

FCC PART 15.247

TEST AND MEASUREMENT REPORT

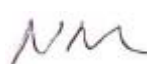
For

Meru Networks, Inc

894 Ross Drive,

Sunnyvale, CA 94089, USA

FCC ID: RE7-AP1020
Model: AP1020e

Report Type: CIIPC	Product Type: 802.11 a/b/g/n Access Point
Test Engineers: Ning Ma 	
Report Number: R1110253-247 (AP1020e)	
Report Date: 2012-02-21	
Reviewed By: Victor Zhang  EMC/RF Lead	
Prepared By: Bay Area Compliance Laboratories Corp. (84) 1274 Anvilwood Avenue, Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732-9164	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" (800-2)

TABLE OF CONTENTS

1	GENERAL DESCRIPTION.....	5
1.1	PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	5
1.2	MECHANICAL DESCRIPTION OF EUT	5
1.3	OBJECTIVE.....	5
1.4	RELATED SUBMITTAL(S)/GRANT(S)	5
1.5	TEST METHODOLOGY	5
1.6	MEASUREMENT UNCERTAINTY	6
1.7	TEST FACILITY	6
2	SYSTEM TEST CONFIGURATION.....	7
2.1	JUSTIFICATION.....	7
2.2	EUT EXERCISE SOFTWARE.....	7
2.3	EQUIPMENT MODIFICATIONS	7
2.4	SPECIAL ACCESSORIES	7
2.5	LOCAL SUPPORT EQUIPMENT	7
2.6	EUT INTERNAL CONFIGURATION	7
3	SUMMARY OF TEST RESULTS.....	8
4	FCC §15.247(I) & §2.1091 - RF EXPOSURE	9
4.1	APPLICABLE STANDARD	9
4.2	MPE PREDICTION	9
4.3	MPE RESULTS	9
5	FCC §15.203 – ANTENNA REQUIREMENTS.....	11
5.1	APPLICABLE STANDARD	11
5.2	ANTENNA LIST	11
6	FCC §15.205, §15.209 & §15.247(D) – UNWANTED EMISSIONS.....	12
6.1	APPLICABLE STANDARD	12
6.2	TEST SETUP	13
6.3	TEST PROCEDURE	13
6.4	TEST SETUP BLOCK DIAGRAM.....	14
6.5	CORRECTED AMPLITUDE & MARGIN CALCULATION	14
6.6	TEST EQUIPMENT LIST AND DETAILS	15
6.7	TEST ENVIRONMENTAL CONDITIONS.....	15
6.8	SUMMARY OF TEST RESULTS.....	15
6.9	RADIATED EMISSIONS TEST RESULT DATA	16
7	EXHIBIT A – FCC EQUIPMENT LABELING REQUIREMENTS.....	43
7.1	FCC ID LABEL REQUIREMENTS	43
7.2	FCC ID LABEL CONTENTS	43
7.3	FCC ID LABEL LOCATION.....	44
8	EXHIBIT B - TEST SETUP PHOTOGRAPHS	45
8.1	RADIATED EMISSION BELOW 1 GHz FRONT VIEW (ANTENNA MODEL: ACC-ANT-ABGN230-W)	45
8.2	RADIATED EMISSION BELOW 1 GHz REAR VIEW (ANTENNA MODEL: ACC-ANT-ABGN230-W)	45
8.3	RADIATED EMISSION BELOW 1 GHz FRONT VIEW (ANTENNA MODEL: ACC-ANT-O4ABGN-0607-PT)	46
8.4	RADIATED EMISSION BELOW 1 GHz REAR VIEW (ANTENNA MODEL: ACC-ANT-O4ABGN-0607-PT)	46
8.5	RADIATED EMISSION BELOW 1 GHz FRONT VIEW (ANTENNA MODEL: ACC-ANT-12ABGN-0304-O).....	47

8.6	RADIATED EMISSION BELOW 1 GHz REAR VIEW (ANTENNA MODEL: ACC-ANT-12ABGN-0304-O).....	47
8.7	RADIATED EMISSION ABOVE 1 GHz FRONT VIEW (ANTENNA MODEL: ACC-ANT-ABGN230-W).....	48
8.8	RADIATED EMISSION ABOVE 1 GHz REAR VIEW (ANTENNA MODEL: ACC-ANT-ABGN230-W).....	48
8.9	RADIATED EMISSION ABOVE 1 GHz FRONT VIEW (ANTENNA MODEL: ACC-ANT-O4ABGN-0607-PT).....	49
8.10	RADIATED EMISSION ABOVE 1 GHz REAR VIEW (ANTENNA MODEL: ACC-ANT-O4ABGN-0607-PT)	49
8.11	RADIATED EMISSION ABOVE 1 GHz FRONT VIEW (ANTENNA MODEL: ACC-ANT-12ABGN-0304-O)	50
8.12	RADIATED EMISSION ABOVE 1 GHz REAR VIEW (ANTENNA MODEL: ACC-ANT-12ABGN-0304-O)	50
9	EXHIBIT C - EUT PHOTOGRAPHS.....	51
9.1	EUT TOP VIEW.....	51
9.2	EUT BOTTOM VIEW	51
9.3	EUT – POE POWER ADAPTER	52
9.4	EUT – AC/DC POWER ADAPTER	52
9.5	EUT – OPEN CHASING VIEW	53
9.6	EUT – MAIN BOARD – COMPONENT VIEW (1)	53
9.7	EUT – MAIN BOARD – COMPONENT VIEW (2)	54
9.8	ANTENNA @ ACC-ANT-ABGN230-W	54
9.9	ANTENNA @ ACC-ANT-12ABGN-0304-O	55
9.10	ANTENNA @ ACC-ANT-12ABGN-0607-PT.....	55

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1110253-247 (AP1020e)	Original Report	2012-02-21

1 General Description

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of *Meru Networks Inc.* and their product model: *AP1020e*, *FCC ID: RE7-AP1020* or the “EUT” as referred to in this report. The EUT is an 802.11 a/b/g/n Access Point with TWO 2x2 802.11 a/b/g/n wireless modules.

1.2 Mechanical Description of EUT

The EUT measures approximately 11.2 cm (L) x 15.3 cm (W) x 3.5 cm (H) and weighs 550 g.

The data gathered are from a sample provided by the manufacturer serial number: 3911A102e0A11B6, provided by manufacturer.

1.3 Objective

This report is prepared on behalf of *Meru Networks Inc.* in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commissions rules.

This is Class II Permissive Change application with adding 3 types external antennas. The objective is to determine compliance with FCC rules for Antenna Requirements, Radiated Spurious Emissions with additional antennas:

Antenna 1: 2 dBi (2.4 GHz)/2 dBi (5 GHz) Omni Directional Rubber Duct Dual Band Antenna (ACC-ANT-ABGN230-W)

Antenna 2: 3 dBi (2.4 GHz)/4 dBi (5 GHz) Ceiling Mount Omni Dual Band Antenna (ACC-ANT-12ABGN-0304-O)

Antenna 3: 6 dBi (2.4 GHz)/7 dBi (5 GHz) Wall Mount Patch Dual Band Antenna (ACC-ANT-O4ABGN-0607-PT)

1.4 Related Submittal(s)/Grant(s)

FCC Part 15.247 submission with FCC ID: RE7-AP1020.

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2:2003, The Treatment of Uncertainty in EMC Measurements, the values ranging from ± 2.0 dB for Conducted Emissions tests and ± 4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.7 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2003, ANSI C63.4-2003, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: R-3729, C-4176, G-469, and T-1206. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is a National Institute of Standards and Technology (NIST) accredited laboratory under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2001670.htm>

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2003.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

The software used, SCRT5.5.1, was provided by customer and verified by Ning Ma to comply with the standard requirements being tested against.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Special Accessories

N/A

2.5 Local Support Equipment

Manufacturers	Description	Models	Serial Number
DELL	Laptop	1XDRM A00	4SD2LQ1
NETGEAR	Router	GS605 v2	1FE1715K02A42

2.6 EUT Internal Configuration

Manufacturers	Description	Models	Series Number
Broadcom	Wi-Fi Module (x2)	LOG-M11	E150630
Meru Network, Inc	Main Board	MVT1.0	40AB103V 8501-6000386-01

3 Summary of Test Results

Results reported relate only to the product tested.

FCC Rules	Description of Test	Results
FCC §15.247(i), §2.1091	RF Exposure Information	Compliance
FCC §15.203	Antenna Requirement	Compliance
FCC §15.207(a)	AC Line Conducted Emissions	N/A ¹
FCC §15.247(d)	Spurious Emissions at Antenna Port	N/A ¹
FCC §15.205	Restricted Bands	Compliance
FCC §15.209, §15.247	Radiated Spurious Emissions	Compliance
FCC §15.247(a)(2)	6 dB Bandwidth	N/A ¹
FCC §15.247(b)(3)	Maximum Peak Output Power	N/A ¹
FCC §15.247(d)	100 kHz Bandwidth of Frequency Band Edge	N/A ¹
FCC §15.247(e)	Power Spectral Density	N/A ¹

Note: N/A¹ please refer to original FCC ID: RE7-AP1020

4 FCC §15.247(i) & §2.1091 - RF Exposure

4.1 Applicable Standard

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

4.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

4.3 MPE Results

For 2.4 GHz Band

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>26.47</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>443.60</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>2412</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>6</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>3.98</u>
<u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u>	<u>0.3514</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>1.0</u>

For 5.8 GHz Band

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>25.04</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>319.15</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>5825</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>7.0</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>5.01</u>
<u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u>	<u>0.3182</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>1.0</u>

The device meets MPE both 2.4 GHz and 5.8 GHz bands for the uncontrolled exposure environment.

5 FCC §15.203 – Antenna Requirements

5.1 Applicable Standard

According to FCC §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to FCC §15.247 (b)(4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2 Antenna List

Antenna Model	2.4 GHz Antenna Gain (dBi)	5 GHz Antenna Gain (dBi)
ACC-ANT-ABGN230-W (Dual Band Omni Directional Antenna)	2.0	2.0
ACC-ANT-12ABGN-0304-O (Dual Band Ceiling Mount Omni Antenna)	3.0	4.0
ACC-ANT-O4ABGN-0607-PT (Dual Band Wall Mount Patch Antenna)	6.0	7.0 (Conducted output limit will be reduced to 29 dBm)

6 FCC §15.205, §15.209 & §15.247(d) – Unwanted Emissions

6.1 Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As per FCC §15.209(a) and RSS-210: 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 (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 Note ¹	3
88 - 216	150 Note ¹	3
216 - 960	200 Note ¹	3
Above 960	500	3

Note ¹ 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.

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	960 – 1240	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5.35 – 5.46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 – 167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3.3458 – 3.358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 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. If the transmitter complies with the

conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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 §15.205(c)).

6.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C and IC RSS-210 limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

6.3 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

The spectrum analyzer or receiver is set as:

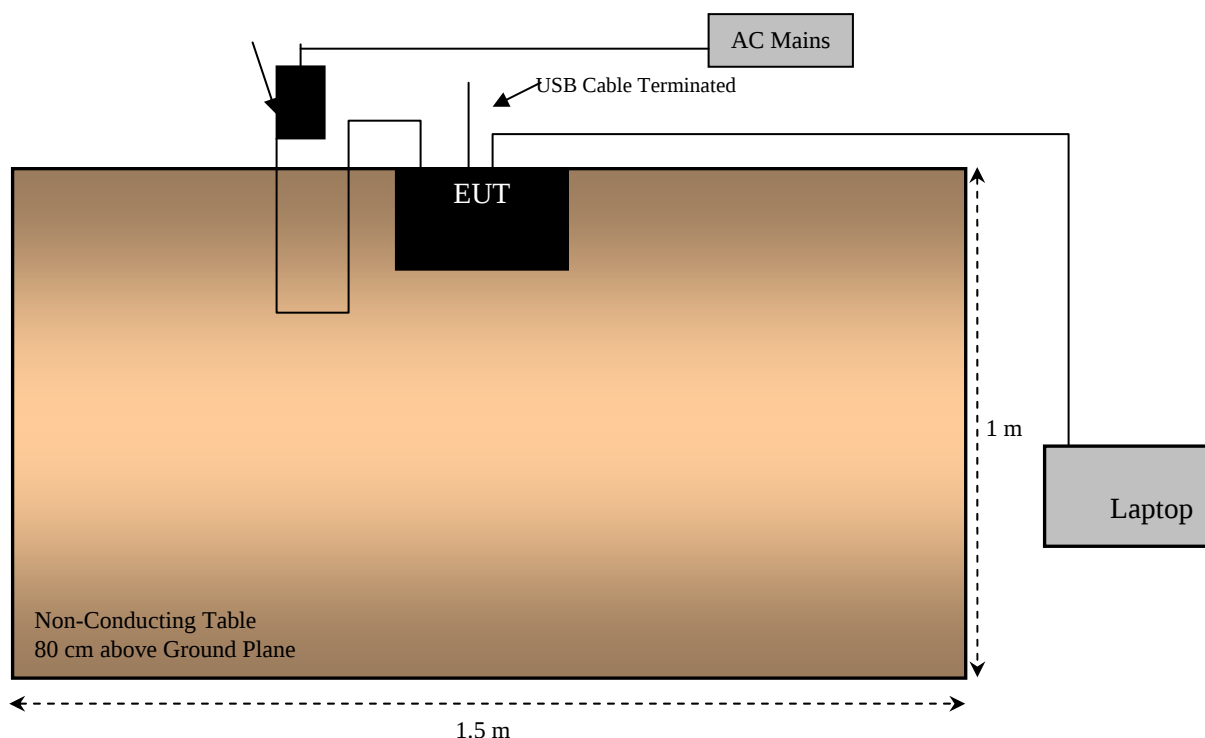
Below 1000 MHz:

$RBW = 100 \text{ kHz} / VBW = 300 \text{ kHz} / \text{Sweep} = \text{Auto}$

Above 1000 MHz:

- (1) Peak: $RBW = 1\text{MHz} / VBW = 1\text{MHz} / \text{Sweep} = \text{Auto}$
- (2) Average: $RBW = 1\text{MHz} / VBW = 10\text{Hz} / \text{Sweep} = \text{Auto}$

6.4 Test Setup Block Diagram



6.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to the indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + AF + CL + Atten - Ga$$

For example, the Corrected Amplitude (CA) of 40.3 dBuV/m = indicated Amplitude reading (Ai) 32.5 dBuV + Antenna Factor (AF) 23.5dB + Cable Loss (CL) 3.7 dB + Attenuator (Atten) 10 dB - Amplifier Gain (Ga) 29.4 dB

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Limit}$$

6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2011-03-21
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB3	A0020106-3	2011-06-29
A.R.A Inc	Horn antenna	DRG-1181A	1132	2011-11-29
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2011-06-09
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2011-05-09

Statement of Traceability: BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

6.7 Test Environmental Conditions

Temperature:	18~21 °C
Relative Humidity:	30~35 %
ATM Pressure:	101.2-102.2kPa

The testing was performed by Ning Ma from 2012-01-23 to 2021-01-24 in 5 meters chamber 2.

6.8 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15, Subpart C, section 15.205, 15.209 and 15.247 standard's radiated emissions limits, and had the worst margin of:

30-1000 MHz:

Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Channel, Range
-0.63	41.741	Vertical	30 MHz-1 GHz

Above 1GHz:

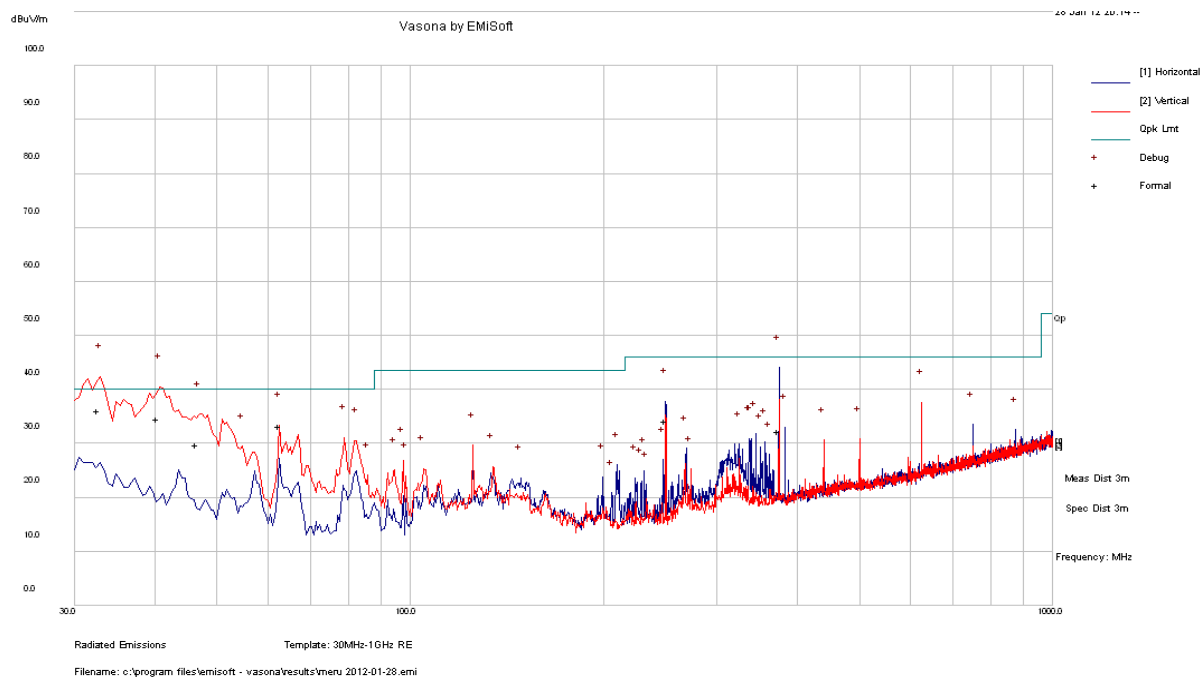
Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Channel, Range
-2.39	11550	Horizontal	Above 1 GHz

Please refer to the following table and plots for specific test result details

6.9 Radiated Emissions Test Result Data

(1) Radiated Emission at 3 meters, 30 MHz – 1 GHz

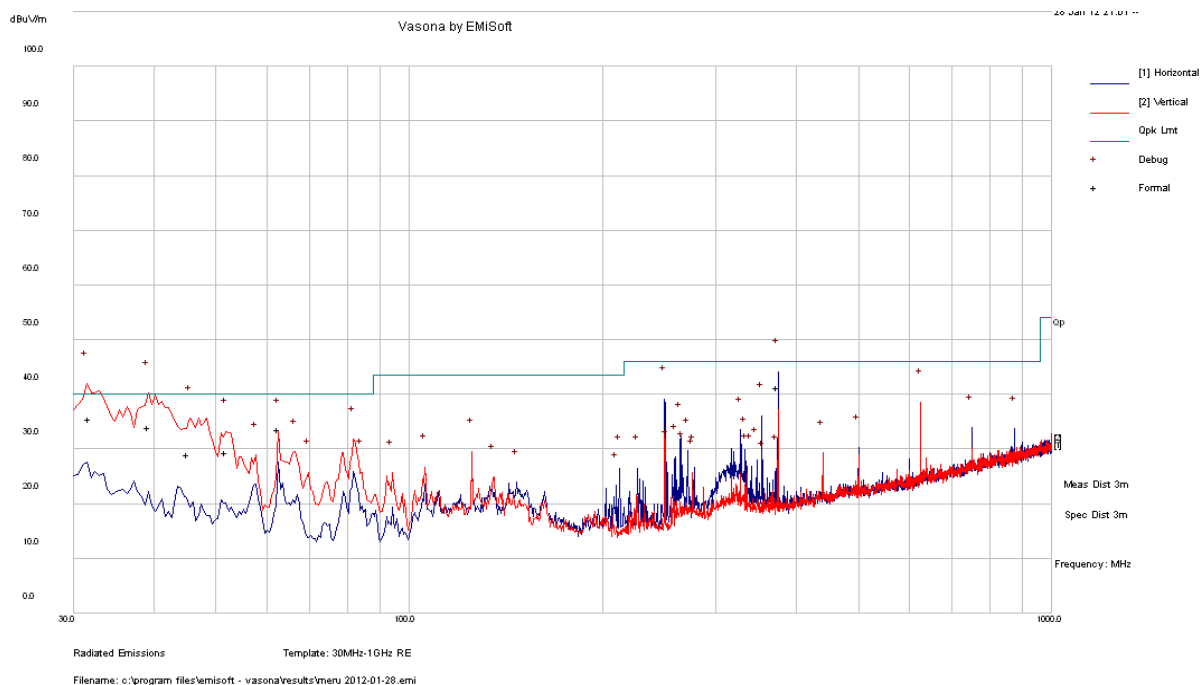
2.4 GHz Band, 3 dBi, Antenna (ACC-ANT-12ABGN-0304-O) – Worst mode 802.11 b Middle Channel



Quasi - Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)
32.7315	36.11	113	V	240	40	-3.89
40.394	34.59	139	V	360	40	-5.41
62.49725	33.24	114	V	173	40	-6.76
46.545	29.82	108	V	168	40	-10.18
249.991	34.11	124	H	231	46	-11.89
375.0165	32.28	196	H	0	46	-13.72

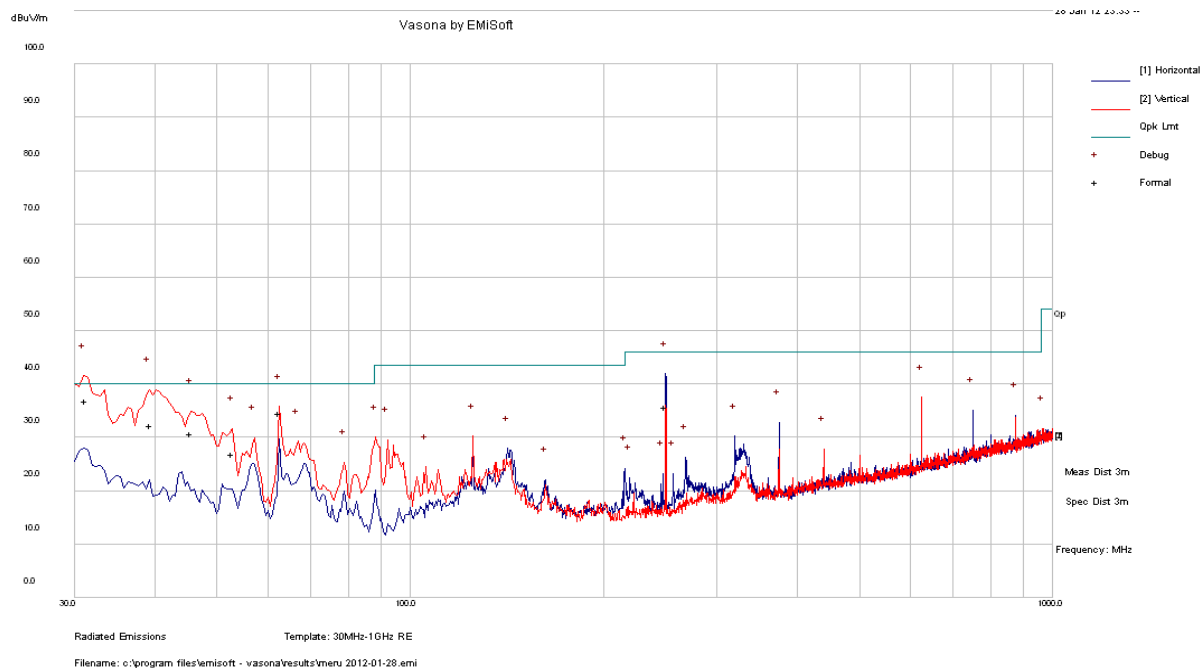
5.8 GHz Band, 4 dBi Antenna (ACC-ANT-12ABGN-0304-O), Worst mode 802.11 a Middle Channel



Quasi - Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)
31.72575	35.55	128	V	320	40	-4.45
375.0128	41.28	202	H	344	46	-4.72
39.3785	34.01	146	V	349	40	-5.99
62.5025	33.57	100	V	181	40	-6.43
51.878	29.37	99	V	360	40	-10.63
45.2715	29.09	137	V	13	40	-10.91

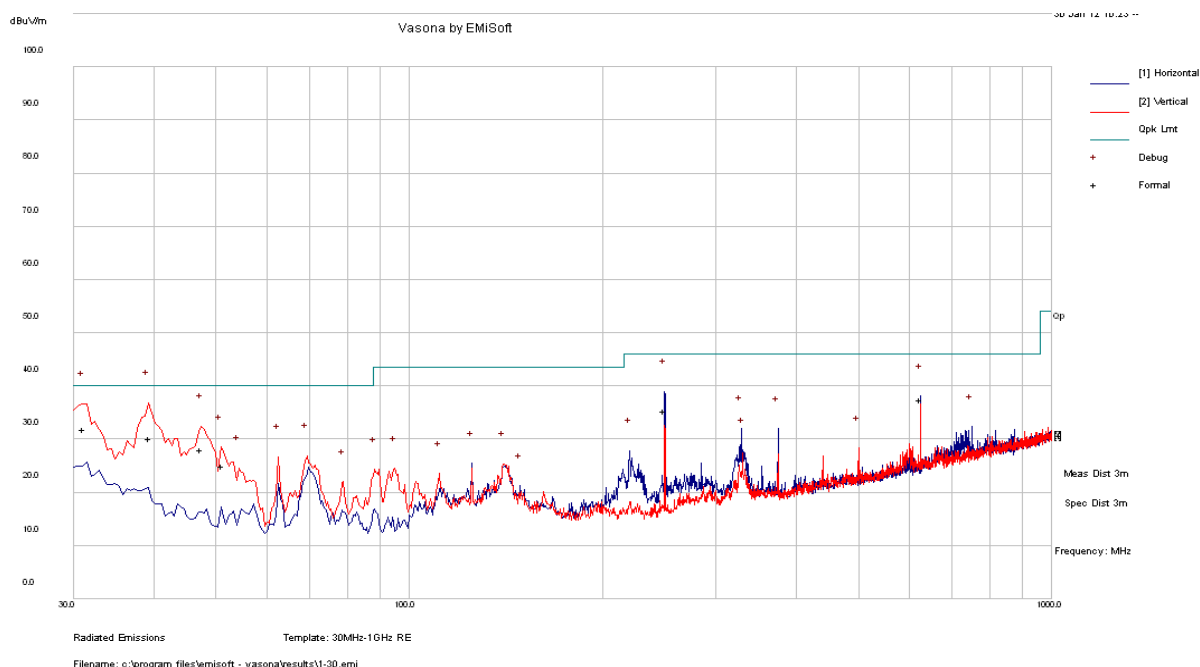
2.4 GHz Band, 6 dBi, Antenna (ACC-ANT-O4ABGN-0607-PT) – Worst mode 802.11 b Middle Channel



Quasi - Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)
31.26975	36.91	116	210	210	40	-3.09
62.52475	34.63	106	206	206	40	-5.37
39.38225	32.27	201	71	71	40	-7.73
45.6655	30.67	106	24	24	40	-9.33
250.0123	35.66	129	58	58	46	-10.34
52.81675	26.92	104	0	0	40	-13.08

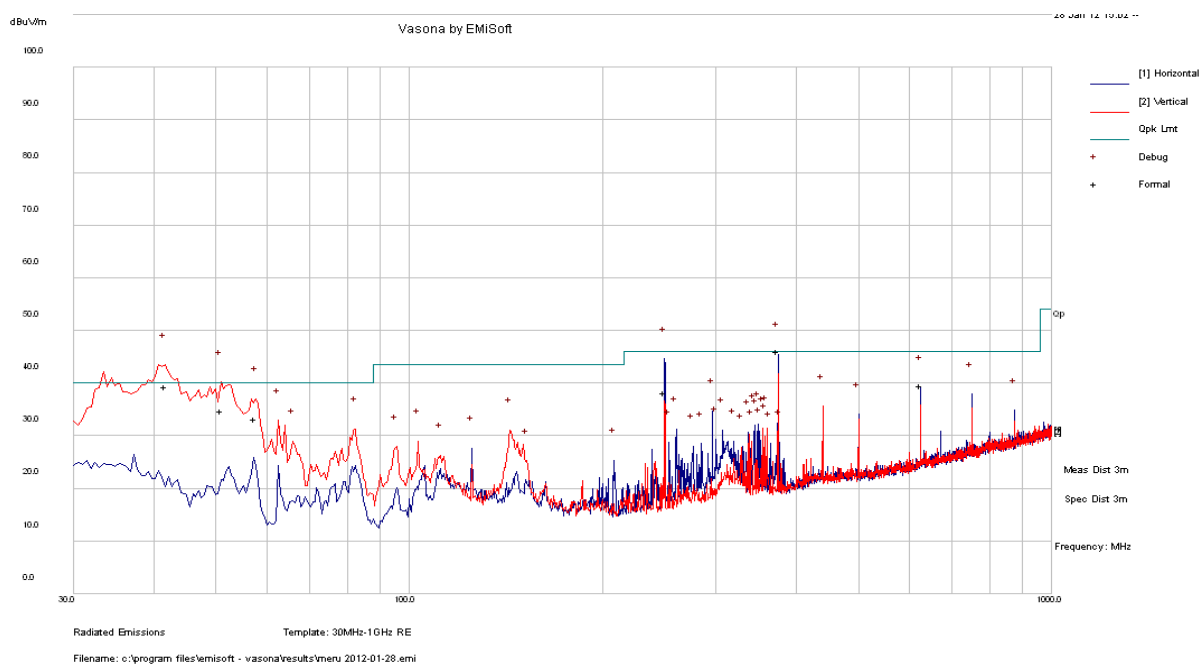
5.8 GHz Band, 7 dBi, Antenna (ACC-ANT-O4ABGN-0607-PT) – Worst mode 802.11 a Middle Channel



Quasi - Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)
31.18425	31.85	123	V	85	40	-8.15
624.9983	37.48	100	V	172	46	-8.52
39.4295	30.17	119	V	282	40	-9.83
250.0015	35.26	109	H	37	46	-10.74
47.48525	28.05	112	V	87	40	-11.95
51.116	25	117	V	67	40	-15.00

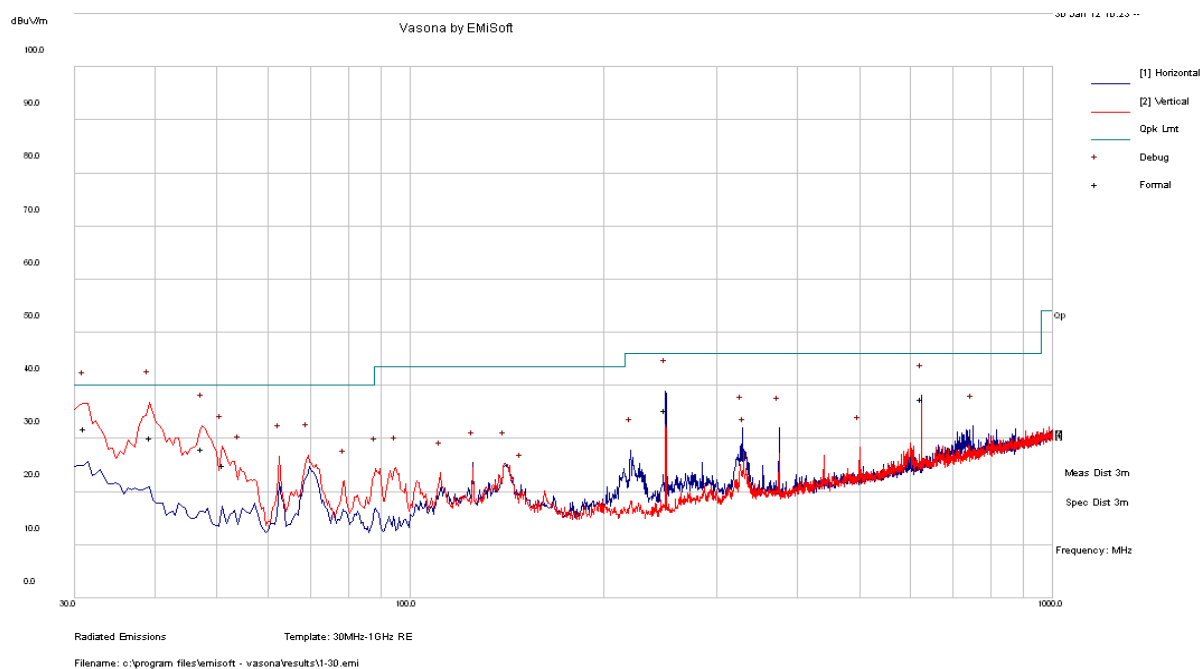
2.4 GHz Band, 2 dBi, Antenna (ACC-ANT-ABGN230-W) – Worst mode 802.11 b Middle Channel



Quasi - Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBuV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBuV/m)	Margin (dB)
41.741	39.37	105	V	0	40	-0.63
375.0043	44.47	102	H	241	46	-1.43
51.1035	34.75	110	V	145	40	-5.25
624.9908	39.64	118	H	183	40	-6.36
57.53875	33.32	129	V	39	40	-6.68
249.9498	38.28	105	H	241	46	-7.72

5.8 GHz Band, 2 dBi Antenna (ACC-ANT-ABGN230-W) – Worst mode 802.11 a Middle Channel



Quasi - Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)
34.4175	35.55	99	V	168	40	-4.45
30.15975	31.35	114	V	183	40	-8.65
84.73275	25.03	119	V	188	40	-14.97
845.0285	18.22	170	V	216	46	-27.78
116.602	14.91	302	H	127	43.5	-28.59
179.1975	8.8	139	H	248	43.5	-34.70

(2) Radiated Emission at 3 meters, above 1 GHz**3 dBi, Antenna (Model Number: ACC-ANT-12ABGN-0304-O), 2.4 GHz Band****802.11 b Mode**

Low Channel 2412 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4824	21.64	H	21.03	42.67	74	-31.33	Peak
4824	20.33	H	21.03	41.36	54	-12.64	Average
4824	25.06	V	21.03	46.09	74	-27.91	Peak
4824	22.43	V	21.03	43.46	54	-10.54	Average
2333	29.52	H	26.16	55.68	74	-18.32	Peak
2333	18.08	H	26.16	44.24	54	-9.76	Average
2333	29.19	V	26.16	55.35	74	-18.65	Peak
2333	19.39	V	26.16	45.55	54	-8.45	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	23.64	H	21.19	44.83	74	-29.17	Peak
4874	22.01	H	21.19	43.20	54	-10.80	Average
4874	24.13	V	21.19	45.32	74	-28.68	Peak
4874	21.67	V	21.19	42.86	54	-11.14	Average

High Channel 2462 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4924	23.95	H	21.35	45.30	74	-28.70	Peak
4924	22.64	H	21.35	43.99	54	-10.01	Average
4924	22.97	V	21.35	44.32	74	-29.68	Peak
4924	21.19	V	21.35	42.54	54	-11.46	Average
2487	32.76	H	26.89	59.65	74	-14.35	Peak
2487	18.2	H	26.89	45.09	54	-8.91	Average
2487	29.83	V	26.89	56.72	74	-17.28	Peak
2487	17.52	V	26.89	44.41	54	-9.59	Average

802.11 g Mode

Low Channel 2412 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4824	23.65	H	21.03	44.68	74	-29.32	Peak
4824	20.42	H	21.03	41.45	54	-12.55	Average
4824	28.33	V	21.03	49.36	74	-24.64	Peak
4824	23.64	V	21.03	44.67	54	-9.33	Average
2389	36.38	H	26.48	62.86	74	-11.14	Peak
2389	16.62	H	26.48	43.1	54	-10.9	Average
2389	37.29	V	26.48	63.77	74	-10.23	Peak
2389	17.39	V	26.48	43.87	54	-10.13	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	24.32	H	21.19	45.51	74	-28.49	Peak
4874	20.36	H	21.19	41.55	54	-12.45	Average
4874	25.21	V	21.19	46.40	74	-27.60	Peak
4874	23.06	V	21.19	44.25	54	-9.75	Average

High Channel 2462 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4924	23.61	H	21.35	44.96	74	-29.04	Peak
4924	20.44	H	21.35	41.79	54	-12.21	Average
4924	23.42	V	21.35	44.77	74	-29.23	Peak
4924	21.26	V	21.35	42.61	54	-11.39	Average
2484	35.13	H	26.92	62.05	74	-11.95	Peak
2484	16.19	H	26.92	43.11	54	-10.89	Average
2484	36.99	V	26.92	63.91	74	-10.09	Peak
2484	17.56	V	26.92	44.48	54	-9.52	Average

802.11 n20 Mode

Low Channel 2412 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4824	23.55	H	21.03	44.58	74	-29.42	Peak
4824	21.35	H	21.03	42.38	54	-11.62	Average
4824	23.68	V	21.03	44.71	74	-29.29	Peak
4824	21.31	V	21.03	42.34	54	-11.66	Average
2390	37.29	H	26.48	63.77	74	-10.23	Peak
2390	15.9	H	26.48	42.38	54	-11.62	Average
2390	37.53	V	26.48	64.01	74	-9.99	Peak
2390	17.19	V	26.48	43.67	54	-10.33	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	25.04	H	21.19	46.23	74	-27.77	Peak
4874	23.69	H	21.19	44.88	54	-9.12	Average
4874	23.22	V	21.19	44.41	74	-29.59	Peak
4874	20.98	V	21.19	42.17	54	-11.83	Average

High Channel 2462 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC/IC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4924	24.67	H	21.35	46.02	74	-27.98	Peak
4924	22.86	H	21.35	44.21	54	-9.79	Average
4924	24.22	V	21.35	45.57	74	-28.43	Peak
4924	21.03	V	21.35	42.38	54	-11.62	Average
2484	37.48	H	26.92	64.4	74	-9.6	Peak
2484	16.22	H	26.92	43.14	54	-10.86	Average
2484	38.04	V	26.92	64.96	74	-9.04	Peak
2484	17.5	V	26.92	44.42	54	-9.58	Average

802.11 n40 Mode

Low Channel 2422 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4844	22.40	H	21.03	43.43	74	-30.57	Peak
4844	19.86	H	21.03	40.89	54	-13.11	Average
4844	23.33	V	21.03	44.36	74	-29.64	Peak
4844	20.01	V	21.03	41.04	54	-12.96	Average
2390	39.89	H	26.46	66.35	74	-7.65	Peak
2390	17.21	H	26.46	43.67	54	-10.33	Average
2390	38.64	V	26.46	65.1	74	-8.9	Peak
2390	16.57	V	26.46	43.03	54	-10.97	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	24.62	H	21.19	45.81	74	-28.19	Peak
4874	21.57	H	21.19	42.76	54	-11.24	Average
4874	25.16	V	21.19	46.35	74	-27.65	Peak
4874	23.56	V	21.19	44.75	54	-9.25	Average

High Channel 2452 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4904	23.77	H	21.35	45.12	74	-28.88	Peak
4904	22.36	H	21.35	43.71	54	-10.29	Average
4904	24.13	V	21.35	45.48	74	-28.52	Peak
4904	22.65	V	21.35	44.00	54	-10.00	Average
2488	38.09	H	26.92	65.01	74	-8.99	Peak
2488	18.3	H	26.92	45.22	54	-8.78	Average
2488	38.71	V	26.92	65.63	74	-8.37	Peak
2488	17.07	V	26.92	43.99	54	-10.01	Average

4 dBi, Antenna (Model Number: ACC-ANT-12ABGN-0304-O), 5.8 GHz Band**802.11 a Mode**

Low Channel 5745 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11490	36.25	H	27.48	63.73	74	-10.27	Peak
11490	21.30	H	27.48	48.78	54	-5.22	Average
11490	39.62	V	27.48	67.10	74	-6.90	Peak
11490	22.16	V	27.48	49.64	54	-4.36	Average
5725	38.5	H	29.04	67.54	74	-6.46	Peak
5725	18.41	H	29.04	47.45	54	-6.55	Average
5725	37.49	V	29.04	66.53	74	-7.47	Peak
5725	20.97	V	29.04	50.01	54	-3.99	Average

Middle Channel 5785MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11570	36.98	H	28.49	65.47	74	-8.53	Peak
11570	20.31	H	28.49	48.80	54	-5.20	Average
11570	39.35	V	28.49	67.84	74	-6.16	Peak
11570	21.34	V	28.49	49.83	54	-4.17	Average

High Channel 5825 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11650	37.69	H	29	66.69	74	-7.31	Peak
11650	21.45	H	29	50.45	54	-3.55	Average
11650	39.03	V	29	68.03	74	-5.97	Peak
11650	21.04	V	29	50.04	54	-3.96	Average
5875	40.11	H	29.18	69.29	74	-4.71	Peak
5875	18.3	H	29.18	47.48	54	-6.52	Average
5875	41.51	V	29.18	70.69	74	-3.31	Peak
5875	20.92	V	29.18	50.1	54	-3.9	Average

802.11 n20 Mode

Low Channel 5745 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11490	38.12	H	27.48	65.60	74	-8.40	Peak
11490	21.33	H	27.48	48.81	54	-5.19	Average
11490	40.06	V	27.48	67.54	74	-6.46	Peak
11490	22.28	V	27.48	49.76	54	-4.24	Average
5725	37.73	H	29.04	66.77	74	-7.23	Peak
5725	21.09	H	29.04	50.13	54	-3.87	Average
5725	38.31	V	29.04	67.35	74	-6.65	Peak
5725	20.2	V	29.04	49.24	54	-4.76	Average

Middle Channel 5785MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11570	37.62	H	28.49	66.11	74	-7.89	Peak
11570	22.30	H	28.49	50.79	54	-3.21	Average
11570	38.45	V	28.49	66.94	74	-7.06	Peak
11570	21.15	V	28.49	49.64	54	-4.36	Average

High Channel 5825 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11650	37.41	H	29	66.41	74	-7.59	Peak
11650	21.22	H	29	50.22	54	-3.78	Average
11650	39.23	V	29	68.23	74	-5.77	Peak
11650	19.87	V	29	48.87	54	-5.13	Average
5875	40.19	H	29.18	69.37	74	-4.63	Peak
5875	20.24	H	29.18	49.42	54	-4.58	Average
5875	41.76	V	29.18	70.94	74	-3.06	Peak
5875	20.92	V	29.18	50.1	54	-3.9	Average

802.11 n40 Mode

Low Channel 5755 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11510	32.52	H	27.48	60.00	74	-14.00	Peak
11510	22.03	H	27.48	49.51	54	-4.49	Average
11510	37.65	V	27.48	65.13	74	-8.87	Peak
11510	21.14	V	27.48	48.62	54	-5.38	Average
5725	40.11	H	29.04	69.15	74	-4.85	Peak
5725	20.49	H	29.04	49.53	54	-4.47	Average
5725	40.72	V	29.04	69.76	74	-4.24	Peak
5725	21.41	V	29.04	50.45	54	-3.55	Average

High Channel 5795MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11590	35.16	H	29	64.16	74	-9.84	Peak
11590	21.34	H	29	50.34	54	-3.66	Average
11590	37.24	V	29	66.24	74	-7.76	Peak
11590	20.96	V	29	49.96	54	-4.04	Average
5875	39.56	H	29.18	68.74	74	-5.26	Peak
5875	20.52	H	29.18	49.7	54	-4.3	Average
5875	40.06	V	29.18	69.24	74	-4.76	Peak
5875	20.84	V	29.18	50.02	54	-3.98	Average

6 dBi, Antenna (Model Number: ACC-ANT-O4ABGN-0607-PT), 2.4 GHz Band**802.11 b Mode**

Low Channel 2412 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4824	22.12	H	21.03	43.15	74	-30.85	Peak
4824	21.59	H	21.03	42.62	54	-11.38	Average
4824	24.43	V	21.03	45.46	74	-28.54	Peak
4824	23.54	V	21.03	44.57	54	-9.43	Average
2333	28.95	H	26.16	55.11	74	-18.89	Peak
2333	17.27	H	26.16	43.43	54	-10.57	Average
2333	29.15	V	26.16	55.31	74	-18.69	Peak
2333	18.41	V	26.16	44.57	54	-9.43	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	23.50	H	21.19	44.69	74	-29.31	Peak
4874	22.30	H	21.19	43.49	54	-10.51	Average
4874	23.42	V	21.19	44.61	74	-29.39	Peak
4874	22.10	V	21.19	43.29	54	-10.71	Average

High Channel 2462 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4924	22.95	H	21.35	44.30	74	-29.70	Peak
4924	21.77	H	21.35	43.12	54	-10.88	Average
4924	22.99	V	21.35	44.34	74	-29.66	Peak
4924	22.16	V	21.35	43.51	54	-10.49	Average
2487	31.87	H	26.89	58.76	74	-15.24	Peak
2487	16.29	H	26.89	43.18	54	-10.82	Average
2487	30.01	V	26.89	56.9	74	-17.1	Peak
2487	16.93	V	26.89	43.82	54	-10.18	Average

802.11 g Mode

Low Channel 2412 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4824	23.54	H	21.03	44.57	74	-29.43	Peak
4824	20.52	H	21.03	41.55	54	-12.45	Average
4824	28.29	V	21.03	49.32	74	-24.68	Peak
4824	22.65	V	21.03	43.68	54	-10.32	Average
2389	35.11	H	26.48	61.59	74	-12.41	Peak
2389	16.35	H	26.48	42.83	54	-11.17	Average
2389	33.9	V	26.48	60.38	74	-13.62	Peak
2389	15.48	V	26.48	41.96	54	-12.04	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	23.20	H	21.19	44.39	74	-29.61	Peak
4874	20.30	H	21.19	41.49	54	-12.51	Average
4874	24.21	V	21.19	45.40	74	-28.60	Peak
4874	22.26	V	21.19	43.45	54	-10.55	Average

High Channel 2462 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4924	22.61	H	21.35	43.96	74	-30.04	Peak
4924	20.88	H	21.35	42.23	54	-11.77	Average
4924	23.36	V	21.35	44.71	74	-29.29	Peak
4924	21.48	V	21.35	42.83	54	-11.17	Average
2484	34.06	H	26.92	60.98	74	-13.02	Peak
2484	15.44	H	26.92	42.36	54	-11.64	Average
2484	36.78	V	26.92	63.7	74	-10.3	Peak
2484	17.07	V	26.92	43.99	54	-10.01	Average

802.11 n20 Mode

Low Channel 2412 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4824	23.54	H	21.03	44.57	74	-29.43	Peak
4824	21.55	H	21.03	42.58	54	-11.42	Average
4824	23.31	V	21.03	44.34	74	-29.66	Peak
4824	21.31	V	21.03	42.34	54	-11.66	Average
2390	36.46	H	26.48	62.94	74	-11.06	Peak
2390	15.73	H	26.48	42.21	54	-11.79	Average
2390	37.49	V	26.48	63.97	74	-10.03	Peak
2390	15.78	V	26.48	42.26	54	-11.74	Average

Middle Channel 2437 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	25.10	H	21.19	46.29	74	-27.71	Peak
4874	23.79	H	21.19	44.98	54	-9.02	Average
4874	23.27	V	21.19	44.46	74	-29.54	Peak
4874	21.99	V	21.19	43.18	54	-10.82	Average

High Channel 2462 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC/IC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4924	25.19	H	21.35	46.54	74	-27.46	Peak
4924	23.71	H	21.35	45.06	54	-8.94	Average
4924	23.22	V	21.35	44.57	74	-29.43	Peak
4924	21.34	V	21.35	42.69	54	-11.31	Average
2484	38.42	H	26.92	65.34	74	-8.66	Peak
2484	15.75	H	26.92	42.67	54	-11.33	Average
2484	41.76	V	26.92	68.68	74	-5.32	Peak
2484	18.3	V	26.92	45.22	54	-8.78	Average

802.11 n40 Mode

Low Channel 2422 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4844	21.40	H	21.03	42.43	74	-31.57	Peak
4844	19.03	H	21.03	40.06	54	-13.94	Average
4844	23.20	V	21.03	44.23	74	-29.77	Peak
4844	20.28	V	21.03	41.31	54	-12.69	Average
2390	39.29	H	26.46	65.75	74	-8.25	Peak
2390	16.59	H	26.46	43.05	54	-10.95	Average
2390	39.29	V	26.46	65.75	74	-8.25	Peak
2390	16.59	V	26.46	43.05	54	-10.95	Average

Middle Channel 2437 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	23.97	H	21.19	45.16	74	-28.84	Peak
4874	22.57	H	21.19	43.76	54	-10.24	Average
4874	24.16	V	21.19	45.35	74	-28.65	Peak
4874	23.46	V	21.19	44.65	54	-9.35	Average

High Channel 2452 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4904	23.51	H	21.35	44.86	74	-29.14	Peak
4904	21.94	H	21.35	43.29	54	-10.71	Average
4904	23.89	V	21.35	45.24	74	-28.76	Peak
4904	22.79	V	21.35	44.14	54	-9.86	Average
2488	37.94	H	26.92	64.86	74	-9.14	Peak
2488	16.63	H	26.92	43.55	54	-10.45	Average
2488	39.86	V	26.92	66.78	74	-7.22	Peak
2488	16.87	V	26.92	43.79	54	-10.21	Average

7 dBi, Antenna (Model Number: ACC-ANT-O4ABGN-0607-PT), 5.8 GHz Band**802.11 a Mode**

Low Channel 5745 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11490	36.64	H	27.48	64.12	74	-9.88	Peak
11490	21.33	H	27.48	48.81	54	-5.19	Average
11490	38.46	V	27.48	65.94	74	-8.06	Peak
11490	22.06	V	27.48	49.54	54	-4.46	Average
5725	39.39	H	29.04	68.43	74	-.57	Peak
5725	19.67	H	29.04	48.71	54	-5.29	Average
5725	40.44	V	29.04	69.48	74	-4.52	Peak
5725	20.05	V	29.04	49.09	54	-4.91	Average

Middle Channel 5785 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11570	36.98	H	28.49	65.47	74	-8.53	Peak
11570	20.31	H	28.49	48.80	54	-5.20	Average
11570	39.64	V	28.49	68.13	74	-5.87	Peak
11570	22.33	V	28.49	50.82	54	-3.18	Average

High Channel 5825 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11650	38.45	H	29	67.45	74	-6.55	Peak
11650	22.13	H	29	51.13	54	-2.87	Average
11650	39.62	V	29	68.62	74	-5.38	Peak
11650	21.47	V	29	50.47	54	-3.53	Average
5875	41.33	H	29.18	70.51	74	-3.49	Peak
5875	19.62	H	29.18	48.80	54	-5.20	Average
5875	40.18	V	29.18	69.36	74	-4.64	Peak
5875	20.08	V	29.18	49.26	54	-4.74	Average

802.11 n20 Mode

Low Channel 5745 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11490	37.16	H	27.48	64.64	74	-9.36	Peak
11490	22.65	H	27.48	50.13	54	-3.87	Average
11490	39.61	V	27.48	67.09	74	-6.91	Peak
11490	22.32	V	27.48	49.80	54	-4.20	Average
5725	40.67	H	29.04	69.71	74	-4.29	Peak
5725	21.12	H	29.04	50.16	54	-3.84	Average
5725	41.32	V	29.04	70.36	74	-3.64	Peak
5725	20.15	V	29.04	49.19	54	-4.81	Average

Middle Channel 5785 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11570	37.69	H	28.49	66.18	74	-7.82	Peak
11570	21.43	H	28.49	49.92	54	-4.08	Average
11570	37.45	V	28.49	65.94	74	-8.06	Peak
11570	20.15	V	28.49	48.64	54	-5.36	Average

High Channel 5825 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11650	37.42	H	29	66.42	74	-7.58	Peak
11650	21.44	H	29	50.44	54	-3.56	Average
11650	38.29	V	29	67.29	74	-6.71	Peak
11650	20.47	V	29	49.47	54	-4.53	Average
5875	40.36	H	29.18	69.54	74	-4.46	Peak
5875	20.32	H	29.18	49.50	54	-4.50	Average
5875	41.17	V	29.18	70.35	74	-3.65	Peak
5875	20.11	V	29.18	49.29	54	-4.71	Average

802.11 n 40 Mode

Low Channel 5755 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11510	36.24	H	27.48	63.72	74	-10.28	Peak
11510	23.34	H	27.48	50.82	54	-3.18	Average
11510	38.61	V	27.48	66.09	74	-7.91	Peak
11510	22.14	V	27.48	49.62	54	-4.38	Average
5725	41.62	H	29.04	70.66	74	-3.34	Peak
5725	20.36	H	29.04	49.40	54	-4.60	Average
5725	40.63	V	29.04	69.67	74	-4.33	Peak
5725	21.04	V	29.04	50.08	54	-3.92	Average

High Channel 5795 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11590	36.16	H	29	65.16	74	-8.84	Peak
11590	21.68	H	29	50.68	54	-3.32	Average
11590	37.36	V	29	66.36	74	-7.64	Peak
11590	21.46	V	29	50.46	54	-3.54	Average
5875	40.68	H	29.18	69.86	74	-4.14	Peak
5875	20.64	H	29.18	49.82	54	-4.18	Average
5875	41.18	V	29.18	70.36	74	-3.64	Peak
5875	21.03	V	29.18	50.21	54	-3.79	Average

2 dBi, Antenna (Model Number: ACC-ANT-ABGN230-W), 2.4 GHz Band**802.11 b Mode**

Low Channel 2412 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4824	22.12	H	21.03	43.15	74	-30.85	Peak
4824	21.59	H	21.03	42.62	54	-11.38	Average
4824	24.43	V	21.03	45.46	74	-28.54	Peak
4824	23.54	V	21.03	44.57	54	-9.43	Average
2333	28.89	H	26.16	55.05	74	-18.95	Peak
2333	17.21	H	26.16	43.37	54	-10.63	Average
2333	29.09	V	26.16	55.25	74	-18.75	Peak
2333	18.35	V	26.16	44.51	54	-9.49	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	23.50	H	21.19	44.69	74	-29.31	Peak
4874	22.30	H	21.19	43.49	54	-10.51	Average
4874	23.42	V	21.19	44.61	74	-29.39	Peak
4874	22.10	V	21.19	43.29	54	-10.71	Average

High Channel 2462 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4924	22.95	H	21.35	44.30	74	-29.70	Peak
4924	21.77	H	21.35	43.12	54	-10.88	Average
4924	22.99	V	21.35	44.34	74	-29.66	Peak
4924	22.16	V	21.35	43.51	54	-10.49	Average
2487	31.81	H	26.89	58.70	74	-15.30	Peak
2487	16.23	H	26.89	43.12	54	-10.88	Average
2487	29.95	V	26.89	56.84	74	-17.16	Peak
2487	16.87	V	26.89	43.76	54	-10.24	Average

802.11 g Mode

Low Channel 2412 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4824	23.54	H	21.03	44.57	74	-29.43	Peak
4824	20.52	H	21.03	41.55	54	-12.45	Average
4824	28.29	V	21.03	49.32	74	-24.68	Peak
4824	22.65	V	21.03	43.68	54	-10.32	Average
2389	35.24	H	26.48	61.72	74	-12.28	Peak
2389	16.48	H	26.48	42.96	54	-11.04	Average
2389	34.03	V	26.48	60.51	74	-13.49	Peak
2389	15.61	V	26.48	42.09	54	-11.91	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	23.20	H	21.19	44.39	74	-29.61	Peak
4874	20.30	H	21.19	41.49	54	-12.51	Average
4874	24.21	V	21.19	45.40	74	-28.60	Peak
4874	22.26	V	21.19	43.45	54	-10.55	Average

High Channel 2462 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4924	22.61	H	21.35	43.96	74	-30.04	Peak
4924	20.88	H	21.35	42.23	54	-11.77	Average
4924	23.36	V	21.35	44.71	74	-29.29	Peak
4924	21.48	V	21.35	42.83	54	-11.17	Average
2484	34.18	H	26.92	61.10	74	-12.90	Peak
2484	15.56	H	26.92	42.48	54	-11.52	Average
2484	36.90	V	26.92	63.82	74	-10.18	Peak
2484	17.19	V	26.92	44.11	54	-9.89	Average

802.11 n20 Mode

Low Channel 2412 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4824	23.54	H	21.03	44.57	74	-29.43	Peak
4824	21.55	H	21.03	42.58	54	-11.42	Average
4824	23.31	V	21.03	44.34	74	-29.66	Peak
4824	21.31	V	21.03	42.34	54	-11.66	Average
2390	36.59	H	26.48	63.07	74	-10.93	Peak
2390	15.86	H	26.48	42.34	54	-11.66	Average
2390	37.62	V	26.48	64.10	74	-9.90	Peak
2390	15.91	V	26.48	42.39	54	-11.61	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	25.10	H	21.19	46.29	74	-27.71	Peak
4874	23.79	H	21.19	44.98	54	-9.02	Average
4874	23.27	V	21.19	44.46	74	-29.54	Peak
4874	21.99	V	21.19	43.18	54	-10.82	Average

High Channel 2462 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4924	25.19	H	21.35	46.54	74	-27.46	Peak
4924	23.71	H	21.35	45.06	54	-8.94	Average
4924	23.22	V	21.35	44.57	74	-29.43	Peak
4924	21.34	V	21.35	42.69	54	-11.31	Average
2484	38.36	H	26.92	65.28	74	-8.72	Peak
2484	15.69	H	26.92	42.61	54	-11.39	Average
2484	41.70	V	26.92	68.62	74	-5.38	Peak
2484	18.24	V	26.92	45.16	54	-8.84	Average

802.11 n40 Mode

Low Channel 2422 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4844	21.40	H	21.03	42.43	74	-31.57	Peak
4844	19.03	H	21.03	40.06	54	-13.94	Average
4844	23.20	V	21.03	44.23	74	-29.77	Peak
4844	20.28	V	21.03	41.31	54	-12.69	Average
2390	39.29	H	26.46	65.75	74	-8.25	Peak
2390	16.59	H	26.46	43.05	54	-10.95	Average
2390	39.29	V	26.46	65.75	74	-8.25	Peak
2390	16.59	V	26.46	43.05	54	-10.95	Average

Middle Channel 2437 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4874	23.97	H	21.19	45.16	74	-28.84	Peak
4874	22.57	H	21.19	43.76	54	-10.24	Average
4874	24.16	V	21.19	45.35	74	-28.65	Peak
4874	23.46	V	21.19	44.65	54	-9.35	Average

High Channel 2452 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
4904	23.51	H	21.35	44.86	74	-29.14	Peak
4904	21.94	H	21.35	43.29	54	-10.71	Average
4904	23.89	V	21.35	45.24	74	-28.76	Peak
4904	22.79	V	21.35	44.14	54	-9.86	Average
2488	37.94	H	26.92	64.86	74	-9.14	Peak
2488	16.63	H	26.92	43.55	54	-10.45	Average
2488	39.86	V	26.92	66.78	74	-7.22	Peak
2488	16.87	V	26.92	43.79	54	-10.21	Average

2 dBi, Antenna (Model Number: ACC-ANT-ABGN230-W), 5.8 GHz Band**802.11 a Mode**

Low Channel 5745 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11490	36.64	H	27.48	64.12	74	-9.88	Peak
11490	21.33	H	27.48	48.81	54	-5.19	Average
11490	38.46	V	27.48	65.94	74	-8.06	Peak
11490	22.06	V	27.48	49.54	54	-4.46	Average
5725	39.39	H	29.04	68.43	74	-5.57	Peak
5725	19.67	H	29.04	48.71	54	-5.29	Average
5725	40.44	V	29.04	69.48	74	-4.52	Peak
5725	20.05	V	29.04	49.09	54	-4.91	Average

Middle Channel 5785MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11570	36.98	H	28.49	65.47	74	-8.53	Peak
11570	20.31	H	28.49	48.80	54	-5.20	Average
11570	39.64	V	28.49	68.13	74	-5.87	Peak
11570	22.33	V	28.49	50.82	54	-3.18	Average

High Channel 5825 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11650	38.45	H	29	67.45	74	-6.55	Peak
11650	22.13	H	29	51.13	54	-2.87	Average
11650	39.62	V	29	68.62	74	-5.38	Peak
11650	21.47	V	29	50.47	54	-3.53	Average
5875	41.33	H	29.18	70.51	74	-3.49	Peak
5875	19.62	H	29.18	48.80	54	-5.20	Average
5875	40.18	V	29.18	69.36	74	-4.64	Peak
5875	20.08	V	29.18	49.26	54	-4.74	Average

802.11 n20 Mode

Low Channel 5745 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11490	37.16	H	27.48	64.64	74	-9.36	Peak
11490	22.65	H	27.48	50.13	54	-3.87	Average
11490	39.61	V	27.48	67.09	74	-6.91	Peak
11490	22.32	V	27.48	49.80	54	-4.20	Average
5725	40.67	H	29.04	69.71	74	-4.29	Peak
5725	21.12	H	29.04	50.16	54	-3.84	Average
5725	41.32	V	29.04	70.36	74	-3.64	Peak
5725	20.15	V	29.04	49.19	54	-4.81	Average

Middle Channel 5785MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11570	37.69	H	28.49	66.18	74	-7.82	Peak
11570	21.43	H	28.49	49.92	54	-4.08	Average
11570	37.45	V	28.49	65.94	74	-8.06	Peak
11570	20.15	V	28.49	48.64	54	-5.36	Average

High Channel 5825 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11650	37.42	H	29	66.42	74	-7.58	Peak
11650	21.44	H	29	50.44	54	-3.56	Average
11650	38.29	V	29	67.29	74	-6.71	Peak
11650	20.47	V	29	49.47	54	-4.53	Average
5875	40.36	H	29.18	69.54	74	-4.46	Peak
5875	20.32	H	29.18	49.50	54	-4.50	Average
5875	41.17	V	29.18	70.35	74	-3.65	Peak
5875	20.11	V	29.18	49.29	54	-4.71	Average

802.11 n40 Mode

Low Channel 5755 MHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11510	36.24	H	27.48	63.72	74	-10.28	Peak
11510	23.34	H	27.48	50.82	54	-3.18	Average
11510	38.61	V	27.48	66.09	74	-7.91	Peak
11510	22.14	V	27.48	49.62	54	-4.38	Average
5725	41.62	H	29.04	70.66	74	-3.34	Peak
5725	20.36	H	29.04	49.40	54	-4.60	Average
5725	40.63	V	29.04	69.67	74	-4.33	Peak
5725	21.04	V	29.04	50.08	54	-3.92	Average

High Channel 5795 MHz measured at 3 meters

Frequency (MHz)	S.A. Reading (dBμV)	Test Antenna		Cord. Reading (dBμV/m)	FCC		Comments
		Polarity (H/V)	Factor (dB/m)		Limit (dBμV/m)	Margin (dB)	
11590	36.16	H	29	65.16	74	-8.84	Peak
11590	21.68	H	29	50.68	54	-3.32	Average
11590	37.36	V	29	66.36	74	-7.64	Peak
11590	21.46	V	29	50.46	54	-3.54	Average
5875	40.68	H	29.18	69.86	74	-4.14	Peak
5875	20.64	H	29.18	49.82	54	-4.18	Average
5875	41.18	V	29.18	70.36	74	-3.64	Peak
5875	21.03	V	29.18	50.21	54	-3.79	Average