



TEST REPORT

Report Reference No...... : **CHTEW19110025** Report verification: 

Project No...... : **SHT1908014005EW**

FCC ID..... : **2ATTZ-SUNBEAM-F1**

Applicant's name..... : **Basic, Inc.**

Address..... : 17688 County Road 558, Memphis, Missouri, United States

Manufacturer..... : Basic, Inc.

Address..... : 17688 County Road 558, Memphis, Missouri, United States

Test item description : **Basic Feature Phone**

Trade Mark : Sunbeam

Model/Type reference..... : F1

Listed Model(s) : -

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

Date of receipt of test sample..... : Oct 11, 2019

Date of testing..... : Oct 12, 2019- Nov 04, 2019

Date of issue..... : Nov 05, 2019

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

Compiled by
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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 15.247 Meas Guidance v05r02](#): Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under Section 15.247 of The FCC Rules

1.2. Report version

Revision No.	Date of issue	Description
N/A	2019-11-05	Original

2. TEST DESCRIPTION

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

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

3. SUMMARY

3.1. Client Information

Applicant:	Basic, Inc.
Address:	17688 County Road 558, Memphis, Missouri, United States
Manufacturer:	Basic, Inc.
Address:	17688 County Road 558, Memphis, Missouri, United States

3.2. Product Description

Name of EUT:	Basic Feature Phone
Trade Mark:	Sunbeam
Model No.:	F1
Listed Model(s):	-
IMEI:	Conducted: 359863101000287 Radiated: 359863101000163
Power supply:	DC 3.7V
Adapter information:	Model: XH005W050100USCD Input: 100-240Va.c., 50/60Hz, 0.2A Output: 5.0Vd.c., 1.0A
Hardware version:	QS3912_MAINPCB_V1.0
Software version:	Sunbeam_F1V_V1.0
WIFI	
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:	FPC Antenna
Antenna gain:	-0.76dBi

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

○	/	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.:5377A

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.: 5377A.

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	0.51 dB	(1)
Conducted spurious emissions 9kHz~40GHz	0.51 dB	(1)
Conducted Disturbance 150kHz~30MHz	3.02 dB	(1)
Radiated Emissions below 1GHz	4.90 dB	(1)
Radiated Emissions above 1GHz	4.96 dB	(1)
Occupied Bandwidth	70 Hz	(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 Emission							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Shielded Room	Albatross projects	HTWE0114	N/A	N/A	2018/09/28	2023/09/27
●	EMI Test Receiver	R&S	HTWE0111	ESCI	101247	2019/10/26	2020/10/25
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2019/10/23	2020/10/22
●	Pulse Limiter	R&S	HTWE0033	ESH3-Z2	100499	2019/10/23	2020/10/22
●	RF Connection Cable	HUBER+SUHNER	HTWE0113-02	ENVIROFLEX_142	EF-NM-BNCM-2M	2019/10/23	2020/10/22
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated Emission-6th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2018/09/30	2021/09/29
●	EMI Test Receiver	R&S	HTWE0099	ESCI	100900	2019/10/26	2020/10/25
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0119	VULB9163	546	2017/04/05	2020/04/04
●	Pre-Amplifier	SCHWARZBECK	HTWE0295	BBV 9742	N/A	2018/11/14	2019/11/13
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-01	N/A	N/A	2019/8/21	2020/8/20
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-02	SUCOFLEX104	501184/4	2019/5/27	2020/5/26
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-7th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	N/A	2018/09/30	2021/09/29
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2019/10/26	2020/10/25
●	Horn Antenna	SCHWARZBECK	HTWE0126	9120D	1011	2017/04/01	2020/03/31
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2019/05/23	2020/05/22
●	RF Connection Cable	HUBER+SUHNER	HTWE0121-01	RE-7-FH	N/A	2019/05/10	2020/05/09
●	Test Software	Audix	N/A	E3	N/A	N/A	N/A

● RF Conducted Method						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	FSV40	100048	2019/10/26	2020/10/25
●	Spectrum Analyzer	Agilent	N9020A	MY50510187	2019/10/26	2020/10/25
●	Test software	Tonscend	JS1120-2(WIFI)	N/A	N/A	N/A

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)

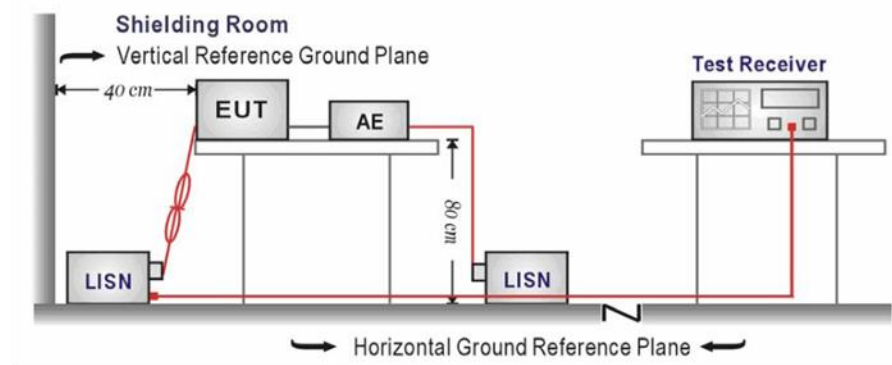
LIMIT

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

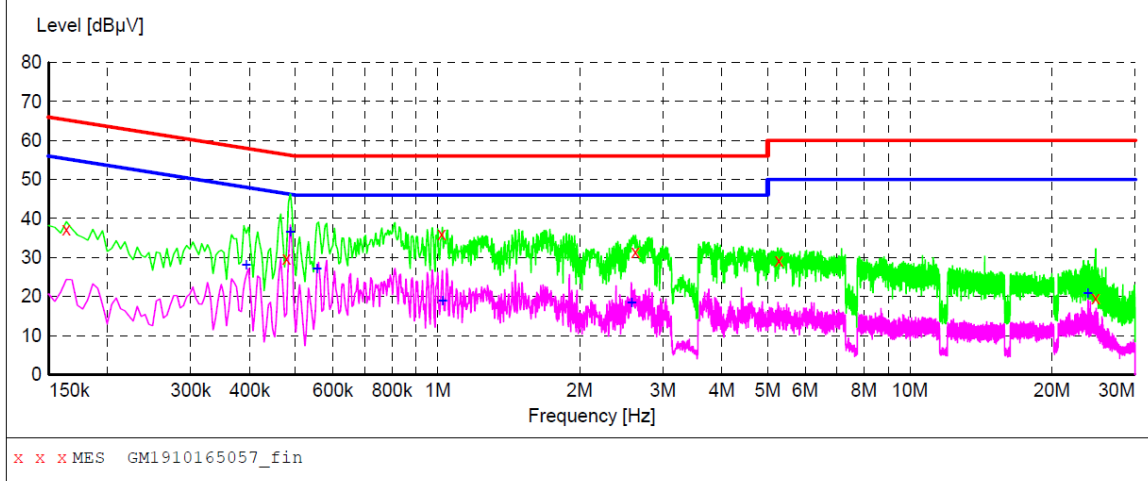
☒ Passed ☐ Not Applicable

Note:

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

Test Line:

L

**MEASUREMENT RESULT: "GM1910165057_fin"**

10/16/2019 4:54PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.163500	37.30	10.1	65	28.0	QP	L1	GND
0.478500	29.80	10.1	56	26.6	QP	L1	GND
1.018500	36.00	10.1	56	20.0	QP	L1	GND
2.620500	31.40	10.1	56	24.6	QP	L1	GND
5.275500	29.20	10.2	60	30.8	QP	L1	GND
24.720000	19.60	10.3	60	40.4	QP	L1	GND

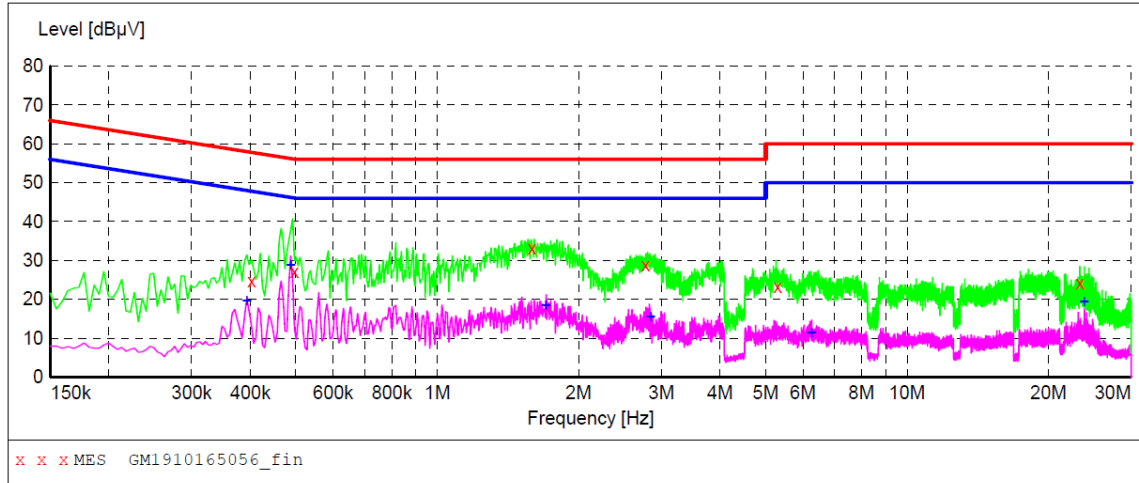
MEASUREMENT RESULT: "GM1910165057_fin2"

10/16/2019 4:54PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.393000	28.00	10.1	48	20.0	AV	L1	GND
0.487500	36.50	10.1	46	9.7	AV	L1	GND
0.555000	27.10	10.1	46	18.9	AV	L1	GND
1.023000	18.80	10.1	46	27.2	AV	L1	GND
2.575500	18.30	10.1	46	27.7	AV	L1	GND
23.860500	20.90	10.2	50	29.1	AV	L1	GND

Test Line:

N

**MEASUREMENT RESULT: "GM1910165056_fin"**

10/16/2019 4:51PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.402000	24.60	10.1	58	33.2	QP	N	GND
0.496500	27.20	10.1	56	28.9	QP	N	GND
1.590000	33.10	10.1	56	22.9	QP	N	GND
2.773500	28.80	10.1	56	27.2	QP	N	GND
5.307000	23.20	10.2	60	36.8	QP	N	GND
23.325000	24.10	10.2	60	35.9	QP	N	GND

MEASUREMENT RESULT: "GM1910165056_fin2"

10/16/2019 4:51PM

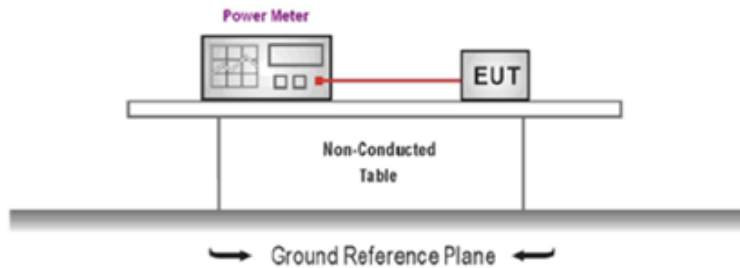
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.393000	19.50	10.1	48	28.5	AV	N	GND
0.487500	28.80	10.1	46	17.4	AV	N	GND
1.702500	18.30	10.1	46	27.7	AV	N	GND
2.845500	15.60	10.1	46	30.4	AV	N	GND
6.256500	11.30	10.2	50	38.7	AV	N	GND
23.865000	19.40	10.2	50	30.6	AV	N	GND

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

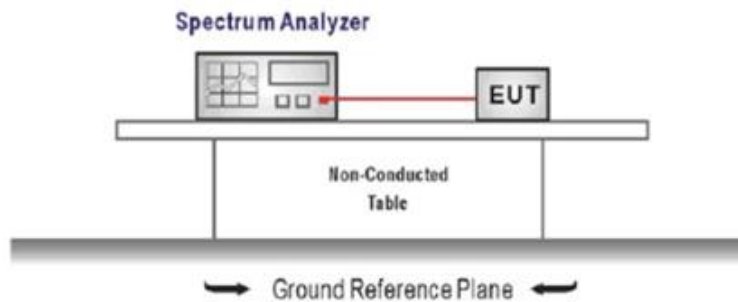
Type	Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
802.11b	01	15.78	12.43	≤30.00	Pass
	06	16.12	14.26		
	11	16.05	14.07		
802.11g	01	20.06	17.34	≤30.00	Pass
	06	19.01	16.71		
	11	20.01	17.46		
802.11n(HT20)	01	19.74	16.82	≤30.00	Pass
	06	19.09	16.39		
	11	18.94	15.66		
802.11n(HT40)	03	19.57	16.14	≤30.00	Pass
	06	19.13	15.97		
	09	20.64	16.85		

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:

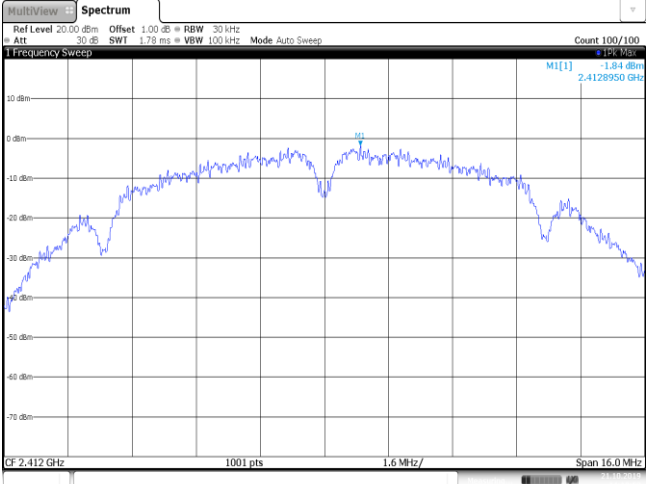
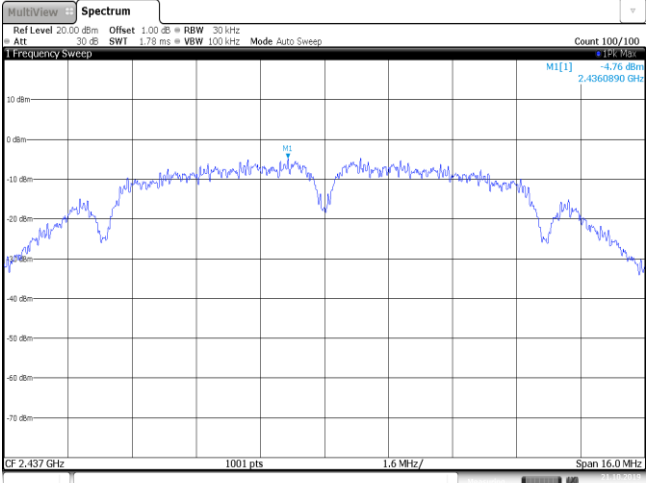
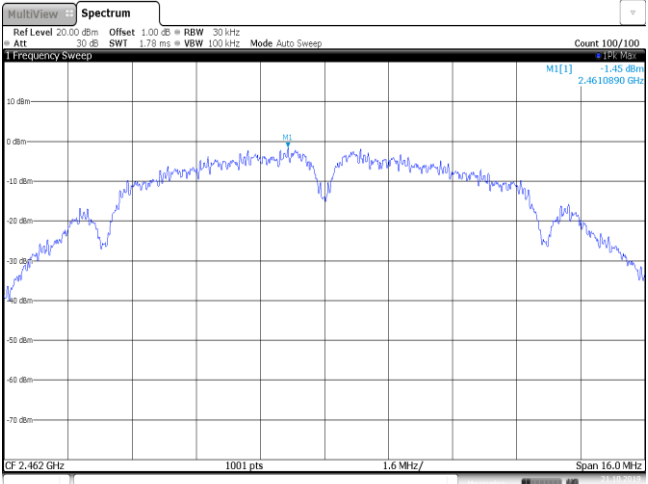
Please refer to the clause 3.3

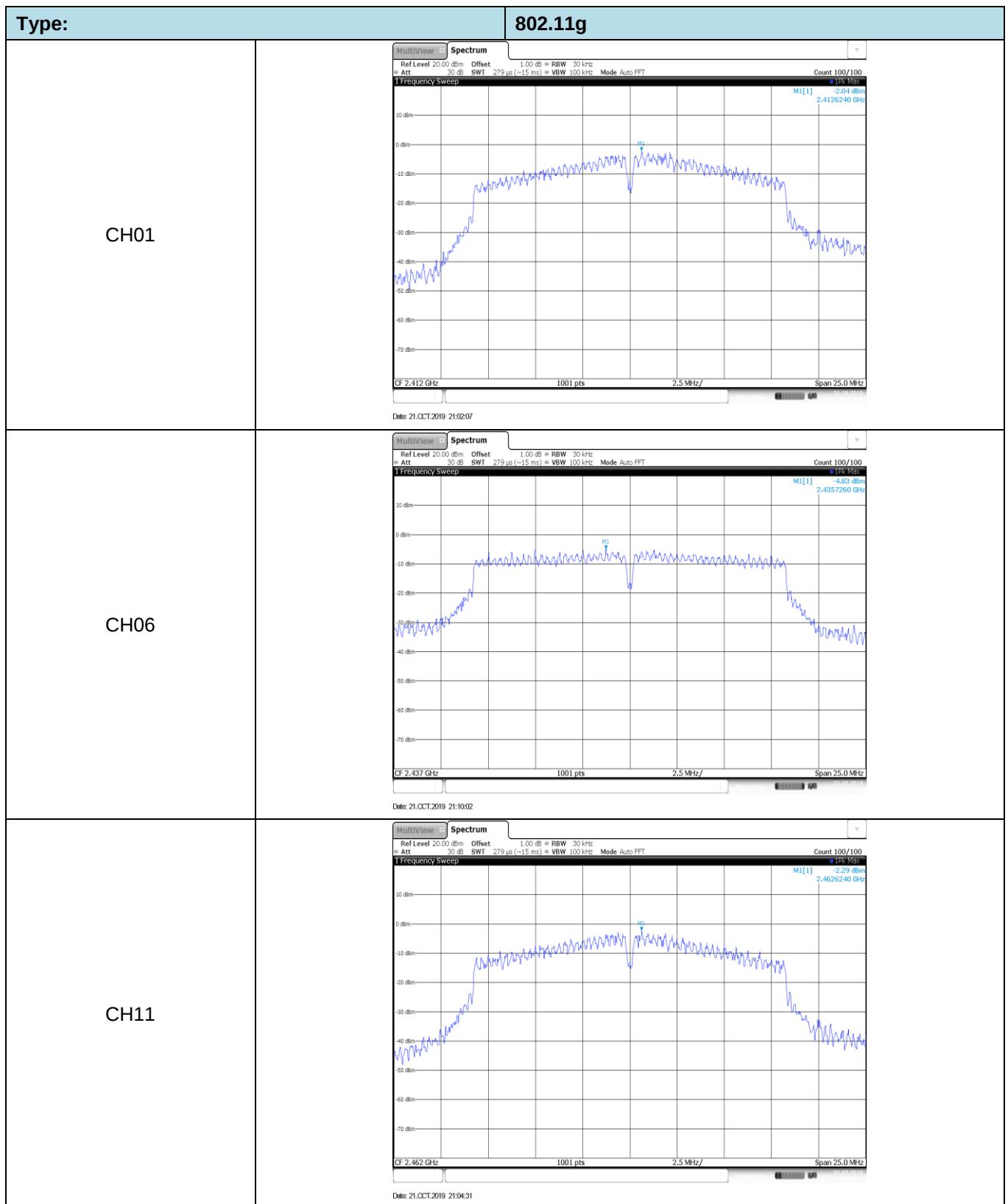
TEST RESULTS

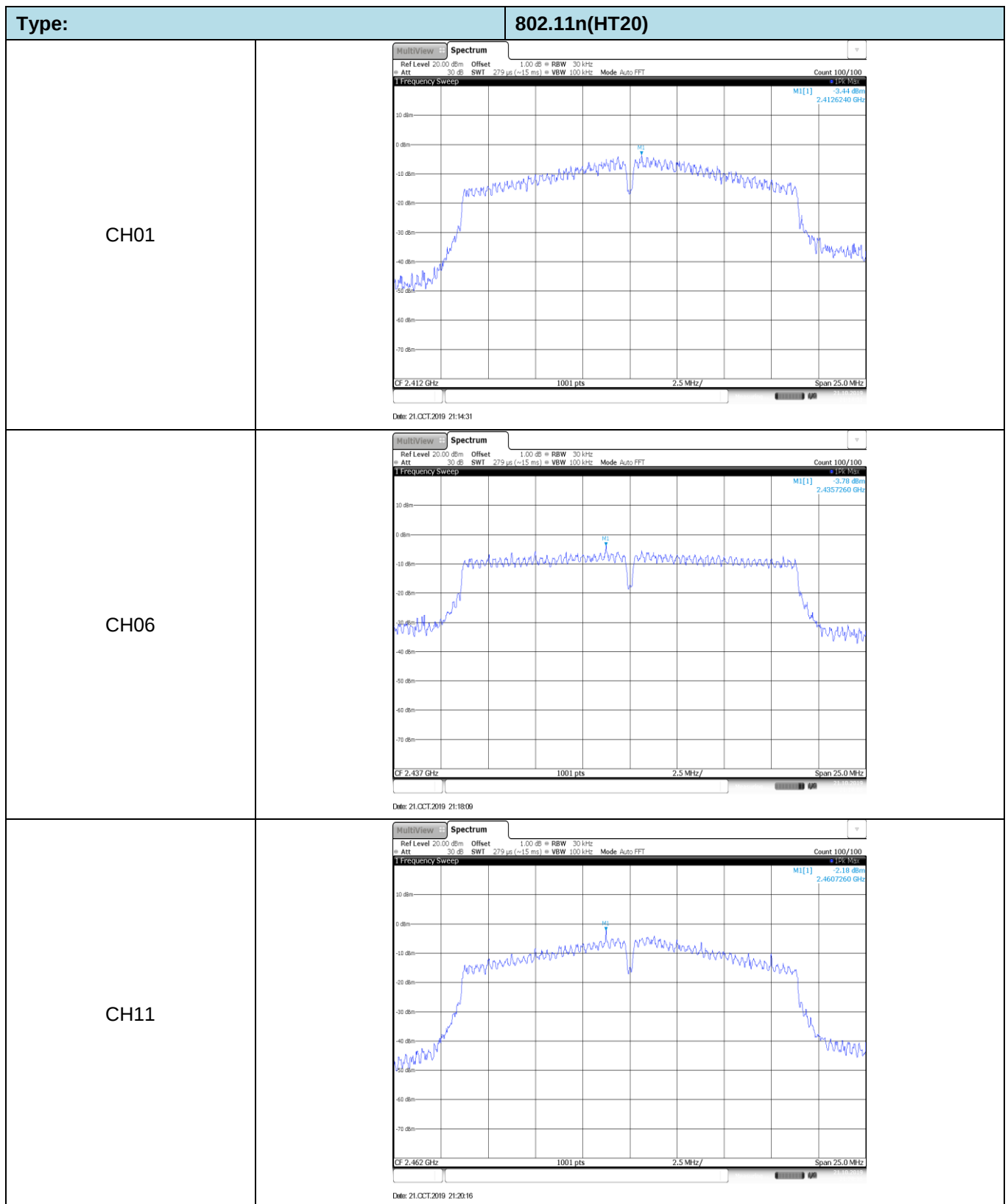
☒ Passed ☐ Not Applicable

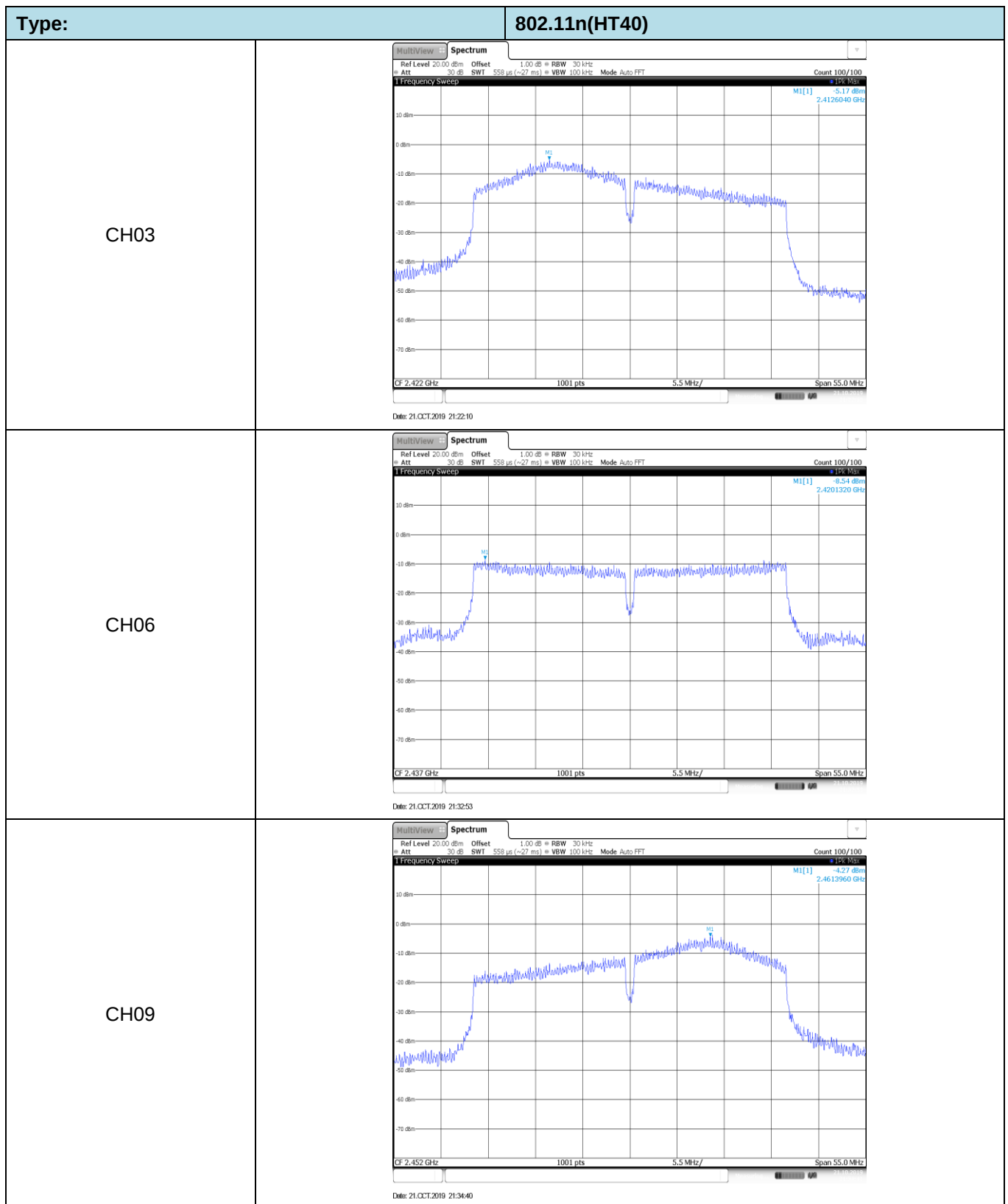
Type	Channel	Power Spectral Density (dBm/30KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-1.84	≤8.00	Pass
	06	-4.76		
	11	-1.45		
802.11g	01	-2.04	≤8.00	Pass
	06	-4.83		
	11	-2.29		
802.11n(HT20)	01	-3.44	≤8.00	Pass
	06	-3.78		
	11	-2.18		
802.11n(HT40)	03	-5.17	≤8.00	Pass
	06	-8.54		
	09	-4.27		

Test plot as follows:

Type:	802.11b
CH01	 21.OCT.2019 14:10:51
CH06	 21.OCT.2019 21:42:58
CH11	 21.OCT.2019 14:15:10







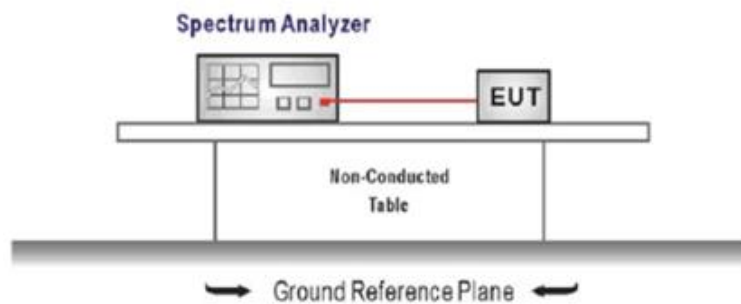
5.5. 6dB bandwidth

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:

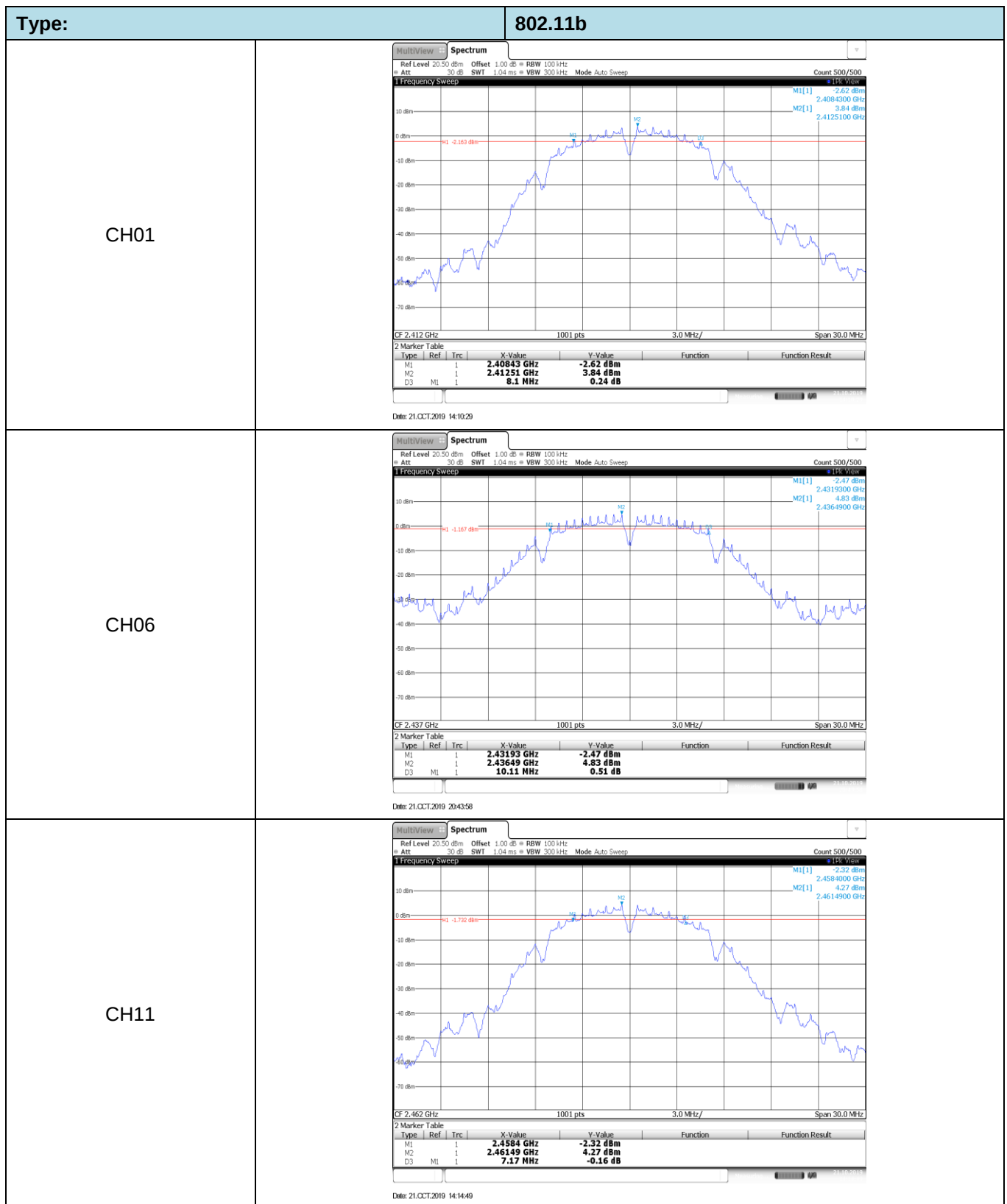
Please refer to the clause 3.3

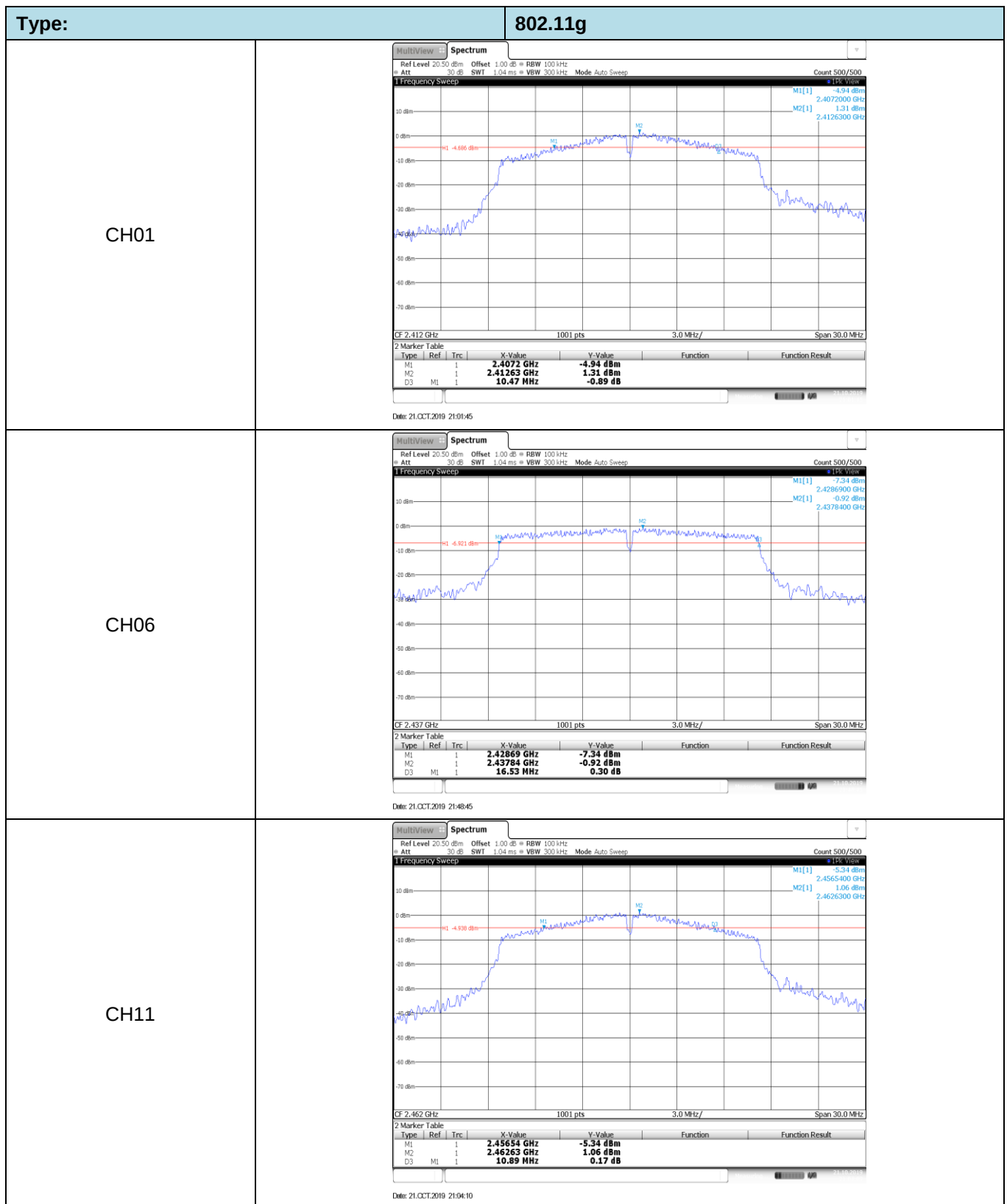
TEST RESULTS

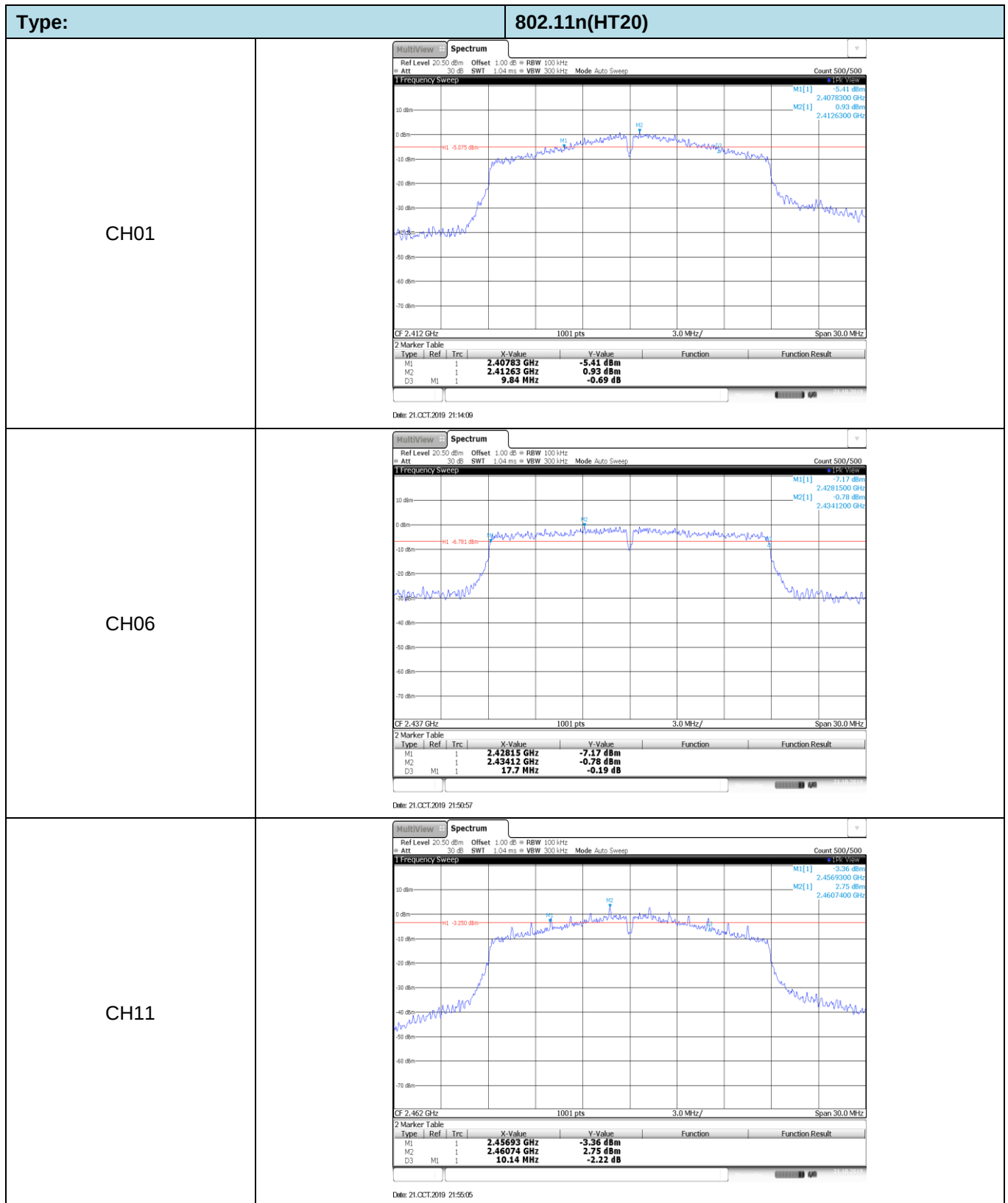
☒ Passed ☐ Not Applicable

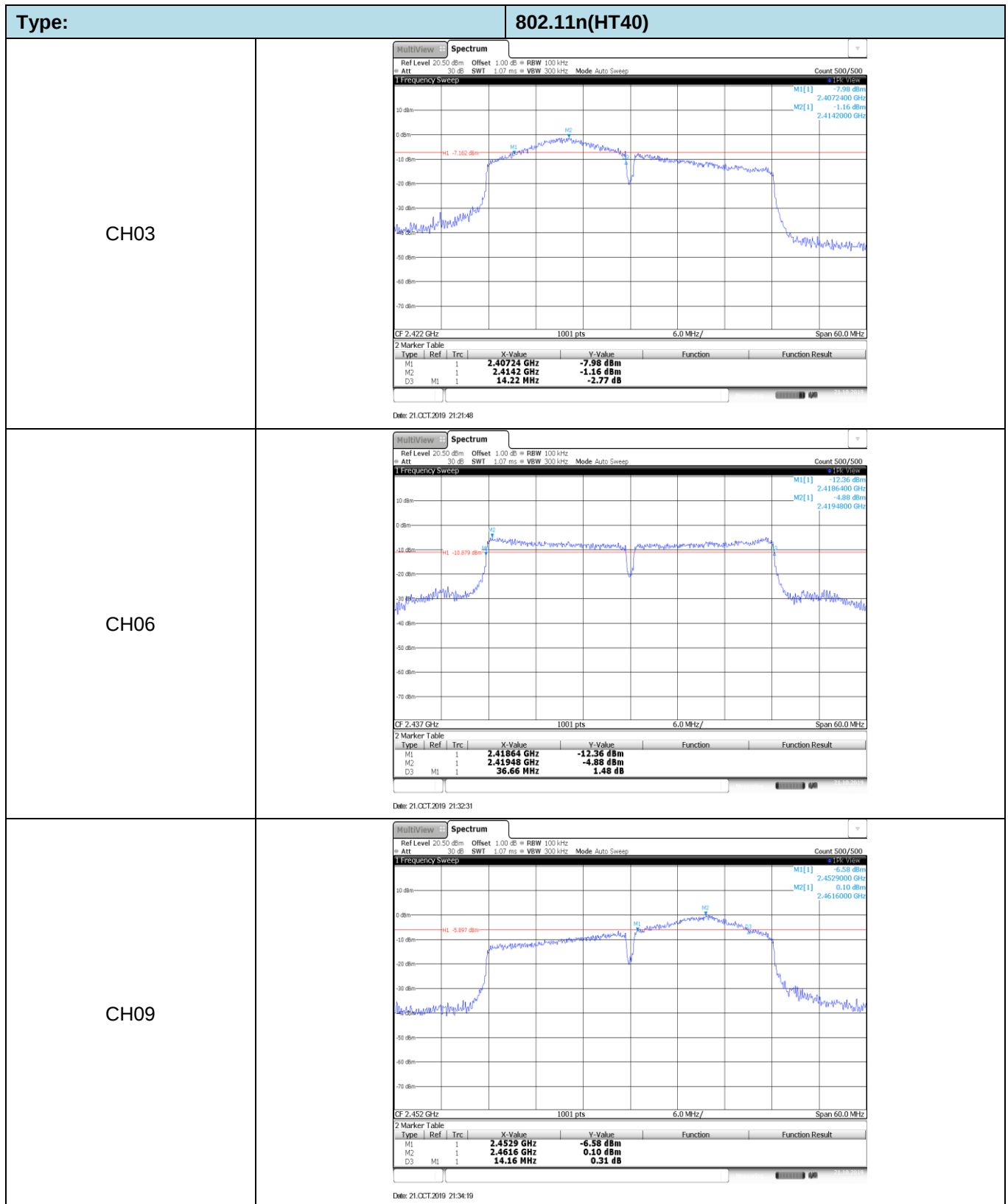
Type	Channel	6dB Bandwidth (MHz)	Limit (kHz)	Result
802.11b	01	8.10	≥500	Pass
	06	10.11		
	11	7.17		
802.11g	01	10.47	≥500	Pass
	06	16.53		
	11	10.89		
802.11n(HT20)	01	9.84	≥500	Pass
	06	17.70		
	11	10.14		
802.11n(HT40)	03	14.22	≥500	Pass
	06	36.66		
	09	14.16		

Test plot as follows:









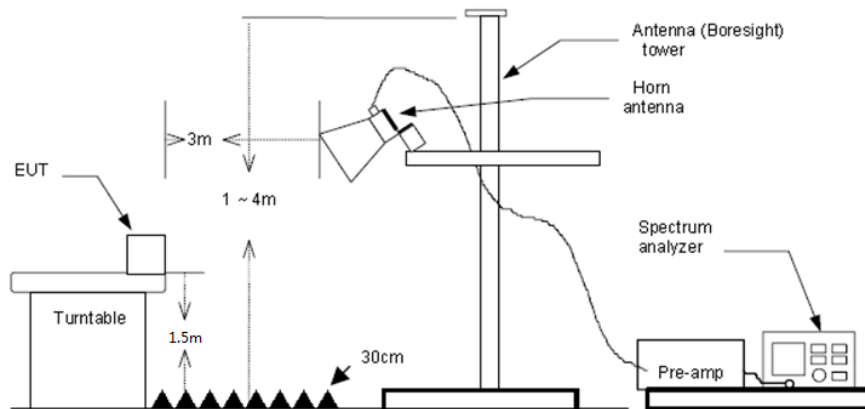
5.6. Restricted band

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 + Factor

802.11b				CH01			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	22.55	35.78	58.33	74.00	15.67	Horizontal	PK
2390.000	22.83	35.50	58.33	74.00	15.67	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	11.53	35.78	47.31	54.00	6.69	Horizontal	AV
2390.000	11.12	35.50	46.62	54.00	7.38	Horizontal	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	23.97	35.78	59.75	74.00	14.25	Vertical	PK
2390.000	21.66	35.50	57.16	74.00	16.84	Vertical	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	11.44	35.78	47.22	54.00	6.78	Vertical	AV
2390.000	10.94	35.50	46.44	54.00	7.56	Vertical	AV
802.11b				CH11			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	22.99	35.31	58.30	74.00	15.70	Horizontal	PK
2500.000	22.33	35.28	57.61	74.00	16.39	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	11.53	35.31	46.84	54.00	7.16	Horizontal	AV
2500.000	10.94	35.28	46.22	54.00	7.78	Horizontal	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	25.39	35.31	60.70	74.00	13.30	Vertical	PK
2500.000	22.48	35.28	57.76	74.00	16.24	Vertical	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	11.38	35.31	46.69	54.00	7.31	Vertical	AV
2500.000	10.96	35.28	46.24	54.00	7.76	Vertical	AV

802.11g				CH01			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	23.16	35.78	58.94	74.00	15.06	Horizontal	PK
2390.000	20.90	35.50	56.40	74.00	17.60	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	11.49	35.78	47.27	54.00	6.73	Horizontal	AV
2390.000	10.98	35.50	46.48	54.00	7.52	Horizontal	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	22.39	35.78	58.17	74.00	15.83	Vertical	PK
2390.000	21.10	35.50	56.60	74.00	17.40	Vertical	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	11.40	35.78	47.18	54.00	6.82	Vertical	AV
2390.000	11.09	35.50	46.59	54.00	7.41	Vertical	AV
802.11g				CH11			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	24.25	35.31	59.56	74.00	14.44	Horizontal	PK
2500.000	22.24	35.28	57.52	74.00	16.48	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	11.45	35.31	46.76	54.00	7.24	Horizontal	AV
2500.000	10.99	35.28	46.27	54.00	7.73	Horizontal	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	23.50	35.31	58.81	74.00	15.19	Vertical	PK
2500.000	21.75	35.28	57.03	74.00	16.97	Vertical	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	11.55	35.31	46.86	54.00	7.14	Vertical	AV
2500.000	10.95	35.28	46.23	54.00	7.77	Vertical	AV

802.11n(HT20)				CH01			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	11.90	35.78	47.68	54.00	6.32	Horizontal	AV
2390.036	11.92	35.50	47.42	54.00	6.58	Horizontal	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	21.60	35.78	57.38	74.00	16.62	Horizontal	PK
2390.036	21.31	35.50	56.81	74.00	17.19	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	11.86	35.78	47.64	54.00	6.36	Vertical	AV
2390.036	11.75	35.50	47.25	54.00	6.75	Vertical	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	22.03	35.78	57.81	74.00	16.19	Vertical	PK
2390.036	20.89	35.50	56.39	74.00	17.61	Vertical	PK
802.11n(HT20)				CH11			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.531	11.45	35.31	46.76	54.00	7.24	Horizontal	AV
2500.000	11.41	35.28	46.69	54.00	7.31	Horizontal	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.531	22.50	35.31	57.81	74.00	16.19	Horizontal	PK
2500.000	21.16	35.28	56.44	74.00	17.56	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.531	11.71	35.31	47.02	54.00	6.98	Vertical	AV
2500.000	11.52	35.28	46.80	54.00	7.20	Vertical	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.531	22.83	35.31	58.14	74.00	15.86	Vertical	PK
2500.000	22.17	35.28	57.45	74.00	16.55	Vertical	PK

802.11n(HT40)				CH03			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	22.78	35.78	58.56	74.00	15.44	Horizontal	PK
2390.000	21.18	35.50	56.68	74.00	17.32	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	11.42	35.78	47.20	54.00	6.80	Horizontal	AV
2390.000	11.14	35.50	46.64	54.00	7.36	Horizontal	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	22.39	35.78	58.17	74.00	15.83	Vertical	PK
2390.000	22.17	35.50	57.67	74.00	16.33	Vertical	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2310.000	11.41	35.78	47.19	54.00	6.81	Vertical	AV
2390.000	11.07	35.50	46.57	54.00	7.43	Vertical	AV
802.11n(HT40)				CH09			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	22.28	35.31	57.59	74.00	16.41	Horizontal	PK
2500.000	21.85	35.28	57.13	74.00	16.87	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	12.18	35.31	47.49	54.00	6.51	Horizontal	AV
2500.000	11.19	35.28	46.47	54.00	7.53	Horizontal	AV
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	22.43	35.31	57.74	74.00	16.26	Vertical	PK
2500.000	21.88	35.28	57.16	74.00	16.84	Vertical	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2483.500	12.07	35.31	47.38	54.00	6.62	Vertical	AV
2500.000	11.19	35.28	46.47	54.00	7.53	Vertical	AV

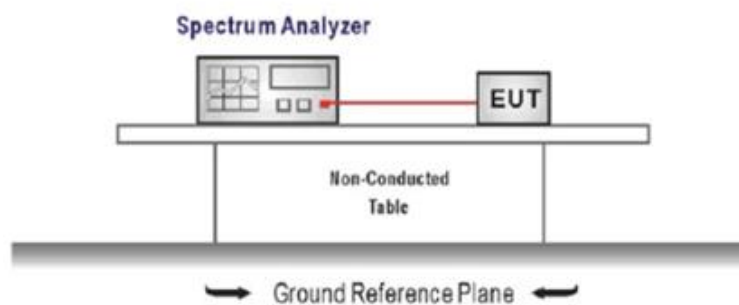
5.7. Band edge and Spurious Emissions (conducted)

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 $\geq 3 \times$ 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 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

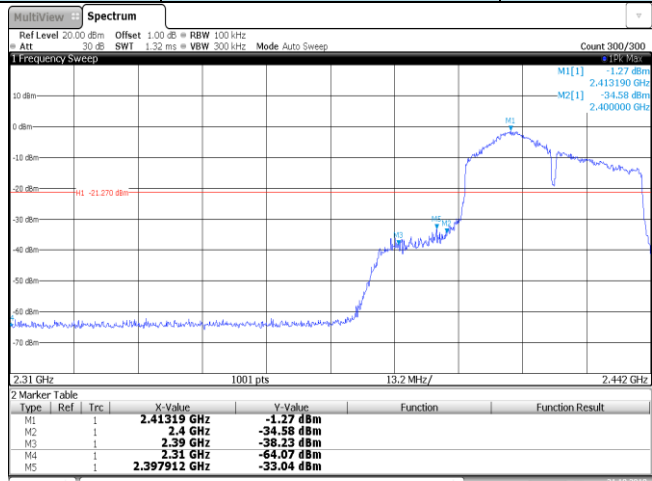
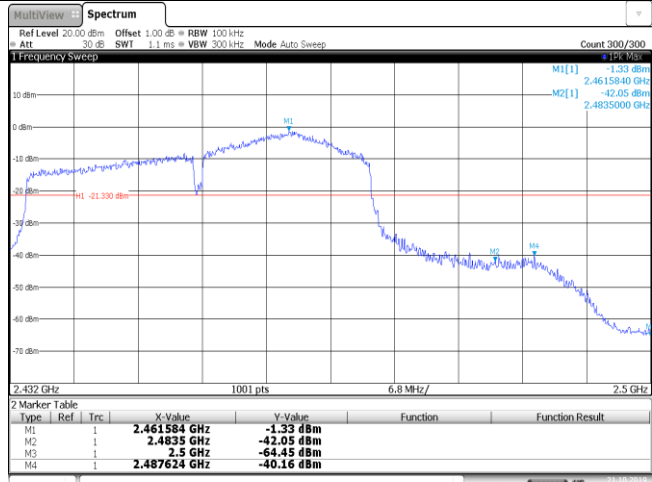
TEST RESULTS

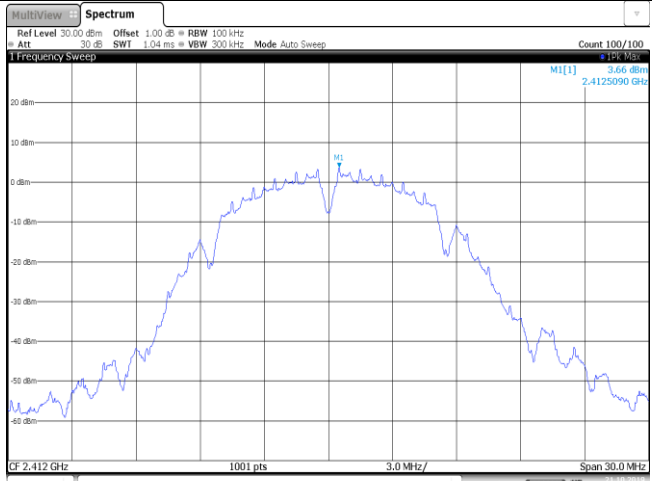
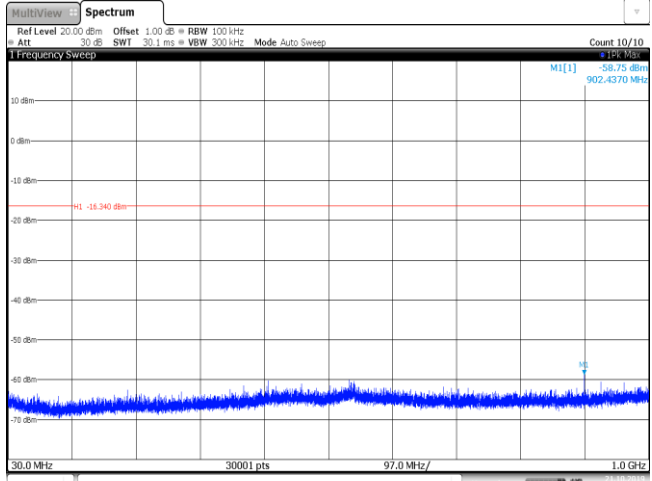
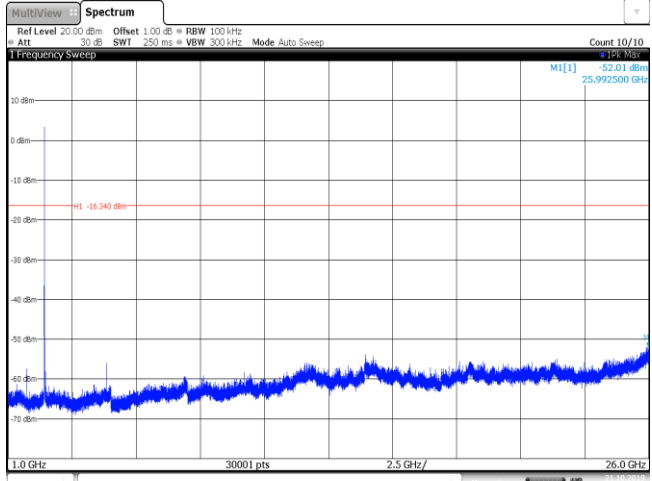
☒ Passed ☐ Not Applicable

Test Item:	Bandedge	Type:	802.11b																																										
CH01	MultViewSpectrum Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWT 1.12 ms VBW 300 kHz Mode Auto Sweep Count 200/300 Frequency Sweep M1 16.400 dBm M1[1] 3.51 dBm 2.412430 GHz M2[1] -52.81 dBm 2.400000 GHz 2.31 GHz 1001 pts 11.2 MHz/ 2.422 GHz 2 Marker Table <table><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><tr><td>M1</td><td>1</td><td></td><td>2.41243 GHz</td><td>3.51 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-52.81 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-61.23 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-64.27 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.399936 GHz</td><td>-53.49 dBm</td><td></td><td></td></tr></table> Date: 21.OCT.2019 14:11:01			Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.41243 GHz	3.51 dBm			M2	1		2.4 GHz	-52.81 dBm			M3	1		2.39 GHz	-61.23 dBm			M4	1		2.31 GHz	-64.27 dBm			M5	1		2.399936 GHz	-53.49 dBm		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
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M2	1		2.4 GHz	-52.81 dBm																																									
M3	1		2.39 GHz	-61.23 dBm																																									
M4	1		2.31 GHz	-64.27 dBm																																									
M5	1		2.399936 GHz	-53.49 dBm																																									
CH11	MultViewSpectrum Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWT 1.03 ms VBW 300 kHz Mode Auto Sweep Count 300/300 Frequency Sweep M1 16.000 dBm M1[1] 3.91 dBm 2.4614710 GHz M2[1] -59.06 dBm 2.4835000 GHz 2.452 GHz 1001 pts 4.8 MHz/ 2.5 GHz 2 Marker Table <table><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><tr><td>M1</td><td>1</td><td></td><td>2.461471 GHz</td><td>3.91 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4835 GHz</td><td>-59.06 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.5 GHz</td><td>-64.06 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.486656 GHz</td><td>-59.35 dBm</td><td></td><td></td></tr></table> Date: 21.OCT.2019 14:15:20			Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.461471 GHz	3.91 dBm			M2	1		2.4835 GHz	-59.06 dBm			M3	1		2.5 GHz	-64.06 dBm			M4	1		2.486656 GHz	-59.35 dBm									
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
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M4	1		2.486656 GHz	-59.35 dBm																																									

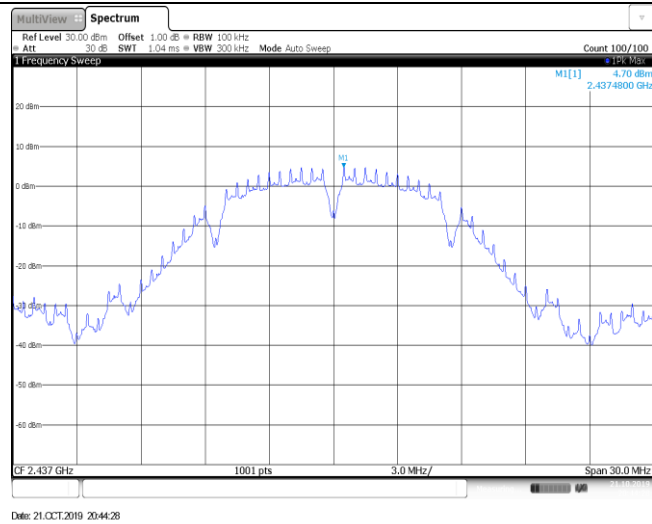
Test Item:	Bandedge	Type:	802.11g
CH01			

Test Item:	Bandedge	Type:	802.11n(HT20)
CH01			

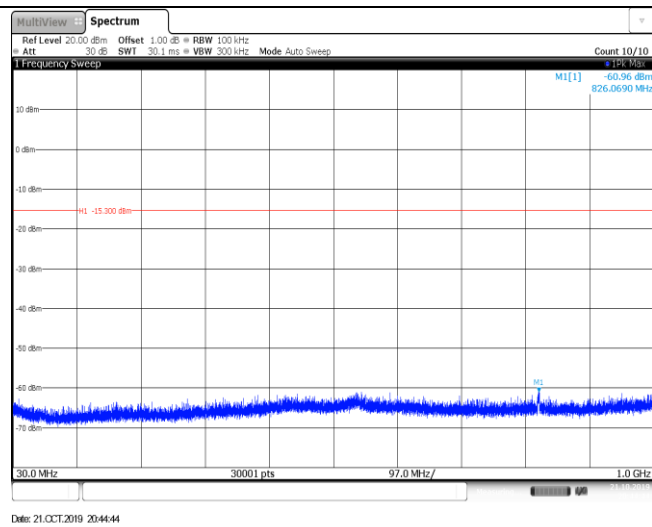
Test Item:	Bandedge	Type:	802.11n(HT40)																																										
CH03	MultViewSpectrum Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Count 200/300 Att 30 dB SW 1.52 ms VBW 300 kHz Mode Auto Sweep Frequency Sweep  2 Marker Table <table><thead><tr><th>Type</th><th>Ref</th><th>Trc</th><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>2.41319 GHz</td><td>-1.27 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-34.58 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-38.23 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-64.07 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.397912 GHz</td><td>-33.04 dBm</td><td></td><td></td></tr></tbody></table> Date: 21.OCT.2019 21:22:20			Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.41319 GHz	-1.27 dBm			M2	1		2.4 GHz	-34.58 dBm			M3	1		2.39 GHz	-38.23 dBm			M4	1		2.31 GHz	-64.07 dBm			M5	1		2.397912 GHz	-33.04 dBm		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.41319 GHz	-1.27 dBm																																									
M2	1		2.4 GHz	-34.58 dBm																																									
M3	1		2.39 GHz	-38.23 dBm																																									
M4	1		2.31 GHz	-64.07 dBm																																									
M5	1		2.397912 GHz	-33.04 dBm																																									
CH09	MultViewSpectrum Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Count 300/300 Att 30 dB SW 1.1 ms VBW 300 kHz Mode Auto Sweep Frequency Sweep  2 Marker Table <table><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>2.461584 GHz</td><td>-1.33 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4835 GHz</td><td>-42.05 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.5 GHz</td><td>-64.45 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.487624 GHz</td><td>-40.16 dBm</td><td></td><td></td></tr></tbody></table> Date: 21.OCT.2019 22:00:04			Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.461584 GHz	-1.33 dBm			M2	1		2.4835 GHz	-42.05 dBm			M3	1		2.5 GHz	-64.45 dBm			M4	1		2.487624 GHz	-40.16 dBm									
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.461584 GHz	-1.33 dBm																																									
M2	1		2.4835 GHz	-42.05 dBm																																									
M3	1		2.5 GHz	-64.45 dBm																																									
M4	1		2.487624 GHz	-40.16 dBm																																									

Test Item:	SE	Type:	802.11b
CH01 Reference level	 Ref Level 30.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWI 1.04 ms VBW 300 kHz Mode Auto Sweep Count 100/100 MI[1] 3.66 dBm 2.4125090 GHz CF 2.412 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 21.OCT.2019 14:11:08		
CH01 30MHz~1000MHz	 Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWI 30.1 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -58.75 dBm 902.4370 MHz 30.0 MHz 30001 pts 97.0 MHz/ 1.0 GHz Date: 21.OCT.2019 14:11:24		
CH01 1GHz~26GHz	 Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWI 250 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -52.01 dBm 25.992500 GHz 1.0 GHz 30001 pts 2.5 GHz/ 26.0 GHz Date: 21.OCT.2019 14:11:40		

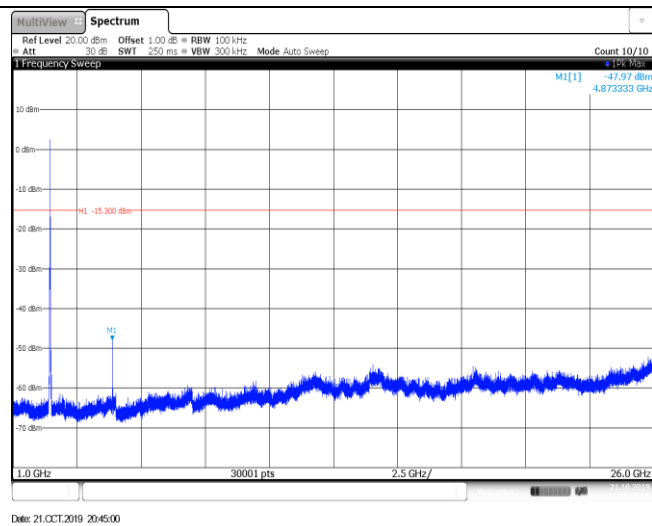
CH06
Reference level



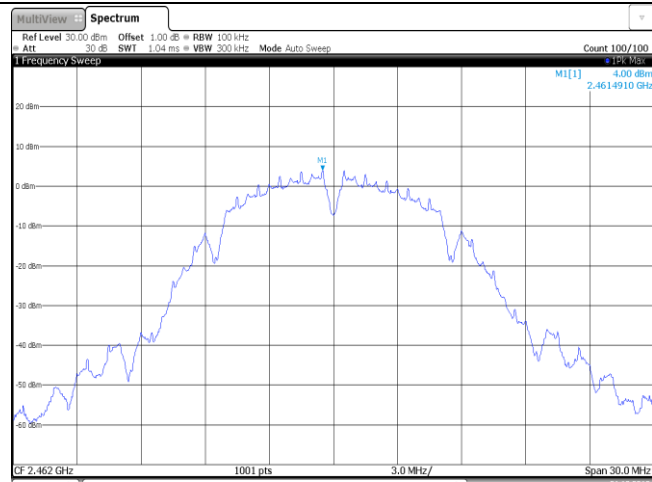
CH06
30MHz~1000MHz



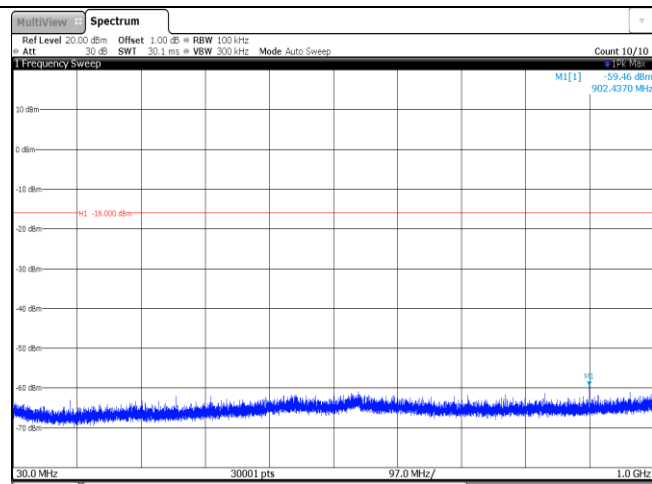
CH06
1GHz~26GHz



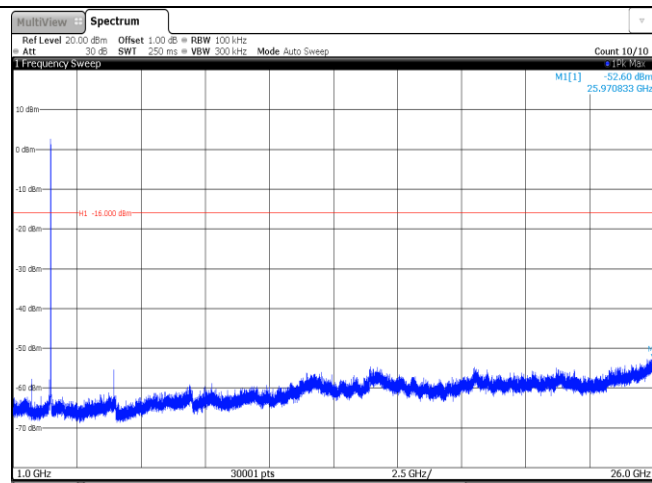
CH11
Reference level

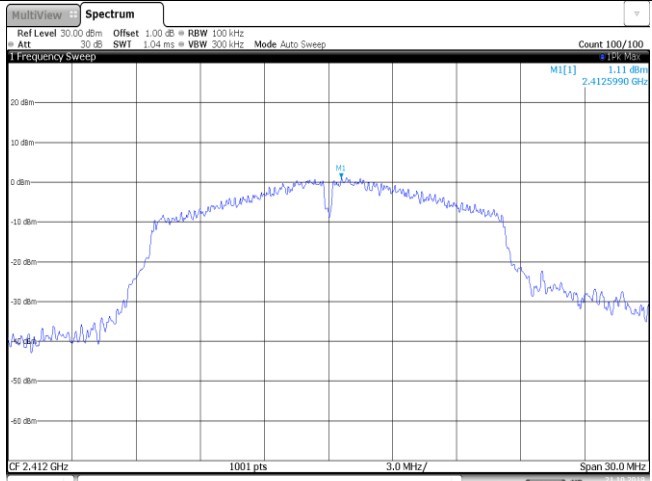
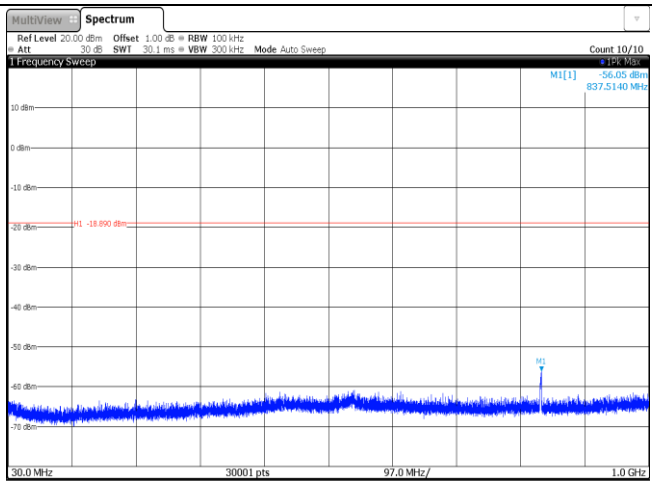
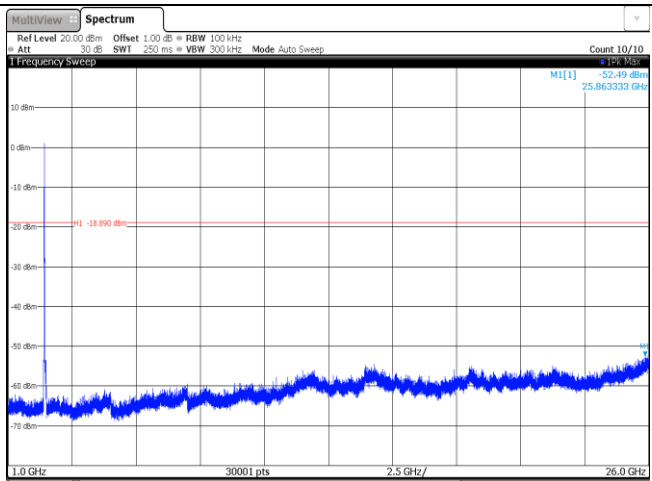


CH11
30MHz~1000MHz

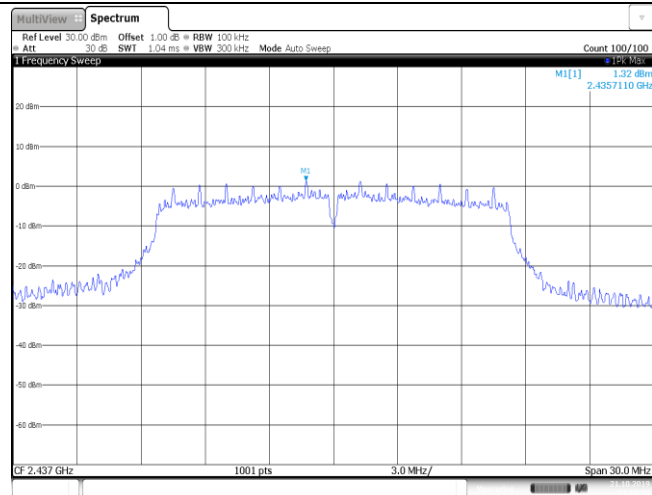


CH11
1GHz~26GHz

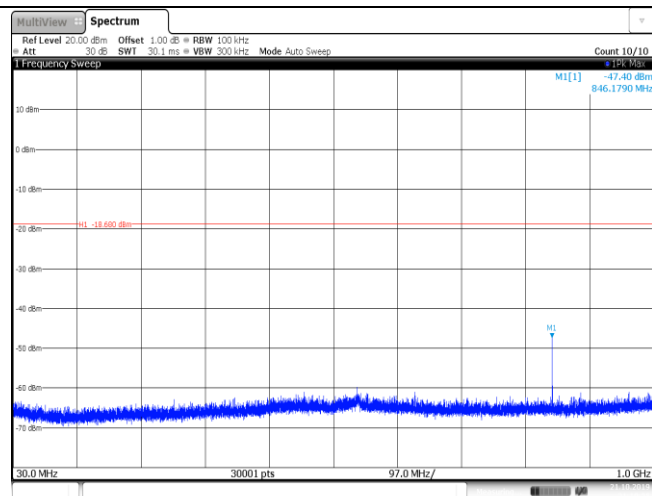


Test Item:	SE	Type:	802.11g
CH01 Reference level	 21.OCT.2019 21:02:24		
CH01 30MHz~1000MHz	 21.OCT.2019 21:02:40		
CH01 1GHz~26GHz	 21.OCT.2019 21:02:56		

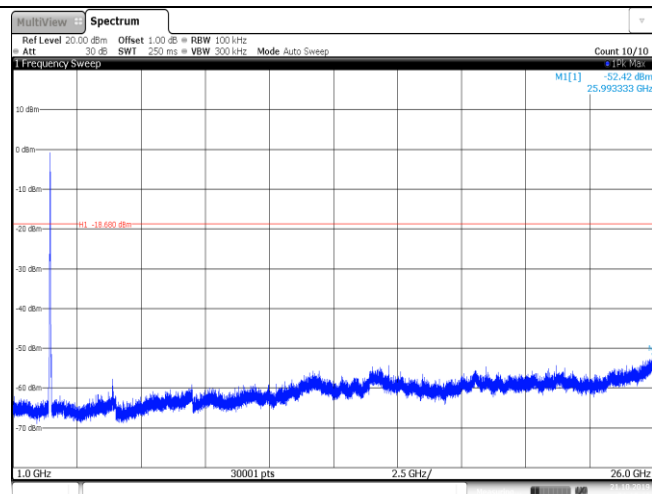
CH06
Reference level



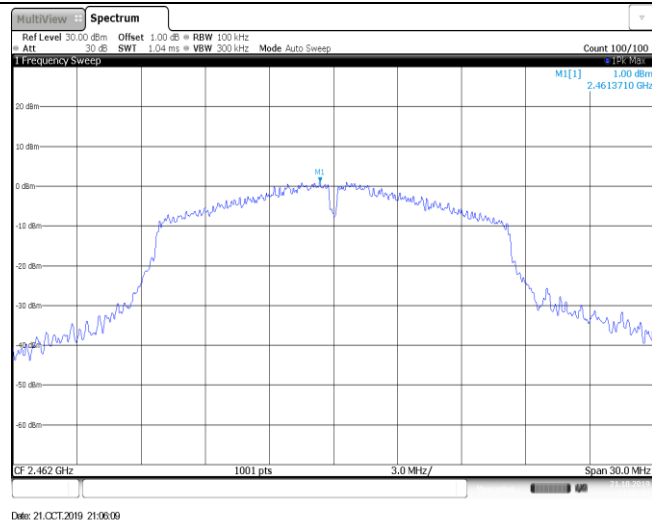
CH06
30MHz~1000MHz



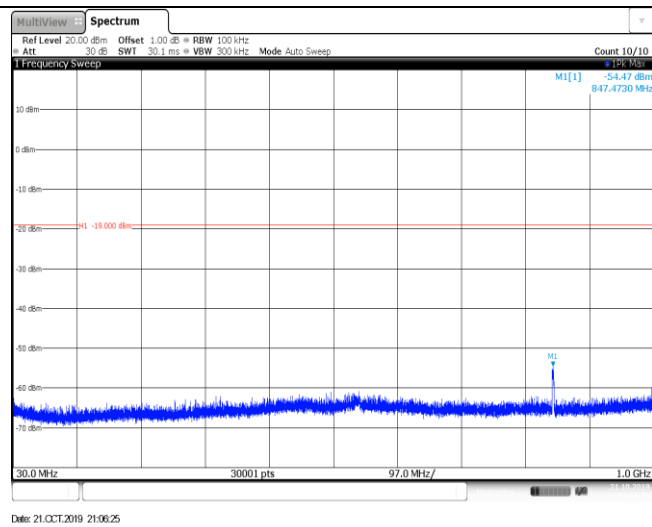
CH06
1GHz~26GHz



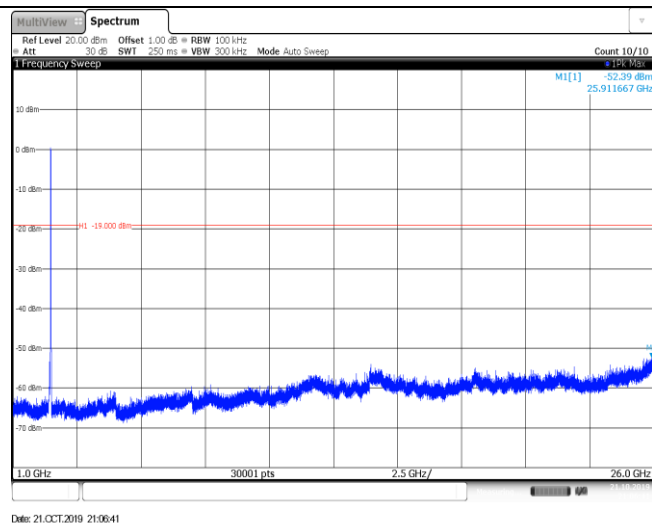
CH11
Reference level

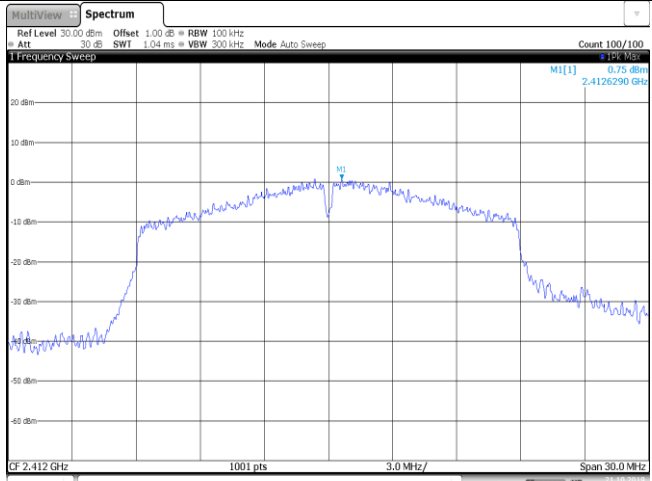
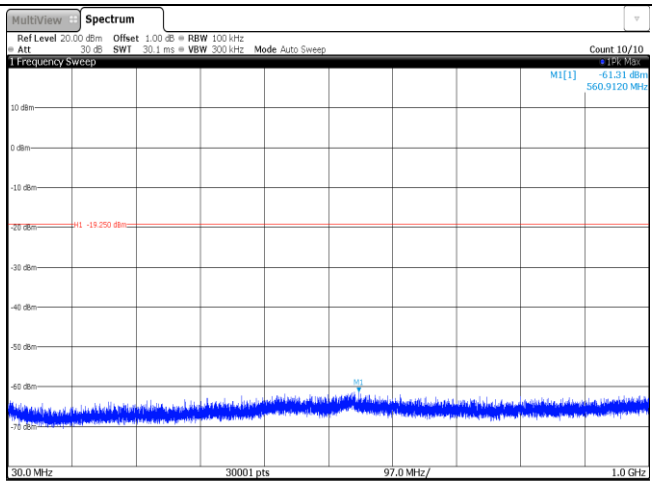
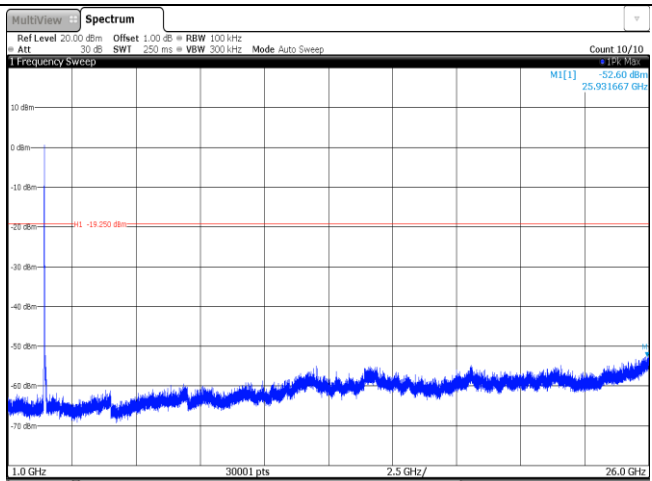


CH11
30MHz~1000MHz

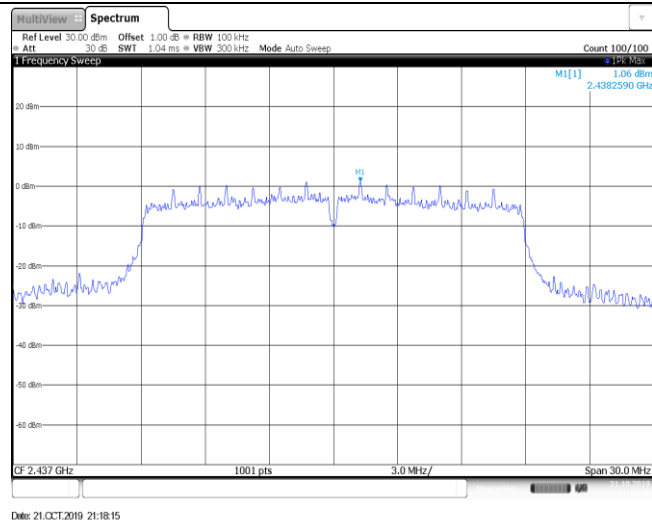


CH11
1GHz~26GHz

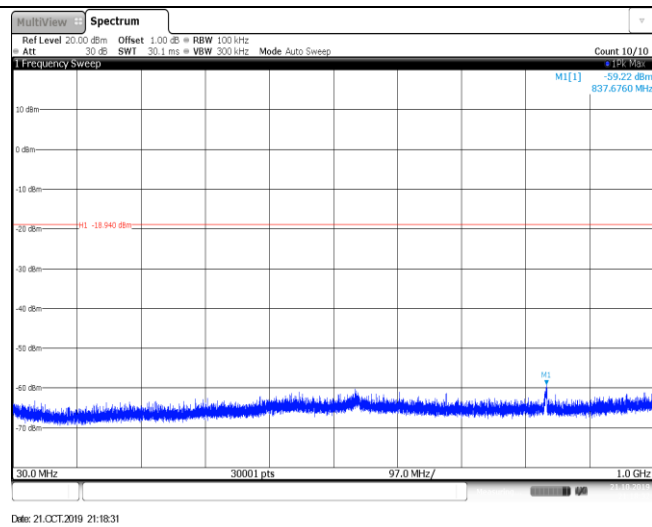


Test Item:	SE	Type:	802.11n(HT20)
CH01 Reference level	 21.OCT.2019 21:14:48		
CH01 30MHz~1000MHz	 21.OCT.2019 21:16:20		
CH01 1GHz~26GHz	 21.OCT.2019 21:16:37		

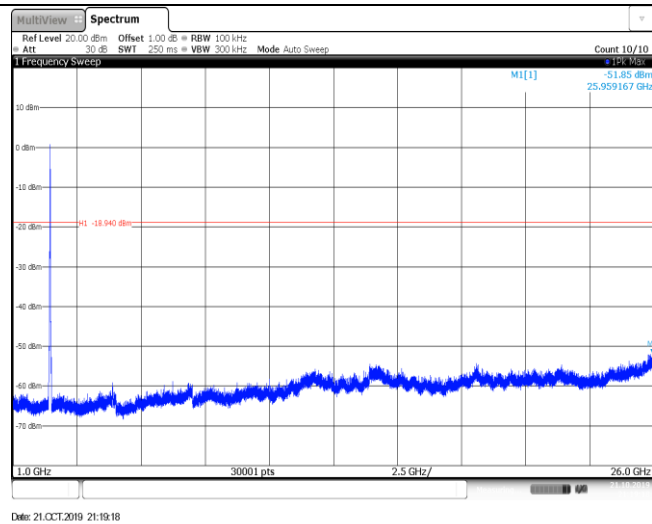
CH06
Reference level

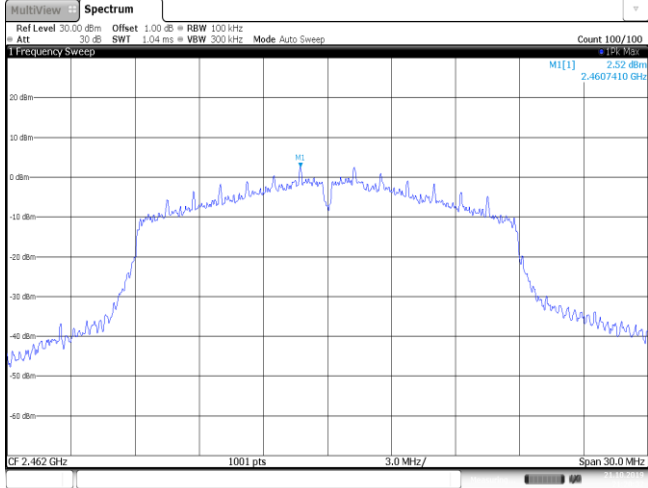
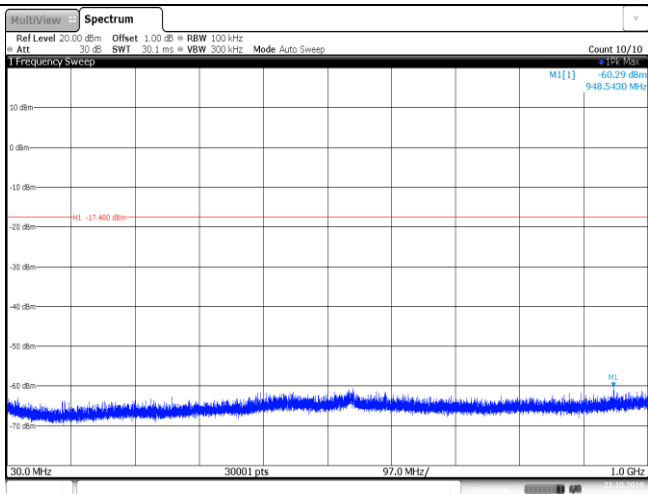
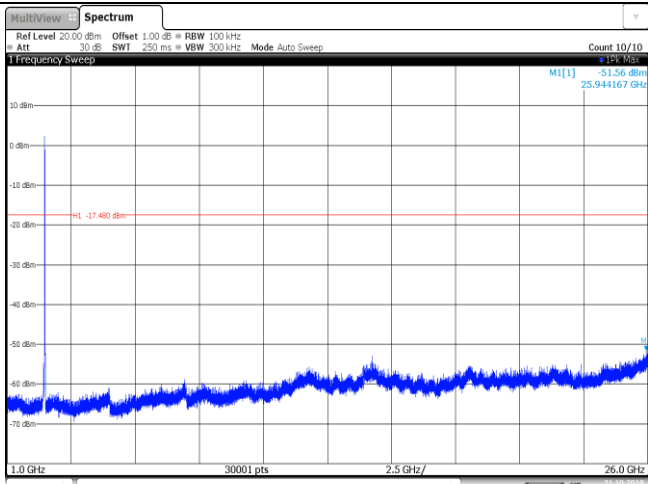


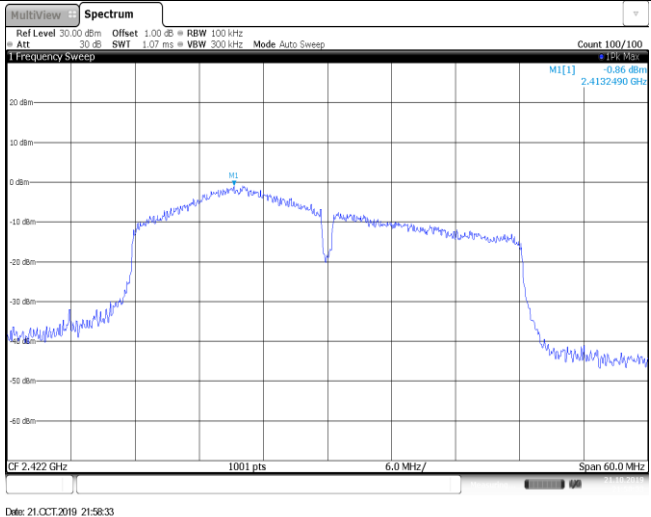
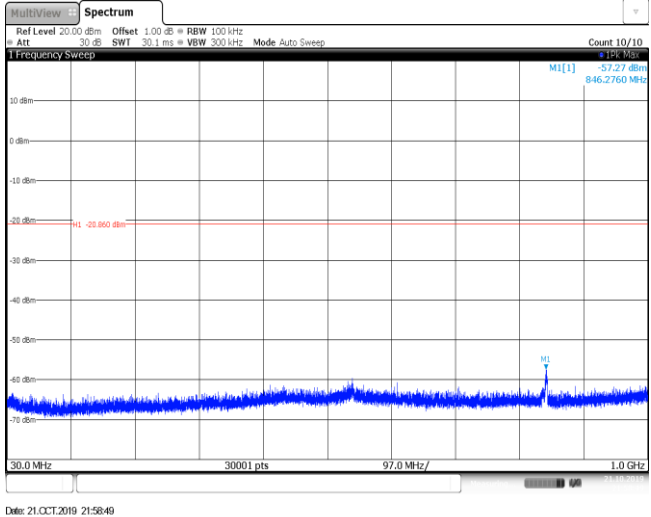
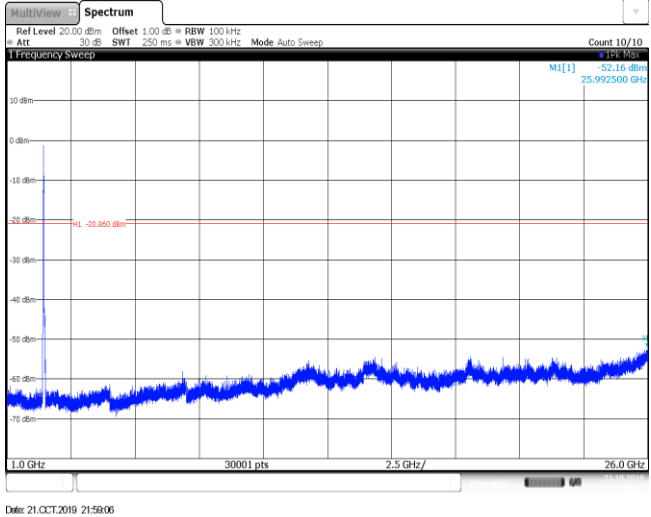
CH06
30MHz~1000MHz



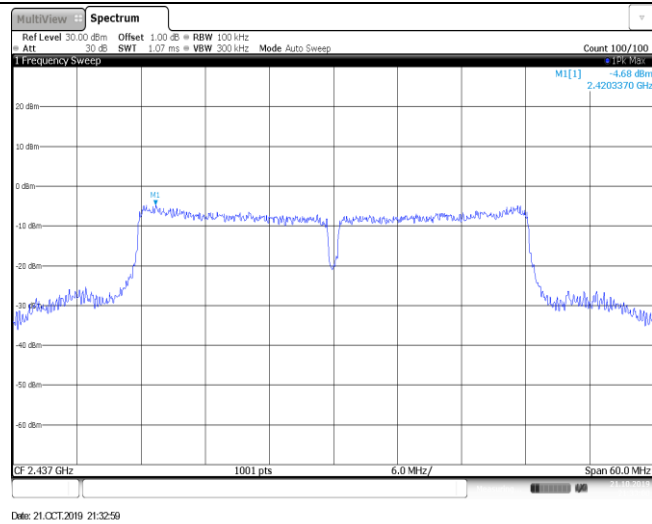
CH06
1GHz~26GHz



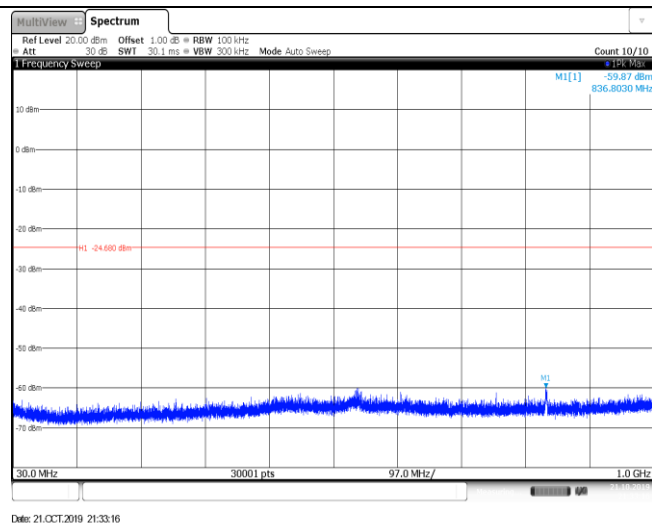
CH11 Reference level	 This spectrum plot shows the reference level for CH11. The y-axis represents power in dBm, ranging from -60 to 20. The x-axis represents frequency in MHz, ranging from 2.462 to 2.467. The plot shows a noisy signal with a peak around 2.464 MHz. The peak is labeled M1[1] with a value of -2.52 dBm. The plot also shows a reference level of 2.4607410 GHz. Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz ATT 30 dB SWT 1.04 ms VBW 300 kHz Mode Auto Sweep Count 100/100 Frequency Sweep M1[1] -2.52 dBm 2.4607410 GHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 2.462 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 21.OCT.2019 21:20:33
CH11 30MHz~1000MHz	 This spectrum plot shows the signal for CH11 in the 30 MHz to 1000 MHz range. The y-axis represents power in dBm, ranging from -70 to 20. The x-axis represents frequency in MHz, ranging from 30.0 to 1.0. The plot shows a noisy signal with a peak around 948.5430 MHz. The peak is labeled M1[1] with a value of -60.29 dBm. The plot also shows a reference level of 948.5430 MHz. Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz ATT 30 dB SWT 30.1 ms VBW 300 kHz Mode Auto Sweep Count 10/10 Frequency Sweep M1[1] -60.29 dBm 948.5430 MHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm 30.0 MHz 30001 pts 97.0 MHz/ 1.0 GHz Date: 21.OCT.2019 21:20:49
CH11 1GHz~26GHz	 This spectrum plot shows the signal for CH11 in the 1 GHz to 26 GHz range. The y-axis represents power in dBm, ranging from -70 to 20. The x-axis represents frequency in GHz, ranging from 1.0 to 26.0. The plot shows a noisy signal with a peak around 25.944167 GHz. The peak is labeled M1[1] with a value of 51.56 dBm. The plot also shows a reference level of 25.944167 GHz. Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz ATT 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep Count 10/10 Frequency Sweep M1[1] 51.56 dBm 25.944167 GHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm 1.0 GHz 30001 pts 2.5 GHz/ 26.0 GHz Date: 21.OCT.2019 21:21:05

Test Item:	SE	Type:	802.11n(HT40)
CH03 Reference level			
CH03 30MHz~1000MHz			
CH03 1GHz~26GHz			

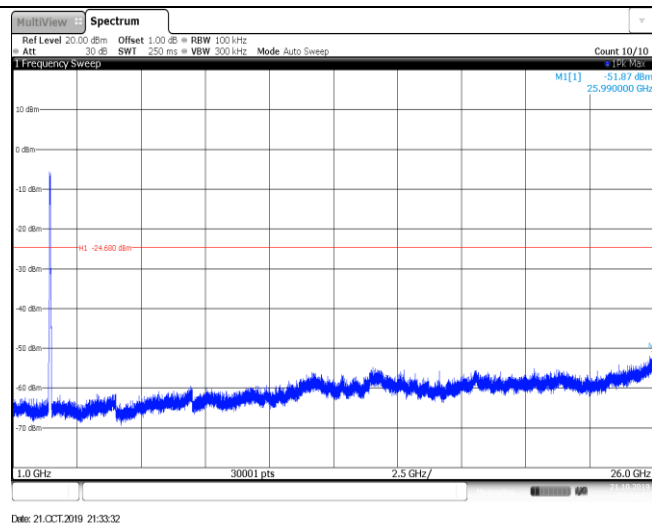
CH06
Reference level



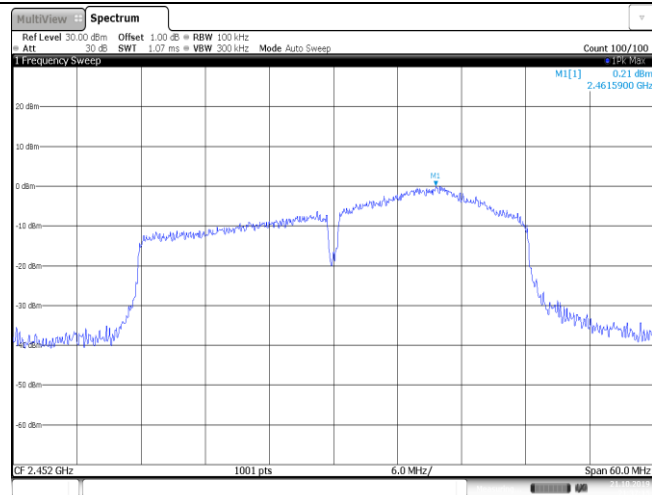
CH06
30MHz~1000MHz



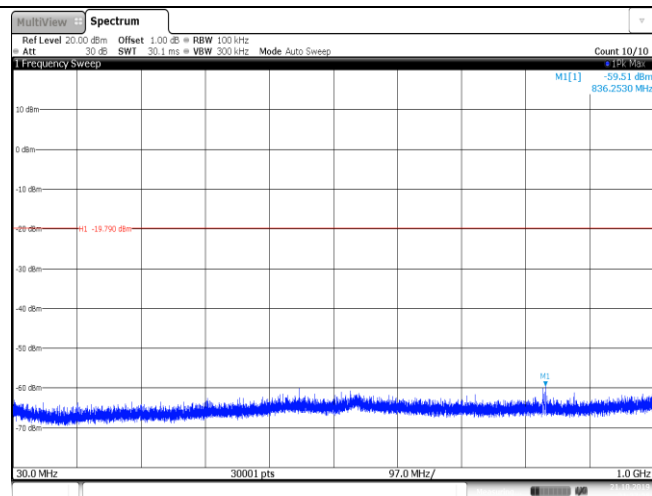
CH06
1GHz~26GHz



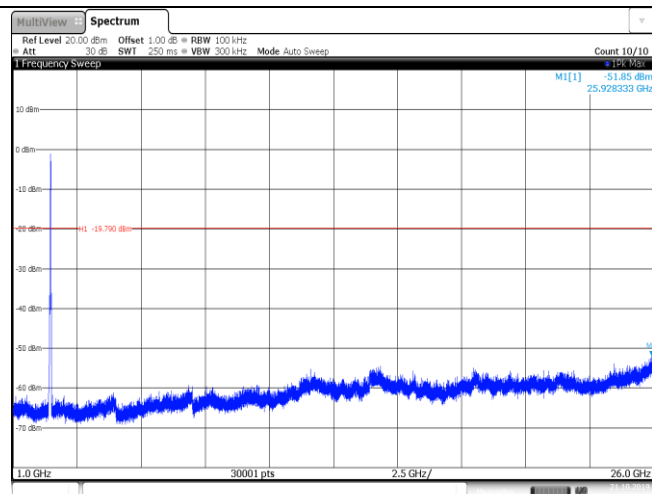
CH09
Reference level



CH09
30MHz~1000MHz



CH09
1GHz~26GHz



5.8. Spurious Emissions (radiated)

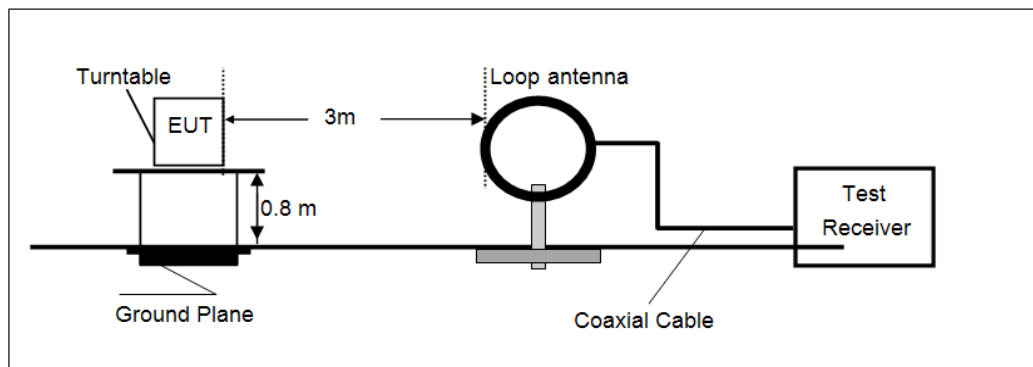
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209

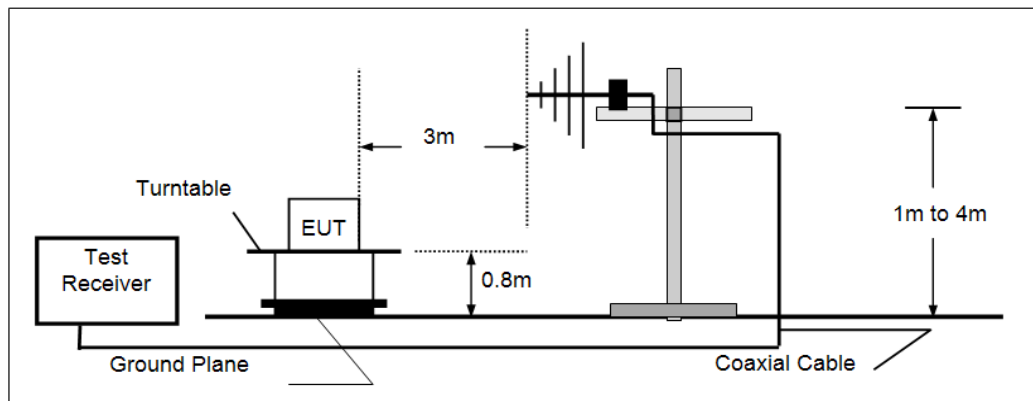
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

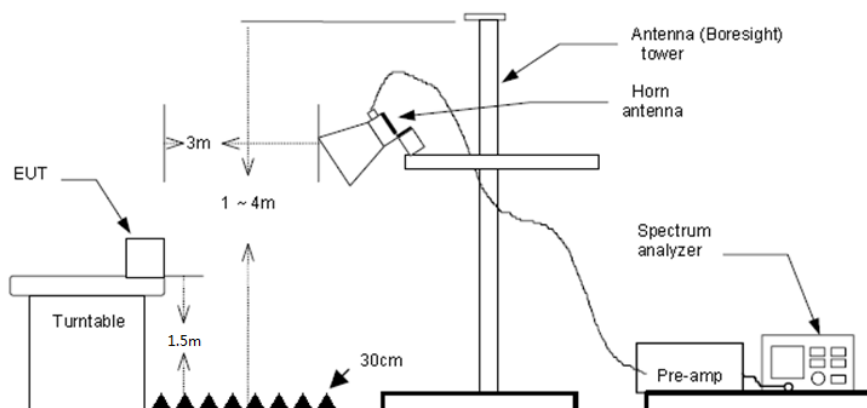
➤ 9kHz ~30MHz



➤ 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 10th 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 + 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.

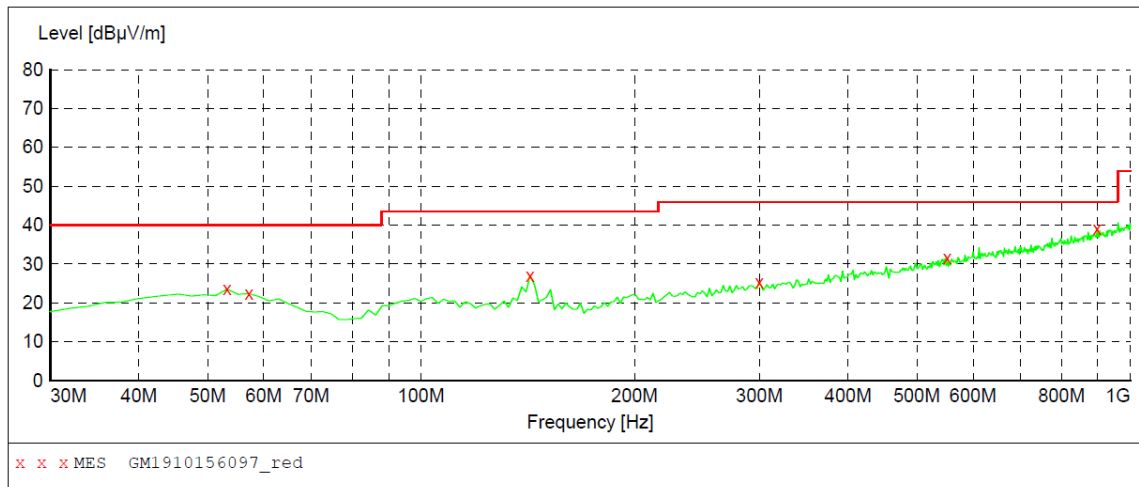
➤ **30MHz ~1000MHz**

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

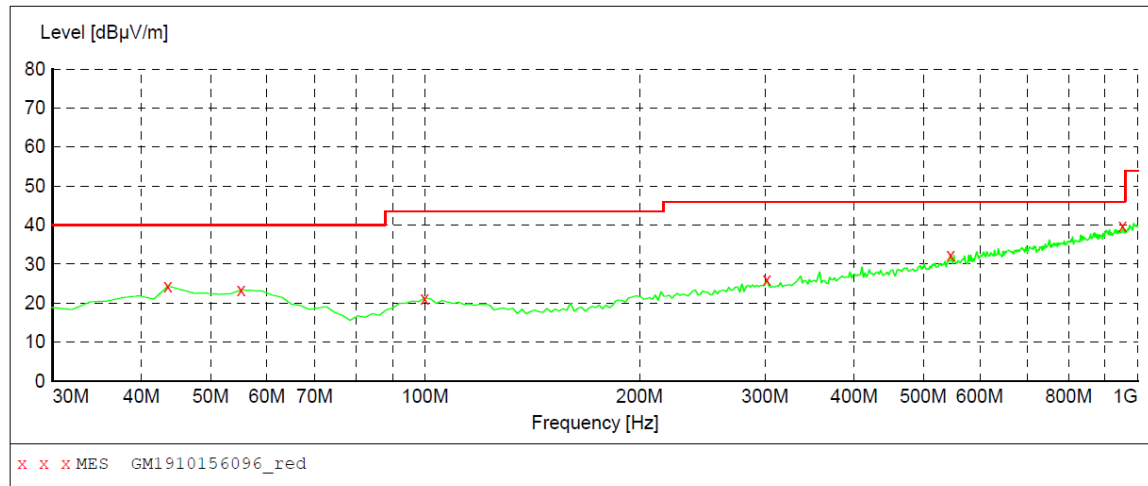
**MEASUREMENT RESULT: "GM1910156097_red"**

10/15/2019 10:39PM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.280000	23.60	-4.6	40.0	16.4	QP	100.0	254.00	VERTICAL
57.160000	22.40	-4.7	40.0	17.6	QP	100.0	268.00	VERTICAL
142.520000	27.00	-9.6	43.5	16.5	QP	100.0	289.00	VERTICAL
299.660000	25.30	-2.4	46.0	20.7	QP	100.0	5.00	VERTICAL
551.860000	31.70	4.2	46.0	14.3	QP	100.0	314.00	VERTICAL
897.180000	39.20	11.1	46.0	6.8	QP	100.0	356.00	VERTICAL

Polarization:

Horizontal

**MEASUREMENT RESULT: "GM1910156096_red"**

10/15/2019 10:37PM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
43.580000	24.40	-4.7	40.0	15.6	QP	300.0	107.00	HORIZONTAL
55.220000	23.40	-4.4	40.0	16.6	QP	100.0	184.00	HORIZONTAL
99.840000	21.30	-6.3	43.5	22.2	QP	300.0	71.00	HORIZONTAL
301.600000	25.90	-2.3	46.0	20.1	QP	100.0	78.00	HORIZONTAL
546.040000	32.30	4.1	46.0	13.7	QP	300.0	0.00	HORIZONTAL
951.500000	39.70	12.2	46.0	6.3	QP	100.0	148.00	HORIZONTAL

➤ 1 GHz ~ 25 GHz

802.11b				CH01			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1574.281	34.11	-6.11	28.00	74.00	46.00	Horizontal	PK
3491.000	33.21	0.94	34.15	74.00	39.85	Horizontal	PK
4676.281	30.78	6.24	37.02	74.00	36.98	Horizontal	PK
7118.812	29.98	14.54	44.52	74.00	29.48	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1544.906	33.49	-5.92	27.57	74.00	46.43	Vertical	PK
4038.843	31.77	3.11	34.88	74.00	39.12	Vertical	PK
7281.843	30.14	15.04	45.18	74.00	28.82	Vertical	PK
8013.281	30.67	16.21	46.88	74.00	27.12	Vertical	PK
802.11b				CH06			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1522.875	33.71	-5.78	27.93	74.00	46.07	Horizontal	PK
4450.093	30.72	5.14	35.86	74.00	38.14	Horizontal	PK
4874.562	34.97	7.15	42.12	74.00	31.88	Horizontal	PK
6902.906	29.55	14.10	43.65	74.00	30.35	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1759.343	33.23	-5.92	27.31	74.00	46.69	Vertical	PK
3689.281	32.59	1.57	34.16	74.00	39.84	Vertical	PK
4873.093	32.69	7.15	39.84	74.00	34.16	Vertical	PK
6722.250	30.20	13.41	43.61	74.00	30.39	Vertical	PK
802.11b				CH11			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1635.968	33.23	-6.22	27.01	74.00	46.99	Horizontal	PK
4175.437	30.97	3.68	34.65	74.00	39.35	Horizontal	PK
5727.906	30.03	9.02	39.05	74.00	34.95	Horizontal	PK
7928.093	30.30	16.28	46.58	74.00	27.42	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1650.656	33.59	-6.19	27.40	74.00	46.60	Vertical	PK
3869.937	32.27	2.47	34.74	74.00	39.26	Vertical	PK
5077.250	31.23	8.58	39.81	74.00	34.19	Vertical	PK
7961.875	30.27	16.24	46.51	74.00	27.49	Vertical	PK

802.11g				CH01			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1735.843	34.80	-5.99	28.81	74.00	45.19	Horizontal	PK
4636.625	30.81	5.99	36.80	74.00	37.20	Horizontal	PK
7531.531	29.96	15.56	45.52	74.00	28.48	Horizontal	PK
9932.937	30.79	17.29	48.08	74.00	25.92	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1685.906	34.34	-6.13	28.21	74.00	45.79	Vertical	PK
4201.875	31.64	3.82	35.46	74.00	38.54	Vertical	PK
7040.968	29.94	14.28	44.22	74.00	29.78	Vertical	PK
7459.562	30.26	15.39	45.65	74.00	28.35	Vertical	PK
802.11g				CH06			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1292.281	34.29	-5.59	28.70	74.00	45.30	Horizontal	PK
3508.625	32.57	1.08	33.65	74.00	40.35	Horizontal	PK
5149.218	30.95	8.89	39.84	74.00	34.16	Horizontal	PK
7085.031	30.22	14.39	44.61	74.00	29.39	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1384.812	32.83	-5.58	27.25	74.00	46.75	Vertical	PK
3162.000	33.34	0.64	33.98	74.00	40.02	Vertical	PK
5722.031	30.97	8.98	39.95	74.00	34.05	Vertical	PK
7544.750	30.53	15.62	46.15	74.00	27.85	Vertical	PK
802.11g				CH11			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1765.218	33.48	-5.90	27.58	74.00	46.42	Horizontal	PK
3668.718	33.53	1.55	35.08	74.00	38.92	Horizontal	PK
4770.281	30.24	6.85	37.09	74.00	36.91	Horizontal	PK
7330.312	30.91	15.15	46.06	74.00	27.94	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1259.968	33.94	-5.67	28.27	74.00	45.73	Vertical	PK
4312.031	31.10	3.91	35.01	74.00	38.99	Vertical	PK
5805.750	29.49	9.57	39.06	74.00	34.94	Vertical	PK
8665.406	30.77	16.06	46.83	74.00	27.17	Vertical	PK

802.11n(HT20)				CH01			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1541.968	33.20	-5.90	27.30	74.00	46.70	Horizontal	PK
4397.218	31.66	4.89	36.55	74.00	37.45	Horizontal	PK
7437.531	30.30	15.39	45.69	74.00	28.31	Horizontal	PK
8011.812	31.78	16.21	47.99	74.00	26.01	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1637.437	33.61	-6.21	27.40	74.00	46.60	Vertical	PK
3551.218	32.74	1.25	33.99	74.00	40.01	Vertical	PK
6114.187	30.31	10.74	41.05	74.00	32.95	Vertical	PK
7906.062	30.40	16.30	46.70	74.00	27.30	Vertical	PK
802.11n(HT20)				CH06			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1282.000	34.85	-5.62	29.23	74.00	44.77	Horizontal	PK
3038.625	33.86	0.05	33.91	74.00	40.09	Horizontal	PK
4492.687	31.68	5.32	37.00	74.00	37.00	Horizontal	PK
9844.812	31.83	17.25	49.08	74.00	24.92	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1470.000	32.88	-5.62	27.26	74.00	46.74	Vertical	PK
3580.593	32.14	1.37	33.51	74.00	40.49	Vertical	PK
4576.406	31.43	5.67	37.10	74.00	36.90	Vertical	PK
6170.000	30.42	10.83	41.25	74.00	32.75	Vertical	PK
802.11n(HT20)				CH11			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1740.250	33.66	-5.98	27.68	74.00	46.32	Horizontal	PK
4008.000	32.39	3.04	35.43	74.00	38.57	Horizontal	PK
7505.093	29.75	15.43	45.18	74.00	28.82	Horizontal	PK
8073.500	32.02	16.30	48.32	74.00	25.68	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1499.375	32.70	-5.63	27.07	74.00	46.93	Vertical	PK
3163.468	33.27	0.65	33.92	74.00	40.08	Vertical	PK
5086.062	30.04	8.67	38.71	74.00	35.29	Vertical	PK
7070.343	30.66	14.35	45.01	74.00	28.99	Vertical	PK

802.11n(HT40)				CH03			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1634.500	33.58	-6.22	27.36	74.00	46.64	Horizontal	PK
3833.218	32.59	2.22	34.81	74.00	39.19	Horizontal	PK
6272.812	30.93	10.97	41.90	74.00	32.10	Horizontal	PK
8042.656	30.34	16.25	46.59	74.00	27.41	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1672.687	33.72	-6.15	27.57	74.00	46.43	Vertical	PK
3640.812	32.17	1.51	33.68	74.00	40.32	Vertical	PK
6322.750	30.83	11.06	41.89	74.00	32.11	Vertical	PK
7997.125	30.94	16.19	47.13	74.00	26.87	Vertical	PK
802.11n(HT40)				CH06			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
2010.500	33.75	-4.63	29.12	74.00	44.88	Horizontal	PK
3680.468	33.00	1.56	34.56	74.00	39.44	Horizontal	PK
6460.812	29.13	12.03	41.16	74.00	32.84	Horizontal	PK
7969.218	30.19	16.23	46.42	74.00	27.58	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1643.312	33.47	-6.20	27.27	74.00	46.73	Vertical	PK
3654.031	33.23	1.53	34.76	74.00	39.24	Vertical	PK
6387.375	29.98	11.24	41.22	74.00	32.78	Vertical	PK
7490.406	30.49	15.41	45.90	74.00	28.10	Vertical	PK
802.11n(HT40)				CH09			
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1685.906	34.29	-6.13	28.16	74.00	45.84	Horizontal	PK
3875.812	33.48	2.51	35.99	74.00	38.01	Horizontal	PK
6215.531	30.62	10.90	41.52	74.00	32.48	Horizontal	PK
8732.968	30.95	16.09	47.04	74.00	26.96	Horizontal	PK
Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1142.468	34.97	-6.44	28.53	74.00	45.47	Vertical	PK
3629.062	33.11	1.49	34.60	74.00	39.40	Vertical	PK
5838.062	29.79	9.71	39.50	74.00	34.50	Vertical	PK
7920.750	30.85	16.29	47.14	74.00	26.86	Vertical	PK

Remark:

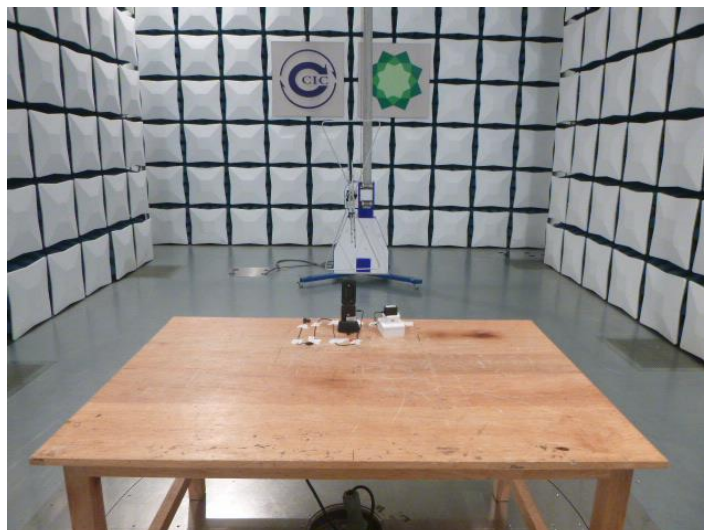
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies(test frequency band is 1GHz to 25GHz) are very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

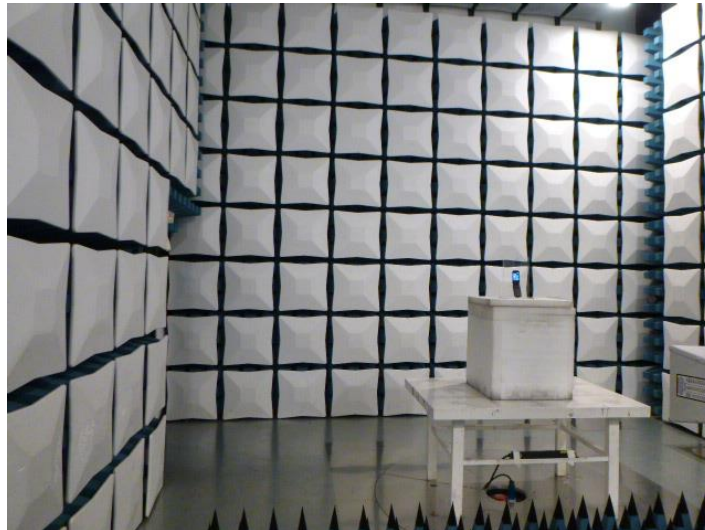
6. TEST SETUP PHOTOS

Conducted Emissions



Radiated Emissions





7. EXTERANAL AND INTERNAL PHOTOS

Reference to the test report No. CHTEW19110021

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