FCC PART 15.407
TEST AND MEASUREMENT REPORT

For

Cisco Systems, Inc.

170 West Tasman Drive,

San Jose, CA 95134, USA

FCC ID: LDKIR829GW-LTE

Report Type:	**Product Type:**
Original Report	Smart Grid Router

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1506011-407	Initial	2015-08-19

1 General Description

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report has been compiled on behalf of *Cisco Systems, Inc.* and their product, *FCC ID: LDKIR829GW-LTE*, model number: *IR829GW-LTE*, which henceforth is referred to as the EUT (Equipment Under Test.) The EUT is a Smart Grid Router.

1.2 Mechanical Description of EUT

The EUT measures approximately 1.73 (H) x 11(W) x 7.7(D) in. (43.9 x 279 x 196 mm) and 1.73 (H) x 11(W) x 10.55(D) in (43.9 x 279 x 268 mm) with IP54 cable guard and weighs approximately 2 kg.

The data gathered are from a typical production sample provided by the manufacturer with serial number: R1506011-01, assigned by BACL.

1.3 Objective

This report is prepared on behalf of *Cisco Systems, Inc.* in accordance with FCC CFR47 §15.407.

The objective is to determine compliance with FCC Part 15.407 for Output Power, Antenna Requirements, AC Line Conducted Emissions, Bandwidth, and power spectral density, Band Edges Measurement, Spurious Emissions, Conducted and Radiated Spurious Emissions.

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.6 Measurement Uncertainty

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

Based on CISPR16-4-2:2011, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$2.0 dB for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

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

1.7 Test Facility

Bay area compliance Laboratories Corp. (BACL) is:
1- An independent Commercial Test Laboratory accredited to **ISO 17025: 2005** by **A2LA**, in the fields of: Electromagnetic Compatibility & Telecommunications covering Emissions, Immunity, Radio, RF Exposure, Safety and Telecom. This includes NEBS (Network Equipment Building System), Wireless RF, Telecommunications Terminal Equipment (TTE); Network Equipment; Information Technology Equipment (ITE); Medical Electrical Equipment; Industrial, Commercial, and Medical Test Equipment; Professional Audio and Video Equipment; Electronic (Digital) Products; Industrial and Scientific Instruments; Cabled Distribution Systems and Energy Efficiency Lighting.

2- An ENERGY STAR Recognized Laboratory, for the LM80 Testing, a wide variety of Luminares and Computers.

3- A NIST Designated Phase-I and Phase-II CAB including: ACMA (Australian Communication and Media Authority), BSMI (Bureau of Standards, Metrology and Inspection of Taiwan), IDA (Infocomm Development Authority of Singapore), IC(Industry Canada), Korea (Ministry of Communications Radio Research Laboratory), NCC (Formerly DGT; Directorate General of Telecommunication of Chinese Taipei) OFTA (Office of the Telecommunications Authority of Hong Kong), Vietnam, VCCI - Voluntary Control Council for Interference of Japan and a designated EU CAB (Conformity Assessment Body) (Notified Body) for the EMC and R&TTE Directives.

4- A Product Certification Body accredited to **ISO Guide 65: 1996** by **A2LA** to certify:
.
2. Radio Standards Specifications (RSS) in the Category I Equipment Standards List and All Broadcasting Technical Standards (BETS) in Category I Equipment Standards List for Industry Canada.
3. Radio Communication Equipment for Singapore.
4. Radio Equipment Specifications, GMDSS Marine Radio Equipment Specifications, and Fixed Network Equipment Specifications for Hong Kong.
5. Japan MIC Telecommunication Business Law (A1, A2) and Radio Law (B1, B2 and B3).
6. Audio/Video, Battery Charging Systems, Computers, Displays, Enterprise Servers, Imaging Equipment, Set-Top Boxes, Telephony, Televisions, Ceiling Fans, CFLs (Including GU24s),Decorative Light Strings, Integral LED Lamps, Luminaires, Residential Ventilating Fans.

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

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2014, ANSI C63.4-2014, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: A-0027. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is an American Association for Laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b

2 EUT Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2014 and KDB-789033 D02 General UNII Test Procedures New Rules v01

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 the average power, peak power and PPSD across all data rates bandwidths, and modulations.

2.2 EUT Exercise Software

The test software used was Putty, used to access IOS and perform commands to control the radio.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Local Support Equipment

Manufacturer	Description	Model No.	Serial No.
DELL	Laptop	Latitude E6530	-

2.5 EUT Internal Configuration Details

Manufacturer	Description	Model
Cisco Systems	Main board	1298MR
Cisco Systems	PCB board	28-12083-01
Cisco Systems	PCB board	95.0948T00 REV.215
Qualcomm	Sierra Wireless AirPrime 4G chip	MC7350
Qualcomm	5G module	AR9590
Qualcomm	2.4G Module	QCA9550

2.6 Power Supply and Line Filter

Manufacturer	Description	Model	Serial Number
Power Systems Technologies Limited	Power adapter	FA060LS1-01	PST1903F56A

2.7 Interface Ports and Cabling

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

3 Summary of Test Results

Results reported relate only to the product tested.

FCC Rules	Description of Test	Result
§15.407(f), §2.1091	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207	AC Power Line Conducted Emissions	Compliant
§15.209(a), 15.407(b)	Spurious Radiated Emissions	Compliant
§15.407(a)	Emission Bandwidth	Compliant
§15.407(a)	Peak Output Power Measurement	Compliant
§15.407(a)	Power Spectral Density	Compliant
§2.1051, §15.407(b)	Spurious Emissions at Antenna Terminals	Compliant
§15.407(h)	Dynamic Frequency Selection (DFS)	N/A*

4 FCC §2.1091 & §15.407(f) - RF Exposure

4.1 Applicable Standard

According to FCC §15.407(f) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

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

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

4.2 MPE Prediction

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

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

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

4.3 MPE Results

5 GHz Band:

Antenna gain = 4 dBi

Maximum peak output power at antenna input terminal (dBm):	22.52
Maximum peak output power at antenna input terminal (mW):	178.649
Prediction distance (cm):	20
Prediction frequency (MHz):	5240
Maximum Antenna Gain, typical (dBi):	4
Maximum Antenna Gain (numeric):	2.512
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.089
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 0.089 mW/cm^2. Limit is 1.0 mW/cm^2.

Antenna gain = 7 dBi

Maximum peak output power at antenna input terminal (dBm):	18.16
Maximum peak output power at antenna input terminal (mW):	65.464
Prediction distance (cm):	20
Prediction frequency (MHz):	5240
Maximum Antenna Gain, typical (dBi):	7
Maximum Antenna Gain (numeric):	5.012
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.065
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 0.065 mW/cm^2. Limit is 1.0 mW/cm^2.

Antenna gain = 14 dBi

Maximum peak output power at antenna input terminal (dBm):	12.71
Maximum peak output power at antenna input terminal (mW):	18.664
Prediction distance (cm):	20
Prediction frequency (MHz):	5200
Maximum Antenna Gain, typical (dBi):	14
Maximum Antenna Gain (numeric):	25.119
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.093
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 0.093 mW/cm^2. Limit is 1.0 mW/cm^2.

5.8 GHz Band:

Antenna gain = 4dBi

Maximum peak output power at antenna input terminal (dBm):	25.75
Maximum peak output power at antenna input terminal (mW):	375.837
Prediction distance (cm):	20
Prediction frequency (MHz):	5785
Maximum Antenna Gain, typical (dBi):	4
Maximum Antenna Gain (numeric):	2.512
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.188
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 0.188 mW/cm^2. Limit is 1.0 mW/cm^2.

Antenna gain = 7 dBi

Maximum peak output power at antenna input terminal (dBm):	25.15
Maximum peak output power at antenna input terminal (mW):	327.341
Prediction distance (cm):	20
Prediction frequency (MHz):	5785
Maximum Antenna Gain, typical (dBi):	7
Maximum Antenna Gain (numeric):	5.012
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.326
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 0.326 mW/cm^2. Limit is 1.0 mW/cm^2.

Antenna gain = 14 dBi

Maximum peak output power at antenna input terminal (dBm):	15.21
Maximum peak output power at antenna input terminal (mW):	33.189
Prediction distance (cm):	20
Prediction frequency (MHz):	5795
Maximum Antenna Gain, typical (dBi):	14
Maximum Antenna Gain (numeric):	25.119
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.166
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 0.166 mW/cm^2. Limit is 1.0 mW/cm^2.

Co-location:

2.4 GHz and 5 GHz bands can transmit simultaneously. A certified 2G/3G/4G module (FCC ID: N7NMC7355, IC: 2417C-MC7355) was built in the host. Per FCC KDB 447498, when RF sources have difference frequencies, the fraction of the FCC power density limit shall be determined and the sum of all fractional components shall be less than 1.

WLAN Co-location

Frequency Band	Evaluated Distance (cm)	Worst-Case MPE (mW/cm^2)	MPE Limit (mW/cm^2)	Worst-Case MPE Ratios	Sum of MPE Ratios	Limit
2.4 GHz	20	0.246	1.0	24.6 %	57.2 %	100 %
5 GHz	20	0.572	1.0	32.6 %		

2.4 GHz WLAN + 5 GHz WLAN + 850 MHz Co-Location

Frequency Band	Evaluated Distance (cm)	Worst-Case MPE (mW/cm^2)	MPE Limit (mW/cm^2)	Worst-Case MPE Ratios	Sum of MPE Ratios	Limit
2.4 GHz	20	0.246	1.0	24.6 %	93.3 %	100 %
5 GHz	20	0.572	1.0	32.6 %		
850 MHz	20	0.198	0.549	36.1 %		

2.4 GHz WLAN + 5 GHz WLAN + 1900 MHz Co-Location

Frequency Band	Evaluated Distance (cm)	Worst-Case MPE (mW/cm^2)	MPE Limit (mW/cm^2)	Worst-Case MPE Ratios	Sum of MPE Ratios	Limit
2.4 GHz	20	0.246	1.0	24.6 %	69.8 %	100 %
5 GHz	20	0.572	1.0	32.6 %		
1900 MHz	20	0.126	1.0	12.6 %		

2.4 GHz WLAN + 5 GHz WLAN + 700 MHz Co-Location

Frequency Band	Evaluated Distance (cm)	Worst-Case MPE (mW/cm^2)	MPE Limit (mW/cm^2)	Worst-Case MPE Ratios	Sum of MPE Ratios	Limit
2.4 GHz	20	0.246	1.0	24.6 %	99.6 %	100 %
5 GHz	20	0.572	1.0	32.6 %		
700 MHz	20	0.199	0.469	42.4 %		

2.4 GHz WLAN + 5 GHz WLAN + 1700 MHz Co-Location

Frequency Band	Evaluated Distance (cm)	Worst-Case MPE (mW/cm^2)	MPE Limit (mW/cm^2)	Worst-Case MPE Ratios	Sum of MPE Ratios	Limit
2.4 GHz	20	0.246	1.0	24.6 %	77.1 %	100 %
5 GHz	20	0.572	1.0	32.6 %		
1700 MHz	20	0.199	1.0	19.9 %		

Conclusion: Simultaneous transmission MPE test exclusion applied to this device due to the sum of MPE ratios for all simultaneous transmitting antennas incorporated in the host is less than 1.0.

5 FCC §15.203 – Antenna Requirements

5.1 Applicable Standard

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

5.2 Antenna List and Details

Antenna Type	Antenna Gain (dBi) @ 5 GHz
Omnidirectional	3
Dipole	3.5
Dual-band dipole	4
Omnidirectional TM02 Mode patch	4.5
Omnidirectional collinear array	6
Omnidirectional collinear array	7
Diversity patch	7
Two element patch array	14

Note: 1) For the Antenna directional gain greater than 6 dBi, the limit for output and power density will be reduced by certain amount.
2) The manufacturer will use three output power settings to control this unit, the table shows below.

Antenna Type	Antenna Gain (dBi)	Software Power Setting
Omnidirectional	3	4
Dipole	3.5	4
Dual-band dipole	4	4
Omnidirectional TM02 Mode patch	4.5	7
Omnidirectional collinear array	6	7
Omnidirectional collinear array	7	7
Diversity patch	7	7
Two element patch array	14	14

6 FCC §15.207 - AC Power Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 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 Note 1	56 to 46 Note 1
0.5-5	56	46
5-30	60	50

Note 1 Decreases with the logarithm of the frequency.

6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.4-2014 measurement procedure. The specification used was FCC §15.207 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.

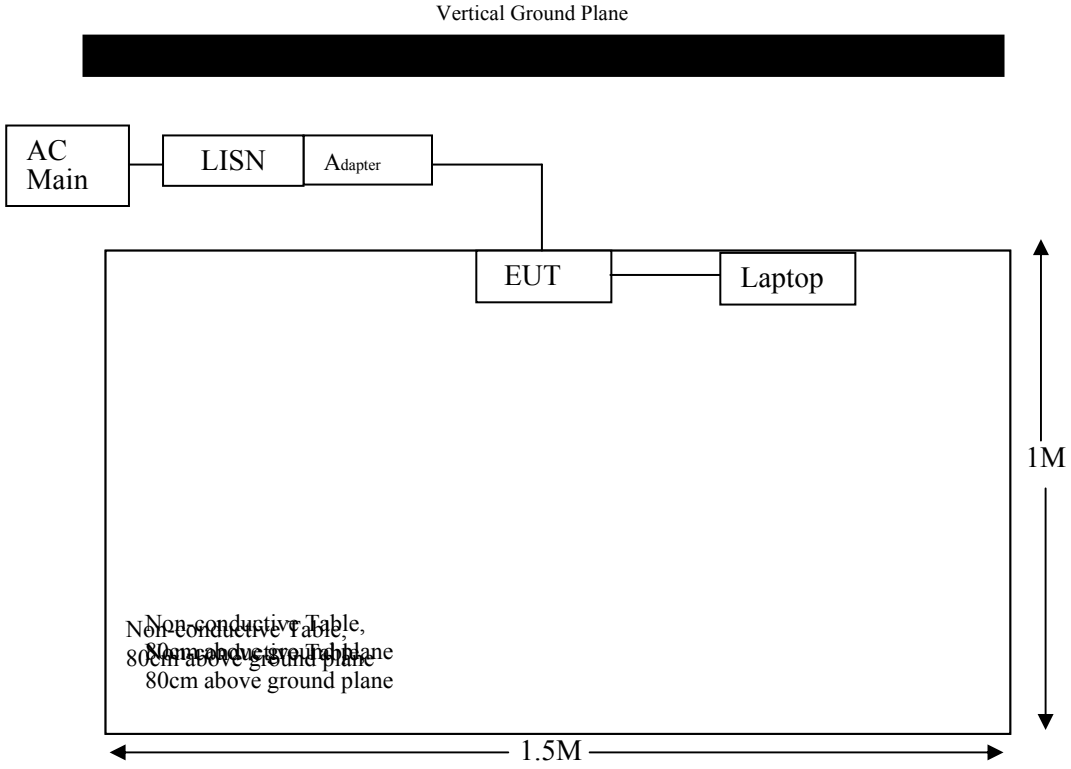
6.3 Test Procedure

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 cord of the support equipment was connected to LISN-2.

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

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

6.4 Test Setup Block Diagram



6.5 Corrected Amplitude & Margin Calculation

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

CA = Ai + CL + Atten

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

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

Margin = Corrected Amplitude - Limit

6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2014-09-28	1 year
Solar Electronics	LISN	9252-50-R-24-N	511205	2014-06-25	1 year
TTE	Filter, High Pass	H962-150k-50-21378	K7133	2015-01-30	1 year
Suirong	30 ft conductive emission cable	LMR 400	-	Cal. Not Required	N/A
Hewlett-Packard	5 ft N-type RF cable	-	1268	Cal. Not Required	N/A

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

6.7 Test Environmental Conditions

Temperature:	23º C
Relative Humidity:	46 %
ATM Pressure:	105.24 kPa

The testing was performed by Jimmy Xiao on 2015-06-18 in 5m chamber3.

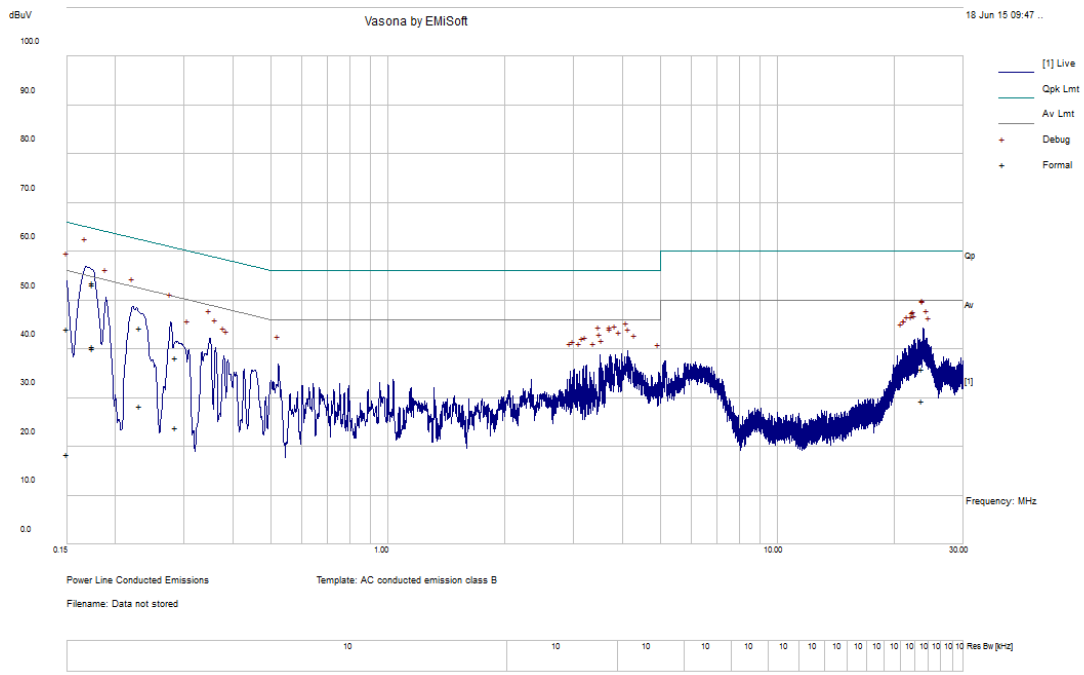
6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC 15.207 standard's conducted emissions limits, with the margin reading of:

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-10.96	0.174459	Line	0.15-30

6.9 Conducted Emissions Test Plots and Data

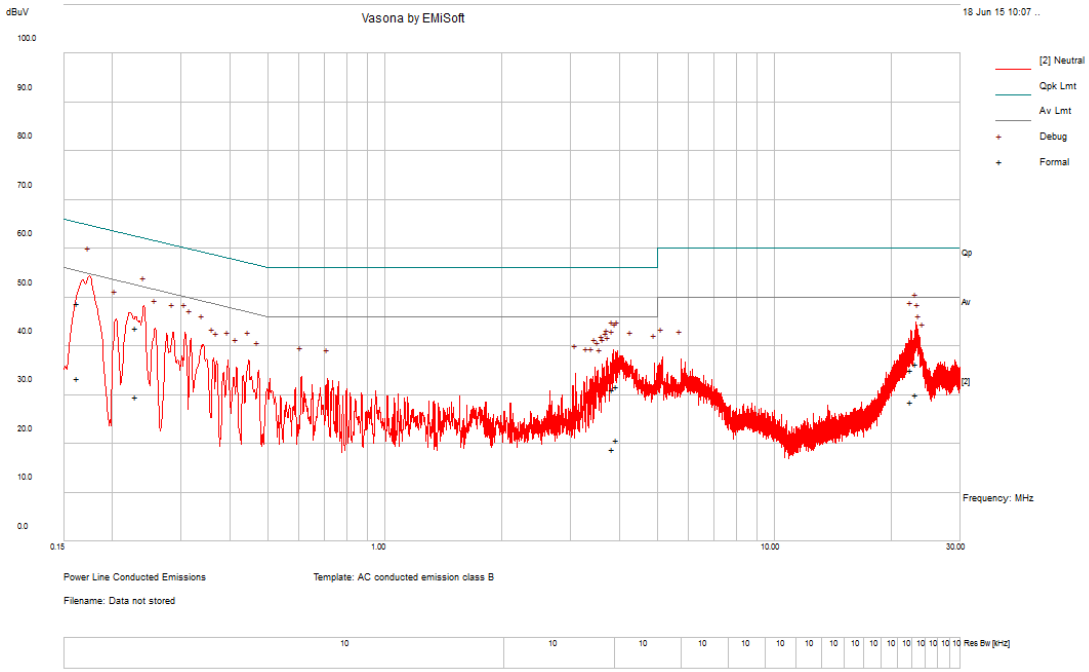
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.174459	53.79	Line	64.75	-10.96	QP
0.150112	44.18	Line	65.99	-21.81	QP
0.174588	53.27	Line	64.74	-11.47	QP
0.231600	44.51	Line	62.39	-17.88	QP
0.285222	38.41	Line	60.66	-22.25	QP
23.60152	35.93	Line	60.00	-24.07	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.174459	40.61	Line	54.75	-14.14	Ave.
0.150112	18.63	Line	55.99	-37.36	Ave.
0.174588	40.20	Line	54.74	-14.54	Ave.
0.231600	28.38	Line	52.39	-24.01	Ave.
0.285222	23.96	Line	50.66	-26.70	Ave.
23.60152	29.38	Line	50.00	-20.62	Ave.

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.163098	48.94	Neutral	65.3	-16.37	QP
0.229269	43.72	Neutral	62.48	-18.75	QP
23.05518	36.42	Neutral	60	-23.58	QP
22.36209	35.08	Neutral	60	-24.92	QP
3.847561	31.27	Neutral	56	-24.73	QP
3.942338	31.82	Neutral	56	-24.18	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.163098	33.42	Neutral	55.3	-21.88	Ave.
0.229269	29.76	Neutral	52.48	-22.71	Ave.
23.05518	30.17	Neutral	50	-19.83	Ave.
22.36209	28.59	Neutral	50	-21.41	Ave.
3.847561	19.01	Neutral	46	-26.99	Ave.
3.942338	20.84	Neutral	46	-25.16	Ave.

7 FCC §15.209 & §15.407(b) - Spurious Radiated Emissions

7.1 Applicable Standard

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

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 Note 1	3
88 - 216	150 Note 1	3
216 - 960	200 Note 1	3
Above 960	500	3

Note 1: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	960 – 1240	4. 5 – 5. 15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5. 35 – 5. 46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 –167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3 3458 – 3 358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC Part 15.407 (b)

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

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

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

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

7.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.4-2014. The specification used was the FCC 15E limits.

The spacing between the peripherals was 10 centimeters.

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

7.3 Test Procedure

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

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

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

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

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

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

7.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to 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 for Class A. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Limit

7.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2014-09-28	1 year
Agilent	Spectrum Analyzer	E4440A	MY44303352	2014-10-16	1 year
Sunol Science Corp	System Controller	SC99V	011003-1	N/R	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-3	2014-09-18	1 year
EMCO	Horn Antenna	3115	9511-4627	2014-10-17	1 year
Hewlett Packard	Pre-amplifier	8447D	2944A10187	2014-08-08	1 year
WiseWave	Horn Antenna	ARH-4223-02	10555-01	2014-08-09	3 Years
Suirong	30 ft conductive emission cable	LMR 400	-	2015-03-05	1 year
-	SMA cable	-	C0002	Each time[1]	N/A
IW Microwave	High Frequency Cable	DC-1438	SPS-2303-3840-SPS	2014-09-23	1 year
Suirong	30 ft conductive emission cable	LMR 400	-	2015-03-05	1 year
Hewlett-Packard	5 ft N-type RF cable	-	1268	2014-07-24	1 year
Agilent	Pre-Amplifier	8449B	3008A01978	2015-03-11	1year

***Statement of Traceability: BACL** attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.*

7.6 Test Environmental Conditions

Temperature:	25 ºC
Relative Humidity:	42 %
ATM Pressure:	104.7 kPa

The testing was performed by Jimmy Xiao on 2015-06-18 in 5m chamber3.

7.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15.205, 15.209 and 15.407 standard's radiated emissions limits, and had the worst margin of:

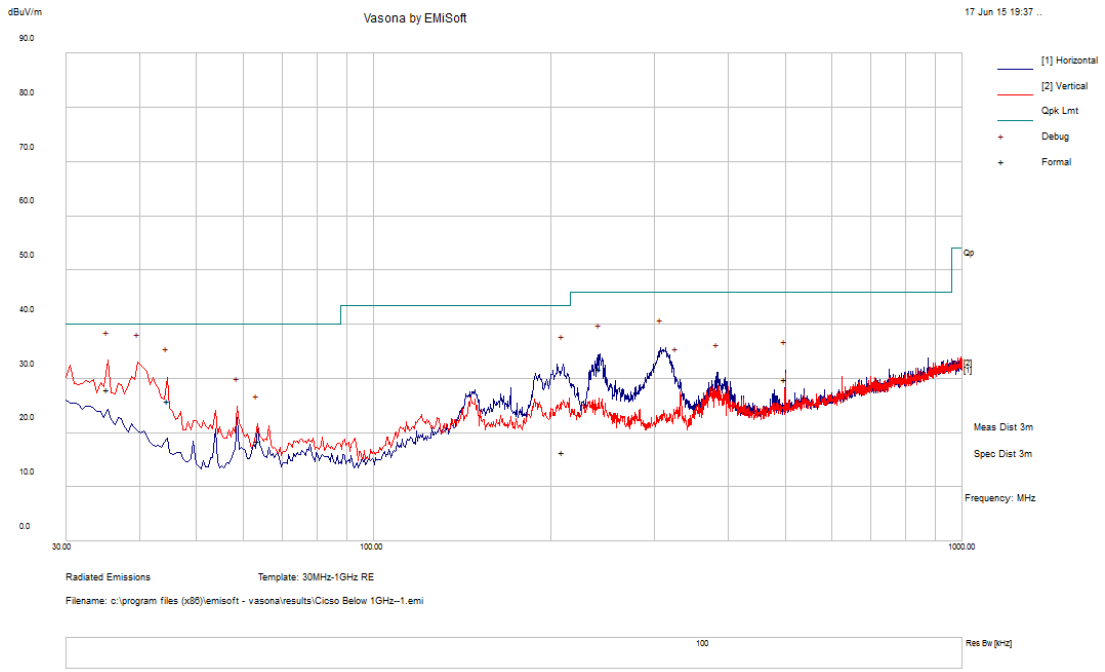
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range**
-4.32	17355	Vertical	1 GHz to 40 GHz,

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

7.8 Radiated Emissions Test Result Data

1) 30 MHz – 1 GHz

Worst Case: 2.4 GHz, 5 GHz and LTE transmitting simultaneously



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments
35.255	28.14	135	V	360	40	-11.86	QP
44.6715	25.99	101	V	342	40	-14.01	QP
209.602	16.46	129	H	223	43.5	-27.04	QP
241.718	31.89	121	H	18	46	-14.11	QP
500.0335	29.87	165	V	209	46	-16.13	QP
63.4985	18.59	158	H	125	40	-21.41	QP

2) 1–40 GHz

Antenna-port conducted measurement is used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. And the radiated emission was measured with cabinet method.

5.2 GHz Band

802.11a mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
10360	43.58	0	150	V	37.65	6.14	36.3	51.07	74	-22.93	Peak
10360	43.96	0	150	H	37.65	6.14	36.3	51.45	74	-22.55	Peak
10360	31.69	0	150	V	37.65	6.14	36.3	39.18	54	-14.82	Ave
10360	31.72	0	150	H	37.65	6.14	36.3	39.21	54	-14.79	Ave
15540	43.89	0	150	V	34.57	7.47	34.0	51.93	74	-22.07	Peak
15540	44.34	0	150	H	34.57	7.47	34.0	52.38	74	-21.62	Peak
15540	32.11	0	150	V	34.57	7.47	34.0	40.15	54	-13.85	Ave
15540	32.05	0	150	H	34.57	7.47	34.0	40.09	54	-13.91	Ave
20720	42.67	0	150	V	32.18	9.28	32.5	51.63	74	-22.37	Peak
20720	43.23	0	150	H	32.18	9.28	32.5	52.19	74	-21.81	Peak
20720	31.25	0	150	V	32.18	9.28	32.5	40.21	54	-13.79	Ave
20720	31.16	0	150	H	32.18	9.28	32.5	40.12	54	-13.88	Ave
Middle Channel 5200 MHz, measured at 3 meters											
10400	44.24	0	150	V	37.65	6.14	36.3	51.73	74	-22.27	Peak
10400	43.19	0	150	H	37.65	6.14	36.3	50.68	74	-23.32	Peak
10400	31.75	0	150	V	37.65	6.14	36.3	39.24	54	-14.76	Ave
10400	31.75	0	150	H	37.65	6.14	36.3	39.24	54	-14.76	Ave
15600	44.53	0	150	V	34.57	7.47	34.0	52.57	74	-21.43	Peak
15600	44.20	0	150	H	34.57	7.47	34.0	52.24	74	-21.76	Peak
15600	32.24	0	150	V	34.57	7.47	34.0	40.28	54	-13.72	Ave
15600	32.24	0	150	H	34.57	7.47	34.0	40.28	54	-13.72	Ave
20800	43.24	0	150	V	32.18	9.28	32.5	52.20	74	-21.80	Peak
20800	42.91	0	150	H	32.18	9.28	32.5	51.87	74	-22.13	Peak
20800	31.19	0	150	V	32.18	9.28	32.5	40.15	54	-13.85	Ave
20800	31.24	0	150	H	32.18	9.28	32.5	40.20	54	-13.80	Ave
High Channel 5240 MHz, measured at 3 meters											
10480	44.94	0	150	V	37.65	6.14	36.3	52.43	74	-21.57	Peak
10480	43.60	0	150	H	37.65	6.14	36.3	51.09	74	-22.91	Peak
10480	31.71	0	150	V	37.65	6.14	36.3	39.20	54	-14.80	Ave
10480	31.61	0	150	H	37.65	6.14	36.3	39.10	54	-14.90	Ave
15720	43.22	0	150	V	34.57	7.47	34.0	51.26	74	-22.74	Peak
15720	44.12	0	150	H	34.57	7.47	34.0	52.16	74	-21.84	Peak
15720	32.16	0	150	V	34.57	7.47	34.0	40.20	54	-13.80	Ave
15720	32.08	0	150	H	34.57	7.47	34.0	40.12	54	-13.88	Ave
20960	44.12	0	150	V	32.18	9.28	32.5	53.08	74	-20.92	Peak
20960	42.98	0	150	H	32.18	9.28	32.5	51.94	74	-22.06	Peak
20960	31.49	0	150	V	32.18	9.28	32.5	40.45	54	-13.55	Ave
20960	31.43	0	150	H	32.18	9.28	32.5	40.39	54	-13.61	Ave

802.11n20 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
10360	43.75	0	150	V	37.65	6.14	36.3	51.24	74	-22.76	Peak
10360	44.39	0	150	H	37.65	6.14	36.3	51.88	74	-22.12	Peak
10360	31.95	0	150	V	37.65	6.14	36.3	39.44	54	-14.56	Ave
10360	31.87	0	150	H	37.65	6.14	36.3	39.36	54	-14.64	Ave
15540	43.83	0	150	V	34.57	7.47	34.0	51.87	74	-22.13	Peak
15540	44.13	0	150	H	34.57	7.47	34.0	52.17	74	-21.83	Peak
15540	32.34	0	150	V	34.57	7.47	34.0	40.38	54	-13.62	Ave
15540	32.21	0	150	H	34.57	7.47	34.0	40.25	54	-13.75	Ave
20720	43.11	0	150	V	32.18	9.28	32.5	52.07	74	-21.93	Peak
20720	42.93	0	150	H	32.18	9.28	32.5	51.89	74	-22.11	Peak
20720	31.41	0	150	V	32.18	9.28	32.5	40.37	54	-13.63	Ave
20720	31.35	0	150	H	32.18	9.28	32.5	40.31	54	-13.69	Ave
Middle Channel 5200 MHz, measured at 3 meters											
10400	43.85	0	150	V	37.65	6.14	36.3	51.34	74	-22.66	Peak
10400	44.02	0	150	H	37.65	6.14	36.3	51.51	74	-22.49	Peak
10400	31.86	0	150	V	37.65	6.14	36.3	39.35	54	-14.65	Ave
10400	31.80	0	150	H	37.65	6.14	36.3	39.29	54	-14.71	Ave
15600	44.23	0	150	V	34.57	7.47	34.0	52.27	74	-21.73	Peak
15600	43.63	0	150	H	34.57	7.47	34.0	51.67	74	-22.33	Peak
15600	32.21	0	150	V	34.57	7.47	34.0	40.25	54	-13.75	Ave
15600	32.25	0	150	H	34.57	7.47	34.0	40.29	54	-13.71	Ave
20800	43.62	0	150	V	32.18	9.28	32.5	52.58	74	-21.42	Peak
20800	43.31	0	150	H	32.18	9.28	32.5	52.27	74	-21.73	Peak
20800	31.30	0	150	V	32.18	9.28	32.5	40.26	54	-13.74	Ave
20800	31.25	0	150	H	32.18	9.28	32.5	40.21	54	-13.79	Ave
High Channel 5240 MHz, measured at 3 meters											
10480	44.77	0	150	V	37.65	6.14	36.3	52.26	74	-21.74	Peak
10480	43.94	0	150	H	37.65	6.14	36.3	51.43	74	-22.57	Peak
10480	31.65	0	150	V	37.65	6.14	36.3	39.14	54	-14.86	Ave
10480	31.62	0	150	H	37.65	6.14	36.3	39.11	54	-14.89	Ave
15720	43.90	0	150	V	34.57	7.47	34.0	51.94	74	-22.06	Peak
15720	43.50	0	150	H	34.57	7.47	34.0	51.54	74	-22.46	Peak
15720	32.09	0	150	V	34.57	7.47	34.0	40.13	54	-13.87	Ave
15720	32.10	0	150	H	34.57	7.47	34.0	40.14	54	-13.86	Ave
20960	43.41	0	150	V	32.18	9.28	32.5	52.37	74	-21.63	Peak
20960	43.76	0	150	H	32.18	9.28	32.5	52.72	74	-21.28	Peak
20960	31.53	0	150	V	32.18	9.28	32.5	40.49	54	-13.51	Ave
20960	31.44	0	150	H	32.18	9.28	32.5	40.40	54	-13.60	Ave

802.11n40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5190 MHz, measured at 3 meters											
10380	43.88	0	150	V	37.65	6.14	36.3	51.37	74	-22.63	Peak
10380	44.16	0	150	H	37.65	6.14	36.3	51.65	74	-22.35	Peak
10380	31.87	0	150	V	37.65	6.14	36.3	39.36	54	-14.64	Ave
10380	31.77	0	150	H	37.65	6.14	36.3	39.26	54	-14.74	Ave
15570	43.86	0	150	V	34.57	7.47	34.0	51.90	74	-22.10	Peak
15570	44.34	0	150	H	34.57	7.47	34.0	52.38	74	-21.62	Peak
15570	32.39	0	150	V	34.57	7.47	34.0	40.43	54	-13.57	Ave
15570	32.35	0	150	H	34.57	7.47	34.0	40.39	54	-13.61	Ave
20760	43.44	0	150	V	32.18	9.28	32.5	52.40	74	-21.60	Peak
20760	43.53	0	150	H	32.18	9.28	32.5	52.49	74	-21.51	Peak
20760	31.37	0	150	V	32.18	9.28	32.5	40.33	54	-13.67	Ave
20760	31.35	0	150	H	32.18	9.28	32.5	40.31	54	-13.69	Ave
High Channel 5230 MHz, measured at 3 meters											
10460	43.95	0	150	V	37.65	6.14	36.3	51.44	74	-22.56	Peak
10460	43.53	0	150	H	37.65	6.14	36.3	51.02	74	-22.98	Peak
10460	31.85	0	150	V	37.65	6.14	36.3	39.34	54	-14.66	Ave
10460	31.84	0	150	H	37.65	6.14	36.3	39.33	54	-14.67	Ave
15690	44.34	0	150	V	34.57	7.47	34.0	52.38	74	-21.62	Peak
15690	43.98	0	150	H	34.57	7.47	34.0	52.02	74	-21.98	Peak
15690	31.96	0	150	V	34.57	7.47	34.0	40.00	54	-14.00	Ave
15690	31.96	0	150	H	34.57	7.47	34.0	40.00	54	-14.00	Ave
20920	43.51	0	150	V	32.18	9.28	32.5	52.47	74	-21.53	Peak
20920	43.50	0	150	H	32.18	9.28	32.5	52.46	74	-21.54	Peak
20920	31.48	0	150	V	32.18	9.28	32.5	40.44	54	-13.56	Ave
20920	31.47	0	150	H	32.18	9.28	32.5	40.43	54	-13.57	Ave

5.8 GHz Band

802.11a mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5745 MHz, measured at 3 meters											
11490	44.70	0	150	V	38.10	4.07	33.87	53.00	74	-21.00	Peak
11490	45.10	0	150	H	38.10	4.07	33.87	53.40	74	-20.60	Peak
11490	31.00	0	150	V	38.10	4.07	33.87	39.30	54	-14.70	Ave
11490	30.99	0	150	H	38.10	4.07	33.87	39.29	54	-14.71	Ave
17235	45.45	0	150	V	42.94	5.17	33.82	59.74	74	-14.26	Peak
17235	45.60	0	150	H	42.94	5.17	33.82	59.89	74	-14.11	Peak
17235	31.75	0	150	V	42.94	5.17	33.82	46.04	54	-7.96	Ave
17235	31.75	0	150	H	42.94	5.17	33.82	46.04	54	-7.96	Ave
22980	46.04	0	150	V	35.00	6.04	34.79	52.29	74	-21.71	Peak
22980	46.19	0	150	H	35.00	6.04	34.79	52.44	74	-21.56	Peak
22980	32.16	0	150	V	35.00	6.04	34.79	38.41	54	-15.59	Ave
22980	32.14	0	150	H	35.00	6.04	34.79	38.39	54	-15.61	Ave
Middle Channel 5785 MHz, measured at 3 meters											
11570	43.62	0	150	V	38.85	4.07	33.87	52.67	74	-21.33	Peak
11570	43.78	0	150	H	38.85	4.07	33.87	52.83	74	-21.17	Peak
11570	30.54	0	150	V	38.85	4.07	33.87	39.59	54	-14.41	Ave
11570	30.71	0	150	H	38.85	4.07	33.87	39.76	54	-14.24	Ave
17355	45.18	0	150	V	46.58	5.17	33.82	63.11	74	-10.89	Peak
17355	44.96	0	150	H	46.58	5.17	33.82	62.89	74	-11.11	Peak
17355	31.73	0	150	V	46.58	5.17	33.82	49.66	54	-4.34	Ave
17355	31.69	0	150	H	46.58	5.17	33.82	49.62	54	-4.38	Ave
23140	44.91	0	150	V	35.00	6.04	34.74	51.21	74	-22.79	Peak
23140	44.57	0	150	H	35.00	6.04	34.74	50.87	74	-23.13	Peak
23140	32.29	0	150	V	35.00	6.04	34.74	38.59	54	-15.41	Ave
23140	32.15	0	150	H	35.00	6.04	34.74	38.45	54	-15.55	Ave
High Channel 5825 MHz, measured at 3 meters											
11650	43.78	0	150	V	39.02	4.07	34.27	52.60	74	-21.40	Peak
11650	44.15	0	150	H	39.02	4.07	34.27	52.97	74	-21.03	Peak
11650	30.84	0	150	V	39.02	4.07	34.27	39.66	54	-14.34	Ave
11650	31.15	0	150	H	39.02	4.07	34.27	39.97	54	-14.03	Ave
17475	43.82	0	150	V	45.02	5.17	33.78	60.23	74	-13.77	Peak
17475	43.37	0	150	H	45.02	5.17	33.78	59.78	74	-14.22	Peak
17475	31.42	0	150	V	45.02	5.17	33.78	47.83	54	-6.17	Ave
17475	31.33	0	150	H	45.02	5.17	33.78	47.74	54	-6.26	Ave
23300	45.68	0	150	V	34.85	6.04	34.71	51.86	74	-22.14	Peak
23300	45.32	0	150	H	34.85	6.04	34.71	51.50	74	-22.50	Peak
23300	33.05	0	150	V	34.85	6.04	34.71	39.23	54	-14.77	Ave
23300	33.02	0	150	H	34.85	6.04	34.71	39.20	54	-14.80	Ave

802.11n20 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5745 MHz, measured at 3 meters											
11490	43.75	0	150	V	38.10	4.07	33.87	52.05	74	-21.95	Peak
11490	43.77	0	150	H	38.10	4.07	33.87	52.07	74	-21.93	Peak
11490	30.12	0	150	V	38.10	4.07	33.87	38.42	54	-15.58	Ave
11490	30.36	0	150	H	38.10	4.07	33.87	38.66	54	-15.34	Ave
17235	44.95	0	150	V	42.94	5.17	33.82	59.24	74	-14.76	Peak
17235	45.19	0	150	H	42.94	5.17	33.82	59.48	74	-14.52	Peak
17235	31.89	0	150	V	42.94	5.17	33.82	46.18	54	-7.82	Ave
17235	31.91	0	150	H	42.94	5.17	33.82	46.20	54	-7.80	Ave
22980	44.72	0	150	V	35.00	6.04	34.79	50.97	74	-23.03	Peak
22980	44.29	0	150	H	35.00	6.04	34.79	50.54	74	-23.46	Peak
22980	32.18	0	150	V	35.00	6.04	34.79	38.43	54	-15.57	Ave
22980	32.16	0	150	H	35.00	6.04	34.79	38.41	54	-15.59	Ave
Middle Channel 5785 MHz, measured at 3 meters											
11570	43.84	0	150	V	38.85	4.07	33.87	52.89	74	-21.11	Peak
11570	44.43	0	150	H	38.85	4.07	33.87	53.48	74	-20.52	Peak
11570	30.33	0	150	V	38.85	4.07	33.87	39.38	54	-14.62	Ave
11570	30.57	0	150	H	38.85	4.07	33.87	39.62	54	-14.38	Ave
17355	44.65	0	150	V	46.58	5.17	33.82	62.58	74	-11.42	Peak
17355	45.46	0	150	H	46.58	5.17	33.82	63.39	74	-10.61	Peak
17355	31.75	0	150	V	46.58	5.17	33.82	49.68	54	-4.32	Ave
17355	31.72	0	150	H	46.58	5.17	33.82	49.65	54	-4.35	Ave
23140	44.21	0	150	V	35.00	6.04	34.74	50.51	74	-23.49	Peak
23140	45.54	0	150	H	35.00	6.04	34.74	51.84	74	-22.16	Peak
23140	32.36	0	150	V	35.00	6.04	34.74	38.66	54	-15.34	Ave
23140	32.42	0	150	H	35.00	6.04	34.74	38.72	54	-15.28	Ave
High Channel 5825 MHz, measured at 3 meters											
11650	45.11	0	150	V	39.02	4.07	34.27	53.93	74	-20.07	Peak
11650	44.66	0	150	H	39.02	4.07	34.27	53.48	74	-20.52	Peak
11650	30.97	0	150	V	39.02	4.07	34.27	39.79	54	-14.21	Ave
11650	31.05	0	150	H	39.02	4.07	34.27	39.87	54	-14.13	Ave
17475	44.55	0	150	V	45.02	5.17	33.78	60.96	74	-13.04	Peak
17475	45.78	0	150	H	45.02	5.17	33.78	62.19	74	-11.81	Peak
17475	31.31	0	150	V	45.02	5.17	33.78	47.72	54	-6.28	Ave
17475	31.38	0	150	H	45.02	5.17	33.78	47.79	54	-6.21	Ave
23300	45.04	0	150	V	34.85	6.04	34.71	51.22	74	-22.78	Peak
23300	46.31	0	150	H	34.85	6.04	34.71	52.49	74	-21.51	Peak
23300	32.95	0	150	V	34.85	6.04	34.71	39.13	54	-14.87	Ave
23300	33.01	0	150	H	34.85	6.04	34.71	39.19	54	-14.81	Ave

802.11n40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5755 MHz, measured at 3 meters											
11510	44.20	0	150	V	38.10	4.07	33.87	52.50	74	-21.50	Peak
11510	43.14	0	150	H	38.10	4.07	33.87	51.44	74	-22.56	Peak
11510	30.55	0	150	V	38.10	4.07	33.87	38.85	54	-15.15	Ave
11510	30.01	0	150	H	38.10	4.07	33.87	38.31	54	-15.69	Ave
17265	44.43	0	150	V	42.94	5.17	33.82	58.72	74	-15.28	Peak
17265	45.91	0	150	H	42.94	5.17	33.82	60.20	74	-13.80	Peak
17265	31.77	0	150	V	42.94	5.17	33.82	46.06	54	-7.94	Ave
17265	32.11	0	150	H	42.94	5.17	33.82	46.40	54	-7.60	Ave
23020	45.95	0	150	V	35.00	6.04	34.79	52.20	74	-21.80	Peak
23020	45.65	0	150	H	35.00	6.04	34.79	51.90	74	-22.10	Peak
23020	32.11	0	150	V	35.00	6.04	34.79	38.36	54	-15.64	Ave
23020	32.08	0	150	H	35.00	6.04	34.79	38.33	54	-15.67	Ave
High Channel 5795 MHz, measured at 3 meters											
11590	43.81	0	150	V	38.85	4.07	33.87	52.86	74	-21.14	Peak
11590	44.72	0	150	H	38.85	4.07	33.87	53.77	74	-20.23	Peak
11590	30.77	0	150	V	38.85	4.07	33.87	39.82	54	-14.18	Ave
11590	31.04	0	150	H	38.85	4.07	33.87	40.09	54	-13.91	Ave
17385	45.52	0	150	V	46.58	5.17	33.82	63.45	74	-10.55	Peak
17385	45.44	0	150	H	46.58	5.17	33.82	63.37	74	-10.63	Peak
17385	31.68	0	150	V	46.58	5.17	33.82	49.61	54	-4.39	Ave
17385	31.70	0	150	H	46.58	5.17	33.82	49.63	54	-4.37	Ave
23180	46.92	0	150	V	35.00	6.04	34.74	53.22	74	-20.78	Peak
23180	46.24	0	150	H	35.00	6.04	34.74	52.54	74	-21.46	Peak
23180	32.48	0	150	V	35.00	6.04	34.74	38.78	54	-15.22	Ave
23180	32.41	0	150	H	35.00	6.04	34.74	38.71	54	-15.29	Ave

8 FCC §15.407(a) & §15.407(e) – Emission Bandwidth

8.1 Applicable Standards

FCC §15.407(a), 26 dB emission bandwidth is measured as reference for power and PSD measurement.

FCC §15.407(e), within the 5.725-5.85 GHz band, the minimum 6 dB Bandwidth of U-NII devices shall be at least 500 kHz.

8.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedures New Rules v01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section C: Emission bandwidth and section D: 99 Percent Occupied Bandwidth

8.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Spectrum Analyzer	FSQ	1155.5001.26	2015-03-09	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.*

8.4 Test Environmental Conditions

Temperature:	21 ºC
Relative Humidity:	43 %
ATM Pressure:	105.2 kPa

The testing was performed by Jimmy Xiao from 2015-06-30 at RF site.

8.5 Test Results

Please refer to the following tables and plots.

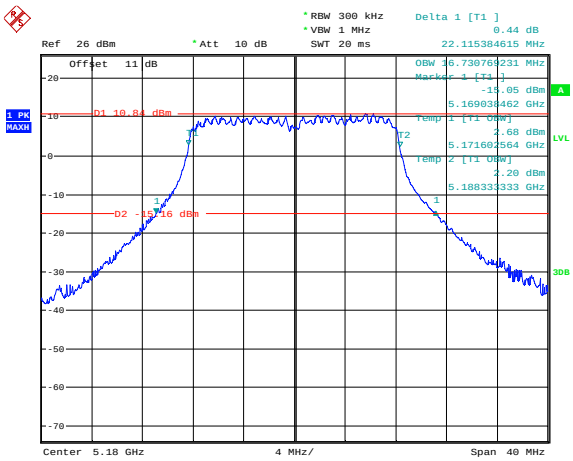
5.2 GHz Band

Channel	Frequency (MHz)	99% OBW (MHz)		26 dB OBW (MHz)	
		Antenna 0	Antenna 1	Antenna 0	Antenna 1
802.11a					
Low	5180	16.73	17.05	22.12	22.76
Middle	5200	16.73	17.05	21.99	22.95
High	5240	16.73	17.05	22.05	22.82
802.11n20					
Low	5180	17.95	18.08	23.85	23.72
Middle	5200	17.95	18.08	23.97	24.04
High	5240	17.95	18.08	23.97	24.17
802.11n40					
Low	5190	36.54	36.92	44.62	47.18
High	5230	36.54	36.92	45.26	47.69

99% OBW & 26 dB OBW

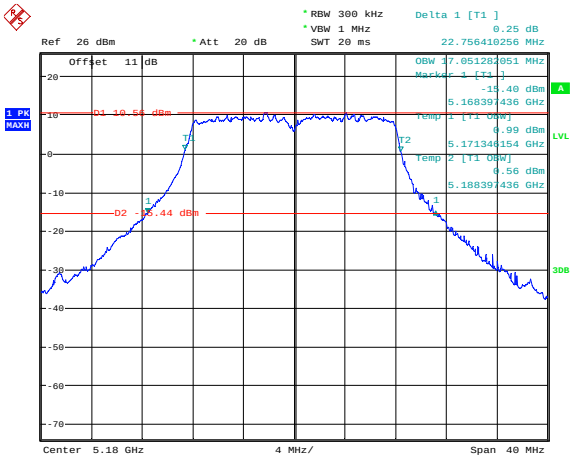
802.11a mode

Low channel: Chain 0



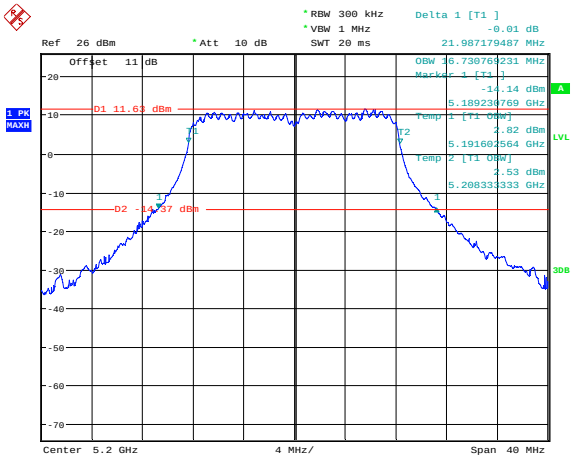
Date: 30.JUN.2015 17:30:31

Low channel: Chain 1



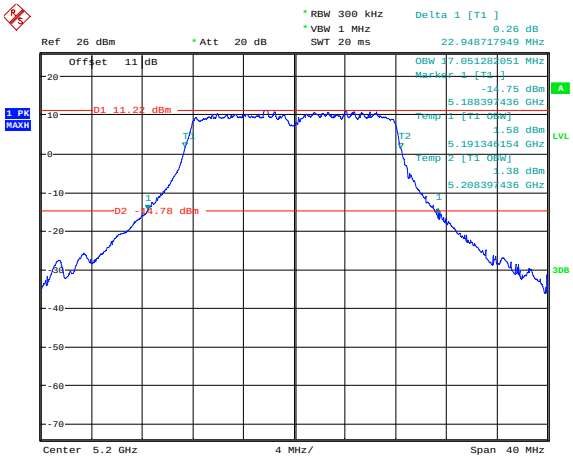
Date: 30.JUN.2015 21:26:39

Middle channel: Chain 0



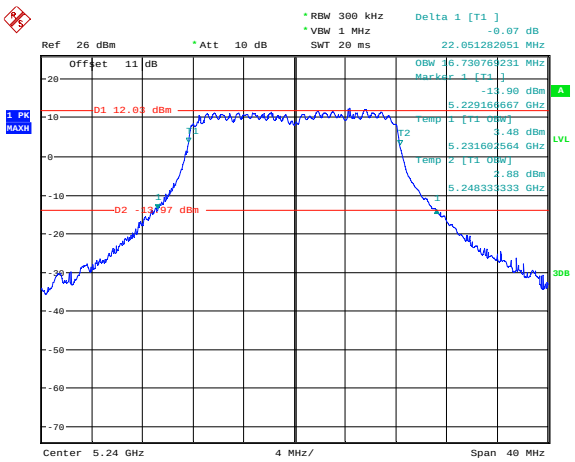
Date: 30.JUN.2015 17:33:26

Middle channel: Chain 1



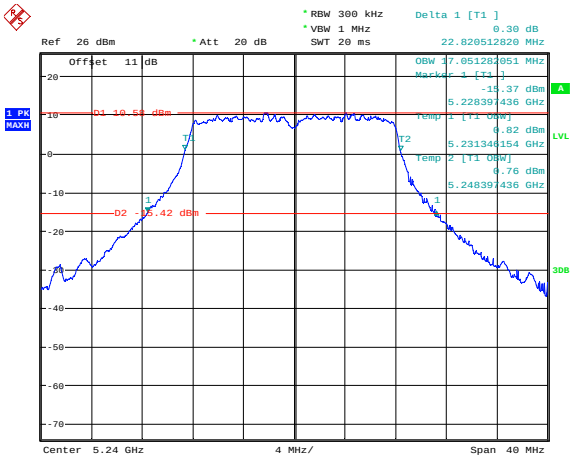
Date: 30.JUN.2015 21:28:38

High channel: Chain 0



Date: 30.JUN.2015 17:35:13

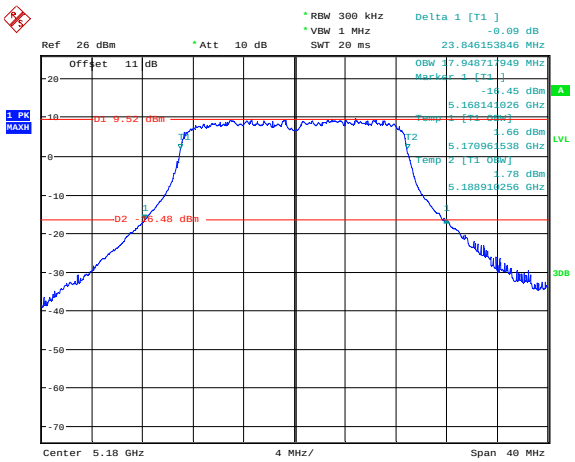
High channel: Chain 1



Date: 30.JUN.2015 21:30:31

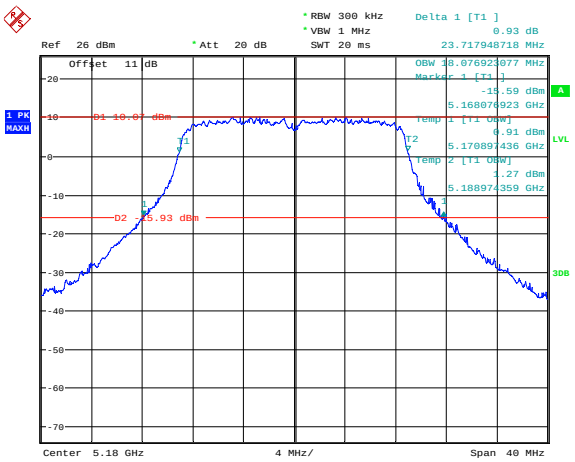
802.11n20 mode

Low channel: Chain 0



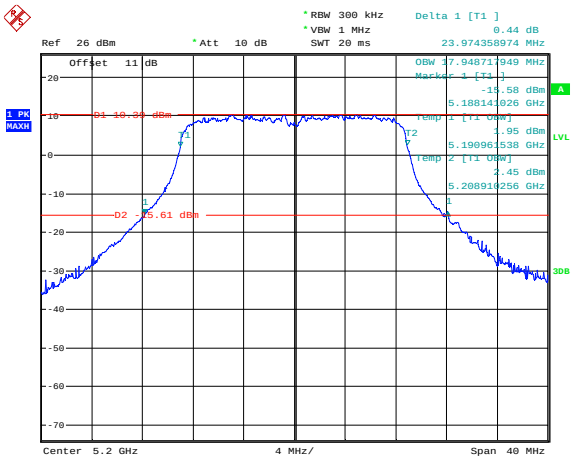
Date: 30.JUN.2015 17:37:32

Low channel: Chain 1



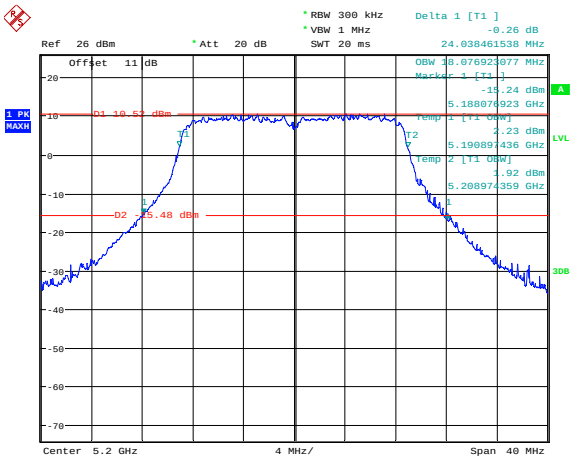
Date: 30.JUN.2015 21:32:37

Middle channel: Chain 0



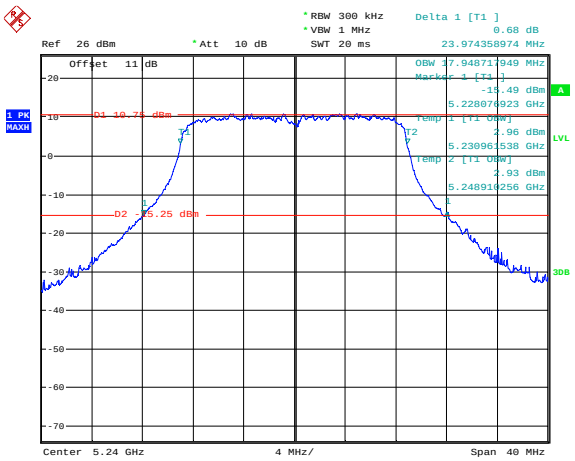
Date: 30.JUN.2015 17:38:53

Middle channel: Chain 1



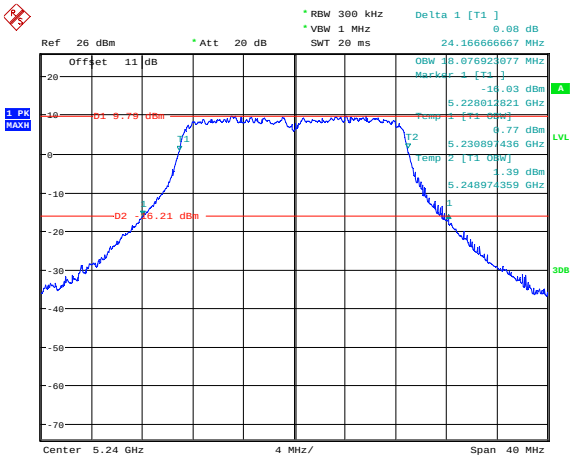
Date: 30.JUN.2015 21:34:29

High channel: Chain 0



Date: 30.JUN.2015 17:40:40

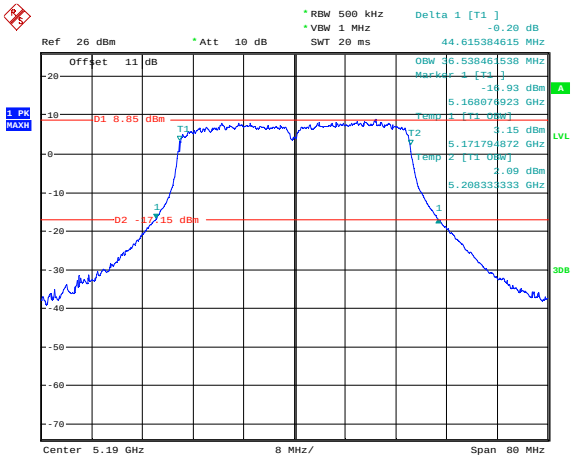
High channel: Chain 1



Date: 30.JUN.2015 21:35:46

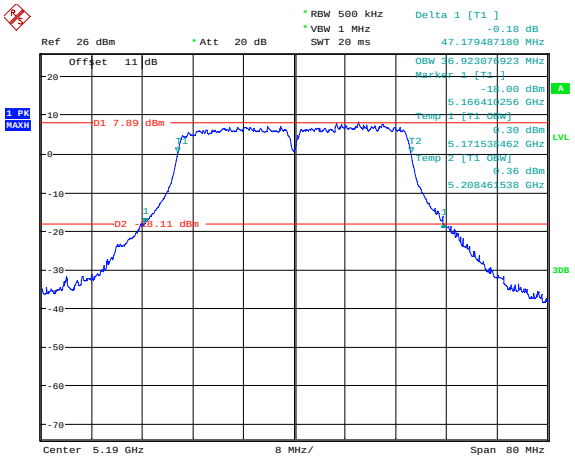
802.11n40 mode

Low channel: Chain 0



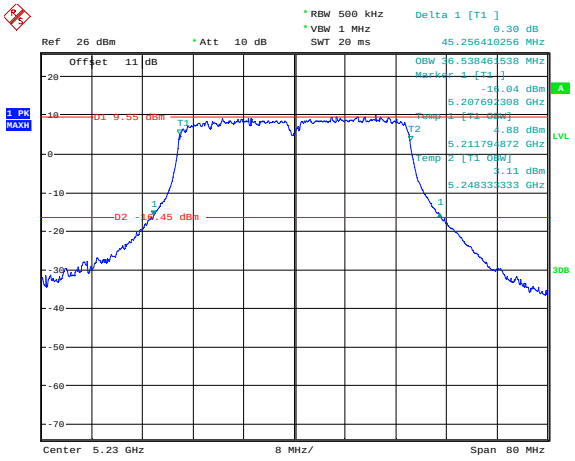
Date: 30.JUN.2015 17:45:00

Low channel: Chain 1



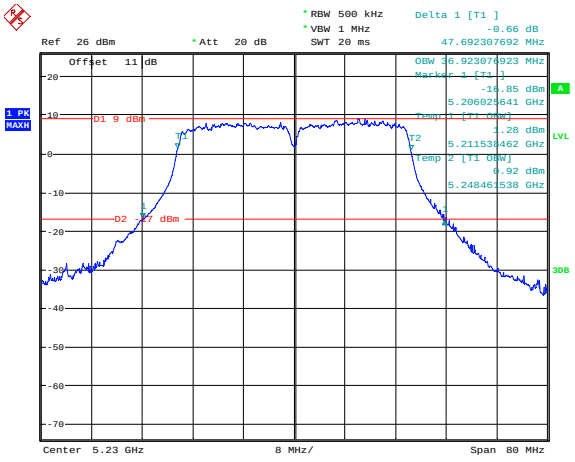
Date: 30.JUN.2015 21:37:45

High channel: Chain 0



Date: 30.JUN.2015 17:46:23

High channel: Chain 1



Date: 30.JUN.2015 21:39:40

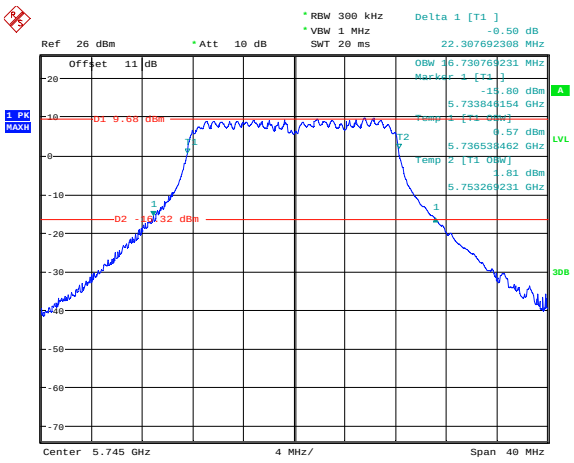
5.8 GHz Band

Channel	Frequency (MHz)	99% OBW (MHz)		6 dB OBW (MHz)		6 dB OBW Limit (kHz)
		Antenna 0	Antenna 1	Antenna 0	Antenna 1	
802.11a						
Low	5745	16.73	17.05	16.39	16.35	500
Middle	5785	16.79	17.44	16.35	16.35	500
High	5825	16.79	17.56	16.35	16.35	500
802.11n20						
Low	5745	18.01	18.01	17.50	17.31	500
Middle	5785	17.95	18.08	17.07	17.50	500
High	5825	17.95	18.27	17.16	17.31	500
802.11n40						
Low	5755	36.54	37.05	36.15	36.28	500
High	5795	36.54	37.05	36.03	36.03	500

99% OBW

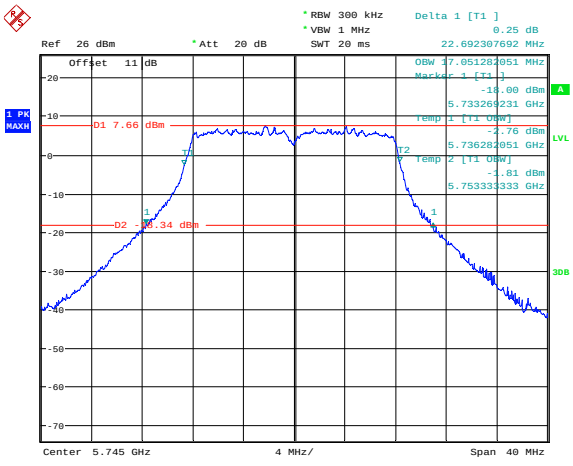
802.11a mode

Low channel: Chain 0



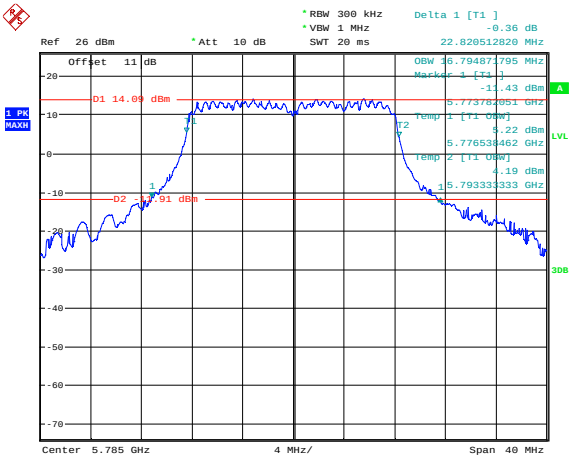
Date: 30.JUN.2015 18:21:22

Low channel: Chain 1



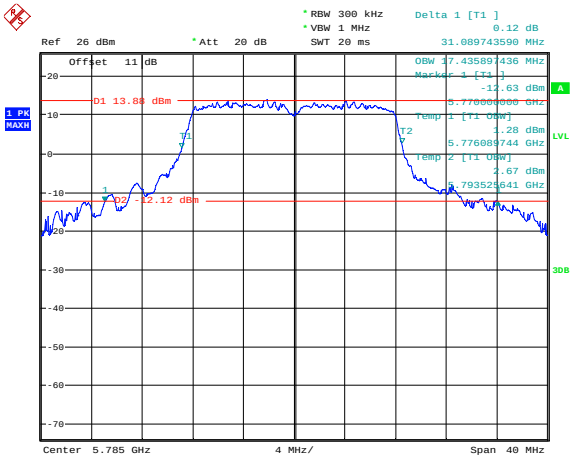
Date: 30.JUN.2015 22:43:54

Middle channel: Chain 0



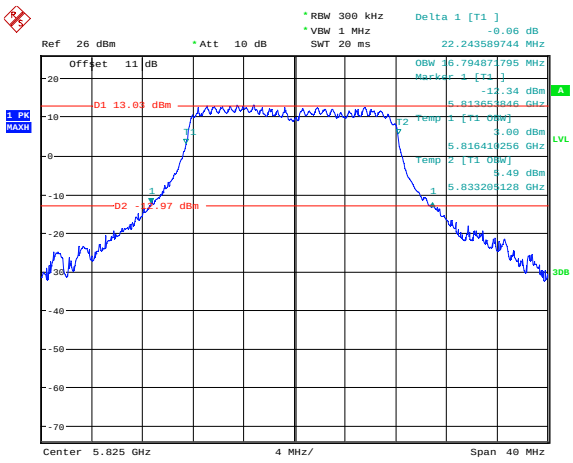
Date: 30.JUN.2015 18:24:16

Middle channel: Chain 1



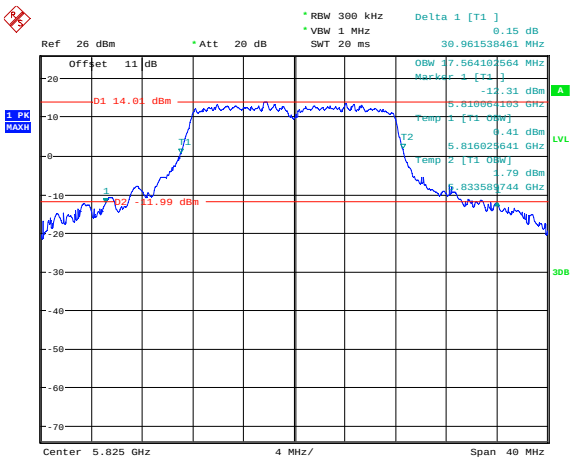
Date: 30.JUN.2015 22:45:58

High channel: Chain 0



Date: 30.JUN.2015 18:25:37

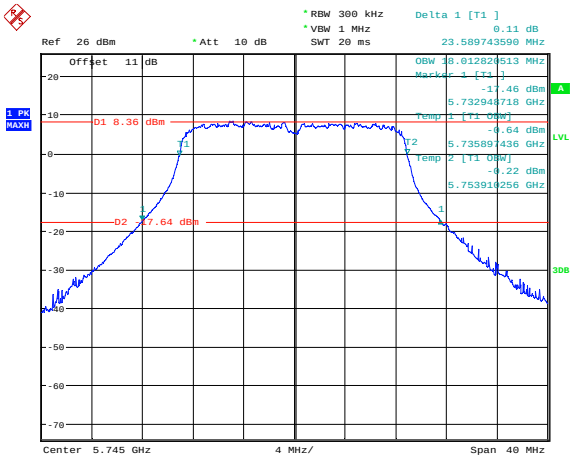
High channel: Chain 1



Date: 30.JUN.2015 22:48:36

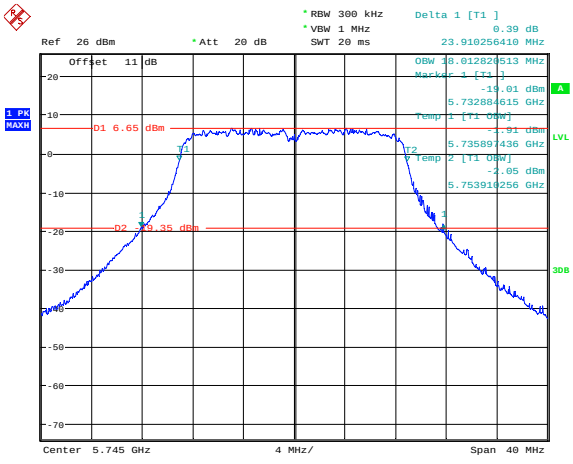
802.11n20 mode

Low channel: Chain 0



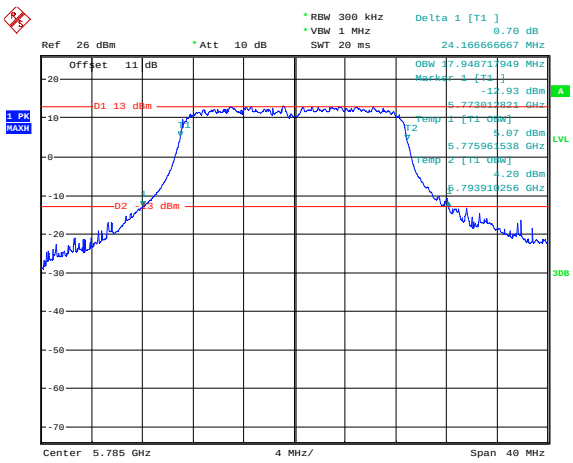
Date: 30.JUN.2015 18:27:08

Low channel: Chain 1



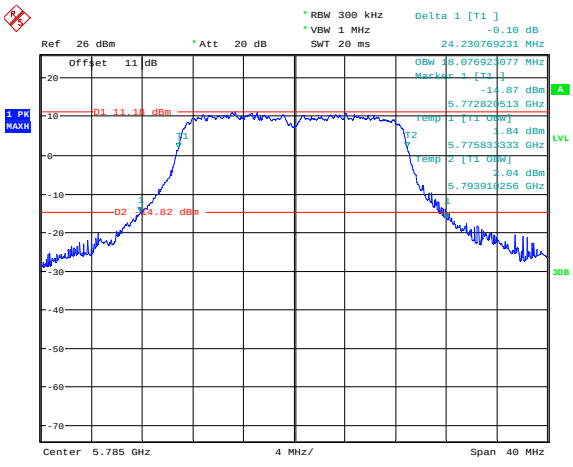
Date: 30.JUN.2015 22:49:55

Middle channel: Chain 0



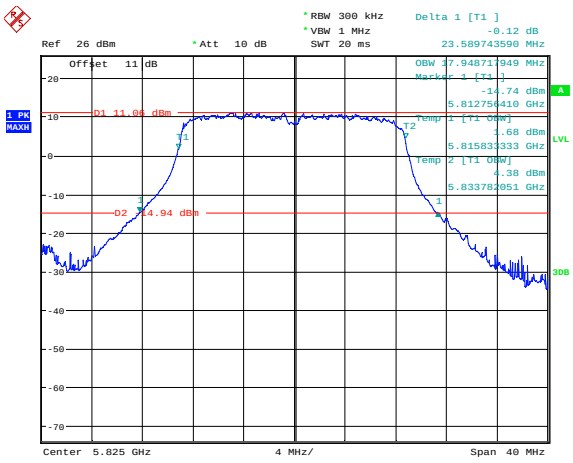
Date: 30.JUN.2015 18:28:09

Middle channel: Chain 1



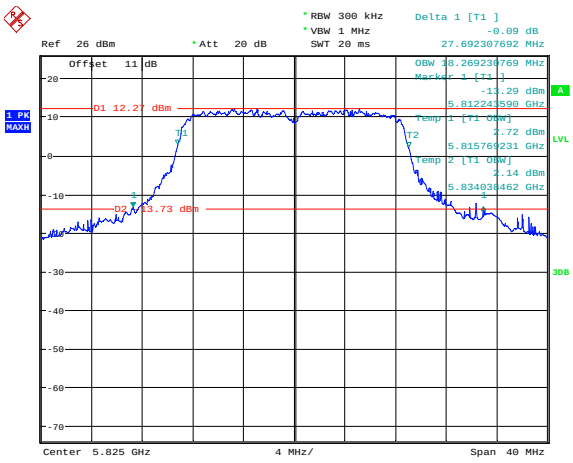
Date: 30.JUN.2015 22:51:34

High channel: Chain 0



Date: 30.JUN.2015 18:29:05

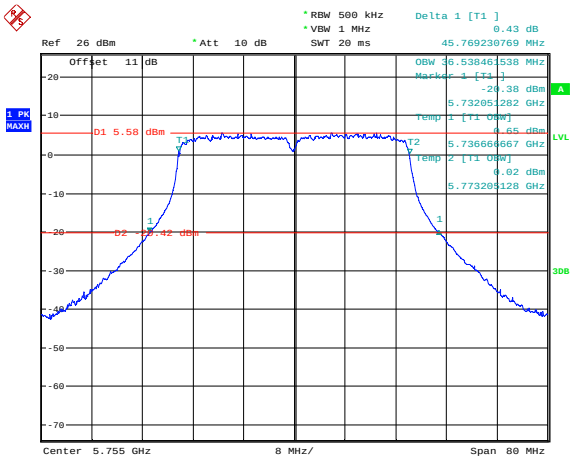
High channel: Chain 1



Date: 30.JUN.2015 22:53:53

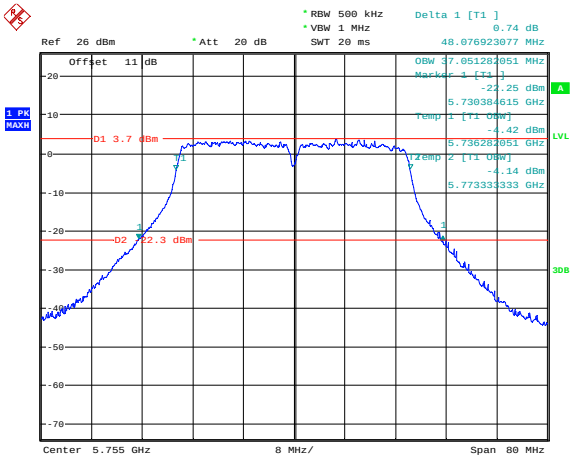
802.11n40 mode

Low channel: Chain 0



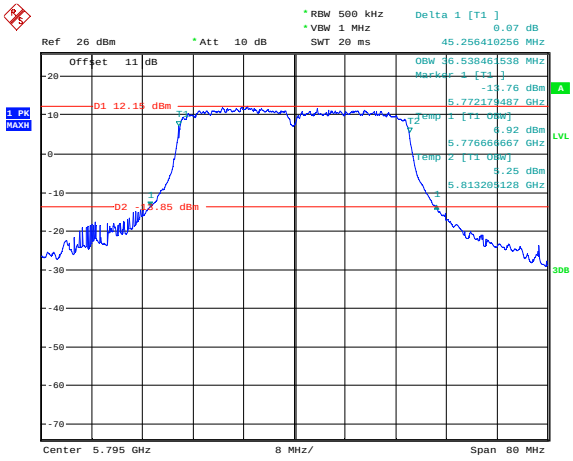
Date: 30.JUN.2015 18:30:26

Low channel: Chain 1



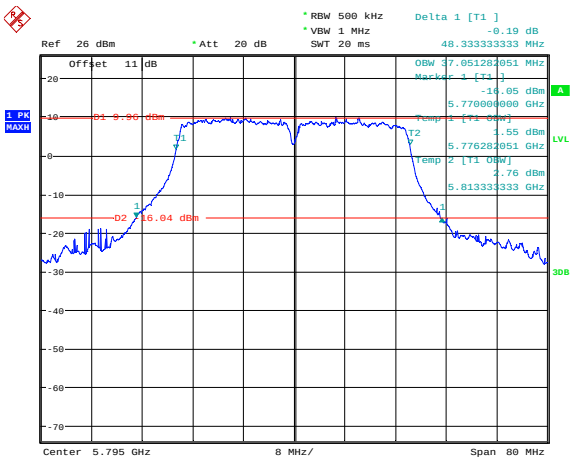
Date: 30.JUN.2015 22:56:43

High channel: Chain 0



Date: 30.JUN.2015 18:31:51

High channel: Chain 1

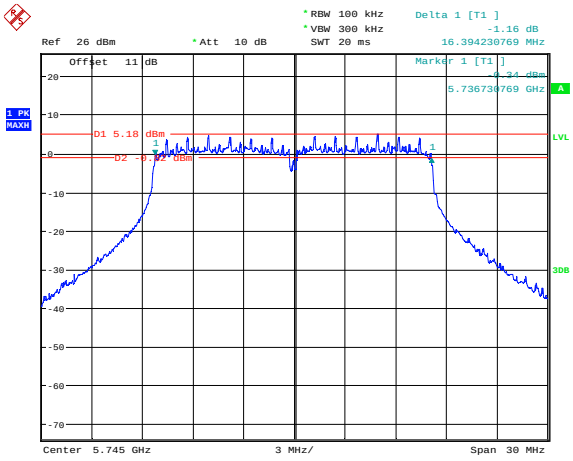


Date: 30.JUN.2015 22:58:38

6 dB OBW

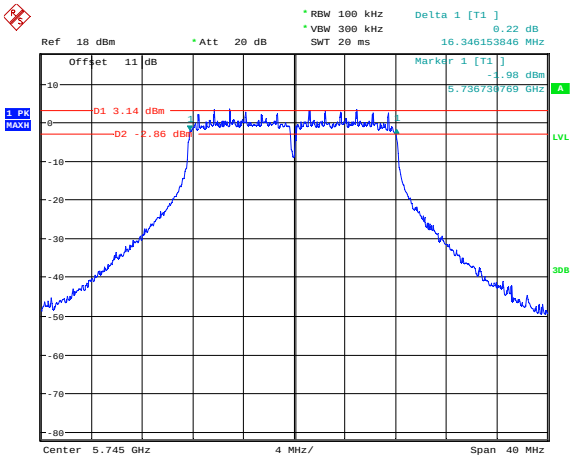
802.11a mode

Low channel: Chain 0



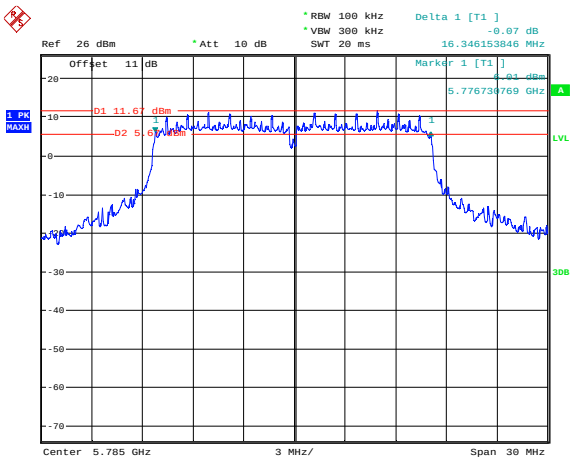
Date: 30.JUN.2015 19:25:56

Low channel: Chain 1



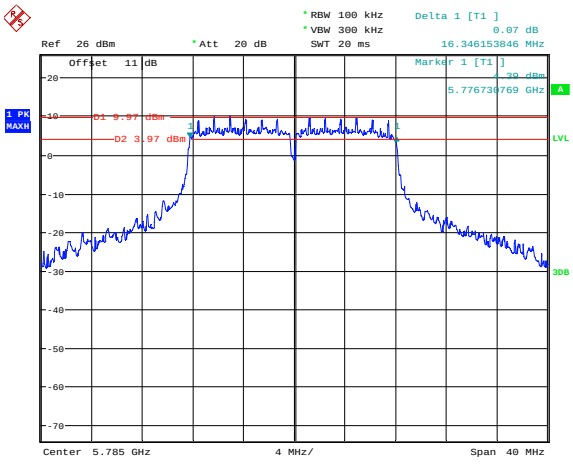
Date: 30.JUN.2015 23:04:44

Middle channel: Chain 0



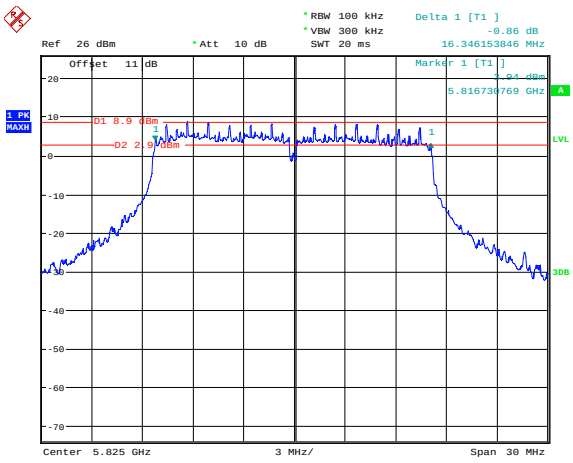
Date: 30.JUN.2015 19:27:28

Middle channel: Chain 1



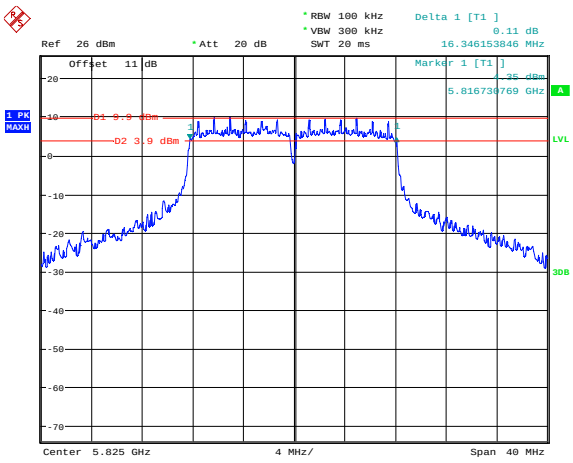
Date: 30.JUN.2015 23:07:03

High channel: Chain 0



Date: 30.JUN.2015 19:28:43

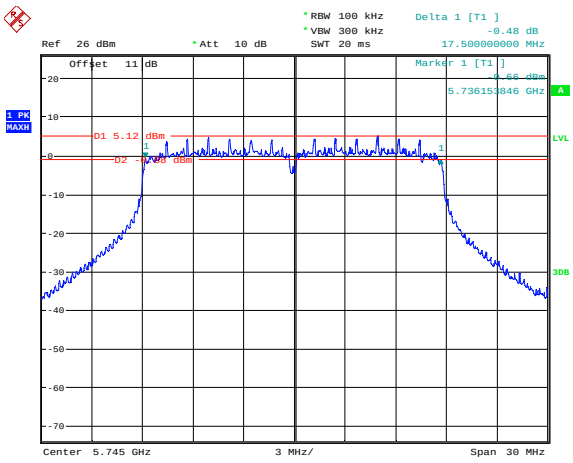
High channel: Chain 1



Date: 30.JUN.2015 23:08:26

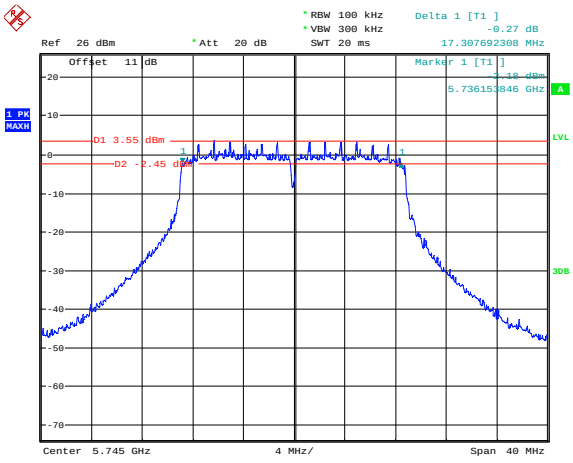
802.11n20 mode

Low channel: Chain 0



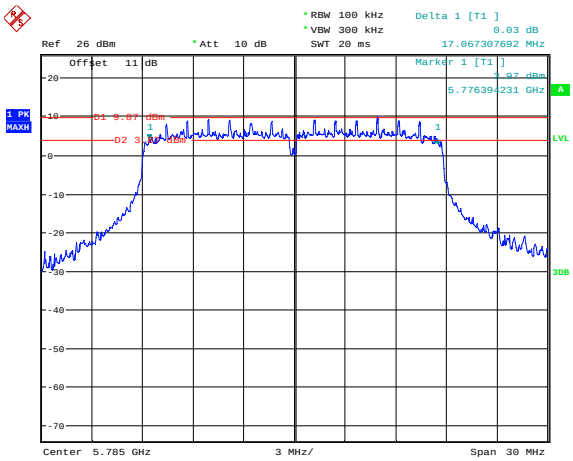
Date: 30.JUN.2015 19:30:23

Low channel: Chain 1



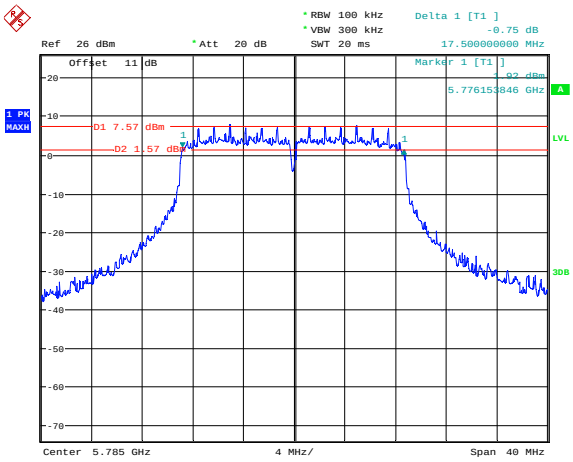
Date: 30.JUN.2015 23:09:46

Middle channel: Chain 0



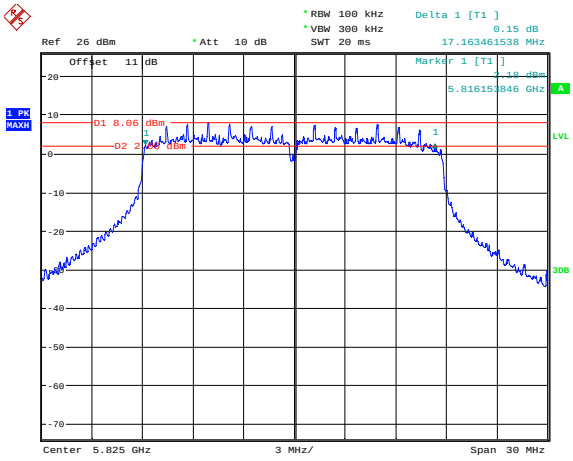
Date: 30.JUN.2015 19:31:51

Middle channel: Chain 1



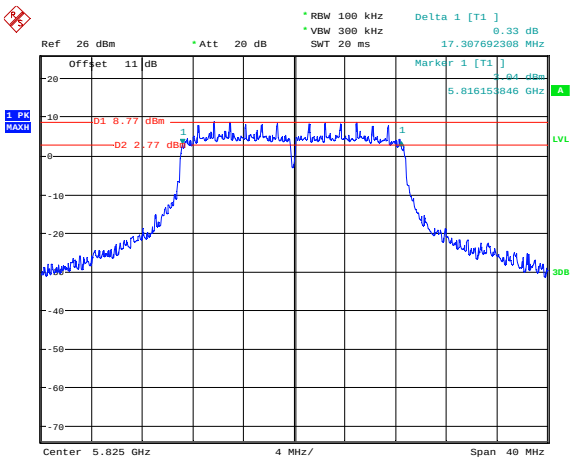
Date: 30.JUN.2015 23:11:12

High channel: Chain 0



Date: 30.JUN.2015 19:33:27

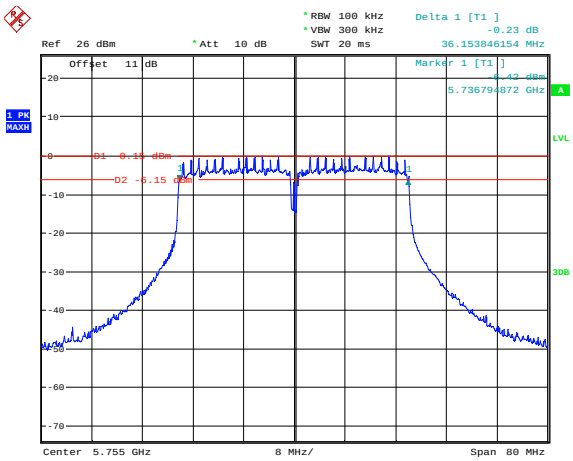
High channel: Chain 1



Date: 30.JUN.2015 23:12:21

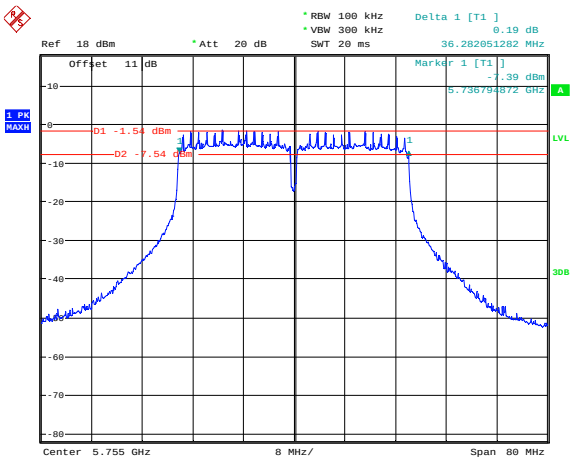
802.11n40 mode

Low channel: Chain 0



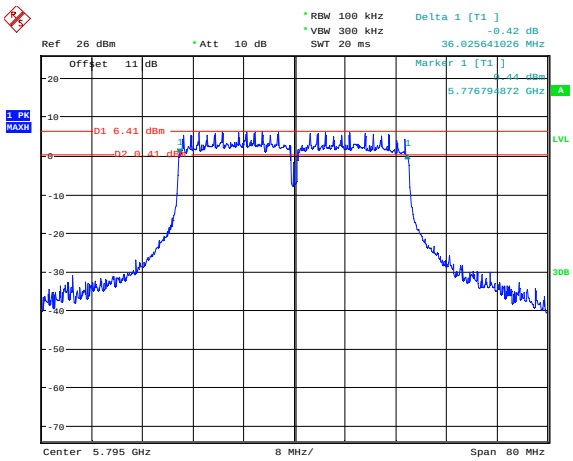
Date: 30.JUN.2015 19:35:20

Low channel: Chain 1



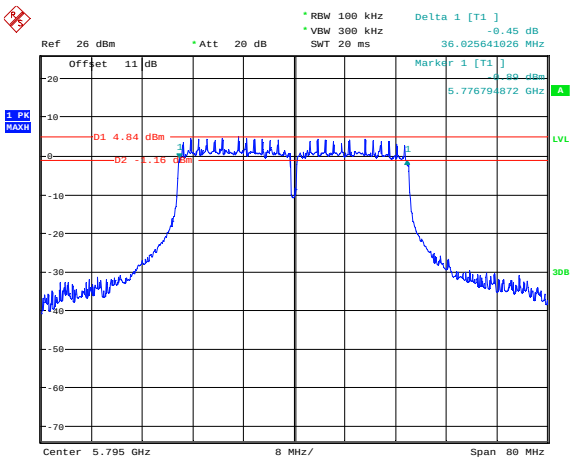
Date: 30.JUN.2015 23:02:56

High channel: Chain 0



Date: 30.JUN.2015 19:36:47

High channel: Chain 1



Date: 30.JUN.2015 23:00:52

9 FCC §407(a) – Maximum Conducted Output Power

9.1 Applicable Standards

According to FCC §15.407(a)

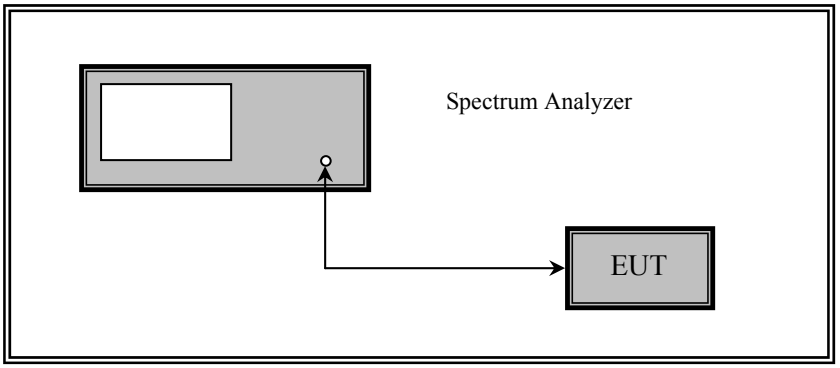
(1) For the band 5.15-5.25 GHz.

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

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

9.2 Measurement Procedure

Test measurements are based on FCC KDB 789033 D02 General UNII Test Procedures New Rules v01, GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORAMTION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E



9.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Spectrum Analyzer	FSQ	1155.5001.26	2015-03-09	1 year
-	SMA Cable	-	C0001	Each Time[1]	N/A
-	Attenuator	BW-S10W5	1419	Each Time[1]	N/A

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.*

9.4 Test Environmental Conditions

Temperature:	22-25º C
Relative Humidity:	40-43 %
ATM Pressure:	102.1-104.4 kPa

The testing was performed by Jimmy Xiao from 2015-06-30 to 2015-07-09 at RF site.

9.5 Test Results

5.2 GHz Band

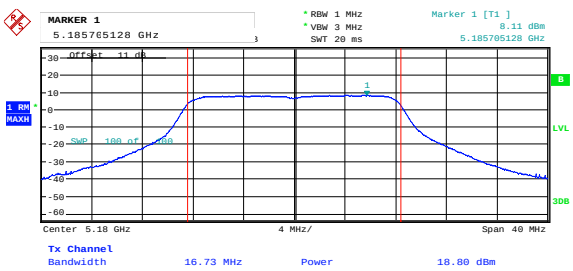
Antenna gain=4 dBi

Channel	Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5180	18.80	17.85	21.36	28.99	Pass
Middle	5200	19.44	18.51	22.01	28.99	Pass
High	5240	19.32	18.62	21.99	28.99	Pass
802.11n20						
Low	5180	18.91	18.05	21.51	28.99	Pass
Middle	5200	19.66	18.59	22.17	28.99	Pass
High	5240	20.24	18.62	22.52	28.99	Pass
802.11n40						
Low	5190	17.87	17.38	20.64	28.99	Pass
High	5230	19.36	18.44	21.93	28.99	Pass

Note: Directional gain=4 dBi + 10lg2 = 7.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. So, the conducted output power limit = 30 dBm - (7.01 dBi – 6 dBi) = 28.99 dBm

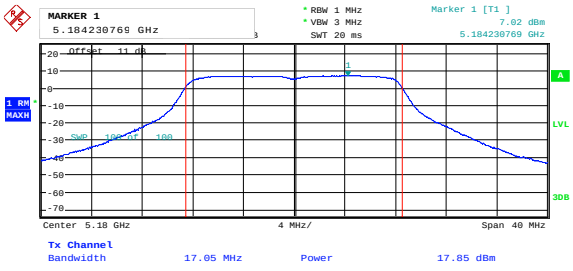
802.11a mode

Low channel: Chain 0



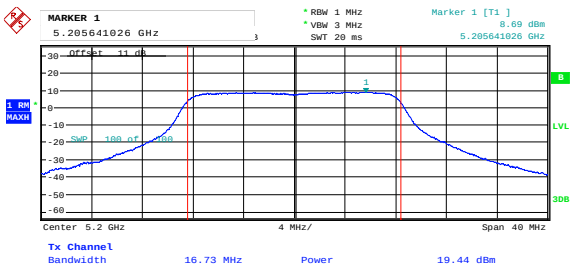
Date: 30.JUN.2015 19:52:06

Low channel: Chain 1



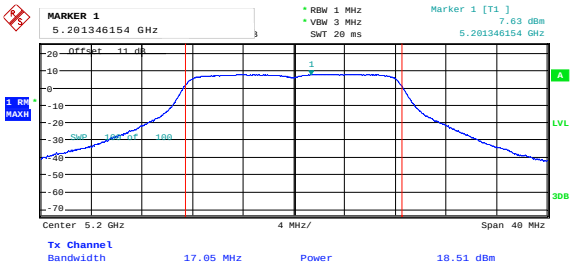
Date: 1.JUL.2015 15:31:17

Middle channel: Chain 0



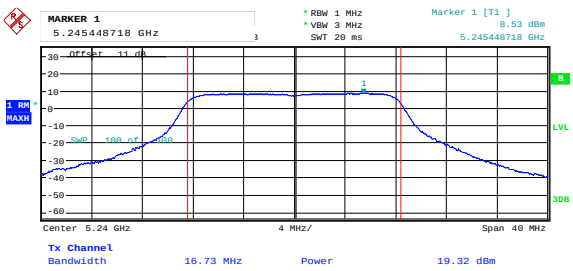
Date: 30.JUN.2015 19:52:53

Middle channel: Chain 1



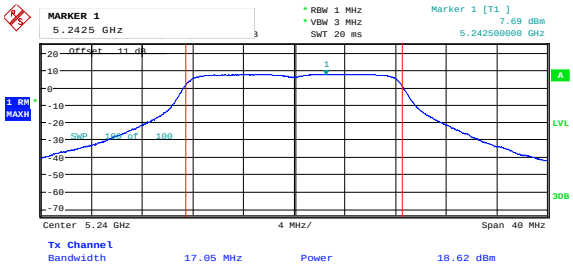
Date: 1.JUL.2015 15:30:01

High channel: Chain 0



Date: 30.JUN.2015 19:53:34

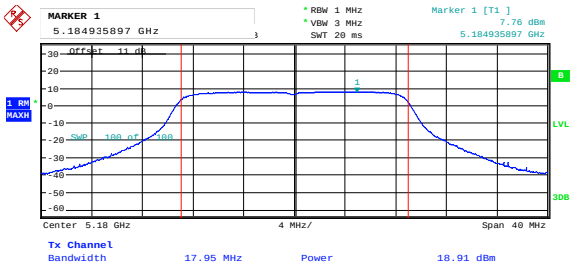
High channel: Chain 1



Date: 1.JUL.2015 15:32:17

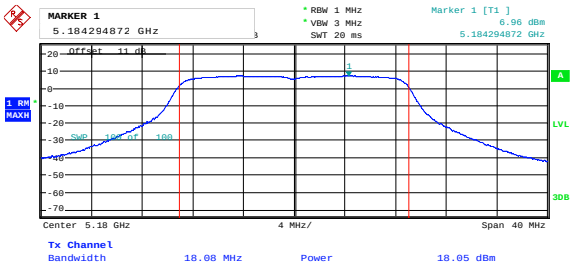
802.11n20 mode

Low channel: Chain 0



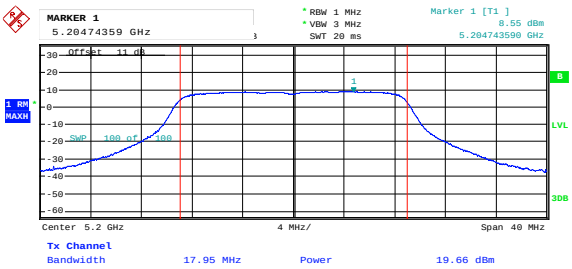
Date: 30.JUN.2015 20:03:26

Low channel: Chain 1



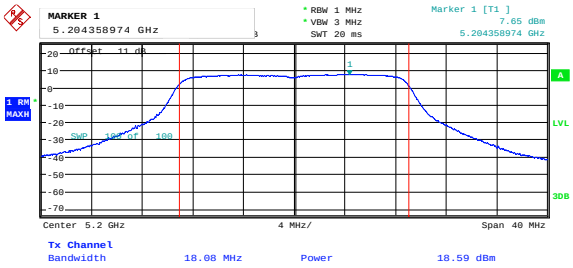
Date: 1.JUL.2015 15:43:45

Middle channel: Chain 0



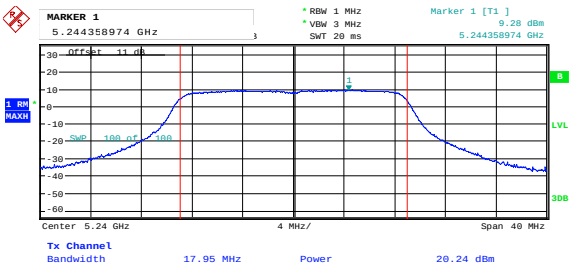
Date: 30.JUN.2015 20:04:21

Middle channel: Chain 1



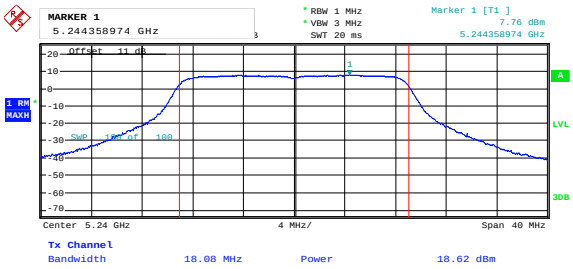
Date: 1.JUL.2015 15:44:25

High channel: Chain 0



Date: 30.JUN.2015 20:05:00

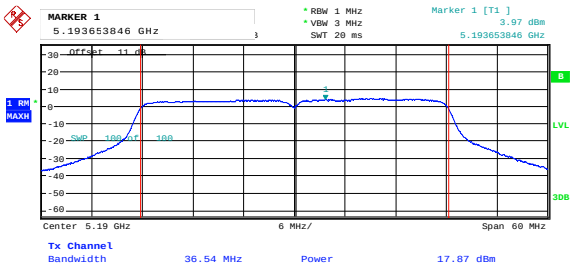
High channel: Chain 1



Date: 1.JUL.2015 15:44:55

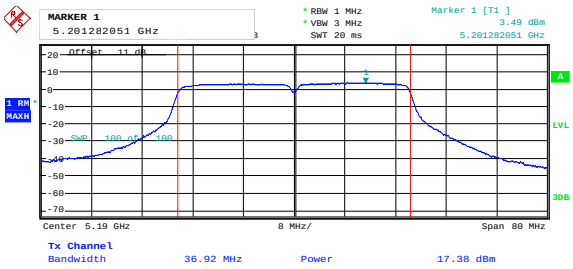
802.11n40 mode

Low channel: Chain 0



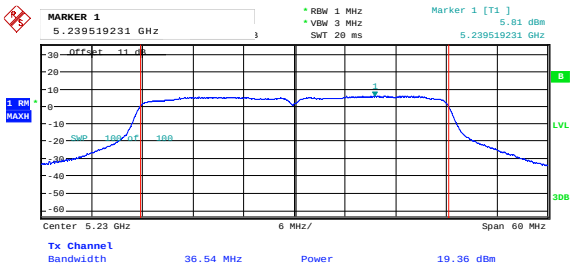
Date: 30.JUN.2015 20:13:18

Low channel: Chain 1



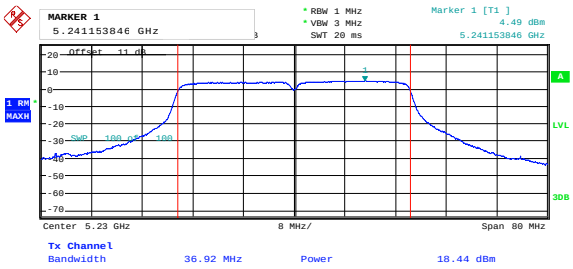
Date: 1.JUL.2015 15:52:15

High channel: Chain 0



Date: 30.JUN.2015 20:14:00

High channel: Chain 1



Date: 1.JUL.2015 15:53:01

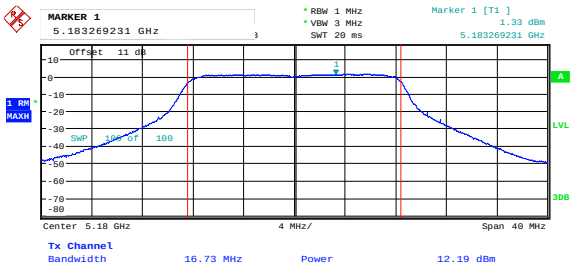
Antenna gain=7 dBi

Channel	Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5180	12.19	13.02	15.64	25.99	Pass
Middle	5200	13.00	13.55	16.29	25.99	Pass
High	5240	14.61	14.76	17.70	25.99	Pass
802.11n20						
Low	5180	13.05	12.58	15.83	25.99	Pass
Middle	5200	14.10	13.28	16.72	25.99	Pass
High	5240	15.67	14.56	18.16	25.99	Pass
802.11n40						
Low	5190	13.28	13.21	16.26	25.99	Pass
High	5230	13.05	12.23	15.67	25.99	Pass

Note: Directional gain=7 dBi + 10lg2 = 10.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. So, the conducted output power limit = 30 dBm - (10.01 dBi – 6 dBi) = 25.99 dBm

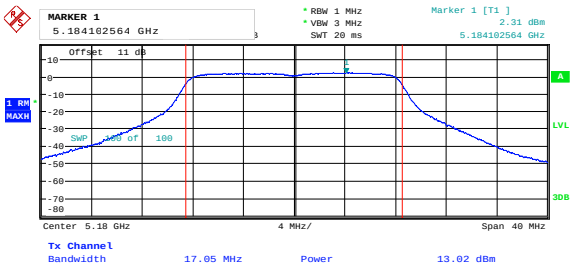
802.11a mode

Low channel: Chain 0



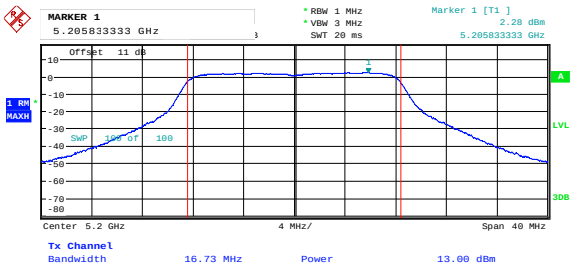
Date: 1.JUL.2015 18:43:26

Low channel: Chain 1



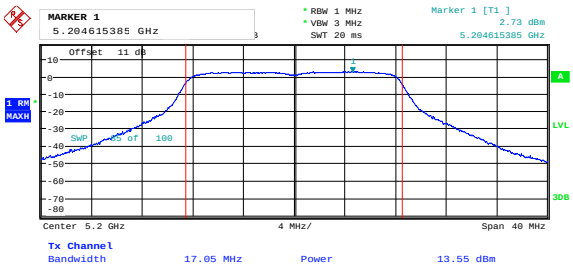
Date: 1.JUL.2015 18:21:37

Middle channel: Chain 0



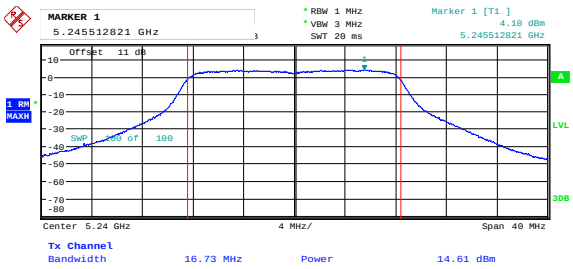
Date: 1.JUL.2015 18:43:49

Middle channel: Chain 1



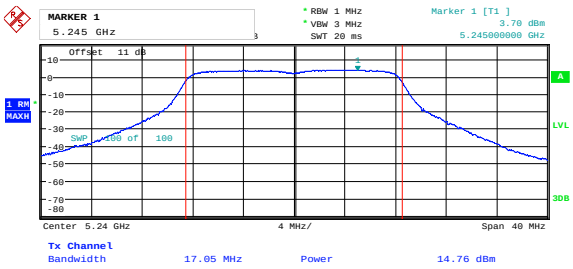
Date: 1.JUL.2015 18:22:00

High channel: Chain 0



Date: 1.JUL.2015 18:44:15

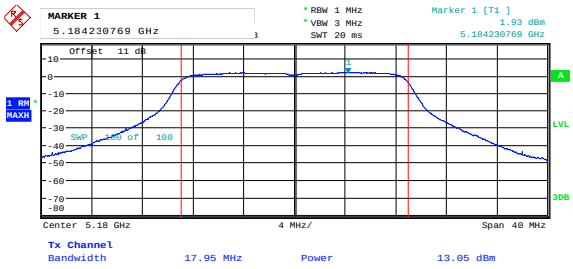
High channel: Chain 1



Date: 1.JUL.2015 18:22:33

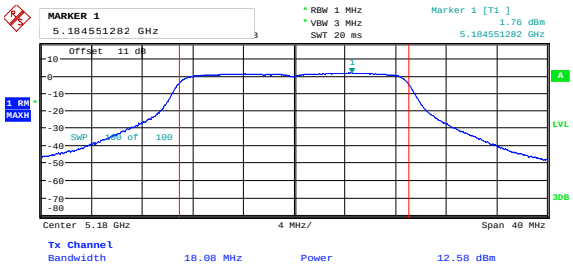
802.11n20 mode

Low channel: Chain 0



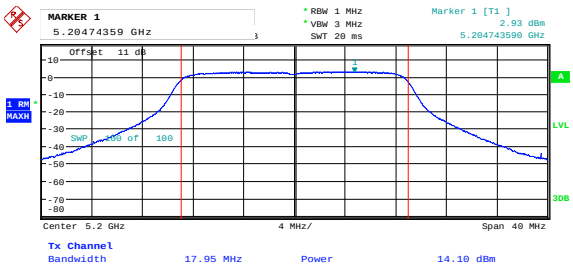
Date: 1.JUL.2015 18:48:33

Low channel: Chain 1



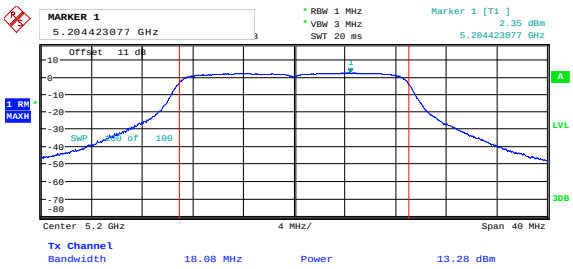
Date: 1.JUL.2015 18:27:46

Middle channel: Chain 0



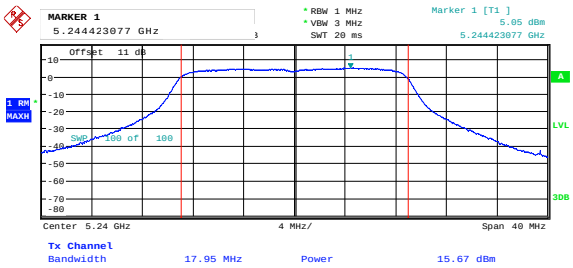
Date: 1.JUL.2015 18:48:55

Middle channel: Chain 1



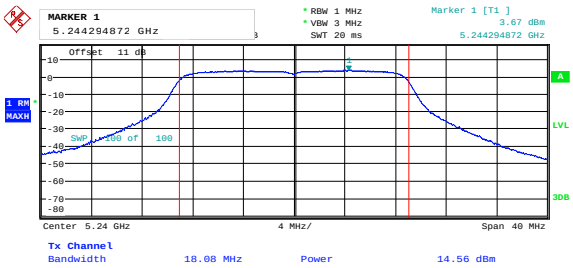
Date: 1.JUL.2015 18:28:04

High channel: Chain 0



Date: 1.JUL.2015 18:49:15

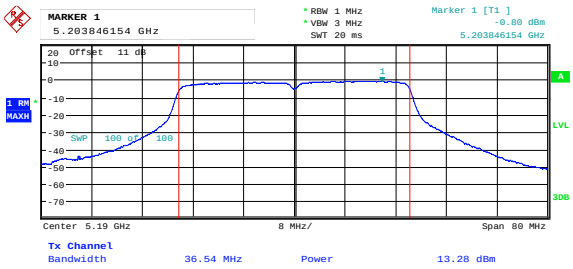
High channel: Chain 1



Date: 1.JUL.2015 18:28:25

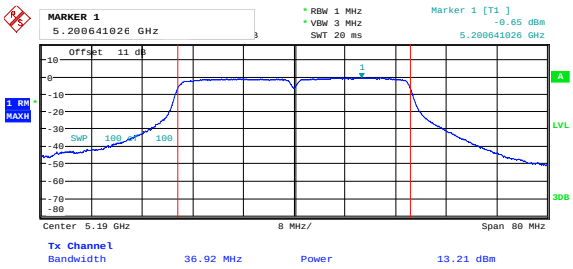
802.11 n40 mode

Low channel: Chain 0



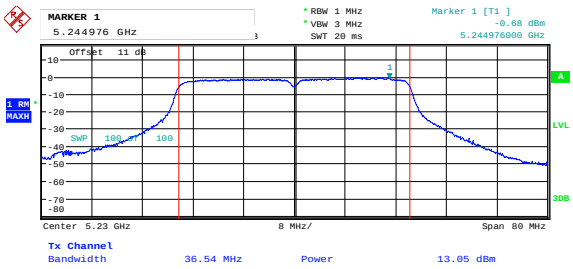
Date: 9.JUL.2015 19:13:32

Low channel: Chain 1



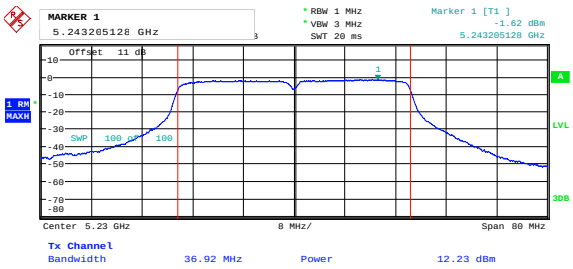
Date: 1.JUL.2015 18:32:58

High channel: Chain 0



Date: 1.JUL.2015 18:54:11

High channel: Chain 1



Date: 1.JUL.2015 18:33:23

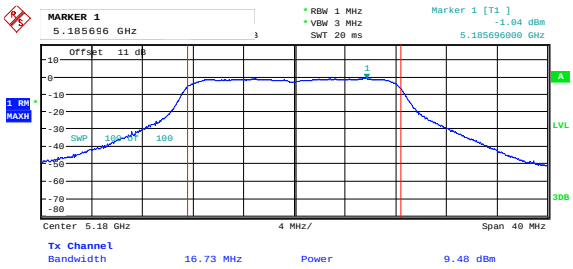
Antenna gain=14 dBi

Channel	Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5180	9.48	8.75	12.14	18.99	Pass
Middle	5200	10.01	9.35	12.70	18.99	Pass
High	5240	9.44	8.47	11.99	18.99	Pass
802.11n20						
Low	5180	9.41	8.68	12.07	18.99	Pass
Middle	5200	10.08	9.28	12.71	18.99	Pass
High	5240	9.38	8.42	11.94	18.99	Pass
802.11n40						
Low	5190	9.73	9.17	12.47	18.99	Pass
High	5230	9.04	8.21	11.66	18.99	Pass

Note: Directional gain=14 dBi + 10lg2 = 17.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. So, the conducted output power limit = 30 dBm - (17.01 dBi – 6 dBi) = 18.99 dBm

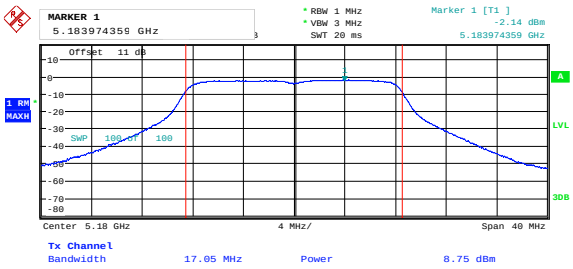
802.11a mode

Low channel: Chain 0



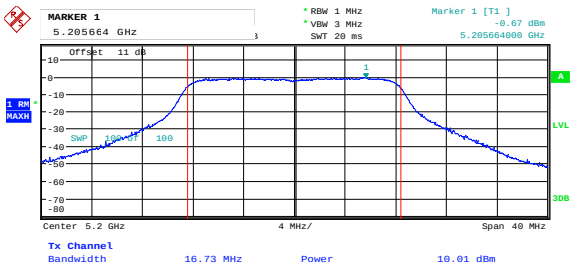
Date: 1.JUL.2015 19:34:56

Low channel: Chain 1



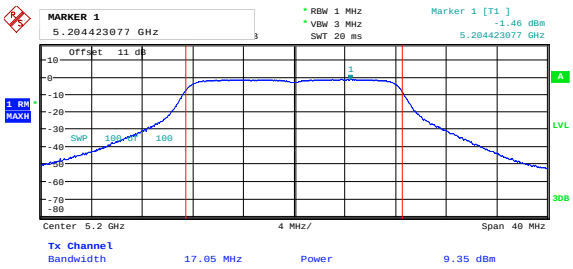
Date: 1.JUL.2015 17:54:19

Middle channel: Chain 0



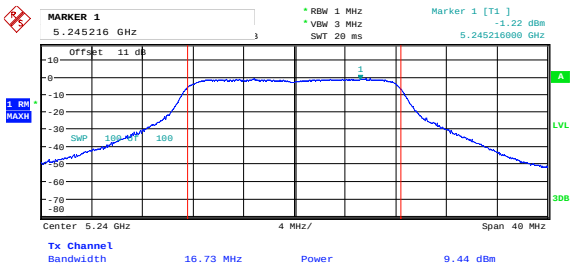
Date: 1.JUL.2015 19:35:43

Middle channel: Chain 1



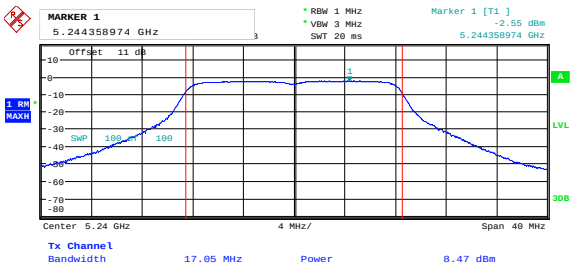
Date: 1.JUL.2015 17:54:58

High channel: Chain 0



Date: 1.JUL.2015 19:36:21

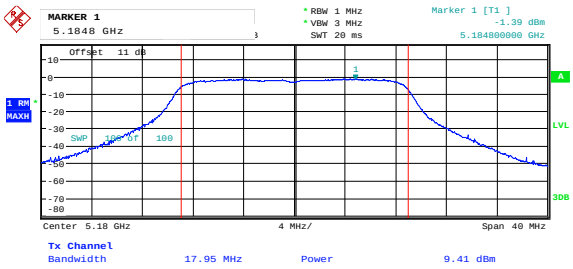
High channel: Chain 1



Date: 1.JUL.2015 17:55:22

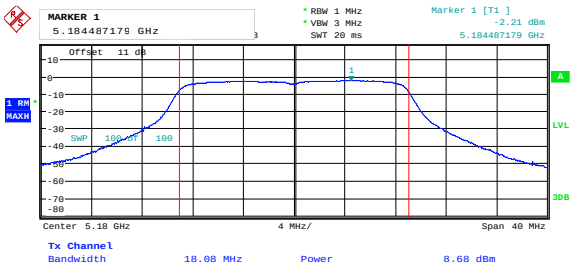
802.11n20 mode

Low channel: Chain 0



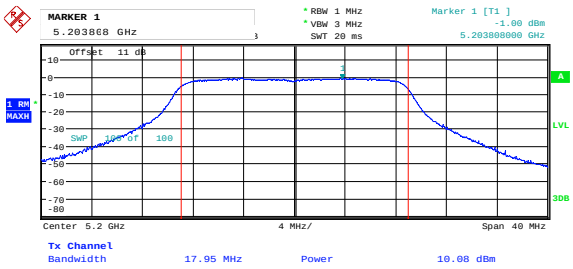
Date: 1.JUL.2015 19:42:27

Low channel: Chain 1



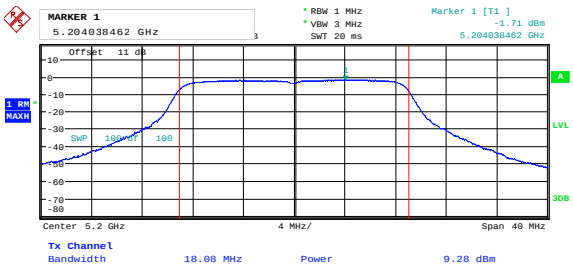
Date: 1.JUL.2015 18:02:36

Middle channel: Chain 0



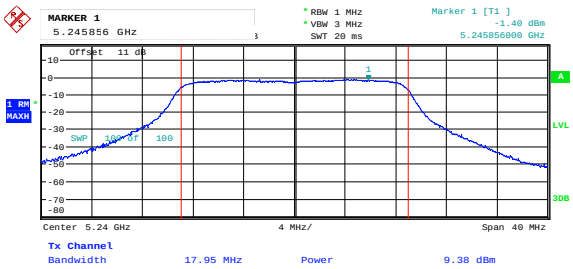
Date: 1.JUL.2015 19:43:03

Middle channel: Chain 1



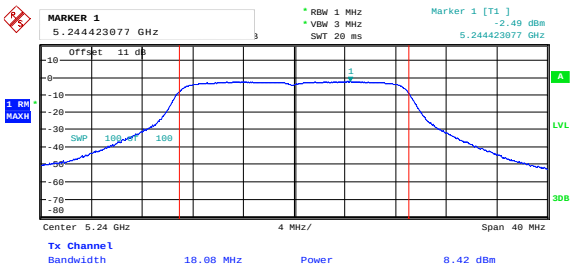
Date: 1.JUL.2015 18:03:09

High channel: Chain 0



Date: 1.JUL.2015 19:43:30

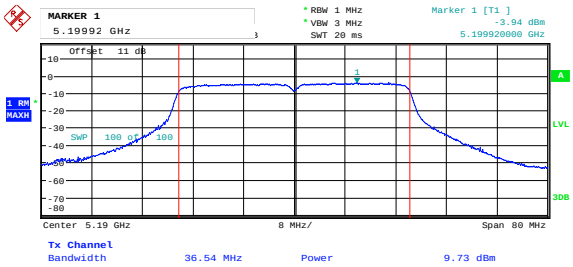
High channel: Chain 1



Date: 1.JUL.2015 18:03:34

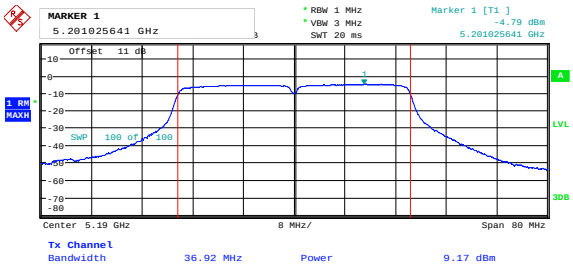
802.11n40 mode

Low channel: Chain 0



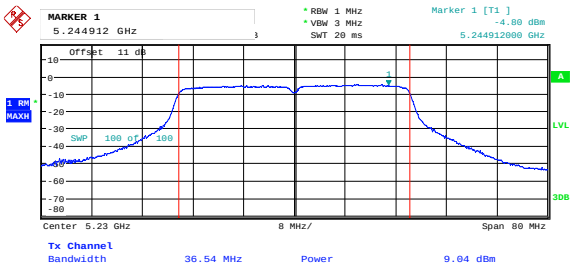
Date: 1.JUL.2015 19:50:58

Low channel: Chain 1



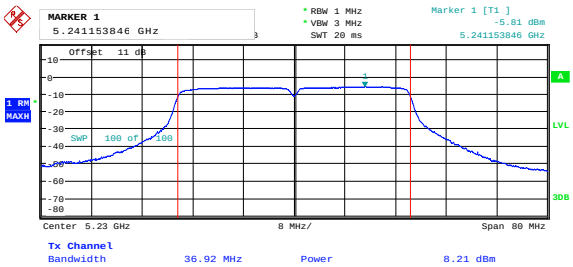
Date: 1.JUL.2015 18:13:14

High channel: Chain 0



Date: 1.JUL.2015 19:51:30

High channel: Chain 1



Date: 1.JUL.2015 18:13:37

5.8 GHz Band

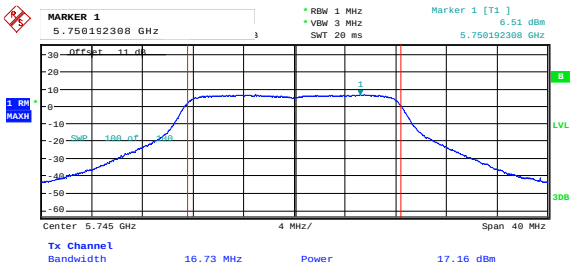
Antenna gain=4 dBi

Channel	Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5745	17.16	15.92	19.59	28.99	Pass
Middle	5785	23.42	21.94	25.75	28.99	Pass
High	5825	20.92	21.76	24.37	28.99	Pass
802.11n20						
Low	5745	16.98	15.72	19.41	28.99	Pass
Middle	5785	21.75	20.14	24.03	28.99	Pass
High	5825	19.81	20.95	23.43	28.99	Pass
802.11n40						
Low	5755	15.13	13.76	17.51	28.99	Pass
High	5795	21.63	19.93	23.87	28.99	Pass

Note: Directional gain=4 dBi + 10lg2 = 7.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. So, the conducted output power limit = 30 dBm - (7.01 dBi – 6 dBi) = 28.99 dBm

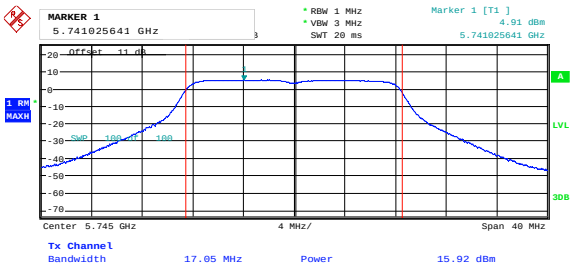
802.11a mode

Low channel: Chain 0



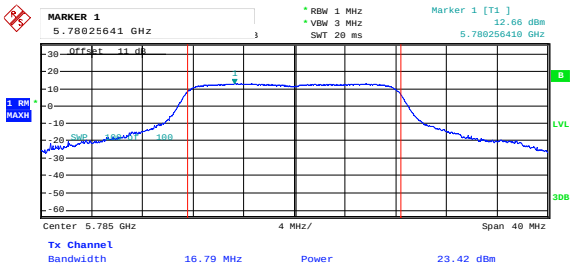
Date: 30.JUN.2015 19:59:55

Low channel: Chain 1



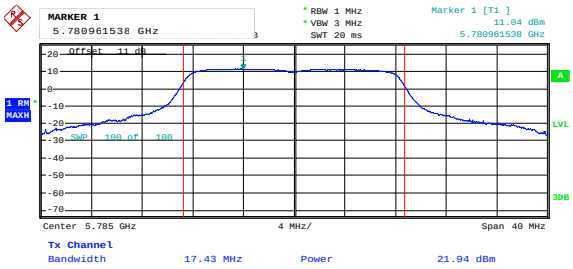
Date: 1.JUL.2015 15:40:35

Middle channel: Chain 0



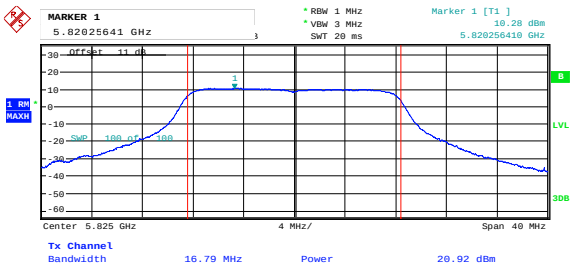
Date: 30.JUN.2015 20:00:38

Middle channel: Chain 1



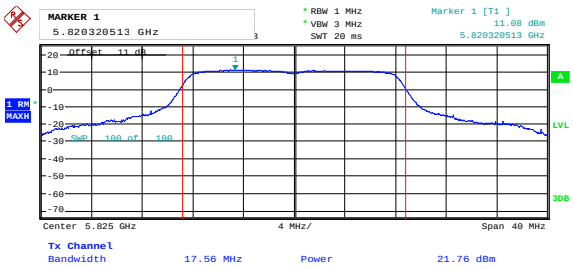
Date: 1.JUL.2015 15:41:49

High channel: Chain 0



Date: 30.JUN.2015 20:01:30

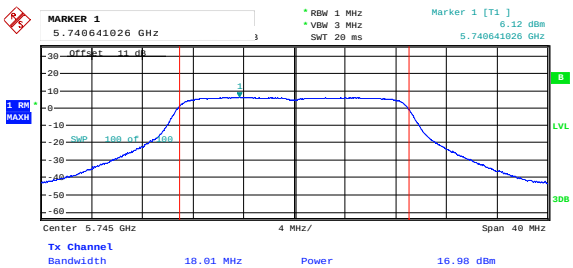
High channel: Chain 1



Date: 1.JUL.2015 15:42:40

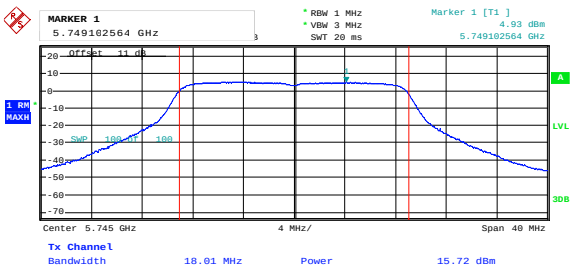
802.11n20 mode

Low channel: Chain 0



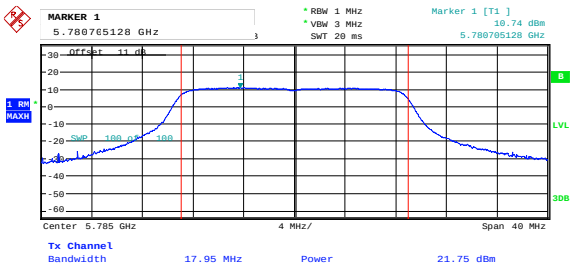
Date: 30.JUN.2015 20:10:02

Low channel: Chain 1



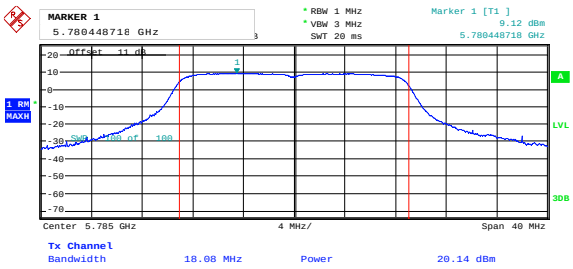
Date: 1.JUL.2015 15:49:18

Middle channel: Chain 0



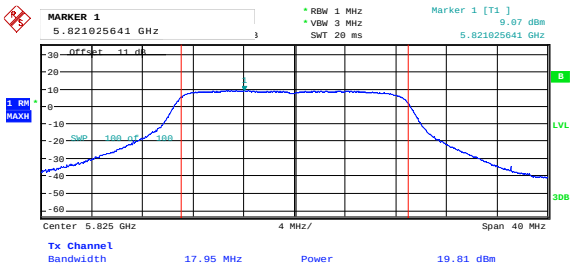
Date: 30.JUN.2015 20:10:49

Middle channel: Chain 1



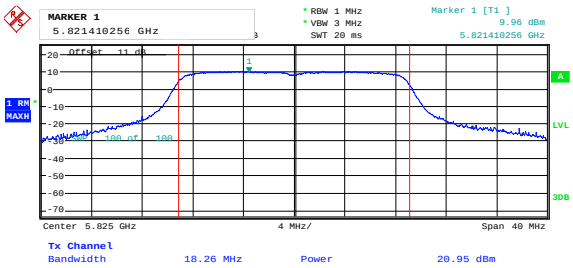
Date: 1.JUL.2015 15:50:13

High channel: Chain 0



Date: 30.JUN.2015 20:11:15

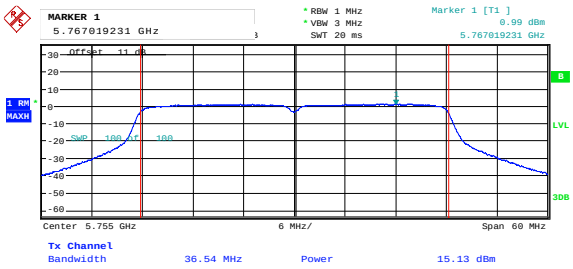
High channel: Chain 1



Date: 1.JUL.2015 15:50:48

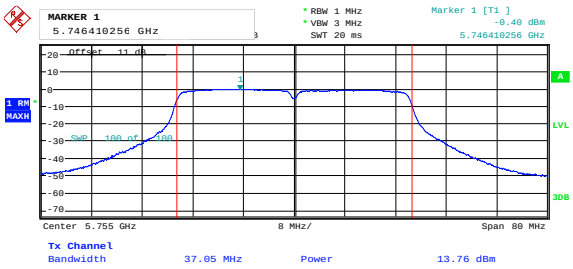
802.11n40 mode

Low channel: Chain 0



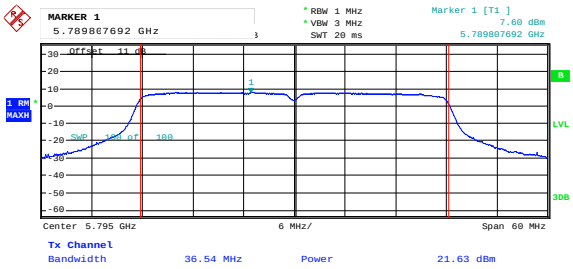
Date: 30.JUN.2015 20:17:55

Low channel: Chain 1



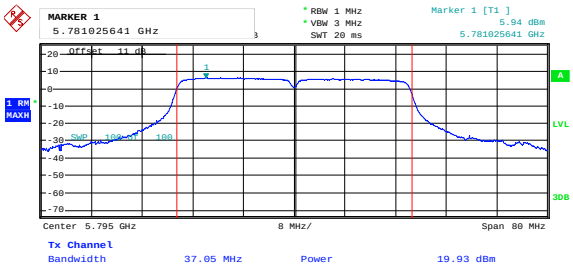
Date: 1.JUL.2015 15:57:37

High channel: Chain 0



Date: 30.JUN.2015 20:18:41

High channel: Chain 1



Date: 1.JUL.2015 15:58:20

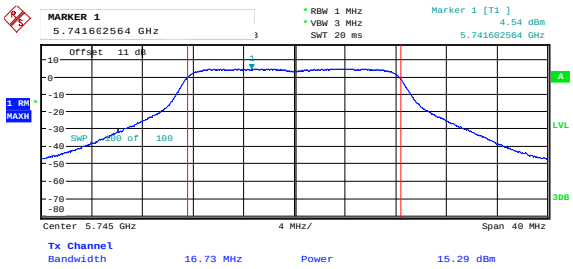
Antenna gain=7 dBi

Channel	Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5745	15.29	13.90	17.66	25.99	Pass
Middle	5785	22.85	21.30	25.15	25.99	Pass
High	5825	18.58	19.09	21.85	25.99	Pass
802.11n20						
Low	5745	15.26	13.92	17.65	25.99	Pass
Middle	5785	21.19	18.49	23.06	25.99	Pass
High	5825	18.91	18.97	21.95	25.99	Pass
802.11n40						
Low	5755	13.62	11.95	15.88	25.99	Pass
High	5795	21.11	19.41	23.35	25.99	Pass

Note: Directional gain=7 dBi + 10lg2 = 10.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. So, the conducted output power limit = 30 dBm - (10.01 dBi – 6 dBi) = 25.99 dBm

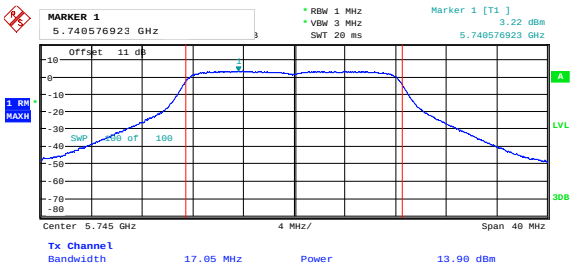
802.11a mode

Low channel: Chain 0



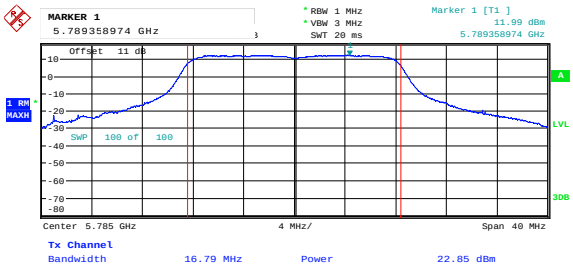
Date: 1.JUL.2015 18:46:55

Low channel: Chain 1



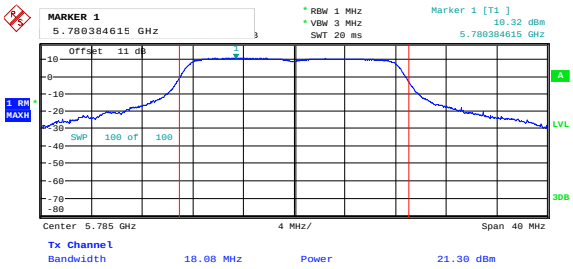
Date: 1.JUL.2015 18:24:56

Middle channel: Chain 0



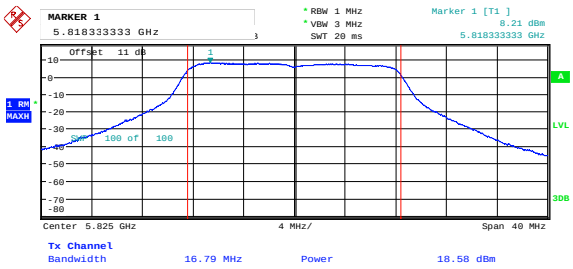
Date: 1.JUL.2015 18:47:20

Middle channel: Chain 1



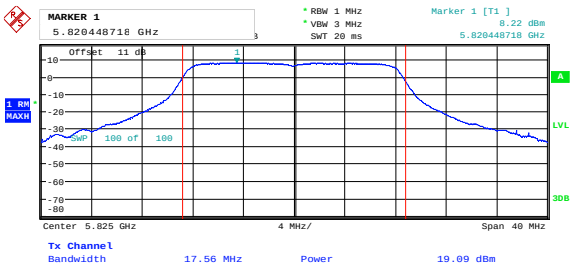
Date: 1.JUL.2015 18:26:24

High channel: Chain 0



Date: 1.JUL.2015 18:47:46

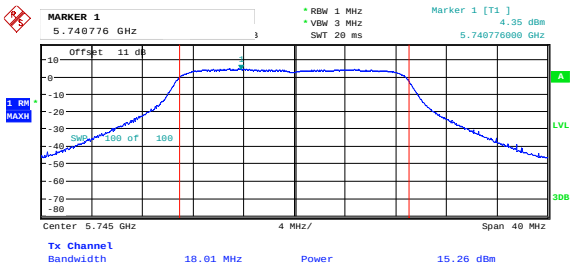
High channel: Chain 1



Date: 1.JUL.2015 18:27:14

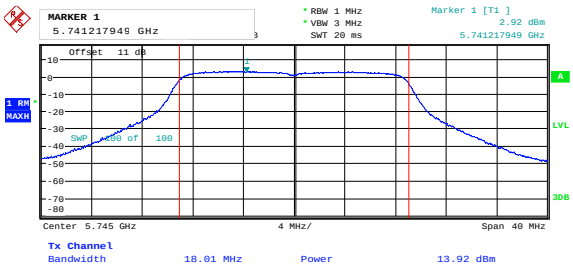
802.11n20 mode

Low channel: Chain 0



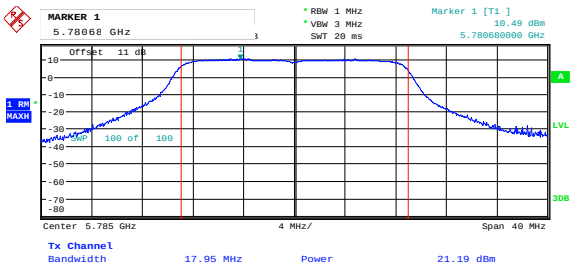
Date: 1.JUL.2015 18:52:07

Low channel: Chain 1



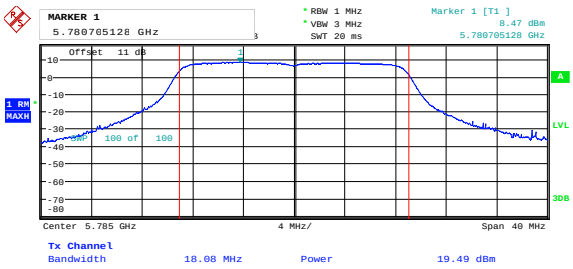
Date: 1.JUL.2015 18:30:48

Middle channel: Chain 0



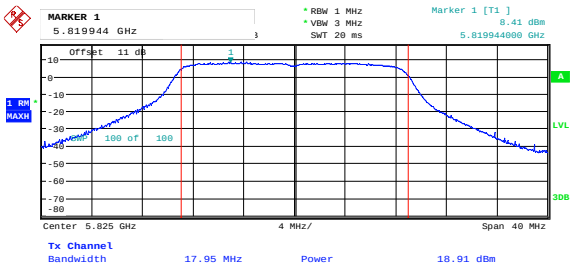
Date: 1.JUL.2015 18:52:41

Middle channel: Chain 1



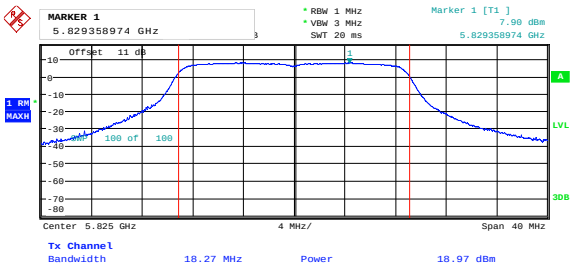
Date: 1.JUL.2015 18:31:41

High channel: Chain 0



Date: 1.JUL.2015 18:53:08

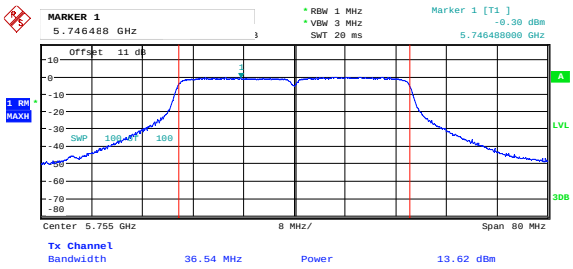
High channel: Chain 1



Date: 1.JUL.2015 18:32:13

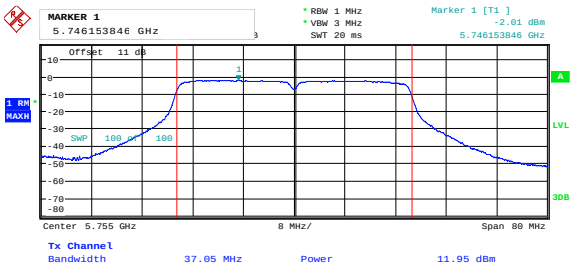
802.11n40 mode

Low channel: Chain 0



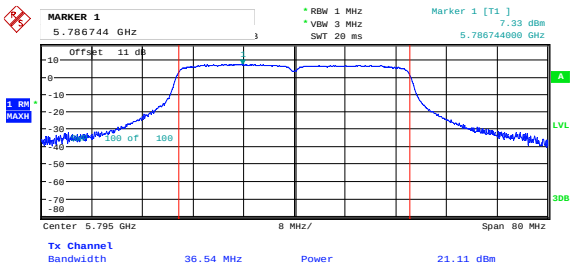
Date: 1.JUL.2015 18:57:14

Low channel: Chain 1



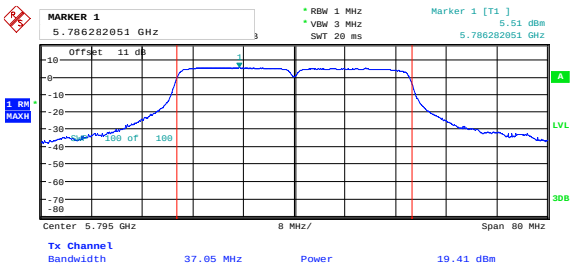
Date: 1.JUL.2015 18:36:21

High channel: Chain 0



Date: 1.JUL.2015 18:56:41

High channel: Chain 1



Date: 1.JUL.2015 18:37:29

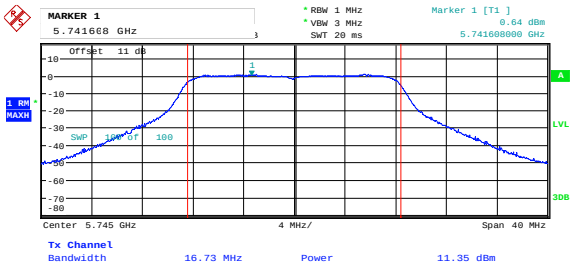
Antenna gain=14 dBi

Channel	Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5745	11.35	9.60	13.57	18.99	Pass
Middle	5785	12.43	10.62	14.63	18.99	Pass
High	5825	10.81	10.72	13.78	18.99	Pass
802.11n20						
Low	5745	11.14	9.54	13.42	18.99	Pass
Middle	5785	12.20	10.46	14.43	18.99	Pass
High	5825	10.68	10.67	13.69	18.99	Pass
802.11n40						
Low	5755	6.45	4.79	8.71	18.99	Pass
High	5795	13.24	10.84	15.21	18.99	Pass

Note: Directional gain=14 dBi + 10lg2 = 17.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. So, the conducted output power limit = 30 dBm - (17.01 dBi – 6 dBi) = 18.99 dBm

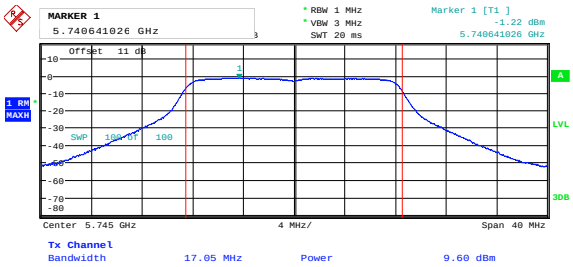
802.11a mode

Low channel: Chain 0



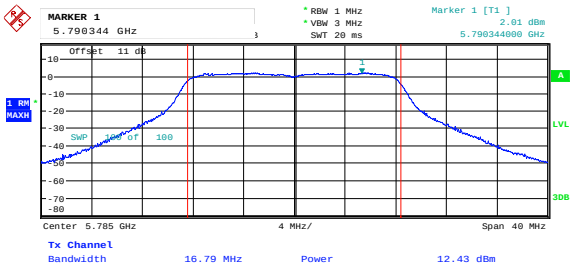
Date: 1.JUL.2015 19:40:24

Low channel: Chain 1



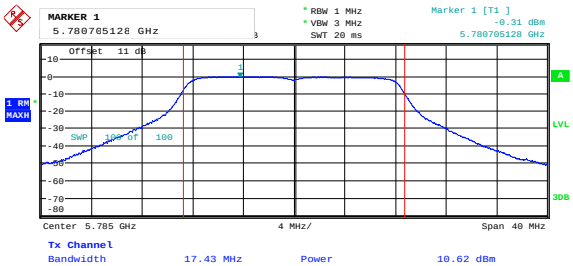
Date: 1.JUL.2015 18:00:11

Middle channel: Chain 0



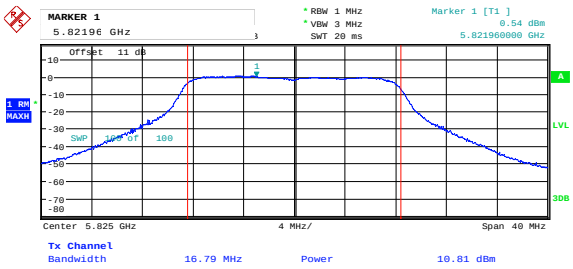
Date: 1.JUL.2015 19:41:02

Middle channel: Chain 1



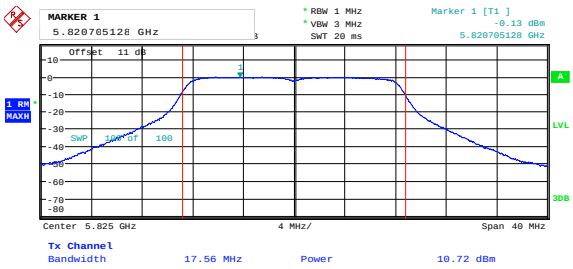
Date: 1.JUL.2015 18:00:54

High channel: Chain 0



Date: 1.JUL.2015 19:41:35

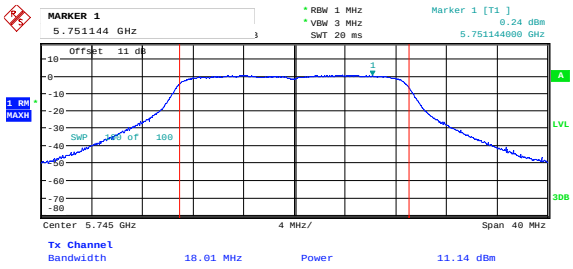
High channel: Chain 1



Date: 1.JUL.2015 18:01:26

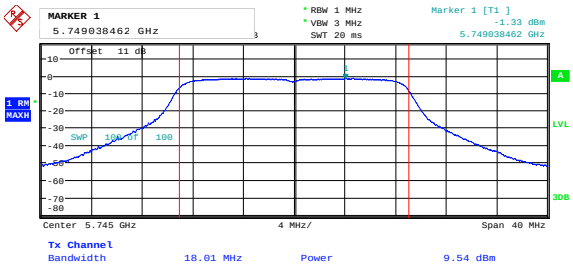
802.11n20 mode

Low channel: Chain 0



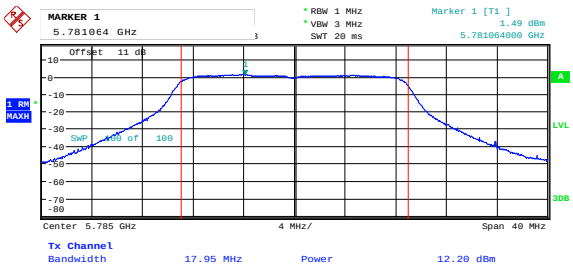
Date: 1.JUL.2015 19:48:07

Low channel: Chain 1



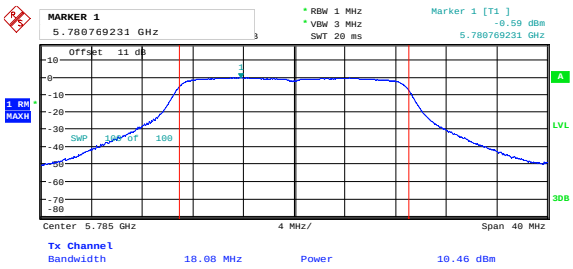
Date: 1.JUL.2015 18:10:15

Middle channel: Chain 0



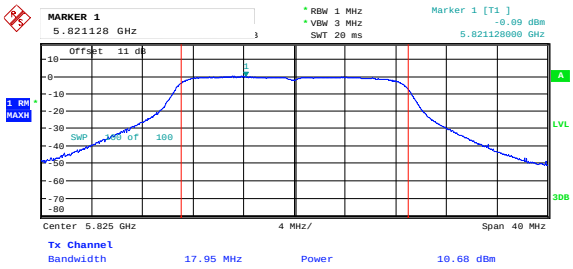
Date: 1.JUL.2015 19:48:43

Middle channel: Chain 1



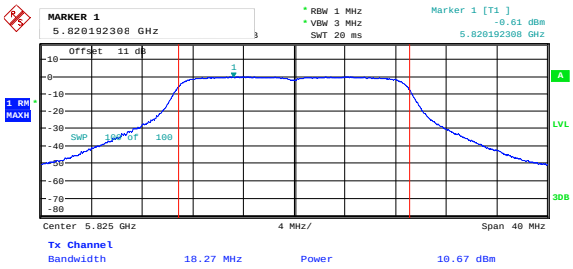
Date: 1.JUL.2015 18:10:55

High channel: Chain 0



Date: 1.JUL.2015 19:49:19

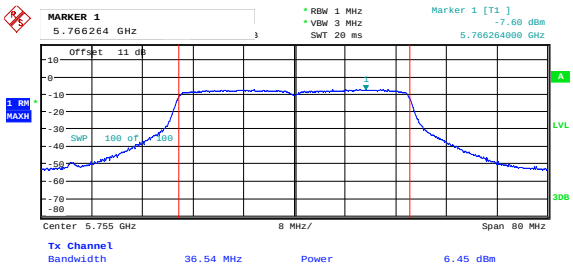
High channel: Chain 1



Date: 1.JUL.2015 18:11:48

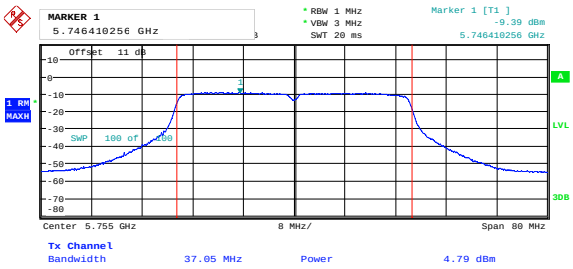
802.11n40 mode

Low channel: Chain 0



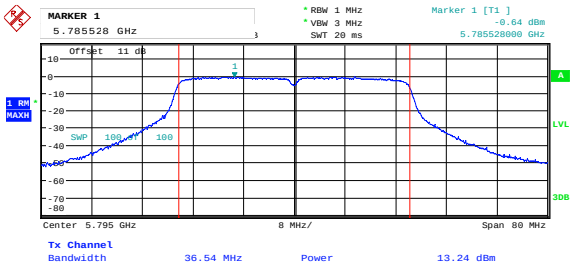
Date: 1.JUL.2015 19:55:02

Low channel: Chain 1



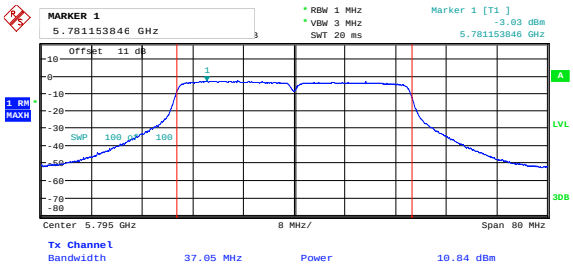
Date: 1.JUL.2015 18:18:01

High channel: Chain 0



Date: 1.JUL.2015 19:55:38

High channel: Chain 1



Date: 1.JUL.2015 18:18:41

10 FCC §15.407(b) - Spurious Emissions at Antenna Ports

10.1 Applicable Standards

According to FCC §15.407(b)

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

(b) (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz

10.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedures New Rules v01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section H: Unwanted emissions measurement

10.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Spectrum Analyzer	FSQ	1155.5001.26	2015-03-09	1 year
Agilent	Spectrum Analyzer	E4446A	US44300386	2014-10-24	1 year
-	SMA Cable	-	C0001	Each Time[1]	N/A
-	Attenuator	BW-S10W5	1419	Each Time[1]	N/A

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.*

10.4 Test Environmental Conditions

Temperature:	22 ºC
Relative Humidity:	40 %
ATM Pressure:	103.8 kPa

The testing was performed by Jimmy Xiao from 2015-07-02 at RF site.

10.5 Test Results

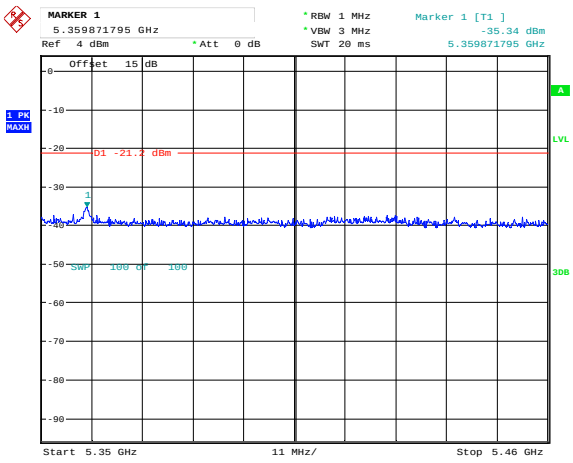
Please refer to the following plots

5.2 GHz Restricted Band

Antenna gain=4 dBi (Chain 0)

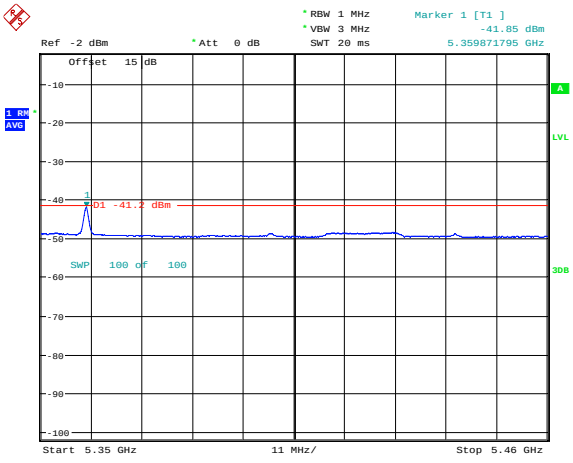
802.11a mode

Low channel (Peak)



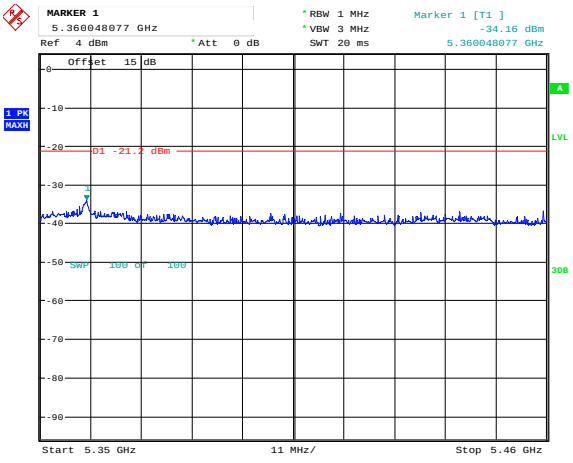
Date: 23.JUN.2015 19:03:32

Low channel (Ave)



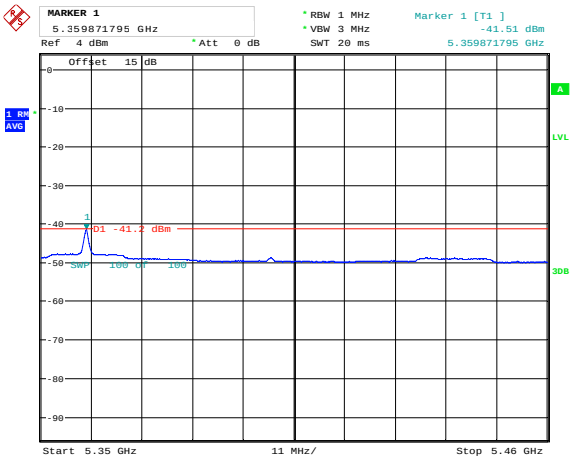
Date: 2.JUL.2015 16:18:28

Middle channel (Peak)



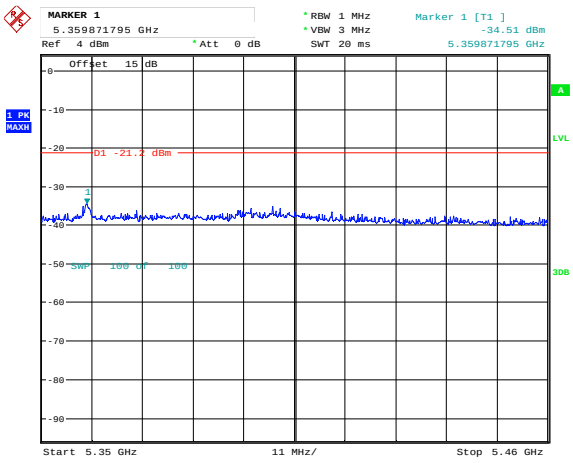
Date: 23.JUN.2015 19:08:10

Middle channel (Ave)



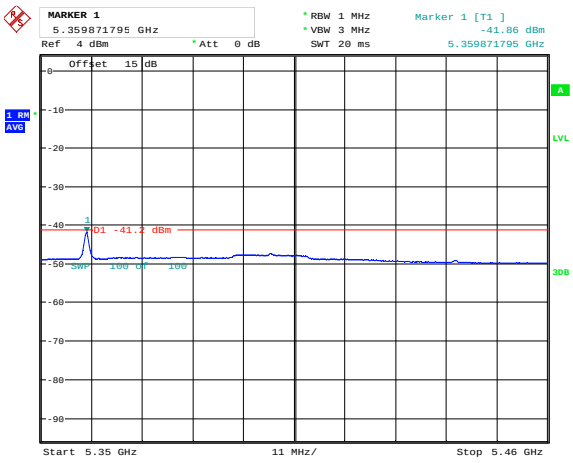
Date: 23.JUN.2015 19:07:31

High channel (Peak)



Date: 23.JUN.2015 19:11:46

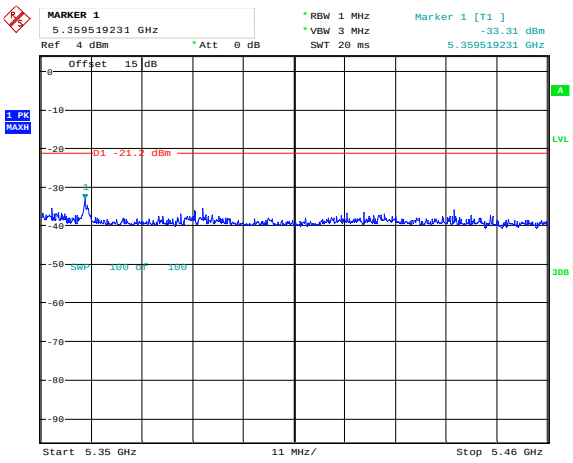
High channel (Ave)



Date: 23.JUN.2015 19:10:57

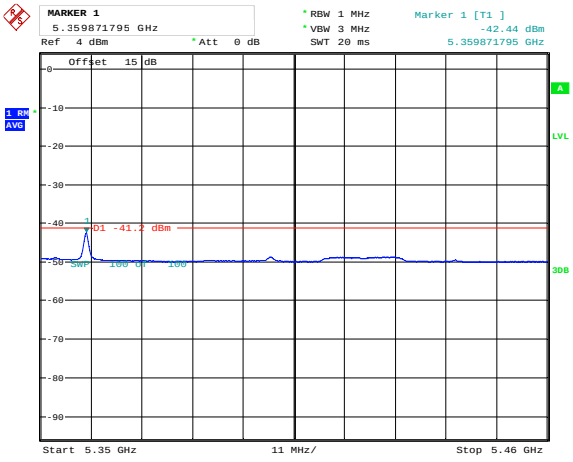
802.11n20 mode

Low channel (Peak)



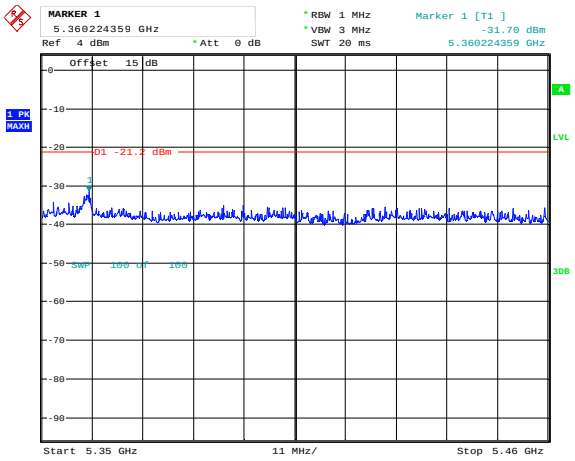
Date: 23.JUN.2015 19:15:08

Low channel (Ave)



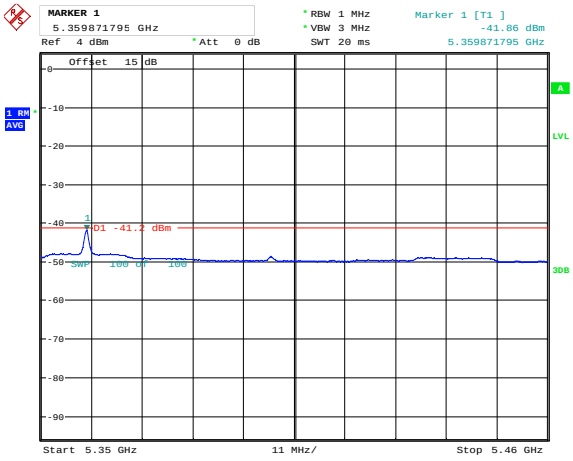
Date: 23.JUN.2015 19:14:25

Middle channel (Peak)



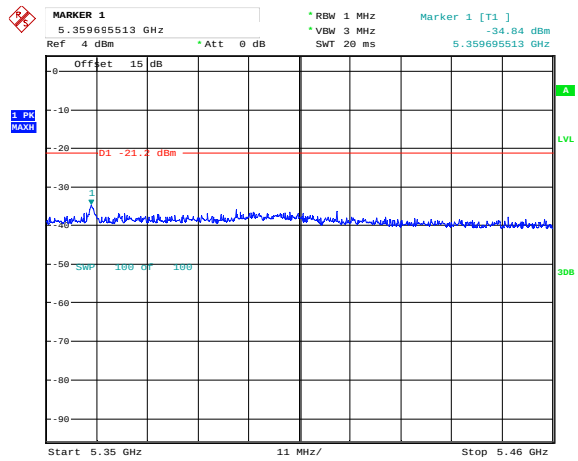
Date: 23.JUN.2015 19:16:57

Middle channel (Ave)



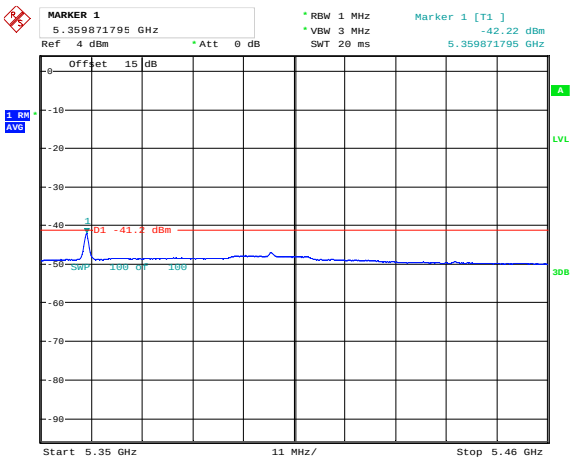
Date: 23.JUN.2015 19:16:19

High channel (Peak)



Date: 23.JUN.2015 19:18:42

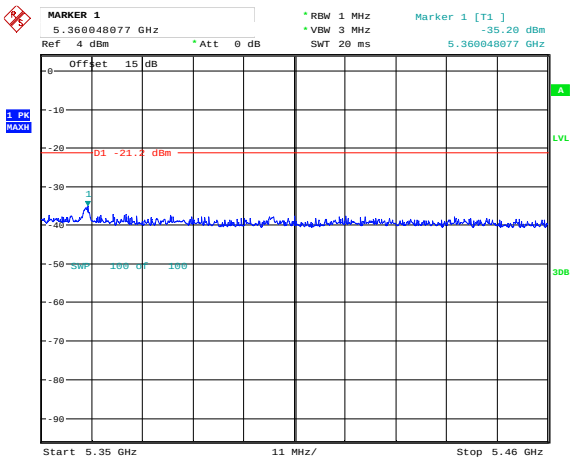
High channel (Ave)



Date: 23.JUN.2015 19:18:11

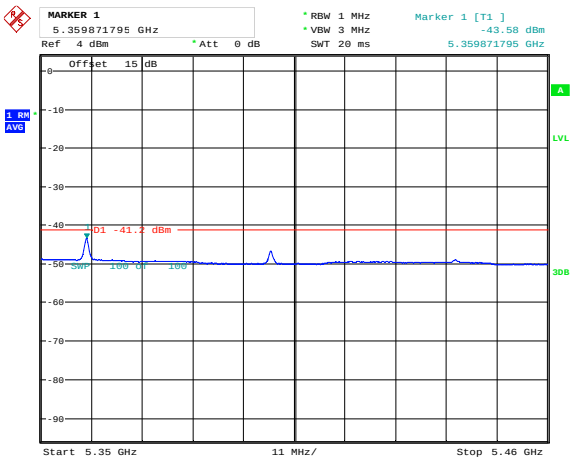
802.11n40 mode

Low channel (Peak)



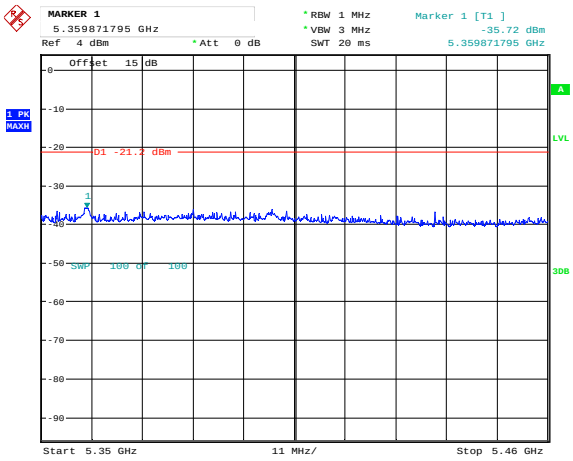
Date: 23.JUN.2015 20:00:35

Low channel (Ave)



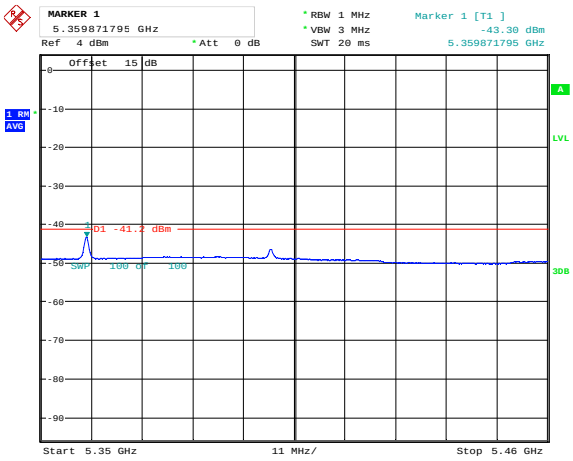
Date: 23.JUN.2015 19:59:47

High channel (Peak)



Date: 23.JUN.2015 20:03:14

High channel (Ave)

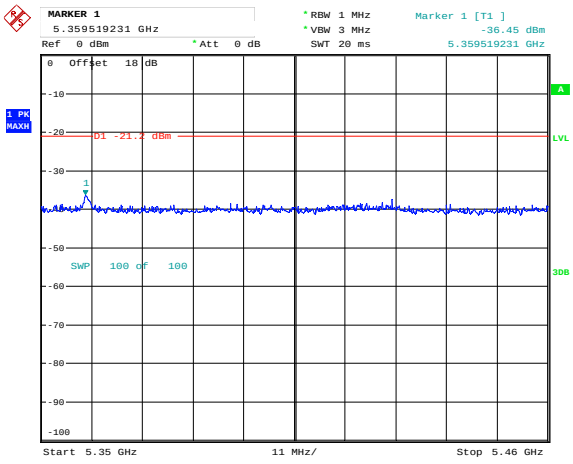


Date: 23.JUN.2015 20:02:35

Antenna gain=7 dBi (Chain 0)

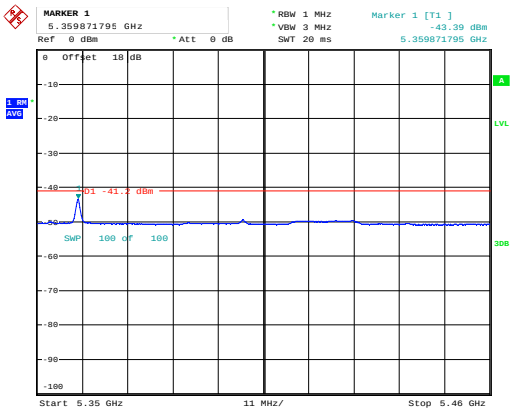
802.11a mode

Low channel (Peak)



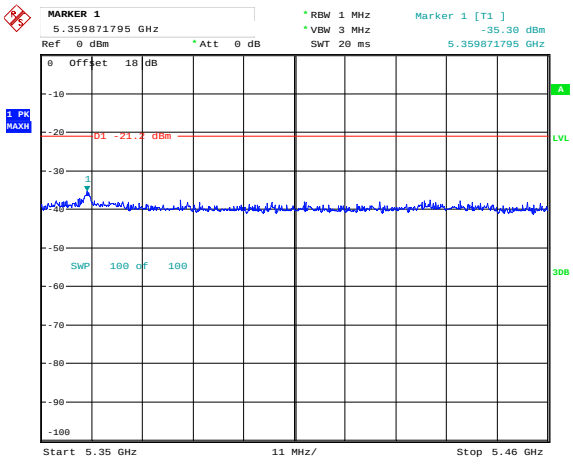
Date: 22.JUN.2015 21:25:52

Low channel (Ave)



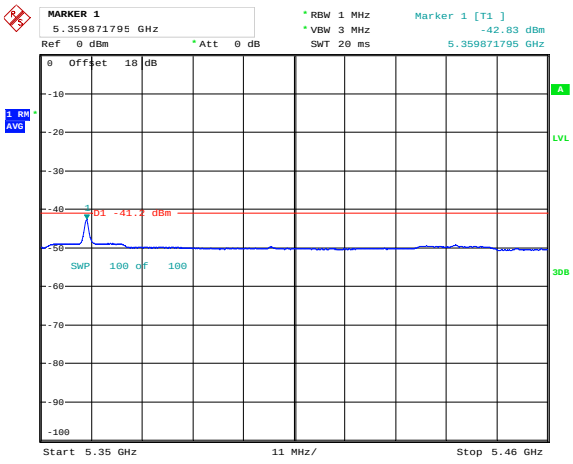
Date: 22.JUN.2015 21:25:04

Middle channel (Peak)



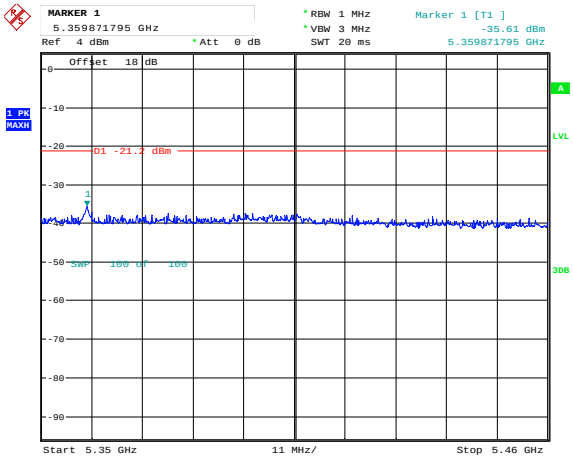
Date: 22.JUN.2015 21:31:09

Middle channel (Ave)



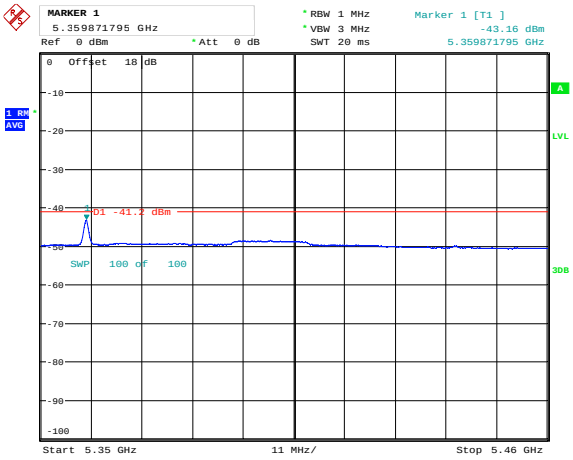
Date: 22.JUN.2015 21:30:15

High channel (Peak)



Date: 22.JUN.2015 21:36:18

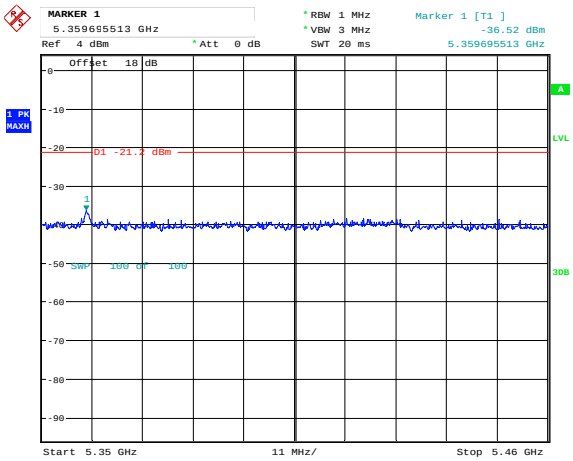
High channel (Ave)



Date: 22.JUN.2015 21:35:35

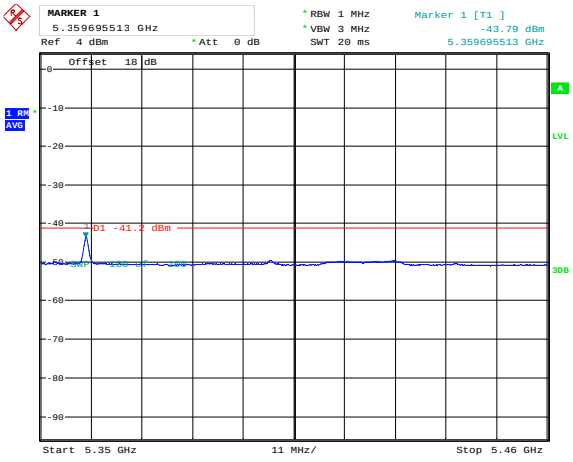
802.11n20 mode

Low channel (Peak)



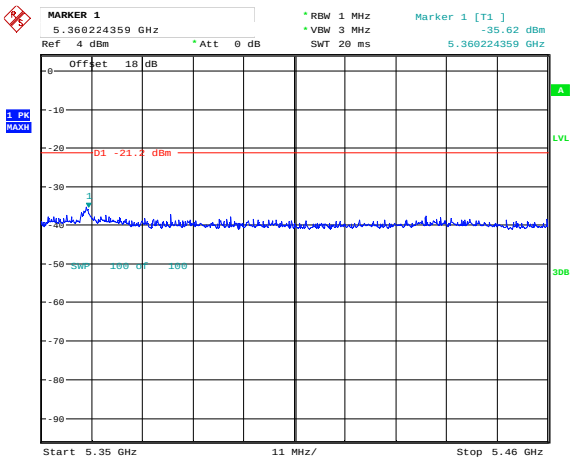
Date: 22.JUN.2015 21:40:41

Low channel (Ave)



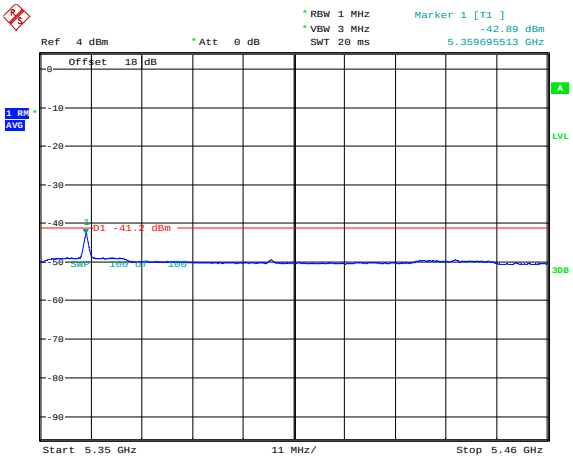
Date: 22.JUN.2015 21:40:02

Middle channel (Peak)



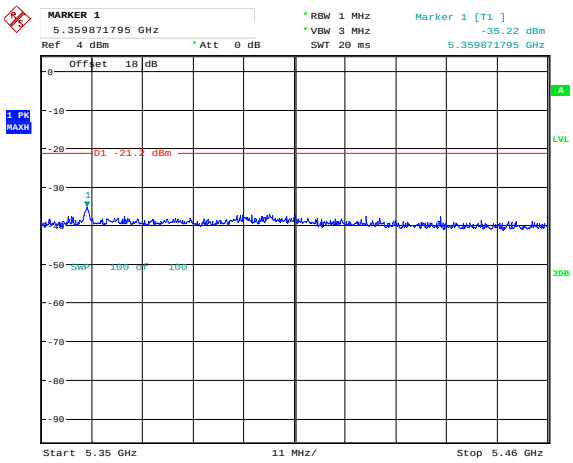
Date: 22.JUN.2015 21:43:33

Middle channel (Ave)



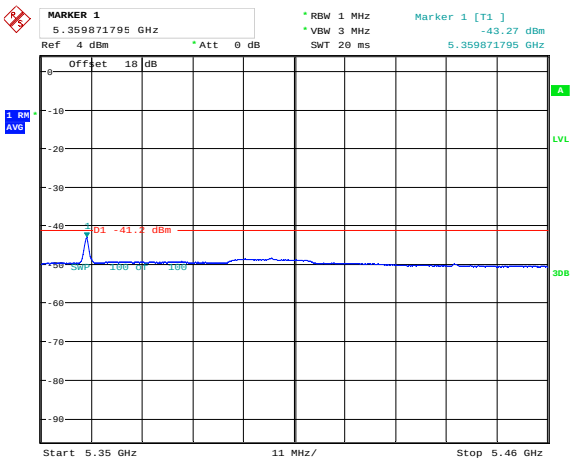
Date: 22.JUN.2015 21:42:53

High channel (Peak)



Date: 22.JUN.2015 21:45:53

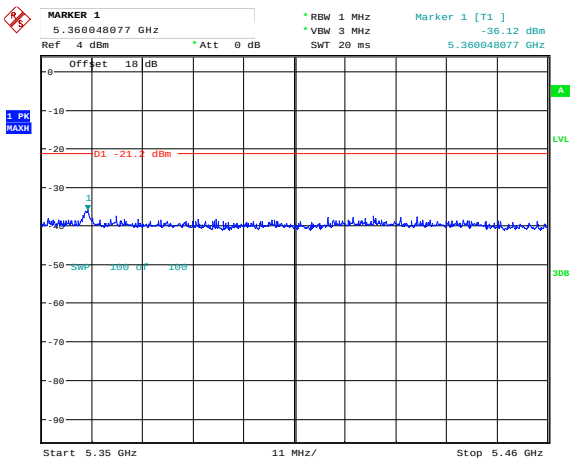
High channel (Ave)



Date: 22.JUN.2015 21:45:08

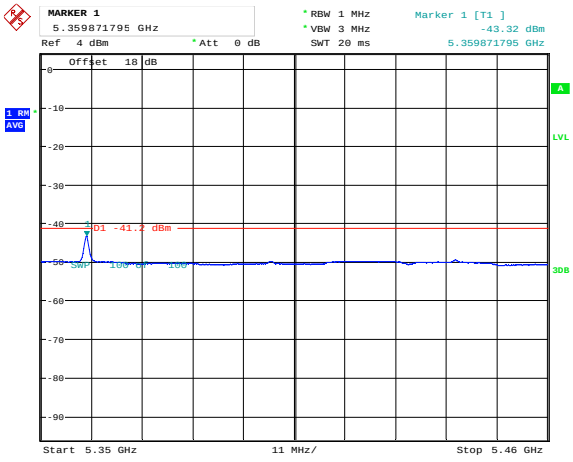
802.11n40 mode

Low channel (Peak)



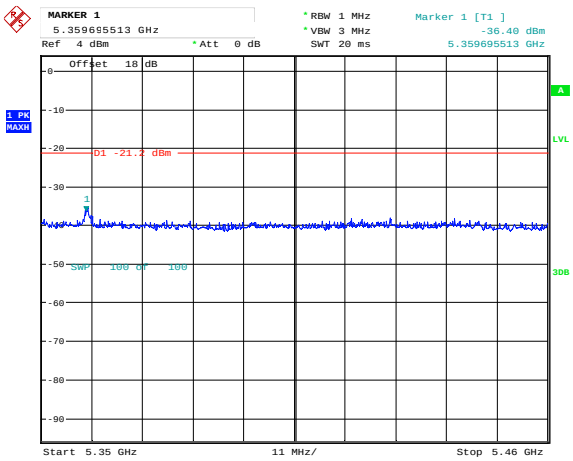
Date: 22.JUN.2015 21:54:41

Low channel (Ave)



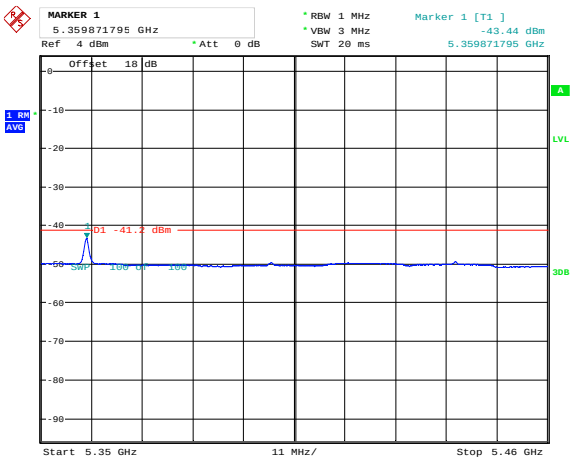
Date: 22.JUN.2015 21:53:52

High channel (Peak)



Date: 22.JUN.2015 22:01:31

High channel (Ave)

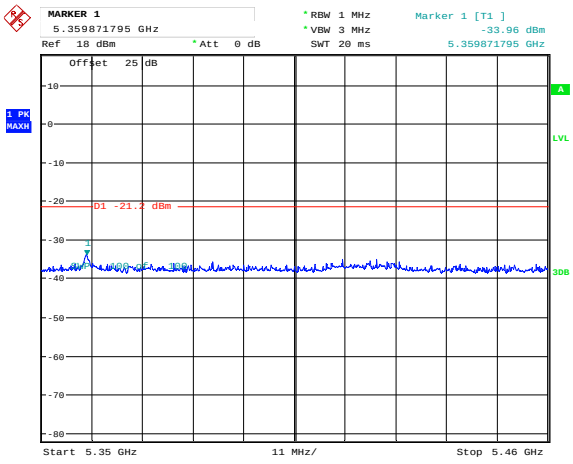


Date: 22.JUN.2015 22:00:59

Antenna gain=14 dBi (Chain 0)

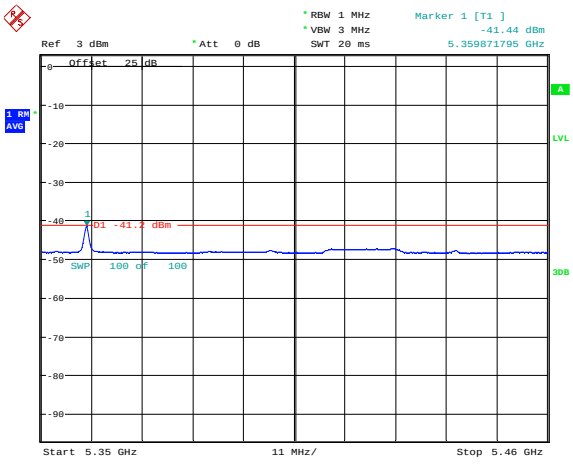
802.11a mode

Low channel (Peak)



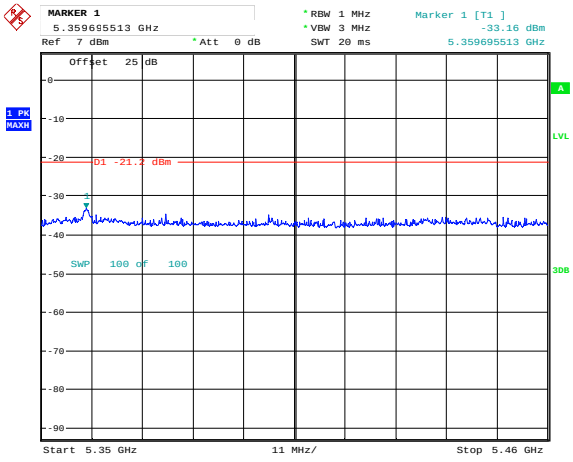
Date: 22.JUN.2015 18:15:16

Low channel (Ave)



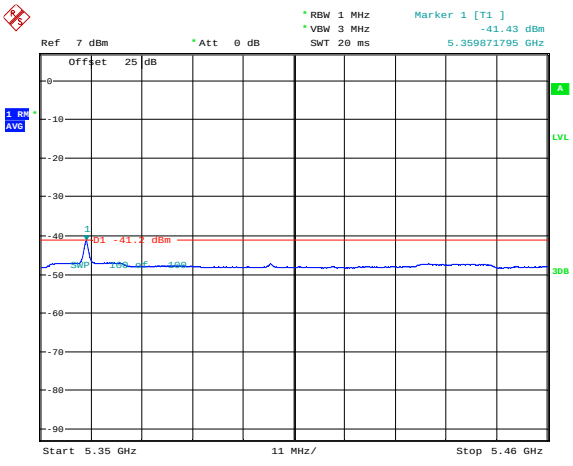
Date: 22.JUN.2015 18:10:39

Middle channel (Peak)



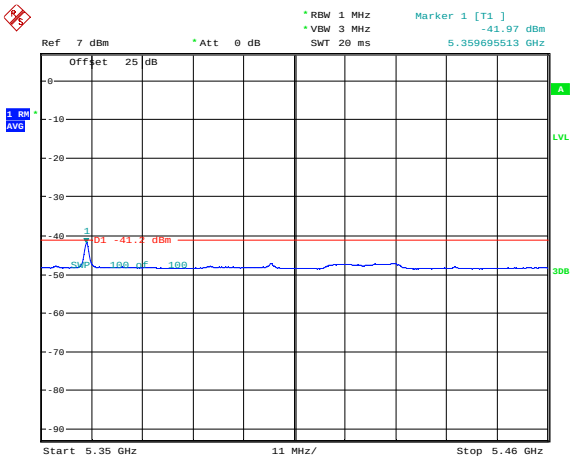
Date: 22.JUN.2015 18:26:39

Middle channel (Ave)



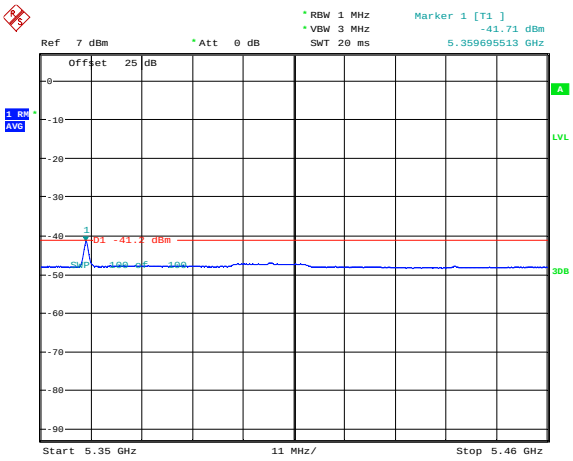
Date: 22.JUN.2015 18:24:45

High channel (Peak)



Date: 22.JUN.2015 18:37:33

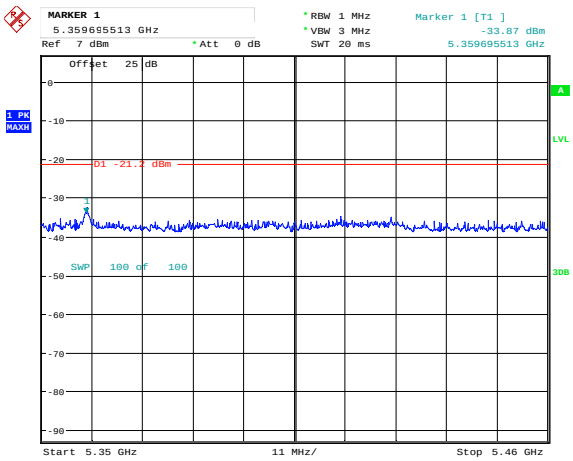
High channel (Ave)



Date: 22.JUN.2015 18:30:57

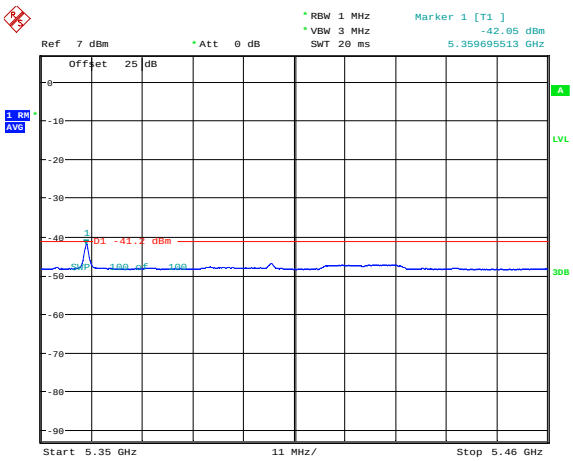
802.11n20 mode

Low channel (Peak)



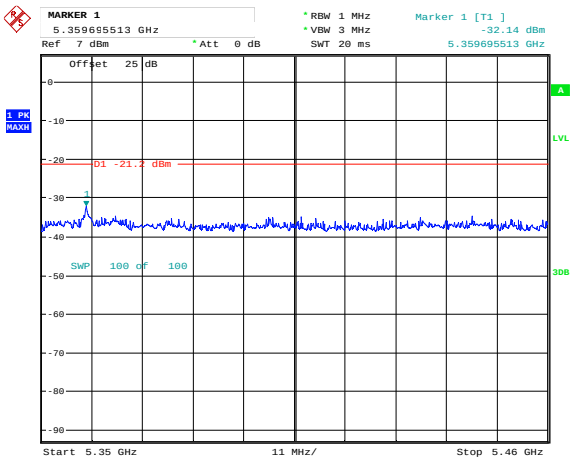
Date: 22.JUN.2015 18:49:52

Low channel (Ave)



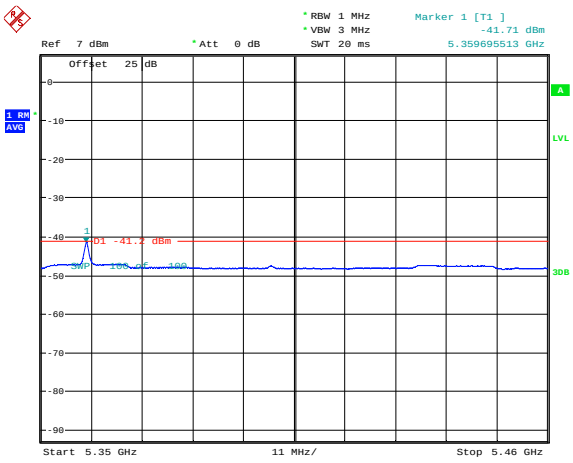
Date: 22.JUN.2015 18:48:57

Middle channel (Peak)



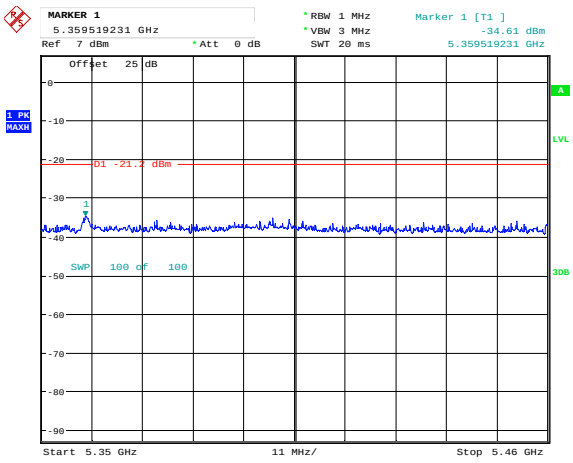
Date: 22.JUN.2015 18:54:02

Middle channel (Ave)



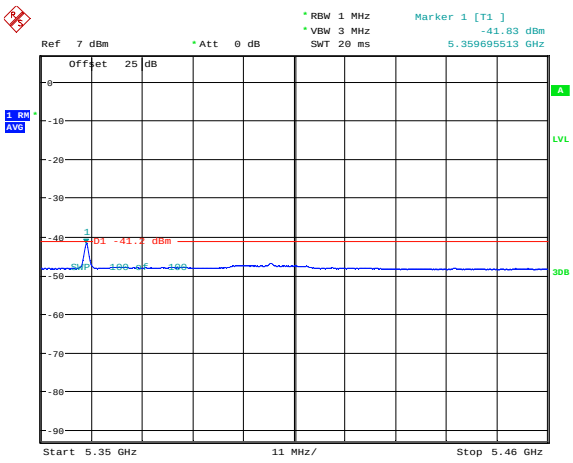
Date: 22.JUN.2015 18:53:22

High channel (Peak)



Date: 22.JUN.2015 18:57:15

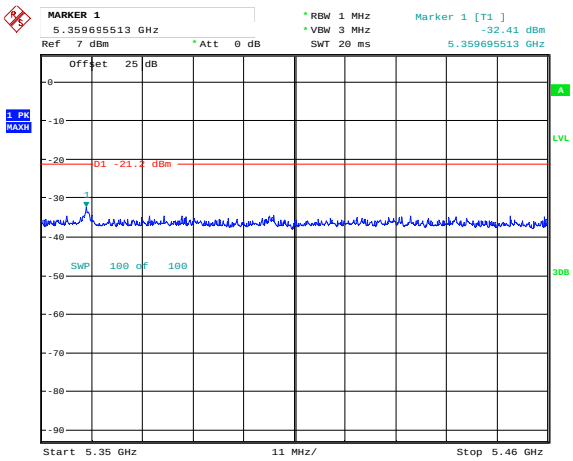
High channel (Ave)



Date: 22.JUN.2015 18:56:32

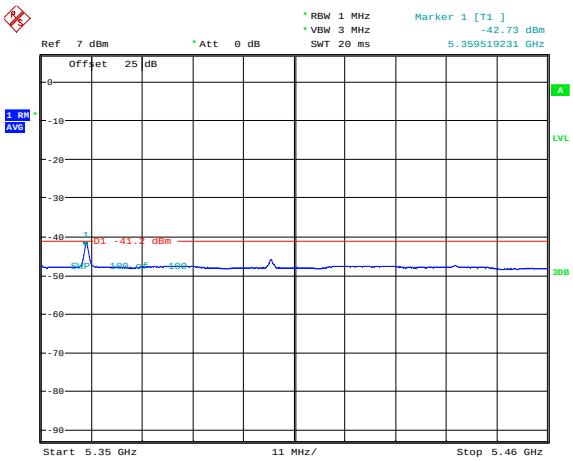
802.11n40 mode

Low channel (Peak)



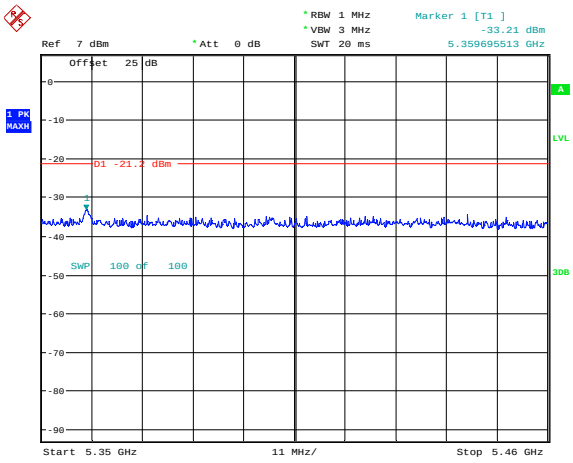
Date: 22.JUN.2015 19:09:22

Low channel (Ave)



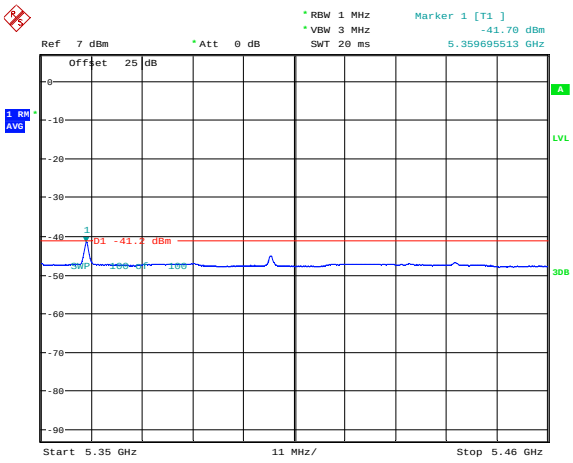
Date: 22.JUN.2015 19:08:16

High channel (Peak)



Date: 22.JUN.2015 19:12:23

High channel (Ave)

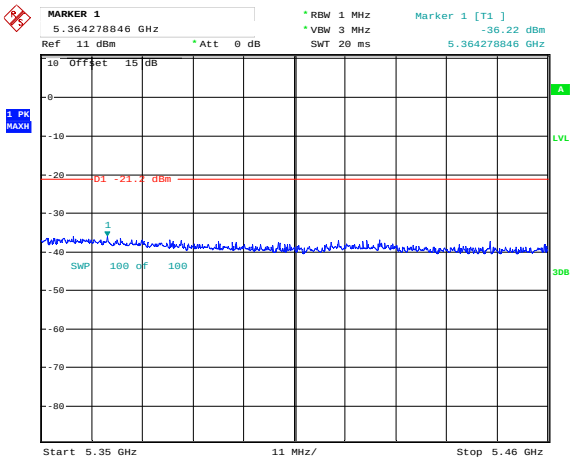


Date: 22.JUN.2015 19:11:36

Antenna gain=4 dBi (Chain 1)

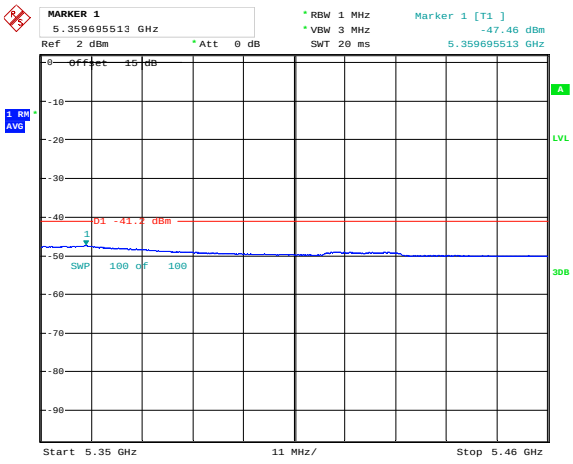
802.11a mode

Low channel (Peak)



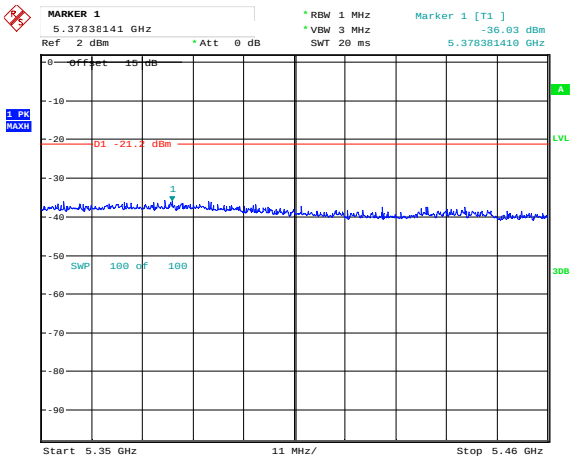
Date: 2.JUL.2015 16:26:53

Low channel (Ave)



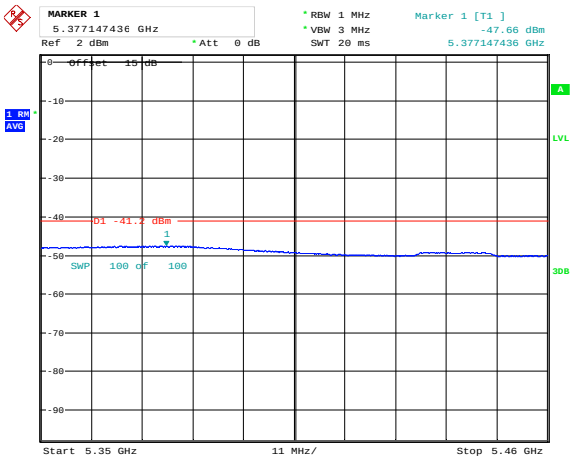
Date: 2.JUL.2015 16:28:08

Middle channel (Peak)



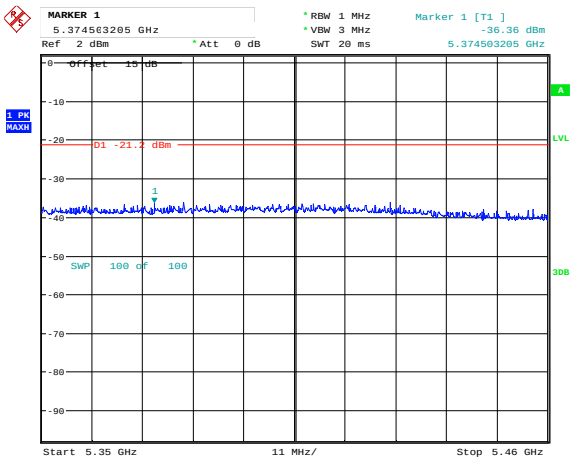
Date: 2.JUL.2015 16:29:18

Middle channel (Ave)



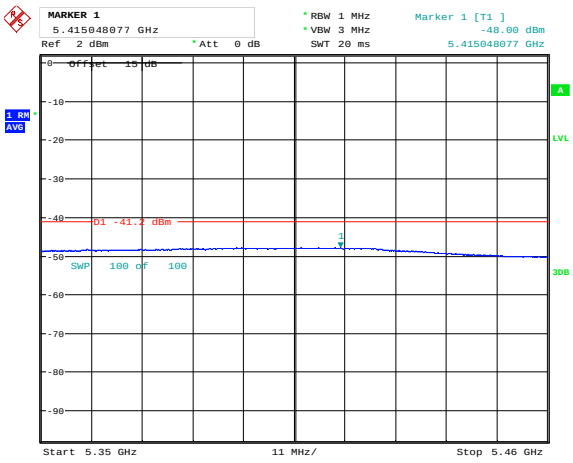
Date: 2.JUL.2015 16:28:49

High channel (Peak)



Date: 2.JUL.2015 16:29:54

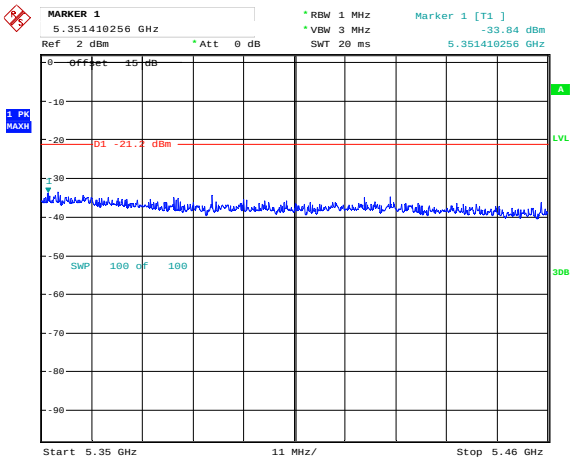
High channel (Ave)



Date: 2.JUL.2015 16:30:27

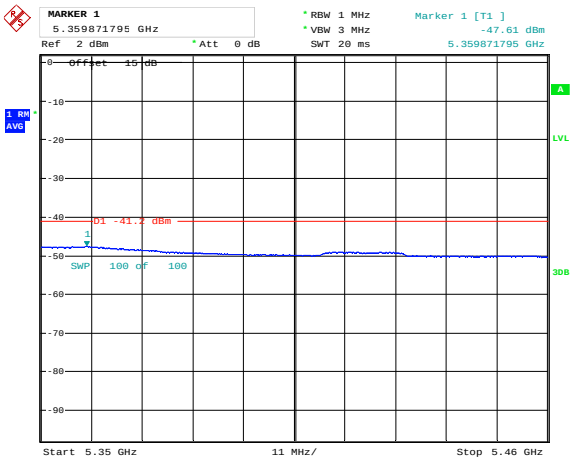
802.11n20 mode

Low channel (Peak)



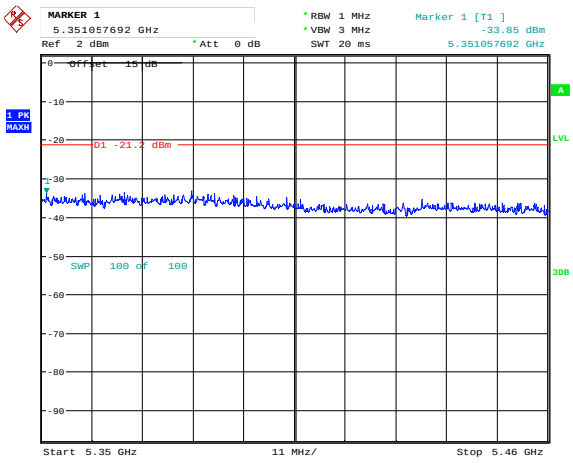
Date: 2.JUL.2015 16:43:28

Low channel (Ave)



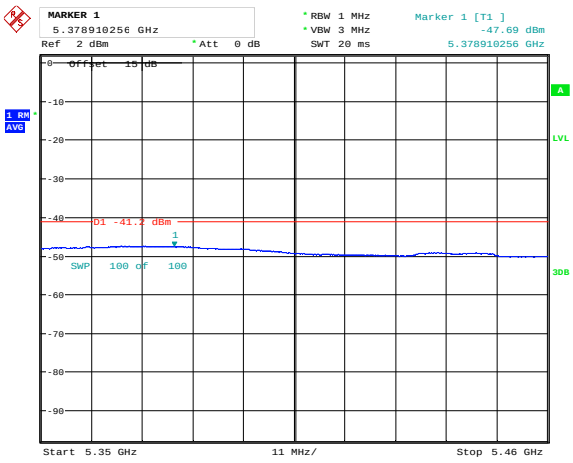
Date: 2.JUL.2015 16:44:00

Middle channel (Peak)



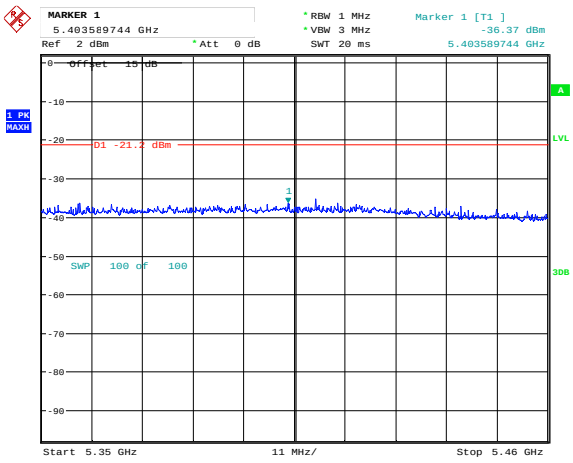
Date: 2.JUL.2015 16:45:32

Middle channel (Ave)



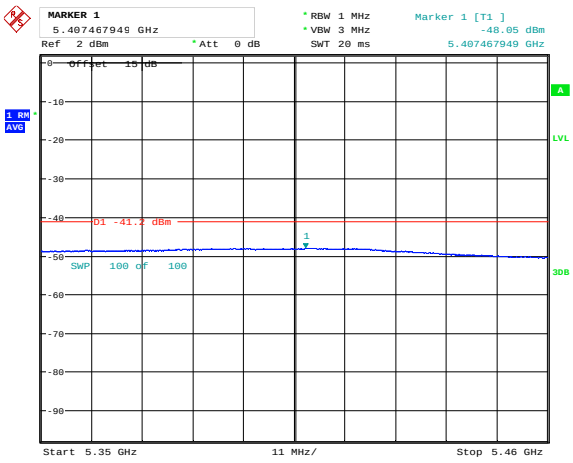
Date: 2.JUL.2015 16:44:55

High channel (Peak)



Date: 2.JUL.2015 16:46:06

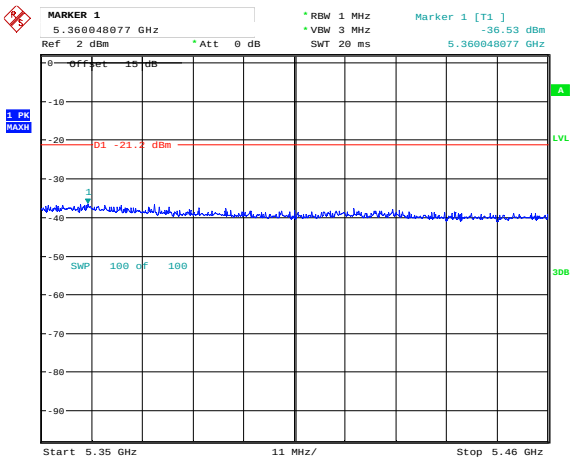
High channel (Ave)



Date: 2.JUL.2015 16:46:42

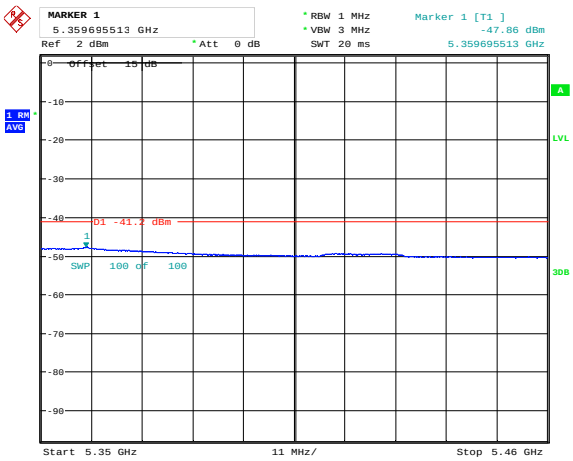
802.11n40 mode

Low channel (Peak)



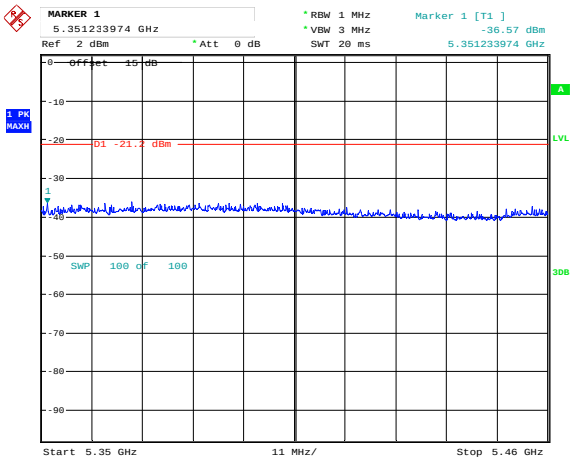
Date: 2.JUL.2015 17:03:20

Low channel (Ave)



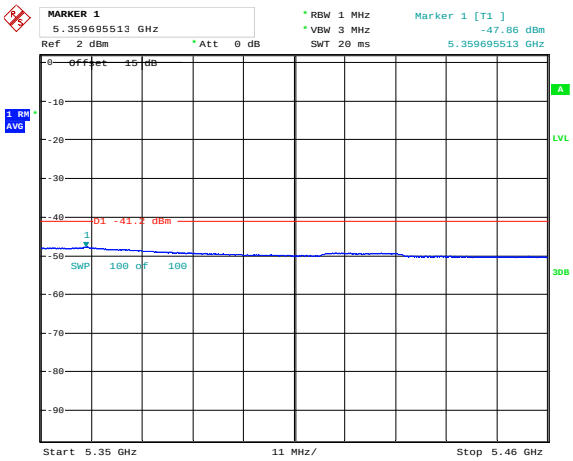
Date: 2.JUL.2015 17:03:49

High channel (Peak)



Date: 2.JUL.2015 17:05:11

High channel (Ave)

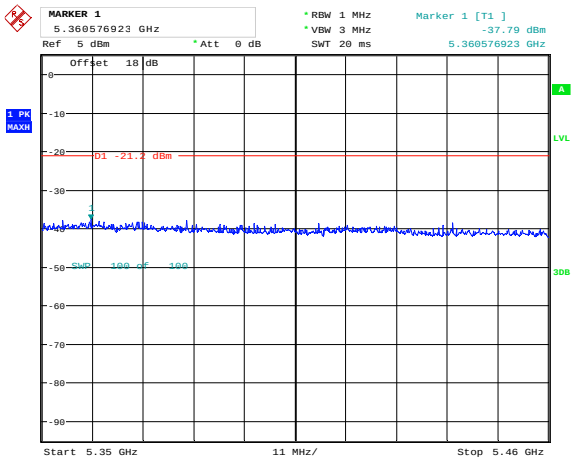


Date: 2.JUL.2015 17:03:49

Antenna gain=7 dBi (Chain 1)

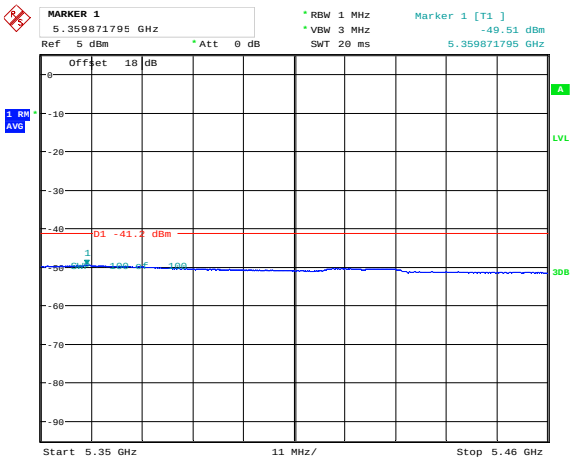
802.11a mode

Low channel (Peak)



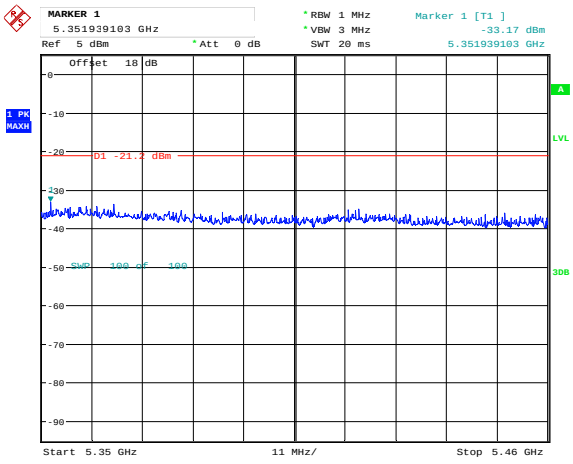
Date: 2.JUL.2015 17:16:02

Low channel (Ave)



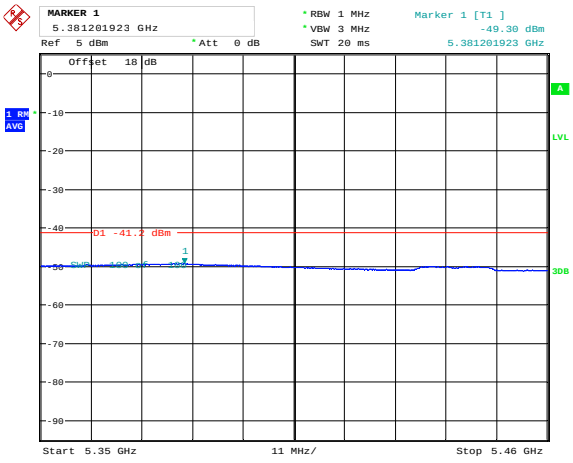
Date: 2.JUL.2015 17:15:28

Middle channel (Peak)



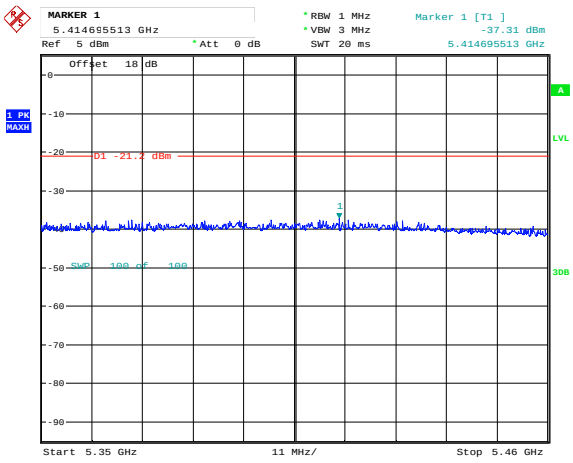
Date: 2.JUL.2015 17:16:45

Middle channel (Ave)



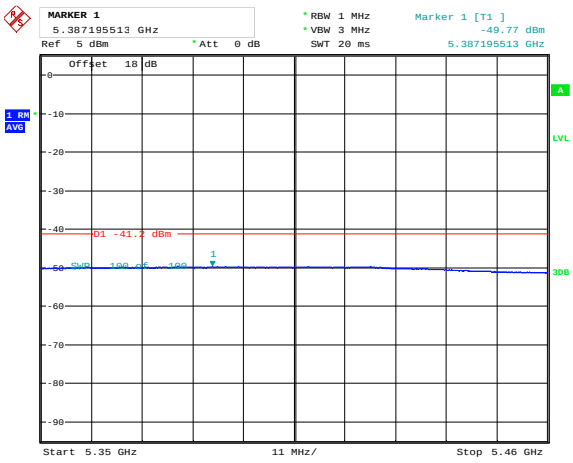
Date: 2.JUL.2015 17:17:36

High channel (Peak)



Date: 2.JUL.2015 17:18:32

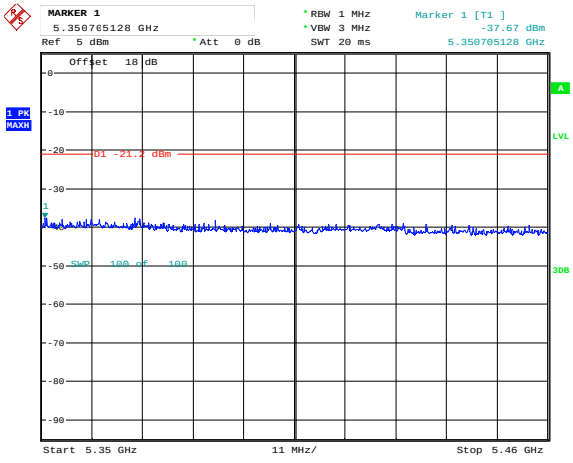
High channel (Ave)



Date: 2.JUL.2015 17:18:10

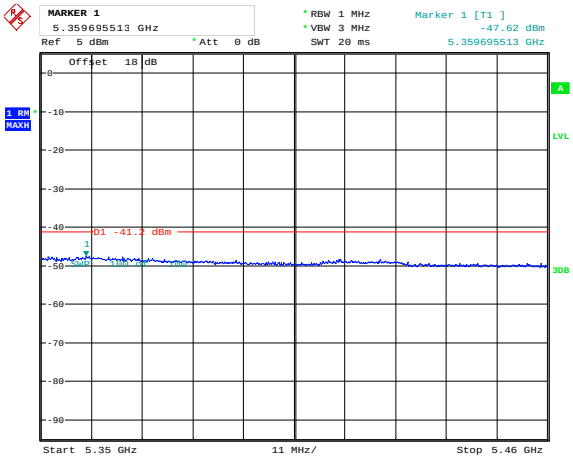
802.11n20 mode

Low channel (Peak)



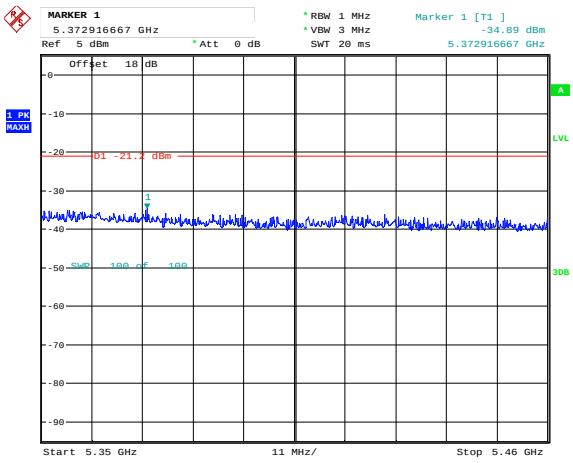
Date: 2.JUL.2015 17:27:29

Low channel (Ave)



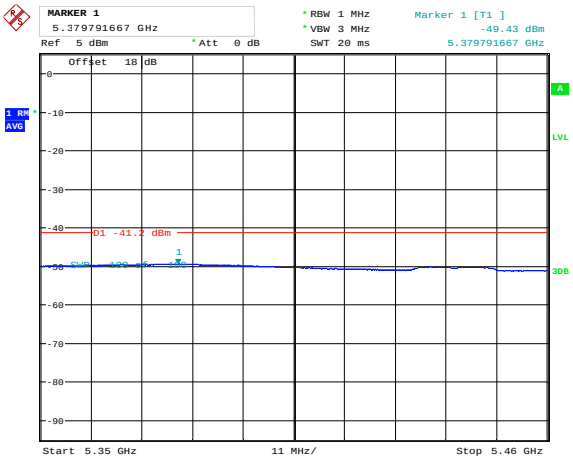
Date: 2.JUL.2015 17:27:03

Middle channel (Peak)



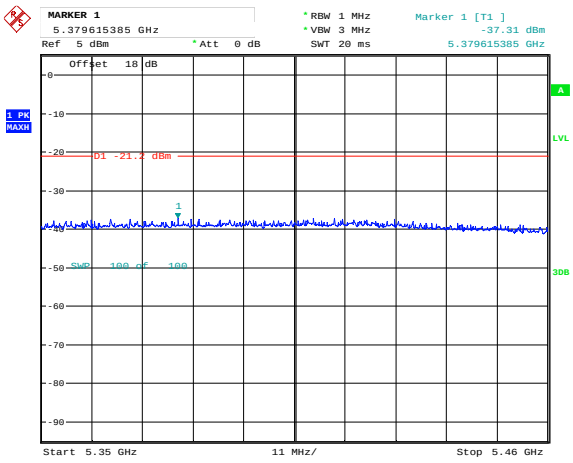
Date: 2.JUL.2015 17:27:52

Middle channel (Ave)



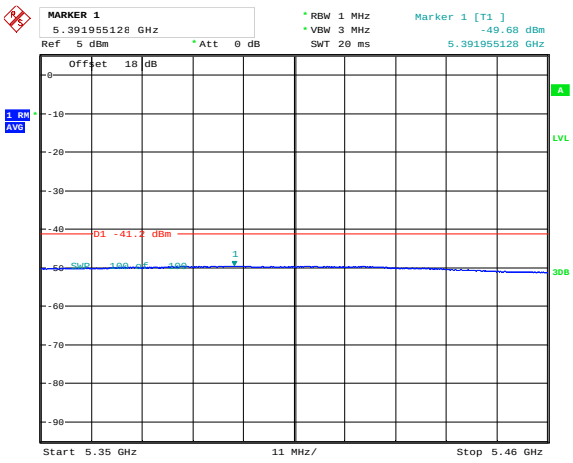
Date: 2.JUL.2015 17:29:22

High channel (Peak)



Date: 2.JUL.2015 17:30:29

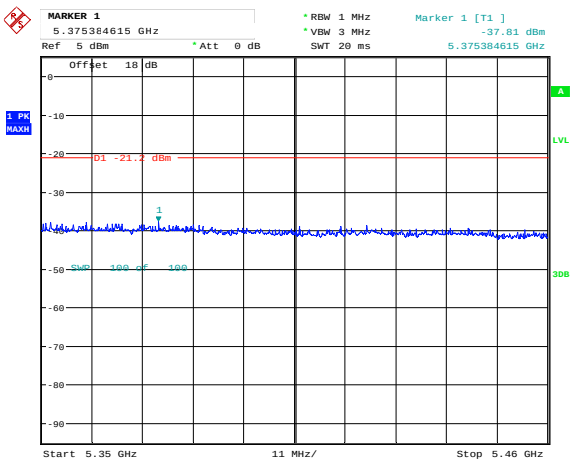
High channel (Ave)



Date: 2.JUL.2015 17:29:42

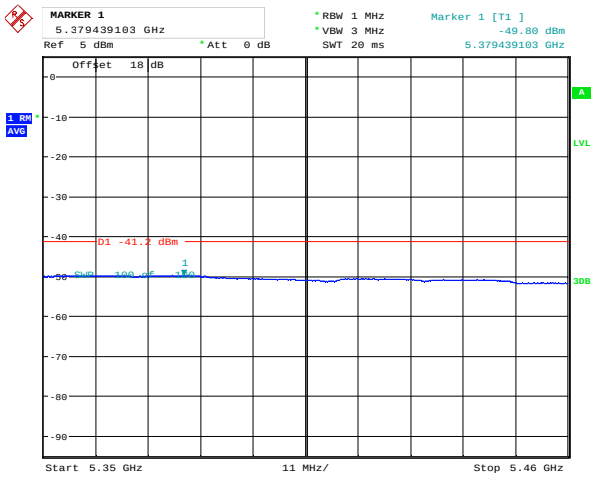
802.11n40 mode

Low channel (Peak)



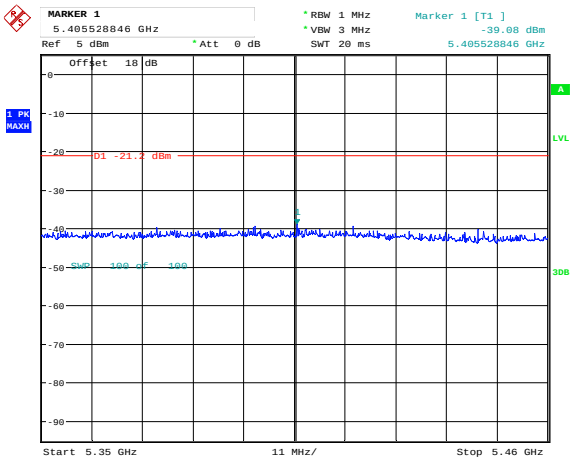
Date: 2.JUL.2015 17:57:33

Low channel (Ave)



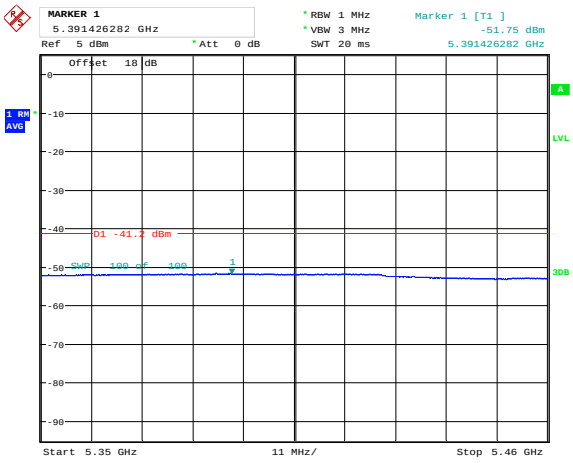
Date: 2.JUL.2015 17:56:06

High channel (Peak)



Date: 2.JUL.2015 17:58:01

High channel (Ave)

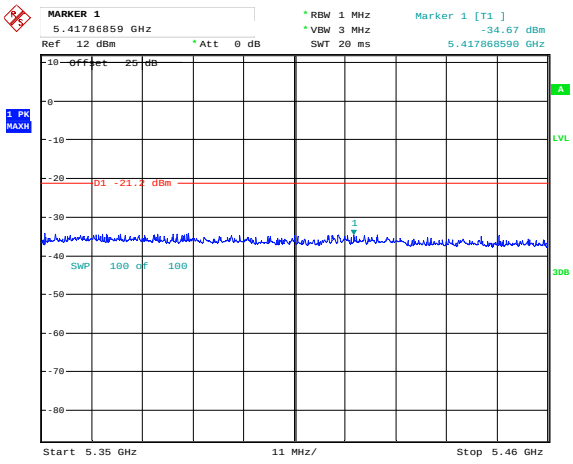


Date: 2.JUL.2015 17:58:57

Antenna gain=14 dBi (Chain 1)

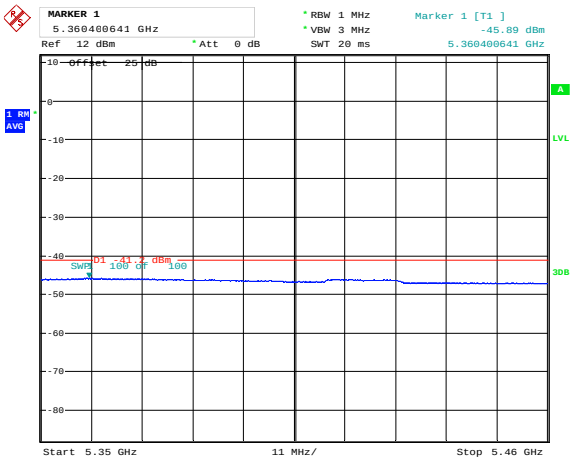
802.11a mode

Low channel (Peak)



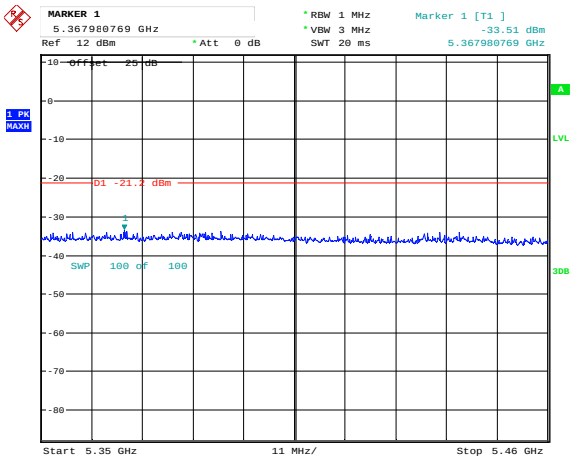
Date: 2.JUL.2015 18:32:46

Low channel (Ave)



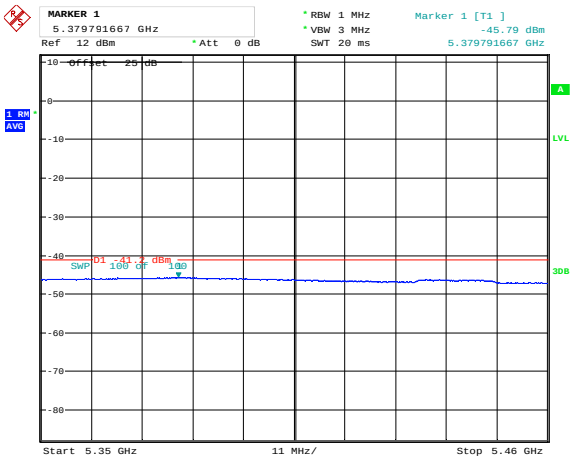
Date: 2.JUL.2015 18:33:19

Middle channel (Peak)



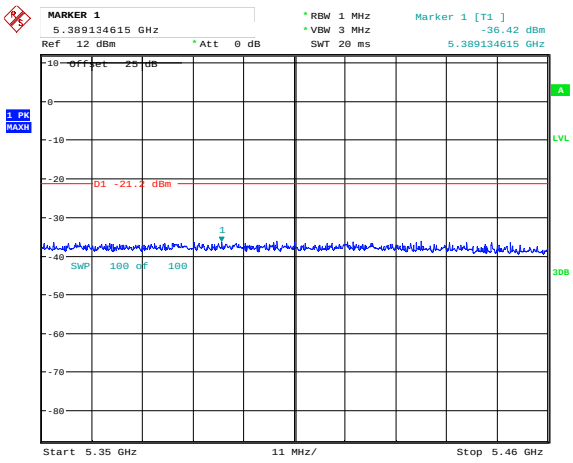
Date: 2.JUL.2015 18:34:58

Middle channel (Ave)



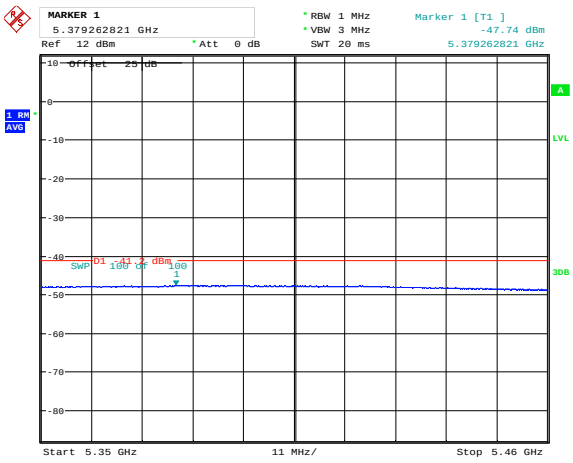
Date: 2.JUL.2015 18:34:23

High channel (Peak)



Date: 2.JUL.2015 18:35:33

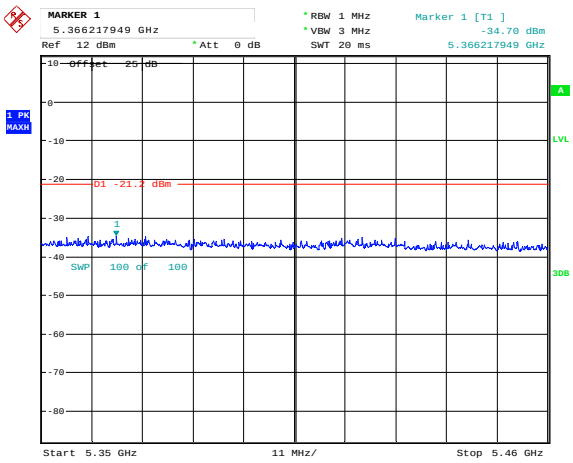
High channel (Ave)



Date: 2.JUL.2015 18:35:57

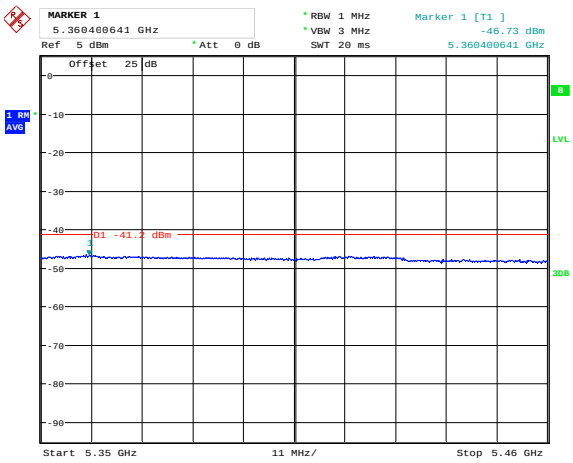
802.11n20 mode

Low channel (Peak)



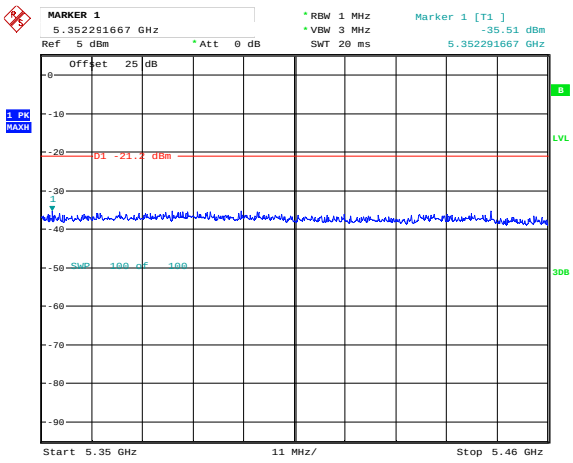
Date: 2.JUL.2015 19:43:40

Low channel (Ave)



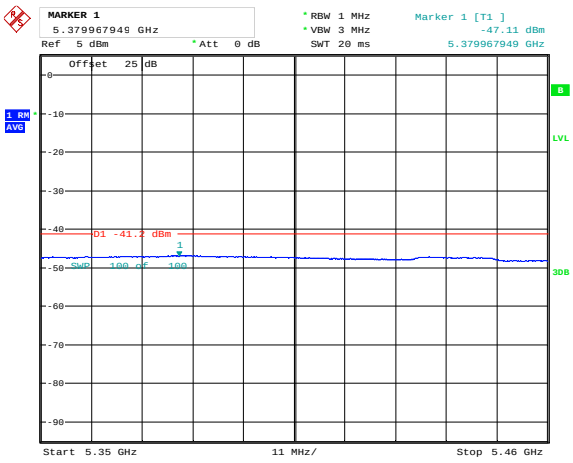
Date: 2.JUL.2015 19:46:29

Middle channel (Peak)



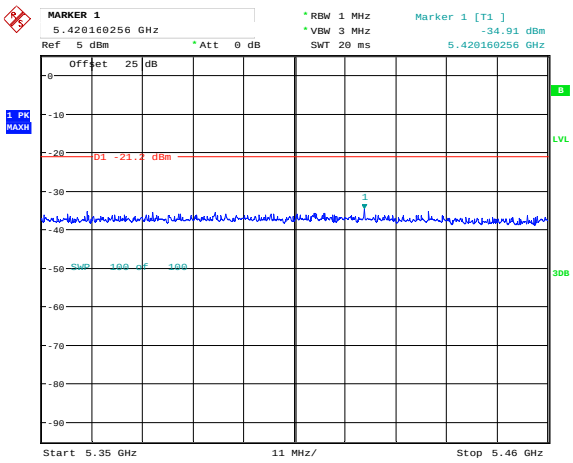
Date: 2.JUL.2015 19:47:43

Middle channel (Ave)



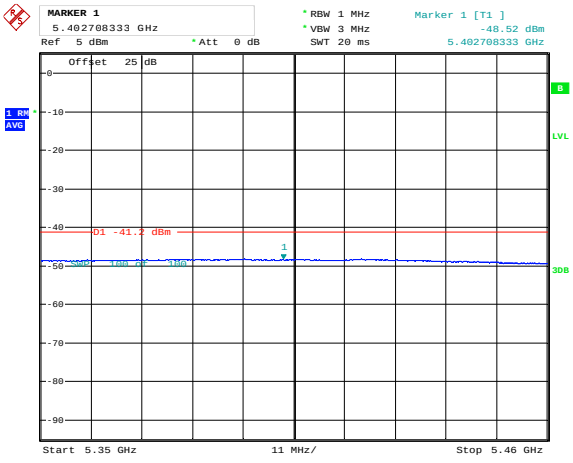
Date: 2.JUL.2015 19:47:17

High channel (Peak)



Date: 2.JUL.2015 19:48:27

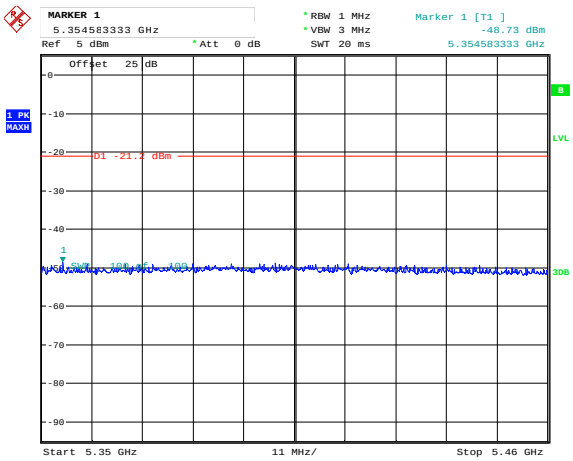
High channel (Ave)



Date: 2.JUL.2015 19:48:58

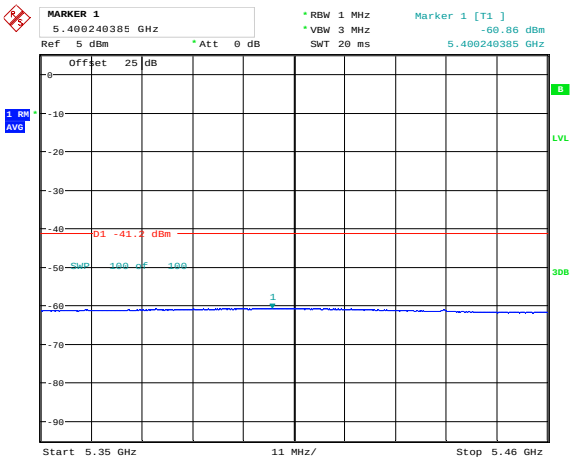
802.11n40 mode

Low channel (Peak)



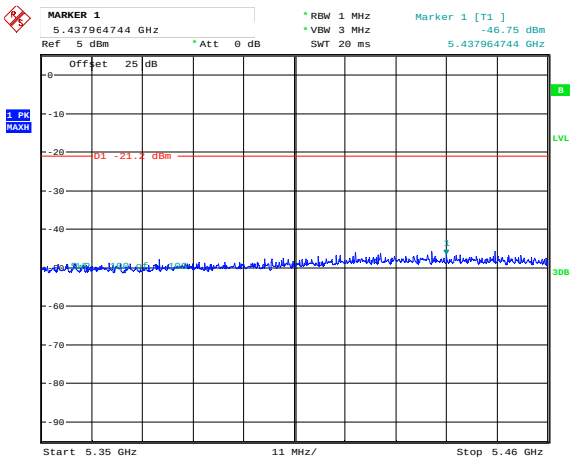
Date: 2.JUL.2015 20:11:27

Low channel (Ave)



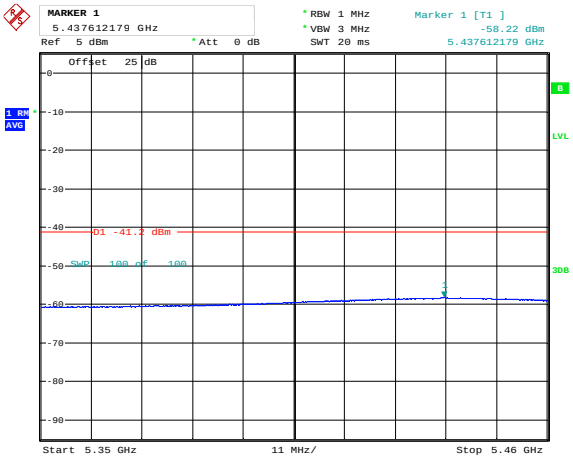
Date: 2.JUL.2015 20:10:55

High channel (Peak)



Date: 2.JUL.2015 20:12:02

High channel (Ave)



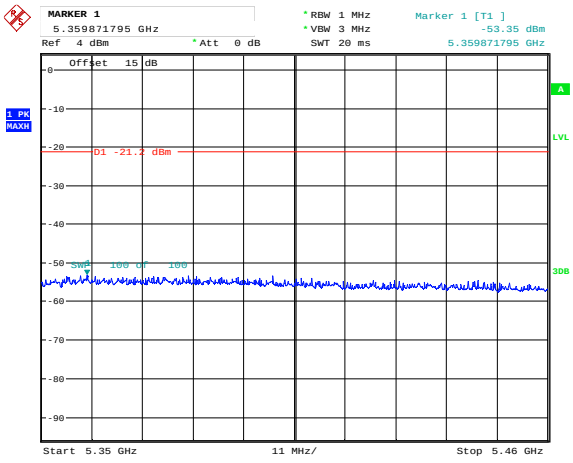
Date: 2.JUL.2015 20:12:26

5.8GHz Band:

Antenna gain=4 dBi (Chain 0)

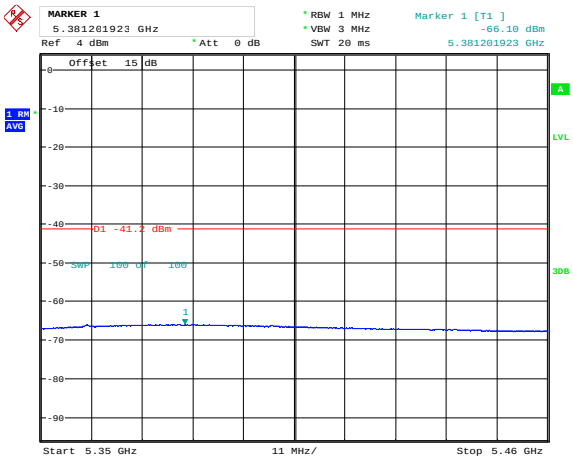
802.11a mode

Low channel (Peak)



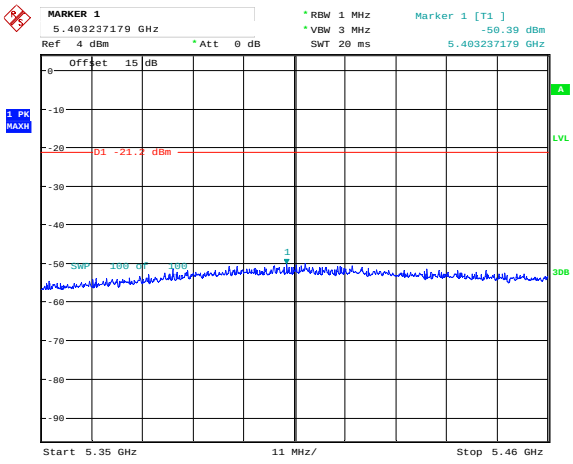
Date: 23.JUN.2015 20:40:24

Low channel (Ave)



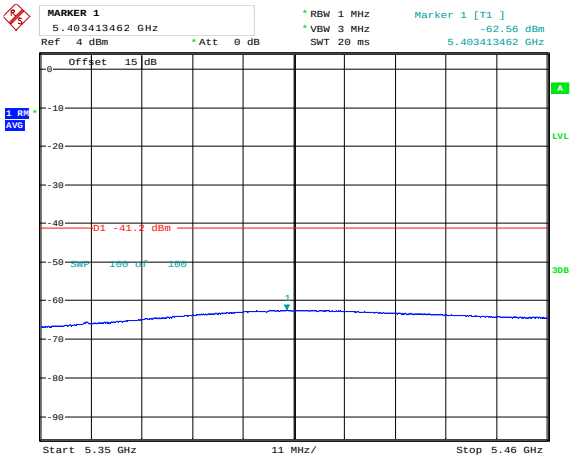
Date: 23.JUN.2015 20:41:00

Middle channel (Peak)



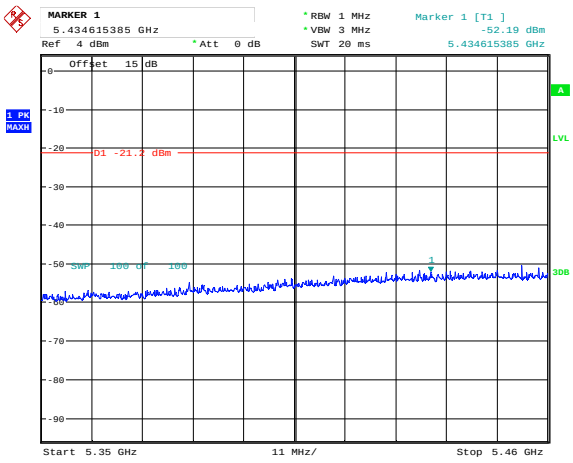
Date: 23.JUN.2015 20:42:15

Middle channel (Ave)



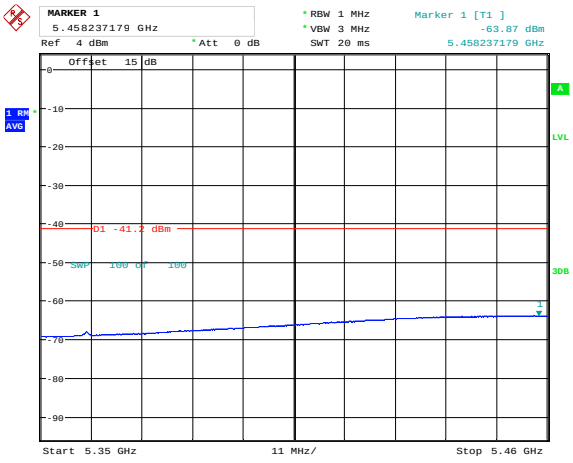
Date: 23.JUN.2015 20:41:48

High channel (Peak)



Date: 23.JUN.2015 20:43:01

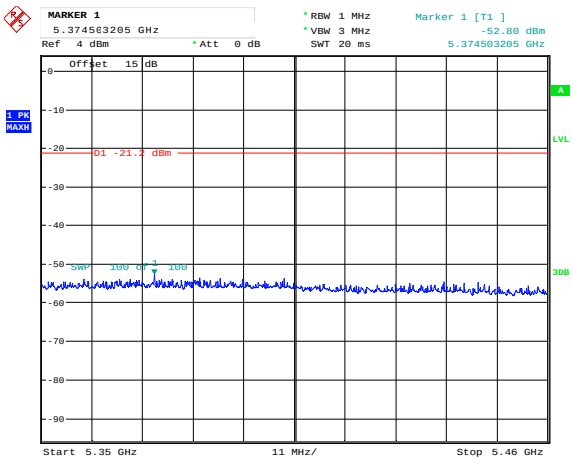
High channel (Ave)



Date: 23.JUN.2015 20:43:50

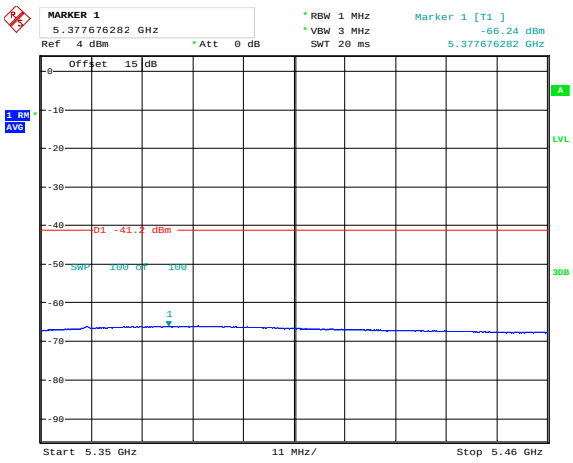
802.11n20 mode

Low channel (Peak)



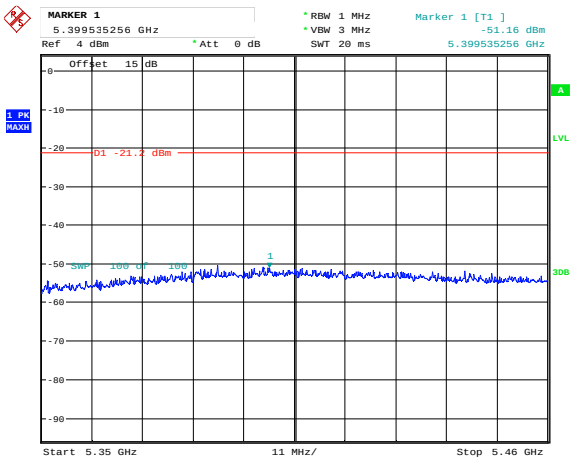
Date: 23.JUN.2015 20:46:15

Low channel (Ave)



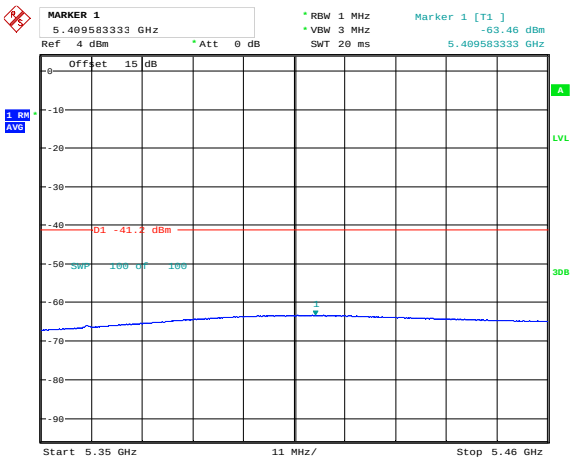
Date: 23.JUN.2015 20:45:27

Middle channel (Peak)



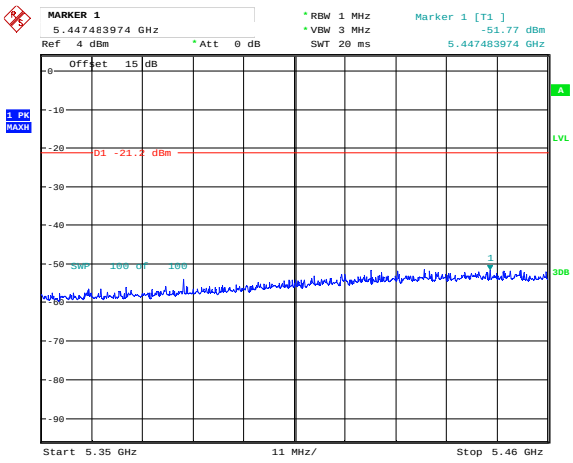
Date: 23.JUN.2015 20:47:02

Middle channel (Ave)



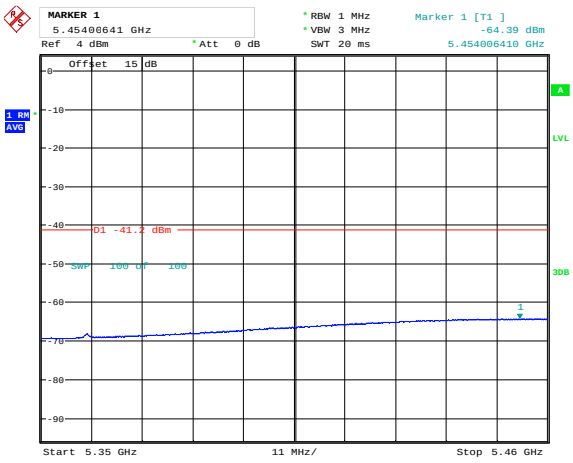
Date: 23.JUN.2015 20:47:47

High channel (Peak)



Date: 23.JUN.2015 20:49:00

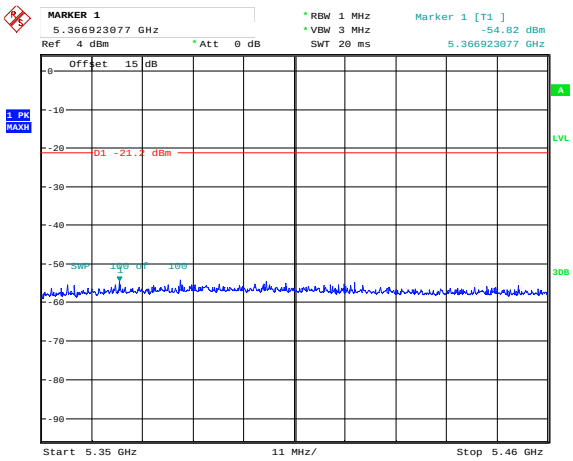
High channel (Ave)



Date: 23.JUN.2015 20:48:31

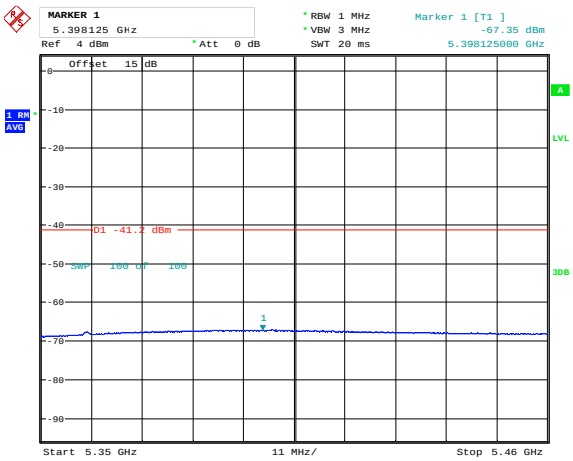
802.11n40 mode

Low channel (Peak)



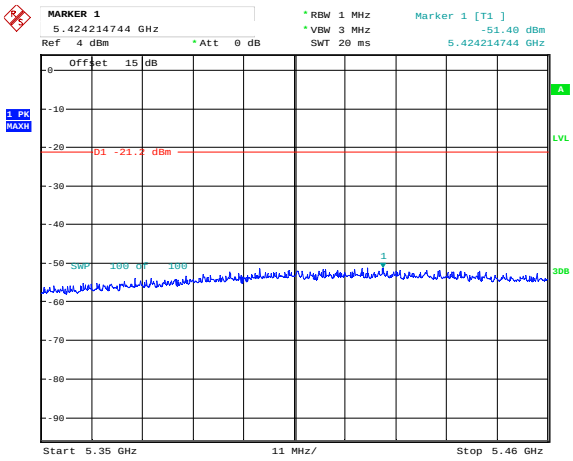
Date: 23.JUN.2015 20:51:35

Low channel (Ave)



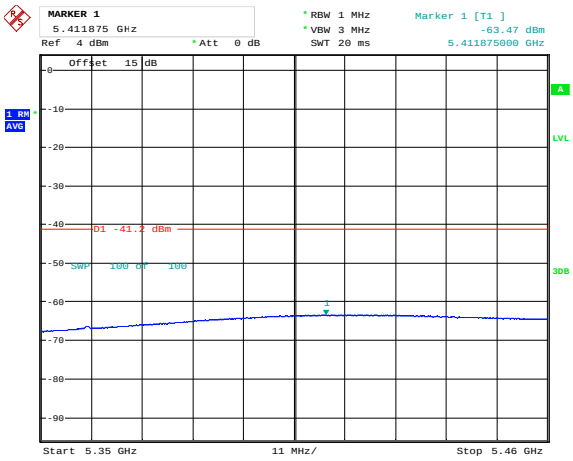
Date: 23.JUN.2015 20:52:05

High channel (Peak)



Date: 23.JUN.2015 20:54:28

High channel (Ave)

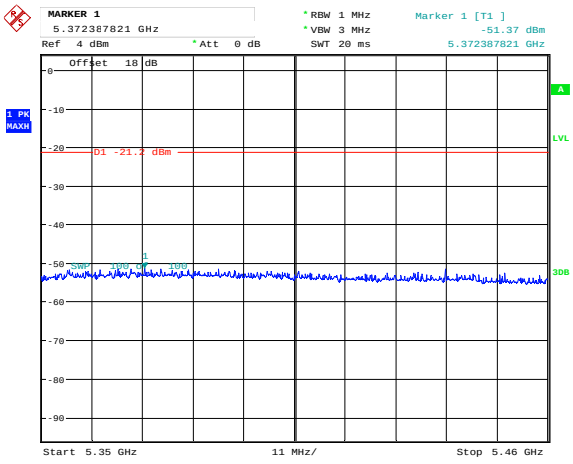


Date: 23.JUN.2015 20:54:00

Antenna gain=7 dBi (Chain 0)

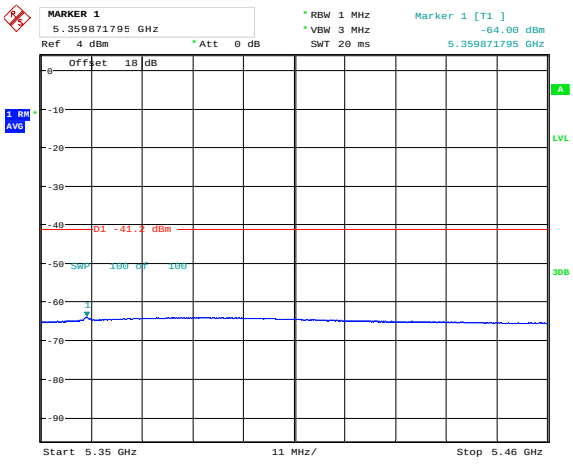
802.11a mode

Low channel (Peak)



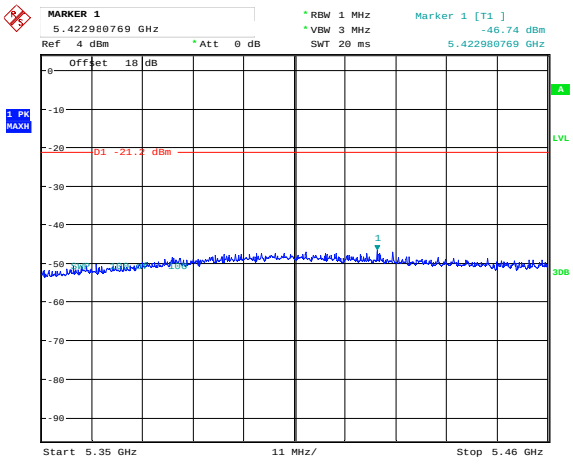
Date: 22.JUN.2015 23:14:29

Low channel (Ave)



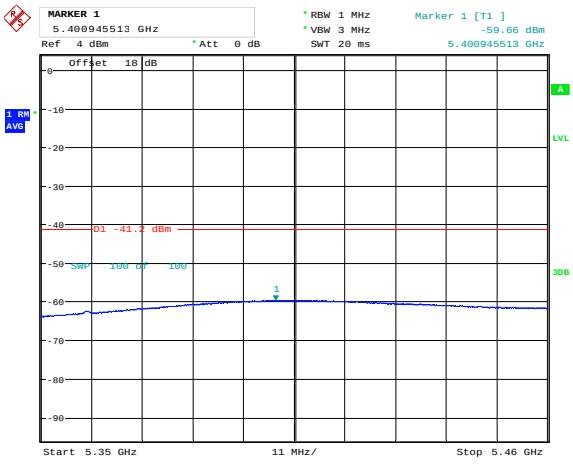
Date: 22.JUN.2015 23:13:30

Middle channel (Peak)



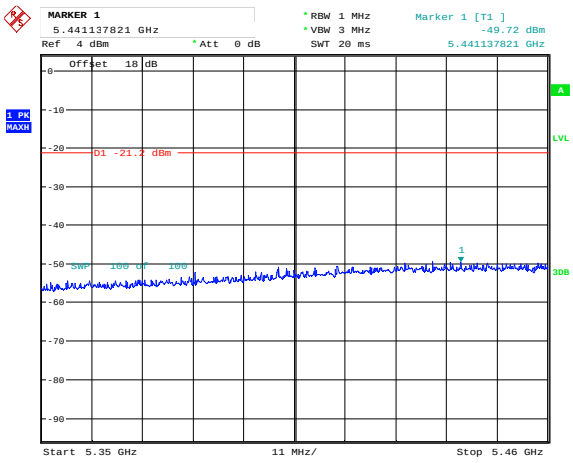
Date: 22.JUN.2015 23:17:05

Middle channel (Ave)



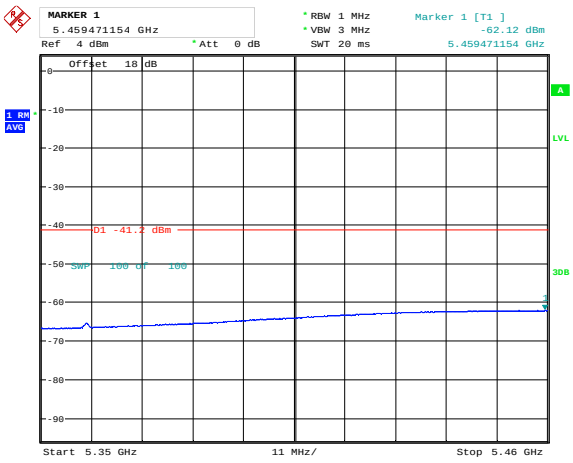
Date: 22.JUN.2015 23:16:01

High channel (Peak)



Date: 22.JUN.2015 23:21:50

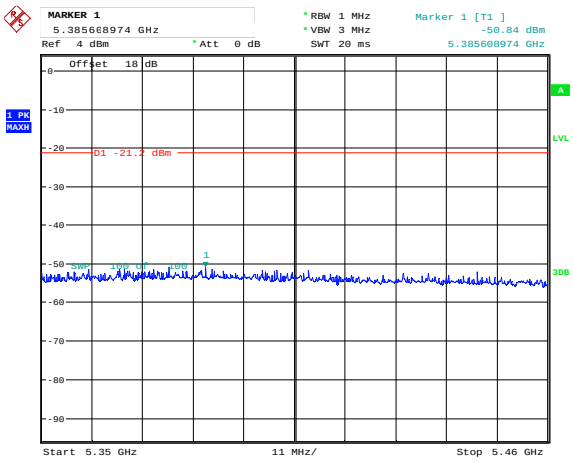
High channel (Ave)



Date: 22.JUN.2015 23:22:32

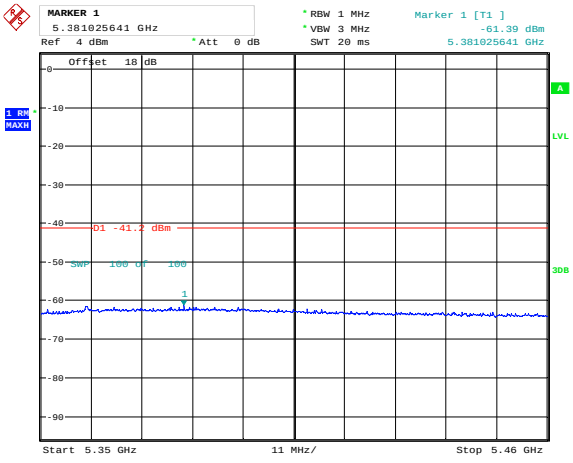
802.11n20 mode

Low channel (Peak)



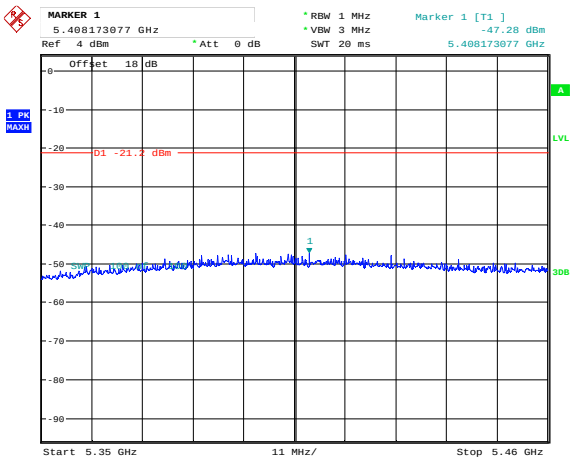
Date: 22.JUN.2015 23:26:14

Low channel (Ave)



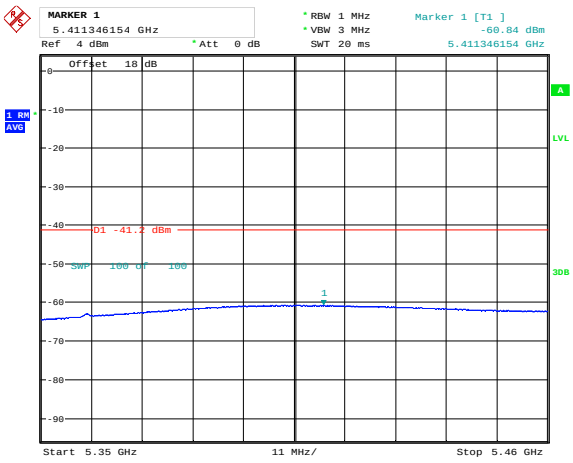
Date: 22.JUN.2015 23:25:24

Middle channel (Peak)



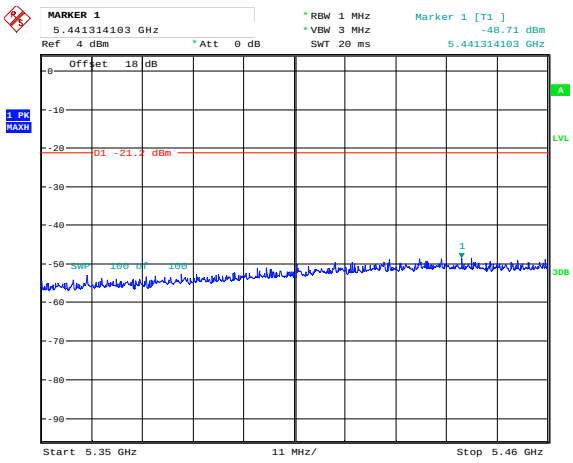
Date: 22.JUN.2015 23:28:12

Middle channel (Ave)



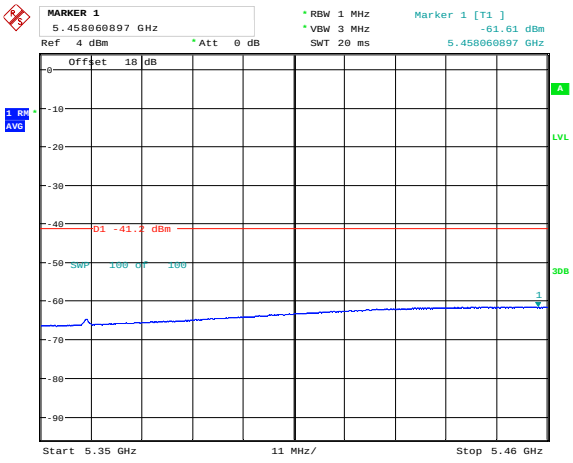
Date: 22.JUN.2015 23:29:03

High channel (Peak)



Date: 22.JUN.2015 23:30:49

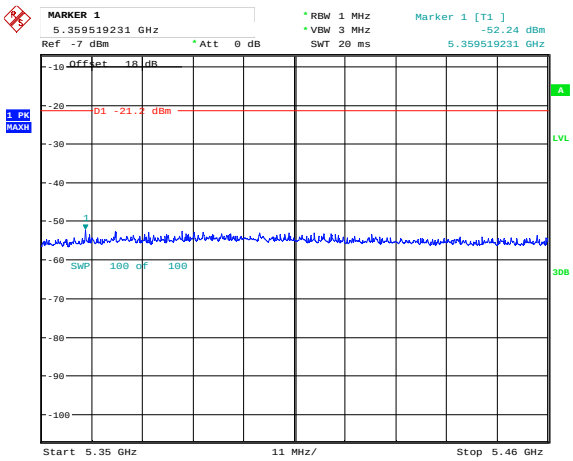
High channel (Ave)



Date: 22.JUN.2015 23:30:12

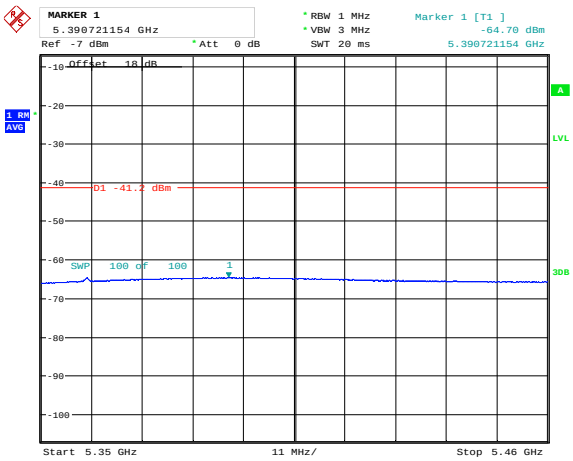
802.11n40 mode

Low channel (Peak)



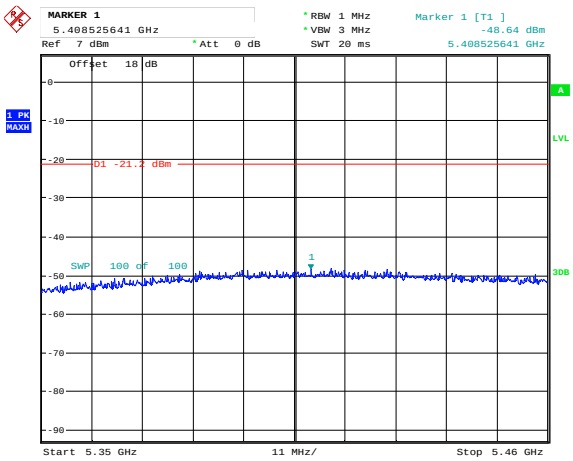
Date: 23.JUN.2015 18:51:17

Low channel (Ave)



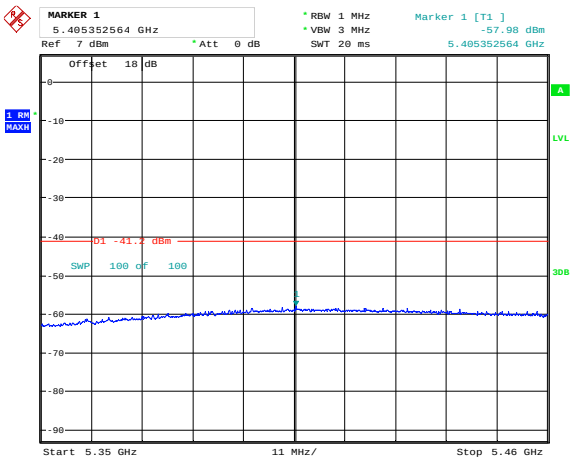
Date: 23.JUN.2015 18:49:22

High channel (Peak)



Date: 23.JUN.2015 18:52:27

High channel (Ave)

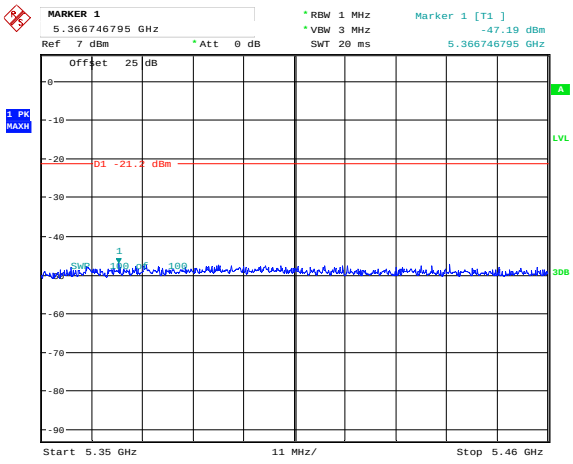


Date: 23.JUN.2015 18:53:16

Antenna gain=14 dBi (Chain 0)

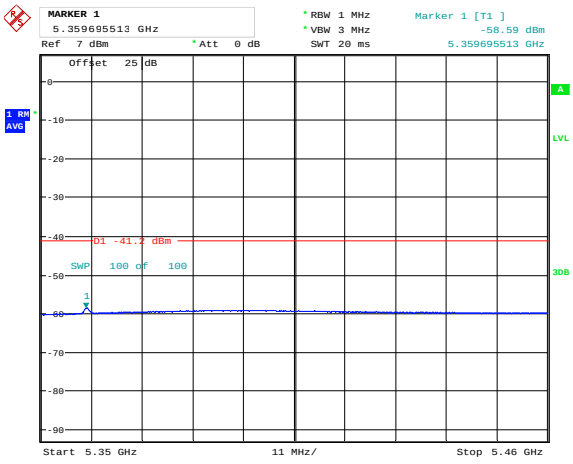
802.11a mode

Low channel (Peak)



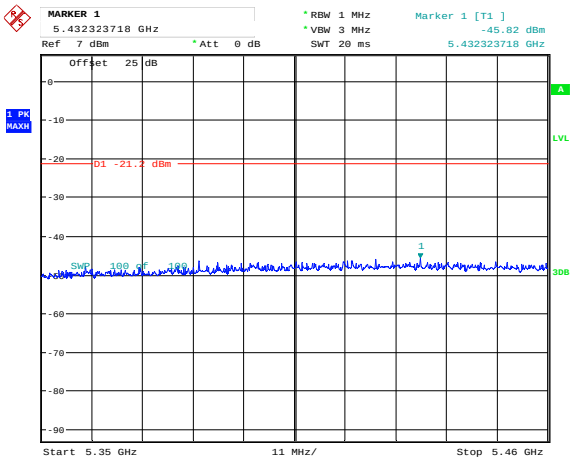
Date: 22.JUN.2015 20:44:51

Low channel (Ave)



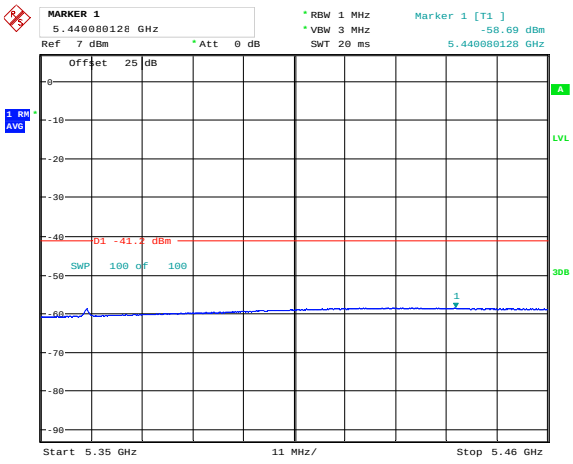
Date: 22.JUN.2015 20:44:09

Middle channel (Peak)



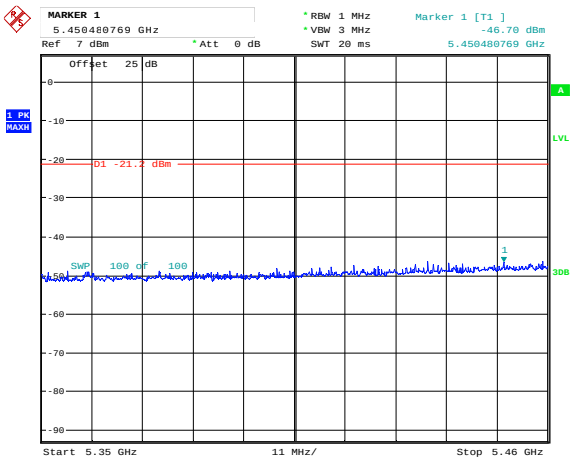
Date: 22.JUN.2015 20:46:19

Middle channel (Ave)



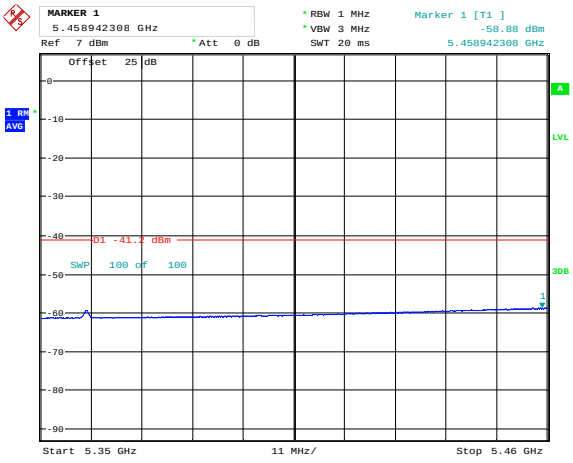
Date: 22.JUN.2015 20:46:54

High channel (Peak)



Date: 22.JUN.2015 20:50:15

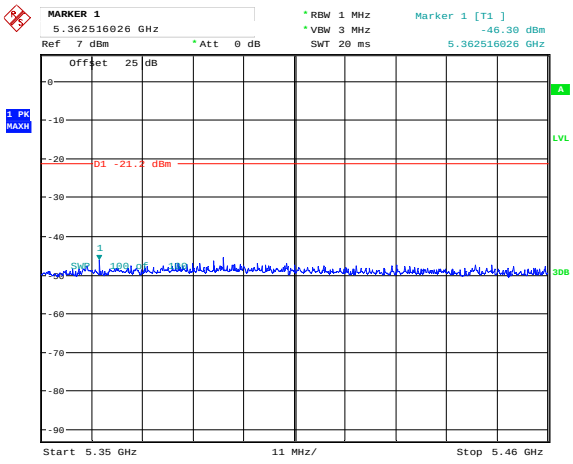
High channel (Ave)



Date: 22.JUN.2015 20:49:13

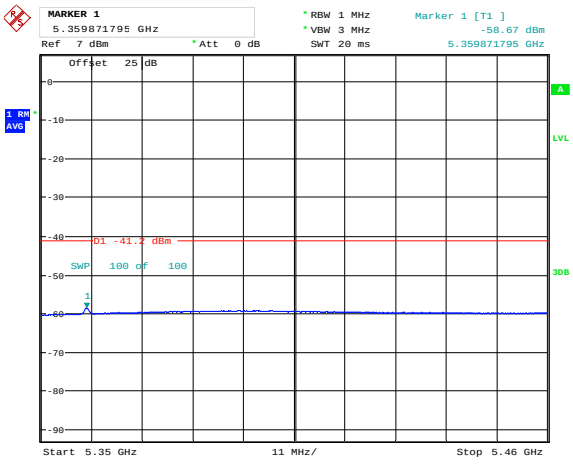
802.11n20 mode

Low channel (Peak)



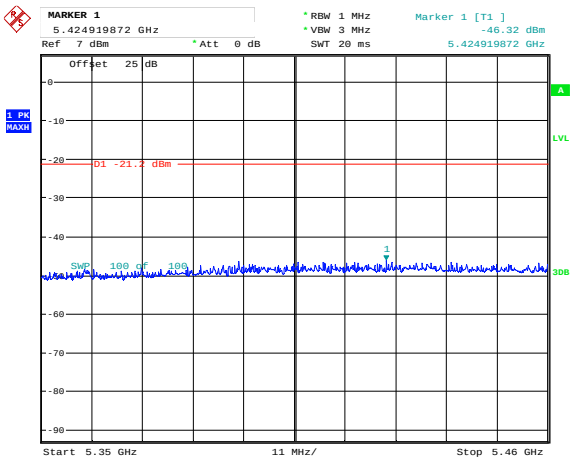
Date: 22.JUN.2015 20:52:48

Low channel (Ave)



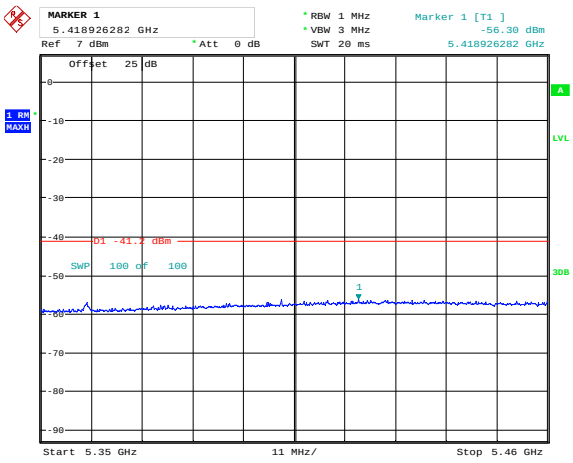
Date: 22.JUN.2015 20:53:28

Middle channel (Peak)



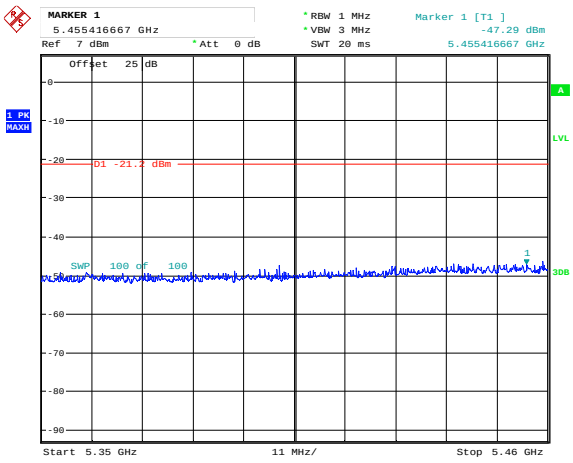
Date: 22.JUN.2015 20:55:19

Middle channel (Ave)



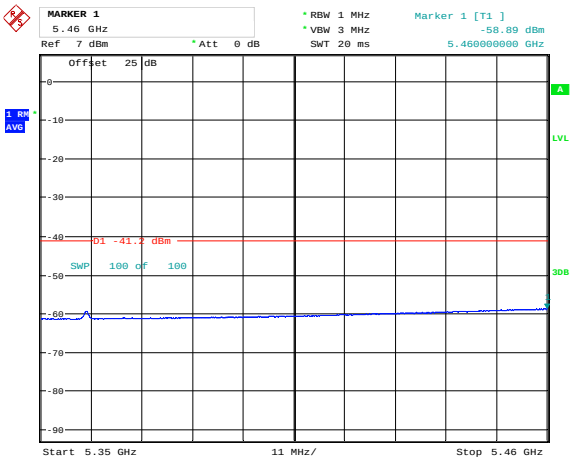
Date: 22.JUN.2015 20:54:56

High channel (Peak)



Date: 22.JUN.2015 20:56:30

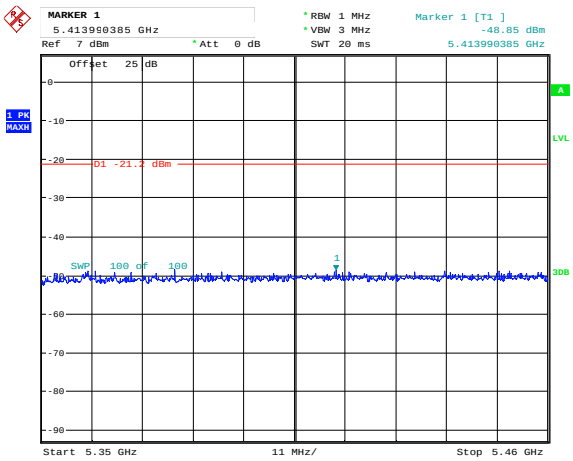
High channel (Ave)



Date: 22.JUN.2015 20:57:03

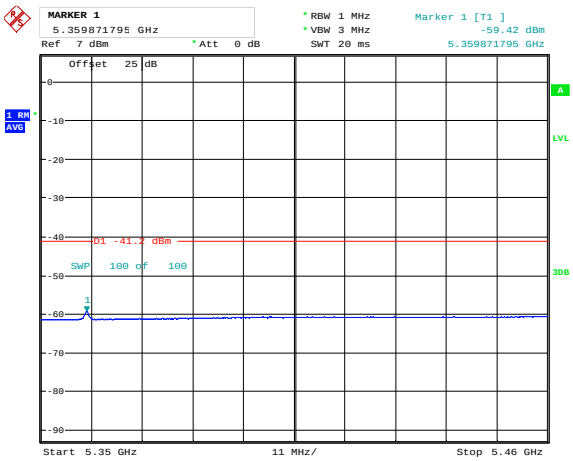
802.11n40 mode

Low channel (Peak)



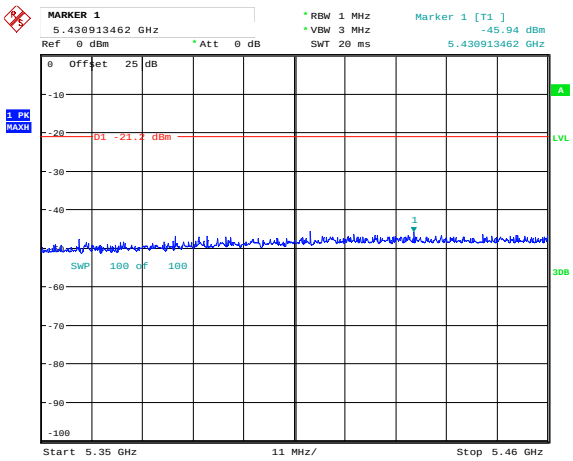
Date: 22.JUN.2015 21:00:27

Low channel (Ave)



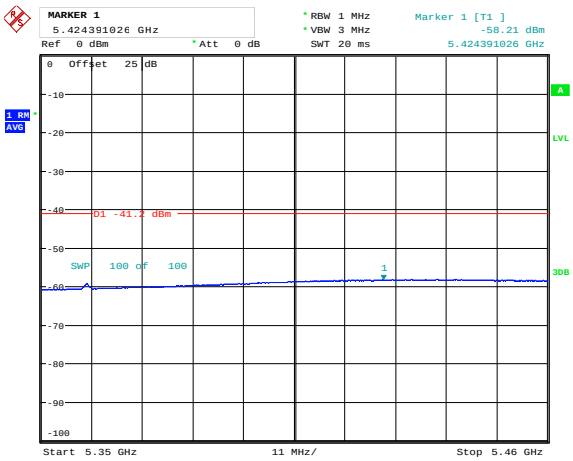
Date: 22.JUN.2015 20:59:38

High channel (Peak)



Date: 23.JUN.2015 18:45:23

High channel (Ave)

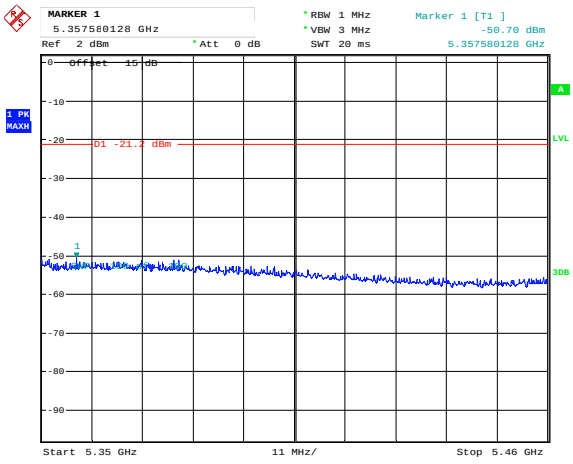


Date: 23.JUN.2015 18:44:26

Antenna gain=4 dBi (Chain 1)

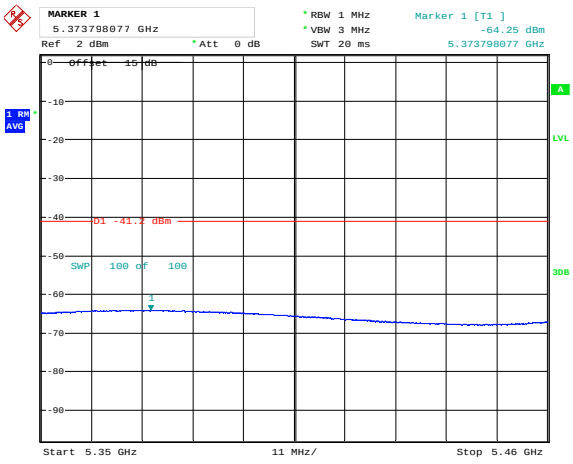
802.11a mode

Low channel (Peak)



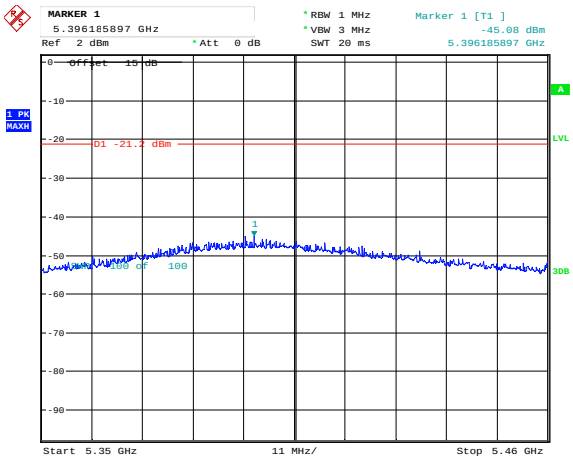
Date: 2.JUL.2015 16:39:28

Low channel (Ave)



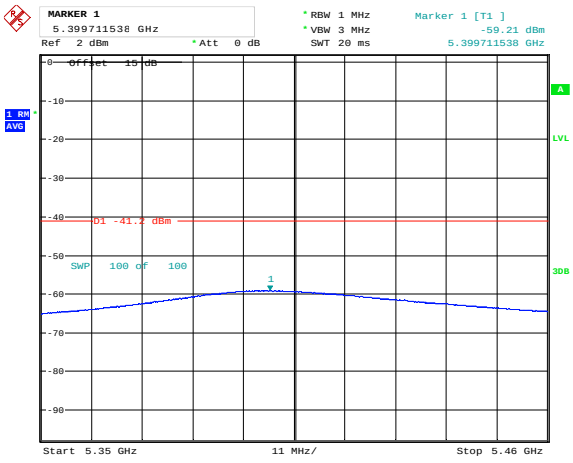
Date: 2.JUL.2015 16:38:57

Middle channel (Peak)



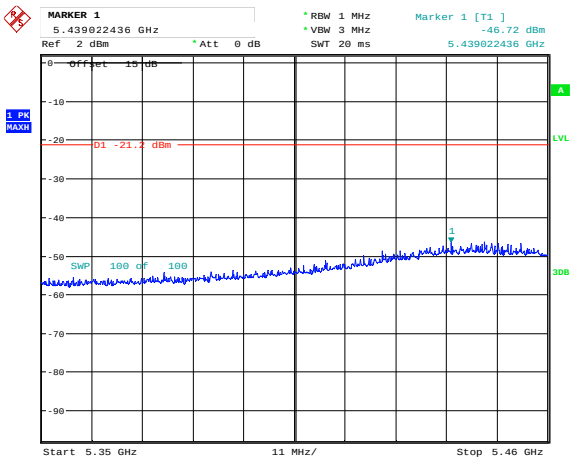
Date: 2.JUL.2015 16:40:11

Middle channel (Ave)



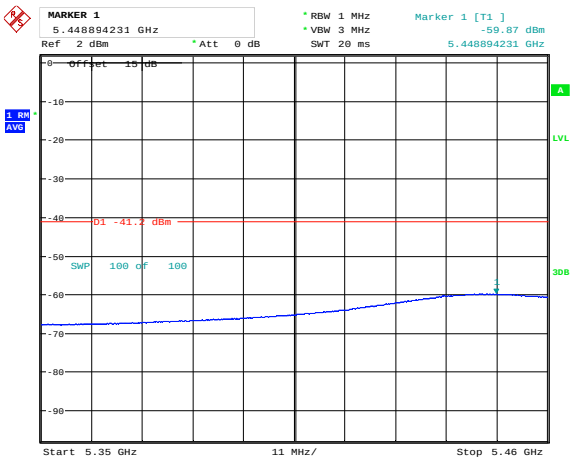
Date: 2.JUL.2015 16:40:48

High channel (Peak)



Date: 2.JUL.2015 16:41:58

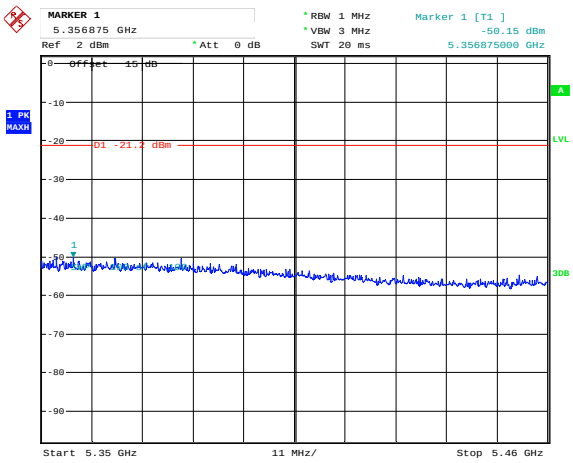
High channel (Ave)



Date: 2.JUL.2015 16:41:28

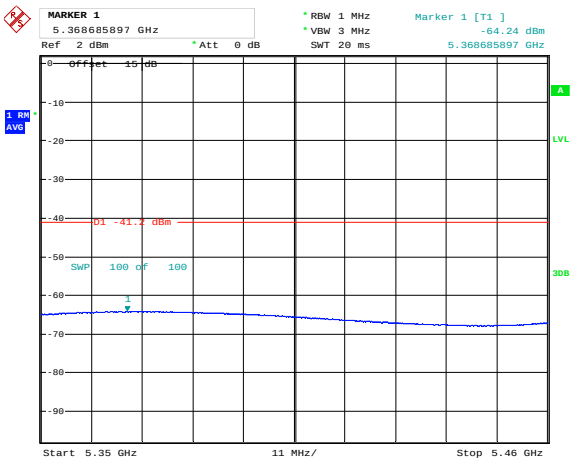
802.11n20 mode

Low channel (Peak)



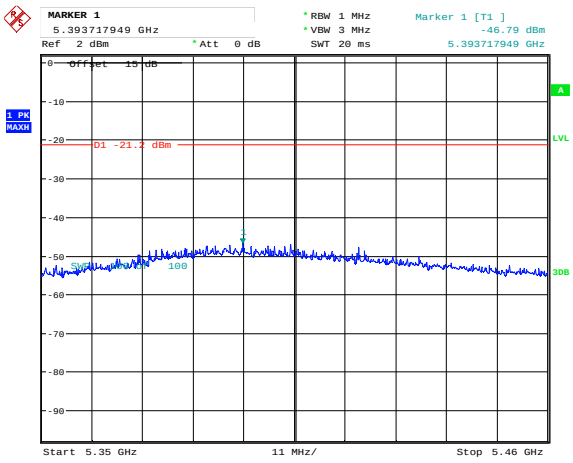
Date: 2.JUL.2015 16:54:57

Low channel (Ave)



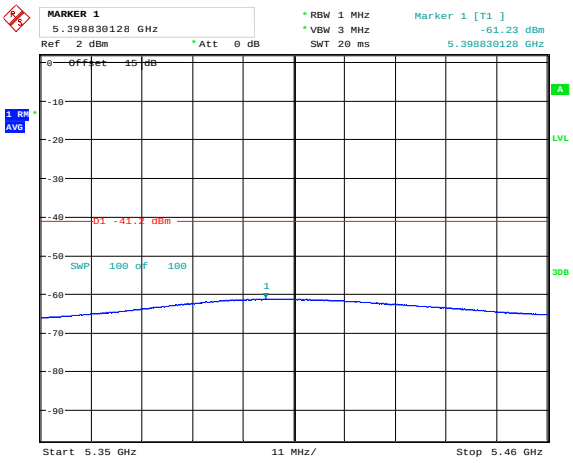
Date: 2.JUL.2015 16:54:26

Middle channel (Peak)



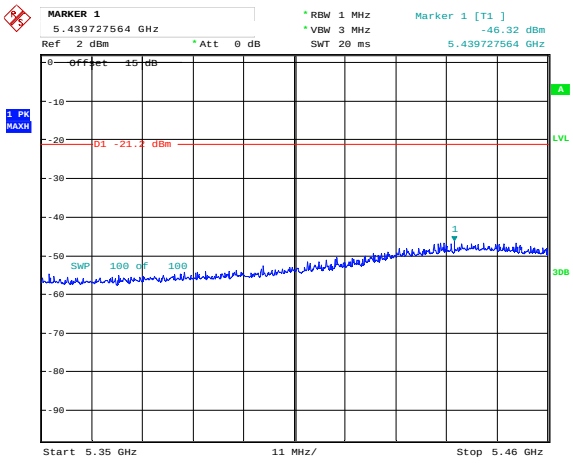
Date: 2.JUL.2015 16:55:40

Middle channel (Ave)



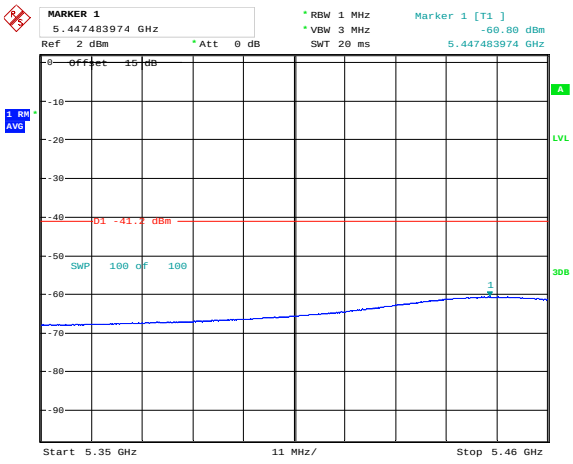
Date: 2.JUL.2015 16:56:07

High channel (Peak)



Date: 2.JUL.2015 17:00:41

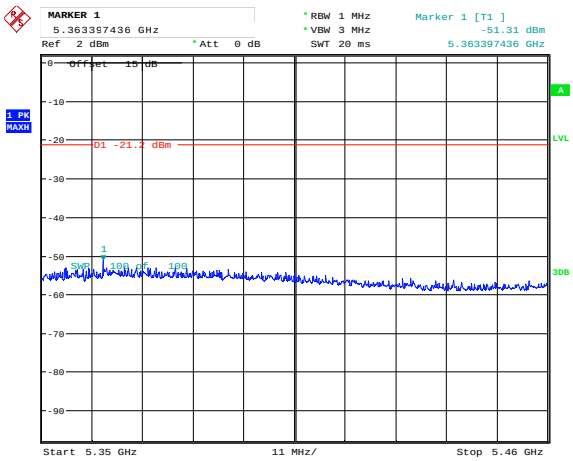
High channel (Ave)



Date: 2.JUL.2015 16:56:44

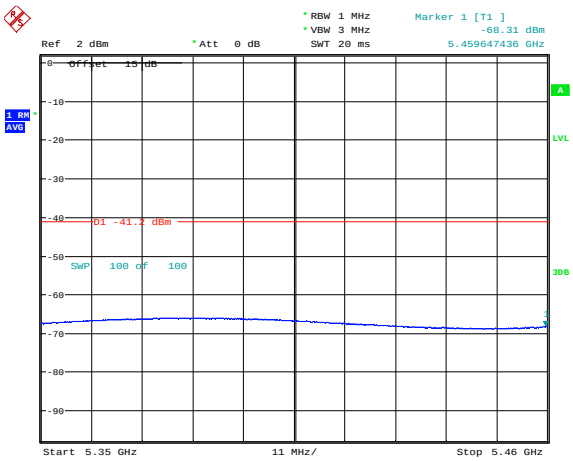
802.11n40 mode

Low channel (Peak)



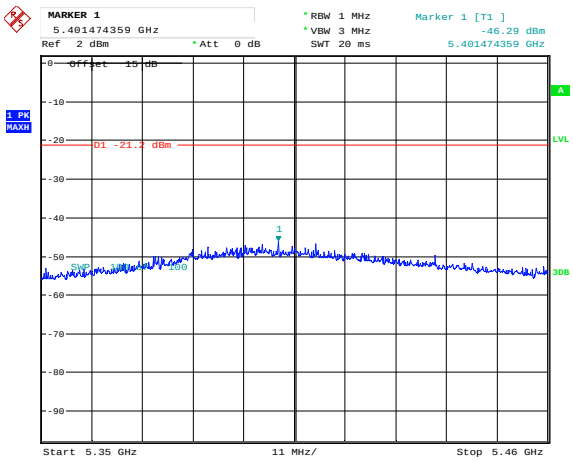
Date: 2.JUL.2015 17:11:21

Low channel (Ave)



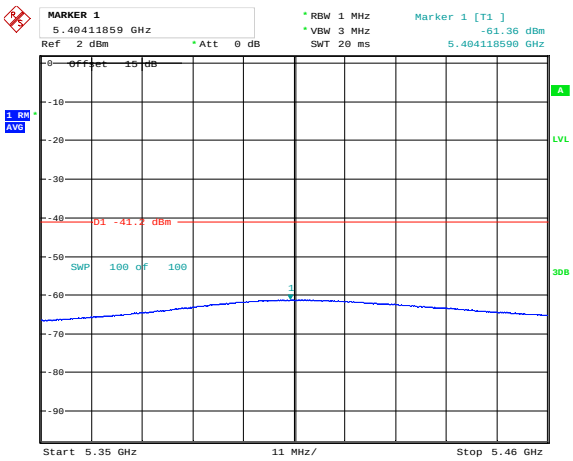
Date: 2.JUL.2015 17:10:58

High channel (Peak)



Date: 2.JUL.2015 17:11:49

High channel (Ave)

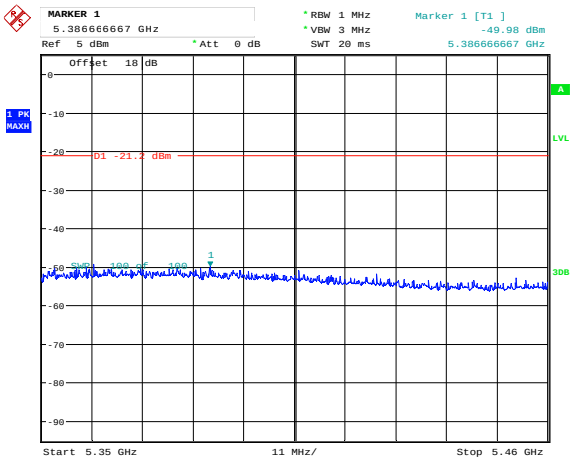


Date: 2.JUL.2015 17:12:25

Antenna gain=7 dBi (Chain 1)

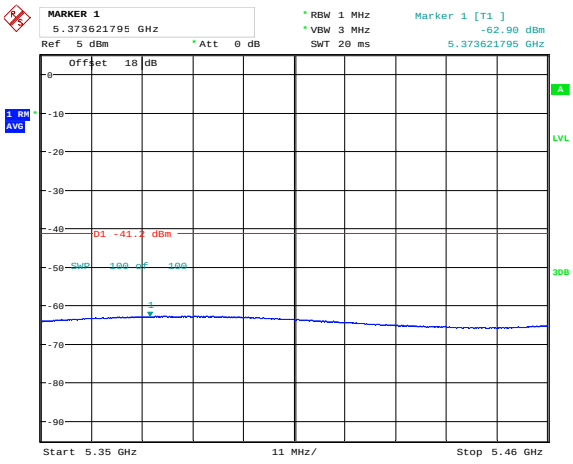
802.11a mode

Low channel (Peak)



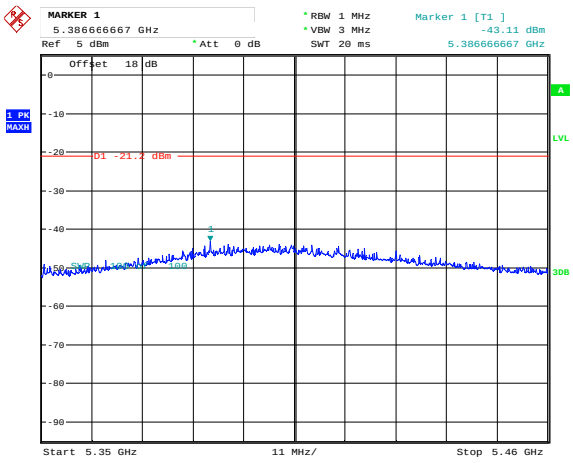
Date: 2.JUL.2015 17:24:11

Low channel (Ave)



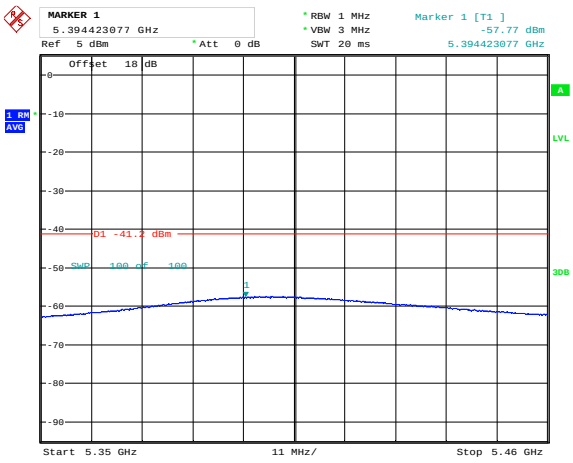
Date: 2.JUL.2015 17:24:35

Middle channel (Peak)



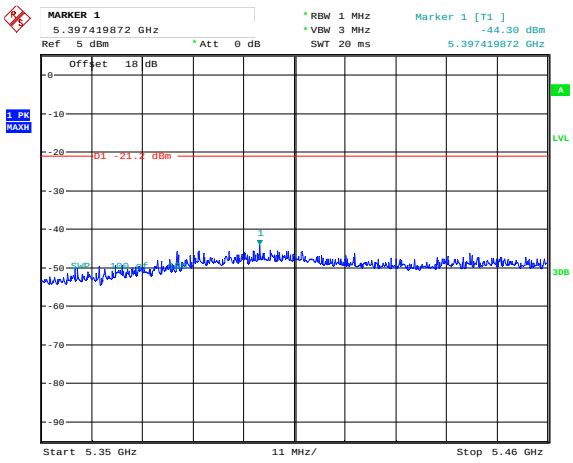
Date: 2.JUL.2015 17:25:41

Middle channel (Ave)



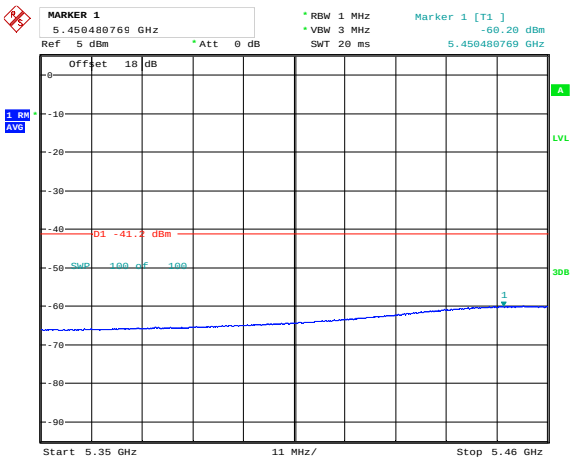
Date: 2.JUL.2015 17:25:00

High channel (Peak)



Date: 2.JUL.2015 17:26:03

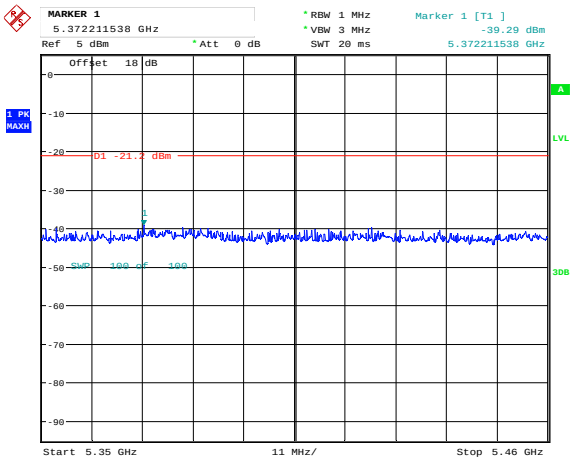
High channel (Ave)



Date: 2.JUL.2015 17:26:30

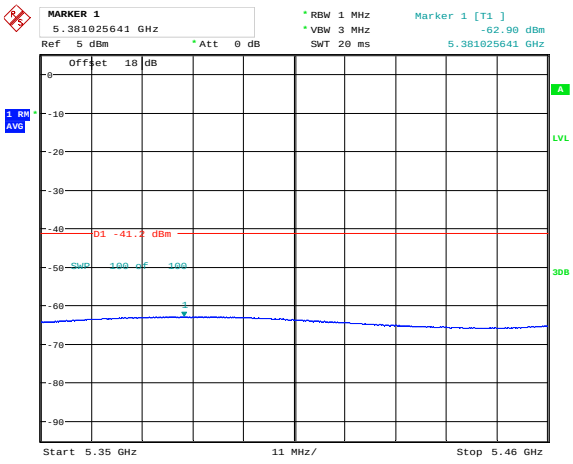
802.11n20 mode

Low channel (Peak)



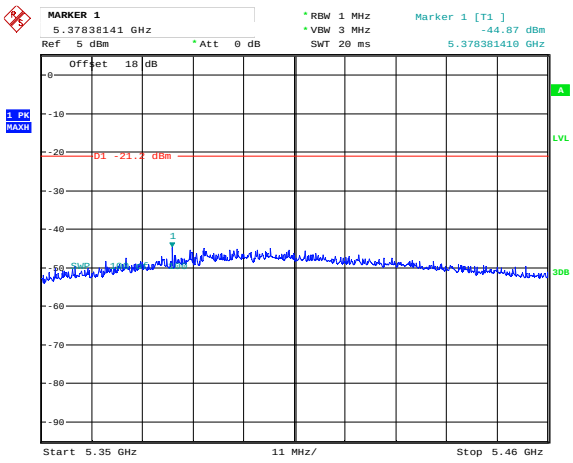
Date: 2.JUL.2015 17:41:37

Low channel (Ave)



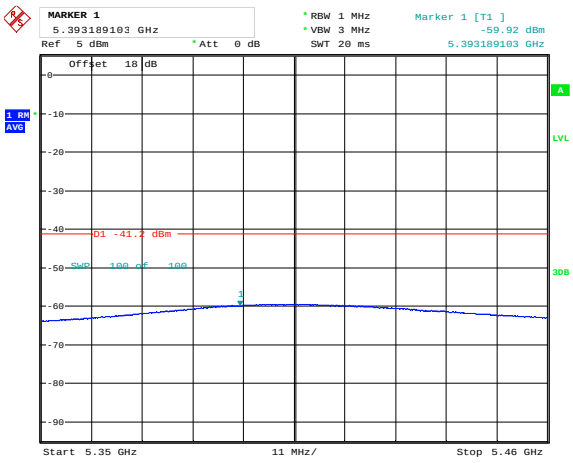
Date: 2.JUL.2015 17:42:08

Middle channel (Peak)



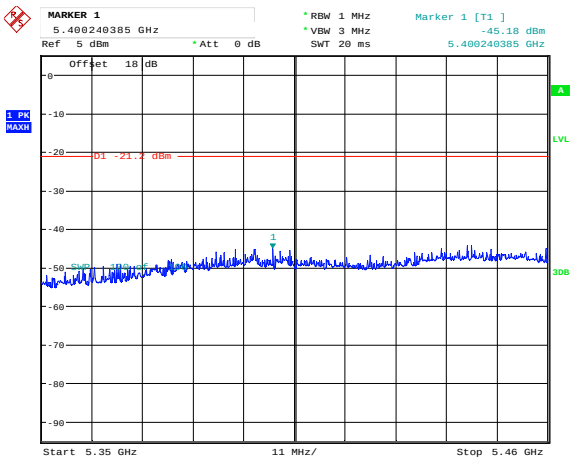
Date: 2.JUL.2015 17:42:57

Middle channel (Ave)



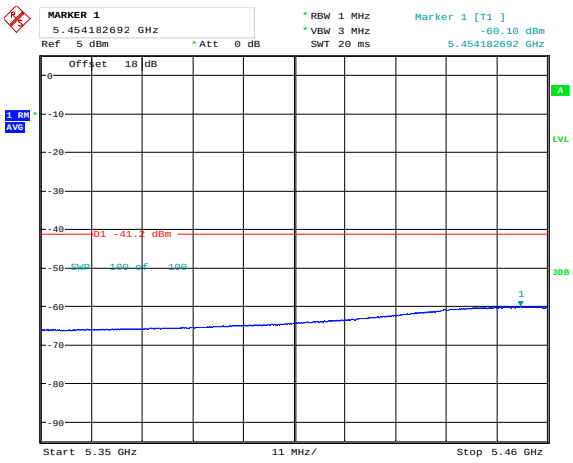
Date: 2.JUL.2015 17:42:33

High channel (Peak)



Date: 2.JUL.2015 17:44:02

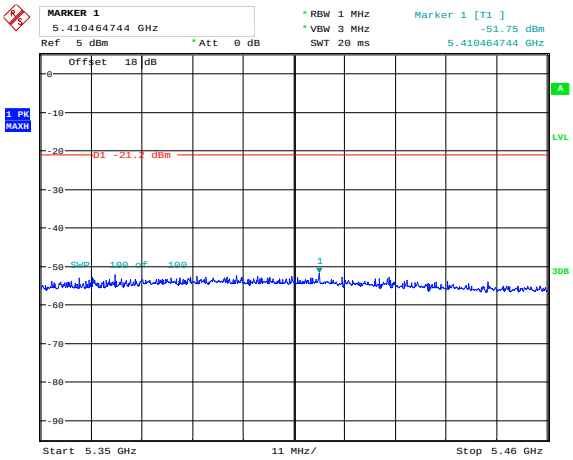
High channel (Ave)



Date: 2.JUL.2015 17:44:36

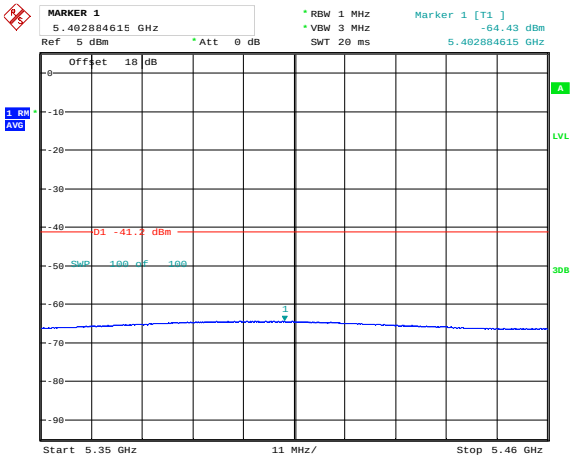
802.11n40 mode

Low channel (Peak)



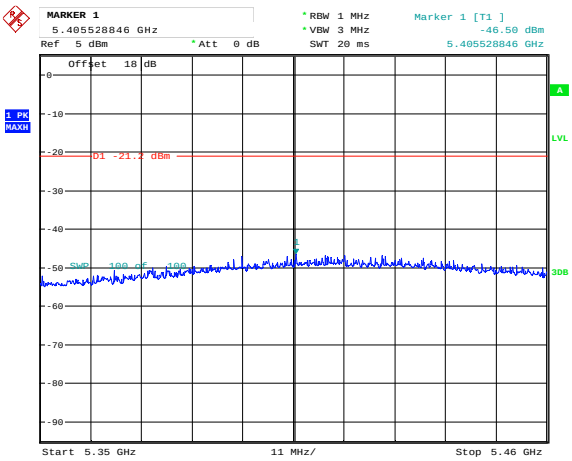
Date: 2.JUL.2015 18:04:53

Low channel (Ave)



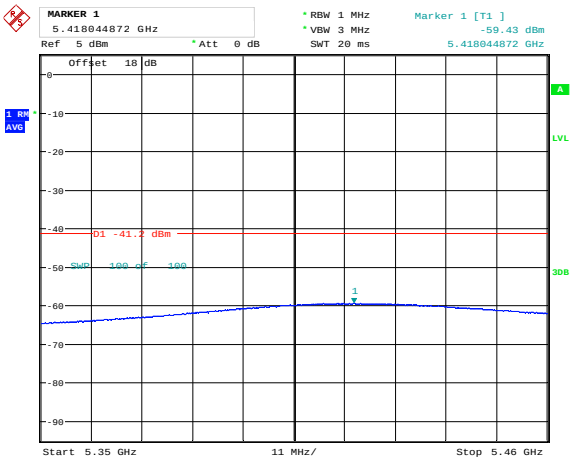
Date: 2.JUL.2015 18:05:16

High channel (Peak)



Date: 2.JUL.2015 18:06:12

High channel (Ave)

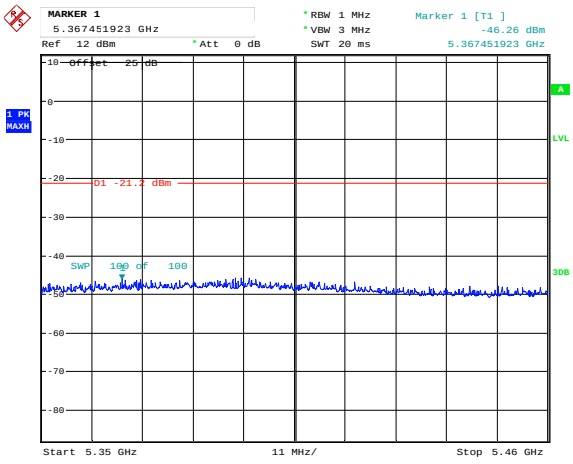


Date: 2.JUL.2015 18:05:50

Antenna gain=14 dBi (Chain 1)

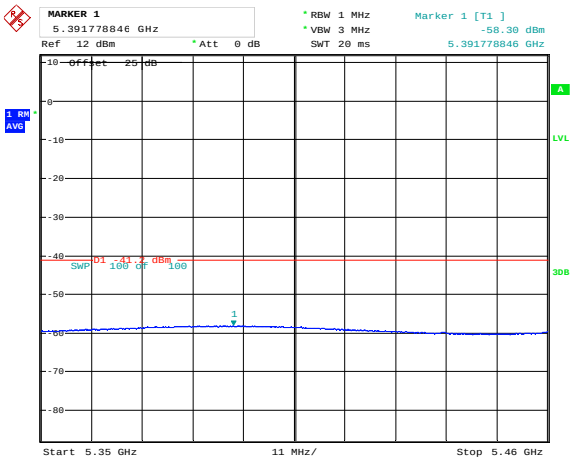
802.11a mode

Low channel (Peak)



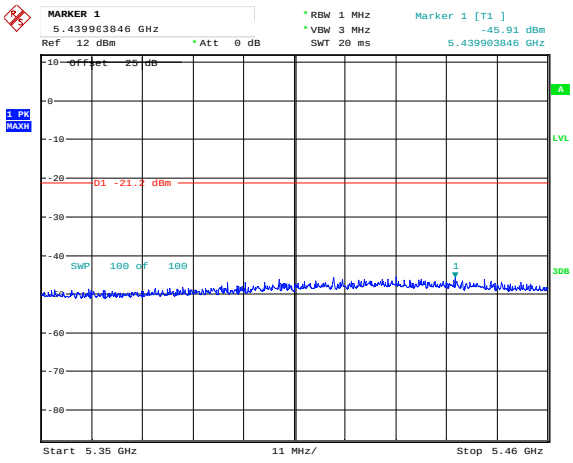
Date: 2.JUL.2015 18:43:46

Low channel (Ave)



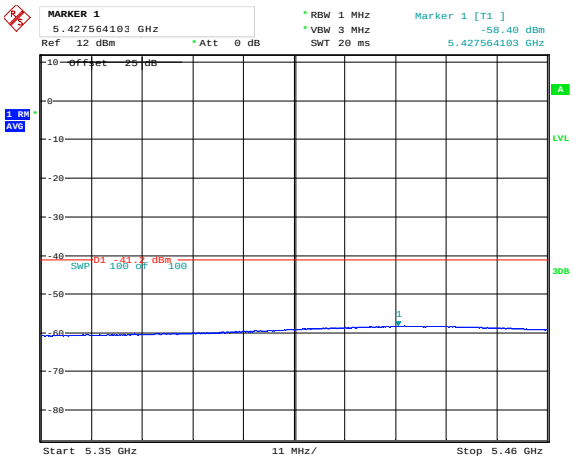
Date: 2.JUL.2015 18:43:23

Middle channel (Peak)



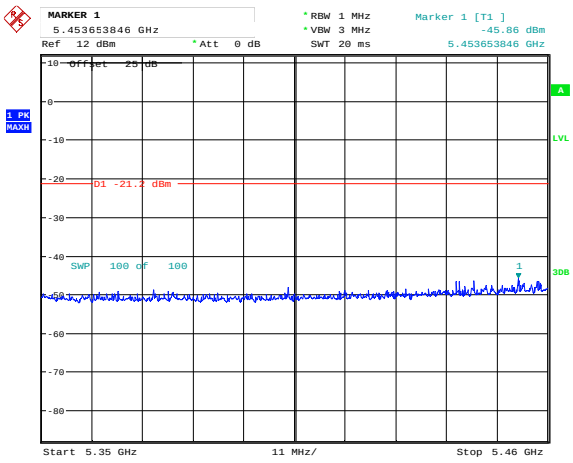
Date: 2.JUL.2015 18:44:15

Middle channel (Ave)



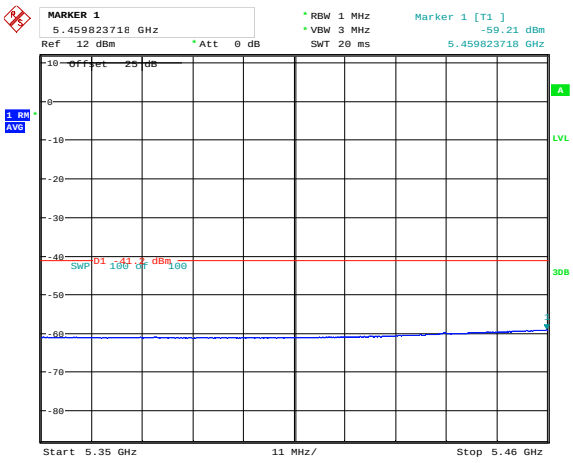
Date: 2.JUL.2015 18:44:38

High channel (Peak)



Date: 2.JUL.2015 18:45:37

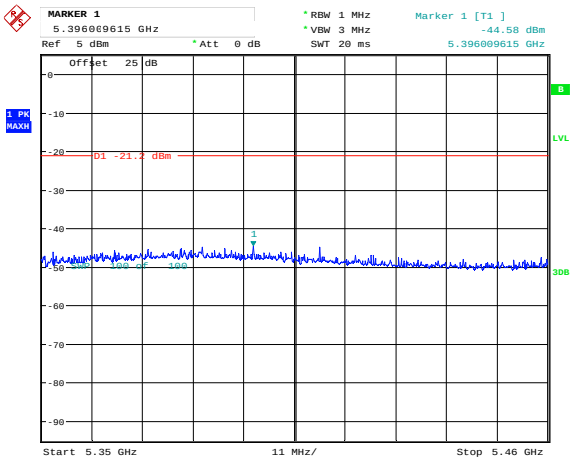
High channel (Ave)



Date: 2.JUL.2015 18:45:12

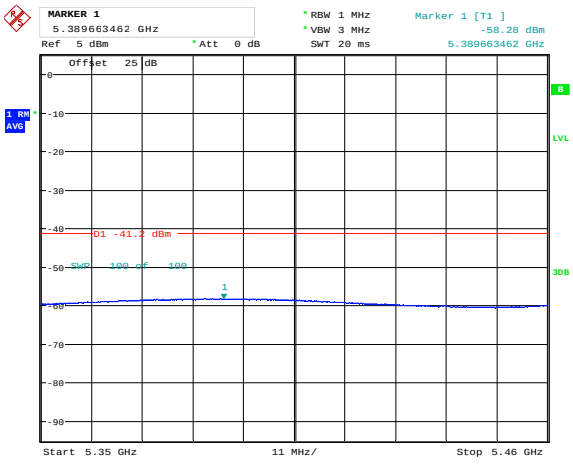
802.11n20 mode

Low channel (Peak)



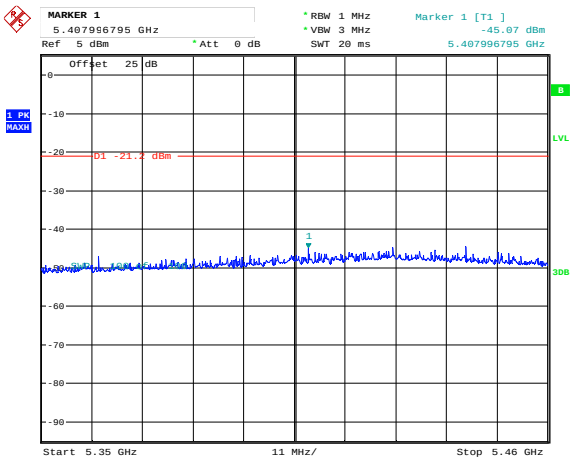
Date: 2.JUL.2015 19:58:01

Low channel (Ave)



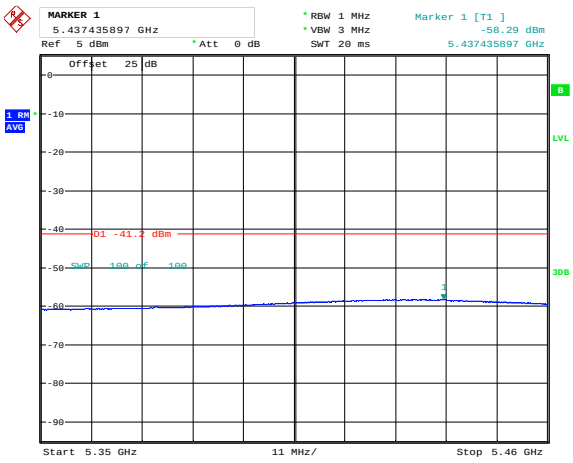
Date: 2.JUL.2015 19:57:32

Middle channel (Peak)



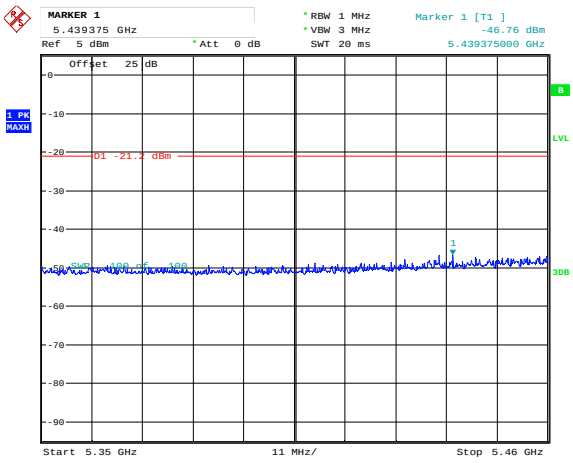
Date: 2.JUL.2015 19:58:30

Middle channel (Ave)



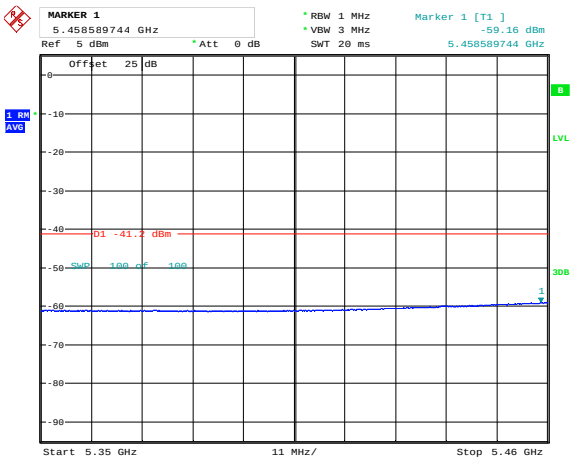
Date: 2.JUL.2015 19:58:53

High channel (Peak)



Date: 2.JUL.2015 19:59:47

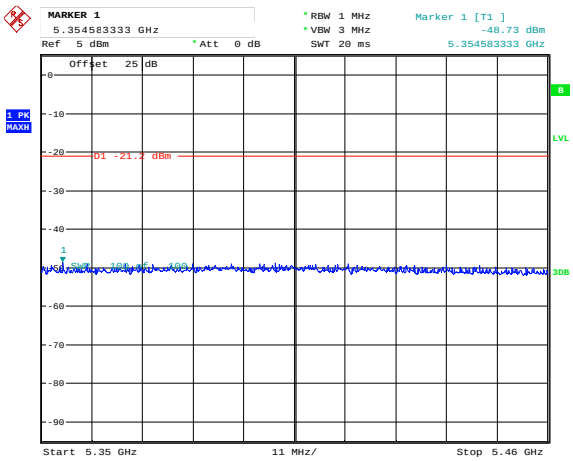
High channel (Ave)



Date: 2.JUL.2015 19:59:24

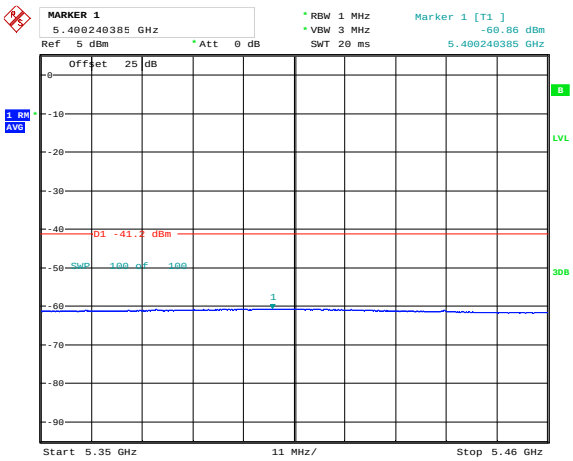
802.11n40 mode

Low channel (Peak)



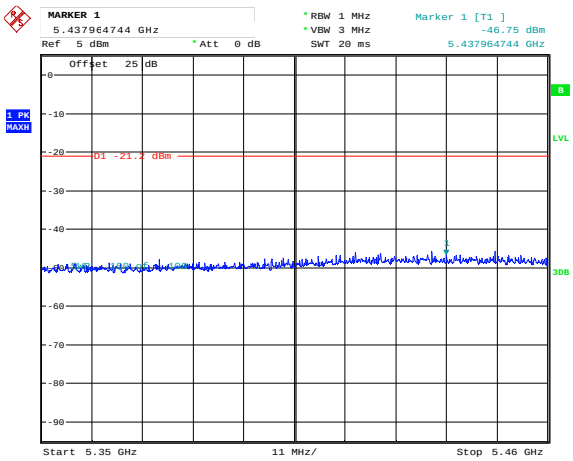
Date: 2.JUL.2015 20:11:27

Low channel (Ave)



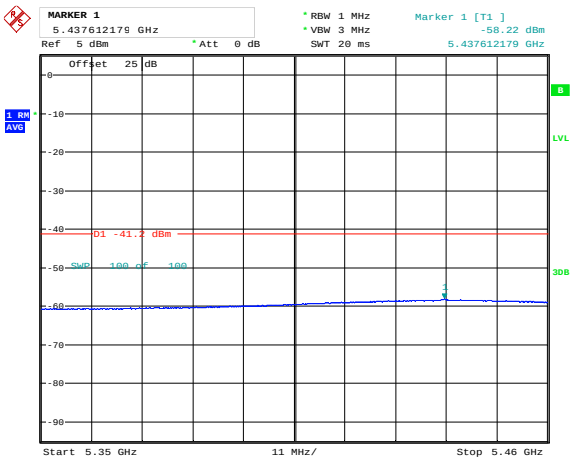
Date: 2.JUL.2015 20:10:55

High channel (Peak)



Date: 2.JUL.2015 20:12:02

High channel (Ave)



Date: 2.JUL.2015 20:12:26

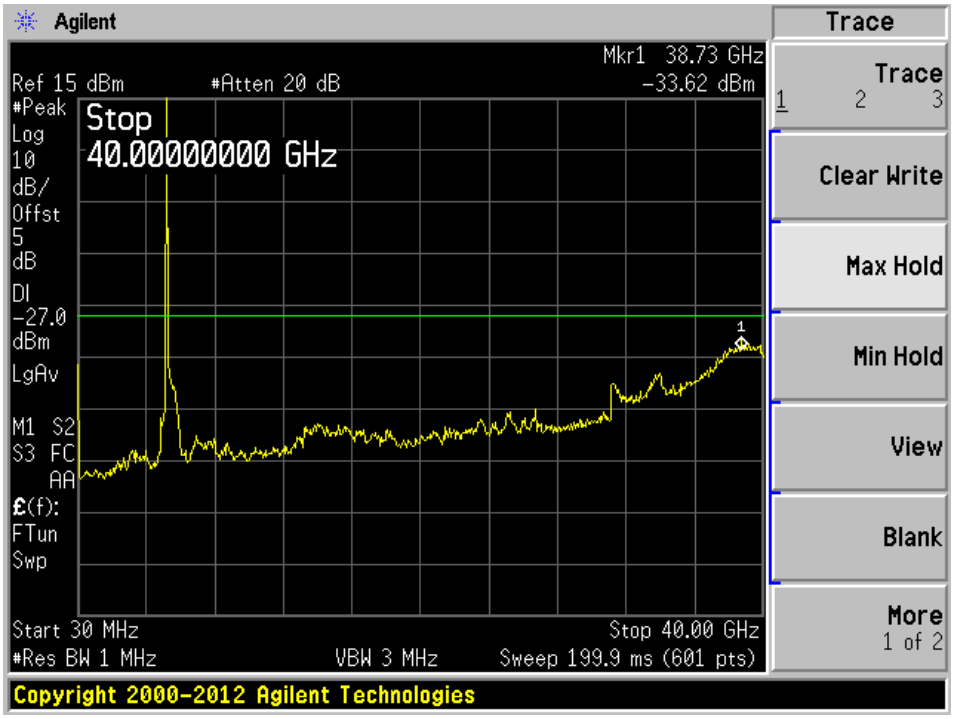
Note: The offset = cable loss + attenuator + antenna gain

Conducted Spurious Emission at Antenna Port (30 MHz-40 GHz)

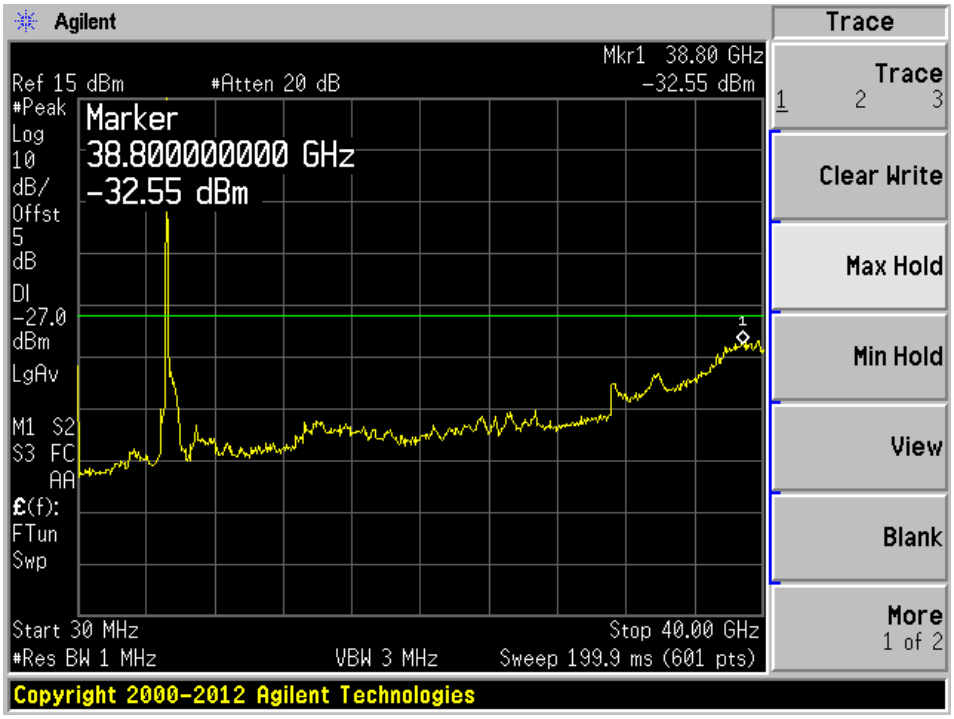
(Tested with the highest power setting)

5.2 GHz Band

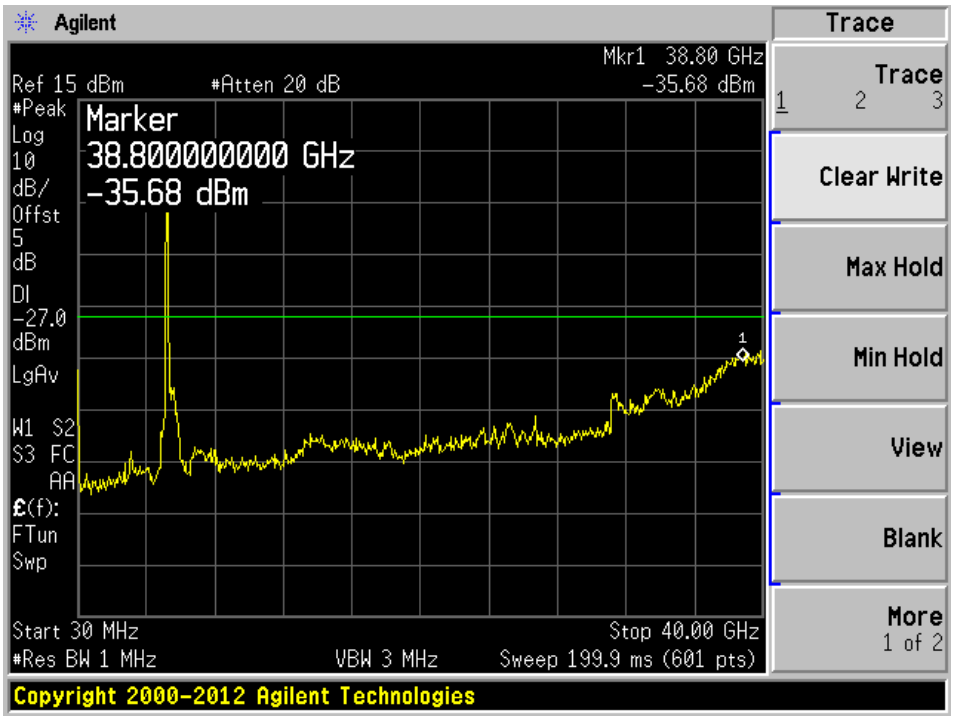
802.11a mode-chain 0



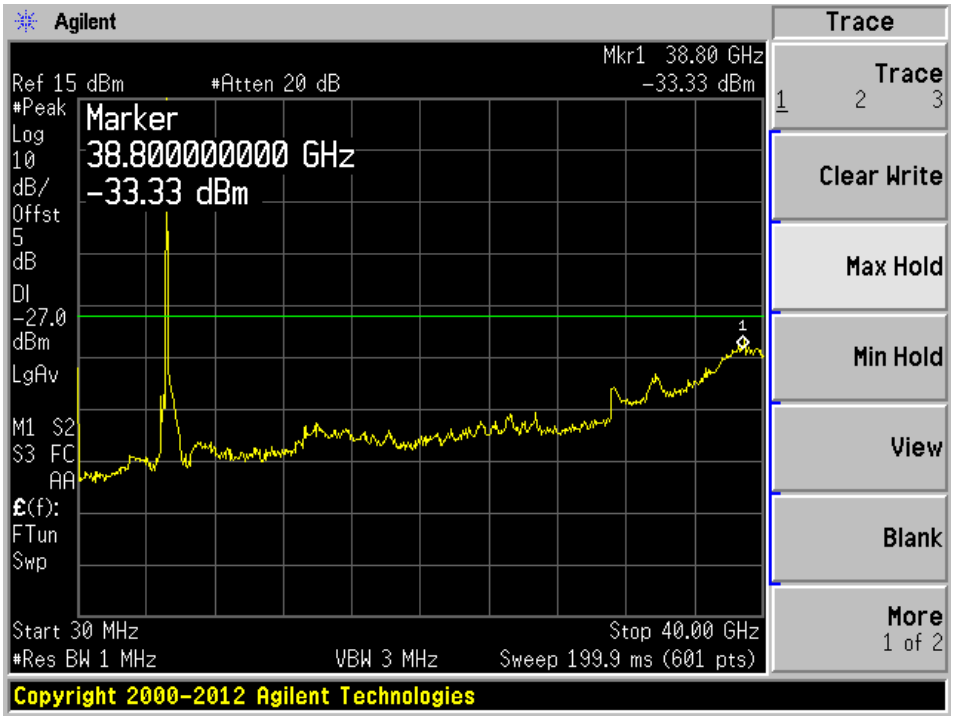
802.11n20 mode-chain 0



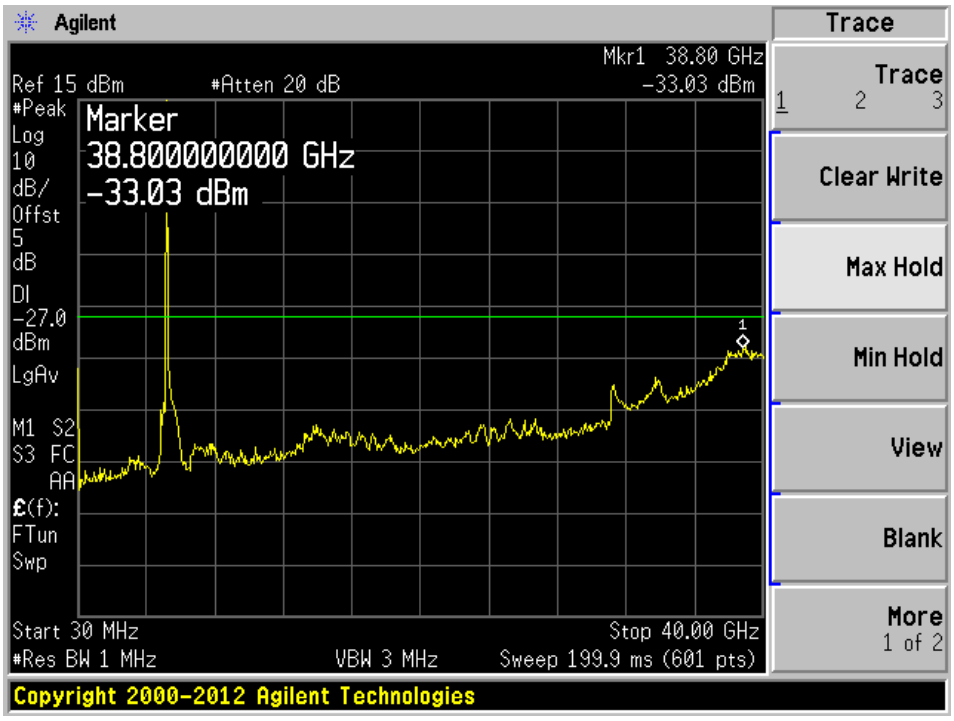
802.11n40 mode-chain 0



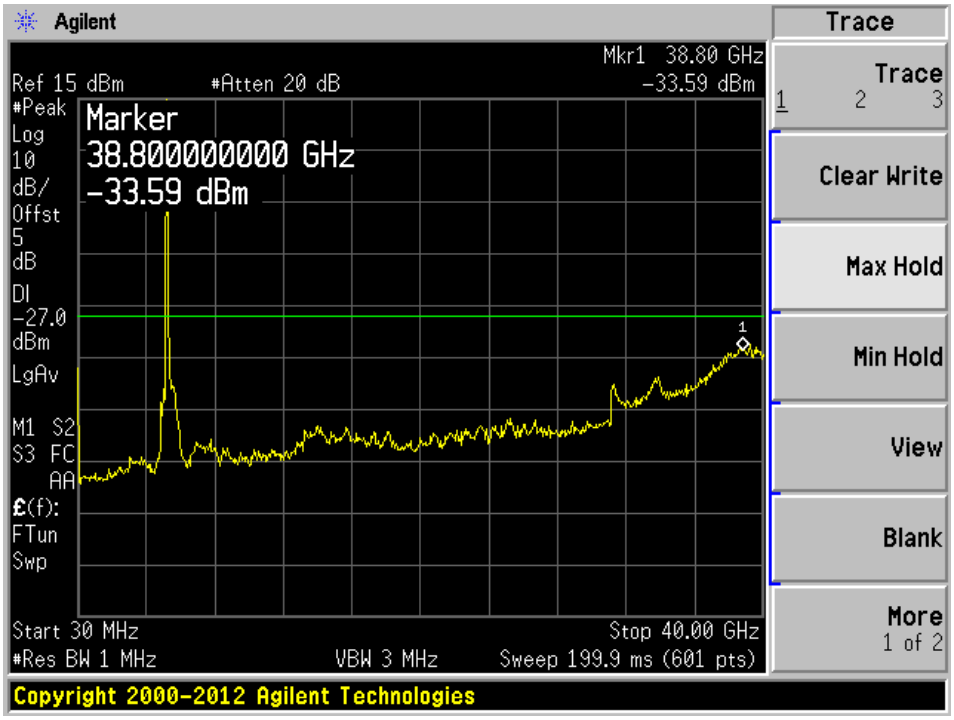
802.11a mode-chain 1



802.11n20 mode-chain 1

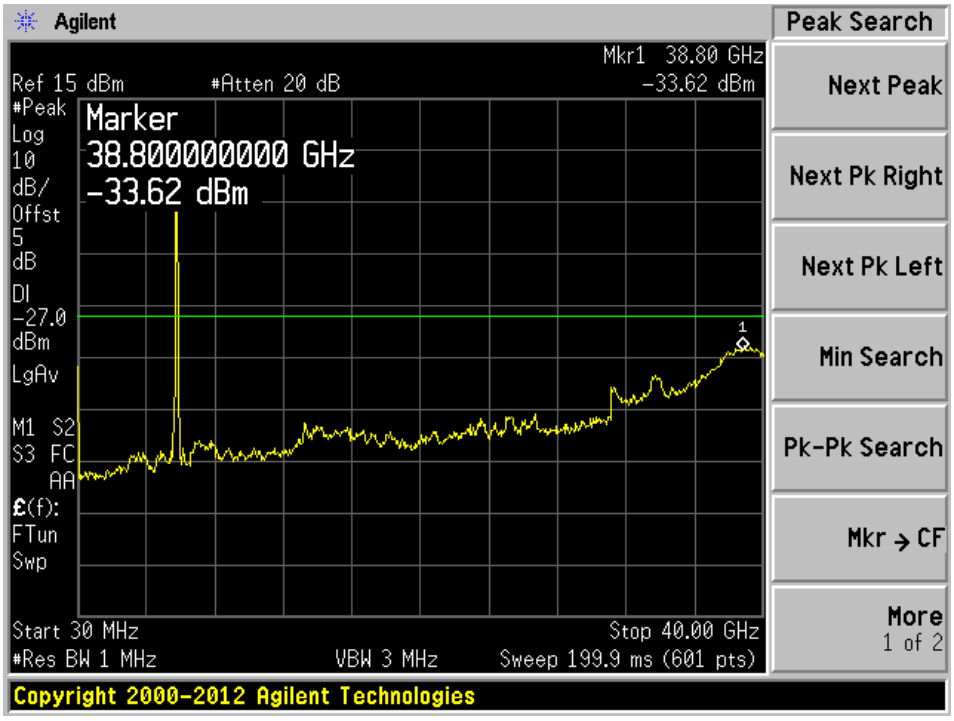


802.11n40 mode-chain 1

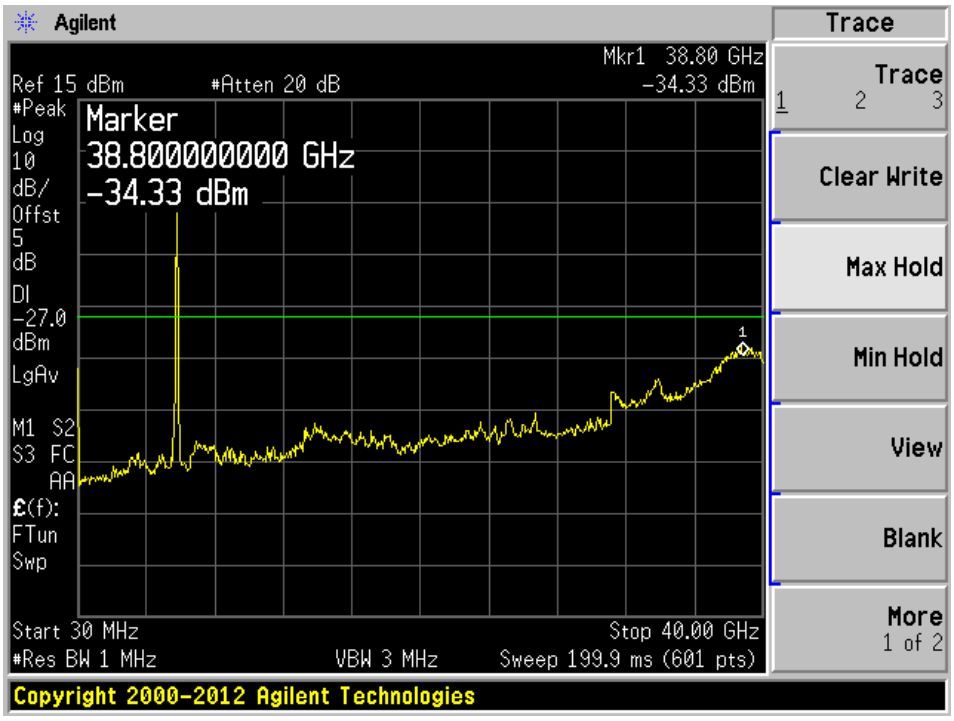


5.8 GHz Band

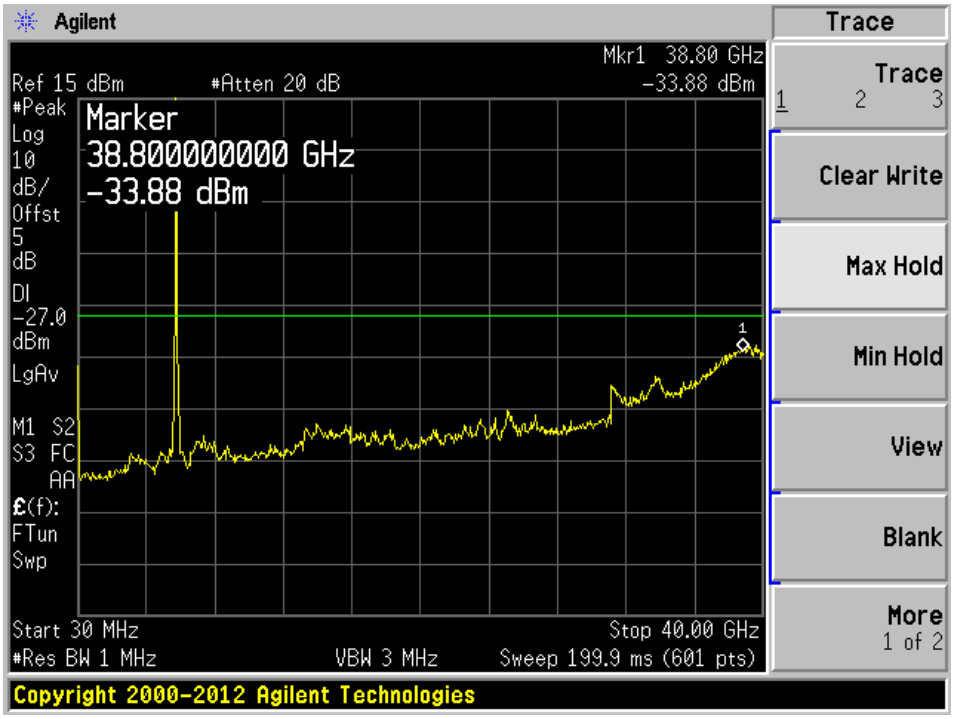
802.11a mode-chain 0



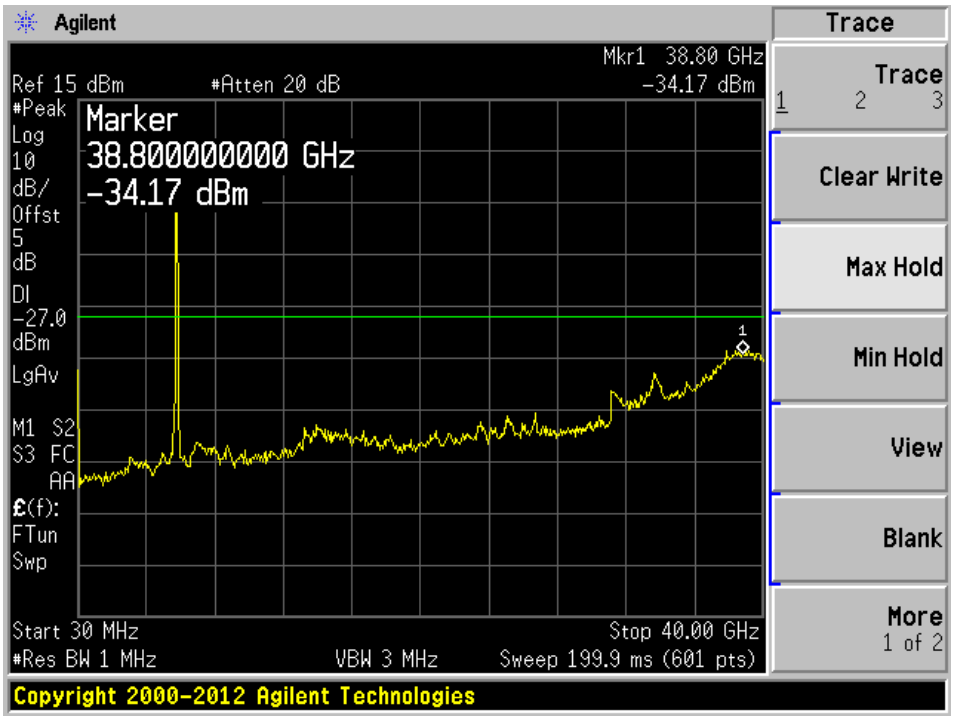
802.11n20 mode-chain 0



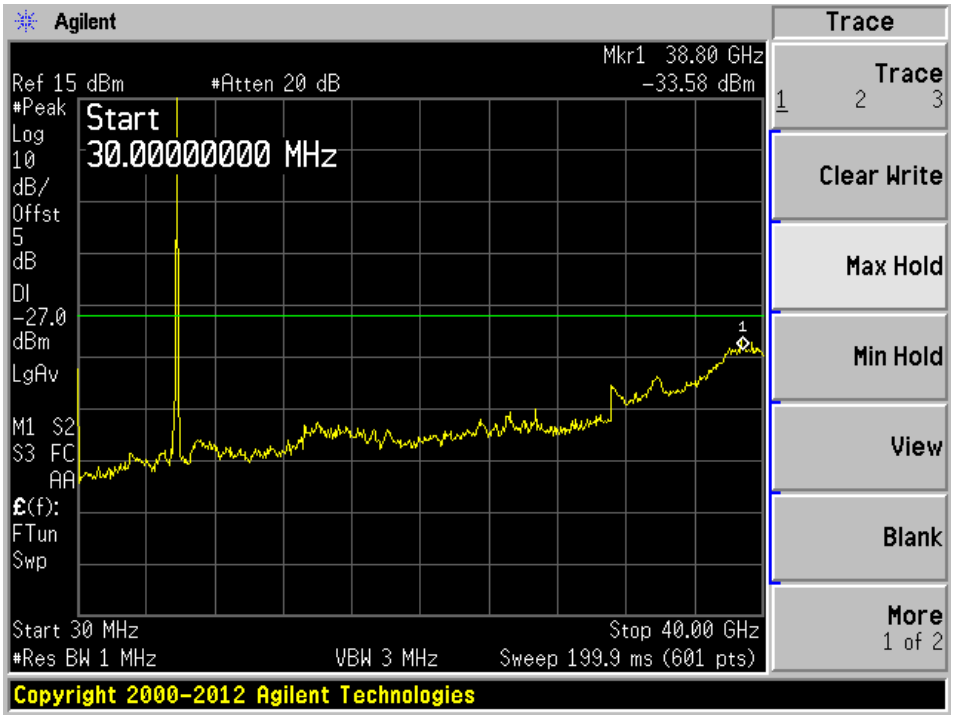
802.11n40 mode-chain 0



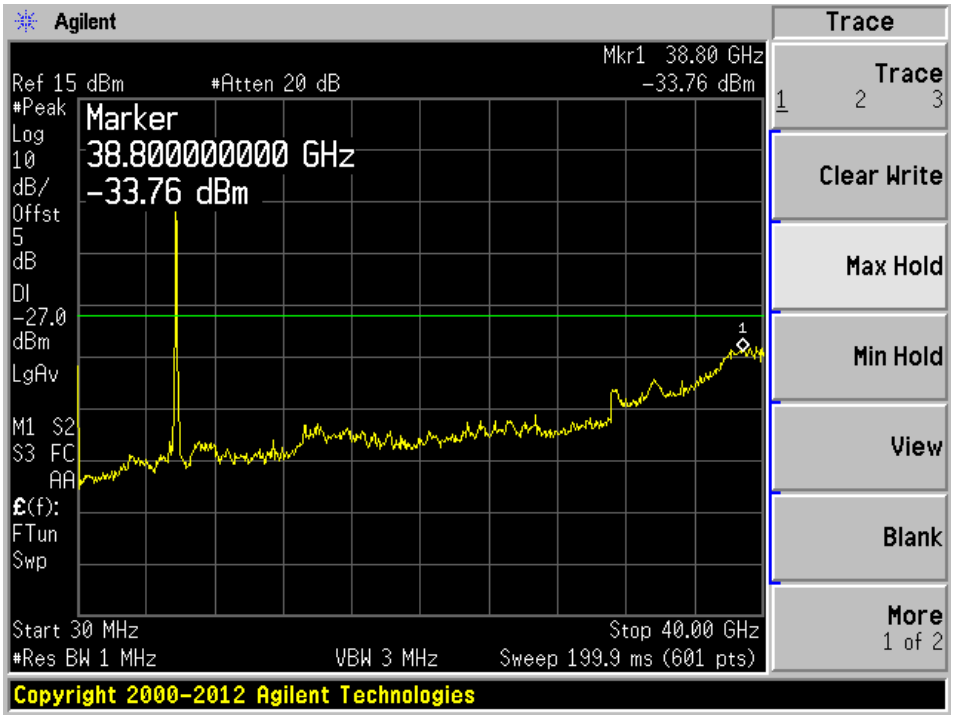
802.11a mode-chain 1



802.11n20 mode-chain 1



802.11n40 mode-chain 1



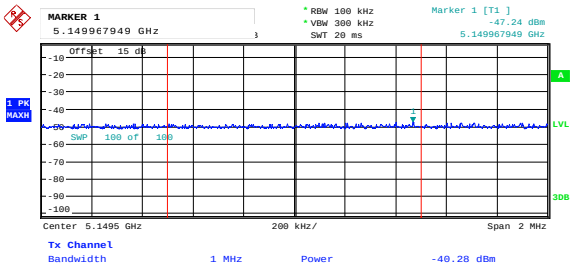
Band Edge

5.2 GHz Band

Antenna gain=4 dBi, Chain 0

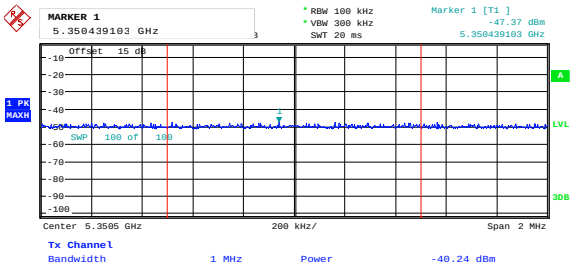
802.11a mode

Left Band-chain 0



Date: 1.JUL.2015 21:07:21

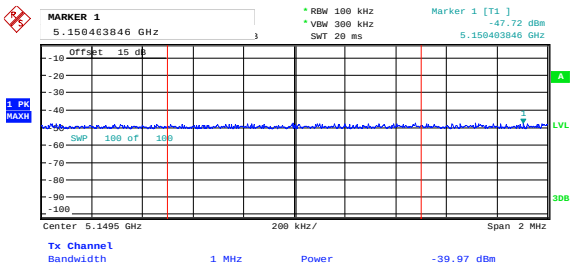
Right Band-chain 0



Date: 1.JUL.2015 21:08:31

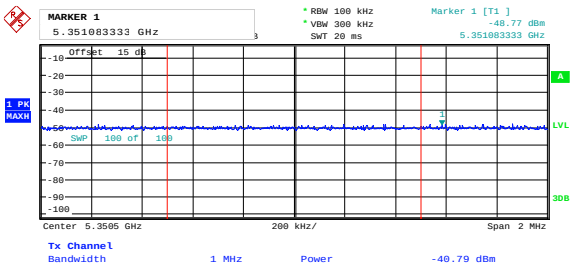
802.11n20 mode

Left Band-chain 0



Date: 1.JUL.2015 21:12:36

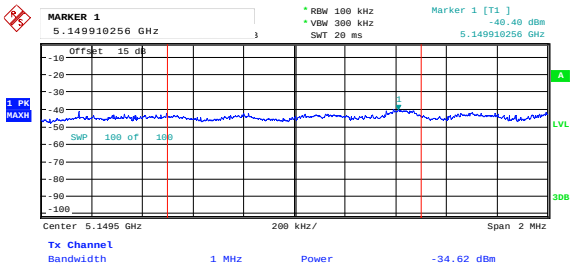
Right Band-chain 0



Date: 1.JUL.2015 21:13:39

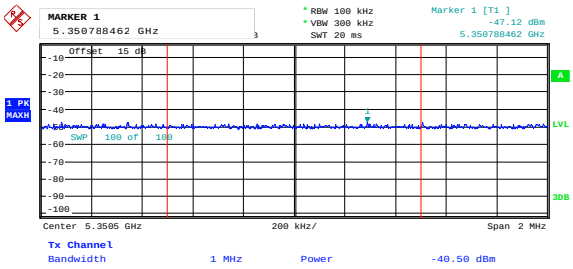
802.11n40 mode

Left Band-chain 0



Date: 1.JUL.2015 21:02:05

Right Band-chain 0

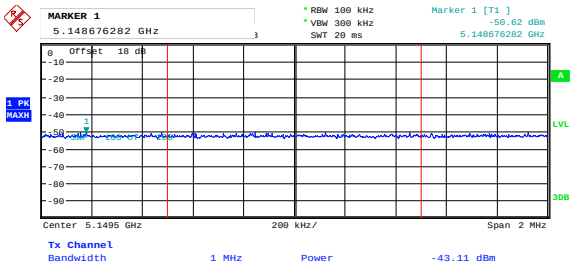


Date: 1.JUL.2015 21:03:14

Antenna gain=7 dBi, Chain0

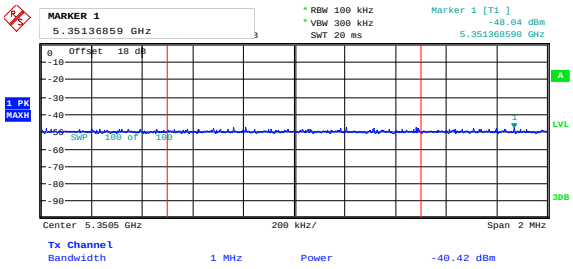
802.11a mode

Left Band-chain 0



Date: 1.JUL.2015 20:37:19

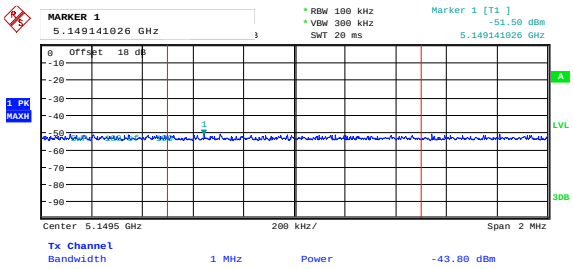
Right Band-chain 0



Date: 1.JUL.2015 20:38:41

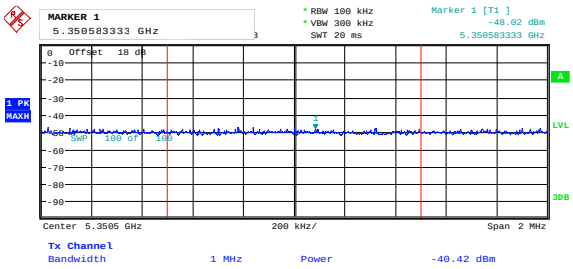
802.11n20 mode

Left Band-chain 0



Date: 1.JUL.2015 20:43:37

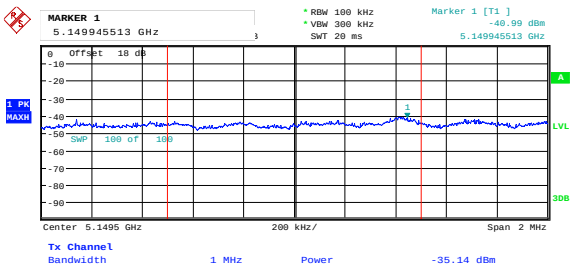
Right Band-chain 0



Date: 1.JUL.2015 20:44:31

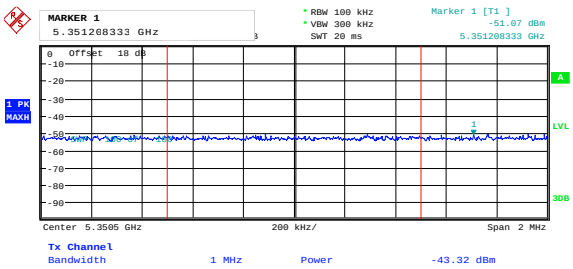
802.11n40 mode

Left Band-chain 0



Date: 1.JUL.2015 20:49:22

Right Band-chain 0

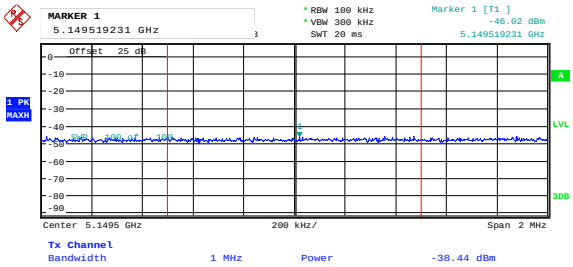


Date: 1.JUL.2015 20:50:35

Antenna gain=14 dBi, Chain 0

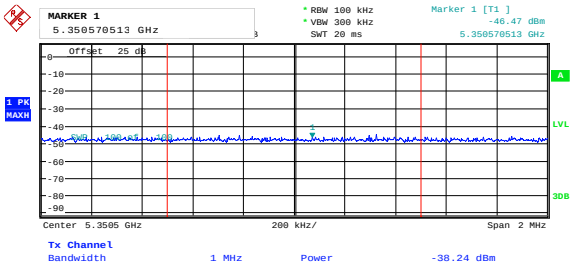
802.11a mode

Left Band-chain 0



Date: 1.JUL.2015 20:03:43

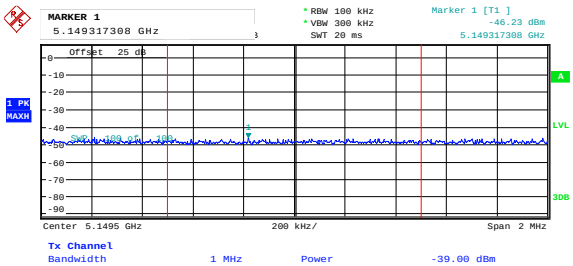
Right Band-chain 0



Date: 1.JUL.2015 20:05:12

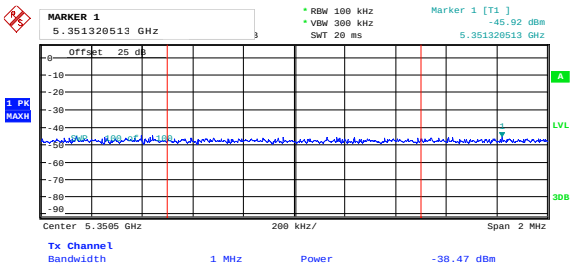
802.11n20 mode

Left Band-chain 0



Date: 1.JUL.2015 20:10:04

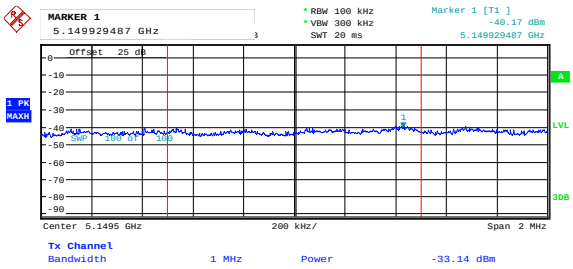
Right Band-chain 0



Date: 1.JUL.2015 20:11:14

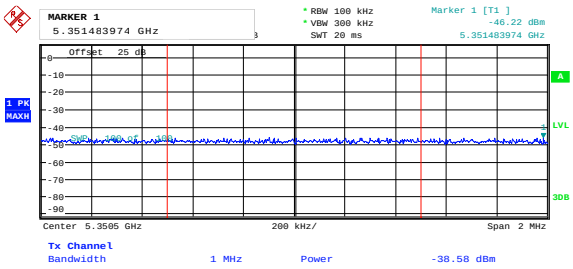
802.11n40 mode

Left Band-chain 0



Date: 1.JUL.2015 20:16:18

Right Band-chain 0

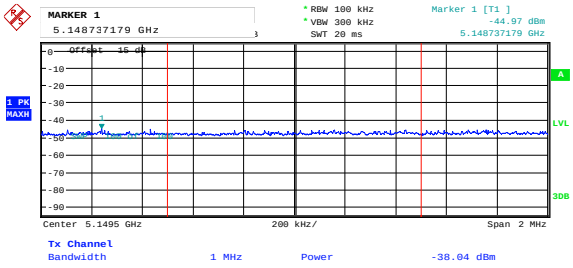


Date: 1.JUL.2015 20:17:44

Antenna gain=4 dBi, Chain 1

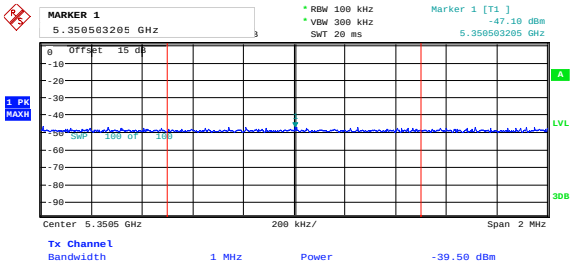
802.11a mode

Left Band-chain 1



Date: 1.JUL.2015 16:32:30

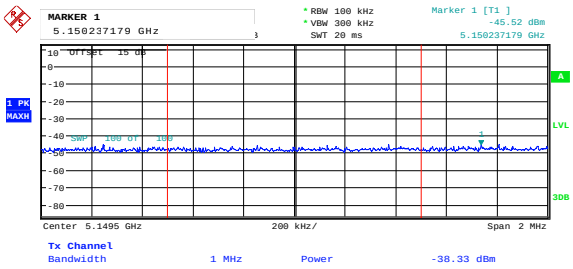
Right Band-chain 1



Date: 1.JUL.2015 16:34:51

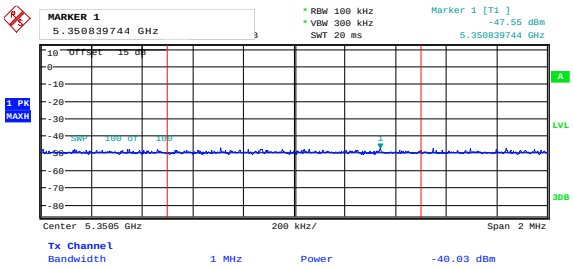
802.11n20 mode

Left Band-chain 1



Date: 1.JUL.2015 16:43:51

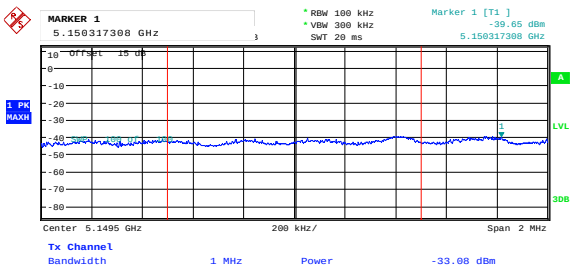
Right Band-chain 1



Date: 1.JUL.2015 16:44:34

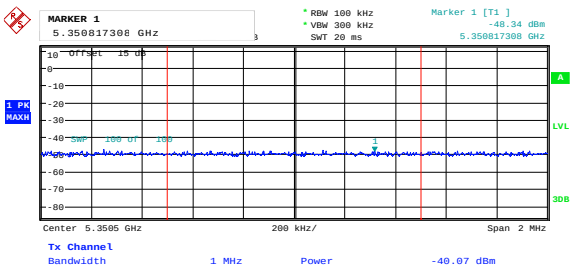
802.11n40 mode

Left Band-chain 1



Date: 1.JUL.2015 16:50:23

Right Band-chain 1

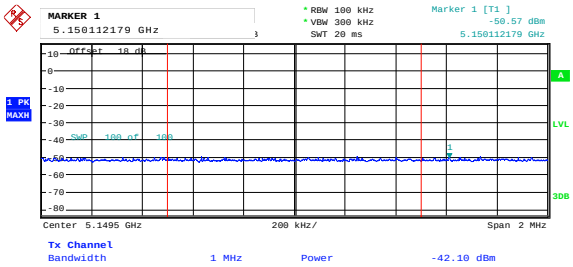


Date: 1.JUL.2015 16:51:04

Antenna gain=7 dBi, Chain 1

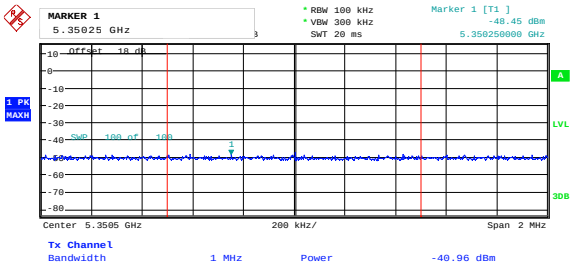
802.11a mode

Left Band-chain 1



Date: 1.JUL.2015 17:02:15

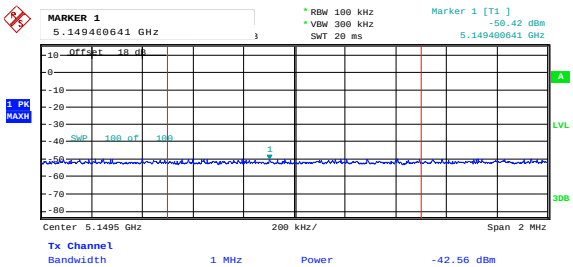
Right Band-chain 1



Date: 1.JUL.2015 17:03:25

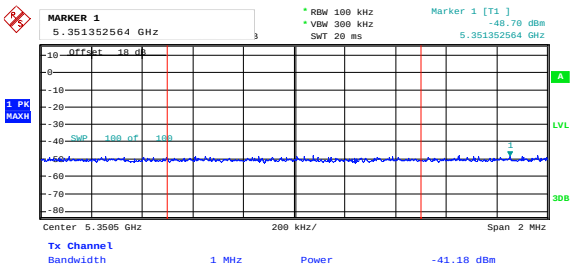
802.11n20 mode

Left Band-chain 1



Date: 1.JUL.2015 17:07:58

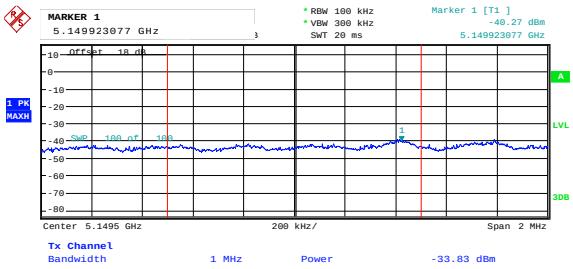
Right Band-chain 1



Date: 1.JUL.2015 17:09:10

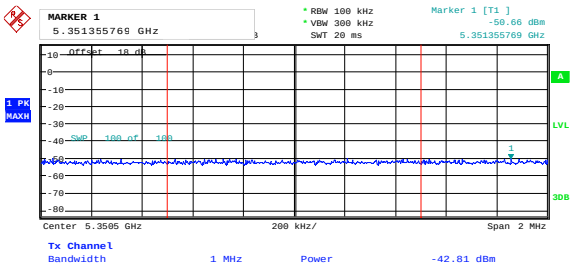
802.11n40 mode

Left Band-chain 1



Date: 1.JUL.2015 17:13:55

Right Band-chain 1

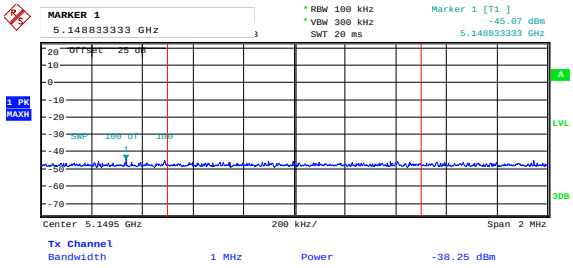


Date: 1.JUL.2015 17:15:08

Antenna gain=14 dBi, Chain 1

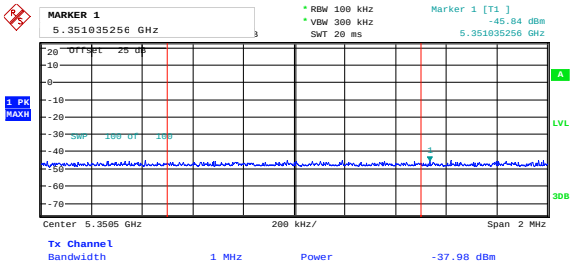
802.11a mode

Left Band-chain 1



Date: 1.JUL.2015 17:36:08

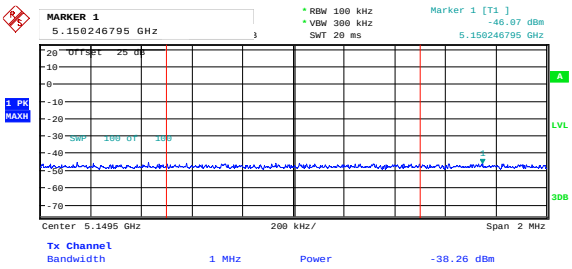
Right Band-chain 1



Date: 1.JUL.2015 17:37:19

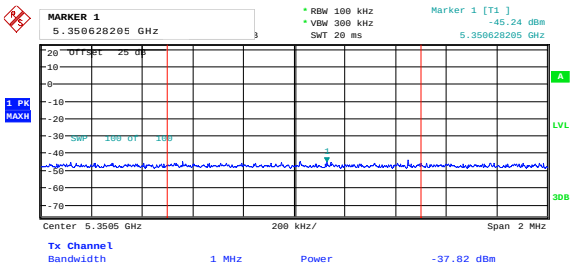
802.11n20 mode

Left Band-chain 1



Date: 1.JUL.2015 17:41:04

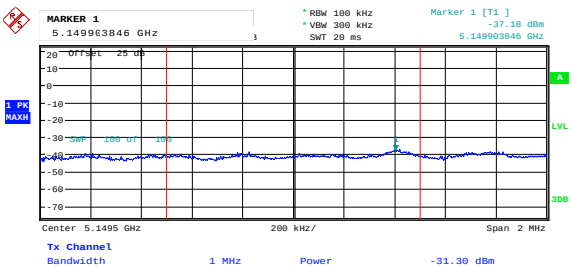
Right Band-chain 1



Date: 1.JUL.2015 17:44:19

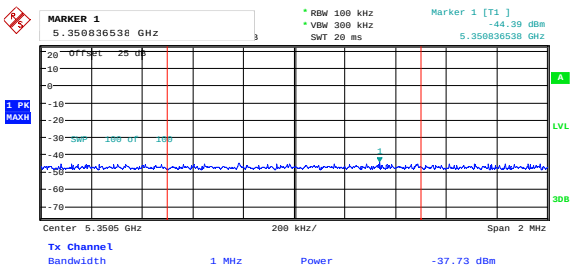
802.11n40 mode

Left Band-chain 1



Date: 1.JUL.2015 17:28:45

Right Band-chain 1



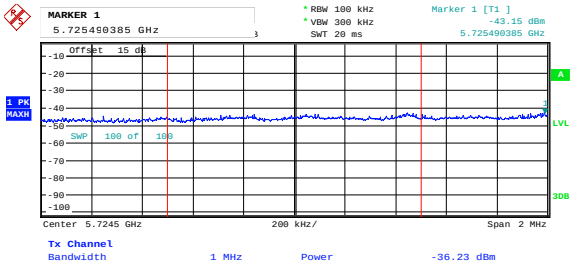
Date: 1.JUL.2015 17:29:39

5.8 GHz Band

Antenna gain=4 dBi, Chain 0

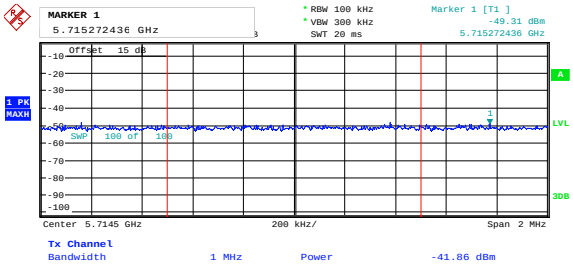
802.11a mode

Left Band (<10MHz)-chain 0



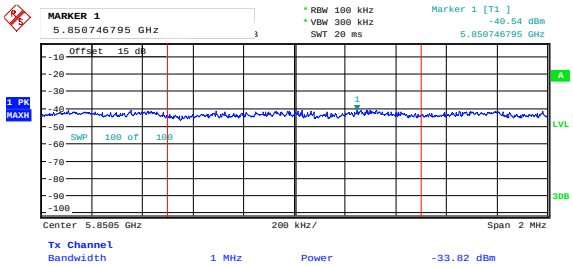
Date: 1.JUL.2015 21:10:48

Left Band (>10MHz)-chain 0



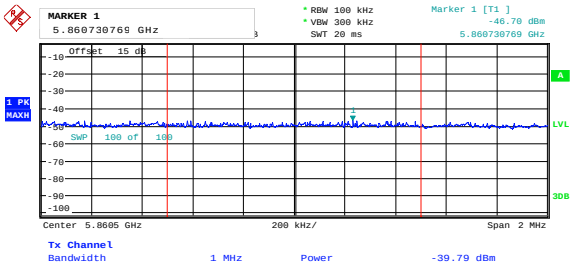
Date: 1.JUL.2015 21:11:04

Right Band (<10MHz)-chain 0



Date: 1.JUL.2015 21:11:32

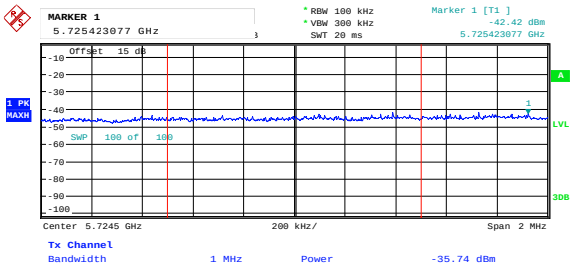
Right Band (>10MHz)-chain 0



Date: 1.JUL.2015 21:11:54

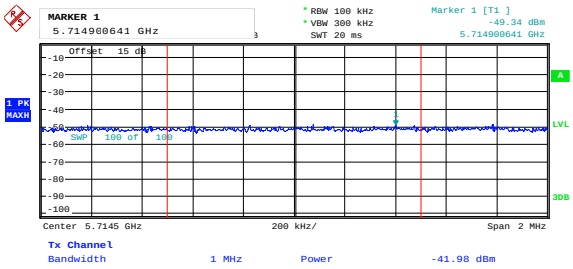
802.11n20 mode

Left Band (<10MHz)-chain 0



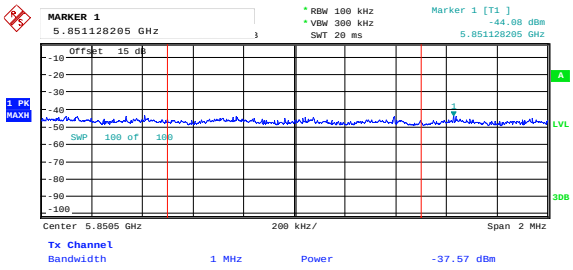
Date: 1.JUL.2015 21:15:29

Left Band (>10MHz)-chain 0



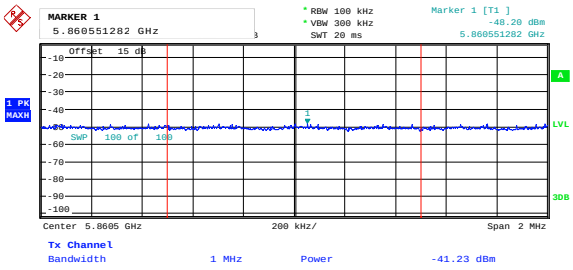
Date: 1.JUL.2015 21:15:44

Right Band (<10MHz)-chain 0



Date: 1.JUL.2015 21:16:17

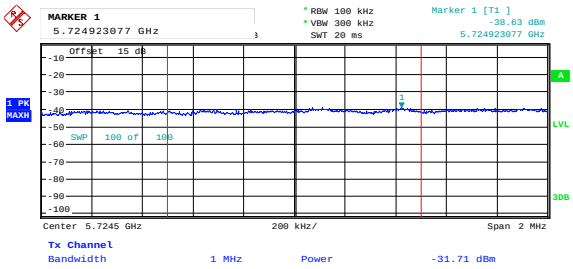
Right Band (>10MHz)-chain 0



Date: 1.JUL.2015 21:16:39

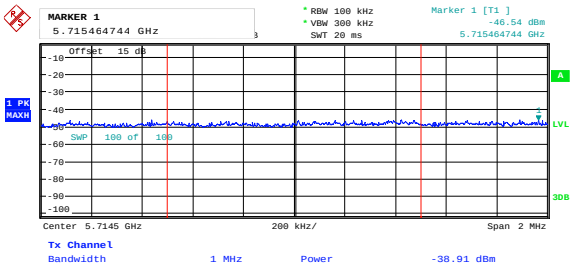
802.11n40 mode

Left Band (<10MHz)-chain 0



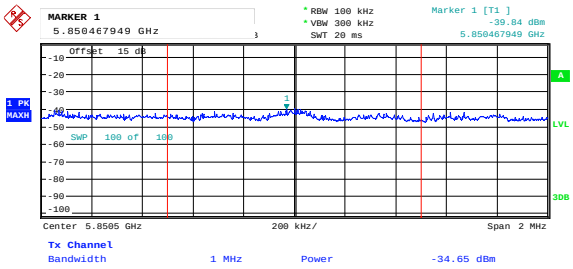
Date: 1.JUL.2015 21:05:38

Left Band (>10MHz)-chain 0



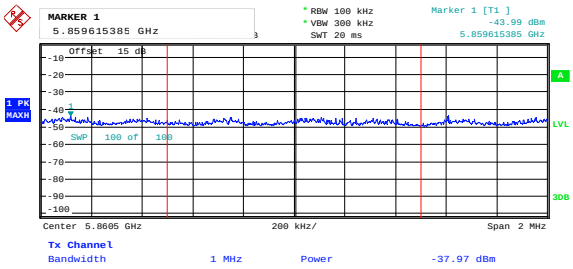
Date: 1.JUL.2015 21:05:55

Right Band (<10MHz)-chain 0



Date: 1.JUL.2015 21:06:23

Right Band (>10MHz)-chain 0

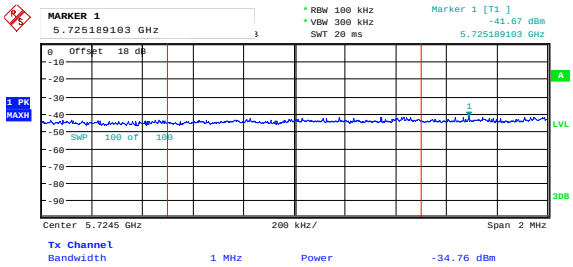


Date: 1.JUL.2015 21:06:47

Antenna gain=7 dBi, chain 0

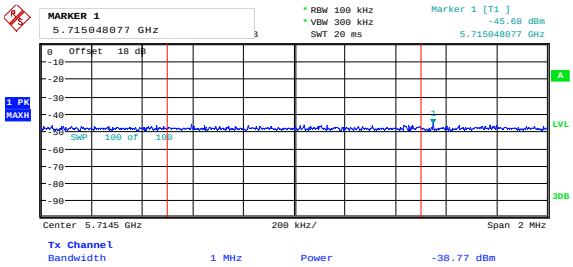
802.11a mode

Left Band (<10MHz)-chain 0



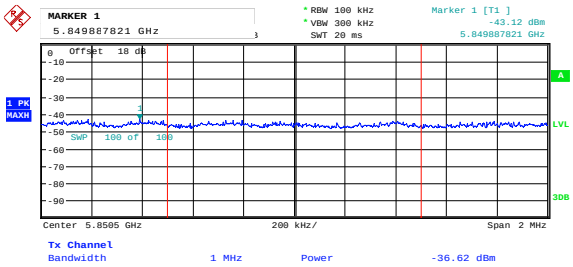
Date: 1.JUL.2015 20:41:24

Left Band (>10MHz)-chain 0



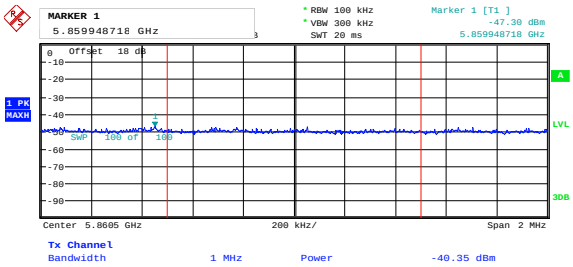
Date: 1.JUL.2015 20:41:57

Right Band (<10MHz)-chain 0



Date: 1.JUL.2015 20:42:31

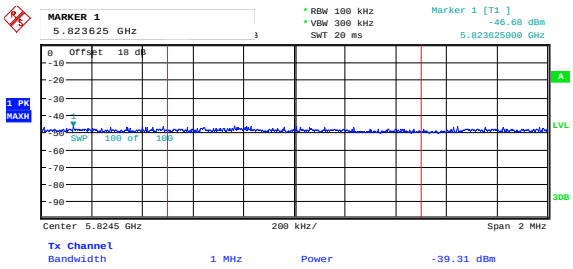
Right Band (>10MHz)-chain 0



Date: 1.JUL.2015 20:42:52

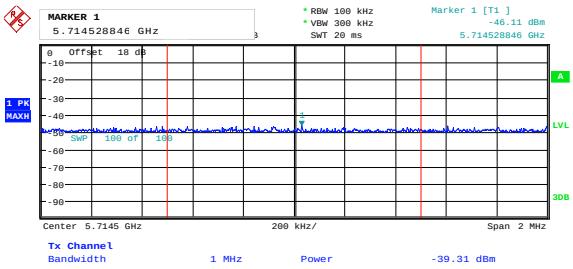
802.11n20 mode

Left Band (<10MHz)-chain 0



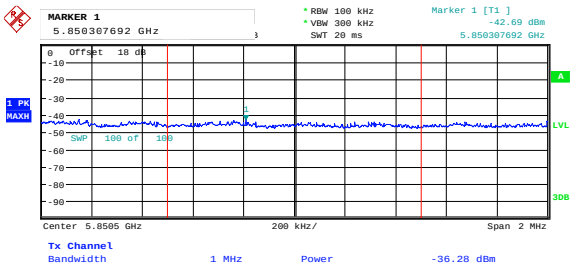
Date: 1.JUL.2015 20:46:50

Left Band (>10MHz)-chain 0



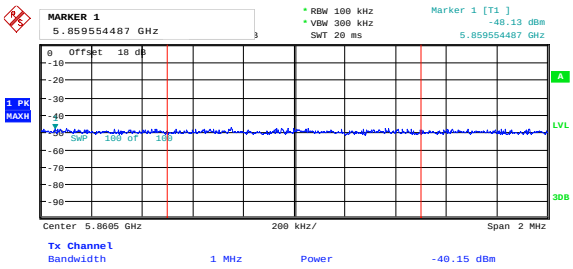
Date: 1.JUL.2015 20:47:06

Right Band (<10MHz)-chain 0



Date: 1.JUL.2015 20:47:44

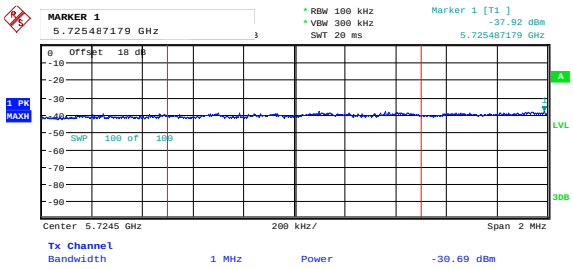
Right Band (>10MHz)-chain 0



Date: 1.JUL.2015 20:48:16

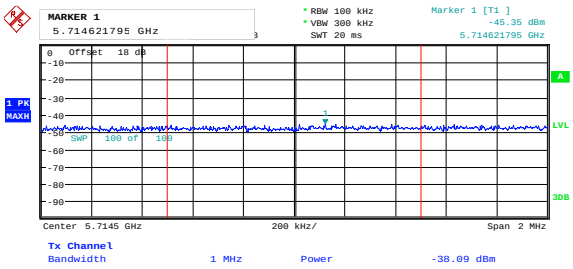
802.11n40 mode

Left Band (<10MHz)-chain 0



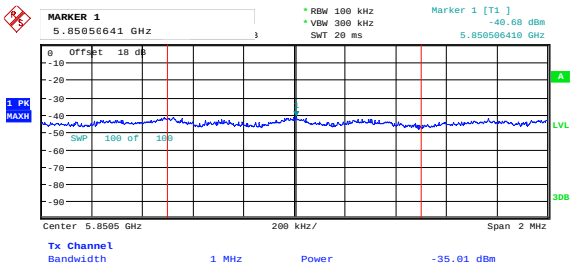
Date: 1.JUL.2015 20:53:42

Left Band (>10MHz)-chain 0



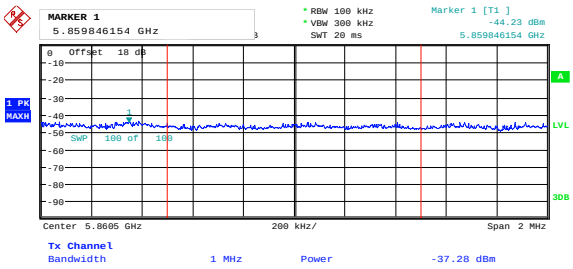
Date: 1.JUL.2015 20:54:02

Right Band (<10MHz)-chain 0



Date: 1.JUL.2015 20:54:39

Right Band (>10MHz)-chain 0

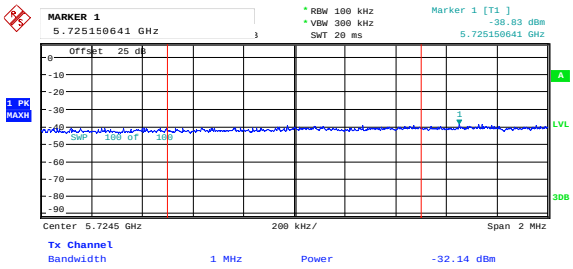


Date: 1.JUL.2015 20:55:05

Antenna gain=14 dBi, Chain 0

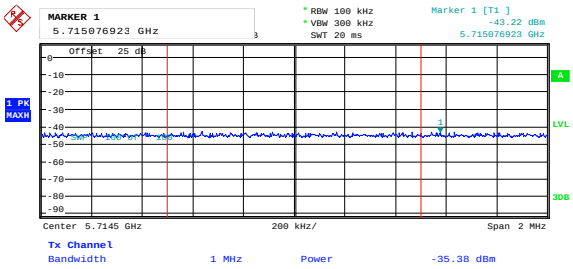
802.11a mode

Left Band (<10MHz)-chain 0



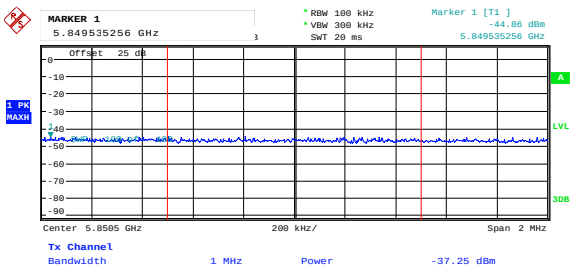
Date: 1.JUL.2015 20:07:45

Left Band (>10MHz)-chain 0



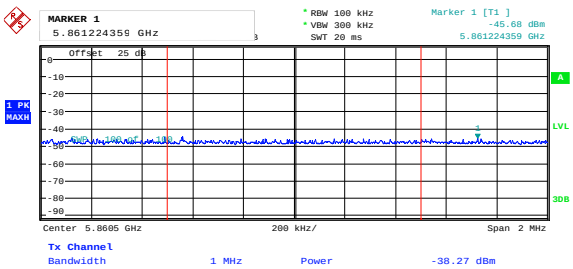
Date: 1.JUL.2015 20:08:04

Right Band (<10MHz)-chain 0



Date: 1.JUL.2015 20:08:51

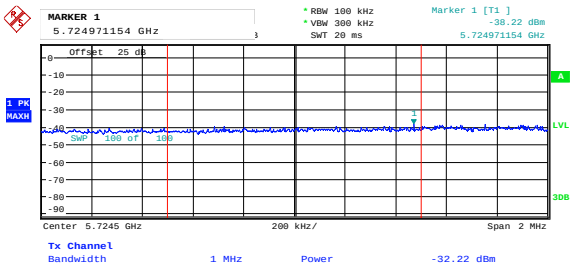
Right Band (>10MHz)-chain 0



Date: 1.JUL.2015 20:09:16

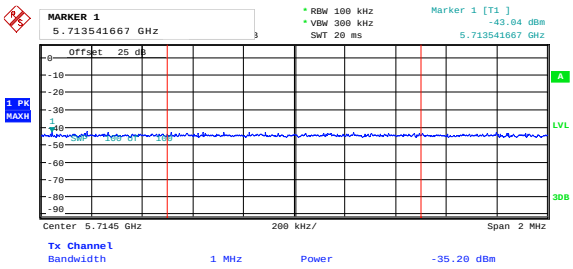
802.11n20 mode

Left Band (<10MHz)-chain 0



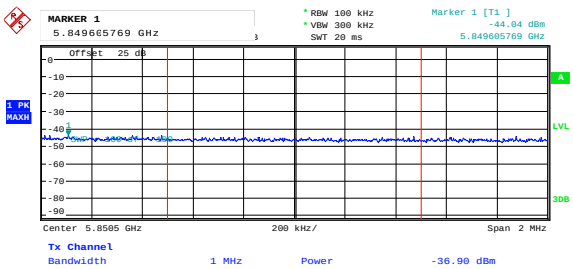
Date: 1.JUL.2015 20:13:42

Left Band (>10MHz)-chain 0



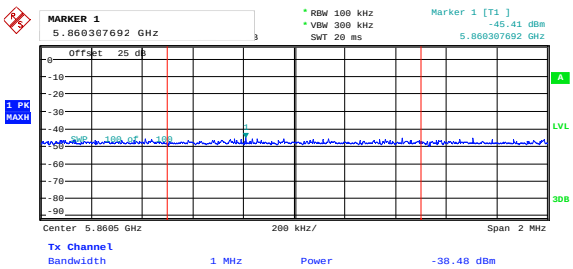
Date: 1.JUL.2015 20:14:08

Right Band (<10MHz)-chain 0



Date: 1.JUL.2015 20:14:56

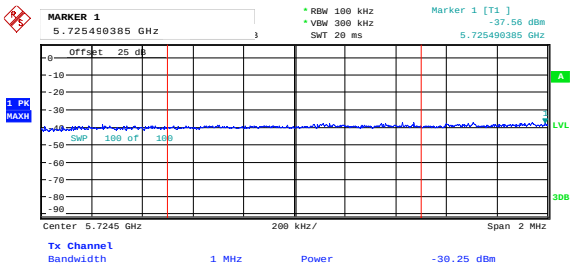
Right Band (>10MHz)-chain 0



Date: 1.JUL.2015 20:15:19

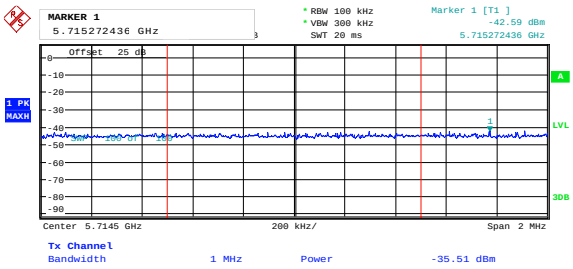
802.11n40 mode

Left Band (<10MHz)-chain 0



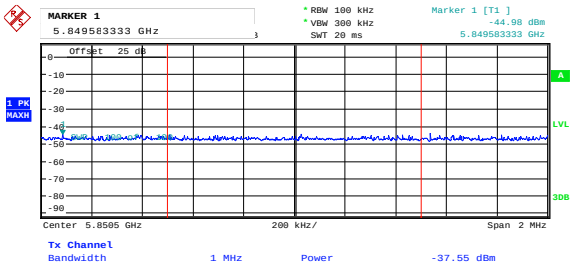
Date: 1.JUL.2015 20:20:02

Left Band (>10MHz)-chain 0



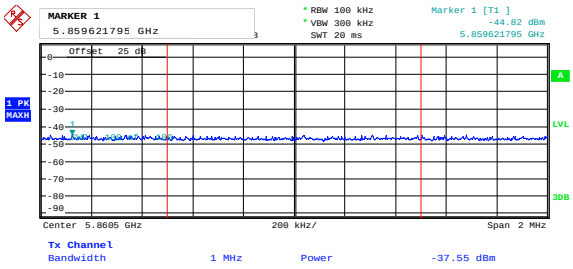
Date: 1.JUL.2015 20:20:20

Right Band (<10MHz)-chain 0



Date: 1.JUL.2015 20:20:49

Right Band (>10MHz)-chain 0

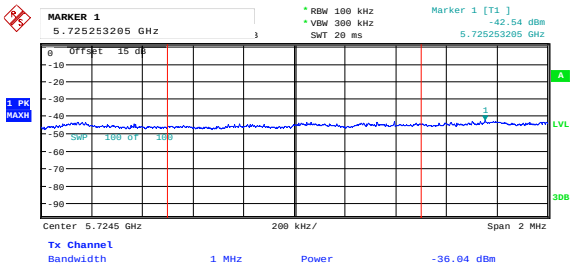


Date: 1.JUL.2015 20:21:15

Antenna gain=4 dBi, Chain 1

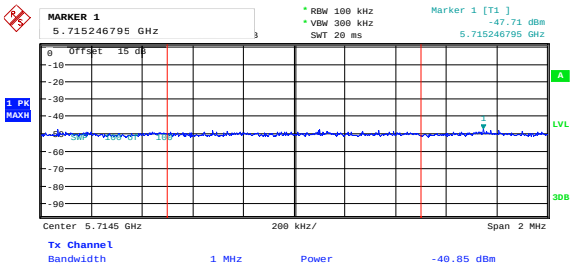
802.11a mode

Left Band (<10MHz)-chain 1



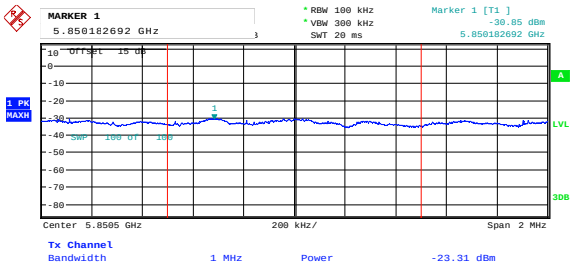
Date: 1.JUL.2015 16:39:47

Left Band (>10MHz)-chain 1



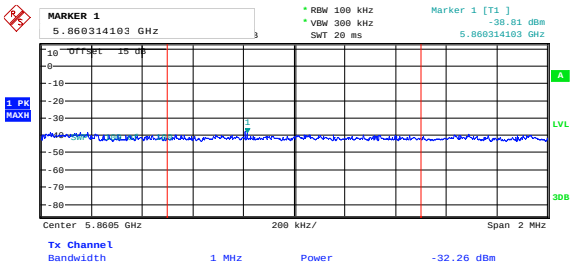
Date: 1.JUL.2015 16:40:20

Right Band (<10MHz)-chain 1



Date: 1.JUL.2015 16:42:02

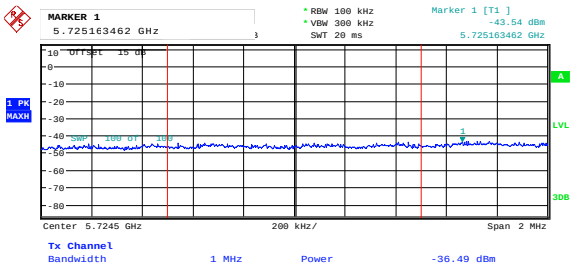
Right Band (>10MHz)-chain 1



Date: 1.JUL.2015 16:42:27

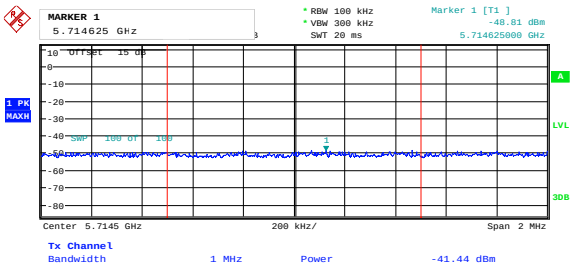
802.11n20 mode

Left Band (<10MHz)-chain 1



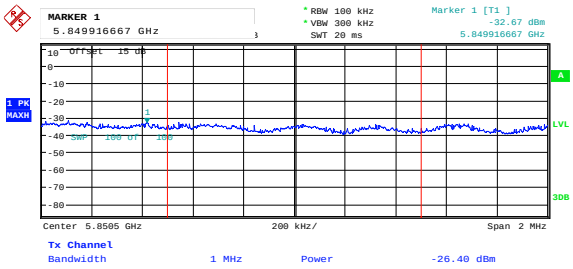
Date: 1.JUL.2015 16:47:48

Left Band (>10MHz)-chain 1



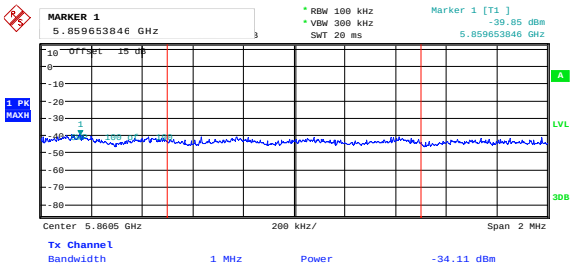
Date: 1.JUL.2015 16:48:11

Right Band (<10MHz)-chain 1



Date: 1.JUL.2015 16:48:54

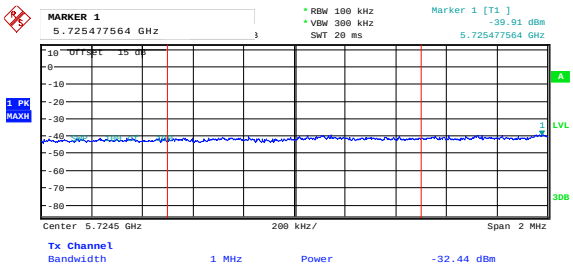
Right Band (>10MHz)-chain 1



Date: 1.JUL.2015 16:49:17

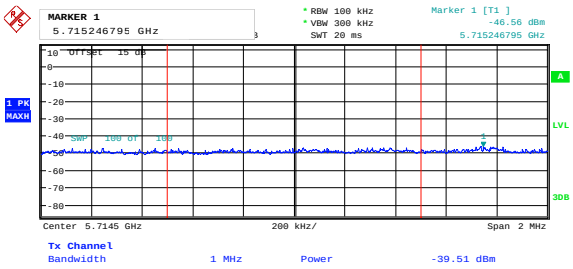
802.11n40 mode

Left Band (<10MHz)-chain 1



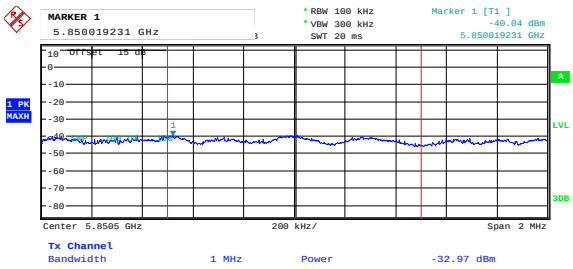
Date: 1.JUL.2015 16:57:34

Left Band (>10MHz)-chain 1



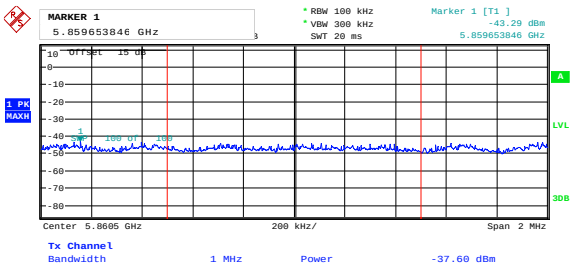
Date: 1.JUL.2015 16:57:57

Right Band (<10MHz)-chain 1



Date: 1.JUL.2015 16:58:35

Right Band (>10MHz)-chain 1

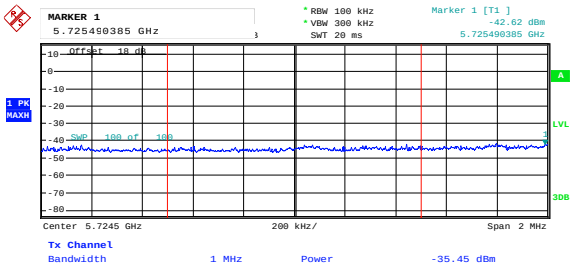


Date: 1.JUL.2015 16:58:57

Antenna gain=7 dBi, Chain 1

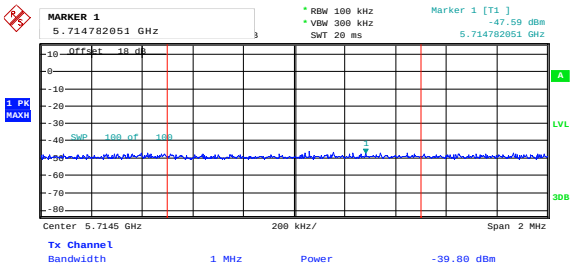
802.11a mode

Left Band (<10MHz)-chain 1



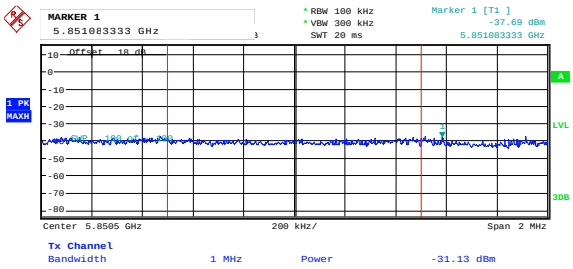
Date: 1.JUL.2015 17:05:52

Left Band (>10MHz)-chain 1



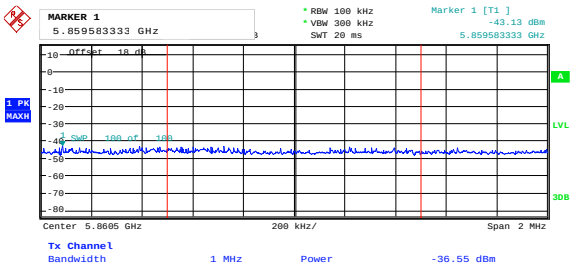
Date: 1.JUL.2015 17:06:06

Right Band (<10MHz)-chain 1



Date: 1.JUL.2015 17:06:39

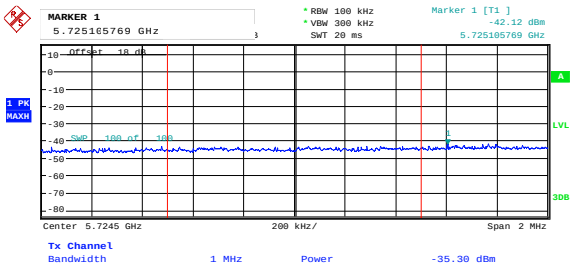
Right Band (>10MHz)-chain 1



Date: 1.JUL.2015 17:07:01

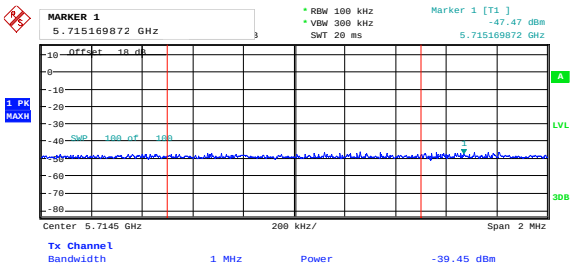
802.11n20 mode

Left Band (<10MHz)-chain 1



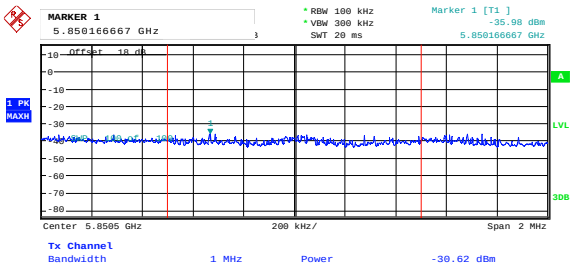
Date: 1.JUL.2015 17:11:45

Left Band (>10MHz)-chain 1



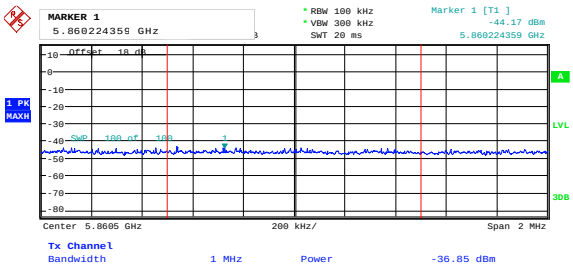
Date: 1.JUL.2015 17:12:00

Right Band (<10MHz)-chain 1



Date: 1.JUL.2015 17:12:40

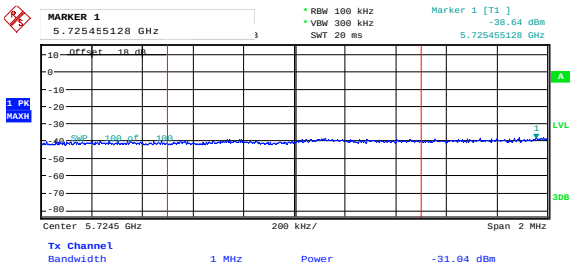
Right Band (>10MHz)-chain 1



Date: 1.JUL.2015 17:13:01

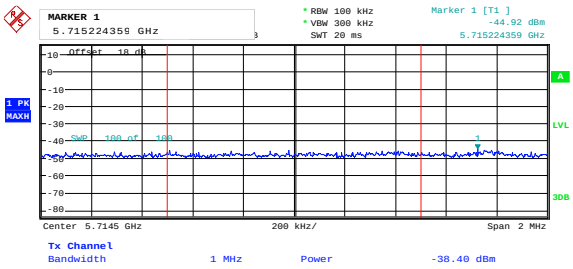
802.11n40 mode

Left Band (<10MHz)-chain 1



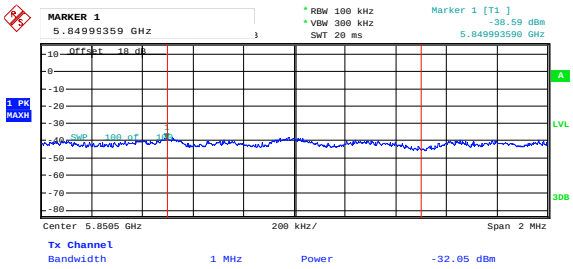
Date: 1.JUL.2015 17:19:00

Left Band (>10MHz)-chain 1



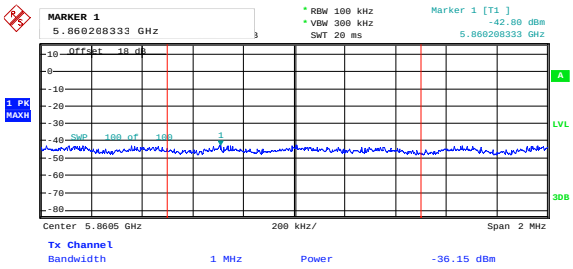
Date: 1.JUL.2015 17:19:20

Right Band (<10MHz)-chain 1



Date: 1.JUL.2015 17:19:56

Right Band (>10MHz)-chain 1

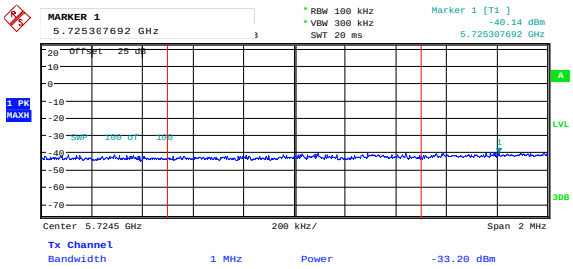


Date: 1.JUL.2015 17:20:21

Antenna gain=14 dBi, Chian 1

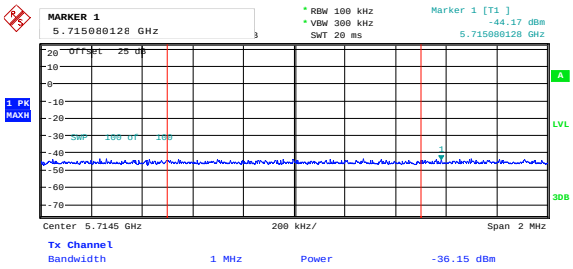
802.11a mode

Left Band (<10MHz)-chain 1



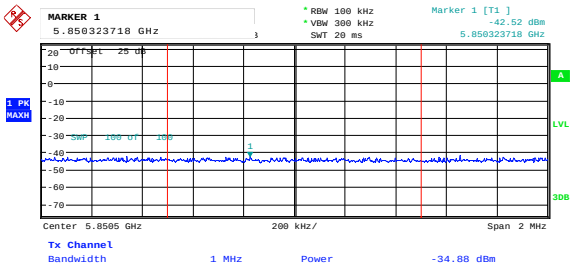
Date: 1.JUL.2015 17:39:22

Left Band (>10MHz)-chain 1



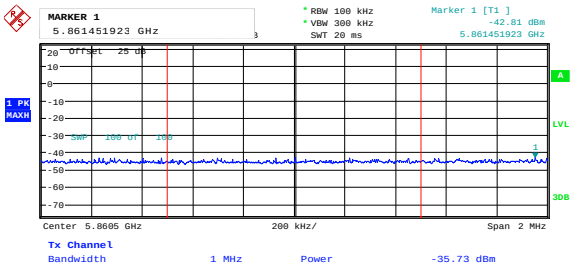
Date: 1.JUL.2015 17:39:37

Right Band (<10MHz)-chain 1



Date: 1.JUL.2015 17:40:09

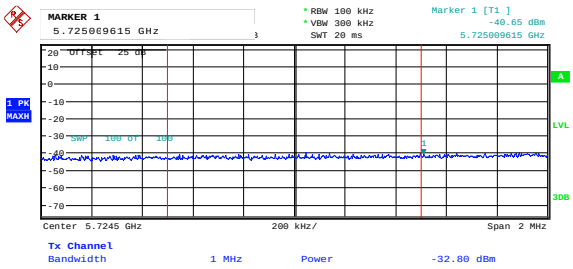
Right Band (>10MHz)-chain 1



Date: 1.JUL.2015 17:40:26

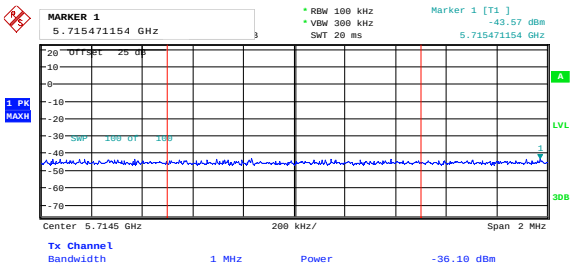
802.11n20 mode

Left Band (<10MHz)-chain 1



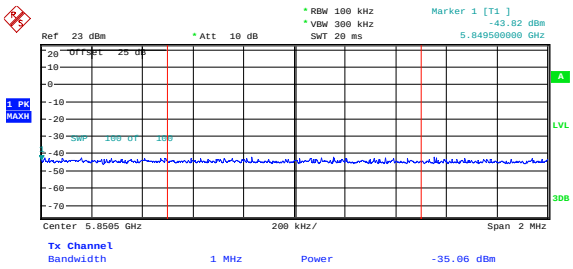
Date: 1.JUL.2015 17:46:55

Left Band (>10MHz)-chain 1



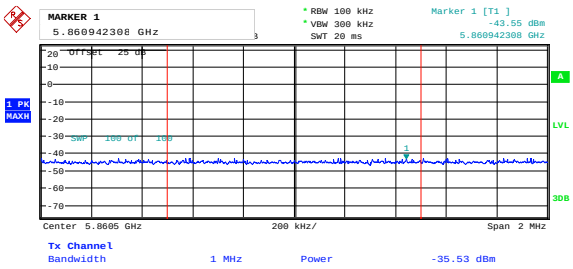
Date: 1.JUL.2015 17:47:10

Right Band (<10MHz)-chain 1



Date: 1.JUL.2015 17:47:48

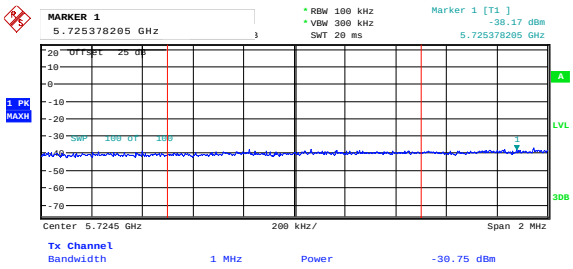
Right Band (>10MHz)-chain 1



Date: 1.JUL.2015 17:48:07

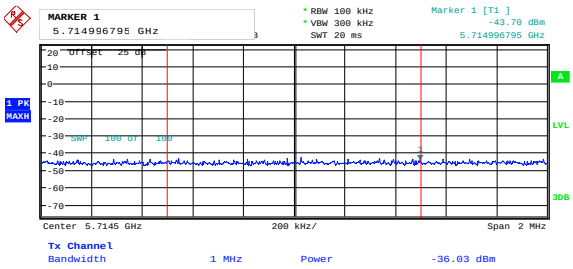
802.11n40 mode

Left Band (<10MHz)-chain 1



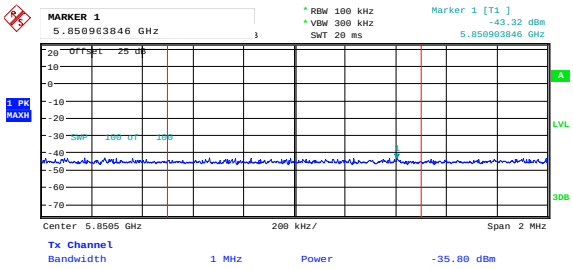
Date: 1.JUL.2015 17:34:01

Left Band (>10MHz)-chain 1



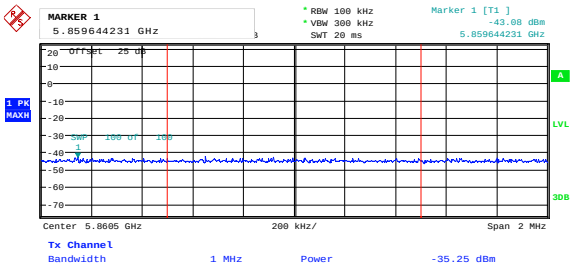
Date: 1.JUL.2015 17:34:23

Right Band (<10MHz)-chain 1



Date: 1.JUL.2015 17:34:54

Right Band (>10MHz)-chain 1



Date: 1.JUL.2015 17:35:21

11 FCC §15.407(a) - Power Spectral Density

11.1 Applicable Standards

According to FCC §15.407(a)

(1) For the band 5.15-5.25 GHz.

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

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

11.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedures New Rules v01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section F: Peak power spectral density (PPSD)

11.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Spectrum Analyzer	FSQ	1155.5001.26	2015-03-09	1 year
-	SMA Cable	-	C0001	Each Time[1]	N/A
-	Attenuator	BW-S10W5	1419	Each Time[1]	N/A

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.*

11.4 Test Environmental Conditions

Temperature:	23º C
Relative Humidity:	42 %
ATM Pressure:	102.5 kPa

The testing was performed by Jimmy Xiao from 2015-06-30 at RF site.

11.5 Test Results

Please refer to the following tables and plots.

5.2 GHz Band

Antenna gain=4 dBi

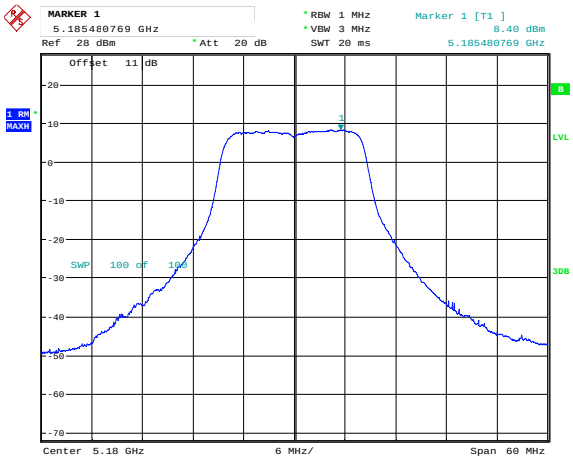
Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)			Limit (dBm/MHz)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5180	8.40	7.81	11.13	15.99	Pass
Middle	5200	9.02	8.53	11.79	15.99	Pass
High	5240	9.31	7.89	11.67	15.99	Pass
802.11n20						
Low	5180	7.71	7.82	10.78	15.99	Pass
Middle	5200	8.60	8.53	11.58	15.99	Pass
High	5240	8.93	7.80	11.41	15.99	Pass
802.11n40						
Low	5190	4.13	3.83	6.99	15.99	Pass
High	5230	5.67	4.68	8.21	15.99	Pass

Note: Directional gain=4 dBi + 10lg2 = 7.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
So, the power spectral density limit = 17 dBm - (7.01 dBi – 6 dBi) = 15.99 dBm

5.2 GHz Band

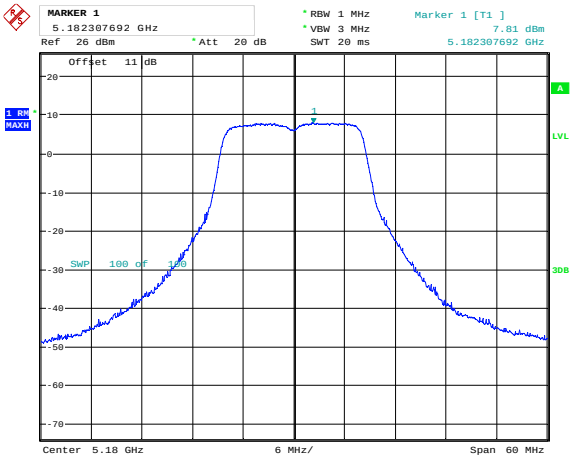
802.11a mode

Low channel: Chain 0



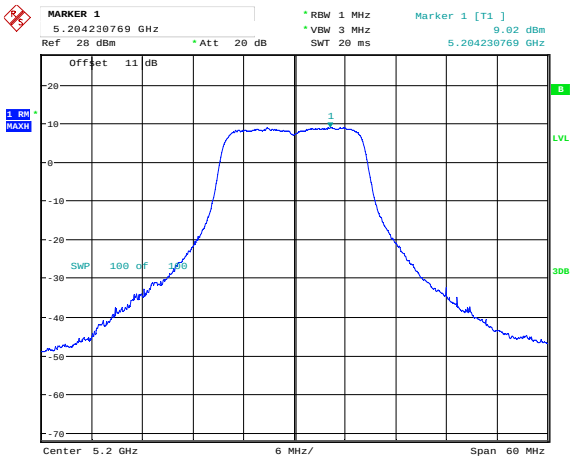
Date: 30.JUN.2015 20:40:48

Low channel: Chain 1



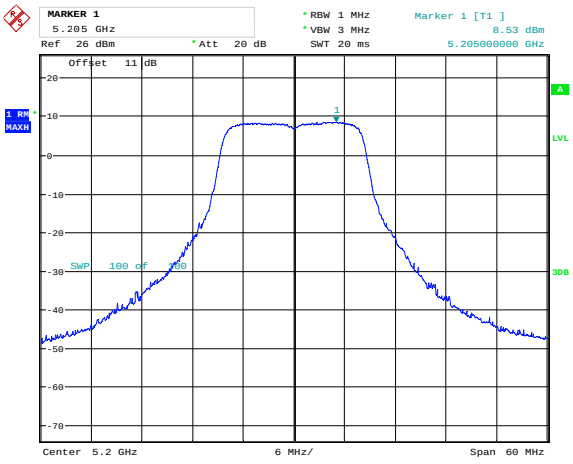
Date: 1.JUL.2015 16:01:08

Middle channel: Chain 0



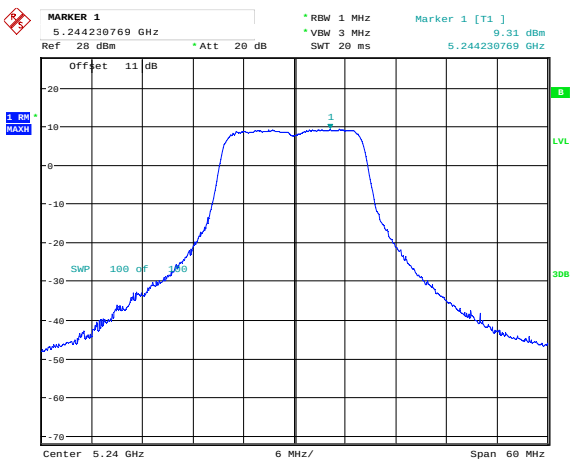
Date: 30.JUN.2015 20:41:47

Middle channel: Chain 1



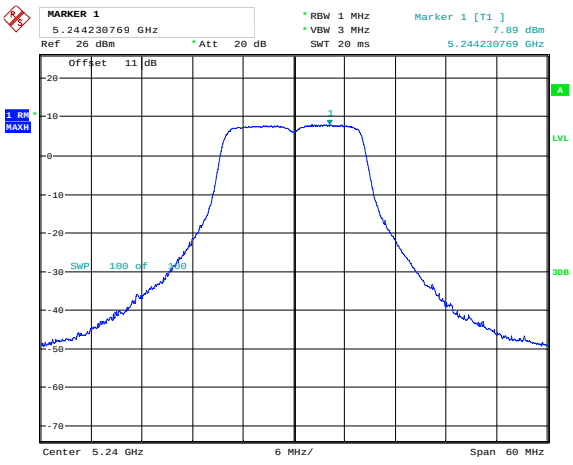
Date: 1.JUL.2015 16:01:44

High channel: Chain 0



Date: 30.JUN.2015 20:42:24

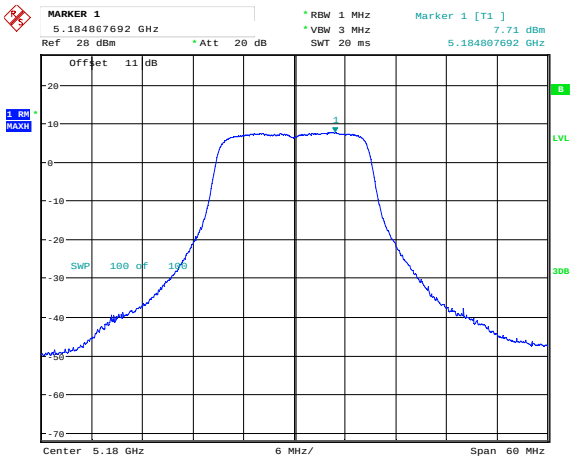
High channel: Chain 1



Date: 1.JUL.2015 16:02:12

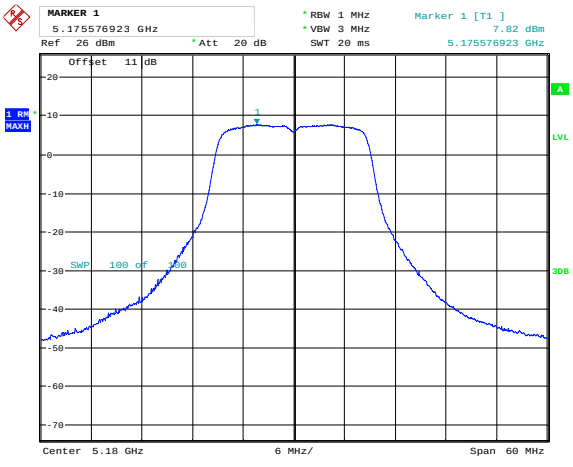
802.11n20 mode

Low channel: Chain 0



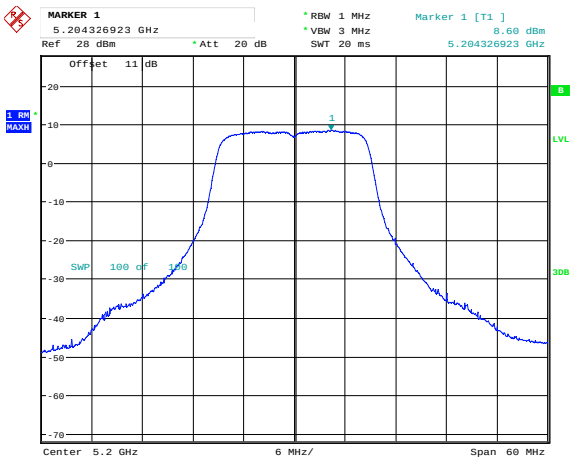
Date: 30.JUN.2015 20:51:21

Low channel: Chain 1



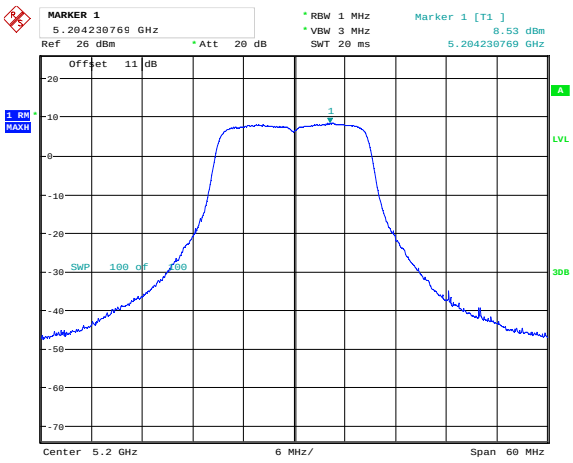
Date: 1.JUL.2015 16:10:09

Middle channel: Chain 0



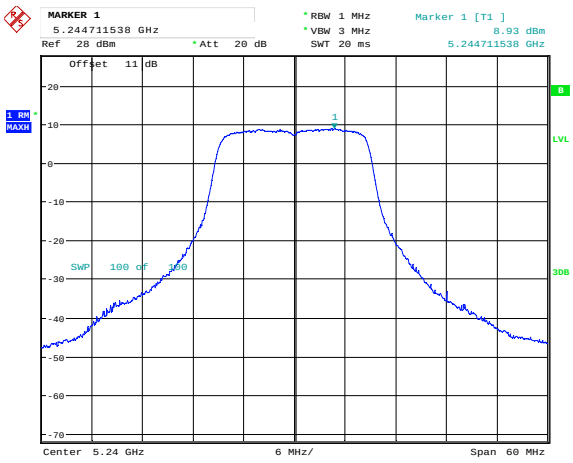
Date: 30.JUN.2015 20:52:07

Middle channel: Chain 1



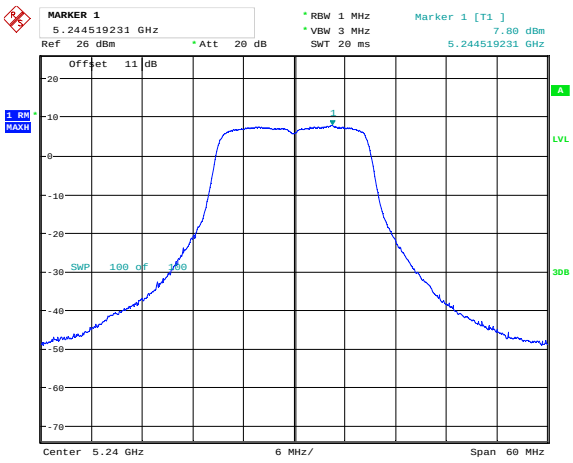
Date: 1.JUL.2015 16:10:50

High channel: Chain 0



Date: 30.JUN.2015 20:52:37

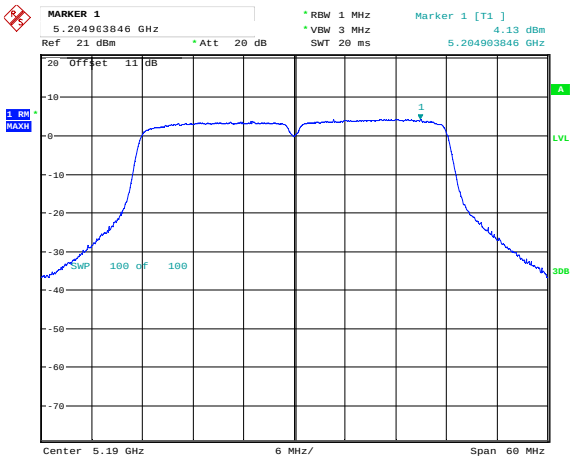
High channel: Chain 1



Date: 1.JUL.2015 16:11:18

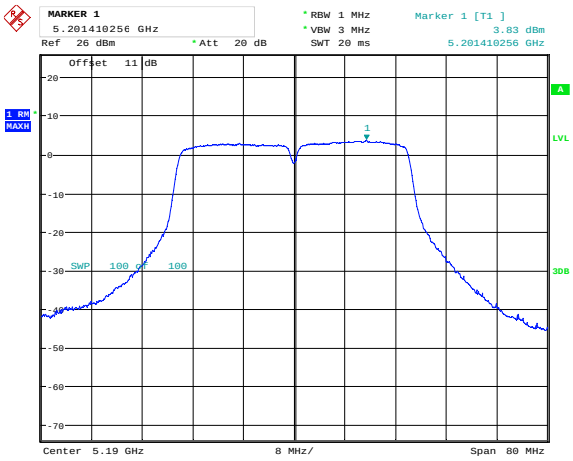
802.11n40 mode

Low channel: Chain 0



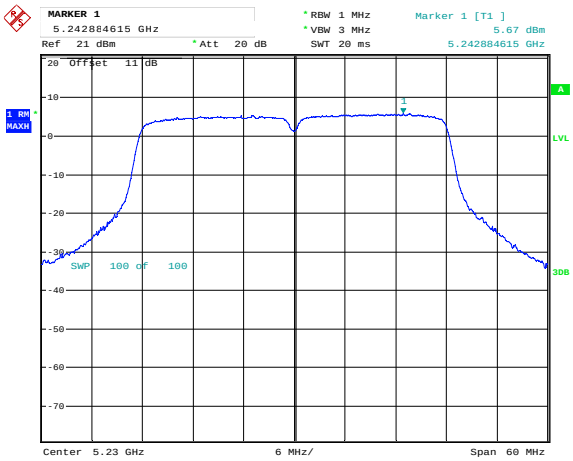
Date: 30.JUN.2015 21:00:32

Low channel: Chain 1



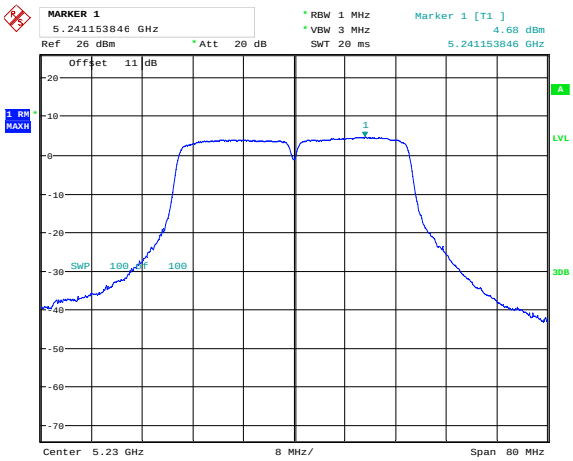
Date: 1.JUL.2015 16:17:24

High channel: Chain 0



Date: 30.JUN.2015 21:01:06

High channel: Chain 1



Date: 1.JUL.2015 16:17:58

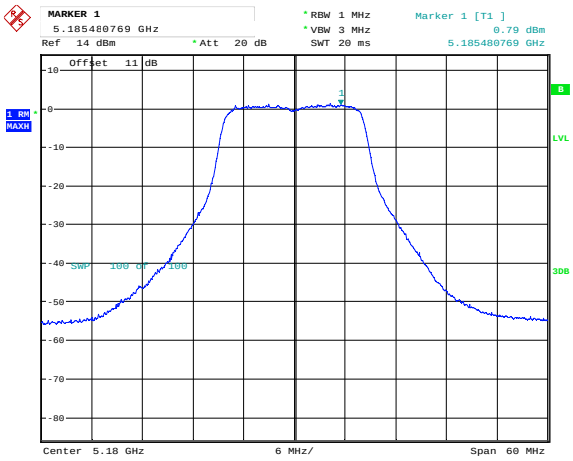
Antenna gain=7 dBi

Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)			Limit (dBm/MHz)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5180	0.79	1.50	4.17	12.99	Pass
Middle	5200	1.84	2.20	5.03	12.99	Pass
High	5240	3.99	3.48	6.75	12.99	Pass
802.11n20						
Low	5180	0.58	1.46	4.05	12.99	Pass
Middle	5200	1.57	1.71	4.65	12.99	Pass
High	5240	2.87	3.07	5.98	12.99	Pass
802.11n40						
Low	5190	-1.71	-0.90	1.72	12.99	Pass
High	5230	-2.70	-1.87	0.75	12.99	Pass

Note: Directional gain=7 dBi + 10lg2 = 10.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
So, the power spectral density limit = 17 dBm - (10.01 dBi – 6 dBi) = 12.99 dBm

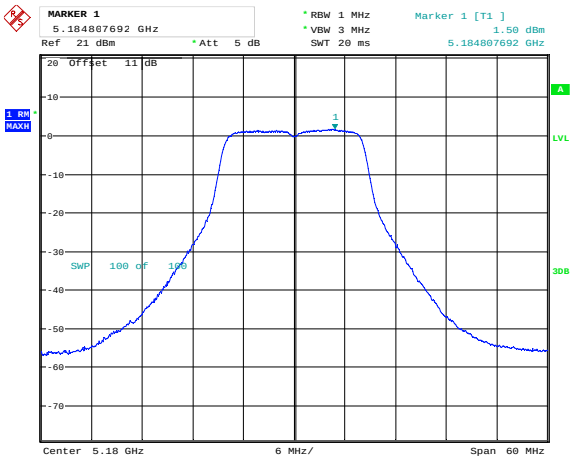
802.11a mode

Low channel: Chain 0



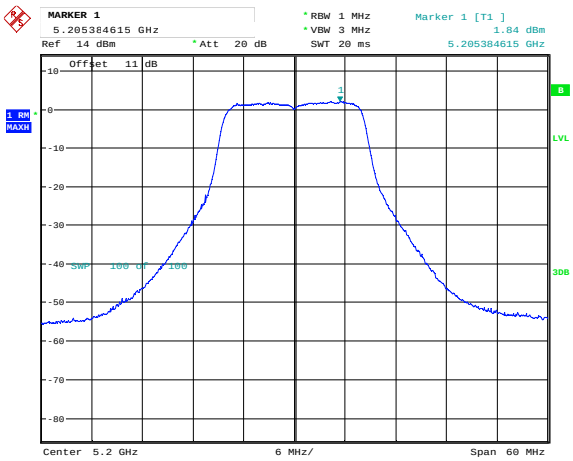
Date: 9.JUL.2015 20:51:30

Low channel: Chain 1



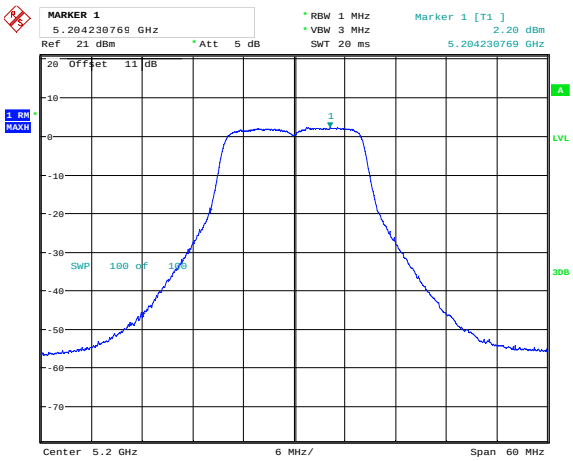
Date: 9.JUL.2015 19:29:28

Middle channel: Chain 0



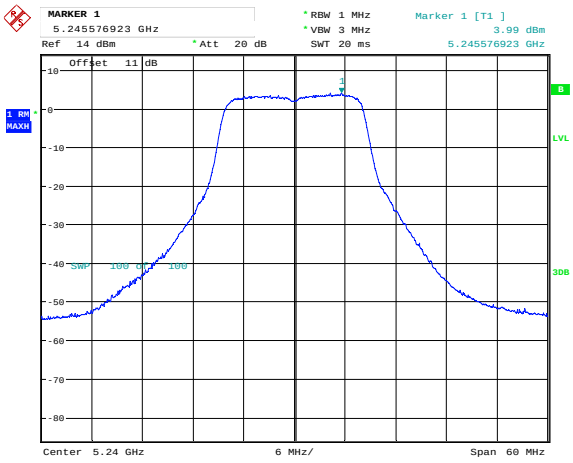
Date: 9.JUL.2015 20:52:04

Middle channel: Chain 1



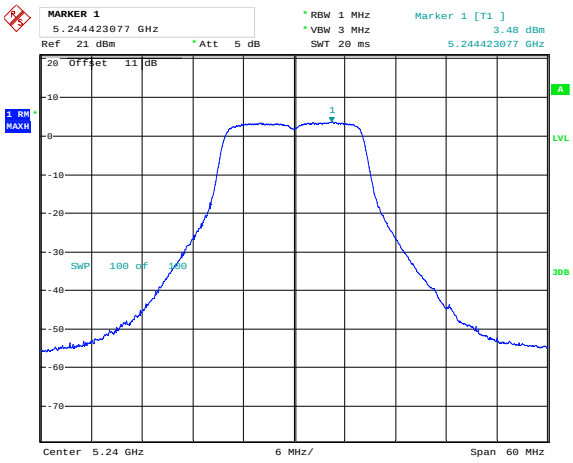
Date: 9.JUL.2015 19:30:42

High channel: Chain 0



Date: 9.JUL.2015 20:52:32

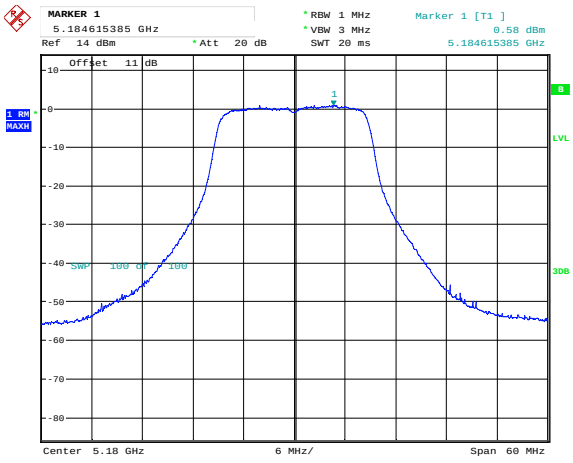
High channel: Chain 1



Date: 9.JUL.2015 19:31:26

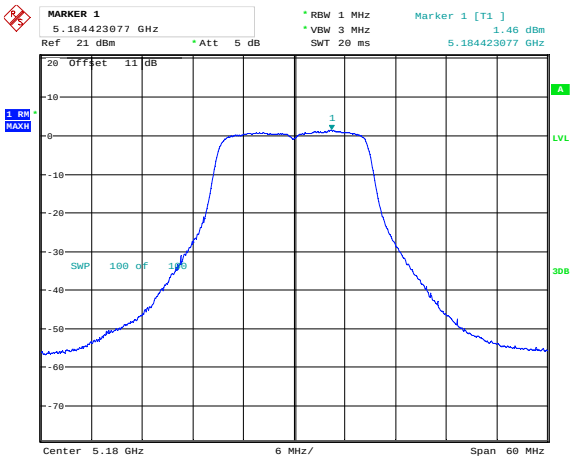
802.11n20 mode

Low channel: Chain 0



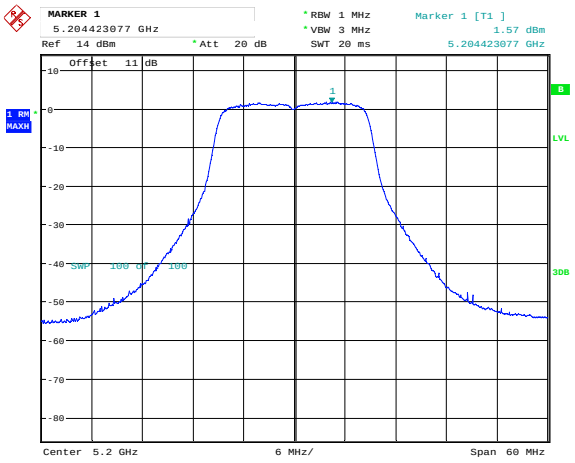
Date: 9.JUL.2015 20:55:57

Low channel: Chain 1



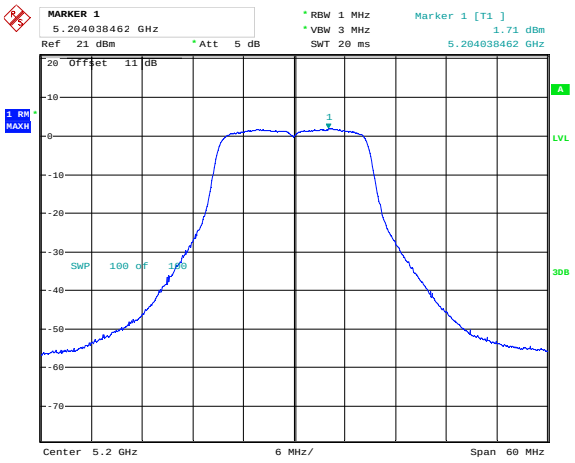
Date: 9.JUL.2015 19:36:31

Middle channel: Chain 0



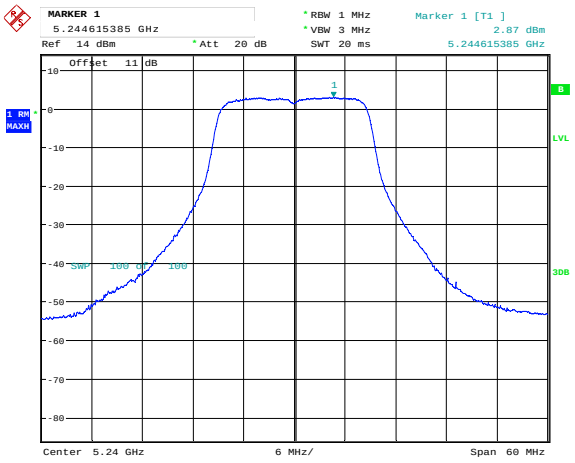
Date: 9.JUL.2015 20:56:56

Middle channel: Chain 1



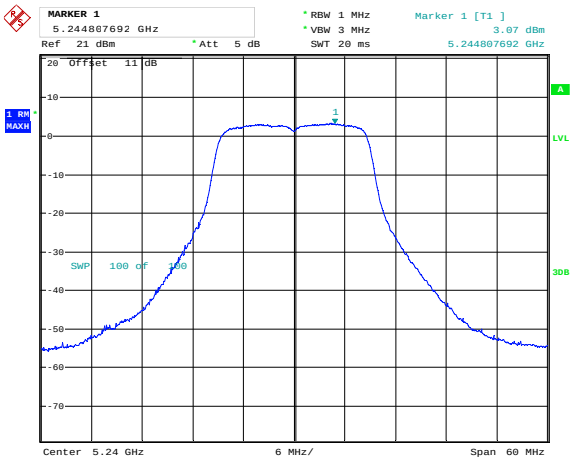
Date: 9.JUL.2015 19:37:13

High channel: Chain 0



Date: 9.JUL.2015 20:57:26

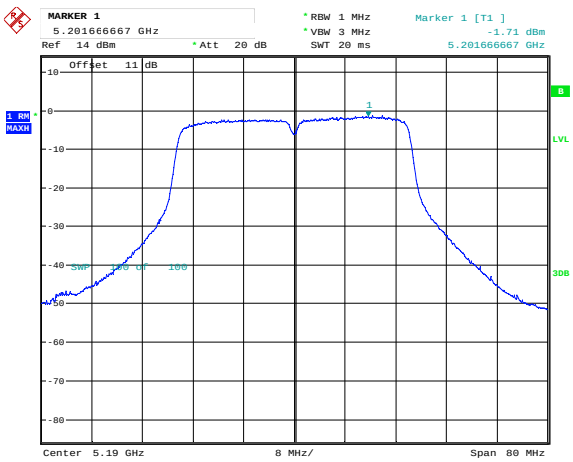
High channel: Chain 1



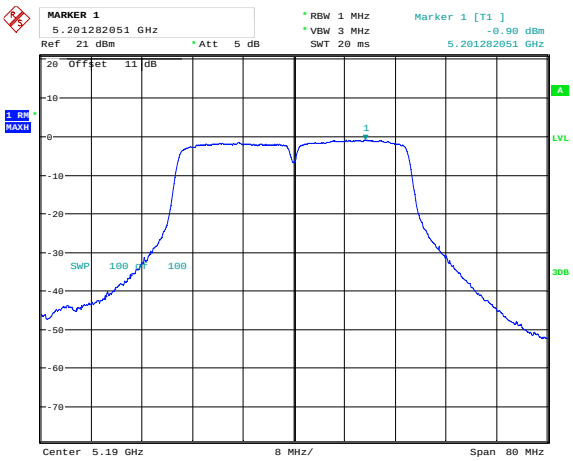
Date: 9.JUL.2015 19:37:48

802.11n40 mode

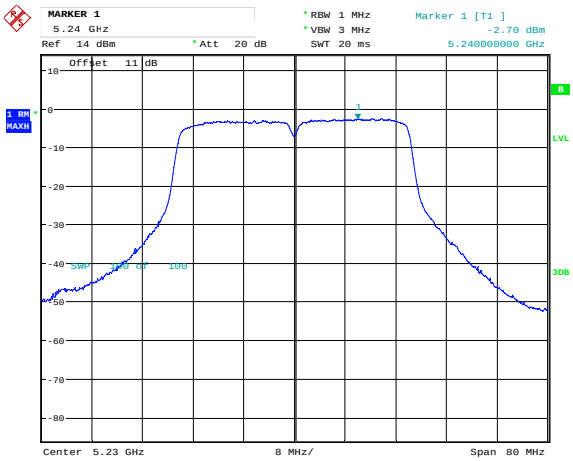
Low channel: Chain 0



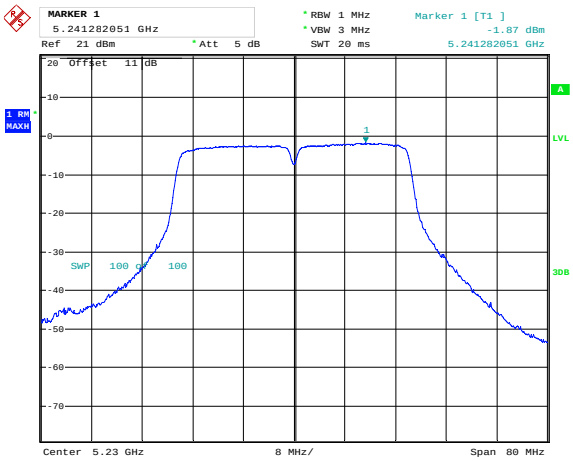
Low channel: Chain 1



High channel: Chain 0



High channel: Chain 1



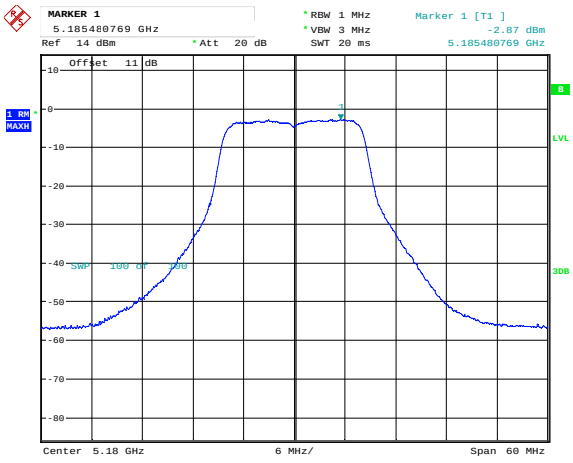
Antenna gain=14 dBi

Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)			Limit (dBm/MHz)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5180	-2.87	-2.67	0.24	5.99	Pass
Middle	5200	-2.15	-2.00	0.94	5.99	Pass
High	5240	-2.75	-2.80	0.24	5.99	Pass
802.11n20						
Low	5180	-3.44	-2.81	-0.10	5.99	Pass
Middle	5200	-2.55	-2.13	0.68	5.99	Pass
High	5240	-3.02	-2.90	0.05	5.99	Pass
802.11n40						
Low	5190	-5.85	-5.20	-2.50	5.99	Pass
High	5230	-6.42	-5.97	-3.18	5.99	Pass

Note: Directional gain=14 dBi + 10lg2 = 17.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
So, the power spectral density limit = 17 dBm - (17.01 dBi – 6 dBi) = 5.99 dBm

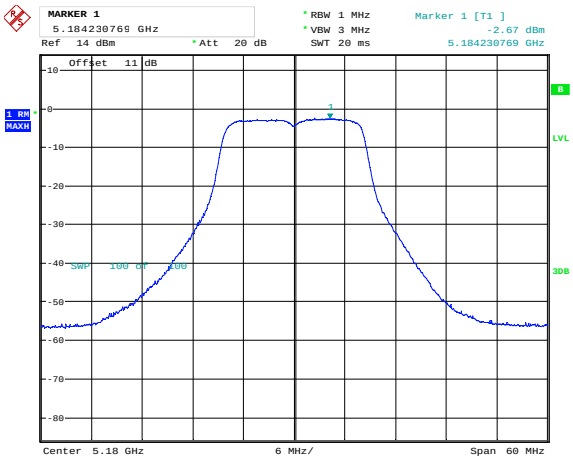
802.11a mode

Low channel: Chain 0



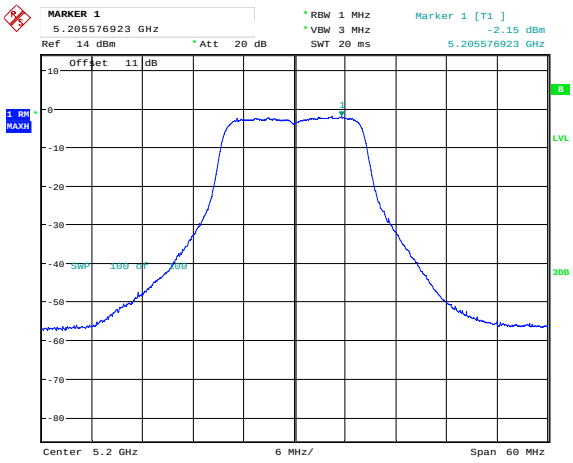
Date: 9.JUL.2015 20:31:57

Low channel: Chain 1



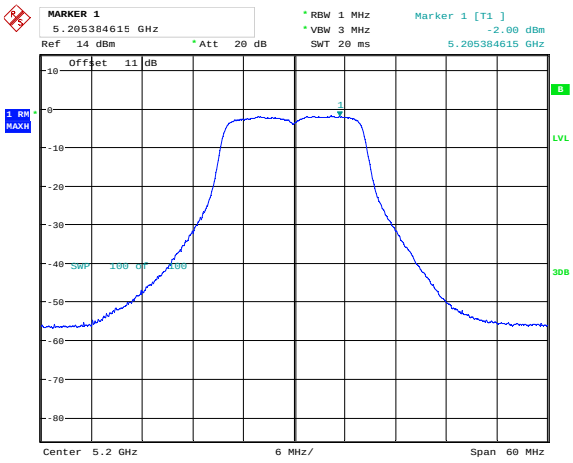
Date: 9.JUL.2015 19:54:16

Middle channel: Chain 0



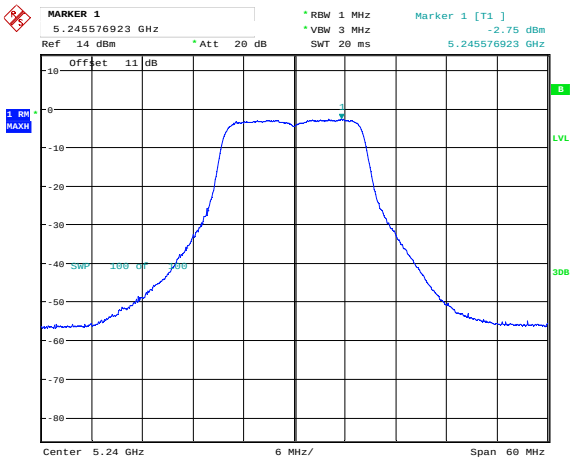
Date: 9.JUL.2015 20:32:44

Middle channel: Chain 1



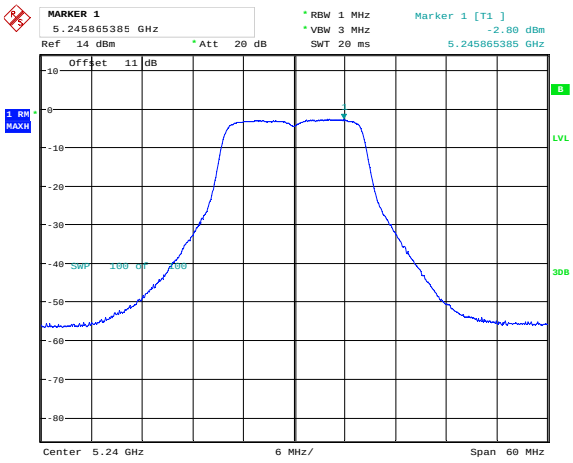
Date: 9.JUL.2015 19:55:05

High channel: Chain 0



Date: 9.JUL.2015 20:33:25

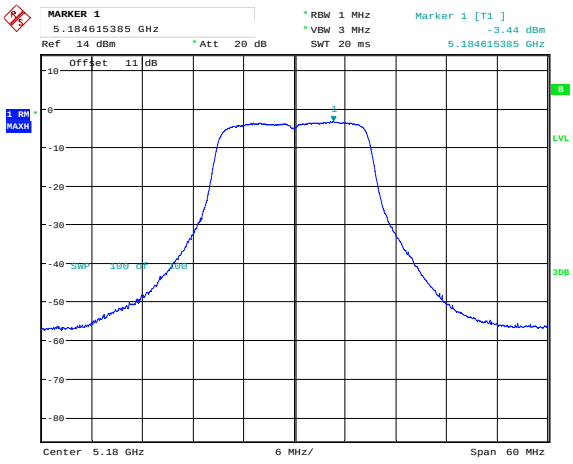
High channel: Chain 1



Date: 9.JUL.2015 19:55:36

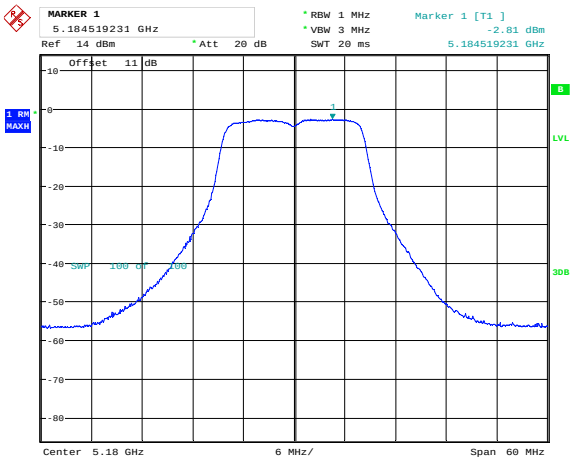
802.11n20 mode

Low channel: Chain 0



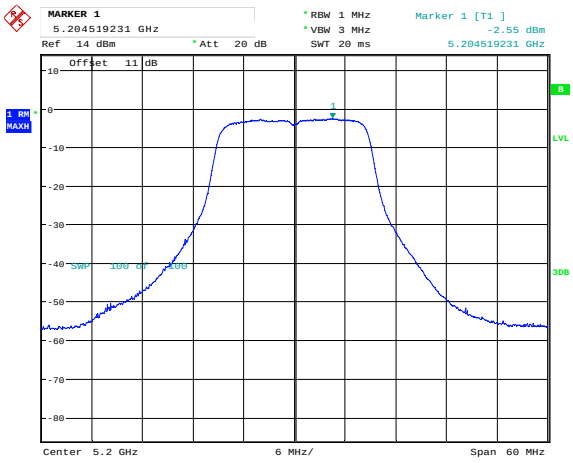
Date: 9.JUL.2015 20:37:19

Low channel: Chain 1



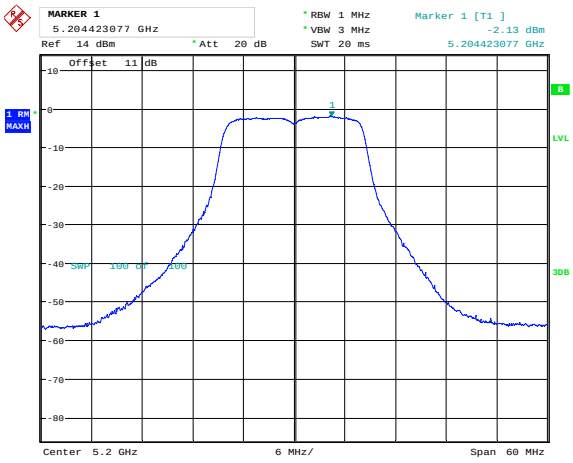
Date: 9.JUL.2015 19:59:21

Middle channel: Chain 0



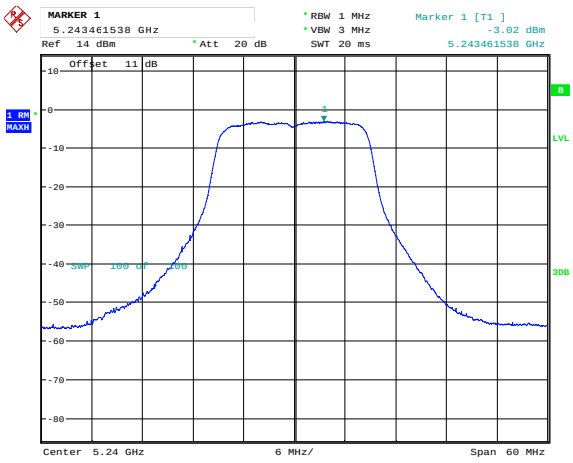
Date: 9.JUL.2015 20:37:57

Middle channel: Chain 1



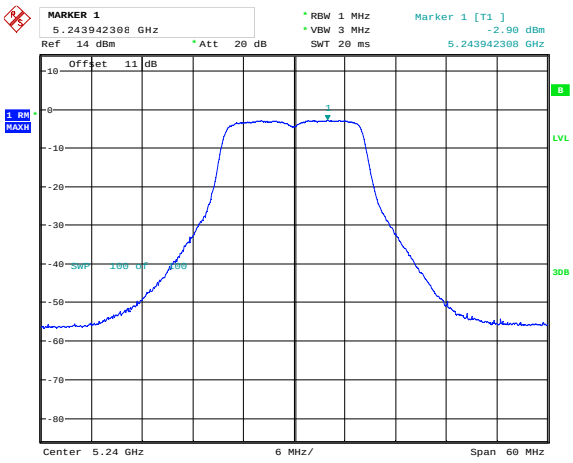
Date: 9.JUL.2015 20:00:00

High channel: Chain 0



Date: 9.JUL.2015 20:38:23

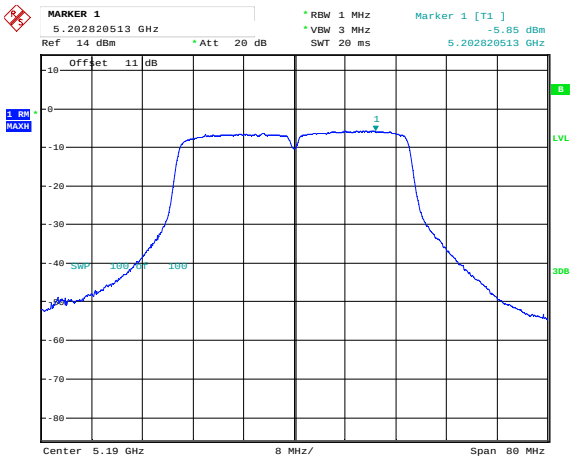
High channel: Chain 1



Date: 9.JUL.2015 20:00:28

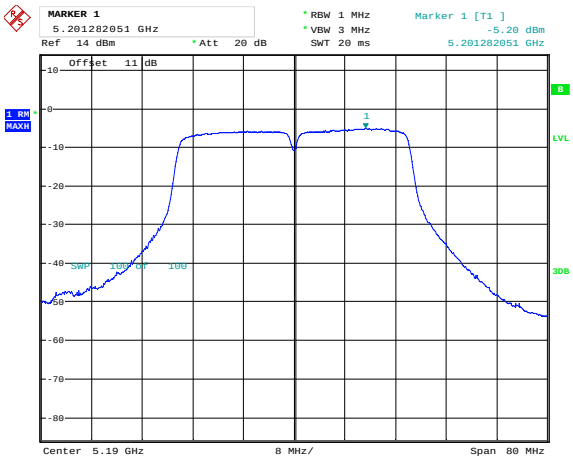
802.11n40 mode

Low channel: Chain 0



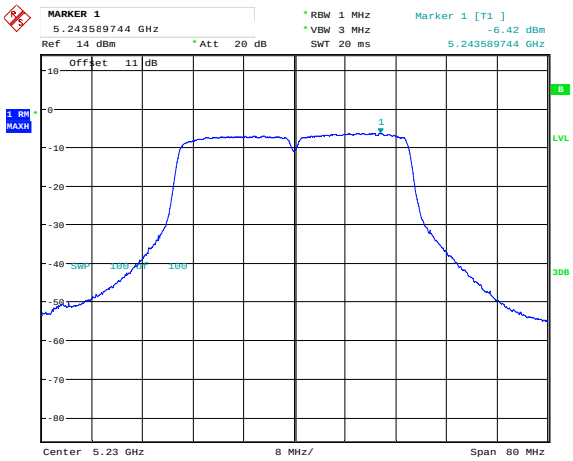
Date: 9.JUL.2015 20:42:41

Low channel: Chain 1



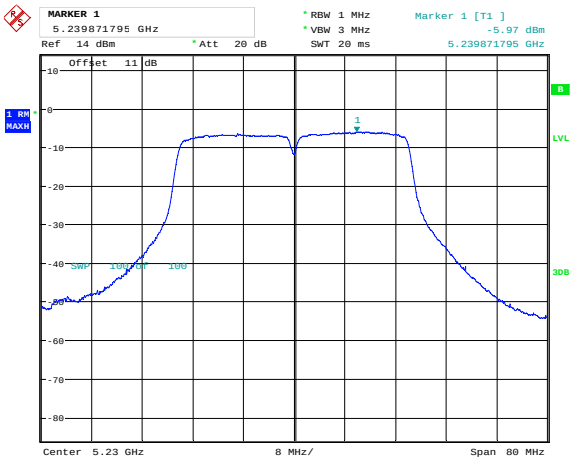
Date: 9.JUL.2015 19:48:23

High channel: Chain 0



Date: 9.JUL.2015 20:43:22

High channel: Chain 1



Date: 9.JUL.2015 19:49:15

5.8 GHz Band

Antenna gain=4 dBi

Channel	Frequency (MHz)	Power Spectral Density (dBm/500 kHz)			Limit (dBm/500 kHz)	Result
		Chain 0	Chain 1	Combined		
802.11a						
Low	5745	3.47	2.47	6.01	28.99	Pass
Middle	5785	9.87	8.73	12.35	28.99	Pass
High	5825	7.38	8.34	10.90	28.99	Pass
802.11n20						
Low	5745	3.79	2.45	6.18	28.99	Pass
Middle	5785	8.54	6.69	10.72	28.99	Pass
High	5825	6.59	7.61	10.14	28.99	Pass
802.11n40						
Low	5755	-1.12	-2.45	1.28	28.99	Pass
High	5795	5.56	3.60	7.70	28.99	Pass

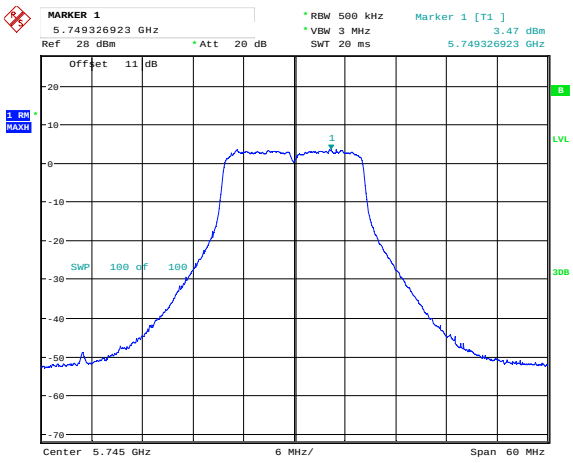
Note: Directional gain=4 dBi + 10lg2 = 7.01 dBi
Per FCC, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
So, the power spectral density limit = 30 dBm - (7.01 dBi – 6 dBi) = 28.99 dBm

When the antenna gain is 14 dBi, the maximum power spectral density limit =30 dBm - (17.01 dBi – 6 dBi) = 18.99 dBm. Based on the power spectral density listed above, the maximum power spectral density is 12.35 dBm which is less than 18.99 dBm. So it is not necessary to test with the high antennas (7 dBi and 14 dBi).

5.8 GHz Band

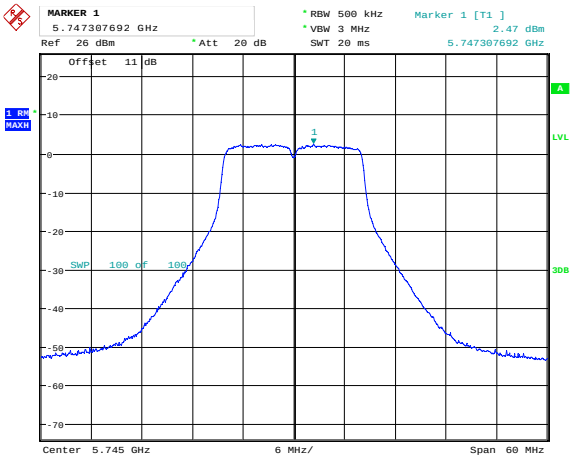
802.11a mode

Low channel: Chain 0



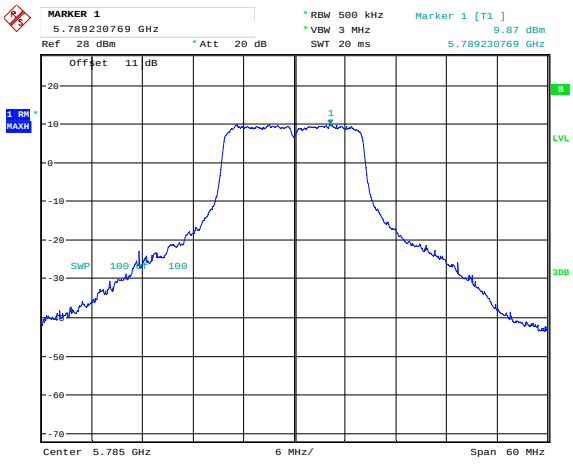
Date: 30.JUN.2015 20:48:53

Low channel: Chain 1



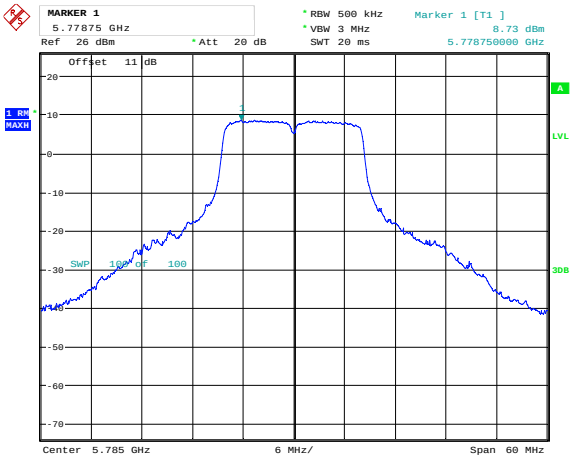
Date: 1.JUL.2015 16:07:58

Middle channel: Chain 0



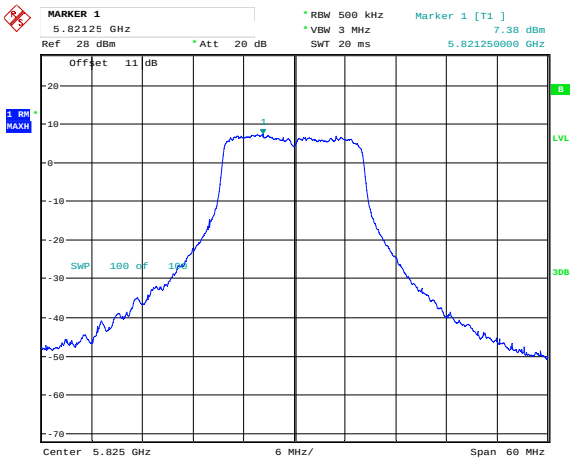
Date: 30.JUN.2015 20:49:27

Middle channel: Chain 1



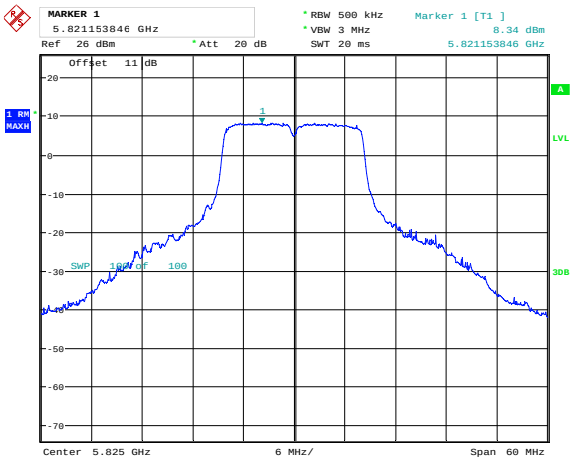
Date: 1.JUL.2015 16:08:34

High channel: Chain 0



Date: 30.JUN.2015 20:50:04

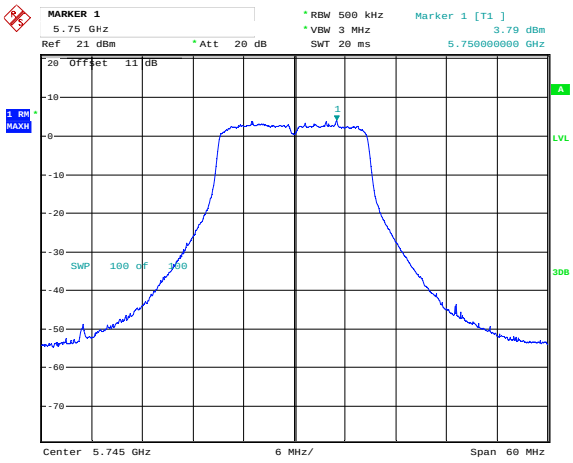
High channel: Chain 1



Date: 1.JUL.2015 16:09:13

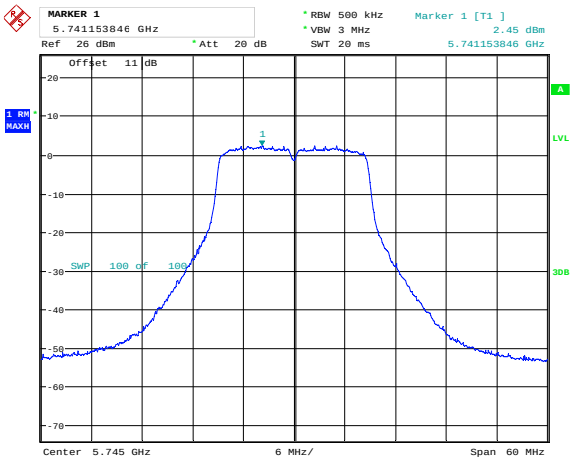
802.11n20 mode

Low channel: Chain 0



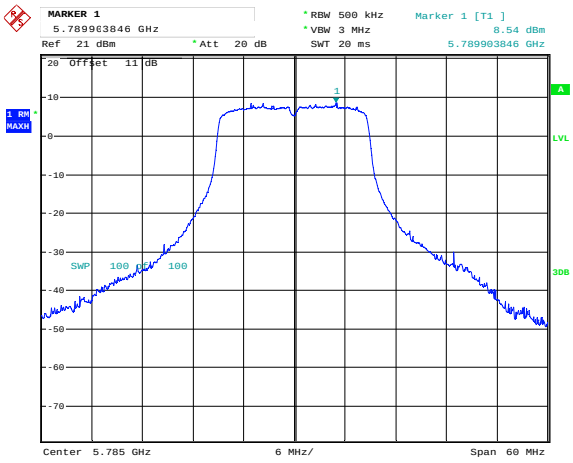
Date: 30.JUN.2015 20:58:25

Low channel: Chain 1



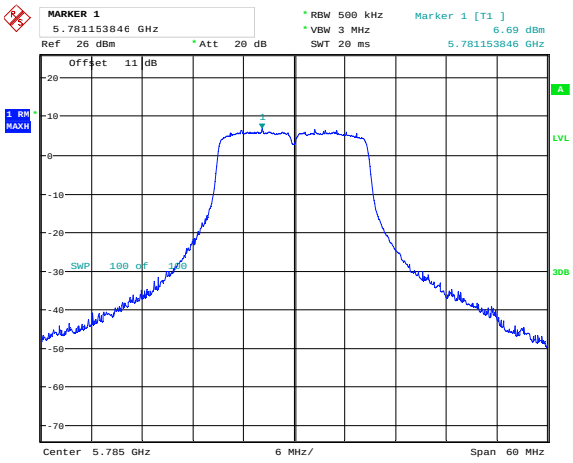
Date: 1.JUL.2015 16:14:37

Middle channel: Chain 0



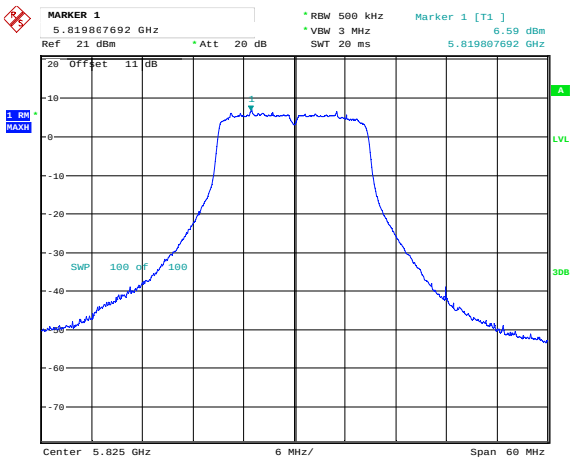
Date: 30.JUN.2015 20:58:57

Middle channel: Chain 1



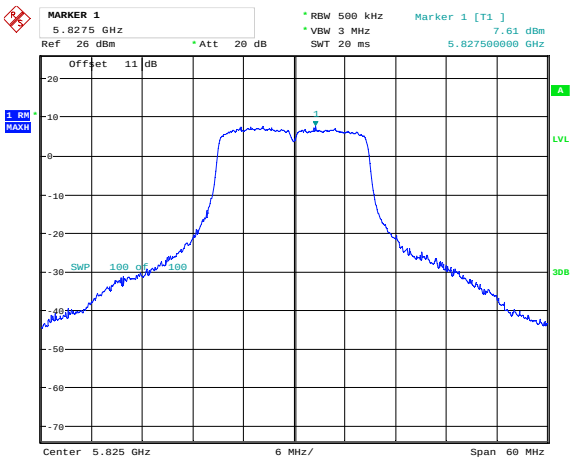
Date: 1.JUL.2015 16:15:07

High channel: Chain 0



Date: 30.JUN.2015 20:59:25

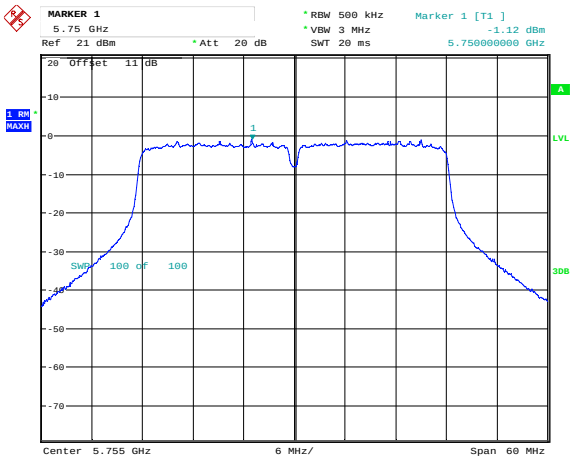
High channel: Chain 1



Date: 1.JUL.2015 16:15:30

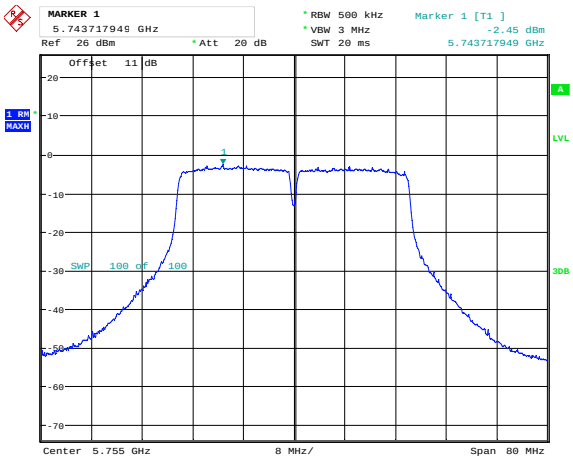
802.11n40 mode

Low channel: Chain 0



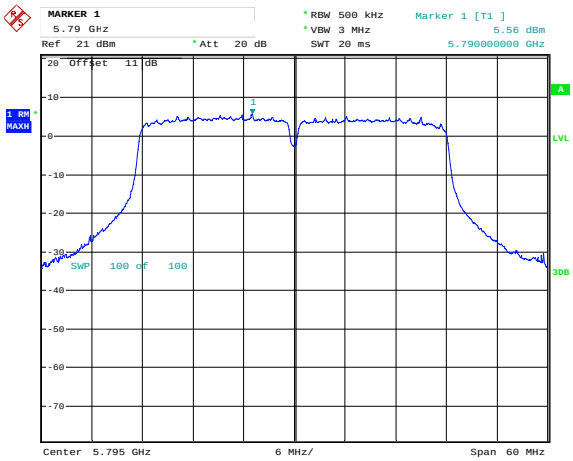
Date: 30.JUN.2015 21:05:06

Low channel: Chain 1



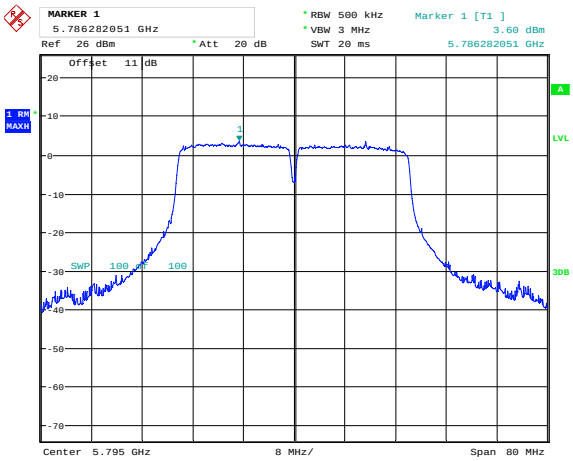
Date: 1.JUL.2015 16:21:18

High channel: Chain 0



Date: 30.JUN.2015 21:05:45

High channel: Chain 1



Date: 1.JUL.2015 16:21:51