

FCC PART 15.407

TEST REPORT

For

Shanghai Xiaoyi Technology Co., Ltd.

6F, Building E, No.2889, Jinke Road, Shanghai, China

FCC ID: 2AFIB-YAS1616

Report Type: Original Report	Product Type: YI Action Camera 4K
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Report Number: RKS151229001-00D	
Report Date: 2016-01-25	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The Shanghai Xiaoyi Technology Co., Ltd.'s product, model number: YAS.1616.INT (FCC ID: 2AFIB-YAS1616) or ("EUT") in this report is a YI Action Camera 4K, which was measured approximately: 65 cm (L) x 43 cm (W) x 22cm (H), rated input voltage: 5VDC or 4.4V from battery.

All measurement and test data in this report was gathered from production sample serial number: 20151217001 (Assigned by BACL, Kunshan). The EUT was received on 2015-12-17.

Antenna information

Manufacturer	Antenna Type	Max. Antenna Gain
Shanghai Amphenol Airwave Communication Electronics Co.,Ltd	FPC	-3.09dBi

Objective

This type approval report is prepared on behalf of Shanghai Xiaoyi Technology Co., Ltd. in accordance with Part 2-Subpart J, Part 15-Subparts A, B and E of the Federal Communication Commissions 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 15.247 DTS and FCC part 15B JBP submission with FCC ID :2AFIB-YAS1616.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, 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. (Kunshan).

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the Chenghu Lake Road, Kunshan Development Zone No.248, Kunshan, Jiangsu, China

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication 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 November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. 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, Channel 5180MHz, 5200MHz,5240MHz were tested.

For 5725~5850 MHz band, Channel 5745MHz, 5785MHz,5825MHz were tested.

EUT Exercise Software

The software “SecureCRT” was used for testing, which was provided by manufacturer. The worst condition (maximum power) was setting by the software as following table:

Test Software Version	SecureCRT		
Test Frequency	5180MHz	5200MHz	5240MHz
Power Level	50	50	50
Test Frequency	5745MHz	5785MHz	5825MHz
Power Level	50	50	50

Equipment Modifications

N/A.

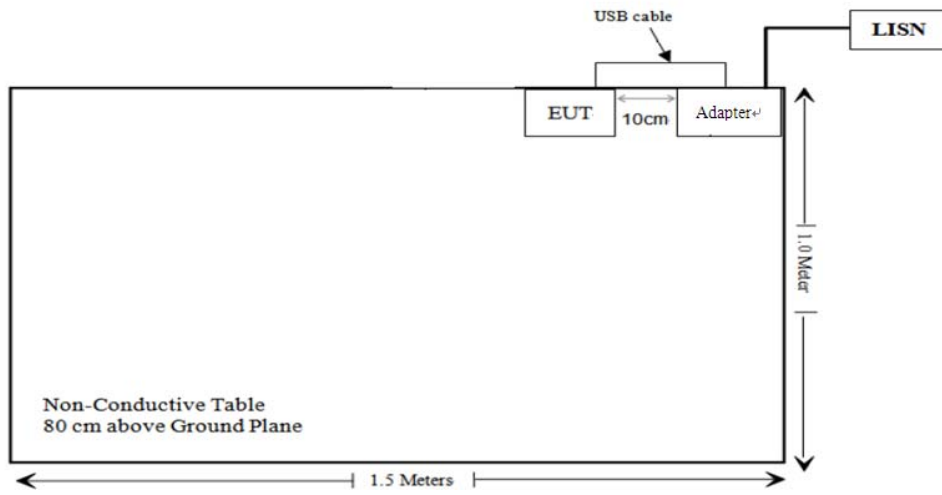
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Lenovo	Notebook	T400	N/A

External Cable

Cable Description	Length (m)	From Port	To
Unshielding Detachable DC Cable	0.3	EUT	ADAPTER

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.407(f) & §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
FCC §15.207&§15.407(b) (6)	AC Power Line 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)	Emission Bandwidth	Compliance
§15.407(a)(1)&§15.407(a)(3)	Conducted Transmitter Output Power	Compliance
§15.407 (a)(1),(5)	Power Spectral Density	Compliance

FCC§15.247 (i), §1.1310& §2.1093 – RF EXPOSURE

Applicable Standard

According to FCC § 1.1310& §2.1093 , systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency level in excess of the Commission's guideline.

The SAR data please refer to the SAR report, report No.: RSH160125050-20A.

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.

Antenna Connector Construction

The EUT has a FPC antenna arrangement for WIFI, which the antenna gain are -3.09 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.407 (b) (6) §15.207 (a) –AC Power Line 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:

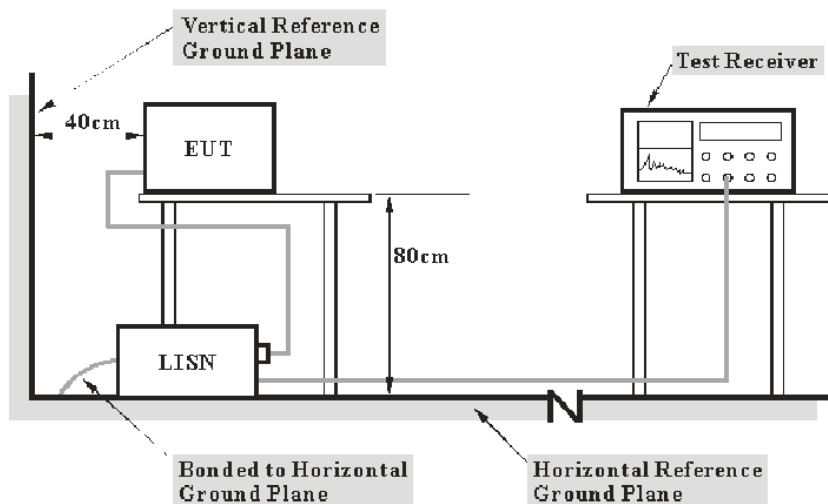
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

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

Table 1 – Values of U_{cispr}

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

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120VAC/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
Rohde & Schwarz	EMI Test Receiver	ESCS30	934115/007	2015-11-12	2016-11-11
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2015-11-12	2016-11-11
Rohde & Schwarz	LISN	ESH3-Z5	892239/018	2015-6-23	2016-6-22
Rohde & Schwarz	Pulse limiter	ESH3-Z2	879940/0058	2015-6-19	2016-6-18
HP	Current probe	8710-1744	636	2015-6-19	2016-6-18
FCC	ISN	FCC-TLISN-T8-02	20376	2015-6-23	2016-6-22
Rohde & Schwarz	CE Test software	EMC 32	V 09.10.0	--	--
MICRO-COAX	Coaxial line	UFB-293B-1-0480-50X50	97F0173	2015-10-1	2016-10-1

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) 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 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:

11.94 dB at 0.175000 MHz in the Line conducted mode

Test Data

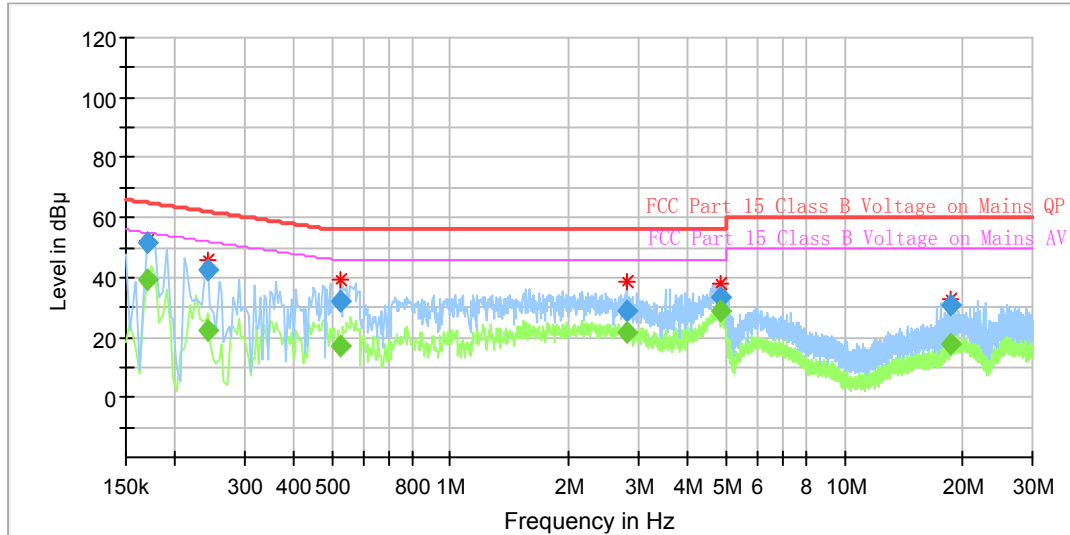
Environmental Conditions

Temperature:	27.2 °C
Relative Humidity:	55 %
ATM Pressure:	100.3 kPa

The testing was performed by Matt Yao on 2016-01-20

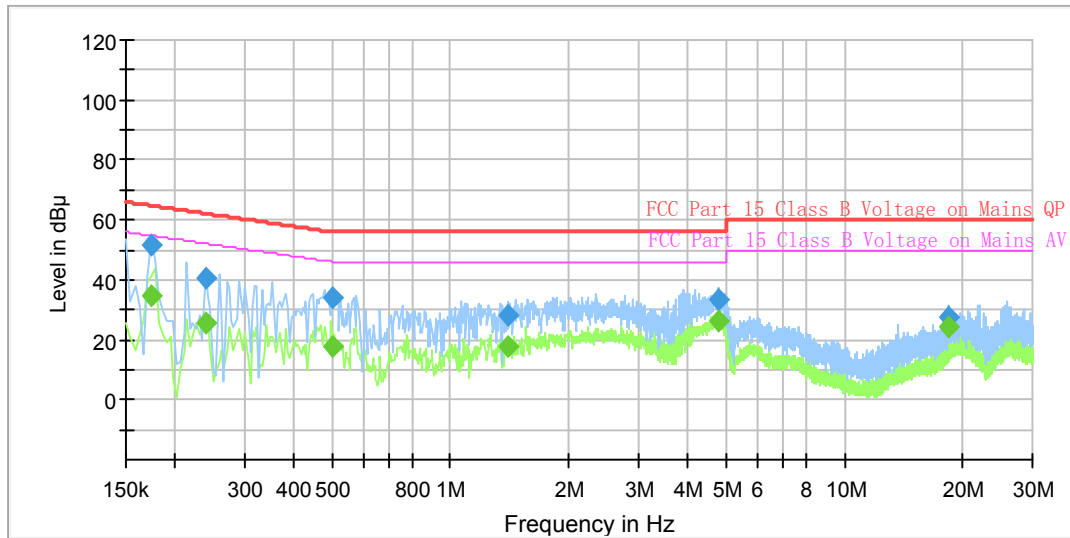
Test Mode: Transmitting

AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.170	---	39.38	9.000	L1	11.0	15.58	54.96	Compliance
0.170	51.87	---	9.000	L1	11.0	13.09	64.96	Compliance
0.242	---	22.54	9.000	L1	11.0	29.49	52.03	Compliance
0.242	42.27	---	9.000	L1	11.0	19.76	62.03	Compliance
0.526	---	17.17	9.000	L1	11.0	28.83	46.00	Compliance
0.526	32.35	---	9.000	L1	11.0	23.65	56.00	Compliance
2.790	---	21.71	9.000	L1	11.2	24.29	46.00	Compliance
2.790	29.16	---	9.000	L1	11.2	26.84	56.00	Compliance
4.850	---	28.64	9.000	L1	11.3	17.36	46.00	Compliance
4.850	33.42	---	9.000	L1	11.3	22.58	56.00	Compliance
18.658	---	17.50	9.000	L1	11.4	32.50	50.00	Compliance
18.658	30.59	---	9.000	L1	11.4	29.41	60.00	Compliance

AC 120V/60 Hz, Neutral



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.174	---	34.84	9.000	N	11.00	19.93	54.77	Compliance
0.174	51.51	---	9.000	N	11.00	13.26	64.77	Compliance
0.238	---	25.67	9.000	N	11.00	26.50	52.17	Compliance
0.238	40.40	---	9.000	N	11.00	21.77	62.17	Compliance
0.502	---	17.81	9.000	N	11.00	28.19	46.00	Compliance
0.502	33.87	---	9.000	N	11.00	22.13	56.00	Compliance
1.394	---	17.97	9.000	N	11.10	28.03	46.00	Compliance
1.394	28.34	---	9.000	N	11.10	27.66	56.00	Compliance
4.794	---	26.38	9.000	N	11.40	19.62	46.00	Compliance
4.794	33.58	---	9.000	N	11.40	22.42	56.00	Compliance
18.330	---	24.34	9.000	N	11.40	25.66	50.00	Compliance
18.330	27.26	---	9.000	N	11.40	32.74	60.00	Compliance

Note:
 1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss
 2) Corrected Amplitude = Reading + Corr.
 3) Margin = Limit –Corrected Amplitude

§15.205 & §15.209 & §15.407(B) (1),(6),(7) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (1), (2), (3), (6), (7); §15.209; §15.205;

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 EIRP of –27dBm/MHz

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 EIRP of –27dBm/MHz

For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27dBm/MHz

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

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

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.

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:

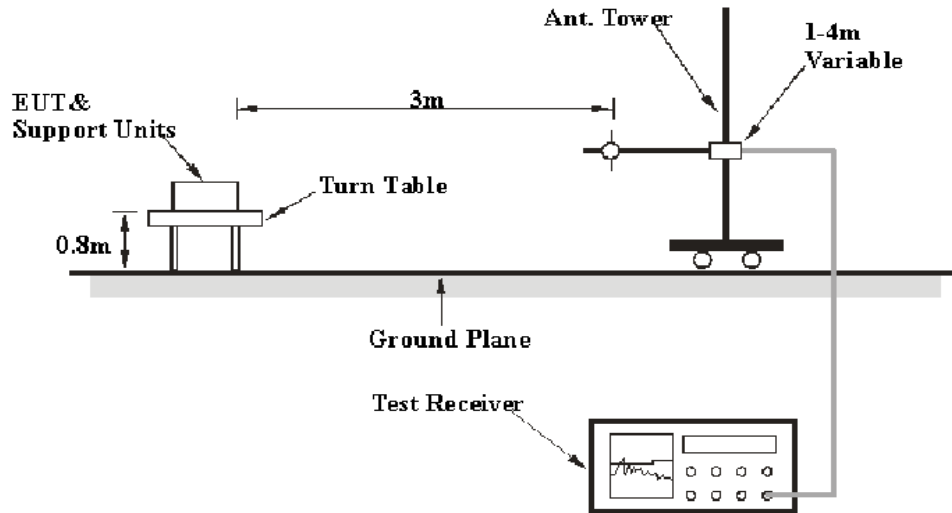
- 30M~200MHz: 5.0 dB
- 200M~1GHz: 6.2 dB
- 1G~6GHz: 4.45 dB
- 6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

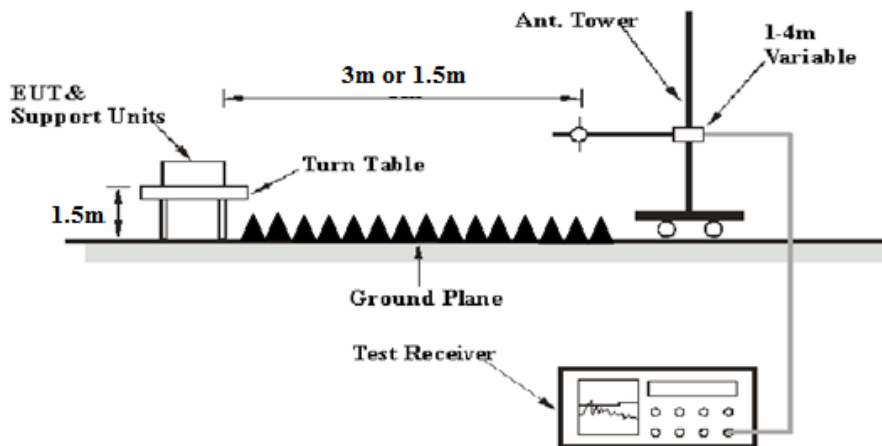
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1 G:



Above 1 G:



The radiated emission tests were performed in the 3 meters chamber, using the setup accordance with the ANSI C63.4-2009. 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 was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

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

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

Test Procedure

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

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

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

The Radiated measurements was performed, The EIRP converted to field strength as follows:

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)

or Limit line = Specific limits(dB μ V) + 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
Sonoma Instrument	Amplifier	330	171377	2015-09-16	2016-09-16
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2015-11-12	2016-11-11
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2015-11-07	2016-11-06
ETS	Horn Antenna	3115	6229	2015-11-07	2016-11-06
EMCO	Horn Antenna	3116	9510-2384	2015-11-07	2016-11-06
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2015-11-12	2016-11-11
Rohde & Schwarz	Signal Analyzer	FSV40	101116	2015-09-02	2016-09-02
Mini	Pre-amplifier	ZVA-183-S+	857001418	2015-09-16	2016-09-16
DUCOMMUN	Pre-amplifier	ALN-22093530-01	990147	2015-09-16	2016-09-16
champrotek	Chamber	Chamber A	1#	2015-09-17	2016-09-17
R&S	Auto test Software	EMC32	V 09.10.0	-	-
BACL	RF cable	KS-LAB-012	KS-LAB-012	2015-06-16	2016-12-15
BACL	RF cable	KS-LAB-010	KS-LAB-010	2015-06-16	2016-12-15

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

Test Results Summary

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

5.15 dB at 872 MHz in the Horizontal polarization for 802.11a Mode 5745-5825 MHz band

Test Data**Environmental Conditions**

Temperature:	26.8 °C
Relative Humidity:	62 %
ATM Pressure:	99.9 kPa

The testing was performed by Matt Yao on 2016-01-18 & 2016-01-21.

Mode: Transmitting

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

802.11a Mode:

5180-5240 MHz band:

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	84.97	PK	120.0	150.0	V	10.28	95.25	89.25	N/A	N/A
5180	73.41	AV	120.0	150.0	V	10.28	83.69	77.69	N/A	N/A
5180	84.83	PK	66.0	200.00	H	10.28	95.11	89.11	N/A	N/A
5180	73.26	AV	66.0	200.00	H	10.28	83.54	77.54	N/A	N/A
5150	32.00	PK	212.0	150.00	V	10.25	42.25	36.25	74	37.75
5150	22.11	AV	212.0	150.00	V	10.25	32.36	26.36	54	27.64
10360	25.15	PK	76.0	150.00	V	20.06	45.21	39.21	74	34.79
10360	14.15	AV	76.0	150.00	V	20.06	34.21	28.21	54	25.79
15540	29.94	PK	0.0	200.00	H	27.2	57.14	51.14	74	22.86
15540	18.12	AV	0.0	200.00	H	27.2	45.32	39.32	54	14.68
6651	29.60	PK	310.0	150.00	V	0.51	30.11	24.11	74	49.89
6651	19.74	AV	310.0	150.00	V	0.51	20.25	14.25	54	39.75
840	35.86	QP	258.0	100.00	H	4.5	40.36	/	46	5.64
Middle Channel:5200MHz										
5200	84.84	PK	151.0	150.0	V	10.28	95.12	89.12	N/A	N/A
5200	73.74	AV	151.0	150.0	V	10.28	84.02	78.02	N/A	N/A
5200	84.70	PK	48.0	200.00	H	10.28	94.98	88.98	N/A	N/A
5200	72.08	AV	48.0	200.00	H	10.28	82.36	76.36	N/A	N/A
10400	24.26	PK	145.0	150.00	V	20.06	44.32	38.32	74	35.68
10400	15.30	AV	145.0	150.00	V	20.06	35.36	29.36	54	24.64
15600	28.94	PK	12.0	200.00	H	27.2	56.14	50.14	74	23.86
15600	17.54	AV	12.0	200.00	H	27.2	44.74	38.74	54	15.26
6658	29.07	PK	345.0	150.00	V	0.51	29.58	23.58	74	50.42
6658	45.23	AV	345.0	150.00	V	0.51	45.74	39.74	54	14.26
7450	12.79	PK	341.0	150.00	H	19.9	32.69	26.69	74	47.31
7450	23.46	AV	341.0	150.00	H	19.9	43.36	37.36	54	16.64
840	33.75	QP	240.0	100.00	H	4.5	38.25	/	46	7.75

High Channel:5240MHz										
5240	84.74	PK	120.0	150.0	V	10.28	95.02	89.02	N/A	N/A
5240	72.86	AV	120.0	150.0	V	10.28	83.14	77.14	N/A	N/A
5240	84.59	PK	66.0	200.00	H	10.28	94.87	88.87	N/A	N/A
5240	72.97	AV	66.0	200.00	H	10.28	83.25	77.25	N/A	N/A
5350	30.76	PK	212.0	150.00	V	10.45	41.21	35.21	74	38.79
5350	22.20	AV	212.0	150.00	V	10.45	32.65	26.65	54	27.35
10480	23.96	PK	76.0	150.00	V	20.06	44.02	38.02	74	35.98
10480	14.26	AV	76.0	150.00	V	20.06	34.32	28.32	54	25.68
15720	28.05	PK	0.0	200.00	H	27.2	55.25	49.25	74	24.75
15720	17.11	AV	0.0	200.00	H	27.2	44.31	38.31	54	15.69
6651	28.18	PK	310.0	150.00	V	0.51	28.69	22.69	74	51.31
6651	21.15	AV	310.0	150.00	V	0.51	21.66	15.66	54	38.34
840	35.61	QP	258.0	100.00	H	4.5	40.11	/	46	5.89

5745-5825 MHz band:

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	91.01	PK	120.0	150.0	V	11.67	94.89	88.89	N/A	N/A
5745	77.96	AV	120.0	150.0	V	11.67	83.55	77.55	N/A	N/A
5745	93.16	PK	66.0	200.00	H	11.67	94.71	88.71	N/A	N/A
5745	82.09	AV	66.0	200.00	H	11.67	83.45	77.45	N/A	N/A
5725	47.66	PK	212.0	150.00	V	11.56	59.22	53.22	74	24.98
5725	30.31	AV	212.0	150.00	V	11.56	41.87	35.87	54	18.13
11490	29.78	PK	76.0	150.00	V	21.64	51.42	45.42	74	22.78
11490	16.92	AV	76.0	150.00	V	21.64	38.56	32.56	54	21.44
17235	30.63	PK	0.0	200.00	H	29.32	59.95	53.95	74	14.25
17235	18.93	AV	0.0	200.00	H	29.32	48.25	42.25	54	11.75
6678	30.22	PK	310.0	150.00	V	0.51	30.73	24.73	74	49.27
6678	20.36	AV	310.0	150.00	V	0.51	20.87	14.87	54	39.13
872	36.33	QP	258.0	100.00	H	4.5	40.83	/	46	5.17

Middle Channel:5785MHz										
5785	91.01	PK	151.0	150.0	V	11.67	95.14	89.14	N/A	N/A
5785	77.96	AV	151.0	150.0	V	11.67	83.45	77.45	N/A	N/A
5785	93.16	PK	48.0	200.00	H	11.67	94.81	88.81	N/A	N/A
5785	82.09	AV	48.0	200.00	H	11.67	83.84	77.84	N/A	N/A
11570	29.78	PK	145.0	200.00	V	21.64	51.92	45.92	74	22.78
11570	16.92	AV	145.0	200.00	V	21.64	38.29	32.29	54	21.44
17355	30.63	PK	12.0	200.00	H	29.32	59.32	53.32	74	14.25
17355	18.93	AV	12.0	200.00	H	29.32	48.64	42.64	54	11.75
6658	28.87	PK	345.0	150.00	V	0.51	29.38	23.38	74	50.62
6658	45.41	AV	345.0	150.00	V	0.51	45.92	39.92	54	14.08
7452	12.92	PK	341.0	150.00	H	19.9	32.82	26.82	74	47.18
7452	23.35	AV	341.0	150.00	H	19.9	43.25	37.25	54	16.75
872	36.14	QP	240.0	100.00	H	4.5	40.64	/	46	5.36

High Channel:5825MHz										
5825	91.01	PK	120.0	150.0	V	11.67	94.56	88.56	N/A	N/A
5825	77.96	AV	120.0	150.0	V	11.67	84.23	78.23	N/A	N/A
5825	93.16	PK	66.0	200.00	H	11.67	94.11	88.11	N/A	N/A
5825	82.09	AV	66.0	200.00	H	11.67	83.51	77.51	N/A	N/A
5850	47.66	PK	212.0	150.00	V	11.82	59.39	53.39	74	24.98
5850	30.31	AV	212.0	150.00	V	11.82	41.46	35.46	54	18.13
11650	29.78	PK	76.0	150.00	V	21.64	51.2	45.2	74	22.78
11650	16.92	AV	76.0	150.00	V	21.64	38.32	32.32	54	21.44
17475	30.63	PK	0.0	200.00	H	29.32	59.84	53.84	74	14.25
17475	18.93	AV	0.0	200.00	H	29.32	48.21	42.21	54	11.75
6626	27.83	PK	310.0	150.00	V	0.51	28.34	22.34	74	51.66
6626	20.90	AV	310.0	150.00	V	0.51	21.41	15.41	54	38.59
872	36.35	QP	258.0	100.00	H	4.5	40.85	/	46	5.15

802.11n ht20 Mode:

5180-5240 MHz band:

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	85.47	PK	129.0	150.0	V	10.28	95.75	89.75	N/A	N/A
5180	72.99	AV	129.0	150.0	V	10.28	83.27	77.27	N/A	N/A
5180	84.93	PK	69.0	200.00	H	10.28	95.21	89.21	N/A	N/A
5180	73.20	AV	69.0	200.00	H	10.28	83.48	77.48	N/A	N/A
5150	32.07	PK	182.0	200.00	V	10.25	42.32	36.32	74	37.68
5150	22.72	AV	182.0	200.00	V	10.25	32.97	26.97	54	27.03
10360	25.29	PK	89.0	150.00	V	20.06	45.35	39.35	74	34.65
10360	14.23	AV	89.0	150.00	V	20.06	34.29	28.29	54	25.71
15540	29.96	PK	34.0	200.00	H	27.2	57.16	51.16	74	22.84
15540	18.32	AV	34.0	200.00	H	27.2	45.52	39.52	54	14.48
6653	30.31	PK	323.0	150.00	V	0.51	30.82	24.82	74	49.18
6653	20.43	AV	323.0	150.00	V	0.51	20.94	14.94	54	39.06
851	35.79	QP	251.0	100.00	H	4.5	40.29	/	46	5.71
Middle Channel:5200MHz										
5200	84.91	PK	149.0	150.0	V	10.28	95.19	89.19	N/A	N/A
5200	74.35	AV	149.0	150.0	V	10.28	84.63	78.63	N/A	N/A
5200	84.13	PK	89.0	200.00	H	10.28	94.41	88.41	N/A	N/A
5200	72.29	AV	89.0	200.00	H	10.28	82.57	76.57	N/A	N/A
10400	24.53	PK	145.0	150.00	V	20.06	44.59	38.59	74	35.41
10400	15.21	AV	145.0	150.00	V	20.06	35.27	29.27	54	24.73
15600	28.82	PK	12.0	150.00	H	27.2	56.02	50.02	74	23.98
15600	17.32	AV	12.0	150.00	H	27.2	44.52	38.52	54	15.48
6658	28.90	PK	348.0	150.00	V	0.51	29.41	23.41	74	50.59
6658	44.78	AV	348.0	150.00	V	0.51	45.29	39.29	54	14.71
7445	12.48	PK	345.0	150.00	H	19.9	32.38	26.38	74	47.62
7445	23.55	AV	345.0	150.00	H	19.9	43.45	37.45	54	16.55
851	33.91	QP	227.0	100.00	H	4.5	38.41	/	46	7.59

High Channel:5240MHz										
5240	85.35	PK	116.0	150.0	V	10.28	95.63	89.63	N/A	N/A
5240	73.00	AV	116.0	150.0	V	10.28	83.28	77.28	N/A	N/A
5240	84.59	PK	56.0	200.00	H	10.28	94.87	88.87	N/A	N/A
5240	73.21	AV	56.0	200.00	H	10.28	83.49	77.49	N/A	N/A
5350	30.84	PK	202.0	150.00	V	10.45	41.29	35.29	74	38.71
5350	21.85	AV	202.0	150.00	V	10.45	32.3	26.3	54	27.7
10480	24.59	PK	76.0	200.00	V	20.06	44.65	38.65	74	35.35
10480	14.22	AV	76.0	200.00	V	20.06	34.28	28.28	54	25.72
15720	28.33	PK	3.0	200.00	H	27.2	55.53	49.53	74	24.47
15720	17.52	AV	3.0	200.00	H	27.2	44.72	38.72	54	15.28
6638	27.90	PK	310.0	150.00	V	0.51	28.41	22.41	74	51.59
6638	21.21	AV	310.0	150.00	V	0.51	21.72	15.72	54	38.28
851	36.03	QP	243.0	100.00	H	4.5	40.53	/	46	5.47

5745-5825 MHz band:

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	91.01	PK	113.0	150.0	V	11.67	94.67	88.67	N/A	N/A
5745	77.96	AV	113.0	150.0	V	11.67	84.14	78.14	N/A	N/A
5745	93.16	PK	93.0	200.00	H	11.67	93.89	87.89	N/A	N/A
5745	82.09	AV	93.0	200.00	H	11.67	83.45	77.45	N/A	N/A
5725	47.66	PK	212.0	150.00	V	11.56	59.98	53.98	74	24.98
5725	30.31	AV	212.0	150.00	V	11.56	41.29	35.29	54	18.13
11490	29.78	PK	76.0	150.00	V	21.64	51.57	45.57	74	22.78
11490	16.92	AV	76.0	150.00	V	21.64	38.27	32.27	54	21.44
17235	30.63	PK	72.0	200.00	H	29.32	59.23	53.23	74	14.25
17235	18.93	AV	72.0	200.00	H	29.32	48.27	42.27	54	11.75
6628	30.31	PK	306.0	150.00	V	0.51	30.82	24.82	74	49.18
6628	20.37	AV	306.0	150.00	V	0.51	20.88	14.88	54	39.12
854	36.33	QP	258.0	100.00	H	4.5	40.83	/	46	5.17

Middle Channel:5785MHz										
5785	91.01	PK	126.0	150.0	V	11.67	94.51	88.51	N/A	N/A
5785	77.96	AV	126.0	150.0	V	11.67	84.21	78.21	N/A	N/A
5785	93.16	PK	63.0	150.00	H	11.67	94.33	88.33	N/A	N/A
5785	82.09	AV	63.0	150.00	H	11.67	83.45	77.45	N/A	N/A
11570	29.78	PK	145.0	150.00	V	21.64	51.78	45.78	74	22.78
11570	16.92	AV	145.0	150.00	V	21.64	38.36	32.36	54	21.44
17355	30.63	PK	12.0	200.00	H	29.32	59.64	53.64	74	14.25
17355	18.93	AV	12.0	200.00	H	29.32	48.98	42.98	54	11.75
6637	28.73	PK	383.0	150.00	V	0.51	29.24	23.24	74	50.76
6637	45.27	AV	383.0	150.00	V	0.51	45.78	39.78	54	14.22
7462	12.72	PK	323.0	150.00	H	19.9	32.62	26.62	74	47.38
7462	23.89	AV	323.0	150.00	H	19.9	43.79	37.79	54	16.21
854	36.03	QP	240.0	100.00	H	4.5	40.53	/	46	5.47
High Channel:5825MHz										
5825	91.01	PK	178.0	150.0	V	11.67	93.88	87.88	N/A	N/A
5825	77.96	AV	178.0	150.0	V	11.67	83.46	77.46	N/A	N/A
5825	93.16	PK	118.0	200.00	H	11.67	93.51	87.51	N/A	N/A
5825	82.09	AV	118.0	200.00	H	11.67	83.45	77.45	N/A	N/A
5850	47.66	PK	217.0	150.00	V	11.82	59.54	53.54	74	24.98
5850	30.31	AV	217.0	150.00	V	11.82	41.93	35.93	54	18.13
11650	29.78	PK	76.0	150.00	V	21.64	51.82	45.82	74	22.78
11650	16.92	AV	76.0	150.00	V	21.64	38.89	32.89	54	21.44
17475	30.63	PK	58.0	200.00	H	29.32	59.81	53.81	74	14.25
17475	18.93	AV	58.0	200.00	H	29.32	48.73	42.73	54	11.75
6676	28.21	PK	310.0	150.00	V	0.51	28.72	22.72	74	51.28
6676	21.36	AV	310.0	150.00	V	0.51	21.87	15.87	54	38.13
854	36.31	QP	228.0	100.00	H	4.5	40.81	/	46	5.19

Conducted Spurious Emission at Antenna Port

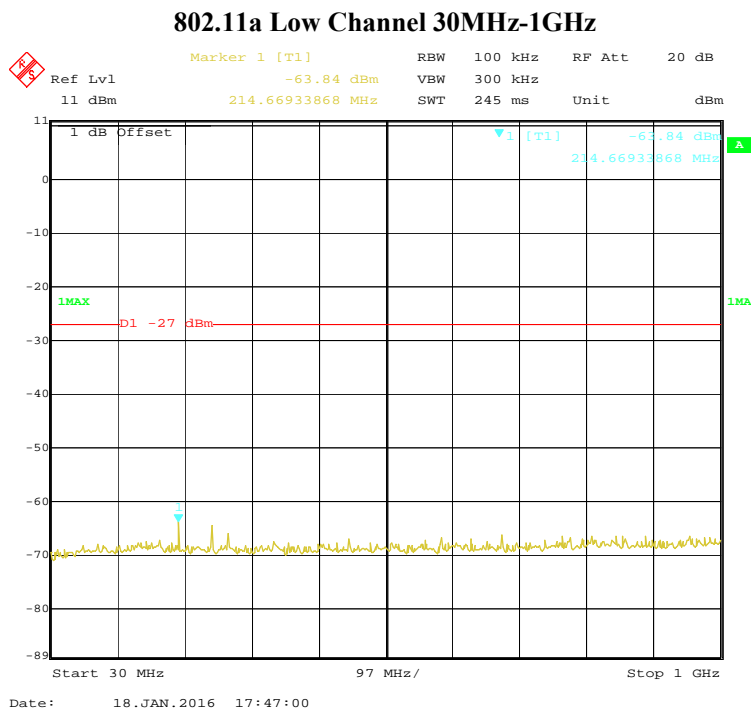
Please refer to the following table and plots:

Mode	Band	Channel	Frequency MHz	E.I.R.P Conducted Spurious Emissions (dBm/MHz)	Limits (dBm/MHz)	Result
802.11a	5180-5240 MHz	Low	5180	-48.54	-27	PASS
		Middle	5200	-48.88	-27	PASS
		High	5240	-49.92	-27	PASS
	5745-5825 MHz	Low	5745	-41.47	-27	PASS
		Middle	5785	-47.17	-27	PASS
		High	5825	-46.70	-27	PASS
802.11n	5180-5240 MHz	Low	5180	-48.97	-27	PASS
		Middle	5200	-48.88	-27	PASS
		High	5240	-49.74	-27	PASS
	5180-5240 MHz	Low	5745	-46.89	-27	PASS
		Middle	5785	-38.26	-27	PASS
		High	5825	-42.75	-27	PASS

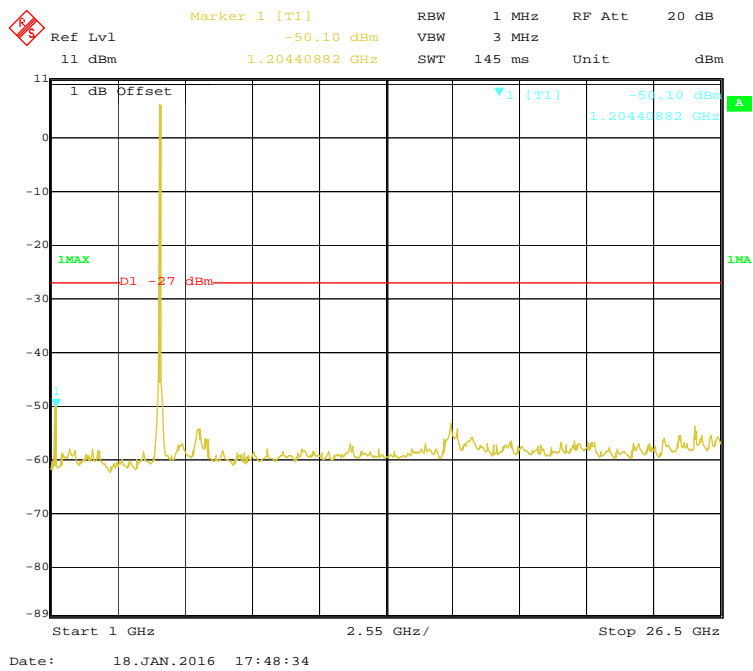
NOTE: E.I.R.P Conducted Spurious Emissions=Reading level+antenna gain
 Antenna gain= -3.09dBi

802.11a Mode

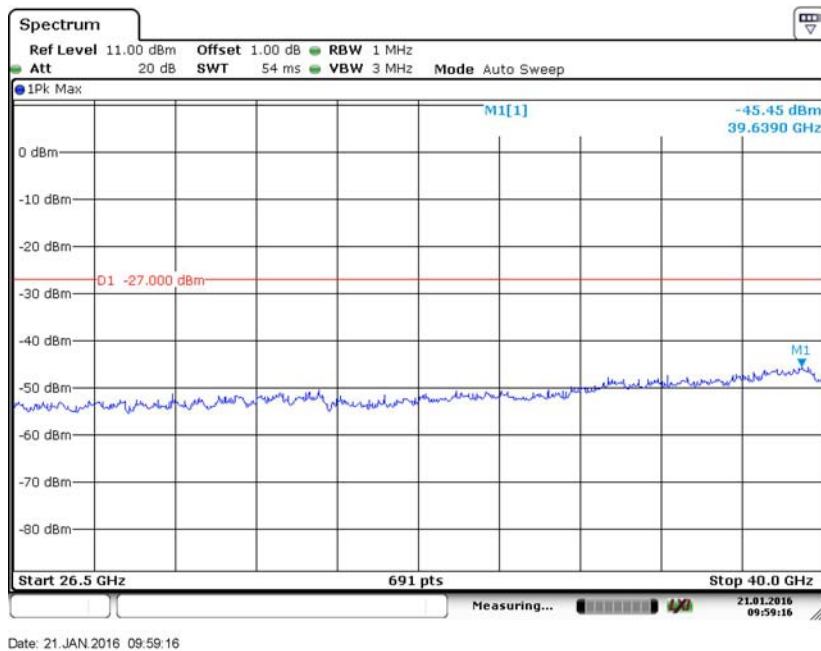
5180-5240 MHz band:



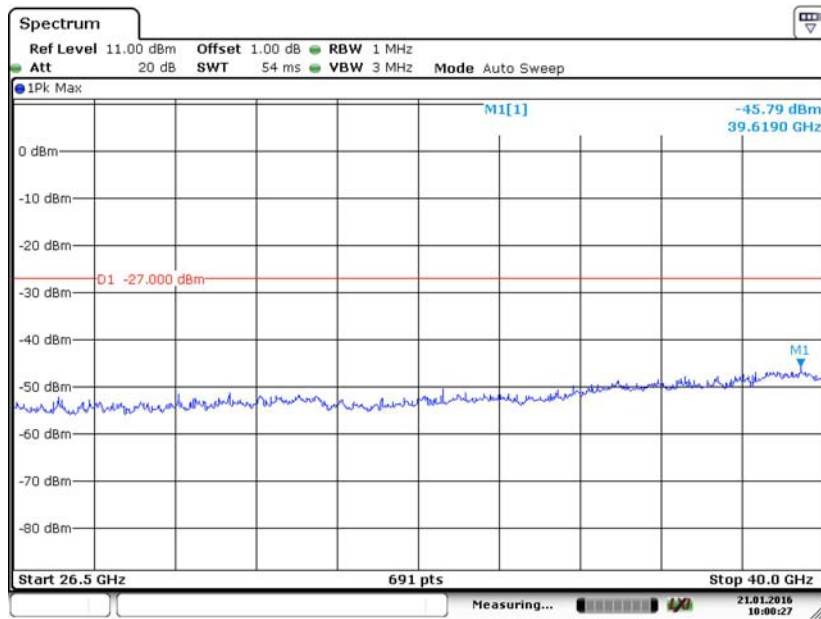
802.11a Low Channel 1GHz-26.5GHz



802.11a Low Channel 26.5GHz-40GHz

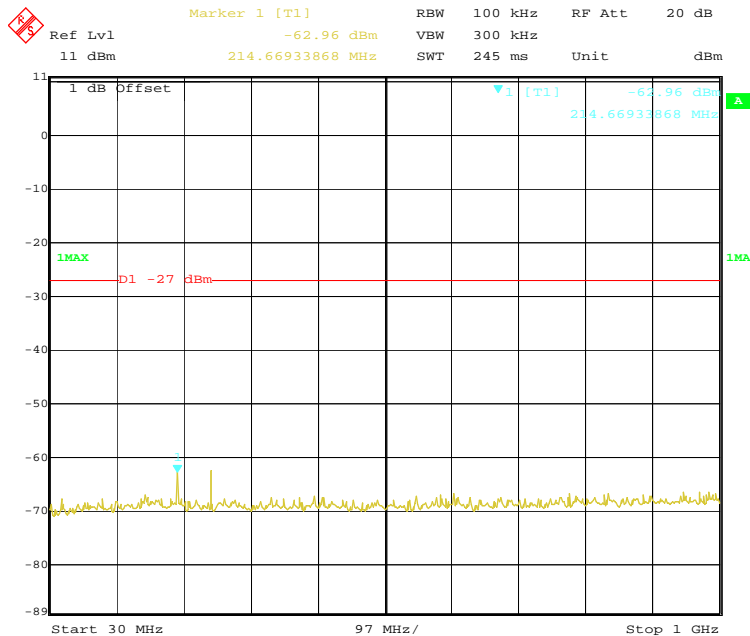


802.11a Middle Channel 26.5GHz-40GHz

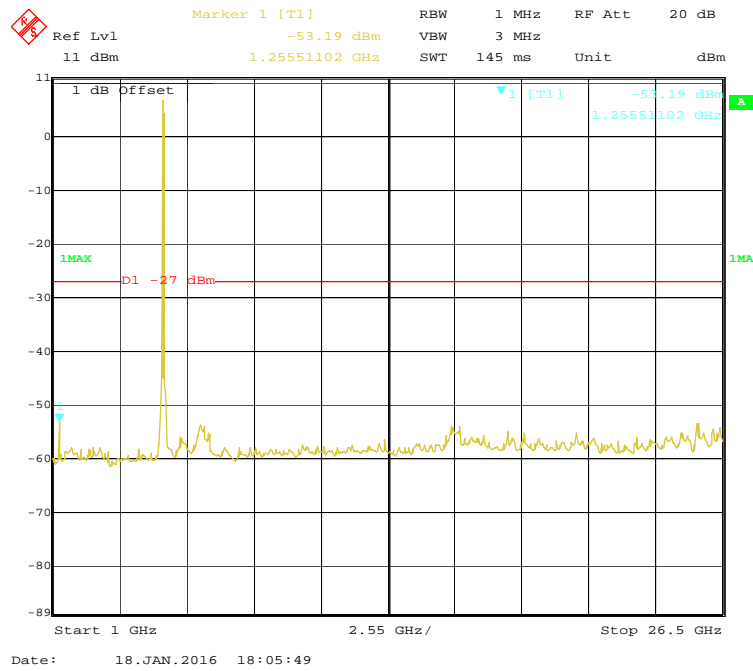


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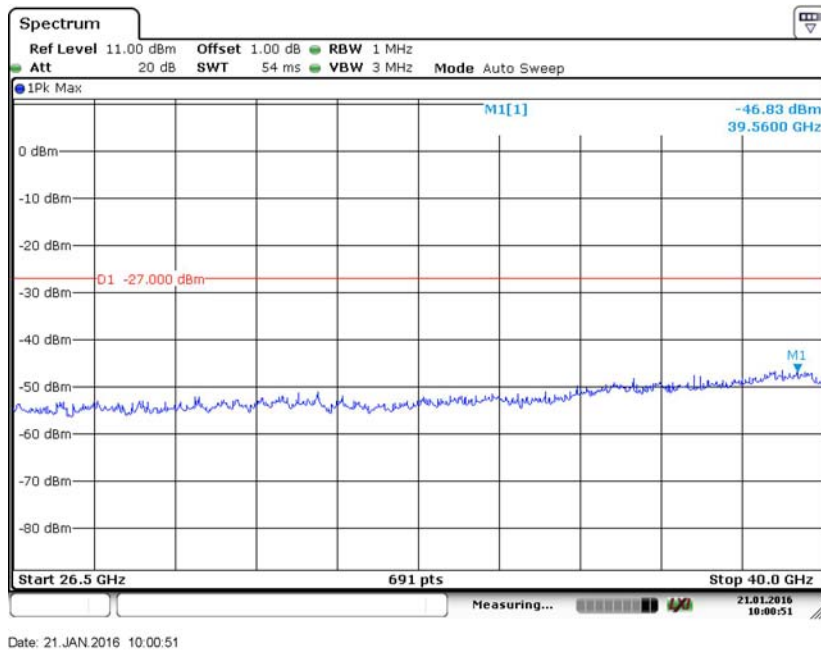
802.11a High Channel 30MHz-1GHz



802.11a High Channel 1GHz-26.5GHz

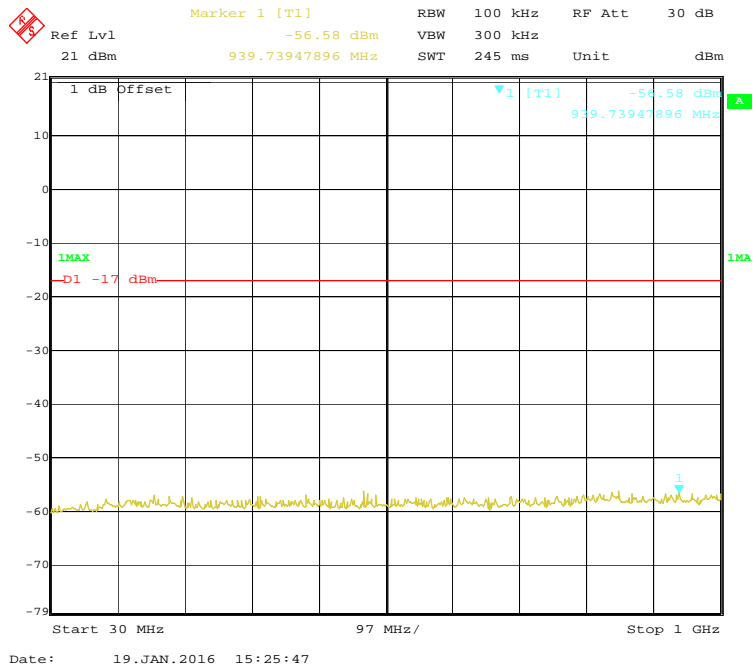


802.11a High Channel 26.5GHz-40GHz

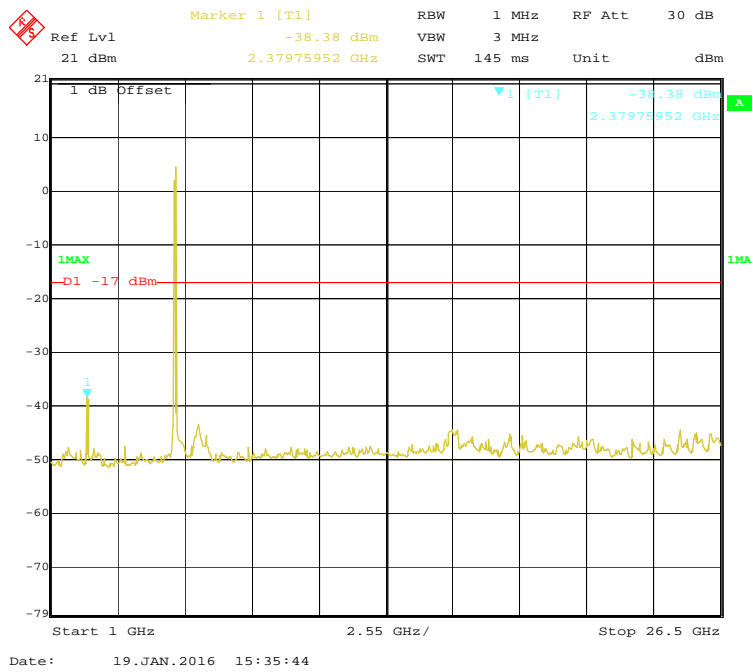


5745-5825 MHz band:

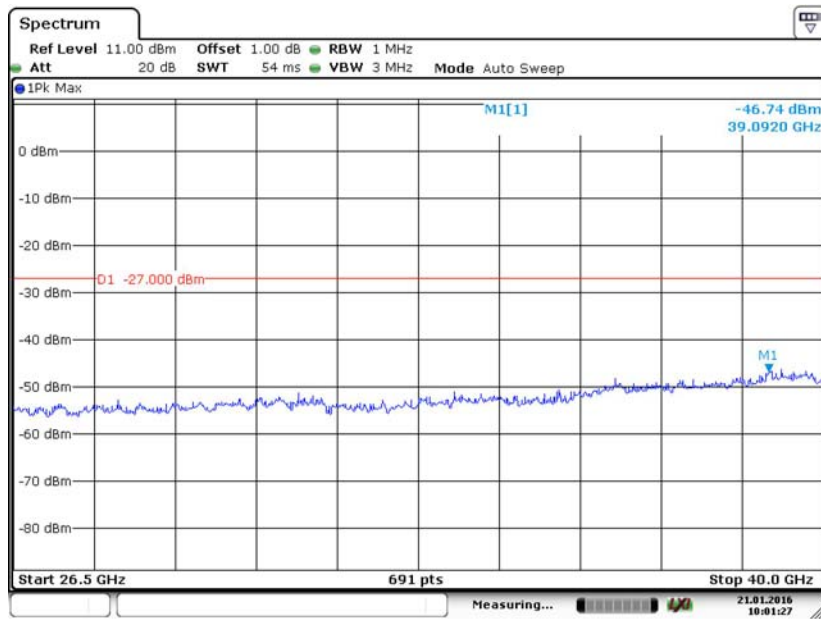
802.11a Low Channel 30MHz-1GHz



802.11a Low Channel 1GHz-26.5GHz

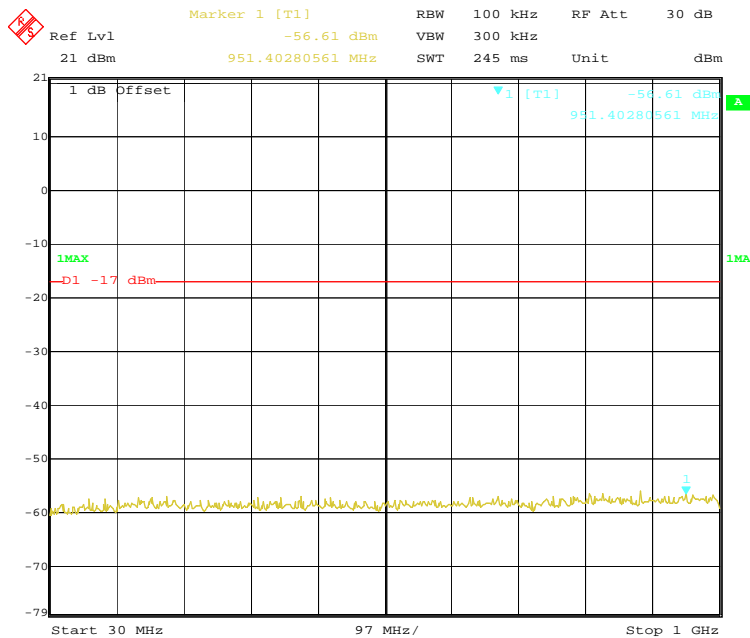


802.11a Low Channel 26.5GHz-40GHz



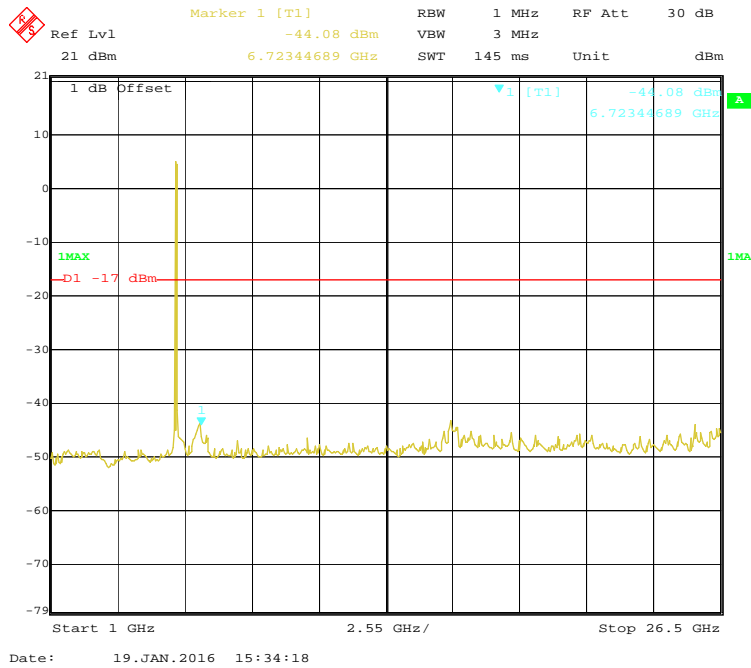
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802.11a Middle Channel 30MHz-1GHz

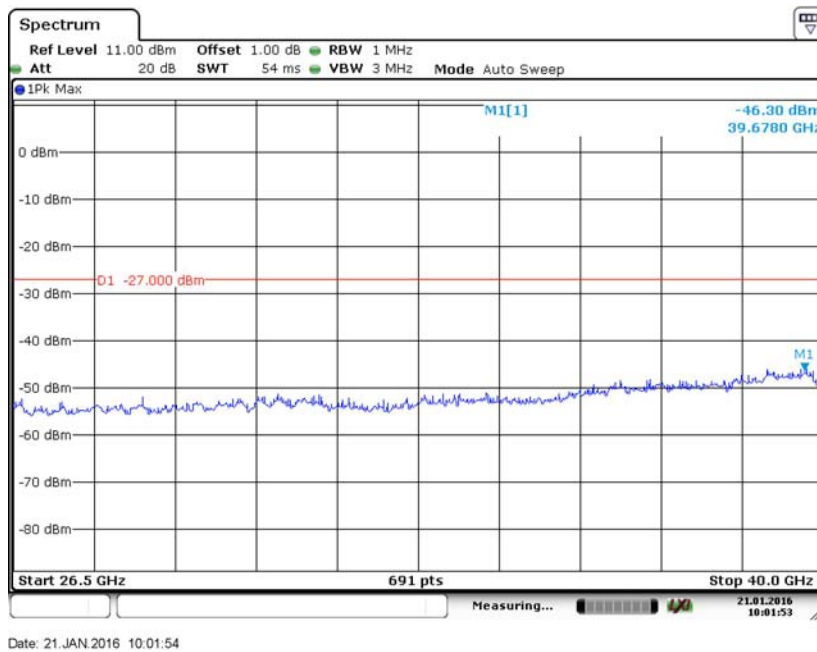


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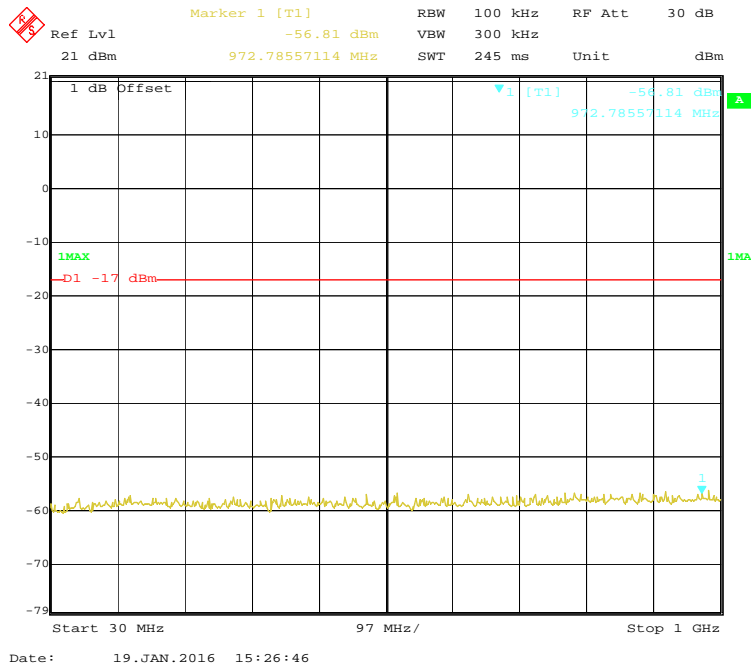
802.11a Middle Channel 1GHz -26.5GHz



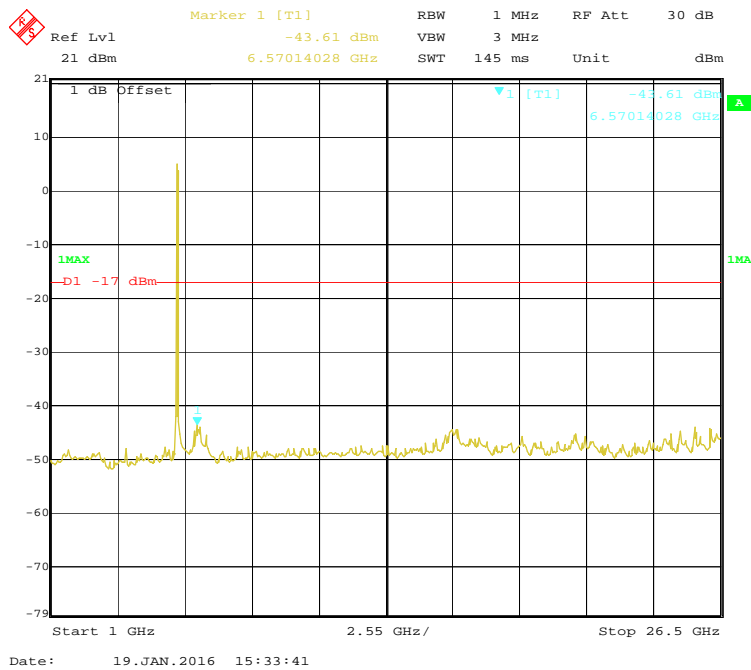
802.11a Middle Channel 26.5GHz-40GHz



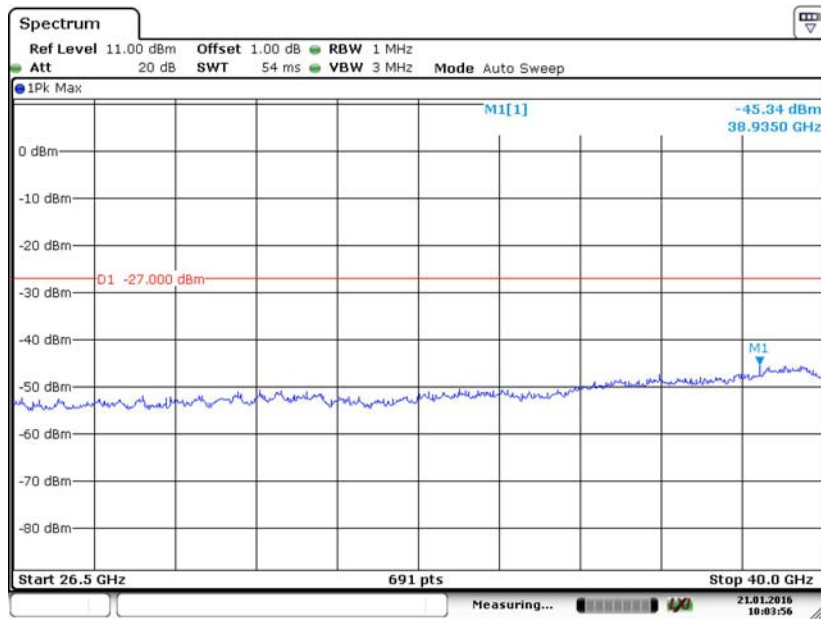
802.11a High Channel 30MHz-1GHz



802.11a High Channel 1GHz-26.5GHz



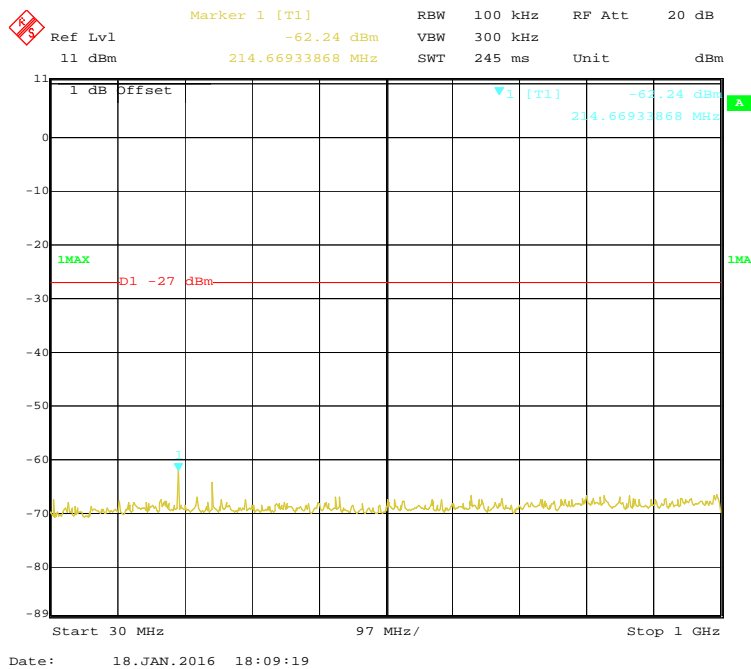
802.11a High Channel 26.5GHz-40GHz



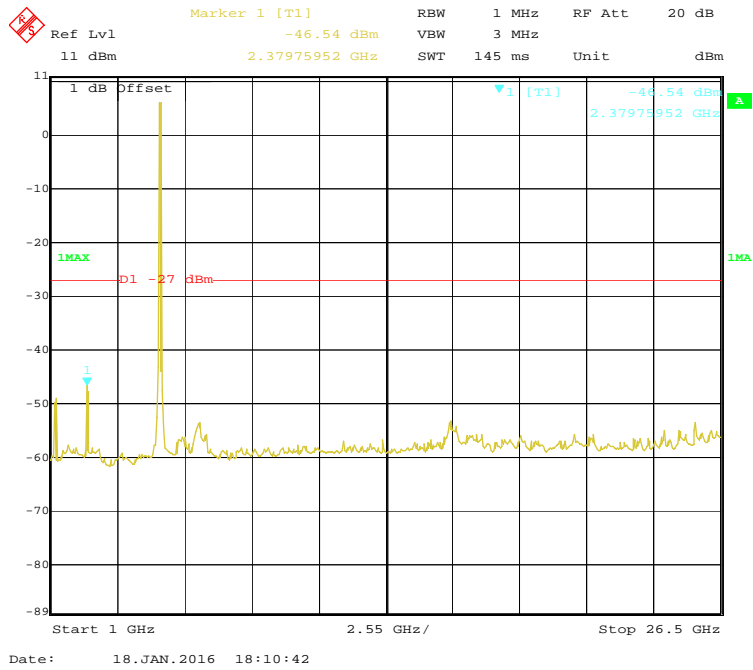
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5180-5240 MHz band:

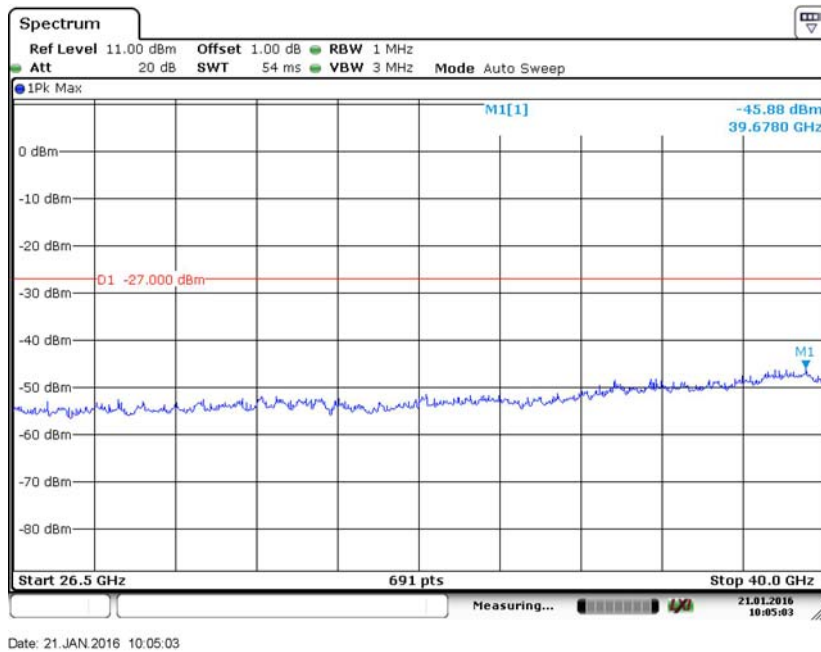
802.11n ht20 Low Channel 30MHz-1GHz



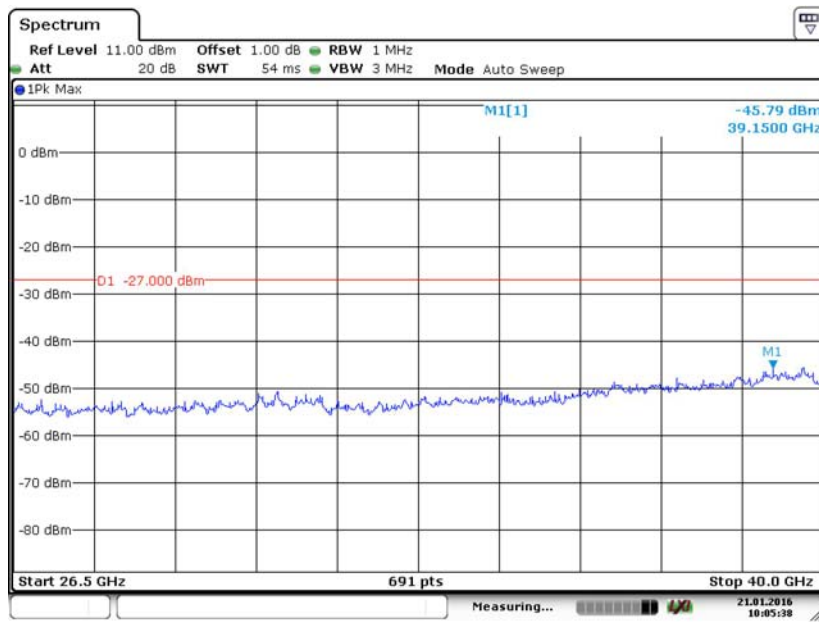
802.11n ht20 Low Channel 1GHz-26.5GHz



802.11n ht20 Low Channel 26.5GHz-40GHz

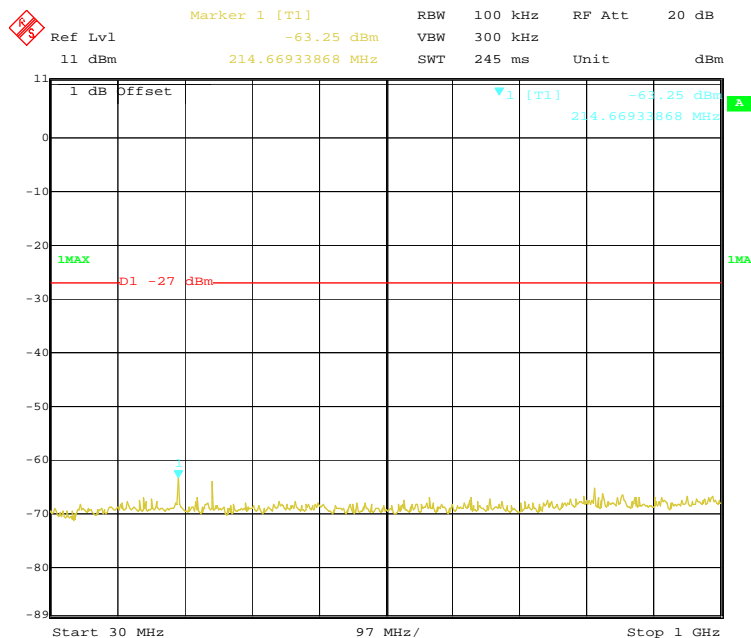


802.11n ht20 Middle Channel 26.5GHz-40GHz



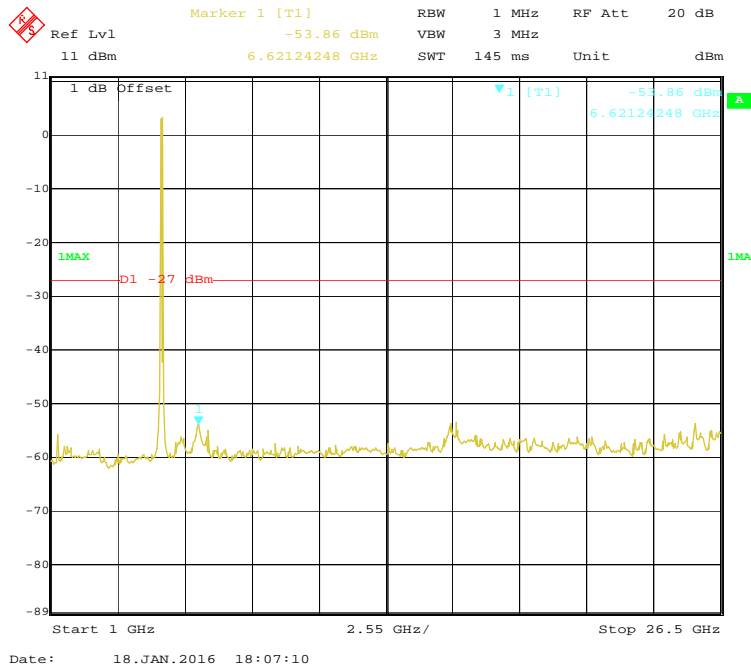
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802.11n ht20 High Channel 30MHz-1GHz

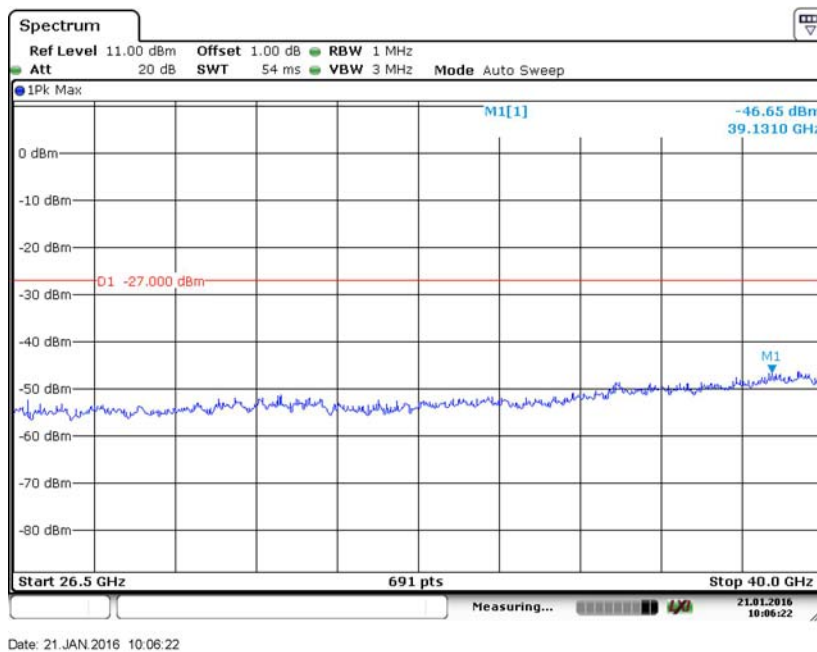


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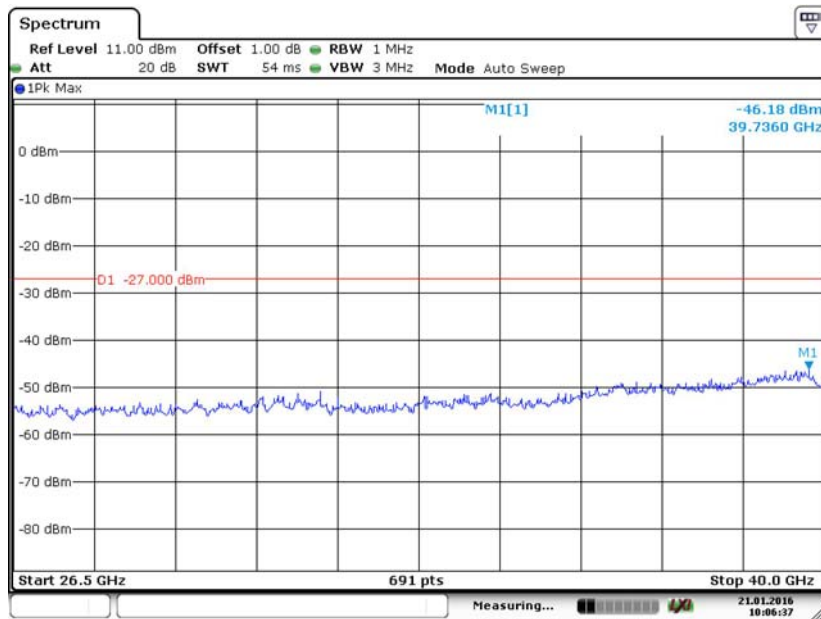
802.11n ht20 High Channel 1GHz-26.5GHz



802.11n ht20 High Channel 26.5GHz-40GHz

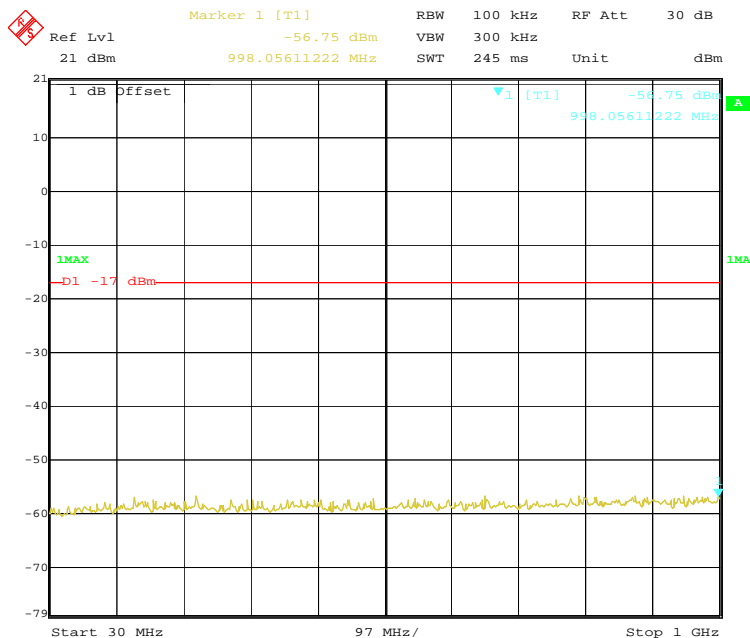


802.11n ht20 Low Channel 26.5GHz-40GHz



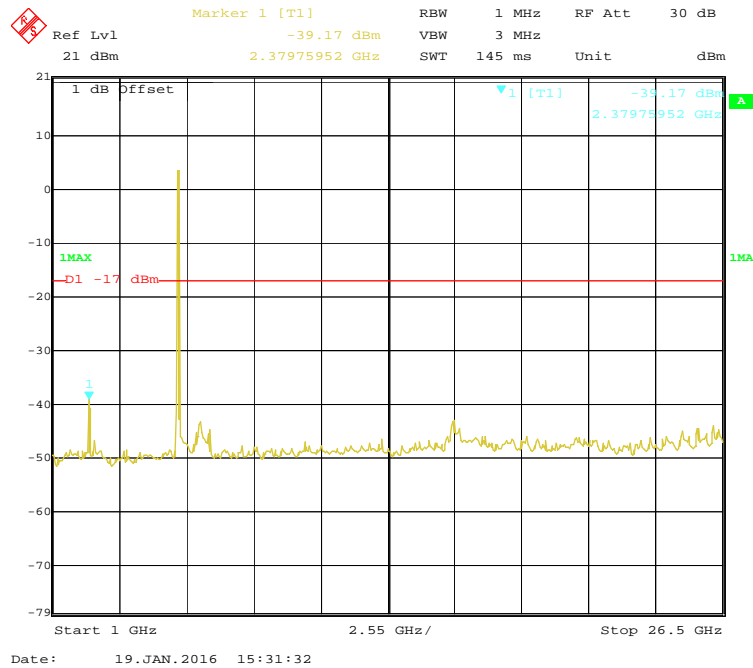
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802.11n ht20 Middle Channel 30MHz-1GHz

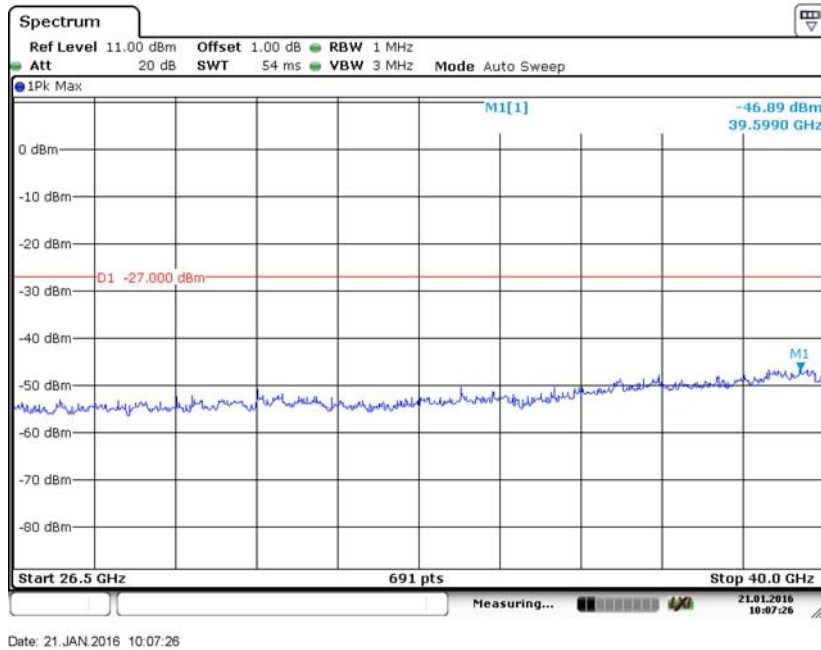


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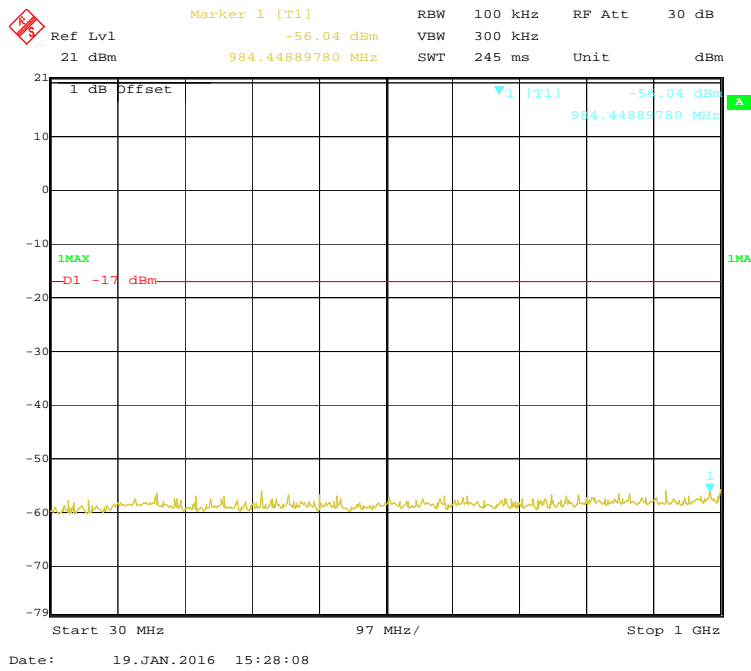
802.11n ht20 Middle Channel 1GHz -26.5GHz



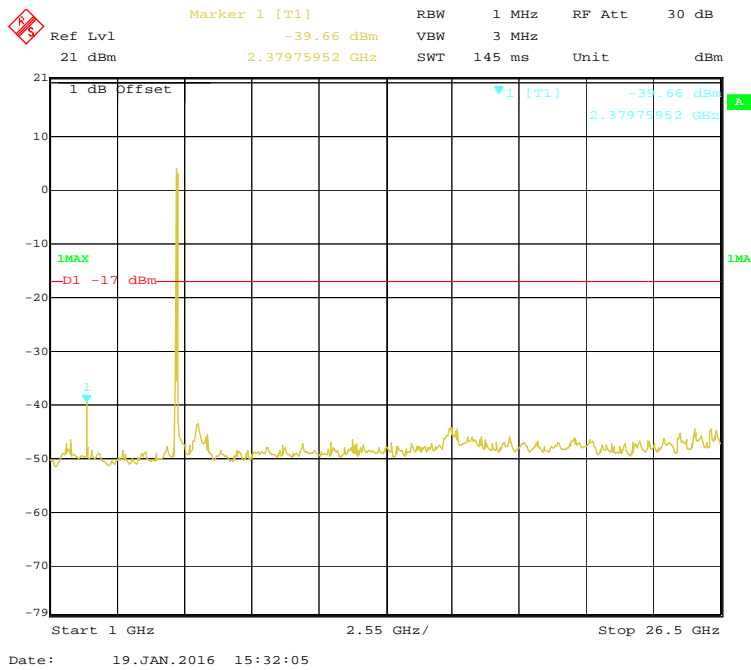
802.11n ht20 Middle Channel 26.5GHz-40GHz



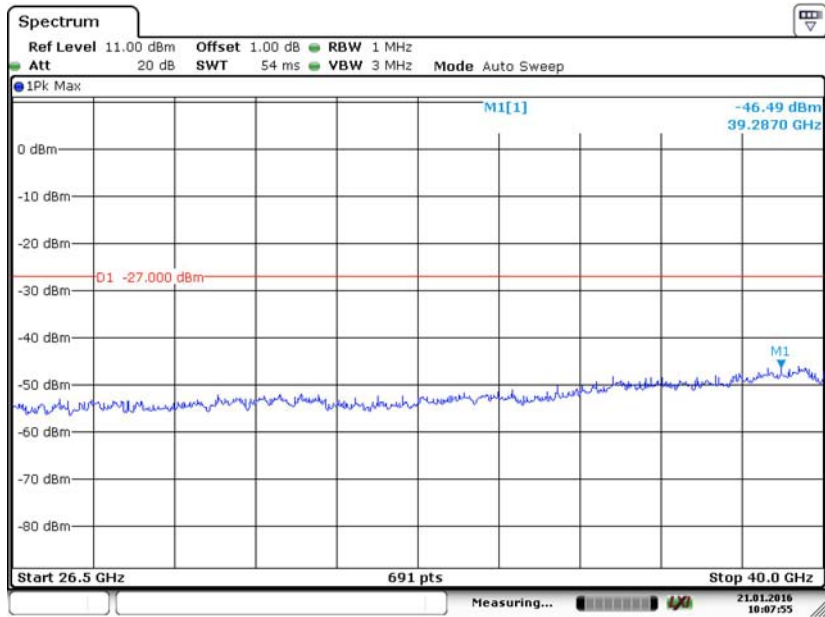
802.11n ht20 High Channel 30MHz-1GHz



802.11n ht20 High Channel 1GHz-26.5GHz



802.11n ht20 High Channel 26.5GHz-40GHz



Date: 21.JAN.2016 10:07:56

FCC §15.407(b) (1) (2) (3)(4) –BAND EDGE

Applicable Standard

FCC §15.407 (b) (1),(2), (3), (4),;

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 EIRP of -27dBm/MHz

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 EIRP of -27 dBm/MHz. Devices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all applicable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15–5.25 GHz band.

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 EIRP of -27 dBm/MHz.

For transmitters operating in the 5.725–5.825 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 EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibration or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 1 MHz and VBW to 3MHz of spectrum analyzer. Offset the antenna gain and cable loss.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2015-11-12	2016-11-11
BACL	RF cable	KS-LAB-012	KS-LAB-012	2015-06-16	2016-12-15

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

Test Data

Environmental Conditions

Temperature:	27.5 °C
Relative Humidity:	60 %
ATM Pressure:	99.9 kPa

The testing was performed by Matt Yao on 2016-01-18&2016-01-19.

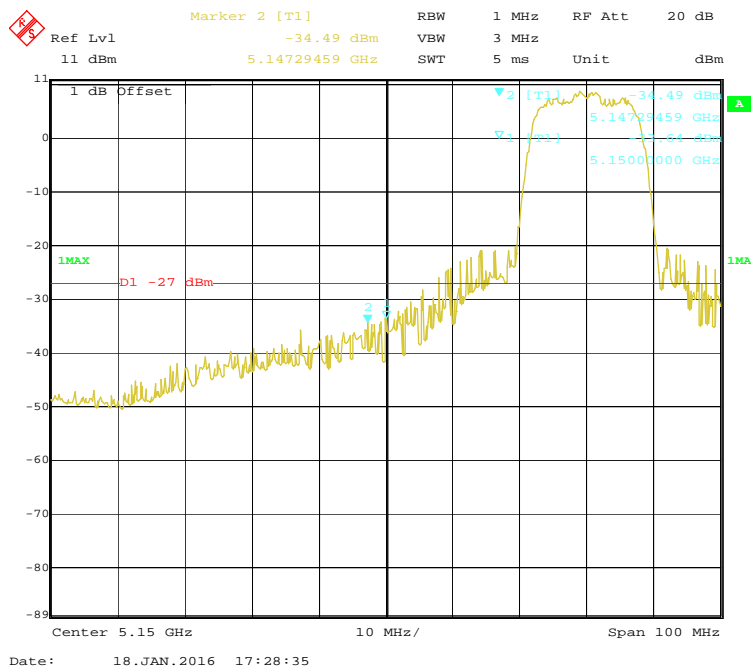
Please refer to the following table and plots.

Test mode	Band	Frequency (MHz)	E.I.R.P BAND EDGE (dBm/MHz)	Limits (dBm/MHz)	Result
802.11a	5180-5240 MHz	Left	-36.73	-27	PASS
		Right	-56.49	-27	PASS
	5745-5825 MHz	Left	-35.48	-27	PASS
		Right	-54.76	-27	PASS
802.11n ht20	5180-5240 MHz	Left	-38.49	-27	PASS
		Right	-37.12	-27	PASS
	5180-5240 MHz	Left	-39.16	-27	PASS
		Right	-34.69	-27	PASS

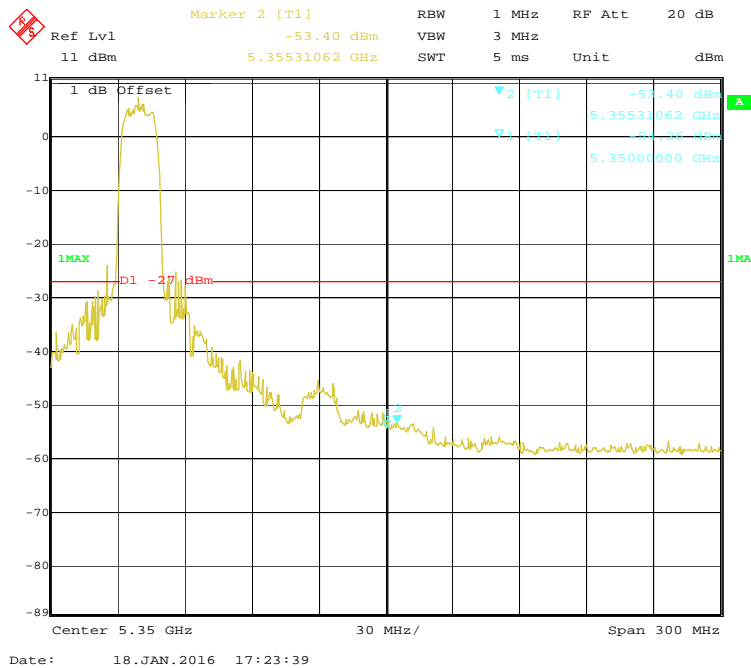
NOTE: E.I.R.P BAND EDGE= Reading Level+antenna gain
 Antenna gain= -3.09dBi

5180-5240 MHz Band:

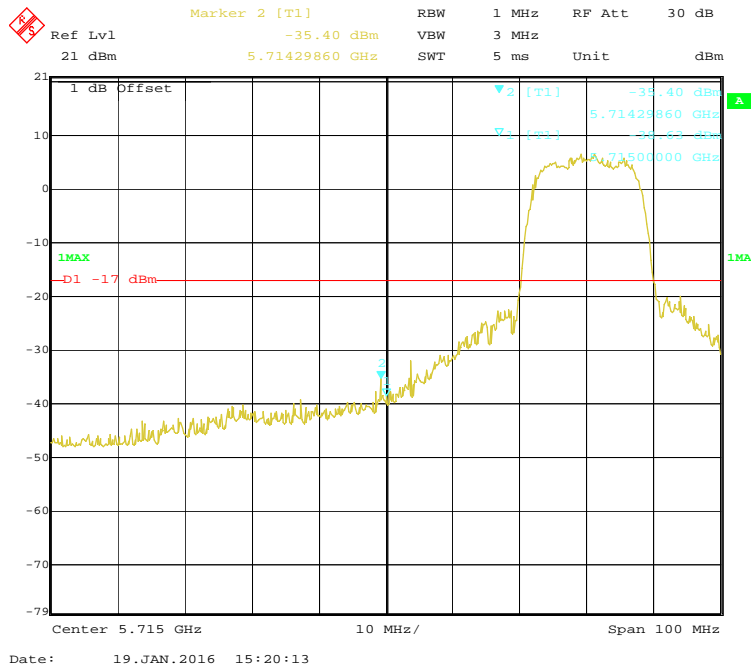
802.11a Band Edge, Left Side



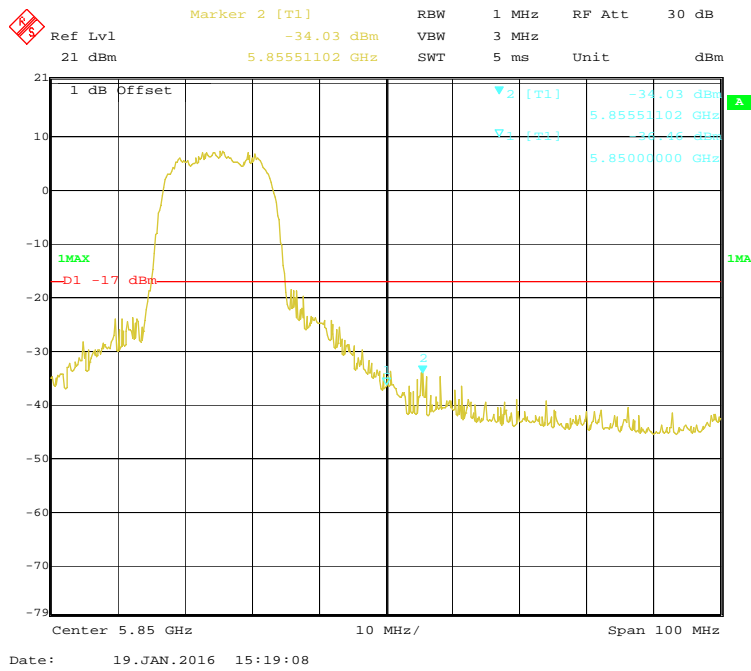
802.11a Band Edge, Right Side



802.11n ht20 Band Edge, Left Side

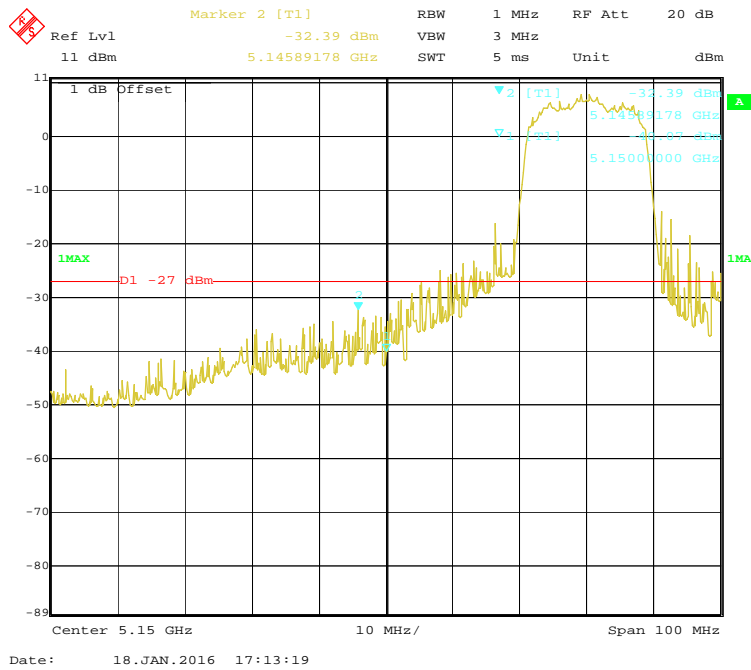


802.11n ht20 Band Edge, Right Side

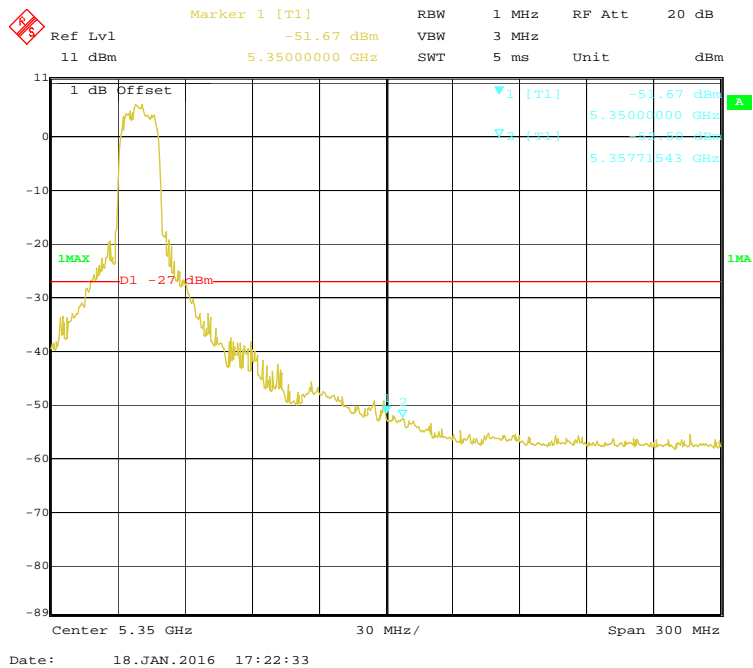


5745-5825 MHz Band:

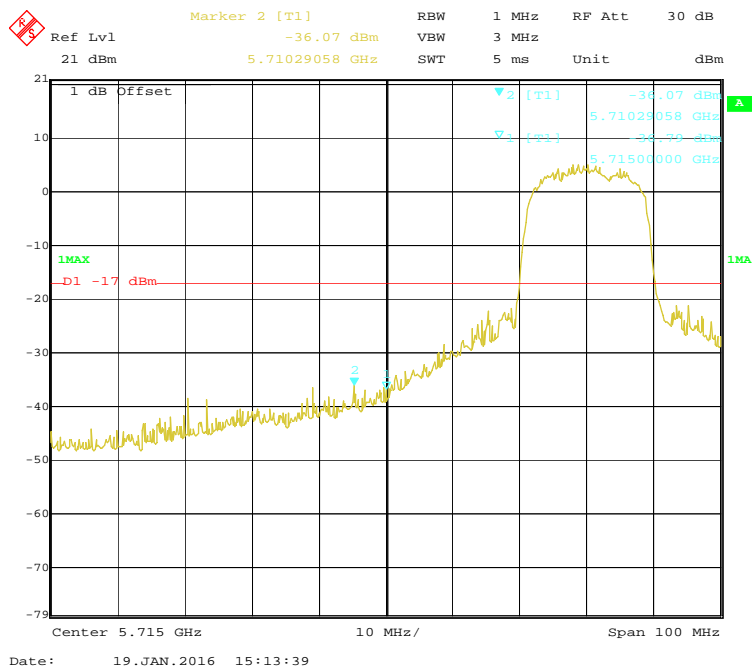
802.11a Band Edge, Left Side



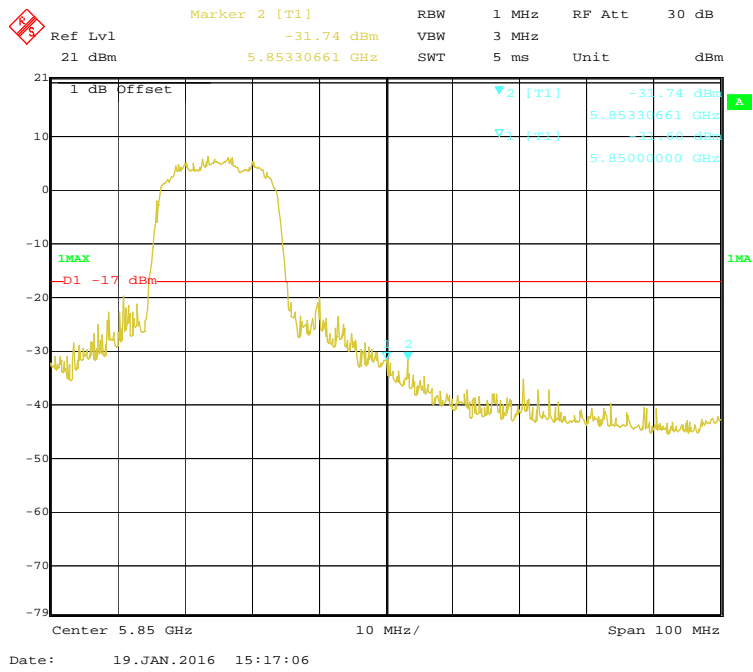
802.11a Band Edge, Right Side



802.11n ht20 Band Edge, Left Side



802.11n ht20 Band Edge, Right Side



FCC §15.407(a) & §15.407(e) – EMISSION BANDWIDTH

Applicable Standard

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2015-11-12	2016-11-11
BACL	RF cable	KS-LAB-012	KS-LAB-012	2015-06-16	2016-12-15

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

Test Procedure

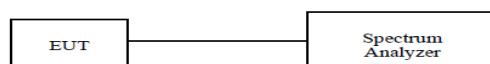
1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Data

Environmental Conditions

Temperature:	27.5 °C
Relative Humidity:	60 %
ATM Pressure:	99.9 kPa

The testing was performed by Matt Yao on 2016-01-18&2016-01-19.

Test Result: Pass.

Please refer to the following tables and plots.

5180-5240MHz:

Test mode	Band	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180-5240 MHz	Low	5180	18.84	17.23
		Middle	5200	18.92	17.23
		High	5240	18.92	17.15
802.11n ht20	5180-5240 MHz	Low	5180	19.32	18.20
		Middle	5200	19.32	18.12
		High	5240	19.24	18.20

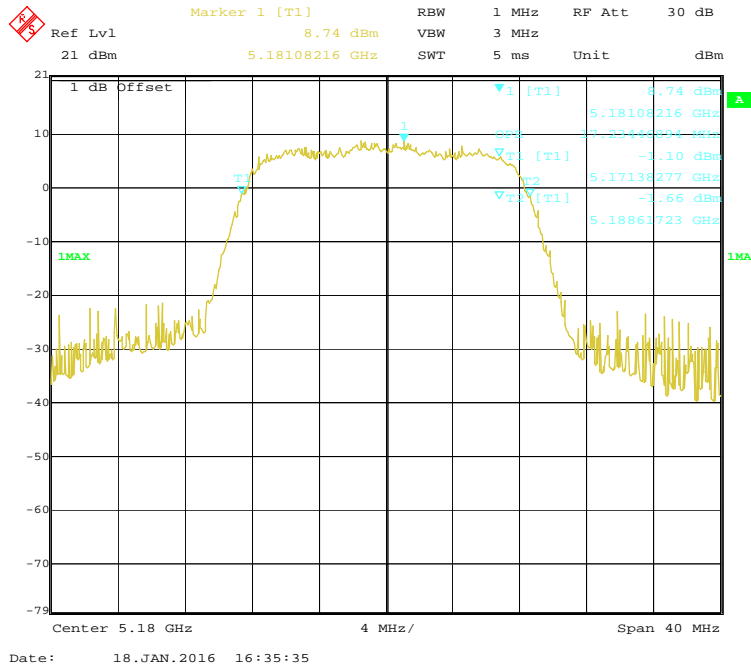
5725-5850MHz:

Test mode	Band	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5745-5825 MHz	Low	5745	16.43	17.39
		Middle	5785	16.11	17.39
		High	5825	15.79	17.15
802.11n ht20	5745-5825 MHz	Low	5745	16.11	18.20
		Middle	5785	15.23	18.20
		High	5825	15.23	18.12

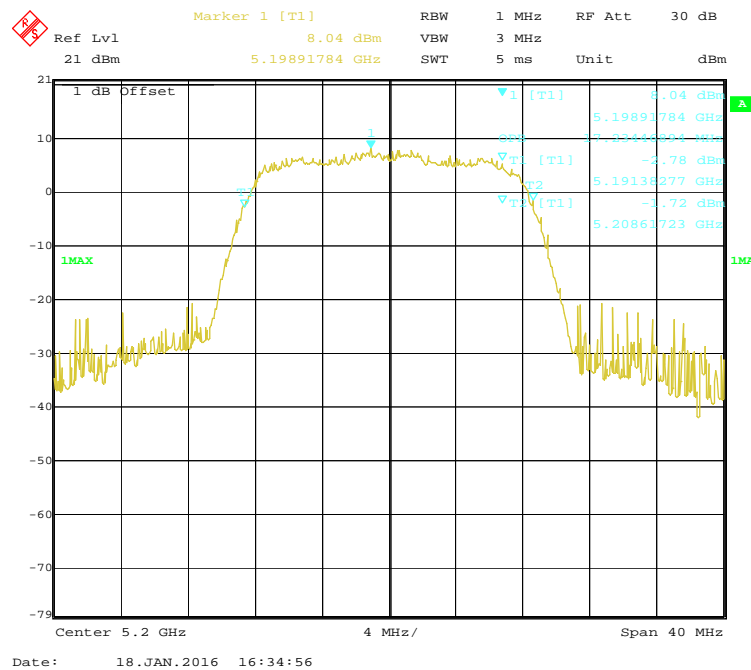
802.11a Mode

5180-5240 MHz Band:

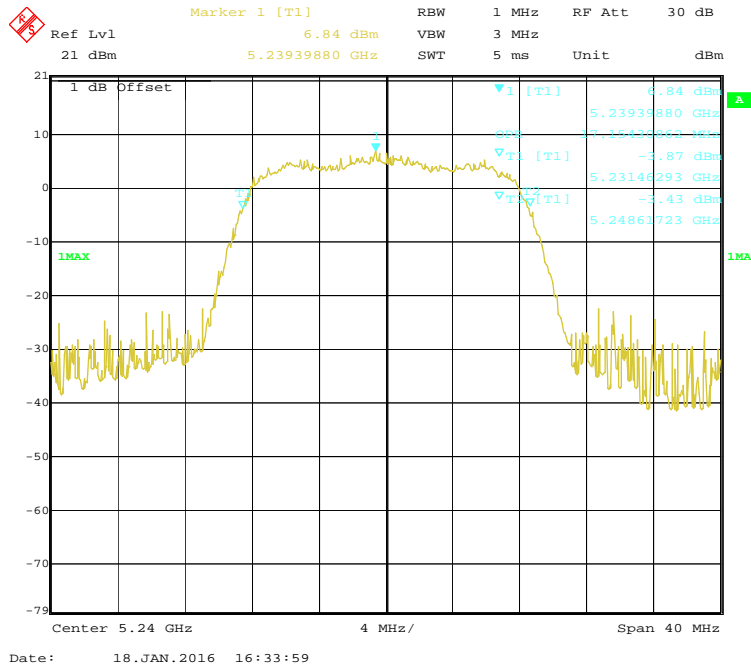
802.11a Low Channel: 99% Bandwidth-5180MHz



802.11a Middle Channel: 99% Bandwidth-5200MHz

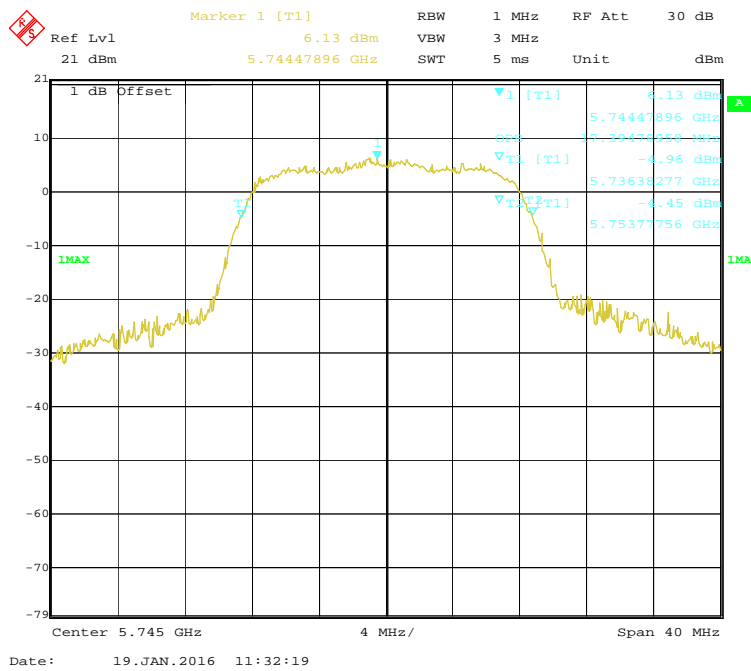


802.11a High Channel: 99% Bandwidth-5240MHz

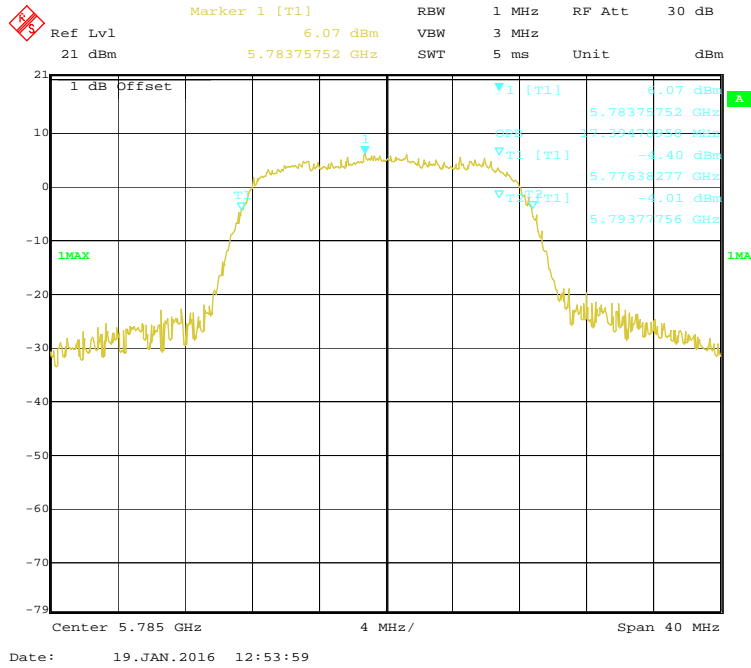


5745-5825 MHz Band:

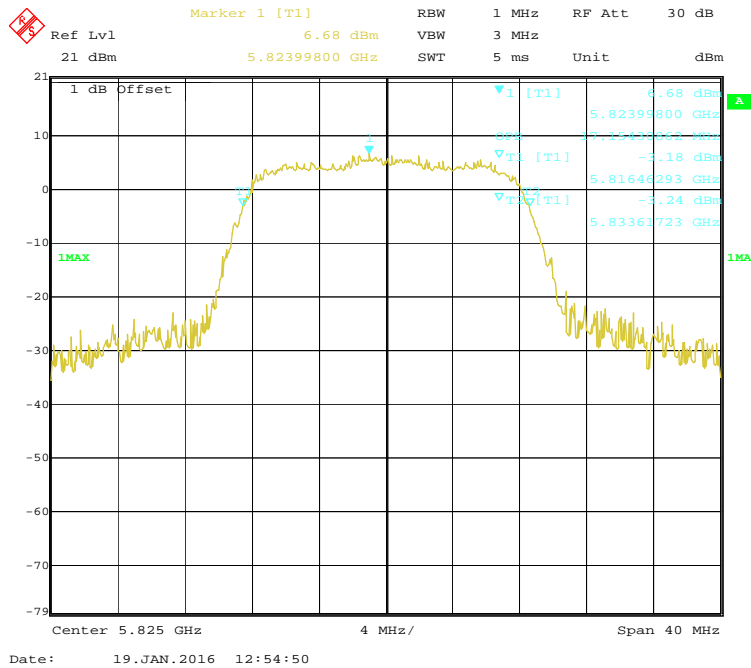
802.11a Low Channel: 99% Bandwidth-5745MHz



802.11a Middle Channel: 99% Bandwidth-5785MHz

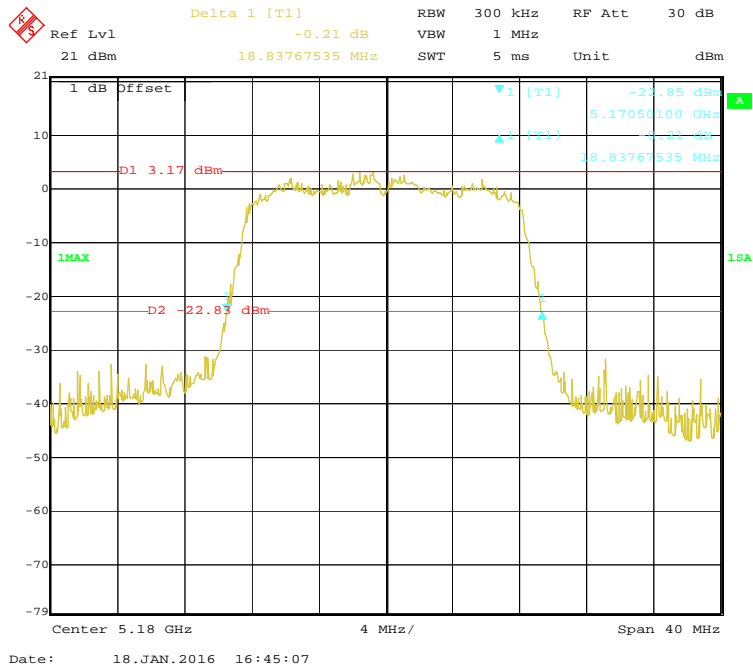


802.11a High Channel: 99% Bandwidth-5825MHz

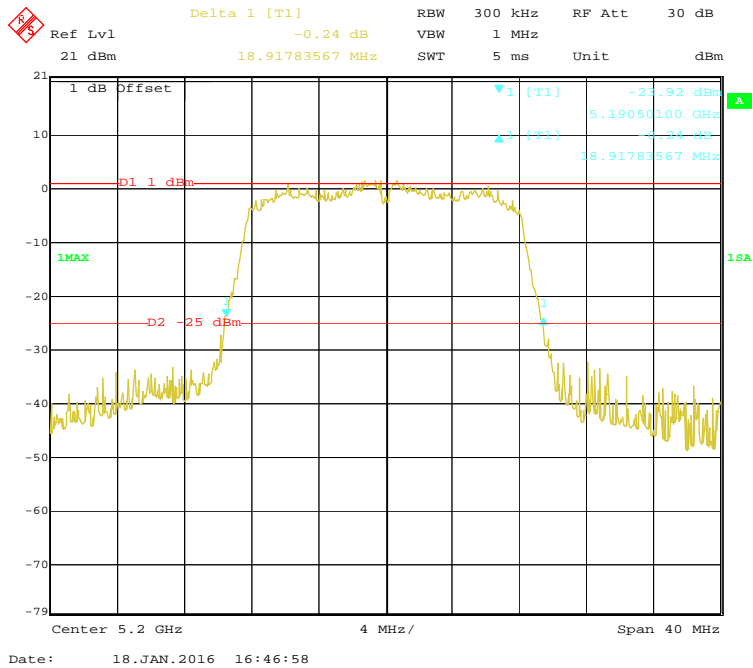


5180-5240 MHz Band:

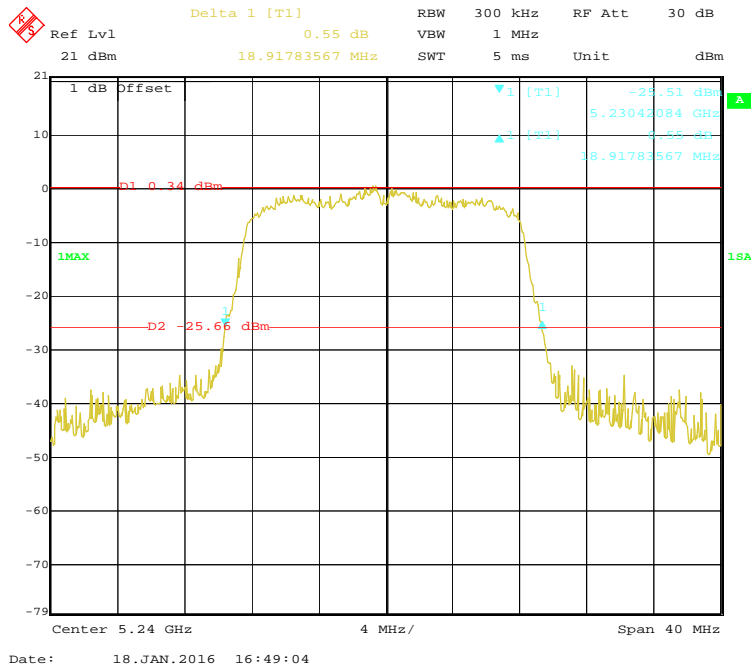
802.11a Low Channel: 26dB Bandwidth-5180MHz



802.11a Middle Channel: 26dB Bandwidth-5200MHz

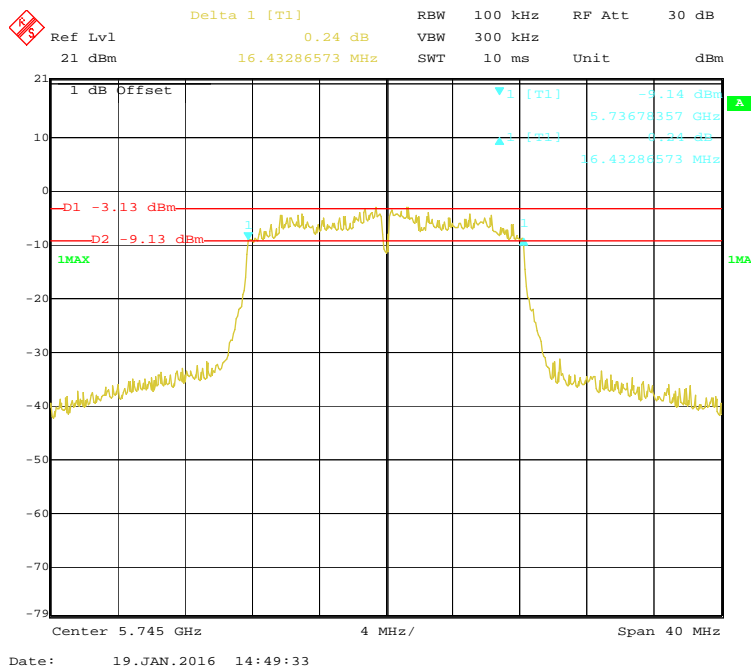


802.11a High Channel: 26dB Bandwidth-5240MHz

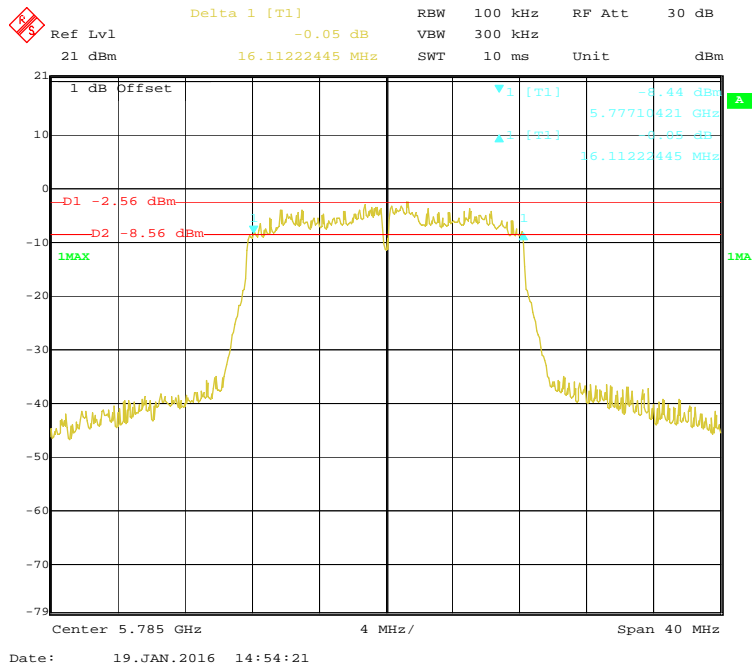


5745-5825 MHz Band:

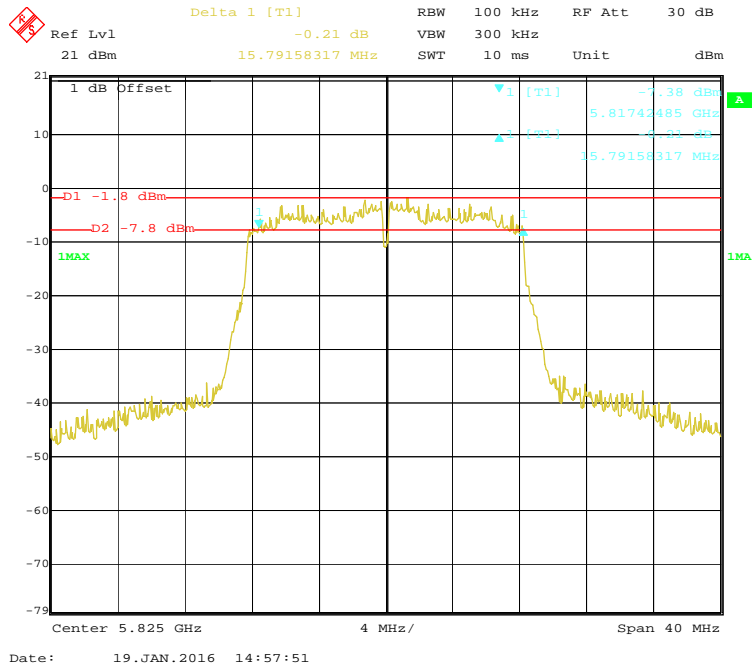
802.11a Low Channel: 6dB Bandwidth-5745MHz



802.11a Middle Channel: 6dB Bandwidth-5785MHz



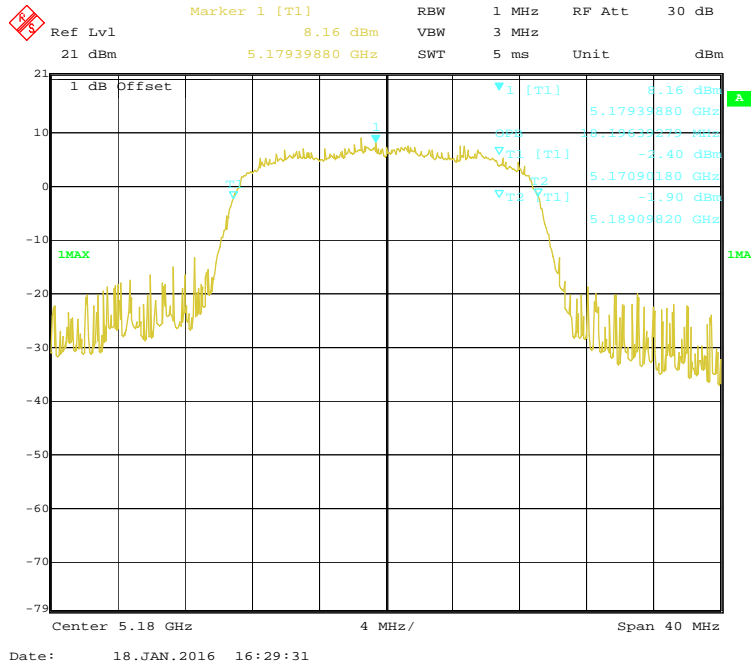
802.11a High Channel: 6dB Bandwidth-5825MHz



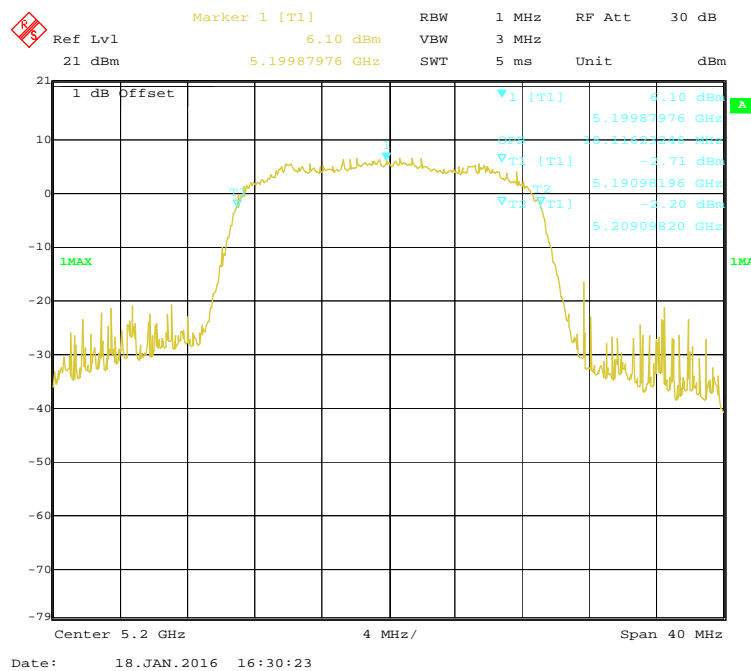
802.11n ht20 Mode

5180-5240 MHz Band:

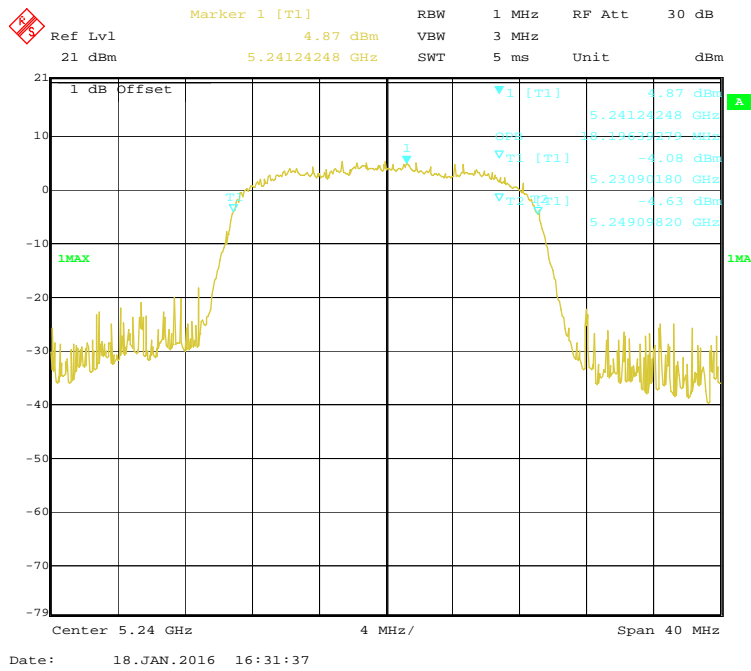
802.11n ht20 Low Channel: 99% Bandwidth-5180MHz



802.11n ht20 Middle Channel: 99% Bandwidth-5200MHz

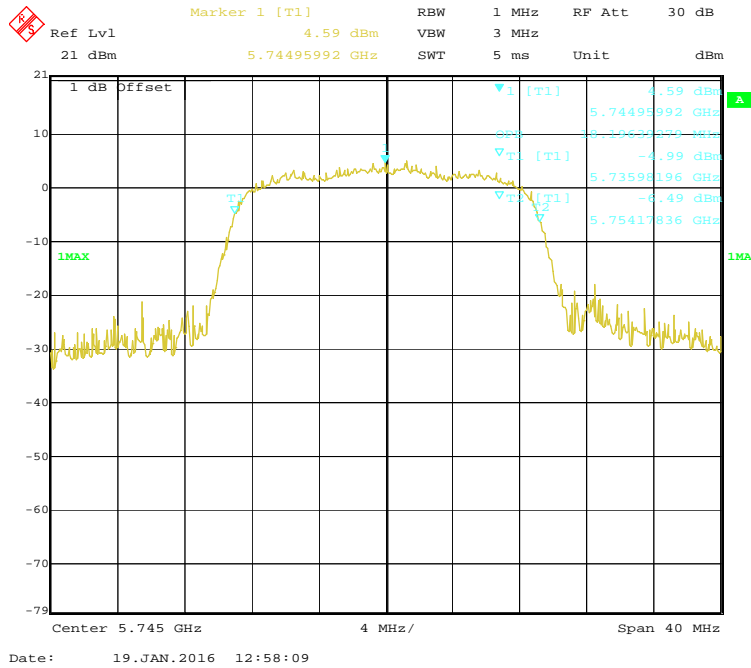


802.11n ht20 High Channel: 99% Bandwidth-5240MHz

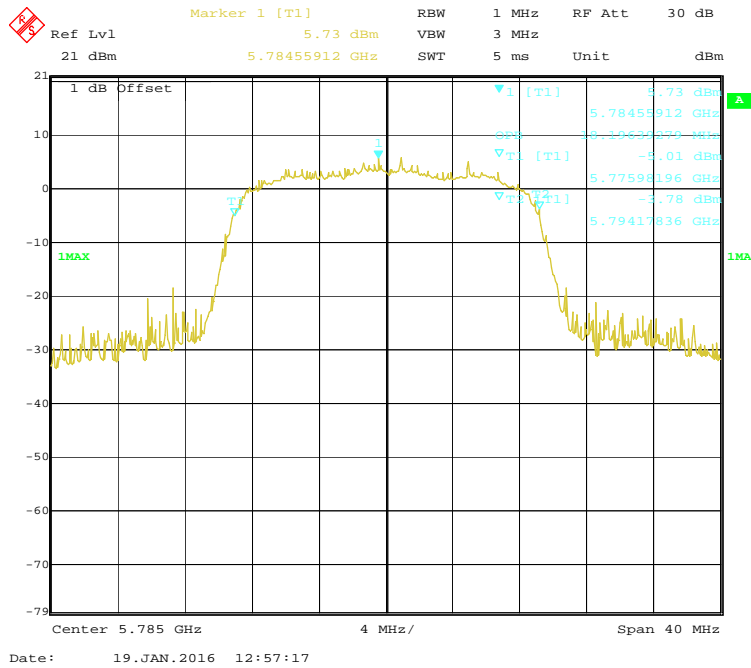


5745-5825 MHz Band:

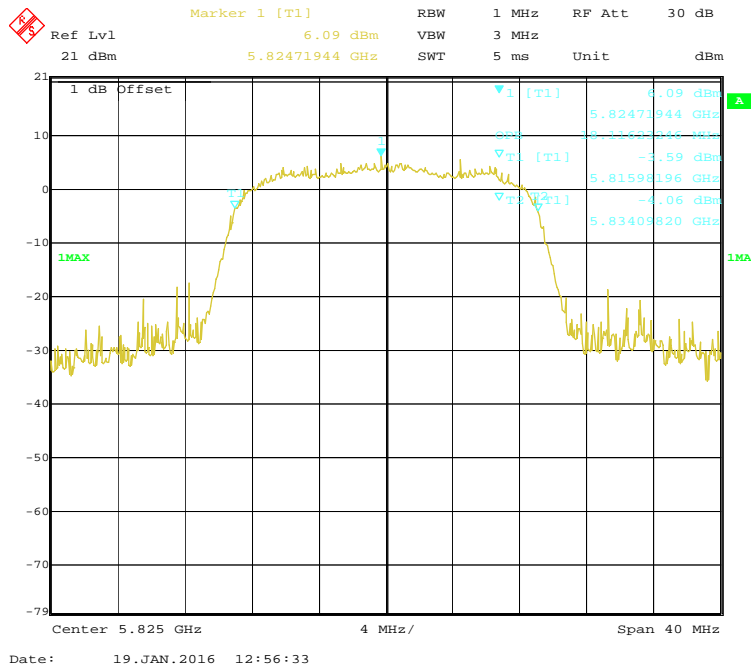
802.11n ht20 Low Channel: 99% Bandwidth-5745MHz



802.11n ht20 Middle Channel: 99% Bandwidth-5785MHz

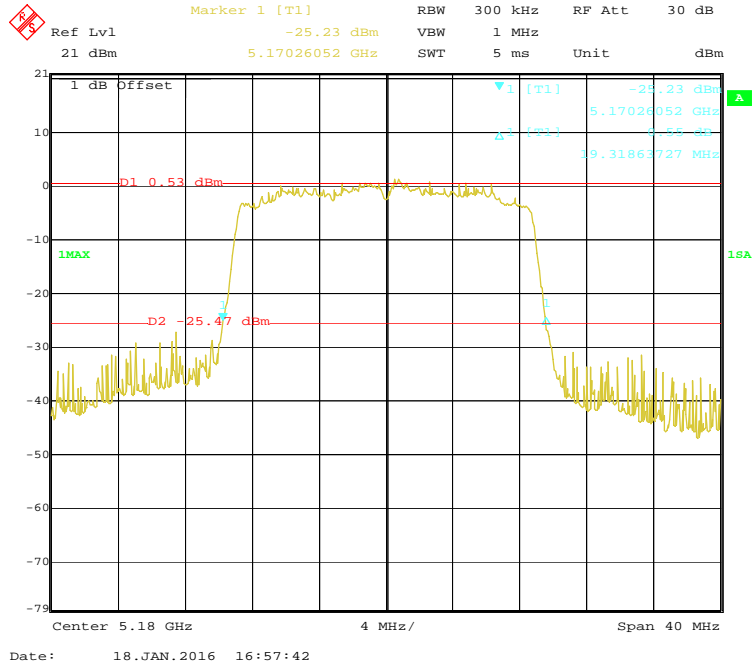


802.11n ht20 High Channel: 99% Bandwidth-5825MHz

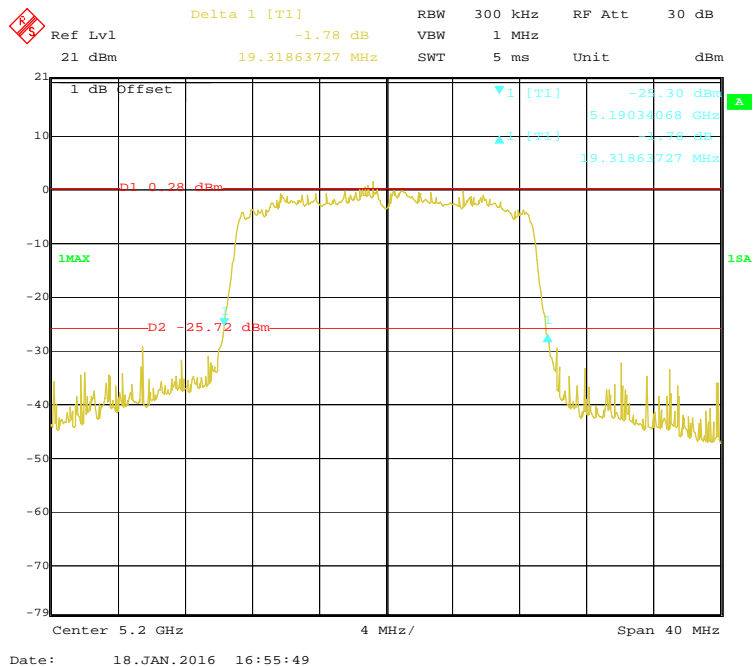


5180-5240 MHz Band:

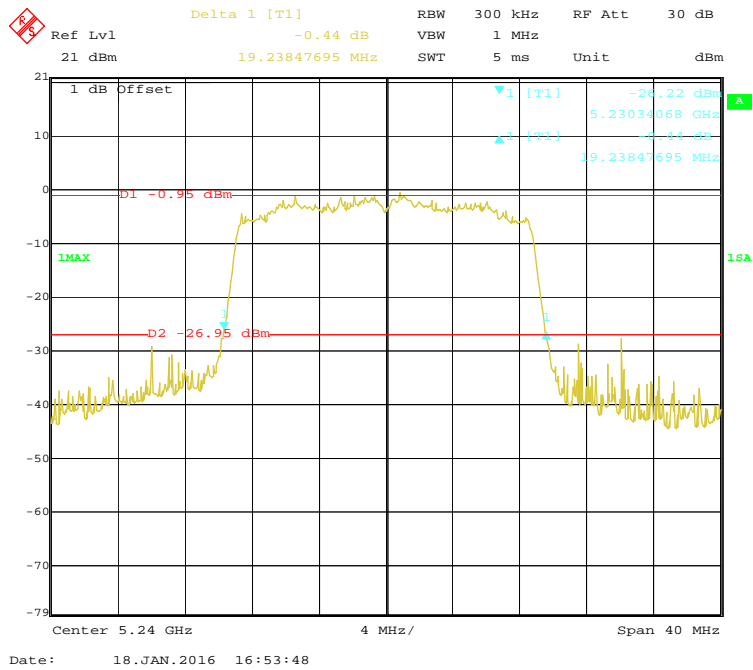
802.11n ht20 Low Channel: 26dB Bandwidth-5180MHz



802.11n ht20 Middle Channel: 26dB Bandwidth-5200MHz

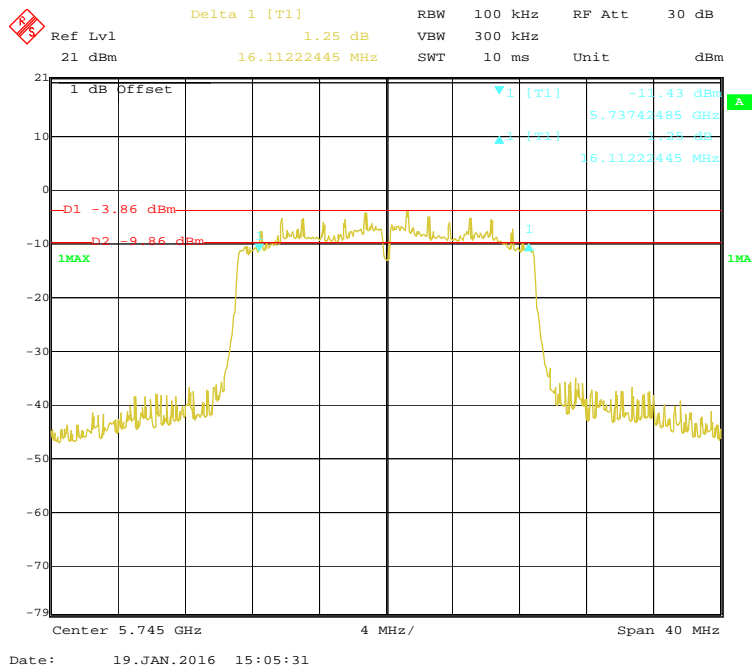


802.11n ht20 High Channel: 26dB Bandwidth-5240MHz

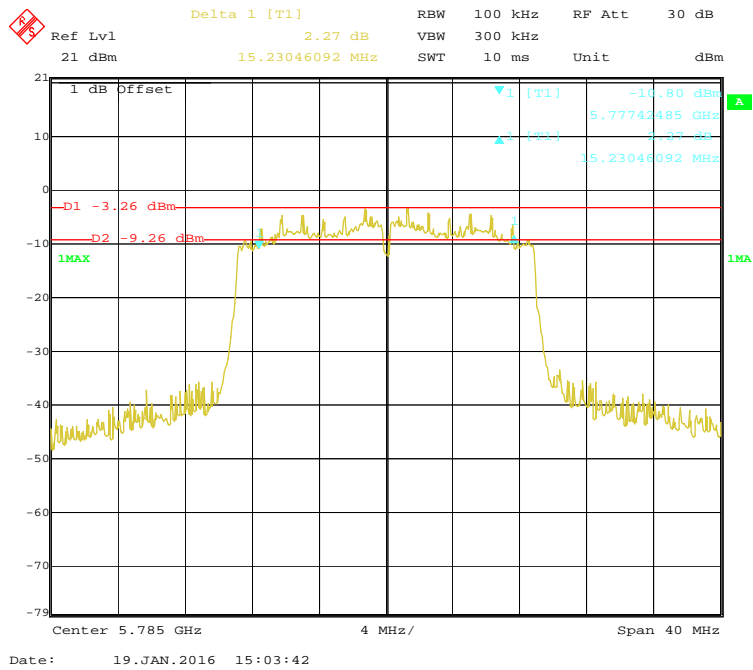


5745-5825 MHz Band:

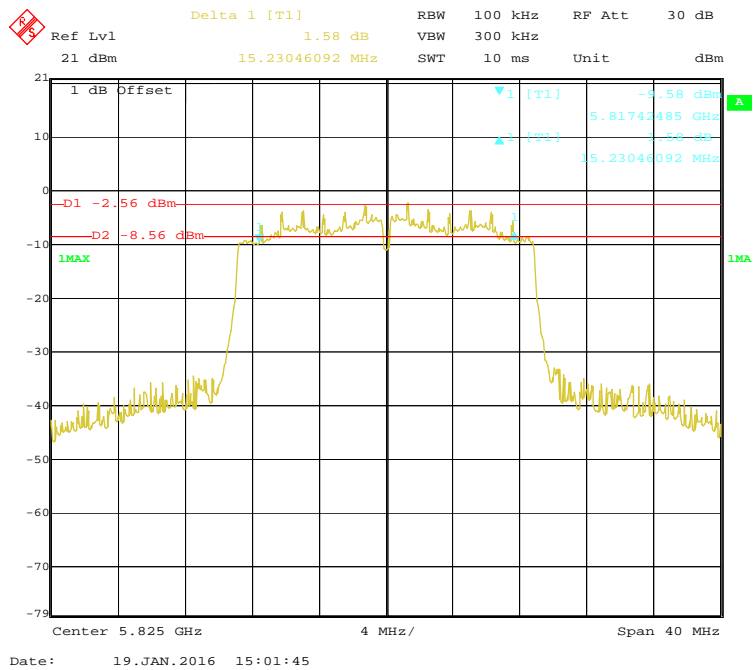
802.11n ht20 Low Channel: 6dB Bandwidth-5745MHz



802.11n ht20 Middle Channel: 6dB Bandwidth-5785MHz



802.11n ht20 High Channel: 6dB Bandwidth-5825MHz



FCC §15.407(a) (1) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

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

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

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

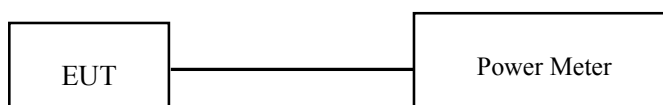
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	OSP120 BASE UNIT	OSP120	101247	2014-05-27	2016-05-27
Rohde & Schwarz	Power Sensor	NRP-Z91	200014	2015-08-01	2017-07-31
BACL	RF cable	KS-LAB-012	KS-LAB-012	2015-06-16	2016-12-15

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

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	27.5 °C
Relative Humidity:	60 %
ATM Pressure:	99.9 kPa

The testing was performed by Matt Yao on 2016-01-18&2016-01-19.

Test Mode: Transmitting

Test mode	Band	Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit	Result
802.11a	5180-5240 MHz	Low	5180	11.41	30	PASS
		Middle	5200	10.29	30	PASS
		High	5240	8.45	30	PASS
	5745-5825 MHz	Low	5745	9.50	30	PASS
		Middle	5785	9.77	30	PASS
		High	5825	10.74	30	PASS
802.11n ht20	5180-5240 MHz	Low	5180	10.10	30	PASS
		Middle	5200	8.97	30	PASS
		High	5240	7.59	30	PASS
	5745-5825 MHz	Low	5745	7.49	30	PASS
		Middle	5785	8.25	30	PASS
		High	5825	9.30	30	PASS

Note: the transmitting duty cycle is 100%.

FCC §15.407(a) (1) (5) - POWER SPECTRAL DENSITY

Applicable Standard

According to § 15.407(a)(1)

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

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

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

According to § 15.407(a)(3)

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

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2015-11-12	2016-11-11
BACL	RF cable	KS-LAB-012	KS-LAB-012	2015-06-16	2016-12-15

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

Test Data

Environmental Conditions

Temperature:	27.5 °C
Relative Humidity:	60 %
ATM Pressure:	99.9 kPa

The testing was performed by Matt Yao on 2016-01-18&2016-01-19

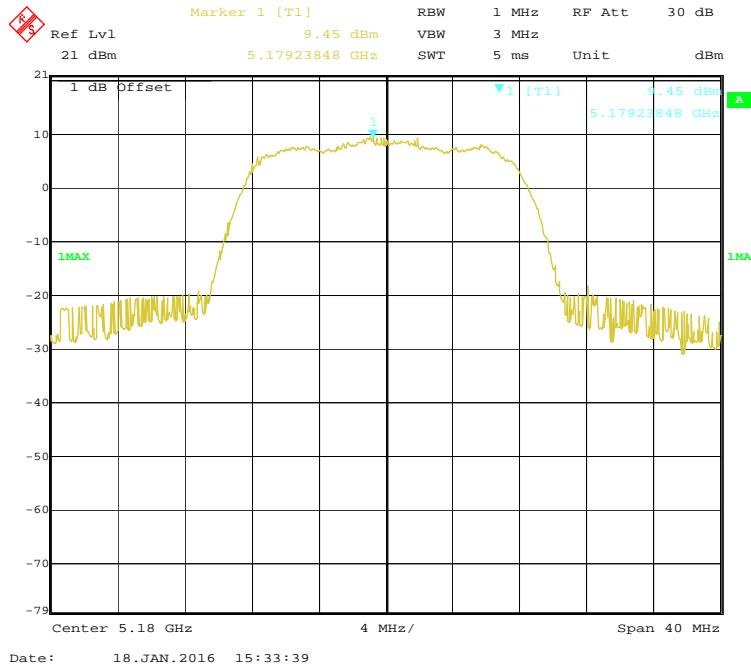
Test Mode: Transmitting

Test mode	Band	Channel	Power Spectral Density	Limits	Result
				(dBm)	
802.11a	5180-5240 MHz	Low	9.45	17	PASS
		Middle	8.15	17	PASS
		High	6.99	17	PASS
	5745-5825 MHz	Low	-4.17	30	PASS
		Middle	-3.91	30	PASS
		High	-3.73	30	PASS
802.11n ht20	5180-5240 MHz	Low	8.73	17	PASS
		Middle	7.97	17	PASS
		High	6.02	17	PASS
	5745-5825 MHz	Low	-4.30	30	PASS
		Middle	-3.23	30	PASS
		High	-3.31	30	PASS

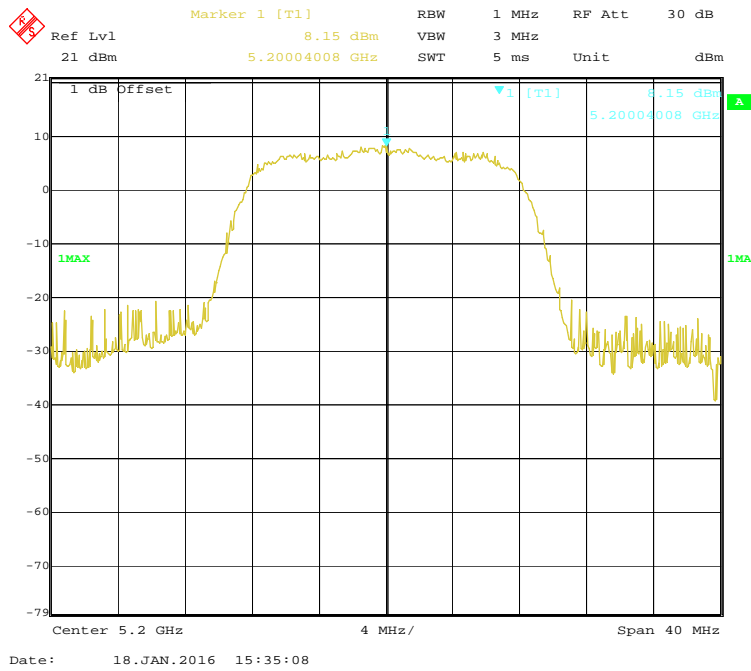
802.11a Mode

5180-5240 MHz Band:

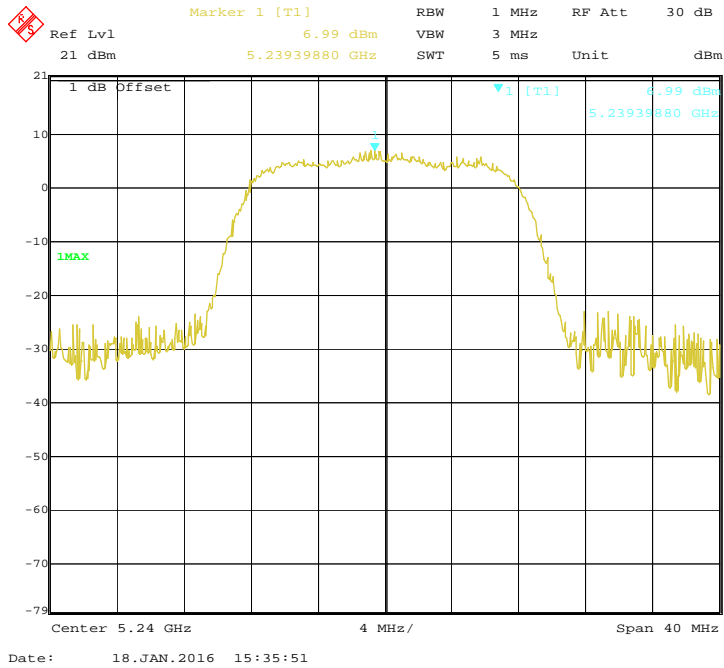
Power Spectral Density, 802.11a Low Channel



Power Spectral Density, 802.11a Middle Channel

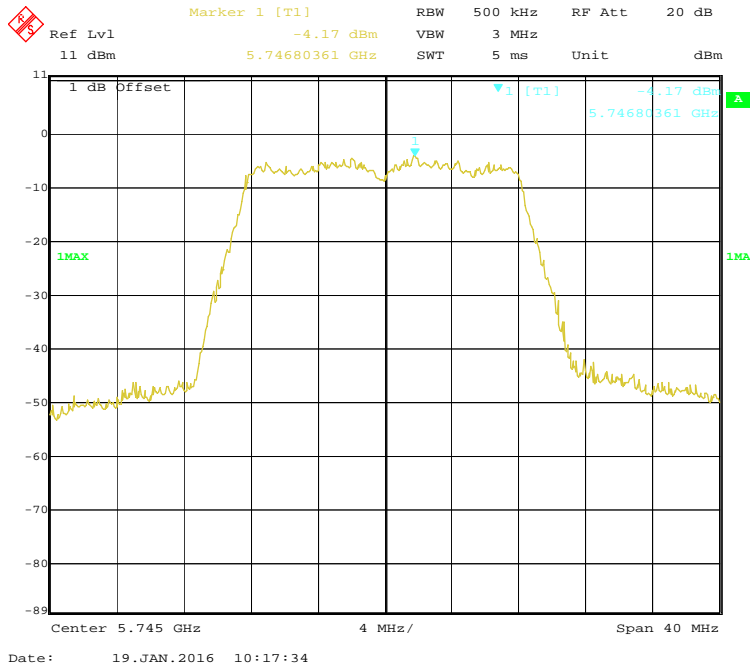


Power Spectral Density, 802.11a High Channel

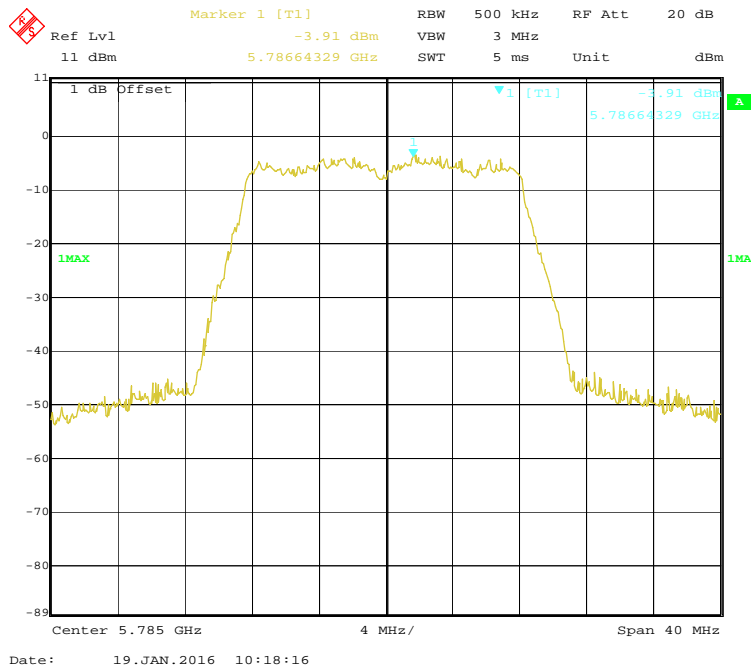


5745-5825 MHz Band:

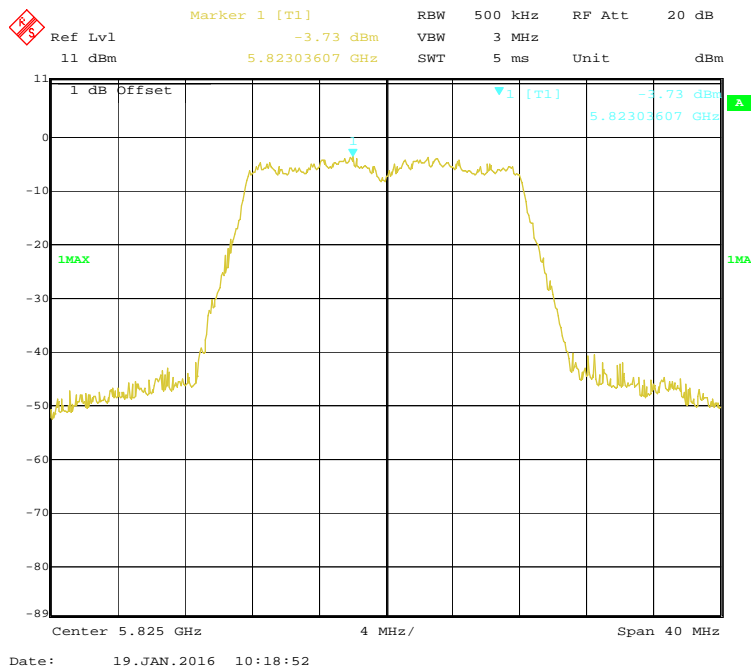
Power Spectral Density, 802.11a Low Channel



Power Spectral Density, 802.11a Middle Channel



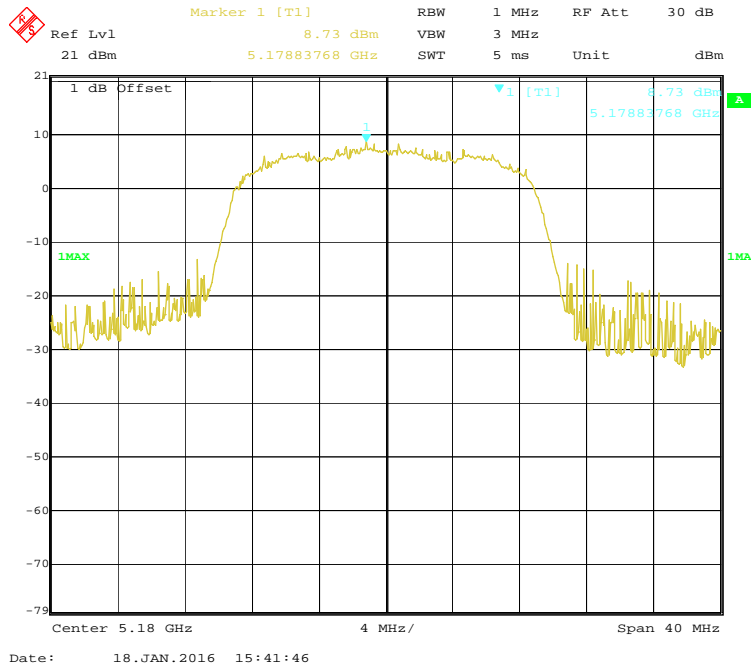
Power Spectral Density, 802.11a High Channel



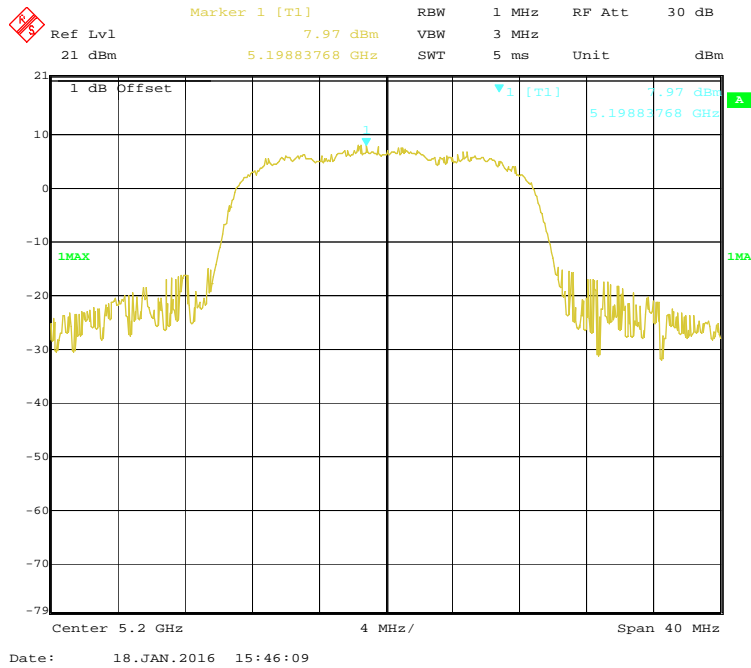
802.11ht20

5180-5240 MHz

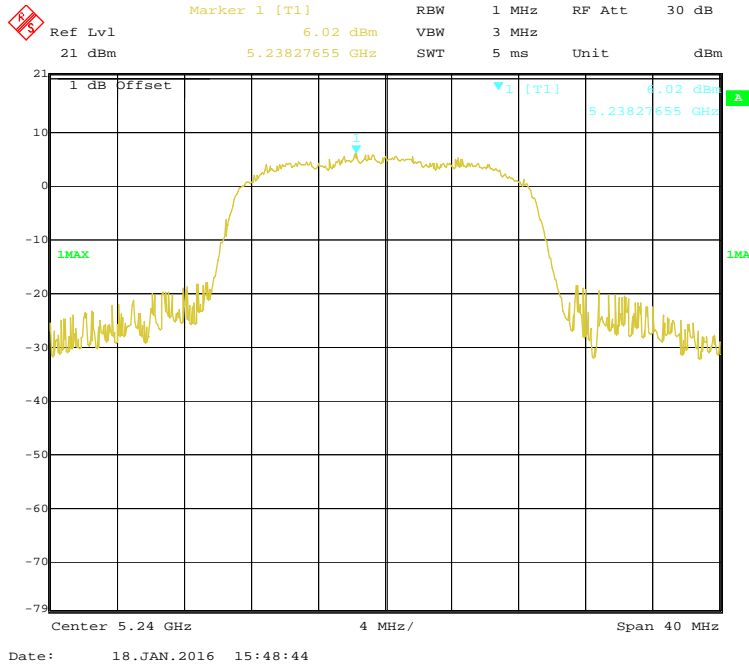
Power Spectral Density, 802.11n ht20 Low Channel



Power Spectral Density, 802.11n ht20 Middle Channel

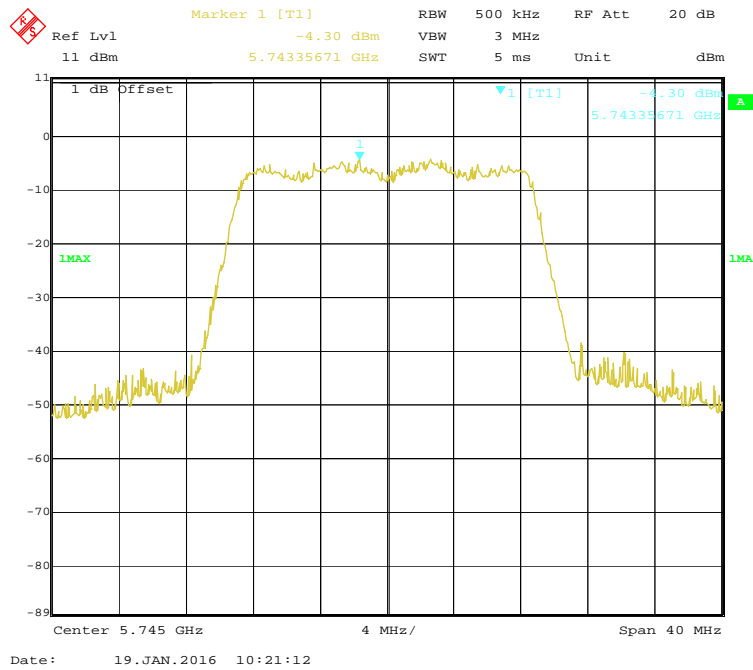


Power Spectral Density, 802.11n ht20 High Channel

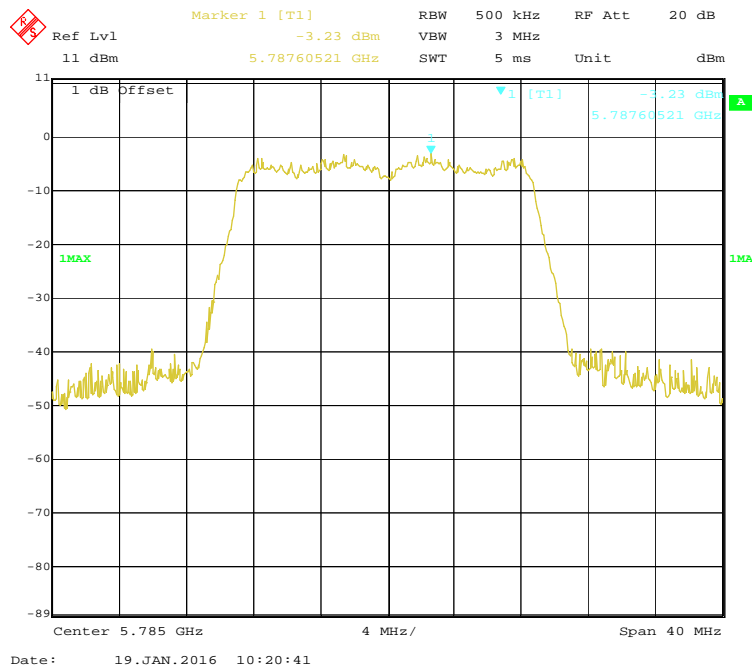


5745-5825 MHz

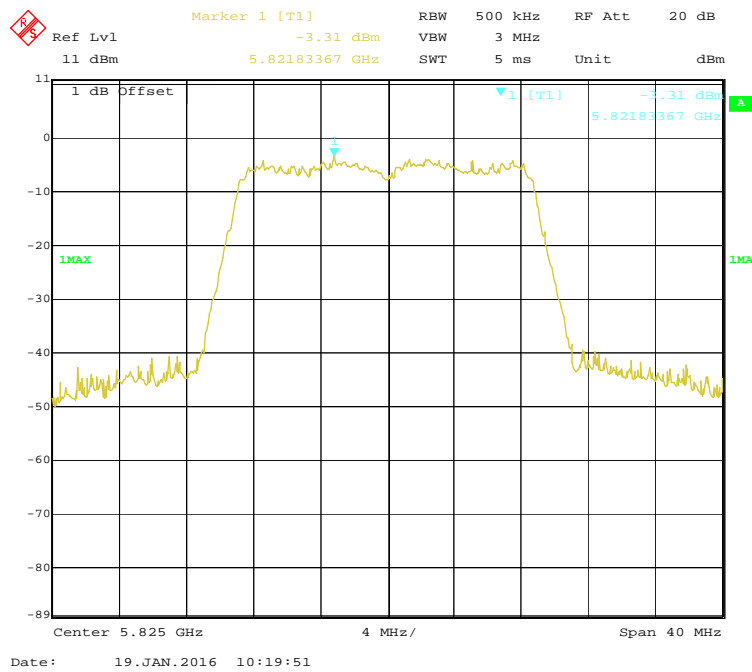
Power Spectral Density, 802.11 n ht20 Low Channel



Power Spectral Density, 802.11n ht20 Middle Channel



Power Spectral Density, 802.11n ht20 High Channel



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