

TCT

TEST REPORT

FCC ID: 2ACMYAWF23

Product: 1080P indoor PT IP Cam

Model No.: AWF23

Additional Model No.: N/A

Trade Mark: N/A

Report No.: TCT170213E007

Issued Date: Feb. 20, 2017

Issued for:

Atoms Labs LLC

2670 Firewheel Dr. Suite D Flower Mound, TX 75028 UAS

Issued By:

Shenzhen Tongce Testing Lab.

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1. Test Certification

Product:	1080P indoor PT IP Cam
Model No.:	AWF23
Additional Model No.:	N/A
Applicant:	Atoms Labs LLC
Address:	2670 Firewheel Dr. Suite D Flower Mound, TX 75028 UAS
Manufacturer:	Atoms Labs LLC
Address:	2670 Firewheel Dr. Suite D Flower Mound, TX 75028 UAS
Date of Test:	Feb. 13, 2017 – Feb. 17, 2017
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247 KDB 558074 D01 DTS Meas Guidance v03r05

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:

Date:

Feb. 17, 2017

Jin Wang

Reviewed By:

Date:

Feb. 20, 2017

Joe Zhou

Approved By:

Tomsin

Date:

Feb. 20, 2017

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(3) §2.1046	PASS
6dB Emission Bandwidth	§15.247 (a)(2) §2.1049	PASS
Power Spectral Density	§15.247 (e)	PASS
Band Edge	1§5.247(d) §2.1051, §2.1057	PASS
Spurious Emission	§15.205/§15.209 §2.1053, §2.1057	PASS

Note:

1. PASS: *Test item meets the requirement.*
2. Fail: *Test item does not meet the requirement.*
3. N/A: *Test case does not apply to the test object.*
4. *The test result judgment is decided by the limit of test standard.*

3. EUT Description

Product Name:	1080P indoor PT IP Cam
Model :	AWF23
Additional Model:	N/A
Trade Mark:	N/A
Operation Frequency:	2412MHz~2462MHz (802.11b/802.11g/802.11n(HT20))
Channel Separation:	5MHz
Number of Channel:	11 for 802.11b/802.11g/802.11n(HT20)
Modulation Technology: (IEEE 802.11b)	Direct Sequence Spread Spectrum (DSSS)
Modulation Technology: (IEEE 802.11g/802.11n)	Orthogonal Frequency Division Multiplexing(OFDM)
Data speed (IEEE 802.11b):	1Mbps, 2Mbps, 5.5Mbps, 11Mbps
Data speed (IEEE 802.11g):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
Data speed (IEEE 802.11n):	Up to 135Mbps
Antenna Type:	External Antenna
Antenna Gain:	3dBi
Power Supply:	Adapter1 Information: MODEL: KSAS0120500150HU INPUT: 100-240V~50/60Hz 0.4A OUTPUT: 5.0V, 1.5A Adapter2 Information: MODEL: KT12W050150US INPUT: 100-240V~50/60Hz 0.4A OUTPUT: 5.0V, 1.5A Adapter3 Information: MODEL: GQ15-050150-AU INPUT: 100-240V~50/60Hz 0.5A Max OUTPUT: 5.0V, 1.5A Adapter4 Information: MODEL: CS12N050150FUF INPUT: 100-240V~50/60Hz 500mA OUTPUT: 5.0V, 1.5A

Operation Frequency each of channel For 802.11b/g/n(HT20)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

802.11b/802.11g/802.11n (HT20)

Channel	Frequency
The lowest channel	2412MHz
The middle channel	2437MHz
The Highest channel	2462MHz

4. General Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%)
The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. For the full battery state and The output power to the maximum state.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Per-scan all kind of data rate in lowest channel, and found the follow list which was worst case.

Mode	Data rate
802.11b	1Mbps
802.11g	6Mbps
802.11n(H20)	6.5Mbps

Final Test Mode:

Operation mode:	Keep the EUT in continuous transmitting with modulation
-----------------	---

1. For WIFI function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.
2. According to ANSI C63.10 standards, the test results are both the "worst case" and "worst setup" 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n(H20). Duty cycle setting during the transmission is 98.5% with maximum power setting for all

modulations.

4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

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

- FCC - Registration No.: 572331

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- CNAS - Registration No.: CNAS L6165

Shenzhen TCT Testing Technology Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6165.

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China

Tel: 86-755-36638142

5.3. Measurement Uncertainty

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

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$

6. Test Results and Measurement Data

6.1. Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
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15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, 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.

15.247(c) (1)(i) requirement:

(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.

E.U.T Antenna:

The WIFI antenna is an external antenna which antenna is R-SMA connector, which is unique antenna connector, the best case gain of the antenna is 3dBi.



6.2. Conducted Emission

6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	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
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													
Test Setup:	<p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
Test Mode:	Charging + transmitting with modulation														
Test Procedure:	<ol style="list-style-type: none"> 1. The E.U.T is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 														
Test Result:	PASS														

6.2.2. Test Instruments

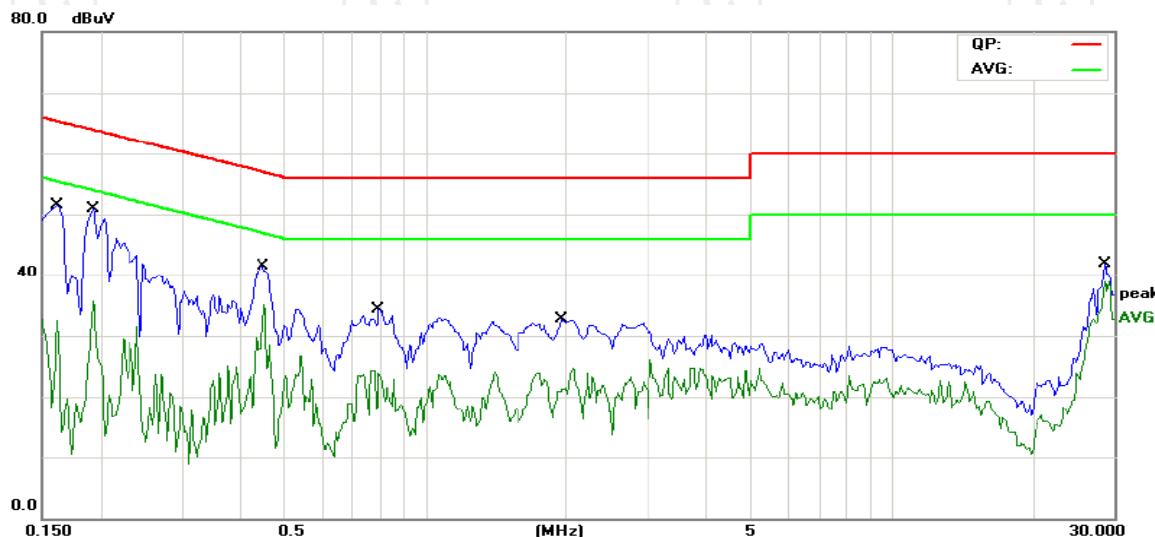
Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCS30	100139	Aug. 11, 2017
LISN	Schwarzbeck	NSLK 8126	8126453	Aug. 16, 2017
Coax cable (9kHz-40GHz)	TCT	CE-05	N/A	Aug. 11, 2017
EMI Test Software	Shurples Technology	EZ-EMC	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.2.3. Test data

Please refer to following diagram for individual

Adapter 1: Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site Chamber #2				Phase:	L1	Temperature:	23 (C)	
Limit: FCC Part 15B Class B Conduction(QP)				Power:		Humidity:	54 %	
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
1		0.1617	35.17	11.49	46.66	65.37	-18.71	QP
2		0.1617	15.73	11.49	27.22	55.37	-28.15	AVG
3 *		0.1930	35.05	11.47	46.52	63.90	-17.38	QP
4		0.1930	17.69	11.47	29.16	53.90	-24.74	AVG
5		0.4469	27.05	11.34	38.39	56.93	-18.54	QP
6		0.4469	17.90	11.34	29.24	46.93	-17.69	AVG
7		0.7906	17.29	11.22	28.51	56.00	-27.49	QP
8		0.7906	9.08	11.22	20.30	46.00	-25.70	AVG
9		1.9586	15.18	11.68	26.86	56.00	-29.14	QP
10		1.9586	5.66	11.68	17.34	46.00	-28.66	AVG
11		28.6055	28.37	10.71	39.08	60.00	-20.92	QP
12		28.6055	21.90	10.71	32.61	50.00	-17.39	AVG

Note:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)

Limit (dB μ V) = Limit stated in standard

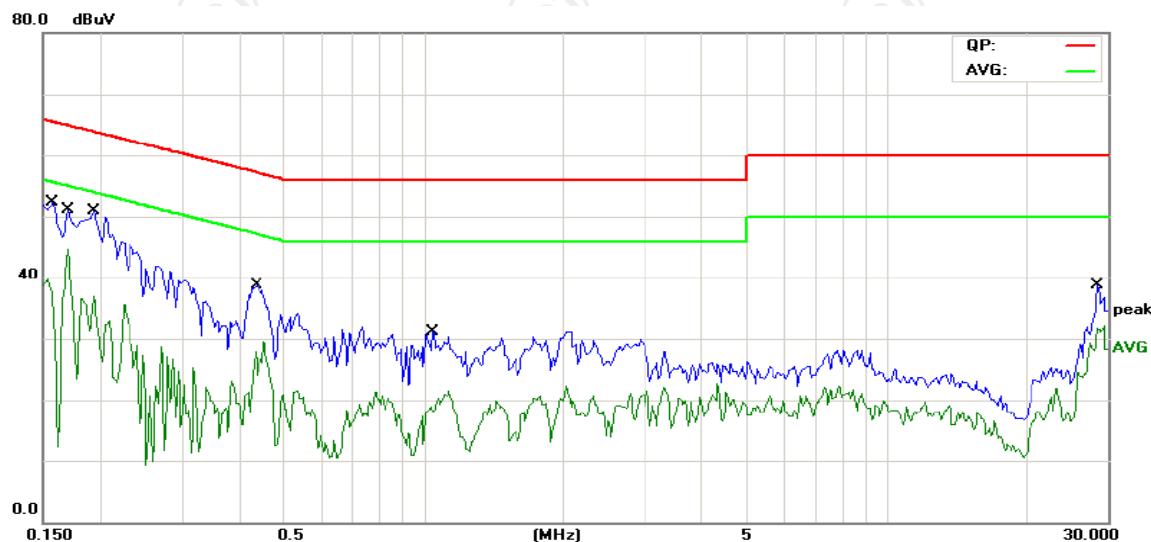
Margin (dB) = Measurement (dB μ V) – Limits (dB μ V)

Q.P. =Quasi-Peak

AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site	Chamber #2	Phase:	N	Temperature:	23 (C)				
	Limit: FCC Part 15B Class B Conduction(QP)	Power:		Humidity:	54 %				
<hr/>									
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dB μ V	dB	dB μ V	dB μ V	dB	Detector	Comment
1		0.1578	36.14	11.49	47.63	65.57	-17.94	QP	
2		0.1578	25.04	11.49	36.53	55.57	-19.04	AVG	
3		0.1695	33.61	11.49	45.10	64.98	-19.88	QP	
4		0.1695	16.67	11.49	28.16	54.98	-26.82	AVG	
5		0.1930	36.24	11.47	47.71	63.90	-16.19	QP	
6	*	0.1930	26.61	11.47	38.08	53.90	-15.82	AVG	
7		0.4352	22.72	11.34	34.06	57.15	-23.09	QP	
8		0.4352	15.16	11.34	26.50	47.15	-20.65	AVG	
9		1.0484	12.95	11.23	24.18	56.00	-31.82	QP	
10		1.0484	6.20	11.23	17.43	46.00	-28.57	AVG	
11		28.5039	24.44	10.71	35.15	60.00	-24.85	QP	
12		28.5039	16.51	10.71	27.22	50.00	-22.78	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

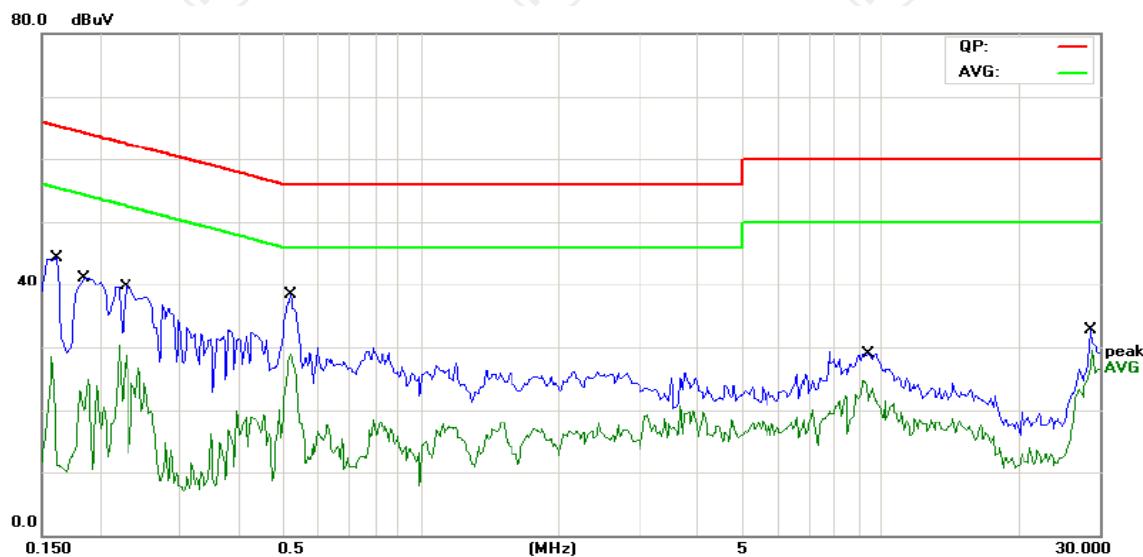
Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)Limit (dB μ V) = Limit stated in standardMargin (dB) = Measurement (dB μ V) - Limits (dB μ V)

Q.P. = Quasi-Peak

AVG = average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Adapter 2:**Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)**

Site	Chamber #2	Phase:	L1	Temperature:	23 (C)				
	Limit: FCC Part 15B Class B Conduction(QP)	Power:		Humidity:	54 %				
<hr/>									
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dB μ V	dB	dB μ V	dB μ V	dB	Detector	Comment
1		0.1617	29.36	11.49	40.85	65.37	-24.52	QP	
2		0.1617	11.47	11.49	22.96	55.37	-32.41	AVG	
3		0.1852	27.05	11.48	38.53	64.24	-25.71	QP	
4		0.1852	10.29	11.48	21.77	54.24	-32.47	AVG	
5		0.2281	23.77	11.46	35.23	62.52	-27.29	QP	
6		0.2281	8.74	11.46	20.20	52.52	-32.32	AVG	
7		0.5211	23.58	11.30	34.88	56.00	-21.12	QP	
8	*	0.5211	16.29	11.30	27.59	46.00	-18.41	AVG	
9		9.3750	12.37	11.29	23.66	60.00	-36.34	QP	
10		9.3750	5.45	11.29	16.74	50.00	-33.26	AVG	
11		28.7031	18.78	10.71	29.49	60.00	-30.51	QP	
12		28.7031	14.57	10.71	25.28	50.00	-24.72	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

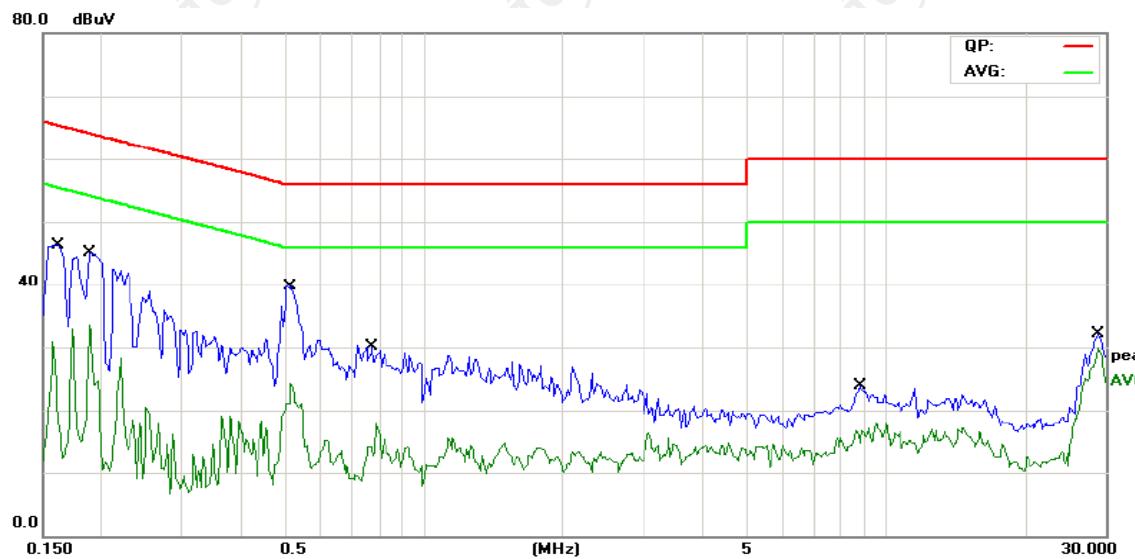
Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)Limit (dB μ V) = Limit stated in standardMargin (dB) = Measurement (dB μ V) – Limits (dB μ V)

Q.P. = Quasi-Peak

AVG = average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site Chamber #2 Phase: **N** Temperature: 23 (C)
 Limit: FCC Part 15B Class B Conduction(QP) Power: Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level	Correct Factor	Measure- ment	Limit	Over	Comment
			dBuV	dB	dBuV	dBuV	dB	
1	0.1617	31.59	11.49	43.08	65.37	-22.29	-22.29	QP
2	0.1617	11.55	11.49	23.04	55.37	-32.33	-32.33	AVG
3	0.1891	29.38	11.48	40.86	64.07	-23.21	-23.21	QP
4	0.1891	12.58	11.48	24.06	54.07	-30.01	-30.01	AVG
5 *	0.5172	24.45	11.30	35.75	56.00	-20.25	-20.25	QP
6	0.5172	12.48	11.30	23.78	46.00	-22.22	-22.22	AVG
7	0.7750	10.40	11.22	21.62	56.00	-34.38	-34.38	QP
8	0.7750	1.12	11.22	12.34	46.00	-33.66	-33.66	AVG
9	8.7969	6.00	11.20	17.20	60.00	-42.80	-42.80	QP
10	8.7969	0.33	11.20	11.53	50.00	-38.47	-38.47	AVG
11	28.8984	20.97	10.71	31.68	60.00	-28.32	-28.32	QP
12	28.8984	16.77	10.71	27.48	50.00	-22.52	-22.52	AVG

Note:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)Limit (dB μ V) = Limit stated in standardMargin (dB) = Measurement (dB μ V) – Limits (dB μ V)

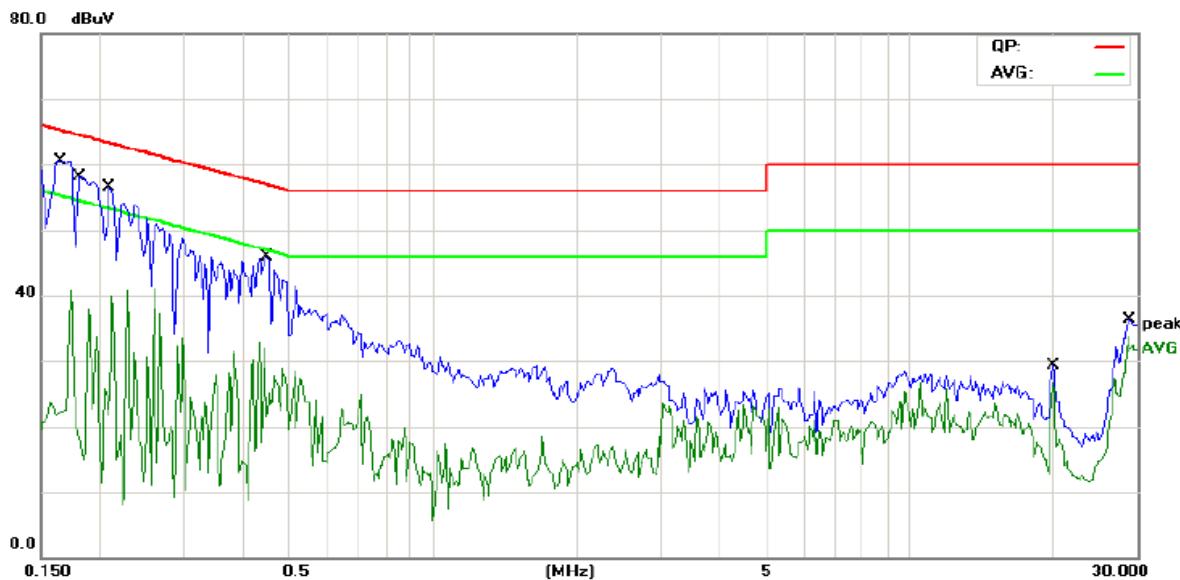
Q.P. =Quasi-Peak

AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Adapter 3:

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site Chamber #2 Phase: L1 Temperature: 23 (C)
Limit: FCC Part 15B Class B Conduction(QP) Power: Humidity: 54 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
							dBdV	dB	Detector
1	*	0.1655	46.89	11.49	58.38	65.18	-6.80	QP	
2		0.1655	27.07	11.49	38.56	55.18	-16.62	AVG	
3		0.1812	41.61	11.48	53.09	64.43	-11.34	QP	
4		0.1812	17.90	11.48	29.38	54.43	-25.05	AVG	
5		0.2086	41.39	11.47	52.86	63.26	-10.40	QP	
6		0.2086	19.34	11.47	30.81	53.26	-22.45	AVG	
7		0.4469	30.07	11.34	41.41	56.93	-15.52	QP	
8		0.4469	12.39	11.34	23.73	46.93	-23.20	AVG	
9		20.0039	15.24	10.59	25.83	60.00	-34.17	QP	
10		20.0039	9.37	10.59	19.96	50.00	-30.04	AVG	
11		28.8438	16.42	10.71	27.13	60.00	-32.87	QP	
12		28.8438	8.35	10.71	19.06	50.00	-30.94	AVG	

Note:-

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dB_{uV}) = Reading level (dB_{uV}) + Corr. Factor (dB)

I limit (dB μ V) = I limit stated in standard

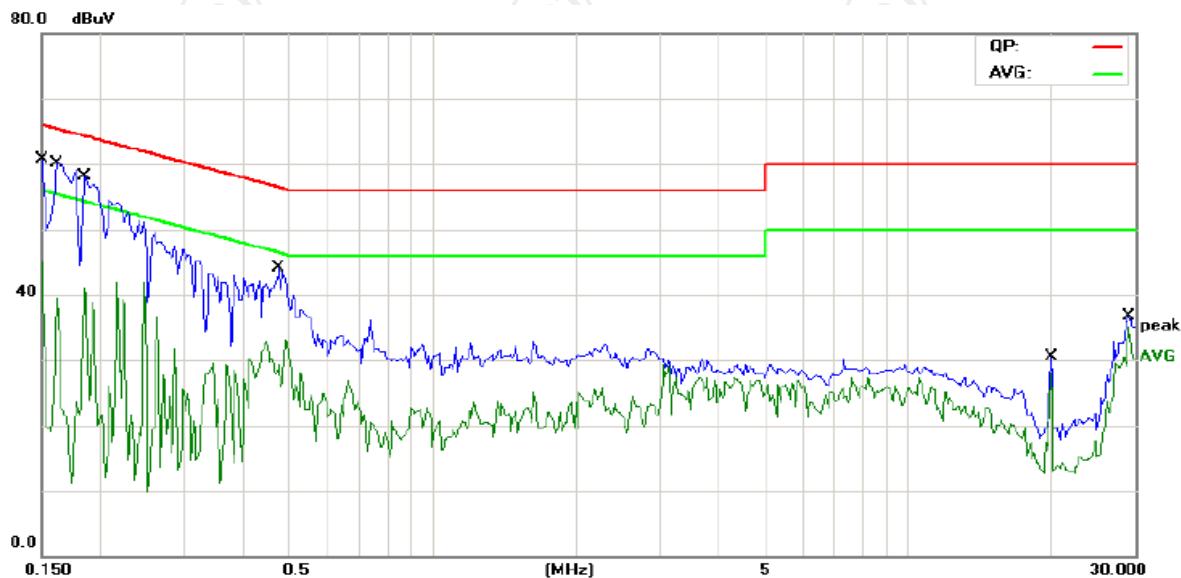
Margin (dB) = Measurement (dB_{B1V}) - Limits (dB_{B1V})

Margin (μ_B) = Mean Q.R. - Quasi Back

Q.P. =Quasi-Pe

AVG =average
time in the next few minutes to start this function

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site Chamber #2				Phase:	N	Temperature:	23 (C)	
Limit: FCC Part 15B Class B Conduction(QP)				Power:		Humidity:	54 %	
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
1	*	0.1500	46.43	11.50	57.93	65.99	-8.06	QP
2		0.1500	23.46	11.50	34.96	55.99	-21.03	AVG
3		0.1617	45.76	11.49	57.25	65.37	-8.12	QP
4		0.1617	23.95	11.49	35.44	55.37	-19.93	AVG
5		0.1852	43.27	11.48	54.75	64.24	-9.49	QP
6		0.1852	21.58	11.48	33.06	54.24	-21.18	AVG
7		0.4742	30.03	11.32	41.35	56.44	-15.09	QP
8		0.4742	21.24	11.32	32.56	46.44	-13.88	AVG
9		20.0000	19.92	10.59	30.51	60.00	-29.49	QP
10		20.0000	17.61	10.59	28.20	50.00	-21.80	AVG
11		29.1289	23.48	10.70	34.18	60.00	-25.82	QP
12		29.1289	18.48	10.70	29.18	50.00	-20.82	AVG

Note:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

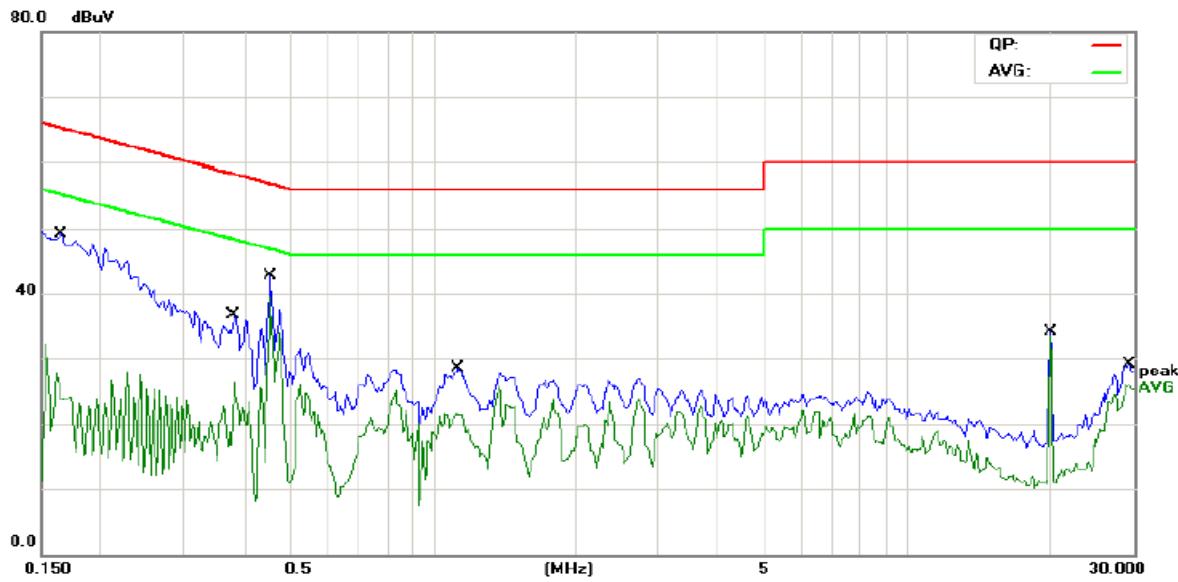
Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)Limit (dB μ V) = Limit stated in standardMargin (dB) = Measurement (dB μ V) - Limits (dB μ V)

Q.P. = Quasi-Peak

AVG = average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Adapter 4:
Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)


Site Chamber #2				Phase:	L1	Temperature:	23 (C)
Limit: FCC Part 15B Class B Conduction(QP)				Power:		Humidity: 54 %	
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dB μ V	dB	dB μ V	dB	Detector
1		0.1655	32.72	11.49	44.21	65.18	-20.97
2		0.1655	14.18	11.49	25.67	55.18	-29.51
3		0.3805	21.21	11.37	32.58	58.27	-25.69
4		0.3805	10.87	11.37	22.24	48.27	-26.03
5		0.4547	29.58	11.33	40.91	56.79	-15.88
6	*	0.4547	27.85	11.33	39.18	46.79	-7.61
7		1.1344	14.07	11.27	25.34	56.00	-30.66
8		1.1344	8.81	11.27	20.08	46.00	-25.92
9		20.0000	22.15	10.59	32.74	60.00	-27.26
10		20.0000	19.64	10.59	30.23	50.00	-19.77
11		29.2656	18.81	10.70	29.51	60.00	-30.49
12		29.2656	14.29	10.70	24.99	50.00	-25.01

Note:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)

Limit (dB μ V) = Limit stated in standard

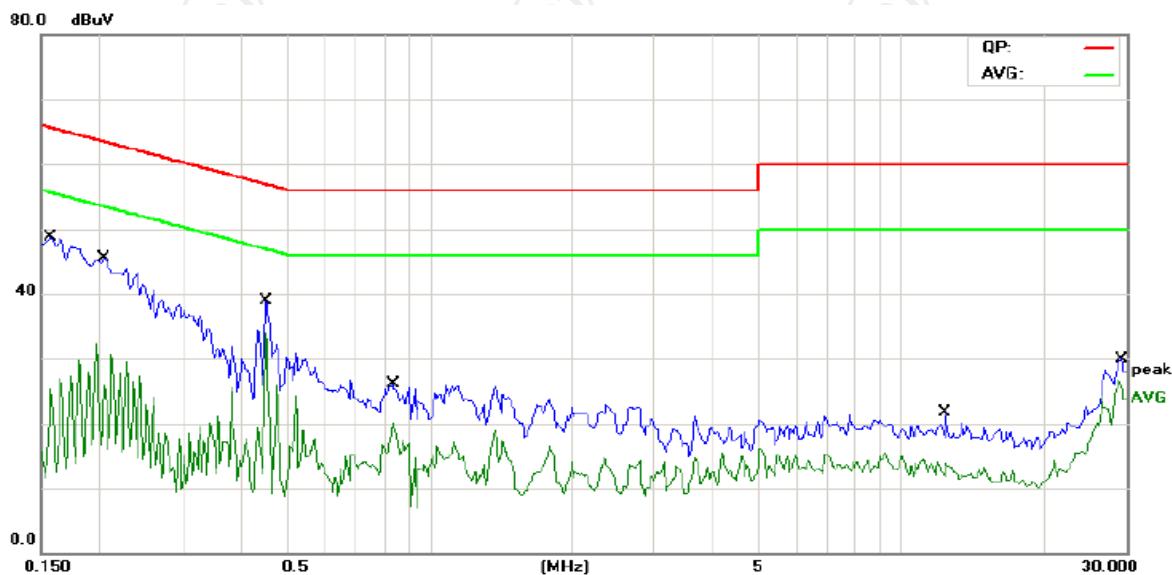
Margin (dB) = Measurement (dB μ V) – Limits (dB μ V)

Q.P. = Quasi-Peak

AVG = average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site Chamber #2 Phase: **N** Temperature: 23 (C)
 Limit: FCC Part 15B Class B Conduction(QP) Power: Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level	Correct Factor	Measure- ment	Limit	Over	Comment
			dBµV	dB	dBµV	dB	Detector	
1		0.1578	32.88	11.49	44.37	65.57	-21.20	QP
2		0.1578	13.91	11.49	25.40	55.57	-30.17	AVG
3		0.2047	29.12	11.47	40.59	63.41	-22.82	QP
4		0.2047	11.47	11.47	22.94	53.41	-30.47	AVG
5		0.4508	26.04	11.33	37.37	56.86	-19.49	QP
6 *		0.4508	21.99	11.33	33.32	46.86	-13.54	AVG
7		0.8375	11.01	11.22	22.23	56.00	-33.77	QP
8		0.8375	5.43	11.22	16.65	46.00	-29.35	AVG
9		12.4180	3.75	11.49	15.24	60.00	-44.76	QP
10		12.4180	-1.04	11.49	10.45	50.00	-39.55	AVG
11		29.2695	17.10	10.70	27.80	60.00	-32.20	QP
12		29.2695	12.08	10.70	22.78	50.00	-27.22	AVG

Note:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)

Limit (dB μ V) = Limit stated in standard

Margin (dB) = Measurement (dB μ V) – Limits (dB μ V)

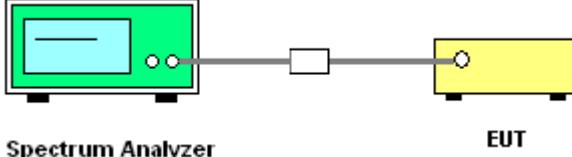
Q.P. = Quasi-Peak

AVG = average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

6.2.4. Maximum Conducted (Average) Output Power

6.2.5. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB 558074
Limit:	30dBm
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none">1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r05.2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.3. Set to the maximum power setting and enable the EUT transmit continuously.4. Measure the conducted output power and record the results in the test report.
Test Result:	PASS

6.2.6. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Aug. 11, 2017
RF cable (9kHz-40GHz)	TCT	RE-06	N/A	Aug. 12, 2017
Antenna Connector	TCT	RFC-01	N/A	Aug. 12, 2017

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.2.7. Test Data

802.11b mode

Test channel	Maximum Conducted Output Power (dBm)	Limit (dBm)	Result
Lowest	13.63	30.00	PASS
Middle	14.44	30.00	PASS
Highest	14.10	30.00	PASS

802.11g mode

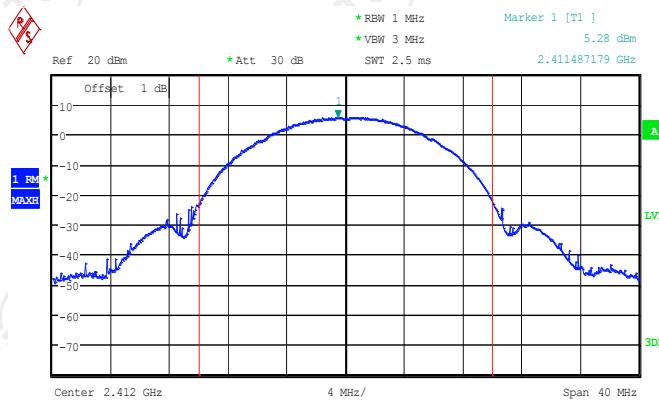
Test channel	Maximum Conducted Output Power (dBm)	Limit (dBm)	Result
Lowest	11.05	30.00	PASS
Middle	11.16	30.00	PASS
Highest	11.44	30.00	PASS

802.11n(H20) mode

Test channel	Maximum Conducted Output Power (dBm)	Limit (dBm)	Result
Lowest	11.27	30.00	PASS
Middle	11.49	30.00	PASS
Highest	11.59	30.00	PASS

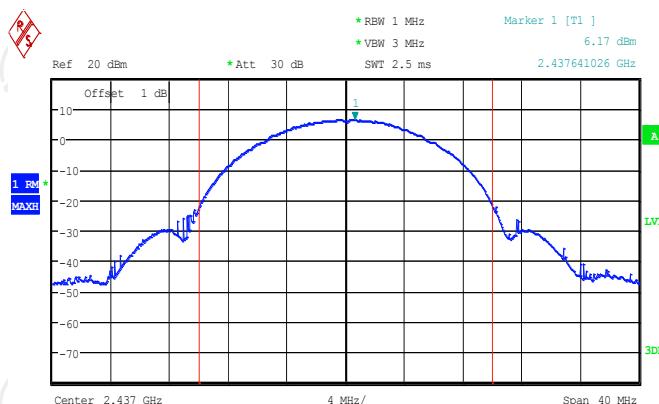
Test plots as follows:
802.11b Modulation

Lowest channel



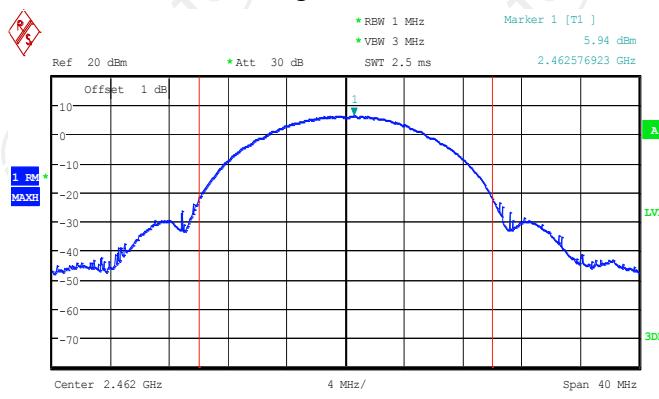
Tx Channel
 Bandwidth 20 MHz Power 13.63 dBm

Middle channel



Tx Channel
 Bandwidth 20 MHz Power 14.44 dBm

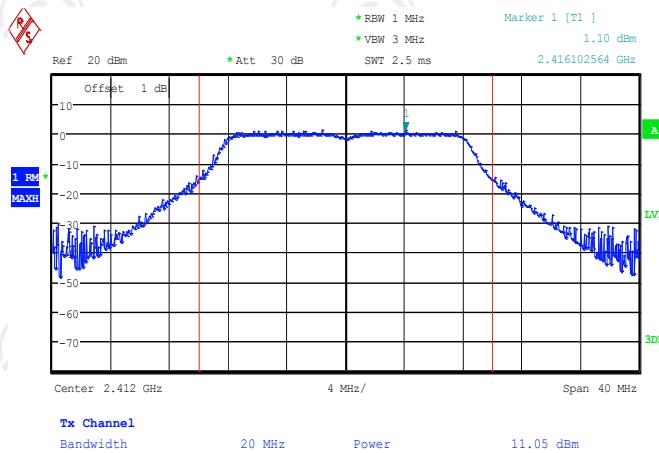
Highest channel



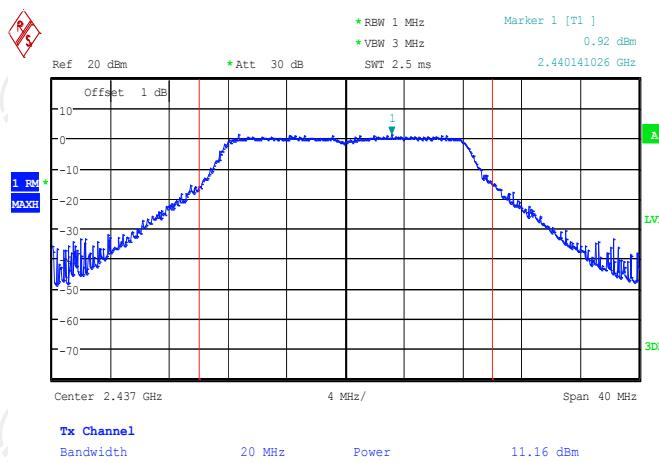
14.10 dBm

802.11g Modulation

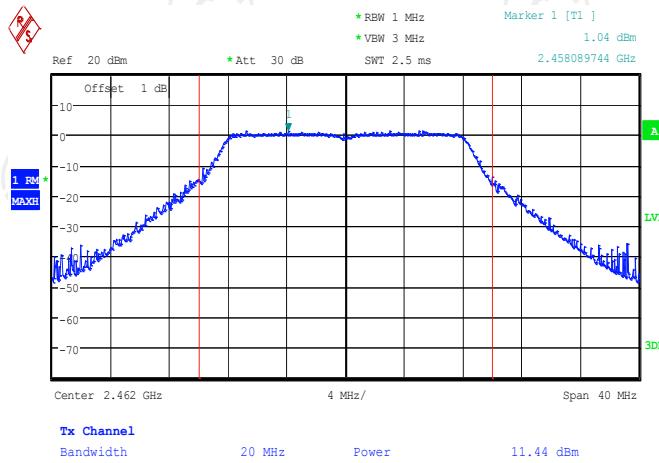
Lowest channel



Middle channel

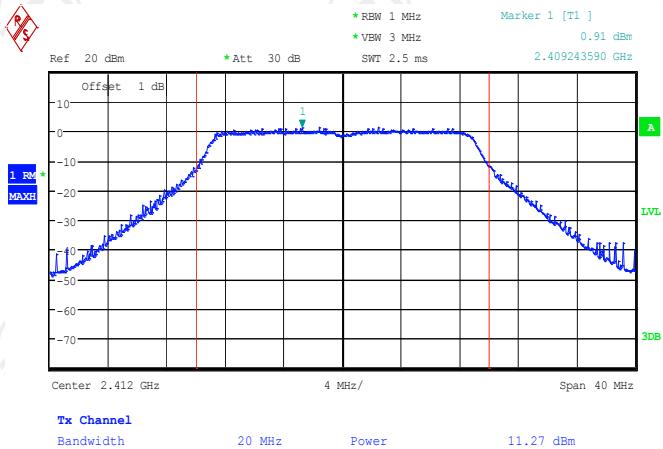


Highest channel

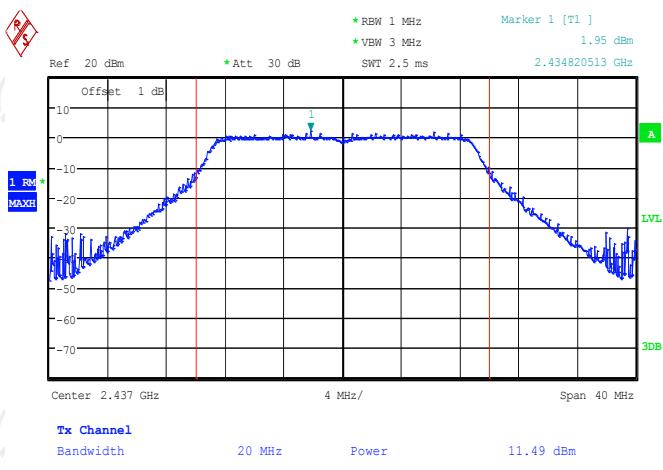


802.11n (HT20) Modulation

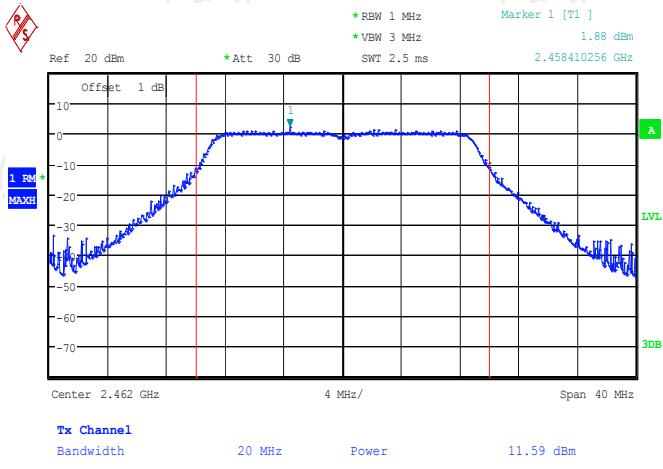
Lowest channel



Middle channel



Highest channel



6.3. Emission Bandwidth

6.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB 558074
Limit:	>500kHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none">1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r05.2. Set to the maximum power setting and enable the EUT transmit continuously.3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.4. Measure and record the results in the test report.
Test Result:	PASS

6.3.2. Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Aug. 11, 2017
RF cable (9kHz-40GHz)	TCT	RE-06	N/A	Aug. 12, 2017
Antenna Connector	TCT	RFC-01	N/A	Aug. 12, 2017

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

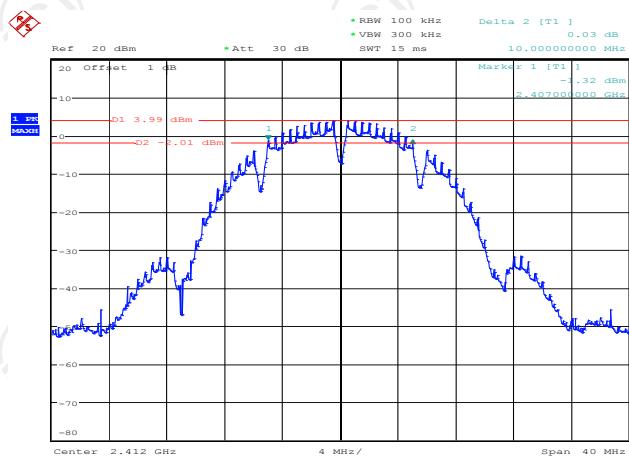
6.3.3. Test data

Test channel	6dB Emission Bandwidth (MHz)		
	802.11b	802.11g	802.11n(H20)
Lowest	10.00	16.54	17.69
Middle	10.06	16.41	17.56
Highest	10.13	16.54	17.69
Limit:	>500k		
Test Result:	PASS		

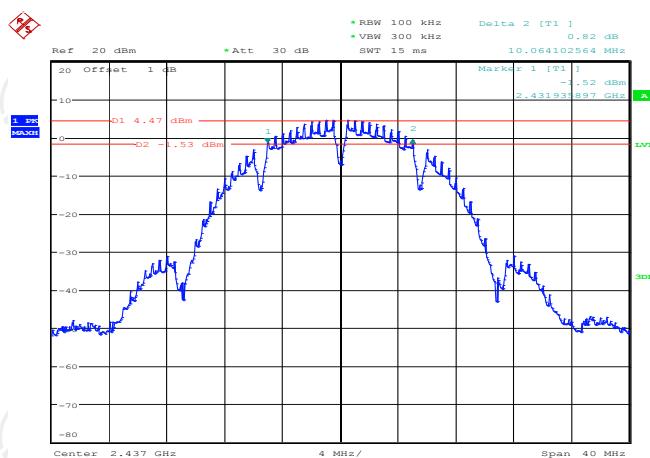
Test plots as follows:

802.11b Modulation

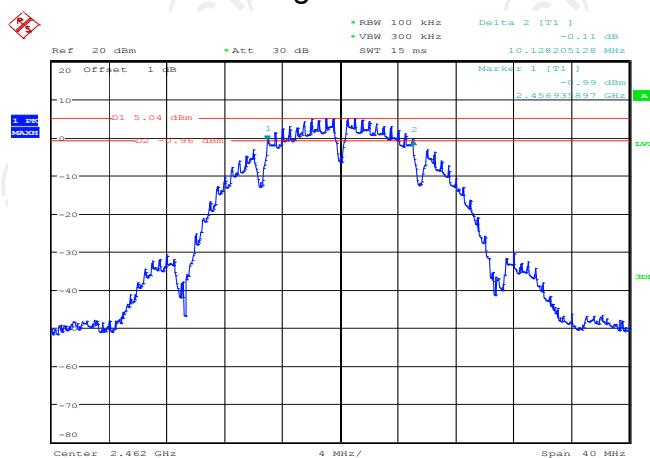
Lowest channel



Middle channel

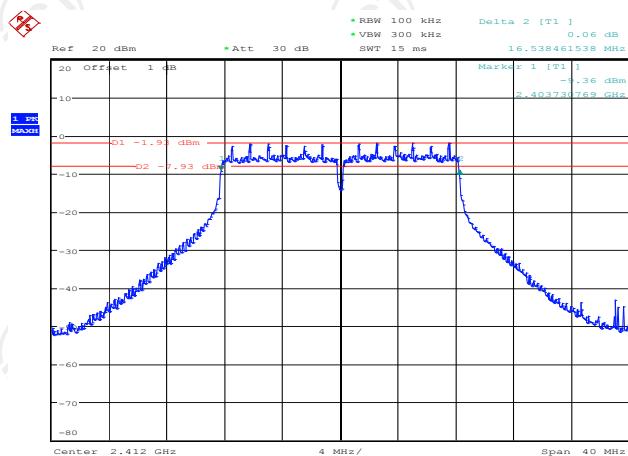


Highest channel

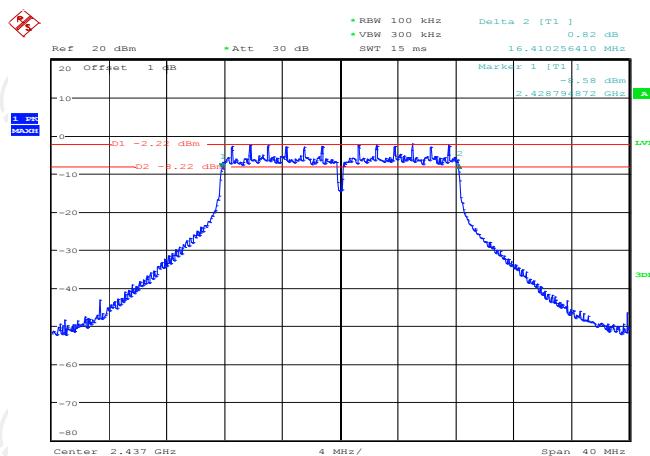


802.11g Modulation

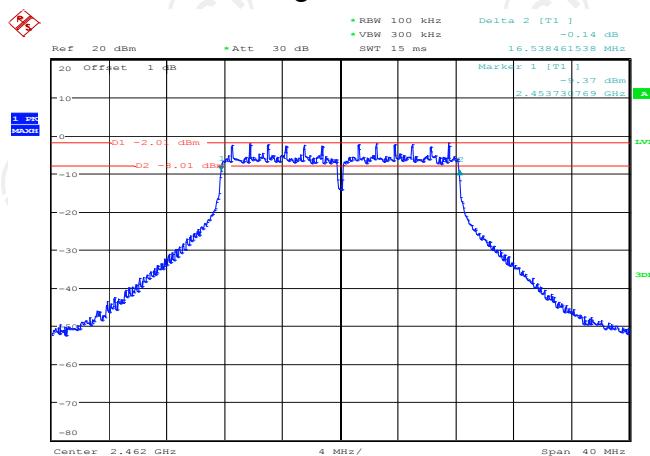
Lowest channel



Middle channel

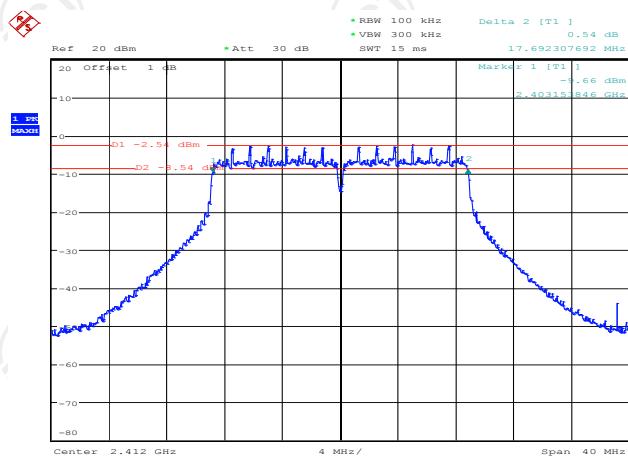


Highest channel

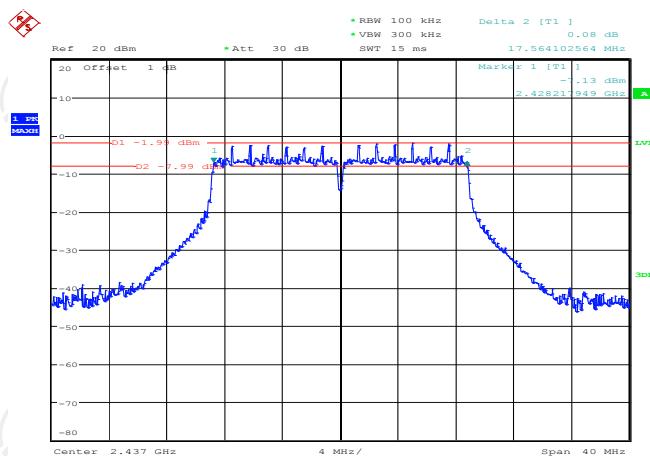


802.11n (HT20) Modulation

Lowest channel

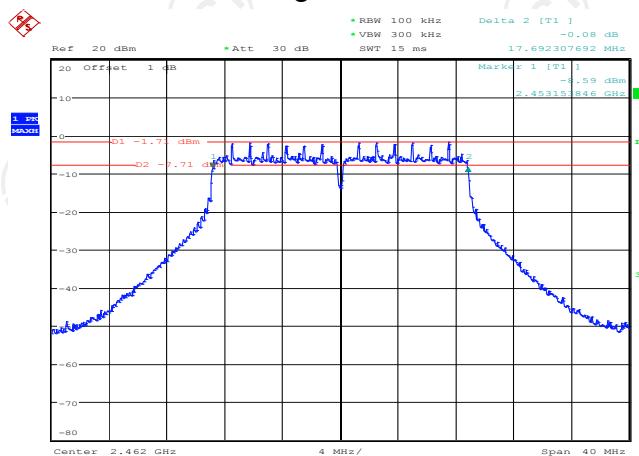


Middle channel



Date: 28.NOV.2016 18:12:00

Highest channel



6.4. Power Spectral Density

6.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB 558074
Limit:	The average power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.
Test Setup:	<p>The diagram illustrates the test setup. A green 'Spectrum Analyzer' is connected via a grey 'RF cable' and a small white 'Attenuator' to a yellow 'EUT' (Equipment Under Test).</p>
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none">1. The testing follows Measurement Procedure 10.3 Method AVGPSD of FCC KDB Publication No.558074 D01 DTS Meas. Guidance v03r052. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.3. Set to the maximum power setting and enable the EUT transmit continuously.4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW): $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$. Video bandwidth VBW $\geq 3 \times \text{RBW}$. Set the span to at least 1.5 times the OBW.5. Detector = RMS, Sweep time = auto couple.6. Employ trace averaging (RMS) mode over a minimum of 100 traces. Use the peak marker function to determine the maximum power level.7. Measure and record the results in the test report.
Test Result:	PASS

6.4.2. Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Aug. 11, 2017
RF cable (9kHz-40GHz)	TCT	RE-06	N/A	Aug. 12, 2017
Antenna Connector	TCT	RFC-01	N/A	Aug. 12, 2017

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

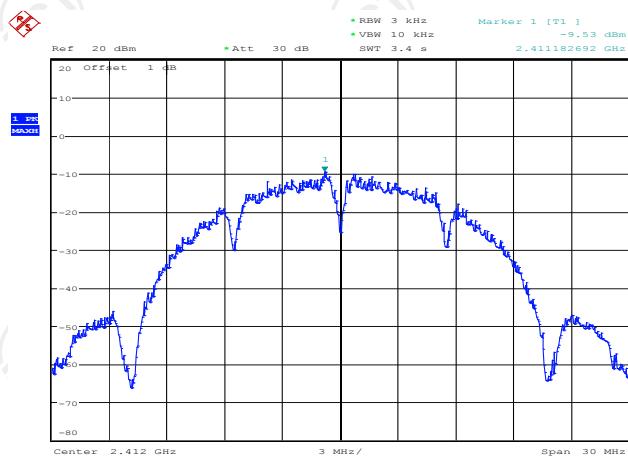
6.4.3. Test data

Test channel	AVG Power Spectral Density (dBm/3kHz)		
	802.11b	802.11g	802.11n(H20)
Lowest	-9.53	-16.63	-17.14
Middle	-10.12	-15.79	-16.36
Highest	-9.24	-14.30	-15.88
Limit:	8dBm/3kHz		
Test Result:	PASS		

Test plots as follows:

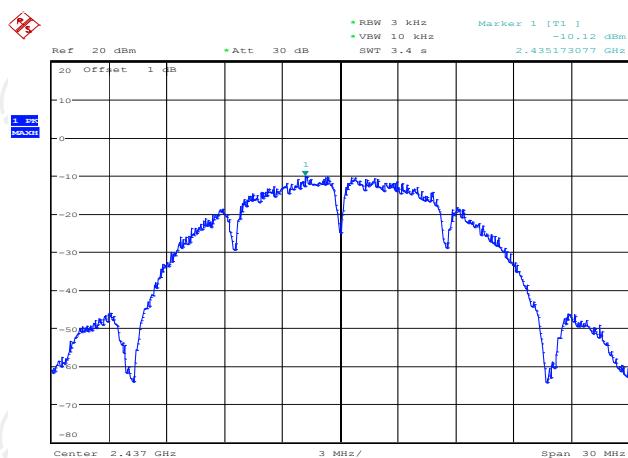
802.11b Modulation

Lowest channel



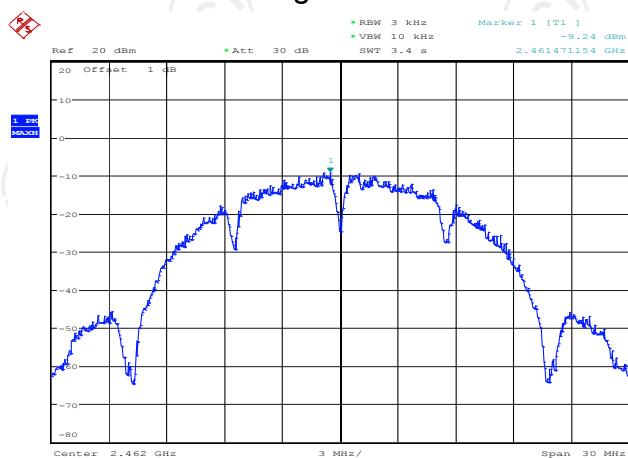
Date: 29.NOV.2016 08:57:17

Middle channel



Date: 29.NOV.2016 08:59:09

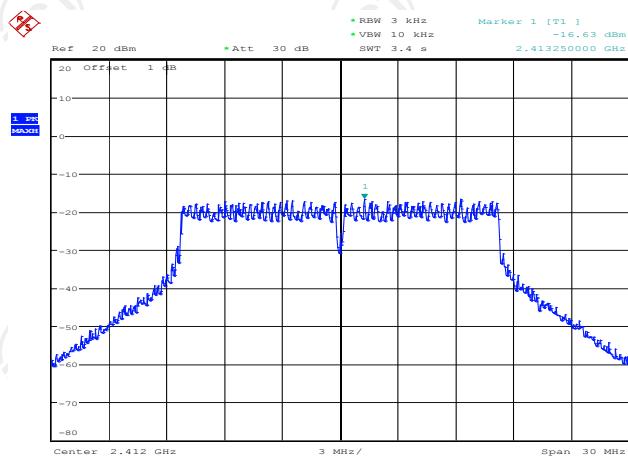
Highest channel



Date: 29.NOV.2016 09:01:15

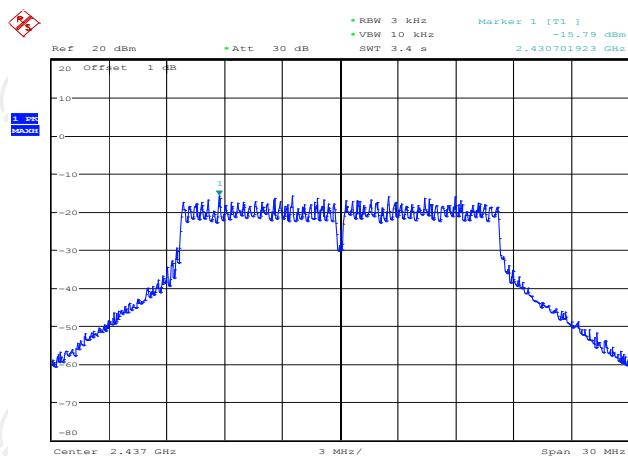
802.11g Modulation

Lowest channel



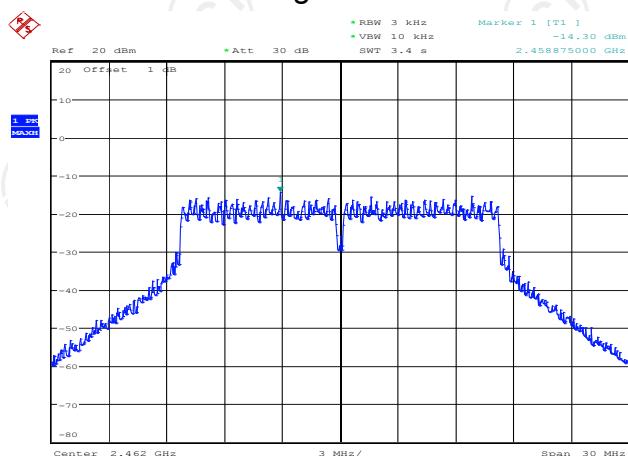
Date: 29.NOV.2016 09:04:08

Middle channel



Date: 29.NOV.2016 09:06:21

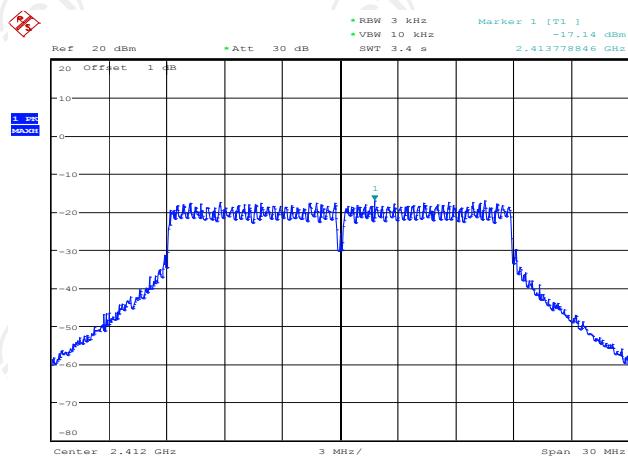
Highest channel



Date: 29.NOV.2016 09:09:27

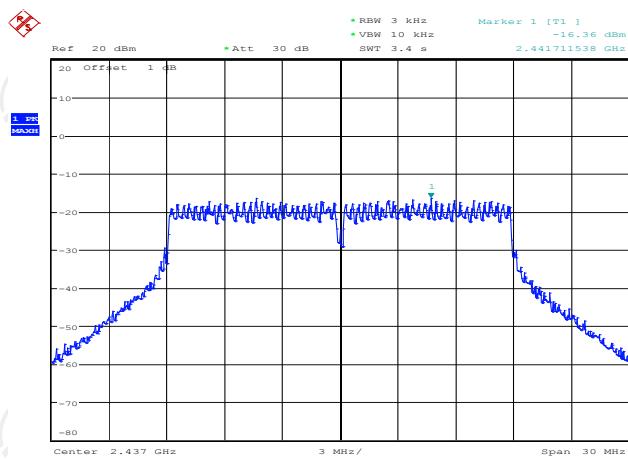
802.11n (HT20) Modulation

Lowest channel



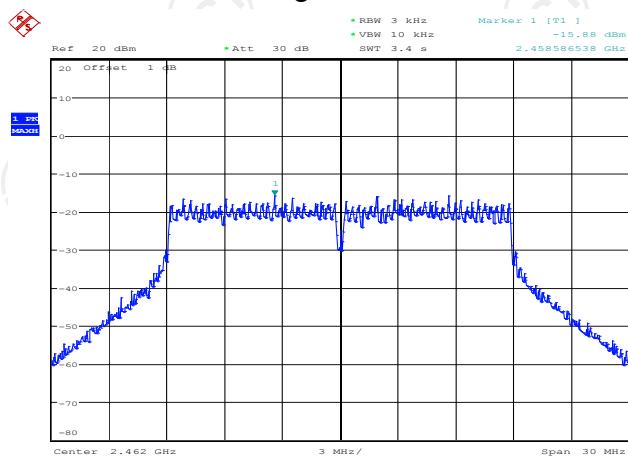
Date: 29.NOV.2016 09:11:45

Middle channel



Date: 29.NOV.2016 09:14:05

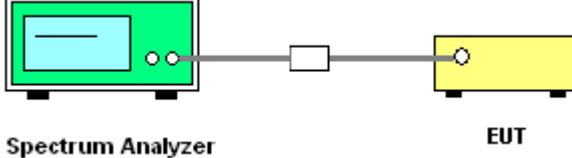
Highest channel



Date: 29.NOV.2016 09:16:30

6.5. Conducted Band Edge and Spurious Emission Measurement

6.5.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074
Limit:	In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).
Test Setup:	 <p>The diagram illustrates the test setup. A green 'Spectrum Analyzer' is connected to a yellow 'EUT' (Equipment Under Test) through a grey 'RF cable'. A small white square component, likely an attenuator, is placed between the spectrum analyzer and the EUT.</p>
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none">1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.3. Set to the maximum power setting and enable the EUT transmit continuously.4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).5. Measure and record the results in the test report.6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
Test Result:	PASS

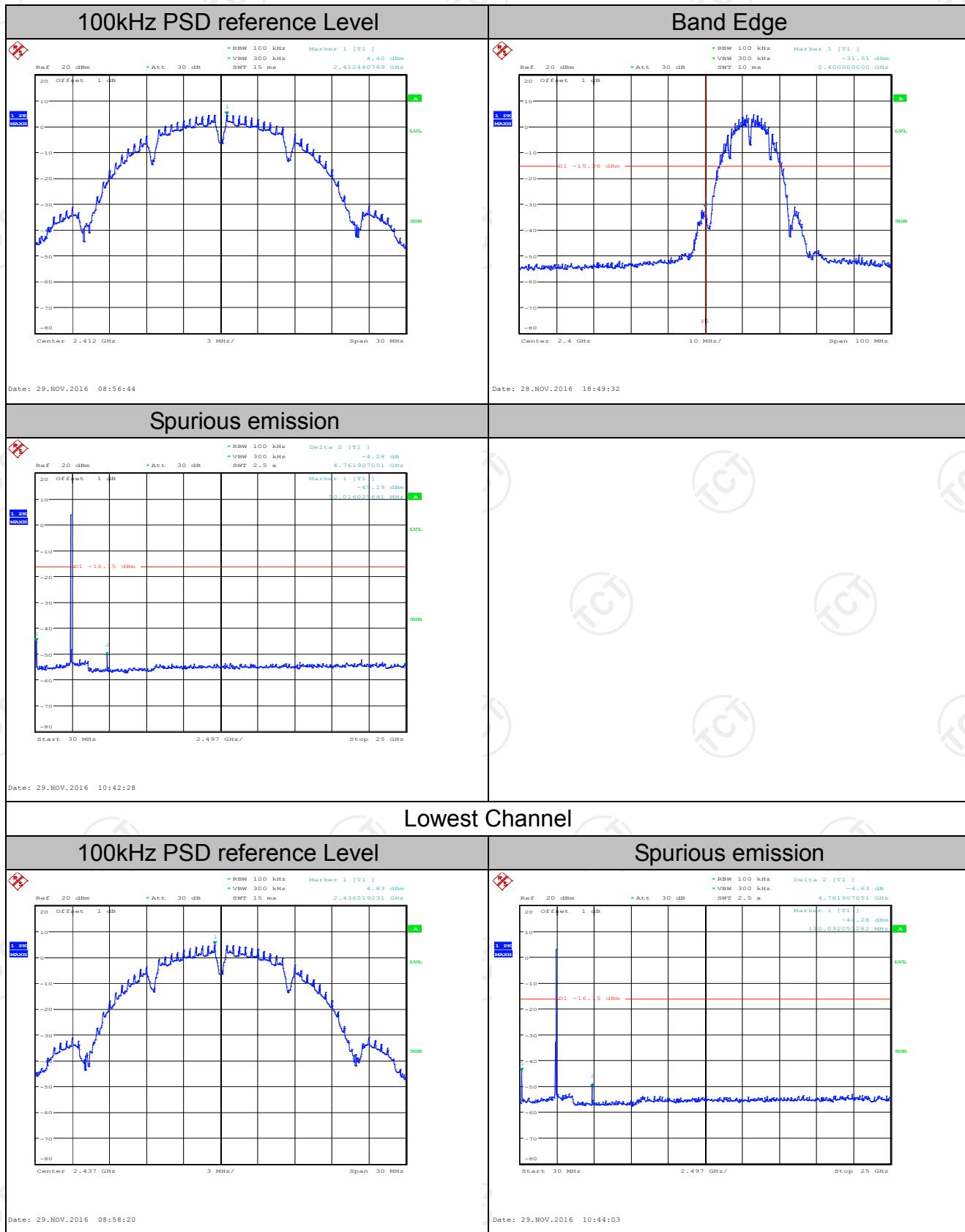
6.5.2. Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Aug. 11, 2017
RF cable (9kHz-40GHz)	TCT	RE-06	N/A	Aug. 12, 2017
Antenna Connector	TCT	RFC-01	N/A	Aug. 12, 2017

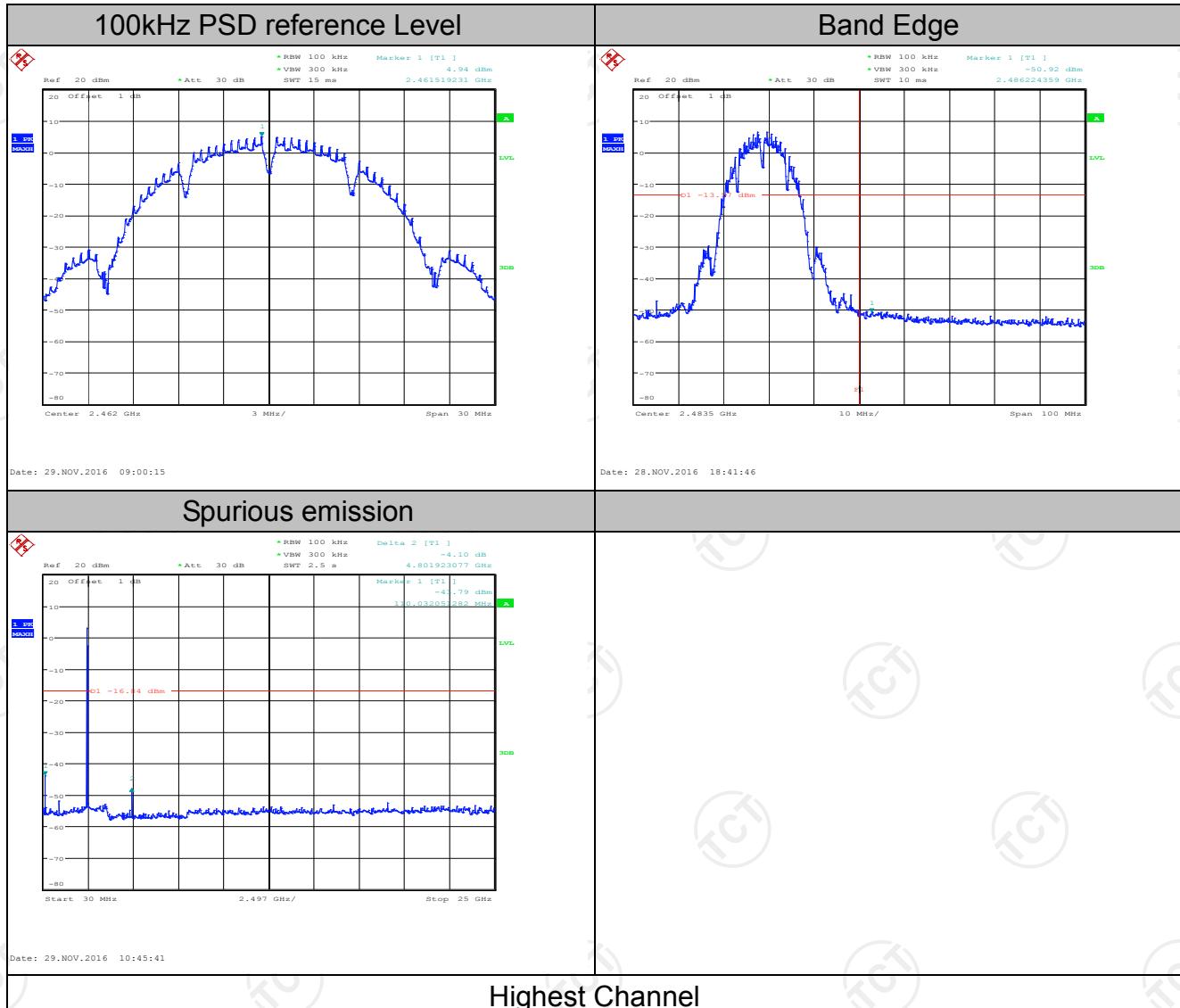
Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.5.3. Test Data

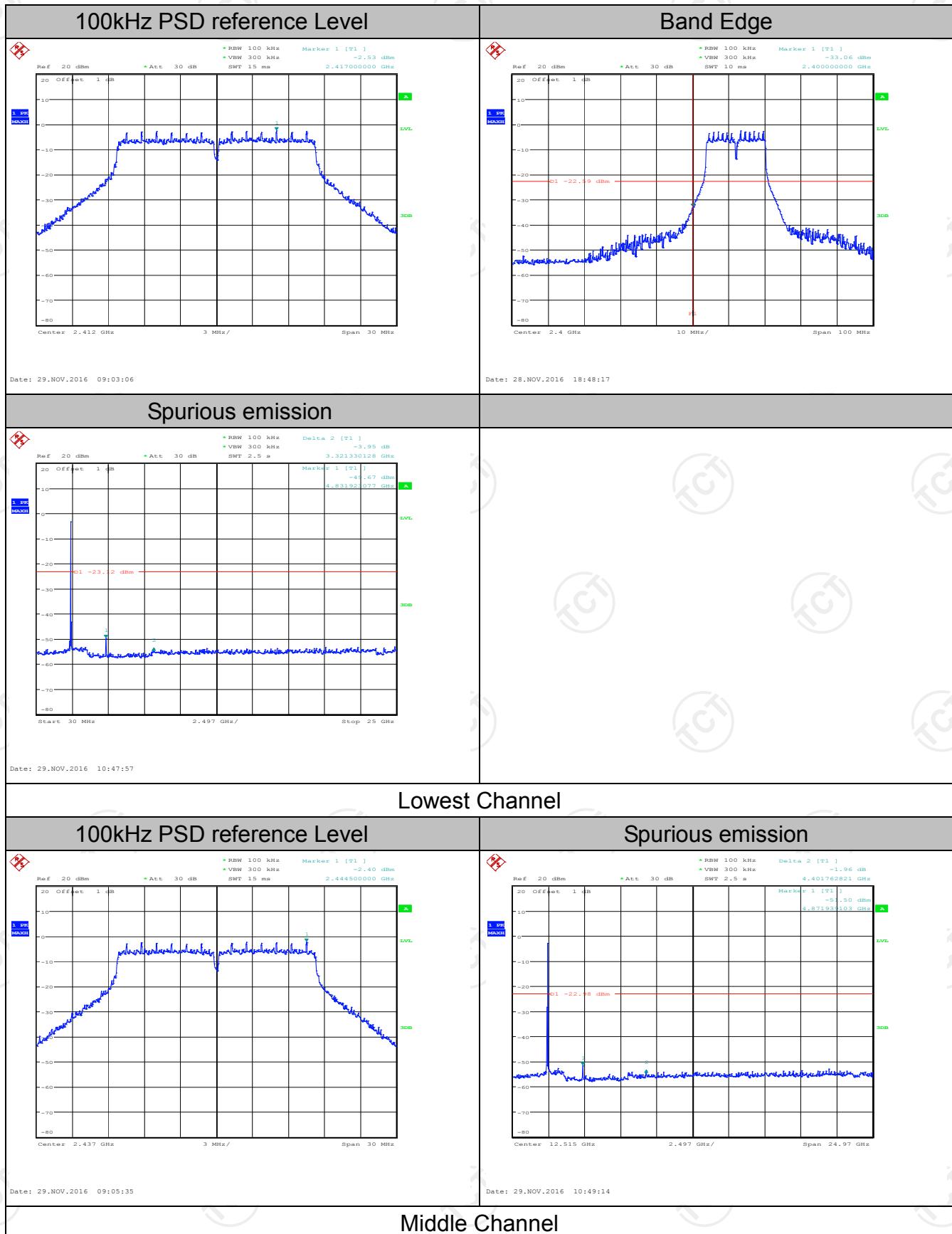
802.11b Modulation

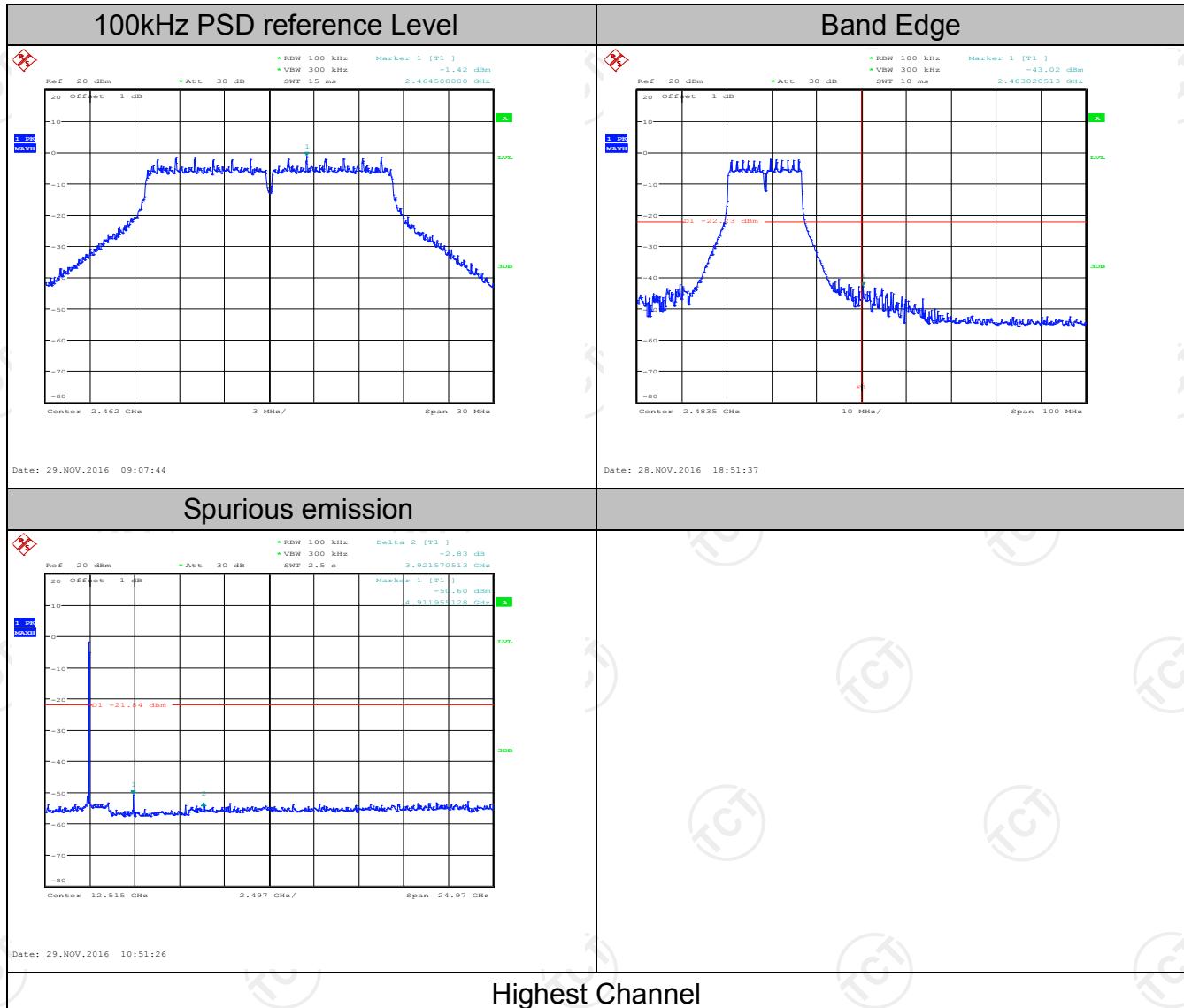


Middle Channel

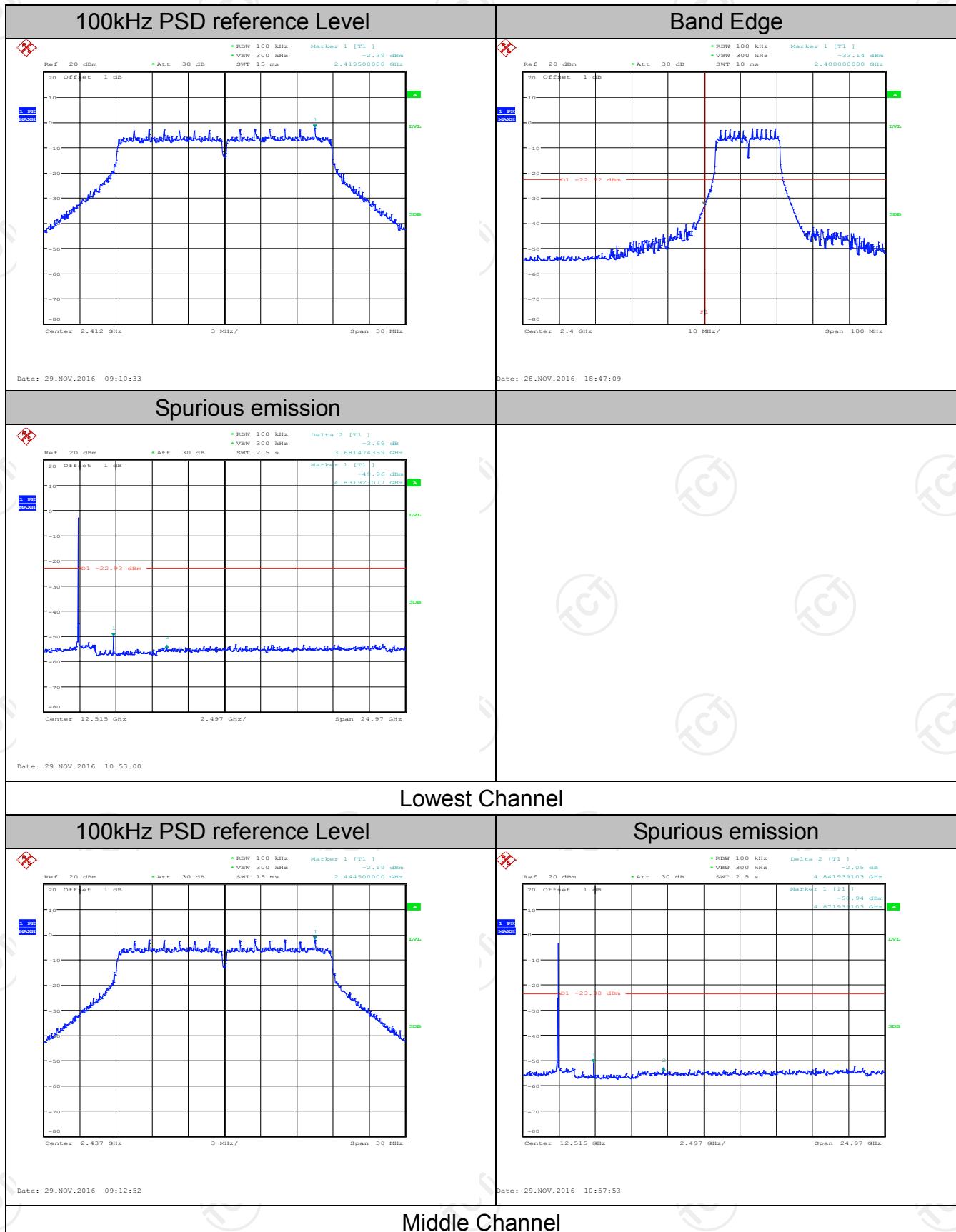


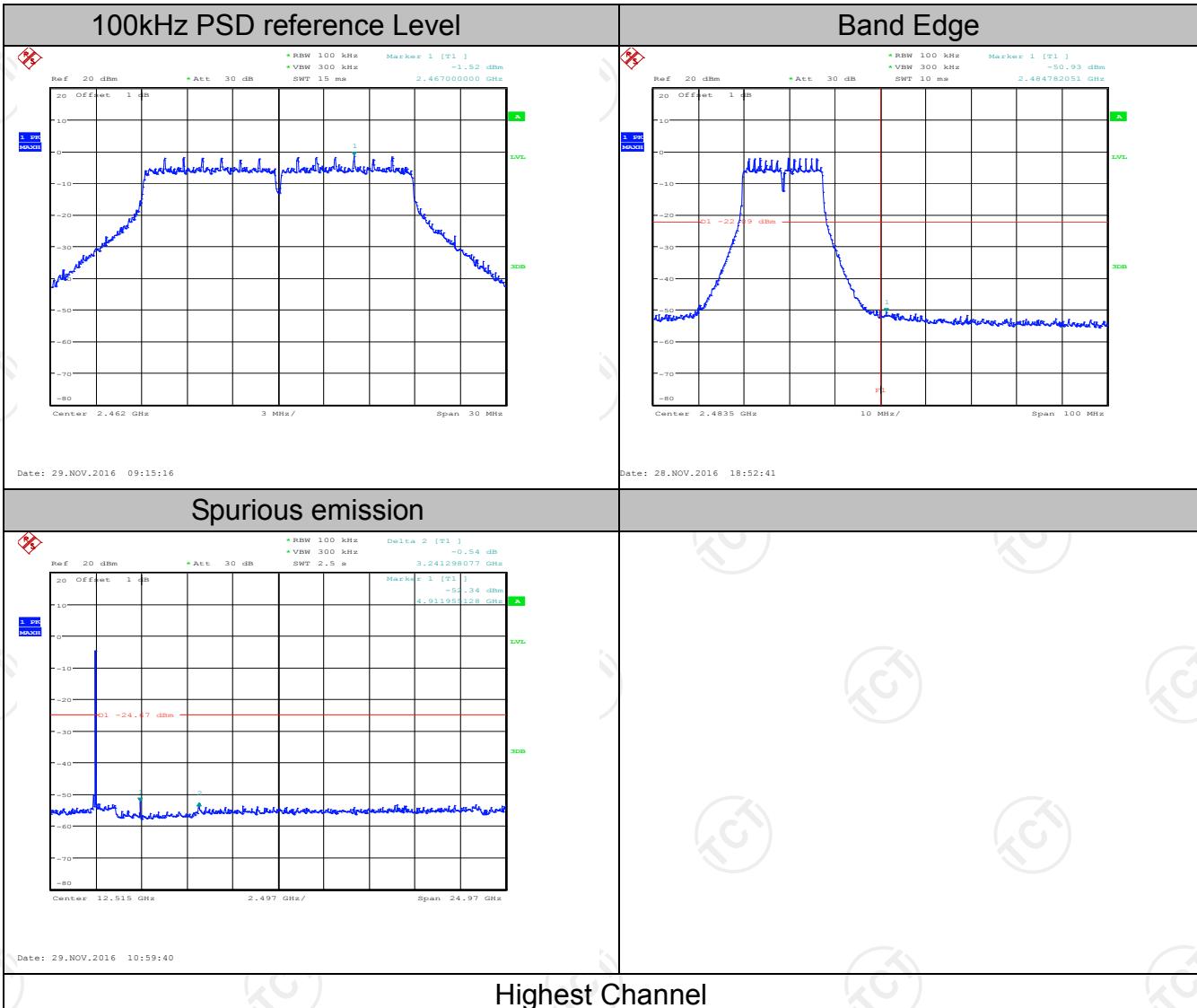
802.11g Modulation





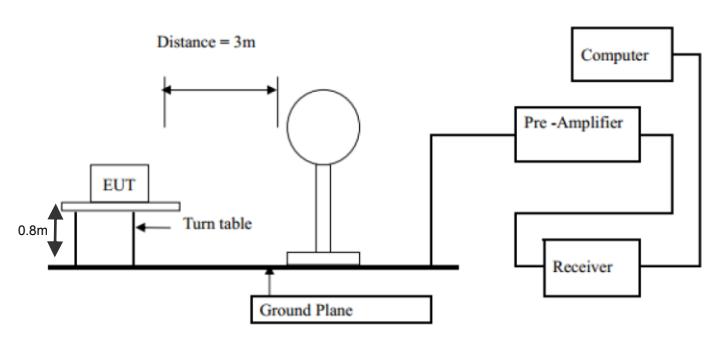
802.11n (HT20) Modulation

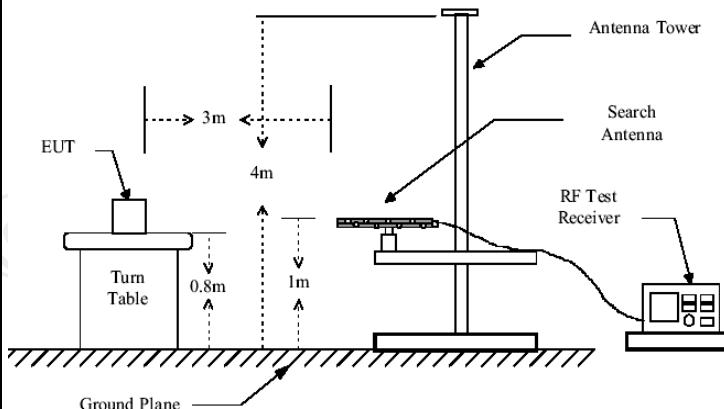




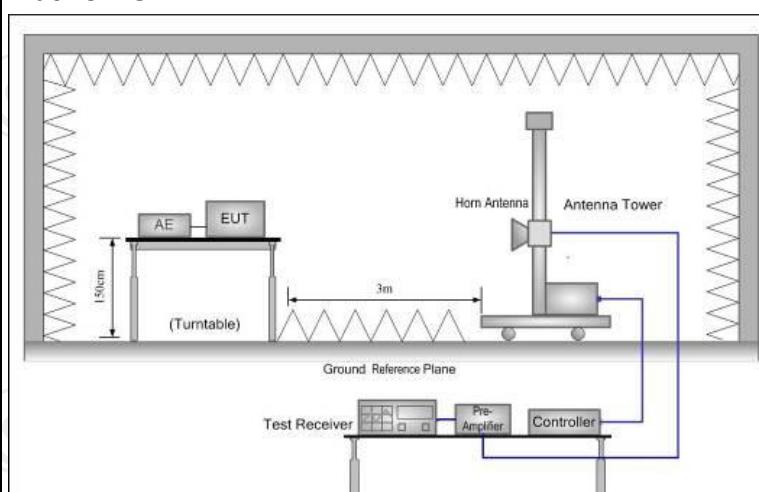
6.6. Radiated Spurious Emission Measurement

6.6.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209																																															
Test Method:	ANSI C63.10: 2013																																															
Frequency Range:	9 kHz to 25 GHz																																															
Measurement Distance:	3 m																																															
Antenna Polarization:	Horizontal & Vertical																																															
Operation mode:	Transmitting mode with modulation																																															
Receiver Setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>9kHz- 150kHz</td> <td>Quasi-peak</td> <td>200Hz</td> <td>1kHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td>150kHz- 30MHz</td> <td>Quasi-peak</td> <td>9kHz</td> <td>30kHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>100KHz</td> <td>300KHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td rowspan="2">Above 1GHz</td><td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </table>					Frequency	Detector	RBW	VBW	Remark	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value	Peak	1MHz	10Hz	Average Value														
Frequency	Detector	RBW	VBW	Remark																																												
9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value																																												
150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value																																												
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value																																												
Above 1GHz	Peak	1MHz	3MHz	Peak Value																																												
	Peak	1MHz	10Hz	Average Value																																												
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Field Strength (microvolts/meter)</th> <th>Measurement Distance (meters)</th> <th></th> </tr> </thead> <tbody> <tr> <td>0.009-0.490</td> <td>2400/F(KHz)</td> <td>300</td> <td></td> </tr> <tr> <td>0.490-1.705</td> <td>24000/F(KHz)</td> <td>30</td> <td></td> </tr> <tr> <td>1.705-30</td> <td>30</td> <td>30</td> <td></td> </tr> <tr> <td>30-88</td> <td>100</td> <td>3</td> <td></td> </tr> <tr> <td>88-216</td> <td>150</td> <td>3</td> <td></td> </tr> <tr> <td>216-960</td> <td>200</td> <td>3</td> <td></td> </tr> <tr> <td>Above 960</td> <td>500</td> <td>3</td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Field Strength (microvolts/meter)</th> <th>Measurement Distance (meters)</th> <th>Detector</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Above 1GHz</td><td>500</td> <td>3</td> <td>Average</td> </tr> <tr> <td>5000</td> <td>3</td> <td>Peak</td> </tr> </tbody> </table>					Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)		0.009-0.490	2400/F(KHz)	300		0.490-1.705	24000/F(KHz)	30		1.705-30	30	30		30-88	100	3		88-216	150	3		216-960	200	3		Above 960	500	3		Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)	Detector	Above 1GHz	500	3	Average	5000	3	Peak
Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)																																														
0.009-0.490	2400/F(KHz)	300																																														
0.490-1.705	24000/F(KHz)	30																																														
1.705-30	30	30																																														
30-88	100	3																																														
88-216	150	3																																														
216-960	200	3																																														
Above 960	500	3																																														
Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)	Detector																																													
Above 1GHz	500	3	Average																																													
	5000	3	Peak																																													
Test setup:	<p>For radiated emissions below 30MHz</p>  <p>30MHz to 1GHz</p>																																															



Above 1GHz



Test Procedure:

1. For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. 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.
For the radiated emission test above 1GHz:
Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for

	<p>receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.</p> <p>3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</p> <p>4. For measurement below 1GHz, 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.</p> <p>5. Use the following spectrum analyzer settings:</p> <ul style="list-style-type: none">(1) Span shall wide enough to fully capture the emission being measured;(2) Set RBW=100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold;(3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement. <p>For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</p>
Test results:	PASS

6.6.2. Test Instruments

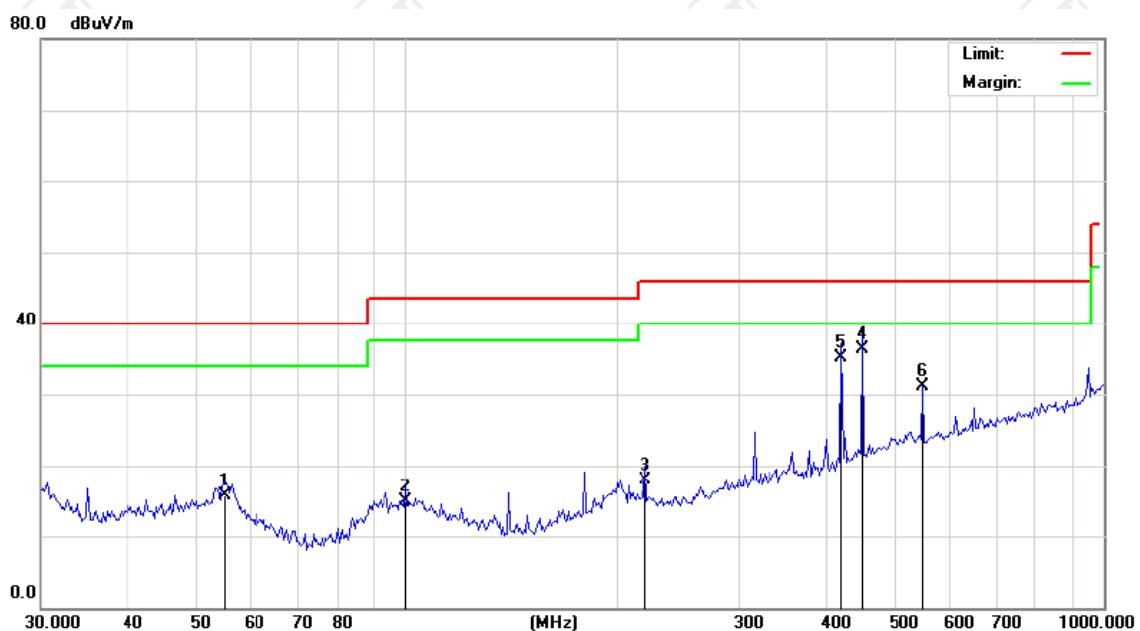
Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ESPI Test Receiver	ROHDE&SCHW ARZ	ESVD	100008	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHW ARZ	FSEM	848597/001	Aug. 11, 2017
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 12, 2017
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Aug. 11, 2017
Pre-amplifier	HP	8447D	2727A05017	Aug. 11, 2017
Loop antenna	ZHINAN	ZN30900A	12024	Aug. 13, 2017
Broadband Antenna	Schwarzbeck	VULB9163	340	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9170	373	Aug. 13, 2017
Coax cable (9kHz-40GHz)	TCT	RE-low-01	N/A	Aug. 11, 2017
Coax cable (9kHz-40GHz)	TCT	RE-high-02	N/A	Aug. 11, 2017
Coax cable (9kHz-40GHz)	TCT	RE-low-03	N/A	Aug. 11, 2017
Coax cable (9kHz-40GHz)	TCT	RE-High-04	N/A	Aug. 11, 2017
Antenna Mast	CCS	CC-A-4M	N/A	Aug. 12, 2017
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.6.3. Test Data

Please refer to following diagram for individual
Below 1GHz

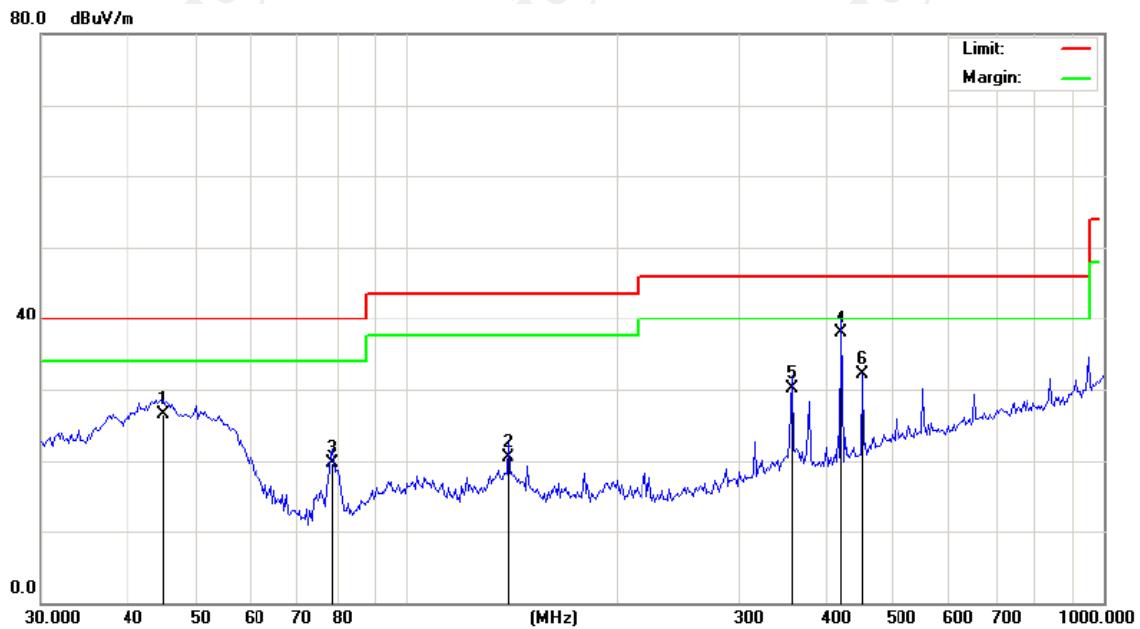
Horizontal:



Site: FCC Part 15B Class B RE_3 m Polarization: **Horizontal** Temperature: 25
Power: Humidity: 54 %

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		55.0422	28.10	-12.42	15.68	40.00	-24.32	QP	
2		99.8598	26.30	-11.45	14.85	43.50	-28.65	QP	
3		220.5476	28.80	-10.96	17.84	46.00	-28.16	QP	
4	*	450.2434	40.80	-4.57	36.23	46.00	-9.77	QP	
5		420.8830	40.60	-5.51	35.09	46.00	-10.91	QP	
6		551.1956	33.51	-2.44	31.07	46.00	-14.93	QP	

Vertical:



Site

Polarization: **Vertical**

Temperature: 25

Limit: FCC Part 15B Class B RE_3 m

Power:

Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level	Correct Factor	Measure- ment	Limit	Over	Detector	Comment
			dBuV	dB	dBuV/m	dB			
1		44.9612	38.80	-12.26	26.54	40.00	-13.46	QP	
2		139.9011	35.90	-15.39	20.51	43.50	-22.99	QP	
3		78.4240	36.10	-16.36	19.74	40.00	-20.26	QP	
4	*	420.8830	43.40	-5.51	37.89	46.00	-8.11	QP	
5		357.5910	37.10	-7.07	30.03	46.00	-15.97	QP	
6		450.2435	36.74	-4.57	32.17	46.00	-13.83	QP	

Note: 1. The low frequency, which started from 9KHz-30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported

2. Measurements were conducted in all three channels (high, middle, low) and all modulation(802.11b, 802.11g, 802.11n(HT20)), and the worst case Mode (Highest channel and 802.11b) was submitted only.

Test Result of Radiated Spurious at Band edges

Modulation Type: 802.11b

Low channel: 2412 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	Correction Factor (dB/m)	Peak Final Emission Level	Peak limit (dB μ V/m)	AV limit (dB μ V/m)
2310	H	45.83	-4.20	41.63	74.00	54.00
2377.38	H	48.37	-4.10	44.27	74.00	54.00
2390	H	53.40	-3.94	49.46	74.00	54.00
2310	V	44.22	-4.20	40.02	74.00	54.00
2377.38	V	54.25	-4.10	50.15	74.00	54.00
2390	V	55.77	-3.94	51.83	74.00	54.00

Modulation Type: 802.11b

Low channel: 2462 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	Correction Factor (dB/m)	Peak Final Emission Level	Peak limit (dB μ V/m)	AV limit (dB μ V/m)
2483.5	H	51.14	-3.60	47.54	74.00	54.00
2487.09	H	47.83	-3.50	44.33	74.00	54.00
2500	H	45.23	-3.34	41.89	74.00	54.00
2483.5	V	54.86	-3.60	51.26	74.00	54.00
2487.09	V	47.24	-3.50	43.74	74.00	54.00
2500	V	42.56	-3.34	39.22	74.00	54.00

Modulation Type: 802.11g

Low channel: 2412 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	Correction Factor (dB/m)	Peak Final Emission Level	Peak limit (dB μ V/m)	AV limit (dB μ V/m)
2310	H	43.06	-4.20	38.86	74.00	54.00
2388.96	H	50.89	-4.12	46.77	74.00	54.00
2390	H	53.42	-3.94	49.48	74.00	54.00
2310	V	45.74	-4.20	41.54	74.00	54.00
2388.96	V	49.69	-4.12	45.57	74.00	54.00
2390	V	54.17	-3.94	50.23	74.00	54.00

Modulation Type: 802.11g

Low channel: 2462 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	Correction Factor (dB/m)	Peak Final Emission Level	Peak limit (dB μ V/m)	AV limit (dB μ V/m)
2483.5	H	52.34	-3.60	48.74	74.00	54.00
2487.59	H	50.05	-3.52	46.53	74.00	54.00
2500	H	46.78	-3.34	43.44	74.00	54.00
2483.5	V	51.62	-3.60	48.02	74.00	54.00
2487.59	V	47.73	-3.52	44.21	74.00	54.00
2500	V	47.5	-3.34	44.16	74.00	54.00

Modulation Type: 802.11n(20MHz)

Low channel: 2412 MHz						
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	Correction Factor (dB/m)	Peak Final Emission Level	Peak limit (dB μ V/m)	AV limit (dB μ V/m)
2310	H	46.51	-4.20	42.31	74.00	54.00
2388.01	H	53.68	-4.10	49.58	74.00	54.00
2390	H	54.76	-3.94	50.82	74.00	54.00
2310	V	48.06	-4.20	43.86	74.00	54.00
2388.01	V	54.28	-4.10	50.18	74.00	54.00
2390	V	55.53	-3.94	51.59	74.00	54.00

Modulation Type: 802.11n(20MHz)

Low channel: 2462 MHz						
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	Correction Factor (dB/m)	Peak Final Emission Level	Peak limit (dB μ V/m)	AV limit (dB μ V/m)
2483.5	H	52.60	-3.60	49.00	74.00	54.00
2392.55	H	51.57	-3.50	48.07	74.00	54.00
2500	H	47.77	-3.34	44.43	74.00	54.00
2483.5	V	53.22	-3.60	49.62	74.00	54.00
2392.55	V	50.79	-3.50	47.29	74.00	54.00
2500	V	48.64	-3.34	45.30	74.00	54.00

Note:

1. Peak Final Emission Level=Peak Reading + Correction Factor;
2. Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

Above 1GHz

Modulation Type: 802.11b

Low channel: 2412 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
4824	H	50.74	---	0.75	51.49	---	74	54	-2.51
7236	H	41.46	---	9.87	51.33	---	74	54	-2.67
---	H	---	---	---	---	---	---	---	---
4824	V	49.78	---	0.75	50.53	---	74	54	-3.47
7236	V	41.58	---	9.87	51.45	---	74	54	-2.55
---	V	---	---	---	---	---	---	---	---

Middle channel: 2437MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
4874	H	49.59	---	0.97	50.56	---	74	54	-3.44
7311	H	41.12	---	9.83	50.95	---	74	54	-3.05
---	H	---	---	---	---	---	---	---	---
4874	V	49.45	---	0.97	50.42	---	74	54	-3.58
7311	V	40.96	---	9.83	50.79	---	74	54	-3.21
---	V	---	---	---	---	---	---	---	---

High channel: 2462 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
4924	H	49.57	---	1.18	50.75	---	74	54	-3.25
7386	H	39.65	---	10.07	49.72	---	74	54	-4.28
---	H	---	---	---	---	---	---	---	---
4924	V	49.99	---	1.18	51.17	---	74	54	-2.83
7386	V	40.53	---	10.07	50.60	---	74	54	-3.40
---	V	---	---	---	---	---	---	---	---

Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dB μ V/m)-Average limit (dB μ V/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency. The highest test frequency is 25GHz.
5. Data of measurement shown “---”in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

Modulation Type: 802.11g

Low channel: 2412 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
4824	H	49.36	---	0.75	50.11	---	74	54	-3.89
7236	H	40.61	---	9.87	50.48	---	74	54	-3.52
---	H	---	---	---	---	---	---	---	---
4824	V	47.57	---	0.75	48.32	---	74	54	-5.68
7236	V	40.68	---	9.87	50.55	---	74	54	-3.45
---	V	---	---	---	---	---	---	---	---

Middle channel: 2437MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
4874	H	48.15	---	0.97	49.12	---	74	54	-4.88
7311	H	40.17	---	9.83	50.00	---	74	54	-4.00
---	H	---	---	---	---	---	---	---	---
4874	V	47.32	---	0.97	48.29	---	74	54	-5.71
7311	V	40.58	---	9.83	50.41	---	74	54	-3.59
---	V	---	---	---	---	---	---	---	---

High channel: 2462 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
4924	H	47.76	---	1.18	48.94	---	74	54	-5.06
7386	H	39.94	---	10.07	50.01	---	74	54	-3.99
---	H	---	---	---	---	---	---	---	---
4924	V	46.57	---	1.18	47.75	---	74	54	-6.25
7386	V	40.20	---	10.07	50.27	---	74	54	-3.73
---	V	---	---	---	---	---	---	---	---

Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dB μ V/m)-Average limit (dB μ V/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency. The highest test frequency is 25GHz.
5. Data of measurement shown “---”in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

Modulation Type: 802.11n (HT20)

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
4824	H	49.07	---	0.75	49.82	---	74	54	-4.18
7236	H	40.60	---	9.87	50.47	---	74	54	-3.53
---	H	---	---	---	---	---	---	---	---
4824	V	47.59	---	0.75	48.34	---	74	54	-5.66
7236	V	40.24	---	9.87	50.11	---	74	54	-3.89
---	V	---	---	---	---	---	---	---	---

Middle channel: 2437MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
4874	H	47.29	---	0.97	48.26	---	74	54	-5.74
7311	H	40.47	---	9.83	50.3	---	74	54	-3.70
---	H	---	---	---	---	---	---	---	---
4874	V	47.42	---	0.97	48.39	---	74	54	-5.61
7311	V	40.03	---	9.83	49.86	---	74	54	-4.14
---	V	---	---	---	---	---	---	---	---

High channel: 2462 MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
4924	H	48.16	---	1.18	49.34	---	74	54	-4.66
7386	H	40.64	---	10.07	50.71	---	74	54	-3.29
---	H	---	---	---	---	---	---	---	---
4924	V	47.00	---	1.18	48.18	---	74	54	-5.82
7386	V	40.28	---	10.07	50.35	---	74	54	-3.65
---	V	---	---	---	---	---	---	---	---

Note:

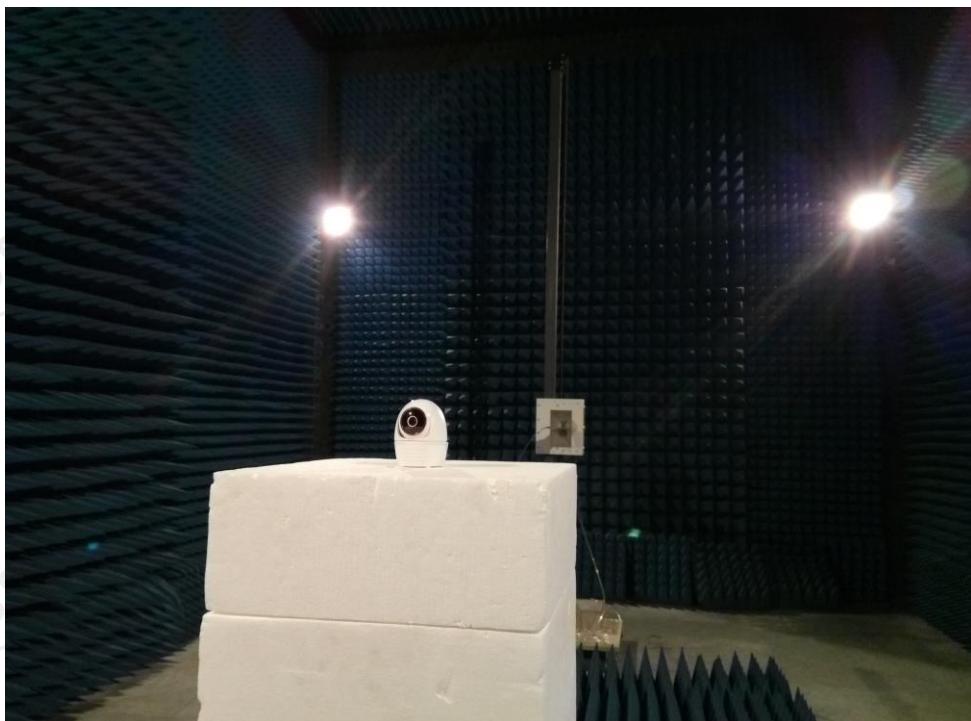
1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dB μ V/m)-Average limit (dB μ V/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency. The highest test frequency is 25GHz.
5. Data of measurement shown “---”in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

Appendix A: Photographs of Test Setup

Product: 1080P indoor PT IP Cam

Model: AWF23

Radiated Emission



CE



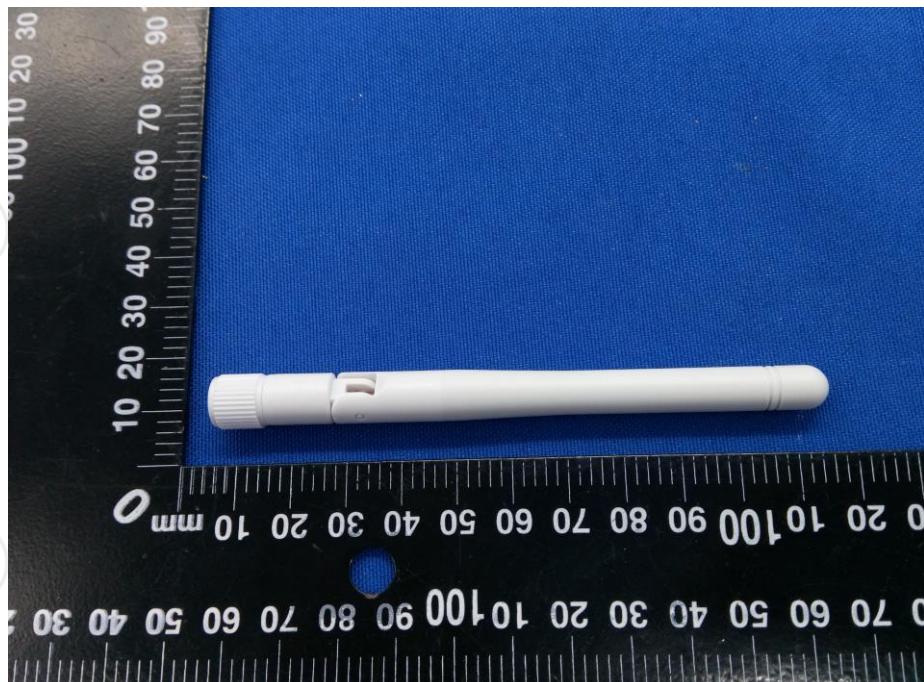
Appendix B: Photographs of EUT Product: 1080P indoor PT IP Cam Model: AWF23 External Photos



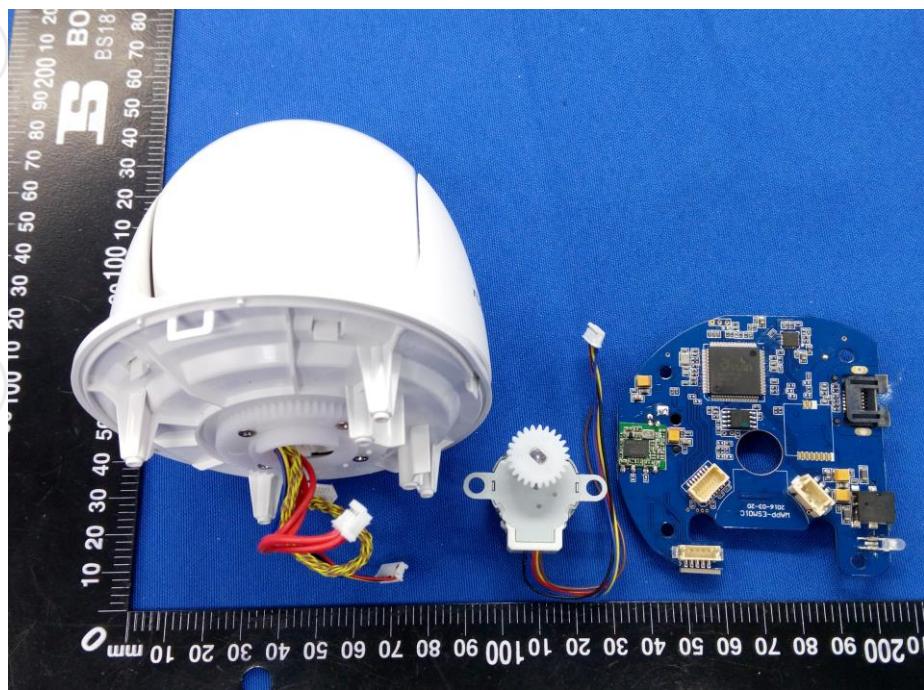
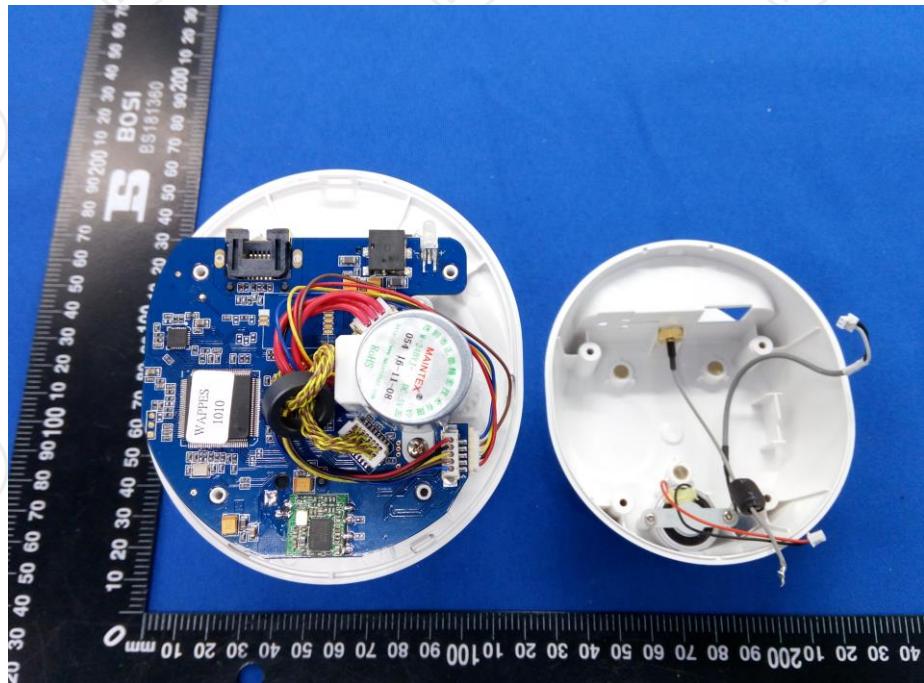


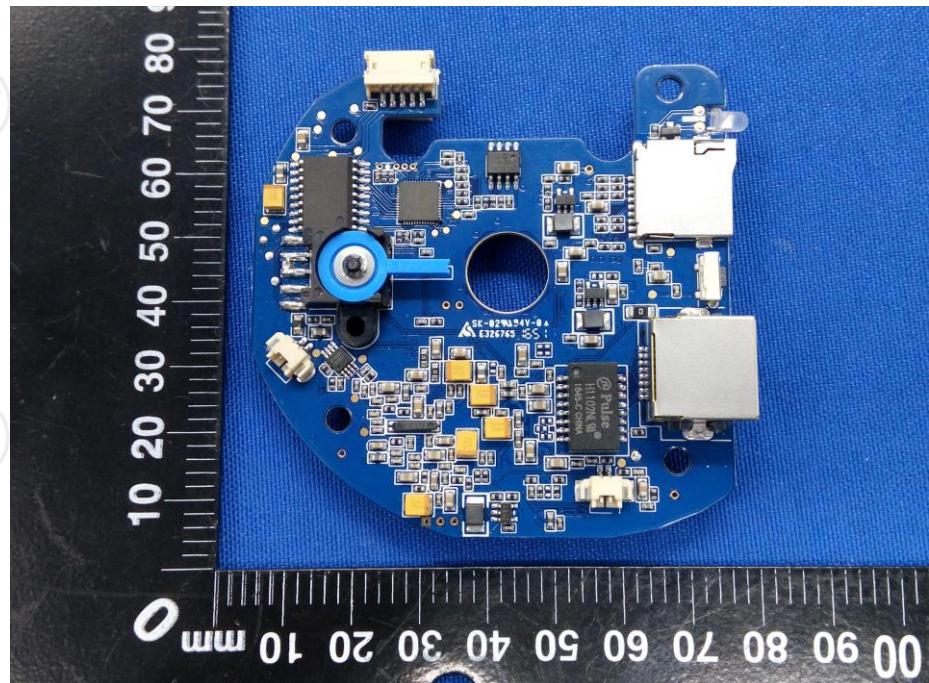
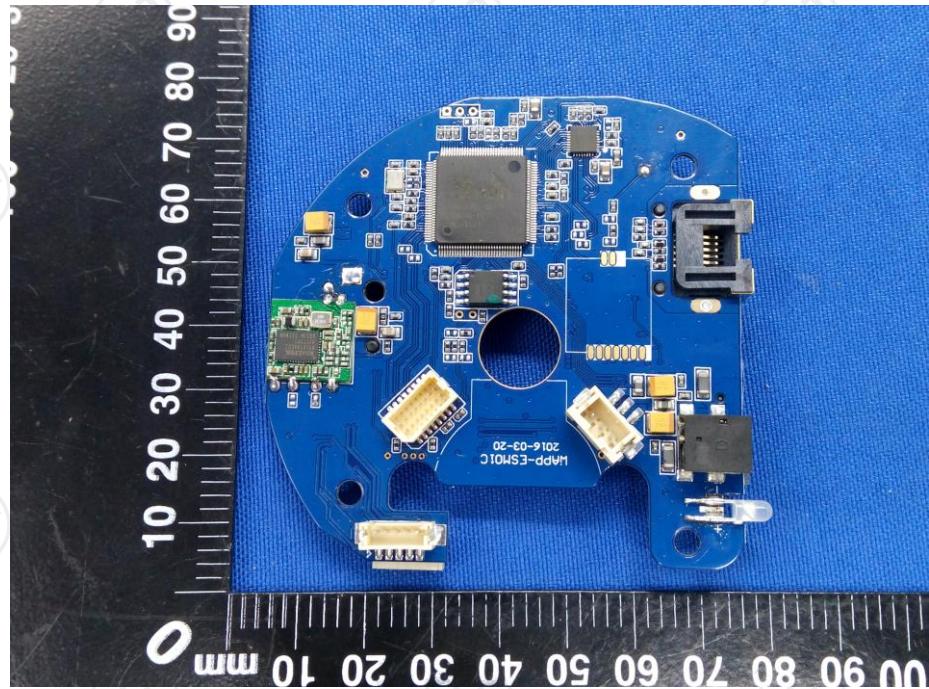






**Product: 1080P indoor PT IP Cam
Model: AWF23
Internal Photos**





*******END OF REPORT*******