FCC PART 15.407
ISEDC RSS-247, ISSUE 2, FEBRUARY 2017

TEST REPORT

For

Mimosa Networks, Inc.

469 El Camino Real, Suite 100,

Santa Clara, CA 95050, USA

FCC ID: 2ABZJ-100-00085
IC: 11823A-10000085

Report Type:	**Product type:**
Original Report	Point to Point Wireless Device

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Report Number:	R18062717-407
Report Date:	2018-10-11
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TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R18062717-407	Original Report	2018-10-11

1 General Description

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of *Mimosa Networks, Inc.* and their product model: *C5x*, FCC ID: 2ABZJ-100-00085, IC: 11823A-10000085 or the "EUT" as referred to in this report. The product is a point to point/Point to multipoint wireless device.

1.2 Objective

This report is prepared on behalf of *Mimosa Networks, Inc.* in accordance with FCC CFR47 §15.407 and ISEDC RSS-247 Issue 2, February 2017.

The objective is to determine compliance with FCC Part 15.407 and ISEDC RSS-247 rules for Output Power, Antenna Requirements, AC Line Conducted Emissions, Emission Bandwidth, Power spectral density, Conducted and Radiated Spurious Emissions.

1.3 Related Submittal(s)/Grant(s)

FCC Part 90Y/ISED RSS-111 report with FCC ID: 2ABZJ-100-00085, IC: 11823A-10000085

1.4 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, 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, and FCC KDB 789033 D02 General UNII Test Procedure New Rules v02r01.

1.5 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 repeatabil

Parameter	Measurement uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.57 dB
Power Spectral Density, conducted	±1.48dB
Unwanted Emissions, conducted	±1.57dB
All emissions, radiated	±4.0 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2 º C
Humidity	±5 %
DC and low frequency voltages	±1.0 %
Time	±2 %
Duty Cycle	±3 %

1.6 Test Facility Registrations

BACLs test facilities that are used to perform Radiated and Conducted Emissions tests are currently recognized by the Federal Communications Commission as Accredited with NIST Designation Number US1129.

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Industry Canada under Registration Numbers: 3062A-1, 3062A-2, and 3062A-3.

BACL is a Chinese Taipei Bureau of Standards Metrology and Inspection (BSMI) validated Conformity Assessment Body (CAB), under Appendix B, Phase I Procedures of the APEC Mutual Recognition Arrangement (MRA). BACL's BSMI Lab Code Number is: SL2-IN-E-1002R

BACL's test facilities that are used to perform AC Line Conducted Emissions, Telecommunications Line Conducted Emissions, Radiated Emissions from 30 MHz to 1 GHz, and Radiated Emissions from 1 GHz to 6 GHz are currently recognized as Accredited in accordance with the Voluntary Control Council for Interference [VCCI] Article 15 procedures under Registration Number A-0027.

1.7 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3279.02),*** in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report..

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3279.03)*** to certify

- For the USA (Federal Communications Commission):
  - 1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
  - 2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
  - 3- All Telephone Terminal Equipment within FCC Scope C.
- For the Canada (Innovation, Science and Economic development Canada - ISEDC):
  - 1 All Scope 1-Licence-Exempt Radio Frequency Devices;
  - 2 All Scope 2-Licensed Personal Mobile Radio Services;
  - 3 All Scope 3-Licensed General Mobile & Fixed Radio Services;
  - 4 All Scope 4-Licensed Maritime & Aviation Radio Services;
  - 5 All Scope 5-Licensed Fixed Microwave Radio Services
  - 6 All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.
- For Singapore (Infocomm Media Development Authority - IMDA):
  - 1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2

2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2

- For the Hong Kong Special Administrative Region:
  1 All Radio Equipment, per KHCA 10XX-series Specifications;
  2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
  3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.
- For Japan:
  1 MIC Telecommunication Business Law (Terminal Equipment):
  - All Scope A1 - Terminal Equipment for the Purpose of Calls;
  - All Scope A2 - Other Terminal Equipment
  2 Radio Law (Radio Equipment):
  - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
  - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
  - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

C- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3279.01)*** to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

1 Electronics and Office Equipment:
- for Telephony (ver. 3.0)
- for Audio/Video (ver. 3.0)
- for Battery Charging Systems (ver. 1.1)
- for Set-top Boxes & Cable Boxes (ver. 4.1)
- for Televisions (ver. 6.1)
- for Computers (ver. 6.0)
- for Displays (ver. 6.0)
- for Imaging Equipment (ver. 2.0)
- for Computer Servers (ver. 2.0)

2 Commercial Food Service Equipment
- for Commercial Dishwashers (ver. 2.0)
- for Commercial Ice Machines (ver. 2.0)
- for Commercial Ovens (ver. 2.1)
- for Commercial Refrigerators and Freezers

3 Lighting Products
- For Decorative Light Strings (ver. 1.5)
- For Luminaires (including sub-components) and Lamps (ver. 1.2)
- For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
- For Integral LED Lamps (ver. 1.4)

4 Heating, Ventilation, and AC Products
- for Residential Ceiling Fans (ver. 3.0)
- for Residential Ventilating Fans (ver. 3.2)

5 Other
- For Water Coolers (ver. 3.0)

D- ***A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:***

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;

- Canada: (Innovation, Science and Economic development Canada - ISEDC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
  - BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
  - NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
  - EMC Directive 2014/30/EU US-EU EMC & Telecom MRA CAB (NB)
  - Radio Equipment (RE) Directive 2014/53/EU US-EU EMC & Telecom MRA CAB (NB)
  - Low Voltage Directive (LVD) 2014/35/EU
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA) APEC Tel MRA -Phase I & Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA -Phase I
- Singapore: (Infocomm Media Development Authority - IMDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter-
- USA:
  - ENERGY STAR Recognized Test Laboratory – US EPA
  - Telecommunications Certification Body (TCB) – US FCC;
  - Nationally Recognized Test Laboratory (NRTL) – US OSHA
- Vietnam: APEC Tel MRA -Phase I;

2 EUT Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.10-2013 and FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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

The worst-case data rates are determined by measuring the average power, peak power and PPSD across all data rates bandwidths, and modulations.

2.2 EUT Exercise Software

The test software used was Putty provided by *Mimosa Networks.* The software is compliant with the standard requirements being tested against.

EUT supports point-to-multipoint client mode and fixed point-to-point Master mode. Please refer to the following power setting table.

Point-to-multipoint client mode

8 dBi Antenna:

Modulation	Band	Channel	Frequency (MHz)	Power Setting
802.11ac20 mode	U-NII-1	Low	5190	16
		Middle	5220	16
		High	5240	16
	U-NII-3	Low	5745	18
		Middle	5775	18
		High	5810	18
802.11ac40 mode	U-NII-1	Low	5200	18
		Middle	5215	18
		High	5230	18
	U-NII-3	Low	5755	18
		Middle	5775	18
		High	5800	18
802.11ac80 mode	U-NII-3	Low	5775	18
		High	5780	18

25 dBi Antenna:

Modulation	Band	Channel	Frequency (MHz)	Power Setting
802.11ac20 mode	U-NII-1	Low	5190	-6
		Middle	5220	-6
		High	5240	-6
	U-NII-3	Low	5745	-6
		Middle	5775	-6
		High	5810	-6
802.11ac40 mode	U-NII-1	Low	5200	-6
		Middle	5215	-6
		High	5230	-6
	U-NII-3	Low	5755	-6
		Middle	5775	-6
		High	5800	-6
802.11ac80 mode	U-NII-3	Low	5775	-6
		High	5780	-6

Fixed point-to-point Master mode

8 dBi Antenna:

Modulation	Band	Channel	Frequency (MHz)	Power Setting
802.11ac20 mode	U-NII-1	Low	5190	13
		Middle	5220	13
		High	5240	13
	U-NII-3	Low	5745	18
		Middle	5775	18
		High	5810	18
802.11ac40 mode	U-NII-1	Low	5200	12
		Middle	5215	12
		High	5230	12
	U-NII-3	Low	5755	18
		Middle	5775	18
		High	5800	18
802.11ac80 mode	U-NII-3	Low	5775	18
		High	5780	18

25 dBi Antenna:

Modulation	Band	Channel	Frequency (MHz)	Power Setting
802.11ac20 mode	U-NII-1	Low	5190	-6
		Middle	5220	-6
		High	5240	-6
	U-NII-3	Low	5745	-6
		Middle	5775	-6
		High	5810	-6
802.11ac40 mode	U-NII-1	Low	5200	-6
		Middle	5215	-6
		High	5230	-6
	U-NII-3	Low	5755	-6
		Middle	5775	-6
		High	5800	-6
802.11ac80 mode	U-NII-3	Low	5775	-6
		High	5780	-6

Note: EUT supports any channel with 5 MHz spacing between Low and High channel listed above.

2.3 Duty Cycle Correction Factor

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 section B:

All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum-power transmission duration, T, are required for each tested mode of operation.

Antenna Port	Radio Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
ANT 1	802.11ac20	2.5	2.6	96.15	0.17
	802.11ac40	1.192	1.283	92.91	0.32
	802.11ac80	0.595	0.635	93.70	0.28
ANT 2	802.11ac20	2.5	2.6	96.15	0.17
	802.11ac40	1.192	1.283	92.91	0.32
	802.11ac80	0.595	0.660	90.15	0.45

Note: Duty Cycle Correction Factor = 10*log(1/duty cycle)

2.4 Equipment Modifications

There are two RF cables, one for each antenna port, coming out of the EUT to connect the antenna ports to the measurement instrument.

2.5 Local Support Equipment

Manufacturer	Description	Model
Dell	Laptop	Latitude E6410

2.6 Support Equipment

Manufacturer	Description	Model
Lenovo	Laptop	P50s
Mimosa Networks	POE injector	G0566-500-120

2.7 Interface Ports and Cabling

Cable Description	Length (m)	To	From
Cat5e	~1	EUT	POE Injector
Cat5e	~1	POE Injector	Laptop

3 Summary of Test Results

FCC and ISEDC Rules	Description of Test	Result
FCC §2.1091, §15.407(f), ISEDC RSS-102	RF Exposure	Compliant
FCC §15.203 ISEDC RSS-Gen §6.8	Antenna Requirement	Compliant
FCC §15.207 ISEDC RSS-Gen §8.8	AC Power Line Conducted Emissions	Compliant
FCC §2.1053, §15.205, §15.209, 15.407(b) ISEDC RSS-247 §6.2	Spurious Radiated Emissions	Compliant
FCC §15.407(e) ISEDC RSS-Gen §6.2	Emission Bandwidth	Compliant
FCC §407(a) ISEDC RSS-247 §6.2	Output Power	Compliant
FCC §2.1051, §15.407(b) ISEDC RSS-247 §6.2	Band Edges	Compliant
FCC §15.407(a) ISEDC RSS-247 §6.2	Power Spectral Density	Compliant
FCC §2.1051, §15.407(b) ISEDC RSS-247 §6.2	Spurious Emissions at Antenna Terminals	Compliant
FCC §15.407(h) ISEDC RSS-247 §6.3	Dynamic Frequency Selection (DFS)	Note[1]

Note[1]: EUT only supports Non-DFS bands U-NII-1 and U-NII-3.

4 FCC §2.1091, §15.407(f) & ISEDC RSS-102 - RF Exposure

4.1 Applicable Standards

According to FCC §15.247(i), §15.407(f) 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

Before equipment certification is granted, the procedure of ISED RSS-102 must be followed concerning the exposure of humans to RF field

According to ISED RSS-102 Issue 5:

2.5.2 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz[6] and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

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

8 dBi Antenna

5.2GHz band:

Maximum average output power at antenna input terminal (dBm):	20.46
Maximum average output power at antenna input terminal (mW):	111.17
Prediction distance (cm):	20
Prediction frequency (MHz):	5230
Maximum Antenna Gain, typical (dBi):	8
Maximum Antenna Gain (numeric):	6.310
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.1396
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

5.8GHz band:

Maximum average output power at antenna input terminal (dBm):	22.35
Maximum average output power at antenna input terminal (mW):	171.79
Prediction distance (cm):	20
Prediction frequency (MHz):	5755
Maximum Antenna Gain, typical (dBi):	8
Maximum Antenna Gain (numeric):	6.310
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.2157
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

25 dBi Antenna

5.2GHz band:

Maximum average output power at antenna input terminal (dBm):	-13.25
Maximum average output power at antenna input terminal (mW):	0.047
Prediction distance (cm):	20
Prediction frequency (MHz):	5220
Maximum Antenna Gain, typical (dBi):	25
Maximum Antenna Gain (numeric):	316.23
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.0030
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

5.8GHz band:

Maximum average output power at antenna input terminal (dBm):	-8.87
Maximum average output power at antenna input terminal (mW):	0.130
Prediction distance (cm):	20
Prediction frequency (MHz):	5800
Maximum Antenna Gain, typical (dBi):	25
Maximum Antenna Gain (numeric):	316.23
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.0082
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

Conclusion

The device is compliant with the requirement MPE limit for uncontrolled exposure. All transceiver modules must be installed with a separation distance of no less than **20** cm from all persons.

4.4 RF exposure evaluation exemption for IC

8 dBi Antenna:

5.8 GHz band: 22.35 + 8 dBi = 30.35 dBm < $1.31\times10^{-2}f^{0.6834}$ = 4.863 W = 36.87 dBm

25 dBi Antenna:

5.8GHz band: -8.87 + 25 dBi = 16.13 dBm < $1.31\times10^{-2}f^{0.6834}$ = 4.889 W = 36.89 dBm

Note: EUT does not support 5150-5250 MHz in Canada

Conclusion

Therefore the RF exposure is not required. All transceiver modules must be installed with a separation distance of no less than **20** cm from all persons.

5 FCC §15.203 & ISEDC RSS-Gen §6.8 - Antenna Requirements

5.1 Applicable Standards

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.

According to ISEDC RSS-Gen §6.8: Transmitter Antenna

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

5.2 Antenna List

The antennas used by the EUT are permanent attached antennas or of an antenna that uses a unique coupling to the intentional radiator.

Frequency Range (MHz)	External/Internal/Integral	Maximum Antenna Gain (dBi)	Antenna Tpye/Pattern
4900 - 5900	Integral	8	Panel
4900 - 5900	External (Screw on)	25	Cassegrain

6 FCC §15.207 & ISEDC RSS-Gen §8.8 - AC Power Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 and ISEDC RSS GEN §8.8

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

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note1	56 to 46 Note2
0.5-5	56	46
5-30	60	50

Note1: Decreases with the logarithm of the frequency.
Note2: A linear average detector is required

6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.10-2013 measurement procedure. The specification used was FCC §15.207 limits and and ISEDC RSS GEN §8.8.

External I/O cables were draped along the edge of the test table and bundle when necessary.
The AC/DC power adapter of the EUT was connected with LISN-1 which provided 120 V / 60 Hz AC power.

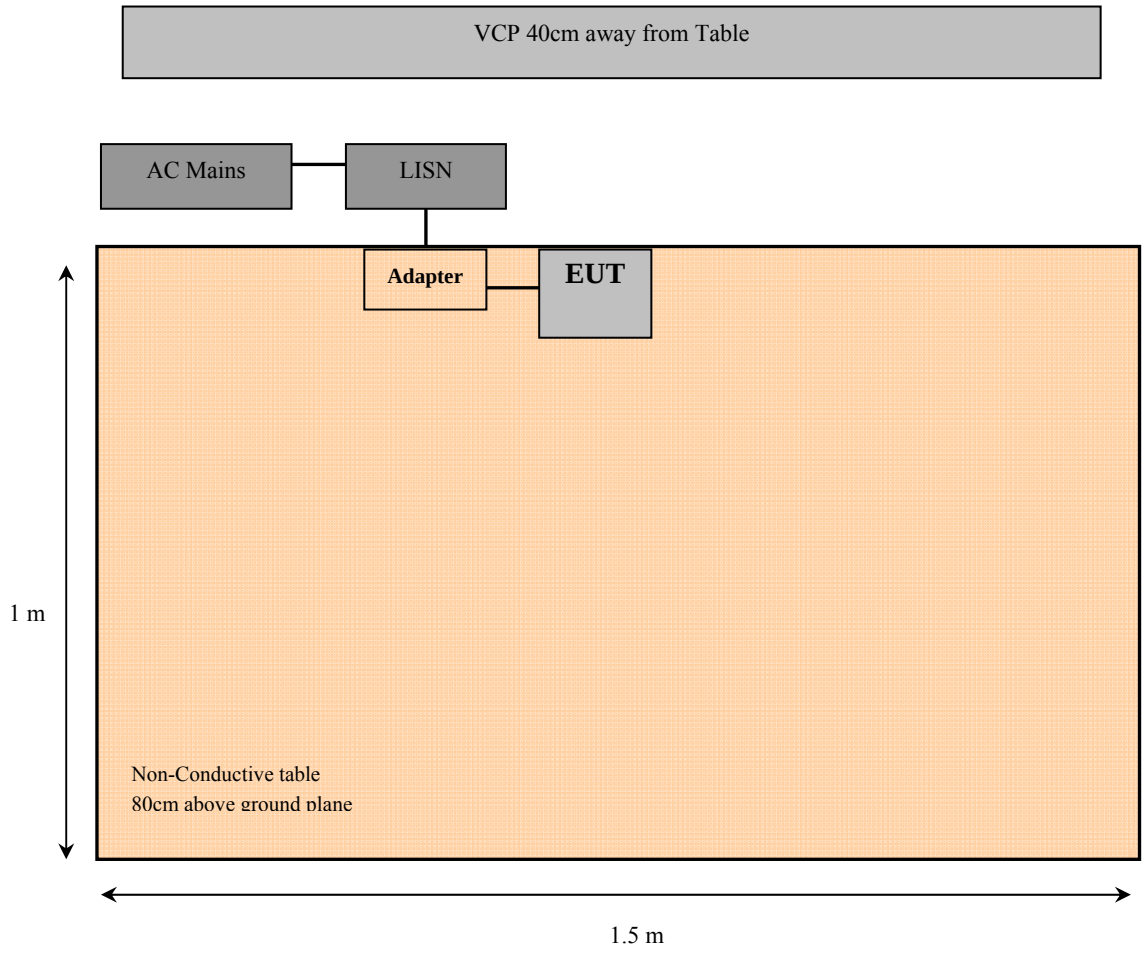
6.3 Test Procedure

During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-1 and the power cords of support equipment were connected to LISN-2.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the peak, quasi-peak, and average detection mode. Quasi-Peak readings are distinguished with a “QP.” Average readings are distinguished with an “Ave”.

6.4 Test Setup Block Diagram



6.5 Corrected Amplitude and Margin Calculation

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

CA = Ai + CL + Atten

For example, a corrected amplitude of 46.2 dBuV = Indicated Reading (32.5 dBuV) + Cable Loss (3.7 dB) + Attenuator (10 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:

Margin = Corrected Amplitude - Limit

6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde and Schwarz	Receiver, EMI Test	ESCI 1166.5950K03	100338	2018-07-05	2 years
Rohde and Schwarz	Impulse Limiter	ESH3-Z2	101964	2018-07-27	1 year
Solar Electronics Company	High Pass Filter	Type 7930-100	7930150203	2018-02-28	1 year
Suirong	30 ft conductive emission cable	LMR 400	-	N/R[1]	N/A
FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160129	2018-04-04	1 year
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

Note[1]: cables and attenuators included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 09 June 2016) "A2LA Policy on Metrological Traceability".*

6.7 Test Environmental Conditions

Temperature:	23º C
Relative Humidity:	42 %
ATM Pressure:	101.31 kPa

The testing was performed by Frank Wang on 2018-10-05 in the Conducted Test Site.

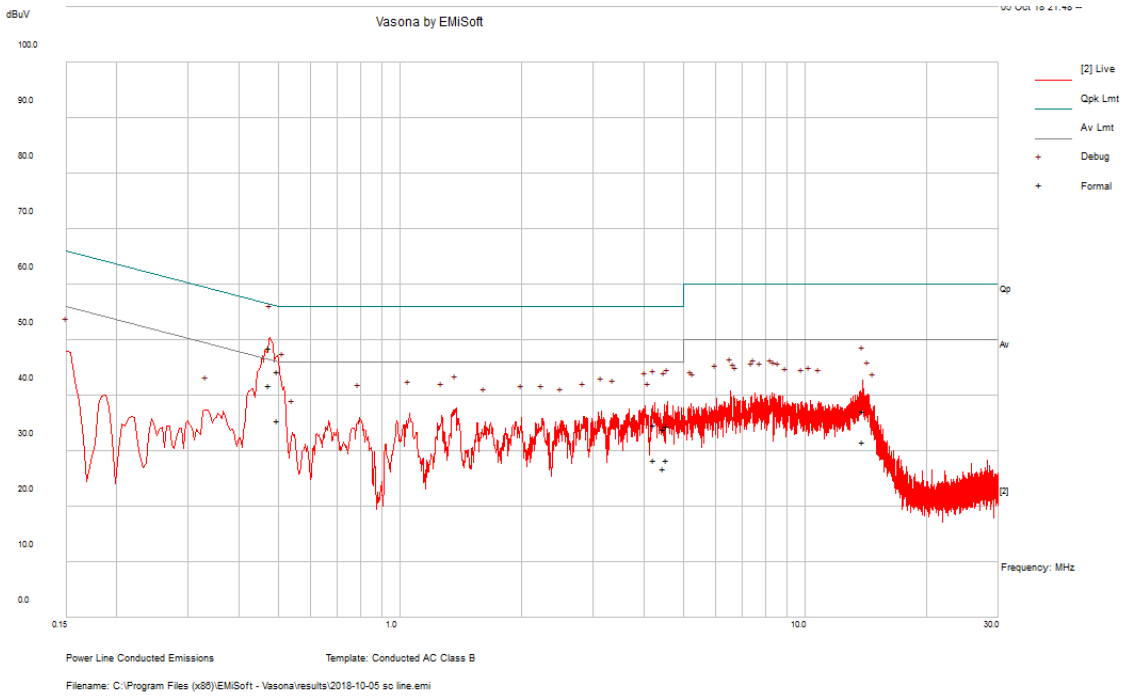
6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC Part 15 and RSS-Gen standards' conducted emissions limits, with the margin reading of:

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-3.92	0.478793	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

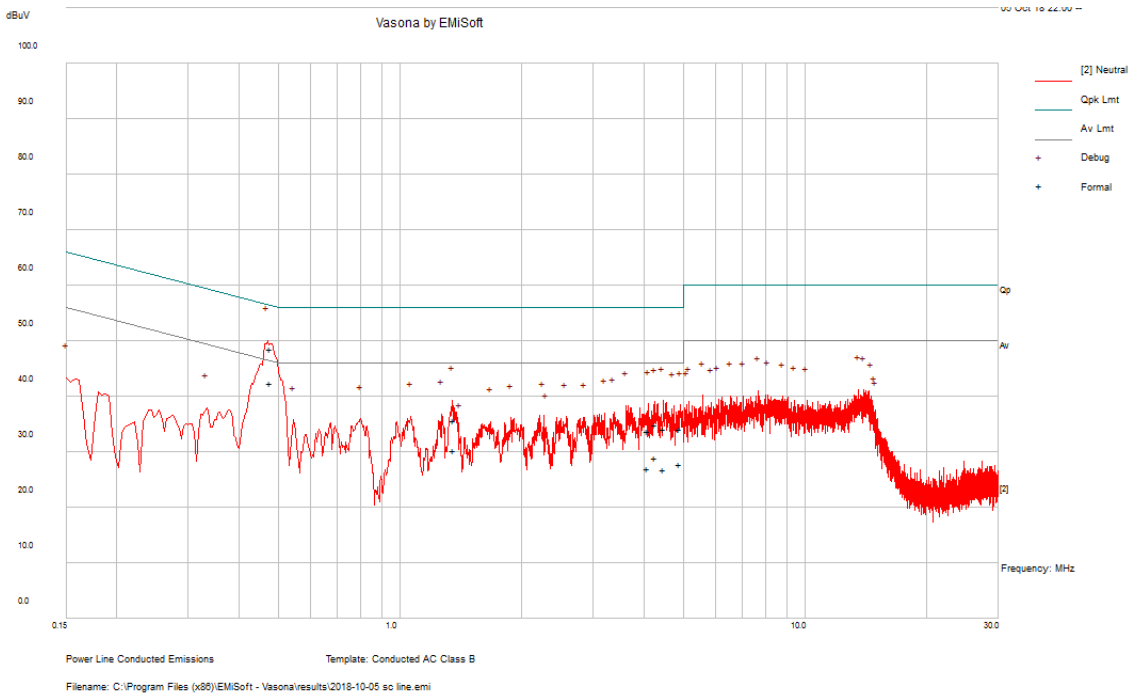
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.475654	48.55	Line	56.41	-7.87	QP
0.498155	44.44	Line	56.03	-11.59	QP
4.554566	34.64	Line	56	-21.36	QP
13.8731	37.23	Line	60	-22.77	QP
4.247043	34.66	Line	56	-21.34	QP
4.483278	33.99	Line	56	-22.01	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.475654	41.81	Line	46.41	-4.61	Ave.
0.498155	35.43	Line	46.03	-10.6	Ave.
4.554566	28.37	Line	46	-17.63	Ave.
13.8731	31.73	Line	50	-18.27	Ave.
4.247043	28.34	Line	46	-17.66	Ave.
4.483278	26.86	Line	46	-19.14	Ave.

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.478793	48.61	Neutral	56.36	-7.75	QP
1.358918	35.61	Neutral	56	-20.39	QP
4.475219	34.17	Neutral	56	-21.83	QP
4.263506	34.94	Neutral	56	-21.06	QP
4.092184	33.76	Neutral	56	-22.24	QP
4.906293	34.22	Neutral	56	-21.78	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.478793	42.44	Neutral	46.36	-3.92	Ave.
1.358918	30.31	Neutral	46	-15.69	Ave.
4.475219	26.96	Neutral	46	-19.04	Ave.
4.263506	29.02	Neutral	46	-16.98	Ave.
4.092184	27.05	Neutral	46	-18.95	Ave.
4.906293	27.82	Neutral	46	-18.18	Ave.

Note: testing was performed at worst case.

7 FCC §15.209, §15.407(b) & ISEDC RSS-247 §6.2 - Spurious Radiated Emissions

7.1 Applicable Standard

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 §15.209: 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 Part 15.407 (b)

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

As per ISEDC RSS-247 §6.2

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

Devices shall comply with the following:

a) All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or

b) All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text "for indoor use only."

Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p. at 5850 MHz instead of 5725 MHz.

Devices operating in the band 5725-5850 MHz with antenna gain greater than 10 dBi can have unwanted emissions that comply with either the limits in this section or in section 5.5 until six (6) months after the publication date of this standard for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2018.

Devices operating in the band 5725-5850 MHz with antenna gain of 10 dBi or less can have unwanted emissions that comply with either the limits in this section or in section 5.5 until April 1, 2018 for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2020.

Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;

b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;

c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and

d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

7.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specification used was the FCC 15.407 and ISEDC RSS-247 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.

7.3 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords were 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 or 1.5 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 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 3MHz / Sweep = 100ms
(2) Average: RBW = 1MHz / VBW = 10Hz or 1/T / Sweep = Auto

7.4 Corrected Amplitude and 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 indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5 dB/m) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (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 for Class A. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Limit

7.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Receiver, EMI Test	ESCI 1166.5950K03	100337	2017-07-15	2 years
Agilent	Analyzer, Spectrum	E4446A	US44300386	2018-06-01	1 year
Sunol Sciences	System Controller	SC99V	011003-1	N/R	N/A
Sunol Sciences	Antenna, Biconi-Log	JB1	A013105-3	2018-02-26	2 years
Agilent	Amplifier, Pre	8447D	2944A10187	2018-04-02	1 year
IW	AOBOR Hi frequency CoAX Cable	DC 1531	KPS-1501A3960KPS	2018-01-04	1 year
-	Hi frequency CoAX Cable	-	-	Each time[1]	N/A
-	SMA cable	-	C00011	Each time[1]	N/A
Agilent	Pre-Amplifier	8449B	3147A00400	2018-02-02	1 year
A.H. Systems	Pre-Amplifer	PAM 1840V	170	2018-09-10	1 Year
Sunol Sciences	Antenna, Horn	DRH-118	A052704	2017-03-27	2 years
Wisewave	Antenna, Horn	ARH-4223-02	10555-01	2018-02-14	2 years
Wisewave	Antenna, Horn	ARH-2823-02	10555-02	2017-12-15	2 years
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

Note[1]: cables and attenuators included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 09 June 2016) "A2LA Policy on Metrological Traceability".*

7.6 Test Environmental Conditions

Temperature:	22-24 ºC
Relative Humidity:	40-41 %
ATM Pressure:	103.1-104.1 kPa

The testing was performed by Jin Yang from 2018-09-20 to 2018-10-03 in 5m chamber 3.

7.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15.407 and RSS-247 standards' radiated emissions limits, and had the worst margin of:

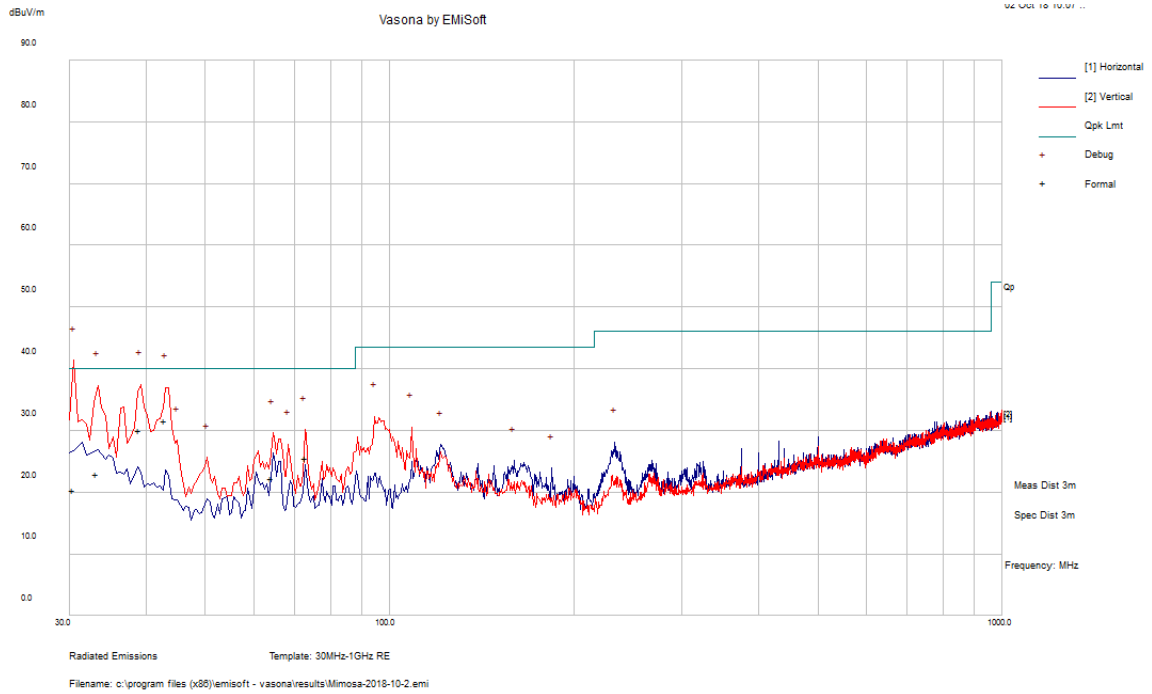
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, Channel**
-0.19	5150	Horizontal	802.11ac20, 5200 MHz

Note: worst case point-to-multipoint client mode was tested

7.8 Radiated Emissions Test Result Data

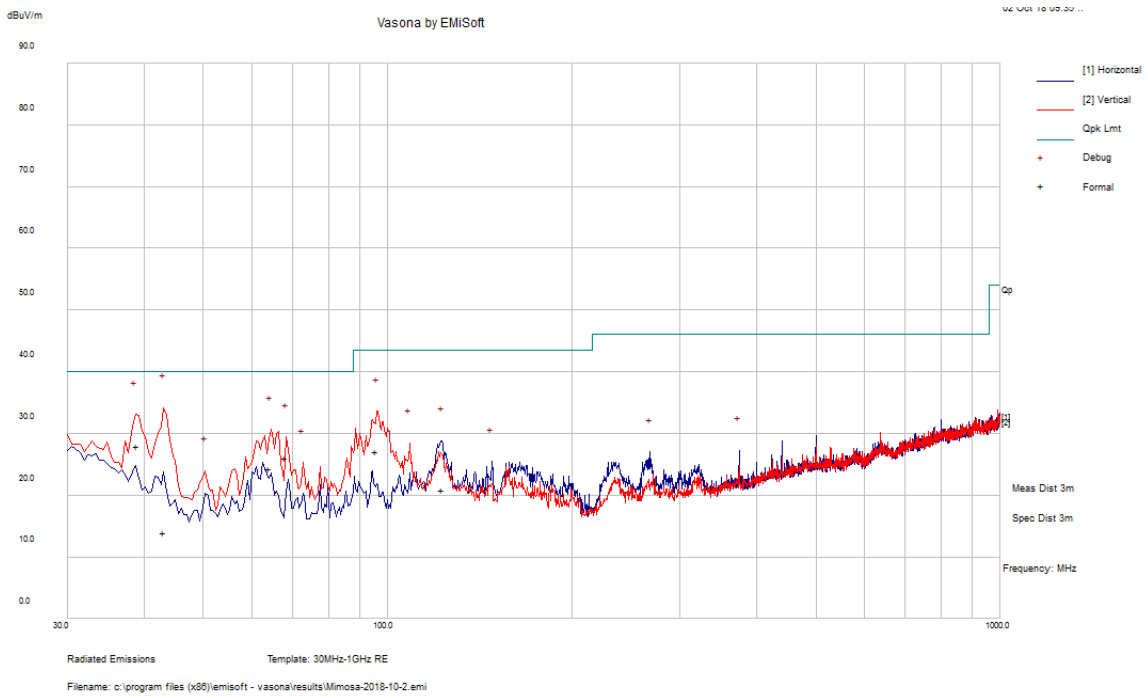
1) 30 MHz – 1 GHz

8 dBi Antenna



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (PK/QP/Ave.)
30.41025	20.41	283	V	120	40	-19.59	QP
38.97225	30.05	109	V	26	40	-9.95	QP
33.14925	22.88	100	V	319	40	-17.12	QP
42.936	31.62	118	V	82	40	-8.38	QP
72.9165	25.65	127	V	207	40	-14.35	QP
64.20725	22.25	201	V	36	40	-17.75	QP

25 dBi Antenna



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (PK/QP/Ave.)
43.1285	14.06	187	V	93	40	-25.94	QP
38.95825	27.94	100	V	3	40	-12.06	QP
64.19275	24.43	182	V	124	40	-15.57	QP
95.80175	27.06	105	V	295	43.5	-16.44	QP
68.217	26.15	211	V	89	40	-13.85	QP
122.7248	20.94	251	H	298	43.5	-22.56	QP

2) 1–40 GHz

U-NII-1

8 dBi Antenna

802.11ac20 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5190 MHz ac20 mode power setting 16											
5190	70.32	0	201	H	33.62	8.61	0.00	112.55	-	-	PK
5190	62.44	0	201	H	33.62	8.61	0.00	104.67	-	-	AV
5190	69.64	0	263	V	33.62	8.61	0.00	111.87	-	-	PK
5190	61.29	0	263	V	33.62	8.61	0.00	103.52	-	-	AV
5150	52.54	0	219	H	33.53	9.82	33.15	62.73	74.00	-11.27	PK
5150	42.28	0	219	H	33.53	9.82	33.15	52.47	54.00	-1.53	AV
5150	52.04	0	224	V	33.42	9.82	33.15	62.13	74.00	-11.87	PK
5150	41.28	0	224	V	33.42	9.82	33.15	51.37	54.00	-2.63	AV
10380	43.68	0	100	H	38.20	14.62	32.88	63.62	74.00	-10.38	PK
10380	31.95	0	100	H	38.20	14.62	32.88	51.89	54.00	-2.11	AV
10380	44.59	0	100	V	38.12	14.62	32.88	64.45	74.00	-9.55	PK
10380	32.29	0	100	V	38.12	14.62	32.88	52.15	54.00	-1.85	AV
Middle Channel 5220 MHz ac20 mode power setting 16											
5220	69.89	0	210	H	33.78	8.61	0.00	112.28	-	-	PK
5220	62.35	0	210	H	33.78	8.61	0.00	104.74	-	-	AV
5220	68.73	0	255	V	33.78	8.61	0.00	111.12	-	-	PK
5220	60.69	0	255	V	33.78	8.61	0.00	103.08	-	-	AV
10400	43.77	0	100	H	38.29	14.64	32.88	63.82	74.00	-10.18	PK
10400	32.09	0	100	H	38.29	14.64	32.88	52.14	54.00	-1.86	AV
High Channel 5240 MHz ac20 mode power setting 16											
5240	70.08	0	212	H	33.78	8.61	0.00	112.47	-	-	PK
5240	62.15	0	212	H	33.78	8.61	0.00	104.54	-	-	AV
5240	68.99	0	257	V	33.78	8.61	0.00	111.38	-	-	PK
5240	60.78	0	257	V	33.78	8.61	0.00	103.17	-	-	AV
10480	43.77	0	100	H	38.28	14.64	32.88	63.81	74.00	-10.19	PK
10480	32.09	0	100	H	38.28	14.64	32.88	52.13	54.00	-1.87	AV

802.11ac40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5200 MHz ac40 mode power setting 18											
5200	70.05	0	219	H	33.62	8.61	0.00	112.28	-	-	PK
5200	61.39	0	219	H	33.62	8.61	0.00	103.62	-	-	AV
5200	69.69	0	202	V	33.62	8.61	0.00	111.92	-	-	PK
5200	60.96	0	202	V	33.62	8.61	0.00	103.19	-	-	AV
5150	56.59	0	219	H	33.53	9.82	33.15	66.78	74.00	-7.22	PK
5150	43.62	0	219	H	33.53	9.82	33.15	53.81	54.00	-0.19	AV
5150	56.74	0	154	V	33.42	9.82	33.15	66.83	74.00	-7.17	PK
5150	43.41	0	154	V	33.42	9.82	33.15	53.50	54.00	-0.50	AV
10400	44.12	0	100	H	38.20	14.59	32.88	64.03	74.00	-9.97	PK
10400	31.98	0	100	H	38.20	14.59	32.88	51.89	54.00	-2.11	AV
Middle Channel 5215 MHz ac40 mode power setting 18											
5215	70.31	0	225	H	33.78	8.61	0.00	112.70	-	-	PK
5215	61.39	0	225	H	33.78	8.61	0.00	103.78	-	-	AV
5215	69.77	0	206	V	33.78	8.61	0.00	112.16	-	-	PK
5215	60.87	0	206	V	33.78	8.61	0.00	103.26	-	-	AV
10430	44.35	0	100	H	38.29	14.64	32.88	64.40	74.00	-9.60	PK
10430	32.22	0	100	H	38.29	14.64	32.88	52.27	54.00	-1.73	AV
High Channel 5230 MHz ac40 mode power setting 18											
5230	70.16	0	223	H	33.78	8.61	0.00	112.55	-	-	PK
5230	61.25	0	223	H	33.78	8.61	0.00	103.64	-	-	AV
5230	69.53	0	199	V	33.78	8.61	0.00	111.92	-	-	PK
5230	60.75	0	199	V	33.78	8.61	0.00	103.14	-	-	AV
10460	43.88	0	100	H	38.28	14.64	32.88	63.92	74.00	-10.08	PK
10460	32.06	0	100	H	38.28	14.64	32.88	52.10	54.00	-1.90	AV

25 dBi Antenna

802.11ac20 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5190 MHz ac20 mode power setting -6											
5190	57.96	0	199	H	33.62	8.61	36.00	64.19	-	-	PK
5190	48.38	0	199	H	33.62	8.61	0.00	90.61	-	-	AV
5190	57.38	0	200	V	33.62	8.61	0.00	99.61	-	-	PK
5190	48.24	0	200	V	33.62	8.61	0.00	90.47	-	-	AV
5150	45.14	0	189	H	33.53	9.82	35.54	52.94	74.00	-21.06	PK
5150	35.36	0	189	H	33.53	9.82	35.54	43.16	54.00	-10.84	AV
5150	45.31	0	189	V	33.42	9.82	35.54	53.01	74.00	-21.00	PK
5150	35.21	0	189	V	33.42	9.82	35.54	42.91	54.00	-11.10	AV
10380	44.39	0	100	H	38.20	14.62	35.07	62.14	74.00	-11.86	PK
10380	32.09	0	100	H	38.20	14.62	35.07	49.84	54.00	-4.16	AV
10380	44.52	0	100	V	38.12	14.62	35.07	62.19	74.00	-11.81	PK
10380	32.35	0	100	V	38.12	14.62	35.07	50.02	54.00	-3.98	AV
Middle Channel 5220 MHz ac20 mode power setting -6											
5220	57.81	0	205	H	33.78	8.61	0.00	100.20	-	-	PK
5220	48.93	0	205	H	33.78	8.61	0.00	91.32	-	-	AV
5220	57.33	0	207	V	33.78	8.61	0.00	99.72	-	-	PK
5220	48.79	0	207	V	33.78	8.61	0.00	91.18	-	-	AV
10400	43.87	0	100	H	38.29	14.64	35.07	61.73	74.00	-12.27	PK
10400	31.99	0	100	H	38.29	14.64	35.07	49.85	54.00	-4.15	AV
High Channel 5240 MHz ac20 mode power setting -6											
5240	57.56	0	203	H	33.78	8.61	0.00	99.95	-	-	PK
5240	48.32	0	203	H	33.78	8.61	0.00	90.71	-	-	AV
5240	57.51	0	211	V	33.78	8.61	0.00	99.90	-	-	PK
5240	48.27	0	211	V	33.78	8.61	0.00	90.66	-	-	AV
10480	43.85	0	100	H	38.28	14.64	34.96	61.81	74.00	-12.19	PK
10480	32.48	0	100	H	38.28	14.64	34.96	50.44	54.00	-3.56	AV

802.11ac40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5200 MHz ac40 mode power setting -6											
5200	54.72	0	201	H	33.62	8.61	0.00	96.95	-	-	PK
5200	45.66	0	201	H	33.62	8.61	0.00	87.89	-	-	AV
5200	54.24	0	201	V	33.62	8.61	0.00	96.47	-	-	PK
5200	45.38	0	201	V	33.62	8.61	0.00	87.61	-	-	AV
5150	45.06	0	189	H	33.53	9.82	35.54	52.86	74.00	-21.14	PK
5150	34.67	0	189	H	33.53	9.82	35.54	42.47	54.00	-11.53	AV
5150	45.09	0	189	V	33.42	9.82	35.54	52.79	74.00	-21.22	PK
5150	34.50	0	189	V	33.42	9.82	35.54	42.20	54.00	-11.81	AV
10400	44.91	0	100	H	38.20	14.59	35.07	62.63	74.00	-11.37	PK
10400	32.30	0	100	H	38.20	14.59	35.07	50.02	54.00	-3.98	AV
Middle Channel 5215 MHz ac20 mode power setting -6											
5215	54.69	0	200	H	33.78	8.61	0.00	97.08	-	-	PK
5215	45.97	0	200	H	33.78	8.61	0.00	88.36	-	-	AV
5215	54.31	0	202	V	33.78	8.61	0.00	96.70	-	-	PK
5215	45.63	0	202	V	33.78	8.61	0.00	88.02	-	-	AV
10430	44.23	0	100	H	38.29	14.64	35.07	62.09	74.00	-11.91	PK
10430	32.29	0	100	H	38.29	14.64	35.07	50.15	54.00	-3.85	AV
High Channel 5230 MHz ac40 mode power setting -6											
5230	54.87	0	205	H	33.78	8.61	0.00	97.26	-	-	PK
5230	45.26	0	205	H	33.78	8.61	0.00	87.65	-	-	AV
5230	54.61	0	211	V	33.78	8.61	0.00	97.00	-	-	PK
5230	45.34	0	211	V	33.78	8.61	0.00	87.73	-	-	AV
10460	44.37	0	100	H	38.28	14.64	34.96	62.33	74.00	-11.67	PK
10460	32.09	0	100	H	38.28	14.64	34.96	50.05	54.00	-3.95	AV

U-NII-3

8 dBi Antenna

802.11ac20 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5745 MHz ac20 mode power setting 18											
5745	71.33	0	241	H	34.07	8.61	0.00	114.01	-	-	PK
5745	62.53	0	241	H	34.07	8.61	0.00	105.21	-	-	AV
5745	70.48	0	239	V	34.07	8.61	0.00	113.16	-	-	PK
5745	62.39	0	239	V	34.07	8.61	0.00	105.07	-	-	AV
11490	42.99	0	100	H	38.45	14.59	32.88	63.16	74.00	-10.84	PK
11490	31.89	0	100	H	38.45	14.59	32.88	52.06	54.00	-1.94	AV
Middle Channel 5775 MHz ac20 mode power setting 18											
5775	71.46	0	245	H	34.17	8.61	0.00	114.24	-	-	PK
5775	62.66	0	245	H	34.17	8.61	0.00	105.44	-	-	AV
5775	70.69	0	236	V	34.17	8.61	0.00	113.47	-	-	PK
5775	62.53	0	236	V	34.17	8.61	0.00	105.31	-	-	AV
11550	42.89	0	100	H	38.46	14.64	32.88	63.11	74.00	-10.89	PK
11550	31.72	0	100	H	38.46	14.64	32.88	51.94	54.00	-2.06	AV
High Channel 5810 MHz ac20 mode power setting 18											
5810	71.65	0	207	H	34.24	9.10	0.00	114.99	-	-	PK
5810	63.09	0	207	H	34.24	9.10	0.00	106.43	-	-	AV
5810	70.98	0	223	V	34.24	9.10	0.00	114.32	-	-	PK
5810	62.55	0	223	V	34.24	9.10	0.00	105.89	-	-	AV
11620	43.05	0	100	H	38.60	15.69	32.75	64.59	74.00	-9.41	PK
11620	31.55	0	100	H	38.60	15.69	32.75	53.09	54.00	-0.91	AV

802.11ac40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5755 MHz ac40 mode power setting 18											
5755	69.86	0	207	H	34.07	8.61	0.00	112.54	-	-	PK
5755	60.75	0	207	H	34.07	8.61	0.00	103.43	-	-	AV
5755	69.22	0	218	V	34.07	8.61	0.00	111.90	-	-	PK
5755	60.12	0	218	V	34.07	8.61	0.00	102.80	-	-	AV
11510	43.11	0	100	H	38.45	14.59	32.88	63.28	74.00	-10.72	PK
11510	31.96	0	100	H	38.45	14.59	32.88	52.13	54.00	-1.87	AV
Mid Channel 5780 MHz ac40 mode power setting 18											
5775	69.79	0	208	H	34.17	8.61	0.00	112.57	-	-	PK
5775	60.83	0	208	H	34.17	8.61	0.00	103.61	-	-	AV
5775	69.01	0	215	V	34.17	8.61	0.00	111.79	-	-	PK
5775	59.70	0	215	V	34.17	8.61	0.00	102.48	-	-	AV
11550	43.05	0	100	H	38.46	14.64	32.88	63.27	74.00	-10.73	PK
11550	31.77	0	100	H	38.46	14.64	32.88	51.99	54.00	-2.01	AV
High Channel 5800 MHz ac40 mode power setting 18											
5800	69.66	0	199	H	34.24	8.61	0.00	112.51	-	-	PK
5800	60.65	0	199	H	34.24	8.61	0.00	103.50	-	-	AV
5800	69.13	0	212	V	34.24	8.61	0.00	111.98	-	-	PK
5800	59.99	0	212	V	34.24	8.61	0.00	102.84	-	-	AV
11600	42.87	0	100	H	38.60	14.64	32.88	63.23	74.00	-10.77	PK
11600	31.69	0	100	H	38.60	14.64	32.88	52.05	54.00	-1.95	AV

802.11ac80 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5775 MHz ac80 mode power setting 18											
5775	67.98	0	215	H	34.17	9.10	0.00	111.25	-	-	PK
5775	57.91	0	215	H	34.17	9.10	0.00	101.18	-	-	AV
5775	67.32	0	236	V	34.17	9.10	0.00	110.59	-	-	PK
5775	57.44	0	236	V	34.17	9.10	0.00	100.71	-	-	AV
11450	43.45	0	100	H	38.46	15.69	32.75	64.85	74.00	-9.15	PK
11450	32.05	0	100	H	38.46	15.69	32.75	53.45	54.00	-0.55	AV
High Channel 5780 MHz ac80 mode power setting 18											
5780	67.76	0	221	H	34.17	9.10	0.00	111.03	-	-	PK
5780	57.70	0	221	H	34.17	9.10	0.00	100.97	-	-	AV
5780	67.43	0	233	V	34.17	9.10	0.00	110.70	-	-	PK
5780	57.56	0	233	V	34.17	9.10	0.00	100.83	-	-	AV
11560	43.36	0	100	H	38.46	15.69	32.75	64.76	74.00	-9.24	PK
11560	32.20	0	100	H	38.46	15.69	32.75	53.60	54.00	-0.40	AV

25 dBi Antenna

802.11ac20 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5745 MHz ac20 mode power setting -6											
5745	61.26	0	201	H	33.62	8.61	0.00	103.49	-	-	PK
5745	51.83	0	201	H	33.62	8.61	0.00	94.06	-	-	AV
5745	60.82	0	196	V	33.62	8.61	0.00	103.05	-	-	PK
5745	51.42	0	196	V	33.62	8.61	0.00	93.65	-	-	AV
5725	63.38	0	201	H	34.07	10.31	35.41	72.34	122.20	-49.86	PK
5725	63.12	0	196	V	33.97	10.31	35.41	71.99	122.20	-50.21	PK
5720	58.98	0	201	H	34.02	10.31	35.41	67.90	110.80	-42.90	PK
5720	58.44	0	196	V	33.93	10.31	35.41	67.27	110.80	-43.53	PK
5700	50.64	0	201	H	34.02	10.31	35.41	59.56	105.20	-45.64	PK
5700	50.29	0	196	V	33.93	10.31	35.41	59.12	105.20	-46.08	PK
5650	44.75	0	201	H	34.05	10.31	35.41	53.69	68.26	-14.57	PK
5650	44.51	0	196	V	34.02	10.31	35.41	53.42	68.26	-14.84	PK
11490	42.41	0	100	H	38.26	14.59	34.32	60.94	74.00	-13.06	PK
11490	32.50	0	100	H	38.26	14.59	34.32	51.03	54.00	-2.97	AV
Middle Channel 5775 MHz ac20 mode power setting -6											
5300	60.77	0	200	H	33.78	8.61	0.00	103.16	-	-	PK
5300	51.62	0	200	H	33.78	8.61	0.00	94.01	-	-	AV
5300	60.79	0	199	V	33.78	8.61	0.00	103.18	-	-	PK
5300	51.54	0	199	V	33.78	8.61	0.00	93.93	-	-	AV
10600	42.13	0	100	H	38.29	14.64	34.90	60.16	74.00	-13.85	PK
10600	32.34	0	100	H	38.29	14.64	34.90	50.37	54.00	-3.64	AV
High Channel 5810 MHz ac20 mode power setting -6											
5810	61.80	0	205	H	33.78	8.61	0.00	104.19	-	-	PK
5810	52.93	0	205	H	33.78	8.61	0.00	95.32	-	-	AV
5810	60.46	0	195	V	33.78	8.61	0.00	102.85	-	-	PK
5810	51.57	0	195	V	33.78	8.61	0.00	93.96	-	-	AV
5850	55.17	0	205	H	34.24	10.59	35.43	64.57	122.20	-57.63	PK
5850	54.93	0	195	V	34.14	10.59	35.43	64.23	122.20	-57.97	PK
5855	53.85	0	205	H	34.24	10.59	35.43	63.25	110.80	-47.55	PK
5855	53.28	0	195	V	34.14	10.59	35.43	62.58	110.80	-48.22	PK
5875	50.88	0	205	H	34.31	10.59	35.43	60.35	105.20	-44.85	PK
5875	50.67	0	195	V	34.24	10.59	35.43	60.07	105.20	-45.13	PK
5900	46.84	0	205	H	34.31	10.59	35.43	56.31	68.26	-11.95	PK
5900	46.37	0	195	V	34.24	10.59	35.43	55.77	68.26	-12.49	PK
11620	42.21	0	100	H	38.28	14.64	34.34	60.79	74.00	-13.21	PK
11620	32.12	0	100	H	38.28	14.64	34.34	50.70	54.00	-3.30	AV

802.11ac40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5755 MHz ac40 mode power setting -6											
5755	60.36	0	199	H	33.62	8.61	0.00	102.59	-	-	PK
5755	51.18	0	199	H	33.62	8.61	0.00	93.41	-	-	AV
5755	59.87	0	200	V	33.62	8.61	0.00	102.10	-	-	PK
5755	51.11	0	200	V	33.62	8.61	0.00	93.34	-	-	AV
5725	62.60	0	199	H	34.07	10.31	35.41	71.56	122.20	-50.64	PK
5725	62.44	0	200	V	33.97	10.31	35.41	71.31	122.20	-50.89	PK
5720	60.93	0	199	H	34.02	10.31	35.41	69.85	110.80	-40.95	PK
5720	60.82	0	200	V	33.93	10.31	35.41	69.65	110.80	-41.15	PK
5700	52.31	0	199	H	34.02	10.31	35.41	61.23	105.20	-43.97	PK
5700	51.96	0	200	V	33.93	10.31	35.41	60.79	105.20	-44.41	PK
5650	46.71	0	199	H	34.05	10.31	35.41	55.65	68.26	-12.61	PK
5650	46.76	0	200	V	34.02	10.31	35.41	55.67	68.26	-12.59	PK
11510	41.41	0	100	H	38.20	14.59	34.32	59.88	74.00	-14.12	PK
11510	31.91	0	100	H	38.20	14.59	34.32	50.38	54.00	-3.62	AV
Mid Channel 5780 MHz ac40 mode power setting -6											
5780	60.58	0	200	H	33.62	8.61	0.00	102.81	-	-	PK
5780	51.23	0	200	H	33.62	8.61	0.00	93.46	-	-	AV
5780	60.09	0	200	V	33.62	8.61	0.00	102.32	-	-	PK
5780	50.94	0	200	V	33.62	8.61	0.00	93.17	-	-	AV
11560	39.36	0	100	H	38.20	14.59	34.90	57.25	74.00	-16.75	PK
11560	30.31	0	100	H	38.20	14.59	34.90	48.20	54.00	-5.80	AV
High Channel 5800 MHz ac40 mode power setting -6											
5800	60.08	0	199	H	33.78	8.61	0.00	102.47	-	-	PK
5800	50.92	0	199	H	33.78	8.61	0.00	93.31	-	-	AV
5800	59.96	0	201	V	33.78	8.61	0.00	102.35	-	-	PK
5800	50.23	0	201	V	33.78	8.61	0.00	92.62	-	-	AV
5850	54.32	0	199	H	34.24	10.59	35.43	63.72	122.20	-58.48	PK
5850	54.21	0	201	V	34.14	10.59	35.43	63.51	122.20	-58.69	PK
5855	53.18	0	199	H	34.24	10.59	35.43	62.58	110.80	-48.22	PK
5855	52.76	0	201	V	34.14	10.59	35.43	62.06	110.80	-48.74	PK
5875	51.19	0	199	H	34.31	10.59	35.43	60.66	105.20	-44.54	PK
5875	50.63	0	201	V	34.24	10.59	35.43	60.03	105.20	-45.17	PK
5900	48.01	0	199	H	34.31	10.59	35.43	57.48	68.26	-10.78	PK
5900	48.23	0	201	V	34.24	10.59	35.43	57.63	68.26	-10.63	PK
11600	39.94	0	100	H	38.28	14.64	34.34	58.52	74.00	-15.48	PK
11600	30.38	0	100	H	38.28	14.64	34.34	48.96	54.00	-5.04	AV

802.11ac80 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5775 MHz ac80 mode power setting -6											
5775	57.82	0	199	H	33.78	8.61	0.00	100.21	-	-	PK
5775	48.53	0	199	H	33.78	8.61	0.00	90.92	-	-	AV
5775	57.46	0	200	V	33.78	8.61	0.00	99.85	-	-	PK
5775	48.27	0	200	V	33.78	8.61	0.00	90.66	-	-	AV
5725	59.00	0	199	H	34.07	10.31	35.41	67.96	105.20	-37.24	PK
5725	59.26	0	200	V	33.97	10.31	35.41	68.13	105.20	-37.07	PK
5720	56.76	0	199	H	34.02	10.31	35.41	65.68	110.80	-45.12	PK
5720	56.81	0	200	V	33.93	10.31	35.41	65.64	110.80	-45.16	PK
5700	54.96	0	199	H	34.02	10.31	35.41	63.88	105.20	-41.32	PK
5700	54.83	0	200	V	33.93	10.31	35.41	63.66	105.20	-41.54	PK
5650	49.32	0	199	H	34.05	10.31	35.41	58.26	68.26	-10.00	PK
5650	49.24	0	200	V	34.02	10.31	35.41	58.15	68.26	-10.11	PK
5850	58.48	0	199	H	34.24	10.59	35.43	67.88	105.20	-37.32	PK
5850	58.32	0	200	V	34.14	10.59	35.43	67.62	105.20	-37.58	PK
5855	56.28	0	199	H	34.24	10.59	35.43	65.68	110.80	-45.12	PK
5855	56.16	0	200	V	34.14	10.59	35.43	65.46	110.80	-45.34	PK
5875	54.50	0	199	H	34.31	10.59	35.43	63.97	105.20	-41.23	PK
5875	54.52	0	200	V	34.24	10.59	35.43	63.92	105.20	-41.28	PK
5900	49.05	0	199	H	34.31	10.59	35.43	58.52	68.26	-9.74	PK
5900	49.16	0	200	V	34.24	10.59	35.43	58.56	68.26	-9.70	PK
11550	41.98	0	100	H	38.22	14.59	34.90	59.89	74.00	-14.11	PK
11550	31.38	0	100	H	38.22	14.59	34.90	49.29	54.00	-4.71	AV

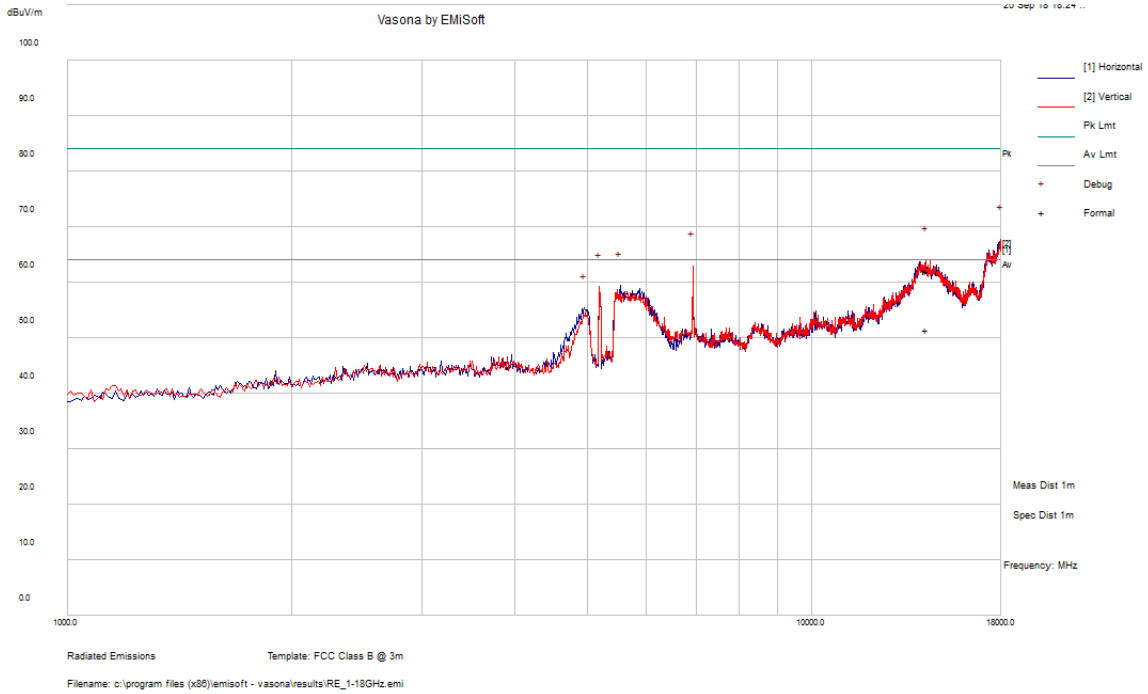
Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5780 MHz ac80 mode power setting -6											
5780	57.74	0	199	H	33.78	8.61	0.00	100.13	-	-	PK
5780	48.48	0	199	H	33.78	8.61	0.00	90.87	-	-	AV
5780	56.93	0	200	V	33.78	8.61	0.00	99.32	-	-	PK
5780	48.12	0	200	V	33.78	8.61	0.00	90.51	-	-	AV
5725	58.52	0	199	H	34.07	10.31	35.41	67.48	105.20	-37.72	PK
5725	58.41	0	200	V	33.97	10.31	35.41	67.28	105.20	-37.92	PK
5720	56.21	0	199	H	34.02	10.31	35.41	65.13	110.80	-45.67	PK
5720	56.33	0	200	V	33.93	10.31	35.41	65.16	110.80	-45.64	PK
5700	55.09	0	199	H	34.02	10.31	35.41	64.01	105.20	-41.19	PK
5700	54.75	0	200	V	33.93	10.31	35.41	63.58	105.20	-41.62	PK
5650	49.11	0	199	H	34.05	10.31	35.41	58.05	68.26	-10.21	PK
5650	48.89	0	200	V	34.02	10.31	35.41	57.80	68.26	-10.46	PK
5850	59.88	0	199	H	34.07	10.31	35.43	68.82	122.20	-53.38	PK
5850	59.12	0	196	V	33.97	10.31	35.43	67.97	122.20	-54.23	PK
5855	58.18	0	199	H	34.02	10.31	35.43	67.08	110.80	-43.72	PK
5855	57.96	0	196	V	33.93	10.31	35.43	66.77	110.80	-44.03	PK
5875	57.79	0	199	H	34.02	10.31	35.43	66.69	105.20	-38.51	PK
5875	57.63	0	196	V	33.93	10.31	35.43	66.44	105.20	-38.76	PK
5900	50.65	0	199	H	34.05	10.31	35.43	59.57	68.26	-8.69	PK
5900	50.23	0	196	V	34.02	10.31	35.43	59.12	68.26	-9.14	PK
11560	40.20	0	100	H	38.22	14.59	34.34	58.68	74.00	-15.32	PK
11560	31.39	0	100	H	38.22	14.59	34.34	49.87	54.00	-4.13	AV

Note 1: Any emissions above 12 GHz are emissions from the noise floor.

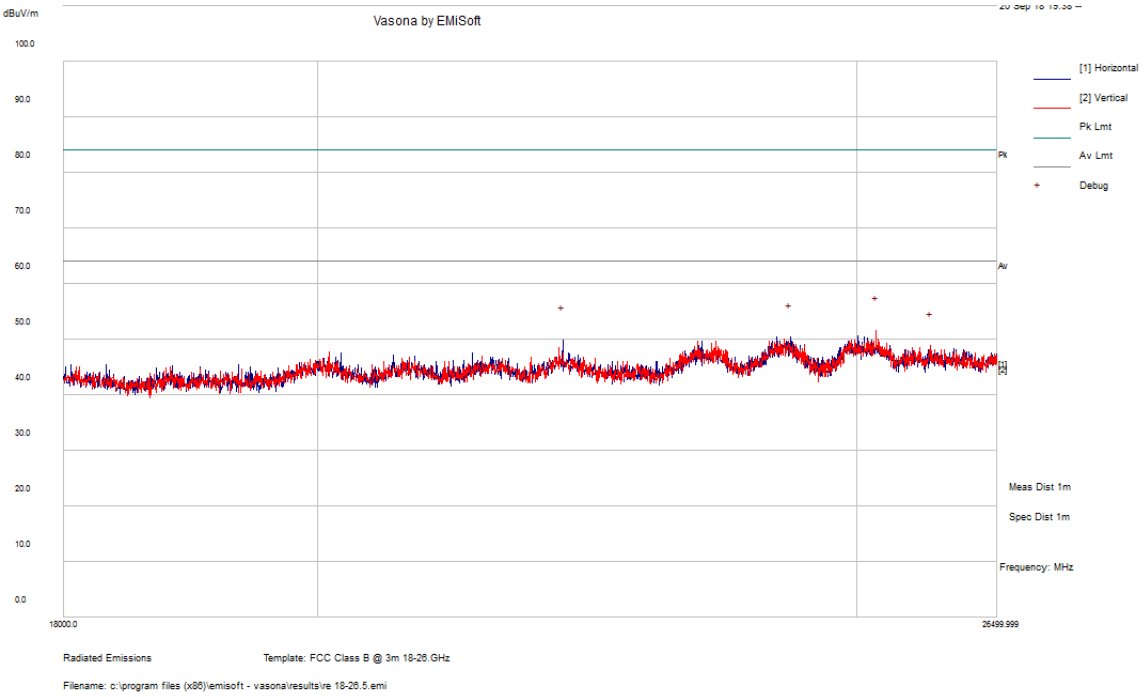
The worst case scan plots have been listed below.

8 dBi Antenna

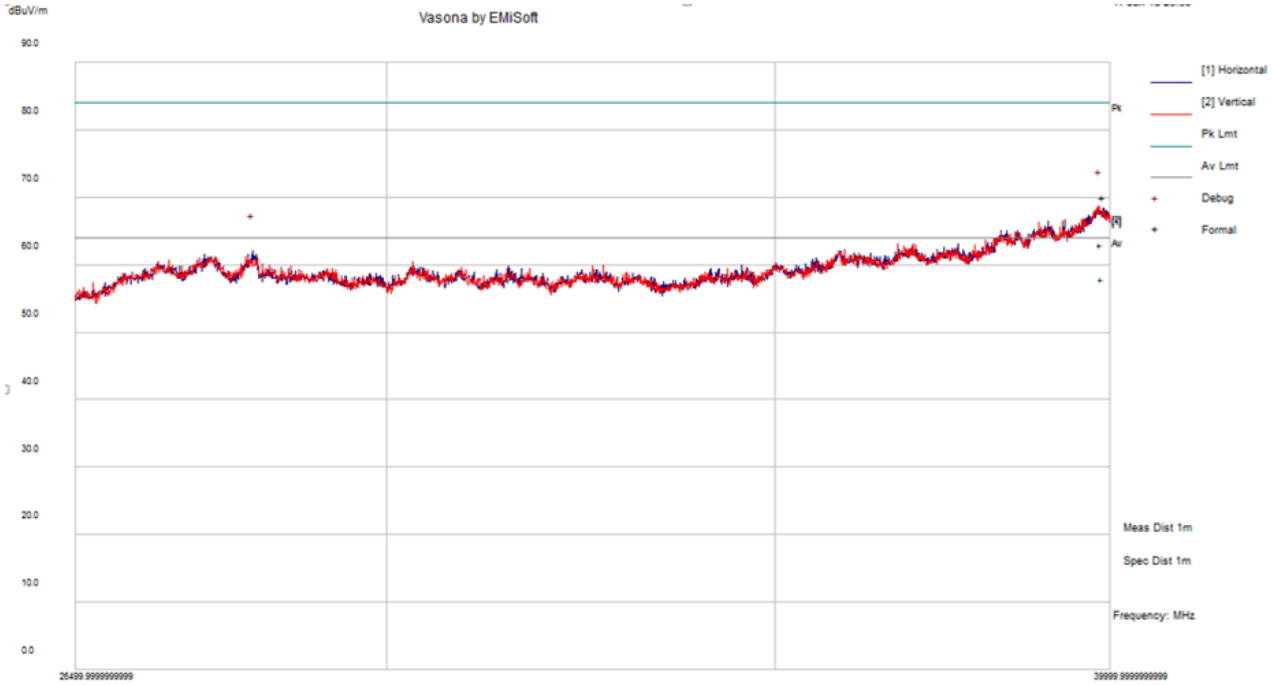
1 GHz – 18 GHz



18 GHz – 26.5 GHz

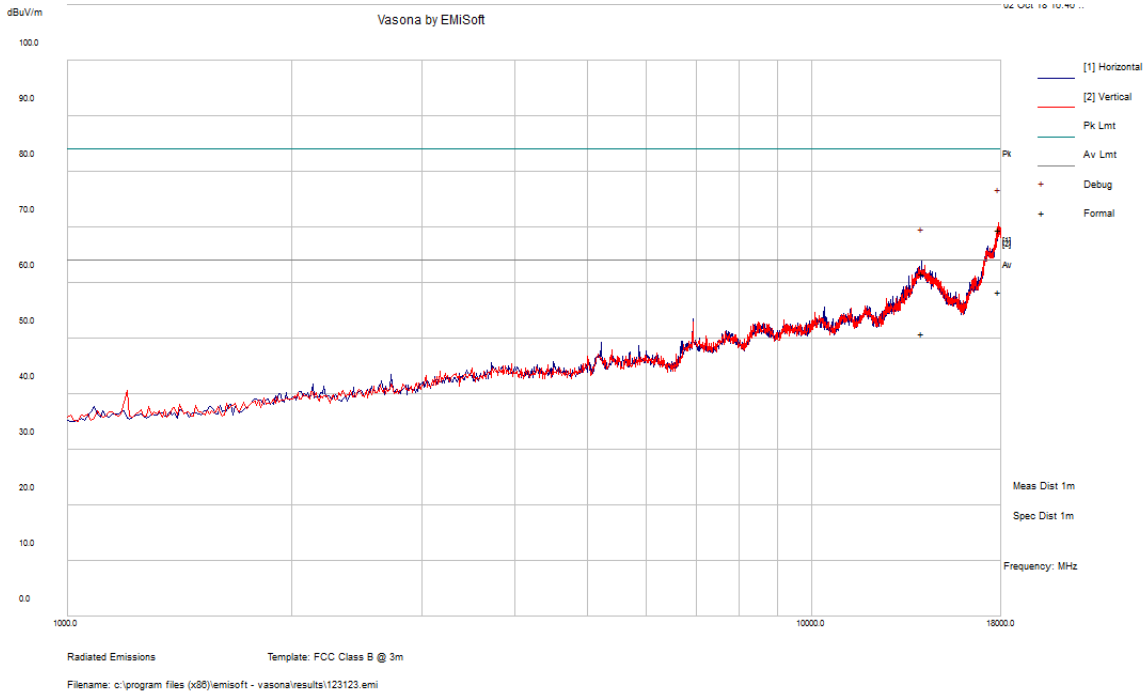


26.5 GHz – 40 GHz

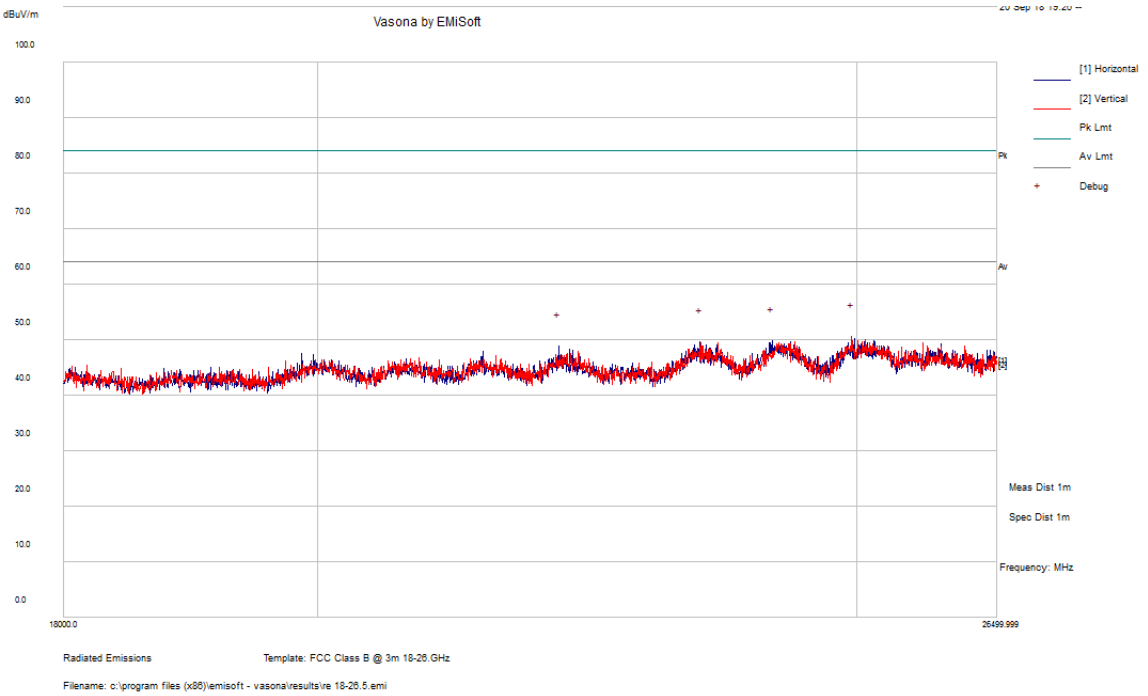


25 dBi Antenna

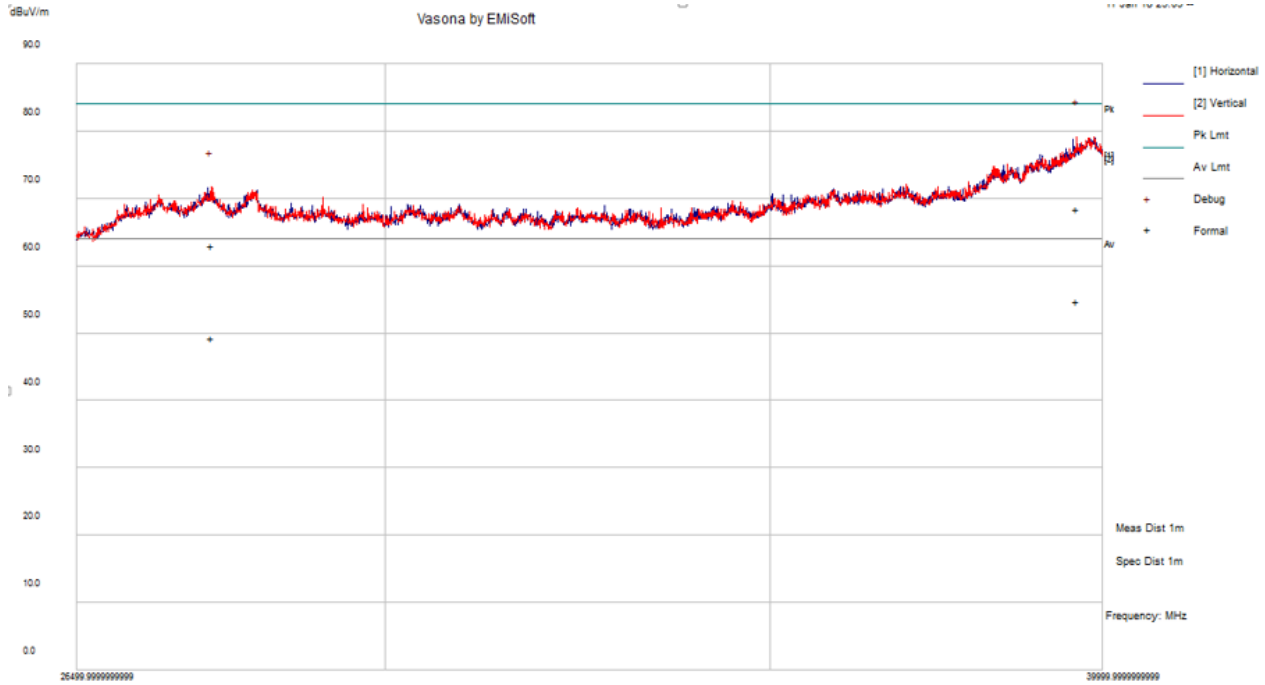
1 GHz – 18 GHz



18 GHz – 26.5 GHz



26.5 GHz – 40 GHz



8 FCC §15.407(e) & ISEDC RSS-247 §6.2 - 6 dB, 26 dB, and 99% Occupied Bandwidth

8.1 Applicable Standards

As per FCC §15.407(e) and ISEDC RSS-247 6.2.4(1): for equipment operating in the band 5725 – 5850 MHz, the minimum 6 dB bandwidth of U-NII devices shall be 500 kHz.

8.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 or 26 dB from the reference level. Record the frequency difference as the minimum emission or emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

8.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	MY48250238	2018-05-08	1 year
-	RF cable	-	-	Each time[1]	N/A
-	20dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 09 June 2016) "A2LA Policy on Metrological Traceability".*

8.4 Test Environmental Conditions

Temperature:	22-24 ºC
Relative Humidity:	40-41 %
ATM Pressure:	103.1-104.1 kPa

The testing was performed by Vincent Licata on 2018-09-13 and Chin Ming Lui on 2018-10-04 at RF site.

8.5 Test Results

Please refer to the following tables and plots.

U-NII-1

Antenna Port	Channel	Frequency (MHz)	99% OBW (kHz)	26 dB OBW (kHz)
802.11ac20 mode				
ANT 1	Low	5190	17965.8	23960
	Middle	5220	17962.1	23974
	High	5240	17950.9	23733
ANT 2	Low	5190	17812.3	23380
	Middle	5220	17805.1	23418
	High	5240	17820.0	23480
802.11ac40 mode				
ANT 1	Low	5200	36455.1	42595
	Middle	5215	36444.6	42525
	High	5230	36448.7	42573
ANT 2	Low	5200	36259.5	41800
	Middle	5215	36261.7	41732
	High	5230	36269.1	41740

U-NII-3

6 dB Bandwidth

Antenna Port	Channel	Frequency (MHz)	6 dB OBW (kHz)	6 dB OBW limit (kHz)
802.11ac20 mode				
ANT 1	Low	5745	17627	≥ 500
	Middle	5775	17621	≥ 500
	High	5810	17626	≥ 500
ANT 2	Low	5745	17639	≥ 500
	Middle	5775	17644	≥ 500
	High	5810	17645	≥ 500
802.11ac40 mode				
ANT 1	Low	5755	36342	≥ 500
	Middle	5775	36404	≥ 500
	High	5800	36422	≥ 500
ANT 2	Low	5755	36405	≥ 500
	Middle	5775	36407	≥ 500
	High	5800	36375	≥ 500
802.11ac80 mode				
ANT 1	Low	5775	75488	≥ 500
	High	5780	75504	≥ 500
ANT 2	Low	5775	75436	≥ 500
	High	5780	75374	≥ 500

26 dB Bandwidth

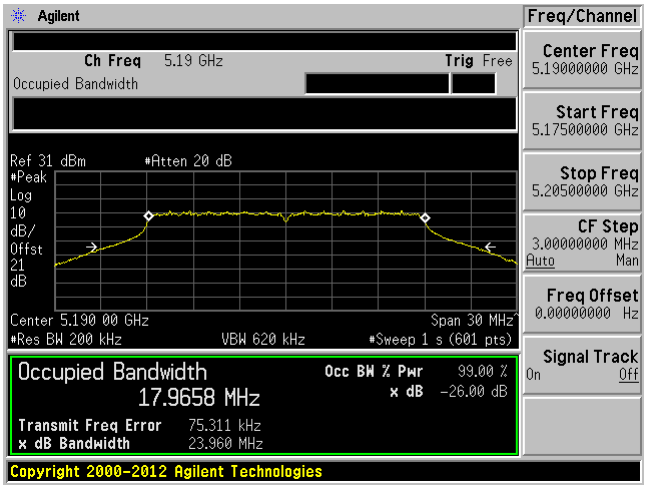
Antenna Port	Channel	Frequency (MHz)	99% OBW (kHz)	26 dB OBW (kHz)
802.11ac20 mode				
ANT 1	Low	5745	17948.5	17696
	Middle	5775	17945.1	17697
	High	5810	17935.6	17692
ANT 2	Low	5745	17816.2	17752
	Middle	5775	17807.5	17742
	High	5810	17814.3	17735
802.11ac40 mode				
ANT 1	Low	5755	36454.6	36549
	Middle	5775	36436.7	36543
	High	5800	36453.3	36556
ANT 2	Low	5755	36301.8	36569
	Middle	5775	36280.2	36542
	High	5800	36280.2	36558
802.11ac80 mode				
ANT 1	Low	5775	75343.2	76171
	High	5780	75321.0	76142
ANT 2	Low	5775	75402.7	75940
	High	5780	75401.2	75949

U-NII-1

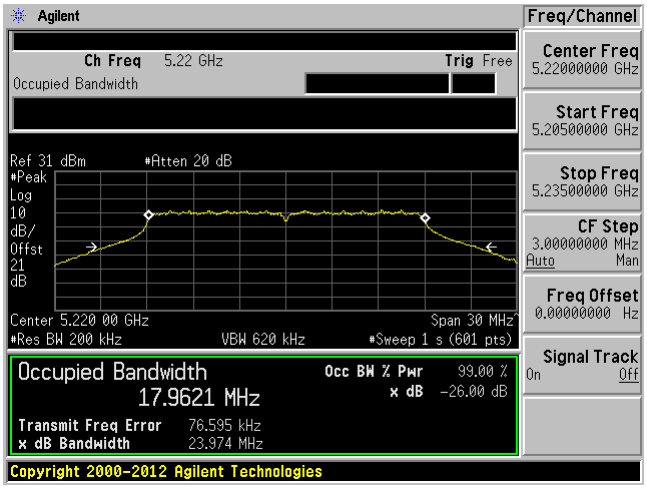
Antenna Port 1

802.11ac20 mode

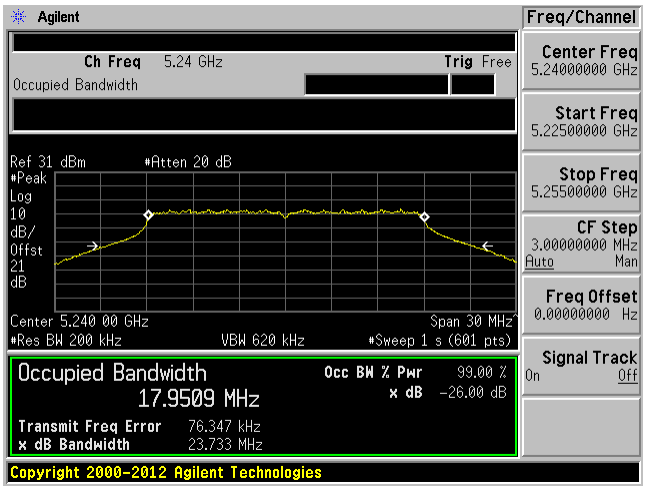
5190 MHz



5220 MHz

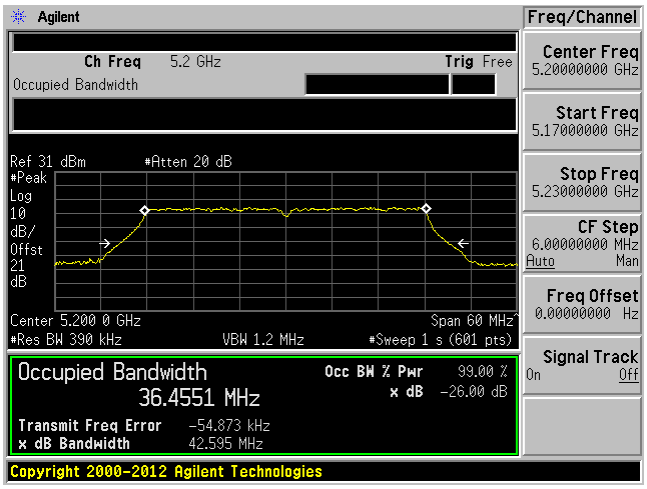


5240 MHz

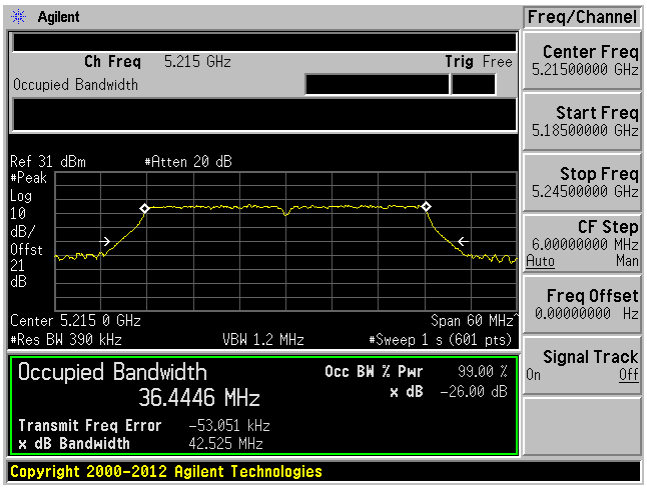


802.11ac40 mode

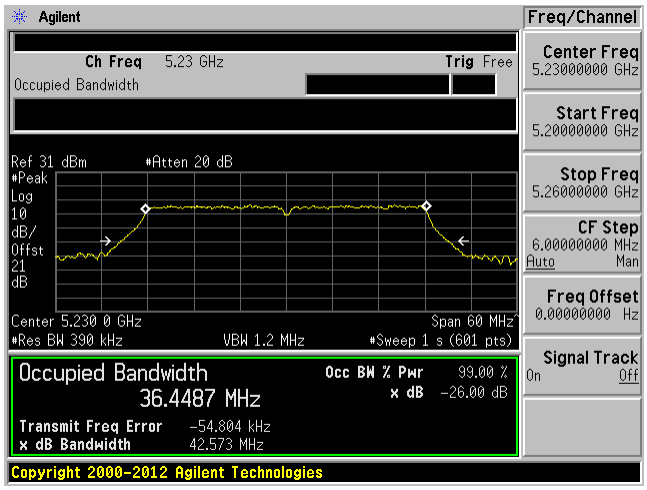
5200 MHz



5215 MHz



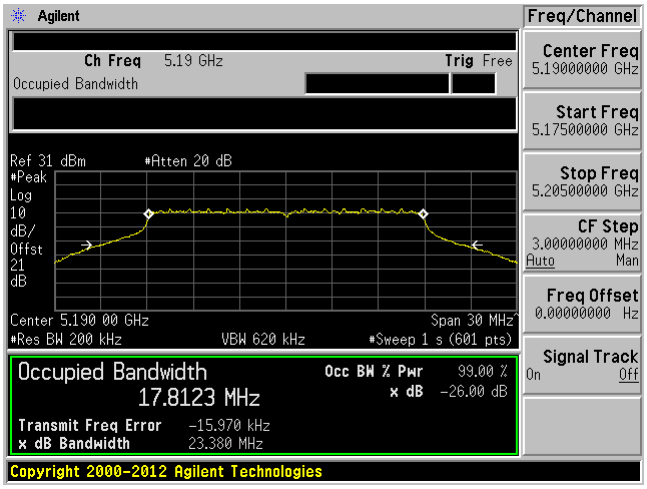
5230 MHz



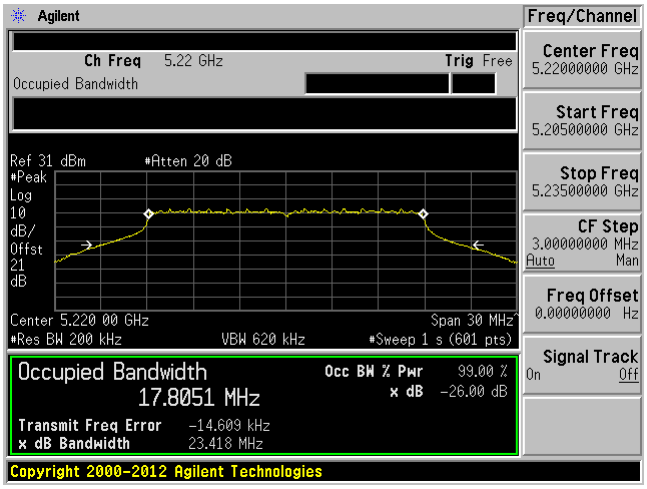
Antenna Port 2

802.11ac20 mode

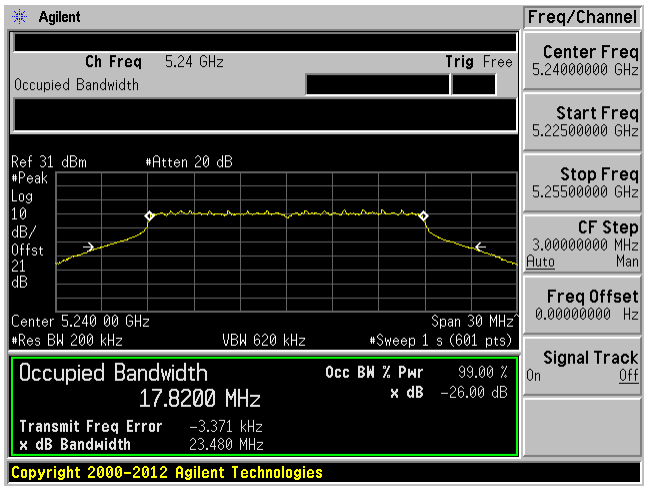
5190 MHz



5220 MHz

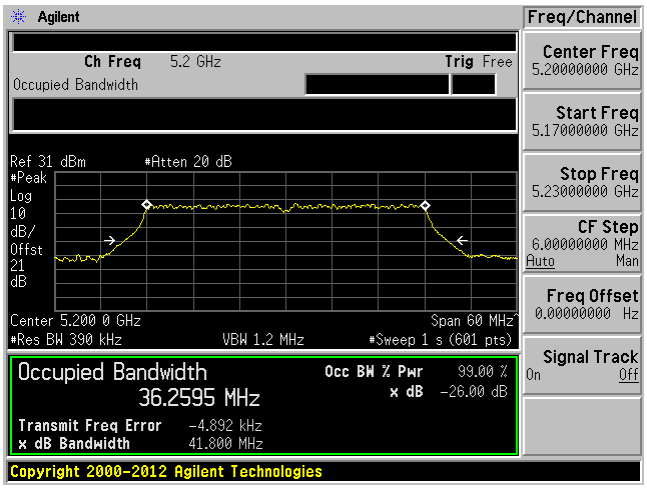


5240 MHz

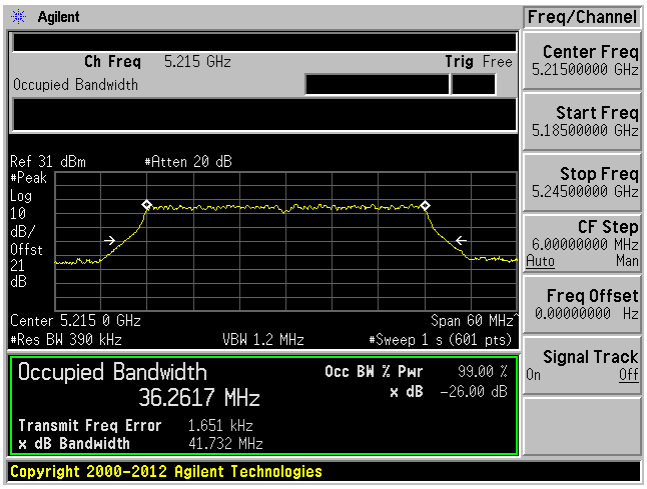


802.11ac40 mode

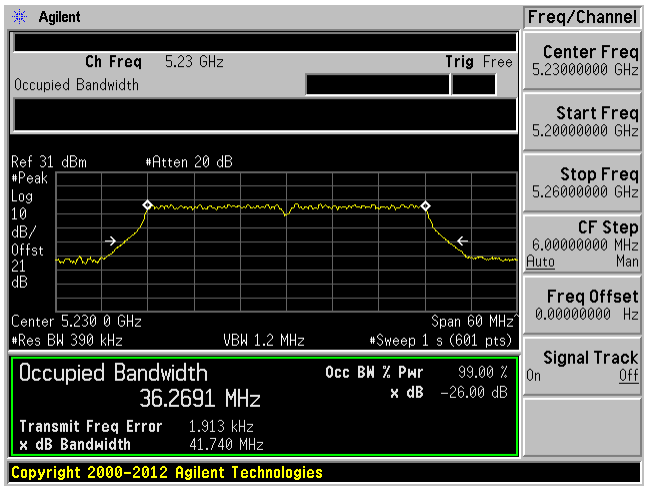
5200 MHz



5215 MHz



5230 MHz



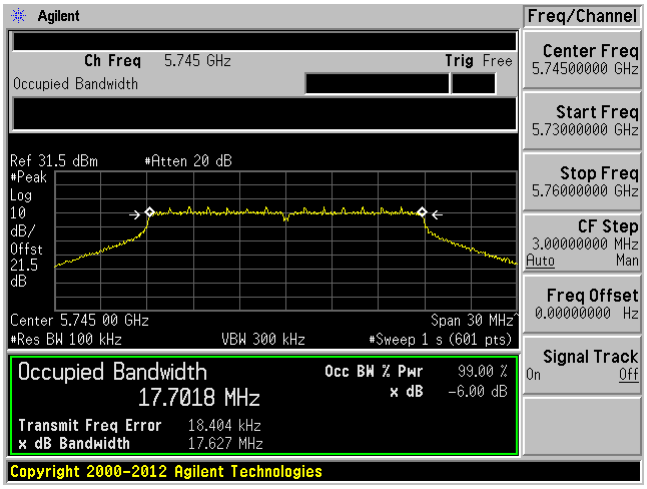
U-NII-3

6dB Bandwidth

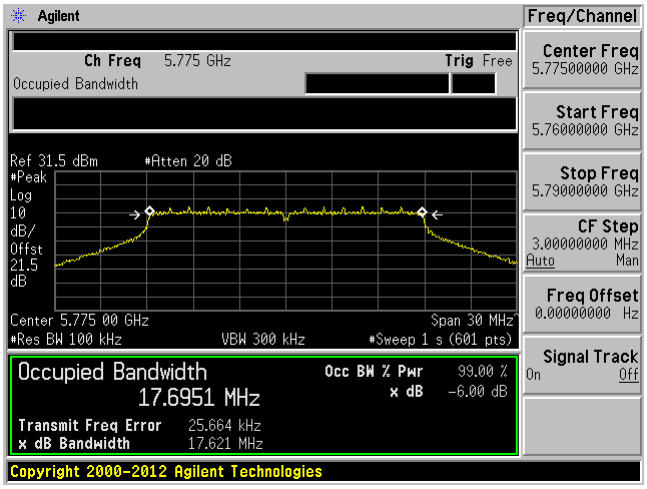
Antenna Port 1

802.11ac20 mode

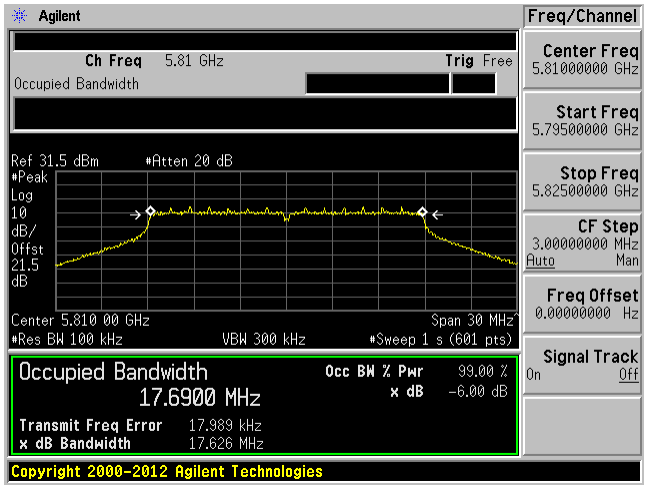
5745 MHz



5775 MHz

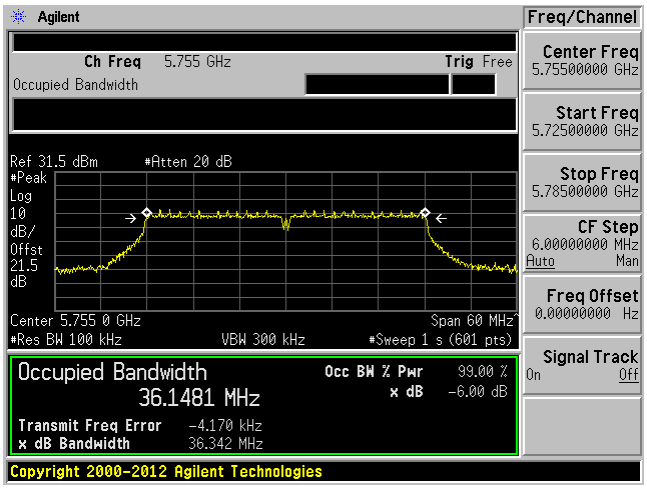


5810 MHz

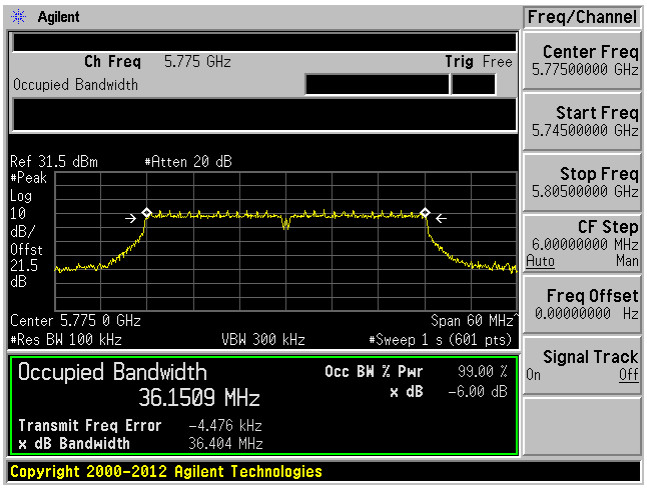


802.11ac40 mode

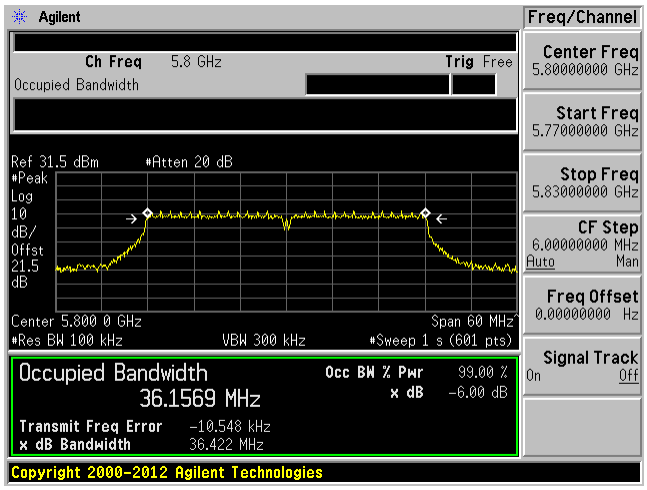
5755 MHz



5775 MHz

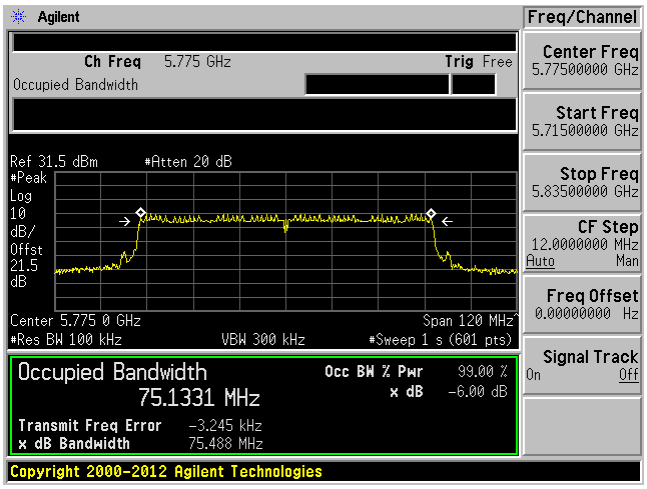


5800 MHz

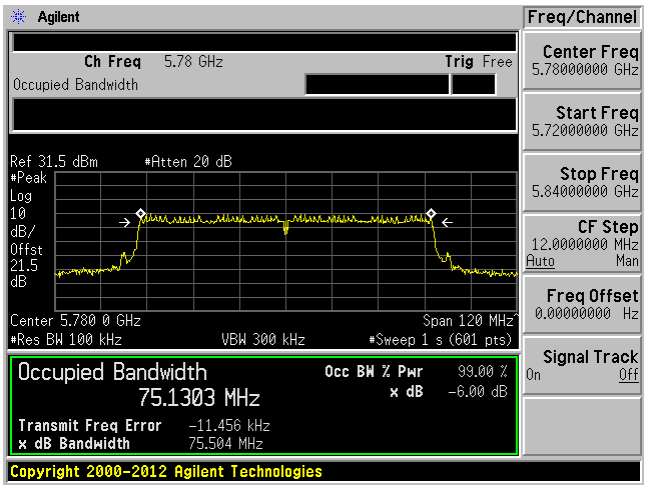


802.11ac80 mode

5775 MHz



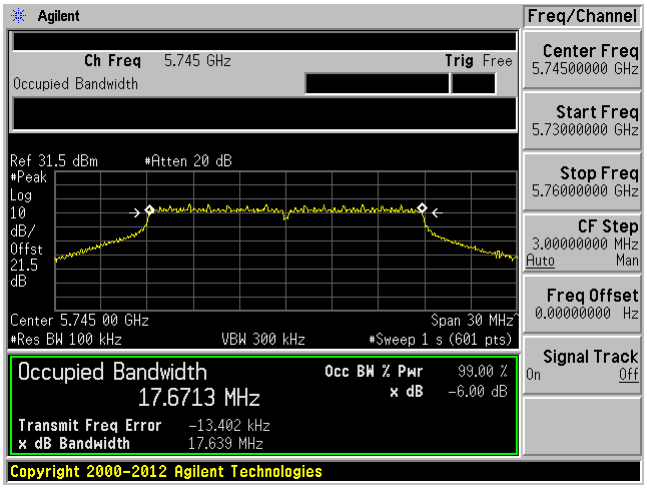
5780 MHz



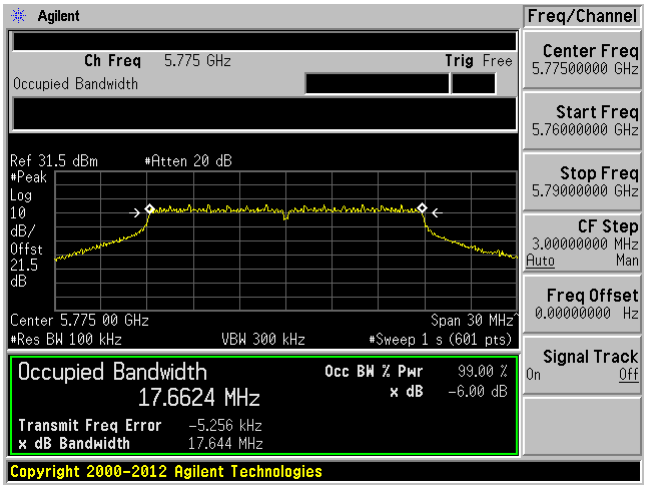
Antenna Port 2

802.11ac20 mode

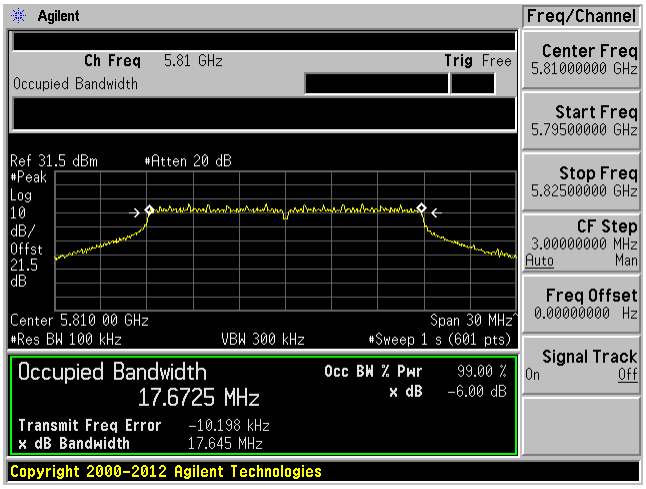
5745 MHz



5775 MHz

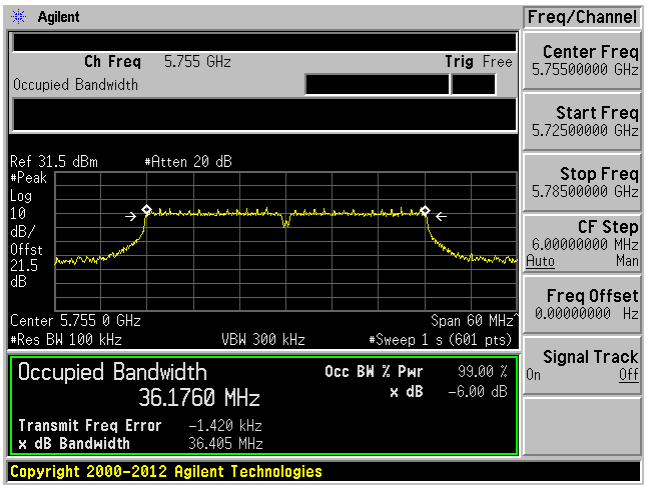


5810 MHz

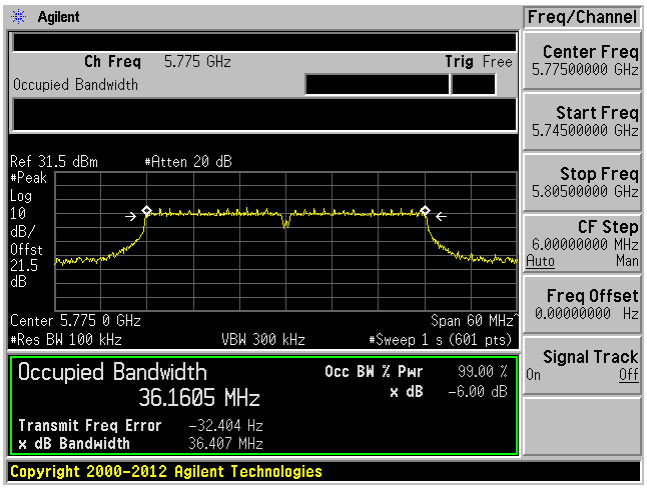


802.11ac40 mode

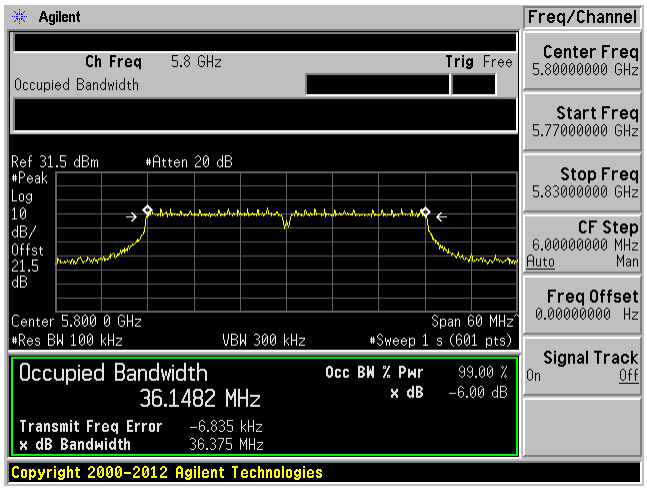
5755 MHz



5775 MHz

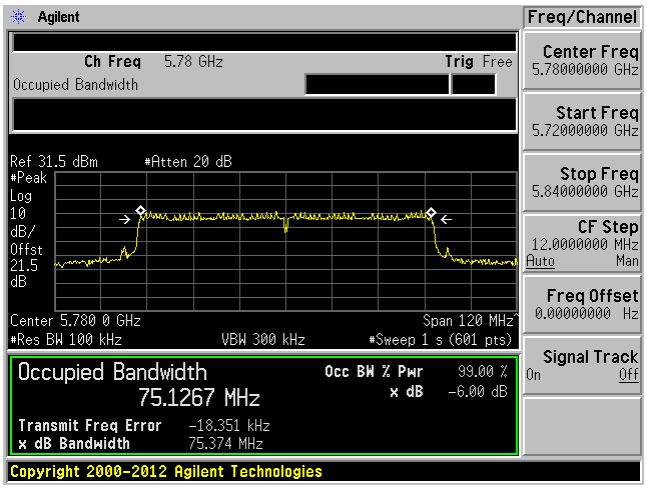


5800 MHz

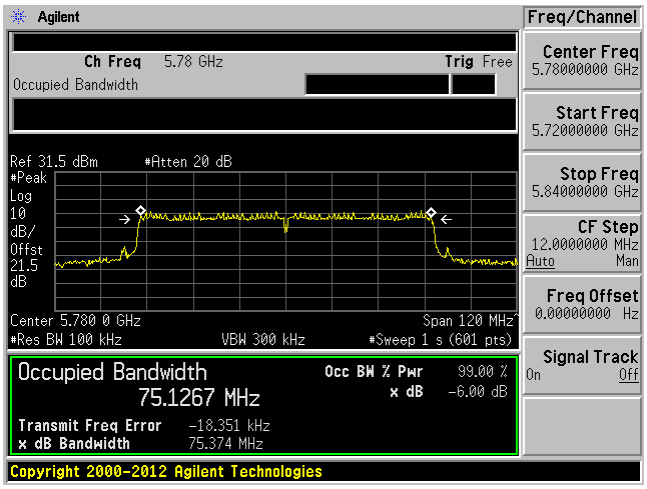


802.11ac80 mode

5775 MHz



5780 MHz

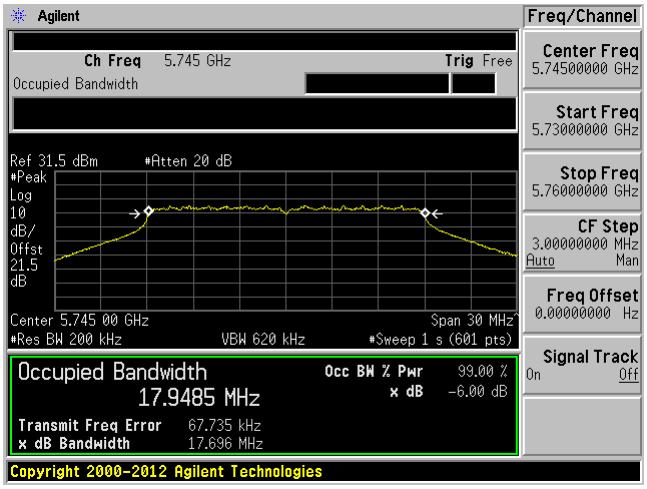


26dB Bandwidth

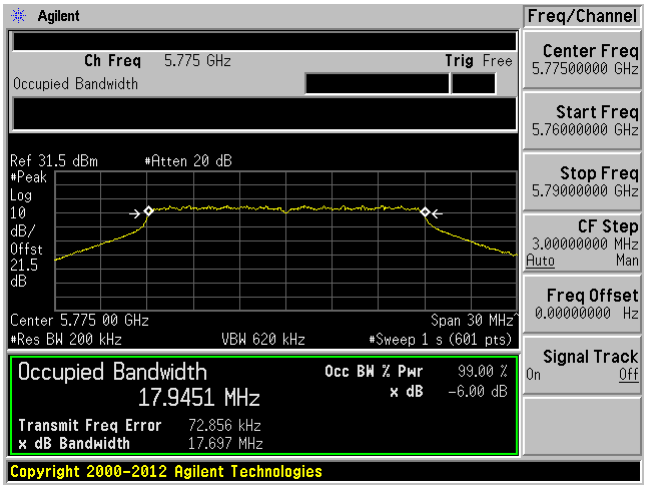
Antenna Port 1

802.11ac20 mode

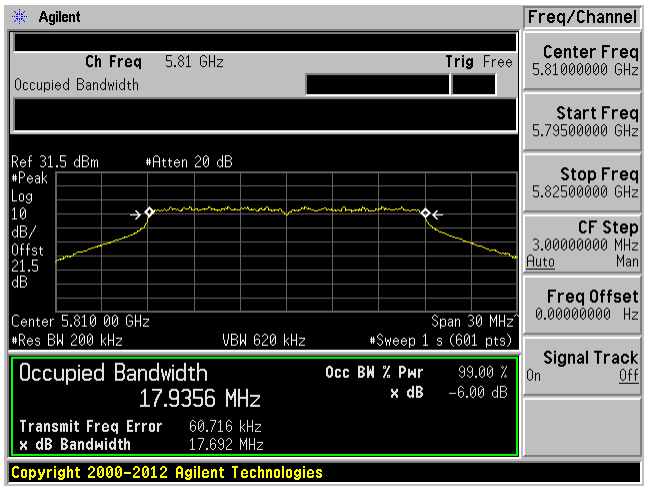
5745 MHz



5775 MHz

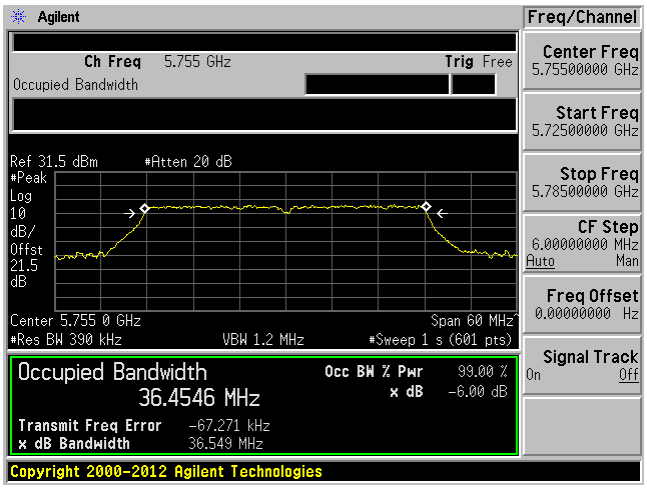


5810 MHz

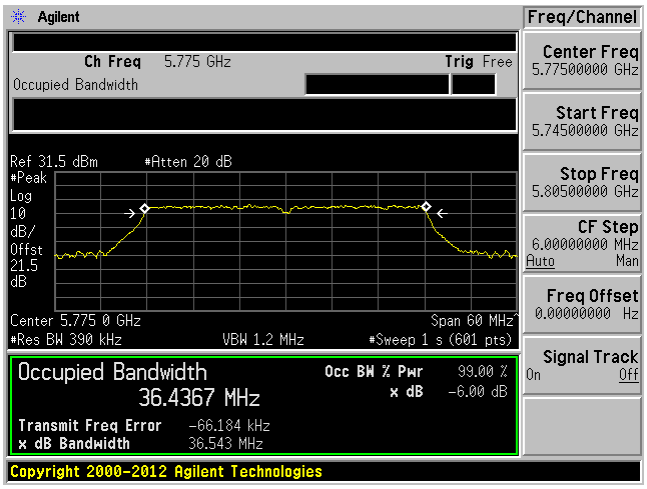


802.11ac40 mode

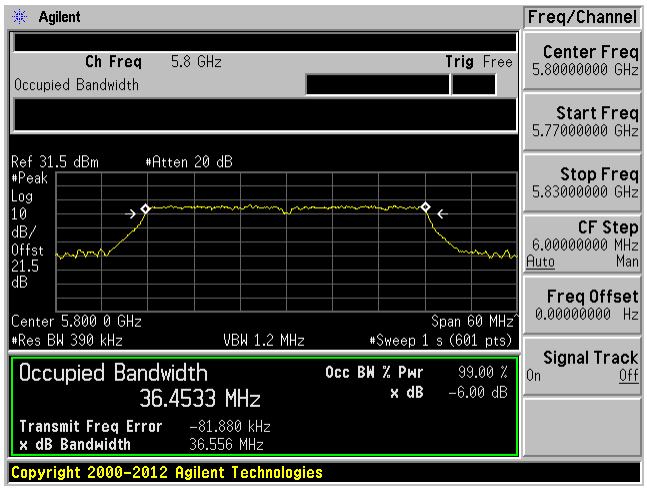
5755 MHz



5775 MHz

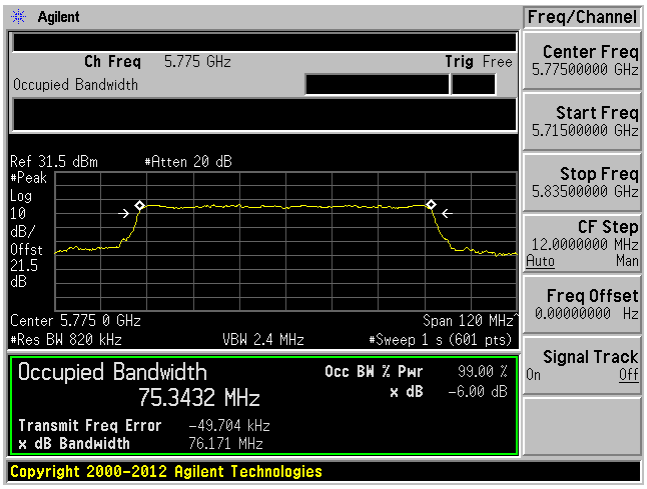


5800 MHz

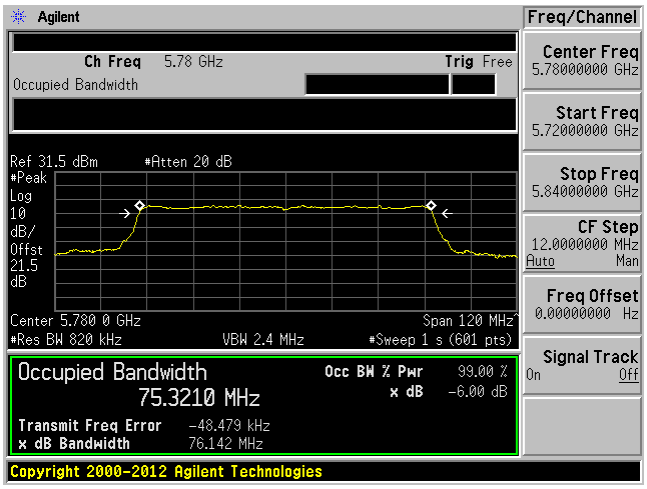


802.11ac80 mode

5775 MHz



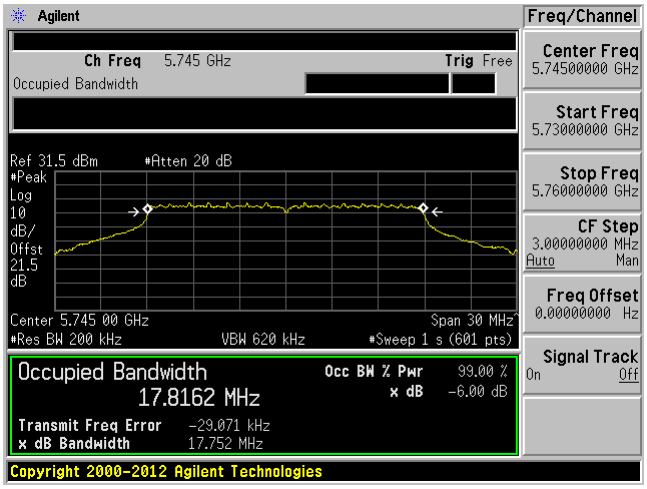
5780 MHz



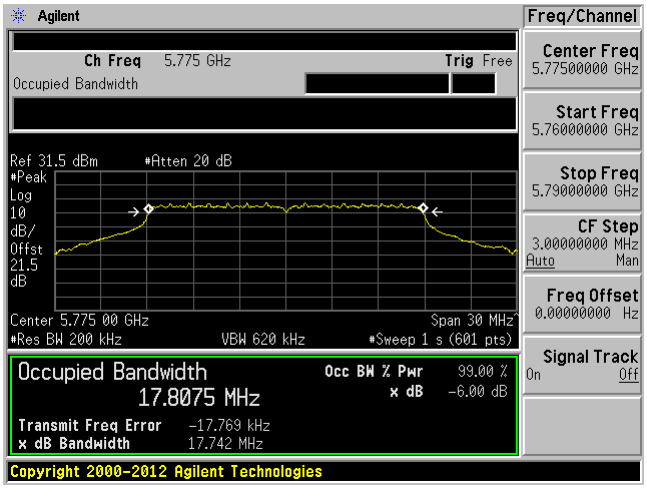
Antenna Port 2

802.11ac20 mode

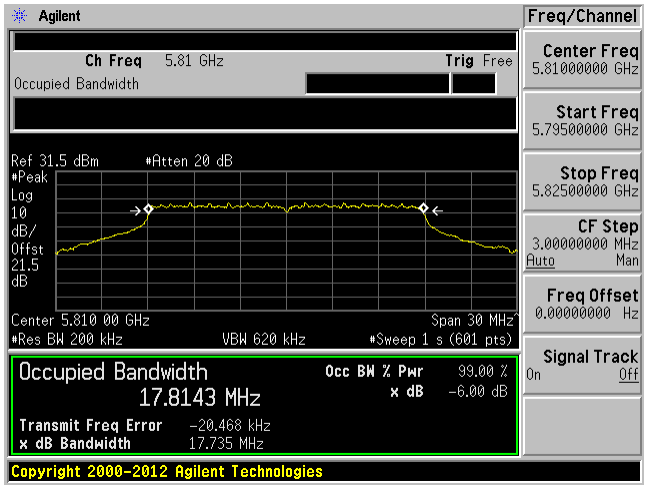
5745 MHz



5775 MHz

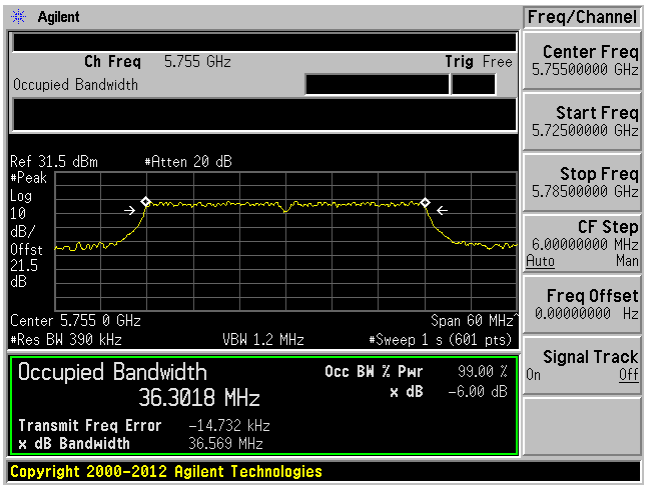


5810 MHz

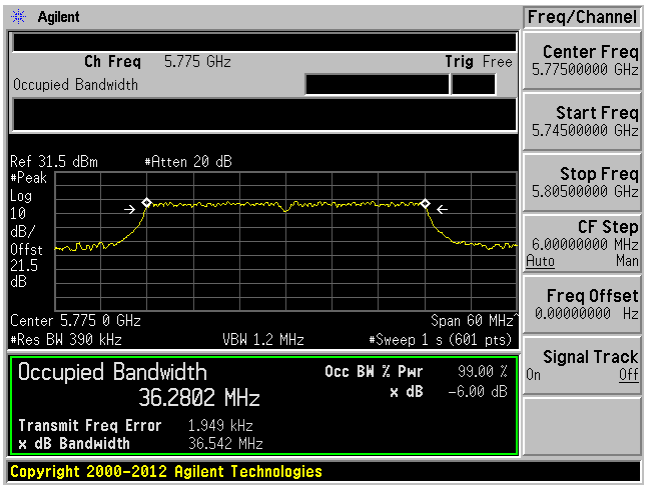


802.11ac40 mode

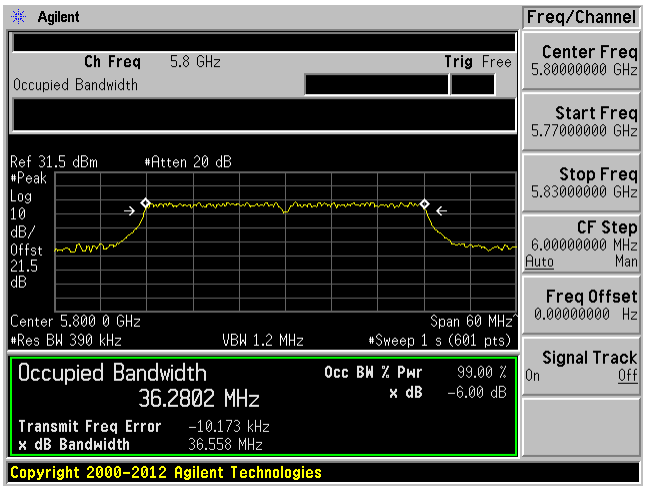
5755 MHz



5775 MHz

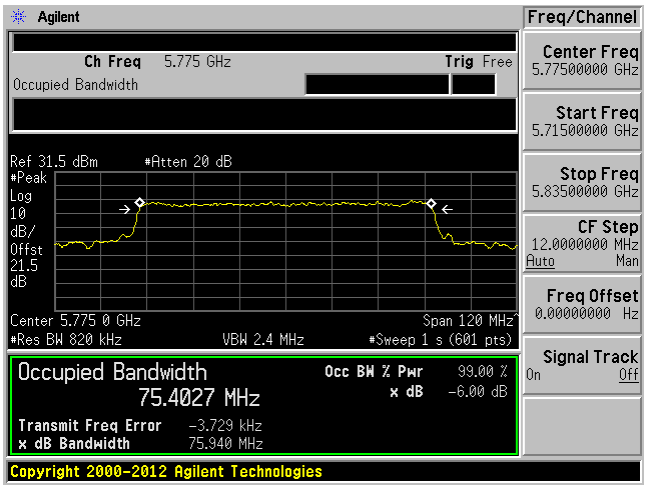


5800 MHz

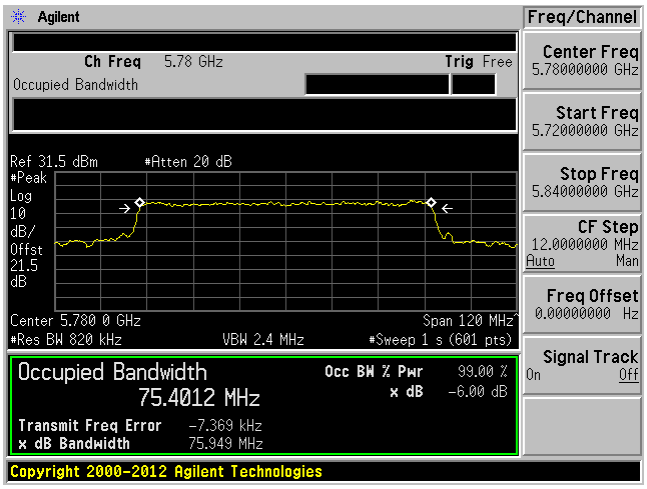


802.11ac80 mode

5775 MHz



5780 MHz



9 FCC §407(a) & ISEDC RSS-247 §6.2 - Output Power

9.1 Applicable Standards

According to FCC §15.407(a):

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in

any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Note to paragraph (a)(3): The Commission strongly recommends that parties employing U-NII devices to provide critical communications services should determine if there are any nearby Government radar systems that could affect their operation.

(4) The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

(5) The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

According to ISEDC RSS-247 §6.2.1 for frequency band 5150-5250 MHz:

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

According to ISEDC RSS-247 §6.2.2 for frequency band 5250-5350 MHz:

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

a. The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
b. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

According to ISEDC RSS-247 §6.2.3 for frequency band 5470-5600 MHz and 5650-5725 MHz:

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

According to ISEDC RSS-247 §6.2.4 for frequency band 5725-5850 MHz:

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint Footnote 3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

9.2 Measurement Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer.

9.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	MY48250238	2018-05-08	1 year
-	RF cable	-	-	Each time[1]	N/A
-	20dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 09 June 2016) "A2LA Policy on Metrological Traceability".*

9.4 Test Environmental Conditions

Temperature:	23º C
Relative Humidity:	42 %
ATM Pressure:	102.7 KPa

The testing was performed by Vincent Licata on 2018-09-13 and Chin Ming Lui on 2018-10-04 in RF site.

9.5 Test Results

U-NII-1 (FCC only)

Point-to-multipoint client mode

8 dBi Antenna

Frequency (MHz)	Conducted Average Power (dBm)				FCC Limit (dBm)
	ANT 1	ANT 2	Total	Corrected Power Total	
802.11ac20 mode					
5190	12.83	14.65	16.84	17.01	22
5220	13.36	14.57	17.02	17.19	22
5240	14.71	13.99	17.38	17.55	22
802.11ac40 mode					
5200	16.14	17.60	19.94	19.62	22
5215	17.83	17.11	20.50	20.18	22
5230	17.91	17.62	20.78	20.46	22

25 dBi Antenna

Frequency (MHz)	Conducted Average Power (dBm)				FCC Limit (dBm)
	ANT 1	ANT 2	Total	Corrected Power Total	
802.11ac20 mode					
5190	-15.85	-17.72	-13.67	-13.50	5
5220	-16.19	-16.69	-13.42	-13.25	5
5240	-15.84	-17.29	-13.49	-13.32	5
802.11ac40 mode					
5200	-16.43	-17.32	-13.84	-13.52	5
5215	-16.68	-18.16	-14.35	-14.03	5
5230	-16.50	-17.70	-14.05	-13.73	5

Fixed point-to-point Master mode

8 dBi Antenna

Frequency (MHz)	Conducted Average Power (dBm)				FCC Limit (dBm)
	ANT 1	ANT 2	Total	Corrected Power Total	
802.11ac20 mode					
5190	12.28	11.05	14.72	14.89	28
5220	12.37	11.02	14.76	14.93	28
5240	12.36	11.42	14.93	15.10	28
802.11ac40 mode					
5200	11.95	10.35	14.23	14.55	28
5215	11.99	10.43	14.29	14.61	28
5230	11.99	10.84	14.46	14.78	28

25 dBi Antenna

Frequency (MHz)	Conducted Average Power (dBm)				FCC Limit (dBm)
	ANT 1	ANT 2	Total	Corrected Power Total	
802.11ac20 mode					
5190	-15.85	-17.72	-13.67	-13.50	11
5220	-16.19	-16.69	-13.42	-13.25	11
5240	-15.84	-17.29	-13.49	-13.32	11
802.11ac40 mode					
5200	-16.43	-17.32	-13.84	-13.52	11
5215	-16.68	-18.16	-14.35	-14.03	11
5230	-16.50	-17.70	-14.05	-13.73	11

U-NII-3

8 dBi Antenna

Frequency (MHz)	Conducted Average Power (dBm)				FCC/ ISED Limit (dBm)
	ANT 1	ANT 2	Total	Corrected Power Total	
802.11ac20 mode					
5745	17.18	18.86	21.11	21.28	30
5775	17.29	18.89	21.17	21.34	30
5810	17.33	18.88	21.18	21.35	30
802.11ac40 mode					
5755	18.30	19.64	22.03	22.35	30
5775	18.08	19.66	21.95	22.27	30
5800	18.15	19.43	21.85	22.17	30
802.11ac80 mode					
5775	17.86	18.84	21.39	21.84	30
5780	17.39	19.10	21.34	21.79	30

25 dBi Antenna

Frequency (MHz)	Conducted Average Power (dBm)				FCC/ ISED Limit (dBm)
	ANT 1	ANT 2	Total	Corrected Power Total	
802.11ac20 mode					
5745	-12.95	-13.34	-10.13	-9.96	30
5775	-12.63	-13.02	-9.81	-9.64	30
5810	-12.80	-12.87	-9.82	-9.65	30
802.11ac40 mode					
5755	-13.54	-13.37	-10.44	-10.12	30
5775	-12.49	-13.04	-9.75	-9.43	30
5800	-12.82	-11.66	-9.19	-8.87	30
802.11ac80 mode					
5775	-13.77	-12.04	-9.81	-9.36	30
5780	-14.50	-11.96	-10.04	-9.59	30

Note: Required Limit = Originial Power limit - (Antenna Gain – 6 dBi)
Note: EUT does not support 5150 - 5250 MHz in Canada

Master mode elevation angle above 30 degrees maximum e.i.r.p. evaluation:

For 8 dBi antenna, the antenna gain at any elevation above 30 degrees (measured at 5.2 GHz) is less than or equal to 5.6 dBi.

Frequency (MHz)	Conducted Average Power (dBm)				EIRP (dBm)	FCC Limit (dBm)
	ANT 1	ANT 2	Total	Corrected Power Total		
802.11ac40 mode						
5240	12.36	11.42	14.93	15.10	20.70	21

For 25 dBi antenna, the antenna gain at any elevation above 30 degrees (measured at 5.2 GHz) is less than or equal to 1.3 dBi.

Frequency (MHz)	Conducted Average Power (dBm)				EIRP (dBm)	FCC Limit (dBm)
	ANT 1	ANT 2	Total	Corrected Power Total		
802.11ac40 mode						
5220	-16.19	-16.69	-13.42	-13.25	-11.95	21

10 FCC §15.407(a) & ISEDC RSS-247 §6.2 - Power Spectral Density

10.1 Applicable Standards

According to FCC §15.407(a):

For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may

employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

According to ISEDC RSS-247 §6.2.1 for frequency band 5150-5250 MHz:

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

According to ISEDC RSS-247 §6.2.2 for frequency band 5250-5350 MHz:

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10}B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10}B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

According to ISEDC RSS-247 §6.2.3 for frequency band 5470-5600 MHz and 5650-5725 MHz:

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10}B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10}B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

According to ISEDC RSS-247 §6.2.4 for frequency band 5725-5850 MHz:

The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

10.2 Measurement Procedure

(i) Set span to encompass the entire emission bandwidth (EBW) of the signal.
(ii) Set RBW = 1 MHz.
(iii) Set VBW ≥ 3 MHz.
(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
(v) Sweep time = auto.
(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every

sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".
(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
(ix) Use the peak search function on the instrument to find the peak of the spectrum and record its value.

10.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	MY48250238	2018-05-08	1 year
-	RF cable	-	-	Each time[1]	N/A
-	20dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 09 June 2016) "A2LA Policy on Metrological Traceability".*

10.4 Test Environmental Conditions

Temperature:	22-24 ºC
Relative Humidity:	40-41 %
ATM Pressure:	103.1-104.1 kPa

The testing was performed by Vincent Licata on 2018-09-13 and Chin Ming Lui on 2018-10-04 at RF site.

10.5 Test Results

U-NII-1 (FCC only)

Point-to-multipoint client mode

8 dBi Antenna

Channel	Frequency (MHz)	ANT 1 (dBm/MHz)	ANT 2 (dBm/MHz)	Total (dBm/MHz)	Corrected PSD Total (dBm/MHz)	Limit (dBm/MHz)
802.11ac20 mode						
Low	5190	1.110	3.084	5.219	5.389	9.00
Middle	5220	1.499	2.902	5.267	5.437	9.00
High	5240	3.066	2.227	5.677	5.847	9.00
802.11ac40 mode						
Low	5200	1.459	2.964	5.287	5.607	9.00
Middle	5215	3.224	2.570	5.920	6.240	9.00
High	5230	3.135	2.954	6.056	6.376	9.00

25 dBi Antenna

Channel	Frequency (MHz)	ANT 1 (dBm/MHz)	ANT 2 (dBm/MHz)	Total (dBm/MHz)	Corrected PSD Total (dBm/MHz)	Limit (dBm/MHz)
802.11ac20 mode						
Low	5190	-27.561	-29.492	-25.410	-25.240	-8.00
Middle	5220	-27.880	-28.466	-25.153	-24.983	-8.00
High	5240	-27.491	-29.029	-25.182	-25.012	-8.00
802.11ac40 mode						
Low	5200	-31.144	-31.977	-28.530	-28.210	-8.00
Middle	5215	-31.446	-32.840	-29.077	-28.757	-8.00
High	5230	-31.228	-32.255	-28.701	-28.381	-8.00

Fixed point-to-point Master mode

8 dBi Antenna

Channel	Frequency (MHz)	ANT 1 (dBm/MHz)	ANT 2 (dBm/MHz)	Total (dBm/MHz)	Corrected PSD Total (dBm/MHz)	Limit (dBm/MHz)
802.11ac20 mode						
Low	5190	0.494	-0.627	2.980	3.150	15.00
Middle	5220	0.593	-0.937	2.905	3.075	15.00
High	5240	0.570	-0.415	3.116	3.286	15.00
802.11ac40 mode						
Low	5200	-2.701	-4.219	-0.384	-0.064	15.00
Middle	5215	-2.754	-3.973	-0.311	0.009	15.00
High	5230	-2.667	-4.069	-0.301	0.019	15.00

25 dBi Antenna

Channel	Frequency (MHz)	ANT 1 (dBm/MHz)	ANT 2 (dBm/MHz)	Total (dBm/MHz)	Corrected PSD Total (dBm/MHz)	Limit (dBm/MHz)
802.11ac20 mode						
Low	5190	-27.561	-29.492	-25.410	-25.240	-2.00
Middle	5220	-27.880	-28.466	-25.153	-24.983	-2.00
High	5240	-27.491	-29.029	-25.182	-25.012	-2.00
802.11ac40 mode						
Low	5200	-31.144	-31.977	-28.530	-28.210	-2.00
Middle	5215	-31.446	-32.840	-29.077	-28.757	-2.00
High	5230	-31.228	-32.255	-28.701	-28.381	-2.00

U-NII-3

8 dBi Antenna

Channel	Frequency (MHz)	PSD (dBm/100 kHz)		Total (dBm/100 kHz)	Corrected PSD Total (dBm/500 kHz)	Limit (dBm/500 kHz)
		ANT 1	ANT 2			
802.11ac20 mode						
Low	5745	-3.552	-1.837	0.400	7.560	30
Middle	5775	-3.469	-1.950	0.367	7.527	30
High	5810	-3.299	-1.837	0.504	7.664	30
802.11ac40 mode						
Low	5755	-5.515	-4.101	-1.740	5.570	30
Middle	5775	-5.708	-3.878	-1.687	5.623	30
High	5800	-5.675	-4.184	-1.856	5.454	30
802.11ac80 mode						
Low	5775	-8.306	-7.604	-4.931	2.509	30
High	5780	-9.322	-7.655	-5.399	2.041	30

25 dBi Antenna

Channel	Frequency (MHz)	PSD (dBm/100 kHz)		Total (dBm/100 kHz)	Corrected PSD Total (dBm/500 kHz)	Limit (dBm/500 kHz)
		ANT 1	ANT 2			
802.11ac20 mode						
Low	5745	-33.637	-33.927	-30.769	-23.609	30
Middle	5775	-33.127	-33.254	-30.180	-23.020	30
High	5810	-33.436	-33.072	-30.240	-23.080	30
802.11ac40 mode						
Low	5755	-37.258	-36.905	-34.068	-26.758	30
Middle	5775	-36.305	-36.779	-33.525	-26.215	30
High	5800	-36.516	-35.294	-32.852	-25.542	30
802.11ac80 mode						
Low	5775	-39.807	-38.794	-36.261	-28.821	30
High	5780	-40.703	-38.062	-36.174	-28.734	30

Corrected PSD (dBm/MHz) = PSD (dBm/MHz) + Duty Cycle Correction (dB)

Note: For the 5725-5850 MHz band, the Corrected PSD (dBm/500 kHz) is equal to:

Correct PSD (dBm/500 kHz) = PSD (dBm/100 kHz) + Duty Cycle Correction (dB) + 10*log(500 kHz/100 kHz)

Please refer to the following plots.

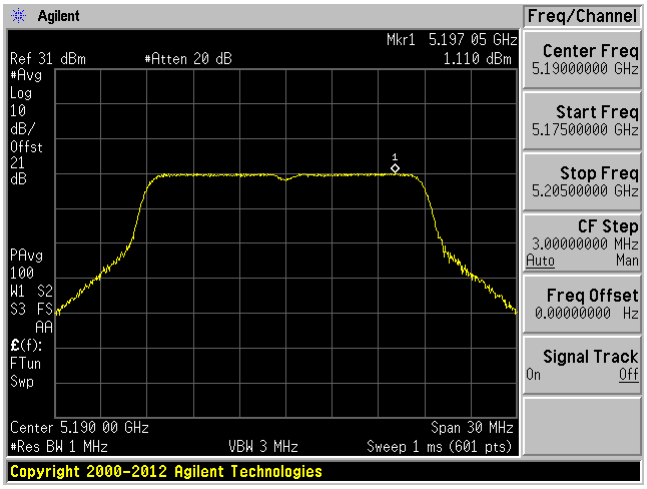
U-NII-1 (FCC only)

Point-to-multipoint client mode

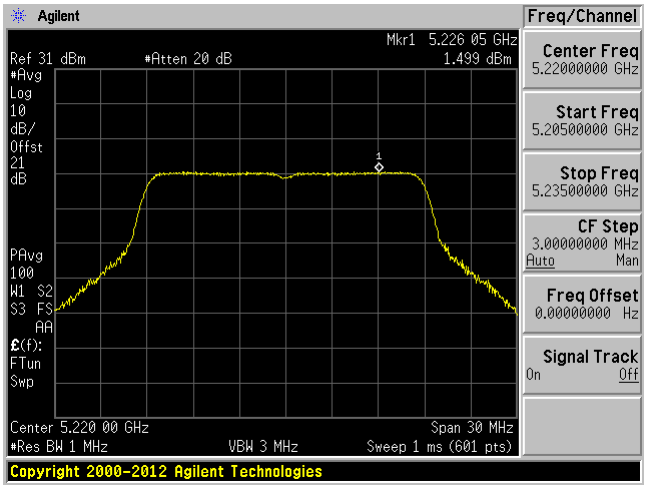
8 dBi Antenna

Antenna Port 1 802.11ac20 mode

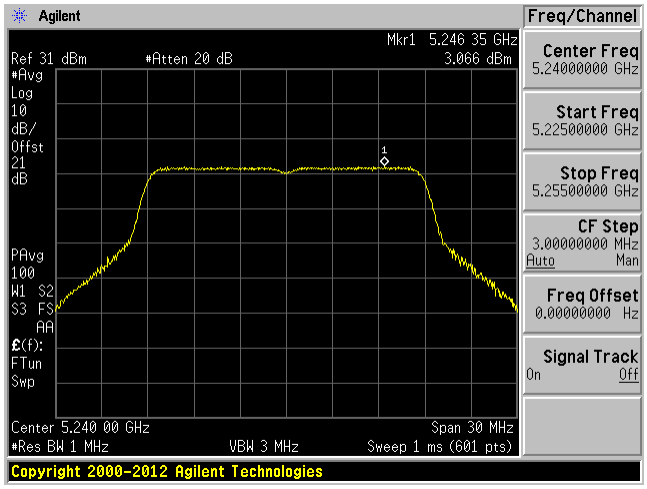
5190 MHz



5220 MHz

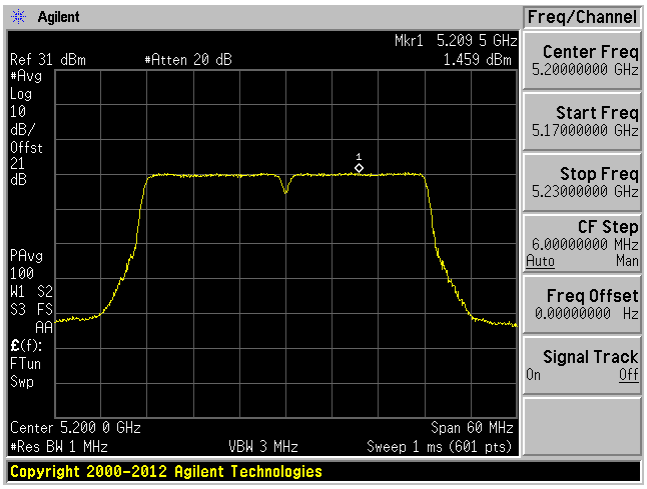


5240 MHz

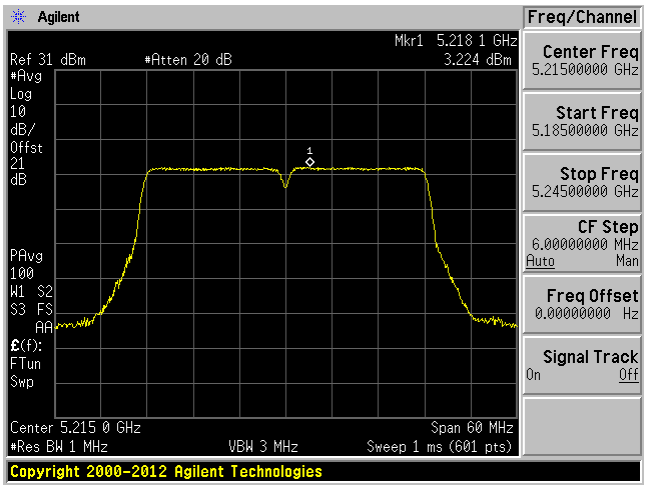


Antenna Port 1 802.11ac40 mode

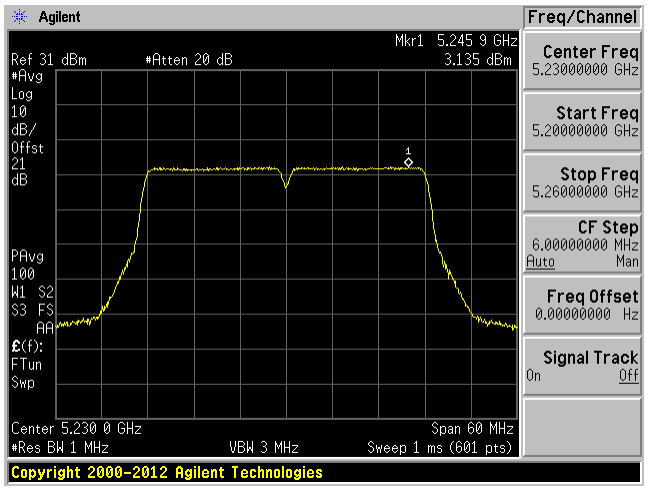
5200 MHz



5215 MHz

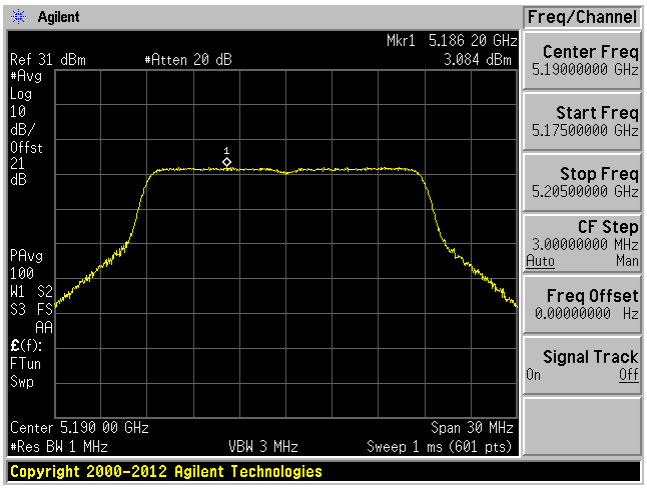


5230 MHz

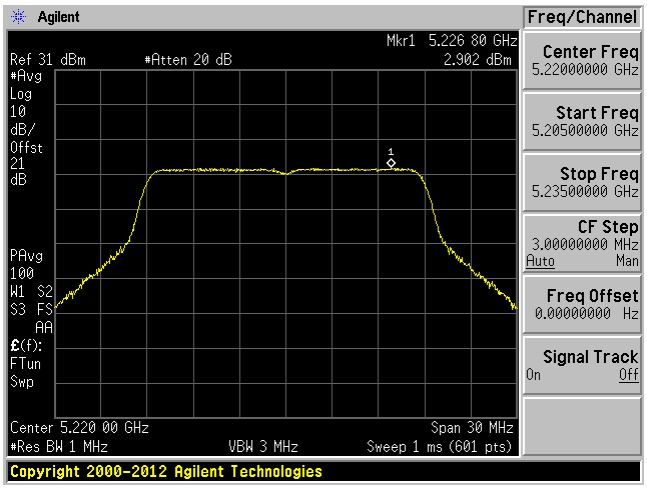


Antenna Port 2 802.11ac20 mode

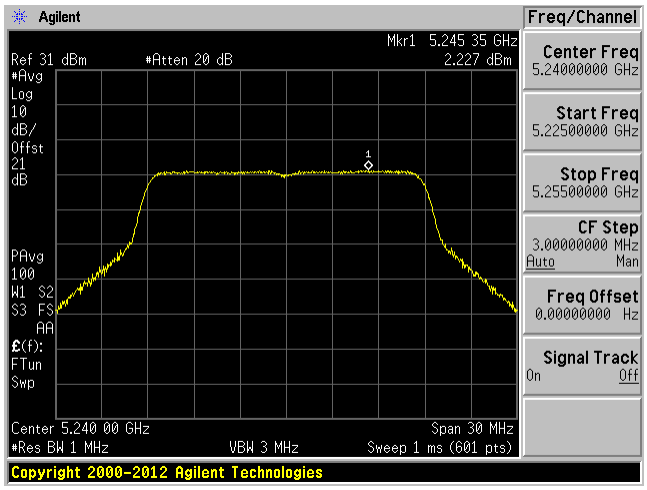
5190 MHz



5220 MHz

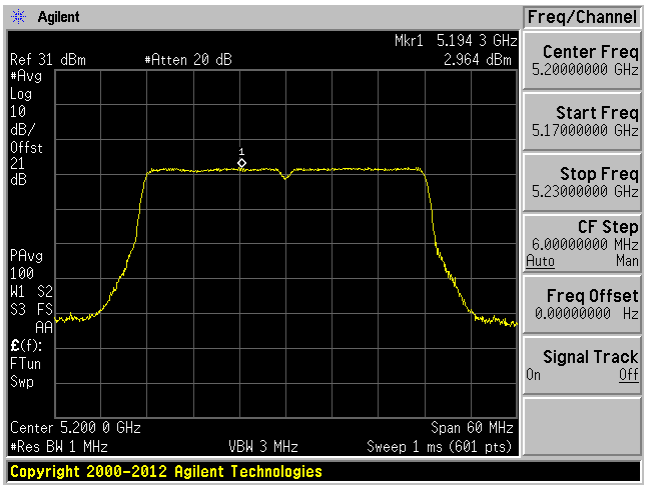


5240 MHz

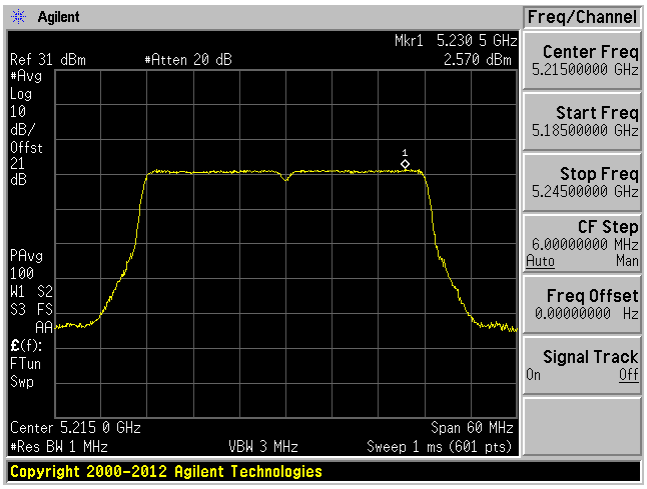


Antenna Port 2 802.11ac40 mode

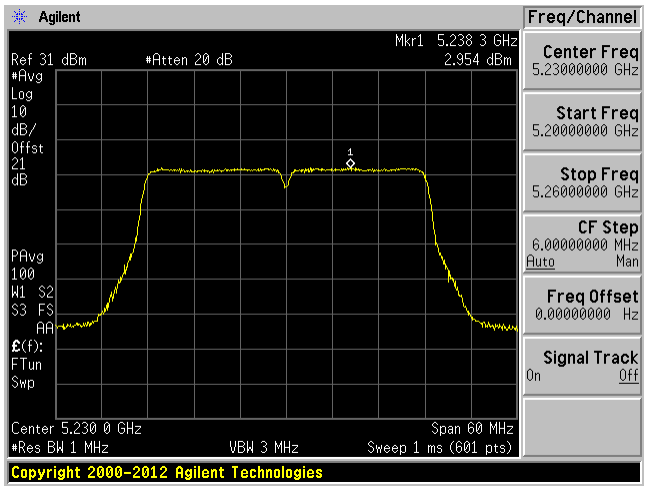
5200 MHz



5215 MHz



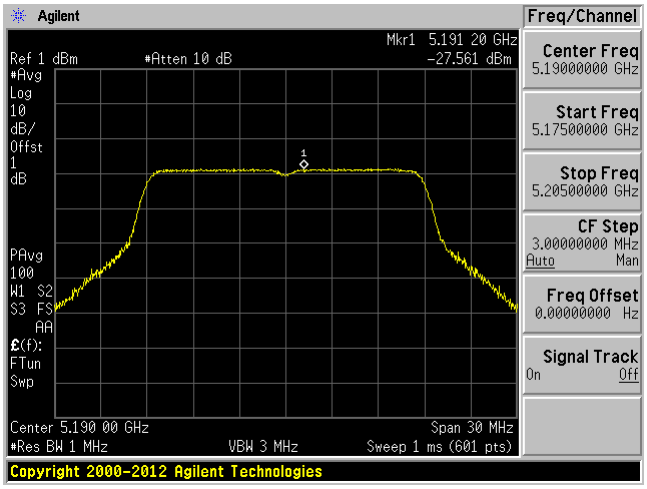
5230 MHz



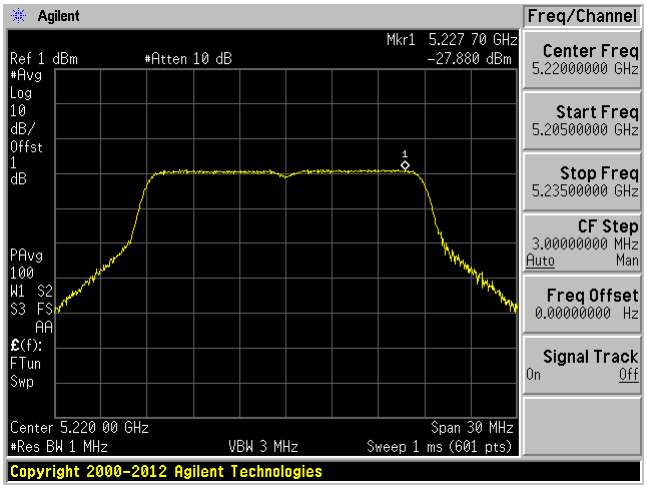
25 dBi Antenna

Antenna Port 1 802.11ac20 mode

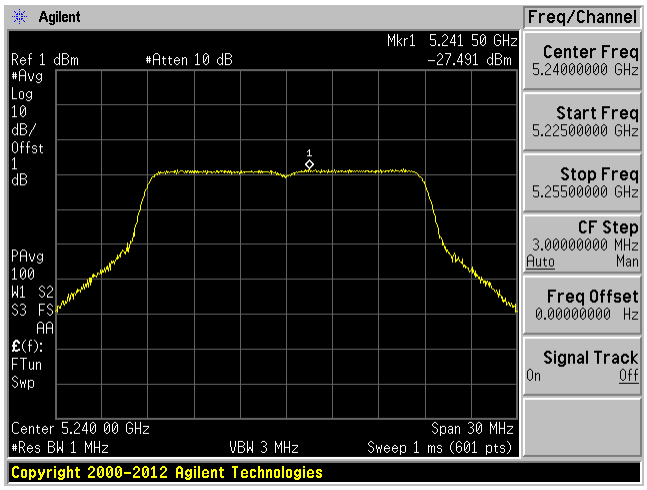
5190 MHz



5220 MHz

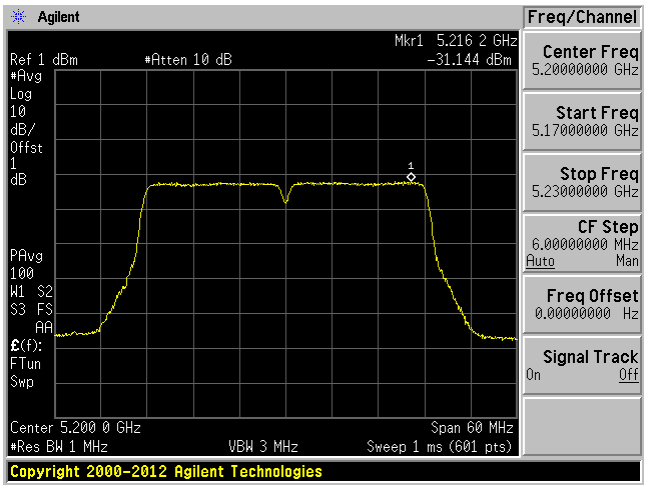


5240 MHz

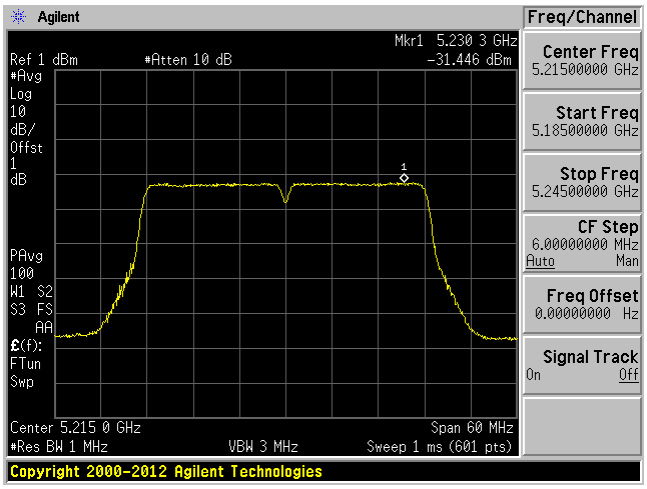


Antenna Port 1 802.11ac40 mode

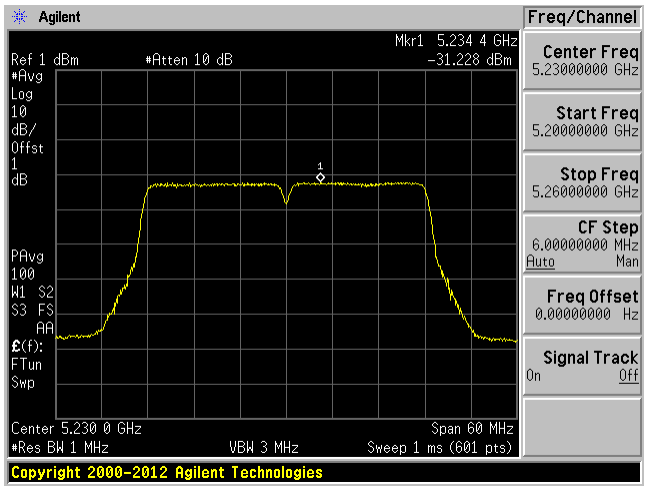
5200 MHz



5215 MHz

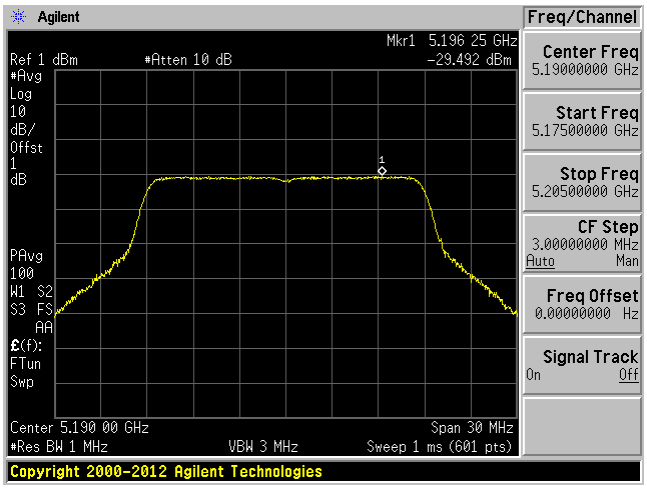


5230 MHz

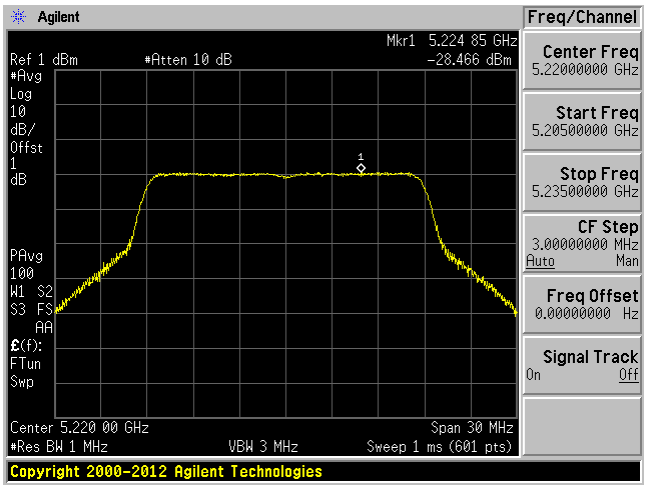


Antenna Port 2 802.11ac20 mode

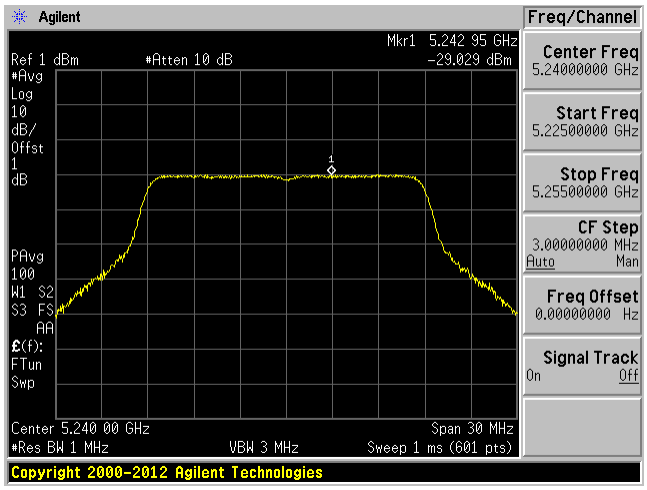
5190 MHz



5220 MHz

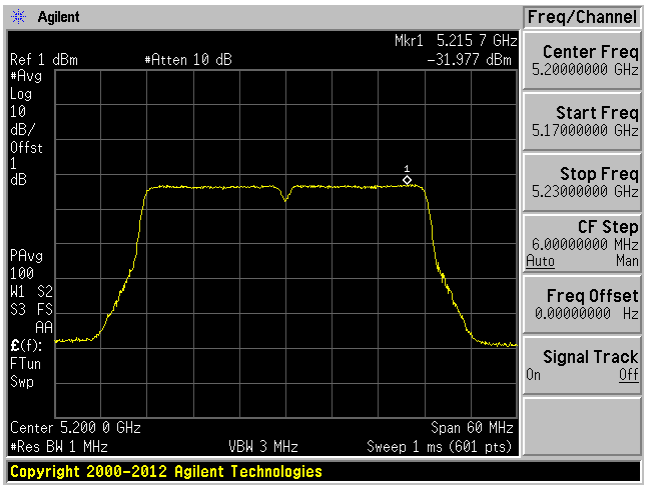


5240 MHz

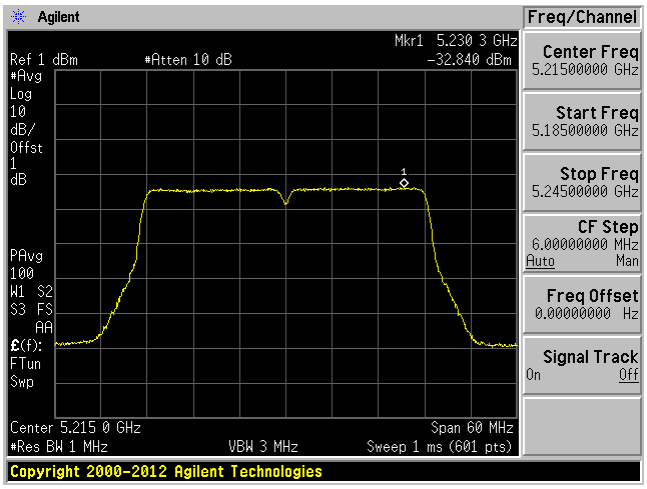


Antenna Port 2 802.11ac40 mode

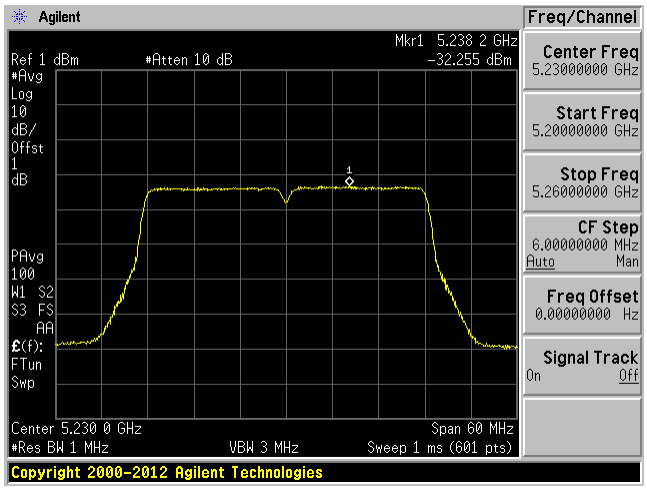
5200 MHz



5215 MHz



5230 MHz

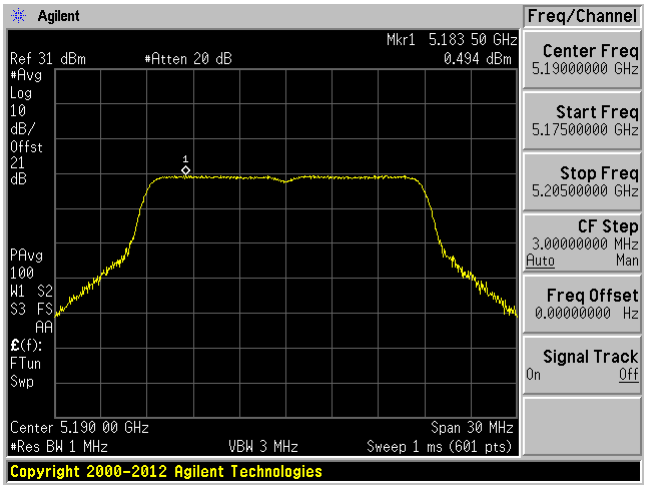


Fixed point-to-point Master mode

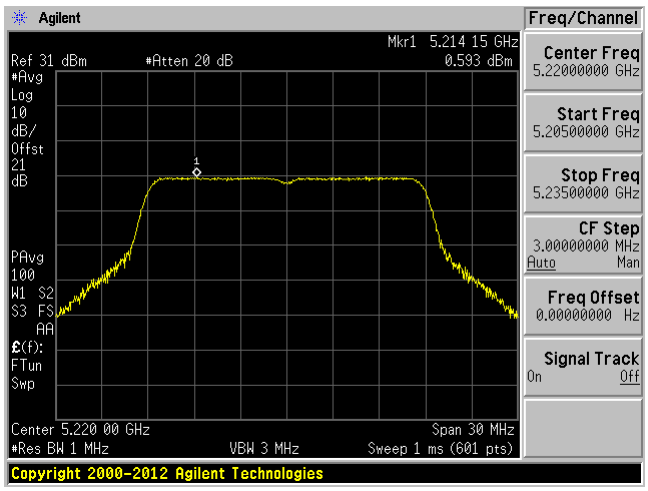
8 dBi Antenna

Antenna Port 1 802.11ac20 mode

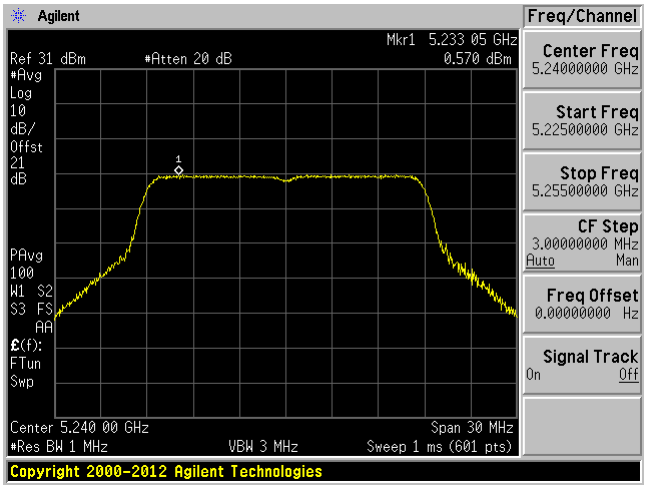
5190 MHz



5220 MHz

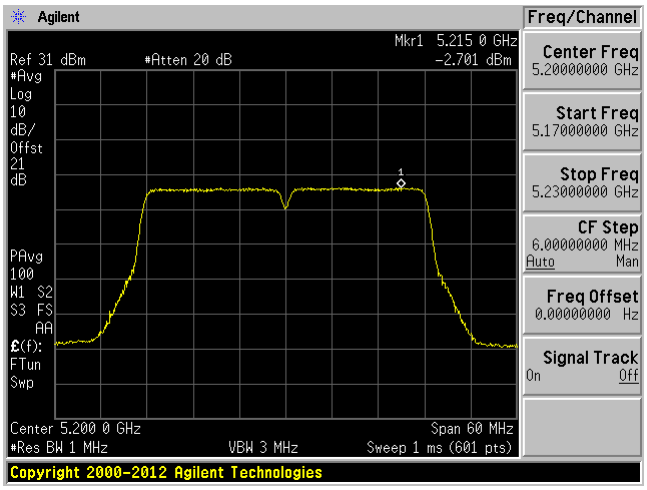


5240 MHz

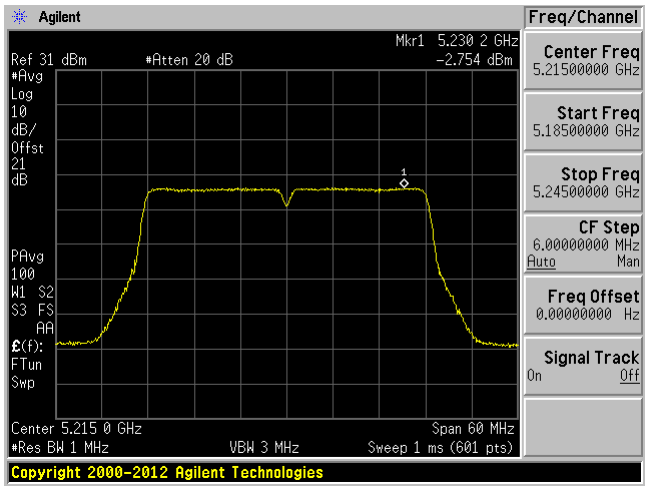


Antenna Port 1 802.11ac40 mode

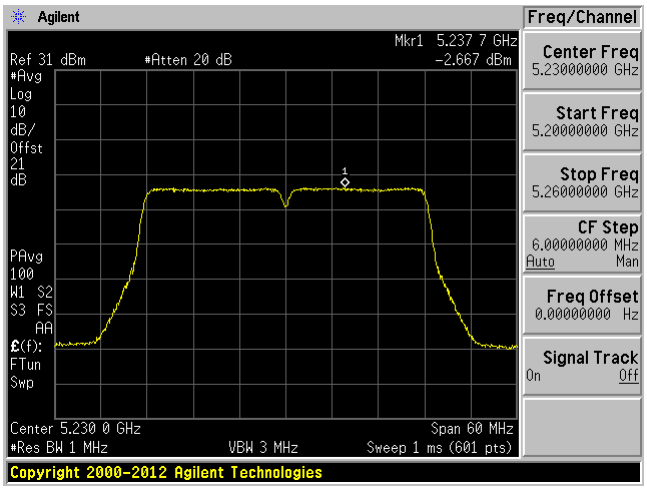
5200 MHz



5215 MHz

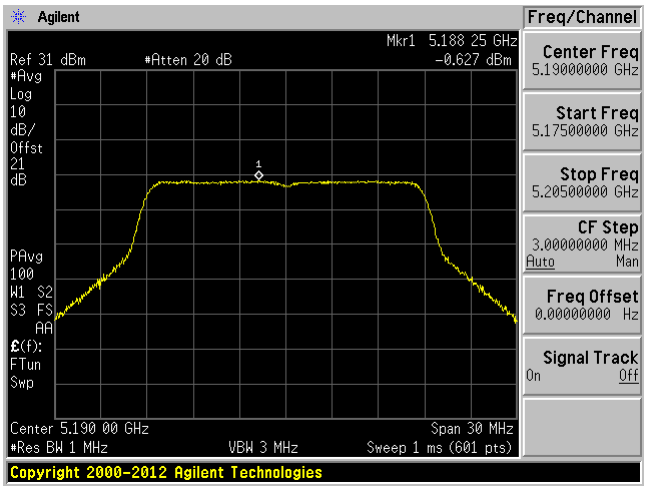


5230 MHz

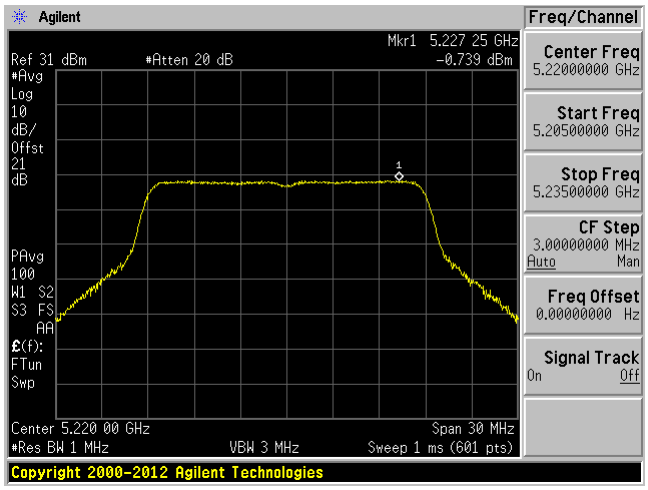


Antenna Port 2 802.11ac20 mode

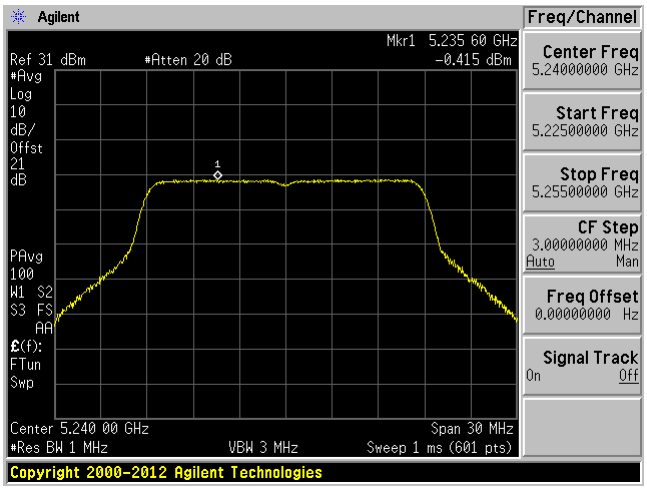
5190 MHz



5220 MHz

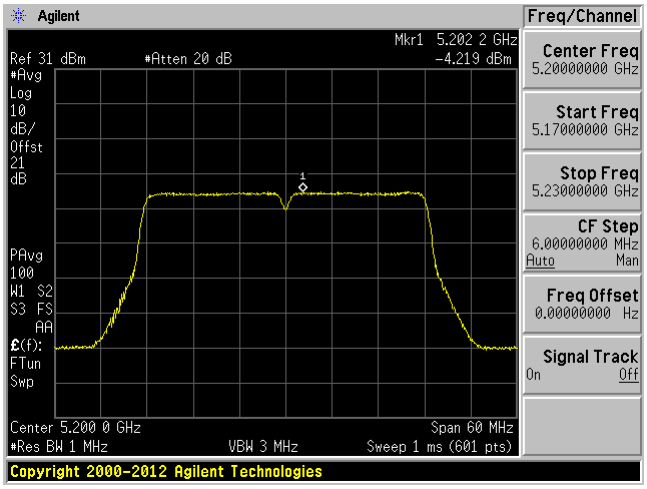


5240 MHz

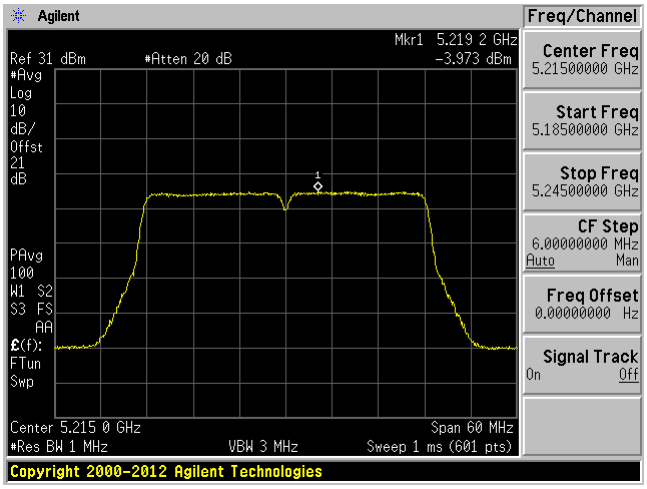


Antenna Port 2 802.11ac40 mode

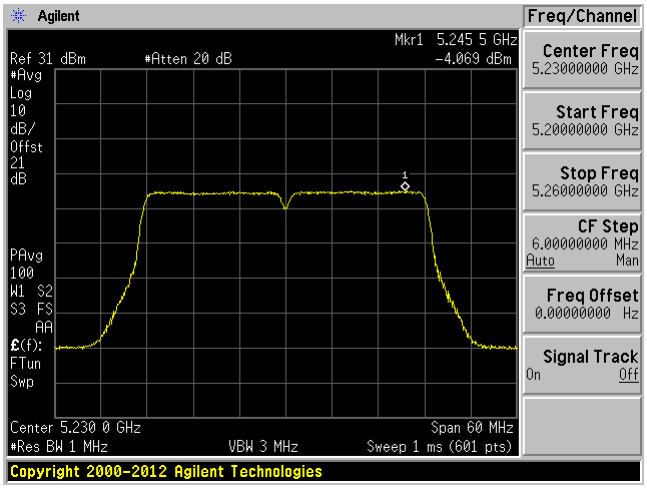
5200 MHz



5215 MHz



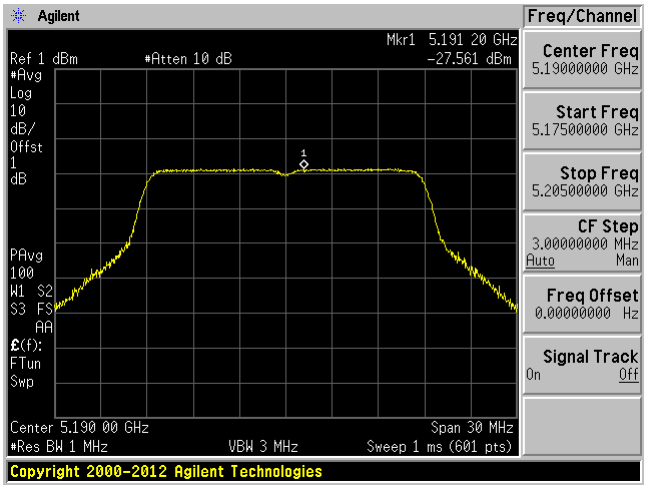
5230 MHz



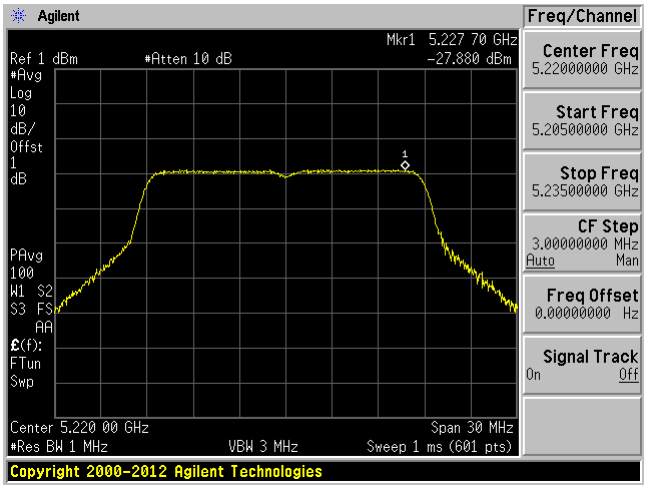
25 dBi Antenna

Antenna Port 1 802.11ac20 mode

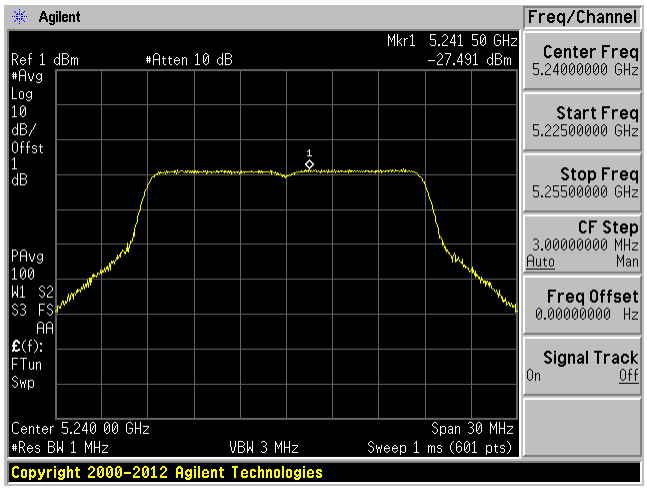
5190 MHz



5220 MHz

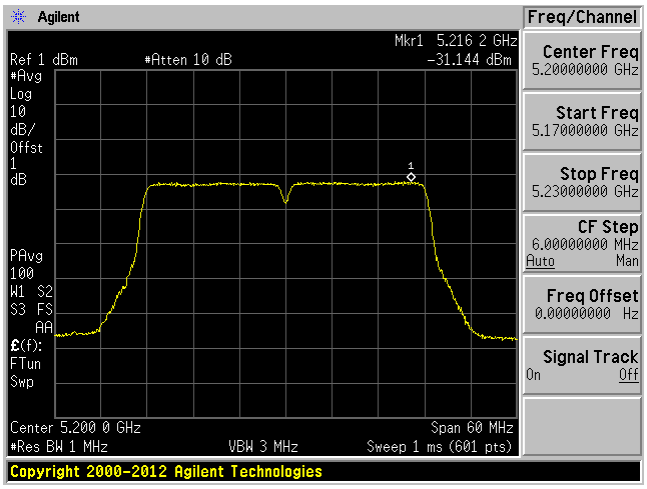


5240 MHz

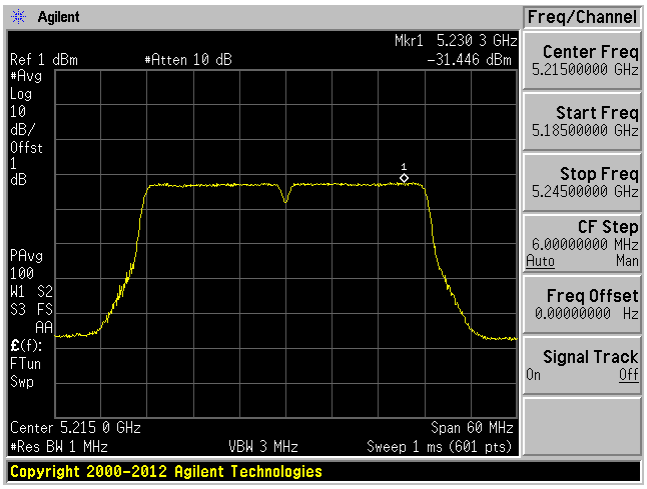


Antenna Port 1 802.11ac40 mode

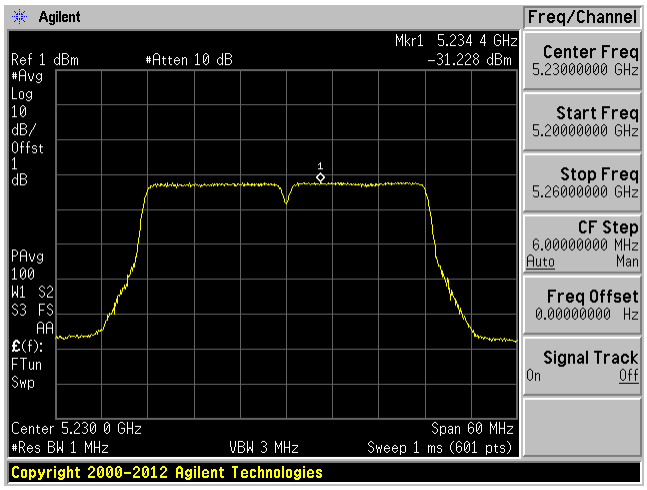
5200 MHz



5215 MHz

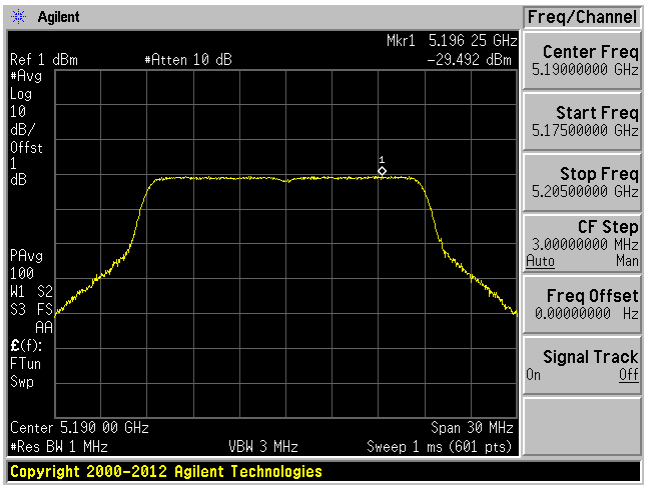


5230 MHz

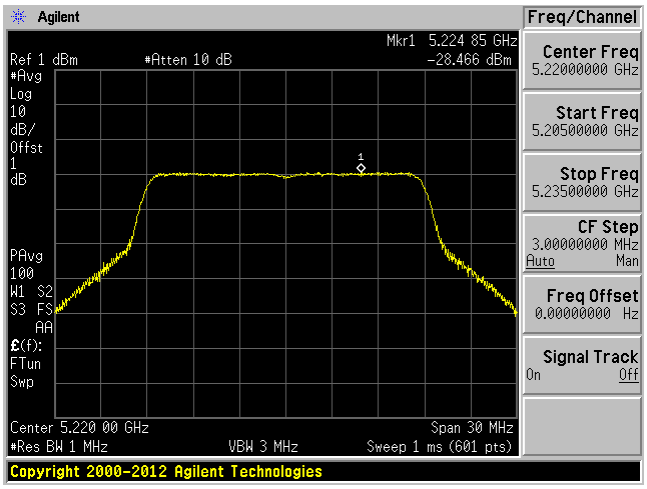


Antenna Port 2 802.11ac20 mode

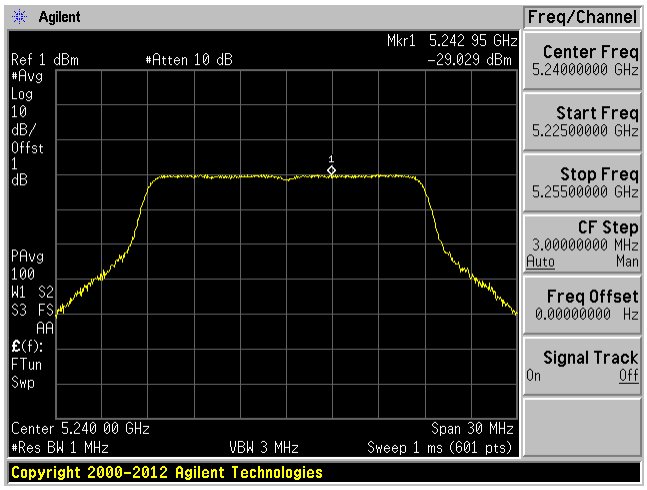
5190 MHz



5220 MHz

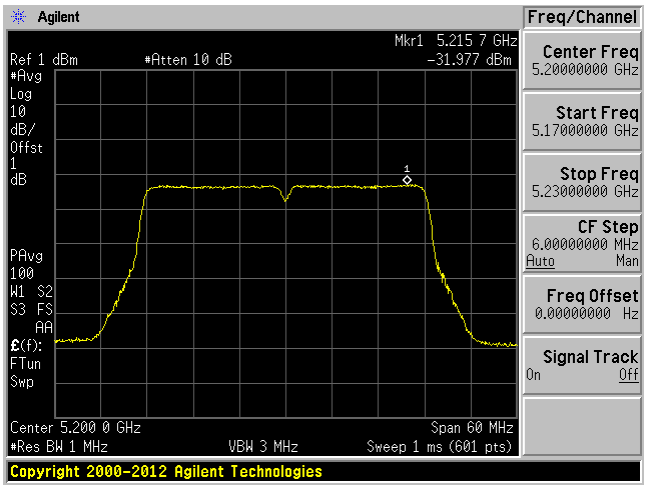


5240 MHz

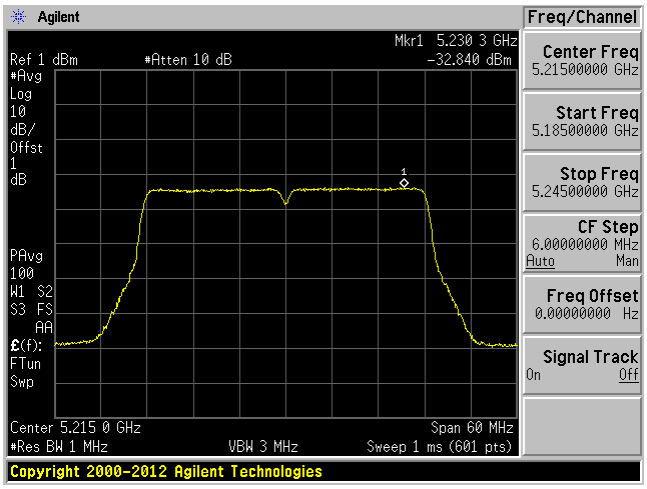


Antenna Port 2 802.11ac40 mode

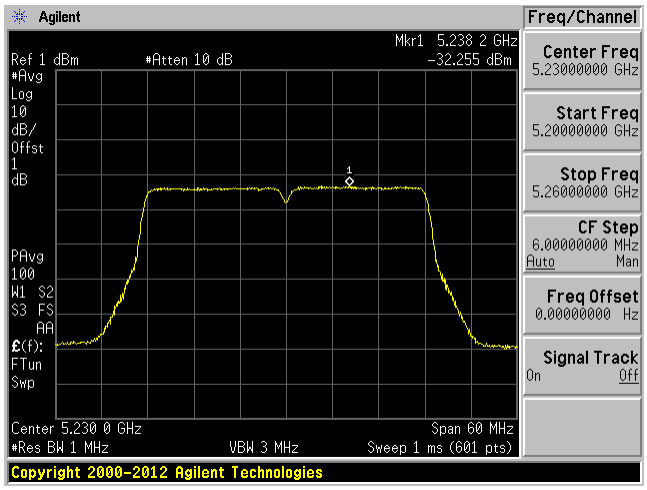
5200 MHz



5215 MHz



5230 MHz

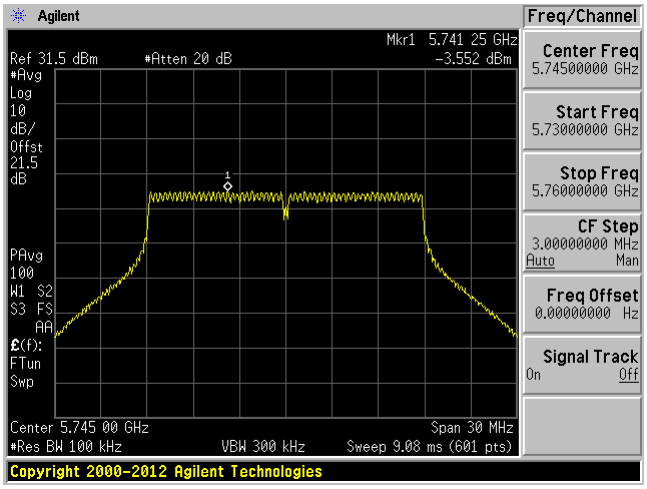


U-NII-3

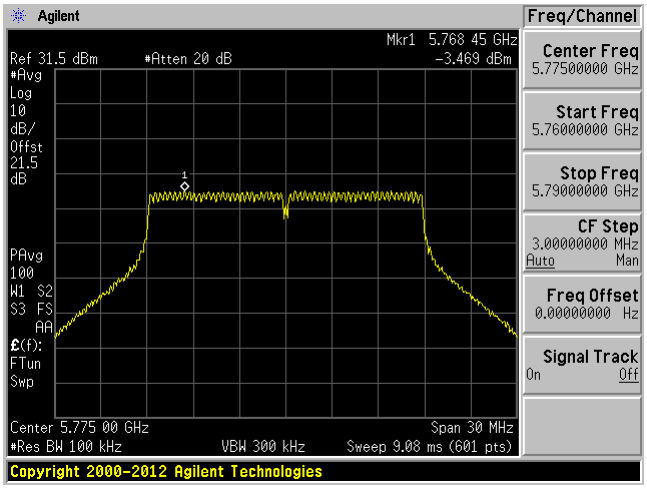
8 dBi Antenna

Antenna Port 1 802.11ac20 mode

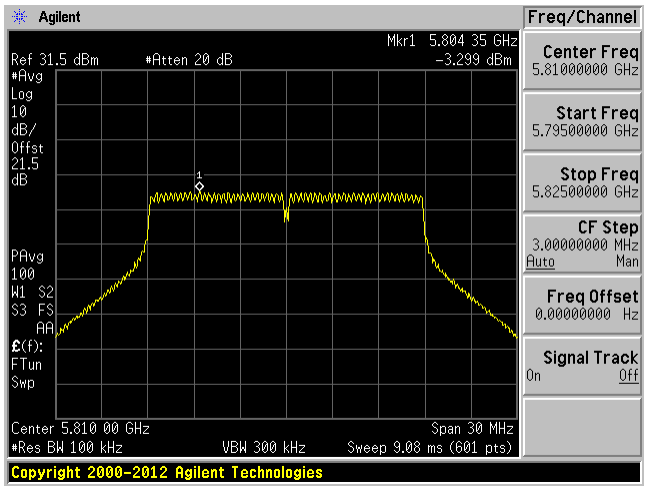
5745 MHz



5775 MHz

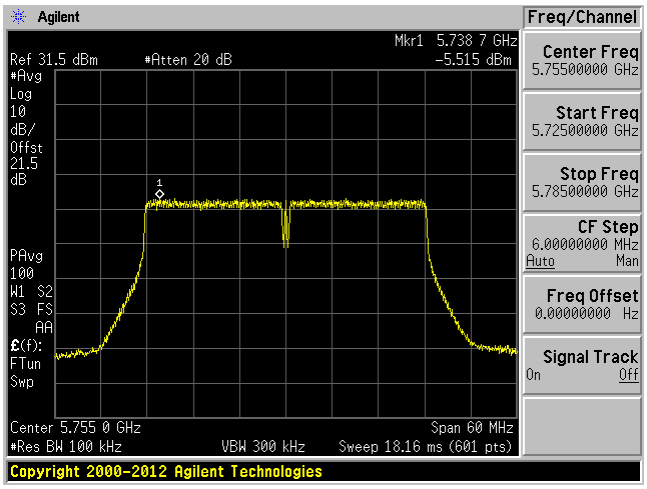


5810 MHz

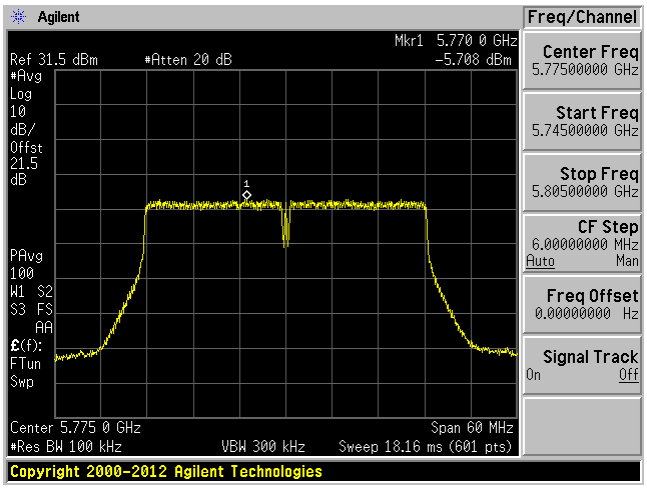


Antenna Port 1 802.11ac40 mode

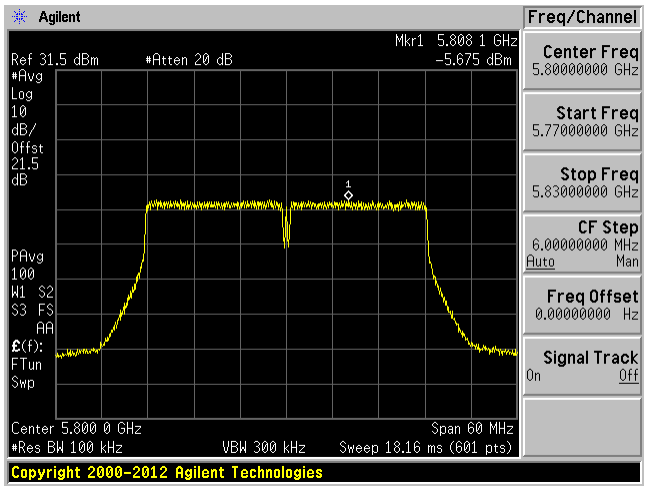
5755 MHz



5775 MHz

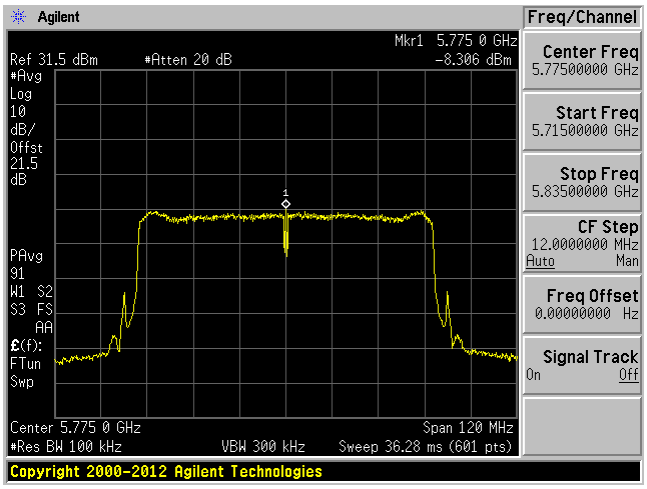


5800 MHz

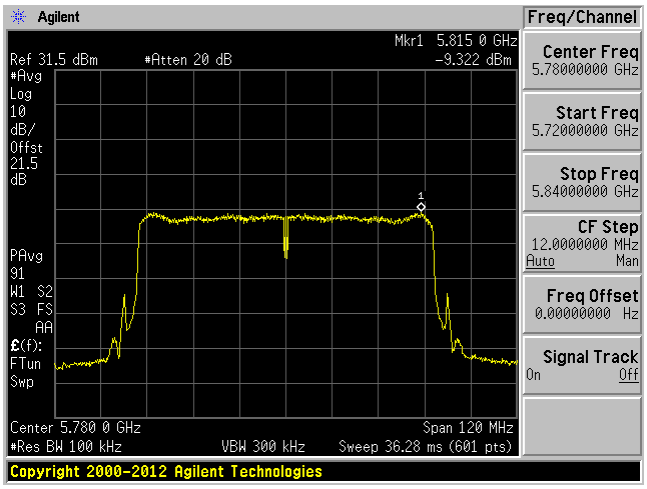


Antenna Port 1 802.11ac80 mode

5775 MHz

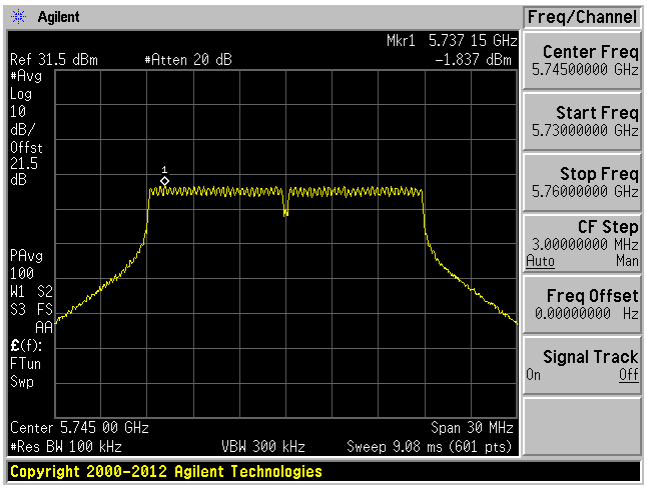


5780 MHz

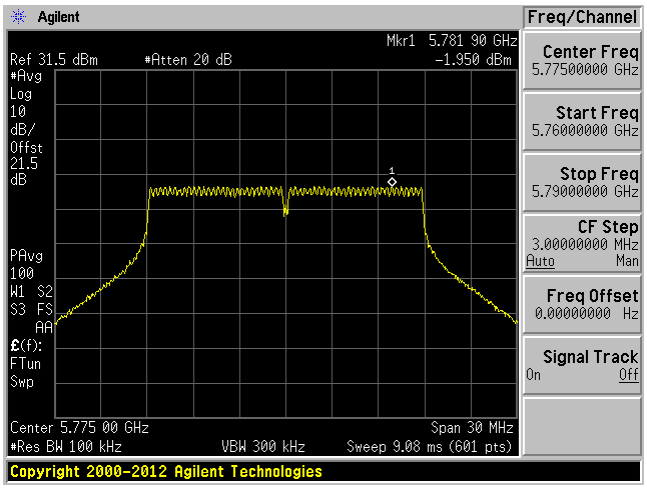


Antenna Port 2 802.11ac20 mode

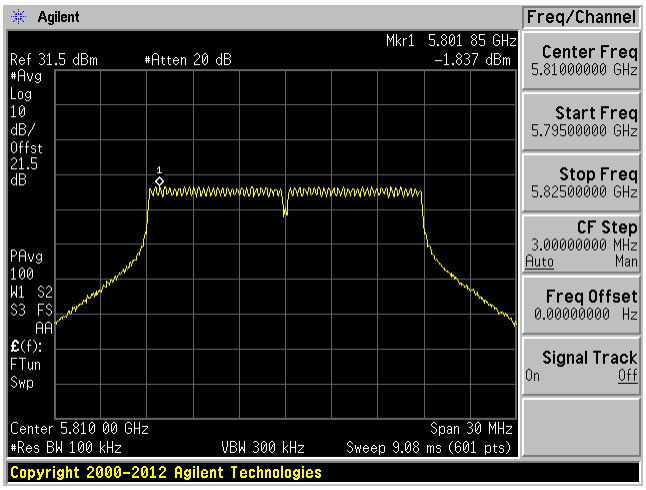
5745 MHz



5775 MHz

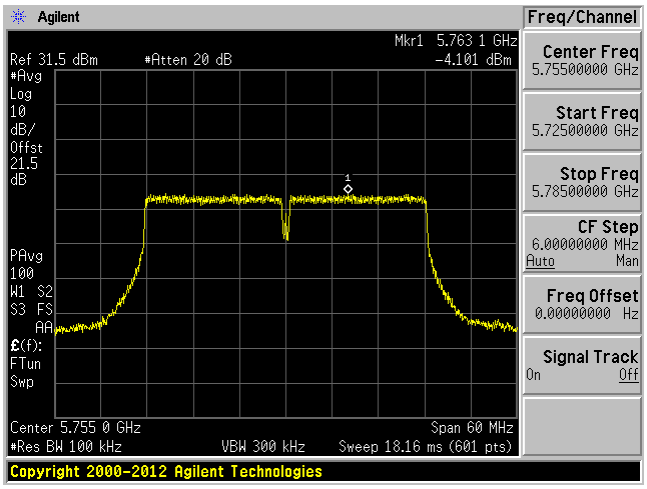


5810 MHz

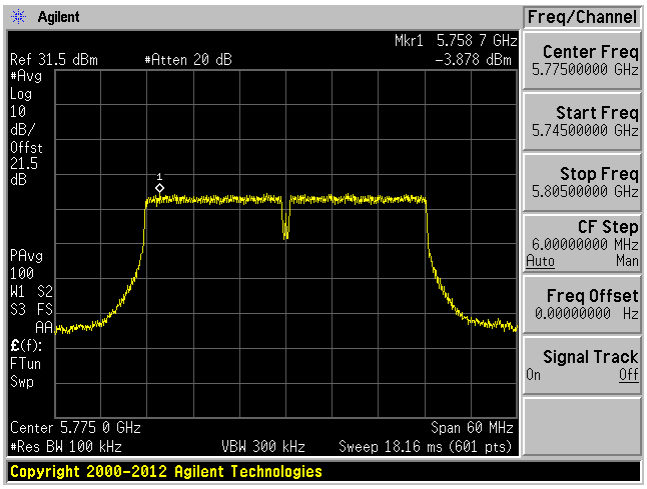


Antenna Port 2 802.11ac40 mode

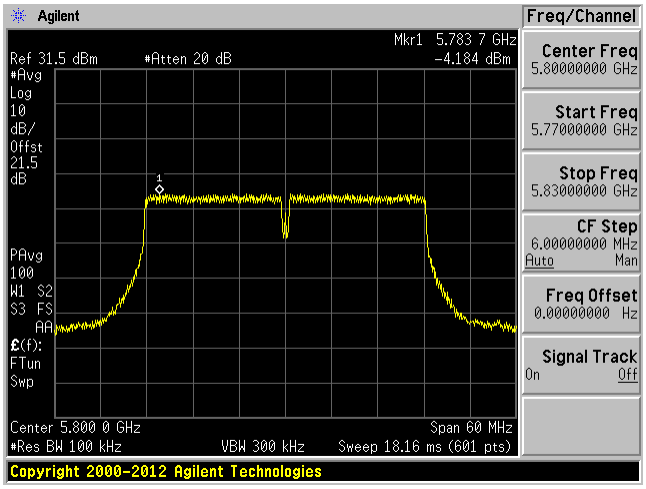
5755 MHz



5775 MHz

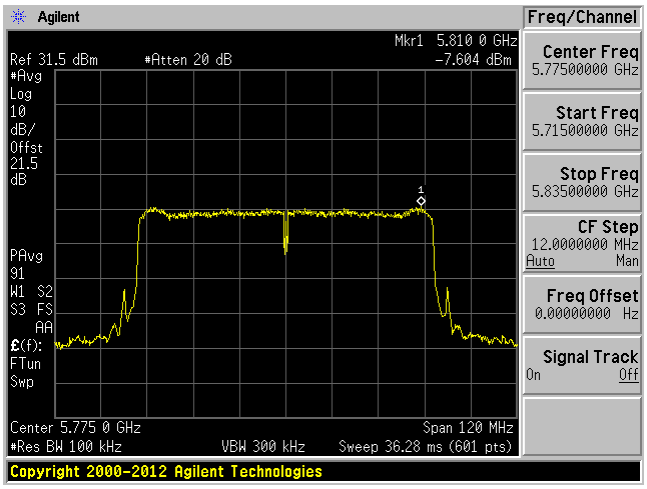


5800 MHz

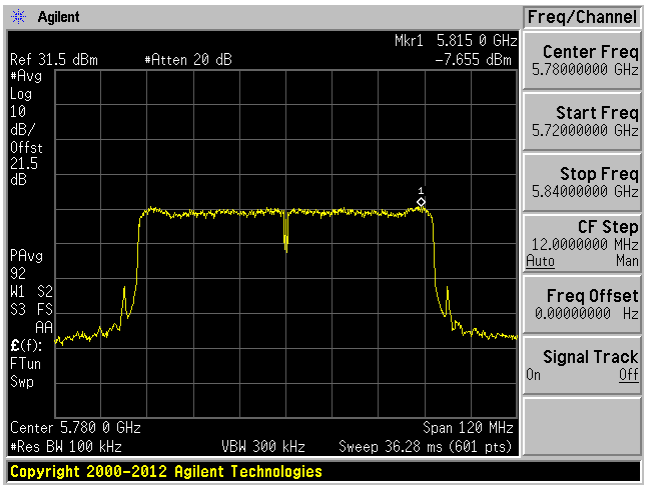


Antenna Port 2 802.11ac80 mode

5775 MHz



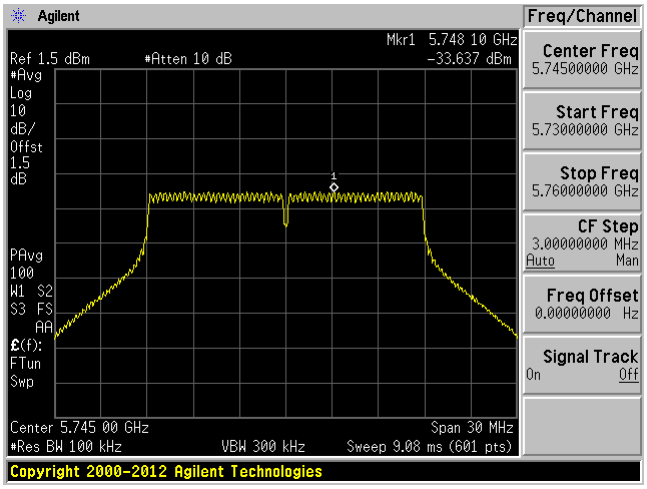
5780 MHz



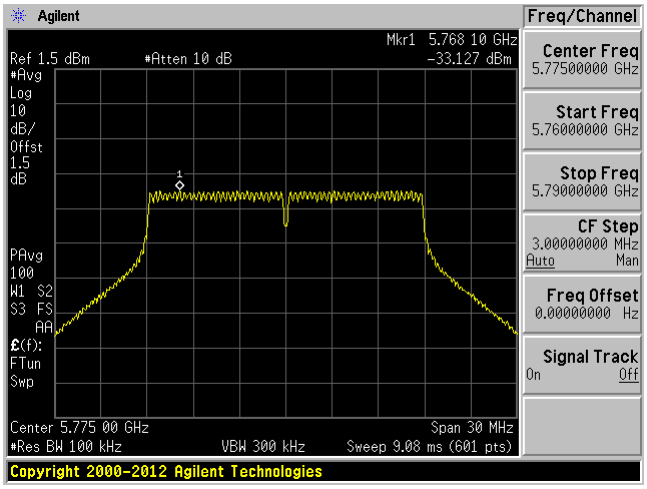
25 dBi Antenna

Antenna Port 1 802.11ac20 mode

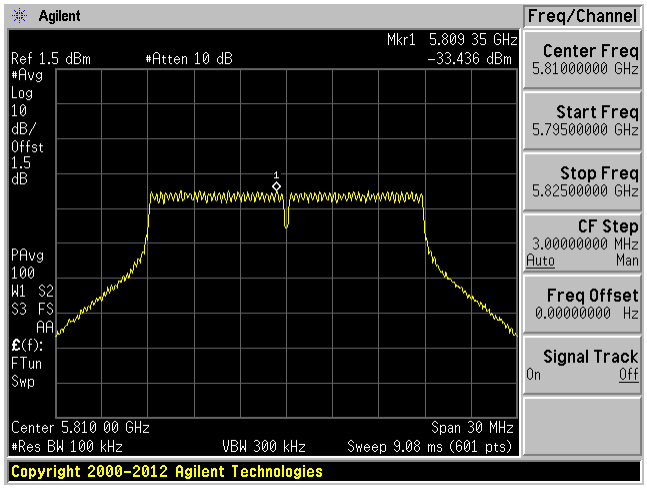
5745 MHz



5775 MHz

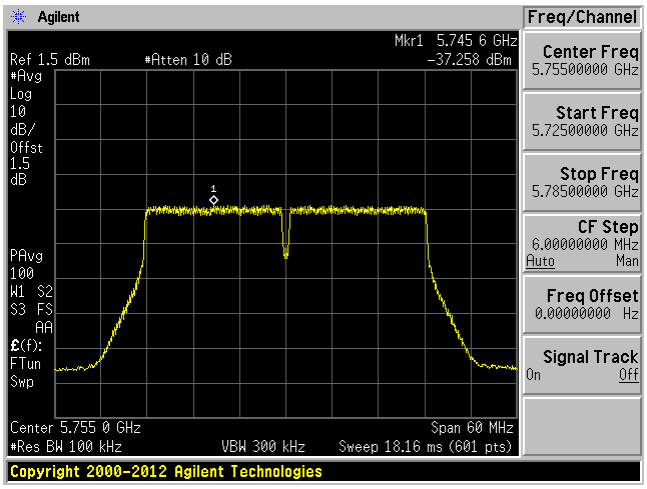


5810 MHz

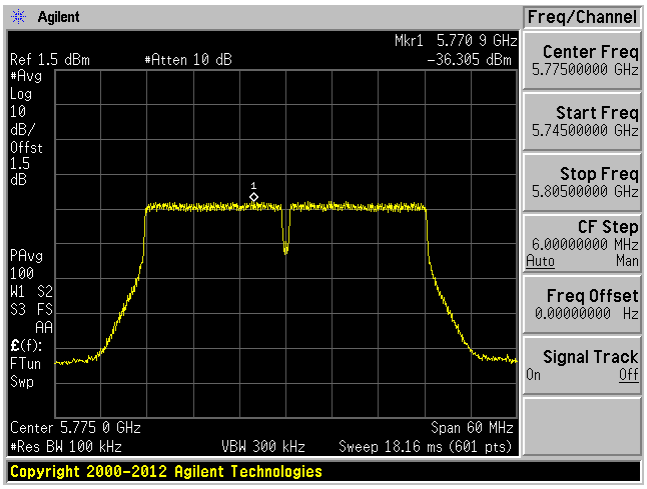


Antenna Port 1 802.11ac40 mode

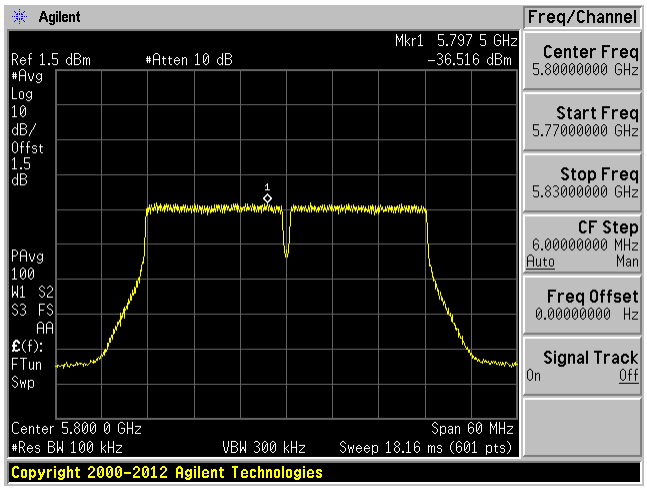
5755 MHz



5775 MHz

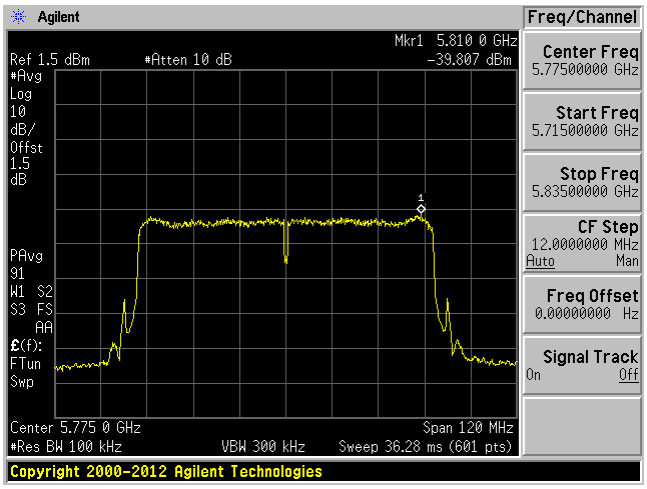


5800 MHz

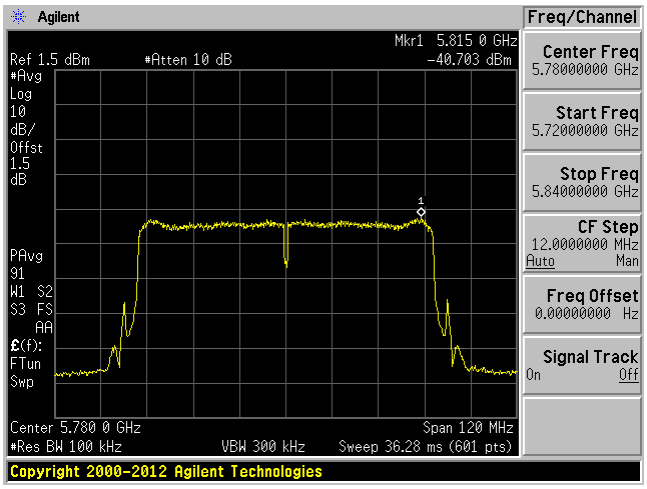


Antenna Port 1 802.11ac80 mode

5775 MHz

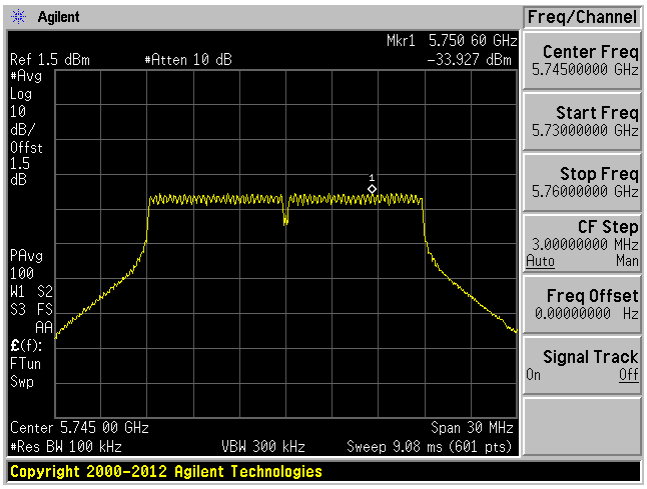


5780 MHz

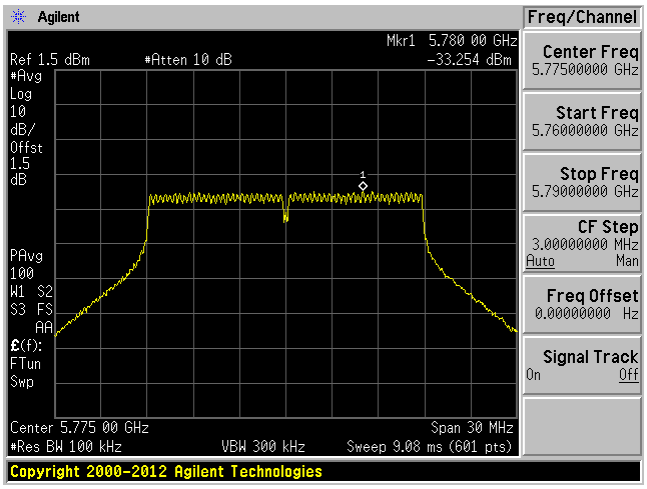


Antenna Port 2 802.11ac20 mode

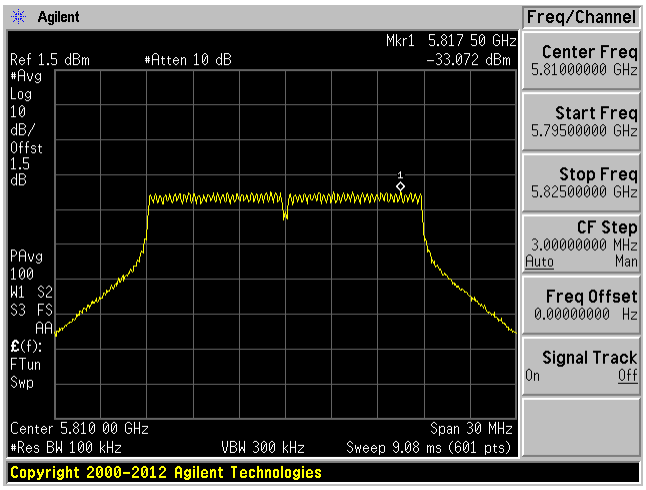
5745 MHz



5775 MHz

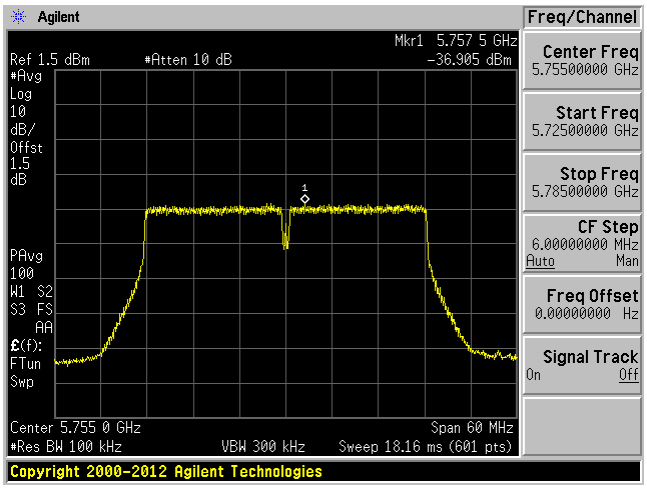


5810 MHz

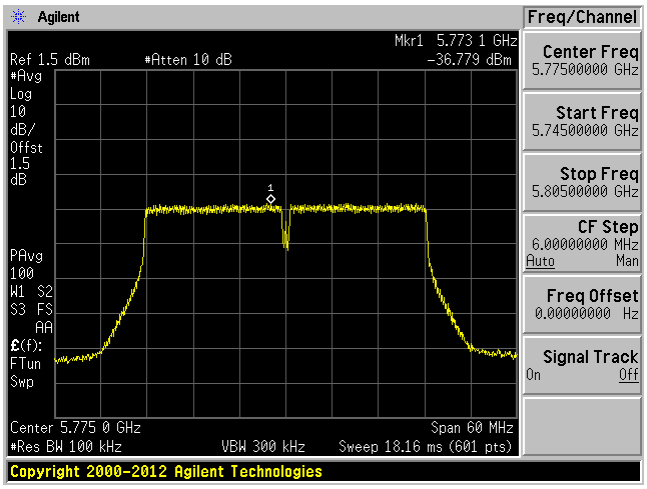


Antenna Port 2 802.11ac40 mode

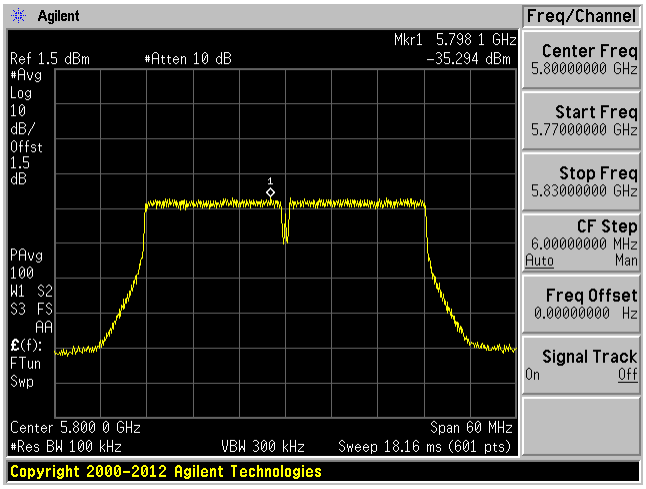
5755 MHz



5775 MHz

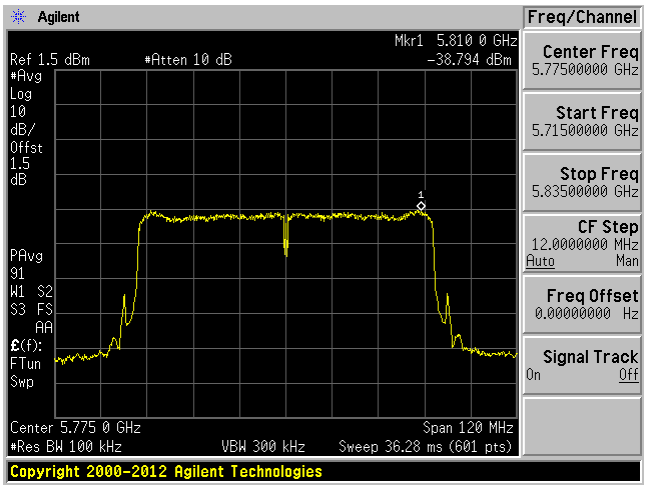


5800 MHz

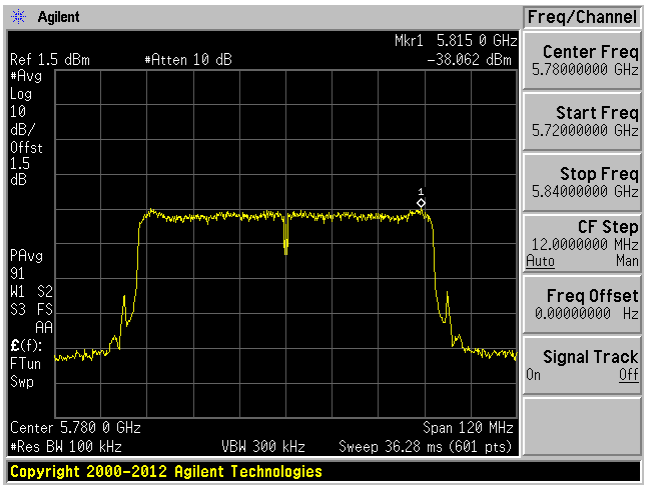


Antenna Port 2 802.11ac80 mode

5775 MHz



5780 MHz



11 FCC §15.407(b) & ISEDC RSS-247 §6.2 - Out of Band Emissions

11.1 Applicable Standards

According to FCC §15.407(b):

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

The provisions of §15.205 apply to intentional radiators operating under this section.

According to ISEDC RSS-247 §6.2.1 for devices operatinging in the frequency band 5150-5250 MHz:

For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5250-5350 MHz.

According to ISEDC RSS-247 §6.2.2 for devices operatinging in the frequency band 5250-5350 MHz:

For devices with both operating frequencies and channel bandwidths contained within the band 5250-5350 MHz, the device shall comply with the following:

1. All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. if the equipment is intended for outdoor use; or
2. All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and any emissions within the band 5150-5250 MHz shall meet the power spectral density limits of Section 6.2.1. The device shall be labelled “for indoor use only.”

For devices with operating frequencies in the band 5250-5350 MHz but having a channel bandwidth that overlaps the band 5150-5250 MHz, the devices’ unwanted emission shall not exceed -27 dBm/MHz e.i.r.p. outside the band 5150-5350 MHz and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device shall be labelled “for indoor use only.”
According to ISEDC RSS-247 §6.2.3 for devices operatinging in the frequency band 5470-5600 MHz and 5650-5725 MHz. Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p.

According to ISEDC RSS-247 §6.2.4 for devices operatinging in the frequency band 5725-5850 MHz:
For the band 5725-5850 MHz, emissions at frequencies from the band edges to 10 MHz above or below the band edges shall not exceed -17 dBm/MHz e.i.r.p.
For emissions at frequencies more than 10 MHz above or below the band edges, the emissions power shall not exceed -27 dBm/MHz.

11.2 Measurement Procedure

Add a correction factor (antenna gain+ Attenuator loss+cable loss) to the offset of the spectrum analyzer.
Integration Method

1. For peak emissions measurements, follow the procedures described in section H)5), "Procedures for Peak Unwanted Emissions Measurements above 1000 MHz", except for the following changes:

- Set RBW = 100 kHz
- Set VBW = 3RBW
- Perform a band-power integration across the 1 MHz bandwidth in which the band-edge emission level is to be measured. CAUTION: You must ensure that the spectrum analyzer or EMI receiver is set for peak-detection and max-hold for this measurement.

2. For average emissions measurements, follow the procedures described in section H)6), "Procedures for Average Unwanted Emissions Measurements above 1000 MHz", except for the following changes:

- Set RBW = 100 kHz
- Set VBW = 3RBW
- Perform a band-power integration across the 1 MHz bandwidth in which the band-edge emission level is to be measured.

11.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	MY48250238	2018-05-08	1 year
-	RF cable	-	-	Each time[1]	N/A
-	20dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 09 June 2016) "A2LA Policy on Metrological Traceability".*

11.4 Test Environmental Conditions

Temperature:	22-24º C
Relative Humidity:	40-41 %
ATM Pressure:	103.1-104.1 kPa

The testing was performed by Vincent Licata on 2018-09-13 and Chin Ming Lui on 2018-10-04 at RF site.

11.5 Test Results

Please refer to the following plots

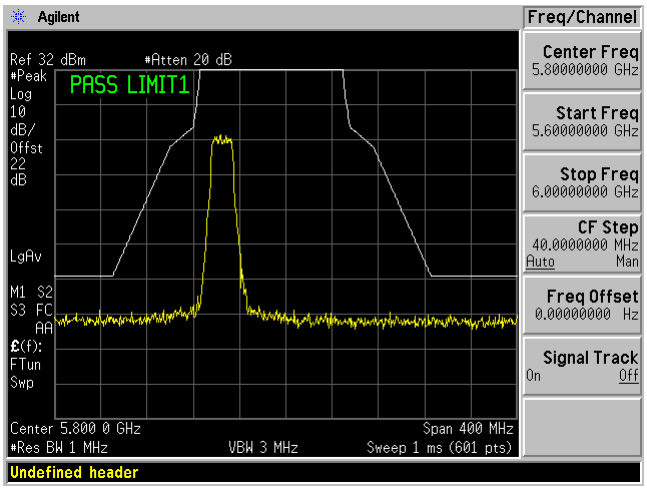
U-NII-3

FCC Emission Mask

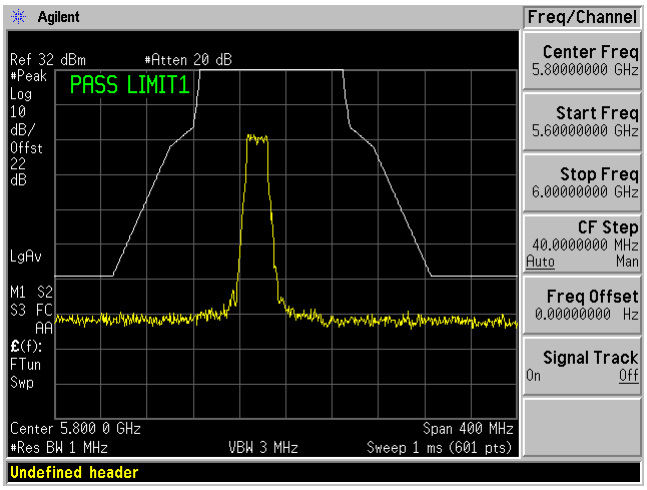
8 dBi Antenna

Antenna Port 1 802.11ac20 mode

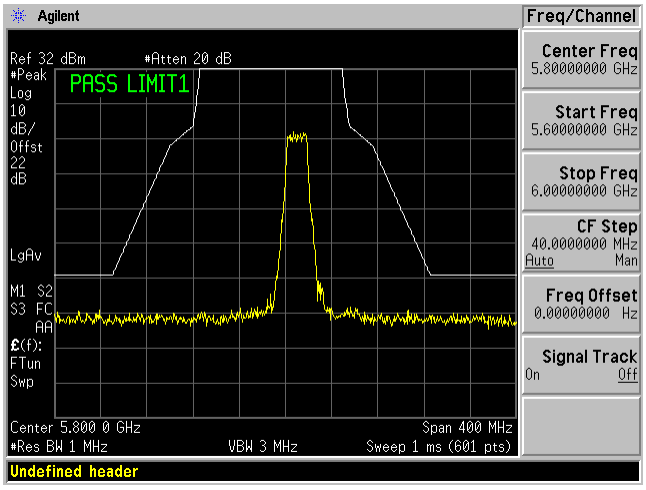
5745 MHz



5775 MHz

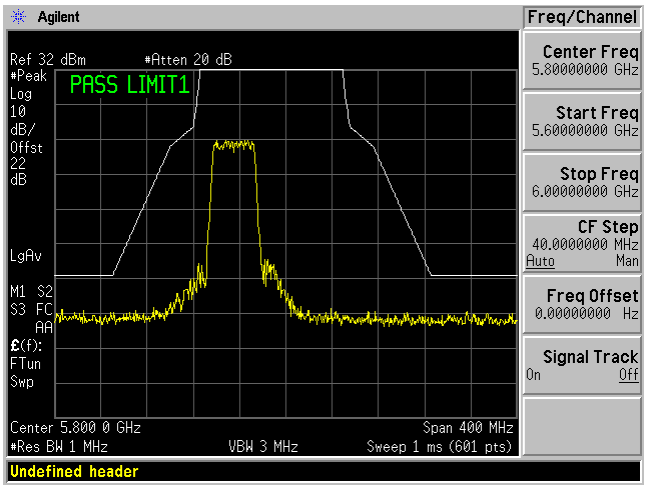


5810 MHz

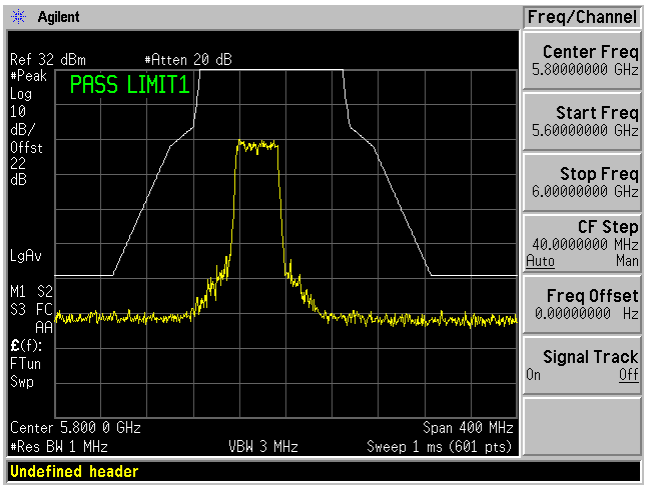


Antenna Port 1 802.11ac40 mode

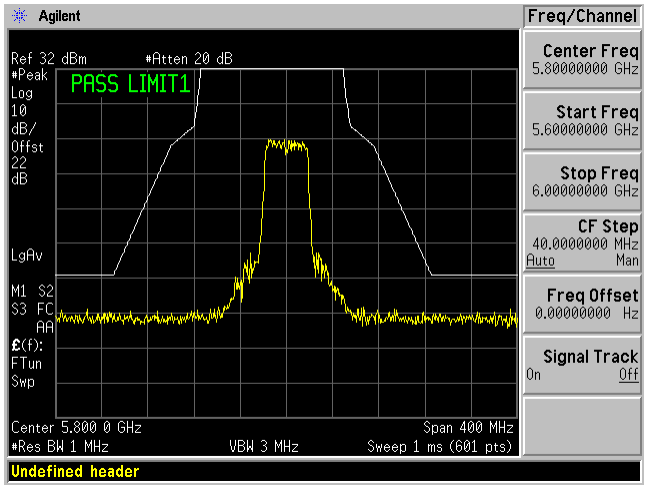
5755 MHz



5775 MHz

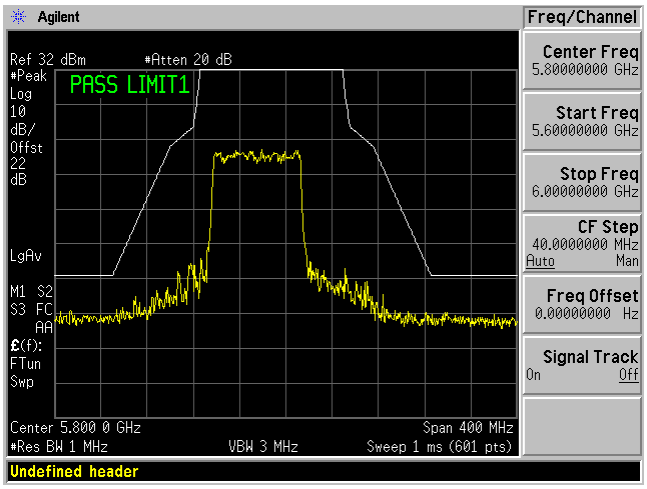


5800 MHz

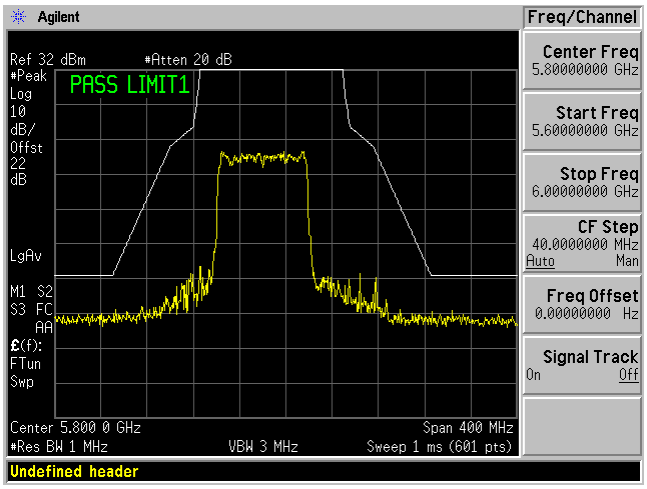


Antenna Port 1 802.11ac80 mode

5775 MHz

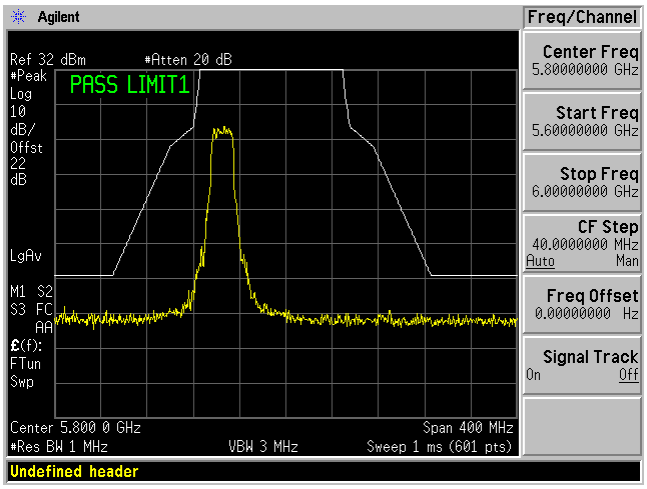


5780 MHz

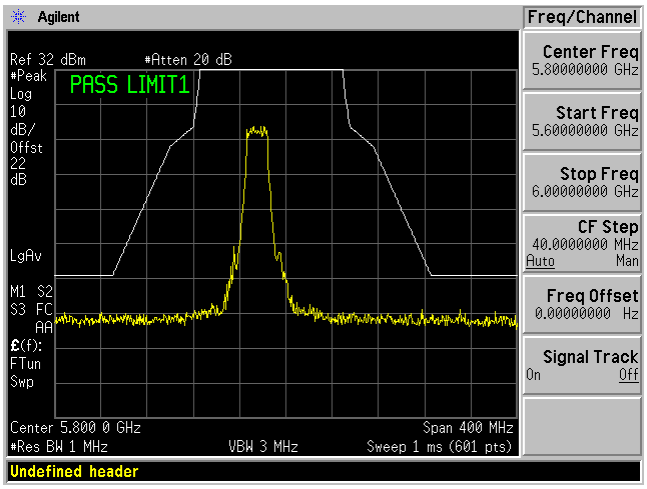


Antenna Port 2 802.11ac20 mode

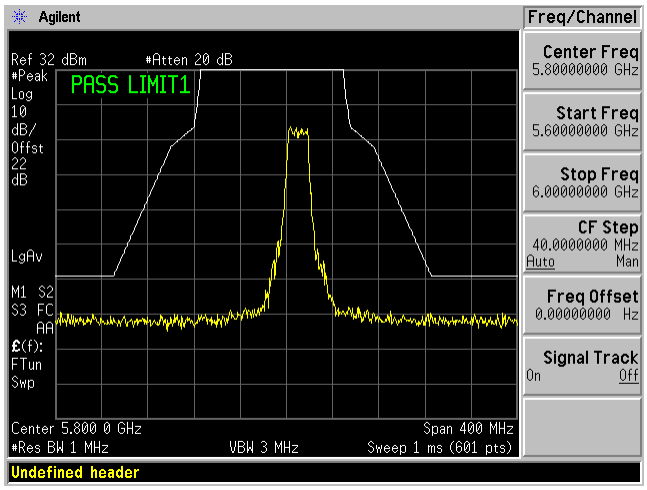
5745 MHz



5775 MHz

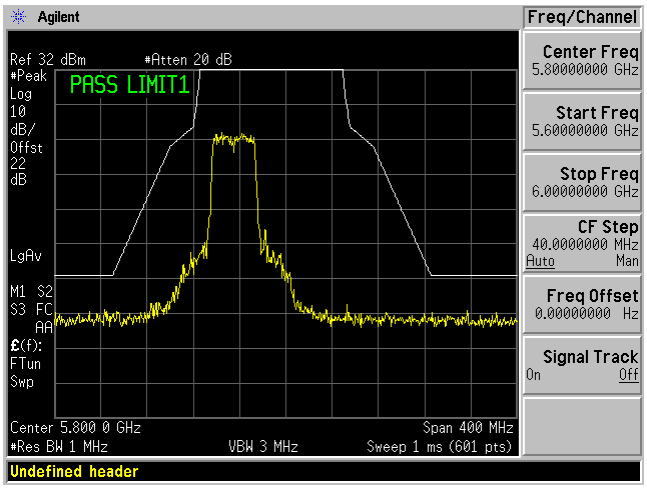


5810 MHz

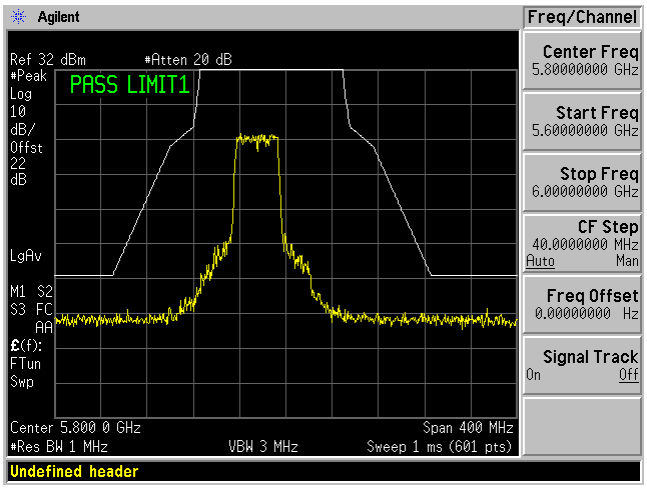


Antenna Port 2 802.11ac40 mode

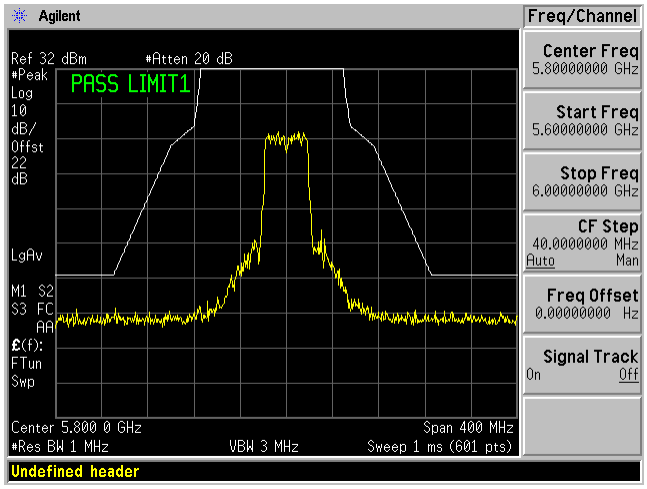
5755 MHz



5775 MHz

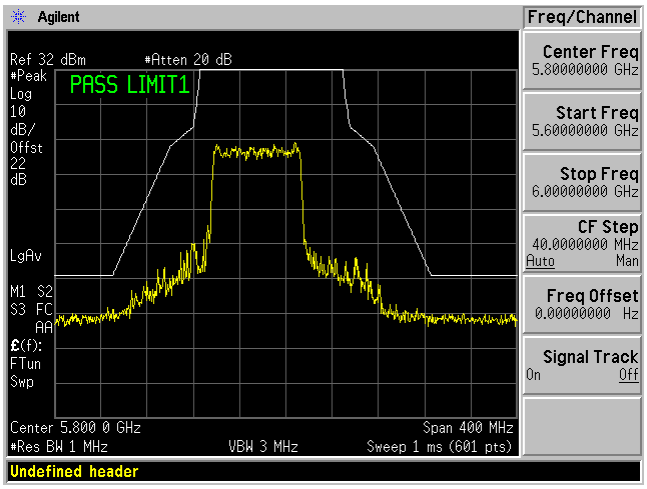


5800 MHz

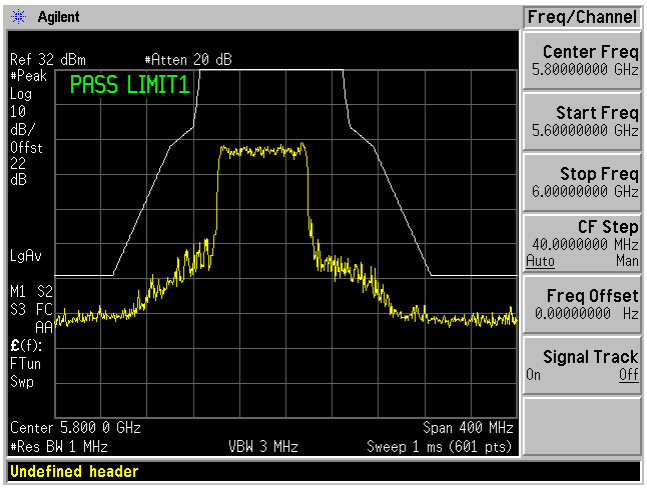


Antenna Port 2 802.11ac80 mode

5775 MHz



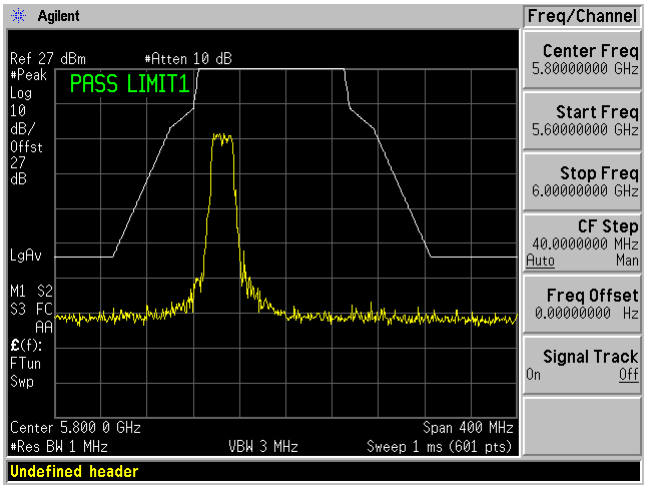
5780 MHz



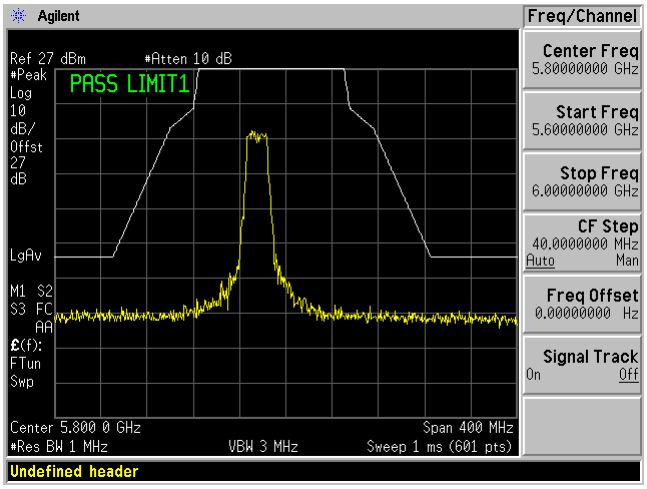
25 dBi Antenna

Antenna Port 1 802.11ac20 mode

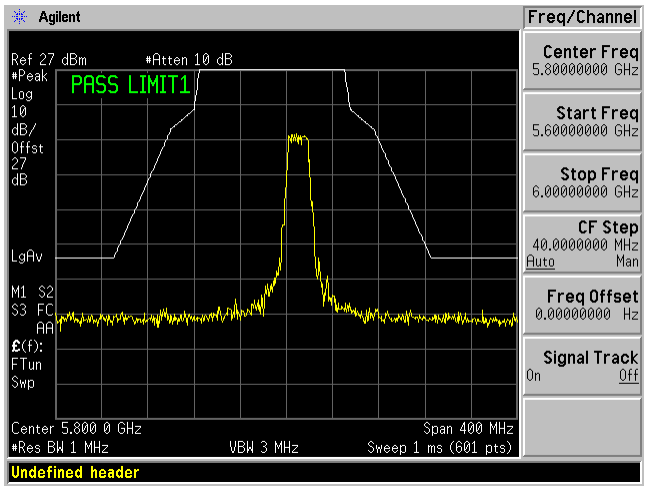
5745 MHz



5775 MHz

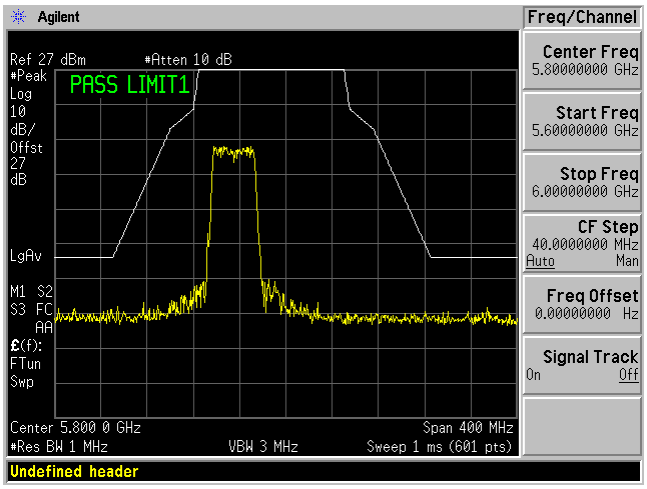


5810 MHz

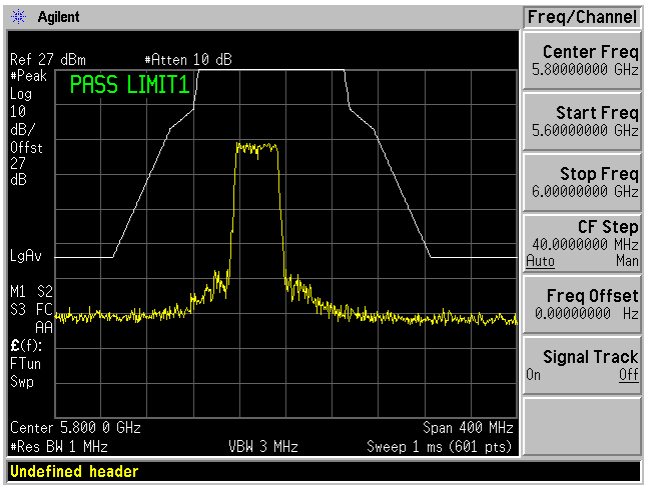


Antenna Port 1 802.11ac40 mode

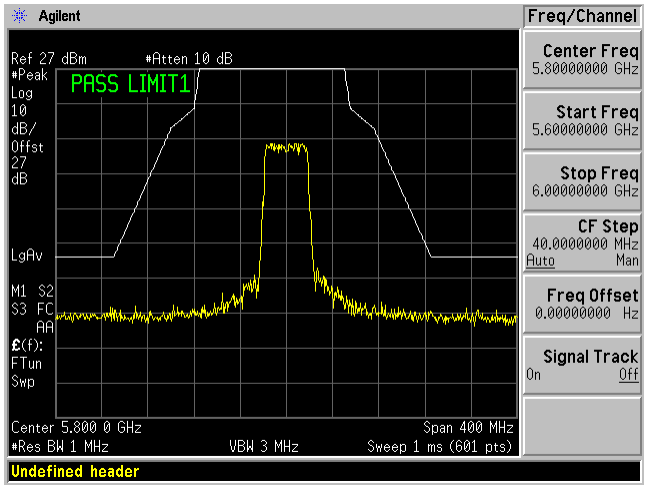
5755 MHz



5775 MHz

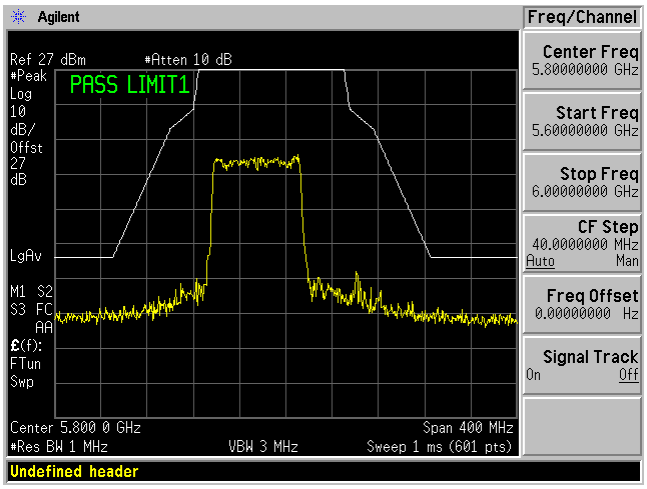


5800 MHz

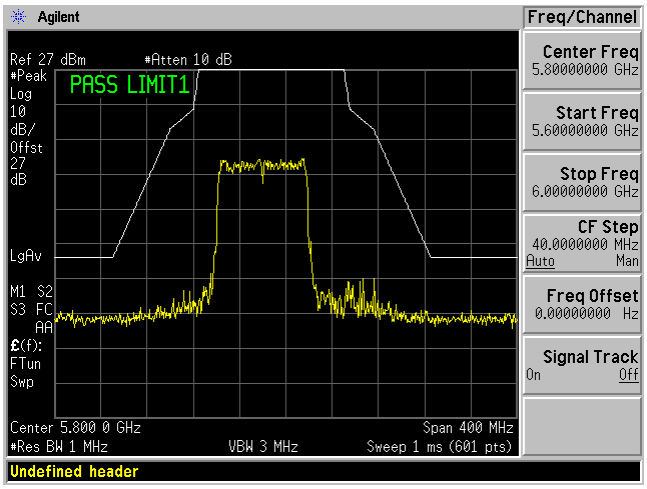


Antenna Port 1 802.11ac80 mode

5775 MHz

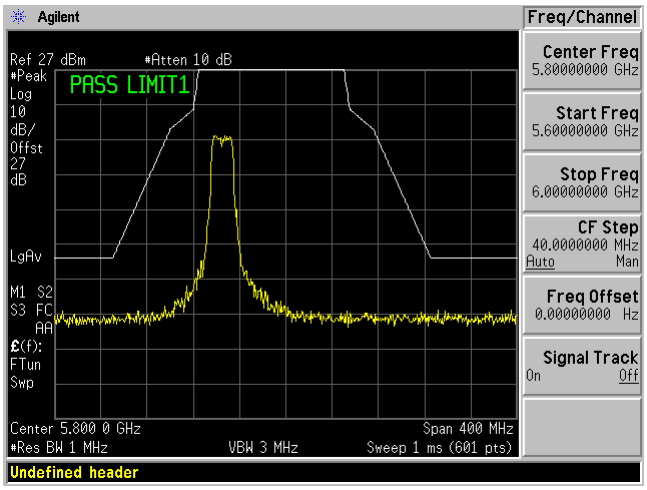


5780 MHz

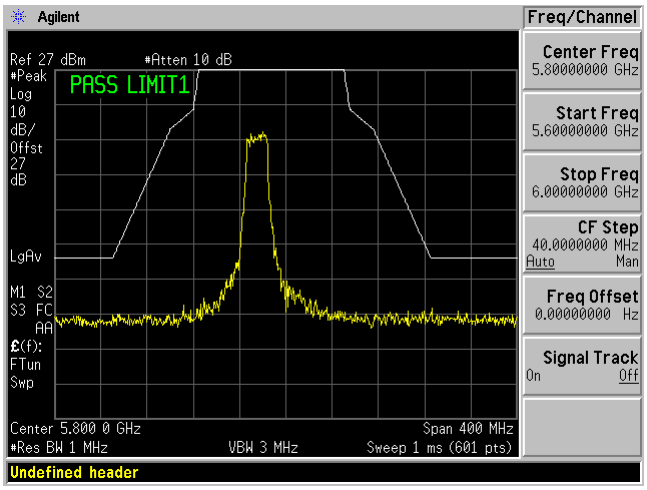


Antenna Port 2 802.11ac20 mode

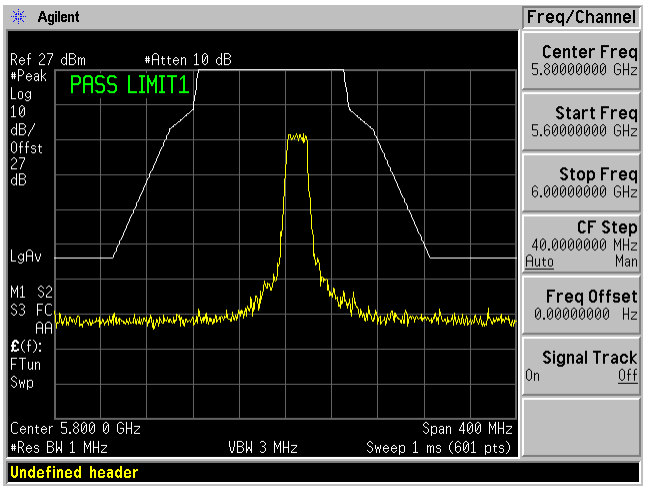
5745 MHz



5775 MHz

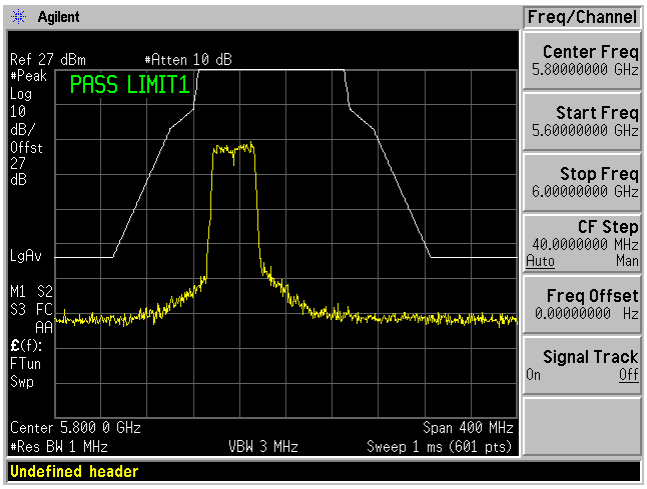


5810 MHz



Antenna Port 2 802.11ac40 mode

5755 MHz



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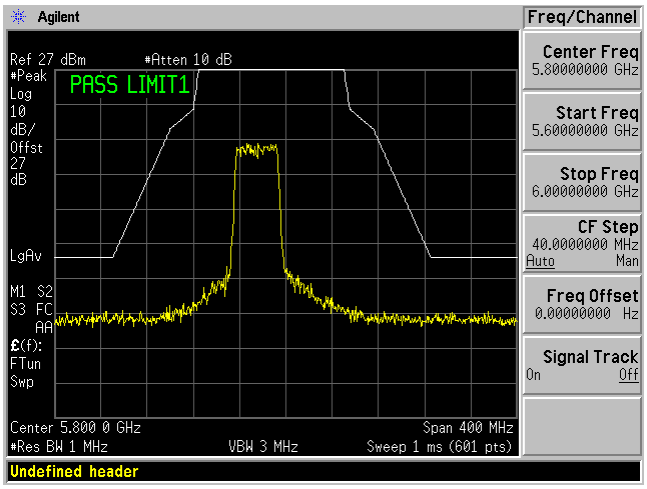
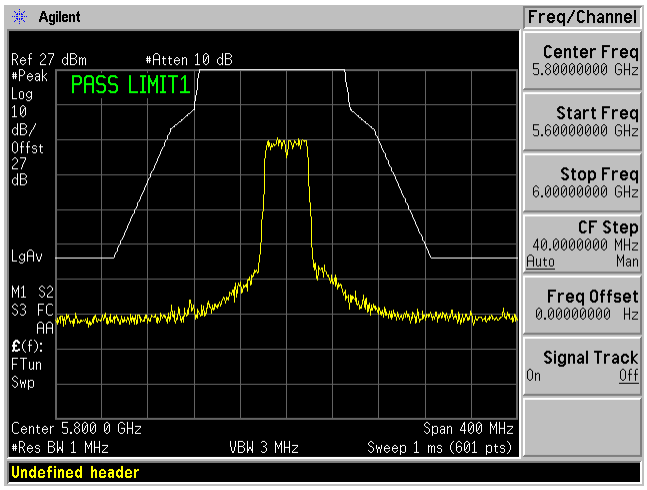
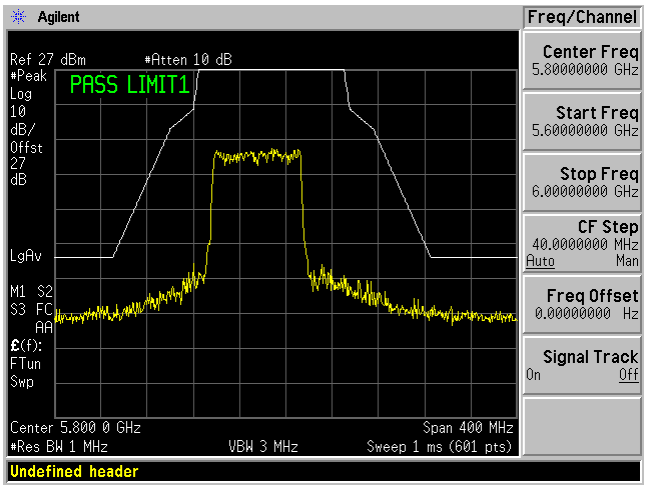


5800 MHz

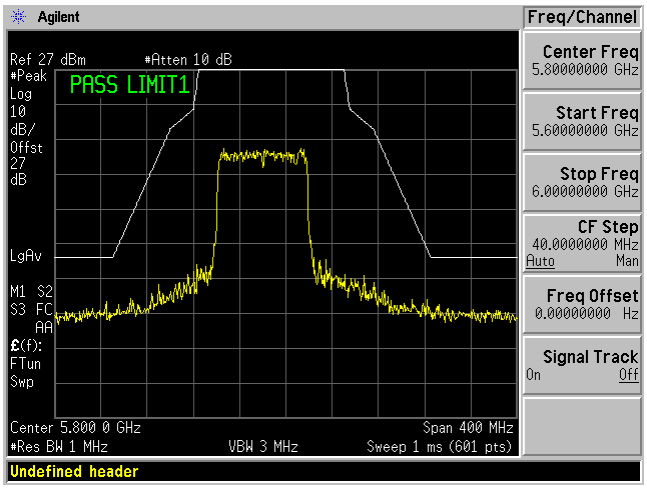


Antenna Port 2 802.11ac80 mode

5775 MHz



5780 MHz



12 Appendix A (Normative) FCC & ISEDC Labeling Requirements

12.1 FCC ID Label Requirement

Per FCC Part 2.925, (a) Each equipment covered in an application for equipment authorization shall bear a nameplate or label listing the following:

(1) FCC Identifier consisting of the two elements in the exact order specified in §2.926. The FCC Identifier shall be preceded by the term FCC ID in capital letters on a single line, and shall be of a type size large enough to be legible without the aid of magnification.

Example: FCC ID: XXX123

Where: XXX—Grantee Code, 123—Equipment Product Code

(b) The grantee code assigned pursuant to paragraph (c) of this section is assigned permanently to applicants/grantees and is valid only for the party specified as the applicant/grantee in the code assignment(s).

(c) A grantee code will have three characters consisting of Arabic numerals, capital letters, or combination thereof

(d) The equipment product code assigned by the grantee shall consist of a series of Arabic numerals, capital letters or a combination thereof, and may include the dash or hyphen (-). The total of Arabic numerals, capital letters and dashes or hyphens shall not exceed 14 and shall be one which has not been previously used in conjunction with:

12.2 IC Label Requirements

Per IC RSP-100, Issue 10 §3.1

Every unit of Category I radio apparatus certified for marketing and use in Canada shall bear a label identified by a unique combination of a model number and a certification number, which are assigned as described below in this section. This label shall be permanently affixed to the device or displayed electronically and its text must be clearly legible. If the dimensions of the device are too small or if it is not practical to place the label on the device and electronic labelling has not been implemented, the label shall be, upon agreement with Industry Canada, placed in a prominent location in the user manual supplied with the device. The user manual may be in an electronic format and must be readily available. The model number is assigned by the applicant and shall be unique to each model of radio apparatus. The model number shall be clearly indicated by a prefix such as "Model:". The word "Model" may be abbreviated; for example, the model number displayed on the label and preceded by the text "M / N:", or equivalent, is acceptable.

The certification number is made up of a Company Number (CN), assigned by Industry Canada's Certification and Engineering Bureau, followed by the Unique Product Number (UPN) assigned by the applicant. The certification number shall appear as follows:

IC: XXXXXX-YYYYYYYYYYY

Where:

• XXXXXX is the Company Number (CN) assigned by Industry Canada, made up of 6 alphanumeric characters (A-Z, 0-9) at most, including a letter at the end of the CN to distinguish between different addresses for the same company;
• YYYYYYYYYYY is the Unique Product Number (UPN) assigned by the applicant, made up of 11 alphanumeric characters (A-Z, 0-9) at most; and

12.3 FCC & IC Label Contents and Location

13 Appendix B (Normative) - EUT Photographs

Please see attachments:

Exhibit – EUT Test Setup Photographs
Exhibit – EUT External Photographs
Exhibit – EUT Internal Photogra

14 Appendix C (Normative) - A2LA Electrical Testing Certificate

Accredited Laboratory

A2LA has accredited

BAY AREA COMPLIANCE LABORATORIES CORP.

Sunnyvale, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets A2LA *R222 - Specific Requirements EPA ENERGY STAR Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system *(refer to joint ISO-ILAC-IAF Communiqué dated April 2017)*.

Presented this 2nd day of October 2018.

President and CEO
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2020

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

---END OF REPORT ---