



# TEST REPORT

Report Reference No.....	TRE1709024403	R/C.....: 88964
FCC ID .....	SS4RT080	
Applicant's name .....	BLUEBIRD INC.	
Address.....	(Dogok-dong, SEI Tower 13,14) 39, Eonjuro30-gil, Gangnam-gu, Seoul, South Korea	
Manufacturer.....	BLUEBIRD INC.	
Address.....	(Dogok-dong, SEI Tower 13,14) 39, Eonjuro30-gil, Gangnam-gu, Seoul, South Korea	
Test item description .....	<b>Smart Rugged Tablet Computer</b>	
Trade Mark .....	BLUEBIRD	
Model/Type reference.....	RT080	
Listed Model(s) .....	-	
Standard .....	<b>FCC CFR Title 47 Part 15 Subpart C Section 15.247</b>	
Date of receipt of test sample.....	Sep.28, 2017	
Date of testing.....	Sep.29, 2017 - Oct.18, 2017	
Date of issue.....	Oct.19, 2017	
Result.....	<b>PASS</b>	

Compiled by  
( position+printedname+signature) ...: File administrators Candy Liu

Supervised by  
(position+printedname+signature) ....: Project Engineer : Edward Pan

Approved by  
(position+printedname+signature) ....: RF Manager 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	Oct.19, 2017	Original

## 2. TEST DESCRIPTION

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

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

### 3. SUMMARY

#### 3.1. Client Information

Applicant:	BLUEBIRD INC.
Address:	(Dogok-dong, SEI Tower 13,14) 39, Eonjuro30-gil, Gangnam-gu, Seoul, South Korea
Manufacturer:	BLUEBIRD INC.
Address:	(Dogok-dong, SEI Tower 13,14) 39, Eonjuro30-gil, Gangnam-gu, Seoul, South Korea

#### 3.2. Product Description

Name of EUT:	Smart Rugged Tablet Computer
Trade Mark:	BLUEBIRD
Model No.:	RT080
Listed Model(s):	-
IMEI:	865006020017332
Power supply:	DC 3.8V From exchange battery
Adapter information:	Input: 100-240Va.c., 50/60Hz, 0.5A Output: 5Vd.c.,2.0A
Hardware version:	V0.3
Software version:	20171011_R1.02
<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:	PIFA Antenna
Antenna gain:	-3.0dBi

### 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 RF test axis
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

○	/	Manufacturer:	/
		Model No.:	/
○	/	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.

#### 4.5. Equipments Used during the Test

Conducted Emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Artificial Mains	Rohde&Schwarz	ESH2-Z5	100028	2016/11/13
2	EMI Test Receiver	Rohde&Schwarz	ESCI3	100038	2016/11/13
3	Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	2016/11/13
4	EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	-	-

Radiated Emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI test receiver	Rohde&Schwarz	ESI 26	100009	2016/11/13
2	Loop Antenna	Rohde&Schwarz	HFH2-Z2	100020	2016/11/13
3	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2016/11/13
4	Horn antenna	ShwarzBeck	9120D	1011	2016/11/13
5	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2016/11/13
6	Amplifier	Sonoma	310N	E009-13	2016/11/13
7	JS Amplifier	Rohde&Schwarz	JS4-00101800-28-5A	F201504	2016/11/13
8	Amplifier	Compliance Direction systems	PAP1-4060	120	2016/11/13
9	High pass filter	Compliance Direction systems	BSU-6	34202	2016/11/13
10	EMI test Software	Rohde&Schwarz	ESK1	-	-
11	EMI test Software	Audix	E3	-	-
12	TURNTABLE	MATURO	TT2.0	-	-
13	ANTENNA MAST	MATURO	TAM-4.0-P	-	-

RF Conducted methods					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	2016/11/13
2	MXA Signal Analyzer	Agilent Technologies	N9020A	MY5050187	2016/11/13

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)

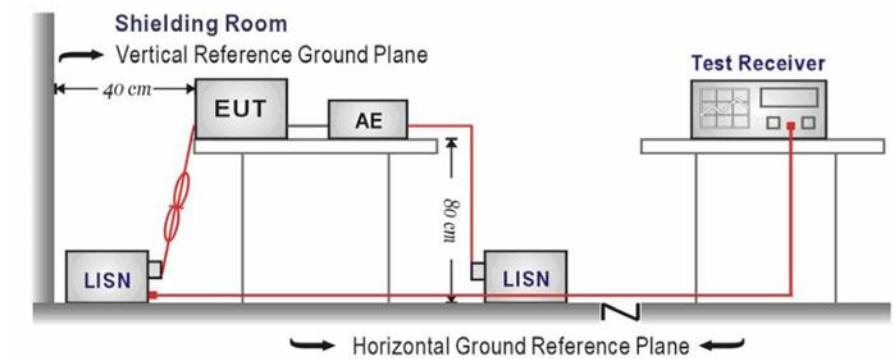
### LIMIT

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:

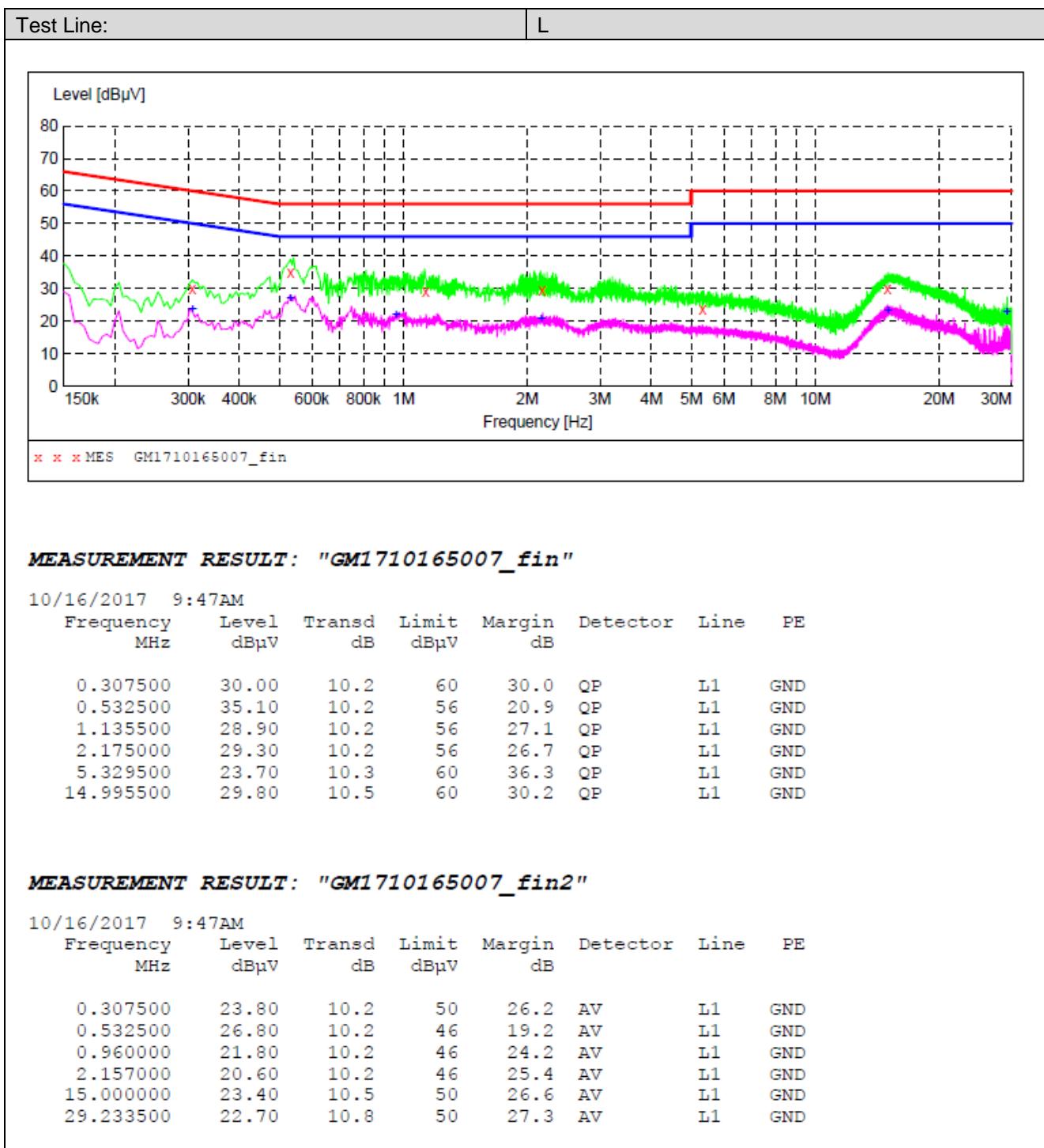
Please refer to the clause 3.3

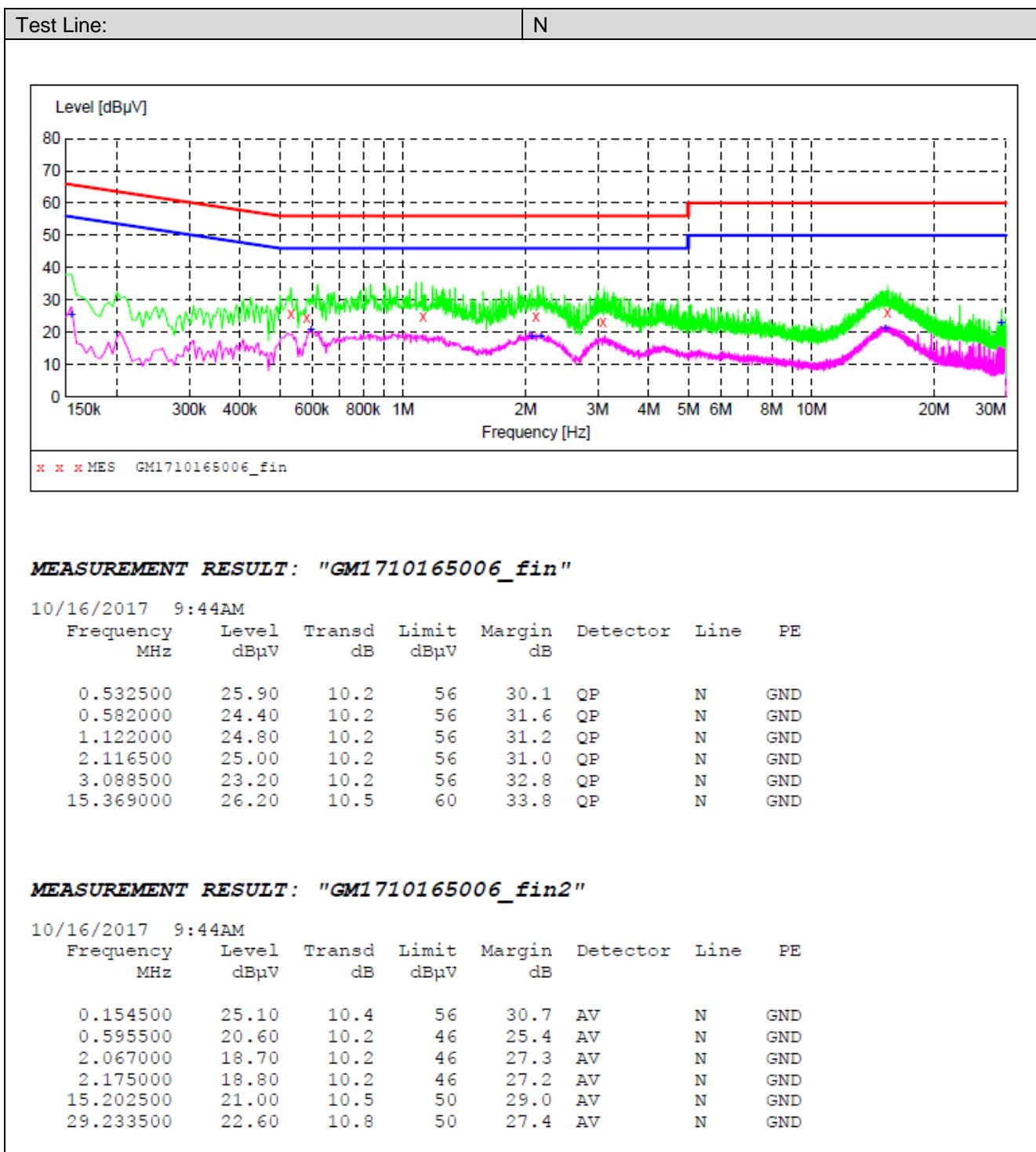
### TEST RESULTS

Passed       Not Applicable

Note:

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



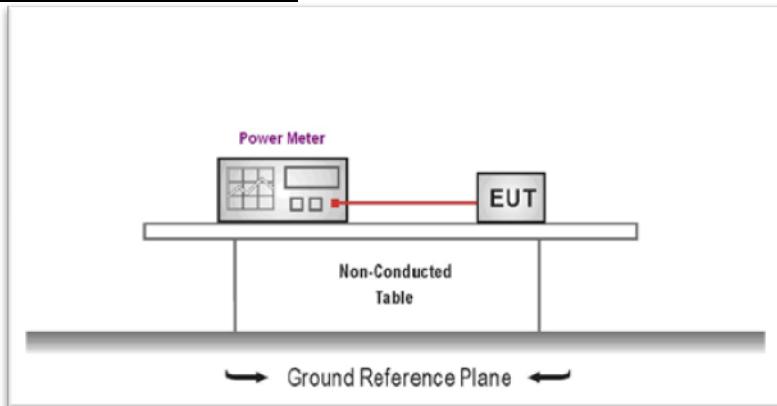


### 5.3. Conducted Peak Output Power

#### 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

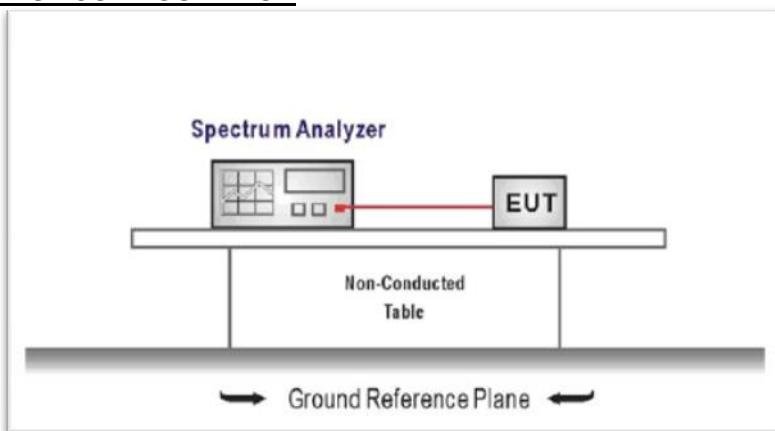
Type	Channel	Output power (dBm)	Limit (dBm)	Result
802.11b	01	16.58	$\leq 30.00$	Pass
	06	16.58		
	11	16.58		
802.11g	01	14.73	$\leq 30.00$	Pass
	06	14.73		
	11	14.73		
802.11n(HT20)	01	12.98	$\leq 30.00$	Pass
	06	12.65		
	11	11.79		
802.11n(HT40)	03	13.13	$\leq 30.00$	Pass
	06	12.87		
	09	12.30		

## 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:

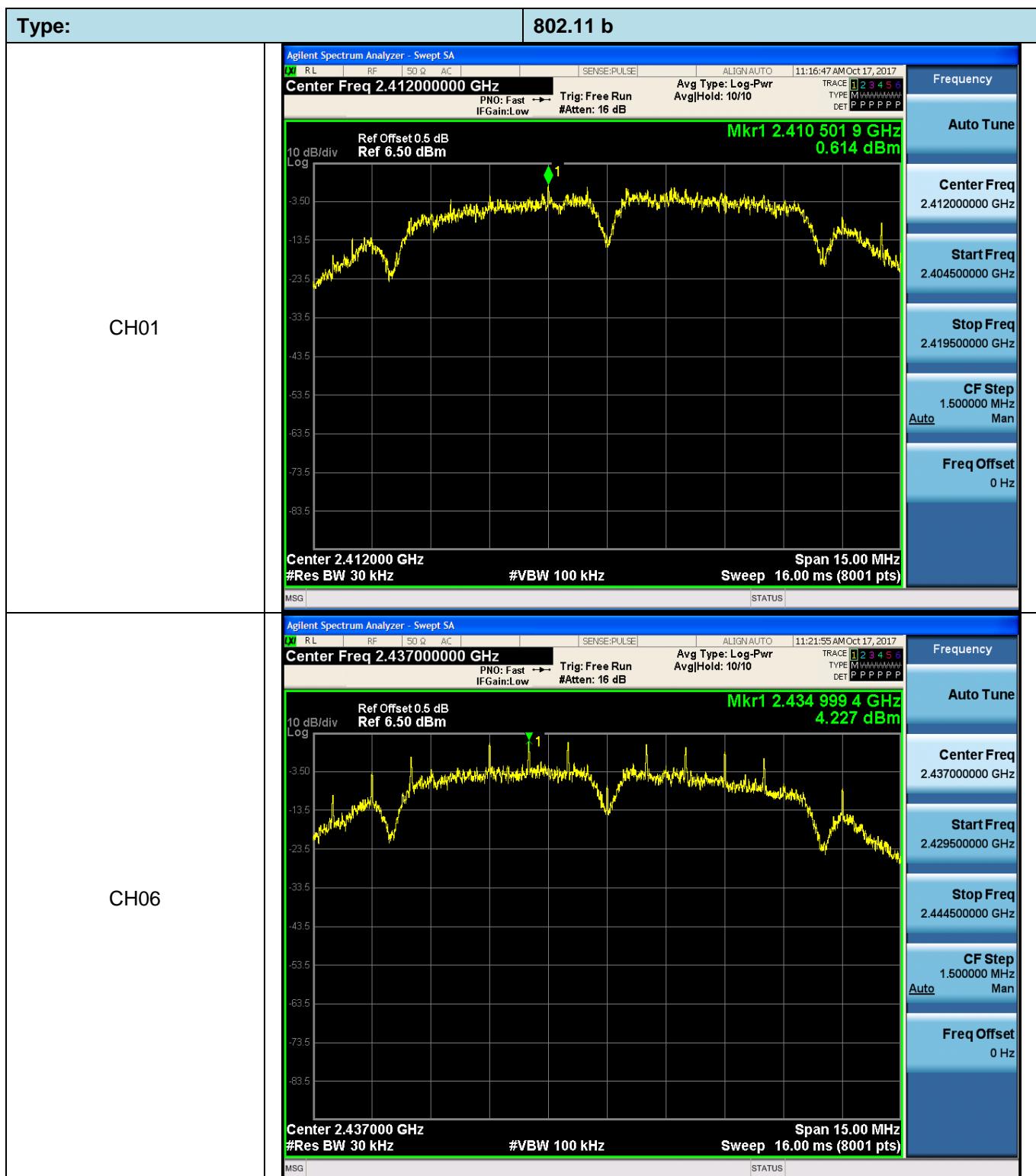
Please refer to the clause 3.3

### TEST RESULTS

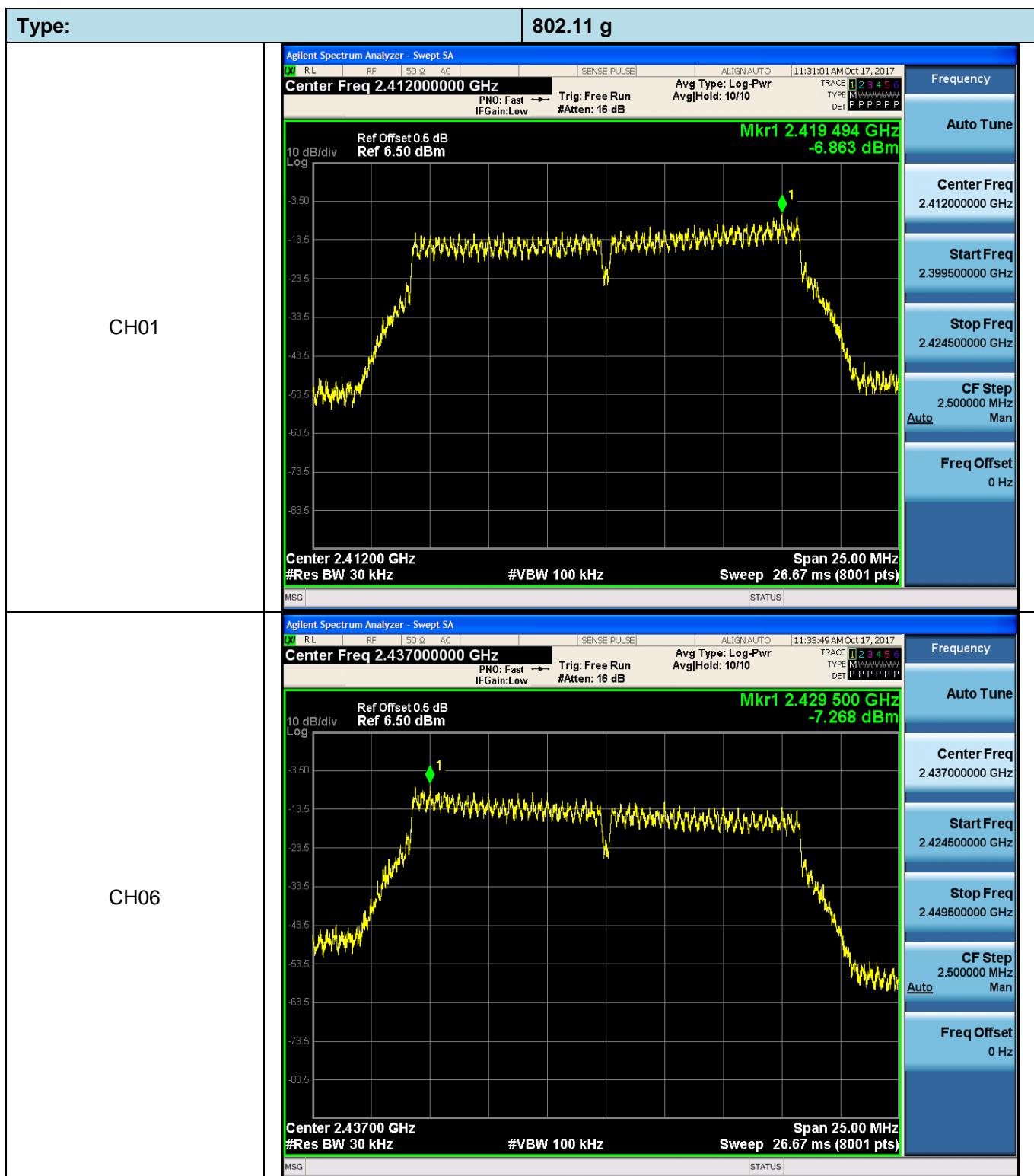
Passed       Not Applicable

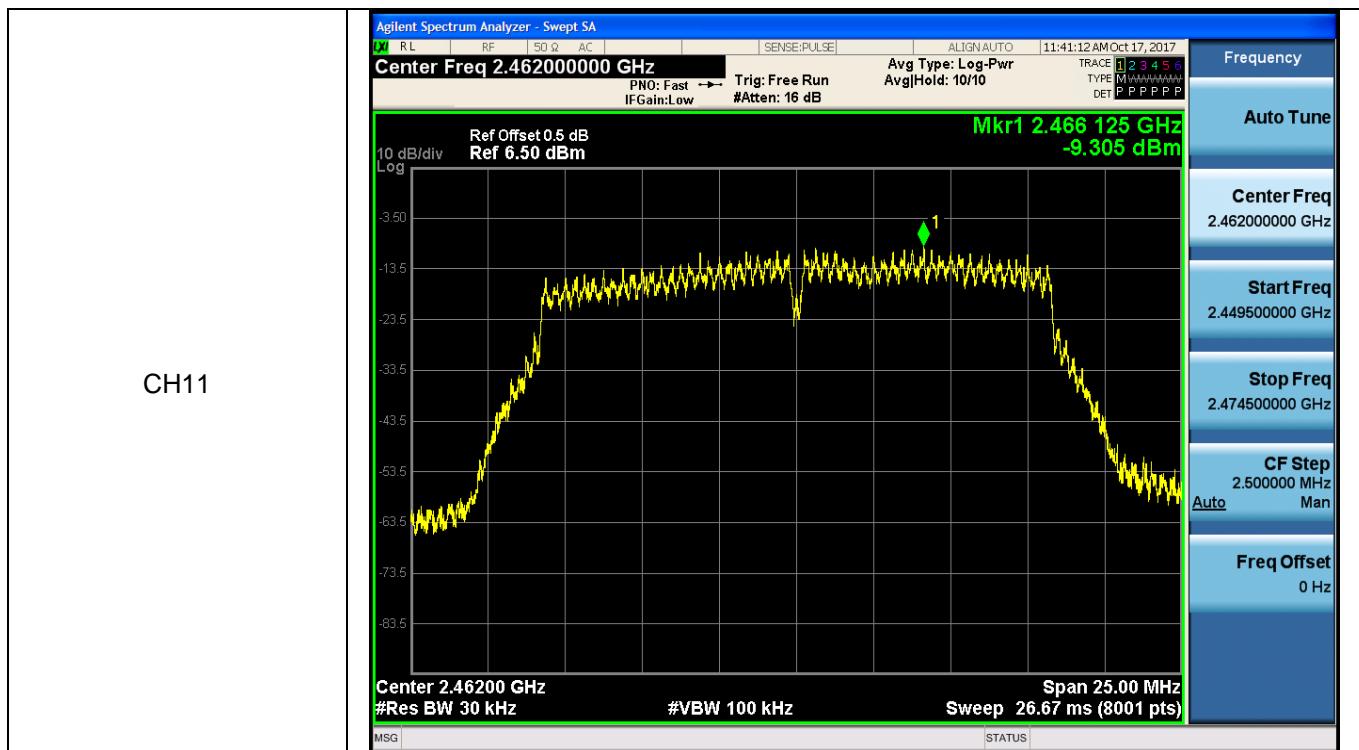
Type	Channel	Power Spectral Density (dBm/RBW)	Limit (dBm/RBW)	Result
802.11b	01	0.614	≤8.00	Pass
	06	4.227		
	11	-0.269		
802.11g	01	-6.863	≤8.00	Pass
	06	-7.268		
	11	-9.305		
802.11n(HT20)	01	-8.848	≤8.00	Pass
	06	-8.088		
	11	-10.952		
802.11n(HT40)	03	-11.757	≤8.00	Pass
	06	-11.071		
	09	-12.628		

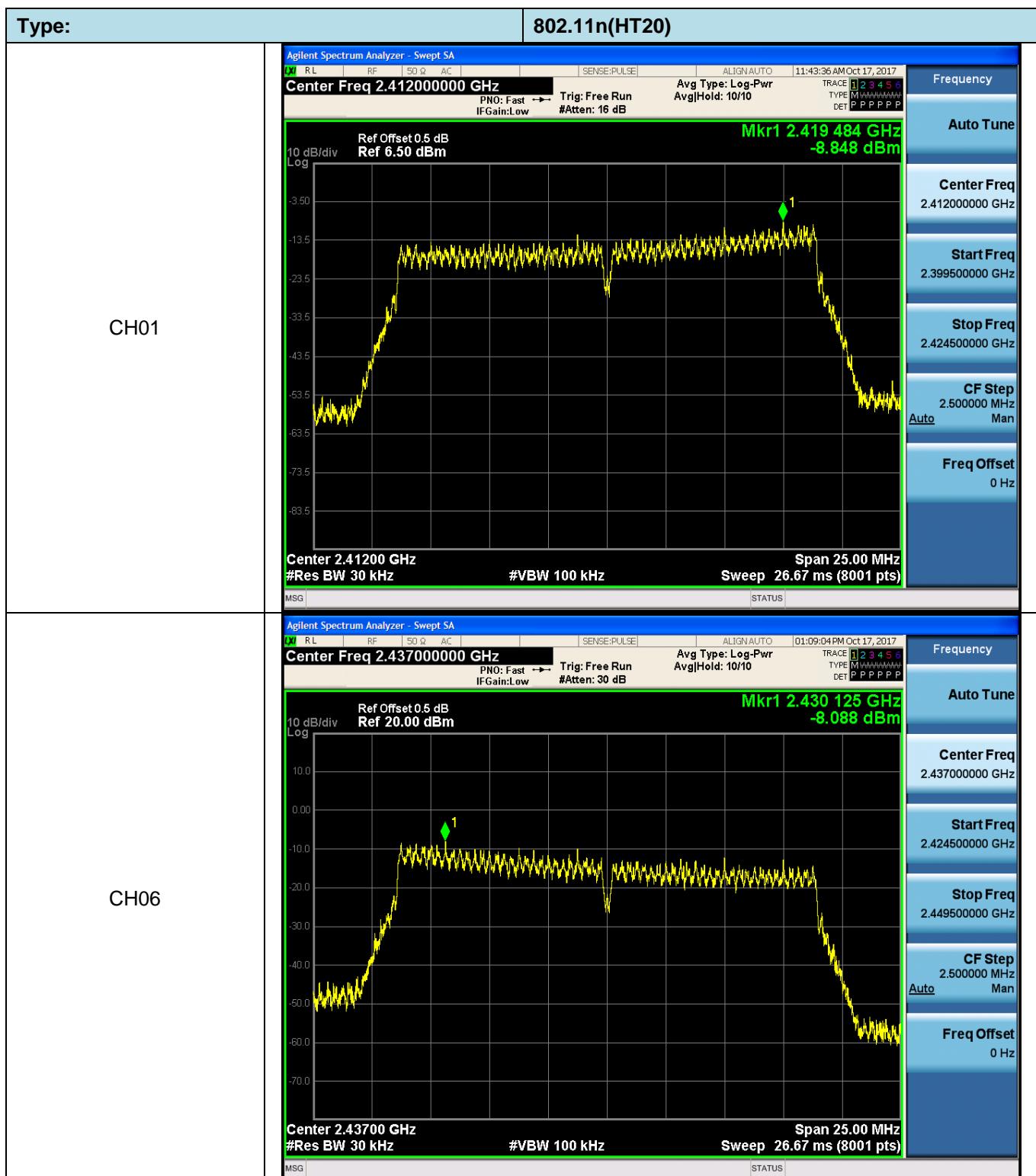
Test plot as follows:

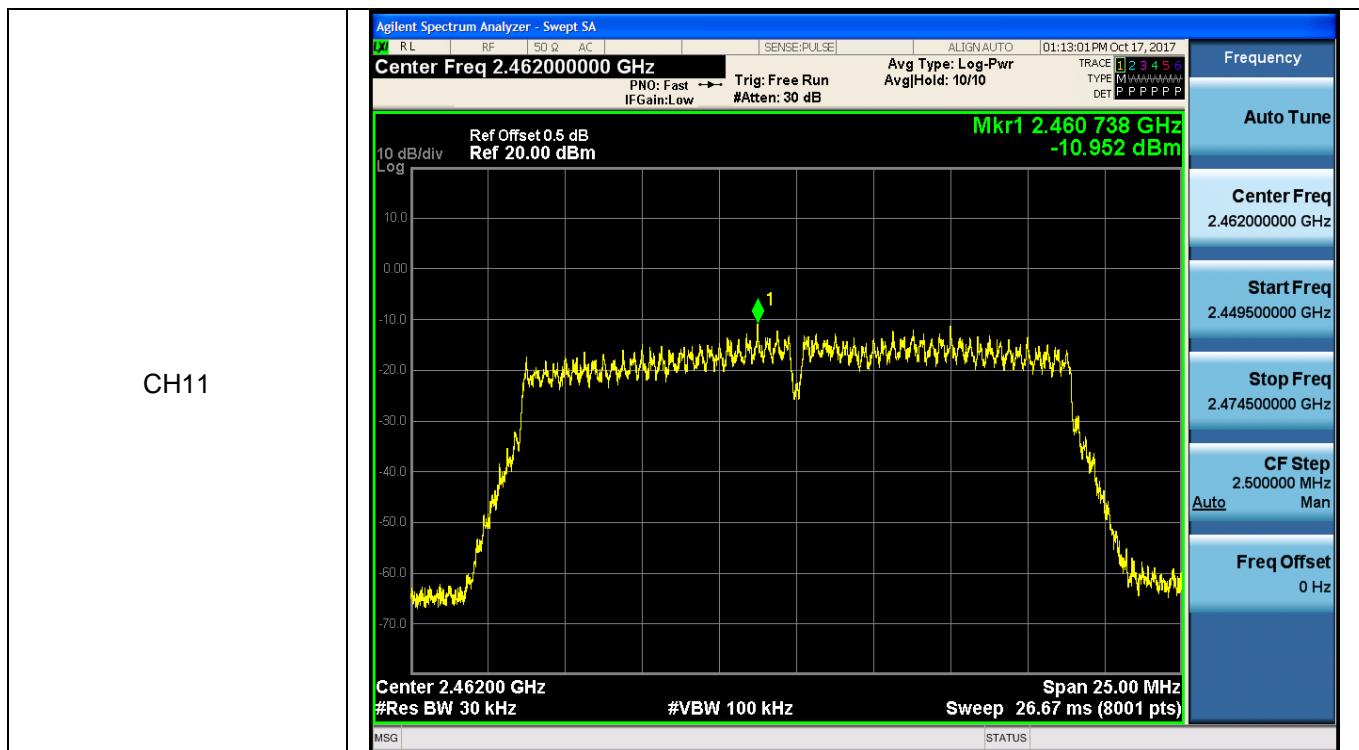


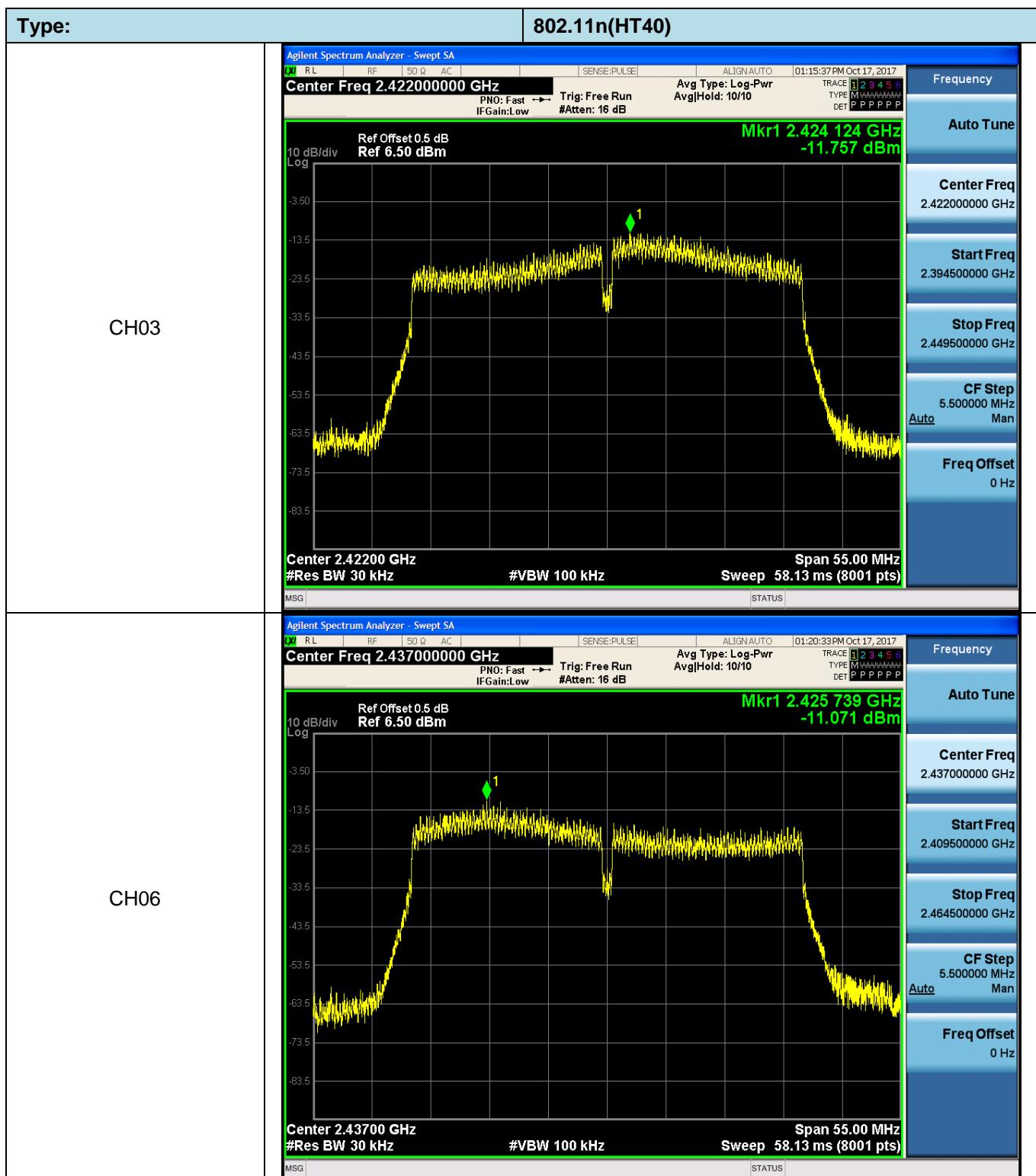


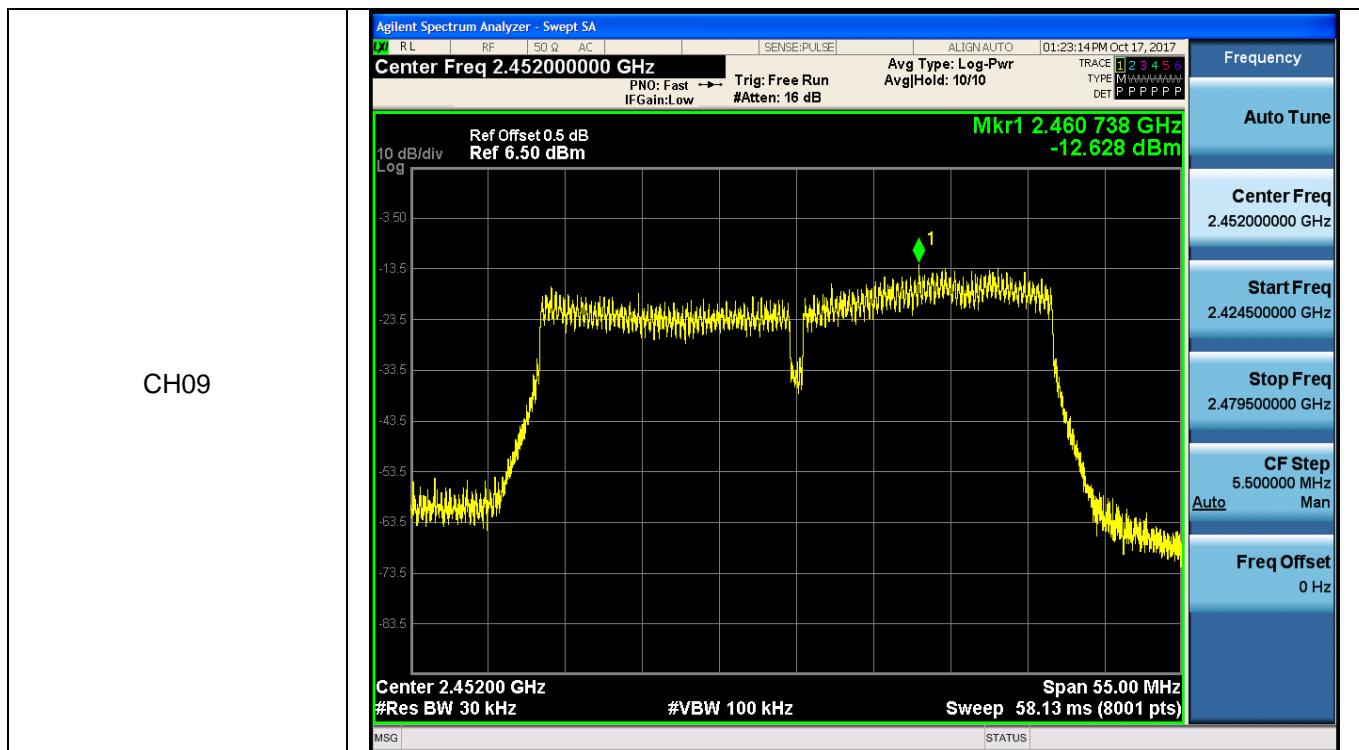










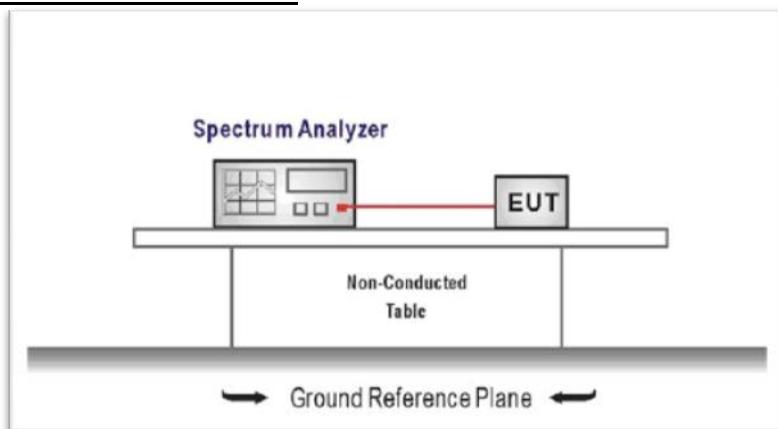


## 5.5. 6dB bandwidth

### 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  $\geq 3 \times$  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. 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:

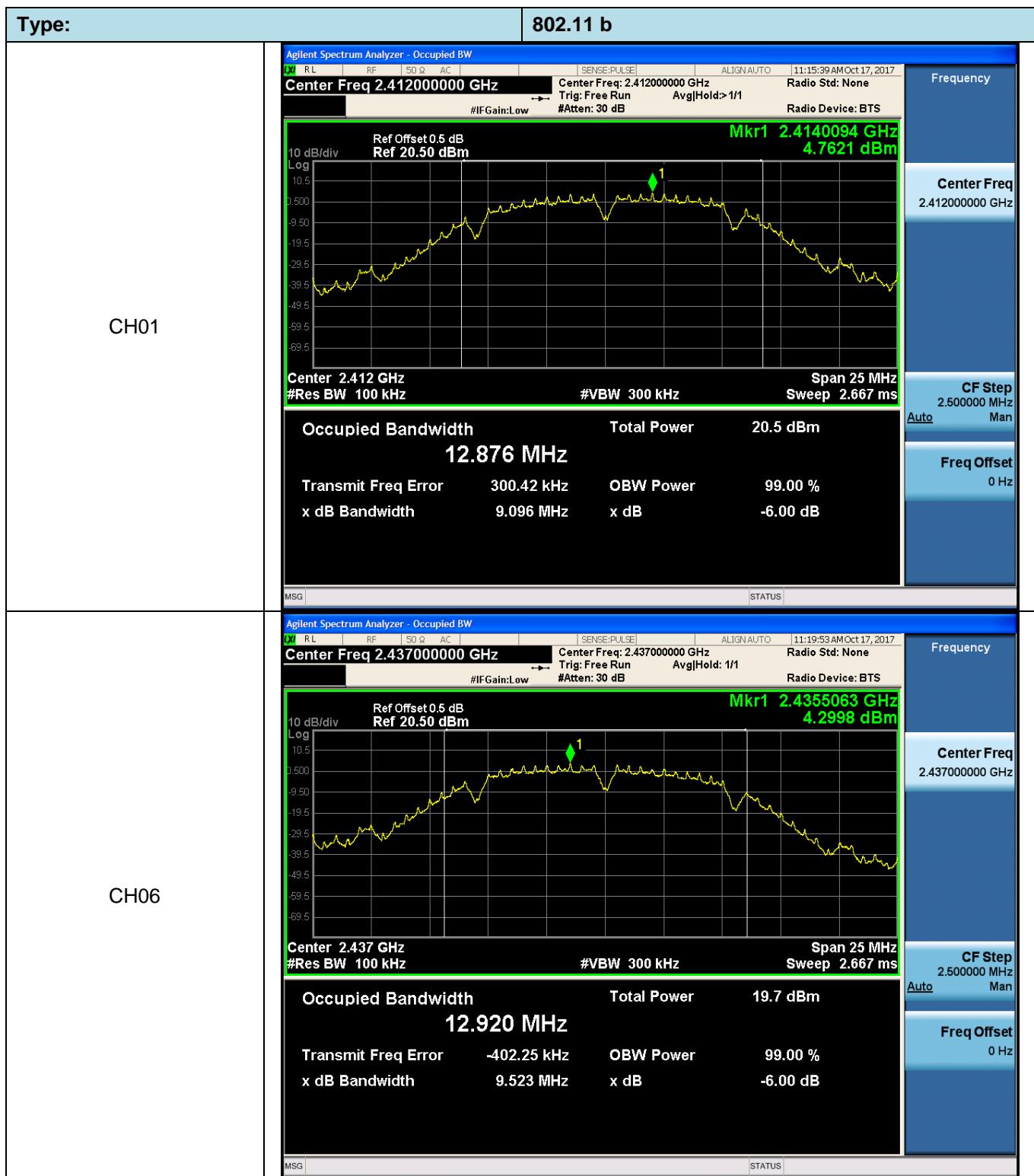
Please refer to the clause 3.3

### TEST RESULTS

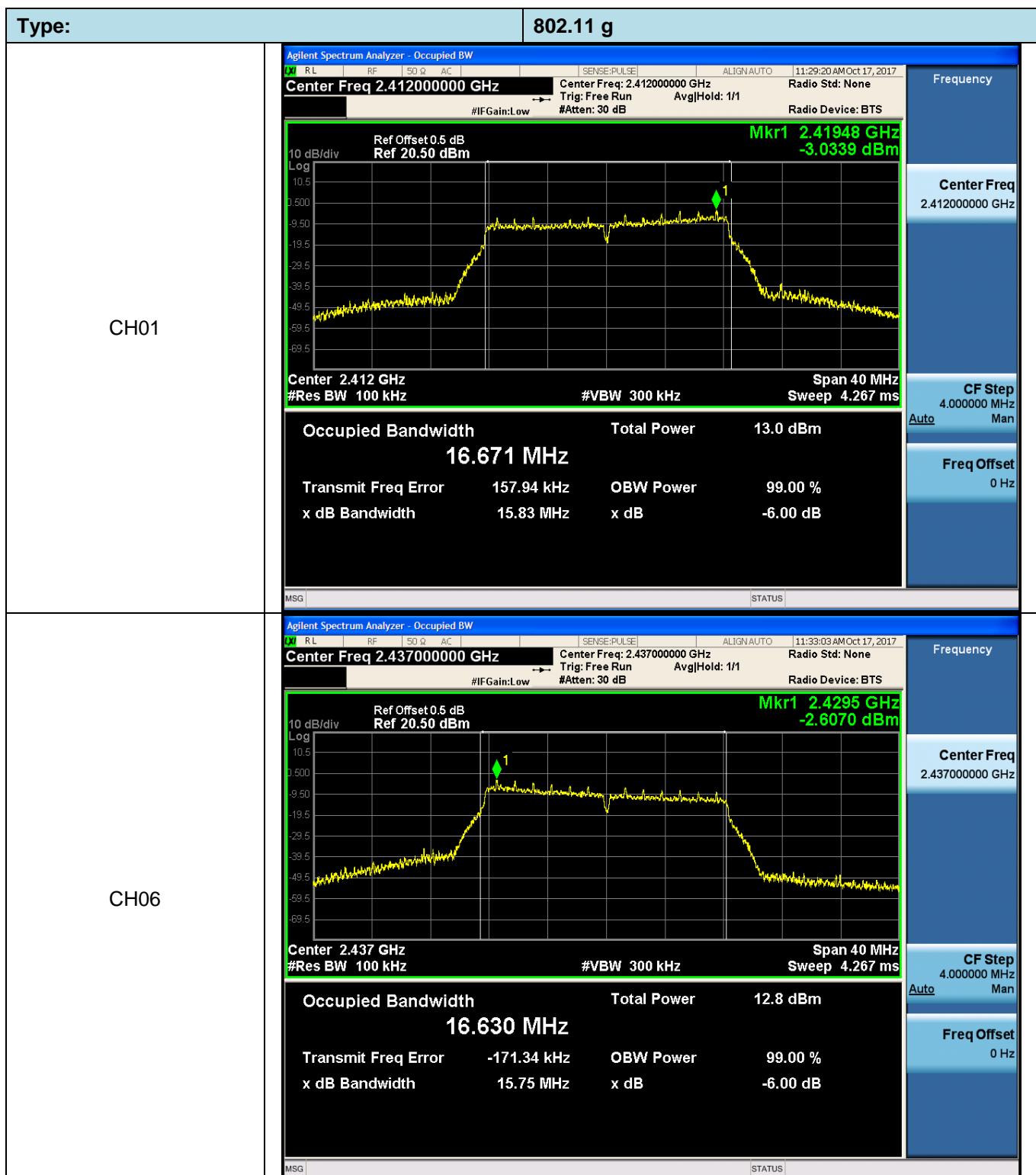
Passed       Not Applicable

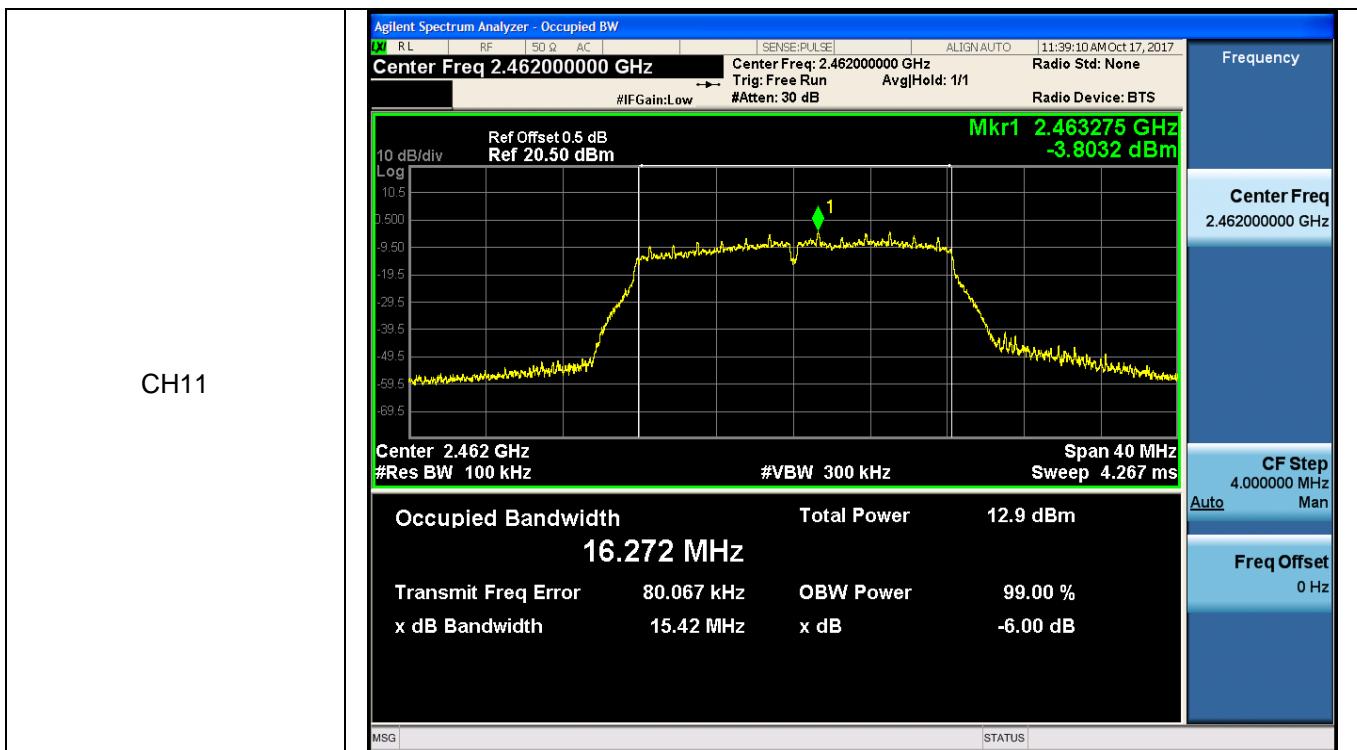
Type	Channel	6dB Bandwidth (MHz)	Limit (kHz)	Result
802.11b	01	9.096	≥500	Pass
	06	9.523		
	11	8.576		
802.11g	01	15.83	≥500	Pass
	06	15.75		
	11	15.42		
802.11n(HT20)	01	16.38	≥500	Pass
	06	16.33		
	11	15.62		
802.11n(HT40)	03	35.07	≥500	Pass
	06	35.10		
	09	35.06		

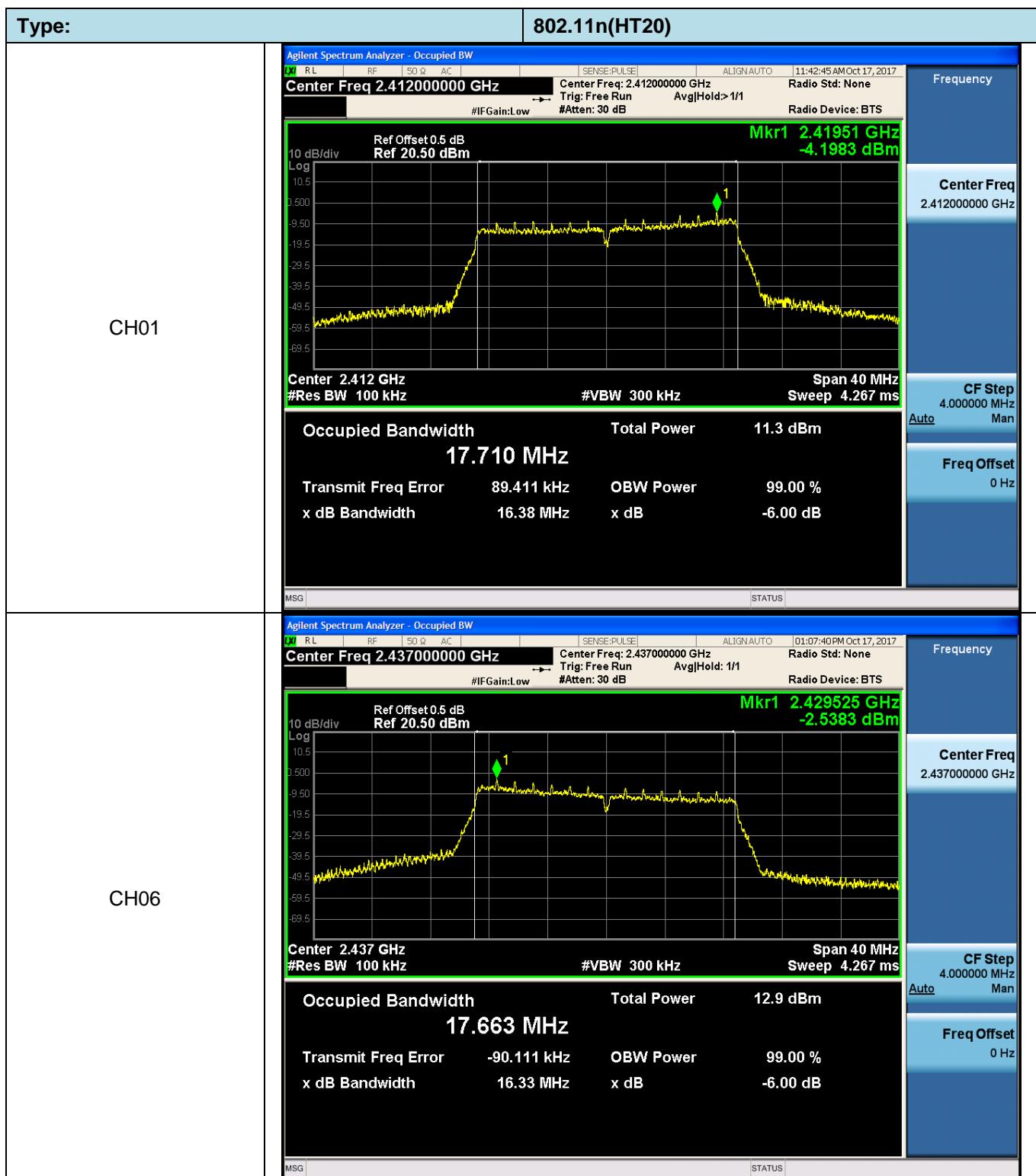
Test plot as follows:



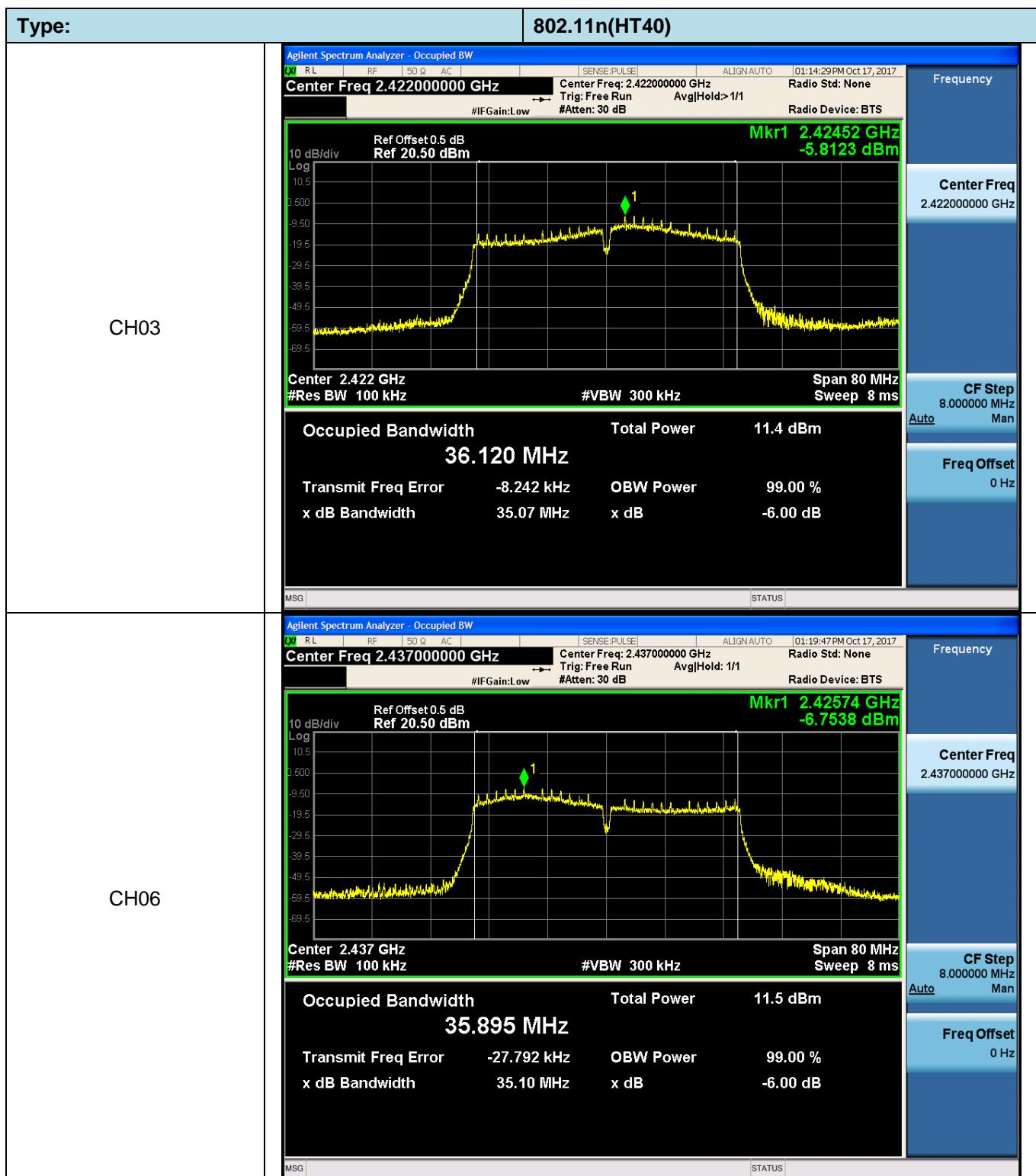












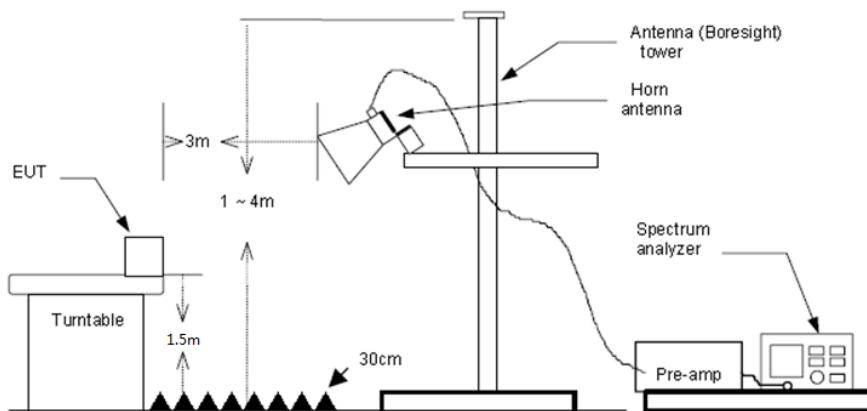


## 5.6. Restricted band

### 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					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
2310.00	17.08	27.27	6.62	0.00	50.97	74.00	-23.03	Vertical	Peak
2390.01	17.51	27.53	6.75	0.00	51.79	74.00	-22.21	Vertical	Peak
2310.00	17.68	27.27	6.62	0.00	51.57	74.00	-22.43	Horizontal	Peak
2390.01	19.34	27.53	6.75	0.00	53.62	74.00	-20.38	Horizontal	Peak
2310.00	11.48	27.27	6.62	0.00	45.37	54.00	-8.63	Vertical	Average
2390.01	11.20	27.53	6.75	0.00	45.48	54.00	-8.52	Vertical	Average
2310.00	11.85	27.27	6.62	0.00	45.74	54.00	-8.26	Horizontal	Average
2390.01	12.18	27.53	6.75	0.00	46.46	54.00	-7.54	Horizontal	Average

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
2483.49	17.37	27.85	6.83	0.00	52.05	74.00	-21.95	Vertical	Peak
2500.00	17.44	27.90	6.84	0.00	52.18	74.00	-21.82	Vertical	Peak
2483.49	17.56	27.85	6.83	0.00	52.24	74.00	-21.76	Horizontal	Peak
2500.00	18.75	27.90	6.84	0.00	53.49	74.00	-20.51	Horizontal	Peak
2483.49	11.15	27.85	6.83	0.00	45.83	54.00	-8.17	Vertical	Average
2500.00	11.27	27.90	6.84	0.00	46.01	54.00	-7.99	Vertical	Average
2483.49	11.21	27.85	6.83	0.00	45.89	54.00	-8.11	Horizontal	Average
2500.00	11.22	27.90	6.84	0.00	45.96	54.00	-8.04	Horizontal	Average

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
2310.00	17.47	27.27	6.62	0.00	51.36	74.00	-22.64	Vertical	Peak
2390.01	18.86	27.53	6.75	0.00	53.14	74.00	-20.86	Vertical	Peak
2310.00	17.87	27.27	6.62	0.00	51.76	74.00	-22.24	Horizontal	Peak
2390.01	20.42	27.53	6.75	0.00	54.70	74.00	-19.30	Horizontal	Peak
2310.00	11.26	27.27	6.62	0.00	45.15	54.00	-8.85	Vertical	Average
2390.01	12.93	27.53	6.75	0.00	47.21	54.00	-6.79	Vertical	Average
2310.00	11.68	27.27	6.62	0.00	45.57	54.00	-8.43	Horizontal	Average
2390.01	15.45	27.53	6.75	0.00	49.73	54.00	-4.27	Horizontal	Average

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
2483.49	18.48	27.85	6.83	0.00	53.16	74.00	-20.84	Vertical	Peak
2500.00	18.32	27.90	6.84	0.00	53.06	74.00	-20.94	Vertical	Peak
2483.49	22.12	27.85	6.83	0.00	56.80	74.00	-17.20	Horizontal	Peak
2500.00	18.05	27.90	6.84	0.00	52.79	74.00	-21.21	Horizontal	Peak
2483.49	14.33	27.85	6.83	0.00	49.01	54.00	-4.99	Vertical	Average
2500.00	11.03	27.90	6.84	0.00	45.77	54.00	-8.23	Vertical	Average
2483.49	18.10	27.85	6.83	0.00	52.78	54.00	-1.22	Horizontal	Average
2500.00	10.92	27.90	6.84	0.00	45.66	54.00	-8.34	Horizontal	Average

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
2310.00	17.18	27.27	6.62	0.00	51.07	74.00	-22.93	Vertical	Peak
2390.01	17.48	27.53	6.75	0.00	51.76	74.00	-22.24	Vertical	Peak
2310.00	17.65	27.27	6.62	0.00	51.54	74.00	-22.46	Horizontal	Peak
2390.01	21.94	27.53	6.75	0.00	56.22	74.00	-17.78	Horizontal	Peak
2310.00	11.15	27.27	6.62	0.00	45.04	54.00	-8.96	Vertical	Average
2390.01	14.33	27.53	6.75	0.00	48.61	54.00	-5.39	Vertical	Average
2310.00	11.38	27.27	6.62	0.00	45.27	54.00	-8.73	Horizontal	Average
2390.01	17.39	27.53	6.75	0.00	51.67	54.00	-2.33	Horizontal	Average

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
2483.49	17.77	27.85	6.83	0.00	52.45	74.00	-21.55	Vertical	Peak
2500.00	17.60	27.90	6.84	0.00	52.34	74.00	-21.66	Vertical	Peak
2483.49	22.42	27.85	6.83	0.00	57.10	74.00	-16.90	Horizontal	Peak
2500.00	17.69	27.90	6.84	0.00	52.43	74.00	-21.57	Horizontal	Peak
2483.49	15.27	27.85	6.83	0.00	49.95	54.00	-4.05	Vertical	Average
2500.00	10.80	27.90	6.84	0.00	45.54	54.00	-8.46	Vertical	Average
2483.49	16.88	27.85	6.83	0.00	51.56	54.00	-2.44	Horizontal	Average
2500.00	12.08	27.90	6.84	0.00	46.82	54.00	-7.18	Horizontal	Average

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
2310.00	18.13	27.27	6.62	0.00	52.02	74.00	-21.98	Vertical	Peak
2389.99	23.11	27.53	6.75	0.00	57.39	74.00	-16.61	Vertical	Peak
2310.00	18.02	27.27	6.62	0.00	51.91	74.00	-22.09	Horizontal	Peak
2389.99	30.24	27.53	6.75	0.00	64.52	74.00	-9.48	Horizontal	Peak
2310.00	11.21	27.27	6.62	0.00	45.10	54.00	-8.90	Vertical	Average
2389.99	18.03	27.53	6.75	0.00	52.31	54.00	-1.69	Vertical	Average
2310.00	9.45	27.27	6.62	0.00	43.34	54.00	-10.66	Horizontal	Average
2389.99	18.58	27.53	6.75	0.00	52.86	54.00	-1.14	Horizontal	Average

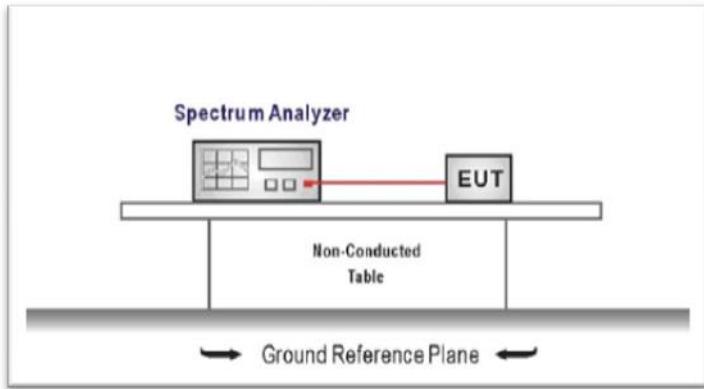
802.11n(HT40)					CH09				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2483.50	22.55	27.85	6.83	0.00	57.23	74.00	-16.77	Vertical	Peak
2500.00	19.05	27.90	6.84	0.00	53.79	74.00	-20.21	Vertical	Peak
2483.50	31.78	27.85	6.83	0.00	66.46	74.00	-7.54	Horizontal	Peak
2500.00	22.70	27.90	6.84	0.00	57.44	74.00	-16.56	Horizontal	Peak
2483.50	17.67	27.85	6.83	0.00	52.35	54.00	-1.65	Vertical	Average
2500.00	12.02	27.90	6.84	0.00	46.76	54.00	-7.24	Vertical	Average
2483.50	18.65	27.85	6.83	0.00	53.33	54.00	-0.67	Horizontal	Average
2500.00	9.98	27.90	6.84	0.00	44.72	54.00	-9.28	Horizontal	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.  
 $RBW = 100 \text{ kHz}$ ,  $VBW \geq 3 \times RBW$   
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  
 $RBW = 100 \text{ kHz}$ ,  $VBW \geq 3 \times RBW$   
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

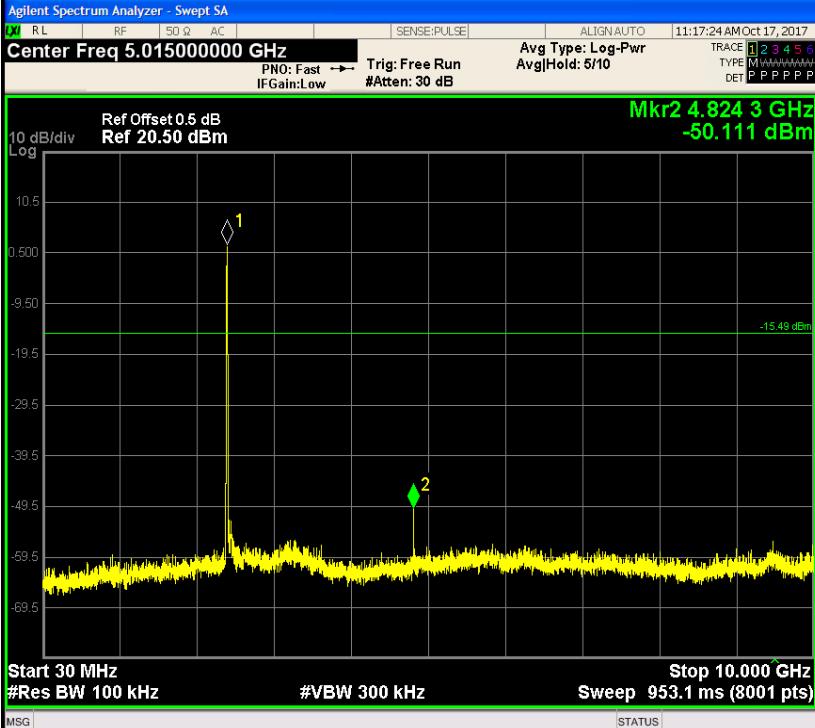
Passed       Not Applicable

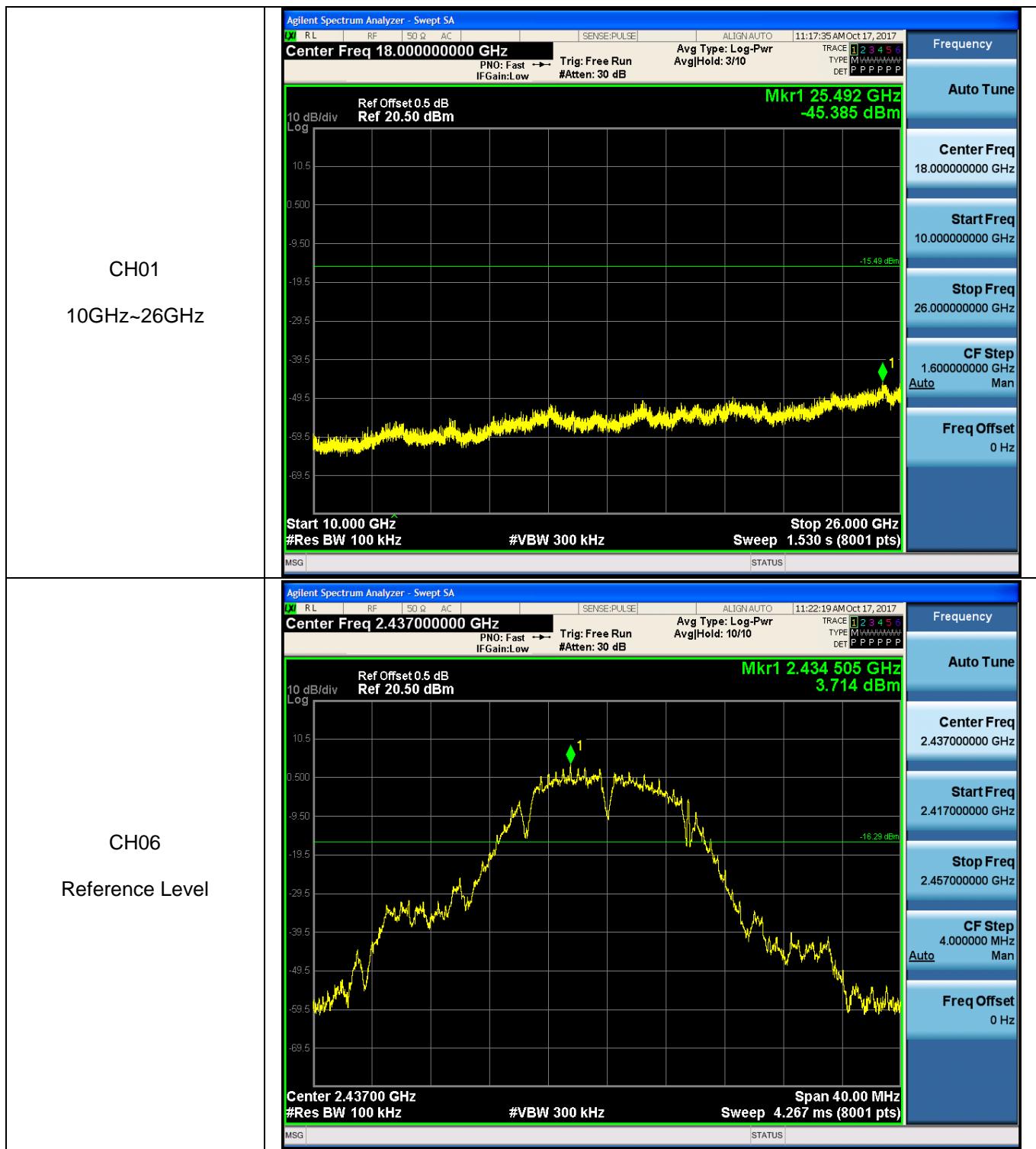
Test Item:	Bandedge	Type:	802.11 b																																																																																																											
CH01	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.366000000 GHz</p> <p>PNO: Fast Trig: Free Run IFGain:Low</p> <p>Avg Type: Log-Pwr Avg Hold: 10/10</p> <p>REF Offset 0.5 dB Ref 20.50 dBm</p> <p>Mkr4 2.389 828 GHz -56.631 dBm</p> <p>Start 2.31000 GHz Stop 2.42200 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 11.20 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.413 502 GHz</td><td>4.760 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.400 000 GHz</td><td>-41.386 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.390 000 GHz</td><td>-59.249 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.389 828 GHz</td><td>-56.631 dBm</td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <p>MSG STATUS</p>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.413 502 GHz	4.760 dBm				2	N	1	f	2.400 000 GHz	-41.386 dBm				3	N	1	f	2.390 000 GHz	-59.249 dBm				4	N	1	f	2.389 828 GHz	-56.631 dBm				5									6									7									8									9									10									11									Frequency Auto Tune Center Freq 2.366000000 GHz Start Freq 2.310000000 GHz Stop Freq 2.422000000 GHz CF Step 11.20000 MHz Freq Offset 0 Hz
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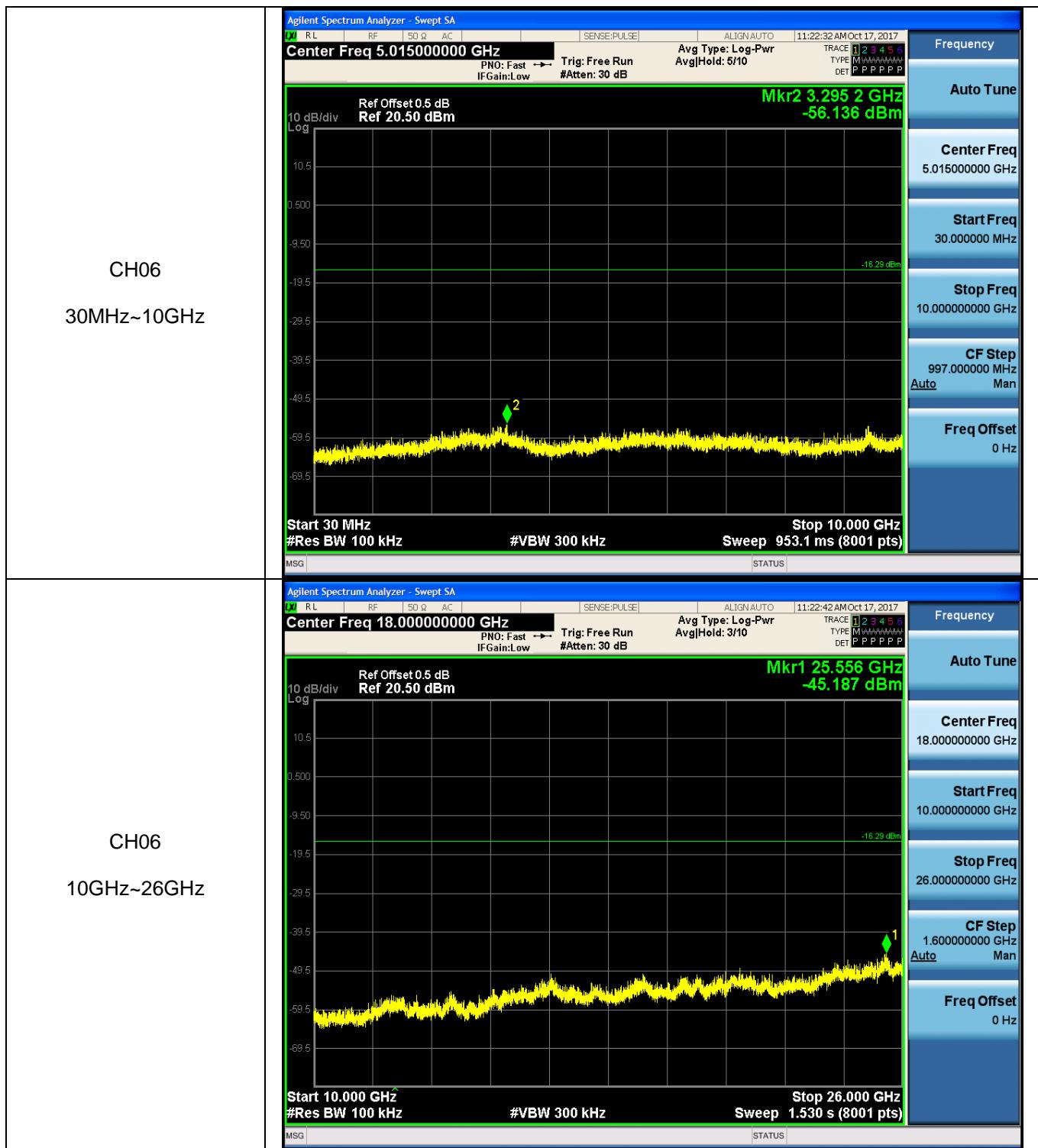
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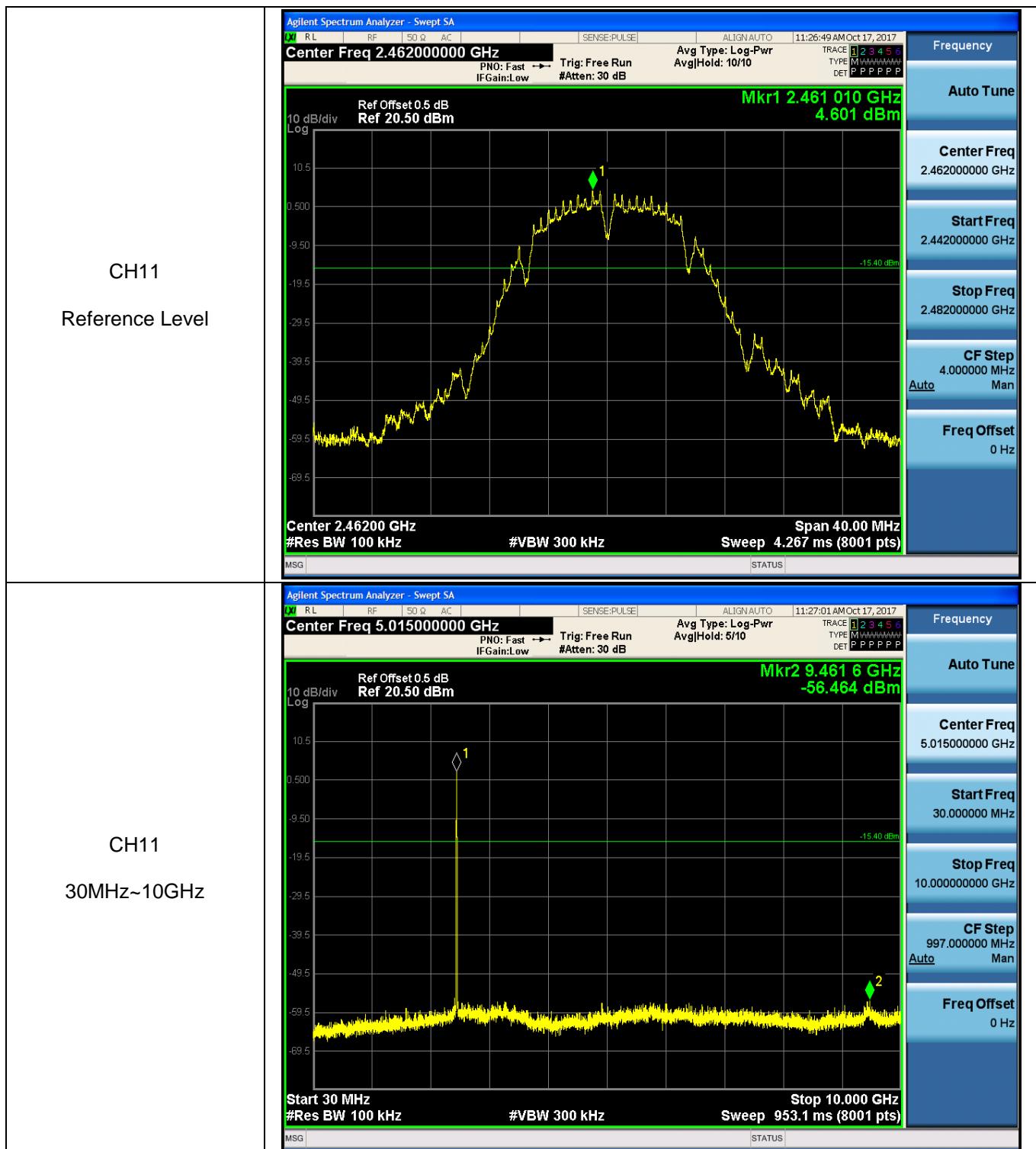
Test Item:	Bandedge	Type:	802.11 n(HT20)																																																																																																											
CH01	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.366000000 GHz</p> <p>PNO: Fast Trig: Free Run IFGain:Low</p> <p>Avg Type: Log-Pwr Avg Hold: 10/10</p> <p>REF Offset 0.5 dB Ref 20.50 dBm</p> <p>Mkr4 2.389 870 GHz -54.841 dBm</p> <p>Start 2.31000 GHz Stop 2.42200 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 11.20 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.419 508 GHz</td><td>-4.002 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.400 000 GHz</td><td>51.280 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.390 000 GHz</td><td>59.423 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.389 870 GHz</td><td>-54.841 dBm</td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <p>MSG STATUS</p>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.419 508 GHz	-4.002 dBm				2	N	1	f	2.400 000 GHz	51.280 dBm				3	N	1	f	2.390 000 GHz	59.423 dBm				4	N	1	f	2.389 870 GHz	-54.841 dBm				5									6									7									8									9									10									11									<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.366000000 GHz</p> <p>Start Freq 2.310000000 GHz</p> <p>Stop Freq 2.422000000 GHz</p> <p>CF Step 11.20000 MHz</p> <p>Freq Offset 0 Hz</p>
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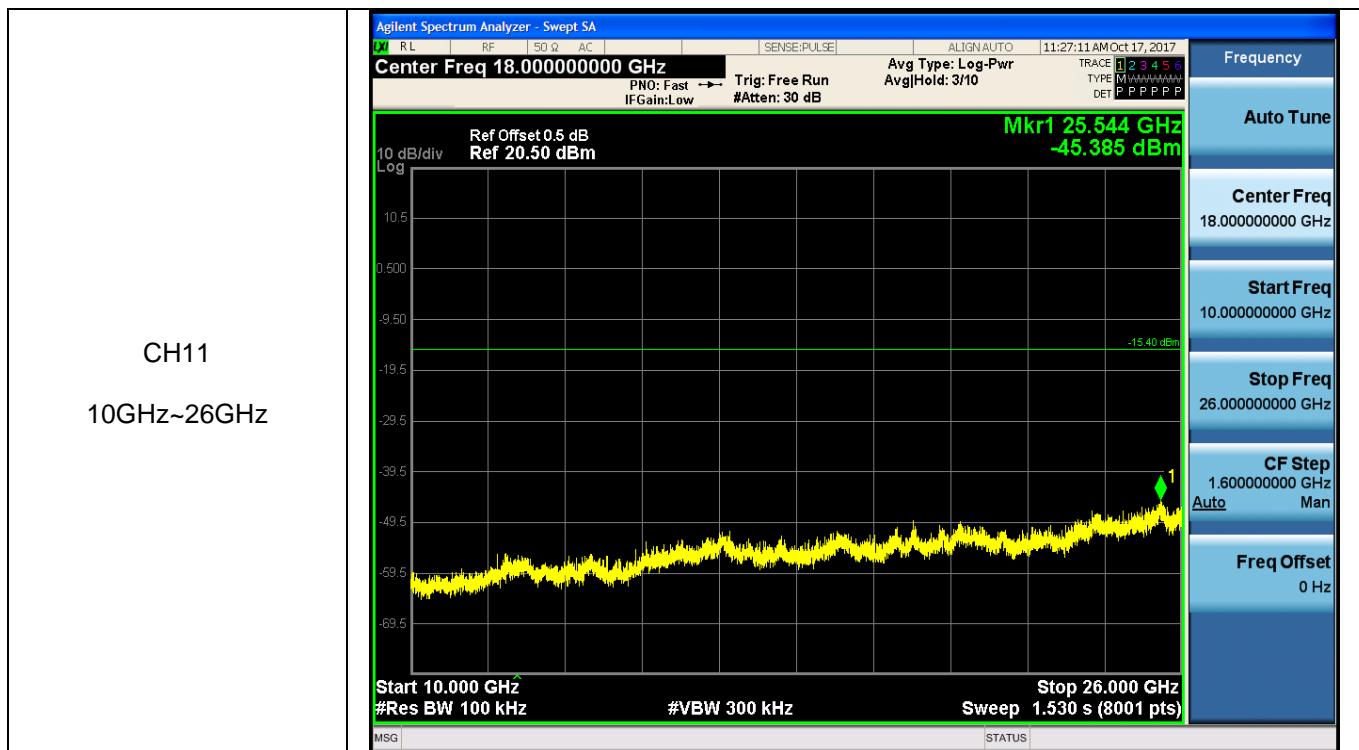
Test Item:	Bandedge	Type:	802.11 n(HT40)																																																																																																											
CH03	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.376000000 GHz</p> <p>PNO: Fast Trig: Free Run IFGain:Low</p> <p>Avg Type: Log-Pwr Avg Hold: 10/10</p> <p>REF Offset 0.5 dB Ref 20.50 dBm</p> <p>Mkr4 2.388 804 0 GHz -56.019 dBm</p> <p>Start 2.31000 GHz Stop 2.44200 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 12.80 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2,425 747 5 GHz</td><td>-5.790 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2,400 000 0 GHz</td><td>54.328 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2,390 000 0 GHz</td><td>59.077 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.388 804 0 GHz</td><td>-56.019 dBm</td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <p>MSG STATUS</p>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2,425 747 5 GHz	-5.790 dBm				2	N	1	f	2,400 000 0 GHz	54.328 dBm				3	N	1	f	2,390 000 0 GHz	59.077 dBm				4	N	1	f	2.388 804 0 GHz	-56.019 dBm				5									6									7									8									9									10									11									<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.376000000 GHz</p> <p>Start Freq 2.310000000 GHz</p> <p>Stop Freq 2.442000000 GHz</p> <p>CF Step 13.200000 MHz</p> <p>Freq Offset 0 Hz</p>
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CH09	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.466000000 GHz</p> <p>PNO: Fast Trig: Free Run IFGain:Low</p> <p>Avg Type: Log-Pwr Avg Hold: 10/10</p> <p>REF Offset 0.5 dB Ref 20.50 dBm</p> <p>Mkr4 2.492 350 0 GHz -54.949 dBm</p> <p>Start 2.43200 GHz Stop 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 6.933 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2,463 280 0 GHz</td><td>-7.477 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2,483 500 0 GHz</td><td>59.981 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2,500 000 0 GHz</td><td>59.437 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>1</td><td>f</td><td>2.492 350 0 GHz</td><td>-54.949 dBm</td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <p>MSG STATUS</p>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2,463 280 0 GHz	-7.477 dBm				2	N	1	f	2,483 500 0 GHz	59.981 dBm				3	N	1	f	2,500 000 0 GHz	59.437 dBm				4	N	1	f	2.492 350 0 GHz	-54.949 dBm				5									6									7									8									9									10									11									<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.466000000 GHz</p> <p>Start Freq 2.432000000 GHz</p> <p>Stop Freq 2.500000000 GHz</p> <p>CF Step 6.800000 MHz</p> <p>Freq Offset 0 Hz</p>
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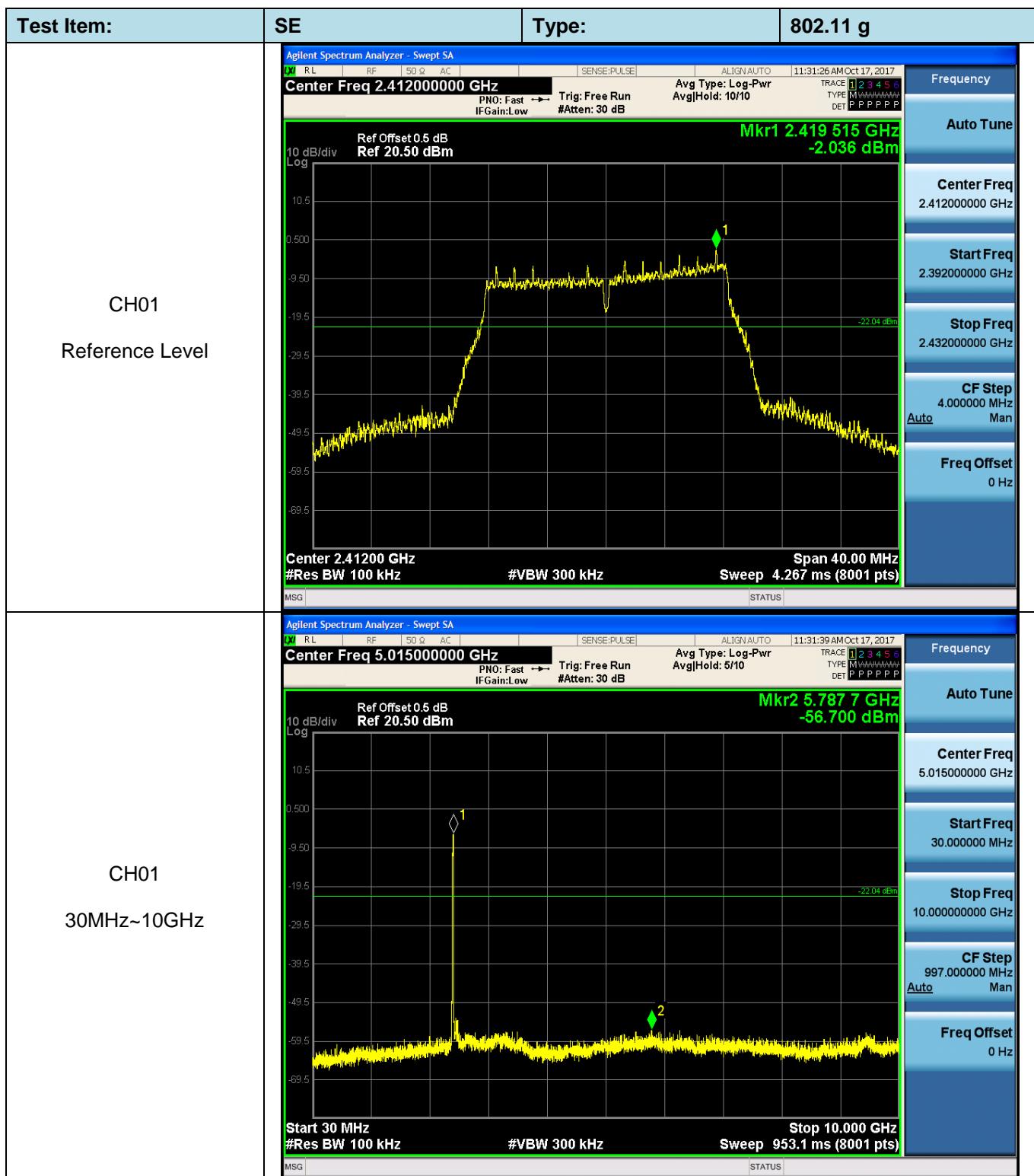
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CH01 30MHz~10GHz			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 5.015000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 10.000000000 GHz</p> <p>CF Step 997.000000 MHz Man</p> <p>Freq Offset 0 Hz</p>

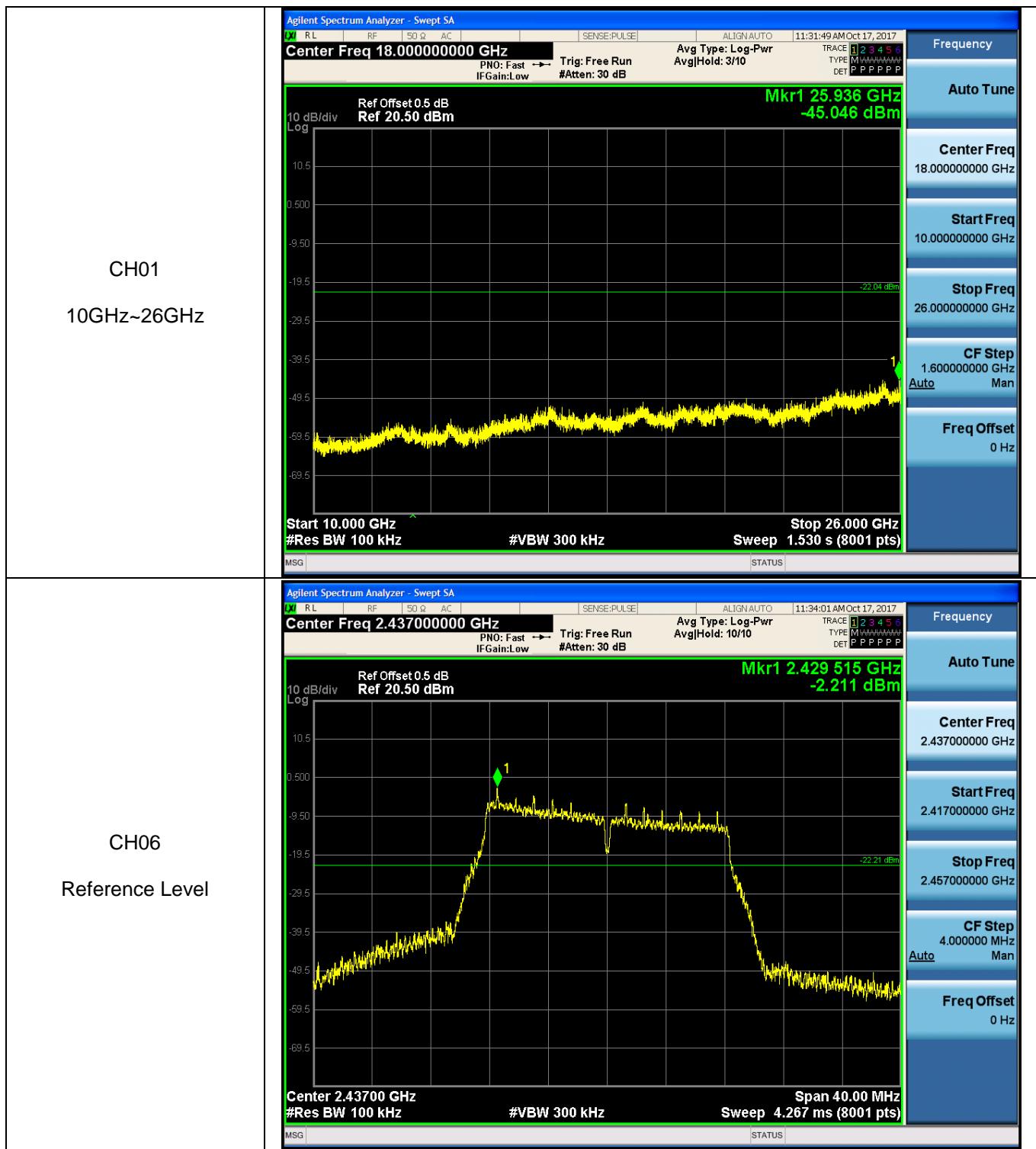


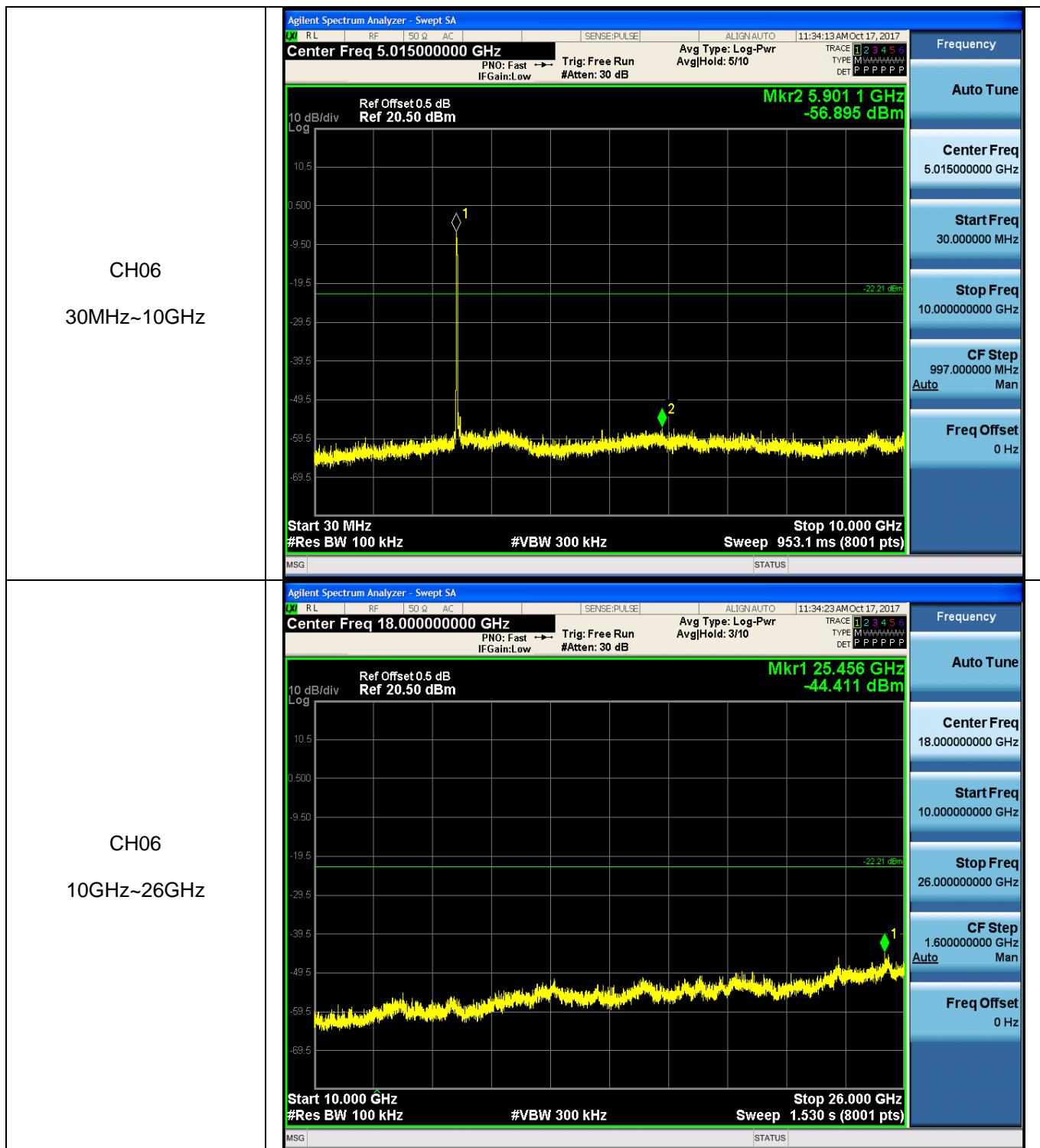


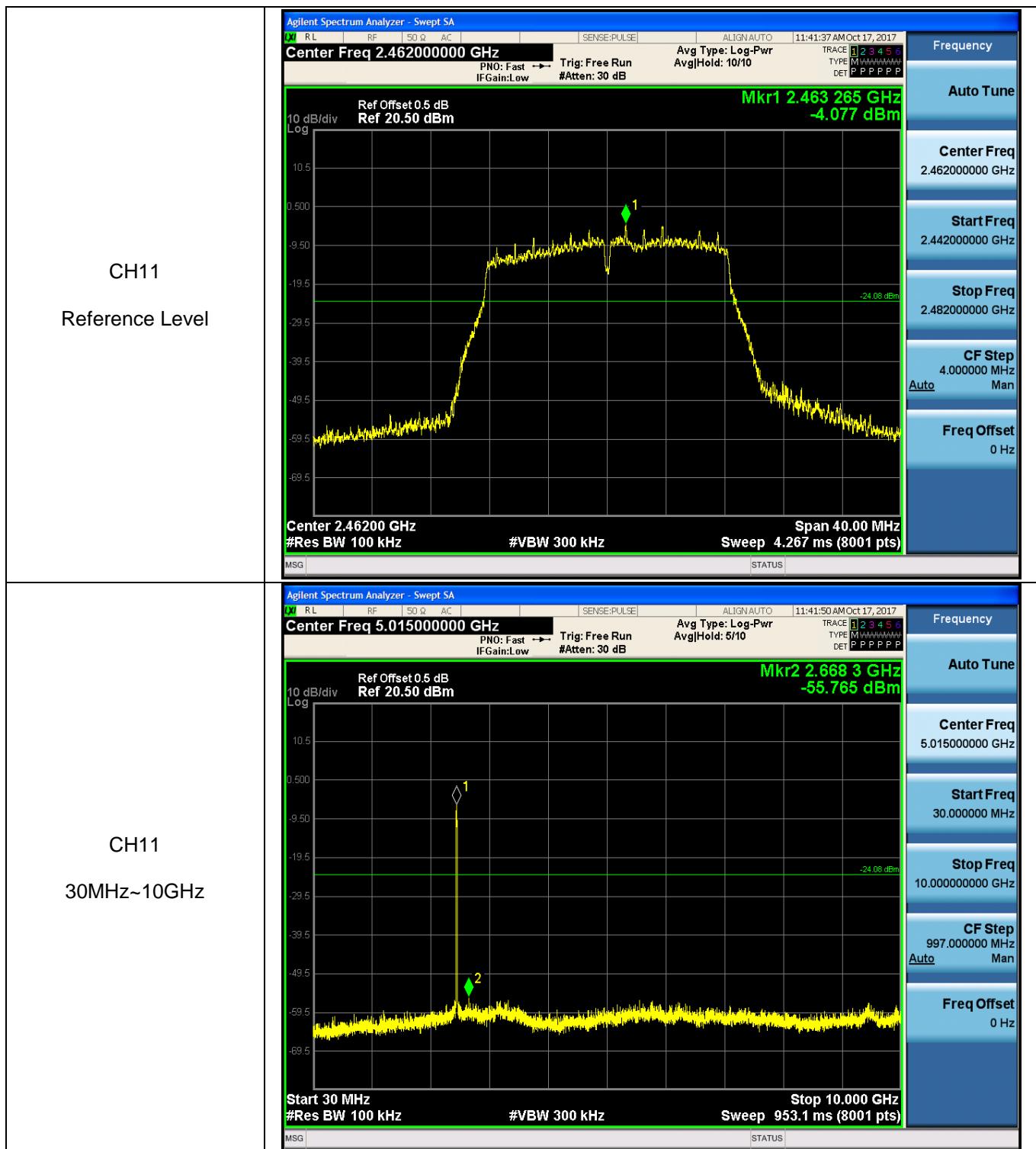


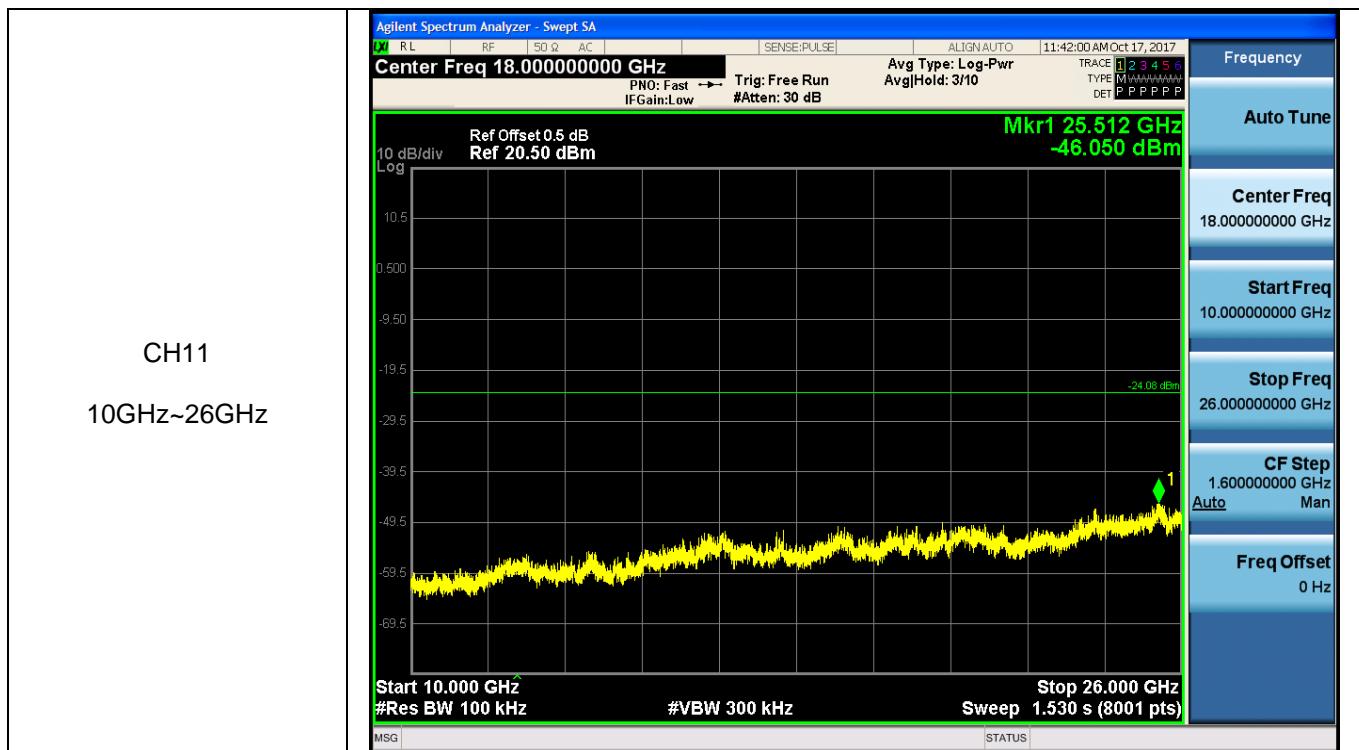


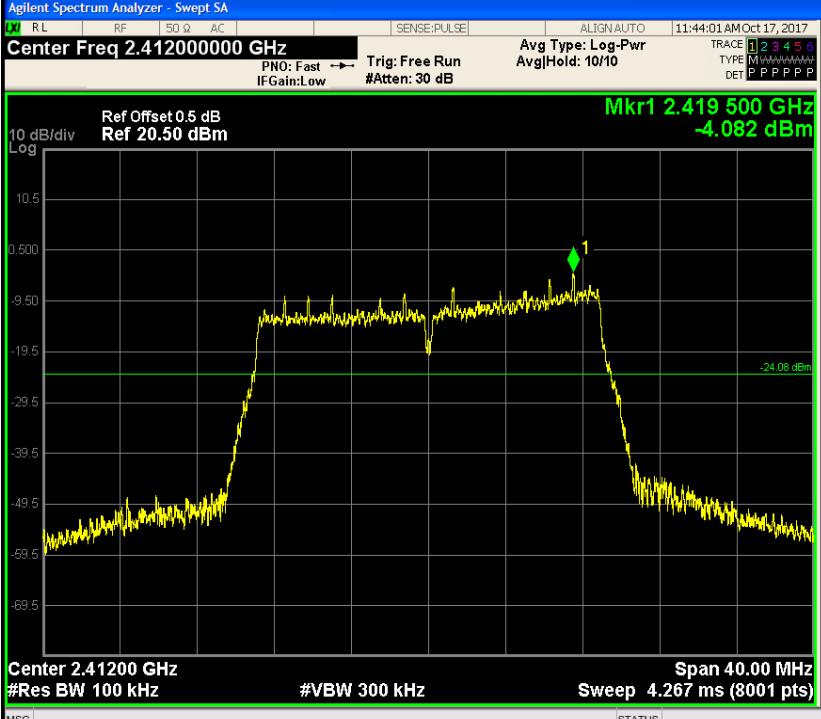
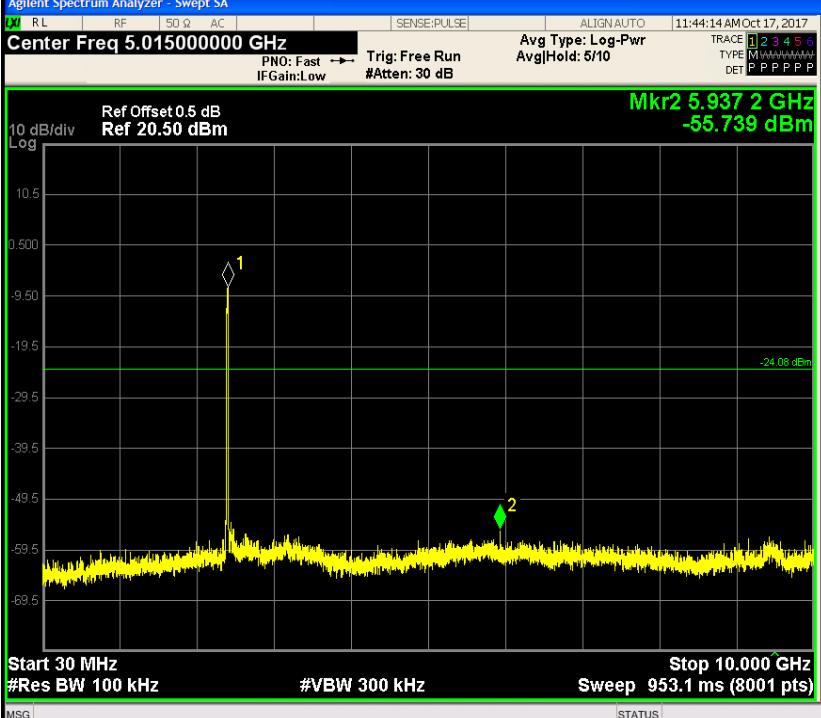


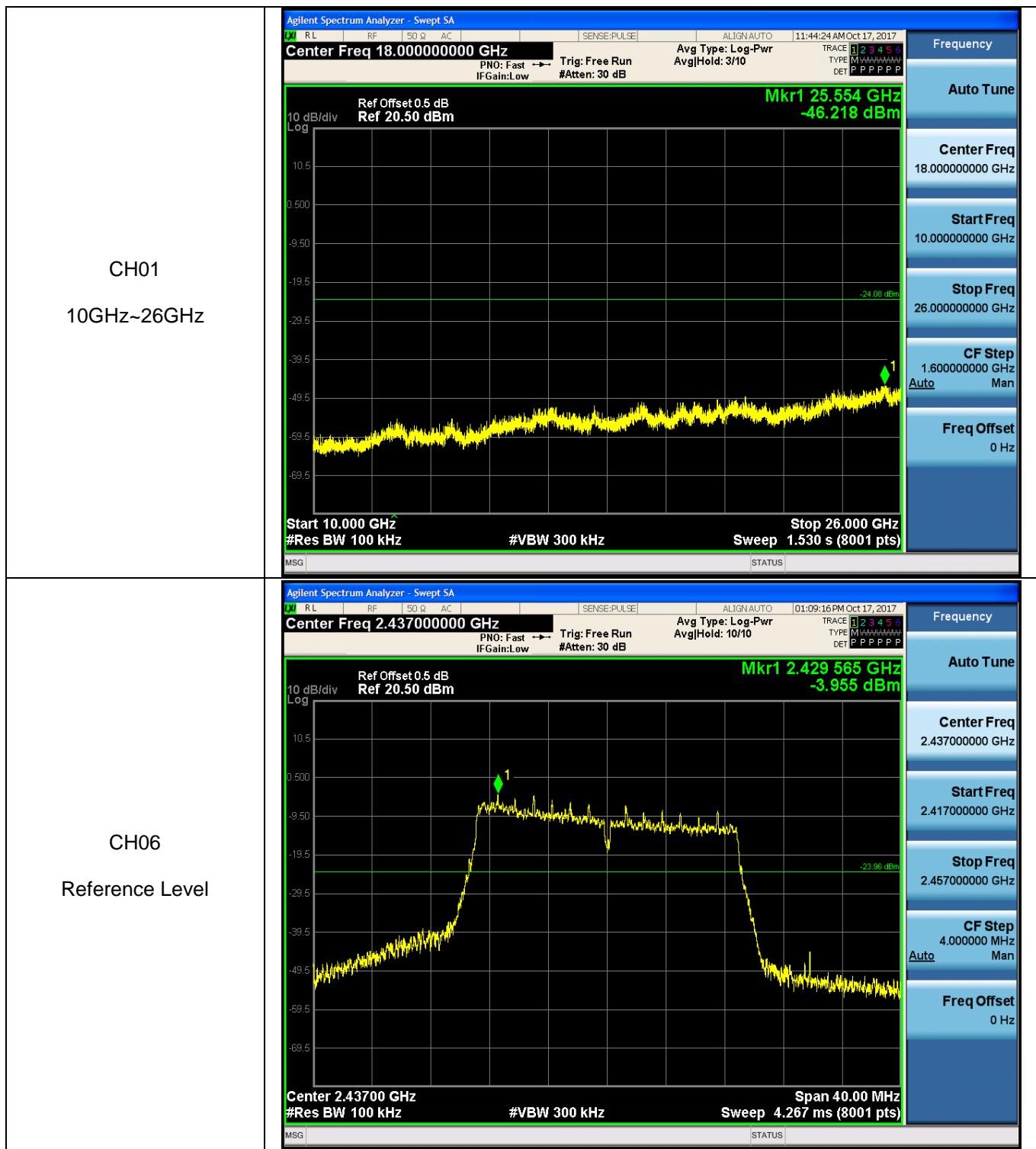


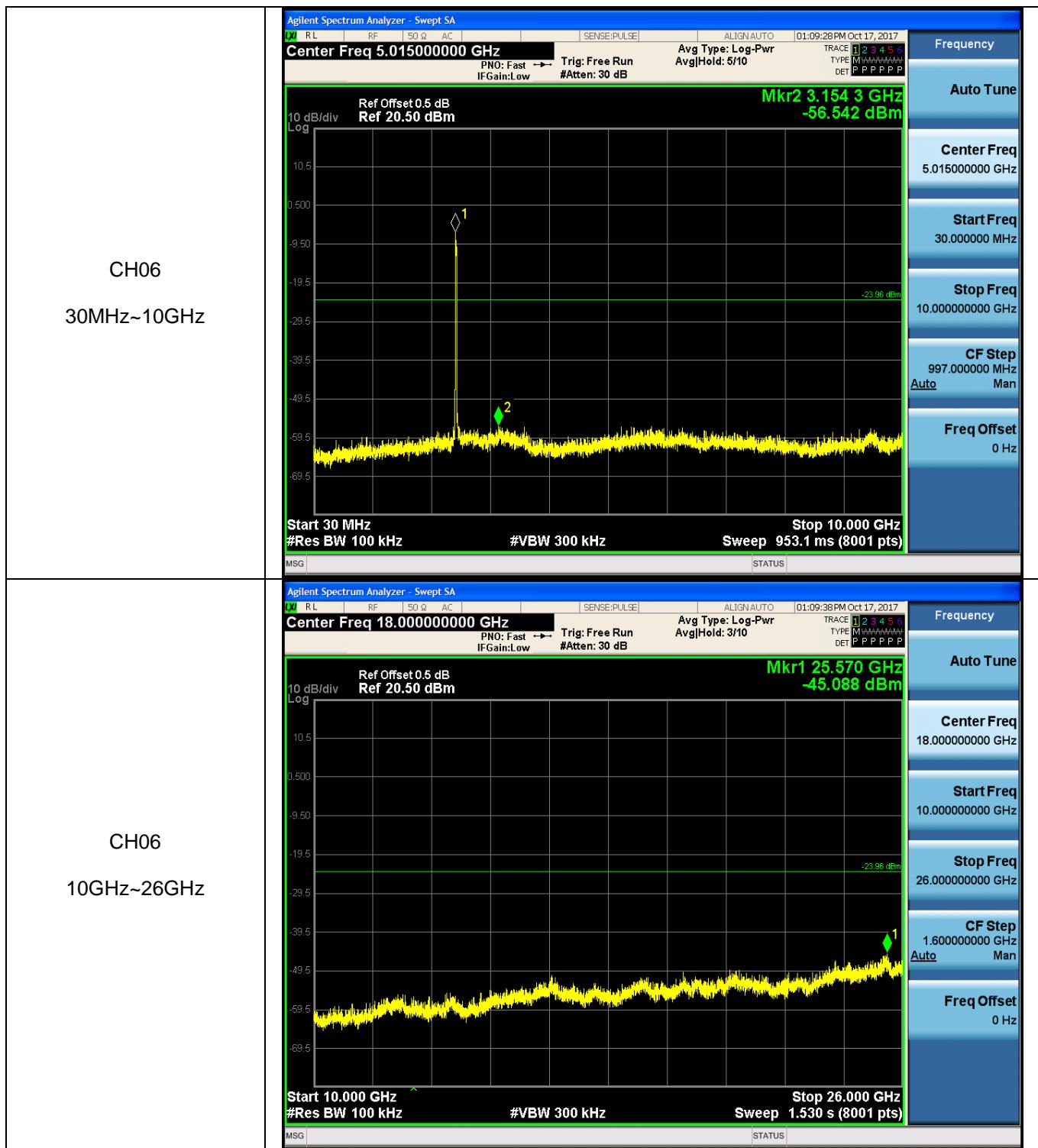


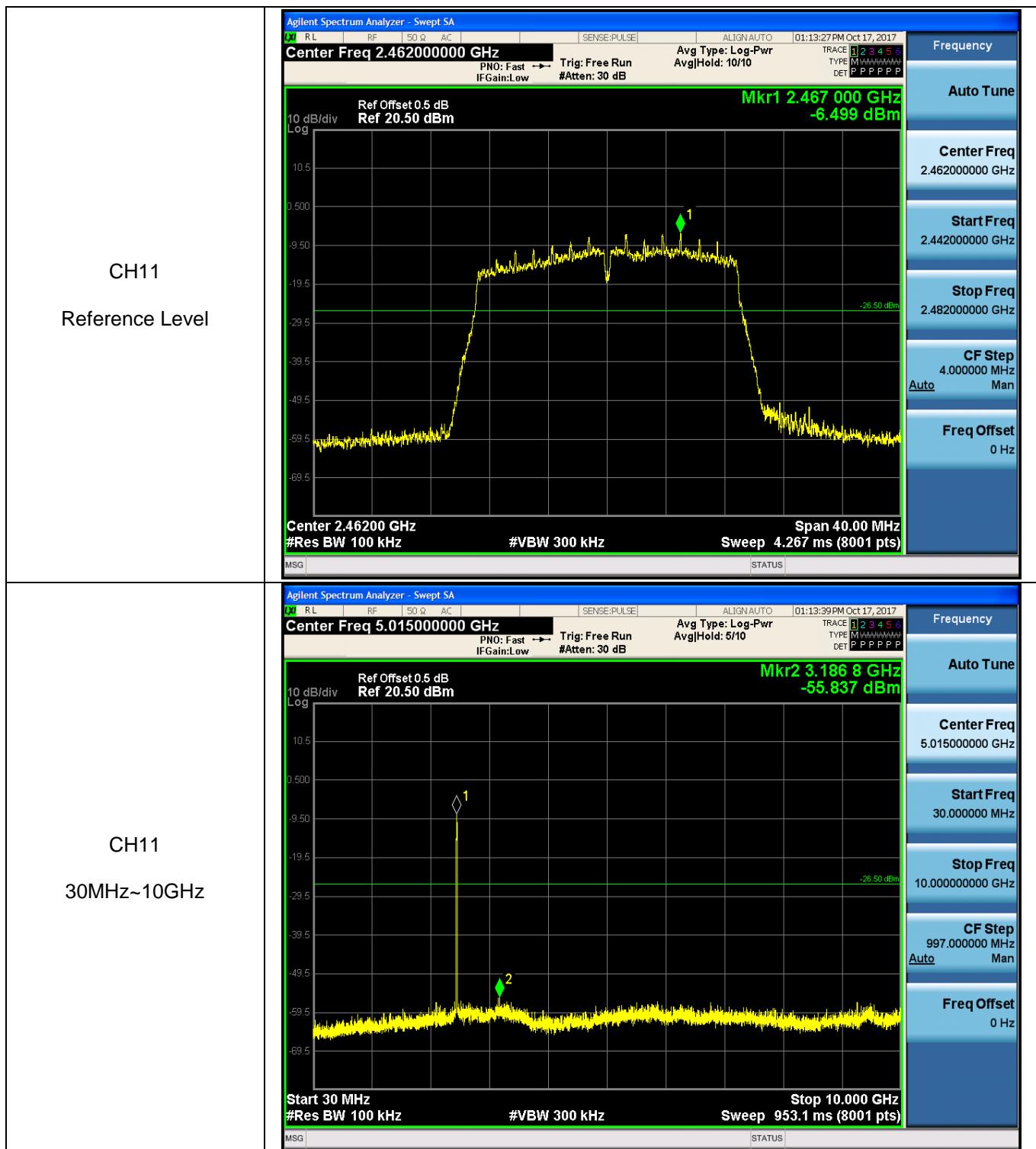


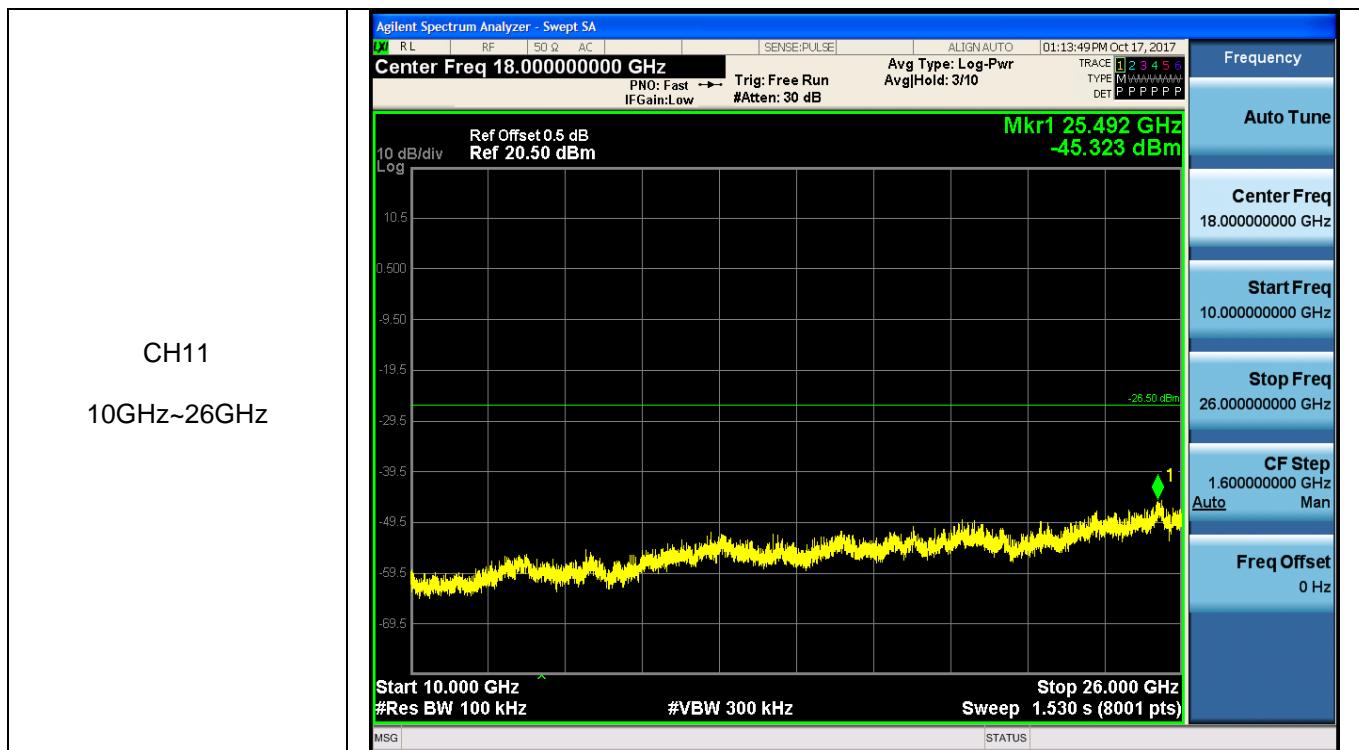


Test Item:	SE	Type:	802.11 n(HT20)
CH01 Reference Level			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39200000 GHz</p> <p>Stop Freq 2.43200000 GHz</p> <p>CF Step 4.00000 MHz</p> <p>Freq Offset 0 Hz</p>
CH01 30MHz~10GHz			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 5.01500000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 10.000000000 GHz</p> <p>CF Step 997.000000 MHz</p> <p>Freq Offset 0 Hz</p>

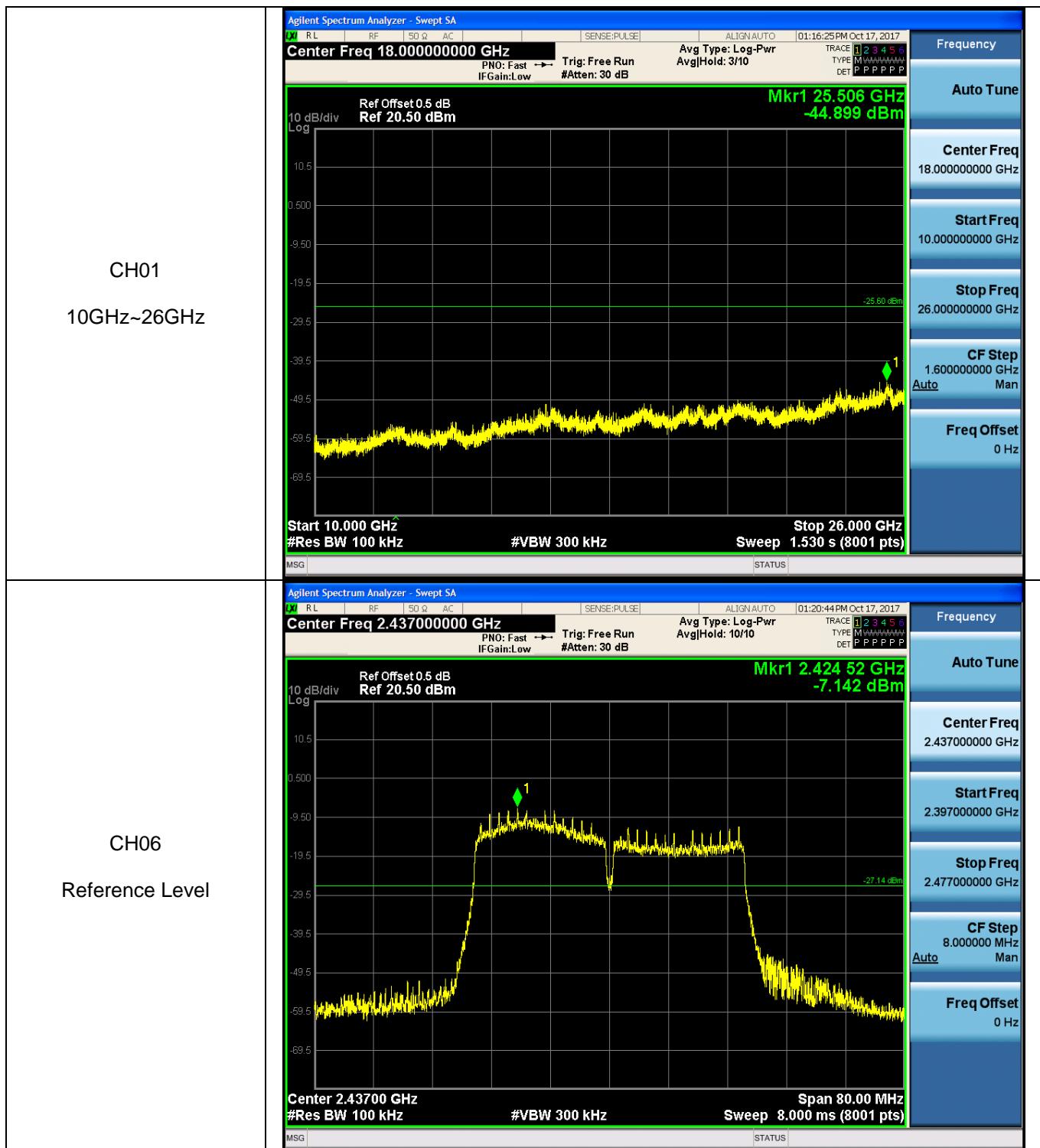


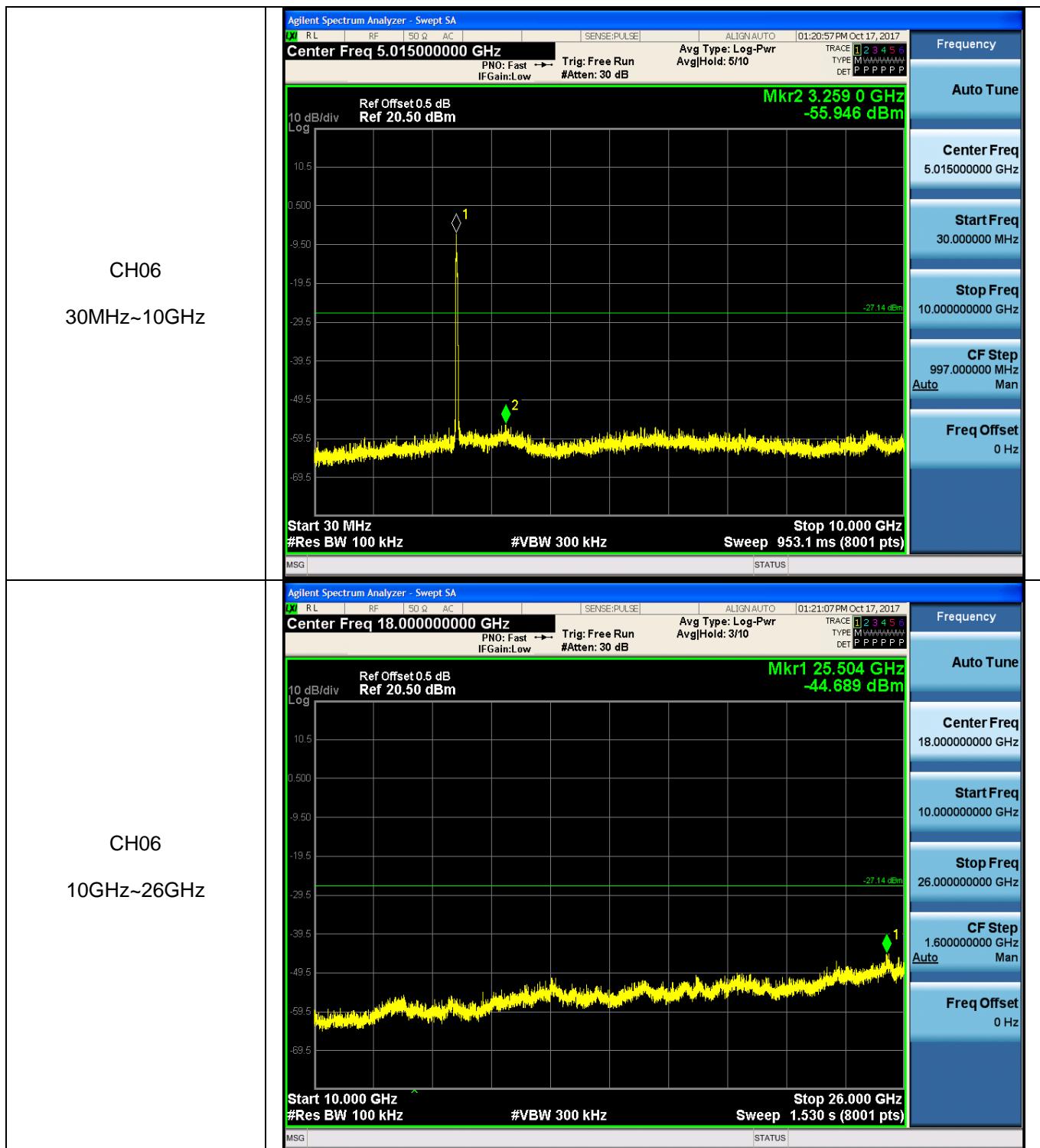


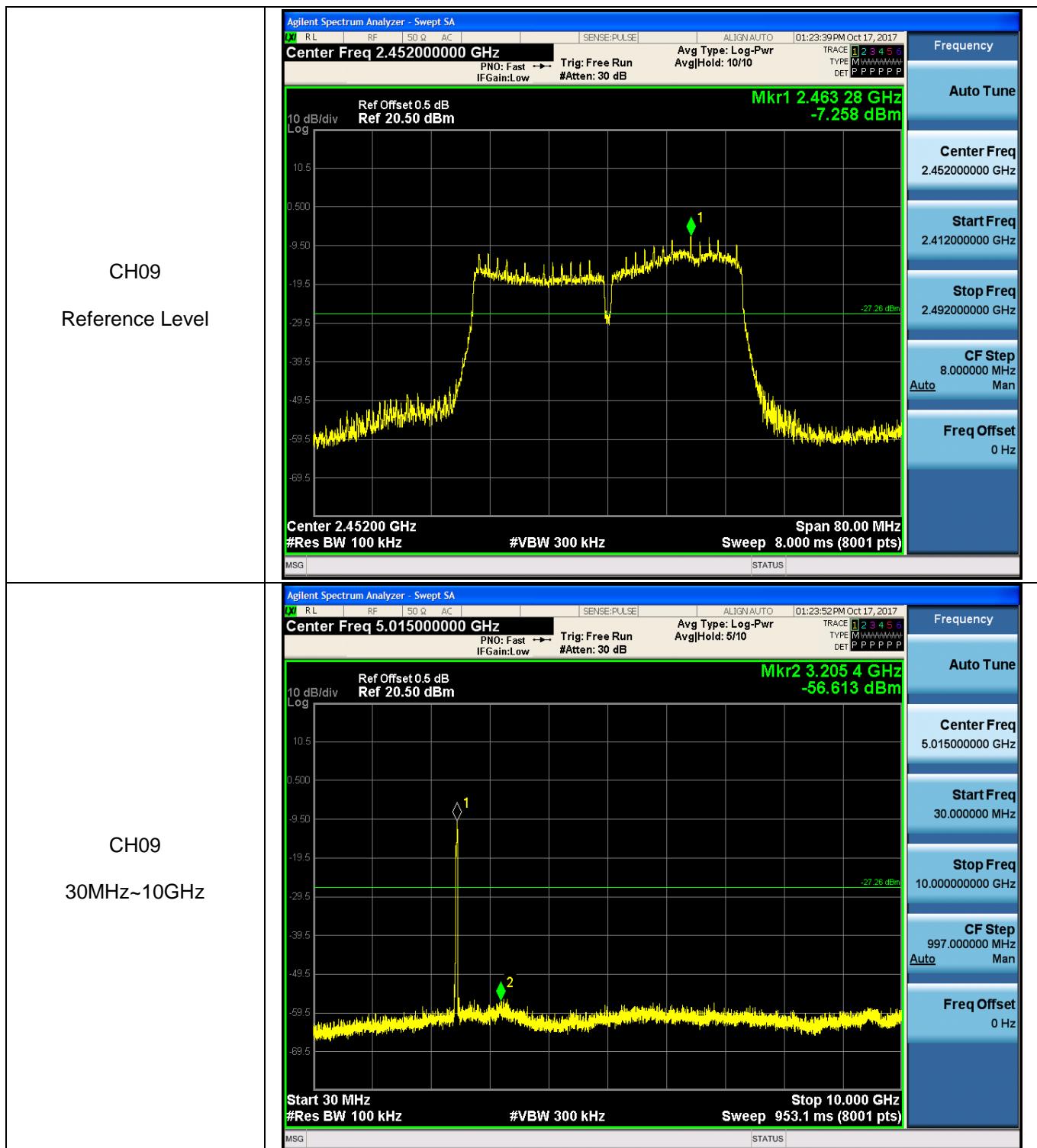


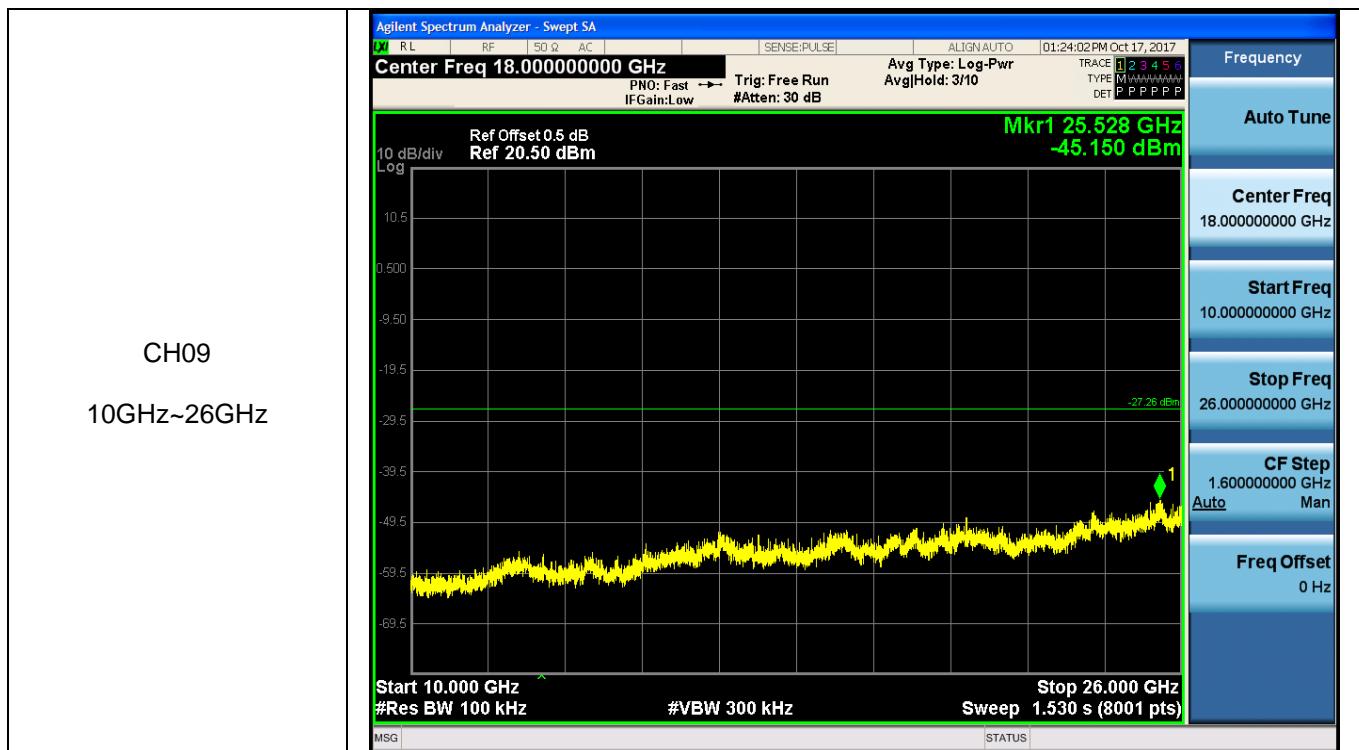


Test Item:	SE	Type:	802.11 n(HT40)
CH03 Reference Level			<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.422000000 GHz</p> <p>PNO: Fast Trig: Free Run</p> <p>IFGain:Low #Atten: 30 dB</p> <p>Avg Type: Log-Pwr Avg Hold: 10/10</p> <p>REF Offset 0.5 dB Ref 20.50 dBm</p> <p>Mkr1 2.424 53 GHz -5.598 dBm</p> <p>10 dB/div Log</p> <p>10.5</p> <p>0.500</p> <p>-9.50</p> <p>-19.5</p> <p>-29.5</p> <p>-39.5</p> <p>-49.5</p> <p>-59.5</p> <p>-69.5</p> <p>Center 2.42200 GHz Span 80.00 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p>
CH03 30MHz~10GHz			<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 5.015000000 GHz</p> <p>PNO: Fast Trig: Free Run</p> <p>IFGain:Low #Atten: 30 dB</p> <p>Avg Type: Log-Pwr Avg Hold: 5/10</p> <p>REF Offset 0.5 dB Ref 20.50 dBm</p> <p>Mkr2 3.284 0 GHz -56.162 dBm</p> <p>10 dB/div Log</p> <p>10.5</p> <p>0.500</p> <p>-9.50</p> <p>-19.5</p> <p>-29.5</p> <p>-39.5</p> <p>-49.5</p> <p>-59.5</p> <p>-69.5</p> <p>Start 30 MHz Stop 10.000 GHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 953.1 ms (8001 pts)</p>









## 5.8. Spurious Emissions (radiated)

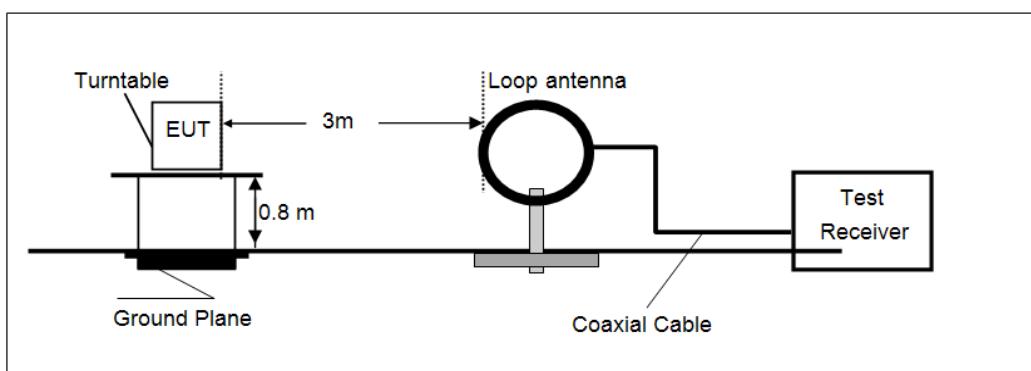
### LIMIT

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

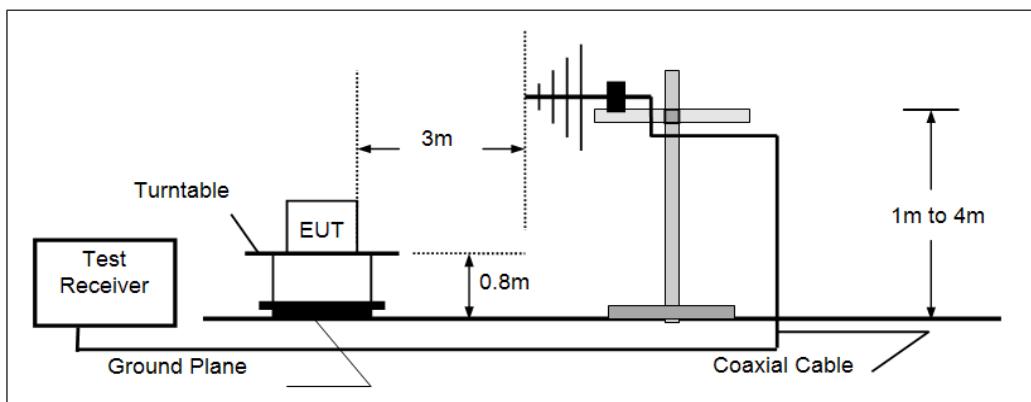
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

### TEST CONFIGURATION

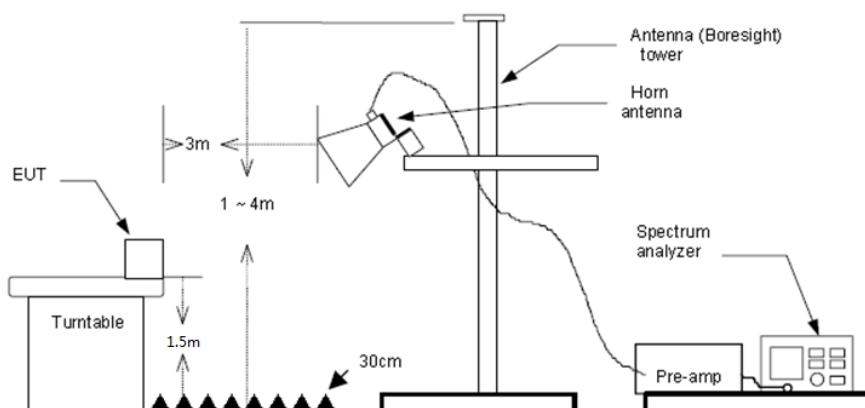
- 9kHz ~30MHz



- 30MHz ~ 1GHz



- Above 1GHz



## TEST PROCEDURE

1. The EUT was 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. 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.
5. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 1GHz, RBW=120kHz, VBW=300kHz, 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) Above 1GHz, 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.

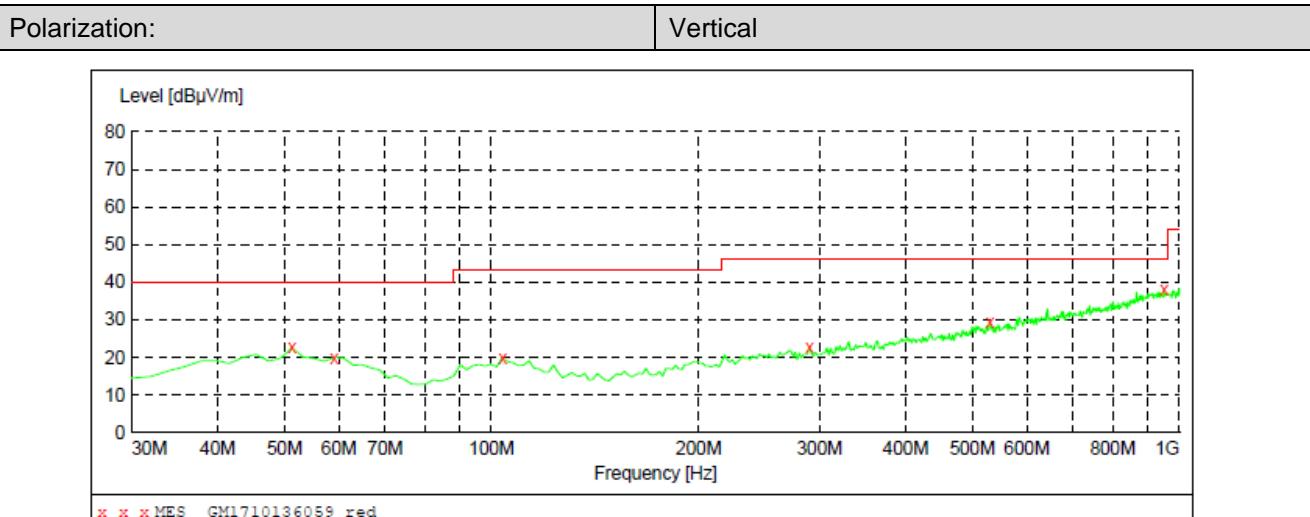
### ➤ **9kHz ~ 30MHz**

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**

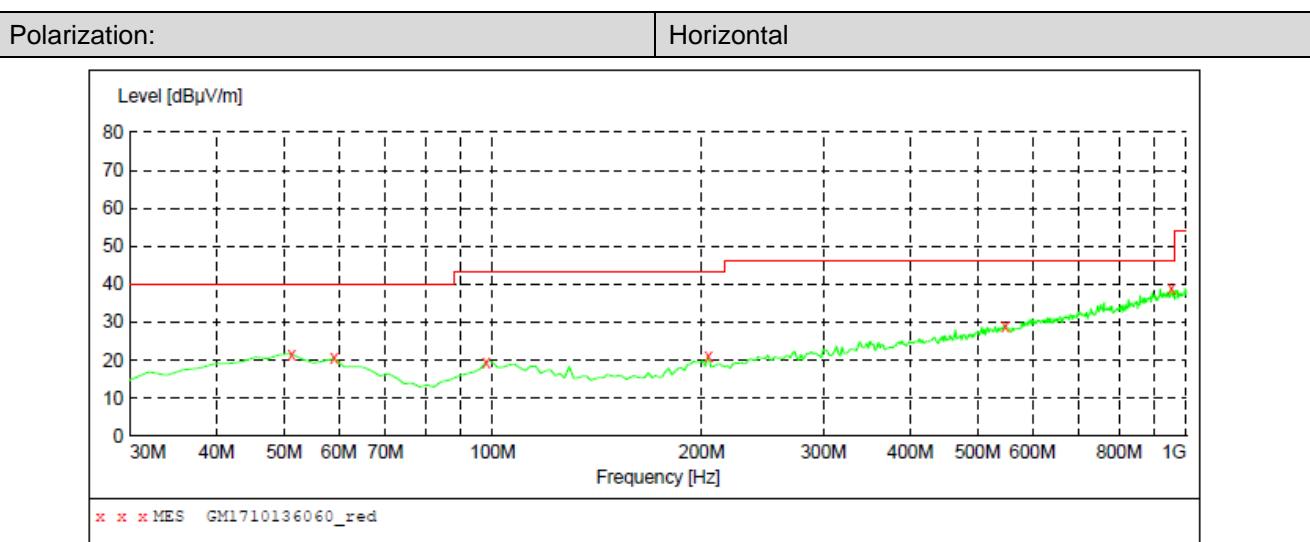
Have pre-scan all modulation mode, found the 802.11b mode CH01 which it was worst case, so only the worst case's data on the test report.

## &gt; 30MHz ~ 1GHz

**MEASUREMENT RESULT: "GM1710136059\_red"**

10/13/2017 6:57PM

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
51.340000	22.60	-8.8	40.0	17.4	QP	100.0	349.00	VERTICAL
59.100000	20.00	-9.8	40.0	20.0	QP	100.0	197.00	VERTICAL
103.720000	20.00	-10.5	43.5	23.5	QP	100.0	157.00	VERTICAL
289.960000	22.70	-7.4	46.0	23.3	QP	100.0	321.00	VERTICAL
530.520000	29.30	-1.1	46.0	16.7	QP	100.0	357.00	VERTICAL
949.560000	37.90	7.2	46.0	8.1	QP	100.0	116.00	VERTICAL

**MEASUREMENT RESULT: "GM1710136060\_red"**

10/13/2017 7:00PM

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
51.340000	21.70	-8.8	40.0	18.3	QP	100.0	0.00	HORIZONTAL
59.100000	20.50	-9.8	40.0	19.5	QP	300.0	0.00	HORIZONTAL
97.900000	19.60	-10.8	43.5	23.9	QP	300.0	110.00	HORIZONTAL
204.600000	21.00	-10.4	43.5	22.5	QP	100.0	239.00	HORIZONTAL
547.980000	29.00	-0.8	46.0	17.0	QP	100.0	334.00	HORIZONTAL
951.500000	38.80	7.3	46.0	7.2	QP	300.0	93.00	HORIZONTAL

## &gt; Above 1 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
1782.18	37.51	25.54	5.93	37.10	31.88	74.00	-42.12	Vertical	Peak
3625.67	38.94	28.92	8.30	38.26	37.90	74.00	-36.10	Vertical	Peak
4821.76	44.70	31.09	9.55	36.90	48.44	74.00	-25.56	Vertical	Peak
7227.39	31.22	35.98	11.89	35.04	44.05	74.00	-29.95	Vertical	Peak
1782.18	37.51	25.54	5.93	37.10	31.88	74.00	-42.12	Horizontal	Peak
3616.45	45.91	28.90	8.29	38.27	44.83	74.00	-29.17	Horizontal	Peak
4821.76	44.70	31.09	9.55	36.90	48.44	74.00	-25.56	Horizontal	Peak
7227.39	30.62	35.98	11.89	35.04	43.45	74.00	-30.55	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
1750.70	37.46	25.46	5.86	37.04	31.74	74.00	-42.26	Vertical	Peak
3653.46	41.43	28.96	8.33	38.26	40.46	74.00	-33.54	Vertical	Peak
4871.10	47.33	31.13	9.59	36.76	51.29	74.00	-22.71	Vertical	Peak
7319.96	35.39	36.07	11.99	34.92	48.53	74.00	-25.47	Vertical	Peak
1786.72	35.86	25.55	5.93	37.11	30.23	74.00	-43.77	Horizontal	Peak
3653.46	47.77	28.96	8.33	38.26	46.80	74.00	-27.20	Horizontal	Peak
4871.10	40.48	31.13	9.59	36.76	44.44	74.00	-29.56	Horizontal	Peak
7319.96	33.94	36.07	11.99	34.92	47.08	74.00	-26.92	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
1132.84	36.98	24.35	4.51	36.60	29.24	74.00	-44.76	Vertical	Peak
3700.26	44.77	29.04	8.39	38.25	43.95	74.00	-30.05	Vertical	Peak
4920.96	43.66	31.15	9.62	36.62	47.81	74.00	-26.19	Vertical	Peak
6730.19	33.02	35.44	11.52	35.12	44.86	74.00	-29.14	Vertical	Peak
1818.84	36.70	25.64	5.99	37.16	31.17	74.00	-42.83	Horizontal	Peak
3690.85	50.08	29.02	8.37	38.25	49.22	74.00	-24.78	Horizontal	Peak
4920.96	43.14	31.15	9.62	36.62	47.29	74.00	-26.71	Horizontal	Peak
7394.88	33.81	36.12	12.06	34.83	47.16	74.00	-26.84	Horizontal	Peak

## Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- The emission levels of other frequencies 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
1828.13	36.79	25.67	6.00	37.16	31.30	74.00	-42.70	Vertical	Peak
3402.13	37.23	28.67	7.96	38.55	35.31	74.00	-38.69	Vertical	Peak
4821.76	37.68	31.09	9.55	36.90	41.42	74.00	-32.58	Vertical	Peak
7227.39	31.40	35.98	11.89	35.04	44.23	74.00	-29.77	Vertical	Peak
1724.17	36.95	25.37	5.81	36.98	31.15	74.00	-42.85	Horizontal	Peak
3616.45	40.13	28.90	8.29	38.27	39.05	74.00	-34.95	Horizontal	Peak
4821.76	34.22	31.09	9.55	36.90	37.96	74.00	-36.04	Horizontal	Peak
7227.39	30.82	35.98	11.89	35.04	43.65	74.00	-30.35	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
1768.62	37.82	25.50	5.90	37.07	32.15	74.00	-41.85	Vertical	Peak
3653.46	39.77	28.96	8.33	38.26	38.80	74.00	-35.20	Vertical	Peak
4871.10	43.39	31.13	9.59	36.76	47.35	74.00	-26.65	Vertical	Peak
7319.96	34.33	36.07	11.99	34.92	47.47	74.00	-26.53	Vertical	Peak
1634.42	36.45	25.12	5.64	36.79	30.42	74.00	-43.58	Horizontal	Peak
3653.46	44.68	28.96	8.33	38.26	43.71	74.00	-30.29	Horizontal	Peak
4883.52	38.89	31.14	9.59	36.73	42.89	74.00	-31.11	Horizontal	Peak
7319.96	33.40	36.07	11.99	34.92	46.54	74.00	-27.46	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
1795.84	36.67	25.58	5.95	37.13	31.07	74.00	-42.93	Vertical	Peak
3690.85	42.58	29.02	8.37	38.25	41.72	74.00	-32.28	Vertical	Peak
4933.50	43.94	31.16	9.63	36.59	48.14	74.00	-25.86	Vertical	Peak
7394.88	32.26	36.12	12.06	34.83	45.61	74.00	-28.39	Vertical	Peak
1768.62	36.59	25.50	5.90	37.07	30.92	74.00	-43.08	Horizontal	Peak
3690.85	47.41	29.02	8.37	38.25	46.55	74.00	-27.45	Horizontal	Peak
4920.96	38.88	31.15	9.62	36.62	43.03	74.00	-30.97	Horizontal	Peak
7394.88	31.74	36.12	12.06	34.83	45.09	74.00	-28.91	Horizontal	Peak

**Remark:**

- Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- The emission levels of other frequencies 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
1764.12	36.80	25.48	5.89	37.06	31.11	74.00	-42.89	Vertical	Peak
3690.85	42.25	29.02	8.37	38.25	41.39	74.00	-32.61	Vertical	Peak
4920.96	44.74	31.15	9.62	36.62	48.89	74.00	-25.11	Vertical	Peak
7394.88	32.19	36.12	12.06	34.83	45.54	74.00	-28.46	Vertical	Peak
1777.65	36.51	25.53	5.92	37.09	30.87	74.00	-43.13	Horizontal	Peak
3690.85	47.42	29.02	8.37	38.25	46.56	74.00	-27.44	Horizontal	Peak
4933.50	38.21	31.16	9.63	36.59	42.41	74.00	-31.59	Horizontal	Peak
7394.88	34.10	36.12	12.06	34.83	47.45	74.00	-26.55	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
1724.17	37.65	25.37	5.81	36.98	31.85	74.00	-42.15	Vertical	Peak
3489.84	37.36	28.70	8.10	38.42	35.74	74.00	-38.26	Vertical	Peak
4821.76	38.66	31.09	9.55	36.90	42.40	74.00	-31.60	Vertical	Peak
7227.39	31.34	35.98	11.89	35.04	44.17	74.00	-29.83	Vertical	Peak
1706.70	36.85	25.33	5.78	36.94	31.02	74.00	-42.98	Horizontal	Peak
3616.45	41.08	28.90	8.29	38.27	40.00	74.00	-34.00	Horizontal	Peak
4821.76	34.47	31.09	9.55	36.90	38.21	74.00	-35.79	Horizontal	Peak
7227.39	30.72	35.98	11.89	35.04	43.55	74.00	-30.45	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
1782.18	36.22	25.54	5.93	37.10	30.59	74.00	-43.41	Vertical	Peak
3653.46	37.23	28.96	8.33	38.26	36.26	74.00	-37.74	Vertical	Peak
4871.10	37.02	31.13	9.59	36.76	40.98	74.00	-33.02	Vertical	Peak
7319.96	30.91	36.07	11.99	34.92	44.05	74.00	-29.95	Vertical	Peak
1746.25	36.82	25.44	5.86	37.03	31.09	74.00	-42.91	Horizontal	Peak
3653.46	44.46	28.96	8.33	38.26	43.49	74.00	-30.51	Horizontal	Peak
4871.10	37.66	31.13	9.59	36.76	41.62	74.00	-32.38	Horizontal	Peak
7319.96	33.66	36.07	11.99	34.92	46.80	74.00	-27.20	Horizontal	Peak

## Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- The emission levels of other frequencies 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
1828.13	36.78	25.67	6.00	37.16	31.29	74.00	-42.71	Vertical	Peak
3634.91	37.42	28.94	8.31	38.26	36.41	74.00	-37.59	Vertical	Peak
4846.37	36.24	31.11	9.57	36.83	40.09	74.00	-33.91	Vertical	Peak
7264.28	31.90	36.02	11.93	35.00	44.85	74.00	-29.15	Vertical	Peak
1823.48	36.04	25.65	6.00	37.16	30.53	74.00	-43.47	Horizontal	Peak
3634.91	37.97	28.94	8.31	38.26	36.96	74.00	-37.04	Horizontal	Peak
4846.37	33.38	31.11	9.57	36.83	37.23	74.00	-36.77	Horizontal	Peak
7264.28	31.59	36.02	11.93	35.00	44.54	74.00	-29.46	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
1737.38	37.40	25.41	5.84	37.01	31.64	74.00	-42.36	Vertical	Peak
3662.78	38.81	28.97	8.34	38.26	37.86	74.00	-36.14	Vertical	Peak
4883.52	41.66	31.14	9.59	36.73	45.66	74.00	-28.34	Vertical	Peak
7319.96	32.75	36.07	11.99	34.92	45.89	74.00	-28.11	Vertical	Peak
1814.22	36.67	25.62	5.98	37.15	31.12	74.00	-42.88	Horizontal	Peak
3662.78	42.54	28.97	8.34	38.26	41.59	74.00	-32.41	Horizontal	Peak
4871.10	36.16	31.13	9.59	36.76	40.12	74.00	-33.88	Horizontal	Peak
7319.96	32.90	36.07	11.99	34.92	46.04	74.00	-27.96	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
1828.13	36.90	25.67	6.00	37.16	31.41	74.00	-42.59	Vertical	Peak
3672.11	39.40	28.99	8.35	38.26	38.48	74.00	-35.52	Vertical	Peak
4908.44	42.60	31.14	9.61	36.66	46.69	74.00	-27.31	Vertical	Peak
7357.33	32.61	36.08	12.03	34.88	45.84	74.00	-28.16	Vertical	Peak
1732.97	36.73	25.40	5.83	37.00	30.96	74.00	-43.04	Horizontal	Peak
3672.11	45.10	28.99	8.35	38.26	44.18	74.00	-29.82	Horizontal	Peak
4908.44	36.74	31.14	9.61	36.66	40.83	74.00	-33.17	Horizontal	Peak
7357.33	32.23	36.08	12.03	34.88	45.46	74.00	-28.54	Horizontal	Peak

## Remark:

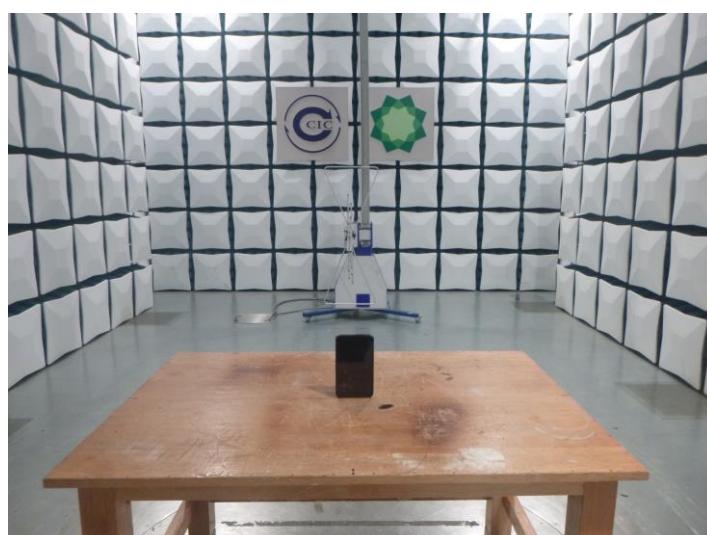
- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- The emission levels of other frequencies are very lower than the limit and not show in test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

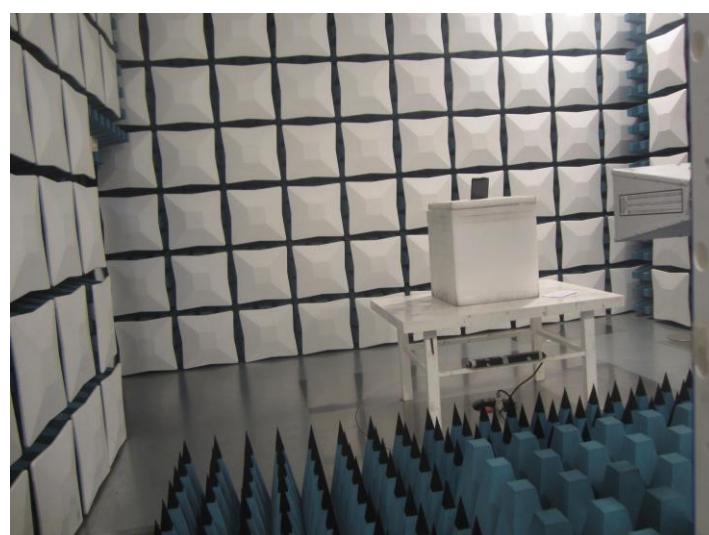
## 6. TEST SETUP PHOTOS

Conducted Emissions



Radiated Emissions





## 7. EXTERANAL AND INTERNAL PHOTOS

Reference to the test report No.: TRE1709024401.

.....End of Report.....