

FCC PART 15.407

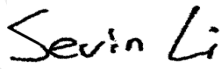
TEST REPORT

For

Digital China Networks(Beijing)Limited

Digital Technology Plaza, No.9 Shangdi 9th Street, Haidian District Beijing China

FCC ID: 2ABKCWL8200-I3

Report Type: Original Report	Product Type: 802.11AC Wireless Access Point
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Report Number:	RBJ141016051-00C
Report Date:	2014-11-23
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Digital China Networks(Beijing)Limited*'s product, model number: *WL8200-I3* (FCC ID: *2ABKCWL8200-I3*) or ("EUT") in this report is a *802.11AC Wireless Access Point*, which was measured approximately: 18.2 cm (L) x 15.4 cm (W) x 4.2 cm (H), DC48 V form POE adapter or DC 12V form AC/DC adapter .

** All measurement and test data in this report was gathered from production sample serial number: 141016051 (Assigned by BACL.Dongguan). The EUT was received on 2014-10-16.*

Objective

This type approval report is prepared on behalf of *Digital China Networks(Beijing)Limited* 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: 2ABKCWL8200-I3.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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, 6 channels are provided to test:

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 802.11n ac80, Channel 42 was tested.

For 5725~5850 MHz band, 7 channels are provided to test:

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 802.11n ac80, 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 software “MT76xxU QA V2.0.4.0 [0325]” 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 Band:

Test Mode	Test Software Version	MT76xxU QA V2.0.4.0 [0325]		
802.11a	Test Channel	Low	Middle	High
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting Chain0	19	19	19
	Power Level Setting Chain1	19	19	19
	Power Level Setting Chain2	19	19	19
802.11n20	Test Channel	Low	Middle	High
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting Chain0	18	18	18
	Power Level Setting Chain1	18	18	18
	Power Level Setting Chain2	18	18	18
802.11n40	Test Channel	Low	Middle	High
	Data Rate	MCS0	/	MCS0
	Power Level Setting Chain0	17	/	17
	Power Level Setting Chain1	17	/	17
	Power Level Setting Chain2	17	/	17
802.11nvht80	Test Channel	Low	Middle	High
	Data Rate	/	1SS0	/
	Power Level Setting Chain0	/	16.5	/
	Power Level Setting Chain1	/	16.5	/
	Power Level Setting Chain2	/	16.5	/

5725–5850MHz Band:

Test Mode	Test Software Version	MT76xxU QA V2.0.4.0 [0325]		
802.11a	Test Channel	Low	Middle	High
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting Chain0	19	19	19
	Power Level Setting Chain1	19	19	19
	Power Level Setting Chain2	19	19	19
802.11n20	Test Channel	Low	Middle	High
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting Chain0	18	18	18
	Power Level Setting Chain1	18	18	18
	Power Level Setting Chain2	18	18	18
802.11n40	Test Channel	Low	Middle	High
	Data Rate	MCS0	/	MCS0
	Power Level Setting Chain0	17	/	17
	Power Level Setting Chain1	17	/	17
	Power Level Setting Chain2	17	/	17
802.11n vht80	Test Channel	Low	Middle	High
	Data Rate	/	1SS0	/
	Power Level Setting Chain0	/	16.5	/
	Power Level Setting Chain1	/	16.5	/
	Power Level Setting Chain2	/	16.5	/

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

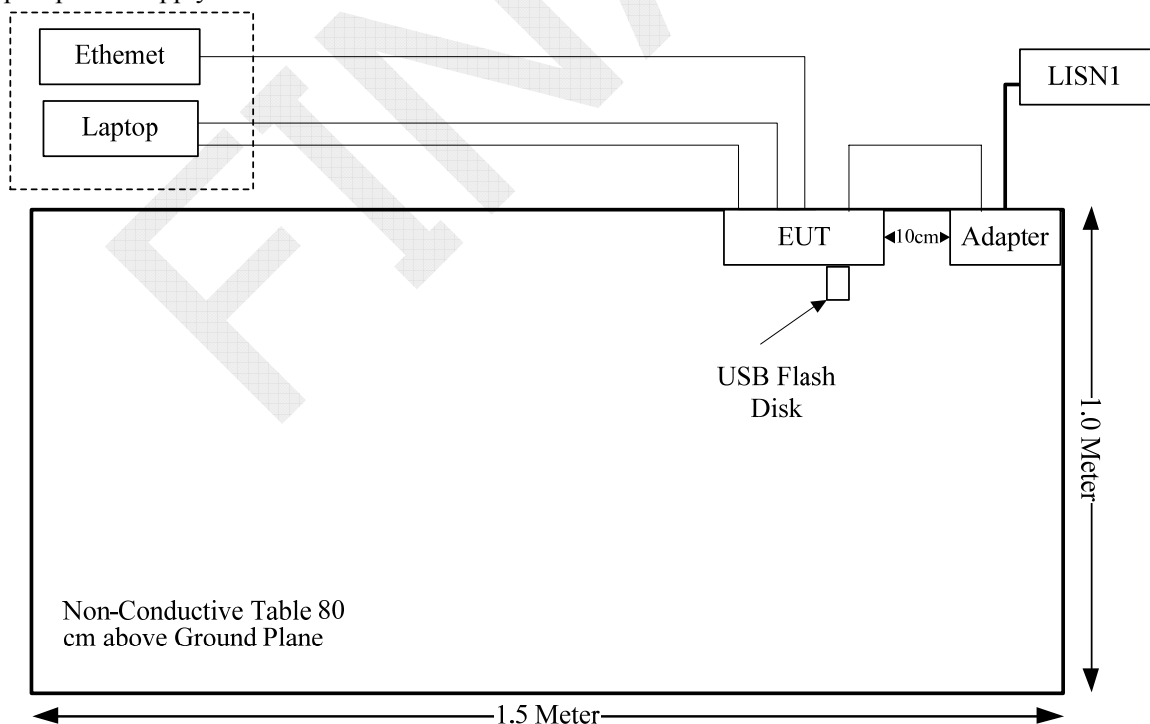
Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017
CWT	Adapter	KPL-06F	G35-D010123-P100
Kingston	USB Flash disk	N/A	N/A
I.T.E	Adapter(POE)	G0548B-480-050	N/A

External Cable

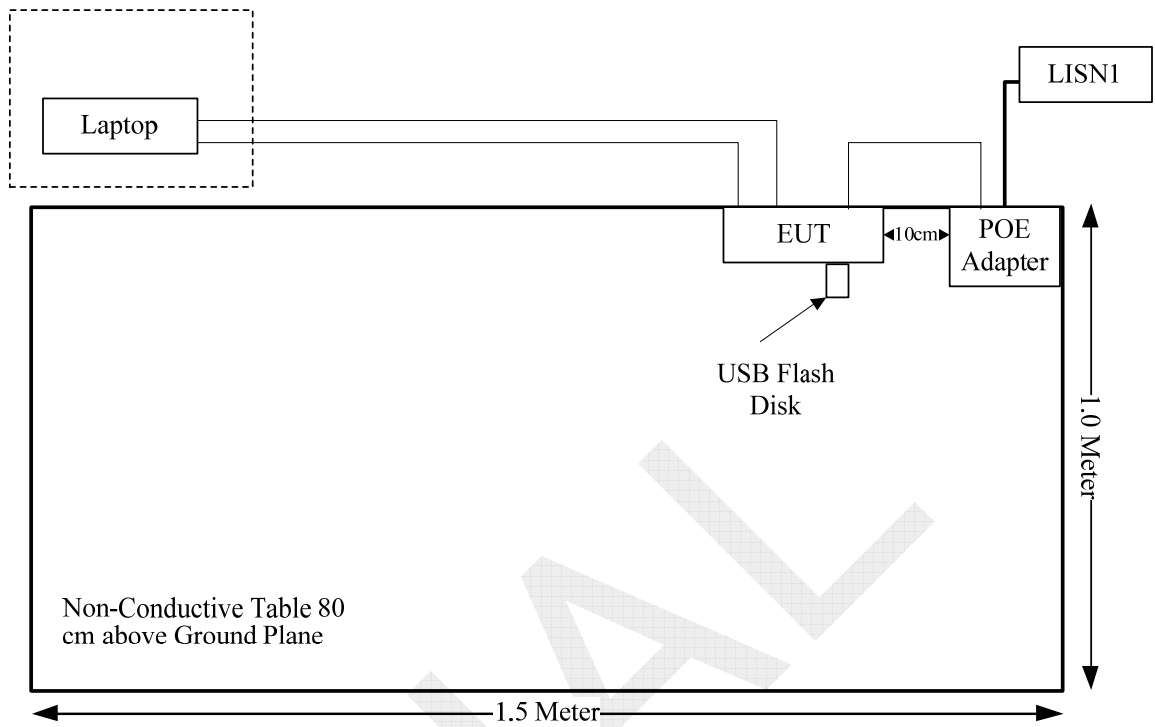
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	NO	NO	10	EUT	Ethernet
RJ45 Cable	NO	NO	10	EUT	Laptop
Serial Cable	NO	NO	5	EUT	Laptop
RJ45 Cable	NO	NO	1.0	EUT	POE Adapter

Block Diagram of Test Setup

AC Adapter power supply



POE Adapter power supply



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

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/cm²);

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 Band	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
5.2Band	5180	5	3.16	21.54	142.56	20.00	0.08973	1.0
5.8Band	5745	5	3.16	21.19	131.52	20.00	0.08278	1.0

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 device used 3 internal antennas for 5G band, all the antenna gain is 5.0 dBi, which fulfill the requirement of this section, please refer to the EUT photos.

Result: Compliance.

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:

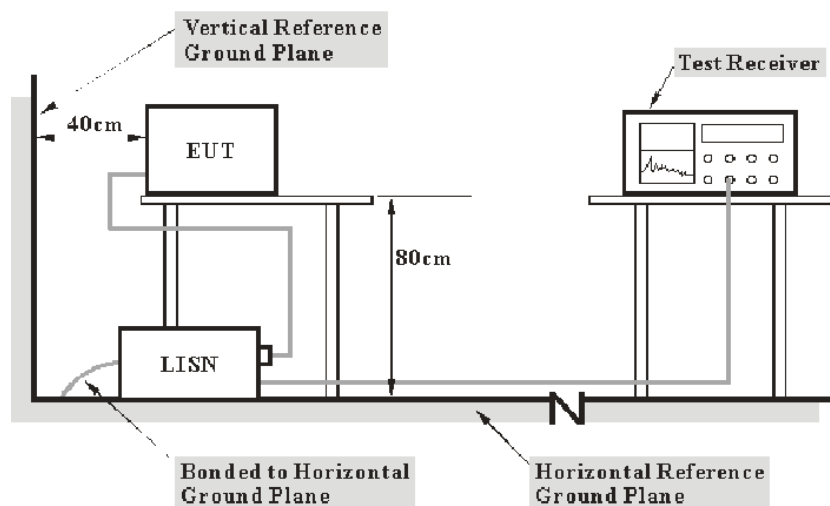
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

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 3.46 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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter of laptop 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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2014-10-16	2015-10-16
R&S	L.I.S.N	ESH3-Z5	843331/015	N/A	N/A
R&S	Two-line V-network	ENV 216	3560.6550.12	2014-01-22	2015-01-22
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 Procedure

During the conducted emission test, the adapter of laptop was connected to the first 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:

4.9 dB at 0.487810 MHz in the Line conducted mode

Test Data

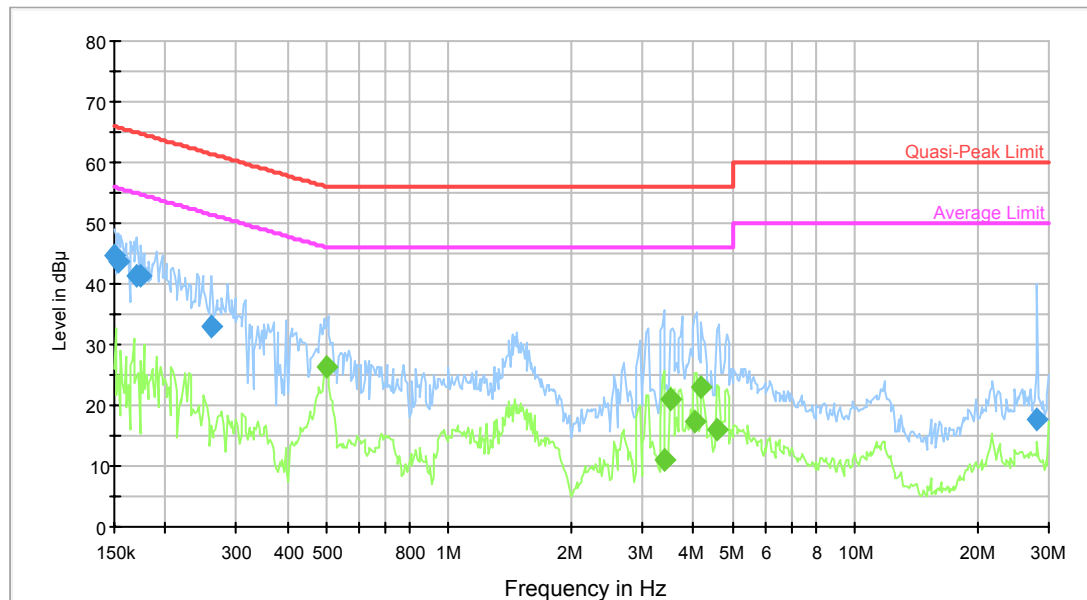
Environmental Conditions

Temperature:	22.3°C -26 °C
Relative Humidity:	52%-59 %
ATM Pressure:	101.1 kPa -101.3 kPa

The testing was performed by Sevin Liu on 2014-11-7&2014-11-11.

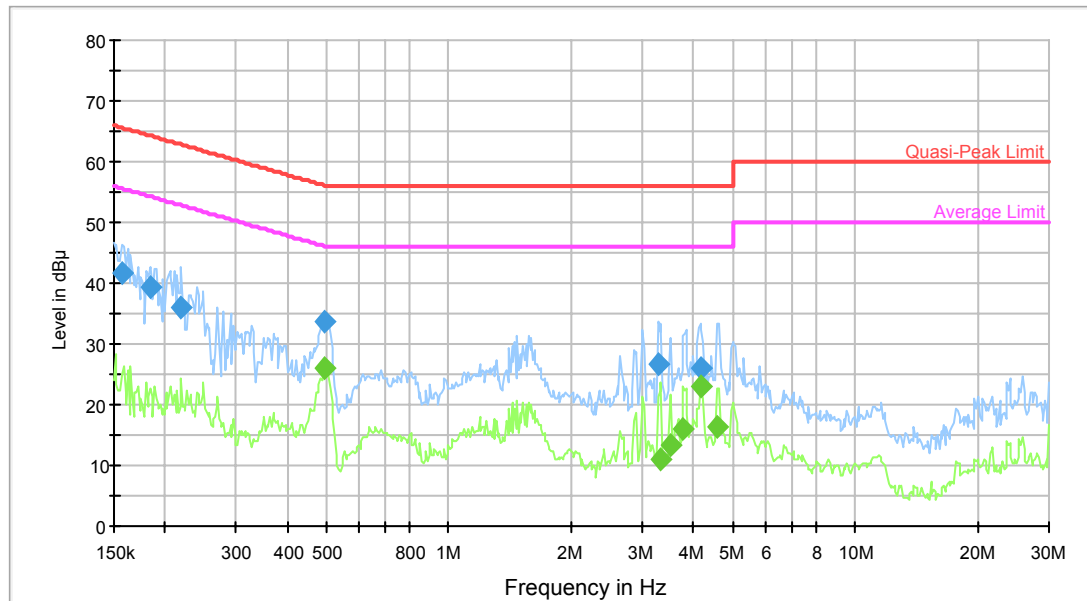
Test Mode: Transmitting (AC/DC adapter)

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	44.6	9.000	L1	10.0	21.4	66.0	Compliance
0.153629	43.6	9.000	L1	10.1	22.2	65.8	Compliance
0.170396	41.4	9.000	L1	10.3	23.6	64.9	Compliance
0.174519	41.3	9.000	L1	10.4	23.5	64.7	Compliance
0.259937	33.0	9.000	L1	10.7	28.5	61.4	Compliance
28.161848	17.7	9.000	L1	11.0	42.3	60.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.499611	26.5	9.000	L1	10.4	19.5	46.0	Compliance
3.381891	10.9	9.000	L1	10.6	35.1	46.0	Compliance
3.519348	21.0	9.000	L1	10.7	25.0	46.0	Compliance
4.029873	17.5	9.000	L1	10.7	28.5	46.0	Compliance
4.193667	23.0	9.000	L1	10.7	23.0	46.0	Compliance
4.577832	16.0	9.000	L1	10.7	30.0	46.0	Compliance

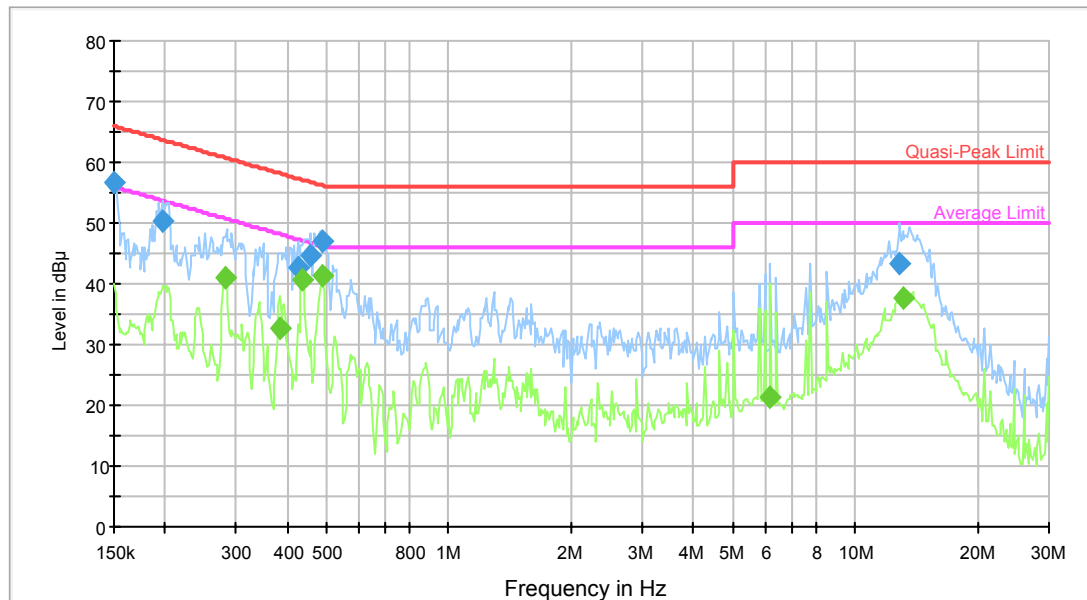
AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.157346	41.7	9.000	N	10.4	23.9	65.6	Compliance
0.184529	39.4	9.000	N	11.0	24.9	64.3	Compliance
0.219886	36.1	9.000	N	11.3	26.7	62.8	Compliance
0.495646	33.6	9.000	N	10.4	22.5	56.1	Compliance
3.275801	26.5	9.000	N	10.7	29.5	56.0	Compliance
4.160384	26.0	9.000	N	10.8	30.0	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.495646	26.0	9.000	N	10.4	20.0	46.1	Compliance
3.328423	10.9	9.000	N	10.7	35.1	46.0	Compliance
3.519348	13.2	9.000	N	10.7	32.8	46.0	Compliance
3.781003	16.1	9.000	N	10.7	29.9	46.0	Compliance
4.160384	23.1	9.000	N	10.8	22.9	46.0	Compliance
4.577832	16.2	9.000	N	10.8	29.8	46.0	Compliance

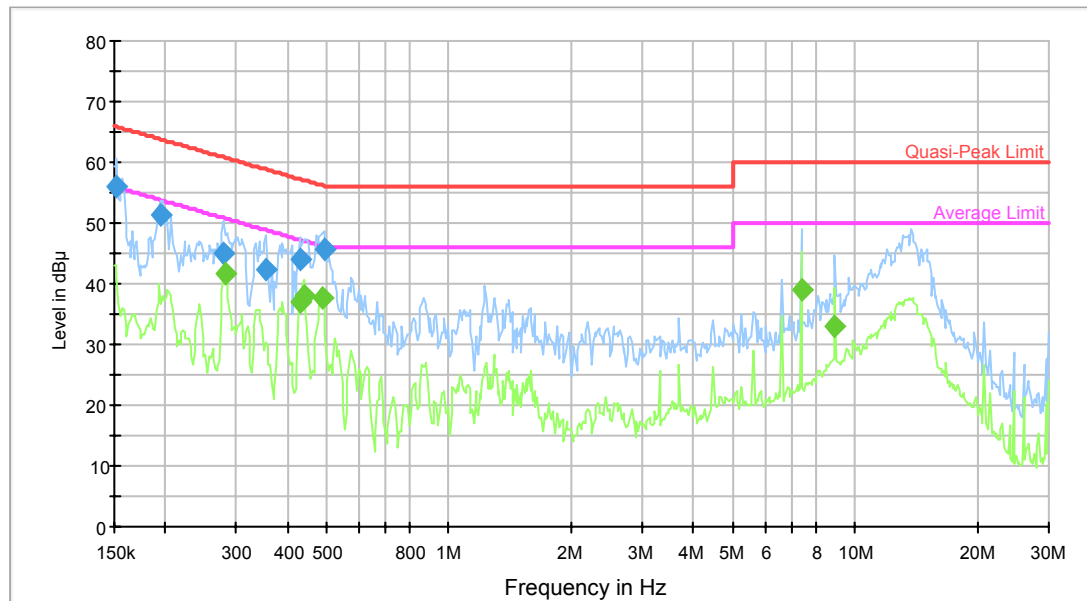
Test Mode: Transmitting (POE adapter)

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	56.7	9.000	L1	10.0	9.3	66.0	Compliance
0.196675	50.3	9.000	L1	10.7	13.5	63.7	Compliance
0.426011	42.6	9.000	L1	10.5	14.7	57.3	Compliance
0.457684	44.5	9.000	L1	10.4	12.2	56.7	Compliance
0.487810	47.0	9.000	L1	10.4	9.2	56.2	Compliance
12.898197	43.4	9.000	L1	10.5	16.6	60.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.281497	40.9	9.000	L1	10.7	9.9	50.8	Compliance
0.384091	32.6	9.000	L1	10.6	15.6	48.2	Compliance
0.436318	40.6	9.000	L1	10.5	6.5	47.1	Compliance
0.487810	41.3	9.000	L1	10.4	4.9	46.2	Compliance
6.196694	21.4	9.000	L1	10.8	28.6	50.0	Compliance
13.210237	37.8	9.000	L1	10.5	12.2	50.0	Compliance

AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.152410	56.0	9.000	N	10.3	9.9	65.9	Compliance
0.195114	51.2	9.000	N	11.2	12.6	63.8	Compliance
0.279263	44.9	9.000	N	11.2	15.9	60.8	Compliance
0.354674	42.4	9.000	N	11.0	16.4	58.9	Compliance
0.429420	44.1	9.000	N	10.6	13.2	57.3	Compliance
0.491712	45.8	9.000	N	10.4	10.3	56.1	Compliance

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.281497	41.5	9.000	N	11.2	9.2	50.8	Compliance
0.429420	36.8	9.000	N	10.6	10.4	47.3	Compliance
0.439808	38.0	9.000	N	10.6	9.0	47.1	Compliance
0.487810	37.8	9.000	N	10.4	8.4	46.2	Compliance
7.384001	38.9	9.000	N	10.7	11.1	50.0	Compliance
8.940144	32.9	9.000	N	10.7	17.1	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_{cisprr} 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_{cisprr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisprr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisprr})$, 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

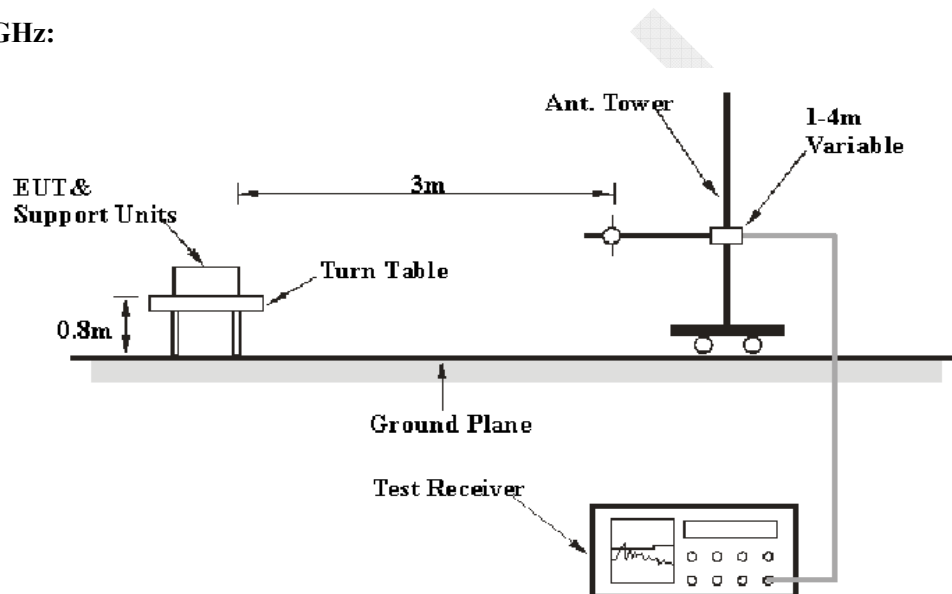
6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

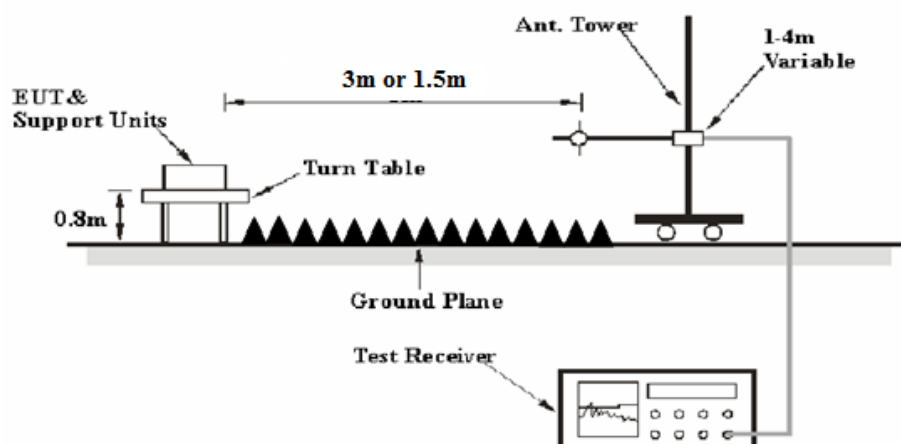
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

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 C63.4-2003. 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 adapter of laptop 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 of laptop 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.

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

According to C63.4, 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 = $20 \log (\text{specific distance } [3m] / \text{test distance } [1.5m])$ dB

Extrapolation result = Corrected Amplitude (dB μ V/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:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Extrapolation result}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2014-05-09	2015-05-09
Sunol Sciences	Antenna	JB3	A060611-3	2014-07-28	2017-07-27
HP	Amplifier	8447E	2434A02181	2014-09-01	2015-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2014-09-06	2015-09-06

* **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:

2.27 dB at 5725 MHz in the **Horizontal** polarization for 802.11n Vht80 mode

Test Data**Environmental Conditions**

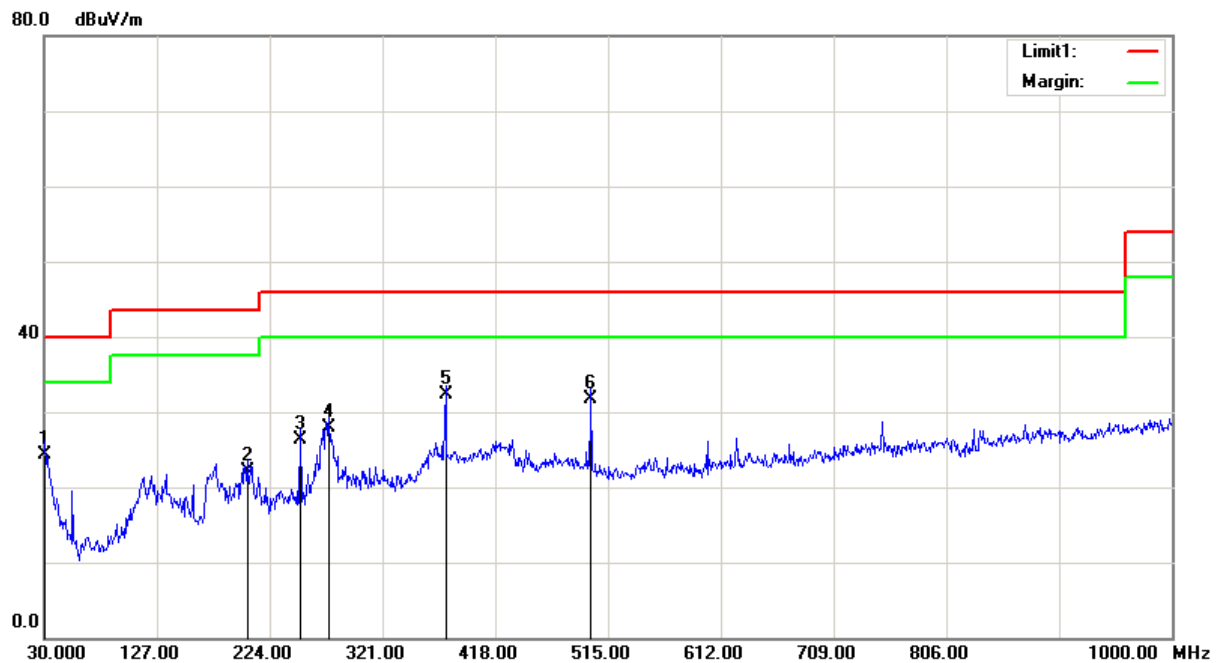
Temperature:	24.1 °C-26.2°C
Relative Humidity:	51 %-54%
ATM Pressure:	101.1 kPa-101.7 kPa

The testing was performed by Sevin Liu on 2014-11-10 & 2014-11-18.

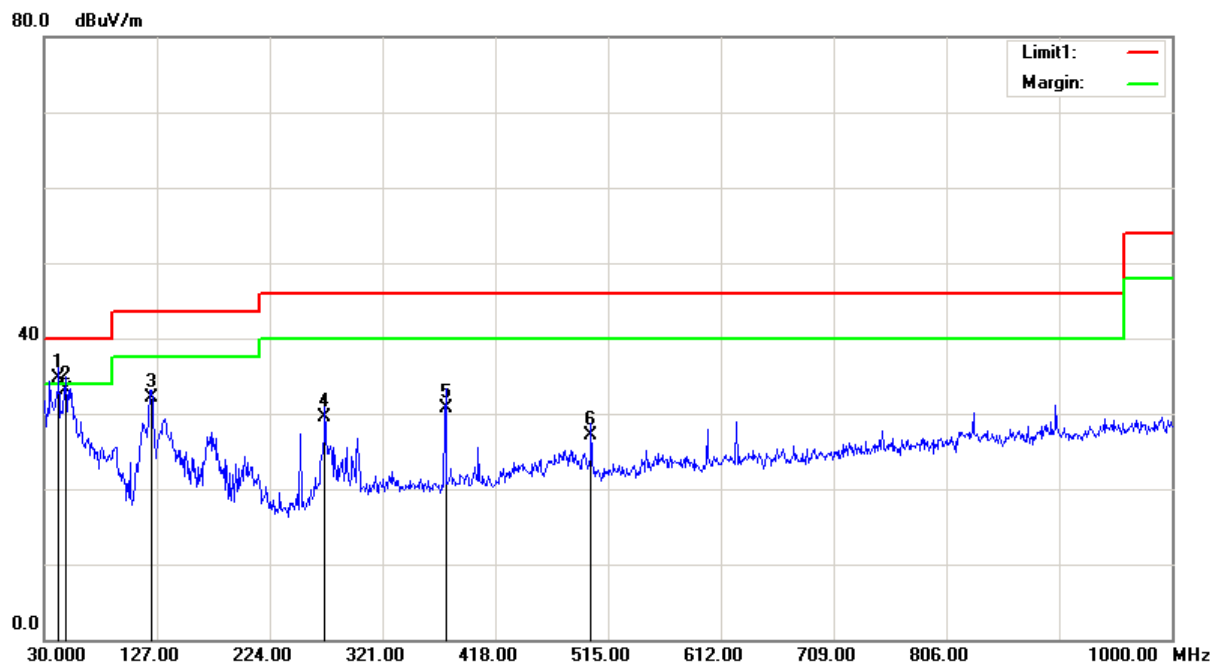
Mode: Transmitting

1) Below 1GHz

AC/DC adapter:

Horizontal:

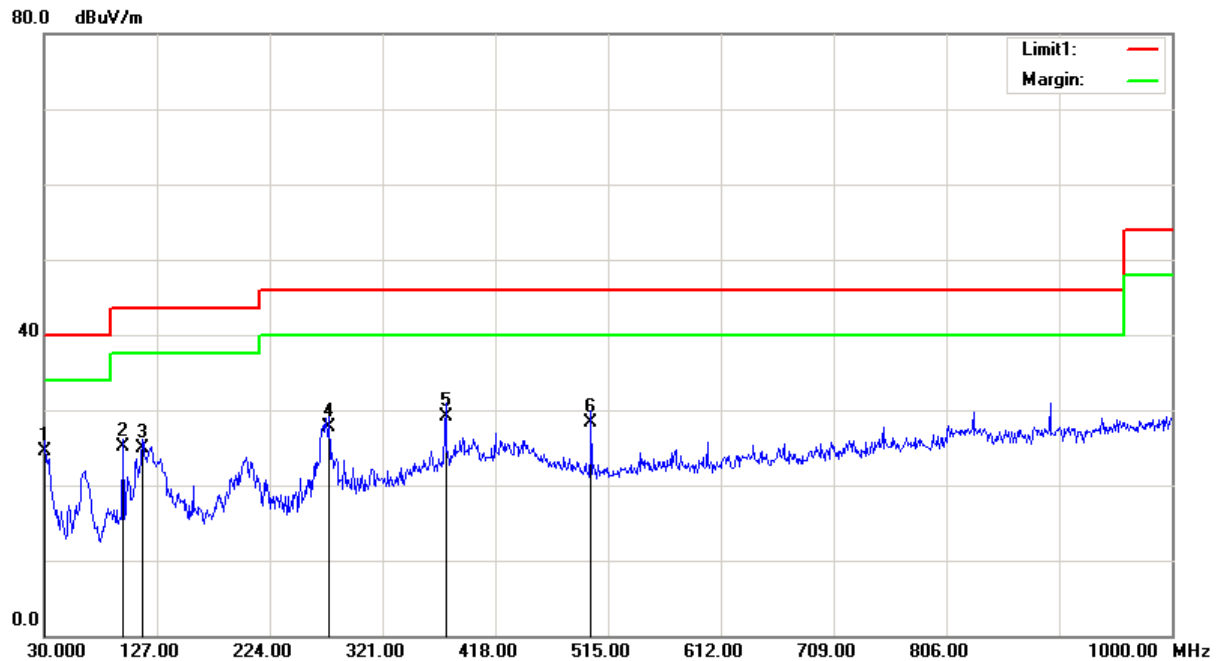
Frequency (MHz)	Receiver Reading (dBμV)	Detector (PK/QP/Ave)	Correction Factor (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	20.92	QP	3.38	24.30	40.00	15.70
204.6000	30.55	QP	-8.45	22.10	43.50	21.40
250.1900	34.36	QP	-7.96	26.40	46.00	19.60
274.4400	34.04	QP	-6.14	27.90	46.00	18.10
375.3200	36.66	QP	-4.26	32.40	46.00	13.60
500.4500	33.40	QP	-1.60	31.80	46.00	14.20

Vertical:

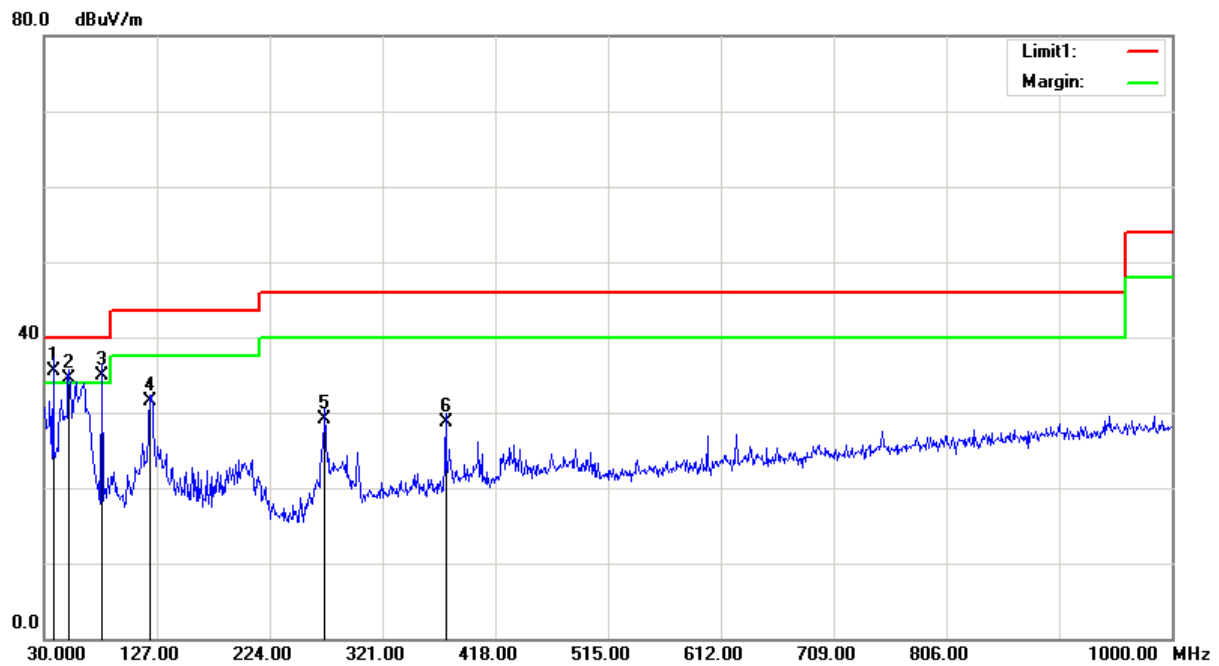
Frequency (MHz)	Receiver Reading (dB μ V)	Detector (PK/QP/Ave)	Correction Factor (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
42.6100	43.19	QP	-8.49	34.70	40.00	5.30
48.4300	44.52	QP	-11.42	33.10	40.00	6.90
122.1500	37.67	QP	-5.57	32.10	43.50	11.40
271.5300	35.67	QP	-6.17	29.50	46.00	16.50
375.3200	35.06	QP	-4.26	30.80	46.00	15.20
500.4500	28.80	QP	-1.60	27.20	46.00	18.80

POE adapter:

Horizontal:



Frequency (MHz)	Receiver Reading (dBμV)	Detector (PK/QP/Ave)	Correction Factor (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	21.22	QP	3.38	24.60	40.00	15.40
97.9000	35.51	QP	-10.41	25.10	43.50	18.40
114.3900	31.25	QP	-6.35	24.90	43.50	18.60
275.4100	33.94	QP	-6.14	27.80	46.00	18.20
375.3200	33.36	QP	-4.26	29.10	46.00	16.90
500.4500	30.00	QP	-1.60	28.40	46.00	17.60

Vertical:

Frequency (MHz)	Receiver Reading (dB μ V)	Detector (PK/QP/Ave)	Correction Factor (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
37.7600	40.19	QP	-4.59	35.60	40.00	4.40
51.3400	46.96	QP	-12.46	34.50	40.00	5.50
79.4700	47.26	QP	-12.36	34.90	40.00	5.10
121.1800	37.23	QP	-5.63	31.60	43.50	11.90
271.5300	35.37	QP	-6.17	29.20	46.00	16.80
375.3200	32.96	QP	-4.26	28.70	46.00	17.30

2) Above 1GHz (test with POE adapter):

Note: For above 1GHz, the test distance is 1.5m.

5150MHz-5250MHz: 802.11a Mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)							
Low Channel:5180 MHz										
5180	79.23	PK	H	31.46	5.94	0.00	116.63	110.63	N/A	N/A
5180	67.56	AV	H	31.46	5.94	0.00	104.96	98.96	N/A	N/A
5180	78.55	PK	V	31.46	5.94	0.00	115.95	109.95	N/A	N/A
5180	66.21	AV	V	31.46	5.94	0.00	103.61	97.61	N/A	N/A
5150	33.91	PK	H	31.40	6.03	0.00	71.34	65.34	74.00	8.66
5150	20.25	AV	H	31.40	6.03	0.00	57.68	51.68	54.00	2.32*
10360	42.15	PK	H	36.97	8.60	25.52	62.20	56.20	74.00	17.80
10360	32.36	AV	H	36.97	8.60	25.52	52.41	46.41	54.00	7.59
15540	32.54	PK	H	37.43	14.71	24.98	59.70	53.70	74.00	20.30
15540	19.25	AV	H	37.43	14.71	24.98	46.41	40.41	54.00	13.59
7513	31.67	PK	H	34.81	7.61	26.17	47.92	41.92	74.00	32.08
7513	16.15	AV	H	34.81	7.61	26.17	32.40	26.40	54.00	27.60
2786	30.85	PK	H	26.64	5.26	27.55	35.20	29.20	74.00	44.80
2786	14.29	AV	H	26.64	5.26	27.55	18.64	12.64	54.00	41.36
Middle Channel:5200 MHz										
5200	78.72	PK	H	31.50	5.88	0.00	116.10	110.10	N/A	N/A
5200	66.65	AV	H	31.50	5.88	0.00	104.03	98.03	N/A	N/A
5200	77.56	PK	V	31.50	5.88	0.00	114.94	108.94	N/A	N/A
5200	65.38	AV	V	31.50	5.88	0.00	102.76	96.76	N/A	N/A
10400	41.99	PK	H	36.98	8.57	25.50	62.04	56.04	74.00	17.96
10400	30.87	AV	H	36.98	8.57	25.50	50.92	44.92	54.00	9.08
15600	30.75	PK	H	37.32	14.61	24.69	57.99	51.99	74.00	22.01
15600	19.26	AV	H	37.32	14.61	24.69	46.50	40.50	54.00	13.50
7430	29.75	PK	H	34.63	7.57	25.94	46.01	40.01	74.00	33.99
7430	18.67	AV	H	34.63	7.57	25.94	34.93	28.93	54.00	25.07
7310	30.03	PK	H	34.34	7.51	25.88	46.00	40.00	74.00	34.00
7310	19.13	AV	H	34.34	7.51	25.88	35.10	29.10	54.00	24.90
High Channel:5240 MHz										
5240	78.27	PK	H	31.58	5.82	0.00	115.67	109.67	N/A	N/A
5240	65.69	AV	H	31.58	5.82	0.00	103.09	97.09	N/A	N/A
5240	77.8	PK	V	31.58	5.82	0.00	115.20	109.20	N/A	N/A
5240	64.31	AV	V	31.58	5.82	0.00	101.71	95.71	N/A	N/A
5350	26.71	PK	H	31.80	6.11	0.00	64.62	58.62	74.00	15.38
5350	15.58	AV	H	31.80	6.11	0.00	53.49	47.49	54.00	6.51
10480	41.68	PK	H	37.00	8.51	26.01	61.18	55.18	74.00	18.82
10480	30.66	AV	H	37.00	8.51	26.01	50.16	44.16	54.00	9.84
15720	31.16	PK	H	37.10	14.42	24.92	57.76	51.76	74.00	22.24
15720	18.97	AV	H	37.10	14.42	24.92	45.57	39.57	54.00	14.43
16026	31.54	PK	H	36.64	13.99	24.56	57.61	51.61	74.00	22.39
16026	19.45	AV	H	36.64	13.99	24.56	45.52	39.52	54.00	14.48
13195	31.83	PK	H	38.75	9.91	25.09	55.40	49.40	74.00	24.60
13195	19.65	AV	H	38.75	9.91	25.09	43.22	37.22	54.00	16.78

*Within measurement uncertainty!

802.11n ht20 Mode:

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5180 MHz										
5180	77.26	PK	H	31.46	5.94	0.00	114.66	108.66	N/A	N/A
5180	65.96	AV	H	31.46	5.94	0.00	103.36	97.36	N/A	N/A
5180	75.62	PK	V	31.46	5.94	0.00	113.02	107.02	N/A	N/A
5180	63.88	AV	V	31.46	5.94	0.00	101.28	95.28	N/A	N/A
5150	31.44	PK	H	31.40	6.03	0.00	68.87	62.87	74.00	11.13
5150	19.91	AV	H	31.40	6.03	0.00	57.34	51.34	54.00	2.66*
10360	44.21	PK	H	36.97	8.60	25.52	64.26	58.26	74.00	15.74
10360	34.69	AV	H	36.97	8.60	25.52	54.74	48.74	54.00	5.26
15540	30.80	PK	H	37.43	14.71	24.98	57.96	51.96	74.00	22.04
15540	19.34	AV	H	37.43	14.71	24.98	46.50	40.50	54.00	13.50
13242	30.29	PK	H	38.84	10.04	25.21	53.96	47.96	74.00	26.04
13242	19.12	AV	H	38.84	10.04	25.21	42.79	36.79	54.00	17.21
14901	31.35	PK	H	40.22	12.28	25.77	58.08	52.08	74.00	21.92
14901	19.26	AV	H	40.22	12.28	25.77	45.99	39.99	54.00	14.01
Middle Channel:5200 MHz										
5200	76.26	PK	H	31.50	5.88	0.00	113.64	107.64	N/A	N/A
5200	64.98	AV	H	31.50	5.88	0.00	102.36	96.36	N/A	N/A
5200	75.63	PK	V	31.50	5.88	0.00	113.01	107.01	N/A	N/A
5200	62.12	AV	V	31.50	5.88	0.00	99.50	93.50	N/A	N/A
10400	43.87	PK	H	36.98	8.57	25.50	63.92	57.92	74.00	16.08
10400	34.08	AV	H	36.98	8.57	25.50	54.13	48.13	54.00	5.87
15600	31.25	PK	H	37.32	14.61	24.69	58.49	52.49	74.00	21.51
15600	19.17	AV	H	37.32	14.61	24.69	46.41	40.41	54.00	13.59
16962	30.72	PK	H	39.34	15.22	24.87	60.41	54.41	74.00	19.59
16962	19.13	AV	H	39.34	15.22	24.87	48.82	42.82	54.00	11.18
13205	31.68	PK	H	38.77	9.94	25.11	55.28	49.28	74.00	24.72
13205	19.63	AV	H	38.77	9.94	25.11	43.23	37.23	54.00	16.77
High Channel:5240 MHz										
5240	76.21	PK	H	31.58	5.82	0.00	113.61	107.61	N/A	N/A
5240	63.45	AV	H	31.58	5.82	0.00	100.85	94.85	N/A	N/A
5240	74.01	PK	V	31.58	5.82	0.00	111.41	105.41	N/A	N/A
5240	61.25	AV	V	31.58	5.82	0.00	98.65	92.65	N/A	N/A
5350	28.76	PK	H	31.80	6.11	0.00	66.67	60.67	74.00	13.33
5350	16.46	AV	V	31.80	6.11	0.00	54.37	48.37	54.00	5.63
10480	42.99	PK	H	37.00	8.51	26.01	62.49	56.49	74.00	17.51
10480	32.74	AV	H	37.00	8.51	26.01	52.24	46.24	54.00	7.76
15720	30.78	PK	H	37.10	14.42	24.92	57.38	51.38	74.00	22.62
15720	19.17	AV	H	37.10	14.42	24.92	45.77	39.77	54.00	14.23
14196	30.88	PK	H	40.77	12.02	25.91	57.76	51.76	74.00	22.24
14196	19.19	AV	H	40.77	12.02	25.91	46.07	40.07	54.00	13.93
13719	31.08	PK	H	39.74	11.12	25.73	56.21	50.21	74.00	23.79
13719	19.22	AV	H	39.74	11.12	25.73	44.35	38.35	54.00	15.65

*Within measurement uncertainty!

802.11n ht40 Mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)							
Low Channel:5190 MHz										
5190	73.98	PK	H	31.48	5.91	0.00	111.37	105.37	N/A	N/A
5190	64.85	AV	H	31.48	5.91	0.00	102.24	96.24	N/A	N/A
5190	71.82	PK	V	31.48	5.91	0.00	109.21	103.21	N/A	N/A
5190	62.42	AV	V	31.48	5.91	0.00	99.81	93.81	N/A	N/A
5150	31.47	PK	H	31.40	6.03	0.00	68.90	62.90	74.00	11.10
5150	19.96	AV	H	31.40	6.03	0.00	57.39	51.39	54.00	2.61*
10380	39.68	PK	H	36.98	8.59	25.51	59.74	53.74	74.00	20.26
10380	30.14	AV	H	36.98	8.59	25.51	50.20	44.20	54.00	9.80
15570	31.78	PK	H	37.37	14.66	24.83	58.98	52.98	74.00	21.02
15570	19.27	AV	H	37.37	14.66	24.83	46.47	40.47	54.00	13.53
13926	30.47	PK	H	40.15	11.47	25.76	56.33	50.33	74.00	23.67
13926	19.14	AV	H	40.15	11.47	25.76	45.00	39.00	54.00	15.00
13231	32.02	PK	H	38.82	10.01	25.18	55.67	49.67	74.00	24.33
13231	19.74	AV	H	38.82	10.01	25.18	43.39	37.39	54.00	16.61
High Channel:5230 MHz										
5230	72.72	PK	H	31.56	5.84	0.00	110.12	104.12	N/A	N/A
5230	63.07	AV	H	31.56	5.84	0.00	100.47	94.47	N/A	N/A
5230	70.97	PK	V	31.56	5.84	0.00	108.37	102.37	N/A	N/A
5230	61.51	AV	V	31.56	5.84	0.00	98.91	92.91	N/A	N/A
5350	27.34	PK	H	31.80	6.11	0.00	65.25	59.25	74.00	14.75
5350	15.18	AV	H	31.80	6.11	0.00	53.09	47.09	54.00	6.91
10460	38.02	PK	H	36.99	8.52	25.88	57.65	51.65	74.00	22.35
10460	28.78	AV	H	36.99	8.52	25.88	48.41	42.41	54.00	11.59
15690	31.05	PK	H	37.16	14.47	24.87	57.81	51.81	74.00	22.19
15690	19.22	AV	H	37.16	14.47	24.87	45.98	39.98	54.00	14.02
14972	31.01	PK	H	39.99	12.21	25.89	57.32	51.32	74.00	22.68
14972	18.94	AV	H	39.99	12.21	25.89	45.25	39.25	54.00	14.75
14278	32.21	PK	H	40.97	12.19	25.85	59.52	53.52	74.00	20.48
14278	19.42	AV	H	40.97	12.19	25.85	46.73	40.73	54.00	13.27

*Within measurement uncertainty!

802.11n Vht80 Mode:

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Extrapolation result	Limit	Margin
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dB)
Channel:5210 MHz										
5210	69.21	PK	H	31.52	5.87	0.00	106.60	100.60	N/A	N/A
5210	56.33	AV	H	31.52	5.87	0.00	93.72	87.72	N/A	N/A
5210	63.24	PK	V	31.52	5.87	0.00	100.63	94.63	N/A	N/A
5210	52.27	AV	V	31.52	5.87	0.00	89.66	83.66	N/A	N/A
5150	30.96	PK	H	31.40	6.03	0.00	68.39	62.39	74.00	11.61
5150	18.02	AV	H	31.40	6.03	0.00	55.45	49.45	54.00	4.55
5350	29.62	PK	H	31.80	6.11	0.00	67.53	61.53	74.00	12.47
5350	17.52	AV	H	31.80	6.11	0.00	55.43	49.43	54.00	4.57
10420	36.44	PK	H	36.98	8.55	25.63	56.34	50.34	74.00	23.66
10420	28.19	AV	H	36.98	8.55	25.63	48.09	42.09	54.00	11.91
15630	31.65	PK	H	37.27	14.56	24.75	58.73	52.73	74.00	21.27
15630	19.02	AV	H	37.27	14.56	24.75	46.10	40.10	54.00	13.90
6120	31.92	PK	V	32.22	6.39	26.89	43.64	37.64	74.00	36.36
6120	19.11	AV	V	32.22	6.39	26.89	30.83	24.83	54.00	29.17

5725MHz-5850MHz:

802.11a Mode:

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5745 MHz										
5745	79.21	PK	H	32.15	6.10	0.00	117.46	111.46	N/A	N/A
5745	70.62	AV	H	32.15	6.10	0.00	108.87	102.87	N/A	N/A
5745	74.97	PK	V	32.15	6.10	0.00	113.22	107.22	N/A	N/A
5745	65.77	AV	V	32.15	6.10	0.00	104.02	98.02	N/A	N/A
5725	27.02	PK	H	32.02	5.93	0.00	64.97	58.97	74.00	15.03
5725	15.00	AV	H	32.02	5.93	0.00	52.95	46.95	54.00	7.05
11490	42.14	PK	H	37.89	9.86	26.14	63.75	57.75	74.00	16.25
11490	31.99	AV	H	37.89	9.86	26.14	53.60	47.60	54.00	6.40
17235	30.89	PK	H	40.91	14.02	25.63	60.19	54.19	74.00	19.81
17235	19.43	AV	H	40.91	14.02	25.63	48.73	42.73	54.00	11.27
7435	30.10	PK	H	34.64	7.57	25.96	46.35	40.35	74.00	33.65
7435	18.87	AV	H	34.64	7.57	25.96	35.12	29.12	54.00	24.88
6775	30.08	PK	H	33.02	7.12	26.66	43.56	37.56	74.00	36.44
6775	18.50	AV	H	33.02	7.12	26.66	31.98	25.98	54.00	28.02
Middle Channel:5785 MHz										
5785	78.01	PK	H	32.16	6.12	0.00	116.29	110.29	N/A	N/A
5785	69.84	AV	H	32.16	6.12	0.00	108.12	102.12	N/A	N/A
5785	74.12	PK	V	32.16	6.12	0.00	112.40	106.40	N/A	N/A
5785	64.87	AV	V	32.16	6.12	0.00	103.15	97.15	N/A	N/A
11570	41.87	PK	H	37.90	9.76	26.07	63.46	57.46	74.00	16.54
11570	31.24	AV	H	37.90	9.76	26.07	52.83	46.83	54.00	7.17
17355	30.94	PK	H	41.63	13.37	25.63	60.31	54.31	74.00	19.69
17355	19.45	AV	H	41.63	13.37	25.63	48.82	42.82	54.00	11.18
15988	31.70	PK	H	36.62	13.99	24.64	57.67	51.67	74.00	22.33
15988	19.58	AV	H	36.62	13.99	24.64	45.55	39.55	54.00	14.45
13707	31.50	PK	H	39.71	11.10	25.74	56.57	50.57	74.00	23.43
13707	19.59	AV	H	39.71	11.10	25.74	44.66	38.66	54.00	15.34
High Channel:5825 MHz										
5825	78.65	PK	H	32.17	6.24	0.00	117.06	111.06	N/A	N/A
5825	68.95	AV	H	32.17	6.24	0.00	107.36	101.36	N/A	N/A
5825	75.13	PK	V	32.17	6.24	0.00	113.54	107.54	N/A	N/A
5825	66.37	AV	V	32.17	6.24	0.00	104.78	98.78	N/A	N/A
5850	28.7	PK	H	32.17	6.34	0.00	67.21	61.21	74.00	12.79
5850	16.17	AV	H	32.17	6.34	0.00	54.68	48.68	54.00	5.32
11650	41.96	PK	H	37.90	9.63	25.75	63.74	57.74	74.00	16.26
11650	30.65	AV	H	37.90	9.63	25.75	52.43	46.43	54.00	7.57
17475	30.84	PK	H	42.35	12.73	25.39	60.53	54.53	74.00	19.47
17475	19.68	AV	H	42.35	12.73	25.39	49.37	43.37	54.00	10.63
13731	32.12	PK	H	39.76	11.14	25.72	57.30	51.30	74.00	22.70
13731	20.11	AV	H	39.76	11.14	25.72	45.29	39.29	54.00	14.71
13195	31.59	PK	H	38.75	9.91	25.09	55.16	49.16	74.00	24.84
13195	20.08	AV	H	38.75	9.91	25.09	43.65	37.65	54.00	16.35

802.11n ht20 Mode:

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5745 MHz										
5745	77.98	PK	H	32.15	6.10	0.00	116.23	110.23	N/A	N/A
5745	67.24	AV	H	32.15	6.10	0.00	105.49	99.49	N/A	N/A
5745	72.42	PK	V	32.15	6.10	0.00	110.67	104.67	N/A	N/A
5745	64.03	AV	V	32.15	6.10	0.00	102.28	96.28	N/A	N/A
5725	34.69	PK	H	32.15	6.04	0.00	72.88	66.88	74.00	7.12
5725	19.45	AV	H	32.15	6.04	0.00	57.64	51.64	54.00	2.36*
11490	44.69	PK	H	37.89	9.86	26.14	66.30	60.30	74.00	13.70
11490	34.62	AV	H	37.89	9.86	26.14	56.23	50.23	54.00	3.77*
17235	30.12	PK	H	40.91	14.02	25.63	59.42	53.42	74.00	20.58
17235	19.56	AV	H	40.91	14.02	25.63	48.86	42.86	54.00	11.14
7513	31.96	PK	H	34.81	7.61	26.17	48.21	42.21	74.00	31.79
7513	20.59	AV	H	34.81	7.61	26.17	36.84	30.84	54.00	23.16
2786	31.58	PK	H	26.64	5.26	27.55	35.93	29.93	74.00	44.07
2786	20.44	AV	H	26.64	5.26	27.55	24.79	18.79	54.00	35.21
Middle Channel:5785 MHz										
5785	76.03	PK	H	32.16	6.12	0.00	114.31	108.31	N/A	N/A
5785	65.85	AV	H	32.16	6.12	0.00	104.13	98.13	N/A	N/A
5785	71.74	PK	V	32.16	6.12	0.00	110.02	104.02	N/A	N/A
5785	62.60	AV	V	32.16	6.12	0.00	100.88	94.88	N/A	N/A
11570	43.95	PK	H	37.90	9.76	26.07	65.54	59.54	74.00	14.46
11570	32.92	AV	H	37.90	9.76	26.07	54.51	48.51	54.00	5.49
17355	31.12	PK	H	41.63	13.37	25.63	60.49	54.49	74.00	19.51
17355	19.21	AV	H	41.63	13.37	25.63	48.58	42.58	54.00	11.42
7430	32.03	PK	H	34.63	7.57	25.94	48.29	42.29	74.00	31.71
7430	20.15	AV	H	34.63	7.57	25.94	36.41	30.41	54.00	23.59
15685	31.65	PK	H	37.17	14.47	24.86	58.43	52.43	74.00	21.57
15685	20.12	AV	H	37.17	14.47	24.86	46.90	40.90	54.00	13.10
High Channel:5825 MHz										
5825	76.12	PK	H	32.17	6.24	0.00	114.53	108.53	N/A	N/A
5825	67.39	AV	H	32.17	6.24	0.00	105.80	99.80	N/A	N/A
5825	72.33	PK	V	32.17	6.24	0.00	110.74	104.74	N/A	N/A
5825	60.88	AV	V	32.17	6.24	0.00	99.29	93.29	N/A	N/A
5850	27.66	PK	V	32.17	6.34	0.00	66.17	60.17	74.00	13.83
5850	15.98	AV	V	32.17	6.34	0.00	54.49	48.49	54.00	5.51
11650	43.57	PK	H	37.90	9.63	25.75	65.35	59.35	74.00	14.65
11650	33.06	AV	H	37.90	9.63	25.75	54.84	48.84	54.00	5.16*
17475	31.12	PK	H	42.35	12.73	25.39	60.81	54.81	74.00	19.19
17475	18.91	AV	H	42.35	12.73	25.39	48.60	42.60	54.00	11.40
16443	31.9	PK	H	37.31	14.36	24.12	59.45	53.45	74.00	20.55
16443	21.17	AV	H	37.31	14.36	24.12	48.72	42.72	54.00	11.28
13719	31.78	PK	H	39.74	11.12	25.73	56.91	50.91	74.00	23.09
13719	21.13	AV	H	39.74	11.12	25.73	46.26	40.26	54.00	13.74

*Within measurement uncertainty!

802.11n ht40 Mode:

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5755 MHz										
5755	73.65	PK	H	32.15	6.11	0.00	111.91	105.91	N/A	N/A
5755	63.89	AV	H	32.15	6.11	0.00	102.15	96.15	N/A	N/A
5755	67.98	PK	V	32.15	6.11	0.00	106.24	100.24	N/A	N/A
5755	59.57	AV	V	32.15	6.11	0.00	97.83	91.83	N/A	N/A
5725	33.98	PK	H	32.15	6.04	0.00	72.17	66.17	74.00	7.83
5725	19.37	AV	H	32.15	6.04	0.00	57.56	51.56	54.00	2.44*
11510	38.69	PK	H	37.90	9.86	26.12	60.33	54.33	74.00	19.67
11510	29.41	AV	H	37.90	9.86	26.12	51.05	45.05	54.00	8.95
17265	31.33	PK	H	41.09	13.86	25.63	60.65	54.65	74.00	19.35
17265	19.57	AV	H	41.09	13.86	25.63	48.89	42.89	54.00	11.11
13977	30.25	PK	H	40.25	11.56	25.81	56.25	50.25	74.00	23.75
13977	18.89	AV	H	40.25	11.56	25.81	44.89	38.89	54.00	15.11
13242	32.36	PK	H	38.84	10.04	25.21	56.03	50.03	74.00	23.97
13242	19.27	AV	H	38.84	10.04	25.21	42.94	36.94	54.00	17.06
High Channel:5795 MHz										
5795	72.59	PK	H	32.16	6.13	0.00	110.88	104.88	N/A	N/A
5795	62.59	AV	H	32.16	6.13	0.00	100.88	94.88	N/A	N/A
5795	69.35	PK	V	32.16	6.13	0.00	107.64	101.64	N/A	N/A
5795	60.82	AV	V	32.16	6.13	0.00	99.11	93.11	N/A	N/A
5850	26.98	PK	H	32.17	6.34	0.00	65.49	59.49	74.00	14.51
5850	15.49	AV	H	32.17	6.34	0.00	54.00	48.00	54.00	6.00
11590	38.24	PK	H	37.90	9.73	26.06	59.81	53.81	74.00	20.19
11590	29.03	AV	H	37.90	9.73	26.06	50.60	44.60	54.00	9.40
17385	31.54	PK	H	41.81	13.21	25.63	60.93	54.93	74.00	19.07
17385	19.48	AV	H	41.81	13.21	25.63	48.87	42.87	54.00	11.13
14936	31.42	PK	H	40.10	12.24	25.83	57.93	51.93	74.00	22.07
14936	19.66	AV	H	40.10	12.24	25.83	46.17	40.17	54.00	13.83
15210	31.64	PK	H	38.89	13.27	25.83	57.97	51.97	74.00	22.03
15210	19.71	AV	H	38.89	13.27	25.83	46.04	40.04	54.00	13.96

*Within measurement uncertainty!

802.11n Vht80 Mode:

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Extrapolation result	Limit	Margin
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dB)
Channel:5775 MHz										
5775	69.14	PK	H	32.16	6.12	0.00	107.42	101.42	N/A	N/A
5775	57.37	AV	H	32.16	6.12	0.00	95.65	89.65	N/A	N/A
5775	64.27	PK	V	32.16	6.12	0.00	102.55	96.55	N/A	N/A
5775	52.69	AV	V	32.16	6.12	0.00	90.97	84.97	N/A	N/A
5725	34.25	PK	H	32.15	6.04	0.00	72.44	66.44	74.00	7.56
5725	19.54	AV	H	32.15	6.04	0.00	57.73	51.73	54.00	2.27*
5850	29.75	PK	H	32.17	6.34	0.00	68.26	62.26	74.00	11.74
5850	17.26	AV	H	32.17	6.34	0.00	55.77	49.77	54.00	4.23*
11550	37.21	PK	H	37.90	9.80	26.09	58.82	52.82	74.00	21.18
11550	28.66	AV	H	37.90	9.80	26.09	50.27	44.27	54.00	9.73
17325	32.15	PK	H	41.45	13.54	25.63	61.51	55.51	74.00	18.49
17325	20.12	AV	H	41.45	13.54	25.63	49.48	43.48	54.00	10.52
6120	29.96	PK	V	32.22	6.39	26.89	41.68	35.68	74.00	38.32
6120	18.12	AV	V	32.22	6.39	26.89	29.84	23.84	54.00	30.16

*Within measurement uncertainty!

Conducted Spurious Emission at Antenna Port

5150MHz-5250MHz:

Mode	Channel	Frequency	Conducted Spurious Emissions (dBm)					Result
		MHz	Chain 0	Chain 1	Chain 2	Total	Limits	
802.11a	Low	5180	-32.54	-32.65	-33.90	-28.22	-27	PASS
	Middle	5200	-32.30	-33.60	-33.38	-28.28	-27	PASS
	High	5240	-33.20	-32.69	-33.80	-28.44	-27	PASS
802.11n20	Low	5180	-33.07	-34.17	-33.13	-28.66	-27	PASS
	Middle	5200	-32.52	-33.14	-33.81	-28.35	-27	PASS
	High	5240	-33.35	-33.03	-33.06	-28.37	-27	PASS
802.11n40	Low	5190	-33.28	-34.05	-33.29	-28.75	-27	PASS
	High	5230	-34.22	-33.43	-33.98	-29.09	-27	PASS
802.11ac80	Low	5210	-33.63	-33.64	-33.58	-28.85	-27	PASS

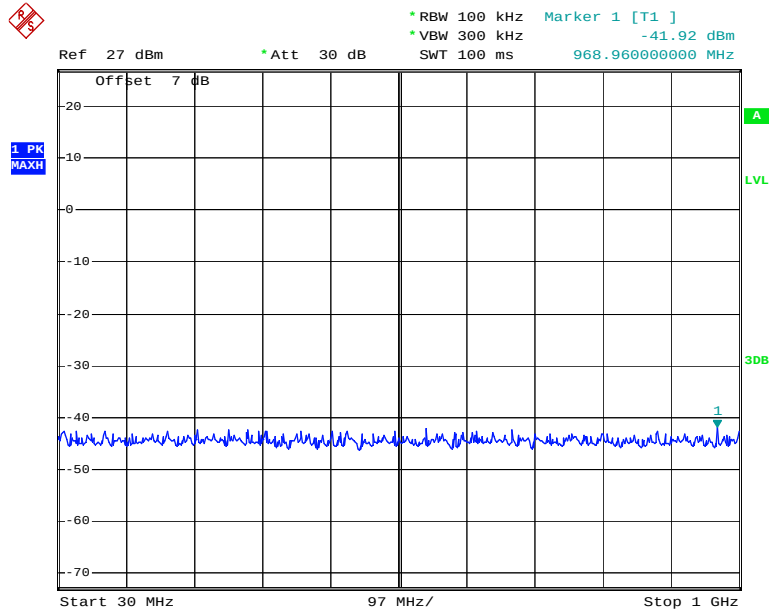
5725MHz-5850MHz:

Mode	Channel	Frequency	Conducted Spurious Emissions (dBm)					Result
		MHz	Chain 0	Chain 1	Chain 2	Total	Limits	
802.11a	Low	5745	-33.40	-32.90	-33.55	-28.50	-27	PASS
	Middle	5785	-33.32	-33.93	-33.35	-28.75	-27	PASS
	High	5825	-33.08	-32.97	-33.13	-28.29	-27	PASS
802.11n20	Low	5745	-34.04	-34.07	-33.13	-28.95	-27	PASS
	Middle	5785	-33.79	-32.41	-33.81	-28.51	-27	PASS
	High	5825	-34.08	-33.30	-33.06	-28.69	-27	PASS
802.11n40	Low	5755	-34.07	-34.04	-32.96	-28.89	-27	PASS
	High	5785	-33.99	-33.54	-33.18	-28.79	-27	PASS
802.11ac80	Low	5775	-32.12	-33.38	-33.88	-28.29	-27	PASS

Note: Offset= Antenna Gain(dBi)+Cable loss(dB)

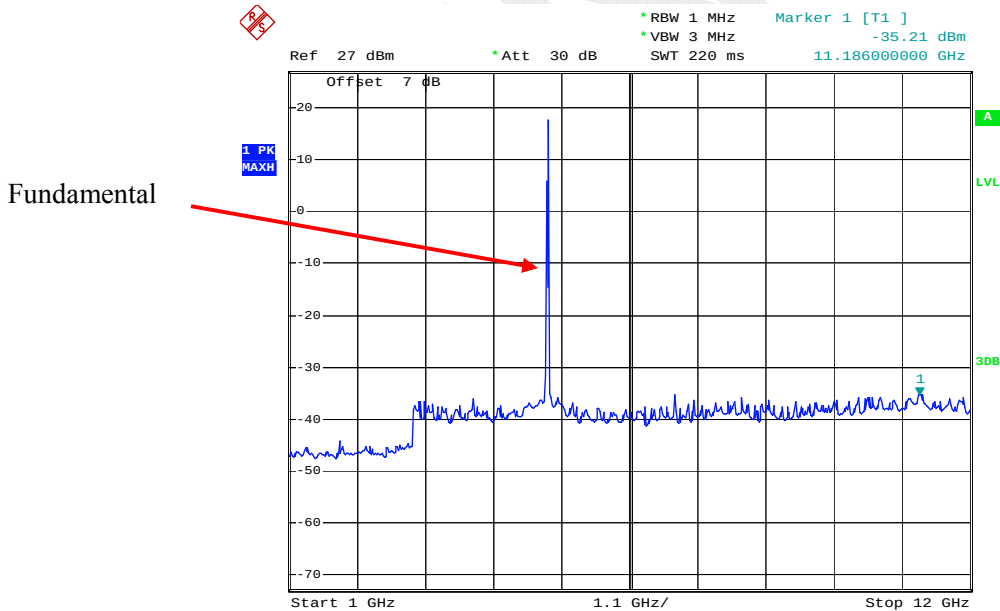
5150MHz-5250MHz:

Antenna0 802.11a Low Channel 30MHz-1GHz



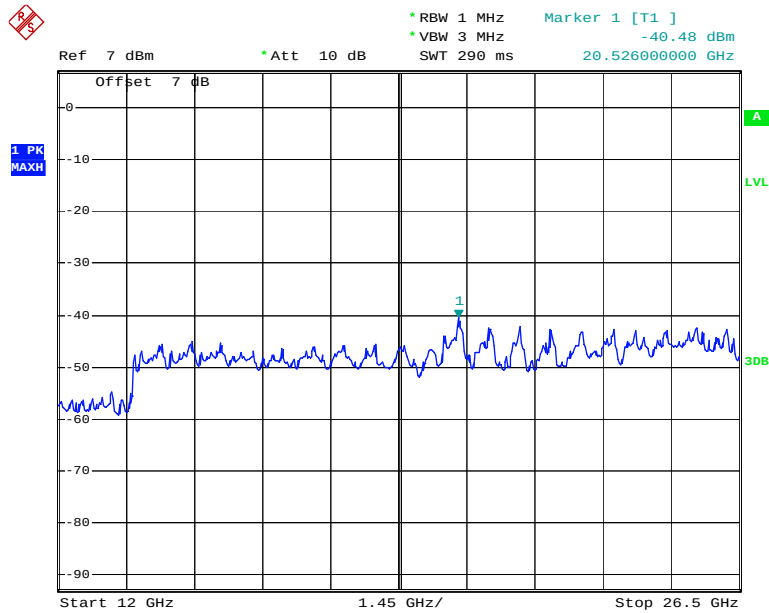
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Antenna0 802.11a Low Channel 1GHz-12GHz



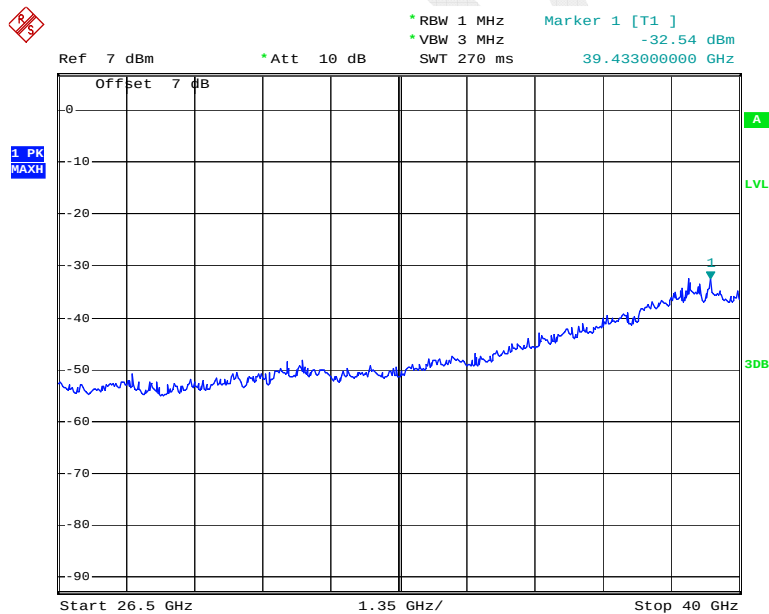
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Antenna0 802.11a Low Channel 12GHz-26.5GHz



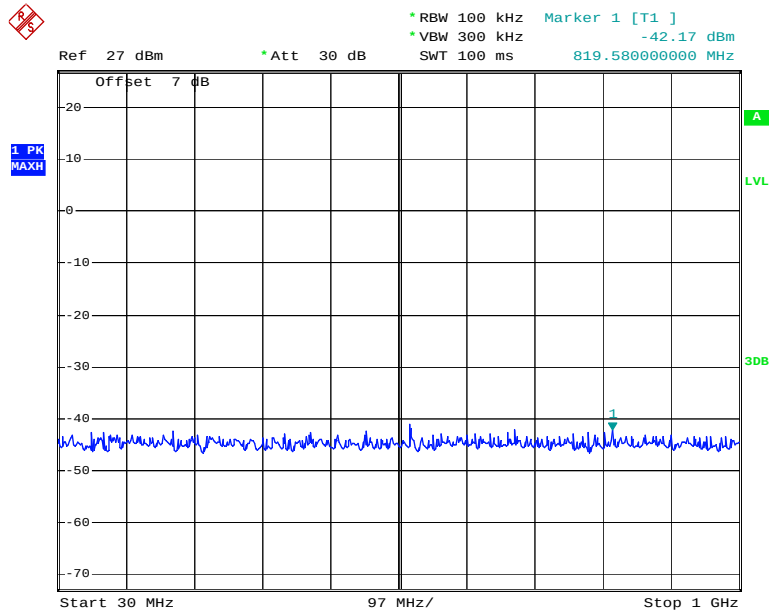
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Antenna0 802.11a Low Channel 26.5GHz-40GHz



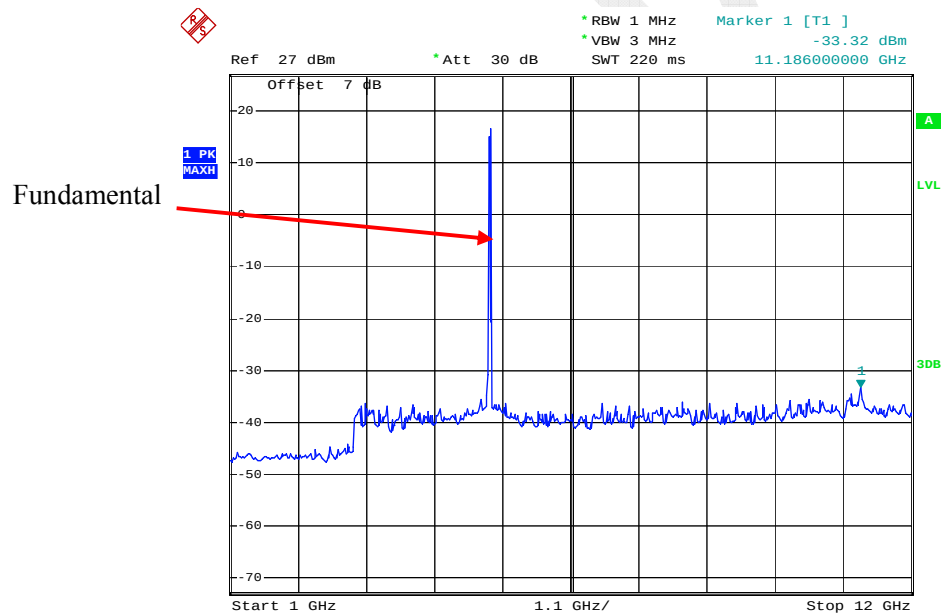
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Antenna0 802.11a Middle Channel 30MHz-1GHz



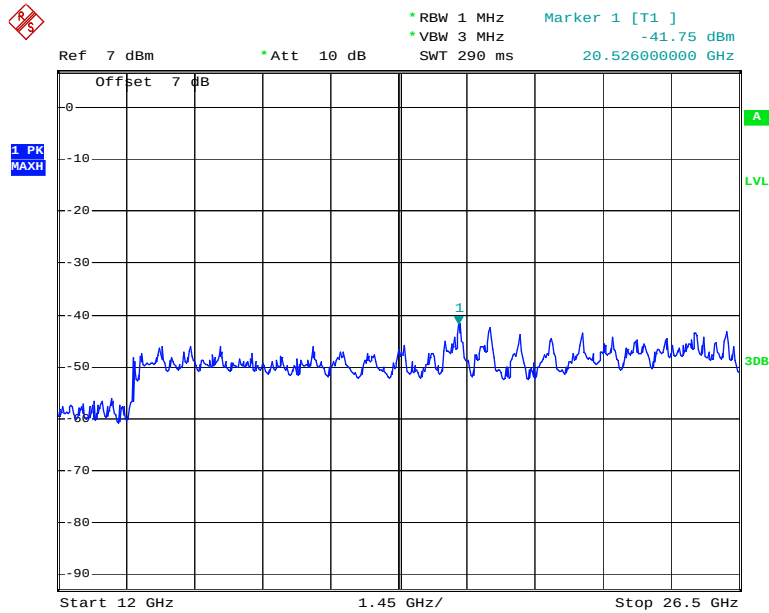
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Antenna0 802.11a Middle Channel 1GHz-12GHz



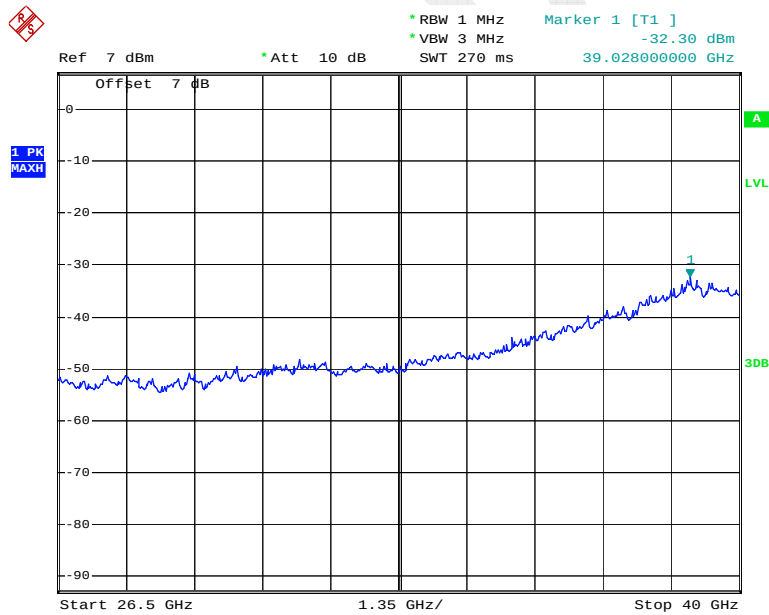
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Antenna0 802.11a Middle Channel 12GHz -26.5GHz



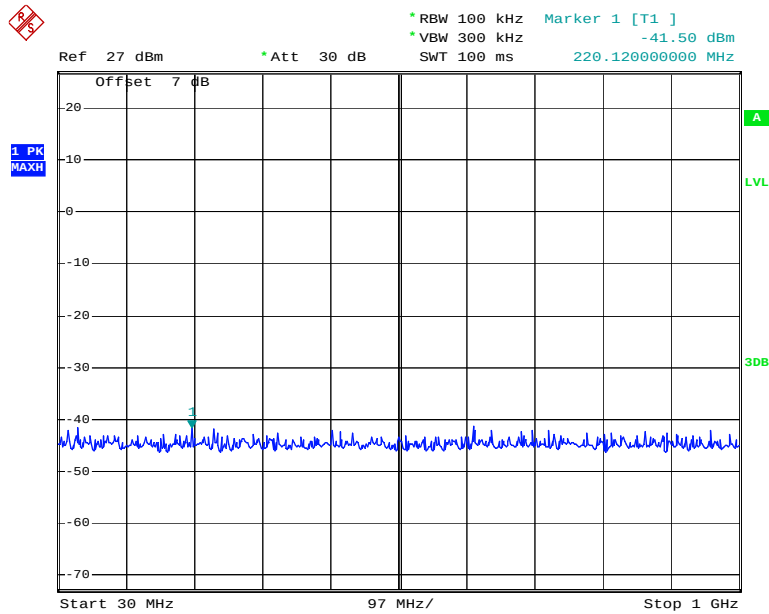
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Antenna0 802.11a Middle Channel 26.5GHz-40GHz



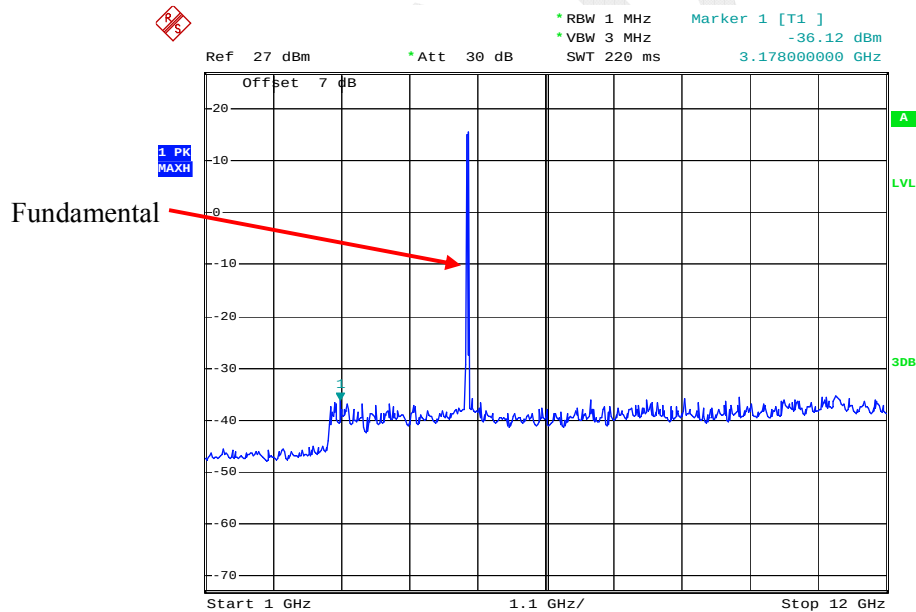
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Antenna0 802.11a High Channel 30MHz-1GHz



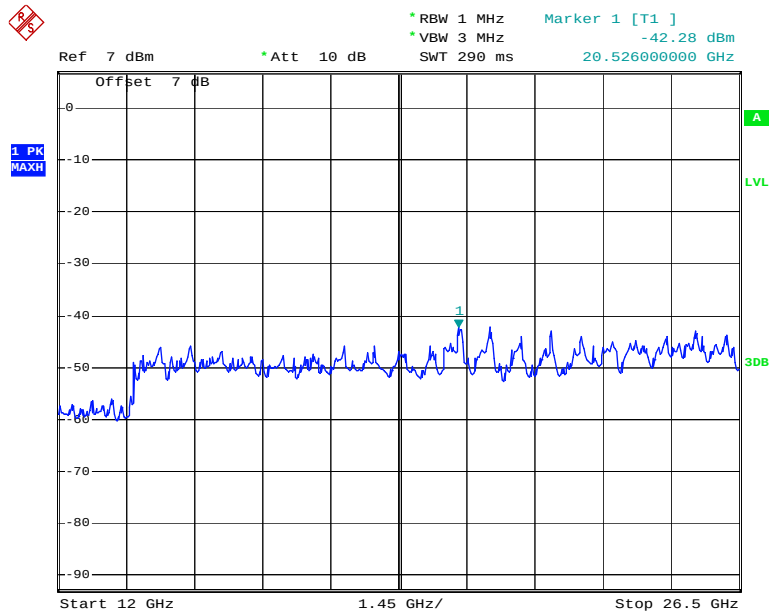
Date: 18.NOV.2014 13:17:39

Antenna0 802.11a High Channel 1GHz-12GHz



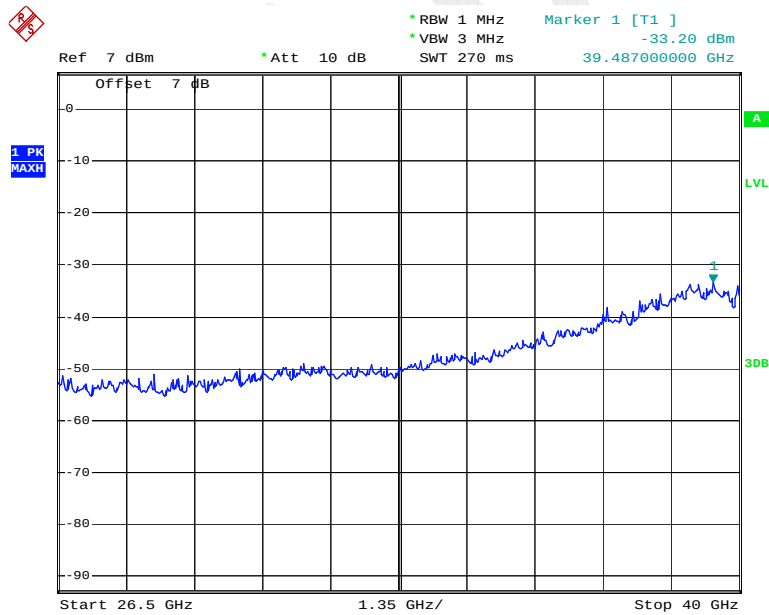
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Antenna0 802.11a High Channel 12GHz-26.5GHz



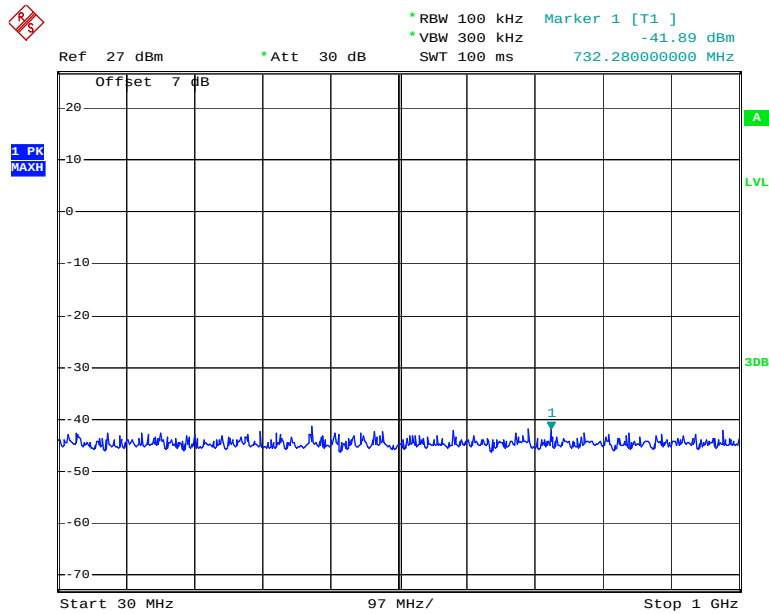
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Antenna0 802.11a High Channel 26.5GHz-40GHz



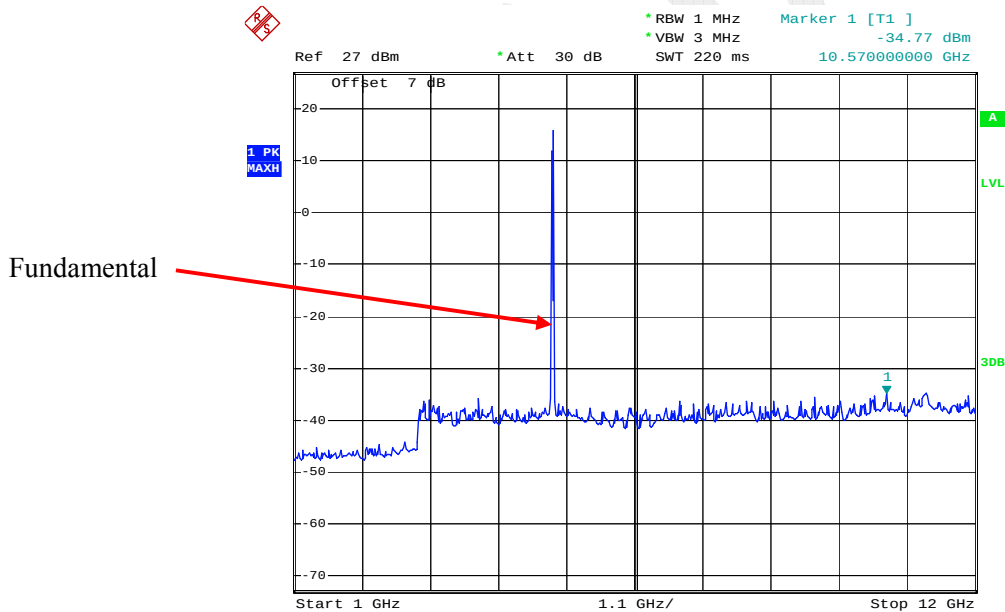
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Antenna0 802.11n ht20 Low Channel 30 MHz-1GHz



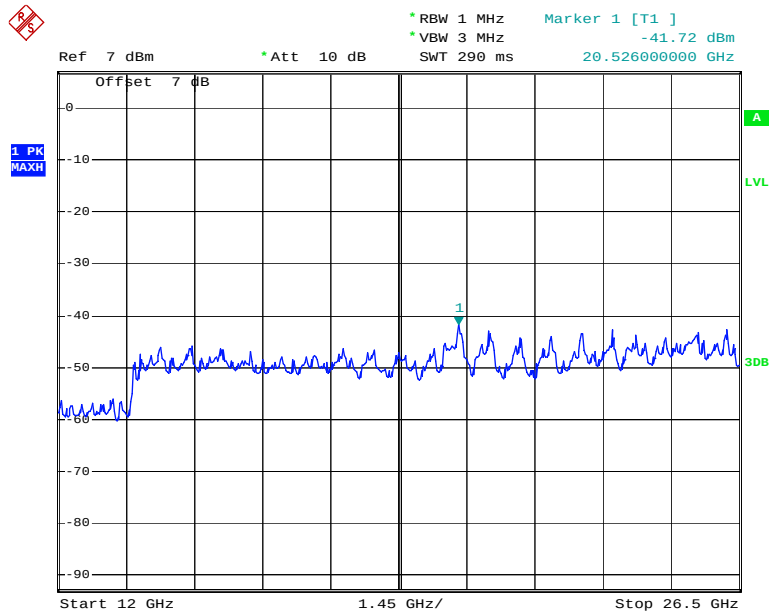
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Antenna0 802.11n ht20 Low Channel 1GHz-12GHz



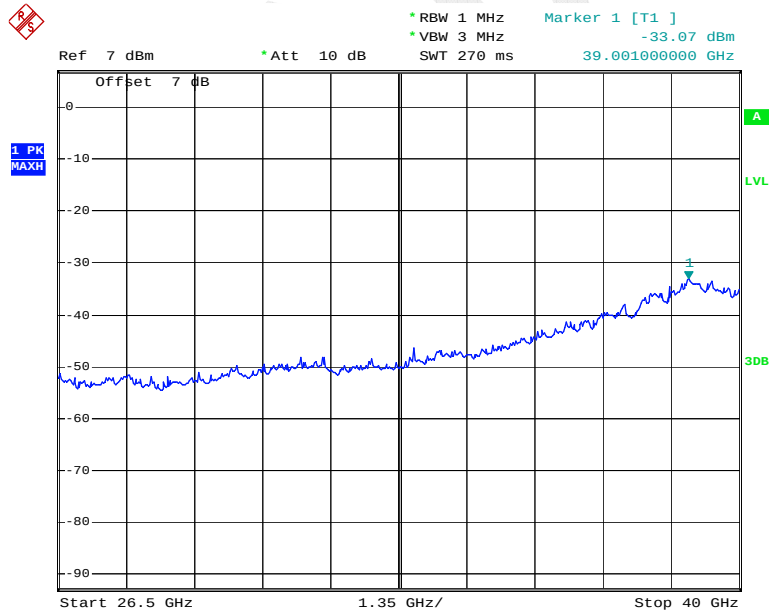
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Antenna0 802.11n ht20 Low Channel 12GHz-26.5GHz



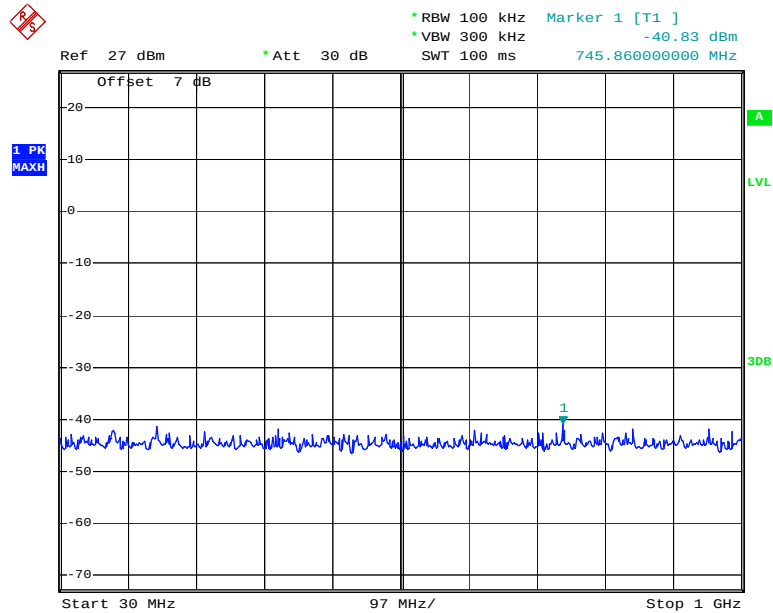
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Antenna0 802.11n ht20 Low Channel 26.5 GHz-40GHz



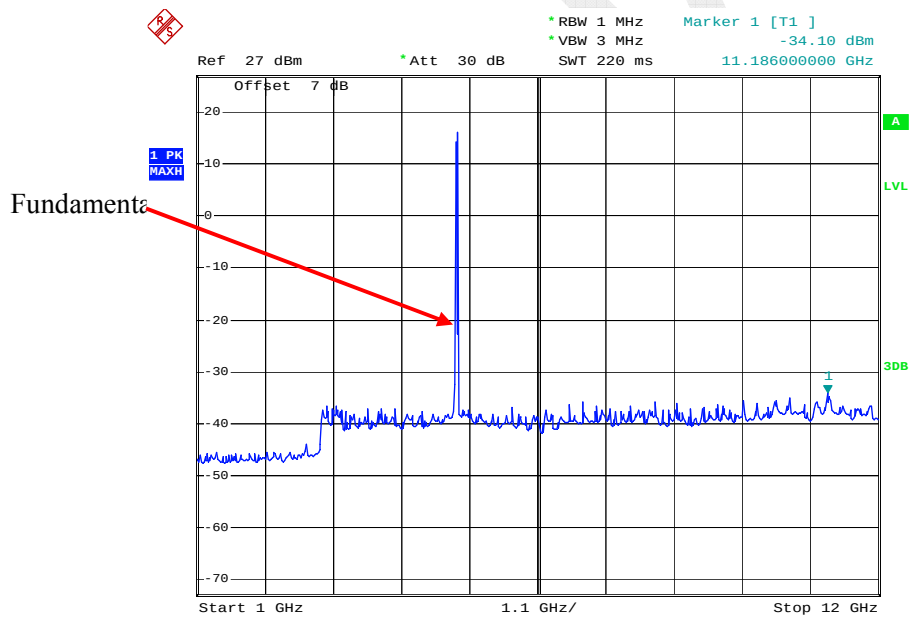
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Antenna0 802.11n ht20 Middle Channel 30 MHz-1GHz



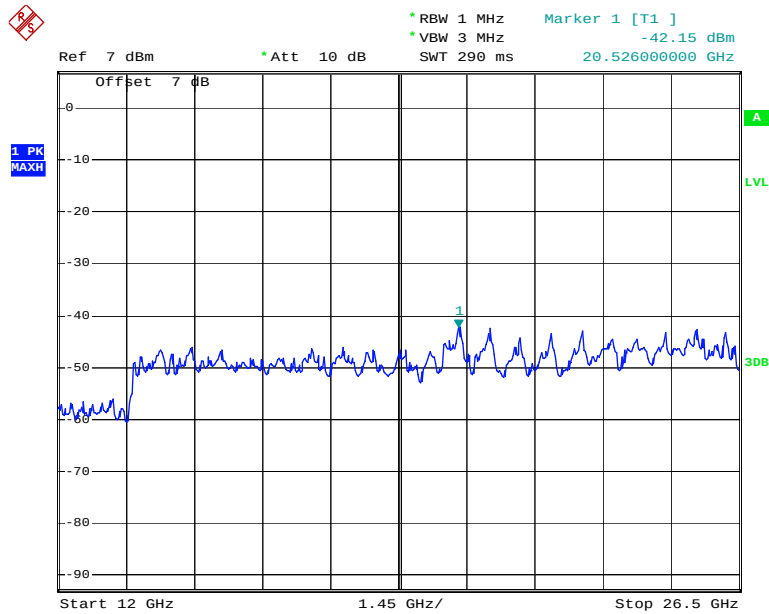
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Antenna0 802.11n ht20 Middle Channel 1GHz-12GHz



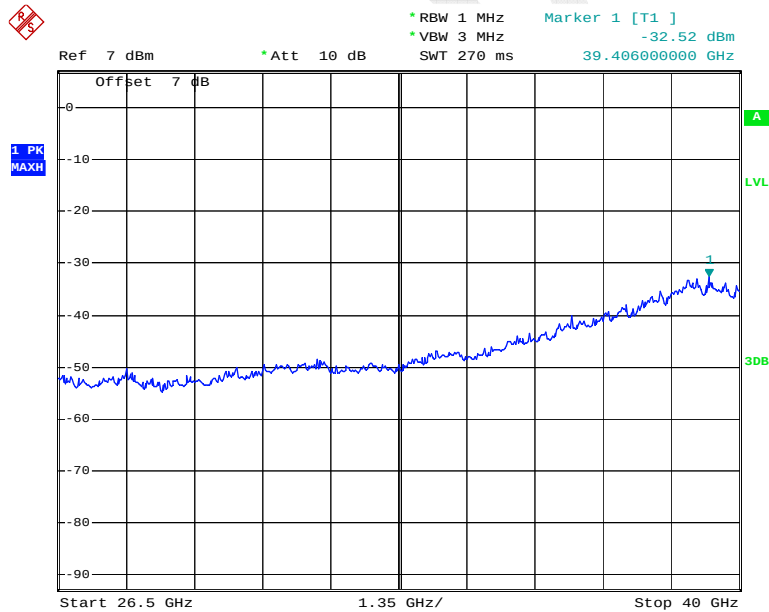
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Antenna0 802.11n ht20 Middle Channel 12 GHz-26.5GHz



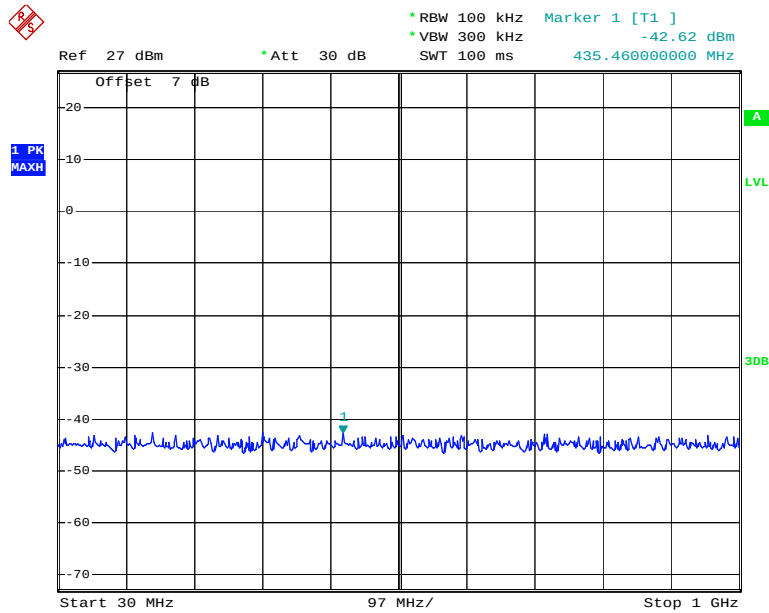
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Antenna0 802.11n ht20 Middle Channel 26.5GHz -40GHz



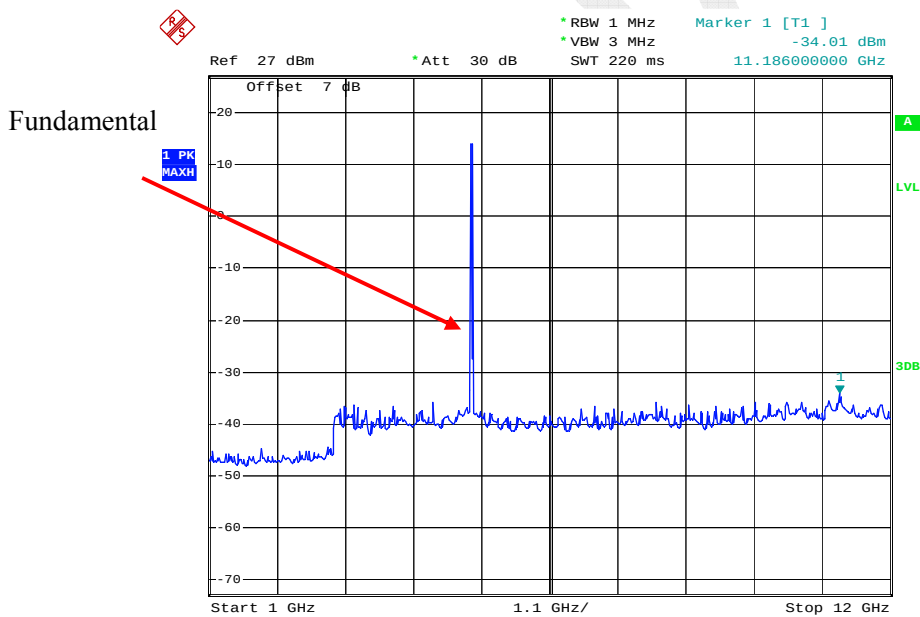
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Antenna0 802.11n ht20 High Channel 30MHz-1GHz



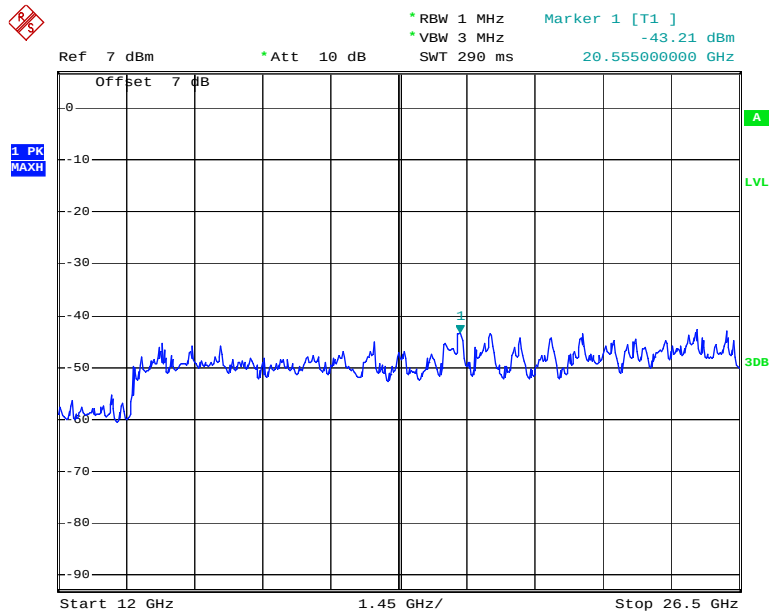
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Antenna0 802.11n ht20 High Channel 1GHz-12GHz



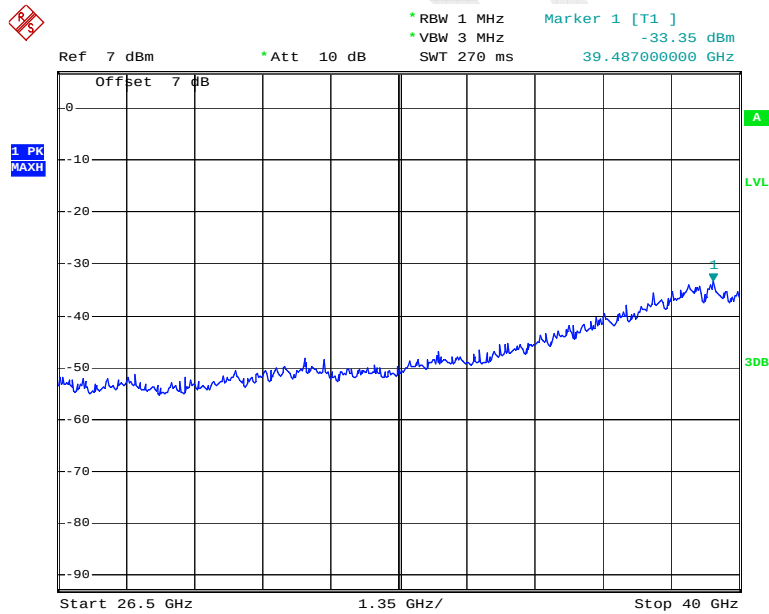
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Antenna0 802.11n ht20 High Channel 12GHz-26.5GHz



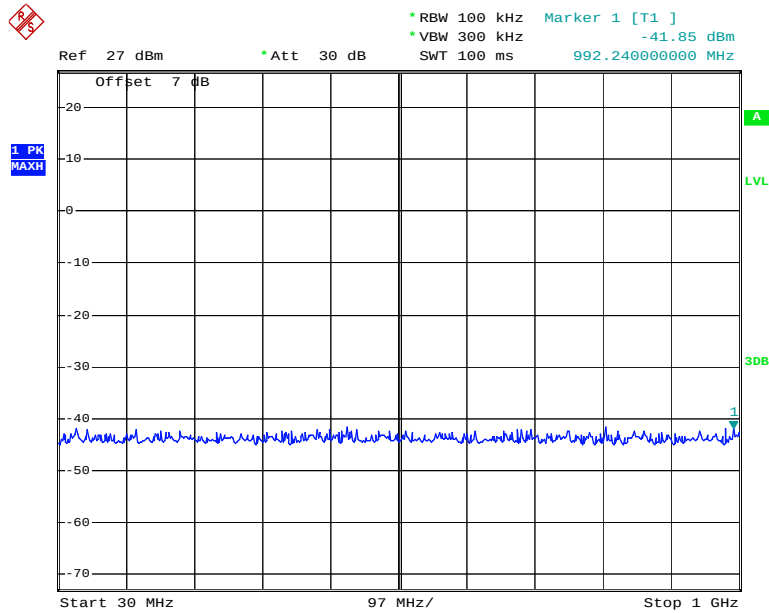
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Antenna0 802.11n ht20 High Channel 26.5GHz-40GHz



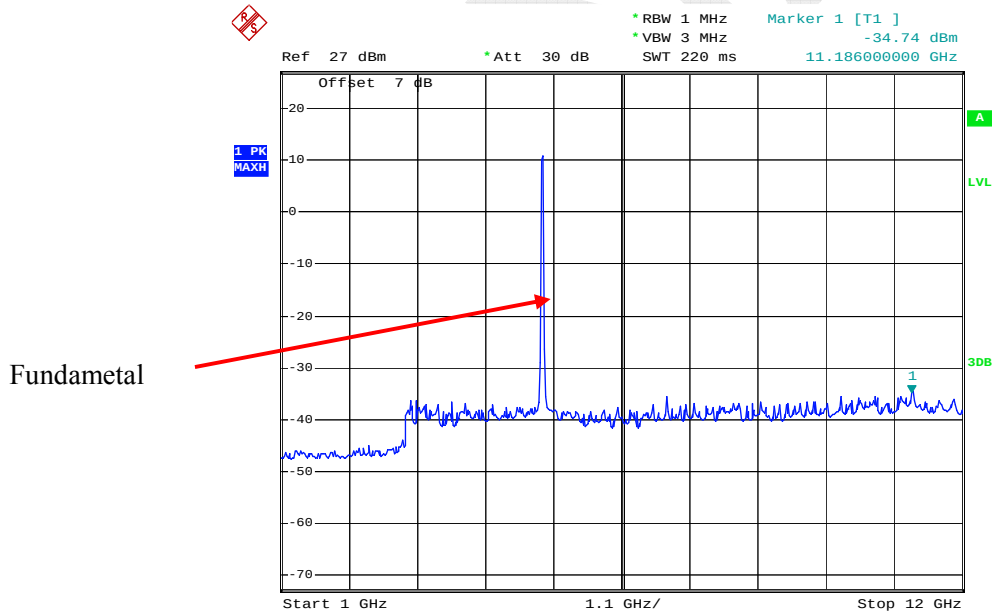
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Antenna0 802.11n ht40 Low Channel 30MHz-1GHz



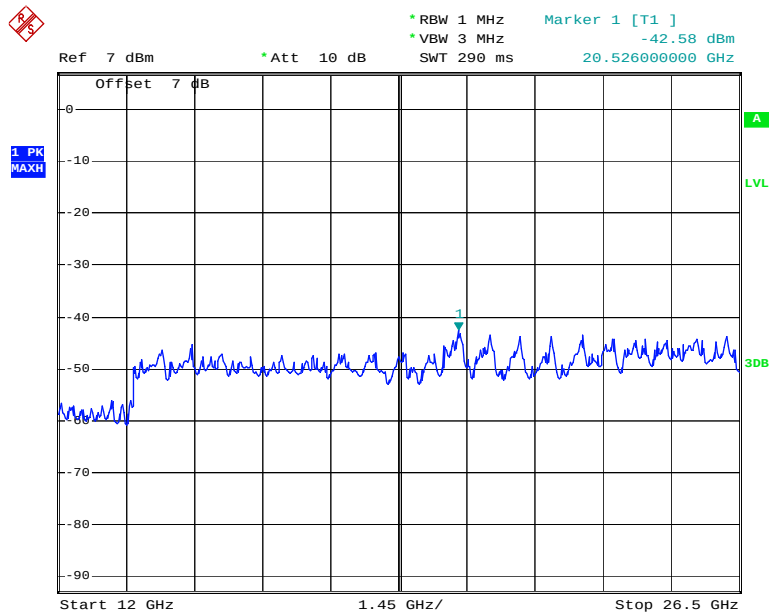
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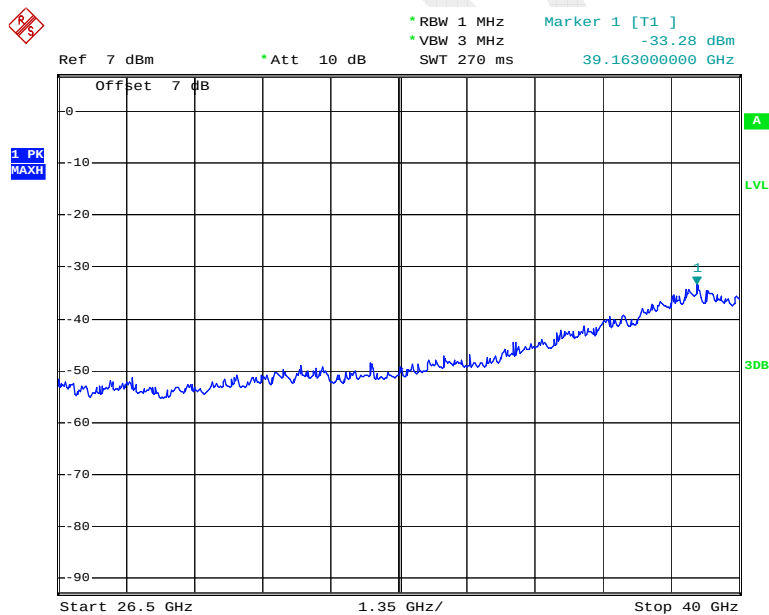
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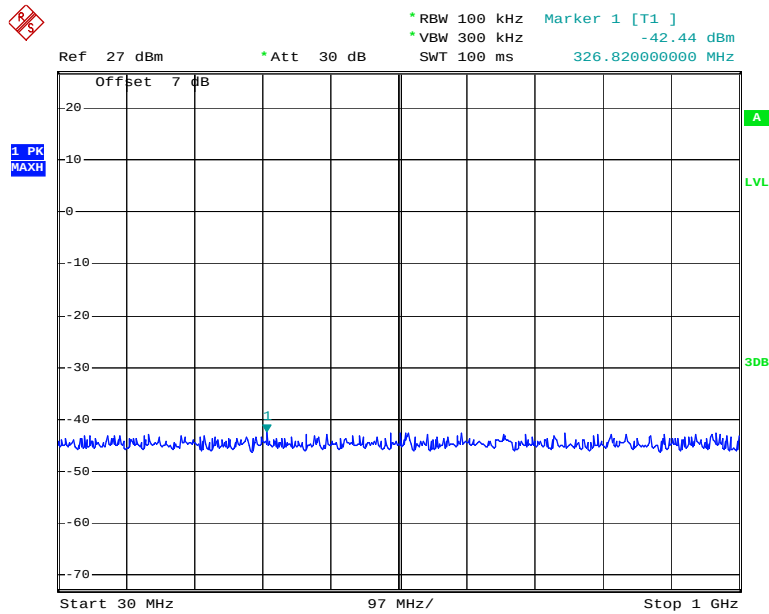
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Antenna0 802.11n ht40 Low Channel 26.5MHz-40GHz



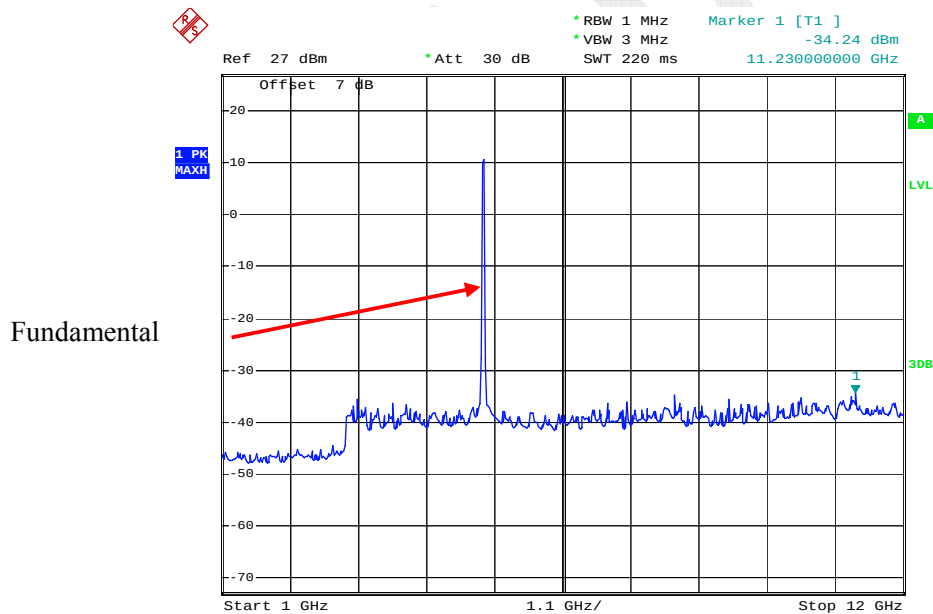
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Antenna0 802.11n ht40 High Channel 30 MHz-1GHz



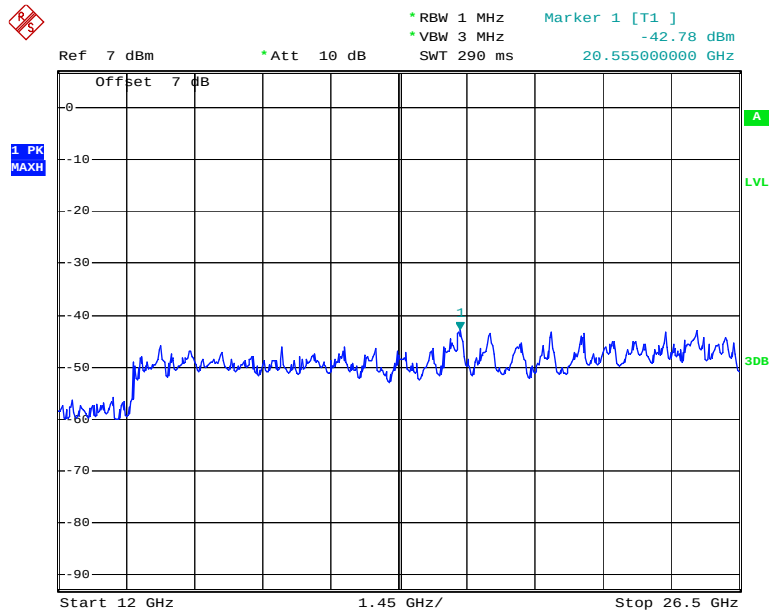
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Antenna0 802.11n ht40 High Channel 1GHz-12GHz



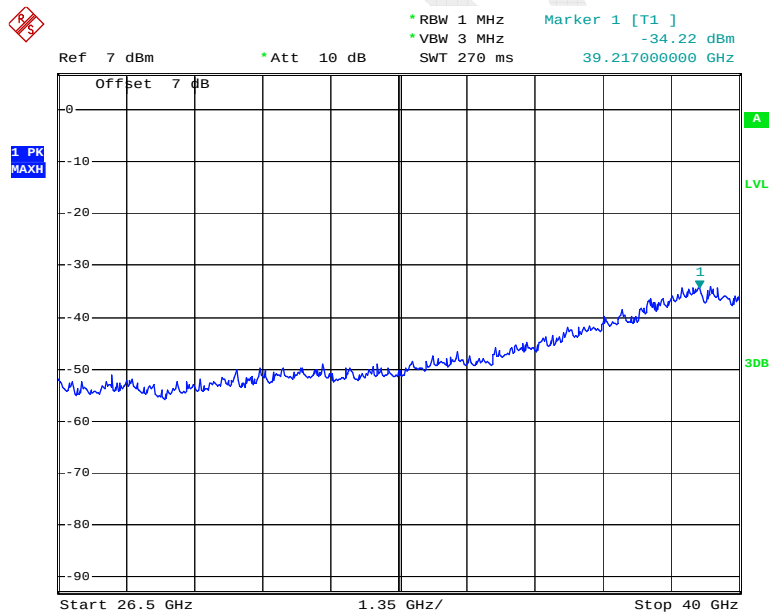
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Antenna0 802.11n ht40 High Channel 12 GHz-26.5GHz



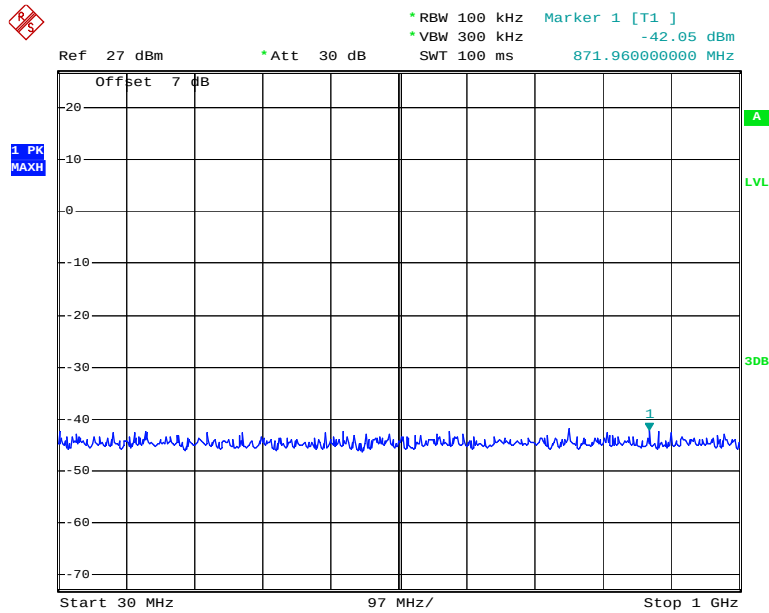
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Antenna0 802.11n ht40 High Channel 26.5GHz-40GHz



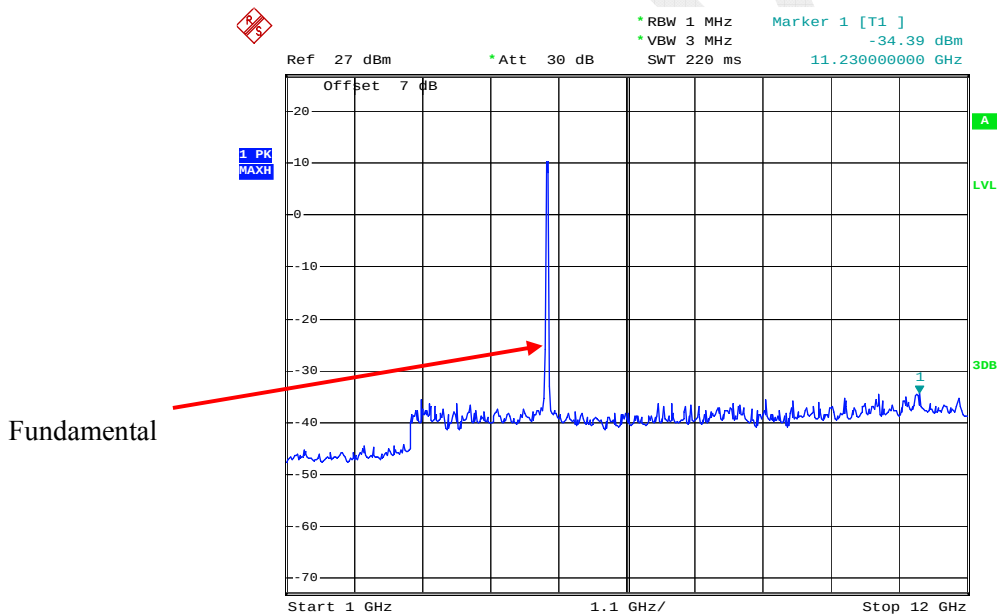
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Antenna0 802.11n ac80 30 MHz-1GHz



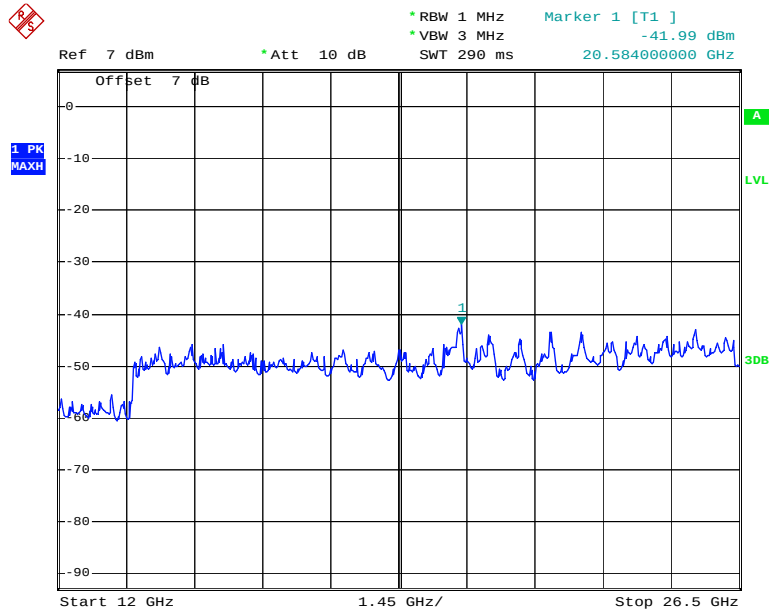
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Antenna0 802.11n ac80 1 GHz-12GHz



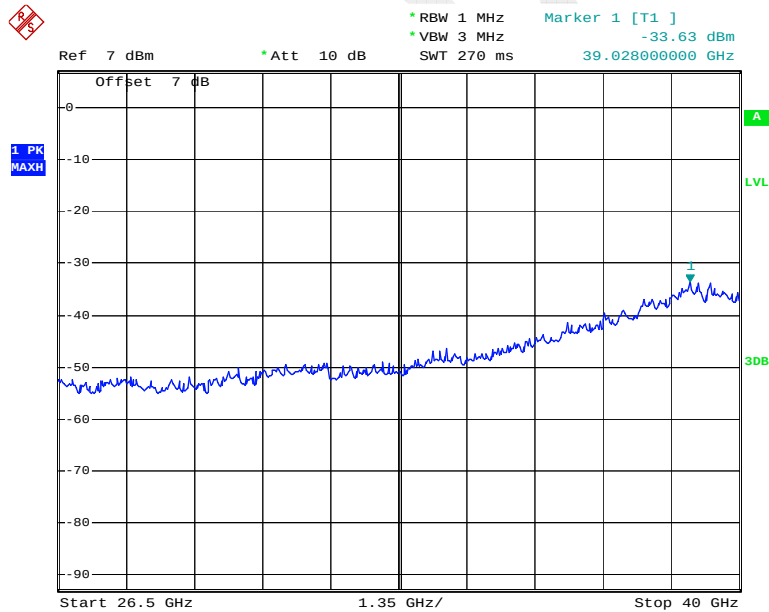
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Antenna0 802.11n ac80 12 GHz-26.5GHz



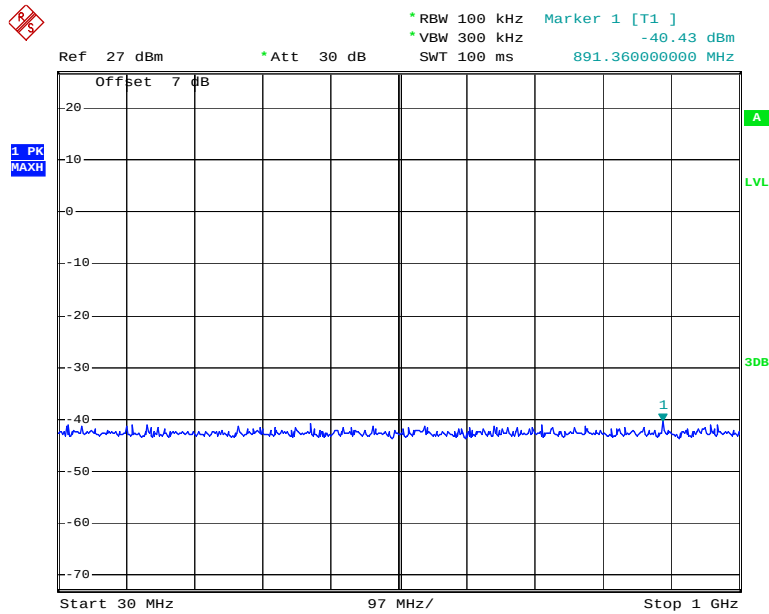
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Antenna0 802.11n ac80 26.5GHz-40GHz



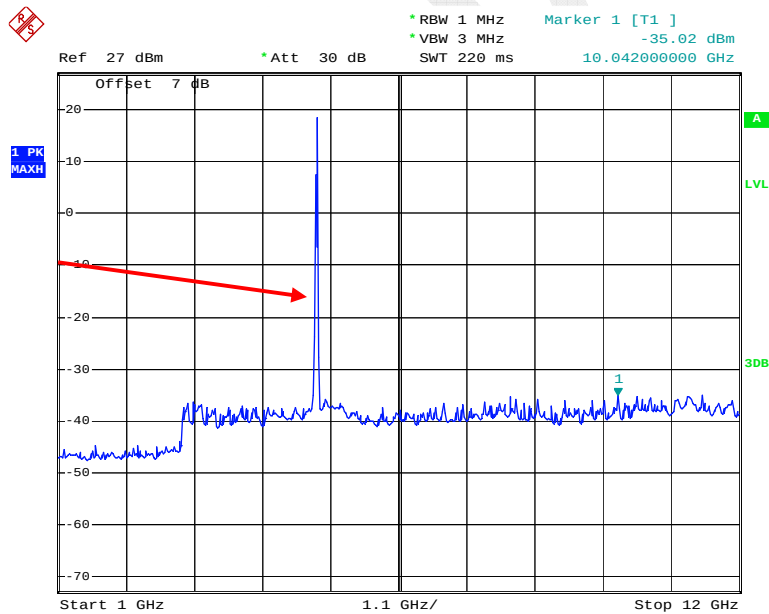
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Antenna1 802.11a Low Channel 30MHz-1GHz



Date: 17.NOV.2014 21:27:20

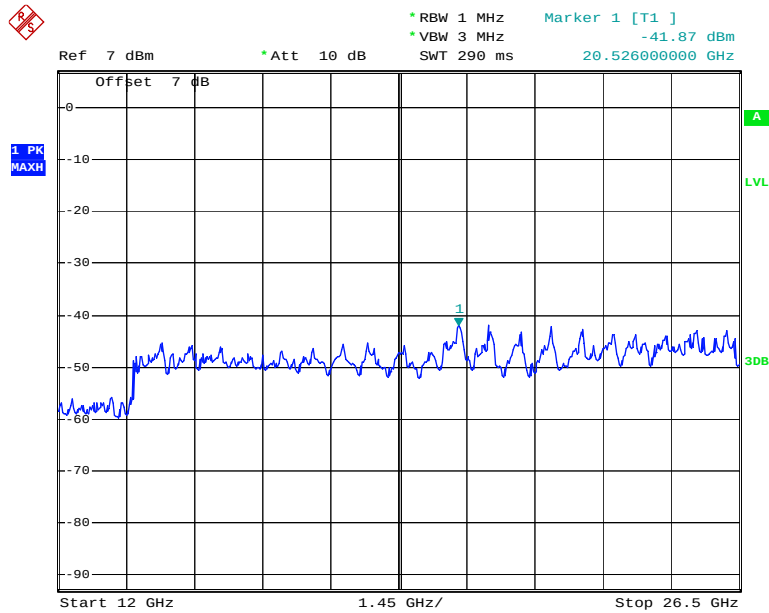
Antenna1 802.11a Low Channel 1GHz-12GHz



Fundamental

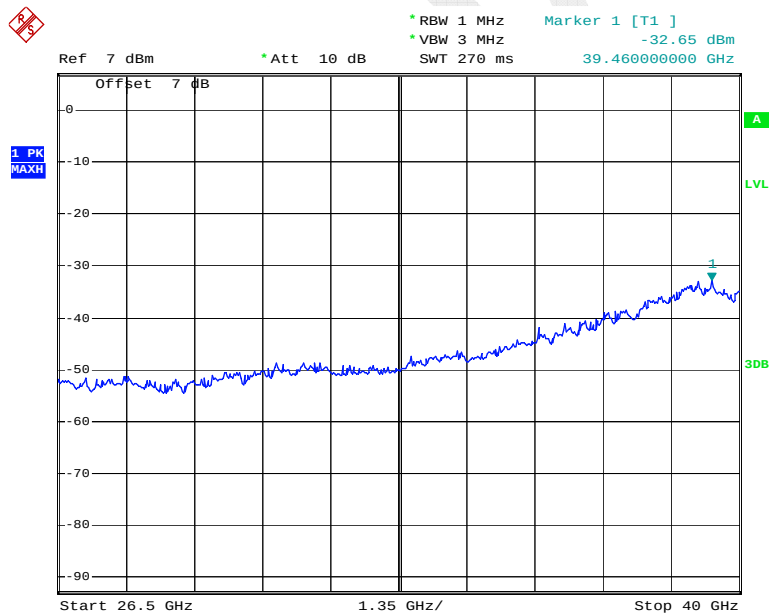
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Antenna1 802.11a Low Channel 12GHz-26.5GHz



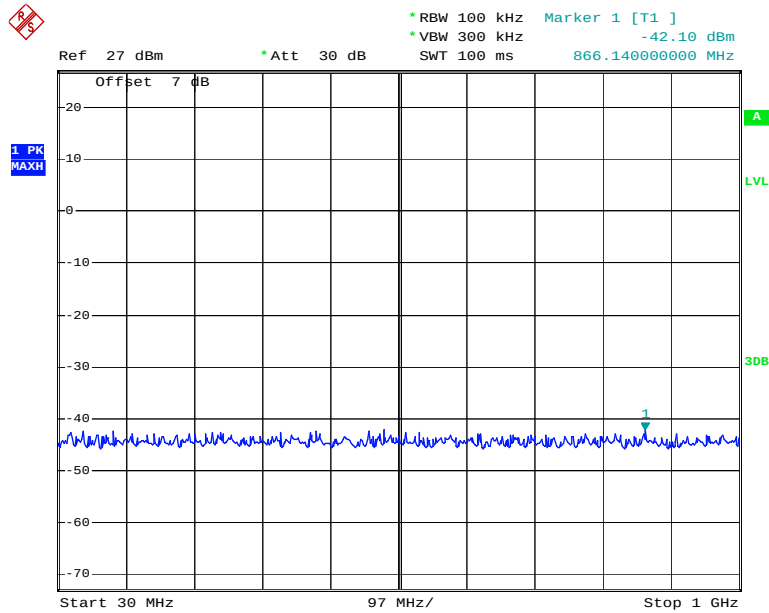
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Antenna1 802.11a Low Channel 26.5GHz-40GHz



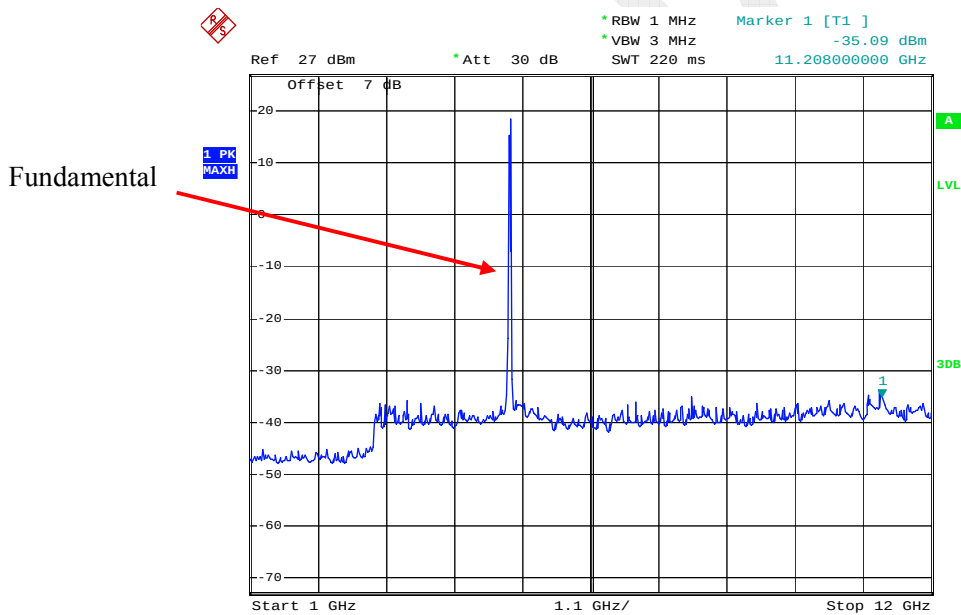
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Antenna1 802.11a Middle Channel 30MHz-1GHz



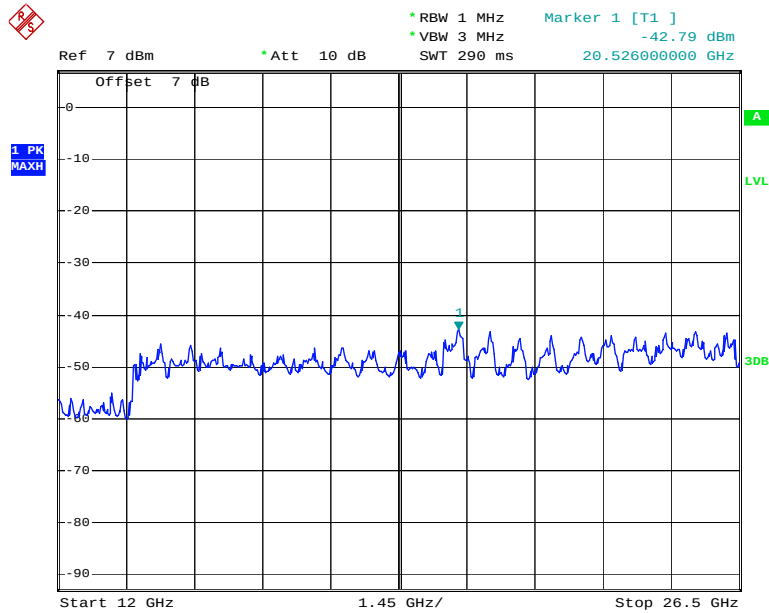
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Antenna1 802.11a Middle Channel 1GHz-12GHz



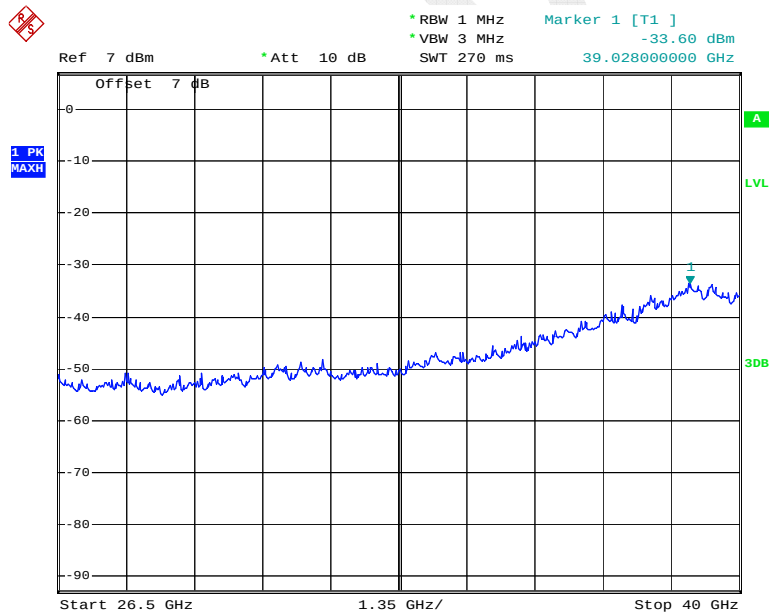
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Antenna1 802.11a Middle Channel 12GHz -26.5GHz



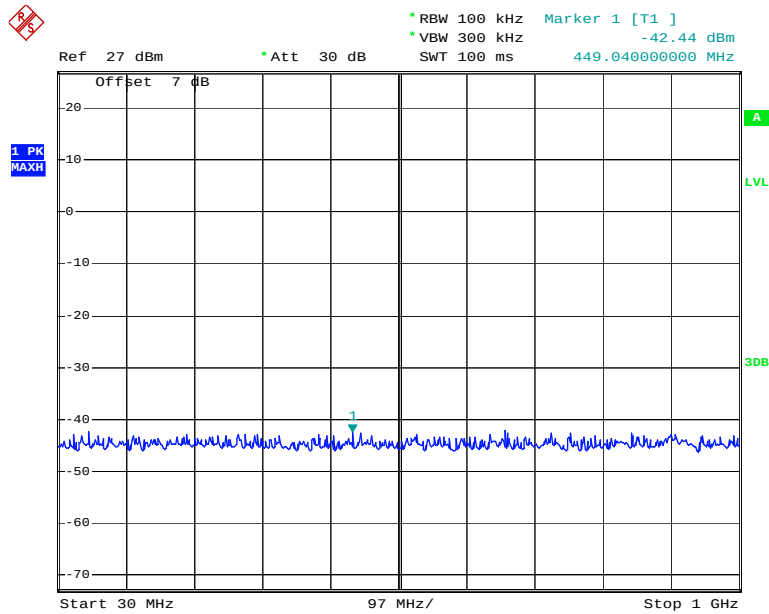
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Antenna1 802.11a Middle Channel 26.5GHz-40GHz



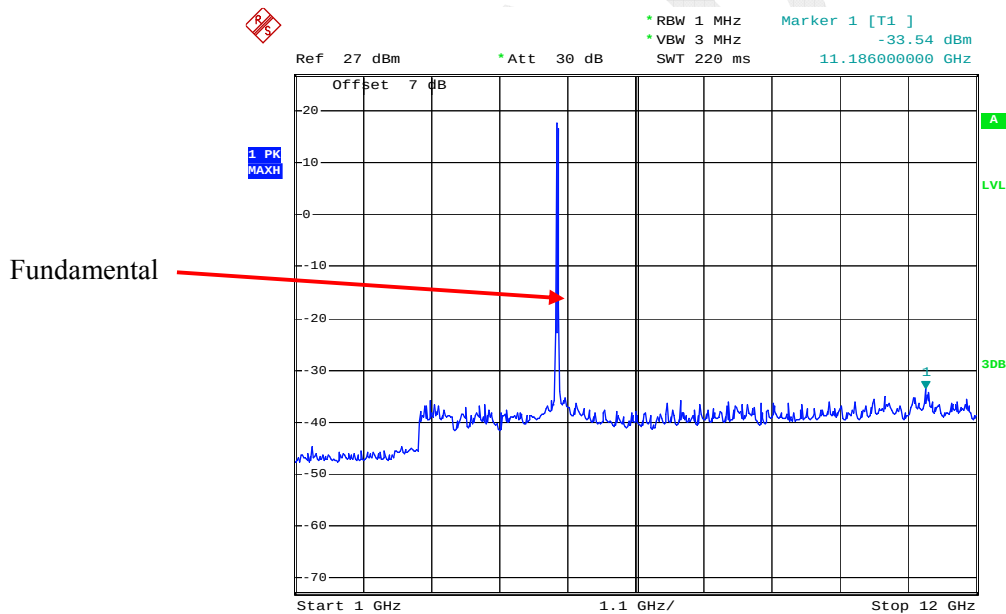
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Antenna1 802.11a High Channel 30MHz-1GHz



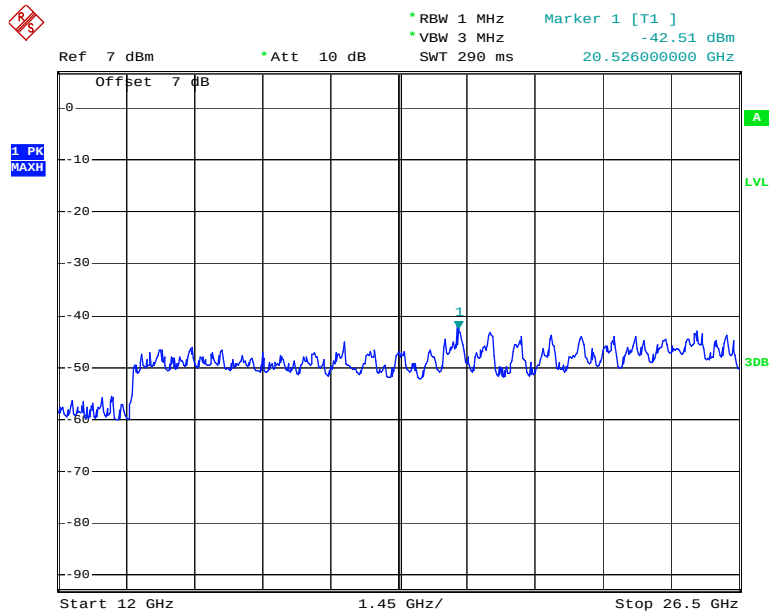
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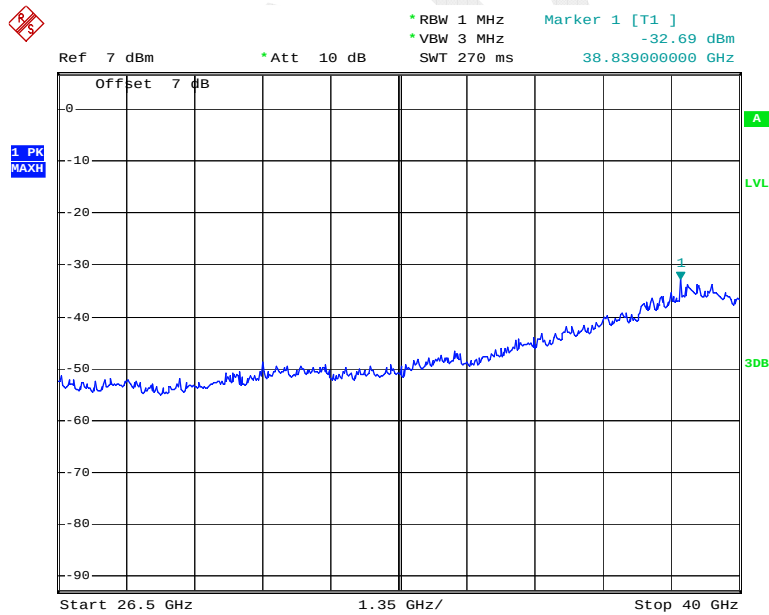
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Antenna1 802.11a High Channel 12GHz-26.5GHz



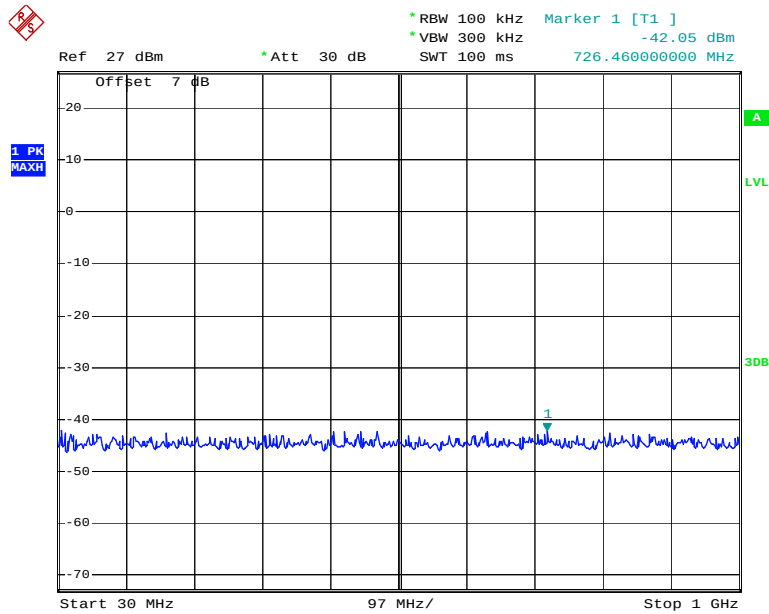
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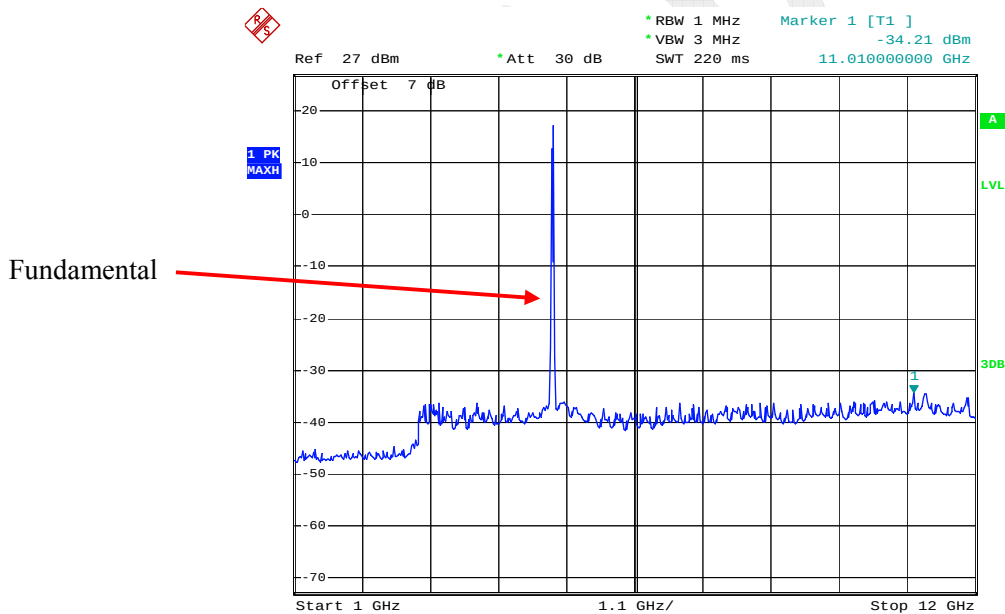
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Antenna1 802.11n ht20 Low Channel 30 MHz-1GHz



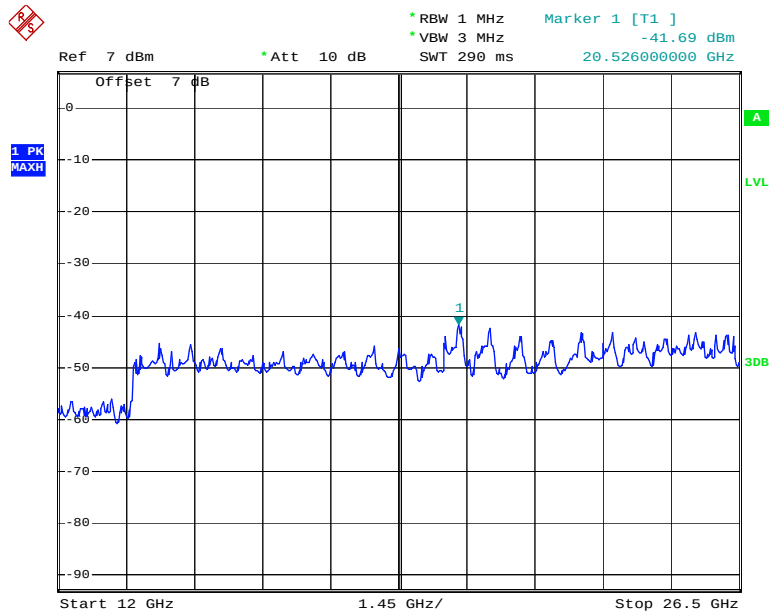
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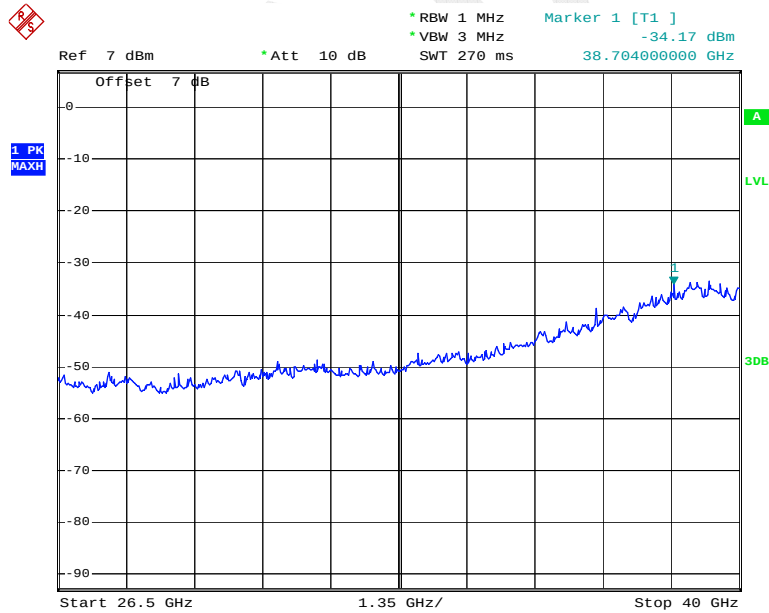
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Antenna1 802.11n ht20 Low Channel 12GHz-26.5GHz



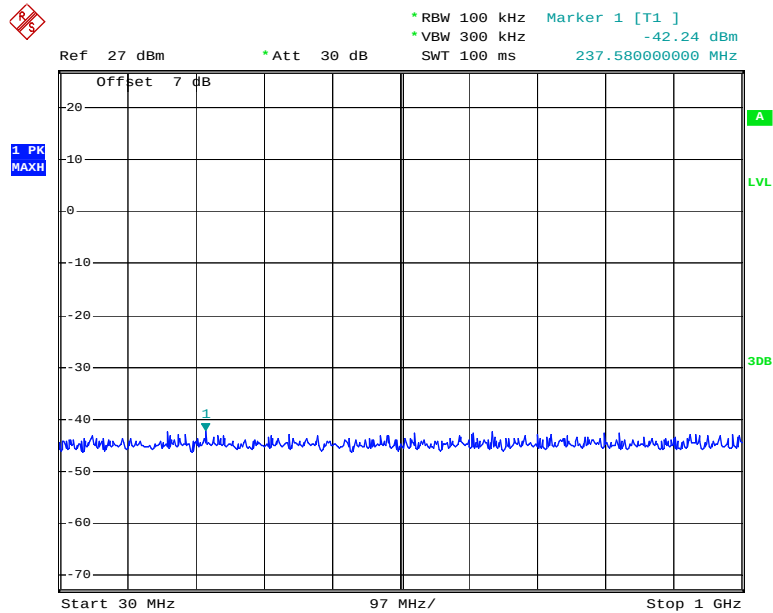
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Antenna1 802.11n ht20 Low Channel 26.5 GHz-40GHz



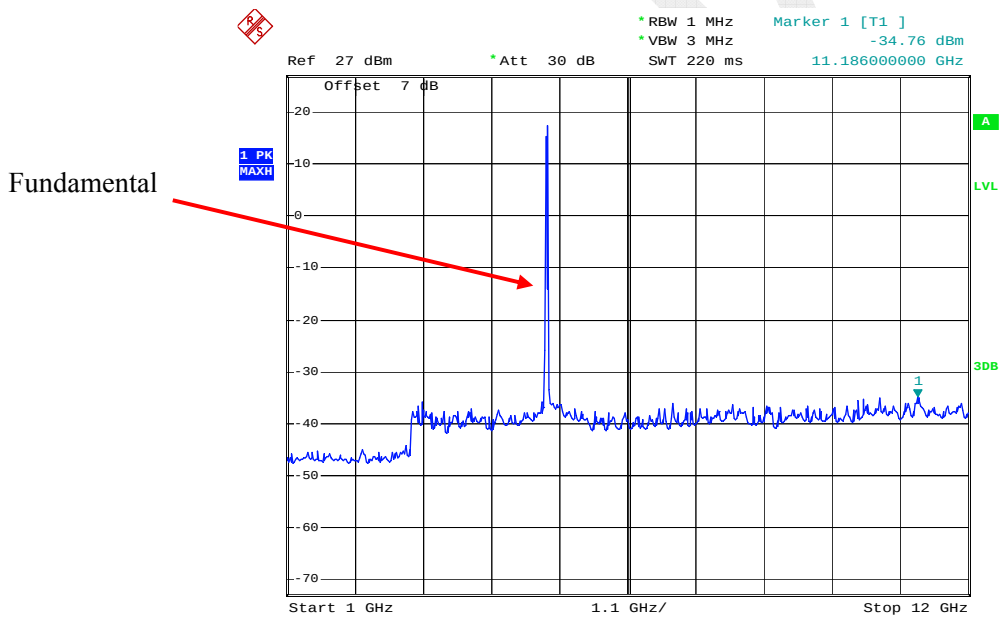
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Antenna1 802.11n ht20 Middle Channel 30 MHz-1GHz



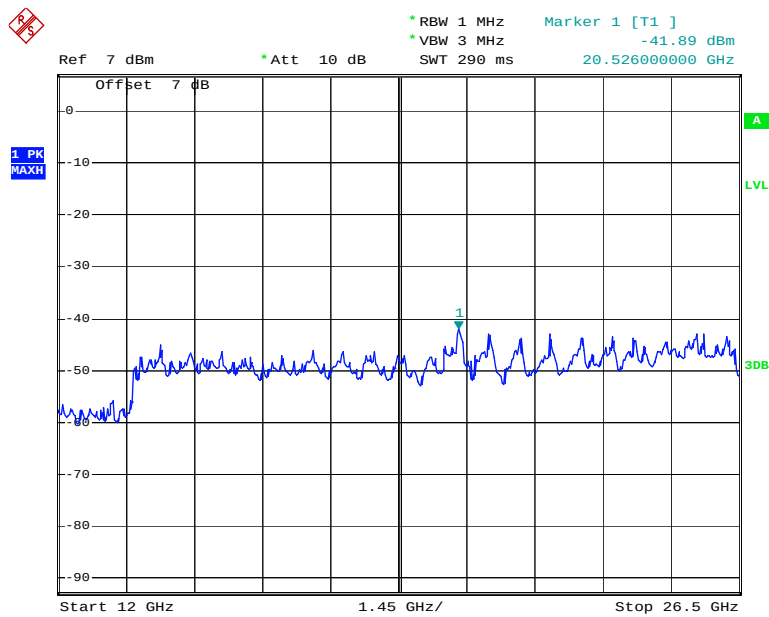
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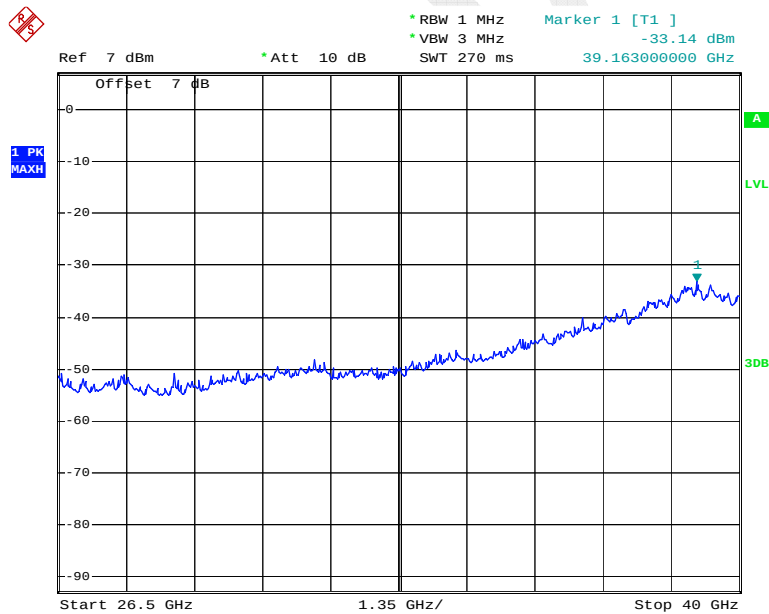
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Antenna1 802.11n ht20 Middle Channel 12 GHz-26.5GHz



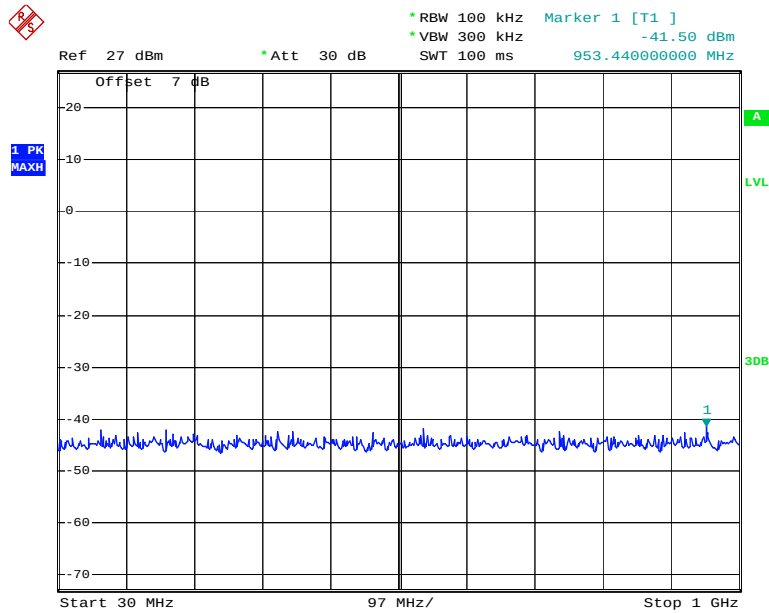
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Antenna1 802.11n ht20 Middle Channel 26.5GHz -40GHz



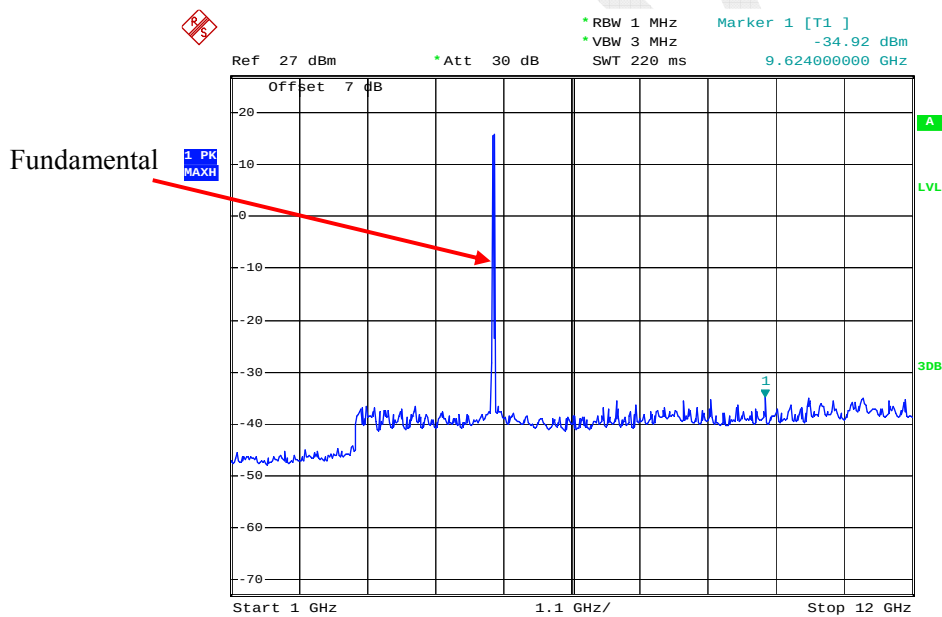
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Antenna1 802.11n ht20 High Channel 30MHz-1GHz



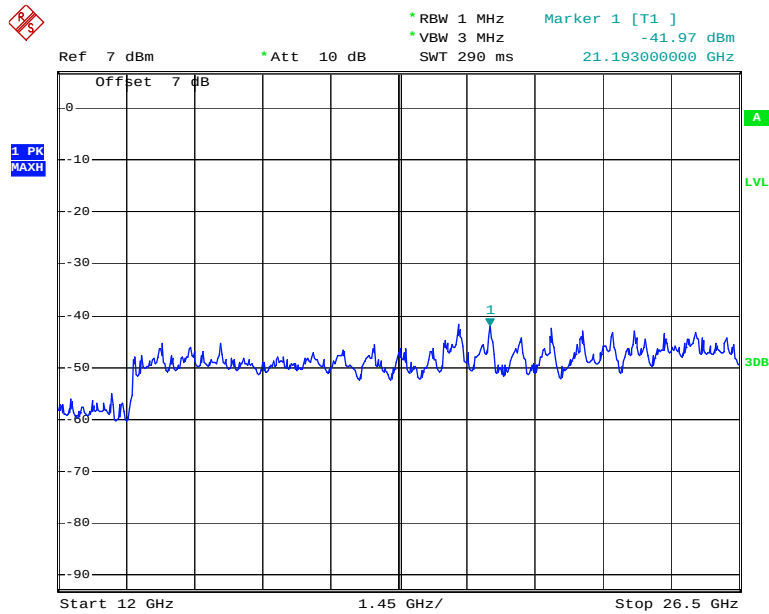
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Antenna1 802.11n ht20 High Channel 1GHz-12GHz



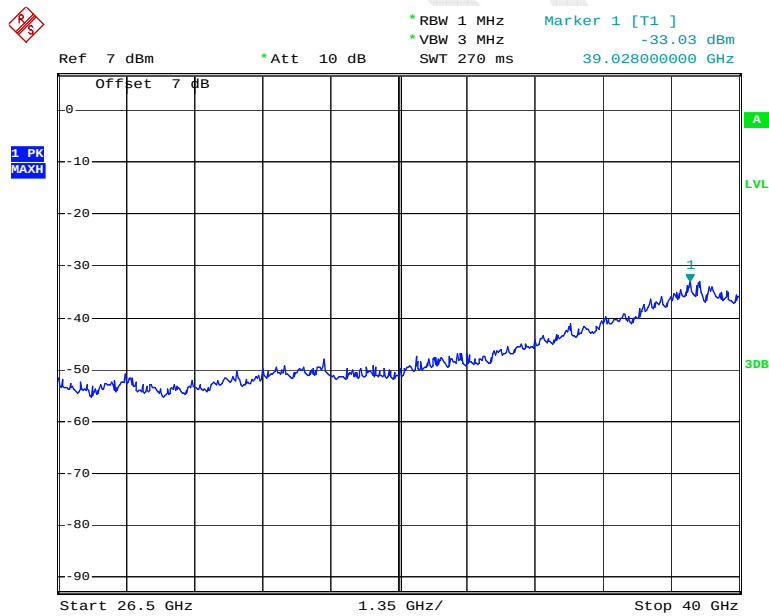
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Antenna1 802.11n ht20 High Channel 12GHz-26.5GHz



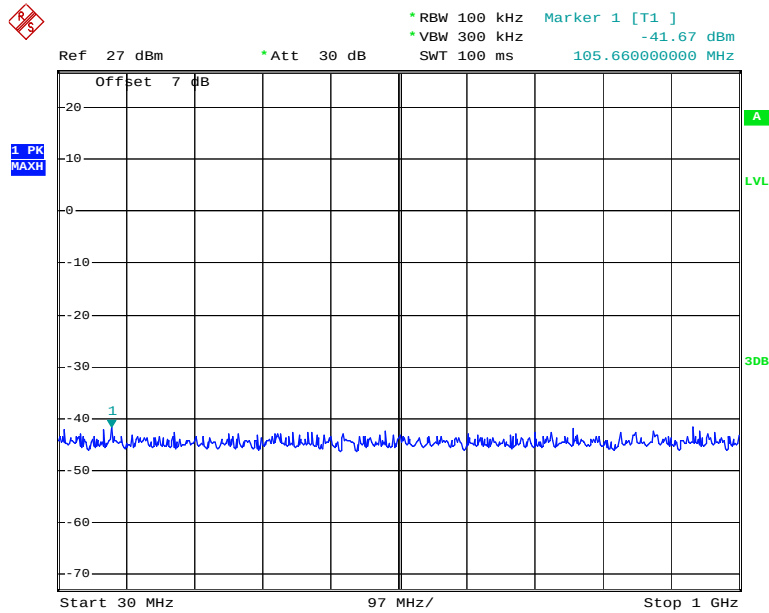
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Antenna1 802.11n ht20 High Channel 26.5GHz-40GHz



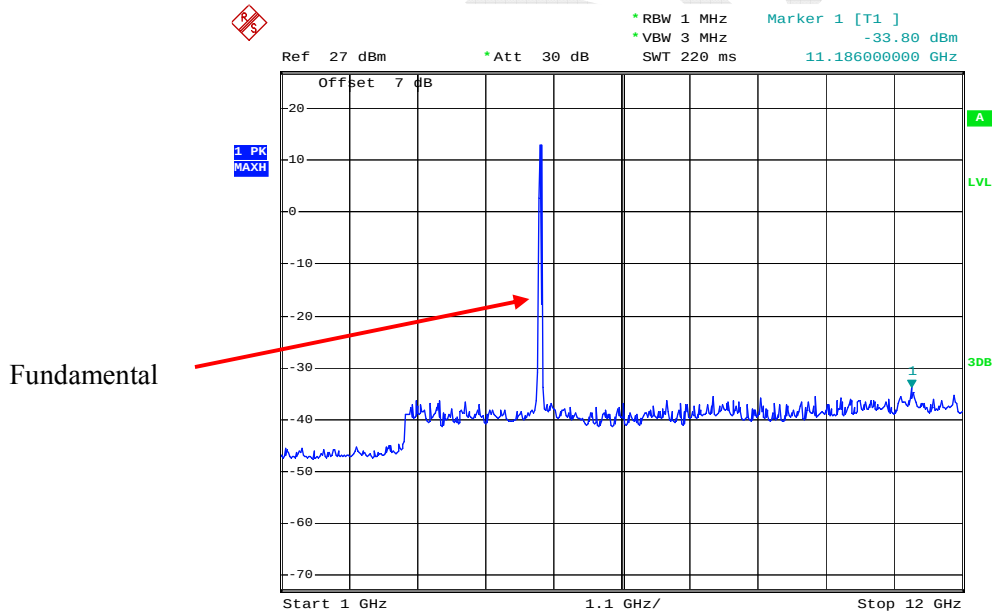
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Antenna1 802.11n ht40 Low Channel 30MHz-1GHz



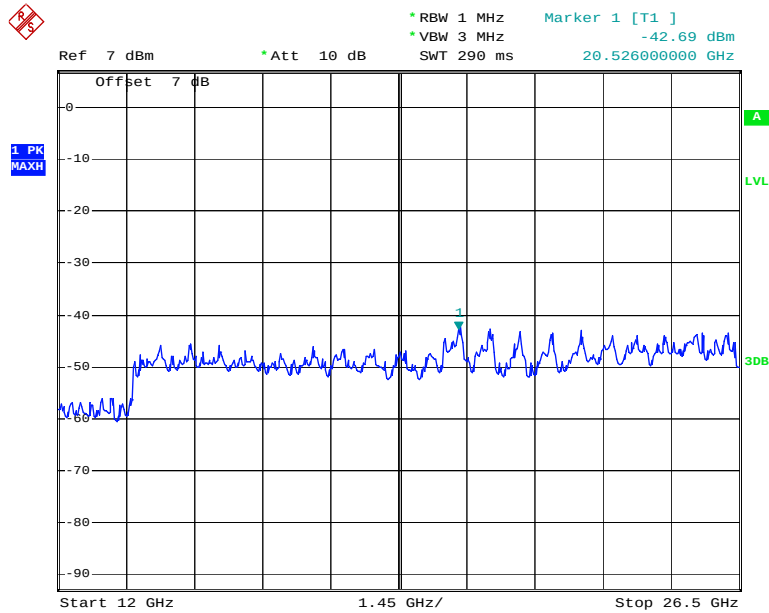
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Antenna1 802.11n ht40 Low Channel 1GHz-12GHz



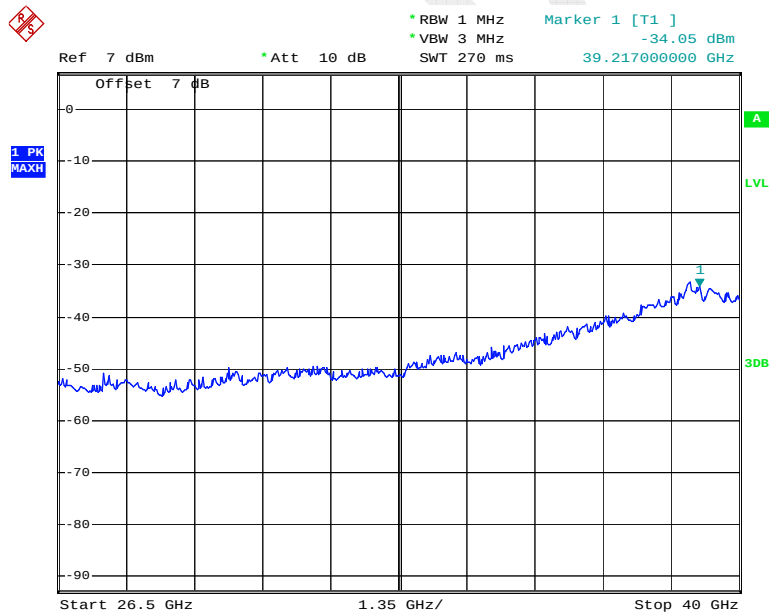
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Antenna1 802.11n ht40 Low Channel 12GHz-26.5GHz



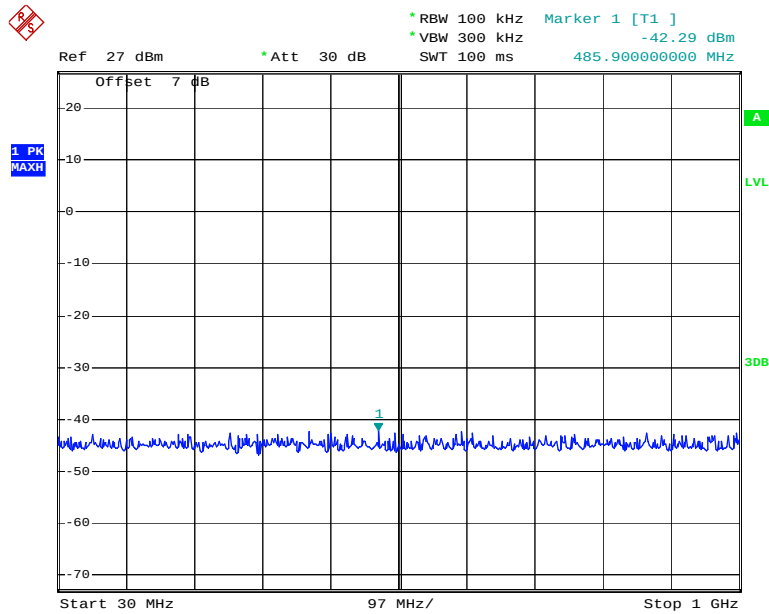
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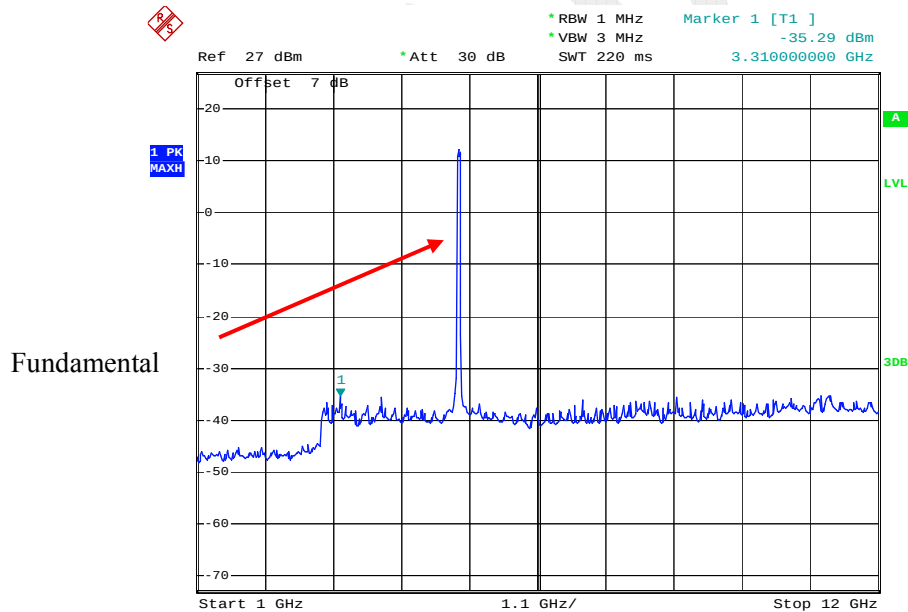
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Antenna1 802.11n ht40 High Channel 30 MHz-1GHz



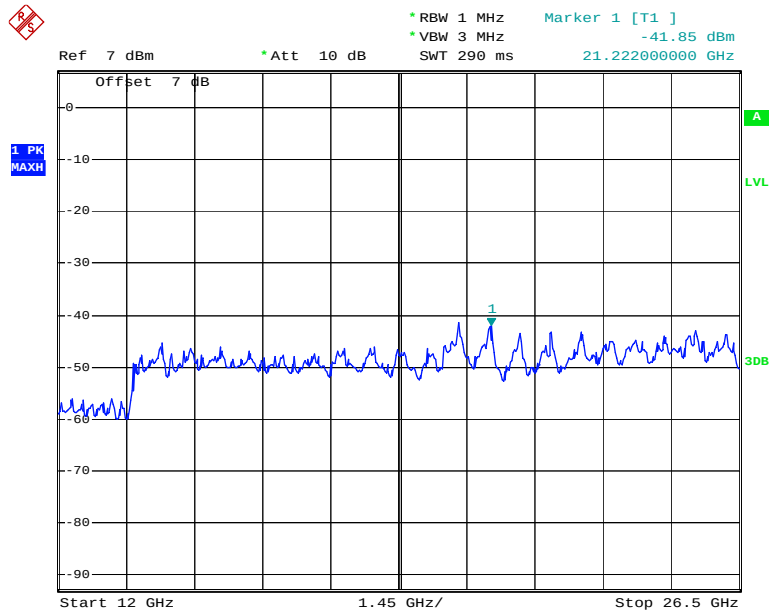
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Antenna1 802.11n ht40 High Channel 1GHz-12GHz



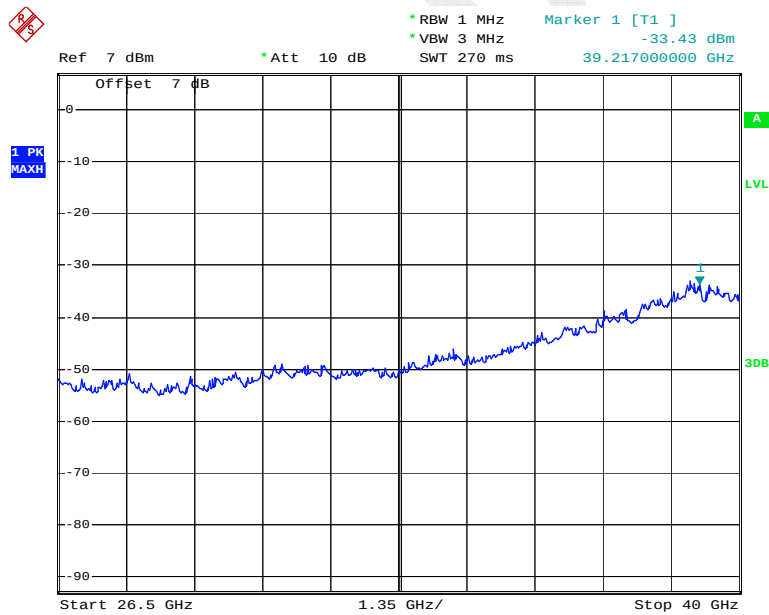
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Antenna1 802.11n ht40 High Channel 12 GHz-26.5GHz



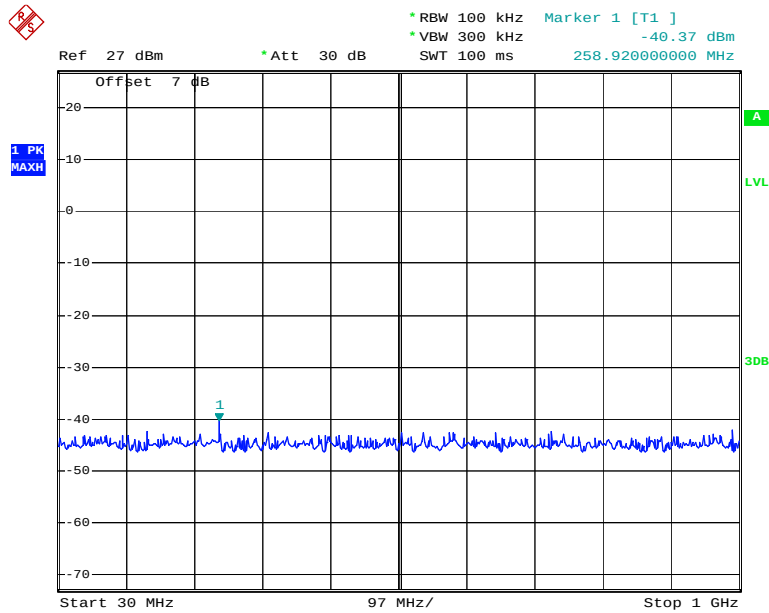
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Antenna1 802.11n ht40 High Channel 26.5GHz-40GHz



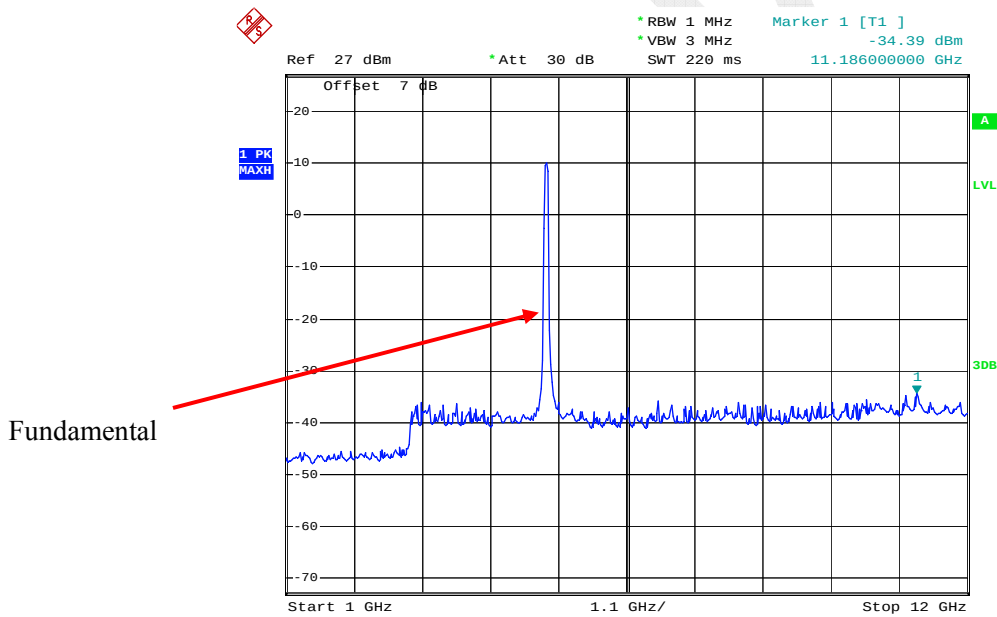
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Antenna1 802.11n ac80 30 MHz-1GHz



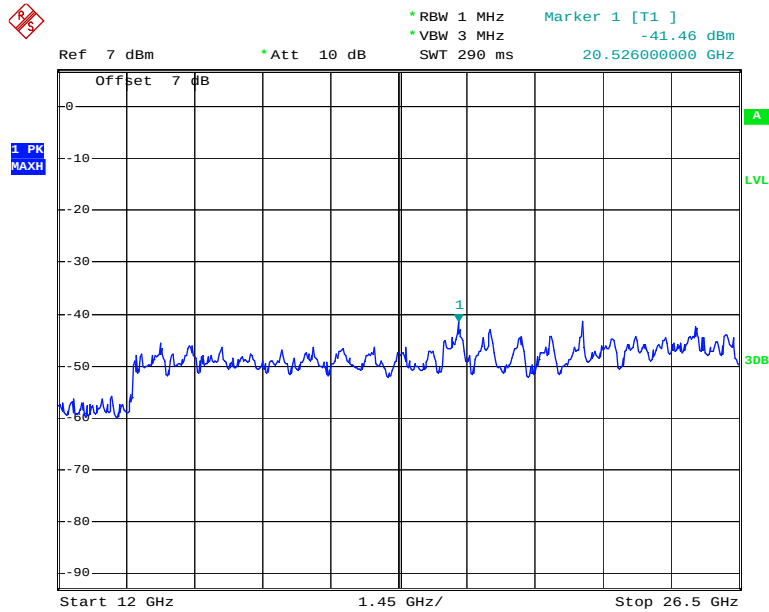
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Antenna1 802.11n ac80 1 GHz-12GHz



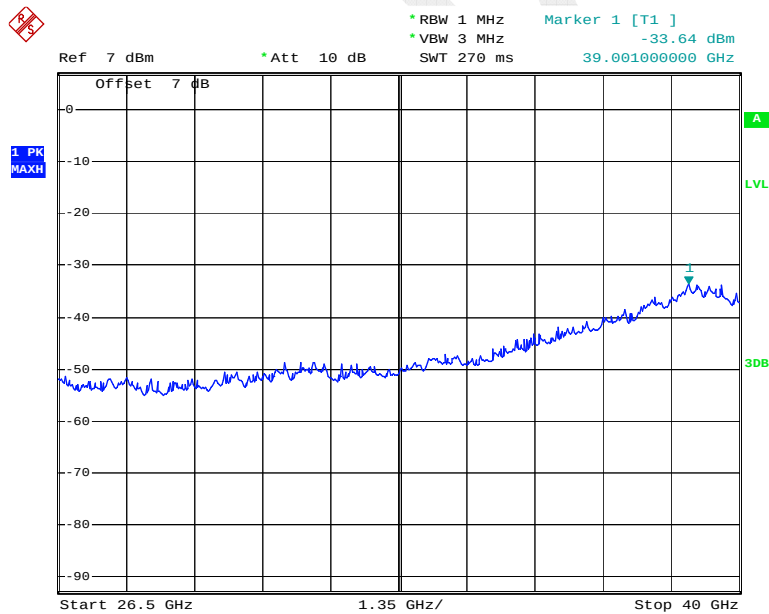
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Antenna1 802.11n ac80 12 GHz-26.5GHz



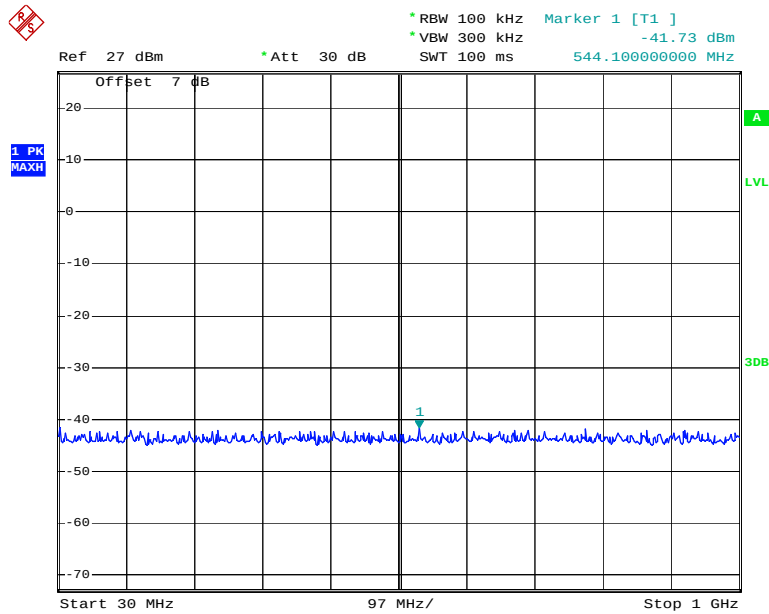
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Antenna1 802.11n ac80 26.5GHz-40GHz



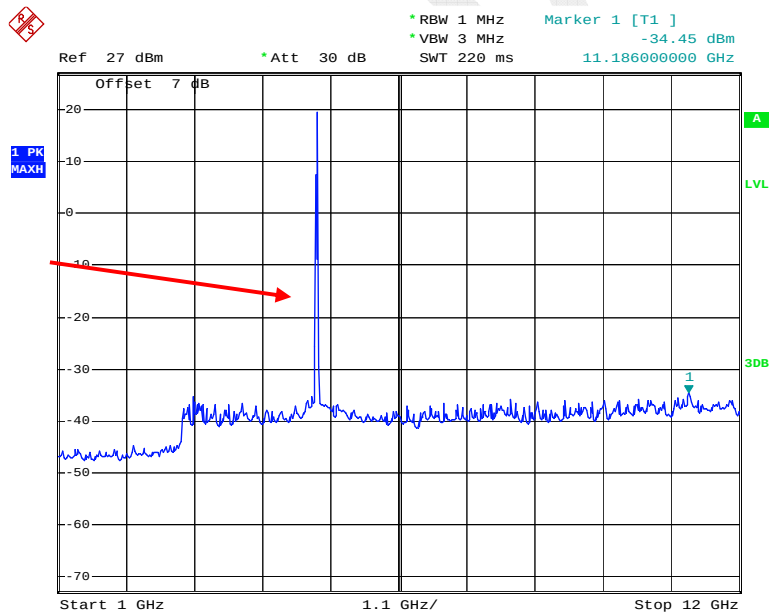
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Antenna2 802.11a Low Channel 30MHz-1GHz



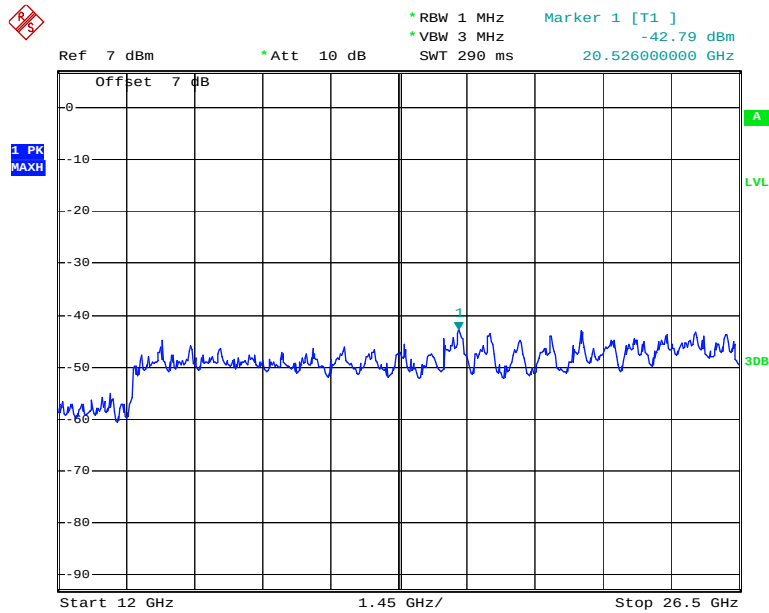
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Antenna2 802.11a Low Channel 1GHz-12GHz



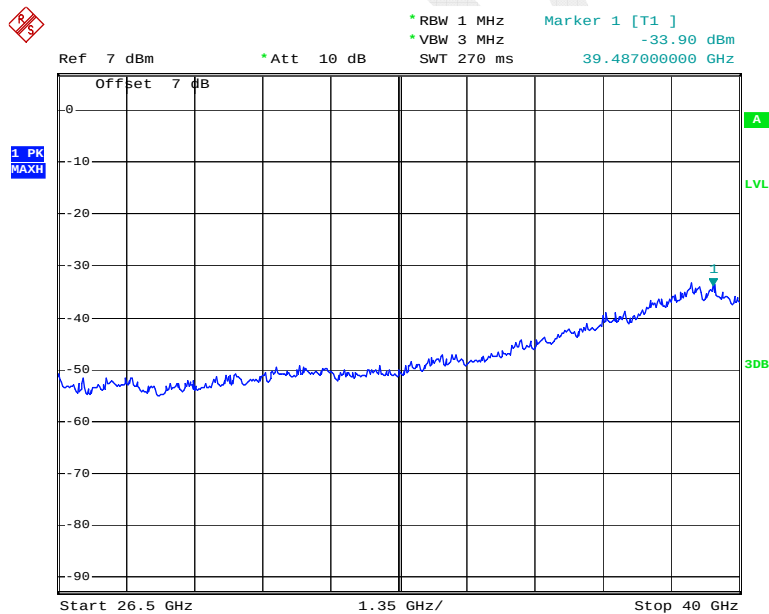
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Antenna2 802.11a Low Channel 12GHz-26.5GHz



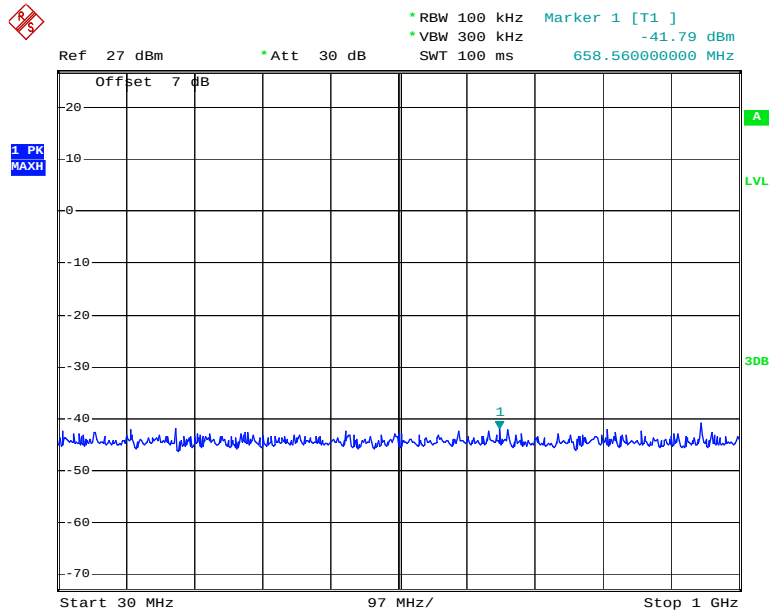
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Antenna2 802.11a Low Channel 26.5GHz-40GHz



Date: 17.NOV.2014 11:16:31

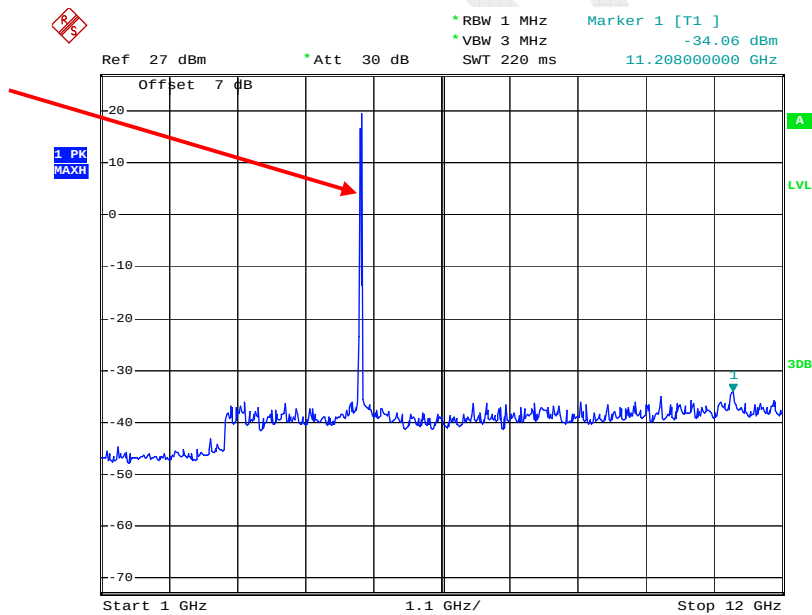
Antenna2 802.11a Middle Channel 30MHz-1GHz



Date: 17.NOV.2014 10:56:03

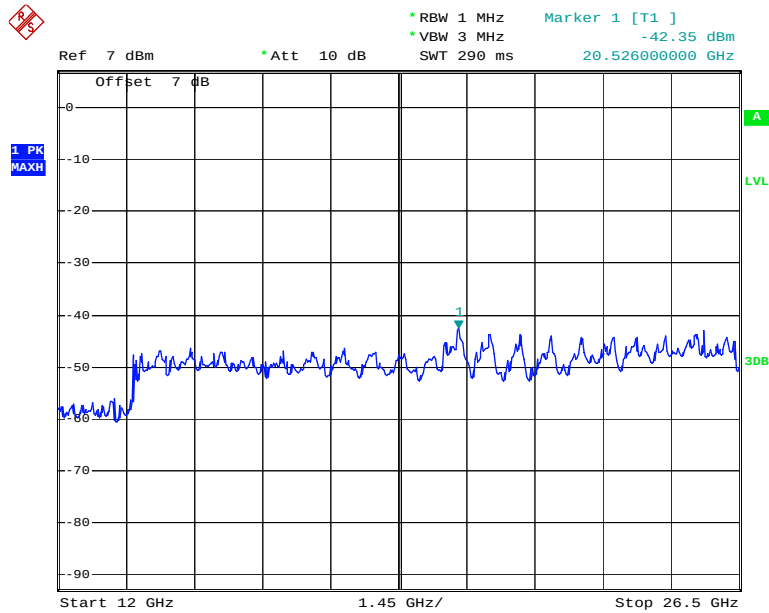
Antenna2 802.11a Middle Channel 1GHz-12GHz

Fundamental



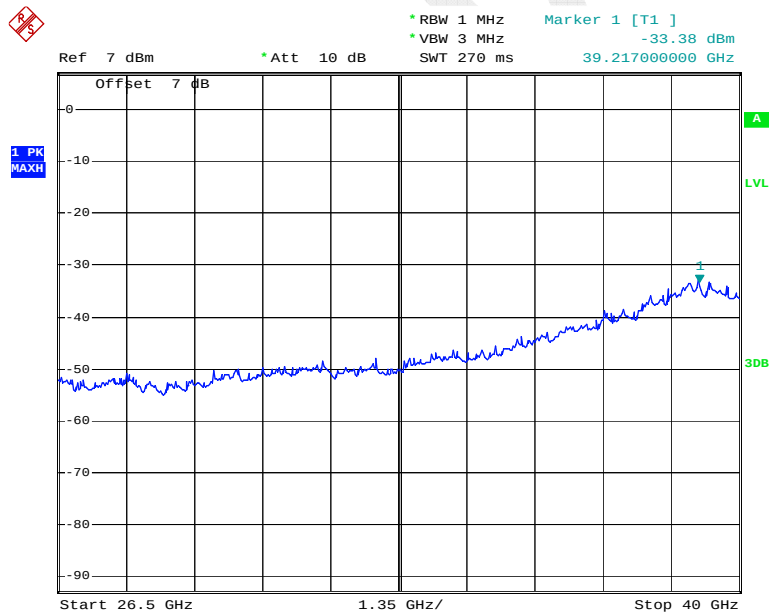
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Antenna2 802.11a Middle Channel 12GHz -26.5GHz



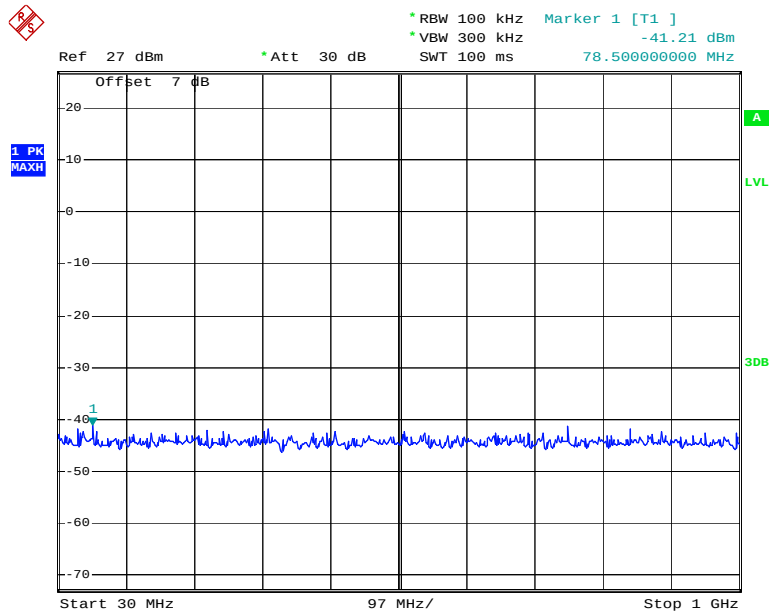
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Antenna2 802.11a Middle Channel 26.5GHz-40GHz



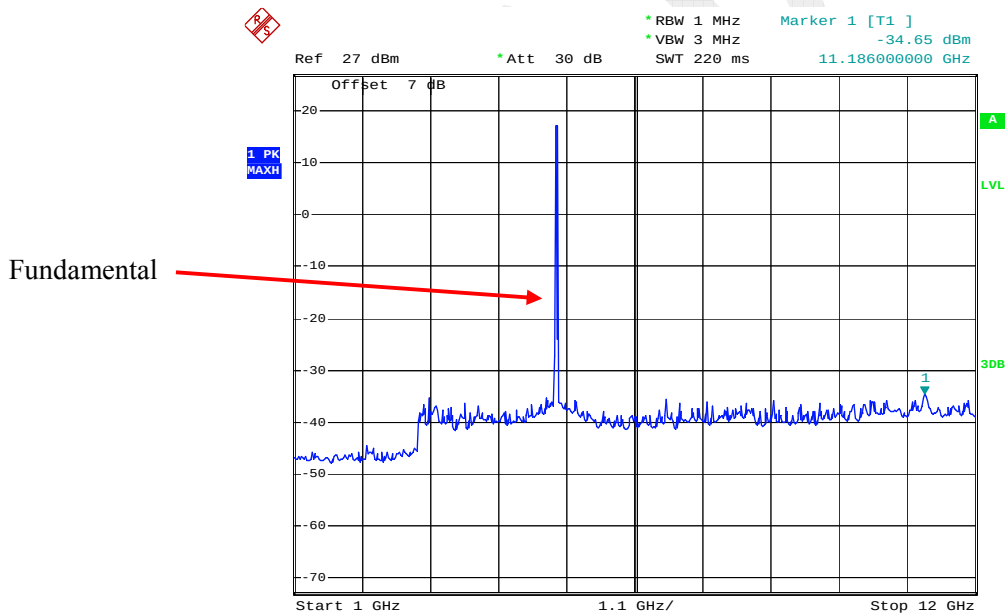
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Antenna2 802.11a High Channel 30MHz-1GHz



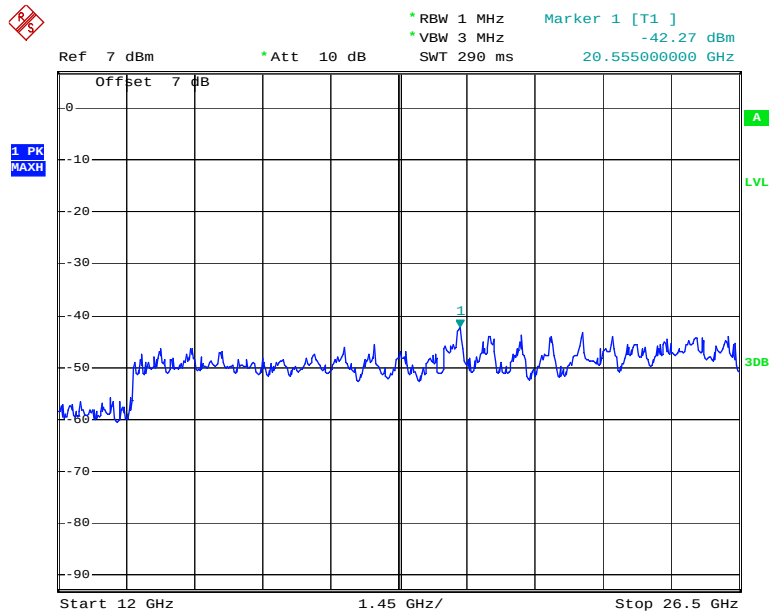
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Antenna2 802.11a High Channel 1GHz-12GHz



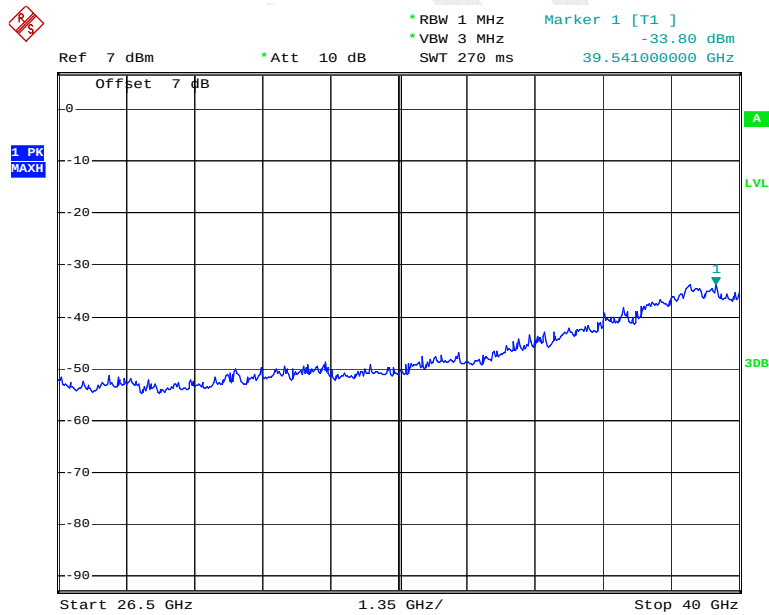
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Antenna2 802.11a High Channel 12GHz-26.5GHz



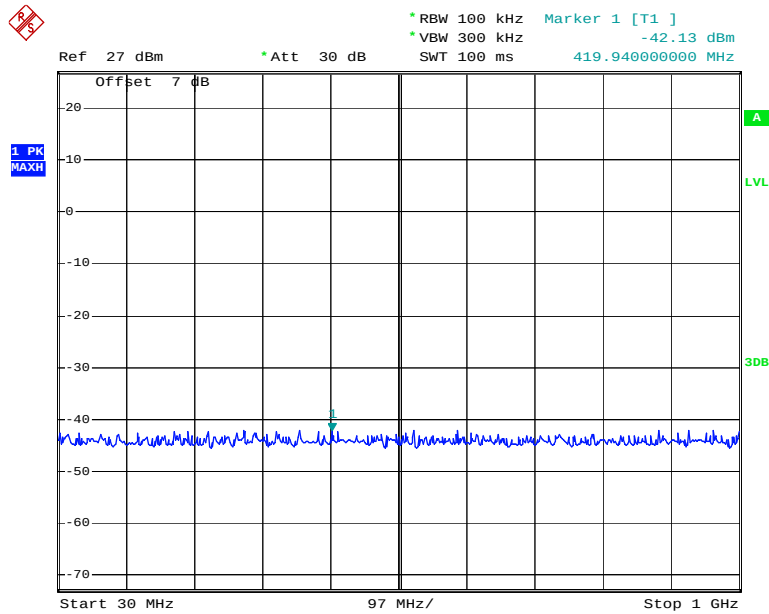
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Antenna2 802.11a High Channel 26.5GHz-40GHz



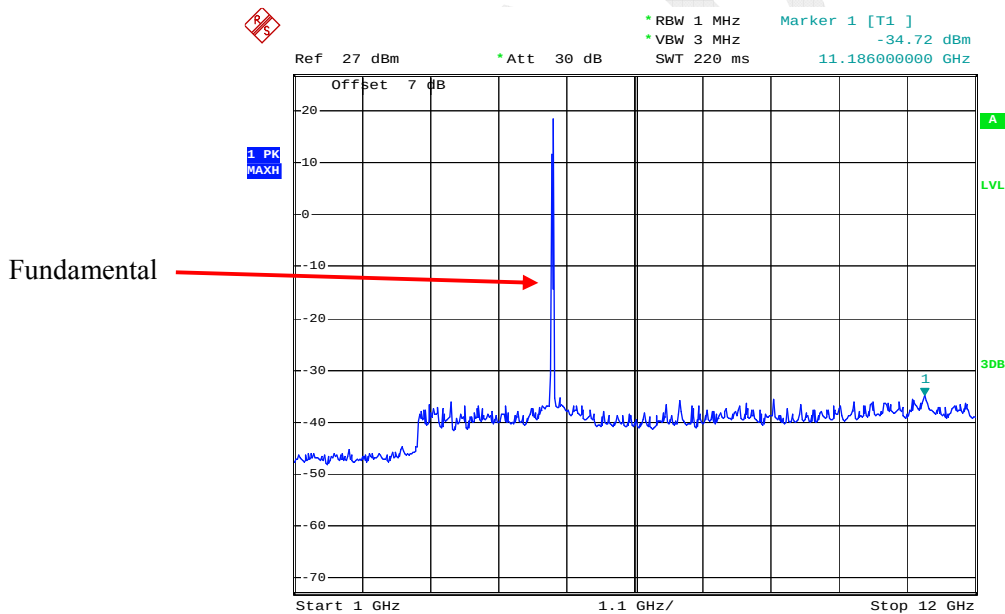
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Antenna2 802.11n ht20 Low Channel 30 MHz-1GHz



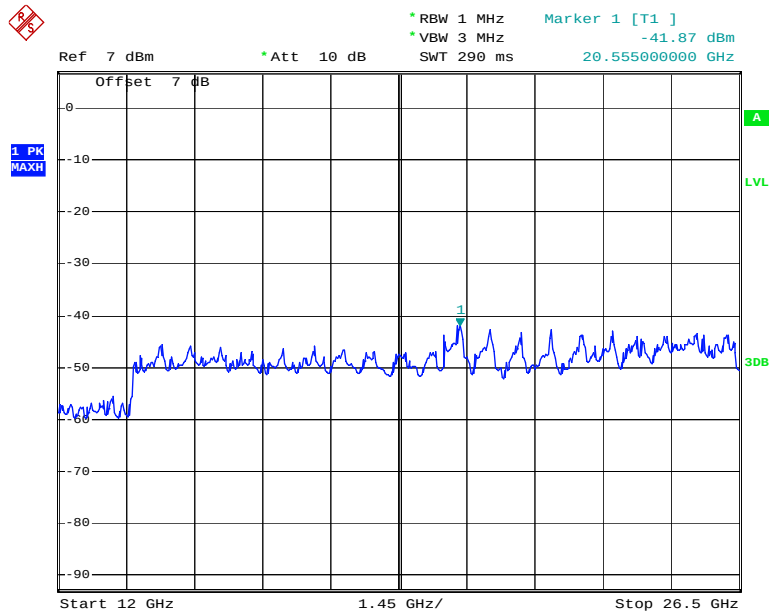
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Antenna2 802.11n ht20 Low Channel 1GHz-12GHz



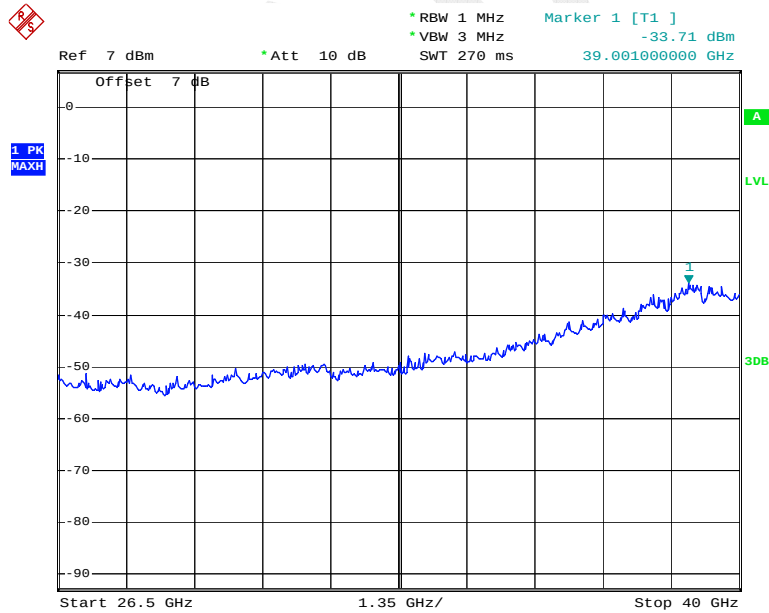
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Antenna2 802.11n ht20 Low Channel 12GHz-26.5GHz



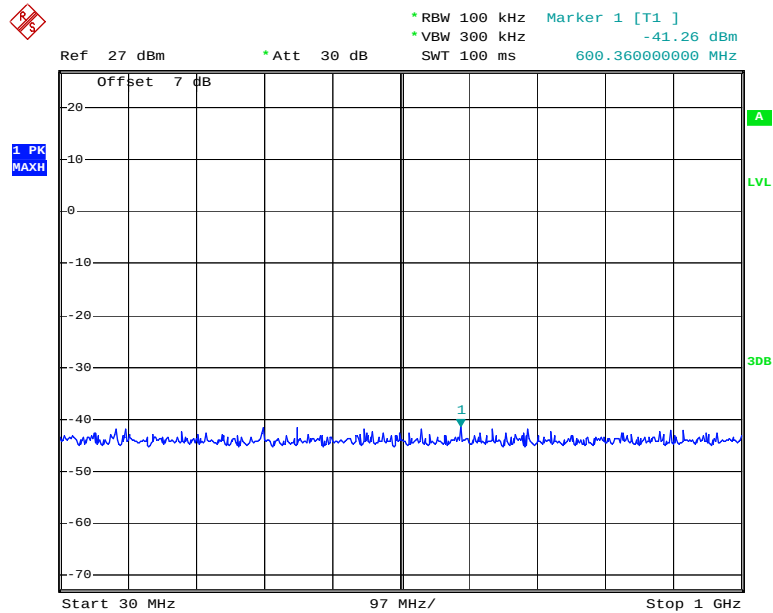
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Antenna2 802.11n ht20 Low Channel 26.5 GHz-40GHz



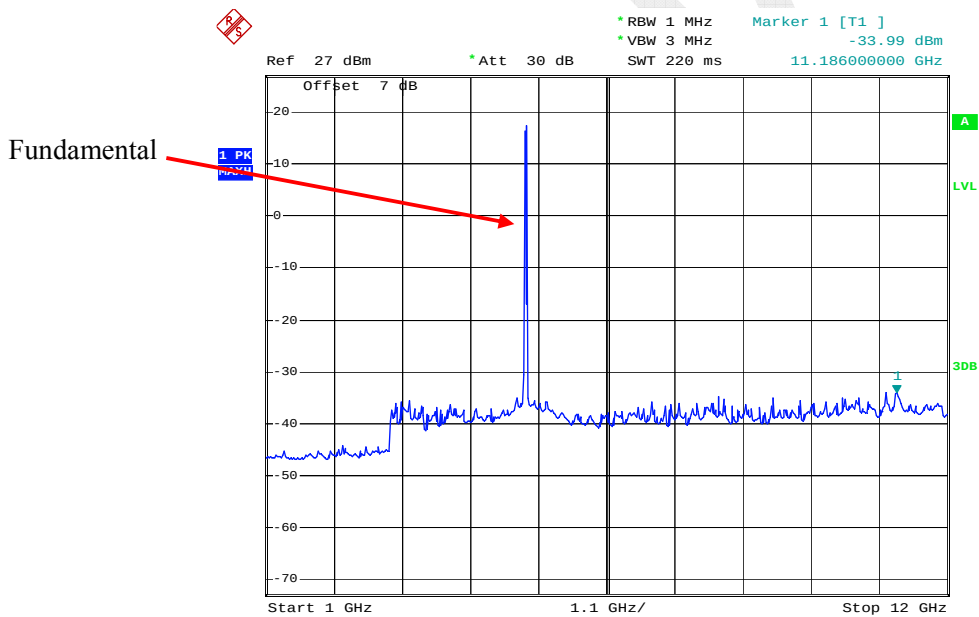
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Antenna2 802.11n ht20 Middle Channel 30 MHz-1GHz



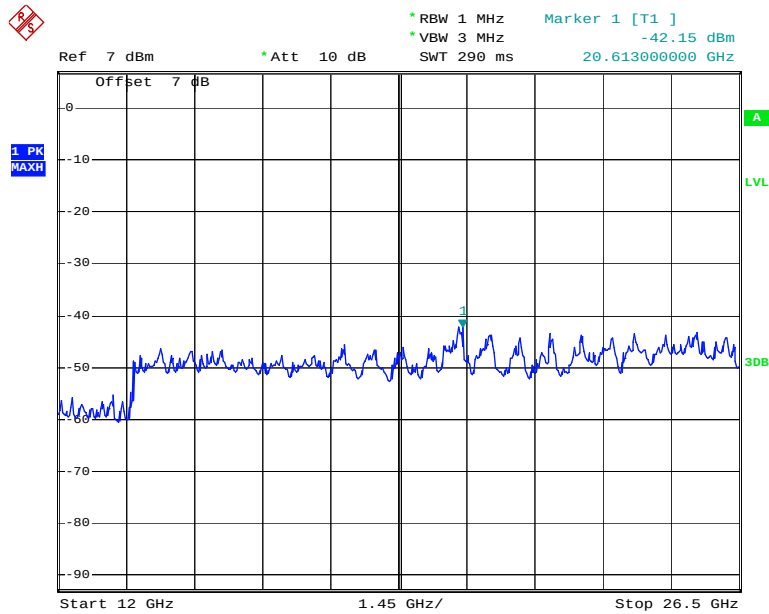
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Antenna2 802.11n ht20 Middle Channel 1GHz-12GHz



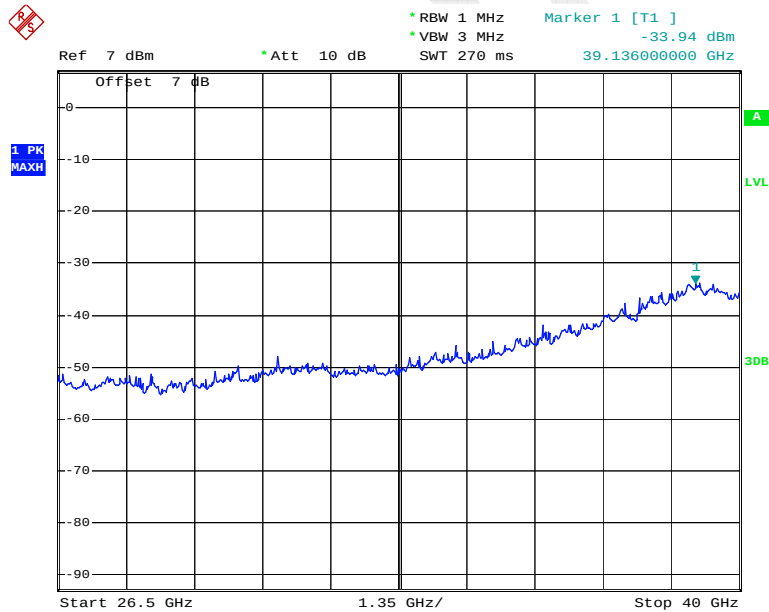
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Antenna2 802.11n ht20 Middle Channel 12 GHz-26.5GHz



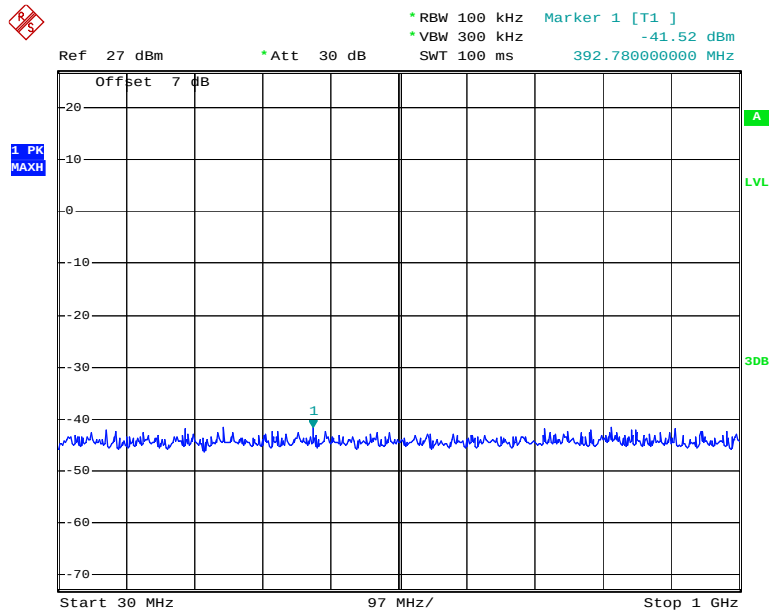
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Antenna2 802.11n ht20 Middle Channel 26.5GHz -40GHz



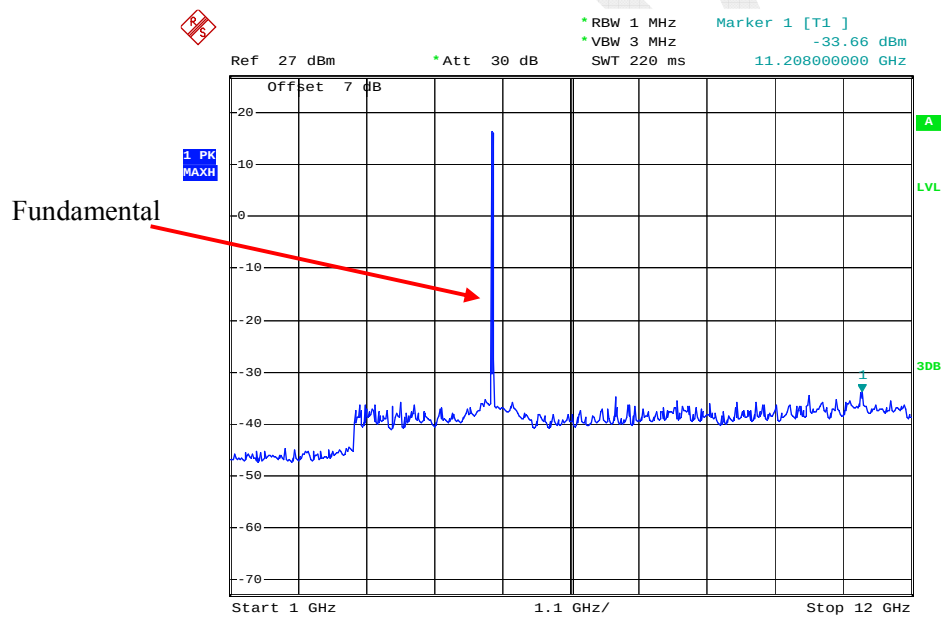
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Antenna2 802.11n ht20 High Channel 30MHz-1GHz



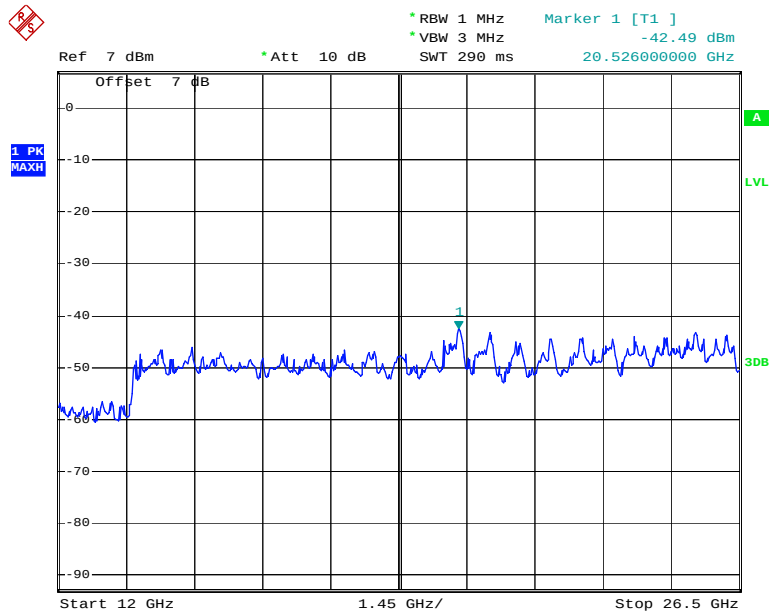
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Antenna2 802.11n ht20 High Channel 1GHz-12GHz



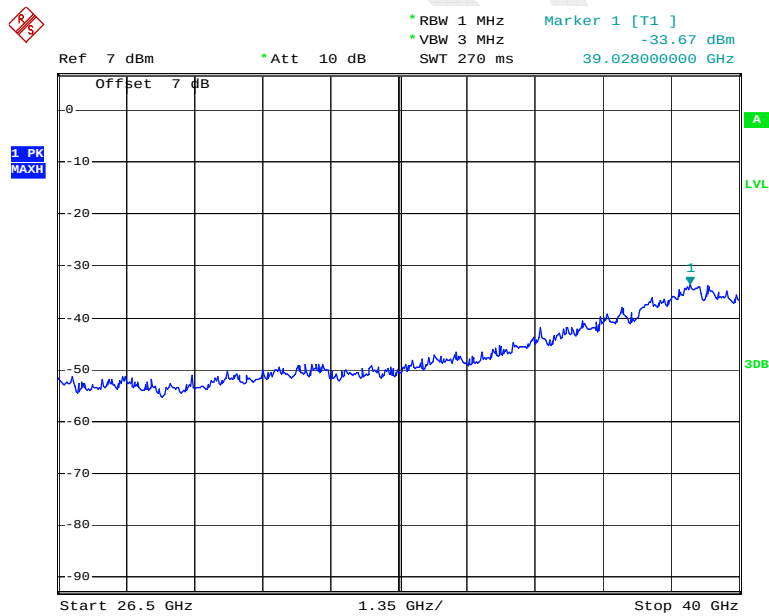
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Antenna2 802.11n ht20 High Channel 12GHz-26.5GHz



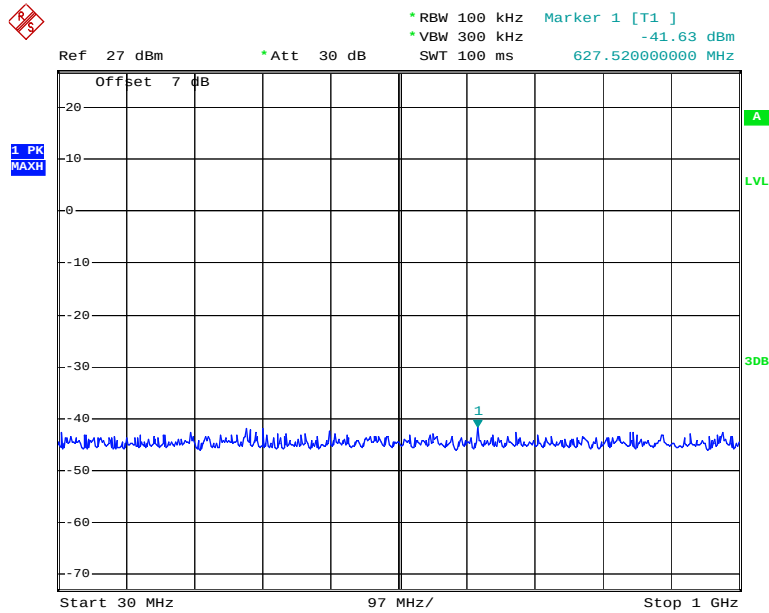
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Antenna2 802.11n ht20 High Channel 26.5GHz-40GHz



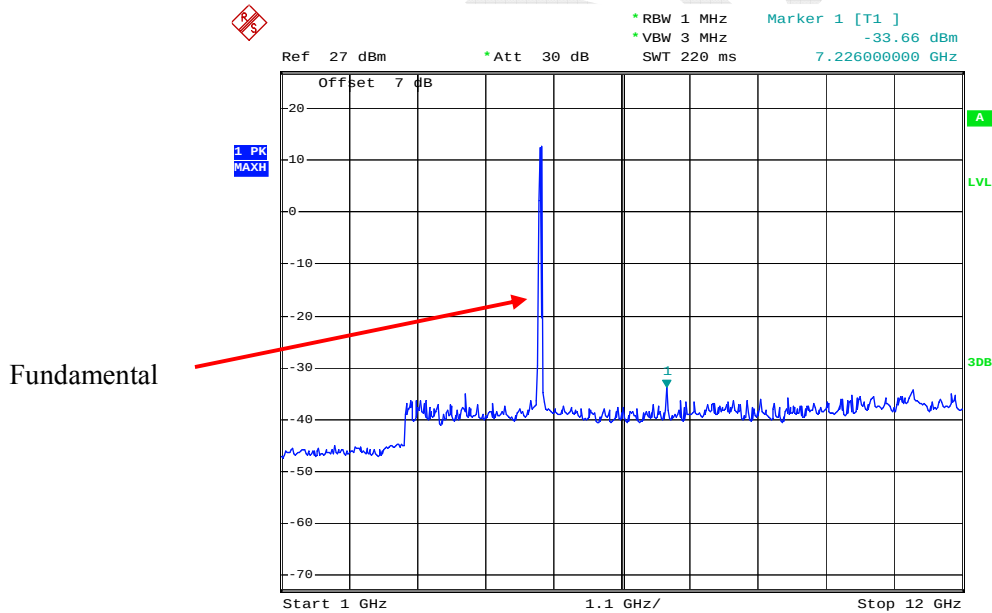
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Antenna2 802.11n ht40 Low Channel 30MHz-1GHz



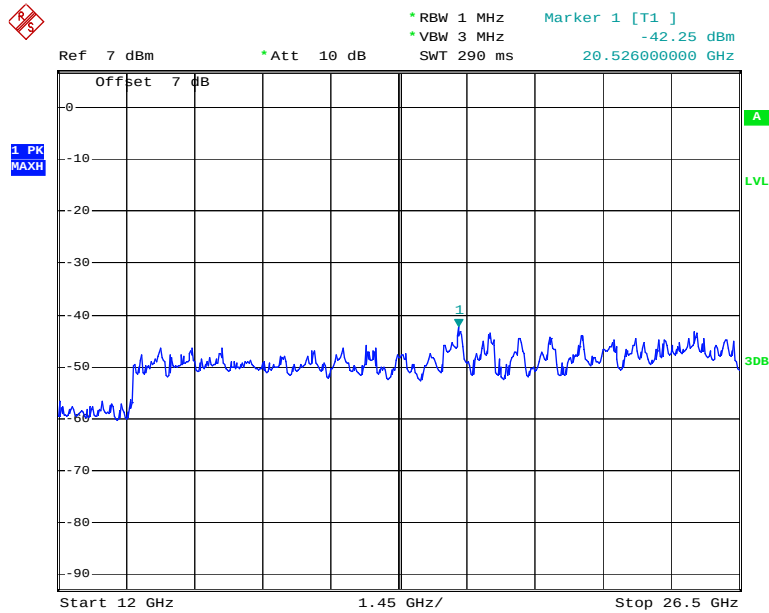
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Antenna2 802.11n ht40 Low Channel 1GHz-12GHz



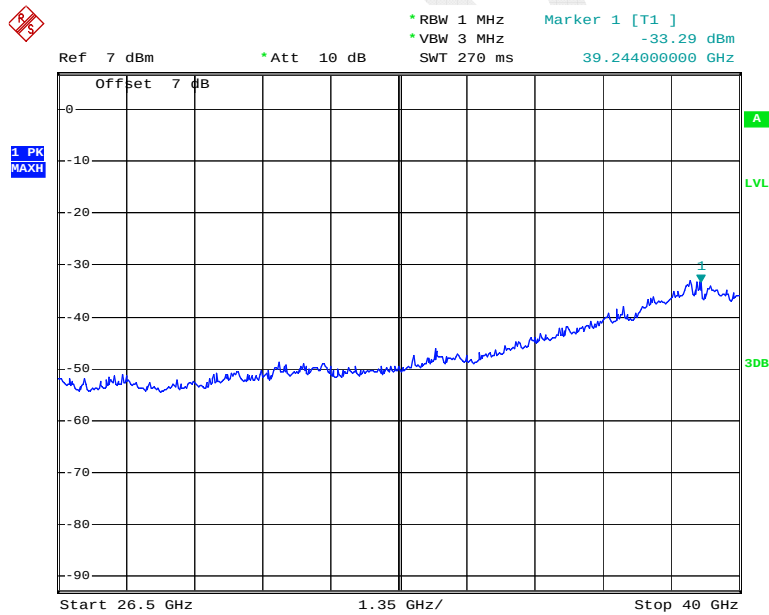
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Antenna2 802.11n ht40 Low Channel 12GHz-26.5GHz



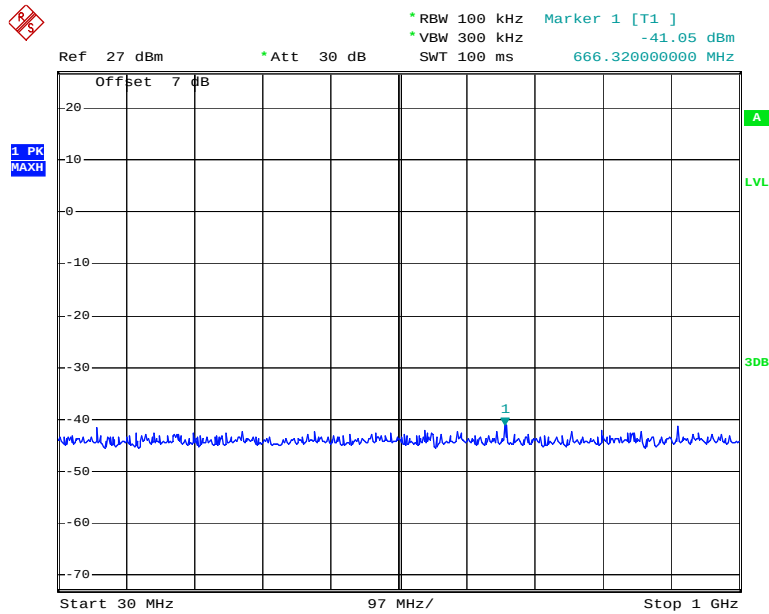
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Antenna2 802.11n ht40 Low Channel 26.5MHz-40GHz



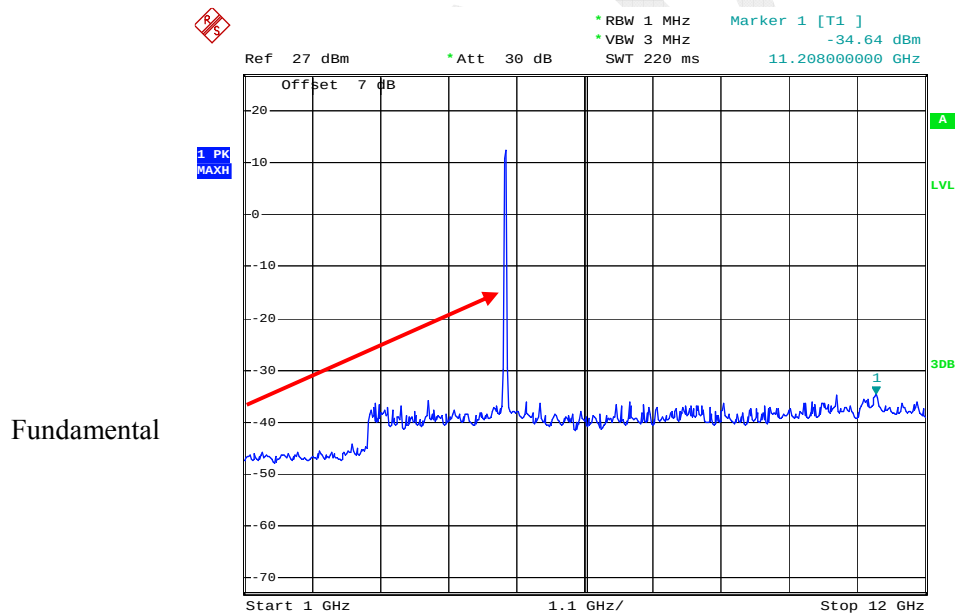
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Antenna2 802.11n ht40 High Channel 30 MHz-1GHz



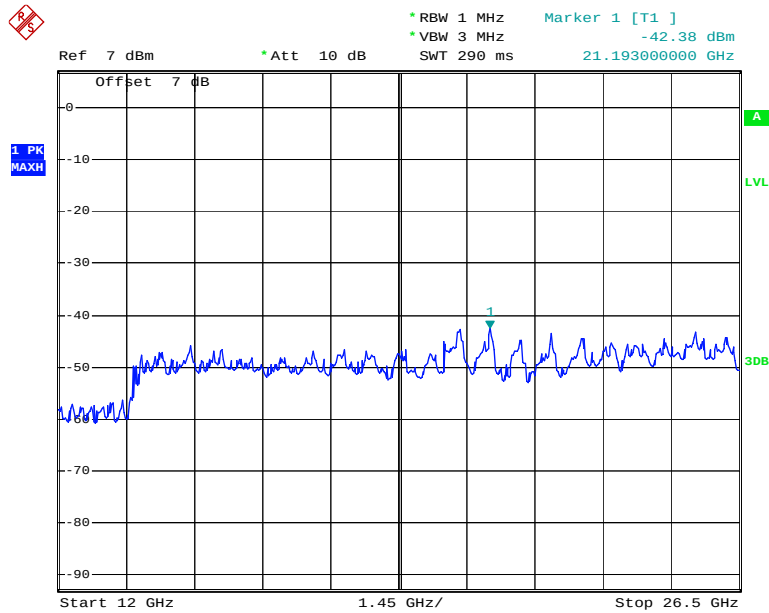
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Antenna2 802.11n ht40 High Channel 1GHz-12GHz



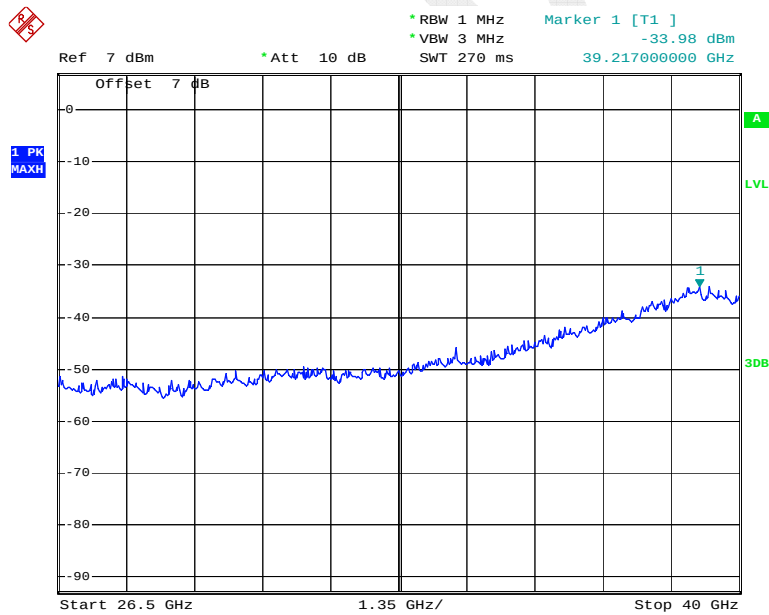
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Antenna2 802.11n ht40 High Channel 12 GHz-26.5GHz



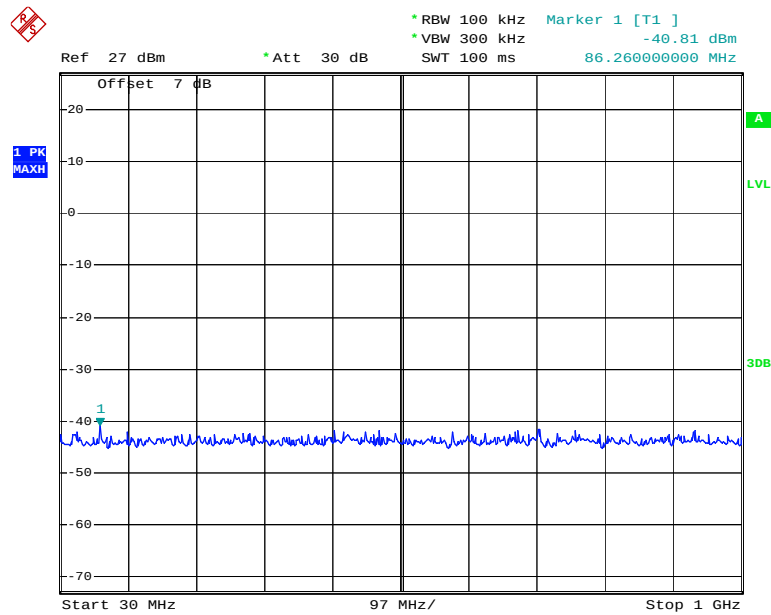
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Antenna2 802.11n ht40 High Channel 26.5GHz-40GHz



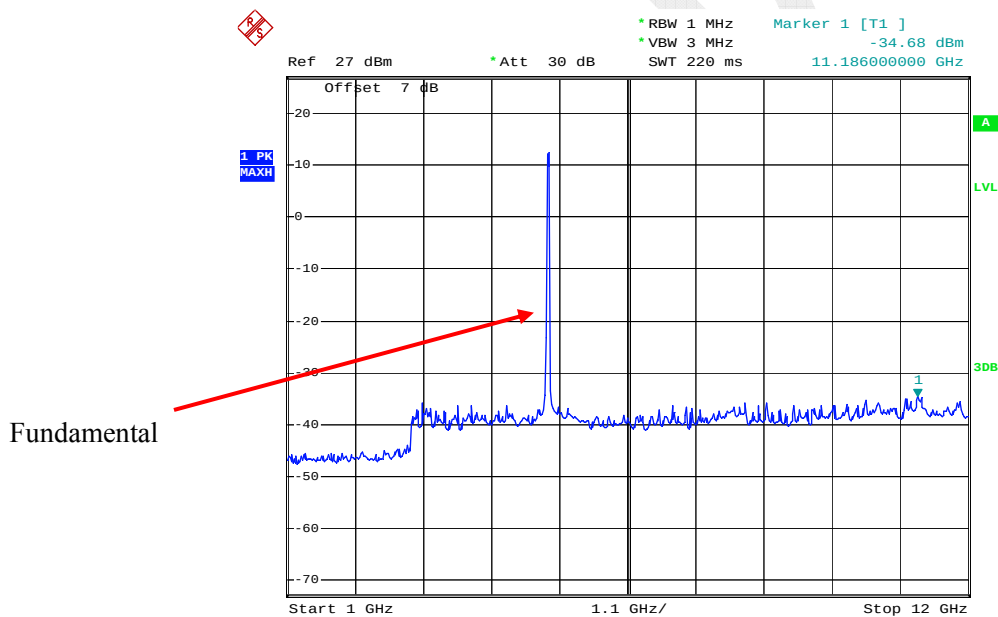
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Antenna2 802.11n ac80 30 MHz-1GHz



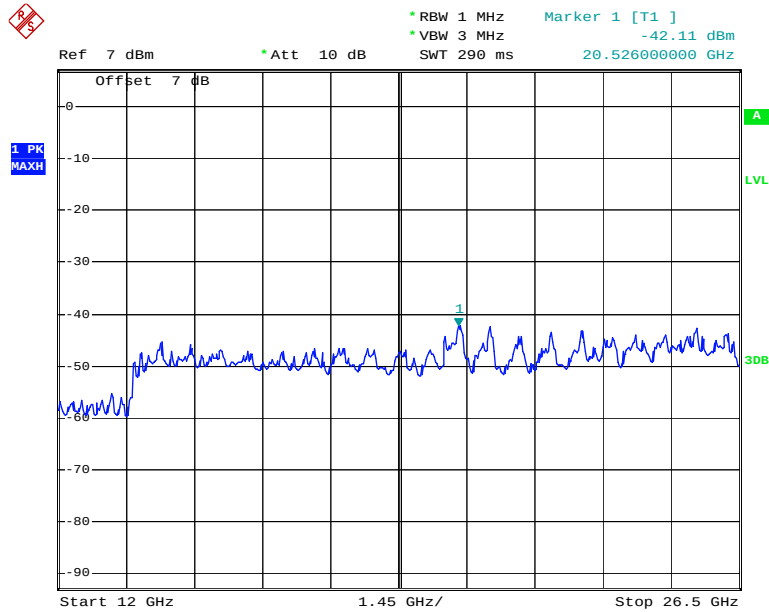
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Antenna2 802.11n ac80 1 GHz-12GHz



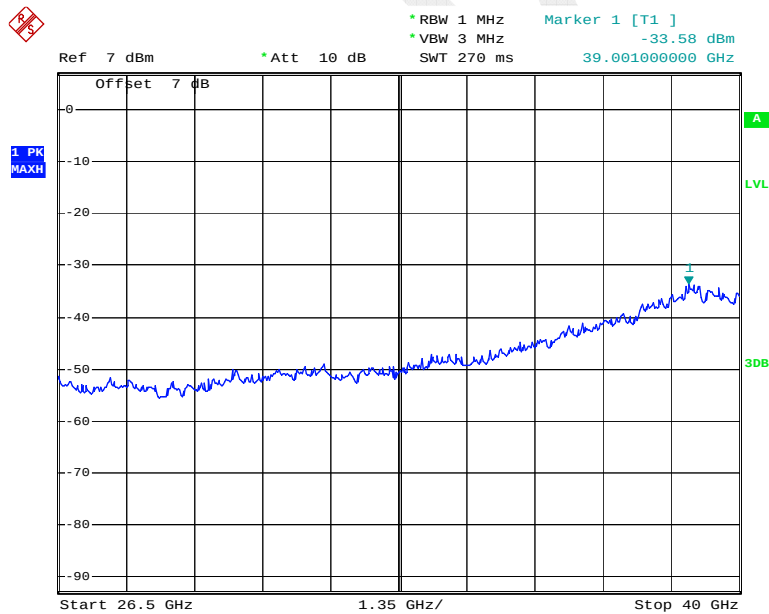
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Antenna2 802.11n ac80 12 GHz-26.5GHz



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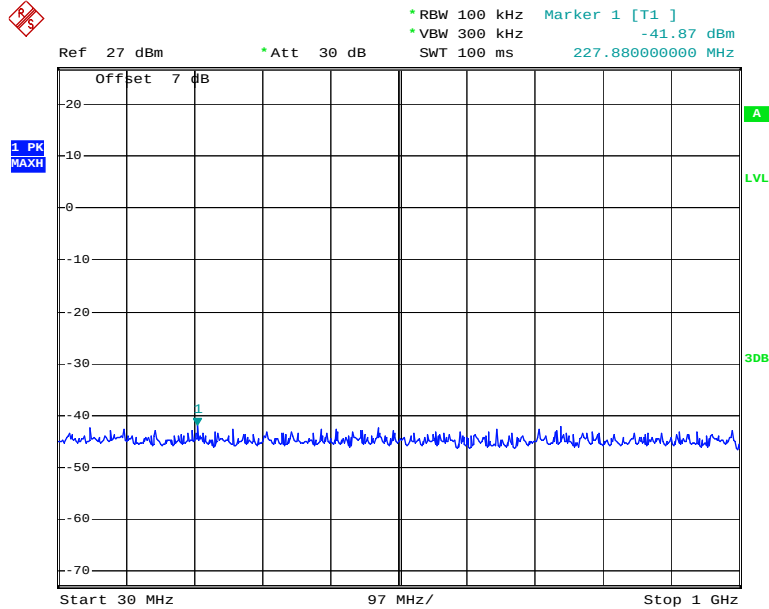
Antenna2 802.11n ac80 26.5GHz-40GHz



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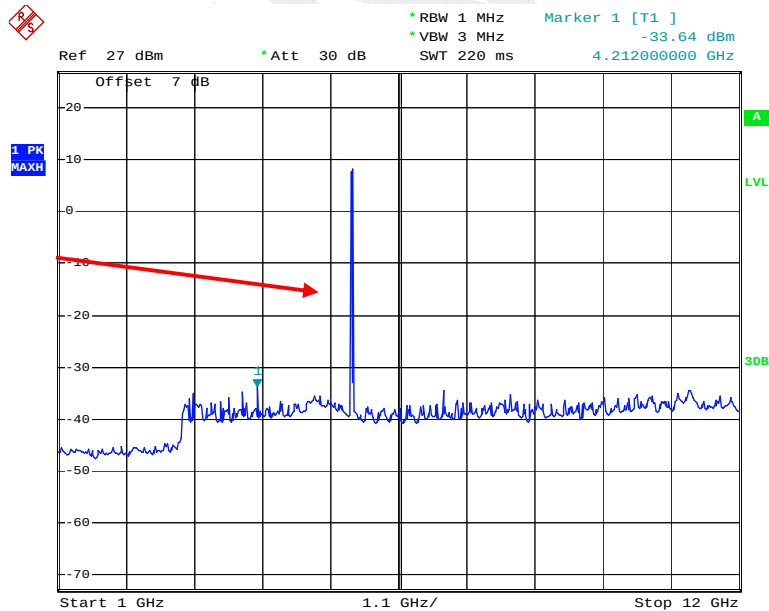
5725MHz-5850MHz:

Antenna0 802.11a Low Channel 30MHz-1GHz



Date: 18.NOV.2014 13:55:59

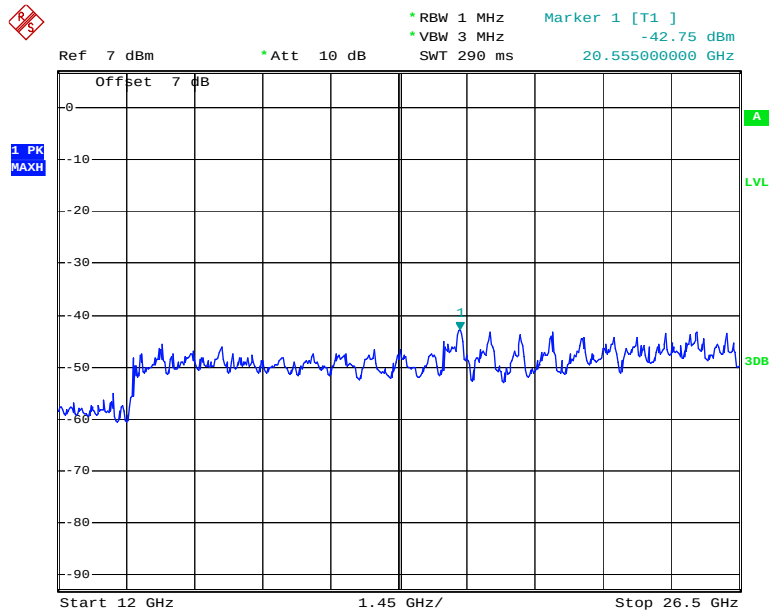
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Fundamental

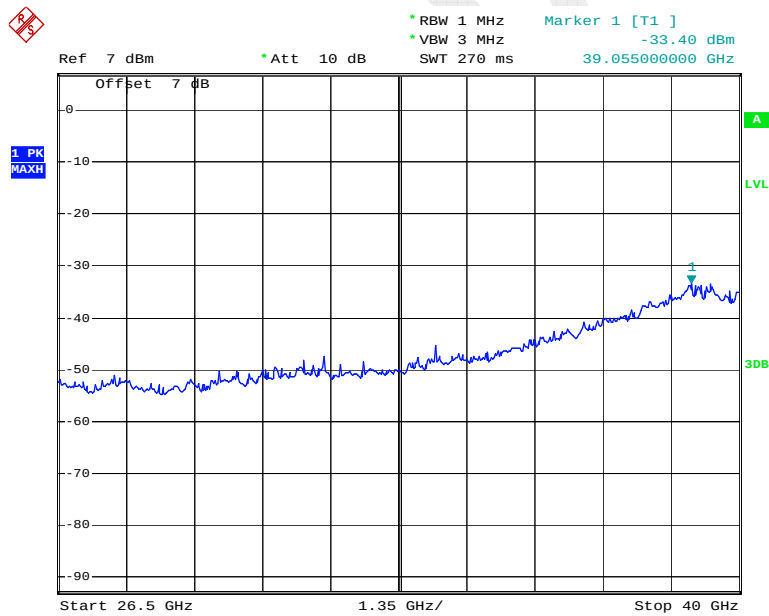
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Antenna0 802.11a Low Channel 12GHz-26.5GHz



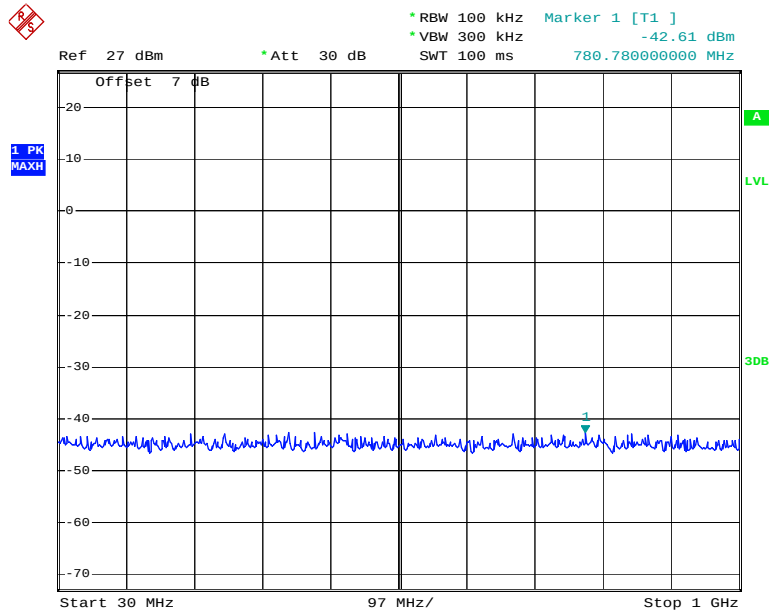
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Antenna0 802.11a Low Channel 26.5GHz-40GHz



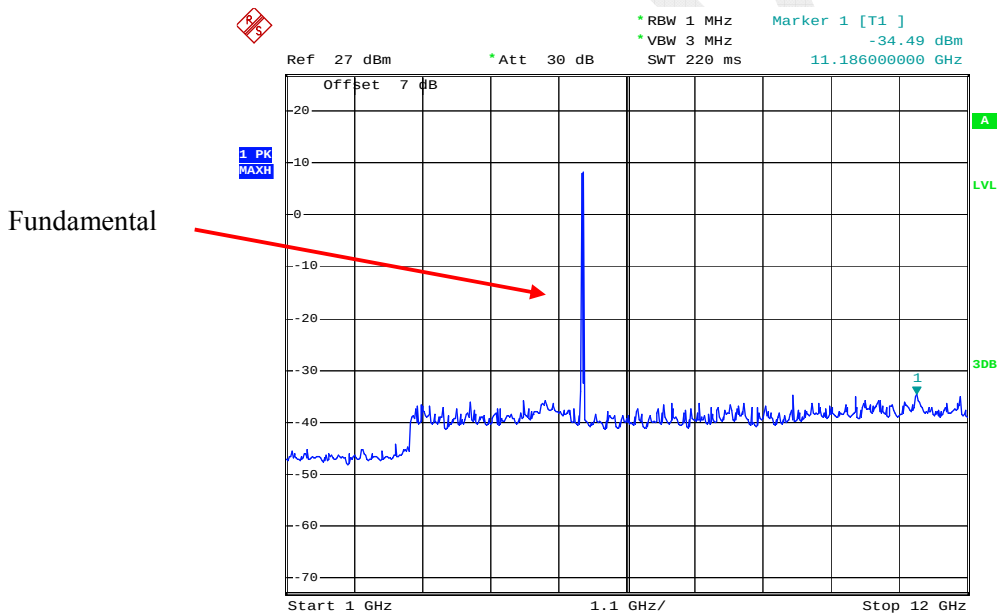
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Antenna0 802.11a Middle Channel 30MHz-1GHz



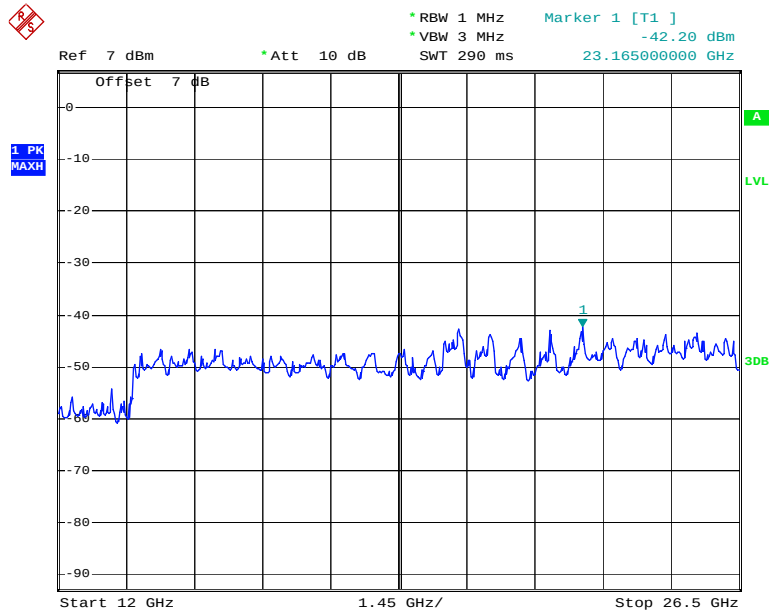
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Antenna0 802.11a Middle Channel 1GHz-12GHz



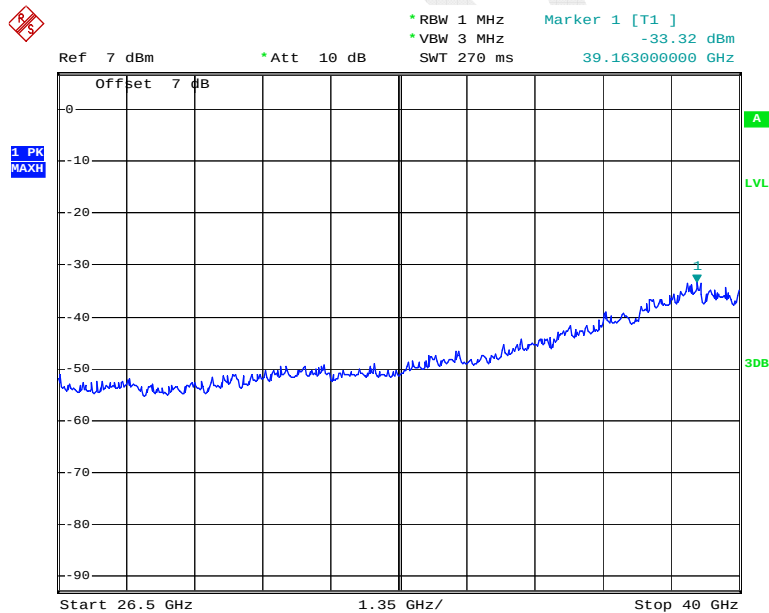
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Antenna0 802.11a Middle Channel 12GHz -26.5GHz



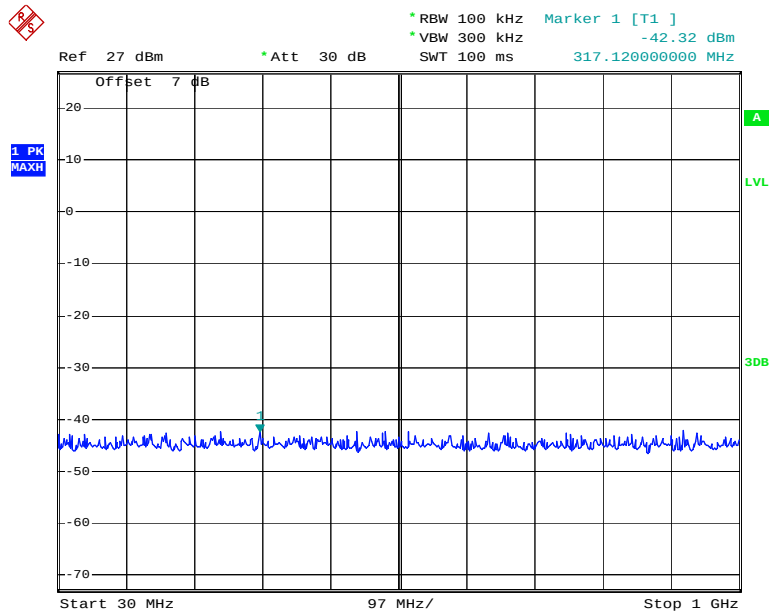
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Antenna0 802.11a Middle Channel 26.5GHz-40GHz



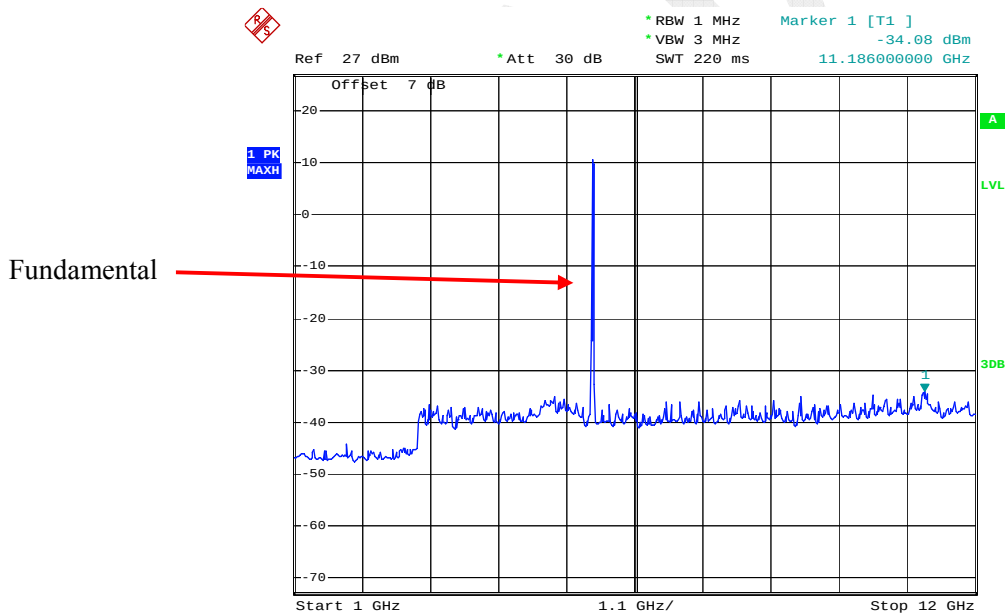
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Antenna0 802.11a High Channel 30MHz-1GHz



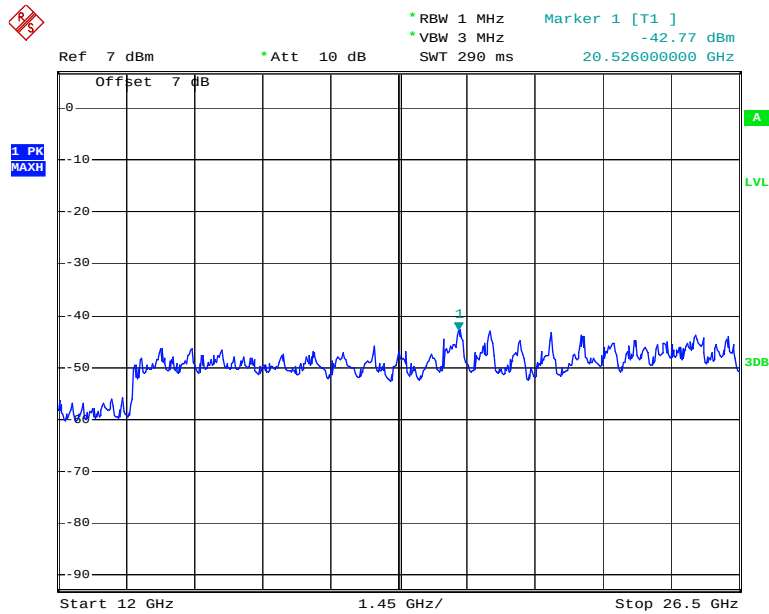
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Antenna0 802.11a High Channel 1GHz-12GHz



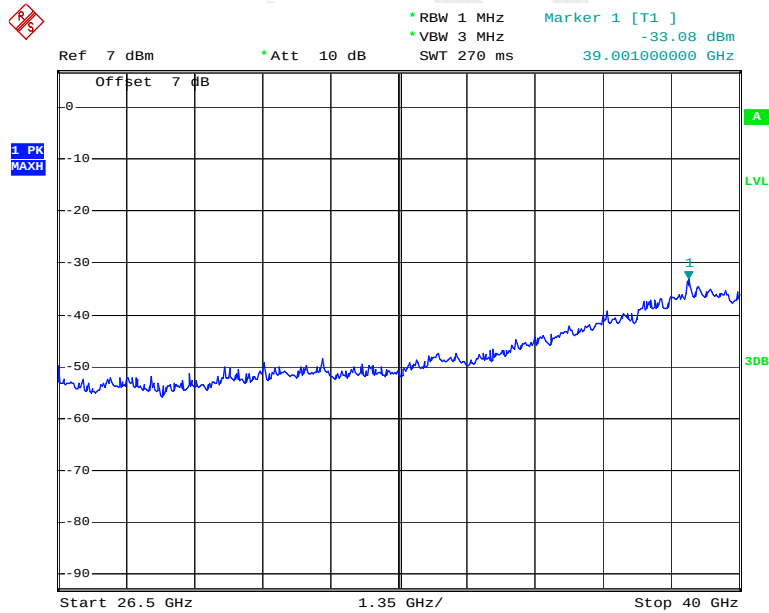
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Antenna0 802.11a High Channel 12GHz-26.5GHz



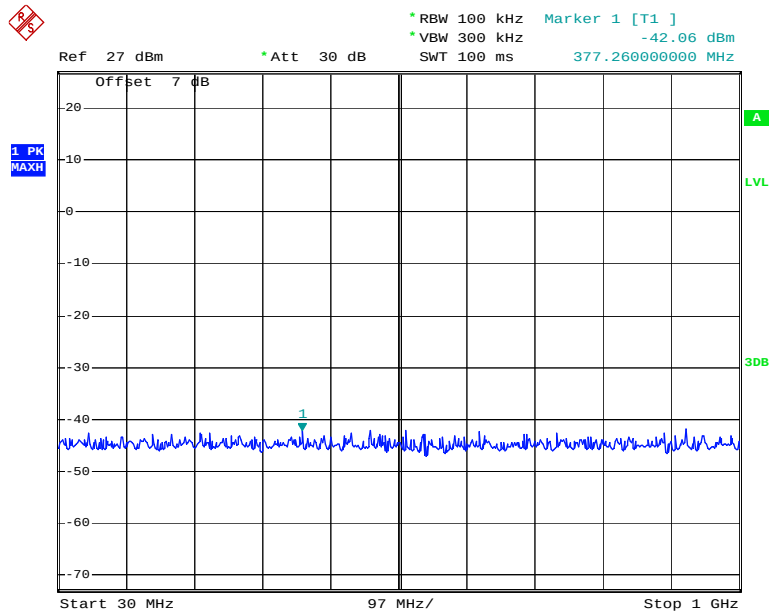
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Antenna0 802.11a High Channel 26.5GHz-40GHz



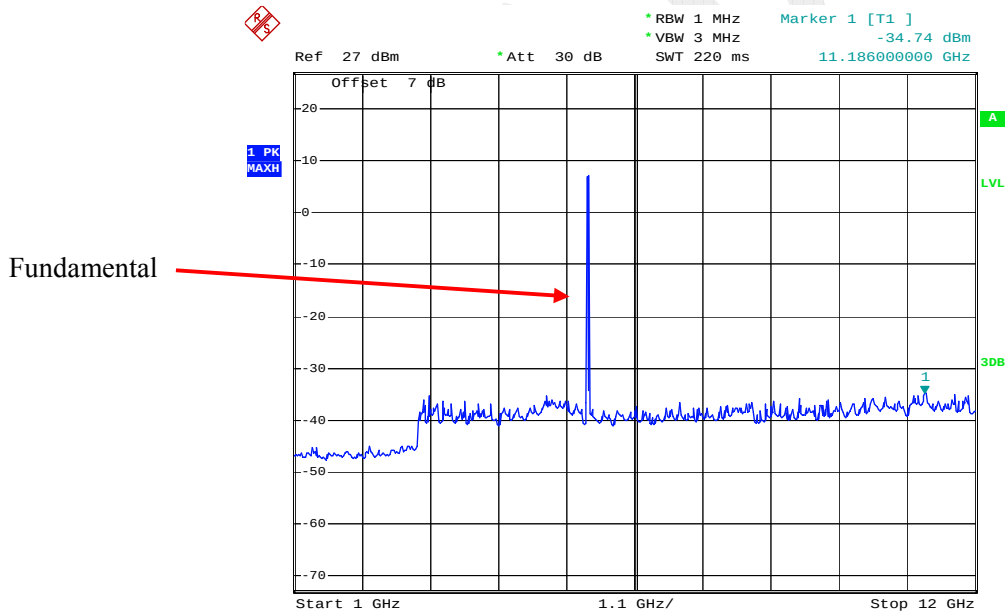
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Antenna0 802.11n ht20 Low Channel 30 MHz-1GHz



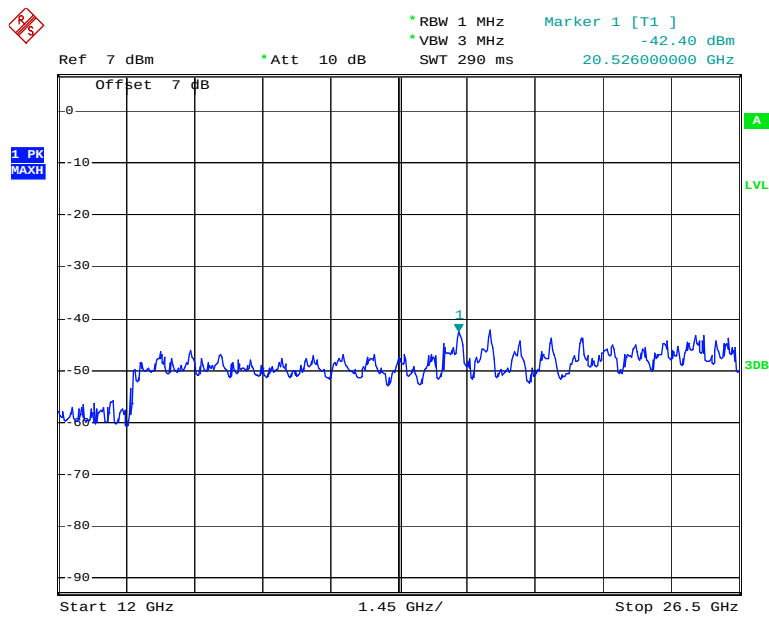
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Antenna0 802.11n ht20 Low Channel 1GHz-12GHz



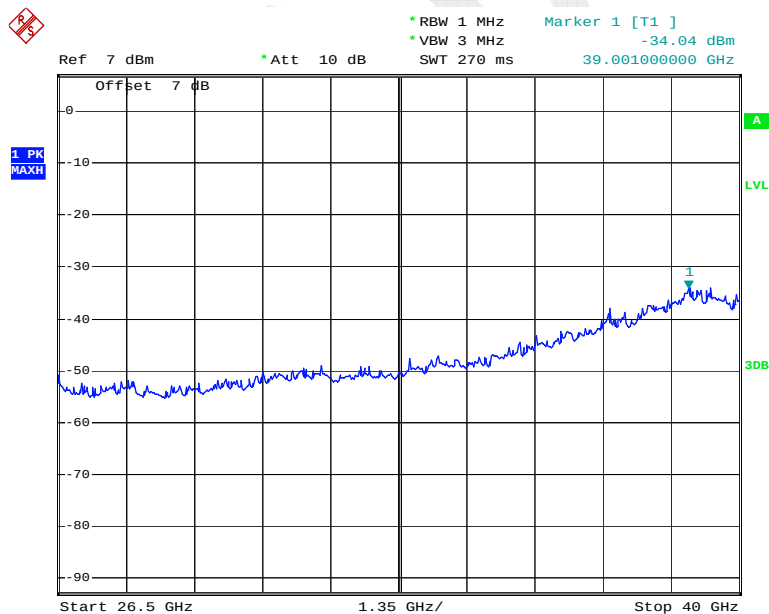
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Antenna0 802.11n ht20 Low Channel 12GHz-26.5GHz



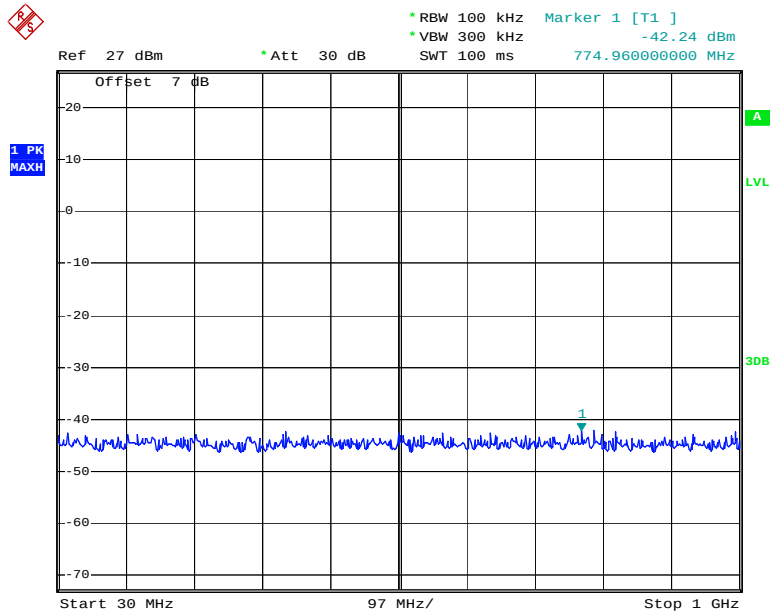
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Antenna0 802.11n ht20 Low Channel 26.5 GHz-40GHz



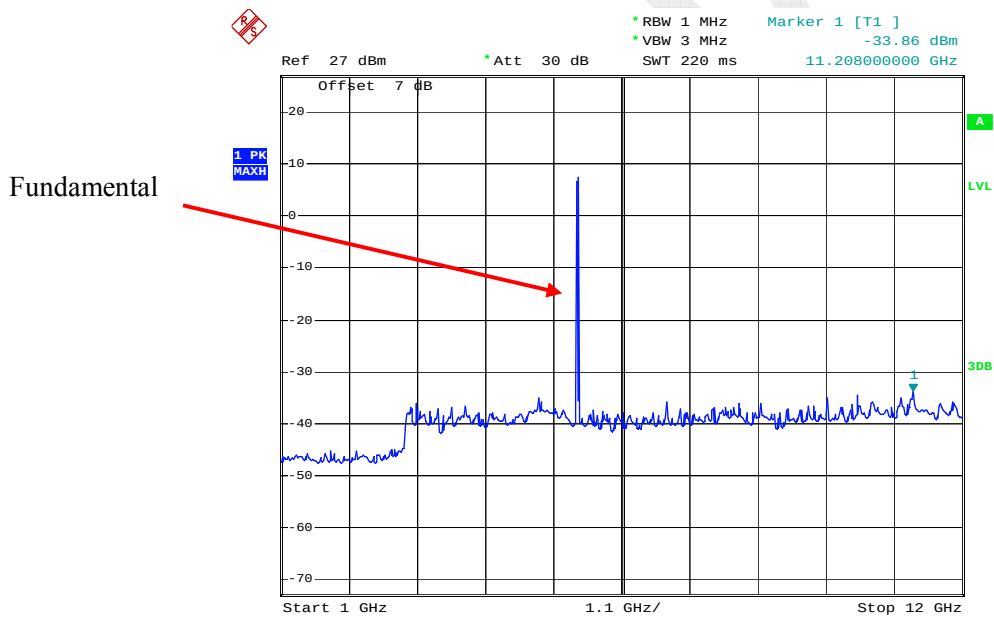
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Antenna0 802.11n ht20 Middle Channel 30 MHz-1GHz



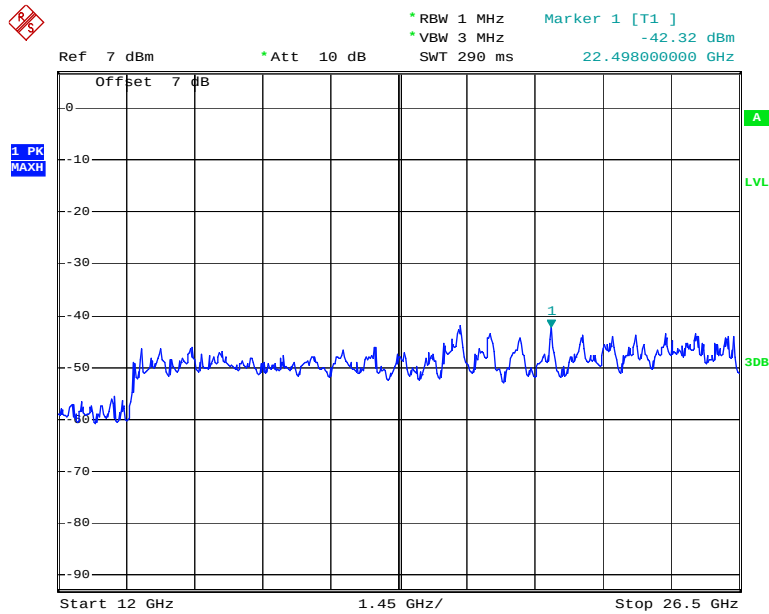
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Antenna0 802.11n ht20 Middle Channel 1GHz-12GHz



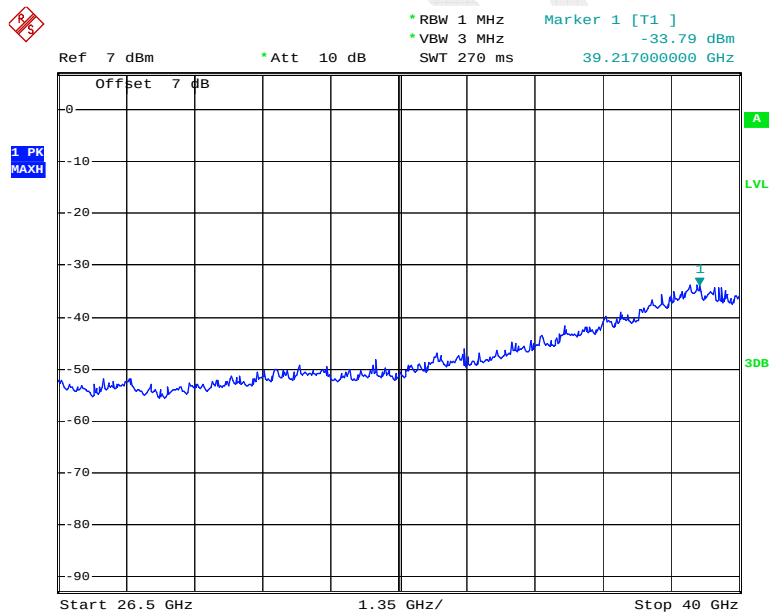
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Antenna0 802.11n ht20 Middle Channel 12 GHz-26.5GHz



Date: 18.NOV.2014 14:49:07

Antenna0 802.11n ht20 Middle Channel 26.5GHz -40GHz



Date: 18.NOV.2014 15:33:48