



FCC 47 CFR PART 15 SUBPART C

for

Indoor-outdoor wireless video camera

Model: GZ100B, 983S1, GZ100W

Brand: Guardzilla

Test Report Number:
C160331Z05-RP1

Issued Date: April 29, 2016

Issued for

Shenzhen Aoni Electronic Industry Co., Ltd
No.5 Bldg, Honghui Industrial park, 2nd liuxian Road, Xinan
street, Baoan District, Shenzhen, China

Issued by:

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Guan Lan Town, Baoan District, Shenzhen, China
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TESTING CERT #2861.01

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	April 29, 2016	Initial Issue	ALL	Sabrina Wang



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1 TEST CERTIFICATION

Product	Indoor-outdoor wireless video camera
Model	GZ100B, 983S1, GZ100W
Brand	Guardzilla
Tested	March 31~April 29, 2016
Applicant	Shenzhen Aoni Electronic Industry Co., Ltd No.5 Bldg, Honghui Industrial park, 2nd liuxian Road, Xinan street, Baoan District, Shenzhen, China
Manufacturer	Shenzhen Aoni Electronic Industry Co., Ltd No.5 Bldg, Honghui Industrial park, 2nd liuxian Road, Xinan street, Baoan District, Shenzhen, China

APPLICABLE STANDARDS			
Standard	Test Type	Standard	Test Type
15.207(a)	Power Line Conducted Emissions	15.247(d) 15.209(a)	<ul style="list-style-type: none"> ● 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 (Shenzhen) 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 C63.10: 2013** 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:

Reviewed by:

Sunday Hu
Supervisor of EMC Dept.
Compliance Certification Services (Shenzhen) Inc.

Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Services (Shenzhen) 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)	<ul style="list-style-type: none">● 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	Indoor-outdoor wireless video camera
Model Number	GZ100B, 983S1, GZ100W
Brand	Guardzilla
Model Discrepancy	N/A
Identify Number	C160331Z05-RP1
Received Date	August 24, 2015
Received Date	March 31, 2016
Power Supply	DC5.0V supply by the adapter
Adapter Model No.	HNBL050100WU I/P: 100-240Vac, 50-60Hz, 0.2A Max O/P: 5.0Vdc, 1.0A DC Cable: Unshielded 1.40m
Transmit Power	IEEE 802.11b mode: 18.74dBm IEEE 802.11g mode: 23.76dBm IEEE 802.11n HT20 MHz mode: 22.77dBm
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: 65.0Mbps with fall back rates of 65.0/58.5/52.0/ 39.0/26.0/19.5/13.0/6.5 Mbps
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	Embedded Antenna with 3dBi gain (Max)
Channels Spacing	IEEE 802.11b/g ,802.11n HT20/HT40 : 5MHz
Temperature Range	-20°C ~ +55°C
Hardware Version	V1.0
Software Version	V1.0

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: **Z63-IPC983** 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: Adapter Charge with WIFI	<input checked="" type="checkbox"/>
Radiated Emission	Mode 1: TX	<input checked="" type="checkbox"/>

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, one statement for spurious below 1GHz, that only worst case was recorded and whether it was low, mid or high.

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	Notebook	B475	WB04861612	DoC	LENOVO	N/A	AC Cable: Unshielded 1.45m DC Cable: Unshielded 1.80m

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 C63.10, 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-4815,R-4320,T-2317, G-10624)
Canada	INDUSTRY CANADA

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccssz.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 μ H/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 (dB μ V)	
	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	02/21/2016	02/20/2017
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	02/21/2016	02/20/2017
LISN	EMCO	3825/2	8901-1459	02/21/2016	02/20/2017
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	02/21/2016	02/20/2017
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

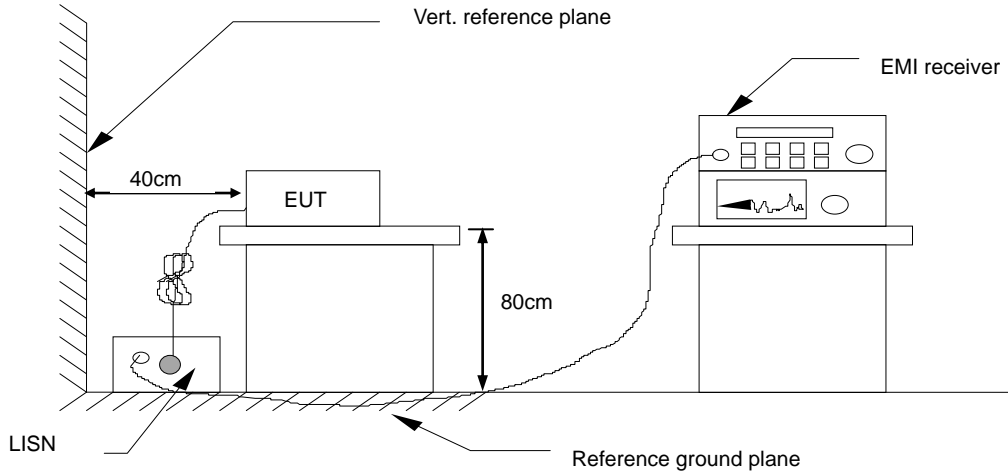
- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.



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

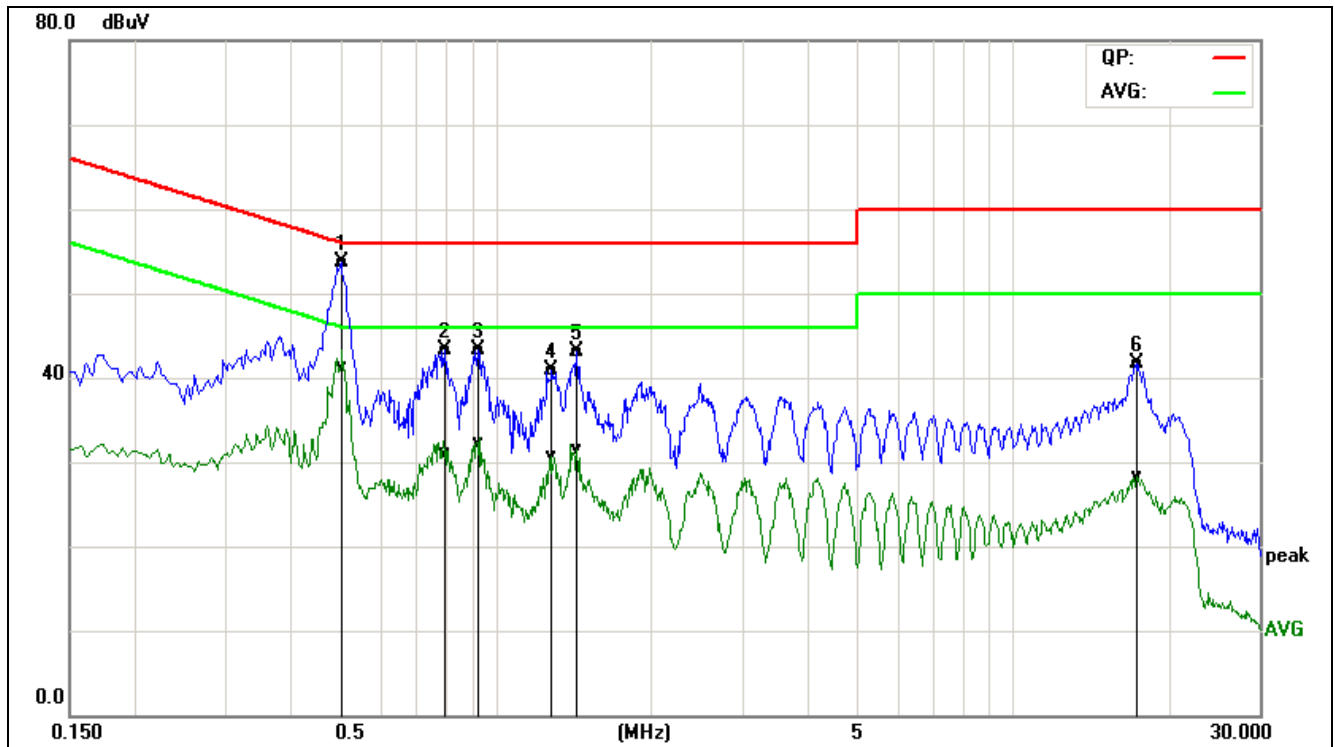
Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	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.	GZ100B	RBW,VBW	9 kHz
Environmental Conditions	22°C, 45% RH	Test Mode	Mode 1
Tested by	Ad Gan	Line	L1
Test Date	April 29, 2016		

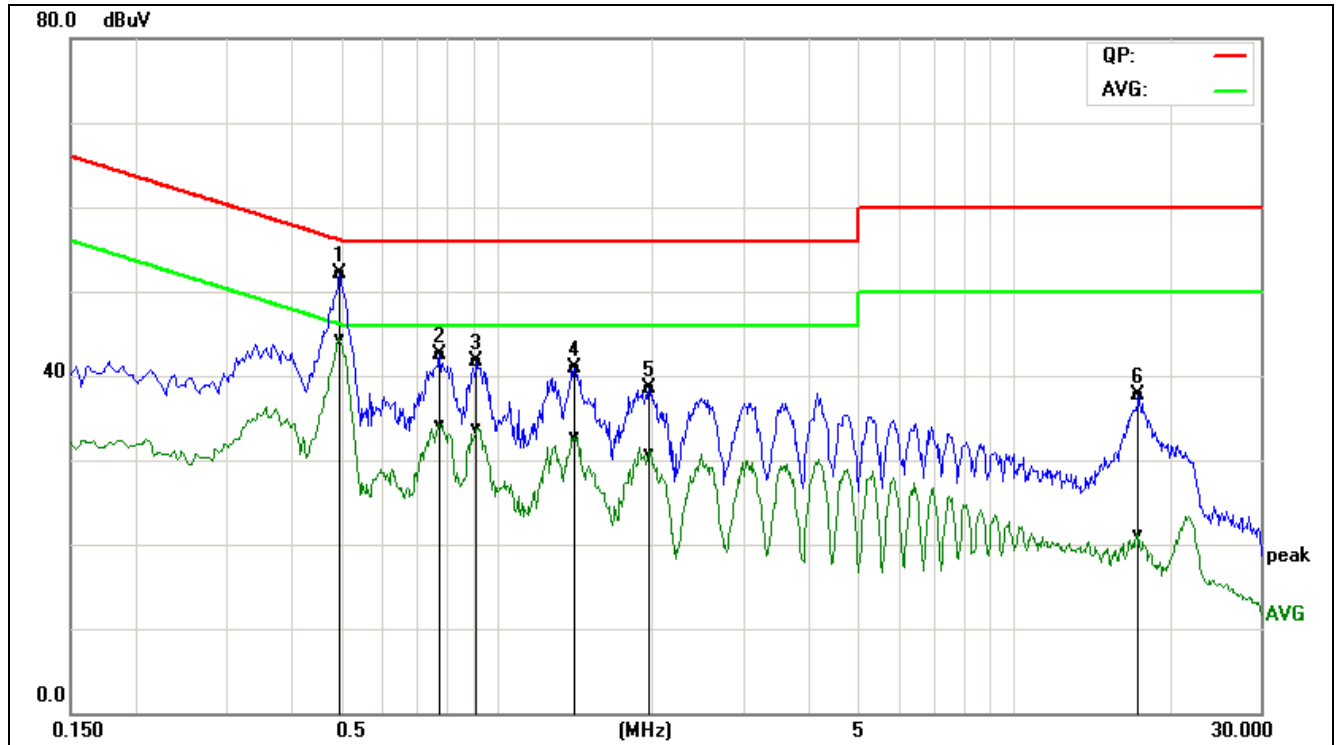


Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)	Line (L1/L2)
0.5020	43.91	31.36	9.88	53.79	41.24	56.00	46.00	-2.21	-4.76	Pass	L1
0.7980	33.38	21.23	9.90	43.28	31.13	56.00	46.00	-12.72	-14.87	Pass	L1
0.9260	33.39	22.39	9.91	43.30	32.30	56.00	46.00	-12.70	-13.70	Pass	L1
1.2860	31.03	20.81	9.92	40.95	30.73	56.00	46.00	-15.05	-15.27	Pass	L1
1.4340	33.17	21.53	9.92	43.09	31.45	56.00	46.00	-12.91	-14.55	Pass	L1
17.3380	31.48	18.06	10.21	41.69	28.27	60.00	50.00	-18.31	-21.73	Pass	L1

REMARKS: L1 = Line One (Live Line)



Model No.	GZ100B	RBW,VBW	9 kHz
Environmental Conditions	22°C, 45% RH	Test Mode	Mode 1
Tested by	Ad Gan	Line	L1
Test Date	April 29, 2016		



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)	Line (L1/L2)
0.4980	42.13	34.33	9.88	52.01	44.21	56.03	46.03	-4.02	-1.82	Pass	L2
0.7780	32.59	24.23	9.90	42.49	34.13	56.00	46.00	-13.51	-11.87	Pass	L2
0.9140	31.81	23.88	9.90	41.71	33.78	56.00	46.00	-14.29	-12.22	Pass	L2
1.4180	30.89	22.83	9.92	40.81	32.75	56.00	46.00	-15.19	-13.25	Pass	L2
1.9700	28.57	20.76	9.93	38.50	30.69	56.00	46.00	-17.50	-15.31	Pass	L2
17.4020	27.59	10.86	10.17	37.76	21.03	60.00	50.00	-22.24	-28.97	Pass	L2

REMARKS: 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 peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to 15.247(b)(3) requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to 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 measured in-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	02/21/2016	02/20/2017

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.

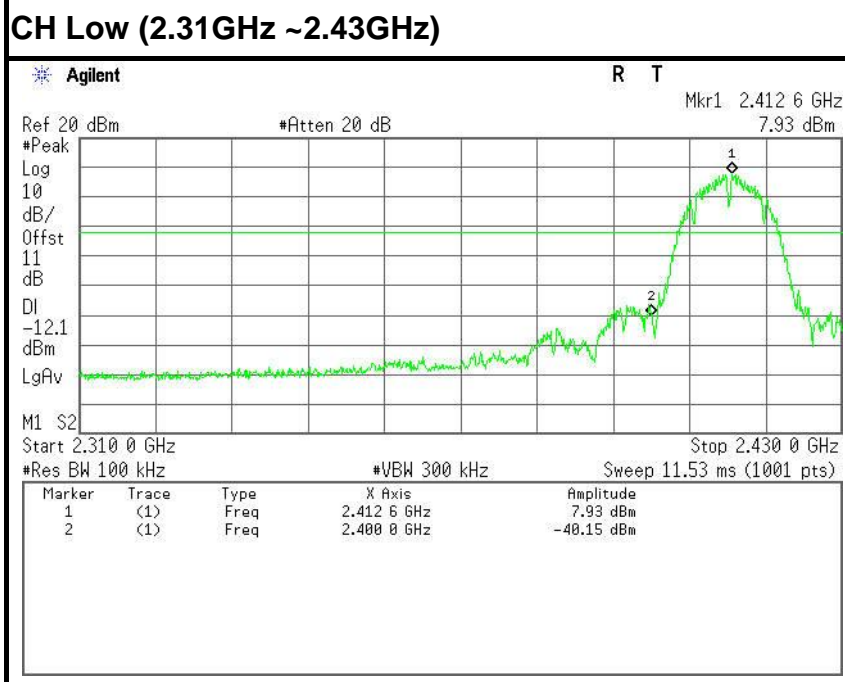
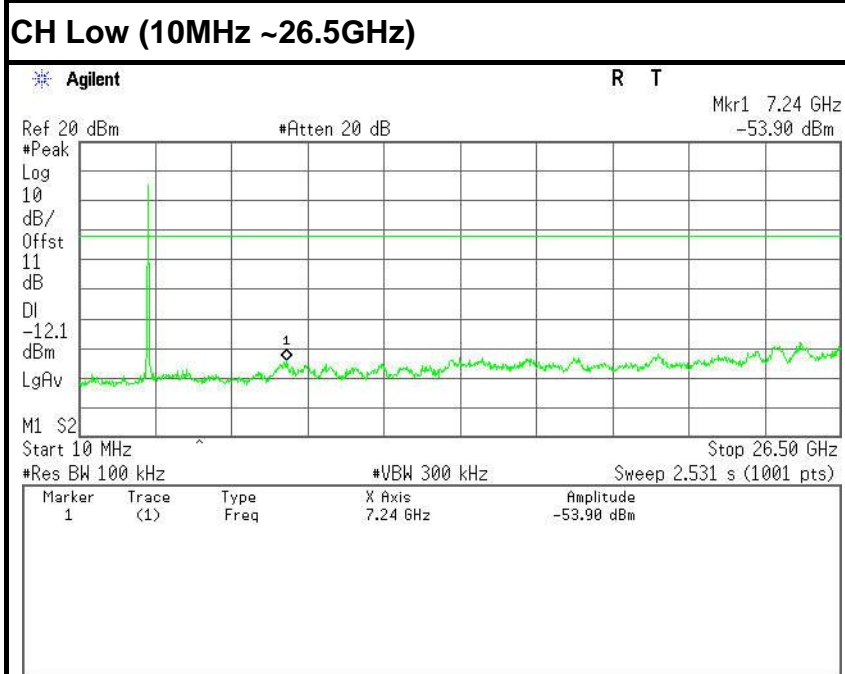
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

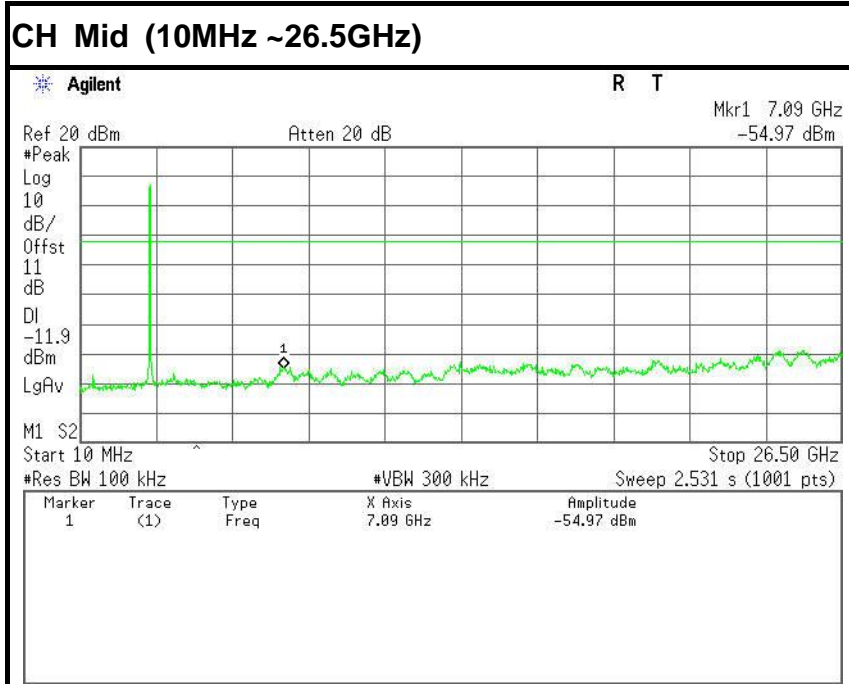
Measurements are made over the 10MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels. No emission found between lowest internal used/generated frequency to 10MHz, it is only recorded 10MHz to 26GHz.

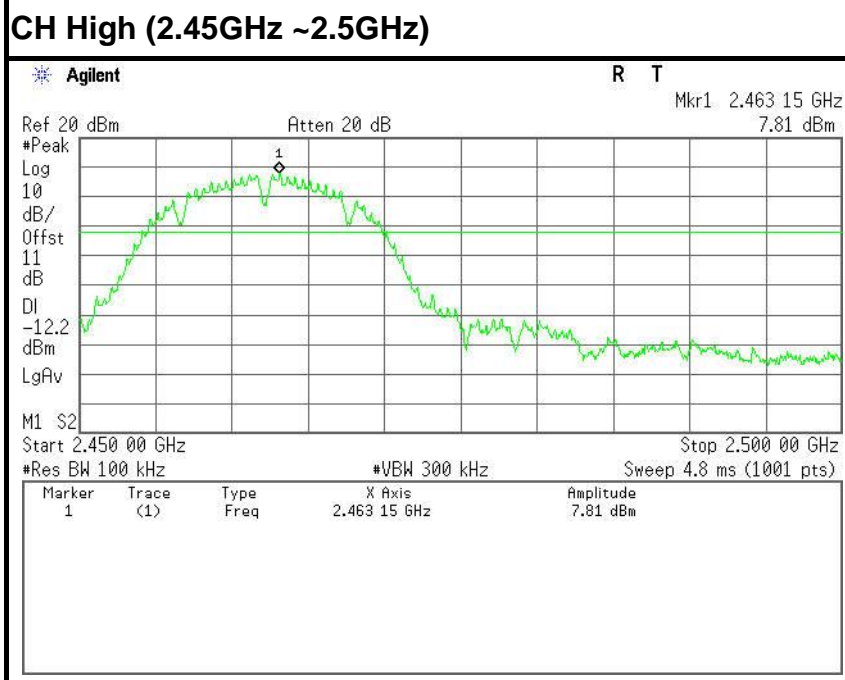
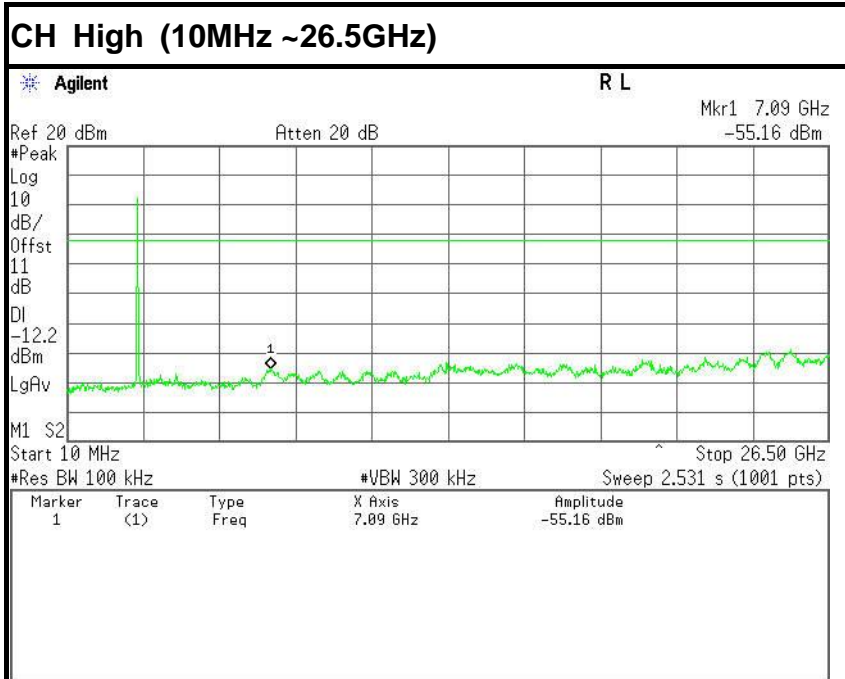


7.2.1.4. TEST RESULTS

Test Plot
IEEE 802.11b mode

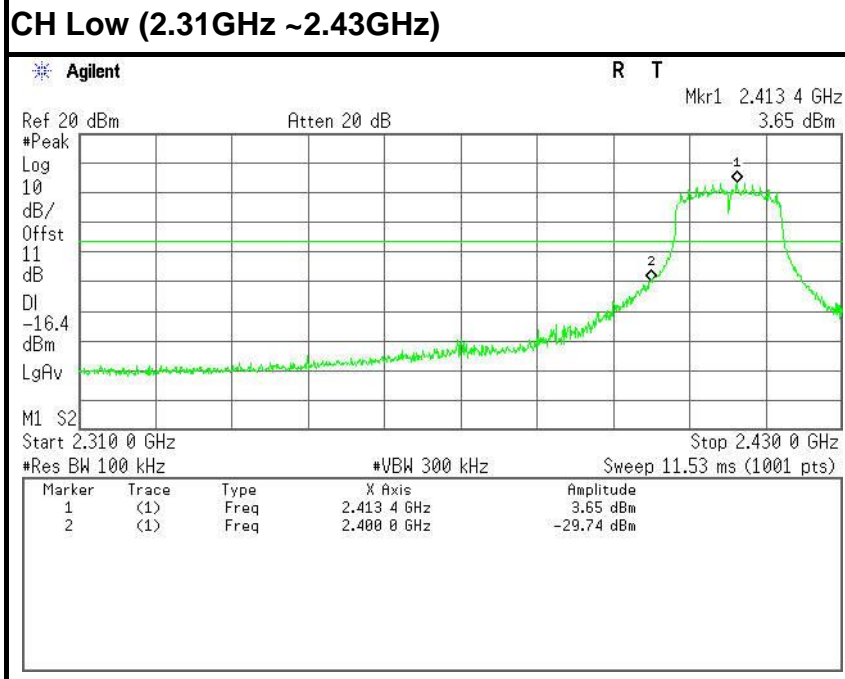
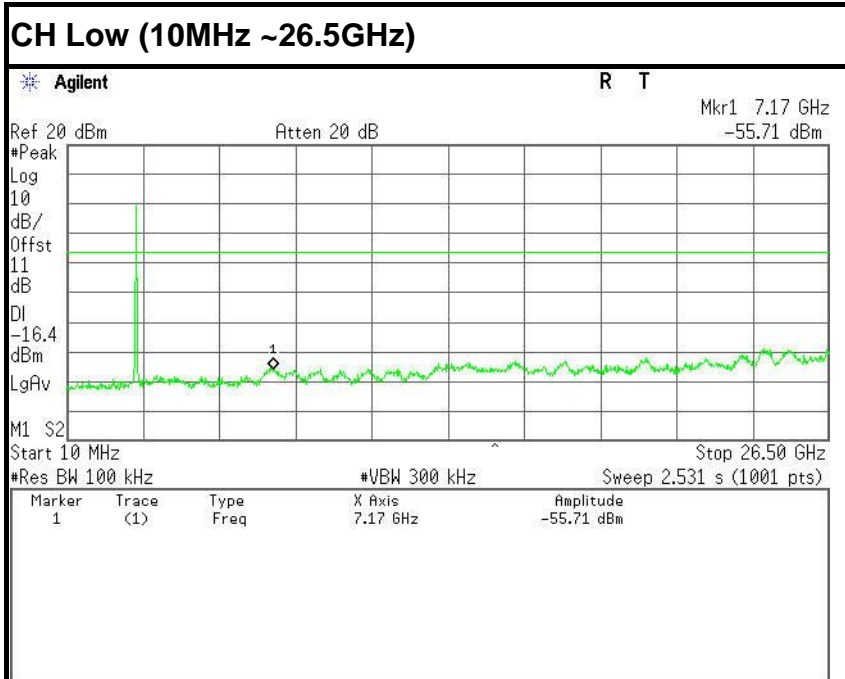


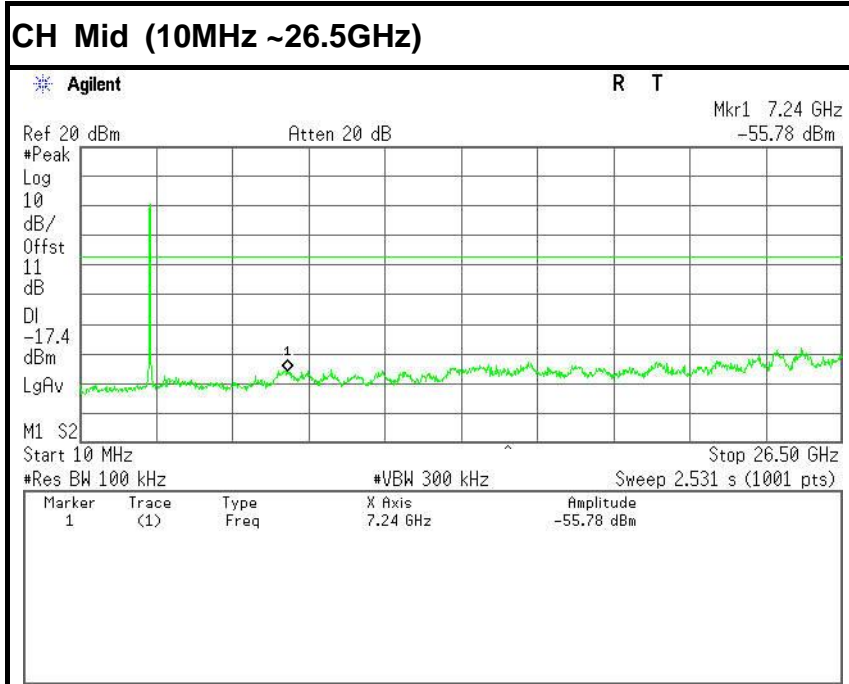


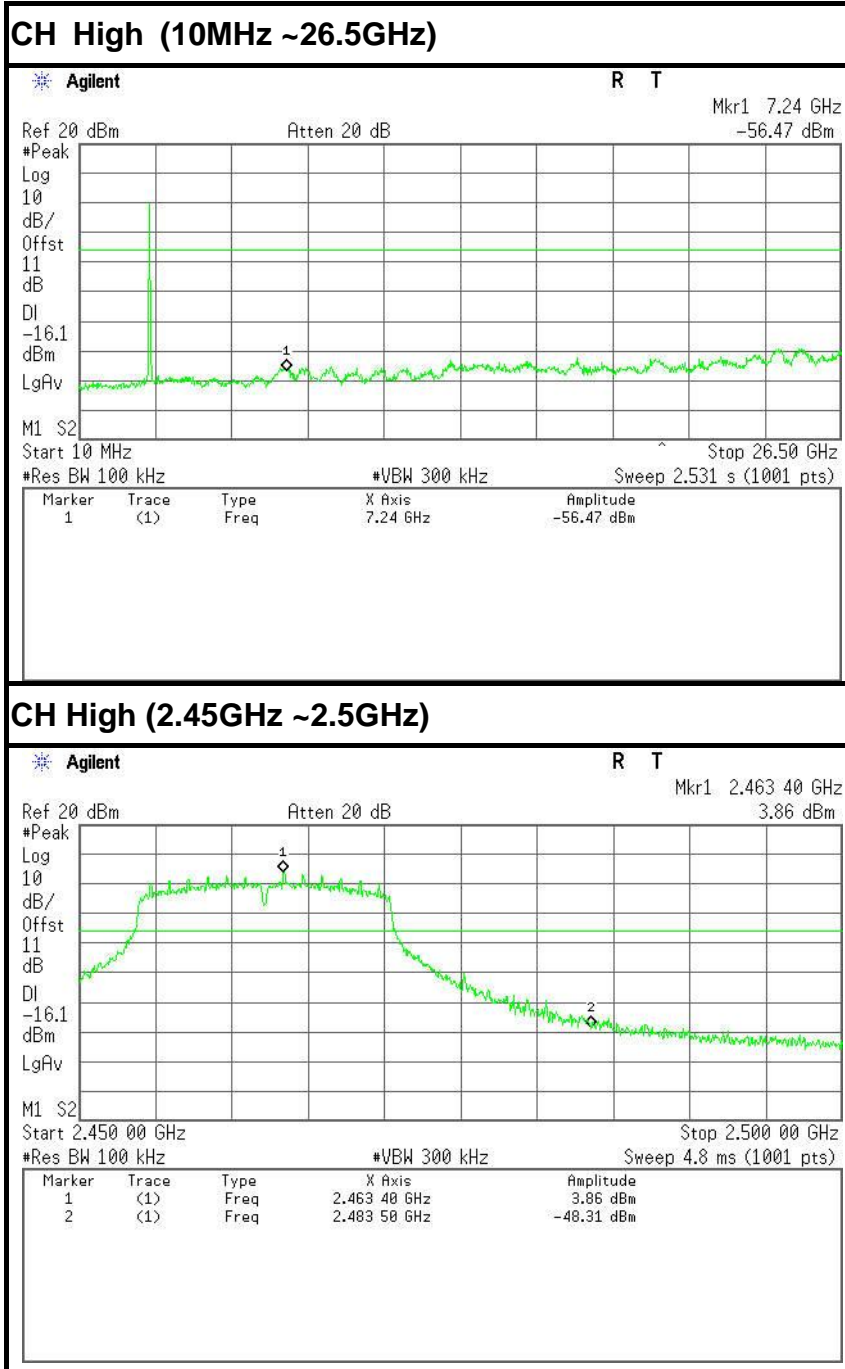




IEEE 802.11g mode



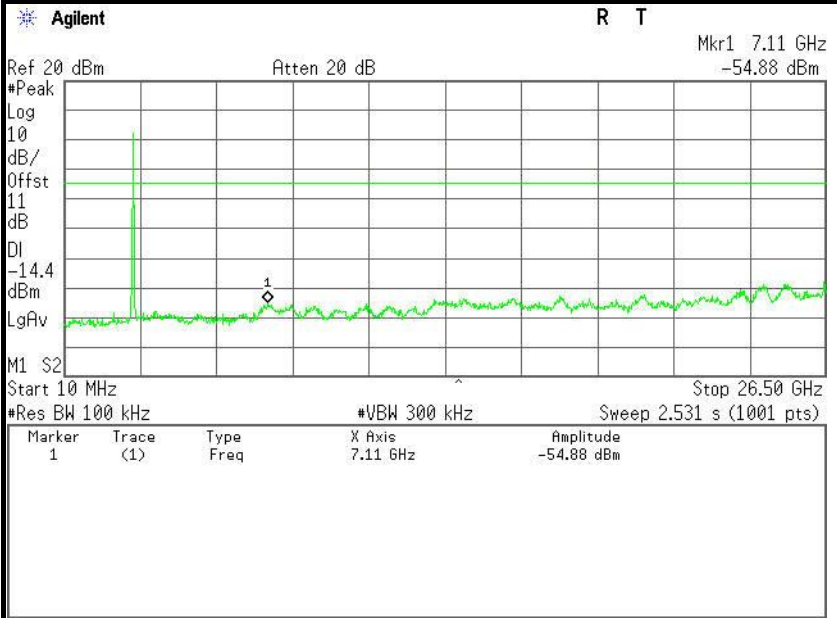




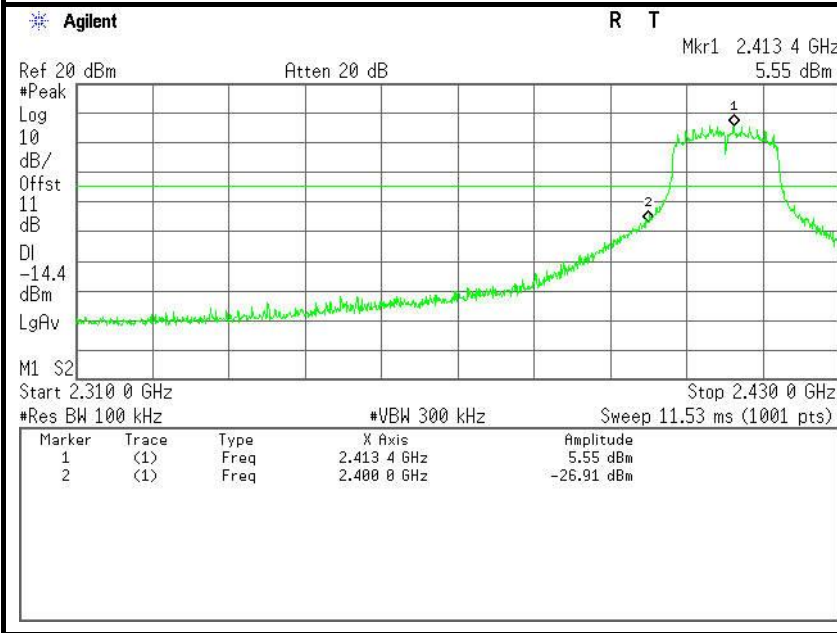


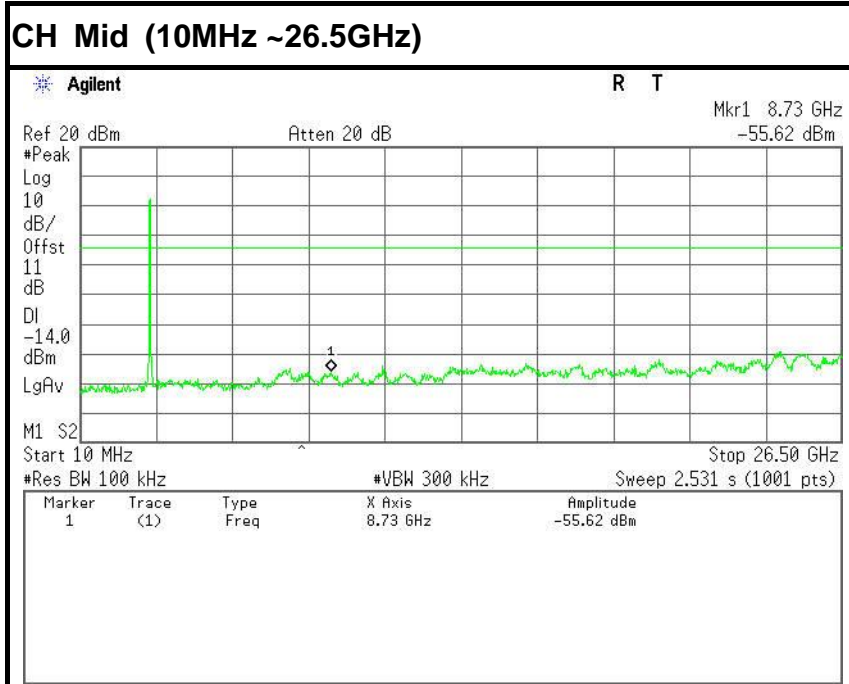
IEEE 802.11n HT20 MHz mode

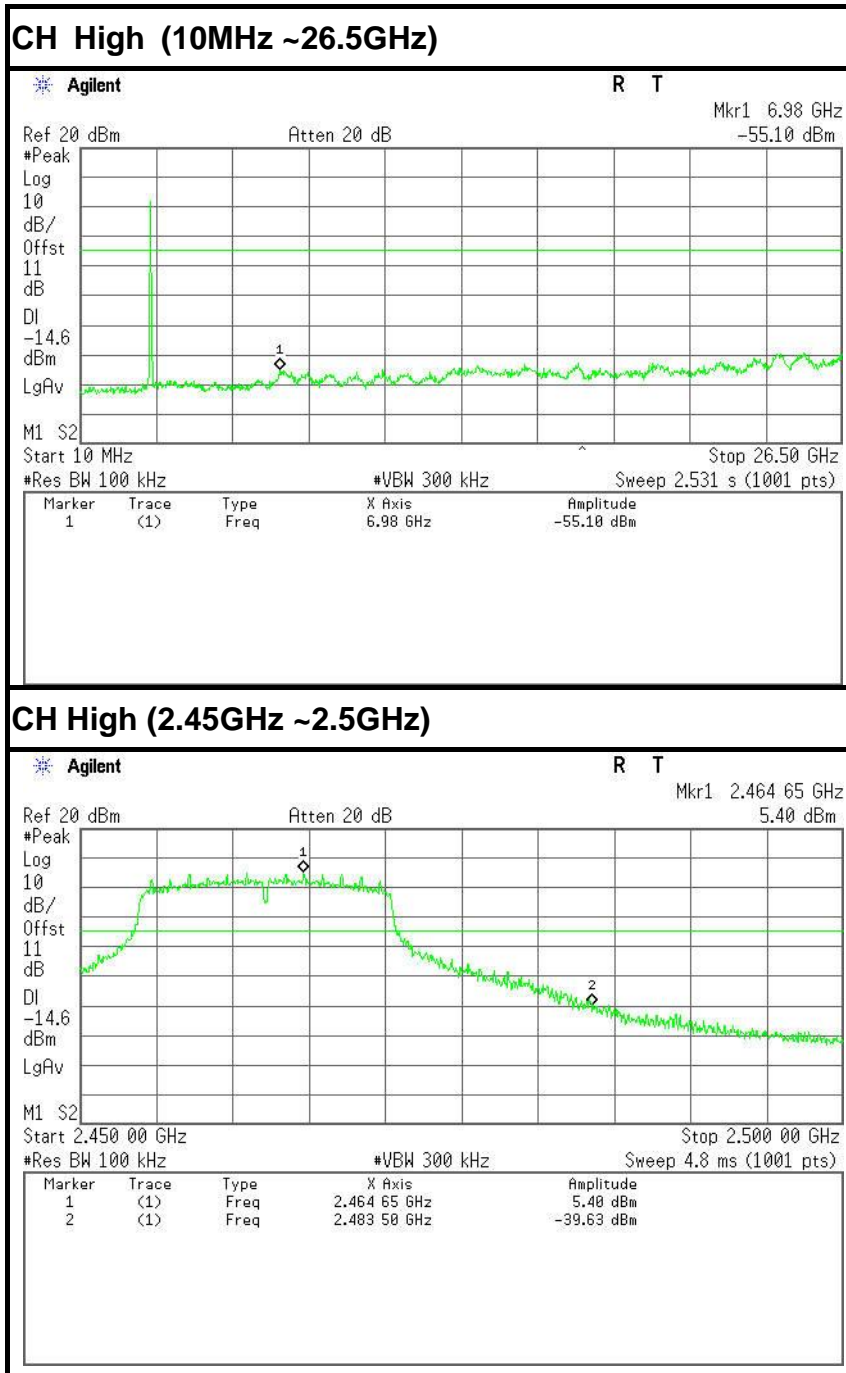
CH Low (10MHz ~26.5GHz)



CH Low (2.31GHz ~2.43GHz)









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	02/21/2016	02/20/2017
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/21/2016	02/20/2017
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2016	03/18/2017
High Noise Amplifier	Agilent	8449B	3008A01838	02/21/2016	02/20/2017
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/28/2016	02/27/2017
Bilog Antenna	SCHAFFNER	CBL6143	5082	02/21/2016	02/20/2017
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02/28/2016	02/27/2017
Loop Antenna	COM-POWER	AL-130	121044	09/25/2015	09/24/2016
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	02/21/2016	02/20/2017
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.

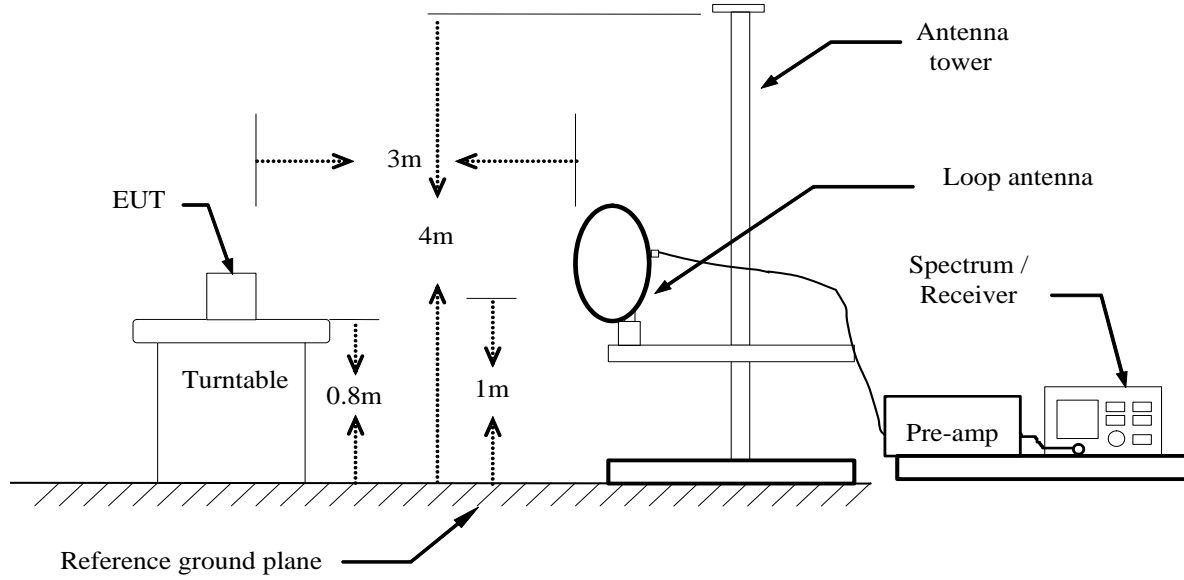


7.2.2.3. TEST PROCEDURE (please refer to measurement standard)

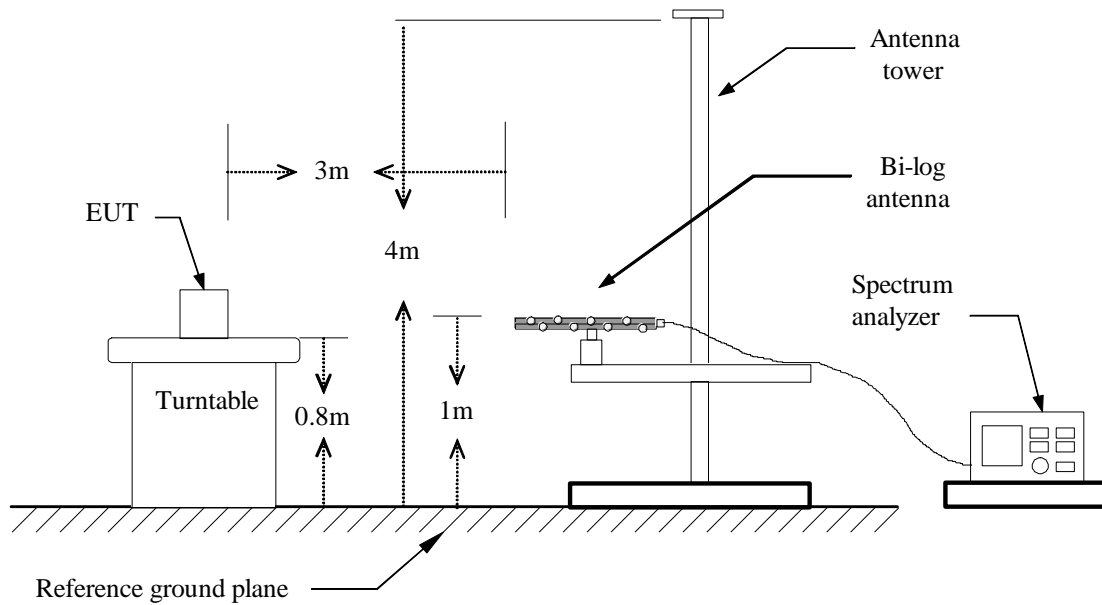
1. The EUT is placed on a turntable, which is 0.8m or 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum 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=1MHz / 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

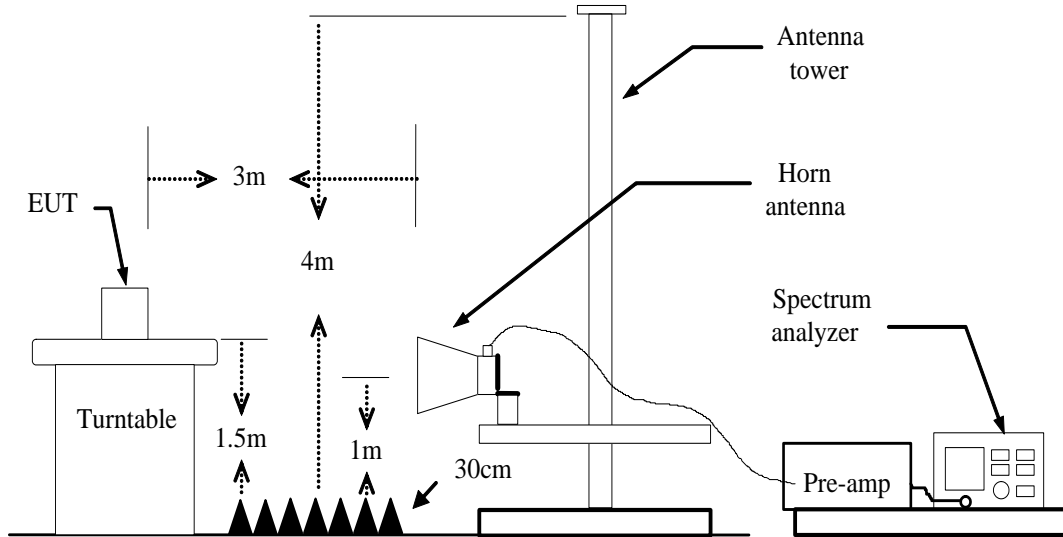


Below 1 GHz





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****Test Mode:** TX**Tested by:** Ad Gan**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
126.0300	60.36	-20.90	39.46	43.50	-4.04	V	QP
210.4200	59.79	-21.46	38.33	43.50	-5.17	V	QP
384.0500	57.60	-16.45	41.15	46.00	-4.85	V	QP
570.2900	58.52	-13.02	45.50	46.00	-0.50	V	QP
600.3600	58.06	-12.86	45.20	46.00	-0.80	V	QP
630.4300	58.10	-12.50	45.60	46.00	-0.40	V	QP
167.7400	65.83	-22.83	43.00	43.50	-0.50	H	QP
210.4200	60.67	-21.46	39.21	43.50	-4.29	H	QP
384.0500	54.80	-16.45	38.35	46.00	-7.65	H	QP
480.0800	51.92	-14.36	37.56	46.00	-8.44	H	QP
570.2900	54.87	-13.02	41.85	46.00	-4.15	H	QP
630.4300	57.70	-12.50	45.20	46.00	-0.80	H	QP

****Remark:** 1. No emission found between lowest internal used/generated frequency to 30MHz.

2. Only worst case recorded for radiated emissions below 1GHz.

Notes:

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



Above 1 GHz

Test Mode: TX / IEEE 802.11b(CH Low)

Tested by: Ad Gan

Ambient temperature: 24°C **Relative humidity:** 52% RH

Date: April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1765.000	57.00	-6.35	50.65	74.00	-23.35	V	peak
3511.000	43.47	-0.47	43.00	74.00	-31.00	V	peak
4402.000	41.58	3.01	44.59	74.00	-29.41	V	peak
4825.000	41.87	4.41	46.28	74.00	-27.72	V	peak
5005.000	42.47	4.99	47.46	74.00	-26.54	V	peak
7003.000	41.73	7.71	49.44	74.00	-24.56	V	peak
1783.000	53.69	-6.31	47.38	74.00	-26.62	H	Peak
2530.000	44.87	-2.21	42.66	74.00	-31.34	H	Peak
3619.000	43.01	-0.02	42.99	74.00	-31.01	H	Peak
4825.000	44.83	4.41	49.24	74.00	-24.76	H	peak
5005.000	43.34	4.99	48.33	74.00	-25.67	H	peak
7777.000	40.91	9.22	50.13	74.00	-23.87	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: Ad Gan

Ambient temperature: 24°C Relative humidity: 52% RH

Date: April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1630.000	50.59	-6.64	43.95	74.00	-30.05	V	Peak
2179.000	46.73	-4.02	42.71	74.00	-31.29	V	Peak
2503.000	44.19	-2.25	41.94	74.00	-32.06	V	Peak
2854.000	44.15	-1.62	42.53	74.00	-31.47	V	Peak
3898.000	41.36	1.16	42.52	74.00	-31.48	V	Peak
5005.000	41.70	4.99	46.69	74.00	-27.31	V	Peak
1594.000	52.93	-6.71	46.22	74.00	-27.78	H	Peak
1765.000	51.50	-6.35	45.15	74.00	-28.85	H	Peak
2494.000	44.63	-2.29	42.34	74.00	-31.66	H	Peak
3322.000	44.48	-0.82	43.66	74.00	-30.34	H	Peak
4411.000	41.53	3.04	44.57	74.00	-29.43	H	Peak
4996.000	41.92	4.97	46.89	74.00	-27.11	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: Ad Gan

Ambient temperature: 24°C Relative humidity: 52% RH

Date: April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1693.000	52.27	-6.50	45.77	74.00	-28.23	V	Peak
2566.000	44.90	-2.14	42.76	74.00	-31.24	V	Peak
3187.000	44.12	-1.05	43.07	74.00	-30.93	V	Peak
4105.000	42.07	1.96	44.03	74.00	-29.97	V	Peak
4411.000	41.15	3.04	44.19	74.00	-29.81	V	Peak
4924.000	43.74	4.73	48.47	74.00	-25.53	V	Peak
1765.000	54.15	-6.35	47.80	74.00	-26.20	H	Peak
2206.000	47.10	-3.87	43.23	74.00	-30.77	H	Peak
2827.000	44.29	-1.67	42.62	74.00	-31.38	H	Peak
3187.000	43.99	-1.05	42.94	74.00	-31.06	H	Peak
4708.000	41.83	4.03	45.86	74.00	-28.14	H	Peak
5005.000	42.91	4.99	47.90	74.00	-26.10	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: Ad Gan

Ambient temperature: 24°C Relative humidity: 52% RH

Date: April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1765.000	58.04	-6.35	51.69	74.00	-22.31	V	Peak
2143.000	47.68	-4.22	43.46	74.00	-30.54	V	Peak
2926.000	44.15	-1.49	42.66	74.00	-31.34	V	Peak
4996.000	41.37	4.97	46.34	74.00	-27.66	V	Peak
5410.000	40.70	5.71	46.41	74.00	-27.59	V	Peak
6895.000	41.92	7.53	49.45	74.00	-24.55	V	Peak
1729.000	49.87	-6.42	43.45	74.00	-30.55	H	Peak
1999.000	47.85	-5.01	42.84	74.00	-31.16	H	Peak
2557.000	45.11	-2.16	42.95	74.00	-31.05	H	Peak
3277.000	43.54	-0.89	42.65	74.00	-31.35	H	Peak
4258.000	41.81	2.50	44.31	74.00	-29.69	H	Peak
5059.000	41.30	5.09	46.39	74.00	-27.61	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: Ad Gan

Ambient temperature: 24°C Relative humidity: 52% RH

Date: April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1603.000	55.34	-6.69	48.65	74.00	-25.35	V	Peak
1783.000	58.04	-6.31	51.73	74.00	-22.27	V	Peak
2908.000	45.34	-1.53	43.81	74.00	-30.19	V	Peak
4321.000	42.11	2.72	44.83	74.00	-29.17	V	Peak
5005.000	42.70	4.99	47.69	74.00	-26.31	V	Peak
5770.000	41.72	5.98	47.70	74.00	-26.30	V	Peak
1585.000	52.71	-6.73	45.98	74.00	-28.02	H	Peak
1702.000	51.70	-6.48	45.22	74.00	-28.78	H	Peak
2557.000	44.61	-2.16	42.45	74.00	-31.55	H	Peak
2953.000	44.12	-1.44	42.68	74.00	-31.32	H	Peak
3889.000	43.52	1.12	44.64	74.00	-29.36	H	Peak
4996.000	43.69	4.97	48.66	74.00	-25.34	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: Ad Gan

Ambient temperature: 24°C Relative humidity: 52% RH

Date: April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1594.000	51.61	-6.71	44.90	74.00	-29.10	V	Peak
1765.000	54.50	-6.35	48.15	74.00	-25.85	V	Peak
2170.000	47.26	-4.07	43.19	74.00	-30.81	V	Peak
3403.000	43.29	-0.68	42.61	74.00	-31.39	V	Peak
4420.000	42.76	3.07	45.83	74.00	-28.17	V	Peak
5005.000	41.74	4.99	46.73	74.00	-27.27	V	Peak
1765.000	55.94	-6.35	49.59	74.00	-24.41	H	Peak
2809.000	44.50	-1.70	42.80	74.00	-31.20	H	Peak
3808.000	43.04	0.78	43.82	74.00	-30.18	H	Peak
4636.000	42.06	3.79	45.85	74.00	-28.15	H	Peak
4996.000	43.20	4.97	48.17	74.00	-25.83	H	Peak
5401.000	41.74	5.69	47.43	74.00	-26.57	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: Ad Gan

Ambient temperature: 24°C Relative humidity: 52% RH

Date: April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1711.000	51.24	-6.46	44.78	74.00	-29.22	V	Peak
2026.000	47.49	-4.86	42.63	74.00	-31.37	V	Peak
2566.000	44.45	-2.14	42.31	74.00	-31.69	V	Peak
2827.000	43.94	-1.67	42.27	74.00	-31.73	V	Peak
3781.000	42.36	0.67	43.03	74.00	-30.97	V	Peak
4996.000	41.68	4.97	46.65	74.00	-27.35	V	Peak
1594.000	52.00	-6.71	45.29	74.00	-28.71	H	Peak
1702.000	52.30	-6.48	45.82	74.00	-28.18	H	Peak
2521.000	45.30	-2.22	43.08	74.00	-30.92	H	Peak
2854.000	43.71	-1.62	42.09	74.00	-31.91	H	Peak
4204.000	41.56	2.31	43.87	74.00	-30.13	H	Peak
5005.000	42.59	4.99	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: Ad Gan

Ambient temperature: 24°C Relative humidity: 52% RH

Date: April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1594.000	50.62	-6.71	43.91	74.00	-30.09	V	Peak
2539.000	45.06	-2.19	42.87	74.00	-31.13	V	Peak
2836.000	43.91	-1.66	42.25	74.00	-31.75	V	Peak
3187.000	43.05	-1.05	42.00	74.00	-32.00	V	Peak
4186.000	41.17	2.24	43.41	74.00	-30.59	V	Peak
5005.000	42.44	4.99	47.43	74.00	-26.57	V	Peak
1765.000	57.21	-6.35	50.86	74.00	-23.14	H	Peak
2512.000	45.06	-2.24	42.82	74.00	-31.18	H	Peak
2863.000	43.67	-1.61	42.06	74.00	-31.94	H	Peak
3466.000	43.90	-0.58	43.32	74.00	-30.68	H	Peak
5005.000	41.19	4.99	46.18	74.00	-27.82	H	Peak
5293.000	40.76	5.50	46.26	74.00	-27.74	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 / EEE 802.11n HT20 MHz (CH High)

Tested by: Ad Gan

Ambient temperature: 24°C Relative humidity: 52% RH

Date: April 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1603.000	51.56	-6.69	44.87	74.00	-29.13	V	Peak
1693.000	51.68	-6.50	45.18	74.00	-28.82	V	Peak
2188.000	47.89	-3.97	43.92	74.00	-30.08	V	Peak
3916.000	42.17	1.24	43.41	74.00	-30.59	V	Peak
4879.000	41.17	4.59	45.76	74.00	-28.24	V	Peak
4996.000	41.73	4.97	46.70	74.00	-27.30	V	Peak
1702.000	51.32	-6.48	44.84	74.00	-29.16	H	Peak
1963.000	47.27	-5.23	42.04	74.00	-31.96	H	Peak
2521.000	44.61	-2.22	42.39	74.00	-31.61	H	Peak
3340.000	43.43	-0.79	42.64	74.00	-31.36	H	Peak
4195.000	41.58	2.28	43.86	74.00	-30.14	H	Peak
4996.000	41.19	4.97	46.16	74.00	-27.84	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).