FCC PART 15, SUBPART C
ISEDC RSS-210, ISSUE 9, AUGUST 2016

TEST REPORT

For

Mimosa Networks

469 El Camino Real, Suite 100
Santa Clara, CA 95050, USA

FCC ID: 2ABZJ-010-00083
IC: 11823A-01000083

Report Type:	**Model:**
Original Report	Microwave P-to-P Backhaul Radio

	Vincent Licata
Prepared By:	Test Engineer
Report Number:	R1712272-249
Report Date:	2018-03-12
	Xiao Lin
Reviewed By:	RF Lead

Bay Area Compliance Laboratories Corp.
1274 Anvilwood Avenue,
Sunnyvale, CA 94089, USA
Tel: (408) 732-9162
Fax: (408) 732-9164

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1712272-249	Original Report	2018-03-12

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *Mimosa Networks*, and their product model: *B24,* FCC ID: 2ABZJ-010-00083, IC: 11823A-01000083 the "EUT" as referred to in this report. The EUT is a Point-to-Point Wireless Link that contains 802.11ac Point-to-Point radio (24050-24250 MHz) with integrated antenna.

1.2 Objective

This report is prepared on behalf of *Mimosa Networks,* in accordance with Part 15, Subparts C of the Federal Communication Commission's rules and ISEDC RSS-210 Issue 9, August 2016.

The objective is to determine compliance with FCC Part 15.249 and ISEDC RSS-210 rules for: Antenna Requirements, Emission Bandwidth, Frequency Tolerance, Conducted Emissions, and Radiated Spurious Emissions.

1.3 Related Submittal(s)/Grant(s)

N/A

1.4 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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 repeatability.

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 (Industry Canada):
    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 (Info-Communications Development Authority (IDA)):

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 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.10-2013.

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 to be as follows for each mode based upon investigation by measuring Field strength across all data rates bandwidths, and modulations.

2.2 EUT Exercise Software

The test firmware used was the Tera term and setup commands provided by *Mimosa Networks*, the software is compliant with the standard requirements being tested against.

Modulation	Frequency (MHz)	Power Setting
802.11ac20	24060	3
	24140	3
	24200	3
802.11ac40	24070	2
	24140	2
	24190	2
802.11ac80	24090	1
	24170	1

802.11ac20

Antenna Polarization	Low Channel Frequency (MHz)		Middle Channel Frequency (MHz)		High Channel Frequency (MHz)	
	F1	F2	F1	F2	F1	F2
V	24080	24060	24120	24140	24180	24200
H	24080	24060	24120	24140	24180	24200

802.11ac40

Antenna Polarization	Low Channel Frequency (MHz)		Middle Channel Frequency (MHz)		High Channel Frequency (MHz)	
	F1	F2	F1	F2	F1	F2
V	24110	24070	24100	24140	24150	24190
H	24110	24070	24100	24140	24150	24190

802.11ac80

Antenna Polarization	Low Channel Frequency (MHz)		High Channel Frequency (MHz)	
	F1	F2	F1	F2
V	24170	24090	24090	24170
H	24170	24090	24090	24170

2.3 Equipment Modifications

None

2.4 Local Support Equipment

Manufacturer	Description	Model	Serial Number
Dell	Laptop	Latitude E6410	3CKRAQ1

2.5 Support Equipment

None

2.6 Interface Ports and Cabling

Cable Description	Length (m)	To	From
RF Cable	< 1 m	EUT	PSA
Ethernet Cable	< 1m	Laptop	POE
Ethernet Cable	< 1m	EUT	POE

3 Summary of Test Results

Results reported relate only to the product tested.

FCC and ISEDC Rules	Description of Test	Results
FCC §15.203, §15.249 (b)(3) ISEDC RSS-210 Annex I (c) ISEDC RSS-Gen §8.3	Antenna Requirement	Compliant
FCC §2.1091 ISEDC RSS-102	RF Exposure	Compliant
FCC §15.207 ISEDC RSS-Gen §8.8	AC Power Line Conducted Emissions	Compliant
FCC §2.1053, §15.205, §15.209, §15.249 (d) ISEDC RSS-210 Annex I ISEDC RSS-Gen §8.9 and §8.10	Radiated Spurious Emissions	Compliant
FCC §15.215 (c) ISEDC RSS-Gen §6.6	20 dB and 99% Emission Bandwidth	Compliant
FCC §15.249(b)(2) ISEDC RSS-210 Annex I (b)	Frequency Tolerance	Compliant

4 FCC §15.203, §15.249 (b) (3) & ISEDC RSS-210 Annex I (c), RSS-Gen §8.3 - Antenna Requirements

4.1 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 §15.249 (b) (3):

Antenna gain must be at least 33 dBi. Alternatively, the main lobe beamwidth must not exceed 3.5 degrees. The beamwidth limit shall apply to both the azimuth and elevation planes. At antenna gains over 33 dBi or beamwidths narrower than 3.5 degrees, power must be reduced to ensure that the field strength does not exceed 2500 millivolts/meter.

According to ISEDC RSS-210 Annex I (c):

The antenna gain must be at least 33 dBi. Alternatively, the beam width of the main lobe shall not exceed 3.5 degrees in the azimuth and elevation planes. For antenna gains greater than 53 dBi, the output power must be reduced as necessary, such that the field strength limit is not exceeded.

According to ISEDC RSS-Gen §8.3: Transmitter Antenna

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the license-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

License-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotopically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the license-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of license-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. [9] When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

4.2 Antenna Description

The antennas used by the EUT are internal permanently attached antennas.

Antenna usage	Antenna Type	Frequency Range (MHz)	Maximum Antenna Gain (dBi)
802.11ac radio	Parabolic, slant ±45º polarized	24000-24250	33.0

5 FCC §2.1091 & ISEDC RSS-102 - RF Exposure

5.1 Applicable Standards

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

Limits for General Population/Uncontrolled Exposure

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

f = frequency in MHz
* = Plane-wave equivalent power density

Before equipment certification is granted, the procedure of IC 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.

5.2 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

5.3 MPE Results

24 GHz band:

Maximum peak output power E.I.R.P. (dBm):	23.22
Maximum peak output power E.I.R.P. (mW):	209.894
Prediction distance (cm):	20
Prediction frequency (MHz):	24200
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.041757
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.041757 mW/cm^2. Limit is 1.0 mW/cm^2.

Maximum peak output power E.I.R.P. (dBm):	23.22
Maximum peak output power E.I.R.P. (mW):	209.894
Prediction distance (cm):	20
Prediction frequency (MHz):	24180
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.041757
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.041757 mW/cm^2. Limit is 1.0 mW/cm^2.

2.4 GHz band:

Maximum peak output power E.I.R.P. (dBm):	21.25
Maximum peak output power E.I.R.P. (mW):	133.352
Prediction distance (cm):	20
Prediction frequency (MHz):	2437
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.02653
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.02653 mW/cm^2. Limit is 1.0 mW/cm^2.

Note: Please refer to original SPORTON LAB report number: FR382432M, FCC ID: PPD-QCNFA335

Conclusion: The sum of the MPE values to their respective limits for worst case colocation 24 GHz band and 2.4 GHz band is 0.110044 mW/cm^2. Limit is 1.0 mW/cm^2.

5.4 RF exposure evaluation exemption for ISEDC

EIRP = 118.48 dBµV/m @ 3 m - 95.26 = 23.22 dBm = 0.21 W

0.21 W + 0.21 W = 0.42 W < 5W

Conclusion: The device meets the exemption requirement.

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

6.1 Applicable Standards

As per FCC §15.207 and ISED RSS-Gen §8.8 Conducted limits:

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 were FCC §15.207 and ISED RSS-Gen §8.8 limits.

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 were 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 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:

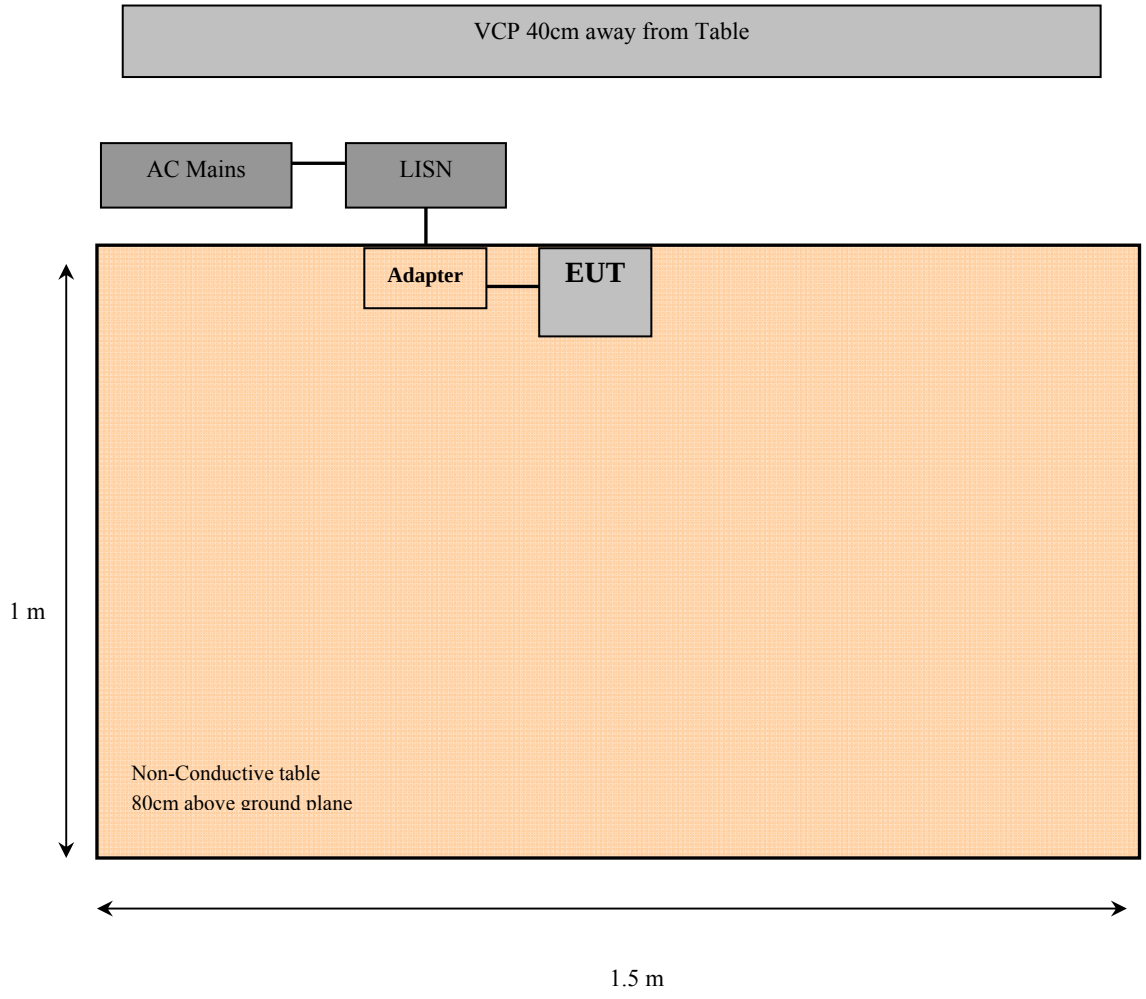
CA = Ai + CL + Atten

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

6.5 Test Setup Block Diagram



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	2016-02-04	2 years
Rohde and Schwarz	Impulse Limiter	ESH3-Z2	101964	2017-07-25	1 year
Solar Electronics Company	High Pass Filter	Type 7930-100	7930150204	2017-03-13	1 year
Suirong	30 ft conductive emission cable	LMR 400	-	N/R	N/A
FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160129	2017-04-24	1 year
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

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 Vincent Licata on 2018-02-02 at ground plane test site.

6.8 Summary of Test Results

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

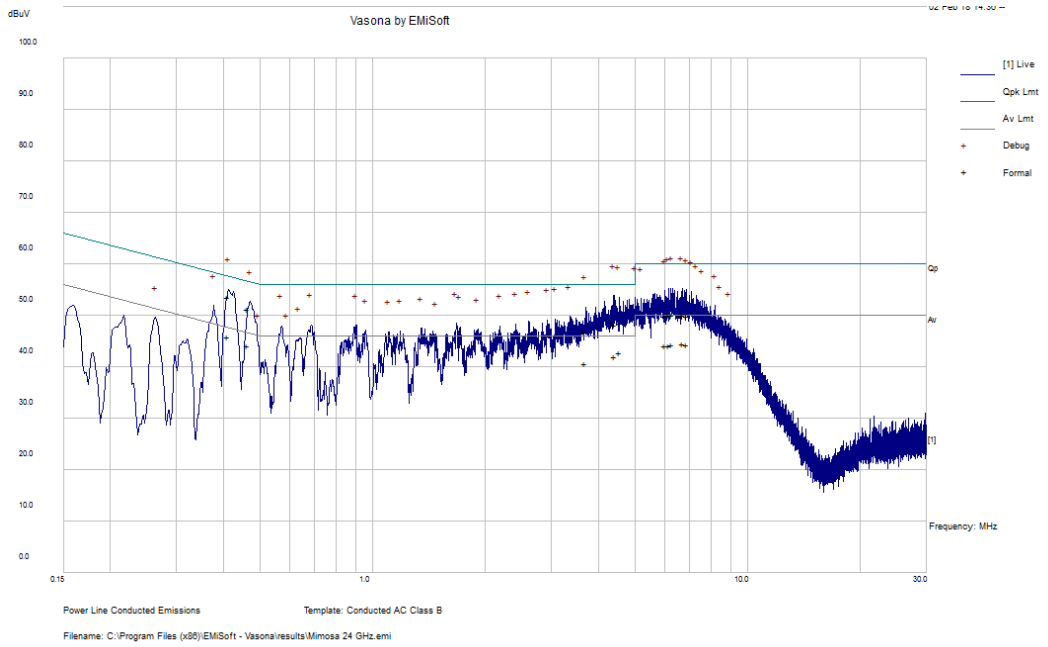
24 GHz Worst Case 802.11ac20 multichannel

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-1.72	0.41211	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

24 GHz Worst Case 802.11ac20 multichannel

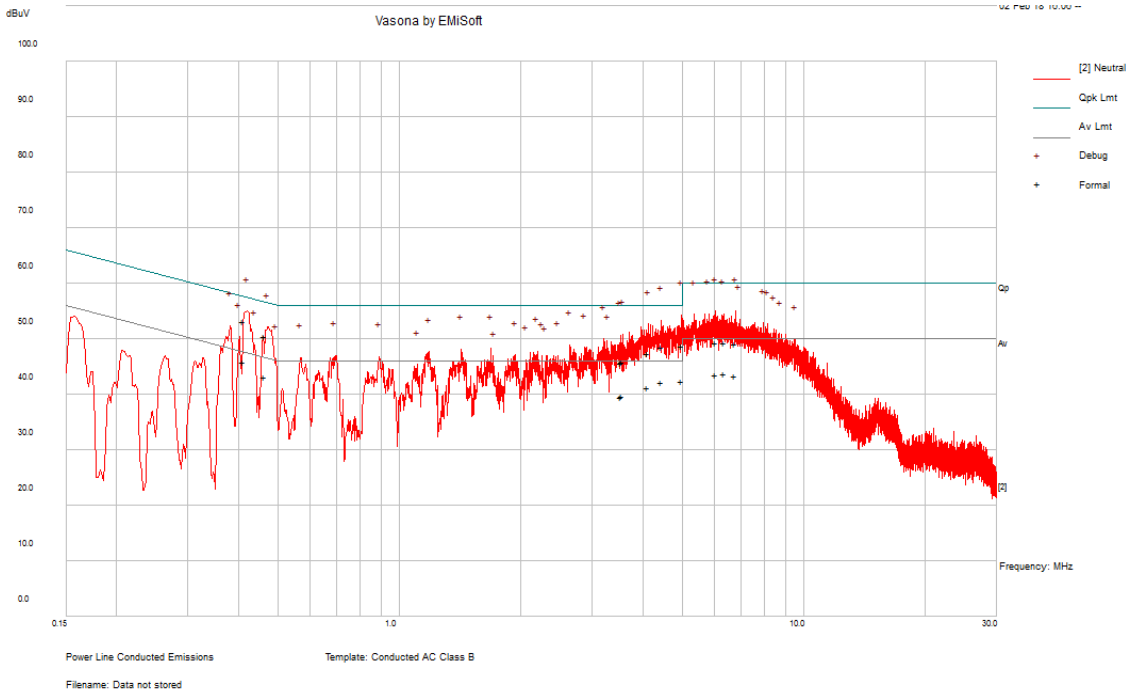
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
4.41248	48.26	Line	56	-7.74	QP
4.545008	48.62	Line	56	-7.38	QP
0.409976	53.62	Line	57.65	-4.03	QP
0.463642	51.23	Line	56.63	-5.39	QP
3.67645	46.79	Line	56	-9.21	QP
6.702482	50.13	Line	60	-9.87	QP
6.294554	50.11	Line	60	-9.89	QP
6.162458	50.07	Line	60	-9.93	QP
6.864392	49.99	Line	60	-10.01	QP
6.010094	50.02	Line	60	-9.98	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
4.41248	42.08	Line	46	-3.92	Ave.
4.545008	42.73	Line	46	-3.27	Ave.
0.409976	45.89	Line	47.65	-1.76	Ave.
0.463642	44.17	Line	46.63	-2.46	Ave.
3.67645	40.72	Line	46	-5.28	Ave.
6.702482	44.47	Line	50	-5.53	Ave.
6.294554	44.26	Line	50	-5.74	Ave.
6.162458	44.22	Line	50	-5.78	Ave.
6.864392	44.43	Line	50	-5.57	Ave.
6.010094	44.09	Line	50	-5.91	Ave.

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
4.992218	48.73	Neutral	56	-7.27	QP
0.41211	53.11	Neutral	57.61	-4.49	QP
4.45517	48.53	Neutral	56	-7.47	QP
4.120484	47.45	Neutral	56	-8.55	QP
0.464434	50.45	Neutral	56.61	-6.16	QP
6.774608	49.15	Neutral	60	-10.85	QP
6.045122	49.33	Neutral	60	-10.67	QP
3.563065	45.92	Neutral	56	-10.08	QP
3.526329	45.61	Neutral	56	-10.39	QP
6.340454	49.3	Neutral	60	-10.7	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
4.992218	42.44	Neutral	46	-3.56	Ave.
0.41211	**45.88**	**Neutral**	**47.61**	**-1.72**	**Ave.**
4.45517	42.33	Neutral	46	-3.67	Ave.
4.120484	41.19	Neutral	46	-4.81	Ave.
0.464434	43.27	Neutral	46.61	-3.34	Ave.
6.774608	43.47	Neutral	50	-6.53	Ave.
6.045122	43.62	Neutral	50	-6.38	Ave.
3.563065	39.77	Neutral	46	-6.23	Ave.
3.526329	39.64	Neutral	46	-6.36	Ave.
6.340454	43.71	Neutral	50	-6.29	Ave.

7 FCC §2.1053, §15.209, §15.249 (d) & ISEDC RSS-210 Annex I, RSS-Gen §8.9, §8.10 - Spurious Radiated Emissions

7.1 Applicable Standards

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

As Per FCC §15.205(a) and RSS-Gen 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 0.495 – 0.505 2.1735 – 2.1905 4.125 – 4.128 4.17725 – 4.17775 4.20725 – 4.20775 6.215 – 6.218 6.26775 – 6.26825 6.31175 – 6.31225 8.291 – 8.294 8.362 – 8.366 8.37625 – 8.38675 8.41425 – 8.41475 12.29 – 12.293 12.51975 – 12.52025 12.57675 – 12.57725 13.36 – 13.41	16.42 – 16.423 16.69475 – 16.69525 25.5 – 25.67 37.5 – 38.25 73 – 74.6 74.8 – 75.2 108 – 121.94 123 – 138 149.9 – 150.05 156.52475 – 156.52525 156.7 – 156.9 162.0125 –167.17 167.72 – 173.2 240 – 285 322 – 335.4 399.9 – 410 608 – 614	960 – 1240 1300 – 1427 1435 – 1626.5 1645.5 – 1646.5 1660 – 1710 1718.8 – 1722.2 2200 – 2300 2310 – 2390 2483.5 – 2500 2690 – 2900 3260 – 3267 3.332 – 3.339 3 3458 – 3 358 3.600 – 4.400	4. 5 – 5. 15 5. 35 – 5. 46 7.25 – 7.75 8.025 – 8.5 9.0 – 9.2 9.3 – 9.5 10.6 – 12.7 13.25 – 13.4 14.47 – 14.5 15.35 – 16.2 17.7 – 21.4 22.01 – 23.12 23.6 – 24.0 31.2 – 31.8 36.43 – 36.5 Above 38.6

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (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**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz.

However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per FCC §15.249 (a): Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

As per FCC §15.249 (b): Fixed, point-to-point operation as referred to in this paragraph shall be limited to systems employing a fixed transmitter transmitting to a fixed remote location. Point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information are not allowed. Fixed, point-to-point operation is permitted in the 24.05-24.25 GHz band subject to the following conditions: (1) The field strength of emissions in this band shall not exceed 2500 millivolts/meter.
As per FCC §15.249 (c): Field strength limits are specified at a distance of 3 meters.

As per FCC §15.249 (d): Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

As per FCC §15.249 (e): As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

As per ISEDC RSS-Gen 8.9,

> Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 4 or Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.
>
> **Table 4 – General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Above 30 MHz**
>
Frequency (MHz)	Field Strength (µv/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for license-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

Note: Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.

As per ISEDC RSS-210 Annex I (a): The field strength of emissions in this band shall not exceed 25 V/m measured at a distance of 3 m. The power delivered to the antenna shall not exceed 1 mW.

As per ISEDC RSS-210 Annex I (d) and (e): Except for harmonic emissions, out-of-band emissions shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits specified in RSS-Gen, whichever is less stringent. Harmonic emissions shall not exceed 2.5 mV/m measured at 3 m; and the field strength limit in (a) of this section is based on average limit. However, the peak field strength shall not exceed 25 V/m measured at 3 m along the antenna boresight.

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 Subpart C and ISEDC RSS-210 limits.

The spacing between the peripherals was 10 centimeters.

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

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 was set 3 meter away from the testing antenna, which was varied from 1-4 meter, and the EUT was placed on a turntable, which was 0.8 meter and 1.5 meter above the ground plane for below and above 1000 MHz measurements, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna's polarity should be changed between horizontal and vertical.

The spectrum analyzer or receiver was set as:

Below 1000 MHz:

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

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 3MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / 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 (+23.5dB) + 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. 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 and Schwarz	Receiver, EMI Test	ESCI 1166.5950K03	100044	2017-09-19	2 years
Agilent	Analyzer, Spectrum	E4446A	US44300386	2017-04-20	1 year
Sunol Sciences	System Controller	SC99V	011003-1	N/R	N/A
Sunol Sciences	Antenna, Biconi-Log	JB3	A020106-2	2018-01-25	2 years
EMCO	Antenna, Horn	3115	9511-4627	2016-01-28	26 months
OML	Harmonic Mixer and Horn Antenna Set	M03HWA; M05HWA; M08HWA; M12HWA; M19HWA	170615-1	2017-06-15	1 year
Agilent	Amplifier, Pre	8447D	2944A06639	2017-06-28	1 year
IW	AOBOR Hi frequency Co AX Cable	KPS-1501A3960KPS	DC 1531	2017-08-05	1 year
-	RF cable	-	-	Each time[1]	N/A
-	RF cable	-	-	Each time[1]	N/A
-	N-Type Cable	-	C00012	Each time[1]	N/A
-	N-Type Cable	-	C00014	Each time[1]	N/A
Pasternack	10 dB Attenuator	PE7087-10	1837	Each time[1]	N/A
Agilent	Pre-Amplifier	8449B	3147A00400	2017-06-15	1 year
Wisewave	Antenna, Horn	ARH-2823-02	10555-02	2017-12-15	2 years
Wisewave	Antenna, Horn	ARH-4223-02	10555-02	2017-12-15	2 years
AH Systems	18-40GHz Pre-Amplifier	PAM-1840VH	170	2017-02-28	14 months
Sunol Sciences	Antenna, Horn	DRH-118	A052704	2017-03-27	2 years
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

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".*

7.6 Test Environmental Conditions

Temperature:	20-24 ºC
Relative Humidity:	42-50 %
ATM Pressure:	102.7 kPa

The testing was performed by Vincent Licata on 2018-03-07 in 5m chamber 3.

7.7 Summary of Test Results

According to the data hereinafter, the EUT complied with FCC Title 47, Part 15C and ISEDC RSS-210 standard's radiated emissions limits, and had the worst margin of:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, channel**
-0.27	24250	Horizontal	802.11ac40, High Channel

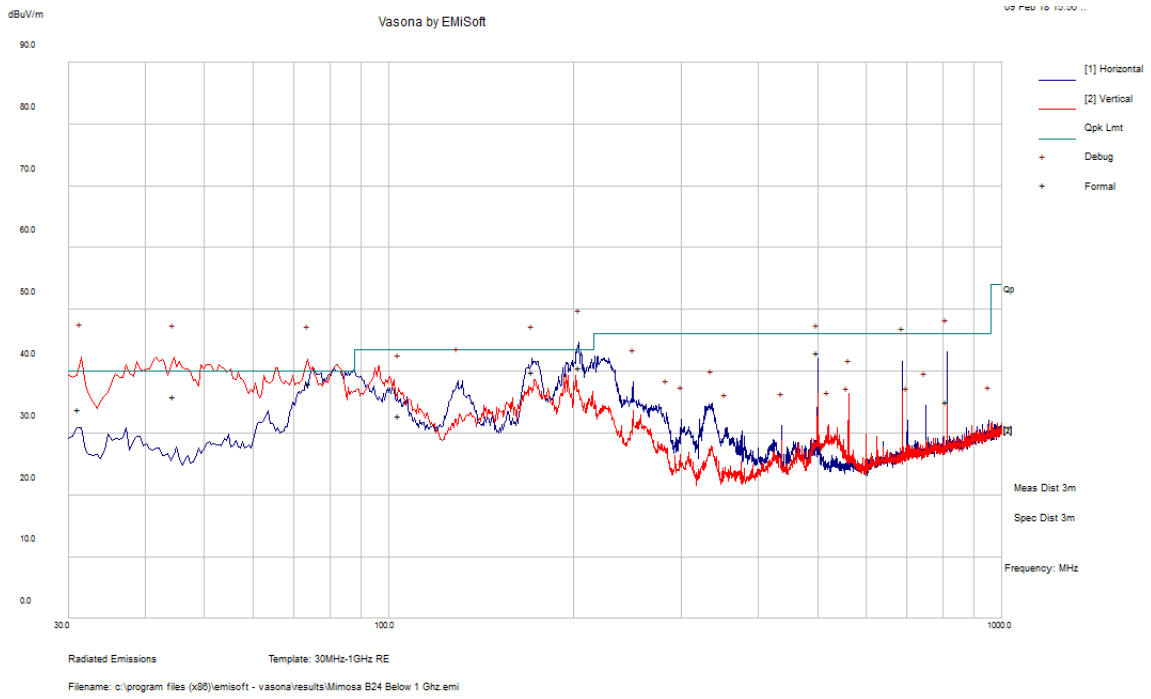
Please refer to the following table and plots for specific test result details

7.8 Radiated Emissions Test Results

1) 30 MHz – 1 GHz

(Worst Case 802.11ac20 High channel, measured at 3 meters)

24 GHz 802.11ac



Note: High Channel EUT was set to transmit 24180 MHz and 24200 MHz

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
31.122	33.84	114	V	113	40	-6.16	QP
44.429	35.91	99	V	316	40	-4.09	QP
74.07875	37.93	99	V	70	40	-2.07	QP
204.0843	40.67	139	H	327	43.5	-2.83	QP
170.9088	39.93	172	H	340	43.5	-3.57	QP
812.5075	35.13	165	V	41	46	-10.87	QP
499.9943	42.97	167	H	204	46	-3.03	QP
103.727	32.82	297	H	22	43.5	-10.68	QP

2) 1–100 GHz

24 GHz 802.11ac20

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 24060 MHz											
24060	98.76	0	150	H	35.33	15.76	32.79	117.05	127.96	-10.91	PK
24060	90.84	0	150	H	35.33	15.76	32.79	109.13	127.96	-18.83	AV
24060	99.58	0	150	V	35.33	15.76	32.79	117.87	127.96	-10.09	PK
24060	91.14	0	150	V	35.33	15.76	32.79	109.43	127.96	-18.53	AV
24000	43.23	0	150	H	35.33	15.76	32.79	61.52	74.00	-12.48	PK
24000	32.07	0	150	H	35.33	15.76	32.79	50.36	54.00	-3.64	AV
24000	46.04	0	150	V	35.33	15.76	32.79	64.33	74.00	-9.67	PK
24000	28.63	0	150	V	35.33	15.76	32.79	46.92	54.00	-7.08	AV
48120	20.07	0	100	H	37.51	0.00	0.00	57.58	74.00	-16.42	PK
48120	8.64	0	100	H	37.51	0.00	0.00	46.15	54.00	-7.85	AV
48120	20.60	0	100	V	37.51	0.00	0.00	58.11	74.00	-15.89	PK
48120	8.66	0	100	V	37.51	0.00	0.00	46.17	54.00	-7.83	AV
Middle Channel 24140 MHz											
24140	99.46	0	150	H	35.33	15.25	32.68	117.36	127.96	-10.60	PK
24140	91.37	0	150	H	35.33	15.25	32.68	109.27	127.96	-18.69	AV
24140	100.26	0	150	V	35.33	15.25	32.68	118.16	127.96	-9.80	PK
24140	92.04	0	150	V	35.33	15.25	32.68	109.94	127.96	-18.02	AV
48280	21.59	0	100	H	37.51	0.00	0.00	59.10	74.00	-14.90	PK
48280	9.89	0	100	H	37.51	0.00	0.00	47.40	54.00	-6.60	AV
48280	21.74	0	100	V	37.51	0.00	0.00	59.25	74.00	-14.75	PK
48280	9.91	0	100	V	37.51	0.00	0.00	47.42	54.00	-6.58	AV
High Channel 24200 MHz											
24200	99.62	0	150	H	35.33	15.58	32.68	117.85	127.96	-10.11	PK
24200	91.26	0	150	H	35.33	15.58	32.68	109.49	127.96	-18.47	AV
24200	100.25	0	150	V	35.33	15.58	32.68	118.48	127.96	-9.48	PK
24200	91.79	0	150	V	35.33	15.58	32.68	110.02	127.96	-17.94	AV
24250	44.03	0	150	H	35.33	15.58	32.68	62.26	74.00	-11.74	PK
24250	32.05	0	150	H	35.33	15.58	32.68	50.28	54.00	-3.72	AV
24250	50.95	0	150	V	35.33	15.58	32.68	69.18	74.00	-4.82	PK
24250	35.17	0	150	V	35.33	15.58	32.68	53.40	54.00	-0.60	AV
48400	22.58	0	100	H	38.89	0.00	0.00	61.47	74.00	-12.53	PK
48400	10.19	0	100	H	38.89	0.00	0.00	49.08	54.00	-4.92	AV
48400	23.23	0	100	V	38.89	0.00	0.00	62.12	74.00	-11.88	PK
48400	10.24	0	100	V	38.89	0.00	0.00	49.13	54.00	-4.87	AV

Note: Low Channel EUT was set to transmit 24060 MHz and 24080 MHz.
Note: Middle Channel EUT was set to transmit 24140 MHz and 24120 MHz.
Note: High Channel EUT was set to transmit 24180 MHz and 24200 MHz.

24 GHz 802.11ac40

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 24070 MHz											
24070	90.44	0	150	H	35.33	15.76	32.79	108.73	127.96	-19.23	PK
24070	82.22	0	150	H	35.33	15.76	32.79	100.51	127.96	-27.45	AV
24070	95.12	0	150	V	35.33	15.76	32.79	113.41	127.96	-14.55	PK
24070	87.55	0	150	V	35.33	15.76	32.79	105.84	127.96	-22.12	AV
24000	45.22	0	150	H	35.33	15.76	32.79	63.51	74.00	-10.49	PK
24000	32.34	0	150	H	35.33	15.76	32.79	50.63	54.00	-3.37	AV
24000	52.12	0	150	V	35.33	15.76	32.79	70.41	74.00	-3.59	PK
24000	35.23	0	150	V	35.33	15.76	32.79	53.52	54.00	-0.48	AV
48140	20.59	0	100	H	37.51	0.00	0.00	58.10	74.00	-15.90	PK
48140	8.67	0	100	H	37.51	0.00	0.00	46.18	54.00	-7.82	AV
48140	20.55	0	100	V	37.51	0.00	0.00	58.06	74.00	-15.94	PK
48140	8.55	0	100	V	37.51	0.00	0.00	46.06	54.00	-7.94	AV
Middle Channel 24140 MHz											
24140	95.04	0	150	H	35.33	15.25	32.68	112.94	127.96	-15.02	PK
24140	87.08	0	150	H	35.33	15.25	32.68	104.98	127.96	-22.98	AV
24140	95.72	0	150	V	35.33	15.25	32.68	113.62	127.96	-14.34	PK
24140	88.35	0	150	V	35.33	15.25	32.68	106.25	127.96	-21.71	AV
48280	21.58	0	100	H	37.51	0.00	0.00	59.09	74.00	-14.91	PK
48280	9.88	0	100	H	37.51	0.00	0.00	47.39	54.00	-6.61	AV
48280	21.71	0	100	V	37.51	0.00	0.00	59.22	74.00	-14.78	PK
48280	9.92	0	100	V	37.51	0.00	0.00	47.43	54.00	-6.57	AV
High Channel 24190 MHz											
24190	95.47	0	150	H	35.33	15.58	32.68	113.70	127.96	-14.26	PK
24190	87.30	0	150	H	35.33	15.58	32.68	105.53	127.96	-22.43	AV
24190	95.84	0	150	V	35.33	15.58	32.68	114.07	127.96	-13.89	PK
24190	88.27	0	150	V	35.33	15.58	32.68	106.50	127.96	-21.46	AV
24250	53.35	0	150	H	35.33	15.58	32.68	71.58	74.00	-2.42	PK
24250	**35.50**	**0**	**150**	**H**	**35.33**	**15.58**	**32.68**	**53.73**	**54.00**	**-0.27**	**AV**
24250	53.33	0	150	V	35.33	15.58	32.68	71.56	74.00	-2.44	PK
24250	34.59	0	150	V	35.33	15.58	32.68	52.82	54.00	-1.18	AV
48380	22.32	0	100	H	38.89	0.00	0.00	61.21	74.00	-12.79	PK
48380	10.27	0	100	H	38.89	0.00	0.00	49.16	54.00	-4.84	AV
48380	22.52	0	100	V	38.89	0.00	0.00	61.41	74.00	-12.59	PK
48380	10.57	0	100	V	38.89	0.00	0.00	49.46	54.00	-4.54	AV

Note: Low Channel EUT was set to transmit 24070 MHz and 24110 MHz.
Note: Middle Channel EUT was set to transmit 24100 MHz and 24140 MHz.
Note: High Channel EUT was set to transmit 24150 MHz and 24190 MHz.

24 GHz 802.11ac80

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 24090 MHz											
24090	90.23	0	150	H	35.33	15.76	32.79	108.52	127.96	-19.44	PK
24090	81.67	0	150	H	35.33	15.76	32.79	99.96	127.96	-28.00	AV
24090	92.20	0	150	V	35.33	15.76	32.79	110.49	127.96	-17.47	PK
24090	84.77	0	150	V	35.33	15.76	32.79	103.06	127.96	-24.90	AV
24000	51.19	0	150	H	35.33	15.76	32.79	69.48	74.00	-4.52	PK
24000	33.31	0	150	H	35.33	15.76	32.79	51.60	54.00	-2.40	AV
24000	50.64	0	150	V	35.33	15.76	32.79	68.93	74.00	-5.07	PK
24000	33.43	0	150	V	35.33	15.76	32.79	51.72	54.00	-2.28	AV
48180	20.45	0	100	H	37.51	0.00	0.00	57.96	74.00	-16.04	PK
48180	8.93	0	100	H	37.51	0.00	0.00	46.44	54.00	-7.56	AV
48180	20.63	0	100	V	37.51	0.00	0.00	58.14	74.00	-15.86	PK
48180	8.88	0	100	V	37.51	0.00	0.00	46.39	54.00	-7.61	AV
High Channel 24170 MHz											
24170	90.50	0	150	H	35.33	15.58	32.68	108.73	127.96	-19.23	PK
24170	82.28	0	150	H	35.33	15.58	32.68	100.51	127.96	-27.45	AV
24170	92.53	0	150	V	35.33	15.58	32.68	110.76	127.96	-17.20	PK
24170	85.24	0	150	V	35.33	15.58	32.68	103.47	127.96	-24.49	AV
24250	49.06	0	150	H	35.33	15.58	32.68	67.29	74.00	-6.71	PK
24250	32.80	0	150	H	35.33	15.58	32.68	51.03	54.00	-2.97	AV
24250	51.56	0	150	V	35.33	15.58	32.68	69.79	74.00	-4.21	PK
24250	34.70	0	150	V	35.33	15.58	32.68	52.93	54.00	-1.07	AV
48340	22.40	0	100	H	38.89	0.00	0.00	61.29	74.00	-12.71	PK
48340	10.45	0	100	H	38.89	0.00	0.00	49.34	54.00	-4.66	AV
48340	22.32	0	100	V	38.89	0.00	0.00	61.21	74.00	-12.79	PK
48340	10.44	0	100	V	38.89	0.00	0.00	49.33	54.00	-4.67	AV

Note: Low and High Channels where transmitted simultaneously.
Note: Loss includes cable loss plus attenuator loss.
Note: Any Emission past 2nd Harmonics is due to noise floor.

8 FCC §15.215 (c) & ISEDC RSS-Gen §6.6 - Emission Bandwidth

8.1 Applicable Standards

As per FCC §15.215 (c):

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

As per ISEDC RSS-Gen §6.6:

The emission bandwidth (×dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated × dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3× the resolution bandwidth. When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

8.2 Measurement Procedure

The measurements are based accordance with ANSI C63.10-2013 and ISEDC RSS- Gen §6.6.

8.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	US44300386	2017-04-20	1 year
-	RF Cable	-	-	Each time[1]	N/A

Note[1]: cable 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:	23º C
Relative Humidity:	42 %
ATM Pressure:	102.7 KPa

The testing was performed by Vincent Licata on 2018-03-07 in RF site.

8.5 Test Results

802.11ac20 mode

Antenna Chain	Channel	Frequency (MHz)	99% OBW (kHz)	20 dB OBW (kHz)	20 dB OBW Result
TX1	Low	24060	17872.2	19929	Pass
	Middle	24140	17900.7	20824	Pass
	High	24200	17914.4	20563	Pass
TX2	Low	24060	17831.6	20018	Pass
	Middle	24140	17831.9	19909	Pass
	High	24200	17829.3	20136	Pass
TX3	Low	24060	17896.3	20222	Pass
	Middle	24140	18042.5	21227	Pass
	High	24200	17895.7	20085	Pass
TX4	Low	24060	17846.6	20046	Pass
	Middle	24140	17995.1	21131	Pass
	High	24200	17853.4	20124	Pass

802.11ac40 mode

Antenna Chain	Channel	Frequency (MHz)	99% OBW (kHz)	20 dB OBW (kHz)	20 dB OBW Result
TX1	Low	24070	36410.9	39710	Pass
	Middle	24140	36398.7	39991	Pass
	High	24190	36307.3	40073	Pass
TX2	Low	24070	36267.3	39031	Pass
	Middle	24140	36279.5	39100	Pass
	High	24190	36220.0	38827	Pass
TX3	Low	24070	36300.0	39187	Pass
	Middle	24140	36463.7	39459	Pass
	High	24190	36321.3	39222	Pass
TX4	Low	24070	36292.9	39045	Pass
	Middle	24140	36495.2	40062	Pass
	High	24190	36286.8	39252	Pass

802.11ac80 mode

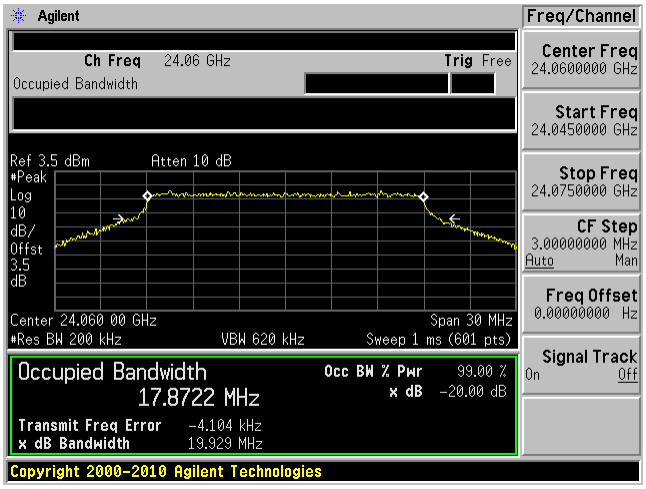
Antenna Chain	Channel	Frequency (MHz)	99% OBW (kHz)	20 dB OBW (kHz)	20 dB OBW Result
TX1	Low	24090	75441.2	79807	Pass
	High	24170	75327.3	79565	Pass
TX2	Low	24090	75360.3	78881	Pass
	High	24170	75266.7	79249	Pass
TX3	Low	24090	75100.6	78304	Pass
	High	24170	75167.8	78585	Pass
TX4	Low	24090	75235.2	79328	Pass
	High	24170	75137.9	78862	Pass

Please refer to the following plots for detailed test results

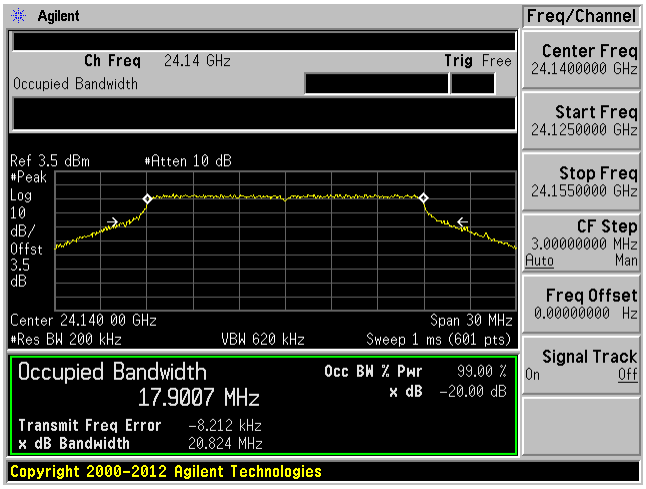
20 dB and 99% Bandwidth

802.11ac20 mode Tx1

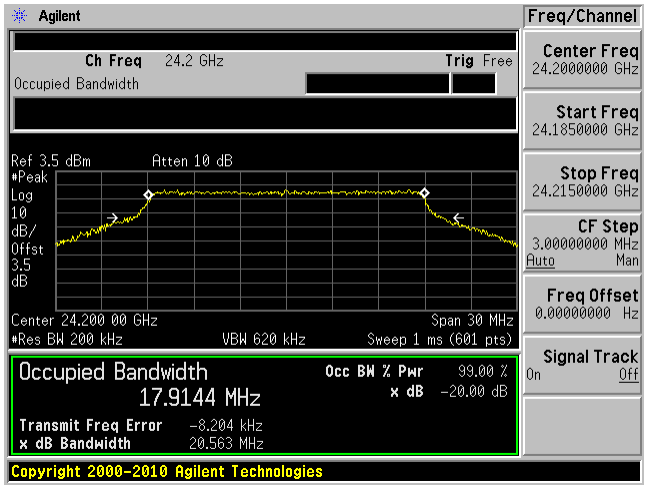
Low Channel 24060 MHz



Middle Channel 24140 MHz

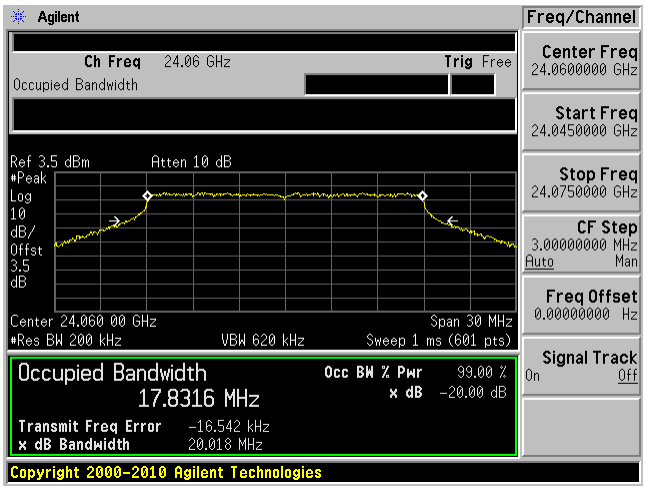


High Channel 24200 MHz

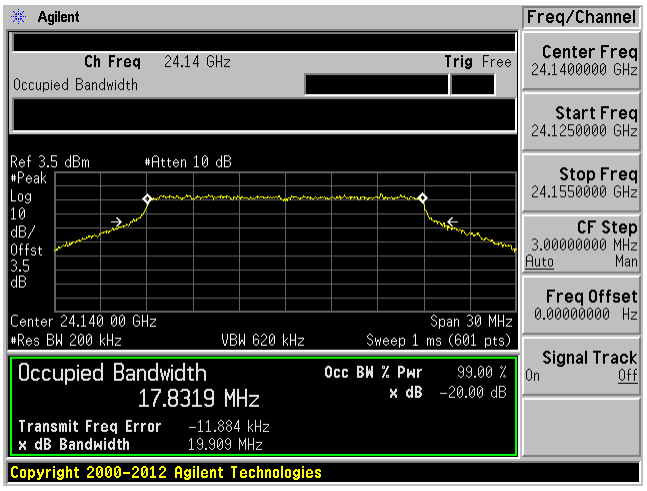


802.11ac20 mode Tx2

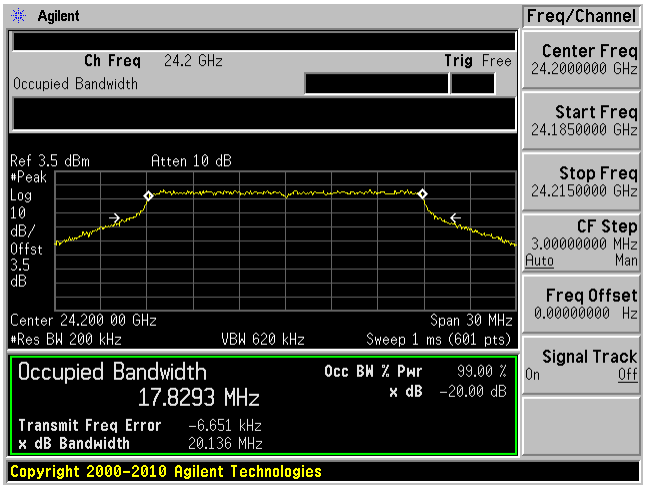
Low Channel 24060 MHz



Middle Channel 24140 MHz

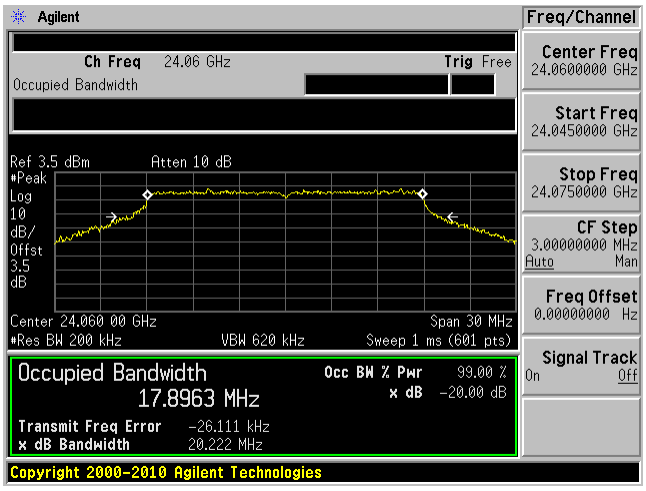


High Channel 24200 MHz

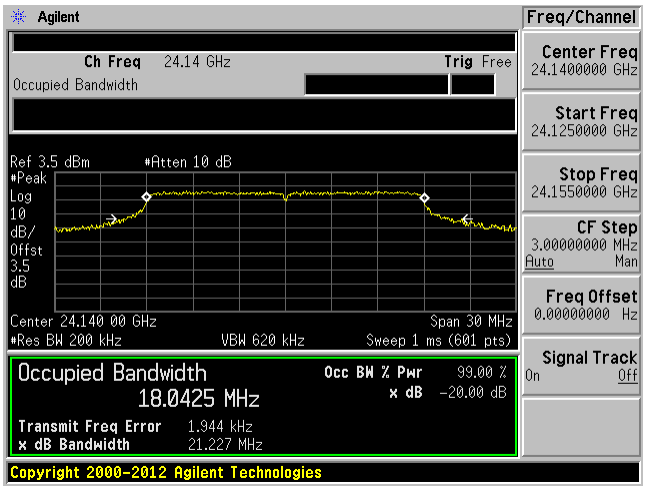


802.11ac20 mode Tx3

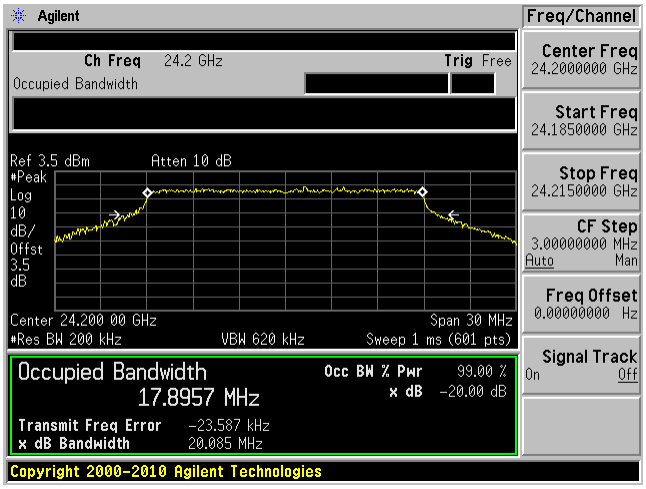
Low Channel 24060 MHz



Middle Channel 24140 MHz

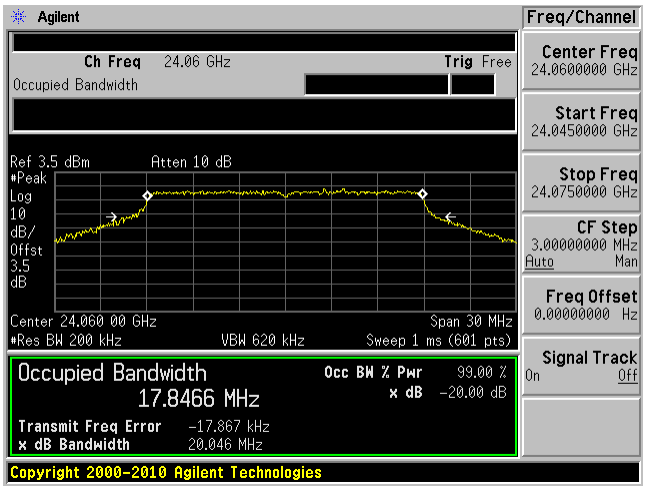


High Channel 24200 MHz

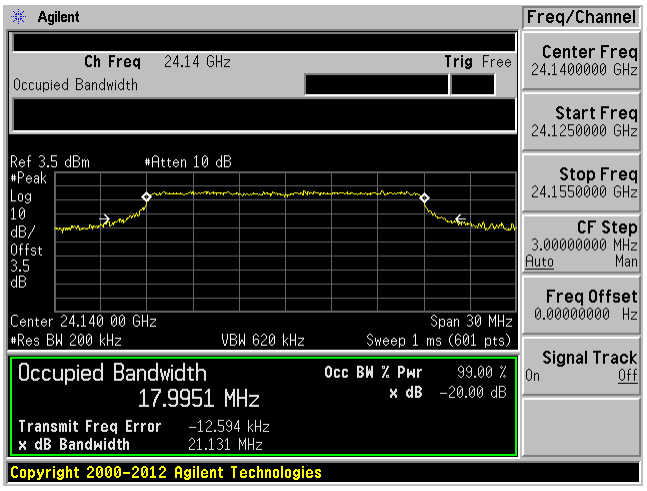


802.11ac20 mode Tx4

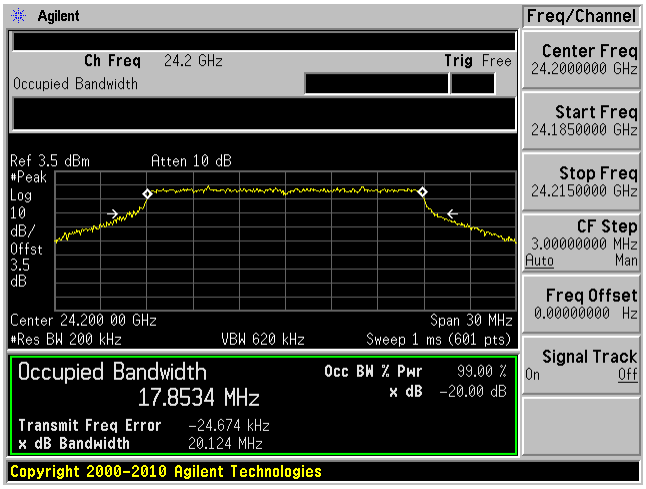
Low Channel 24060 MHz



Middle Channel 24140 MHz

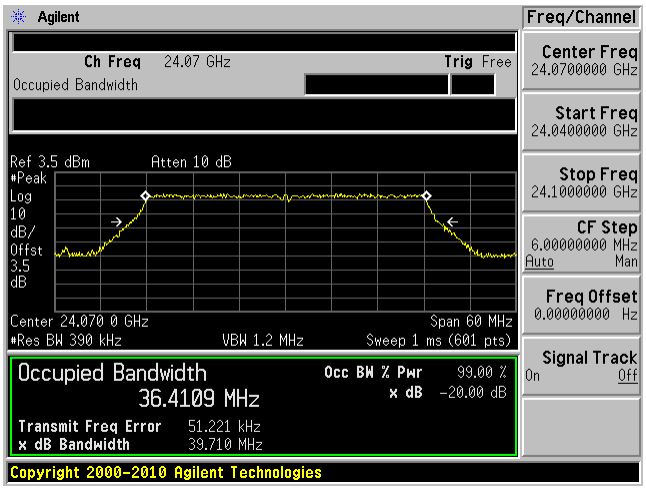


High Channel 24200 MHz

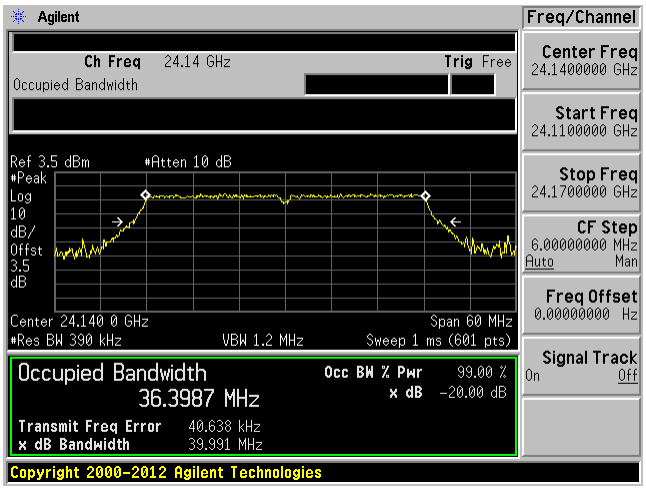


802.11ac40 mode Tx1

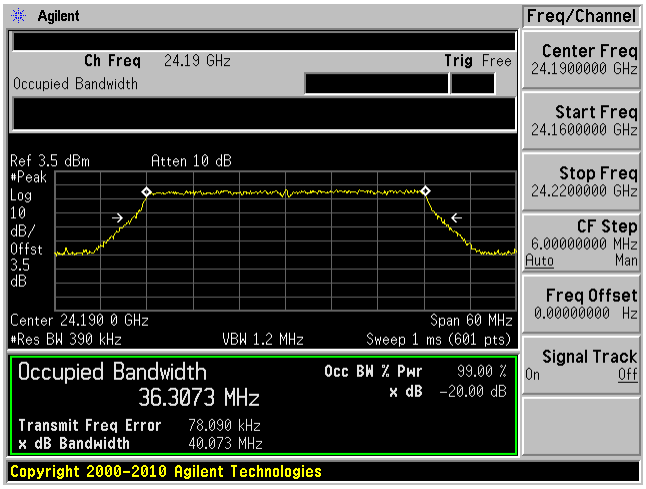
Low Channel 24070 MHz



Middle Channel 24140 MHz

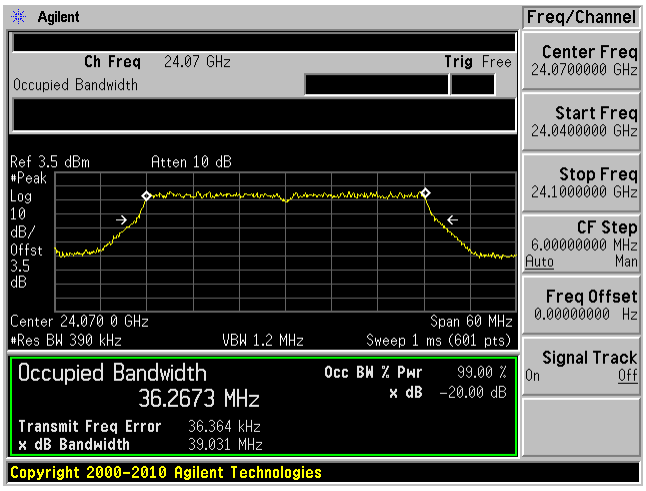


High Channel 24190 MHz

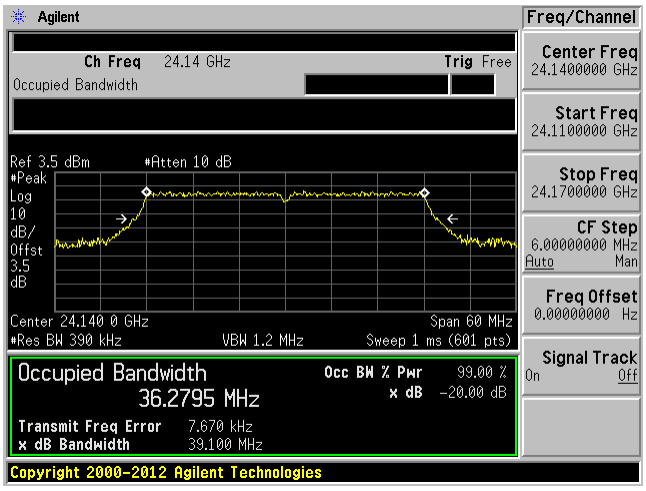


802.11ac40 mode Tx2

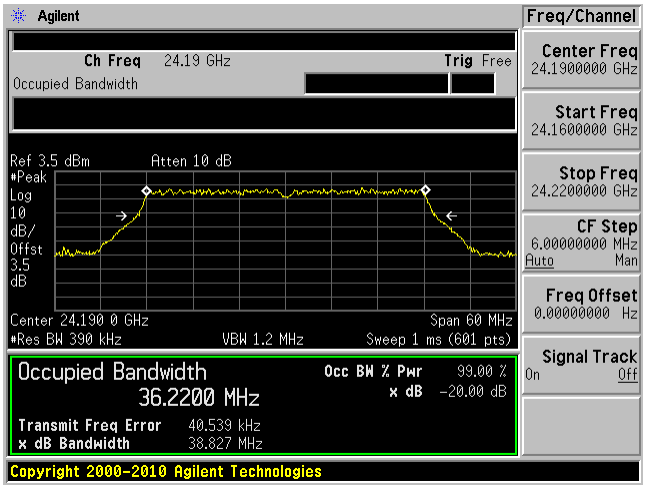
Low Channel 24070 MHz



Middle Channel 24140 MHz

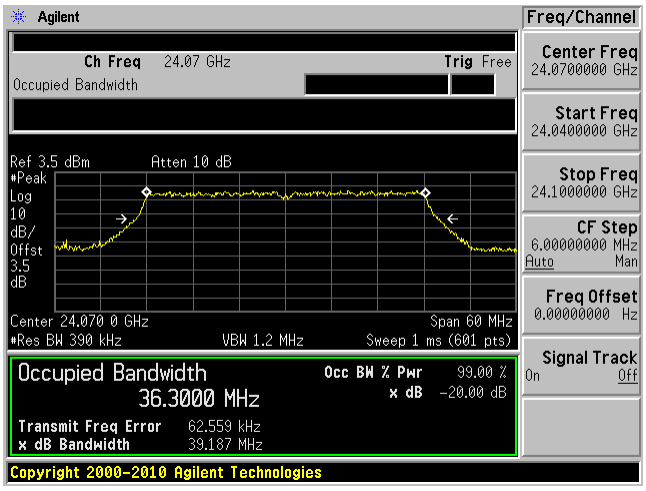


High Channel 24190 MHz

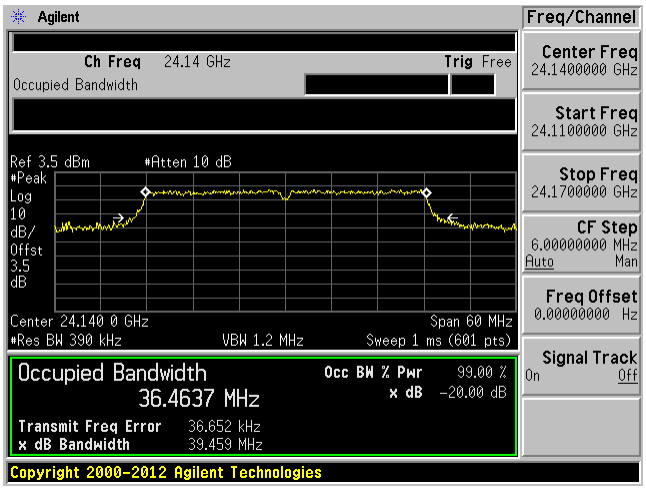


802.11ac40 mode Tx3

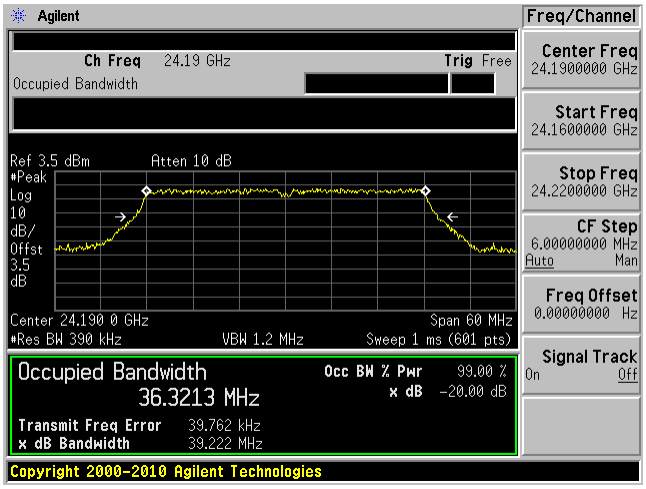
Low Channel 24070 MHz



Middle Channel 24140 MHz

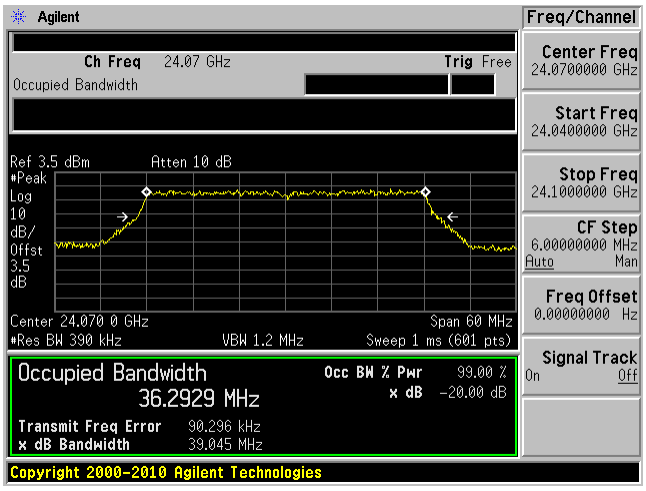


High Channel 24190 MHz

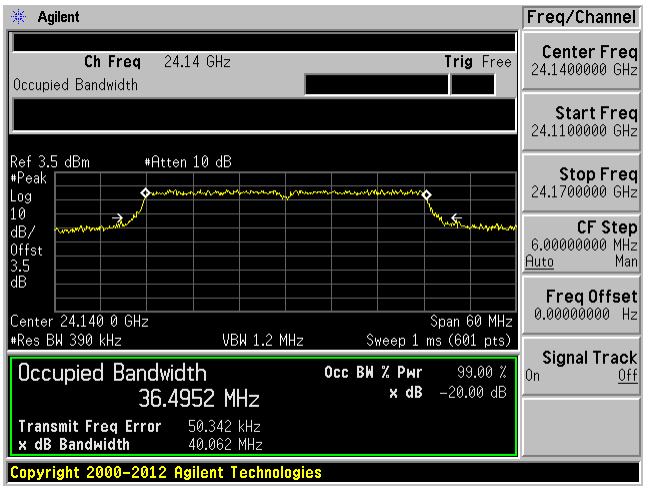


802.11ac40 mode Tx4

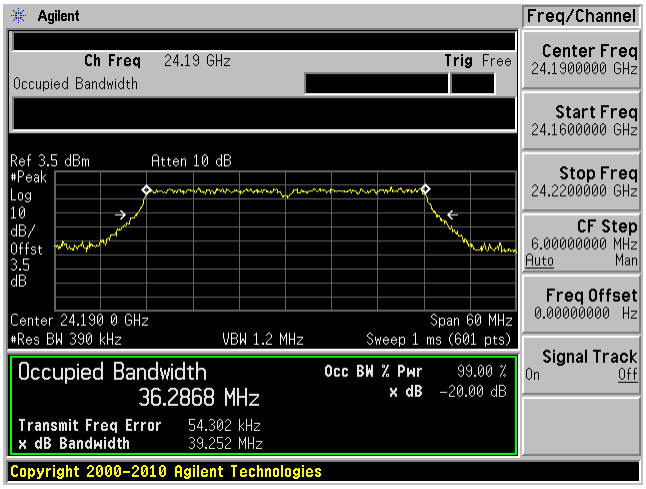
Low Channel 24070 MHz



Middle Channel 24140 MHz

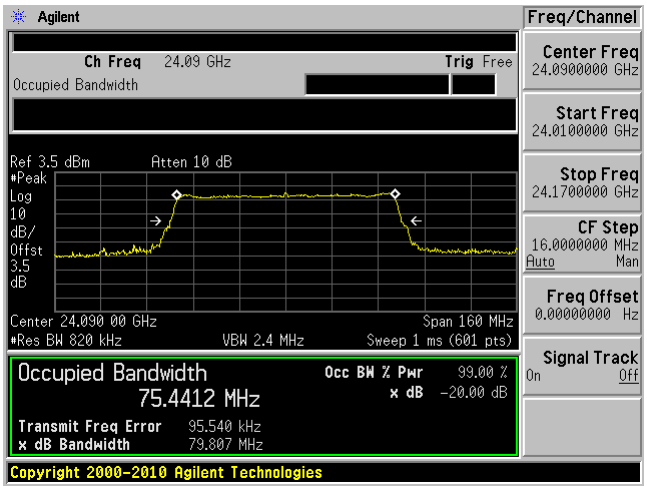


High Channel 24190 MHz

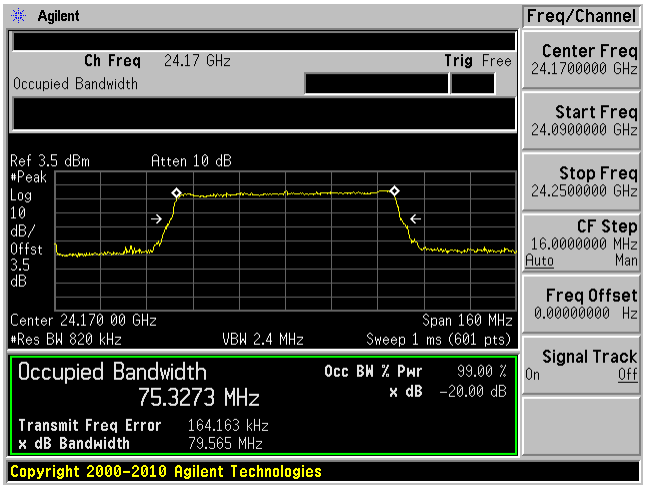


802.11ac80 mode Tx1

Low Channel 24090 MHz

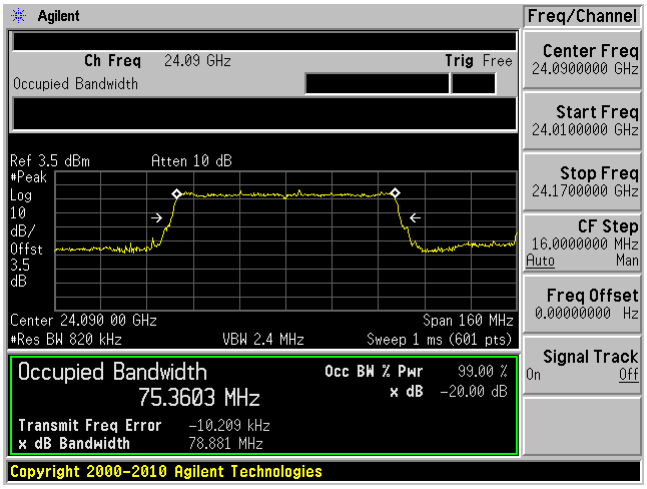


High Channel 24170 MHz

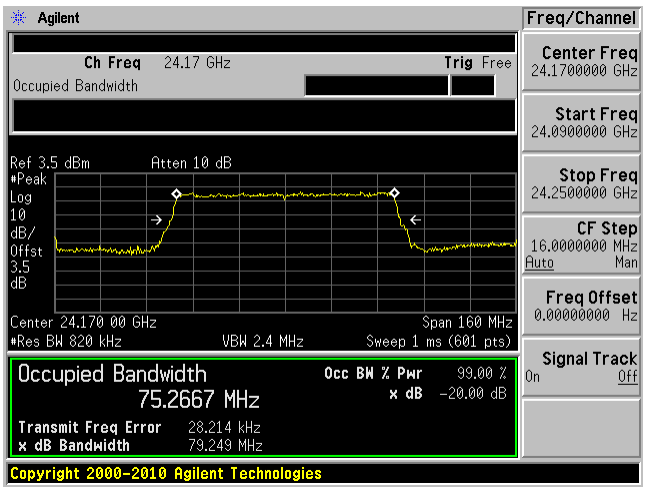


802.11ac80 mode Tx2

Low Channel 24090 MHz

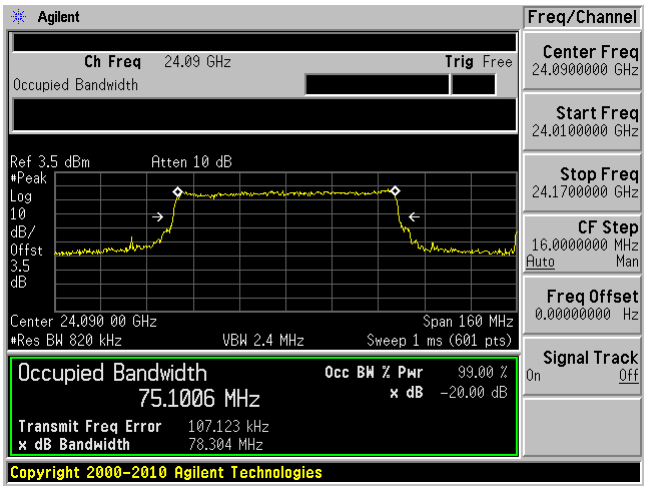


High Channel 24170 MHz

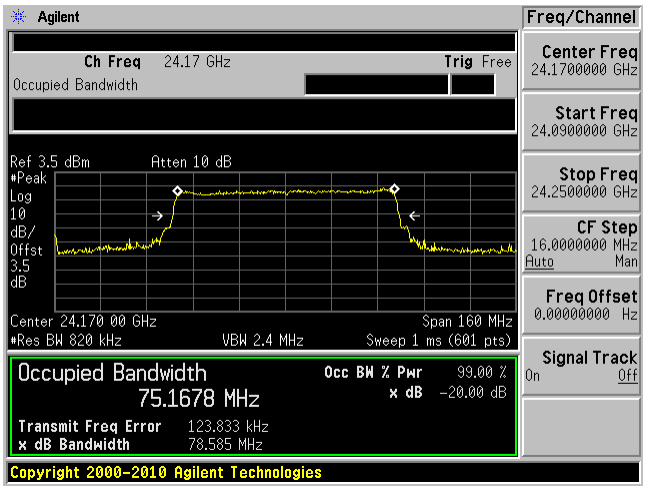


802.11ac80 mode Tx3

Low Channel 24090 MHz

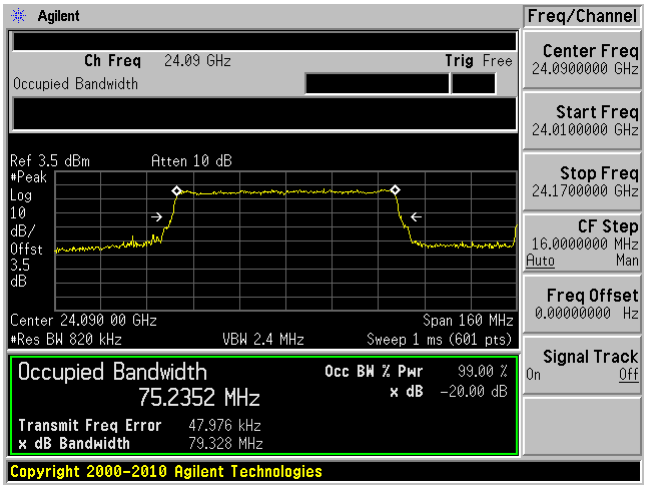


High Channel 24170 MHz

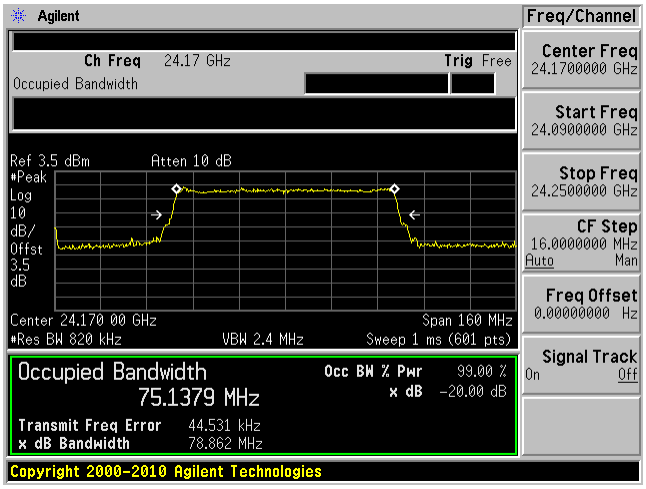


802.11ac80 mode Tx4

Low Channel 24090 MHz



High Channel 24170 MHz



9 FCC §15.249 (b) (2) & ISEDC RSS-210 Annex I (b) – Frequency Tolerance

9.1 Applicable Standards

As per FCC §15.249 (b) (2) and ISEDC RSS-210 Annex I (b), the frequency tolerance of the carrier signal shall be maintained within ±0.001% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

9.2 Measurement Procedure

The measurements are based accordance with ANSI C63.10-2013.

9.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Analyzer, Spectrum	FSQ26	200749	2017-06-08	2 years
-	RF Cable	-	-	Each time[1]	N/A
Tenney	Chamber, Environmental	TUJR	27445-06	2017-10-02	1 year

Note[1]: cable 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 2018-02-01 and 2018-03-08 in RF site.

9.5 Test Results

TX1 20 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0504200	24.0696560	24.0600380	24.0600000	0.0001579	±0.001%
	24.1304800	24.1496000	24.1400400	24.1400000	0.0001657	±0.001%
	24.1903320	24.2096760	24.2000040	24.2000000	0.0000165	±0.001%
802.11ac40	24.0511920	24.0889680	24.0700800	24.0700000	0.0003324	±0.001%
	24.1212960	24.1588640	24.1400800	24.1400000	0.0003314	±0.001%
	24.1714160	24.2088720	24.1901440	24.1900000	0.0005953	±0.001%
802.11ac80	24.0516800	24.1284960	24.0900880	24.0900000	0.0003653	±0.001%
	24.1317440	24.2085440	24.1701440	24.1700000	0.0005958	±0.001%

TX1 20 ºC High Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0505160	24.0695440	24.0600300	24.0600000	0.0001247	±0.001%
	24.1304200	24.1496160	24.1400180	24.1400000	0.0000746	±0.001%
	24.1903640	24.2096440	24.2000040	24.2000000	0.0000165	±0.001%
802.11ac40	24.0514000	24.0889680	24.0701840	24.0700000	0.0007644	±0.001%
	24.1212800	24.1588160	24.1400480	24.1400000	0.0001988	±0.001%
	24.1714000	24.2089680	24.1901840	24.1900000	0.0007606	±0.001%
802.11ac80	24.0517440	24.1284960	24.0901200	24.0900000	0.0004981	±0.001%
	24.1317120	24.2085760	24.1701440	24.1700000	0.0005958	±0.001%

TX1 20 ºC Low Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0505040	24.0695600	24.0600320	24.0600000	0.0001330	±0.001%
	24.1305920	24.1494840	24.1400380	24.1400000	0.0001574	±0.001%
	24.1904320	24.2095480	24.1999900	24.2000000	-0.0000413	±0.001%
802.11ac40	24.0512560	24.0890560	24.0701560	24.0700000	0.0006481	±0.001%
	24.1213680	24.1588560	24.1401120	24.1400000	0.0004640	±0.001%
	24.1713200	24.2089360	24.1901280	24.1900000	0.0005291	±0.001%
802.11ac80	24.0516320	24.1284960	24.0900640	24.0900000	0.0002657	±0.001%
	24.1317920	24.2085280	24.1701600	24.1700000	0.0006620	±0.001%

TX2 20 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0505080	24.0695240	24.0600160	24.0600000	0.0000665	±0.001%
	24.1306920	24.1493760	24.1400340	24.1400000	0.0001408	±0.001%
	24.1906960	24.2094280	24.2000620	24.2000000	0.0002562	±0.001%
802.11ac40	24.0514160	24.0887280	24.0700720	24.0700000	0.0002991	±0.001%
	24.1214560	24.1586080	24.1400320	24.1400000	0.0001326	±0.001%
	24.1714400	24.2087280	24.1900840	24.1900000	0.0003473	±0.001%
802.11ac80	24.0518240	24.1283040	24.0900640	24.0900000	0.0002657	±0.001%
	24.1317920	24.2084160	24.1701040	24.1700000	0.0004303	±0.001%

TX2 20 ºC High Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0505400	24.0695680	24.0600540	24.0600000	0.0002244	±0.001%
	24.1307240	24.1493560	24.1400400	24.1400000	0.0001657	±0.001%
	24.1905000	24.2094840	24.1999920	24.2000000	-0.0000331	±0.001%
802.11ac40	24.0514640	24.0887760	24.0701200	24.0700000	0.0004985	±0.001%
	24.1214640	24.1586080	24.1400360	24.1400000	0.0001491	±0.001%
	24.1714000	24.2086800	24.1900400	24.1900000	0.0001654	±0.001%
802.11ac80	24.0517440	24.1284000	24.0900720	24.0900000	0.0002989	±0.001%
	24.1317920	24.2083200	24.1700560	24.1700000	0.0002317	±0.001%

TX2 20 ºC Low Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0505760	24.0694560	24.0600160	24.0600000	0.0000665	±0.001%
	24.1307200	24.1493480	24.1400340	24.1400000	0.0001408	±0.001%
	24.1904760	24.2095360	24.2000060	24.2000000	0.0000248	±0.001%
802.11ac40	24.0514240	24.0887920	24.0701080	24.0700000	0.0004487	±0.001%
	24.1213680	24.1586160	24.1399920	24.1400000	-0.0000331	±0.001%
	24.1714240	24.2086800	24.1900520	24.1900000	0.0002150	±0.001%
802.11ac80	24.0517280	24.1283040	24.0900160	24.0900000	0.0000664	±0.001%
	24.1317440	24.2082880	24.1700160	24.1700000	0.0000662	±0.001%

TX3 20 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0506000	24.0695000	24.0600500	24.0600000	0.0002078	±0.001%
	24.1308920	24.1491560	24.1400240	24.1400000	0.0000994	±0.001%
	24.1904600	24.2095760	24.2000180	24.2000000	0.0000744	±0.001%
802.11ac40	24.0513520	24.0889360	24.0701440	24.0700000	0.0005983	±0.001%
	24.1213600	24.1589920	24.1401760	24.1400000	0.0007291	±0.001%
	24.1712960	24.2089360	24.1901160	24.1900000	0.0004795	±0.001%
802.11ac80	24.0517920	24.1284800	24.0901360	24.0900000	0.0005645	±0.001%
	24.1317440	24.2084800	24.1701120	24.1700000	0.0004634	±0.001%

TX3 20 ºC High Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0504080	24.0693840	24.0598960	24.0600000	-0.0004323	±0.001%
	24.1306080	24.1494160	24.1400120	24.1400000	0.0000497	±0.001%
	24.1904880	24.2093920	24.1999400	24.2000000	-0.0002479	±0.001%
802.11ac40	24.0512880	24.0888960	24.0700920	24.0700000	0.0003822	±0.001%
	24.1213520	24.1589920	24.1401720	24.1400000	0.0007125	±0.001%
	24.1713680	24.2089520	24.1901600	24.1900000	0.0006614	±0.001%
802.11ac80	24.0518080	24.1284480	24.0901280	24.0900000	0.0005313	±0.001%
	24.1317440	24.2084800	24.1701120	24.1700000	0.0004634	±0.001%

TX3 20 ºC Low Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0505840	24.0695680	24.0600760	24.0600000	0.0003159	±0.001%
	24.1306000	24.1494440	24.1400220	24.1400000	0.0000911	±0.001%
	24.1906080	24.2094960	24.2000520	24.2000000	0.0002149	±0.001%
802.11ac40	24.0513760	24.0888880	24.0701320	24.0700000	0.0005484	±0.001%
	24.1213600	24.1588720	24.1401160	24.1400000	0.0004805	±0.001%
	24.1713200	24.2089360	24.1901280	24.1900000	0.0005291	±0.001%
802.11ac80	24.0517920	24.1284640	24.0901280	24.0900000	0.0005313	±0.001%
	24.1317280	24.2084480	24.1700880	24.1700000	0.0003641	±0.001%

TX4 20 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0506200	24.0695000	24.0600600	24.0600000	0.0002494	±0.001%
	24.1307240	24.1494400	24.1400820	24.1400000	0.0003397	±0.001%
	24.1904600	24.2094360	24.1999480	24.2000000	-0.0002149	±0.001%
802.11ac40	24.0514240	24.0887840	24.0701040	24.0700000	0.0004321	±0.001%
	24.1214560	24.1587200	24.1400880	24.1400000	0.0003645	±0.001%
	24.1714160	24.2086160	24.1900160	24.1900000	0.0000661	±0.001%
802.11ac80	24.0516480	24.1284960	24.0900720	24.0900000	0.0002989	±0.001%
	24.1315680	24.2084480	24.1700080	24.1700000	0.0000331	±0.001%

TX4 20 ºC High Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0504640	24.0695000	24.0599820	24.0600000	-0.0000748	±0.001%
	24.1307400	24.1494520	24.1400960	24.1400000	0.0003977	±0.001%
	24.1905480	24.2094280	24.1999880	24.2000000	-0.0000496	±0.001%
802.11ac40	24.0515280	24.0886560	24.0700920	24.0700000	0.0003822	±0.001%
	24.1214400	24.1588560	24.1401480	24.1400000	0.0006131	±0.001%
	24.1714400	24.2087440	24.1900920	24.1900000	0.0003803	±0.001%
802.11ac80	24.0516800	24.1284960	24.0900880	24.0900000	0.0003653	±0.001%
	24.1316480	24.2083840	24.1700160	24.1700000	0.0000662	±0.001%

TX4 20 ºC Low Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0506440	24.0695000	24.0600720	24.0600000	0.0002993	±0.001%
	24.1307320	24.1493880	24.1400600	24.1400000	0.0002486	±0.001%
	24.1904040	24.2095080	24.1999560	24.2000000	-0.0001818	±0.001%
802.11ac40	24.0514640	24.0887920	24.0701280	24.0700000	0.0005318	±0.001%
	24.1214080	24.1587840	24.1400960	24.1400000	0.0003977	±0.001%
	24.1714400	24.2087840	24.1901120	24.1900000	0.0004630	±0.001%
802.11ac80	24.0516320	24.1285280	24.0900800	24.0900000	0.0003321	±0.001%
	24.1315840	24.2084000	24.1699920	24.1700000	-0.0000331	±0.001%

Tx1 -20 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0505080	24.0695120	24.0600100	24.0600000	0.0000416	±0.001%
	24.1304920	24.1496400	24.1400660	24.1400000	0.0002734	±0.001%
	24.1905360	24.2094560	24.1999960	24.2000000	-0.0000165	±0.001%
802.11ac40	24.0513840	24.0887920	24.0700880	24.0700000	0.0003656	±0.001%
	24.1211200	24.1590080	24.1400640	24.1400000	0.0002651	±0.001%
	24.1713680	24.2087920	24.1900800	24.1900000	0.0003307	±0.001%
802.11ac80	24.0516960	24.1283200	24.0900080	24.0900000	0.0000332	±0.001%
	24.1318080	24.2082880	24.1700480	24.1700000	0.0001986	±0.001%

Tx2 -20 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0506160	24.0695240	24.0600700	24.0600000	0.0002909	±0.001%
	24.1306880	24.1493480	24.1400180	24.1400000	0.0000746	±0.001%
	24.1905560	24.2094880	24.2000220	24.2000000	0.0000909	±0.001%
802.11ac40	24.0515200	24.0887040	24.0701120	24.0700000	0.0004653	±0.001%
	24.1214400	24.1587360	24.1400880	24.1400000	0.0003645	±0.001%
	24.1714320	24.2086720	24.1900520	24.1900000	0.0002150	±0.001%
802.11ac80	24.0517280	24.1283040	24.0900160	24.0900000	0.0000664	±0.001%
	24.1317920	24.2083360	24.1700640	24.1700000	0.0002648	±0.001%

Tx3 -20 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0503680	24.0696160	24.0599920	24.0600000	-0.0000333	±0.001%
	24.1305960	24.1494920	24.1400440	24.1400000	0.0001823	±0.001%
	24.1904680	24.2094760	24.1999720	24.2000000	-0.0001157	±0.001%
802.11ac40	24.0513280	24.0889520	24.0701400	24.0700000	0.0005816	±0.001%
	24.1213840	24.1588640	24.1401240	24.1400000	0.0005137	±0.001%
	24.1712960	24.2089040	24.1901000	24.1900000	0.0004134	±0.001%
802.11ac80	24.0517600	24.1284640	24.0901120	24.0900000	0.0004649	±0.001%
	24.1316960	24.2084640	24.1700800	24.1700000	0.0003310	±0.001%

Tx4 -20 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0505800	24.0693880	24.0599840	24.0600000	-0.0000665	±0.001%
	24.1307400	24.1493400	24.1400400	24.1400000	0.0001657	±0.001%
	24.1905160	24.2094840	24.2000000	24.2000000	0.0000000	±0.001%
802.11ac40	24.0516160	24.0886160	24.0701160	24.0700000	0.0004819	±0.001%
	24.1213520	24.1587520	24.1400520	24.1400000	0.0002154	±0.001%
	24.1715200	24.2086000	24.1900600	24.1900000	0.0002480	±0.001%
802.11ac80	24.0521280	24.1281120	24.0901200	24.0900000	0.0004981	±0.001%
	24.1319520	24.2080640	24.1700080	24.1700000	0.0000331	±0.001%

Tx1 50 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0506560	24.0694360	24.0600460	24.0600000	0.0001912	±0.001%
	24.1306320	24.1495600	24.1400960	24.1400000	0.0003977	±0.001%
	24.1904640	24.2094240	24.1999440	24.2000000	-0.0002314	±0.001%
802.11ac40	24.0514080	24.0888800	24.0701440	24.0700000	0.0005983	±0.001%
	24.1213600	24.1589440	24.1401520	24.1400000	0.0006297	±0.001%
	24.1714320	24.2086480	24.1900400	24.1900000	0.0001654	±0.001%
802.11ac80	24.0518400	24.1283040	24.0900720	24.0900000	0.0002989	±0.001%
	24.1316320	24.2084640	24.1700480	24.1700000	0.0001986	±0.001%

Tx2 50 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0505240	24.0695080	24.0600160	24.0600000	0.0000665	±0.001%
	24.1308240	24.1493560	24.1400900	24.1400000	0.0003728	±0.001%
	24.1906720	24.2094520	24.2000620	24.2000000	0.0002562	±0.001%
802.11ac40	24.0514480	24.0887840	24.0701160	24.0700000	0.0004819	±0.001%
	24.1213200	24.1586880	24.1400040	24.1400000	0.0000166	±0.001%
	24.1713920	24.2087120	24.1900520	24.1900000	0.0002150	±0.001%
802.11ac80	24.0518720	24.1282720	24.0900720	24.0900000	0.0002989	±0.001%
	24.1317920	24.2083200	24.1700560	24.1700000	0.0002317	±0.001%

Tx3 50 ºC Normal Voltage

Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0506040	24.0695120	24.0600580	24.0600000	0.0002411	±0.001%
	24.1306280	24.1494920	24.1400600	24.1400000	0.0002486	±0.001%
	24.1905080	24.2094800	24.1999940	24.2000000	-0.0000248	±0.001%
802.11ac40	24.0514000	24.0890000	24.0702000	24.0700000	0.0008309	±0.001%
	24.1213440	24.1588960	24.1401200	24.1400000	0.0004971	±0.001%
	24.1713760	24.2088480	24.1901120	24.1900000	0.0004630	±0.001%
802.11ac80	24.0518240	24.1284640	24.0901440	24.0900000	0.0005978	±0.001%
	24.1317280	24.2084960	24.1701120	24.1700000	0.0004634	±0.001%

Tx4 50 ºC Normal Voltage

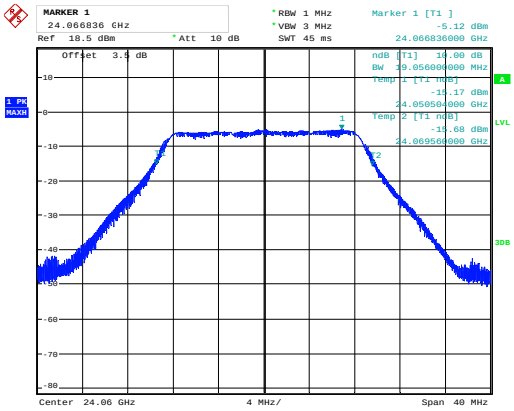
Mode	f1 (GHz)	f2 (GHz)	Average (GHz)	Frequency (GHz)	Deviation (%)	Limit
802.11ac20	24.0506480	24.0694480	24.0600480	24.0600000	0.0001995	±0.001%
	24.1307720	24.1493400	24.1400560	24.1400000	0.0002320	±0.001%
	24.1906320	24.2094040	24.2000180	24.2000000	0.0000744	±0.001%
802.11ac40	24.0514720	24.0887840	24.0701280	24.0700000	0.0005318	±0.001%
	24.1214240	24.1587120	24.1400680	24.1400000	0.0002817	±0.001%
	24.1714160	24.2087280	24.1900720	24.1900000	0.0002976	±0.001%
802.11ac80	24.0516960	24.1285920	24.0901440	24.0900000	0.0005978	±0.001%
	24.1316960	24.2085120	24.1701040	24.1700000	0.0004303	±0.001%

Please refer to the following plots for detailed test results

20 ºC

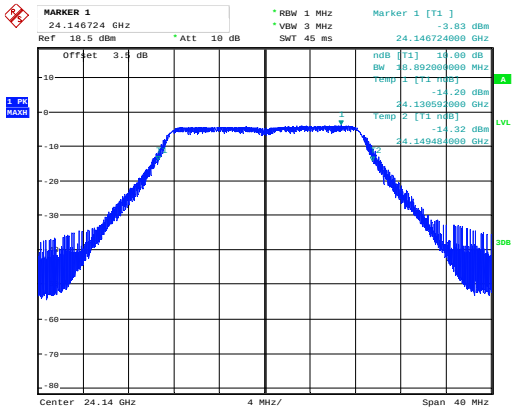
802.11ac20 mode Tx1 Low Voltage

Low Channel 24060 MHz



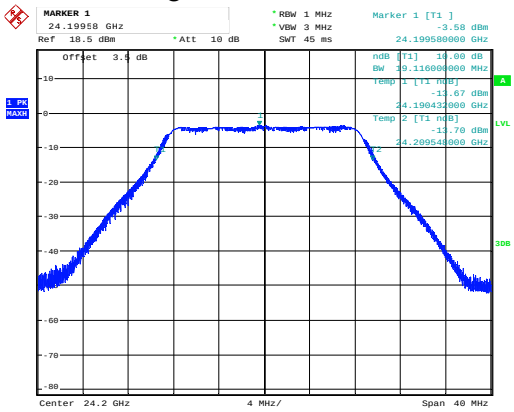
Date: 8.MAR.2018 11:56:23

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:01:10

High Channel 24200 MHz



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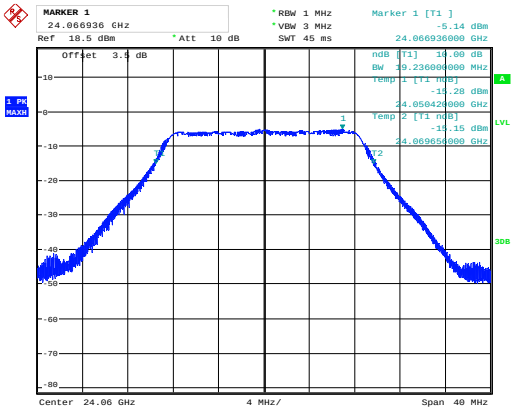
802.11ac20 mode Tx1 Nominal Voltage

Low Channel 24060 MHz



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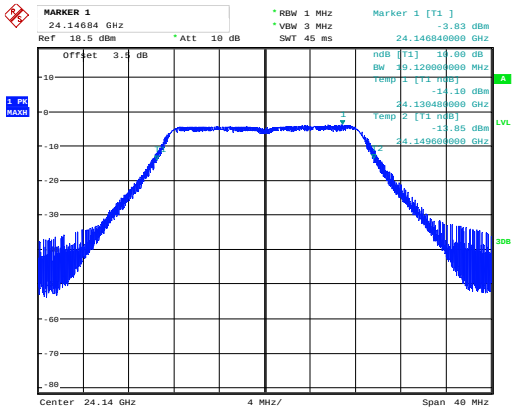
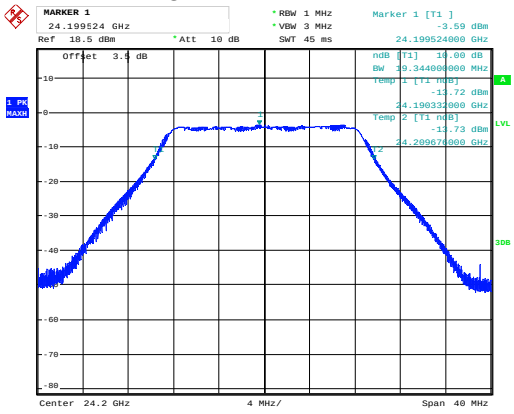
Middle Channel 24140 MHz



Date: 1.FEB.2018 09:59:58

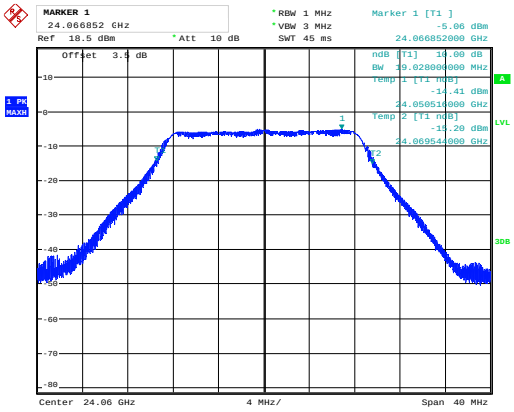
High Channel 24200 MHz



Date: 8.MAR.2018 12:01:03

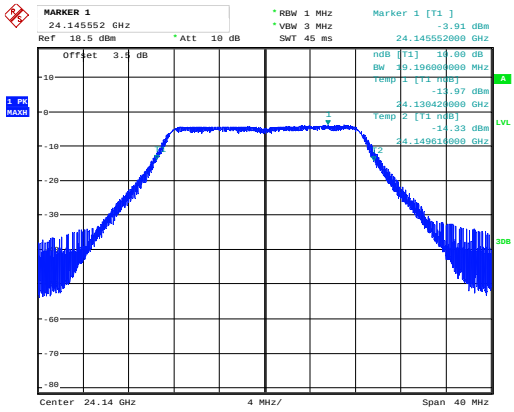
802.11ac20 mode Tx1 High Voltage

Low Channel 24060 MHz



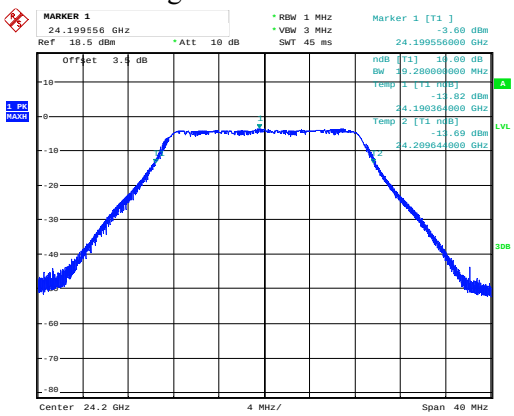
Date: 8.MAR.2018 11:55:32

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:00:43

High Channel 24200 MHz



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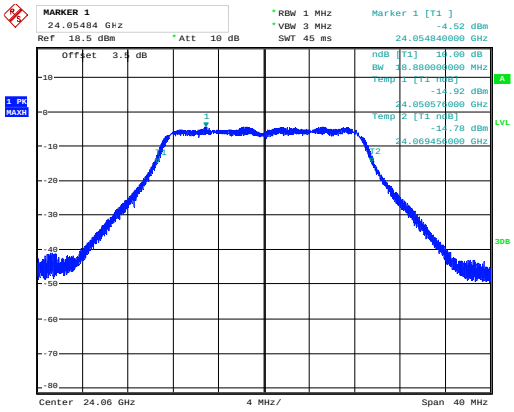
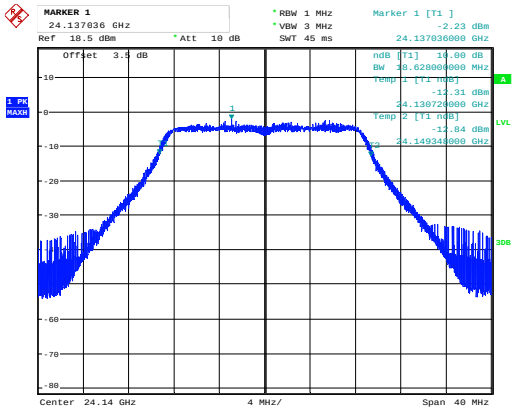
802.11ac20 mode Tx2 Low Voltage

Low Channel 24060 MHz



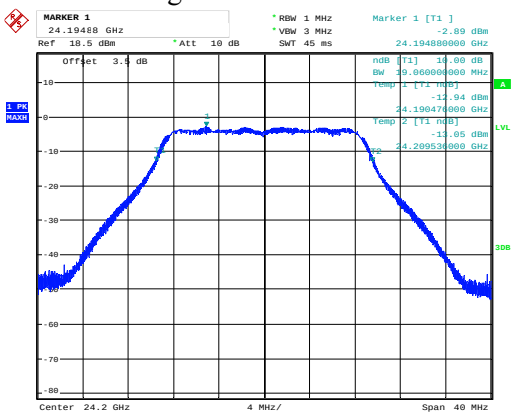
Date: 8.MAR.2018 11:56:57

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:03:38

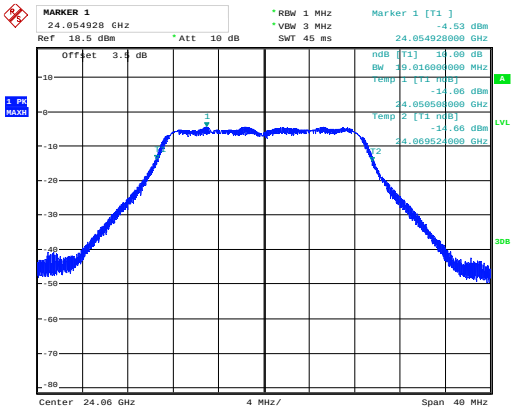
High Channel 24200 MHz



Date: 8.MAR.2018 11:59:38

802.11ac20 mode Tx2 Nominal Voltage

Low Channel 24060 MHz



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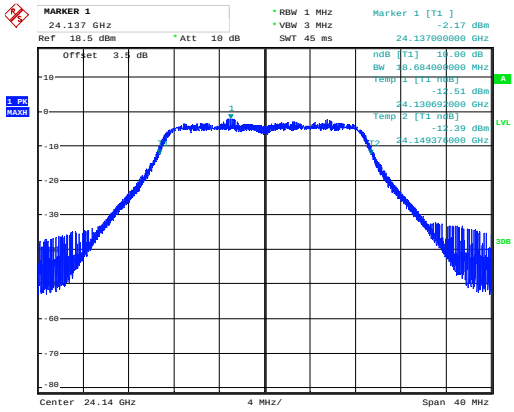
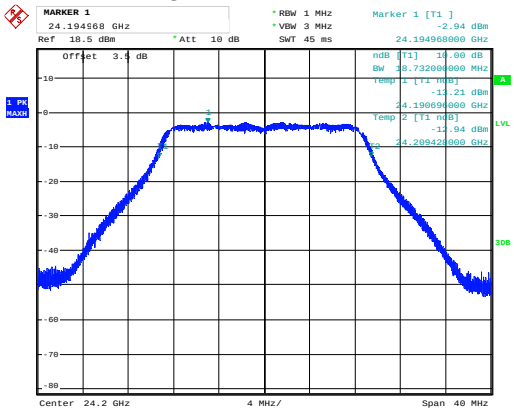
Middle Channel 24140 MHz



Date: 1.FEB.2018 10:02:25

High Channel 24200 MHz



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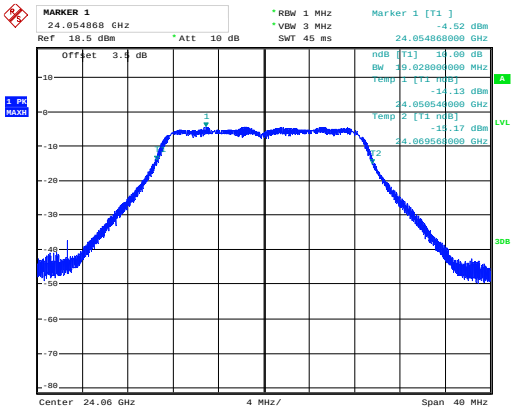
802.11ac20 mode Tx2 High Voltage

Low Channel 24060 MHz



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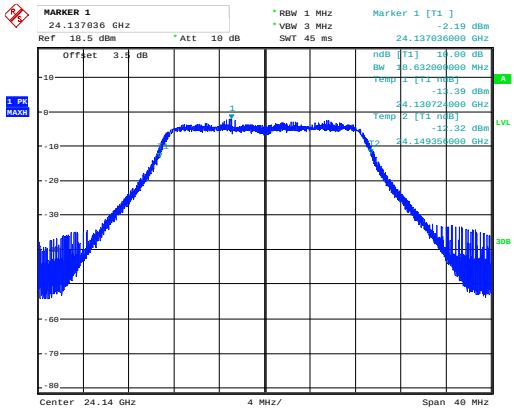
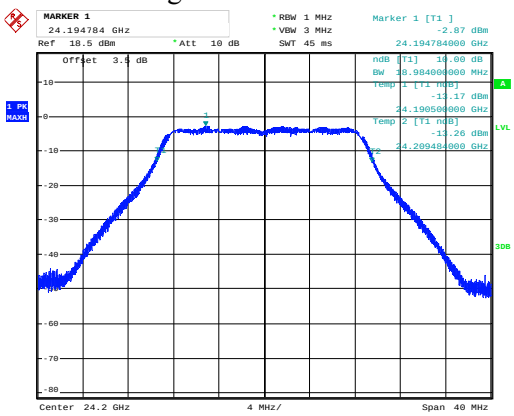
Middle Channel 24140 MHz



Date: 1.FEB.2018 10:03:06

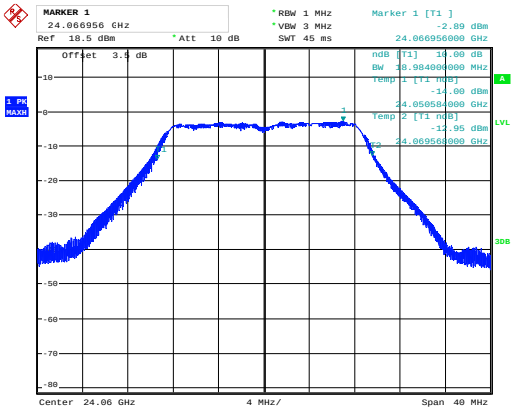
High Channel 24200 MHz



Date: 8.MAR.2018 11:58:38

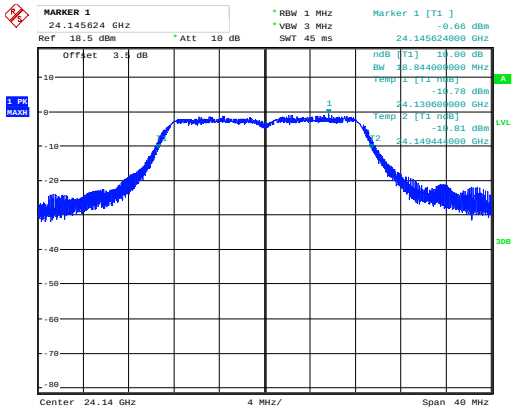
802.11ac20 mode Tx3 Low Voltage

Low Channel 24060 MHz



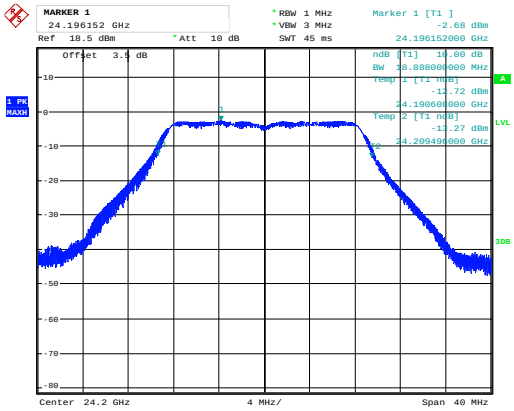
Date: 8.MAR.2018 11:18:15

Middle Channel 24140 MHz



Date: 1.FEB.2018 09:43:56

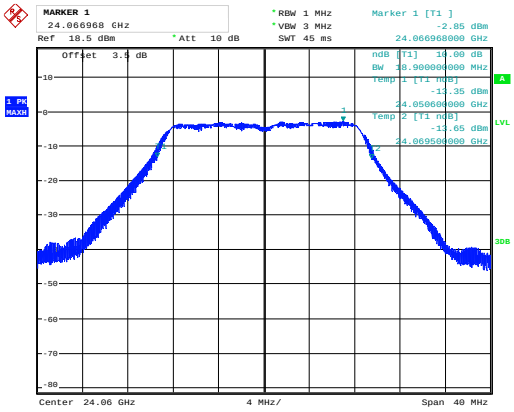
High Channel 24200 MHz



Date: 8.MAR.2018 11:13:15

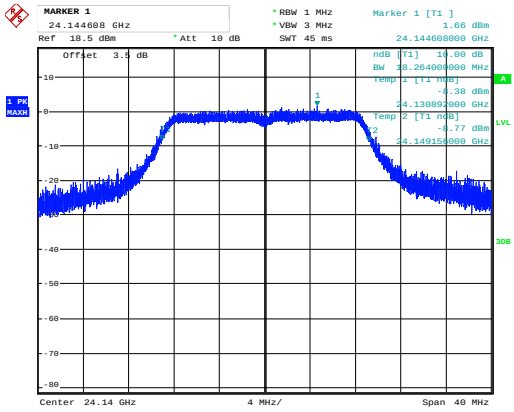
802.11ac20 mode Tx3 Nominal Voltage

Low Channel 24060 MHz



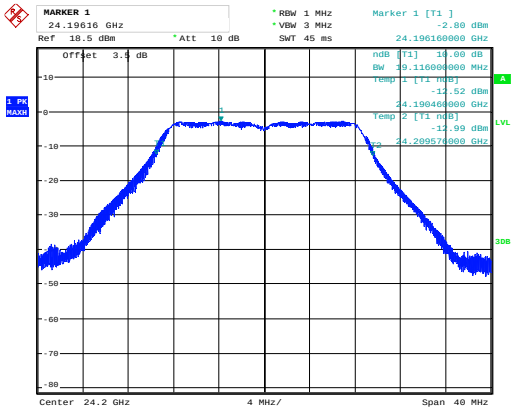
Date: 8.MAR.2018 11:18:46

Middle Channel 24140 MHz



Date: 1.FEB.2018 09:42:24

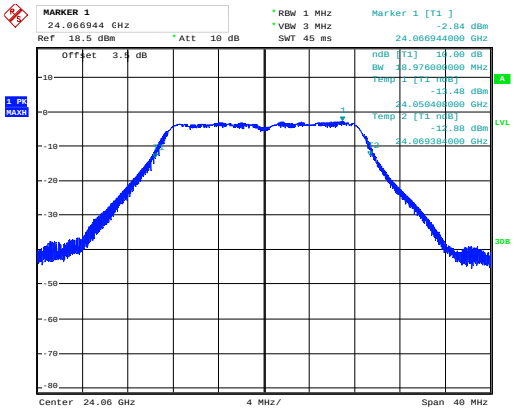
High Channel 24200 MHz



Date: 8.MAR.2018 11:12:04

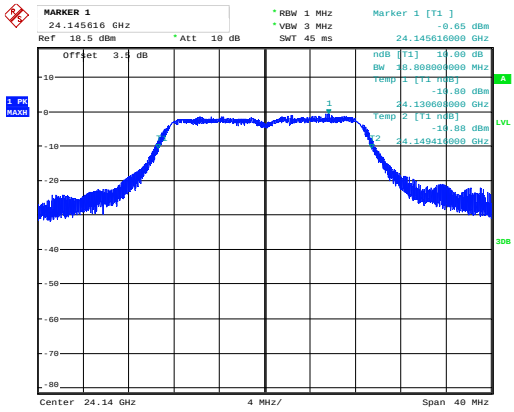
802.11ac20 mode Tx3 High Voltage

Low Channel 24060 MHz



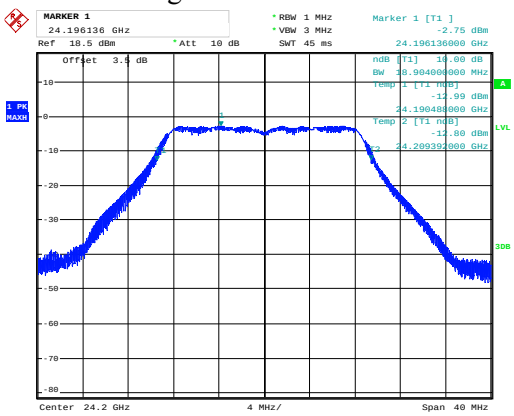
Date: 8.MAR.2018 11:19:23

Middle Channel 24140 MHz



Date: 1.FEB.2018 09:43:19

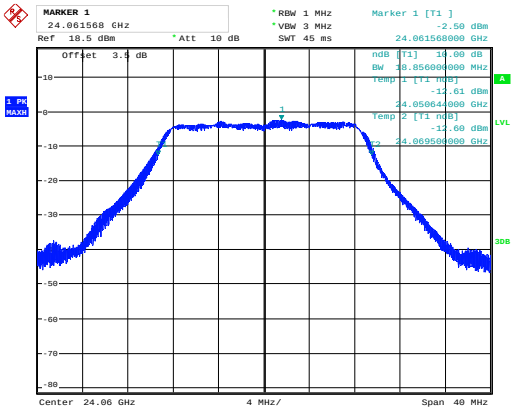
High Channel 24200 MHz



Date: 8.MAR.2018 11:12:42

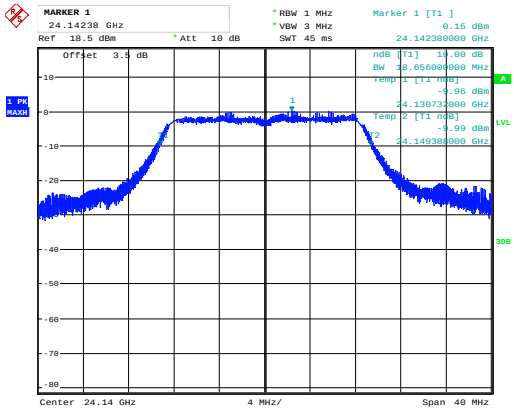
802.11ac20 mode Tx4 Low Voltage

Low Channel 24060 MHz



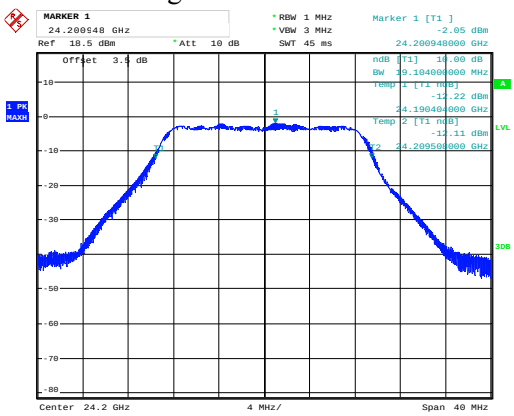
Date: 8.MAR.2018 11:17:28

Middle Channel 24140 MHz



Date: 1.FEB.2018 09:46:17

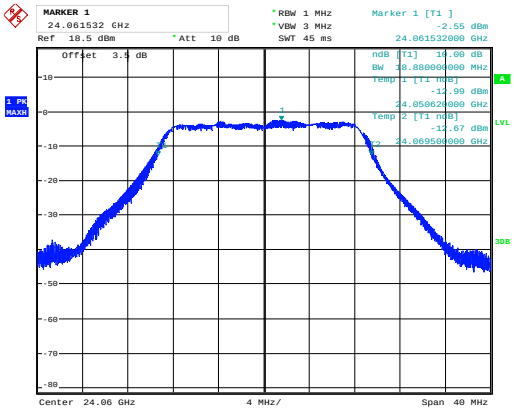
High Channel 24200 MHz



Date: 8.MAR.2018 11:14:26

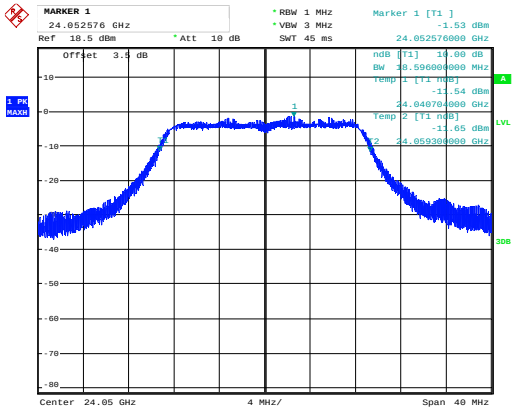
802.11ac20 mode Tx4 Nominal Voltage

Low Channel 24060 MHz



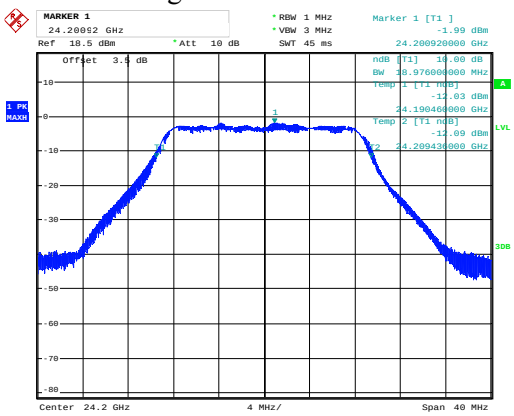
Date: 8.MAR.2018 11:17:02

Middle Channel 24140 MHz



Date: 1.FEB.2018 09:36:36

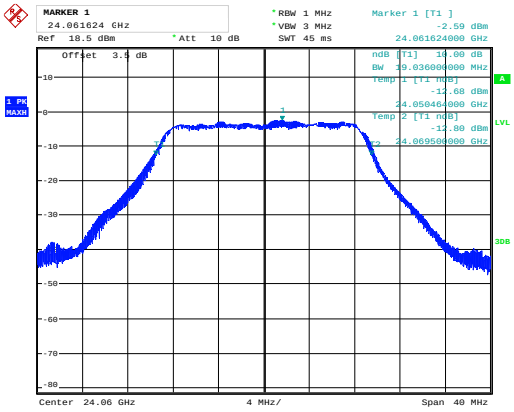
High Channel 24200 MHz



Date: 8.MAR.2018 11:14:55

802.11ac20 mode Tx4 High Voltage

Low Channel 24060 MHz



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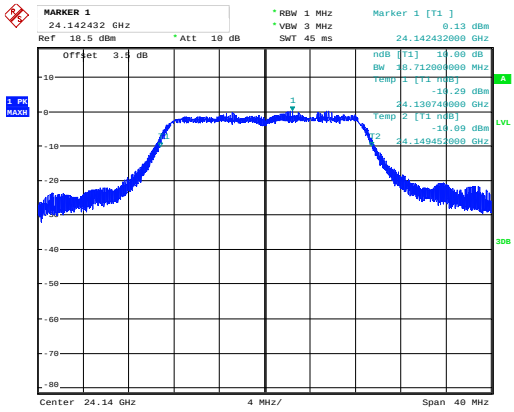
Middle Channel 24140 MHz



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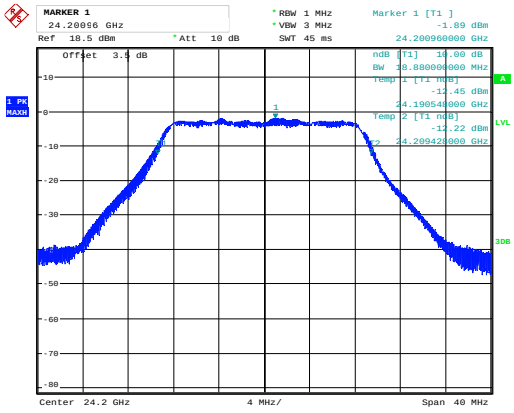
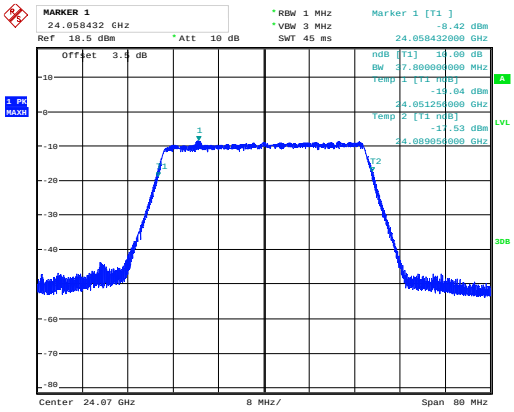
High Channel 24200 MHz



Date: 8.MAR.2018 11:15:26

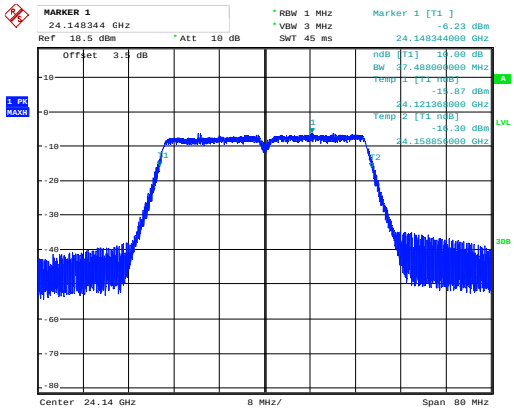
802.11ac40 mode Tx1 Low Voltage

Low Channel 24070 MHz



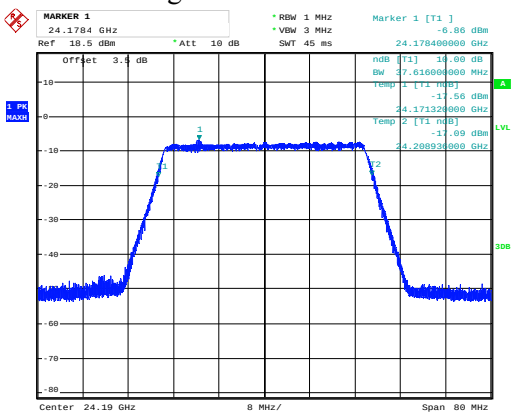
Date: 8.MAR.2018 11:48:33

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:52:14

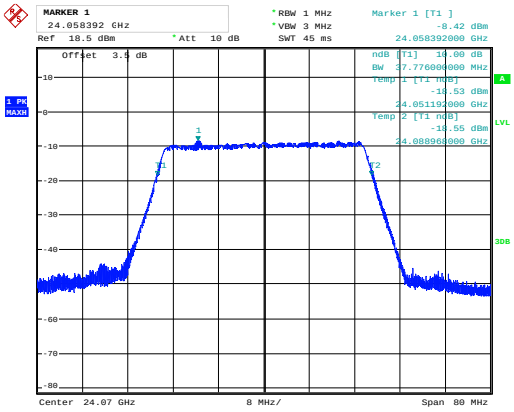
High Channel 24190 MHz



Date: 8.MAR.2018 11:52:38

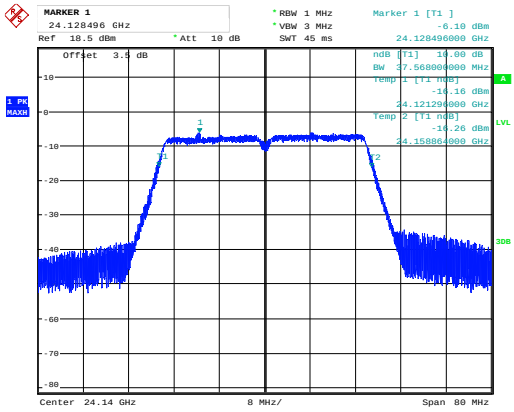
802.11ac40 mode Tx1 Nominal Voltage

Low Channel 24070 MHz



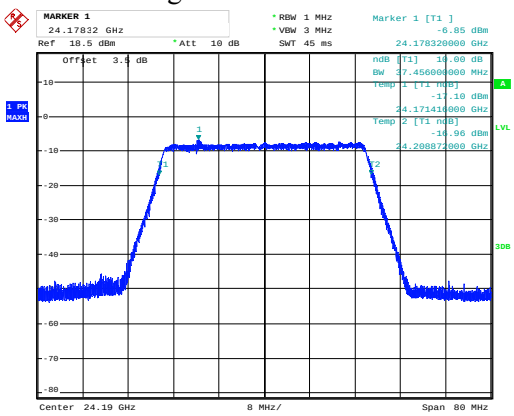
Date: 8.MAR.2018 11:48:04

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:50:54

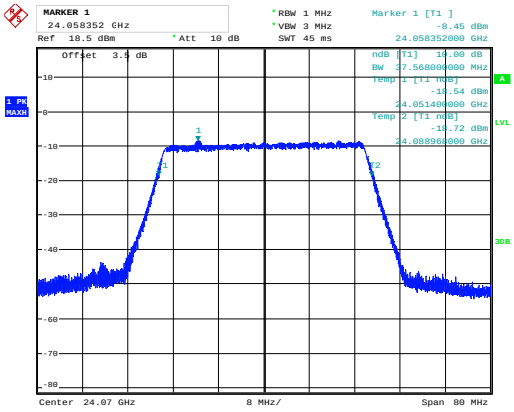
High Channel 24190 MHz



Date: 8.MAR.2018 11:52:58

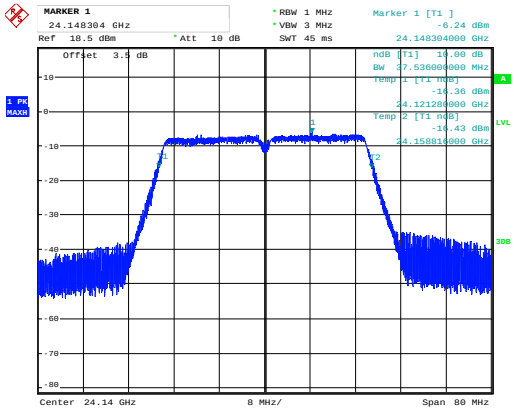
802.11ac40 mode Tx1 High Voltage

Low Channel 24070 MHz



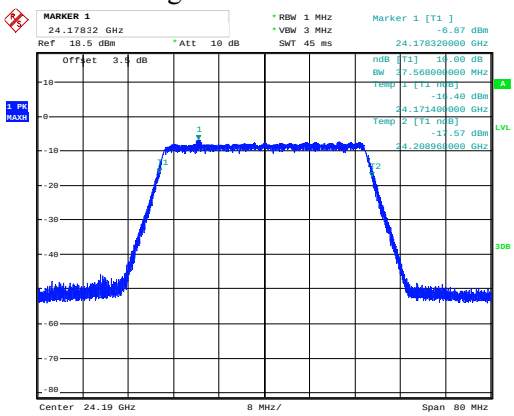
Date: 8.MAR.2018 11:47:22

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:51:31

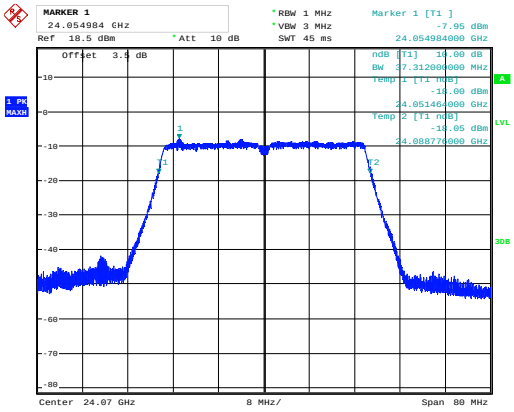
High Channel 24190 MHz



Date: 8.MAR.2018 11:53:21

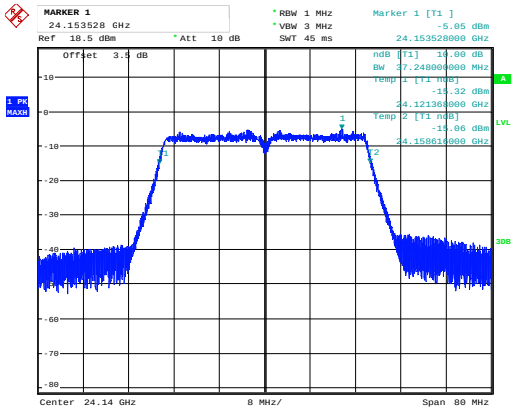
802.11ac40 mode Tx2 Low Voltage

Low Channel 24070 MHz



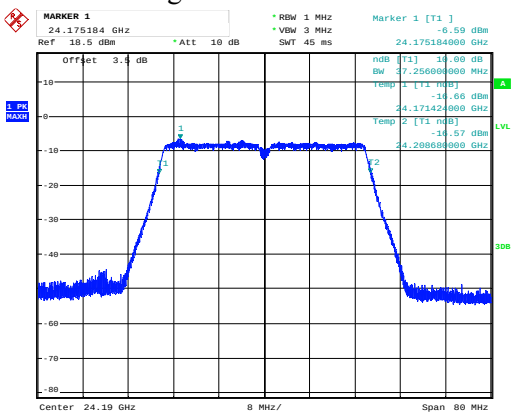
Date: 8.MAR.2018 11:50:15

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:54:10

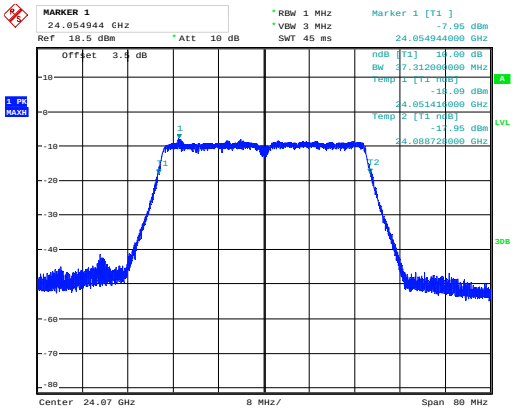
High Channel 24190 MHz



Date: 8.MAR.2018 11:51:55

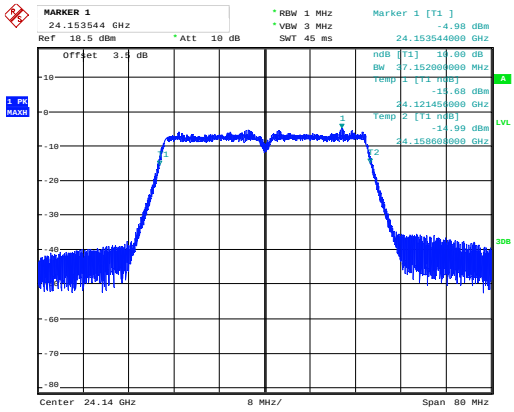
802.11ac40 mode Tx2 Nominal Voltage

Low Channel 24070 MHz



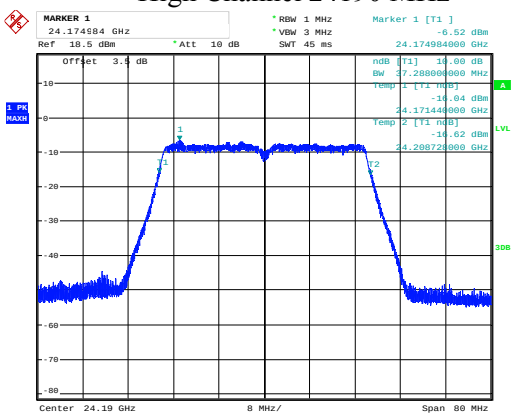
Date: 8.MAR.2018 11:49:39

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:53:15

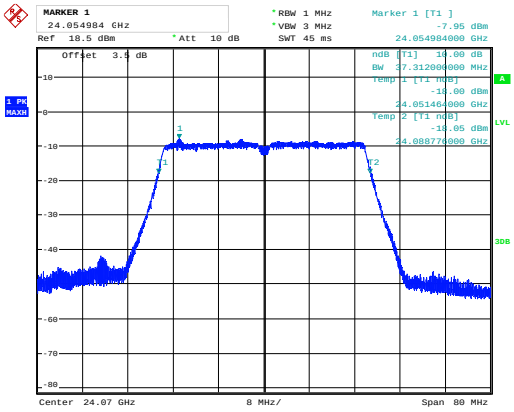
High Channel 24190 MHz



Date: 8.MAR.2018 11:51:34

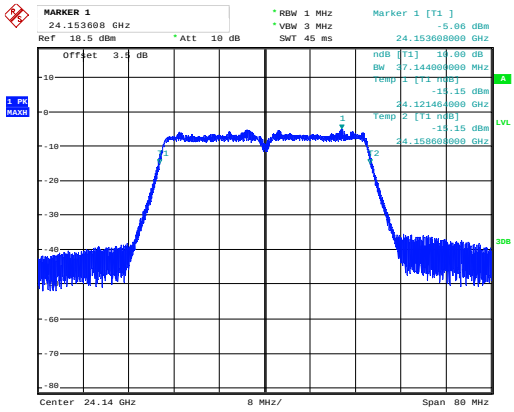
802.11ac40 mode Tx2 High Voltage

Low Channel 24070 MHz



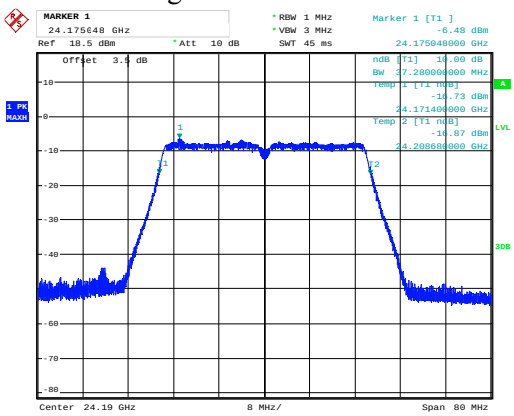
Date: 8.MAR.2018 11:50:15

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:53:45

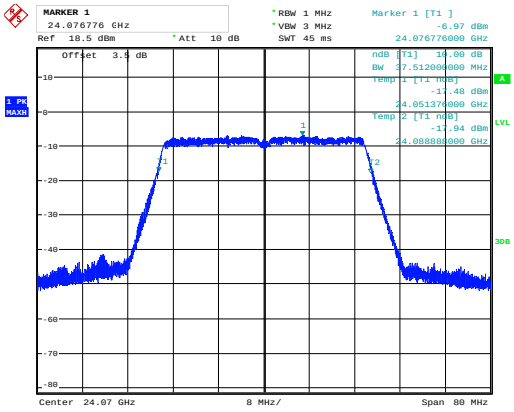
High Channel 24190 MHz



Date: 8.MAR.2018 11:51:00

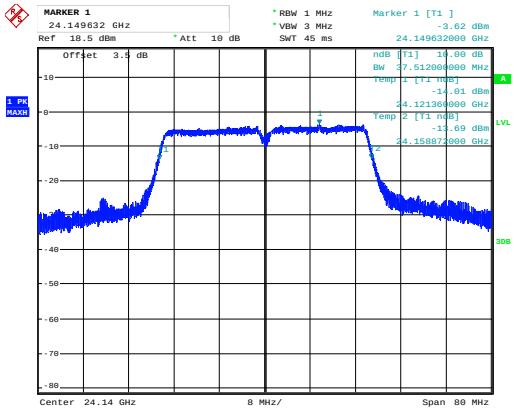
802.11ac40 mode Tx3 Low Voltage

Low Channel 24070 MHz



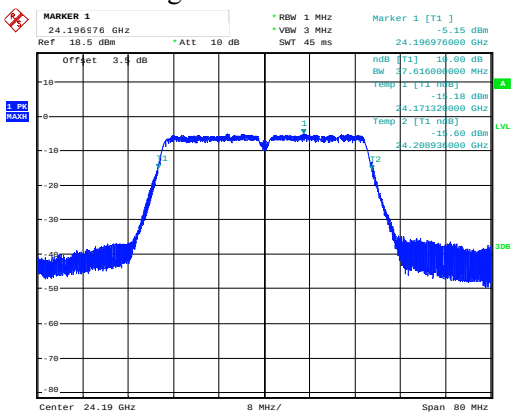
Date: 8.MAR.2018 11:22:23

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:23:23

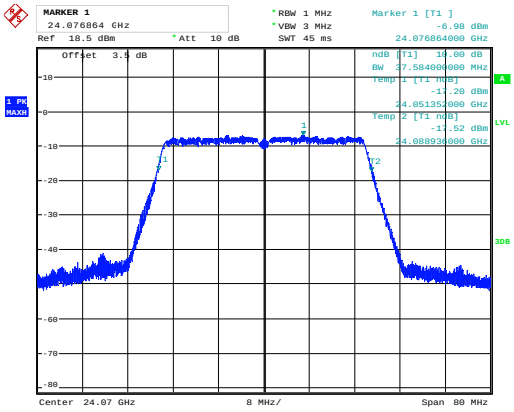
High Channel 24190 MHz



Date: 8.MAR.2018 11:26:30

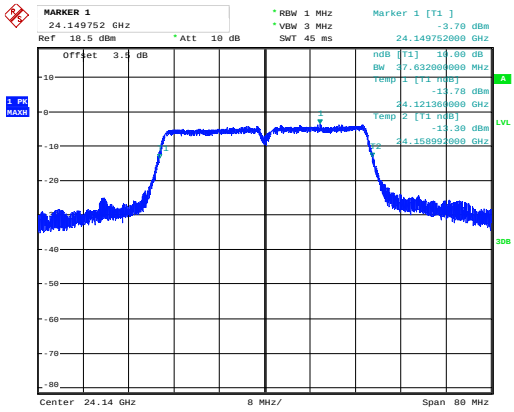
802.11ac40 mode Tx3 Nominal Voltage

Low Channel 24070 MHz



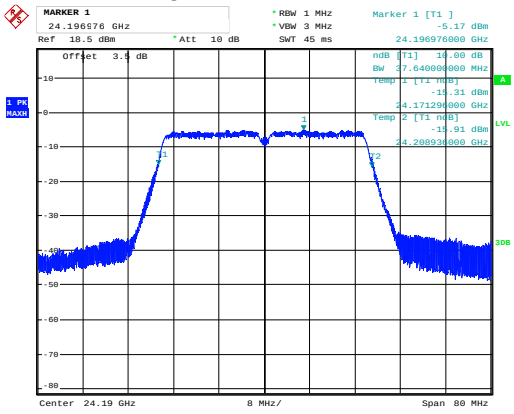
Date: 8.MAR.2018 11:21:59

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:22:26

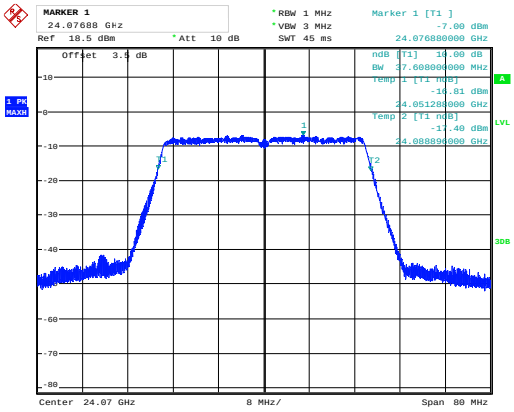
High Channel 24190 MHz



Date: 8.MAR.2018 11:26:01

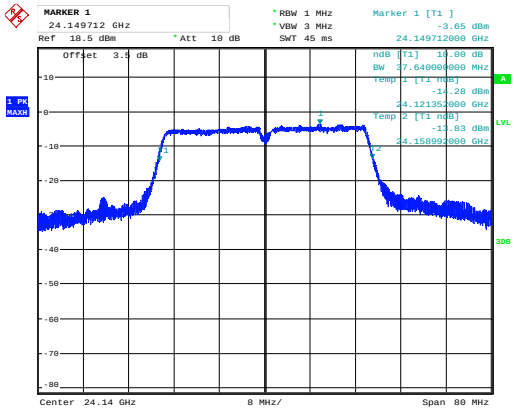
802.11ac40 mode Tx3 High Voltage

Low Channel 24070 MHz



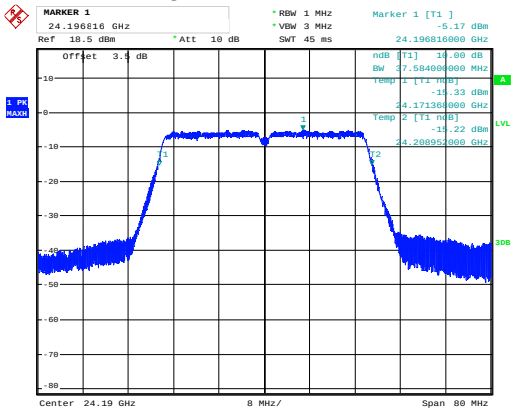
Date: 8.MAR.2018 11:21:17

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:23:02

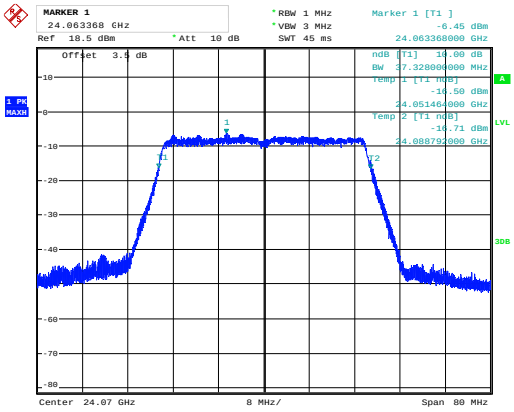
High Channel 24190 MHz



Date: 8.MAR.2018 11:25:20

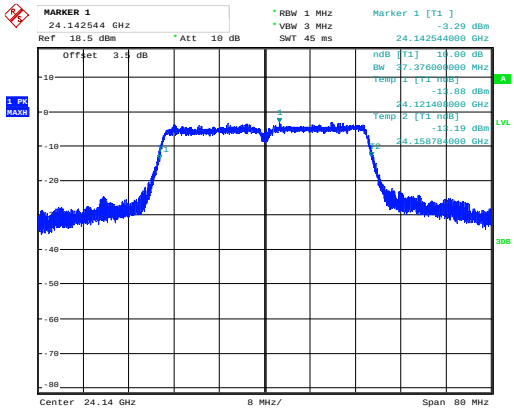
802.11ac40 mode Tx4 Low Voltage

Low Channel 24070 MHz



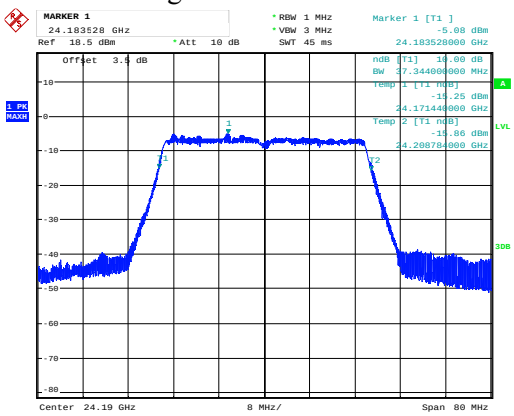
Date: 8.MAR.2018 11:23:06

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:39:59

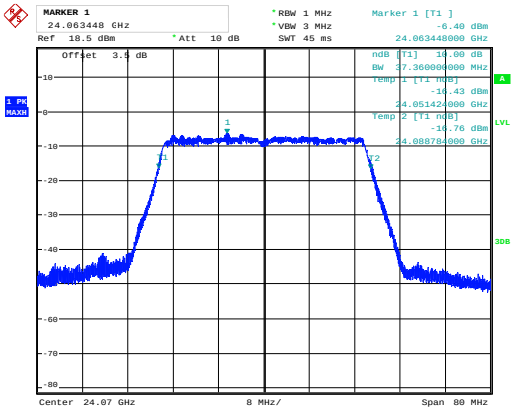
High Channel 24190 MHz



Date: 8.MAR.2018 11:27:12

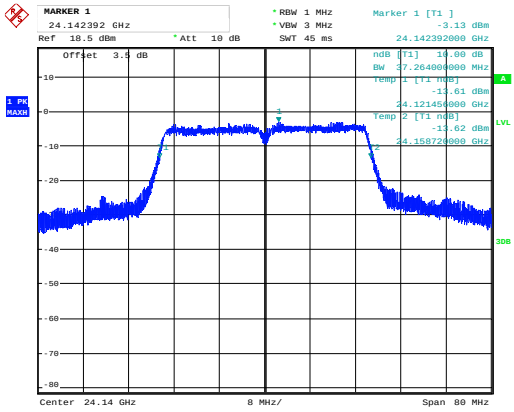
802.11ac40 mode Tx4 Nominal Voltage

Low Channel 24070 MHz



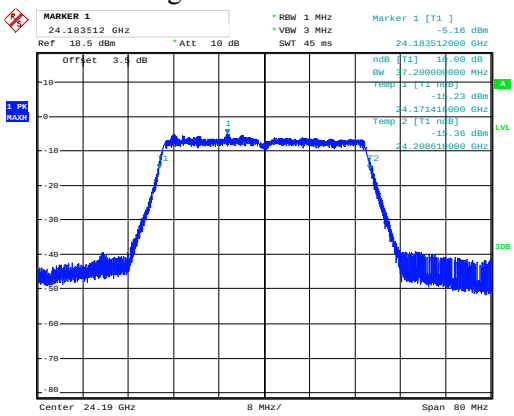
Date: 8.MAR.2018 11:23:34

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:38:44

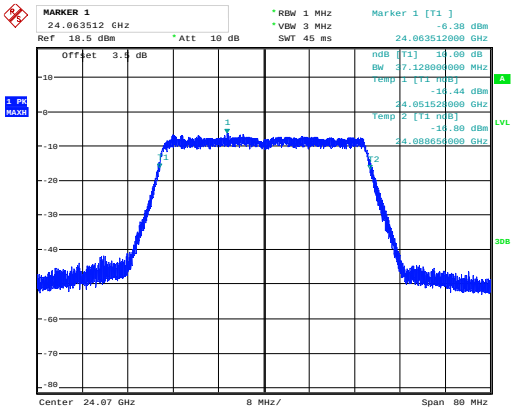
High Channel 24190 MHz



Date: 8.MAR.2018 11:27:29

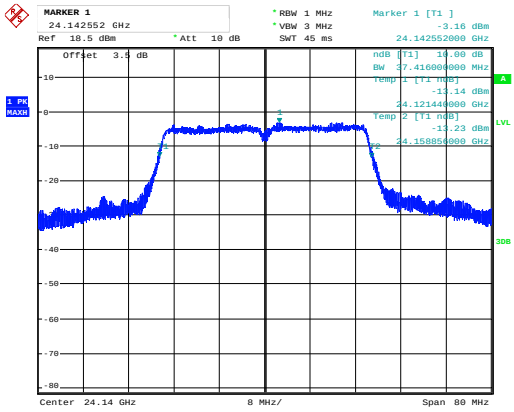
802.11ac40 mode Tx4 High Voltage

Low Channel 24070 MHz



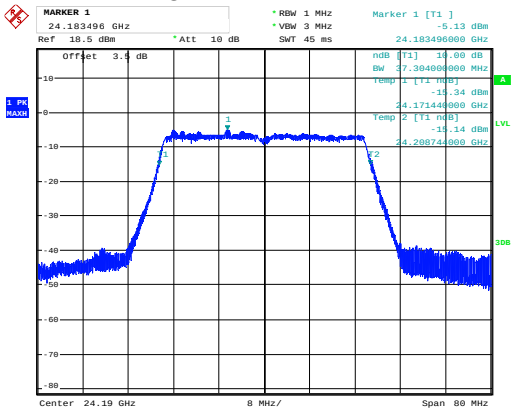
Date: 8.MAR.2018 11:24:18

Middle Channel 24140 MHz



Date: 1.FEB.2018 10:39:28

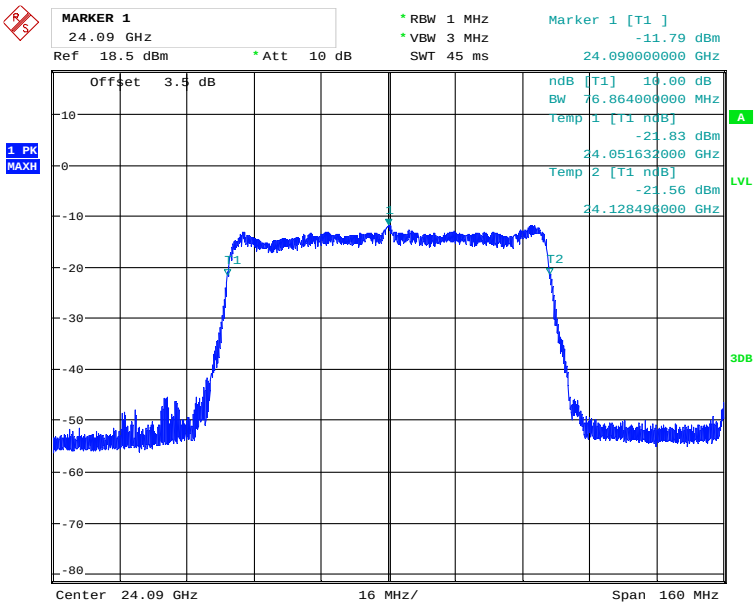
High Channel 24190 MHz



Date: 8.MAR.2018 11:27:54

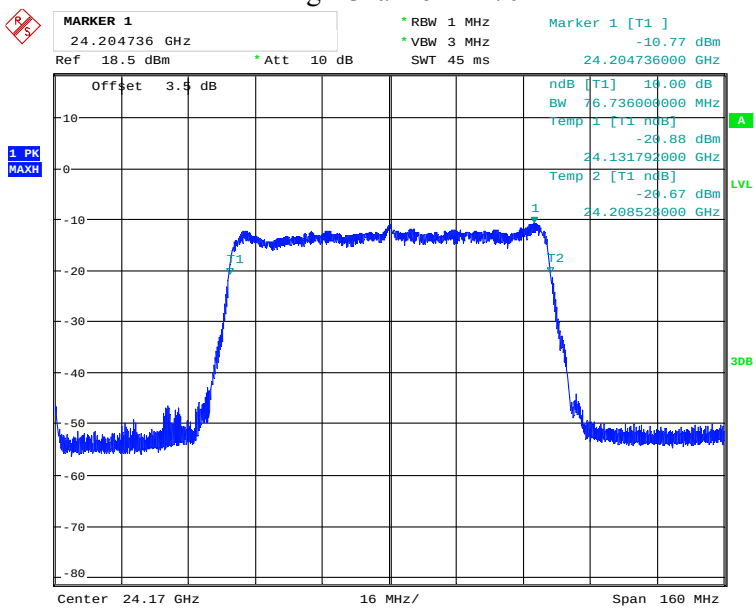
802.11ac80 mode Tx1 Low Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:44:05

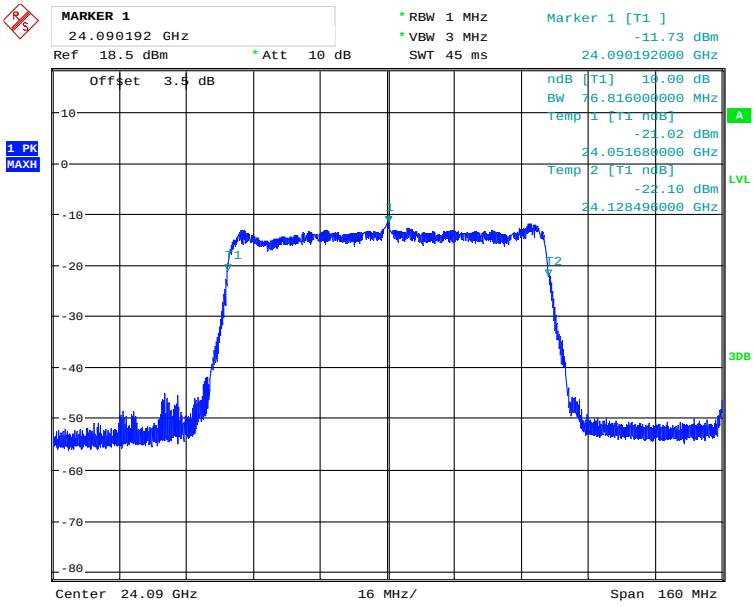
High Channel 24170 MHz



Date: 8.MAR.2018 11:39:18

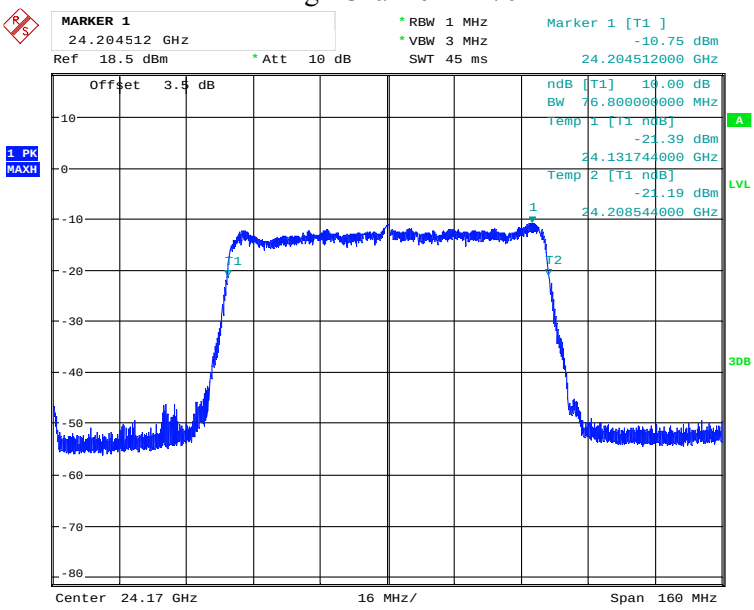
802.11ac80 mode Tx1 Nominal Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:44:25

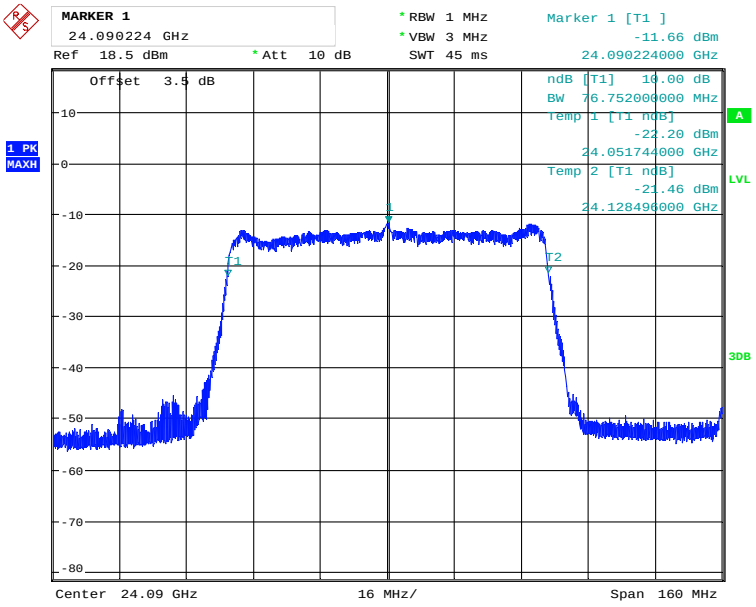
High Channel 24170 MHz



Date: 8.MAR.2018 11:38:55

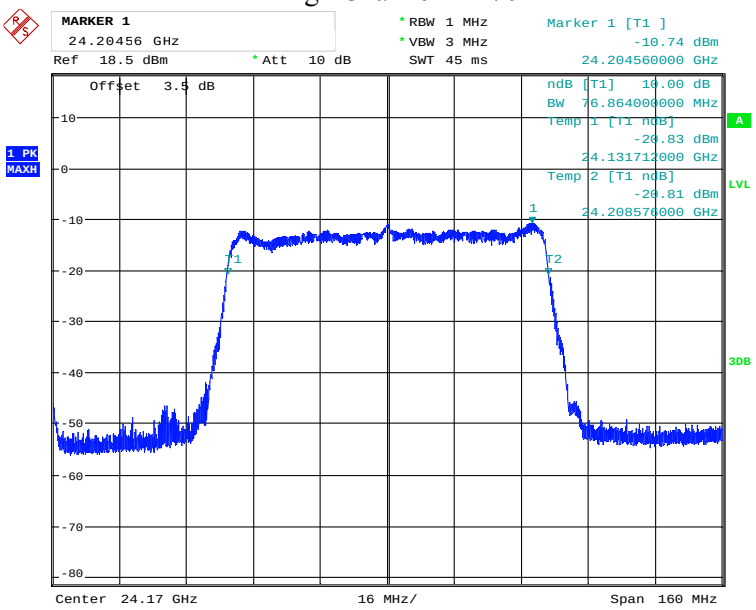
802.11ac80 mode Tx1 High Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:44:43

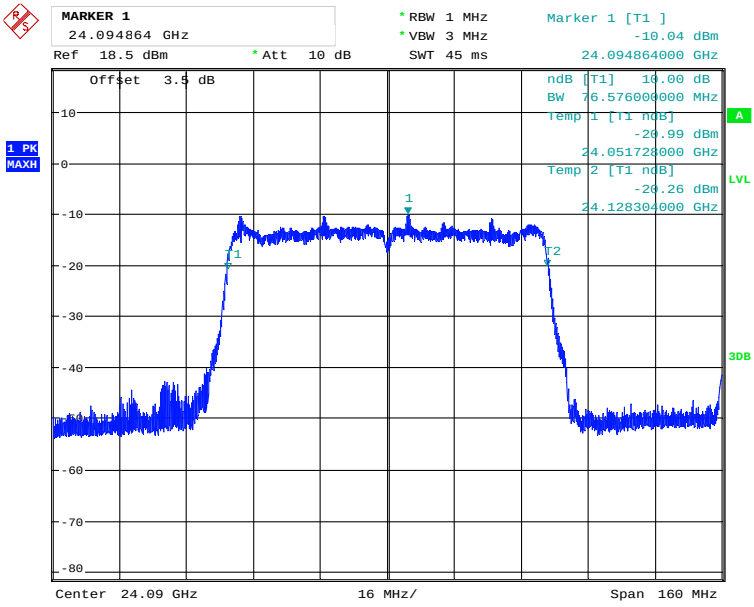
High Channel 24170 MHz



Date: 8.MAR.2018 11:38:26

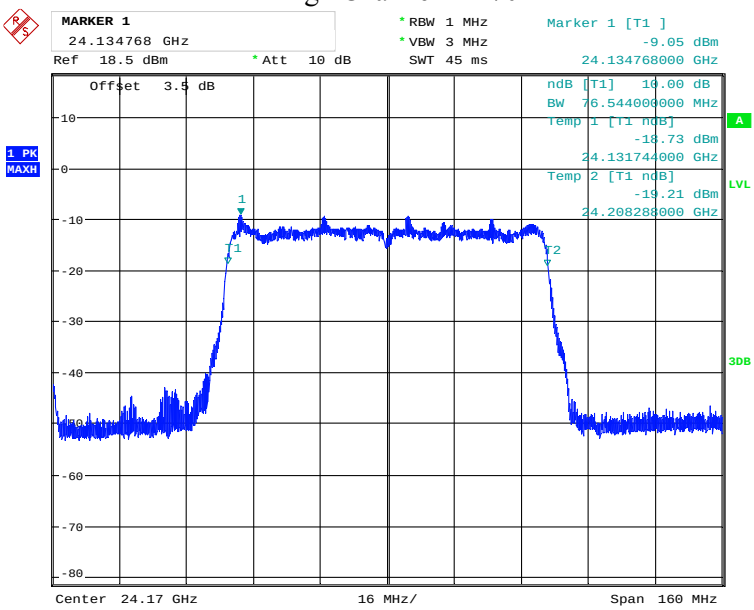
802.11ac80 mode Tx2 Low Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:43:07

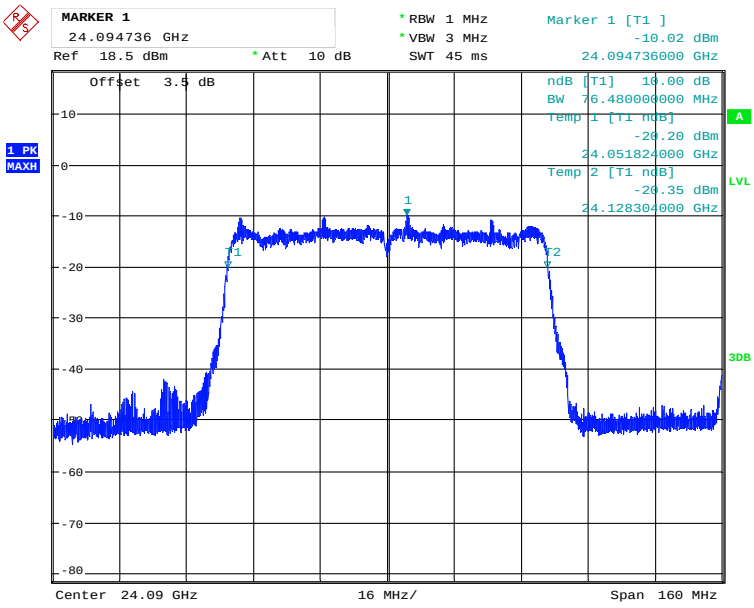
High Channel 24170 MHz



Date: 8.MAR.2018 11:40:10

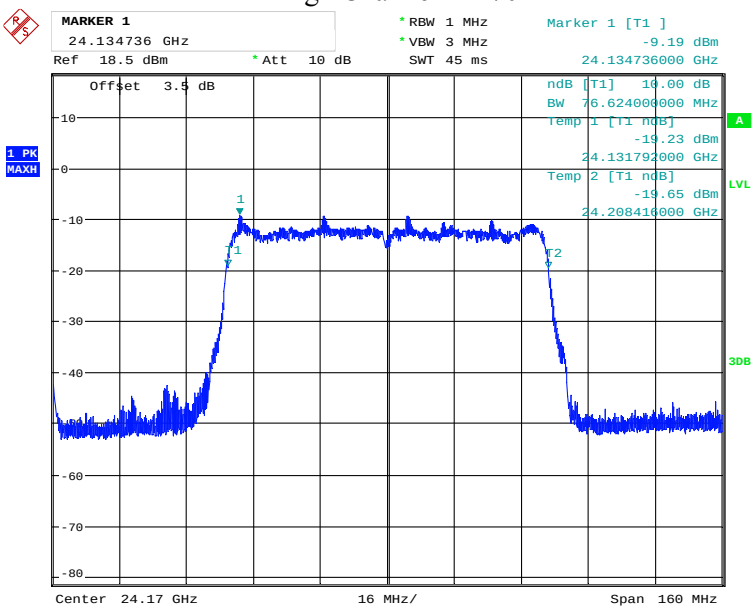
802.11ac80 mode Tx2 Nominal Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:42:17

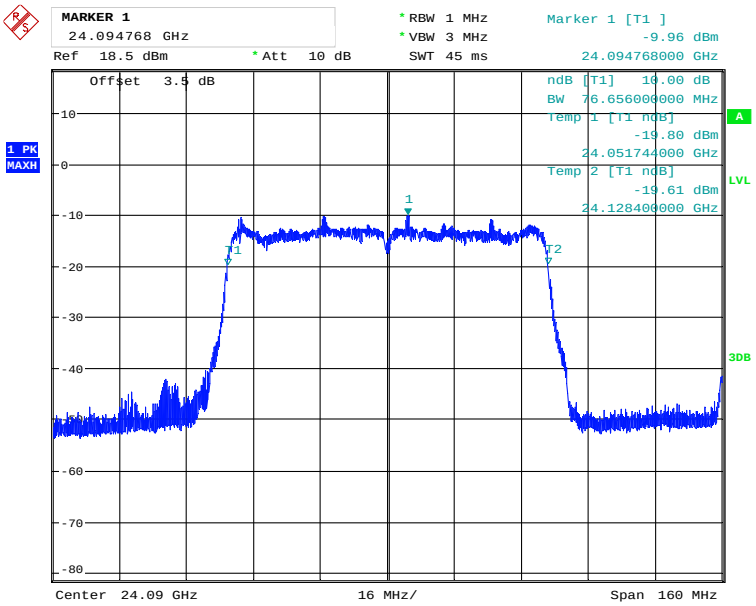
High Channel 24170 MHz



Date: 8.MAR.2018 11:40:37

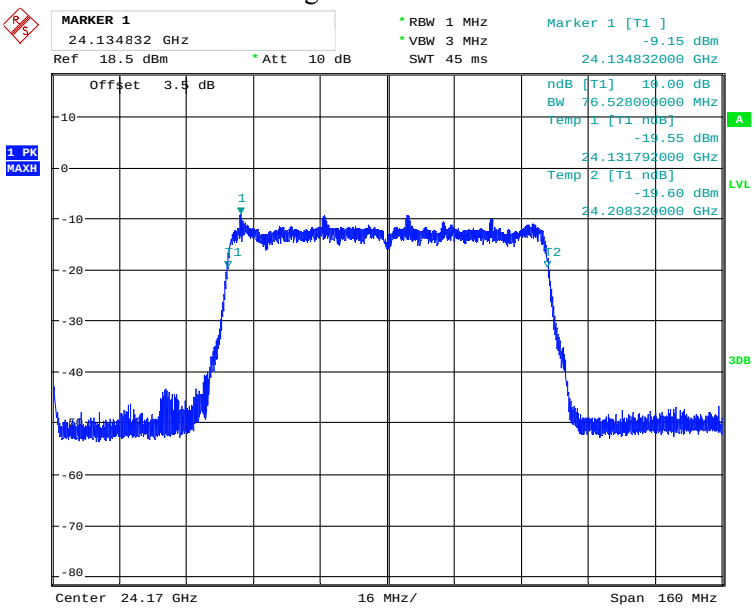
802.11ac80 mode Tx2 High Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:41:49

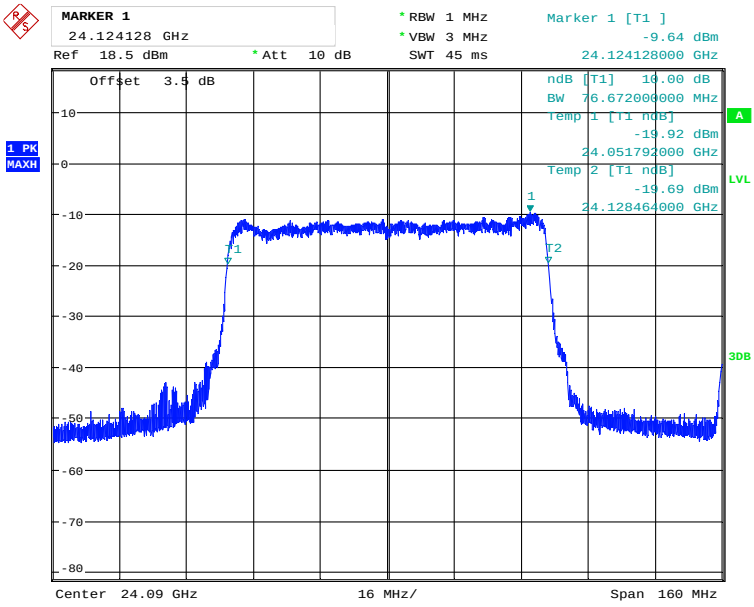
High Channel 24170 MHz



Date: 8.MAR.2018 11:40:54

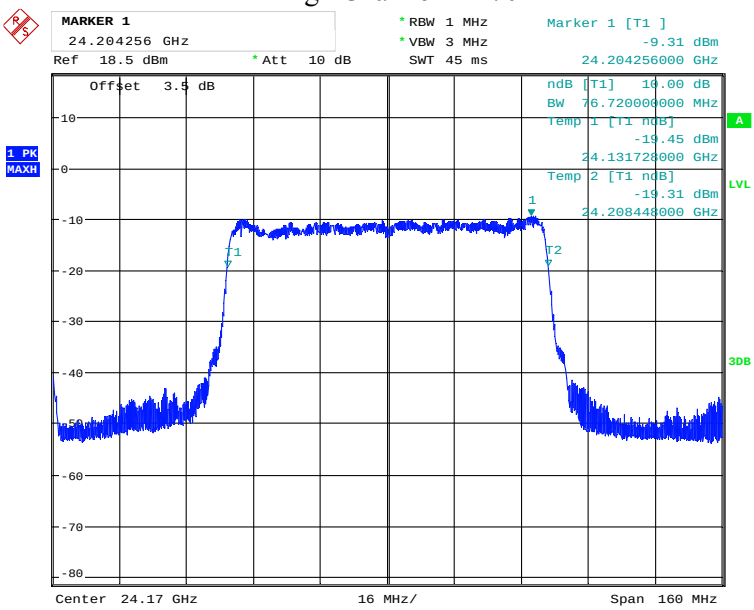
802.11ac80 mode Tx3 Low Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:30:20

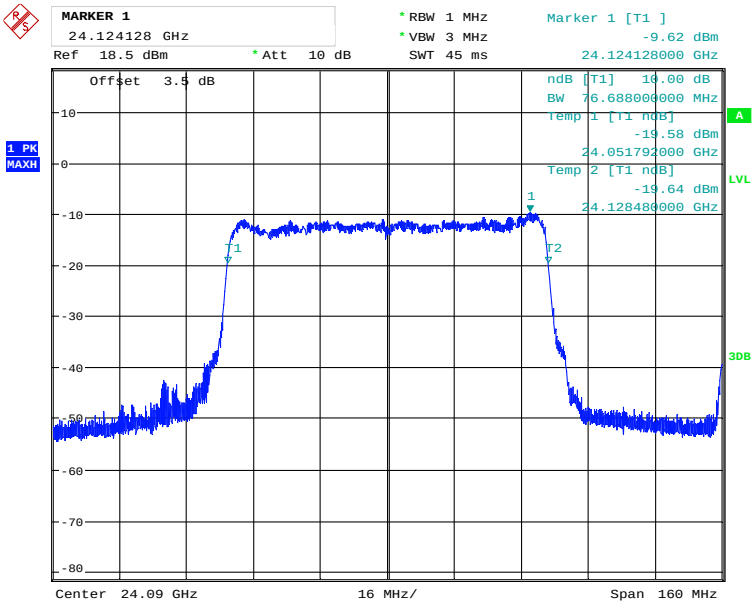
High Channel 24170 MHz



Date: 8.MAR.2018 11:34:46

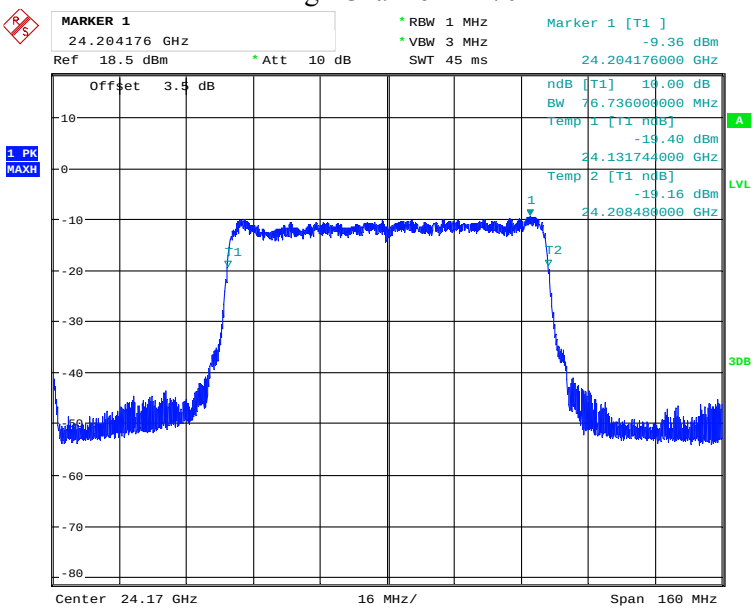
802.11ac80 mode Tx3 Nominal Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:29:55

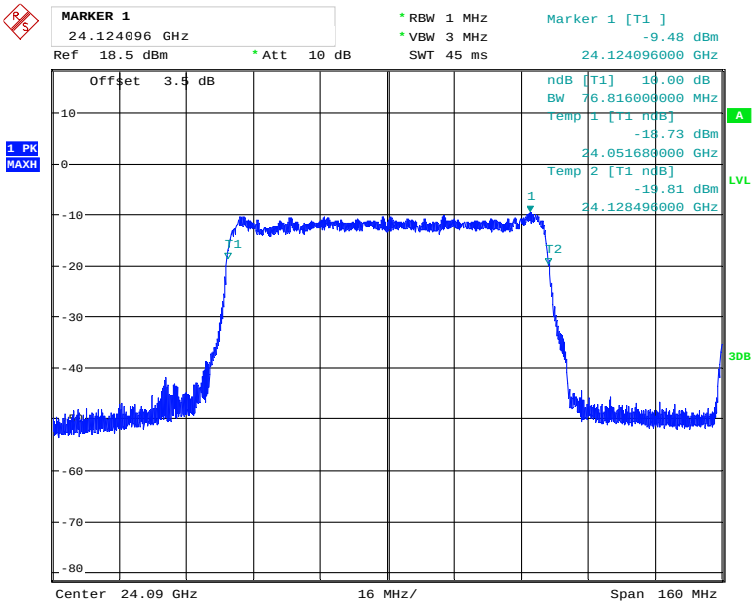
High Channel 24170 MHz



Date: 8.MAR.2018 11:35:13

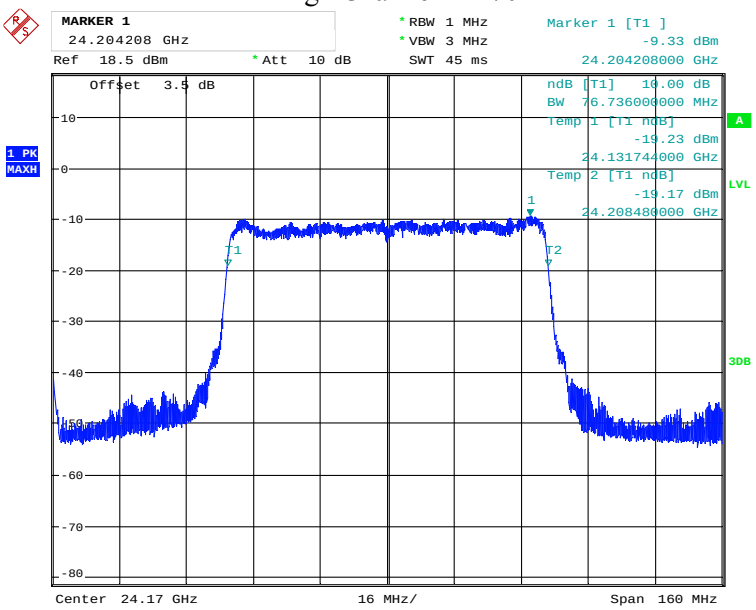
802.11ac80 mode Tx3 High Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:31:57

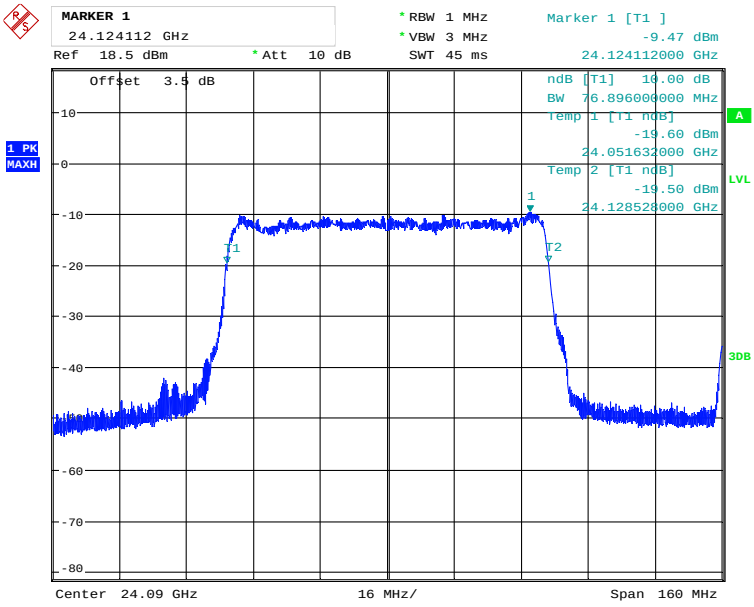
High Channel 24170 MHz



Date: 8.MAR.2018 11:35:36

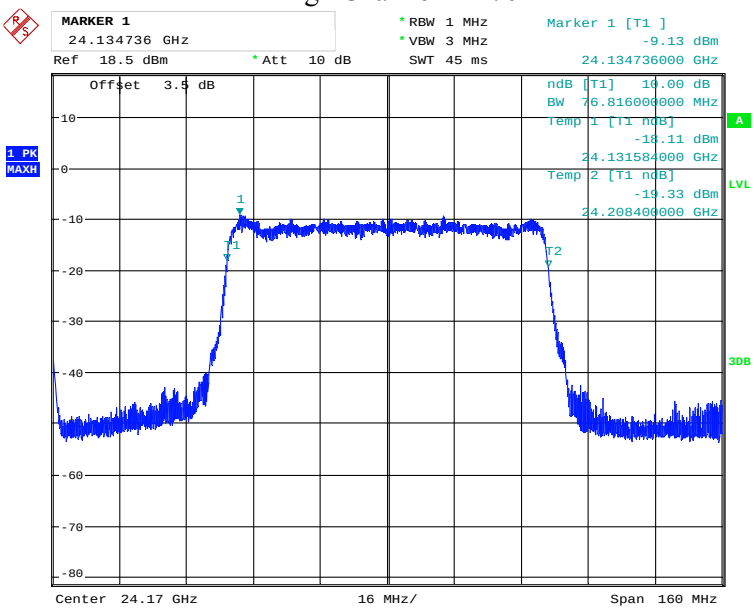
802.11ac80 mode Tx4 Low Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:31:05

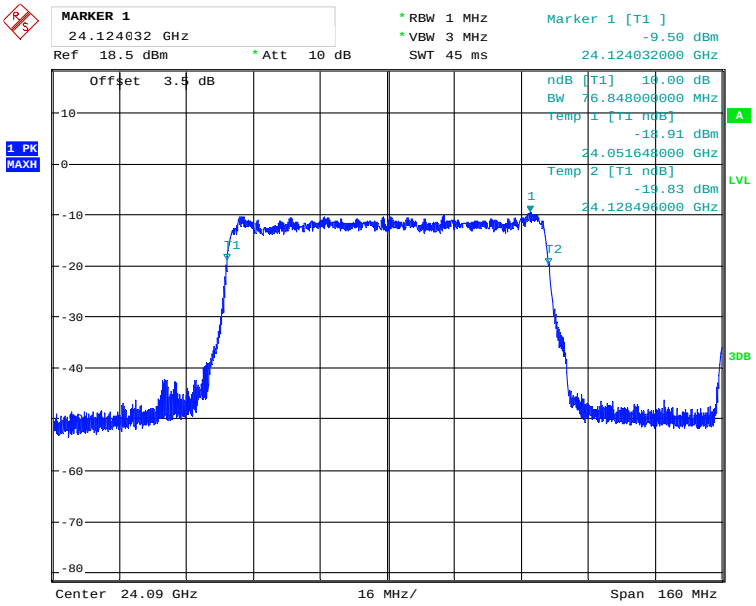
High Channel 24170 MHz



Date: 8.MAR.2018 11:33:59

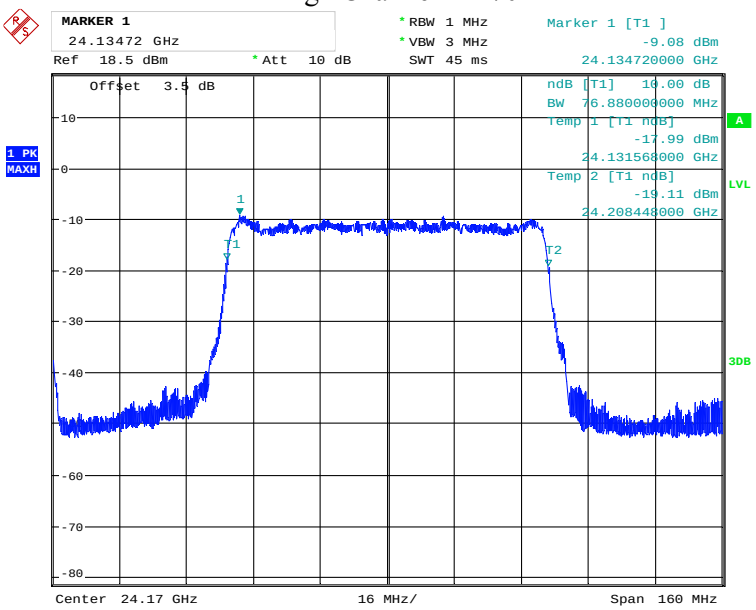
802.11ac80 mode Tx4 Nominal Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:31:31

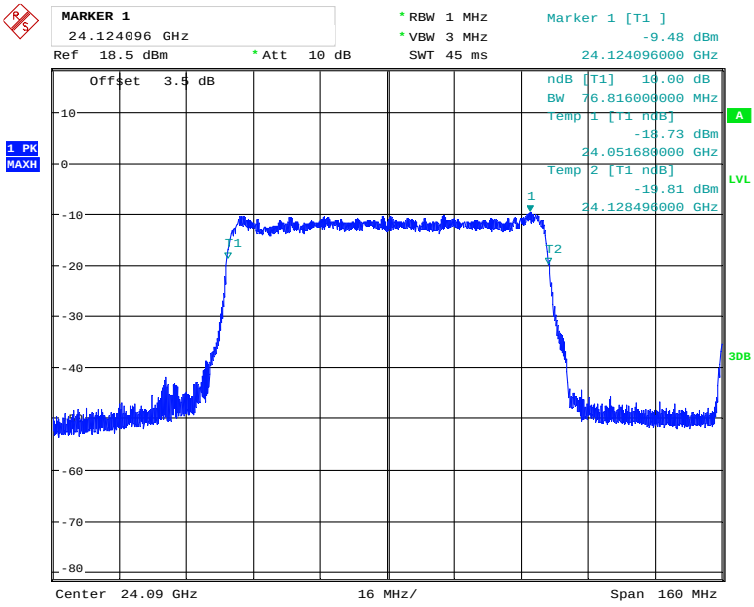
High Channel 24170 MHz



Date: 8.MAR.2018 11:33:37

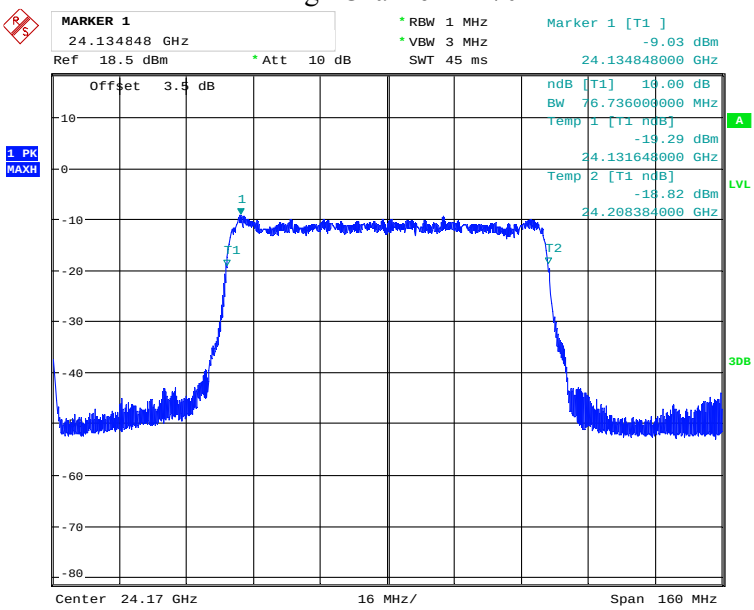
802.11ac80 mode Tx4 High Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 11:31:57

High Channel 24170 MHz

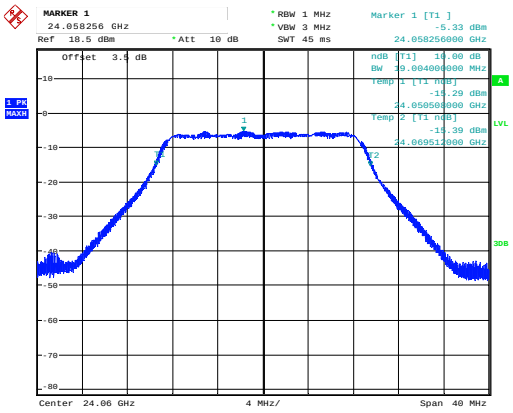


Date: 8.MAR.2018 11:32:58

-20 ºC

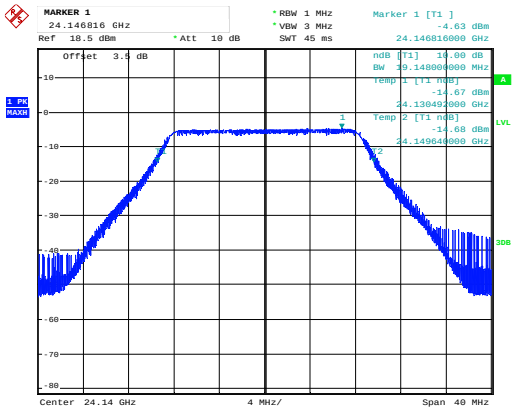
802.11ac20 mode Tx1 Nominal Voltage

Low Channel 24060 MHz



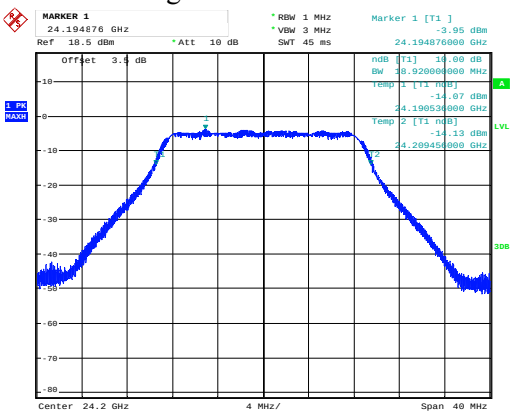
Date: 8.MAR.2018 09:58:54

Middle Channel 24140 MHz



Date: 1.FEB.2018 16:16:57

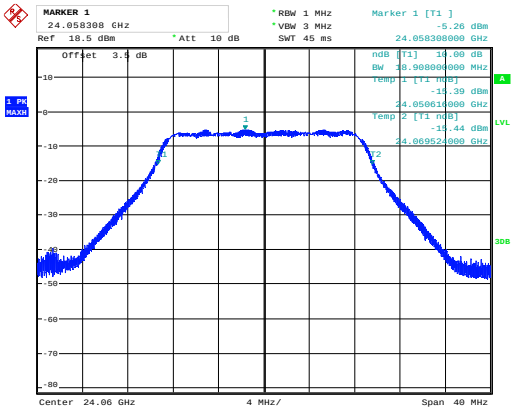
High Channel 24200 MHz



Date: 8.MAR.2018 10:00:04

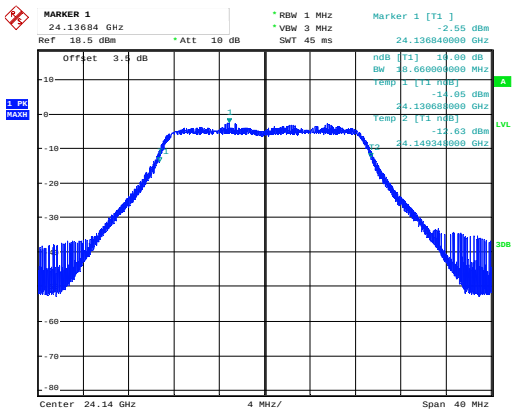
802.11ac20 mode Tx2 Nominal Voltage

Low Channel 24060 MHz



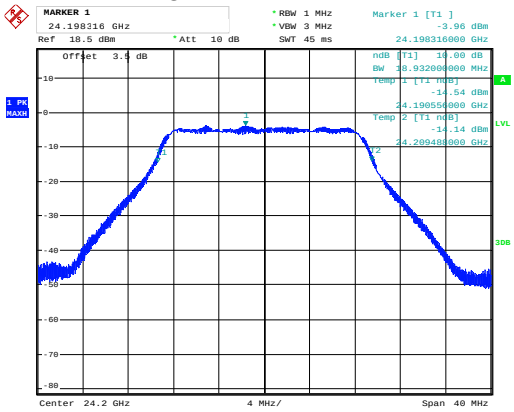
Date: 8.MAR.2018 09:57:53

Middle Channel 24140 MHz



Date: 1.FEB.2018 16:16:08

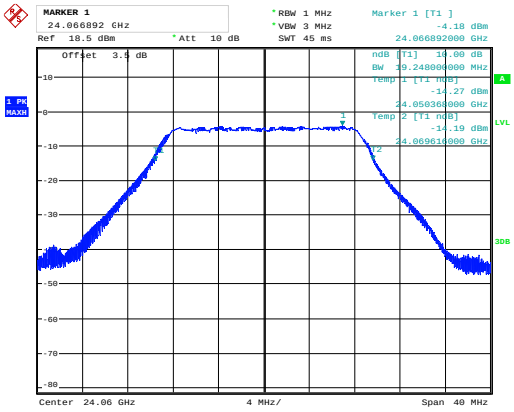
High Channel 24200 MHz



Date: 8.MAR.2018 10:00:44

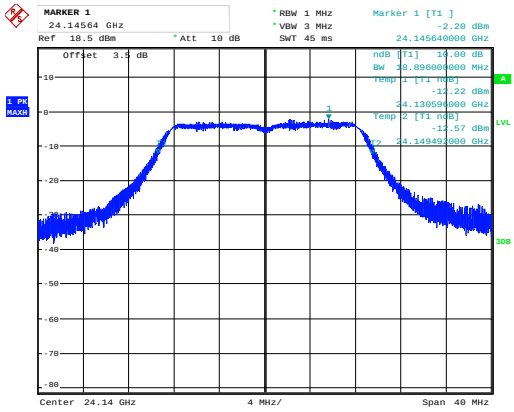
802.11ac20 mode Tx3 Nominal Voltage

Low Channel 24060 MHz



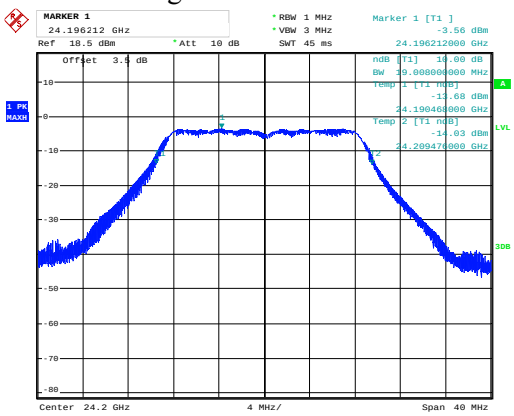
Date: 8.MAR.2018 09:18:04

Middle Channel 24140 MHz



Date: 2.FEB.2018 09:37:34

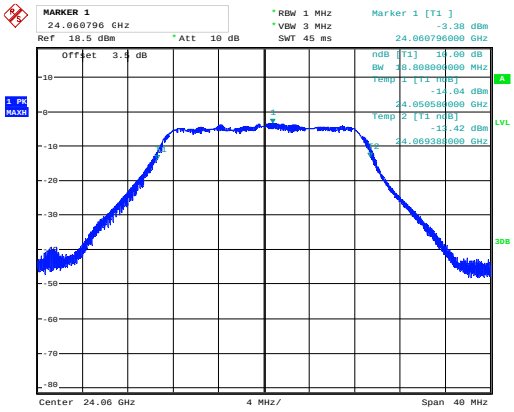
High Channel 24200 MHz



Date: 8.MAR.2018 09:26:52

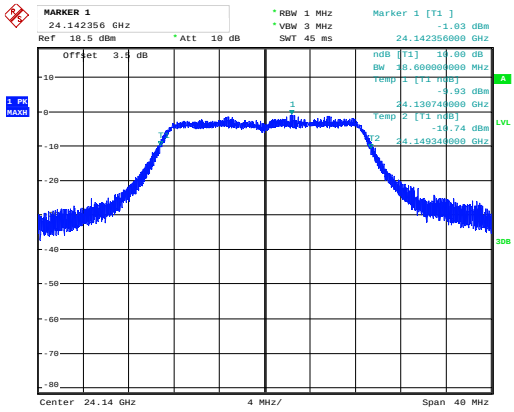
802.11ac20 mode Tx4 Nominal Voltage

Low Channel 24060 MHz



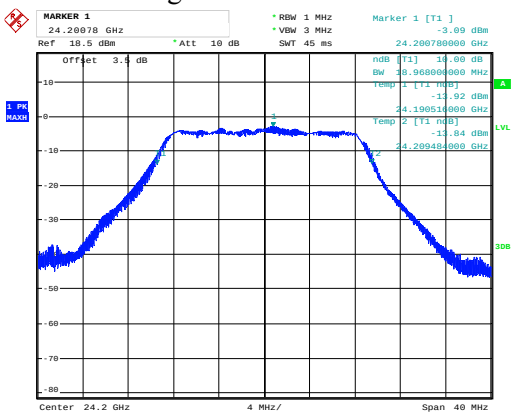
Date: 8.MAR.2018 09:23:59

Middle Channel 24140 MHz



Date: 2.FEB.2018 09:38:08

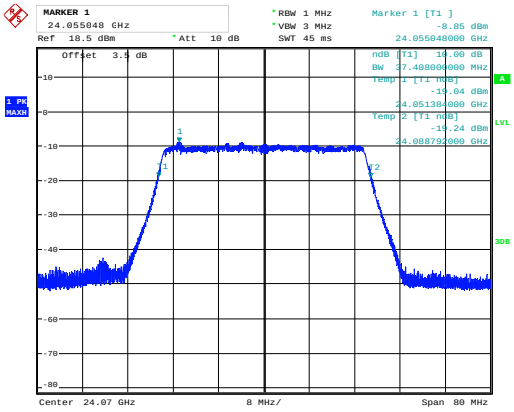
High Channel 24200 MHz



Date: 8.MAR.2018 09:25:36

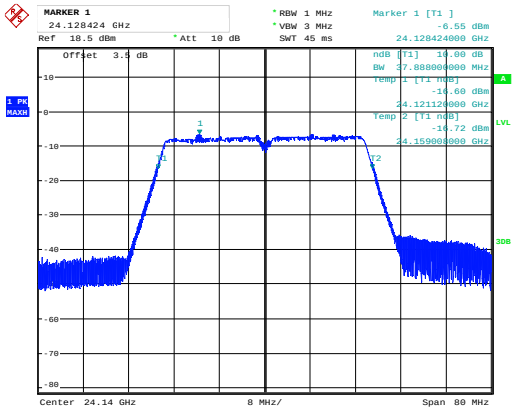
802.11ac40 mode Tx1 Nominal Voltage

Low Channel 24070 MHz



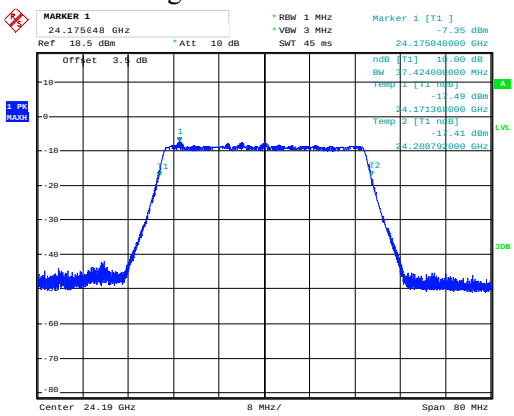
Date: 8.MAR.2018 09:50:11

Middle Channel 24140 MHz



Date: 1.FEB.2018 16:24:46

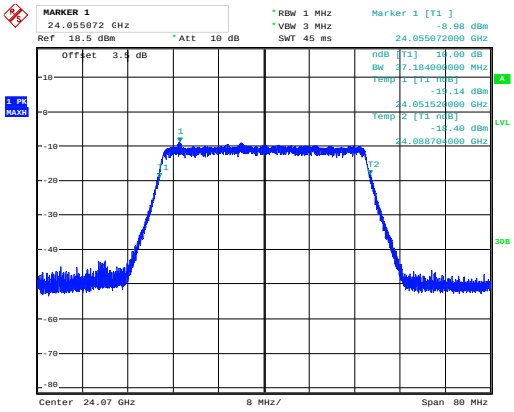
High Channel 24190 MHz



Date: 8.MAR.2018 09:52:38

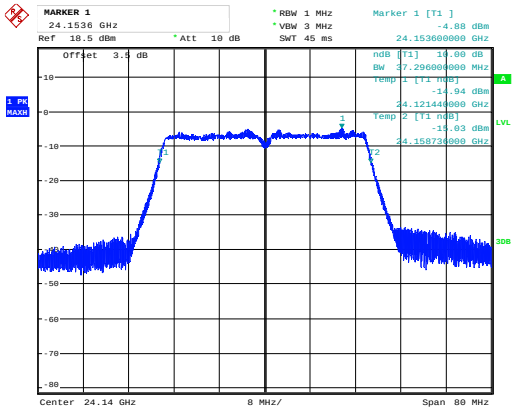
802.11ac40 mode Tx2 Nominal Voltage

Low Channel 24070 MHz



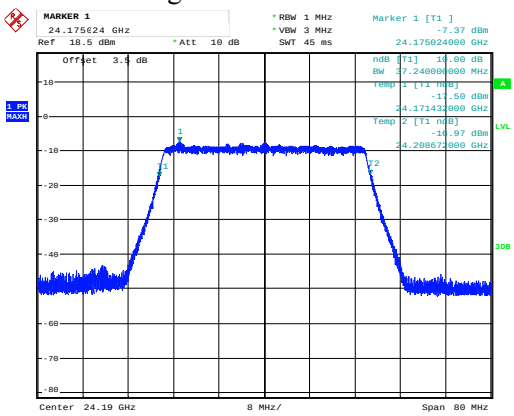
Date: 8.MAR.2018 09:54:02

Middle Channel 24140 MHz



Date: 1.FEB.2018 16:23:26

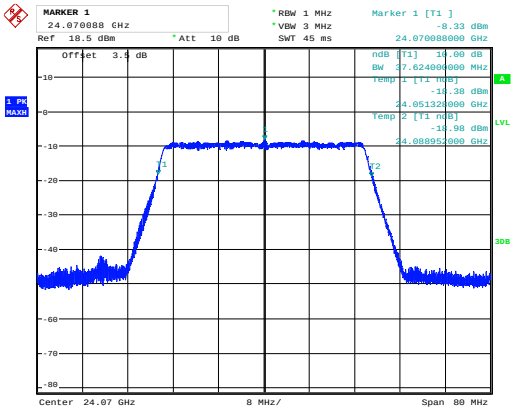
High Channel 24190 MHz



Date: 8.MAR.2018 09:51:42

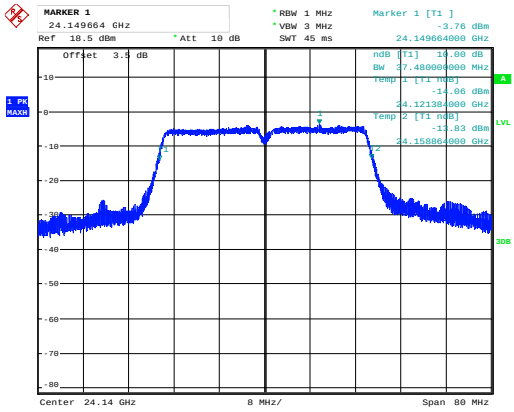
802.11ac40 mode Tx3 Nominal Voltage

Low Channel 24070 MHz



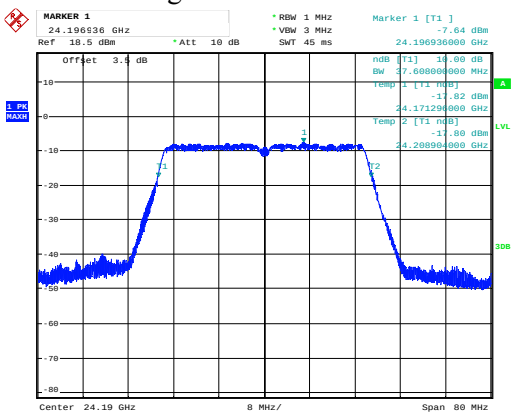
Date: 8.MAR.2018 09:28:11

Middle Channel 24140 MHz



Date: 2.FEB.2018 09:31:53

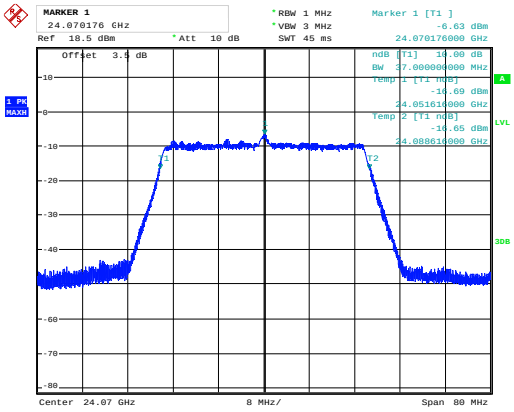
High Channel 24190 MHz



Date: 8.MAR.2018 09:32:30

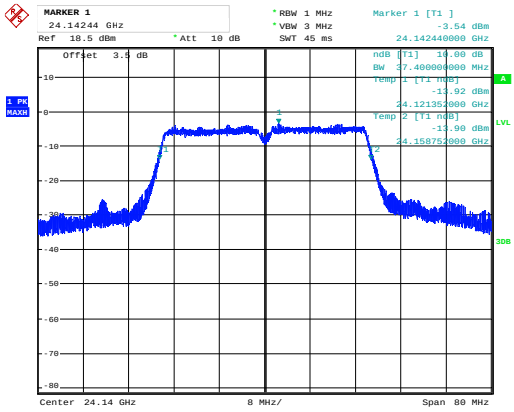
802.11ac40 mode Tx4 Nominal Voltage

Low Channel 24070 MHz



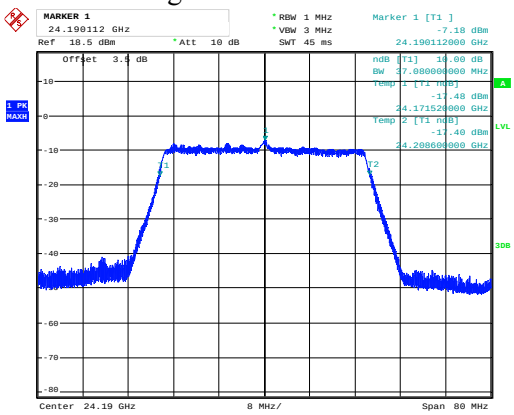
Date: 8.MAR.2018 09:29:22

Middle Channel 24140 MHz



Date: 2.FEB.2018 09:32:37

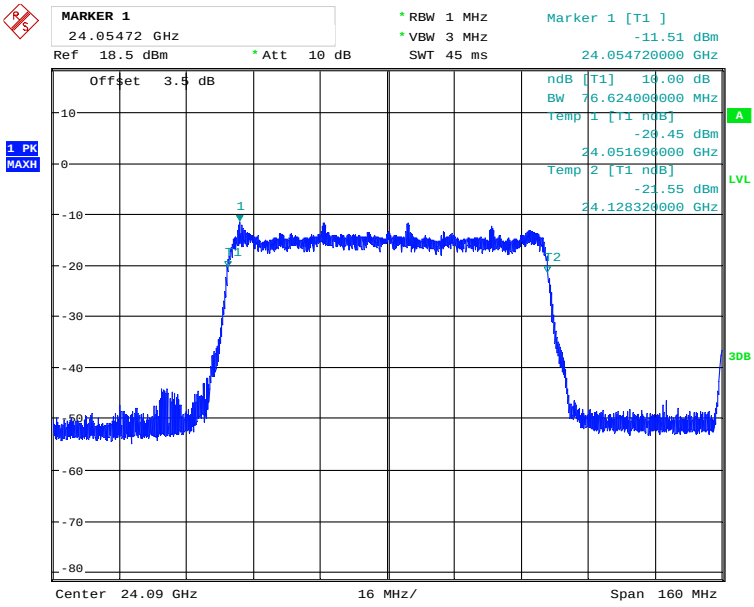
High Channel 24190 MHz



Date: 8.MAR.2018 09:30:50

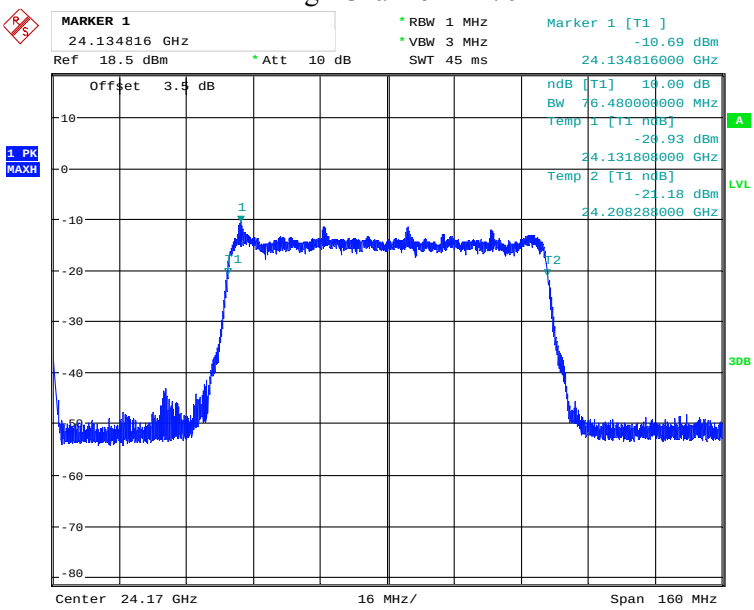
802.11ac80 mode Tx1 Nominal Voltage

Low Channel 24090 MHz



Date: 8.MAR.2018 09:48:24

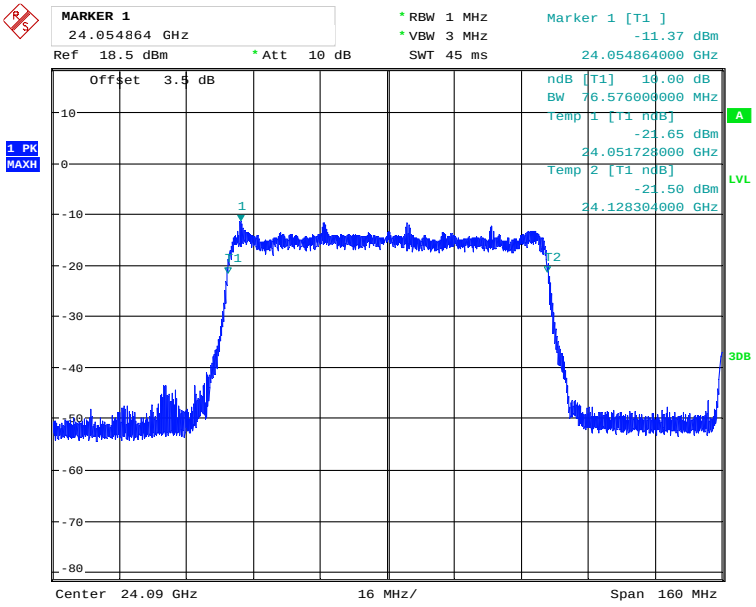
High Channel 24170 MHz



Date: 8.MAR.2018 09:46:39

802.11ac80 mode Tx2 Nominal Voltage

Low Channel 24090 MHz



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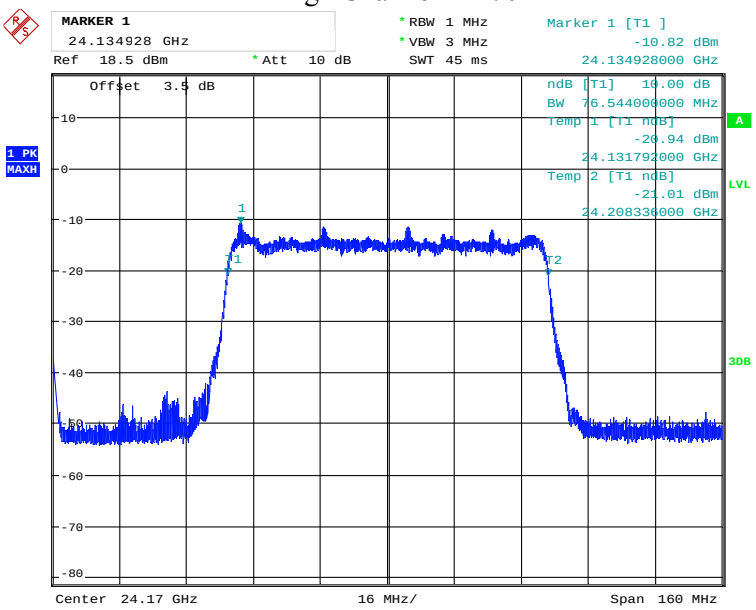

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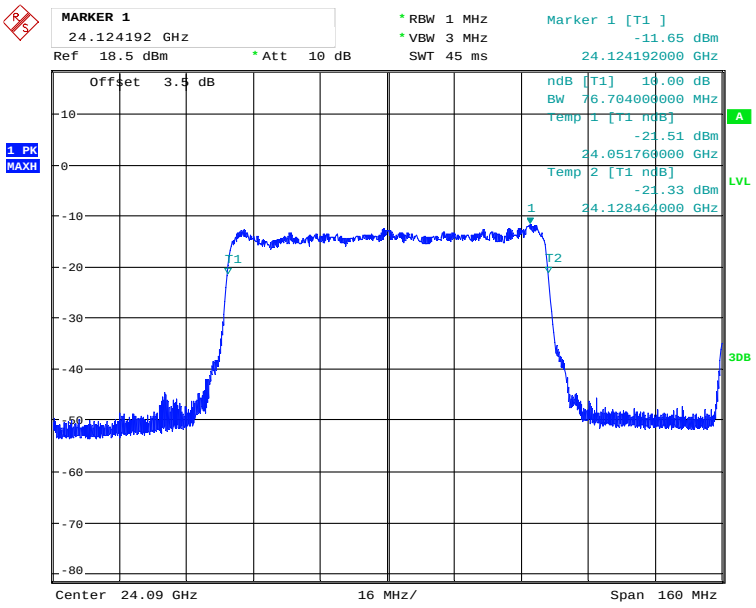
802.11ac80 mode Tx3 Nominal Voltage

Low Channel 24090 MHz



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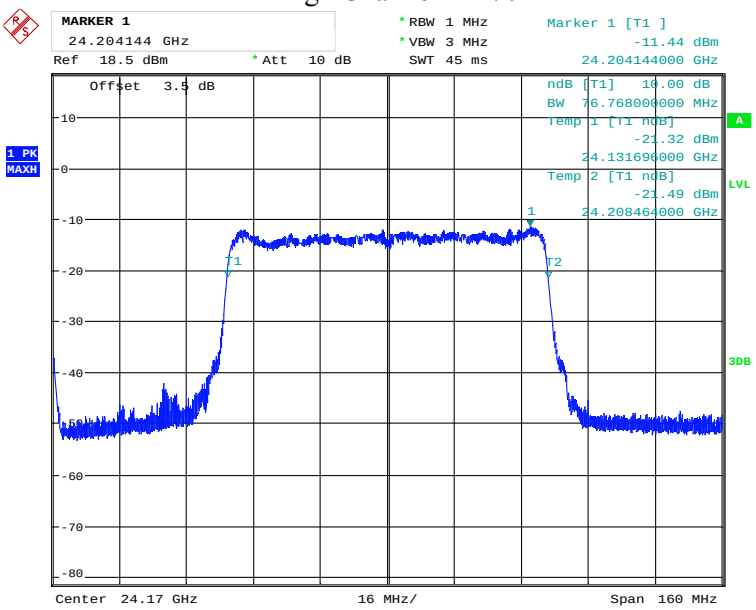

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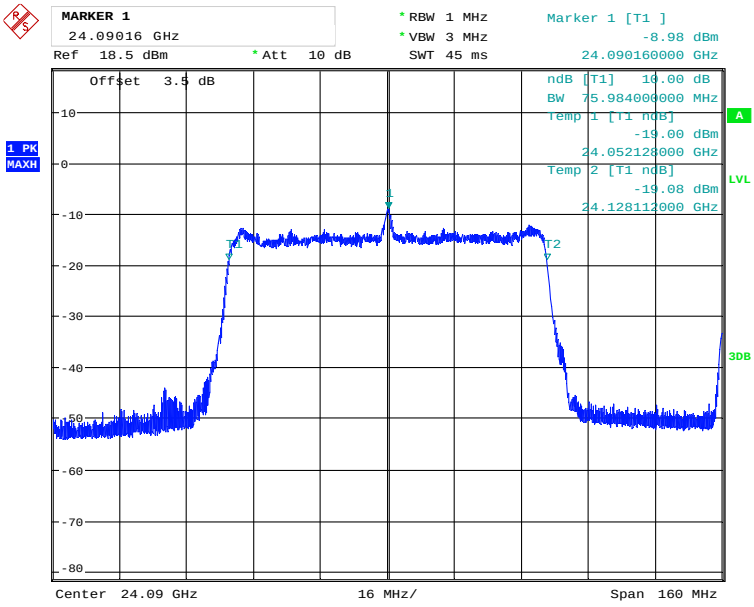
802.11ac80 mode Tx4 Nominal Voltage

Low Channel 24090 MHz



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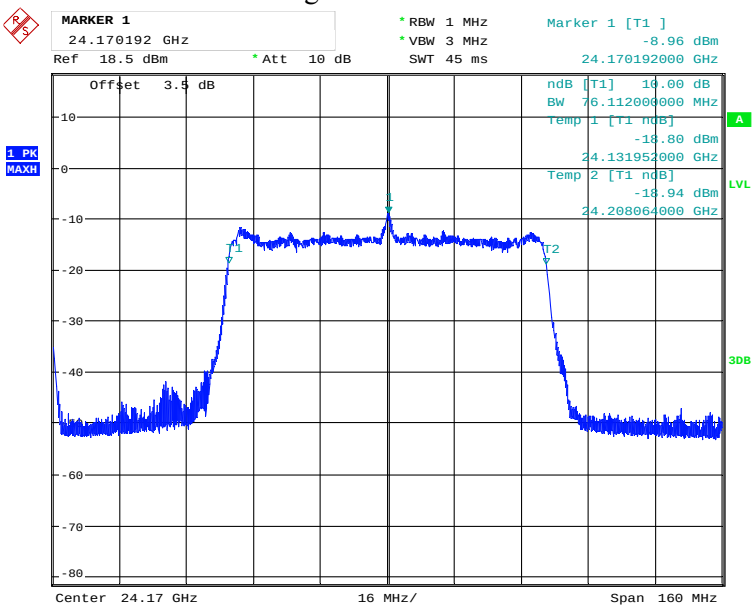

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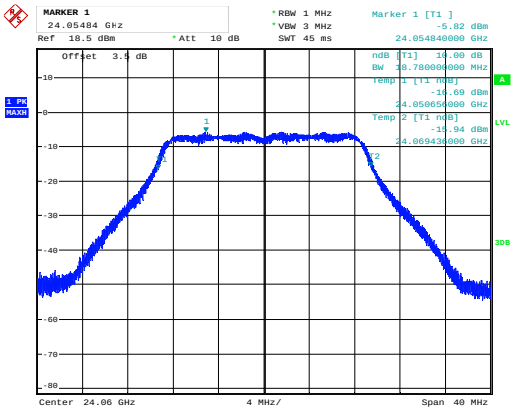
50 ºC

802.11ac20 mode Tx1 Nominal Voltage

Low Channel 24060 MHz



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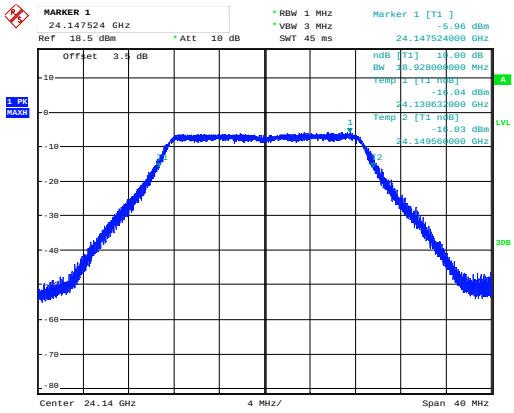
Middle Channel 24140 MHz



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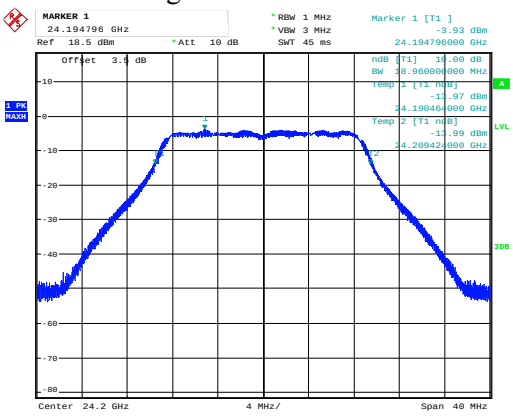
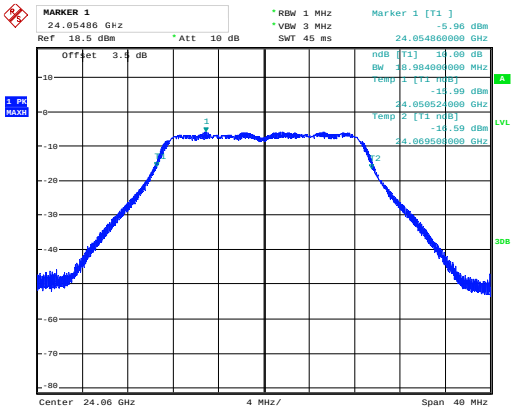
High Channel 24200 MHz



Date: 8.MAR.2018 10:26:16

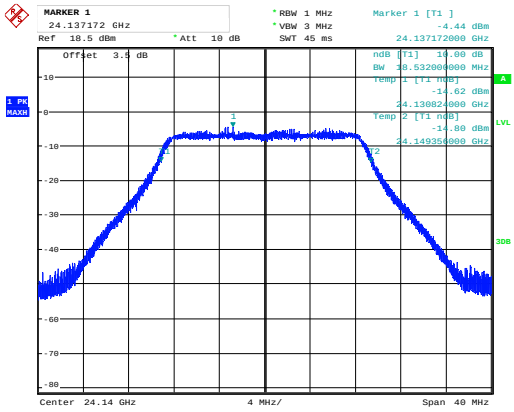
802.11ac20 mode Tx2 Nominal Voltage

Low Channel 24060 MHz



Date: 8.MAR.2018 10:27:44

Middle Channel 24140 MHz



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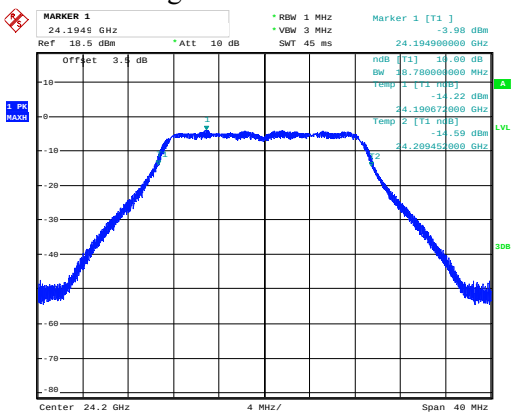

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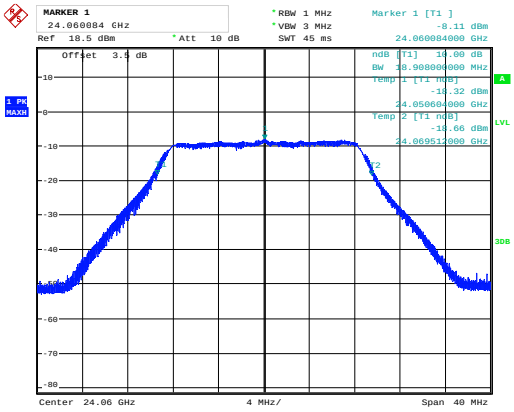
802.11ac20 mode Tx3 Nominal Voltage

Low Channel 24060 MHz



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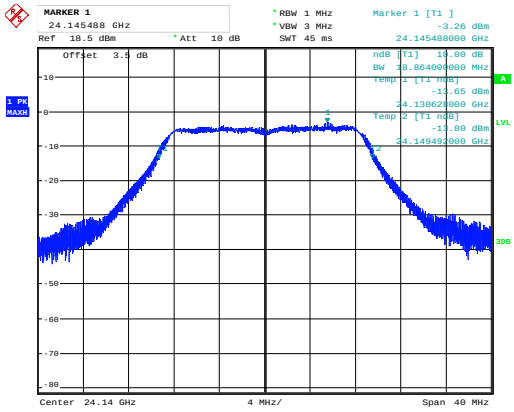

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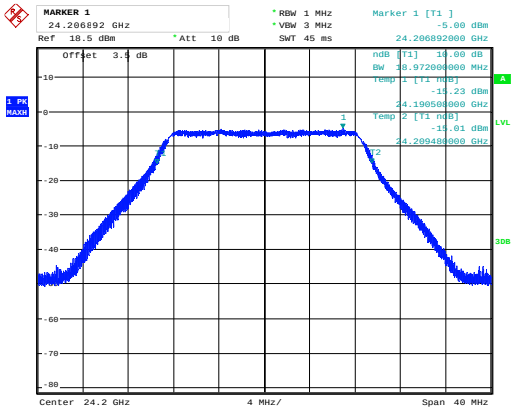
High Channel 24200 MHz



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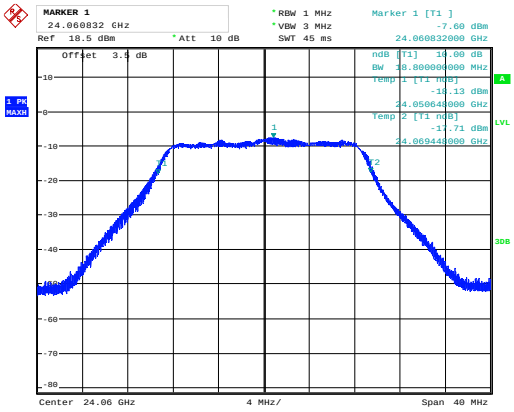
802.11ac20 mode Tx4 Nominal Voltage

Low Channel 24060 MHz



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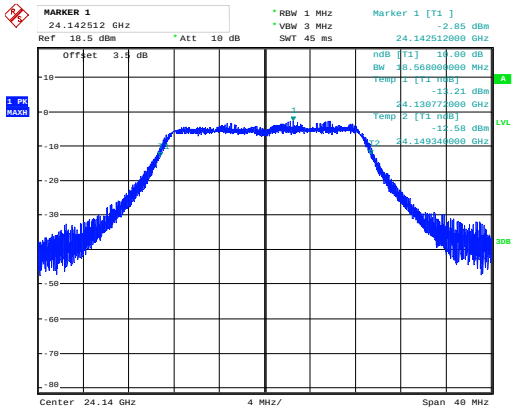
Middle Channel 24140 MHz



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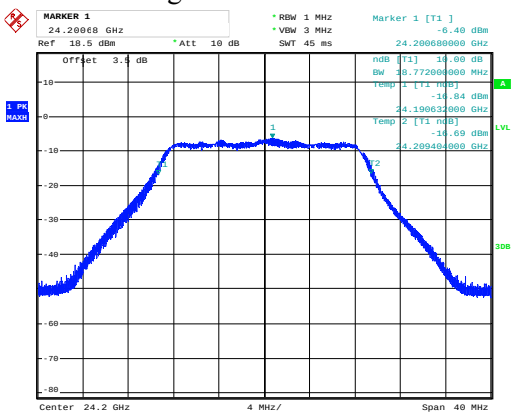

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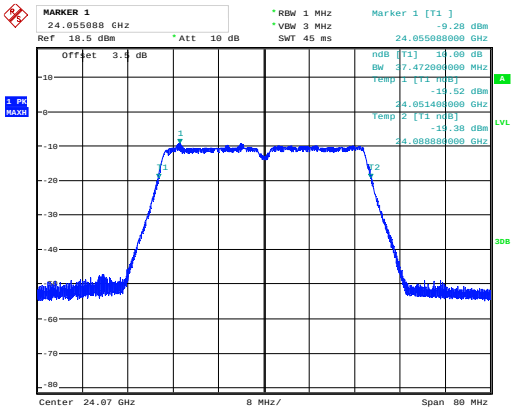
802.11ac40 mode Tx1 Nominal Voltage

Low Channel 24070 MHz



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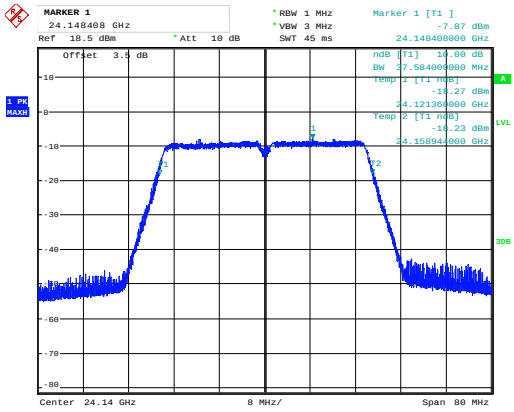

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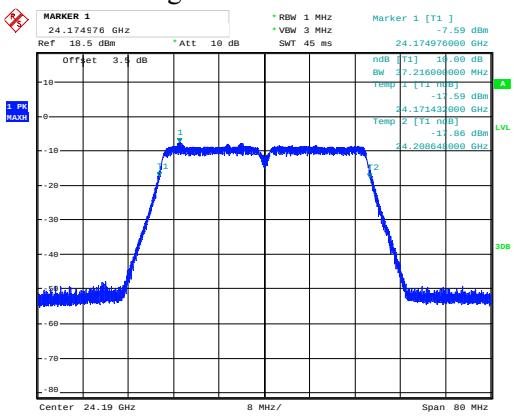
High Channel 24190 MHz



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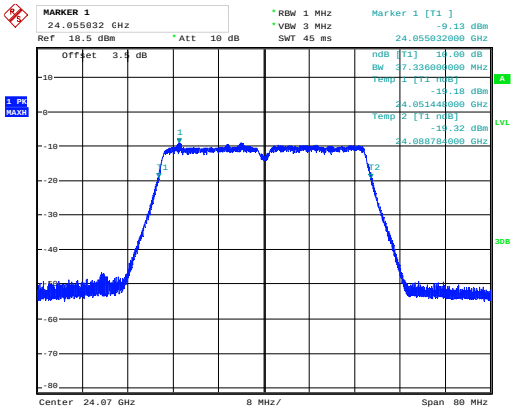
802.11ac40 mode Tx2 Nominal Voltage

Low Channel 24070 MHz



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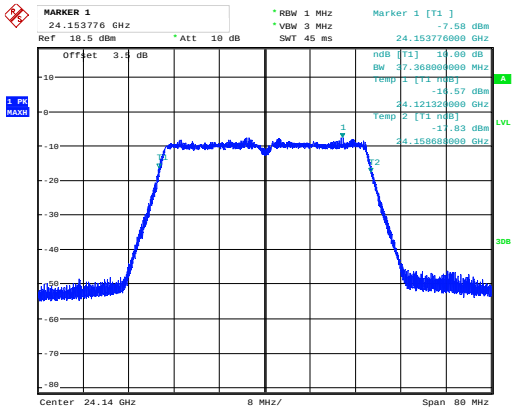

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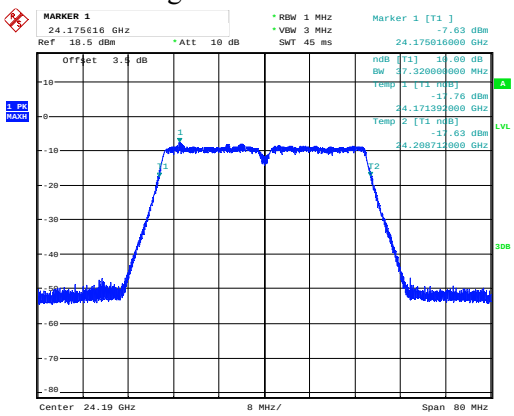
High Channel 24190 MHz



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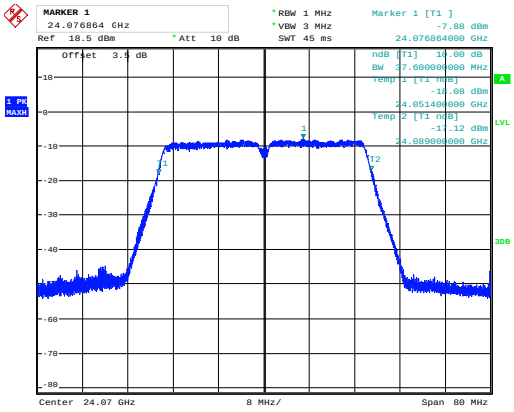
802.11ac40 mode Tx3 Nominal Voltage

Low Channel 24070 MHz



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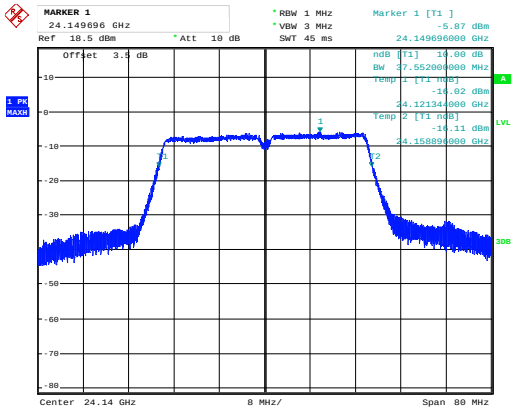

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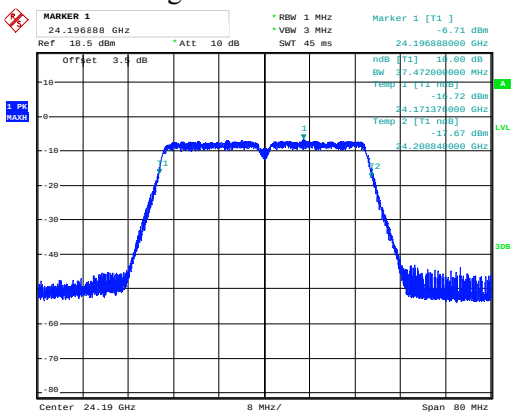
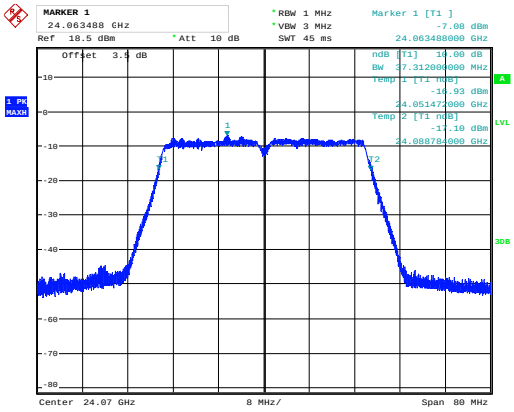


Date: 8.MAR.2018 10:47:44

802.11ac40 mode Tx4 Nominal Voltage

Low Channel 24070 MHz



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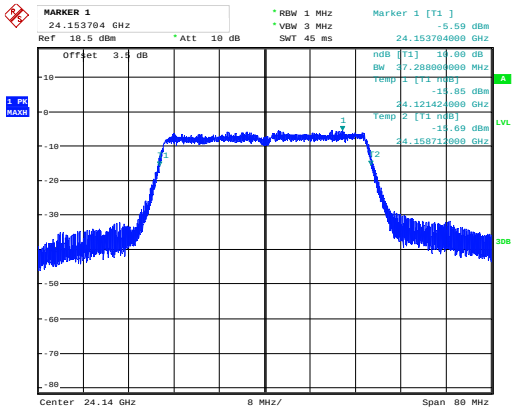

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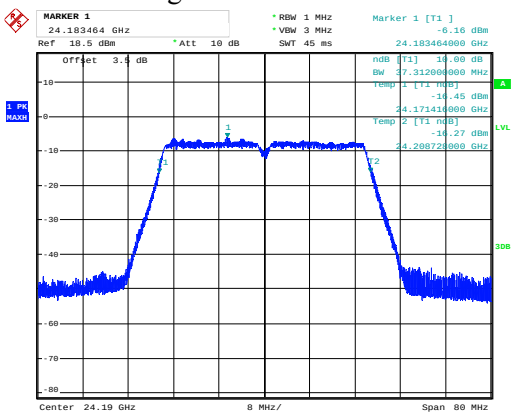

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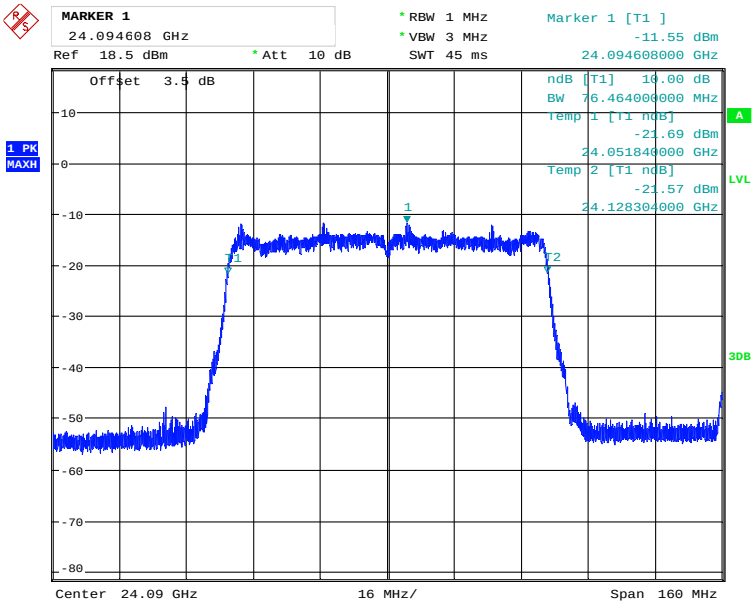
802.11ac80 mode Tx1 Nominal Voltage

Low Channel 24090 MHz



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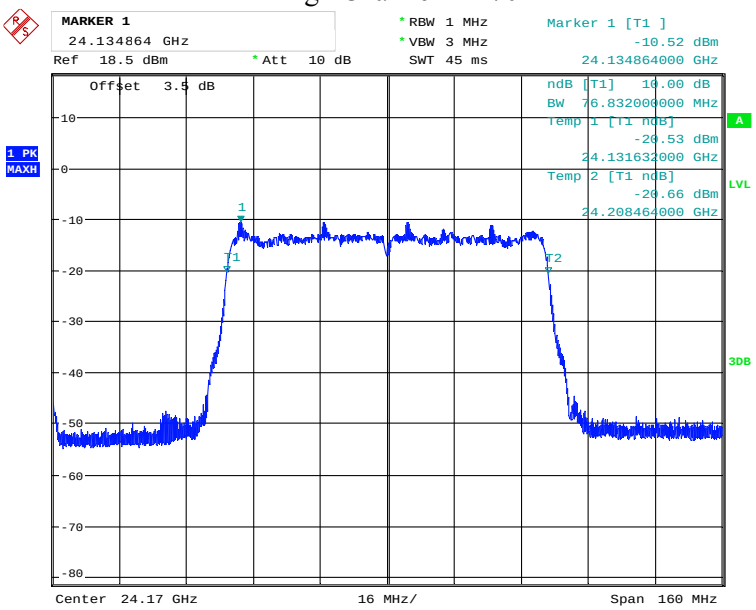
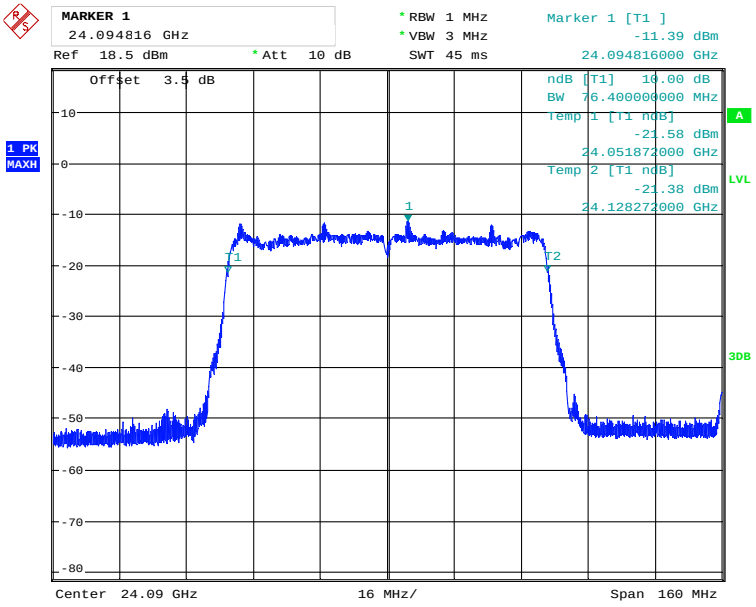
High Channel 24170 MHz



Date: 8.MAR.2018 10:32:59

802.11ac80 mode Tx2 Nominal Voltage

Low Channel 24090 MHz



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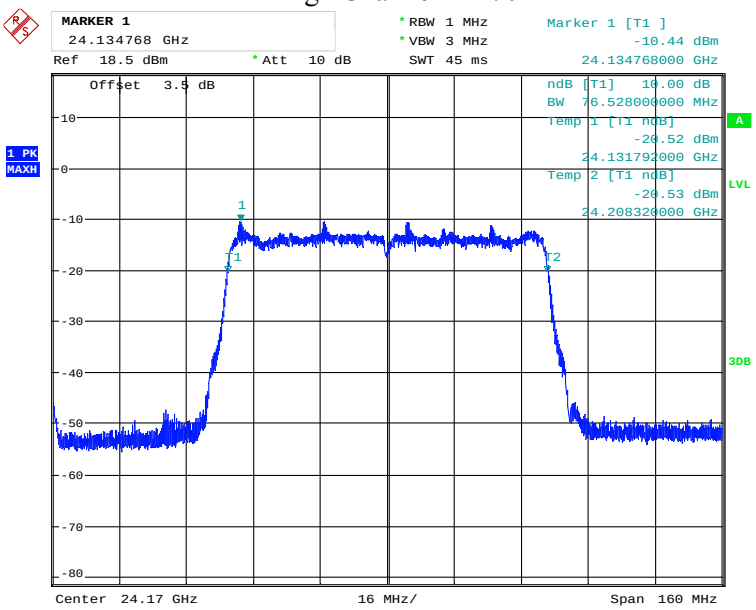
High Channel 24170 MHz



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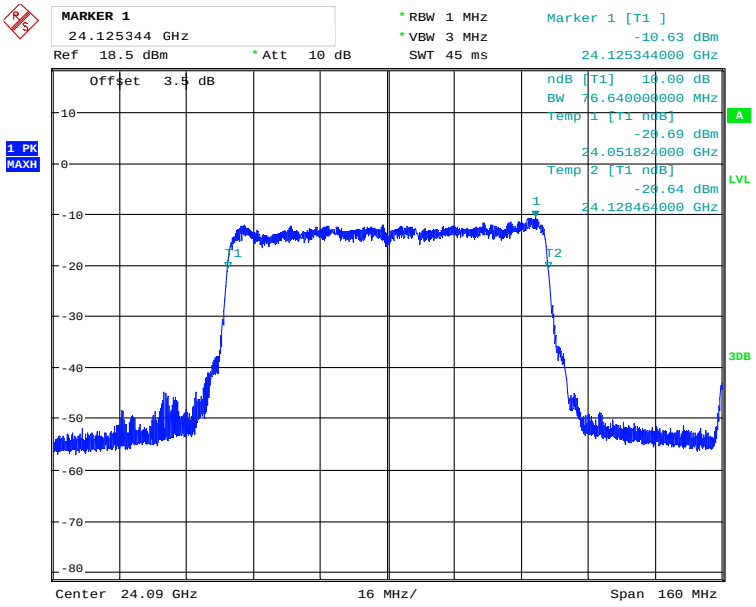
802.11ac80 mode Tx3 Nominal Voltage

Low Channel 24090 MHz



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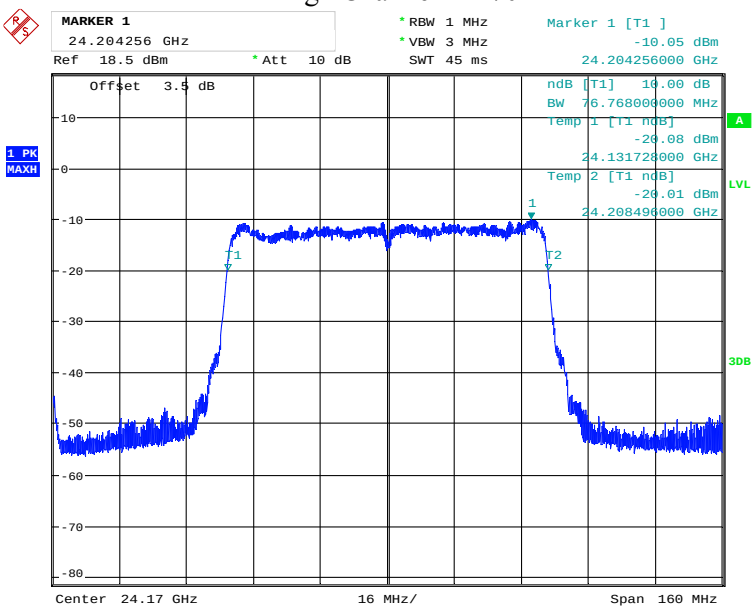

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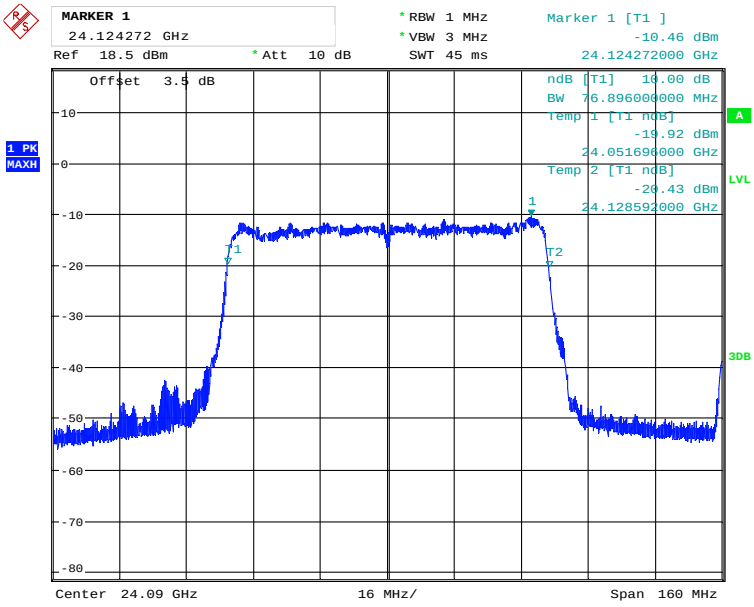
802.11ac80 mode Tx4 Nominal Voltage

Low Channel 24090 MHz



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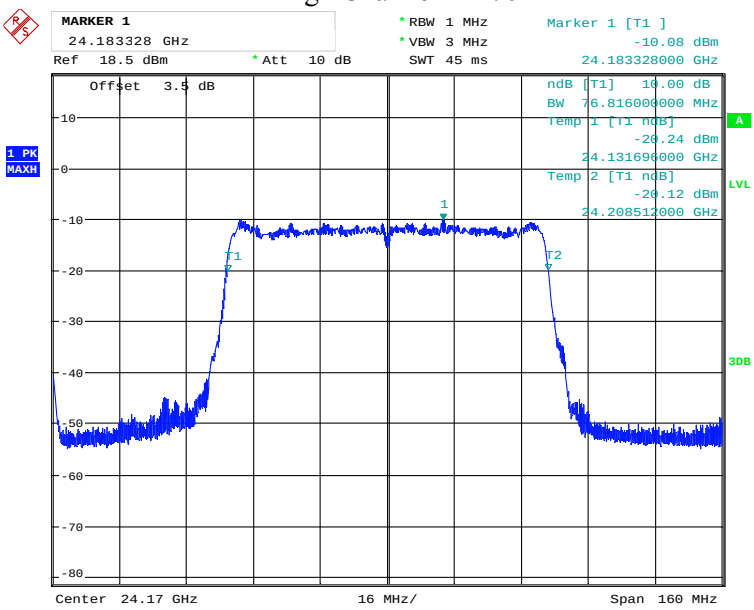


Date: 8.MAR.2018 10:42:40

10 Exhibit A – FCC & ISED Equipment Labeling Requirements

10.1 FCC ID Label Requirements

As per FCC §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

As per FCC §15.19,

(a) In addition to the requirements in part 2 of this chapter, a device subject to certification, or verification shall be labeled as follows:

(3) All other devices shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified above is required to be affixed only to the main control unit. If the EUT is integrated within another device then a label affixed to the host shall also state, "Contains FCC ID: XXXXXX"

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

10.2 IC Label Requirements

As per IC RSP-100 Section 3.1, the certification number shall appear as follows:

IC: XXXXXX-YYYYYYYY

Where:

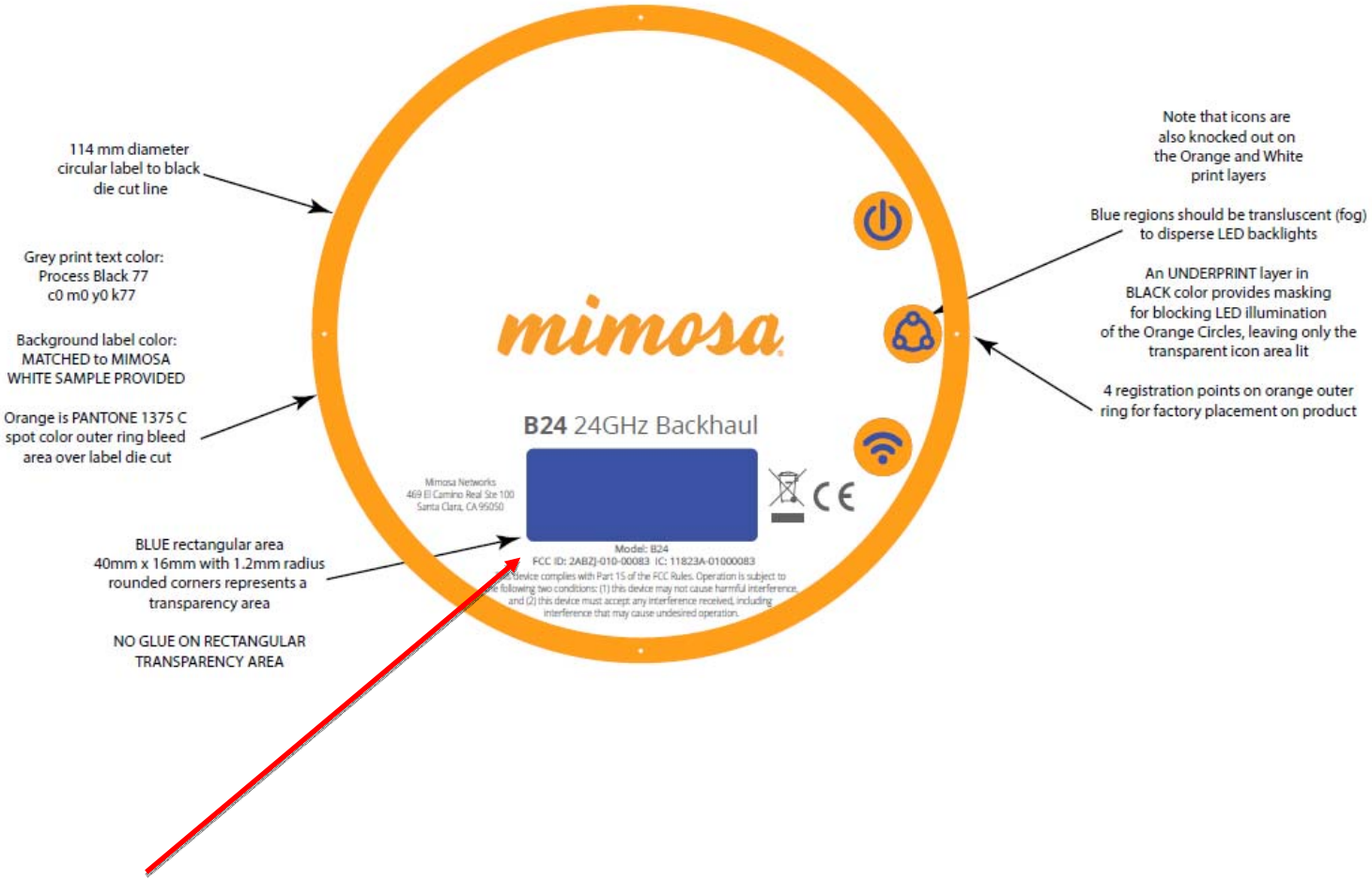
- The letters "IC:" indicate that this is an Innovation, Science and Economic Development Canada's certification number, but they are not part of the certification number. XXXXXXYYYYYYYYYY is the ISED certification number.
- XXXXXX is the CN assigned by Innovation, Science and Economic Development Canada. Newly assigned CNs will be made up of five numeric characters (e.g. "20001") whereas existing CNs may consist of up to five numeric characters followed by an alphabetic character (e.g. "21A" or "15589J").
- YYYYYYYYYY is the Unique Product Number (UPN) assigned by the applicant, made up of a maximum of 11 alphanumeric characters.
- The CN and UPN are limited to capital alphabetic characters (A-Z) and numerals (0-9) only. The use of punctuation marks or other symbols, including "wildcard" characters, is not permitted.

- The HVIN may contain punctuation marks or symbols but they shall not represent any indeterminate ("wildcard") characters.

As per RSS-Gen §2.1 Equipment Labeling:

The application for equipment certification shall be submitted in accordance with Industry Canada's Radio Standards Procedure RSP-100, Radio Equipment Certification Procedure which sets out the requirements for certification and labelling of radio apparatus. RSP-100 shall be used in conjunction with RSS-Gen and other Radio Standards Specifications (RSSs) specifically applicable to the type of radio apparatus for which certification is sought.

10.3 FCC & IC ID Label Contents and Location



11 Appendix

Please see attachments:

Exhibit B – EUT Test Setup Photographs
Exhibit C – EUT External Photographs
Exhibit D – EUT Internal Photographs

12 Annex A (Informative) - 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 the requirements of 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 8 January 2009*).

Presented this 30th day of August 2016.

Senior Director of Quality & Communications
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2018

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

--- END OF REPORT ---