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TEST REPORT

Report Reference No. ..... :	**TRE1704011601**	R/C…….: 59884
FCC ID ..... :	**2AHY3-PICASSO**	
Applicant's name..... :	**Simbans Limited**	
Address.....:	806, 8th Floor, Tai Tak Industrial Building 2-12 Kwai Fat Road, Kwai Chung,Hong Kong	
Manufacturer.....:	Simbans Limited	
Address.....:	806, 8th Floor, Tai Tak Industrial Building 2-12 Kwai Fat Road, Kwai Chung,Hong Kong	
Test item description..... :	**Simbans Picasso 10 Inch Tablet**	
Trade Mark.....:	Simbans	
Model/Type reference.....:	Picasso	
Listed Model(s).....:	-	
Standard ..... :	**FCC CFR Title 47 Part 15 Subpart C Section 15.247**	
Date of receipt of test sample…….:	Apr. 14, 2017	
Date of testing……...:	Apr. 17, 2017 – May 07, 2017	
Date of issue……..:	May 07, 2017	
Result..... ……...:	**PASS**	

Compiled by (position+printedname+signature)...:	File administrators Shayne Zhu	Shayne Zhu
Supervised by (position+printedname+signature)....:	Project Engineer Jeff Sun	Jeff Sun
Approved by (position+printedname+signature)....:	RF Manager Hans Hu	Hans Hu

Testing Laboratory Name..... :	**Shenzhen Huatongwei International Inspection Co., Ltd.**
Address.....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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The test report merely corresponds to the test sample.
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1. Test standards and Report version

1.1. Applicable 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

KDB558074 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	May 07, 2017	Original

2. Test Description

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
Line Conducted Emissions (AC Main)	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
Power Spectral Density	15.247 (e)	Pass
6dB Bandwidth	15.247 (a)(2)	Pass
Restricted band	15.247(d)/15.205	Pass
Spurious Emissions	15.247(d)/15.209	Pass

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

3. Summary

3.1. Client Information

Applicant:	Simbans Limited
Address:	806, 8th Floor, Tai Tak Industrial Building 2-12 Kwai Fat Road, Kwai Chung, Hong Kong
Manufacturer:	Simbans Limited
Address:	806, 8th Floor, Tai Tak Industrial Building 2-12 Kwai Fat Road, Kwai Chung, Hong Kong

3.2. Product Description

Name of EUT:	Simbans Picasso 10 Inch Tablet			
Trade Mark:	Simbans			
Model No.:	Picasso			
Listed Model(s):	-			
Power supply:	DC 3.7V from internal battery			
Adapter information:	Model: KA23-0502000DEU Input: 100-240Va.c.,50/60Hz, 0.35A Output:5Vd.c., 2000mA			
WIFI				
Supported type:	☒802.11b	☒802.11g	☒802.11n(H20)	☒802.11n(HT40)
Modulation:	DSSS for 802.11b OFDM for 802.11g/802.11n(H20)/802.11n(HT40)			
Operation frequency:	2412MHz~2462MHz for 802.11b/802.11g/802.11n(H20) 2422MHz~2452MHz for 802.11n(HT40)			
Channel number:	11 for 802.11b/802.11g/802.11n(H20) 7 for 802.11n(HT40)			
Channel separation:	5MHz			
Antenna type:	Integral antenna			
Antenna gain:	1.5dBi			

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
Phone: 86-755-26748019 Fax: 86-755-26748089

4.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

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.: 317478

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. Registration 317478.

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. Equipments Used during the Test

Line Conducted Emission (AC Main)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	R&S	ESCI	101247	2016/11/13
2	Artificial Mains	Shwarzbeck	NNLK 8121	573	2016/11/13
3	Pulse Limiter	R&S	ESH3-Z2	101488	2016/11/13
4	Test Software	R&S	ES-K1	N/A	N/A
5	Test cable	ENVIROFLEX	3651	1101902	2016/11/13

Maximum Peak Output Power / Power Spectral Density / 6dB Bandwidth / Band Edge Compliance of RF Emission / Spurious RF Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal
1	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	2016/11/13
2	Power Meter	Anritsu	ML2480B	100798	2016/11/13
3	Power Sensor	Anritsu	MA2411B	100258	2016/11/13
4	Test cable	FARPU	MCX-J	N/A	2016/11/13
5	Temporary antenna connector	D-LENP	NJ-SMAK	N/A	2016/11/13

NOTE: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	Rohde&Schwarz	ESI 26	100009	2016/11/13
2	RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	N/A
3	EMI Test Software	Rohde&Schwarz	ESK1	N/A	N/A
4	Loop Antenna	Rohde&Schwarz	HZ-9	838622\013	2016/11/13
5	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2016/11/13
6	Horn Antenna	ShwarzBeck	9120D	1011	2016/11/13
7	Broadband Horn Antenna	Shwarzbeck	BBHA9170	BBHA917047 2	2016/11/13
8	Preamplifier	Shwarzbeck	BBV9742	9742-196	2016/11/13
9	Broadband Preamplifer	Shwarzbeck	BBV 9721	9721-102	2016/11/13
10	Broadband Preamplifer	Shwarzbeck	BBV 9718	9718-247	2016/11/13
11	Turn Table	MATURO	TT2.0	/	N/A
12	Antenna Mast	MATURO	TAM-4.0-P	/	N/A
13	EMI Test Software	Audix	E3	N/A	N/A
14	Test Software	R&S	ES-K1	N/A	N/A
15	Test cable	Siva Cables Italy	RG 58A/U	W14.02	2016/11/13

The Cal. Interval was one year.

4.4. Environmental conditions

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

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

4.5. 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 measurementof mobile radio equipment characteristics;Part 2” and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system according to ISO/IEC 17025. Further more, 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 is reported:

Test Items	MeasurementUncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emissions 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emissions 9KHz-40 GHz	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)
Occupied Bandwidth	---------	(1)

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

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 anantenna 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.

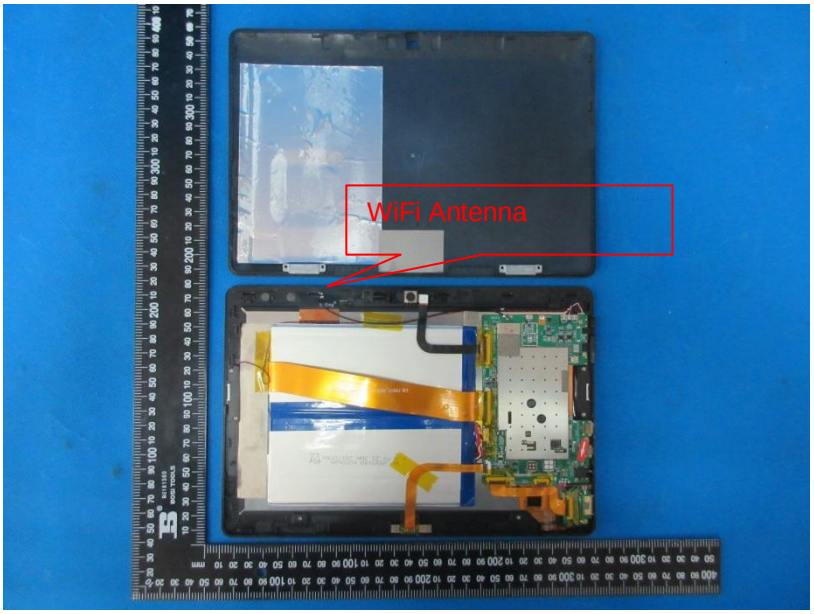
FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(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 6dBi 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 6dBi.

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)

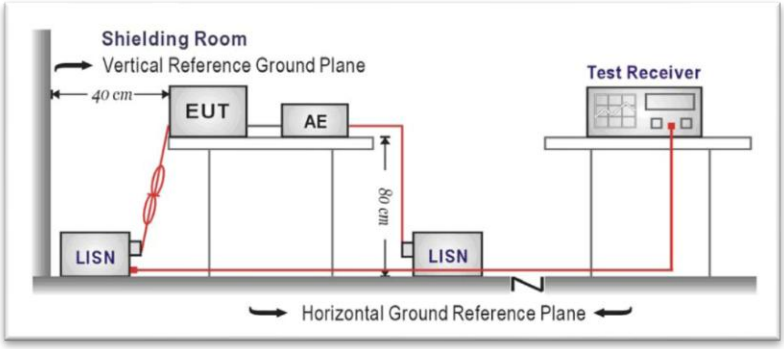
LIMIT

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 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT was placed on a plat form of nominal size, 1 m by 1.5 m, raised 10 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 10 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50ohm / 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.

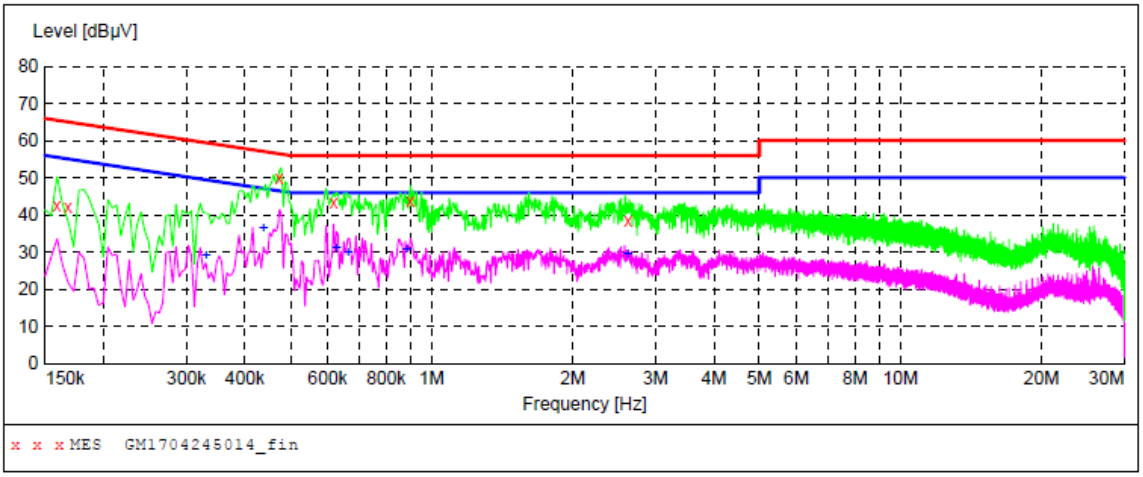
TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

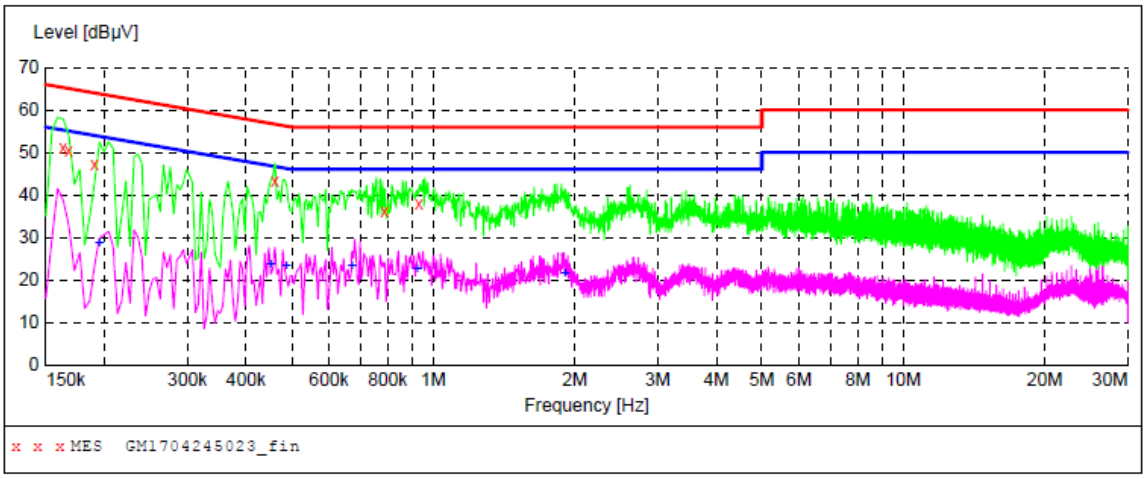
Test Line:	L



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	42.70	10.4	66	22.8	QP	L1	GND
0.168000	42.00	10.4	65	23.1	QP	L1	GND
0.474000	50.10	10.2	56	6.3	QP	L1	GND
0.618000	43.50	10.2	56	12.5	QP	L1	GND
0.901500	43.90	10.1	56	12.1	QP	L1	GND
2.625000	38.60	10.2	56	17.4	QP	L1	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.330000	28.90	10.2	50	20.6	AV	L1	GND
0.438000	36.40	10.2	47	10.7	AV	L1	GND
0.627000	31.30	10.2	46	14.7	AV	L1	GND
0.663000	29.70	10.2	46	16.3	AV	L1	GND
0.883500	30.80	10.1	46	15.2	AV	L1	GND
2.611500	29.30	10.2	46	16.7	AV	L1	GND

Test Line:	N



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.163500	51.30	10.4	65	14.0	QP	N	GND
0.168000	50.50	10.4	65	14.6	QP	N	GND
0.190500	47.40	10.3	64	16.6	QP	N	GND
0.460500	43.20	10.2	57	13.5	QP	N	GND
0.789000	36.00	10.2	56	20.0	QP	N	GND
0.933000	37.90	10.2	56	18.1	QP	N	GND

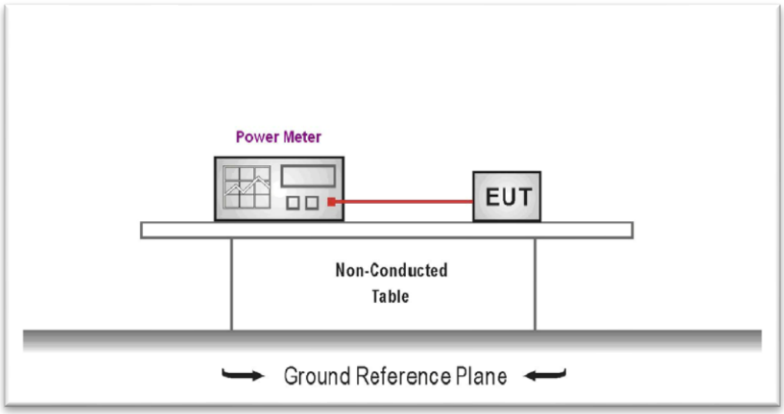
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	28.70	10.3	54	25.1	AV	N	GND
0.451500	23.50	10.2	47	23.3	AV	N	GND
0.487500	23.40	10.2	46	22.8	AV	N	GND
0.672000	23.20	10.2	46	22.8	AV	N	GND
0.924000	22.40	10.2	46	23.6	AV	N	GND
1.905000	21.60	10.2	46	24.4	AV	N	GND

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: 2013and KDB 558074 D01 for compliance to FCC 47CFR 15.247requirements.
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**

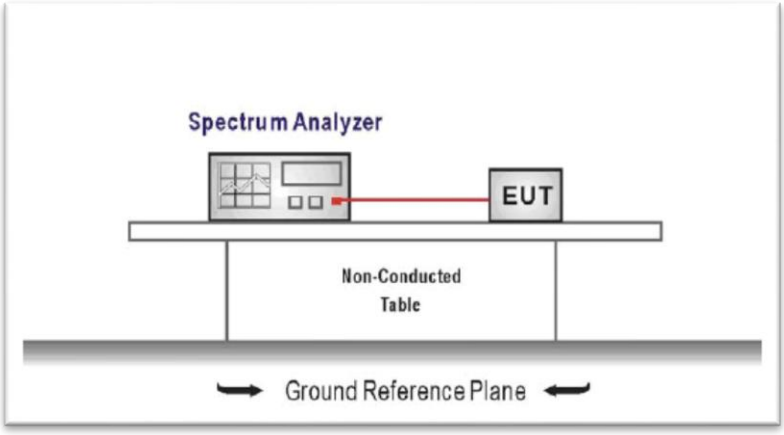
Type	Channel	Output power (dBm)	Limit (dBm)	Result
802.11b	01	7.86	30.00	Pass
	06	7.91		
	11	7.62		
802.11g	01	8.55	30.00	Pass
	06	8.43		
	11	8.53		
802.11n(HT20)	01	8.70	30.00	Pass
	06	8.53		
	11	8.54		
802.11n(HT40)	03	8.35	30.00	Pass
	06	8.60		
	09	8.23		

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. Configurethe spectrum analyzer as shown below:
   Center frequency=DTS channel center frequency
   Span =1.5 times the DTS bandwidth
   RBW = 3 kHz ≤ RBW ≤ 100 kHz, VBW ≥ 3 × 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 waveform 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:

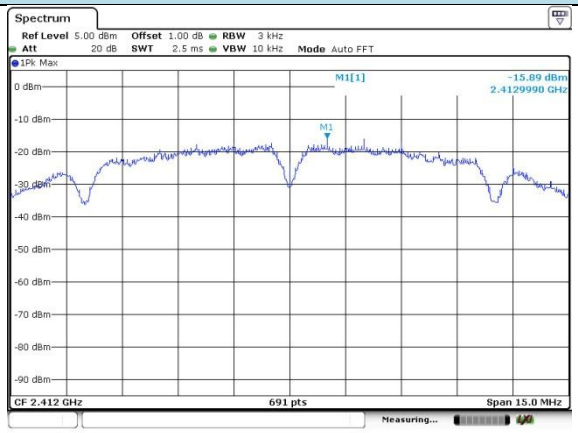
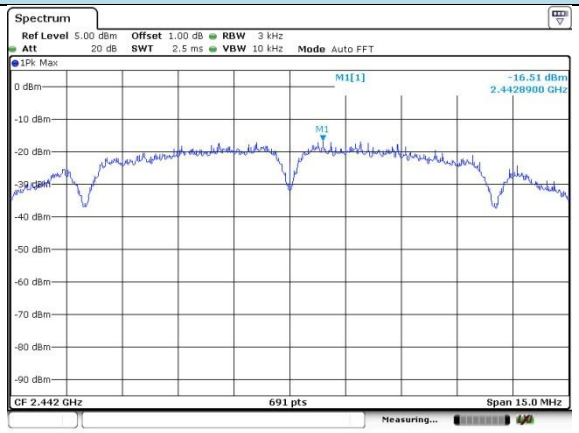
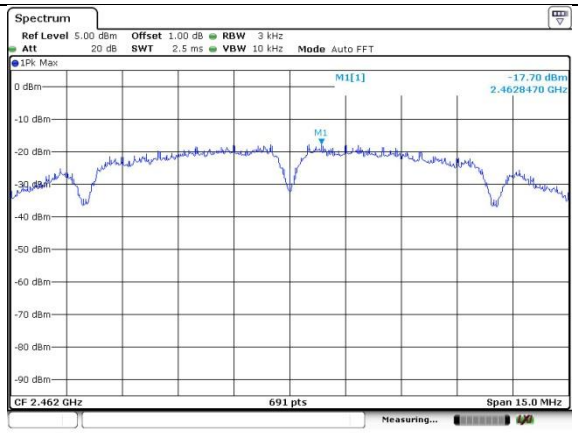
Please refer to the clause 3.3

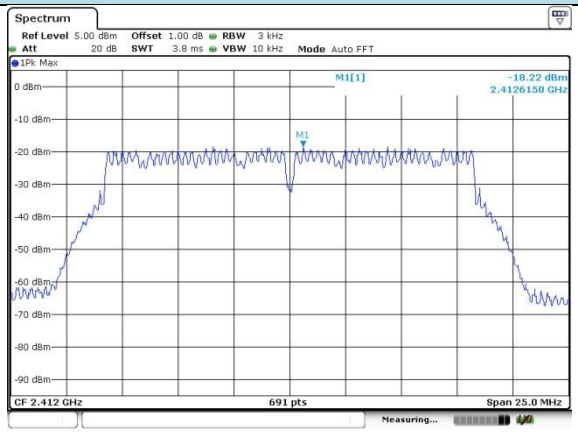
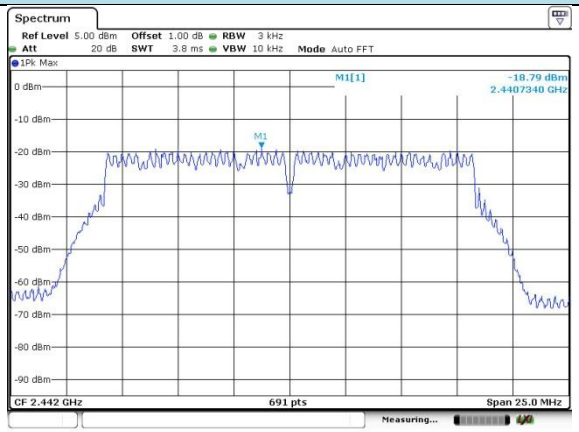
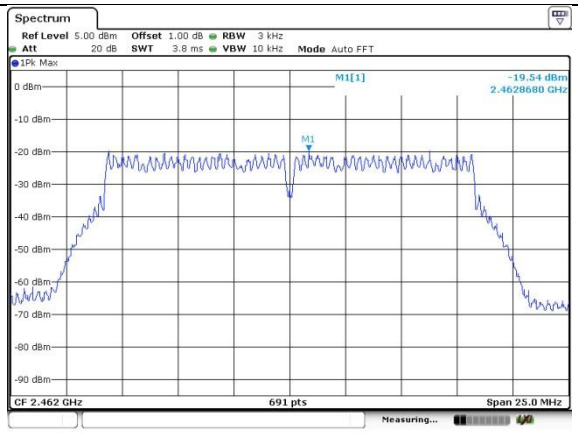
TEST RESULTS

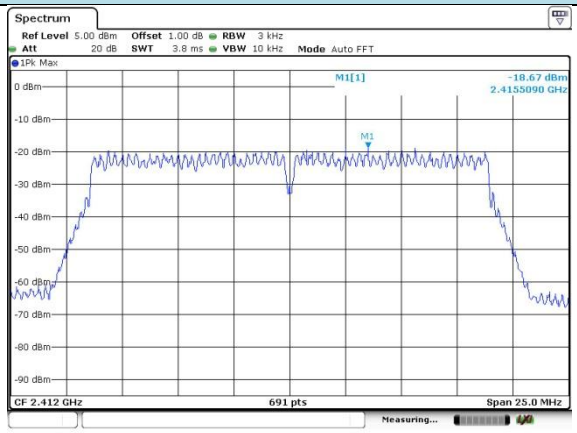
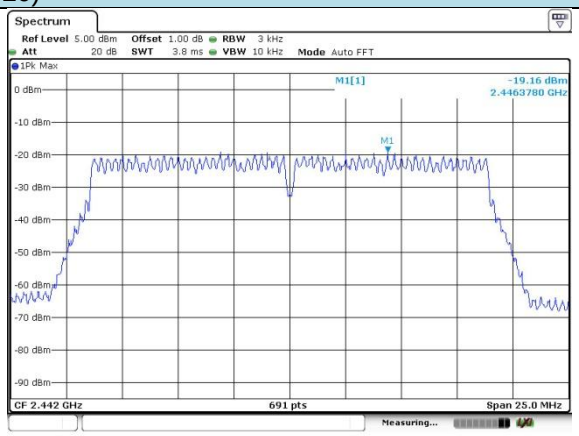
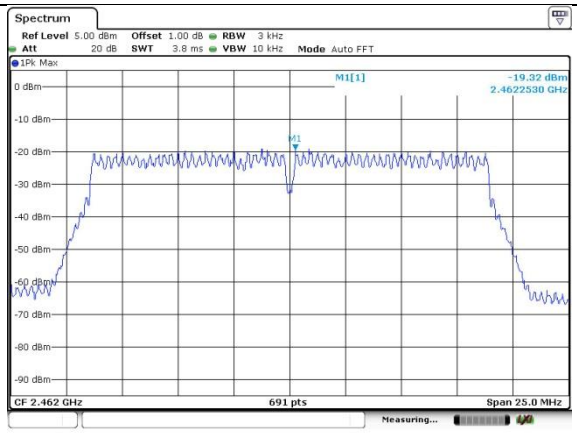
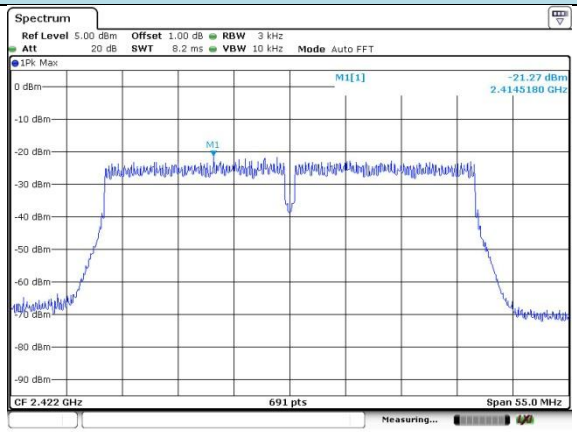
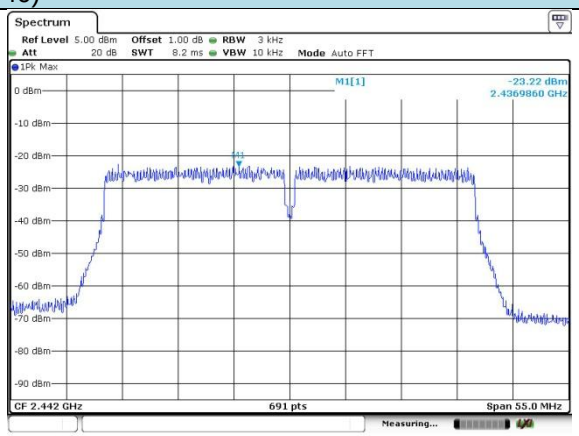
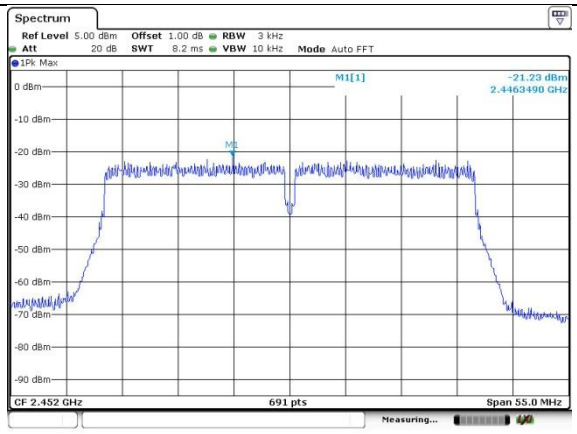
☒ **Passed** ☐ **Not Applicable**

Type	Channel	Power SpectralDensity(dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-15.89	8.00	Pass
	07	-16.51		
	11	-17.70		
802.11g	01	-18.22	8.00	Pass
	07	-18.79		
	11	-19.54		
802.11n(HT20)	01	-18.67	8.00	Pass
	07	-19.16		
	11	-19.32		
802.11n(HT40)	03	-21.27	8.00	Pass
	07	-23.22		
	09	-21.23		

Test plot as follows:

802.11b	
	
CH01	CH06
	No Plot
CH11	-

802.11g	
	
CH01	CH06
	No Plot
CH11	-

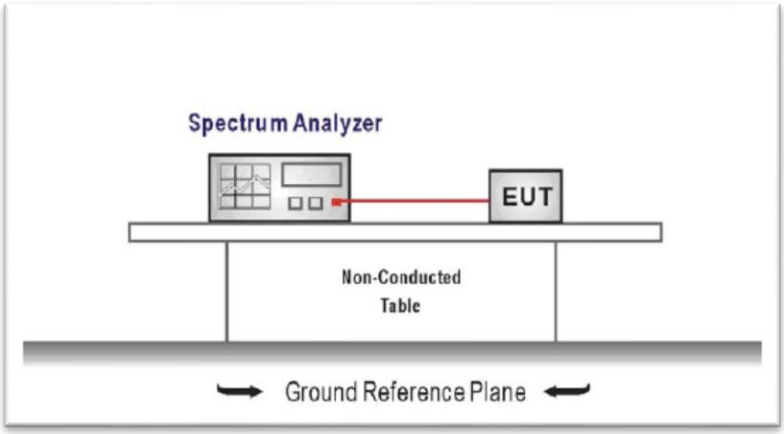
802.11n(HT20)	
	
CH01	CH06
	No Plot
CH11	-
802.11n(HT40)	
	
CH03	CH06
	No Plot
CH09	-

5.5. 6dB bandwidthand

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 andthe spectrum analyzer).
   Center Frequency =DTS channel center frequency
   Span=2 x DTS bandwidth
   RBW = 100 kHz, VBW ≥ 3 × 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 waveform 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, andrecord the pertinent measurements.

TEST MODE:

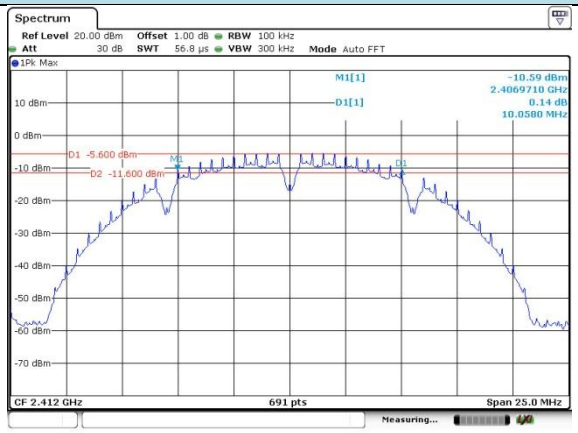
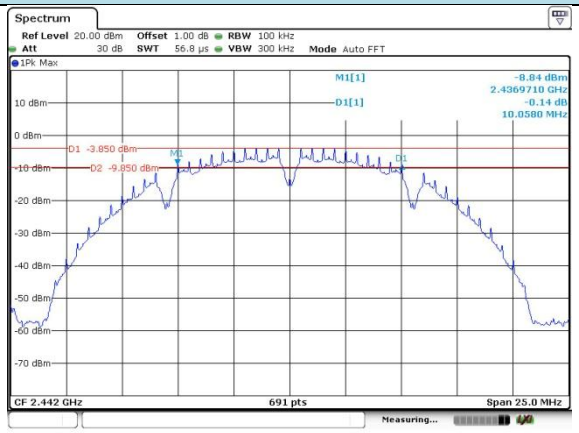
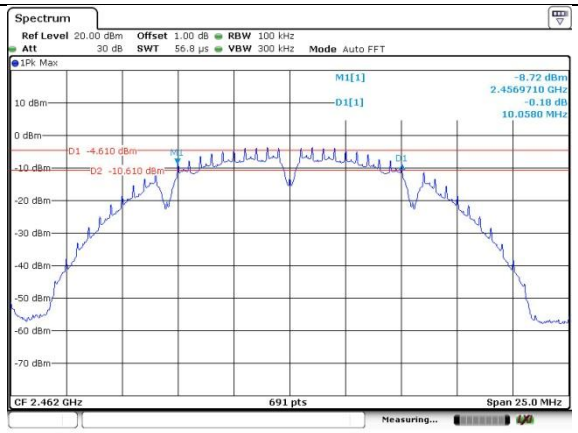
Please refer to the clause 3.3

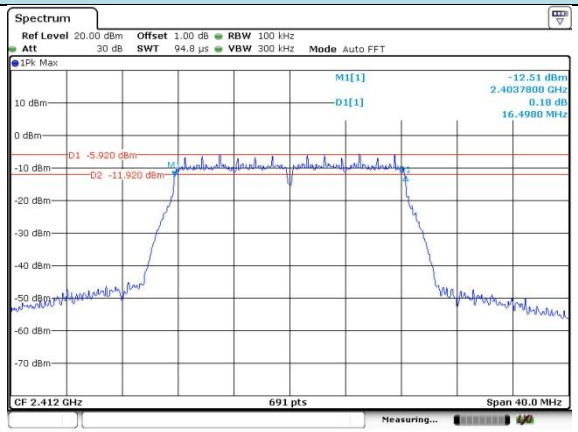
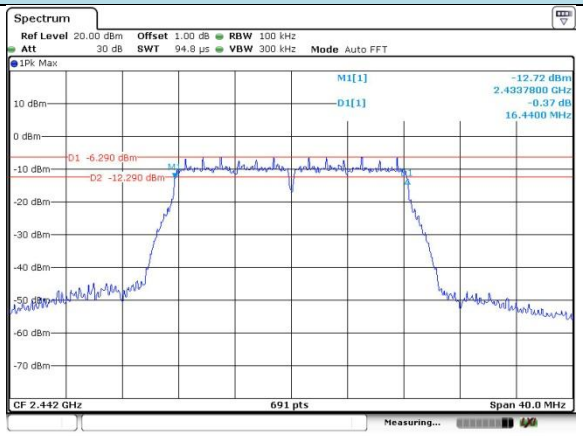
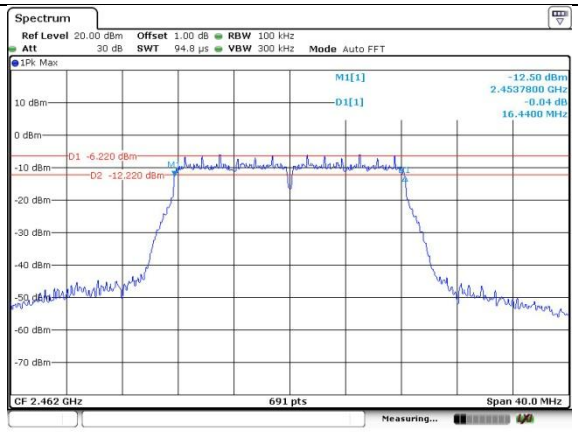
TEST RESULTS

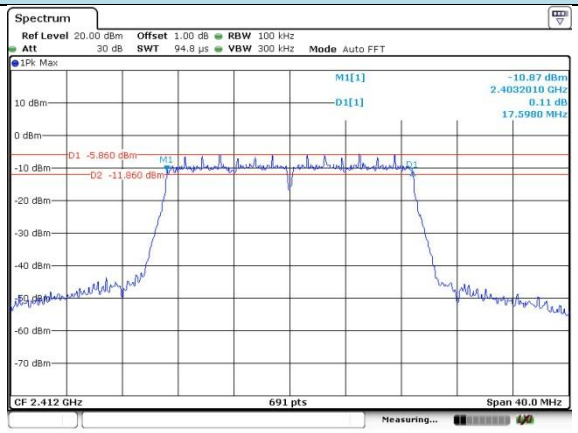
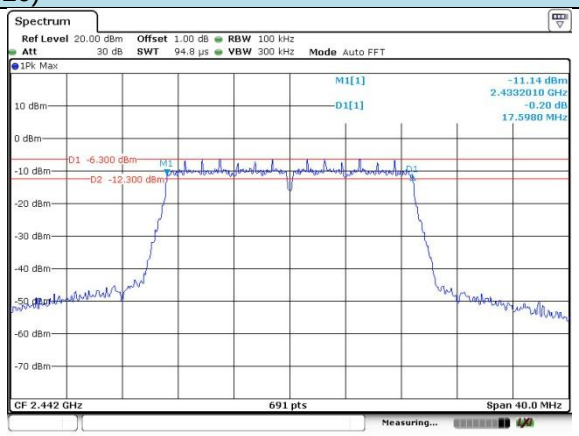
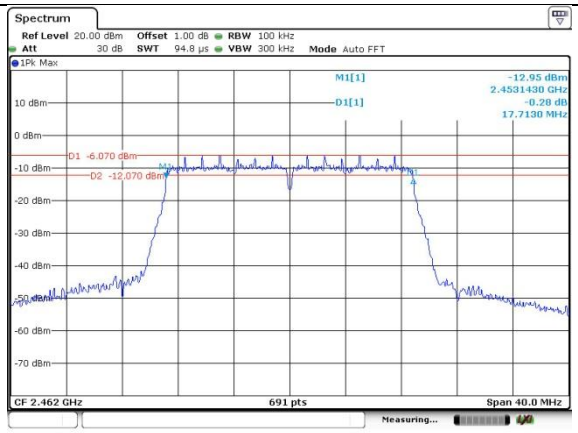
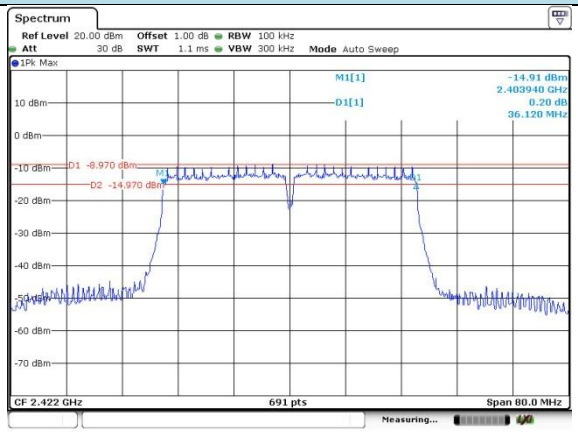
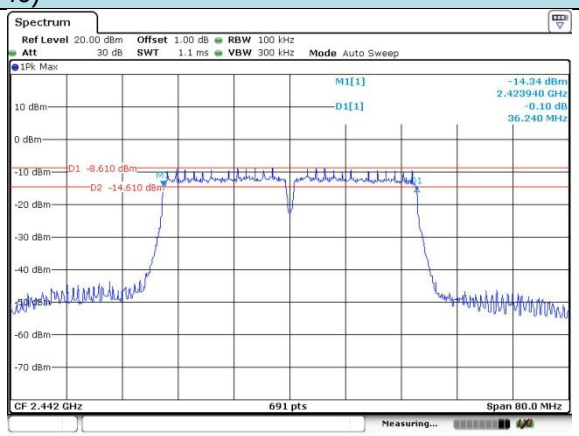
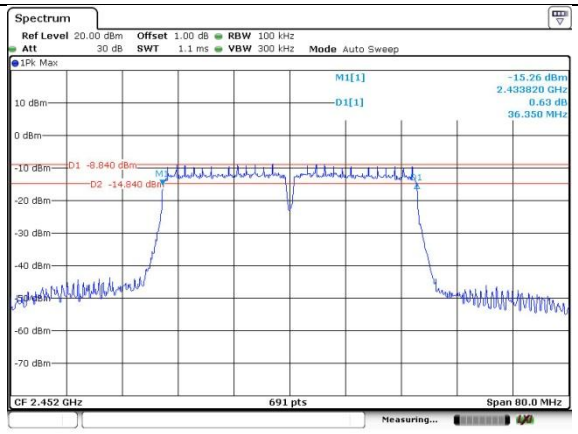
☒ **Passed** ☐ **Not Applicable**

Type	Channel	6dB Bandwidth (MHz)	Limit (kHz)	Result
802.11b	01	10.06	≥500	Pass
	07	10.06		
	11	10.06		
802.11g	01	16.50	≥500	Pass
	07	16.44		
	11	16.44		
802.11n(HT20)	01	17.60	≥500	Pass
	07	17.60		
	11	17.71		
802.11n(HT40)	03	36.12	≥500	Pass
	07	36.24		
	09	36.35		

Test plot as follows:

802.11b	
	
CH01	CH06
	No Plot
CH11	-

802.11g	
	
CH01	CH06
	No Plot
CH11	-

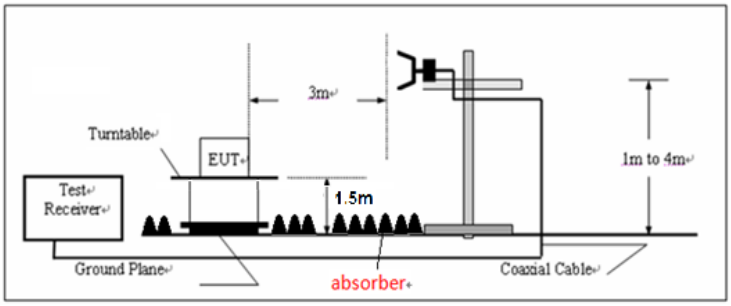
802.11n(HT20)	
	
CH01	CH06
	No Plot
CH11	-
802.11n(HT40)	
	
CH03	CH06
	No Plot
CH09	-

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 emission 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 rotated360 degrees to determine the position of the maximum emission level.
3) The EUT waspositioned 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. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find themaximum 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)	Margin Limit (dB)	Polarization	Test value
2388.65	54.47	27.53	6.81	37.45	51.36	74.00	-22.64	Vertical	Peak
2388.47	53.73	27.53	6.81	37.45	50.62	74.00	-23.38	Horizontal	
2389.46	45.46	27.53	6.81	37.45	42.35	54.00	-11.65	Vertical	Average
2389.52	44.69	27.53	6.81	37.45	41.58	54.00	-12.42	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
2484.38	57.14	27.85	6.96	37.57	54.38	74.00	-19.62	Vertical	Peak
2484.57	56.41	27.85	6.96	37.57	53.65	74.00	-20.35	Horizontal	
2484.63	46.28	27.85	6.96	37.57	43.52	54.00	-10.48	Vertical	Average
2484.75	45.12	27.85	6.96	37.57	42.36	54.00	-11.64	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
2386.75	52.33	27.53	6.81	37.92	48.75	74.00	-25.25	Vertical	Peak
2386.74	53.10	27.53	6.81	37.92	49.52	74.00	-24.48	Horizontal	
2386.40	44.10	27.53	6.81	37.92	40.52	54.00	-13.48	Vertical	Average
2386.25	43.50	27.53	6.81	37.99	39.85	54.00	-14.15	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
2484.66	54.24	27.85	6.96	37.60	51.45	74.00	-22.55	Vertical	Peak
2484.47	53.43	27.85	6.96	37.60	50.64	74.00	-23.36	Horizontal	
2484.85	44.11	27.85	6.96	37.60	41.32	54.00	-12.68	Vertical	Average
2484.36	43.65	27.85	6.96	37.60	40.86	54.00	-13.14	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
2389.25	51.69	27.53	6.81	37.58	48.45	74.00	-25.55	Vertical	Peak
2389.35	50.76	27.53	6.81	37.58	47.52	74.00	-26.48	Horizontal	
2389.26	42.60	27.53	6.81	37.58	39.36	54.00	-14.64	Vertical	Average
2389.47	42.69	27.53	6.81	37.58	39.45	54.00	-14.55	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
2484.64	53.11	27.85	6.96	37.67	50.25	74.00	-23.75	Vertical	Peak
2484.62	52.24	27.85	6.96	37.67	49.38	74.00	-24.62	Horizontal	
2484.58	44.11	27.85	6.96	37.67	41.25	54.00	-12.75	Vertical	Average
2484.66	43.53	27.85	6.96	37.67	40.67	54.00	-13.33	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
2389.24	51.69	27.53	6.81	37.58	48.45	74.00	-25.55	Vertical	Peak
2389.35	50.76	27.53	6.81	37.58	47.52	74.00	-26.48	Horizontal	
2389.26	43.60	27.53	6.81	37.58	40.36	54.00	-13.64	Vertical	Average
2389.46	43.69	27.53	6.81	37.58	40.45	54.00	-13.55	Horizontal	

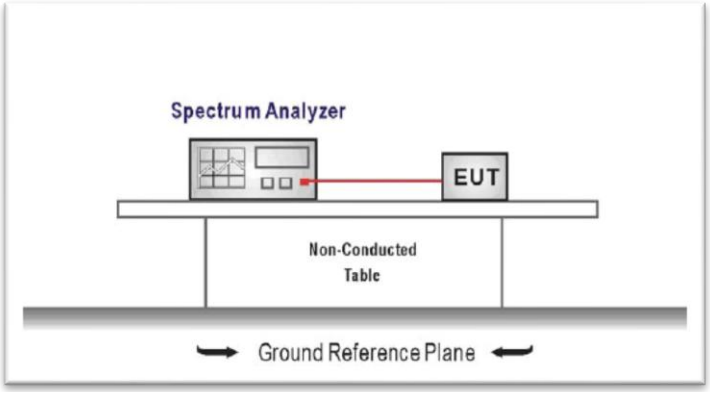
802.11n(HT40)					CH09				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2484.63	52.01	27.85	6.96	37.67	49.15	74.00	-24.85	Vertical	Peak
2484.62	52.24	27.85	6.96	37.67	49.38	74.00	-24.62	Horizontal	
2484.58	44.01	27.85	6.96	37.67	41.15	54.00	-12.85	Vertical	Average
2484.66	43.03	27.85	6.96	37.67	40.17	54.00	-13.83	Horizontal	

5.7. Band edge and Spurious Emission (conducted)

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section15.247 (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 ≥ 3 x RBW
   Detector = peak, Sweep time = auto couple, Trace mode = max hold
   Allow trace to fully stabilize
   Use the peak marker function to determine the maximum PSD level

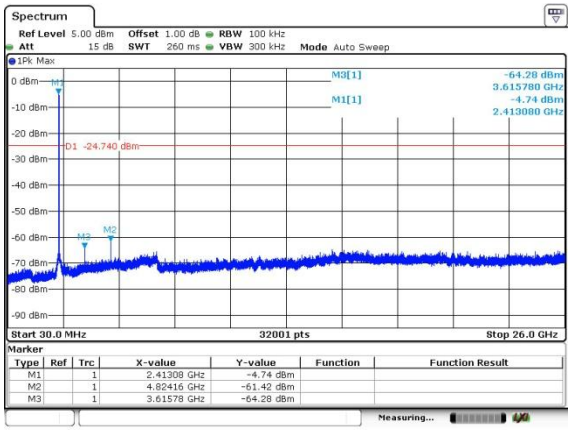
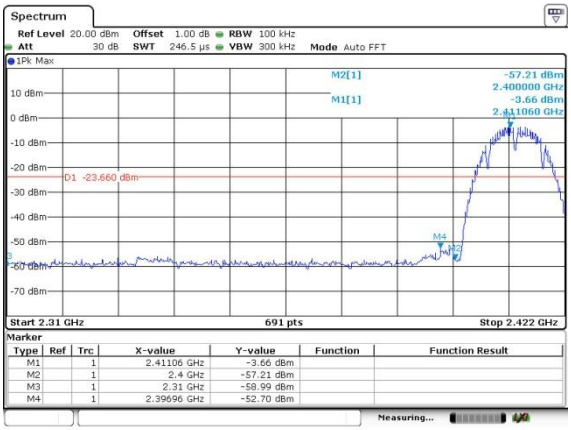
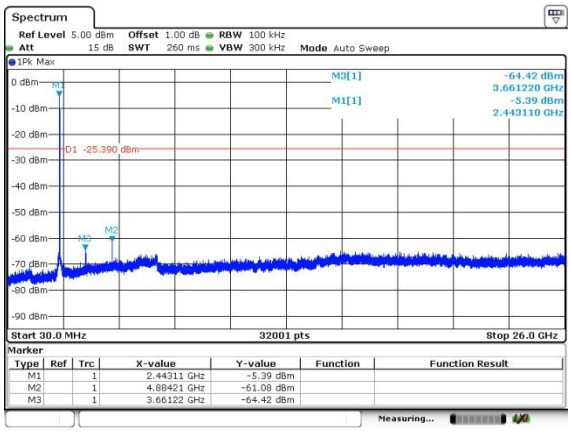
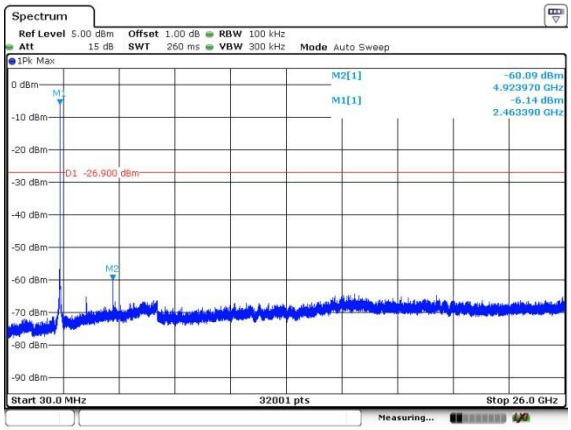
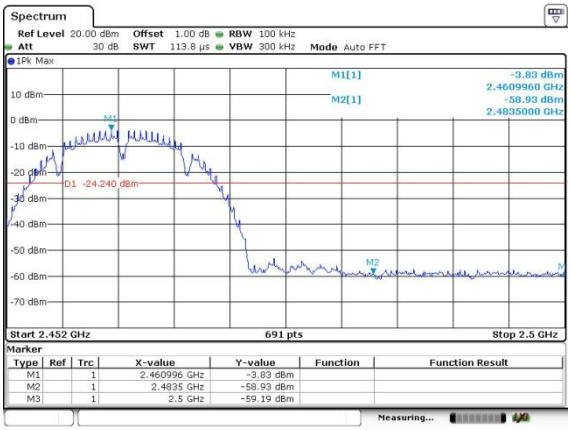
   Note: the channel found to contain the maximum PSD level can be used to establish the reference level.
3. Emission level measurement
   Set the center frequency and span to encompass frequency range to be measured
   RBW = 100 kHz, VBW ≥ 3 x RBW
   Detector = peak, Sweep time = auto couple, Trace mode = max hold
   Allow trace to fully stabilize
   Use the peak marker function to determine the maximum amplitude level.
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
5. Ensure that the amplitude of all unwanted emissions 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 emissions relative to the limit.

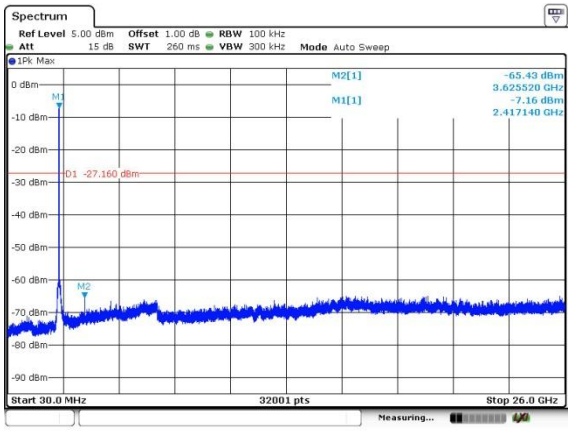
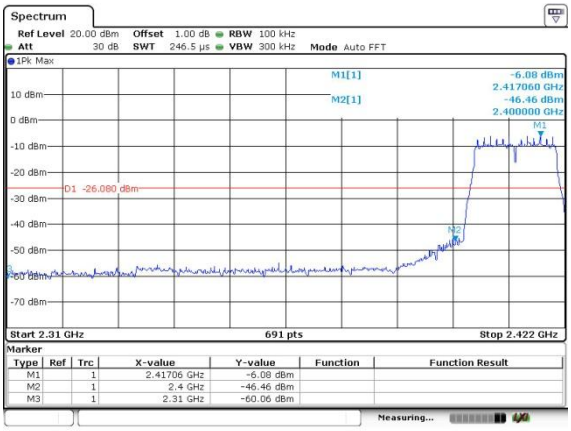
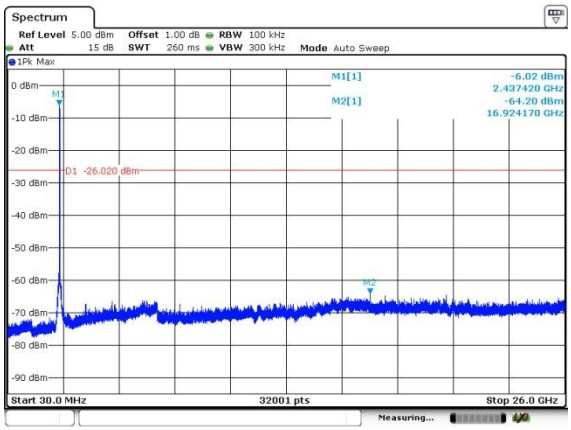
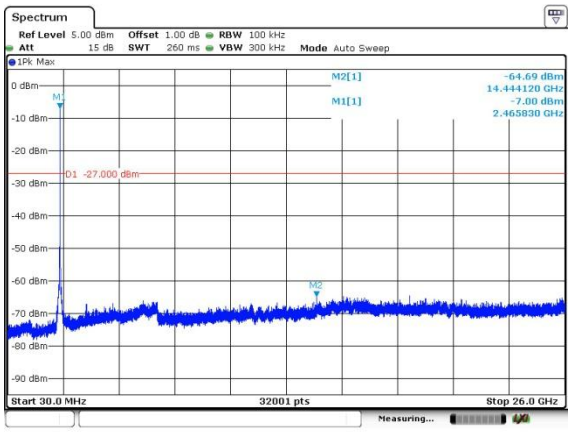
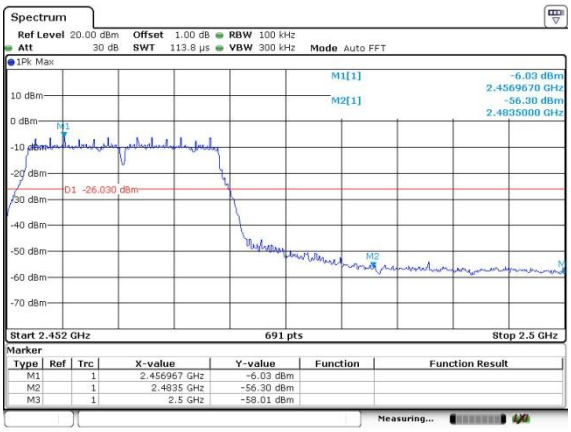
TEST MODE:

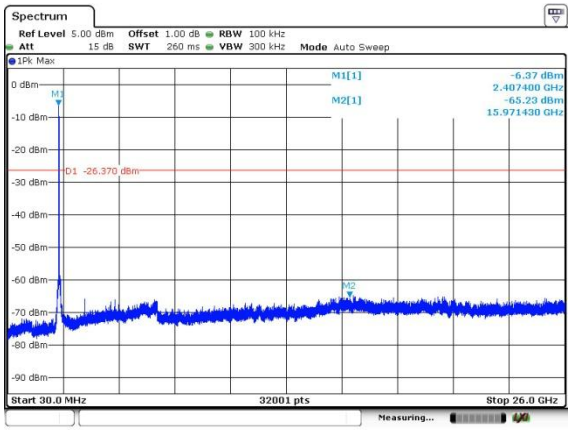
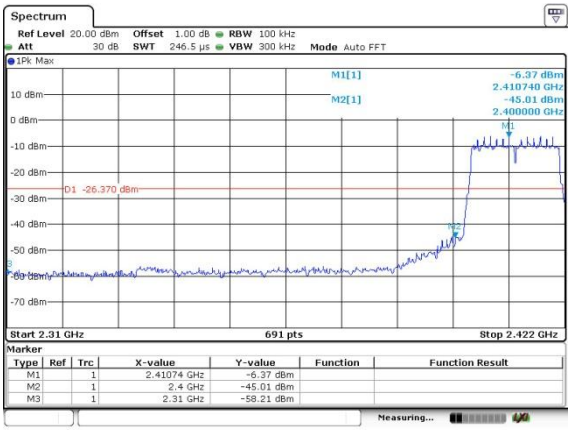
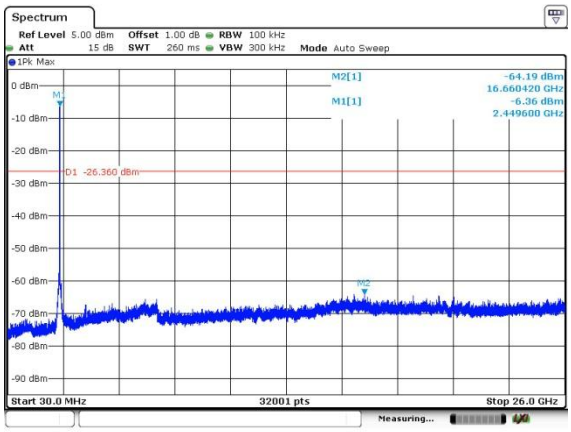
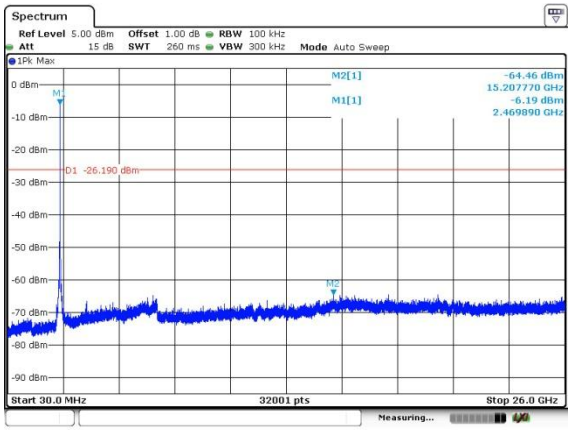
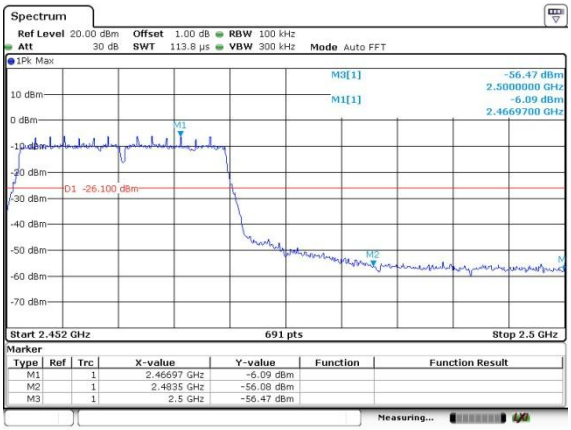
Please refer to the clause 3.3

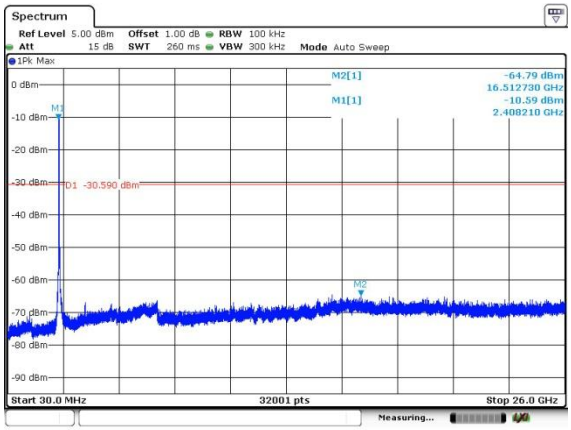
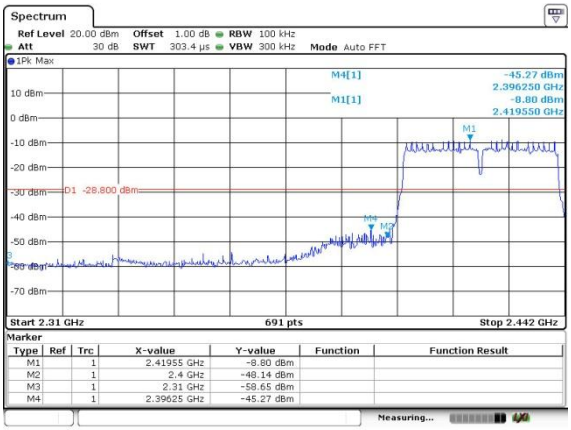
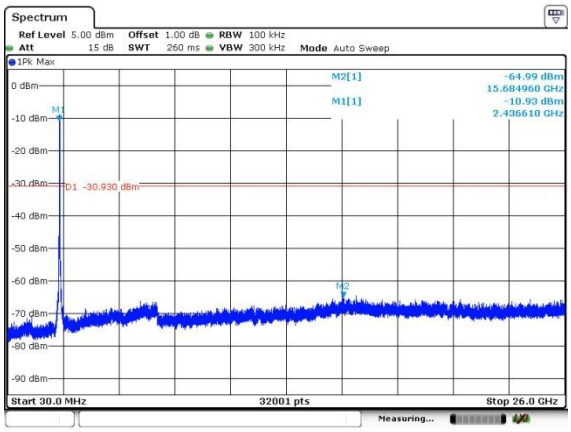
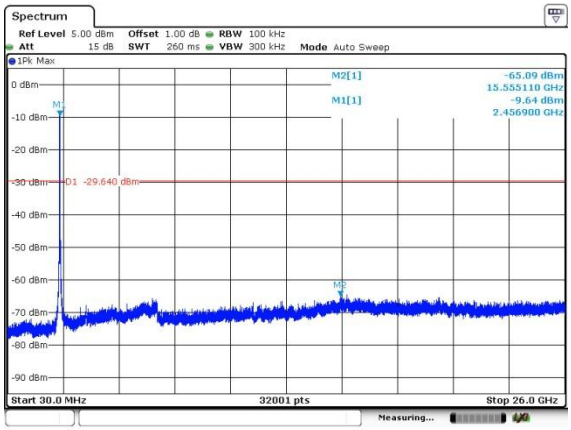
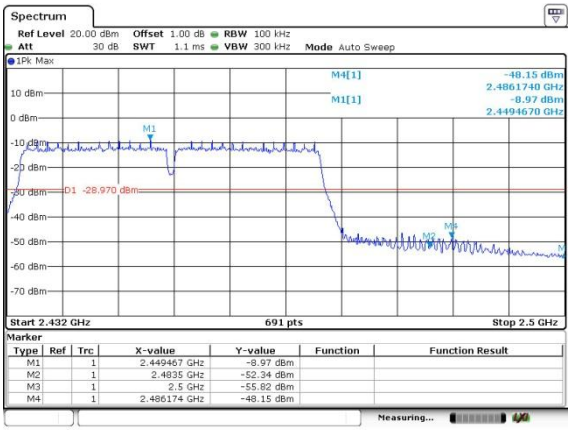
TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

802.11b	
	
CH01-SE	CH01-Bandedge
	No Plot
CH06-SE	-
	
CH11-SE	CH11-Bandedge

802.11g	
	
CH01-SE	CH01-Bandedge
	No Plot
CH06-SE	-
	
CH11-SE	CH11-Bandedge

802.11n (HT20)	
	
CH01-SE	CH01-Bandedge
	No Plot
CH06-SE	-
	
CH11-SE	CH11-Bandedge

802.11n (HT40)	
	
CH03-SE	CH03-Bandedge
	No Plot
CH06	-
	
CH09-SE	CH09-Bandedge

5.8. Spurious Emissions (radiated)

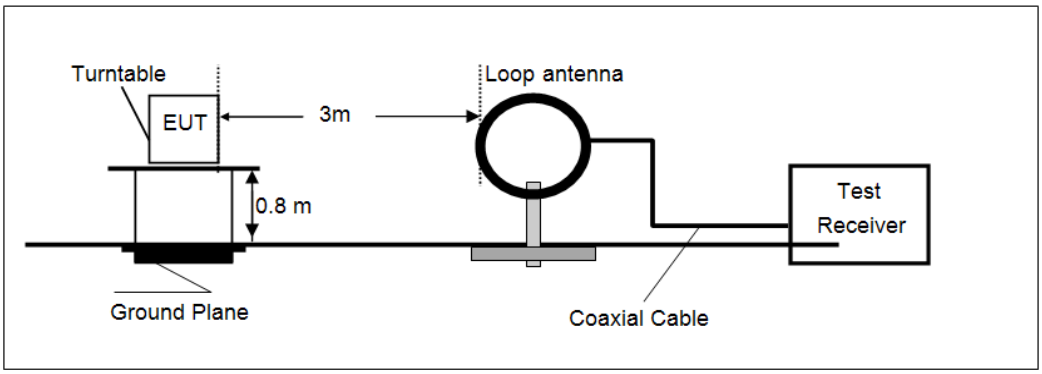
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209

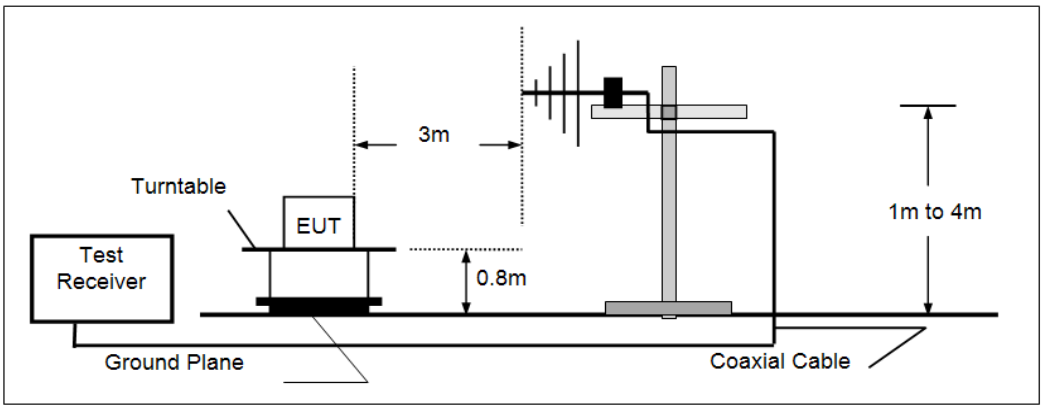
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

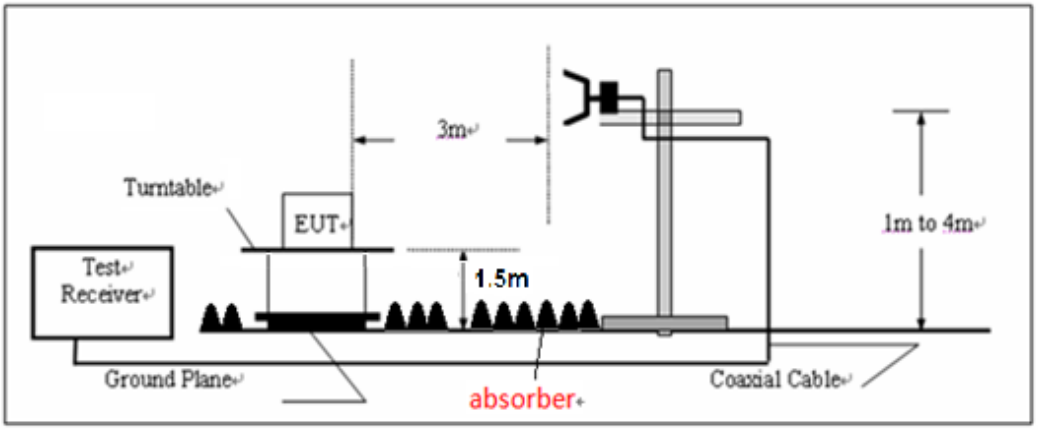
- 9KHz ~30MHz



- 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 0.8/1.5 meter above ground plane. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT waspositioned 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. Thisis 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=QP, Trace=max hold; If the emission level of the EUT measured by the peak detectoris 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, theemission measurement will be repeated using the quasi-peak detector and reported.
   (3) Above 1GHz, RBW=1MHz, VBW=3MHz Peak detetor for Peak value
   RBW=1MHz, VBW=3MHz RMS detetor for Average value.

Remark: “floor-standing equipment” Where possible, the antenna(s) of the EUT shall be located at a height of 1.5 m above the floor, and the intentional radiator circuitry shall be located within the system at a height of at least 0.8 m above the floor.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

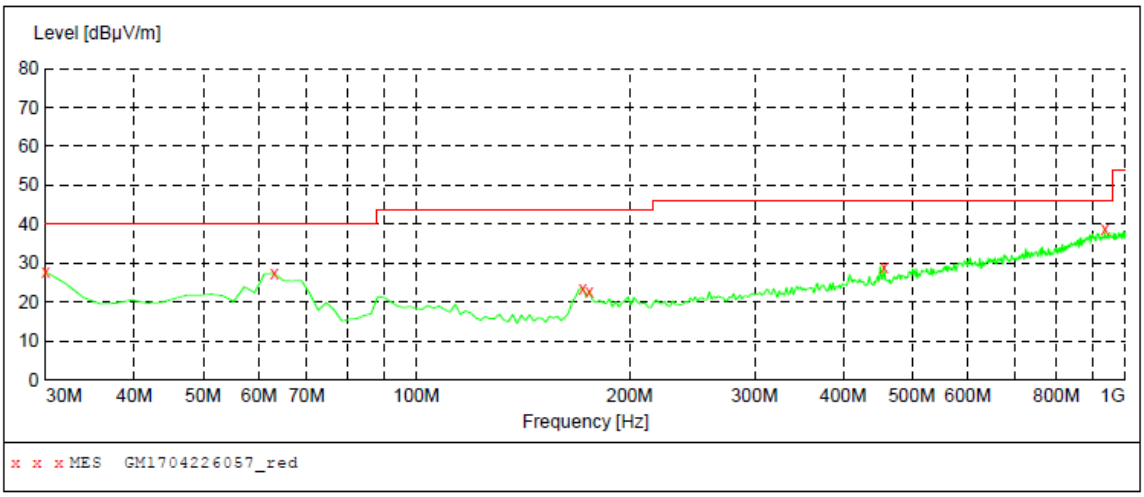
☒ **Passed** ☐ **Not Applicable**

Note:
1) Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2) “*”, means this data is the too weak instrument of signal is unable to test.
3) 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.

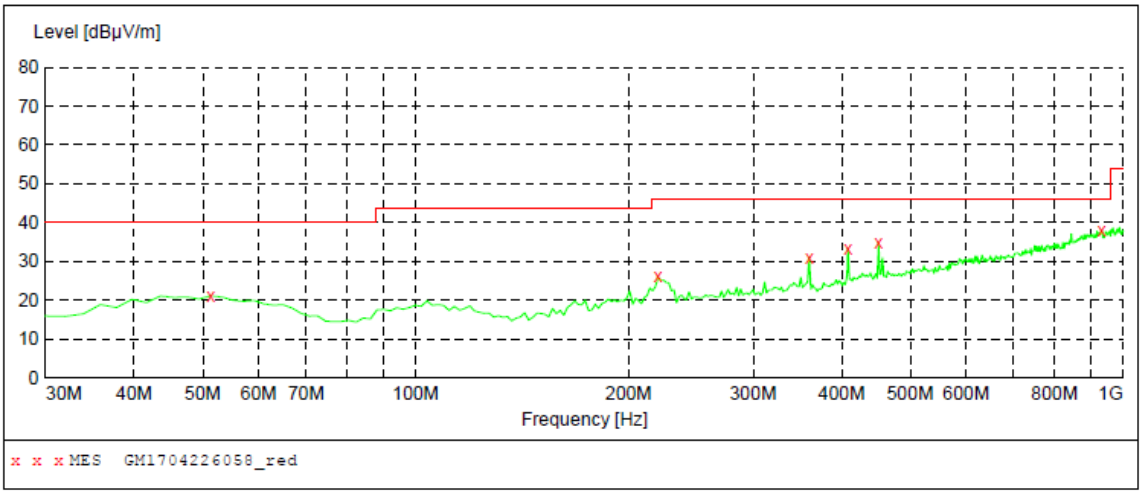
➢ **30MHz ~ 1GHz**

Polarization:	Vertical



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	27.70	-13.3	40.0	12.3	QP	100.0	0.00	VERTICAL
62.980000	27.40	-10.8	40.0	12.6	QP	100.0	13.00	VERTICAL
171.620000	23.60	-12.9	43.5	19.9	QP	100.0	3.00	VERTICAL
175.500000	22.70	-12.7	43.5	20.8	QP	100.0	67.00	VERTICAL
456.800000	29.10	-3.1	46.0	16.9	QP	100.0	186.00	VERTICAL
935.980000	38.70	7.1	46.0	7.3	QP	100.0	186.00	VERTICAL

Polarization:	Horizontal



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
51.340000	21.10	-8.8	40.0	18.9	QP	300.0	257.00	HORIZONTAL
220.120000	26.00	-9.9	46.0	20.0	QP	100.0	225.00	HORIZONTAL
359.800000	31.10	-5.6	46.0	14.9	QP	100.0	225.00	HORIZONTAL
408.300000	33.20	-4.0	46.0	12.8	QP	100.0	225.00	HORIZONTAL
450.980000	34.80	-3.2	46.0	11.2	QP	300.0	245.00	HORIZONTAL
932.100000	37.80	7.1	46.0	8.2	QP	300.0	337.00	HORIZONTAL

➢ **Above 1GHz**

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)	Margin Limit (dB)	Polarization	Test value
1702.36	37.43	25.32	5.77	36.93	31.59	74.00	-42.41	Vertical	Peak
3681.47	36.84	29.01	8.36	38.25	35.96	74.00	-38.04	Vertical	
6992.14	31.56	35.80	11.84	34.80	44.40	74.00	-29.60	Vertical	
10062.31	32.16	38.44	13.55	33.71	50.44	74.00	-23.56	Vertical	
1569.19	35.86	24.92	5.48	36.68	29.58	74.00	-44.42	Horizontal	
2532.28	36.05	27.94	6.86	37.86	32.99	74.00	-41.01	Horizontal	
3728.63	37.75	29.07	8.42	38.24	37.00	74.00	-37.00	Horizontal	
10036.73	31.95	38.42	13.54	33.48	50.43	74.00	-23.57	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
2229.65	37.11	26.96	6.49	37.42	33.14	74.00	-40.86	Vertical	Peak
4582.42	34.45	30.96	9.43	37.26	37.58	74.00	-36.42	Vertical	
7009.96	31.62	35.82	11.85	34.80	44.49	74.00	-29.51	Vertical	
9587.23	31.97	38.15	13.74	35.17	48.69	74.00	-25.31	Vertical	
1343.51	37.02	24.56	4.90	36.49	29.99	74.00	-44.01	Horizontal	
2525.84	36.51	27.94	6.86	37.86	33.45	74.00	-40.55	Horizontal	
5191.17	33.40	31.67	9.82	36.21	38.68	74.00	-35.32	Horizontal	
9611.66	32.28	38.17	13.73	35.19	48.99	74.00	-25.01	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
1791.27	35.98	25.57	5.94	37.12	30.37	74.00	-43.63	Vertical	Peak
3738.13	36.12	29.09	8.43	38.24	35.40	74.00	-38.60	Vertical	
5073.59	34.16	31.38	9.73	36.33	38.94	74.00	-35.06	Vertical	
9065.08	32.33	37.93	13.37	34.88	48.75	74.00	-25.25	Vertical	
1685.12	35.73	25.27	5.74	36.90	29.84	74.00	-44.16	Horizontal	
4055.37	36.56	29.64	8.82	37.98	37.04	74.00	-36.96	Horizontal	
7045.74	31.47	35.83	11.85	34.86	44.29	74.00	-29.71	Horizontal	
9042.04	32.34	37.92	13.35	34.71	48.90	74.00	-25.10	Horizontal	

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 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)	Margin Limit (dB)	Polarization	Test value
1138.63	36.14	24.36	4.52	36.60	28.42	74.00	-45.58	Vertical	Peak
1768.62	34.34	25.50	5.90	37.07	28.67	74.00	-45.33	Vertical	
3104.22	35.39	28.55	7.61	38.21	33.34	74.00	-40.66	Vertical	
6094.14	32.31	33.54	10.83	35.37	41.31	74.00	-32.69	Vertical	
1150.28	36.60	24.37	4.55	36.59	28.93	74.00	-45.07	Horizontal	
3104.22	35.40	28.55	7.61	38.21	33.35	74.00	-40.65	Horizontal	
6628.18	31.38	35.27	11.39	35.31	42.73	74.00	-31.27	Horizontal	
9611.66	32.29	38.17	13.73	35.19	49.00	74.00	-25.00	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
2108.21	34.84	26.52	6.36	37.32	30.40	74.00	-43.60	Vertical	Peak
3653.46	36.72	28.96	8.33	38.26	35.75	74.00	-38.25	Vertical	
4883.52	37.81	31.14	9.59	36.73	41.81	74.00	-32.19	Vertical	
9088.19	33.32	37.94	13.39	35.04	49.61	74.00	-24.39	Vertical	
1746.25	36.32	25.44	5.86	37.03	30.59	74.00	-43.41	Horizontal	
3588.94	36.98	28.85	8.25	38.29	35.79	74.00	-38.21	Horizontal	
5925.86	31.77	33.09	10.64	35.40	40.10	74.00	-33.90	Horizontal	
8973.25	32.18	37.87	13.28	34.39	48.94	74.00	-25.06	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
1693.72	35.92	25.29	5.75	36.92	30.04	74.00	-43.96	Vertical	Peak
3662.78	36.58	28.97	8.34	38.26	35.63	74.00	-38.37	Vertical	
5762.24	32.80	32.83	10.53	35.42	40.74	74.00	-33.26	Vertical	
9111.35	32.62	37.94	13.42	35.21	48.77	74.00	-25.23	Vertical	
1818.84	34.97	25.64	5.99	37.16	29.44	74.00	-44.56	Horizontal	
4366.07	34.76	30.55	9.10	37.58	36.83	74.00	-37.17	Horizontal	
5718.40	32.89	32.75	10.46	35.54	40.56	74.00	-33.44	Horizontal	
8927.68	31.87	37.80	13.23	34.36	48.54	74.00	-25.46	Horizontal	

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 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)	Margin Limit (dB)	Polarization	Test value
1659.57	35.83	25.19	5.69	36.85	29.86	74.00	-44.14	Vertical	Peak
4202.50	34.20	30.09	8.94	37.65	35.58	74.00	-38.42	Vertical	
6833.77	31.83	35.58	11.64	34.96	44.09	74.00	-29.91	Vertical	
8571.38	33.55	37.31	12.88	34.48	49.26	74.00	-24.74	Vertical	
1759.64	35.38	25.48	5.88	37.06	29.68	74.00	-44.32	Horizontal	
3672.11	35.65	28.99	8.35	38.26	34.73	74.00	-39.27	Horizontal	
6816.39	32.36	35.55	11.62	34.97	44.56	74.00	-29.44	Horizontal	
9088.19	32.30	37.94	13.39	35.04	48.59	74.00	-25.41	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
1755.16	35.13	25.47	5.87	37.05	29.42	74.00	-44.58	Vertical	Peak
4202.50	34.03	30.09	8.94	37.65	35.41	74.00	-38.59	Vertical	
6816.39	31.07	35.55	11.62	34.97	43.27	74.00	-30.73	Vertical	
8441.46	32.27	37.15	12.86	34.31	47.97	74.00	-26.03	Vertical	
1655.35	36.35	25.18	5.68	36.84	30.37	74.00	-43.63	Horizontal	
3728.63	36.13	29.07	8.42	38.24	35.38	74.00	-38.62	Horizontal	
6283.16	32.74	34.29	11.00	35.30	42.73	74.00	-31.27	Horizontal	
8527.85	32.58	37.27	12.88	34.43	48.30	74.00	-25.70	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
1750.70	35.00	25.46	5.86	37.04	29.28	74.00	-44.72	Vertical	Peak
3709.69	38.13	29.06	8.40	38.25	37.34	74.00	-36.66	Vertical	
5806.41	32.26	32.91	10.59	35.32	40.44	74.00	-33.56	Vertical	
7470.56	32.06	36.18	12.30	34.88	45.66	74.00	-28.34	Vertical	
1773.13	35.59	25.51	5.91	37.08	29.93	74.00	-44.07	Horizontal	
3184.25	36.02	28.58	7.70	38.20	34.10	74.00	-39.90	Horizontal	
7527.83	32.24	36.22	12.49	34.92	46.03	74.00	-27.97	Horizontal	
10036.73	31.98	38.42	13.54	33.48	50.46	74.00	-23.54	Horizontal	

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 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)	Margin Limit (dB)	Polarization	Test value
1642.76	35.48	25.15	5.65	36.81	29.47	74.00	-44.53	Vertical	Peak
4343.90	33.64	30.48	9.08	37.59	35.61	74.00	-38.39	Vertical	
7489.60	31.13	36.20	12.36	34.89	44.80	74.00	-29.20	Vertical	
9960.38	32.01	38.37	13.56	33.65	50.29	74.00	-23.71	Vertical	
1737.38	35.48	25.41	5.84	37.01	29.72	74.00	-44.28	Horizontal	
3681.47	35.35	29.01	8.36	38.25	34.47	74.00	-39.53	Horizontal	
5747.59	33.37	32.80	10.51	35.46	41.22	74.00	-32.78	Horizontal	
10641.89	31.44	38.83	13.59	33.52	50.34	74.00	-23.66	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
1689.41	34.67	25.27	5.74	36.91	28.77	74.00	-45.23	Vertical	Peak
3598.09	35.85	28.87	8.27	38.27	34.72	74.00	-39.28	Vertical	
7027.82	31.79	35.83	11.85	34.83	44.64	74.00	-29.36	Vertical	
10036.73	31.79	38.42	13.54	33.48	50.27	74.00	-23.73	Vertical	
1680.83	35.66	25.26	5.73	36.89	29.76	74.00	-44.24	Horizontal	
4076.07	34.82	29.71	8.84	37.94	35.43	74.00	-38.57	Horizontal	
6172.20	30.85	33.88	10.96	35.31	40.38	74.00	-33.62	Horizontal	
10480.59	32.14	38.68	13.59	34.65	49.76	74.00	-24.24	Horizontal	

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)	Margin Limit (dB)	Polarization	Test value
1818.84	34.73	25.64	5.99	37.16	29.20	74.00	-44.80	Vertical	Peak
3112.13	36.15	28.55	7.61	38.21	34.10	74.00	-39.90	Vertical	
5895.77	32.53	33.04	10.63	35.38	40.82	74.00	-33.18	Vertical	
9960.38	31.42	38.37	13.56	33.65	49.70	74.00	-24.30	Vertical	
1786.72	35.21	25.55	5.93	37.11	29.58	74.00	-44.42	Horizontal	
4512.97	34.58	30.91	9.32	37.37	37.44	74.00	-36.56	Horizontal	
7063.69	31.90	35.85	11.85	34.88	44.72	74.00	-29.28	Horizontal	
10669.02	32.85	38.86	13.59	33.71	51.59	74.00	-22.41	Horizontal	

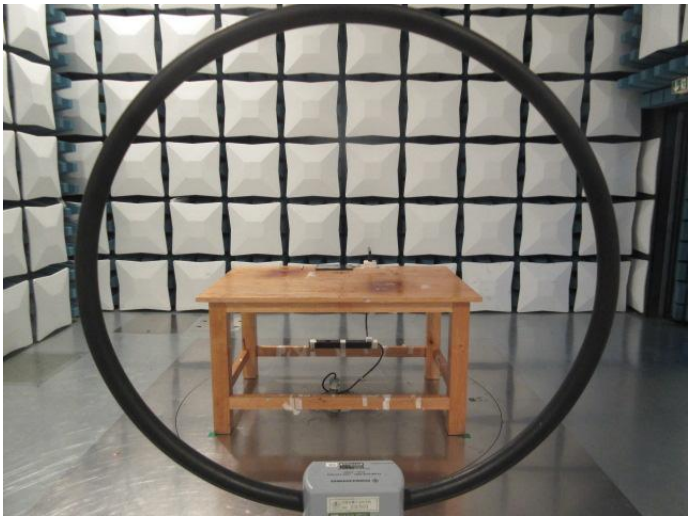
Remark:

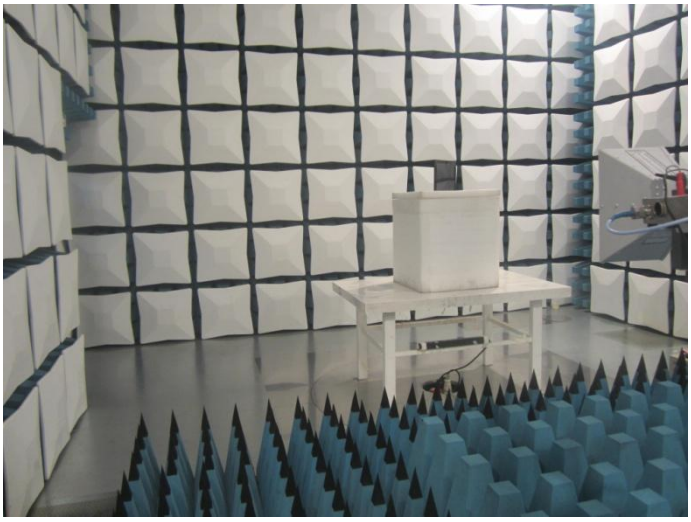
1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in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

6. Test Setup Photos of the EUT

Conducted Emissions (AC Mains)

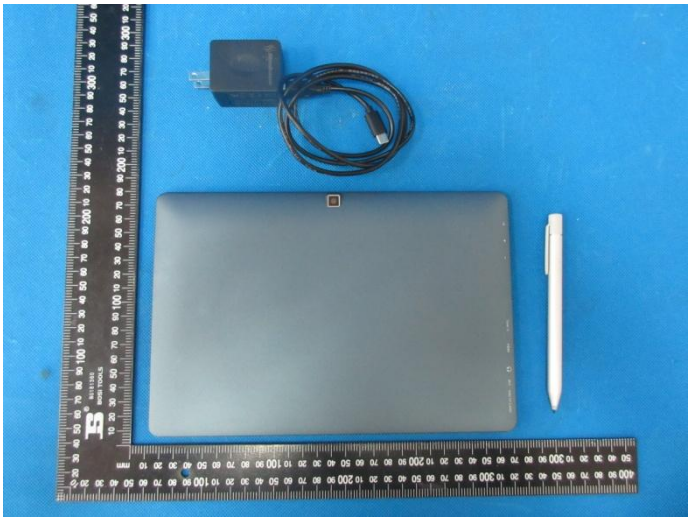
Radiated Emissions

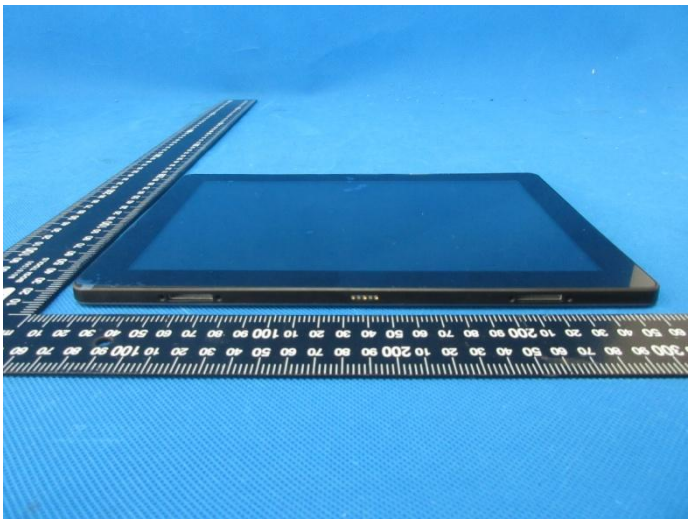


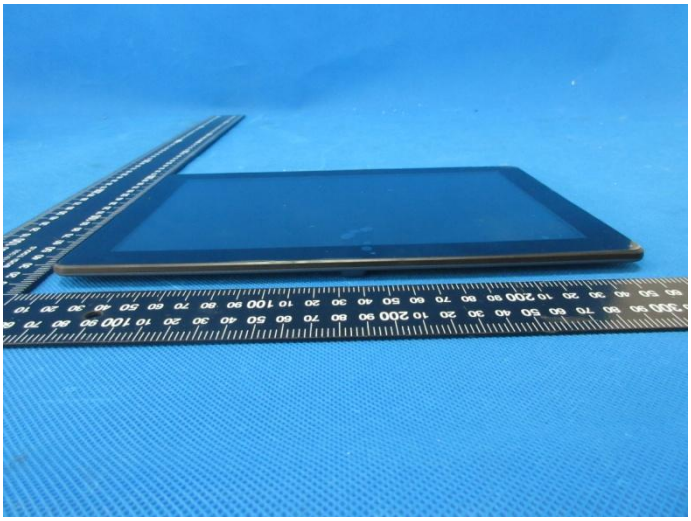


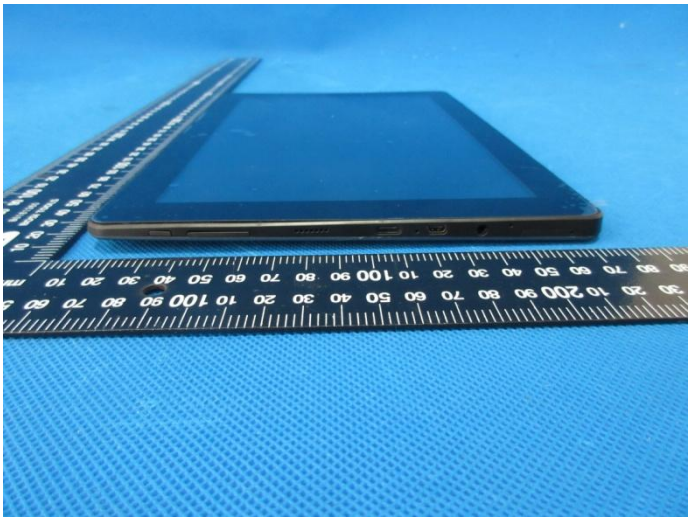
7. External and Internal Photos of the EUT

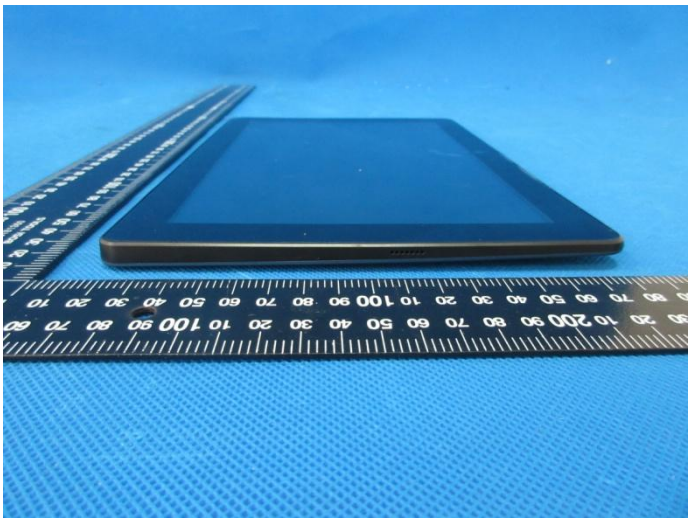
External Photos of the EUT



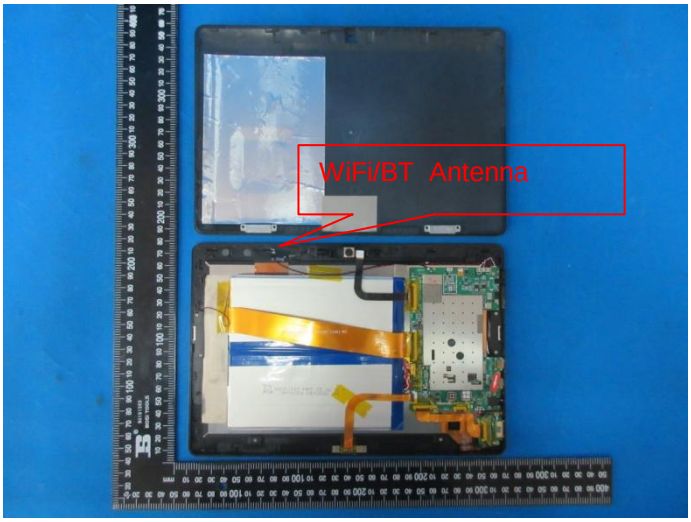


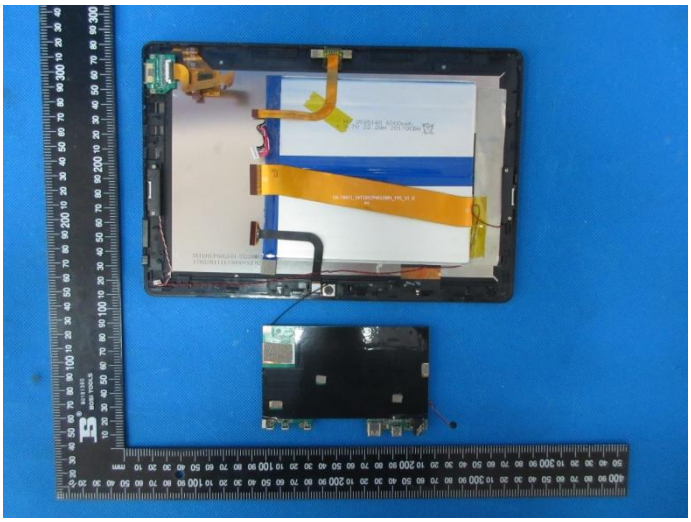


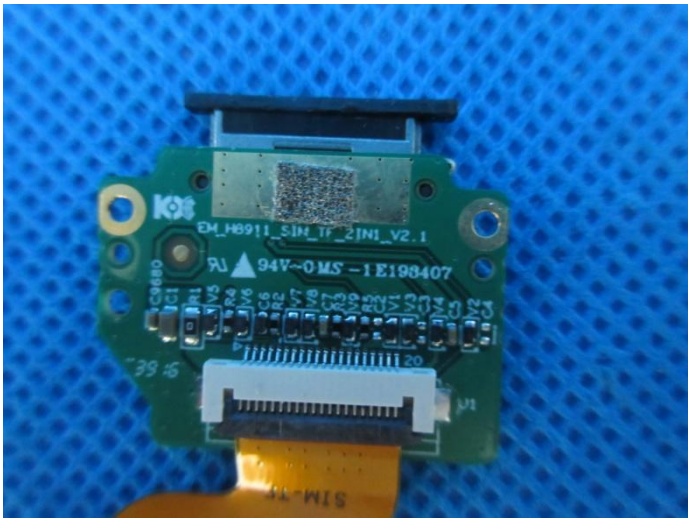


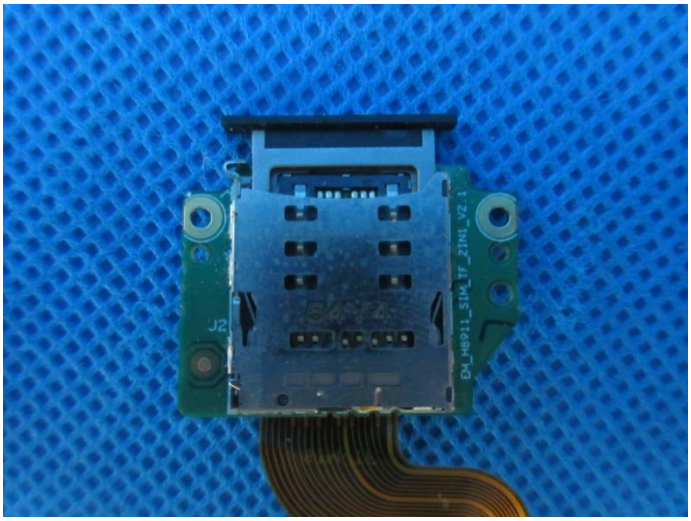


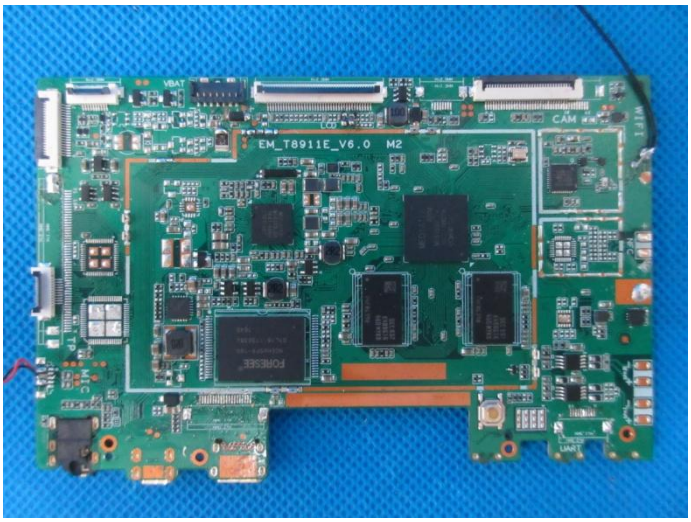
Internal Photos of the EUT











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