

# FCC PART 15.407

## TEST REPORT

For

### ZIONCOM ELECTRONICS (SHENZHEN) LTD.

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Shajing Street, Baoan District, Shenzhen City, China

**FCC ID: X7D-WL0273**

<b>Report Type:</b> Original Report	<b>Product Type:</b> AC600 Wireless Dual Band USB Adapter
<b>Test Engineer:</b> Dean Liu	<i>Dean Liu</i>
<b>Report Number:</b> RDG141110002-00B	
<b>Report Date:</b> 2014-11-20	
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FEMVA

## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The ZIONCOM ELECTRONICS (SHENZHEN) LTD.'s product, model number: A1000UA (FCC ID: X7D-WL0273) or ("EUT") in this report is a AC600 Wireless Dual Band USB Adapter, which was measured approximately: 8.6 cm (L) x2.5 cm (W) x 1.5 cm (H), rated input voltage: DC 5.0V from system.

*Note: The series product, model A1000UA, WL0273 are electrically identical, the only difference between them is the model name, we selected A1000UA for fully testing, the details was explained in the attached declaration letter.*

*\* All measurement and test data in this report was gathered from production sample serial number: 141110002 (Assigned by BAACL.Dongguan). The EUT was received on 2014-11-10.*

### Objective

This type approval report is prepared on behalf of ZIONCOM ELECTRONICS (SHENZHEN) LTD. 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: X7D-WL0273.

### 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 Frequency	5180MHz	5200MHz	5240MHz
	Data Rate	(OFDM)6Mbps	(OFDM)6Mbps	(OFDM)6Mbps
	Power Level Setting	22	21	21
802.11n ht20	Test Frequency	5180MHz	5200MHz	5240MHz
	Data Rate	(HT Mixmode) MCS0	(HT Mixmode) MCS0	(HT Mixmode) MCS0
	Power Level Setting	01	01	01
802.11n ht40	Test Frequency	5190MHz	5230MHz	/
	Data Rate	(HT Mix mode) MCS0	(HT Mix mode) MCS0	/
	Power Level Setting	00	00	/
802.11n ac80	Test Frequency	5210MHz	/	/
	Data Rate	(VHTMode) MCS0	/	/
	Power Level Setting	07	/	/

5725–5850MHz Band:

Test Mode	Test Software Version	MT76xxU QA V2.0.4.0 [0325]		
802.11a	Test Frequency	5745MHz	5785MHz	5825MHz
	Data Rate	(OFDM)6Mbps	(OFDM)6Mbps	(OFDM)6Mbps
	Power Level Setting	01	01	01
802.11n ht20	Test Frequency	5745MHz	5785MHz	5825MHz
	Data Rate	(HT Mix mode) MCS0	(HT Mix mode) MCS0	(HT Mix mode) MCS0
	Power Level Setting	08	09	0A
802.11n ht40	Test Frequency	5755MHz	5795MHz	/
	Data Rate	(HT Mix mode) MCS0	(HT Mix mode) MCS0	/
	Power Level Setting	05	06	/
802.11n ac80	Test Frequency	5775MHz	/	/
	Data Rate	(VHT Mode) MCS0	/	/
	Power Level Setting	07	/	/

**Equipment Modifications**

No modification was made to the EUT.

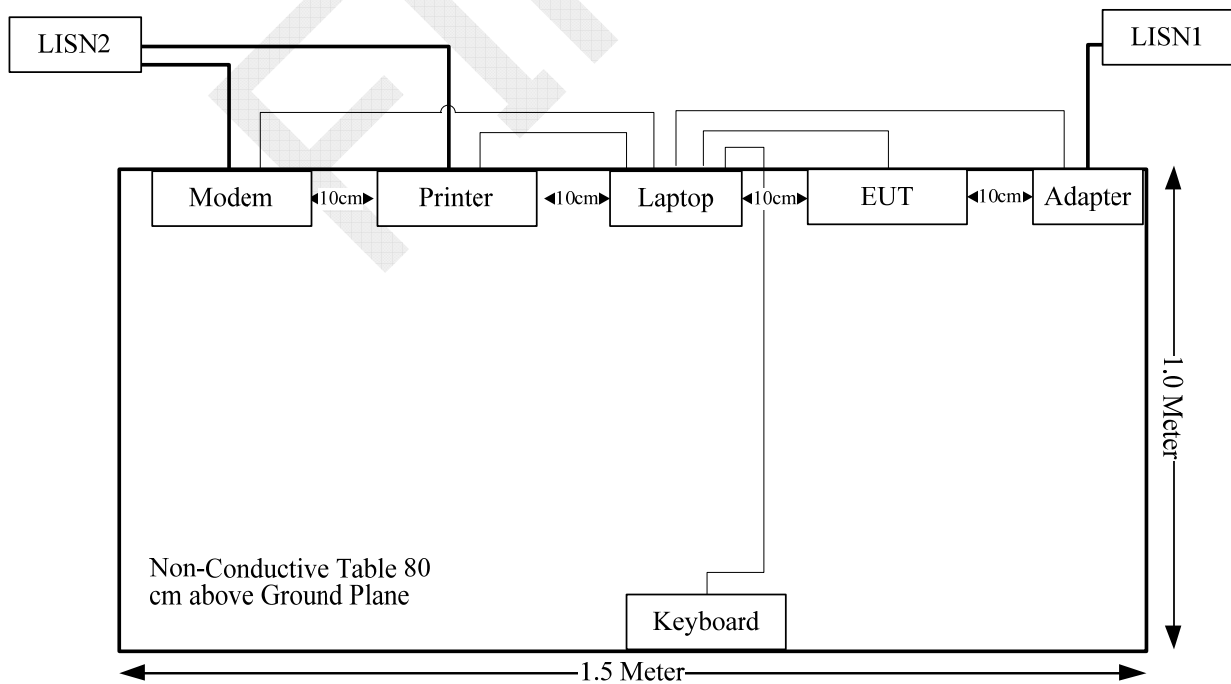
**Support Equipment List and Details**

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017
HP	Printer	C3941A	JPTVOB2337
DELL	Keyboard	L100	CNORH656658907BL05DC
SAST	Modem	AEM-2100	0293

**External Cable**

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Serial Cable	yes	No	1.2	Serial Port of Laptop	Modem
Parallel Cable	yes	No	1.2	ParallelPort of Laptop	Printer
Keyboard Cable	yes	No	1.5	USB Port of Laptop	Keyboard
USB Cable	No	No	1.5	USB Port of Laptop	EUT

**Block Diagram of Test Setup**



**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
FCC §15.407 (f)	RF 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) - RF EXPOSURE

### Applicable Standard

According to §15.407(f) U-NII devices are subject to the radio frequency radiation exposure requirements specified in §1.1307(b), §2.1091 and §2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a “general population/uncontrolled” environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

According to KDB447498 D01 General RF Exposure Guidance v05r02:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

### Measurement Result

For 5150-5250 MHz band:

The maximum conducted output power = 7.61 dBm (5.77 mW) at 5230 MHz  
 $[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})] [\sqrt{f(\text{GHz})}]$   
 $= 5.77/5 \cdot (\sqrt{5.230}) = 2.64 < 3.0$

For 5725-5850 MHz band:

The maximum conducted output power = 7.59 dBm (5.74 mW) at 5825 MHz  
 $[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})] [\sqrt{f(\text{GHz})}]$   
 $= 5.74/5 \cdot (\sqrt{5.825}) = 2.77 < 3.0$

**So the stand-alone SAR evaluation is not necessary.**

## **FCC §15.203 – ANTENNA REQUIREMENT**

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### **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**

This product used one external detachable dual-band antenna and with RP-SMA female connector, the maximum gain is 5 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:

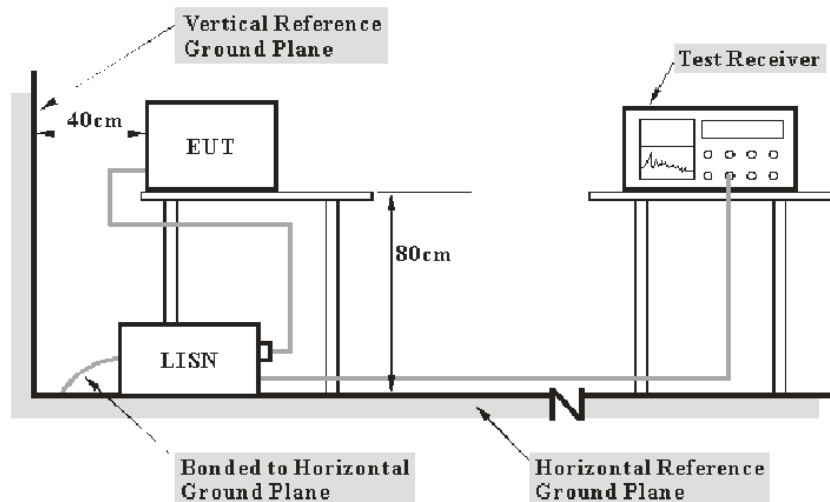
- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

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:

**6.90 dB at 0.196675 MHz** in the **Neutral** conducted mode

## Test Data

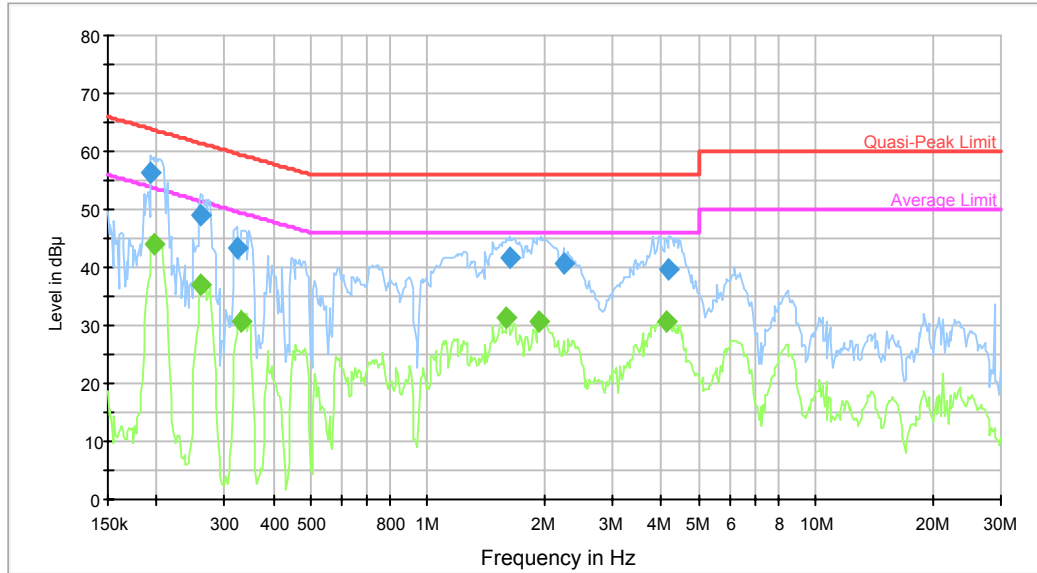
### Environmental Conditions

<b>Temperature:</b>	28.1 °C
<b>Relative Humidity:</b>	52 %
<b>ATM Pressure:</b>	99.7 kPa

*The testing was performed by Dean Liu on 2014-11-13.*

Test Mode: Transmitting

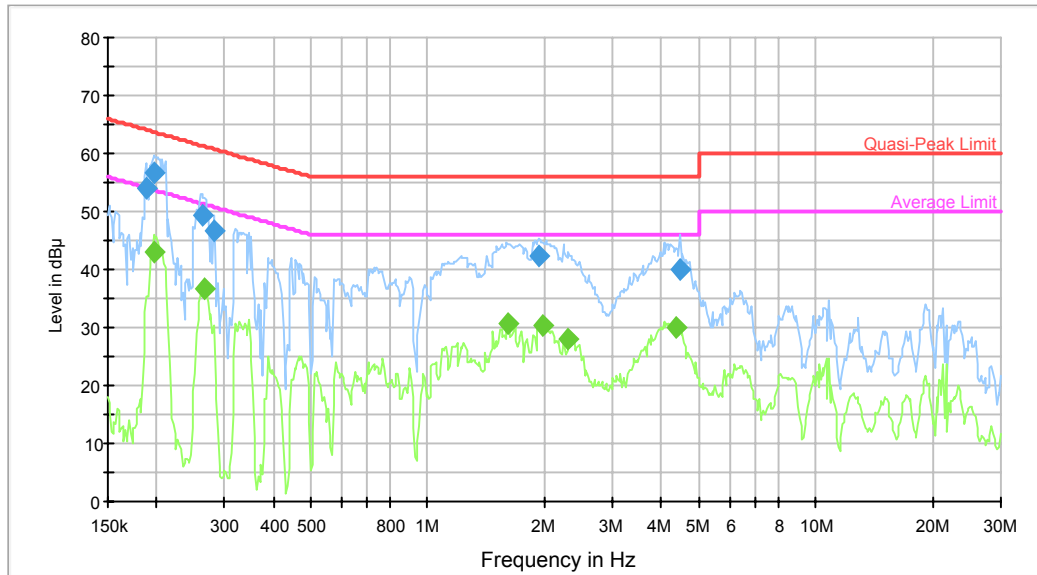
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.193566	56.2	9.000	L1	11.2	7.6	63.9	Compliance
0.259937	49.0	9.000	L1	11.2	12.4	61.4	Compliance
0.322331	43.2	9.000	L1	11.1	16.4	59.6	Compliance
1.624765	41.6	9.000	L1	10.5	14.4	56.0	Compliance
2.234662	40.8	9.000	L1	10.5	15.2	56.0	Compliance
4.193667	39.7	9.000	L1	10.8	16.3	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.196675	44.1	9.000	L1	11.3	9.6	53.7	Compliance
0.259937	37.0	9.000	L1	11.2	14.4	51.4	Compliance
0.330129	30.5	9.000	L1	11.1	18.9	49.4	Compliance
1.599078	31.4	9.000	L1	10.5	14.6	46.0	Compliance
1.936076	30.6	9.000	L1	10.5	15.4	46.0	Compliance
4.127365	30.5	9.000	L1	10.8	15.5	46.0	Compliance

**AC120 V, 60 Hz, Neutral:**



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.188994	53.8	9.000	N	11.1	10.3	64.1	Compliance
0.196675	56.8	9.000	N	11.3	6.9	63.7	Compliance
0.262017	49.3	9.000	N	11.2	12.1	61.4	Compliance
0.281497	46.5	9.000	N	11.2	14.3	60.8	Compliance
1.936076	42.3	9.000	N	10.5	13.7	56.0	Compliance
4.469698	40.1	9.000	N	10.8	15.9	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.196675	43.1	9.000	N	11.3	10.6	53.7	Compliance
0.266226	36.8	9.000	N	11.2	14.4	51.2	Compliance
1.611870	30.7	9.000	N	10.5	15.3	46.0	Compliance
1.982914	30.4	9.000	N	10.5	15.6	46.0	Compliance
2.307034	28.0	9.000	N	10.5	18.0	46.0	Compliance
4.364119	30.0	9.000	N	10.8	16.0	46.0	Compliance

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

### **Applicable Standard**

FCC §15.407; §15.209; §15.205;

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

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

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

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

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

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

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

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

### **Measurement Uncertainty**

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

If  $U_{lab}$  is less than or equal to  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  of Table 1, then:

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



Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:

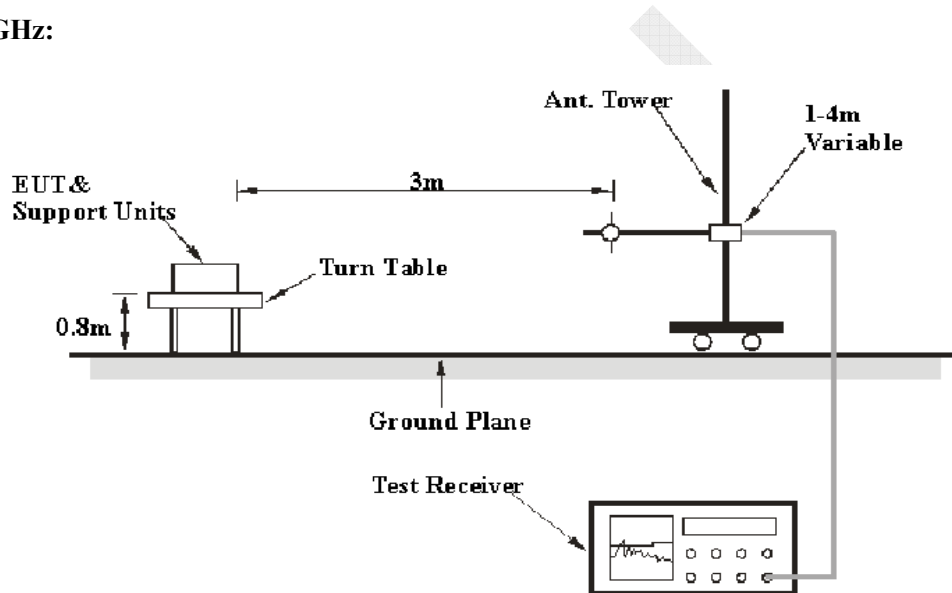
- 30M~200MHz: 5.0 dB
- 200M~1GHz: 6.2 dB
- 1G~6GHz: 4.45 dB
- 6G~18GHz: 5.23 dB

Table 1 – Values of  $U_{cispr}$

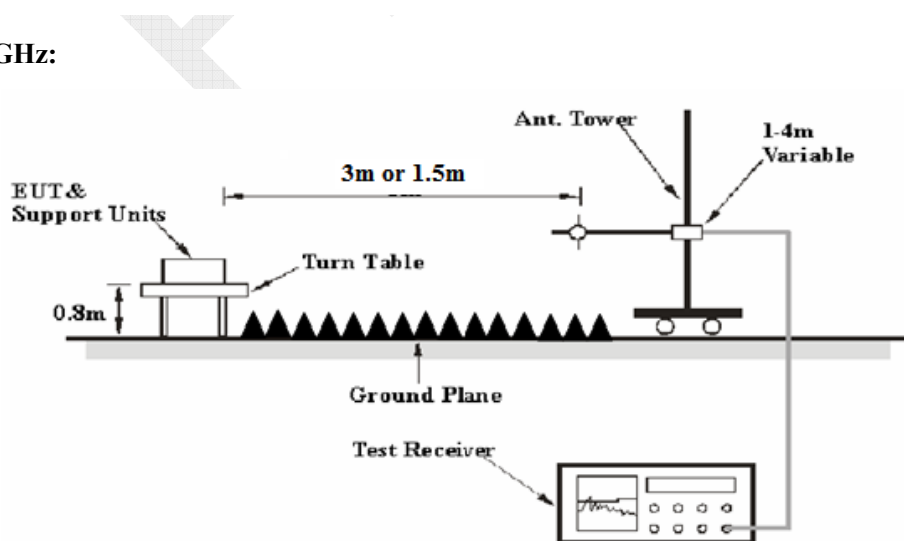
Measurement	$U_{cispr}$
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

### EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission tests were performed in the 3 meters chamber, using the setup accordance with the ANSI C63.4-2003. 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 $\mu$ 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:

**6.17 dB at 5725 MHz** in the **Vertical** polarization for 802.11n AC80 mode

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	24.6 °C-25.6°C
<b>Relative Humidity:</b>	52 %-54%
<b>ATM Pressure:</b>	101.2 kPa-101.6 kPa

*The testing was performed by Dean Liu on 2014-11-12 & 2014-11-17.*

*Mode: Transmitting*

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	62.81	PK	H	31.46	5.94	0.00	100.21	94.21	N/A	N/A
5180	48.32	AV	H	31.46	5.94	0.00	85.72	79.72	N/A	N/A
5180	68.61	PK	V	31.46	5.94	0.00	106.01	100.01	N/A	N/A
5180	53.42	AV	V	31.46	5.94	0.00	90.82	84.82	N/A	N/A
5150	27.25	PK	V	31.40	6.03	0.00	64.68	58.68	74.00	15.32
5150	14.18	AV	V	31.40	6.03	0.00	51.61	45.61	54.00	8.39
10360	30.14	PK	V	36.97	8.60	25.52	50.19	44.19	74.00	29.81
10360	18.29	AV	V	36.97	8.60	25.52	38.34	32.34	54.00	21.66
15540	32.14	PK	V	37.43	14.71	24.98	59.30	53.30	74.00	20.70
15540	18.99	AV	V	37.43	14.71	24.98	46.15	40.15	54.00	13.85
7513	30.38	PK	V	34.81	7.61	26.17	46.63	40.63	74.00	33.37
7513	18.83	AV	V	34.81	7.61	26.17	35.08	29.08	54.00	24.92
2786	32.96	PK	V	26.64	5.26	27.55	37.31	31.31	74.00	42.69
2786	21.41	AV	V	26.64	5.26	27.55	25.76	19.76	54.00	34.24
271	27.24	QP	V	13.71	2.00	21.50	21.45	21.45	46.00	24.55
Middle Channel:5200 MHz										
5200	62.82	PK	H	31.50	5.88	0.00	100.20	94.20	N/A	N/A
5200	48.22	AV	H	31.50	5.88	0.00	85.60	79.60	N/A	N/A
5200	68.61	PK	V	31.50	5.88	0.00	105.99	99.99	N/A	N/A
5200	52.99	AV	V	31.50	5.88	0.00	90.37	84.37	N/A	N/A
10400	29.21	PK	V	36.98	8.57	25.50	49.26	43.26	74.00	30.74
10400	18.13	AV	V	36.98	8.57	25.50	38.18	32.18	54.00	21.82
15600	30.51	PK	V	37.32	14.61	24.69	57.75	51.75	74.00	22.25
15600	18.93	AV	V	37.32	14.61	24.69	46.17	40.17	54.00	13.83
7513	30.52	PK	V	34.81	7.61	26.17	46.77	40.77	74.00	33.23
7513	18.83	AV	V	34.81	7.61	26.17	35.08	29.08	54.00	24.92
2786	32.92	PK	V	26.64	5.26	27.55	37.27	31.27	74.00	42.73
2786	21.26	AV	V	26.64	5.26	27.55	25.61	19.61	54.00	34.39
271	26.85	QP	V	13.71	2.00	21.50	21.06	21.06	46.00	24.94
401	28.21	QP	V	16.22	2.43	21.77	25.09	25.09	46.00	20.91
High Channel:5240 MHz										
5240	61.18	PK	H	31.58	5.82	0.00	98.58	92.58	N/A	N/A
5240	46.63	AV	H	31.58	5.82	0.00	84.03	78.03	N/A	N/A
5240	68.33	PK	V	31.58	5.82	0.00	105.73	99.73	N/A	N/A
5240	52.84	AV	V	31.58	5.82	0.00	90.24	84.24	N/A	N/A
5350	27.14	PK	V	31.80	6.11	0.00	65.05	59.05	74.00	14.95
5350	13.98	AV	V	31.80	6.11	0.00	51.89	45.89	54.00	8.11
10480	29.18	PK	V	37.00	8.51	26.01	48.68	42.68	74.00	31.32
10480	18.13	AV	V	37.00	8.51	26.01	37.63	31.63	54.00	22.37
15720	30.66	PK	V	37.10	14.42	24.92	57.26	51.26	74.00	22.74
15720	19.16	AV	V	37.10	14.42	24.92	45.76	39.76	54.00	14.24
7513	30.41	PK	V	34.81	7.61	26.17	46.66	40.66	74.00	33.34
7513	18.19	AV	V	34.81	7.61	26.17	34.44	28.44	54.00	25.56
2786	33.14	PK	V	26.64	5.26	27.55	37.49	31.49	74.00	42.51
2786	22.07	AV	V	26.64	5.26	27.55	26.42	20.42	54.00	33.58
271	27.03	QP	V	13.71	2.00	21.50	21.24	21.24	46.00	24.76

802.11n ht20 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	62.07	PK	H	31.46	5.94	0.00	99.47	93.47	N/A	N/A
5180	48.21	AV	H	31.46	5.94	0.00	85.61	79.61	N/A	N/A
5180	68.46	PK	V	31.46	5.94	0.00	105.86	99.86	N/A	N/A
5180	52.79	AV	V	31.46	5.94	0.00	90.19	84.19	N/A	N/A
5150	26.23	PK	H	31.40	6.03	0.00	63.66	57.66	74.00	16.34
5150	14.06	AV	H	31.40	6.03	0.00	51.49	45.49	54.00	8.51
10360	28.42	PK	H	36.97	8.60	25.52	48.47	42.47	74.00	31.53
10360	17.56	AV	H	36.97	8.60	25.52	37.61	31.61	54.00	22.39
15540	29.98	PK	H	37.43	14.71	24.98	57.14	51.14	74.00	22.86
15540	18.02	AV	H	37.43	14.71	24.98	45.18	39.18	54.00	14.82
7513	29.97	PK	H	34.81	7.61	26.17	46.22	40.22	74.00	33.78
7513	18.66	AV	H	34.81	7.61	26.17	34.91	28.91	54.00	25.09
2786	32.41	PK	H	26.64	5.26	27.55	36.76	30.76	74.00	43.24
2786	21.02	AV	H	26.64	5.26	27.55	25.37	19.37	54.00	34.63
271	26.70	QP	H	13.71	2.00	21.50	20.91	20.91	46.00	25.09
Middle Channel:5200 MHz										
5200	61.51	PK	H	31.50	5.88	0.00	98.89	92.89	N/A	N/A
5200	47.33	AV	H	31.50	5.88	0.00	84.71	78.71	N/A	N/A
5200	67.27	PK	V	31.50	5.88	0.00	104.65	98.65	N/A	N/A
5200	52.31	AV	V	31.50	5.88	0.00	89.69	83.69	N/A	N/A
10400	28.41	PK	H	36.98	8.57	25.50	48.46	42.46	74.00	31.54
10400	17.49	AV	H	36.98	8.57	25.50	37.54	31.54	54.00	22.46
15600	29.94	PK	H	37.32	14.61	24.69	57.18	51.18	74.00	22.82
15600	18.03	AV	H	37.32	14.61	24.69	45.27	39.27	54.00	14.73
7513	29.91	PK	H	34.81	7.61	26.17	46.16	40.16	74.00	33.84
7513	18.63	AV	H	34.81	7.61	26.17	34.88	28.88	54.00	25.12
2786	32.37	PK	H	26.64	5.26	27.55	36.72	30.72	74.00	43.28
2786	21.01	AV	H	26.64	5.26	27.55	25.36	19.36	54.00	34.64
271	27.10	QP	H	13.71	2.00	21.50	21.31	21.31	46.00	24.69
401	27.66	QP	H	16.22	2.43	21.77	24.54	24.54	46.00	21.46
High Channel:5240 MHz										
5240	60.66	PK	H	31.58	5.82	0.00	98.06	92.06	N/A	N/A
5240	46.03	AV	H	31.58	5.82	0.00	83.43	77.43	N/A	N/A
5240	66.80	PK	V	31.58	5.82	0.00	104.20	98.20	N/A	N/A
5240	52.07	AV	V	31.58	5.82	0.00	89.47	83.47	N/A	N/A
5350	26.88	PK	H	31.80	6.11	0.00	64.79	58.79	74.00	15.21
5350	13.97	AV	H	31.80	6.11	0.00	51.88	45.88	54.00	8.12
10480	28.38	PK	H	37.00	8.51	26.01	47.88	41.88	74.00	32.12
10480	17.48	AV	H	37.00	8.51	26.01	36.98	30.98	54.00	23.02
15720	29.74	PK	H	37.10	14.42	24.92	56.34	50.34	74.00	23.66
15720	17.93	AV	H	37.10	14.42	24.92	44.53	38.53	54.00	15.47
7513	29.81	PK	H	34.81	7.61	26.17	46.06	40.06	74.00	33.94
7513	18.58	AV	H	34.81	7.61	26.17	34.83	28.83	54.00	25.17
2786	32.28	PK	H	26.64	5.26	27.55	36.63	30.63	74.00	43.37
2786	20.94	AV	H	26.64	5.26	27.55	25.29	19.29	54.00	34.71
271	26.86	QP	H	13.71	2.00	21.50	21.07	21.07	46.00	24.93

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	59.29	PK	H	31.48	5.91	0.00	96.68	90.68	N/A	N/A
5190	45.75	AV	H	31.48	5.91	0.00	83.14	77.14	N/A	N/A
5190	64.90	PK	V	31.48	5.91	0.00	102.29	96.29	N/A	N/A
5190	50.55	AV	V	31.48	5.91	0.00	87.94	81.94	N/A	N/A
5150	27.03	PK	H	31.40	6.03	0.00	64.46	58.46	74.00	15.54
5150	14.10	AV	H	31.40	6.03	0.00	51.53	45.53	54.00	8.47
10380	27.84	PK	H	36.98	8.59	25.51	47.90	41.90	74.00	32.10
10380	17.49	AV	H	36.98	8.59	25.51	37.55	31.55	54.00	22.45
15570	30.83	PK	H	37.37	14.66	24.83	58.03	52.03	74.00	21.97
15570	19.01	AV	H	37.37	14.66	24.83	46.21	40.21	54.00	13.79
7513	29.78	PK	H	34.81	7.61	26.17	46.03	40.03	74.00	33.97
7513	18.69	AV	H	34.81	7.61	26.17	34.94	28.94	54.00	25.06
2786	32.97	PK	H	26.64	5.26	27.55	37.32	31.32	74.00	42.68
2786	21.03	AV	H	26.64	5.26	27.55	25.38	19.38	54.00	34.62
271	26.80	QP	H	13.71	2.00	21.50	21.01	21.01	46.00	24.99
High Channel:5230 MHz										
5230	57.83	PK	H	31.56	5.84	0.00	95.23	89.23	N/A	N/A
5230	44.16	AV	H	31.56	5.84	0.00	81.56	75.56	N/A	N/A
5230	64.40	PK	V	31.56	5.84	0.00	101.80	95.80	N/A	N/A
5230	49.93	AV	V	31.56	5.84	0.00	87.33	81.33	N/A	N/A
5350	26.94	PK	V	31.80	6.11	0.00	64.85	58.85	74.00	15.15
5350	13.99	AV	V	31.80	6.11	0.00	51.90	45.90	54.00	8.10
10460	27.93	PK	V	36.99	8.52	25.88	47.56	41.56	74.00	32.44
10460	17.51	AV	V	36.99	8.52	25.88	37.14	31.14	54.00	22.86
15690	30.79	PK	V	37.16	14.47	24.87	57.55	51.55	74.00	22.45
15690	18.91	AV	V	37.16	14.47	24.87	45.67	39.67	54.00	14.33
7513	29.68	PK	V	34.81	7.61	26.17	45.93	39.93	74.00	34.07
7513	18.73	AV	V	34.81	7.61	26.17	34.98	28.98	54.00	25.02
2786	32.86	PK	V	26.64	5.26	27.55	37.21	31.21	74.00	42.79
2786	21.01	AV	V	26.64	5.26	27.55	25.36	19.36	54.00	34.64
271	25.70	QP	V	13.71	2.00	21.50	19.91	19.91	46.00	26.09

802.11n ac80 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)						
Channel:5210 MHz										
5210	52.93	PK	H	31.52	5.87	0.00	90.32	84.32	N/A	N/A
5210	39.07	AV	H	31.52	5.87	0.00	76.46	70.46	N/A	N/A
5210	60.73	PK	V	31.52	5.87	0.00	98.12	92.12	N/A	N/A
5210	41.74	AV	V	31.52	5.87	0.00	79.13	73.13	N/A	N/A
5150	27.77	PK	V	31.40	6.03	0.00	65.20	59.20	74.00	14.80
5150	15.63	AV	V	31.40	6.03	0.00	53.06	47.06	54.00	6.94
5350	27.81	PK	V	31.60	5.81	0.00	65.22	59.22	74.00	14.78
5350	15.73	AV	V	31.60	5.81	0.00	53.14	47.14	54.00	6.86
10420	29.12	PK	V	36.98	8.55	25.63	49.02	43.02	74.00	30.98
10420	18.41	AV	V	36.98	8.55	25.63	38.31	32.31	54.00	21.69
15630	28.80	PK	V	37.27	14.56	24.75	55.88	49.88	74.00	24.12
15630	18.31	AV	V	37.27	14.56	24.75	45.39	39.39	54.00	14.61
7513	30.93	PK	V	34.81	7.61	26.17	47.18	41.18	74.00	32.82
7513	18.68	AV	V	34.81	7.61	26.17	34.93	28.93	54.00	25.07
2786	34.06	PK	V	26.64	5.26	27.55	38.41	32.41	74.00	41.59
2786	21.02	AV	V	26.64	5.26	27.55	25.37	19.37	74.00	54.63
271	27.61	QP	V	13.71	2.00	21.50	21.82	21.82	46.00	24.18

\*Within measurement uncertainty!

5725MHz-5850MHz:  
802.11 ac 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:5745 MHz										
5745	62.77	PK	H	32.15	6.10	0.00	101.02	95.02	N/A	N/A
5745	48.51	AV	H	32.15	6.10	0.00	86.76	80.76	N/A	N/A
5745	67.92	PK	V	32.15	6.10	0.00	106.17	100.17	N/A	N/A
5745	53.64	AV	V	32.15	6.10	0.00	91.89	85.89	N/A	N/A
5725	27.14	PK	V	32.15	6.04	0.00	65.33	59.33	74.00	14.67
5725	13.94	AV	V	32.15	6.04	0.00	52.13	46.13	54.00	7.87
11490	29.04	PK	V	37.89	9.86	26.14	50.65	44.65	74.00	29.35
11490	17.99	AV	V	37.89	9.86	26.14	39.60	33.60	54.00	20.40
17235	30.24	PK	V	40.91	14.02	25.63	59.54	53.54	74.00	20.46
17235	18.74	AV	V	40.91	14.02	25.63	48.04	42.04	54.00	11.96
7513	30.15	PK	V	34.81	7.61	26.17	46.40	40.40	74.00	33.60
7513	18.63	AV	V	34.81	7.61	26.17	34.88	28.88	54.00	25.12
2786	32.76	PK	V	26.64	5.26	27.55	37.11	31.11	74.00	42.89
2786	21.11	AV	V	26.64	5.26	27.55	25.46	19.46	54.00	34.54
271	27.20	QP	V	13.71	2.00	21.50	21.41	21.41	46.00	24.59
Middle Channel:5785 MHz										
5785	60.55	PK	H	32.16	6.12	0.00	98.83	92.83	N/A	N/A
5785	48.01	AV	H	32.16	6.12	0.00	86.29	80.29	N/A	N/A
5785	67.52	PK	V	32.16	6.12	0.00	105.80	99.80	N/A	N/A
5785	53.78	AV	V	32.16	6.12	0.00	92.06	86.06	N/A	N/A
11570	29.02	PK	V	37.90	9.76	26.07	50.61	44.61	74.00	29.39
11570	17.96	AV	V	37.90	9.76	26.07	39.55	33.55	54.00	20.45
17355	30.34	PK	V	41.63	13.37	25.63	59.71	53.71	74.00	20.29
17355	18.75	AV	V	41.63	13.37	25.63	48.12	42.12	54.00	11.88
7513	30.22	PK	V	34.81	7.61	26.17	46.47	40.47	74.00	33.53
7513	18.66	AV	V	34.81	7.61	26.17	34.91	28.91	54.00	25.09
2786	32.72	PK	V	26.64	5.26	27.55	37.07	31.07	74.00	42.93
2786	21.02	AV	V	26.64	5.26	27.55	25.37	19.37	54.00	34.63
271	26.80	QP	V	13.71	2.00	21.50	21.01	21.01	46.00	24.99
401	28.10	QP	V	16.22	2.43	21.77	24.98	24.98	46.00	21.02
High Channel:5825 MHz										
5825	61.51	PK	H	32.17	6.24	0.00	99.92	93.92	N/A	N/A
5825	49.02	AV	H	32.17	6.24	0.00	87.43	81.43	N/A	N/A
5825	67.53	PK	V	32.17	6.24	0.00	105.94	99.94	N/A	N/A
5825	53.89	AV	V	32.17	6.24	0.00	92.30	86.30	N/A	N/A
5850	27.85	PK	V	32.17	6.34	0.00	66.36	60.36	74.00	13.64
5850	14.30	AV	V	32.17	6.34	0.00	52.81	46.81	54.00	7.19
11650	29.11	PK	V	37.90	9.63	25.75	50.89	44.89	74.00	29.11
11650	18.10	AV	V	37.90	9.63	25.75	39.88	33.88	54.00	20.12
17475	30.42	PK	V	42.35	12.73	25.39	60.11	54.11	74.00	19.89
17475	19.01	AV	V	42.35	12.73	25.39	48.70	42.70	54.00	11.30
7513	30.26	PK	V	34.81	7.61	26.17	46.51	40.51	74.00	33.49
7513	18.68	AV	V	34.81	7.61	26.17	34.93	28.93	54.00	25.07
2786	33.14	PK	V	26.64	5.26	27.55	37.49	31.49	74.00	42.51
2786	22.06	AV	V	26.64	5.26	27.55	26.41	20.41	54.00	33.59
271	27.01	QP	V	13.71	2.00	21.50	21.22	21.22	46.00	24.78



802.11n ht20 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:5745 MHz										
5745	61.50	PK	H	32.15	6.10	0.00	99.75	93.75	N/A	N/A
5745	47.58	AV	H	32.15	6.10	0.00	85.83	79.83	N/A	N/A
5745	67.67	PK	V	32.15	6.10	0.00	105.92	99.92	N/A	N/A
5745	52.96	AV	V	32.15	6.10	0.00	91.21	85.21	N/A	N/A
5725	27.49	PK	V	32.15	6.04	0.00	65.68	59.68	74.00	14.32
5725	14.07	AV	V	32.15	6.04	0.00	52.26	46.26	54.00	7.74
11490	29.01	PK	V	37.89	9.86	26.14	50.62	44.62	74.00	29.38
11490	19.26	AV	V	37.89	9.86	26.14	40.87	34.87	54.00	19.13
17235	29.54	PK	V	40.91	14.02	25.63	58.84	52.84	74.00	21.16
17235	18.74	AV	V	40.91	14.02	25.63	48.04	42.04	54.00	11.96
7513	29.60	PK	V	34.81	7.61	26.17	45.85	39.85	74.00	34.15
7513	18.65	AV	V	34.81	7.61	26.17	34.90	28.90	54.00	25.10
2786	33.32	PK	V	26.64	5.26	27.55	37.67	31.67	74.00	42.33
2786	21.01	AV	V	26.64	5.26	27.55	25.36	19.36	54.00	34.64
271	26.70	QP	V	13.71	2.00	21.50	20.91	20.91	46.00	25.09
Middle Channel:5785 MHz										
5785	59.63	PK	H	32.16	6.12	0.00	97.91	91.91	N/A	N/A
5785	46.68	AV	H	32.16	6.12	0.00	84.96	78.96	N/A	N/A
5785	67.26	PK	V	32.16	6.12	0.00	105.54	99.54	N/A	N/A
5785	53.38	AV	V	32.16	6.12	0.00	91.66	85.66	N/A	N/A
11570	29.03	PK	V	37.90	9.76	26.07	50.62	44.62	74.00	29.38
11570	19.28	AV	V	37.90	9.76	26.07	40.87	34.87	54.00	19.13
17355	29.66	PK	V	41.63	13.37	25.63	59.03	53.03	74.00	20.97
17355	18.83	AV	V	41.63	13.37	25.63	48.20	42.20	54.00	11.80
7513	29.74	PK	V	34.81	7.61	26.17	45.99	39.99	74.00	34.01
7513	18.66	AV	V	34.81	7.61	26.17	34.91	28.91	54.00	25.09
2786	32.36	PK	V	26.64	5.26	27.55	36.71	30.71	74.00	43.29
2786	21.02	AV	V	26.64	5.26	27.55	25.37	19.37	54.00	34.63
271	27.10	QP	V	13.71	2.00	21.50	21.31	21.31	46.00	24.69
401	28.00	QP	V	16.22	2.43	21.77	24.88	24.88	46.00	21.12
High Channel:5825 MHz										
5825	58.66	PK	H	32.17	6.24	0.00	97.07	91.07	N/A	N/A
5825	45.40	AV	H	32.17	6.24	0.00	83.81	77.81	N/A	N/A
5825	65.06	PK	V	32.17	6.24	0.00	103.47	97.47	N/A	N/A
5825	50.87	AV	V	32.17	6.24	0.00	89.28	83.28	N/A	N/A
5850	27.14	PK	V	32.17	6.34	0.00	65.65	59.65	74.00	14.35
5850	14.32	AV	V	32.17	6.34	0.00	52.83	46.83	54.00	7.17
11650	29.33	PK	V	37.90	9.63	25.75	51.11	45.11	74.00	28.89
11650	19.38	AV	V	37.90	9.63	25.75	41.16	35.16	54.00	18.84
17475	29.67	PK	V	42.35	12.73	25.39	59.36	53.36	74.00	20.64
17475	18.85	AV	V	42.35	12.73	25.39	48.54	42.54	54.00	11.46
7513	29.83	PK	V	34.81	7.61	26.17	46.08	40.08	74.00	33.92
7513	18.82	AV	V	34.81	7.61	26.17	35.07	29.07	54.00	24.93
2786	33.71	PK	V	26.64	5.26	27.55	38.06	32.06	74.00	41.94
2786	21.02	AV	V	26.64	5.26	27.55	25.37	19.37	54.00	34.63
271	26.90	QP	V	13.71	2.00	21.50	21.11	21.11	46.00	24.89

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:5755 MHz										
5755	59.80	PK	H	32.15	6.11	0.00	98.06	92.06	N/A	N/A
5755	49.17	AV	H	32.15	6.11	0.00	87.43	81.43	N/A	N/A
5755	65.80	PK	V	32.15	6.11	0.00	104.06	98.06	N/A	N/A
5755	54.72	AV	V	32.15	6.11	0.00	92.98	86.98	N/A	N/A
5725	27.55	PK	V	32.15	6.04	0.00	65.74	59.74	74.00	14.26
5725	14.06	AV	V	32.15	6.04	0.00	52.25	46.25	54.00	7.75
11510	29.92	PK	V	37.90	9.86	26.12	51.56	45.56	74.00	28.44
11510	19.10	AV	V	37.90	9.86	26.12	40.74	34.74	54.00	19.26
17265	29.96	PK	V	41.09	13.86	25.63	59.28	53.28	74.00	20.72
17265	18.24	AV	V	41.09	13.86	25.63	47.56	41.56	54.00	12.44
7513	29.80	PK	V	34.81	7.61	26.17	46.05	40.05	74.00	33.95
7513	18.32	AV	V	34.81	7.61	26.17	34.57	28.57	54.00	25.43
2786	32.39	PK	V	26.64	5.26	27.55	36.74	30.74	74.00	43.26
2786	21.03	AV	V	26.64	5.26	27.55	25.38	19.38	54.00	34.62
271	28.40	QP	V	13.71	2.00	21.50	22.61	22.61	46.00	23.39
High Channel:5795 MHz										
5795	60.15	PK	H	32.16	6.13	0.00	98.44	92.44	N/A	N/A
5795	50.12	AV	H	32.16	6.13	0.00	88.41	82.41	N/A	N/A
5795	66.03	PK	V	32.16	6.13	0.00	104.32	98.32	N/A	N/A
5795	54.92	AV	V	32.16	6.13	0.00	93.21	87.21	N/A	N/A
5850	27.03	PK	V	32.17	6.34	0.00	65.54	59.54	74.00	14.46
5850	14.20	AV	V	32.17	6.34	0.00	52.71	46.71	54.00	7.29
11590	28.74	PK	V	37.90	9.73	26.06	50.31	44.31	74.00	29.69
11590	18.38	AV	V	37.90	9.73	26.06	39.95	33.95	54.00	20.05
17385	29.02	PK	V	41.81	13.21	25.63	58.41	52.41	74.00	21.59
17385	18.36	AV	V	41.81	13.21	25.63	47.75	41.75	54.00	12.25
7513	30.21	PK	V	34.81	7.61	26.17	46.46	40.46	74.00	33.54
7513	18.66	AV	V	34.81	7.61	26.17	34.91	28.91	54.00	25.09
2786	33.26	PK	V	26.64	5.26	27.55	37.61	31.61	74.00	42.39
2786	21.06	AV	V	26.64	5.26	27.55	25.41	19.41	54.00	34.59
271	27.60	QP	V	13.71	2.00	21.50	21.81	21.81	46.00	24.19

\*Within measurement uncertainty!

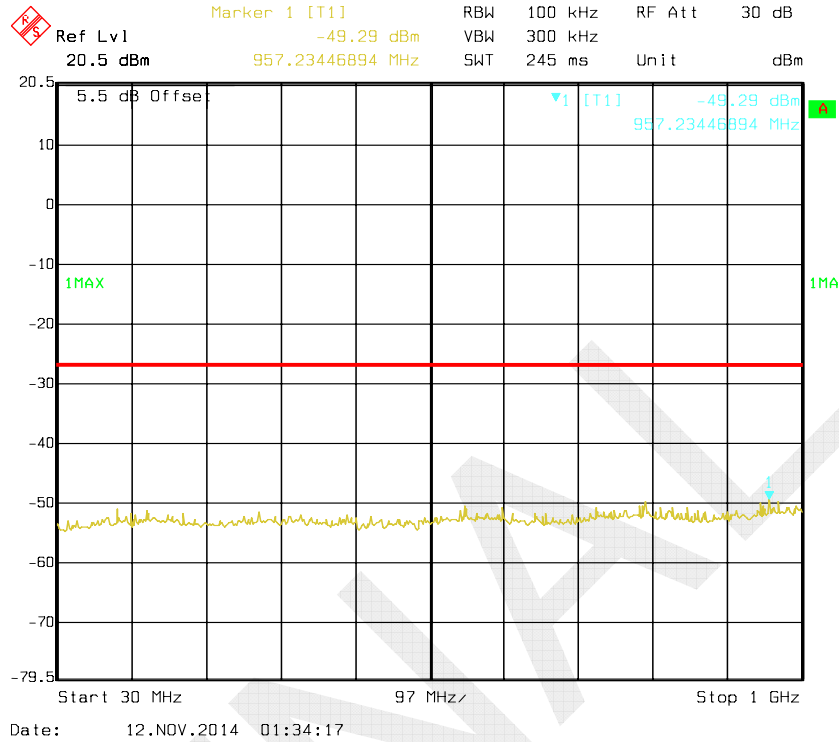
802.11n ac80 mode:

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)						
Channel:5775 MHz										
5775	53.00	PK	H	32.16	6.12	0.00	91.28	85.28	N/A	N/A
5775	39.12	AV	H	32.16	6.12	0.00	77.40	71.40	N/A	N/A
5775	60.81	PK	V	32.16	6.12	0.00	99.09	93.09	N/A	N/A
5775	41.80	AV	V	32.16	6.12	0.00	80.08	74.08	N/A	N/A
5725	27.76	PK	V	32.15	6.04	0.00	65.95	59.95	74.00	14.05
5725	15.64	AV	V	32.15	6.04	0.00	53.83	47.83	54.00	6.17
5850	27.82	PK	V	32.17	6.34	1.00	65.33	59.33	74.00	14.67
5850	15.75	AV	V	32.17	6.34	2.00	52.26	46.26	54.00	7.74
11550	29.18	PK	V	37.90	9.80	26.09	50.79	44.79	74.00	29.21
11550	18.44	AV	V	37.90	9.80	26.09	40.05	34.05	54.00	19.95
17325	28.82	PK	V	41.45	13.54	25.63	58.18	52.18	74.00	21.82
17325	18.32	AV	V	41.45	13.54	25.63	47.68	41.68	54.00	12.32
7513	30.96	PK	V	34.81	7.61	26.17	47.21	41.21	74.00	32.79
7513	18.70	AV	V	34.81	7.61	26.17	34.95	28.95	54.00	25.05
2786	34.07	PK	V	26.64	5.26	27.55	38.42	32.42	74.00	41.58
2786	21.03	AV	V	26.64	5.26	27.55	25.38	19.38	54.00	34.62
271	27.60	QP	V	13.71	2.00	21.50	21.81	21.81	46.00	24.19

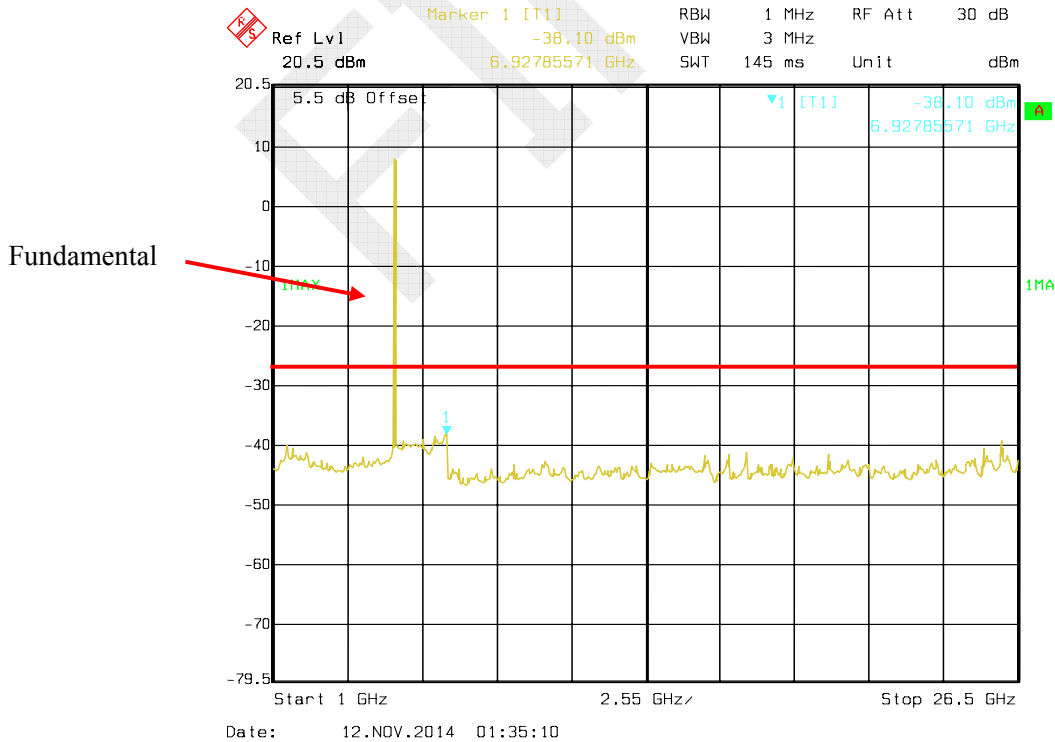
### Conducted Spurious Emission at Antenna Port

Please refer to the following plots:  
5150MHz-5250MHz:

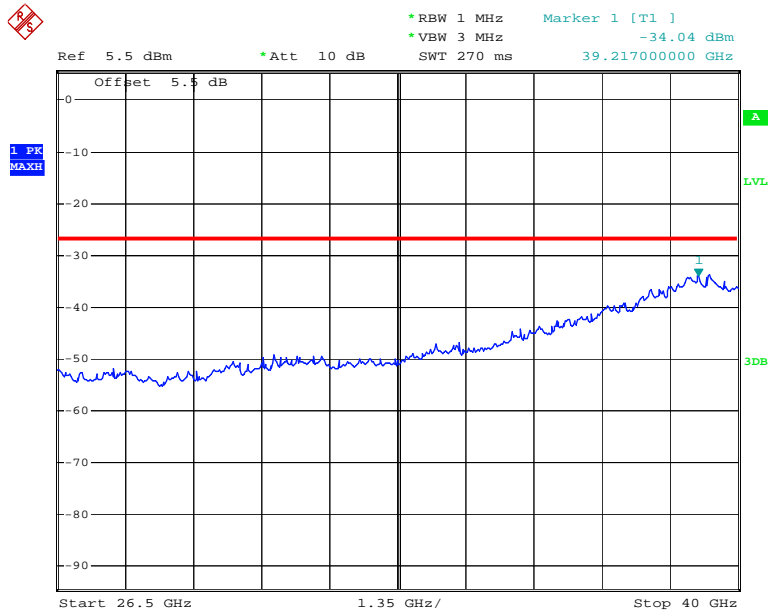
#### 802.11a Low Channel 30MHz-1GHz



#### 802.11a Low Channel 1GHz-26.5GHz

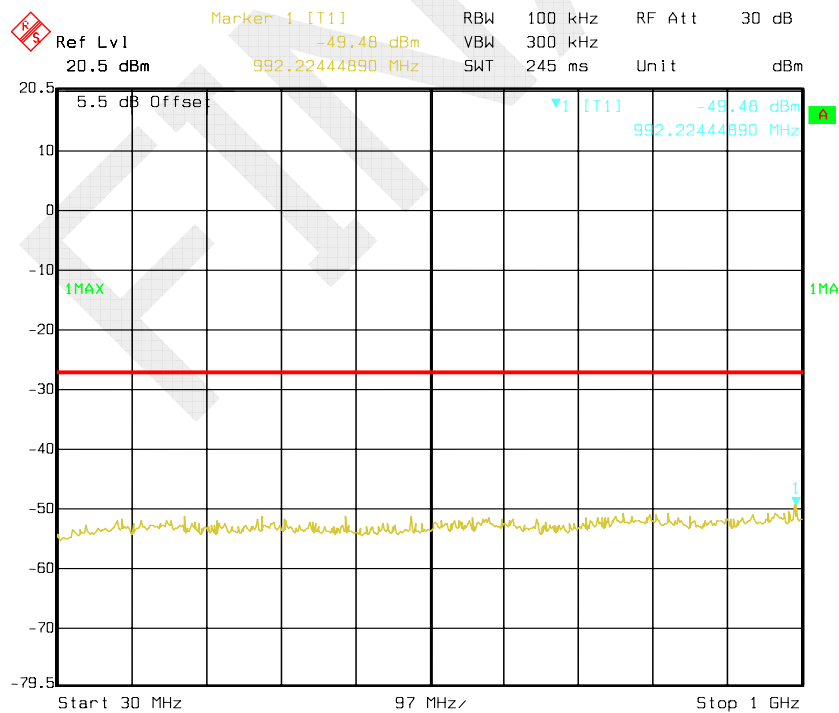


### 802.11a Low Channel 26.5GHz-40GHz



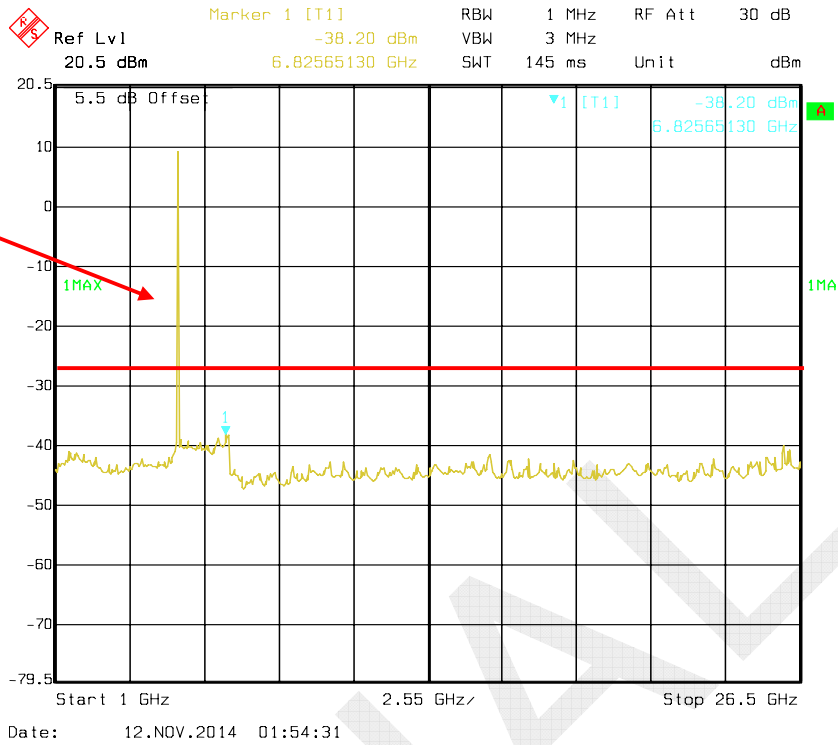
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### 802.11a Middle Channel 30MHz-1GHz

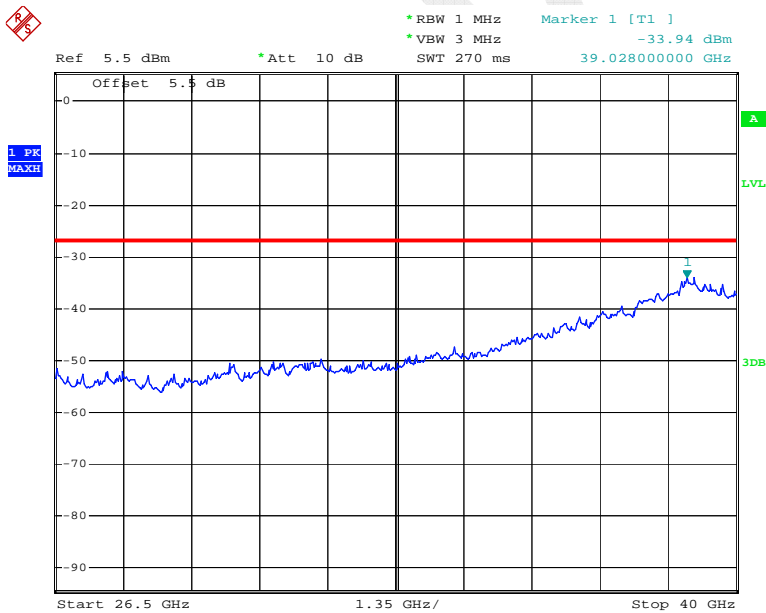


Date: 12.NOV.2014 01:55:23

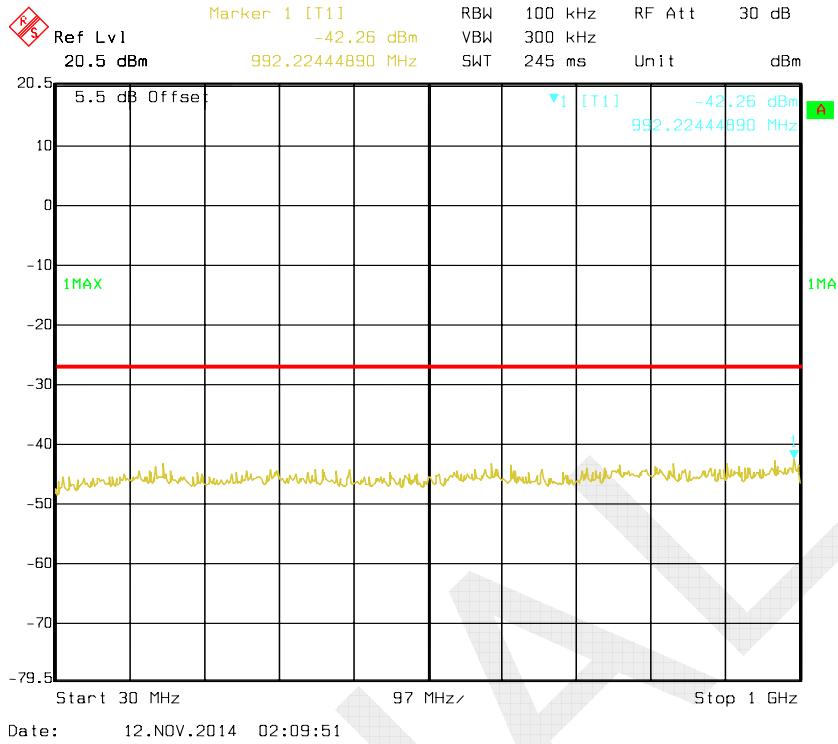
**802.11a Middle Channel 1GHz -26.5GHz**



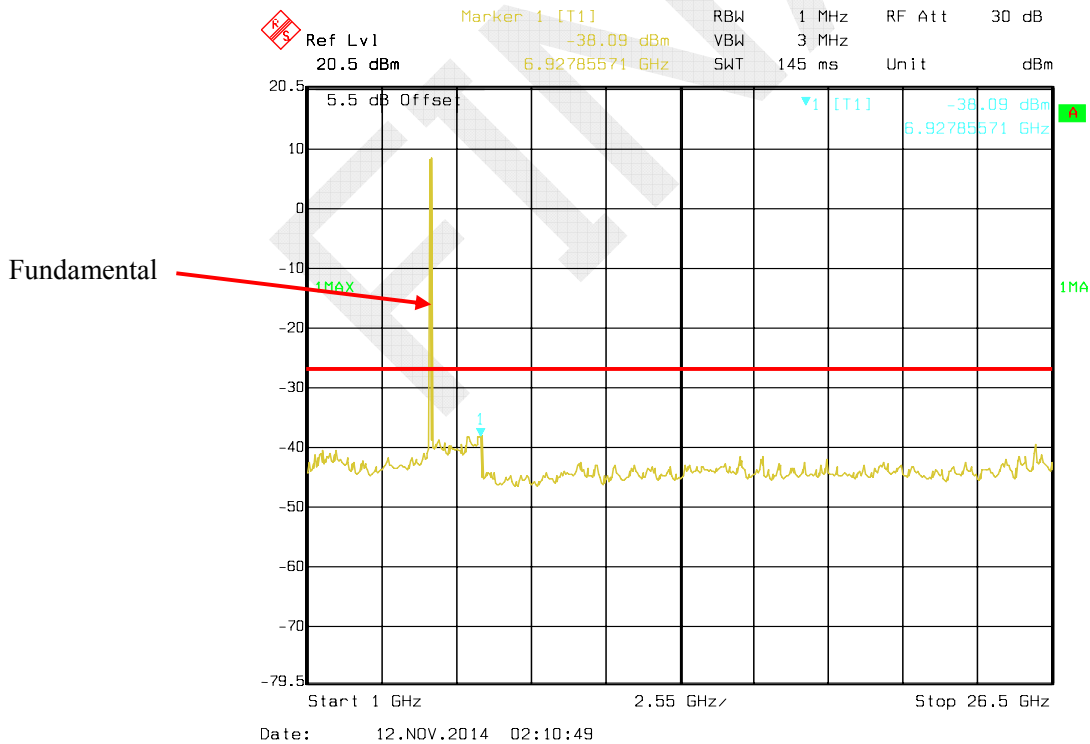
**802.11a Middle Channel 26.5GHz-40GHz**



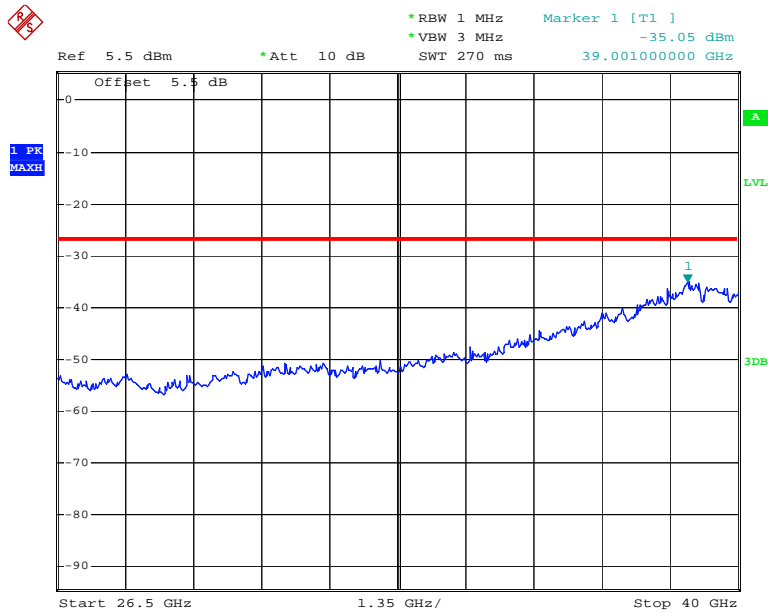
### 802.11a High Channel 30MHz-1GHz



### 802.11a High Channel 1GHz-26.5GHz

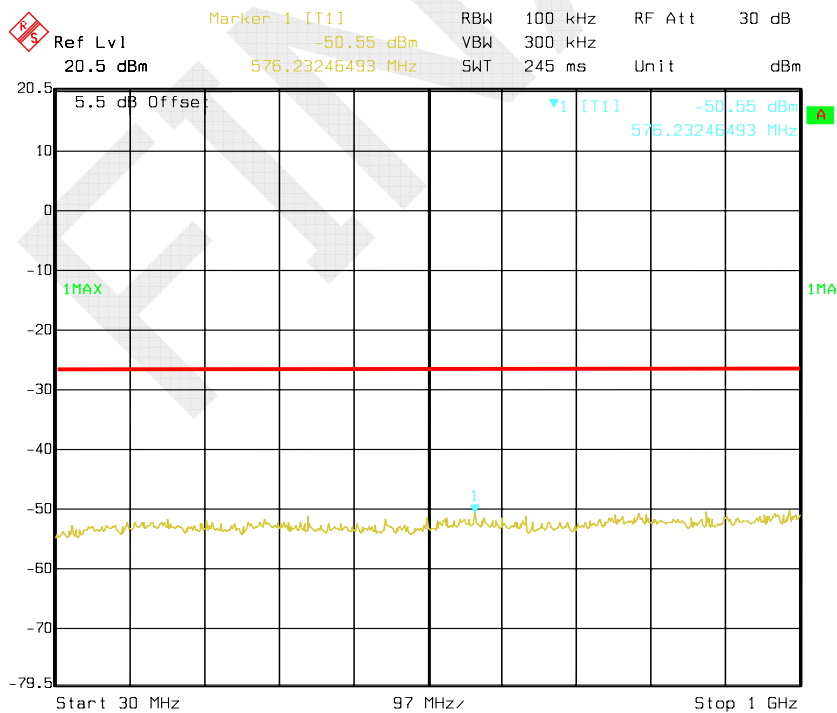


### 802.11a High Channel 26.5GHz-40GHz



Date: 17.NOV.2014 09:48:56

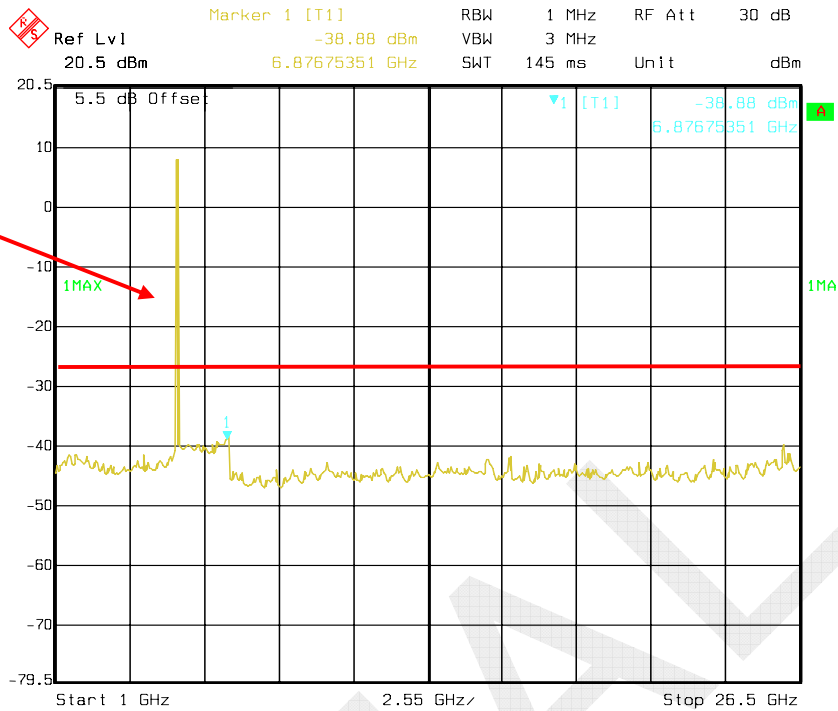
### 802.11n ht20 Low Channel 30MHz-1GHz



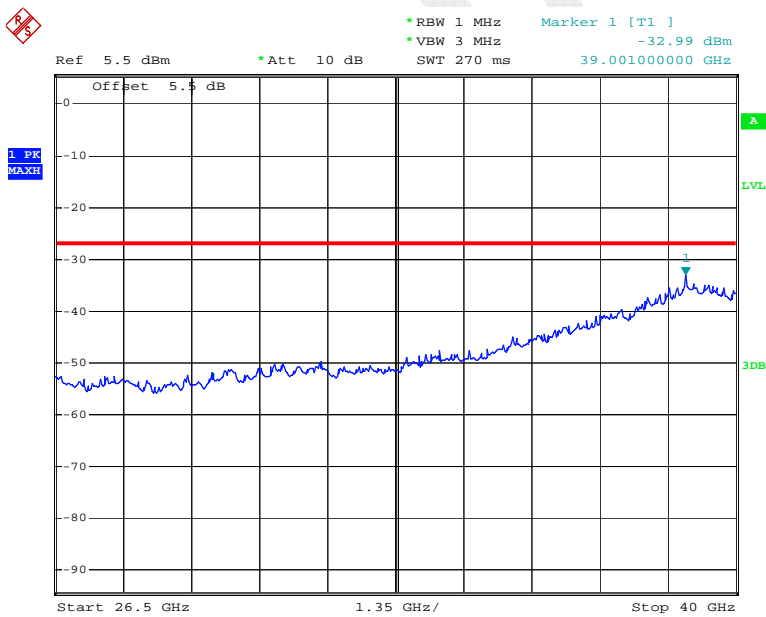
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**802.11n ht20 Low Channel 1GHz-26.5GHz**

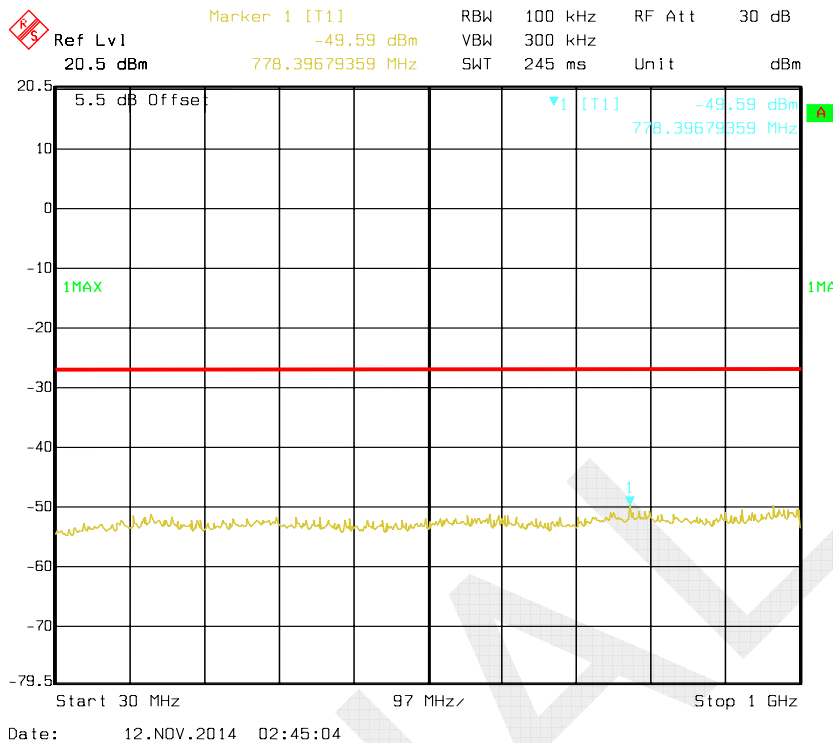


**802.11n ht20 Low Channel 26.5GHz-40GHz**



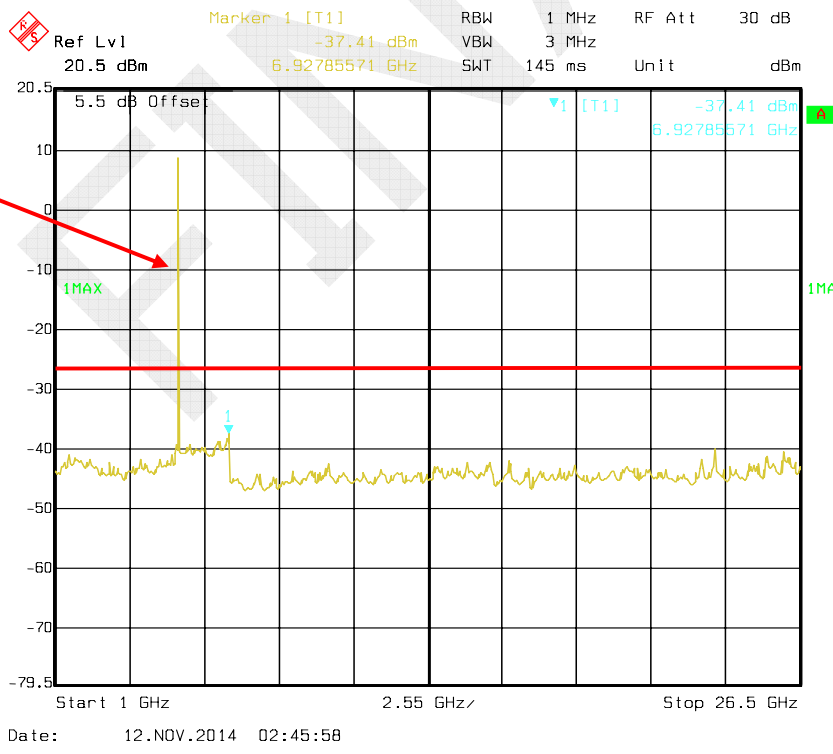
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**802.11n ht20 Middle Channel 30MHz-1GHz**

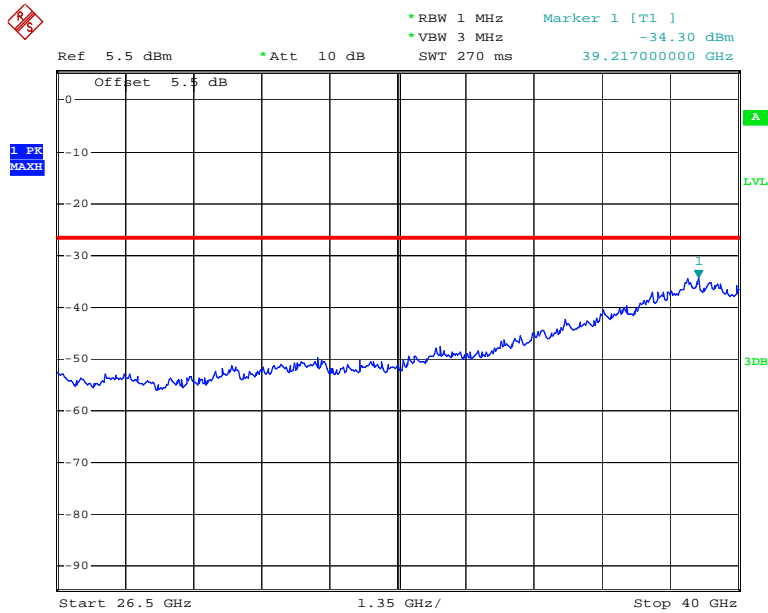


**802.11n ht20 Middle Channel 1GHz-26.5GHz**

Fundamental

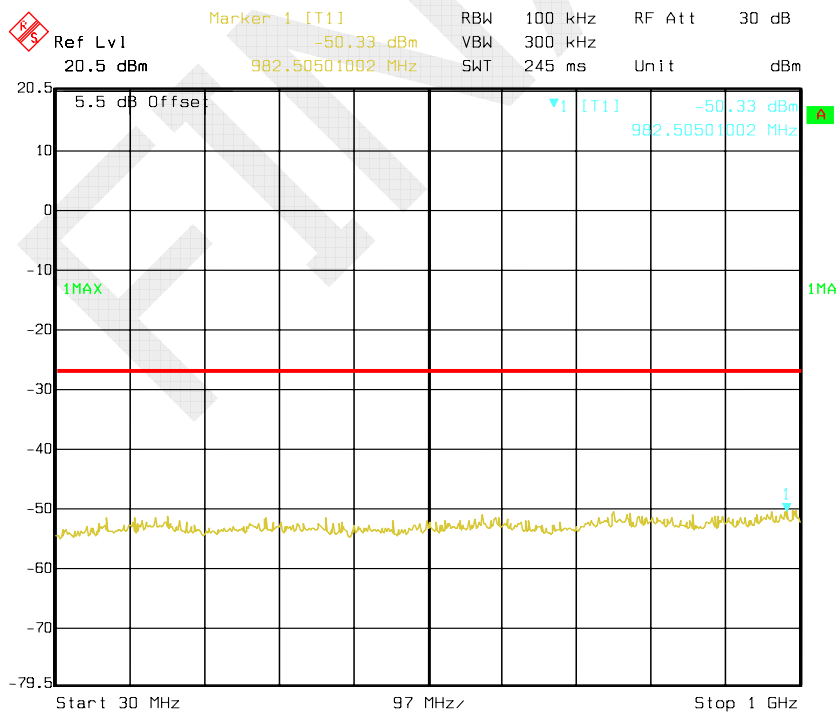


**802.11n ht20 Middle Channel 26.5GHz-40GHz**



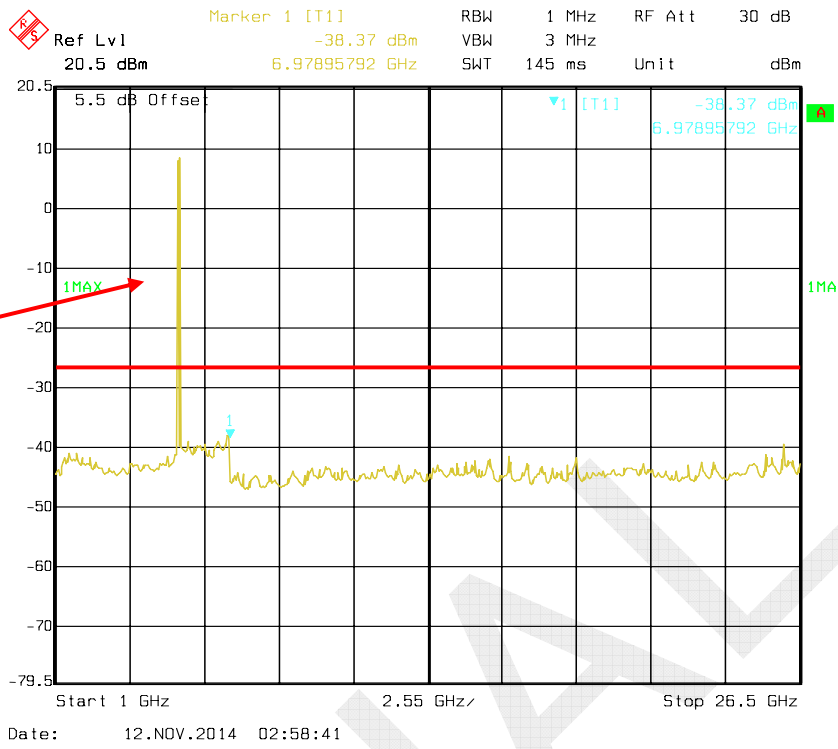
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**802.11n ht20 High Channel 30MHz-1GHz**

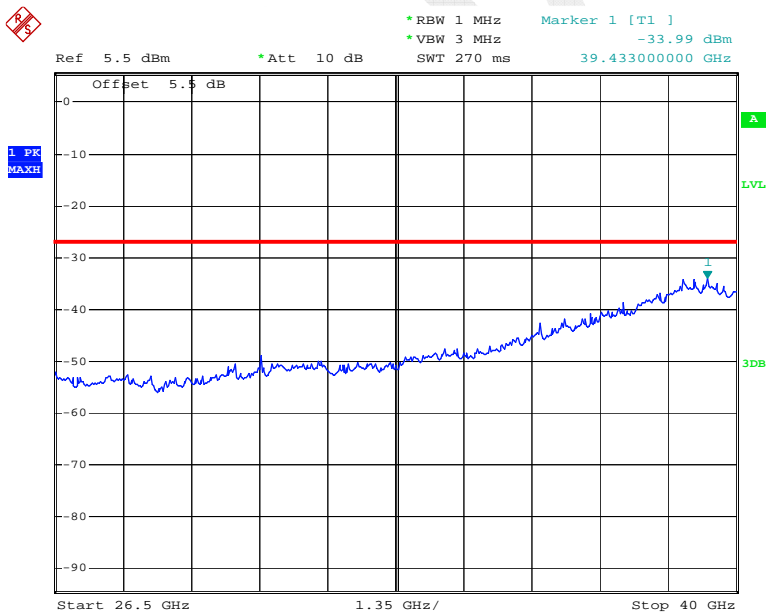


Date: 12.NOV.2014 02:57:40

**802.11n ht20 High Channel 1GHz-26.5GHz**

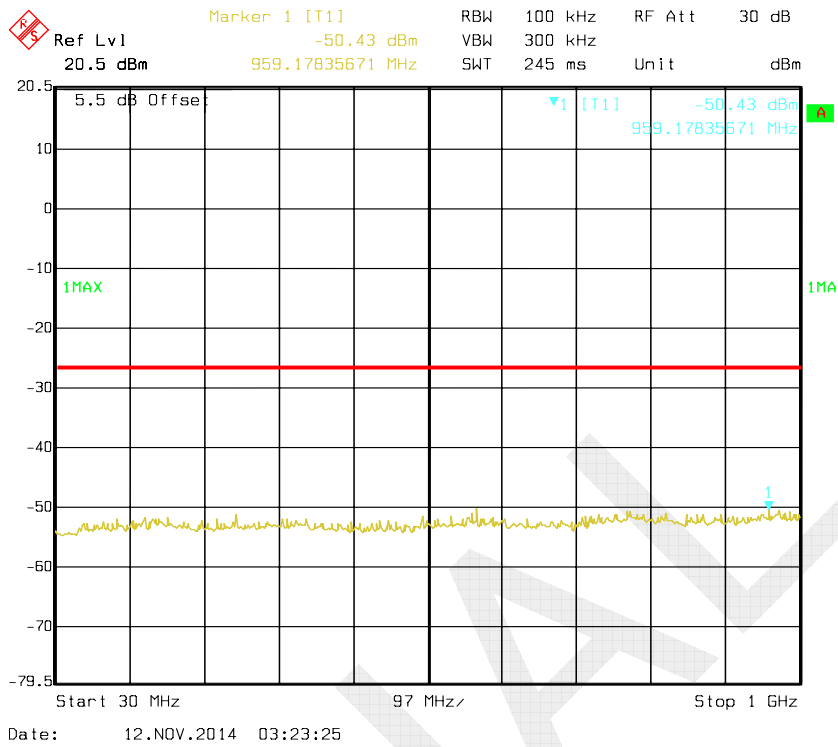


**802.11n ht20 High Channel 26.5GHz-40GHz**

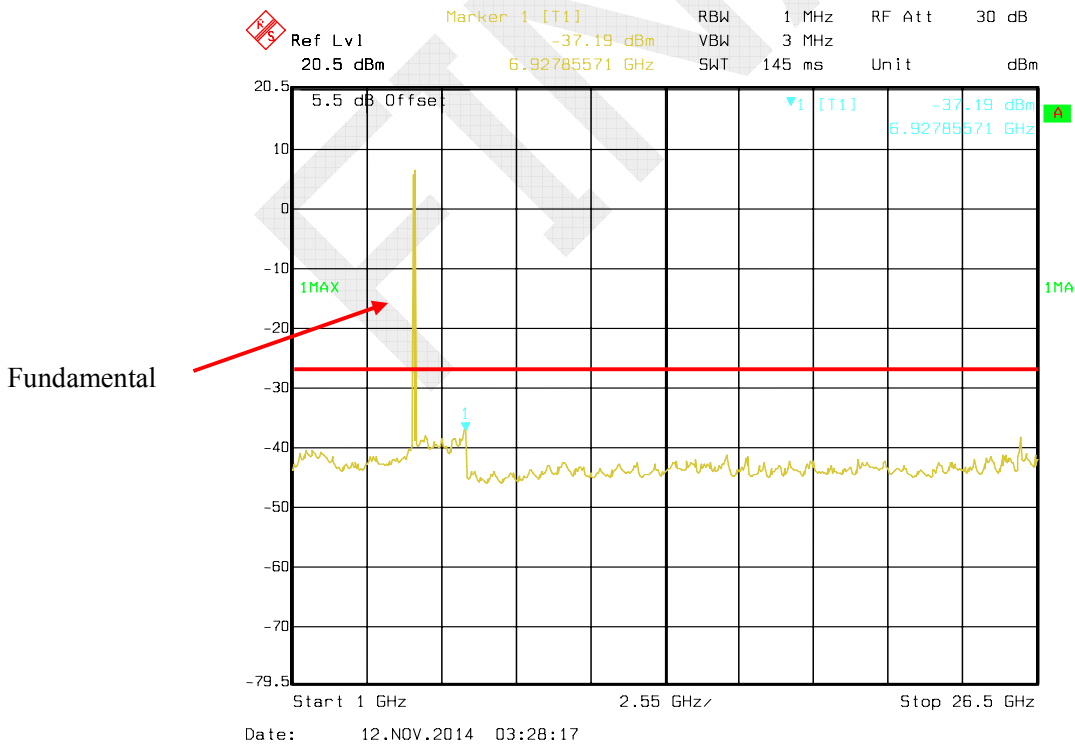


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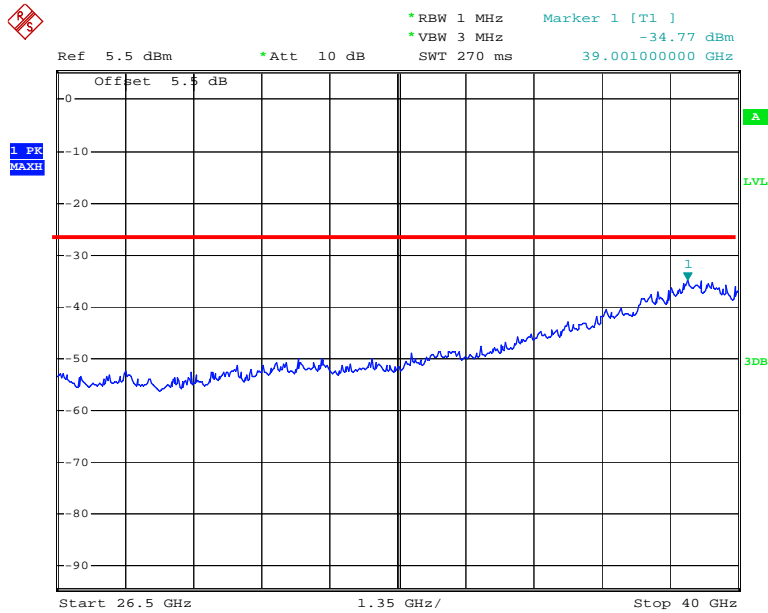
**802.11n ht40 Low Channel 30MHz-1GHz**



**802.11n ht40 Low Channel 1GHz-26.5GHz**

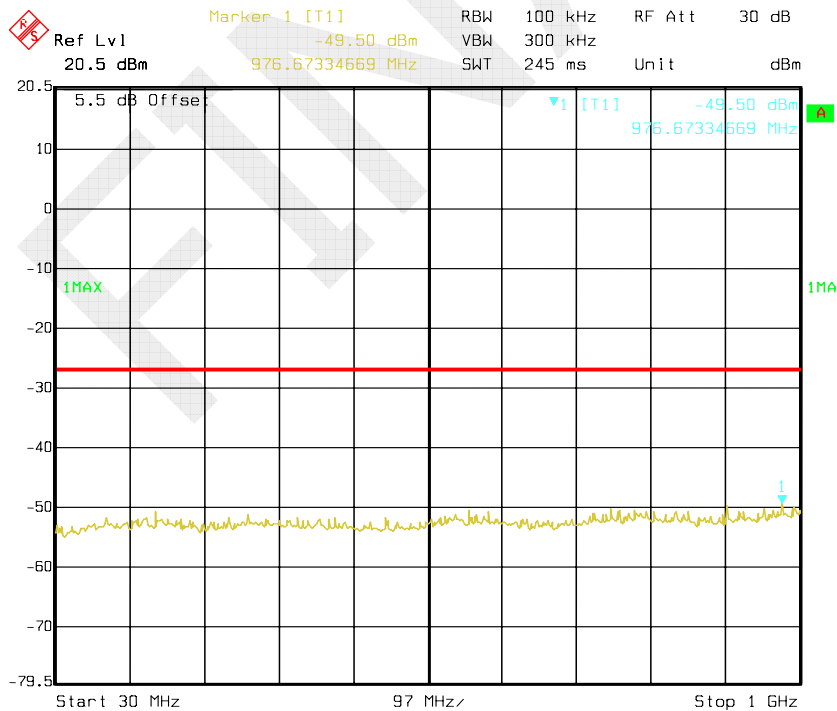


**802.11n ht40 Low Channel 26.5GHz-40GHz**



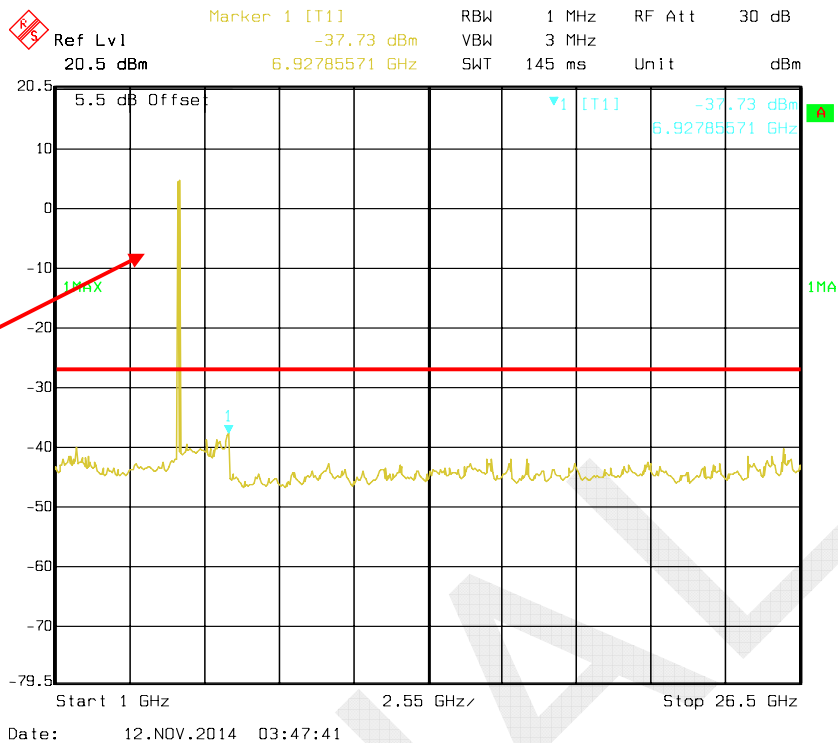
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**802.11n ht40 High Channel 30MHz-1GHz**

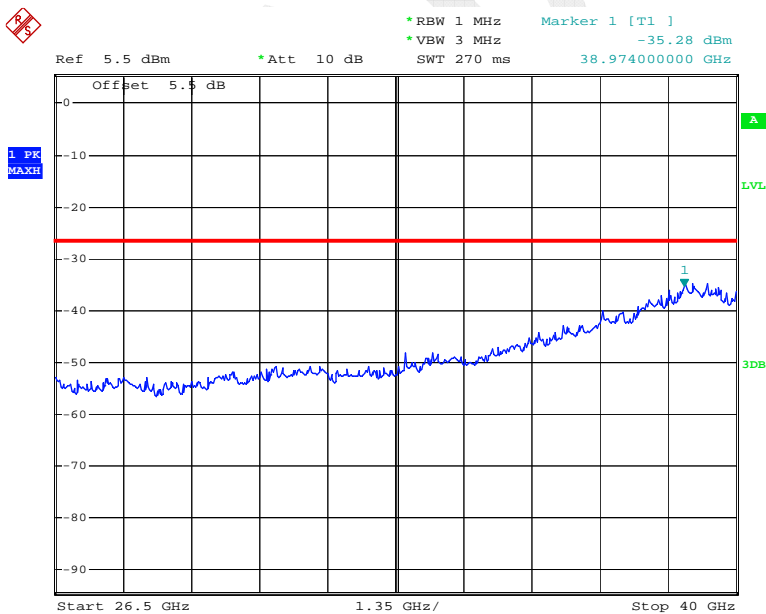


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**802.11n ht40 High Channel 1GHz-26.5GHz**

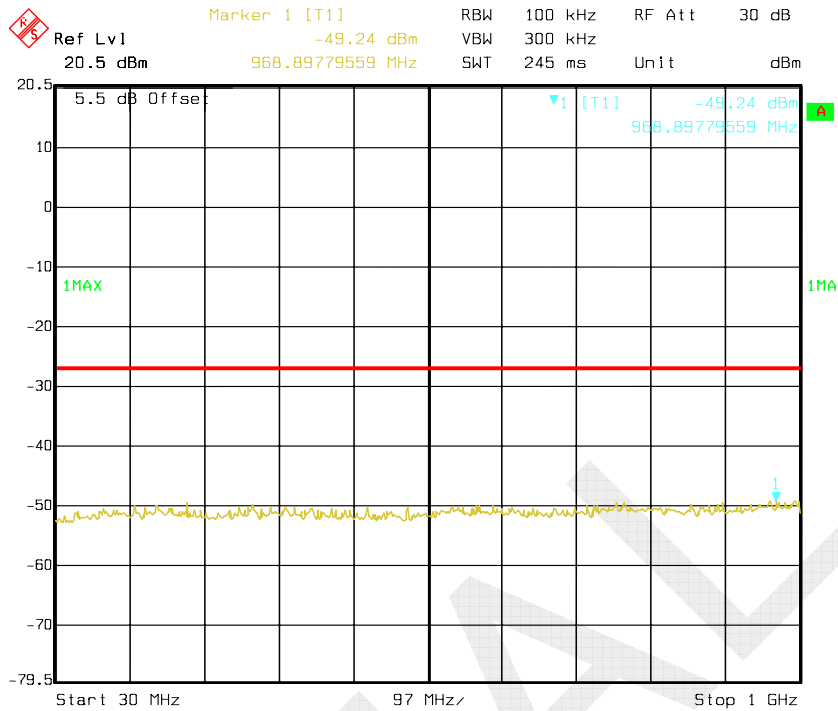


**802.11n ht40 High Channel 26.5GHz-40GHz**

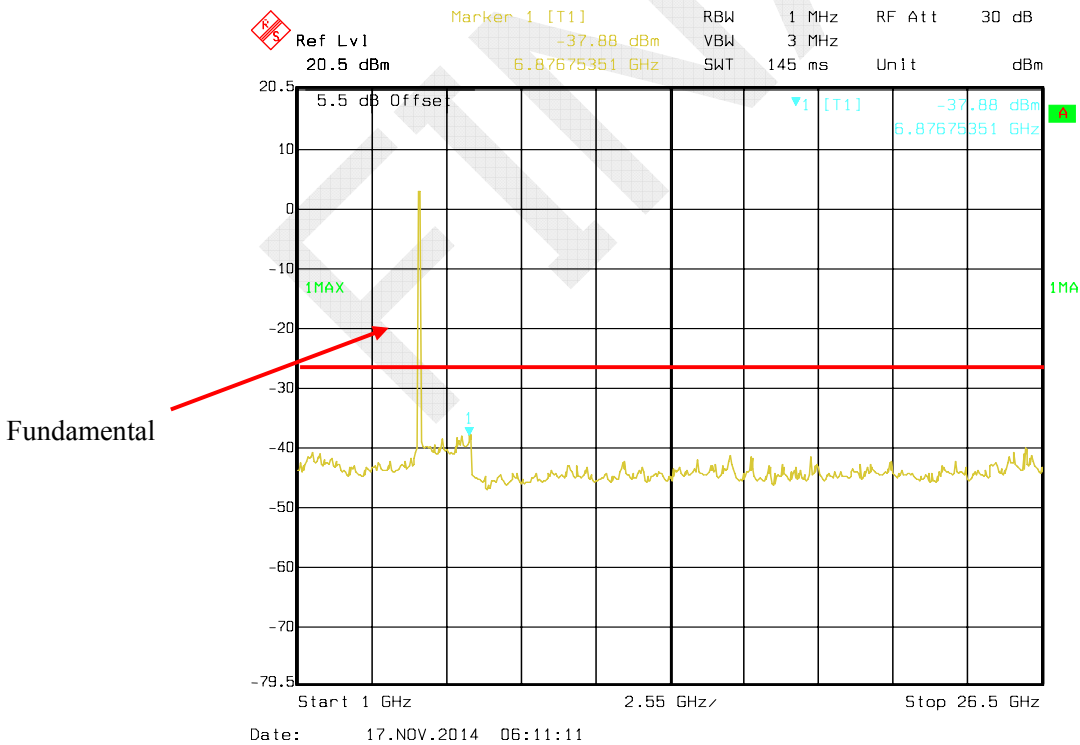


Date: 17.NOV.2014 09:50:12

**802.11n ac80 Low Channel 30MHz-1GHz**

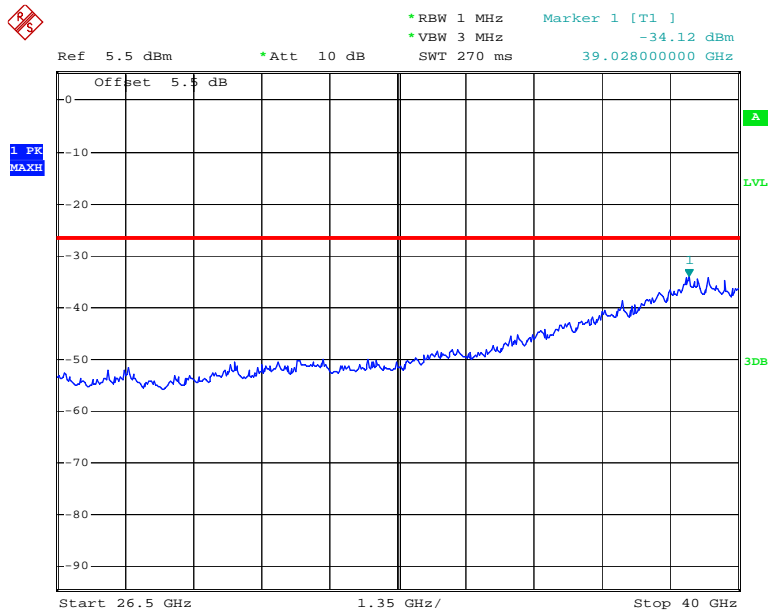


**802.11n ac80 Low Channel 1GHz-26.5GHz**





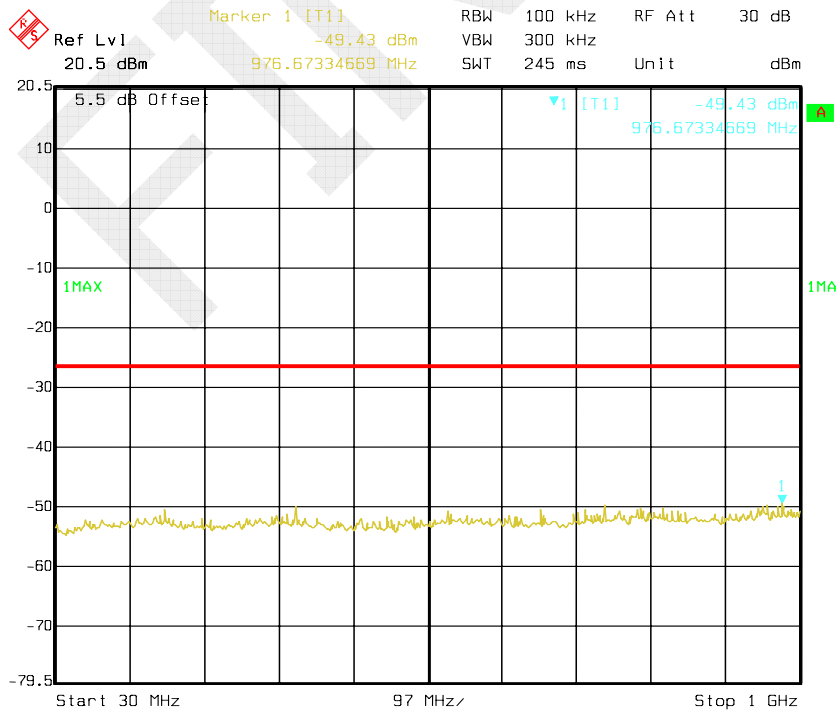
**802.11n ac80 Low Channel 26.5GHz-40GHz**



Date: 17.NOV.2014 09:50:55

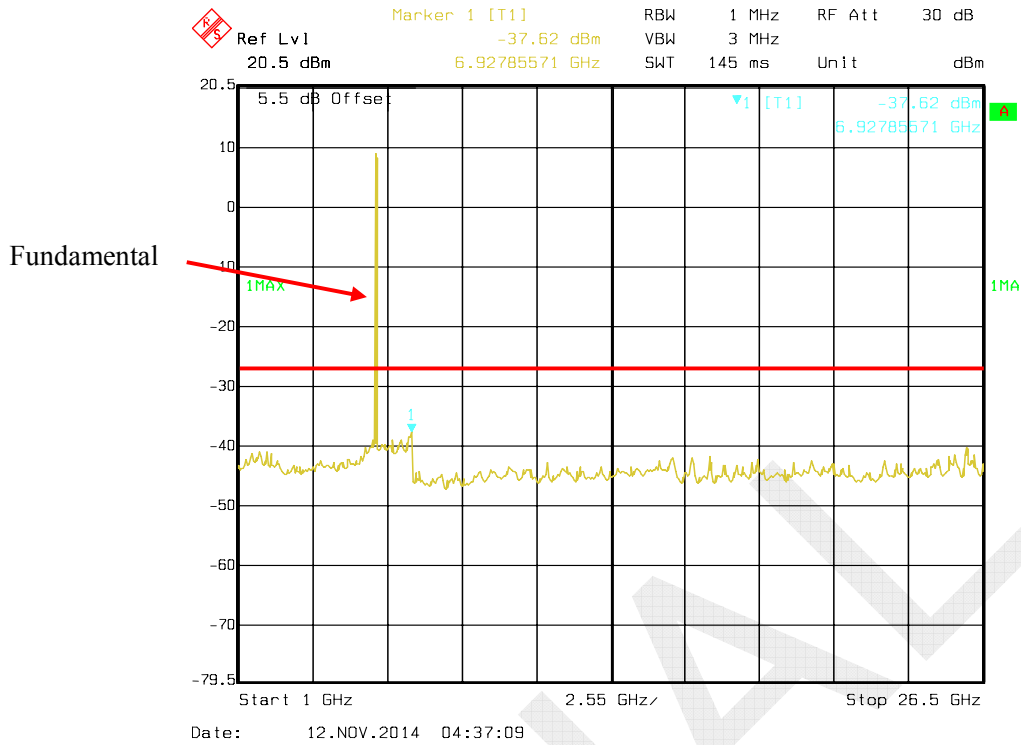
5725MHz-5850MHz:

**802.11a Low Channel 30MHz-1GHz**

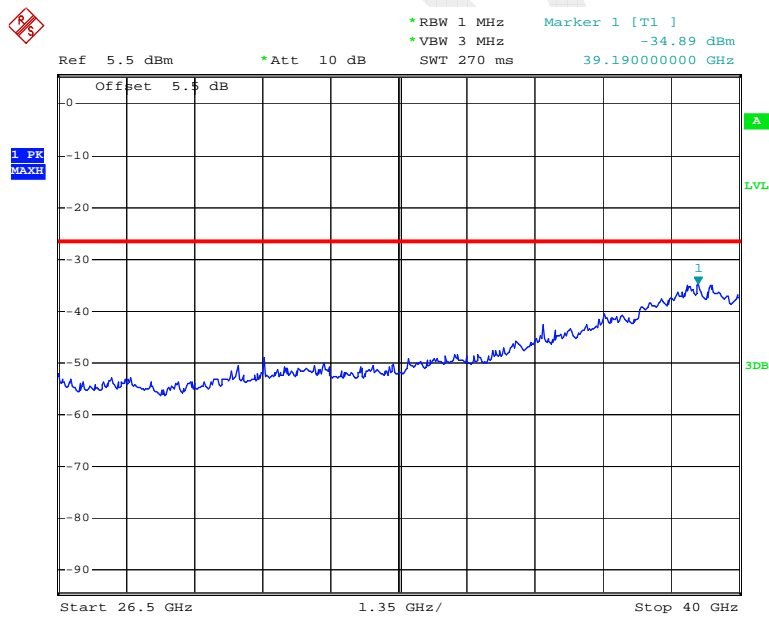


Date: 12.NOV.2014 04:36:30

### 802.11a Low Channel 1GHz-26.5GHz

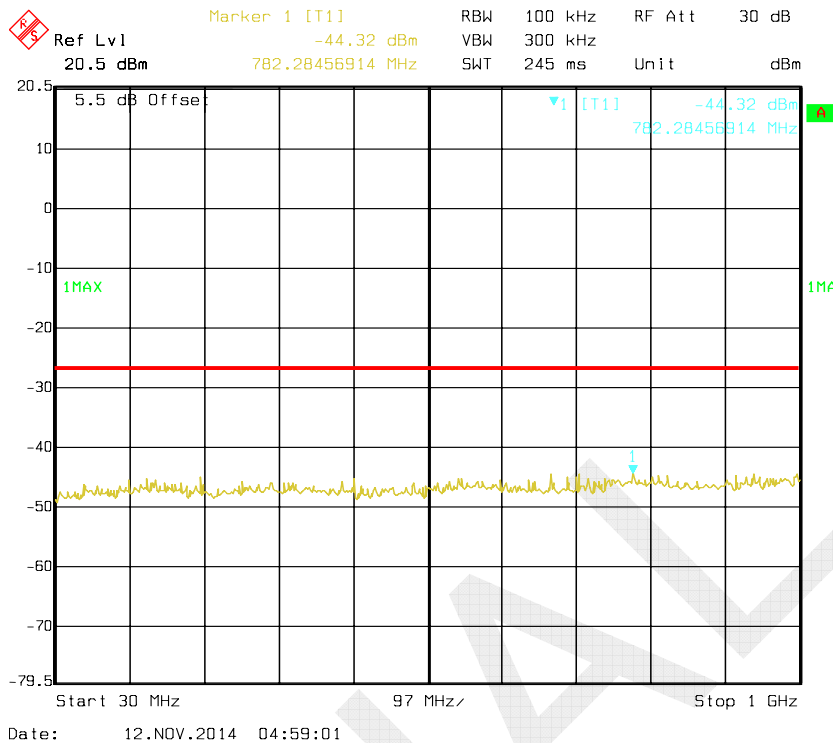


### 802.11a Low Channel 26.5GHz-40GHz



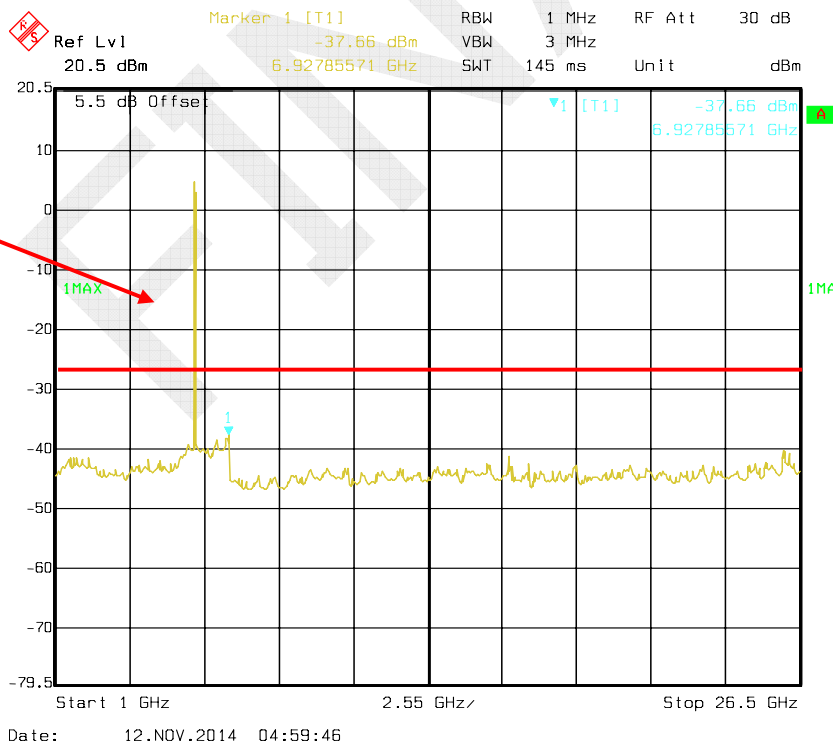
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### 802.11a Middle Channel 30MHz-1GHz

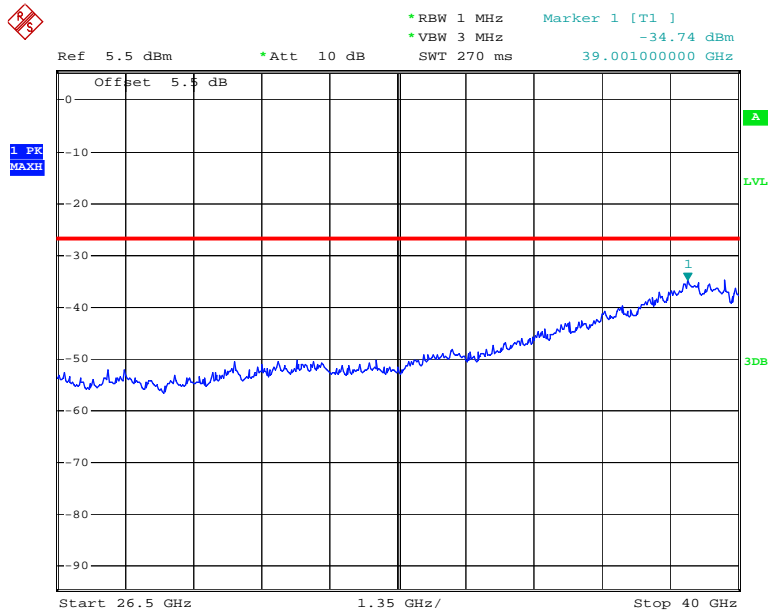


### 802.11a Middle Channel 1GHz -26.5GHz

Fundamental

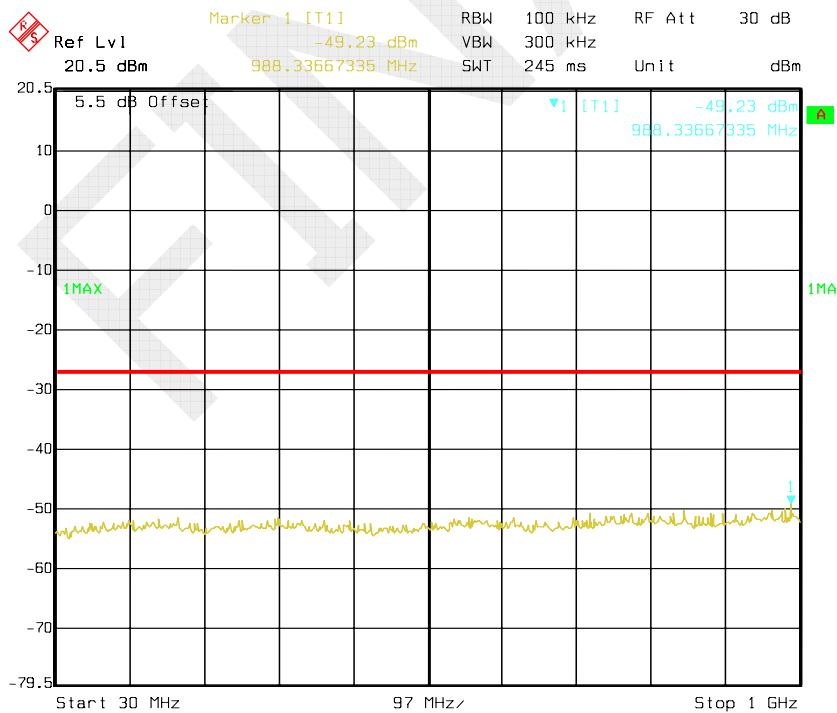


**802.11a Middle Channel 26.5GHz-40GHz**



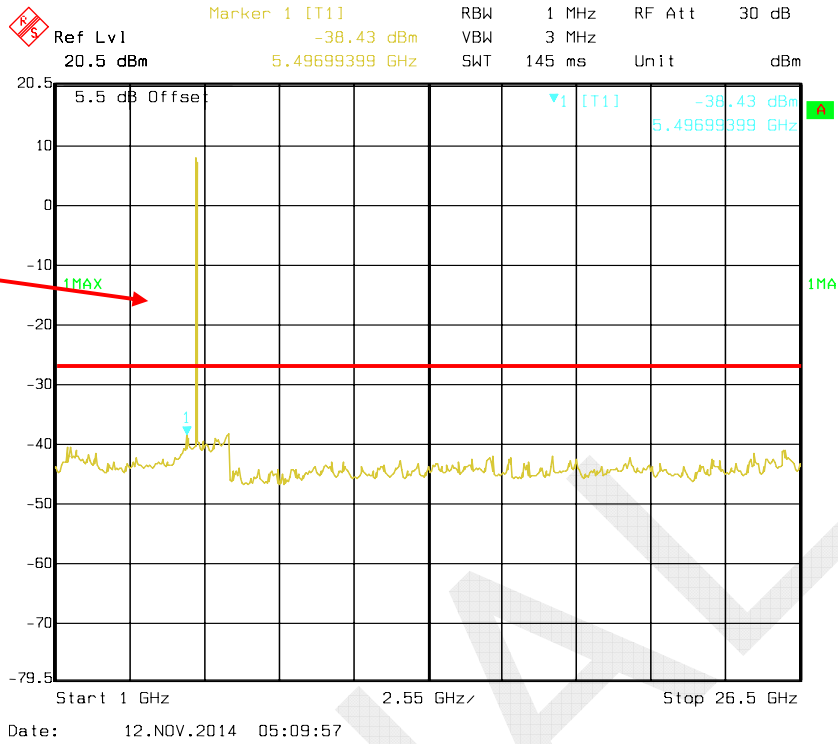
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**802.11a High Channel 30MHz-1GHz**

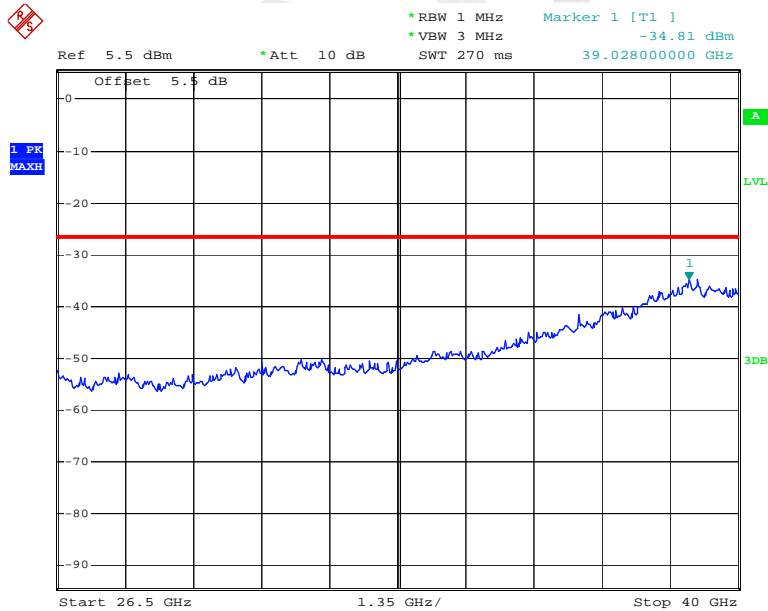


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### 802.11a High Channel 1GHz-26.5GHz

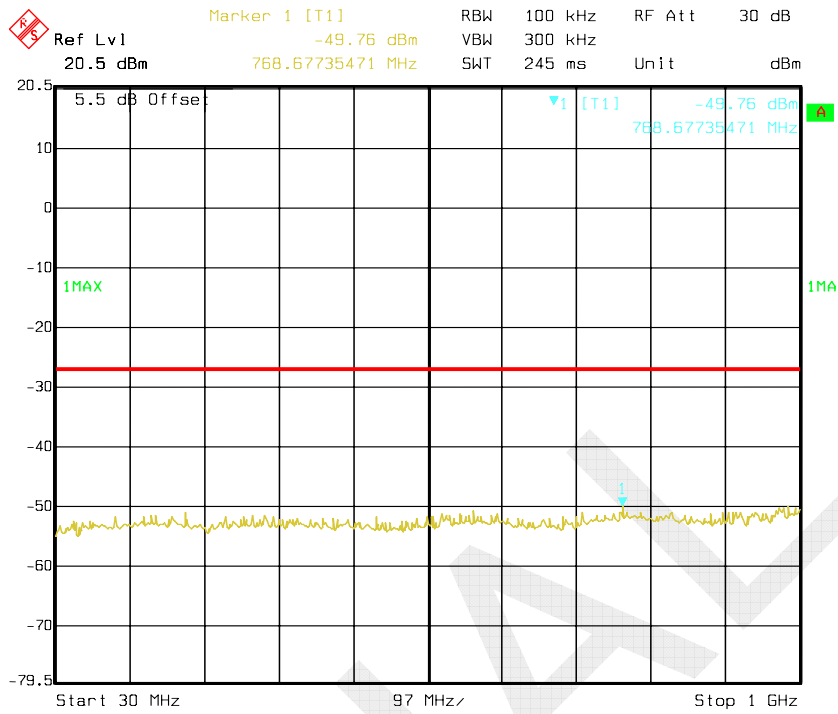


### 802.11a High Channel 26.5GHz-40GHz



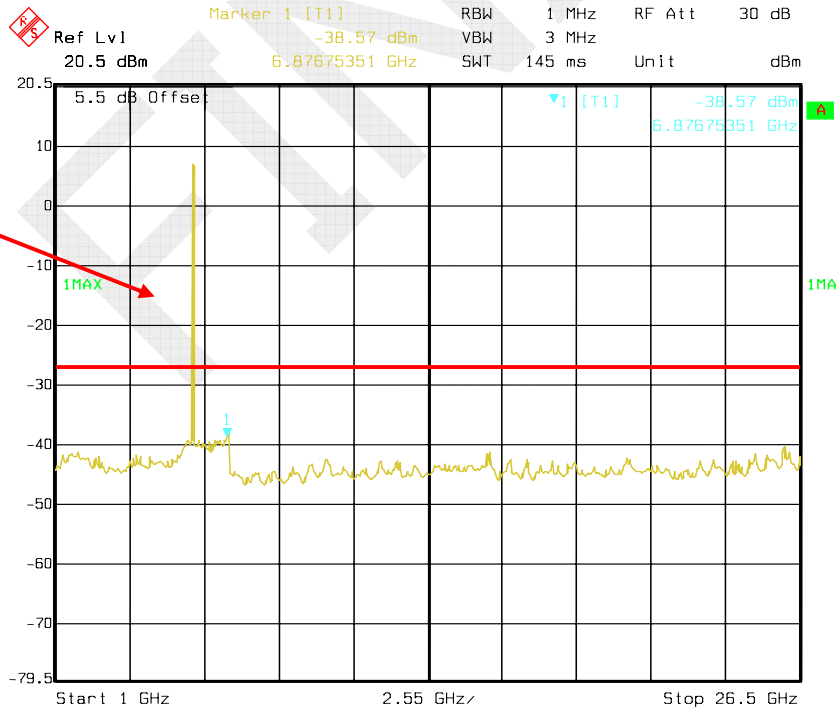
Date: 17.NOV.2014 09:51:32

**802.11n ht20 Low Channel 30MHz-1GHz**



Date: 12.NOV.2014 05:33:13

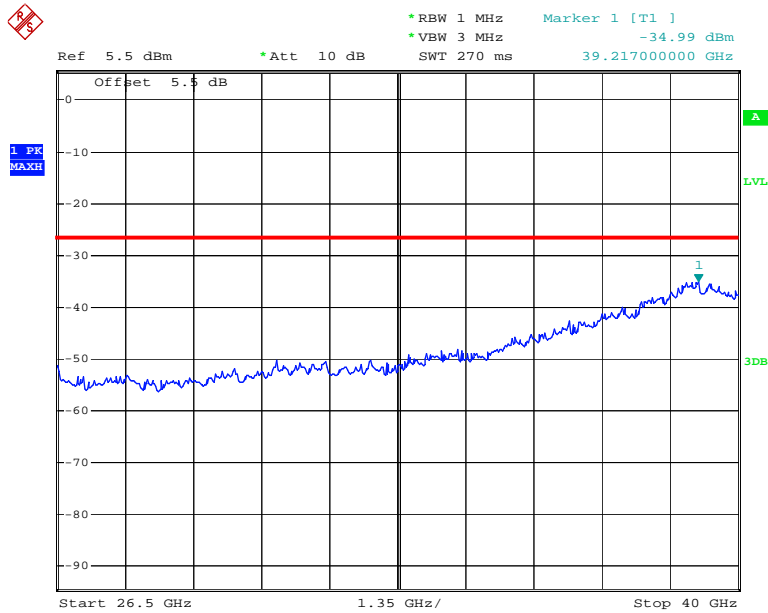
**802.11n ht20 Low Channel 1GHz-26.5GHz**



Date: 12.NOV.2014 05:33:56

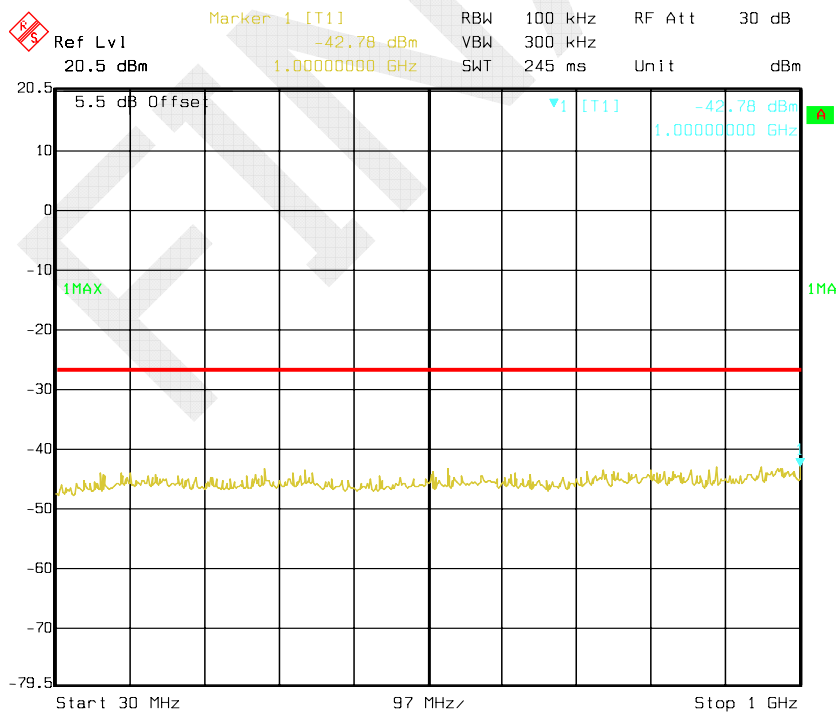
Fundamental

**802.11n ht20 Low Channel 26.5GHz-40GHz**



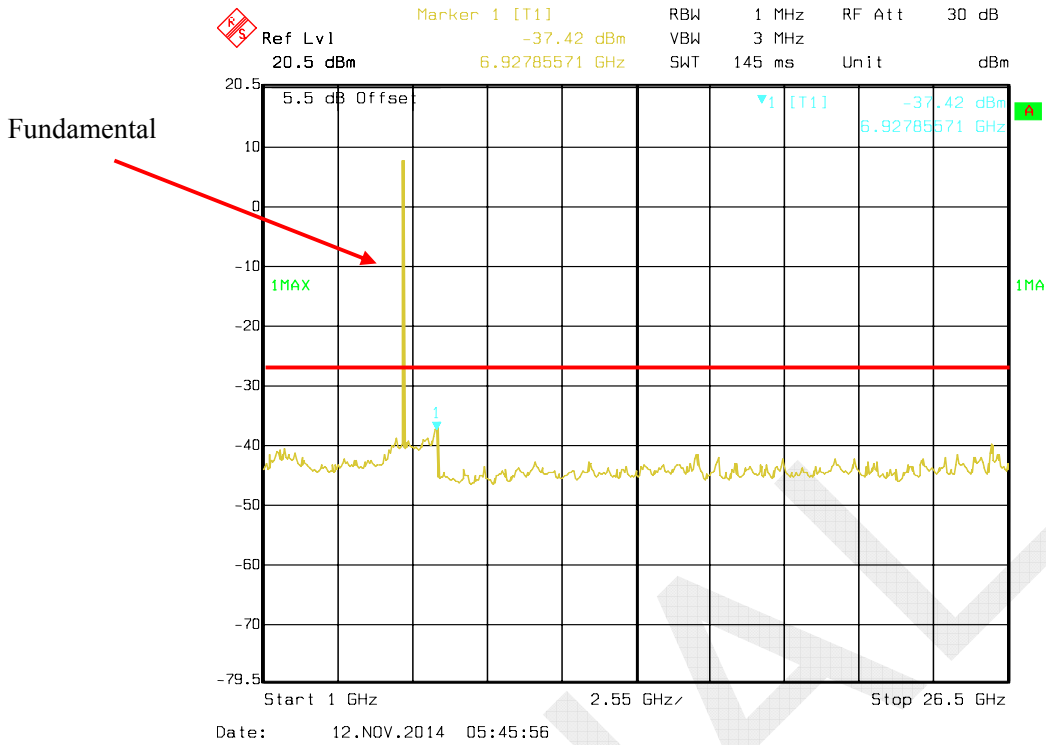
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**802.11n ht20 Middle Channel 30MHz-1GHz**

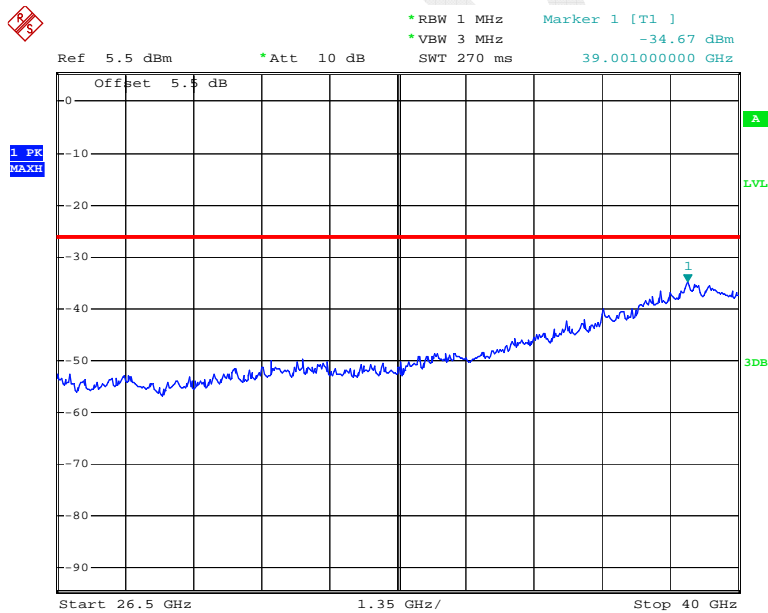


Date: 12.NOV.2014 05:45:00

**802.11n ht20 Middle Channel 1GHz -26.5GHz**

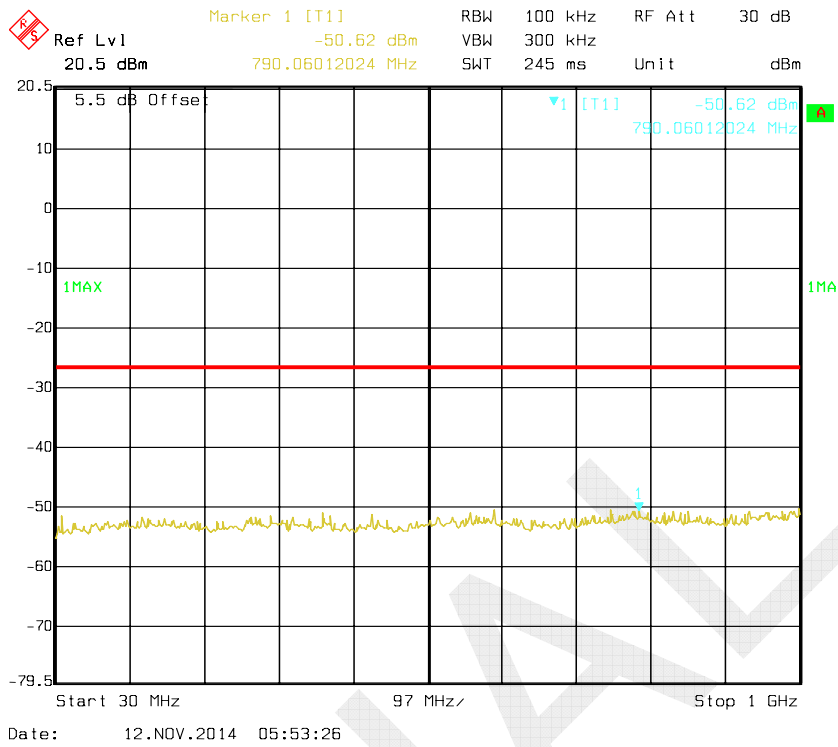


**802.11n ht20 Middle Channel 26.5GHz-40GHz**

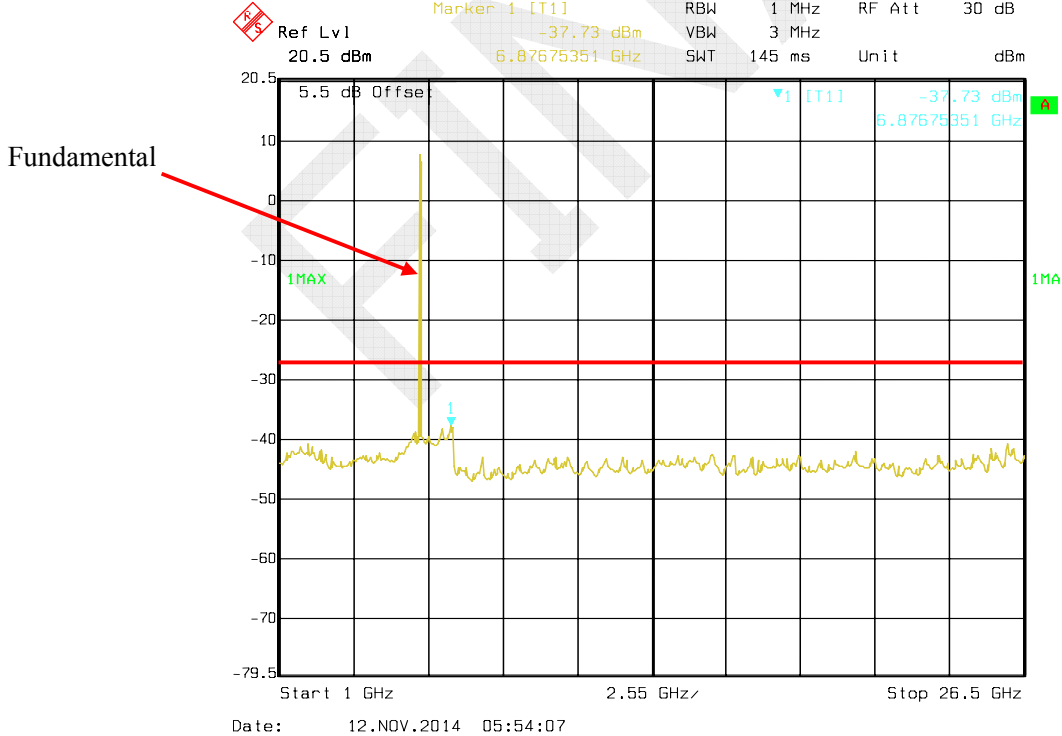




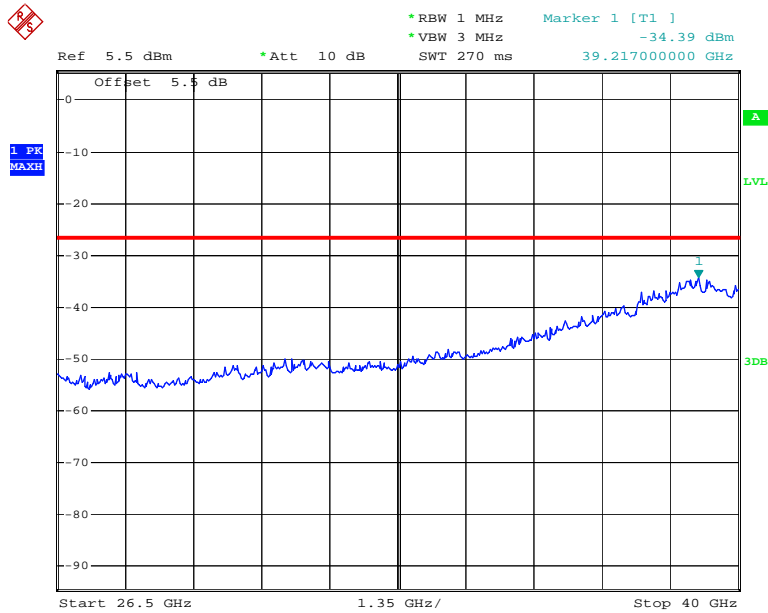
**802.11n ht20 High Channel 30MHz-1GHz**



**802.11n ht20 High Channel 1GHz-26.5GHz**

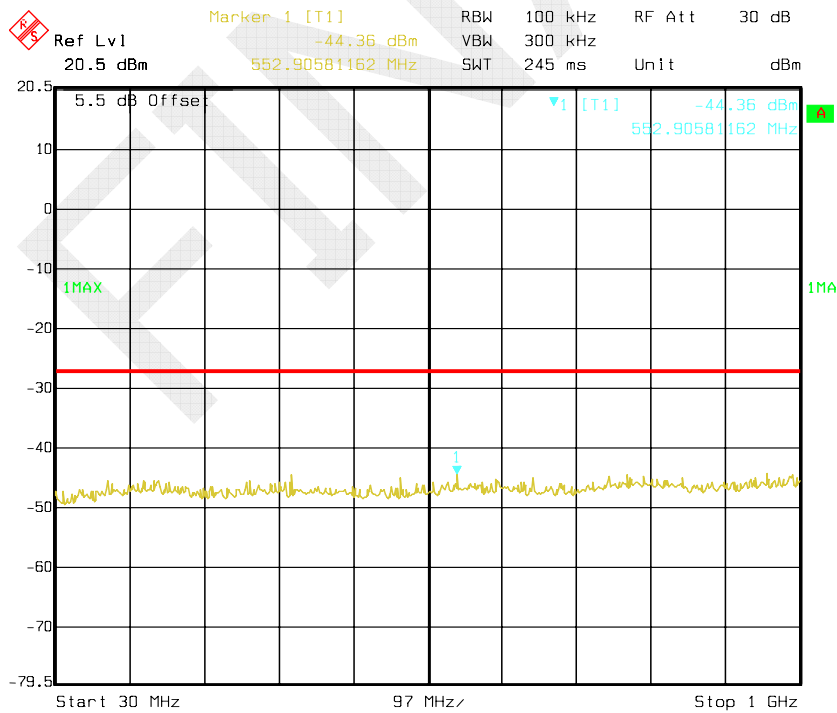


**802.11n ht20 High Channel 26.5GHz-40GHz**



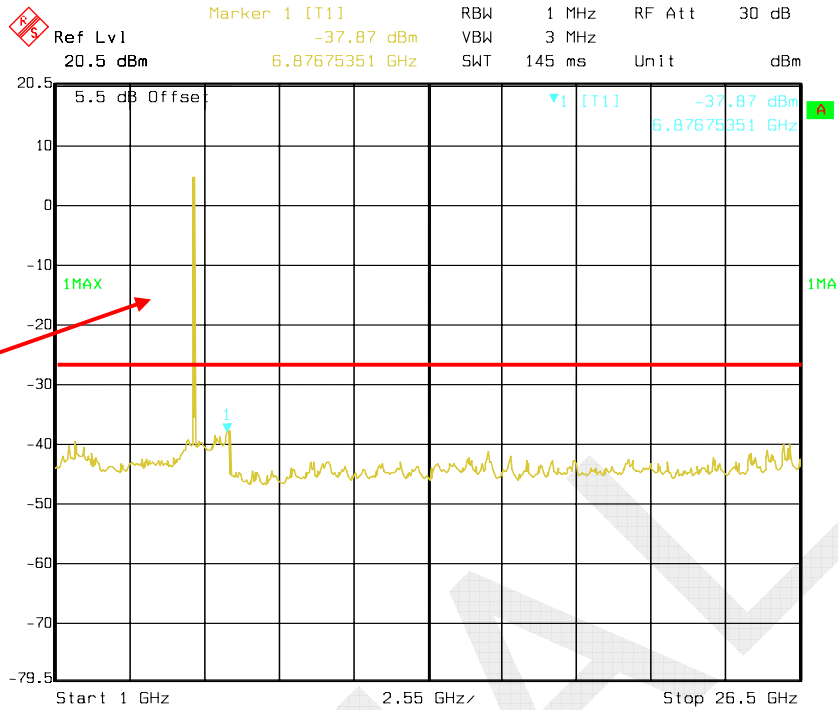
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**802.11n ht40 Low Channel 30MHz-1GHz**



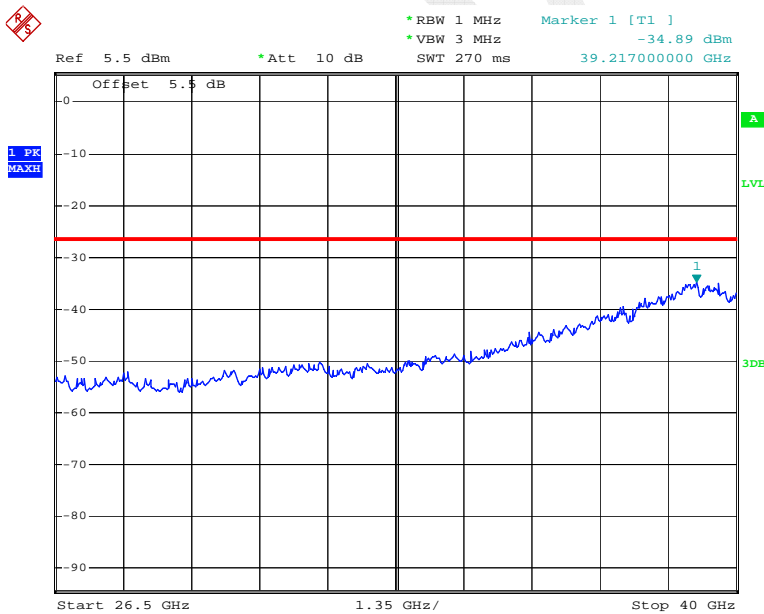
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**802.11n ht40 Low Channel 1GHz-26.5GHz**

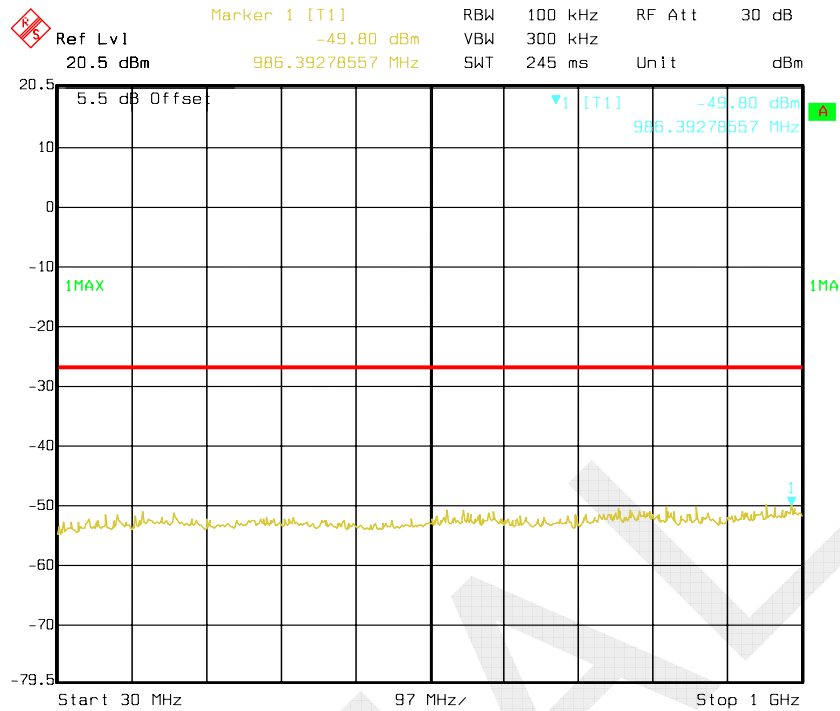


Fundamental

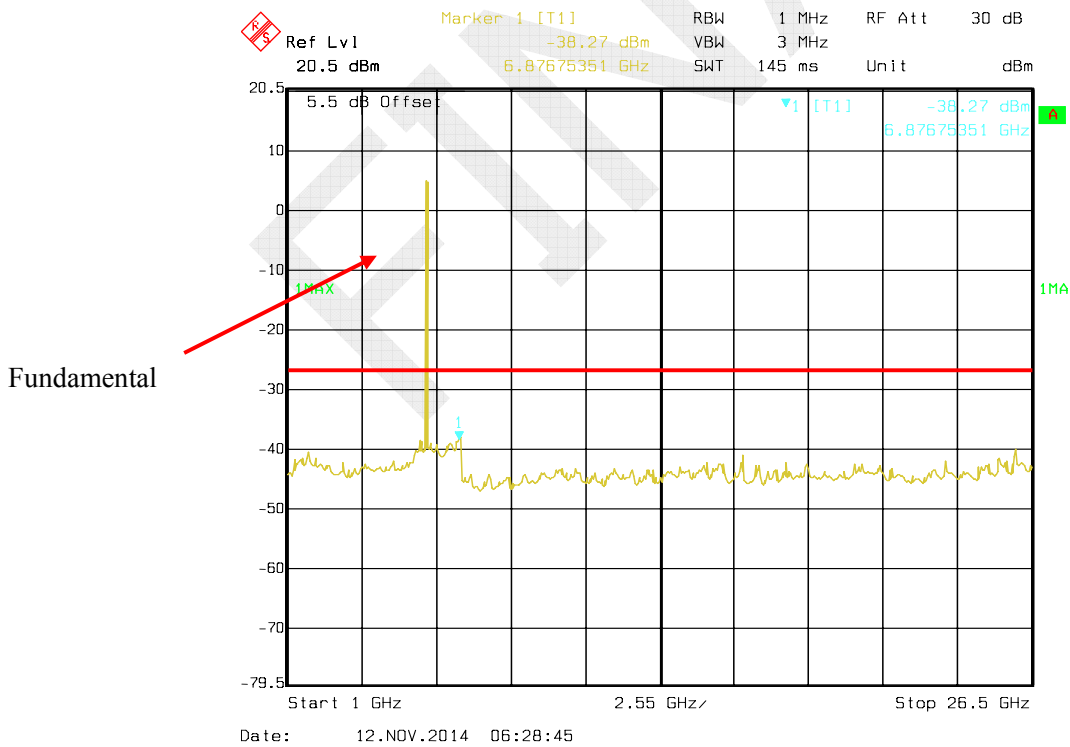
**802.11n ht40 Low Channel 26.5GHz-40GHz**



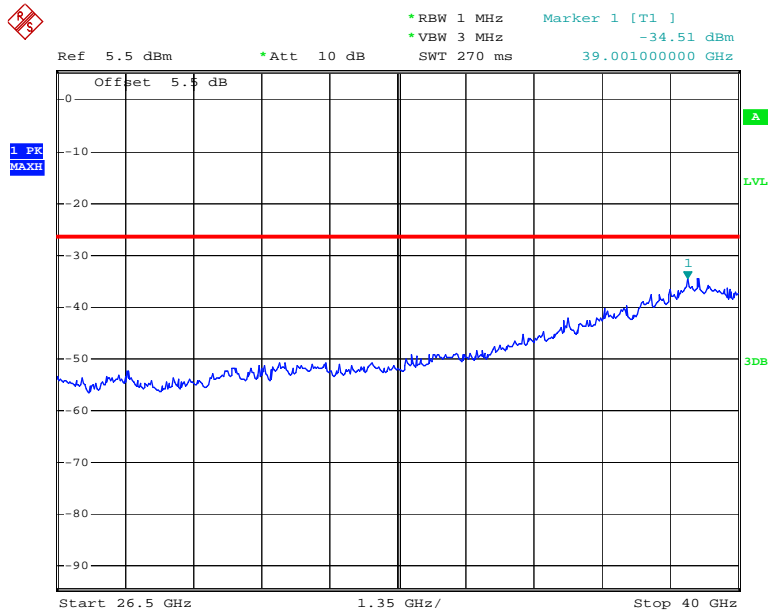
### 802.11n ht40 High Channel 30MHz-1GHz



### 802.11n ht40 High Channel 1GHz-26.5GHz

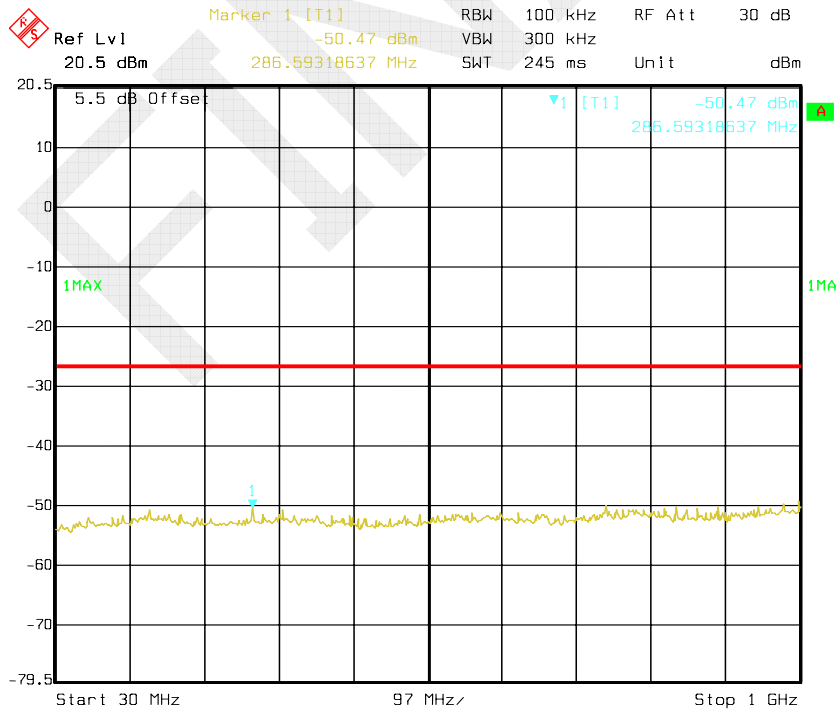


**802.11n ht40 High Channel 26.5GHz-40GHz**



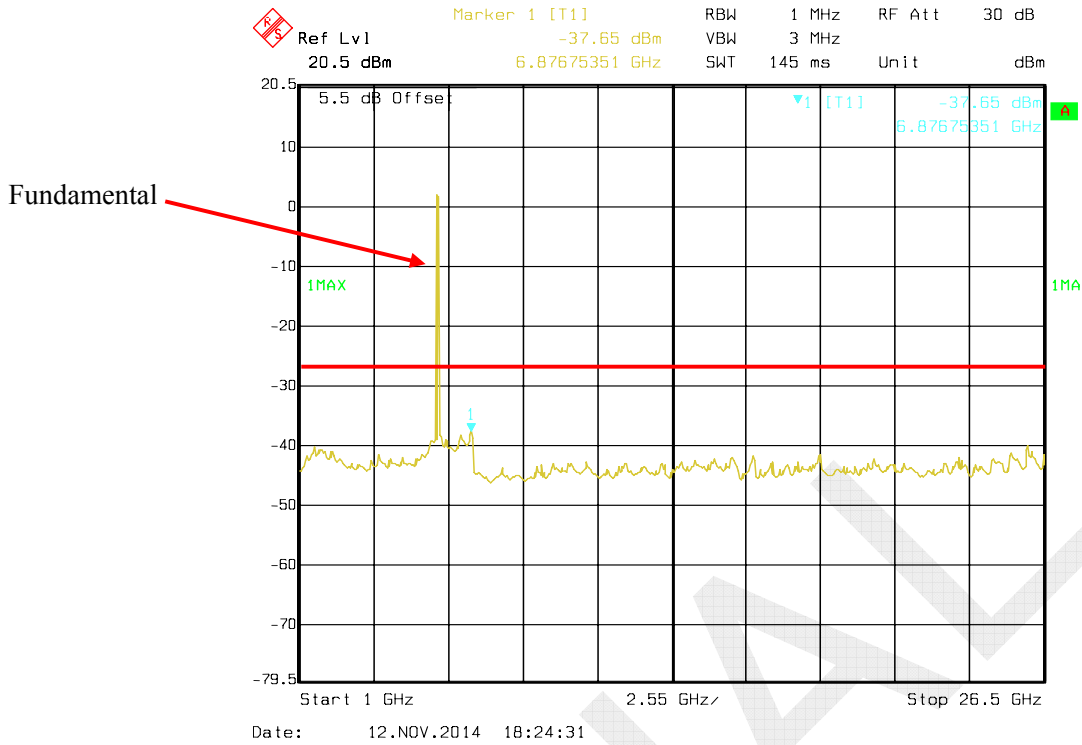
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**802.11n ac80 Low Channel 30MHz-1GHz**

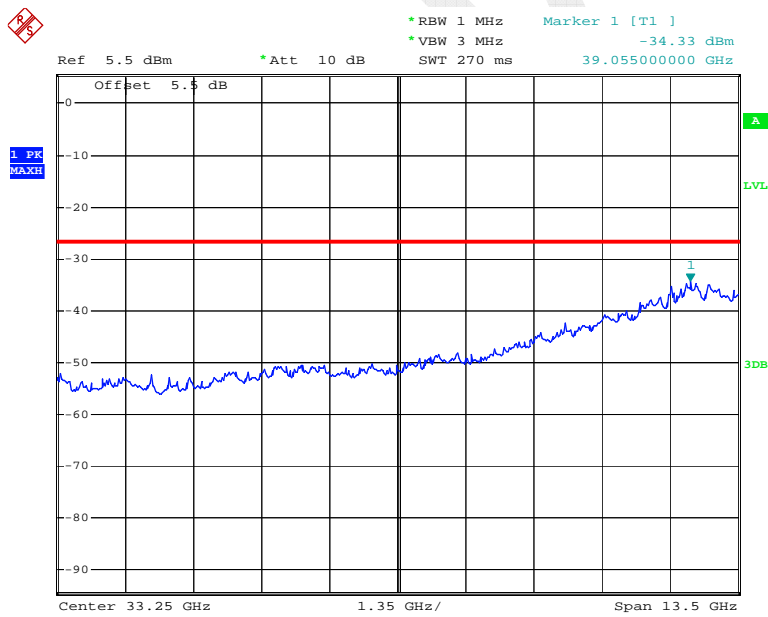


Date: 12.NOV.2014 18:23:35

### 802.11n ac80 Low Channel 1GHz-26.5GHz



### 802.11n ac80 Low Channel 26.5GHz-40GHz



Date: 17.NOV.2014 09:53:13

## **FCC §15.407(b) (1) –BAND EDGE**

### **Applicable Standard**

FCC §15.407 (b) (1), (2), (3), (4);

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

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

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

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

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

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

### **Test Procedure**

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

### **Test Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09

\* **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**

<b>Temperature:</b>	25.4°C ~26.2 °C
<b>Relative Humidity:</b>	47%~56 %
<b>ATM Pressure:</b>	101.2 kPa ~101.6 kPa

*The testing was performed by Dean Liu from 2014-11-12 to 2014-11-17.*

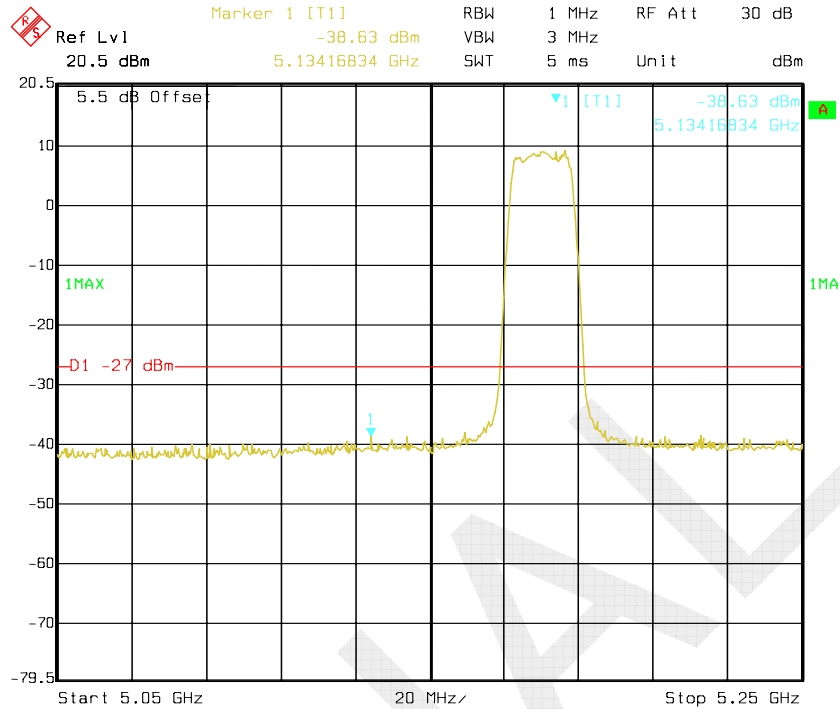
Please refer to the following plots:

FEMVA



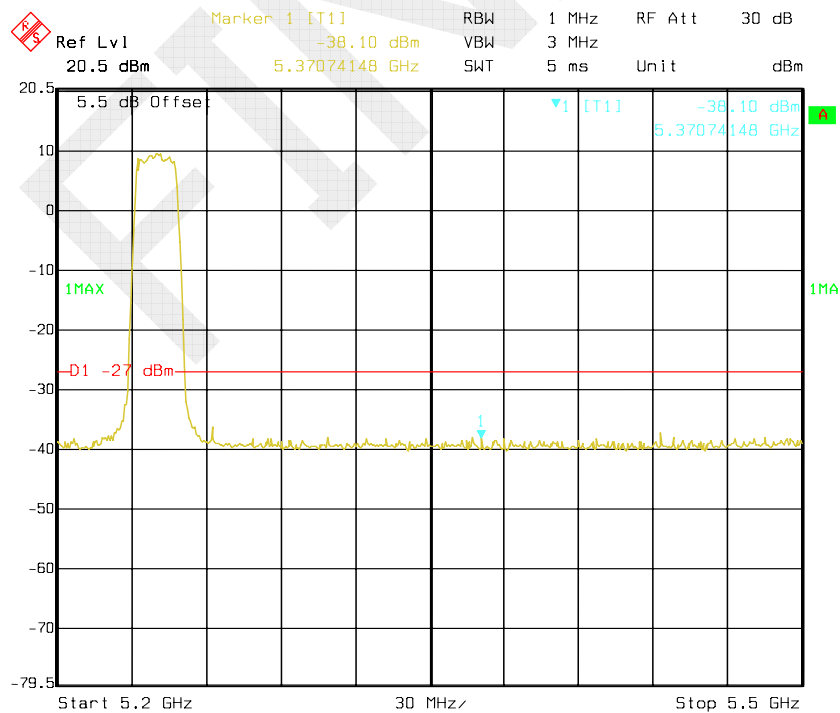
5150MHz-5250MHz:

**802.11a Band Edge, Left Side**



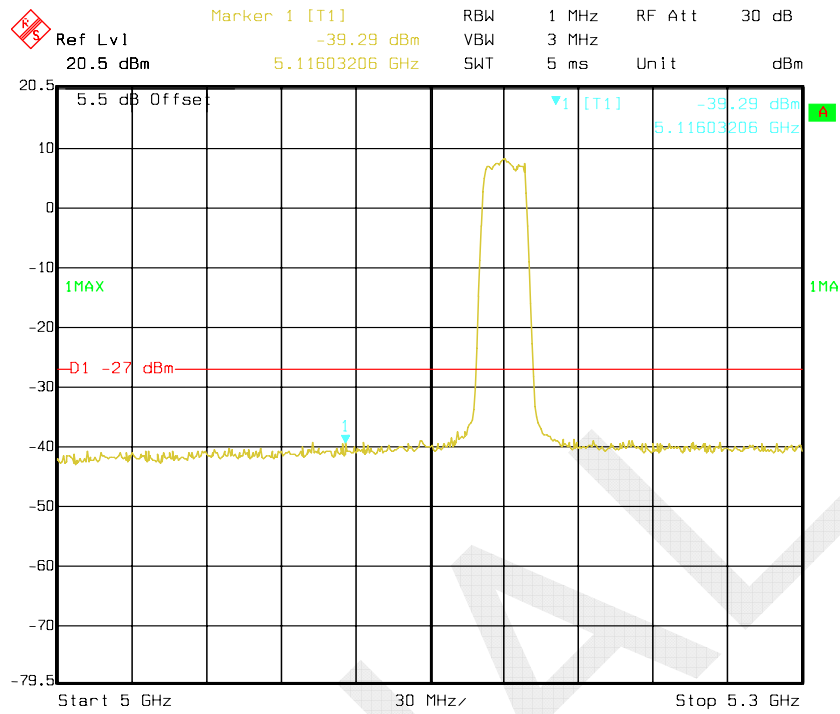
Date: 12.NOV.2014 01:37:41

**802.11a Band Edge, Right Side**



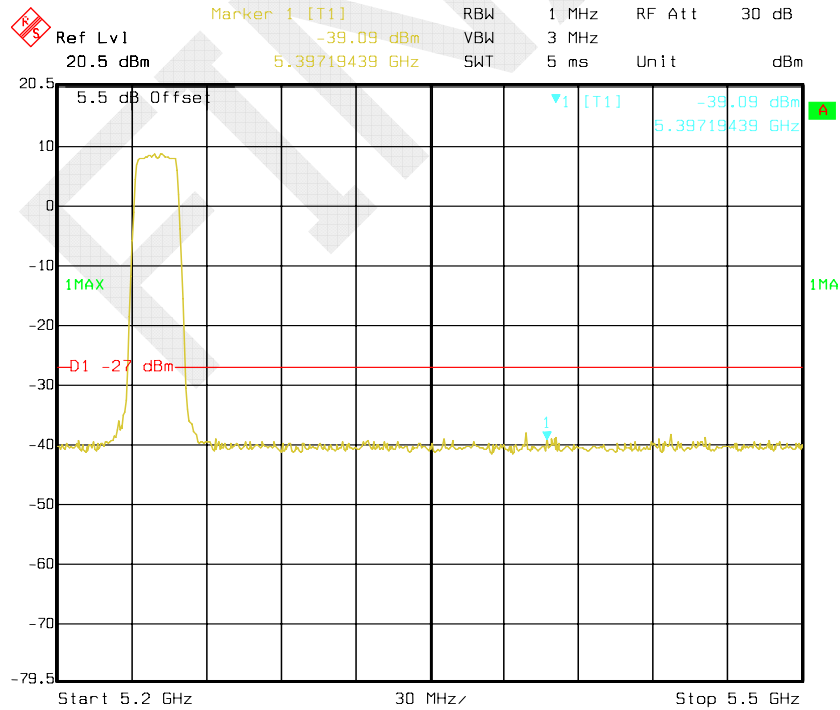
Date: 12.NOV.2014 23:41:48

### 802.11n ht20 Band Edge, Left Side



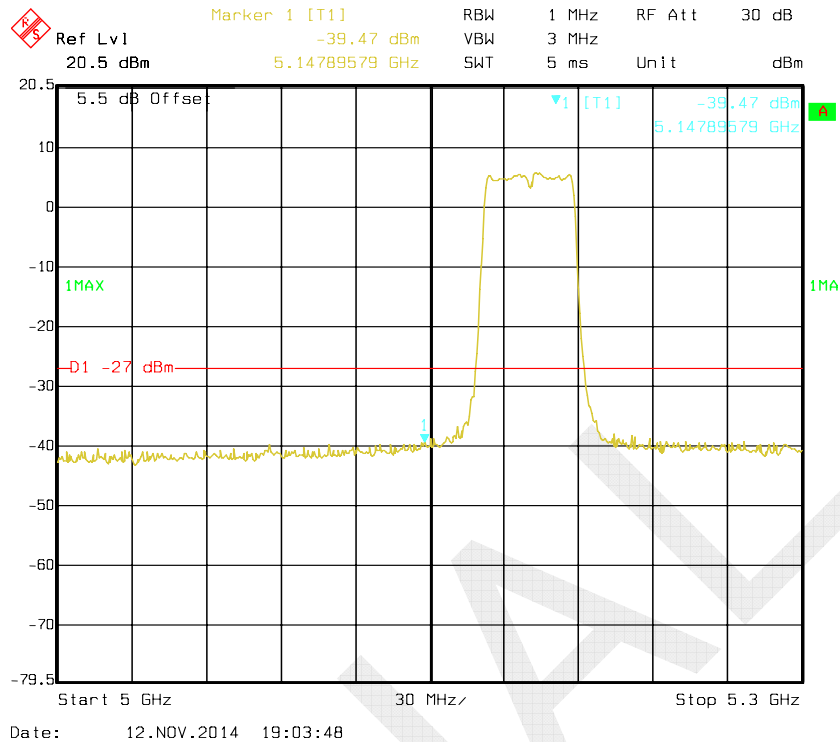
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### 802.11n ht20 Band Edge, Right Side

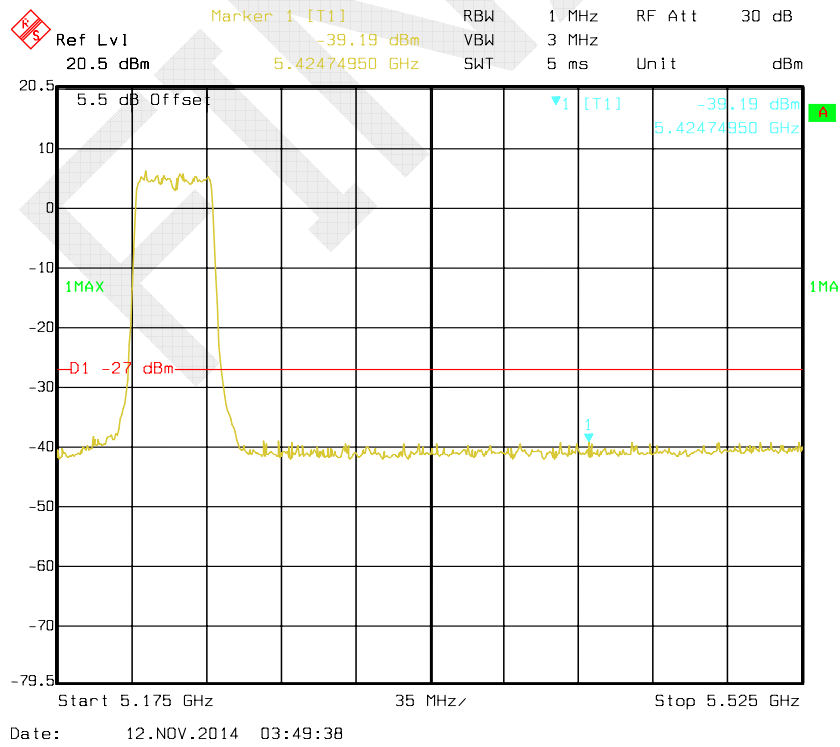


Date: 12.NOV.2014 02:59:59

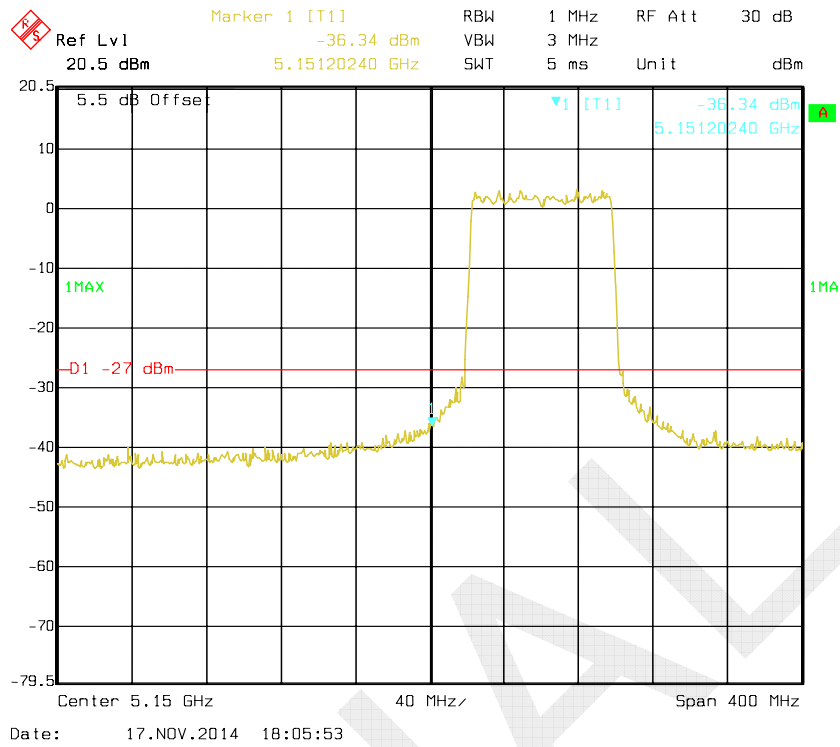
### 802.11n ht40 Band Edge, Left Side



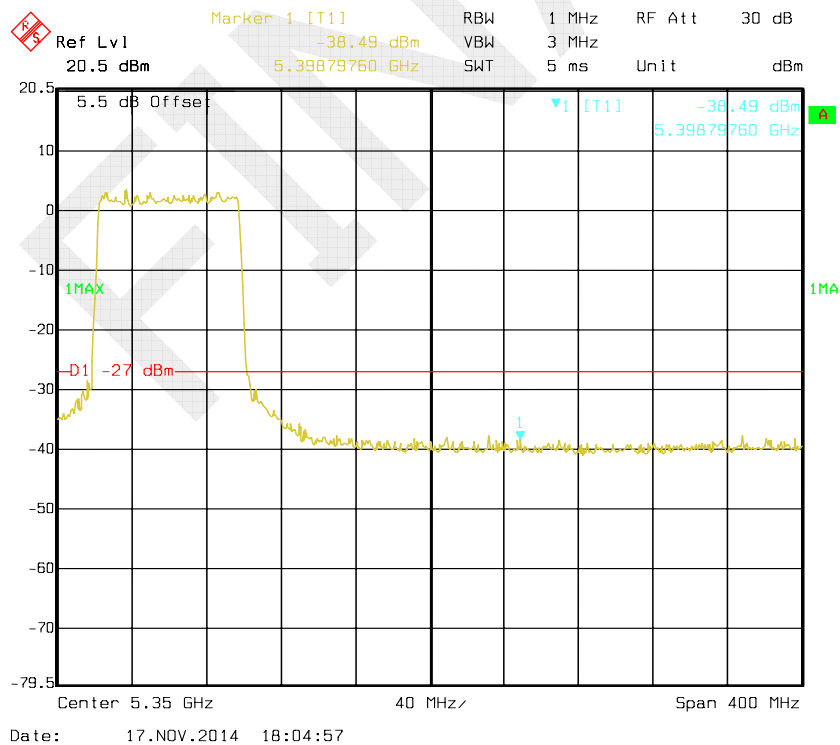
### 802.11n ht40 Band Edge, Right Side



### 802.11n ac80 Band Edge, Left Side

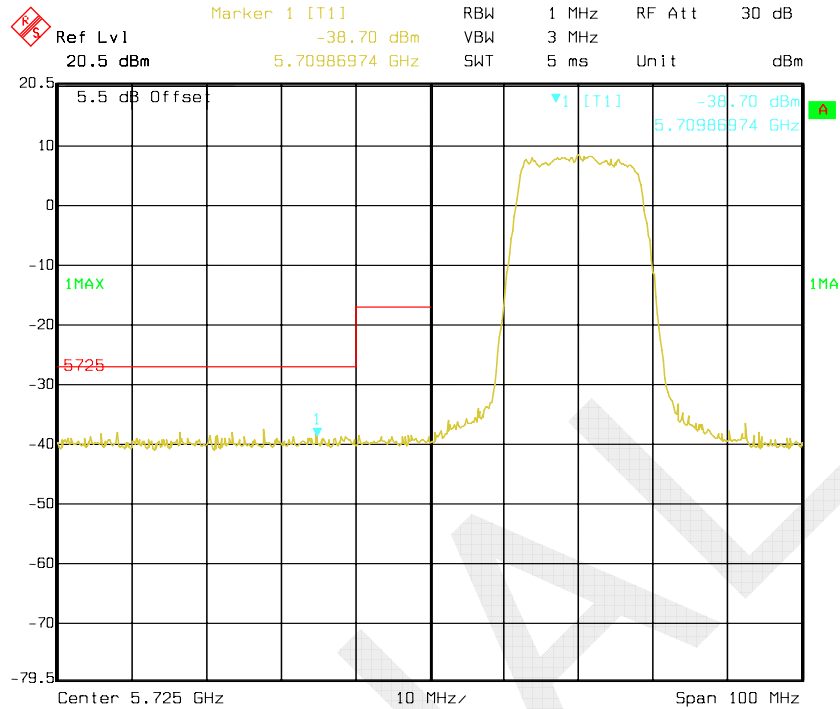


### 802.11n ac80 Band Edge, Right Side

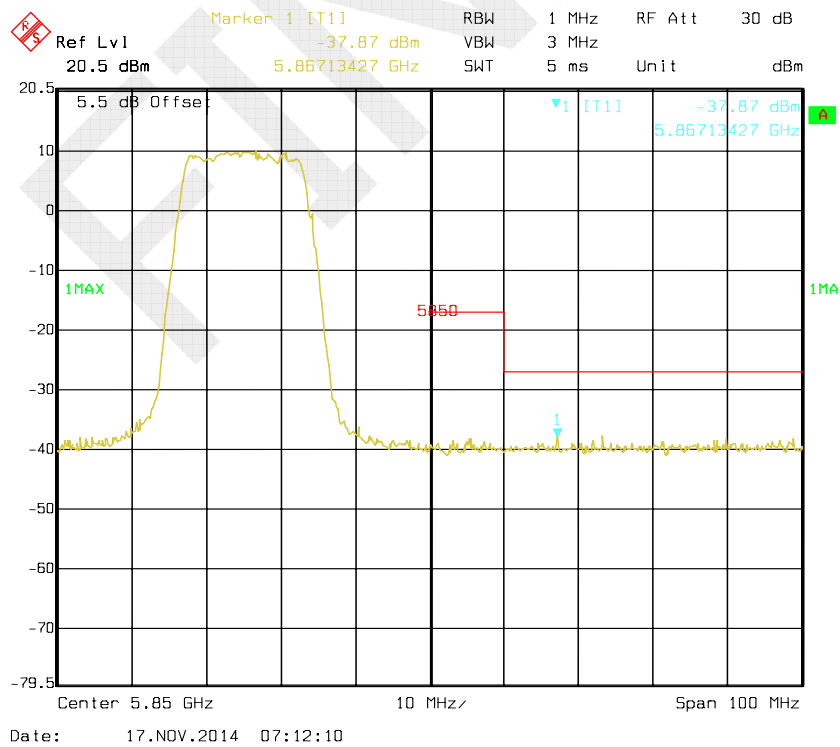


5725MHz-5850MHz:

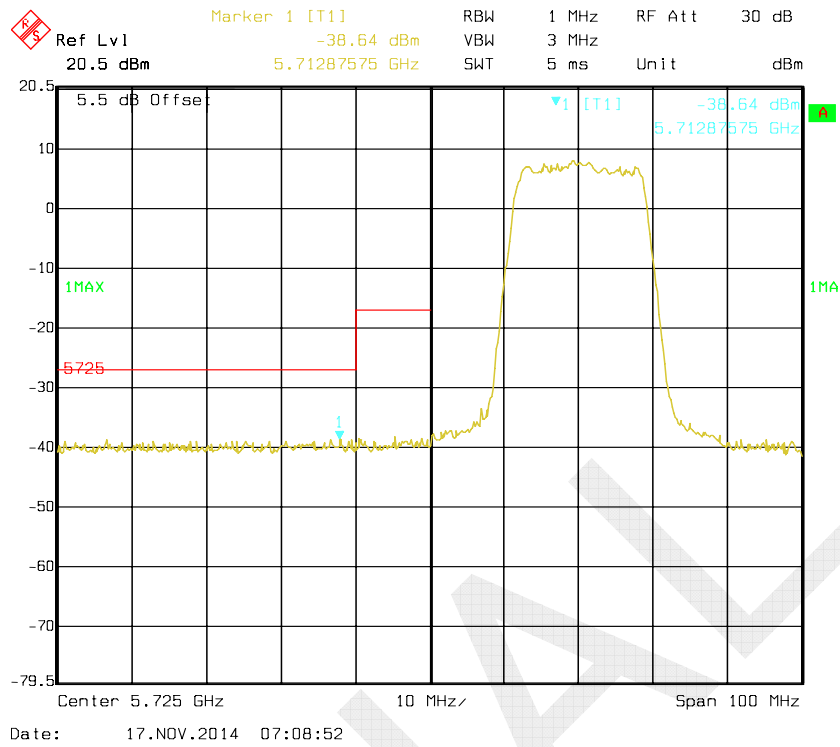
**802.11a Band Edge, Left Side**



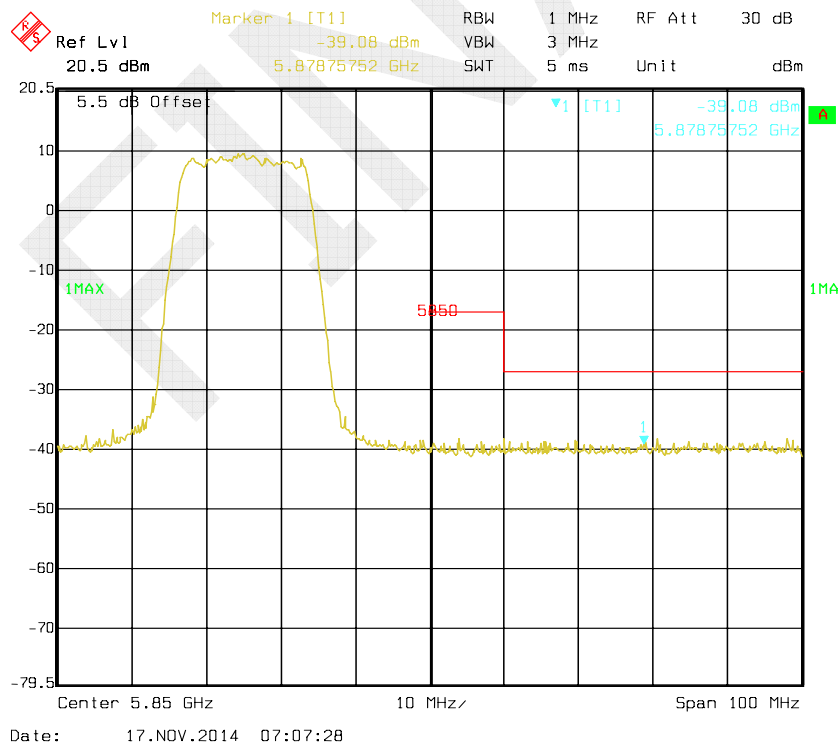
**802.11a Band Edge, Right Side**



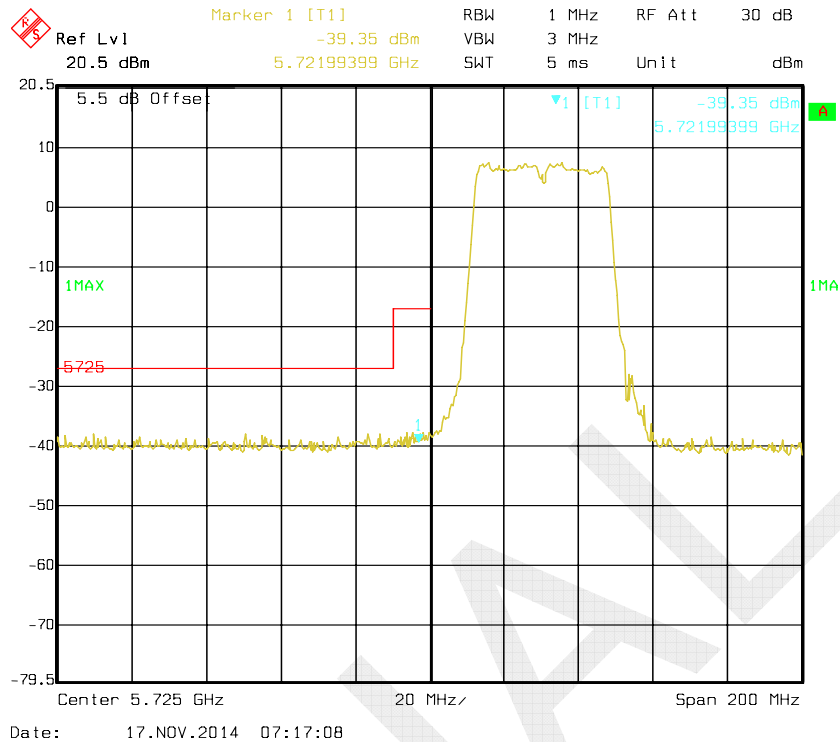
**802.11n ht20 Band Edge, Left Side**



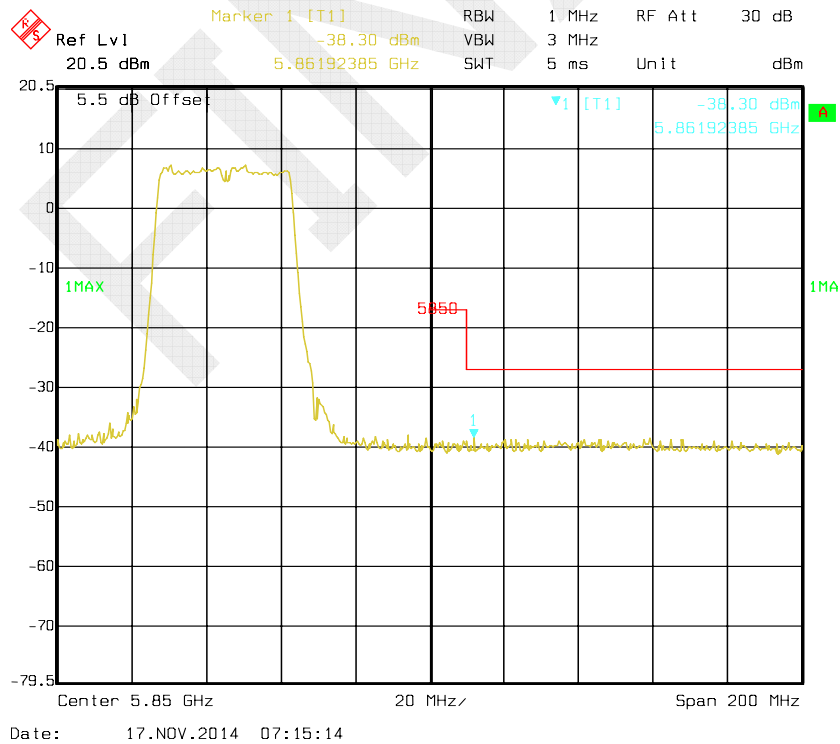
**802.11n ht20 Band Edge, Right Side**



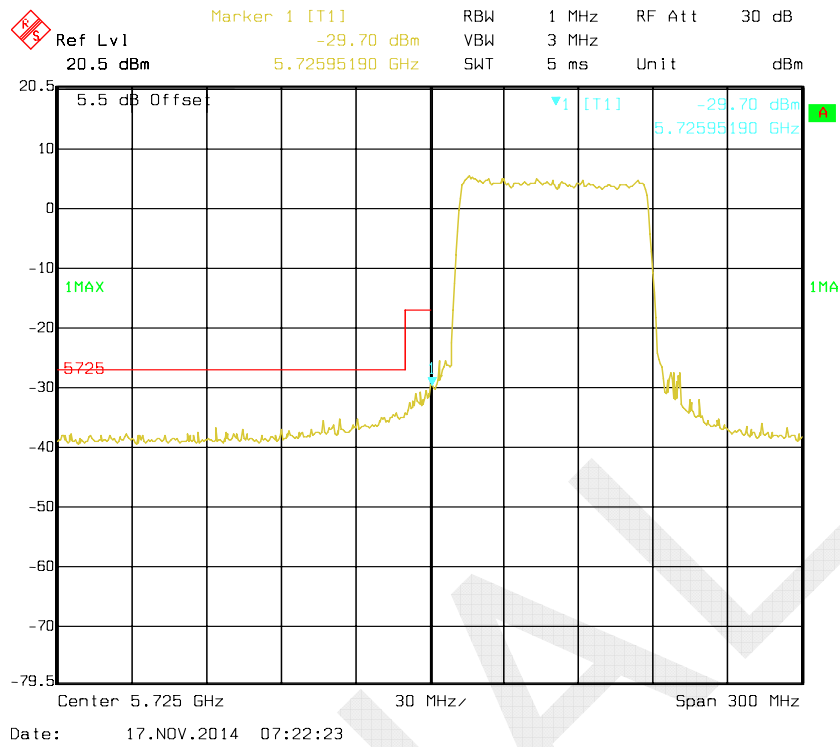
### 802.11n ht40 Band Edge, Left Side



### 802.11n ht40 Band Edge, Right Side



### 802.11n ac80 Band Edge, Left Side



### 802.11n ac80 Band Edge, Right Side

