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TEST REPORT

FCC PART 15.247

Report Reference No.: CTL1703037071-WF

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Product Name.....: VoIP Wireless ATA

Model/Type reference: FTA1101

Brand Name.....: Flyingvoice

FCC ID: 2AL9D-FTA1101

Applicant's name: **Flyingvoice Network Technology Co., Ltd**

Address of applicant: Room102, 1F East, Bldg 3#, Minqi Park, Pingshan, Xili, Nanshan District, Shenzhen, China

Test Firm: **Shenzhen CTL Testing Technology Co., Ltd.**

Address of Test Firm: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

Test specification.....:

Standard.....: **FCC Part 15.247:** Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.

TRF Originator: Shenzhen CTL Testing Technology Co., Ltd.

Master TRF: Dated 2011-01

Date of Receipt.....: May 02, 2017

Date of Test Date.....: May 02, 2017–May 18, 2017

Data of Issue.....: May 24, 2017

Result.....: Positive

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TEST REPORT

Test Report No. :	CTL1703037071-WF	May 24, 2017
		Date of issue

Equipment under Test : VoIP Wireless ATA

Model /Type : FTA1101

Applicant : **Flyingvoice Network Technology Co., Ltd**

Address : Room102, 1F East, Bldg 3#, Minqi Park, Pingshan,
Xili, Nanshan District, Shenzhen, China

Manufacturer : **Flyingvoice Network Technology Co., Ltd**

Address : Room102, 1F East, Bldg 3#, Minqi Park, Pingshan,
Xili, Nanshan District, Shenzhen, China

Test result	Pass *
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* In the configuration tested, the EUT complied with the standards specified page 5.

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

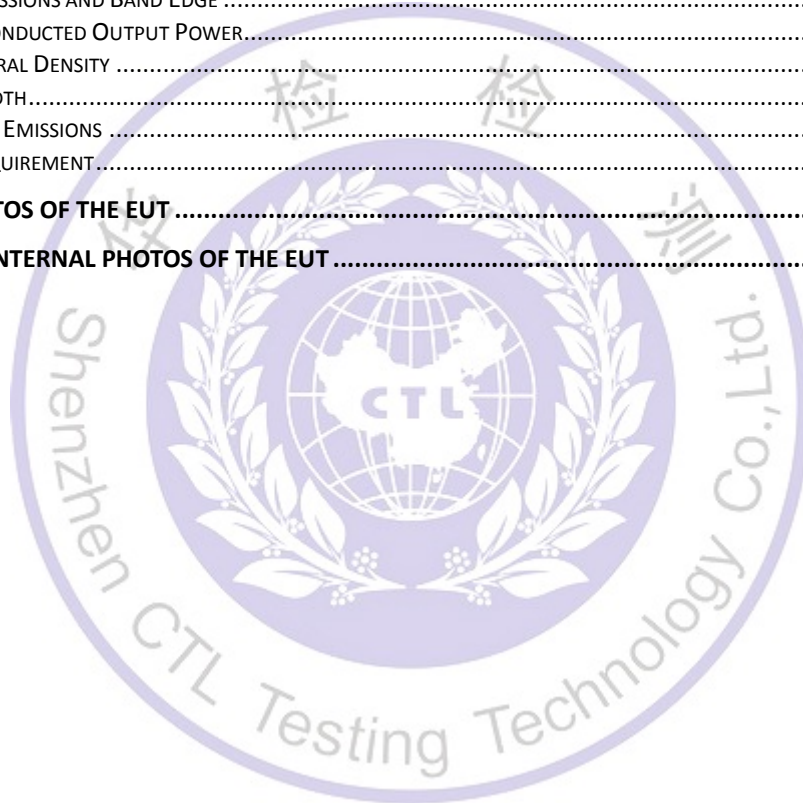
**** Modified History ****

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2017-05-24	CTL1703037071-WF	Tracy Qi



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1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

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

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

[ANSI C63.4: 2014](#): –American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz
Range of 9 kHz to 40GHz

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

[KDB 662911](#): D01Emissions Testing of Transmitters with Multiple Outputs in the Same Band

1.2. Test Description

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Conducted Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

1.3.2 Laboratory accreditation

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

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 970318

Shenzhen CTL Testing Technology 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 970318, December 19, 2013.

1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power conducted	± 0.57 dB	(1)
Transmitter power Radiated	± 2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	± 2.20 dB	(1)
Occupied Bandwidth	± 0.01 ppm	(1)
Radiated Emission 30~1000MHz	± 4.10 dB	(1)
Radiated Emission Above 1GHz	± 4.32 dB	(1)
Conducted Disturbance 0.15~30MHz	± 3.20 dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

1.5.Environmental conditions

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

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

1.6.General Description of EUT

Product Name:	VoIP Wireless ATA
Model/Type reference:	FTA1101
Power supply:	AC 120V/60Hz
WIFI	
Supported type:	802.11b/802.11g/802.11n(H20)/802.11n(H40)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20)/802.11n(H40): OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11 802.11n(H40): 7
Channel separation:	5MHz
Antenna type:	PCB Antenna : 2
Antenna gain:	2.0dBi

Note: 802.11b/802.11g have SISO mode only ;802.11n(H20)/802.11n(H40) have MIMO mode only
Directional gain = $2 + 10 \log 2 = 5.01 \text{ dBi}$

2. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

Operation Frequency WIFI :

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

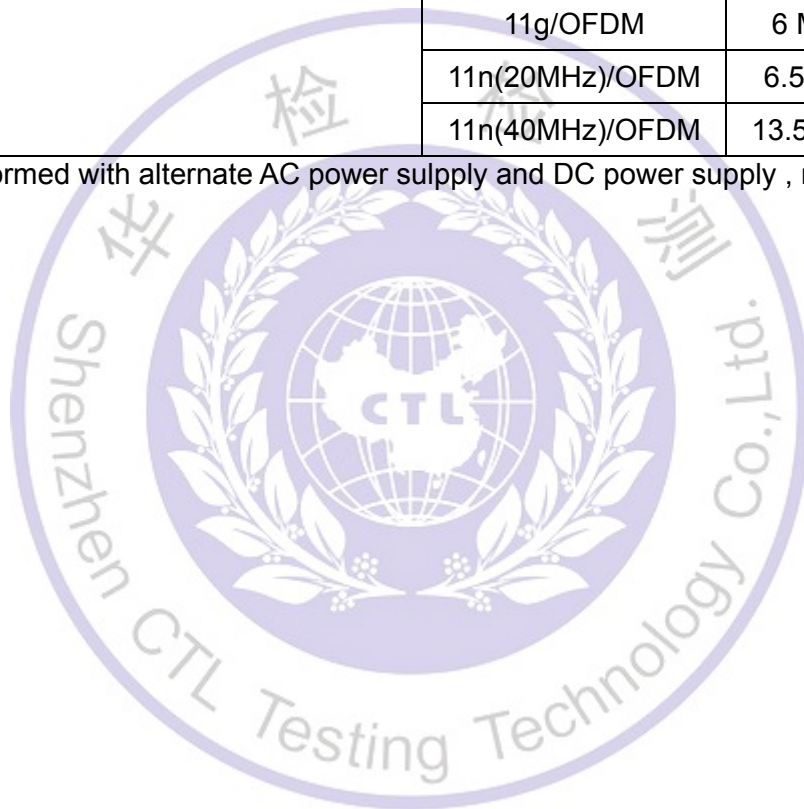
Note: The line display in grey were the channel selected for testing

Data Rate Used:

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Maximum Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9kHz~1GHz& Radiated Emission 1GHz~10th Harmonic	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	6.5Mbps	1/6/11
	11n(40MHz)/OFDM	13.5 Mbps	3/6/9
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11
	11n(40MHz)/OFDM	13.5 Mbps	3//9

Note: All tests performed with alternate AC power sulply and DC power supply , recorded the worst case at AC mode



2.1. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
ULTRA-ROADBAND ANTENNA	Sunol Sciences Corp.	JB1	A061713	2016/06/02	2017/06/01
EMI Test Receiver	R&S	ESCI	103710	2016/06/02	2017/06/01
Spectrum Analyzer	Agilent	E4407B	MY41440676	2016/05/21	2017/05/20
Controller	EM Electronics	Controller EM 1000	N/A	2016/05/21	2017/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2016/05/19	2017/05/18
Active Loop Antenna	Daze	ZN30900A	N/A	2016/05/19	2017/05/18
LISN	R&S	ENV216	3560.6550.1 2	2016/06/02	2017/06/01
LISN	R&S	ESH2-Z5	860014/010	2016/06/02	2017/06/01
ISN	FCC	F-071115-1 057-1-09	11229	2016/05/19	2017/05/18
Amplifier	Agilent	8349B	3008A02306	2016/05/19	2017/05/18
Amplifier	Agilent	8447D	2944A10176	2016/05/19	2017/05/18
Transient Limiter	SCHWARZCECK	VTSD 9561F	9666	2016/06/02	2017/06/01
Radio Communication Tester	R&S	CMU200	115419	2016/05/22	2017/05/21
Temperature/Humidity Meter	Gangxing	CTH-608	02	2016/05/20	2017/05/19
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2016/05/20	2017/05/19
Power Meter	Agilent	U2531A	TW53323507	2016/05/21	2017/05/20
Power Sensor	Agilent	U2021XA	MY5365004	2016/05/21	2017/05/20
Climate Chamber	ESPEC	EL-10KA	A20120523	2016/05/20	2017/05/19
High-Pass Filter	K&L	9SH10-270 0/X12750-O /O	N/A	2016/05/20	2017/05/19
High-Pass Filter	K&L	41H10-137 5/U12750-O /O	N/A	2016/05/20	2017/05/19
RF Cable	HUBER+SUHNER	RG214	N/A	2016/05/20	2017/05/19

2.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AL9D-FTA1101 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.3. Modifications

No modifications were implemented to meet testing criteria.



3. TEST CONDITIONS AND RESULTS

3.1. Conducted Emissions Test

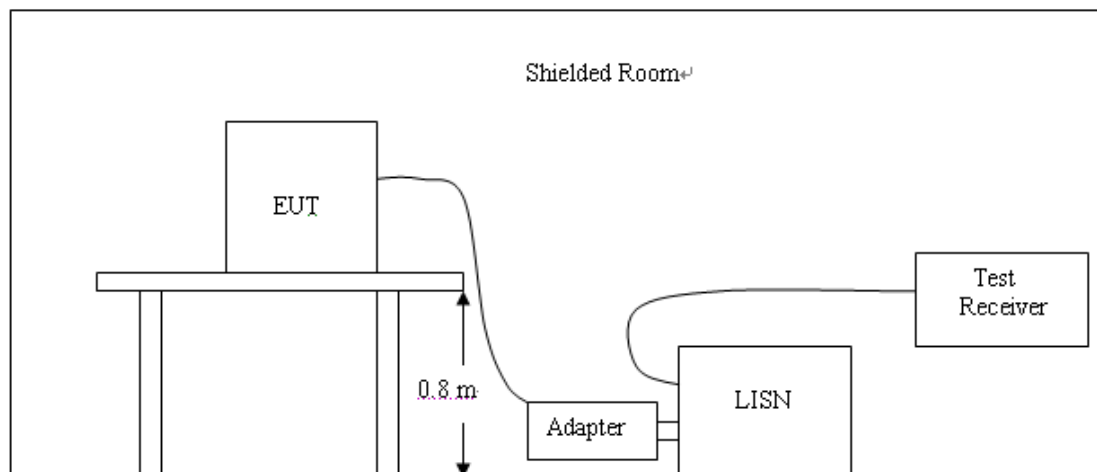
LIMIT

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

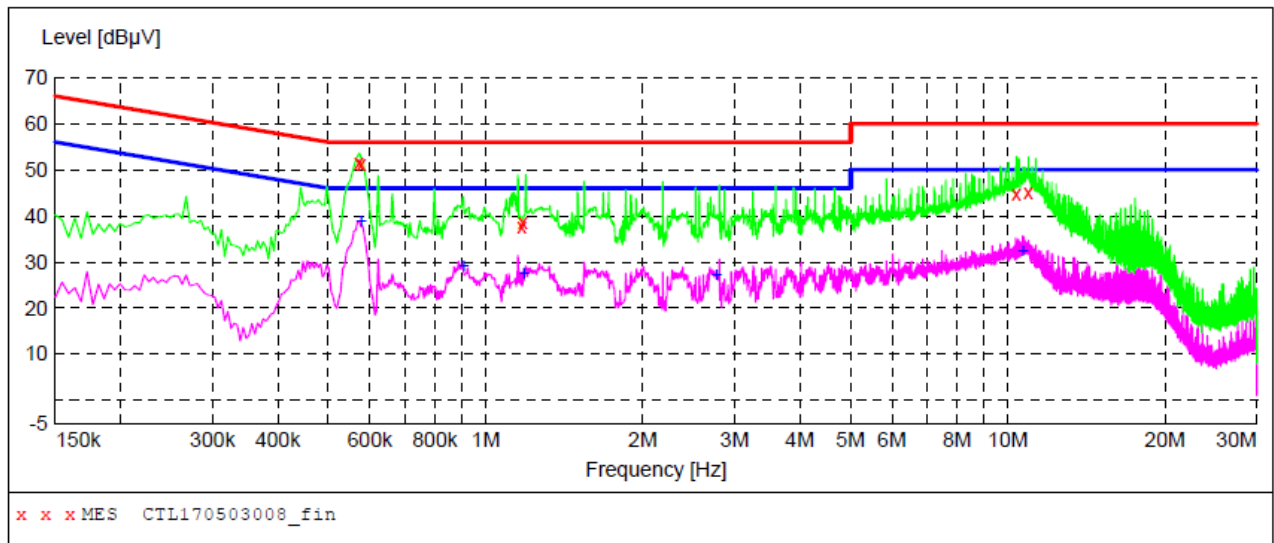


TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL170503008_fin"**

5/3/2017 2:39PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.572000	51.60	10.2	56	4.4	QP	L1	GND
0.578000	51.10	10.2	56	4.9	QP	L1	GND
1.172000	37.80	10.3	56	18.2	QP	L1	GND
1.178000	38.70	10.3	56	17.3	QP	L1	GND
10.388000	44.80	10.6	60	15.2	QP	L1	GND
10.952000	45.10	10.6	60	14.9	QP	L1	GND

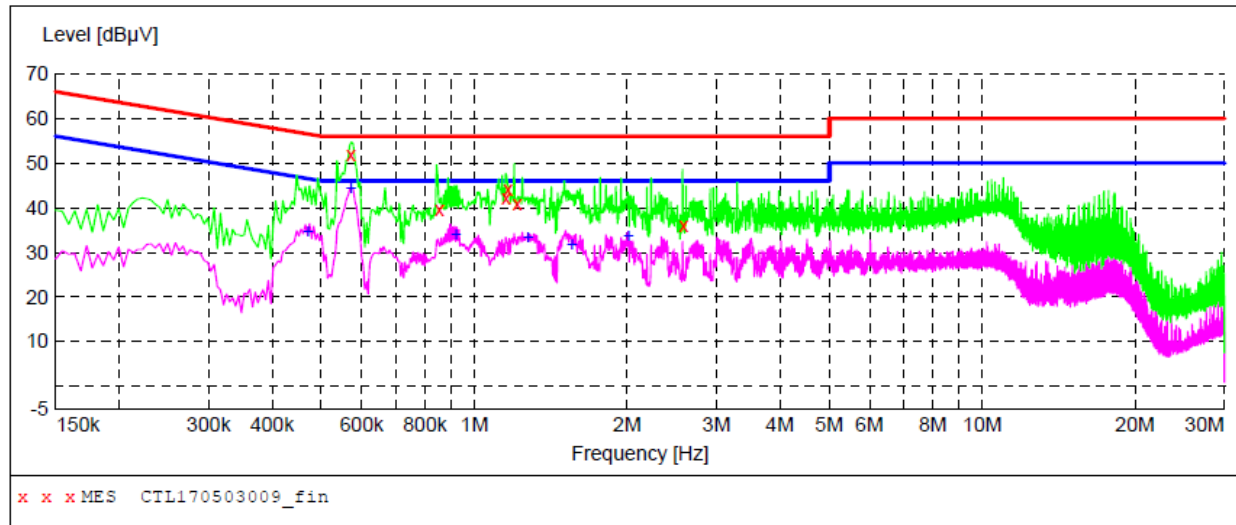
MEASUREMENT RESULT: "CTL170503008_fin2"

5/3/2017 2:39PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.578000	38.90	10.2	46	7.1	AV	L1	GND
0.908000	29.20	10.2	46	16.8	AV	L1	GND
1.184000	27.60	10.3	46	18.4	AV	L1	GND
2.768000	27.40	10.4	46	18.6	AV	L1	GND
10.682000	32.40	10.6	50	17.6	AV	L1	GND

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL170503009_fin"**

5/3/2017 2:42PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.572000	51.80	10.2	56	4.2	QP	N	GND
0.854000	39.50	10.2	56	16.5	QP	N	GND
1.154000	42.20	10.3	56	13.8	QP	N	GND
1.166000	44.00	10.3	56	12.0	QP	N	GND
1.214000	40.80	10.3	56	15.2	QP	N	GND
2.582000	35.90	10.4	56	20.1	QP	N	GND

MEASUREMENT RESULT: "CTL170503009_fin2"

5/3/2017 2:42PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.470000	34.80	10.2	47	11.7	AV	N	GND
0.572000	44.50	10.2	46	1.5	AV	N	GND
0.920000	34.00	10.3	46	12.0	AV	N	GND
1.274000	33.30	10.3	46	12.7	AV	N	GND
1.556000	31.90	10.3	46	14.1	AV	N	GND
2.012000	33.80	10.4	46	12.2	AV	N	GND

3.2. Radiated Emissions and Band Edge

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

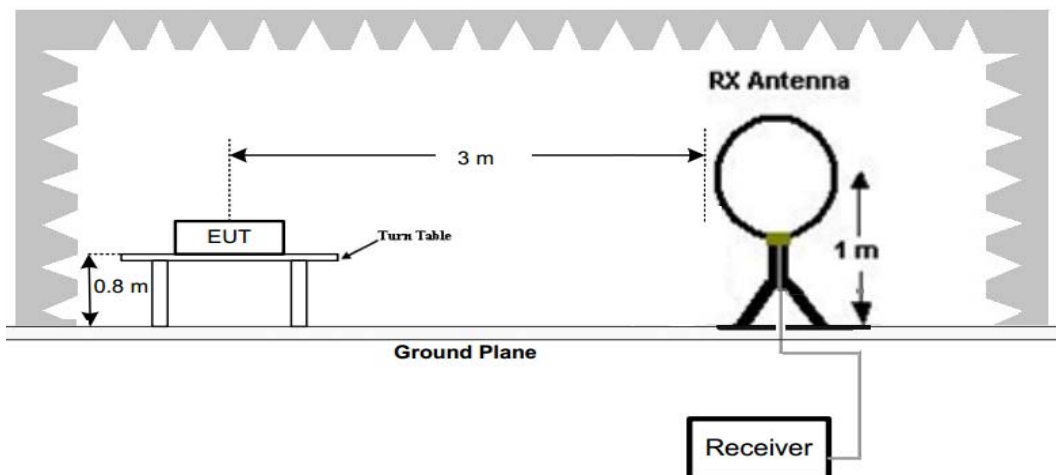
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

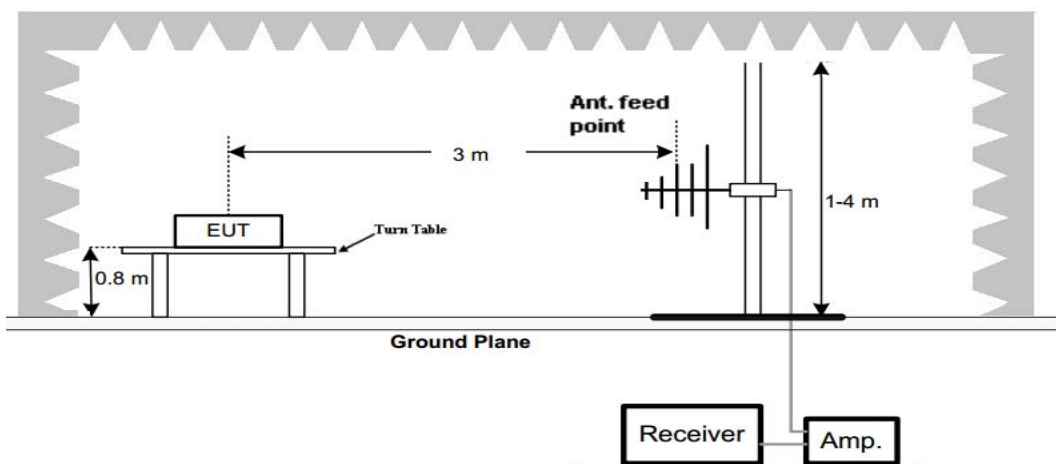
Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

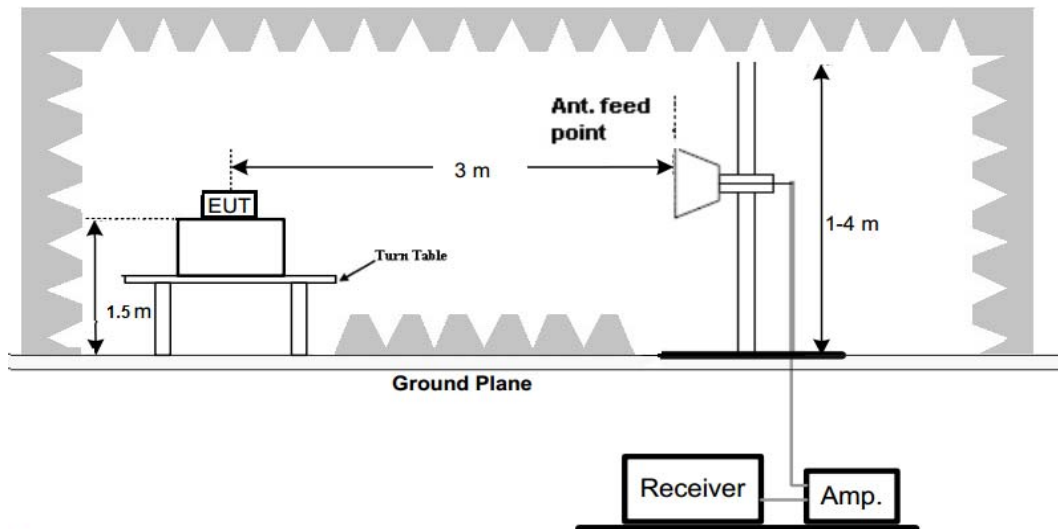
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz

**Test Procedure**

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.

TEST RESULTS

Remark:

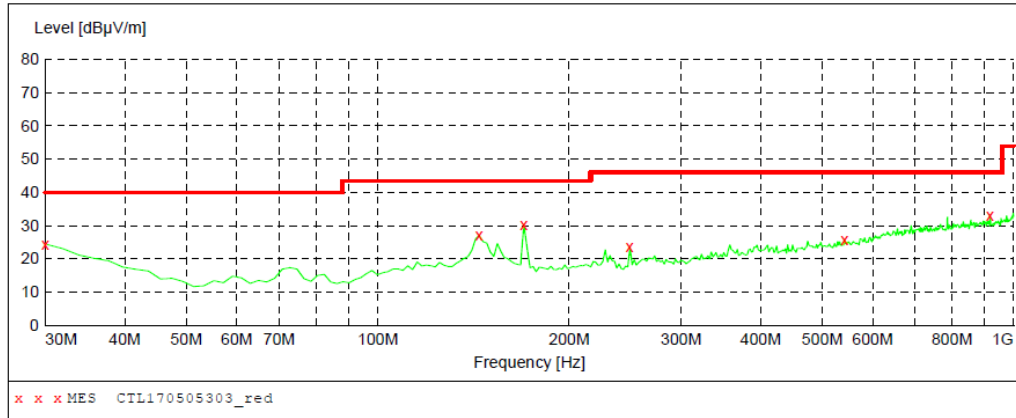
1. We tested three channels (lowest/middle/highest) of each mode and recorded worst case at 802.11b low channel for measurement below 1GHz.
2. We tested three channels (lowest/middle/highest) of each mode and recorded worst case at 802.11b mode above 1GHz.
3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Horizontal

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

***MEASUREMENT RESULT: "CTL170505303_red"***

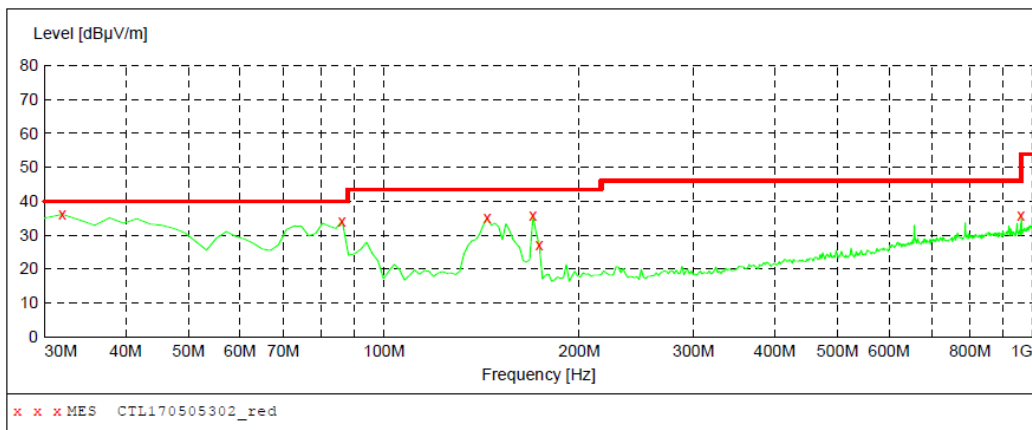
5/5/2017 9:42AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	24.40	20.8	40.0	15.6	---	0.0	0.00	HORIZONTAL
144.460000	27.00	14.1	43.5	16.5	---	0.0	0.00	HORIZONTAL
169.680000	30.40	13.3	43.5	13.1	---	0.0	0.00	HORIZONTAL
249.220000	23.50	13.8	46.0	22.5	---	0.0	0.00	HORIZONTAL
542.160000	25.90	20.7	46.0	20.1	---	0.0	0.00	HORIZONTAL
918.520000	33.10	26.2	46.0	12.9	---	0.0	0.00	HORIZONTAL

Vertical

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

***MEASUREMENT RESULT: "CTL170505302_red"***

5/5/2017 9:39AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.940000	36.10	19.2	40.0	3.9	---	0.0	0.00	VERTICAL
86.260000	34.10	9.0	40.0	5.9	---	0.0	0.00	VERTICAL
144.460000	35.00	14.1	43.5	8.5	---	0.0	0.00	VERTICAL
169.680000	35.80	13.3	43.5	7.7	---	0.0	0.00	VERTICAL
173.560000	27.10	13.0	43.5	16.4	---	0.0	0.00	VERTICAL
959.260000	35.90	26.6	46.0	10.1	---	0.0	0.00	VERTICAL

For 1GHz to 25GHz**802.11b Mode (above 1GHz)**

Frequency(MHz):			2412		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	58.43	PK	74	15.57	53.88	33.52	6.92	35.89	4.55
4824.00	51.02	AV	54	2.98	46.47	33.52	6.92	35.89	4.55
5128.15	50.36	PK	74	23.64	43.16	34.38	7.10	34.28	7.20
5128.15	--	AV	54	--	--	--	--	--	--
7236.00	48.79	PK	74	25.21	37.52	37.1	9.19	35.02	11.27
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2412		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	60.04	PK	74	13.96	55.49	33.52	6.92	35.89	4.55
4824.00	52.81	AV	54	1.19	48.26	33.52	6.92	35.89	4.55
5128.15	51.83	PK	74	22.17	44.63	34.38	7.10	34.28	7.20
5128.15	--	AV	54	--	--	--	--	--	--
7236.00	49.48	PK	74	24.52	38.21	37.1	9.19	35.02	11.27
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	59.46	PK	74	14.54	53.22	33.59	6.95	34.3	6.24
4874.00	51.21	AV	54	2.79	44.97	33.59	6.95	34.3	6.24
5215.50	48.36	PK	74	25.64	40.76	34.56	7.15	34.11	7.60
5215.50	--	AV	54	--	--	--	--	--	--
7311.00	48.53	PK	74	25.47	36.87	37.44	9.22	35	11.66
7311.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	59.73	PK	74	14.27	53.39	33.59	6.95	34.2	6.34
4874.00	52.01	AV	54	1.99	45.67	33.59	6.95	34.2	6.34
5215.50	48.86	PK	74	25.14	41.96	34.07	7.05	34.22	6.90
5215.50	--	AV	54	--	--	--	--	--	--
7311.00	49.95	PK	74	24.05	38.29	37.44	9.22	35	11.66
7311.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4924.00	59.39	PK	74	14.61	53.55	33.71	6.98	35.91	4.78
4924.00	49.45	AV	54	4.55	43.73	33.71	6.98	35.91	4.78
5235.50	51.08	PK	74	22.92	41.24	34.34	7.09	34.27	7.17
5235.50	--	AV	54	--	--	--	--	--	--
7386.00	48.24	PK	74	25.76	37.4	37.61	9.25	34.98	11.88
7386.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4924.00	60.19	PK	74	13.81	55.41	33.71	6.98	35.91	4.78
4924.00	51.66	AV	54	2.34	46.88	33.71	6.98	35.91	4.78
5235.50	48.47	PK	74	25.53	41.3	34.34	7.09	34.27	7.17
5235.50	--	AV	54	--	--	--	--	--	--
7386.00	48.92	PK	74	25.08	37.04	37.61	9.25	34.98	11.88
7386.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RMS detector is for AV value.

Note: 802.11b/802.11g Ant 1 Ant 2 SISO mode and 802.11n H20 &H40 MIMO mode all have been tested, only worse case 802.11b Ant 1 is reported

Results of Band Edges Test (Radiated)

Frequency(MHz):			2412		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2412.00	113.49	PK	--	--	80.1	28.78	4.61	0	33.39
2412.00	107.04	AV	--	--	73.65	28.78	4.61	0	33.39
2361.75	42.18	PK	74	31.82	9.1	28.52	4.56	0	33.08
2361.75	--	AV	54	--	--	--	--	--	--
2390.00	60.07	PK	74	13.93	26.75	28.72	4.60	0	33.32
2390.00	52.36	AV	54	1.64	19.04	28.72	4.60	0	33.32
2400.00	61.12	PK	74	12.88	27.73	28.78	4.61	0	33.39
2400.00	52.96	AV	54	1.04	19.57	28.78	4.61	0	33.39

Frequency(MHz):			2412		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2412.00	114.05	PK	--	--	80.66	28.78	4.61	0	33.39
2412.00	106.36	AV	--	--	72.97	28.78	4.61	0	33.39
2361.75	43.02	PK	74	30.98	9.94	28.52	4.56	0	33.08
2361.75	--	AV	54	--	--	--	--	--	--
2390.00	60.94	PK	74	13.06	27.62	28.72	4.60	0	33.32
2390.00	51.18	AV	54	2.82	17.86	28.72	4.60	0	33.32
2400.00	62.32	PK	74	11.68	28.93	28.78	4.61	0	33.39
2400.00	52.91	AV	54	1.09	19.52	28.78	4.61	0	33.39

Frequency(MHz):			2462		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2462.00	114.06	PK	--	--	80.44	28.92	4.7	0	33.62
2462.00	108.91	AV	--	--	75.29	28.92	4.7	0	33.62
2483.50	43.14	PK	74	30.86	9.51	28.93	4.7	0	33.63
2483.50	--	AV	54	--	--	--	--	--	--
2486.75	42.38	PK	74	31.62	8.74	28.94	4.71	0	33.64
2486.75	--	AV	54	--	--	--	--	--	--
2500.00	43.55	PK	74	30.45	9.87	28.96	4.72	0	33.68
2500.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
2462.00	113.18	PK	--	--	79.56	28.92	4.7	0	33.62
2462.00	107.25	AV	--	--	73.63	28.92	4.7	0	33.62
2483.50	43.04	PK	74	30.96	9.41	28.93	4.7	0	33.63
2483.50	--	AV	54	--	--	--	--	--	--
2486.75	44.18	PK	74	29.82	10.54	28.94	4.71	0	33.64
2486.75	--	AV	54	--	--	--	--	--	--
2500.00	43.67	PK	74	30.33	9.99	28.96	4.72	0	33.68
2500.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RMS detector is for AV value.

Note: 802.11b/802.11g Ant 1 Ant 2 SISO mode and 802.11n H20 &H40 MIMO mode all have been tested, only worse case 802.11b Ant 1 is reported



3.3. Maximum Conducted Output Power

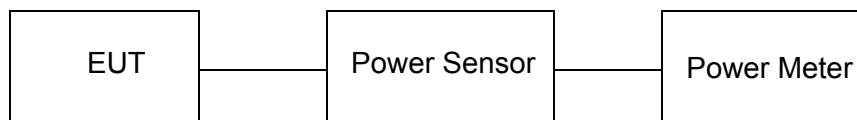
Limit

The Maximum Peak Output Power Measurement is 30dBm.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



Test Results

WIFI						
Type	Channel	PK Output power Ant1 (dBm)	PK Output power Ant2 (dBm)	Output power Total (dBm)	Limit (dBm)	Result
802.11b	01	16.04	16.39	/	30.00	Pass
	06	16.11	16.44	/		
	11	16.32	16.48	/		
802.11g	01	14.99	14.12	/	30.00	Pass
	06	14.96	14.10	/		
	11	14.17	14.19	/		
802.11n(HT20) MIMO	01	13.70	13.09	16.42	30.00	Pass
	06	13.74	12.98	16.39		
	11	13.92	13.12	16.55		
802.11n(HT40) MIMO	03	12.76	12.99	15.89	30.00	Pass
	06	12.98	12.98	15.99		
	09	12.79	12.07	15.46		

Note: 1.The test results including the cable lose.

3.4. Power Spectral Density

Limit

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 Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW ≥ 3 kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Set the span to 1.5 times the DTS channel bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be 8dBm.

Test Configuration



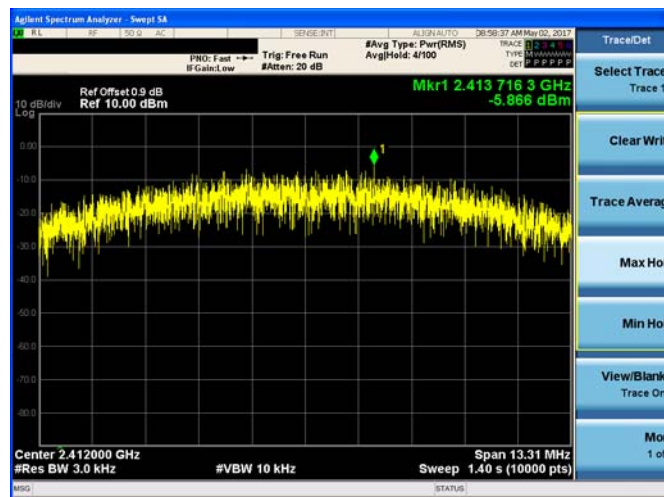
Test Results

WIFI						
Type	Channel	Power Spectral Density Ant1 (dBm/3KHz)	Power Spectral Density Ant2 (dBm/3KHz)	Power Spectral Density Total (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-5.866	-5.494	/	8.00	Pass
	06	-5.864	-5.753	/		
	11	-5.788	-5.424	/		
802.11g	01	-11.896	-11.540	/	8.00	Pass
	06	-11.294	-10.818	/		
	11	-11.647	-11.462	/		
802.11n(HT20) MIMO	01	-11.371	-11.066	-8.21	8.00	Pass
	06	-10.178	-11.110	-7.61		
	11	-9.800	-11.039	-7.37		
802.11n(HT40) MIMO	03	-14.874	-14.573	-11.71	8.00	Pass
	06	-15.497	-14.541	-11.98		
	09	-15.752	-13.664	-11.57		

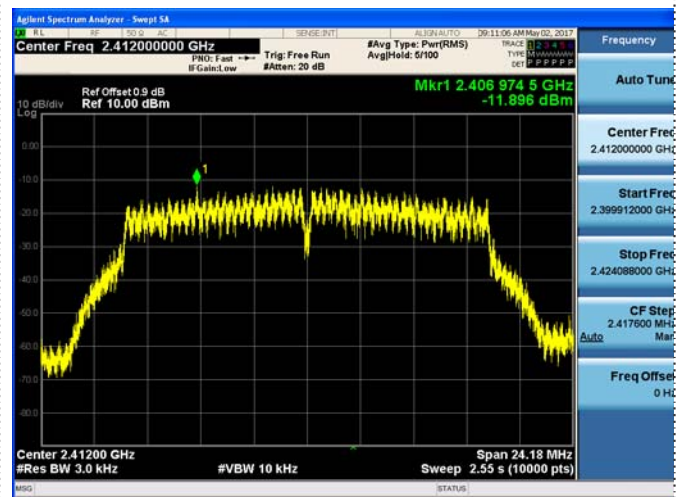
Test plot as follows:

Ant1

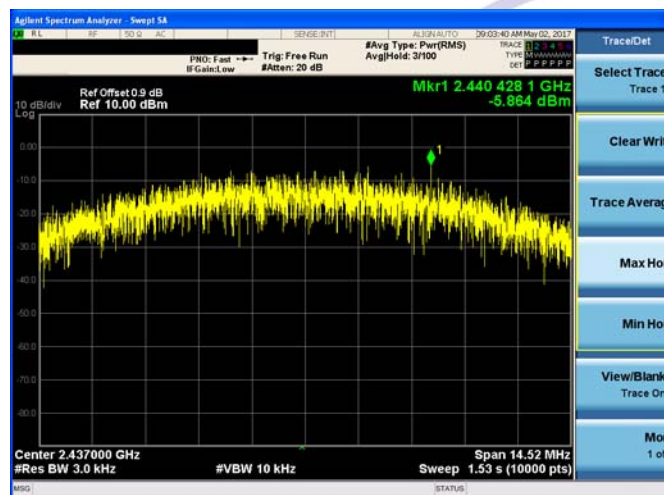
802.11b



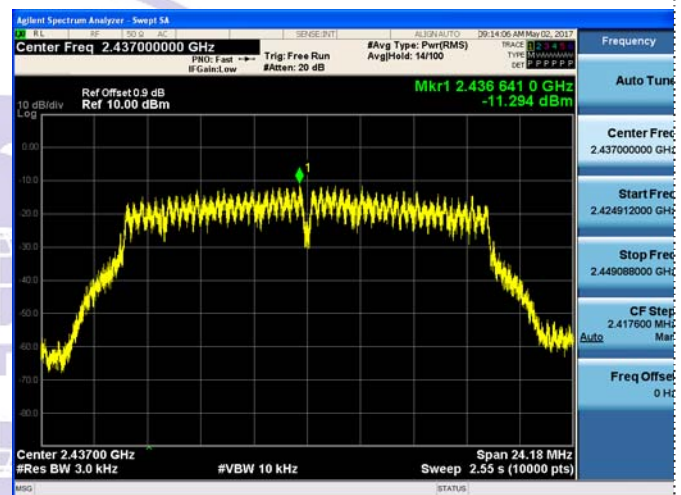
802.11g



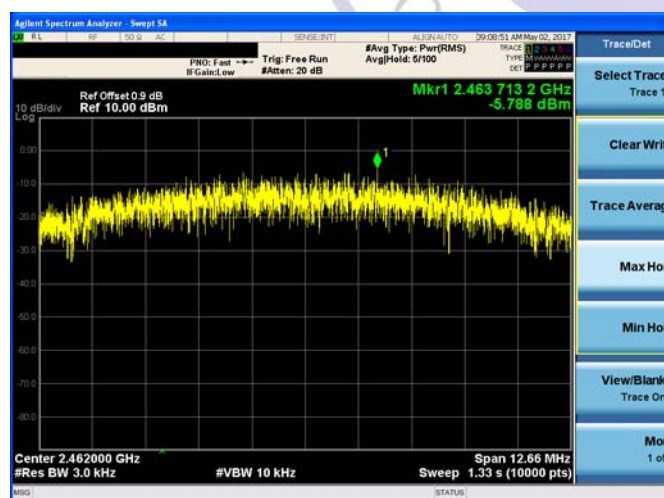
CH01



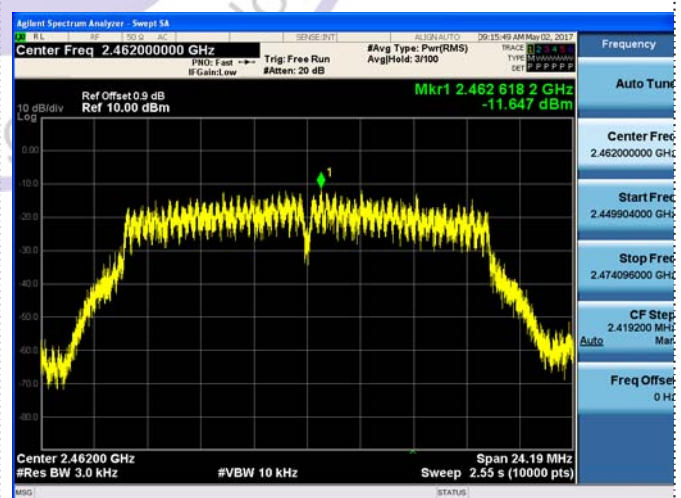
CH01



CH06



CH06



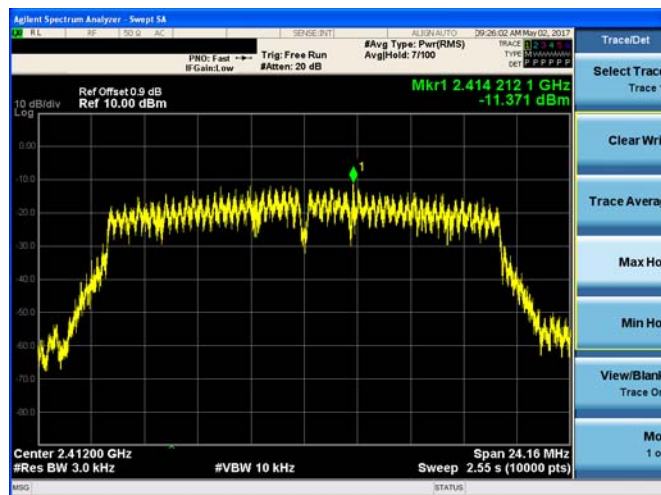
CH11



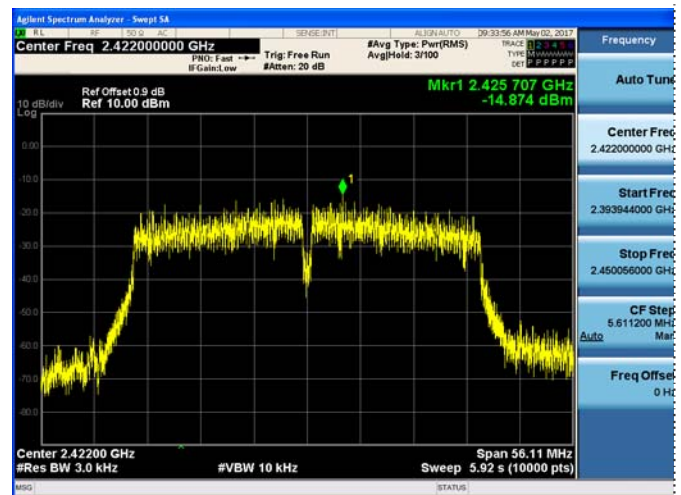
CH11



802.11n(HT20)



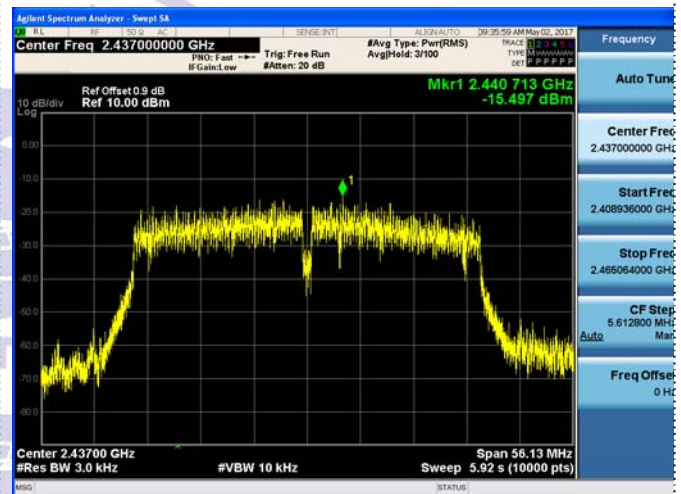
802.11n(HT40)



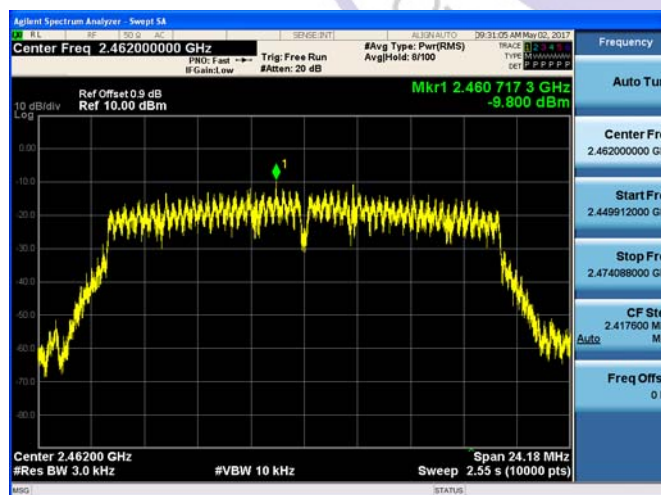
CH01



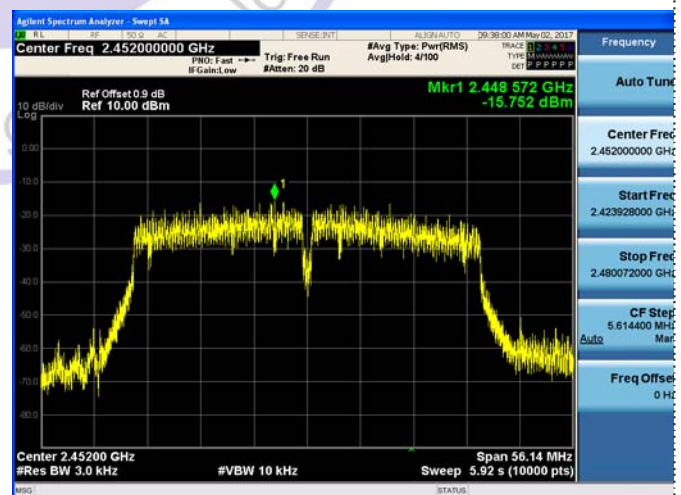
CH03



CH06



CH06



CH11

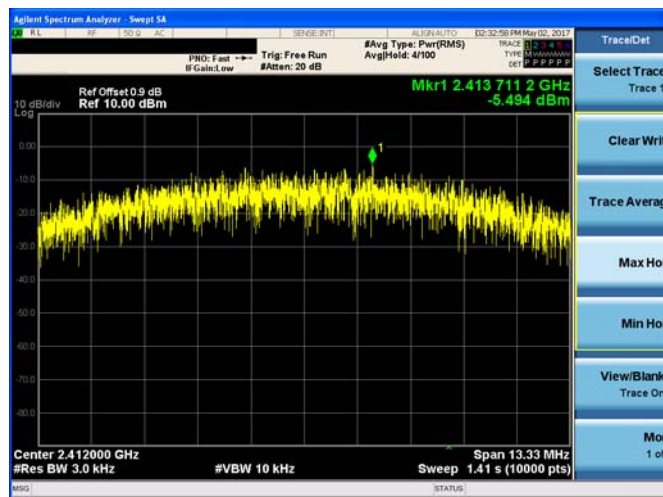


CH09

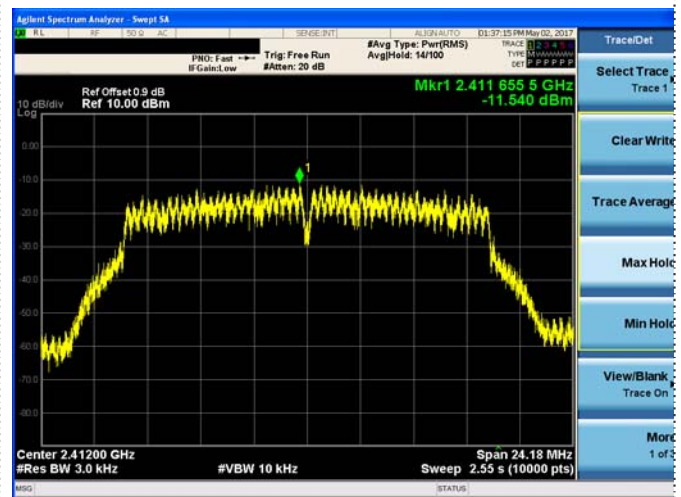


Ant 2

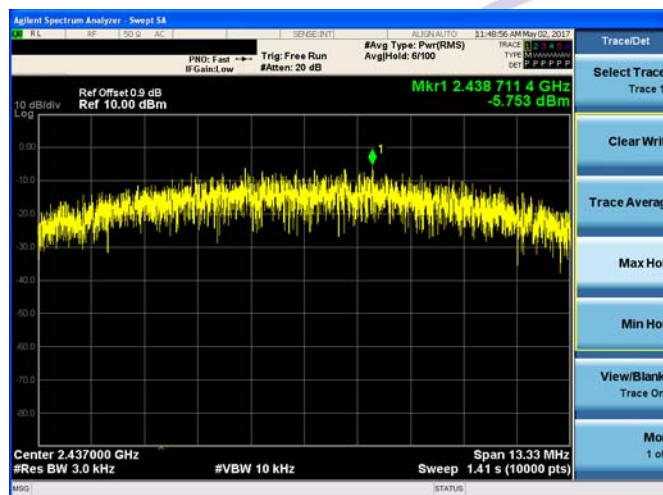
802.11b



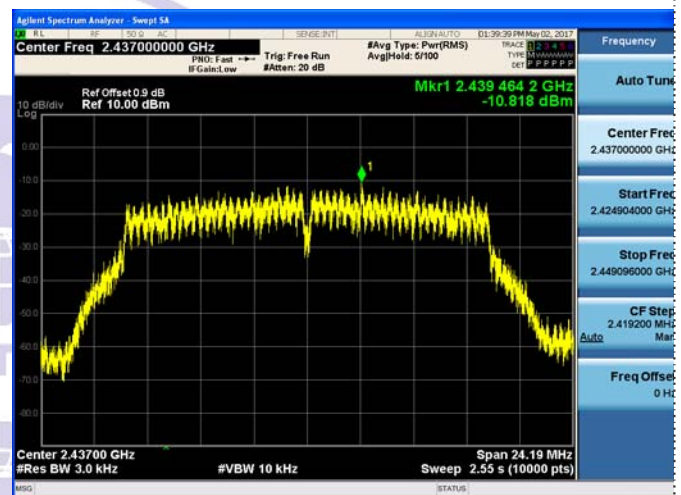
802.11g



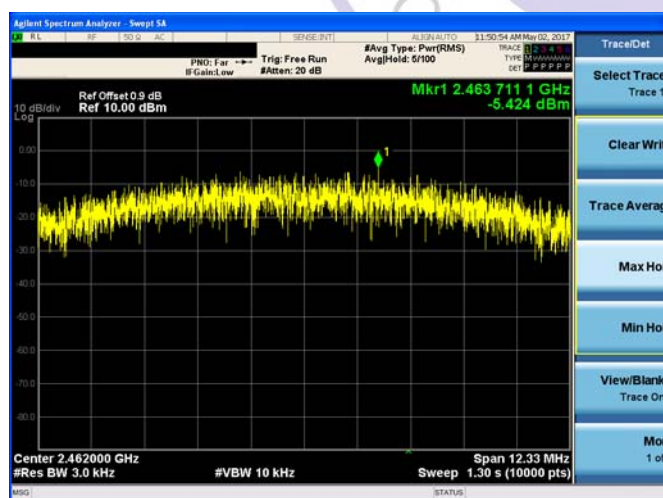
CH01



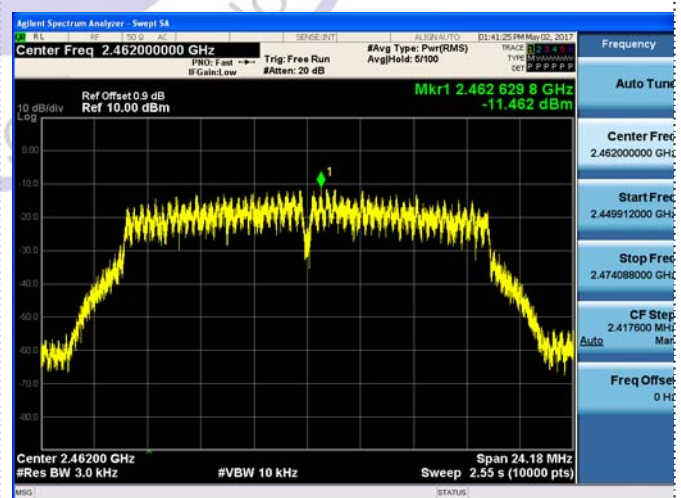
CH01



CH06



CH06



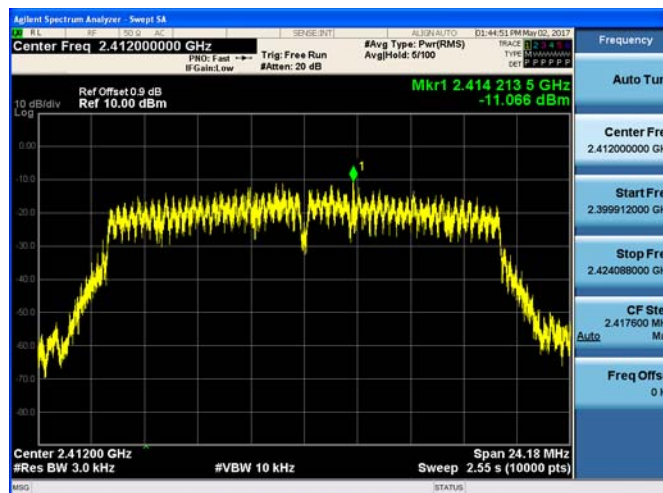
CH11



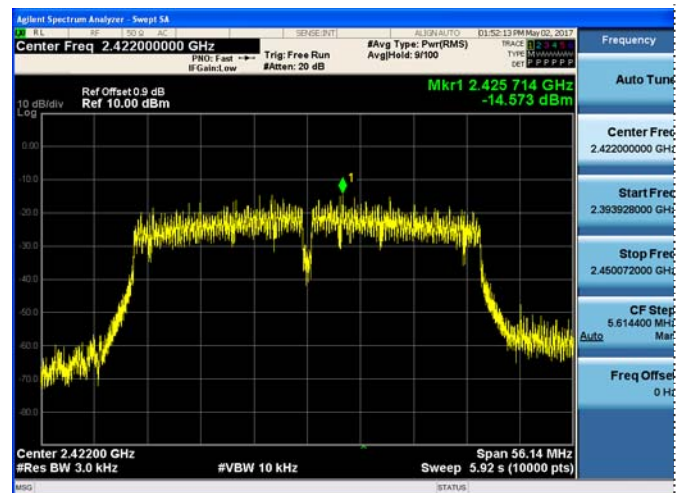
CH11



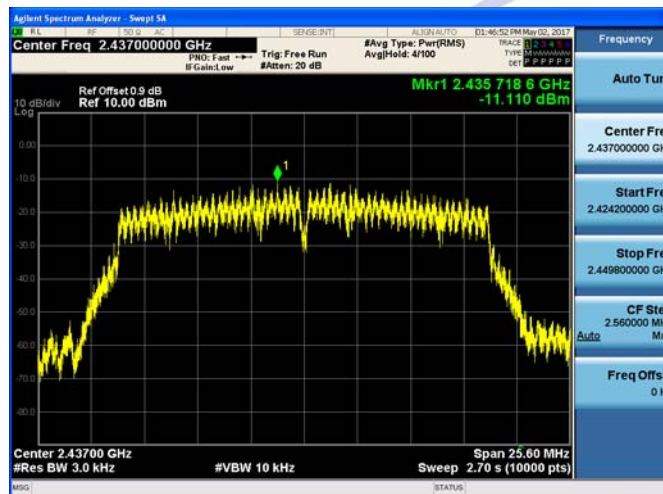
802.11n(HT20)



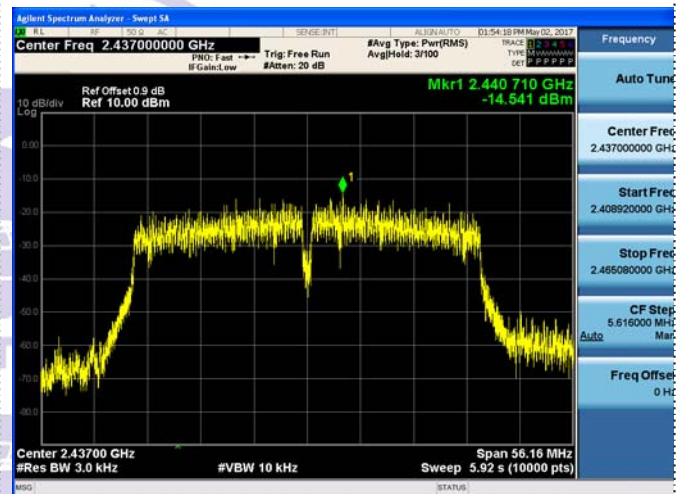
802.11n(HT40)



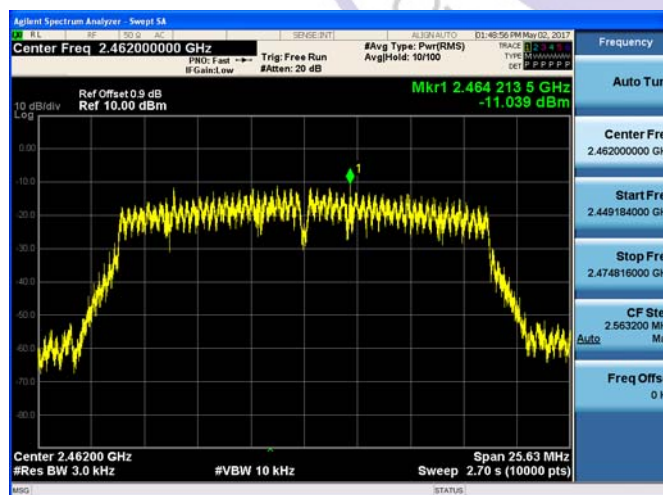
CH01



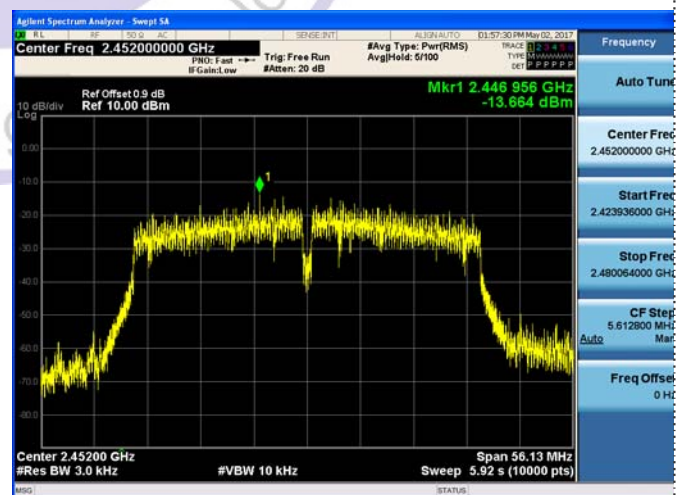
CH03



CH06



CH06



CH11

CH09

3.5. 6dB Bandwidth

Limit

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

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

Test Configuration



Test Results

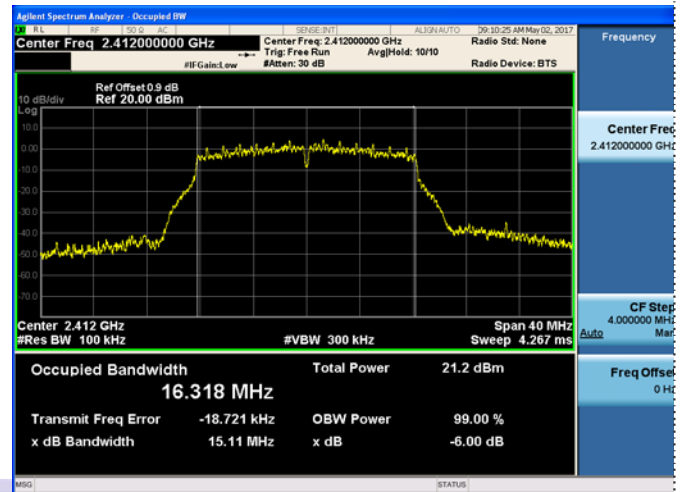
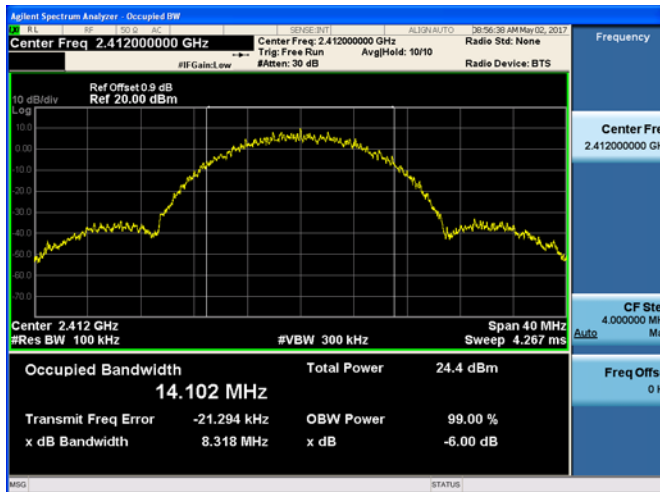
WIFI					
Type	Channel	6dB Bandwidth Ant1 (MHz)	6dB Bandwidth Ant2 (MHz)	Limit (KHz)	Result
802.11b	01	8.318	8.332	≥500	Pass
	06	9.072	8.333		
	11	7.910	7.707		
802.11g	01	15.11	15.11	≥500	Pass
	06	15.11	15.12		
	11	15.12	15.11		
802.11n(HT20)	01	15.10	15.11	≥500	Pass
	06	15.11	16.00		
	11	15.11	16.02		
802.11n(HT40)	03	35.07	35.09	≥500	Pass
	06	35.08	35.10		
	09	35.09	35.08		

Test plot as follows:

Ant 1

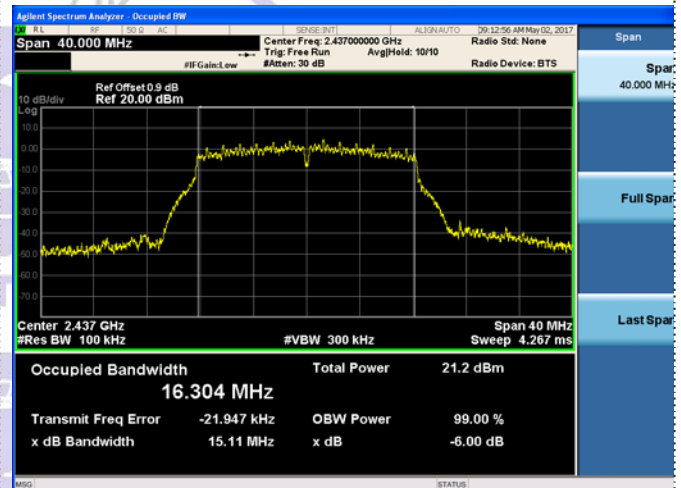
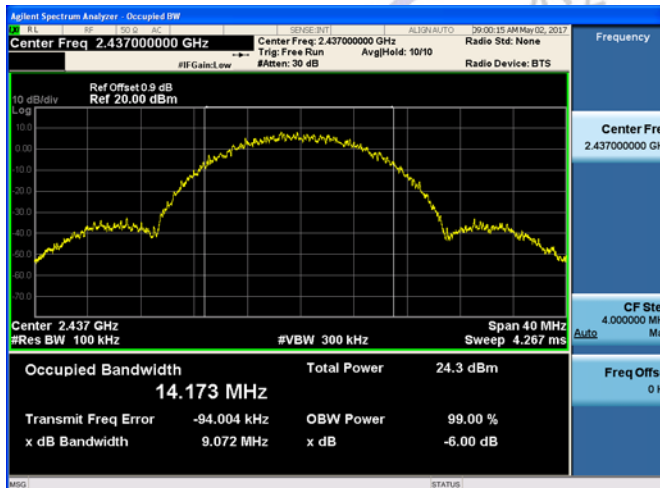
802.11b

802.11g



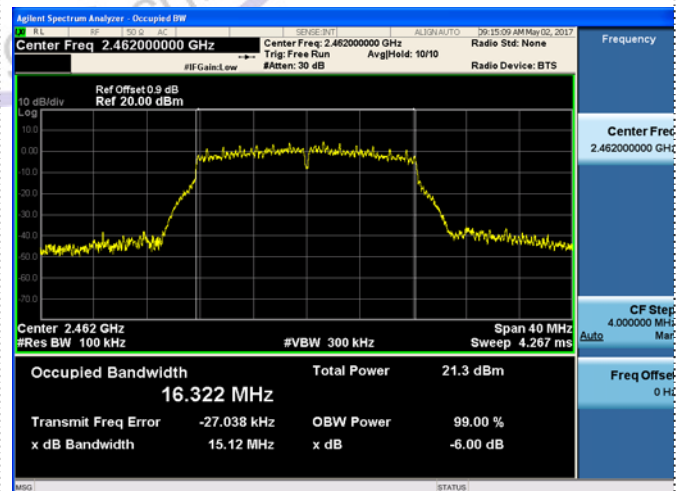
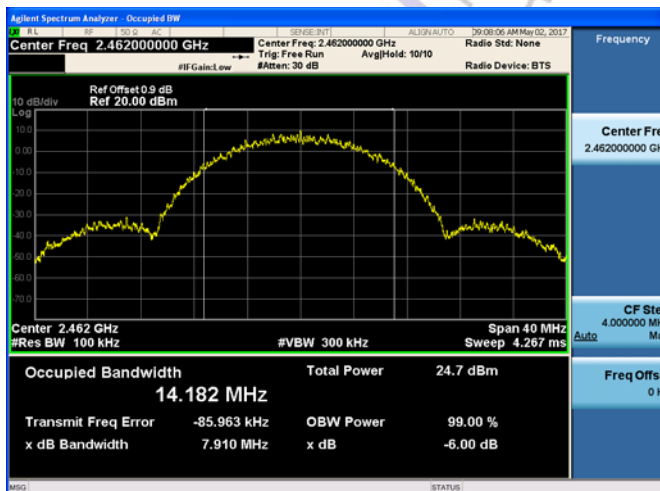
CH01

CH01



CH06

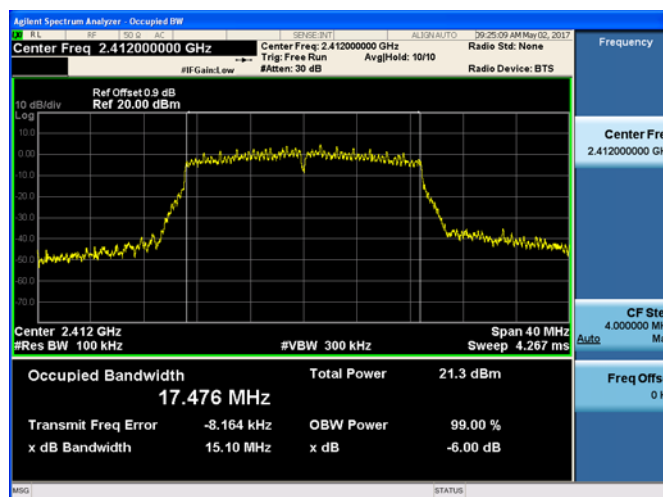
CH06



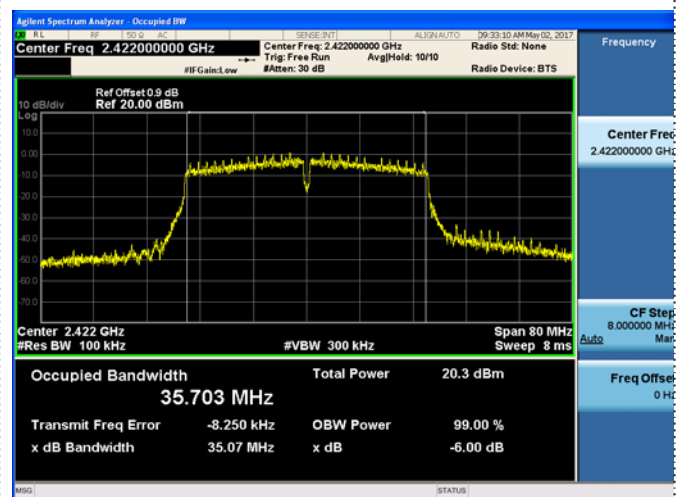
CH11

CH11

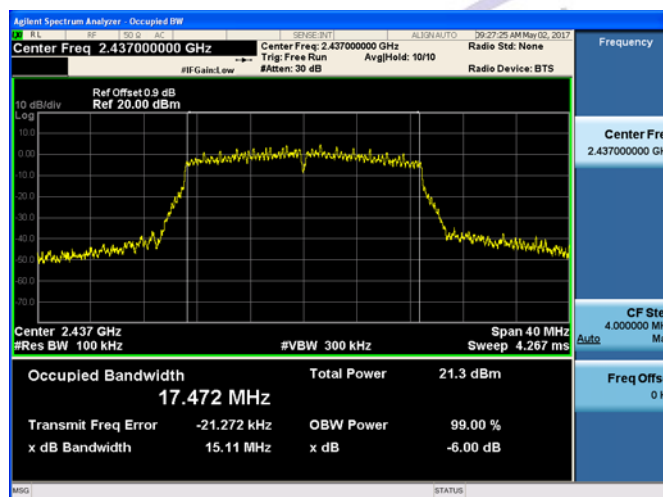
802.11n(HT20)



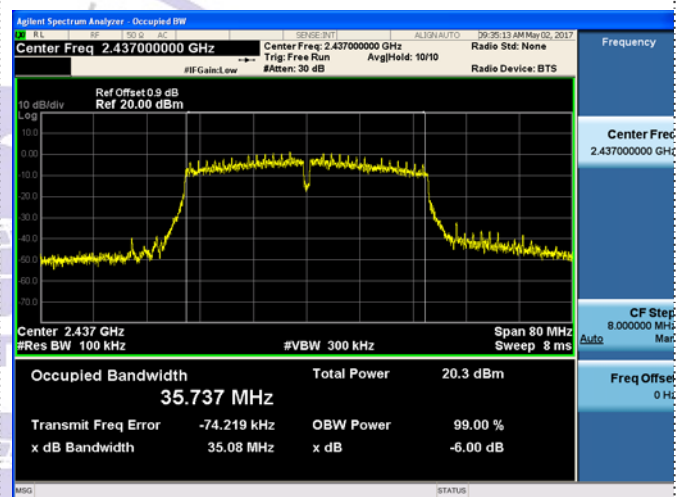
802.11n(HT40)



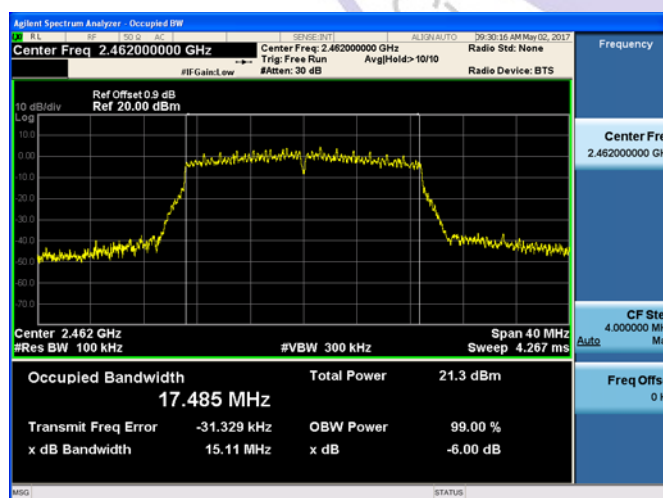
CH01



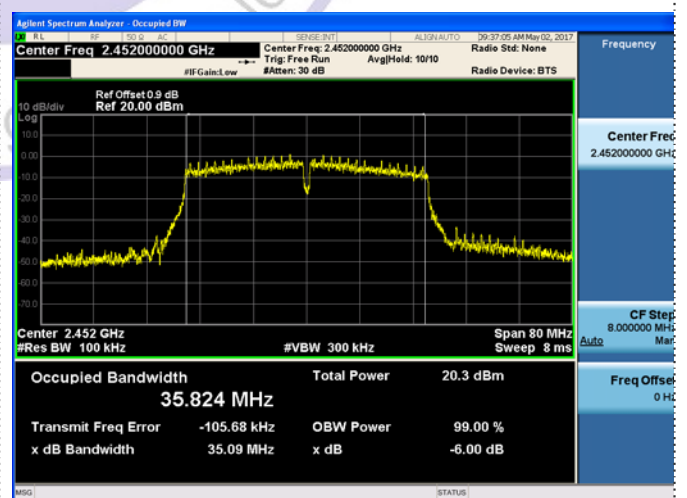
CH03



CH06



CH06



CH11

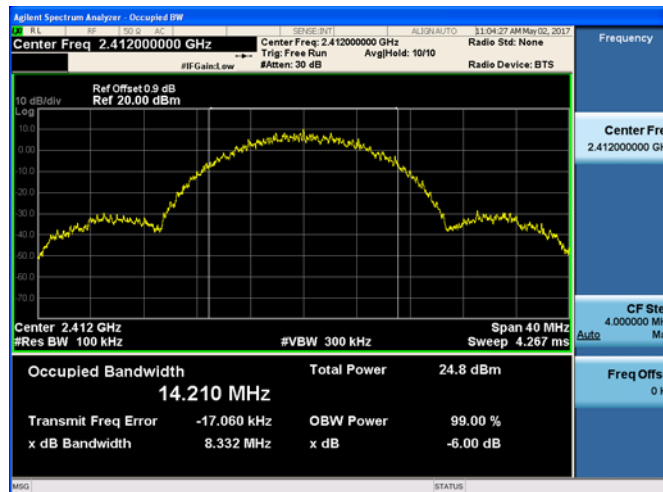


CH09

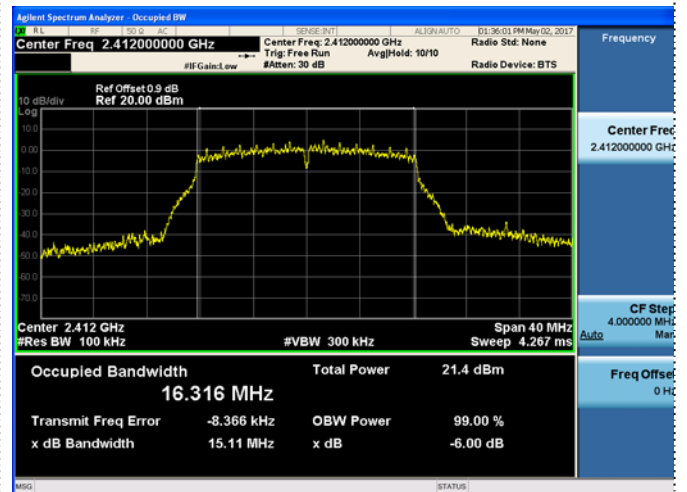


Ant 2

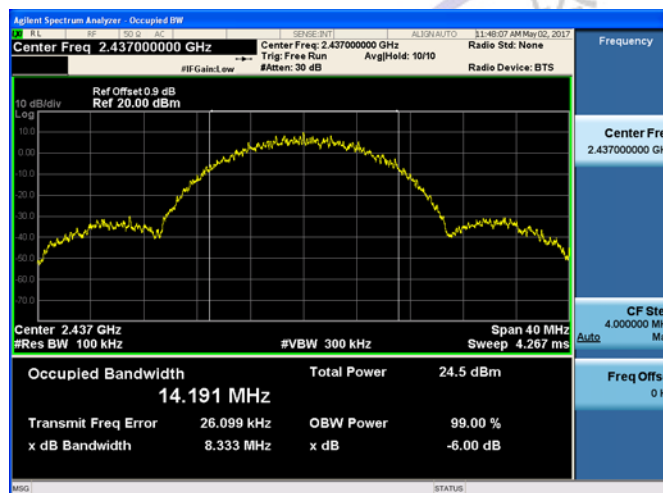
802.11b



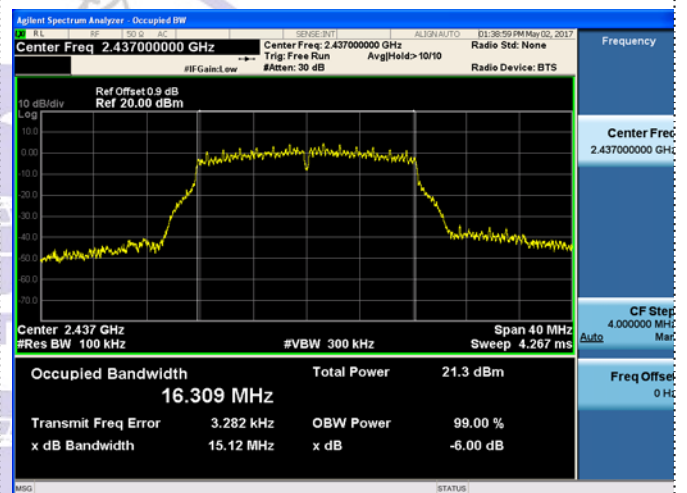
802.11g



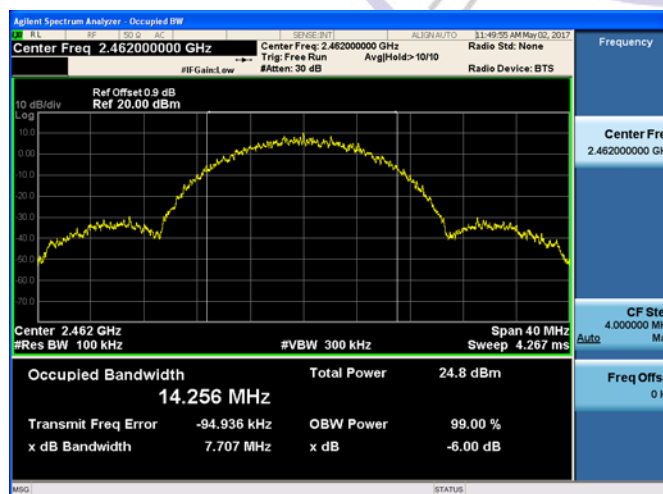
CH01



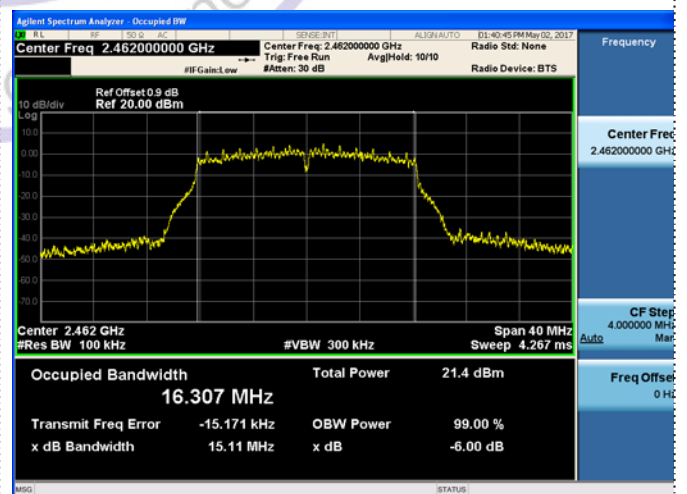
CH01



CH06



CH06



CH11



CH11

