FCC PART 15.407

TEST REPORT

For

Nusoft Corporation

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FCC ID: 2AGVZNFW-560

Report Type:	**Product Type:**
Original Report	Nusoft Wireless Router

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Report Number:	RSZ151201810-00C
Report Date:	2016-02-17
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Nusoft Corporation*'s product, model number: *NFW-560 (FCC ID: 2AGVZNFW-560)* (the "EUT") in this report was a *Nusoft Wireless Router* , which was measured approximately: 150 mm (L) x 219.6 mm (W) x 44.5 mm (H), rated input voltage: DC12V from adapter.

Adapter information:
Model: DSA-12PFT-12FUS 120100
Input: 100-240V~ 50/60Hz 0.5A
Output: 12V, 1A

Note: The series product, model NFW-560, NFW-560A, NFW-520, AboCom WS600, AboCom WS550 are electrically identical, the differences between them are model number and memory size, we selected NFW-560 for testing, the details was explained in the attached declaration letter.

All measurement and test data in this report was gathered from production sample serial number: NF5615120001 (Assigned by applicant). The EUT was received on 2015-12-02.

Objective

This type approval report is prepared on behalf of *Nusoft Corporation* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and E of the Federal Communications Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: 2AGVZNFW-560.
FCC Part 15C DTS submissions with FCC ID: 2AGVZNFW-560.

Test Methodology

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

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). 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 06, 2015.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

For 5150~5250 MHz band, channels are provided to test as fallows:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240
42	5210	/	/

For 802.11a, 802.11n ht20, Channel 36, 40 and 48 were tested, for 802.11n ht40, Channel 38, 46 were tested. For 802.11AC 80, channel 42 was tested.

For 5725~5850MHz band, channels are provided to test as fallows:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	159	5795
151	5755	161	5805
153	5765	165	5825
155	5775	/	/
157	5785	/	/

For 802.11a, 802.11n ht20, Channel 149, 157 and 165 was tested, for 802.11n ht40, Channel 151, 159 was tested. For 802.11AC 80, channel 155 was tested.

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

EUT Exercise Software

The Engineering mode building in the system was used in test, The worst condition (maximum power with 100% duty cycle) was setting by the software as following table:

5150~5250 MHz band

Test Mode	Test Software Version	MT7662 (Antenna 0 & 1)		
802.11a	Test Frequency	5180MHz	5200MHz	5240MHz
	Data Rate	OFDM(MCS=7 54Mbps)	OFDM(MCS=7 54Mbps)	OFDM(MCS=7 54Mbps)
	Power Level Setting	23	23	23
802.11n ht20	Test Frequency	5180MHz	5200MHz	5240MHz
	Data Rate	HT Mixmode(MCS=7 65Mbps)	HT Mixmode(MCS=7 65Mbps)	HT Mixmode(MCS=7 65Mbps)
	Power Level Setting	23	23	23
802.11n ht40	Test Frequency	5190MHz	5230MHz	/
	Data Rate	HT Mixmode(MCS=7 65Mbps)	HT Mixmode(MCS=7 65Mbps)	/
	Power Level Setting	21	21	/
802.11n AC80	Test Frequency	5210MHz	/	/
	Data Rate	HT Mixmode(MCS=7 65Mbps)	/	/
	Power Level Setting	21	/	/

5725~5850 MHz band

Test Mode	Test Software Version	MT7662 (Antenna 0)		
802.11a	Test Frequency	5745MHz	5785MHz	5825MHz
	Data Rate	OFDM(MCS=7 54Mbps)	OFDM(MCS=7 54Mbps)	(OFDM)6Mbps OFDM(MCS=7 54Mbps)
	Power Level Setting	18	18	18
802.11n ht20	Test Frequency	5745MHz	5785MHz	5825MHz
	Data Rate	HT Mixmode(MCS=7 65Mbps)	HT Mixmode(MCS=7 65Mbps)	HT Mixmode(MCS=7 65Mbps)
	Power Level Setting	18	18	18
802.11n ht40	Test Frequency	5755MHz	5795MHz	/
	Data Rate	HT Mixmode(MCS=7 65Mbps)	HT Mixmode(MCS=7 65Mbps)	/
	Power Level Setting	1F	1F	/
802.11n AC80	Test Frequency	5775MHz	/	/
	Data Rate	HT Mixmode(MCS=7 65Mbps)	/	/
	Power Level Setting	1D	/	/

Test Mode	Test Software Version	MT7662 (Antenna 1)		
802.11a	Test Frequency	5745MHz	5785MHz	5825MHz
	Data Rate	OFDM(MCS=7 54Mbps)	OFDM(MCS=7 54Mbps)	OFDM(MCS=7 54Mbps)
	Power Level Setting	18	18	18
802.11n ht20	Test Frequency	5745MHz	5785MHz	5825MHz
	Data Rate	HT Mixmode(MCS=7 65Mbps)	HT Mixmode(MCS=7 65Mbps)	HT Mixmode(MCS=7 65Mbps)
	Power Level Setting	18	18	18
802.11n ht40	Test Frequency	5755MHz	5795MHz	/
	Data Rate	HT Mixmode(MCS=7 65Mbps)	HT Mixmode(MCS=7 65Mbps)	/
	Power Level Setting	17	17	/
802.11n AC80	Test Frequency	5775MHz	/	/
	Data Rate	HT Mixmode(MCS=7 65Mbps)	/	/
	Power Level Setting	17	/	/

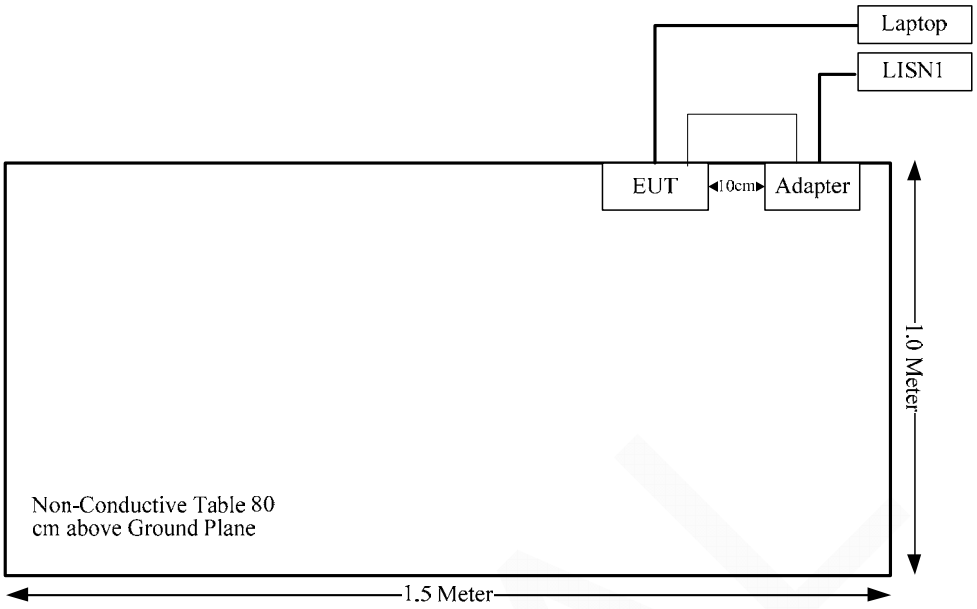
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017

External I/O Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	No	10	RJ45 Port of Laptop	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.407 (f) & §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
§15.205& §15.209 &§15.407(b) (1),(6),(7)	Undesirable Emission& Restricted Bands	Compliance
§15.407(b) (1),(2),(3),(4)	Out Of Band Emissions	Compliance
§15.407(a) (1)	26 dB Bandwidth	Compliance
§15.407(a)(1),	Conducted Transmitter Output Power	Compliance
§15.407 (a)(1),(5)	Power Spectral Density	Compliance

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FCC §15.407 (f) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.407(f)and subpart §1.1310, 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 Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) 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)**
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;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Calculated Data:
MPE evaluation for single transmission:

Frequency Range (MHz)	Antenna Gain		Target Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2412-2462	5.0	3.16	25	316.23	20	0.199	1.0
5150-5250	5.0	3.16	17	50.12	20	0.032	1.0
5725-5850	5.0	3.16	15	31.62	20	0.020	1.0

MPE evaluation for simultaneous transmission:

2.4 G and 5G can transmit at the same time, MPE evaluation is as below formula:

PD1/Limit1+PD2/Limit2+……＜1, PD (Power Density)

MPE evaluation= MPE of 2.4G + MPE of 5G = 0.199/1+0.032/1=0.231＜1.0

Result: MPE evaluation of single and simultaneous transmission meet the requirement of standard.

FINAL

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

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

And according to FCC 47 CFR section 15.407 (a)(1),if transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has 4 external detachable antennas and with RP-SMA female connector, 2 antennas for 2.4G and others for 5G, all antennas gain is 5dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FINAL

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

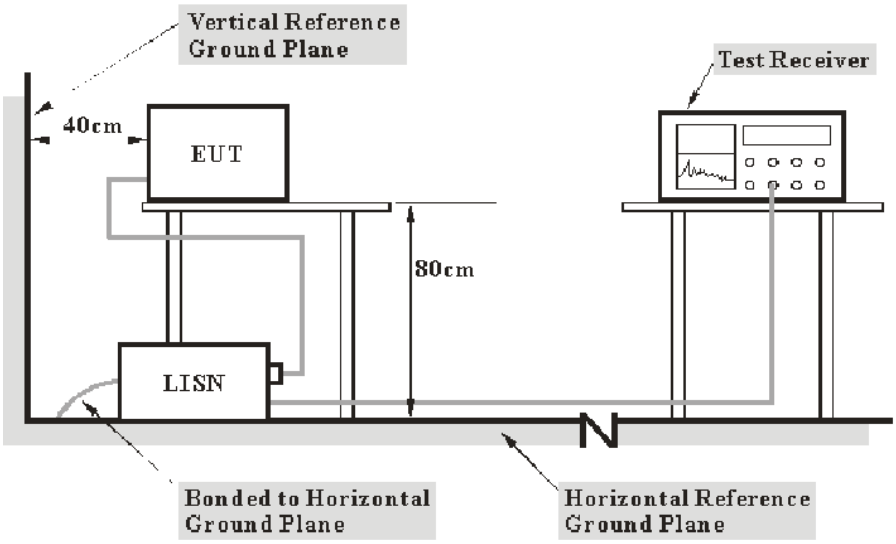
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
– compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
– non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN.

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

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,
V_C: corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN or ISN

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

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2015-10-20	2016-10-20
R&S	L.I.S.N	ESH2-Z5	892107/021	2015-06-09	2016-06-09
R&S	Two-line V-network	ENV 216	3560.6550.12	2014-12-11	2015-12-11
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

9.5 dB at **1.289541 MHz** in the **Neutral** conducted mode

Test Data

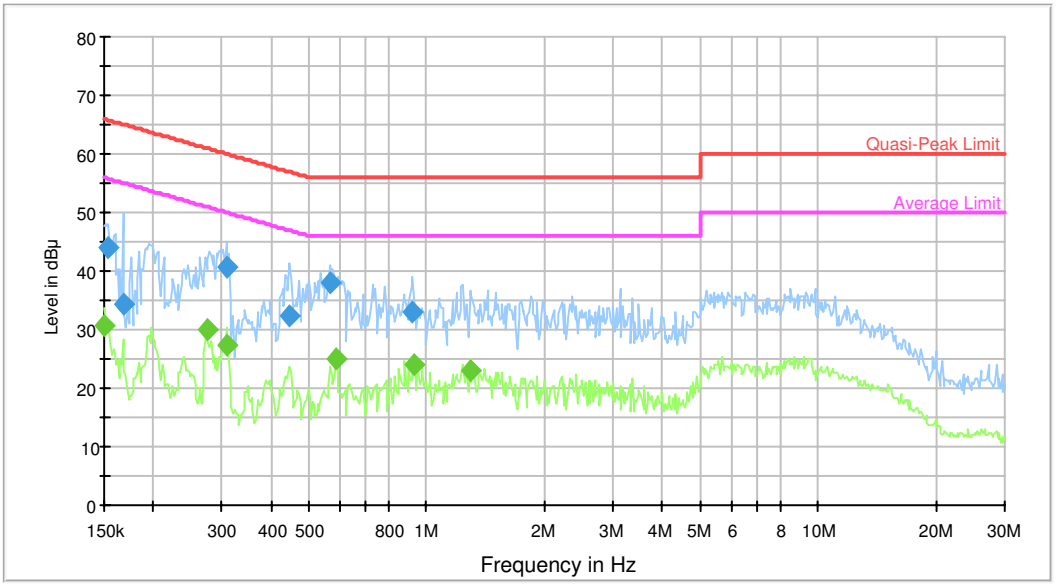
Environmental Conditions

Temperature:	21.9°C
Relative Humidity:	53 %
ATM Pressure:	101.2 kPa

The testing was performed by Allen Qiao on 2015-12-09.

Test Mode: Transmitting

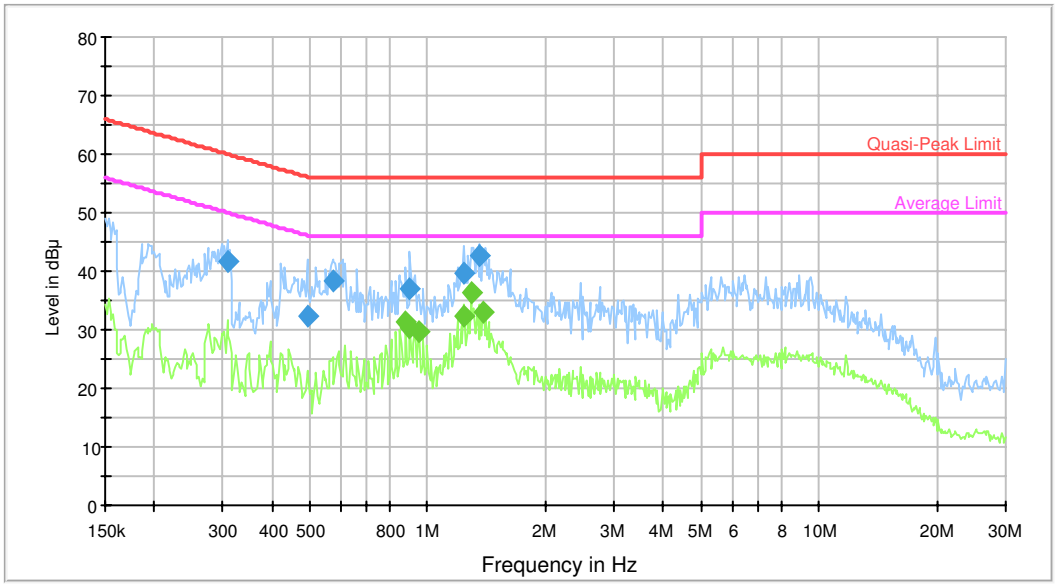
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.153629	44.0	9.000	L1	9.8	21.8	65.8	Compliance
0.167702	34.4	9.000	L1	9.8	30.7	65.1	Compliance
0.307284	40.5	9.000	L1	9.8	19.5	60.0	Compliance
0.446873	32.3	9.000	L1	9.8	24.6	56.9	Compliance
0.567545	37.9	9.000	L1	9.8	18.1	56.0	Compliance
0.922769	33.1	9.000	L1	9.8	22.9	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	30.6	9.000	L1	9.8	25.4	56.0	Compliance
0.274848	29.9	9.000	L1	9.8	21.1	51.0	Compliance
0.307284	27.2	9.000	L1	9.8	22.8	50.0	Compliance
0.585926	24.9	9.000	L1	9.8	21.1	46.0	Compliance
0.930151	24.1	9.000	L1	9.8	21.9	46.0	Compliance
1.289541	23.1	9.000	L1	9.8	22.9	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.307284	41.5	9.000	N	9.8	18.5	60.0	Compliance
0.491712	32.2	9.000	N	9.8	23.9	56.1	Compliance
0.572086	38.4	9.000	N	9.8	17.6	56.0	Compliance
0.900972	36.9	9.000	N	9.8	19.1	56.0	Compliance
1.239175	39.7	9.000	N	9.8	16.3	56.0	Compliance
1.363512	42.6	9.000	N	9.8	13.4	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.879690	31.2	9.000	N	9.8	14.8	46.0	Compliance
0.900972	30.2	9.000	N	9.8	15.8	46.0	Compliance
0.952654	29.7	9.000	N	9.8	16.3	46.0	Compliance
1.239175	32.2	9.000	N	9.8	13.8	46.0	Compliance
1.289541	36.5	9.000	N	9.8	9.5	46.0	Compliance
1.385415	33.0	9.000	N	9.8	13.0	46.0	Compliance

FCC §15.209, §15.205 & §15.407(b) (1) (6) (7) –UNWANTED EMISSION

Applicable Standard

FCC §15.407; §15.209; §15.205;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

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

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

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

(4) For transmitters operating in the 5.725-5.85 GHz band: 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) The provisions of §15.205 apply to intentional radiators operating under this section.

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner：

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
－ compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
－ non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
－ compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
－ non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

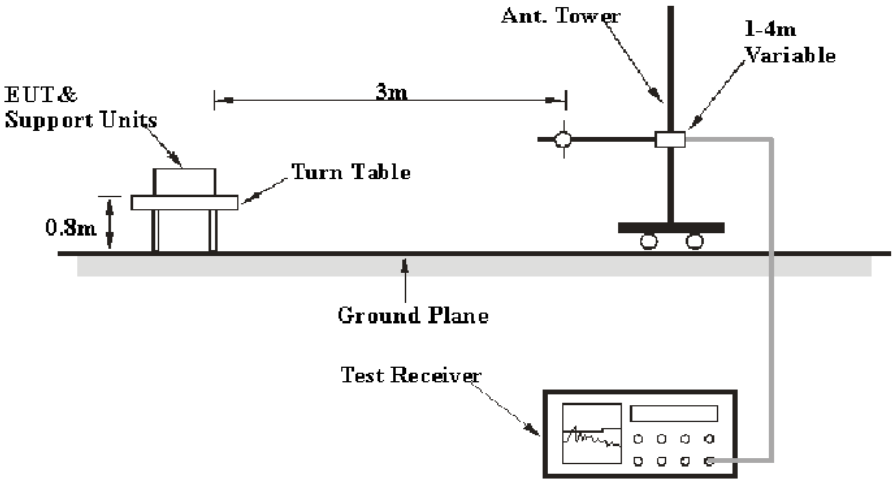
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:
30M~200MHz: 5.0 dB
200M~1GHz: 6.2 dB
1G~6GHz: 4.45 dB
6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

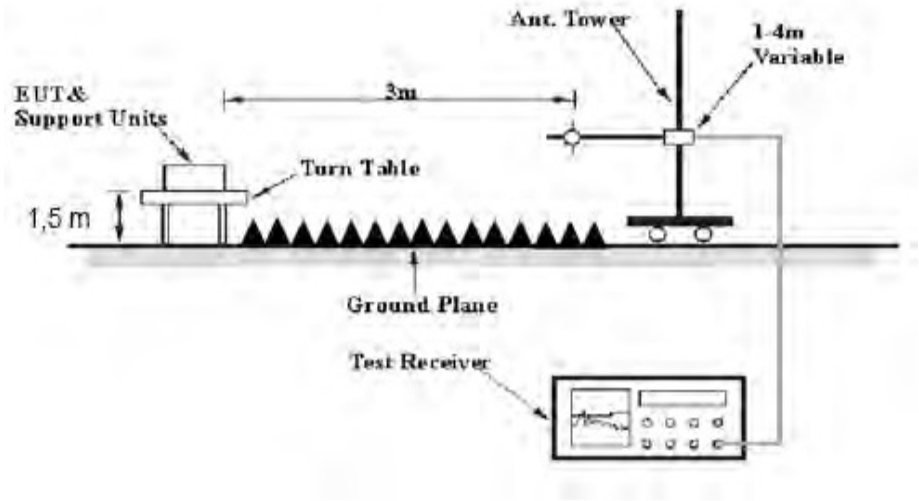
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission tests were performed in the 3 meters chamber, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.407 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

According to KDB 789033 D02 General UNII Test Procedures New Rules v01, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m
Distance extrapolation factor =20 log (specific distance [3m]/test distance [1.5m]) dB
Extrapolation result = Corrected Amplitude (dBμV/m) - distance extrapolation factor (6dB)

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

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

Margin = Limit –Extrapolation result

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-08-03	2016-08-02
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2015-09-01	2016-09-01
Agilent	Spectrum Analyzer	E4440A	SG43360054	2015-11-23	2016-11-22
N/A	Coaxial Cable	14m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	8m	N/A	2015-05-06	2016-05-06
Sinoscite	Bandstop Filters	BSF5150-5850MN-0899-003	N/A	2015-05-06	2016-05-06
ETS-Lindgren	Horn Antenna	3115	9808-5557	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Ducommun Technolagies	Horn Antenna	ARH-2823-02	1007726-01 1302	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2015-09-06	2016-09-06

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, Section 15.205, 15.209 and 15.407, with the worst margin reading of:

0.79 dB at **5715 MHz** in the **Vertical** polarization

Test Data

Environmental Conditions

Temperature:	21.5°C
Relative Humidity:	50 %
ATM Pressure:	101.2 kPa

The testing was performed by Allen Qiao on 2015-12-18.

Result: Compliance.

Note: The emission compliance 15.209 general requirements,or compliance the outside band emission limits in the un-restricted bands.

Test Mode: Transmitting

5150MHz-5250MHz: 802.11a Mode:

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel: 5180 MHz									
5180	66.28	PK	H	31.46	5.40	0.00	103.14	N/A	N/A
5180	55.09	AV	H	31.46	5.40	0.00	91.95	N/A	N/A
5180	75.36	PK	V	31.46	5.40	0.00	112.22	N/A	N/A
5180	64.31	AV	V	31.46	5.40	0.00	101.17	N/A	N/A
5150	26.24	PK	V	31.40	5.26	0.00	62.90	74.00	11.10
5150	14.52	AV	V	31.40	5.26	0.00	51.18	54.00	2.82*
10360	29.35	PK	V	36.97	8.36	25.52	49.16	74.00	24.84
10360	17.03	AV	V	36.97	8.36	25.52	36.84	54.00	17.16
15540	31.47	PK	V	37.43	14.94	24.98	58.86	74.00	15.14
15540	19.03	AV	V	37.43	14.94	24.98	46.42	54.00	7.58
6933	32.85	PK	V	33.43	6.34	26.38	46.24	74.00	27.76
6933	20.12	AV	V	33.43	6.34	26.38	33.51	54.00	20.49
4936	31.25	PK	V	30.93	5.35	27.43	40.10	74.00	33.90
4936	18.66	AV	V	30.93	5.35	27.43	27.51	54.00	26.49
265.21	35.40	QP	V	13.39	1.96	21.50	29.25	46.00	16.75
Middle Channel: 5200 MHz									
5200	66.80	PK	H	31.50	5.49	0.00	103.79	N/A	N/A
5200	55.55	AV	H	31.50	5.49	0.00	92.54	N/A	N/A
5200	75.85	PK	V	31.50	5.49	0.00	112.84	N/A	N/A
5200	64.71	AV	V	31.50	5.49	0.00	101.70	N/A	N/A
10400	29.79	PK	V	36.98	8.32	25.50	49.59	74.00	24.41
10400	17.45	AV	V	36.98	8.32	25.50	37.25	54.00	16.75
15600	31.59	PK	V	37.32	14.69	24.69	58.91	74.00	15.09
15600	19.26	AV	V	37.32	14.69	24.69	46.58	54.00	7.42
6933	33.08	PK	V	33.43	6.34	26.38	46.47	74.00	27.53
6933	20.32	AV	V	33.43	6.34	26.38	33.71	54.00	20.29
3280	31.36	PK	V	28.10	5.61	27.30	37.77	74.00	36.23
3280	18.77	AV	V	28.10	5.61	27.30	25.18	54.00	28.82
265.21	35.30	QP	V	13.39	1.96	21.50	29.15	46.00	16.85
High Channel: 5240 MHz									
5240	66.52	PK	H	31.58	5.28	0.00	103.38	N/A	N/A
5240	55.38	AV	H	31.58	5.28	0.00	92.24	N/A	N/A
5240	75.65	PK	V	31.58	5.28	0.00	112.51	N/A	N/A
5240	64.52	AV	V	31.58	5.28	0.00	101.38	N/A	N/A
5350	24.33	PK	V	31.80	5.61	0.00	61.74	74.00	12.26
5350	13.25	AV	V	31.80	5.61	0.00	50.66	54.00	3.34*
10480	29.76	PK	V	37.00	8.23	26.01	48.98	74.00	25.02
10480	17.44	AV	V	37.00	8.23	26.01	36.66	54.00	17.34
15720	31.72	PK	V	37.10	14.20	24.92	58.10	74.00	15.90
15720	19.43	AV	V	37.10	14.20	24.92	45.81	54.00	8.19
6984	33.08	PK	V	33.56	6.36	26.27	46.73	74.00	27.27
6984	20.39	AV	V	33.56	6.36	26.27	34.04	54.00	19.96
3280	31.36	PK	V	28.10	5.61	27.30	37.77	74.00	36.23
3280	18.86	AV	V	28.10	5.61	27.30	25.27	54.00	28.73
265.21	35.20	QP	V	13.39	1.96	21.50	29.05	46.00	16.95

**within uncertainty measurement!*

802.11n ht20 Mode:

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel: 5180 MHz									
5180	65.34	PK	H	31.46	5.40	0.00	102.20	N/A	N/A
5180	54.06	AV	H	31.46	5.40	0.00	90.92	N/A	N/A
5180	75.89	PK	V	31.46	5.40	0.00	112.75	N/A	N/A
5180	64.35	AV	V	31.46	5.40	0.00	101.21	N/A	N/A
5150	26.68	PK	V	31.40	5.26	0.00	63.34	74.00	10.66
5150	14.57	AV	V	31.40	5.26	0.00	51.23	54.00	2.77*
10360	29.68	PK	V	36.97	8.36	25.52	49.49	74.00	24.51
10360	17.35	AV	V	36.97	8.36	25.52	37.16	54.00	16.84
15540	31.21	PK	V	37.43	14.94	24.98	58.60	74.00	15.40
15540	18.92	AV	V	37.43	14.94	24.98	46.31	54.00	7.69
6933	32.41	PK	V	33.43	6.34	26.38	45.80	74.00	28.20
6933	19.88	AV	V	33.43	6.34	26.38	33.27	54.00	20.73
4936	31.39	PK	V	30.93	5.35	27.43	40.24	74.00	33.76
4936	18.72	AV	V	30.93	5.35	27.43	27.57	54.00	26.43
265.21	35.30	QP	V	13.39	1.96	21.50	29.15	46.00	16.85
Middle Channel: 5200 MHz									
5200	65.89	PK	H	31.50	5.49	0.00	102.88	N/A	N/A
5200	54.45	AV	H	31.50	5.49	0.00	91.44	N/A	N/A
5200	76.24	PK	V	31.50	5.49	0.00	113.23	N/A	N/A
5200	64.70	AV	V	31.50	5.49	0.00	101.69	N/A	N/A
10400	30.10	PK	V	36.98	8.32	25.50	49.90	74.00	24.10
10400	17.75	AV	V	36.98	8.32	25.50	37.55	54.00	16.45
15600	31.41	PK	V	37.32	14.69	24.69	58.73	74.00	15.27
15600	19.16	AV	V	37.32	14.69	24.69	46.48	54.00	7.52
7513	32.55	PK	V	34.81	6.95	26.17	48.14	74.00	25.86
7513	20.17	AV	V	34.81	6.95	26.17	35.76	54.00	18.24
3288	31.65	PK	V	28.12	5.42	27.30	37.89	74.00	36.11
3288	18.90	AV	V	28.12	5.42	27.30	25.14	54.00	28.86
265.21	35.20	QP	V	13.39	1.96	21.50	29.05	46.00	16.95
High Channel: 5240 MHz									
5240	65.14	PK	H	31.58	5.28	0.00	102.00	N/A	N/A
5240	53.68	AV	H	31.58	5.28	0.00	90.54	N/A	N/A
5240	75.55	PK	V	31.58	5.28	0.00	112.41	N/A	N/A
5240	63.99	AV	V	31.58	5.28	0.00	100.85	N/A	N/A
5350	25.45	PK	V	31.80	5.61	0.00	62.86	74.00	11.14
5350	13.86	AV	V	31.80	5.61	0.00	51.27	54.00	2.73*
10480	30.16	PK	V	37.00	8.23	26.01	49.38	74.00	24.62
10480	17.72	AV	V	37.00	8.23	26.01	36.94	54.00	17.06
15720	31.41	PK	V	37.10	14.20	24.92	57.79	74.00	16.21
15720	19.08	AV	V	37.10	14.20	24.92	45.46	54.00	8.54
6984	32.58	PK	V	33.56	6.36	26.27	46.23	74.00	27.77
6984	20.05	AV	V	33.56	6.36	26.27	33.70	54.00	20.30
3288	31.61	PK	V	28.12	5.42	27.30	37.85	74.00	36.15
3288	19.08	AV	V	28.12	5.42	27.30	25.32	54.00	28.68
265.21	35.10	QP	V	13.39	1.96	21.50	28.95	46.00	17.05

**within uncertainty measurement!*

802.11n ht40 Mode:

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Channel: 5190 MHz									
5190	60.38	PK	H	31.48	5.44	0.00	97.30	N/A	N/A
5190	50.11	AV	H	31.48	5.44	0.00	87.03	N/A	N/A
5190	70.46	PK	V	31.48	5.44	0.00	107.38	N/A	N/A
5190	60.05	AV	V	31.48	5.44	0.00	96.97	N/A	N/A
5150	25.89	PK	V	31.40	5.26	0.00	62.55	74.00	11.45
5150	14.32	AV	V	31.40	5.26	0.00	50.98	54.00	3.02*
10380	29.85	PK	V	36.98	8.34	25.51	49.66	74.00	24.34
10380	17.43	AV	V	36.98	8.34	25.51	37.24	54.00	16.76
15570	31.02	PK	V	37.37	14.81	24.83	58.37	74.00	15.63
15570	18.76	AV	V	37.37	14.81	24.83	46.11	54.00	7.89
6933	32.52	PK	V	33.43	6.34	26.38	45.91	87.38	41.47
6933	19.98	AV	V	33.43	6.34	26.38	33.37	76.97	43.60
4936	31.24	PK	V	30.93	5.35	27.43	40.09	74.00	33.91
4936	18.62	AV	V	30.93	5.35	27.43	27.47	54.00	26.53
265.21	35.30	QP	V	13.39	1.96	21.50	29.15	46.00	16.85
Channel: 5230 MHz									
5230	61.00	PK	H	31.56	5.33	0.00	97.89	N/A	N/A
5230	50.48	AV	H	31.56	5.33	0.00	87.37	N/A	N/A
5230	70.83	PK	V	31.56	5.33	0.00	107.72	N/A	N/A
5230	60.36	AV	V	31.56	5.33	0.00	97.25	N/A	N/A
5350	24.19	PK	V	31.80	5.61	0.00	61.60	74.00	12.40
5350	13.08	AV	V	31.80	5.61	0.00	50.49	54.00	3.51*
10460	30.17	PK	V	36.99	8.25	25.88	49.53	74.00	24.47
10460	17.72	AV	V	36.99	8.25	25.88	37.08	54.00	16.92
15690	31.19	PK	V	37.16	14.32	24.87	57.80	74.00	16.20
15690	19.02	AV	V	37.16	14.32	24.87	45.63	54.00	8.37
6973	32.80	PK	V	33.53	6.36	26.30	46.39	87.72	41.33
6973	20.16	AV	V	33.53	6.36	26.30	33.75	77.25	43.50
3288	31.42	PK	V	28.12	5.42	27.30	37.66	74.00	36.34
3288	18.76	AV	V	28.12	5.42	27.30	25.00	54.00	29.00
265.21	35.10	QP	V	13.39	1.96	21.50	28.95	46.00	17.05

**within uncertainty measurement!*

802.11n ac80 Mode:

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Channel: 5210 MHz									
5210	57.82	PK	H	31.52	5.44	0.00	94.78	N/A	N/A
5210	47.21	AV	H	31.52	5.44	0.00	84.17	N/A	N/A
5210	68.66	PK	V	31.52	5.44	0.00	105.62	N/A	N/A
5210	57.75	AV	V	31.52	5.44	0.00	94.71	N/A	N/A
5150	30.26	PK	V	31.40	5.26	0.00	66.92	74.00	7.08
5150	16.23	AV	V	31.40	5.26	0.00	52.89	54.00	1.11*
5350	25.78	PK	V	31.80	5.61	0.00	63.19	74.00	10.81
5350	14.05	AV	V	31.80	5.61	0.00	51.46	54.00	2.54*
10420	29.69	PK	V	36.98	8.30	25.63	49.34	74.00	24.66
10420	17.26	AV	V	36.98	8.30	25.63	36.91	54.00	17.09
15630	29.97	PK	V	37.27	14.57	24.75	57.06	74.00	16.94
15630	17.65	AV	V	37.27	14.57	24.75	44.74	54.00	9.26
6946	32.41	PK	V	33.46	6.35	26.36	45.86	74.00	28.14
6946	19.83	AV	V	33.46	6.35	26.36	33.28	54.00	20.72
265.21	35.20	QP	V	13.39	1.96	21.50	29.05	46.00	16.95

**within uncertainty measurement!*

5725MHz-5850MHz: 802.11a Mode:

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel: 5745 MHz									
5745	62.35	PK	H	32.15	5.53	0.00	100.03	N/A	N/A
5745	51.02	AV	H	32.15	5.53	0.00	88.70	N/A	N/A
5745	72.48	PK	V	32.15	5.53	0.00	110.16	N/A	N/A
5745	61.14	AV	V	32.15	5.53	0.00	98.82	N/A	N/A
5725	30.33	PK	V	32.15	5.60	0.00	68.08	78.20	10.12
5715	28.05	PK	V	32.14	5.63	0.00	65.82	68.20	2.38*
11490	29.13	PK	V	37.89	8.94	26.14	49.82	74.00	24.18
11490	17.05	AV	V	37.89	8.94	26.14	37.74	54.00	16.26
17235	30.55	PK	V	40.91	13.69	25.63	59.52	74.00	14.48
17235	18.24	AV	V	40.91	13.69	25.63	47.21	54.00	6.79
4867	32.14	PK	V	30.75	5.09	27.42	40.56	74.00	33.44
4867	19.62	AV	V	30.75	5.09	27.42	28.04	54.00	25.96
7310	32.56	PK	V	34.34	6.74	25.88	47.76	74.00	26.24
7310	20.03	AV	V	34.34	6.74	25.88	35.23	54.00	18.77
265.21	35.60	QP	V	13.39	1.96	21.50	29.45	46.00	16.55
Middle Channel: 5785 MHz									
5785	62.11	PK	H	32.16	5.47	0.00	99.74	N/A	N/A
5785	50.74	AV	H	32.16	5.47	0.00	88.37	N/A	N/A
5785	71.99	PK	V	32.16	5.47	0.00	109.62	N/A	N/A
5785	60.62	AV	V	32.16	5.47	0.00	98.25	N/A	N/A
11570	29.58	PK	V	37.90	8.92	26.07	50.33	74.00	23.67
11570	17.36	AV	V	37.90	8.92	26.07	38.11	54.00	15.89
17355	30.61	PK	V	41.63	12.99	25.63	59.60	74.00	14.40
17355	18.39	AV	V	41.63	12.99	25.63	47.38	54.00	6.62
4867	32.37	PK	V	30.75	5.09	27.42	40.79	74.00	33.21
4867	19.89	AV	V	30.75	5.09	27.42	28.31	54.00	25.69
7310	32.76	PK	V	34.34	6.74	25.88	47.96	74.00	26.04
7310	20.21	AV	V	34.34	6.74	25.88	35.41	54.00	18.59
265.21	35.50	QP	V	13.39	1.96	21.50	29.35	46.00	16.65
High Channel: 5825 MHz									
5825	62.31	PK	H	32.17	5.75	0.00	100.23	N/A	N/A
5825	51.04	AV	H	32.17	5.75	0.00	88.96	N/A	N/A
5825	72.56	PK	V	32.17	5.75	0.00	110.48	N/A	N/A
5825	61.15	AV	V	32.17	5.75	0.00	99.07	N/A	N/A
5850	27.58	PK	V	32.17	6.05	0.00	65.80	78.20	12.40
5860	26.41	PK	V	32.17	6.02	0.00	64.60	68.20	3.60*
11650	29.57	PK	V	37.90	8.90	25.75	50.62	74.00	23.38
11650	17.43	AV	V	37.90	8.90	25.75	38.48	54.00	15.52
17475	30.65	PK	V	42.35	12.30	25.39	59.91	74.00	14.09
17475	18.46	AV	V	42.35	12.30	25.39	47.72	54.00	6.28
4867	32.32	PK	V	30.75	5.09	27.42	40.74	74.00	33.26
4867	19.85	AV	V	30.75	5.09	27.42	28.27	54.00	25.73
7310	32.70	PK	V	34.34	6.74	25.88	47.90	74.00	26.10
7310	20.32	AV	V	34.34	6.74	25.88	35.52	54.00	18.48
265.21	35.40	QP	V	13.39	1.96	21.50	29.25	46.00	16.75

**within uncertainty measurement!*

802.11n ht20 Mode:

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel: 5745 MHz									
5745	64.47	PK	H	32.15	5.53	0.00	102.15	N/A	N/A
5745	53.10	AV	H	32.15	5.53	0.00	90.78	N/A	N/A
5745	72.39	PK	V	32.15	5.53	0.00	110.07	N/A	N/A
5745	61.36	AV	V	32.15	5.53	0.00	99.04	N/A	N/A
5725	32.52	PK	V	32.15	5.60	0.00	70.27	78.20	7.93
5715	29.13	PK	V	32.14	5.63	0.00	66.90	68.20	1.30*
11490	29.63	PK	V	37.89	8.94	26.14	50.32	74.00	23.68
11490	17.25	AV	V	37.89	8.94	26.14	37.94	54.00	16.06
17235	30.72	PK	V	40.91	13.69	25.63	59.69	74.00	14.31
17235	18.41	AV	V	40.91	13.69	25.63	47.38	54.00	6.62
4867	32.40	PK	V	30.75	5.09	27.42	40.82	74.00	33.18
4867	19.90	AV	V	30.75	5.09	27.42	28.32	54.00	25.68
7310	32.68	PK	V	34.34	6.74	25.88	47.88	74.00	26.12
7310	20.15	AV	V	34.34	6.74	25.88	35.35	54.00	18.65
265.21	35.30	QP	V	13.39	1.96	21.50	29.15	46.00	16.85
Middle Channel: 5785 MHz									
5785	64.27	PK	H	32.16	5.47	0.00	101.90	N/A	N/A
5785	52.93	AV	H	32.16	5.47	0.00	90.56	N/A	N/A
5785	71.95	PK	V	32.16	5.47	0.00	109.58	N/A	N/A
5785	60.89	AV	V	32.16	5.47	0.00	98.52	N/A	N/A
11570	29.33	PK	V	37.90	8.92	26.07	50.08	74.00	23.92
11570	16.88	AV	V	37.90	8.92	26.07	37.63	54.00	16.37
17355	30.28	PK	V	41.63	12.99	25.63	59.27	74.00	14.73
17355	18.01	AV	V	41.63	12.99	25.63	47.00	54.00	7.00
4867	31.99	PK	V	30.75	5.09	27.42	40.41	74.00	33.59
4867	19.45	AV	V	30.75	5.09	27.42	27.87	54.00	26.13
7310	32.41	PK	V	34.34	6.74	25.88	47.61	74.00	26.39
7310	19.90	AV	V	34.34	6.74	25.88	35.10	54.00	18.90
265.21	35.20	QP	V	13.39	1.96	21.50	29.05	46.00	16.95
High Channel: 5825 MHz									
5825	63.49	PK	H	32.17	5.75	0.00	101.41	N/A	N/A
5825	52.42	AV	H	32.17	5.75	0.00	90.34	N/A	N/A
5825	71.54	PK	V	32.17	5.75	0.00	109.46	N/A	N/A
5825	60.68	AV	V	32.17	5.75	0.00	98.60	N/A	N/A
5850	26.31	PK	V	32.17	6.05	0.00	64.53	78.20	13.67
5860	25.85	PK	V	32.17	6.02	0.00	64.04	68.20	4.16*
11650	29.30	PK	V	37.90	8.90	25.75	50.35	74.00	23.65
11650	16.93	AV	V	37.90	8.90	25.75	37.98	54.00	16.02
17475	30.27	PK	V	42.35	12.30	25.39	59.53	74.00	14.47
17475	17.89	AV	V	42.35	12.30	25.39	47.15	54.00	6.85
4867	31.87	PK	V	30.75	5.09	27.42	40.29	74.00	33.71
4867	19.58	AV	V	30.75	5.09	27.42	28.00	54.00	26.00
7310	32.35	PK	V	34.34	6.74	25.88	47.55	74.00	26.45
7310	19.88	AV	V	34.34	6.74	25.88	35.08	54.00	18.92
265.21	35.10	QP	V	13.39	1.96	21.50	28.95	46.00	17.05

**within uncertainty measurement!*

802.11n ht40 Mode:

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Channel: 5755 MHz									
5755	61.14	PK	H	32.15	5.50	0.00	98.79	N/A	N/A
5755	50.21	AV	H	32.15	5.50	0.00	87.86	N/A	N/A
5755	68.06	PK	V	32.15	5.50	0.00	105.71	N/A	N/A
5755	57.47	AV	V	32.15	5.50	0.00	95.12	N/A	N/A
5725	30.51	PK	V	32.15	5.60	0.00	68.26	78.20	9.94
5715	28.02	PK	V	32.14	5.63	0.00	65.79	68.20	2.41*
11510	29.58	PK	V	37.90	8.95	26.12	50.31	74.00	23.69
11510	17.32	AV	V	37.90	8.95	26.12	38.05	54.00	15.95
17265	30.74	PK	V	41.09	13.51	25.63	59.71	74.00	14.29
17265	18.39	AV	V	41.09	13.51	25.63	47.36	54.00	6.64
4867	32.31	PK	V	30.75	5.09	27.42	40.73	74.00	33.27
4867	19.83	AV	V	30.75	5.09	27.42	28.25	54.00	25.75
7310	32.69	PK	V	34.34	6.74	25.88	47.89	74.00	26.11
7310	20.14	AV	V	34.34	6.74	25.88	35.34	54.00	18.66
265.21	35.30	QP	V	13.39	1.96	21.50	29.15	46.00	16.85
Channel: 5795 MHz									
5795	60.35	PK	H	32.16	5.46	0.00	97.97	N/A	N/A
5795	49.15	AV	H	32.16	5.46	0.00	86.77	N/A	N/A
5795	68.46	PK	V	32.16	5.46	0.00	106.08	N/A	N/A
5795	57.24	AV	V	32.16	5.46	0.00	94.86	N/A	N/A
5850	25.68	PK	V	32.17	6.05	0.00	63.90	78.20	14.30
5860	25.07	PK	V	32.17	6.02	0.00	63.26	68.20	4.94
11590	29.72	PK	V	37.90	8.92	26.06	50.48	74.00	23.52
11590	17.43	AV	V	37.90	8.92	26.06	38.19	54.00	15.81
17385	30.86	PK	V	41.81	12.82	25.63	59.86	74.00	14.14
17385	18.50	AV	V	41.81	12.82	25.63	47.50	54.00	6.50
4867	32.49	PK	V	30.75	5.09	27.42	40.91	74.00	33.09
4867	20.08	AV	V	30.75	5.09	27.42	28.50	54.00	25.50
7310	32.96	PK	V	34.34	6.74	25.88	48.16	74.00	25.84
7310	20.37	AV	V	34.34	6.74	25.88	35.57	54.00	18.43
265.21	35.20	QP	V	13.39	1.96	21.50	29.05	46.00	16.95

**within uncertainty measurement!*

802.11n ac80 Mode:

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Channel: 5775 MHz									
5775	56.04	PK	H	32.16	5.48	0.00	93.68	N/A	N/A
5775	45.17	AV	H	32.16	5.48	0.00	82.81	N/A	N/A
5775	66.23	PK	V	32.16	5.48	0.00	103.87	N/A	N/A
5775	55.42	AV	V	32.16	5.48	0.00	93.06	N/A	N/A
5725	31.22	PK	V	32.15	5.60	0.00	68.97	78.20	9.23
5715	29.64	PK	V	32.14	5.63	0.00	67.41	68.20	0.79*
5850	27.41	PK	V	32.17	6.05	0.00	65.63	78.20	12.57
5860	26.78	PK	V	32.17	6.02	0.00	64.97	68.20	3.23*
11550	28.56	PK	V	37.90	8.93	26.09	49.30	74.00	24.70
11550	16.59	AV	V	37.90	8.93	26.09	37.33	54.00	16.67
17325	30.24	PK	V	41.45	13.17	25.63	59.23	74.00	14.77
17325	17.85	AV	V	41.45	13.17	25.63	46.84	54.00	7.16
7754	32.21	PK	V	35.00	6.84	26.91	47.14	74.00	26.86
7754	19.67	AV	V	35.00	6.84	26.91	34.60	54.00	19.40
265.21	35.20	QP	V	13.39	1.96	21.50	29.05	46.00	16.95

**within uncertainty measurement!*

FCC§15.407(b) –CONDUCTED SPURIOUS EMISSION AT ANTENNA PORT

Applicable Standard

FCC §15.407;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

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

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

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

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

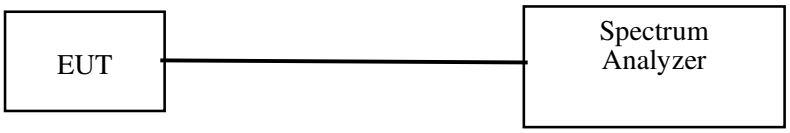
(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The Resolution bandwidth is set to 1MHz, The Video bandwidth is set to ≥ 1MHz, report the peak value out of the oprating band. Offset the antenna gain and cable loss.
3. Repeat above procedures until all frequencies measured were complete.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2015-05-06	2016-05-06

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	21.6~22.0 °C
Relative Humidity:	52 %
ATM Pressure:	101.2 kPa

The testing was performed by Allen Qiao on 2015-12-13 &2015-12-14

Result: Compliance.

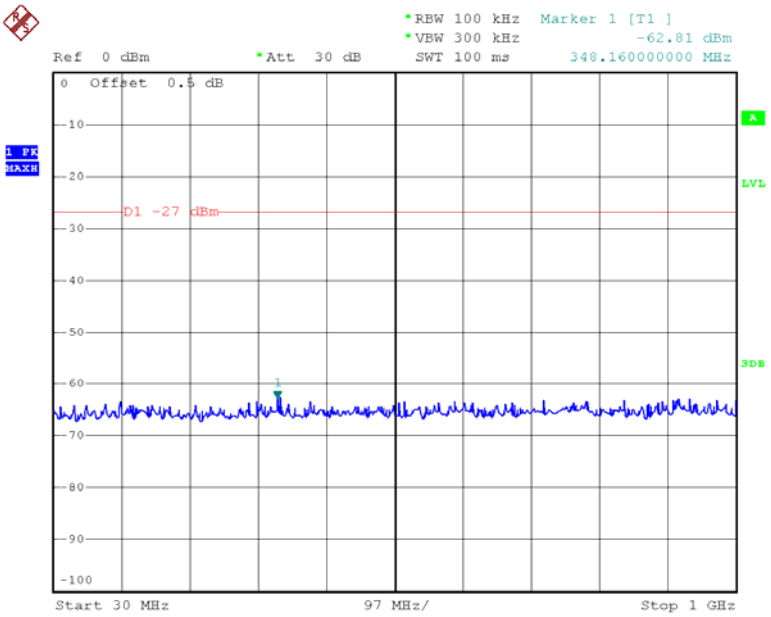
Please refer to the following plots.

Note: All spurious emission per chain at the antenna port is lower than -35dBm, so the total emission combined two chains is lower than -32dBm, antenna gain is 5dBi, so compliance the requirements.

5150MHz-5250MHz:

Antenna 0

802.11a Low Channel 30MHz-1GHz



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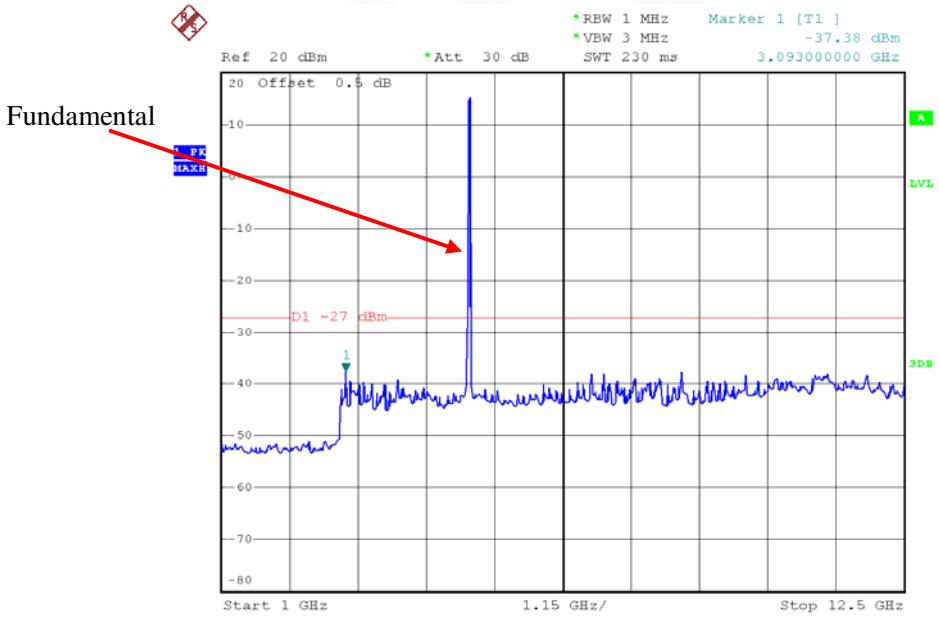
802.11a Low Channel 1GHz-12.5GHz



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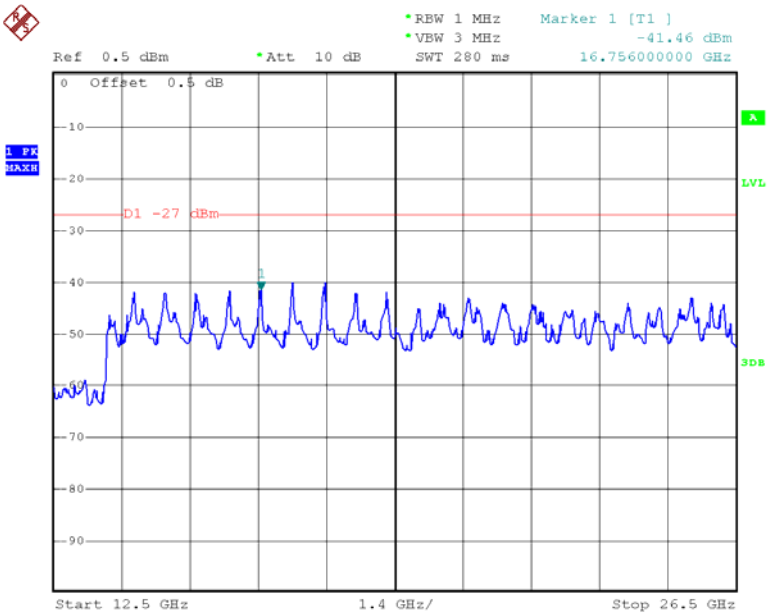
802.11a Low Channel 12.5GHz-26.5GHz



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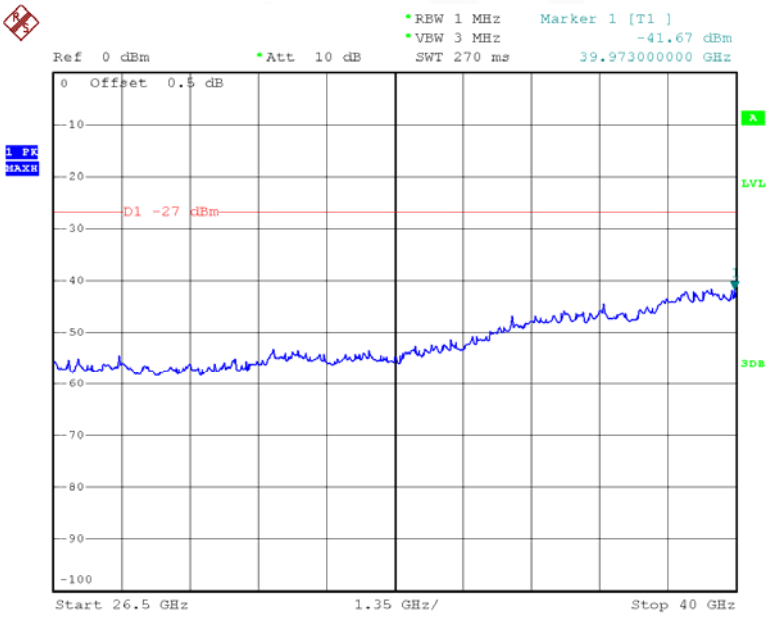
802.11a Low Channel 26.5GHz-40GHz



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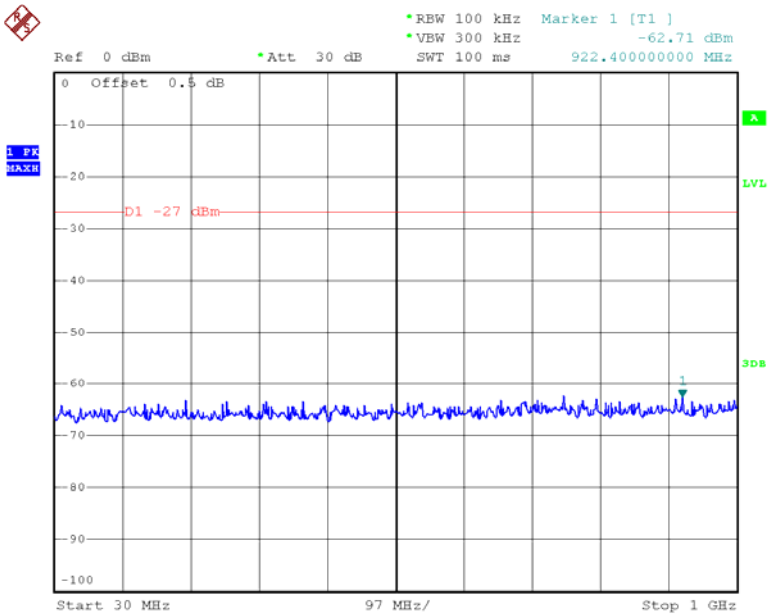
802.11a Middle Channel 30MHz -1GHz



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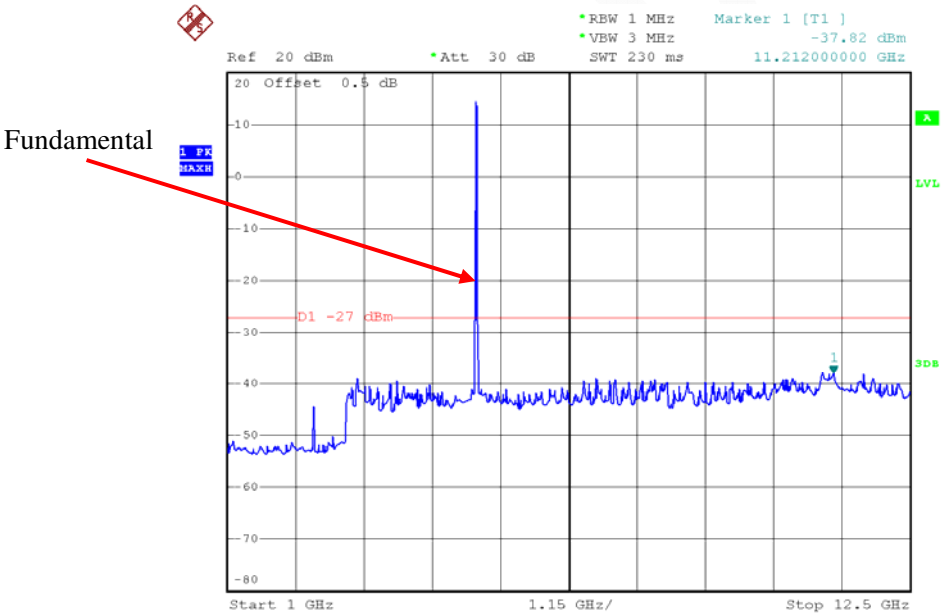
802.11a Middle Channel 1GHz-12.5GHz



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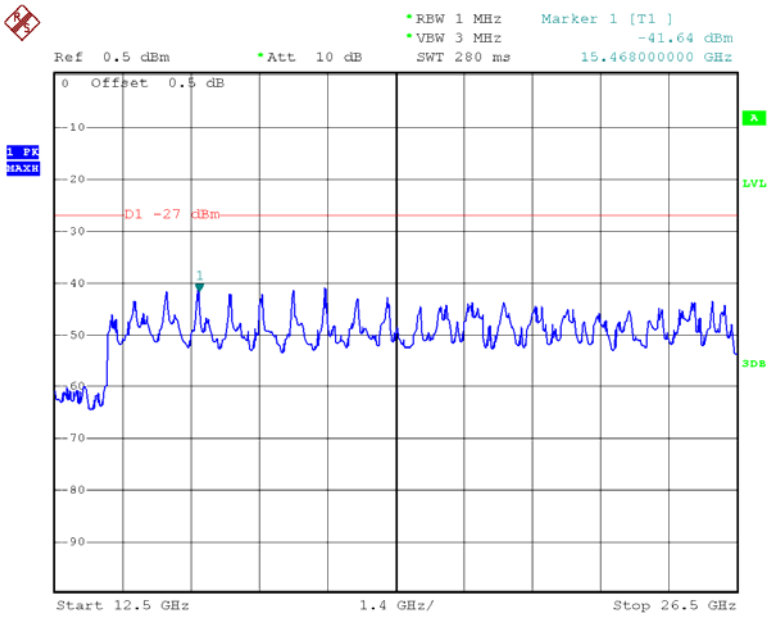
802.11a Middle Channel 12.5GHz-26.5GHz



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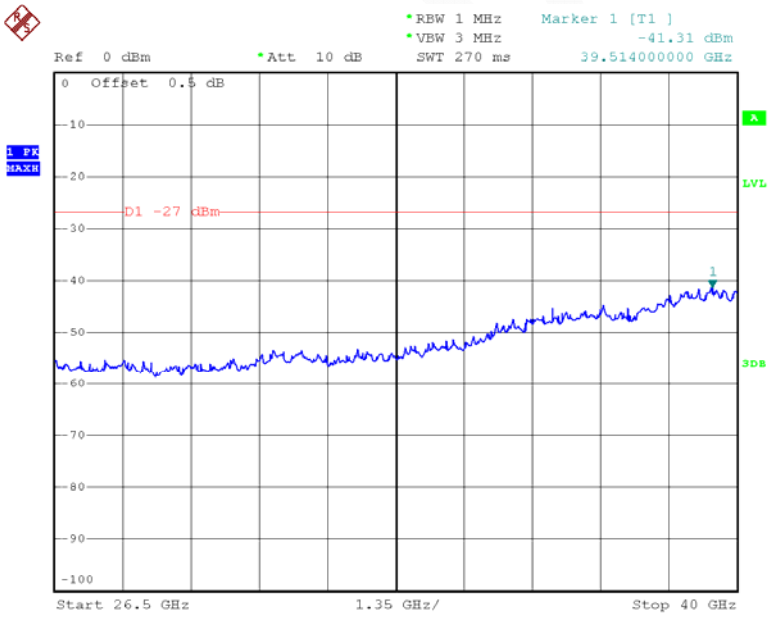
802.11a Middle Channel 26.5GHz-40GHz



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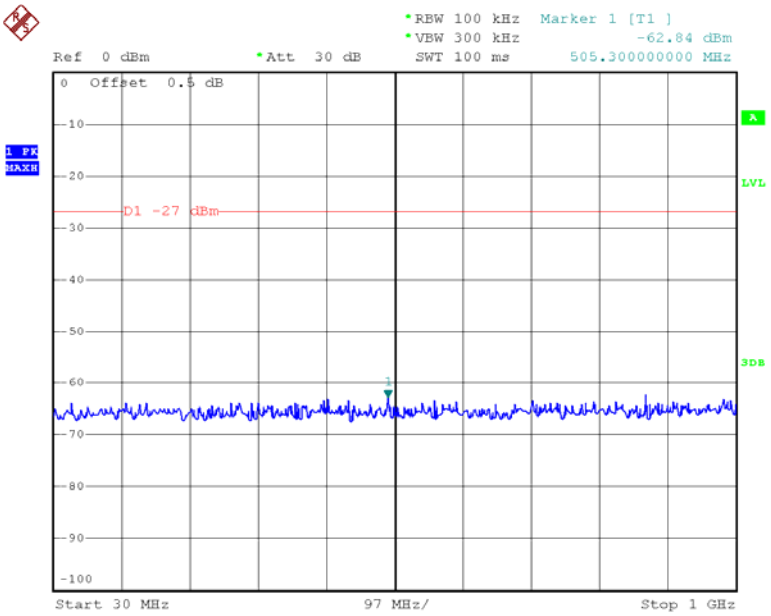
802.11a High Channel 30MHz-1GHz



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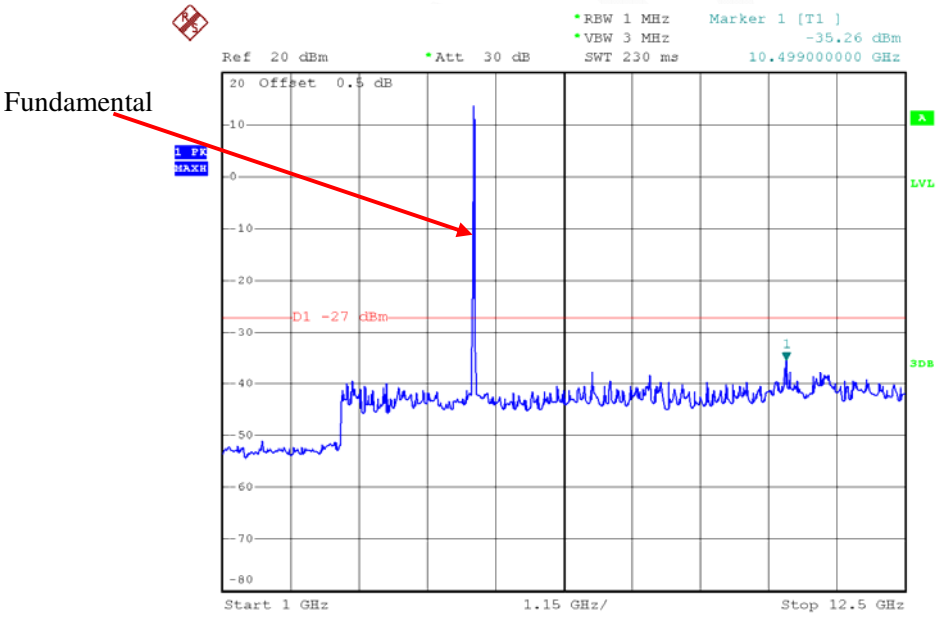
802.11a High Channel 1GHz-26.5GHz



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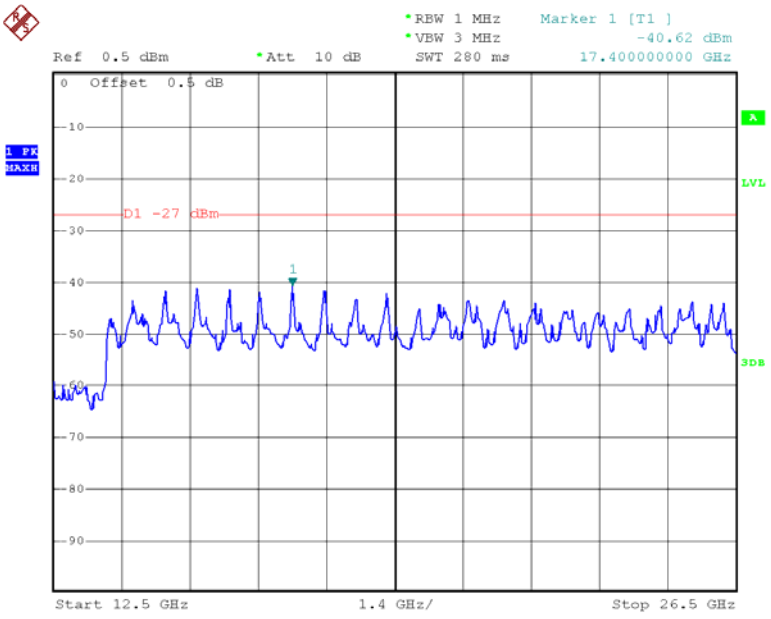
802.11a High Channel 12.5GHz-26.5GHz



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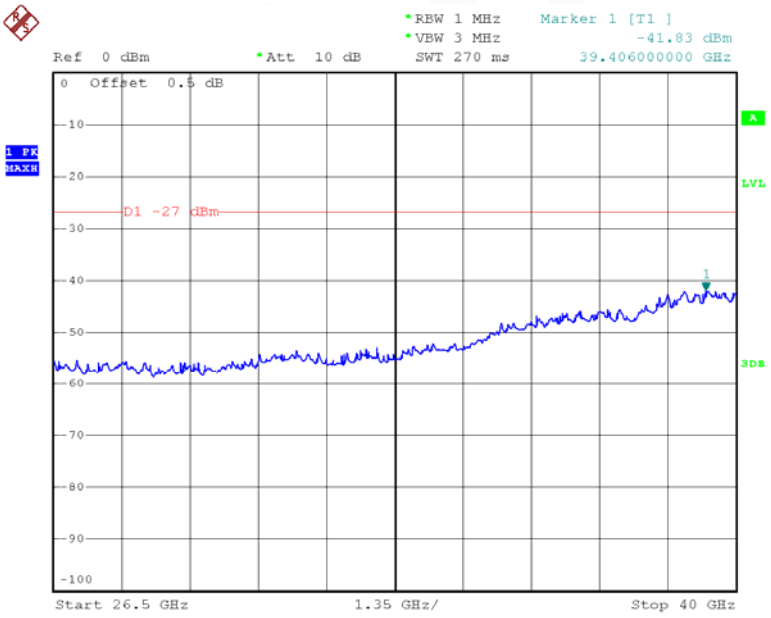
802.11a High Channel 26.5GHz-40GHz



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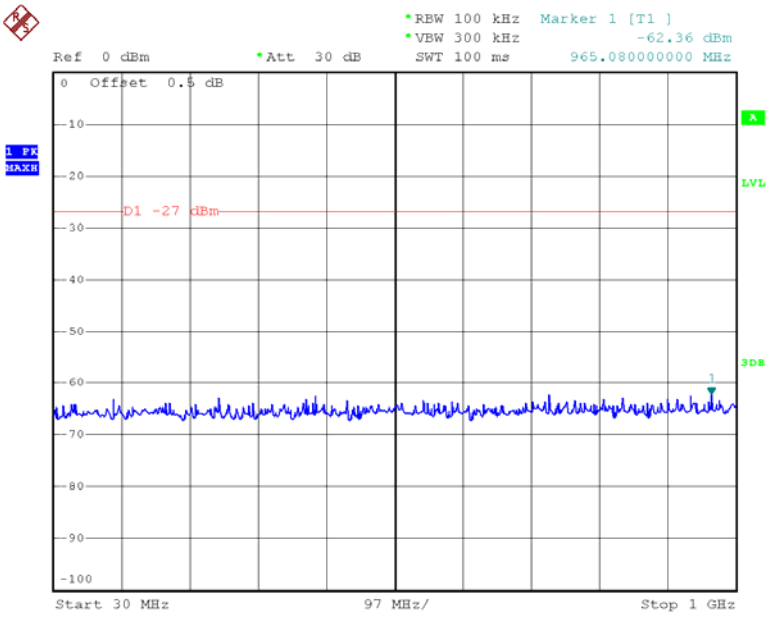
802.11n ht20 Low Channel 30MHz-1GHz



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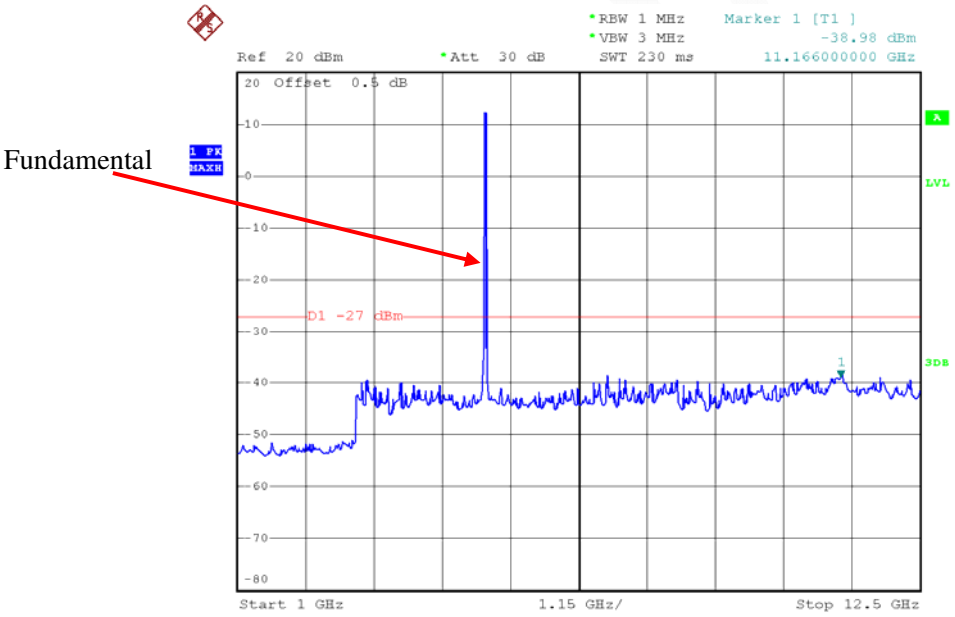
802.11n ht20 Low Channel 1GHz-12.5GHz



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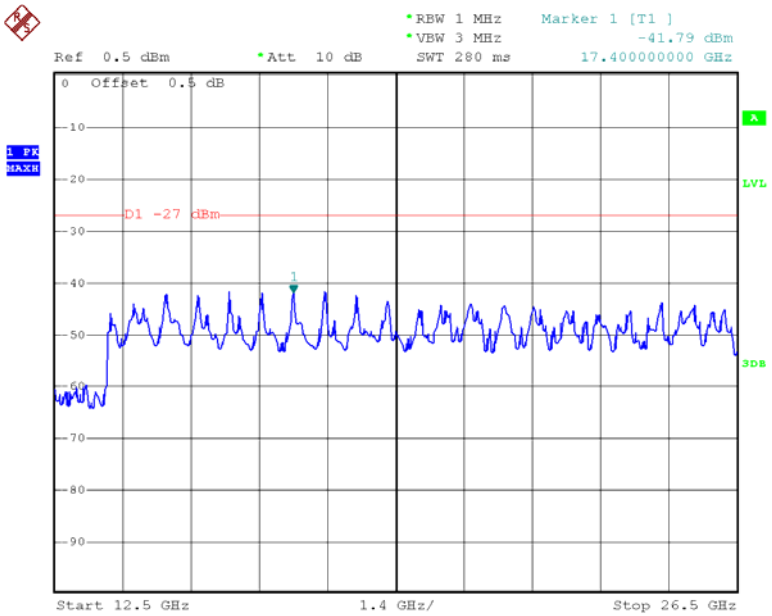
802.11n ht20 Low Channel 12.5GHz-26.5GHz



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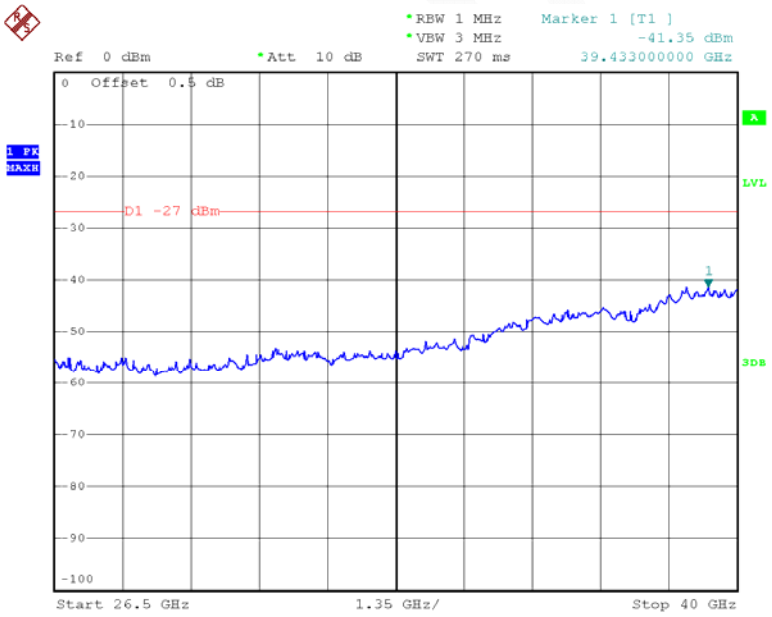
802.11n20 Low Channel 26.5GHz-40GHz



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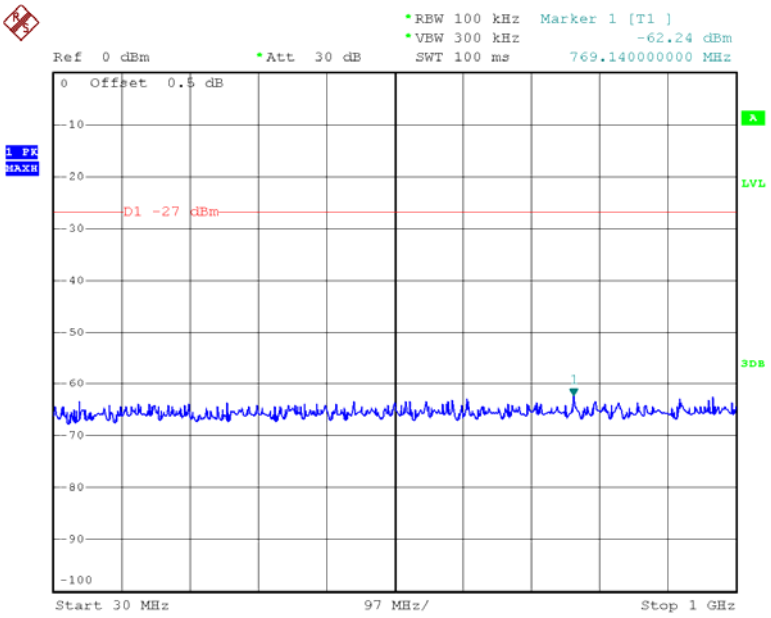
802.11n ht20 Middle Channel 30MHz -1GHz



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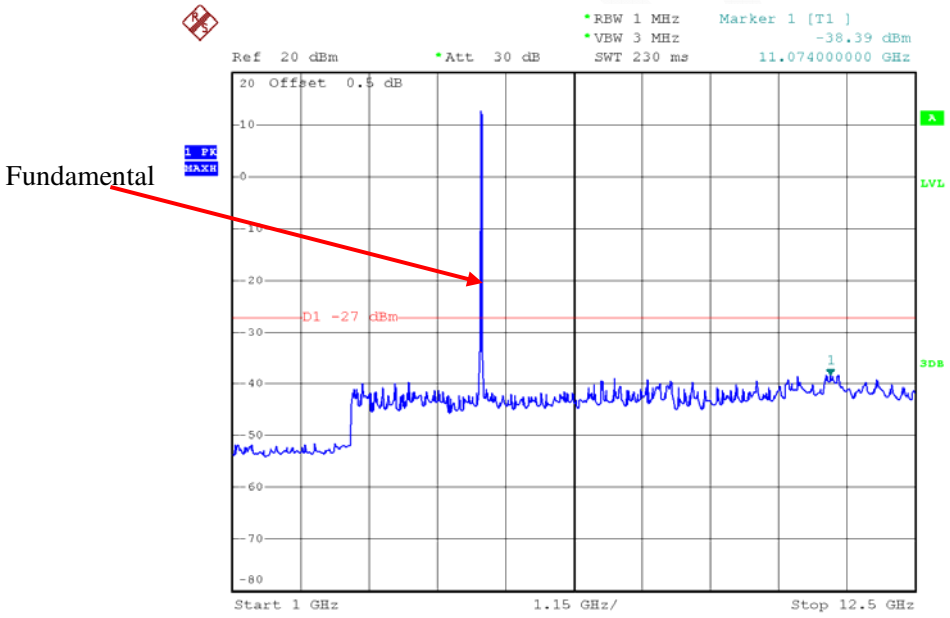
802.11n ht20 Middle Channel 1GHz-12.5GHz



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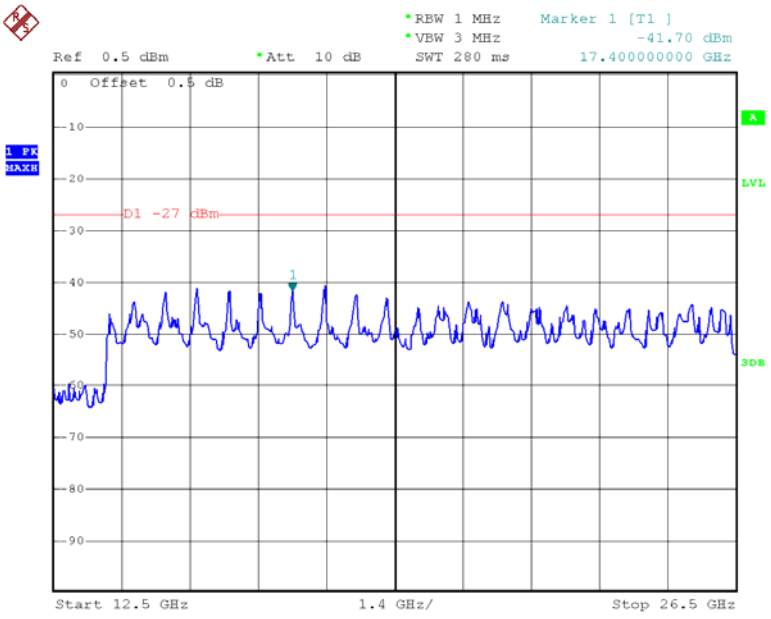
802.11n20 Middle Channel 12.5GHz-26.5GHz



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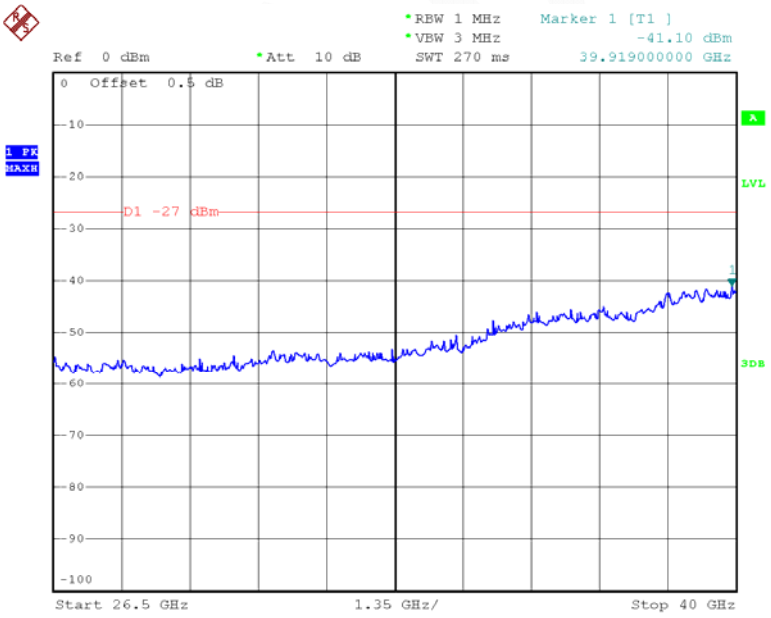
802.11n20 Middle Channel 26.5GHz-40GHz



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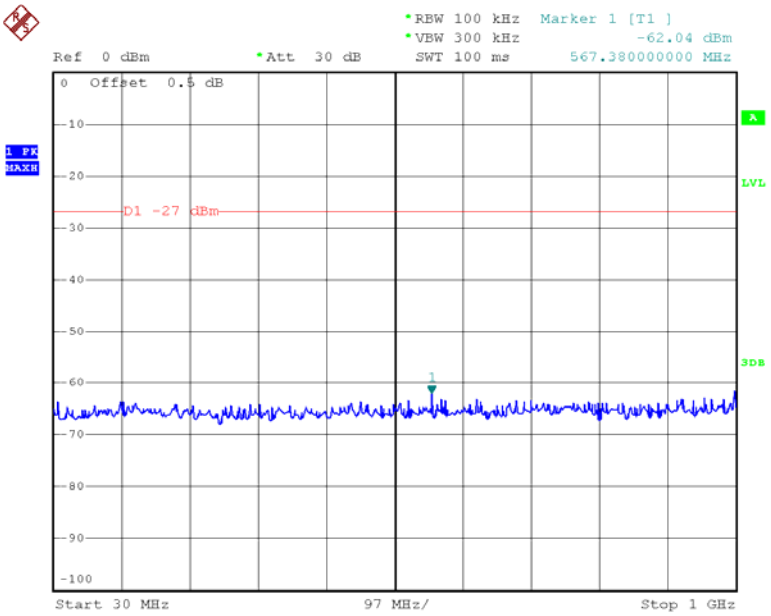
802.11n ht20 High Channel 30MHz-1GHz



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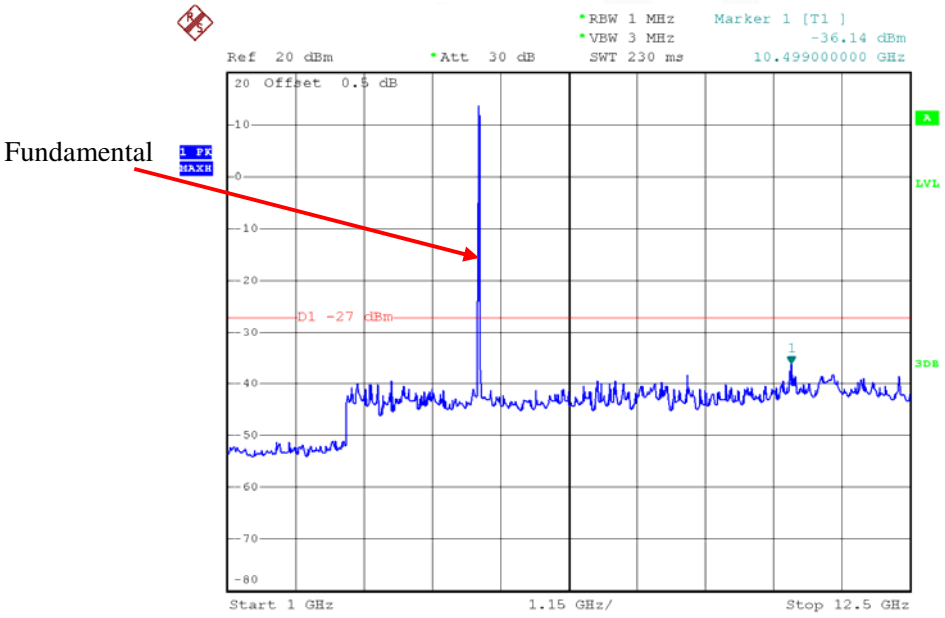
802.11n ht20 High Channel 1GHz-12.5GHz



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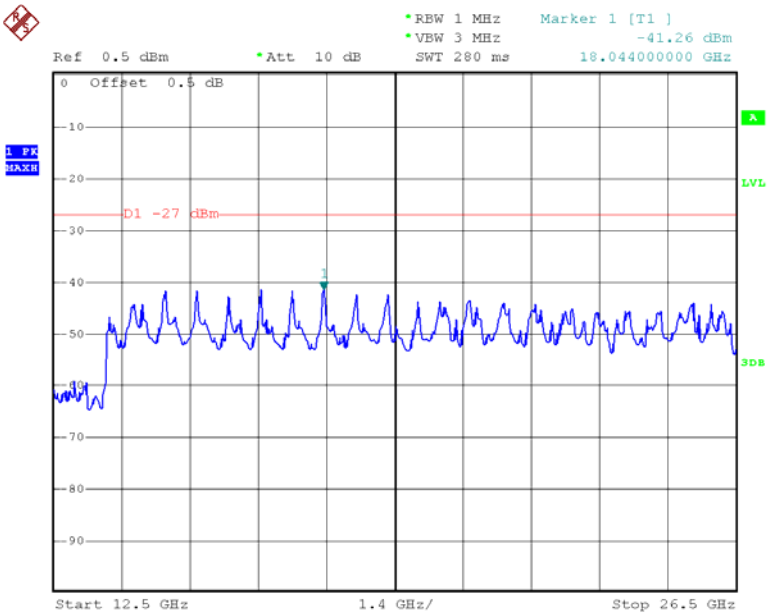
802.11n ht20 High Channel 12.5GHz-26.5GHz



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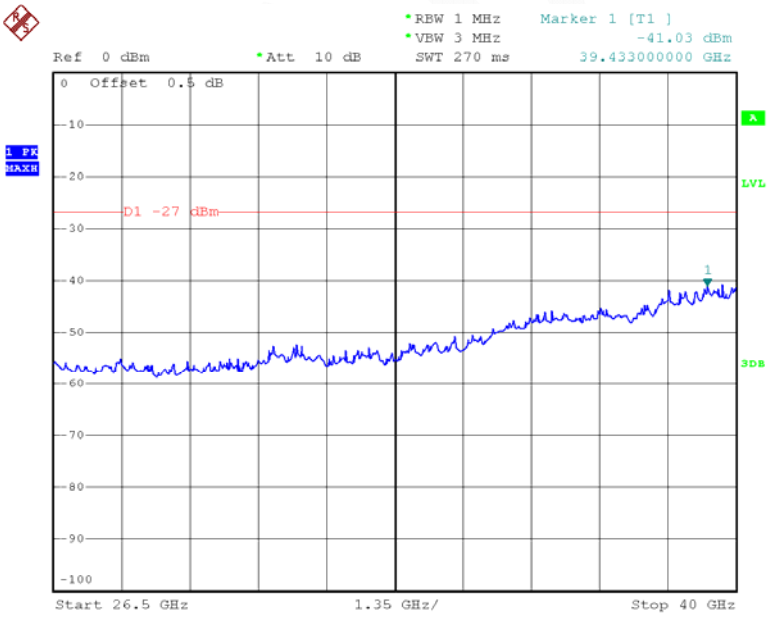
802.11n20 High Channel 26.5GHz-40GHz



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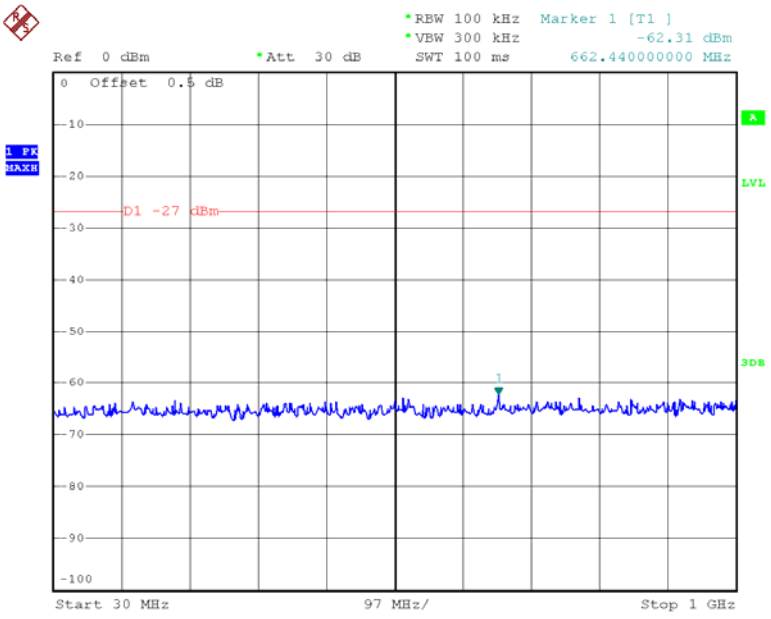
802.11n ht40 Low Channel 30MHz-1GHz



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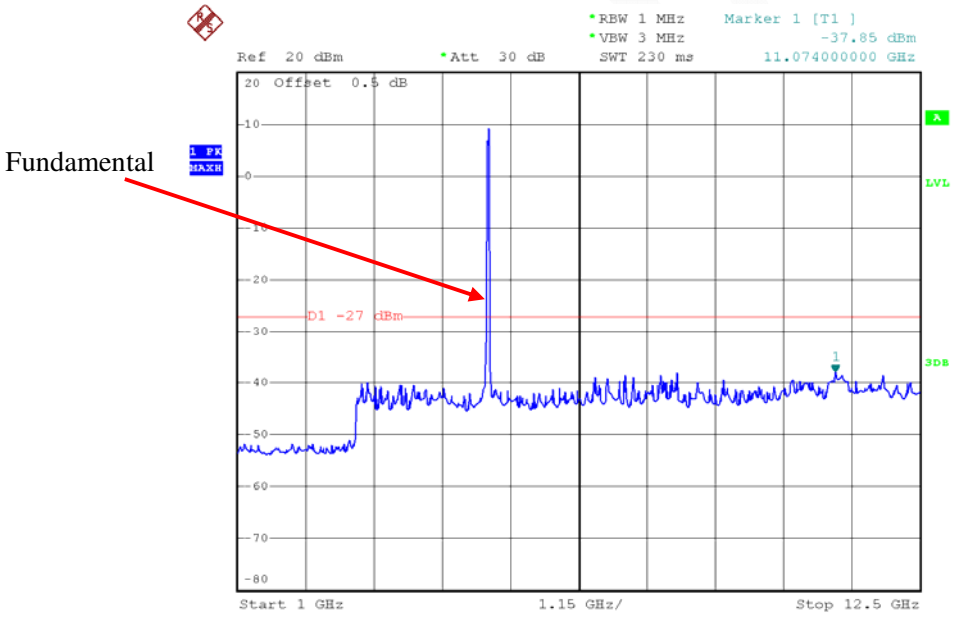
802.11n ht40 Low Channel 1GHz-26.5GHz



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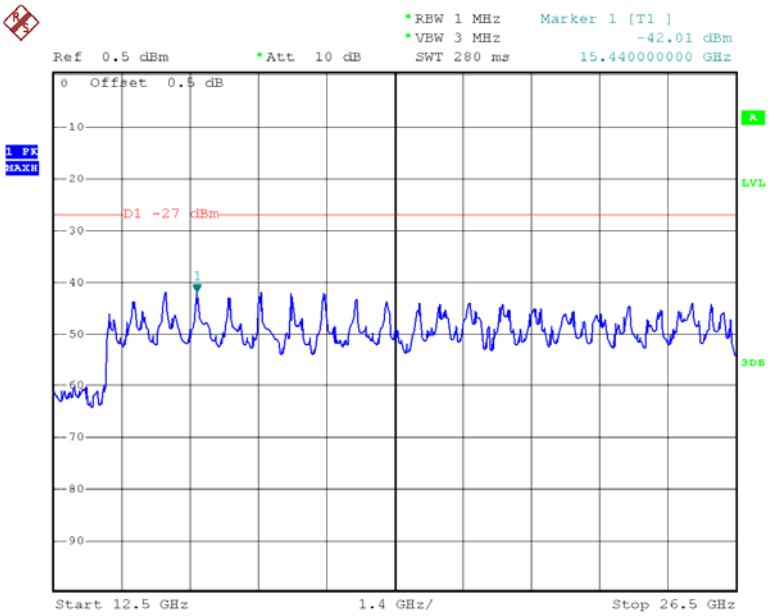
802.11n40 Low Channel 12.5GHz-26.5GHz



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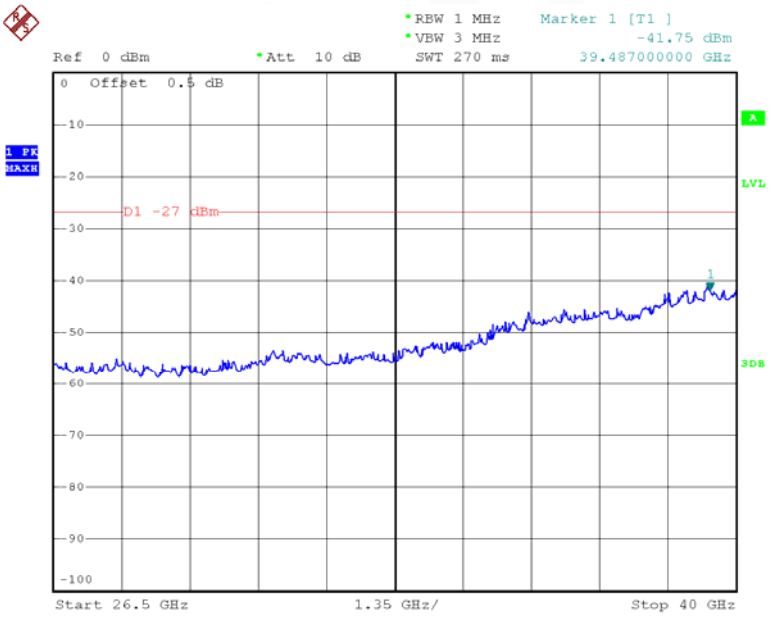
802.11n40 Low Channel 26.5GHz-40GHz



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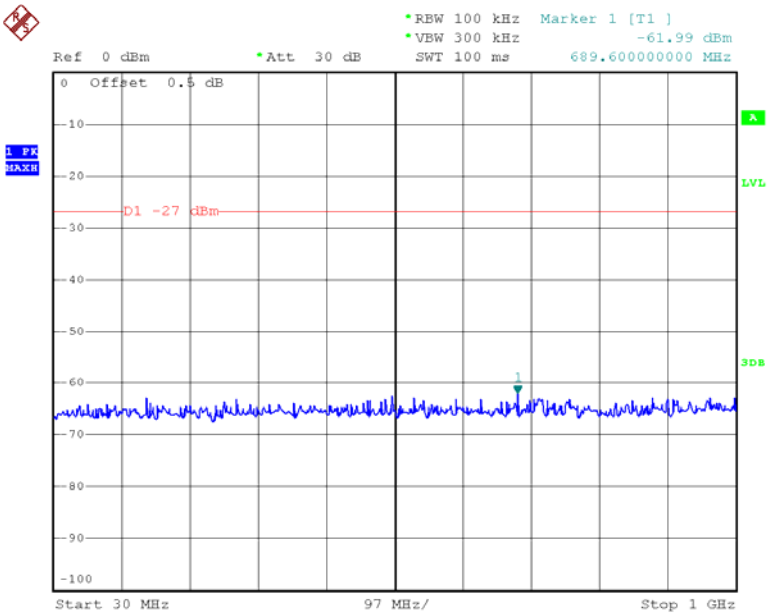
802.11n ht40 High Channel 30MHz-1GHz



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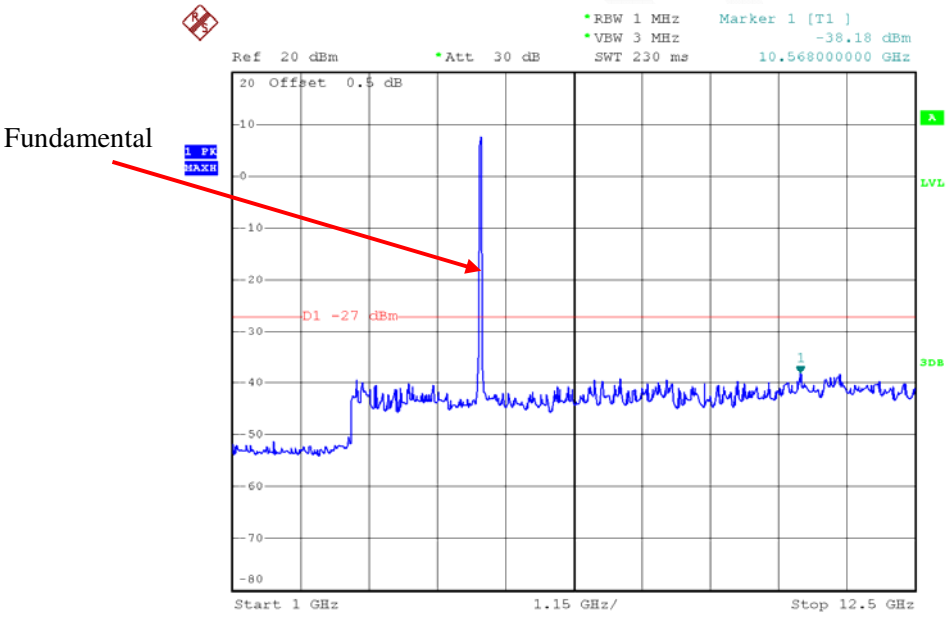
802.11n ht40 High Channel 1GHz-12.5GHz



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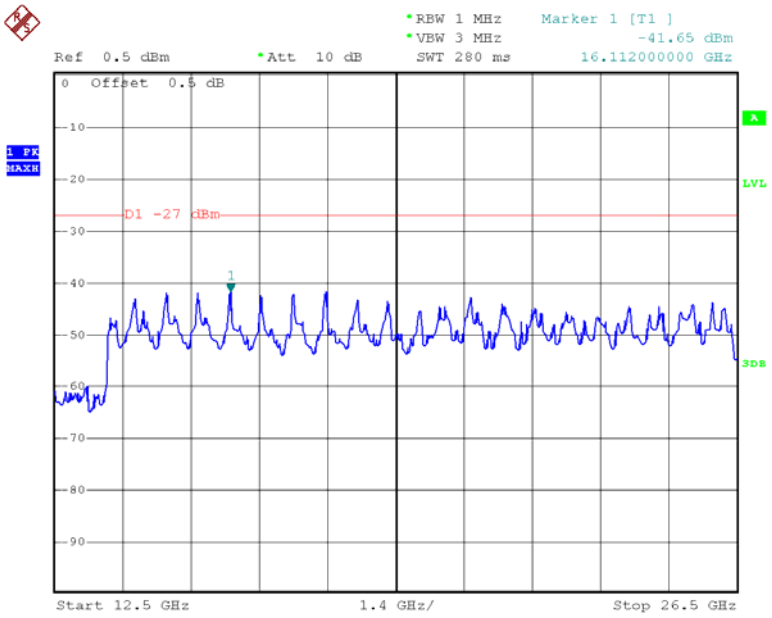
802.11n ht40 High Channel 12.5GHz-26.5GHz



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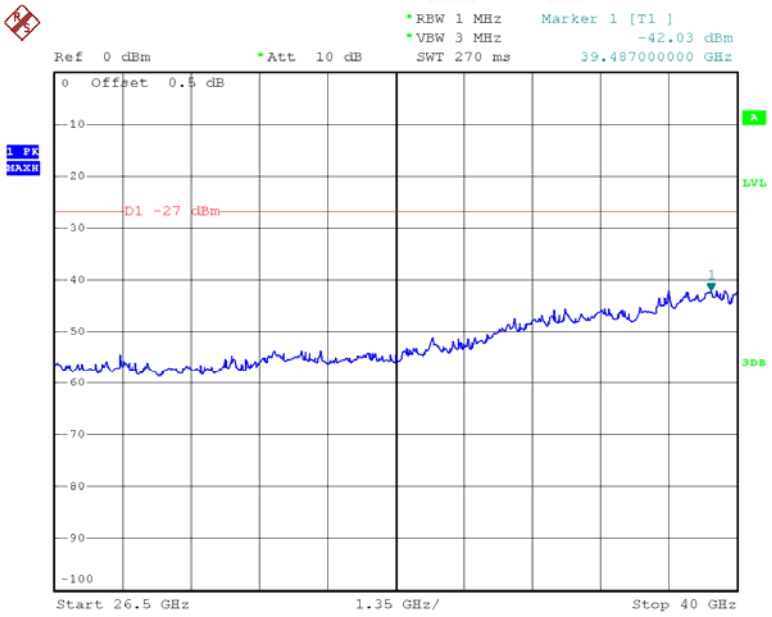
802.11n40 High Channel 26.5GHz-40GHz



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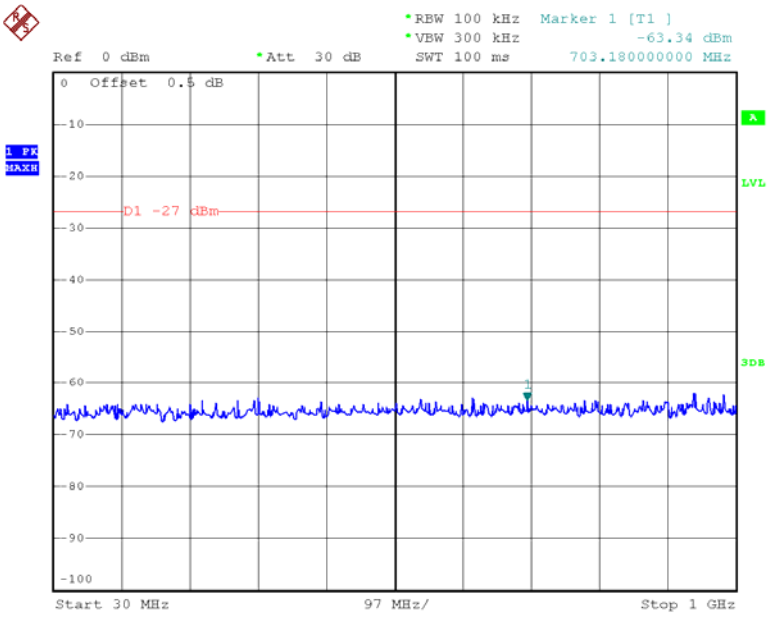
802.11n AC80 Middle Channel 30MHz-1GHz



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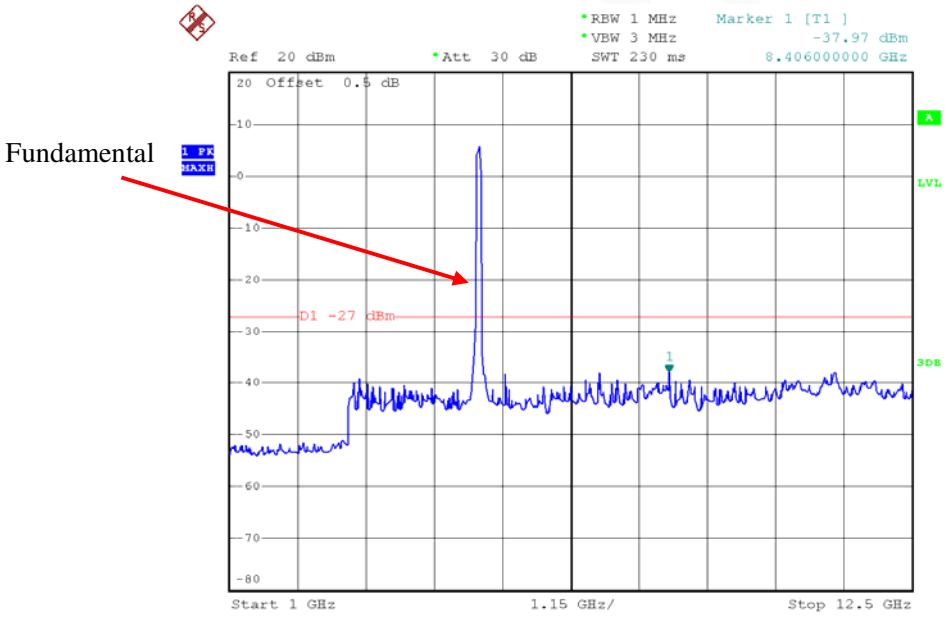
802.11n AC80 Middle Channel 1GHz-26.5GHz



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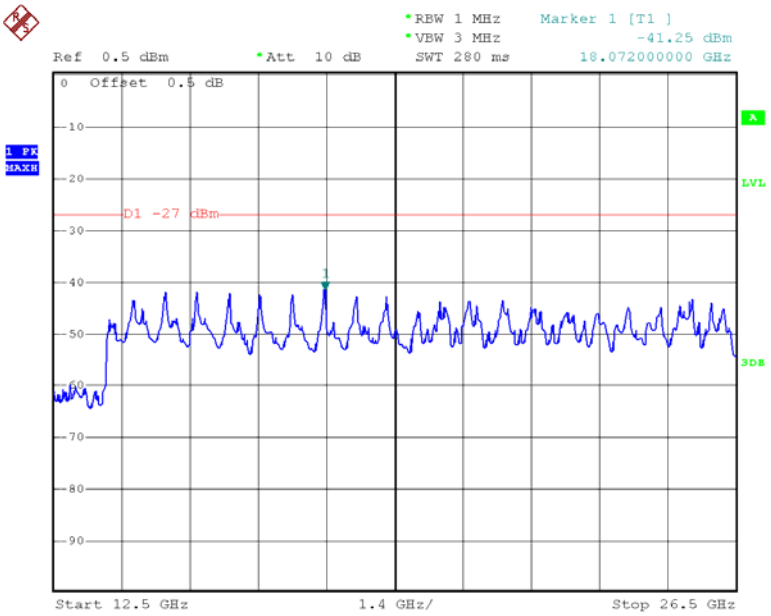
802.11n AC80 Middle Channel 12.5GHz-26.5GHz



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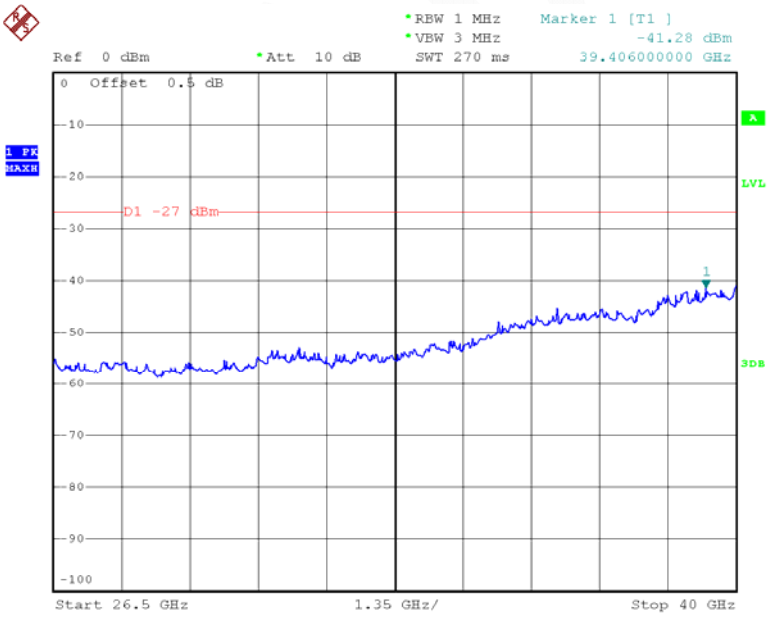
802.11 AC80 Middle Channel 26.5GHz-40GHz



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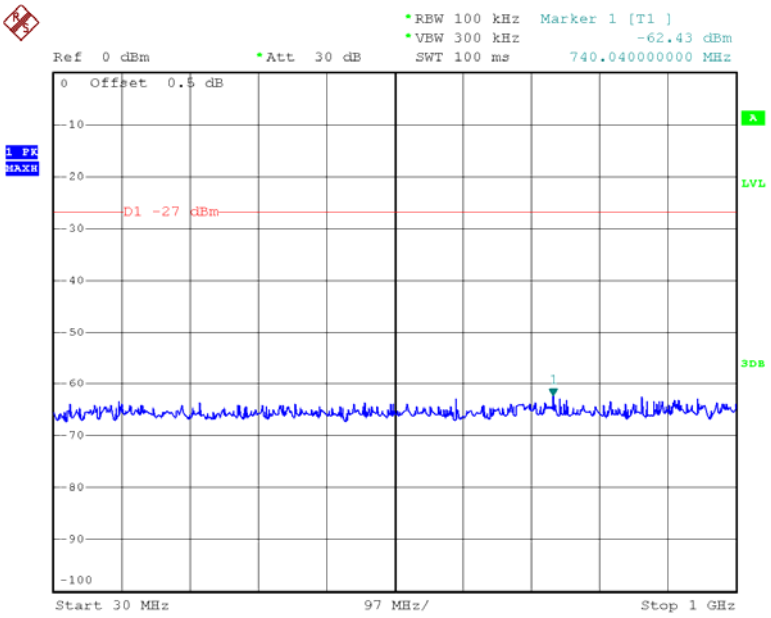
Antenna 1

802.11a Low Channel 30MHz-1GHz



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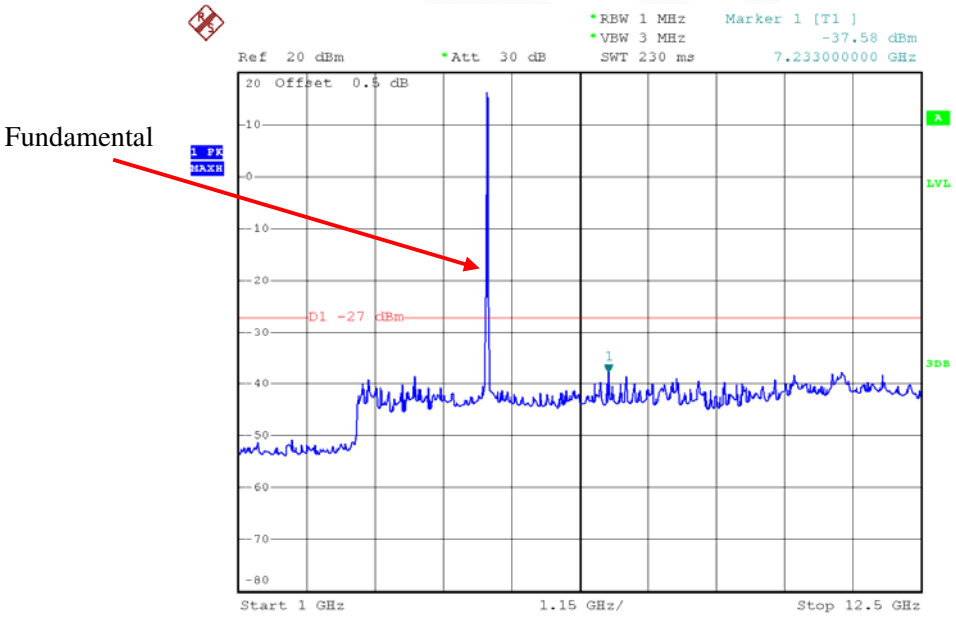
802.11a Low Channel 1GHz-26.5GHz



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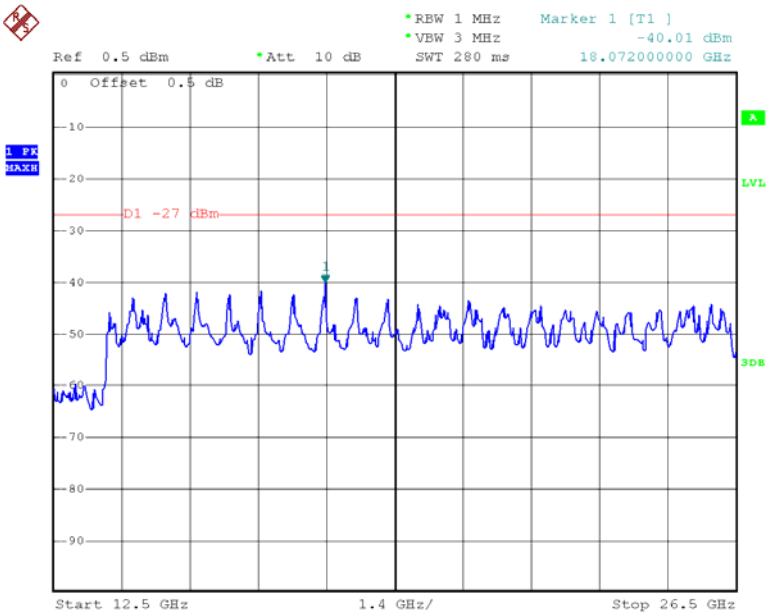
802.11a Low Channel 12.5GHz-26.5GHz



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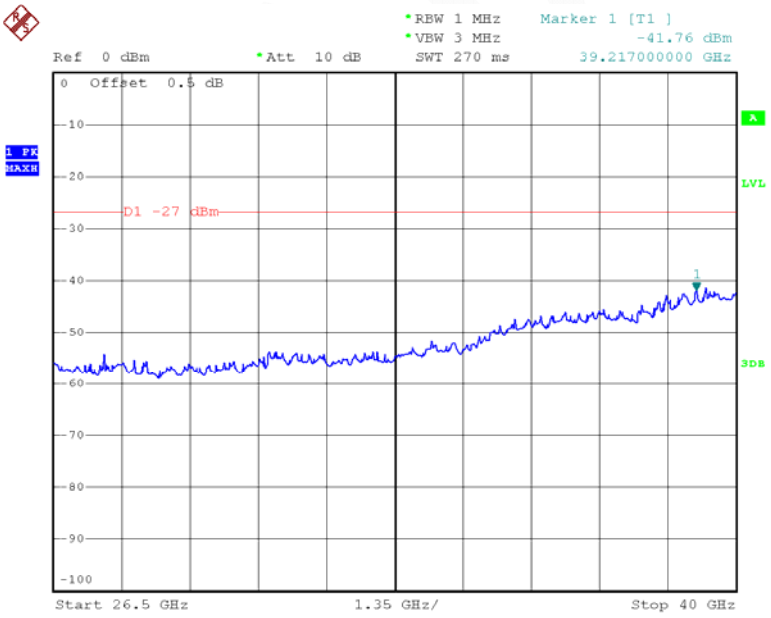
802.11a Low Channel 26.5GHz-40GHz



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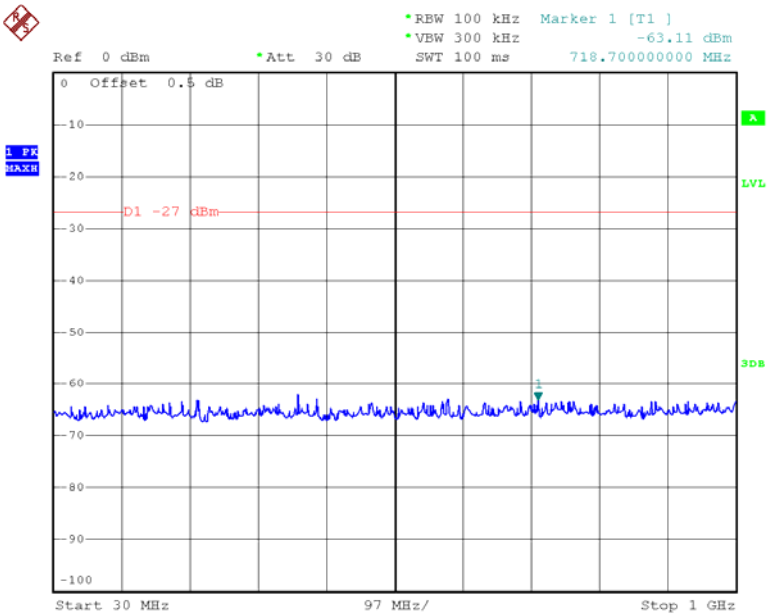
802.11a Middle Channel 30MHz -1GHz



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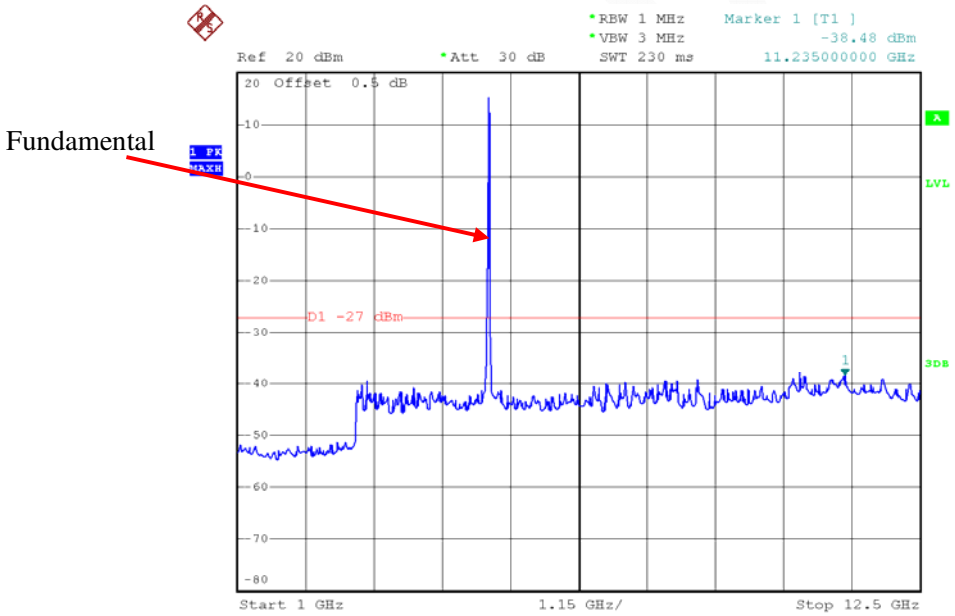
802.11a Middle Channel 1GHz-12.5GHz



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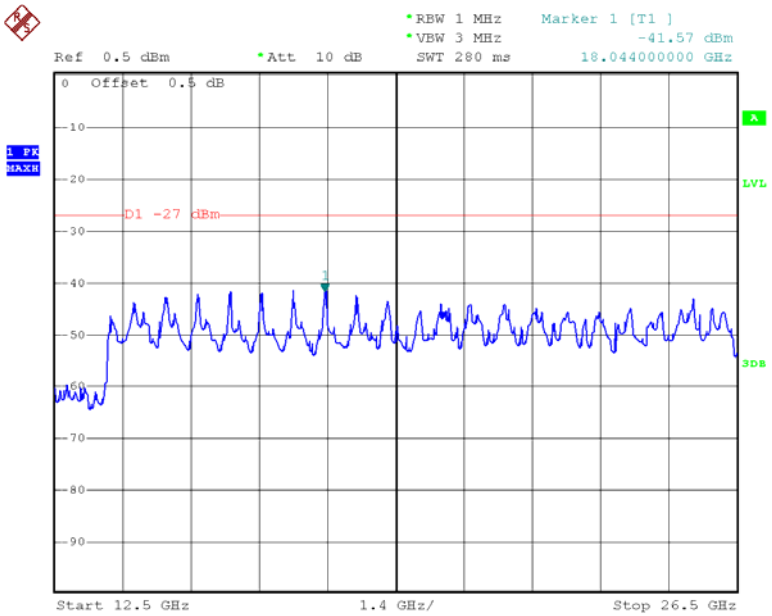
802.11a Middle Channel 12.5GHz-26.5GHz



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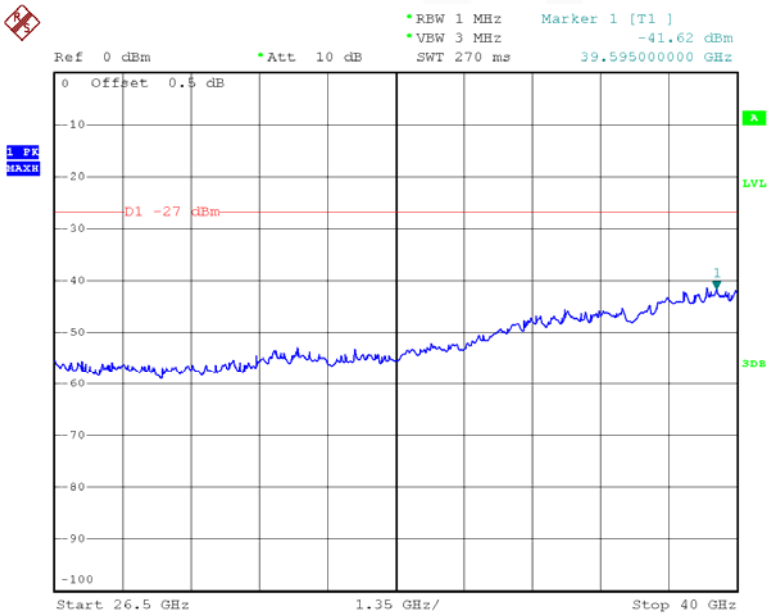
802.11a Middle Channel 26.5GHz-40GHz



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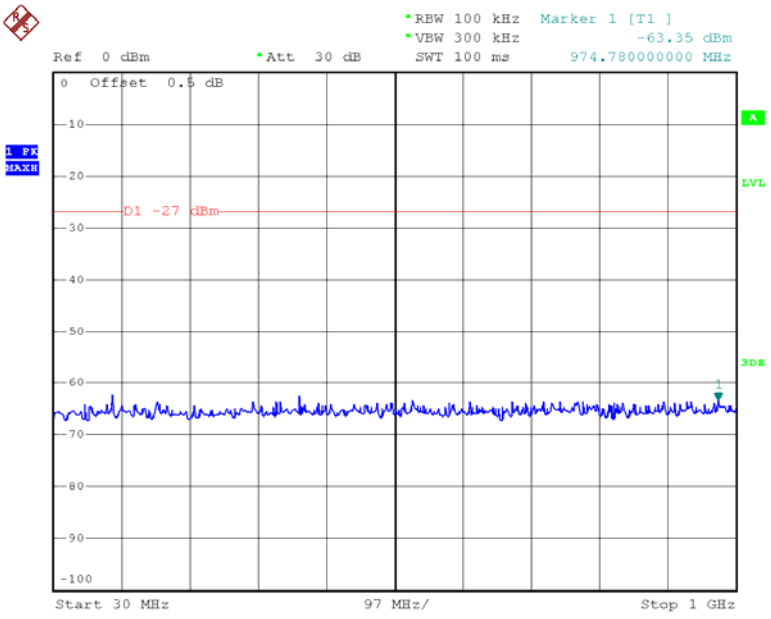
802.11a High Channel 30MHz-1GHz



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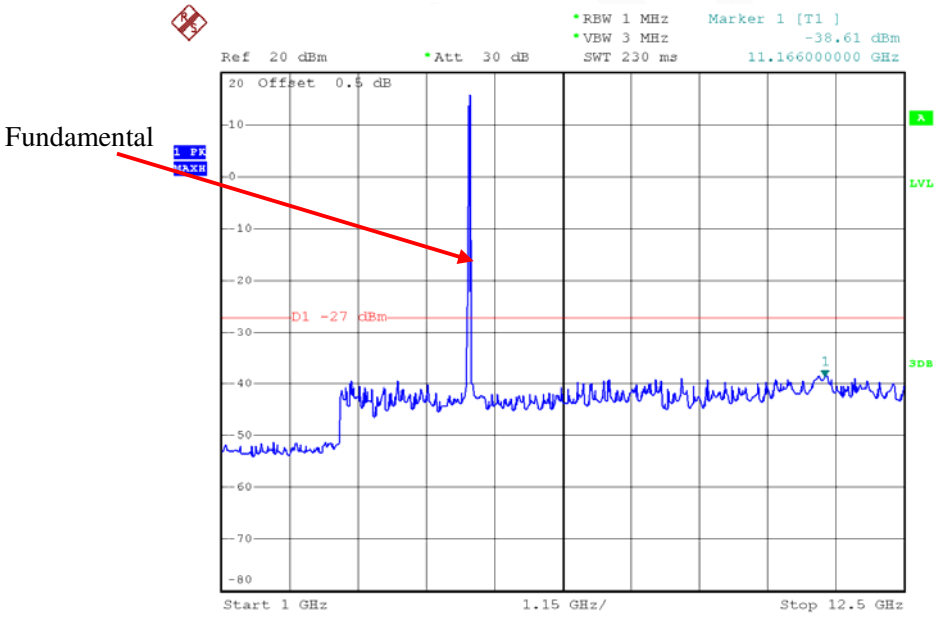
802.11a High Channel 1GHz-12.5GHz



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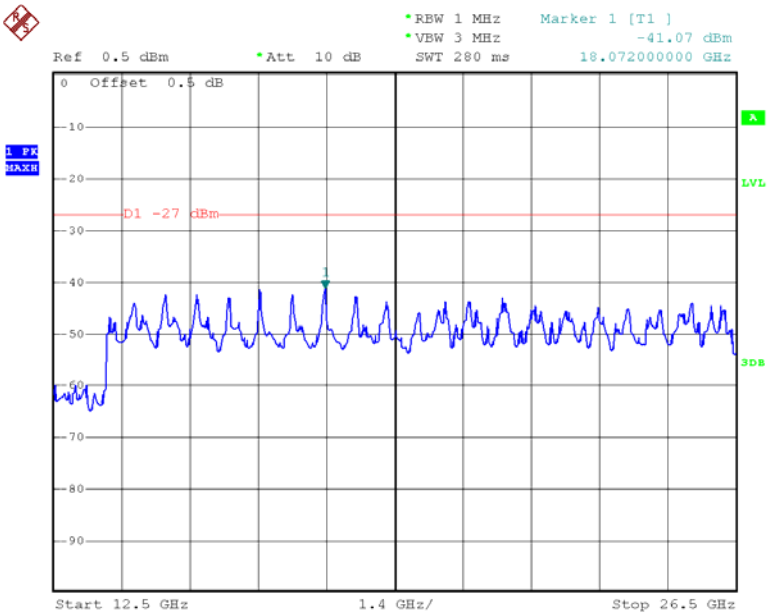
802.11a High Channel 12.5GHz-26.5GHz



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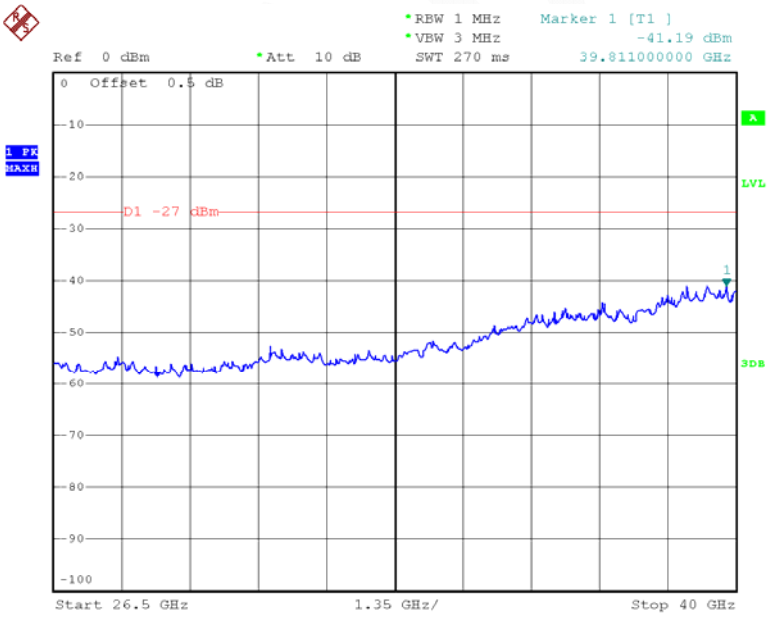
802.11a High Channel 26.5GHz-40GHz



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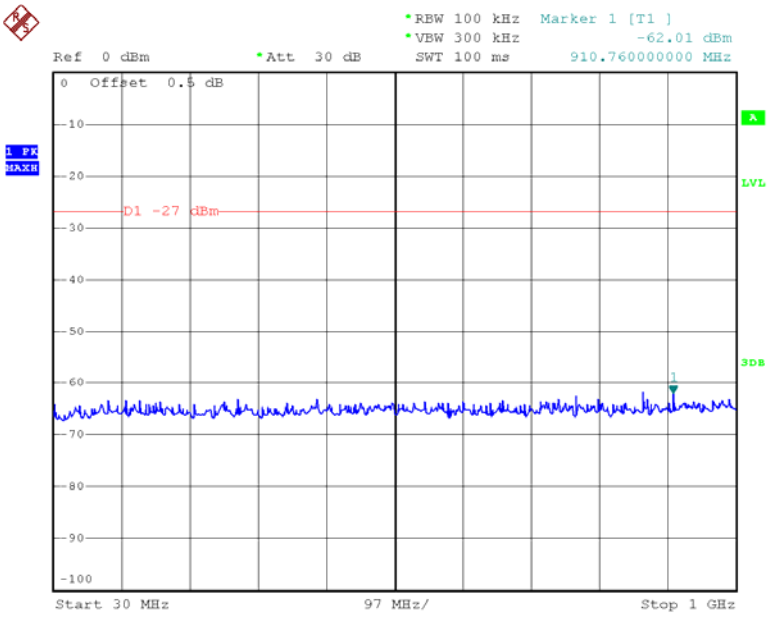
802.11n ht20 Low Channel 30MHz-1GHz



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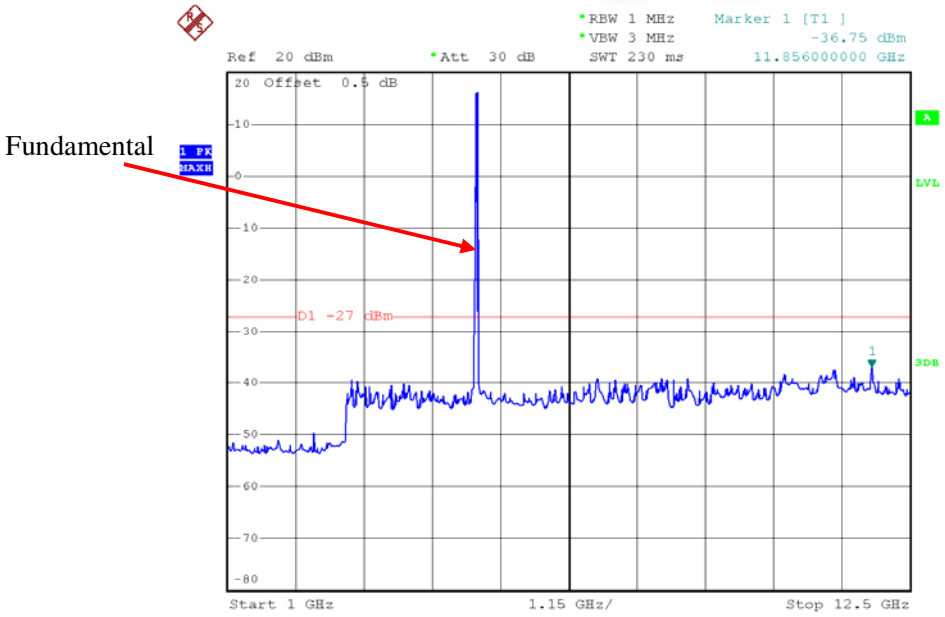
802.11n ht20 Low Channel 1GHz-12.5GHz



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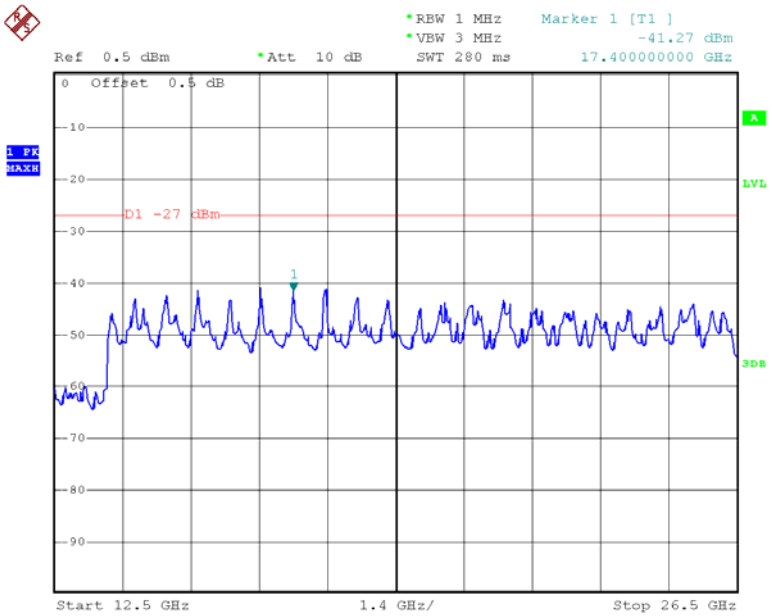
802.11n ht20 Low Channel 12.5GHz-26.5GHz



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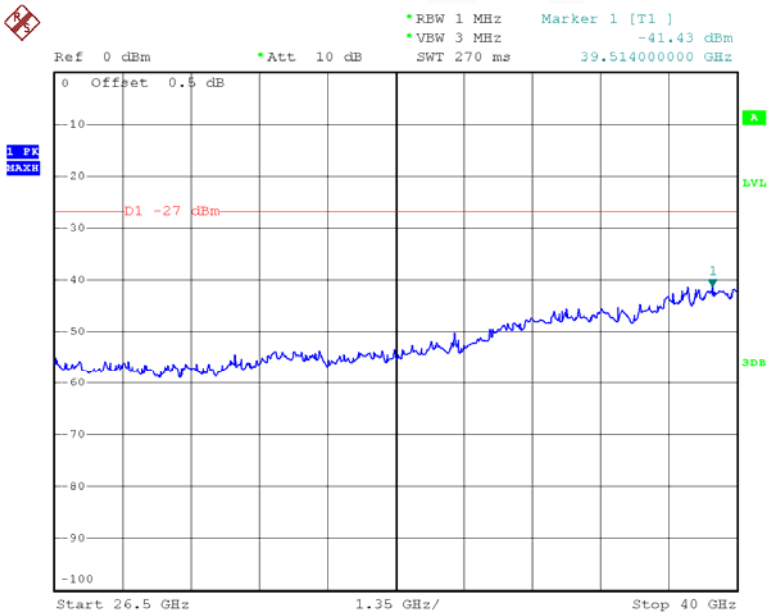
802.11n20 Low Channel 26.5GHz-40GHz



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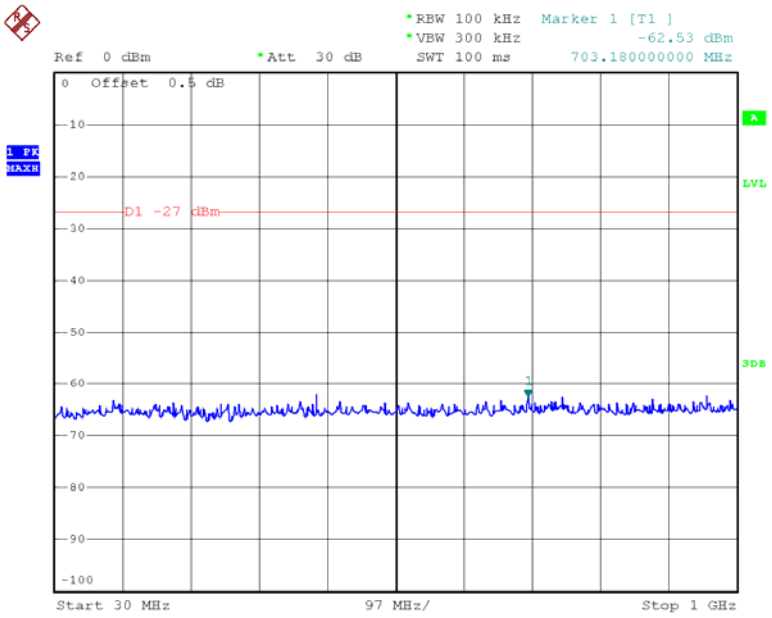
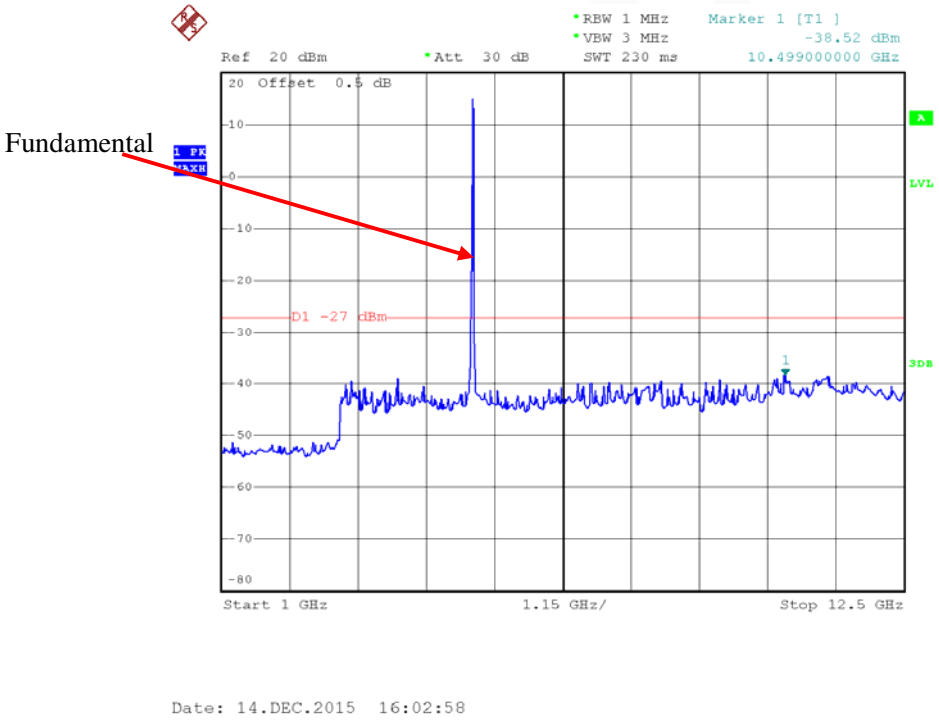
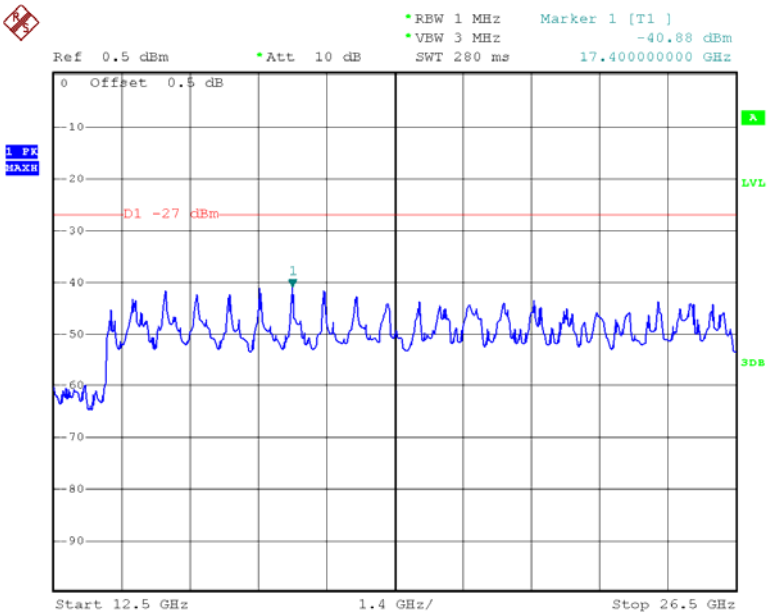
802.11n ht20 Middle Channel 30MHz -1GHz



802.11n ht20 Middle Channel 1GHz-12.5GHz



802.11n20 Middle Channel 12.5GHz-26.5GHz



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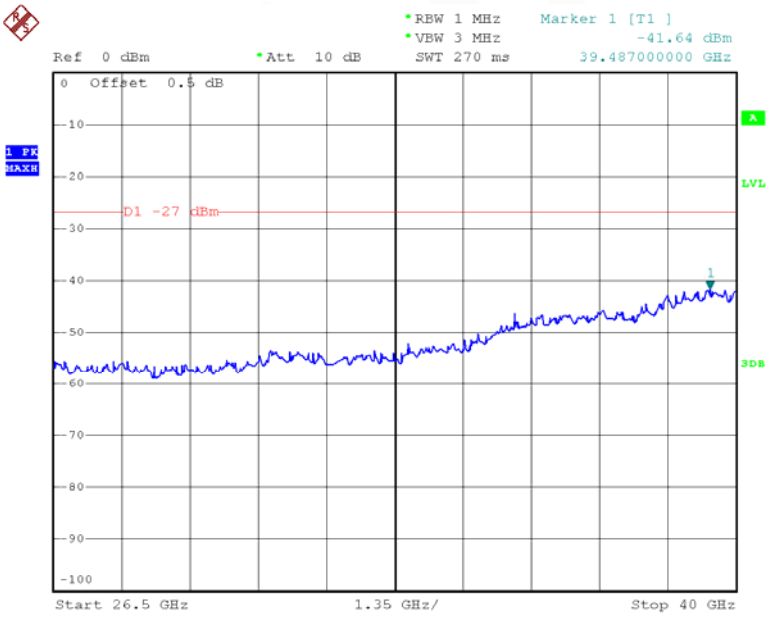
802.11n20 Middle Channel 26.5GHz-40GHz



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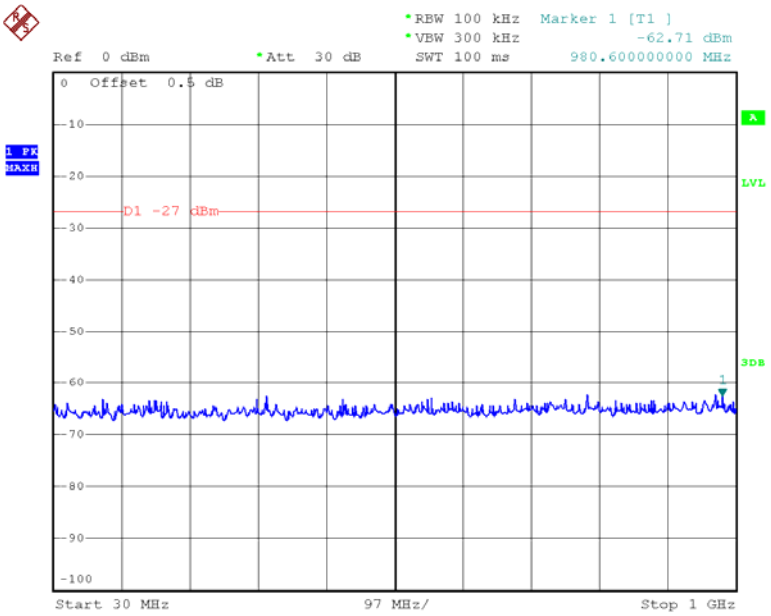
802.11n ht20 High Channel 30MHz-1GHz



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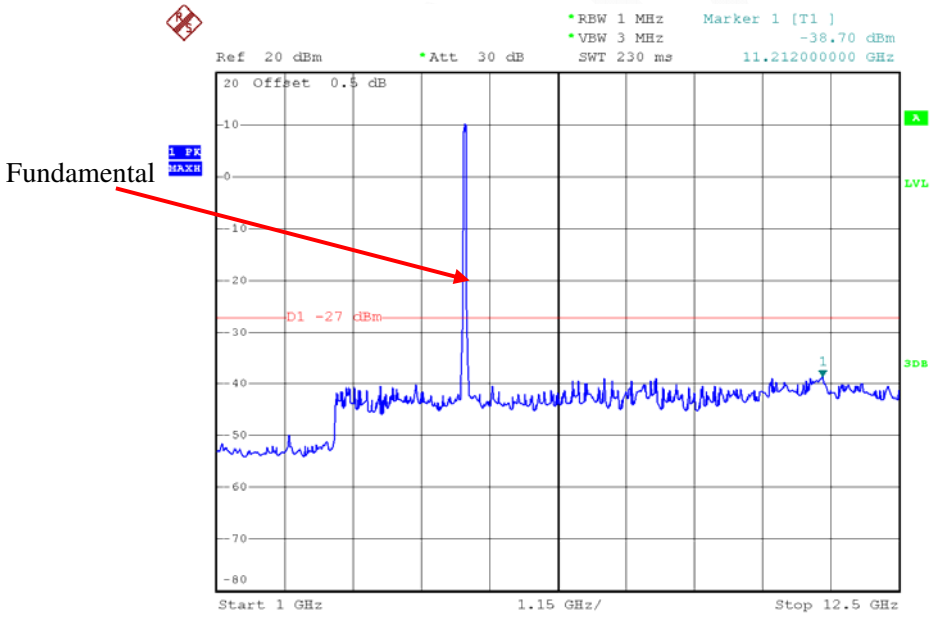
802.11n ht20 High Channel 1GHz-12.5GHz



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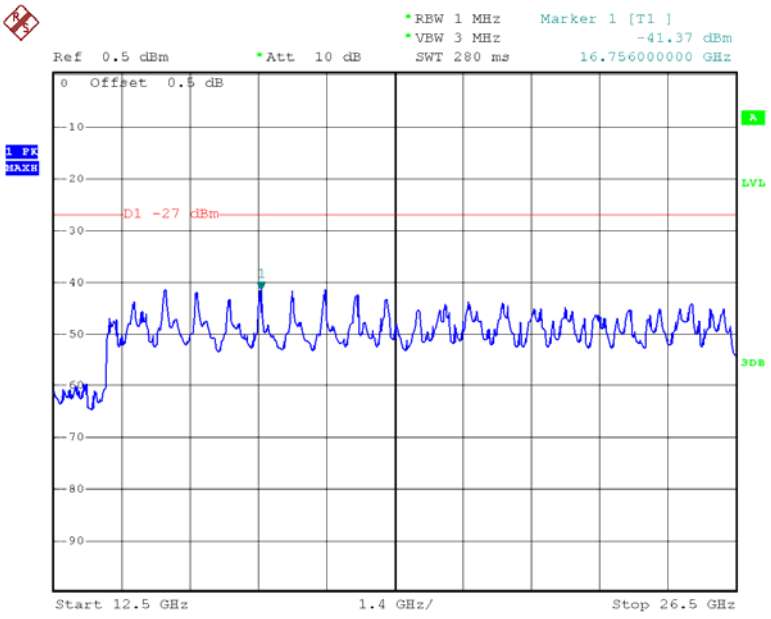
802.11n ht20 High Channel 12.5GHz-26.5GHz



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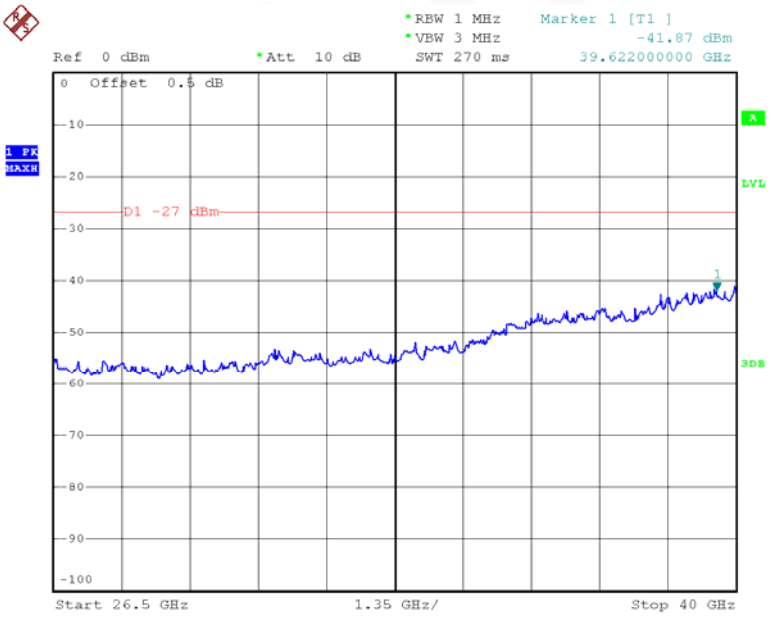
802.11n20 High Channel 26.5GHz-40GHz



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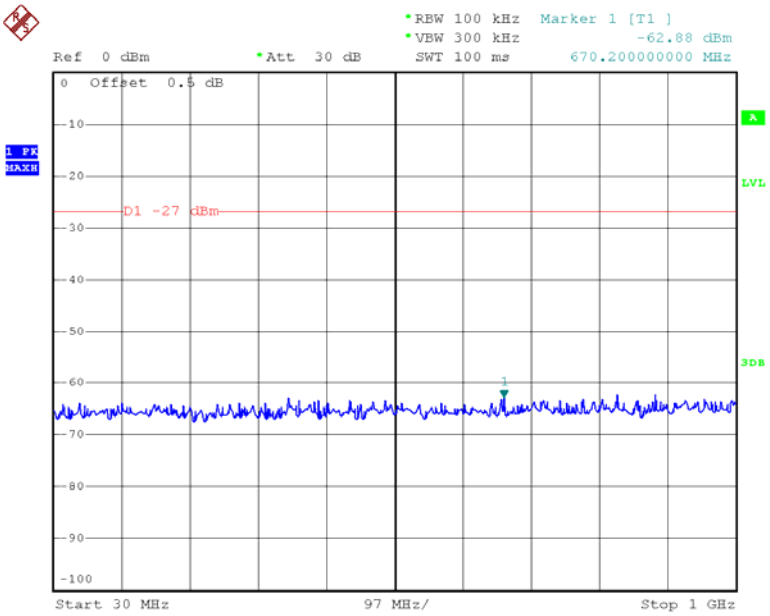
802.11n ht40 Low Channel 30MHz-1GHz



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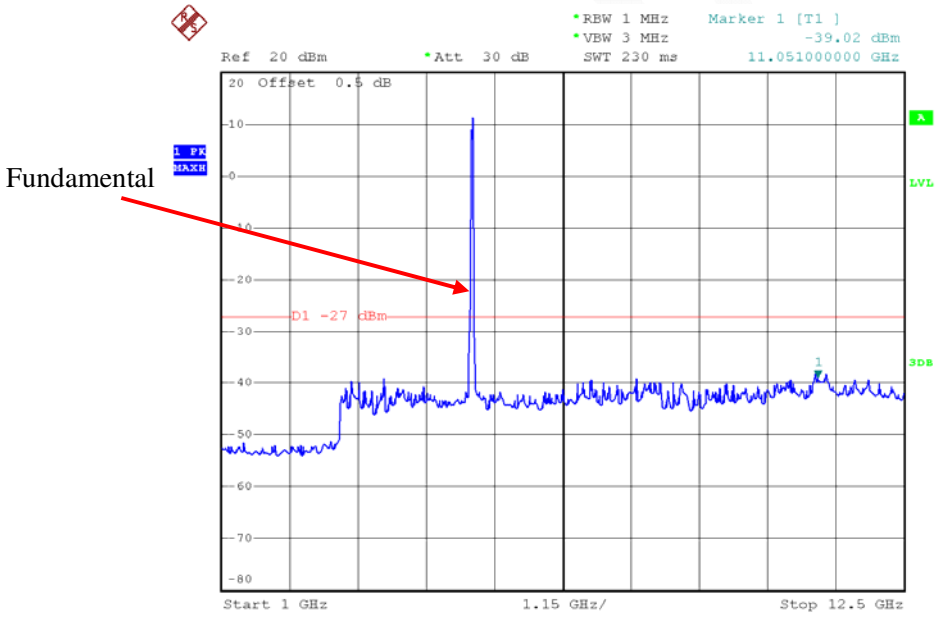
802.11n ht40 Low Channel 1GHz-12.5GHz



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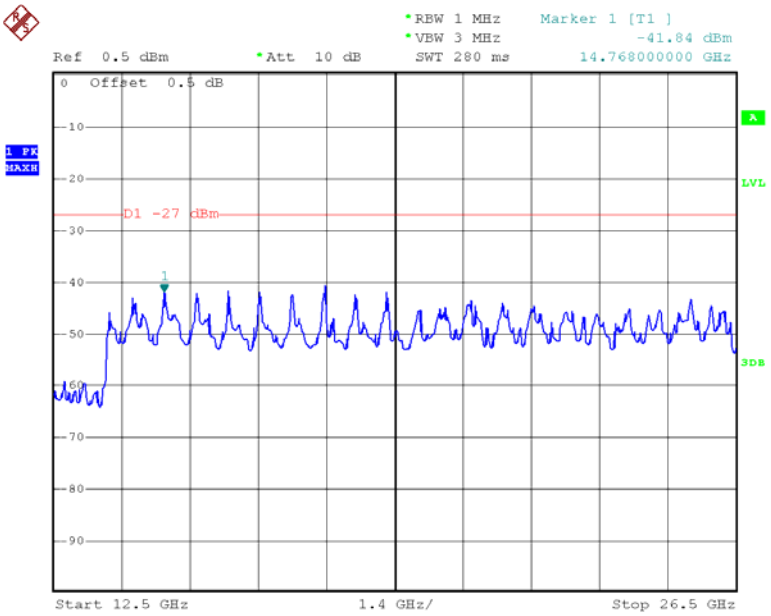
802.11n40 Low Channel 12.5GHz-26.5GHz



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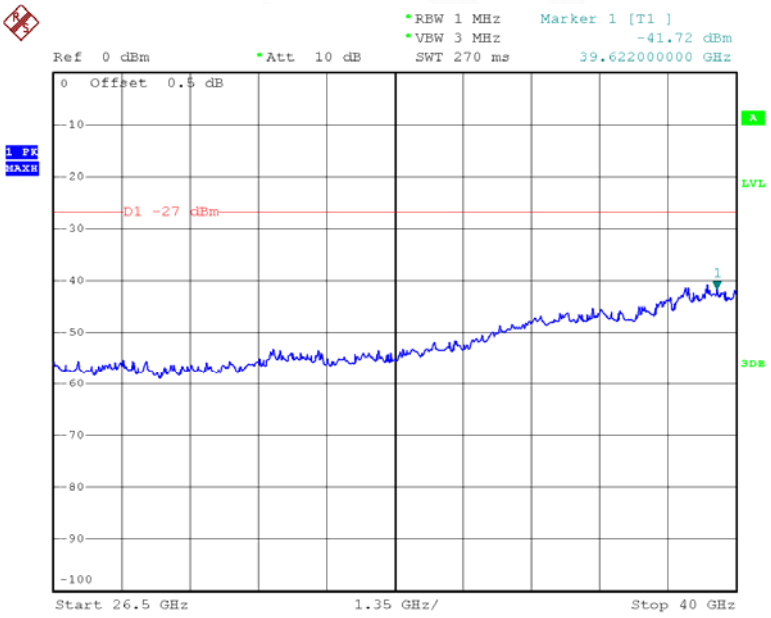
802.11n40 Low Channel 26.5GHz-40GHz



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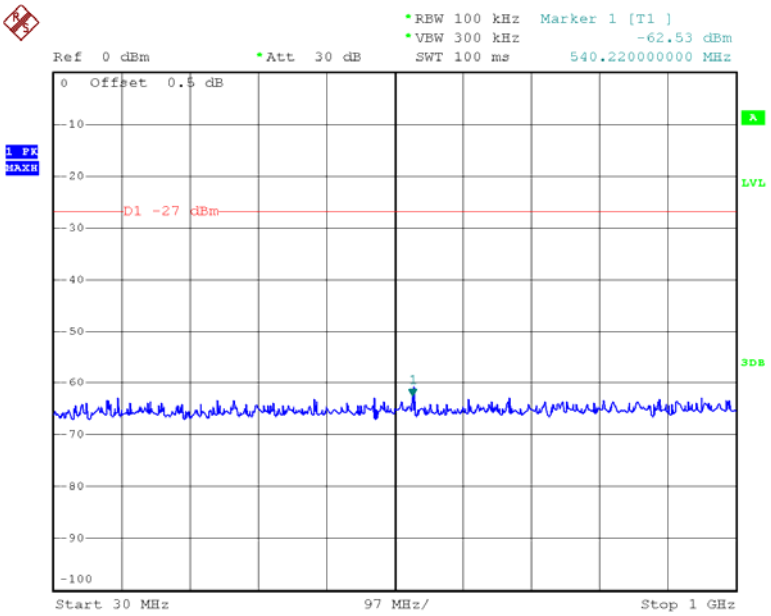
802.11n ht40 High Channel 30MHz-1GHz



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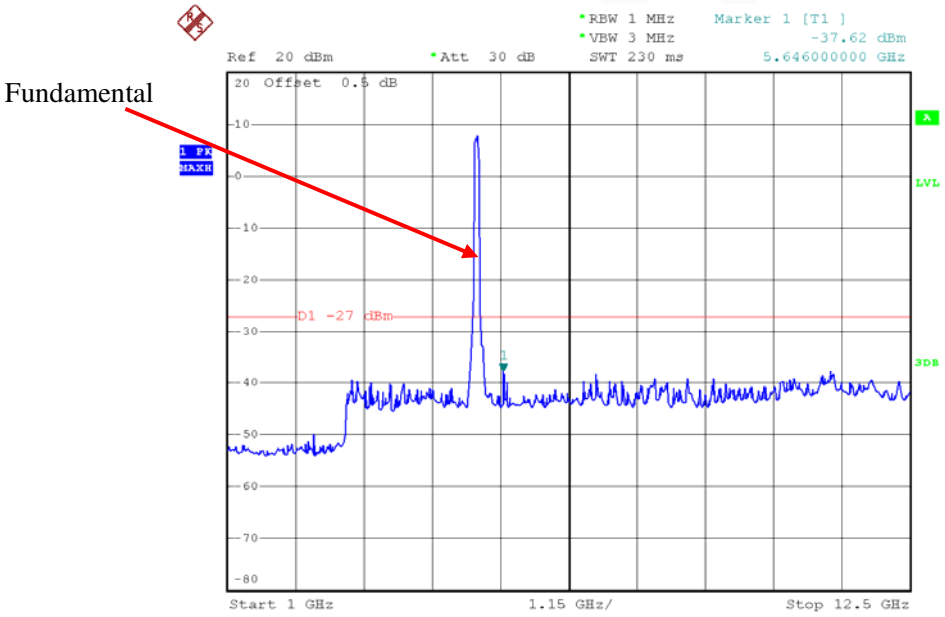
802.11n ht40 High Channel 1GHz-12.5GHz



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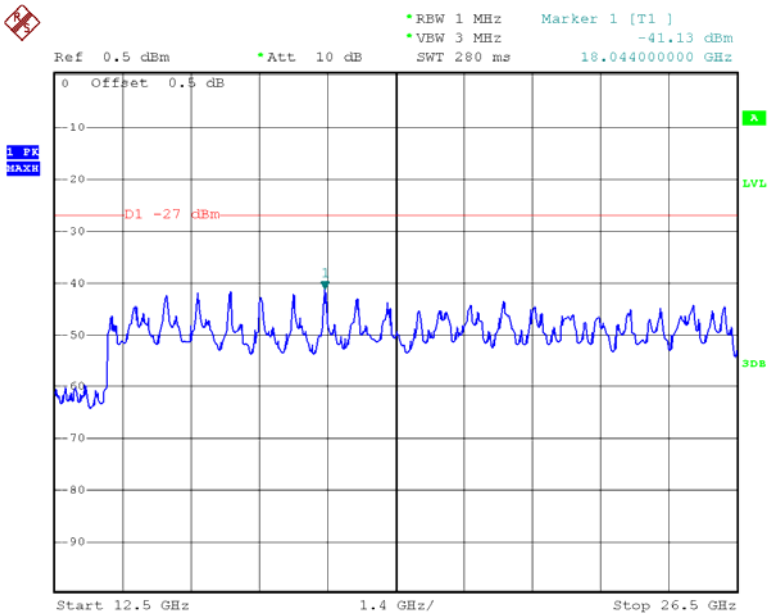
802.11n ht40 High Channel 12.5GHz-26.5GHz



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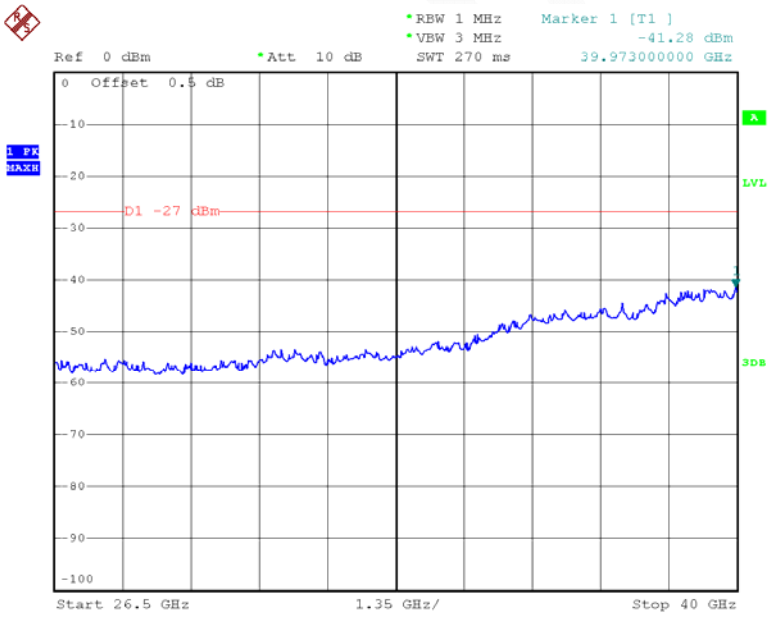
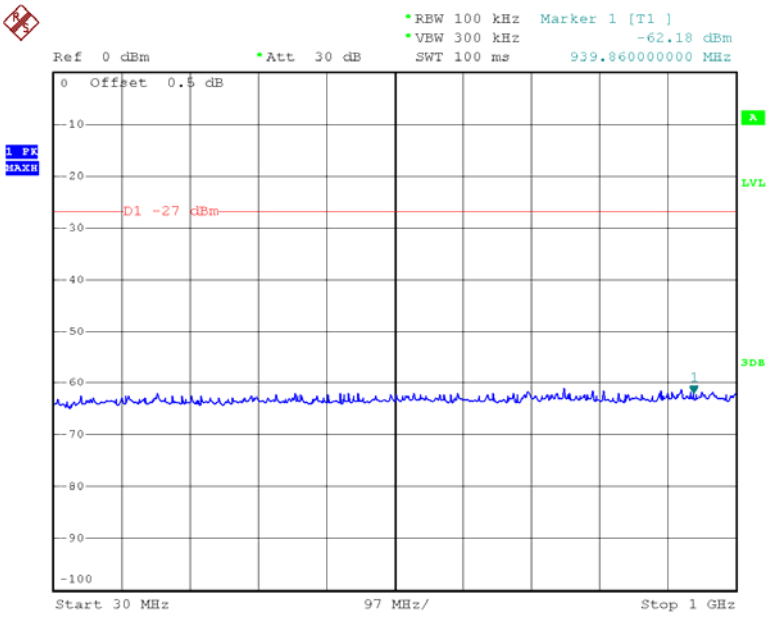
802.11n40 High Channel 26.5GHz-40GHz



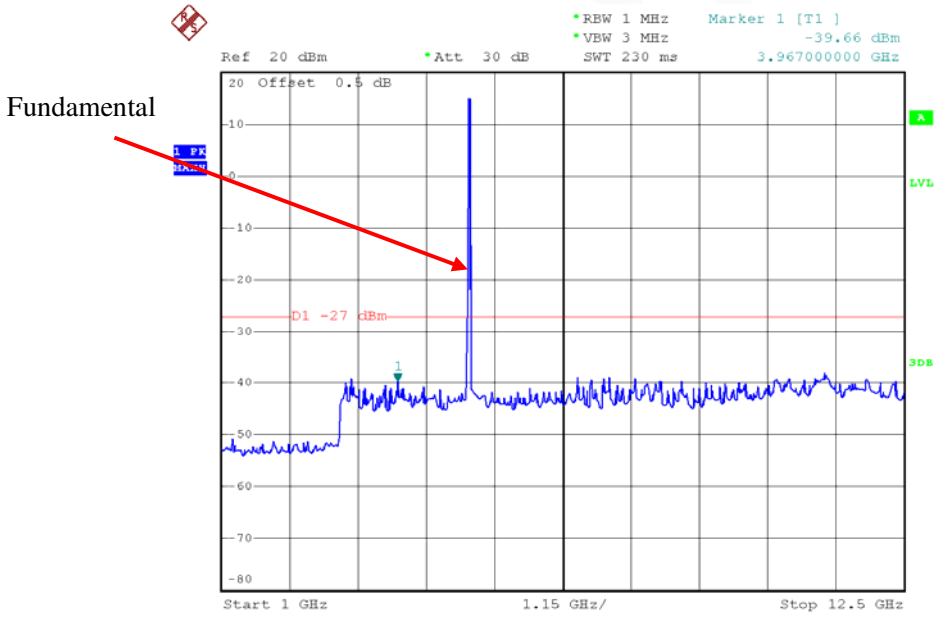
Date: 14.DEC.2015 15:26:09

802.11n AC80 Middle Channel 30MHz-1GHz



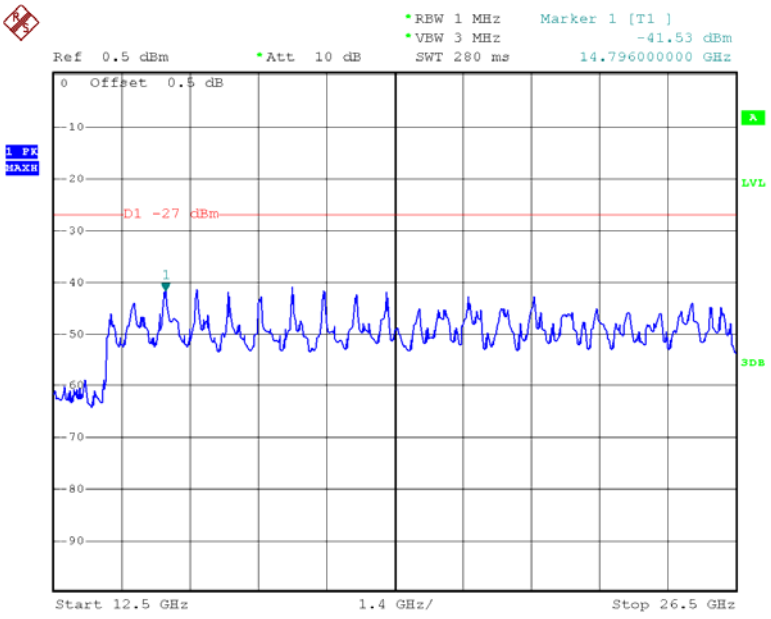
Date: 15.DEC.2015 13:08:50

802.11n AC80 Middle Channel 1GHz-12.5GHz



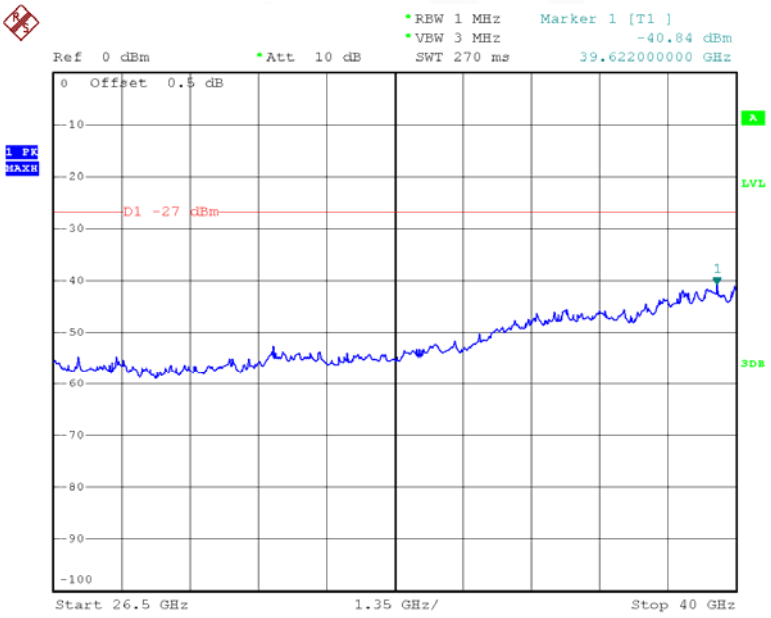
Date: 14.DEC.2015 15:58:39

802.11 AC80 Middle Channel 12.5GHz-26.5GHz



Date: 14.DEC.2015 16:09:11

802.11 AC80 Middle Channel 26.5GHz-40GHz



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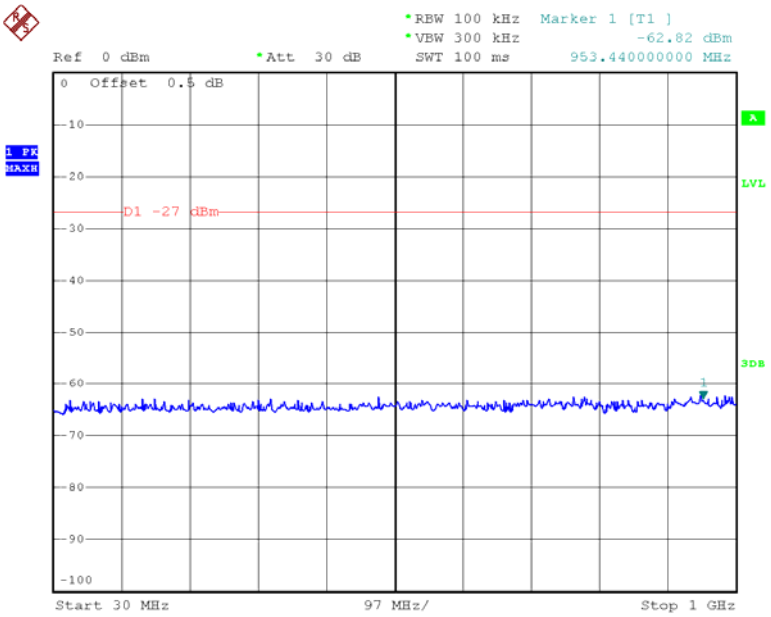
5725MHz-5850MHz:

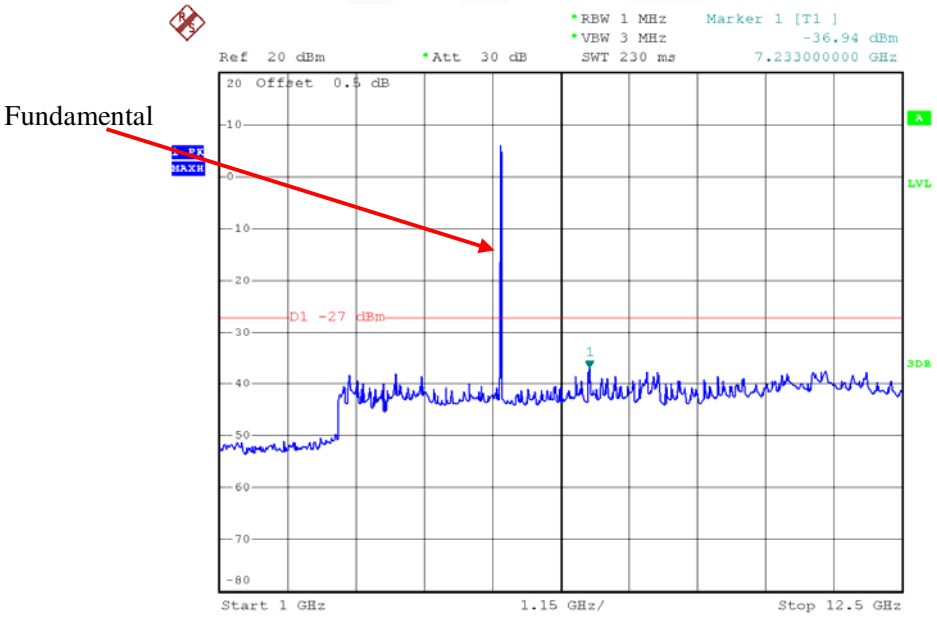
Antenna 0

802.11a Low Channel 30MHz-1GHz



Date: 18.DEC.2015 11:41:27

802.11a Low Channel 1GHz-12.5GHz



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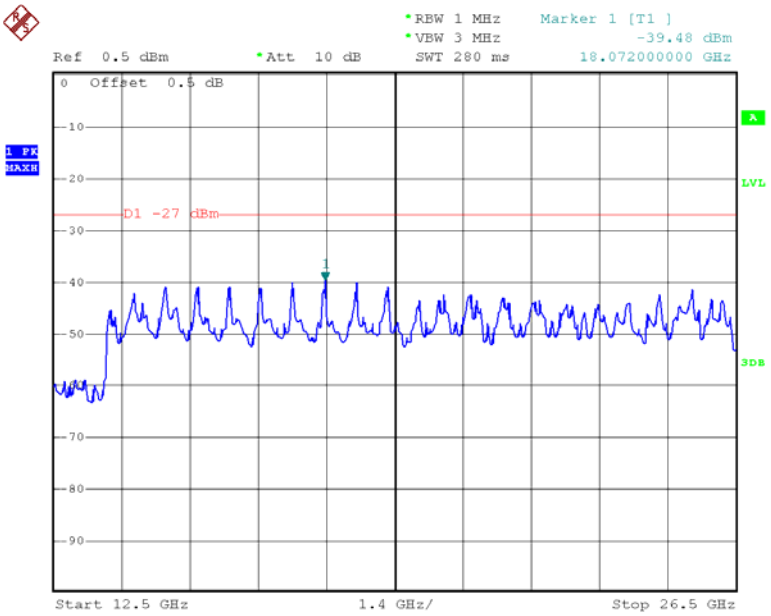
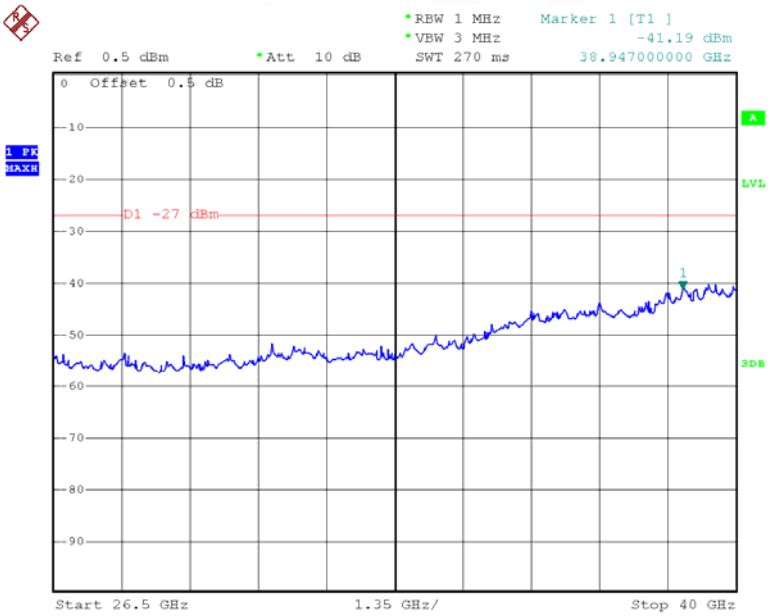
802.11a Low Channel 12.5GHz-26.5GHz



Date: 18.DEC.2015 11:45:40

802.11a Low Channel 26.5GHz-40GHz



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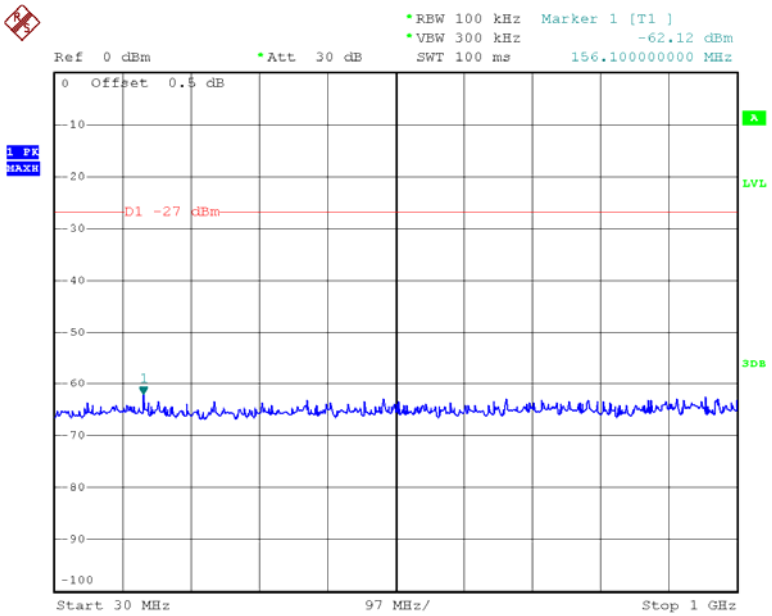
802.11a Middle Channel 30MHz -1GHz



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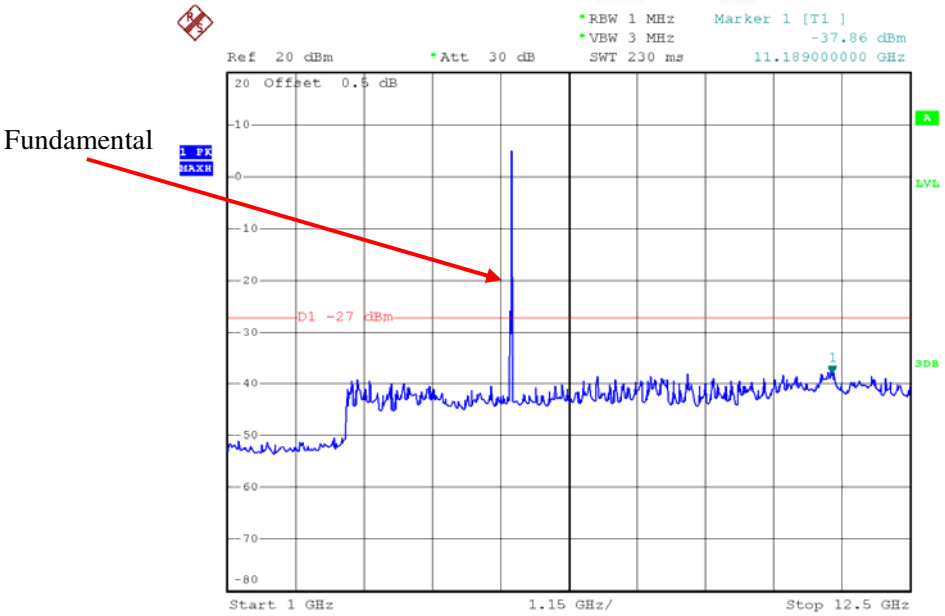
802.11a Middle Channel 1GHz-12.5GHz



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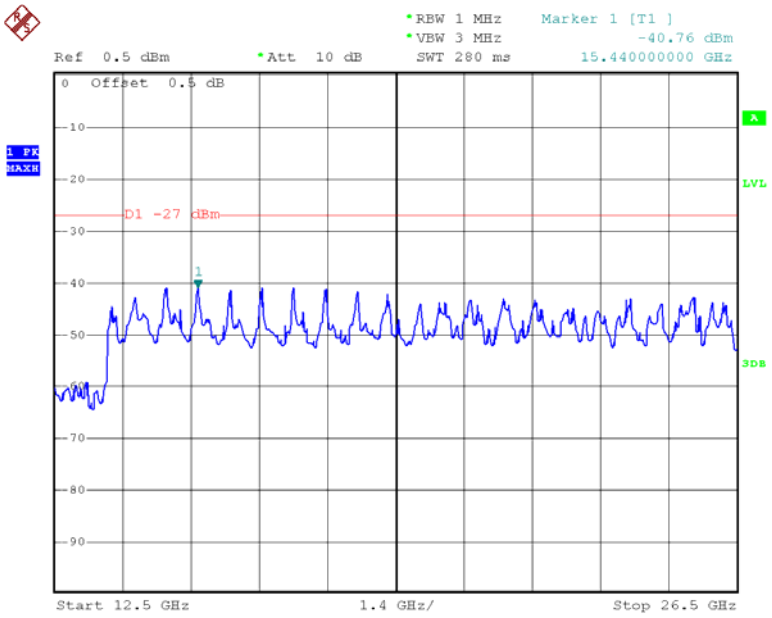
802.11a Middle Channel 12.5GHz-26.5GHz



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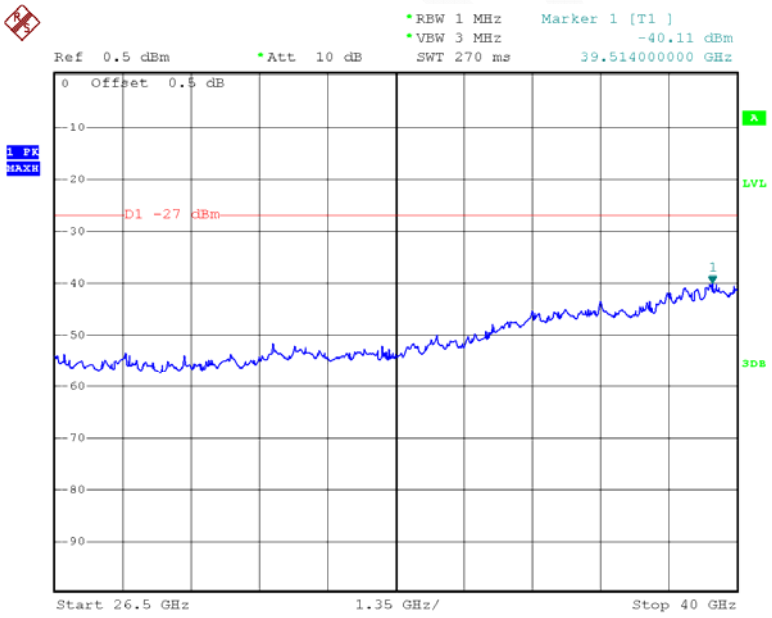
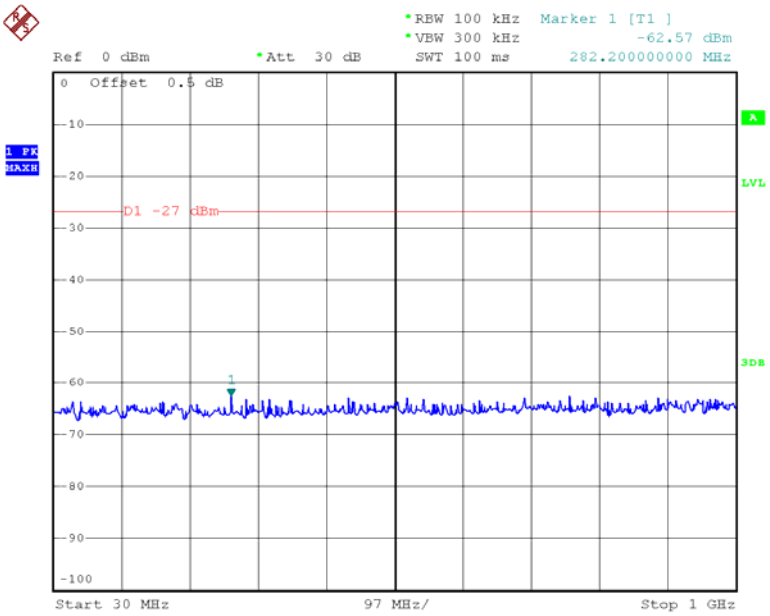
802.11a Middle Channel 26.5GHz-40GHz



Date: 18.DEC.2015 11:49:46

802.11a High Channel 30MHz-1GHz



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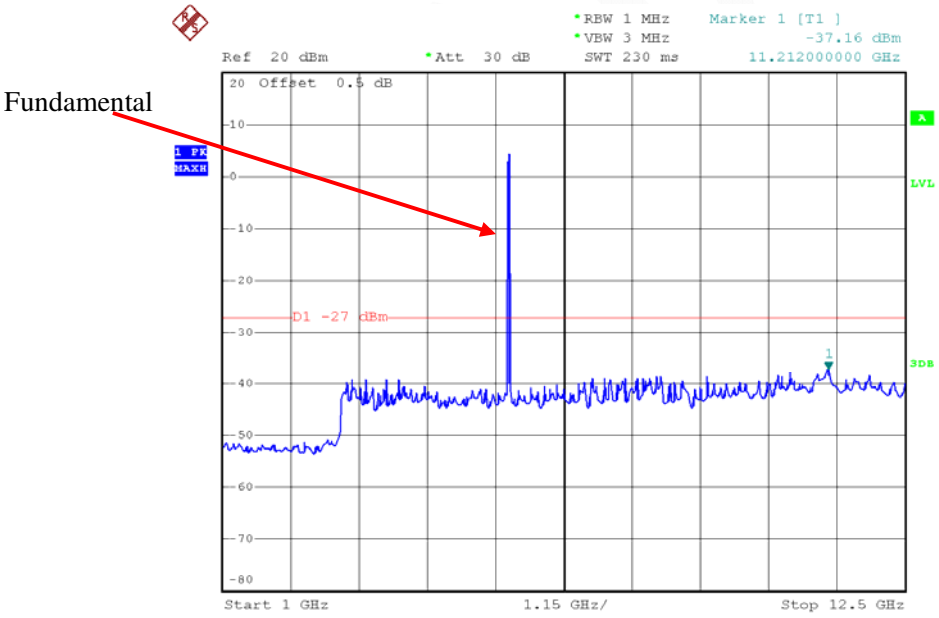
802.11a High Channel 1GHz-26.5GHz



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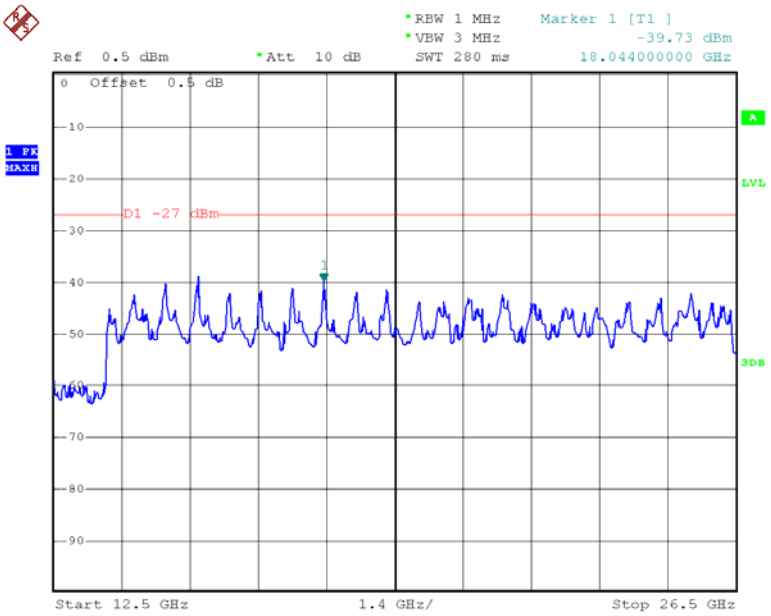
802.11a High Channel 12.5GHz-26.5GHz



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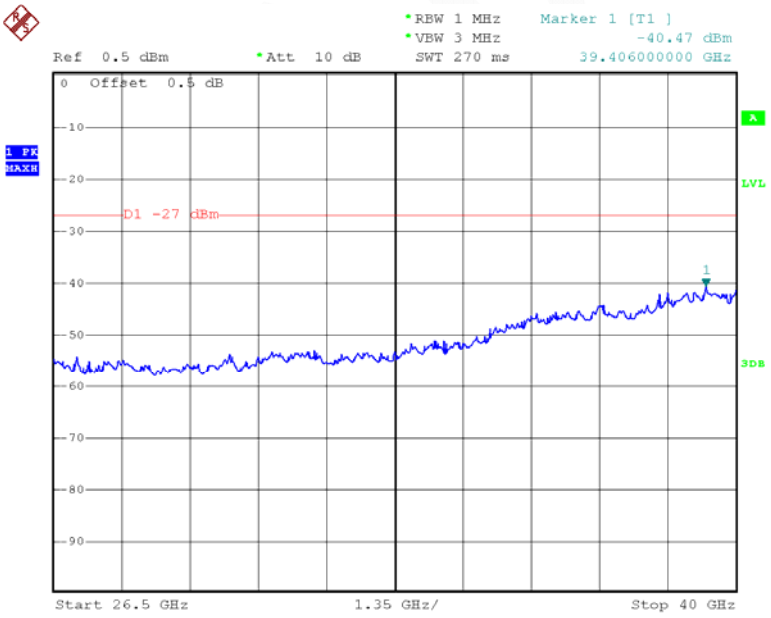
802.11a High Channel 26.5GHz-40GHz



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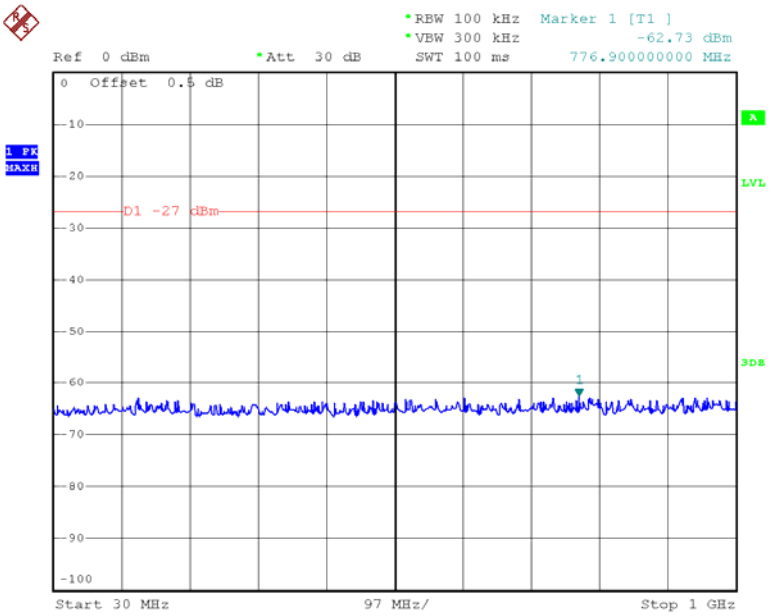
802.11n ht20 Low Channel 30MHz-1GHz



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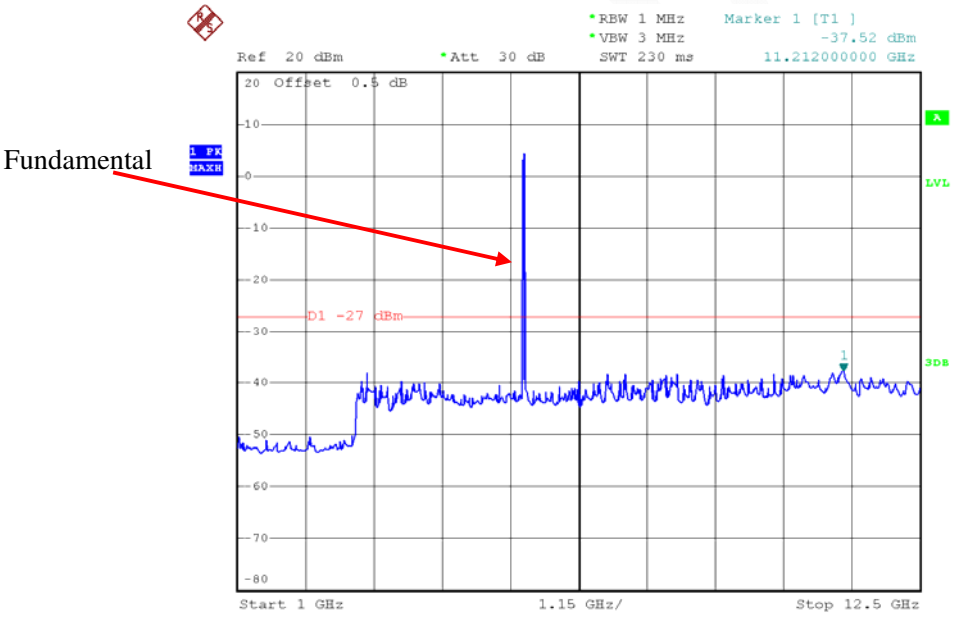
802.11n ht20 Low Channel 1GHz-12.5GHz



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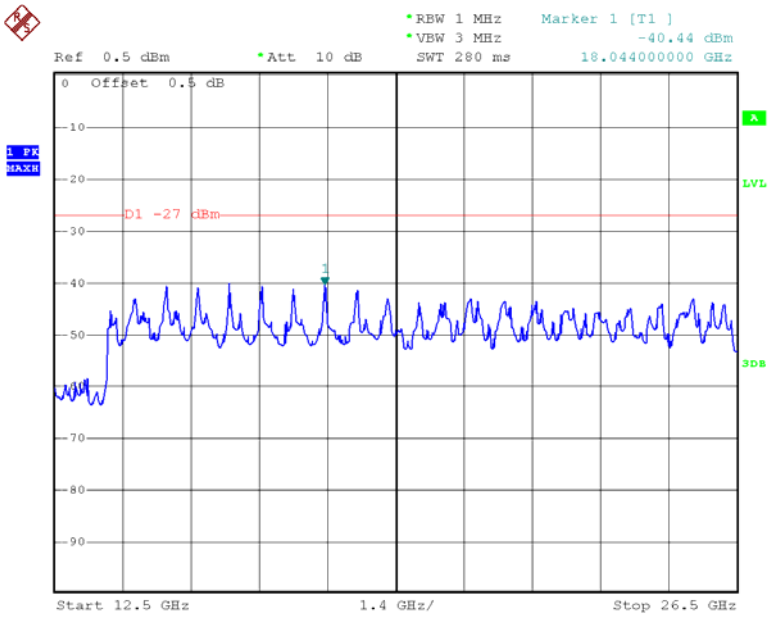
802.11n ht20 Low Channel 12.5GHz-26.5GHz



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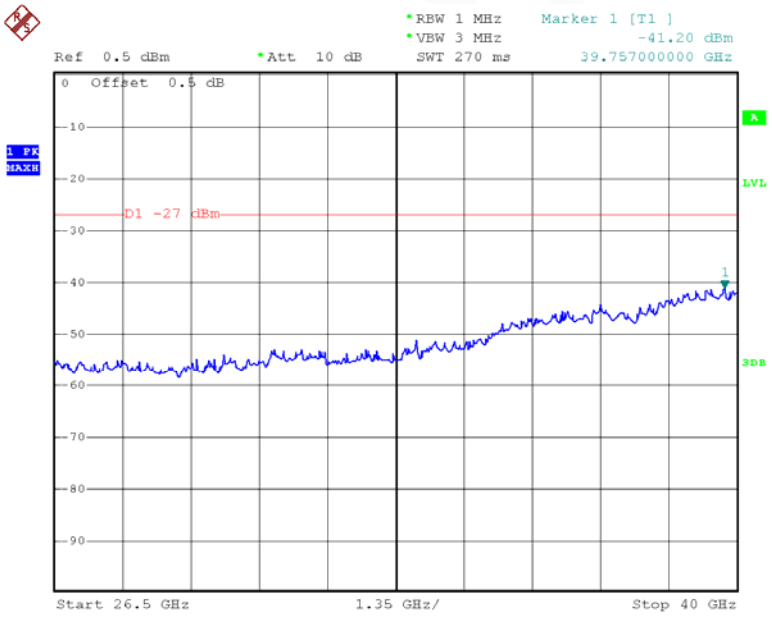
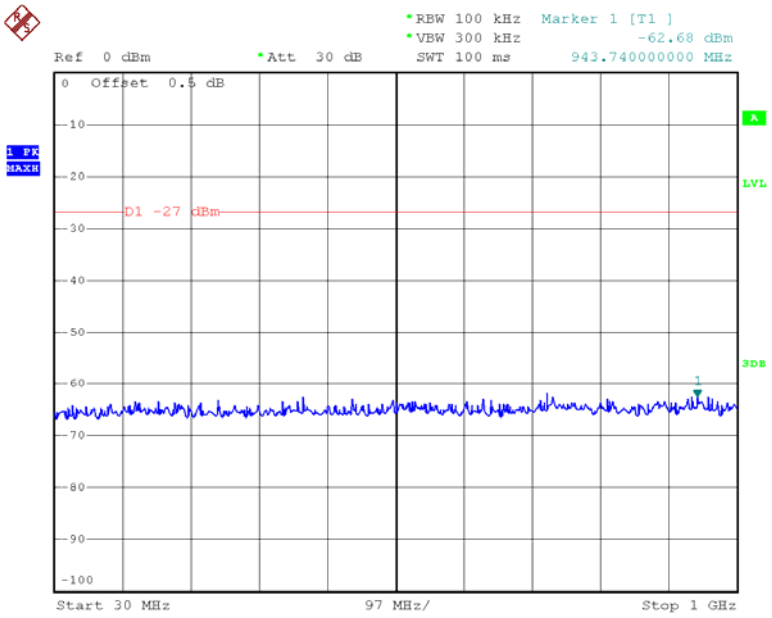
802.11n20 Low Channel 26.5GHz-40GHz



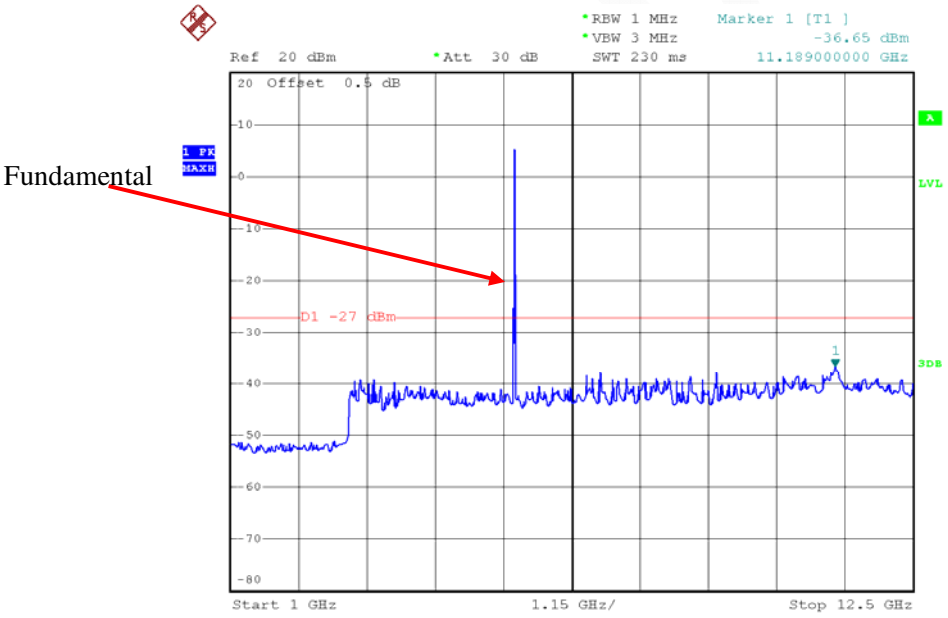
Date: 18.DEC.2015 11:50:28

802.11n ht20 Middle Channel 30MHz -1GHz



Date: 18.DEC.2015 11:42:01

802.11n ht20 Middle Channel 1GHz-12.5GHz



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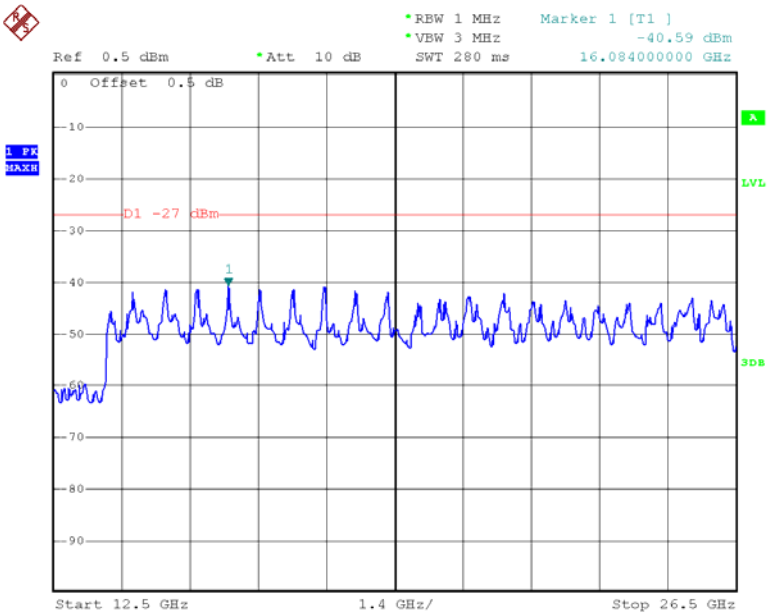
802.11n20 Middle Channel 12.5GHz-26.5GHz



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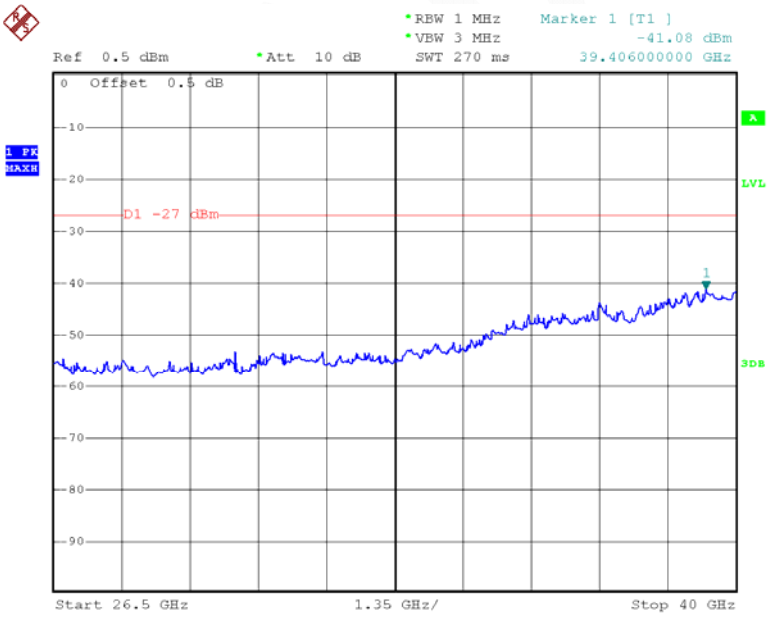
802.11n20 Middle Channel 26.5GHz-40GHz



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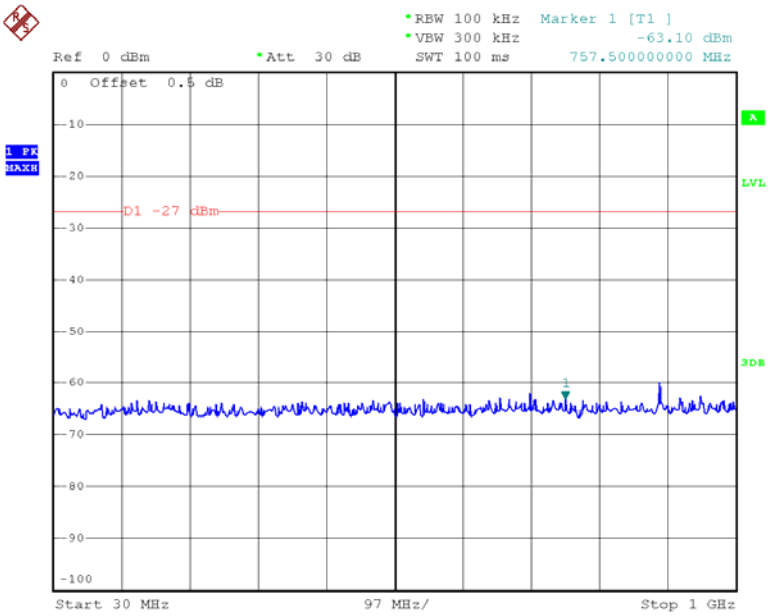
802.11n ht20 High Channel 30MHz-1GHz



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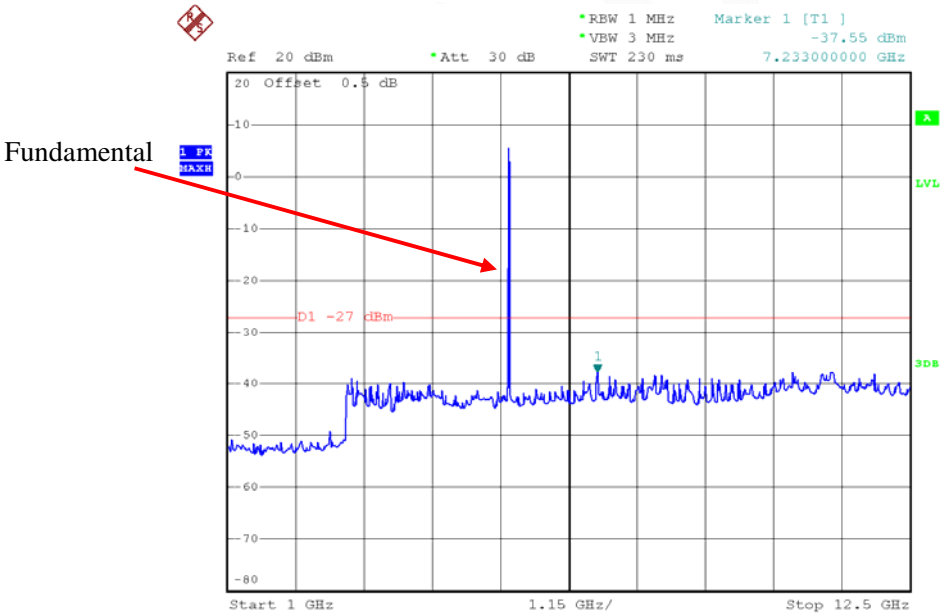
802.11n ht20 High Channel 1GHz-12.5GHz



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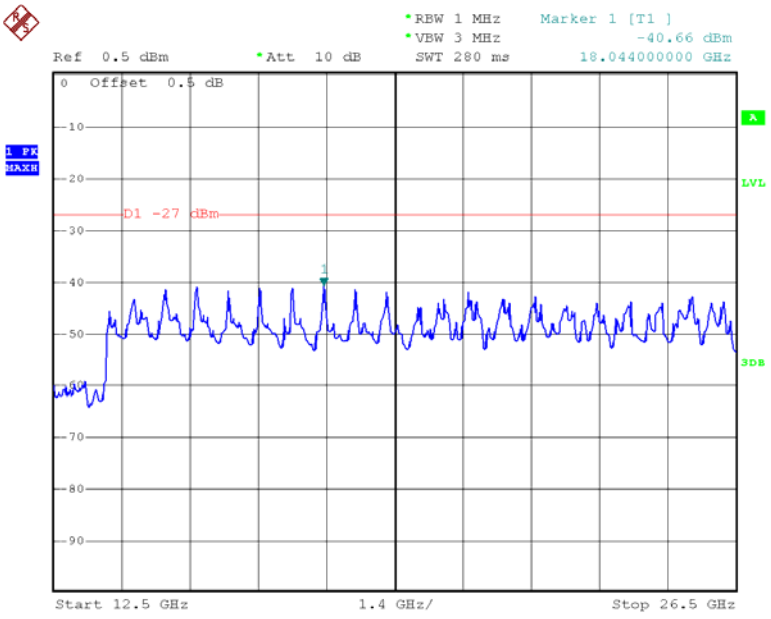
802.11n ht20 High Channel 12.5GHz-26.5GHz



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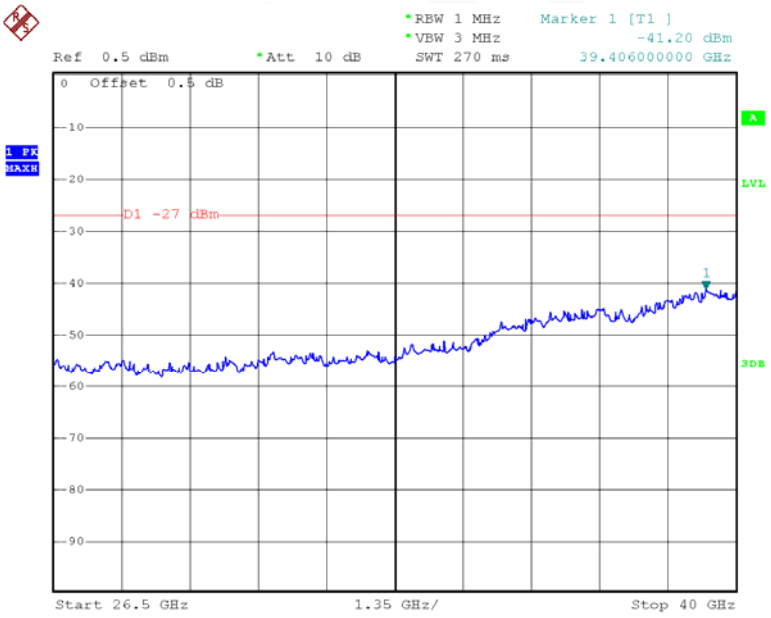
802.11n20 High Channel 26.5GHz-40GHz



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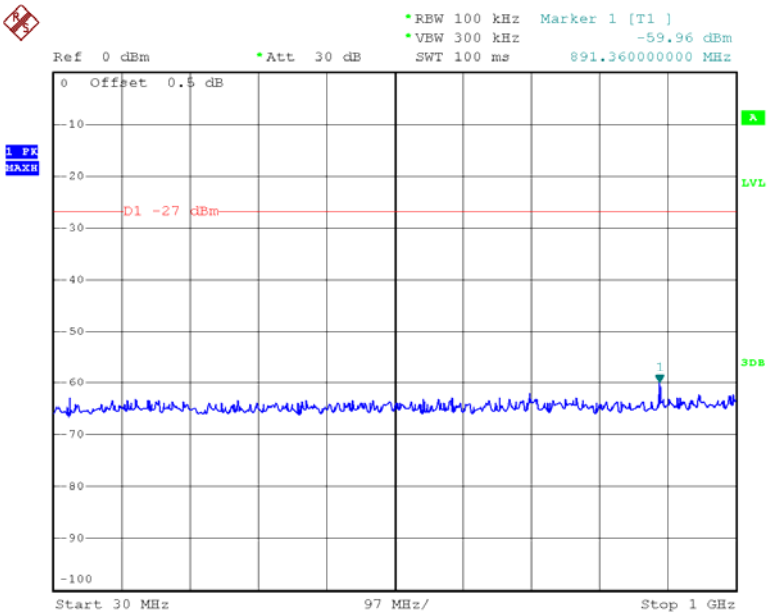
802.11n ht40 Low Channel 30MHz-1GHz



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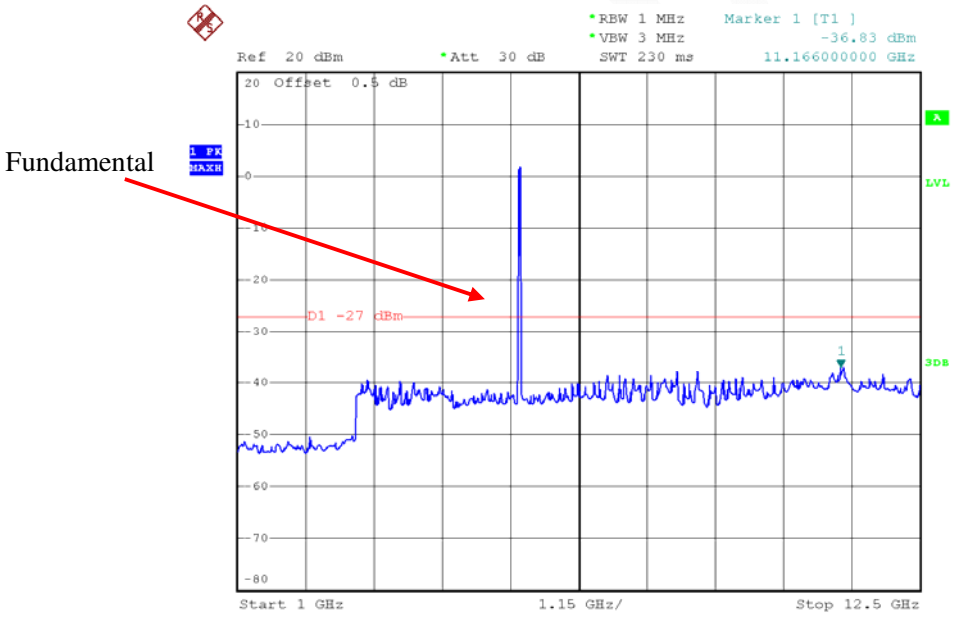
802.11n ht40 Low Channel 1GHz-26.5GHz



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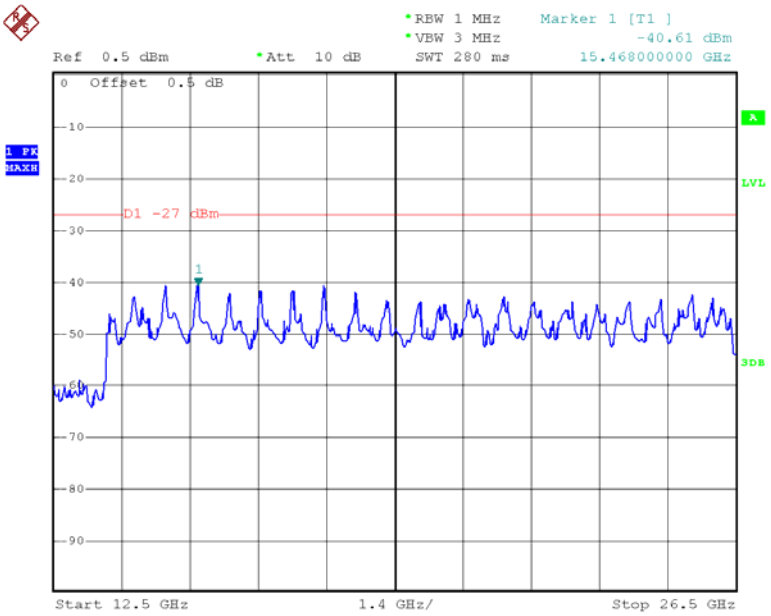
802.11n40 Low Channel 12.5GHz-26.5GHz



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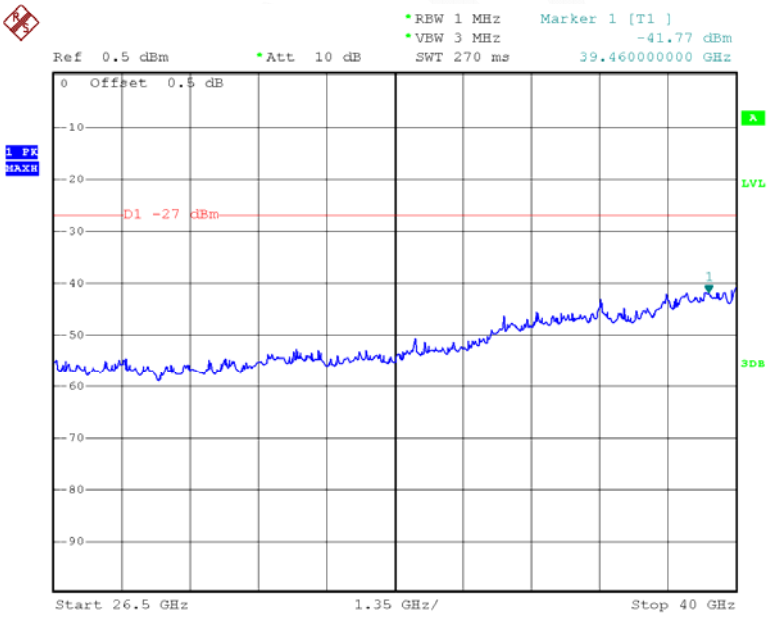
802.11n40 Low Channel 26.5GHz-40GHz



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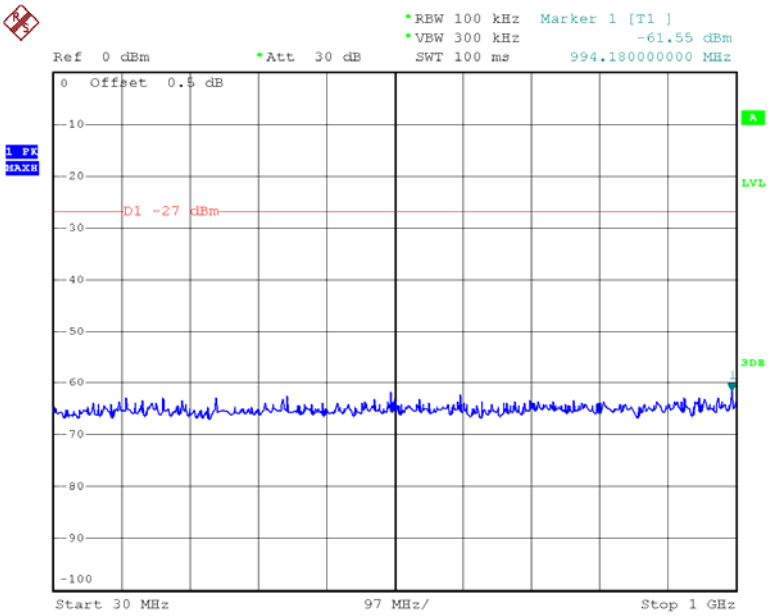
802.11n ht40 High Channel 30MHz-1GHz



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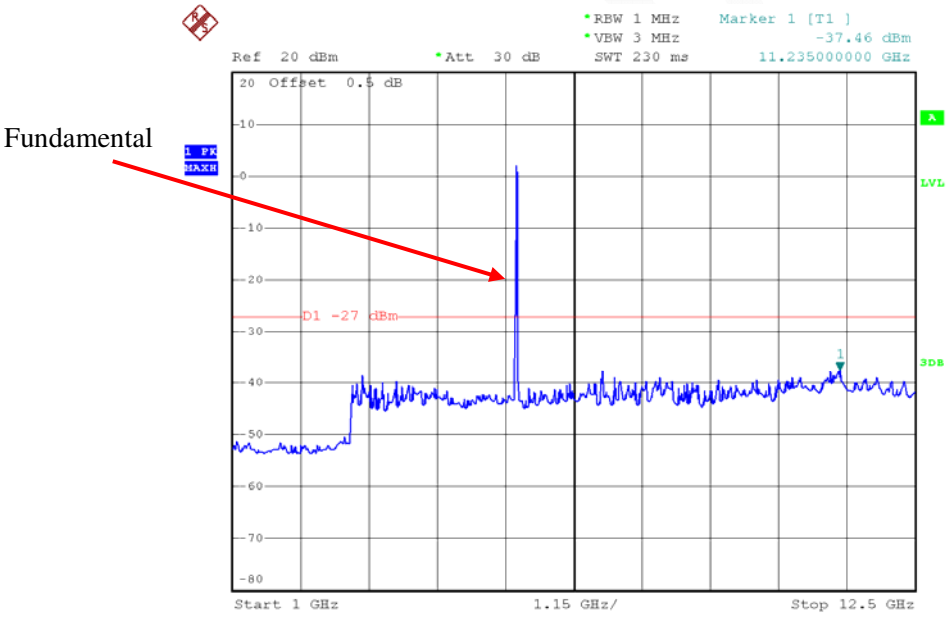
802.11n ht40 High Channel 1GHz-12.5GHz



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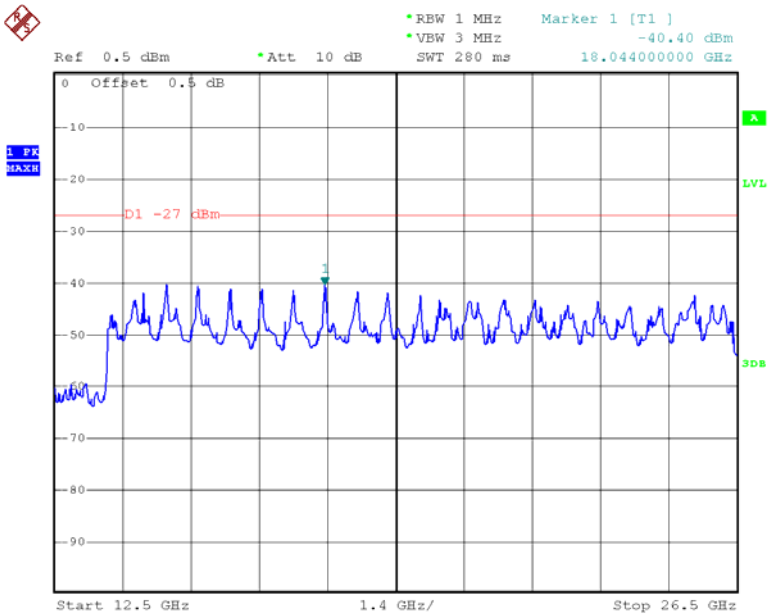
802.11n ht40 High Channel 12.5GHz-26.5GHz



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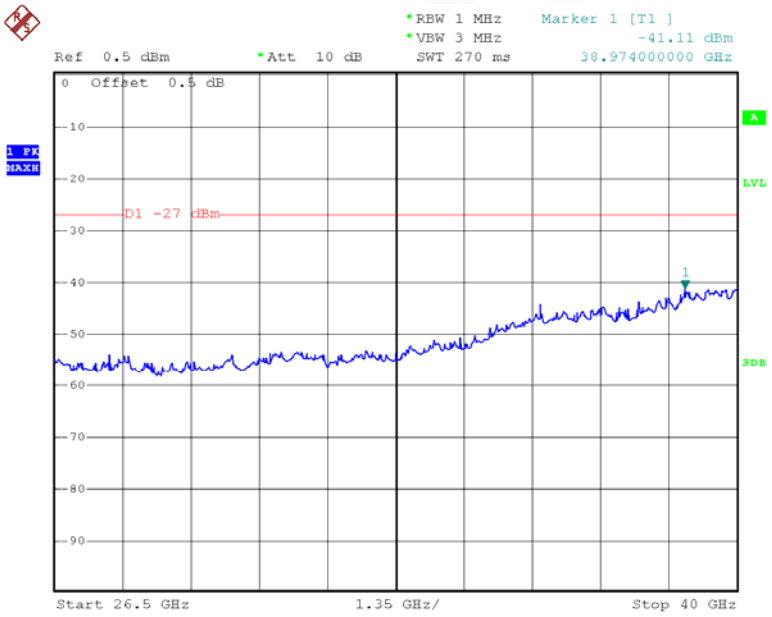
802.11n40 High Channel 26.5GHz-40GHz



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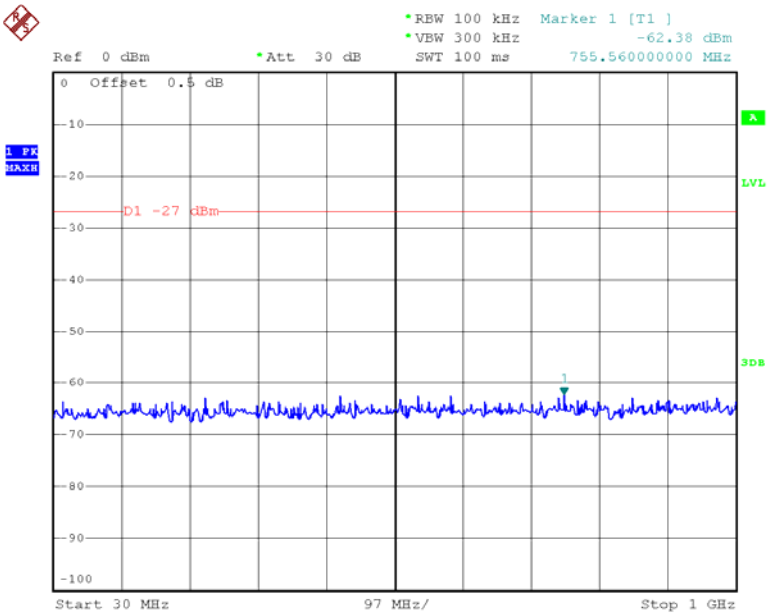
802.11n AC80 Middle Channel 30MHz-1GHz



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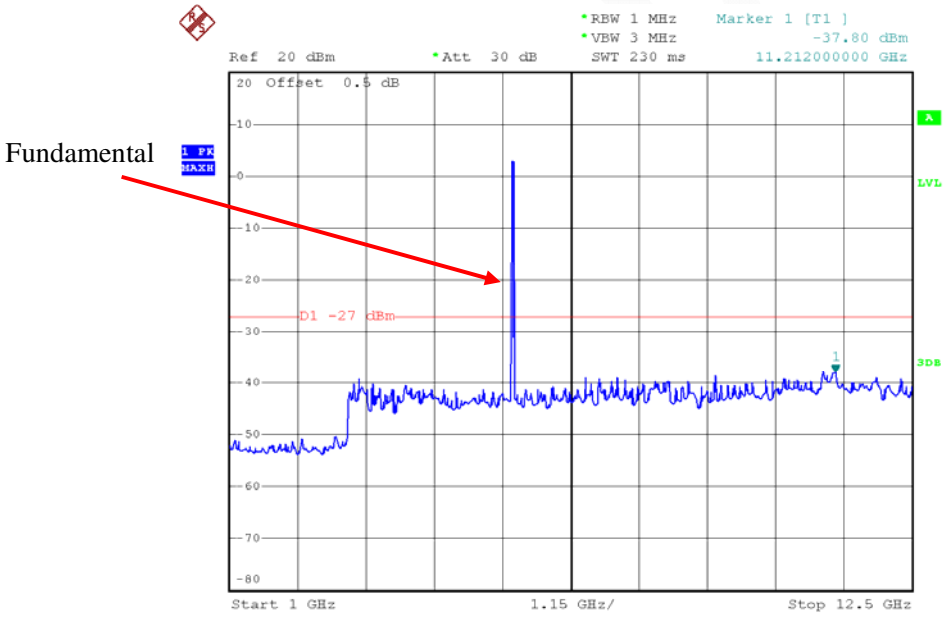
802.11n AC80 Middle Channel 1GHz-26.5GHz



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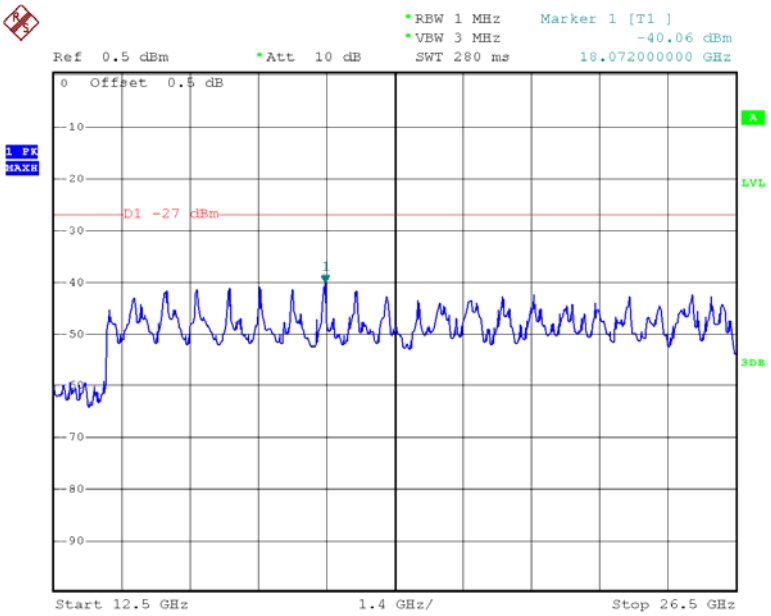
802.11n AC80 Middle Channel 12.5GHz-26.5GHz



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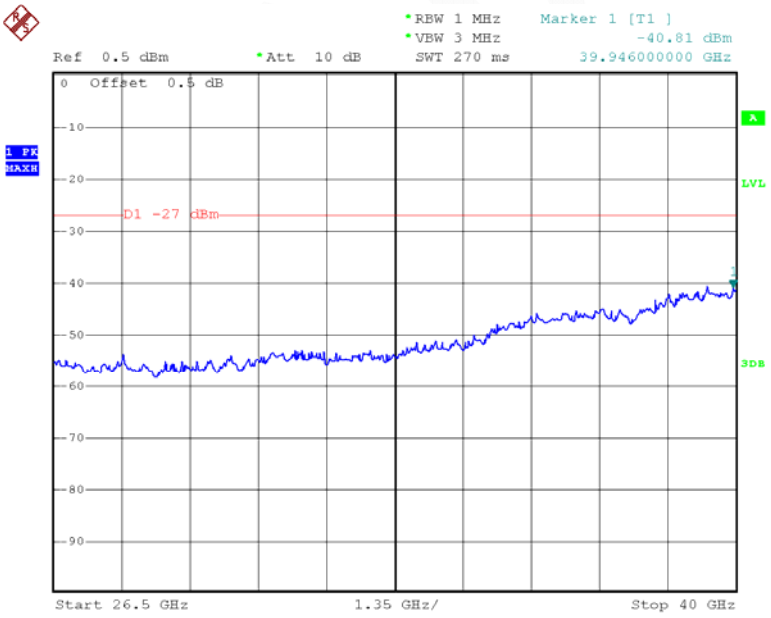
802.11 AC80 Middle Channel 26.5GHz-40GHz



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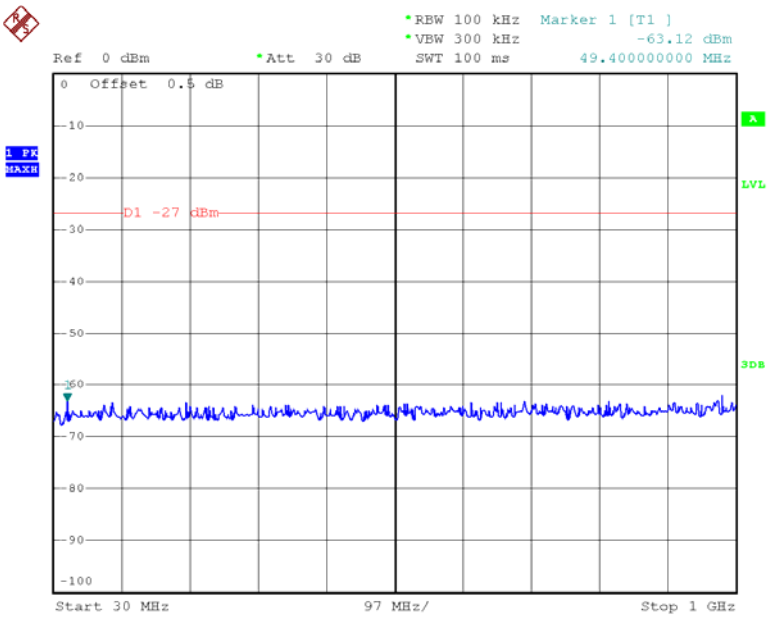
Antenna 1

802.11a Low Channel 30MHz-1GHz



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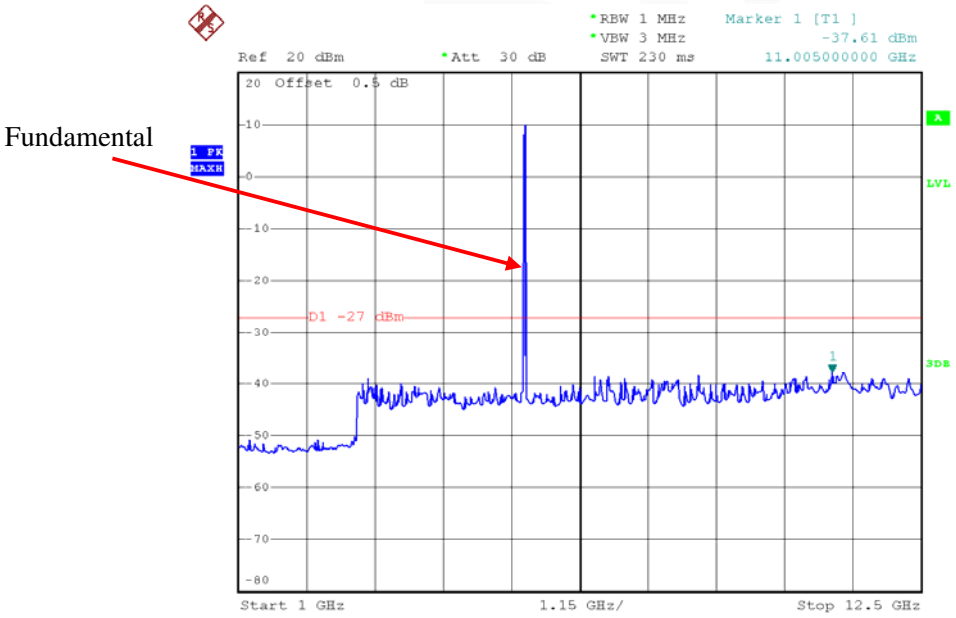
802.11a Low Channel 1GHz-26.5GHz



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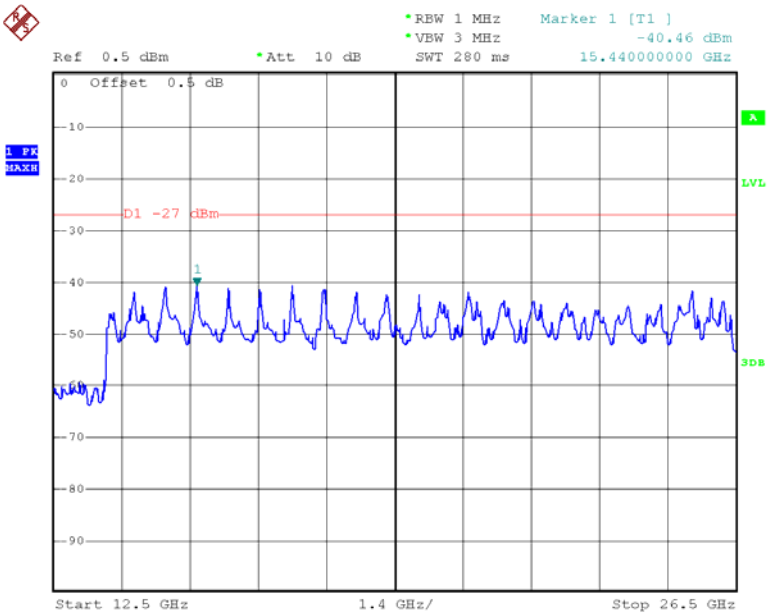
802.11a Low Channel 12.5GHz-26.5GHz



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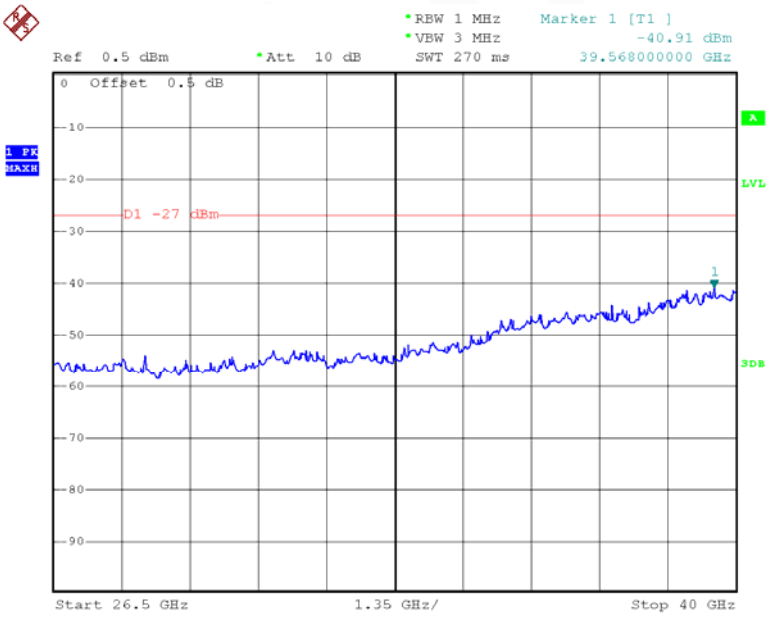
802.11a Low Channel 26.5GHz-40GHz



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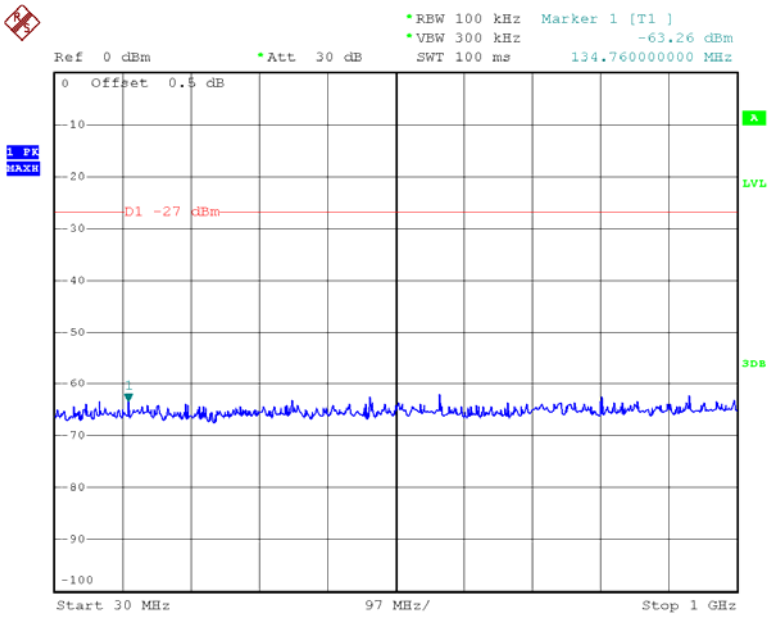
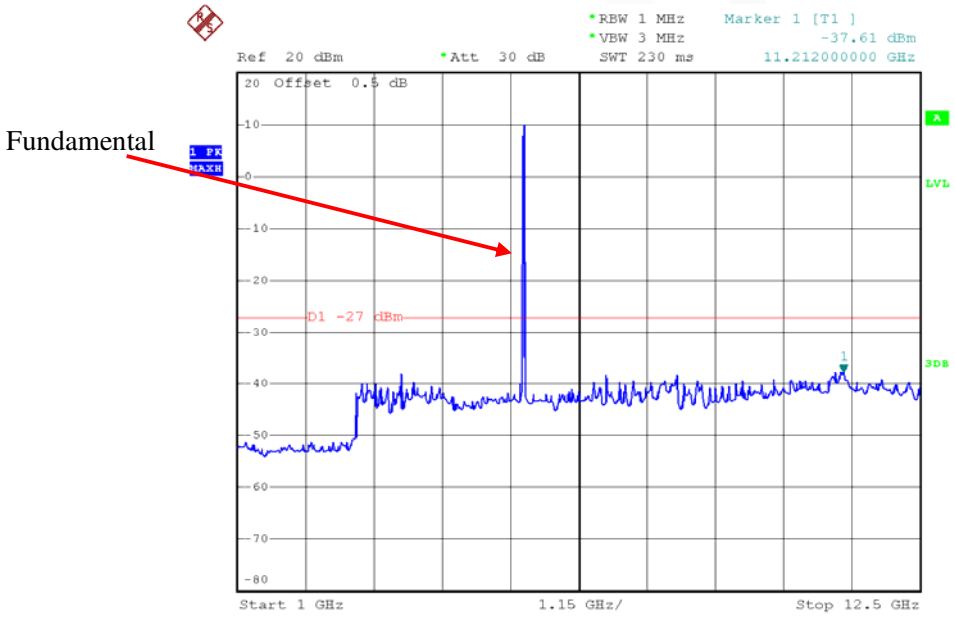
802.11a Middle Channel 30MHz -1GHz



Date: 18.DEC.2015 11:42:40

802.11a Middle Channel 1GHz-12.5GHz



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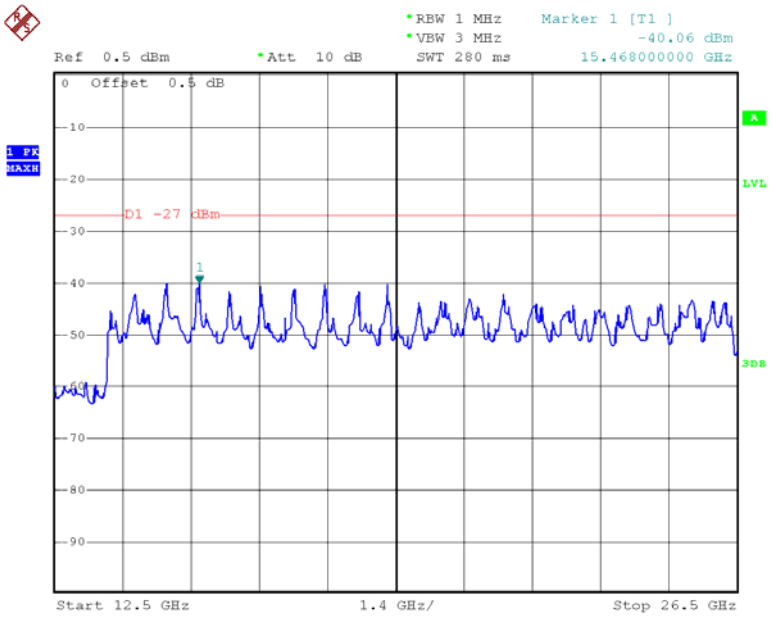
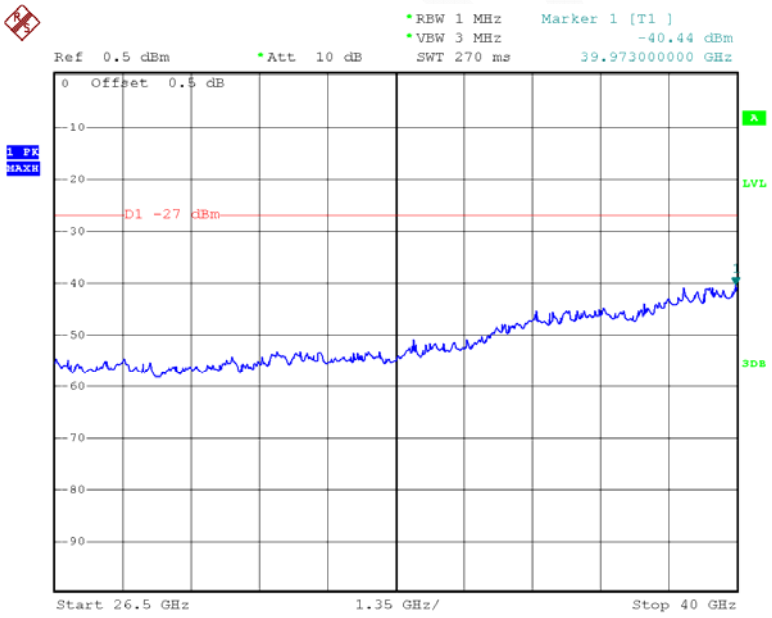
802.11a Middle Channel 12.5GHz-26.5GHz



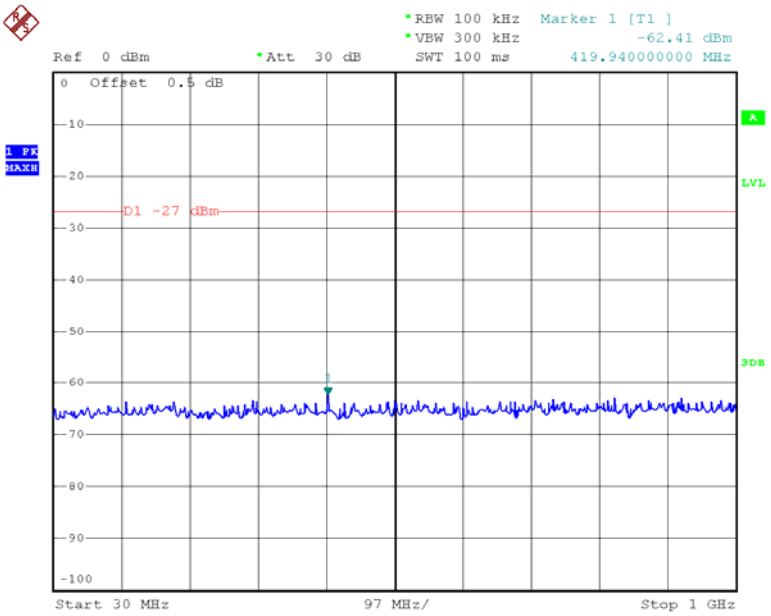
Date: 18.DEC.2015 11:47:04

802.11a Middle Channel 26.5GHz-40GHz



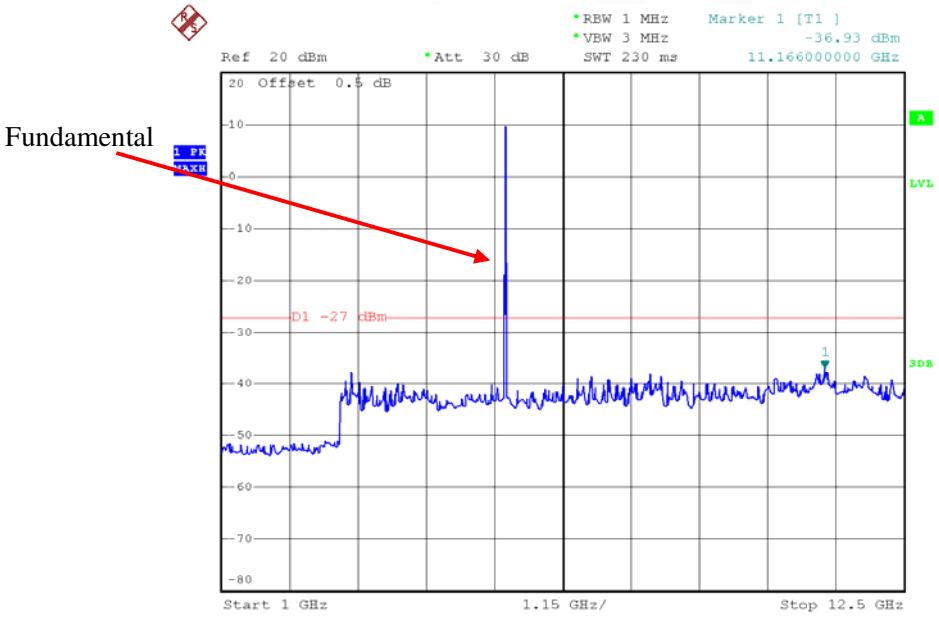
Date: 18.DEC.2015 11:51:22

802.11a High Channel 30MHz-1GHz



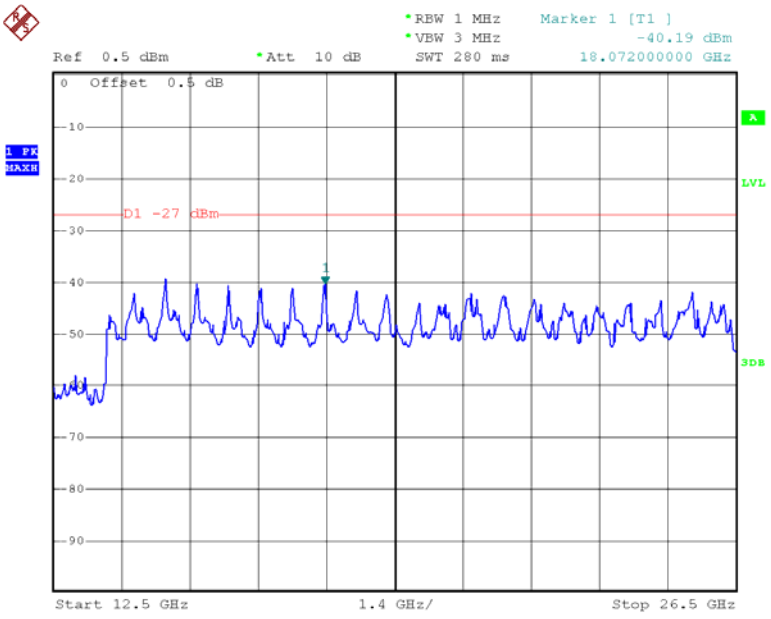
Date: 18.DEC.2015 11:42:47

802.11a High Channel 1GHz-12.5GHz



Date: 18.DEC.2015 12:08:16

802.11a High Channel 12.5GHz-26.5GHz



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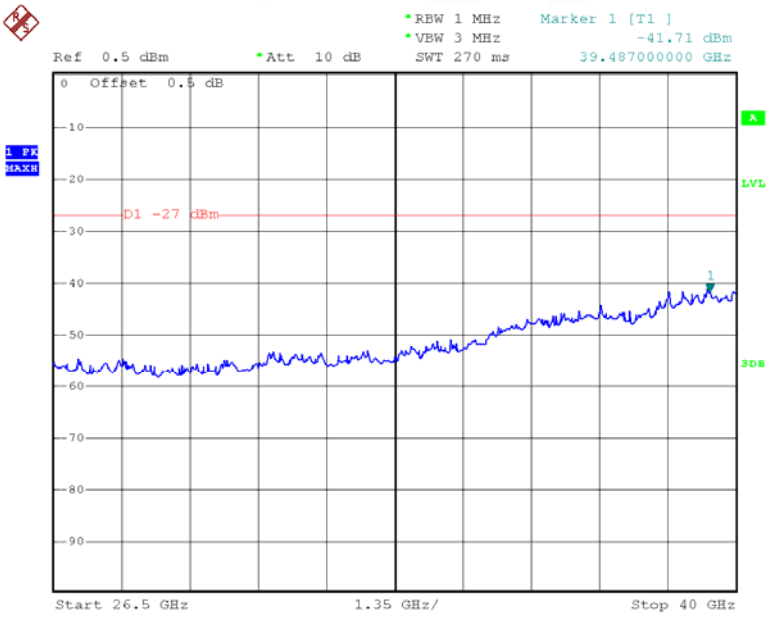
802.11a High Channel 26.5GHz-40GHz



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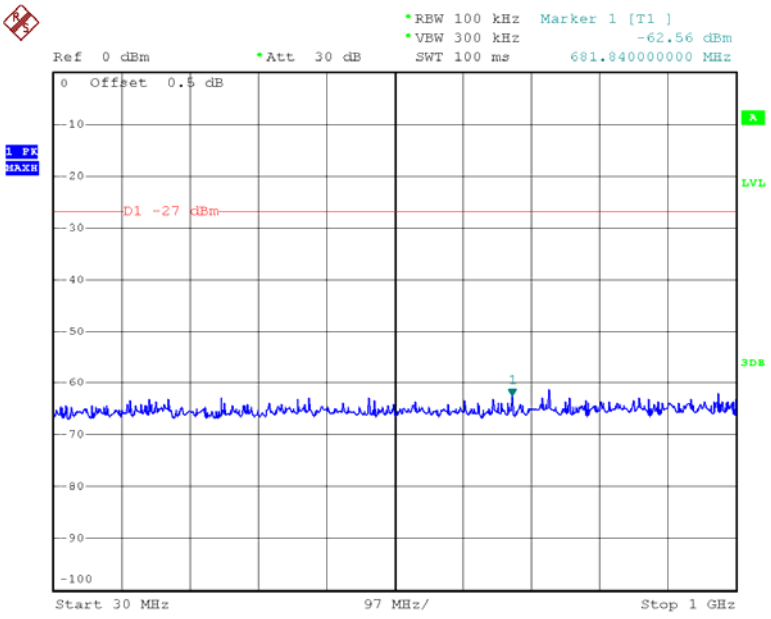
802.11n ht20 Low Channel 30MHz-1GHz



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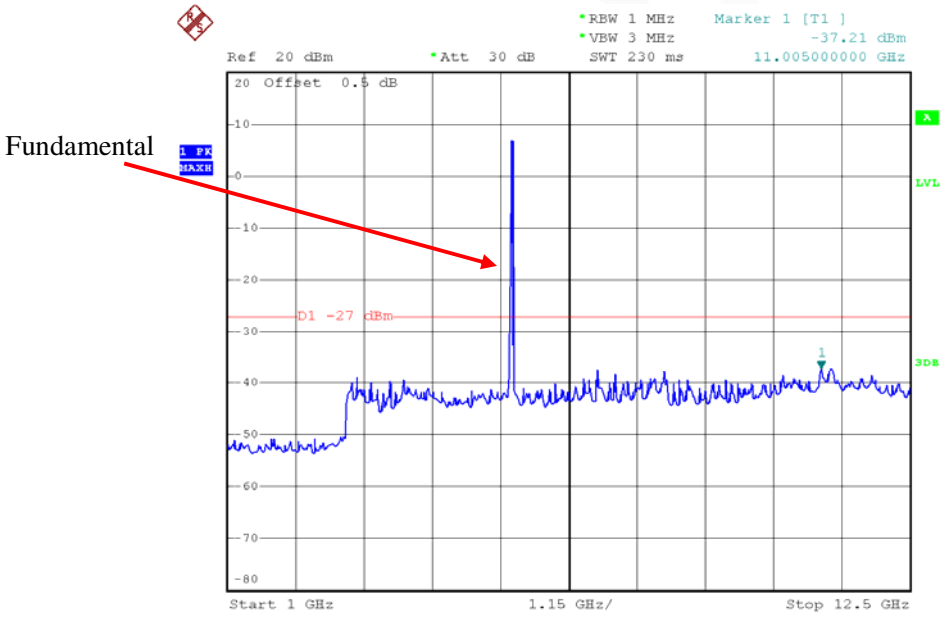
802.11n ht20 Low Channel 1GHz-12.5GHz



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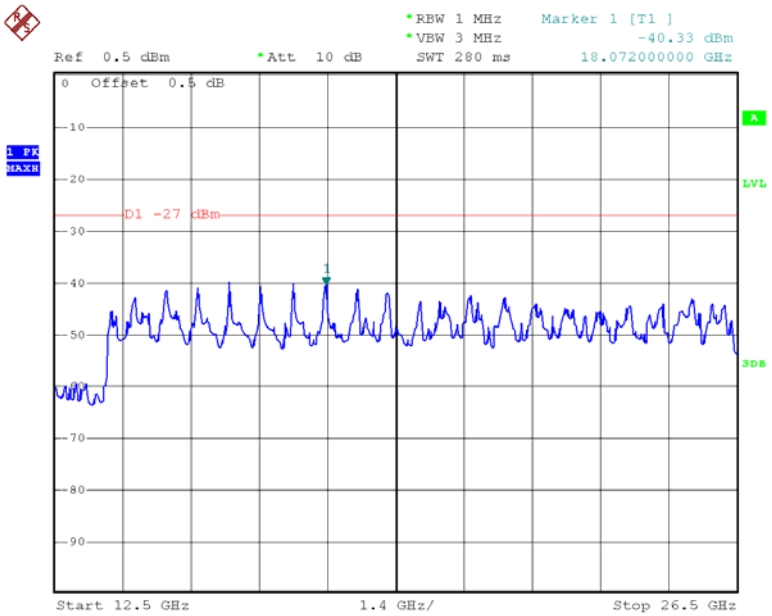
802.11n ht20 Low Channel 12.5GHz-26.5GHz



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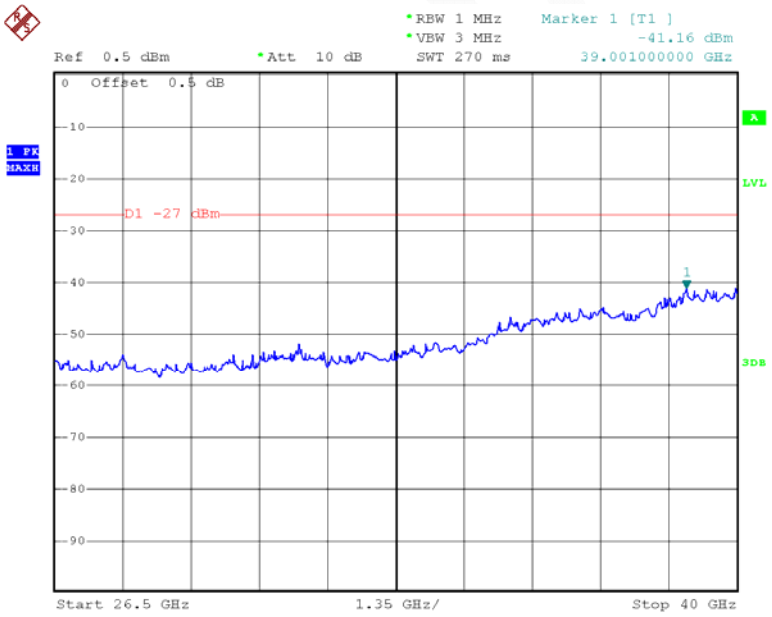
802.11n20 Low Channel 26.5GHz-40GHz



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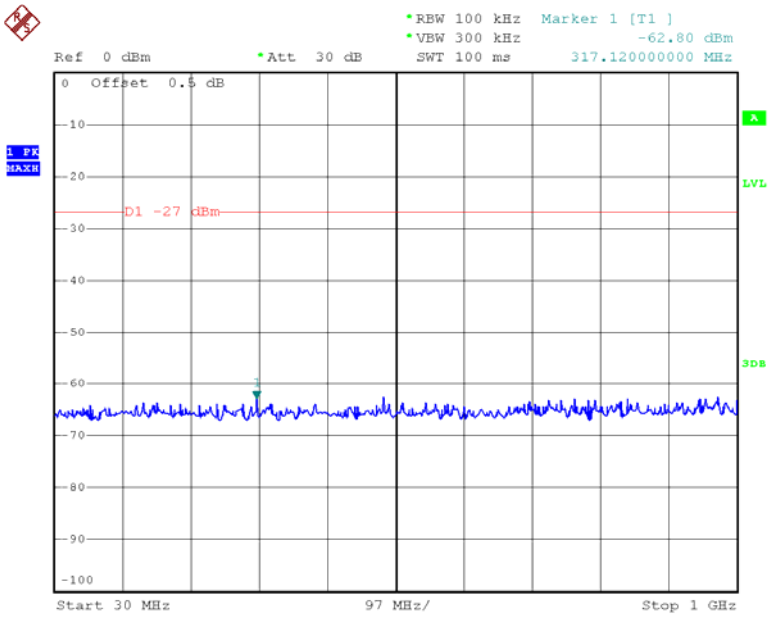
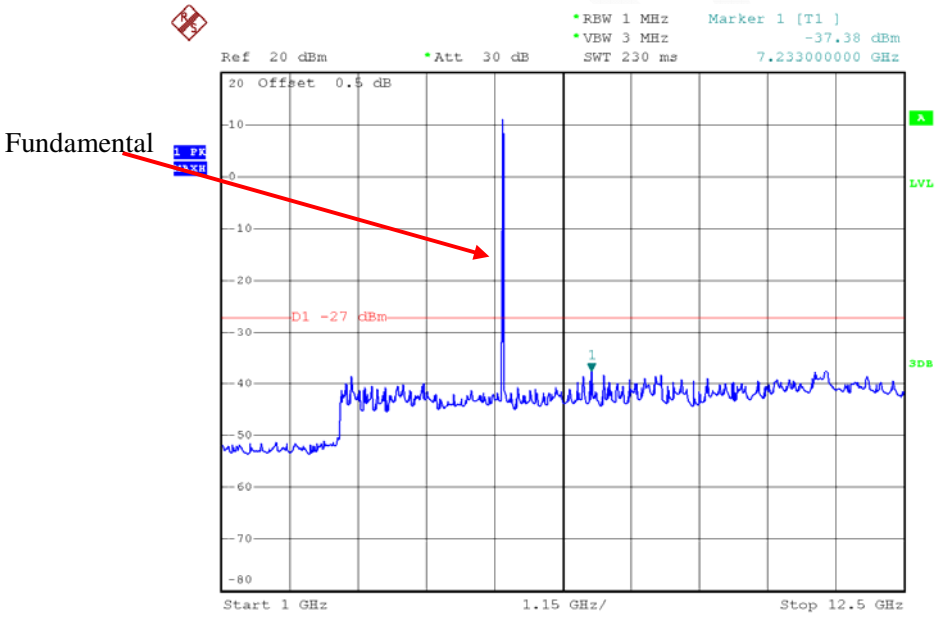
802.11n ht20 Middle Channel 30MHz -1GHz



Date: 18.DEC.2015 11:43:00

802.11n ht20 Middle Channel 1GHz-12.5GHz



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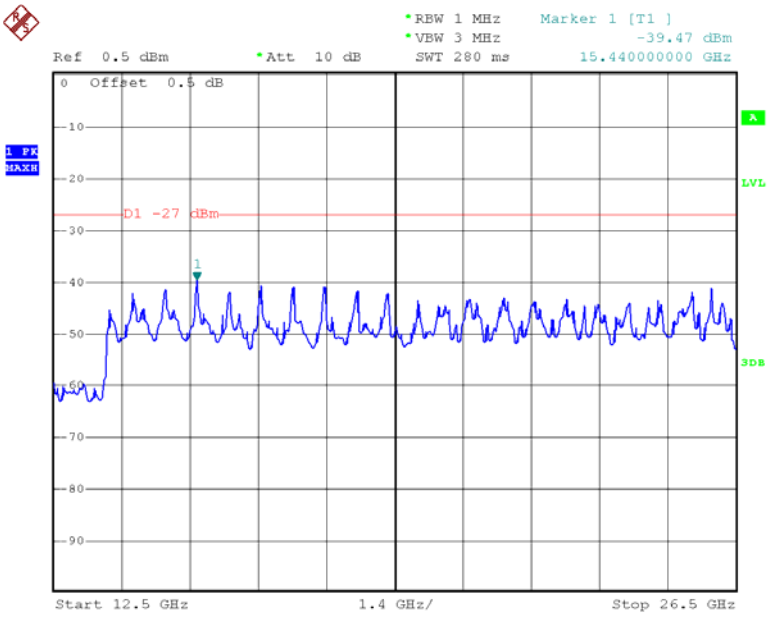
802.11n20 Middle Channel 12.5GHz-26.5GHz



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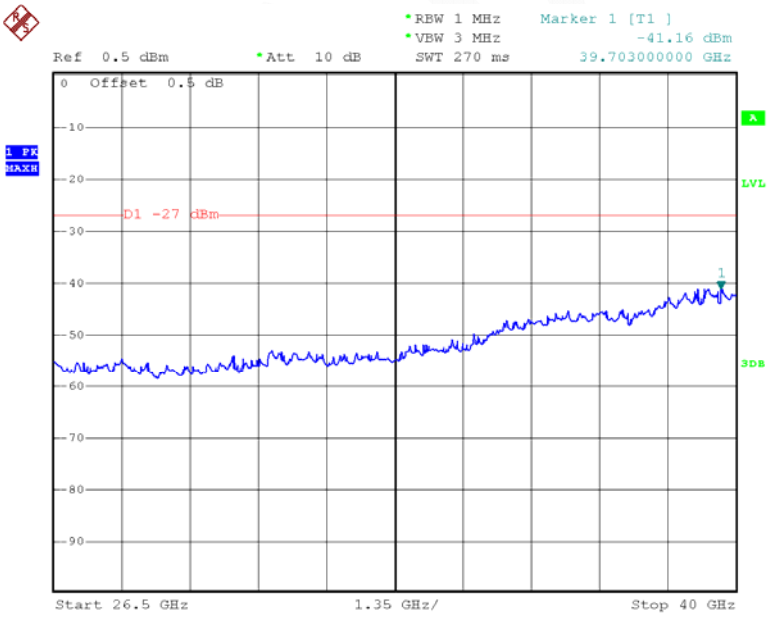
802.11n20 Middle Channel 26.5GHz-40GHz



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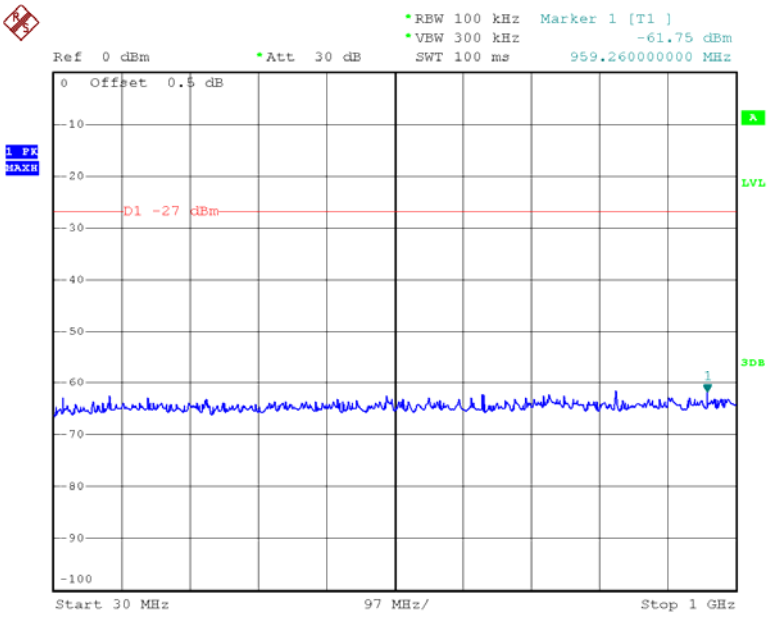
802.11n ht20 High Channel 30MHz-1GHz



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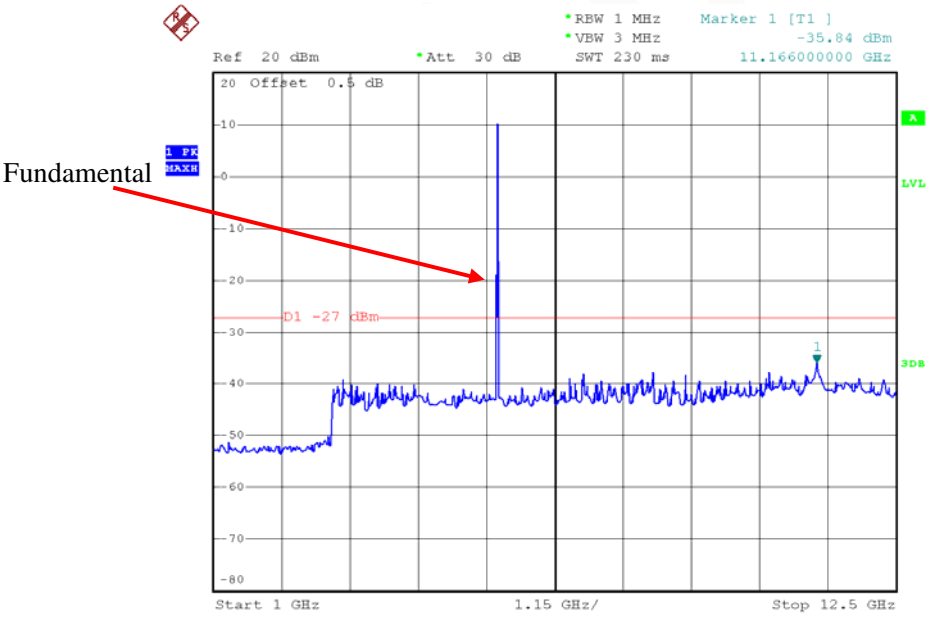
802.11n ht20 High Channel 1GHz-12.5GHz



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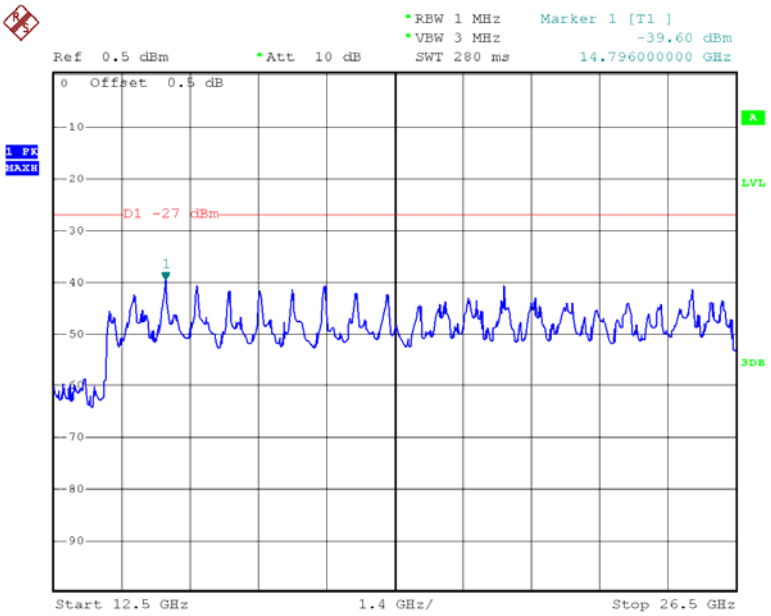
802.11n ht20 High Channel 12.5GHz-26.5GHz



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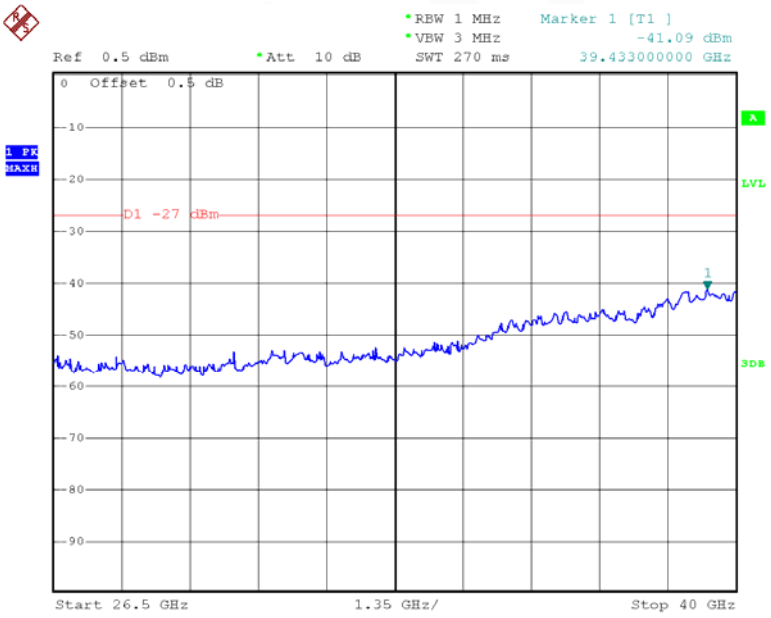
802.11n20 High Channel 26.5GHz-40GHz



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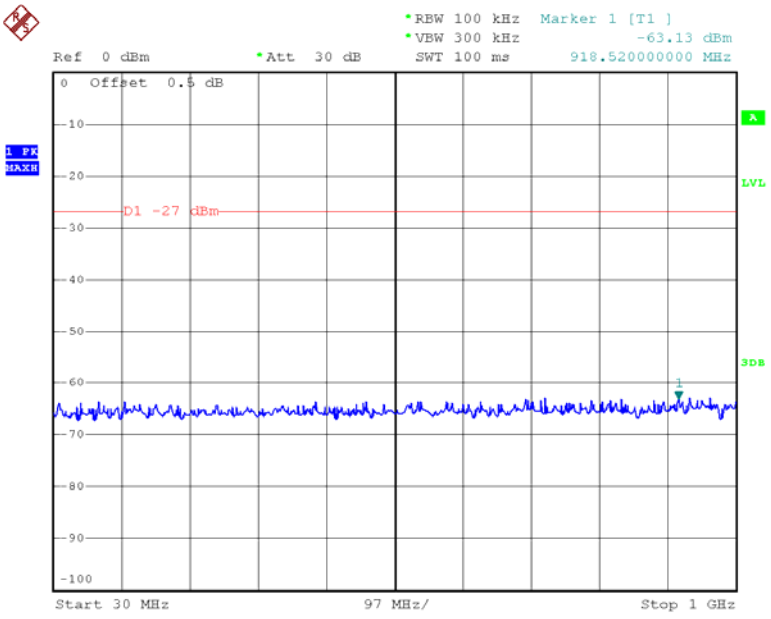
802.11n ht40 Low Channel 30MHz-1GHz



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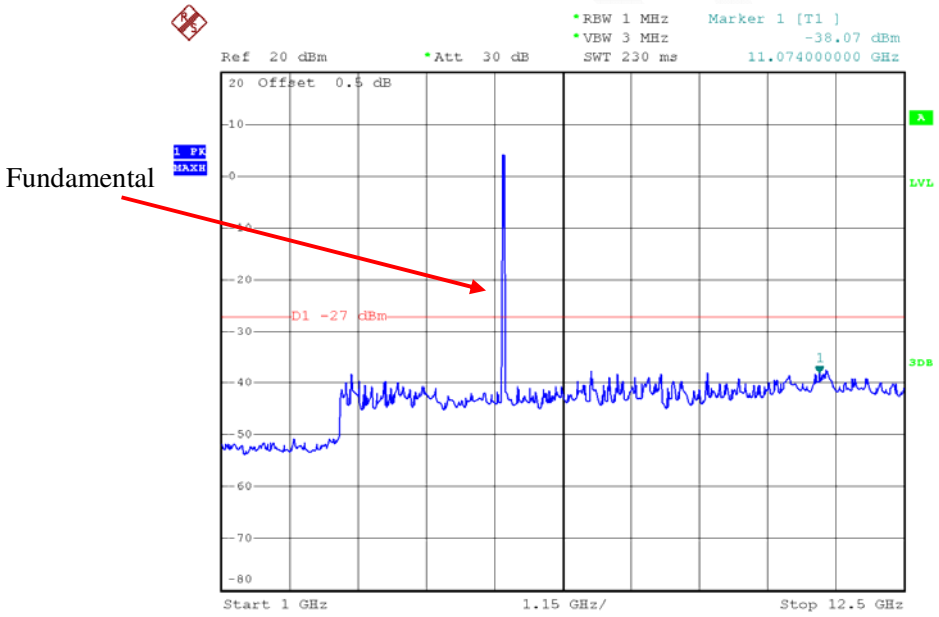
802.11n ht40 Low Channel 1GHz-12.5GHz



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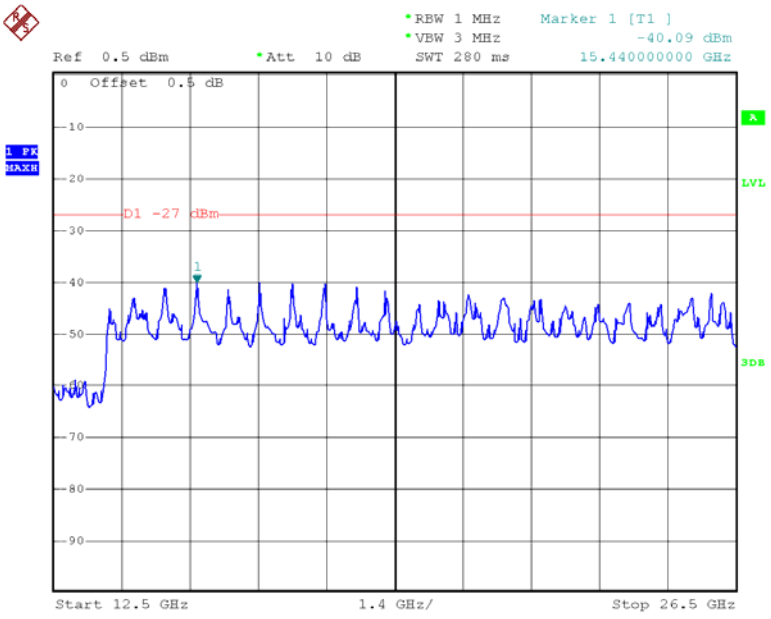
802.11n40 Low Channel 12.5GHz-26.5GHz



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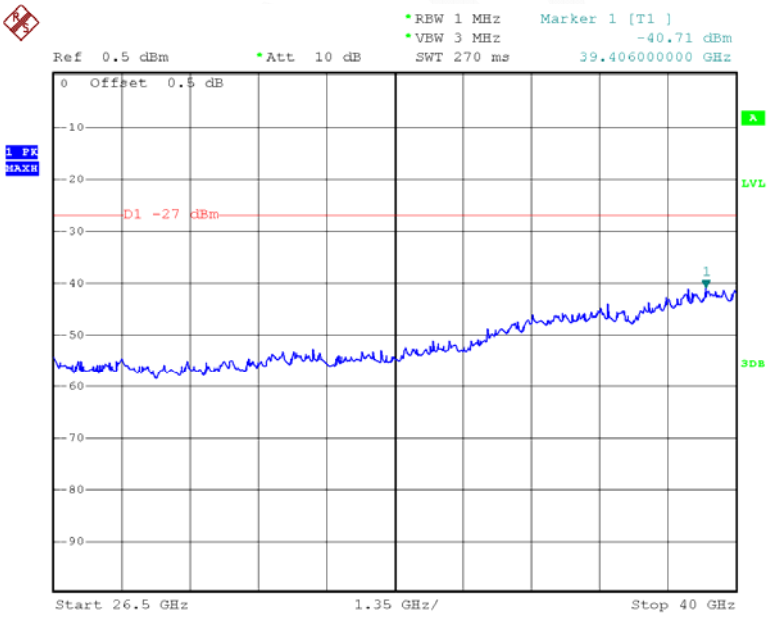
802.11n40 Low Channel 26.5GHz-40GHz



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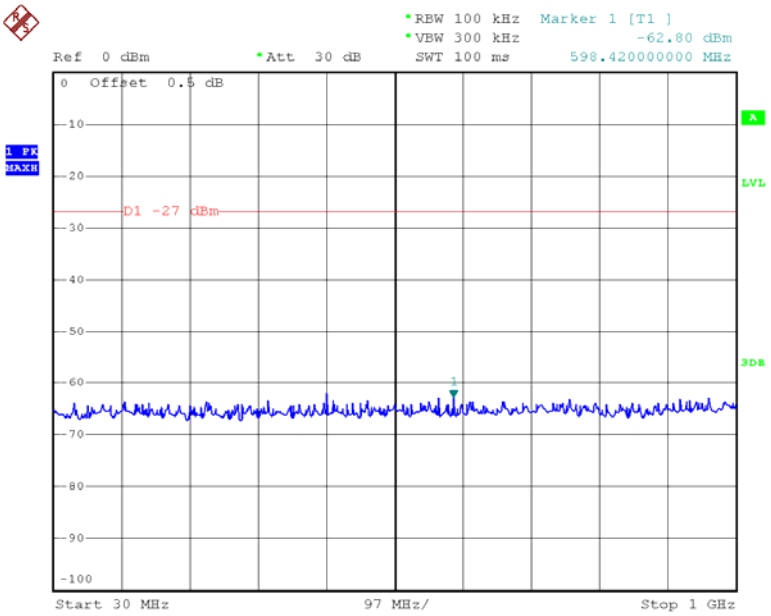
802.11n ht40 High Channel 30MHz-1GHz



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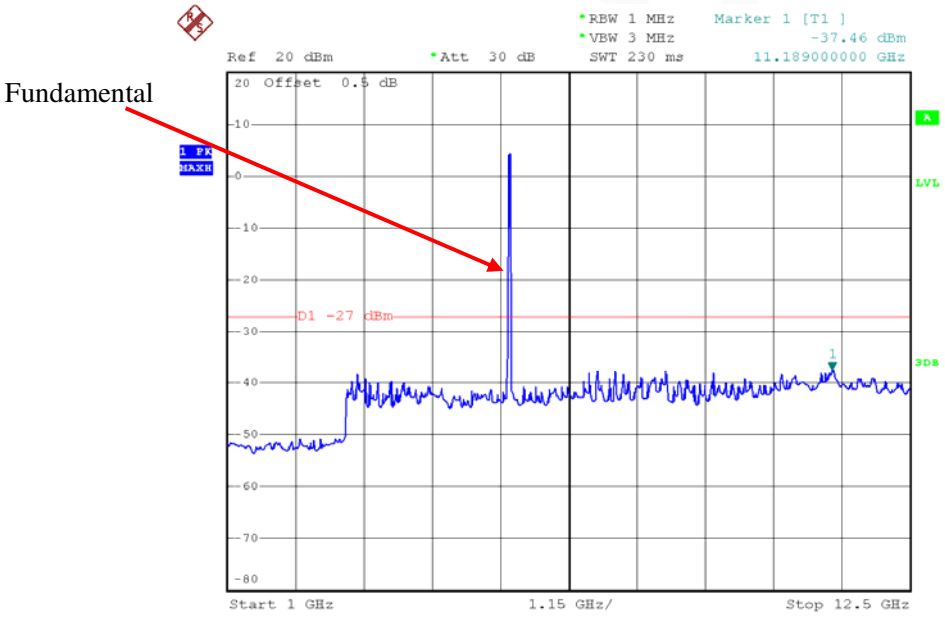
802.11n ht40 High Channel 1GHz-12.5GHz



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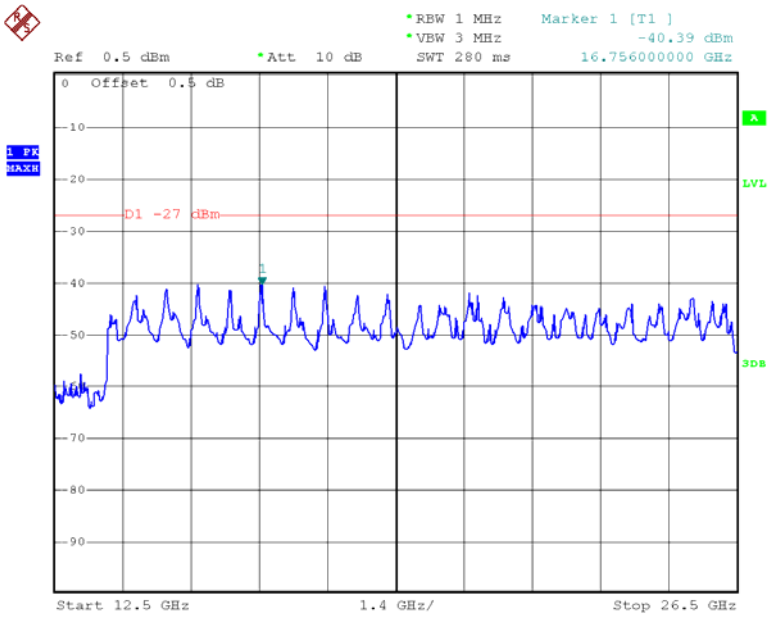
802.11n ht40 High Channel 12.5GHz-26.5GHz



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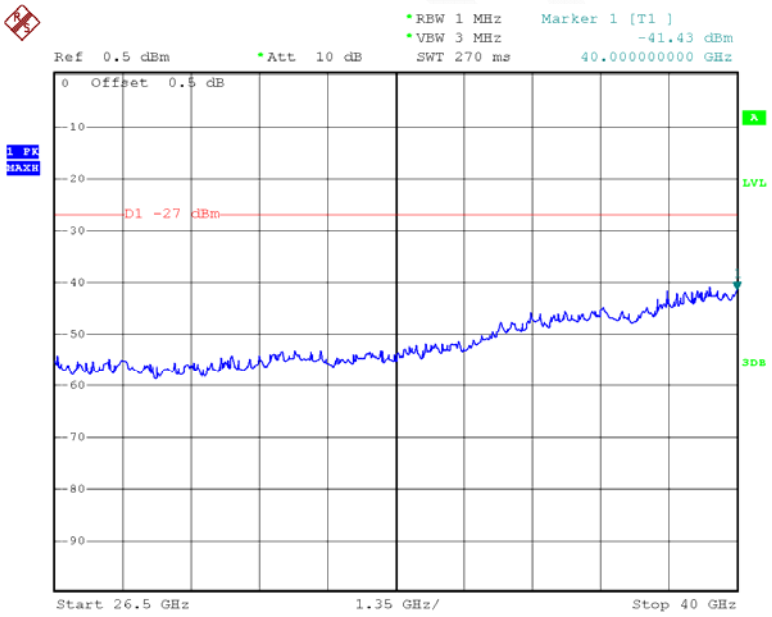
802.11n40 High Channel 26.5GHz-40GHz



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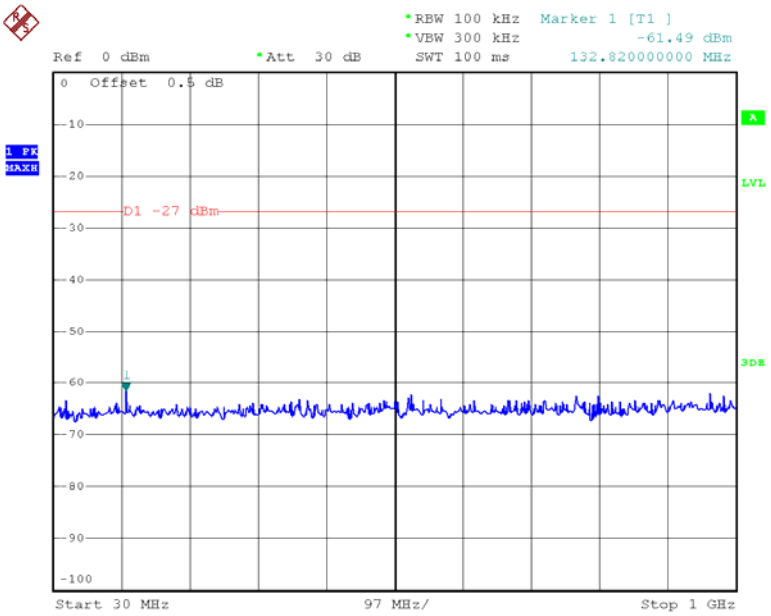
802.11n AC80 Middle Channel 30MHz-1GHz



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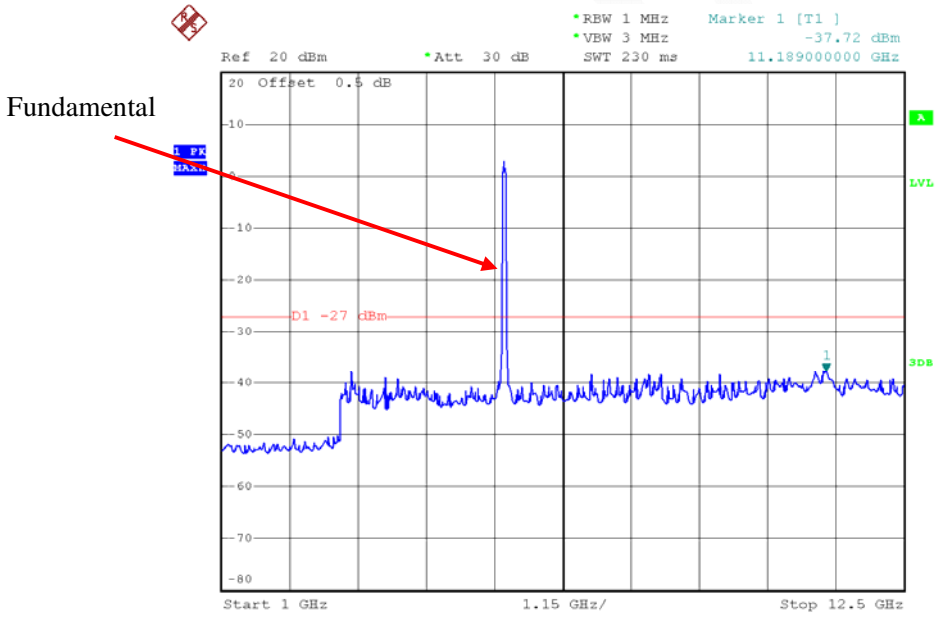
802.11n AC80 Middle Channel 1GHz-12.5GHz



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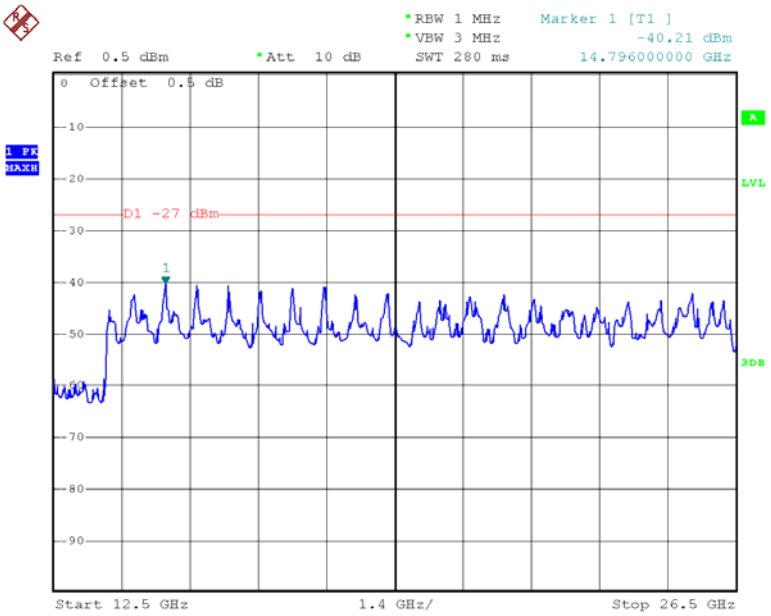
802.11 AC80 Middle Channel 12.5GHz-26.5GHz



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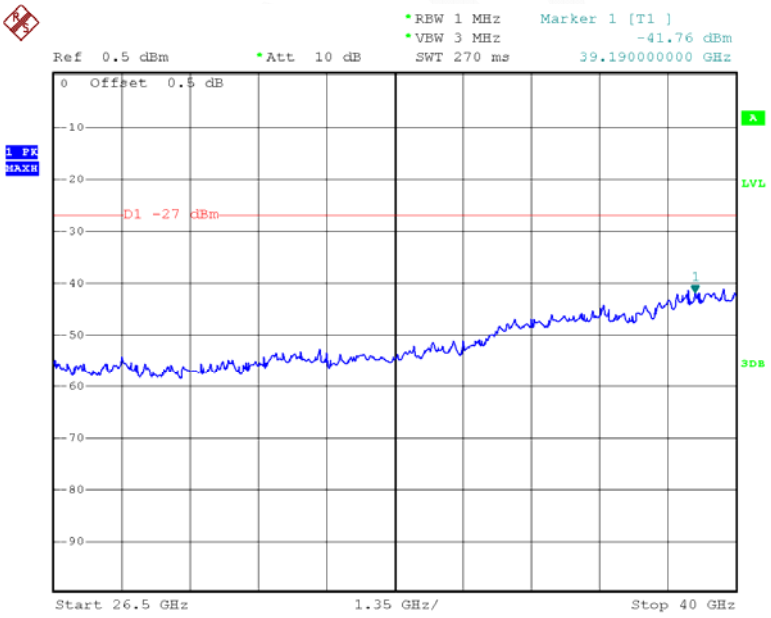
802.11 AC80 Middle Channel 26.5GHz-40GHz



Date: 18.DEC.2015 11:52:15

FCC §15.407(b) (1) –BAND EDGE

Applicable Standard

FCC §15.407 (b) (1), (2), (3), (4);

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

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

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

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

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

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2015-05-06	2016-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	21.3 °C
Relative Humidity:	53 %
ATM Pressure:	101.2 kPa

The testing was performed by Allen Qiao on 2015-12-12.

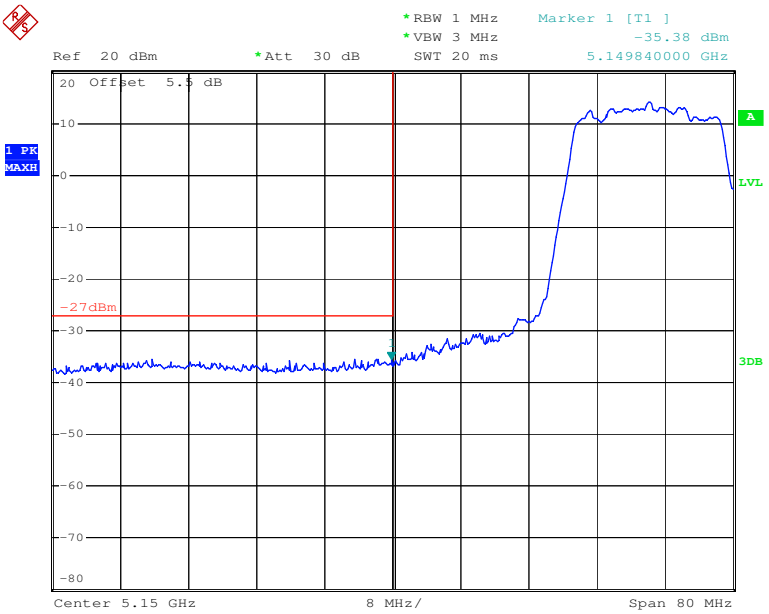
Please refer to the following table and plots:

UNII Band	Test mode	Channel	Frequency (MHz)	Reading (dBm/MHz)		Total (dBm)	Limit (dBm)
				Antenna0	Antenna1		
5150-5250MHz	802.11 a	Low	5180	-35.38	-33.95	-31.6	-27
		High	5240	-35.91	-34.8	-32.31	-27
	5G 802.11 n20	Low	5180	-35.1	-34.43	-31.74	-27
		High	5240	-35.72	-35.28	-32.48	-27
	5G 802.11 n40	Low	5190	-34.47	-32.3	-30.24	-27
		High	5230	-40.51	-35.38	-34.22	-27
	802.11 ac80	Middle	5210	-33.39	-29	-27.65	-27
5725-5850MHz	802.11 a	Low	5745	-32.22	-28.81	-27.18	-17
				-36.37	-35.31	-32.80	-27
		High	5825	-34.25	-31.39	-29.58	-17
				-35.81	-35.46	-32.62	-27
	5G 802.11 n20	Low	5745	-32.59	-28.96	-27.40	-17
				-36.49	-35.58	-33.00	-27
		High	5825	-34.58	-31.37	-29.67	-17
				-35.98	-35.54	-32.74	-27
	5G 802.11 n40	Low	5755	-34.46	-32.36	-30.27	-17
				-35.83	-34.94	-32.35	-27
		High	5795	-36.60	-36.62	-33.60	-17
				-36.32	-36.00	-33.15	-27
	802.11 ac80	Middle	5775	-30.40	-30.70	-27.54	-17
				-32.14	-32.61	-29.36	-27

5150~5250MHz:

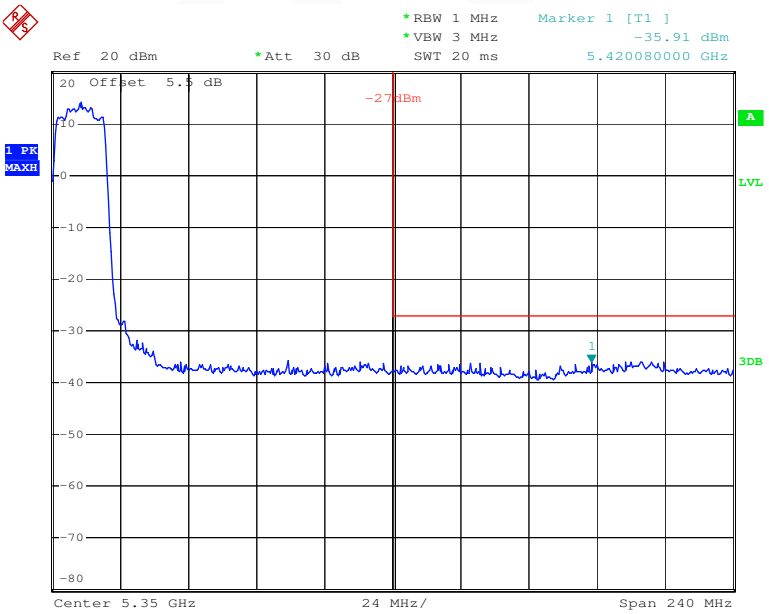
Antenna 0

802.11a Band Edge, Left Side



Date: 12.DEC.2015 12:52:48

802.11a Band Edge, Right Side



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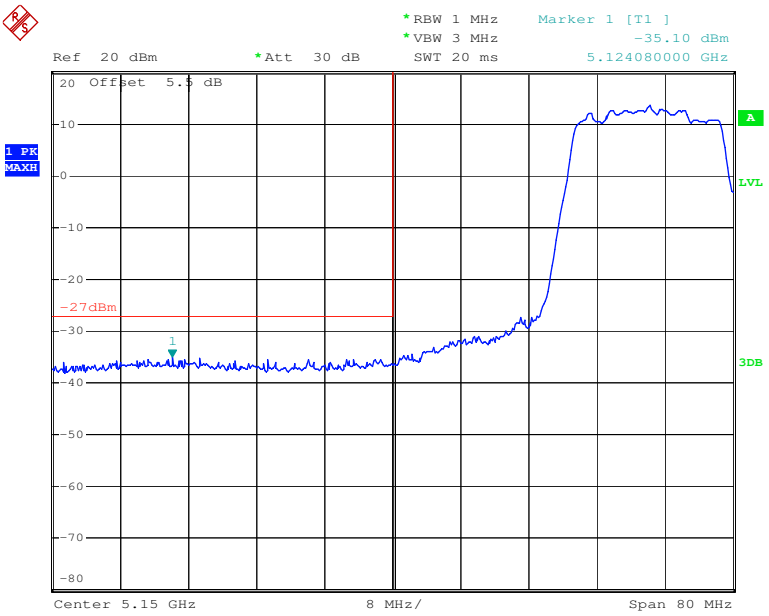
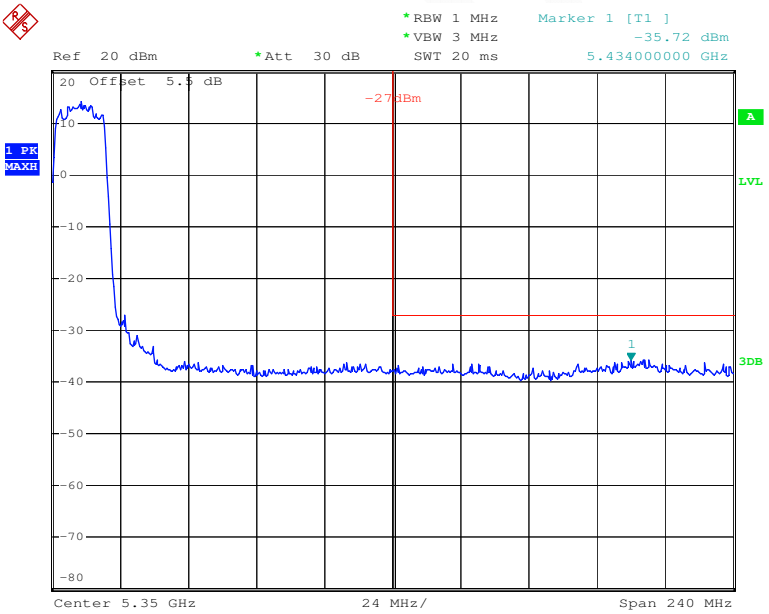
802.11n ht20 Band Edge, Left Side



Date: 12.DEC.2015 13:02:48

802.11n ht20 Band Edge, Right Side



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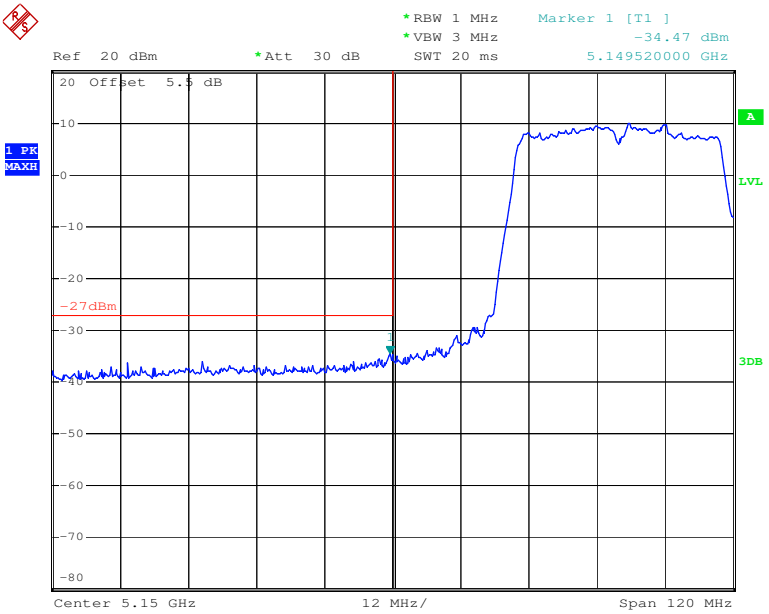
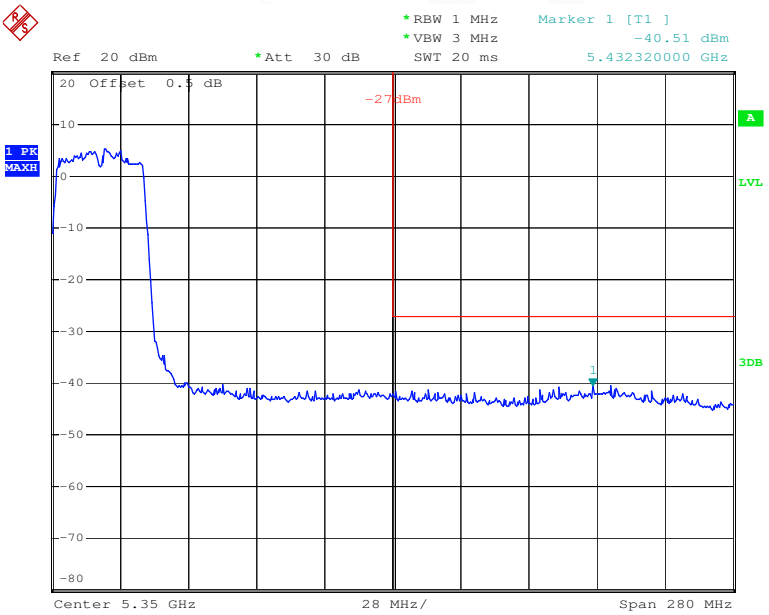
802.11n ht40 Band Edge, Left Side



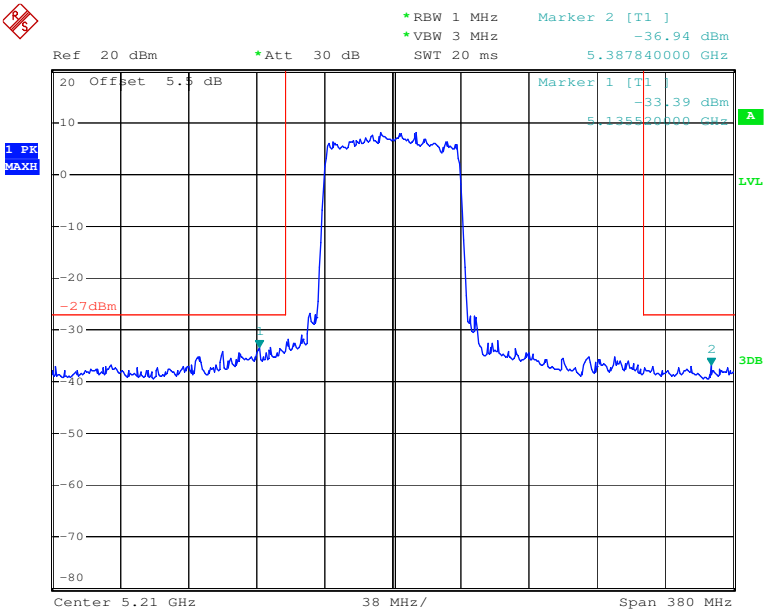
Date: 12.DEC.2015 13:11:25

802.11n ht40 Band Edge, Right Side



Date: 12.DEC.2015 13:14:06

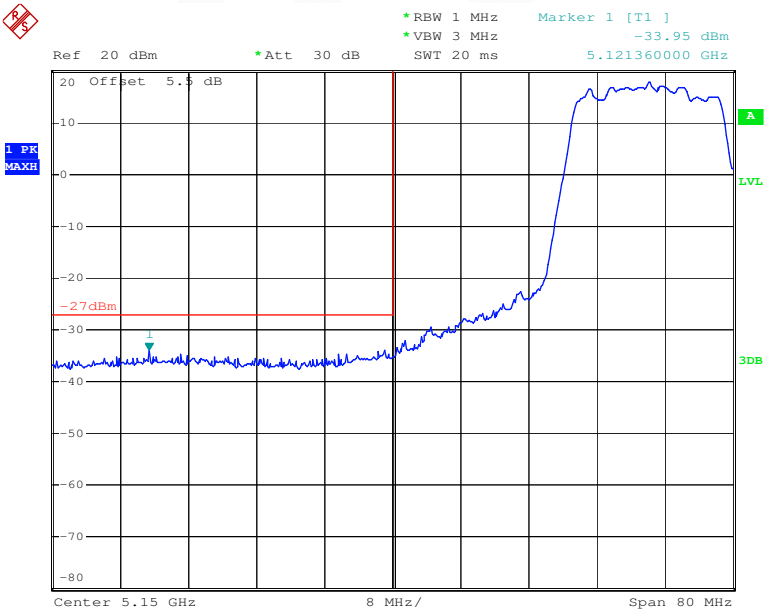
802.11 AC80 Band Edge, Middle



Date: 12.DEC.2015 13:16:36

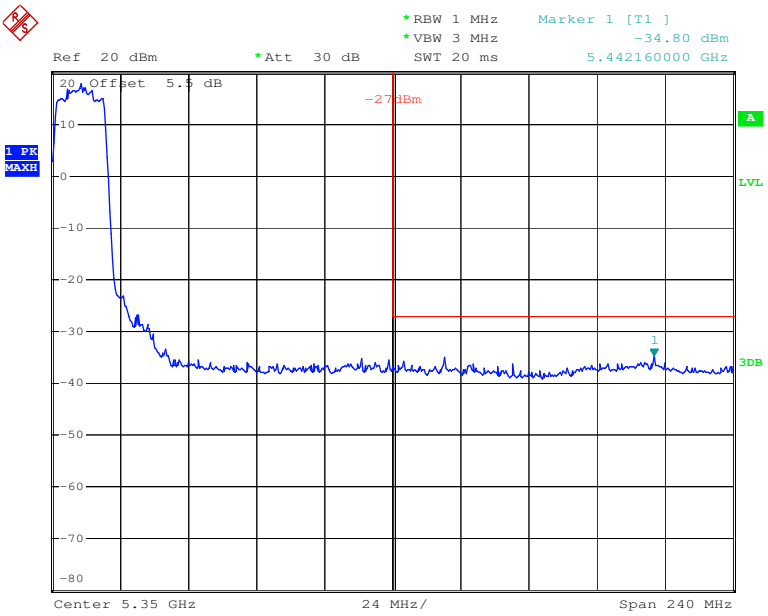
Antenna 1

802.11a Band Edge, Left Side



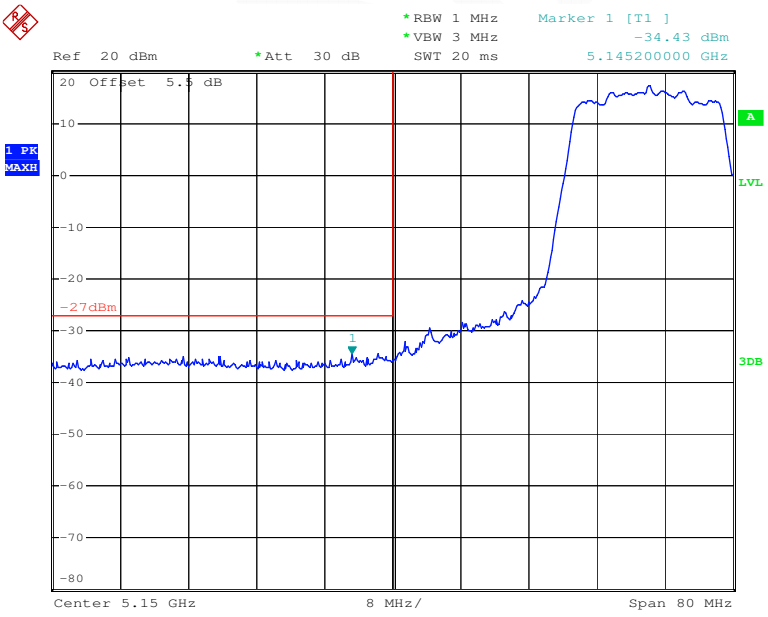
Date: 12.DEC.2015 11:44:13

802.11a Band Edge, Right Side



Date: 12.DEC.2015 11:48:18

802.11n ht20 Band Edge, Left Side



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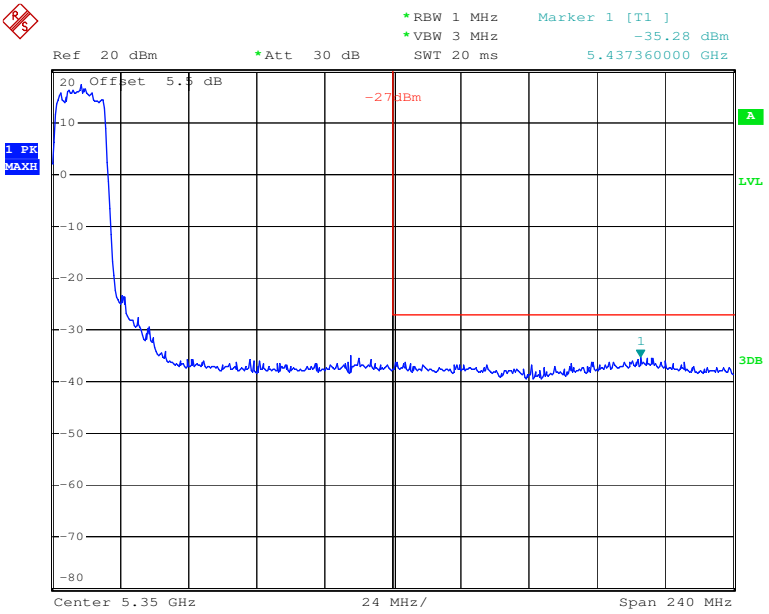
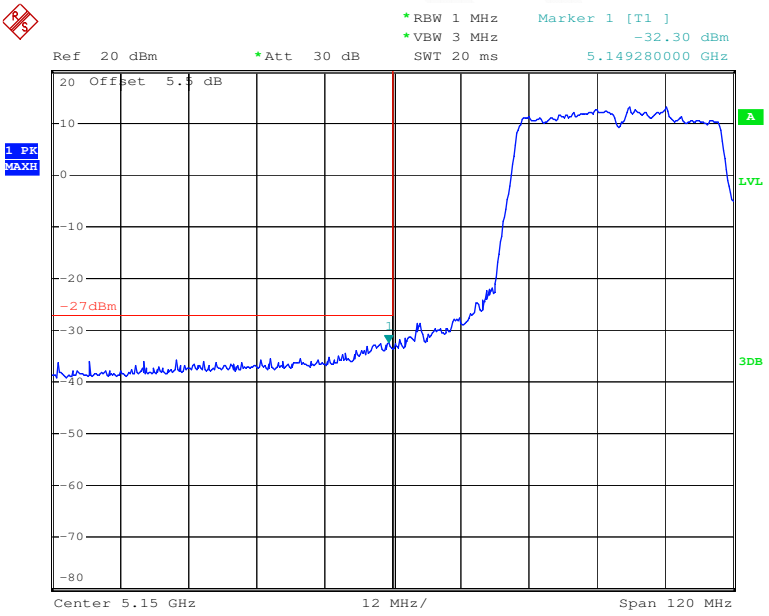
802.11n ht20 Band Edge, Right Side



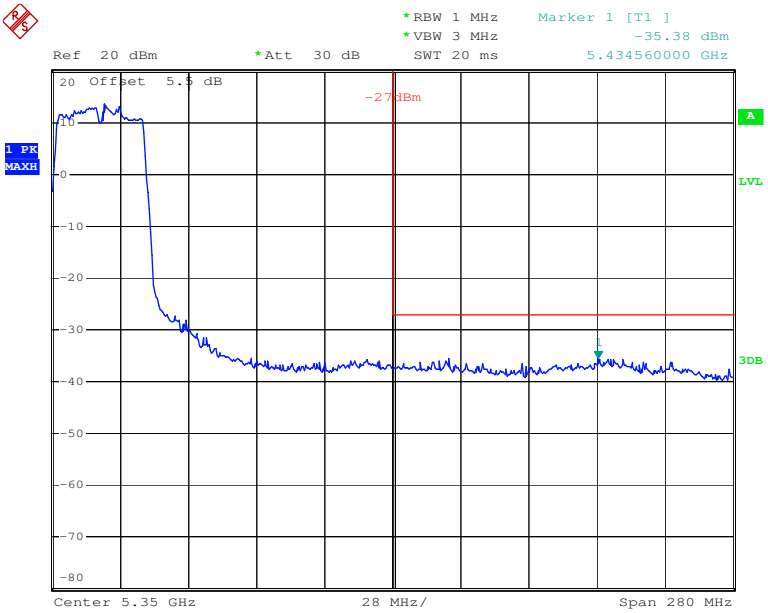
Date: 12.DEC.2015 11:56:21

802.11n ht40 Band Edge, Left Side



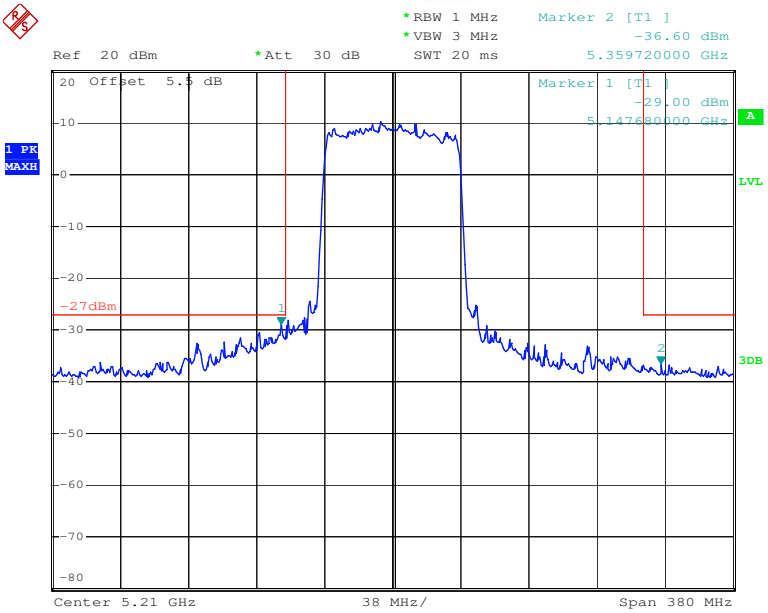
Date: 12.DEC.2015 11:58:44

802.11n ht40 Band Edge, Right Side



Date: 12.DEC.2015 12:00:55

802.11 AC80 Band Edge, Middle

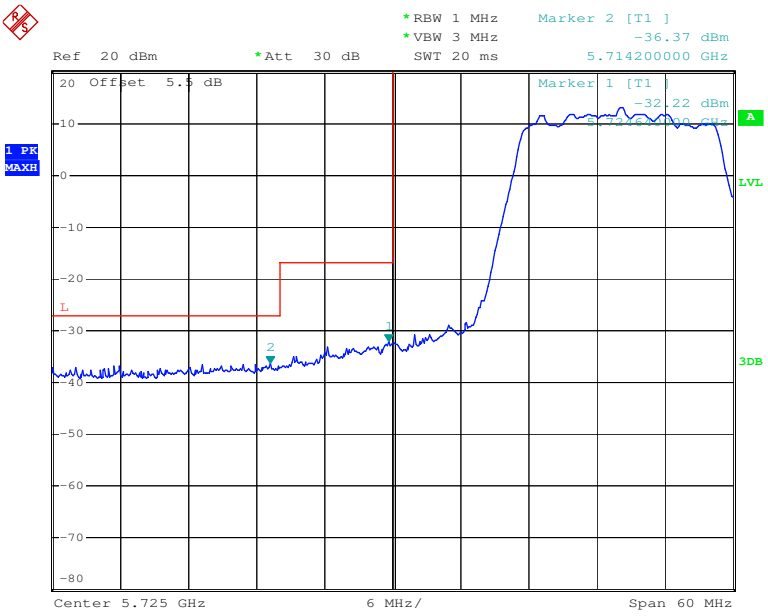


Date: 12.DEC.2015 12:03:47

5725~5850MHz:

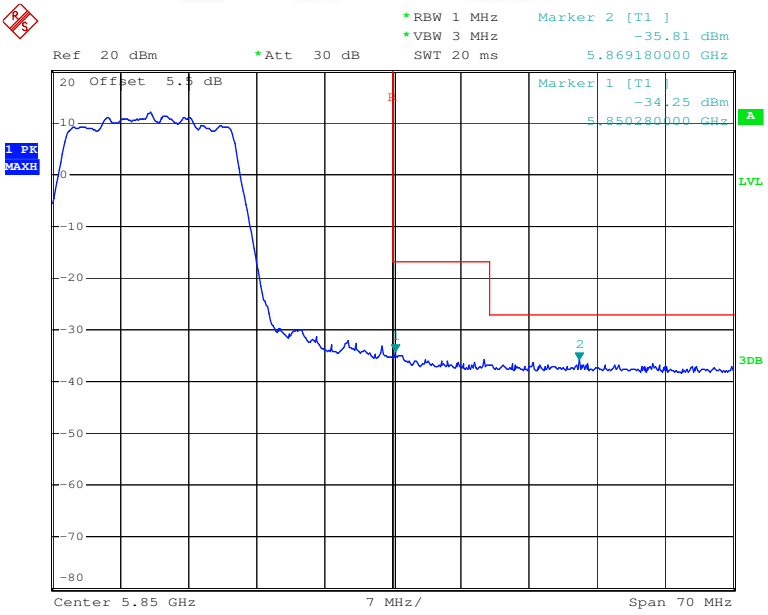
Antenna 0

802.11a Band Edge, Left Side



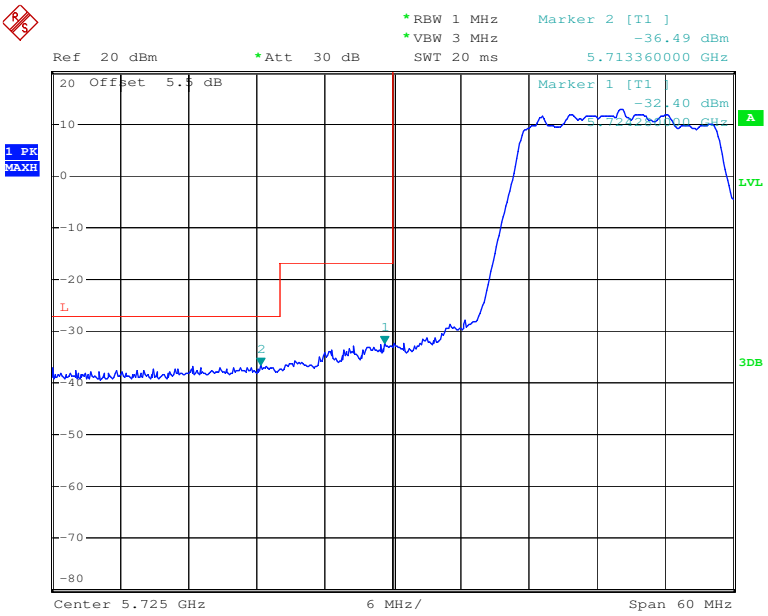
Date: 12.DEC.2015 13:20:51

802.11a Band Edge, Right Side



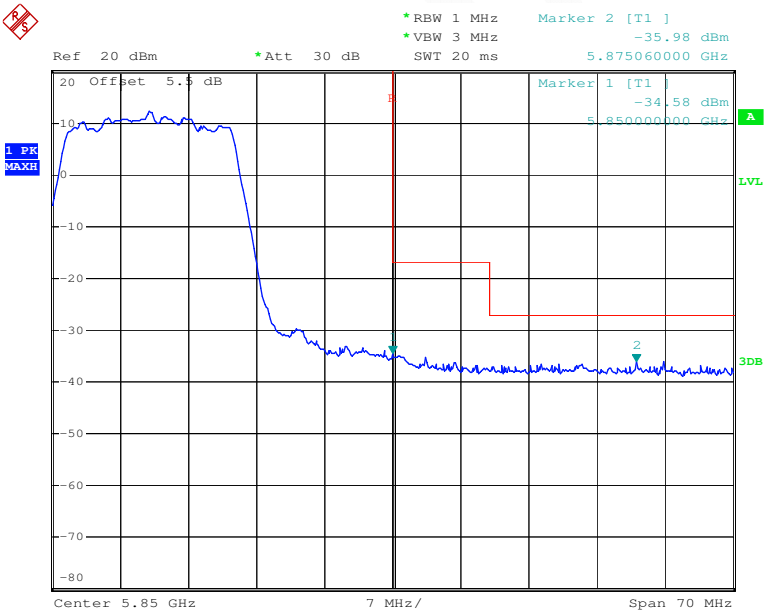
Date: 12.DEC.2015 13:26:27

802.11n ht20 Band Edge, Left Side



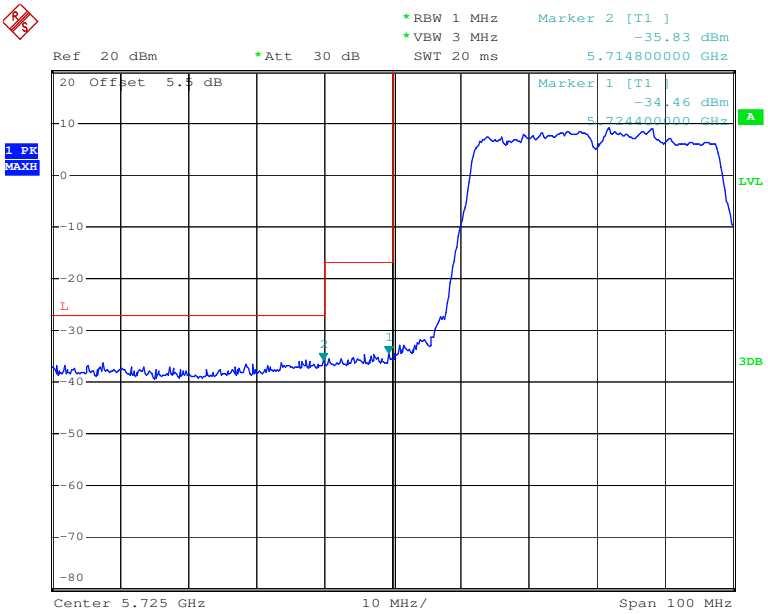
Date: 12.DEC.2015 13:31:07

802.11n ht20 Band Edge, Right Side



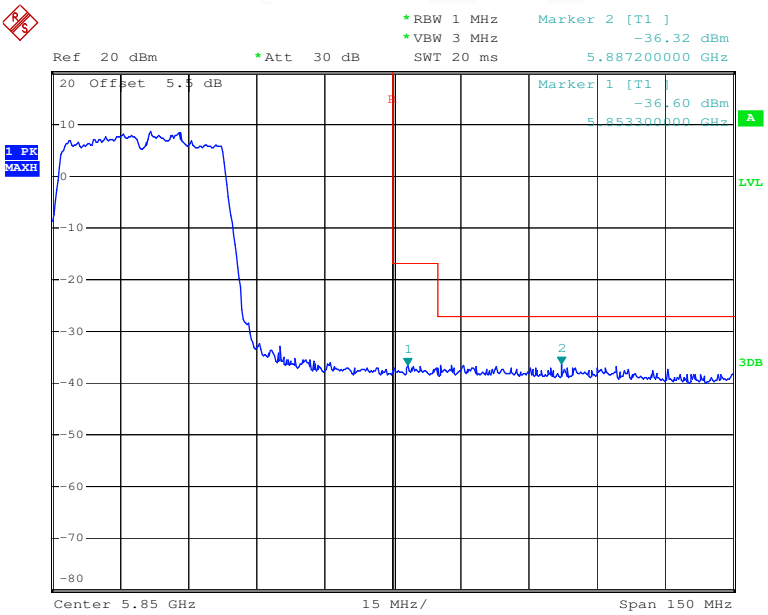
Date: 12.DEC.2015 13:37:46

802.11n ht40 Band Edge, Left Side



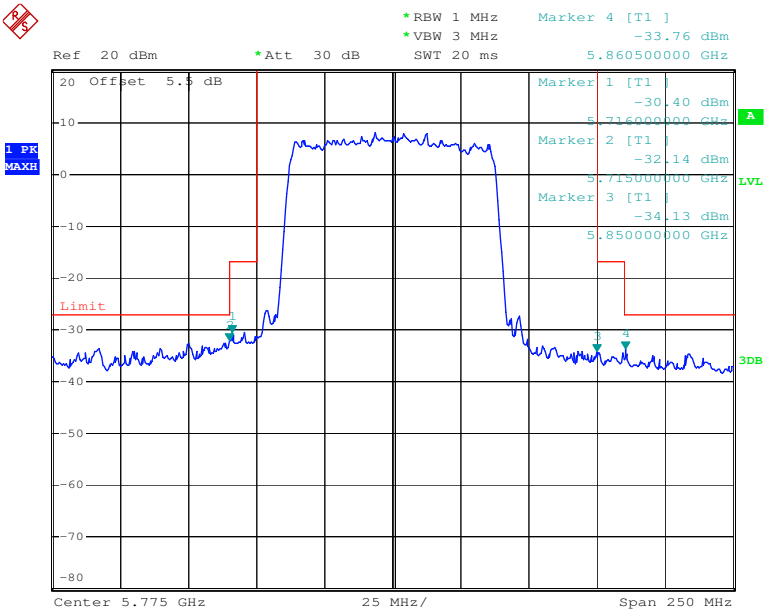
Date: 12.DEC.2015 13:42:10

802.11n ht40 Band Edge, Right Side



Date: 12.DEC.2015 13:44:48

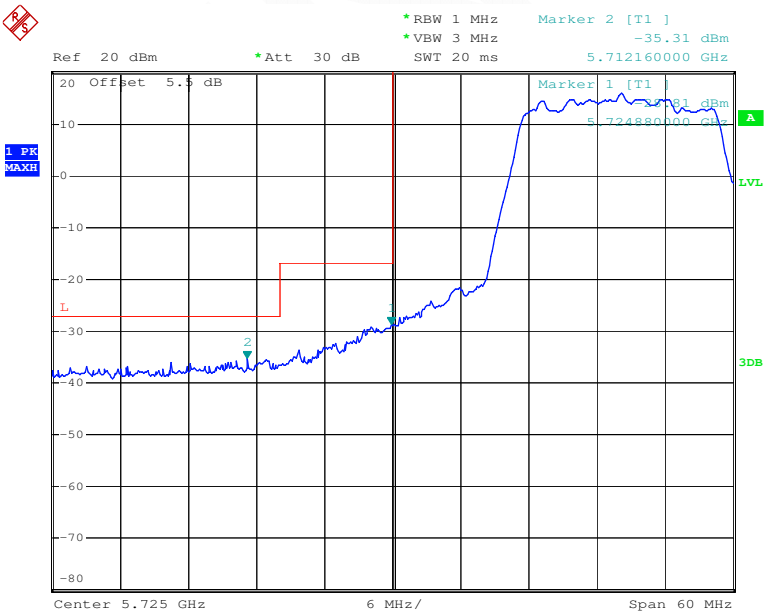
802.11 AC80 Band Edge, Middle



Date: 12.DEC.2015 13:47:59

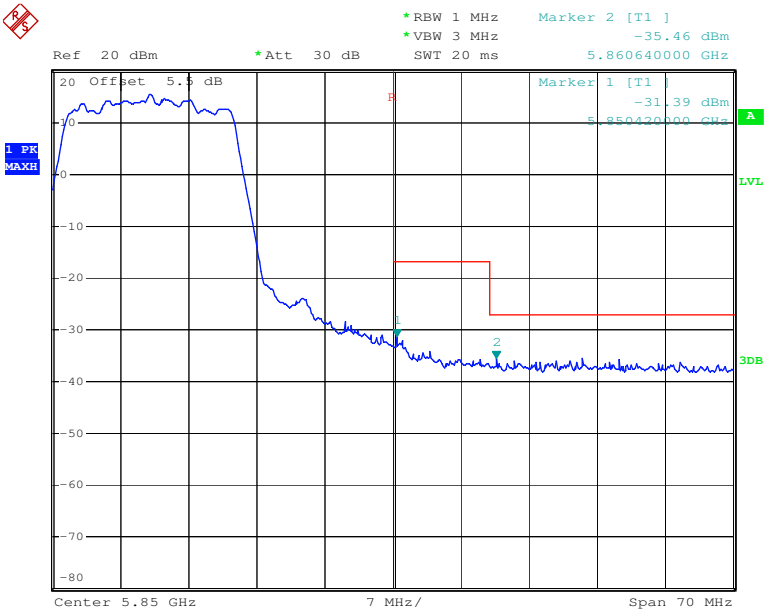
Antenna 1

802.11a Band Edge, Left Side



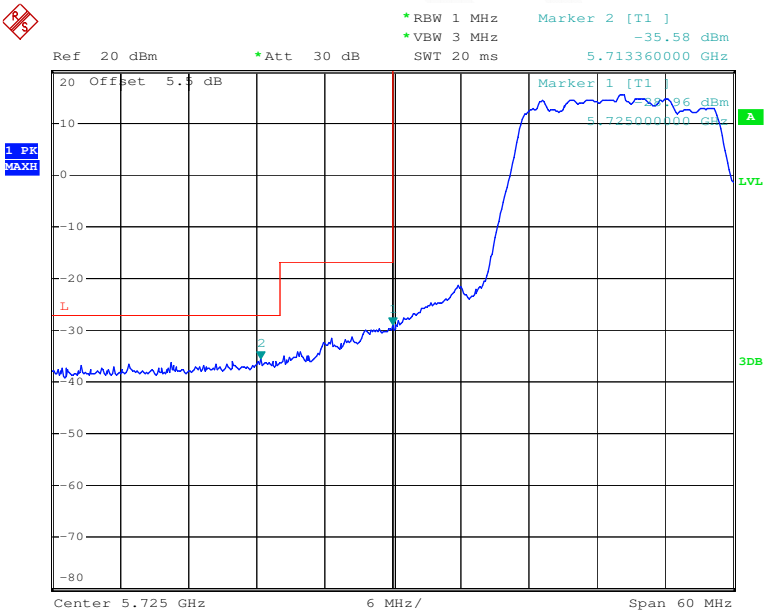
Date: 12.DEC.2015 12:06:36

802.11a Band Edge, Right Side



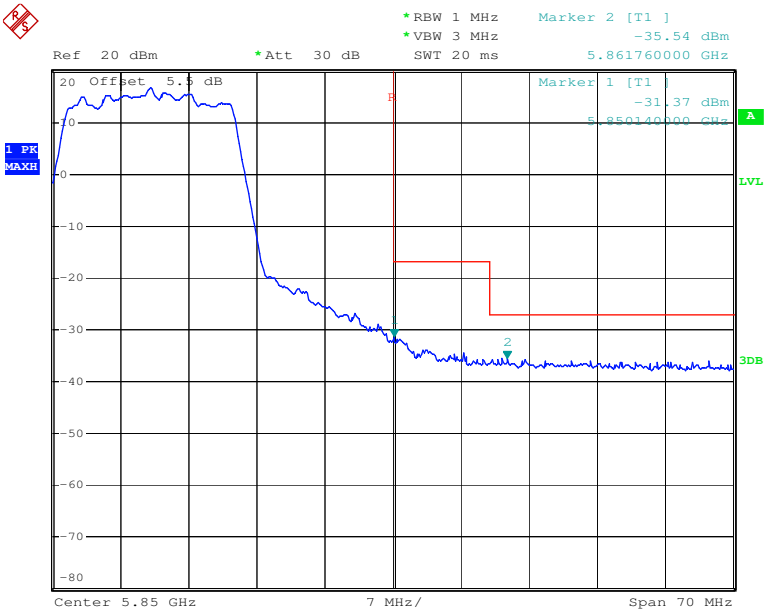
Date: 12.DEC.2015 12:11:08

802.11n ht20 Band Edge, Left Side



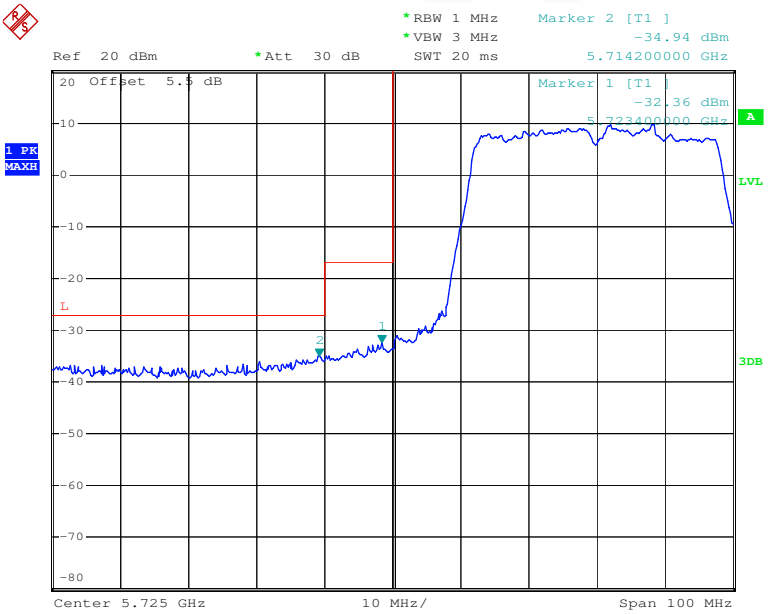
Date: 12.DEC.2015 12:14:22

802.11n ht20 Band Edge, Right Side



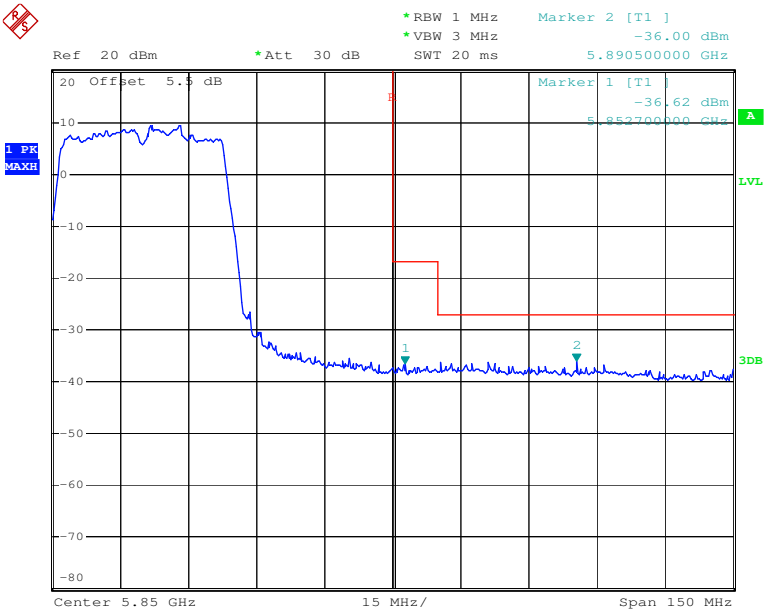
Date: 12.DEC.2015 12:19:40

802.11n ht40 Band Edge, Left Side



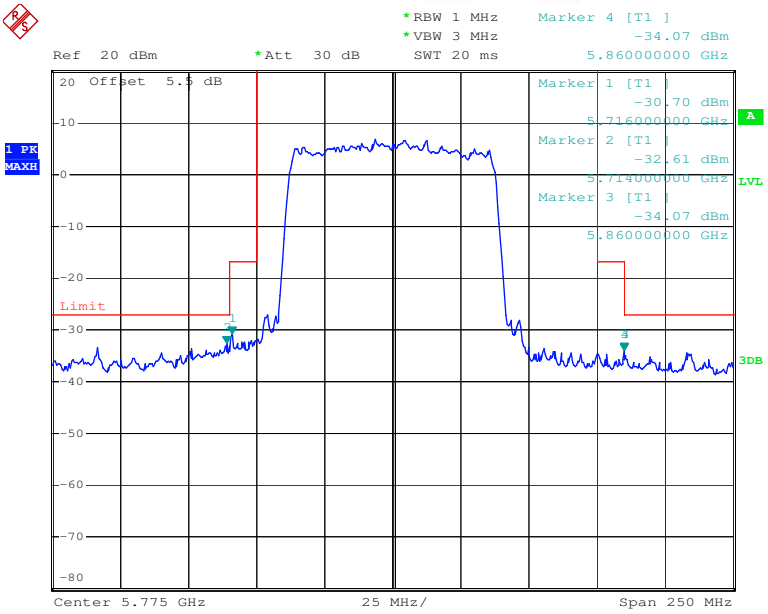
Date: 12.DEC.2015 12:22:11

802.11n ht40 Band Edge, Right Side



Date: 12.DEC.2015 12:25:28

802.11 AC80 Band Edge, Middle



Date: 12.DEC.2015 12:28:02

FCC §15.407(a) –EMISSION BANDWIDTH

Applicable Standard

15.407(a)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2015-05-06	2016-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01

Test Data

Environmental Conditions

Temperature:	21.8 °C
Relative Humidity:	51 %
ATM Pressure:	101.2 kPa

The testing was performed by Allen Qiao on 2015-12-12 to 2016-02-17.

Test Result: Pass.

Please refer to the following tables and plots.

Test mode: Transmitting

5150~5250MHz Band:

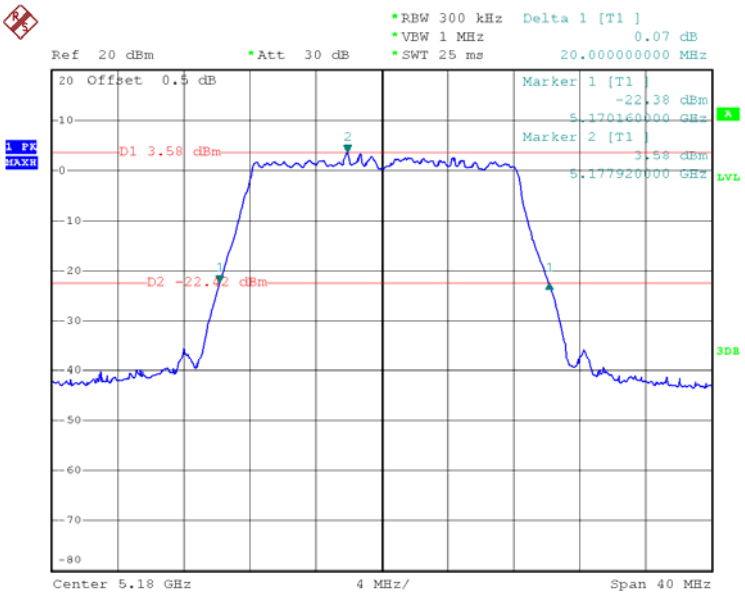
Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
			Antenna 0	Antenna 1
802.11 a	Low	5180	20	20.8
	Middle	5200	20.08	20.4
	High	5240	19.76	20
802.11 n20	Low	5180	20.32	20.4
	Middle	5200	20.4	20.32
	High	5240	20.32	20
802.11 n40	Low	5190	39.84	40.48
	High	5230	40	40
802.11n ac80	Middle	5210	80	80.96

5725~5850MHz Band:

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Limits (MHz)
			Antenna 0	Antenna 1	
802.11 a	Low	5745	17.6	17.6	0.5
	Middle	5785	17.68	17.6	0.5
	High	5825	17.68	17.68	0.5
802.11 n20	Low	5745	17.6	17.68	0.5
	Middle	5785	17.6	17.68	0.5
	High	5825	17.68	17.68	0.5
802.11 n40	Low	5755	36.48	36.48	0.5
	High	5795	36.64	36.64	0.5
802.11n ac80	Middle	5775	75.84	75.84	0.5

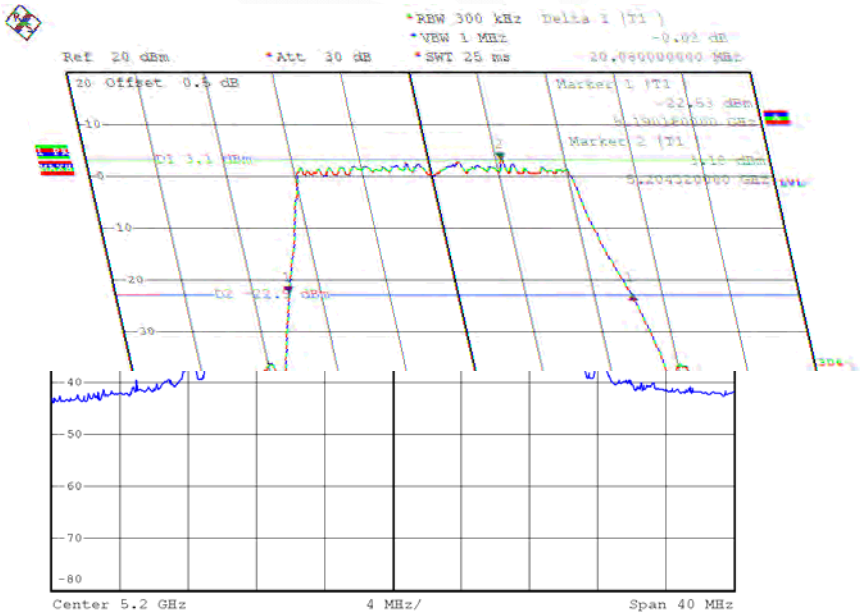
5150~5250MHz 26dB Bandwidth:
Antenna 0:

802.11a Low Channel



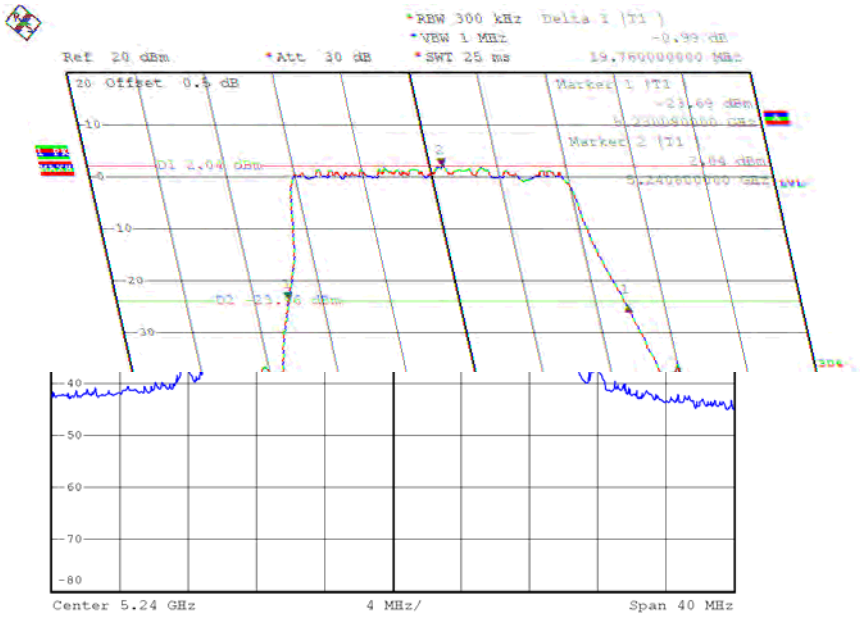
Date: 29.JAN.2016 16:54:52

802.11a Middle Channel



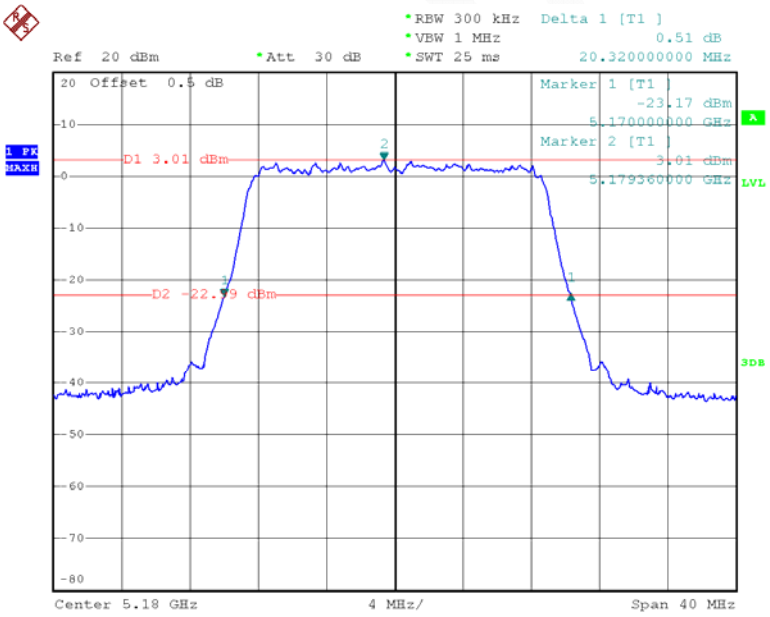
Date: 29.JAN.2016 16:56:35

802.11a High Channel



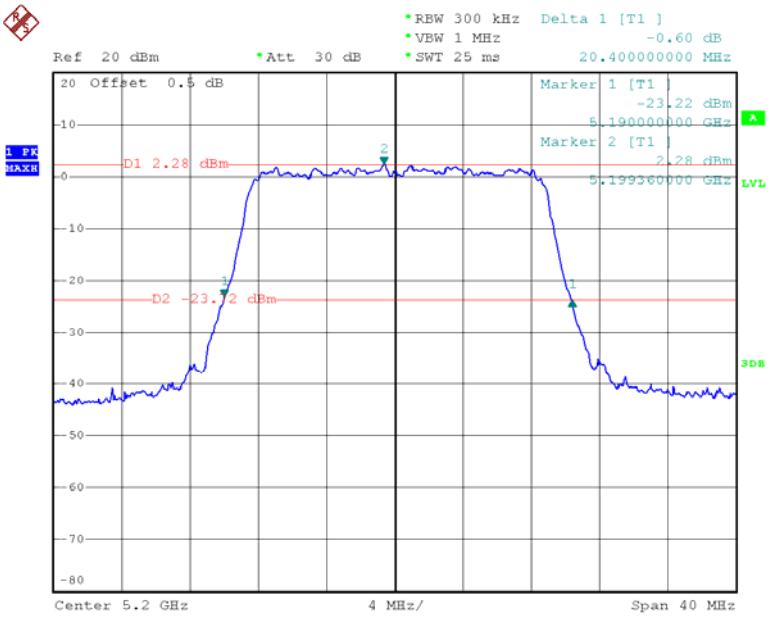
Date: 29.JAN.2016 17:56:38

802.11n ht20 Low Channel



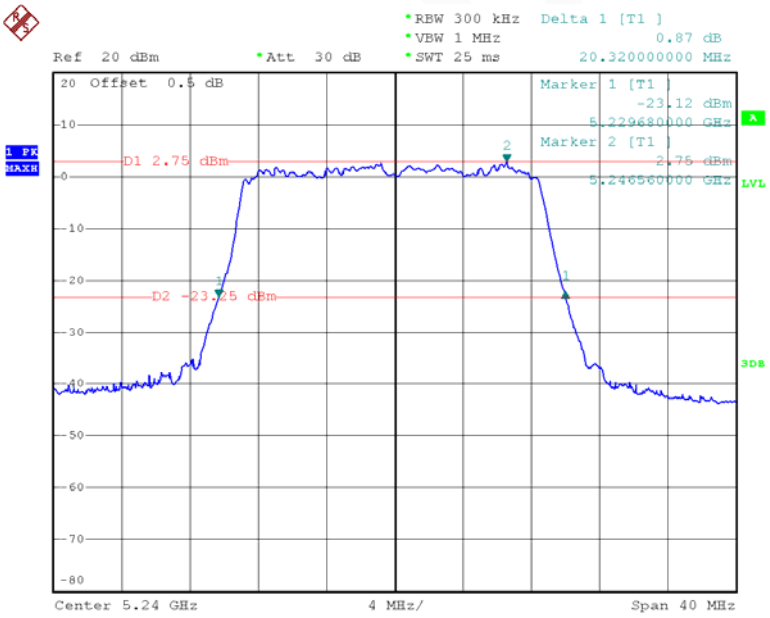
Date: 29.JAN.2016 17:05:11

802.11n ht20 Middle Channel



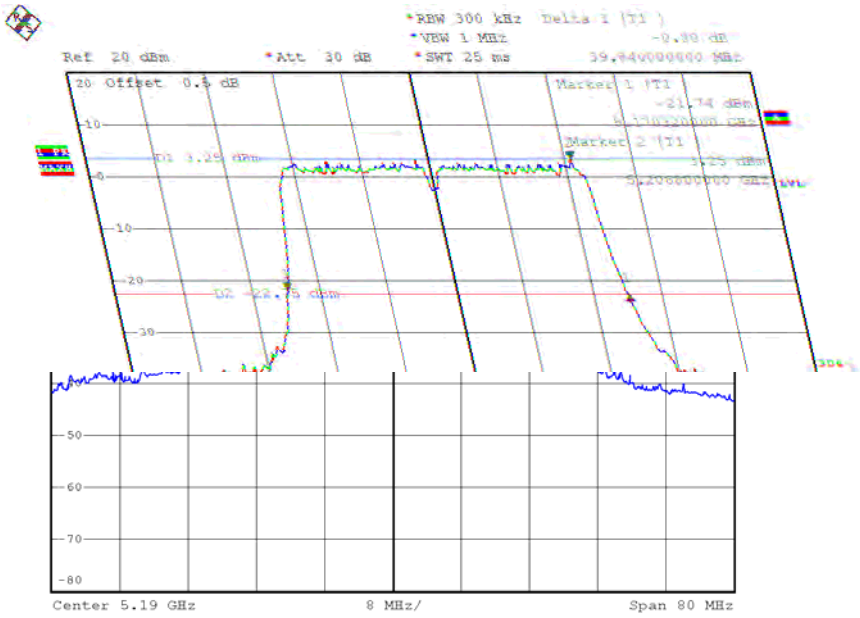
Date: 29.JAN.2016 17:06:24

802.11n ht20 High Channel



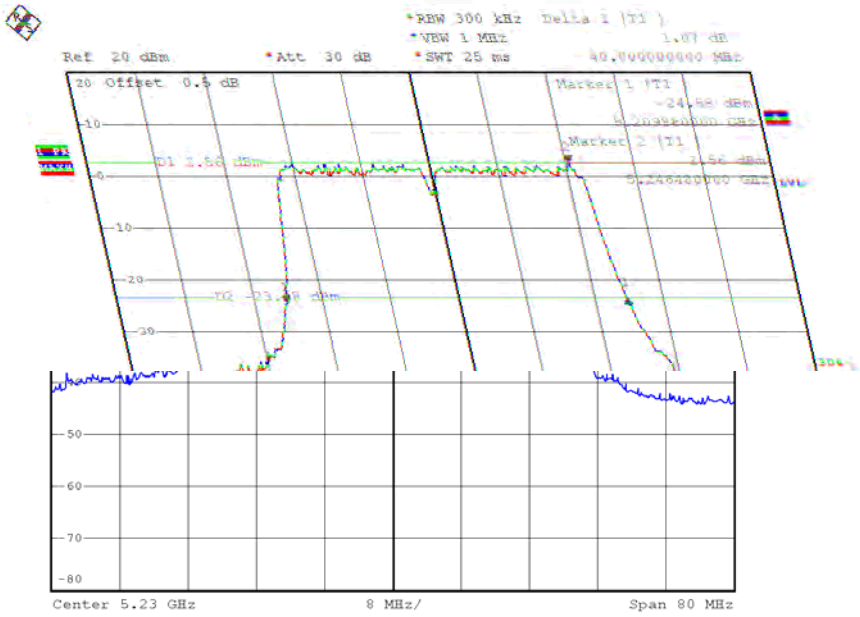
Date: 29.JAN.2016 18:02:32

802.11n ht40 Low Channel



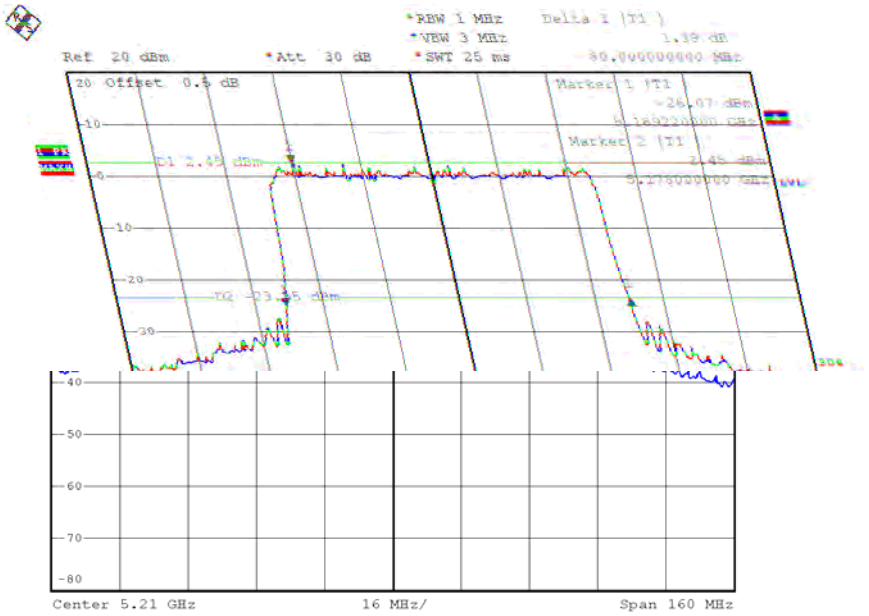
Date: 29.JAN.2016 17:28:33

802.11n ht40 High Channel



Date: 29.JAN.2016 17:37:15

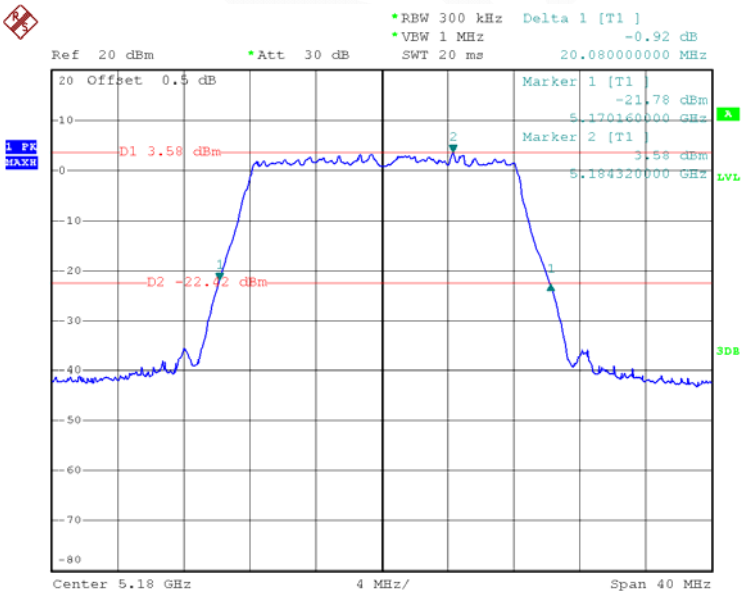
802.11n AC80 Middle Channel



Date: 29.JAN.2016 17:46:01

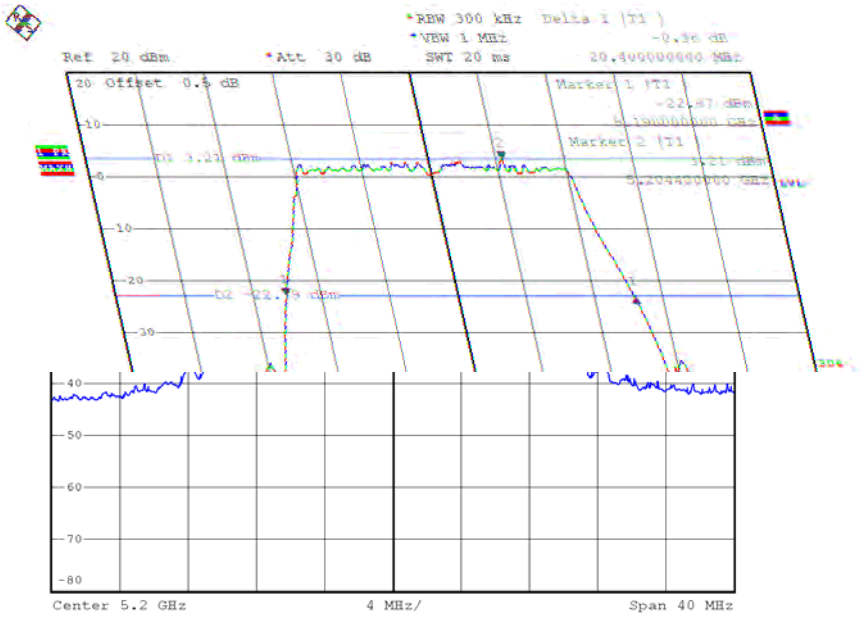
Antenna 1:

802.11a Low Channel



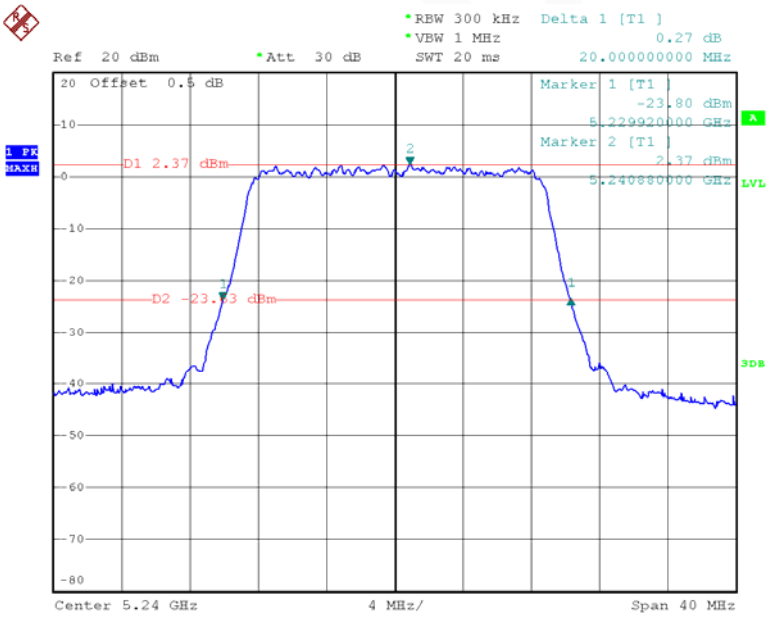
Date: 17.FEB.2016 09:39:05

802.11a Middle Channel



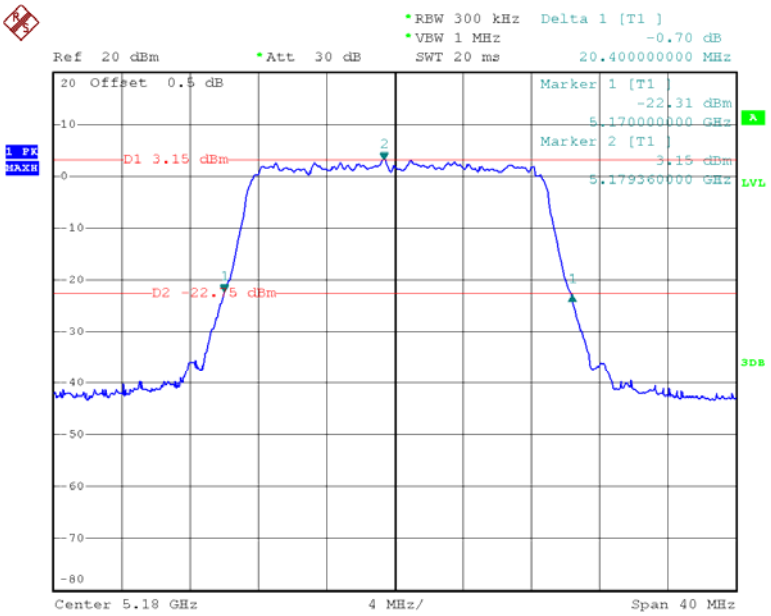
Date: 17.FEB.2016 09:41:10

802.11a High Channel



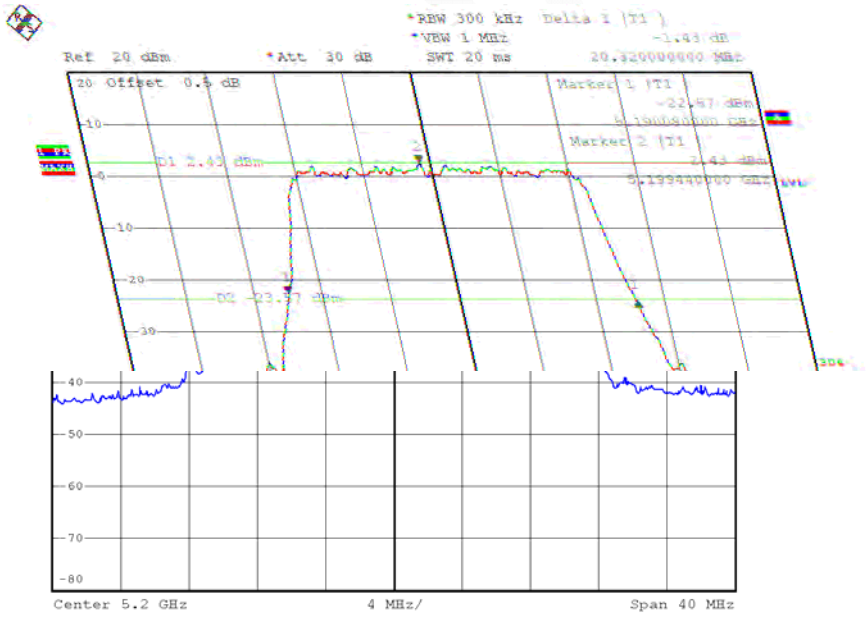
Date: 17.FEB.2016 10:06:47

802.11n ht20 Low Channel



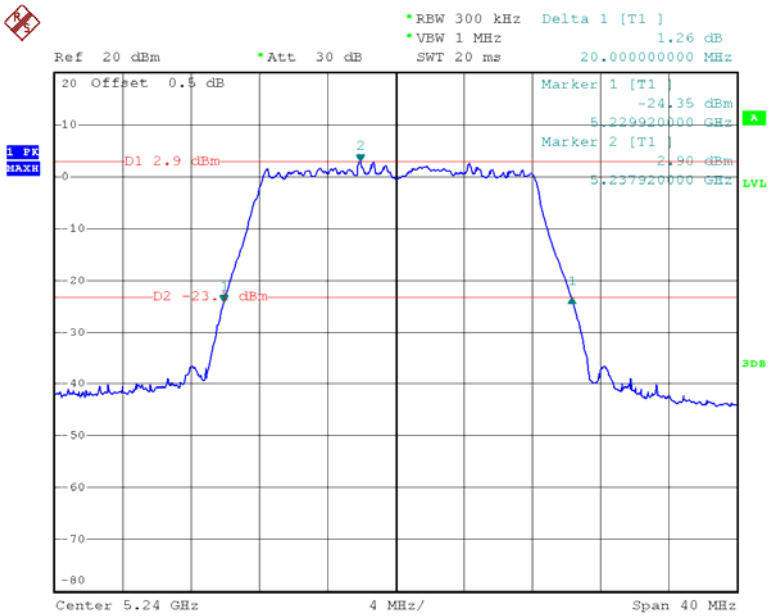
Date: 17.FEB.2016 09:44:19

802.11n ht20 Middle Channel



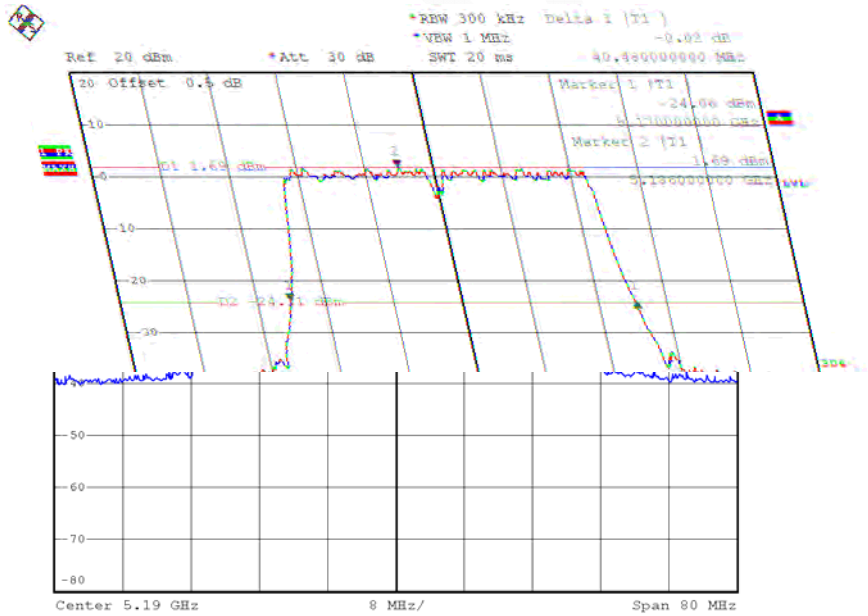
Date: 17.FEB.2016 10:52:11

802.11n ht20 High Channel



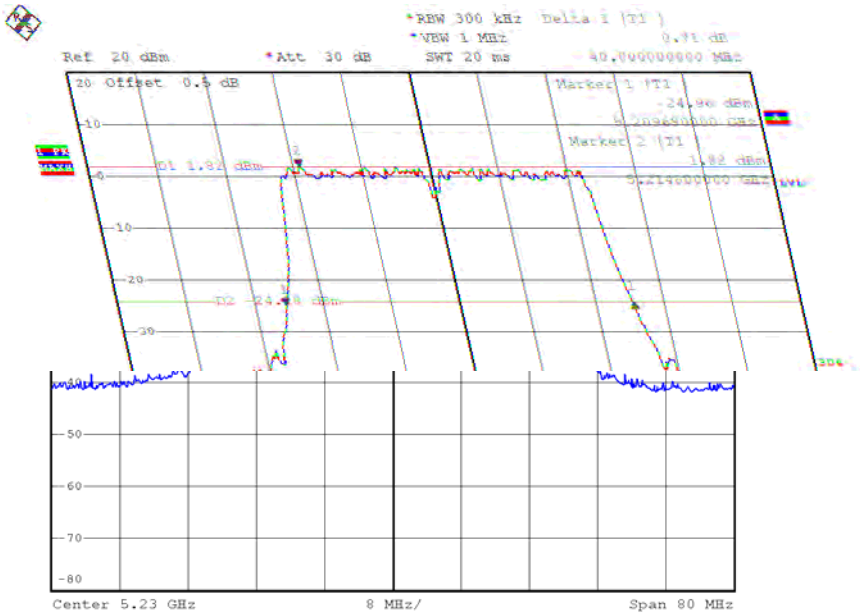
Date: 17.FEB.2016 10:08:27

802.11n ht40 Low Channel



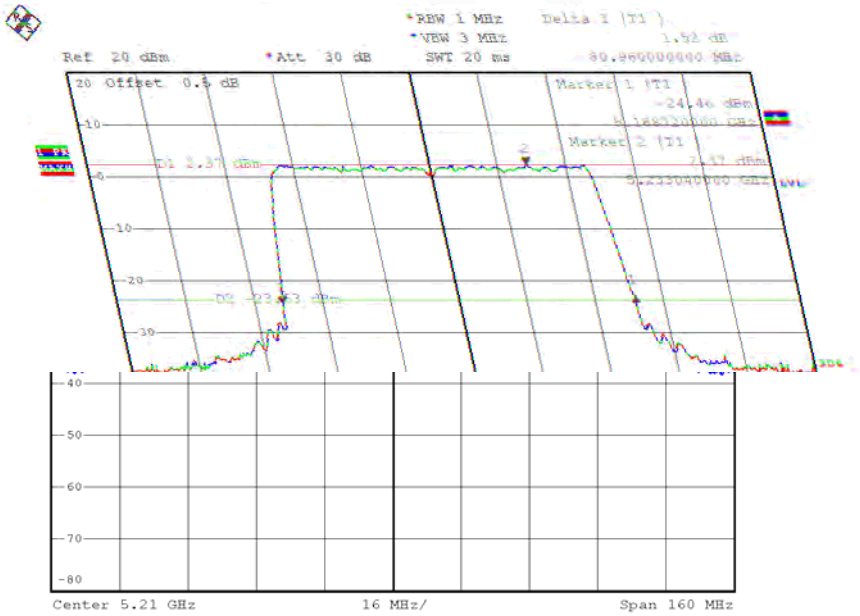
Date: 17.FEB.2016 10:20:37

802.11n ht40 High Channel



Date: 17.FEB.2016 10:22:16

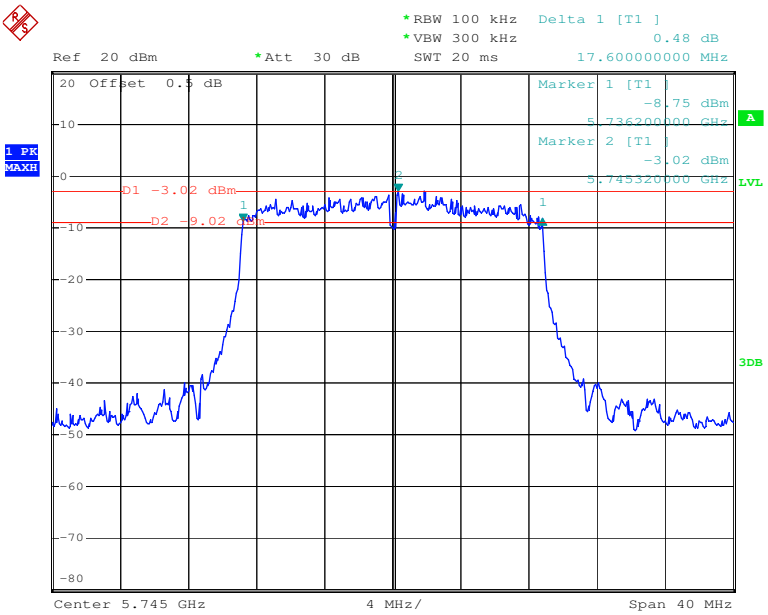
802.11n AC80 Middle Channel



Date: 17.FEB.2016 10:27:29

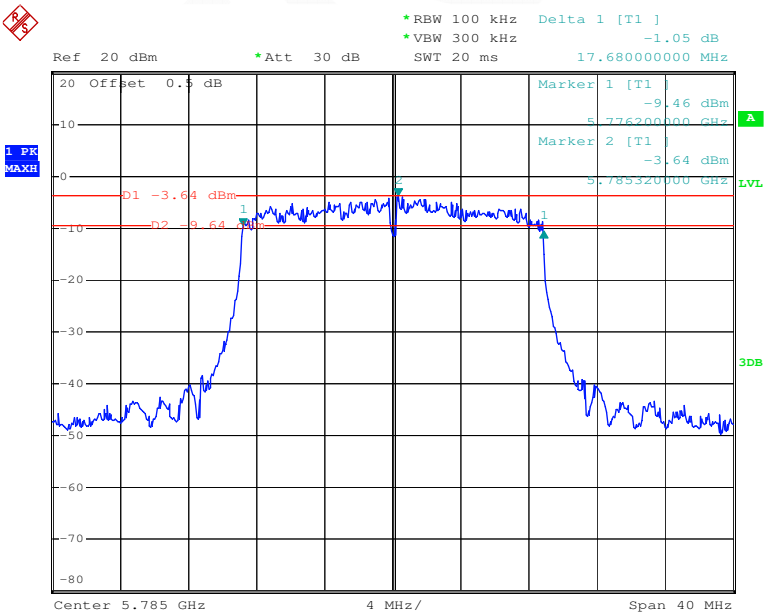
5725~5850MHz 6dB Bandwidth:
Antenna 0:

802.11a Low Channel



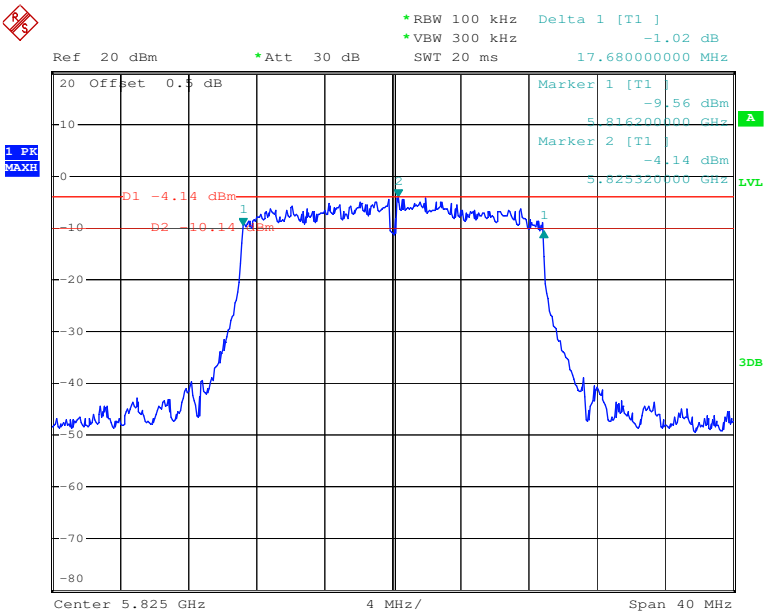
Date: 12.DEC.2015 13:19:32

802.11a Middle Channel



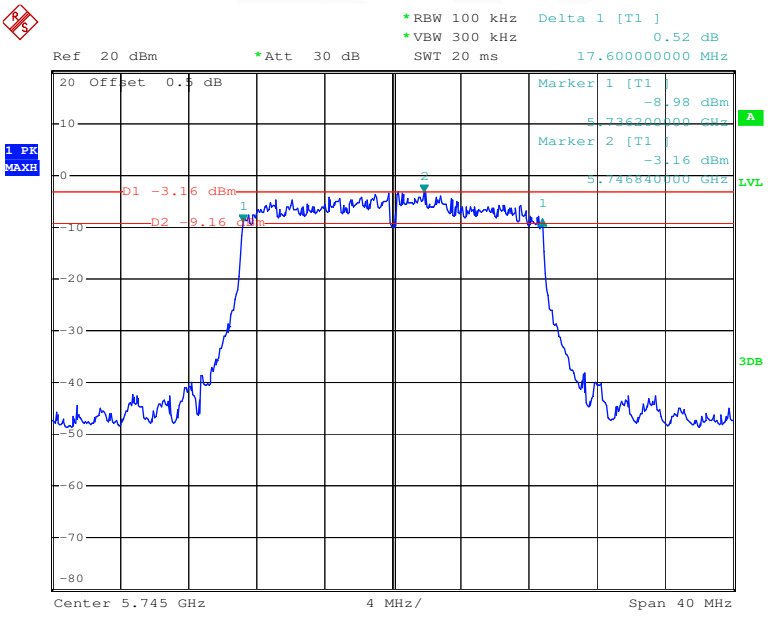
Date: 12.DEC.2015 13:22:04

802.11a High Channel



Date: 12.DEC.2015 13:25:05

802.11n ht20 Low Channel



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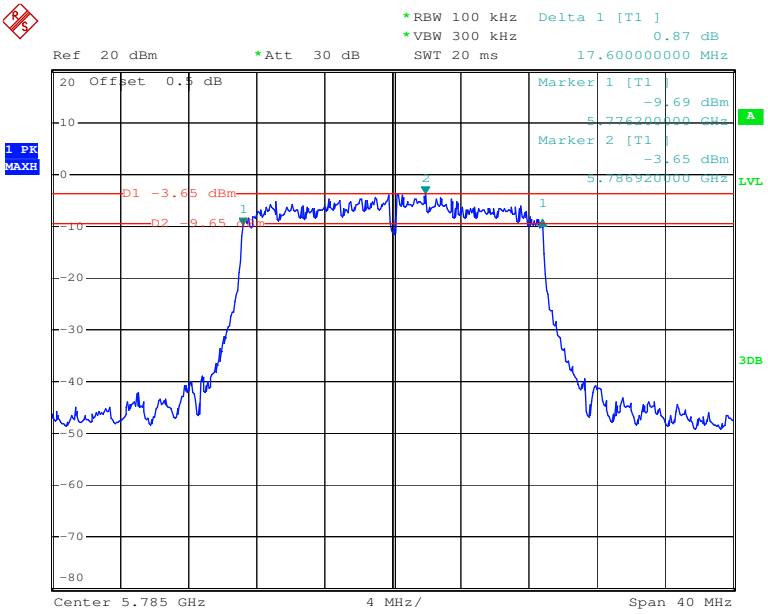
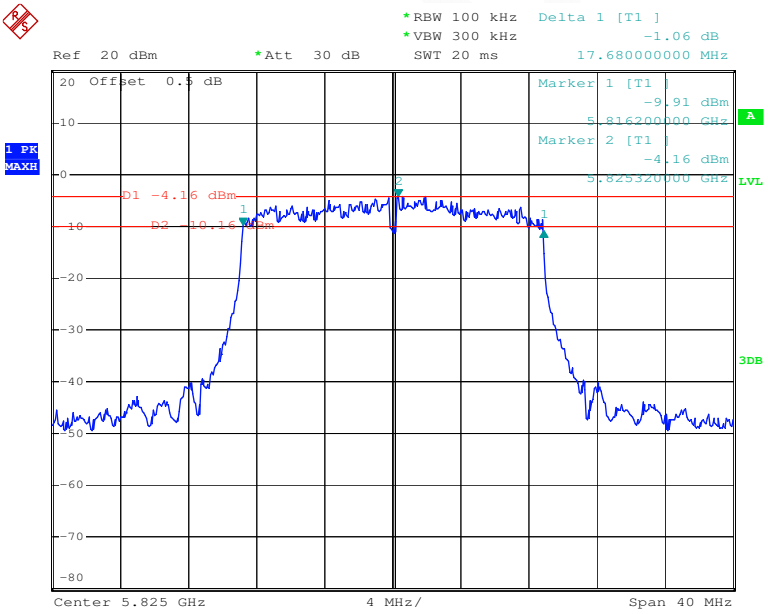
802.11n ht20 Middle Channel



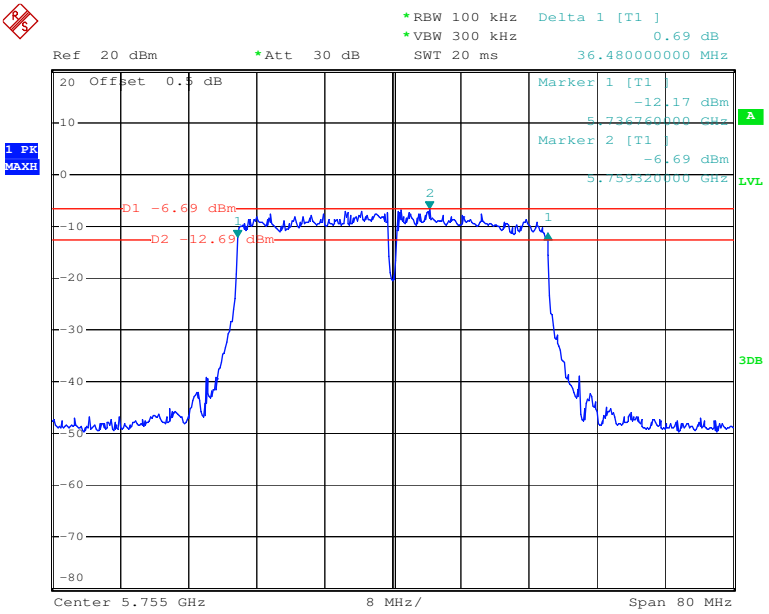
Date: 12.DEC.2015 13:38:49

802.11n ht20 High Channel



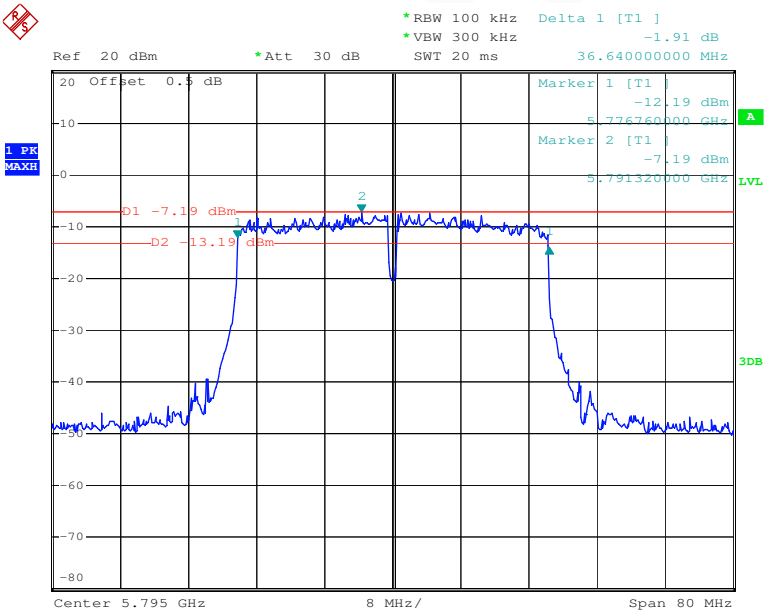
Date: 12.DEC.2015 13:36:35

802.11n ht40 Low Channel



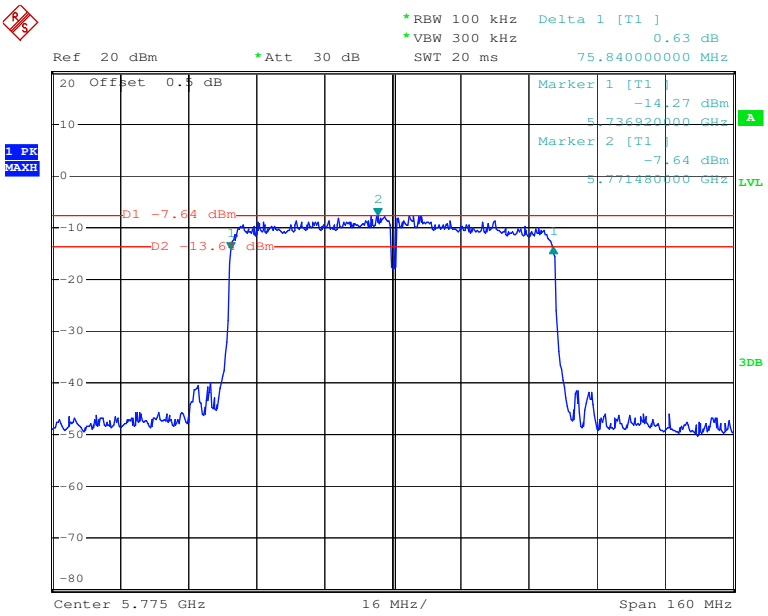
Date: 12.DEC.2015 13:41:00

802.11n ht40 High Channel



Date: 12.DEC.2015 13:43:32

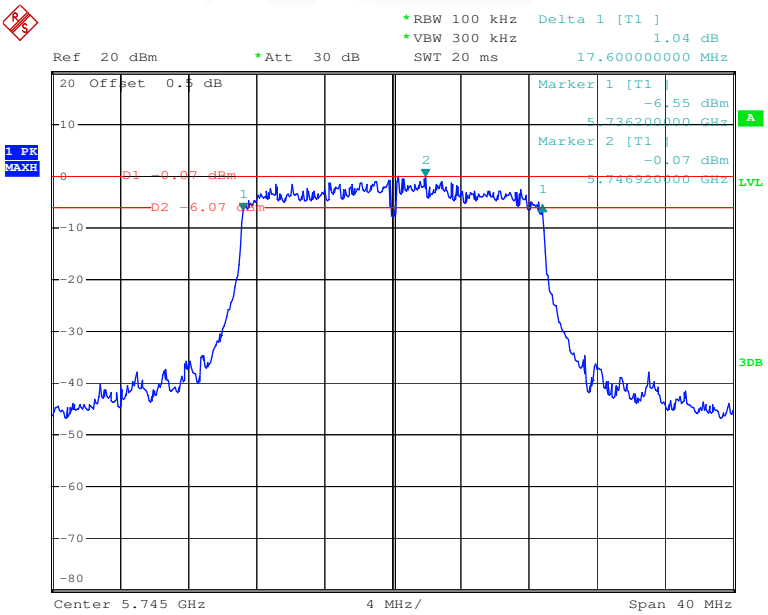
802.11n AC80 Middle Channel



Date: 12.DEC.2015 13:46:40

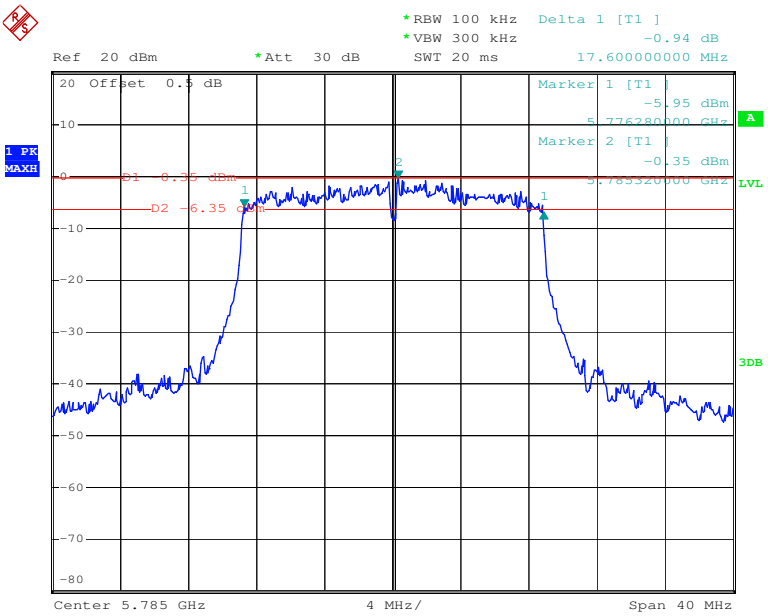
Antenna 1:

802.11a Low Channel



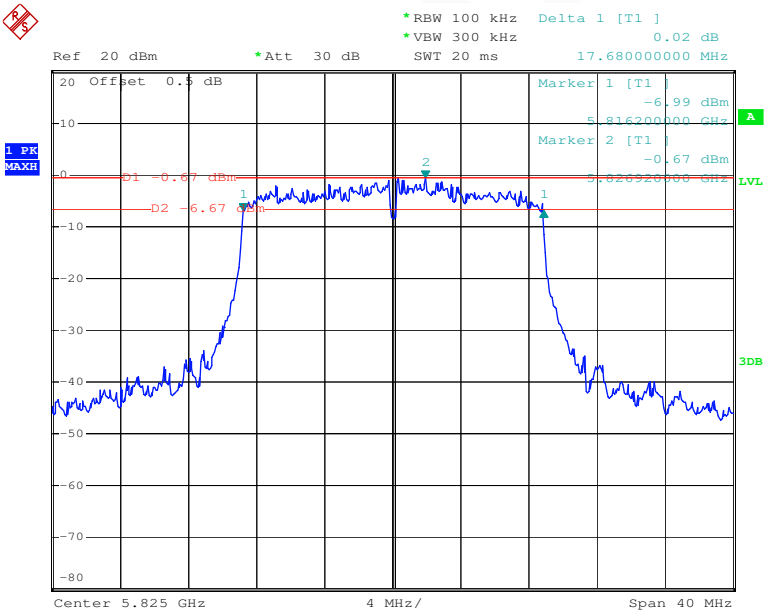
Date: 12.DEC.2015 12:05:27

802.11a Middle Channel



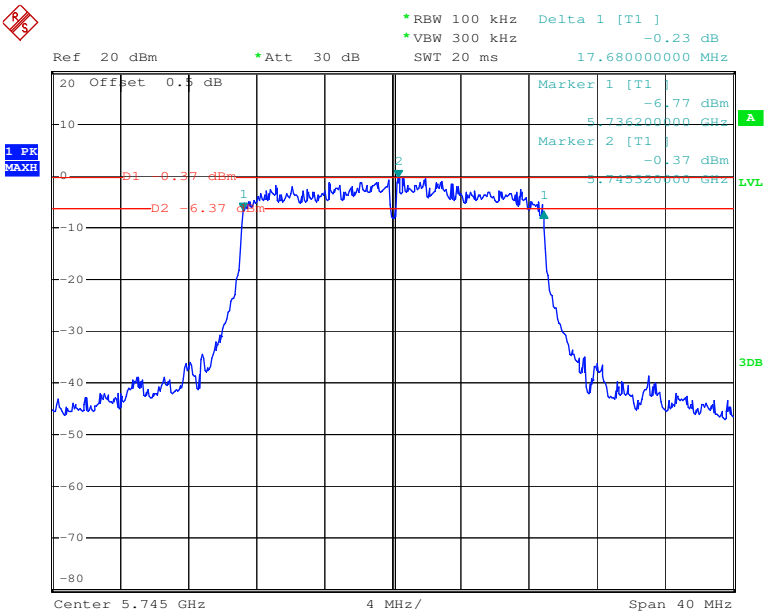
Date: 12.DEC.2015 12:07:54

802.11a High Channel



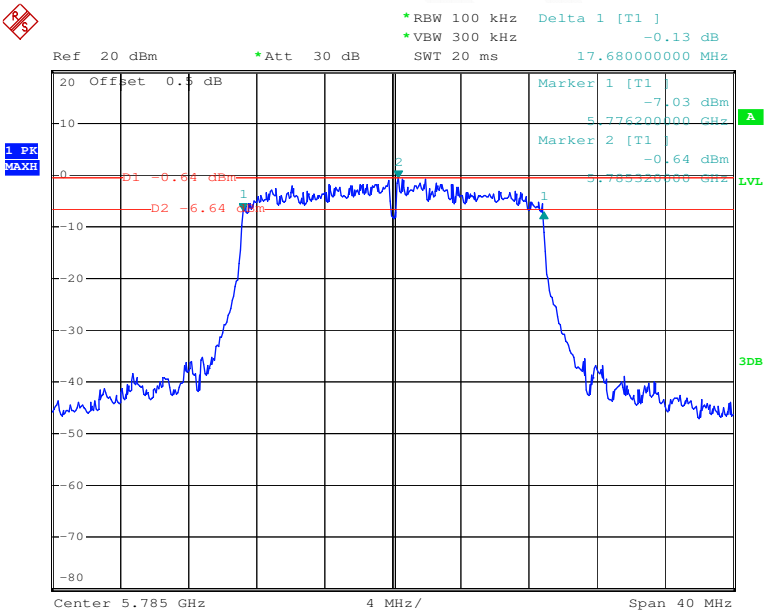
Date: 12.DEC.2015 12:09:59

802.11n ht20 Low Channel



Date: 12.DEC.2015 12:13:06

802.11n ht20 Middle Channel



Date: 12.DEC.2015 12:15:59

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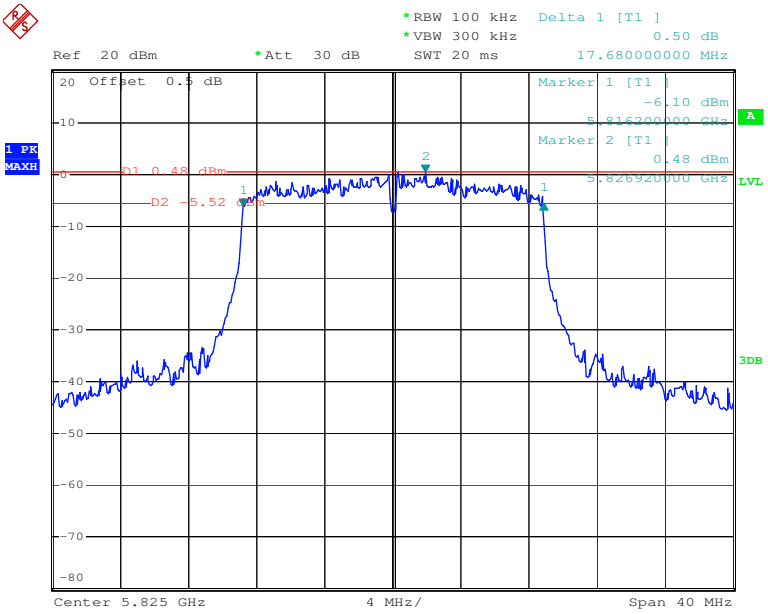
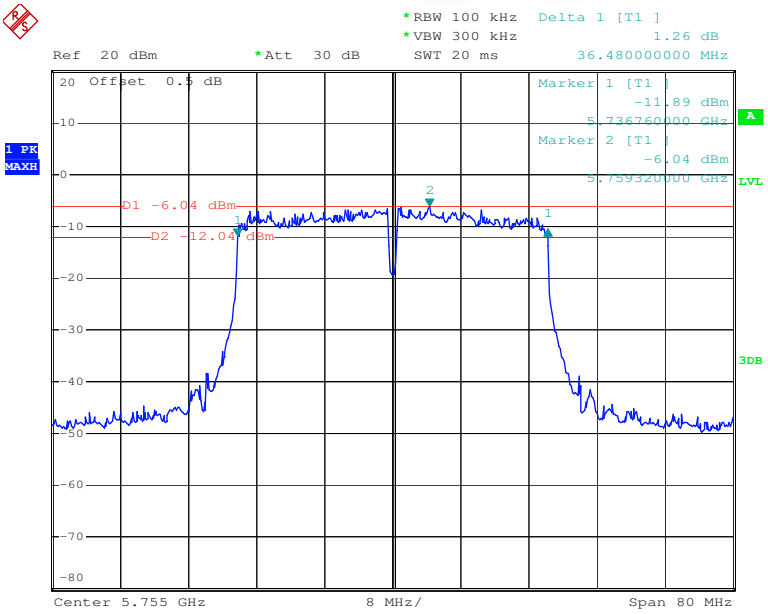


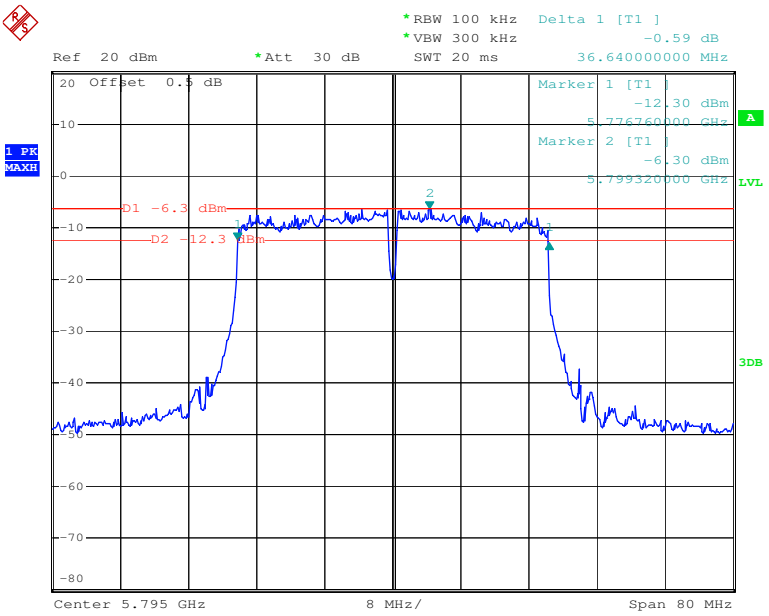
Date: 12.DEC.2015 12:18:23

802.11n ht40 Low Channel



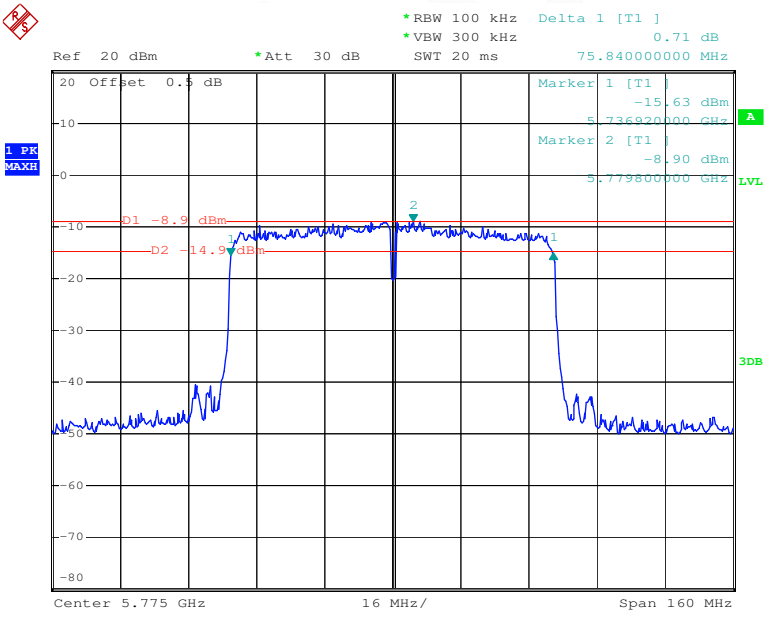
Date: 12.DEC.2015 12:20:55

802.11n ht40 High Channel



Date: 12.DEC.2015 12:24:07

802.11n AC80 Middle Channel



Date: 12.DEC.2015 12:26:45

FCC §15.407(a) (1) (ii) (4) –MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

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

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

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

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54210016	2015-11-03	2016-11-03
Agilent	Wideband Power Sensor	N1921A	MY54170013	2015-11-03	2016-11-03
Agilent	P-Series Power Meter	N1912A	MY5000448	2015-11-03	2016-11-03

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01

Test Data

Environmental Conditions

Temperature:	21.8 °C
Relative Humidity:	51 %
ATM Pressure:	101.2 kPa

The testing was performed by Allen Qiao on 2015-12 -12.

Test Mode: Transmitting

Band	Mode	Channel	Frequency (MHz)	Conducted RMS Output Power (dBm)		Total (dBm)	Limit (dBm)
				Antenna 0	Antenna 1		
5150-5250MHz	802.11a	Low	5180	10.81	14.86	16.3	30
		Middle	5200	10.46	15.32	16.55	30
		High	5240	10.81	14.63	16.14	30
	802.11 n20	Low	5180	10.38	14	15.57	30
		Middle	5200	10.27	14.65	16	30
		High	5240	10.98	14.11	15.83	30
	802.11 n40	Low	5190	10.19	13.37	15.08	30
		High	5230	10.76	13.9	15.62	30
	802.11n ac80	Middle	5210	11.6	13.5	15.66	30
5725-5850MHz	802.11a	Low	5745	9.65	12.59	14.37	30
		Middle	5785	8.96	12.17	13.87	30
		High	5825	8.68	12.06	13.7	30
	802.11 n20	Low	5745	9.5	12.43	14.22	30
		Middle	5785	9.09	12.08	13.85	30
		High	5825	8.66	13.2	14.51	30
	802.11 n40	Low	5755	9.2	9.89	12.57	30
		High	5795	8.85	9.69	12.3	30
	802.11n ac80	Middle	5775	11.5	10.35	13.97	30

Note: The device employed 2 pcs 5dBi external antenna, and employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on IEEE 802.11 devices:

Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

So:

Directional gain = G_{ANT} + *Array Gain = 5dBi*

FCC §15.407(a) - POWER SPECTRAL DENSITY

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

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

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

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

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

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

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

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2015-05-06	2016-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	21.8 °C
Relative Humidity:	51 %
ATM Pressure:	101.2 kPa

The testing was performed by Allen Qiao on 2015-12 -12.

Test Mode: Transmitting

Test Result:Compliance.Please refer to the following table and plot.

5150~5250MHz:

Mode	Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)		Total (dBm/MHz)	Limit (dBm/MHz)
			Antenna 0	Antenna 1		
802.11 a	Low	5180	0.17	4.3	5.72	15
	Middle	5200	-0.13	4.72	5.95	15
	High	5240	0.16	4	5.5	15
802.11 n20	Low	5180	-0.18	3.38	4.97	15
	Middle	5200	-0.31	4.02	5.38	15
	High	5240	0.41	3.48	5.22	15
802.11 n40	Low	5190	-3.5	-0.42	1.32	15
	High	5230	-2.87	0.27	1.99	15
802.11 ac80	Middle	5210	-4.94	-2.95	-0.82	15

5725~5850MHz:

Mode	Channel	Frequency (MHz)	Power Spectral Density(dBm/300kHz)		Total (dBm/300k Hz)	Total (dBm/500k Hz)	Limit (dBm/500k Hz)
			Antenna 0	Antenna 1			
802.11 a	Low	5745	-4.69	-1.78	0.01	2.23	28
	Middle	5785	-5.14	-2.26	-0.46	1.76	28
	High	5825	-5.77	-2.45	-0.8	1.42	28
802.11 n20	Low	5745	-4.81	-1.96	-0.14	2.08	28
	Middle	5785	-5.16	-2.1	-0.36	1.86	28
	High	5825	-5.83	-1.24	0.06	2.28	28
802.11 n40	Low	5755	-8.38	-7.66	-4.99	-2.77	28
	High	5795	-8.86	-7.91	-5.35	-3.13	28
802.11 ac80	Middle	5775	-8.99	-10.25	-6.56	-4.34	28

Note 1: According to 789033 D02 General UNII Test Procedures New Rules v01, the test value for 5725-5850 MHz should add 10*log(500kHz/RBW)=2.22dBc to the measured result.

Note 2: The device employed 2 pcs 5dBi external antenna, and employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

Array Gain = 10 log (NANT/NSS) dB.

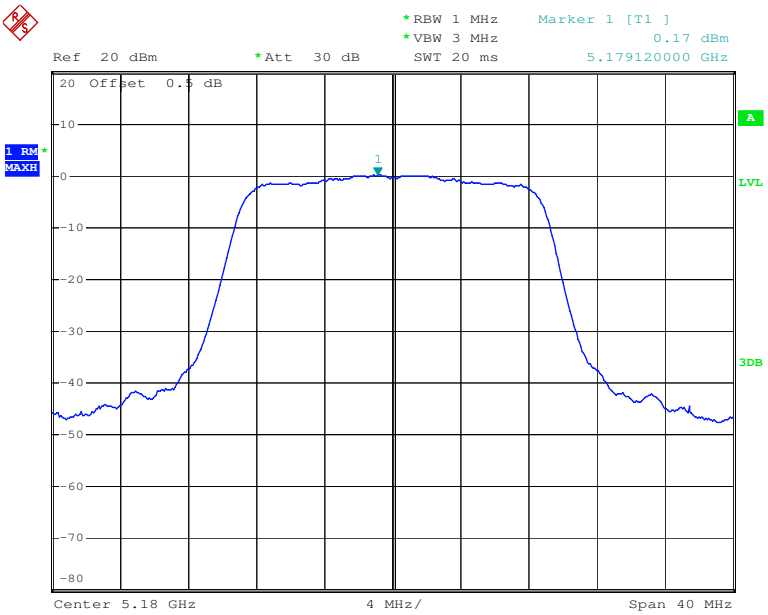
So:

Directional gain = G_{ANT} *+ Array Gain = 5+10*log (2) =5+3=8 dBi*

The Power density Limits was reduce 2dB (8-6=2dB)

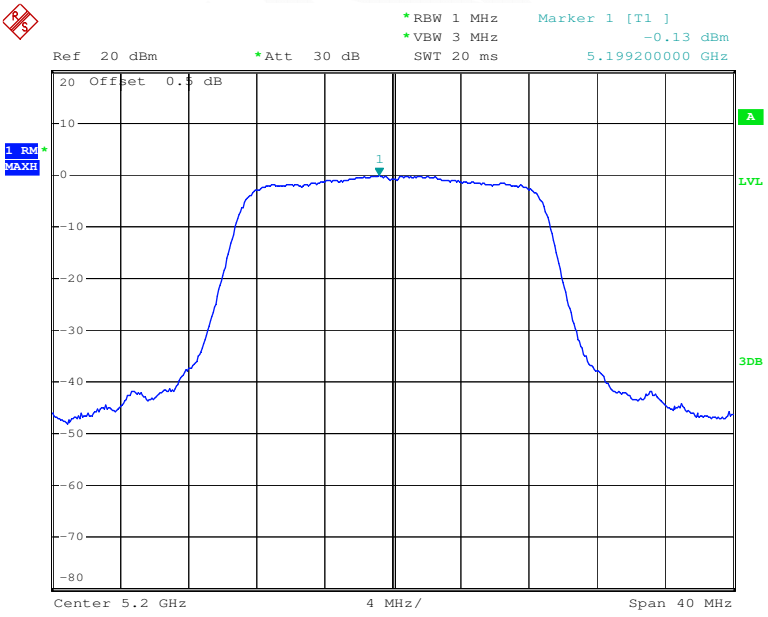
5150~5250MHz:
Antenna 0

Power Spectral Density, 802.11a Low Channel



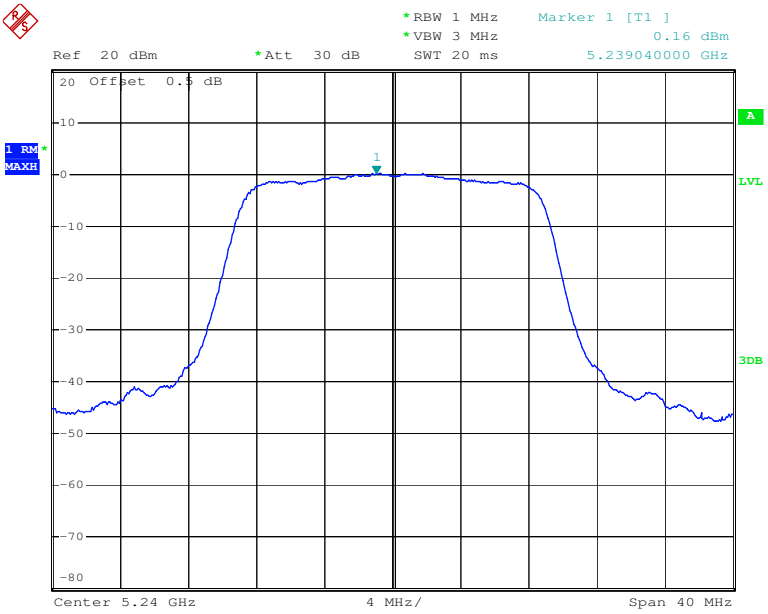
Date: 12.DEC.2015 12:52:21

Power Spectral Density, 802.11a Middle Channel



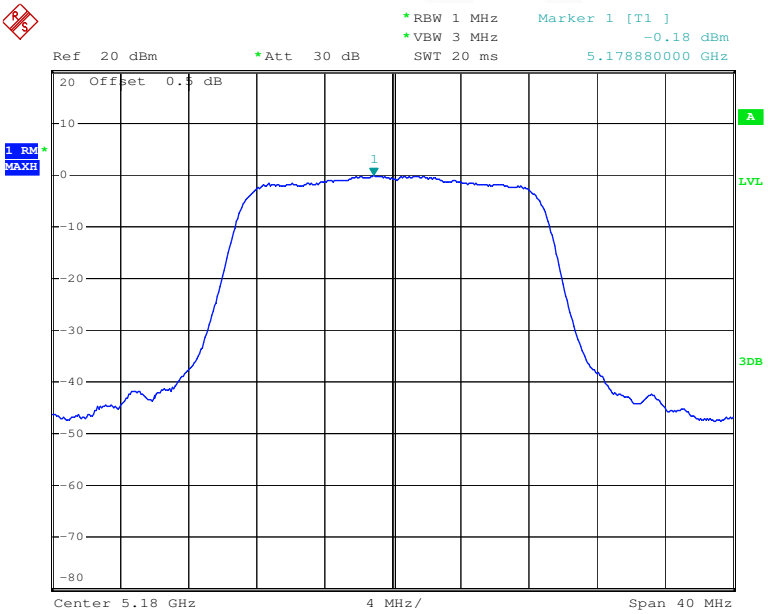
Date: 12.DEC.2015 12:57:30

Power Spectral Density, 802.11a High Channel



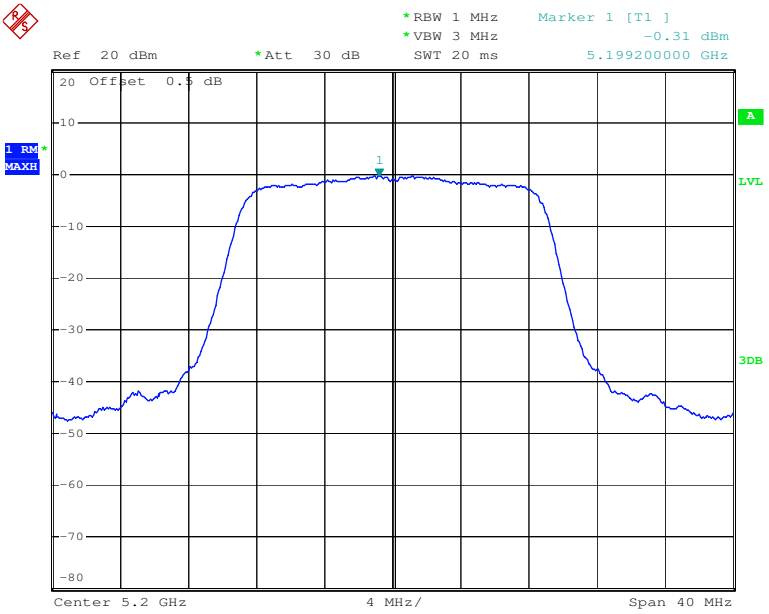
Date: 12.DEC.2015 12:59:21

Power Spectral Density, 802.11n ht20 Low Channel



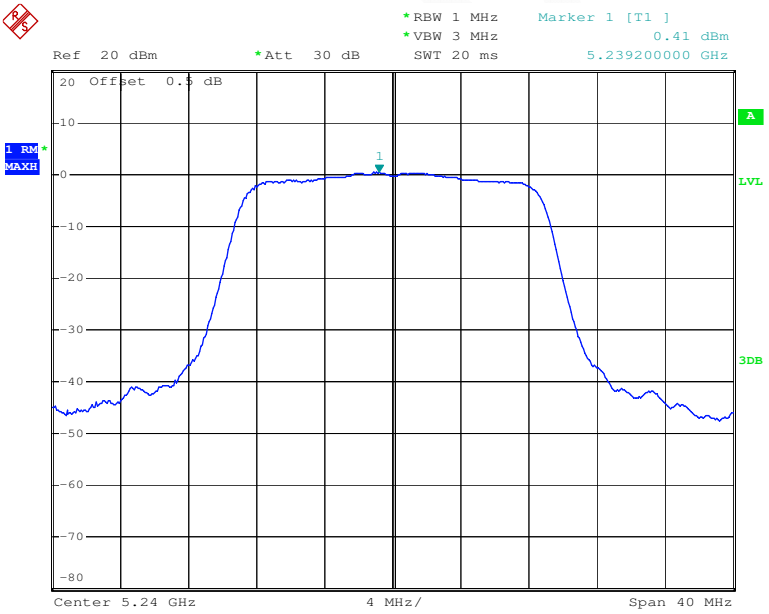
Date: 12.DEC.2015 13:02:08

Power Spectral Density, 802.11n ht20 Middle Channel



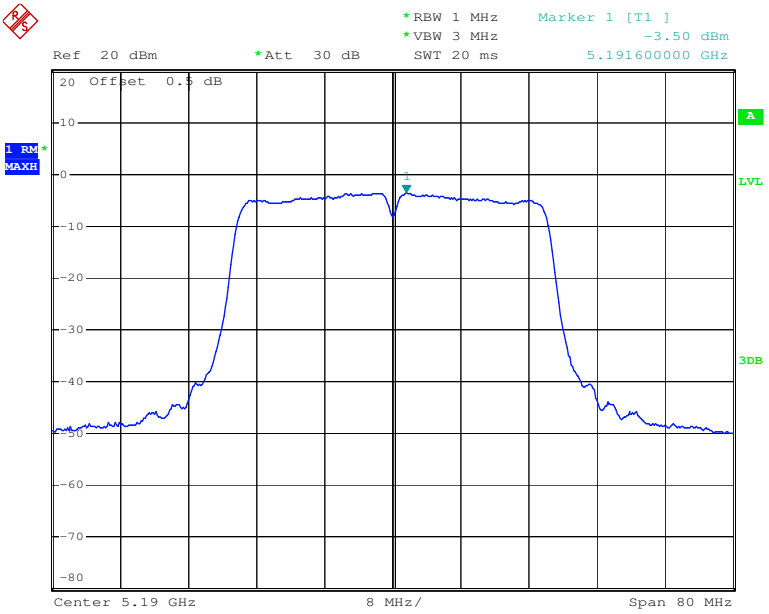
Date: 12.DEC.2015 13:04:20

Power Spectral Density, 802.11n ht20 High Channel



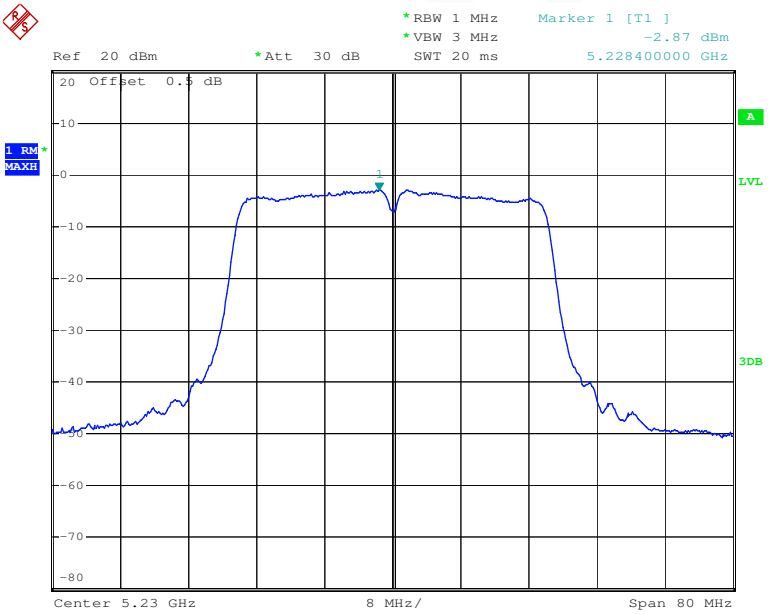
Date: 12.DEC.2015 13:06:22

Power Spectral Density, 802.11n ht40 Low Channel



Date: 12.DEC.2015 13:10:51

Power Spectral Density, 802.11n ht40 High Channel



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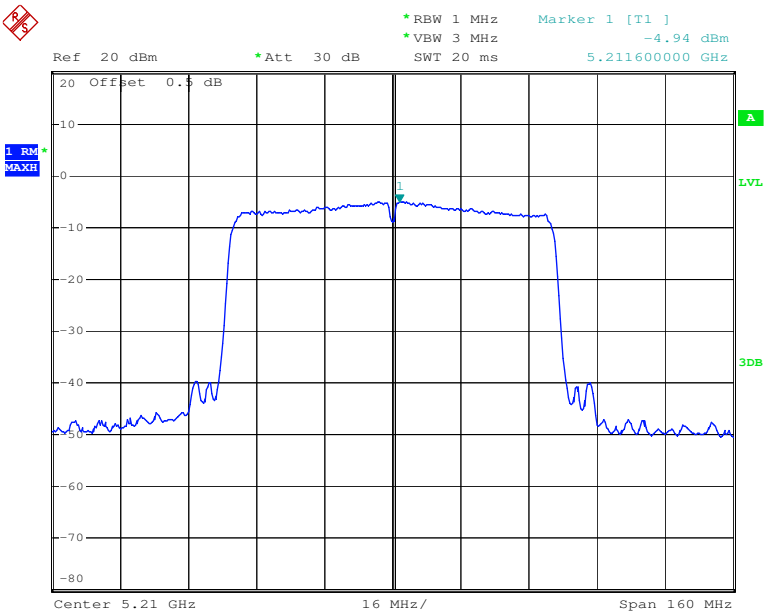
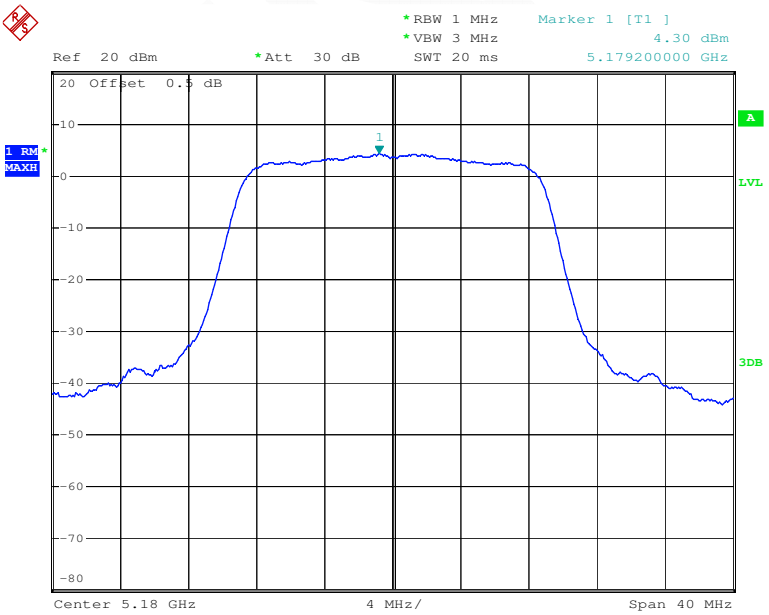
Power Spectral Density, 802.11n AC80 Middle Channel



Date: 12.DEC.2015 13:16:07

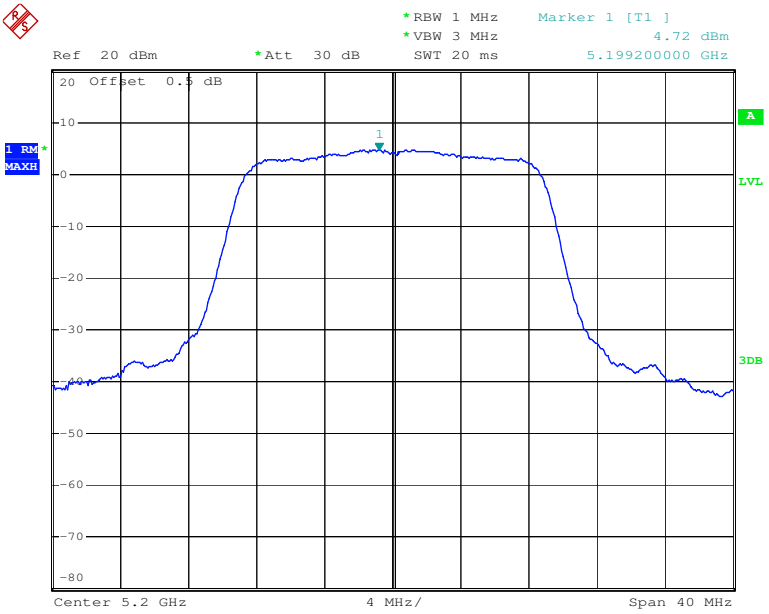
Antenna 1

Power Spectral Density, 802.11a Low Channel



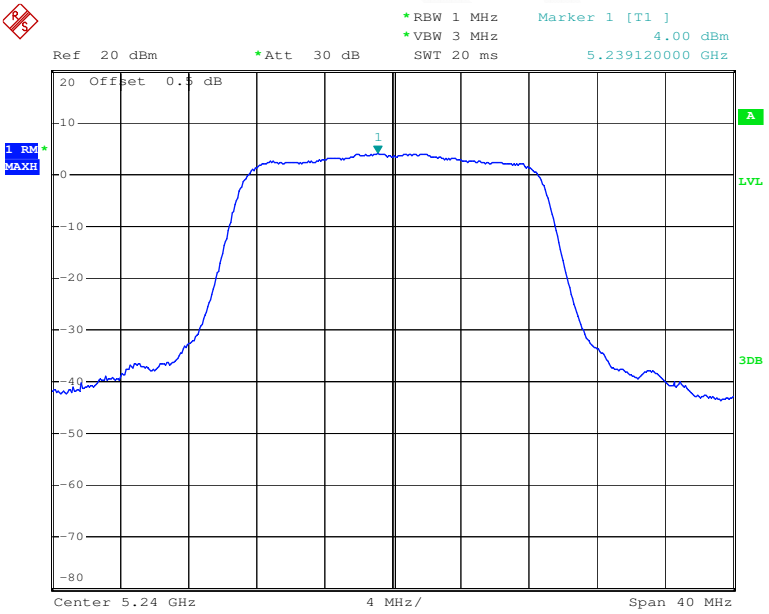
Date: 12.DEC.2015 11:43:45

Power Spectral Density, 802.11a Middle Channel



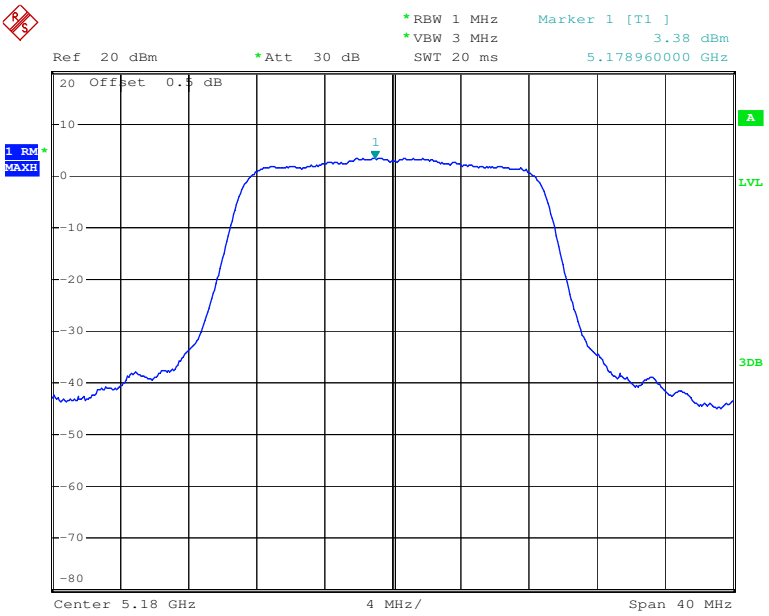
Date: 12.DEC.2015 11:46:01

Power Spectral Density, 802.11a High Channel



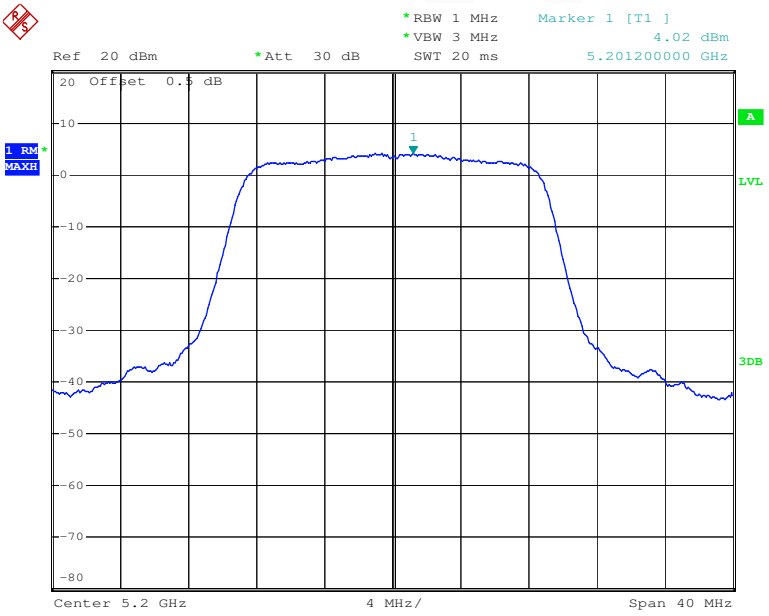
Date: 12.DEC.2015 11:47:50

Power Spectral Density, 802.11n ht20 Low Channel



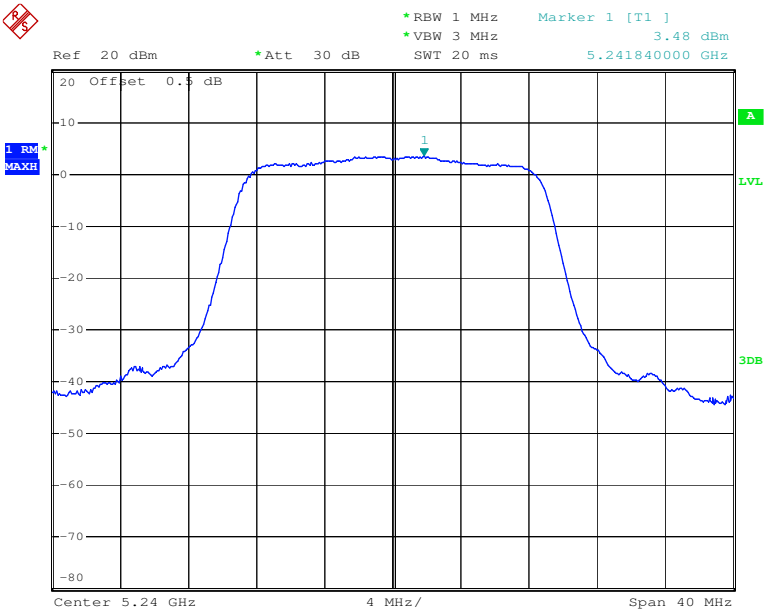
Date: 12.DEC.2015 11:51:41

Power Spectral Density, 802.11n ht20 Middle Channel



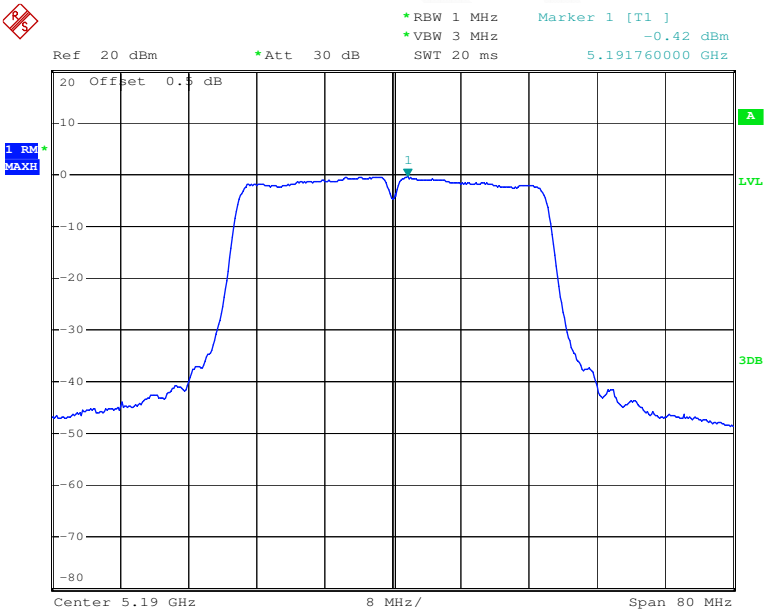
Date: 12.DEC.2015 11:54:06

Power Spectral Density, 802.11n ht20 High Channel



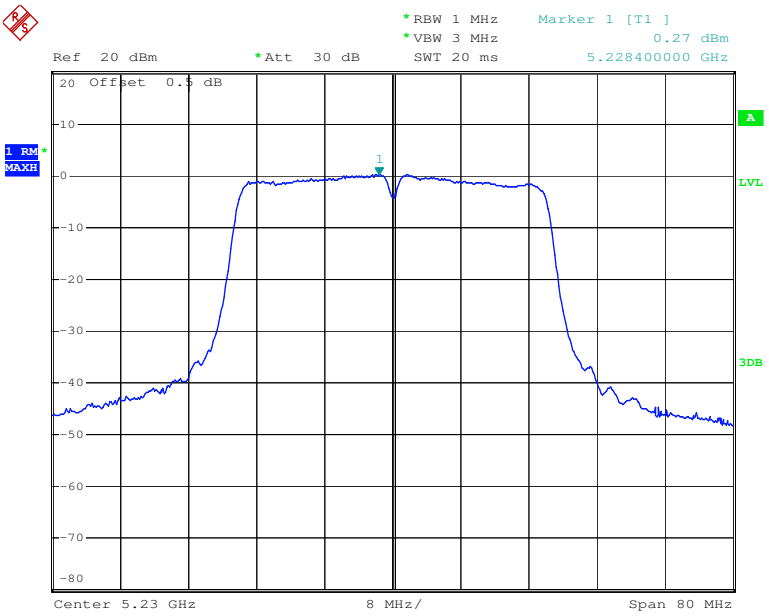
Date: 12.DEC.2015 11:55:53

Power Spectral Density, 802.11n ht40 Low Channel



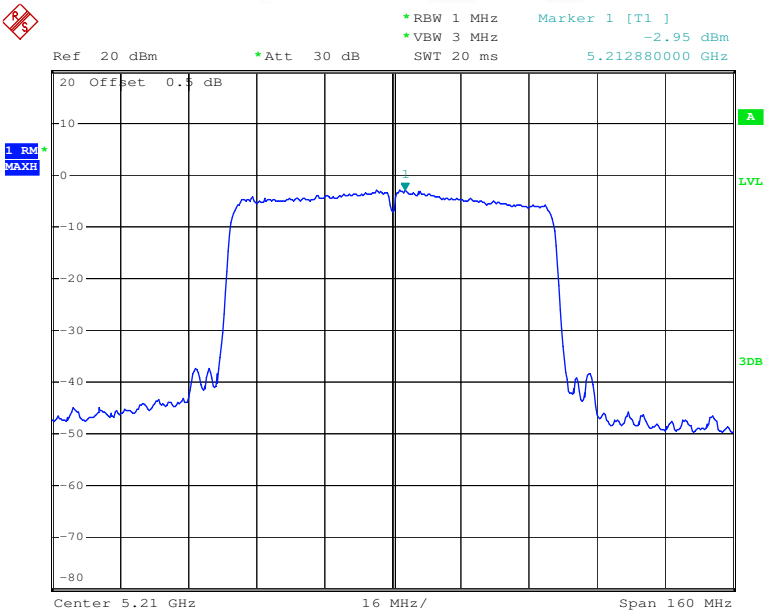
Date: 12.DEC.2015 11:58:10

Power Spectral Density, 802.11n ht40 High Channel



Date: 12.DEC.2015 12:00:22

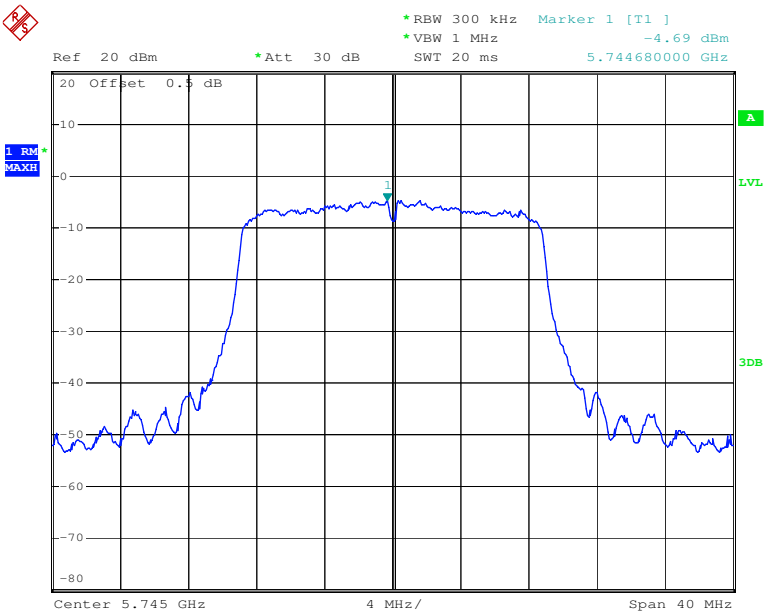
Power Spectral Density, 802.11n AC80 Middle Channel



Date: 12.DEC.2015 12:03:18

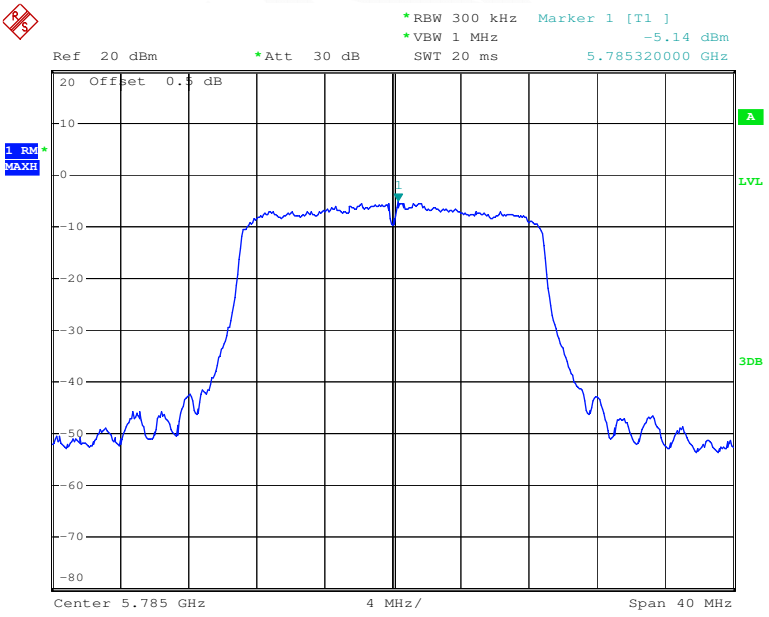
5725~5850MHz:
Antenna 0

Power Spectral Density, 802.11a Low Channel



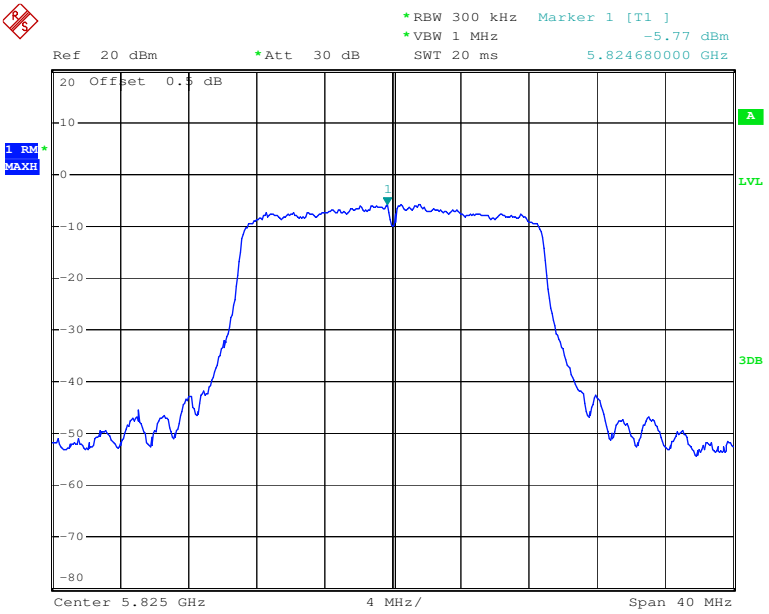
Date: 12.DEC.2015 13:20:14

Power Spectral Density, 802.11a Middle Channel



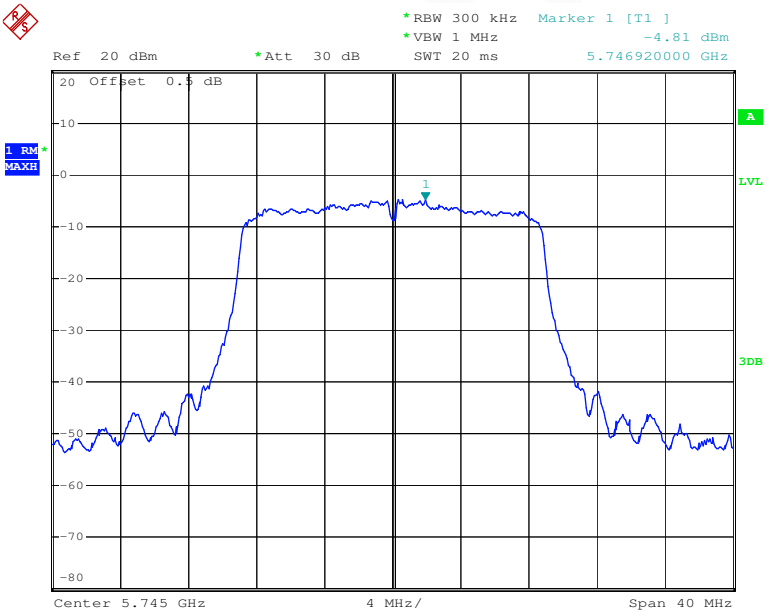
Date: 12.DEC.2015 13:22:47

Power Spectral Density, 802.11a High Channel



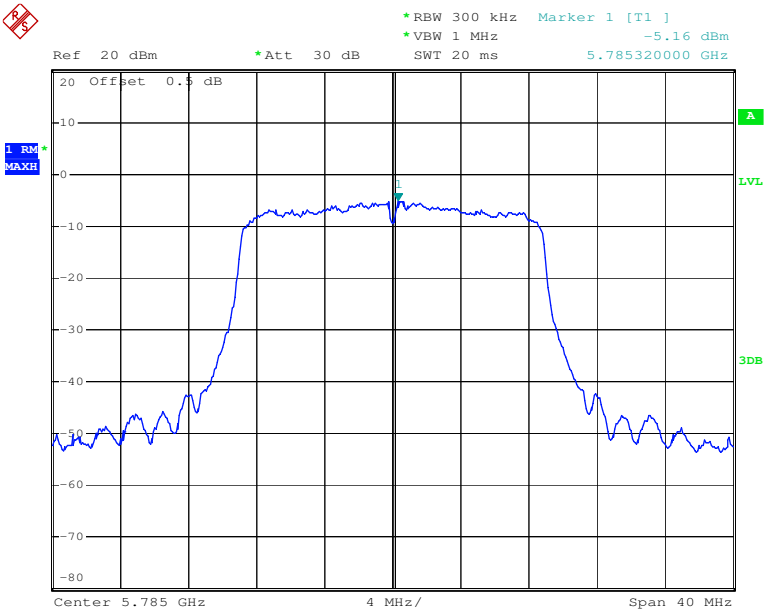
Date: 12.DEC.2015 13:25:48

Power Spectral Density, 802.11n ht20 Low Channel



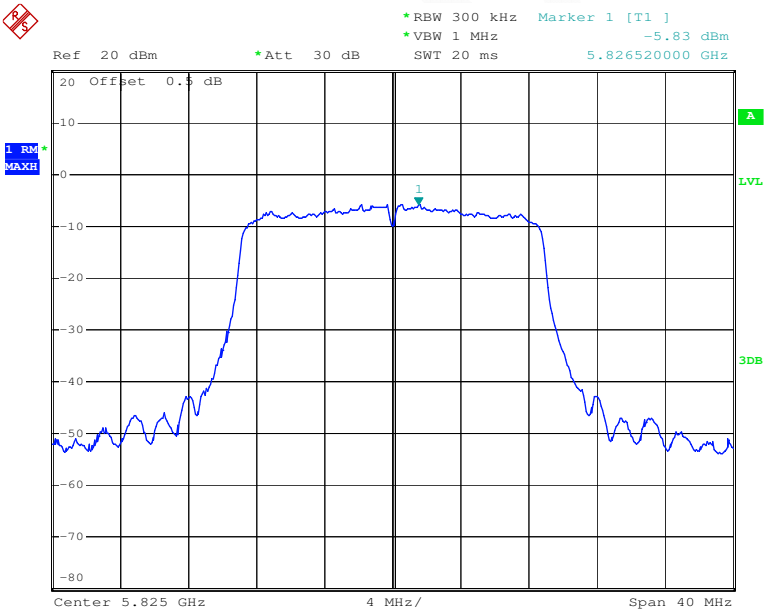
Date: 12.DEC.2015 13:30:39

Power Spectral Density, 802.11n ht20 Middle Channel



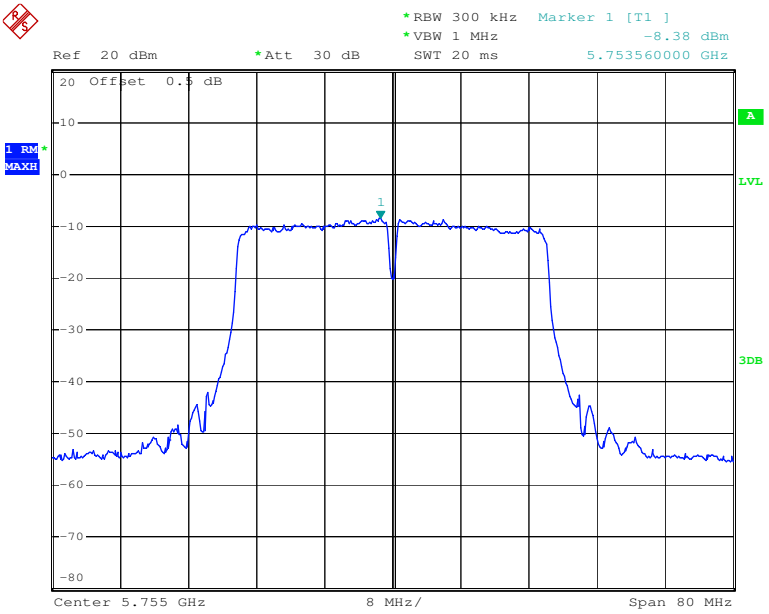
Date: 12.DEC.2015 13:39:32

Power Spectral Density, 802.11n ht20 High Channel



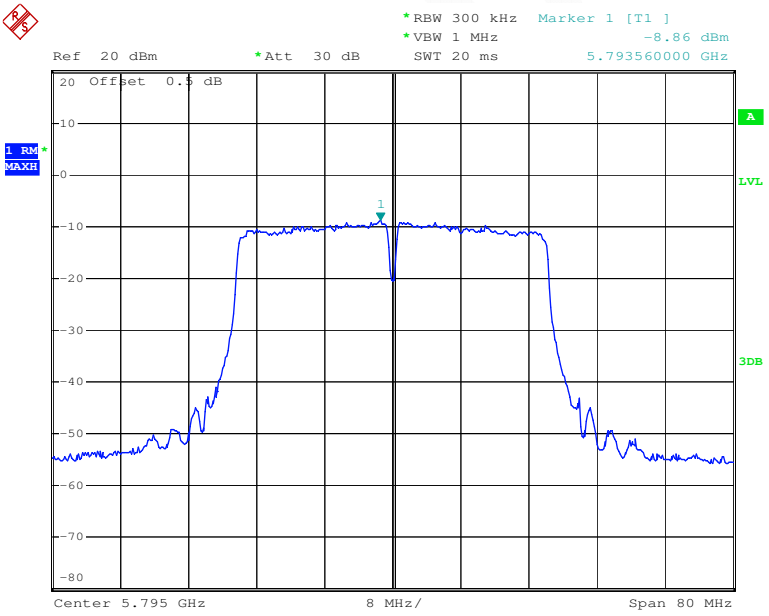
Date: 12.DEC.2015 13:37:19

Power Spectral Density, 802.11n ht40 Low Channel



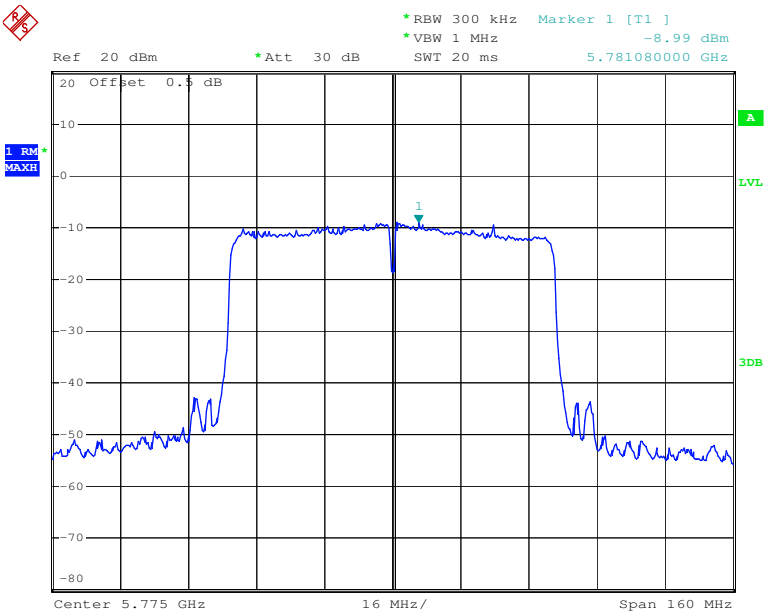
Date: 12.DEC.2015 13:41:42

Power Spectral Density, 802.11n ht40 High Channel



Date: 12.DEC.2015 13:44:14

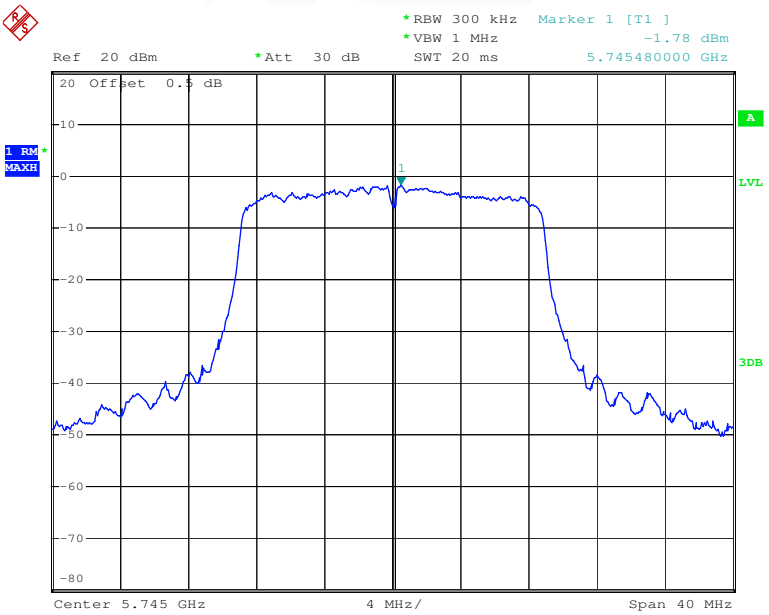
Power Spectral Density, 802.11n AC80 Middle Channel



Date: 12.DEC.2015 13:47:23

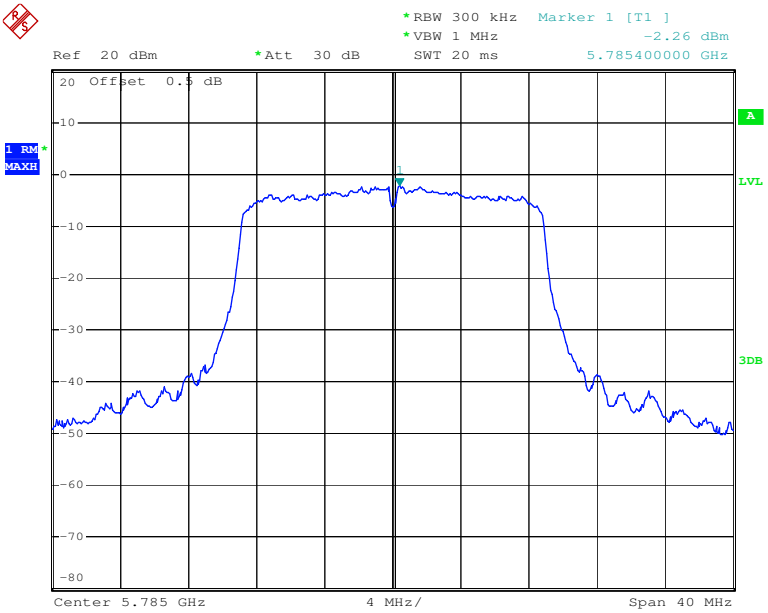
Antenna 1

Power Spectral Density, 802.11a Low Channel



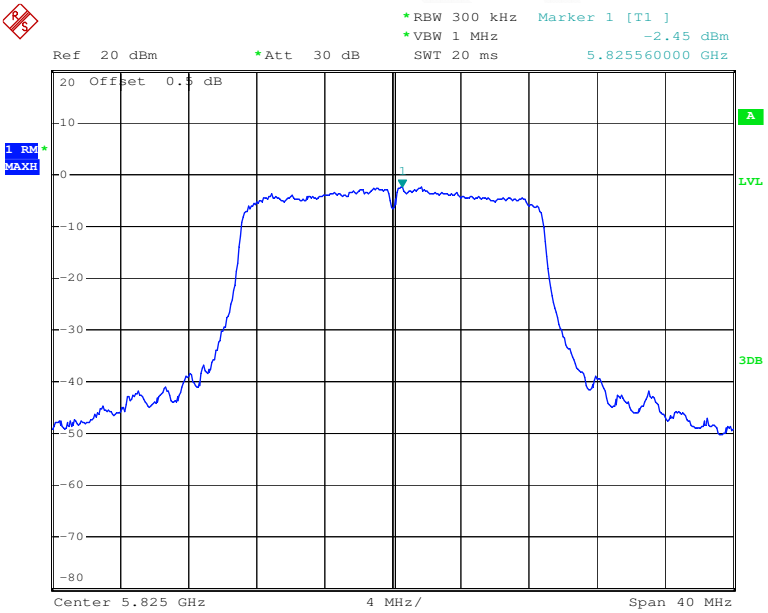
Date: 12.DEC.2015 12:06:08

Power Spectral Density, 802.11a Middle Channel



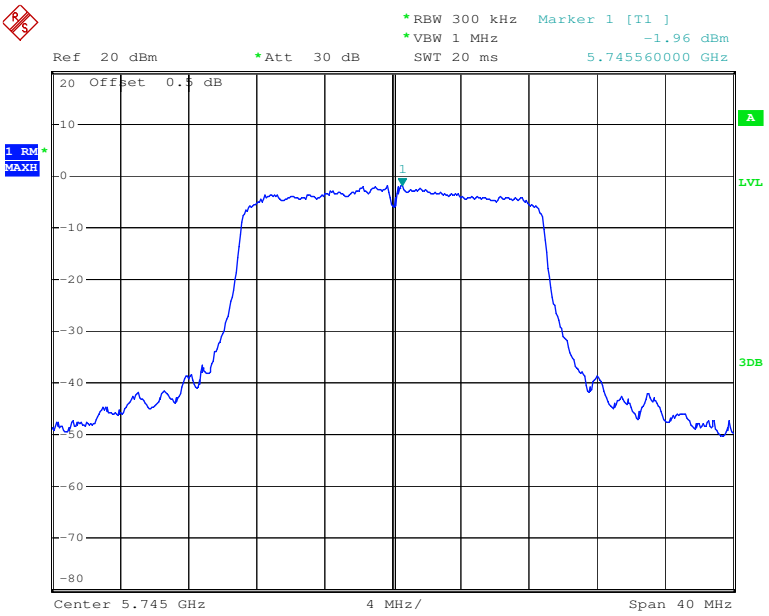
Date: 12.DEC.2015 12:08:35

Power Spectral Density, 802.11a High Channel



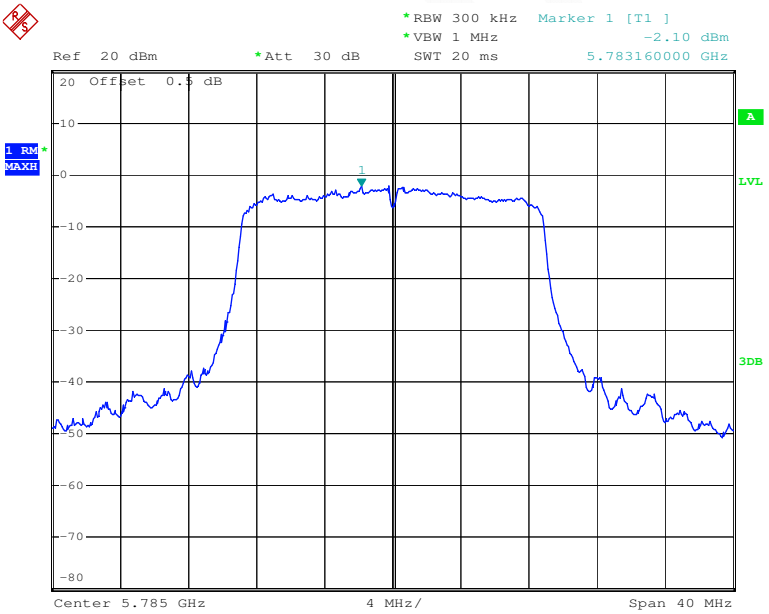
Date: 12.DEC.2015 12:10:41

Power Spectral Density, 802.11n ht20 Low Channel



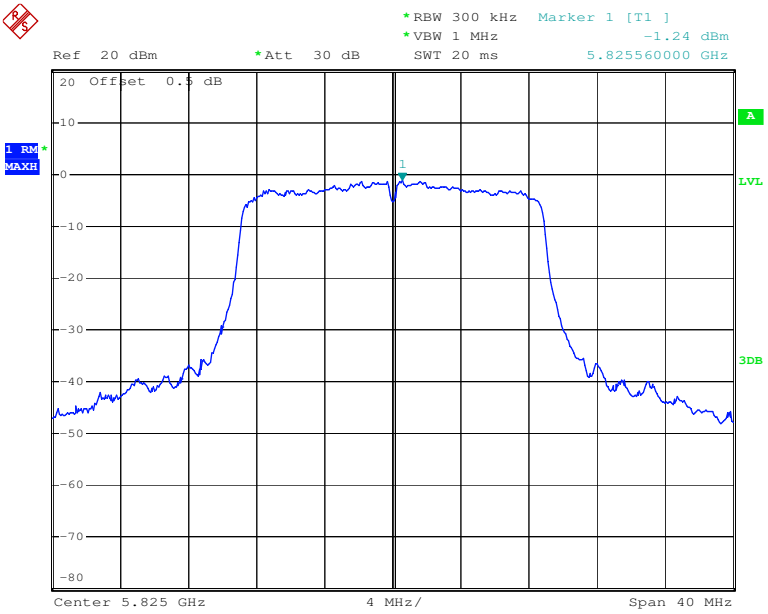
Date: 12.DEC.2015 12:13:48

Power Spectral Density, 802.11n ht20 Middle Channel



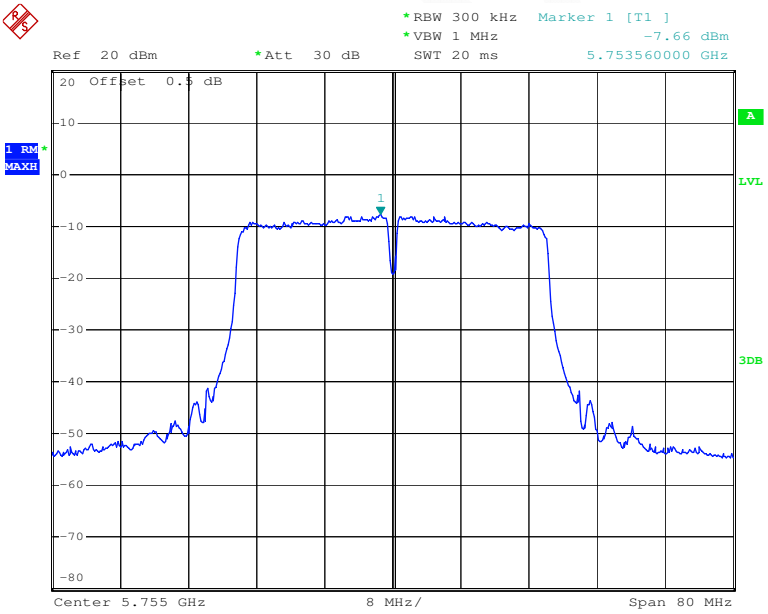
Date: 12.DEC.2015 12:16:40

Power Spectral Density, 802.11n ht20 High Channel



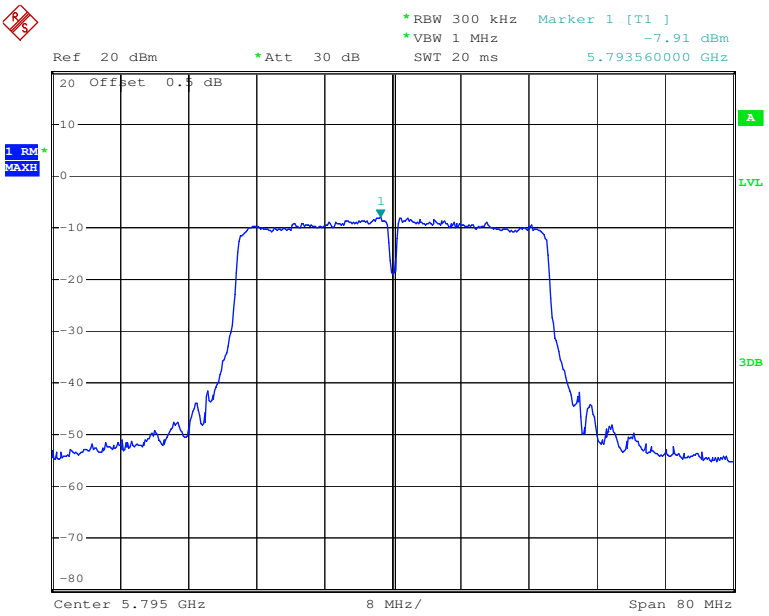
Date: 12.DEC.2015 12:19:05

Power Spectral Density, 802.11n ht40 Low Channel



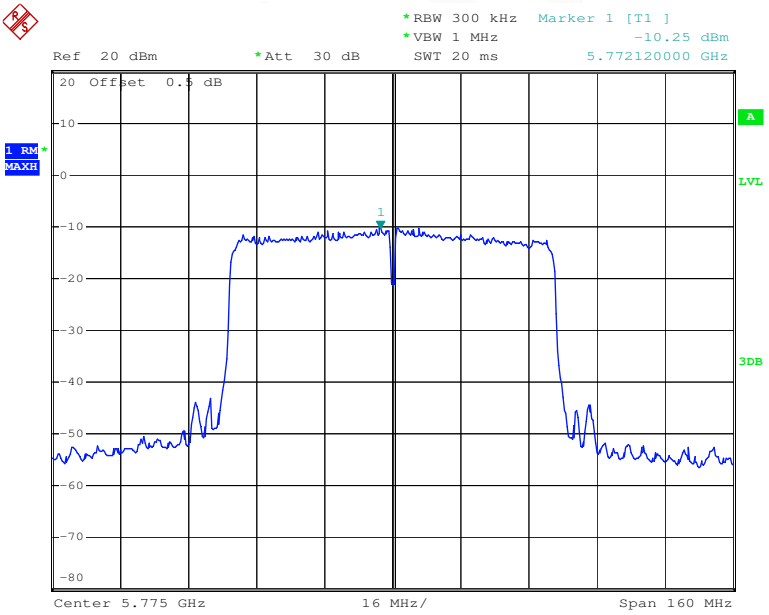
Date: 12.DEC.2015 12:21:40

Power Spectral Density, 802.11n ht40 High Channel



Date: 12.DEC.2015 12:24:53

Power Spectral Density, 802.11n AC80 Middle Channel



Date: 12.DEC.2015 12:27:27

DECLARATION LETTER

Nusoft Corporation
3F.-1, No. 880, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235-86, Taiwan (R.O.C.)
Tel: +886-2-8226-6789

13/11/2015

Product Similarity Declaration

To Whom It May Concern,

We, Nusoft Corporation, hereby declare that we have a product named as Nusoft Wireless Router (Model number: NFW-560) was tested by BACL, meanwhile, for our marketing purpose, we would like to list a series models (NFW-560A, NFW-520, AboCom WS600, AboCom WS550) on reports and certificate. The schematics for this series are identical, only with two differences in model number and memory size. The postfix "A" in the model number indicates the router is equipped with a DDR memory of 512MB. For those models without a postfix "A" is shipped with 256MB. The memory chips are pin-to-pin compatible, therefore no changes are made to PCB schematic and layout.

We confirm that all information above is true, and we'll be responsible for all the consequences. Please contact me if you have any question.

Signature: Zheng-xiong Lin
Printed Name: Zheng-xiong Lin
Title: Project Specialist

******* END OF REPORT *******