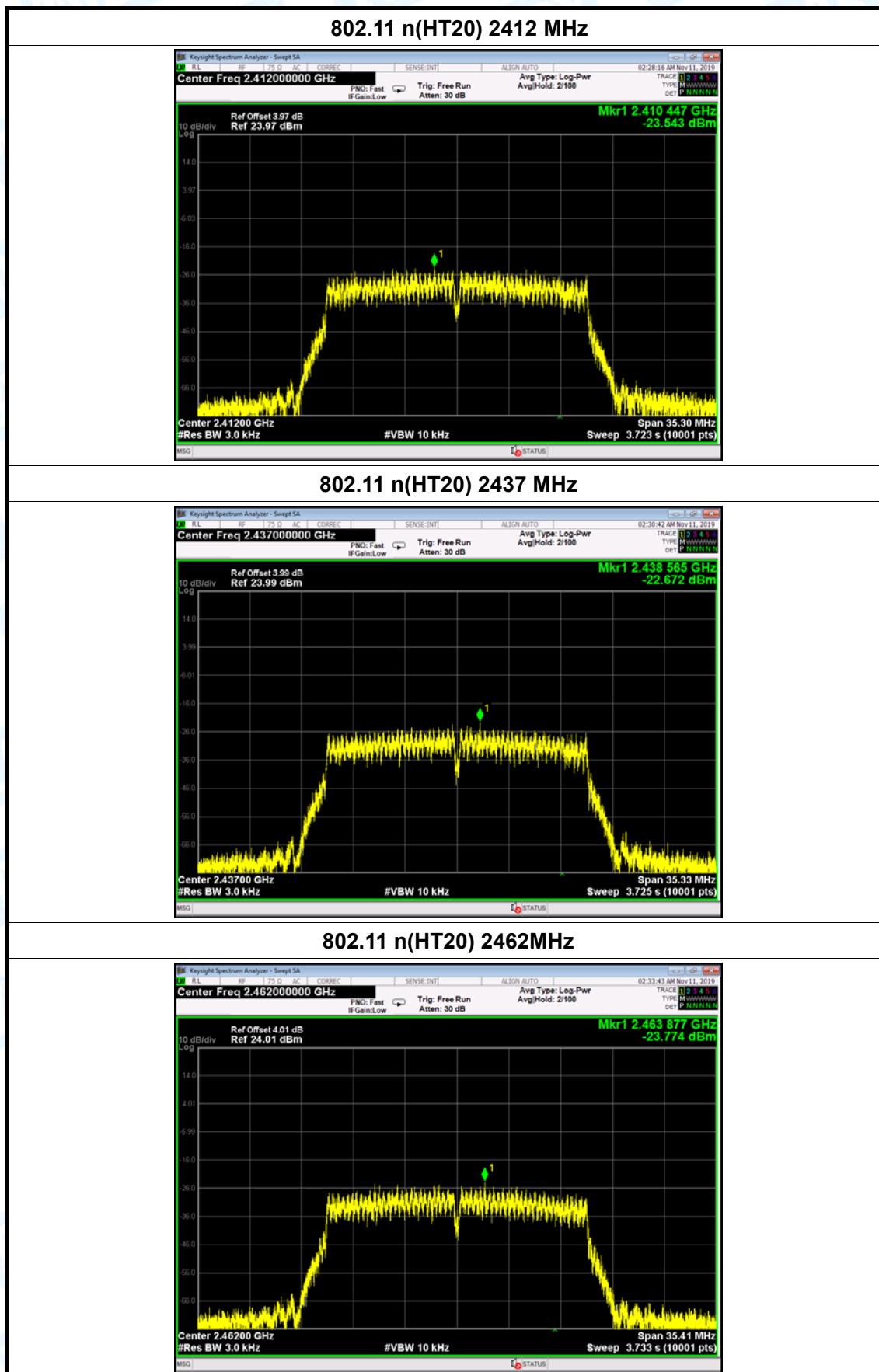


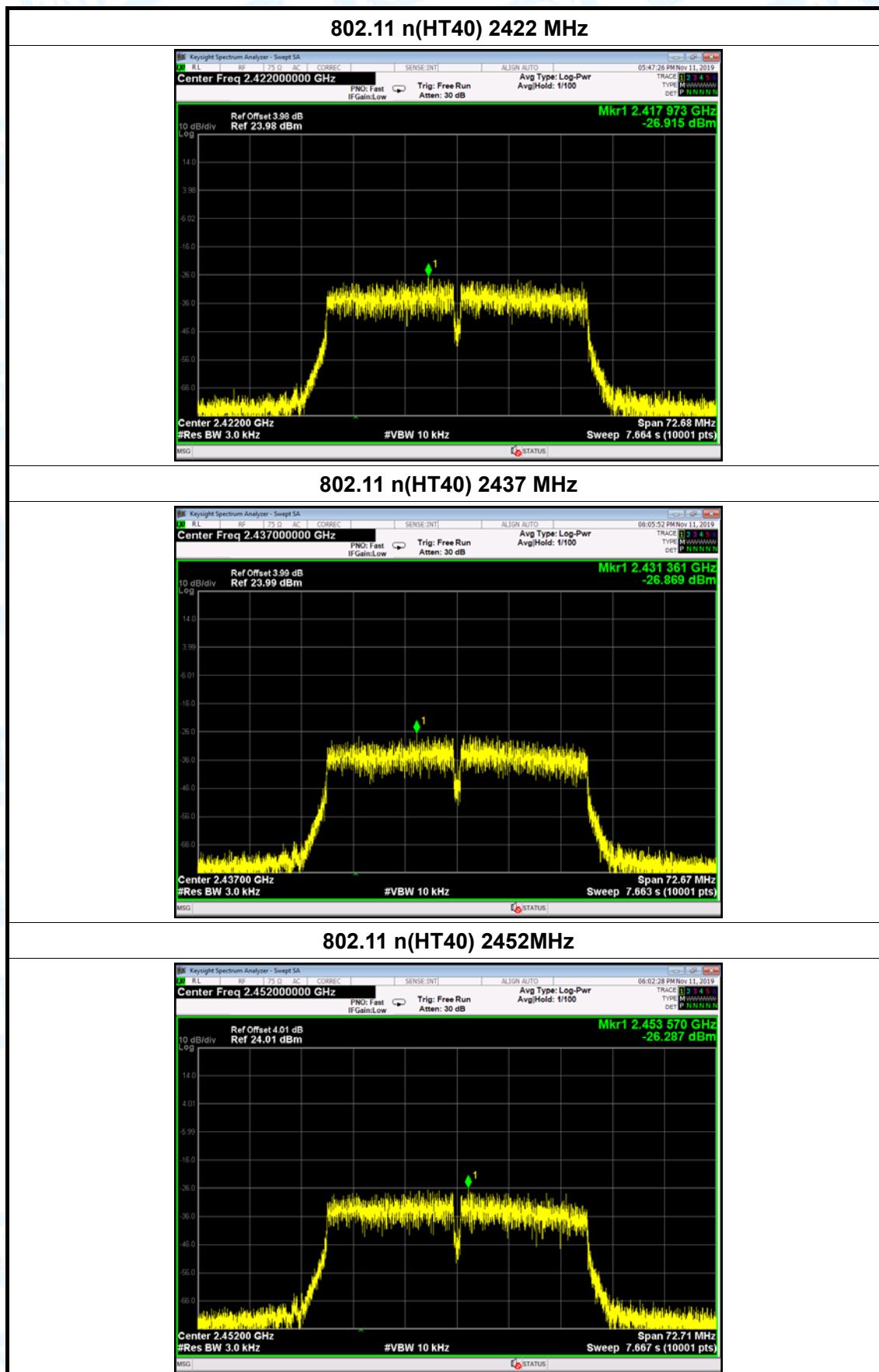
## 802.11 g 2437 MHz



## 802.11 g 2462MHz







----END OF REPORT----