



# TEST REPORT

**Report Reference No.**..... : **TRE1711022001** R/C.....: 58113

**FCC ID**..... : **2AMIL-LS1**

**Applicant's name**..... : **Fonerics Electronics Co.,Ltd**

**Address**.....: 201,Floor 2,No.2 Building,Foxda Industrial Zone, Northern Lanzhu Road,Pingshan,Shenzhen,China

**Manufacturer**.....: Fonerics Electronics Co.,Ltd

**Address**.....: 201,Floor 2,No.2 Building,Foxda Industrial Zone, Northern Lanzhu Road,Pingshan,Shenzhen,China

**Test item description** ..... : **LS1 Smart Wi-Fi LED Light Strip**

**Trade Mark** .....: VOCOLinc

**Model/Type reference**.....: LS1

**Listed Model(s)** .....: -

**Standard** ..... : **FCC CFR Title 47 Part 15 Subpart C Section 15.247**

**Date of receipt of test sample**.....: Nov.30,2017

**Date of testing**.....: Dec.01,2017 - Dec.24,2017

**Date of issue**.....: Dec.25,2017

**Result**.....: **PASS**

Compiled by  
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(Position+Printed name+Signature): Project Engineer John Qiao *John Qiao*

Approved by  
(position+printedname+signature).....: RF Manager Hans Hu *Hans Hu*

**Testing Laboratory Name** ..... : **Shenzhen Huatongwei International Inspection Co., Ltd.**

**Address**.....: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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*The test report merely correspond to the test sample.*

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## 1. TEST STANDARDS AND REPORT VERSION

### 1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

[ANSI C63.10:2013](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB 558074 D01 DTS Meas Guidance v04](#): Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating under §15.247

### 1.2. Report version

Version No.	Date of issue	Description
00	Dec.25,2017	Original

## **2. TEST DESCRIPTION**

<b>Test Item</b>	<b>FCC Rule</b>	<b>Result</b>	<b>Test Engineer</b>
Antenna requirement	15.203/15.247(c)	PASS	Baozhu.hu
Line Conducted Emissions (AC Main)	15.207	PASS	Baozhu.hu
Conducted Peak Output Power	15.247(b)(3)	PASS	Baozhu.hu
Power Spectral Density	15.247(e)	PASS	Baozhu.hu
6dB Bandwidth	15.247(a)(2)	PASS	Baozhu.hu
Restricted band	15.247(d)/15.205	PASS	Baozhu.hu
Spurious Emissions	15.247(d)/15.209	PASS	Baozhu.hu

Note: The measurement uncertainty is not included in the test result.

### 3. SUMMARY

#### 3.1. Client Information

Applicant:	Fonerics Electronics Co.,Ltd
Address:	201,Floor 2,No.2 Building,Foxda Industrial Zone, Northern Lanzhu Road,Pingshan,Shenzhen,China
Manufacturer:	Fonerics Electronics Co.,Ltd
Address:	201,Floor 2,No.2 Building,Foxda Industrial Zone, Northern Lanzhu Road,Pingshan,Shenzhen,China

#### 3.2. Product Description

Name of EUT:	LS1 Smart Wi-Fi LED Light Strip
Trade Mark:	VOCOLinc
Model No.:	LS1
Listed Model(s):	-
IMEI:	-
Power supply:	DC12V,2A
Adapter information:	Model: SK03T1-1200200Z Input: 100-240Va.c., 50/60Hz, 0.6A Output: 12Vd.c., 2A
Hardware version:	V0.1
Software version:	V1.0
<b>WIFI</b>	
Supported type:	802.11b/802.11g/802.11n(HT20)/802.11n(HT40)
Modulation:	DSSS for 802.11b OFDM for 802.11g/802.11n(HT20)/802.11n(HT40)
Operation frequency:	2412MHz~2462MHz for 802.11b/802.11g/802.11n(HT20) 2422MHz~2452MHz for 802.11n(HT40)
Channel number:	11 for 802.11b/802.11g/802.11n(HT20) 7 for 802.11n(HT40)
Channel separation:	5MHz
Antenna type:	Integral Antenna
Antenna gain:	1.2 dBi

### 3.3. Operation state

#### ➤ Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

802.11b/g/n(HT20)		802.11n(HT40)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	01	-
02	2417	02	-
03	2422	03	2422
04	2427	04	2427
05	2432	05	2432
06	2437	06	2437
07	2442	07	2442
08	2447	08	2447
09	2452	09	2452
10	2457	10	-
11	2462	11	-

#### ➤ Test mode

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%).
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.
For Radiated suprious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit(duty cycle>98%). The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report.

### 3.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

●	Adapter	Manufacturer:	Shenzhen Simsukian Electronics Technology Co.,Ltd
		Model No.:	SK03T1-1200200Z
○	/	Manufacturer:	/
		Model No.:	/

### 3.5. Modifications

No modifications were implemented to meet testing criteria.

## **4. TEST ENVIRONMENT**

### **4.1. Address of the test laboratory**

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

### **4.2. Test Facility**

#### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### **A2LA-Lab Cert. No.: 3902.01**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### **FCC-Registration No.: 762235**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files.

#### **IC-Registration No.:5377B-1**

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377B-1.

#### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

### 4.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

### 4.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd. quality system according to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei International Inspection Co., Ltd. is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.39 dB	(1)
Radiated Emissions 30~1000MHz	4.24 dB	(1)
Radiated Emissions 1~18GHz	5.16 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .



#### 4.1. Equipments Used during the Test

Conducted Emissions						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)
1	EMI Test Receiver	R&S	ESCI	101247	11/11/2017	11/10/2018
2	Artificial Mains	SCHWARZBECK	NNLK 8121	573	11/11/2017	11/10/2018
3	2-Line V-Network	R&S	ESH3-Z5	100049	11/11/2017	11/10/2018
4	Pulse Limiter	R&S	ESH3-Z2	101488	11/11/2017	11/10/2018
5	RF Connection Cable	HUBER+SUHNER	EF400	N/A	11/21/2017	11/20/2018
6	Test Software	R&S	ES-K1	N/A	N/A	N/A

Radiated Emissions						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)
1	EMI Test Receiver	R&S	ESCI	101247	11/11/2017	11/10/2018
2	Loop Antenna	R&S	HFH2-Z2	100020	11/20/2017	11/19/2018
3	Ultra-Broadband Antenna	SCHWARZBECK	VULB9163	538	4/5/2017	4/4/2018
4	Preamplifier	SCHWARZBECK	BBV 9743	9743-0022	10/18/2017	10/17/2018
5	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	11/21/2017	11/20/2018
6	EMI Test Software	R&S	ESK1	N/A	N/A	N/A
7	Spectrum Analyzer	R&S	FSP40	100597	11/11/2017	11/10/2018
8	Horn Antenna	SCHWARZBECK	9120D	1011	3/27/2017	3/26/2018
9	Horn Antenna	SCHWARZBECK	BBHA9170	25841	3/27/2017	3/26/2018
10	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-248	10/18/2017	10/17/2018
11	High pass filter	Compliance Direction systems	BSU-6	34202	11/11/2017	11/10/2018
12	RF Connection Cable	HUBER+SUHNER	RE-7-FH	N/A	11/21/2017	11/20/2018
13	EMI Test Software	Audix	E3	N/A	N/A	N/A
14	Turntable	MATURO	TT2.0	/	N/A	N/A
15	Antenna Mast	MATURO	TAM-4.0-P	/	N/A	N/A

RF Conducted Test						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)
1	Spectrum Analyzer	R&S	FSV40	100048	11/11/2017	11/10/2018
2	EXA Signal Analyzer	Agilent	N9020A	184247	9/22/2017	9/21/2018
3	Power Meter	Agilent	U2021XA	178231	9/22/2017	9/21/2018
4	OSP	R&S	OSP120	101317	N/A	N/A

The Cal.Interval was one year.

## 5. TEST CONDITIONS AND RESULTS

### 5.1. Antenna requirement

#### REQUIREMENT:

#### **FCC CFR Title 47 Part 15 Subpart C Section 15.203:**

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, 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.

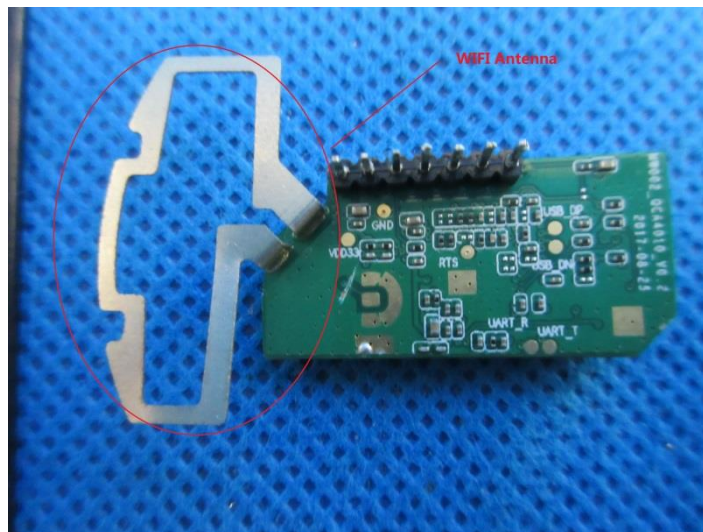
#### **FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):**

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

#### TEST RESULTS

Passed       Not Applicable

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



## 5.2. Conducted Emissions (AC Main)

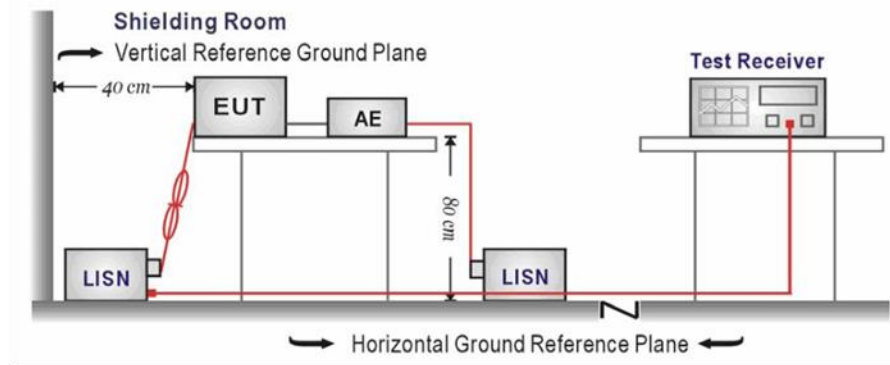
### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

### TEST CONFIGURATION



### TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

### TEST MODE:

Please refer to the clause 3.3

### TEST RESULTS

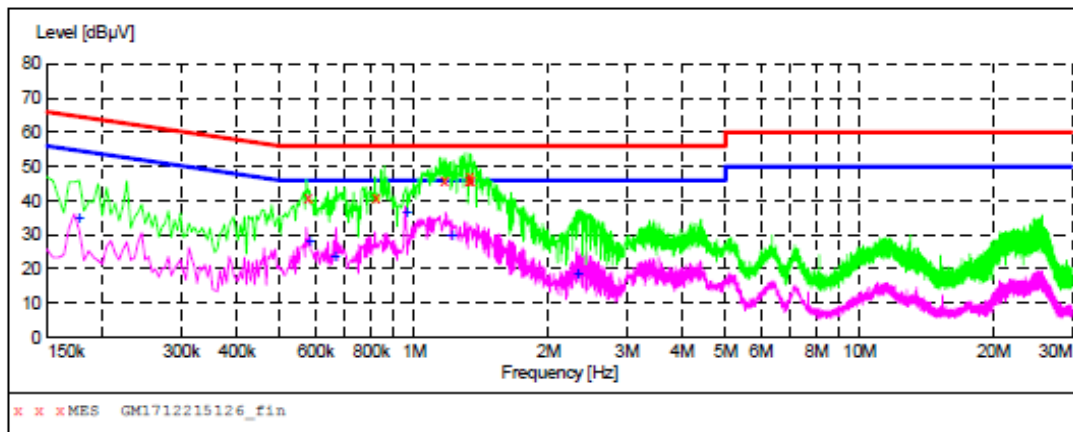
Passed       Not Applicable

Note:

- 1) Transd=Cable lose+ Pulse Limiter Factor + Artificial Mains Factor
- 2) Margin= Limit -Level

Test Line:

L



**MEASUREMENT RESULT: "GM1712215126\_fin"**

2017-12-21 15:22

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.577500	40.60	10.0	56	15.4	QP	L1	GND
0.820500	41.10	10.0	56	14.9	QP	L1	GND
1.167000	46.20	10.1	56	9.8	QP	L1	GND
1.324500	46.00	10.1	56	10.0	QP	L1	GND
1.333500	46.80	10.1	56	9.2	QP	L1	GND
1.342500	46.00	10.1	56	10.0	QP	L1	GND

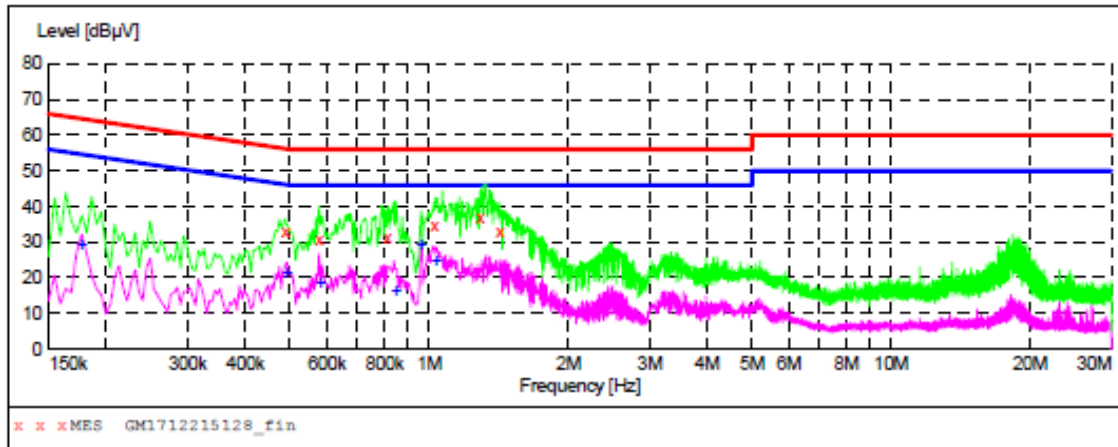
**MEASUREMENT RESULT: "GM1712215126\_fin2"**

2017-12-21 15:22

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	35.00	10.0	55	19.6	AV	L1	GND
0.582000	28.60	10.0	46	17.4	AV	L1	GND
0.663000	24.00	10.0	46	22.0	AV	L1	GND
0.960000	36.90	10.0	46	9.1	AV	L1	GND
1.216500	30.20	10.1	46	15.8	AV	L1	GND
2.328000	19.00	10.1	46	27.0	AV	L1	GND

Test Line:

N



**MEASUREMENT RESULT: "GM1712215128\_fin"**

2017-12-21 15:34

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.487500	33.10	9.9	56	23.1	QP	N	GND
0.577500	30.60	10.0	56	25.4	QP	N	GND
0.811500	31.30	10.0	56	24.7	QP	N	GND
1.027500	34.80	10.1	56	21.2	QP	N	GND
1.288500	37.00	10.1	56	19.0	QP	N	GND
1.419000	33.20	10.1	56	22.8	QP	N	GND

**MEASUREMENT RESULT: "GM1712215128\_fin2"**

2017-12-21 15:34

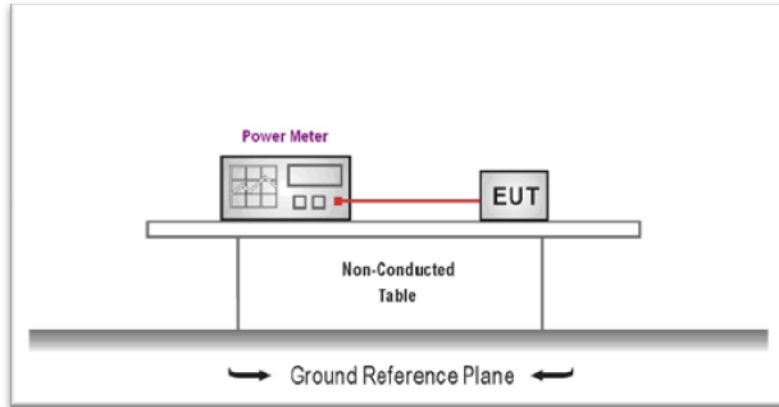
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	29.90	10.0	55	24.7	AV	N	GND
0.492000	21.50	9.9	46	24.6	AV	N	GND
0.582000	18.90	10.0	46	27.1	AV	N	GND
0.847500	16.60	10.0	46	29.4	AV	N	GND
0.960000	29.30	10.0	46	16.7	AV	N	GND
1.036500	24.90	10.1	46	21.1	AV	N	GND

### 5.3. Conducted Peak Output Power

#### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3): 30dBm

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10: 2013 and KDB 558074 D01 for compliance to FCC 47 CFR 15.247 requirements.
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
3. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector
4. Record the measurement data.

#### TEST MODE:

Please refer to the clause 3.3

#### TEST RESULTS

Passed       Not Applicable

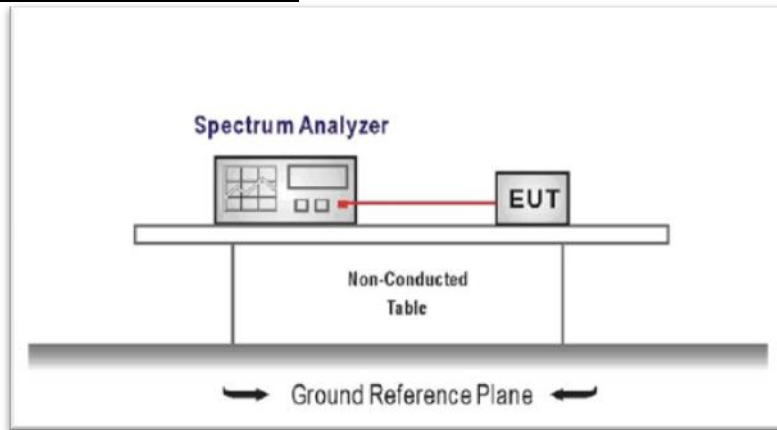
Type	Channel	Output power (dBm)	Limit (dBm)	Result
802.11b	01	8.82	≤30.00	Pass
	06	8.09		
	11	4.17		
802.11g	01	14.81	≤30.00	Pass
	06	14.11		
	11	12.17		
802.11n(HT20)	01	16.97	≤30.00	Pass
	06	15.20		
	11	11.80		
802.11n(HT40)	03	17.59	≤30.00	Pass
	06	16.06		
	09	13.46		

## 5.4. Power Spectral Density

### LIMIT

**FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e):**For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input,
2. Configure the spectrum analyzer as shown below:  
Center frequency=DTS channel center frequency  
Span =1.5 times the DTS bandwidth  
 $RBW = 3 \text{ kHz} \leq RBW \leq 100 \text{ kHz}$ ,  $VBW \geq 3 \times RBW$   
Sweep time = auto couple  
Detector = peak  
Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Use the peak marker function to determine the maximum amplitude level within the RBW.
5. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### TEST MODE:

Please refer to the clause 3.3

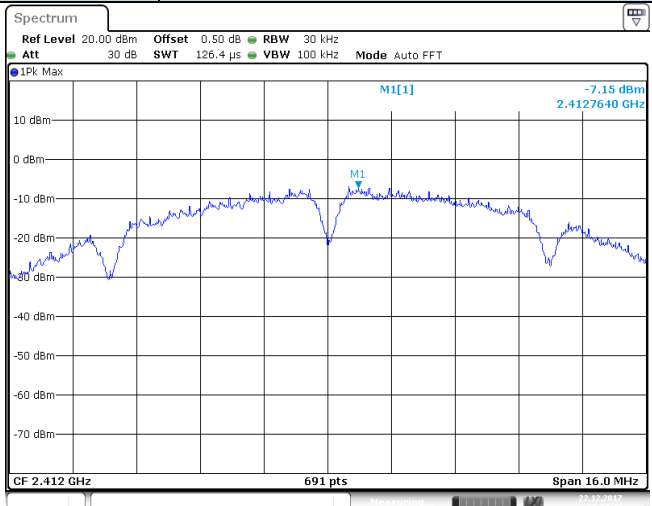
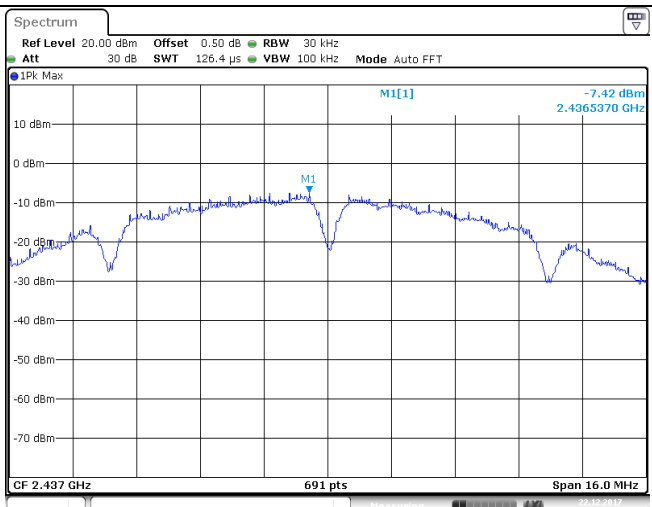
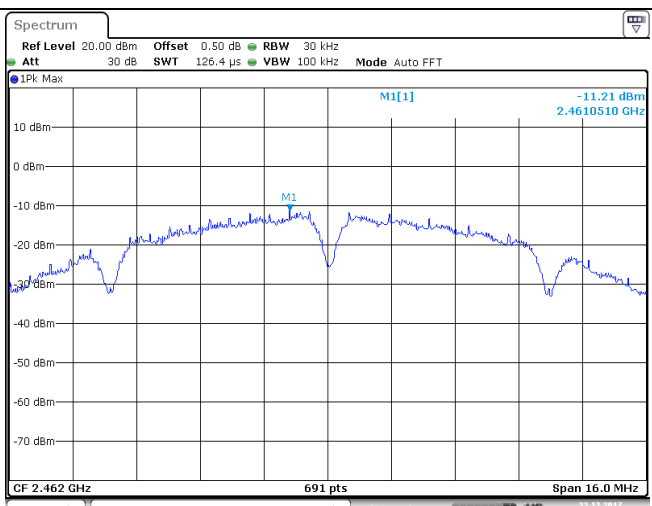
### TEST RESULTS

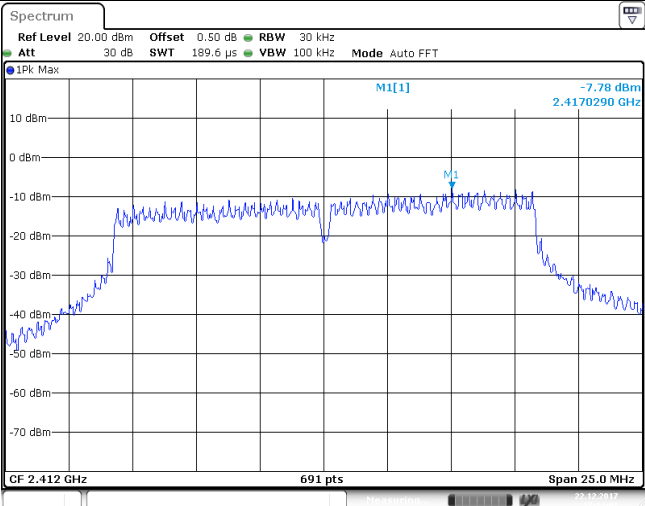
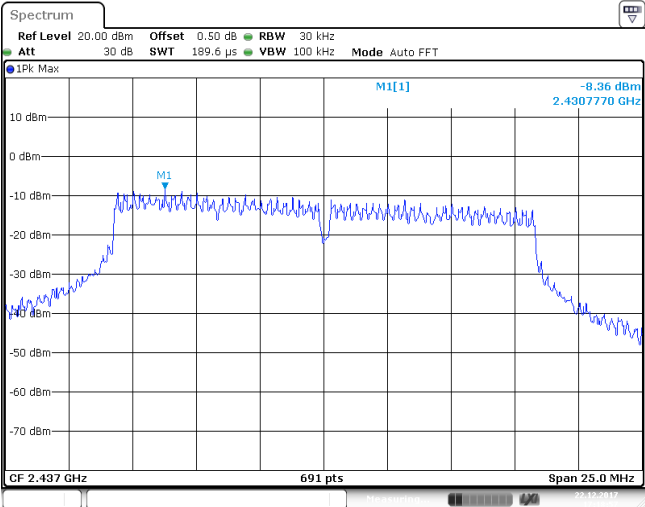
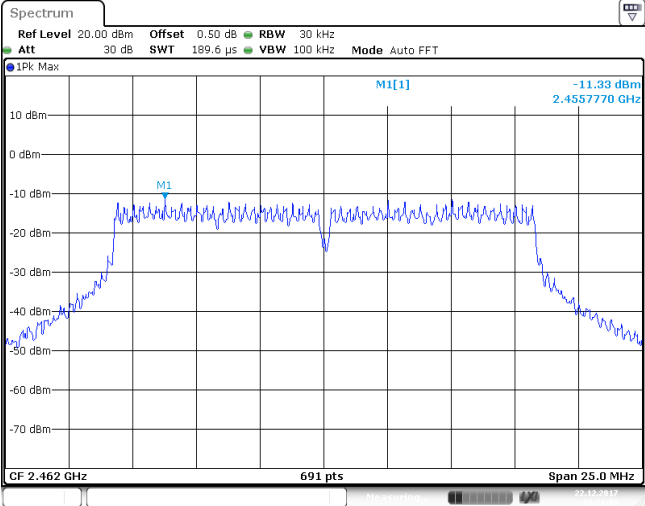
Passed       Not Applicable

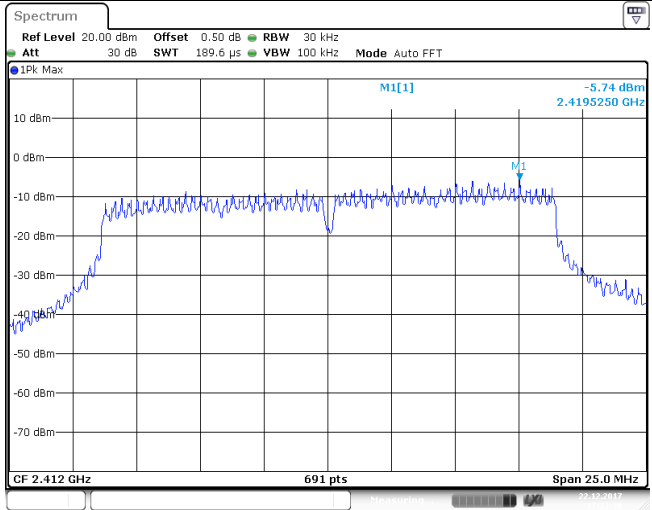
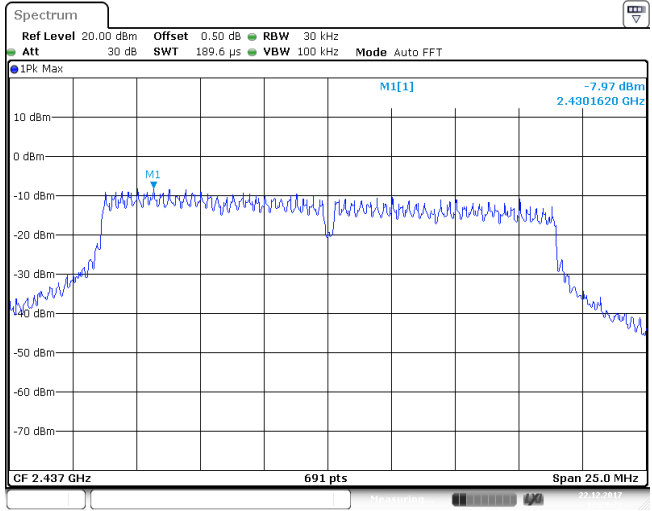
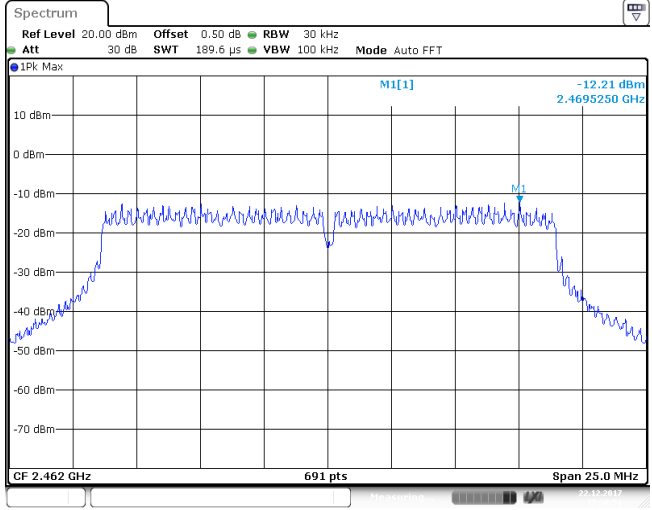


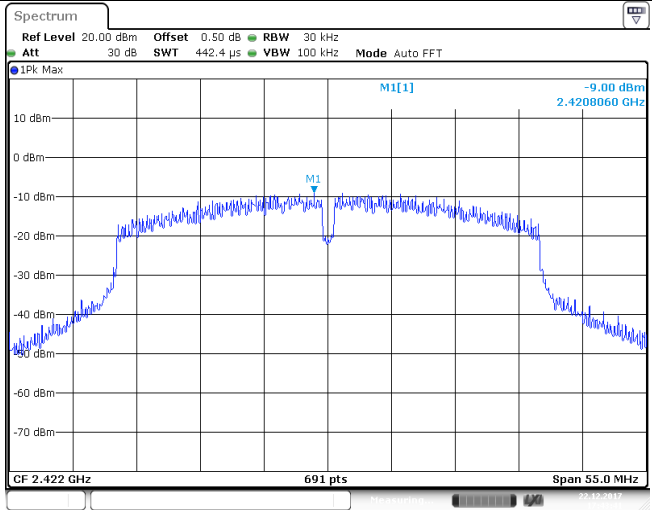
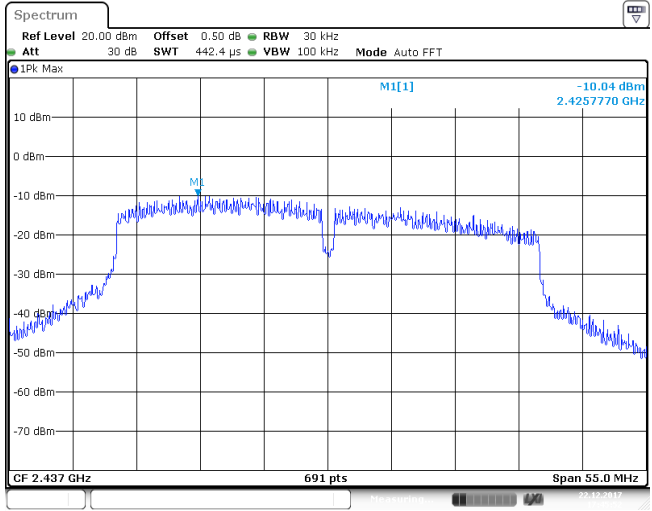
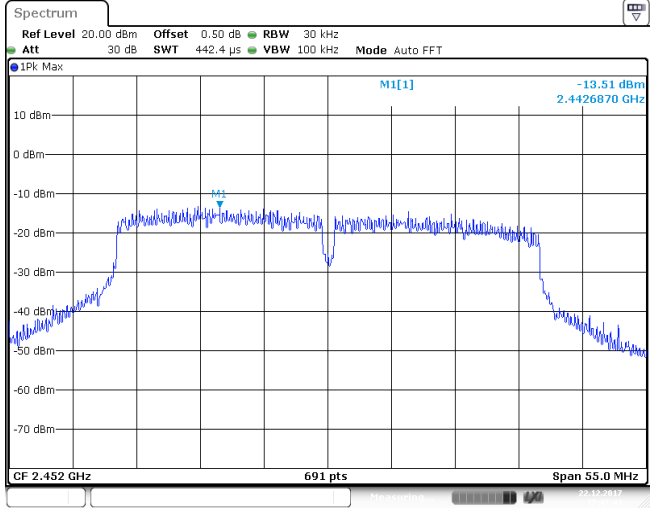
Type	Channel	Power Spectral Density (dBm/30KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-7.15	≤8.00	Pass
	06	-7.42		
	11	-11.21		
802.11g	01	-7.78	≤8.00	Pass
	06	-8.36		
	11	-11.33		
802.11n(HT20)	01	-5.89	≤8.00	Pass
	06	-7.97		
	11	-12.21		
802.11n(HT40)	03	-9.00	≤8.00	Pass
	06	-10.04		
	09	-13.51		

Test plot as follows:

Type:		802.11 b
CH01		
CH06		
CH11		

Type:		802.11 g
CH01		
CH06		
CH11		

Type:		802.11n(HT20)
CH01		
CH06		
CH11		

Type:		802.11n(HT40)
CH03		
CH06		
CH09		

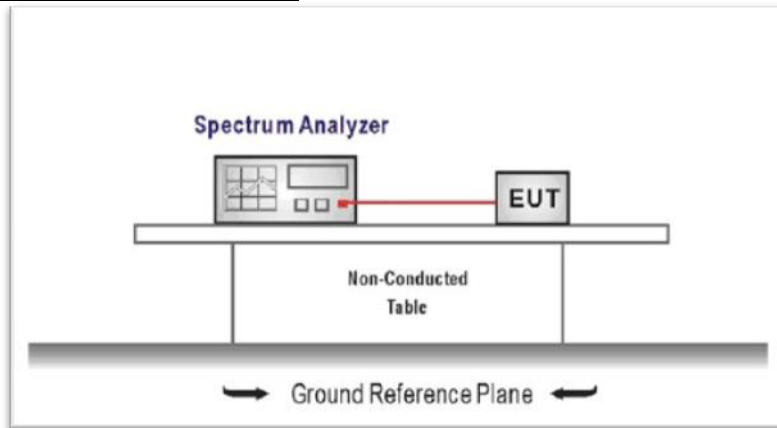
## 5.5. 6dB bandwidth

### LIMIT

#### **FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2):**

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).  
Center Frequency = DTS channel center frequency  
Span = 2 x DTS bandwidth  
RBW = 100 kHz, VBW ≥ 3 x RBW  
Sweep time = auto couple  
Detector = Peak  
Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission, and record the pertinent measurements.

### TEST MODE:

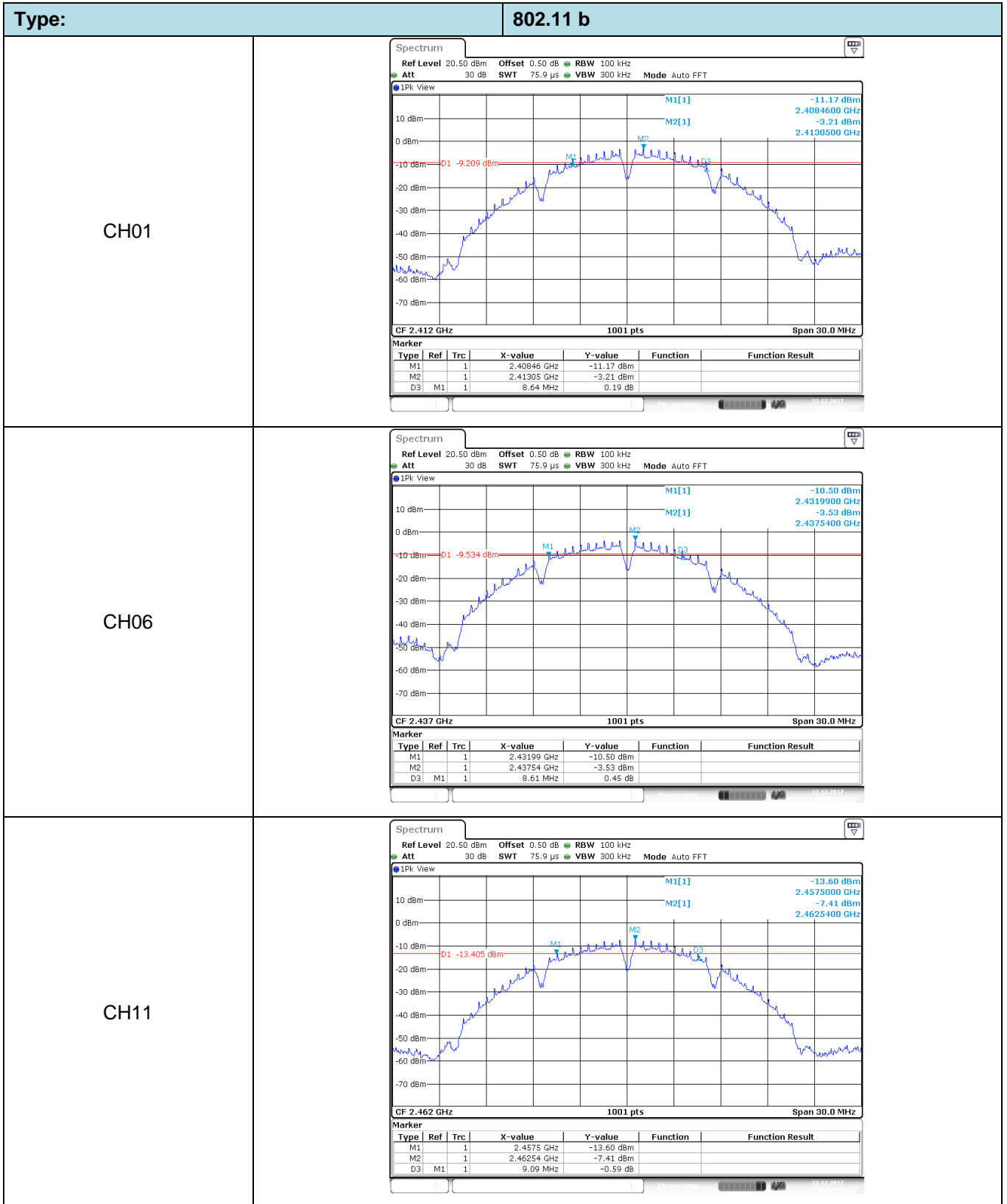
Please refer to the clause 3.3

### TEST RESULTS

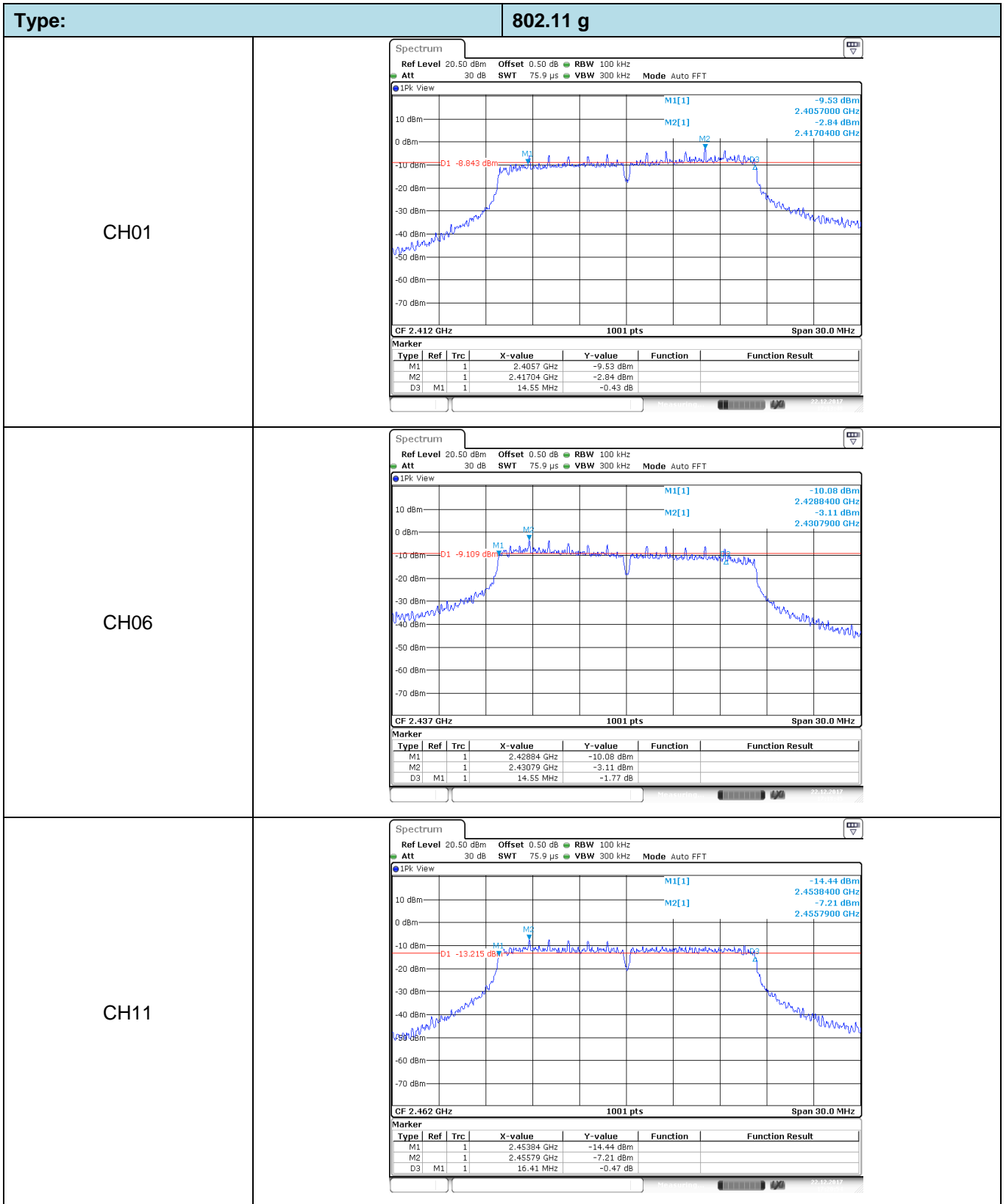
Passed       Not Applicable

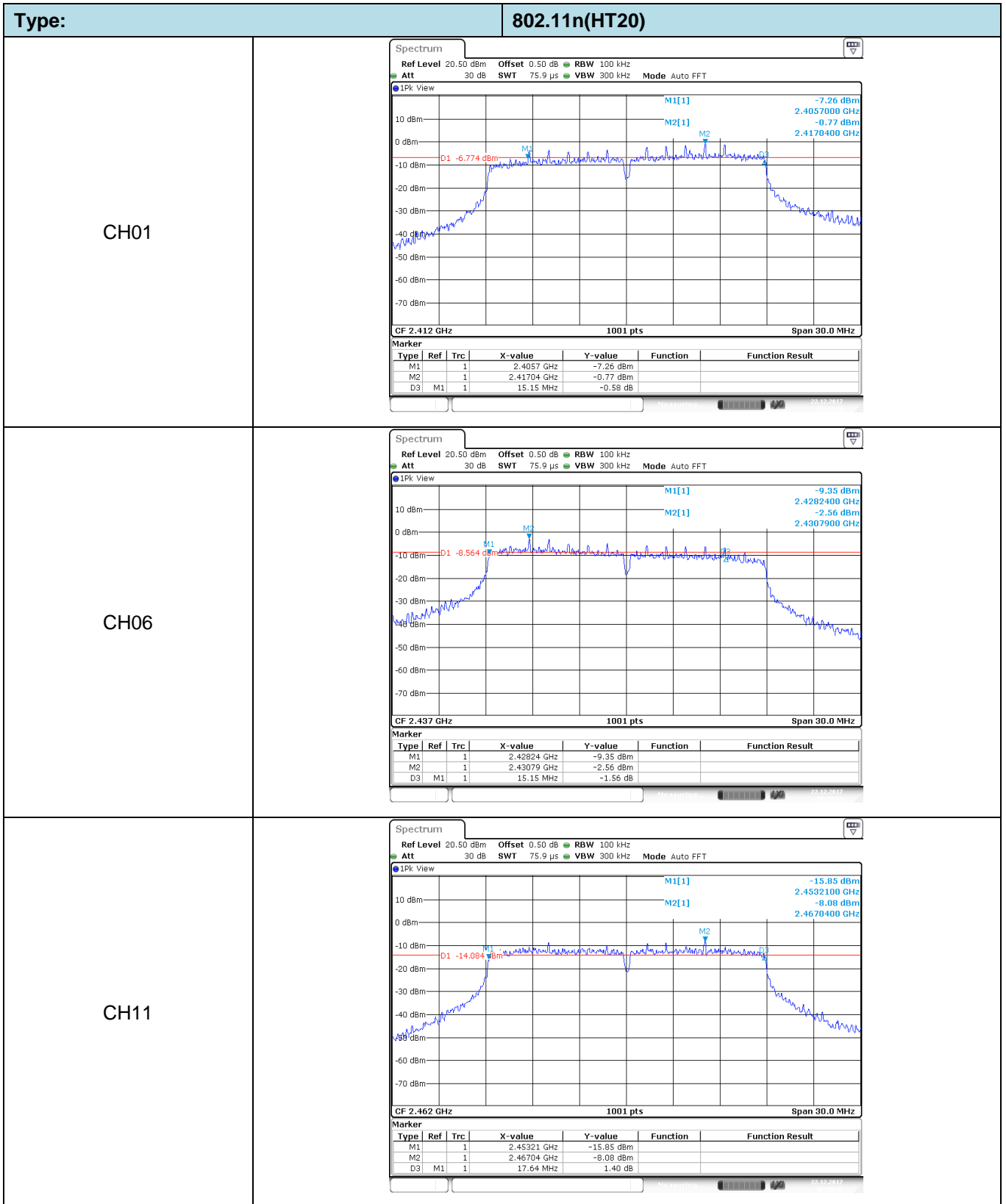
Type	Channel	6dB Bandwidth (MHz)	Limit (kHz)	Result
802.11b	01	8.64	≥500	Pass
	06	8.61		
	11	9.09		
802.11g	01	14.55	≥500	Pass
	06	14.55		
	11	16.41		
802.11n(HT20)	01	15.15	≥500	Pass
	06	15.15		
	11	17.64		
802.11n(HT40)	03	30.18	≥500	Pass
	06	28.98		
	09	35.82		

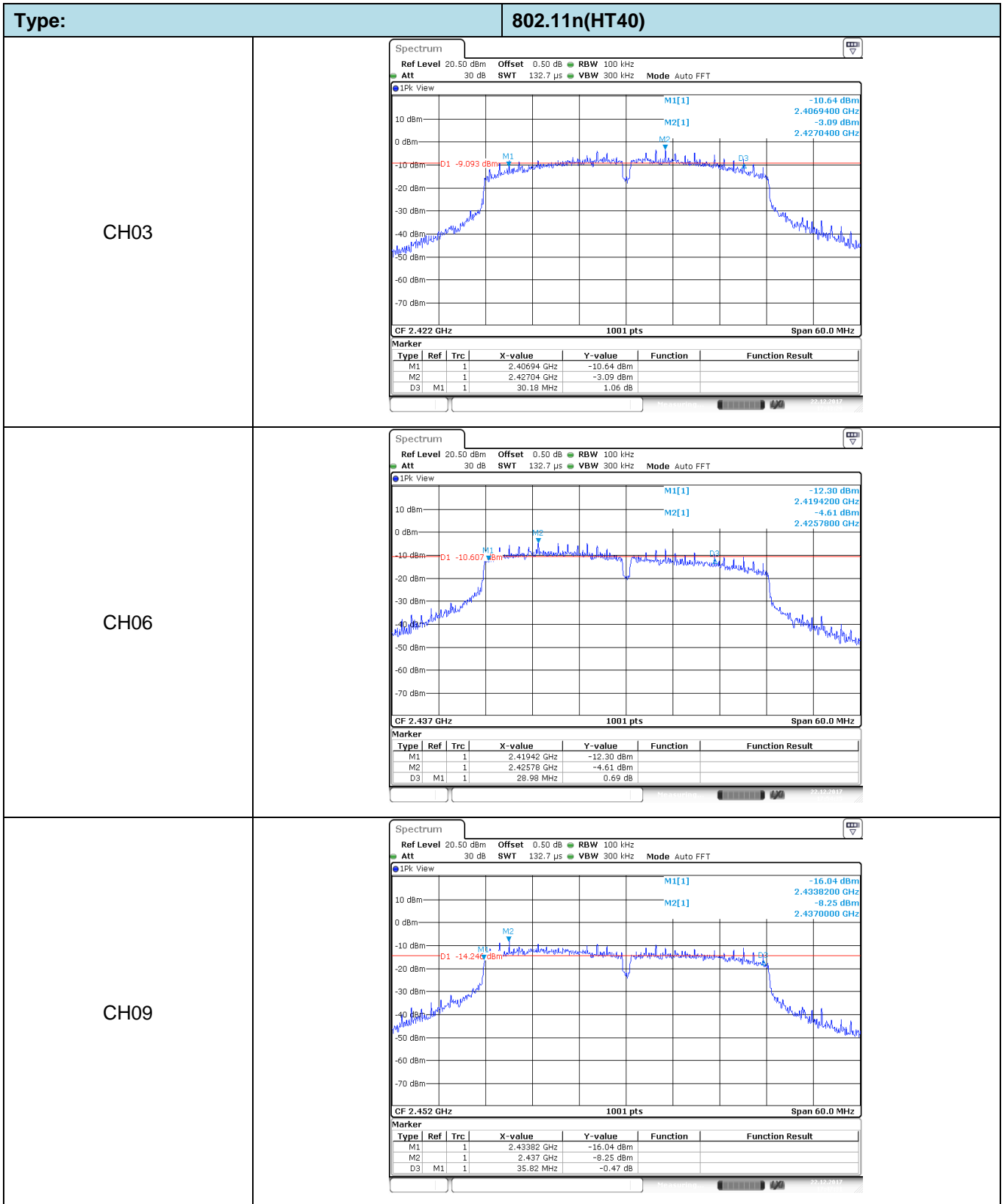
Test plot as follows:











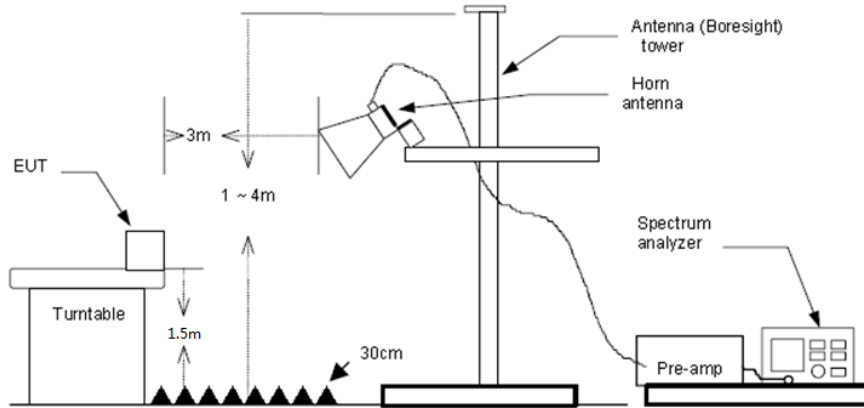
**5.6. Restricted band**

**LIMIT**

**FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

**TEST CONFIGURATION**



**TEST PROCEDURE**

- 1) The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2) The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3) The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- 4) The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- 5) The receiver set as follow:  
 RBW=1MHz, VBW=3MHz PEAK detector for Peak value.  
 RBW=1MHz, VBW=3MHz RMS detector for Average value.

**TEST MODE:**

Please refer to the clause 3.3

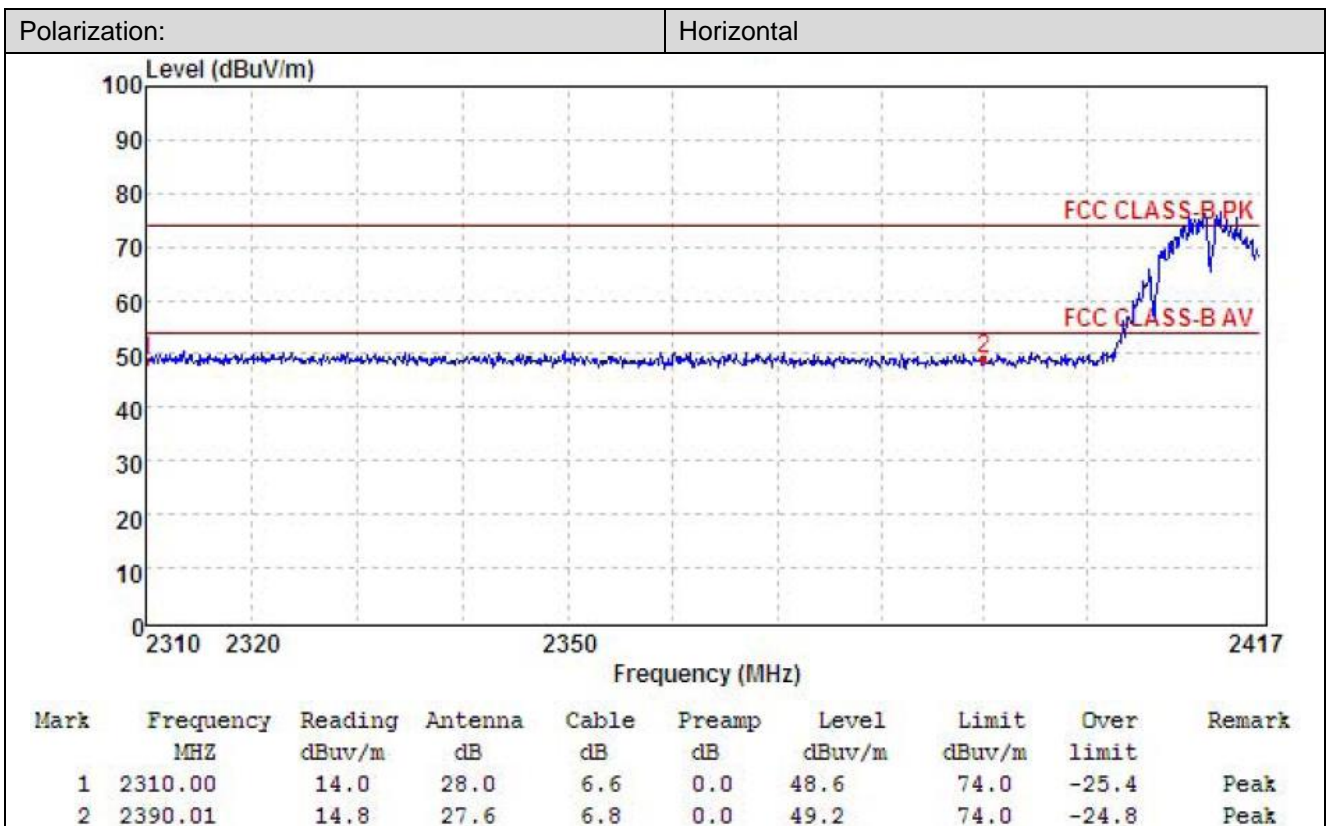
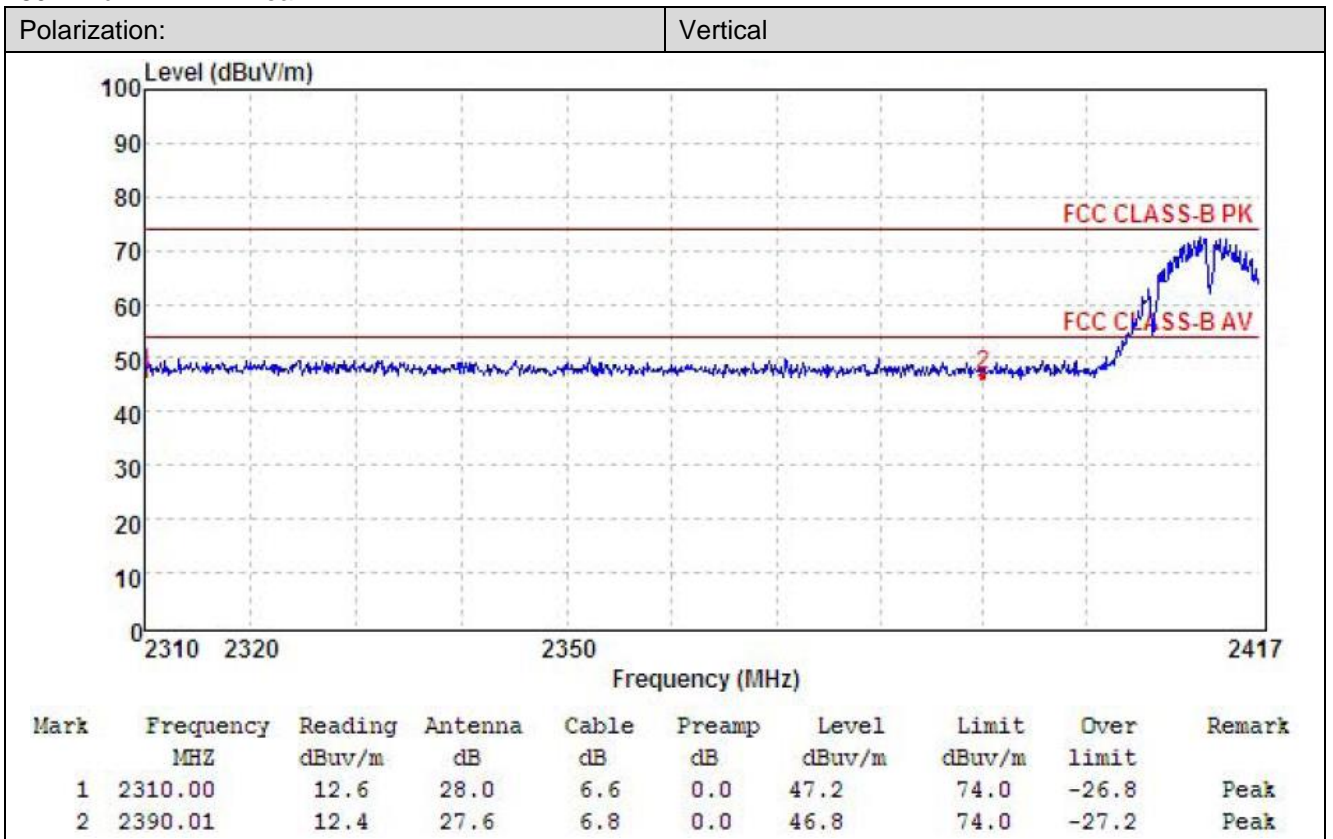
**TEST RESULTS**

Passed       Not Applicable

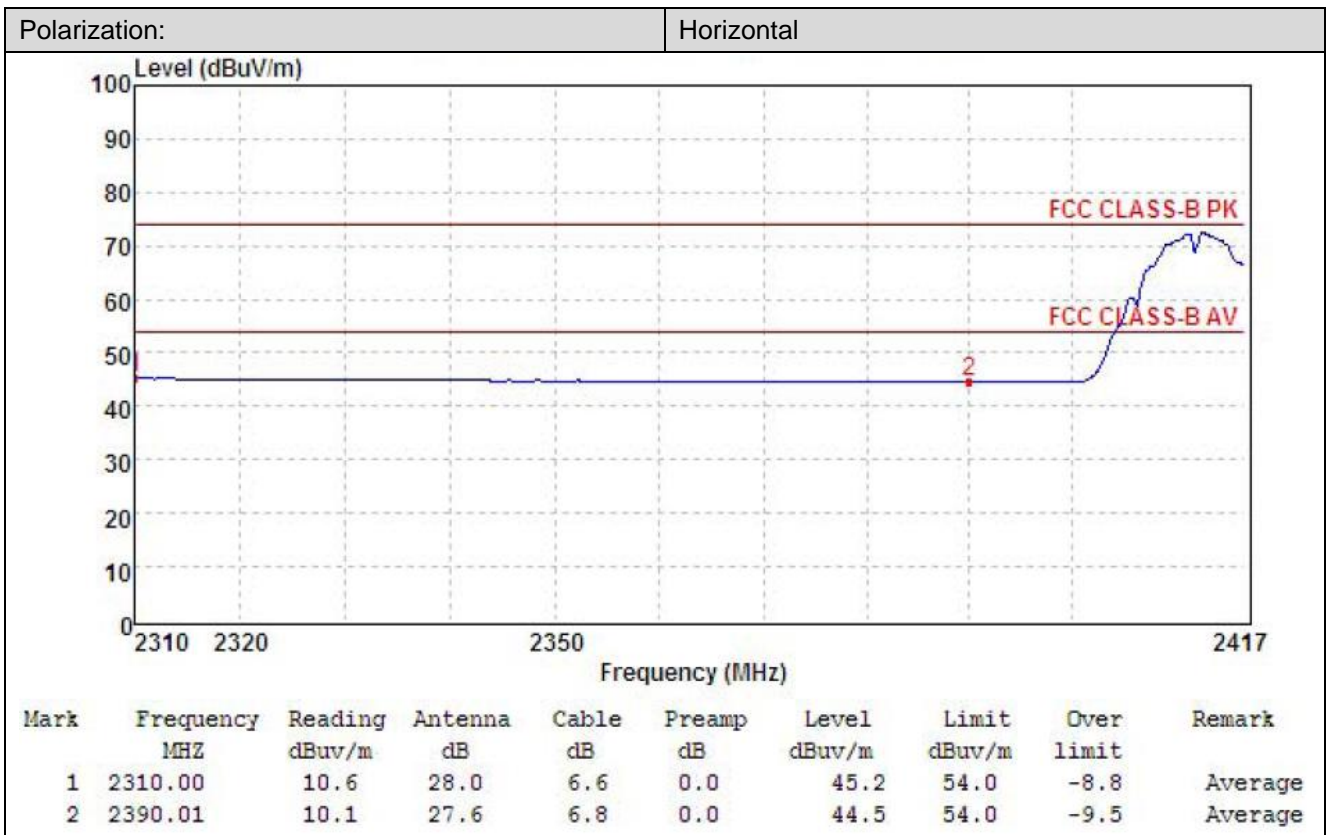
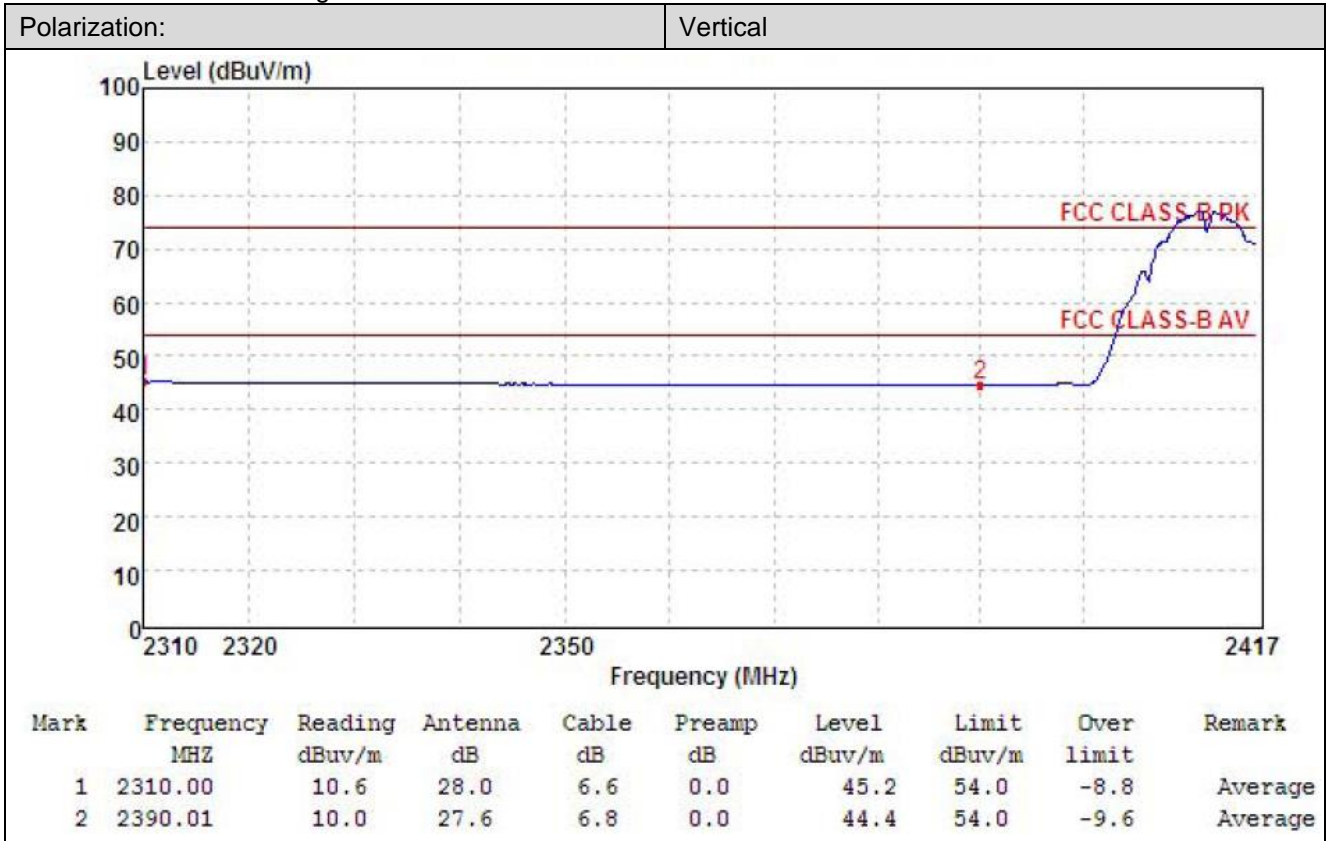
Note:

- 1) Final level= Read level + Antenna Factor+ Cable Loss- Preamp Factor

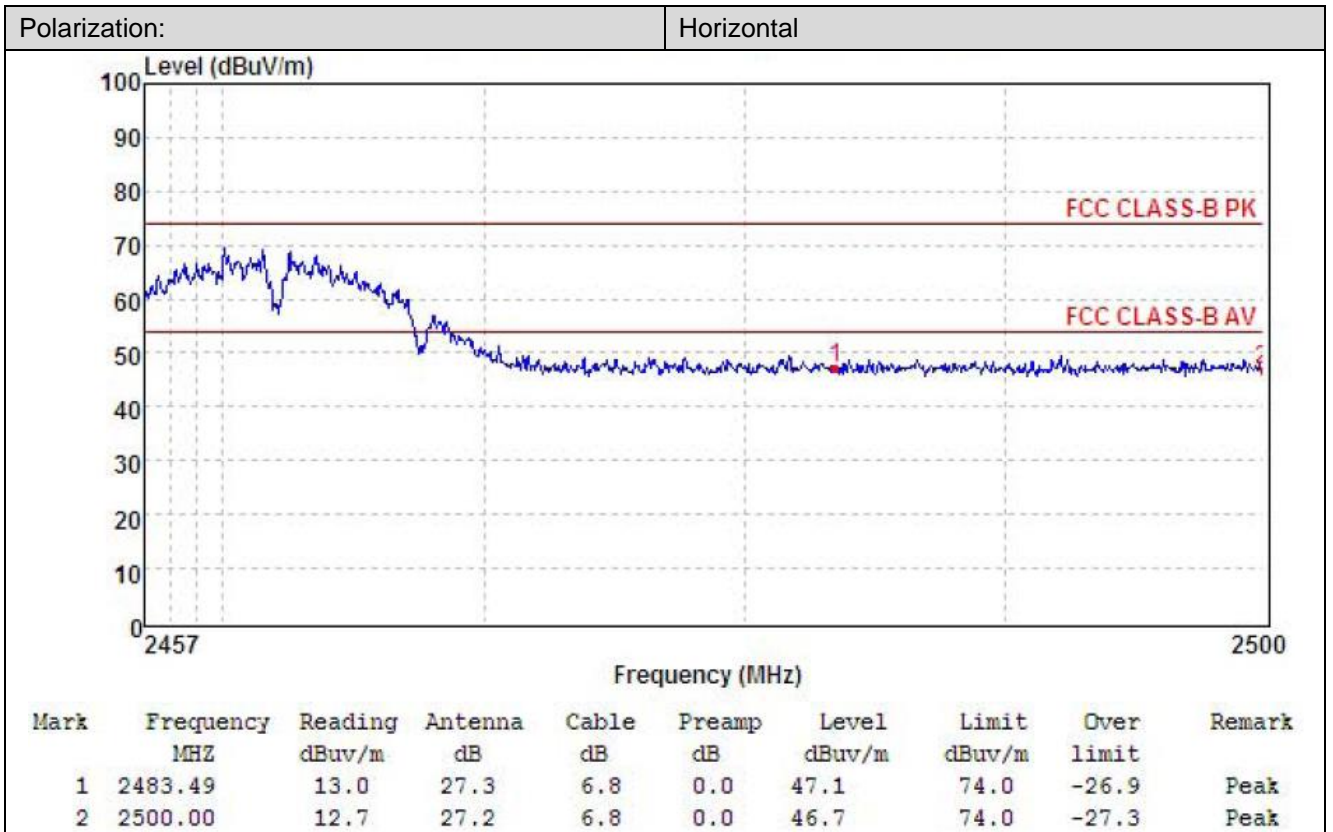
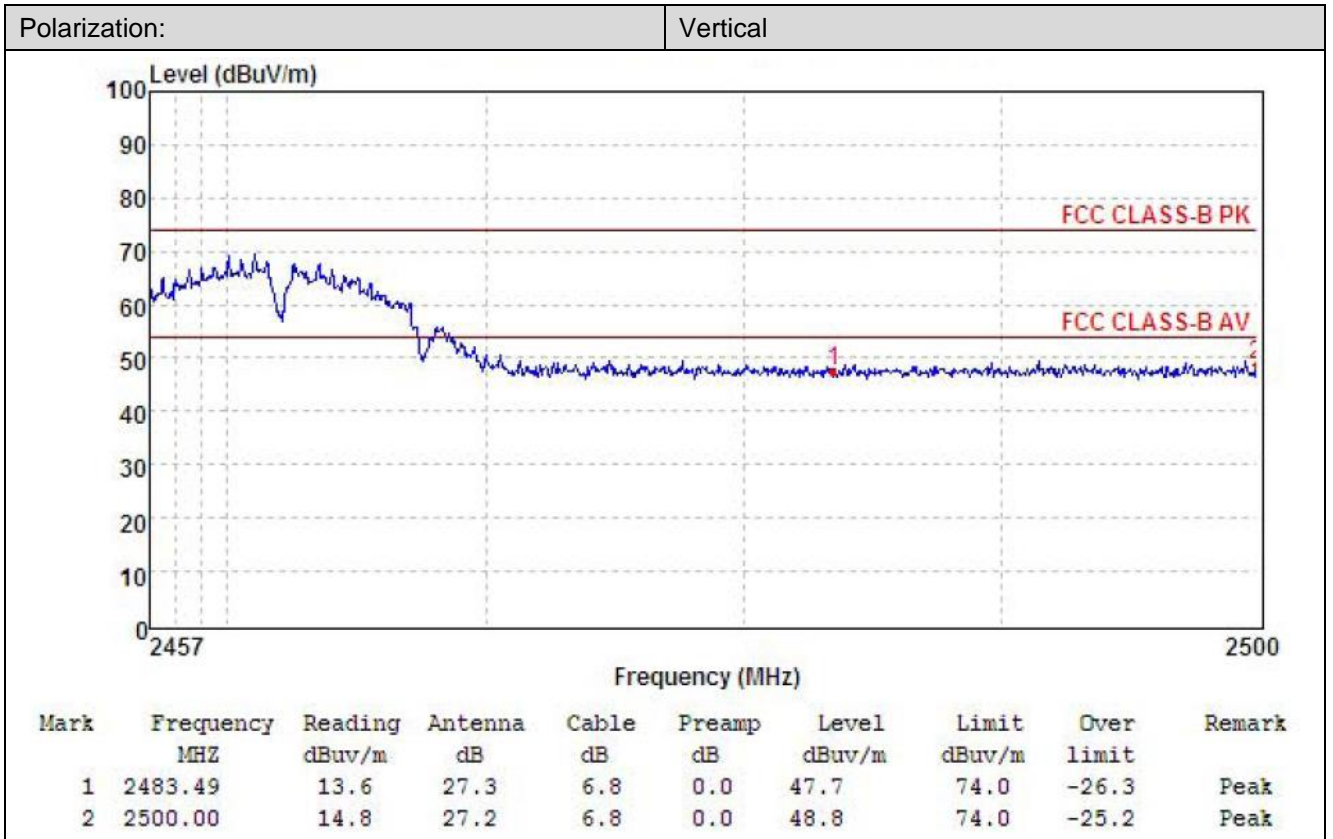
802.11b-2412MHz Peak:



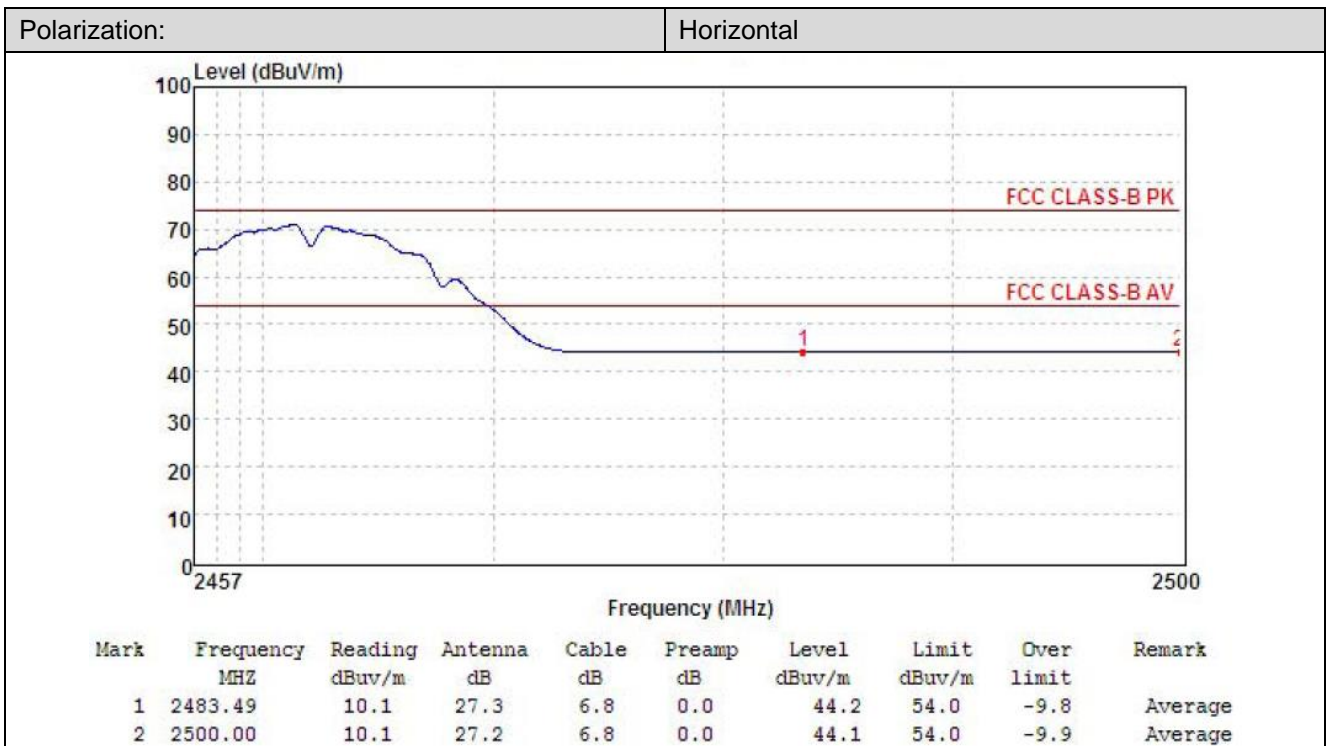
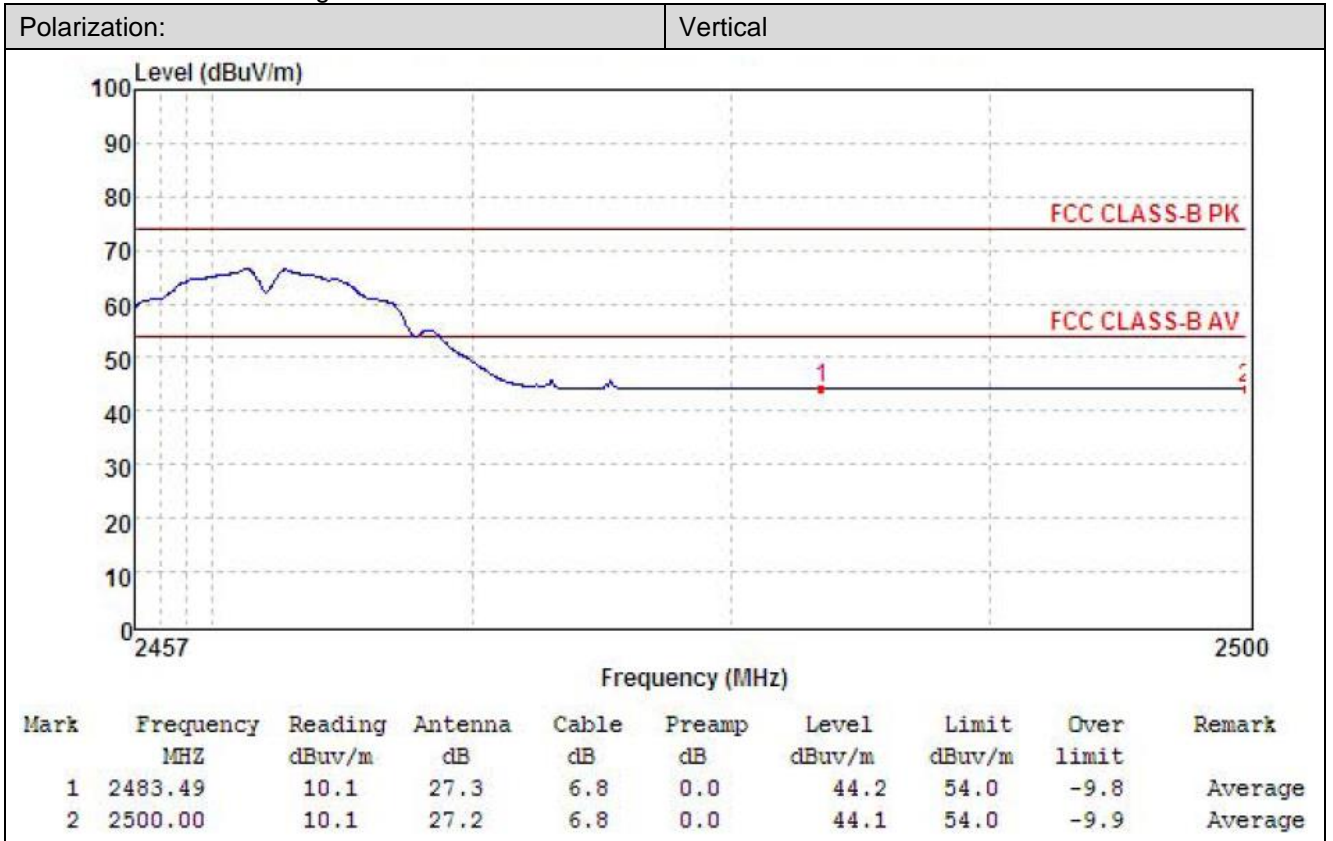
802.11b-2412MHz Average:



802.11b-2462MHz Peak:

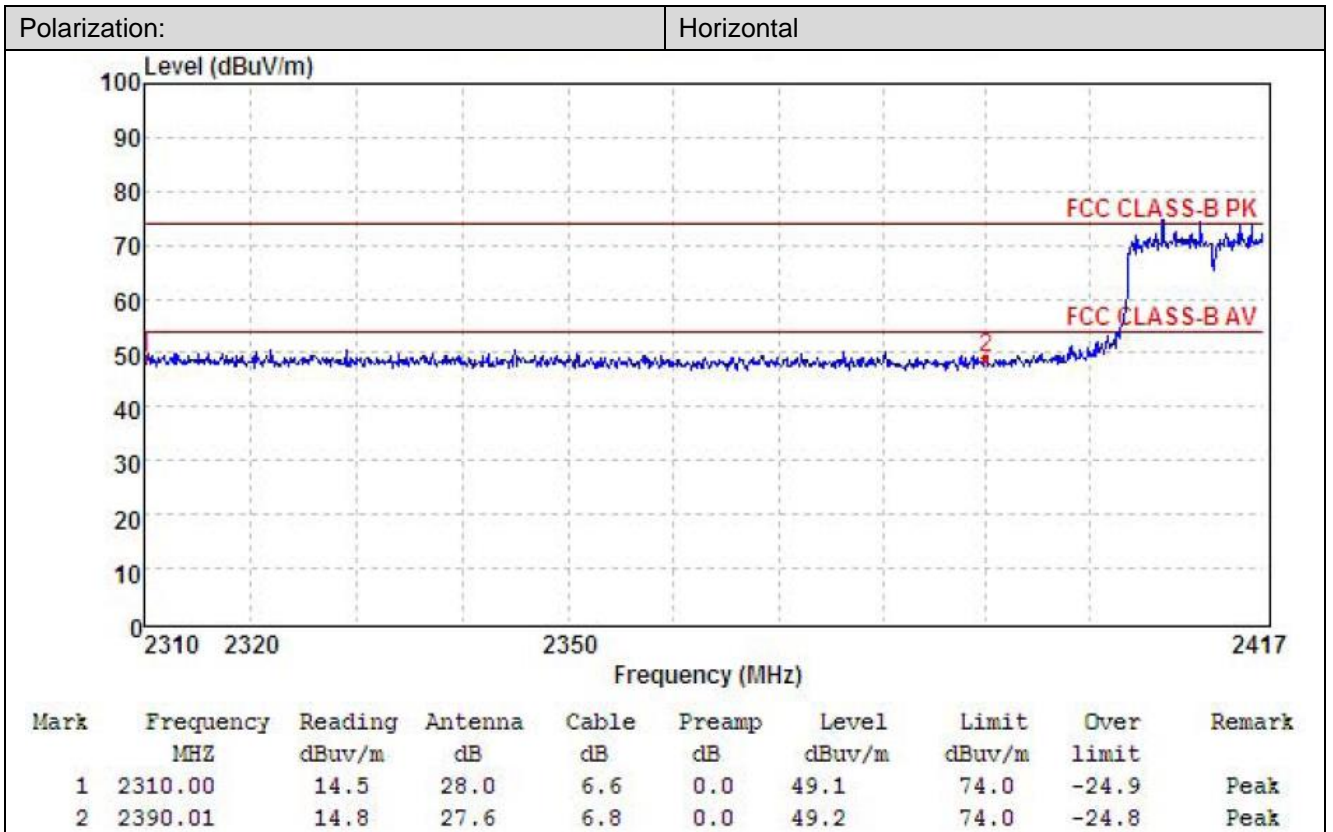
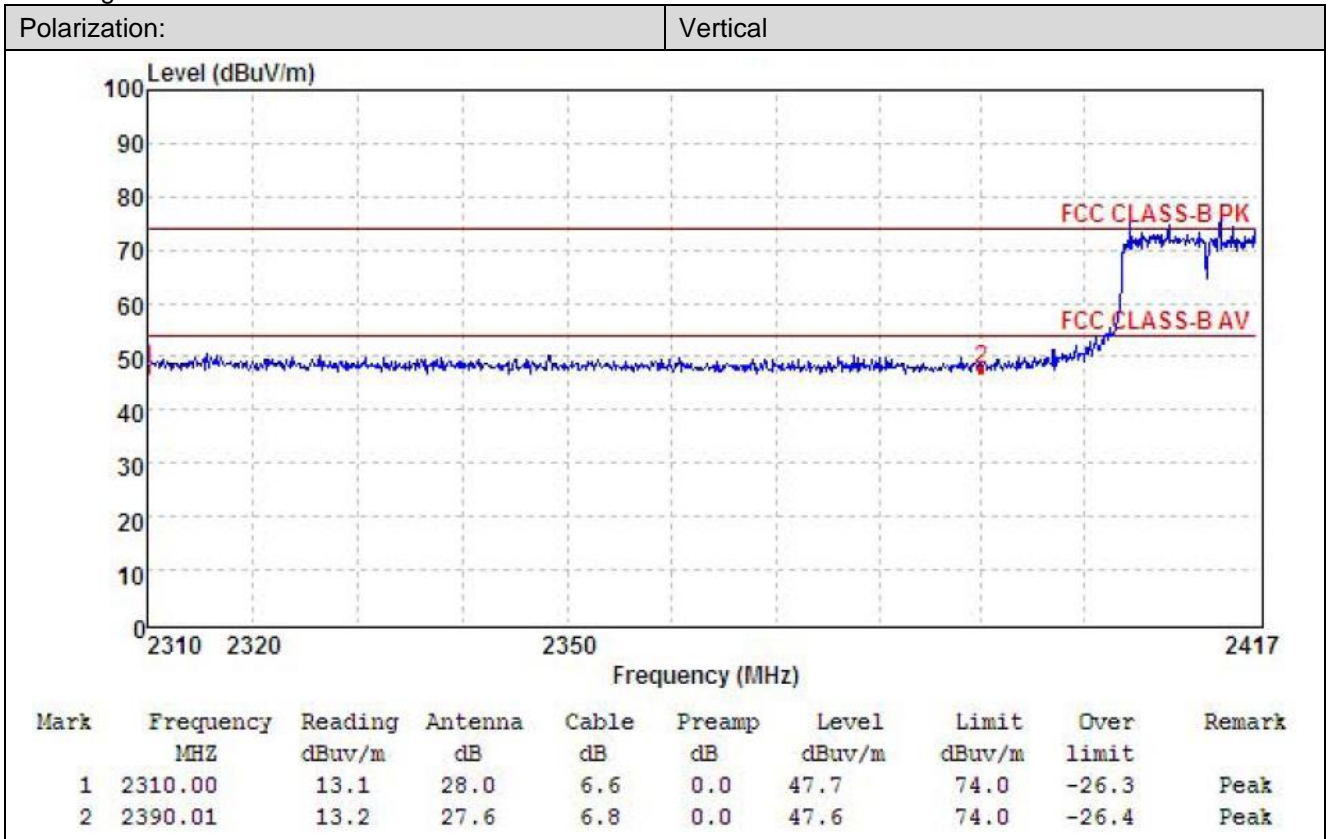


802.11b-2462MHz Average:

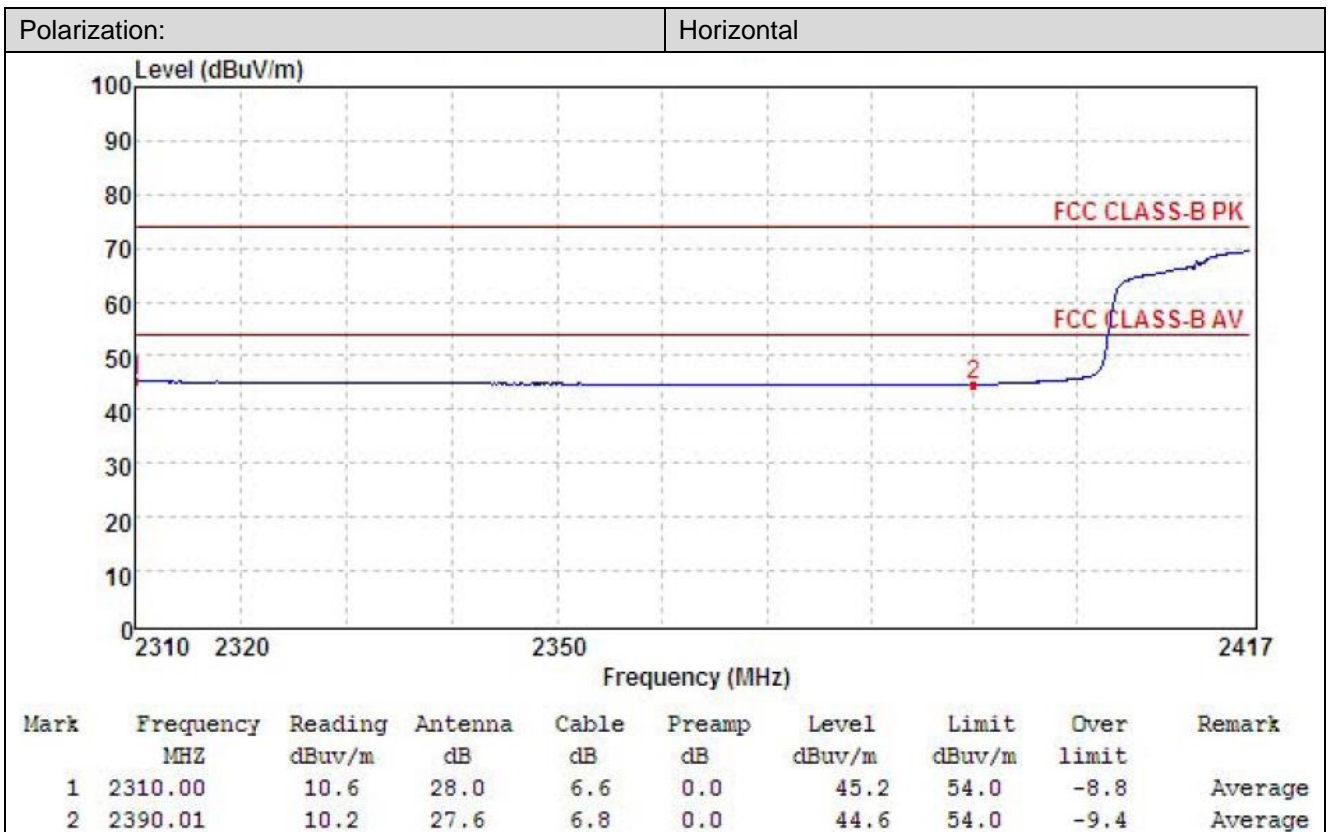
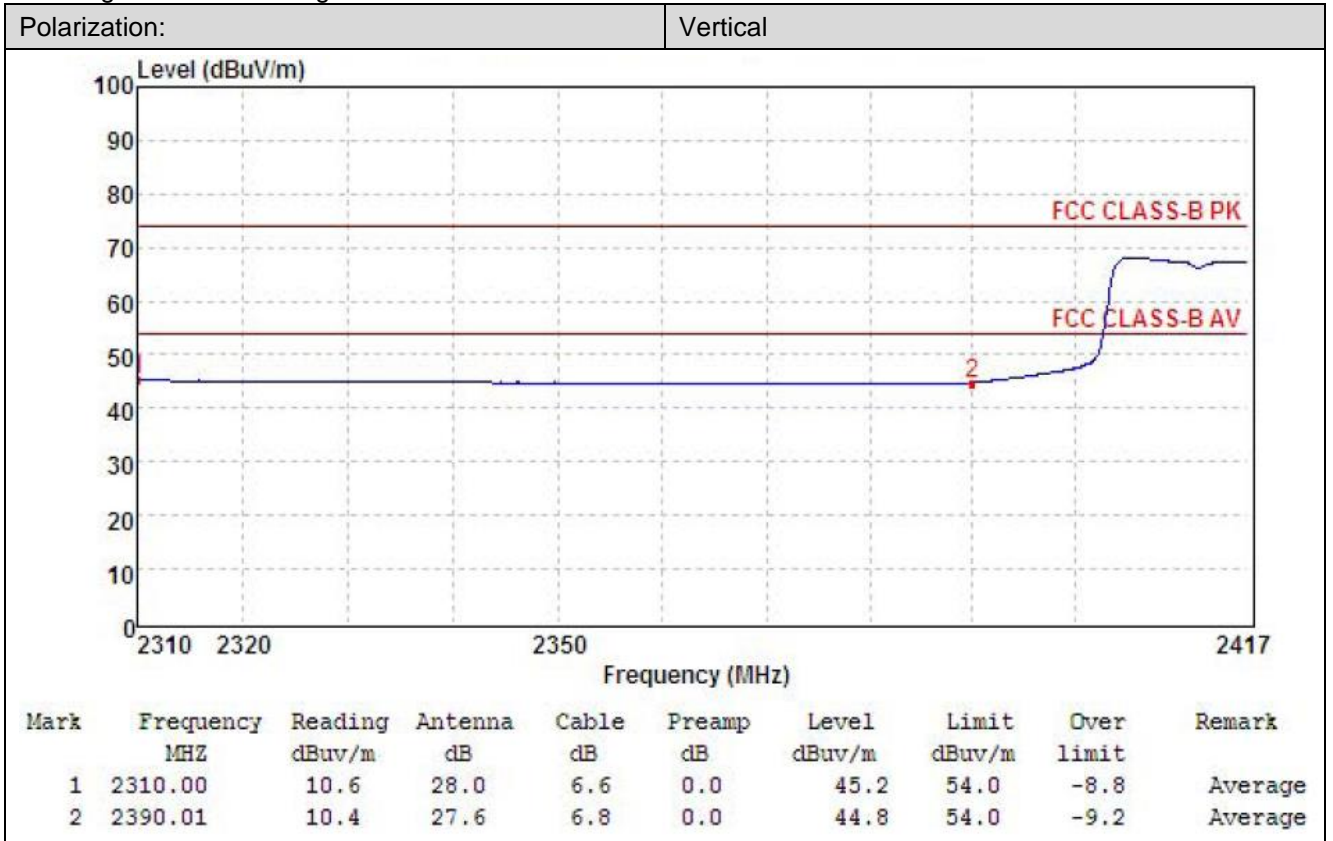




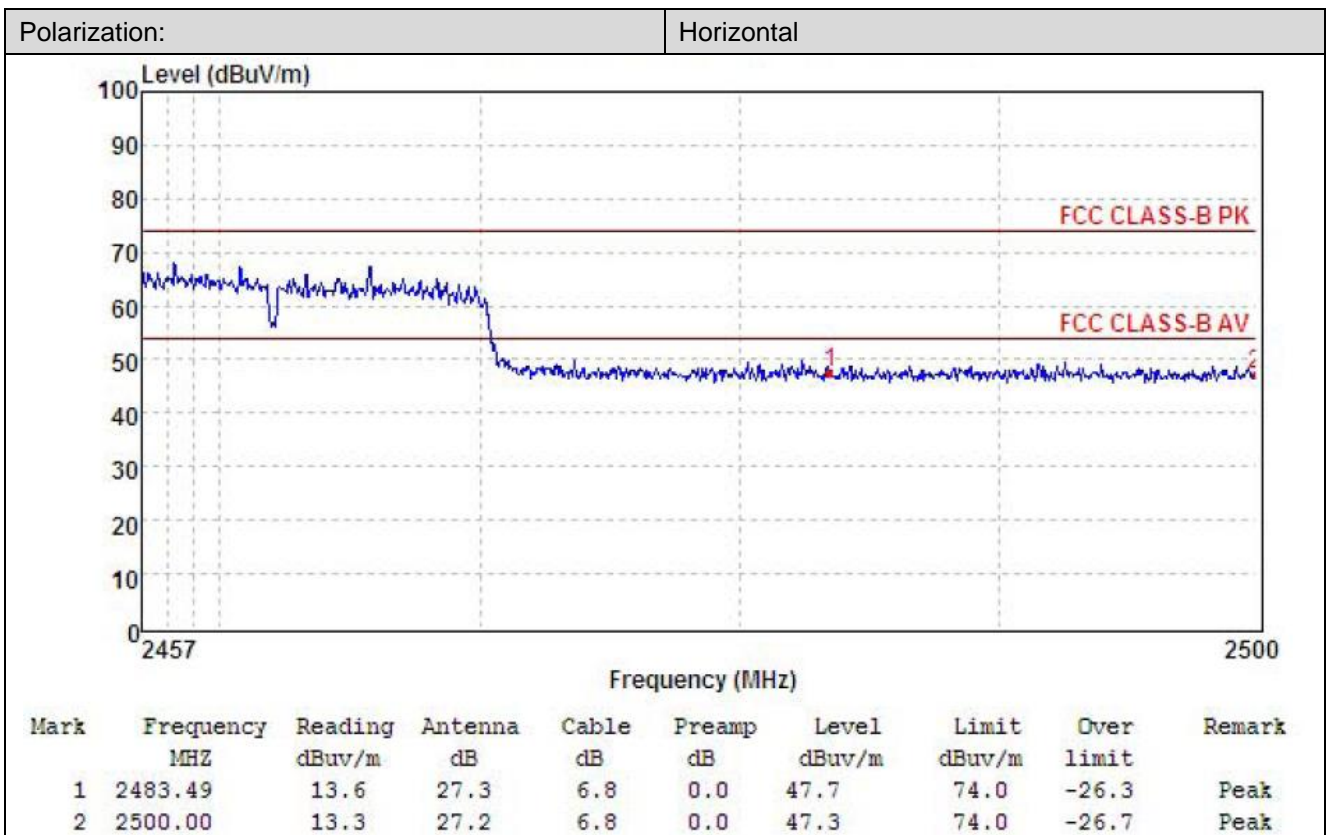
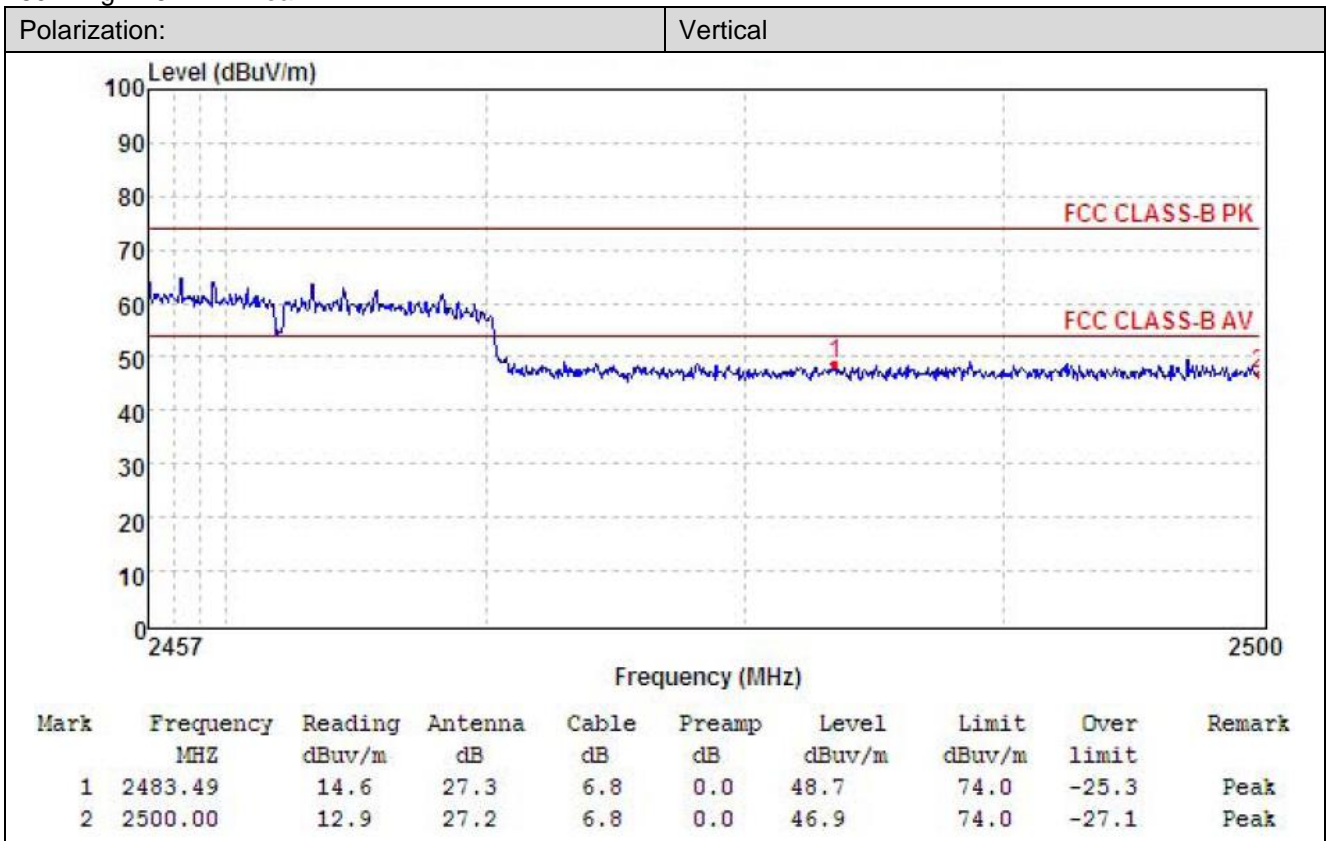
802.11g-2412MHz Peak:



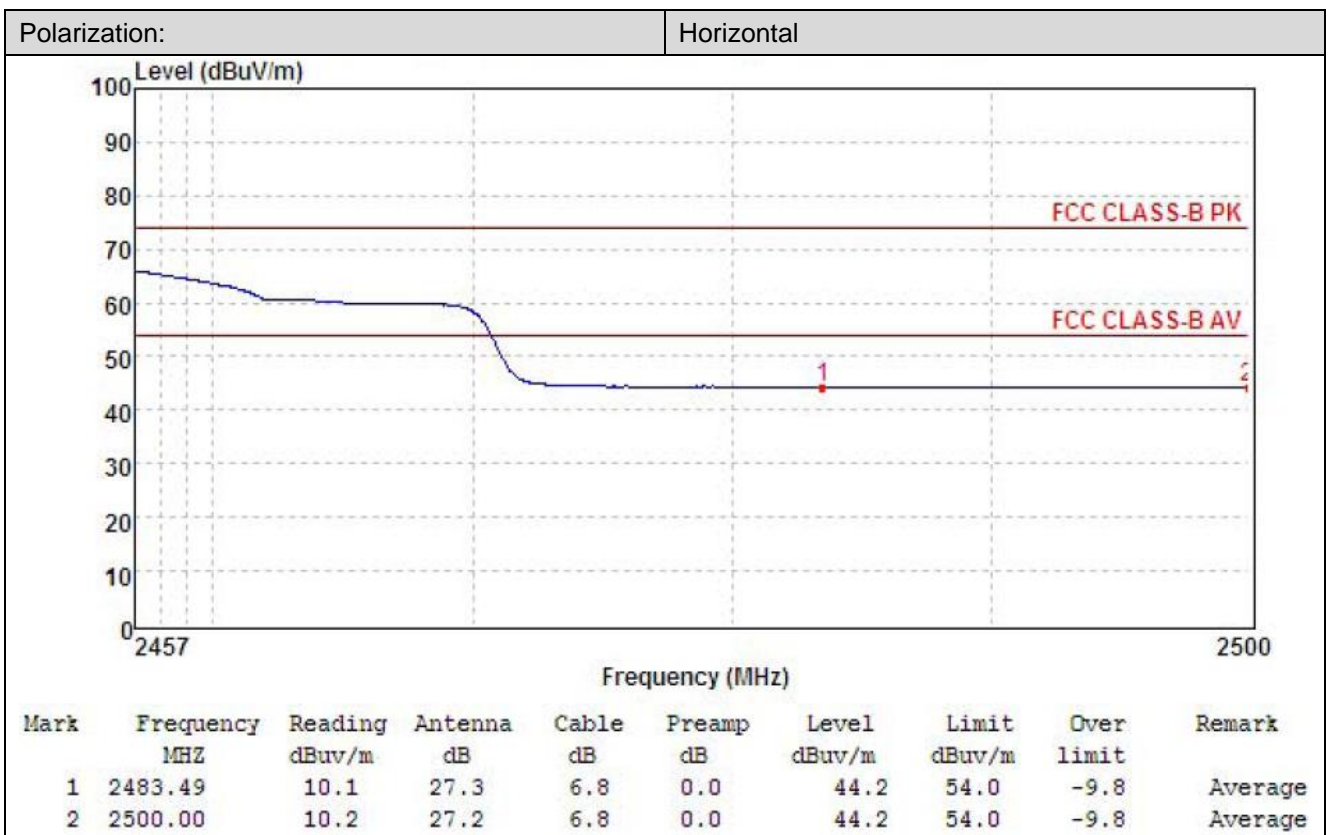
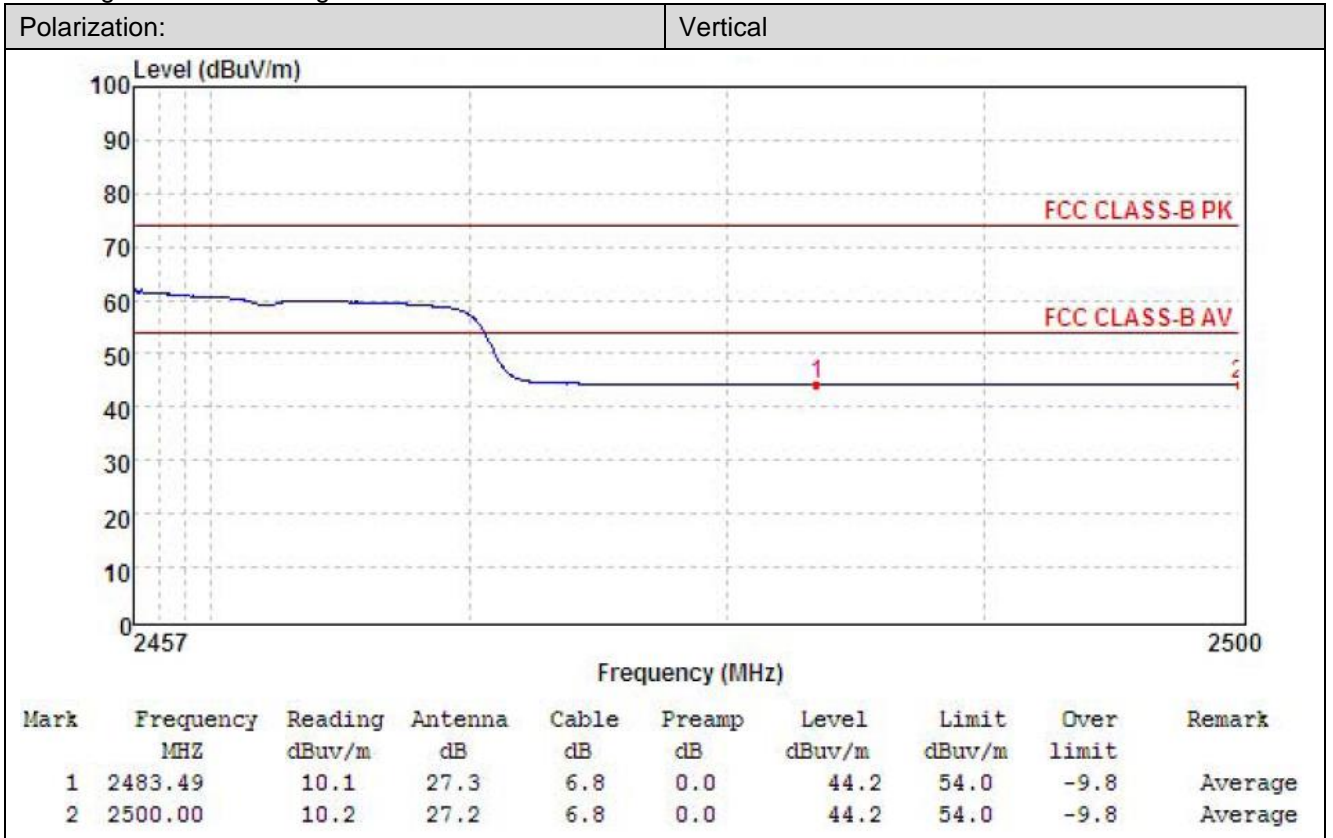
802.11g-2412MHz Average:



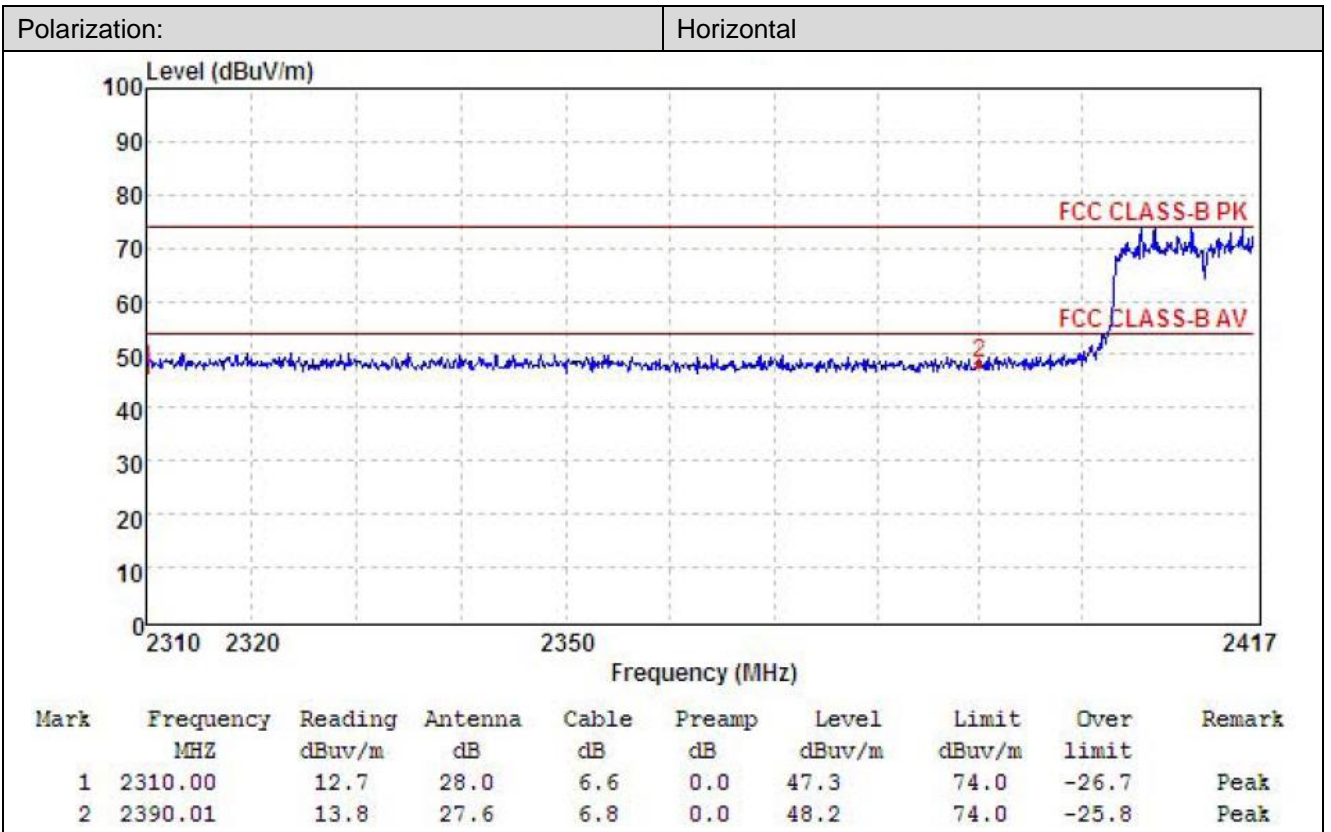
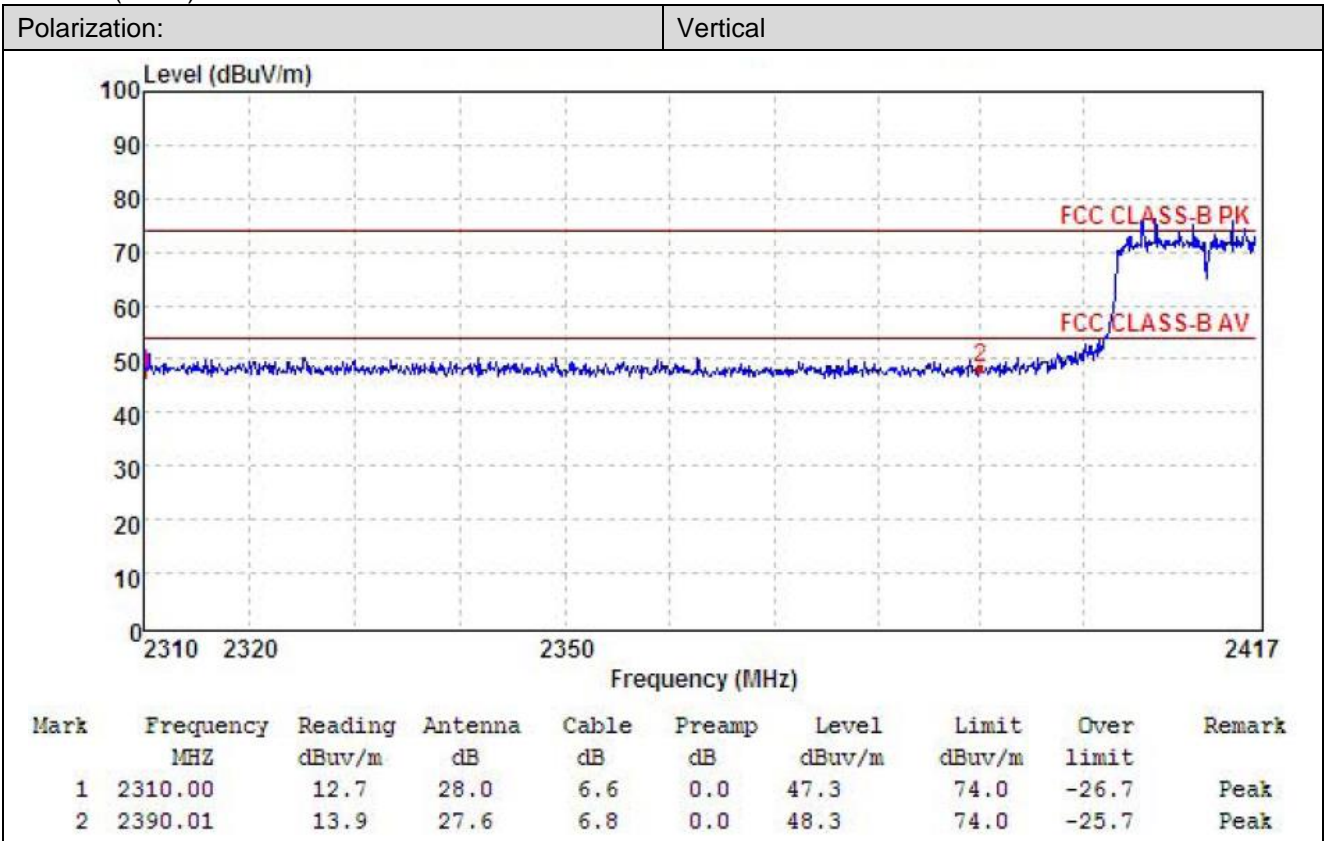
802.11g-2462MHz Peak:



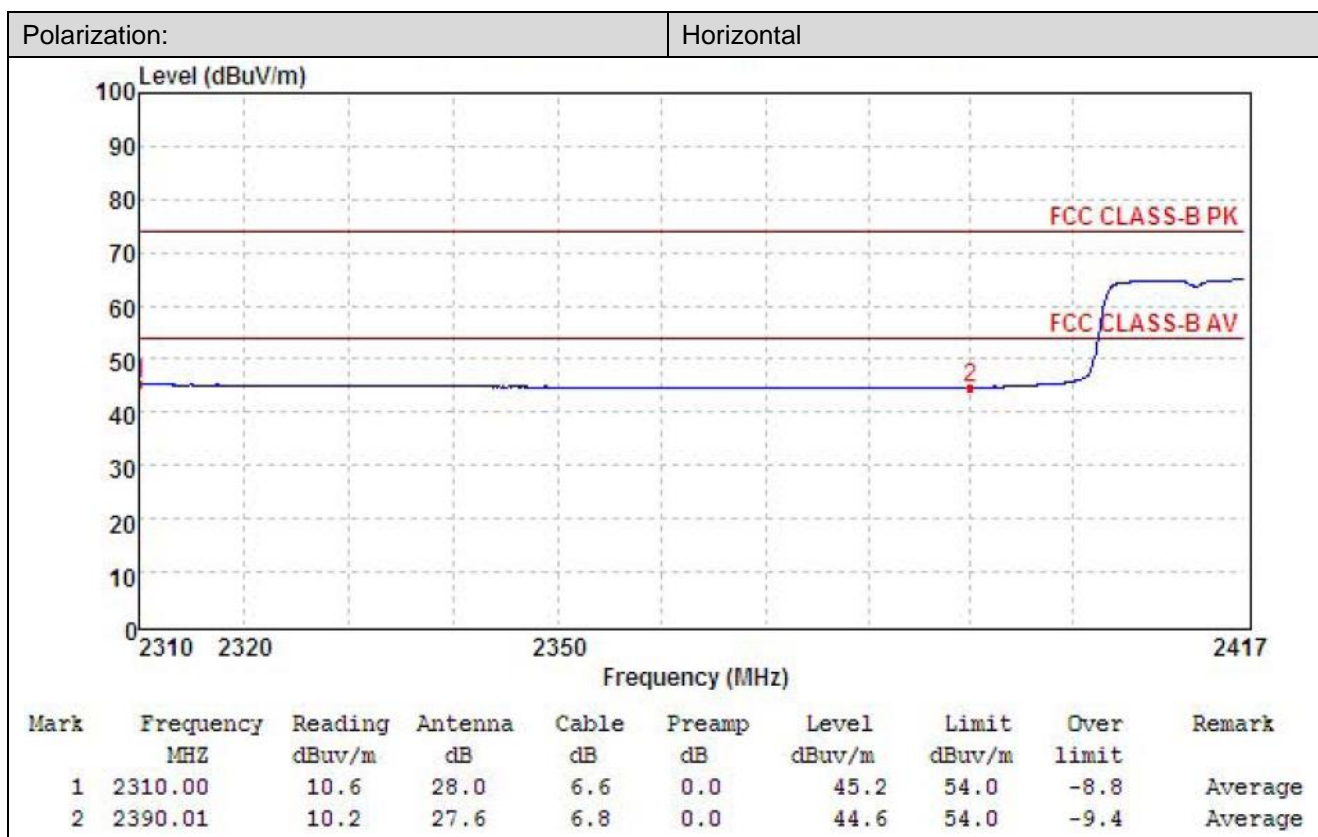
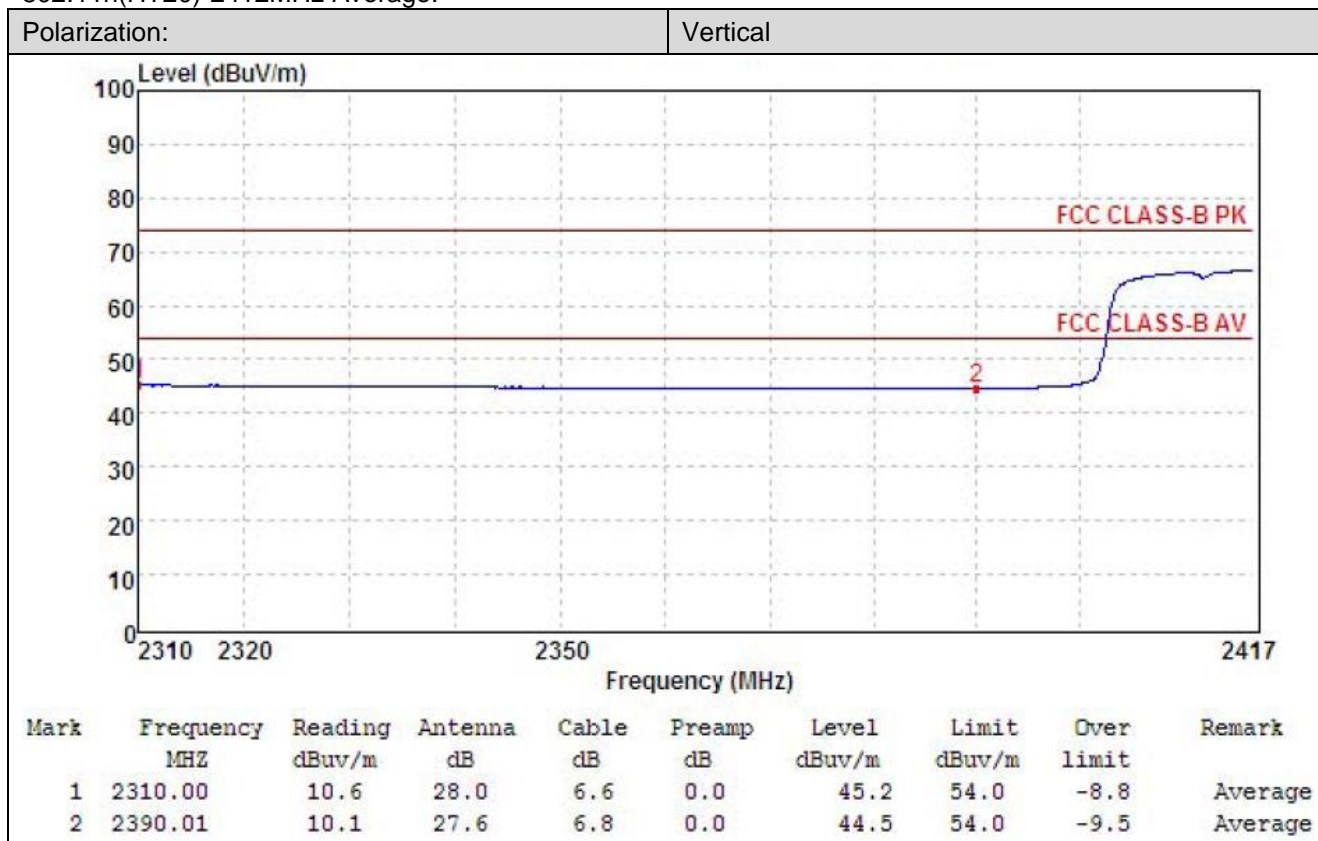
802.11g-2462MHz Average:



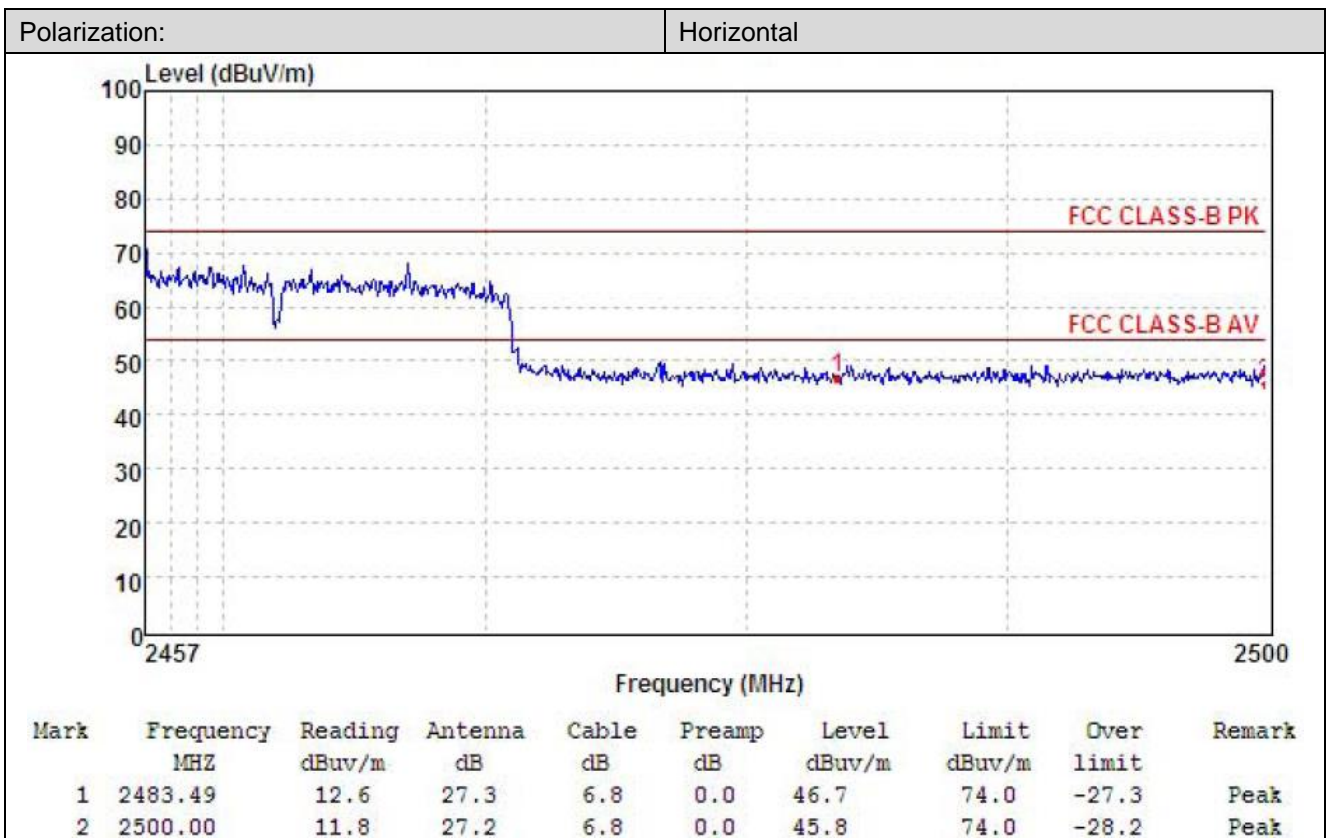
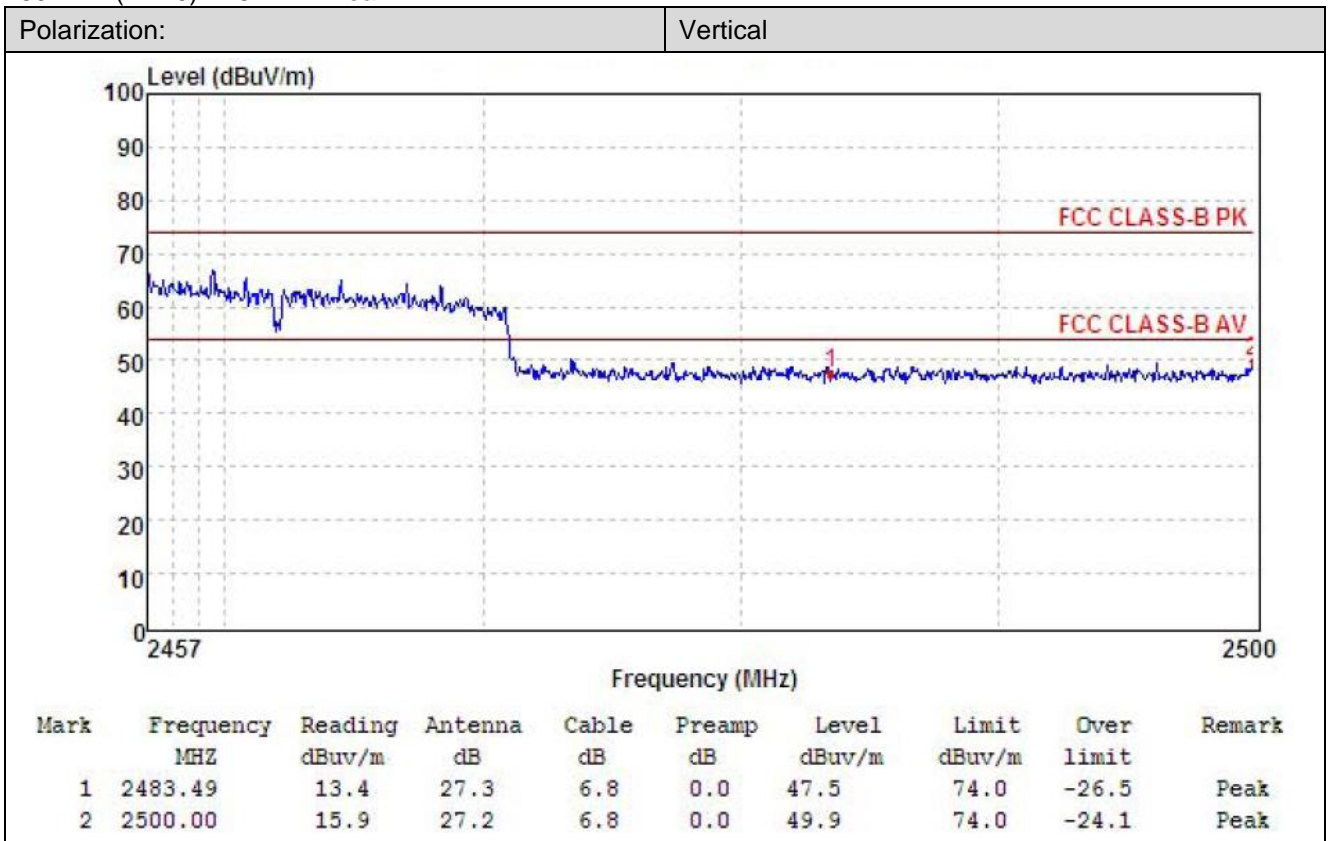
802.11n(HT20)-2412MHz Peak:



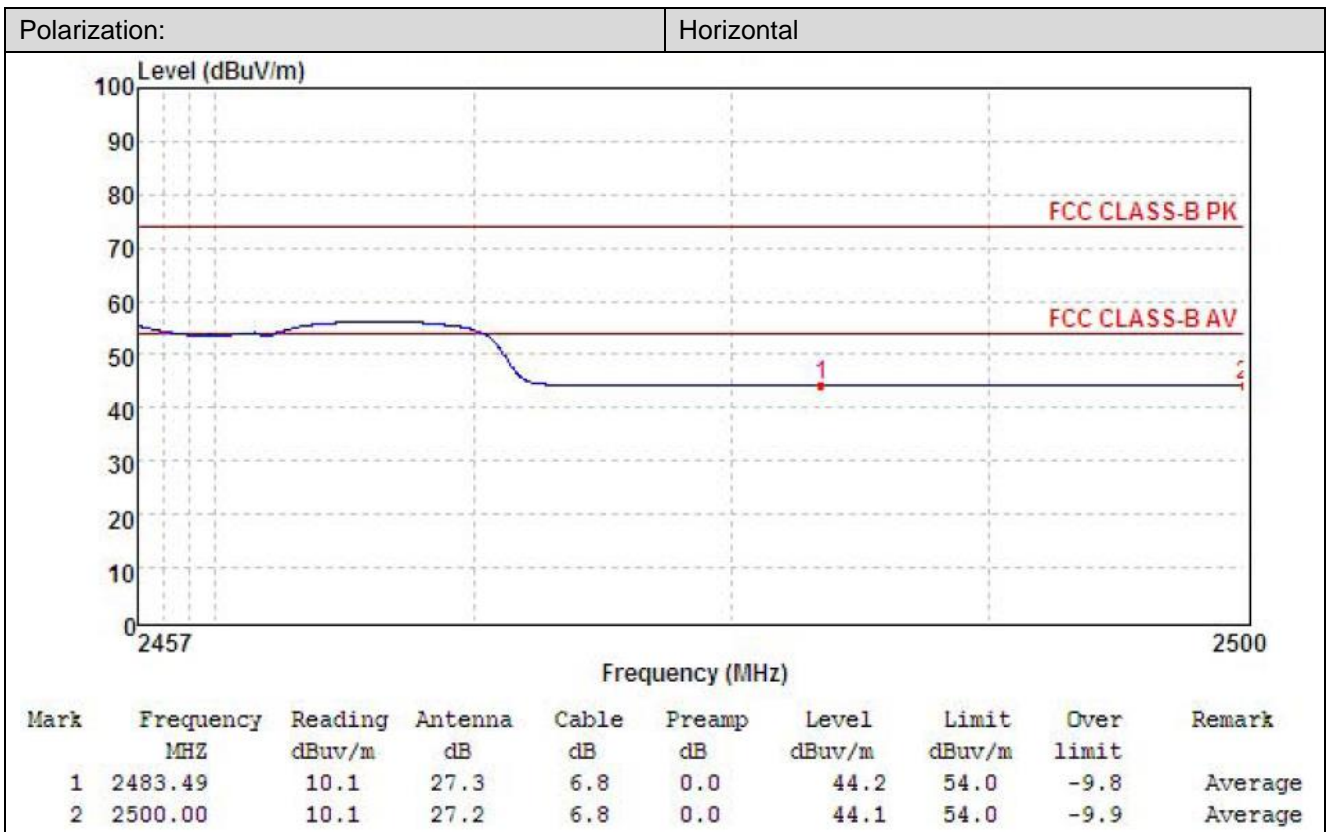
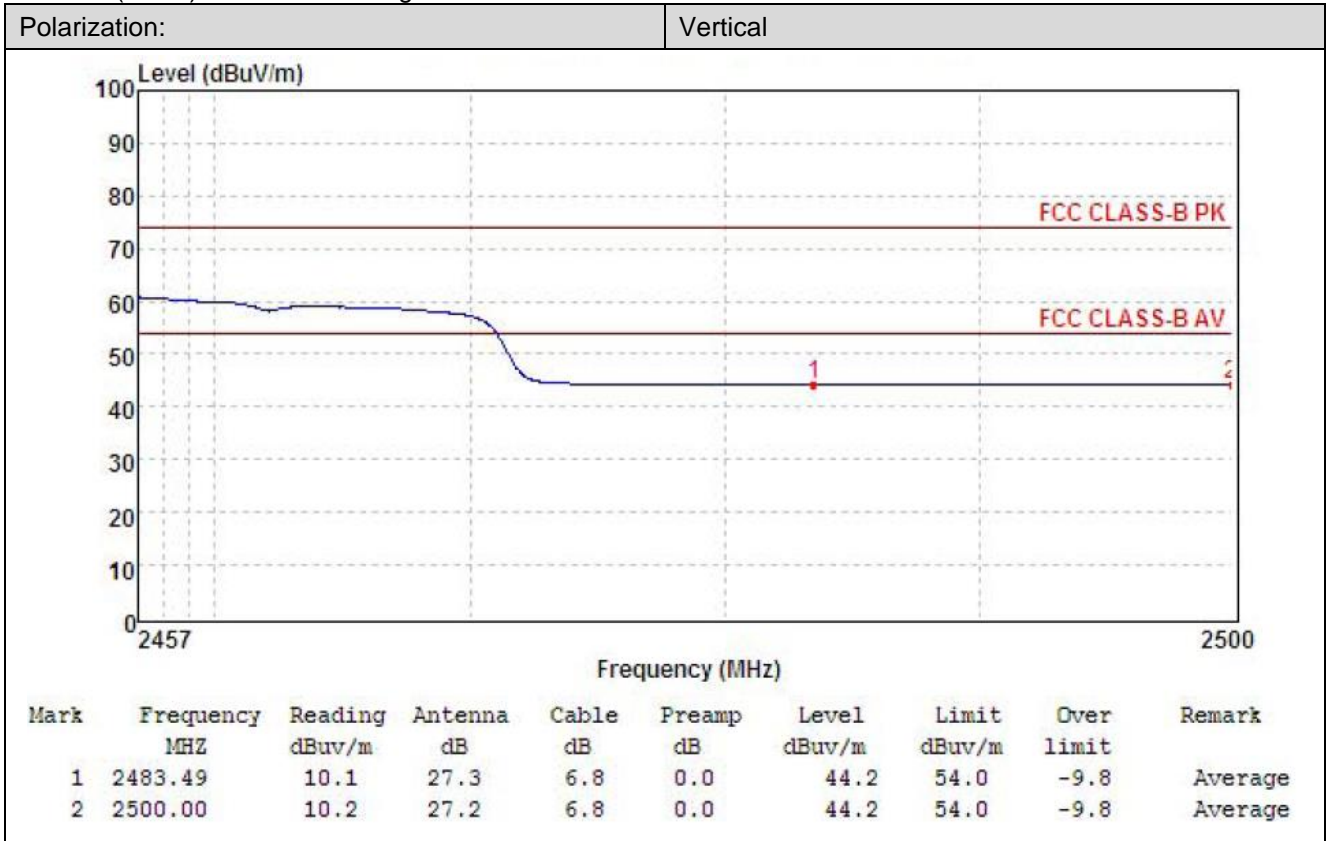
802.11n(HT20)-2412MHz Average:



802.11n(HT20)-2462MHz Peak:

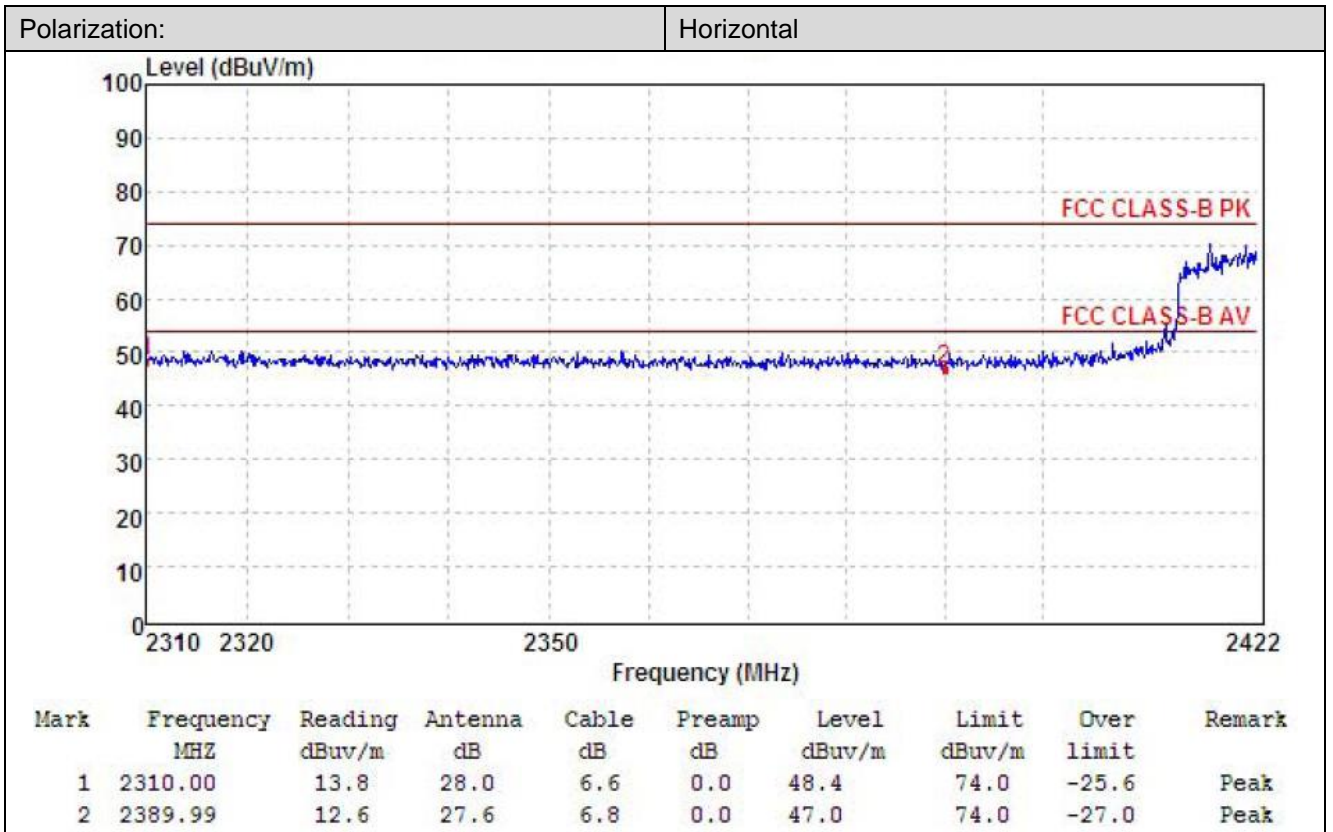
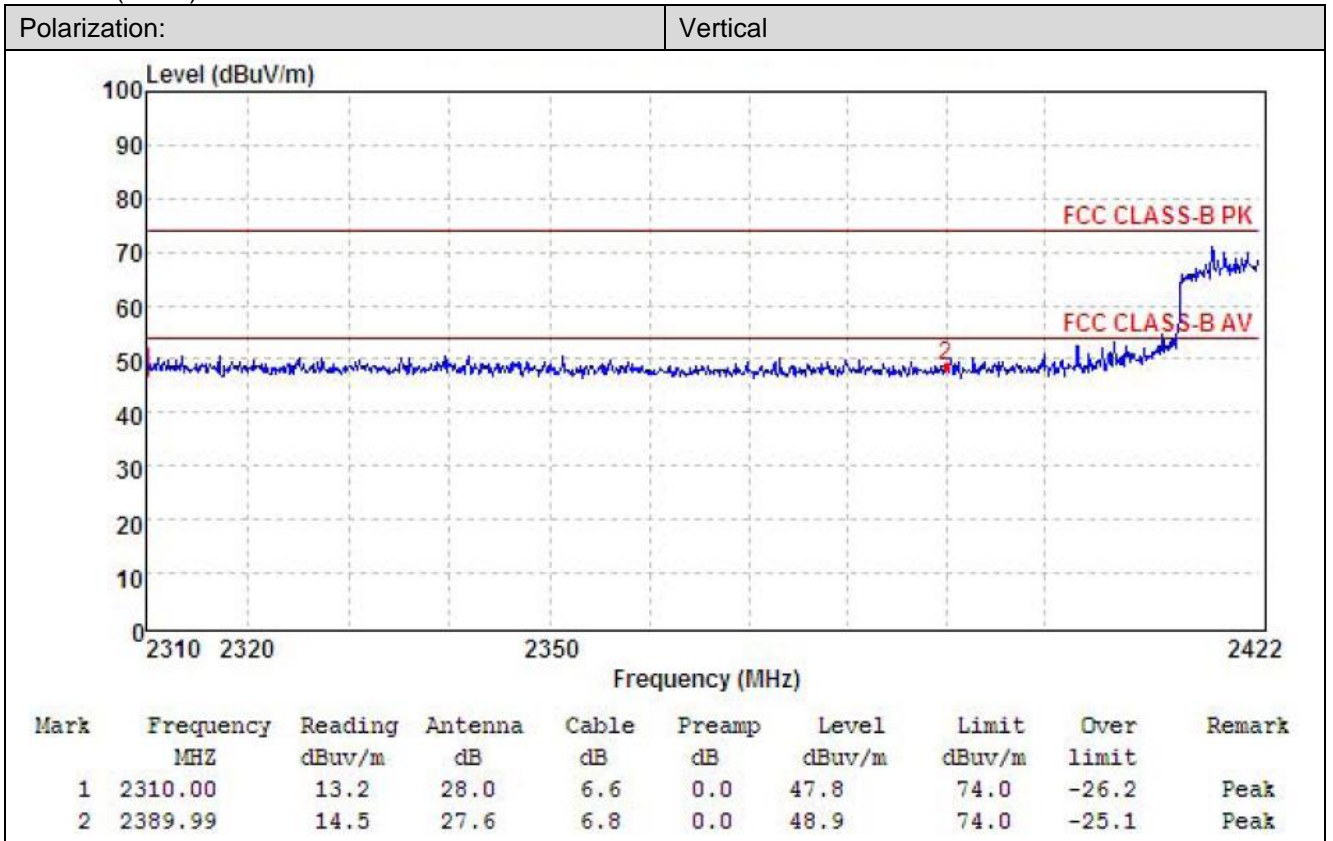


802.11n(HT20)-2462MHz Average:

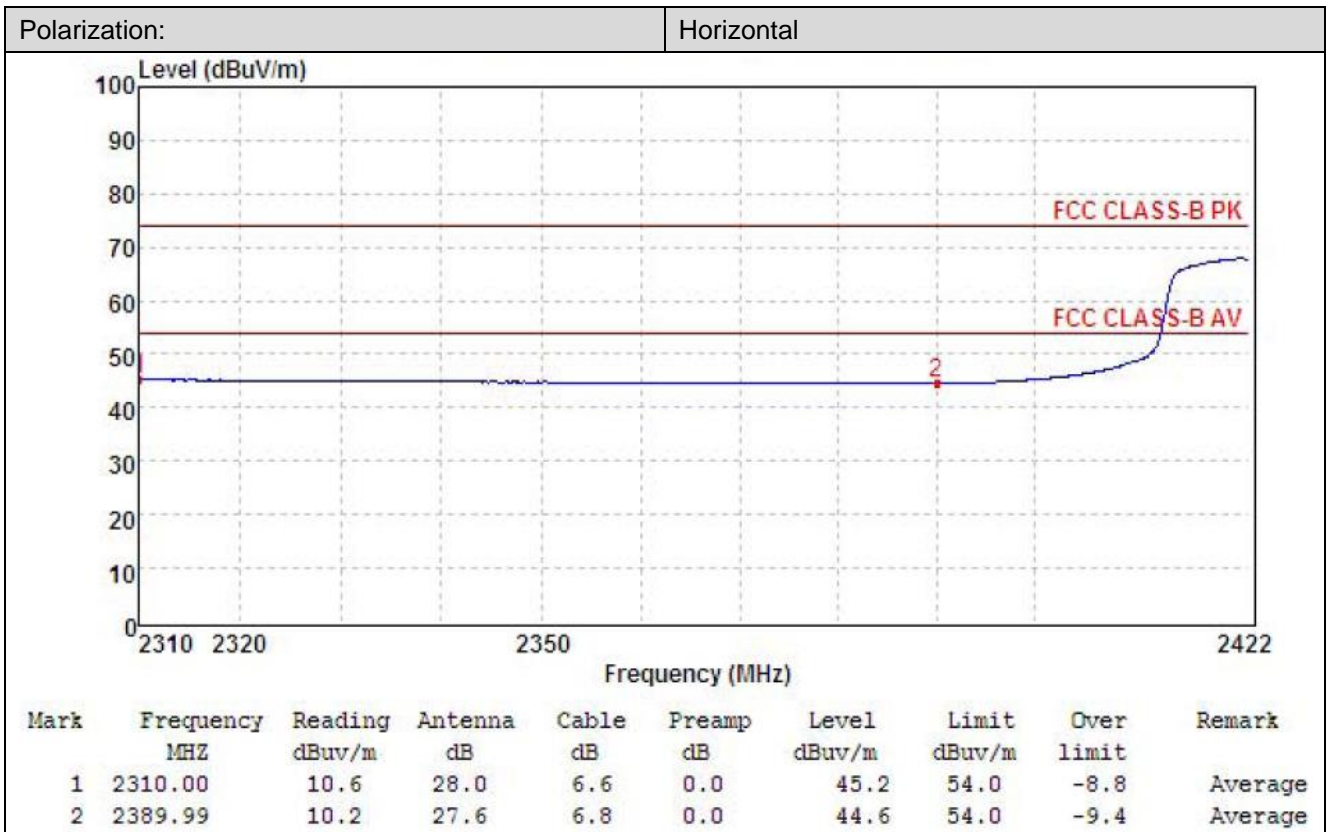
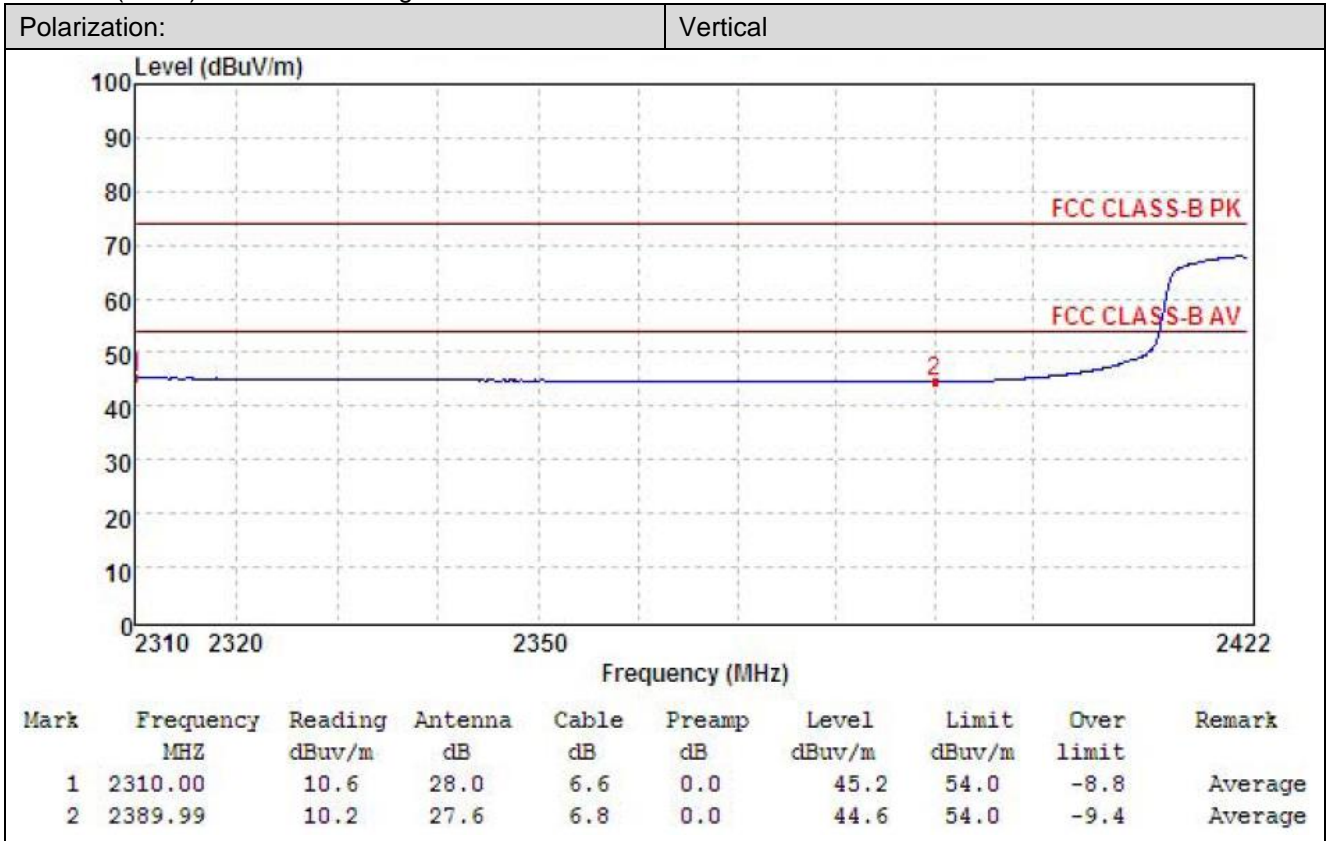




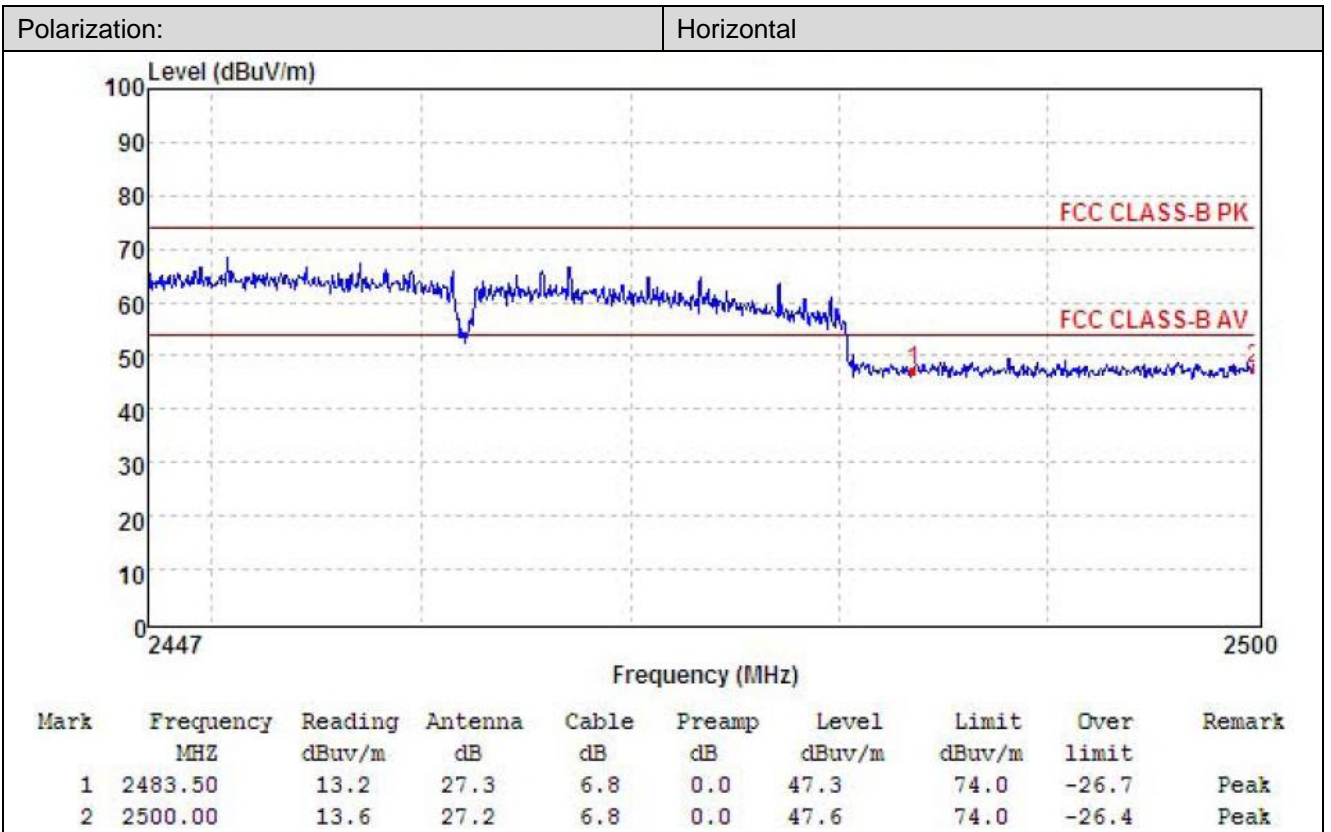
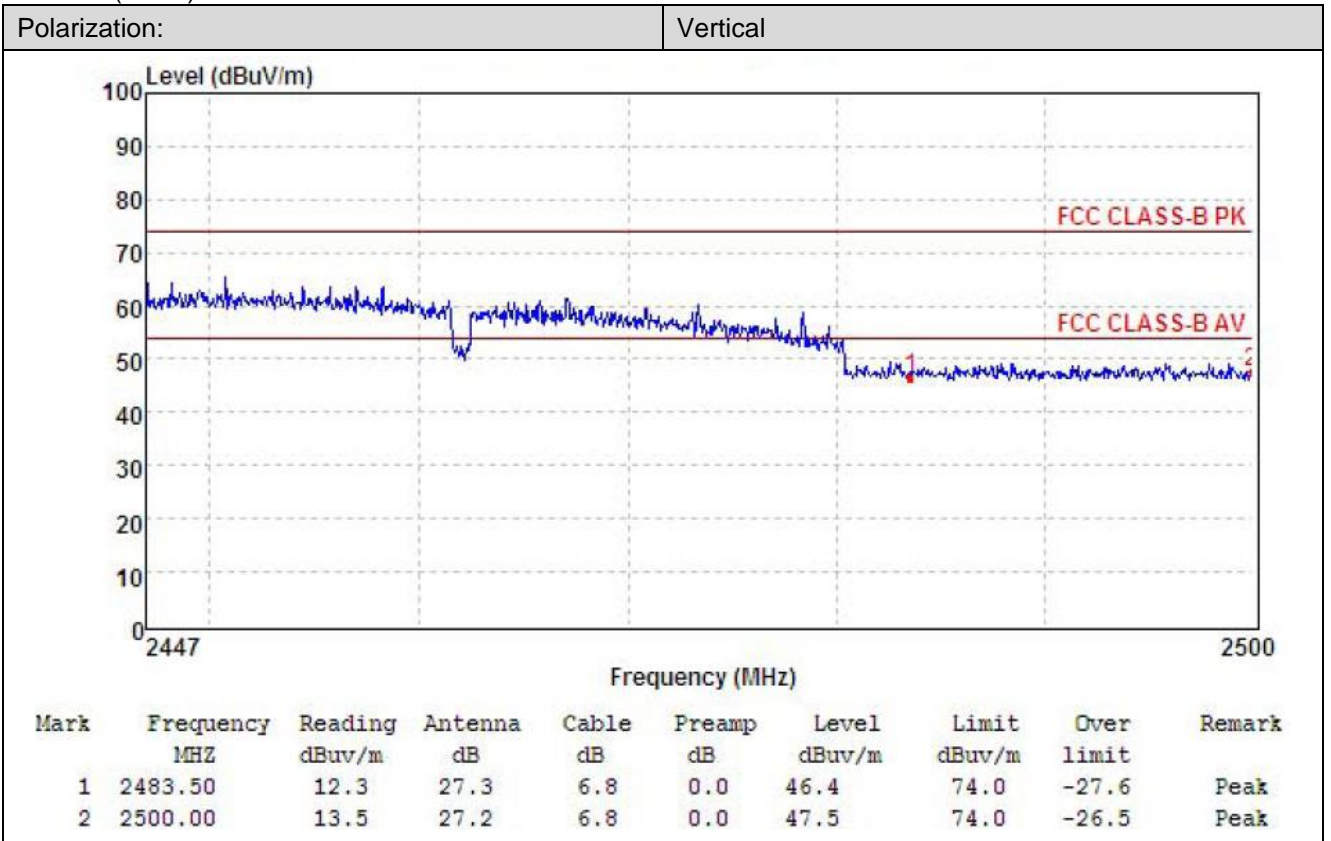
802.11n(HT40)-2422MHz Peak:



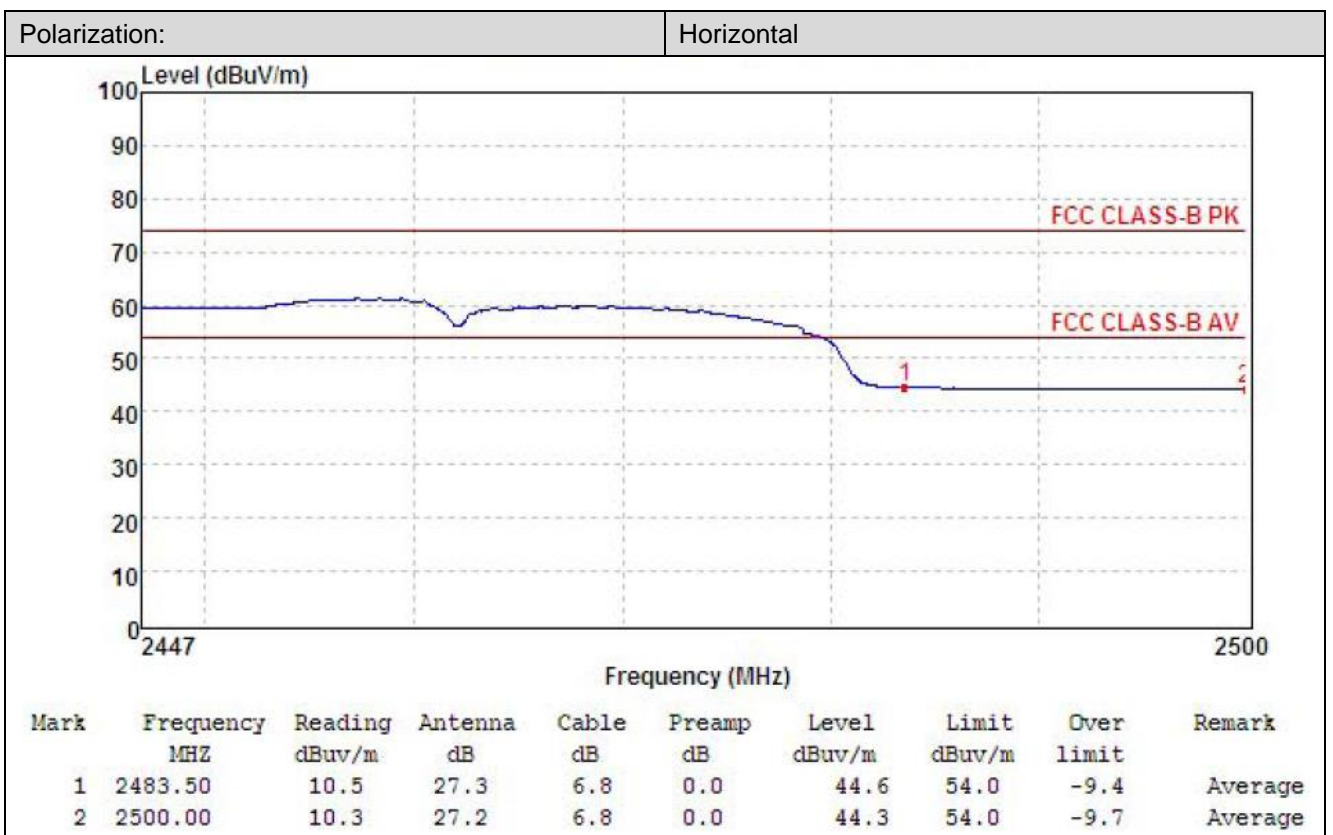
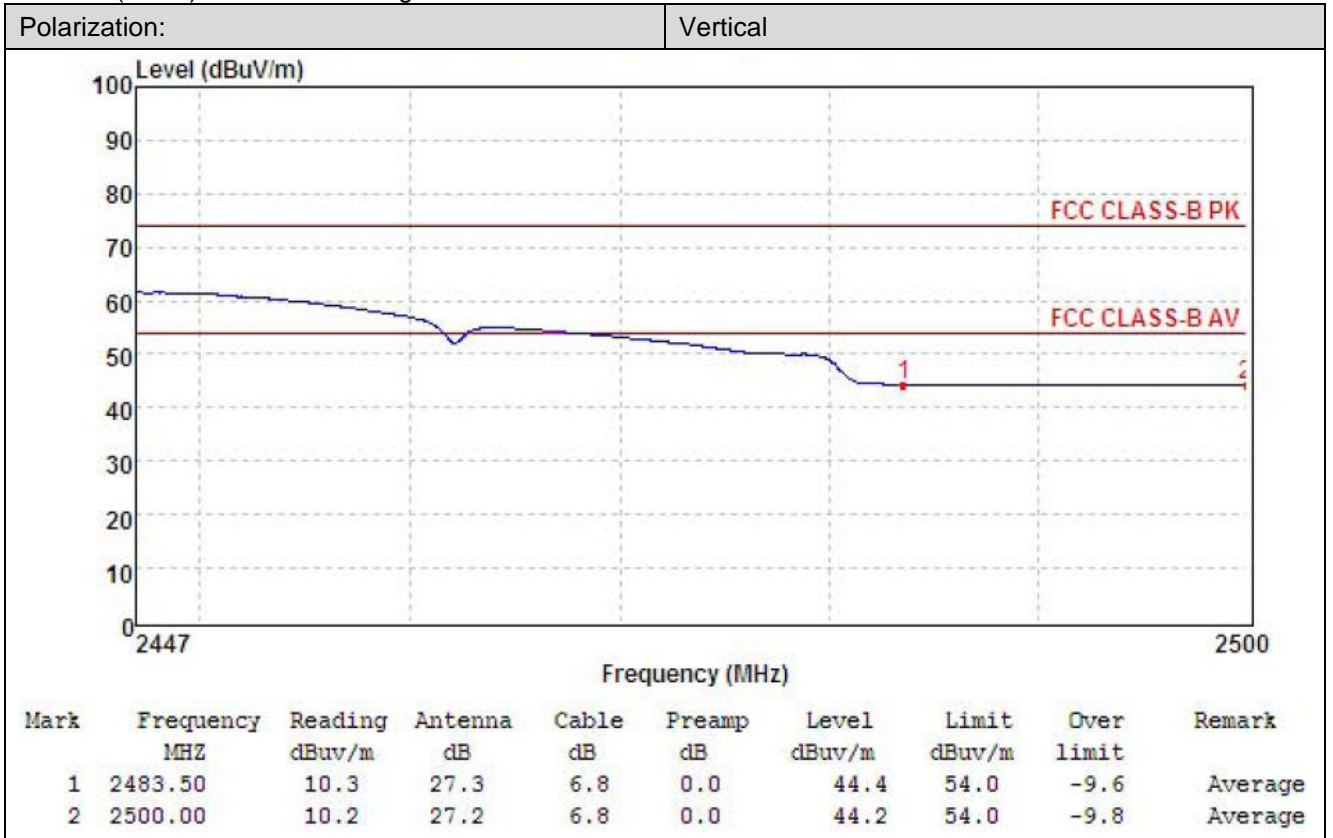
802.11n(HT40)-2422MHz Average:



802.11n(HT40)-2452MHz Peak:



802.11n(HT40)-2452MHz Average:



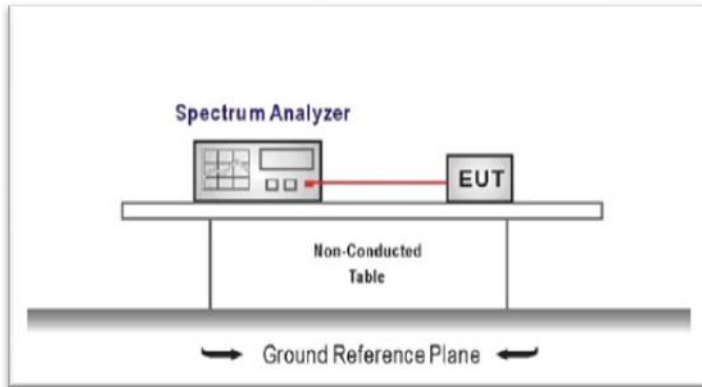
## 5.7. Band edge and Spurious Emissions (conducted)

### LIMIT

#### **FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Establish a reference level by using the following procedure  
Center frequency=DTS channel center frequency  
The span = 1.5 times the DTS bandwidth.  
RBW = 100 kHz, VBW  $\geq$  3 x RBW  
Detector = peak, Sweep time = auto couple, Trace mode = max hold  
Allow trace to fully stabilize  
Use the peak marker function to determine the maximum PSD level

Note: the channel found to contain the maximum PSD level can be used to establish the reference level.

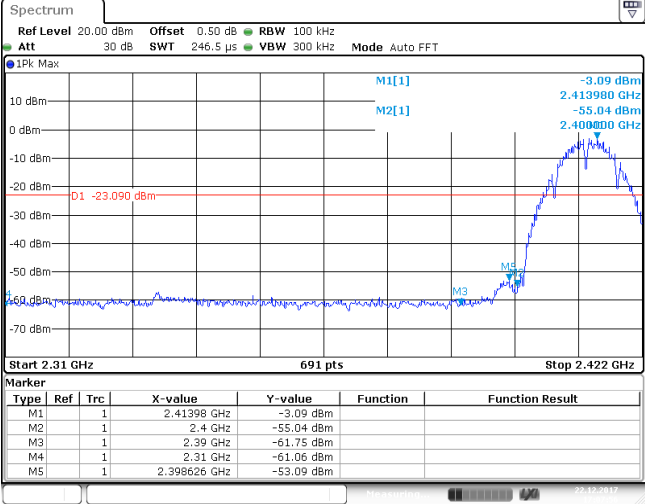
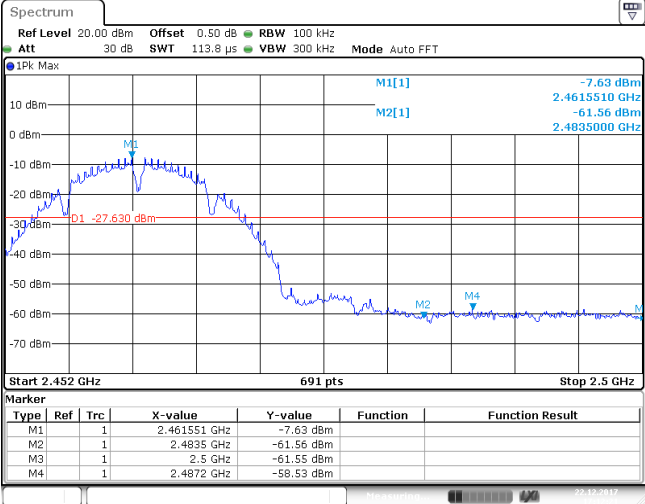
3. Emission level measurement  
Set the center frequency and span to encompass frequency range to be measured  
RBW = 100 kHz, VBW  $\geq$  3 x RBW  
Detector = peak, Sweep time = auto couple, Trace mode = max hold  
Allow trace to fully stabilize  
Use the peak marker function to determine the maximum amplitude level.
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
5. Ensure that the amplitude of all unwanted emission outside of the authorized frequency band excluding restricted frequency bands) are attenuated by at least the minimum requirements specified (at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz). Report the three highest emission relative to the limit.

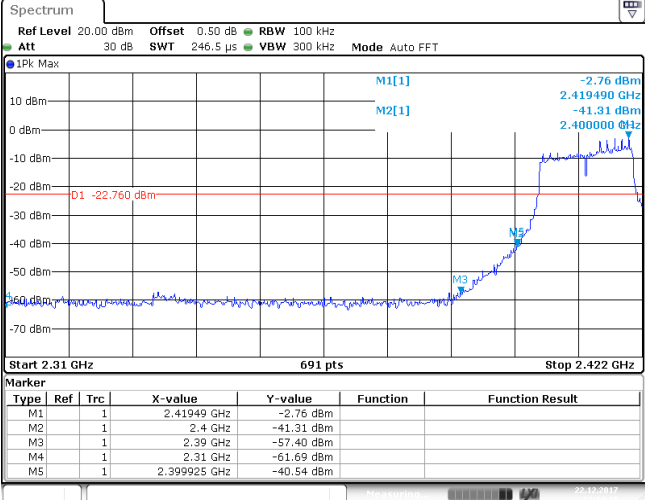
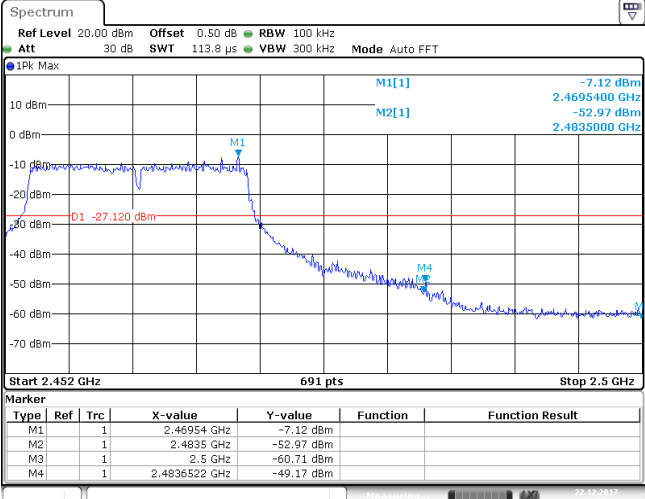
### TEST MODE:

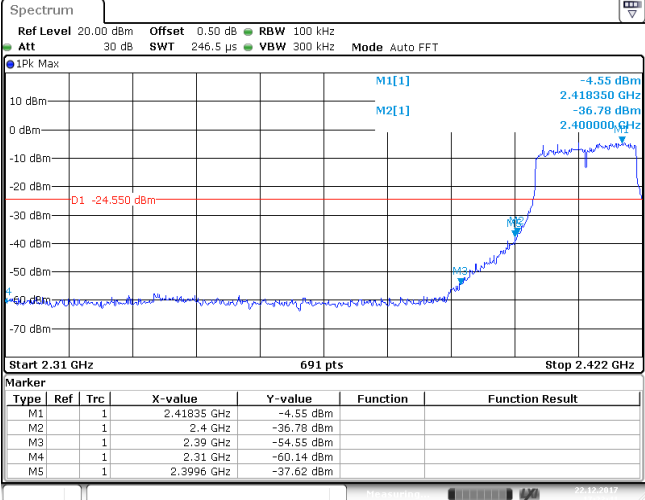
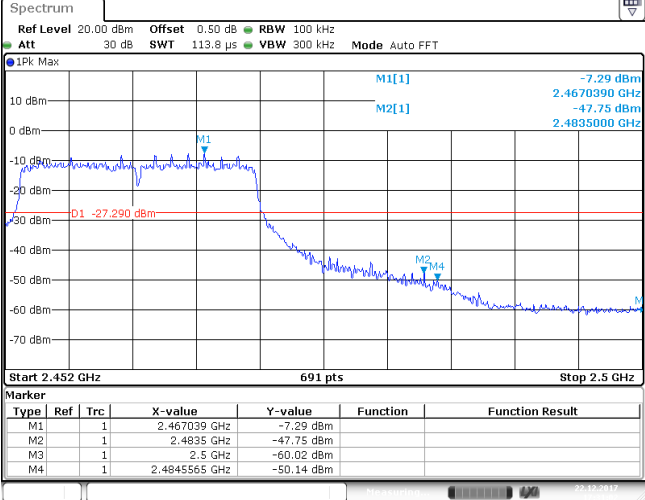
Please refer to the clause 3.3

### TEST RESULTS

Passed       Not Applicable

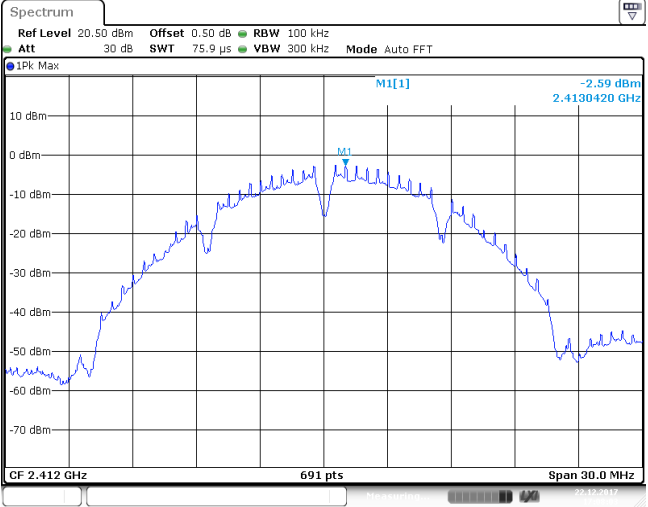
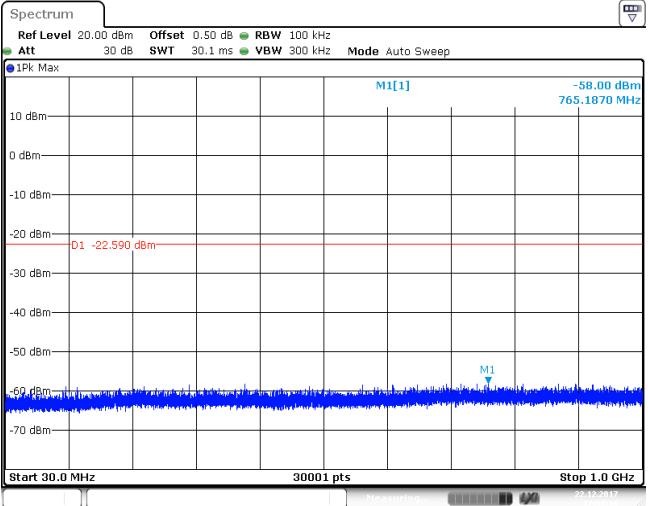
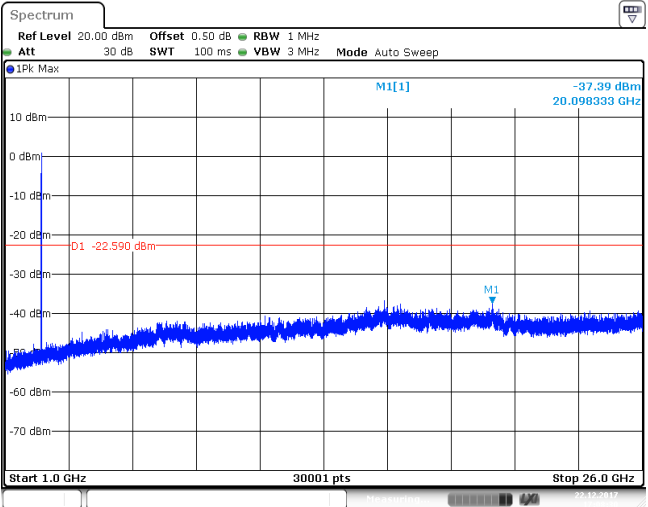
Test Item:	Bandedge	Type:	802.11 b																																										
CH01	 <p><b>Spectrum</b>            Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz            Att 30 dB SWT 246.5 <math>\mu</math>s VBW 300 kHz Mode Auto FFT</p> <p>1Pk Max</p> <p>M1[1] -3.09 dBm 2.413980 GHz            M2[1] -55.04 dBm 2.400000 GHz</p> <p>D1 -23.090 dBm</p> <p>M3 M4 M5</p> <p>Start 2.31 GHz 691 pts Stop 2.422 GHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>2.41398 GHz</td> <td>-3.09 dBm</td> <td></td> <td></td> </tr> <tr> <td>M2</td> <td>1</td> <td></td> <td>2.4 GHz</td> <td>-55.04 dBm</td> <td></td> <td></td> </tr> <tr> <td>M3</td> <td>1</td> <td></td> <td>2.39 GHz</td> <td>-61.75 dBm</td> <td></td> <td></td> </tr> <tr> <td>M4</td> <td>1</td> <td></td> <td>2.31 GHz</td> <td>-61.06 dBm</td> <td></td> <td></td> </tr> <tr> <td>M5</td> <td>1</td> <td></td> <td>2.398626 GHz</td> <td>-53.09 dBm</td> <td></td> <td></td> </tr> </tbody> </table>			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.41398 GHz	-3.09 dBm			M2	1		2.4 GHz	-55.04 dBm			M3	1		2.39 GHz	-61.75 dBm			M4	1		2.31 GHz	-61.06 dBm			M5	1		2.398626 GHz	-53.09 dBm		
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																							
M1	1		2.41398 GHz	-3.09 dBm																																									
M2	1		2.4 GHz	-55.04 dBm																																									
M3	1		2.39 GHz	-61.75 dBm																																									
M4	1		2.31 GHz	-61.06 dBm																																									
M5	1		2.398626 GHz	-53.09 dBm																																									
CH11	 <p><b>Spectrum</b>            Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz            Att 30 dB SWT 113.8 <math>\mu</math>s VBW 300 kHz Mode Auto FFT</p> <p>1Pk Max</p> <p>M1[1] -7.63 dBm 2.4615510 GHz            M2[1] -61.56 dBm 2.4835000 GHz</p> <p>D1 -27.630 dBm</p> <p>M3 M4</p> <p>Start 2.452 GHz 691 pts Stop 2.5 GHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>2.461551 GHz</td> <td>-7.63 dBm</td> <td></td> <td></td> </tr> <tr> <td>M2</td> <td>1</td> <td></td> <td>2.4835 GHz</td> <td>-61.56 dBm</td> <td></td> <td></td> </tr> <tr> <td>M3</td> <td>1</td> <td></td> <td>2.5 GHz</td> <td>-61.55 dBm</td> <td></td> <td></td> </tr> <tr> <td>M4</td> <td>1</td> <td></td> <td>2.4872 GHz</td> <td>-58.53 dBm</td> <td></td> <td></td> </tr> </tbody> </table>			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.461551 GHz	-7.63 dBm			M2	1		2.4835 GHz	-61.56 dBm			M3	1		2.5 GHz	-61.55 dBm			M4	1		2.4872 GHz	-58.53 dBm									
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																							
M1	1		2.461551 GHz	-7.63 dBm																																									
M2	1		2.4835 GHz	-61.56 dBm																																									
M3	1		2.5 GHz	-61.55 dBm																																									
M4	1		2.4872 GHz	-58.53 dBm																																									

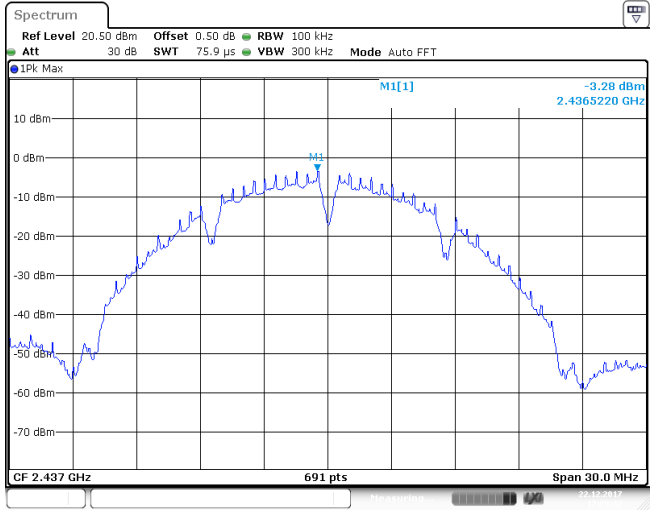
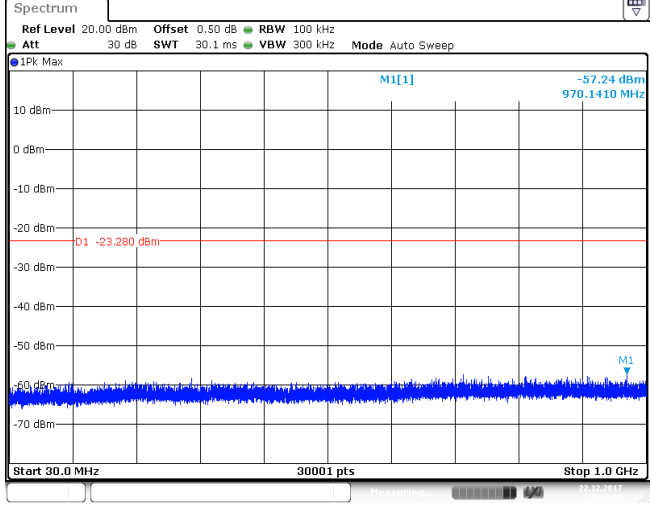
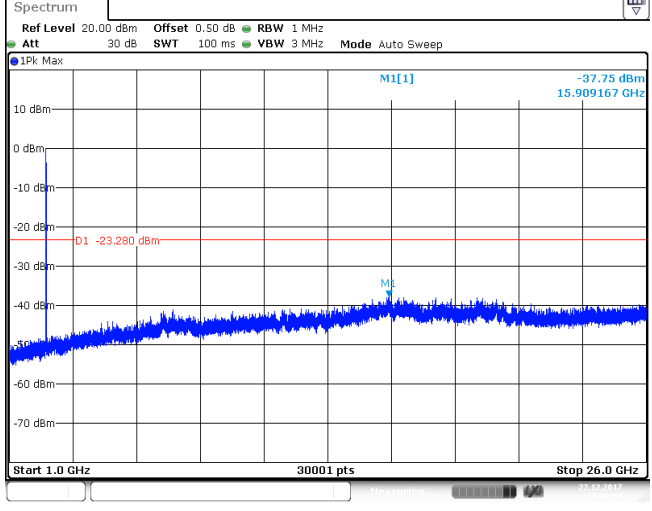
Test Item:	Bandedge	Type:	802.11 g																																										
CH01	 <p><b>Spectrum</b>                      Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz                      Att 30 dB SWT 246.5 <math>\mu</math>s VBW 300 kHz Mode Auto FFT</p> <p>1Pk Max</p> <p>M1[1] -2.76 dBm                      2.419490 GHz                      M2[1] -41.31 dBm                      2.400000 GHz</p> <p>D1 -22.760 dBm</p> <p>M3                      M4                      M5</p> <p>Start 2.31 GHz 691 pts Stop 2.422 GHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>2.41949 GHz</td> <td>-2.76 dBm</td> <td></td> <td></td> </tr> <tr> <td>M2</td> <td>1</td> <td></td> <td>2.4 GHz</td> <td>-41.31 dBm</td> <td></td> <td></td> </tr> <tr> <td>M3</td> <td>1</td> <td></td> <td>2.39 GHz</td> <td>-57.40 dBm</td> <td></td> <td></td> </tr> <tr> <td>M4</td> <td>1</td> <td></td> <td>2.31 GHz</td> <td>-61.69 dBm</td> <td></td> <td></td> </tr> <tr> <td>M5</td> <td>1</td> <td></td> <td>2.39925 GHz</td> <td>-40.54 dBm</td> <td></td> <td></td> </tr> </tbody> </table>			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.41949 GHz	-2.76 dBm			M2	1		2.4 GHz	-41.31 dBm			M3	1		2.39 GHz	-57.40 dBm			M4	1		2.31 GHz	-61.69 dBm			M5	1		2.39925 GHz	-40.54 dBm		
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CH11	 <p><b>Spectrum</b>                      Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz                      Att 30 dB SWT 113.8 <math>\mu</math>s VBW 300 kHz Mode Auto FFT</p> <p>1Pk Max</p> <p>M1[1] -7.12 dBm                      2.4695400 GHz                      M2[1] -52.97 dBm                      2.4835000 GHz</p> <p>D1 -27.120 dBm</p> <p>M1                      M3                      M4</p> <p>Start 2.452 GHz 691 pts Stop 2.5 GHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>2.46954 GHz</td> <td>-7.12 dBm</td> <td></td> <td></td> </tr> <tr> <td>M2</td> <td>1</td> <td></td> <td>2.4835 GHz</td> <td>-52.97 dBm</td> <td></td> <td></td> </tr> <tr> <td>M3</td> <td>1</td> <td></td> <td>2.5 GHz</td> <td>-60.71 dBm</td> <td></td> <td></td> </tr> <tr> <td>M4</td> <td>1</td> <td></td> <td>2.483522 GHz</td> <td>-49.17 dBm</td> <td></td> <td></td> </tr> </tbody> </table>			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.46954 GHz	-7.12 dBm			M2	1		2.4835 GHz	-52.97 dBm			M3	1		2.5 GHz	-60.71 dBm			M4	1		2.483522 GHz	-49.17 dBm									
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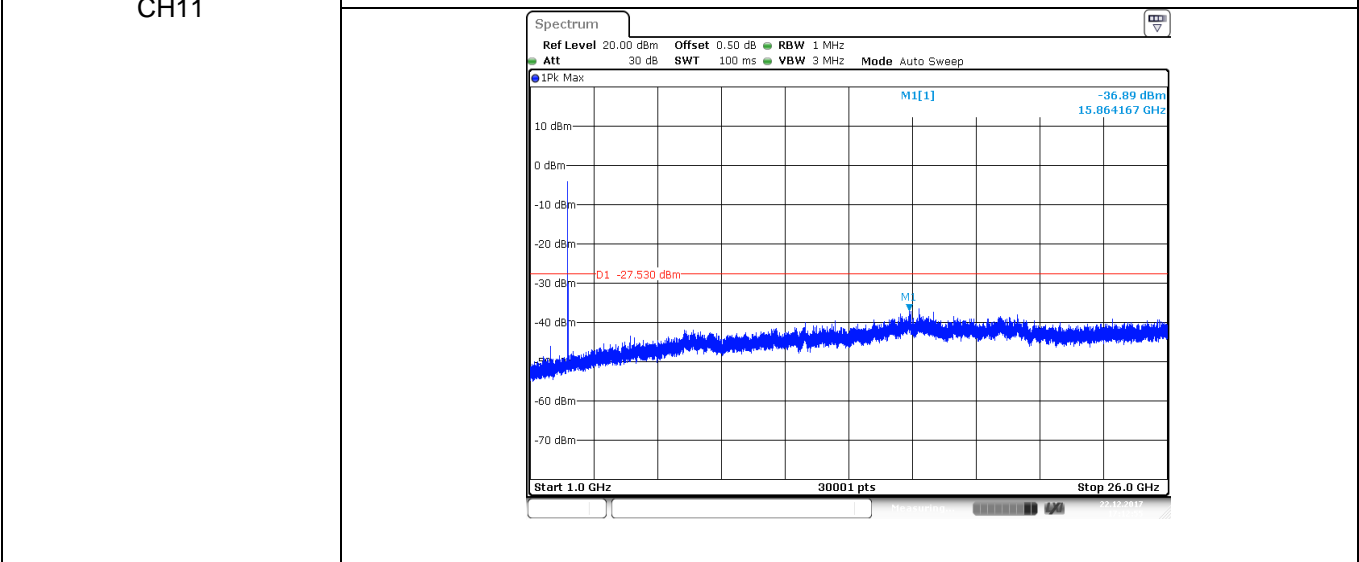
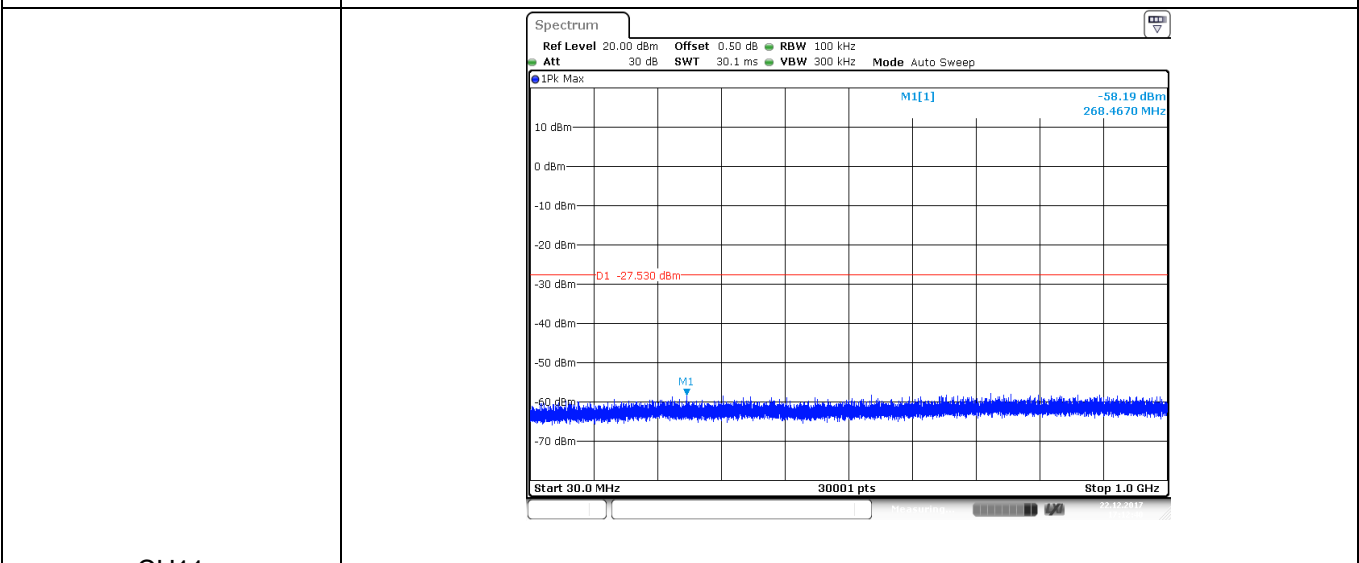
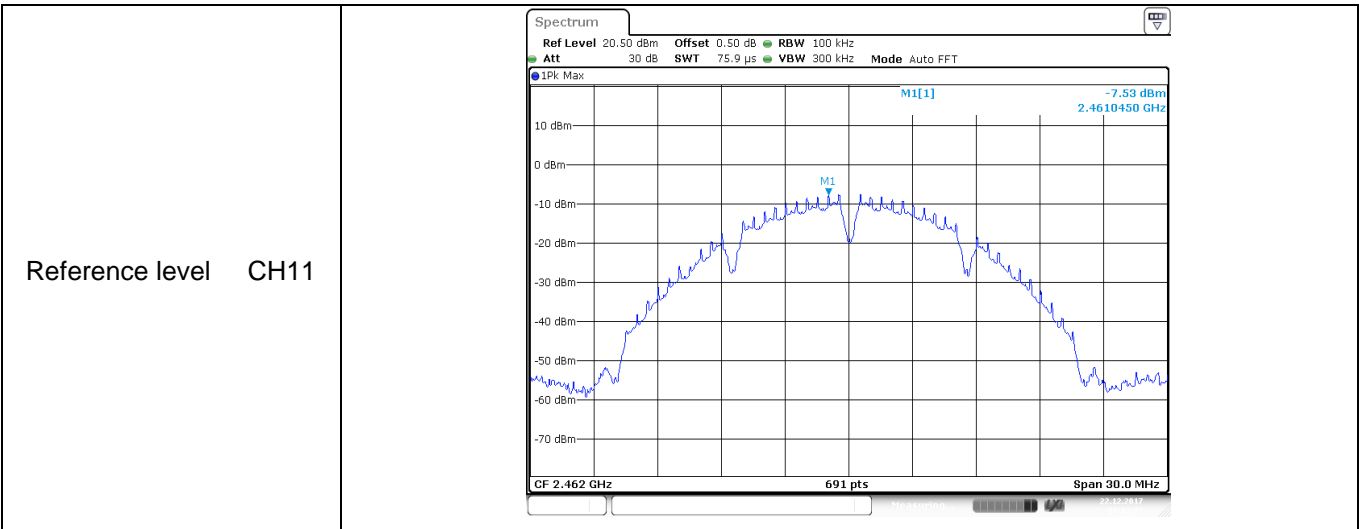
Test Item:	Bandedge	Type:	802.11 n(HT20)																																										
CH01	 <p><b>Spectrum</b>                  Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz                  Att 30 dB SWT 246.5 μs VBW 300 kHz Mode Auto FFT</p> <p>1Pk Max</p> <p>M1[1] -4.55 dBm 2.41835 GHz                  M2[1] -36.78 dBm 2.400000 GHz</p> <p>D1 -24.550 dBm</p> <p>Start 2.31 GHz 691 pts Stop 2.422 GHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>2.41835 GHz</td> <td>-4.55 dBm</td> <td></td> <td></td> </tr> <tr> <td>M2</td> <td>1</td> <td></td> <td>2.4 GHz</td> <td>-36.78 dBm</td> <td></td> <td></td> </tr> <tr> <td>M3</td> <td>1</td> <td></td> <td>2.39 GHz</td> <td>-54.55 dBm</td> <td></td> <td></td> </tr> <tr> <td>M4</td> <td>1</td> <td></td> <td>2.31 GHz</td> <td>-60.14 dBm</td> <td></td> <td></td> </tr> <tr> <td>M5</td> <td>1</td> <td></td> <td>2.3996 GHz</td> <td>-37.62 dBm</td> <td></td> <td></td> </tr> </tbody> </table>			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.41835 GHz	-4.55 dBm			M2	1		2.4 GHz	-36.78 dBm			M3	1		2.39 GHz	-54.55 dBm			M4	1		2.31 GHz	-60.14 dBm			M5	1		2.3996 GHz	-37.62 dBm		
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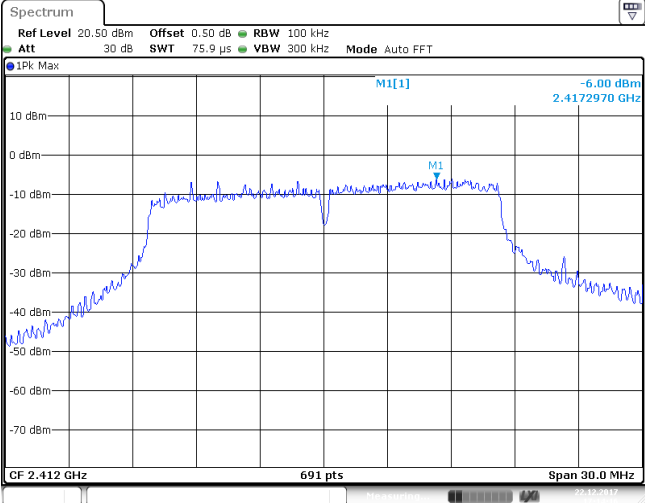
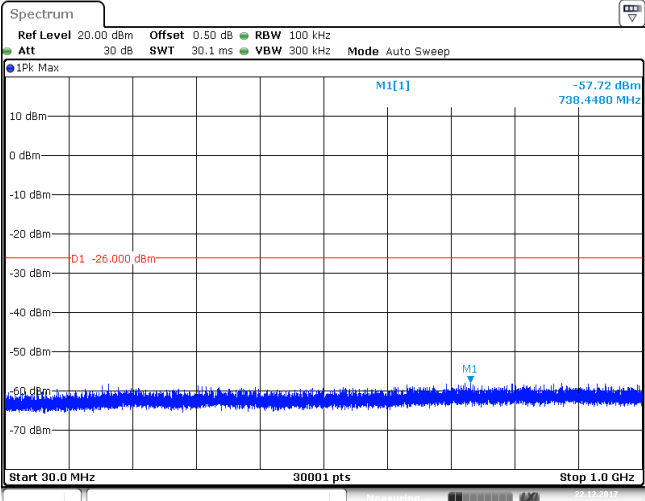
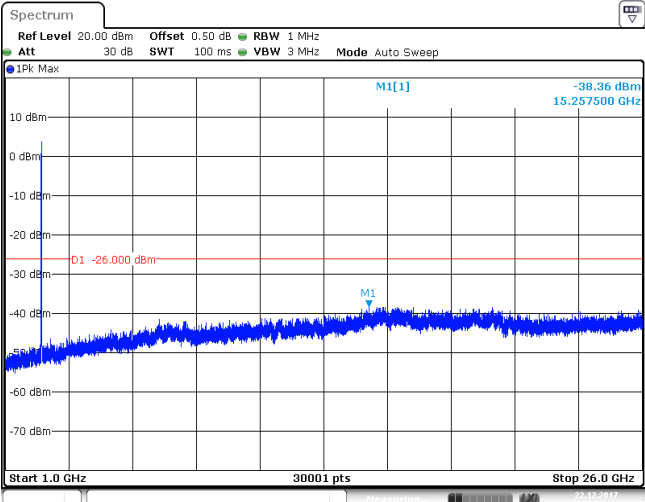


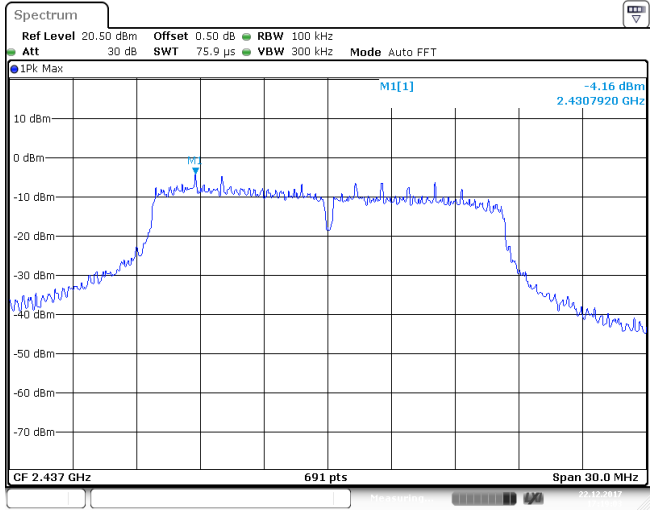
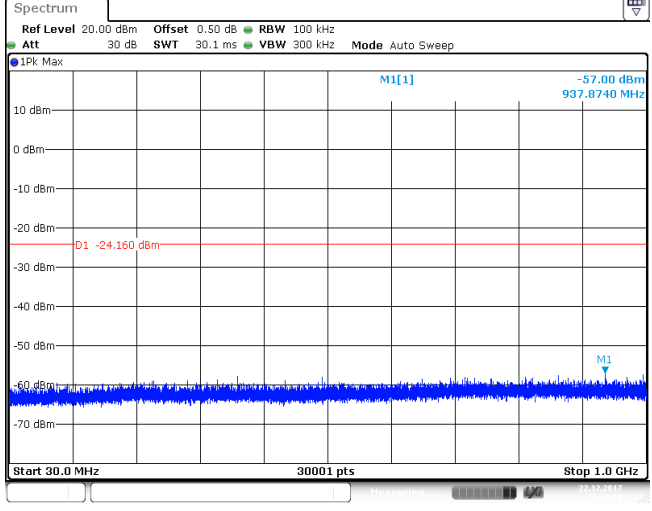
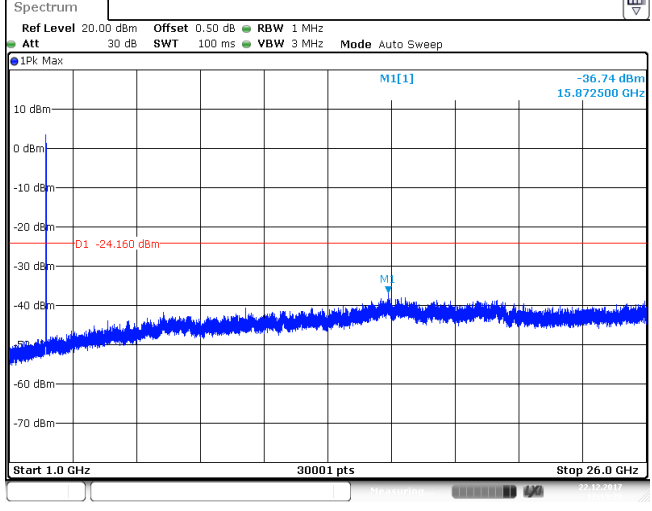
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CH03	<p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz Att 30 dB SWT 303.4 μs VBW 300 kHz Mode Auto FFT</p> <p>1Pk Max</p> <p>M1[1] -5.83 dBm 2.419550 GHz M2[1] -35.97 dBm 2.400000 GHz</p> <p>D1 -25.830 dBm</p> <p>Start 2.31 GHz 691 pts Stop 2.442 GHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>2.41955 GHz</td> <td>-5.83 dBm</td> <td></td> <td></td> </tr> <tr> <td>M2</td> <td>1</td> <td></td> <td>2.4 GHz</td> <td>-35.97 dBm</td> <td></td> <td></td> </tr> <tr> <td>M3</td> <td>1</td> <td></td> <td>2.39 GHz</td> <td>-50.99 dBm</td> <td></td> <td></td> </tr> <tr> <td>M4</td> <td>1</td> <td></td> <td>2.31 GHz</td> <td>-61.72 dBm</td> <td></td> <td></td> </tr> <tr> <td>M5</td> <td>1</td> <td></td> <td>2.39953 GHz</td> <td>-36.60 dBm</td> <td></td> <td></td> </tr> </tbody> </table>			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.41955 GHz	-5.83 dBm			M2	1		2.4 GHz	-35.97 dBm			M3	1		2.39 GHz	-50.99 dBm			M4	1		2.31 GHz	-61.72 dBm			M5	1		2.39953 GHz	-36.60 dBm		
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M5	1		2.39953 GHz	-36.60 dBm																																									
CH09	<p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz Att 30 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max</p> <p>M1[1] -7.86 dBm 2.4370680 GHz M2[1] -46.52 dBm 2.4835000 GHz</p> <p>D1 -27.860 dBm</p> <p>Start 2.432 GHz 691 pts Stop 2.5 GHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>2.437068 GHz</td> <td>-7.86 dBm</td> <td></td> <td></td> </tr> <tr> <td>M2</td> <td>1</td> <td></td> <td>2.4835 GHz</td> <td>-46.52 dBm</td> <td></td> <td></td> </tr> <tr> <td>M3</td> <td>1</td> <td></td> <td>2.5 GHz</td> <td>-53.33 dBm</td> <td></td> <td></td> </tr> <tr> <td>M4</td> <td>1</td> <td></td> <td>2.4846261 GHz</td> <td>-41.42 dBm</td> <td></td> <td></td> </tr> </tbody> </table>			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.437068 GHz	-7.86 dBm			M2	1		2.4835 GHz	-46.52 dBm			M3	1		2.5 GHz	-53.33 dBm			M4	1		2.4846261 GHz	-41.42 dBm									
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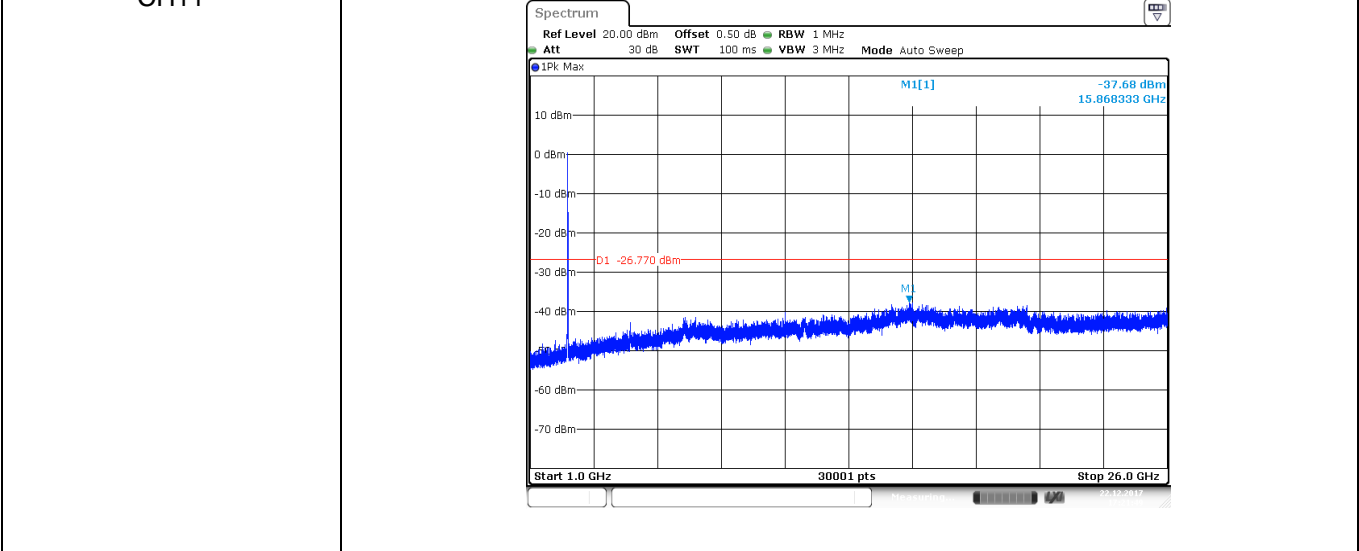
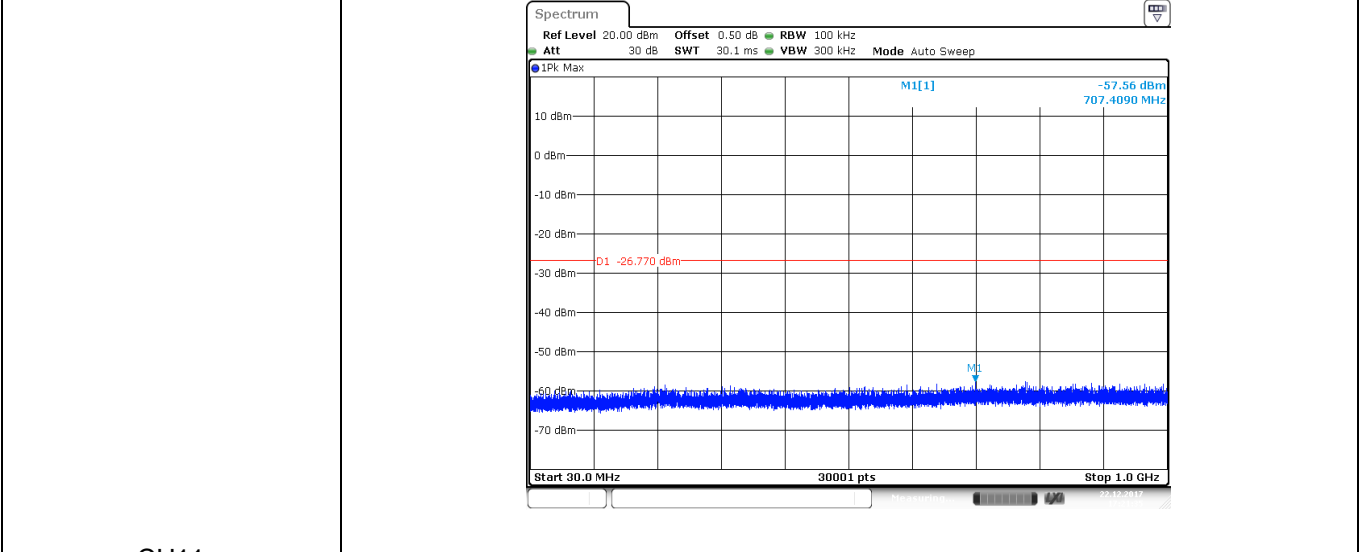
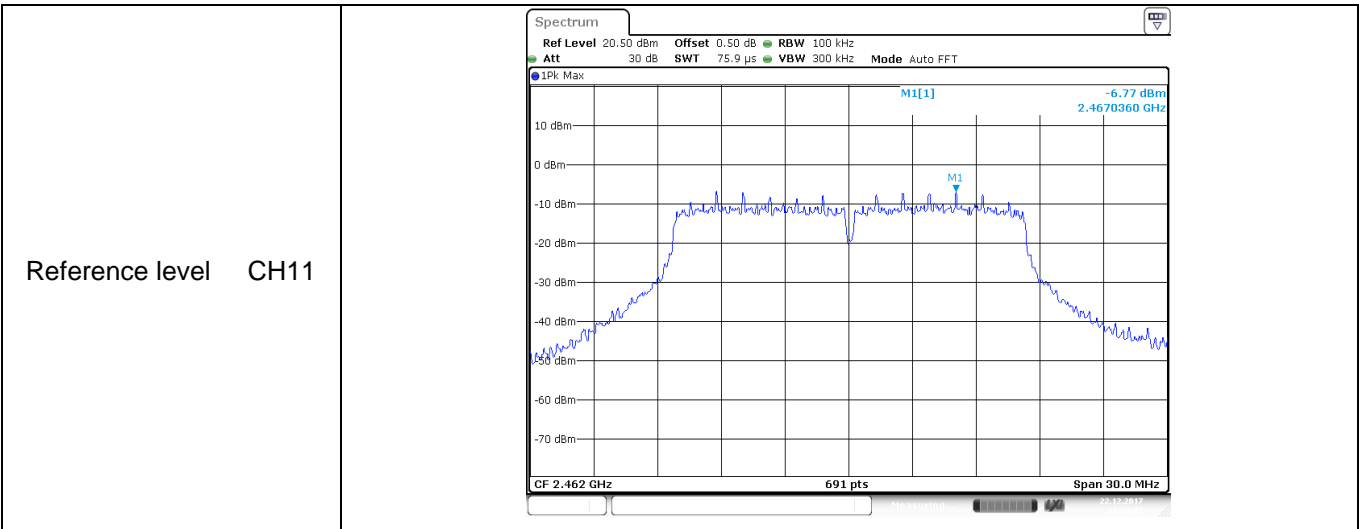
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CH01			
CH01			

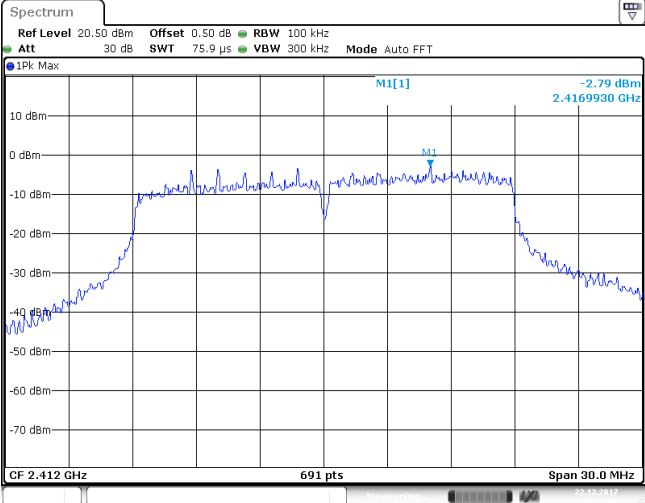
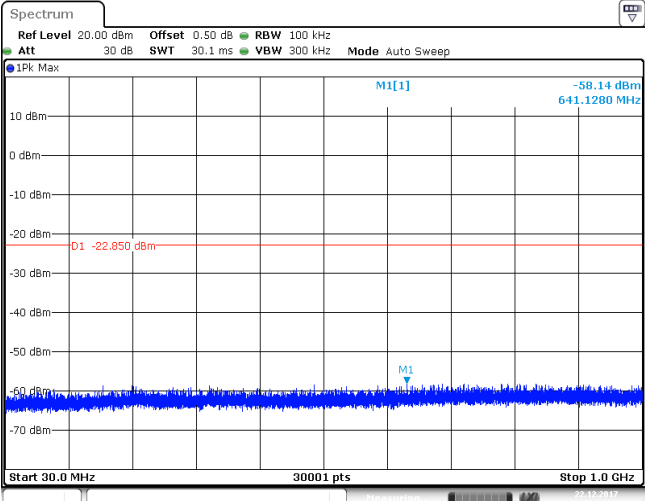
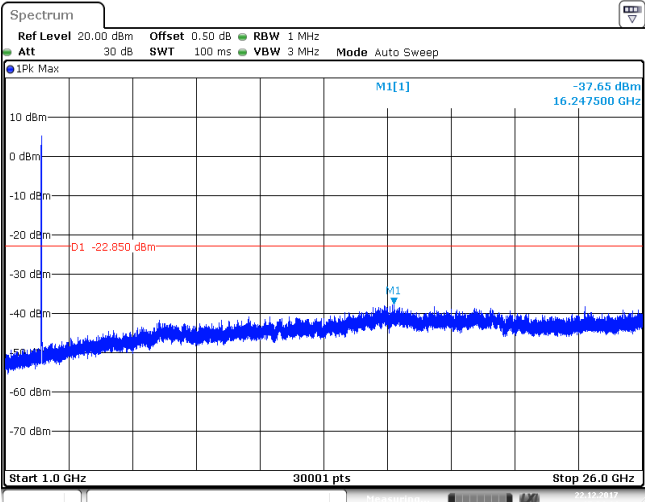
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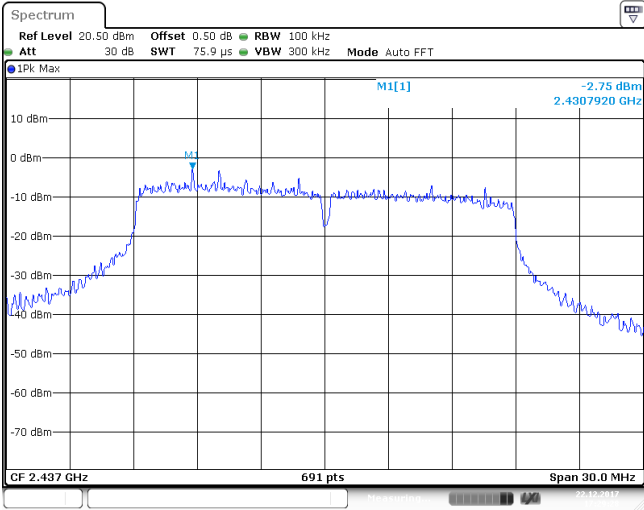
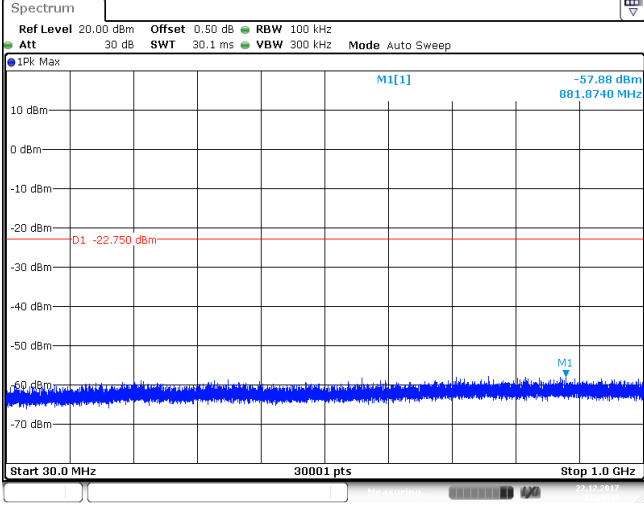
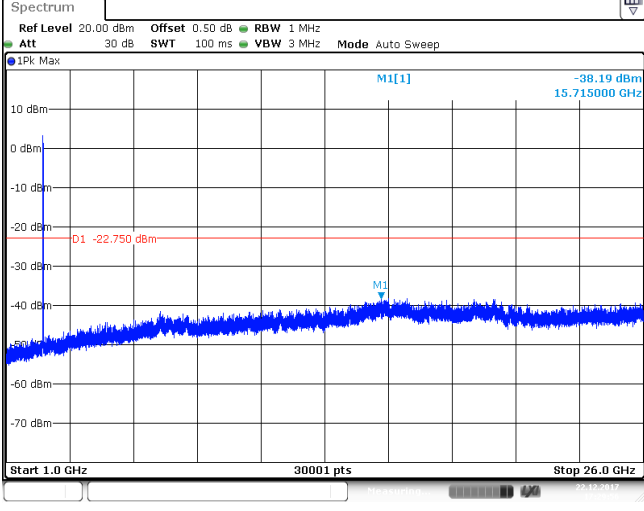
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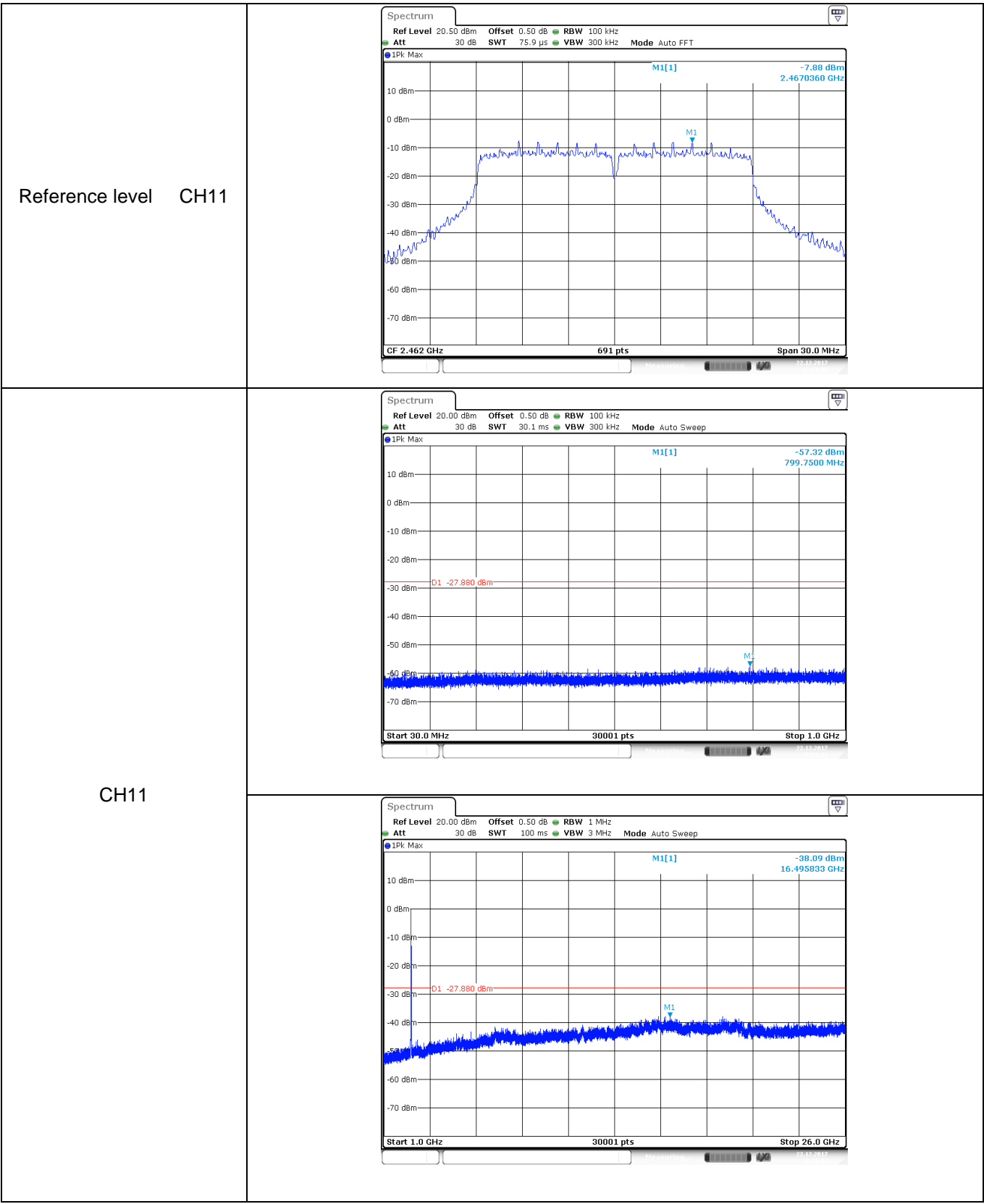
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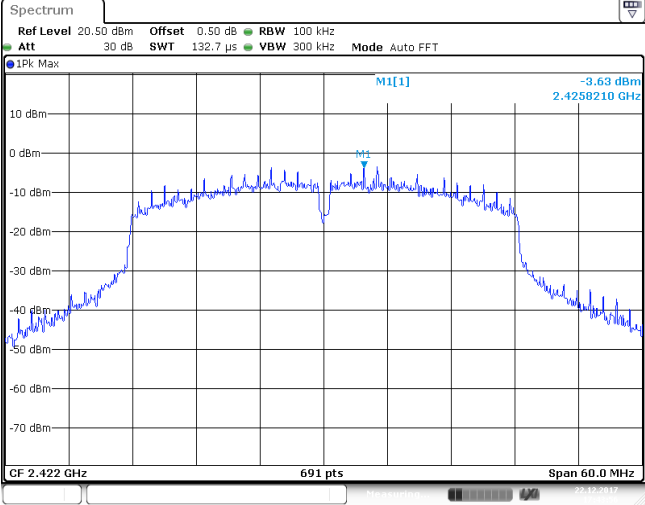
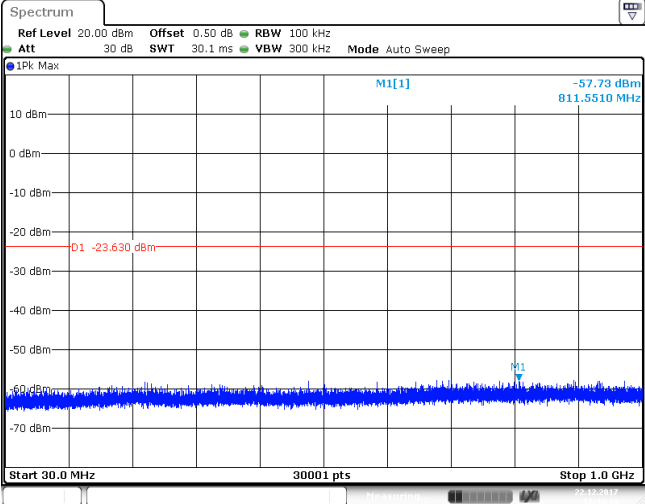
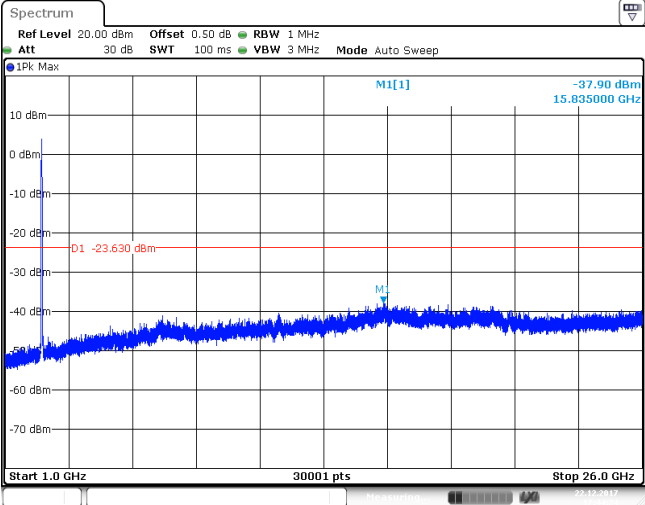


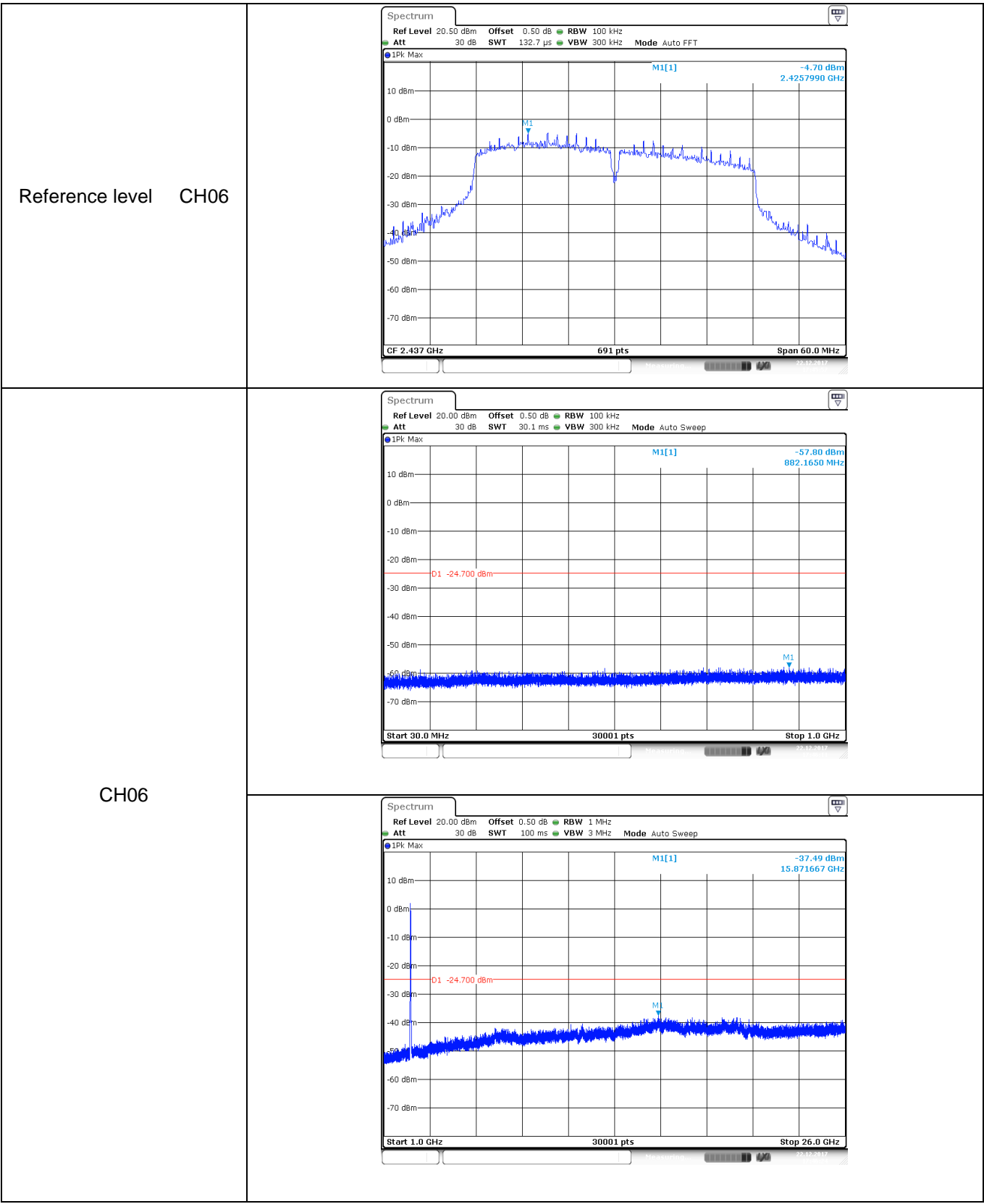
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Reference level CH01			
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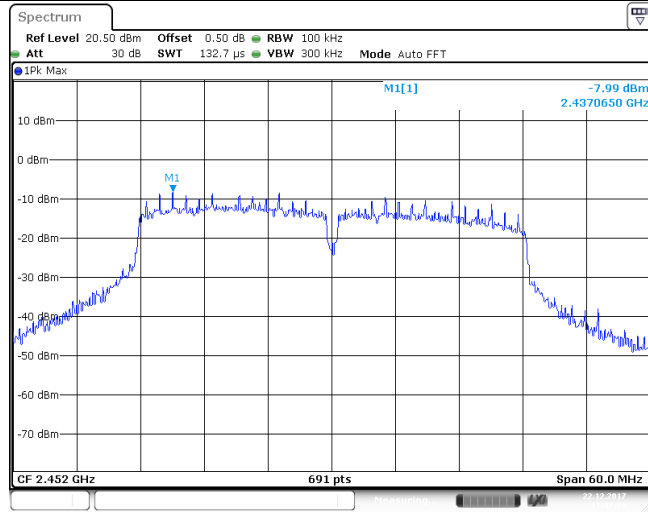
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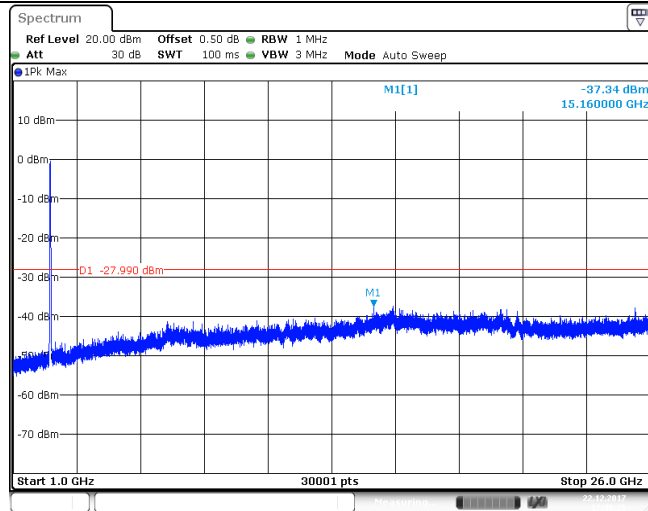
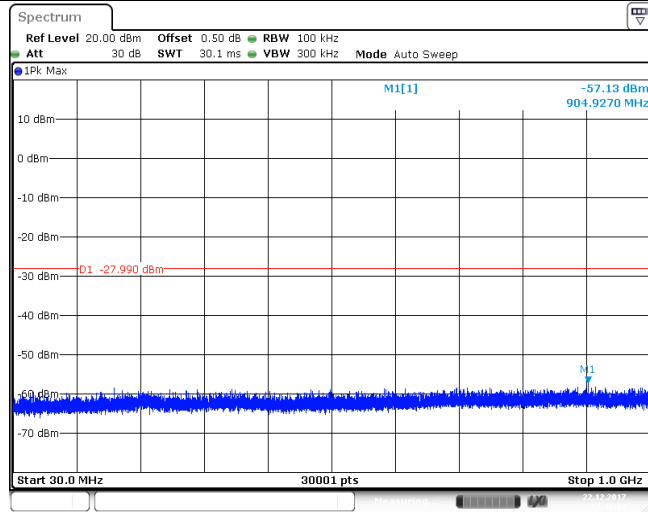
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CH03			
			



Reference level CH09



CH09



### 5.8. Spurious Emissions (radiated)

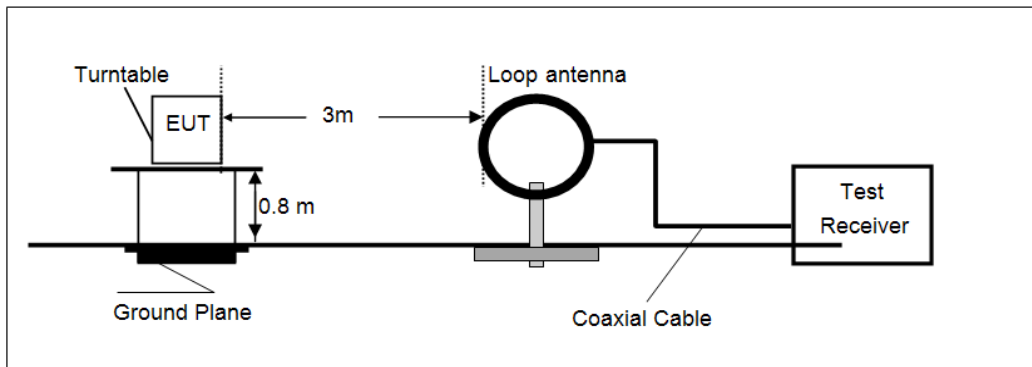
#### LIMIT

#### FCC CFR Title 47 Part 15 Subpart C Section 15.209

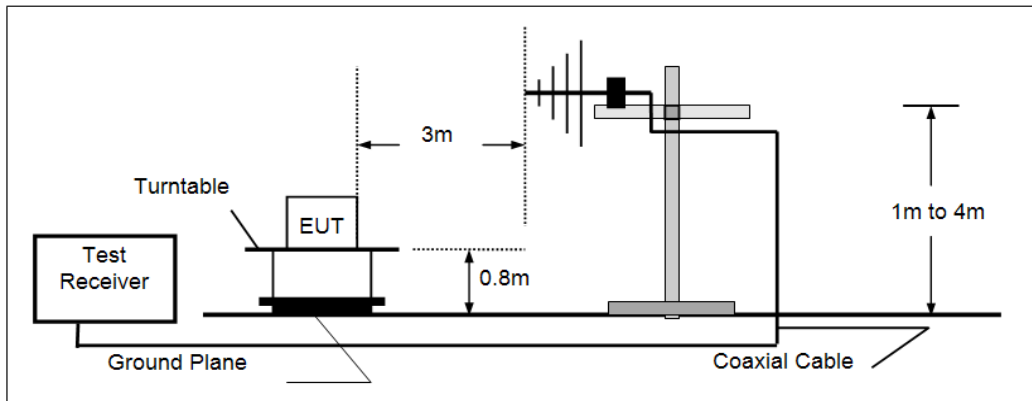
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

#### TEST CONFIGURATION

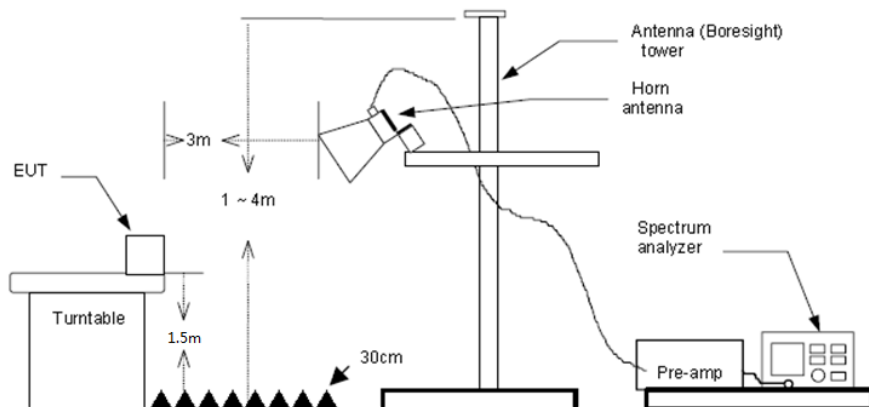
➤ 9kHz ~30MHz



➤ 30MHz ~ 1GHz



➤ Above 1GHz



**TEST PROCEDURE**

1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 1 GHz:  
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;  
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
  - (3) From 1 GHz to 10<sup>th</sup> harmonic:  
RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
RBW=1MHz, VBW=3MHz RMS detector for Average value.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

**Passed**       **Not Applicable**

**Note:**

- 1) Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2) The emission levels of other frequencies are very lower than the limit and not show in test report.

**➤ 9kHz ~ 30MHz**

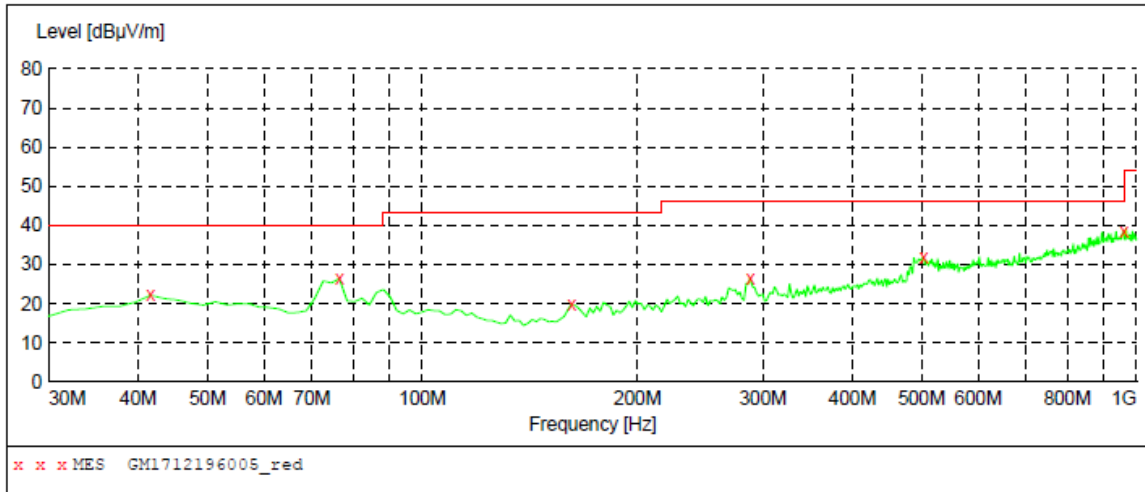
The EUT was pre-scanned the frequency band (9kHz~30MHz), found the radiated level lower than the limit, so don't show on the report.

**➤ 30MHz ~1000MHz**

Have pre-scan all modulation mode, found the 802.11b mode CH01 which it was worst case, so only the worst case's data on the test report.

➤ 30MHz ~ 1GHz

Polarization: Vertical

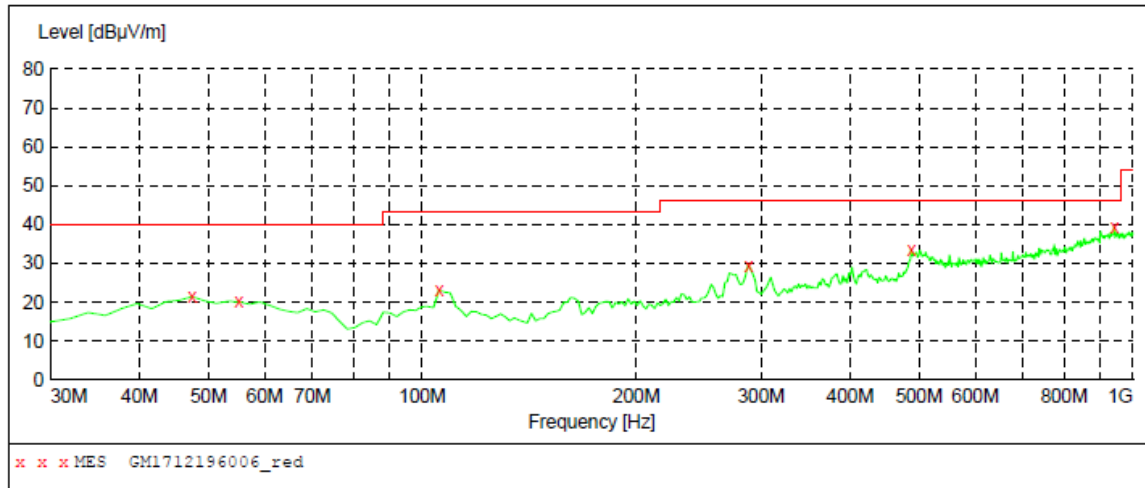


**MEASUREMENT RESULT: "GM1712196005\_red"**

12/19/2017 10:03AM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
41.640000	22.20	-9.5	40.0	17.8	QP	100.0	0.00	VERTICAL
76.560000	26.40	-15.3	40.0	13.6	QP	100.0	138.00	VERTICAL
161.920000	19.90	-13.3	43.5	23.6	QP	100.0	328.00	VERTICAL
288.020000	26.50	-7.5	46.0	19.5	QP	100.0	166.00	VERTICAL
503.360000	31.90	-1.7	46.0	14.1	QP	100.0	194.00	VERTICAL
959.260000	38.50	7.3	46.0	7.5	QP	100.0	359.00	VERTICAL

Polarization: Horizontal



**MEASUREMENT RESULT: "GM1712196006\_red"**

12/19/2017 10:07AM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	21.50	-8.8	40.0	18.5	QP	100.0	360.00	HORIZONTAL
55.220000	20.10	-9.2	40.0	19.9	QP	300.0	232.00	HORIZONTAL
105.660000	23.10	-10.5	43.5	20.4	QP	300.0	122.00	HORIZONTAL
288.020000	29.60	-7.5	46.0	16.4	QP	100.0	211.00	HORIZONTAL
487.840000	33.60	-2.2	46.0	12.4	QP	100.0	227.00	HORIZONTAL
941.800000	39.40	7.2	46.0	6.6	QP	100.0	211.00	HORIZONTAL



## ➤ 1 GHz ~ 25 GHz

802.11b					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1711.05	40.55	25.22	5.79	36.95	34.61	74.00	-39.39	Vertical	Peak
4821.76	40.67	31.56	9.55	36.90	44.88	74.00	-29.12	Vertical	Peak
6017.06	34.68	32.50	10.70	35.44	42.44	74.00	-31.56	Vertical	Peak
7245.81	35.70	36.25	11.91	35.02	48.84	74.00	-25.16	Vertical	Peak
1613.75	35.10	24.94	5.60	36.75	28.89	74.00	-45.11	Horizontal	Peak
3192.37	36.04	28.80	7.71	38.20	34.35	74.00	-39.65	Horizontal	Peak
4821.76	40.20	31.56	9.55	36.90	44.41	74.00	-29.59	Horizontal	Peak
7245.81	35.52	36.25	11.91	35.02	48.66	74.00	-25.34	Horizontal	Peak

802.11b					CH06				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1621.99	35.69	24.97	5.61	36.77	29.50	74.00	-44.50	Vertical	Peak
3104.22	35.03	28.80	7.61	38.21	33.23	74.00	-40.77	Vertical	Peak
5086.52	32.55	31.85	9.74	36.31	37.83	74.00	-36.17	Vertical	Peak
7840.75	30.95	36.35	13.06	34.96	45.40	74.00	-28.60	Vertical	Peak
1948.25	34.65	25.79	6.19	37.26	29.37	74.00	-44.63	Horizontal	Peak
3598.09	34.50	29.29	8.27	38.27	33.79	74.00	-40.21	Horizontal	Peak
4797.27	36.85	31.59	9.54	36.96	41.02	74.00	-32.98	Horizontal	Peak
7961.43	32.49	36.95	12.49	34.63	47.30	74.00	-26.70	Horizontal	Peak

802.11b					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1378.14	34.64	25.96	4.96	36.47	29.09	74.00	-44.91	Vertical	Peak
3192.37	35.10	28.80	7.71	38.20	33.41	74.00	-40.59	Vertical	Peak
4920.96	36.93	31.42	9.62	36.62	41.35	74.00	-32.65	Vertical	Peak
8022.46	31.72	37.08	12.35	34.53	46.62	74.00	-27.38	Vertical	Peak
1213.44	35.61	26.29	4.68	36.56	30.02	74.00	-43.98	Horizontal	Peak
3184.25	37.42	28.80	7.70	38.20	35.72	74.00	-38.28	Horizontal	Peak
4920.96	38.15	31.42	9.62	36.62	42.57	74.00	-31.43	Horizontal	Peak
7470.56	31.30	36.16	12.30	34.88	44.88	74.00	-29.12	Horizontal	Peak

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies(test frequency band is 1GHz to 25GHz) are very lower than the limit and not show in test report.

802.11g					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
3216.84	36.44	28.70	7.74	38.23	34.65	74.00	-39.35	Vertical	Peak
4821.76	40.95	31.56	9.55	36.90	45.16	74.00	-28.84	Vertical	Peak
6017.06	35.40	32.50	10.70	35.44	43.16	74.00	-30.84	Vertical	Peak
7227.39	36.31	36.23	11.89	35.04	49.39	74.00	-24.61	Vertical	Peak
1244.73	36.03	26.25	4.74	36.55	30.47	74.00	-43.53	Horizontal	Peak
4834.05	46.52	31.53	9.56	36.86	50.75	74.00	-23.25	Horizontal	Peak
7227.39	43.52	36.23	11.89	35.04	56.60	74.00	-17.40	Horizontal	Peak
9660.72	33.82	39.09	13.71	35.32	51.30	74.00	-22.70	Horizontal	Peak

802.11g					CH06				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1759.64	35.64	25.32	5.88	37.06	29.78	74.00	-44.22	Vertical	Peak
3192.37	37.88	28.80	7.71	38.20	36.19	74.00	-37.81	Vertical	Peak
4871.10	41.37	31.46	9.59	36.76	45.66	74.00	-28.34	Vertical	Peak
7301.36	35.24	36.30	11.97	34.95	48.56	74.00	-25.44	Vertical	Peak
1741.81	34.74	25.29	5.85	37.02	28.86	74.00	-45.14	Horizontal	Peak
4076.07	32.59	29.85	8.84	37.94	33.34	74.00	-40.66	Horizontal	Peak
4895.97	38.72	31.41	9.60	36.69	43.04	74.00	-30.96	Horizontal	Peak
7338.62	35.12	36.30	12.01	34.90	48.53	74.00	-25.47	Horizontal	Peak

802.11g					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
3184.25	38.67	28.80	7.70	38.20	36.97	74.00	-37.03	Vertical	Peak
4933.50	39.21	31.43	9.63	36.59	43.68	74.00	-30.32	Vertical	Peak
6017.06	34.61	32.50	10.70	35.44	42.37	74.00	-31.63	Vertical	Peak
8637.08	33.35	37.52	12.93	34.48	49.32	74.00	-24.68	Vertical	Peak
1388.71	34.28	25.93	4.98	36.47	28.72	74.00	-45.28	Horizontal	Peak
3104.22	35.17	28.80	7.61	38.21	33.37	74.00	-40.63	Horizontal	Peak
4920.96	35.14	31.42	9.62	36.62	39.56	74.00	-34.44	Horizontal	Peak
6992.14	31.33	35.25	11.84	34.80	43.62	74.00	-30.38	Horizontal	Peak

## Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies(test frequency band is 1GHz to 25GHz) are very lower than the limit and not show in test report.

802.11n(HT20)					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1498.91	33.74	25.80	5.28	36.59	28.23	74.00	-45.77	Vertical	Peak
3192.37	38.66	28.80	7.71	38.20	36.97	74.00	-37.03	Vertical	Peak
4797.27	39.30	31.59	9.54	36.96	43.47	74.00	-30.53	Vertical	Peak
7245.81	36.26	36.25	11.91	35.02	49.40	74.00	-24.60	Vertical	Peak
2223.98	33.78	27.65	6.48	37.41	30.50	74.00	-43.50	Horizontal	Peak
3709.69	35.23	29.33	8.40	38.25	34.71	74.00	-39.29	Horizontal	Peak
4821.76	34.41	31.56	9.55	36.90	38.62	74.00	-35.38	Horizontal	Peak
7245.81	33.78	36.25	11.91	35.02	46.92	74.00	-27.08	Horizontal	Peak

802.11n(HT20)					CH06				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1138.63	36.84	25.82	4.52	36.60	30.58	74.00	-43.42	Vertical	Peak
3192.37	34.76	28.80	7.71	38.20	33.07	74.00	-40.93	Vertical	Peak
6494.56	30.42	33.96	11.16	35.33	40.21	74.00	-33.79	Vertical	Peak
9019.05	31.62	37.96	13.33	34.55	48.36	74.00	-25.64	Vertical	Peak
1814.22	35.47	25.39	5.98	37.15	29.69	74.00	-44.31	Horizontal	Peak
3080.60	35.35	28.76	7.58	38.22	33.47	74.00	-40.53	Horizontal	Peak
4883.52	34.31	31.43	9.59	36.73	38.60	74.00	-35.40	Horizontal	Peak
7319.96	34.26	36.30	11.99	34.92	47.63	74.00	-26.37	Horizontal	Peak

802.11n(HT20)					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
3192.37	37.07	28.80	7.71	38.20	35.38	74.00	-38.62	Vertical	Peak
4946.07	43.92	31.45	9.63	36.55	48.45	74.00	-25.55	Vertical	Peak
7376.08	36.19	36.30	12.04	34.85	49.68	74.00	-24.32	Vertical	Peak
9859.47	33.92	39.10	13.61	34.93	51.70	74.00	-22.30	Vertical	Peak
3151.99	35.01	28.80	7.66	38.21	33.26	74.00	-40.74	Horizontal	Peak
4933.50	42.84	31.43	9.63	36.59	47.31	74.00	-26.69	Horizontal	Peak
7394.88	36.40	36.30	12.06	34.83	49.93	74.00	-24.07	Horizontal	Peak
9884.60	32.67	39.10	13.60	34.62	50.75	74.00	-23.25	Horizontal	Peak

## Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies(test frequency band is 1GHz to 25GHz) are very lower than the limit and not show in test report.

802.11n(HT40)					CH03				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2590.96	50.96	27.75	6.90	37.84	47.77	74.00	-26.23	Vertical	Peak
3192.37	41.42	28.80	7.71	38.20	39.73	74.00	-34.27	Vertical	Peak
4785.08	34.15	31.54	9.53	36.98	38.24	74.00	-35.76	Vertical	Peak
7282.79	33.22	36.28	11.95	34.97	46.48	74.00	-27.52	Vertical	Peak
1439.09	34.95	25.86	5.11	36.51	29.41	74.00	-44.59	Horizontal	Peak
3192.37	36.52	28.80	7.71	38.20	34.83	74.00	-39.17	Horizontal	Peak
3834.51	34.63	29.63	8.55	38.21	34.60	74.00	-39.40	Horizontal	Peak
4933.50	32.92	31.43	9.63	36.59	37.39	74.00	-36.61	Horizontal	Peak

802.11n(HT40)					CH06				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1746.25	34.37	25.29	5.86	37.03	28.49	74.00	-45.51	Vertical	Peak
3192.37	34.50	28.80	7.71	38.20	32.81	74.00	-41.19	Vertical	Peak
4524.47	33.28	30.75	9.34	37.35	36.02	74.00	-37.98	Vertical	Peak
7547.01	32.22	36.15	12.55	34.94	45.98	74.00	-28.02	Vertical	Peak
1899.28	33.53	25.30	6.11	37.22	27.72	74.00	-46.28	Horizontal	Peak
3112.13	34.74	28.80	7.61	38.21	32.94	74.00	-41.06	Horizontal	Peak
4524.47	33.28	30.75	9.34	37.35	36.02	74.00	-37.98	Horizontal	Peak
7045.74	31.40	35.44	11.85	34.86	43.83	74.00	-30.17	Horizontal	Peak

802.11n(HT40)					CH09				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2258.20	34.45	27.85	6.54	37.50	31.34	74.00	-42.66	Vertical	Peak
3184.25	38.86	28.80	7.70	38.20	37.16	74.00	-36.84	Vertical	Peak
4920.96	35.03	31.42	9.62	36.62	39.45	74.00	-34.55	Vertical	Peak
6017.06	35.27	32.50	10.70	35.44	43.03	74.00	-30.97	Vertical	Peak
1506.56	33.93	25.74	5.30	36.60	28.37	74.00	-45.63	Horizontal	Peak
3192.37	37.17	28.80	7.71	38.20	35.48	74.00	-38.52	Horizontal	Peak
4933.50	33.90	31.43	9.63	36.59	38.37	74.00	-35.63	Horizontal	Peak
6611.33	31.32	34.20	11.37	35.34	41.55	74.00	-32.45	Horizontal	Peak

## Remark:

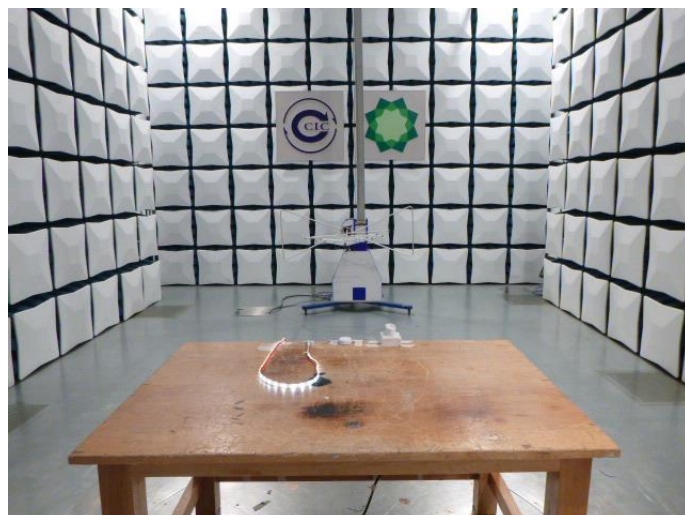
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies(test frequency band is 1GHz to 25GHz) are very lower than the limit and not show in test report.

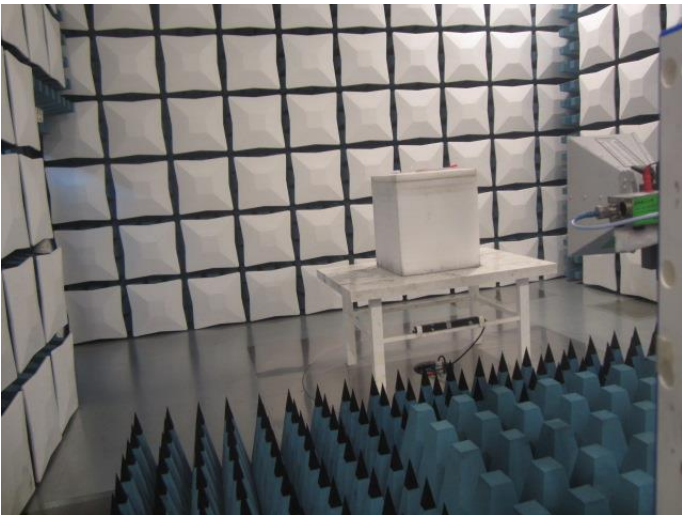
## 6. TEST SETUP PHOTOS

### Conducted Emissions



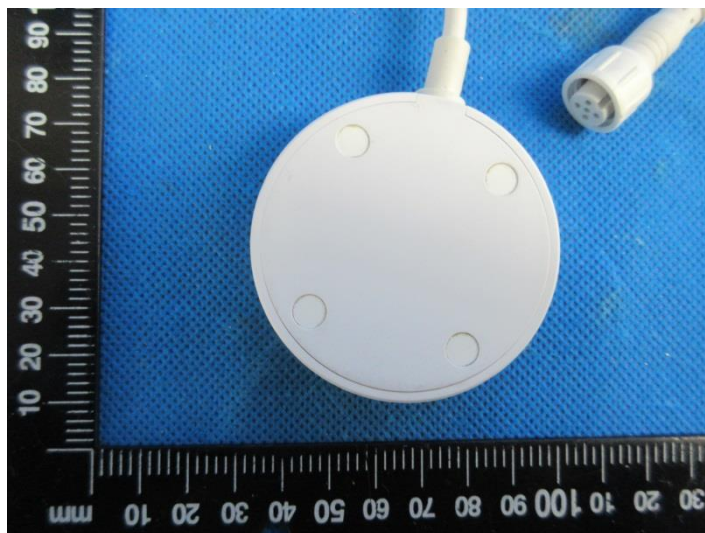
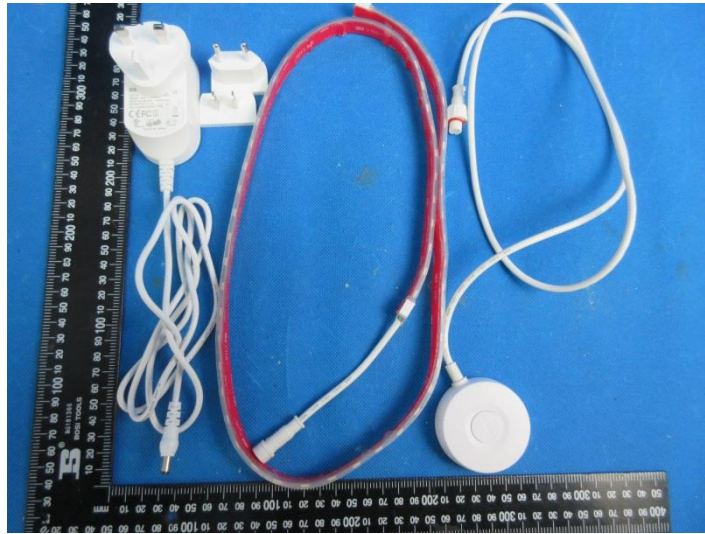
### Radiated Emissions

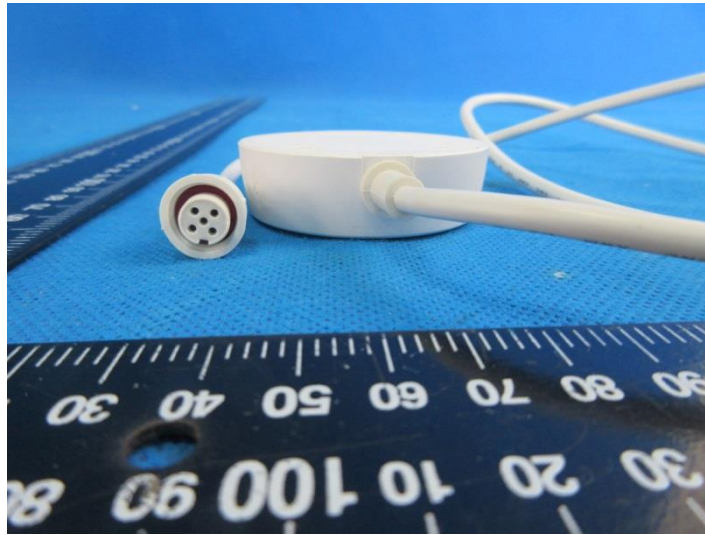
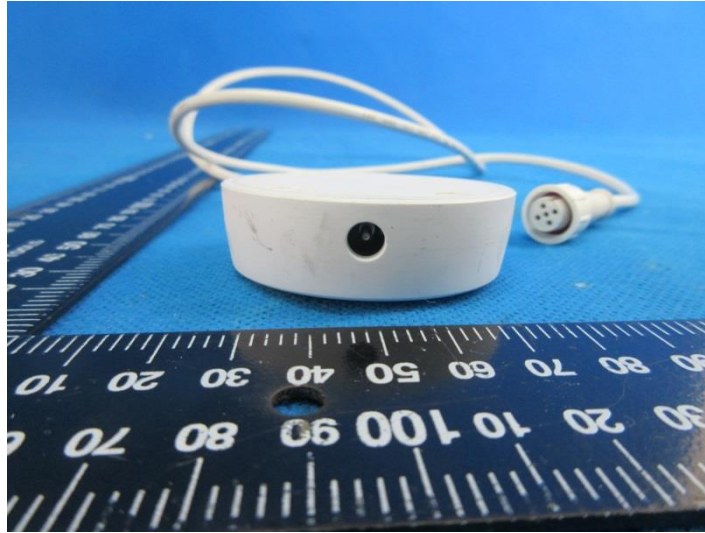




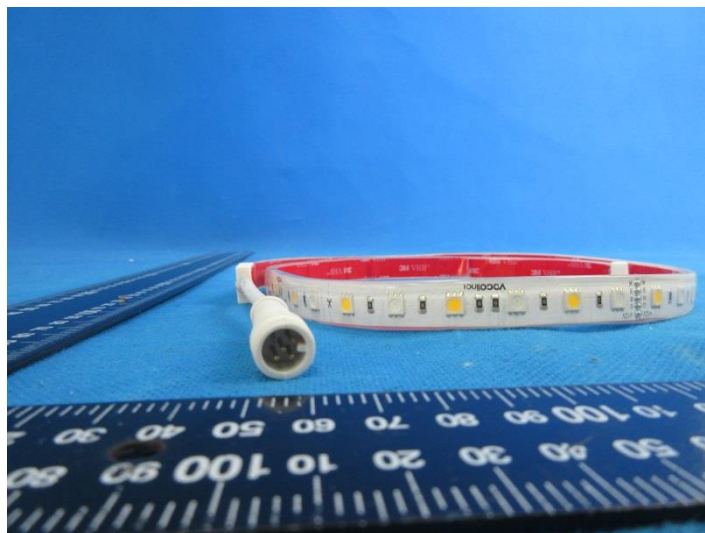
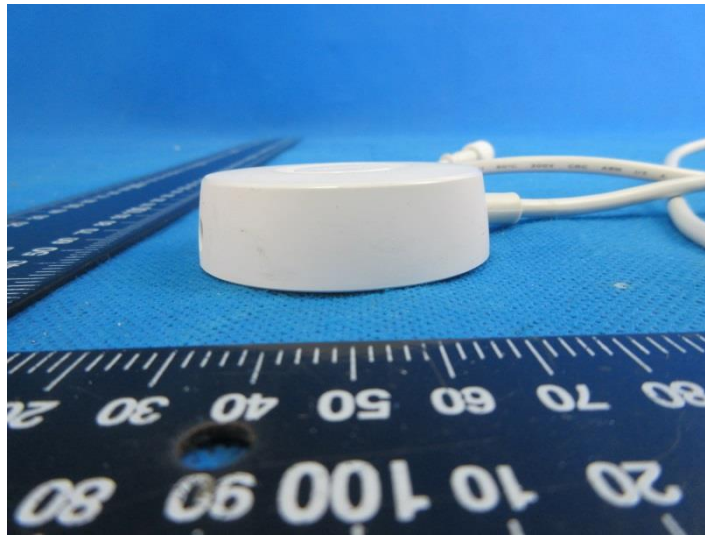
## 7. EXTERNAL AND INTERNAL PHOTOS

### External Photos of the EUT

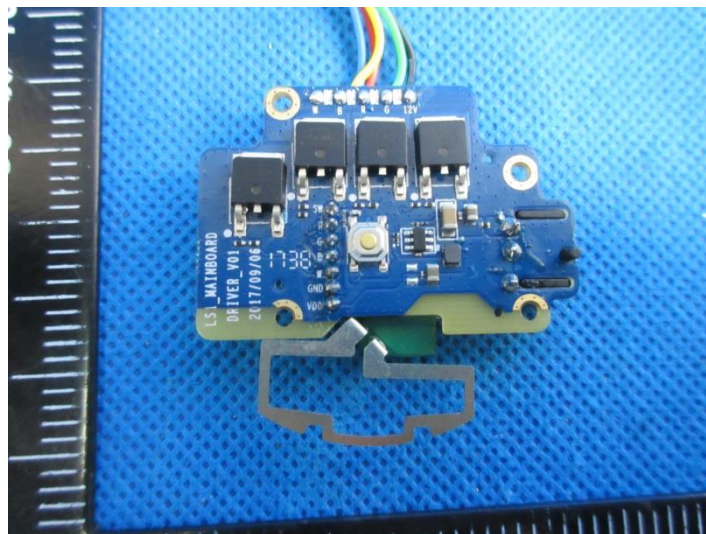
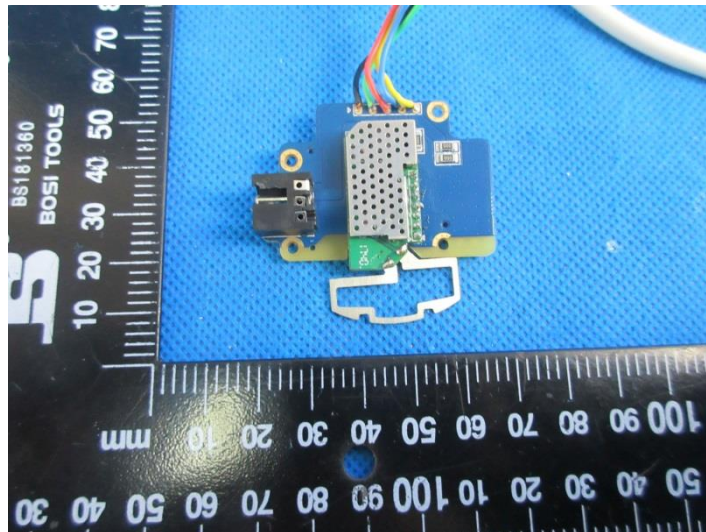
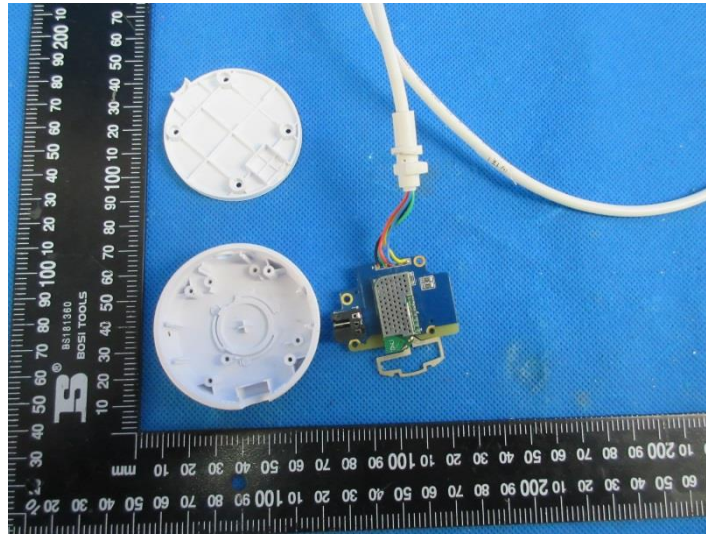


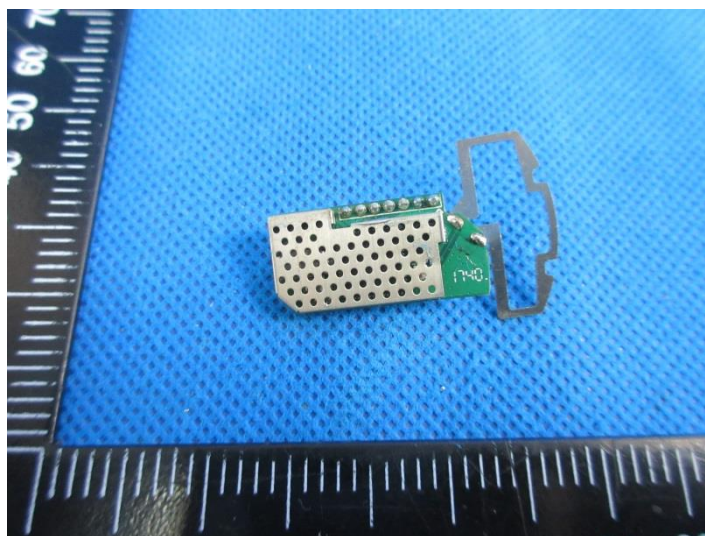
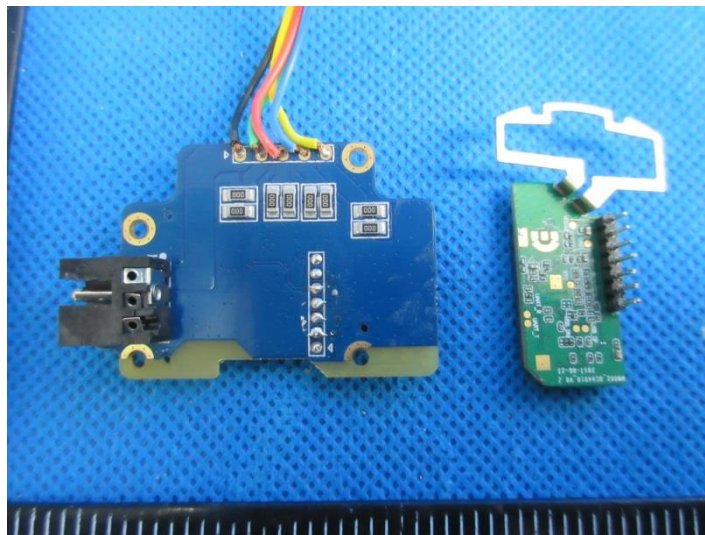
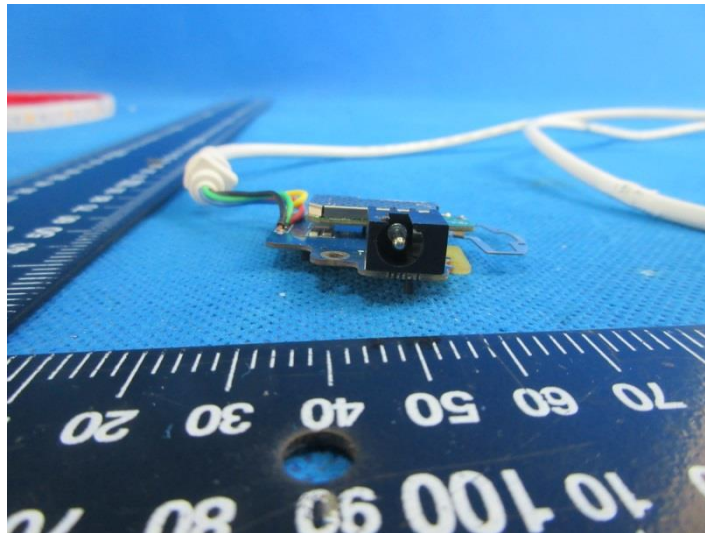


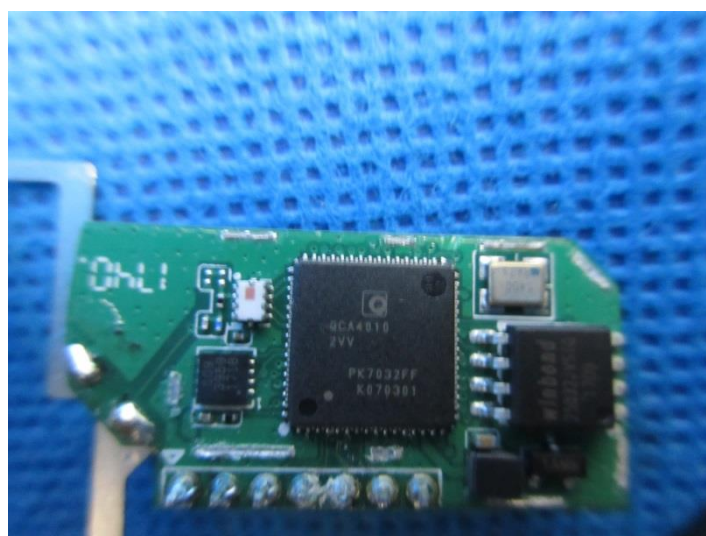
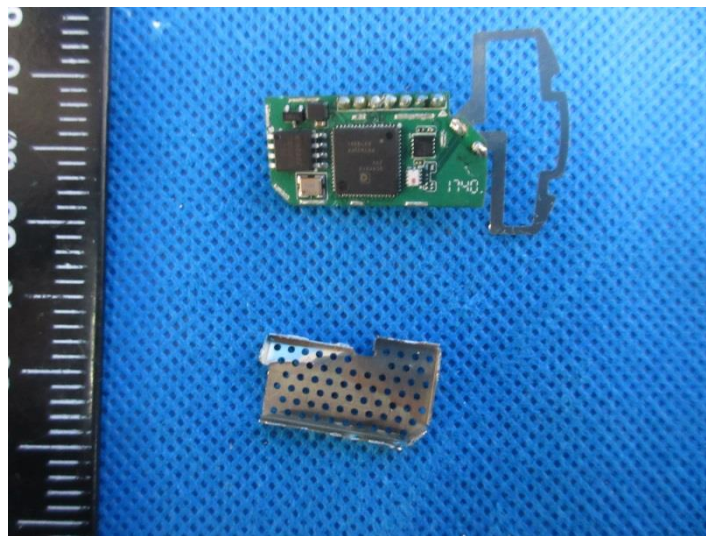
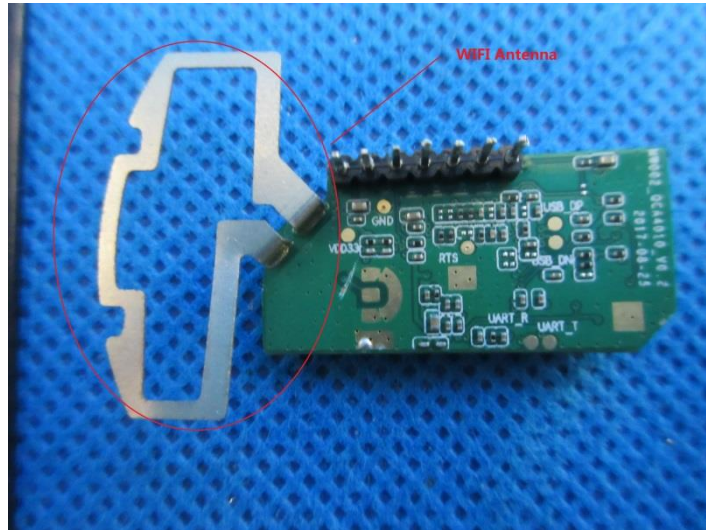


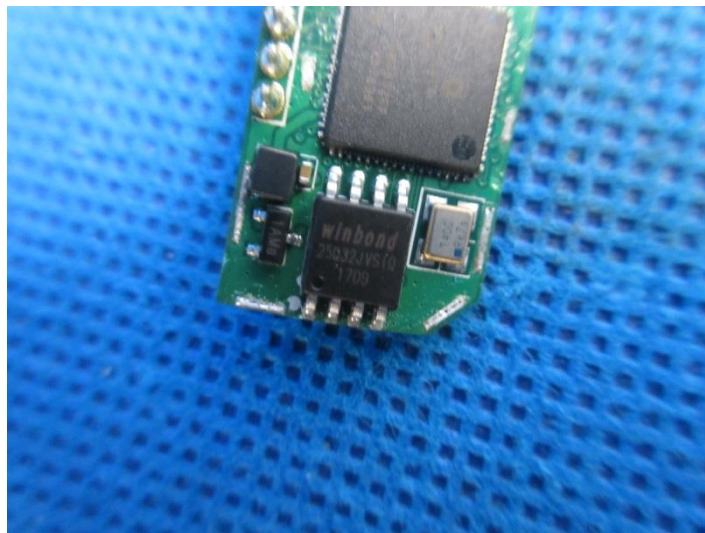


**Internal Photos of the EUT**









-----End of Report-----