FCC 47 CFR PART 15 SUBPART C

for

Wireless Clouding Smart Box

Model: TD1302-01

Brand: STAR

Test Report Number:

C140612Z04-RP1-2

Issued Date: September 5, 2014

Issued for

JIE XI TE INE., LTD

2F, No.356, Sec. 1, Dihua St., Datong Dist., Taipei City 10348, Taiwan (R.O.C.)

Issued by:

Compliance Certification Services (Shenzhen) Inc.

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A2LA ACCREDITED TESTING CERT #2861.01

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	September 5, 2014	Initial Issue	ALL	Sinphy Xie

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1 TEST CERTIFICATION

Product	Wireless Clouding Smart Box
Model	TD1302-01
Brand	STAR
Tested	June 12~ September 4, 2014
Applicant	**JIE XI TE INE., LTD** 2F, No.356, Sec. 1, Dihua St., Datong Dist., Taipei City 10348, Taiwan (R.O.C.)
Manufacturer	**SINO ON (Hong Kong) Limited** Room 402, Tower B, Idiopathic Information Building, No.4 Kefeng Road, Science Park, Nanshan District, Shenzhen, Guangdong, P.R. China

APPLICABLE STANDARDS			
Standard	**Test Type**	**Standard**	**Test Type**
15.207(a)	Power Line Conducted Emissions	15.247(d) 15.209(a)	● Spurious Emissions ● Conducted Measurement ● Radiated Emissions
15.247(a)(2)	6dB Bandwidth Measurement	15.247(b)(3) 15.247(b)(4)	Peak Power Measurement
15.247(d)	Band Edges Measurement	15.247(e)	Peak Power Spectral Density

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in **ANSI C63.4: 2009** and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.
The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Sunday Hu
Supervisor of EMC Dept.
Compliance Certification Service Inc.

Reviewed by:

Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Service Inc.

2 TEST RESULT SUMMARY

APPLICABLE STANDARDS			
Standard	**Test Type**	**Result**	**Remark**
15.247(a)(2)	6dB Bandwidth Measurement	Pass	Meet the requirement of limit.
15.247(b)(3) 15.247(b)(4)	Peak Power Measurement	Pass	Meet the requirement of limit.
15.247(d)	Band Edges Measurement	Pass	Meet the requirement of limit.
15.247(e)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.247(d) 15.209(a)	● Spurious Emissions ● Conducted Measurement ● Radiated Emissions	Pass	Meet the requirement of limit.
15.207(a)	Power line Conducted Emissions	Pass	Meet the requirement of limit.

Note: 1. The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.
2. The information of measurement uncertainty is available upon the customer's request.

3 EUT DESCRIPTION

Product	Wireless Clouding Smart Box
Model Number	TD1302-01
Brand	STAR
Model Discrepancy	N/A
Serial Number	C140612Z04-RP1-2
Received Date	June 12, 2014
Power Supply	DC5V powered by the adapter
Adapter Manufacturer/ Model Name	SHENZHEN SUNLIGHT ELECTRONIC CO.,LTD/GA050020 I/P: 100-240Vac, 50/60Hz, 0.40A O/P: 5.0Vdc, 2.0A DC Cable: Shielded, 1.00m
AV Cable	Shielded, 1.80m
Transmit Power	IEEE 802.11b mode: -6.72dBm IEEE 802.11g mode: -0.73dBm IEEE 802.11n HT20 MHz mode: -1.26dBm
Modulation Technique	IEEE 802.11b mode: DSSS(CCK,QPSK, BPSK) IEEE 802.11g mode: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE 802.11n HT20 MHz mode: OFDM (BPSK/QPSK/16QAM/64QAM)
Transmit Data Rate	IEEE 802.11b: 11Mbps(CCK) with fall back rates of 5.5/2/1Mbps IEEE 802.11g: 54Mbps with fall back rates of 48/36/24/18/12/9 /6Mbps IEEE 802.11n HT20: 130Mbps with fall back rates of 130/117/104/ 78/52/39/26/13Mbps
Number of Channels	IEEE 802.11b mode: 11 Channels IEEE 802.11g mode: 11 Channels IEEE 802.11n HT20 MHz mode: 11 Channels
Antenna Specification	External Antenna with 1.0dBi gain(Max)
Channels Spacing	IEEE 802.11b/g ,802.11n HT20 : 5MHz
Temperature Range	0°C ~ +40°C
Hardware Version	V1.0
Software Version	sugar_ref001-eng 4.2.2 JDQ39 20140423 test-keys

Note: *1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

2. This submittal(s) (test report) is intended for FCC ID: 2ADEATD1302-01 filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.

4 TEST METHODOLOGY

4.1. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Test Item	Test mode	Worse mode
Conducted Emission	**Mode 1:** USB+HDMI+RJ45 **Mode 2:** USB+AV+RJ45 **Mode 3:** SD+AV+RJ45 **Mode 4:** SD+ HDMI +RJ45	**Mode 1**
Radiated Emission	**Mode 1:** TX	**Mode 1**

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

IEEE802.11b mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High(2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT20 MHz mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.

5 SETUP OF EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF SUPPORT UNITS

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

No.	Equipment	Model No.	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1	Monitor	ST240LB	CNOVTTD2742611102DJU	N/A	DELL	Shielded 1.50m	Unshielded 1.80m
2	TV	19CE830LED	F0911925	N/A	SANYO	Shielded 1.80m	Unshielded 1.50m
3	SD Card	N/A	N/A	N/A	Samsung	N/A	N/A
4	IPOD	A1285	YM91546Y3QY	N/A	Apple	Shielded 1.20m	N/A
5	Notebook	B475	W1304861612	N/A	Lenovo	Unshielded 3.00m	Unshielded 1.50m

Note:

Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5.2. CONFIGURATION OF SYSTEM UNDER TEST

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

6 FACILITIES AND ACCREDITATIONS

6.1. FACILITIES

All measurement facilities used to collect the measurement data are located at **No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
China	CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA	FCC
Japan	VCCI(C-3478, R-3135, T-652, G-624)
Canada	INDUSTRY CANADA
Taiwan	BSMI
Norway	Nemko

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsrf.com

6.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Parameter	Uncertainty
Radiated Emission, 30 to 200 MHz Test Site : 966(2)	+/-3.6880dB
Radiated Emission, 200 to 1000 MHz Test Site : 966(2)	+/-3.6695dB
Radiated Emission, 1 to 8 GHz	+/-5.1782dB
Radiated Emission, 8 to 18 GHz	+/-5.2173dB
Conducted Emissions	+/-3.6836dB
Band Width	178kHz
Peak Output Power MU	+/-1.906dB
Band Edge MU	+/-0.182dB
Channel Separation MU	416.178Hz
Duty Cycle MU	0.054ms
Frequency Stability MU	226Hz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.

7 FCC PART 15.247 REQUIREMENTS

7.1. POWER LINE CONDUCTED EMISSIONS MEASUREMENT

7.1.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

NOTE:
(1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

7.1.2. TEST INSTRUMENTS

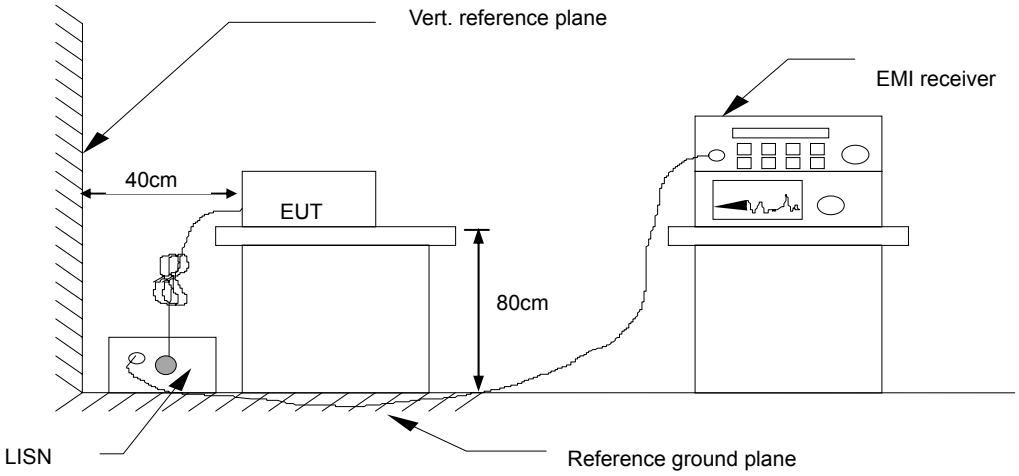
Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2014	03/08/2015
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	04/20/2014	04/19/2015
LISN	EMCO	3825/2	8901-1459	03/09/2014	03/08/2015
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	03/04/2014	03/03/2015
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

7.1.3. TEST PROCEDURES (please refer to measurement standard)

- The EUT and Support equipment, if needed, was placed on a non-conducted table, which is 0.8m above the ground plane and 0.4m away from the conducted wall.
- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane. All support equipment power received from a second LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The frequency range from 150 kHz to 30 MHz was searched. The test data of the worst-case condition(s) was recorded. Emission levels under limit 20dB were not recorded.

7.1.4. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.1.5. DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

7.1.6. TEST RESULTS

Model No.	TD1302-01	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 1
Tested by	Sun Guo	**Line**	L1
Test Date	July 15,2014		

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1580	37.98	25.36	9.60	47.58	34.96	65.56	55.57	-17.98	-20.61	Pass
0.5140	36.16	26.02	9.69	45.85	35.71	56.00	46.00	-10.15	-10.29	Pass
2.2540	35.87	26.86	9.72	45.59	36.58	56.00	46.00	-10.41	-9.42	Pass
3.6620	34.47	24.14	9.70	44.17	33.84	56.00	46.00	-11.83	-12.16	Pass
6.0540	34.91	23.01	9.73	44.64	32.74	60.00	50.00	-15.36	-17.26	Pass
13.3460	33.49	21.16	9.90	43.39	31.06	60.00	50.00	-16.61	-18.94	Pass

Model No.	TD1302-01	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 1
Tested by	Sun Guo	**Line**	L2
Test Date	July 15,2014		

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1620	38.61	19.58	9.78	48.39	29.36	65.36	55.36	-16.97	-26.00	Pass
0.5180	35.97	24.19	9.68	45.65	33.87	56.00	46.00	-10.35	-12.13	Pass
1.9500	31.72	21.27	9.73	41.45	31.00	56.00	46.00	-14.55	-15.00	Pass
2.1260	31.93	17.66	9.73	41.66	27.39	56.00	46.00	-14.34	-18.61	Pass
6.1900	32.94	21.85	9.78	42.72	31.63	60.00	50.00	-17.28	-18.37	Pass
12.5620	33.23	20.48	9.79	43.02	30.27	60.00	50.00	-16.98	-19.73	Pass

REMARKS: *L1 = Line One (Live Line)*

L2 = Line Two (Neutral Line)

7.2. SPURIOUS EMISSIONS MEASUREMENT

7.2.1. CONDUCTED EMISSIONS MEASUREMENT

7.2.1.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

§15.247(d)specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:
If the peakoutput power procedure is used to measure the fundamental emission powerto demonstrate compliance to 15.247(b)(3)requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency bandshall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
If the averageoutput power procedure is used to measure the fundamental emission powerto demonstrate compliance to 15.247(b)(3)requirements,then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measuredin-band average PSD level.
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) (see Section 15.205(c)).

7.2.1.2. TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015

7.2.1.3. TEST PROCEDURE (please refer to measurement standard)

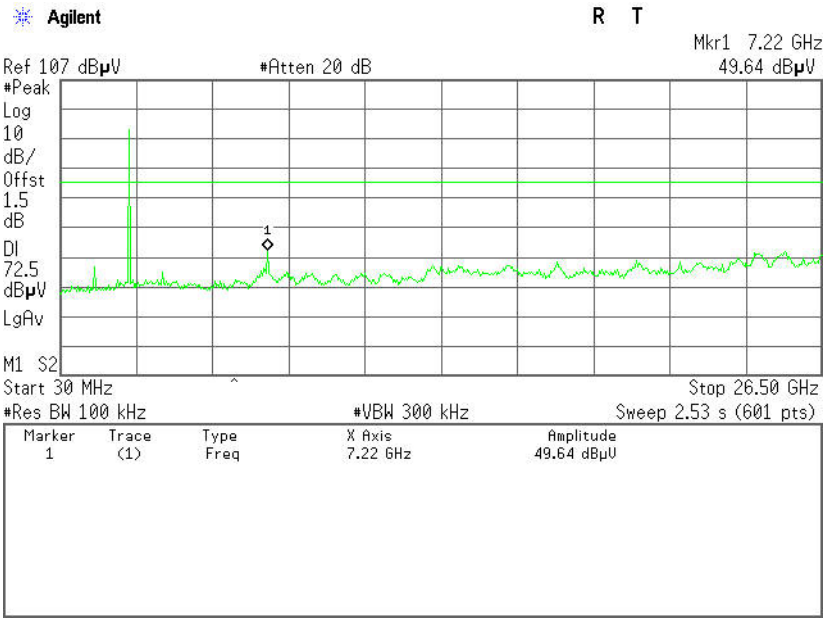
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.
Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

7.2.1.4. TEST RESULTS

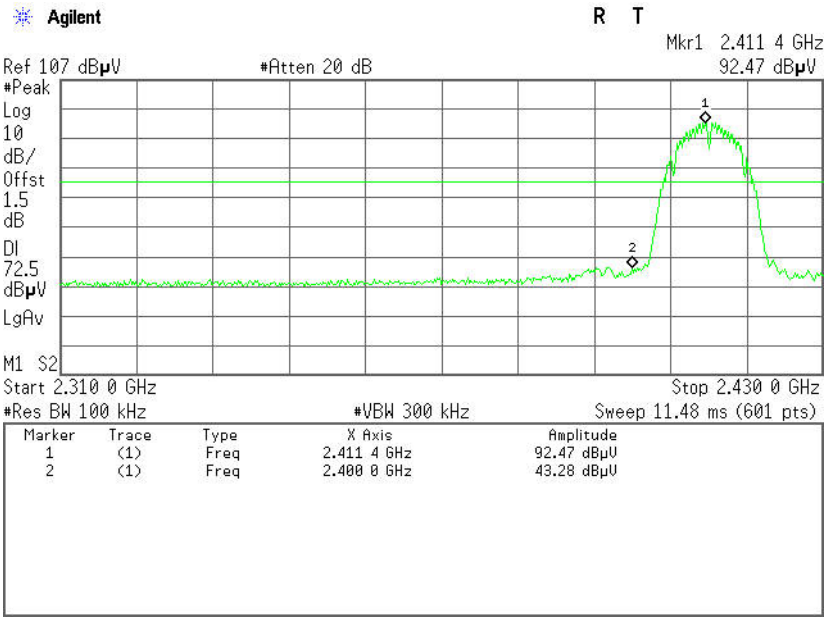
Test Plot

IEEE 802.11b mode

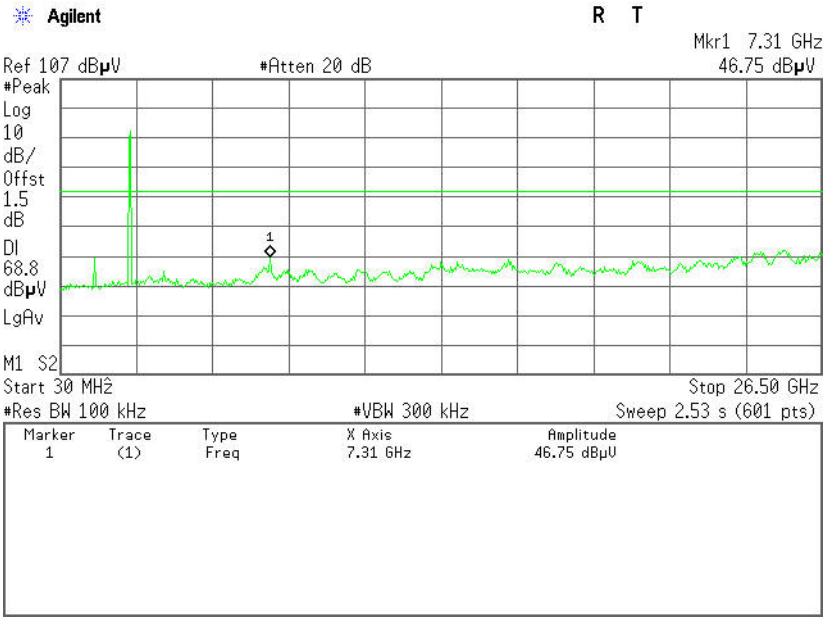
CH Low (30MHz ~26.5GHz)



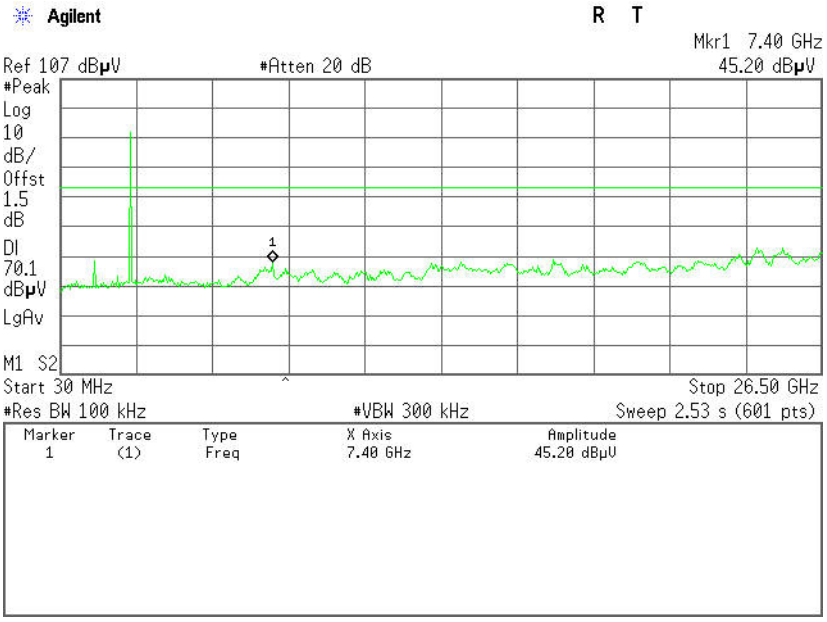
CH Low (2.31GHz ~2.43GHz)



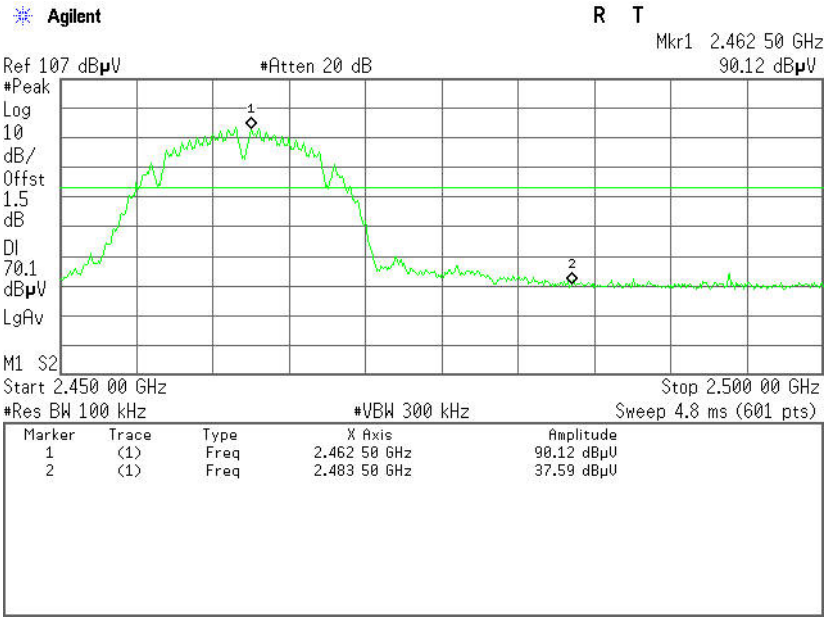
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)

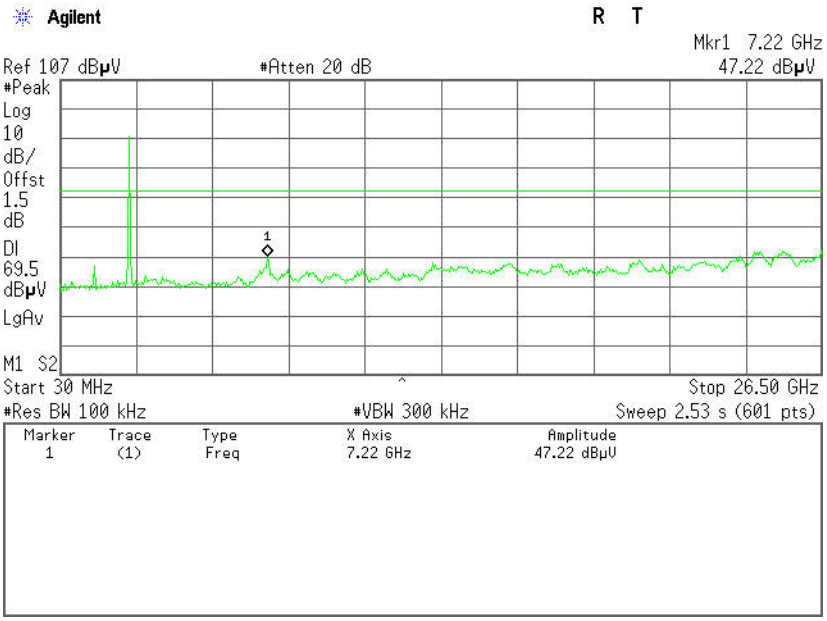


CH High (2.45GHz ~2.5GHz)

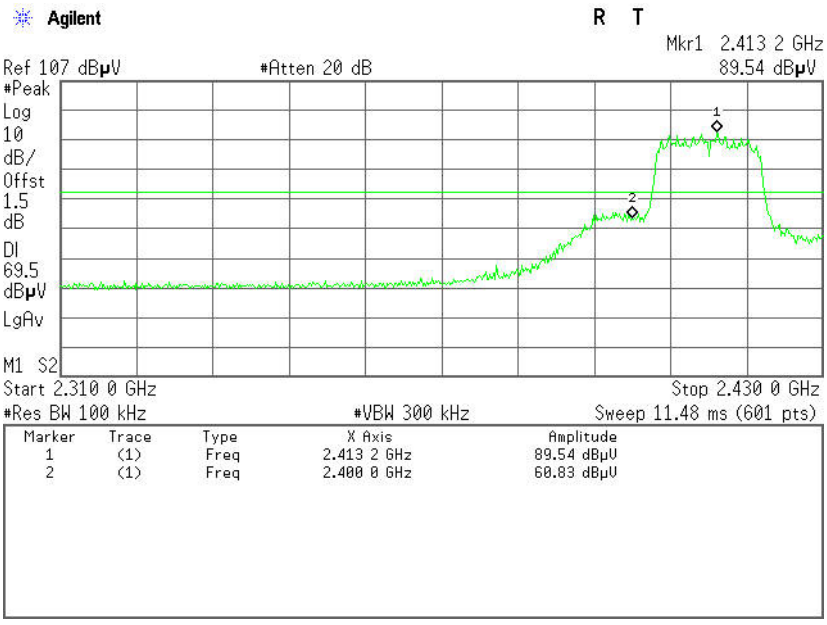


IEEE 802.11g mode

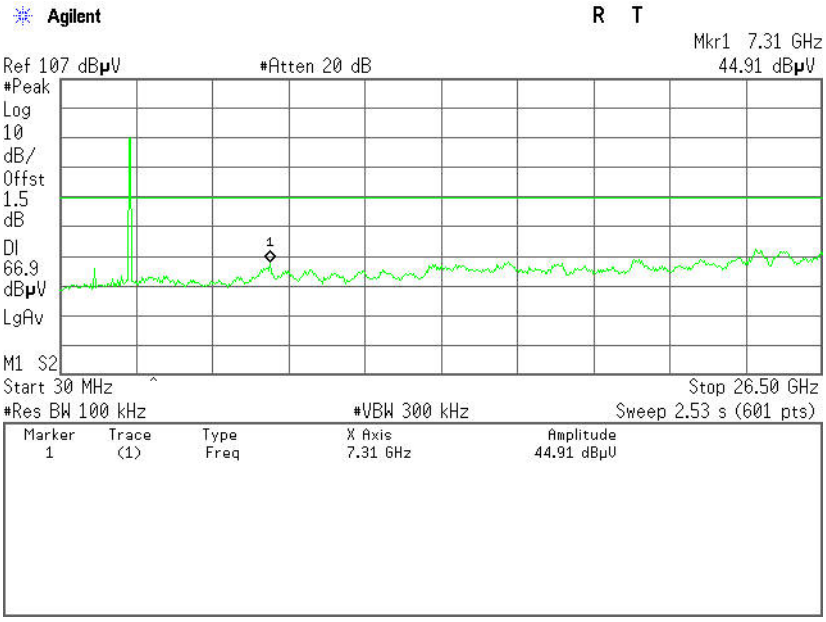
CH Low (30MHz ~26.5GHz)



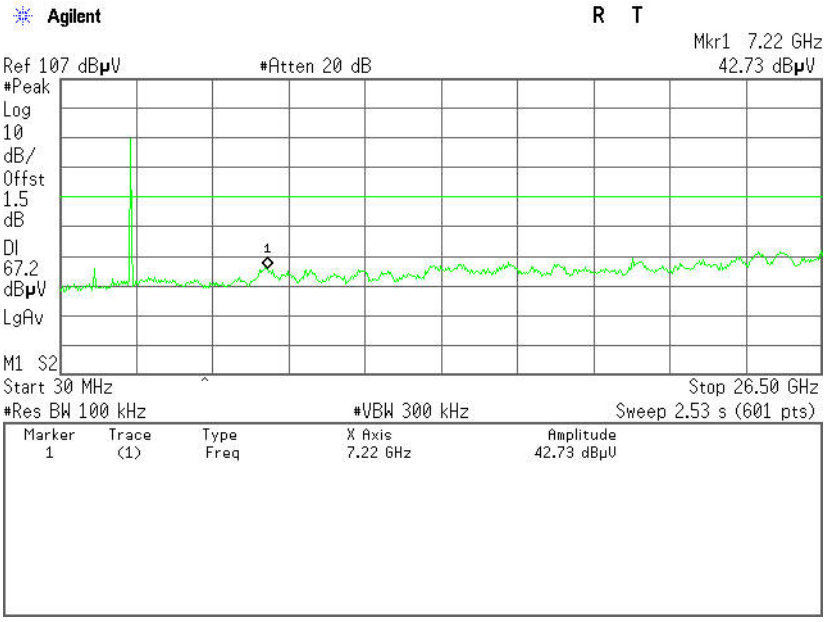
CH Low (2.31GHz ~2.43GHz)



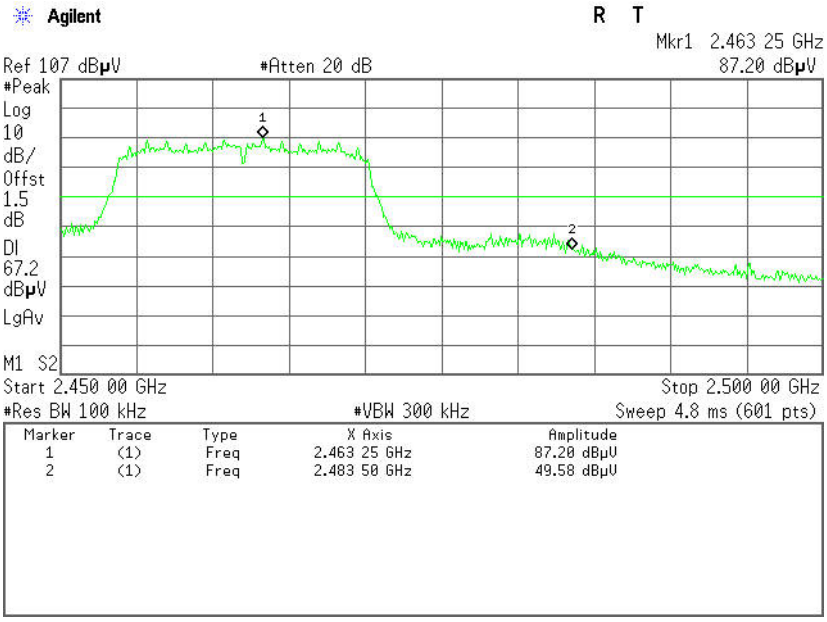
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)

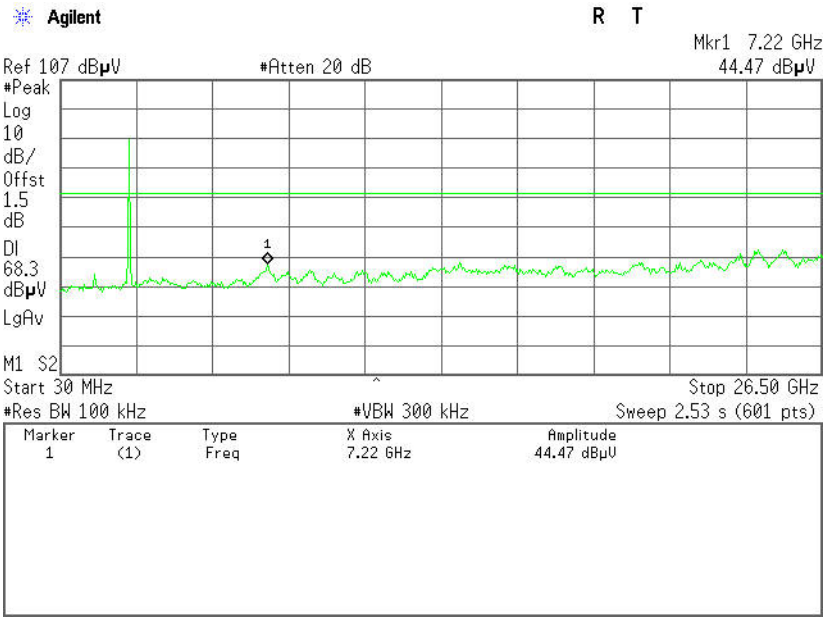


CH High (2.45GHz ~2.5GHz)

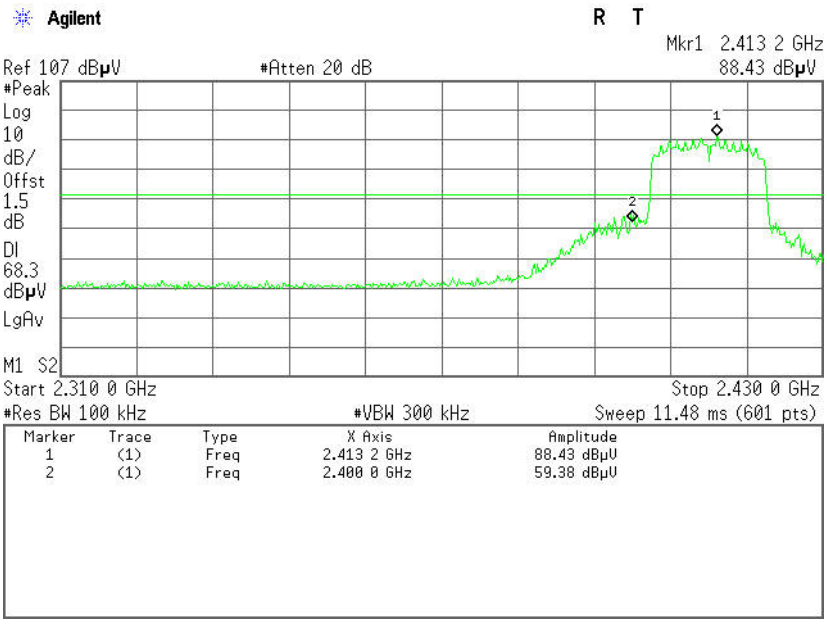


IEEE 802.11n HT20 MHz mode

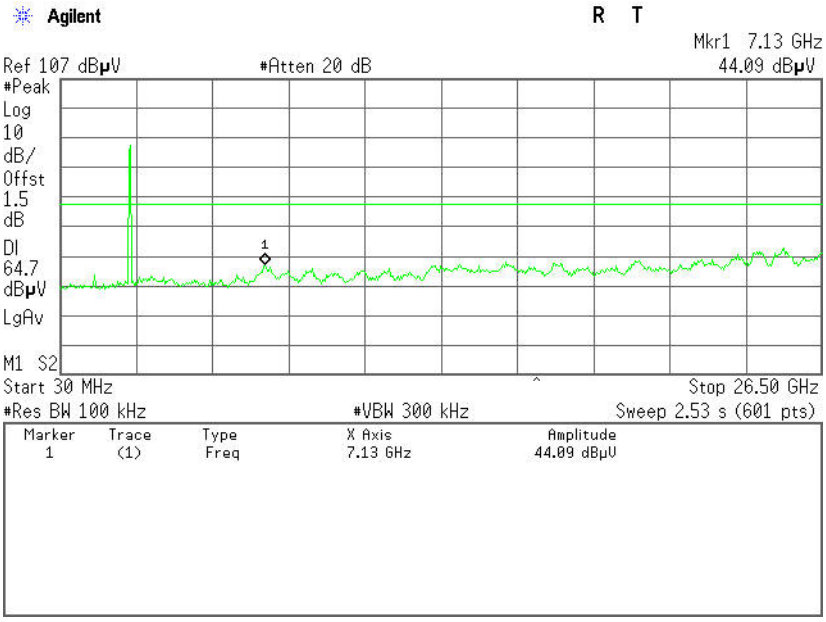
CH Low (30MHz ~26.5GHz)



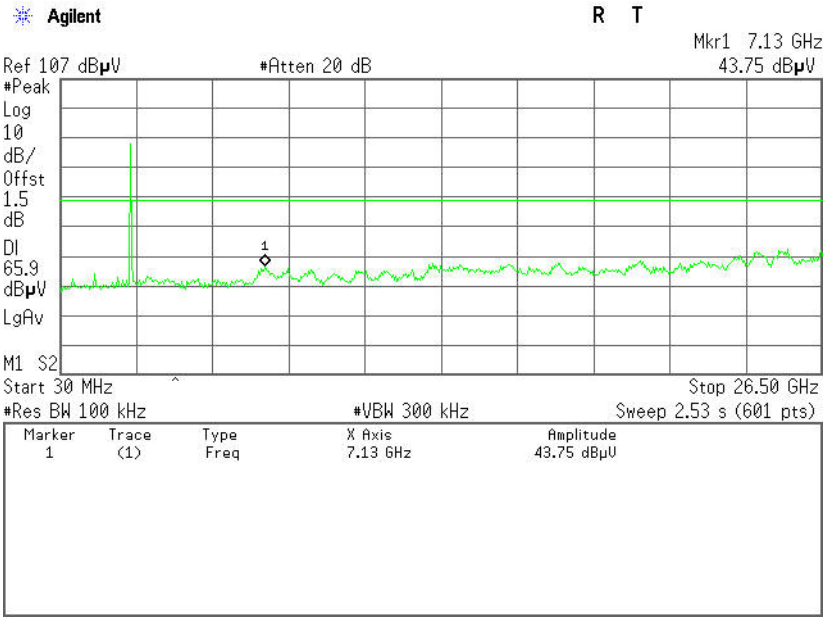
CH Low (2.31GHz ~2.43GHz)



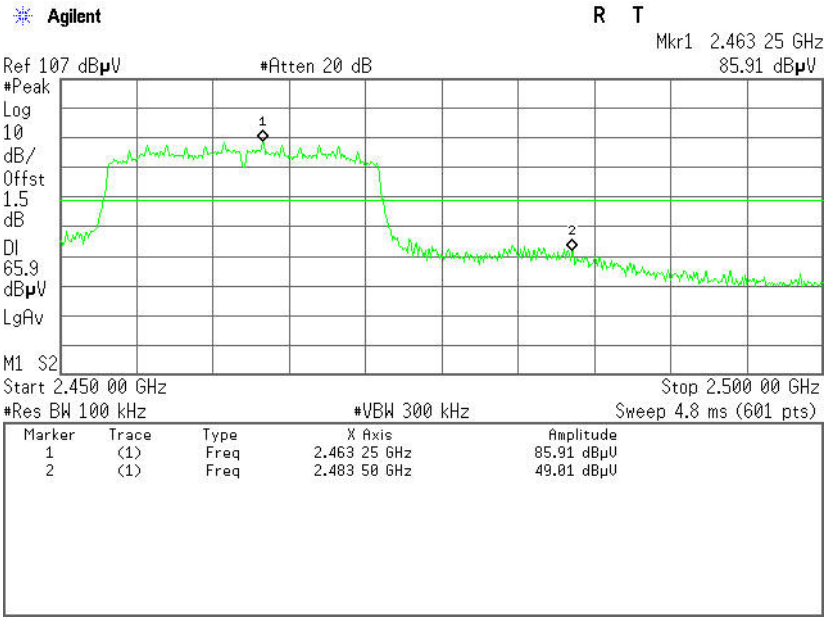
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)



CH High (2.45GHz ~2.5GHz)



7.2.2. RADIATED EMISSIONS MEASUREMENT

7.2.2.1. LIMITS OF RADIATED EMISSIONS MEASUREMENT

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 (mV/m)	Measurement Distance (m)
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

Remark: 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.

1. In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

NOTE:(1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

7.2.2.2. TEST INSTRUMENTS

Radiated Emission Test Site 966(2)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2014	03/08/2015
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2015	03/18/2015
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2015	03/18/2015
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	07/10/2014	07/09/2015
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/01/2014	03/01/2015
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/01/2014	03/01/2015
Loop Antenna	A、R、A	PLA-1030/B	1029	09/27/2013	09/26/2014
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2014	02/28/2015
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The FCC Site Registration number is 101879.

3. N.C.R = No Calibration Required.

7.2.2.3. TEST PROCEDURE (please refer to measurement standard)

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz / VBW=300kHz / Sweep=AUTO

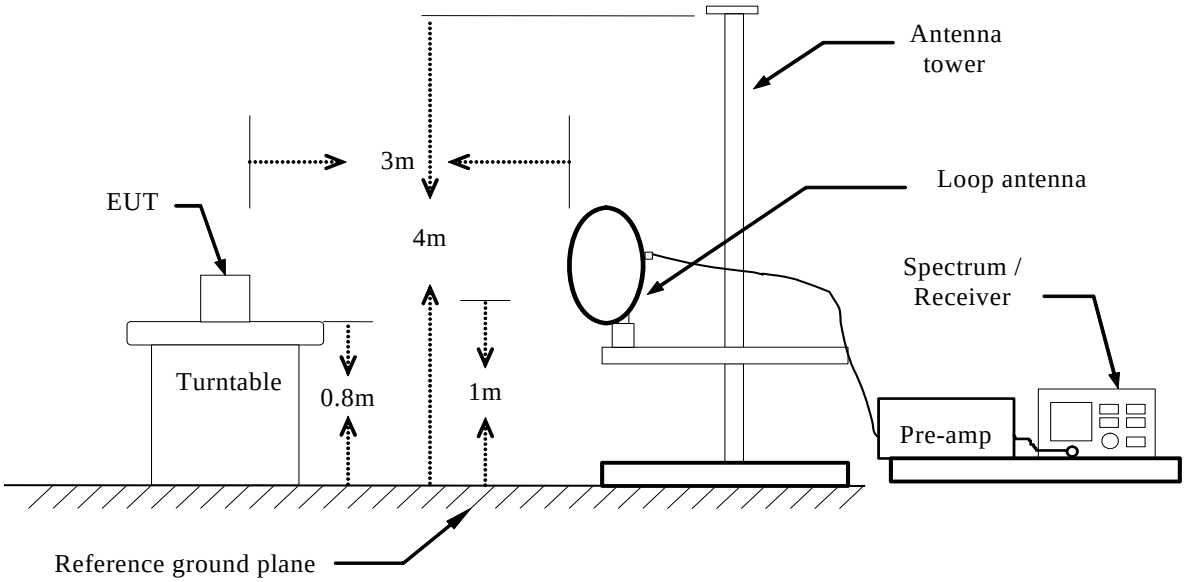
   Above 1GHz:

   (a) PEAK: RBW=1MHz,VBW=3MHz / Sweep=AUTO

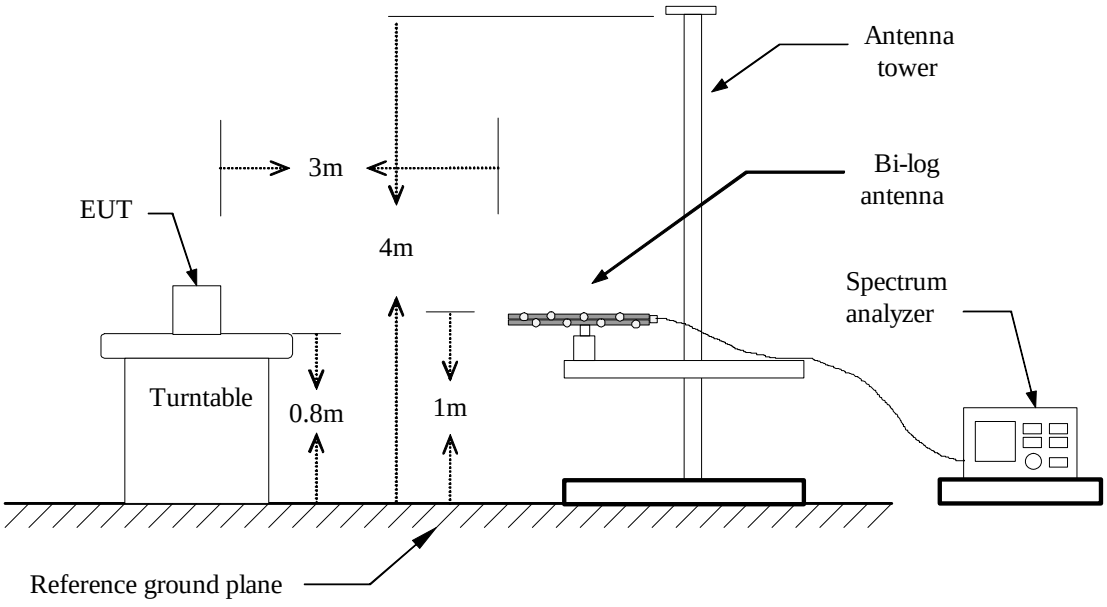
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

7.2.2.4. TEST SETUP

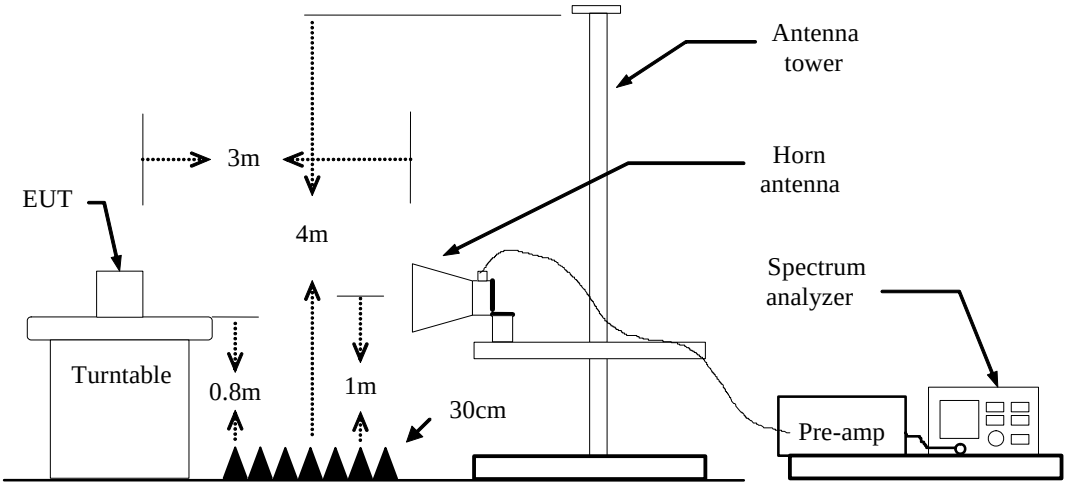
Below 30MHz



Below 1 GHz



Above 1 GHz



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.2.2.5. DATA SAPLE

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXX.XXXX	36.37	-12.20	24.17	40.00	-15.83	V	QP

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Q.P. = Quasi-peak Reading

Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXXX.XXXX	62.09	-11.42	50.67	74.00	-23.33	V	Peak
XXXX.XXXX	49.78	-11.42	38.36	54.00	-15.64	V	AVG

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Peak = Peak Reading
AVG = Average Reading

Calculation Formula

Margin (dB) = Result (dBuV/m) – Limits (dBuV/m)
Result (dBuV/m) = Reading (dBuV) + Correction Factor

7.2.2.6. TEST RESULTS

Below 1 GHz

Operation Mode: TX
Test Date: August 28, 2014
Temperature: 24°C
Tested by: Sun Guo
Humidity: 52% RH
Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
213.3300	47.87	-21.12	26.75	43.50	-16.75	V	QP
296.7500	56.11	-19.86	36.25	46.00	-9.75	V	QP
445.1600	48.99	-15.57	33.42	46.00	-12.58	V	QP
575.1400	49.66	-13.07	36.59	46.00	-9.41	V	QP
742.9500	38.89	-11.30	27.59	46.00	-18.41	V	QP
864.2000	41.28	-10.49	30.79	46.00	-15.21	V	QP
104.6900	50.16	-22.81	27.35	43.50	-16.15	H	QP
296.7500	52.88	-19.86	33.02	46.00	-12.98	H	QP
384.0500	54.94	-16.45	38.49	46.00	-7.51	H	QP
568.3500	51.91	-13.06	38.85	46.00	-7.15	H	QP
682.8100	44.37	-12.37	32.00	46.00	-14.00	H	QP
833.1600	49.04	-10.63	38.41	46.00	-7.59	H	QP

***Remark:** No emission found between lowest internal used/generated frequency to 30MHz.*

Notes:

1. *Radiated emissions measured in frequency range from 9kHz to 1GHz were made with an instrument using Quasi-peak detector mode.*
2. *Data of measurement within this frequency range shown " --- " 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.*
3. *The IF bandwidth of Receiver between 30MHz to 1GHz was 120kHz.*
4. *Frequency (MHz). = Emission frequency in MHz*
   Reading (dBμV/m) = Receiver reading
   Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain
   Limit (dBμV/m) = Limit stated in standard
   Margin (dB) = Measured (dBμV/m) – Limits (dBμV/m)
   Antenna Pol e(H/V) = Current carrying line of reading

Above 1 GHz

Test Mode: TX / IEEE 802.11b (CH Low) **Tested by:** Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 19, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2836.000	45.41	-4.59	40.82	74.00	-33.18	V	Peak
3619.000	52.32	-2.45	49.87	74.00	-24.13	V	Peak
4825.000	42.22	1.78	44.00	74.00	-30.00	V	Peak
6013.000	40.62	3.45	44.07	74.00	-29.93	V	Peak
6949.000	40.64	7.48	48.12	74.00	-25.88	V	Peak
7237.000	41.16	8.16	49.32	74.00	-24.68	V	Peak
3619.000	47.10	-2.45	44.65	74.00	-29.35	H	Peak
3997.000	43.33	-1.05	42.28	74.00	-31.72	H	Peak
4915.000	42.01	2.16	44.17	74.00	-29.83	H	Peak
5725.000	40.74	2.93	43.67	74.00	-30.33	H	Peak
6814.000	40.89	6.90	47.79	74.00	-26.21	H	Peak
7750.000	41.19	9.16	50.35	74.00	-23.65	H	Peak

***REMARKS**:*

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " 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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11b (CH Mid) **Tested by:** Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 19, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2269.000	53.25	-7.17	46.08	74.00	-27.92	V	peak
3457.000	48.29	-2.97	45.32	74.00	-28.68	V	peak
4870.000	42.86	1.97	44.83	74.00	-29.17	V	peak
5410.000	41.97	2.54	44.51	74.00	-29.49	V	peak
6967.000	40.14	7.56	47.70	74.00	-26.30	V	peak
7759.000	41.28	9.18	50.46	74.00	-23.54	V	peak
1945.000	53.94	-8.39	45.55	74.00	-28.45	H	Peak
2917.000	47.39	-4.20	43.19	74.00	-30.81	H	Peak
3457.000	46.05	-2.97	43.08	74.00	-30.92	H	Peak
4915.000	41.62	2.16	43.78	74.00	-30.22	H	Peak
5743.000	41.27	2.96	44.23	74.00	-29.77	H	Peak
7192.000	39.62	8.07	47.69	74.00	-26.31	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " 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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11b (CH High) **Tested by:** Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 19, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1819.000	54.21	-8.58	45.63	74.00	-28.37	V	peak
3457.000	47.46	-2.97	44.49	74.00	-29.51	V	peak
4888.000	40.80	2.04	42.84	74.00	-31.16	V	peak
5257.000	41.50	2.53	44.03	74.00	-29.97	V	peak
6742.000	40.89	6.59	47.48	74.00	-26.52	V	peak
7759.000	40.60	9.18	49.78	74.00	-24.22	V	peak
1927.000	54.39	-8.42	45.97	74.00	-28.03	H	Peak
2917.000	49.26	-4.20	45.06	74.00	-28.94	H	Peak
3457.000	46.64	-2.97	43.67	74.00	-30.33	H	Peak
4294.000	42.47	-0.18	42.29	74.00	-31.71	H	Peak
4987.000	40.99	2.46	43.45	74.00	-30.55	H	Peak
5815.000	40.86	3.08	43.94	74.00	-30.06	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " 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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11g (CH Low) **Tested by:** Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 19, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1819.000	54.14	-8.58	45.56	74.00	-28.44	V	Peak
2917.000	46.99	-4.20	42.79	74.00	-31.21	V	Peak
3619.000	53.33	-2.45	50.88	74.00	-23.12	V	Peak
4375.000	43.54	0.06	43.60	74.00	-30.40	V	Peak
4942.000	42.74	2.27	45.01	74.00	-28.99	V	Peak
6013.000	41.50	3.45	44.95	74.00	-29.05	V	Peak
1945.000	54.13	-8.39	45.74	74.00	-28.26	H	Peak
2917.000	46.74	-4.20	42.54	74.00	-31.46	H	Peak
3619.000	48.18	-2.45	45.73	74.00	-28.27	H	Peak
4933.000	41.02	2.23	43.25	74.00	-30.75	H	Peak
6130.000	40.59	3.95	44.54	74.00	-29.46	H	Peak
6931.000	40.32	7.40	47.72	74.00	-26.28	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " 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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11g (CH Mid) **Tested by:** Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 19, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2917.000	46.81	-4.20	42.61	74.00	-31.39	V	Peak
3457.000	47.50	-2.97	44.53	74.00	-29.47	V	Peak
4942.000	41.82	2.27	44.09	74.00	-29.91	V	Peak
5212.000	41.39	2.53	43.92	74.00	-30.08	V	Peak
6931.000	40.54	7.40	47.94	74.00	-26.06	V	Peak
7543.000	40.24	8.76	49.00	74.00	-25.00	V	Peak
2917.000	48.67	-4.20	44.47	74.00	-29.53	H	Peak
3457.000	46.59	-2.97	43.62	74.00	-30.38	H	Peak
4375.000	42.63	0.06	42.69	74.00	-31.31	H	Peak
5284.000	41.31	2.53	43.84	74.00	-30.16	H	Peak
6373.000	40.40	5.00	45.40	74.00	-28.60	H	Peak
7795.000	40.47	9.25	49.72	74.00	-24.28	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " 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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11g (CH High) **Tested by:** Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 19, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3457.000	47.43	-2.97	44.46	74.00	-29.54	V	Peak
4420.000	41.68	0.19	41.87	74.00	-32.13	V	Peak
4861.000	41.86	1.93	43.79	74.00	-30.21	V	Peak
6049.000	40.82	3.60	44.42	74.00	-29.58	V	Peak
6868.000	40.85	7.13	47.98	74.00	-26.02	V	Peak
7768.000	40.92	9.20	50.12	74.00	-23.88	V	Peak
3457.000	45.77	-2.97	42.80	74.00	-31.20	H	Peak
4276.000	42.44	-0.23	42.21	74.00	-31.79	H	Peak
4942.000	41.68	2.27	43.95	74.00	-30.05	H	Peak
5896.000	41.30	3.22	44.52	74.00	-29.48	H	Peak
6562.000	40.77	5.81	46.58	74.00	-27.42	H	Peak
7741.000	41.23	9.14	50.37	74.00	-23.63	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " 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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11n HT20 MHz(CH Low) **Tested by:** Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 19, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1207.000	61.41	-13.38	48.03	74.00	-25.97	V	Peak
3457.000	47.34	-2.97	44.37	74.00	-29.63	V	Peak
3619.000	53.33	-2.45	50.88	74.00	-23.12	V	Peak
4537.000	41.67	0.58	42.25	74.00	-31.75	V	Peak
5068.000	40.96	2.52	43.48	74.00	-30.52	V	Peak
6994.000	40.96	7.67	48.63	74.00	-25.37	V	Peak
2917.000	49.36	-4.20	45.16	74.00	-28.84	H	Peak
3619.000	46.46	-2.45	44.01	74.00	-29.99	H	Peak
4231.000	42.88	-0.36	42.52	74.00	-31.48	H	Peak
4942.000	40.89	2.27	43.16	74.00	-30.84	H	Peak
5149.000	41.78	2.52	44.30	74.00	-29.70	H	Peak
6769.000	40.88	6.70	47.58	74.00	-26.42	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " 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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11n HT20 MHz(CH Mid) **Tested by:** Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 19, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1819.000	54.29	-8.58	45.71	74.00	-28.29	V	Peak
3457.000	47.04	-2.97	44.07	74.00	-29.93	V	Peak
4492.000	42.89	0.41	43.30	74.00	-30.70	V	Peak
5050.000	41.05	2.51	43.56	74.00	-30.44	V	Peak
5842.000	41.01	3.12	44.13	74.00	-29.87	V	Peak
6886.000	41.52	7.21	48.73	74.00	-25.27	V	Peak
3457.000	47.89	-2.97	44.92	74.00	-29.08	H	Peak
4015.000	42.27	-1.00	41.27	74.00	-32.73	H	Peak
4816.000	41.33	1.74	43.07	74.00	-30.93	H	Peak
5455.000	41.68	2.55	44.23	74.00	-29.77	H	Peak
6247.000	40.60	4.45	45.05	74.00	-28.95	H	Peak
6940.000	40.39	7.44	47.83	74.00	-26.17	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " 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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11n HT20 MHz(CH High) **Tested by:** Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 19, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2917.000	46.48	-4.20	42.28	74.00	-31.72	V	Peak
3457.000	45.71	-2.97	42.74	74.00	-31.26	V	Peak
4330.000	42.09	-0.07	42.02	74.00	-31.98	V	Peak
5212.000	41.09	2.53	43.62	74.00	-30.38	V	Peak
5761.000	40.84	2.99	43.83	74.00	-30.17	V	Peak
6949.000	41.06	7.48	48.54	74.00	-25.46	V	Peak
2917.000	47.40	-4.20	43.20	74.00	-30.80	H	Peak
3457.000	46.12	-2.97	43.15	74.00	-30.85	H	Peak
3862.000	43.58	-1.55	42.03	74.00	-31.97	H	Peak
4366.000	42.86	0.04	42.90	74.00	-31.10	H	Peak
5140.000	41.43	2.52	43.95	74.00	-30.05	H	Peak
5482.000	41.25	2.55	43.80	74.00	-30.20	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " 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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

7.3. 6dB BANDWIDTH MEASUREMENT

7.3.1. LIMITS

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.3.2. TEST INSTRUMENTS

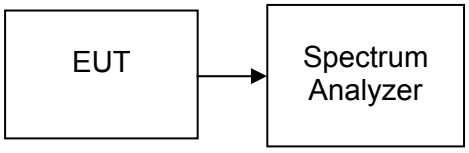
Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015

7.3.3. TEST PROCEDURES (please refer to measurement standard)

8.1 Option 1:

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ⩾ 3 x RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3.4. TEST SETUP



7.3.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Test Result
Low	2412	7.626	>500	PASS
Mid	2437	8.051		PASS
High	2462	7.626		PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	15.151	>500	PASS
Mid	2437	15.123		PASS
High	2462	15.131		PASS

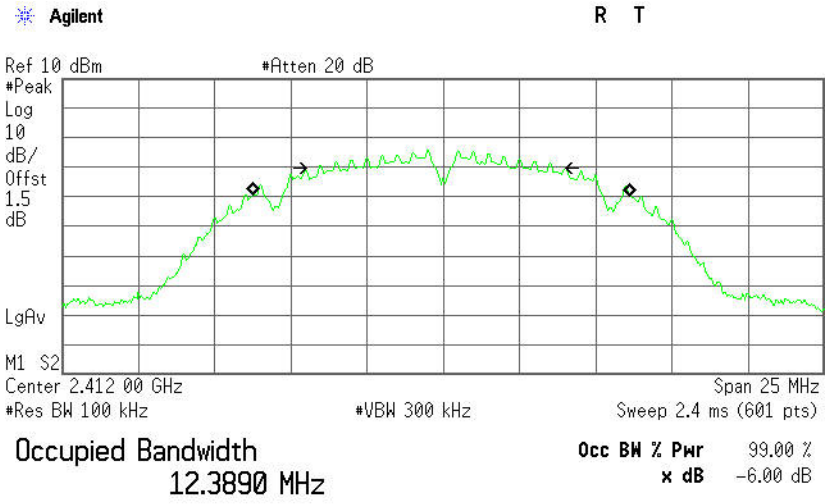
Test mode: IEEE 802.11n HT20 MHz

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	15.144	>500	PASS
Mid	2437	16.152		PASS
High	2462	15.144		PASS

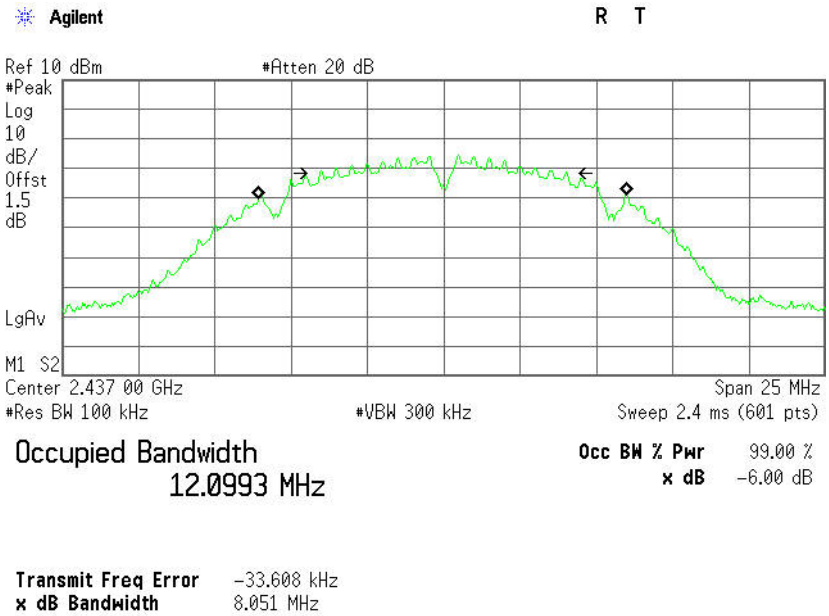
Test Plot

IEEE 802.11b mode

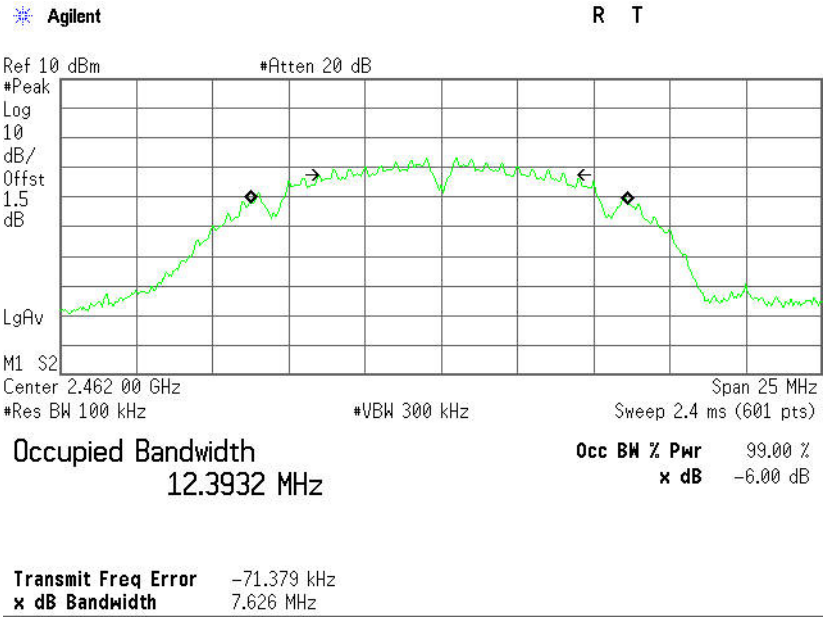
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

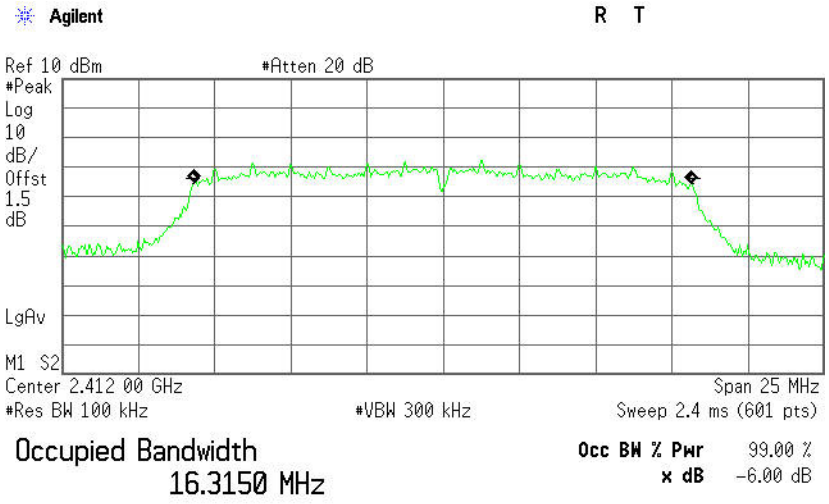


6dB Bandwidth (CH High)

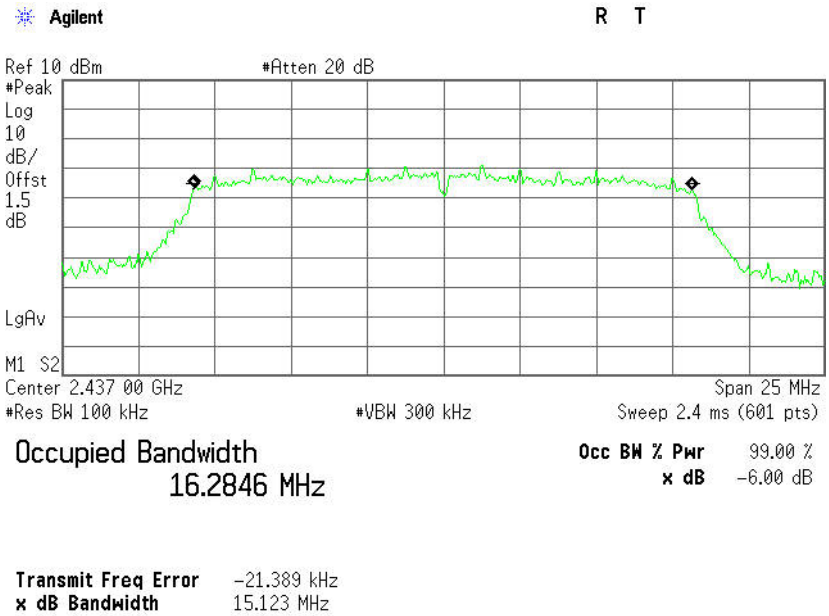


IEEE 802.11g mode

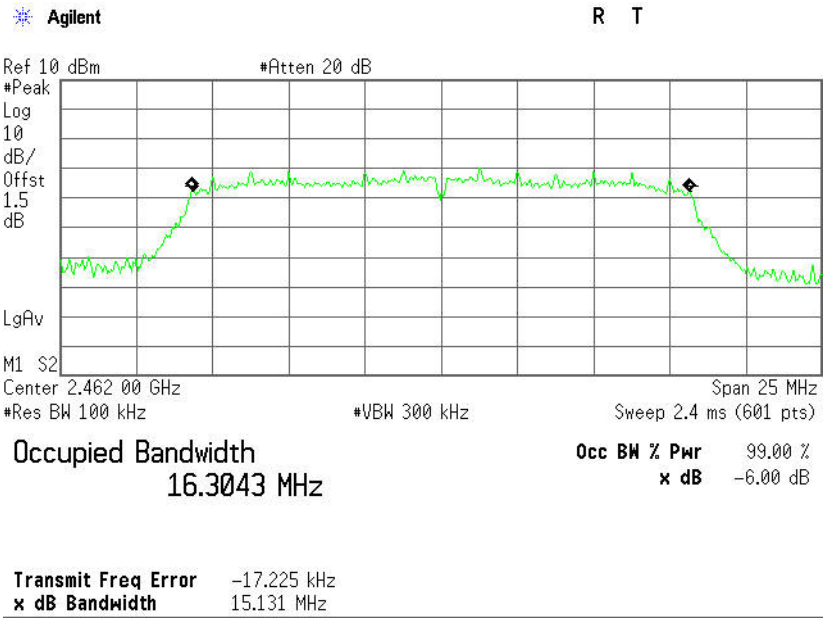
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

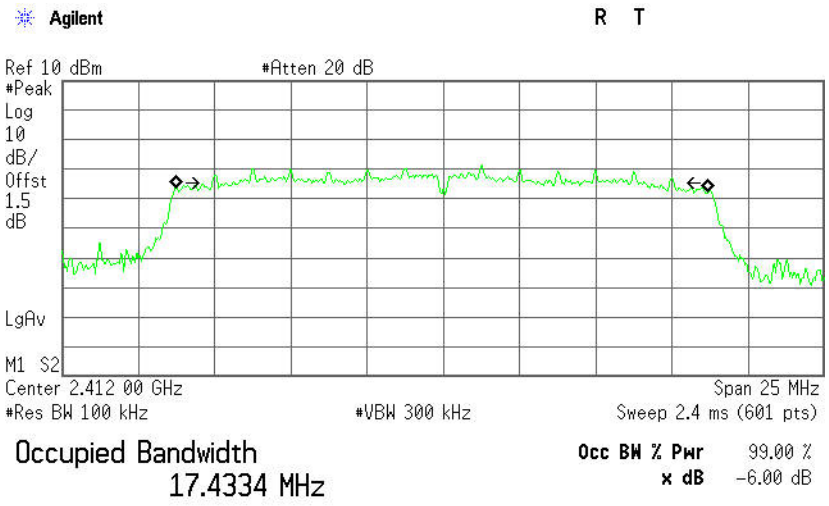


6dB Bandwidth (CH High)

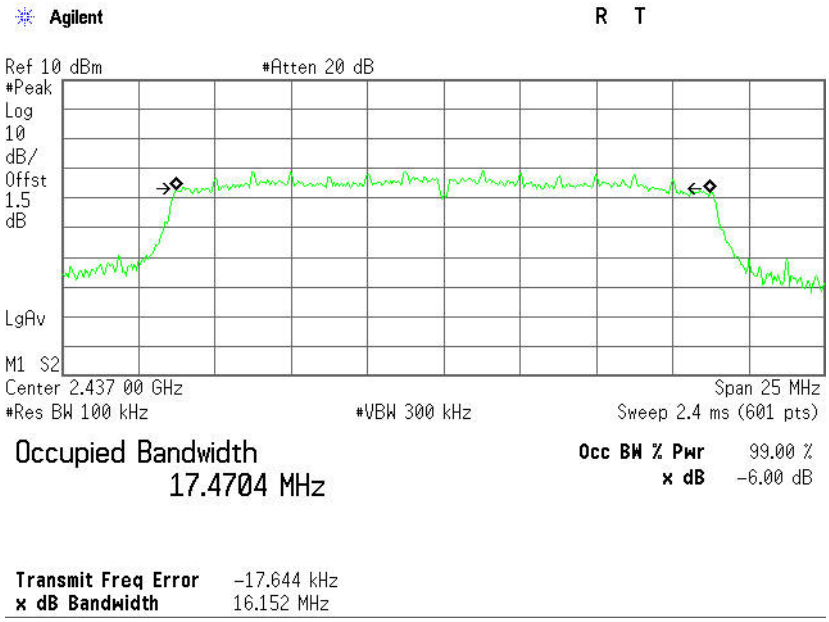


IEEE 802.11n HT20 MHz mode

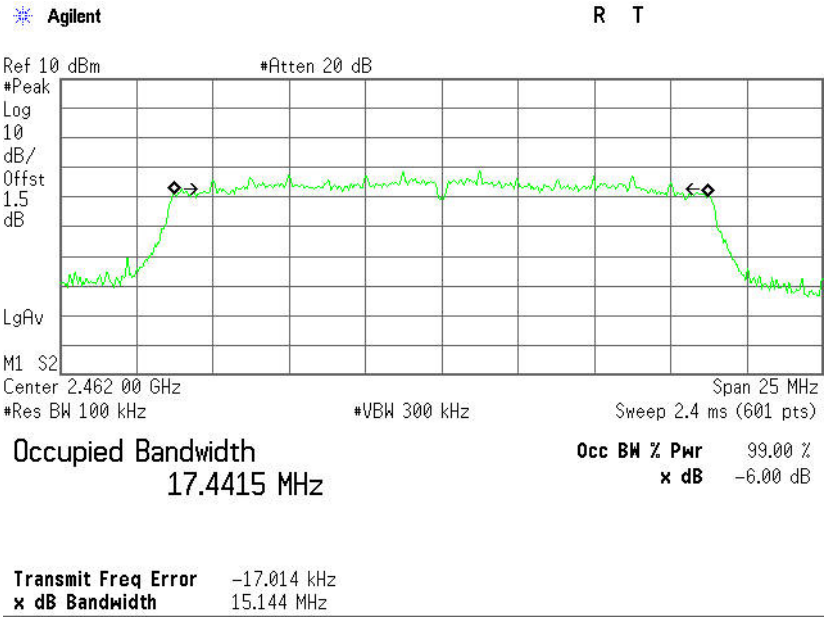
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)



7.4. PEAK OUTPUT POWER

7.4.1. LIMITS

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.

2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.4.2. TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Power Meter	Anritsu	ML2495A	1204003	03/09/2014	03/08/2015
Power Sensor	Anritsu	MA2411B	1126150	03/09/2014	03/08/2015
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015

7.4.3. TEST PROCEDURES (please refer to measurement standard)

9.1.1 RBW ≥ *DTS bandwidth*

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the *DTS bandwidth*.
a) Set the RBW ≥ *DTS bandwidth*.
b) Set VBW ≥ 3 RBW.
c) Set span ≥ 3 x RBW
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

9.1.2 Integrated band power method

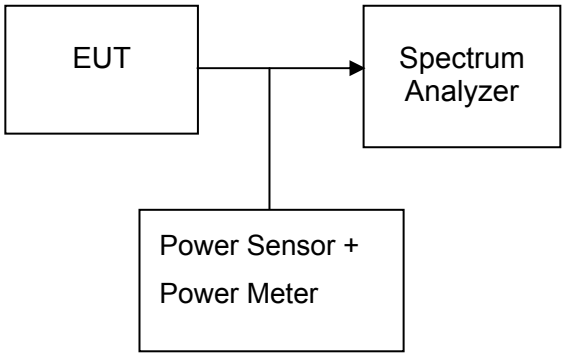
This procedure may be used when the maximum available RBW of the measurement instrument is less than the *DTS bandwidth*.

a) Set the RBW = 1 MHz.
b) Set the VBW ≥ 3 RBW
c) Set the span ≥ 1.5 x DTS bandwidth.
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select peak detector). If the instrument does not have a band power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS bandwidth.

9.1.3 PKPM1 Peak power meter method

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

7.4.4. TEST SETUP



7.4.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	-6.72	0.00021	1	PASS
Mid	2437	-8.55	0.00014		PASS
High	2462	-9.35	0.00012		PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	-0.73	0.00085	1	PASS
Mid	2437	-2.55	0.00056		PASS
High	2462	-3.58	0.00044		PASS

Test mode: IEEE 802.11n HT20 MHz

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	-1.26	0.00075	1	PASS
Mid	2437	-3.22	0.00048		PASS
High	2462	-4.12	0.00039		PASS

7.5. BAND EDGES MEASUREMENT

7.5.1. LIMITS

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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) (see Section 15.205(c)).

7.5.2. TEST INSTRUMENTS

Radiated Emission Test Site 966(2)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2014	03/08/2015
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2015	03/18/2015
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2015	03/18/2015
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	07/10/2014	07/09/2015
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/01/2014	03/01/2015
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/01/2014	03/01/2015
Loop Antenna	A、R、A	PLA-1030/B	1029	09/27/2013	09/26/2014
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2014	02/28/2015
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

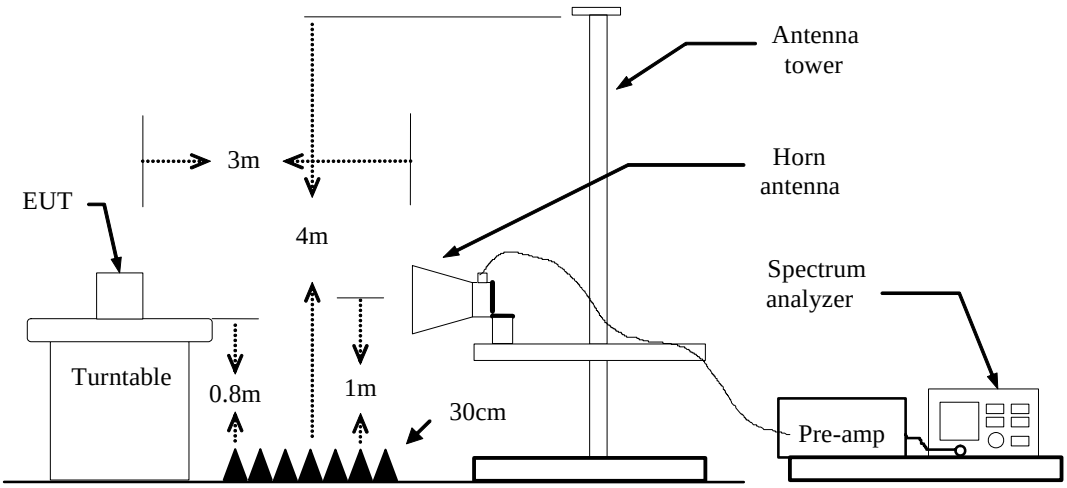
2. The FCC Site Registration number is 101879.

3. N.C.R = No Calibration Required.

7.5.3. TEST PROCEDURES (please refer to measurement standard)

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are

7.5.4. TEST SETUP



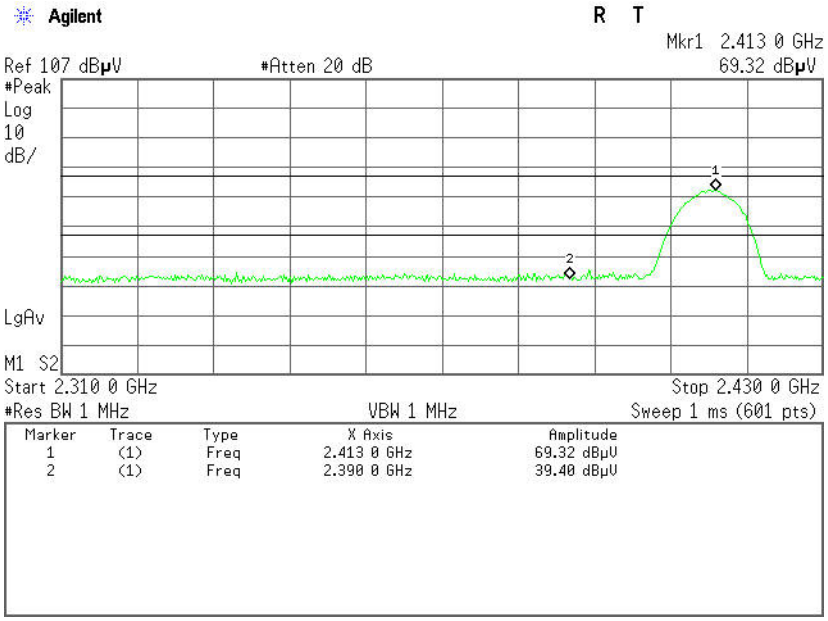
7.5.5. TEST RESULTS

Test Plot

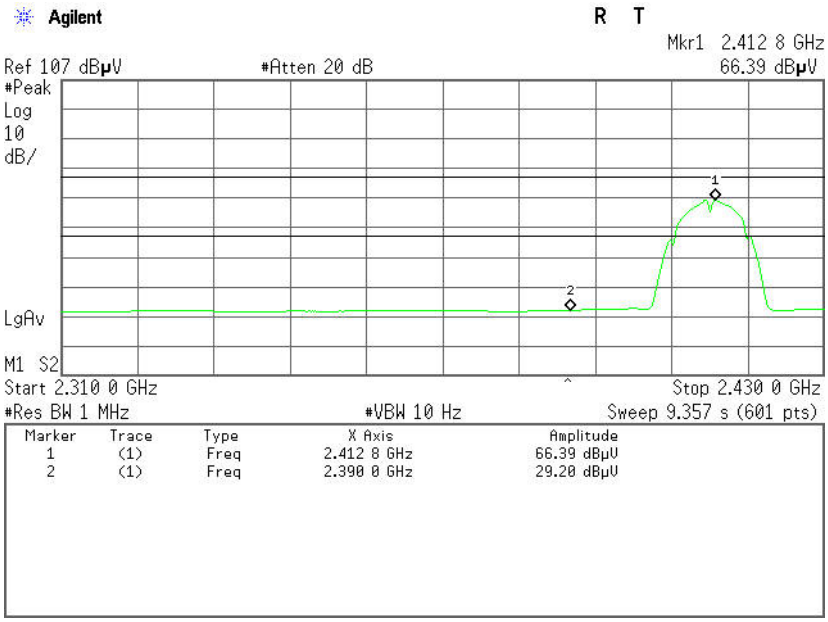
IEEE 802.11b mode

Band Edges (CH Low)

Detector mode: Peak **Polarity: Vertical**

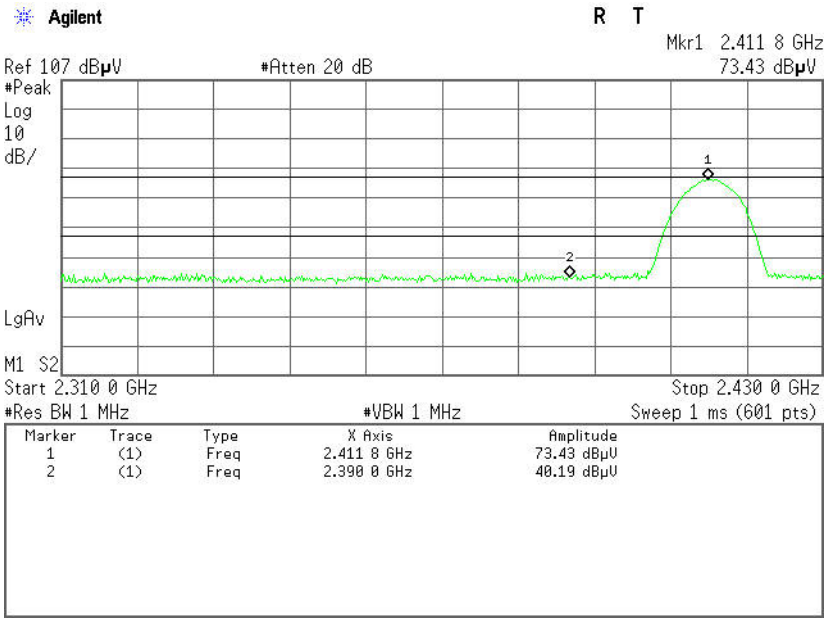


Detector mode: Average **Polarity: Vertical**

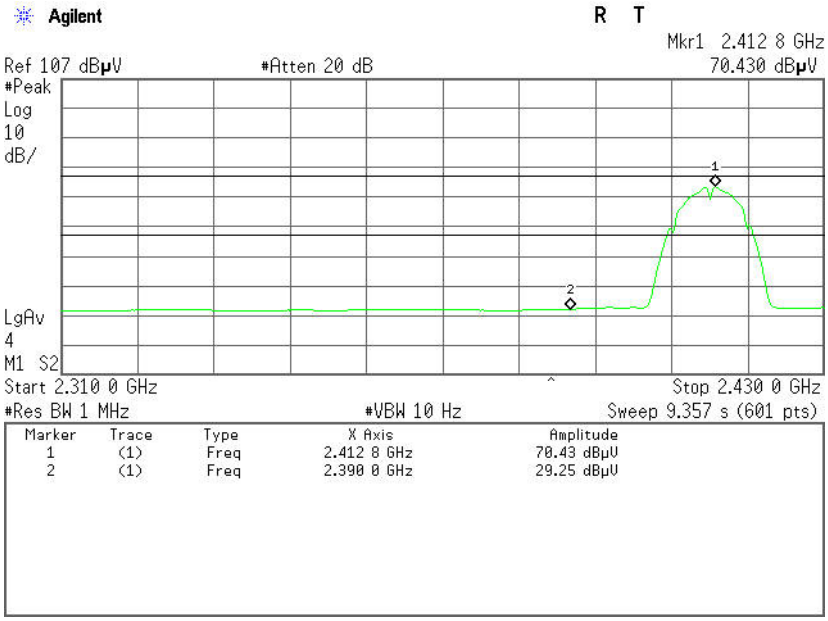


No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2390.0000	32.80	-6.60	39.40	74.00	-34.60	Peak	Vertical
2	2390.0000	22.60	-6.60	29.20	54.00	-24.80	Average	Vertical

Detector mode: Peak **Polarity: Horizontal**



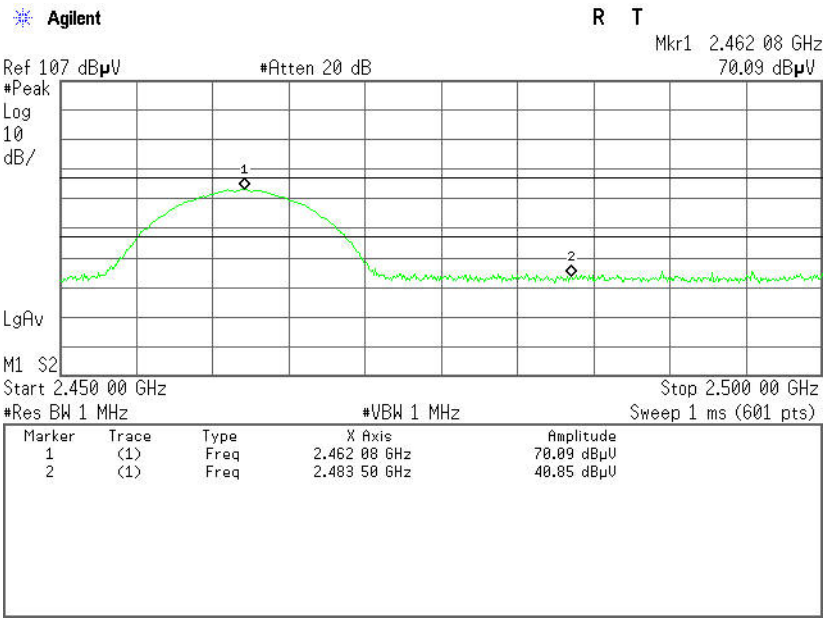
Detector mode: Average **Polarity: Horizontal**



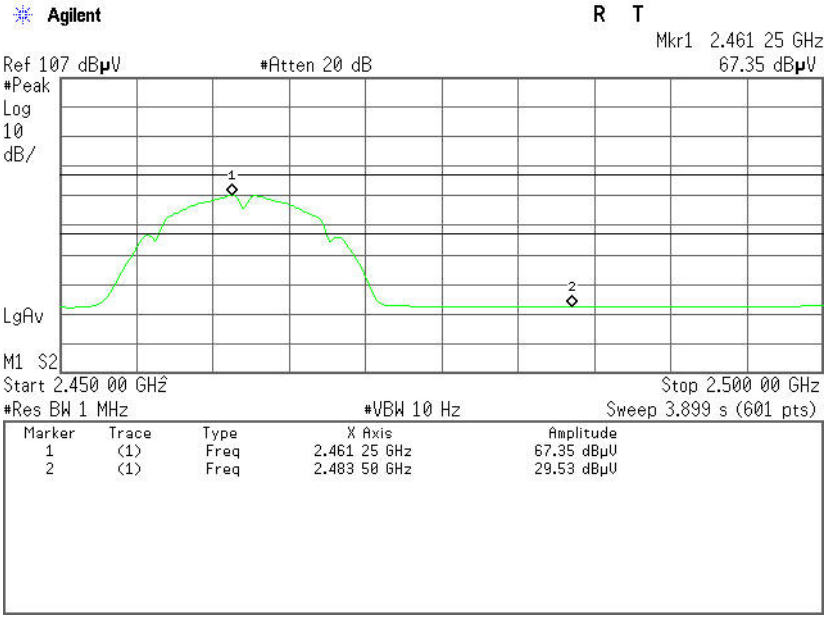
No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2390.0000	33.59	-6.60	40.19	74.00	-33.81	Peak	Horizontal
2	2390.0000	22.65	-6.60	29.25	54.00	-24.75	Average	Horizontal

Band Edges (CH High)

Detector mode: Peak Polarity: Vertical

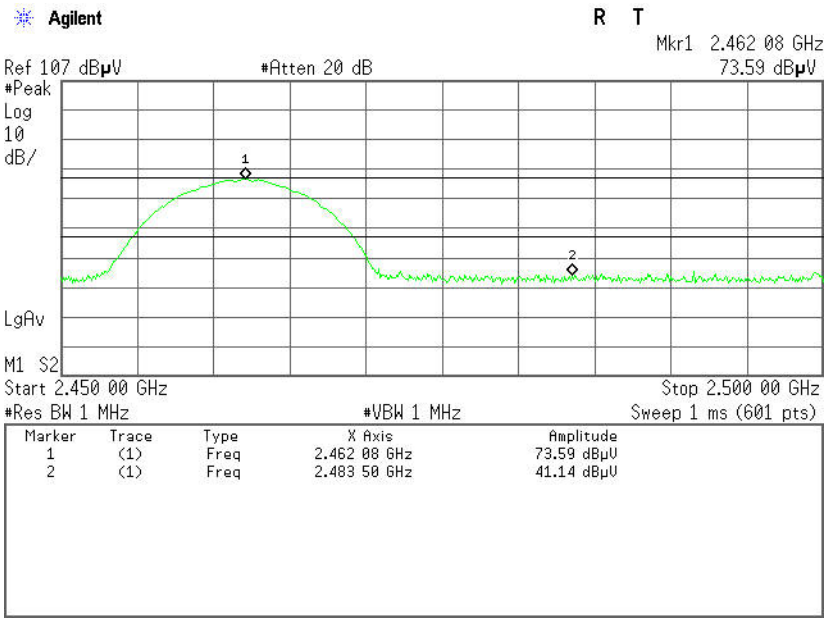


Detector mode: Average Polarity: Vertical

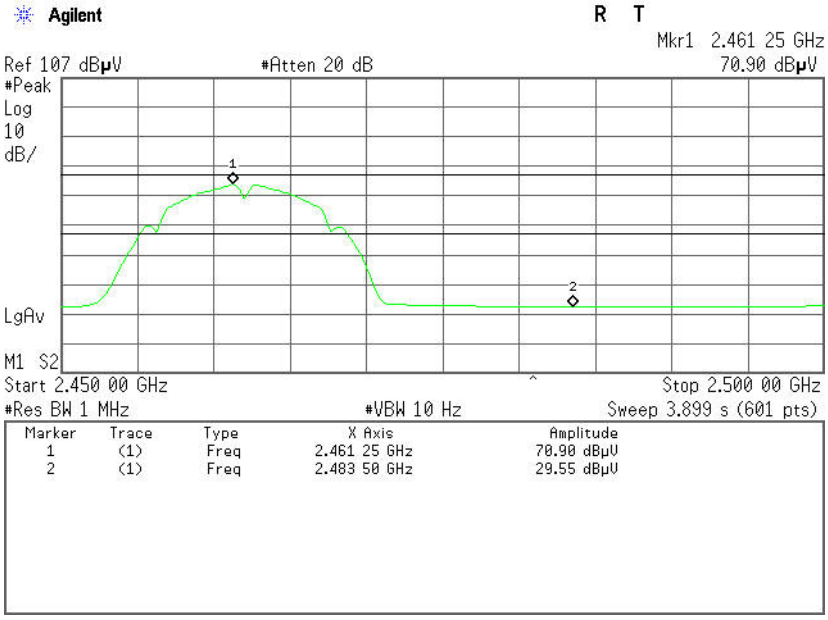


No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2483.5000	34.61	-6.24	40.85	74.00	-33.15	Peak	Vertical
2	2483.5000	23.29	-6.24	29.53	54.00	-24.47	AVG	Vertical

Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**

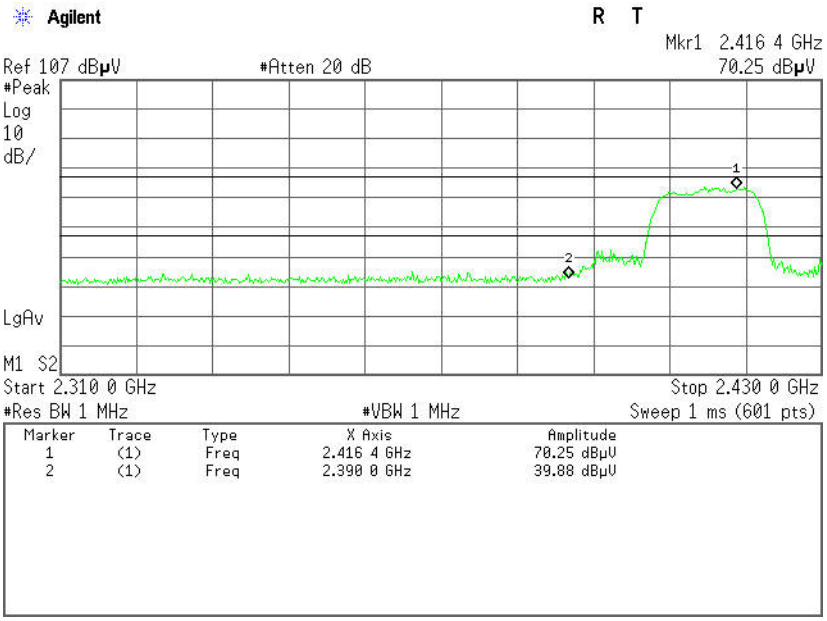


No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2483.5000	34.90	-6.24	41.14	74.00	-32.86	Peak	Vertical
2	2483.5000	23.31	-6.24	29.55	54.00	-24.45	AVG	Vertical

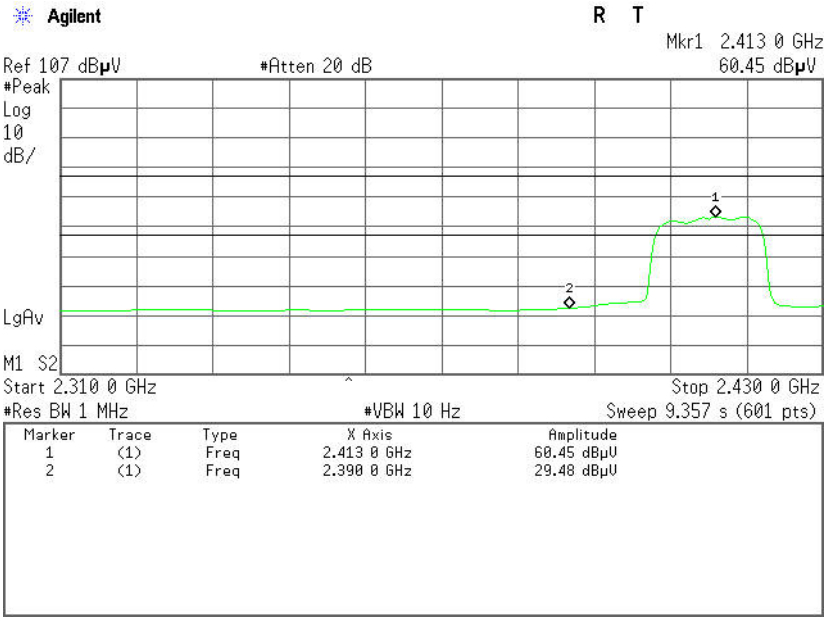
IEEE 802.11g mode

Band Edges (CH Low)

Detector mode: Peak Polarity: Vertical

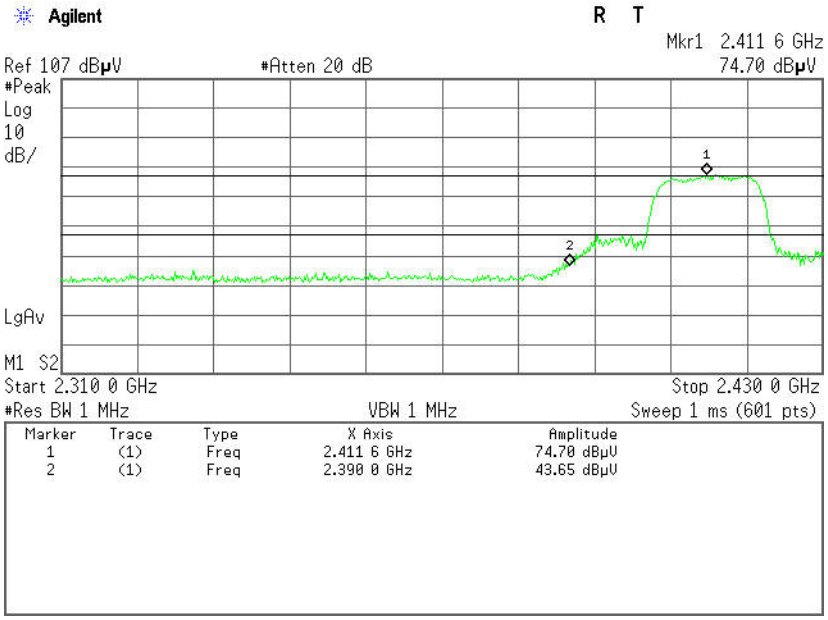


Detector mode: Average Polarity: Vertical

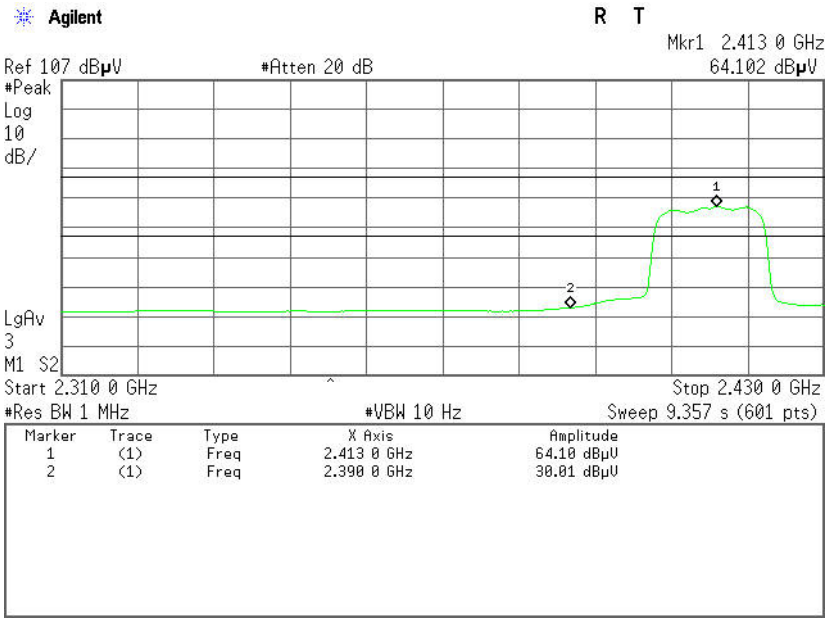


No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2390.0000	33.28	-6.60	39.88	74.00	-34.12	Peak	Vertical
2	2390.0000	22.88	-6.60	29.48	54.00	-24.52	Average	Vertical

Detector mode: Peak **Polarity: Horizontal**



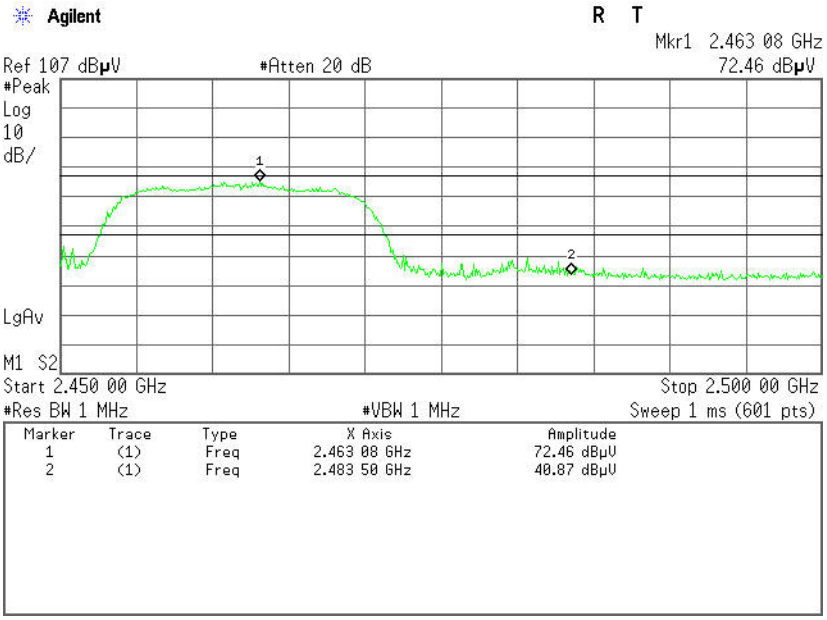
Detector mode: Average **Polarity: Horizontal**



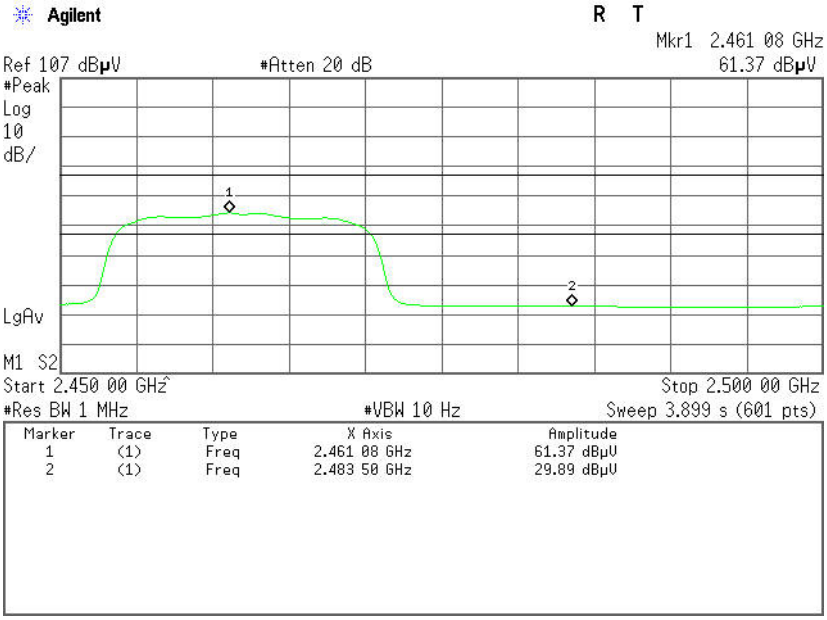
No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2390.0000	37.05	-6.60	43.65	74.00	-30.35	Peak	Horizontal
2	2390.0000	23.41	-6.60	30.01	54.00	-23.99	Average	Horizontal

Band Edges (CH High)

Detector mode: Peak Polarity: Vertical

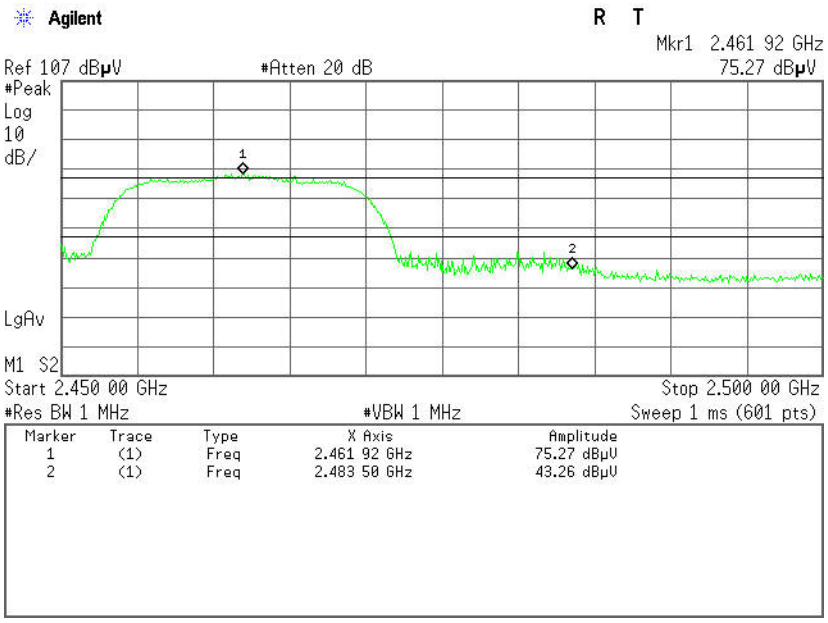


Detector mode: Average Polarity: Vertical

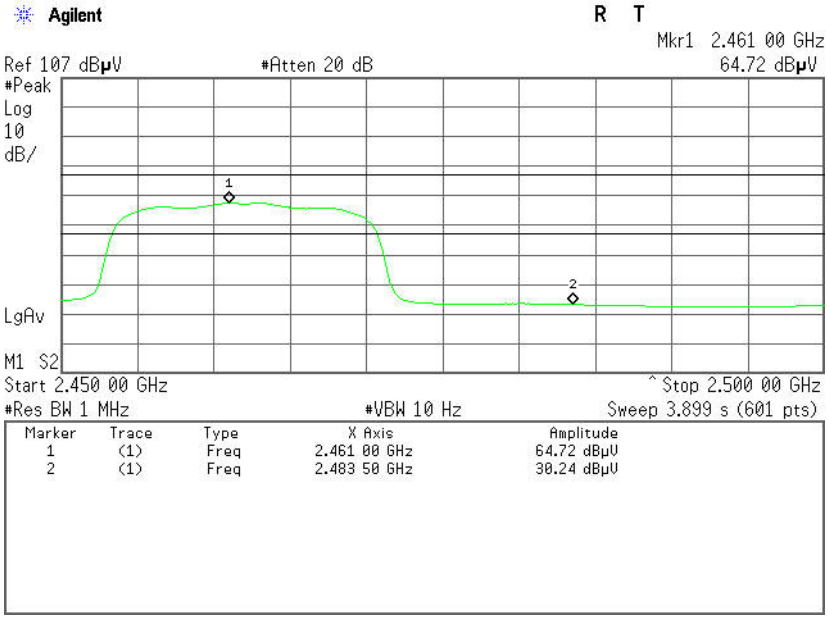


No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2483.5000	34.63	-6.24	40.87	74.00	-33.13	Peak	Vertical
2	2483.5000	23.65	-6.24	29.89	54.00	-24.11	AVG	Vertical

Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**

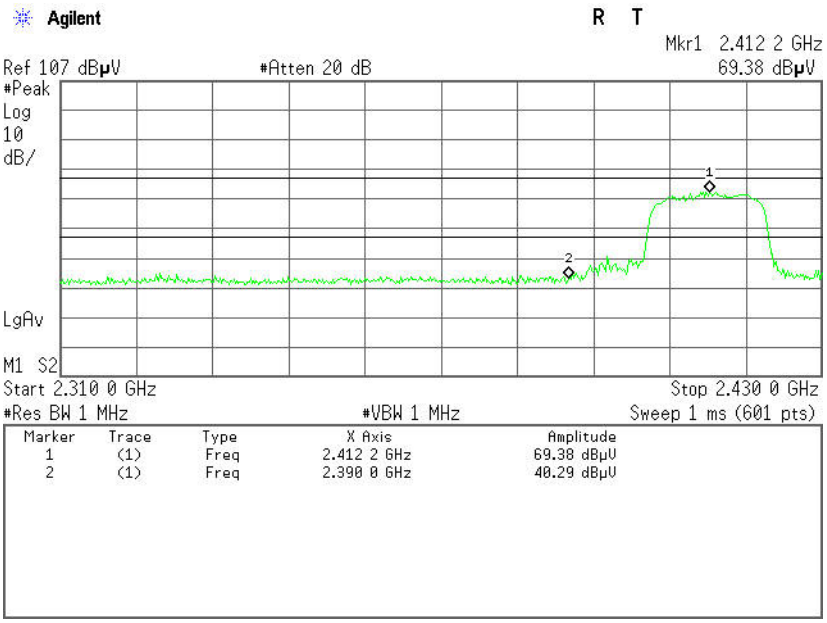


No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2483.5000	37.02	-6.24	43.26	74.00	-30.74	Peak	Horizontal
2	2483.5000	24.00	-6.24	30.24	54.00	-23.76	AVG	Horizontal

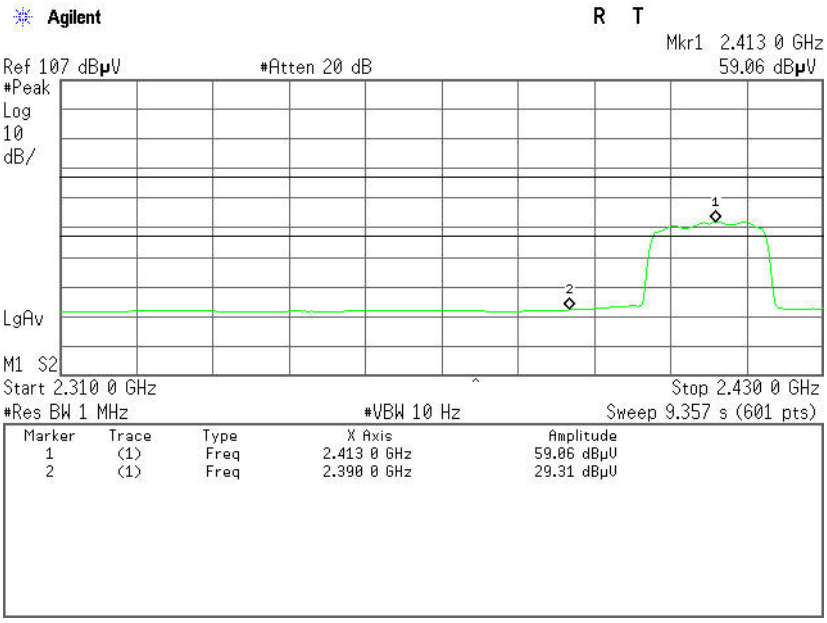
IEEE 802.11n HT20 MHz mode

Band Edges (CH Low)

Detector mode: Peak **Polarity: Vertical**

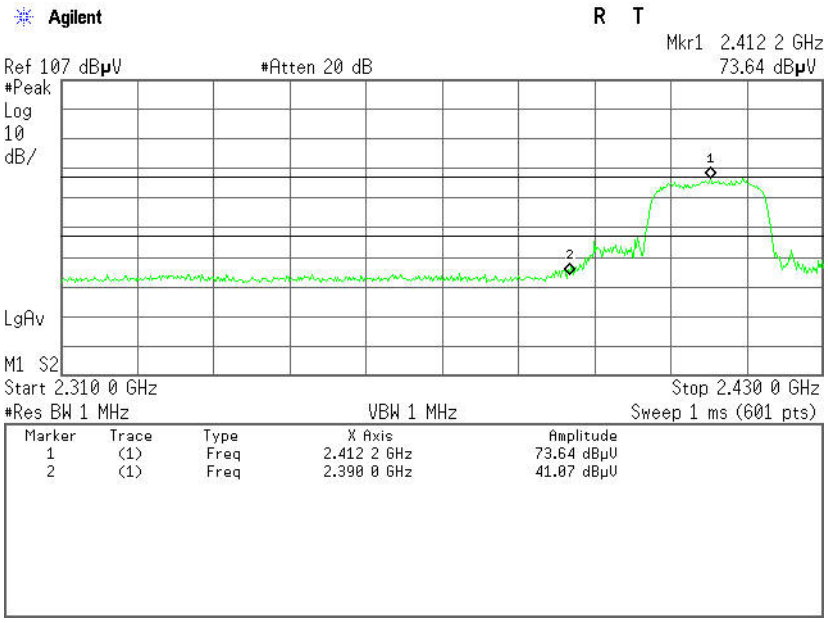


Detector mode: Average **Polarity: Vertical**

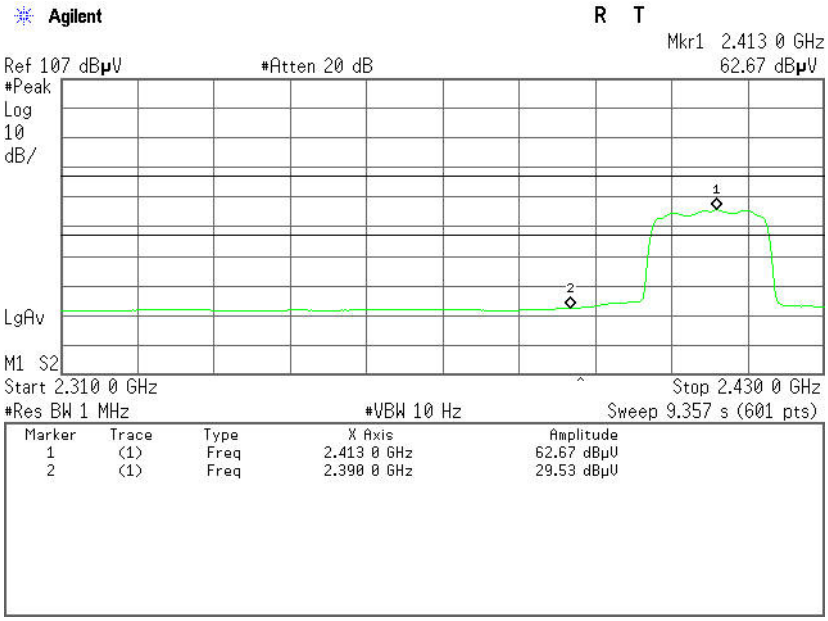


No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2390.0000	33.69	-6.60	40.29	74.00	-33.71	Peak	Vertical
2	2390.0000	22.71	-6.60	29.31	54.00	-24.69	Average	Vertical

Detector mode: Peak **Polarity: Horizontal**



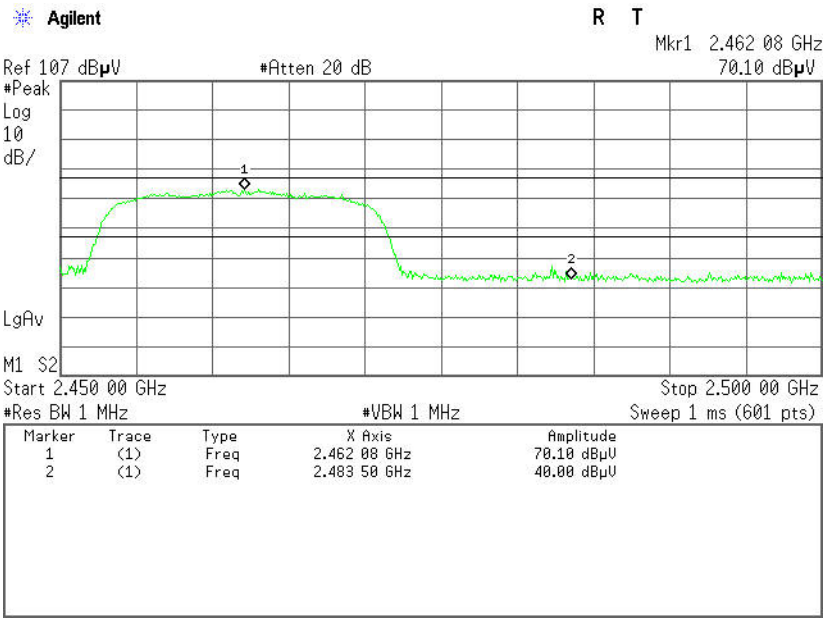
Detector mode: Average **Polarity: Horizontal**



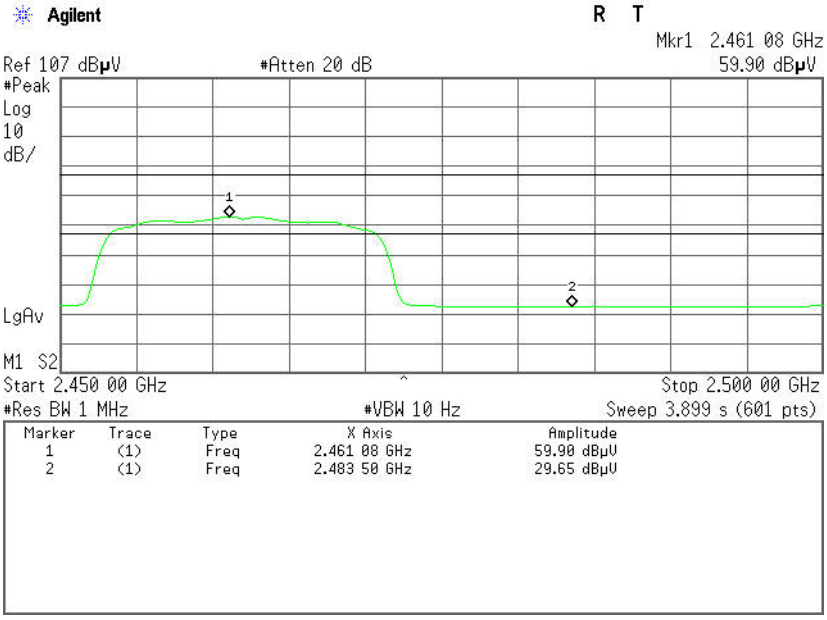
No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2390.0000	34.47	-6.60	41.07	74.00	-32.93	Peak	Horizontal
2	2390.0000	22.93	-6.60	29.53	54.00	-24.47	Average	Horizontal

Band Edges (CH High)

Detector mode: Peak Polarity: Vertical

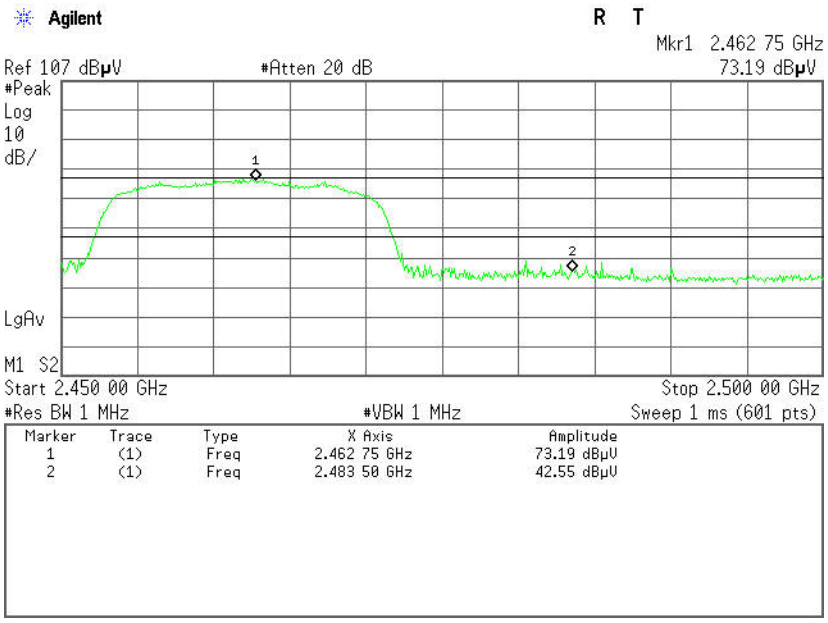


Detector mode: Average Polarity: Vertical

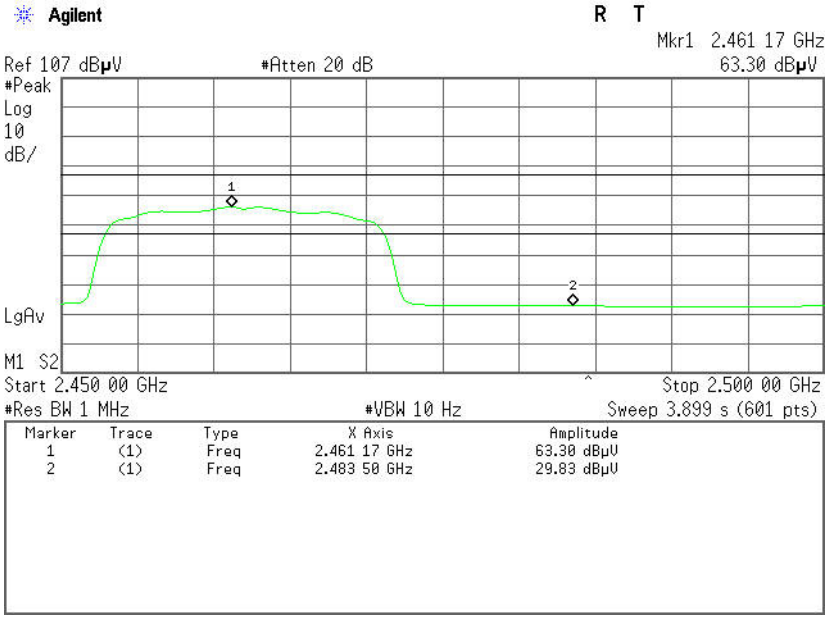


No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2483.5000	33.76	-6.24	40.00	74.00	-34.00	Peak	Vertical
2	2483.5000	23.41	-6.24	29.65	54.00	-24.35	AVG	Vertical

Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Antenna Pole
1	2483.5000	36.31	-6.24	42.55	74.00	-31.45	Peak	Horizontal
2	2483.5000	23.59	-6.24	29.83	54.00	-24.17	AVG	Horizontal

7.6. PEAK POWER SPECTRAL DENSITY MEASUREMENT

7.6.1. LIMITS

According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

7.6.2. TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015

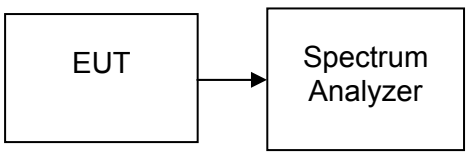
7.6.3. TEST PROCEDURES (please refer to measurement standard)

§15.247(e)specifies a conducted power spectral density (PSD) limit of 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission. The same method as used to determine the conducted output power shall be used to determine the power spectral density (i.e.,if peak-detected fundamental power was measured then use the peak PSD procedure and if average fundamental power was measured then use the average PSD procedure).

10.2 Method PKPSD (peak PSD)

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 x 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.

7.6.4. TEST SETUP



7.6.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-28.81	8	PASS
Mid	2437	-30.17		PASS
High	2462	-30.97		PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-32.25	8	PASS
Mid	2437	-33.45		PASS
High	2462	-34.86		PASS

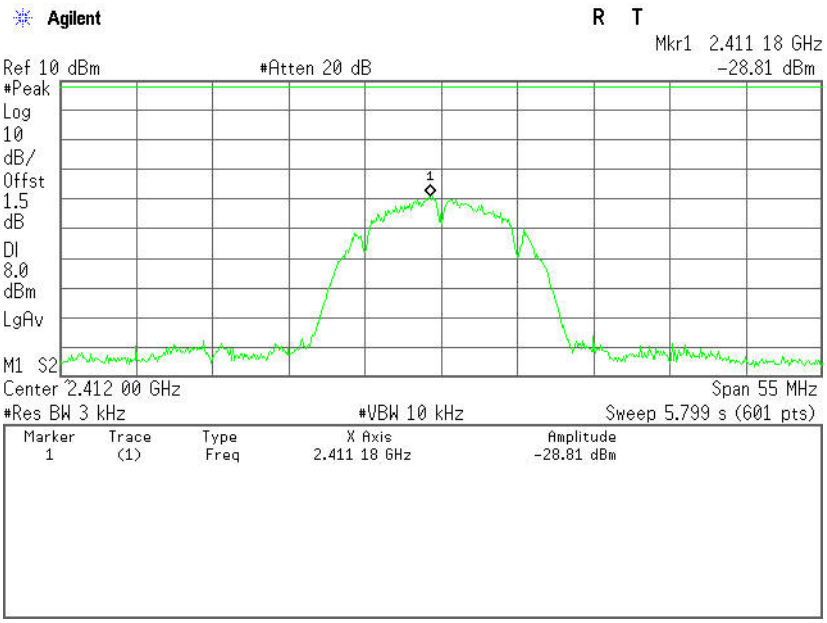
Test mode: IEEE 802.11n HT20 MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-32.92	8	PASS
Mid	2437	-34.30		PASS
High	2462	-35.19		PASS

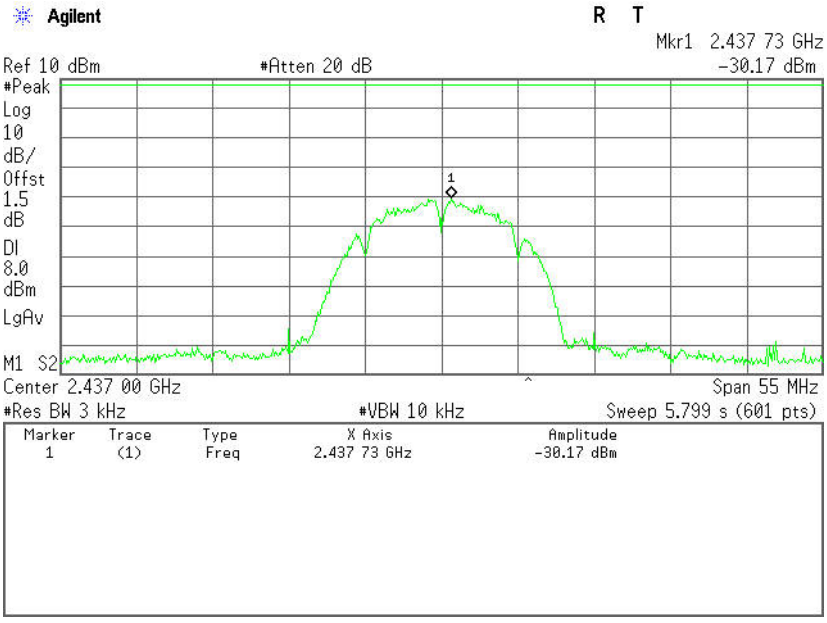
Test Plot

IEEE 802.11b mode

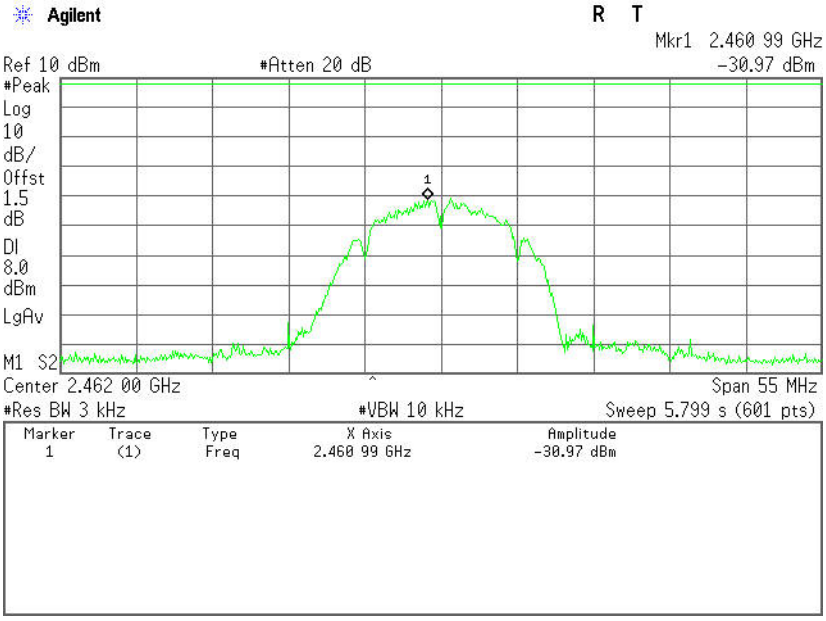
PPSD (CH Low)



PPSD (CH Mid)

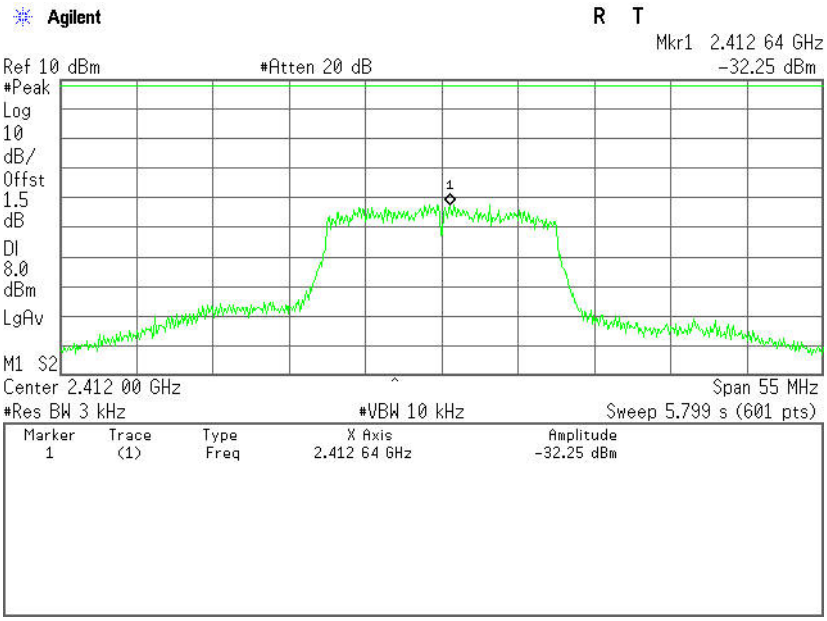


PPSD (CH High)

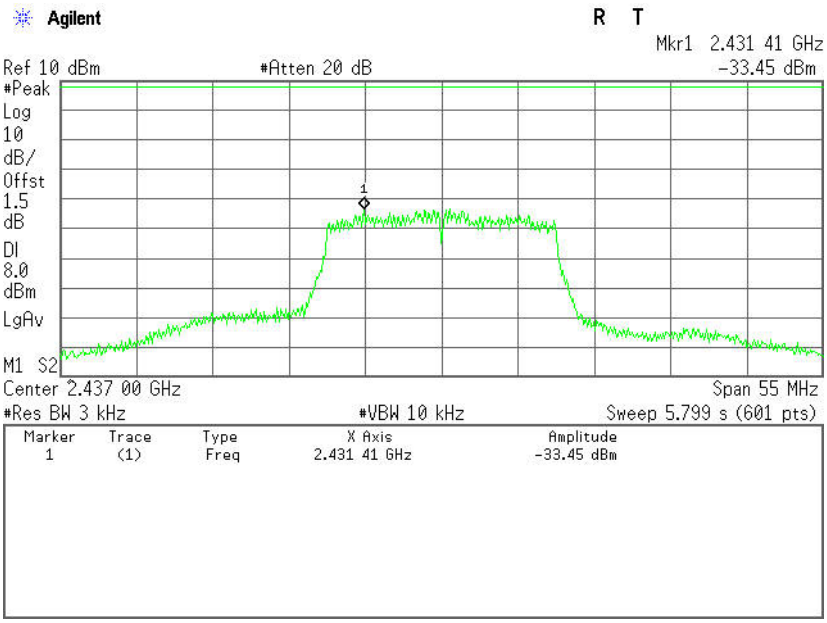


IEEE 802.11g mode

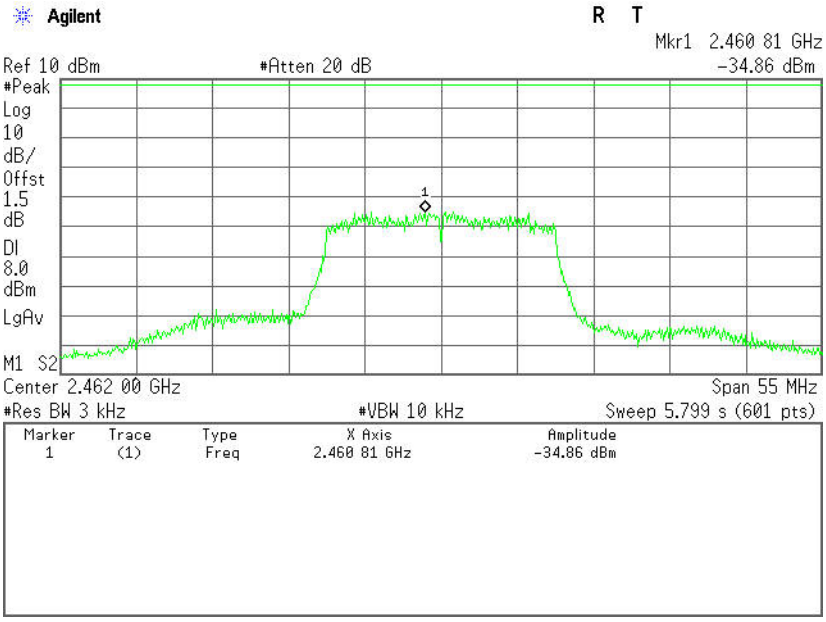
PPSD (CH Low)



PPSD (CH Mid)

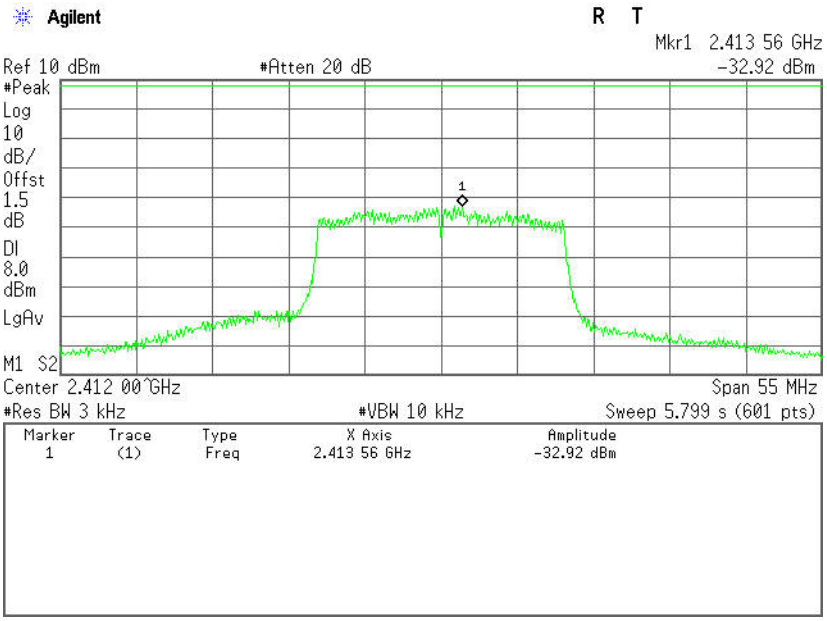


PPSD (CH High)

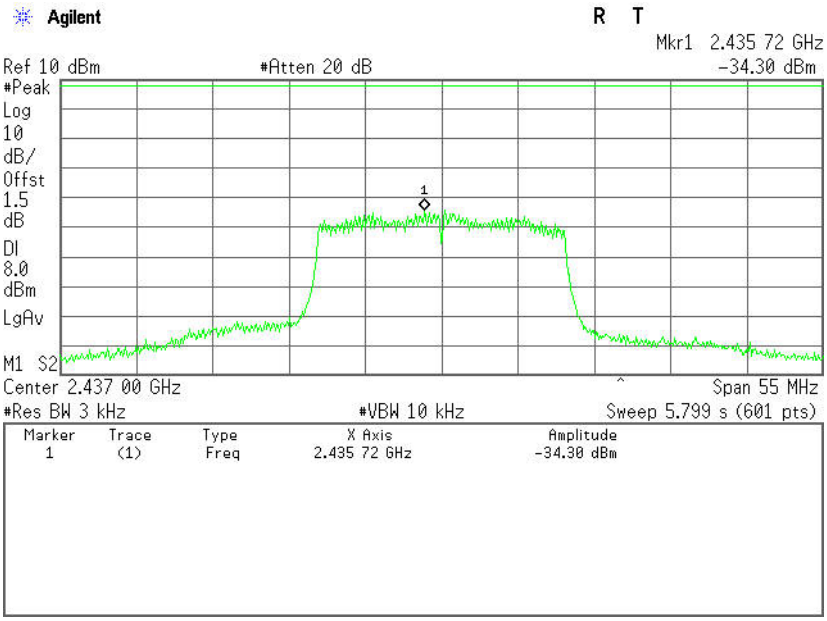


IEEE 802.11n HT20 MHz mode

PPSD (CH Low)



PPSD (CH Mid)



PPSD (CH High)