FCC 47 CFR PART 15 SUBPART C

RF Test Report

Applicant	:	MitraStar Technology Corporation
Product Type	:	Adaptador Wifi+ Dual
Trade Name	:	MitraStar
Model Number	:	HGW-500BNA-QC v2
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART C ANSI C63.10:2013
Receive Date	:	Aug. 11, 2016
Test Period	:	Aug. 18 ~ Aug. 25, 2016
Issue Date	:	Sep. 08, 2016

Issue by

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Taiwan Accreditation Foundation accreditation number: 1330

Revision History

Rev.	Issue Date	Revisions	Revised By
00	Sep. 08, 2016	Initial Issue	Tiffany Lee

Verification of Compliance

Issued Date: Sep. 08, 2016

Applicant	:	MitraStar Technology Corporation
Product Type	:	Adaptador Wifi+ Dual
Trade Name	:	MitraStar
Model Number	:	HGW-500BNA-QC v2
FCC ID	:	ZMYHGW500BNAQCV2
EUT Rated Voltage	:	DC 12V, 1A
Test Voltage	:	120 Vac / 60 Hz
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART C ANSI C63.10:2013
Test Result	:	Complied
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade District, Taoyuan City 33465, Taiwan (R.O.C) Tel：+886-3-2710188 / Fax：+886-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By	:	Fly Lu	Reviewed By	:	Eric Ou Yang
(Manager)		(Fly Lu)	(Testing Engineer)		(Eric Ou Yang)

TABLE OF CONTENTS

1 General Information

1.1 Summary of Test Result

Standard	Item	Result	Remark
15.247			
15.207	AC Power Conducted Emission	PASS	-----
Standard	Item	Result	Remark
15.247			
15.247(d)	Transmitter Radiated Emissions	PASS	-----
15.247(b)(3)	Max. Output Power	PASS	-----
15.247(a)(2)	6dB RF Bandwidth	PASS	-----
15.247(e)	Power Spectral Density	PASS	-----
15.247(d)	Out of Band Conducted Spurious Emission	PASS	-----
15.203	Antenna Requirement	PASS	-----

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conducted Emission	9kHz ~ 150KHz	2.7
	150kHz ~ 30MHz	2.8
Radiated Emission	9kHz ~ 30MHz	1.457
	30MHz ~ 1000MHz	6.300
	1000MHz ~ 18000MHz	5.474
	18000MHz ~ 26500MHz	5.630
	26500MHz ~ 40000MHz	5.054
Conducted Output Power	+0.27 dB / -0.28 dB	
RF Bandwidth	4.96%	
Power Spectral Density	+0.71 dB / -0.77 dB	

2 EUT Description

Applicant	MitraStar Technology Corporation No. 6, Innovation Rd II, Science-Based Industrial, Hsin-Chu, Taiwan			
Manufacturer (1)	MitraStar Technology Corporation No. 6, Innovation Rd II, Hsinchu Science Park, Hsinchu 30076, Taiwan			
Manufacturer (2)	WuXi MitraStar Technology Co. Ltd 60#-E, Minshan Road, Wuxi New district Jangsu, P.R.C.			
Product Type	Adaptador Wifi+ Dual			
Trade Name	MitraStar			
Model Number	HGW-500BNA-QC v2			
FCC ID	ZMYHGW500BNAQCV2			
Operate Freq. Band	Frequency Range (MHz)	Modulation	Channel Bandwidth	Data Rate 400 GI (ns)
IEEE 802.11b	2412 ~ 2462	DSSS	20MHz	Up to 11Mbps
IEEE 802.11g	2412 ~ 2462	OFDM	20MHz	Up to 54Mbps
IEEE 802.11n 2.4GHz 20MHz	2412 ~ 2462	OFDM	20MHz	Up to 144.4Mbps
IEEE 802.11n 2.4GHz 40MHz	2422 ~ 2452	OFDM	40MHz	Up to 300Mbps
Antenna information	Type		Max. Gain (dBi)	
	PCB Dipole Antenna		0.10	
Antenna Delivery	See section 3.1			

Frequency Band	Max. RF Output Power (W)
IEEE 802.11b	0.208
IEEE 802.11g	0.159
IEEE 802.11n 2.4GHz 20MHz	0.417
IEEE 802.11n 2.4GHz 40MHz	0.177

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Normal operation mode
Mode 2: IEEE 802.11b
Mode 3: IEEE 802.11g
Mode 4: IEEE 802.11n 2.4GHz 20MHz
Mode 5: IEEE 802.11n 2.4GHz 40MHz
Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0
Mode 7: IEEE 802.11n 2.4GHz 40MHz-MCS0

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “X axis” position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

Test Mode	ANT-0	ANT-1	ANT-0+1
Mode 2: IEEE 802.11b	V	---	---
Mode 3: IEEE 802.11g	V	---	---
Mode 4: IEEE 802.11n 2.4GHz 20MHz	V	V	V
Mode 5: IEEE 802.11n 2.4GHz 40MHz	V	V	V
Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0	V	---	---
Mode 7: IEEE 802.11n 2.4GHz 40MHz-MCS0	V	---	---

Test Mode	Antenna Delivery	Test Channel	Data Rate (Mbps)
Mode 2: IEEE 802.11b	1TX / 1RX (only ANT-0)	1,6, 11	1
Mode 3: IEEE 802.11g	1TX / 1RX (only ANT-0)	1,6, 11	6
Mode 4: IEEE 802.11n 2.4GHz 20MHz	2TX / 2RX (MIMO)	1,6, 11	13
Mode 5: IEEE 802.11n 2.4GHz 40MHz	2TX / 2RX (MIMO)	3, 6, 9	27
Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0	1TX / 1RX (only ANT-0)	1,6, 11	6.5
Mode 7: IEEE 802.11n 2.4GHz 40MHz-MCS0	1TX / 1RX (only ANT-0)	3, 6, 9	13.5

Duty cycle

Test Mode	Frequency (MHz)	on time (ms)	on+off time (ms)	Duty cycle	Duty Factor (dB)	1/T Minimum VBW (kHz)
Mode 2: IEEE 802.11b	2412.0	1.000	1.000	1.000	0.000	0.010
Mode 3: IEEE 802.11g	2412.0	1.000	1.000	1.000	0.000	0.010
Mode 4: IEEE 802.11n 2.4GHz 20MHz	2412.0	1.000	1.000	1.000	0.000	0.010
Mode 5: IEEE 802.11n 2.4GHz 40MHz	2422.0	1.000	1.000	1.000	0.000	0.010
Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0	2412.0	1.000	1.000	1.000	0.000	0.010
Mode 7: IEEE 802.11n 2.4GHz 40MHz-MCS0	2422.0	1.000	1.000	1.000	0.000	0.010

Duty Cycle Graphs

Mode 2: IEEE 802.11b	
On time	
On+off time	

Mode 3: IEEE 802.11g Mode	
On time	
On+off time	

Mode 4: IEEE 802.11n 2.4GHz 20MHz Mode	
On time	
On+off time	

Mode 5: IEEE 802.11n 2.4GHz 40MHz Mode	
On time	
On+off time	

Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0 Mode	
On time	
On+off time	

Mode 7: IEEE 802.11n 2.4GHz 40MHz-MCS0 Mode	
On time	
On+off time	

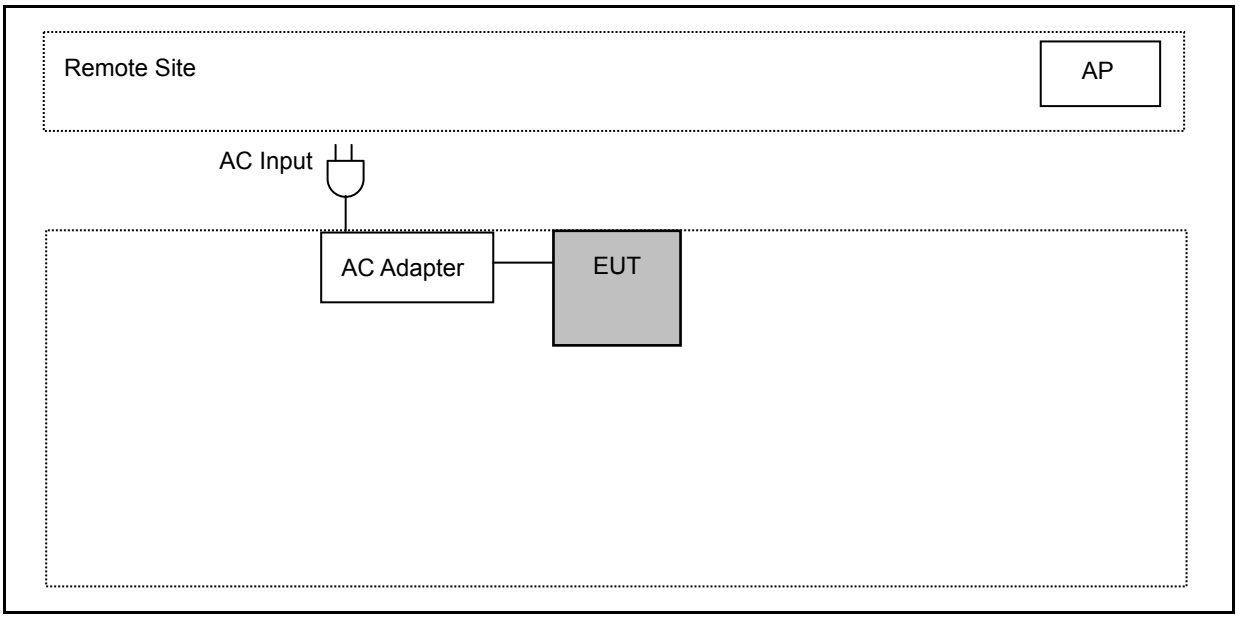
3.2. EUT Exercise Software

1.	Setup the EUT shown on 3.3.
2.	Turn on the power of all equipment.
3.	Turn Wi-Fi function link to AP
4.	EUT run test program.

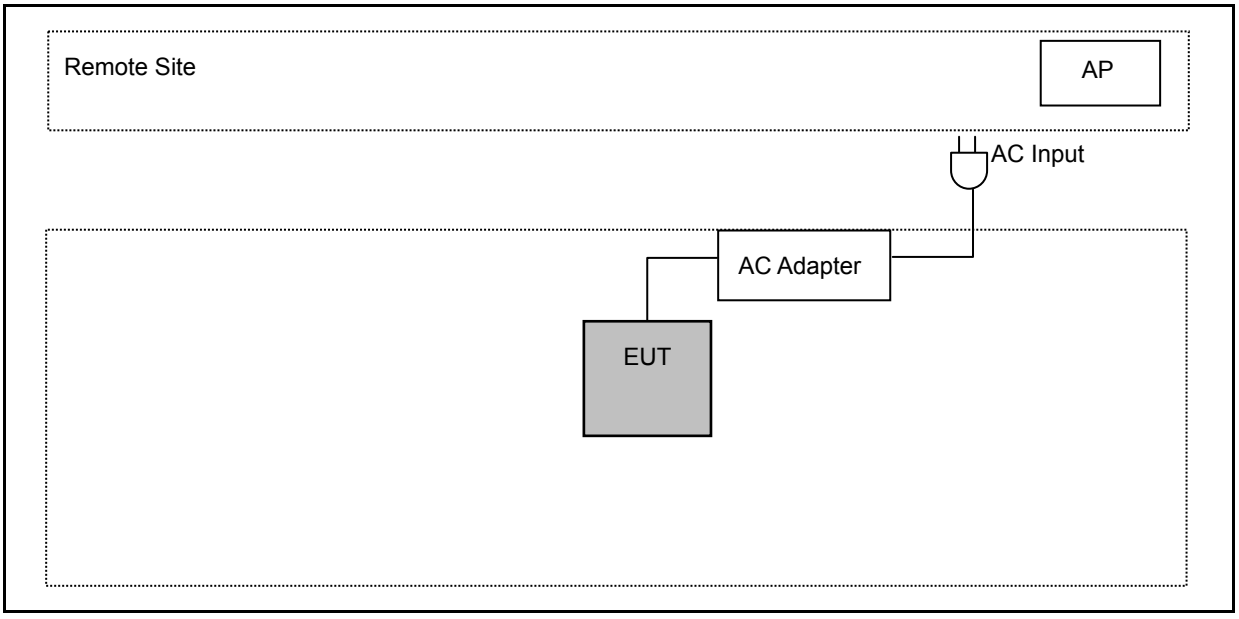
Measurement Software	
1	EZ-EMC Ver. ATL-03A1-1
2	EZ-EMC Ver ATL-ITC-3A1-1

3.3. Configuration of Test System Details

Conducted Emissions



Radiated Emissions



3.4. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

4 AC Power Line Conducted Emission Measurement

4.1. Limit

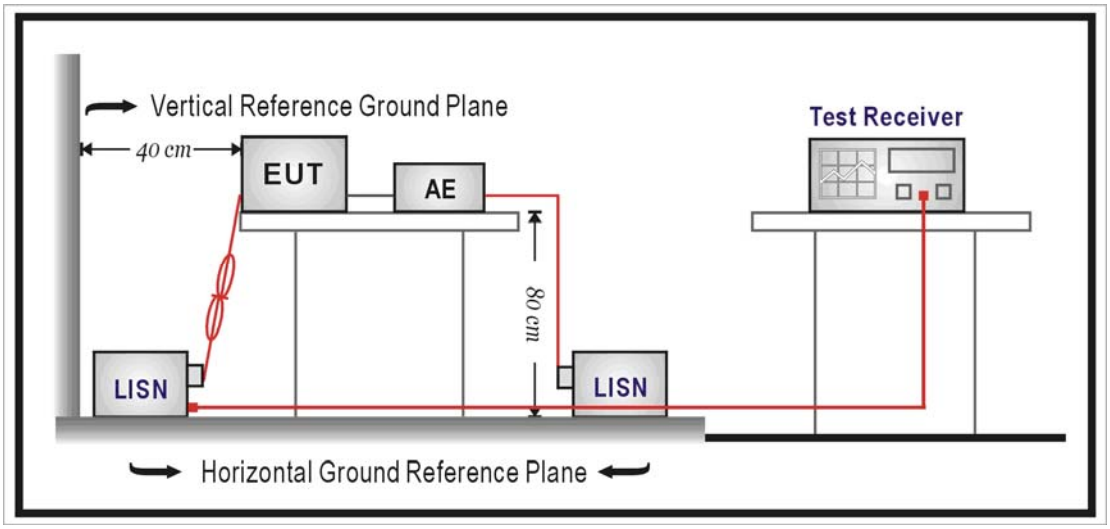
Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Test Receiver	R&S	ESCI	100367	05/31/2016	1 year
LISN	R&S	ENV216	101040	03/15/2016	1 year
LISN	R&S	ENV216	101041	03/07/2016	1 year
RF Cable	Woken	00100D1380194M	TE-02-02	05/31/2016	1 year
Test Site	ATL	TE02	TE02	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

4.3. Test Setup



4.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50Ω// 50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50Ω// 50uH coupling impedance with 50ohm termination.

Tabletop device shall be placed on a non-conducting platform, of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The wall of screened room shall be located 40cm to the rear of the EUT. Other surfaces of tabletop or floor standing EUT shall be at least 80cm from any other ground conducting surface including one or more LISNs. For floor-standing device shall be placed under the EUT with a 12mm insulating material.

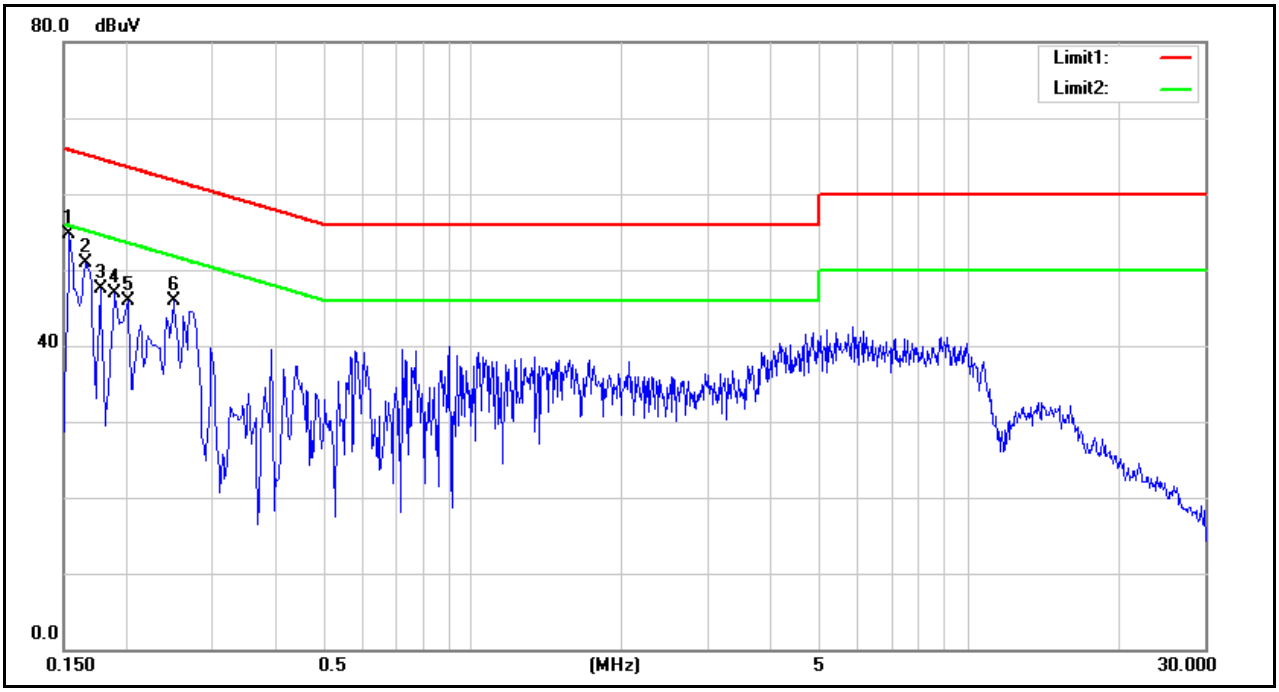
Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a resolution bandwidth of 9 kHz. The equipment under test (EUT) shall be meet the limits in section 4.1, as applicable, including the average limit and the quasi-peak limit when using respectively, an average detector and quasi-peak detector measured in accordance with the methods described of related standard. When all of peak value were complied with quasi-peak and average limit from 150kHz to 30MHz then quasi-peak and average measurement was unnecessary.

The AMN shall be placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for AMNs mounted on top of the ground reference plane. This distance is between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment shall be at least 0,8 m from the AMN. If the mains power cable is longer than 1m then the cable shall be folded back and forth at the centre of the lead to form a bundle no longer than 0.4m. All of interconnecting cables that hang closer than 40cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long. All of EUT and AE shall be separate place more than 0.1m. All 50 Ω ports of the LISN shall be resistively terminated into 50 Ω loads when not connected to the measuring instrument.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

4.5. Test Result

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	08/21/2016
		Test By:	Eric Ou Yang
Description:			

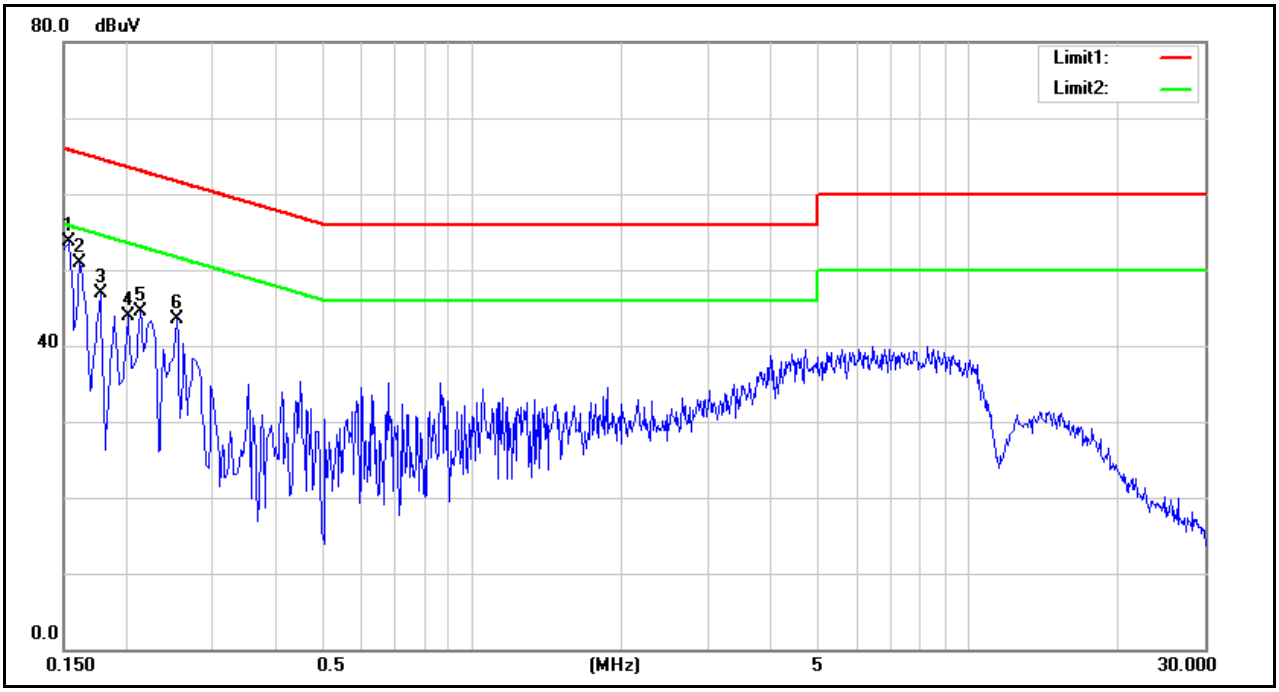


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1540	35.61	13.09	9.60	45.21	22.69	65.78	55.78	-20.57	-33.09	Pass
2	0.1660	38.59	28.66	9.60	48.19	38.26	65.16	55.16	-16.97	-16.90	Pass
3	0.1780	31.72	10.87	9.59	41.31	20.46	64.58	54.58	-23.27	-34.12	Pass
4	0.1900	34.34	25.71	9.59	43.93	35.30	64.04	54.04	-20.11	-18.74	Pass
5	0.2020	31.98	17.05	9.59	41.57	26.64	63.53	53.53	-21.96	-26.89	Pass
6	0.2500	32.46	25.48	9.60	42.06	35.08	61.76	51.76	-19.70	-16.68	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	08/21/2016
		Test By:	Eric Ou Yang
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1540	36.31	13.45	9.59	45.90	23.04	65.78	55.78	-19.88	-32.74	Pass
2	0.1620	35.95	21.02	9.59	45.54	30.61	65.36	55.36	-19.82	-24.75	Pass
3	0.1780	32.33	9.33	9.58	41.91	18.91	64.58	54.58	-22.67	-35.67	Pass
4	0.2020	29.55	15.98	9.58	39.13	25.56	63.53	53.53	-24.40	-27.97	Pass
5	0.2140	29.76	18.60	9.58	39.34	28.18	63.05	53.05	-23.71	-24.87	Pass
6	0.2540	28.25	18.70	9.59	37.84	28.29	61.63	51.63	-23.79	-23.34	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

5 Radiated Emission Measurement

5.1. Limit

According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m at meter)	Measurement Distance (meters)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 - 88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

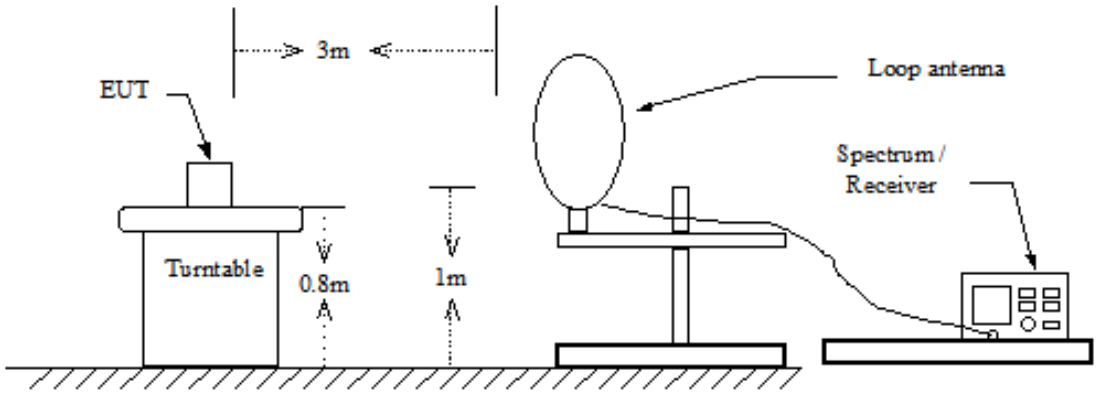
5.2. Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
RF Pre-selector	Agilent	N9039A	MY46520256	01/08/2016	1 year
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/08/2016	1 year
Pre Amplifier	Agilent	8449B	3008A02237	10/07/2015	1 year
Pre Amplifier	Agilent	8447D	2944A11119	01/11/2016	1 year
Broadband Antenna	Schwarzbeck	VULB9168	416	09/25/2015	1 year
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/06/2016	1 year
Horn Antenna (18~40GHz)	ETS	3116	86467	09/01/2015	1 year
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	02/01/2016	1 year
Microwave Cable	EMCI	EMC102-KM-KM-14000	151001	10/15/2015	1 year
Microwave Cable	EMCI	EMC-104-SM-SM-14000	140202	10/15/2015	1 year
Microwave Cable	EMCI	EMC104-SM-SM-600	140301	10/15/2015	1 year
Test Site	ATL	TE01	888001	08/27/2015	1 year

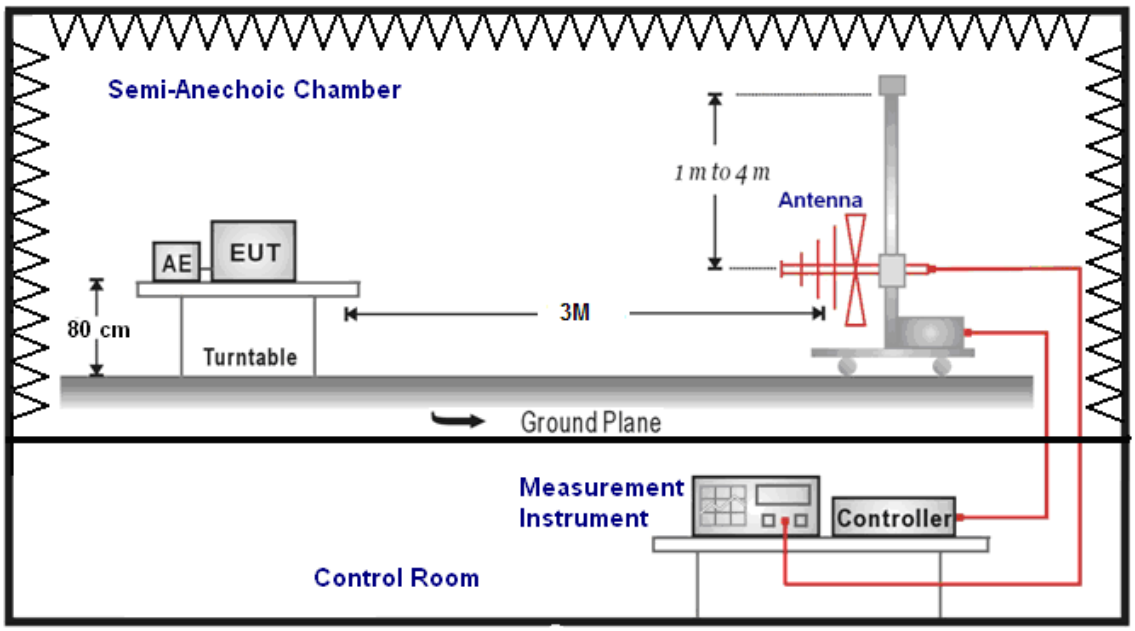
Note: N.C.R. = No Calibration Request.

5.3. Setup

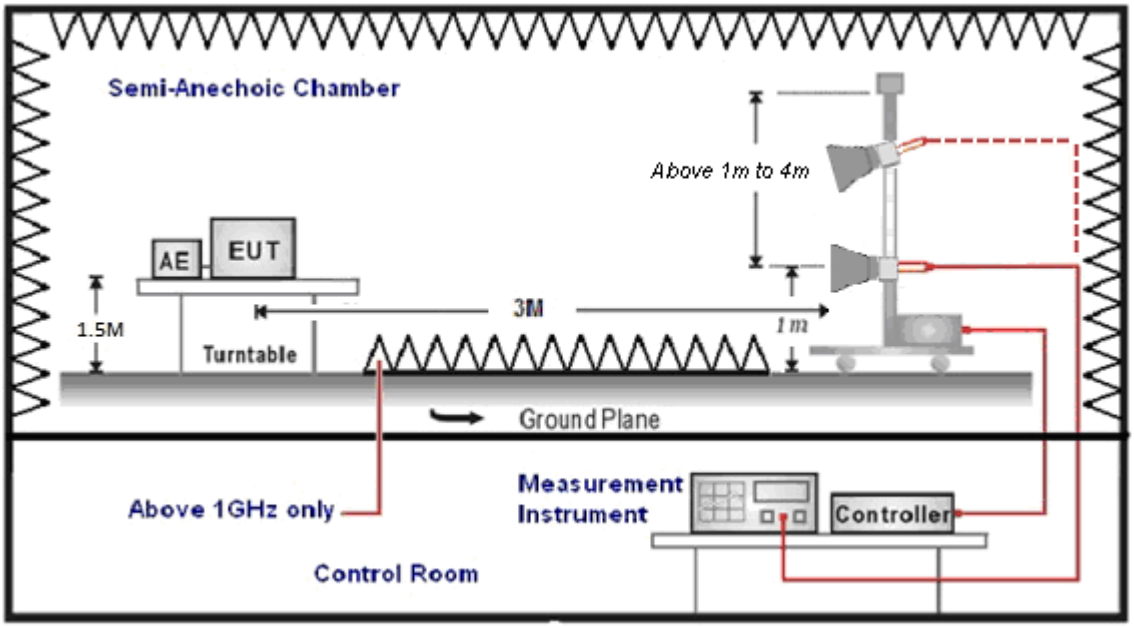
9kHz ~ 30MHz



Below 1GHz



Above 1GHz


Semi-Anechoic Chamber
Above 1m to 4m
AE
EUT
1.5M
Turntable
3M
1 m
Ground Plane
Above 1GHz only
Measurement
Instrument
Controller
Control Room

5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 or 1.5 meters height(below 1GHz use 0.8m turntable / above 1GHz use 1.5m turntable), top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements when Duty cycle >0.98 / 1/T for average measurements when Duty cycle <0.98. A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna was used in frequencies 1 –26.5 GHz at a distance of 3 meter. The antenna at an angle toward the source of the emission. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)
FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.
P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)
The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:
(a) For fundamental frequency : Transmitter Output < +30dBm
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5.5. Test Result

Below 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 1	Date:	08/18/2016
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
250.0000	44.73	-5.28	39.45	46.00	-6.55	QP	H
280.0000	42.63	-3.91	38.72	46.00	-7.28	QP	H
320.0000	38.47	-3.10	35.37	46.00	-10.63	QP	H
448.0000	37.64	-0.23	37.41	46.00	-8.59	QP	H
480.0000	36.53	0.37	36.90	46.00	-9.10	QP	H
500.0000	36.83	0.74	37.57	46.00	-8.43	QP	H
272.0000	41.79	-4.35	37.44	46.00	-8.56	QP	V
280.0000	47.06	-3.91	43.15	46.00	-2.85	QP	V
304.0000	40.41	-3.32	37.09	46.00	-8.91	QP	V
448.0000	38.61	-0.23	38.38	46.00	-7.62	QP	V
480.0000	38.66	0.37	39.03	46.00	-6.97	QP	V
500.0000	36.74	0.74	37.48	46.00	-8.52	QP	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.No emission found between lowest internal used/generated frequencies to 30MHz (9 kHz~30MHz).

Above 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	08/19/2016
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4824.000	51.17	-7.96	43.21	74.00	-30.79	peak	H
4824.000	63.13	-7.96	55.17	74.00	-18.83	peak	V
4824.000	61.43	-7.96	53.47	54.00	-0.53	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	08/19/2016
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4874.000	50.76	-7.80	42.96	74.00	-31.04	peak	H
4874.000	63.20	-7.80	55.40	74.00	-18.60	peak	V
4874.000	61.55	-7.80	53.75	54.00	-0.25	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	08/19/2016
Frequency:	2462MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4924.000	50.78	-7.65	43.13	74.00	-30.87	peak	H
4924.000	59.28	-7.65	51.63	74.00	-22.37	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	08/19/2016
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4824.000	49.09	-7.96	41.13	74.00	-32.87	peak	H
4824.000	52.56	-7.96	44.60	74.00	-29.40	peak	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	08/19/2016
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4874.000	47.62	-7.80	39.82	74.00	-34.18	peak	H
4874.000	56.25	-7.80	48.45	74.00	-25.55	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	08/19/2016
Frequency:	2462MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4924.000	47.68	-7.65	40.03	74.00	-33.97	peak	H
4924.000	49.79	-7.65	42.14	74.00	-31.86	peak	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	08/19/2016
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4824.000	50.64	-7.96	42.68	74.00	-31.32	peak	H
4824.000	55.28	-7.96	47.32	74.00	-26.68	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	08/19/2016
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4874.000	54.34	-7.80	46.54	74.00	-27.46	peak	H
4874.000	64.17	-7.80	56.37	74.00	-17.63	peak	V
4874.000	54.87	-7.80	47.07	54.00	-6.93	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	08/19/2016
Frequency:	2462MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4924.000	48.62	-7.65	40.97	74.00	-33.03	peak	H
4924.000	55.45	-7.65	47.80	74.00	-26.20	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	08/19/2016
Frequency:	2422MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4844.000	47.94	-7.88	40.06	74.00	-33.94	peak	H
4844.000	53.68	-7.88	45.80	74.00	-28.20	peak	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	08/19/2016
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4874.000	47.59	-7.80	39.79	74.00	-34.21	peak	H
4874.000	56.08	-7.80	48.28	74.00	-25.72	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	08/19/2016
Frequency:	2452MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4904.000	45.07	-7.70	37.37	74.00	-36.63	peak	H
4904.000	52.37	-7.70	44.67	74.00	-29.33	peak	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 6	Date:	08/19/2016
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4824.000	48.22	-7.96	40.26	74.00	-33.74	peak	H
4824.000	51.26	-7.96	43.30	74.00	-30.70	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 6	Date:	08/19/2016
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4874.000	52.18	-7.80	44.38	74.00	-29.62	peak	H
4874.000	58.49	-7.80	50.69	74.00	-23.31	peak	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 6	Date:	08/19/2016
Frequency:	2462MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4924.000	48.34	-7.65	40.69	74.00	-33.31	peak	H
4924.000	46.49	-7.65	38.84	74.00	-35.16	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 7	Date:	08/19/2016
Frequency:	2422MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4844.000	46.78	-7.88	38.90	74.00	-35.10	peak	H
4844.000	48.14	-7.88	40.26	74.00	-33.74	peak	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 7	Date:	08/19/2016
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4874.000	48.84	-7.80	41.04	74.00	-32.96	peak	H
4874.000	52.90	-7.80	45.10	74.00	-28.90	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 7	Date:	08/19/2016
Frequency:	2452MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4904.000	46.91	-7.70	39.21	74.00	-34.79	peak	H
4904.000	44.98	-7.70	37.28	74.00	-36.72	peak	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Band Edge

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	08/18/2016
Frequency:	2412 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2372.480	56.61	-0.41	56.20	74.00	-17.80	peak	H
2372.480	49.85	-0.41	49.44	54.00	-4.56	AVG	H
2390.000	56.78	-0.34	56.44	74.00	-17.56	peak	H
2390.000	51.64	-0.34	51.30	54.00	-2.70	AVG	H
2388.650	65.15	-0.34	64.81	74.00	-9.19	peak	V
2388.650	53.97	-0.34	53.63	54.00	-0.37	AVG	V
2390.000	64.00	-0.34	63.66	74.00	-10.34	peak	V
2390.000	52.60	-0.34	52.26	54.00	-1.74	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	08/18/2016
Frequency:	2437 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2385.810	56.20	-0.36	55.84	74.00	-18.16	peak	H
2385.810	49.74	-0.36	49.38	54.00	-4.62	AVG	H
2390.000	56.33	-0.34	55.99	74.00	-18.01	peak	H
2390.000	48.31	-0.34	47.97	54.00	-6.03	AVG	H
2483.500	50.61	0.03	50.64	74.00	-23.36	peak	H
2487.460	53.84	0.04	53.88	74.00	-20.12	peak	H
2487.460	45.73	0.04	45.77	54.00	-8.23	AVG	H
2385.810	59.66	-0.36	59.30	74.00	-14.70	peak	V
2385.810	53.93	-0.36	53.57	54.00	-0.43	AVG	V
2390.000	59.30	-0.34	58.96	74.00	-15.04	peak	V
2390.000	50.74	-0.34	50.40	54.00	-3.60	AVG	V
2483.500	55.11	0.03	55.14	74.00	-18.86	peak	V
2483.500	49.47	0.03	49.50	54.00	-4.50	AVG	V
2488.030	59.25	0.05	59.30	74.00	-14.70	peak	V
2488.030	52.45	0.05	52.50	54.00	-1.50	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 2	Date:	08/18/2016
Frequency:	2462 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	54.04	0.03	54.07	74.00	-19.93	peak	H
2483.500	48.95	0.03	48.98	54.00	-5.02	AVG	H
2488.040	56.41	0.05	56.46	74.00	-17.54	peak	H
2488.040	49.85	0.05	49.90	54.00	-4.10	AVG	H
2483.500	60.84	0.03	60.87	74.00	-13.13	peak	V
2483.500	52.48	0.03	52.51	54.00	-1.49	AVG	V
2487.800	63.08	0.05	63.13	74.00	-10.87	peak	V
2487.800	53.70	0.05	53.75	54.00	-0.25	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	08/18/2016
Frequency:	2412 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2389.530	66.37	-0.34	66.03	74.00	-7.97	peak	H
2389.530	49.86	-0.34	49.52	54.00	-4.48	AVG	H
2390.000	66.13	-0.34	65.79	74.00	-8.21	peak	H
2390.000	50.61	-0.34	50.27	54.00	-3.73	AVG	H
2389.090	71.00	-0.34	70.66	74.00	-3.34	peak	V
2389.090	52.48	-0.34	52.14	54.00	-1.86	AVG	V
2390.000	69.60	-0.34	69.26	74.00	-4.74	peak	V
2390.000	54.07	-0.34	53.73	54.00	-0.27	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	08/18/2016
Frequency:	2437 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2384.860	59.48	-0.36	59.12	74.00	-14.88	peak	H
2384.860	47.40	-0.36	47.04	54.00	-6.96	AVG	H
2390.000	59.78	-0.34	59.44	74.00	-14.56	peak	H
2390.000	48.15	-0.34	47.81	54.00	-6.19	AVG	H
2483.500	53.93	0.03	53.96	74.00	-20.04	peak	H
2483.500	47.27	0.03	47.30	54.00	-6.70	AVG	H
2484.420	56.50	0.04	56.54	74.00	-17.46	peak	H
2484.420	46.60	0.04	46.64	54.00	-7.36	AVG	H
2385.810	63.80	-0.36	63.44	74.00	-10.56	peak	V
2385.810	51.01	-0.36	50.65	54.00	-3.35	AVG	V
2390.000	63.43	-0.34	63.09	74.00	-10.91	peak	V
2390.000	51.81	-0.34	51.47	54.00	-2.53	AVG	V
2483.500	62.29	0.03	62.32	74.00	-11.68	peak	V
2483.500	53.54	0.03	53.57	54.00	-0.43	AVG	V
2495.060	63.66	0.08	63.74	74.00	-10.26	peak	V
2495.060	50.14	0.08	50.22	54.00	-3.78	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 3	Date:	08/18/2016
Frequency:	2462 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	63.83	0.03	63.86	74.00	-10.14	peak	H
2483.500	47.96	0.03	47.99	54.00	-6.01	AVG	H
2485.120	64.14	0.04	64.18	74.00	-9.82	peak	H
2485.120	47.13	0.04	47.17	54.00	-6.83	AVG	H
2483.500	69.65	0.03	69.68	74.00	-4.32	peak	V
2483.500	53.74	0.03	53.77	54.00	-0.23	AVG	V
2484.840	69.37	0.04	69.41	74.00	-4.59	peak	V
2484.840	53.15	0.04	53.19	54.00	-0.81	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	08/18/2016
Frequency:	2412 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2387.990	62.47	-0.34	62.13	74.00	-11.87	peak	H
2387.990	47.72	-0.34	47.38	54.00	-6.62	AVG	H
2390.000	61.89	-0.34	61.55	74.00	-12.45	peak	H
2390.000	48.93	-0.34	48.59	54.00	-5.41	AVG	H
2389.310	69.11	-0.34	68.77	74.00	-5.23	peak	V
2389.310	53.63	-0.34	53.29	54.00	-0.71	AVG	V
2390.000	69.83	-0.34	69.49	74.00	-4.51	peak	V
2390.000	54.04	-0.34	53.70	54.00	-0.30	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	08/18/2016
Frequency:	2437 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2389.420	61.22	-0.34	60.88	74.00	-13.12	peak	H
2389.420	48.71	-0.34	48.37	54.00	-5.63	AVG	H
2390.000	57.51	-0.34	57.17	74.00	-16.83	peak	H
2390.000	48.83	-0.34	48.49	54.00	-5.51	AVG	H
2483.500	55.77	0.03	55.80	74.00	-18.20	peak	H
2483.500	47.79	0.03	47.82	54.00	-6.18	AVG	H
2487.270	59.47	0.04	59.51	74.00	-14.49	peak	H
2487.270	45.93	0.04	45.97	54.00	-8.03	AVG	H
2389.230	65.09	-0.34	64.75	74.00	-9.25	peak	V
2389.230	52.68	-0.34	52.34	54.00	-1.66	AVG	V
2390.000	63.08	-0.34	62.74	74.00	-11.26	peak	V
2390.000	52.75	-0.34	52.41	54.00	-1.59	AVG	V
2483.500	63.14	0.03	63.17	74.00	-10.83	peak	V
2483.500	53.71	0.03	53.74	54.00	-0.26	AVG	V
2484.230	64.41	0.04	64.45	74.00	-9.55	peak	V
2484.230	52.72	0.04	52.76	54.00	-1.24	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 4	Date:	08/18/2016
Frequency:	2462 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	57.98	0.03	58.01	74.00	-15.99	peak	H
2483.500	47.95	0.03	47.98	54.00	-6.02	AVG	H
2483.640	63.27	0.03	63.30	74.00	-10.70	peak	H
2483.640	48.07	0.03	48.10	54.00	-5.90	AVG	H
2483.500	67.27	0.03	67.30	74.00	-6.70	peak	V
2483.500	53.53	0.03	53.56	54.00	-0.44	AVG	V
2484.960	69.64	0.04	69.68	74.00	-4.32	peak	V
2484.960	52.04	0.04	52.08	54.00	-1.92	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	08/18/2016
Frequency:	2422 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2388.960	62.85	-0.34	62.51	74.00	-11.49	peak	H
2388.960	48.03	-0.34	47.69	54.00	-6.31	AVG	H
2390.000	60.15	-0.34	59.81	74.00	-14.19	peak	H
2390.000	49.48	-0.34	49.14	54.00	-4.86	AVG	H
2387.520	60.98	-0.34	60.64	74.00	-13.36	peak	V
2387.520	48.23	-0.34	47.89	54.00	-6.11	AVG	V
2390.000	60.98	-0.34	60.64	74.00	-13.36	peak	V
2390.000	49.49	-0.34	49.15	54.00	-4.85	AVG	V
2483.500	57.12	0.03	57.15	74.00	-16.85	peak	V
2483.500	47.91	0.03	47.94	54.00	-6.06	AVG	V
2485.940	58.06	0.04	58.10	74.00	-15.90	peak	V
2485.940	46.53	0.04	46.57	54.00	-7.43	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	08/18/2016
Frequency:	2437 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2388.470	67.85	-0.34	67.51	74.00	-6.49	peak	H
2388.470	52.48	-0.34	52.14	54.00	-1.86	AVG	H
2390.000	67.96	-0.34	67.62	74.00	-6.38	peak	H
2390.000	53.96	-0.34	53.62	54.00	-0.38	AVG	H
2483.500	68.68	0.03	68.71	74.00	-5.29	peak	H
2483.500	52.65	0.03	52.68	54.00	-1.32	AVG	H
2483.850	69.00	0.03	69.03	74.00	-4.97	peak	H
2483.850	52.14	0.03	52.17	54.00	-1.83	AVG	H
2483.500	55.87	0.03	55.90	74.00	-18.10	peak	V
2483.500	49.03	0.03	49.06	54.00	-4.94	AVG	V
2483.800	60.06	0.03	60.09	74.00	-13.91	peak	V
2483.800	48.63	0.03	48.66	54.00	-5.34	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 5	Date:	08/18/2016
Frequency:	2452 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	64.28	0.03	64.31	74.00	-9.69	peak	H
2483.500	53.66	0.03	53.69	54.00	-0.31	AVG	H
2486.000	67.07	0.04	67.11	74.00	-6.89	peak	H
2486.000	51.84	0.04	51.88	54.00	-2.12	AVG	H
2388.600	70.56	-0.34	70.22	74.00	-3.78	peak	V
2388.600	53.08	-0.34	52.74	54.00	-1.26	AVG	V
2390.000	69.12	-0.34	68.78	74.00	-5.22	peak	V
2390.000	54.00	-0.34	53.66	54.00	-0.34	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 6	Date:	08/18/2016
Frequency:	2412 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2387.990	64.21	-0.34	63.87	74.00	-10.13	peak	H
2387.990	48.57	-0.34	48.23	54.00	-5.77	AVG	H
2390.000	61.19	-0.34	60.85	74.00	-13.15	peak	H
2390.000	49.40	-0.34	49.06	54.00	-4.94	AVG	H
2387.440	66.10	-0.35	65.75	74.00	-8.25	peak	V
2387.440	49.61	-0.35	49.26	54.00	-4.74	AVG	V
2390.000	64.69	-0.34	64.35	74.00	-9.65	peak	V
2390.000	54.02	-0.34	53.68	54.00	-0.32	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 6	Date:	08/18/2016
Frequency:	2437 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2385.050	58.85	-0.36	58.49	74.00	-15.51	peak	H
2385.050	44.37	-0.36	44.01	54.00	-9.99	AVG	H
2390.000	56.55	-0.34	56.21	74.00	-17.79	peak	H
2390.000	46.46	-0.34	46.12	54.00	-7.88	AVG	H
2483.500	53.17	0.03	53.20	74.00	-20.80	peak	H
2483.500	44.40	0.03	44.43	54.00	-9.57	AVG	H
2484.610	53.84	0.04	53.88	74.00	-20.12	peak	H
2484.610	44.23	0.04	44.27	54.00	-9.73	AVG	H
2386.950	60.11	-0.35	59.76	74.00	-14.24	peak	V
2386.950	47.98	-0.35	47.63	54.00	-6.37	AVG	V
2390.000	58.34	-0.34	58.00	74.00	-16.00	peak	V
2390.000	48.53	-0.34	48.19	54.00	-5.81	AVG	V
2483.500	58.86	0.03	58.89	74.00	-15.11	peak	V
2483.500	51.01	0.03	51.04	54.00	-2.96	AVG	V
2484.420	60.92	0.04	60.96	74.00	-13.04	peak	V
2484.420	46.72	0.04	46.76	54.00	-7.24	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 6	Date:	08/18/2016
Frequency:	2462 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	60.29	0.03	60.32	74.00	-13.68	peak	H
2483.500	47.04	0.03	47.07	54.00	-6.93	AVG	H
2486.320	62.25	0.04	62.29	74.00	-11.71	peak	H
2486.320	45.51	0.04	45.55	54.00	-8.45	AVG	H
2483.500	69.86	0.03	69.89	74.00	-4.11	peak	V
2483.500	53.50	0.03	53.53	54.00	-0.47	AVG	V
2485.480	72.24	0.04	72.28	74.00	-1.72	peak	V
2485.480	50.36	0.04	50.40	54.00	-3.60	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 57	Date:	08/18/2016
Frequency:	2422 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2387.520	61.73	-0.34	61.39	74.00	-12.61	peak	H
2387.520	48.60	-0.34	48.26	54.00	-5.74	AVG	H
2390.000	60.37	-0.34	60.03	74.00	-13.97	peak	H
2390.000	49.36	-0.34	49.02	54.00	-4.98	AVG	H
2388.120	67.66	-0.34	67.32	74.00	-6.68	peak	V
2388.120	51.85	-0.34	51.51	54.00	-2.49	AVG	V
2390.000	63.29	-0.34	62.95	74.00	-11.05	peak	V
2390.000	54.04	-0.34	53.70	54.00	-0.30	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 7	Date:	08/18/2016
Frequency:	2437 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2389.040	62.69	-0.34	62.35	74.00	-11.65	peak	H
2389.040	49.20	-0.34	48.86	54.00	-5.14	AVG	H
2390.000	62.13	-0.34	61.79	74.00	-12.21	peak	H
2390.000	50.11	-0.34	49.77	54.00	-4.23	AVG	H
2483.500	58.67	0.03	58.70	74.00	-15.30	peak	H
2483.500	47.84	0.03	47.87	54.00	-6.13	AVG	H
2483.850	58.29	0.03	58.32	74.00	-15.68	peak	H
2483.850	47.57	0.03	47.60	54.00	-6.40	AVG	H
2388.090	66.55	-0.34	66.21	74.00	-7.79	peak	V
2388.090	52.59	-0.34	52.25	54.00	-1.75	AVG	V
2390.000	64.02	-0.34	63.68	74.00	-10.32	peak	V
2390.000	53.84	-0.34	53.50	54.00	-0.50	AVG	V
2483.500	64.20	0.03	64.23	74.00	-9.77	peak	V
2483.500	53.55	0.03	53.58	54.00	-0.42	AVG	V
2484.610	64.97	0.04	65.01	74.00	-8.99	peak	V
2484.610	52.74	0.04	52.78	54.00	-1.22	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	HGW-500BNA-QC v2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	Mode 7	Date:	08/18/2016
Frequency:	2452 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	54.08	0.03	54.11	74.00	-19.89	peak	H
2483.500	46.92	0.03	46.95	54.00	-7.05	AVG	H
2483.800	57.19	0.03	57.22	74.00	-16.78	peak	H
2483.800	46.84	0.03	46.87	54.00	-7.13	AVG	H
2483.500	68.17	0.03	68.20	74.00	-5.80	peak	V
2483.500	53.64	0.03	53.67	54.00	-0.33	AVG	V
2483.950	69.93	0.04	69.97	74.00	-4.03	peak	V
2483.950	53.16	0.04	53.20	54.00	-0.80	AVG	V

Note:1.Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

6 Maximum Conducted Output Power Measurement

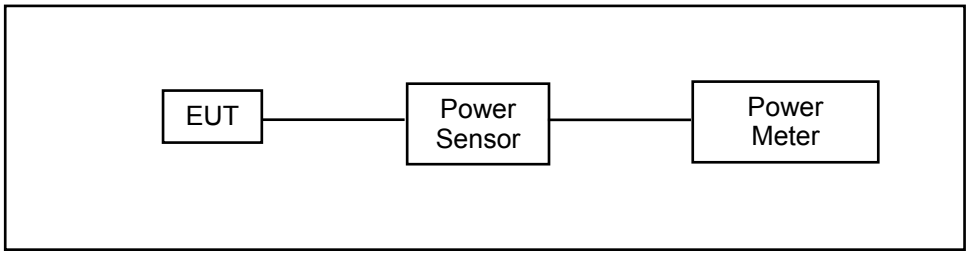
6.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for maximum output power is 30dBm.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

* SISO mode ：Directional Gain = Max. Gain = 0.10 dBi < 6 dBi.
* MIMO mode：Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+ …+10^(Gn/20)]^2/NANT}
* MIMO mode：Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+…+10^(Gn/20)]^2/NANT} = 3.11dBi < 6dBi
* MIMO mode power limit shall be reduced = 30 dBm.

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Power Sensor	Anritsu	MA2411B	1126022	08/24/2016	1 year
Power Meter	Anritsu	ML2495A	1135009	08/24/2016	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

6.4. Test Procedure

The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor.

6.5. Test Result

Test Mode	Frequency (MHz)	RF Power setting in Test Software		Test Software Version
		ANT-0	ANT-1	
Mode 2	2412	50.0	---	RTL819x 3.0
	2437	53.0	---	
	2462	52.0	---	
Mode 3	2412	48.0	---	
	2437	58.0	---	
	2462	48.0	---	
Mode 4	2412	47.0	49.0	
	2437	62.0	63.0	
	2462	49.0	49.0	
Mode 5	2422	49.0	51.0	
	2437	53.0	54.0	
	2452	48.0	49.0	
Mode 6	2412	51.0	---	
	2437	63.0	---	
	2462	51.0	---	
Mode 7	2422	51.0	---	
	2437	56.0	---	
	2452	51.0	---	

Model Number	HGW-500BNA-QC v2			
Test Item	Maximum Conducted Output Power			
Date of Test	08/18/2016			
ANT-0				
Test Mode	Frequency (MHz)	Data Rate	Average Output Power	
			Measurement Results	
			dBm	W
Mode 2	2412	1M	22.13	0.163
	2437		**23.18**	0.208
	2462		**23.18**	0.208
	2437	2M	23.08	0.203
	2437	5.5M	23.10	0.204
	2437	11M	23.03	0.201
Mode 3	2412	6M	17.91	0.062
	2437		**22.01**	0.159
	2462		18.24	0.067
	2437	9M	21.95	0.157
	2437	12M	21.90	0.155
	2437	18M	21.92	0.156
	2437	24M	21.88	0.154

	2437	36M	21.86	0.153
	2437	48M	21.81	0.152
	2437	54M	21.78	0.151

Note: The relevant measured result has the offset with cable loss already.

Model Number	HGW-500BNA-QC v2			
Test Item	Maximum Conducted Output Power			
Date of Test	08/18/2016			
ANT-0				
Test Mode	Frequency (MHz)	Data Rate	Average Output Power	
			Measurement Results	
			dBm	W
Mode 4	2412	13M	17.49	0.056
	2437		**23.26**	0.212
	2462		18.25	0.067
	2437	26M	23.20	0.209
	2437	39M	23.17	0.207
	2437	52M	23.10	0.204
	2437	78M	23.14	0.206
	2437	104M	23.08	0.203
	2437	117M	23.02	0.200
	2437	130M	22.98	0.199
Mode 5	2422	27M	17.42	0.055
	2437		**19.27**	0.085
	2452		17.57	0.057
	2437	54M	19.20	0.083
	2437	81M	19.17	0.083
	2437	108M	19.13	0.082
	2437	162M	19.10	0.081
	2437	216M	19.12	0.082
	2437	243M	19.08	0.081
	2437	270M	19.06	0.081

Note: The relevant measured result has the offset with cable loss already.

Model Number	HGW-500BNA-QC v2			
Test Item	Maximum Conducted Output Power			
Date of Test	08/18/2016			
ANT-0				
Test Mode	Frequency (MHz)	Data Rate	Average Output Power	
			Measurement Results	
			dBm	W
Mode 6	2412	6.5M	18.39	0.069
	2437		**23.06**	0.202
	2462		18.86	0.077
	2437	13M	23.02	0.200
	2437	19.5M	23.00	0.200
	2437	26M	22.97	0.198
	2437	39M	22.92	0.196
	2437	52M	22.94	0.197
	2437	58.5M	22.90	0.195
	2437	65M	22.86	0.193
Mode 7	2422	13.5M	18.09	0.064
	2437		**20.62**	0.115
	2452		18.41	0.069
	2437	27M	20.58	0.114
	2437	40.5M	20.55	0.114
	2437	54M	20.52	0.113
	2437	81M	20.50	0.112
	2437	108M	20.53	0.113
	2437	121.5M	20.48	0.112
	2437	135M	20.42	0.110

Note: The relevant measured result has the offset with cable loss already.

Model Number	HGW-500BNA-QC v2			
Test Item	Maximum Conducted Output Power			
Date of Test	08/18/2016			
ANT-1				
Test Mode	Frequency (MHz)	Data Rate	Average Output Power	
			Measurement Results	
			dBm	W
Mode 4	2412	13M	17.44	0.055
	2437		**23.12**	0.205
	2462		17.76	0.060
	2437	26M	23.10	0.204
	2437	39M	23.05	0.202
	2437	52M	23.02	0.200
	2437	78M	23.04	0.201
	2437	104M	22.99	0.199
	2437	117M	22.96	0.198
	2437	130M	22.91	0.195
Mode 5	2422	27M	17.57	0.057
	2437		**19.66**	0.092
	2452		17.05	0.051
	2437	54M	19.60	0.091
	2437	81M	19.58	0.091
	2437	108M	19.51	0.089
	2437	162M	19.48	0.089
	2437	216M	19.50	0.089
	2437	243M	19.46	0.088
	2437	270M	19.41	0.087

Note: The relevant measured result has the offset with cable loss already.

Model Number	HGW-500BNA-QC v2			
Test Item	Maximum Conducted Output Power			
Date of Test	08/18/2016			
ANT-0+1				
Test Mode	Frequency (MHz)	Data Rate	Average Output Power	
			Measurement Results	
			dBm	W
Mode 4	2412	13M	20.48	0.112
	2437		**26.20**	0.417
	2462		21.02	0.127
	2437	26M	26.16	0.413
	2437	39M	26.12	0.409
	2437	52M	26.07	0.405
	2437	78M	26.10	0.407
	2437	104M	26.05	0.402
	2437	117M	26.00	0.398
	2437	130M	25.96	0.394
Mode 5	2422	27M	20.51	0.112
	2437		**22.48**	0.177
	2452		20.33	0.108
	2437	54M	22.41	0.174
	2437	81M	22.39	0.173
	2437	108M	22.33	0.171
	2437	162M	22.30	0.170
	2437	216M	22.32	0.171
	2437	243M	22.28	0.169
	2437	270M	22.25	0.168

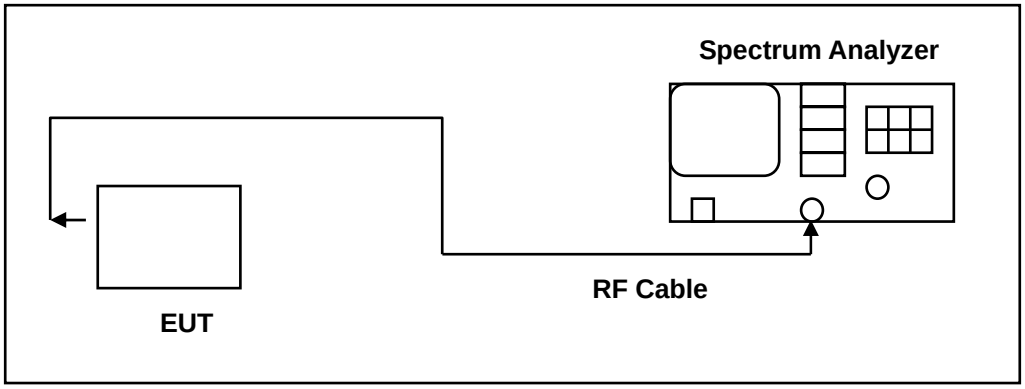
Note: The relevant measured result has the offset with cable loss already.

7 6dB RF Bandwidth Measurement

7.1. Limit

6dB RF Bandwidth: Systems using digital modulation techniques may operate in the 2400–2483.5 MHz bands. The minimum 6 dB band-width shall be at least 500 kHz.

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

7.4. Test Procedure

The EUT tested to DTS test procedure of KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.
6dB RF Bandwidth: The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A peak output reading was taken, a DISPLAY line was drawn 6 dB lower than peak level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.
The test was performed at 3 channels (Channel low, middle, high)

7.5. Test Result

Model Number	HGW-500BNA-QC v2			
Test Item	6dB RF Bandwidth			
Date of Test	08/25/2016			
Test Mode	Frequency (MHz)	Measurement (kHz)		Limit (kHz)
		ANT-0	ANT-1	
Mode 2	2412	10080	---	> 500
	2437	10080	---	> 500
	2462	10080	---	> 500
Mode 3	2412	16580	---	> 500
	2437	16560	---	> 500
	2462	16580	---	> 500
Mode 4	2412	17810	17770	> 500
	2437	17740	17810	> 500
	2462	17810	17790	> 500
Mode 5	2422	36410	36360	> 500
	2437	36410	36360	> 500
	2452	36420	36380	> 500
Mode 6	2412	17810	---	> 500
	2437	17840	---	> 500
	2462	17810	---	> 500
Mode 7	2422	36410	---	> 500
	2437	36410	---	> 500
	2452	36440	---	> 500

7.6. Test Graphs

Mode 2: IEEE 802.11b _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 3: IEEE 802.11g _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 4: IEEE 802.11n 2.4GHz 20MHz _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 5: IEEE 802.11n 2.4GHz 40MHz _ANT-0	
2422 MHz	
2437 MHz	
2452 MHz	

Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0 _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 7: IEEE 802.11n 2.4GHz 40MHz-MCS0 _ANT-0	
2422 MHz	
2437 MHz	
2452 MHz	

Mode 4: IEEE 802.11n 2.4GHz 20MHz-MCS0 _ANT-1	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 5: IEEE 802.11n 2.4GHz 40MHz-MCS0 _ANT-1	
2422 MHz	
2437 MHz	
2452 MHz	

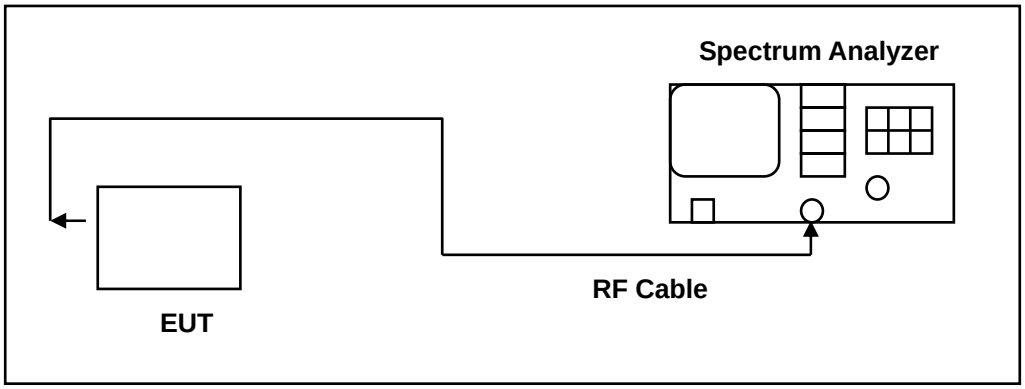
8 Maximum Power Density Measurement

8.1. 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.

* SISO mode ：Directional Gain = Max. Gain = 0.10 dBi < 6 dBi.
* MIMO mode：Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+ …+10^(Gn/20)]^2/NANT}
* MIMO mode：Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+…+10^(Gn/20)]^2/NANT} = 3.11dBi < 6dBi
* MIMO mode power density shall be reduced = 8 dBm / 3kHz

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

8.4. Test Procedure

The EUT tested to DTS test procedure of KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 × RBW.
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 amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

8.5. Test Result

Model Number	HGW-500BNA-QC v2				
Test Item	Maximum Power Density				
Date of Test	08/25/2016				
Test Mode	Frequency (MHz)	Measurement (dBm/3KHz)			Limit (dBm/3KHz)
		ANT-0	ANT-1	ANT-0+1	
Mode 2	2412	-8.850	---	---	< 8
	2437	-7.660	---	---	< 8
	2462	-7.430	---	---	< 8
Mode 3	2412	-11.590	---	---	< 8
	2437	-7.170	---	---	< 8
	2462	-11.040	---	---	< 8
Mode 4	2412	-10.640	-10.750	-7.684	< 8
	2437	-4.730	-4.410	-1.557	< 8
	2462	-9.740	-10.300	-7.001	< 8
Mode 5	2422	-11.570	-12.250	-8.886	< 8
	2437	-10.220	-10.140	-7.170	< 8
	2452	-11.450	-12.320	-8.853	< 8
Mode 6	2412	-9.820	---	---	< 8
	2437	-5.170	---	---	< 8
	2462	-9.760	---	---	< 8
Mode 7	2422	-10.750	---	---	< 8
	2437	-7.940	---	---	< 8
	2452	-10.490	---	---	< 8

8.6. Test Graphs

Mode 2: IEEE 802.11b _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 3: IEEE 802.11g _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 4: IEEE 802.11n 2.4GHz 20MHz _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 5: IEEE 802.11n 2.4GHz 40MHz _ANT-0	
2422 MHz	
2437 MHz	
2452 MHz	

Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0 _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 7: IEEE 802.11n 2.4GHz 40MHz-MCS0 _ANT-0	
2422 MHz	
2437 MHz	
2452 MHz	

Mode 4: IEEE 802.11n 2.4GHz 20MHz _ANT-1	
2412 MHz	
2437 MHz	
2462 MHz	

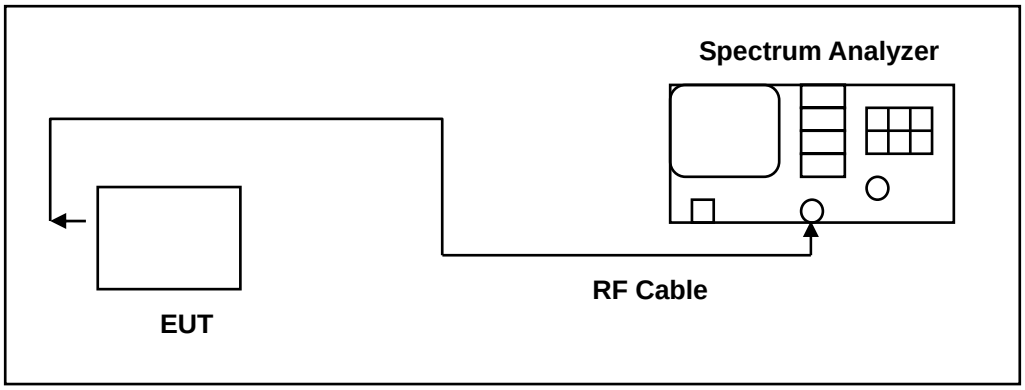
Mode 5: IEEE 802.11n 2.4GHz 40MHz _ANT-1	
2422 MHz	
2437 MHz	
2452 MHz	

9 Out of Band Conducted Emissions Measurement

9.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Spectrum Analyzer	Agilent	E4408B	MY45107753	08/08/2016	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

9.4. Test Procedure

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 30 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band.
The test was performed at 3 channels.

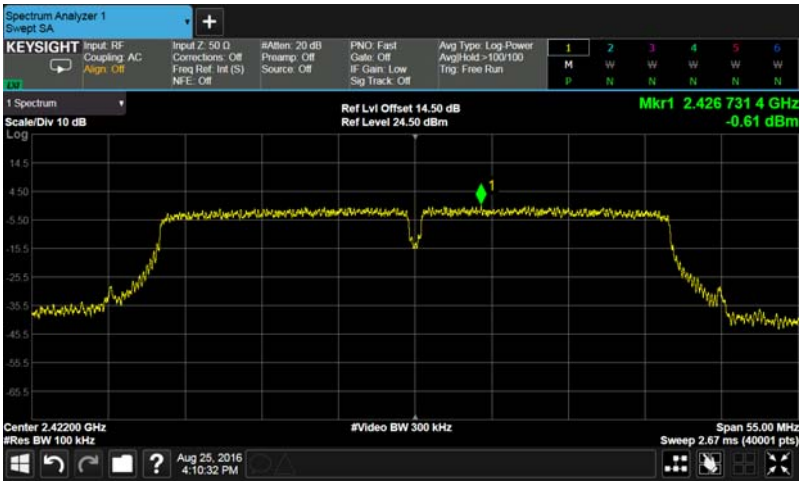
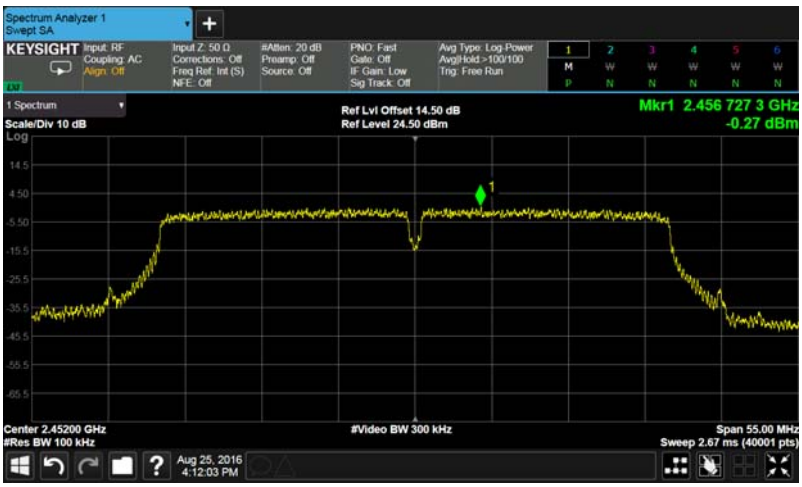
9.5. Test Graphs

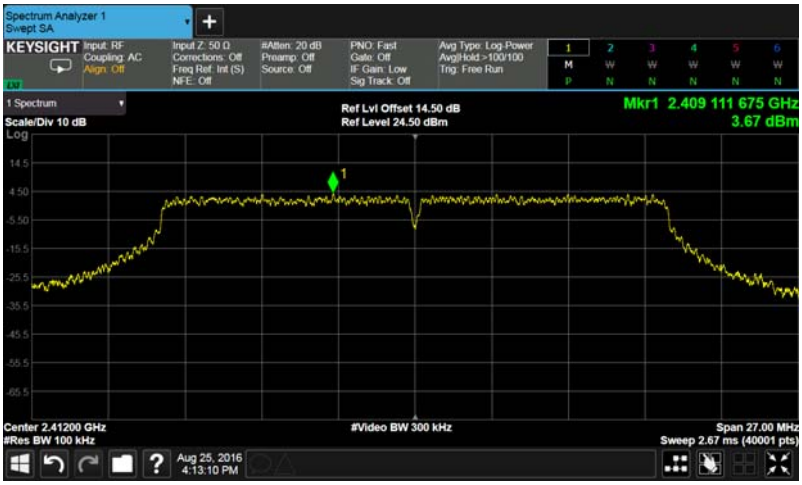
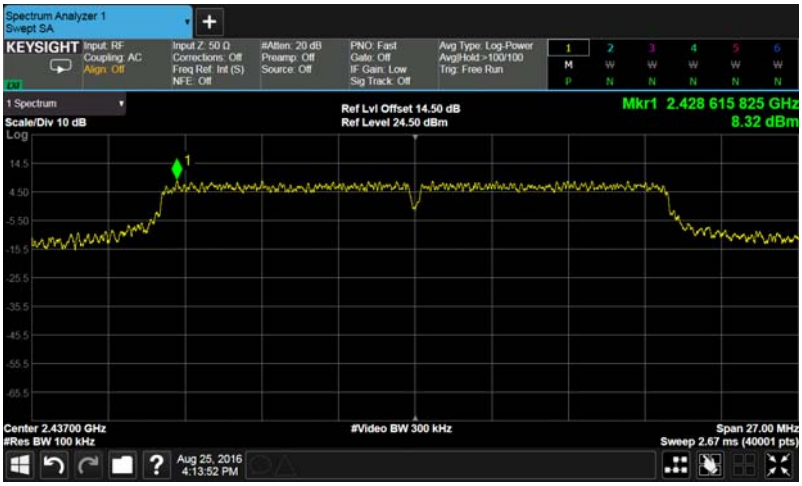
Reference level

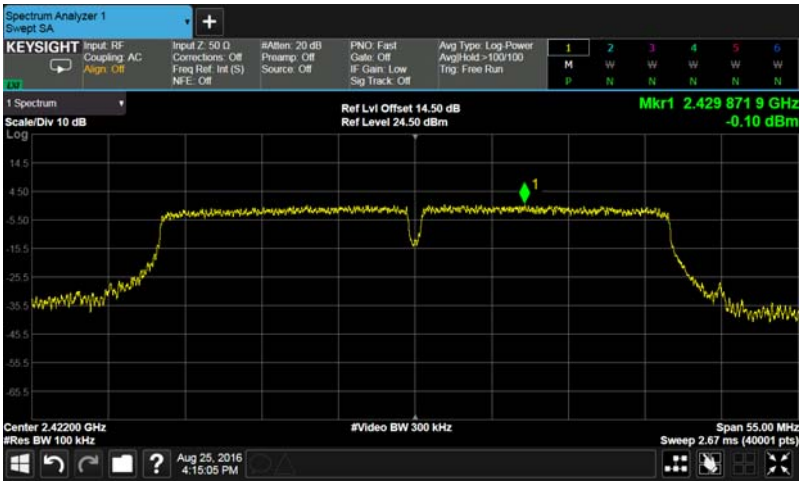
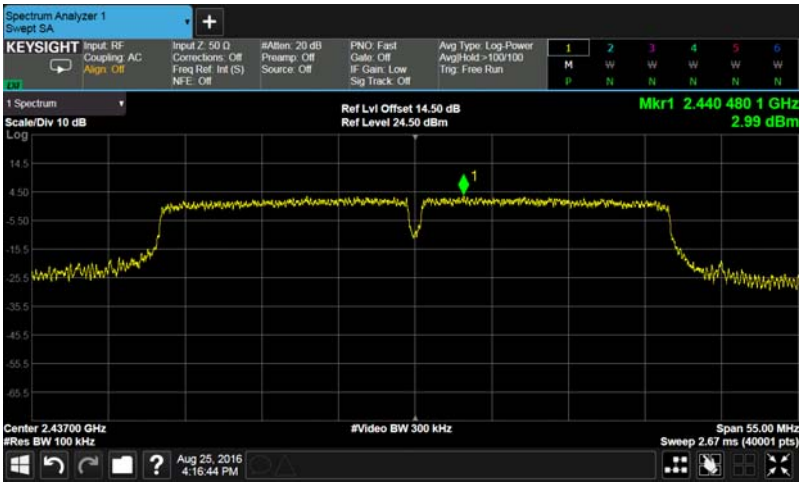
Mode 2: IEEE 802.11b _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

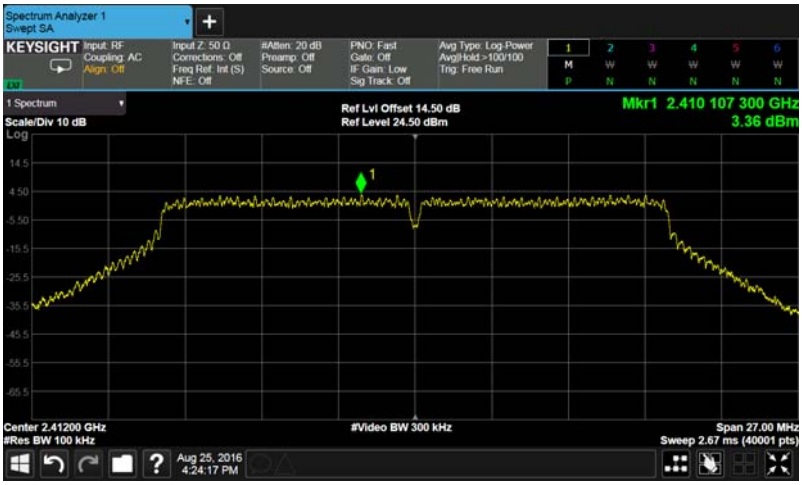
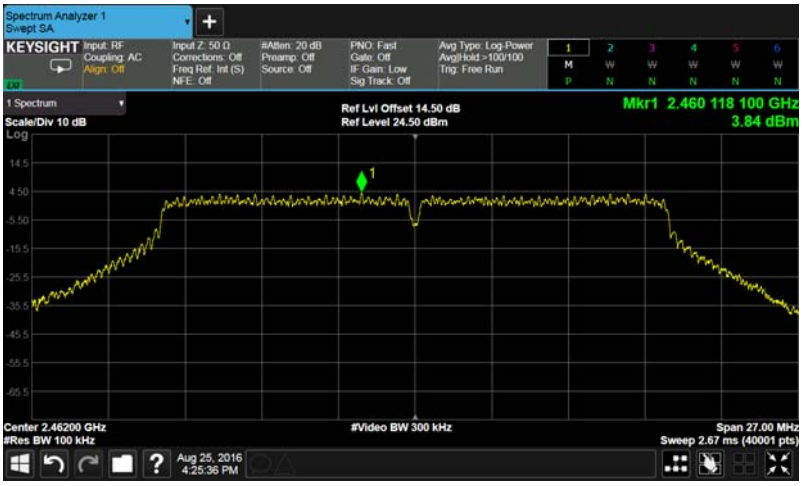
Mode 3: IEEE 802.11g _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

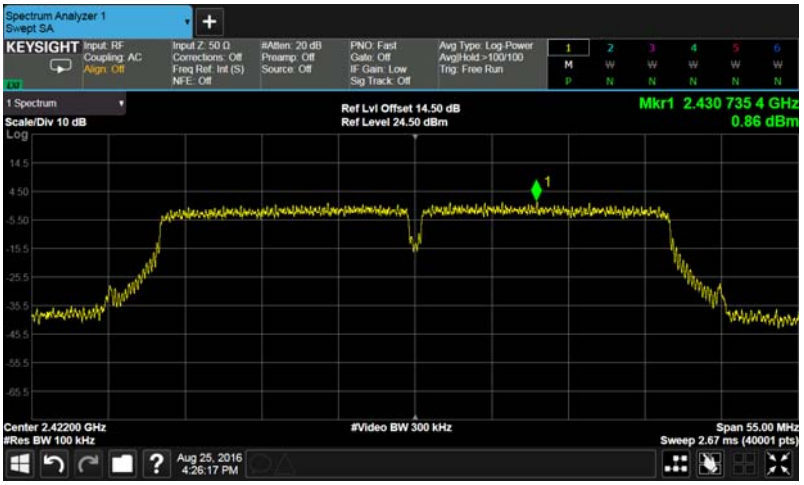
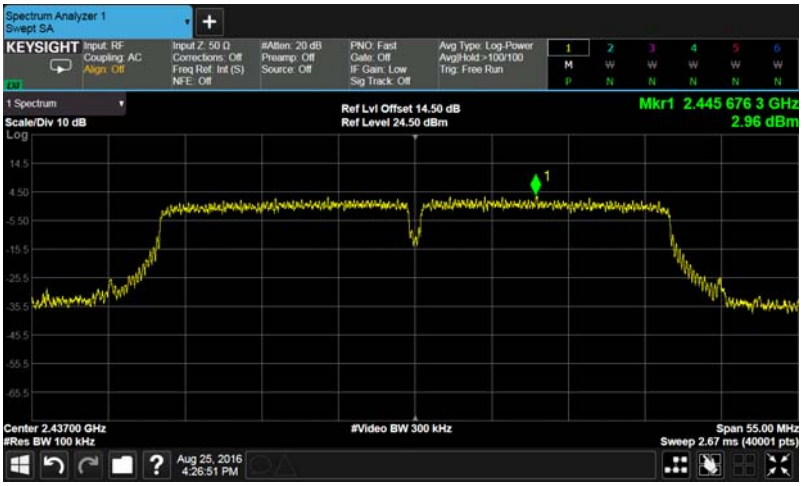
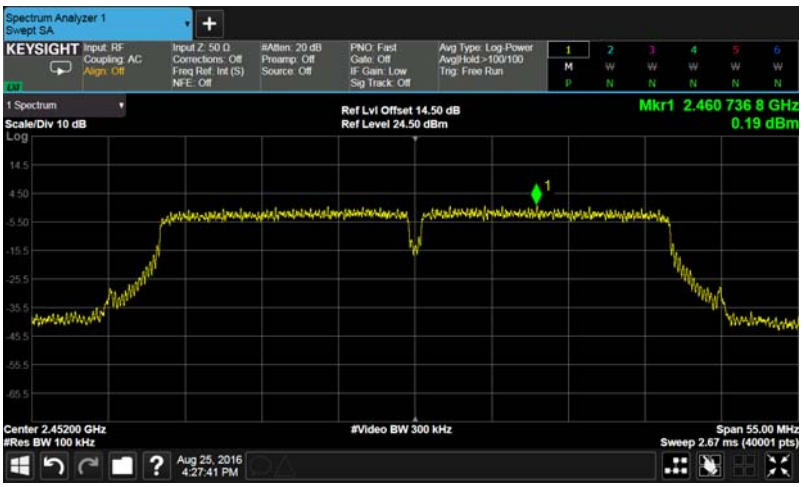
Mode 4: IEEE 802.11n 2.4GHz 20MHz _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 5: IEEE 802.11n 2.4GHz 40MHz _ANT-0	
2422 MHz	
2437 MHz	
2452 MHz	

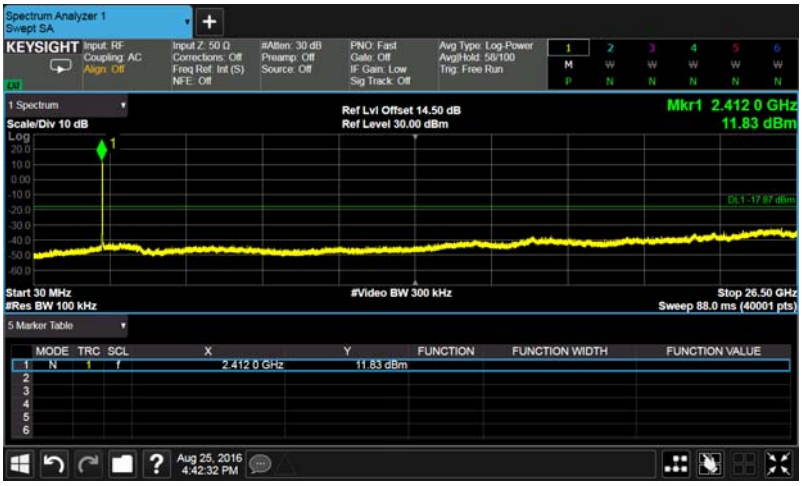
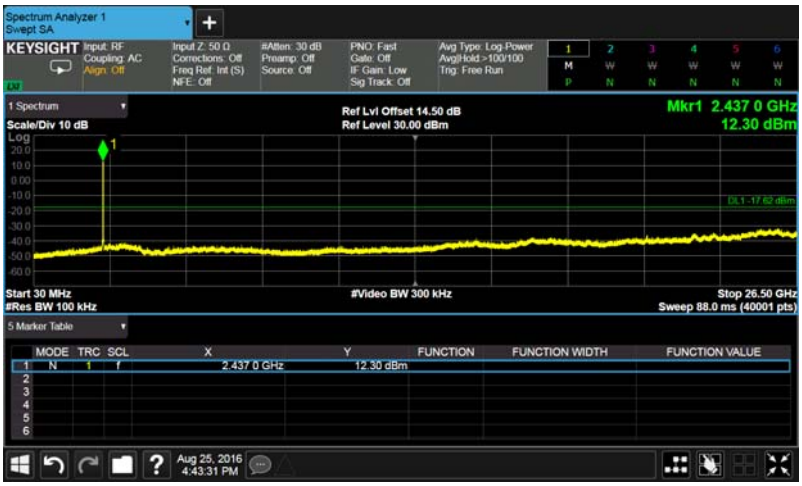
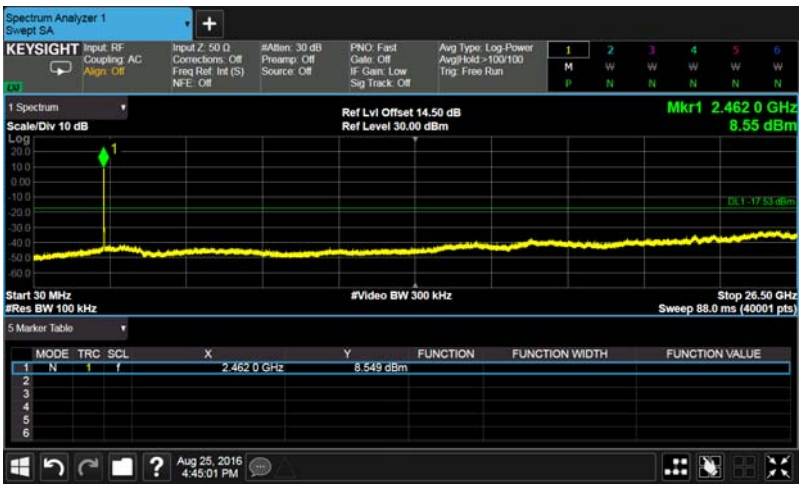
Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0 _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

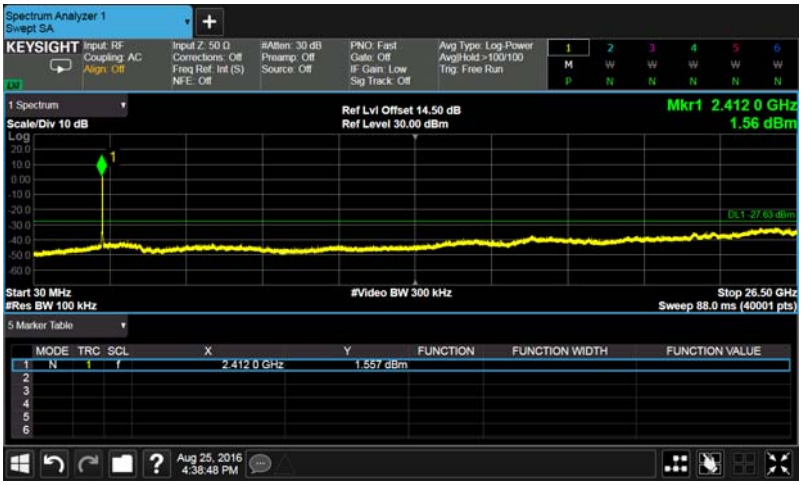
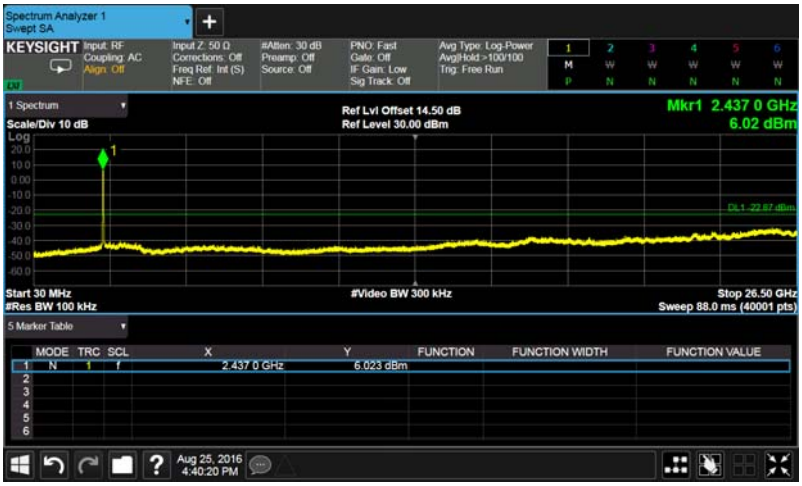
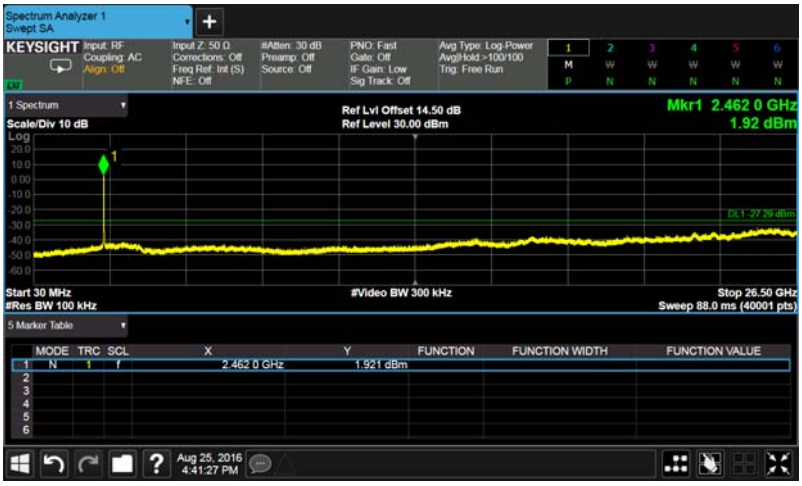
Mode 7: IEEE 802.11n 2.4GHz 40MHz-MCS0 _ANT-0	
2422 MHz	
2437 MHz	
2452 MHz	

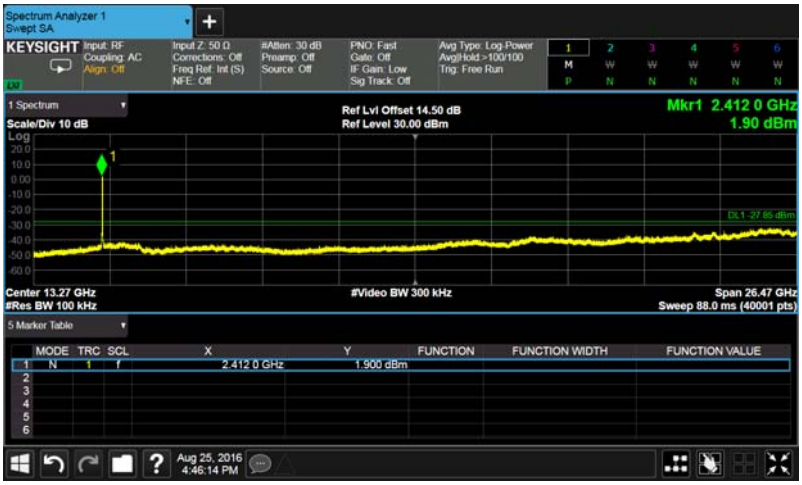
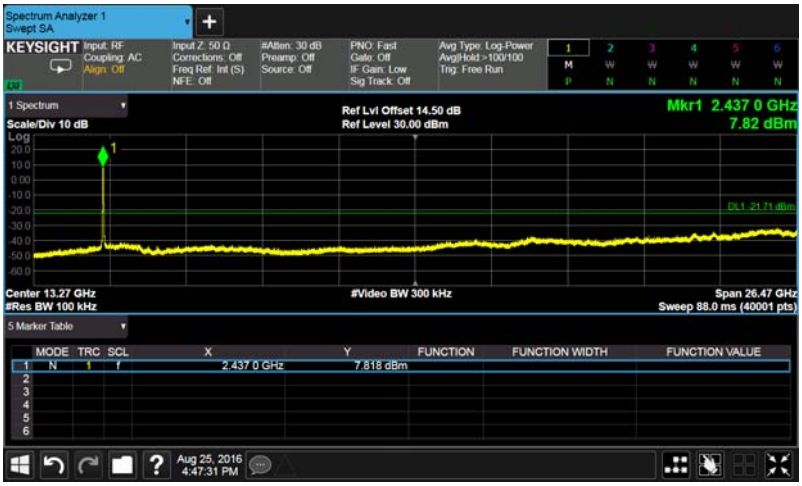
Mode 4: IEEE 802.11n 2.4GHz 20MHz _ANT-1	
2412 MHz	
2437 MHz	
2462 MHz	

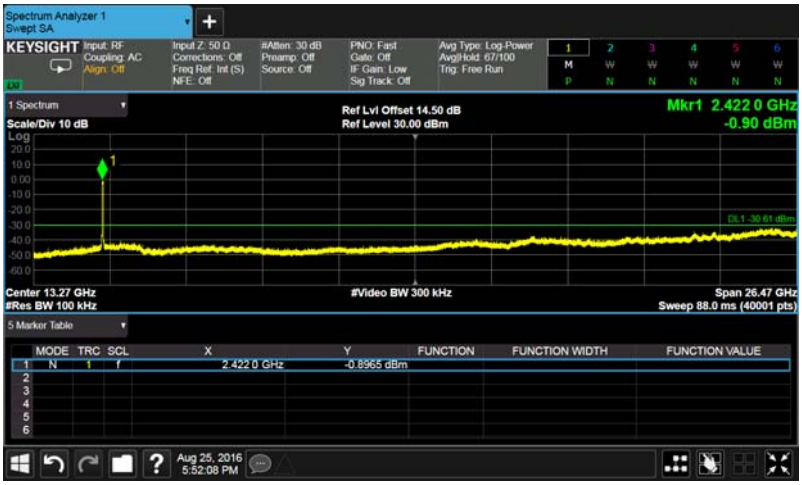
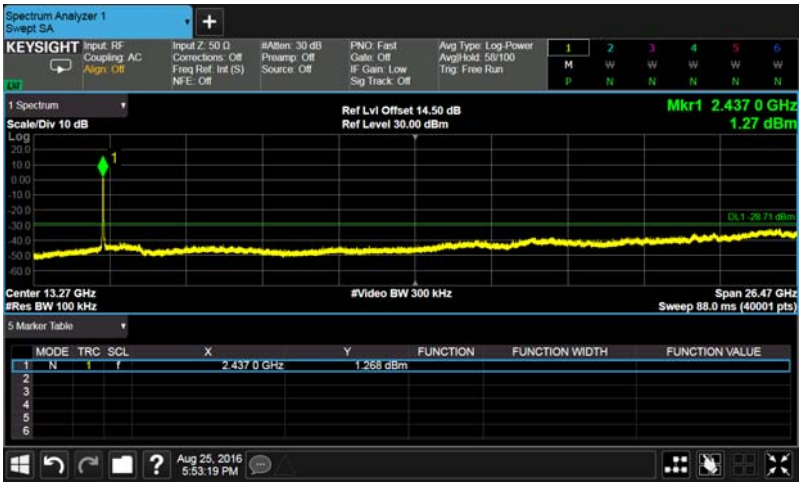
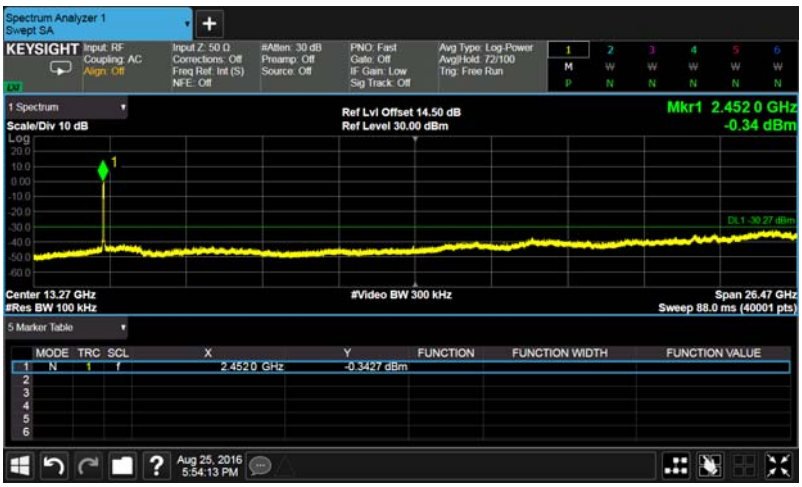
Mode 5: IEEE 802.11n 2.4GHz 40MHz _ANT-1	
2422 MHz	
2437 MHz	
2452 MHz	

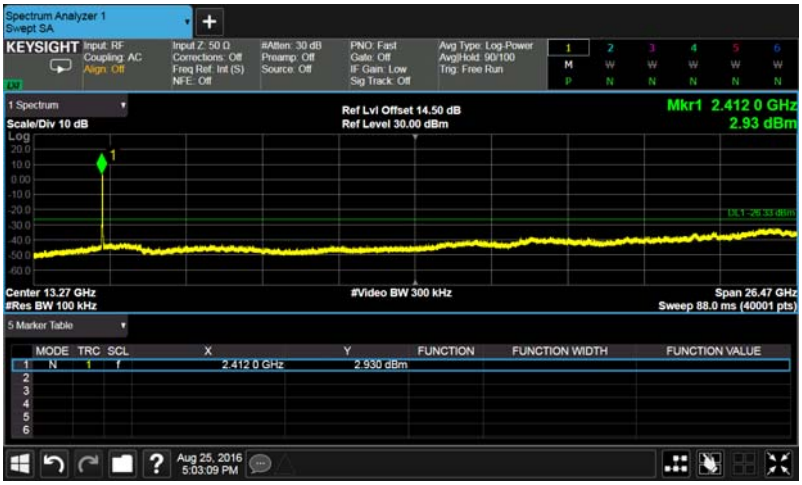
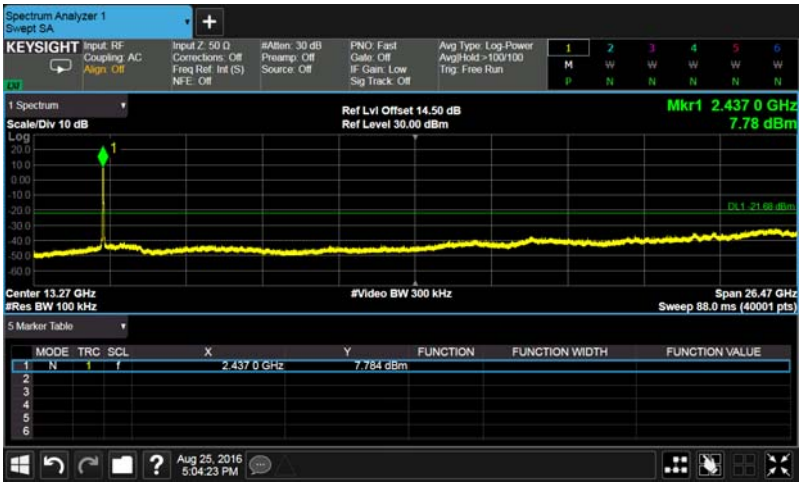
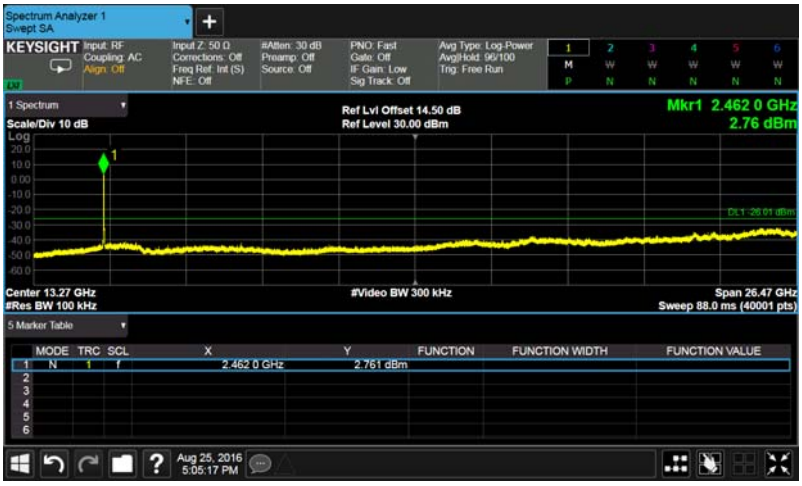
Out of Band Conducted Emissions

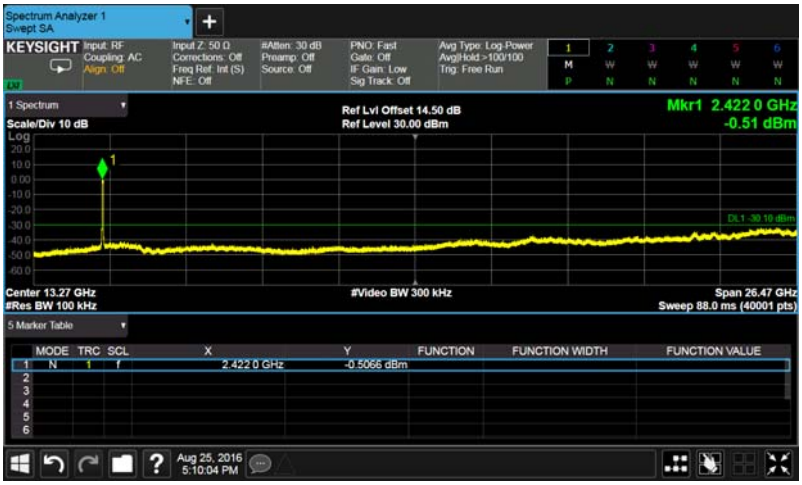
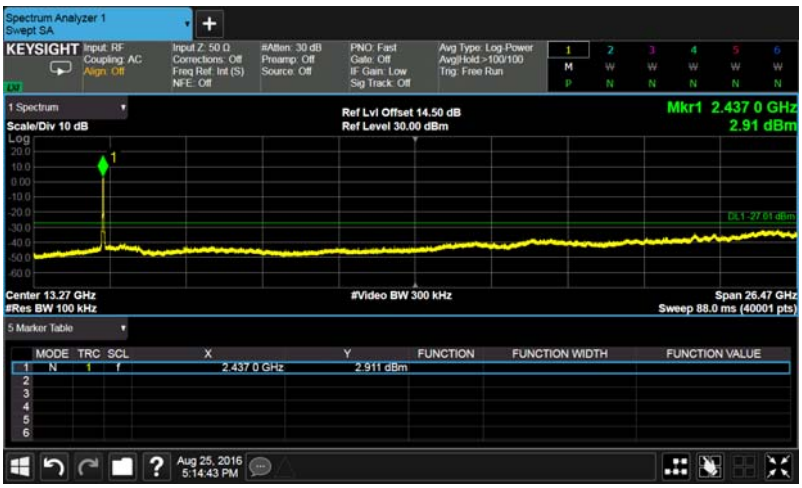
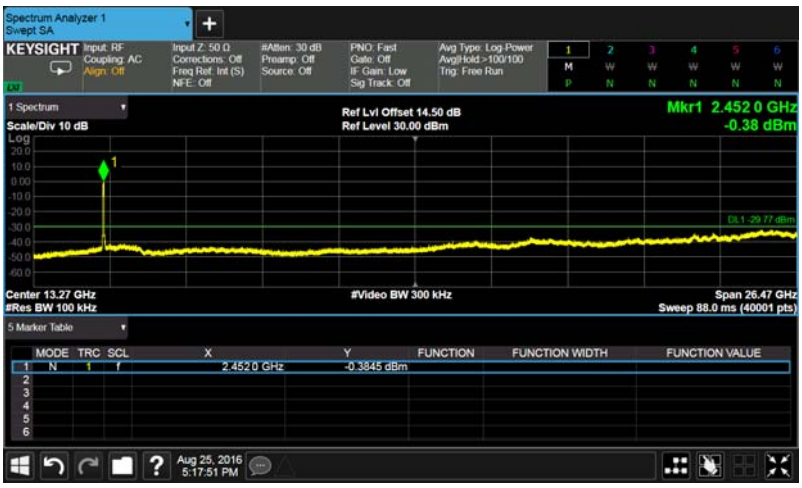
Mode 2: IEEE 802.11b _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

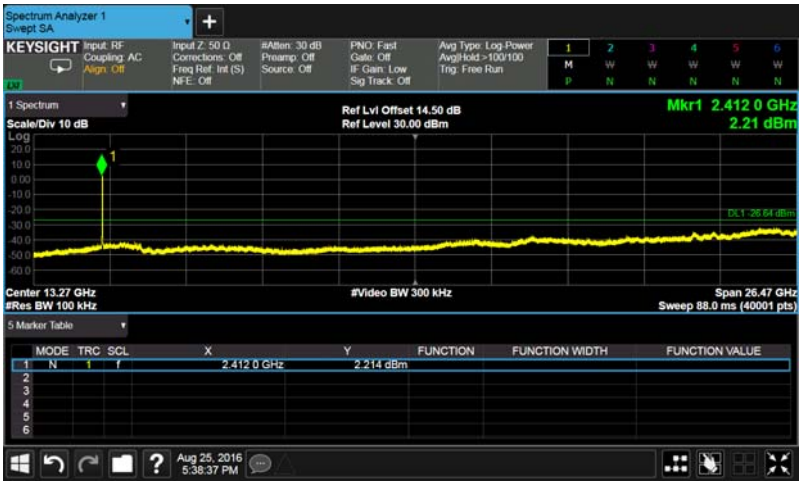
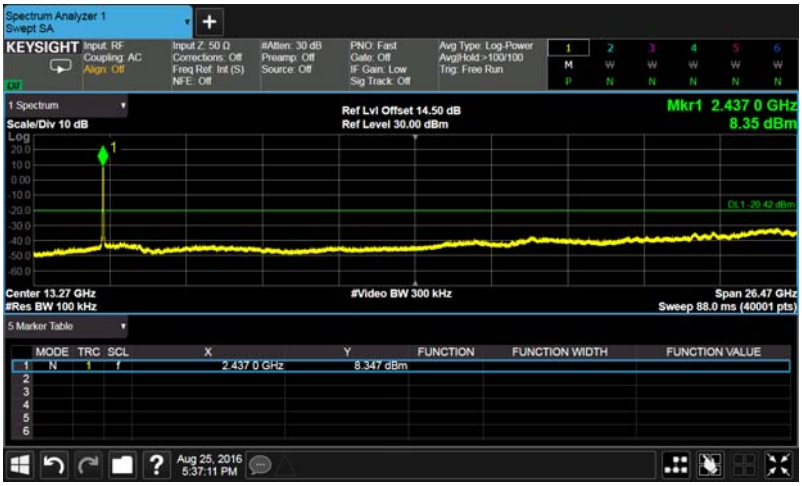
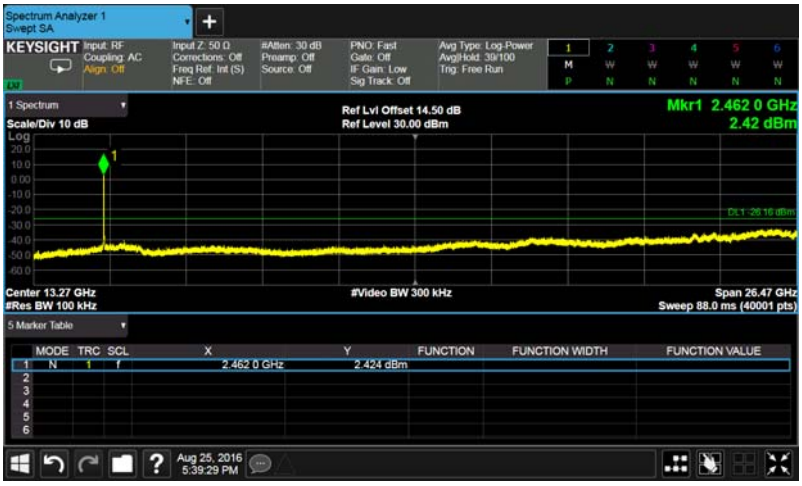
Mode 3: IEEE 802.11g _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

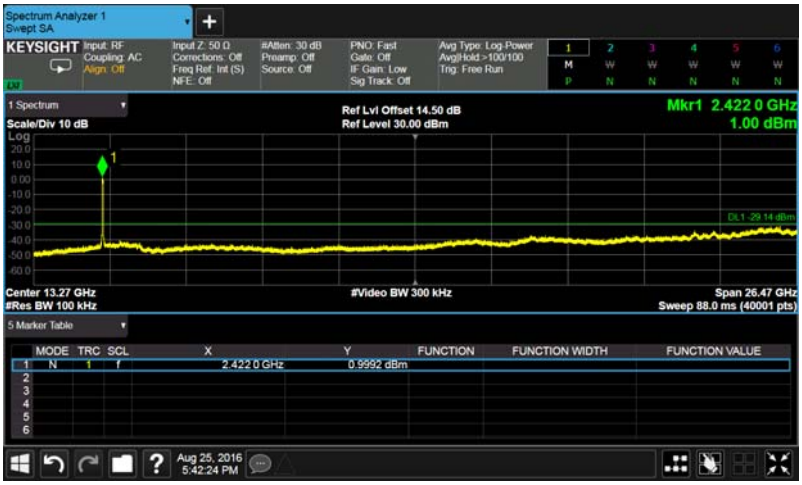
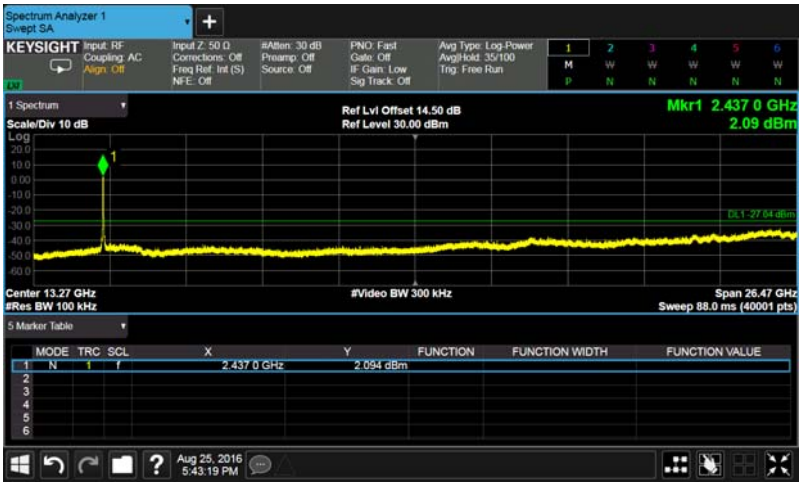
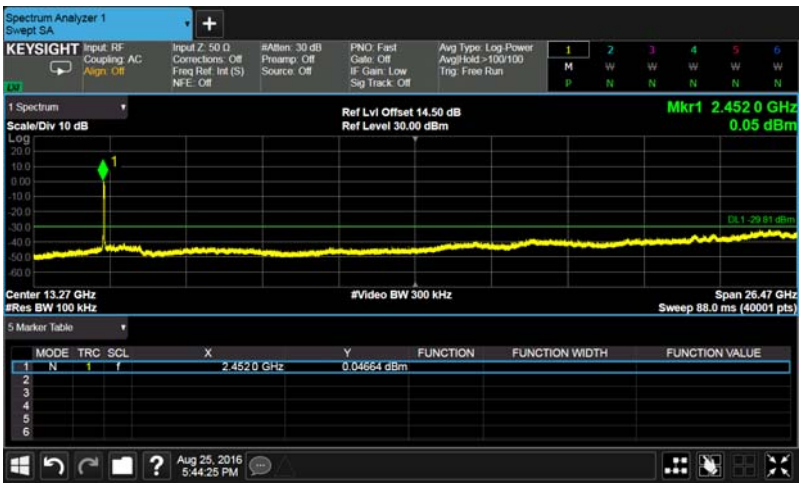
Mode 4: IEEE 802.11n 2.4GHz 20MHz _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 5: IEEE 802.11n 2.4GHz 40MHz _ANT-0	
2422 MHz	
2437 MHz	
2452 MHz	

Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0 _ANT-0	
2412 MHz	
2437 MHz	
2462 MHz	

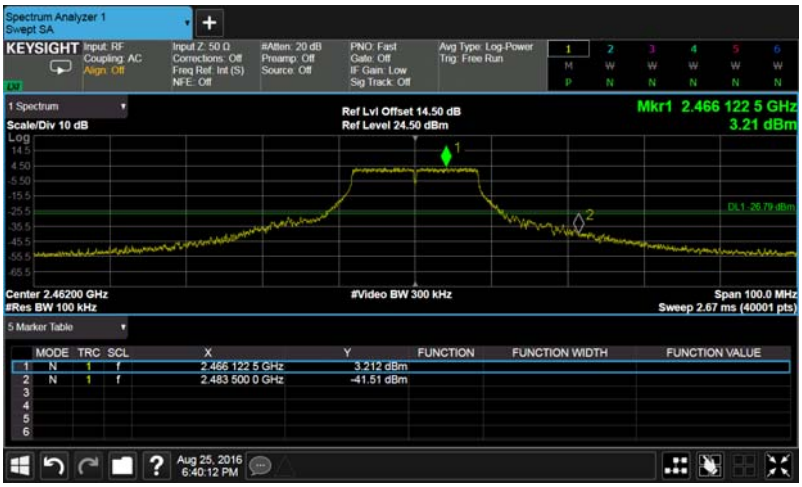
Mode 7: IEEE 802.11n 2.4GHz 40MHz-MCS0 _ANT-0	
2422 MHz	
2437 MHz	
2452 MHz	

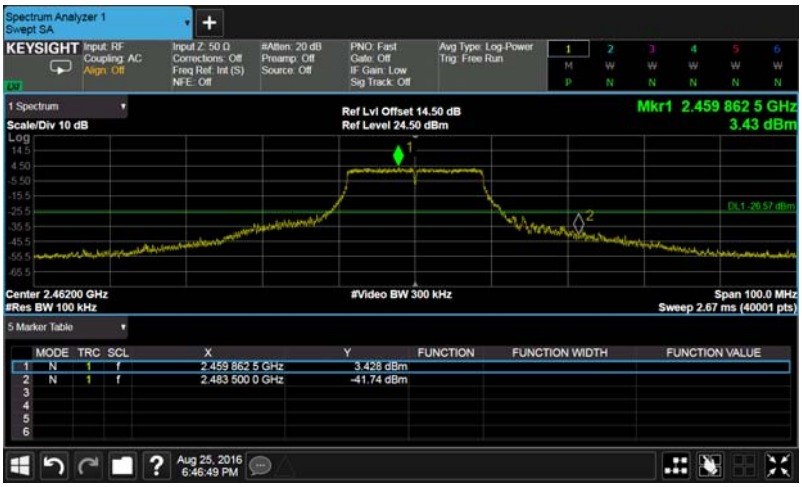
Mode 4: IEEE 802.11n 2.4GHz 20MHz _ANT-1	
2412 MHz	
2437 MHz	
2462 MHz	

Mode 5: IEEE 802.11n 2.4GHz 40MHz _ANT-1	
2422 MHz	
2437 MHz	
2452 MHz	

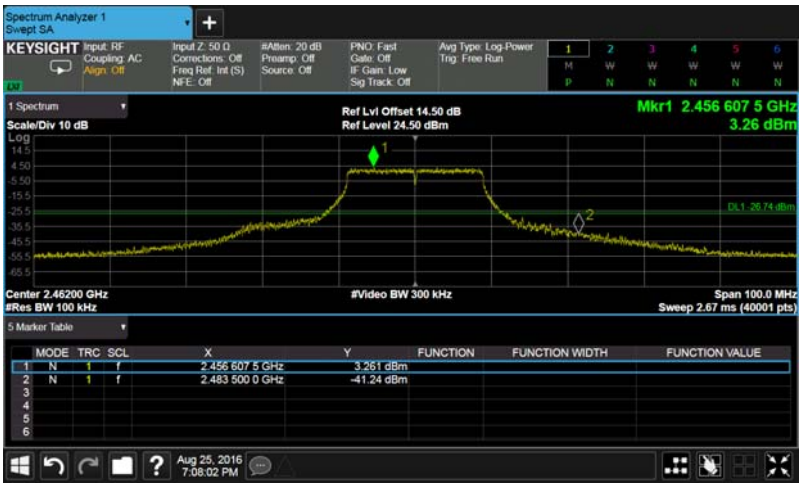
Conducted Band Edge

Mode 2: IEEE 802.11b _ANT-0	
2412 MHz	
2462 MHz	

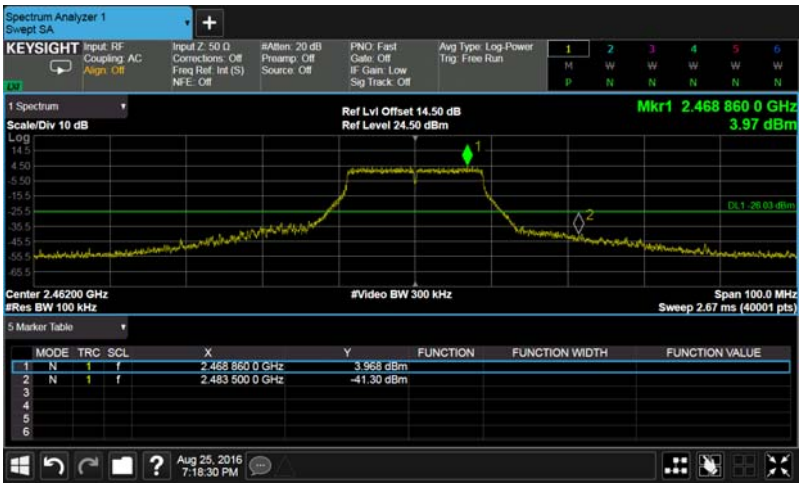
Mode 3: IEEE 802.11g _ANT-0	
2412 MHz	
2462 MHz	

Mode 4: IEEE 802.11n 2.4GHz 20MHz _ANT-0	
2412 MHz	
2462 MHz	

Mode 5: IEEE 802.11n 2.4GHz 40MHz _ANT-0	
2422 MHz	
2452 MHz	

Mode 6: IEEE 802.11n 2.4GHz 20MHz-MCS0 _ANT-0	
2412 MHz	
2462 MHz	

Mode7: IEEE 802.11n 2.4GHz 40MHz –MCS0_ANT-0	
2422 MHz	
2452 MHz	

Mode 4: IEEE 802.11n 2.4GHz 20MHz _ANT-1	
2412 MHz	
2462 MHz	

Mode 5: IEEE 802.11n 2.4GHz 40MHz _ANT-1	
2422 MHz	
2452 MHz	

10 Antenna Measurement

10.1. Limit

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2. Antenna Description

See section 2 – antenna information.

10.3. Directional Gain Calculated

Directional Gain = Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+ …+10^(Gn/20)]^2/NANT}

Operate Freq. Band	Directional Gain (dBi)
IEEE 802.11n 2.4GHz 20MHz	3.11
IEEE 802.11n 2.4GHz 40MHz	3.11