FCC PART 15.407

TEST REPORT

For

Hiro Inc.

13617 12th St. Unit C, Chino, CA 91710 USA

FCC ID: 2ADU2-H50319

Report Type:	**Product Type:**
Original Report	AC1200 Wireless Dual Band PCI Express Adapter

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Report Number:	RDG160329003-00B
Report Date:	2016-04-08
Reviewed By:	Jerry Zhang EMC Manager
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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).

TABLE OF CONTENTS

GENERAL INFORMATION **4**
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 4
OBJECTIVE 4
RELATED SUBMITTAL(S)/GRANT(S) 4
TEST METHODOLOGY 4
TEST FACILITY 4
SYSTEM TEST CONFIGURATION **5**
DESCRIPTION OF TEST CONFIGURATION 5
EUT EXERCISE SOFTWARE 6
EQUIPMENT MODIFICATIONS 6
SUPPORT EQUIPMENT LIST AND DETAILS 6
EXTERNAL CABLE 7
BLOCK DIAGRAM OF TEST SETUP 7
SUMMARY OF TEST RESULTS **8**
FCC §15.407(f) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE) **9**
APPLICABLE STANDARD 9
FCC §15.203 – ANTENNA REQUIREMENT **10**
APPLICABLE STANDARD 10
ANTENNA CONNECTOR CONSTRUCTION 10
FCC §15.407 (b) (6) §15.207 (a) – CONDUCTED EMISSIONS **11**
APPLICABLE STANDARD 11
MEASUREMENT UNCERTAINTY 11
EUT SETUP 11
EMI TEST RECEIVER SETUP 12
CORRECTED AMPLITUDE & MARGIN CALCULATION 12
TEST EQUIPMENT LIST AND DETAILS 12
TEST PROCEDURE 13
TEST RESULTS SUMMARY 13
TEST DATA 13
FCC §15.209, §15.205 & §15.407(b) (1) (6) (7) –UNWANTED EMISSION **16**
APPLICABLE STANDARD 16
MEASUREMENT UNCERTAINTY 16
EUT SETUP 17
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP 18
TEST PROCEDURE 18
CORRECTED AMPLITUDE & MARGIN CALCULATION 18
TEST EQUIPMENT LIST AND DETAILS 19
TEST RESULTS SUMMARY 19
TEST DATA 19
FCC§15.407(b) –CONDUCTED SPURIOUS EMISSION AT ANTENNA PORT **28**
APPLICABLE STANDARD 28
TEST EQUIPMENT LIST AND DETAILS 29
TEST DATA 29
FCC §15.407(b) (1) –BAND EDGE **86**
APPLICABLE STANDARD 86

FINAL

TEST EQUIPMENT LIST AND DETAILS....87
TEST DATA....87

FCC §15.407(a) –EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH....104

APPLICABLE STANDARD....104
TEST EQUIPMENT LIST AND DETAILS....104
TEST PROCEDURE....104
TEST DATA....104

FCC §15.407(a) –MAXIMUM CONDUCTED OUTPUT POWER....126

APPLICABLE STANDARD....126
TEST EQUIPMENT LIST AND DETAILS....127
TEST PROCEDURE....127
TEST DATA....127

FCC §15.407(a) - POWER SPECTRAL DENSITY....129

APPLICABLE STANDARD....129
TEST PROCEDURE....130
TEST EQUIPMENT LIST AND DETAILS....130
TEST DATA....130

FINAL

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Hiro Inc.* 's product, model number: *H50319 (FCC ID: 2ADU2-H50319)* (the "EUT") in this report was a *AC1200 Wireless Dual Band PCI Express Adapter,* which was measured approximately: 7.7 cm (L) x 5.6 cm (W) x 0.6 cm (H).

All measurement and test data in this report was gathered from production sample serial number: 160329003 (Assigned by BACL, Dongguan). The EUT was received on 2016-03-30.

Objective

This type approval report is prepared on behalf of *Hiro Inc.* 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 15C DTS submissions with FCC ID: 2ADU2-H50319.

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.

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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 follows:

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 802.11 ac80, channel 42 was tested.

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	159	5795
151	5755	161	5805
153	5765	163	5815
155	5775	165	5825
157	5785	/	/

For 802.11a, 802.11n ht20, Channel 149, 157 and 165 were tested, for 802.11n ht40, Channel 151, 159 were tested, for 802.11ac80 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.

The EUT sold with two kinds of antenna, antenna model: H001-10215-B, antenna gain is 5 dBi each chain both 2.4GHz and 5GHz bands(include the antenna RF cable loss). Antenna model: H001-10278-B, antenna gain is 2dBi both 2.4GHz and 5GHz bands. Radiation test was performed with the high gain antenna since the some antenna type.

EUT Exercise Software

The software "Realtek 11ac 8812A PCIE WLAN MP Diagnostic program" was used for testing, and the commands were provided by manufacturer. The worst condition (maximum power) was setting by the software as following table:

5150-5250MHz:

Software and version			Realtek 11ac 8812A PCIE WLAN MP Diagnostic program			
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)		Power Level	
			Chain 0	Chain 1	Chain 0	Chain 1
802.11 a	Low	5180	6	6	40	40
	Middle	5200	6	6	40	40
	High	5240	6	6	39	39
802.11 n20	Low	5180	MCS8	MCS8	40	40
	Middle	5200	MCS8	MCS8	40	40
	High	5240	MCS8	MCS8	40	40
802.11 n40	Low	5190	MCS8	MCS8	42	42
	High	5230	MCS8	MCS8	41	41
802.11 ac80	Middle	5210	MCS8	MCS8	38	38

5725-5850MHz:

Software and version			Realtek 11ac 8812A PCIE WLAN MP Diagnostic program			
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)		Power Level	
			Chain 0	Chain 1	Chain 0	Chain 1
802.11 a	Low	5745	6	6	41	34
	Middle	5785	6	6	44	33
	High	5825	6	6	43	30
802.11 n20	Low	5745	MCS8	MCS8	41	33
	Middle	5785	MCS8	MCS8	44	32
	High	5825	MCS8	MCS8	44	31
802.11 n40	Low	5755	MCS8	MCS8	44	35
	High	5795	MCS8	MCS8	46	35
802.11 ac80	Middle	5775	MCS8	MCS8	42	32

Equipment Modifications

No modification was made to the EUT.

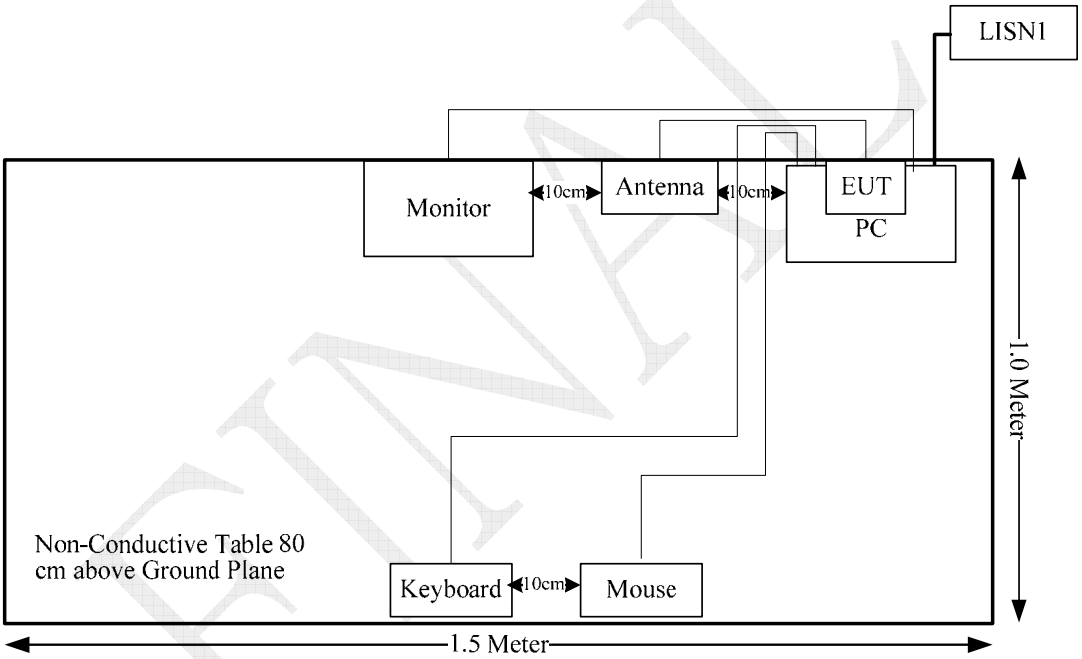
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
HP	PC	N/A	545862
DELL	Monitor	S22C330H	ZXDCHTHD101491K
DELL	Keyboard	SK-8115	CN-0J4628-71616-52H-0RT6
DELL	Mouse	MO56UOA	F0Y02P7Y

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
VGA Cable	Yes	Yes	1.8	PC	Monitor
USB Cable	Yes	No	1.8	PC	Mouse
USB Cable	Yes	No	1.8	PC	Keyboard
RF Cable*2	Yes	No	1.21	EUT	Antenna

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	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);

Calculated Data:

Frequency (MHz)	Antenna Gain		Tune-up Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2412-2462	5.00	3.16	23	199.53	20.00	0.13	1.0
5150-5250	5.00	3.16	17	50.12	20.00	0.03	1.0
5725-5850	5.00	3.16	17	50.12	20.00	0.03	1.0

Note: The tune-up power is 21+/-2dBm@ 2.4GHz Band. 15+/-2 dBm@5G band 802.11a and n mode, 14+/-2 dBm@5G band 802.11ac mode.

Result: The device meet FCC MPE at 20 cm distance

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 sold with two kinds of antenna, antenna model: H001-10215-B, antenna gain is 5 dBi each chain in both 2.4GHz and 5GHz(include the antenna RF cable loss). Antenna model: H001-10278-B, antenna gain is 2dBi in both 2.4GHz and 5GHz.

All antennas use unique type antenna connectors, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

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FCC §15.407 (b) (6) §15.207 (a) – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207, §15.407(b) (6)

Measurement Uncertainty

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

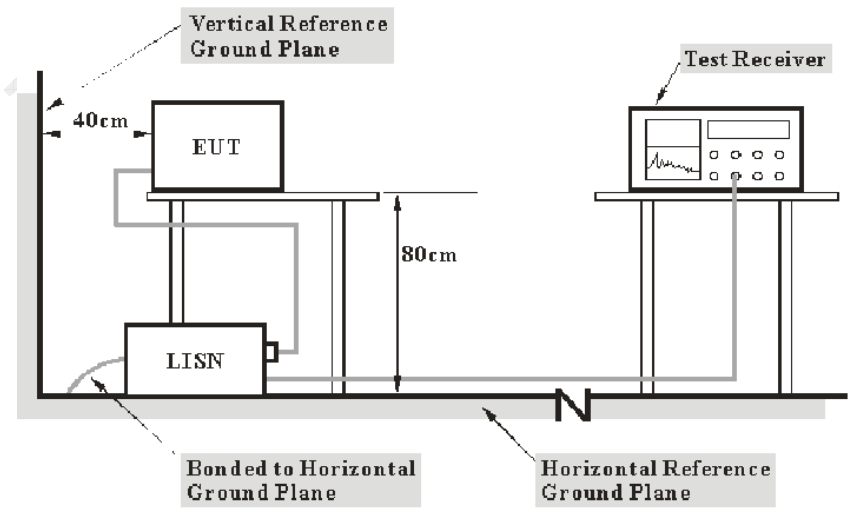
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of 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 3.12 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 PC 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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$
$C_f = A_C + VDF$

Herein,
V_C (cord. Reading): corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN
C_f: Correction Factor

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	2015-11-26	2016-11-25
N/A	Coaxial Cable	1.8m	N/A	2015-05-06	2016-05-06
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).

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Test Procedure

During the conducted emission test, the adapter was connected to thefirst LISN and the other support equipments were connected to the outlet of the second 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.

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:

7.90 dB at **4.094608 MHz** in the **Neutral** conducted mode.

Test Data

Environmental Conditions

Temperature:	26.3 °C
Relative Humidity:	57 %
ATM Pressure:	100.9 kPa

The testing was performed by Dean Liu on 2015-04-01.

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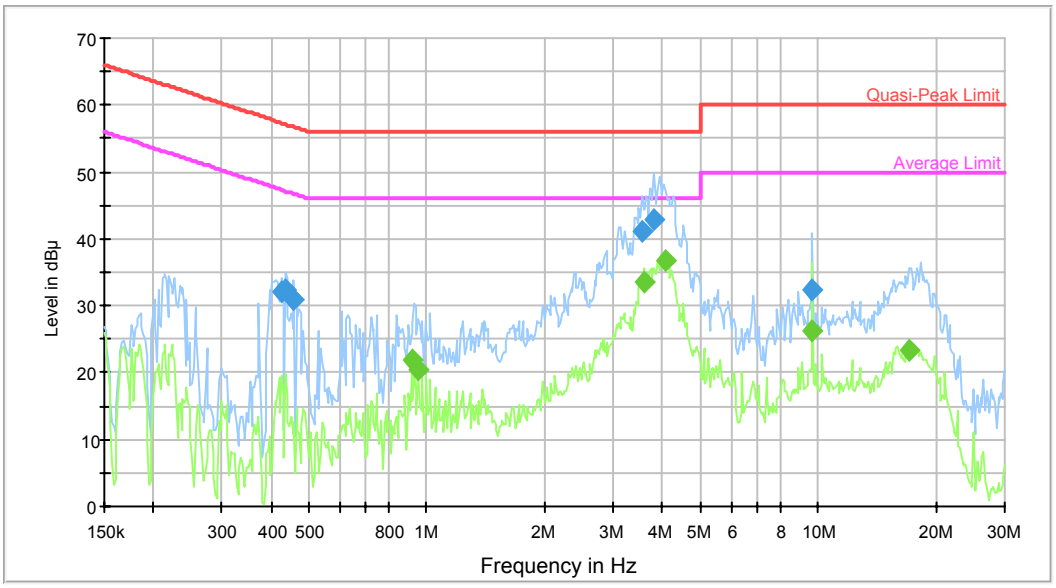
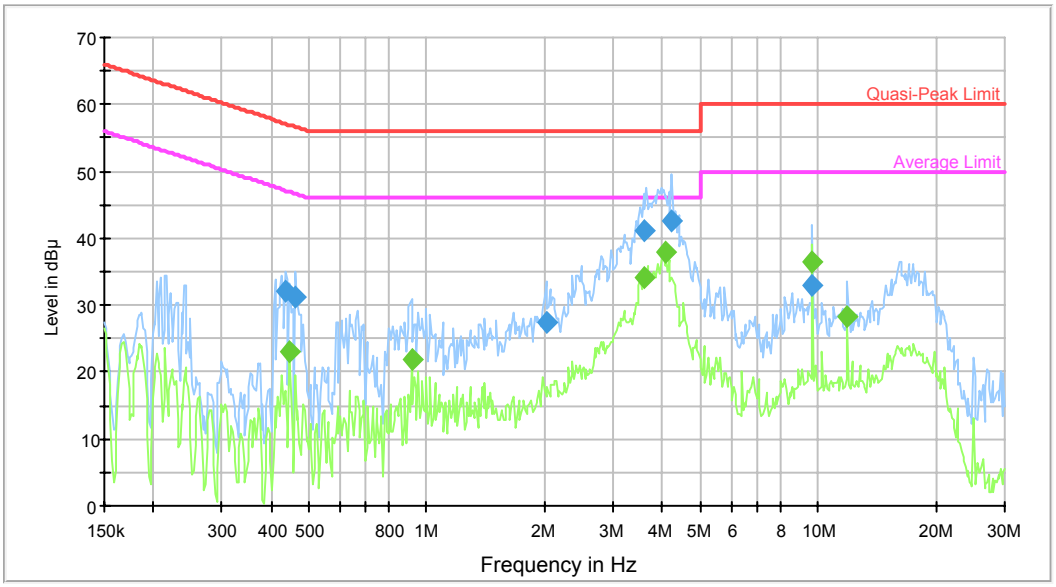
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.426011	32.0	9.000	L1	9.8	25.3	57.3	Compliance
0.436318	32.5	9.000	L1	9.8	24.6	57.1	Compliance
0.457684	31.0	9.000	L1	9.8	25.7	56.7	Compliance
3.547503	41.0	9.000	L1	9.8	15.0	56.0	Compliance
3.811251	43.0	9.000	L1	9.9	13.0	56.0	Compliance
9.681660	32.4	9.000	L1	10.0	27.6	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.915445	21.8	9.000	L1	9.8	24.2	46.0	Compliance
0.952654	20.4	9.000	L1	9.8	25.6	46.0	Compliance
3.575883	33.5	9.000	L1	9.8	12.5	46.0	Compliance
4.094608	36.9	9.000	L1	9.9	9.1	46.0	Compliance
9.681660	26.3	9.000	L1	10.0	23.7	50.0	Compliance
17.046987	23.3	9.000	L1	10.1	26.7	50.0	Compliance

AC120 V, 60 Hz, Neutral:



requency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.436318	32.1	9.000	N	9.7	25.0	57.1	Compliance
0.461346	31.3	9.000	N	9.7	25.4	56.7	Compliance
2.014768	27.3	9.000	N	9.8	28.7	56.0	Compliance
3.575883	41.1	9.000	N	9.8	14.9	56.0	Compliance
4.227217	42.7	9.000	N	9.9	13.3	56.0	Compliance
9.681660	33.0	9.000	N	10.0	27.0	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.446873	23.1	9.000	N	9.7	23.8	46.9	Compliance
0.915445	21.8	9.000	N	9.8	24.2	46.0	Compliance
3.575883	34.3	9.000	N	9.8	11.7	46.0	Compliance
4.094608	38.1	9.000	N	9.9	7.9	46.0	Compliance
9.681660	36.5	9.000	N	10.0	13.5	50.0	Compliance
11.910327	28.4	9.000	N	10.1	21.6	50.0	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.

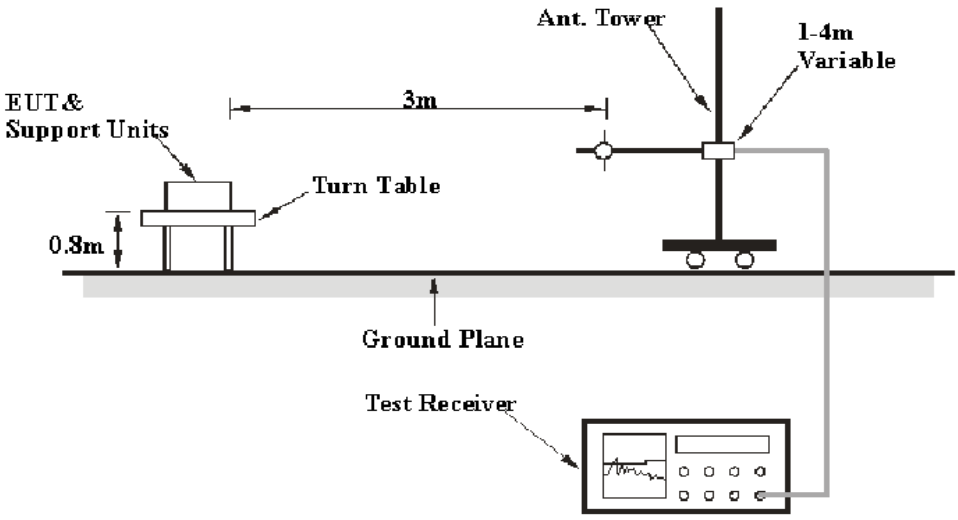
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

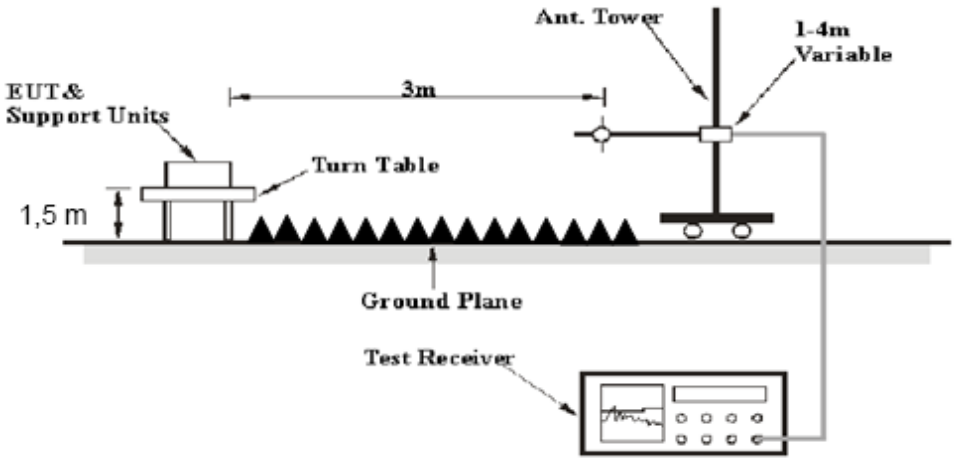
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

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 external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

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

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

During the radiated emission test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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.

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	2014-12-04	2015-12-04
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	2016-02-19	2017-02-19
Agilent	Spectrum Analyzer	8564E	3943A01781	2015-05-08	2016-05-08
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:

5.66 dB at **17475 MHz** in the **Vertical** polarization for 802.11a mode

Test Data

Environmental Conditions

Temperature:	25.1~25.4°C
Relative Humidity:	50 ~ 51%
ATM Pressure:	100.7 ~ 100.9 kPa

The testing was performed by Dean Liu from 2016-04-02 to 2016-04-07.

Test Mode: Transmitting

5150MHz-5250MHz: 802.11a 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)					
Low Channel:5180 MHz									
5180	83.90	PK	H	31.46	5.40	27.13	93.63	N/A	N/A
5180	75.57	AV	H	31.46	5.40	27.13	85.30	N/A	N/A
5180	90.86	PK	V	31.46	5.40	27.13	100.59	N/A	N/A
5180	82.67	AV	V	31.46	5.40	27.13	92.40	N/A	N/A
5150	41.73	PK	V	31.40	5.26	27.18	51.21	74.00	22.79
5150	24.96	AV	V	31.40	5.26	27.18	34.44	54.00	19.56
10360	29.87	PK	V	36.97	8.36	25.52	49.68	74.00	24.32
10360	16.31	AV	V	36.97	8.36	25.52	36.12	54.00	17.88
15540	32.04	PK	V	37.43	14.94	24.98	59.43	74.00	14.57
15540	18.63	AV	V	37.43	14.94	24.98	46.02	54.00	7.98
4485	33.01	PK	V	29.80	5.12	27.08	40.85	74.00	33.15
4485	20.56	AV	V	29.80	5.12	27.08	28.40	54.00	25.60
7403	31.75	PK	V	34.57	6.85	25.87	47.30	74.00	26.70
7403	19.21	AV	V	34.57	6.85	25.87	34.76	54.00	19.24
231.62	46.00	QP	H	11.97	1.83	21.48	38.32	46.00	7.68
Middle Channel:5200 MHz									
5200	83.55	PK	H	31.50	5.49	27.09	93.45	N/A	N/A
5200	75.07	AV	H	31.50	5.49	27.09	84.97	N/A	N/A
5200	90.50	PK	V	31.50	5.49	27.09	100.40	N/A	N/A
5200	82.16	AV	V	31.50	5.49	27.09	92.06	N/A	N/A
10400	29.93	PK	V	36.98	8.32	25.50	49.73	74.00	24.27
10400	16.22	AV	V	36.98	8.32	25.50	36.02	54.00	17.98
15600	31.88	PK	V	37.32	14.69	24.69	59.20	74.00	14.80
15600	18.59	AV	V	37.32	14.69	24.69	45.91	54.00	8.09
4485	32.93	PK	V	29.80	5.12	27.08	40.77	74.00	33.23
4485	20.40	AV	V	29.80	5.12	27.08	28.24	54.00	25.76
7403	31.75	PK	V	34.57	6.85	25.87	47.30	74.00	26.70
7403	19.14	AV	V	34.57	6.85	25.87	34.69	54.00	19.31
231.62	46.50	QP	H	11.97	1.83	21.48	38.82	46.00	7.18
674.28	37.30	QP	V	20.20	3.16	22.30	38.36	46.00	7.64
High Channel:5240 MHz									
5240	83.85	PK	H	31.58	5.28	27.07	93.64	N/A	N/A
5240	75.41	AV	H	31.58	5.28	27.07	85.20	N/A	N/A
5240	90.82	PK	V	31.58	5.28	27.07	100.61	N/A	N/A
5240	82.48	AV	V	31.58	5.28	27.07	92.27	N/A	N/A
5350	32.52	PK	V	31.80	5.61	27.02	42.91	74.00	31.09
5350	20.73	AV	V	31.80	5.61	27.02	31.12	54.00	22.88
10480	30.07	PK	V	37.00	8.23	26.01	49.29	74.00	24.71
10480	16.27	AV	V	37.00	8.23	26.01	35.49	54.00	18.51
15720	31.86	PK	V	37.10	14.20	24.92	58.24	74.00	15.76
15720	18.55	AV	V	37.10	14.20	24.92	44.93	54.00	9.07
4485	32.62	PK	V	29.80	5.12	27.08	40.46	74.00	33.54
4485	20.05	AV	V	29.80	5.12	27.08	27.89	54.00	26.11
7403	31.29	PK	V	34.57	6.85	25.87	46.84	74.00	27.16
7403	18.78	AV	V	34.57	6.85	25.87	34.33	54.00	19.67
231.62	46.30	QP	H	11.97	1.83	21.48	38.62	46.00	7.38

802.11n ht20 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)					
Low Channel:5180 MHz									
5180	84.07	PK	H	31.46	5.40	27.13	93.80	N/A	N/A
5180	73.88	AV	H	31.46	5.40	27.13	83.61	N/A	N/A
5180	93.27	PK	V	31.46	5.40	27.13	103.00	N/A	N/A
5180	83.05	AV	V	31.46	5.40	27.13	92.78	N/A	N/A
5150	37.92	PK	V	31.40	5.26	27.18	47.40	74.00	26.60
5150	23.84	AV	V	31.40	5.26	27.18	33.32	54.00	20.68
10360	29.62	PK	V	36.97	8.36	25.52	49.43	74.00	24.57
10360	16.24	AV	V	36.97	8.36	25.52	36.05	54.00	17.95
15540	31.83	PK	V	37.43	14.94	24.98	59.22	74.00	14.78
15540	18.48	AV	V	37.43	14.94	24.98	45.87	54.00	8.13
4485	33.07	PK	V	29.80	5.12	27.08	40.91	74.00	33.09
4485	20.54	AV	V	29.80	5.12	27.08	28.38	54.00	25.62
7403	31.70	PK	V	34.57	6.85	25.87	47.25	74.00	26.75
7403	19.24	AV	V	34.57	6.85	25.87	34.79	54.00	19.21
231.62	46.20	QP	H	11.97	1.83	21.48	38.52	46.00	7.48
Middle Channel:5200 MHz									
5200	83.90	PK	H	31.50	5.49	27.09	93.80	N/A	N/A
5200	73.43	AV	H	31.50	5.49	27.09	83.33	N/A	N/A
5200	92.83	PK	V	31.50	5.49	27.09	102.73	N/A	N/A
5200	82.58	AV	V	31.50	5.49	27.09	92.48	N/A	N/A
10400	29.76	PK	V	36.98	8.32	25.50	49.56	74.00	24.44
10400	16.29	AV	V	36.98	8.32	25.50	36.09	54.00	17.91
15600	31.83	PK	V	37.32	14.69	24.69	59.15	74.00	14.85
15600	18.63	AV	V	37.32	14.69	24.69	45.95	54.00	8.05
4485	33.42	PK	V	29.80	5.12	27.08	41.26	74.00	32.74
4485	20.88	AV	V	29.80	5.12	27.08	28.72	54.00	25.28
7403	32.16	PK	V	34.57	6.85	25.87	47.71	74.00	26.29
7403	19.66	AV	V	34.57	6.85	25.87	35.21	54.00	18.79
231.62	46.70	QP	H	11.97	1.83	21.48	39.02	46.00	6.98
674.28	37.60	QP	V	20.20	3.16	22.30	38.66	46.00	7.34
High Channel:5240 MHz									
5240	83.71	PK	H	31.58	5.28	27.07	93.50	N/A	N/A
5240	73.32	AV	H	31.58	5.28	27.07	83.11	N/A	N/A
5240	92.96	PK	V	31.58	5.28	27.07	102.75	N/A	N/A
5240	82.53	AV	V	31.58	5.28	27.07	92.32	N/A	N/A
5350	34.23	PK	V	31.80	5.61	27.02	44.62	74.00	29.38
5350	22.59	AV	V	31.80	5.61	27.02	32.98	54.00	21.02
10480	29.40	PK	V	37.00	8.23	26.01	48.62	74.00	25.38
10480	16.24	AV	V	37.00	8.23	26.01	35.46	54.00	18.54
15720	31.81	PK	V	37.10	14.20	24.92	58.19	74.00	15.81
15720	18.52	AV	V	37.10	14.20	24.92	44.90	54.00	9.10
4485	33.28	PK	V	29.80	5.12	27.08	41.12	74.00	32.88
4485	20.80	AV	V	29.80	5.12	27.08	28.64	54.00	25.36
7403	32.25	PK	V	34.57	6.85	25.87	47.80	74.00	26.20
7403	19.72	AV	V	34.57	6.85	25.87	35.27	54.00	18.73
231.62	46.10	QP	H	11.97	1.83	21.48	38.42	46.00	7.58

802.11n ht40 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)					
Low Channel:5190 MHz									
5190	81.77	PK	H	31.48	5.44	27.11	91.58	N/A	N/A
5190	71.47	AV	H	31.48	5.44	27.11	81.28	N/A	N/A
5190	89.73	PK	V	31.48	5.44	27.11	99.54	N/A	N/A
5190	79.41	AV	V	31.48	5.44	27.11	89.22	N/A	N/A
5150	42.09	PK	V	31.40	5.26	27.18	51.57	74.00	22.43
5150	28.91	AV	V	31.40	5.26	27.18	38.39	54.00	15.61
10380	29.93	PK	V	36.98	8.34	25.51	49.74	74.00	24.26
10380	16.25	AV	V	36.98	8.34	25.51	36.06	54.00	17.94
15570	31.70	PK	V	37.37	14.81	24.83	59.05	74.00	14.95
15570	18.45	AV	V	37.37	14.81	24.83	45.80	54.00	8.20
4485	33.16	PK	V	29.80	5.12	27.08	41.00	74.00	33.00
4485	20.69	AV	V	29.80	5.12	27.08	28.53	54.00	25.47
7403	31.98	PK	V	34.57	6.85	25.87	47.53	74.00	26.47
7403	19.46	AV	V	34.57	6.85	25.87	35.01	54.00	18.99
231.62	46.50	QP	H	11.97	1.83	21.48	38.82	46.00	7.18
High Channel:5230 MHz									
5230	82.59	PK	H	31.56	5.33	27.08	92.40	N/A	N/A
5230	72.11	AV	H	31.56	5.33	27.08	81.92	N/A	N/A
5230	90.51	PK	V	31.56	5.33	27.08	100.32	N/A	N/A
5230	80.08	AV	V	31.56	5.33	27.08	89.89	N/A	N/A
5350	35.09	PK	V	31.80	5.61	27.02	45.48	74.00	28.52
5350	22.74	AV	V	31.80	5.61	27.02	33.13	54.00	20.87
10460	29.82	PK	V	36.99	8.25	25.88	49.18	74.00	24.82
10460	16.12	AV	V	36.99	8.25	25.88	35.48	54.00	18.52
15690	32.15	PK	V	37.16	14.32	24.87	58.76	74.00	15.24
15690	18.56	AV	V	37.16	14.32	24.87	45.17	54.00	8.83
4485	32.74	PK	V	29.80	5.12	27.08	40.58	74.00	33.42
4485	20.30	AV	V	29.80	5.12	27.08	28.14	54.00	25.86
7403	31.49	PK	V	34.57	6.85	25.87	47.04	74.00	26.96
7403	19.13	AV	V	34.57	6.85	25.87	34.68	54.00	19.32
231.62	45.80	QP	H	11.97	1.83	21.48	38.12	46.00	7.88

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)					
Middle Channel:5210 MHz									
5210	77.71	PK	H	31.52	5.44	27.09	87.58	N/A	N/A
5210	67.61	AV	H	31.52	5.44	27.09	77.48	N/A	N/A
5210	87.57	PK	V	31.52	5.44	27.09	97.44	N/A	N/A
5210	77.44	AV	V	31.52	5.44	27.09	87.31	N/A	N/A
5150	43.56	PK	V	31.40	5.26	27.18	53.04	74.00	20.96
5150	30.21	AV	V	31.40	5.26	27.18	39.69	54.00	14.31
5350	35.51	PK	V	31.80	5.61	27.02	45.90	74.00	28.10
5350	22.14	AV	V	31.80	5.61	27.02	32.53	54.00	21.47
10420	29.51	PK	V	36.98	8.30	25.63	49.16	74.00	24.84
10420	16.11	AV	V	36.98	8.30	25.63	35.76	54.00	18.24
15630	31.85	PK	V	37.27	14.57	24.75	58.94	74.00	15.06
15630	18.42	AV	V	37.27	14.57	24.75	45.51	54.00	8.49
4485	33.75	PK	V	29.80	5.12	27.08	41.59	74.00	32.41
4485	21.23	AV	V	29.80	5.12	27.08	29.07	54.00	24.93
231.62	46.00	QP	H	11.97	1.83	21.48	38.32	46.00	7.68

FINAL

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	81.65	PK	H	32.15	5.53	26.60	92.73	N/A	N/A
5745	73.01	AV	H	32.15	5.53	26.60	84.09	N/A	N/A
5745	91.13	PK	V	32.15	5.53	26.60	102.21	N/A	N/A
5745	82.60	AV	V	32.15	5.53	26.60	93.68	N/A	N/A
5725	56.38	PK	V	32.15	5.60	26.63	67.50	78.20	10.70
5715	42.65	PK	V	32.14	5.63	26.64	53.78	68.20	14.42
11490	29.17	PK	V	37.89	8.94	26.14	49.86	74.00	24.14
11490	16.52	AV	V	37.89	8.94	26.14	37.21	54.00	16.79
17235	31.99	PK	V	40.91	13.69	25.63	60.96	74.00	13.04
17235	18.84	AV	V	40.91	13.69	25.63	47.81	54.00	6.19
4485	34.81	PK	V	29.80	5.12	27.08	42.65	74.00	31.35
4485	22.40	AV	V	29.80	5.12	27.08	30.24	54.00	23.76
7120	30.72	PK	V	33.89	6.51	26.04	45.08	74.00	28.92
7120	18.27	AV	V	33.89	6.51	26.04	32.63	54.00	21.37
230.65	46.80	QP	H	11.92	1.82	21.48	39.06	46.00	6.94
Middle Channel:5785 MHz									
5785	81.85	PK	H	32.16	5.47	26.56	92.92	N/A	N/A
5785	73.41	AV	H	32.16	5.47	26.56	84.48	N/A	N/A
5785	91.26	PK	V	32.16	5.47	26.56	102.33	N/A	N/A
5785	82.95	AV	V	32.16	5.47	26.56	94.02	N/A	N/A
11570	29.27	PK	V	37.90	8.92	26.07	50.02	74.00	23.98
11570	16.64	AV	V	37.90	8.92	26.07	37.39	54.00	16.61
17355	32.10	PK	V	41.63	12.99	25.63	61.09	74.00	12.91
17355	18.72	AV	V	41.63	12.99	25.63	47.71	54.00	6.29
4485	34.91	PK	V	29.80	5.12	27.08	42.75	74.00	31.25
4485	22.32	AV	V	29.80	5.12	27.08	30.16	54.00	23.84
7120	30.86	PK	V	33.89	6.51	26.04	45.22	74.00	28.78
7120	18.39	AV	V	33.89	6.51	26.04	32.75	54.00	21.25
230.65	46.50	QP	H	11.92	1.82	21.48	38.76	46.00	7.24
473.25	37.20	QP	H	17.91	2.64	21.95	35.80	46.00	10.20
High Channel:5825 MHz									
5825	82.11	PK	H	32.17	5.75	26.61	93.42	N/A	N/A
5825	73.75	AV	H	32.17	5.75	26.61	85.06	N/A	N/A
5825	91.60	PK	V	32.17	5.75	26.61	102.91	N/A	N/A
5825	83.33	AV	V	32.17	5.75	26.61	94.64	N/A	N/A
5850	48.62	PK	V	32.17	6.05	26.68	60.16	78.20	18.04
5860	39.45	PK	V	32.17	6.02	26.71	50.93	68.20	17.27
11650	29.43	PK	V	37.90	8.90	25.75	50.48	74.00	23.52
11650	16.94	AV	V	37.90	8.90	25.75	37.99	54.00	16.01
17475	32.43	PK	V	42.35	12.30	25.39	61.69	74.00	12.31
17475	19.08	AV	V	42.35	12.30	25.39	48.34	54.00	5.66
4485	35.29	PK	V	29.80	5.12	27.08	43.13	74.00	30.87
4485	22.78	AV	V	29.80	5.12	27.08	30.62	54.00	23.38
7120	31.16	PK	V	33.89	6.51	26.04	45.52	74.00	28.48
7120	18.74	AV	V	33.89	6.51	26.04	33.10	54.00	20.90
230.65	46.90	QP	H	11.92	1.82	21.48	39.16	46.00	6.84

802.11n ht20 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)					
Low Channel:5745 MHz									
5745	83.75	PK	H	32.15	5.53	26.60	94.83	N/A	N/A
5745	73.25	AV	H	32.15	5.53	26.60	84.33	N/A	N/A
5745	92.92	PK	V	32.15	5.53	26.60	104.00	N/A	N/A
5745	82.30	AV	V	32.15	5.53	26.60	93.38	N/A	N/A
5725	52.00	PK	V	32.15	5.60	26.63	63.12	78.20	15.08
5715	43.59	PK	V	32.14	5.63	26.64	54.72	68.20	13.48
11490	29.67	PK	V	37.89	8.94	26.14	50.36	74.00	23.64
11490	16.90	AV	V	37.89	8.94	26.14	37.59	54.00	16.41
17235	31.83	PK	V	40.91	13.69	25.63	60.80	74.00	13.20
17235	18.75	AV	V	40.91	13.69	25.63	47.72	54.00	6.28
4485	34.50	PK	V	29.80	5.12	27.08	42.34	74.00	31.66
4485	21.95	AV	V	29.80	5.12	27.08	29.79	54.00	24.21
7120	31.60	PK	V	33.89	6.51	26.04	45.96	74.00	28.04
7120	19.20	AV	V	33.89	6.51	26.04	33.56	54.00	20.44
230.65	46.20	QP	H	11.92	1.82	21.48	38.46	46.00	7.54
Middle Channel:5785 MHz									
5785	84.89	PK	H	32.16	5.47	26.56	95.96	N/A	N/A
5785	74.38	AV	H	32.16	5.47	26.56	85.45	N/A	N/A
5785	93.72	PK	V	32.16	5.47	26.56	104.79	N/A	N/A
5785	83.45	AV	V	32.16	5.47	26.56	94.52	N/A	N/A
11570	29.72	PK	V	37.90	8.92	26.07	50.47	74.00	23.53
11570	16.86	AV	V	37.90	8.92	26.07	37.61	54.00	16.39
17355	31.92	PK	V	41.63	12.99	25.63	60.91	74.00	13.09
17355	18.74	AV	V	41.63	12.99	25.63	47.73	54.00	6.27
4485	34.45	PK	V	29.80	5.12	27.08	42.29	74.00	31.71
4485	21.86	AV	V	29.80	5.12	27.08	29.70	54.00	24.30
7120	31.60	PK	V	33.89	6.51	26.04	45.96	74.00	28.04
7120	19.12	AV	V	33.89	6.51	26.04	33.48	54.00	20.52
230.65	47.20	QP	H	11.92	1.82	21.48	39.46	46.00	6.54
473.25	37.60	QP	H	17.91	2.64	21.95	36.20	46.00	9.80
High Channel:5825 MHz									
5825	85.14	PK	H	32.17	5.75	26.61	96.45	N/A	N/A
5825	74.73	AV	H	32.17	5.75	26.61	86.04	N/A	N/A
5825	94.32	PK	V	32.17	5.75	26.61	105.63	N/A	N/A
5825	84.16	AV	V	32.17	5.75	26.61	95.47	N/A	N/A
5850	48.17	PK	V	32.17	6.05	26.68	59.71	78.20	18.49
5860	41.29	PK	V	32.17	6.02	26.71	52.77	68.20	15.43
11650	29.94	PK	V	37.90	8.90	25.75	50.99	74.00	23.01
11650	17.06	AV	V	37.90	8.90	25.75	38.11	54.00	15.89
17475	32.30	PK	V	42.35	12.30	25.39	61.56	74.00	12.44
17475	19.02	AV	V	42.35	12.30	25.39	48.28	54.00	5.72
4485	34.83	PK	V	29.80	5.12	27.08	42.67	74.00	31.33
4485	22.34	AV	V	29.80	5.12	27.08	30.18	54.00	23.82
7120	32.00	PK	V	33.89	6.51	26.04	46.36	74.00	27.64
7120	19.56	AV	V	33.89	6.51	26.04	33.92	54.00	20.08
230.65	46.50	QP	H	11.92	1.82	21.48	38.76	46.00	7.24

802.11n ht40 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)					
Low Channel:5755 MHz									
5755	80.32	PK	H	32.15	5.50	26.59	91.38	N/A	N/A
5755	70.78	AV	H	32.15	5.50	26.59	81.84	N/A	N/A
5755	90.18	PK	V	32.15	5.50	26.59	101.24	N/A	N/A
5755	80.09	AV	V	32.15	5.50	26.59	91.15	N/A	N/A
5725	52.65	PK	V	32.15	5.60	26.63	63.77	78.20	14.43
5715	50.14	PK	V	32.14	5.63	26.64	61.27	68.20	6.93
11510	29.69	PK	V	37.90	8.95	26.12	50.42	74.00	23.58
11510	16.93	AV	V	37.90	8.95	26.12	37.66	54.00	16.34
17265	31.81	PK	V	41.09	13.51	25.63	60.78	74.00	13.22
17265	18.83	AV	V	41.09	13.51	25.63	47.80	54.00	6.20
4485	34.52	PK	V	29.80	5.12	27.08	42.36	74.00	31.64
4485	21.96	AV	V	29.80	5.12	27.08	29.80	54.00	24.20
7120	31.58	PK	V	33.89	6.51	26.04	45.94	74.00	28.06
7120	19.11	AV	V	33.89	6.51	26.04	33.47	54.00	20.53
230.65	46.30	QP	H	11.92	1.82	21.48	38.56	46.00	7.44
High Channel:5795 MHz									
5795	81.43	PK	H	32.16	5.46	26.55	92.50	N/A	N/A
5795	71.62	AV	H	32.16	5.46	26.55	82.69	N/A	N/A
5795	91.22	PK	V	32.16	5.46	26.55	102.29	N/A	N/A
5795	81.49	AV	V	32.16	5.46	26.55	92.56	N/A	N/A
5850	43.57	PK	V	32.17	6.05	26.68	55.11	78.20	23.09
5860	40.36	PK	V	32.17	6.02	26.71	51.84	68.20	16.36
11590	29.68	PK	V	37.90	8.92	26.06	50.44	74.00	23.56
11590	16.92	AV	V	37.90	8.92	26.06	37.68	54.00	16.32
17385	32.00	PK	V	41.81	12.82	25.63	61.00	74.00	13.00
17385	18.82	AV	V	41.81	12.82	25.63	47.82	54.00	6.18
4485	34.36	PK	V	29.80	5.12	27.08	42.20	74.00	31.80
4485	22.00	AV	V	29.80	5.12	27.08	29.84	54.00	24.16
7120	31.51	PK	V	33.89	6.51	26.04	45.87	74.00	28.13
7120	19.17	AV	V	33.89	6.51	26.04	33.53	54.00	20.47
230.65	46.90	QP	H	11.92	1.82	21.48	39.16	46.00	6.84

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)					
Middle Channel:5775 MHz									
5775	78.68	PK	H	32.16	5.48	26.57	89.75	N/A	N/A
5775	68.94	AV	H	32.16	5.48	26.57	80.01	N/A	N/A
5775	87.33	PK	V	32.16	5.48	26.57	98.40	N/A	N/A
5775	77.61	AV	V	32.16	5.48	26.57	88.68	N/A	N/A
5725	45.05	PK	V	32.15	5.60	26.63	56.17	78.20	22.03
5715	44.85	PK	V	32.14	5.63	26.64	55.98	68.20	12.22
5850	39.57	PK	V	32.17	6.05	26.68	51.11	78.20	27.09
5860	38.39	PK	V	32.17	6.02	26.71	49.87	68.20	18.33
11550	30.94	PK	V	37.90	8.93	26.09	51.68	74.00	22.32
11550	16.94	AV	V	37.90	8.93	26.09	37.68	54.00	16.32
17325	32.12	PK	V	41.45	13.17	25.63	61.11	74.00	12.89
17325	18.77	AV	V	41.45	13.17	25.63	47.76	54.00	6.24
4485	34.64	PK	V	29.80	5.12	27.08	42.48	74.00	31.52
4485	22.21	AV	V	29.80	5.12	27.08	30.05	54.00	23.95
230.65	47.20	QP	H	11.92	1.82	21.48	39.46	46.00	6.54

FINAL

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.

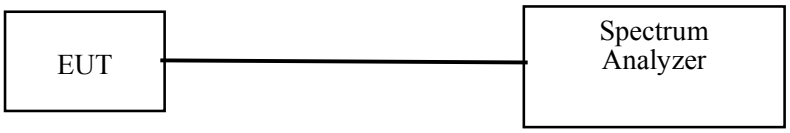
(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(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 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	2014-05-09	2015-05-09
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06
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:	25.4 °C
Relative Humidity:	51 %
ATM Pressure:	100.9 kPa

The testing was performed by Dean Liu from 2016-04-02 to 2016-04-05.

Please refer to the following plots:

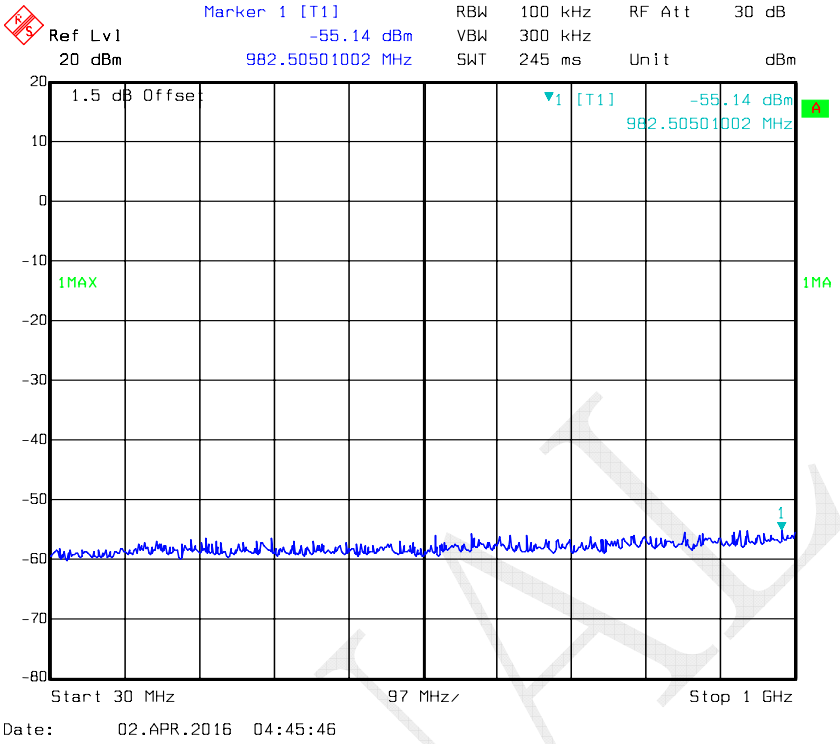
Result: Compliance.

Note: All emissions at each chain is low than limit 8 dBc (low than -35dBm), so combined two chain and added the antenna gain 5dBi is meet the test requirements.

FINAL

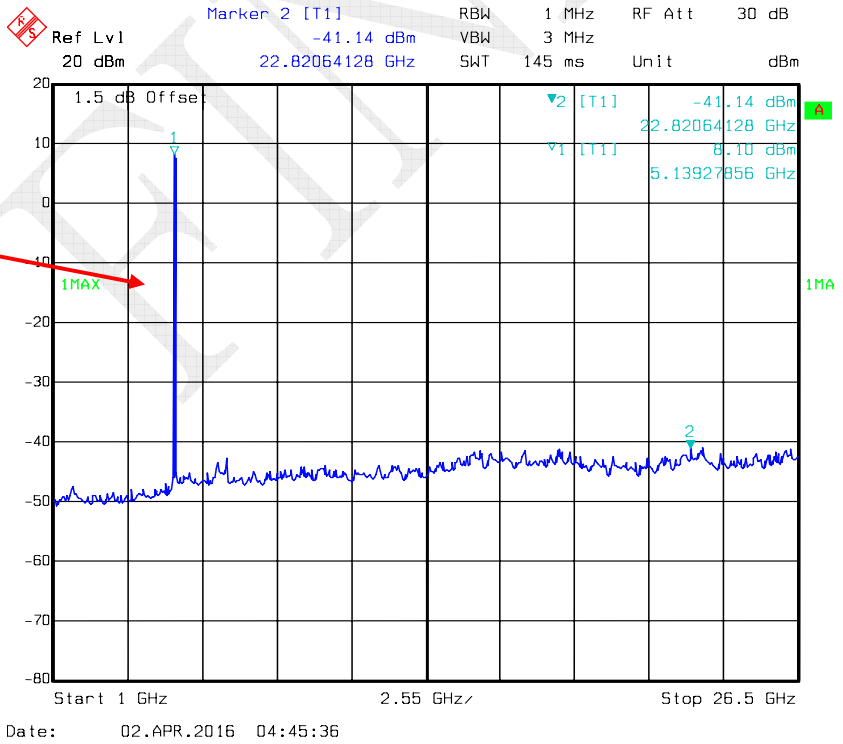
5150MHz-5250MHz:

802.11a Low Channel 30MHz-1GHz – Chain0

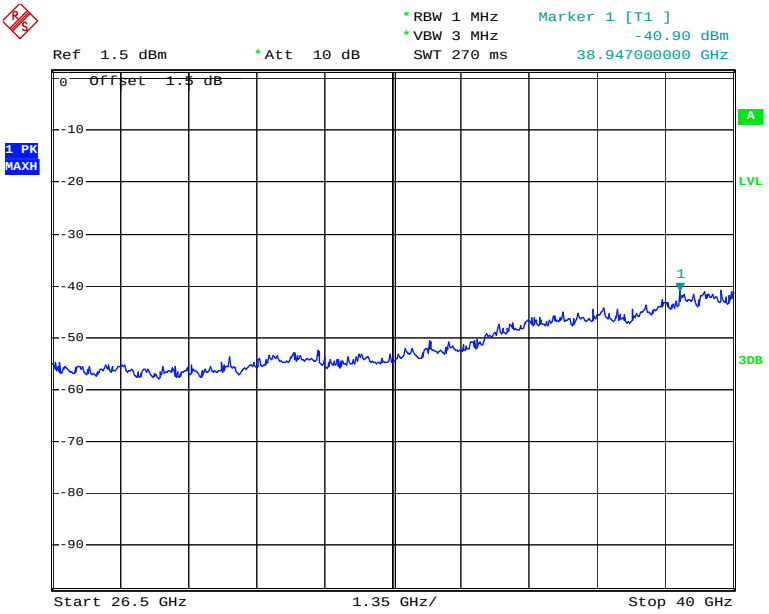


802.11a Low Channel 1GHz-26.5GHz – Chain0

Fundamental



802.11a Low Channel 26.5GHz-40GHz – Chain0



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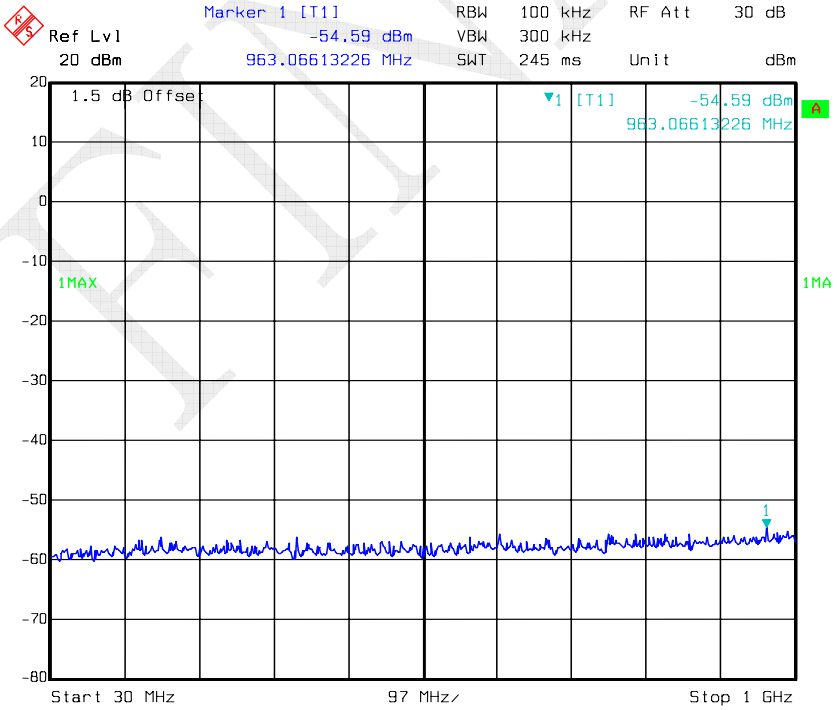
802.11a Middle Channel 30MHz-1GHz – Chain0



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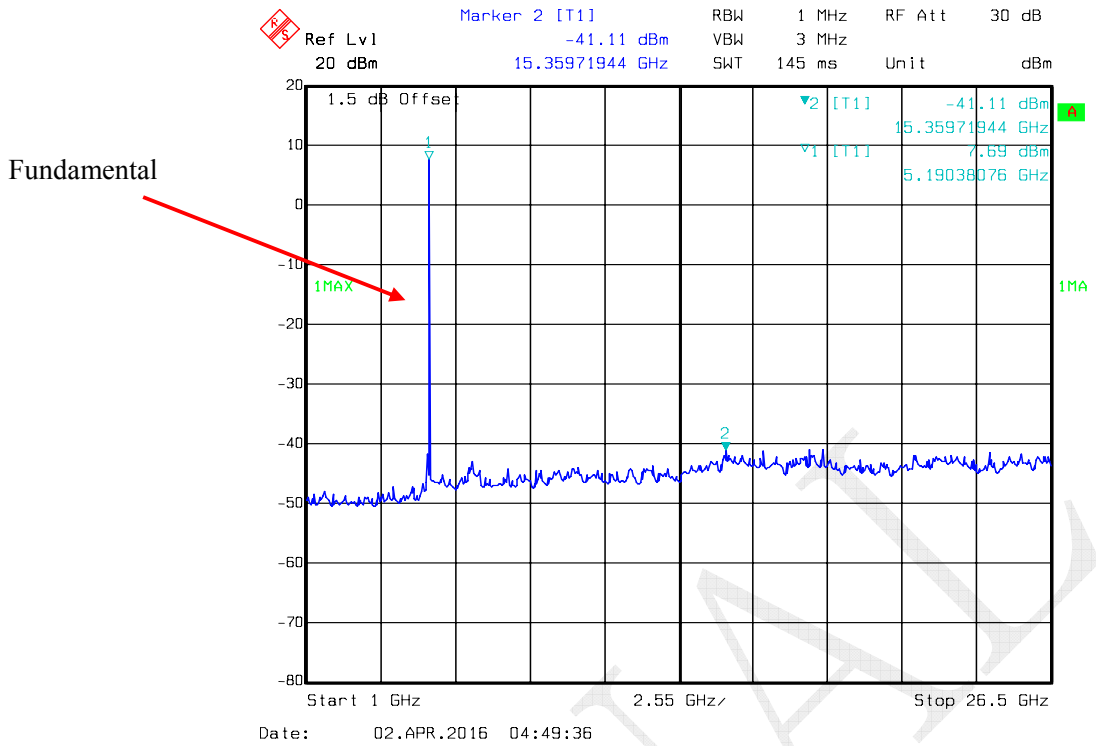
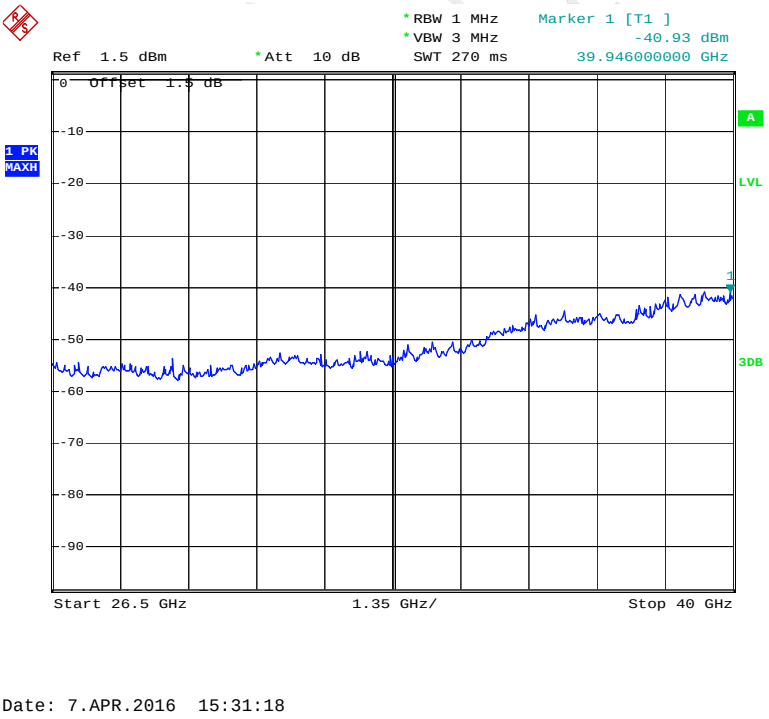
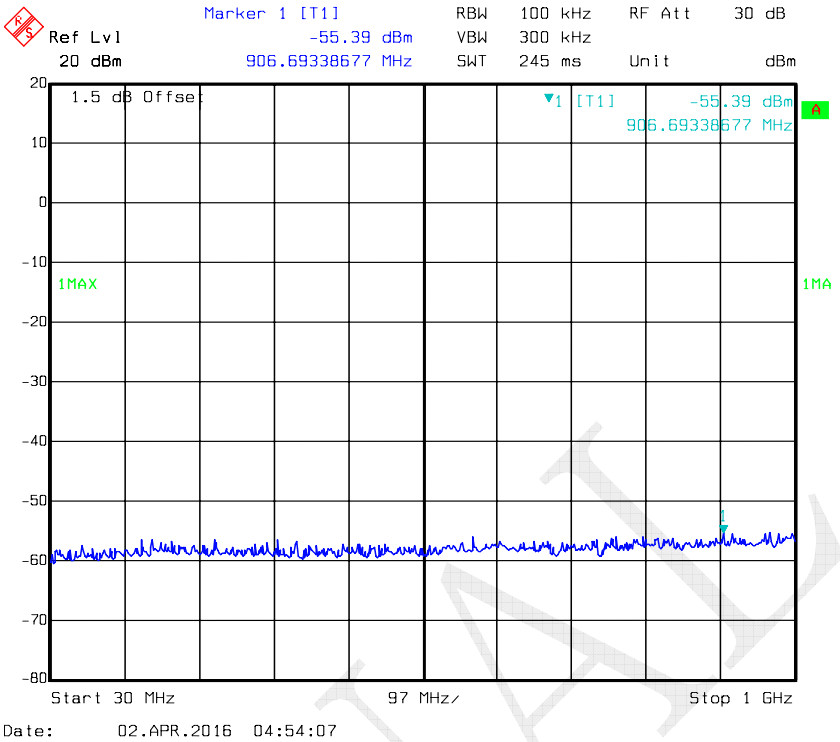
802.11a Middle Channel 1GHz -26.5GHz – Chain0



802.11a Middle Channel 26.5GHz-40GHz – Chain0

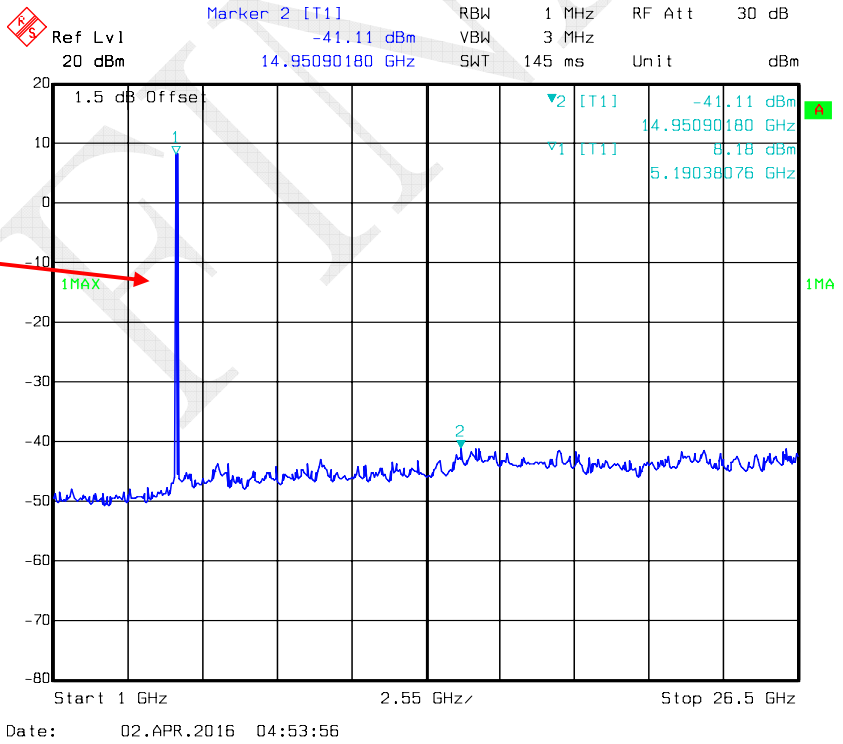


802.11a High Channel 30MHz-1GHz – Chain0

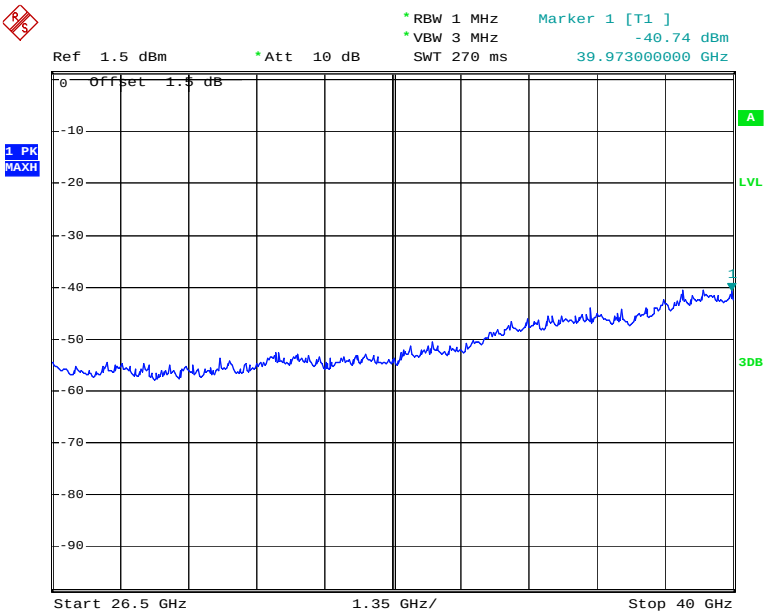


802.11a High Channel 1GHz-26.5GHz – Chain0

Fundamental



802.11a High Channel 26.5GHz-40GHz – Chain0



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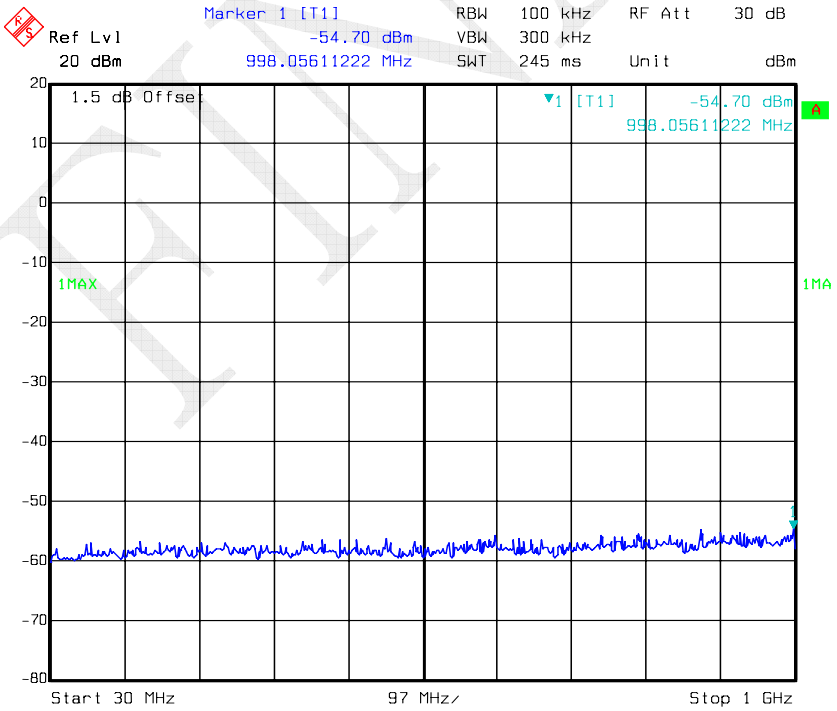
802.11n ht20 Low Channel 30MHz-1GHz – Chain0



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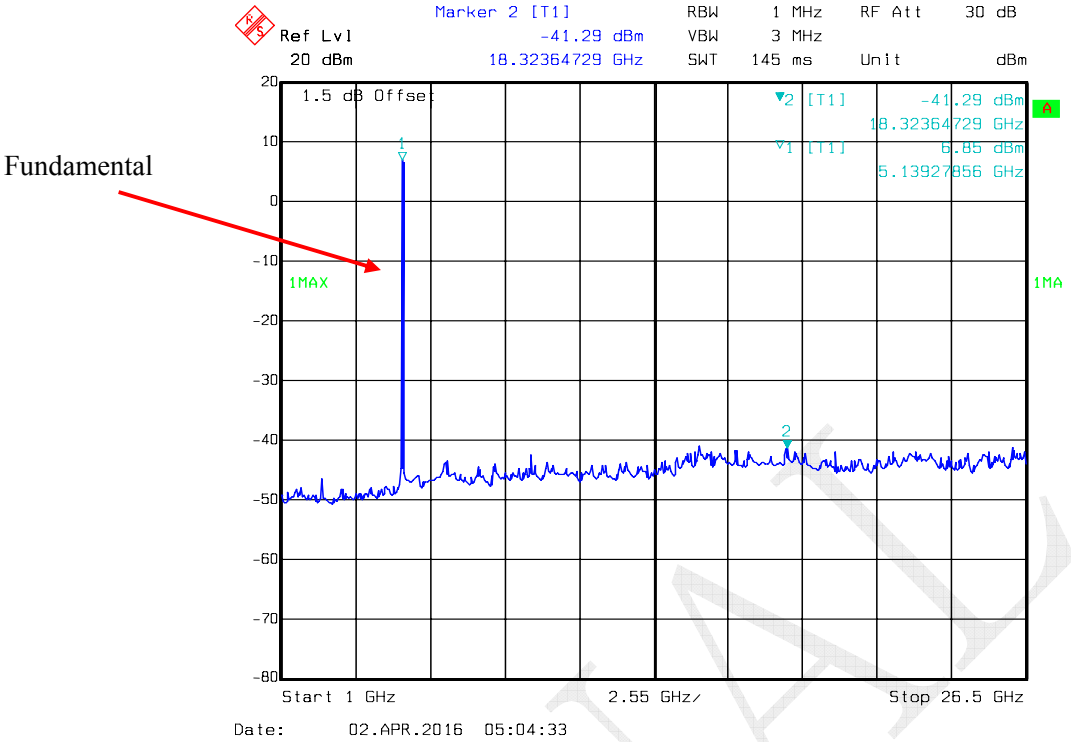
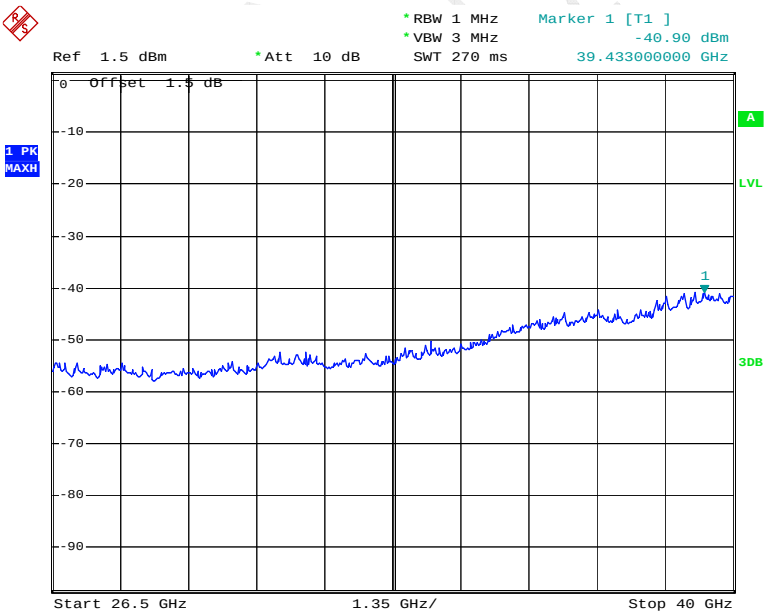
802.11n ht20 Low Channel 1GHz-26.5GHz – Chain0



802.11n ht20 Low Channel 26.5GHz-40GHz – Chain0



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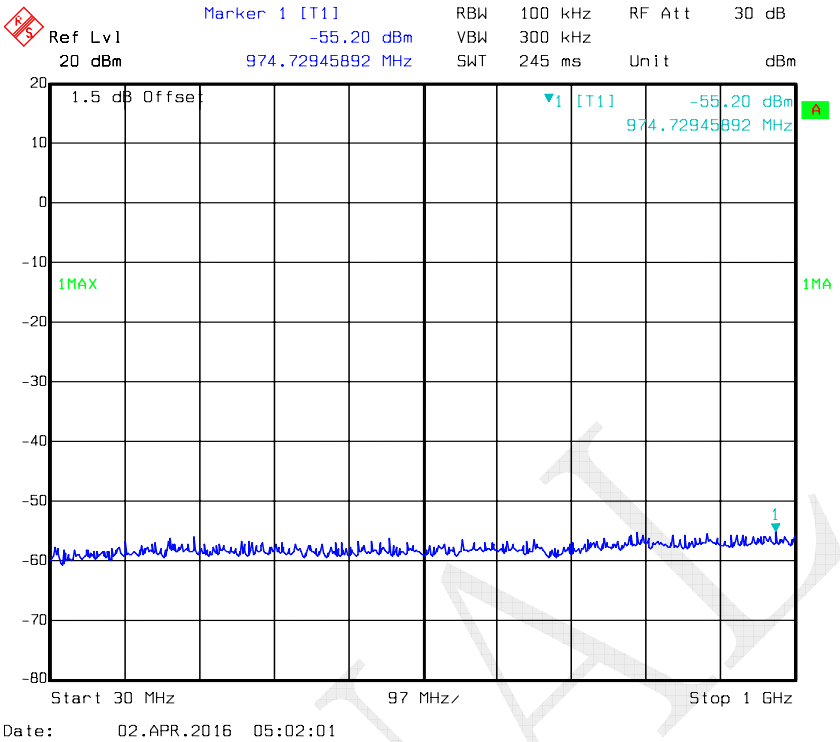
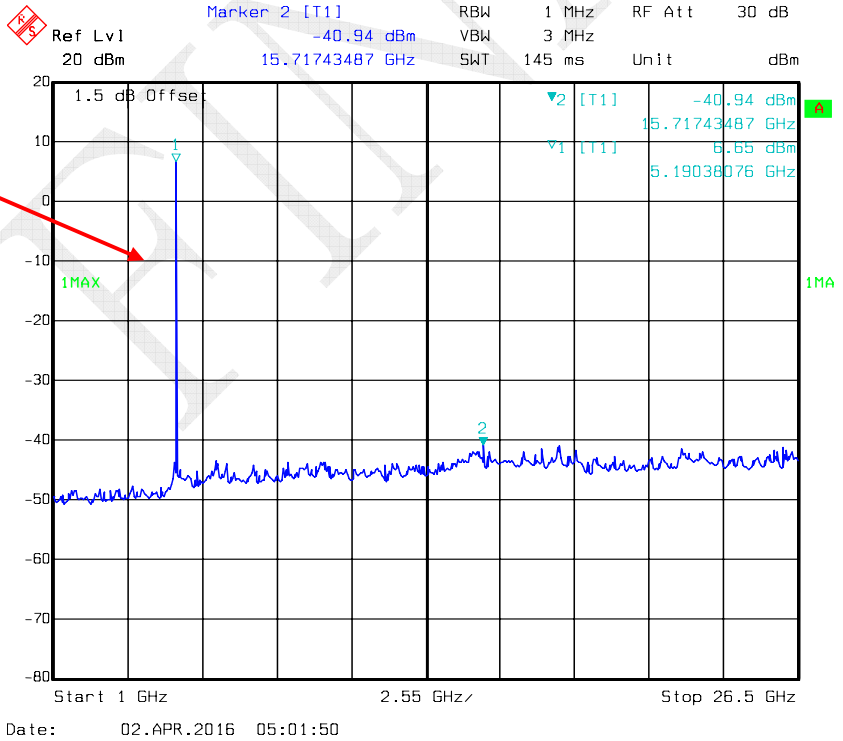
802.11n ht20 Middle Channel 30MHz-1GHz – Chain0

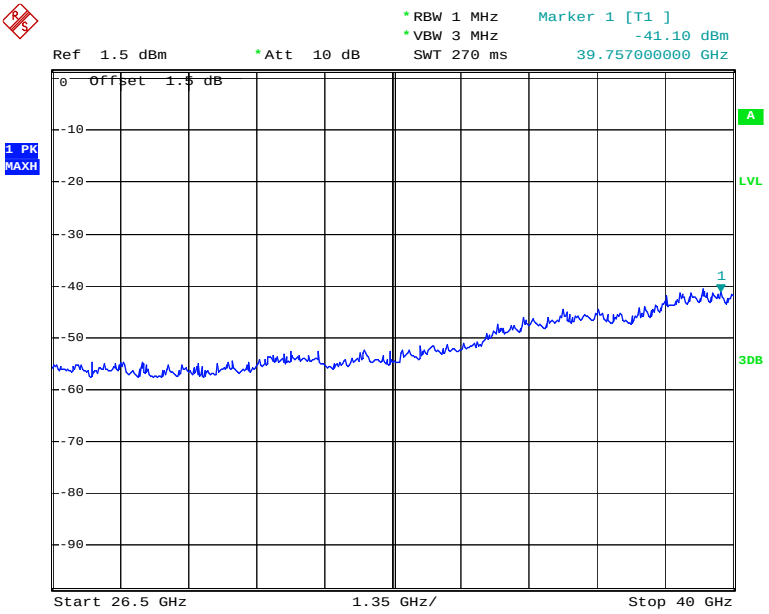


802.11n ht20 Middle Channel 1GHz -26.5GHz – Chain0

Fundamental



802.11n ht20 Middle Channel 26.5GHz-40GHz – Chain0



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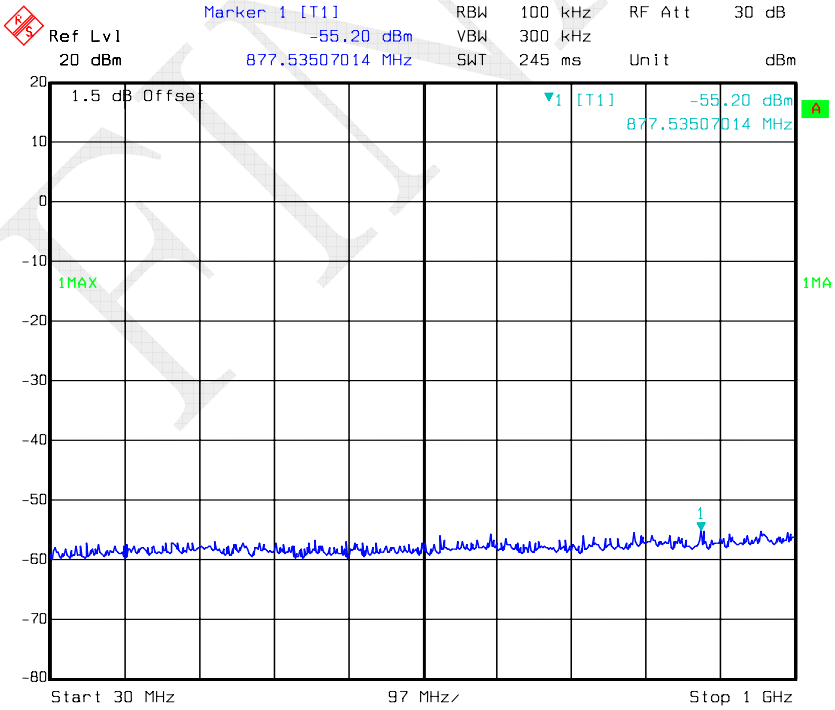
802.11n ht20 High Channel 30MHz-1GHz – Chain0



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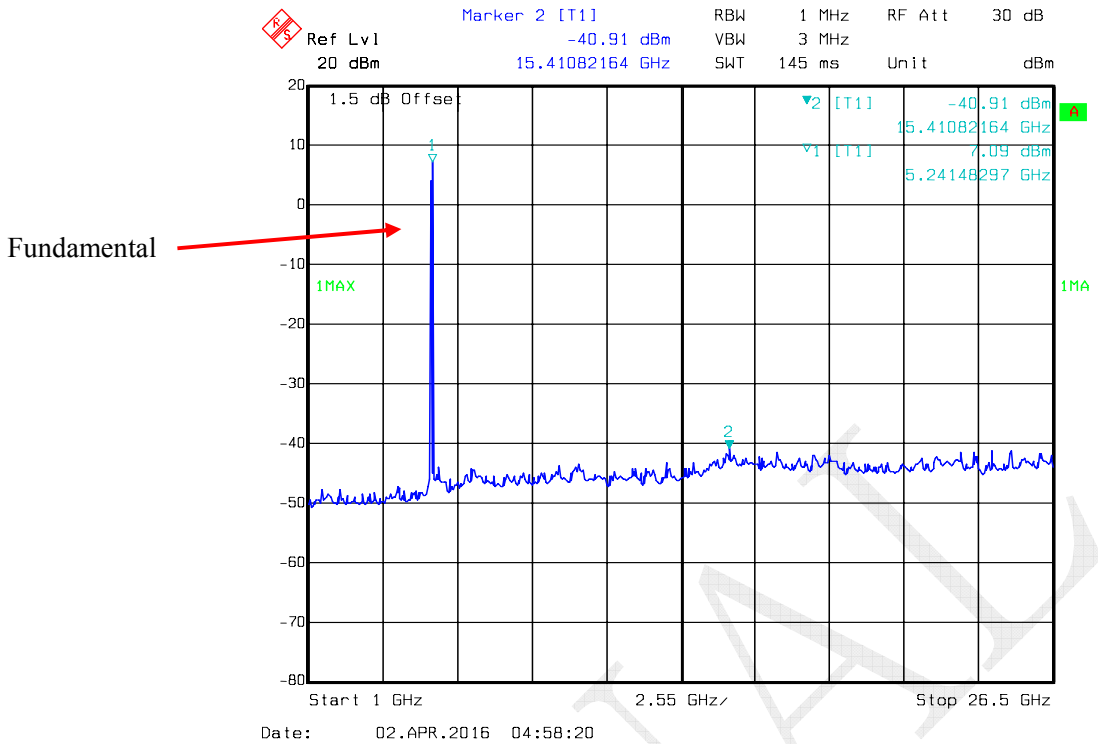
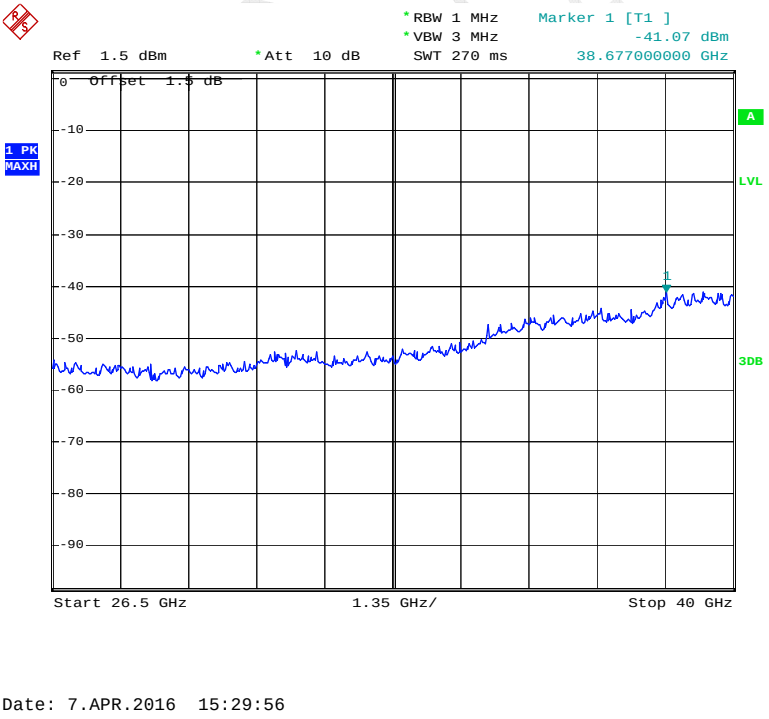
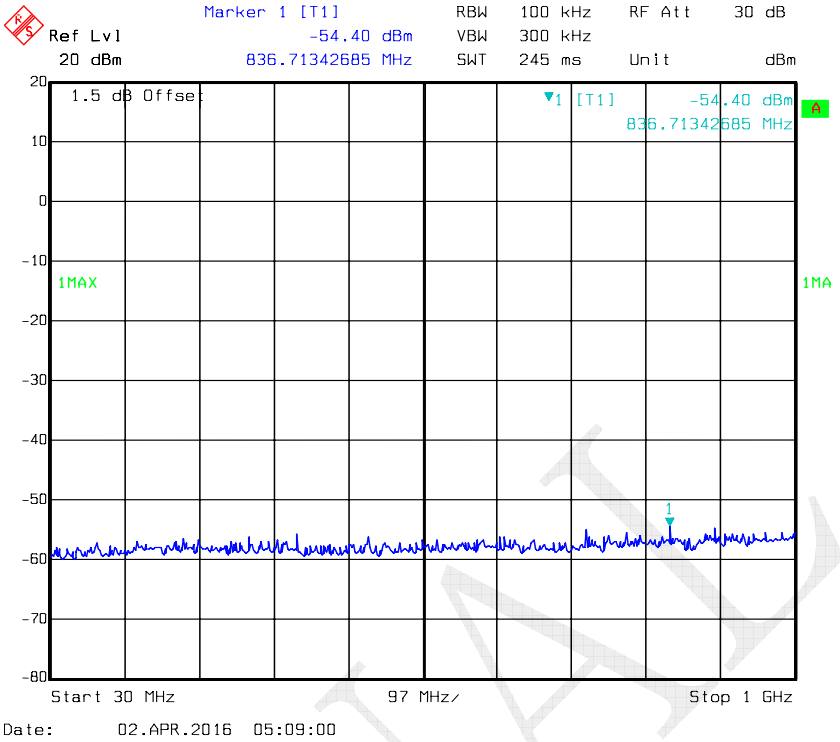
802.11n ht20 High Channel 1GHz-26.5GHz – Chain0



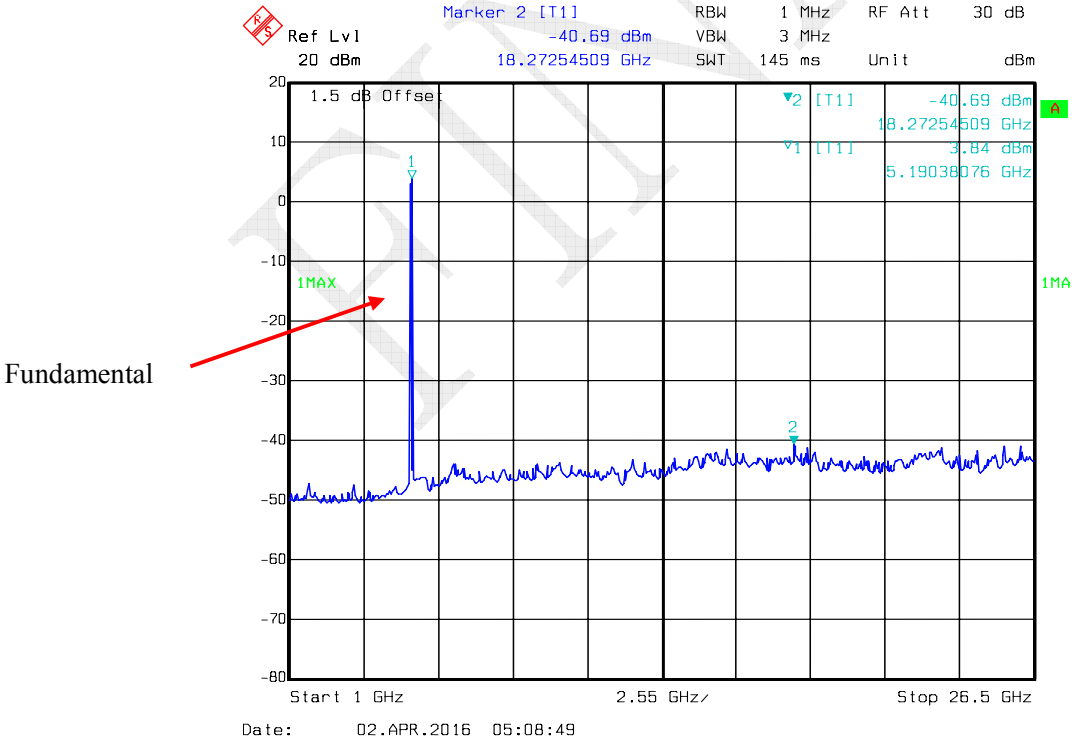
802.11n ht20 High Channel 26.5GHz-40GHz – Chain0



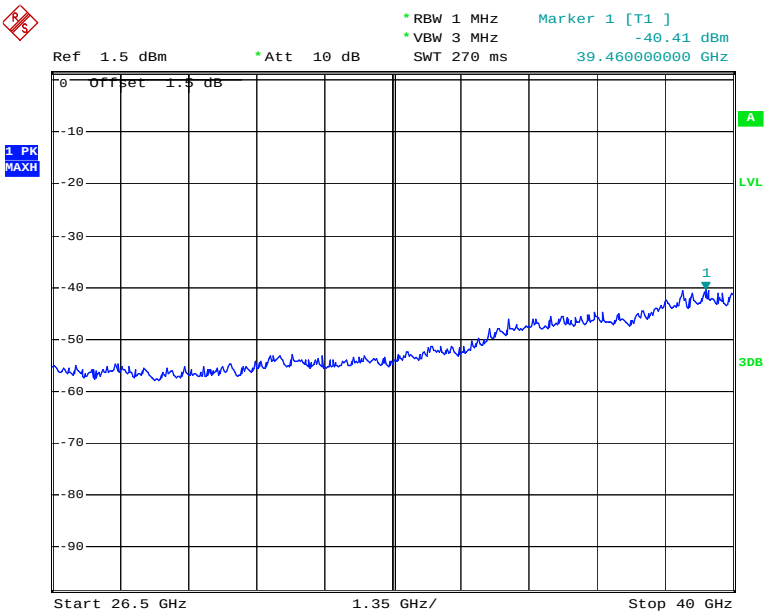
802.11n ht40 Low Channel 30MHz-1GHz – Chain0



802.11n ht40 Low Channel 1GHz-26.5GHz – Chain0



802.11n ht40 Low Channel 26.5GHz-40GHz – Chain0



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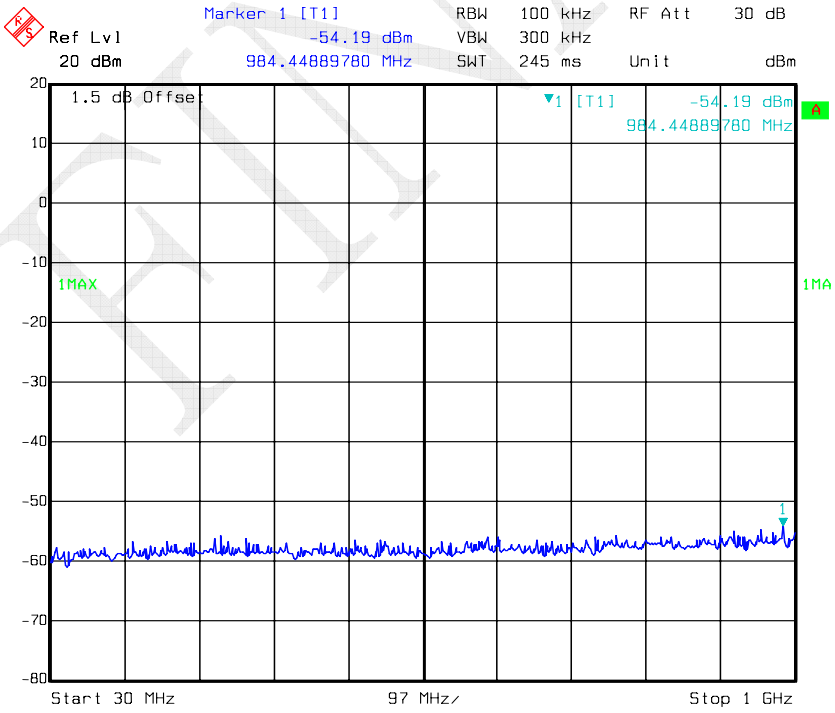
802.11n ht40 High Channel 30MHz-1GHz – Chain0



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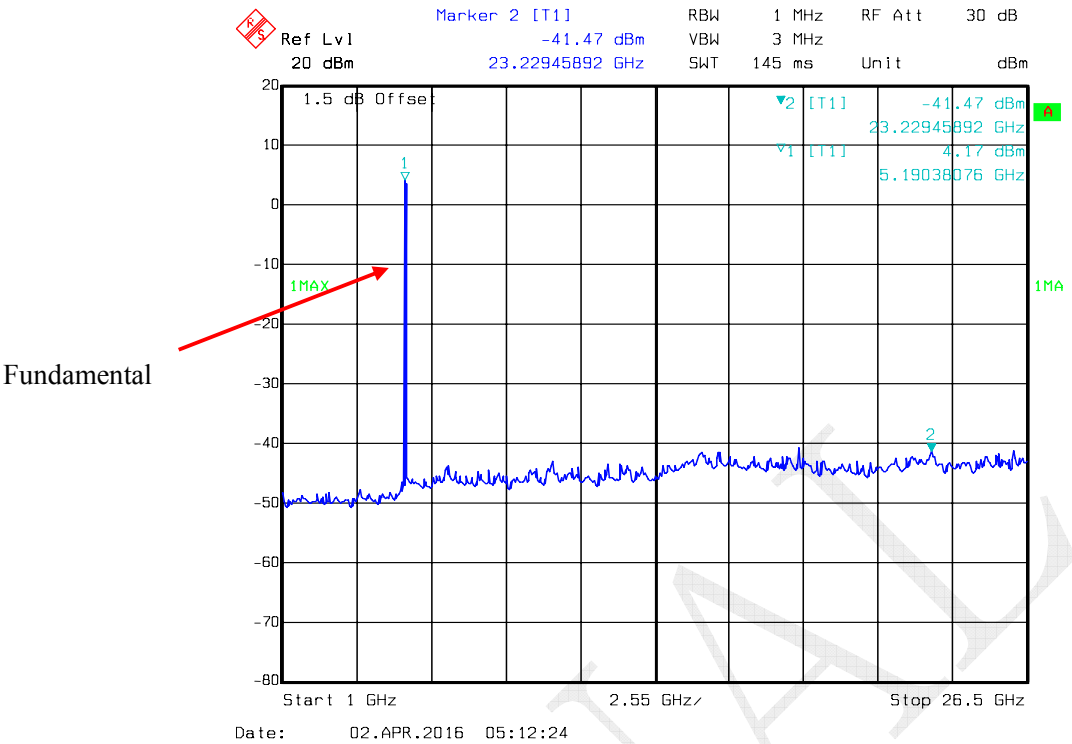
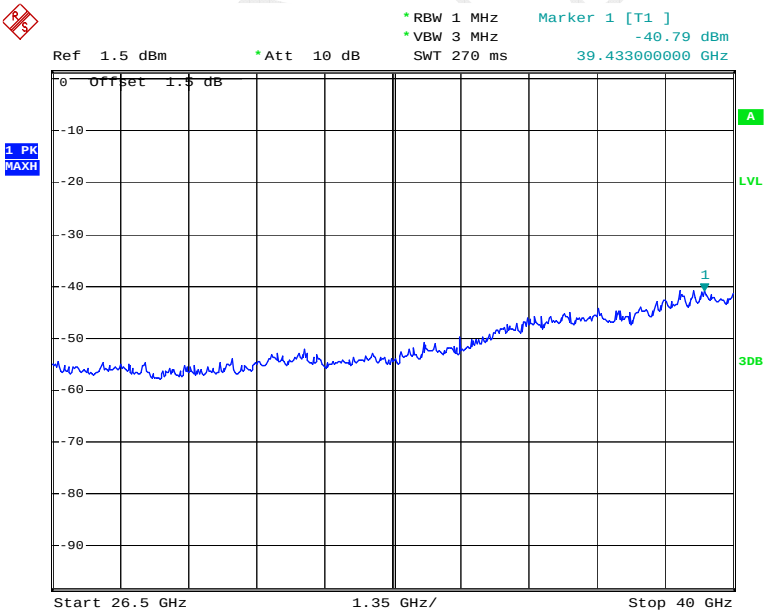
802.11n ht40 High Channel 1GHz-26.5GHz – Chain0

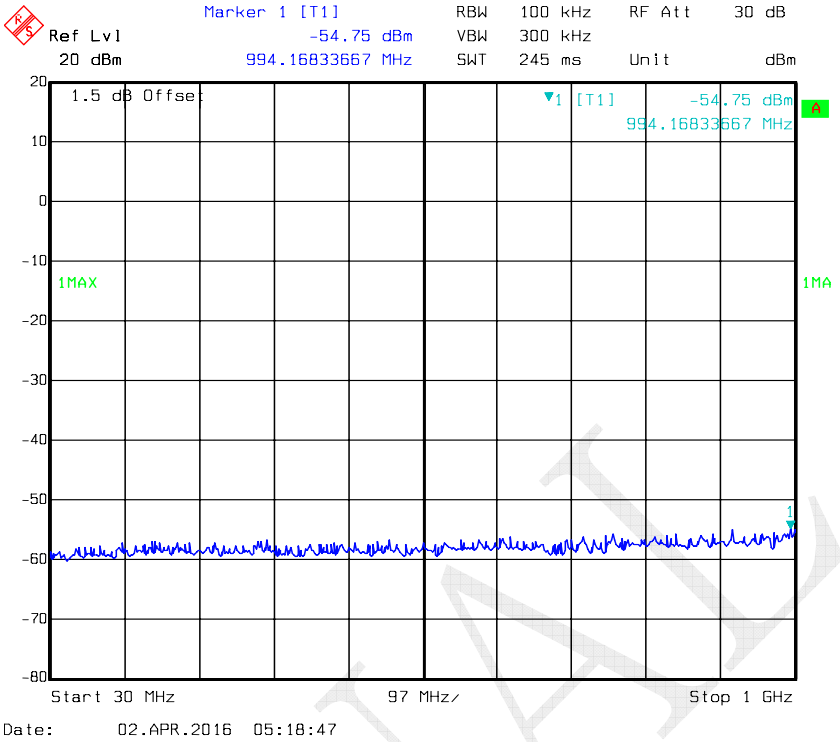


802.11n ht40 High Channel 26.5GHz-40GHz – Chain0

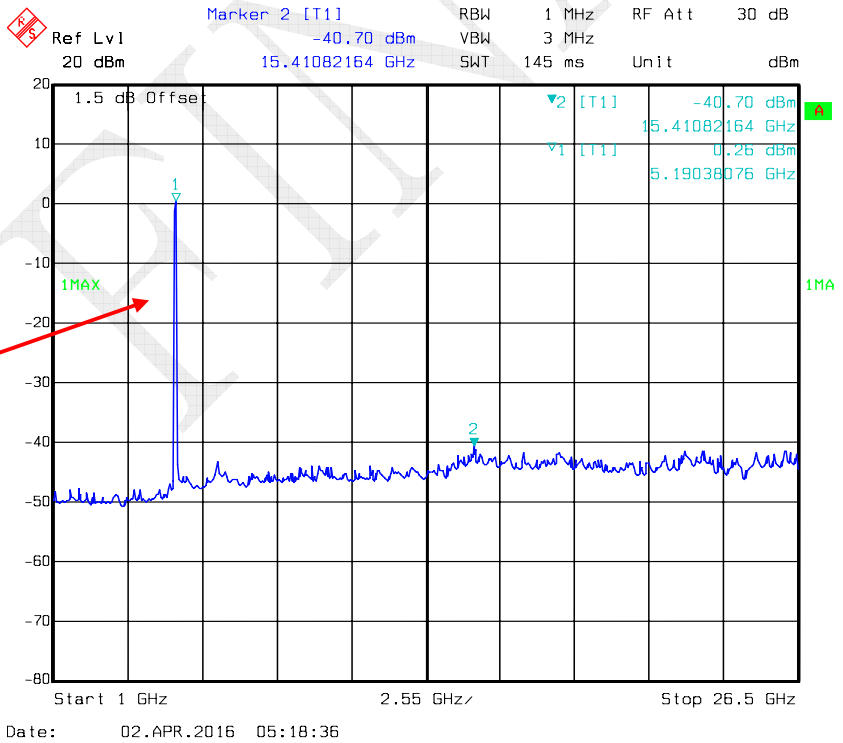


Date: 7.APR.2016 15:30:39

802.11n ac80 Middle Channel 30MHz-1GHz – Chain0

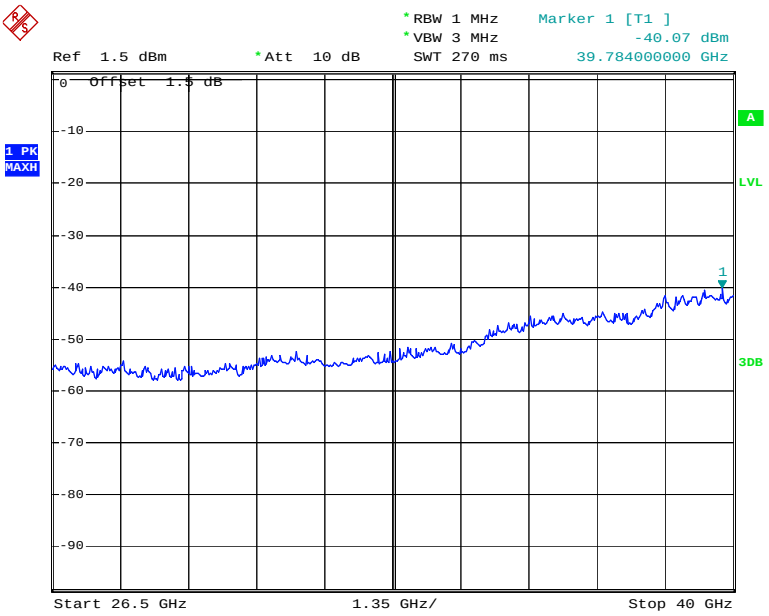


802.11n ac80 Middle Channel 1GHz-26.5GHz – Chain0



Fundamental

802.11n ac80 Middle Channel 26.5GHz-40GHz – Chain0



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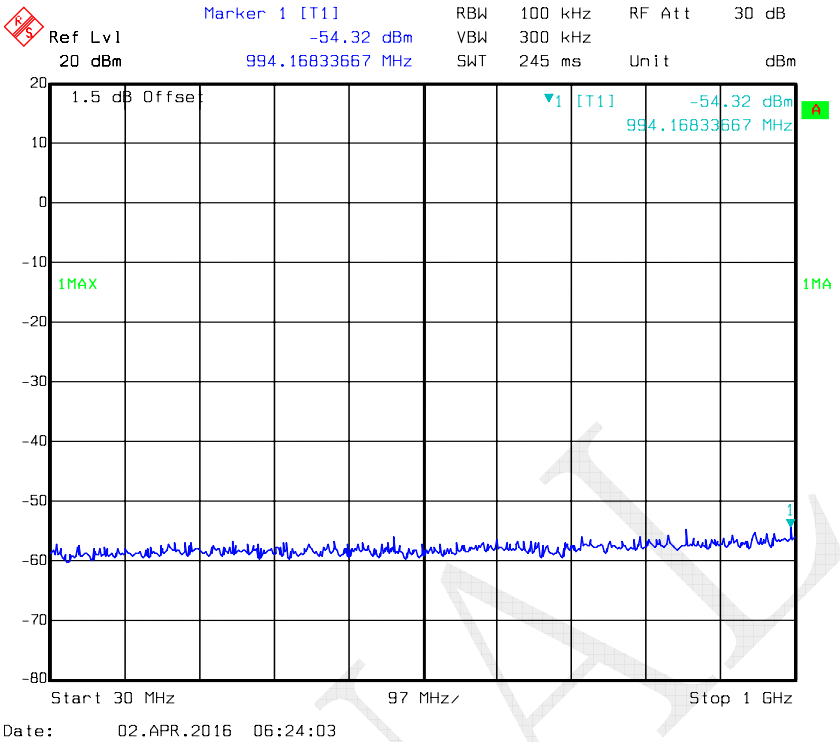
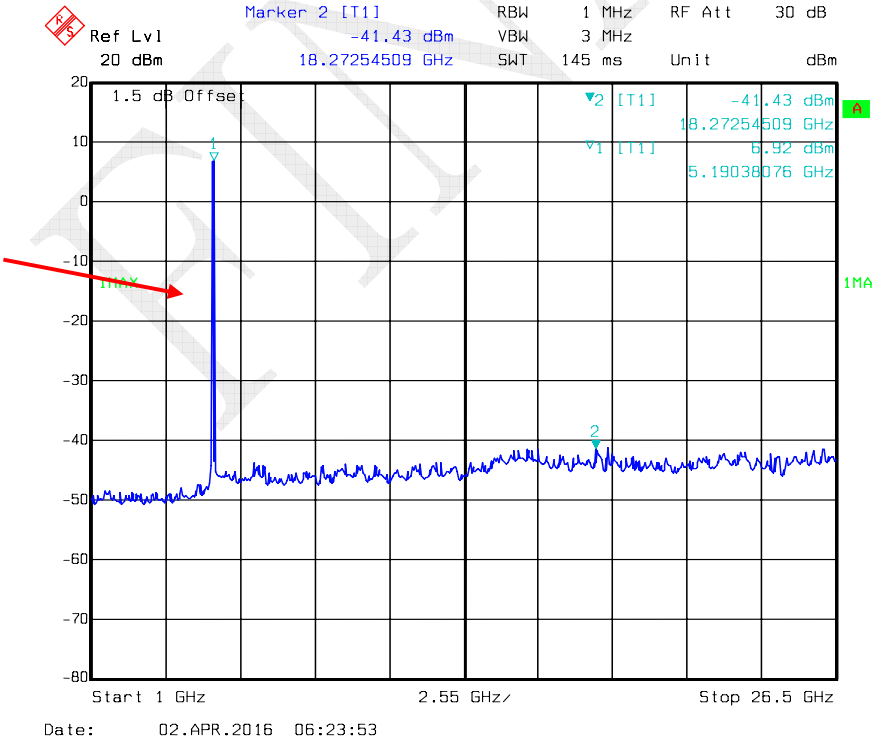
802.11a Low Channel 30MHz-1GHz – Chain1

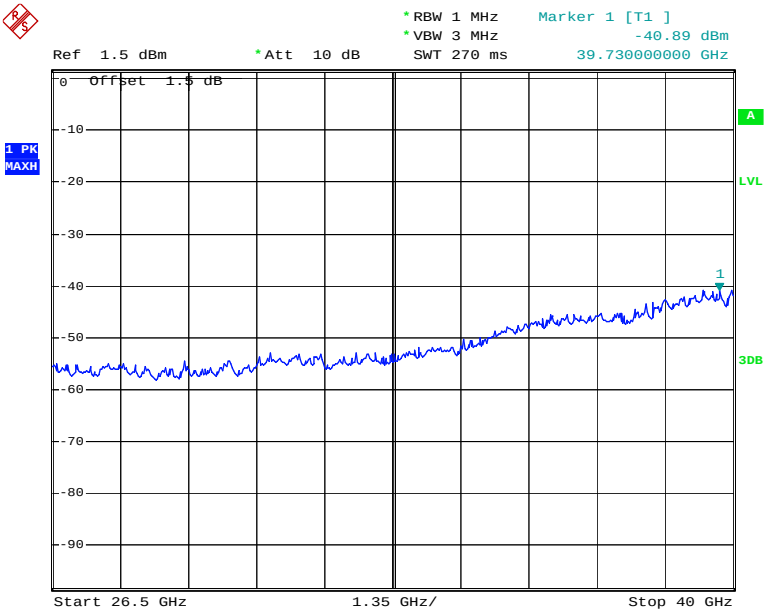


802.11a Low Channel 1GHz-26.5GHz – Chain1

Fundamental



802.11a Low Channel 26.5GHz-40GHz – Chain1



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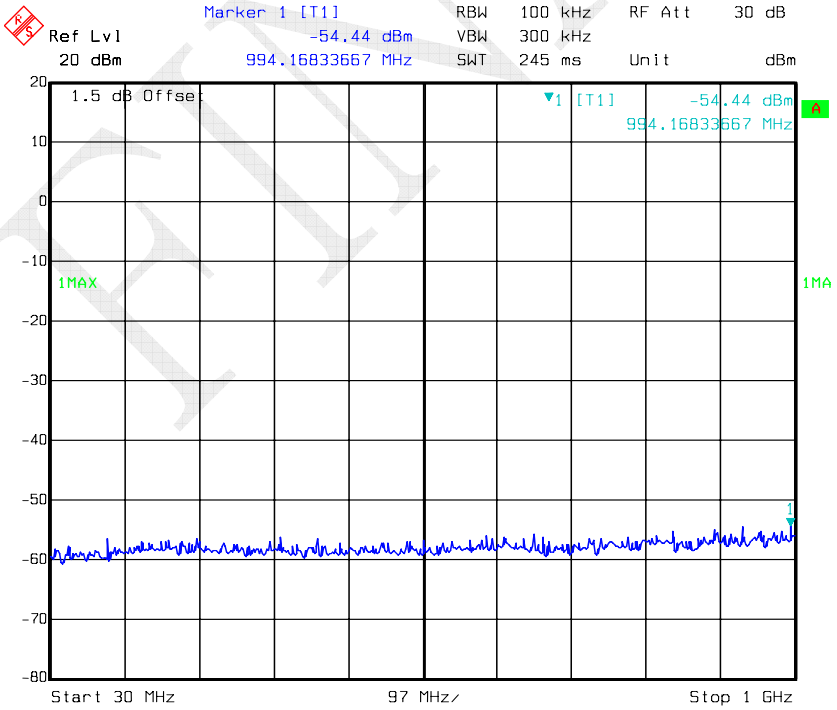
802.11a Middle Channel 30MHz-1GHz – Chain1



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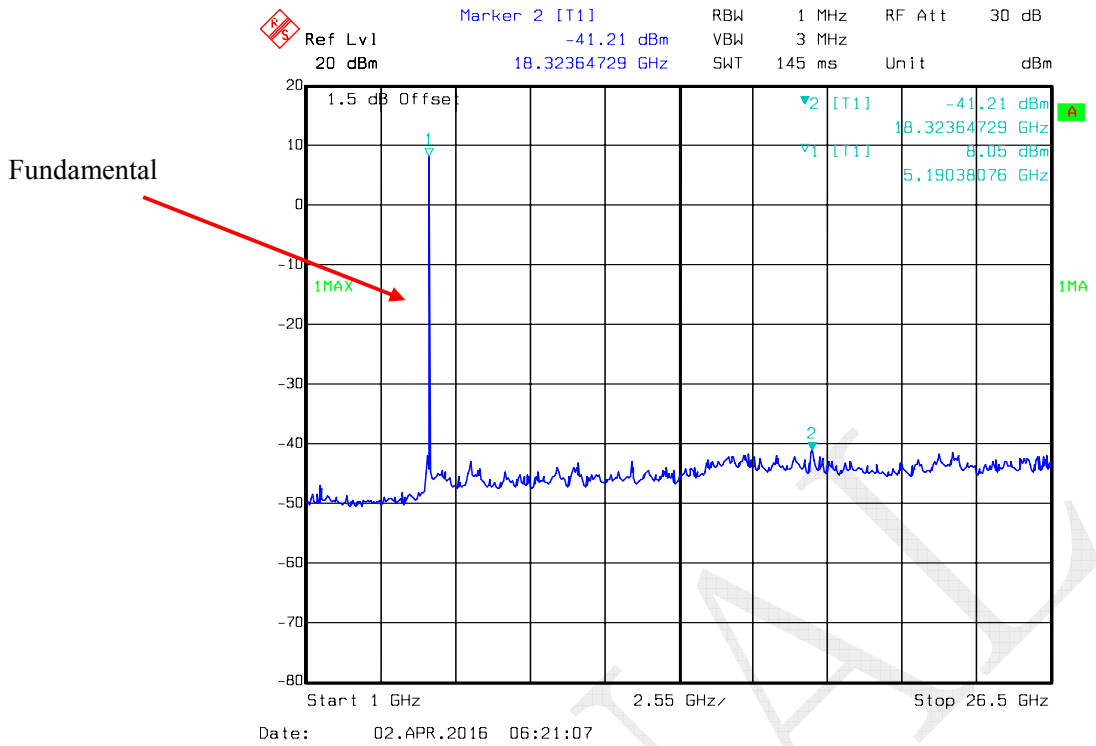
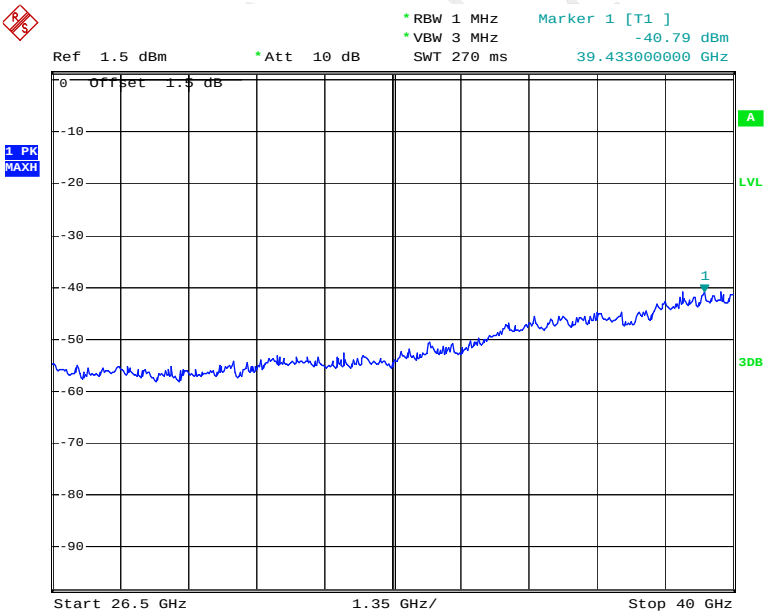
802.11a Middle Channel 1GHz -26.5GHz – Chain1



802.11a Middle Channel 26.5GHz-40GHz – Chain1



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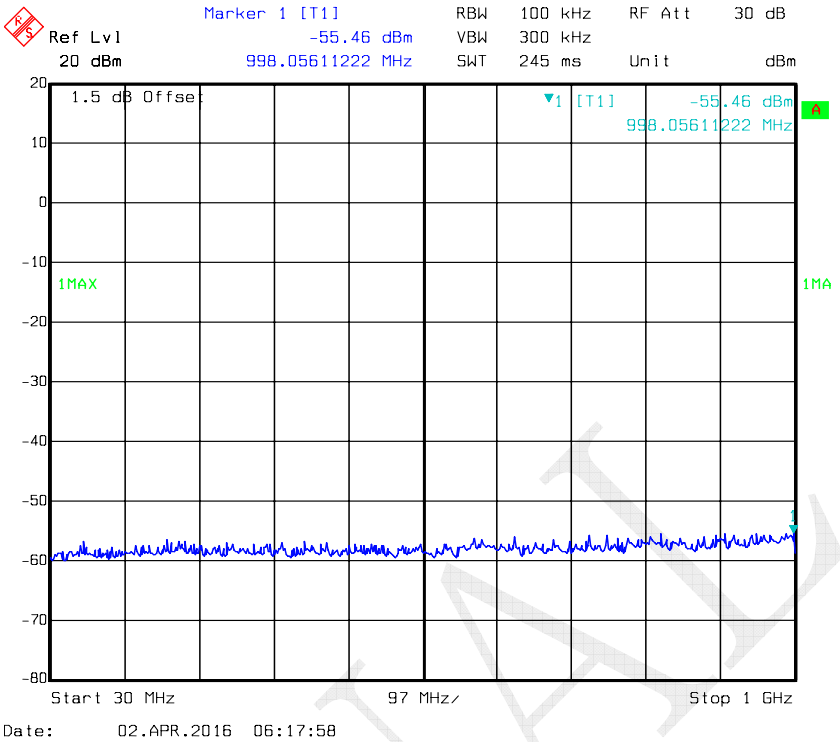
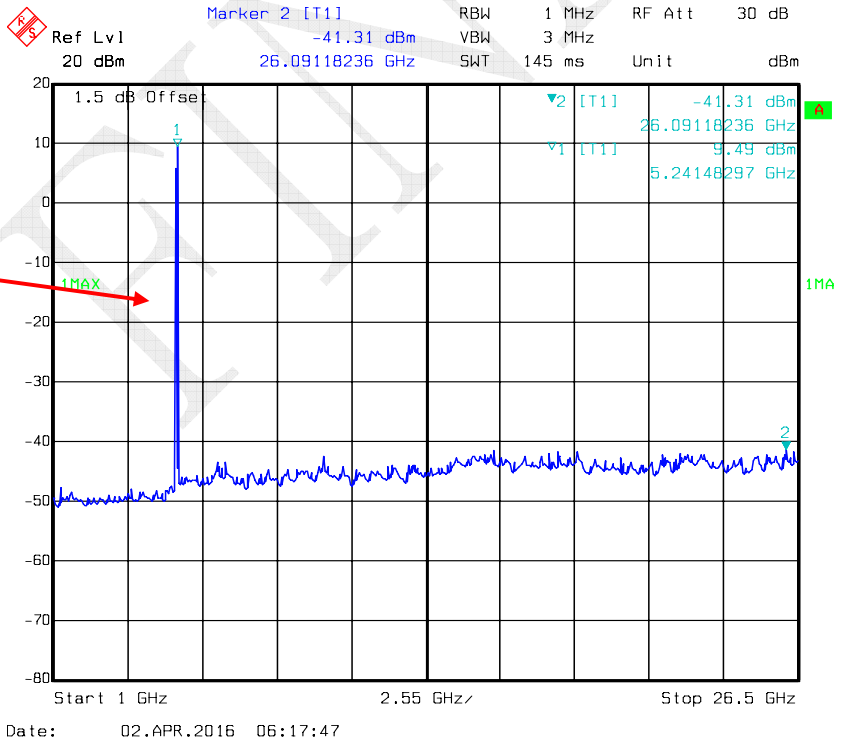
802.11a High Channel 30MHz-1GHz – Chain1

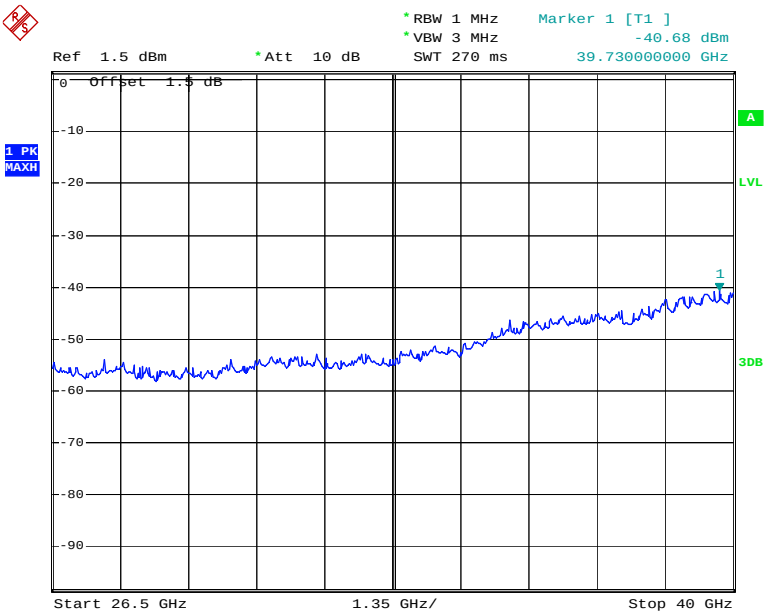


802.11a High Channel 1GHz-26.5GHz – Chain1

Fundamental



802.11a High Channel 26.5GHz-40GHz – Chain1



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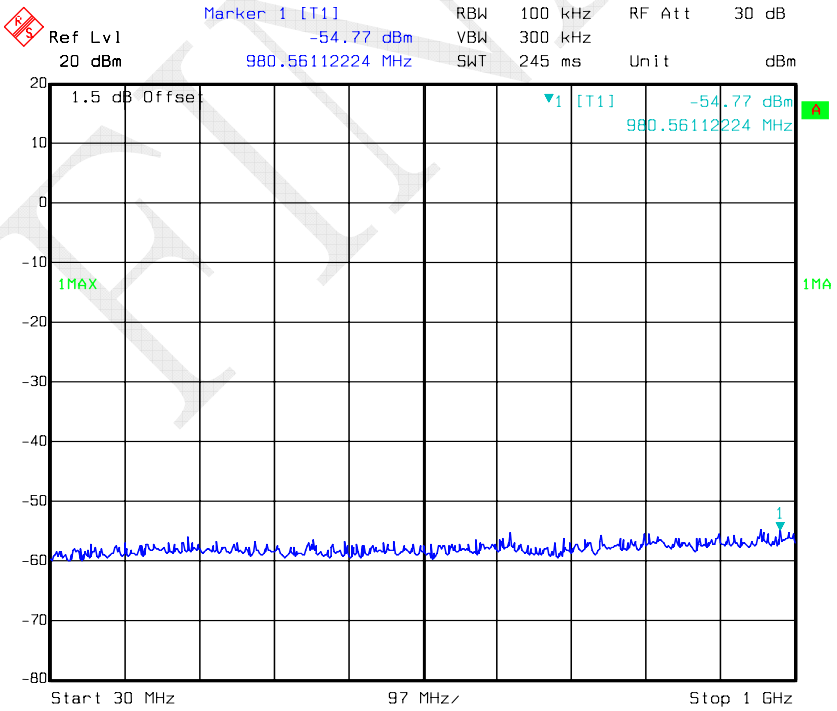
802.11n ht20 Low Channel 30MHz-1GHz – Chain1



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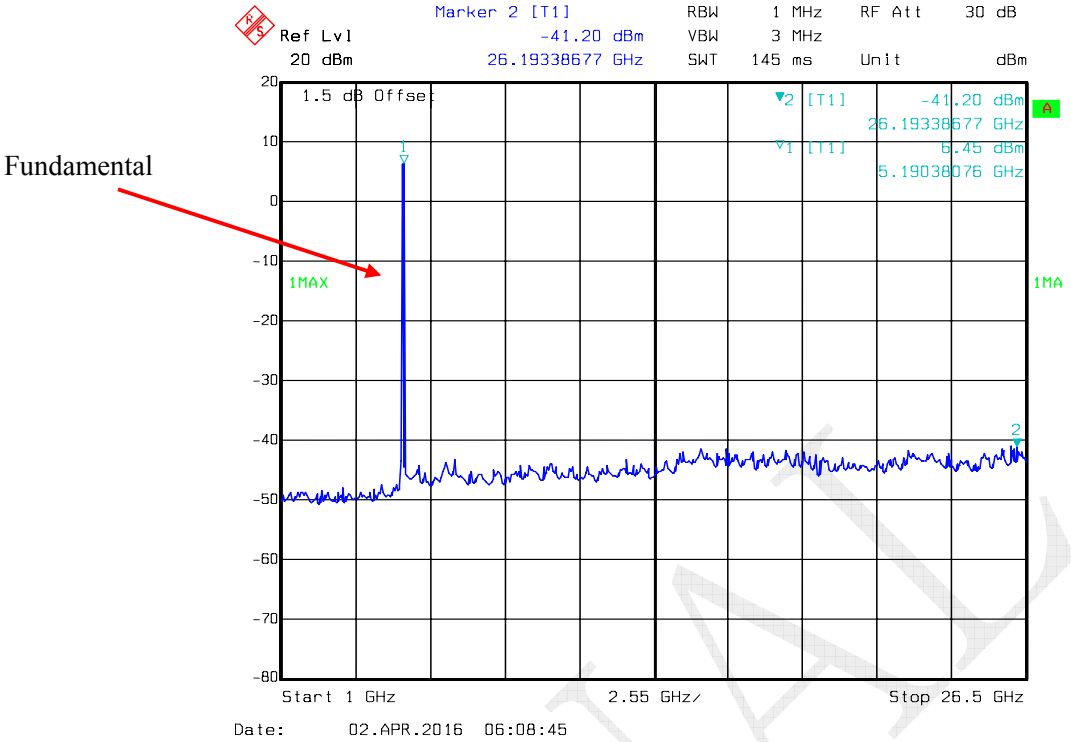
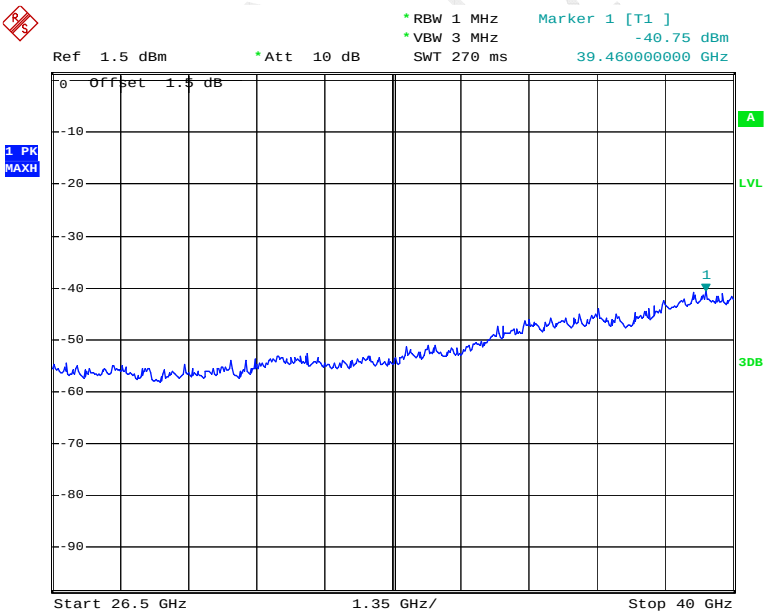
802.11n ht20 Low Channel 1GHz-26.5GHz – Chain1



802.11n ht20 Low Channel 26.5GHz-40GHz – Chain1



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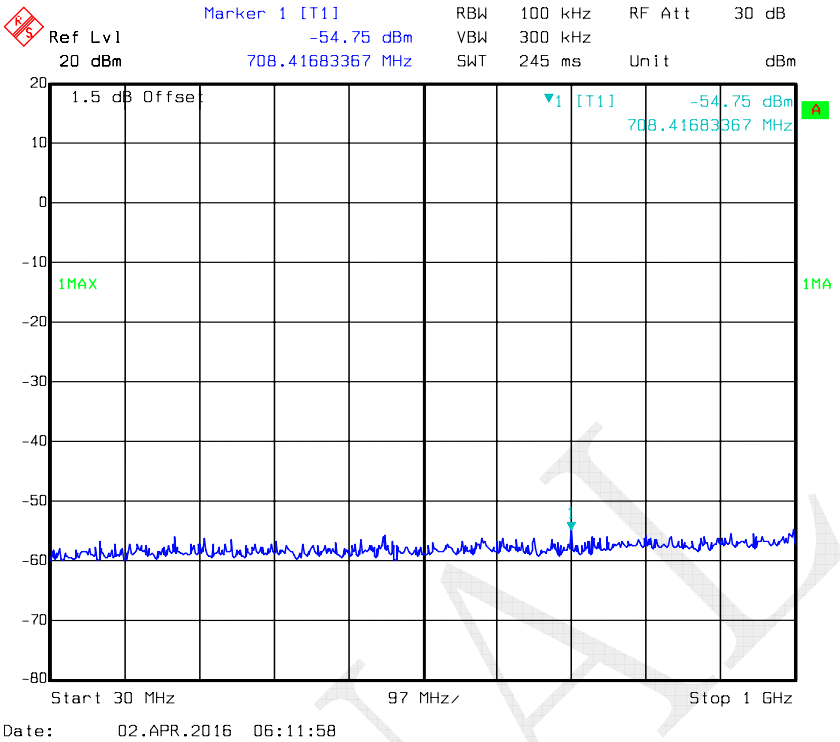
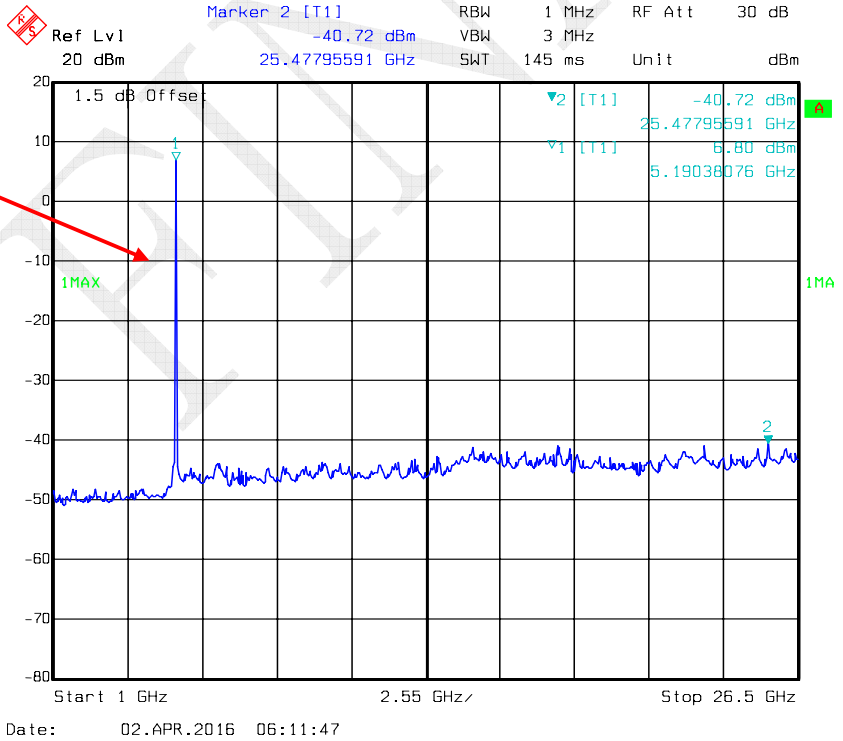
802.11n ht20 Middle Channel 30MHz-1GHz – Chain1

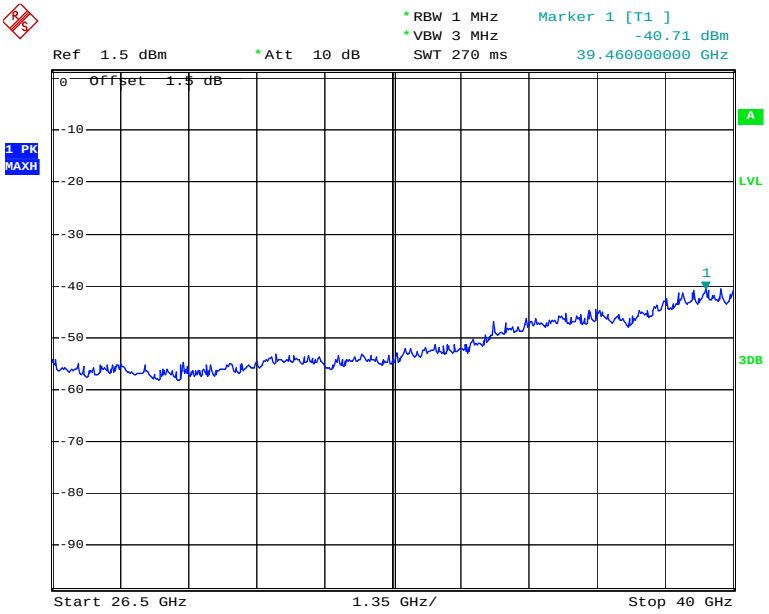


802.11n ht20 Middle Channel 1GHz -26.5GHz – Chain1

Fundamental



802.11n ht20 Middle Channel 26.5GHz-40GHz – Chain1



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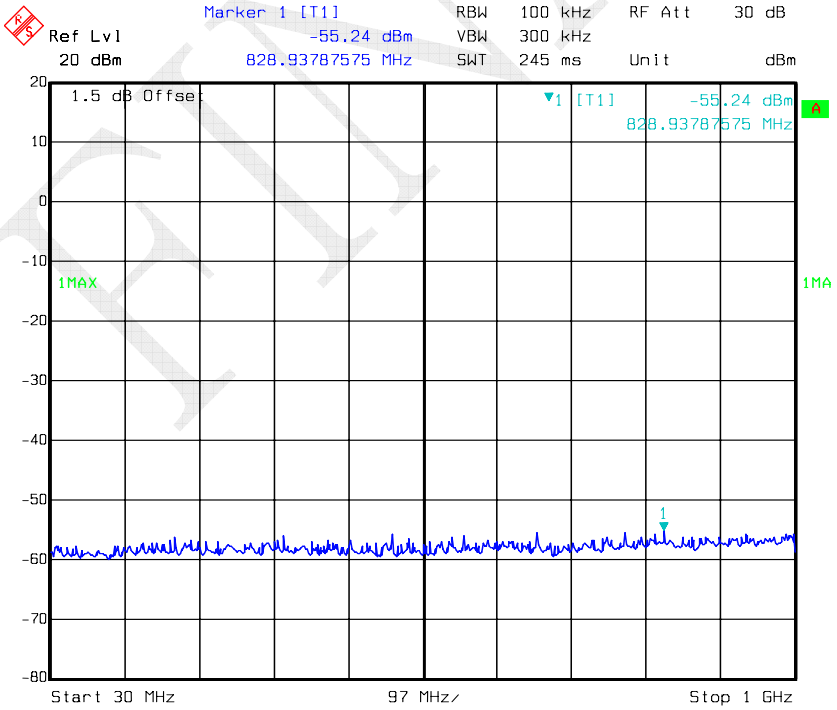
802.11n ht20 High Channel 30MHz-1GHz – Chain1



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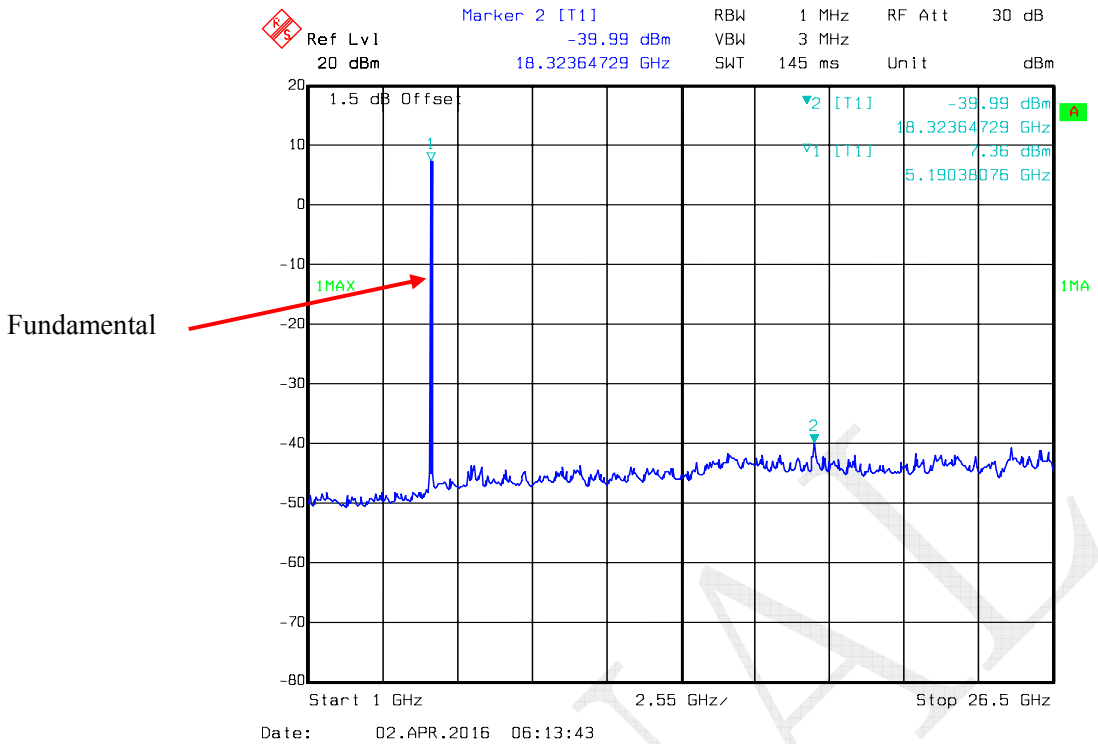
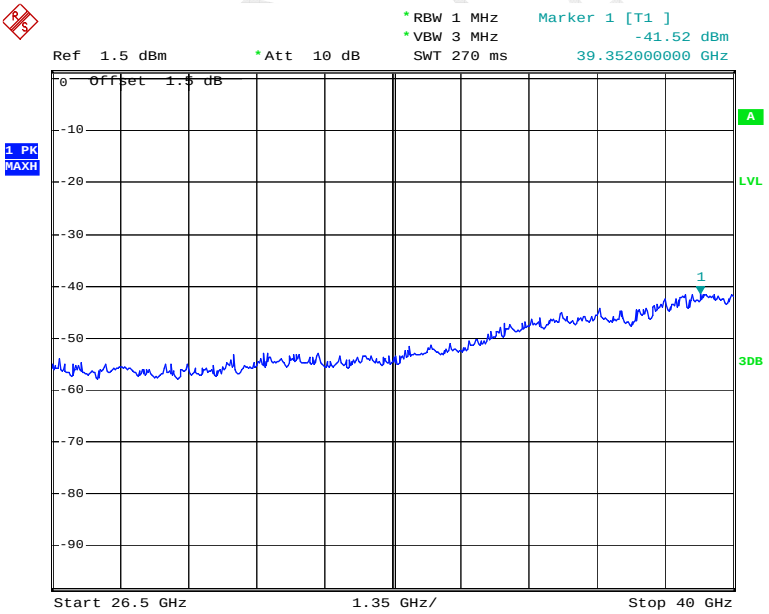
802.11n ht20 High Channel 1GHz-26.5GHz – Chain1



802.11n ht20 High Channel 26.5GHz-40GHz – Chain1



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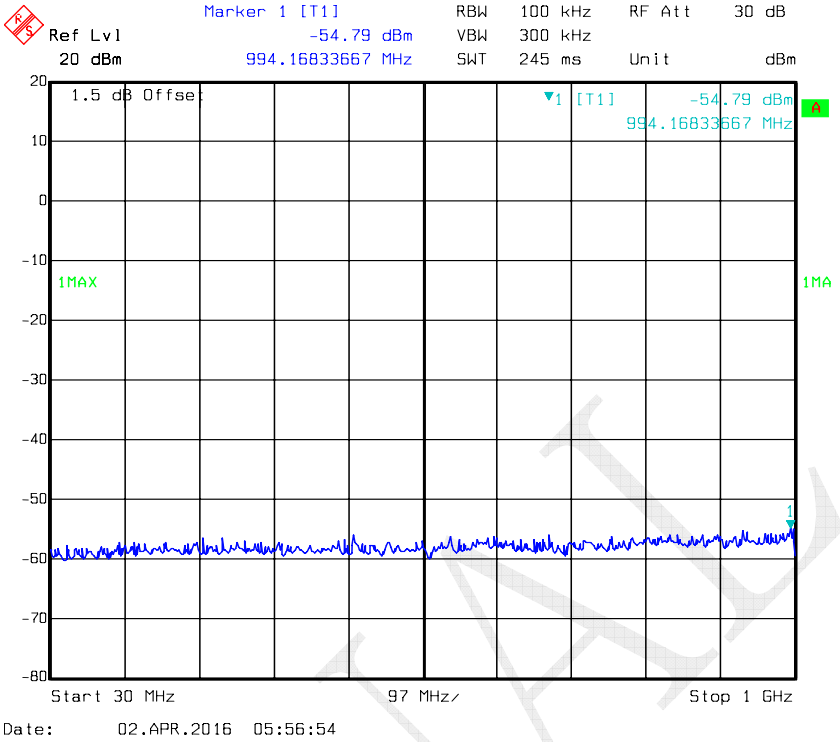
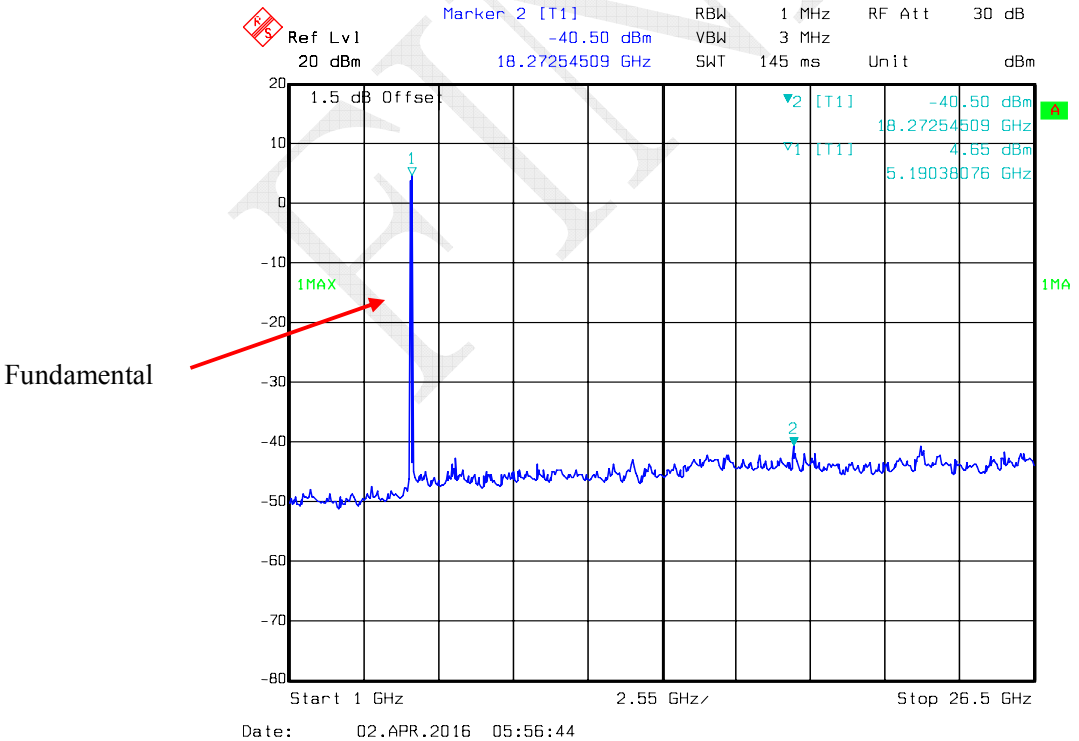
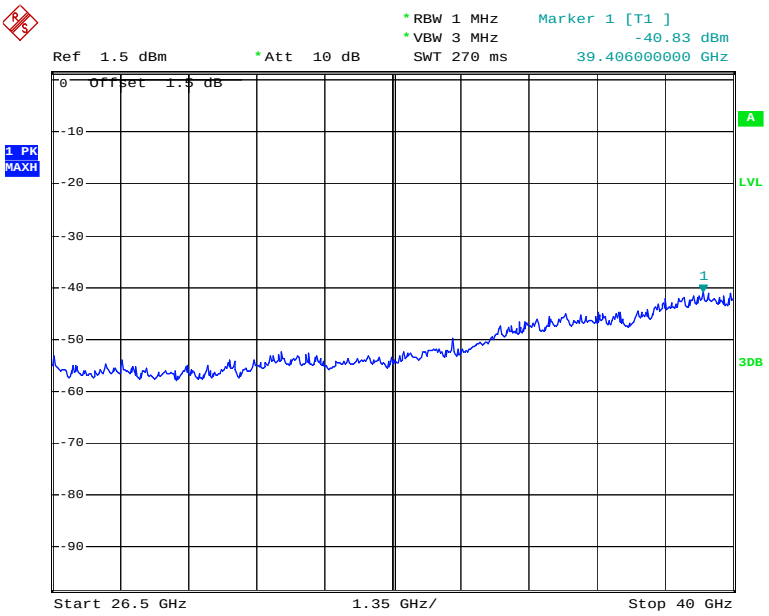
802.11n ht40 Low Channel 30MHz-1GHz – Chain1



802.11n ht40 Low Channel 1GHz-26.5GHz – Chain1



802.11n ht40 Low Channel 26.5GHz-40GHz – Chain1



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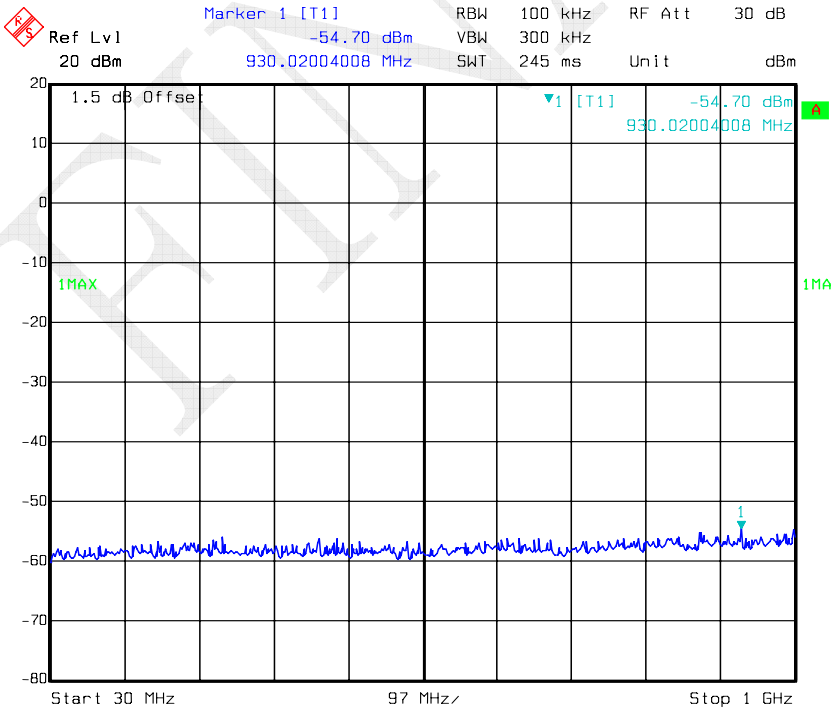
802.11n ht40 High Channel 30MHz-1GHz – Chain1



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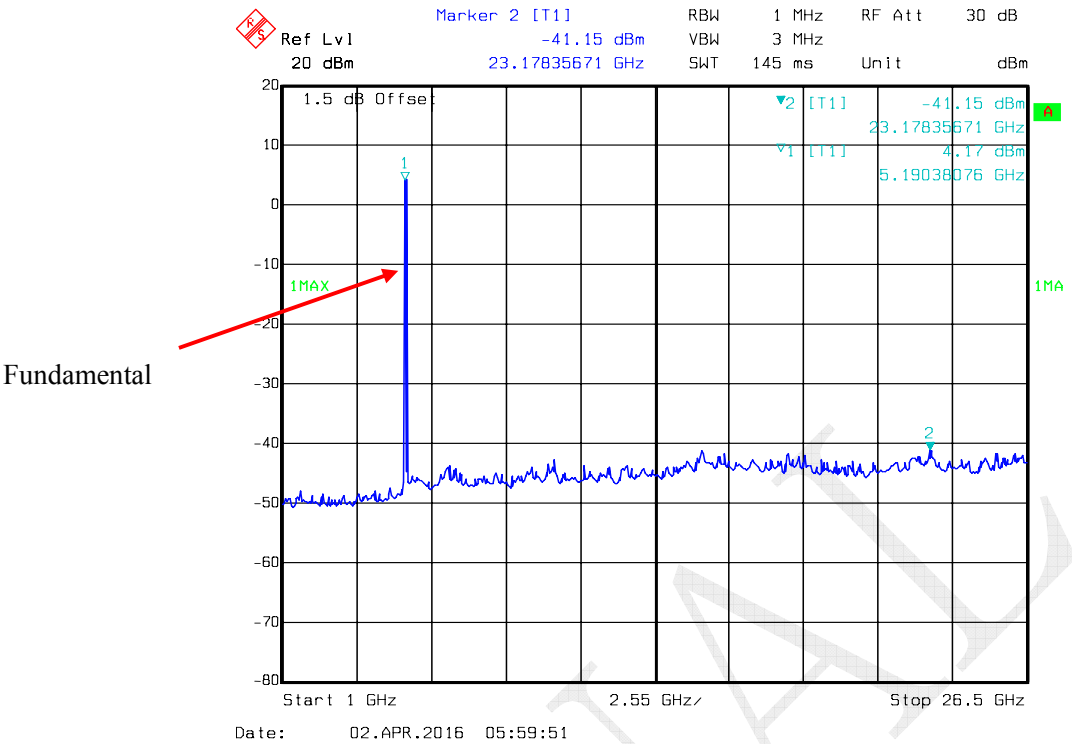
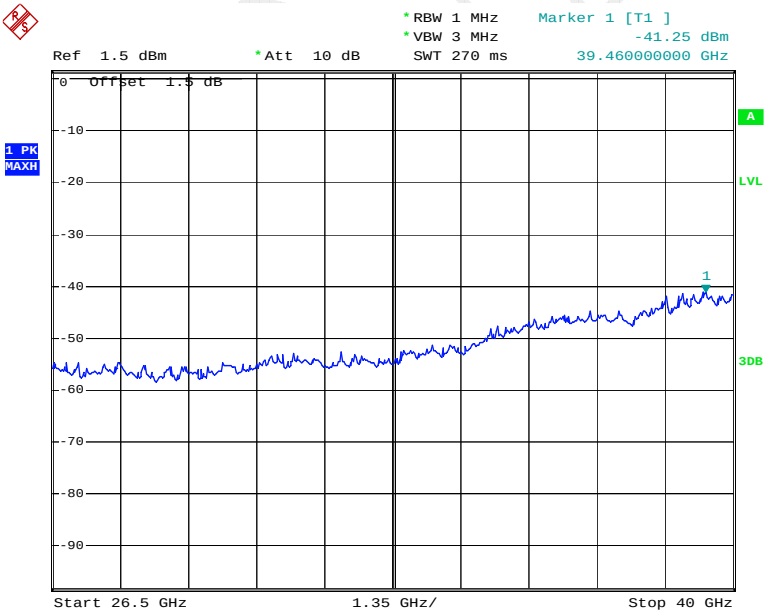
802.11n ht40 High Channel 1GHz-26.5GHz – Chain1



802.11n ht40 High Channel 26.5GHz-40GHz – Chain1



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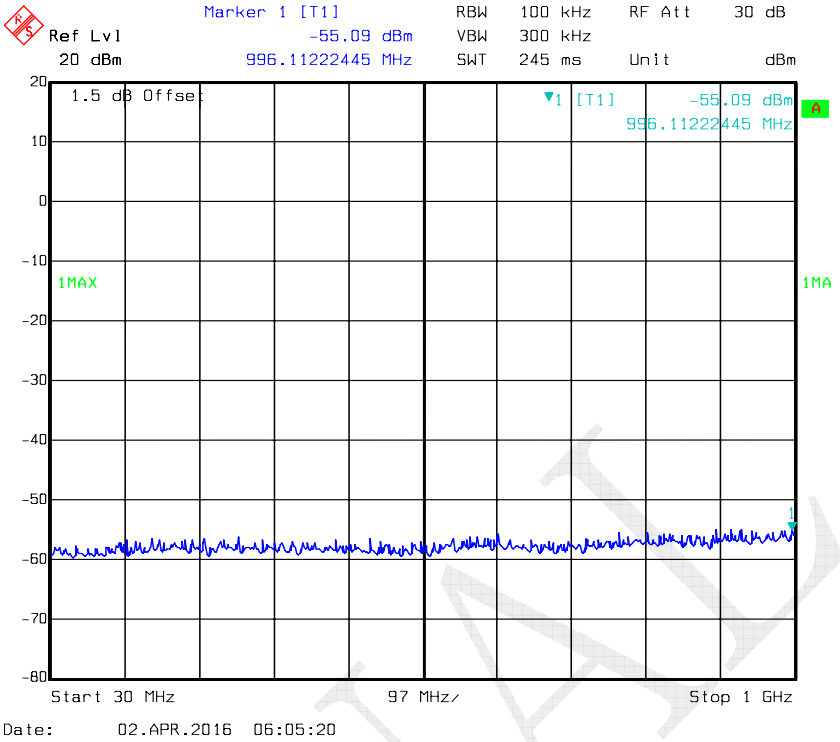
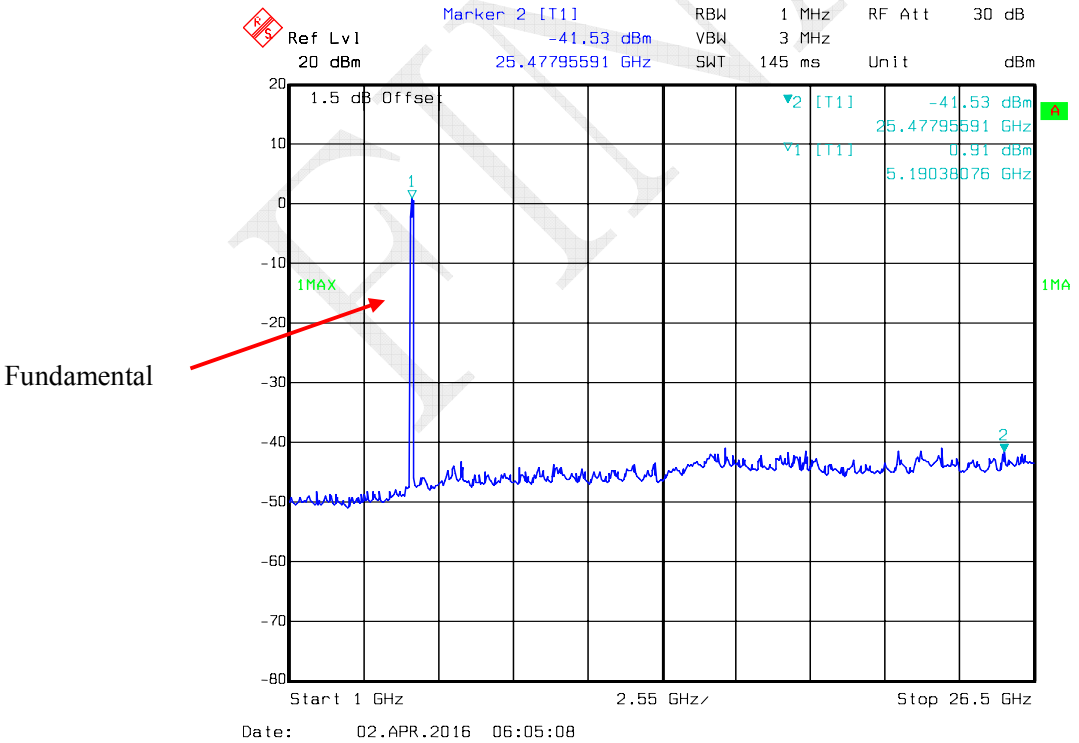
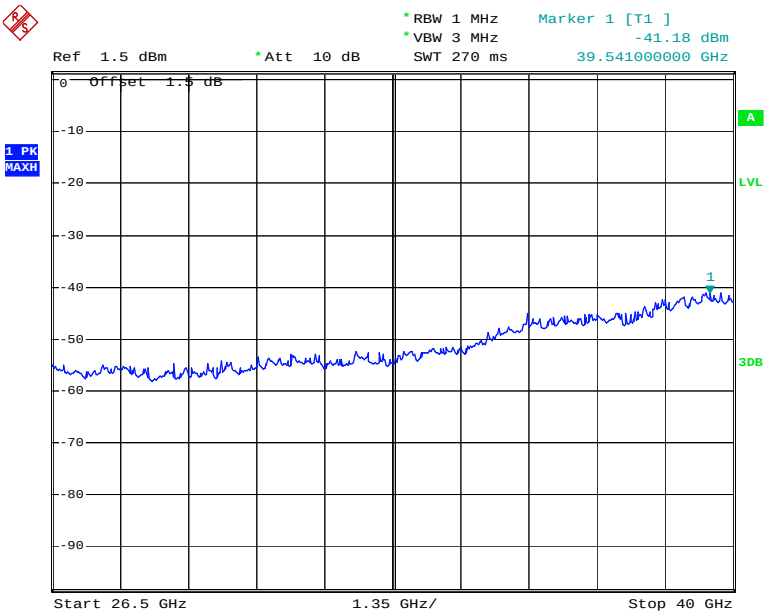
802.11n ac80 Middle Channel 30MHz-1GHz – Chain1



802.11n ac80 Middle Channel 1GHz-26.5GHz – Chain1



802.11n ac80 Middle Channel 26.5GHz-40GHz – Chain1



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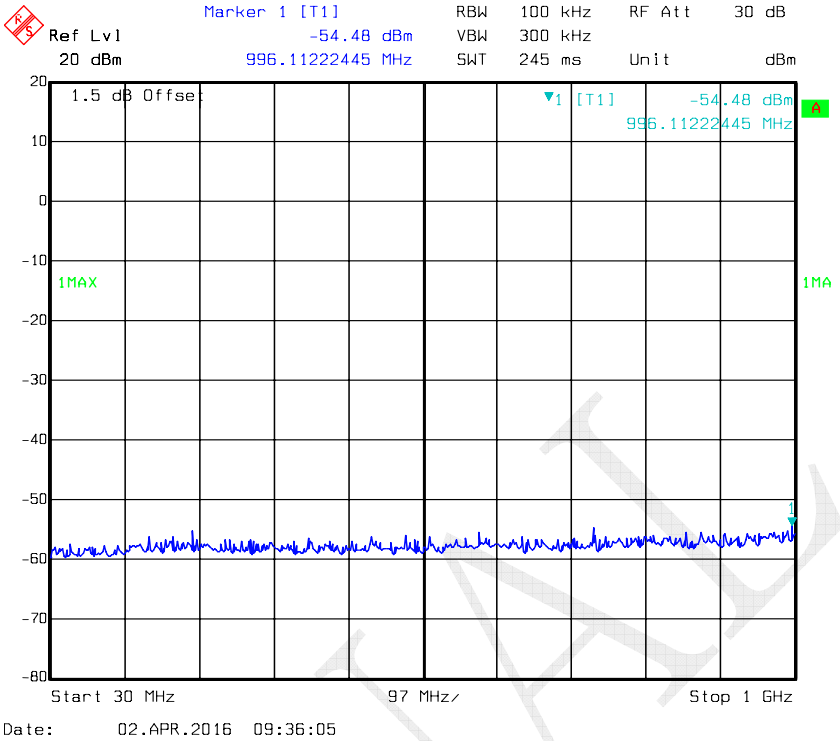
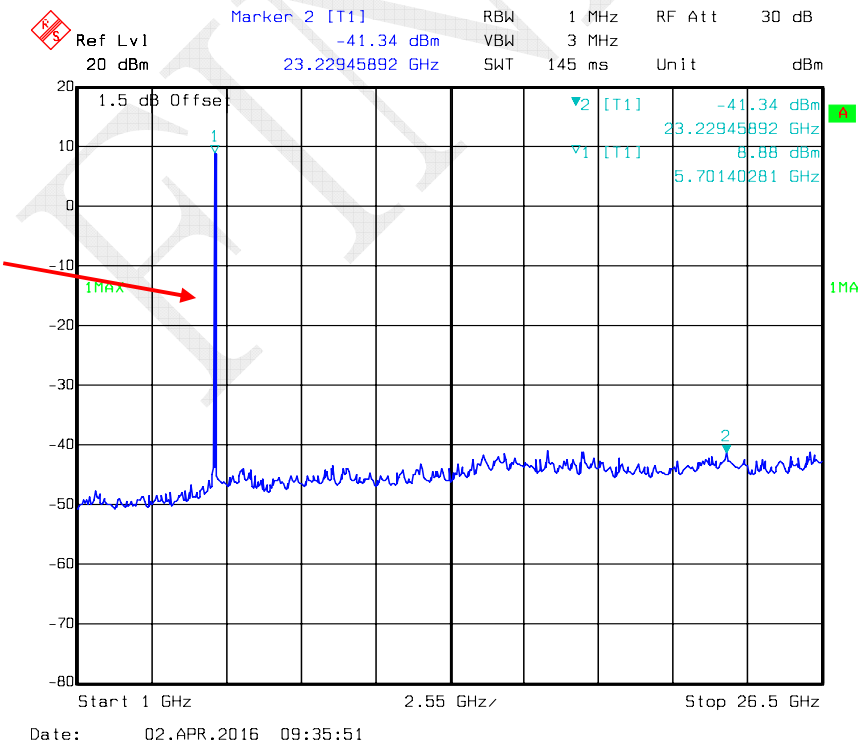
5725MHz-5850MHz:

802.11a Low Channel 30MHz-1GHz – Chain0

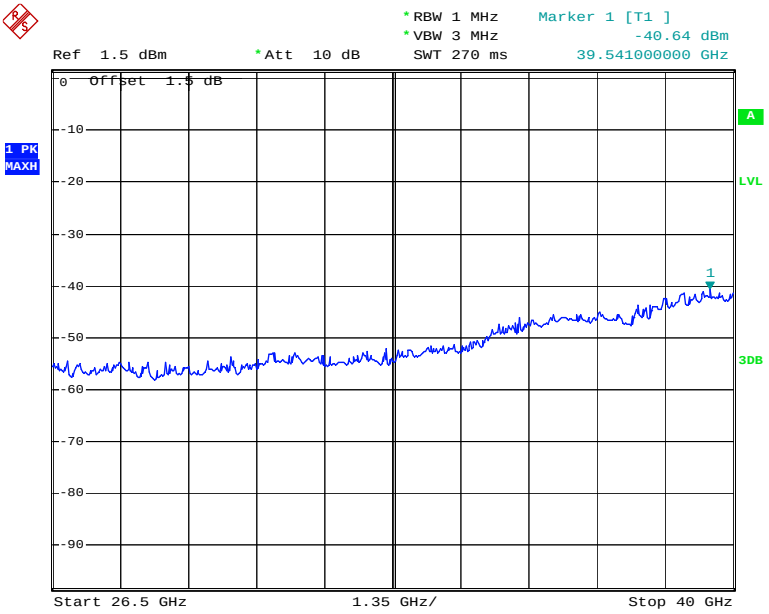


802.11a Low Channel 1GHz-26.5GHz – Chain0

Fundamental



802.11a Low Channel 26.5GHz-40GHz – Chain0



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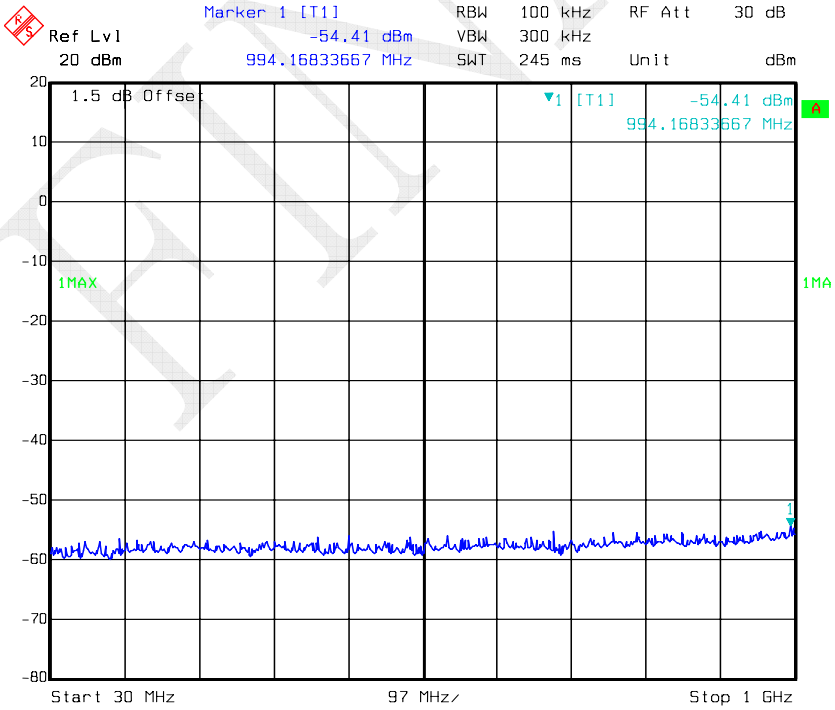
802.11a Middle Channel 30MHz-1GHz – Chain0



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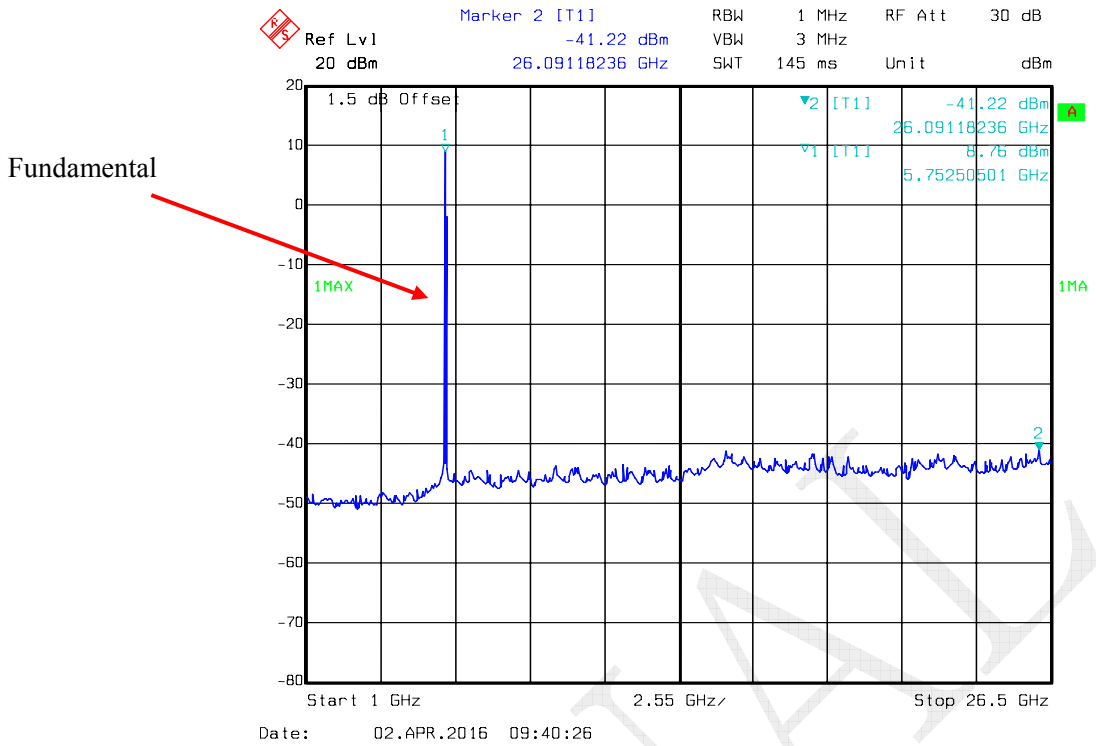
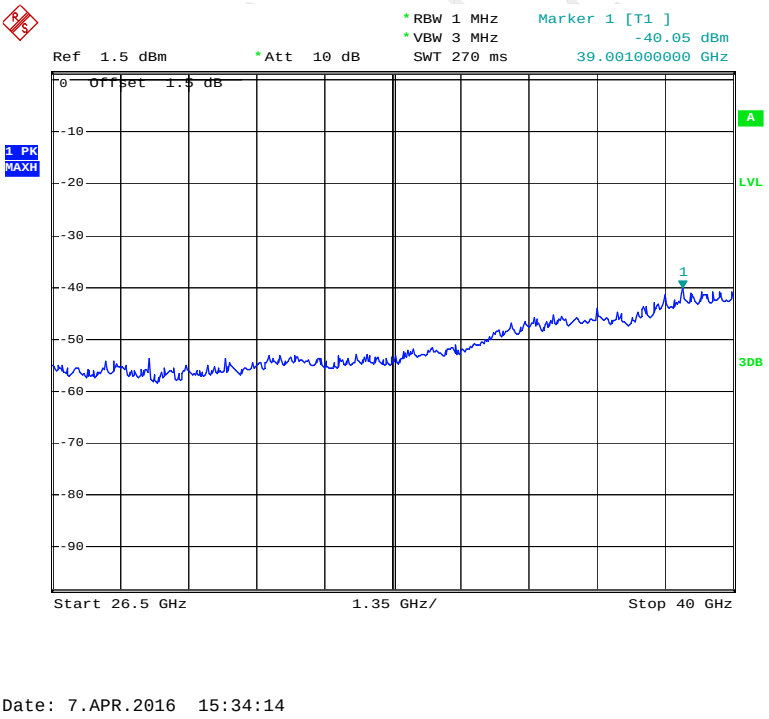
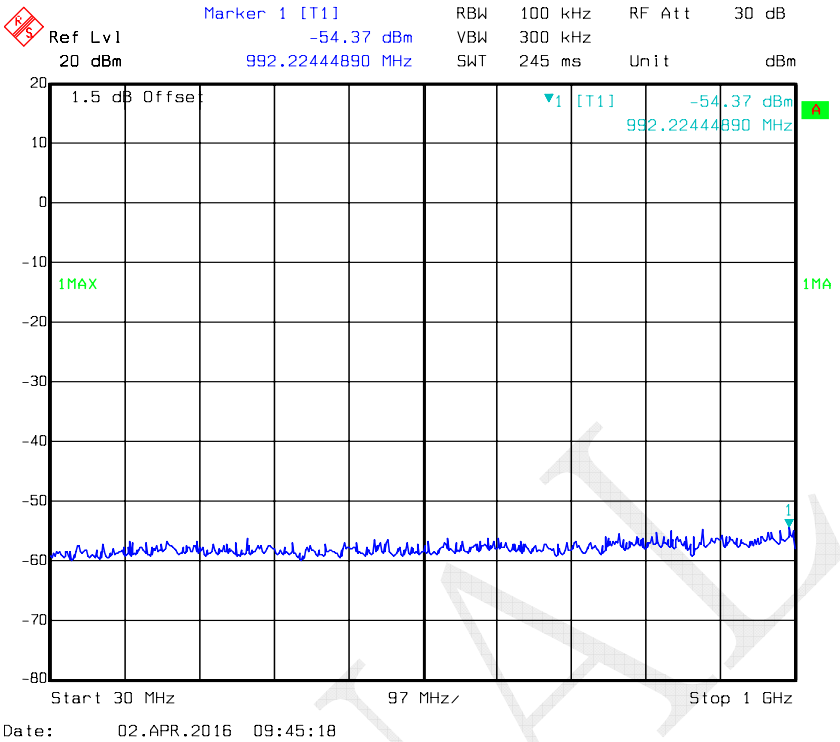
802.11a Middle Channel 1GHz -26.5GHz – Chain0



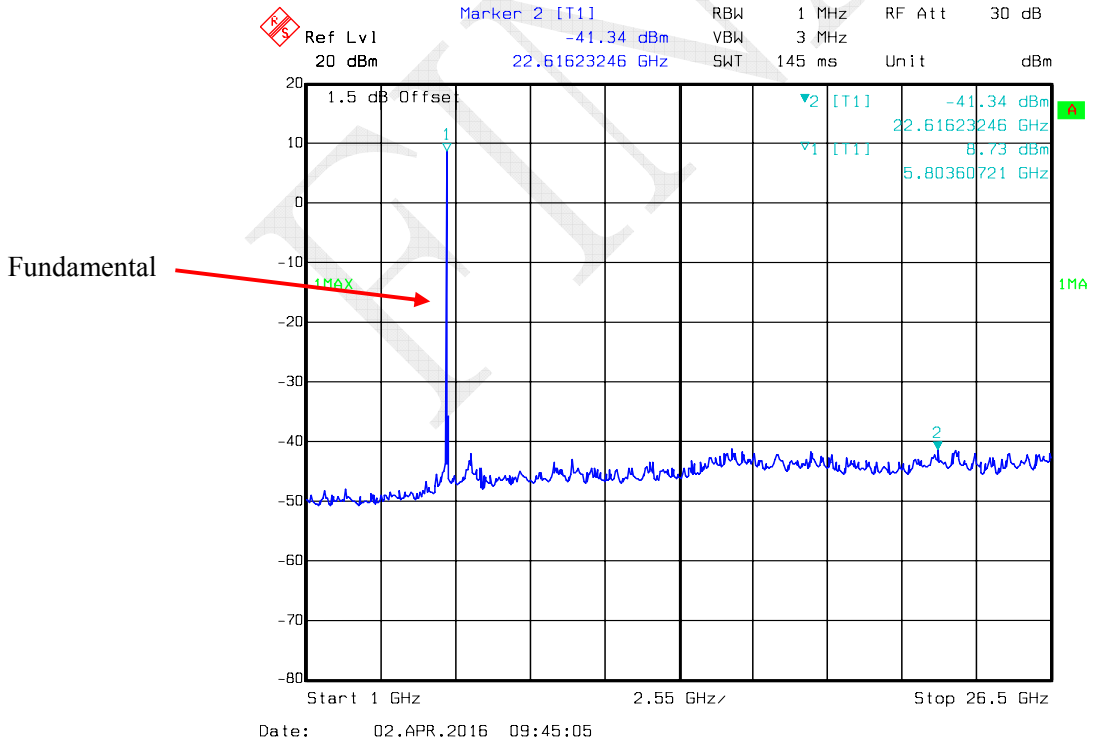
802.11a Middle Channel 26.5GHz-40GHz – Chain0



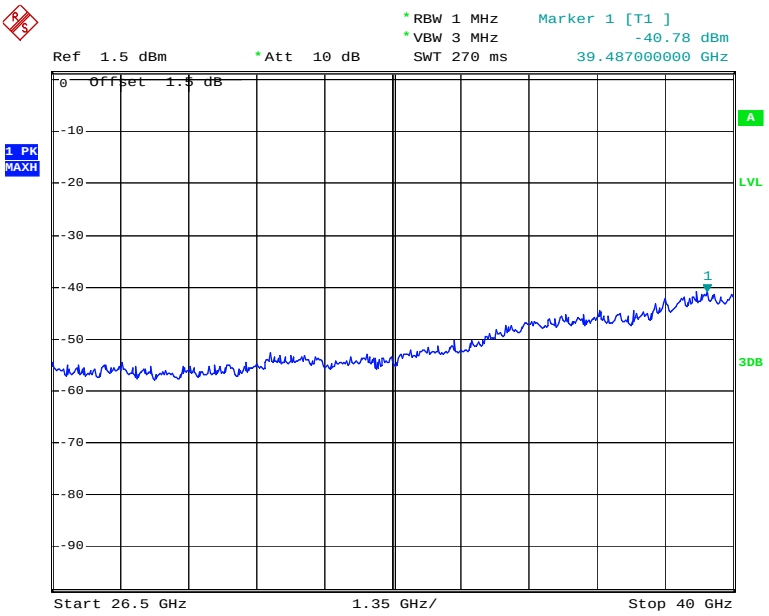
802.11a High Channel 30MHz-1GHz – Chain0



802.11a High Channel 1GHz-26.5GHz – Chain0



802.11a High Channel 26.5GHz-40GHz – Chain0



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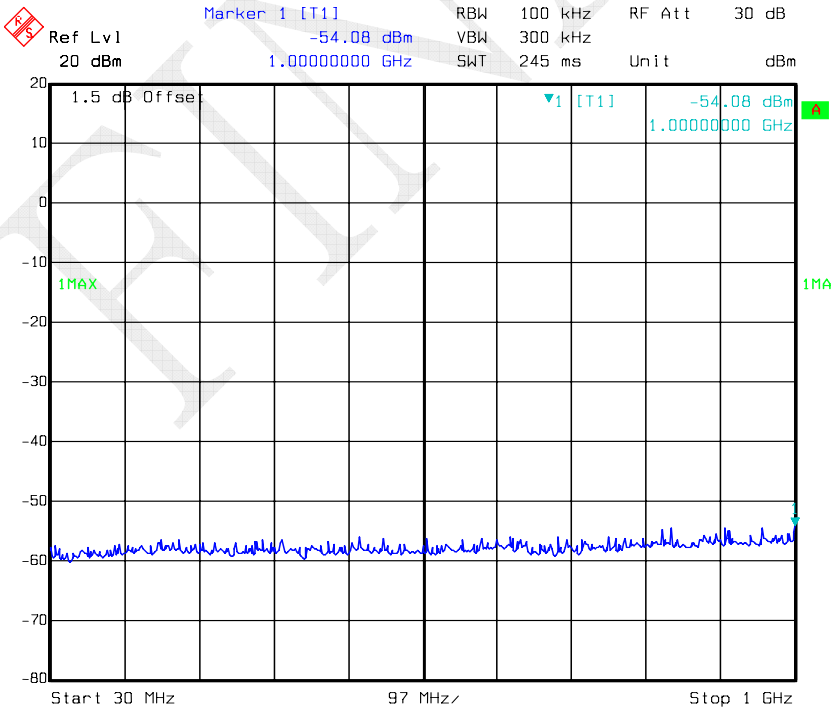
802.11n ht20 Low Channel 30MHz-1GHz – Chain0



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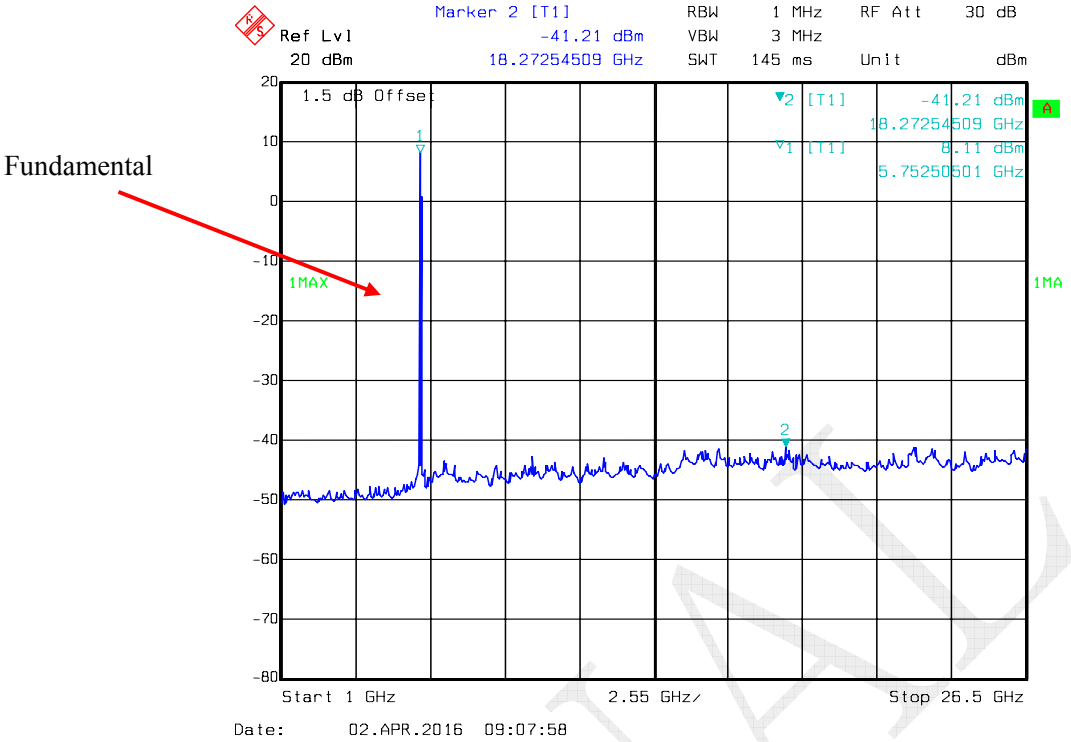
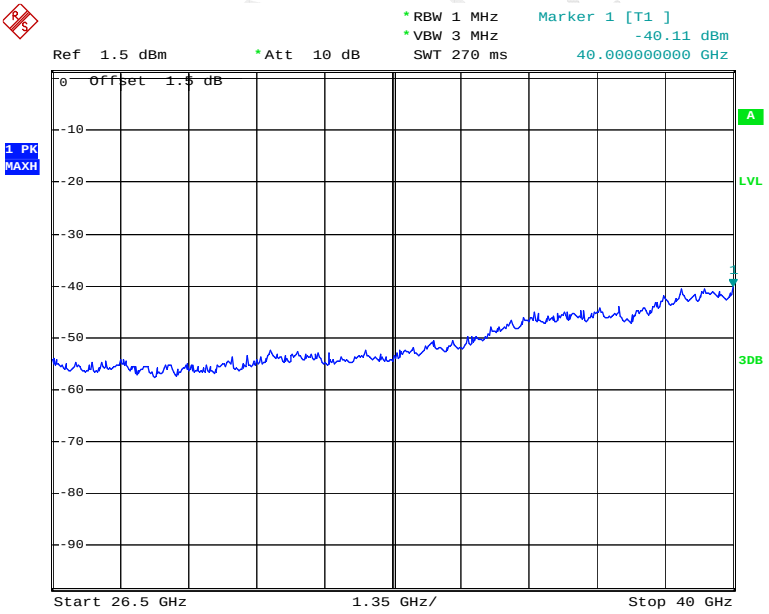
802.11n ht20 Low Channel 1GHz-26.5GHz – Chain0



802.11n ht20 Low Channel 26.5GHz-40GHz – Chain0



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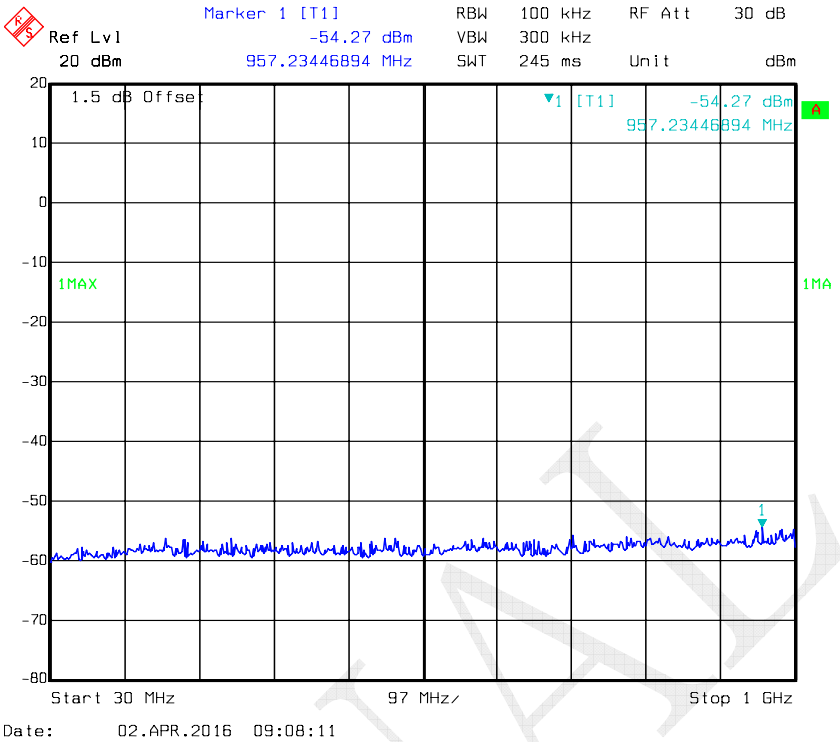
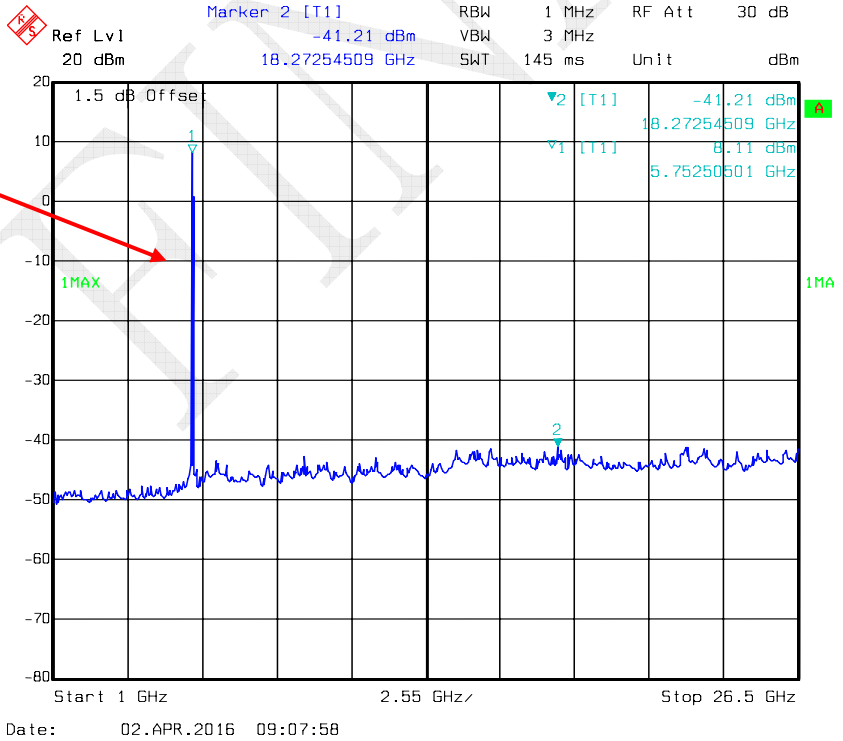
802.11n ht20 Middle Channel 30MHz-1GHz – Chain0

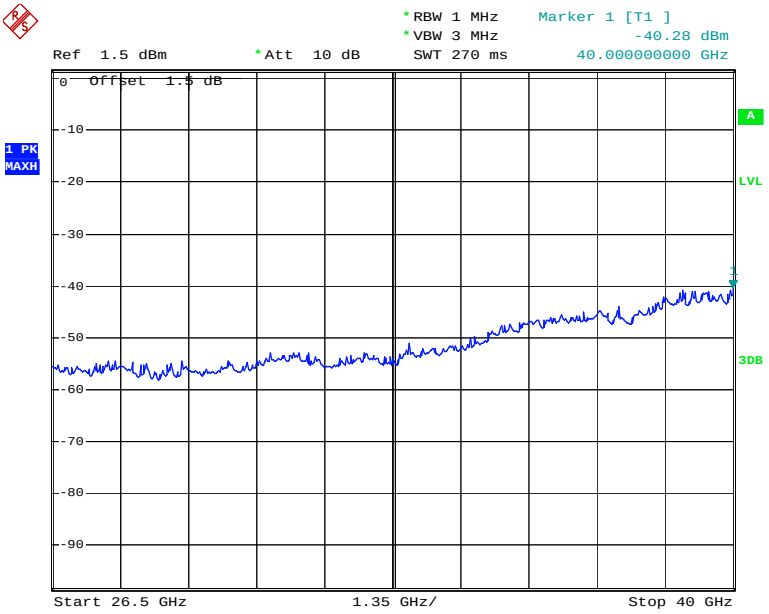


802.11n ht20 Middle Channel 1GHz -26.5GHz – Chain0

Fundamental



802.11n ht20 Middle Channel 26.5GHz-40GHz – Chain0



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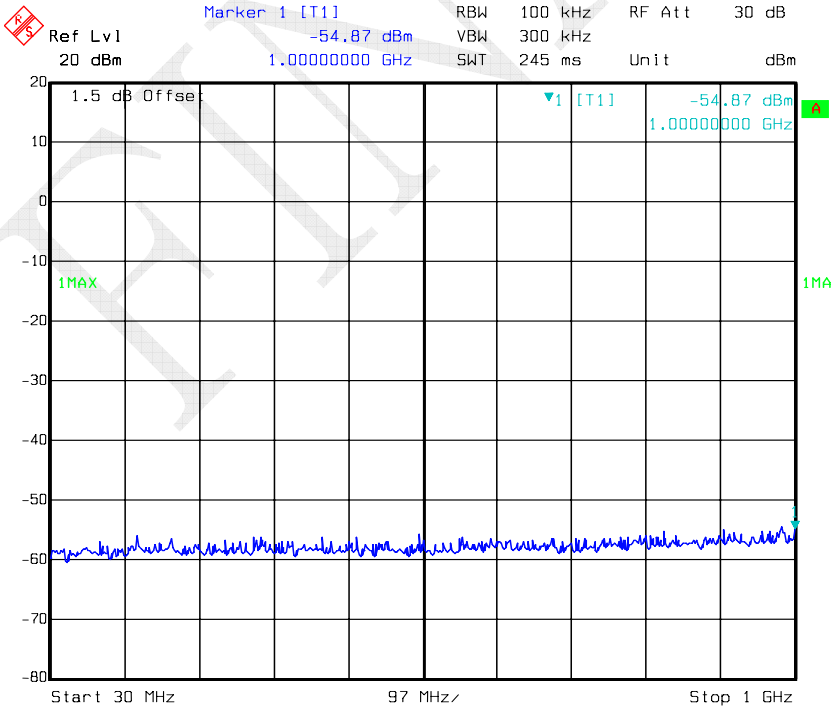
802.11n ht20 High Channel 30MHz-1GHz – Chain0



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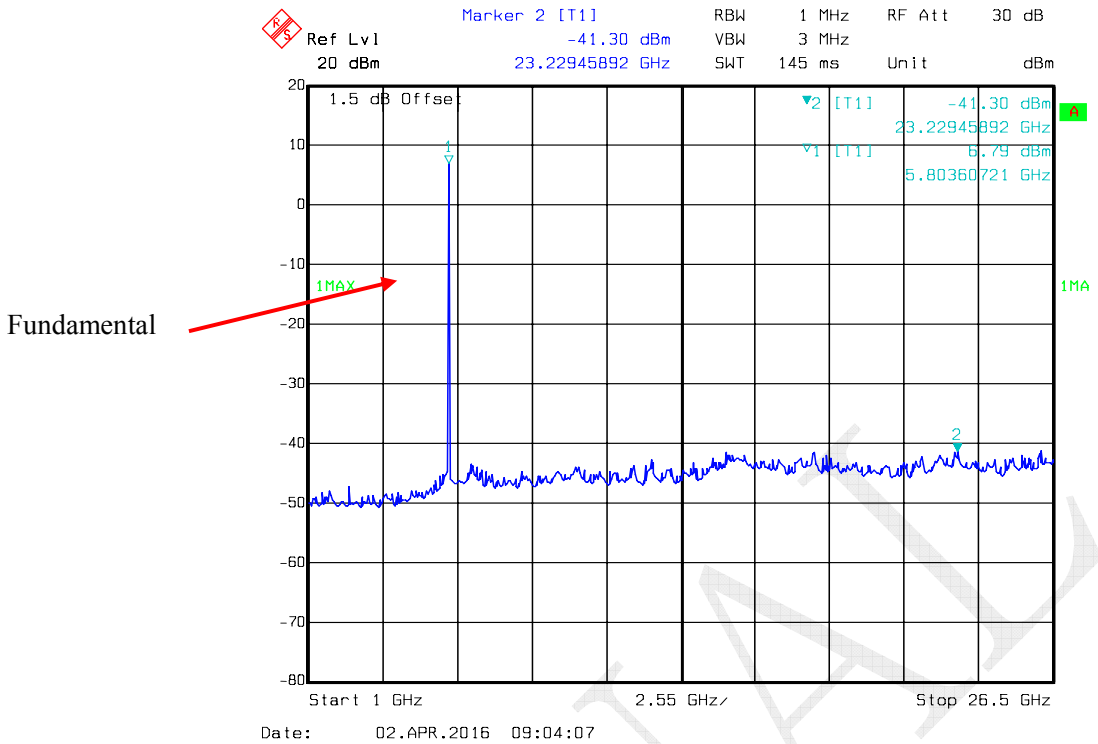
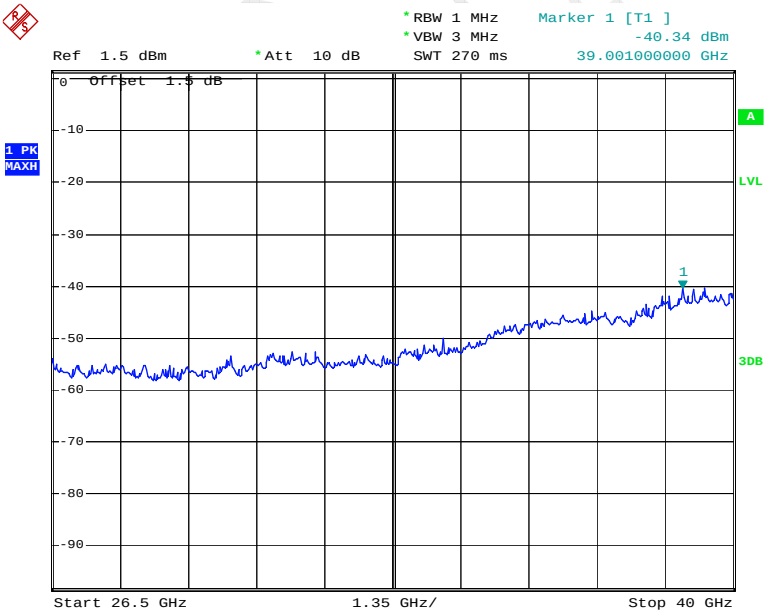
802.11n ht20 High Channel 1GHz-26.5GHz – Chain0

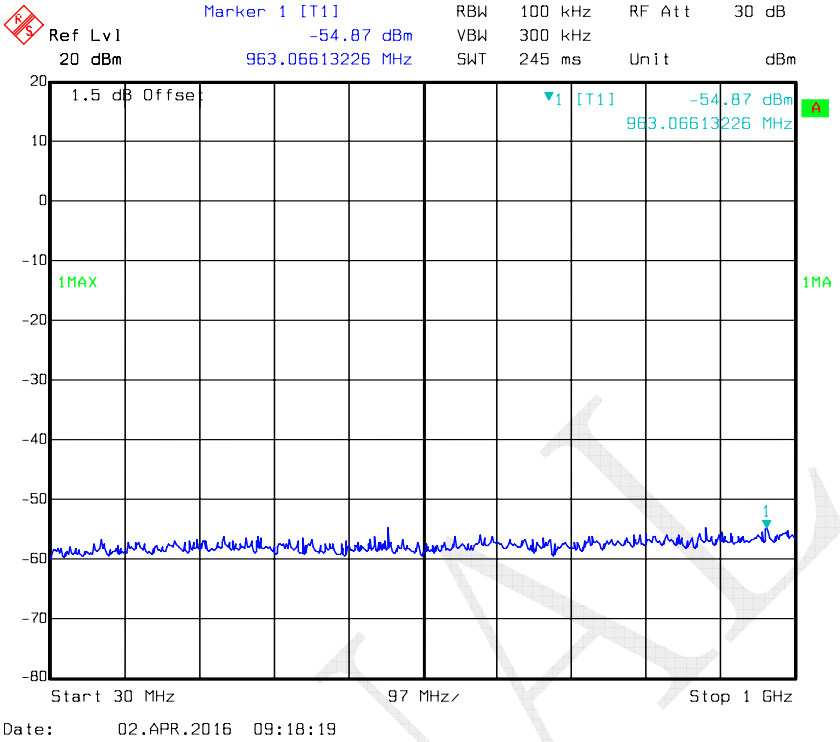


802.11n ht20 High Channel 26.5GHz-40GHz – Chain0

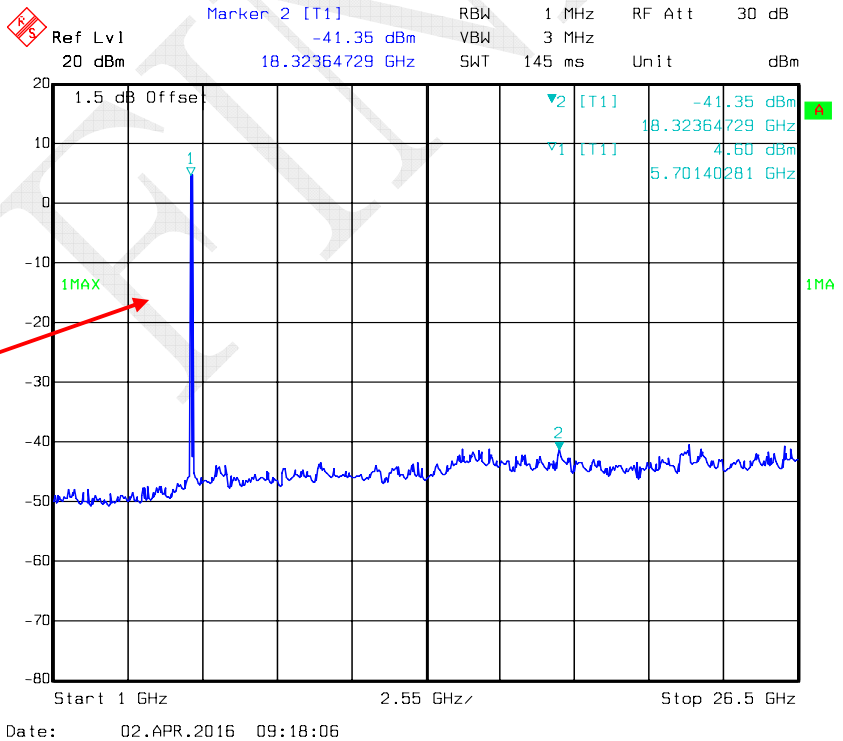


Date: 7.APR.2016 15:33:09

802.11n ht40 Low Channel 30MHz-1GHz – Chain0

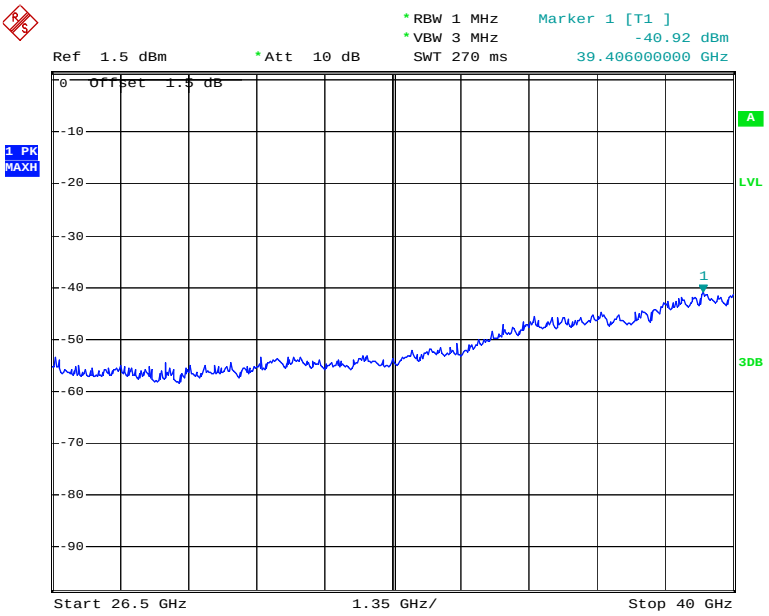


802.11n ht40 Low Channel 1GHz-26.5GHz – Chain0



Fundamental

802.11n ht40 Low Channel 26.5GHz-40GHz – Chain0



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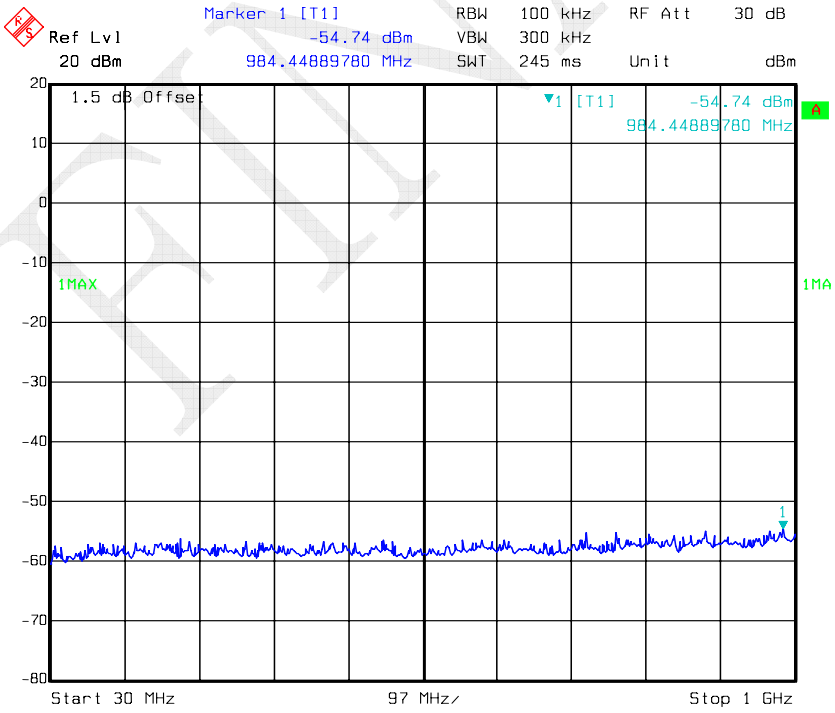
802.11n ht40 High Channel 30MHz-1GHz – Chain0



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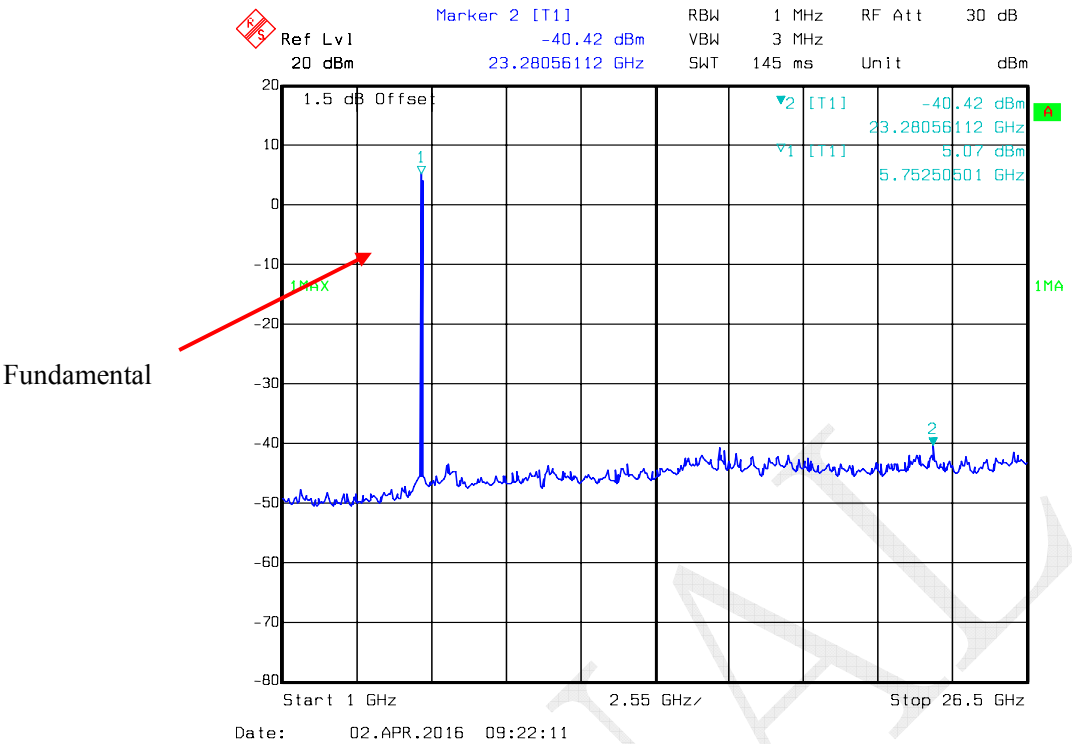
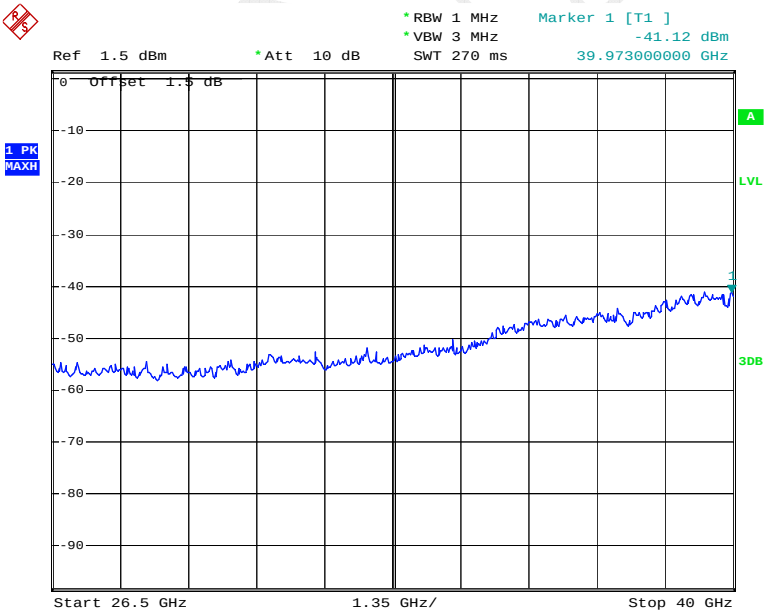
802.11n ht40 High Channel 1GHz-26.5GHz – Chain0



Fundamental

802.11n ht40 High Channel 26.5GHz-40GHz – Chain0



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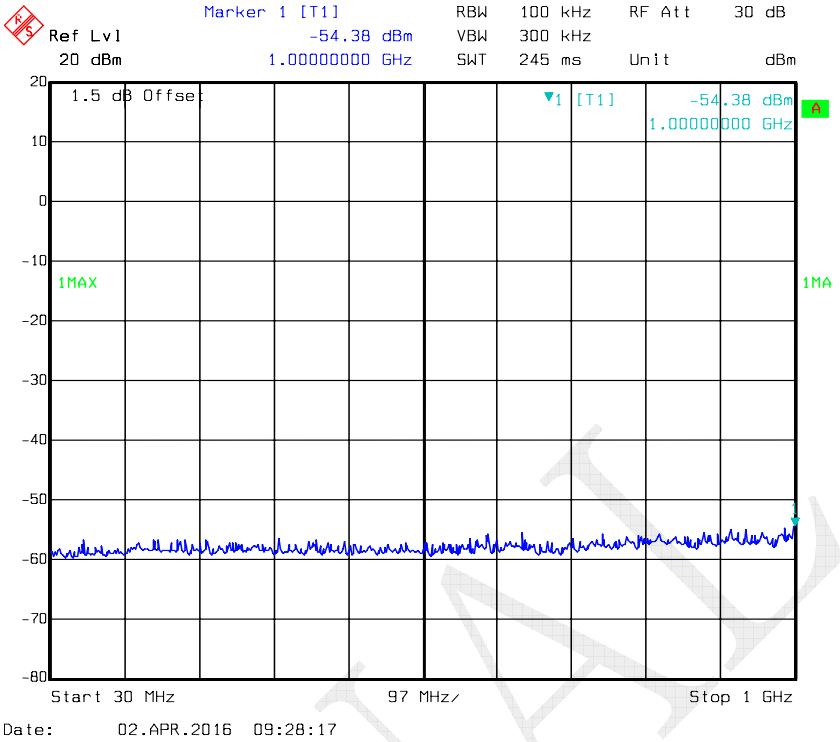
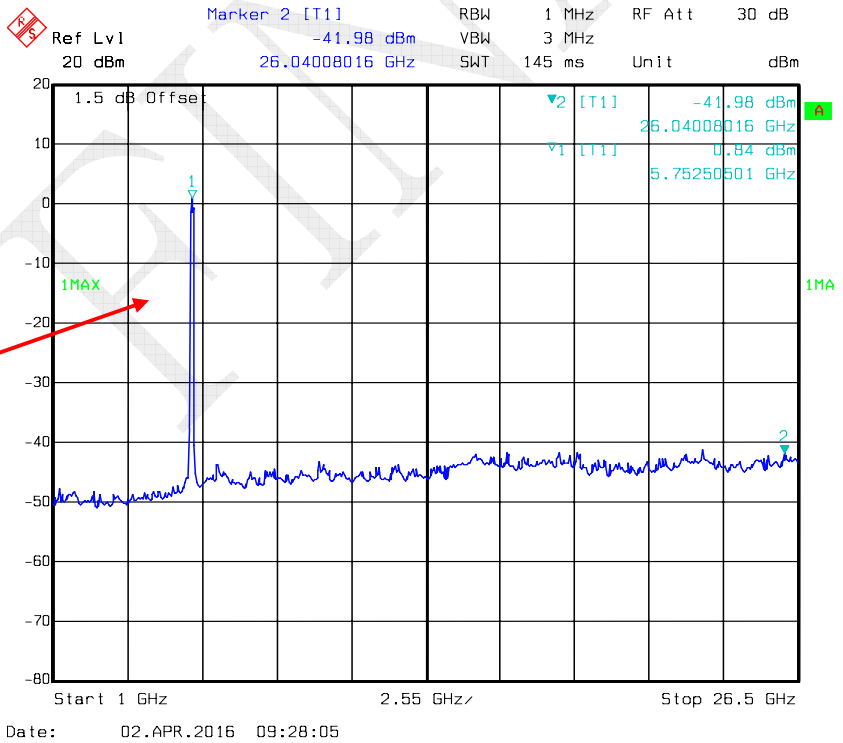
802.11n ac80 Middle Channel 30MHz-1GHz – Chain0

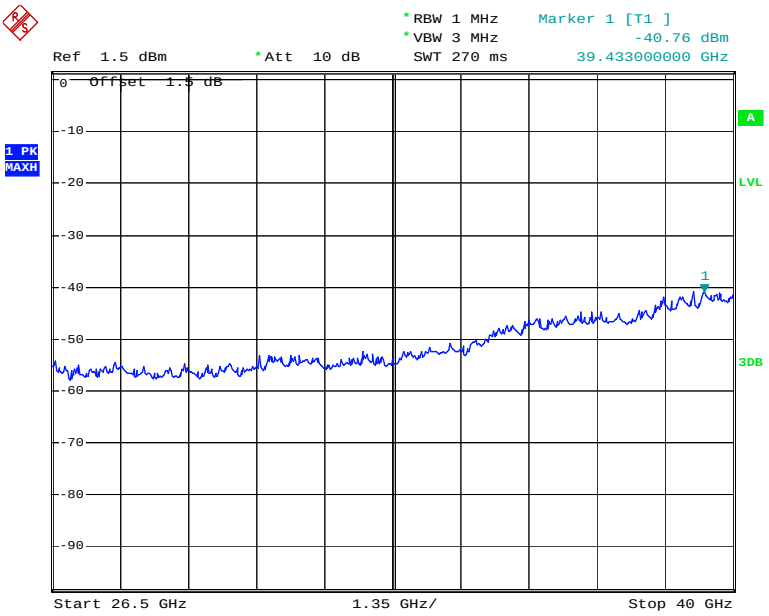


802.11n ac80 Middle Channel 1GHz-26.5GHz – Chain0



Fundamental

802.11n ac80 Middle Channel 26.5GHz-40GHz – Chain0



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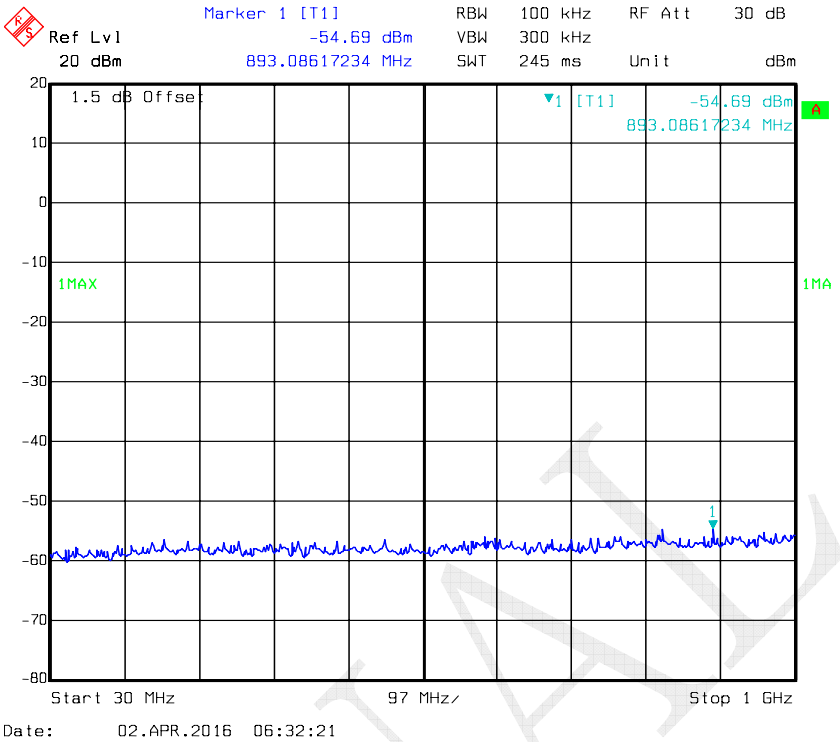
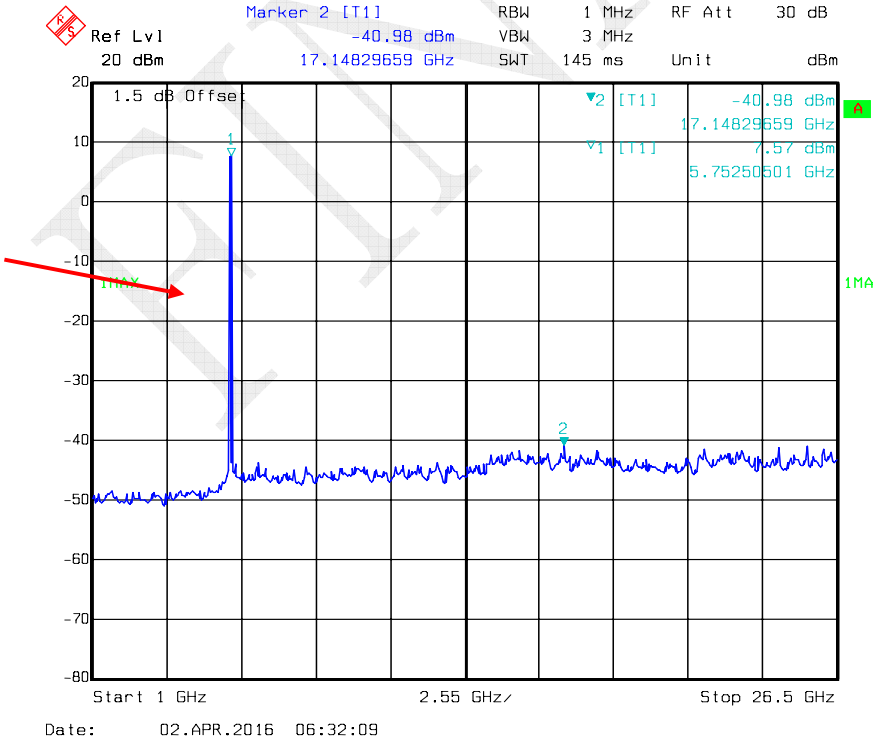
802.11a Low Channel 30MHz-1GHz – Chain1

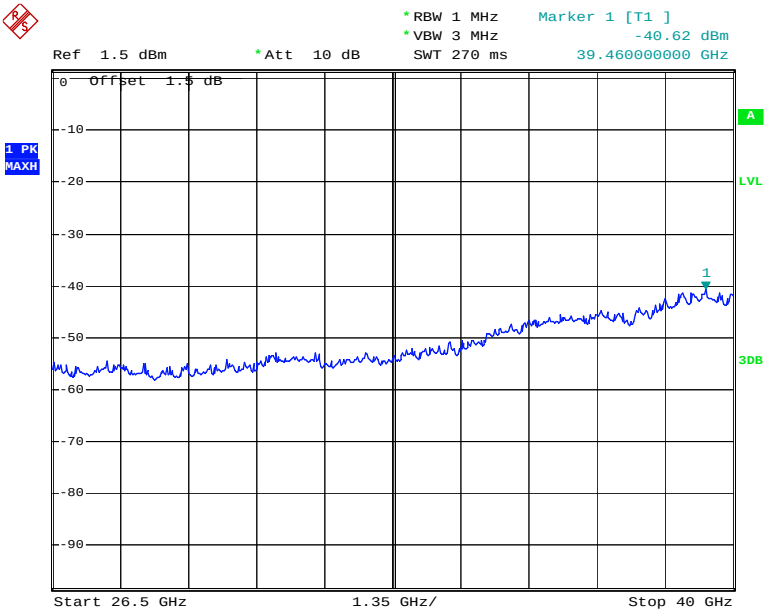


802.11a Low Channel 1GHz-26.5GHz – Chain1

Fundamental



802.11a Low Channel 26.5GHz-40GHz – Chain1



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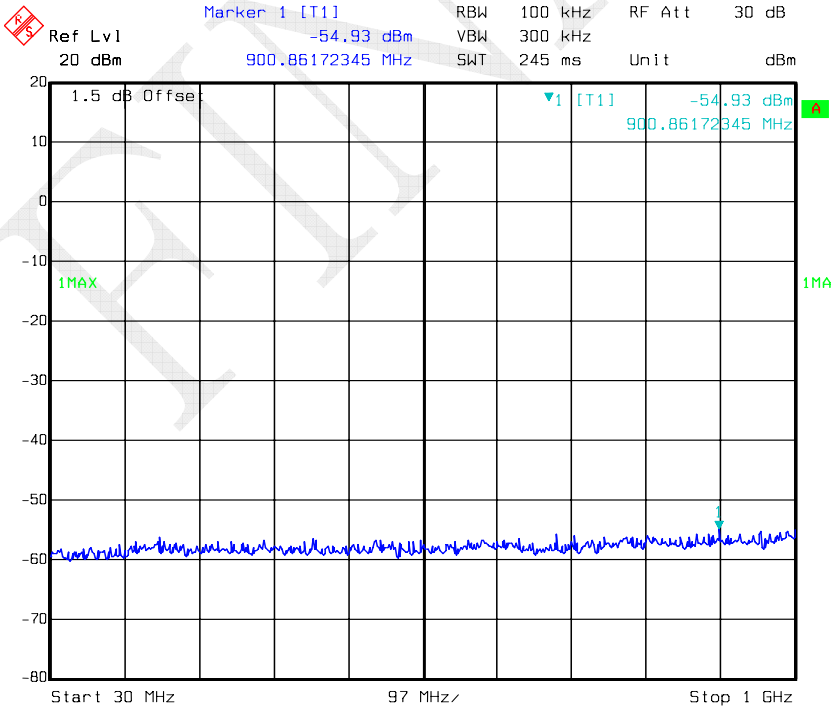
802.11a Middle Channel 30MHz-1GHz – Chain1



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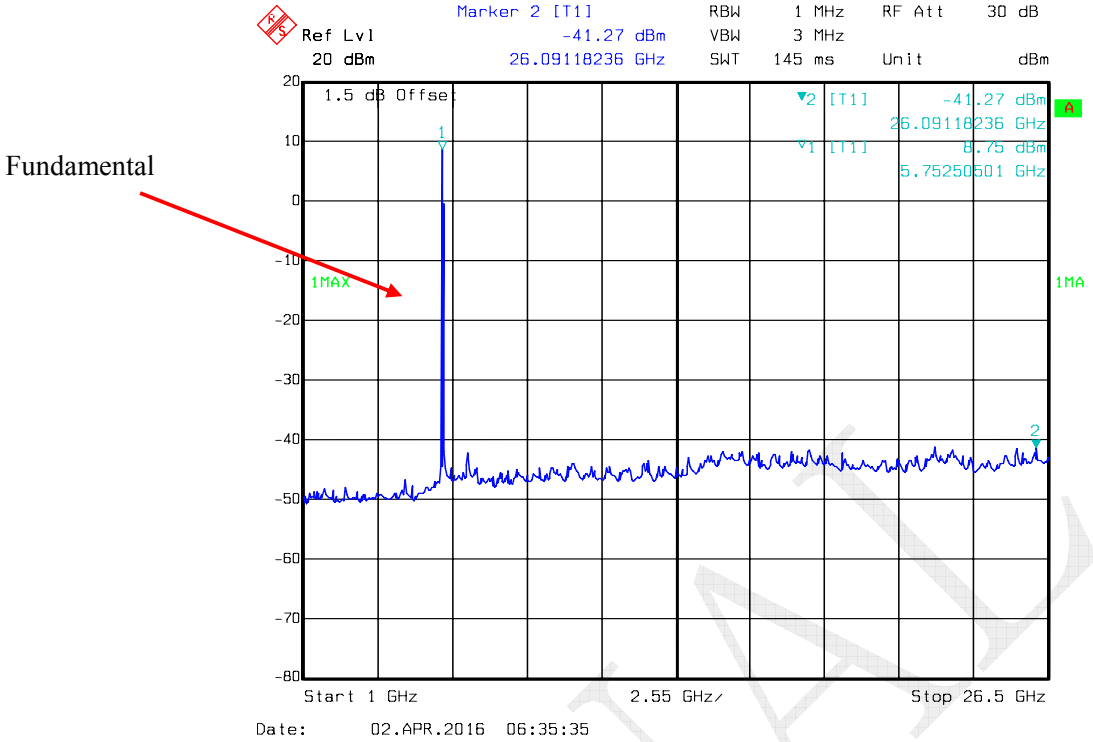
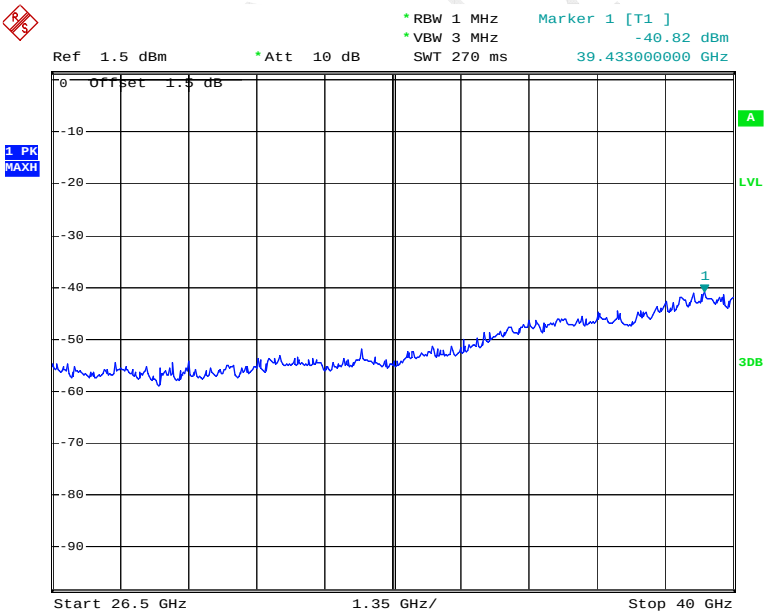
802.11a Middle Channel 1GHz -26.5GHz – Chain1



802.11a Middle Channel 26.5GHz-40GHz – Chain1



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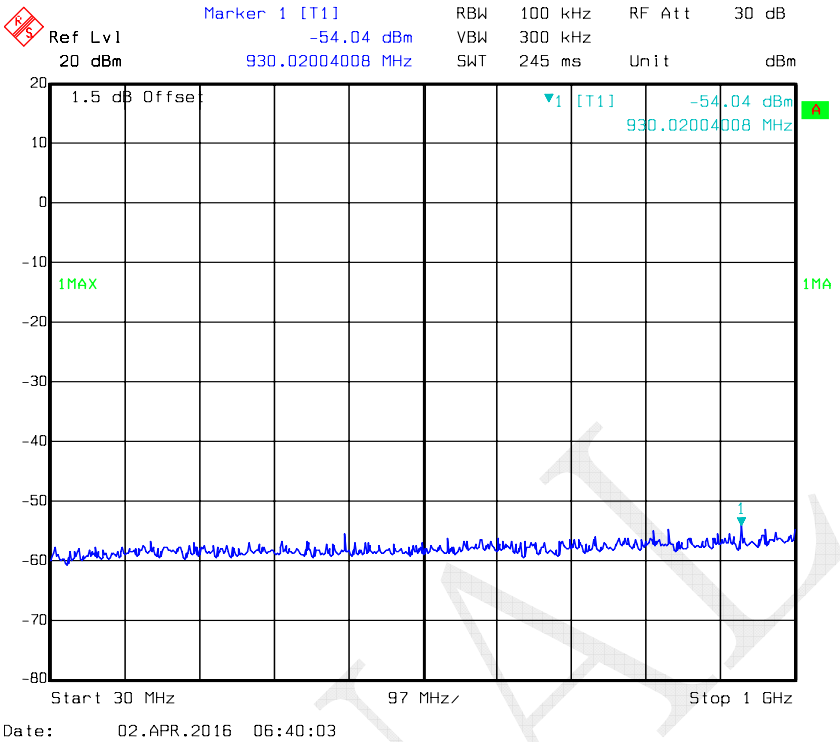
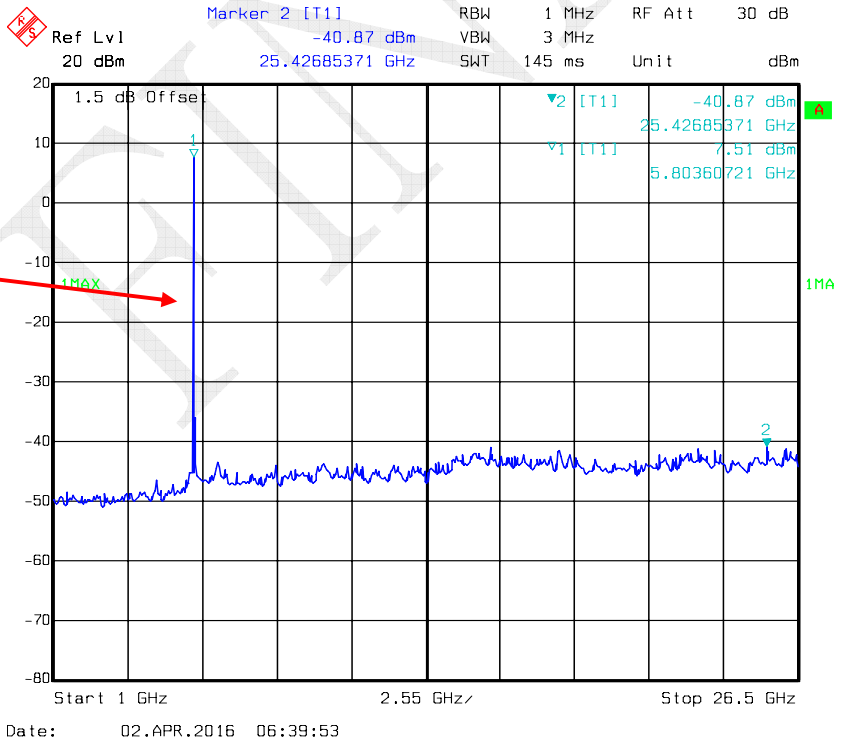
802.11a High Channel 30MHz-1GHz – Chain1

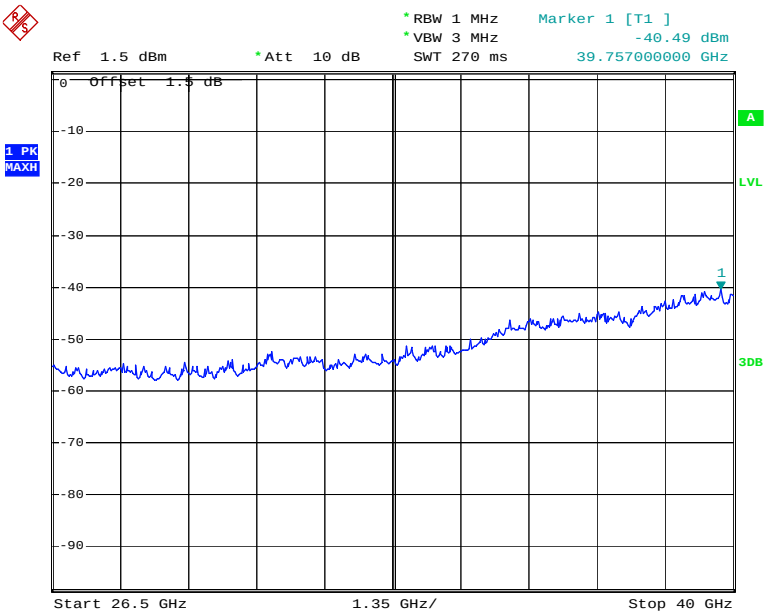


802.11a High Channel 1GHz-26.5GHz – Chain1

Fundamental



802.11a High Channel 26.5GHz-40GHz – Chain1



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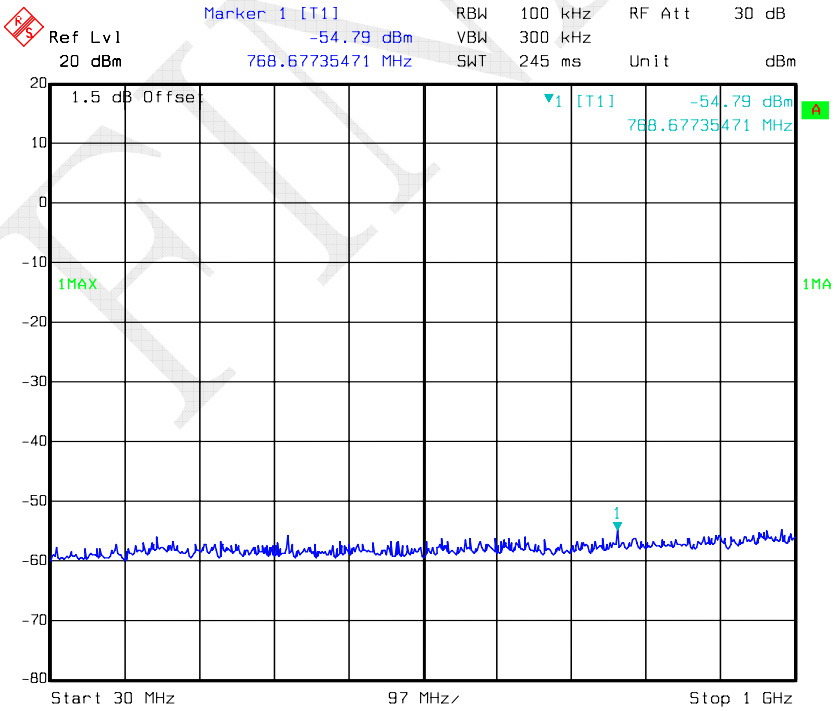
802.11n ht20 Low Channel 30MHz-1GHz – Chain1



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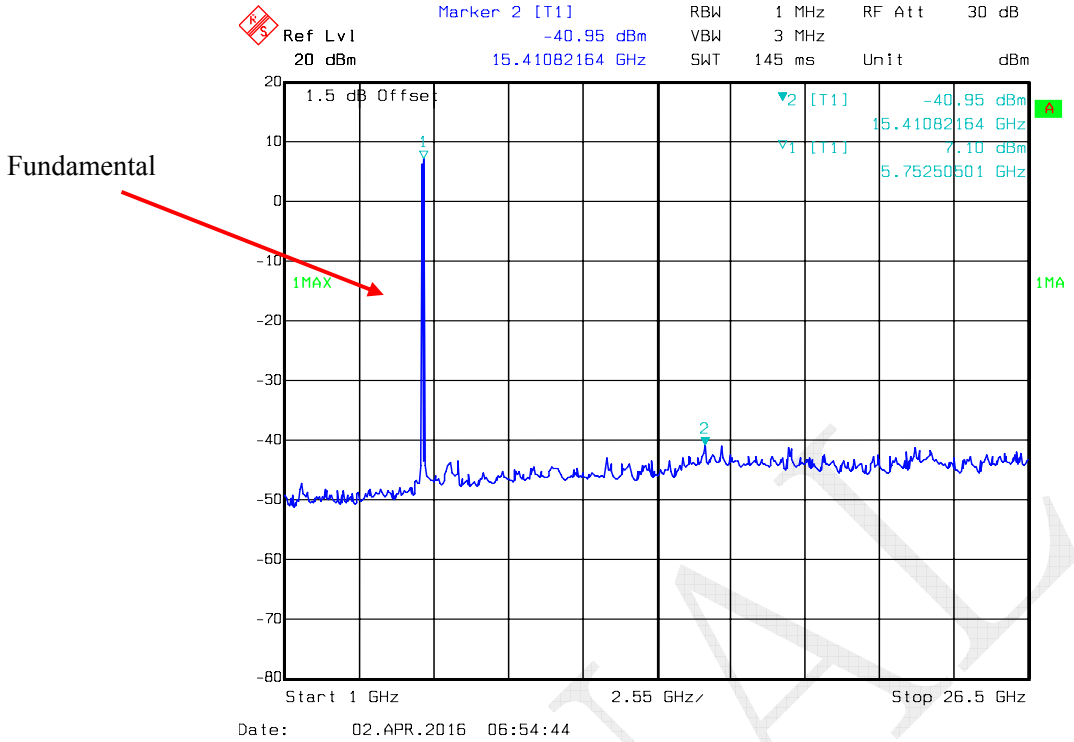
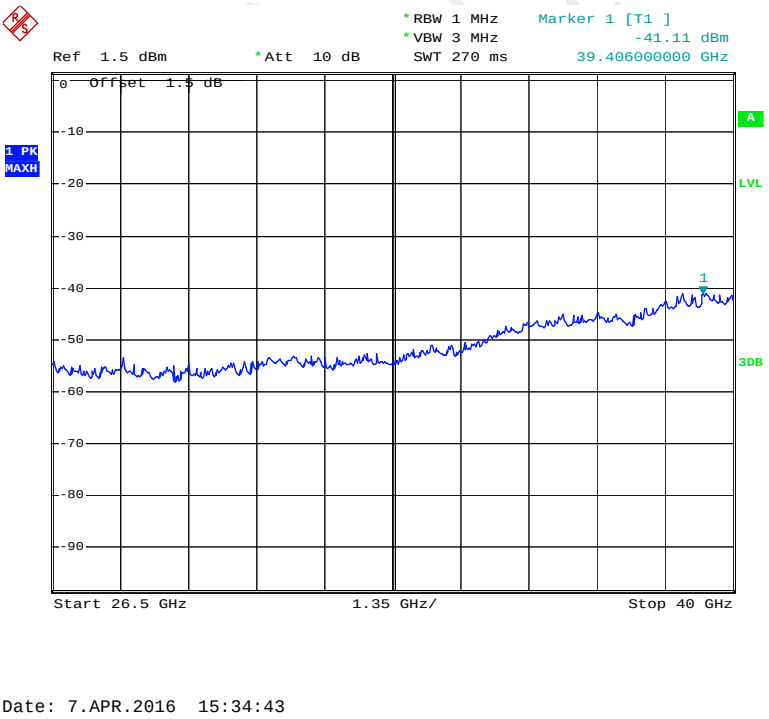
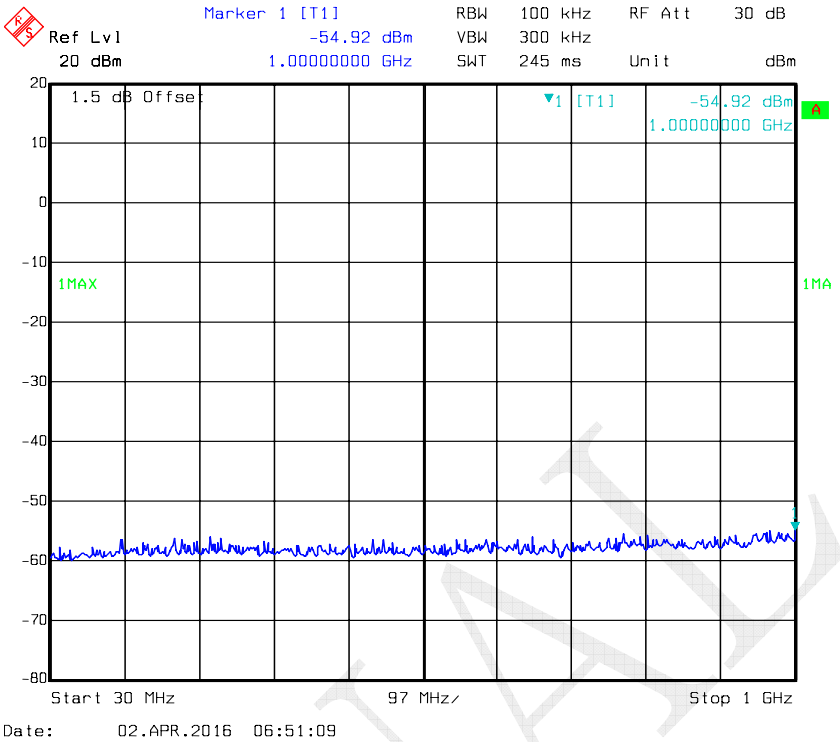
802.11n ht20 Low Channel 1GHz-26.5GHz – Chain1



802.11n ht20 Low Channel 26.5GHz-40GHz – Chain1

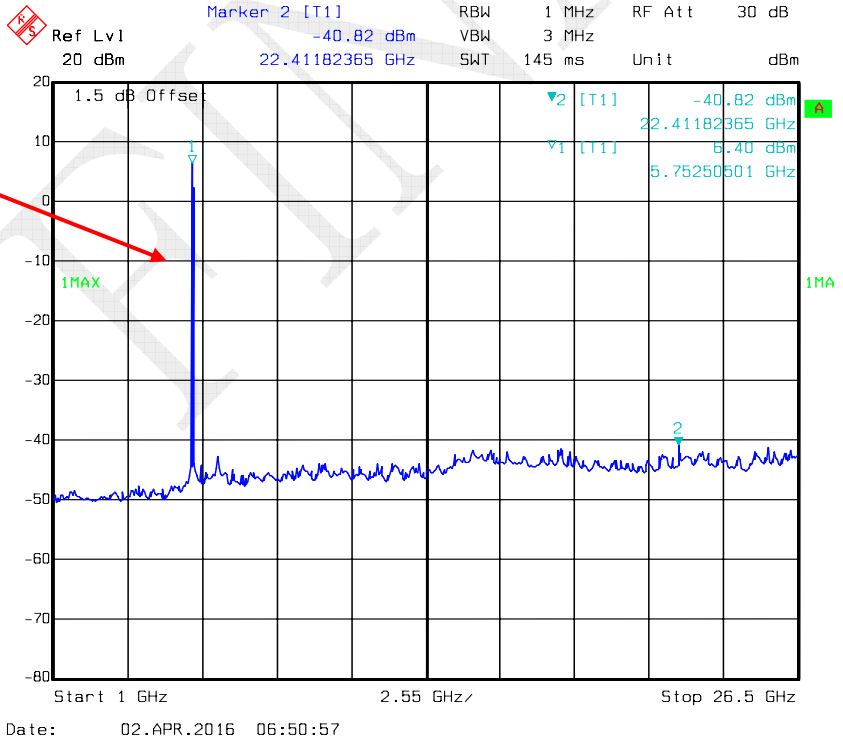


802.11n ht20 Middle Channel 30MHz-1GHz – Chain1

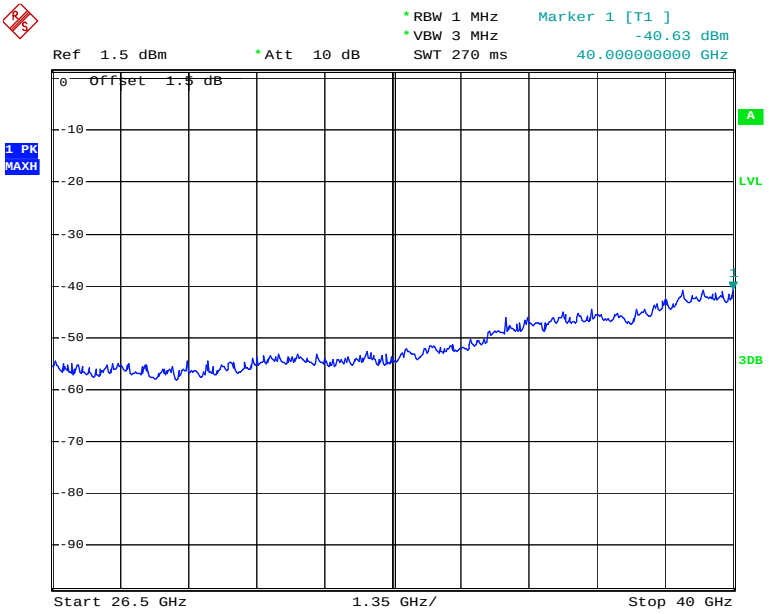


802.11n ht20 Middle Channel 1GHz -26.5GHz – Chain1

Fundamental



802.11n ht20 Middle Channel 26.5GHz-40GHz – Chain1



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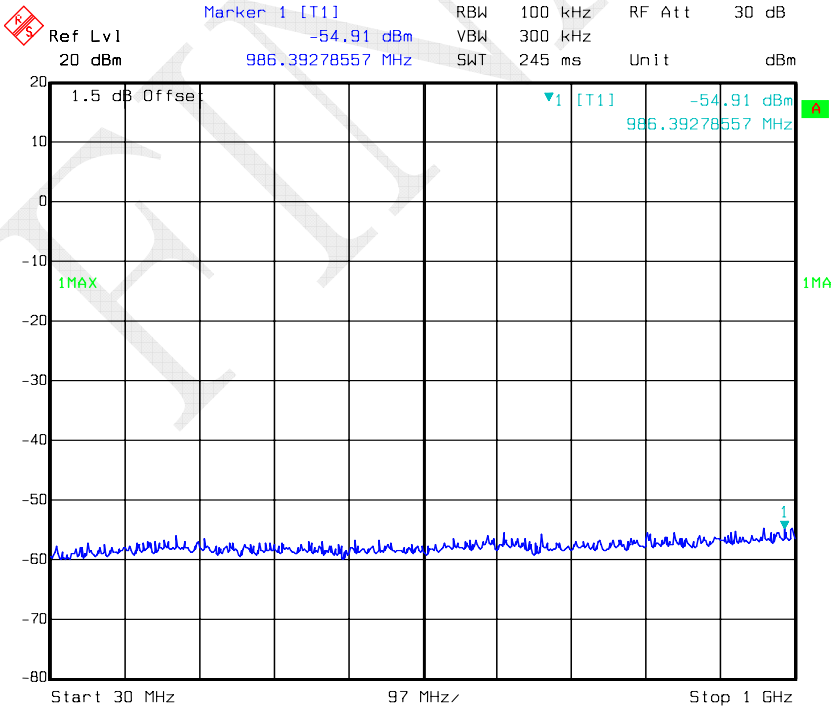
802.11n ht20 High Channel 30MHz-1GHz – Chain1



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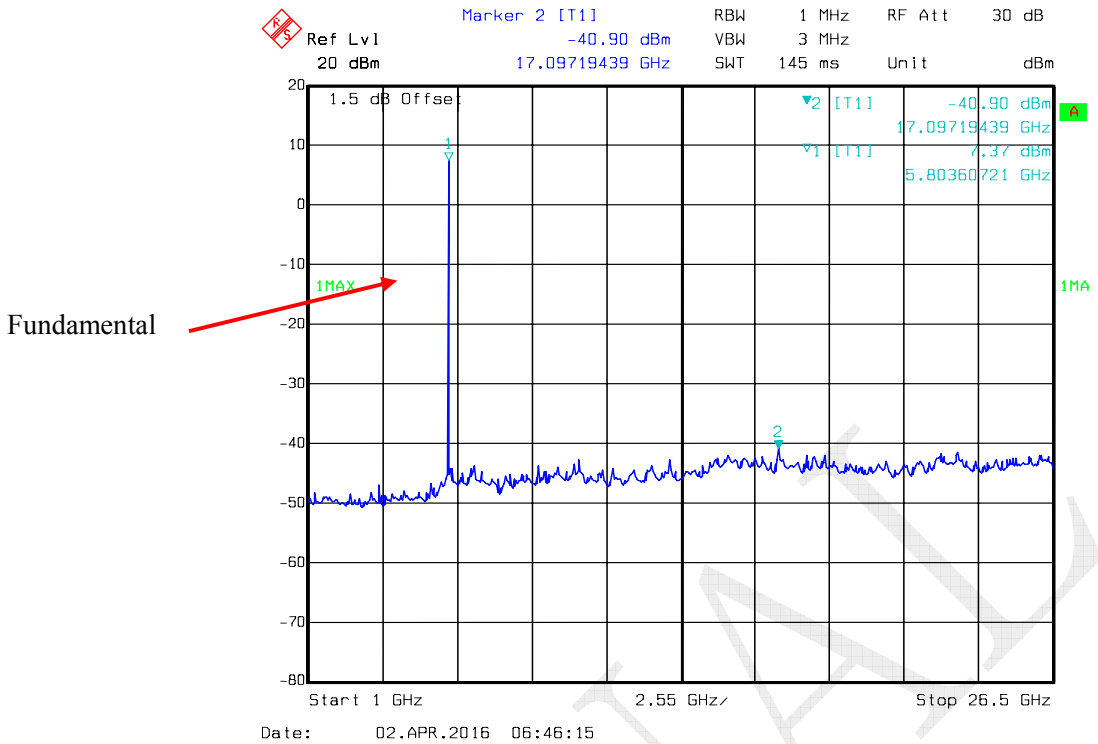
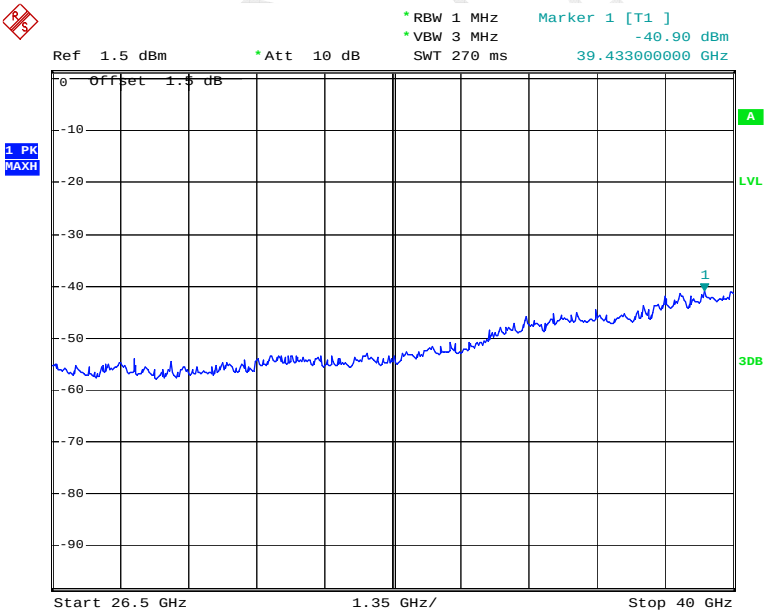
802.11n ht20 High Channel 1GHz-26.5GHz – Chain1



802.11n ht20 High Channel 26.5GHz-40GHz – Chain1



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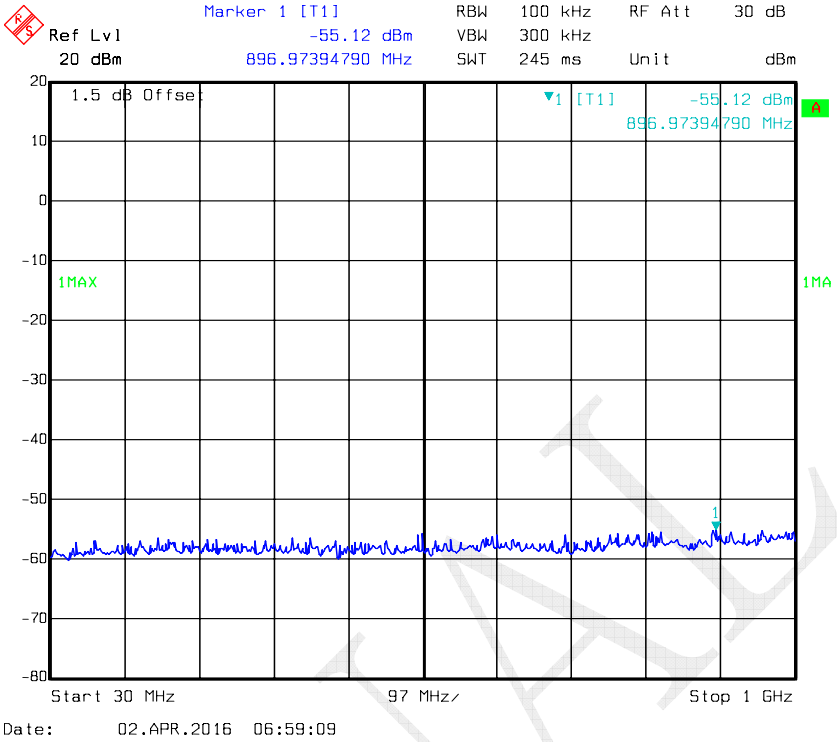
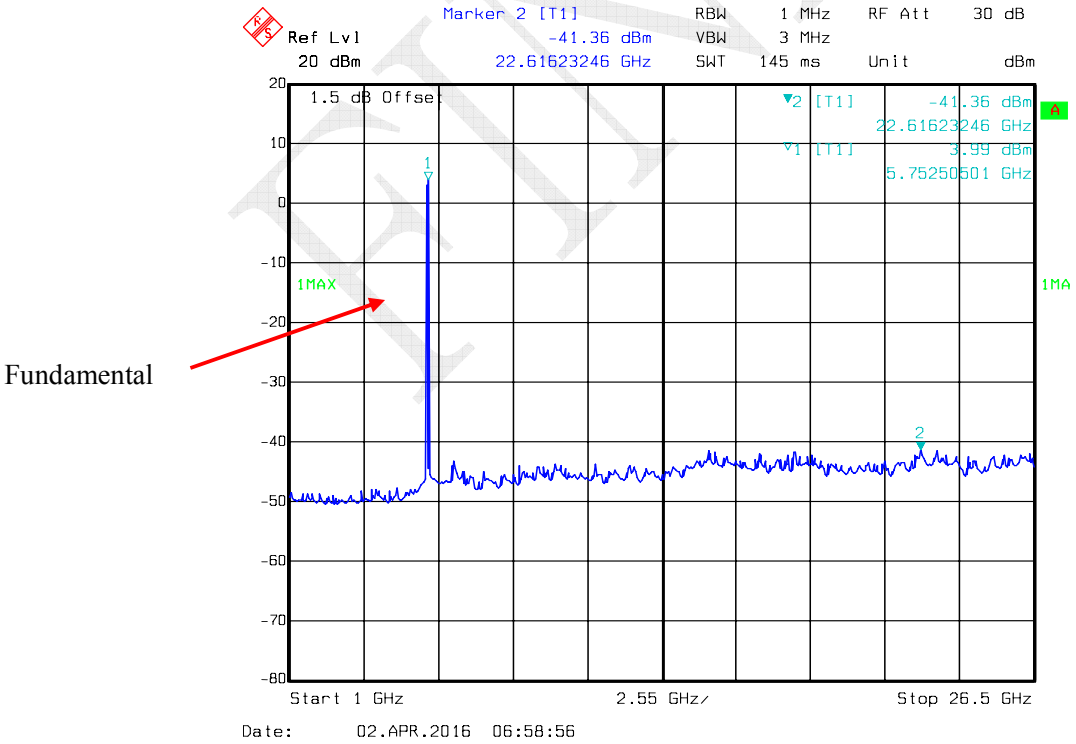
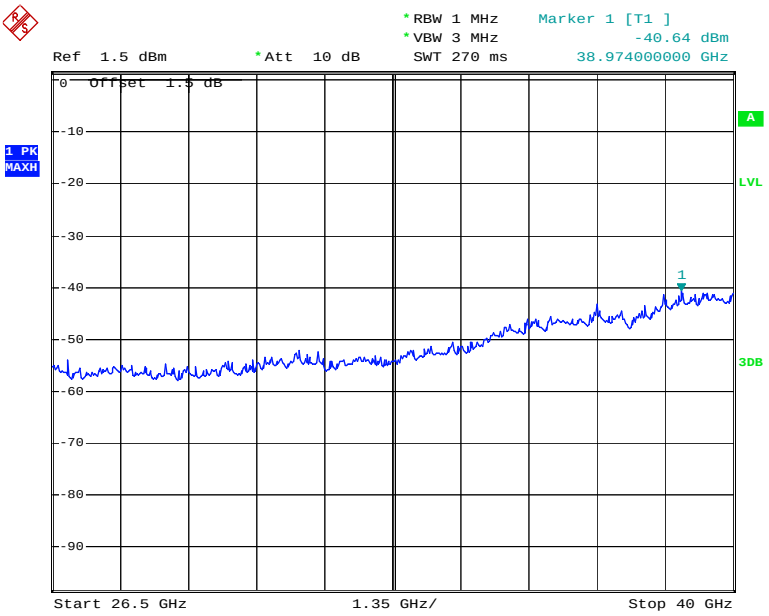
802.11n ht40 Low Channel 30MHz-1GHz – Chain1



802.11n ht40 Low Channel 1GHz-26.5GHz – Chain1



802.11n ht40 Low Channel 26.5GHz-40GHz – Chain1



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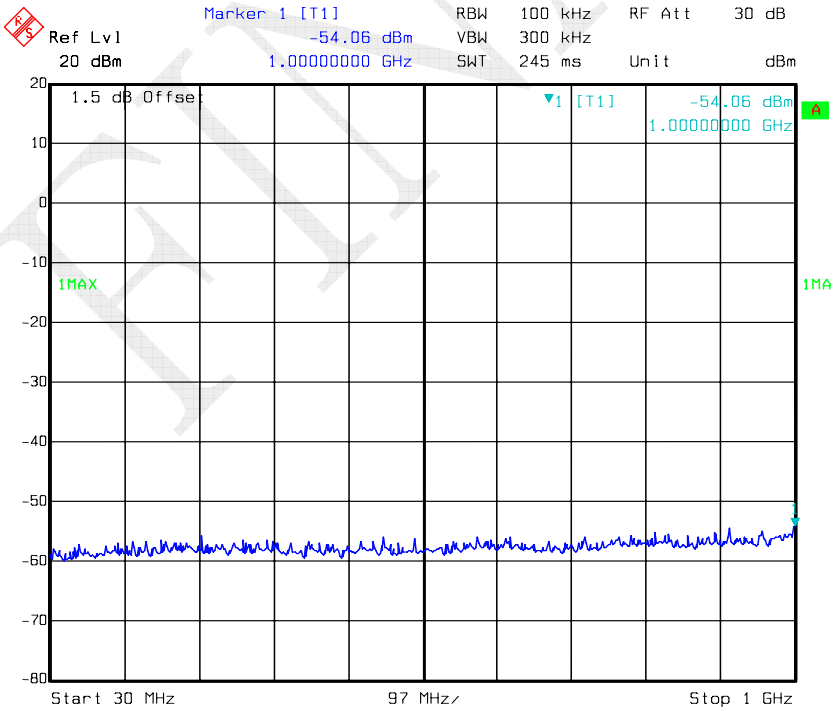
802.11n ht40 High Channel 30MHz-1GHz – Chain1



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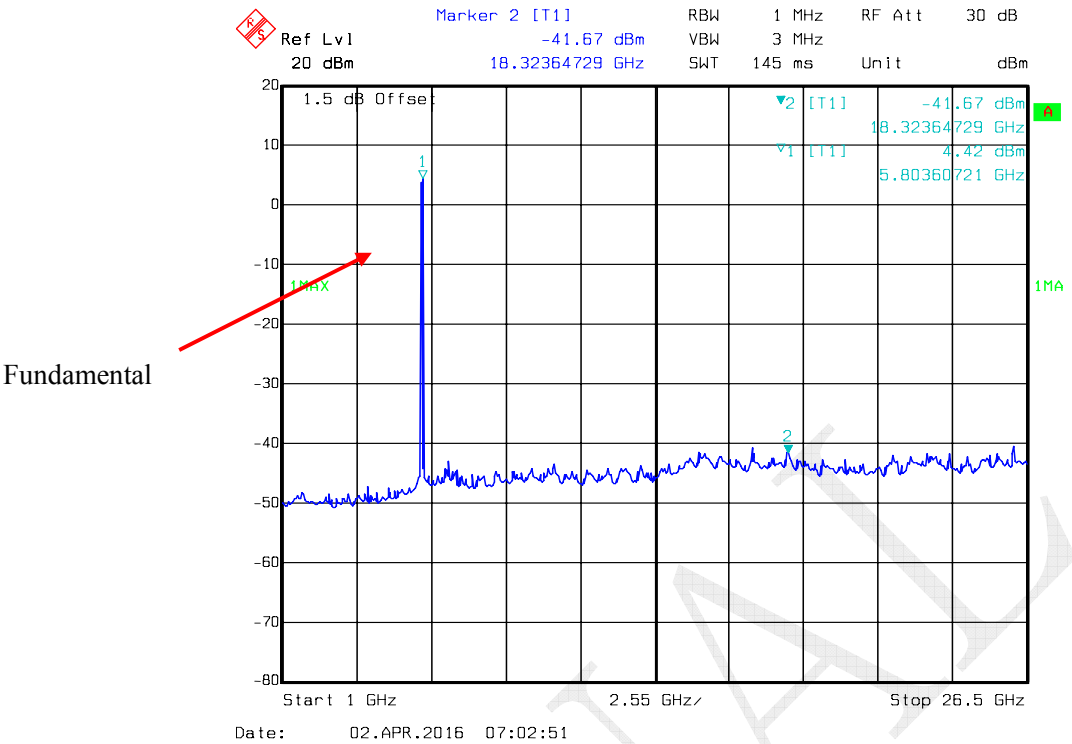
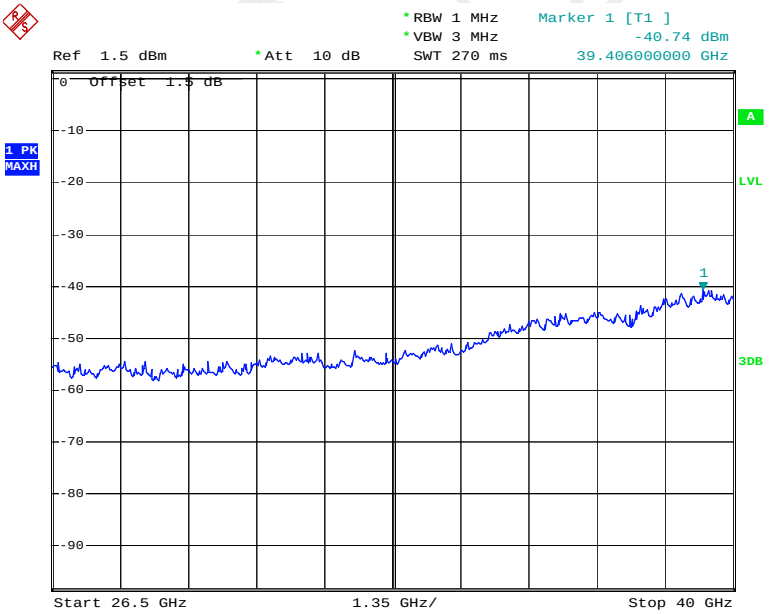
802.11n ht40 High Channel 1GHz-26.5GHz – Chain1



Fundamental

802.11n ht40 High Channel 26.5GHz-40GHz – Chain1



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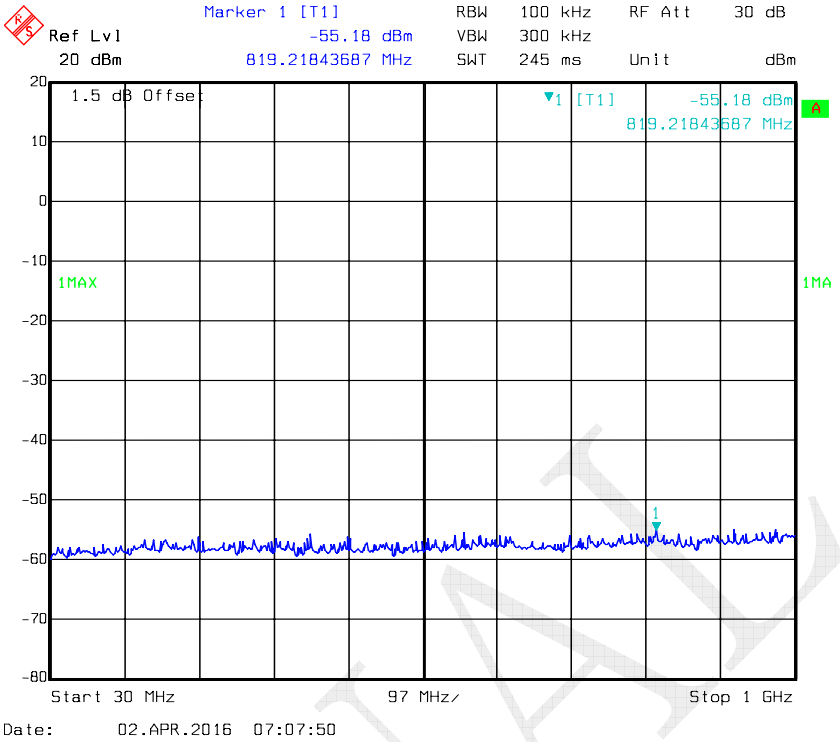
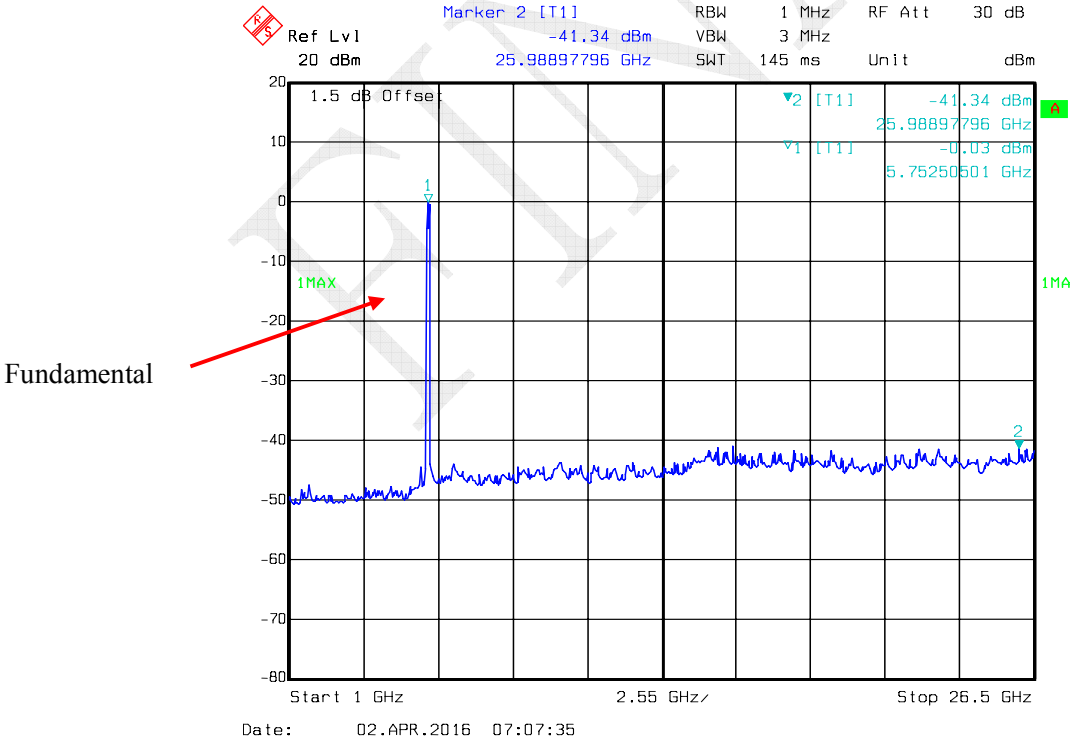
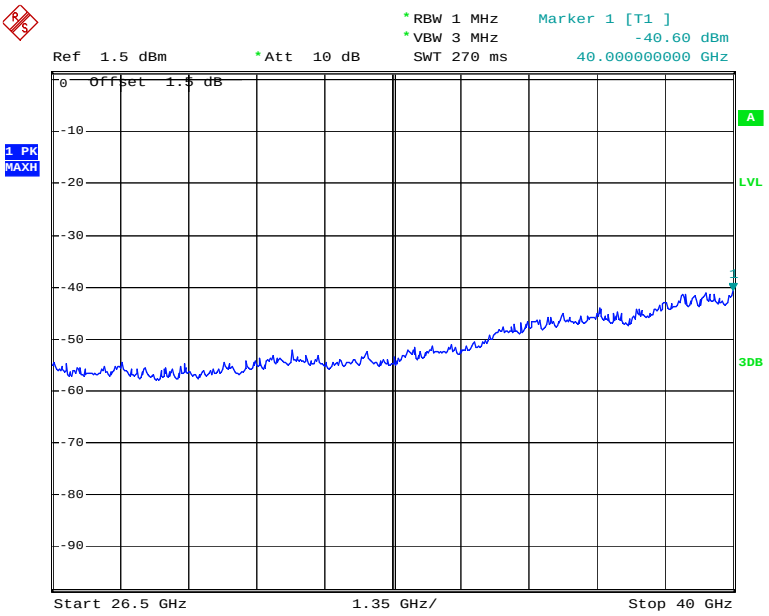
802.11n ac80 Middle Channel 30MHz-1GHz – Chain1



802.11n ac80 Middle Channel 1GHz-26.5GHz – Chain1



802.11n ac80 Middle Channel 26.5GHz-40GHz – Chain1



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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.

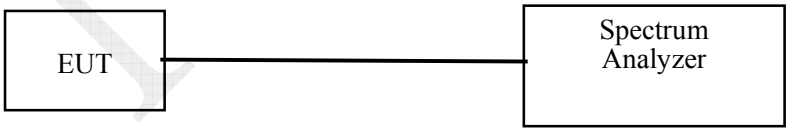
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(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

4. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
5. 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.
6. 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	2014-05-09	2015-05-09
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06
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:	25.4 °C
Relative Humidity:	51 %
ATM Pressure:	100.9 kPa

The testing was performed by Dean Liu from 2016-04-02 to 2016-04-05.

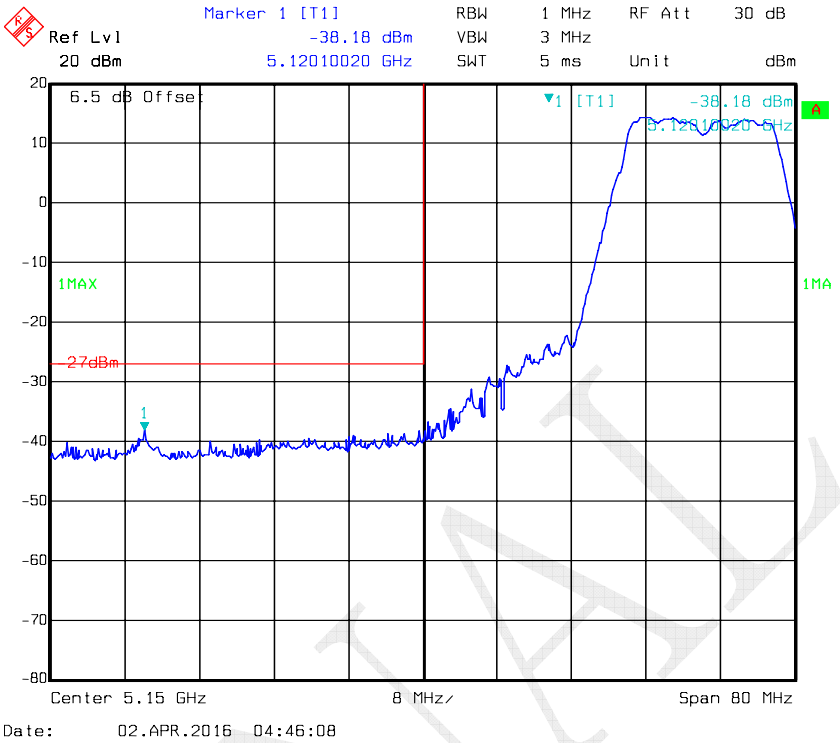
Please refer to the following plots:

Note: All emissions at each chain is low than limit 3 dBc, so combined two chain is meet the test requirements.

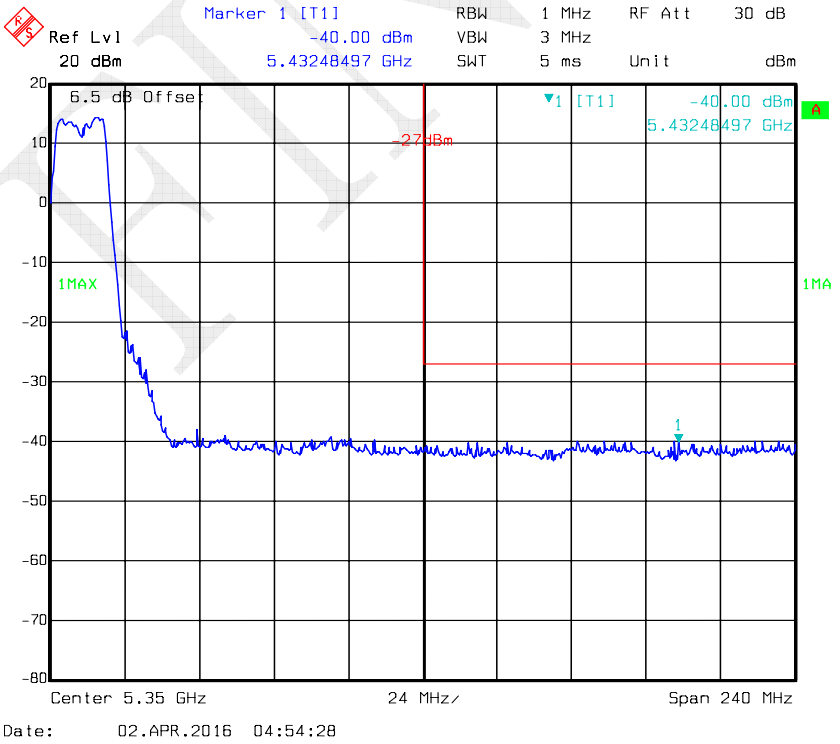
FINAL

5150MHz-5250MHz:

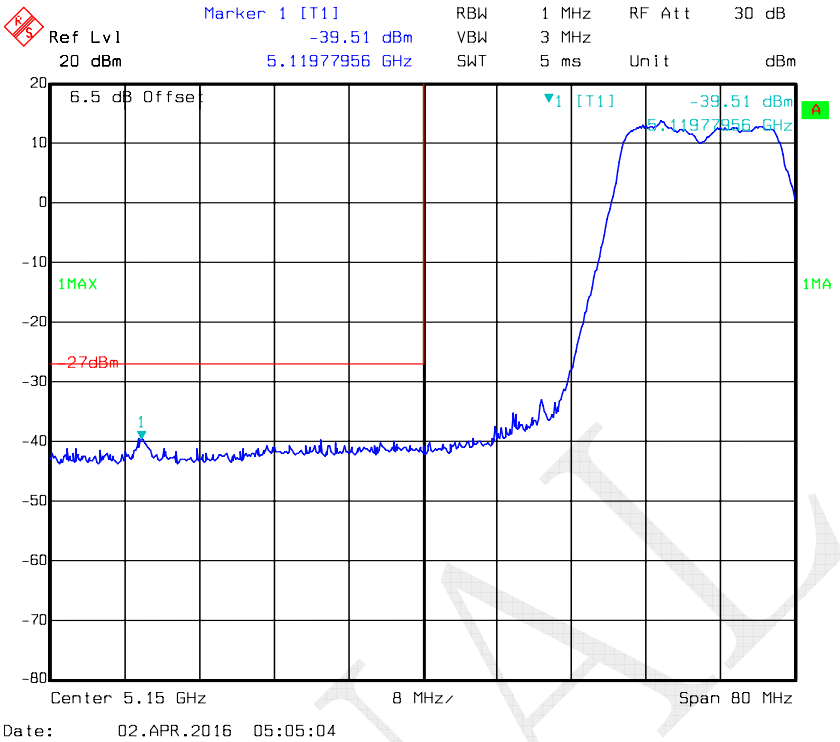
802.11a Band Edge, Left Side – Chain0



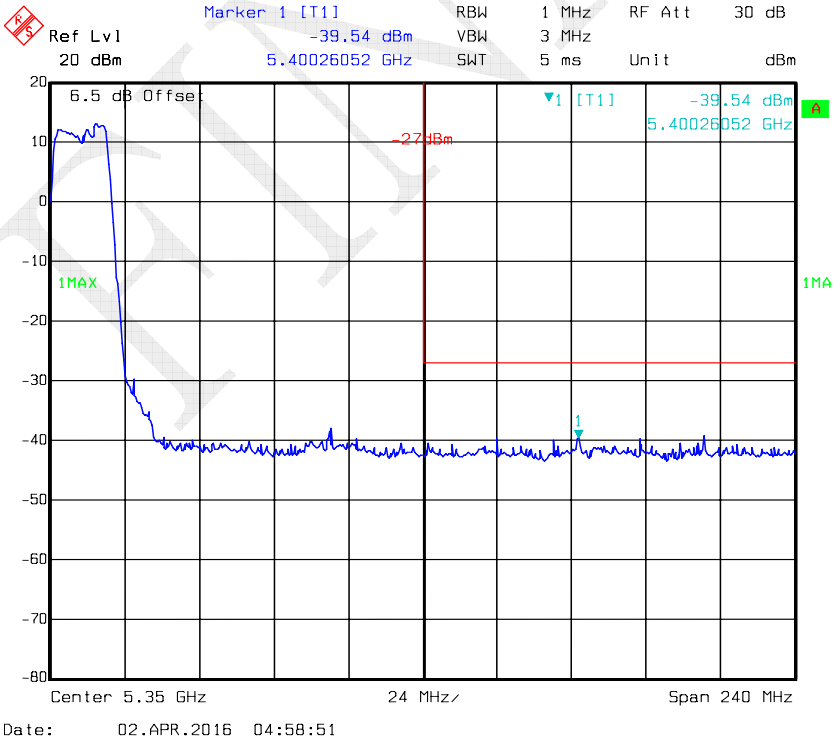
802.11a Band Edge, Right Side– Chain0



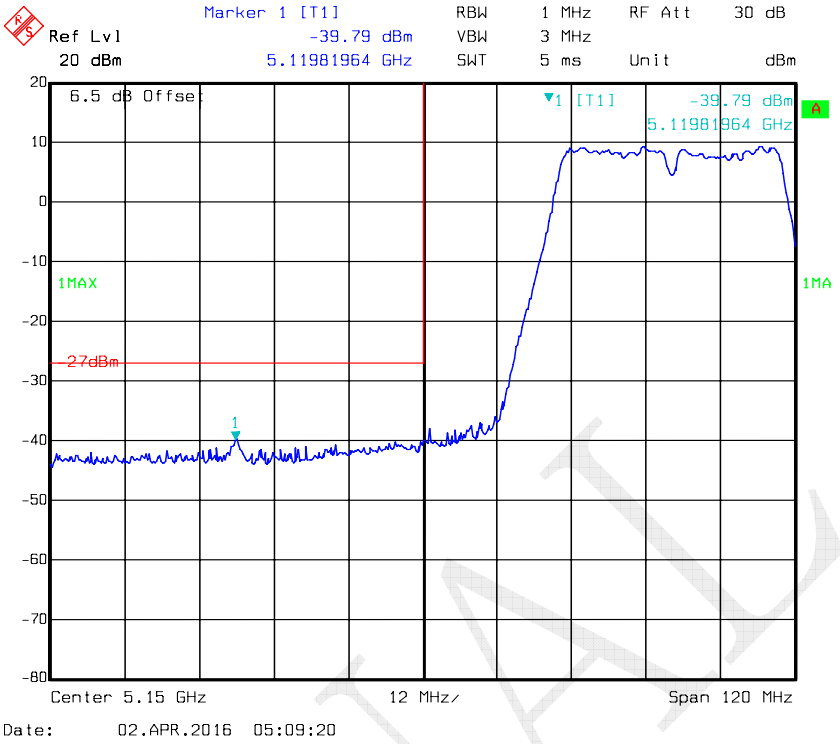
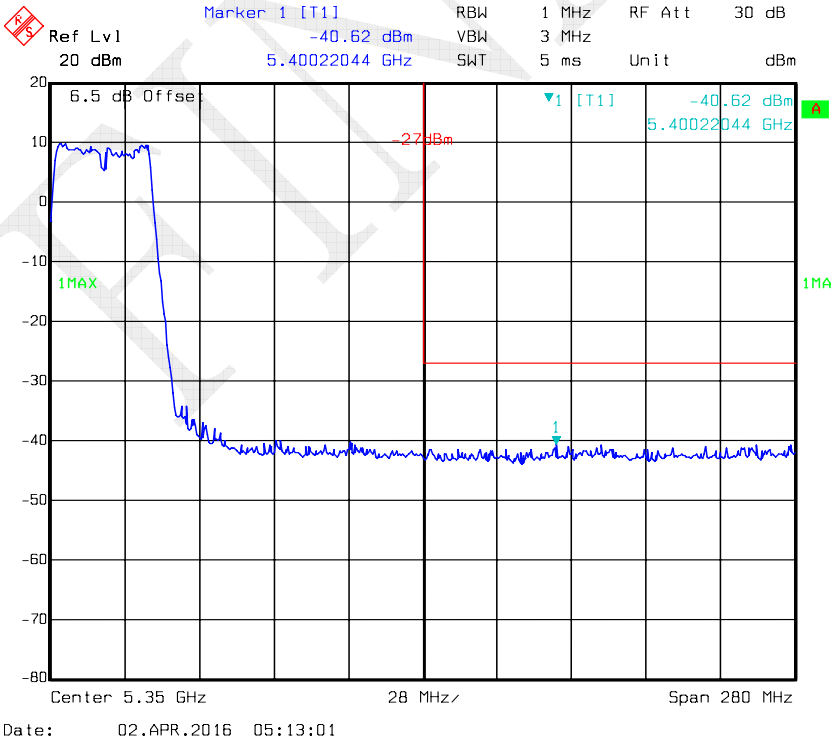
802.11n ht20 Band Edge, Left Side– Chain0



802.11n ht20 Band Edge, Right Side– Chain0



802.11n ht40 Band Edge, Left Side– Chain0



802.11n ht40 Band Edge, Right Side– Chain0