FCC PART 15.407

TEST REPORT

For

Skspruce Technologies Inc.

1732 North 1st St Suite 220，San Jose，CA

FCC ID: 2ACKD-WOA5200

Report Type:	**Product Name:**
Original Report	Outdoor Access Point

Test Engineer:	Fidel Zhou
Report Number:	RSC140417005
Report Date:	2014-07-25
Reviewed By:	Henry Ding EMC Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China Tel: 028-65523123, Fax: 028-65525125 www.baclcorp.com

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Skspruce Technologies Inc.*'s product, model number: *WOA5200 (FCC ID: 2ACKD-WOA5200) or* ("EUT") in this report is an *Outdoor Access Point,* which was measured approximately: 26 cm (L) x 21 cm (W) x 7.5 cm (H), rated input voltage: DC 48 V from adapter.
The operating frequency is 5725~5850MHz.

Adapter:
Manufacturer: PoE Injector
Model: PSE801
Input: AC 100 - 240V, 50/60Hz
Output: DC 48 - 56V

**All measurement and test data in this report was gathered from final production sample, serial number: 8122013122000001 (provided by Applicant). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2014-04-11, and EUT complied with test requirement.*

Objective

This type approval report is prepared on behalf of *Skspruce Technologies Inc.* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and E of the Federal Communications Commission 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 submissions with FCC ID: 2ACKD-WOA5200.

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. (Chengdu).

Test Facility

The test site used by BACL to collect test data is located in the 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China

Test site at BACL 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 July 31, 2009. 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.: 560332. 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.

The operating frequency range is 5725~5850 MHz, the frequencies are 5745 MHz, 5785 MHz, 5825 MHz, 5755 MHz, 5795 MHz for 5725~5850 MHz band, which was provided by the manufacturer.

EUT Exercise Software

The test was performed under "***art2_ver_2_28_6BIN, SecureCRT & SecureCRT_3987***" which was provided by the manufacturer.

Equipment under Test (EUT) General Description

Applicant	Description	Model Number	Serial Number
Skspruce Technologies Inc.	Outdoor Access Point	WOA5200	8122013122000001

Support Equipment List and Details

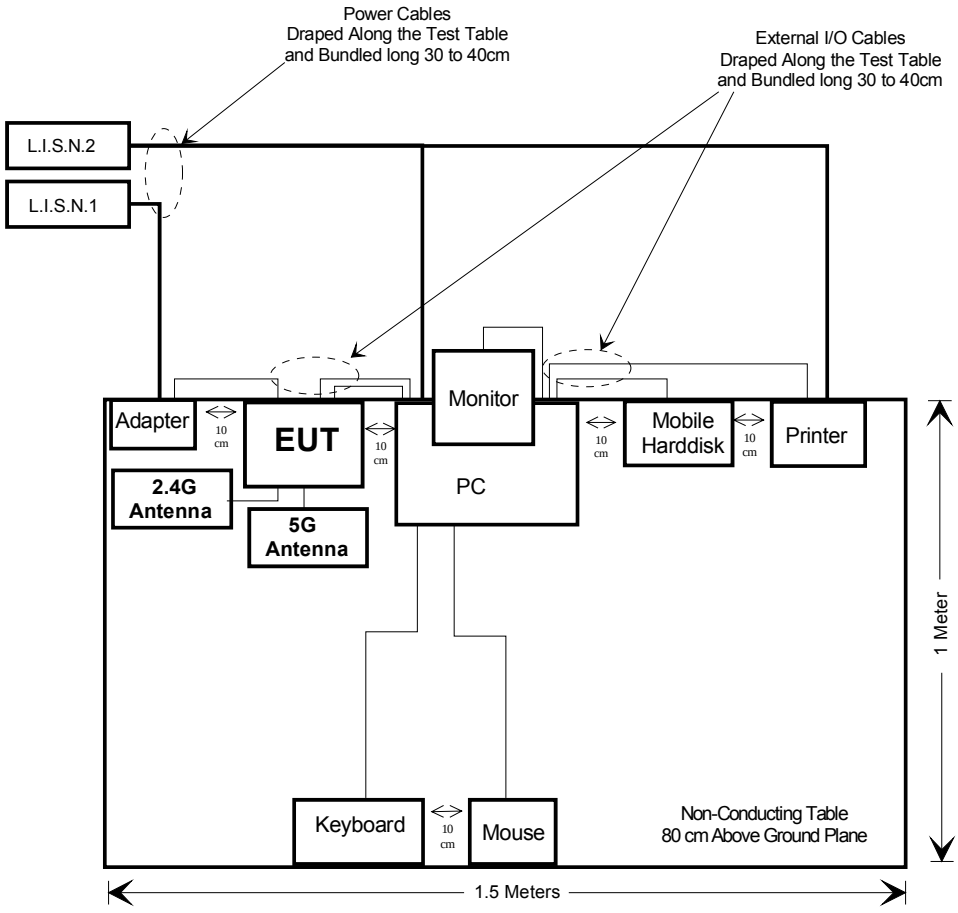
Manufacturer	Description	Model	Serial Number
IBM	PC	8176	99Y7315
DELL	Monitor	SK-8815	9161649
IBM	Keyboard	KM-110X	XBK133000993
Logitech	Mouse	M-U0004	810-001808
TOSHIBA	Mobile Hard Disk	V6700-A500	1297FH0YSRE8
EPSON	Printer	B261A	GXSK285854

External I/O Cable

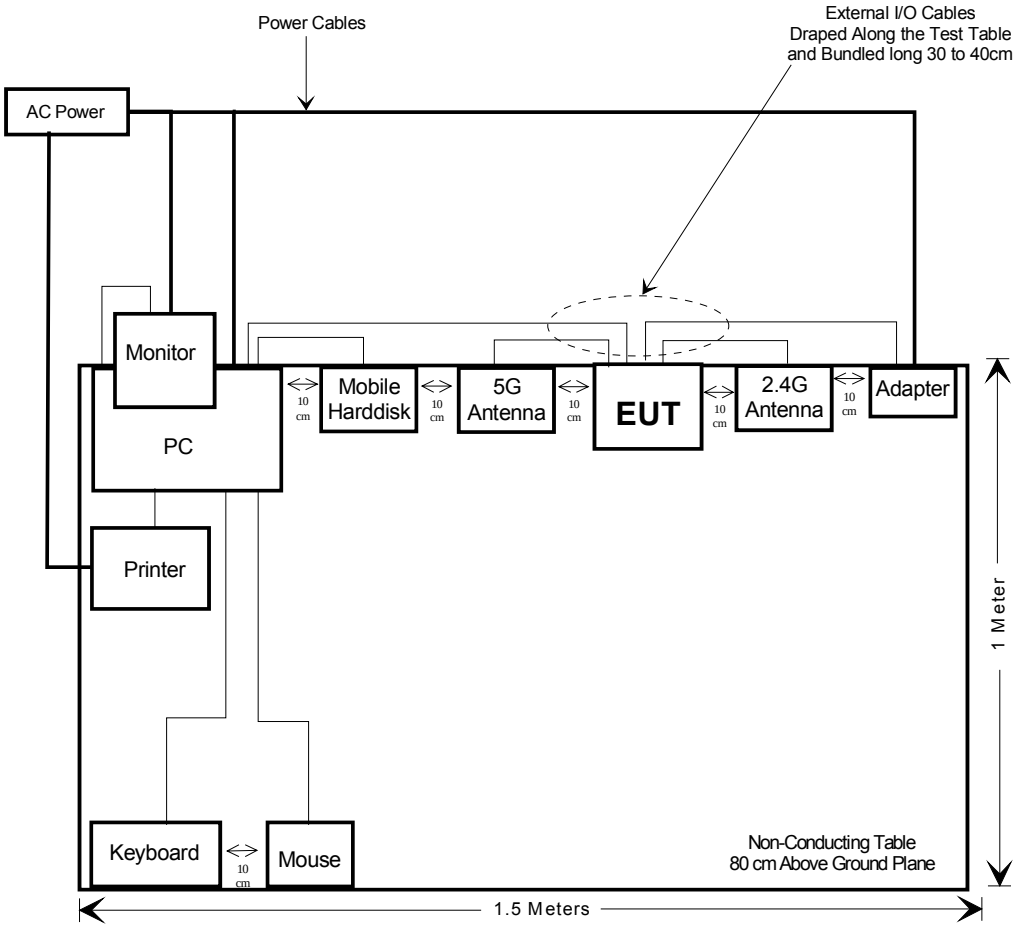
Cable Description	Length (m)	From	To
Shielded VGA cable	1.5	PC	Monitor
Unshielded LAN cable	1.0	PC	EUT
Shielded RS232 cable	2.5	PC	EUT
Shielded Mouse cable	1.5	PC	Mouse
Shielded Keyboard cable	1.5	PC	keyboard
Shielded RS232 Cable	1.5m	PC	Printer
Shielded USB Cable	0.5m	PC	Mobile Hard Disk

Block Diagram of Test Setup

For AC Line Conducted Emissions:



For Spurious Emissions:



SUMMARY OF TEST RESULTS

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

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

Applicable Standard

According to subpart 15.407(f)and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

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

Calculated Formulary:

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

Calculated Data:

DTS Band：

Mode	**Frequency (MHz)**	**Antenna Gain**		**Conducted Power**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
		(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
802.11b	2437	14	25.12	21.99	158.12	35	0.258	1.0
802.11g	2437	14	25.12	22.17	164.82	35	0.269	1.0
802.11n HT20	2412	14	25.12	20.03	100.69	35	0.164	1.0
02.11n HT40	2422	14	25.12	20.58	114.29	35	0.187	1.0

UNII Band：

Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11a	5825	14.5	28.18	24.09	256.45	35	0.470	1.0
802.11n HT20	5755	14.5	28.18	24.07	255.27	35	0.468	1.0
802.11n HT40	5795	14.5	28.18	23.71	234.96	35	0.430	1.0

According to KDB 447498 D01 General RF exposure guidance v05r02, EUT has 5GHz and 2.4GHz transmitting simultaneously. So the sum of MPE ratio for four antennas is 0.737 which is less than 1.0, So the collocation exposure exclusion applies.

Result: The device meet FCC MPE at 35 cm distance.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
And according to FCC 47 CFR section 15.407 (a)(1),if transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has four directive dual-polarized antennas, which was used a unique type of connector to attach to the EUT, and complied with 15.203, 2.4GHz maximum gain is 14 dBi and 5GHz maximum gain is 14.5 dBi, please refer to the external 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：

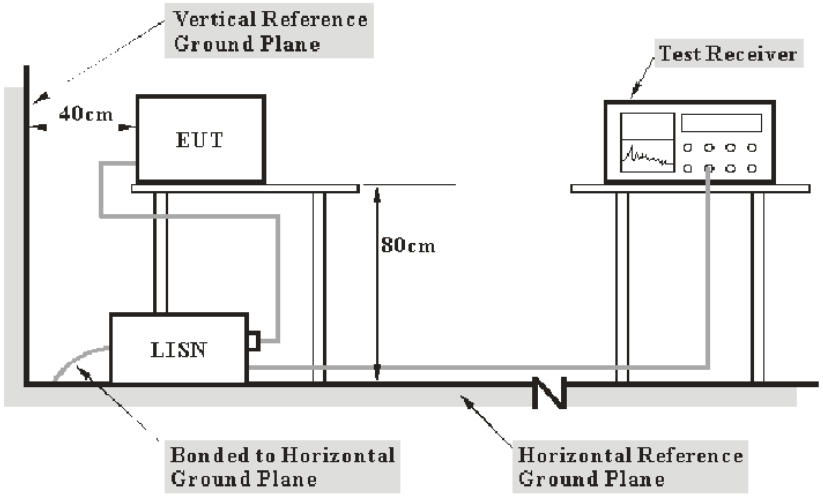
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of 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. (Chengdu) is 3.17 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.

DC 48V was used by the EUT through AC adapter.

EMI Test Receiver Setup

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

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

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

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

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

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2013-08-22	2014-08-21
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.06	2013-07-31	2014-10-16
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.12	2014-02-08	2015-02-07

*** Statement of Traceability:** BACL (Chengdu) 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 LISN and the other support equipments were connected to the outlet of the second LISN.

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

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

Test Results Summary

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

7.9 dB at **0.517000 MHz** in the **Neutral** conducted mode

Test Data

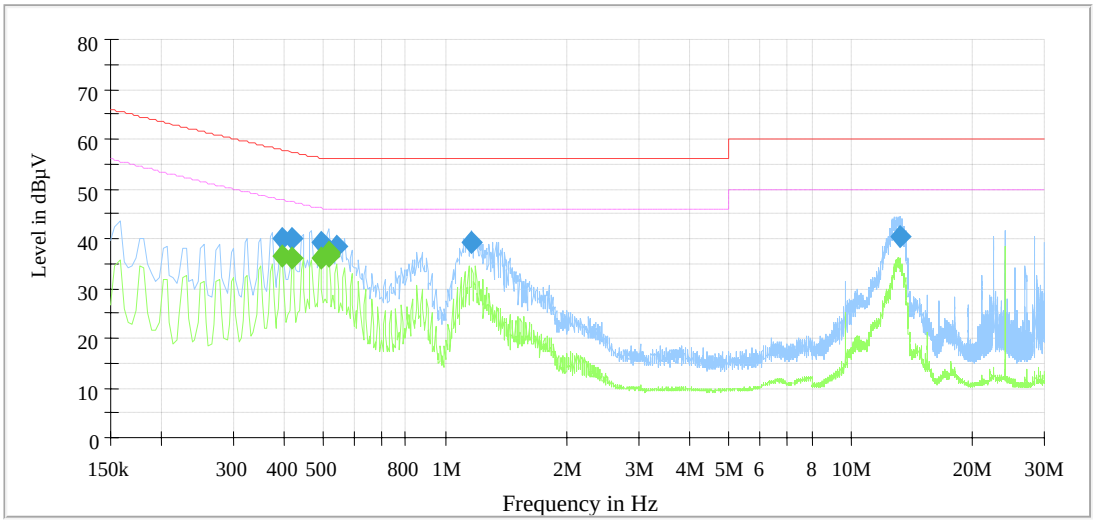
Environmental Conditions

Temperature:	31 °C
Relative Humidity:	46 %
ATM Pressure:	100.0 kPa

The testing was performed by Fidel Zhou on 2014-06-19.

Test Mode: Transmitting

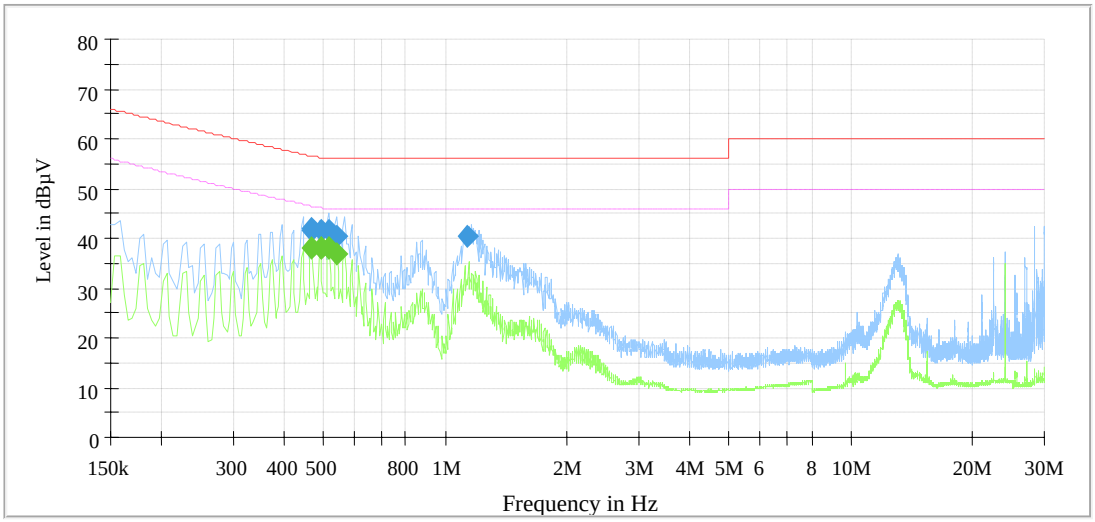
AC 120V/60 Hz, Line



AC Line Conducted Emissions					
Frequency MHz	Corrected Amplitude (dBµV)	Detector (QP/AV)	Phase (Line/Neutral)	Limit dBµV	Margin dB
0.397000	39.9	QP	Line	57.8	17.9
0.421000	39.9	QP	Line	57.3	17.5
0.493000	39.2	QP	Line	56.1	16.9
0.541000	38.5	QP	Line	56.0	17.5
1.165000	39.3	QP	Line	56.0	16.7
13.221000	40.5	QP	Line	60.0	19.5
0.397000	36.6	AV	Line	47.8	11.1
0.421000	36.1	AV	Line	47.3	11.3
0.493000	35.9	AV	Line	46.1	10.2
0.517000	37.4	AV	Line	46.0	8.6
0.517000	36.8	AV	Line	46.0	9.2
0.517000	36.5	AV	Line	46.0	9.5

AC 120V/60 Hz, Neutral

-



AC Line Conducted Emissions					
Frequency MHz	Corrected Amplitude (dBµV)	Detector (QP/AV)	Phase (Line/Neutral)	Limit dBµV	Margin dB
0.469000	41.9	QP	Neutral	56.5	14.6
0.469000	41.7	QP	Neutral	56.5	14.8
0.493000	41.6	QP	Neutral	56.1	14.5
0.517000	41.6	QP	Neutral	56.0	14.4
0.541000	40.4	QP	Neutral	56.0	15.6
1.141000	40.2	QP	Neutral	56.0	15.8
0.469000	38.2	AV	Neutral	46.5	8.3
0.493000	38.1	AV	Neutral	46.1	8.0
0.493000	38.0	AV	Neutral	46.1	8.1
0.517000	38.1	AV	Neutral	46.0	7.9
0.530000	38.0	AV	Neutral	46.0	8.0
0.541000	36.8	AV	Neutral	46.0	9.2

Note: EUT transmitting simultaneously with 2.4G and 5G radio frequency and supports intelligent radio frequency management functionalities.

FCC §15.209, §15.205 & §15.407(b) (4) (6) (7) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (4), (6), (7); §15.209; §15.205;

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.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

According to KDB 789033 D01 General UNII Test Procedures v01, emission shall be computed as:
E[dBuV/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.

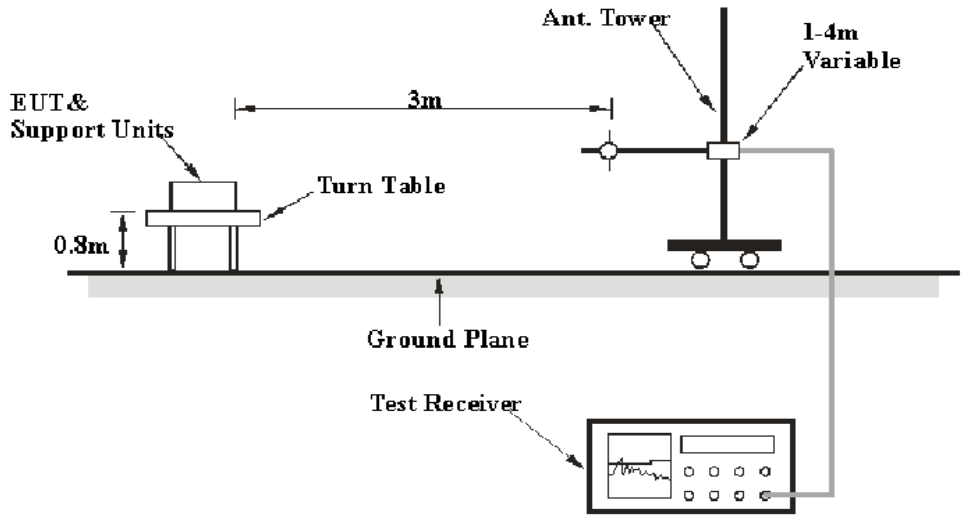
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Chengdu) is:
30M~200MHz: ±4.7 dB ;
200M~1GHz: ±6.0 dB ;
1G-6GHz: ±5.13dB;
6G~40GHz: ±5.47 dB;

Table 1 – V**a**lues of U_{cispr}

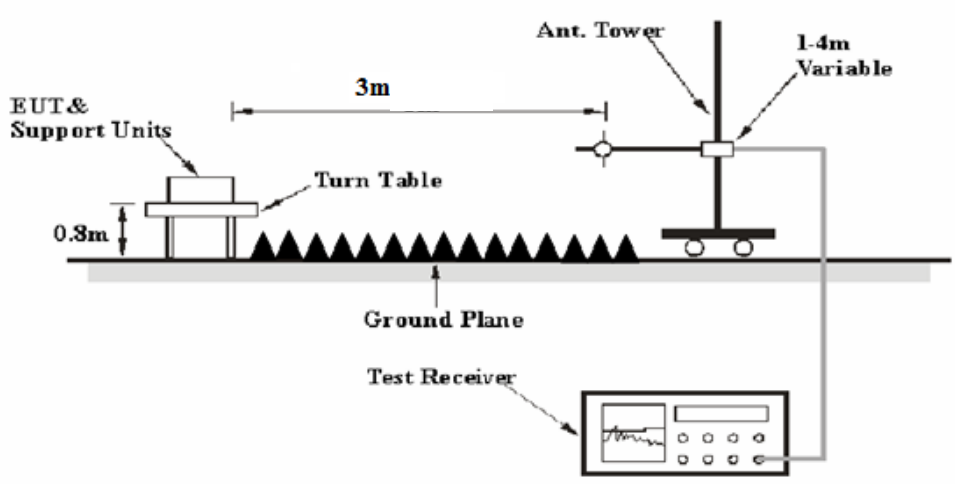
Measurement		U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5 dB

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.

DC 48V was used by the EUT through AC adapter.

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	1 MHz	3 MHz	/	PK
	1 MHz	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 1 GHz.

According to ANSI C63.4-2003, the above 1GHz test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m.
Extrapolation result (dBμV/m) = Corrected Amplitude (dBμV/m) -9.54dB

Test Equipment List and Details

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2014-07-23	2015-07-22
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2013-08-22	2014-08-21
Sunol Sciences	Broadband Antenna	JB3	A101808	2014-04-10	2015-04-09
Rohde & Schwarz	Spectrum Analyzer	FSL18	100180	2014-06-23	2015-06-22
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2013-10-17	2014-10-16
Rohde&Schwarz	Spectrum Analyzer	FSP38	100478	2014-06-16	2015-06-15
EM TEST	Horn Antenna	3115	003-6076	2014-04-09	2015-04-08
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2015-06-15
Ducommun Technolagies	Horn Antenna	ARH-2823-02	1007726-01 1302	2014-06-16	2015-06-15
HP	Amplifier	8449B	3008A00277	2013-07-31	2014-10-16
EMCT	Semi-Anechoic Chamber	966	N/A	2013-03-13	2016-03-12

*** Statement of Traceability:** BACL (Chengdu) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Receiver Reading + Cable loss + Antenna Factor – Amplifier Gain

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

Margin = Limit-Corrected Amplitude

The distance between EUT and receiving antenna is for 1m.

Extrapolation result = Corrected Amplitude-9.54

Margin = Limit- Extrapolation result

Test Results Summary

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

2.59 dB at **11570 MHz** in the **Vertical** polarization mode

Test Data

Environmental Conditions

Temperature:	27 °C & 23 °C
Relative Humidity:	58 % & 57 %
ATM Pressure:	100.1 kPa & 100.5 kPa

The testing was performed by Fidel Zhou on 2014-07-10 & 2014-07-11.

Test mode: transmitting

For 802.11a mode

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
5745 MHz										
a) 11490	52.63	PK	V	38.00	6.34	23.80	73.17	63.63	68.20	*4.57
a) 11490	38	AV	V	38.00	6.34	23.80	58.54	49.00	54.00	*5.00
a) 17235	43.52	PK	V	43.00	6.45	22.40	70.57	61.03	68.20	7.17
a) 17235	28.95	AV	V	43.00	6.45	22.40	56.00	46.46	54.00	7.54
280	45.25	QP	V	13.37	0.26	26.20	32.68	-	46.00	13.32
5785 MHz										
a) 11570	53.16	PK	V	38.00	6.34	23.80	73.70	64.16	68.20	*4.04
a) 11570	40.41	AV	V	38.00	6.34	23.80	60.95	51.41	54.00	*2.59
a) 17355	35.63	PK	V	43.00	6.45	22.40	62.68	53.14	68.20	15.06
a) 17355	28.82	AV	V	43.00	6.45	22.40	55.87	46.33	54.00	7.67
280	47.35	QP	V	13.37	0.26	26.20	34.78	-	46.00	11.22
5825 MHz										
a) 11650	53.54	PK	V	38.00	6.34	23.80	74.08	64.54	68.20	*3.66
a) 11650	35.84	AV	V	38.00	6.34	23.80	56.38	46.84	54.00	7.16
a) 17475	44.15	PK	V	43.00	6.45	22.40	71.20	61.66	68.20	6.54
a) 17475	28.37	AV	V	43.00	6.45	22.40	55.42	45.88	54.00	8.12
280	46.67	QP	V	13.37	0.26	26.20	34.10	-	46.00	11.90

*Within measurement uncertainty!

Note a):

The distance between EUT and receiving antenna is for 1 m.
Extrapolation result = Corrected Amplitude-9.54
Margin = Limit- Extrapolation result

Note: According to KDB 789033 D02 General UNII Test Procedures New Rules v01 required, the limits is -27dBm(EIRP) = 68.2 dBμV/m @ 3m

For 802.11n HT20 mode

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
5745 MHz										
a) 11490	51.24	PK	V	38.00	6.34	23.80	71.78	62.24	68.20	5.96
a) 11490	36.41	AV	V	38.00	6.34	23.80	56.95	47.41	54.00	6.59
a) 17235	42.35	PK	V	43.00	6.45	22.40	69.40	59.86	68.20	8.34
a) 17235	28.46	AV	V	43.00	6.45	22.40	55.51	45.97	54.00	8.03
280	46.82	QP	V	13.37	0.26	26.20	34.25	-	46.00	11.75
5785 MHz										
a) 11570	52.54	PK	V	38.00	6.34	23.80	73.08	63.54	68.20	*4.66
a) 11570	36.96	AV	V	38.00	6.34	23.80	57.50	47.96	54.00	6.04
a) 17355	40.44	PK	V	43.00	6.45	22.40	67.49	57.95	68.20	10.25
a) 17355	28.28	AV	V	43.00	6.45	22.40	55.33	45.79	54.00	8.21
280	45.67	QP	V	13.37	0.26	26.20	33.10	-	46.00	12.90
5825 MHz										
a) 11650	51.58	PK	V	38.00	6.34	23.80	72.12	62.58	68.20	5.62
a) 11650	35.25	AV	V	38.00	6.34	23.80	55.79	46.25	54.00	7.75
a) 17475	40.36	PK	V	43.00	6.45	22.40	67.41	57.87	68.20	10.33
a) 17475	28.21	AV	V	43.00	6.45	22.40	55.26	45.72	54.00	8.28
280	44.64	QP	V	13.37	0.26	26.20	32.07	-	46.00	13.93

*Within measurement uncertainty!

Note a):

The distance between EUT and receiving antenna is for 1 m.
Extrapolation result = Corrected Amplitude-9.54
Margin = Limit- Extrapolation result

Note: According to KDB 789033 D02 General UNII Test Procedures New Rules v01 required, the limits is -27dBm(EIRP) = 68.2 dBμV/m @ 3m

For 802.11n HT40 mode

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
5755 MHz										
a) 11510	47.56	PK	V	38.00	6.34	23.80	68.10	58.56	68.20	9.64
a) 11510	34.23	AV	V	38.00	6.34	23.80	54.77	45.23	54.00	8.77
a) 17265	42.33	PK	V	43.00	6.45	22.40	69.38	59.84	68.20	8.36
a) 17265	28.47	AV	V	43.00	6.45	22.40	55.52	45.98	54.00	8.02
280	45.53	QP	V	13.37	0.26	26.20	32.96	/	46.00	13.04
5795 MHz										
a) 11590	47.68	PK	V	38.00	6.34	23.80	68.22	58.68	68.20	9.52
a) 11590	35.15	AV	V	38.00	6.34	23.80	55.69	46.15	54.00	7.85
a) 17385	42.39	PK	V	43.00	6.45	22.40	69.44	59.90	68.20	8.30
a) 17385	29.16	AV	V	43.00	6.45	22.40	56.21	46.67	54.00	7.33
280	45.19	QP	V	13.37	0.26	26.20	32.62	-	46.00	13.38

*Within measurement uncertainty!

Note a):

The distance between EUT and receiving antenna is for 1 m.
Extrapolation result = Corrected Amplitude-9.54
Margin = Limit- Extrapolation result

Note: According to KDB 789033 D02 General UNII Test Procedures New Rules v01 required, the limits is -27dBm(EIRP) = 68.2 dBμV/m @ 3m

FCC §15.407(b) (4) – BAND EDGE

Applicable Standard

FCC §15.407 (b) (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;

Test Procedure

Radiated emission method, according to KDB 789033 D02 General UNII Test Procedures New Rules v01, clause II.G 3 d) (i), marker-delta method, as described in ANSI C63.10

Test Equipment List and Details

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2013-07-23	2014-07-22
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2013-08-22	2014-08-21
Sunol Sciences	Broadband Antenna	JB3	A101808	2014-04-10	2015-04-09
Rohde & Schwarz	Spectrum Analyzer	FSL18	100180	2014-06-23	2015-06-22
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2013-10-17	2014-10-16
EM TEST	Horn Antenna	3115	003-6076	2014-04-09	2015-04-08
WEINSCHEL ENGINEERING	Attenuator	1A 10dB	AB1165	2013-10-31	2014-10-30
Mini-circuits	Filter	VHF-3100+	31306	2014-07-15	2015-07-14
Mini-circuits	Filter	VHF-6010+	31336	2014-07-15	2015-07-14
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2013-11-18	2014-11-17
EMCT	Semi-Anechoic Chamber	966	N/A	2013-03-13	2016-03-12

*** Statement of Traceability:** BACL (Chengdu) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	28 °C & 28 °C
Relative Humidity:	47 % & 45 %
ATM Pressure:	100.5 kPa & 100.4 kPa

The testing was performed by Fidel Zhou on 2014-07-21 & 2014-07-22.

Test mode: transmitting

For 802.11a mode

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
5745 MHz									
5745	82.56	PK	H	32.50	4.15	0.00	119.21	N/A	N/A
5745	75.23	AV	H	32.50	4.15	0.00	111.88	N/A	N/A
5745	83.23	PK	V	32.50	4.15	0.00	119.88	N/A	N/A
5745	75.55	AV	V	32.50	4.15	0.00	112.20	N/A	N/A
5724.95	57.18	PK	V	32.50	4.10	26.55	67.23	78.20	10.97
5724.95	38.84	AV	V	32.50	4.10	26.55	48.89	54.00	5.11
5850.05	48.73	PK	V	32.50	4.20	26.55	58.88	78.20	19.32
5850.05	35.26	AV	V	32.50	4.20	26.55	45.41	54.00	8.59
5785 MHz									
5785	83.22	PK	H	32.50	4.15	0.00	119.87	N/A	N/A
5785	76.21	AV	H	32.50	4.15	0.00	112.86	N/A	N/A
5785	83.41	PK	V	32.50	4.15	0.00	120.06	N/A	N/A
5785	75.67	AV	V	32.50	4.15	0.00	112.32	N/A	N/A
5722.35	48.74	PK	V	32.50	4.10	26.55	58.79	78.20	19.41
5722.35	35.26	AV	V	32.50	4.10	26.55	45.31	54.00	8.69
5856.45	47.16	PK	V	32.50	4.20	26.55	57.31	78.20	20.89
5856.45	35.72	AV	V	32.50	4.20	26.55	45.87	54.00	8.13
5825 MHz									
5825	84.27	PK	H	32.50	4.15	0.00	120.92	N/A	N/A
5825	77.02	AV	H	32.50	4.15	0.00	113.67	N/A	N/A
5825	83.47	PK	V	32.50	4.15	0.00	120.12	N/A	N/A
5825	74.4	AV	V	32.50	4.15	0.00	111.05	N/A	N/A
5724.8	47.28	PK	V	32.50	4.10	26.55	57.33	78.20	20.87
5724.8	35.24	AV	V	32.50	4.10	26.55	45.29	54.00	8.71
5850.75	48.66	PK	V	32.50	4.20	26.55	58.81	78.20	19.39
5850.75	36.75	AV	V	32.50	4.20	26.55	46.90	54.00	7.10

For 802.11n HT20 mode

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
5745 MHz									
5745	81.57	PK	H	32.50	4.15	0.00	118.22	N/A	N/A
5745	73.01	AV	H	32.50	4.15	0.00	109.66	N/A	N/A
5745	82.2	PK	V	32.50	4.15	0.00	118.85	N/A	N/A
5745	74.18	AV	V	32.50	4.15	0.00	110.83	N/A	N/A
5724.95	59.58	PK	V	32.50	4.10	26.55	69.63	78.20	8.57
5724.95	39.21	AV	V	32.50	4.10	26.55	49.26	54.00	4.74
5850.05	47.26	PK	V	32.50	4.20	26.55	57.41	78.20	20.79
5850.05	34.61	AV	V	32.50	4.20	26.55	44.76	54.00	9.24
5785 MHz									
5785	81.08	PK	H	32.50	4.15	0.00	117.73	N/A	N/A
5785	74.33	AV	H	32.50	4.15	0.00	110.98	N/A	N/A
5785	82.41	PK	V	32.50	4.15	0.00	119.06	N/A	N/A
5785	74.17	AV	V	32.50	4.15	0.00	110.82	N/A	N/A
5722.35	47.39	PK	V	32.50	4.10	26.55	57.44	78.20	20.76
5722.35	33.72	AV	V	32.50	4.10	26.55	43.77	54.00	10.23
5856.45	47.16	PK	V	32.50	4.20	26.55	57.31	78.20	20.89
5856.45	33.67	AV	V	32.50	4.20	26.55	43.82	54.00	10.18
5825 MHz									
5825	82.39	PK	H	32.50	4.15	0.00	119.04	N/A	N/A
5825	74.55	AV	H	32.50	4.15	0.00	111.20	N/A	N/A
5825	80.42	PK	V	32.50	4.15	0.00	117.07	N/A	N/A
5825	72.27	AV	V	32.50	4.15	0.00	108.92	N/A	N/A
5724.8	47.28	PK	V	32.50	4.10	26.55	57.33	78.20	20.87
5724.8	34.82	AV	V	32.50	4.10	26.55	44.87	54.00	9.13
5850.75	47.62	PK	V	32.50	4.20	26.55	57.77	78.20	20.43
5850.75	34.19	AV	V	32.50	4.20	26.55	44.34	54.00	9.66

For 802.11n HT40 mode

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
5755 MHz									
5755	80.44	PK	H	32.50	4.15	0.00	117.09	N/A	N/A
5755	72.65	AV	H	32.50	4.15	0.00	109.30	N/A	N/A
5755	81.68	PK	V	32.50	4.15	0.00	118.33	N/A	N/A
5755	73.5	AV	V	32.50	4.15	0.00	110.15	N/A	N/A
5724.95	61.22	PK	V	32.50	4.10	26.55	71.27	78.20	6.93
5724.95	42.53	AV	V	32.50	4.10	26.55	52.58	54.00	1.42
5850.05	47.33	PK	V	32.50	4.20	26.55	57.48	78.20	20.72
5850.05	34.65	AV	V	32.50	4.20	26.55	44.80	54.00	9.20
5795 MHz									
5795	81.64	PK	H	32.50	4.15	0.00	118.29	N/A	N/A
5795	73.28	AV	H	32.50	4.15	0.00	109.93	N/A	N/A
5795	80.96	PK	V	32.50	4.15	0.00	117.61	N/A	N/A
5795	73.39	AV	V	32.50	4.15	0.00	110.04	N/A	N/A
5722.35	47.21	PK	V	32.50	4.10	26.55	57.26	78.20	20.94
5722.35	33.21	AV	V	32.50	4.10	26.55	43.26	54.00	10.74
5856.45	47.89	PK	V	32.50	4.20	26.55	58.04	78.20	20.16
5856.45	34.09	AV	V	32.50	4.20	26.55	44.24	54.00	9.76

Note:
Corrected Amplitude = Receiver Reading + Cable loss + Antenna Factor – Amplifier Gain
Margin = Limit-Corrected Amplitude

FCC §15.407 (a)(3) & (e) – 6dB BANDWIDTH

Applicable Standard

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.

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	Spectrum Analyzer	FSEM30	100018	2013-10-17	2014-10-16

*** Statement of Traceability:** BACL (Chengdu) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

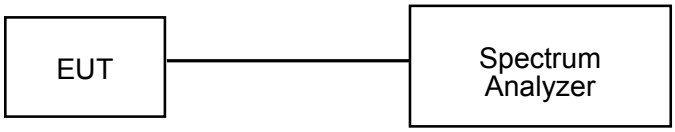
According to KDB 789033 D02 General UNII Test Procedures New Rules v01, clause II.C 2

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3. Set RBW = 100 kHz and the video bandwidth (VBW) ≥ 3 x RBW. Use a peak detector. Do not use the Max Hold function and auto couple. Rather, use the trace to stabilize the emission. Measure the maximum width of emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

4. Repeat above procedures until all frequencies measured were complete.



Test Data

Environmental Conditions

Temperature:	28 °C & 29 °C
Relative Humidity:	45 % & 50 %
ATM Pressure:	100.4 kPa & 100.7 kPa

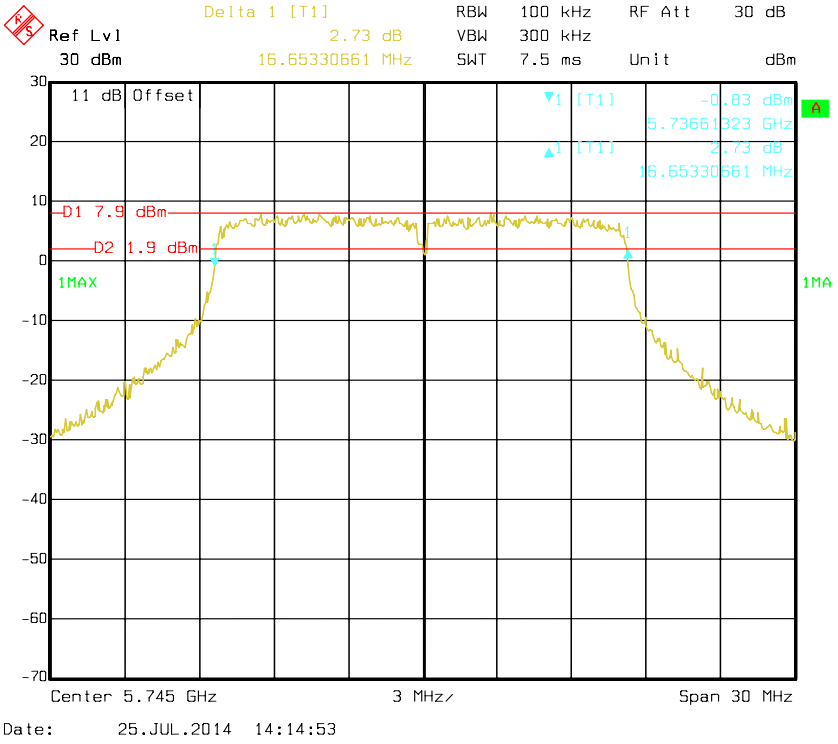
The testing was performed by Fidel Zhou on 2014-07-24 & 2014-07-25.

Test Result: Pass.
Please refer to the following tables and plots.

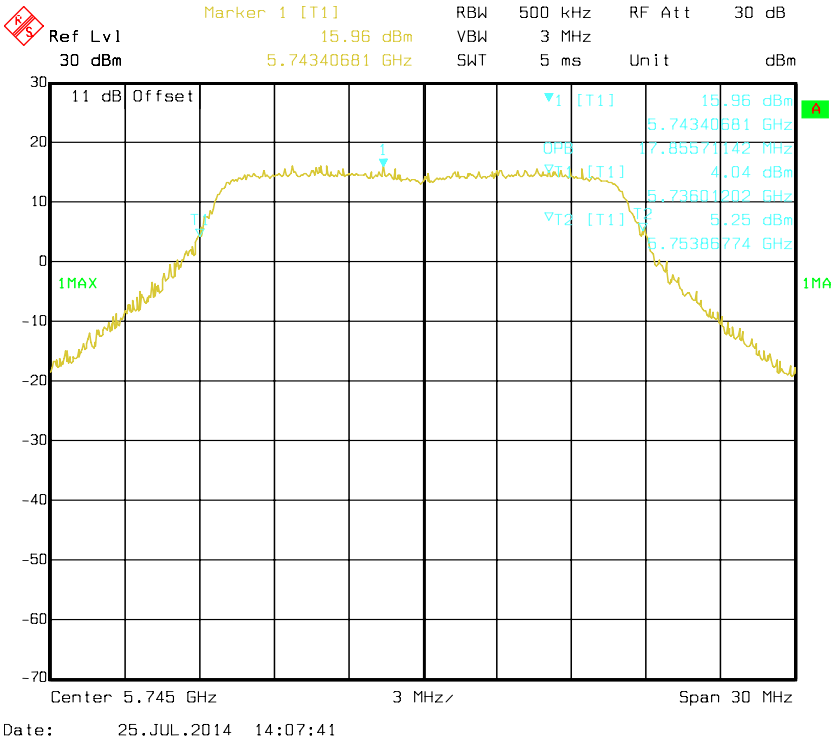
Test mode: Transmitting

Mode	Frequency (MHz)	6dB Bandwidth (MHz)		OBW (MHz)		Limit (kHz)
		Antenna 0	Antenna 1	Antenna 0	Antenna 1	
802.11a	5745	16.65	16.65	17.85	17.73	>500
	5785	16.65	16.65	17.79	17.85	>500
	5825	16.65	16.65	17.73	17.85	>500
802.11n HT20	5745	17.85	17.85	17.79	18.75	>500
	5785	17.85	17.85	17.67	18.69	>500
	5825	17.85	17.85	17.67	18.69	>500
802.11n HT40	5755	36.67	36.79	36.91	37.03	>500
	5795	36.71	36.83	37.03	37.03	>500

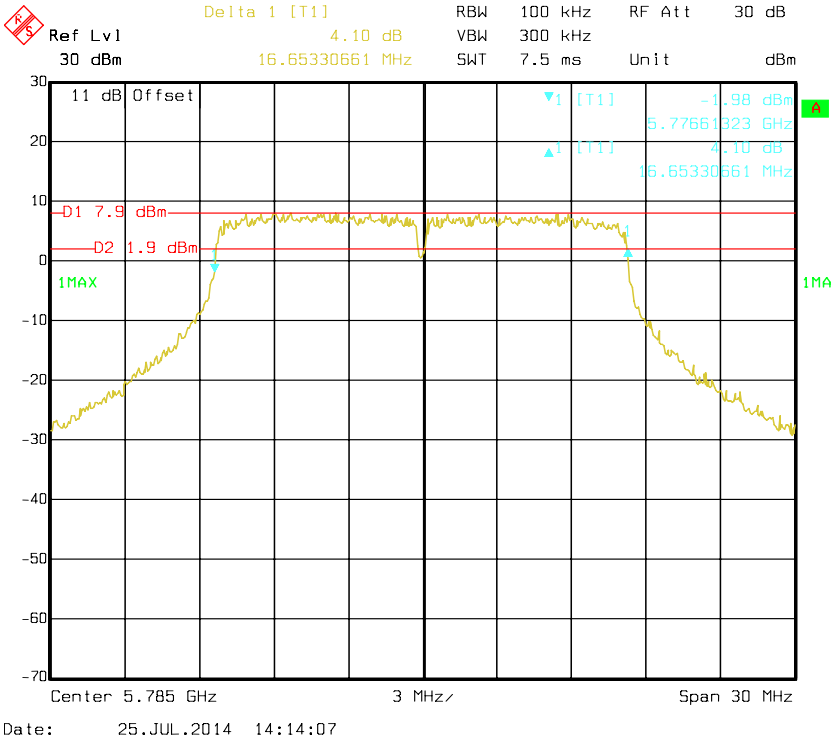
802.11a mode, Antenna 0: 6 dB Bandwidth-5745 MHz



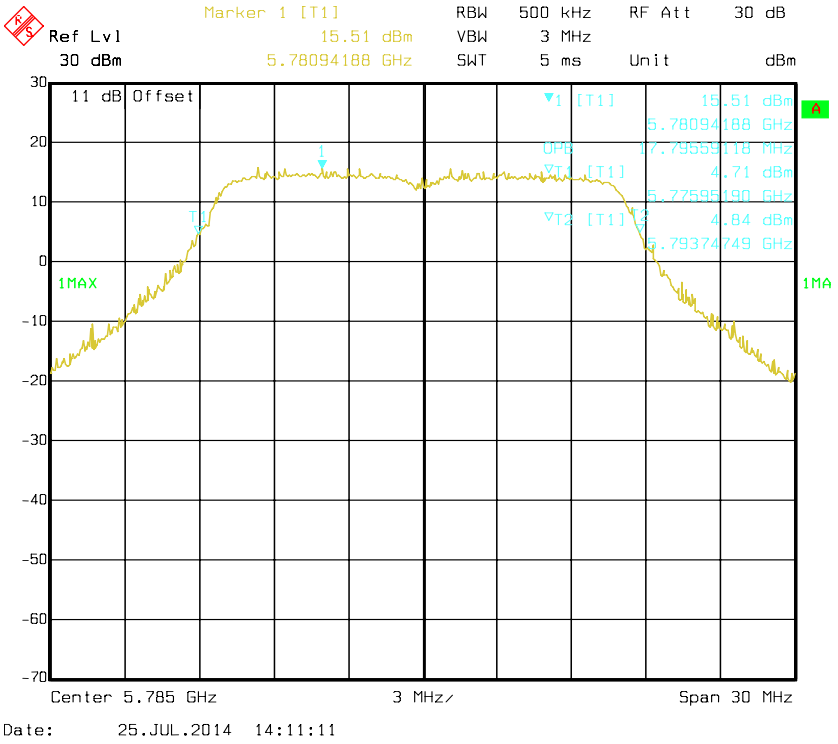
802.11a mode, Antenna 0: OBW Bandwidth-5745 MHz



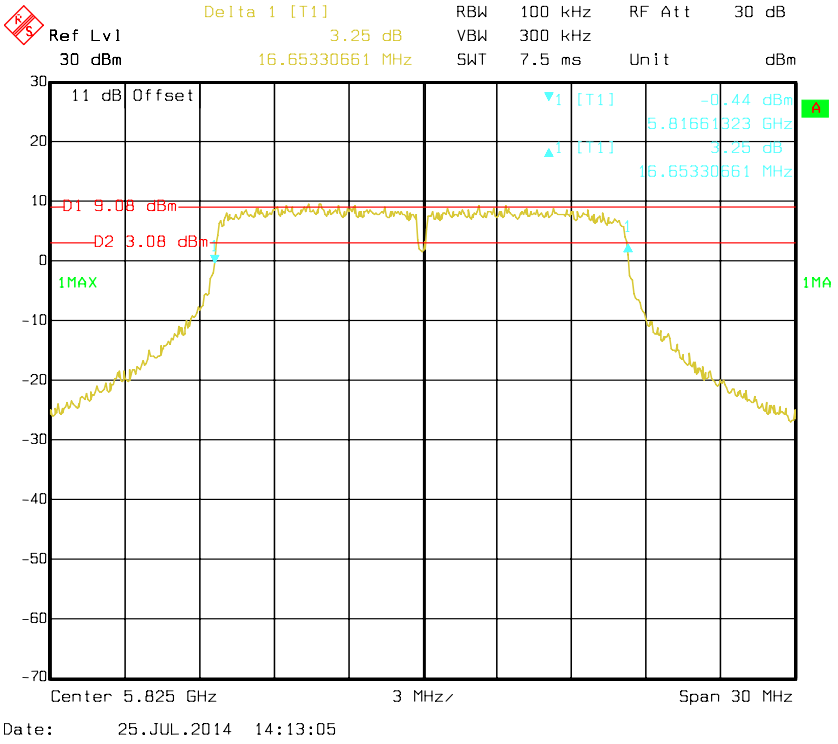
802.11a mode, Antenna 0: 6 dB Bandwidth-5785 MHz



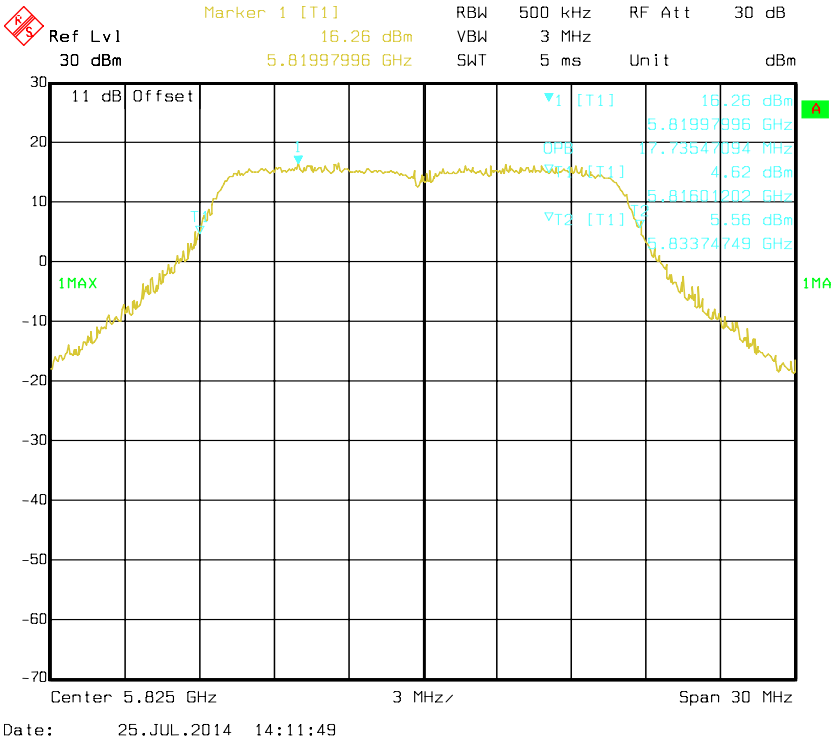
802.11a mode, Antenna 0: OBW Bandwidth-5785 MHz



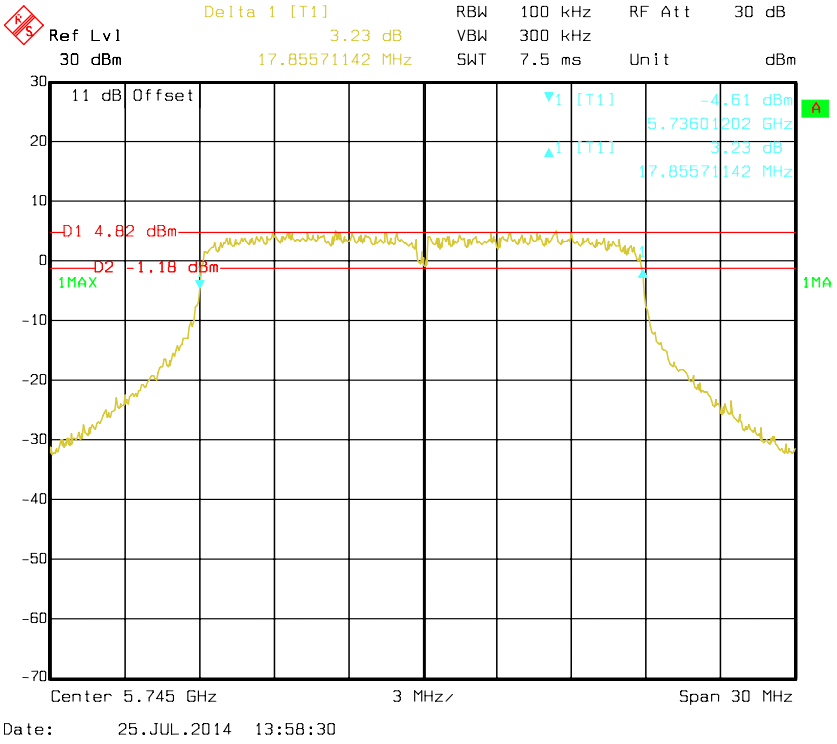
802.11a mode, Antenna 0: 6 dB Bandwidth-5825 MHz



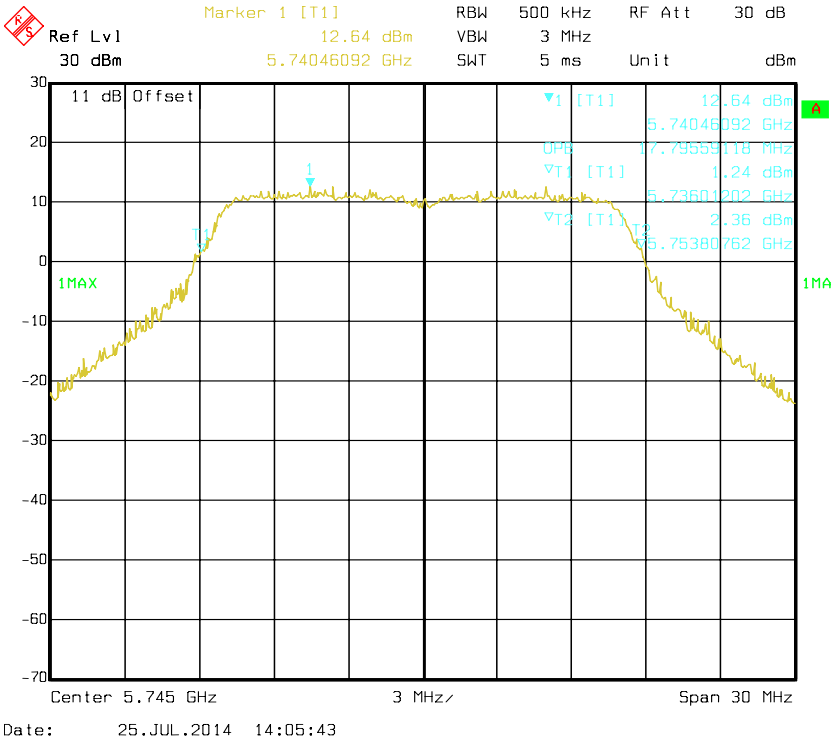
802.11a mode, Antenna 0: OBW Bandwidth-5825 MHz



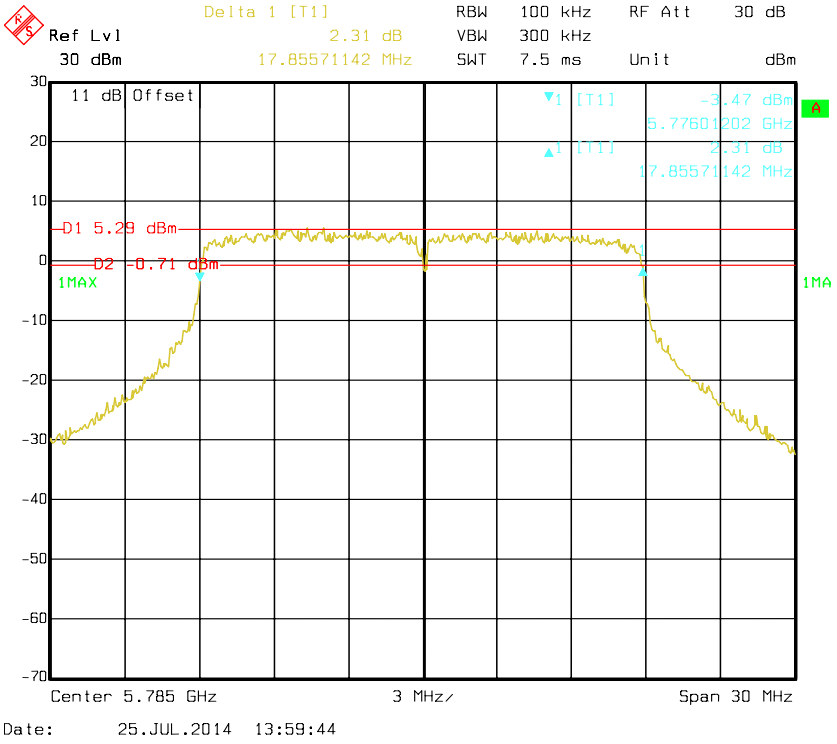
802.11n HT20 mode, Antenna 0: 6 dB Bandwidth-5745 MHz



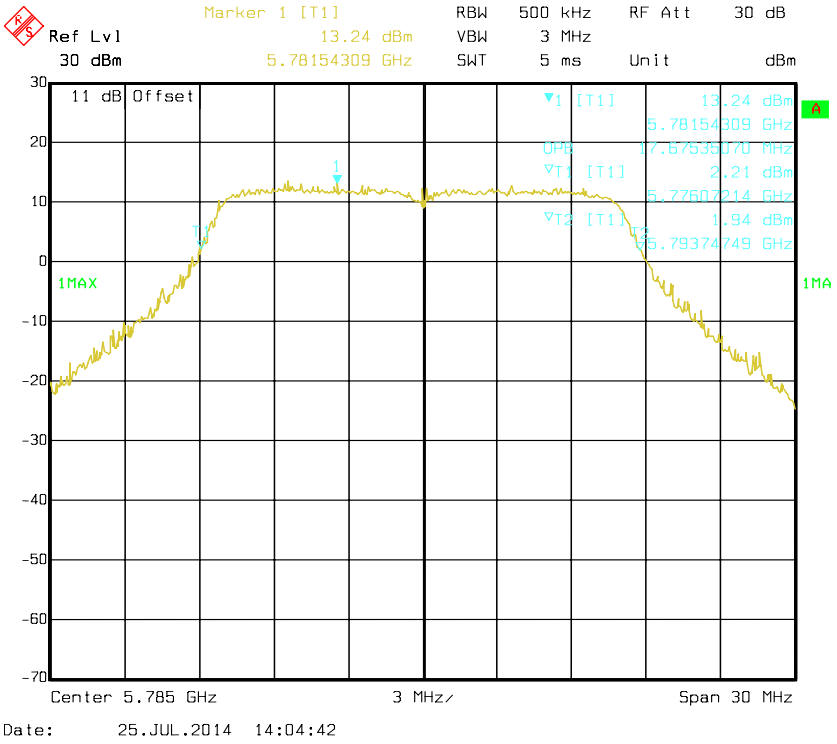
802.11n HT20 mode, Antenna 0: OBW Bandwidth-5745 MHz



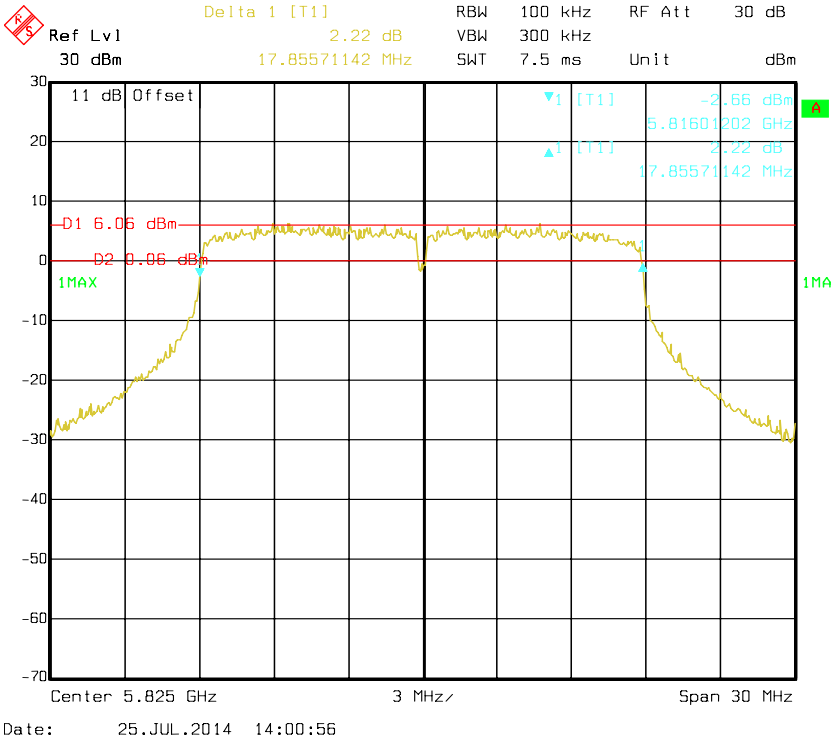
802.11n HT20 mode, Antenna 0: 6 dB Bandwidth-5785 MHz



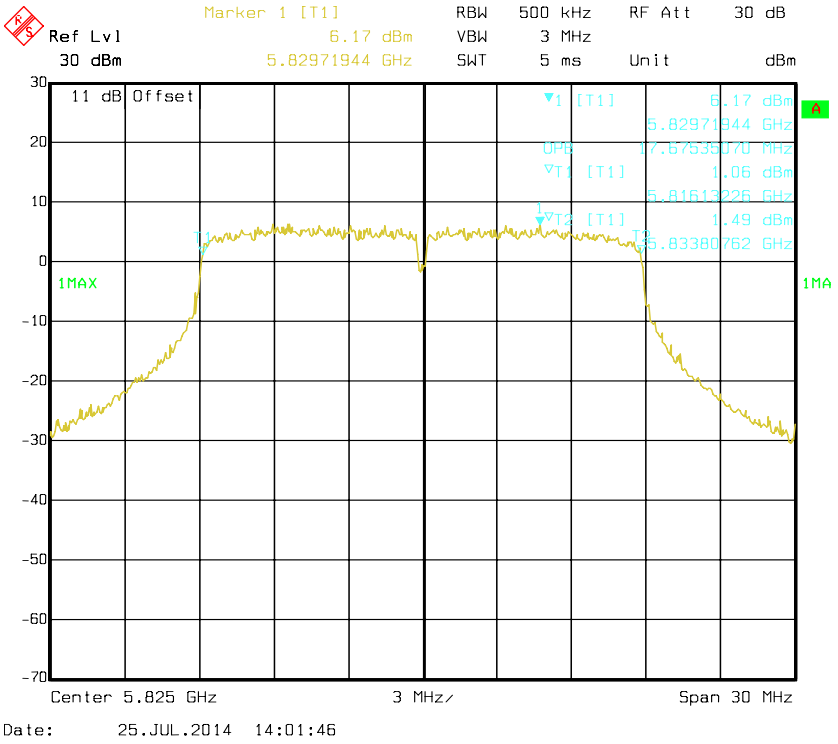
802.11n HT20 mode, Antenna 0: OBW Bandwidth-5785 MHz



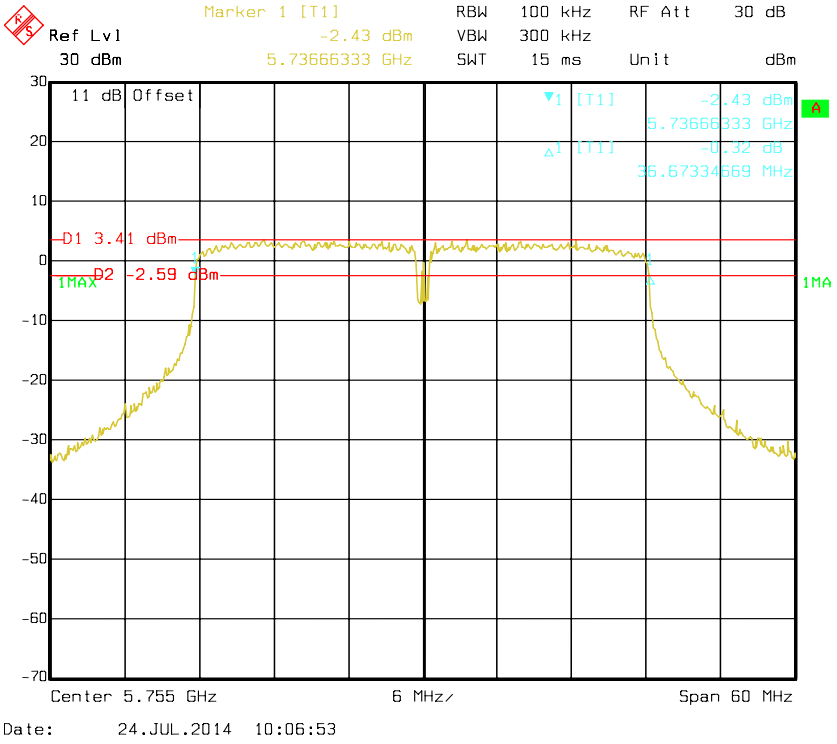
802.11n HT20 mode, Antenna 0: 6 dB Bandwidth-5825 MHz



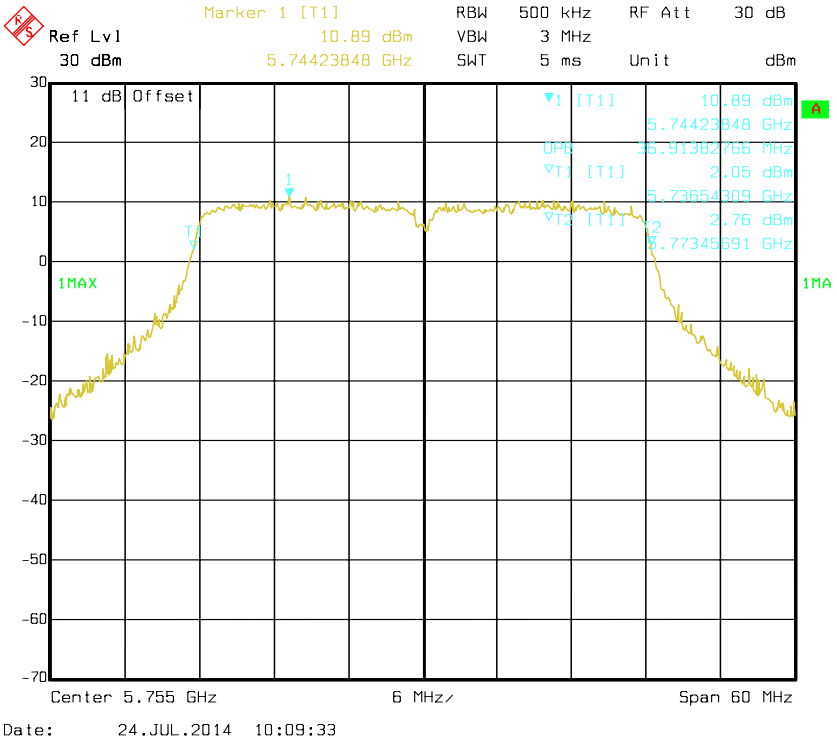
802.11n HT20 mode, Antenna 0: OBW Bandwidth-5825 MHz



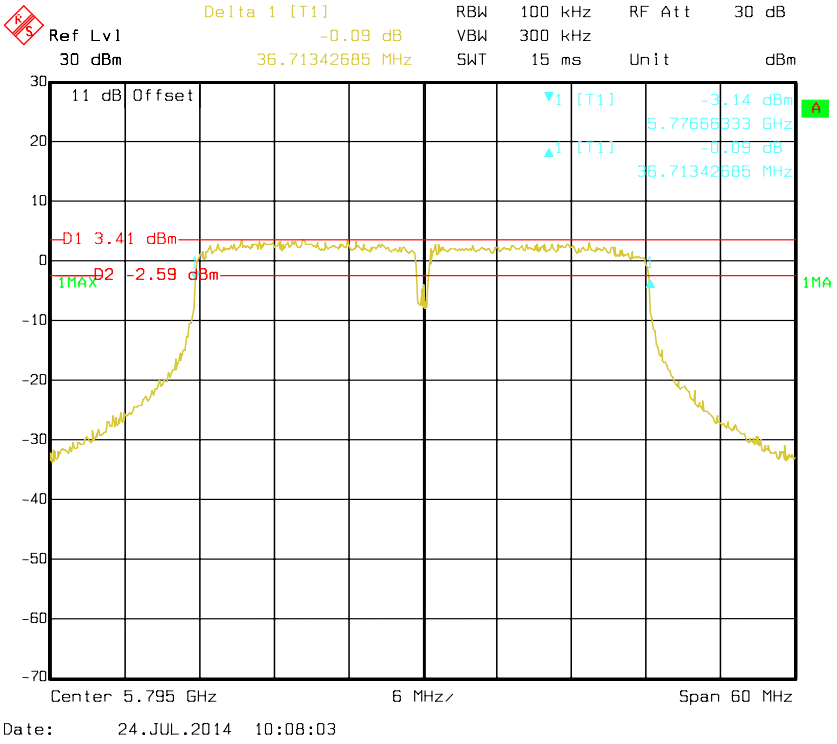
802.11n HT40 mode, Antenna 0: 6 dB Bandwidth-5755 MHz



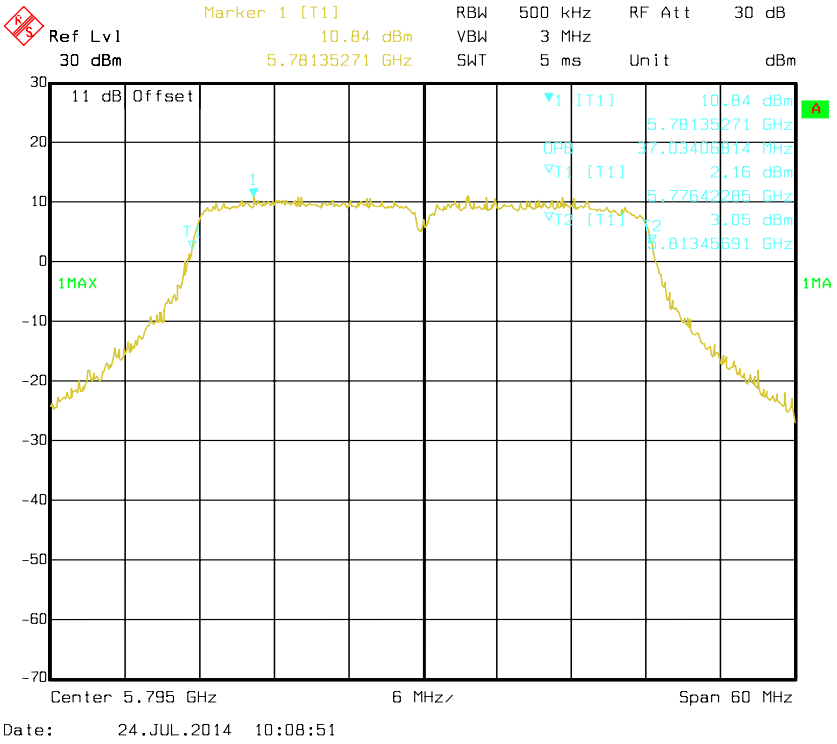
802.11n HT40 mode, Antenna 0: OBW Bandwidth-5755 MHz



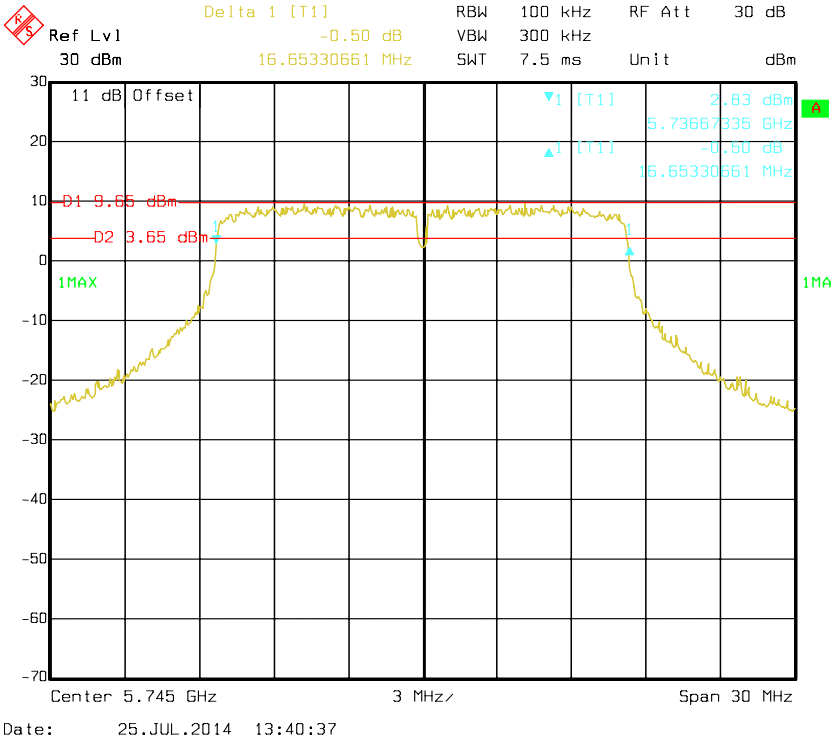
802.11n HT40 mode, Antenna 0: 6 dB Bandwidth-5795 MHz



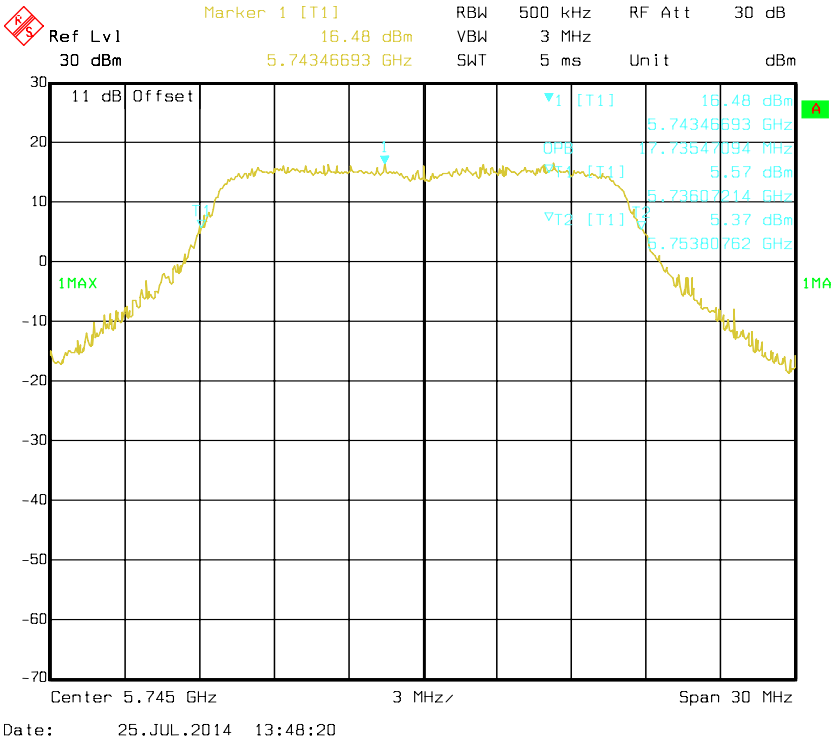
802.11n HT40 mode, Antenna 0: OBW Bandwidth-5795 MHz



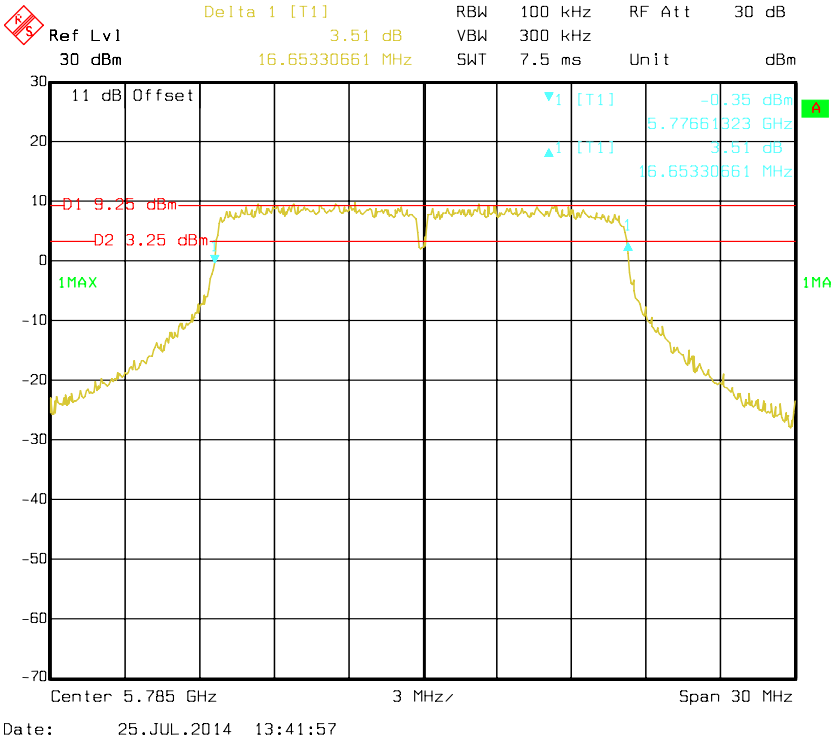
802.11a mode, Antenna 1: 6 dB Bandwidth-5745 MHz



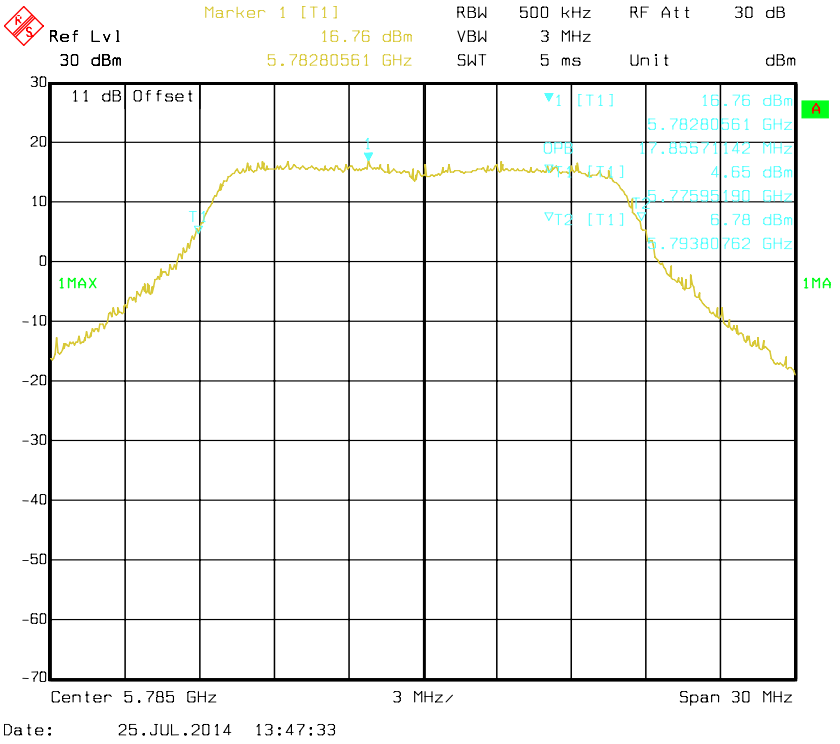
802.11a mode, Antenna 1: OBW Bandwidth-5745 MHz



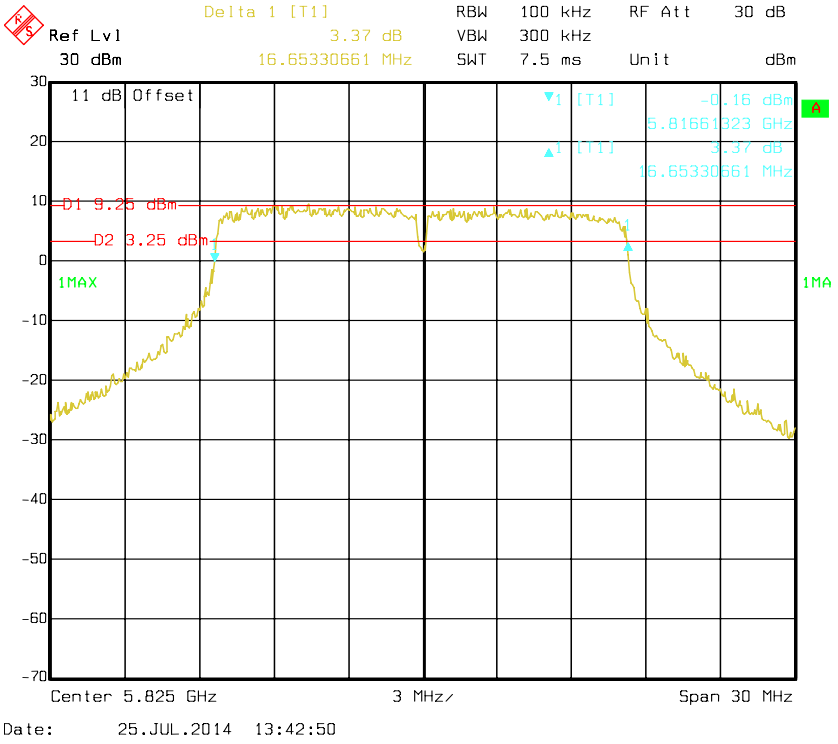
802.11a mode, Antenna 1: 6 dB Bandwidth-5785 MHz



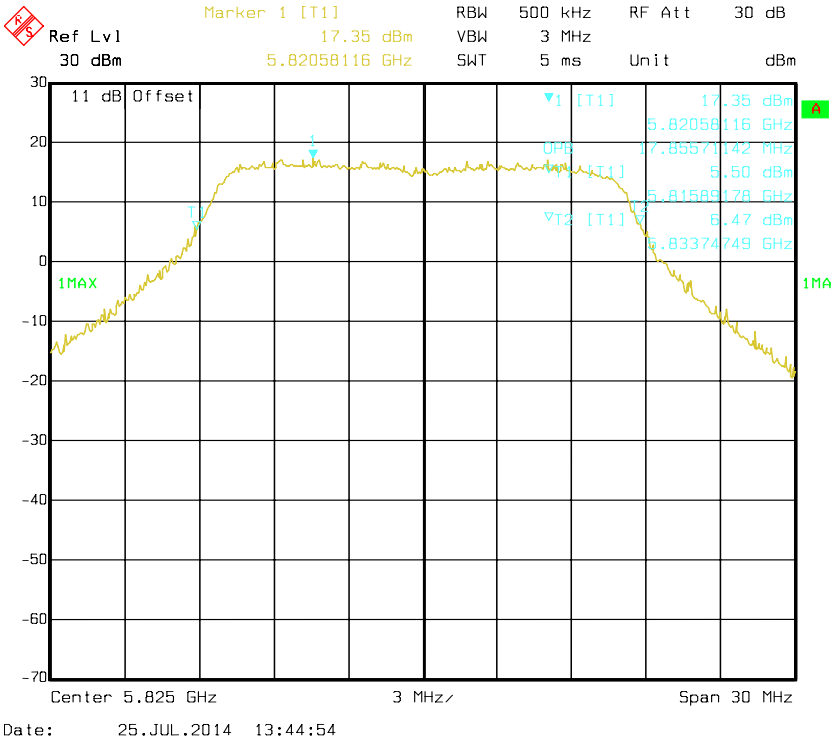
802.11a mode, Antenna 1: OBW Bandwidth-5785 MHz



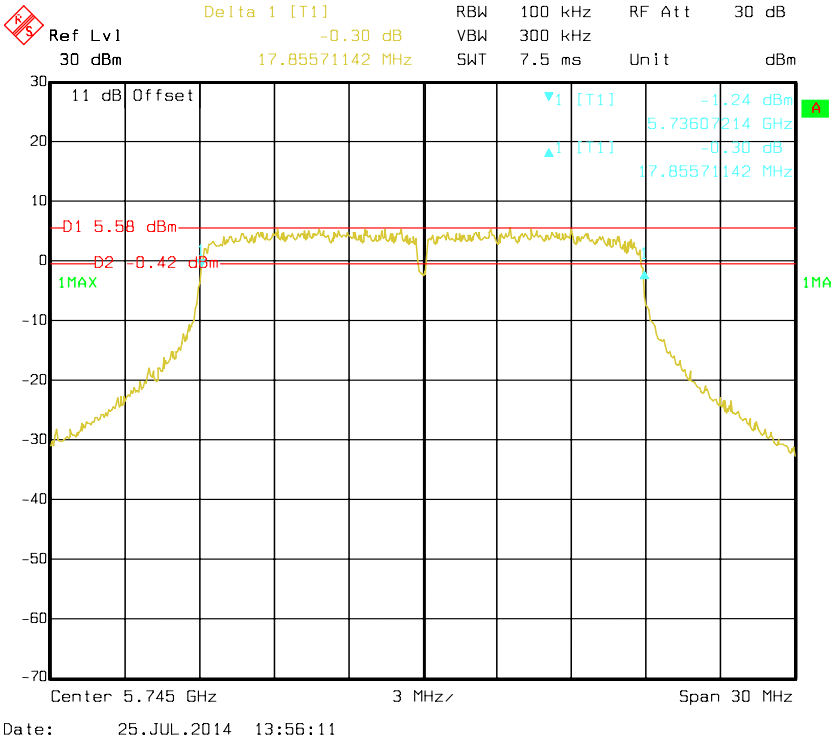
802.11a mode, Antenna 1: 6 dB Bandwidth-5825 MHz



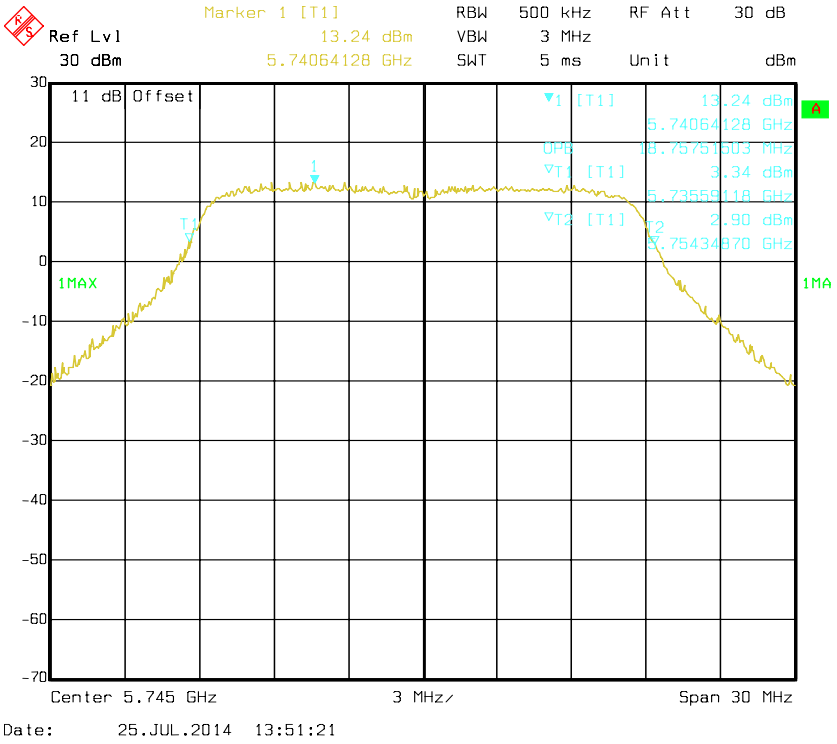
802.11a mode, Antenna 1: OBW Bandwidth-5825 MHz



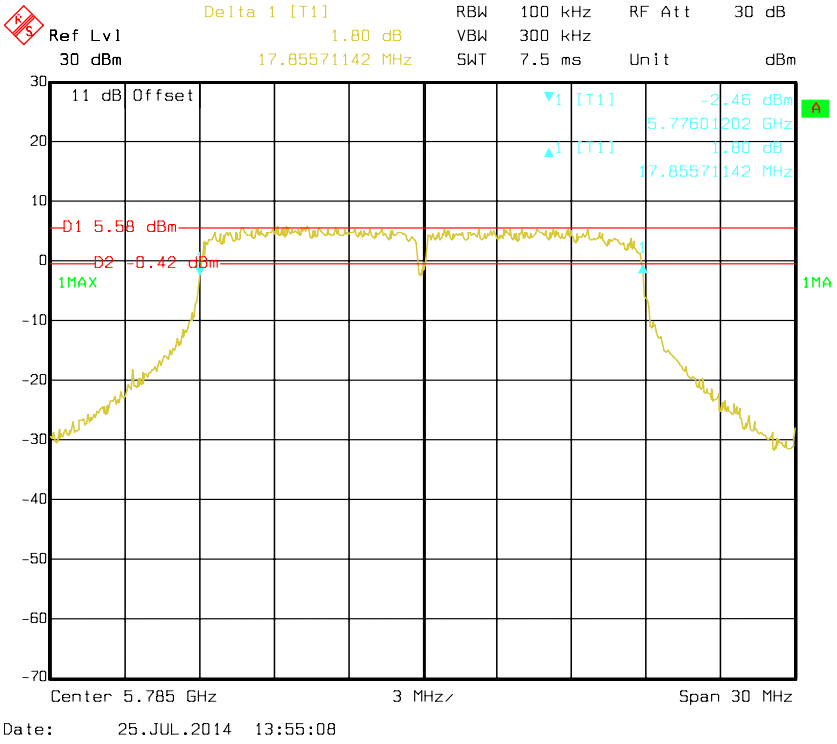
802.11n HT20 mode, Antenna 1: 6 dB Bandwidth-5745 MHz



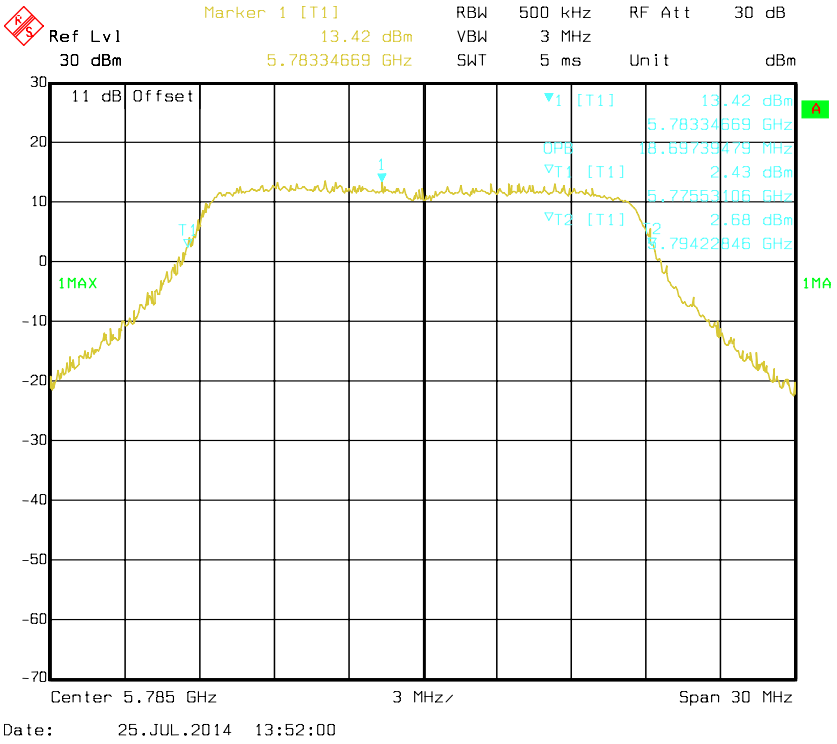
802.11n HT20 mode, Antenna 1: OBW Bandwidth-5745 MHz



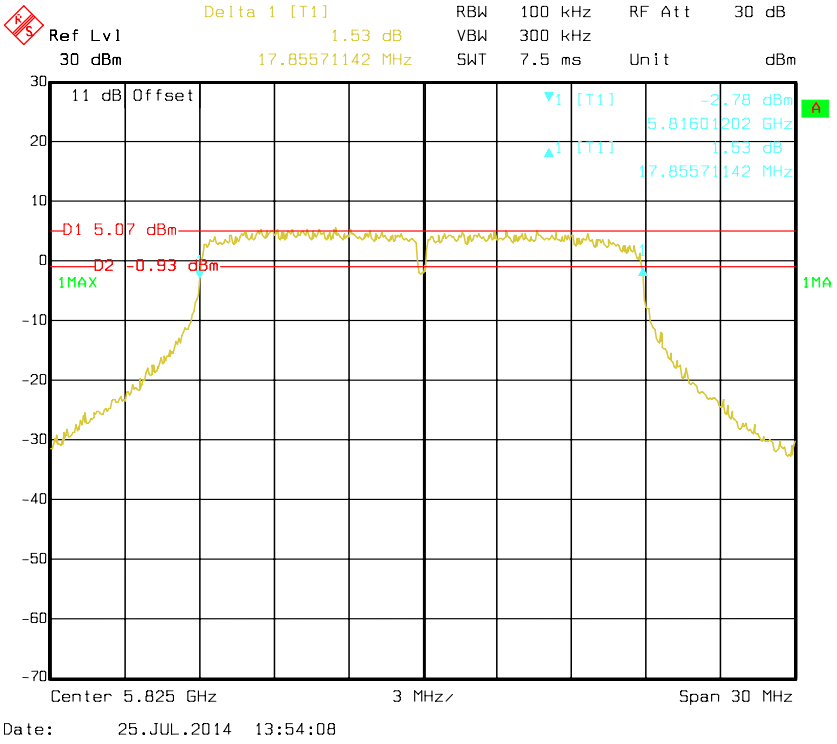
802.11n HT20 mode, Antenna 1: 6 dB Bandwidth-5785 MHz



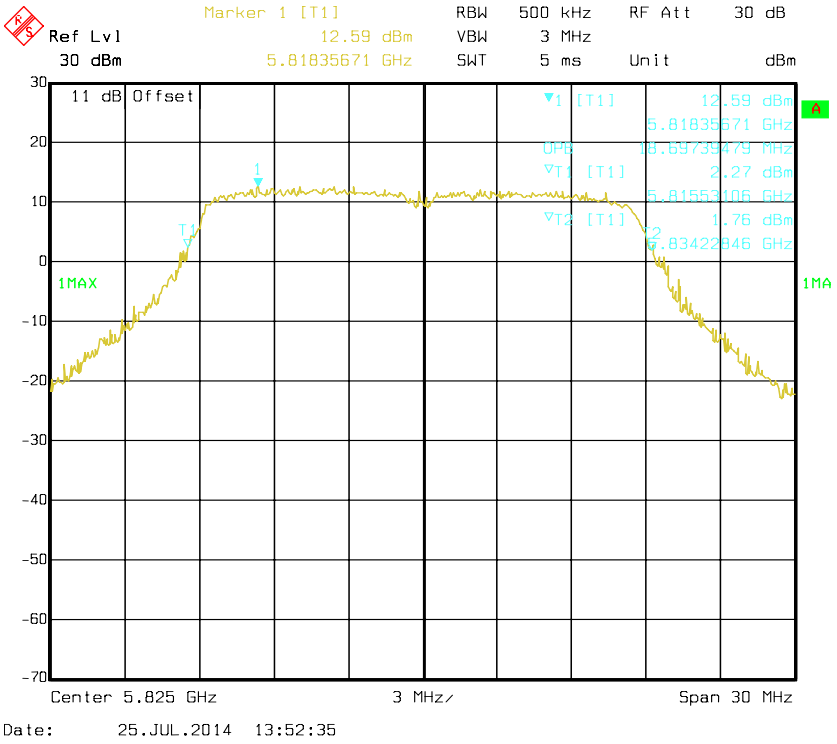
802.11n HT20 mode, Antenna 1: OBW Bandwidth-5785 MHz



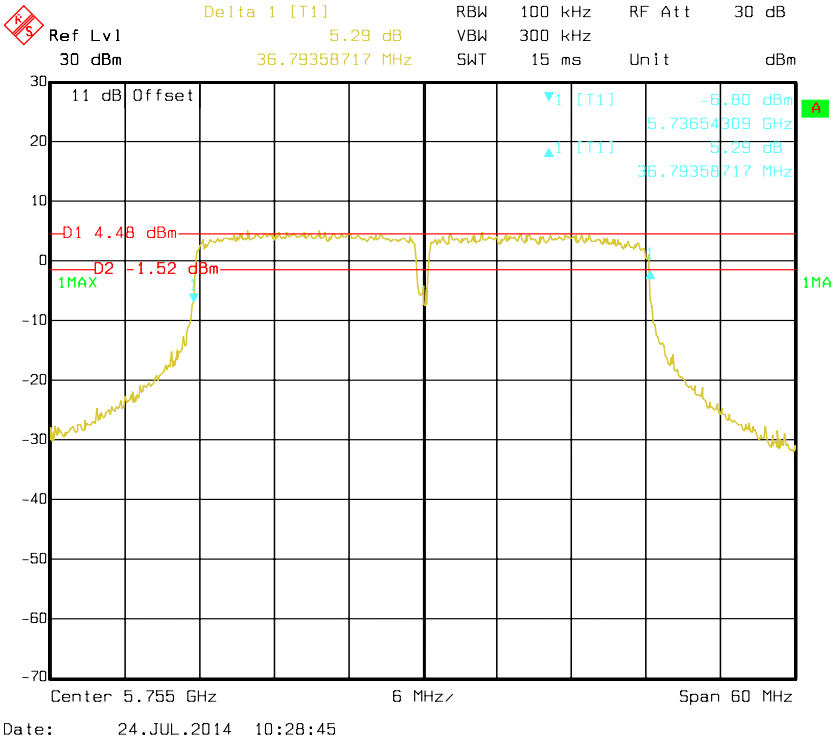
802.11n HT20 mode, Antenna 1: 6 dB Bandwidth-5825 MHz



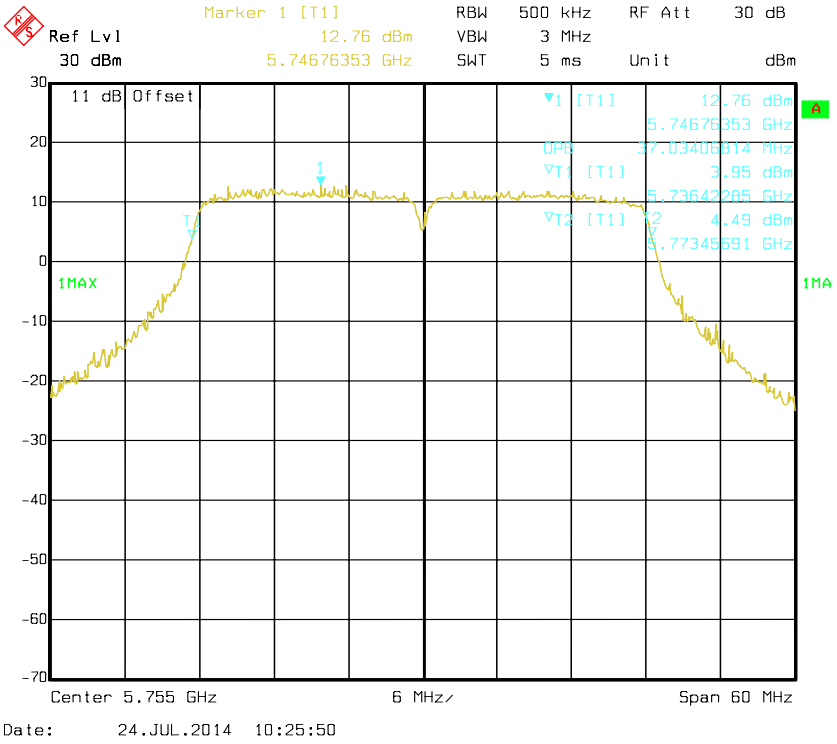
802.11n HT20 mode, Antenna 1: OBW Bandwidth-5825 MHz



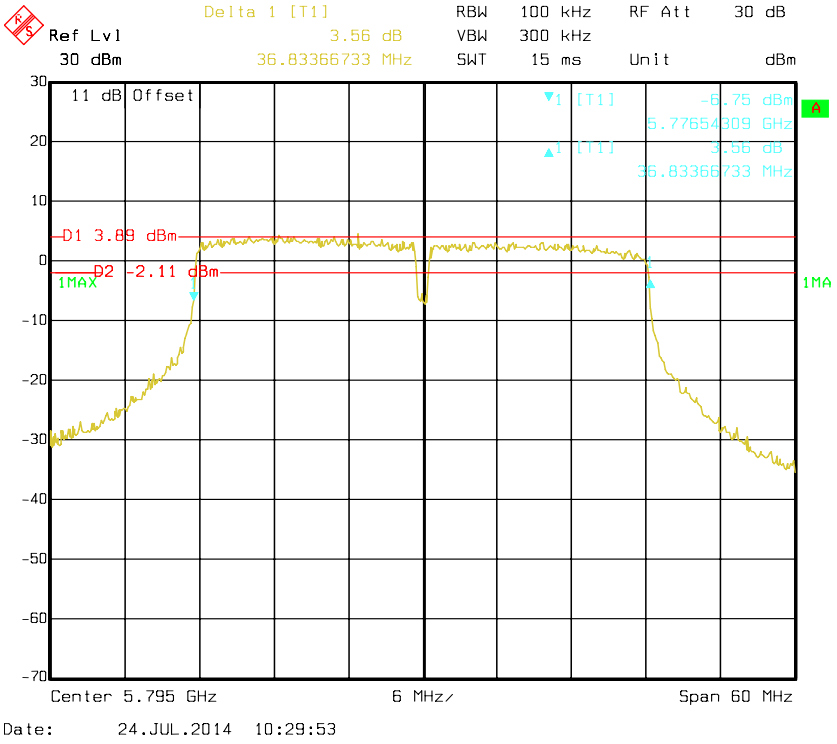
802.11n HT40 mode, Antenna 1: 6 dB Bandwidth-5755 MHz



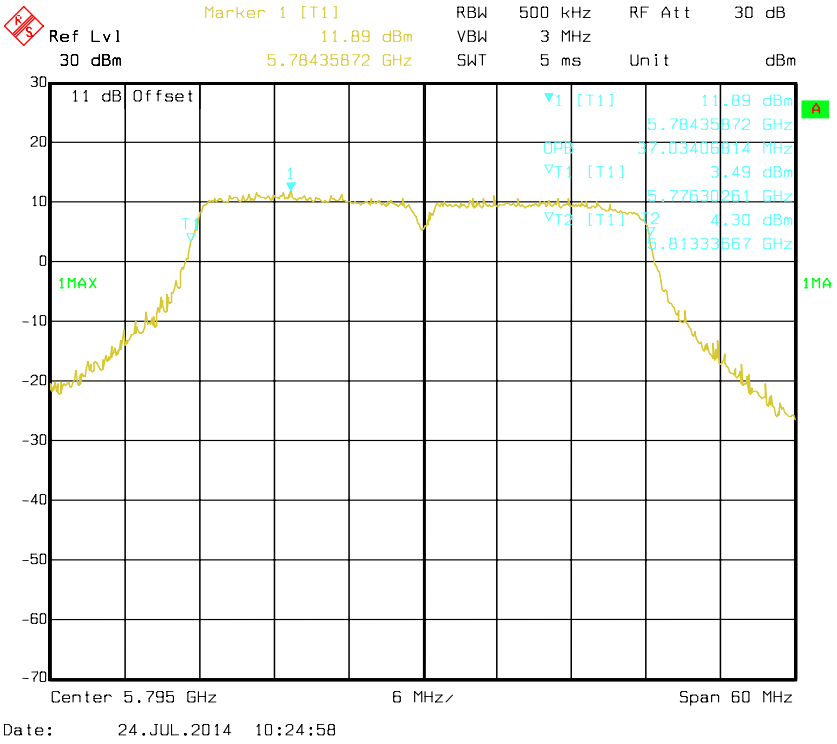
802.11n HT40 mode, Antenna 1: OBW Bandwidth-5755 MHz



802.11n HT40 mode, Antenna 1: 6 dB Bandwidth-5795 MHz



802.11n HT40 mode, Antenna 1: OBW Bandwidth-5795 MHz



FCC §15.407(a) (3)– CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

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	Spectrum Analyzer	FSEM30	100018	2013-10-17	2014-10-16

*** Statement of Traceability:** BACL (Chengdu) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01, clause II.E 2 b)

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set 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 span to encompass the entire emission bandwidth (EBW) of the signal. Set RBW = 1 MHz.Set VBW ≥ 3 MHz. Use sample detector mode Use a video trigger with the trigger level set to enable triggering only on full power pulses.Transmitter must operate at full control power for entire sweep of every sweep.If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”. Trace average 100 traces in power averaging mode.Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.
4. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

Temperature:	28 °C, 28 °C & 24 °C
Relative Humidity:	46 %, 45 % & 57 %
ATM Pressure:	100.5 kPa,100.4 kPa & 100.7 kPa

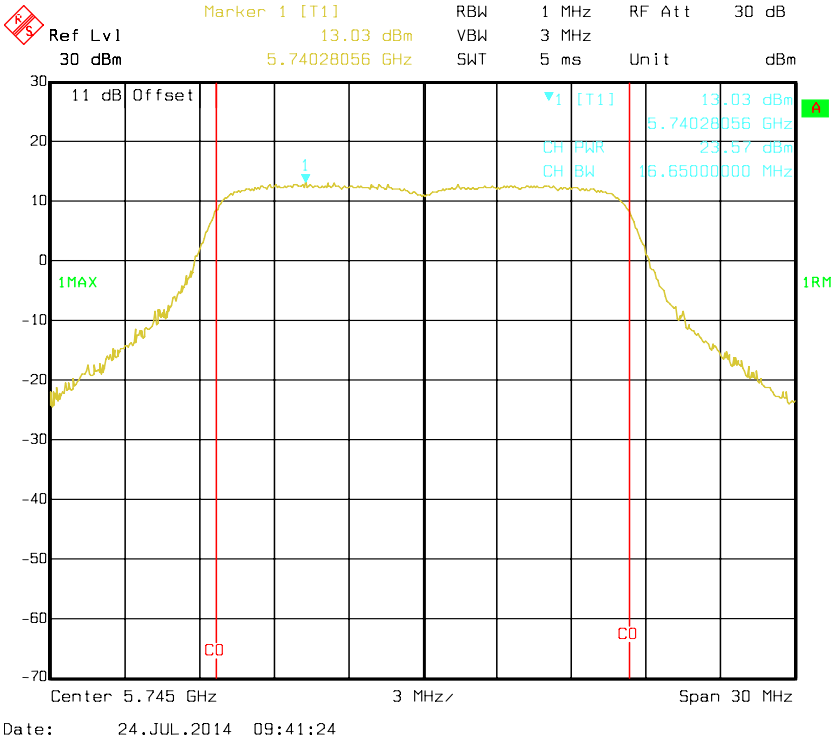
The testing was performed by Fidel Zhou on 2014-07-23, 2014-07-24 & 2014-07-25.

Test Mode: Transmitting

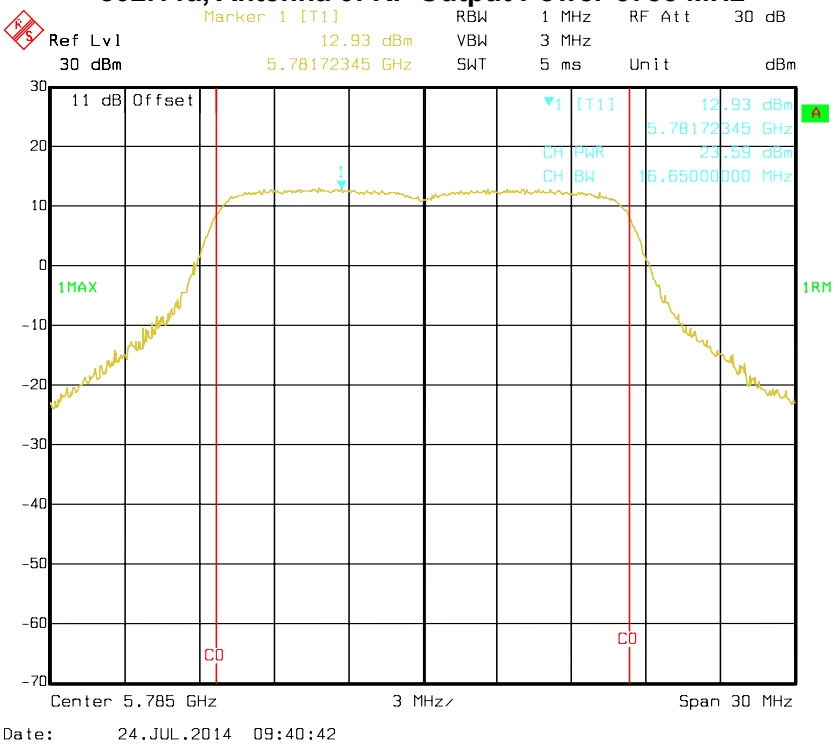
Mode	Frequency (MHz)	Output Power (dBm)			Limit (dBm)
		Antenna 0	Antenna 1	Antenna 0 + Antenna 1	
802.11a	5745	23.57	23.51	/	30
	5785	23.59	24.00	/	30
	5825	24.09	23.79	/	30
802.11n HT20	5745	20.86	20.65	23.77	30
	5785	21.40	20.69	24.07	30
	5825	21.03	20.24	23.66	30
802.11n HT40	5755	20.76	20.34	23.57	30
	5795	21.05	20.31	23.71	30

Note: Duty cycle is more than 98%.

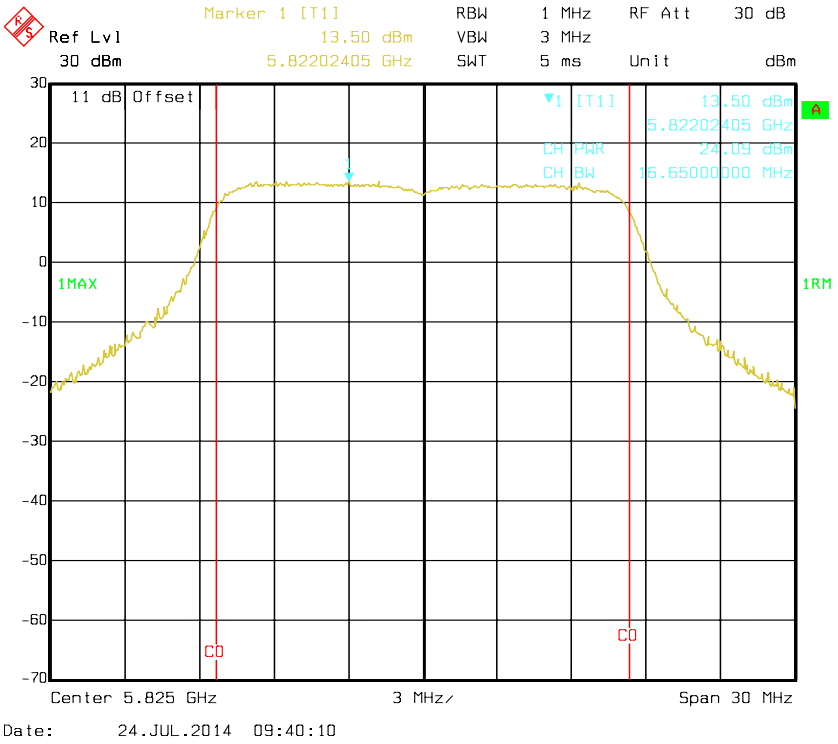
802.11a, Antenna 0: RF Output Power-5745 MHz



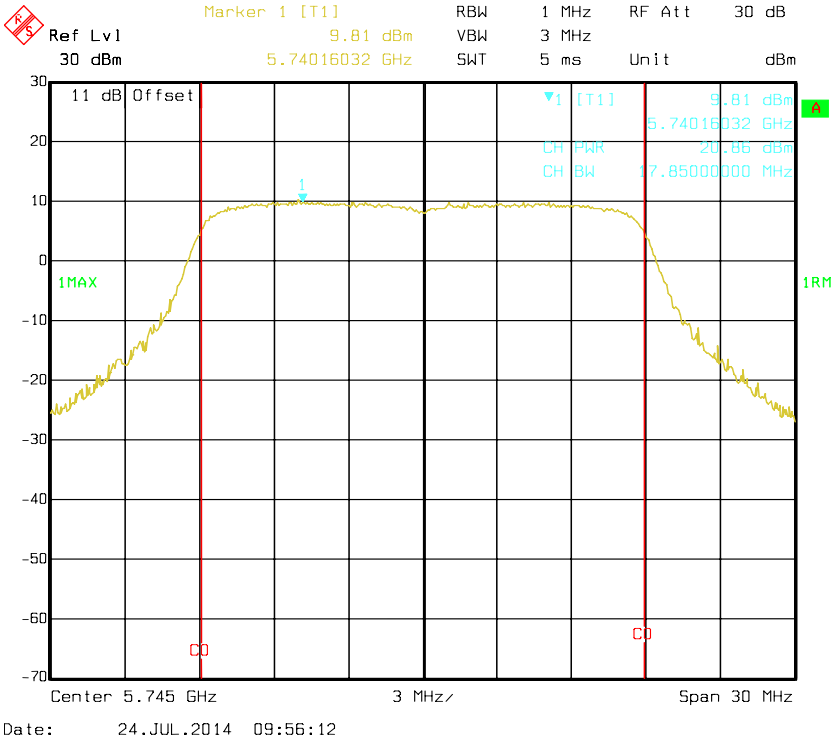
802.11a, Antenna 0: RF Output Power-5785 MHz



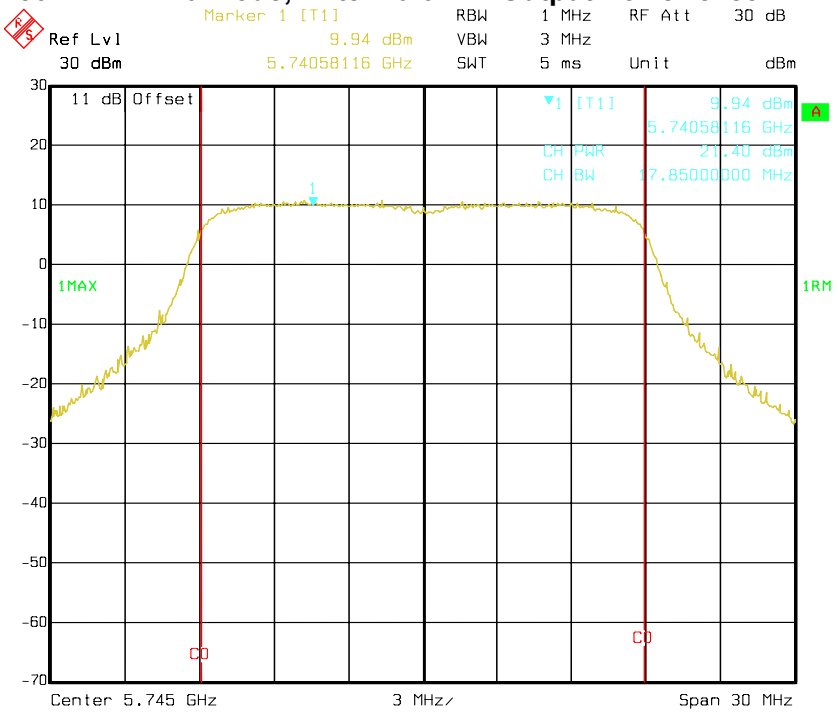
802.11a, Antenna 0: RF Output Power-5825 MHz



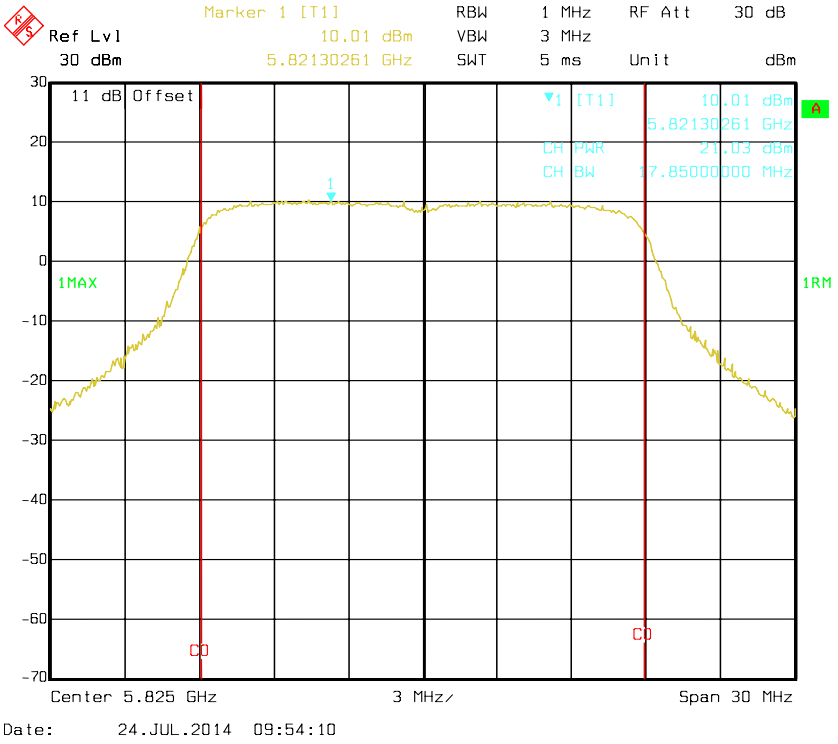
802.11n HT20 mode, Antenna 0: RF Output Power-5745 MHz



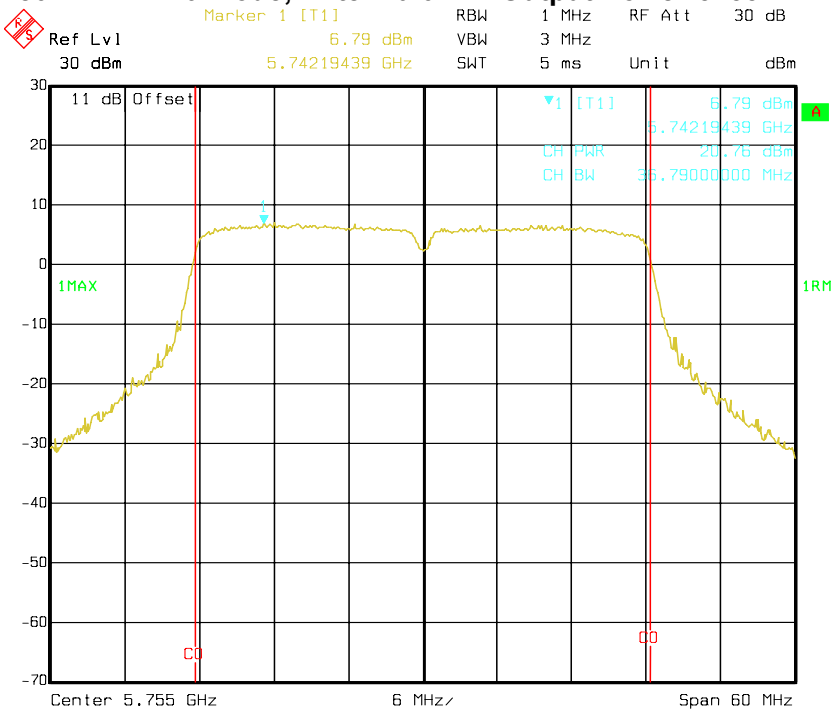
802.11n HT20 mode, Antenna 0: RF Output Power-5785 MHz



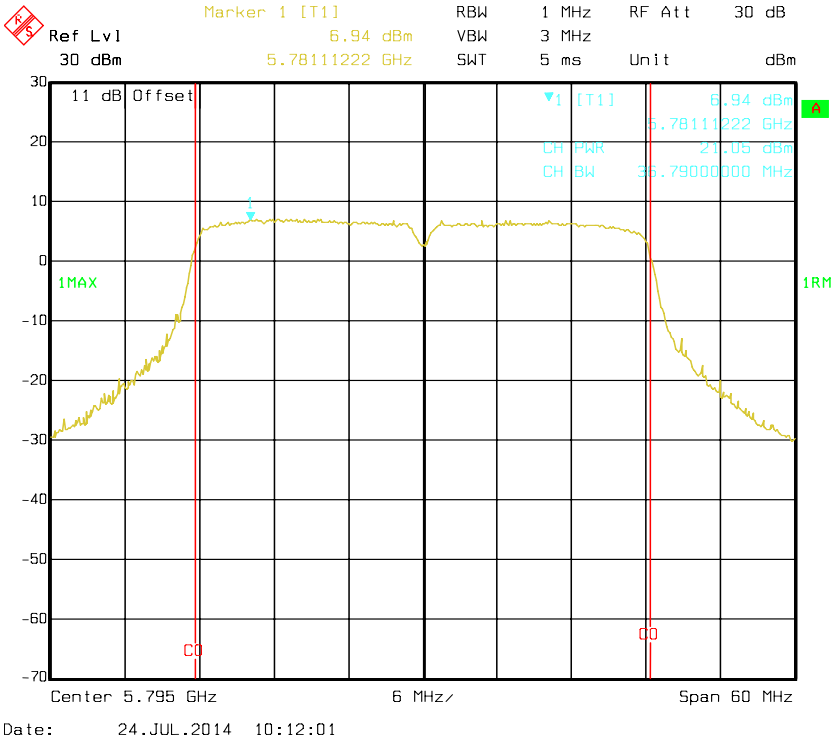
802.11n HT20 mode, Antenna 0: RF Output Power-5825 MHz



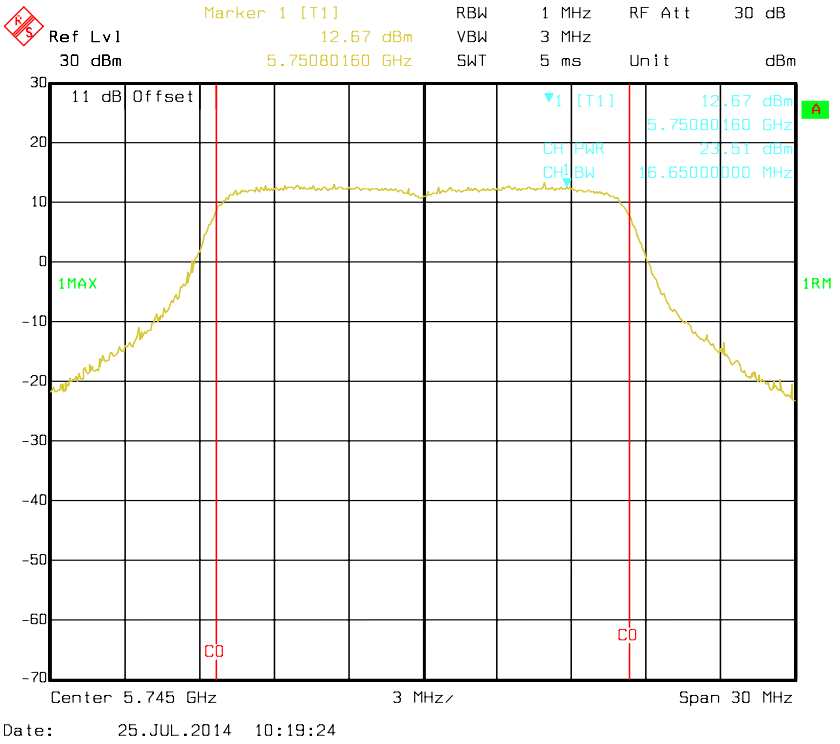
802.11n HT40 mode, Antenna 0: RF Output Power-5755 MHz



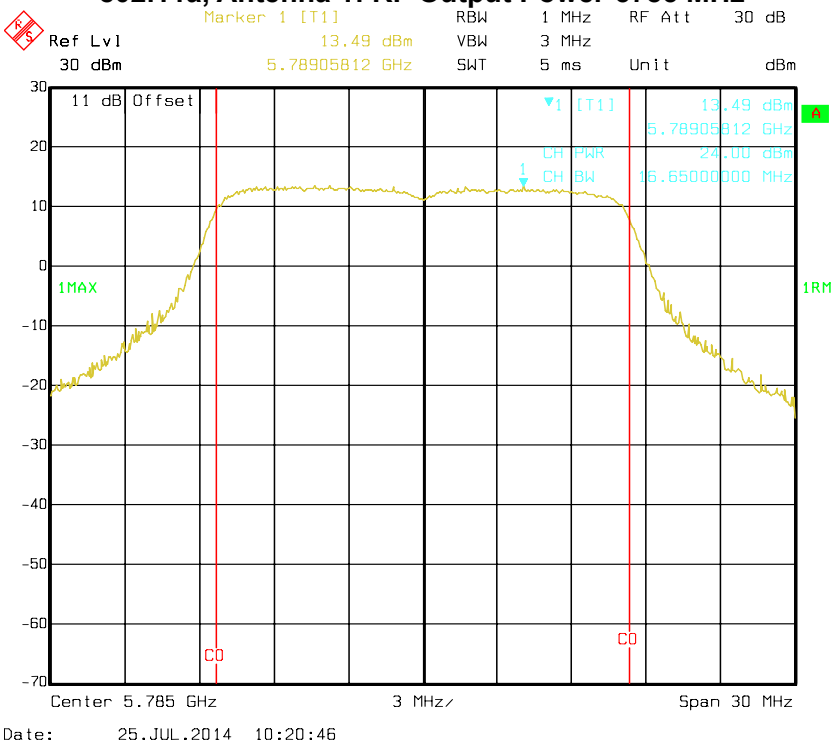
802.11n HT40 mode, Antenna 0: RF Output Power-5795 MHz



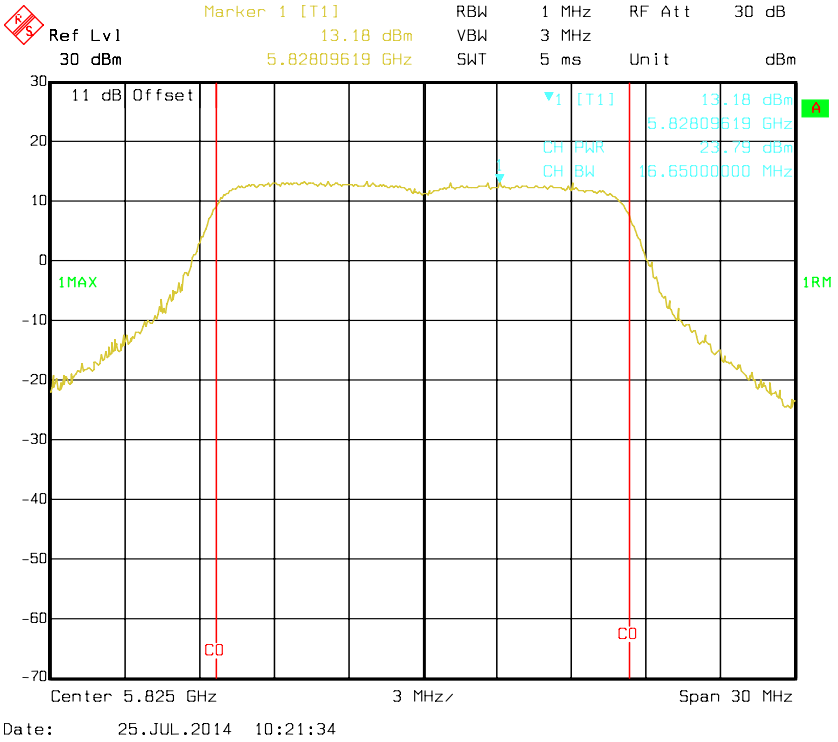
802.11a, Antenna 1: RF Output Power-5745 MHz



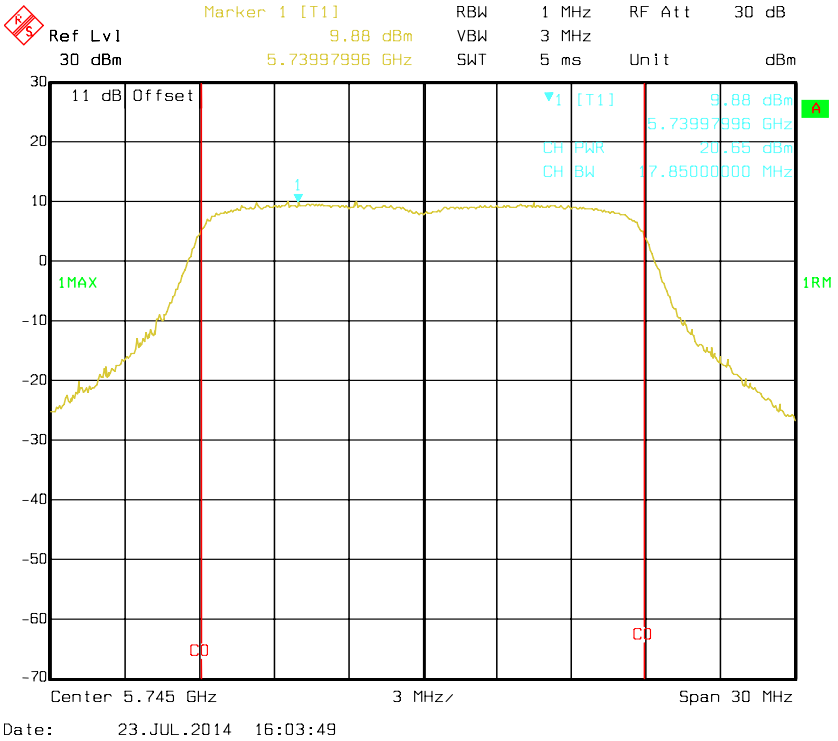
802.11a, Antenna 1: RF Output Power-5785 MHz



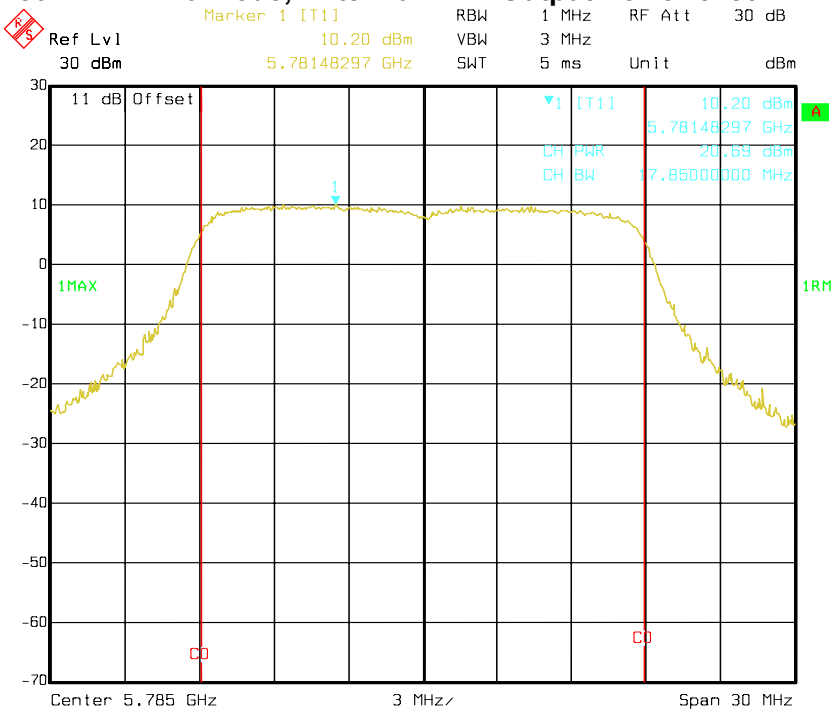
802.11a, Antenna 1: RF Output Power-5825 MHz



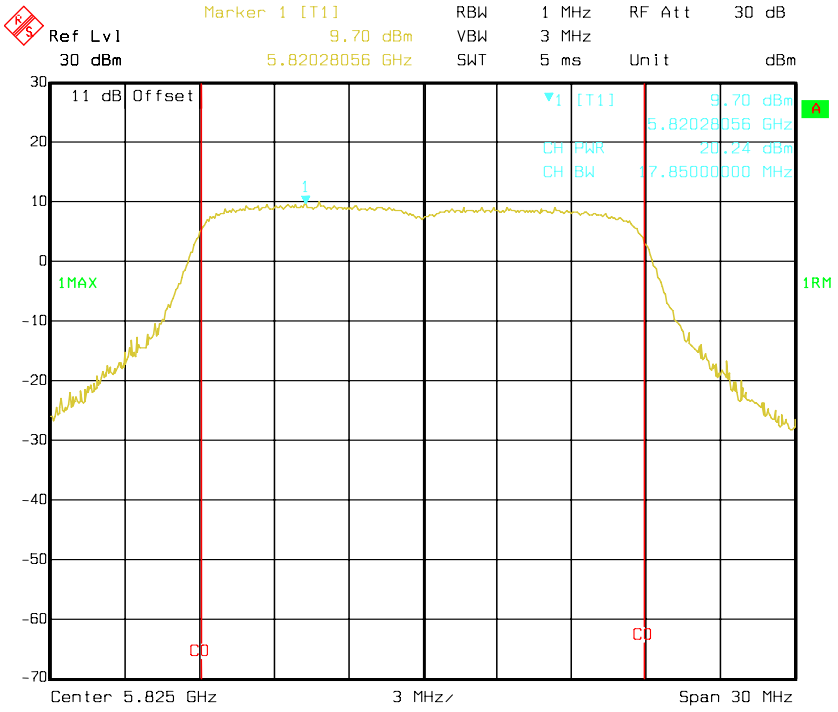
802.11n HT20 mode, Antenna 1: RF Output Power-5745 MHz



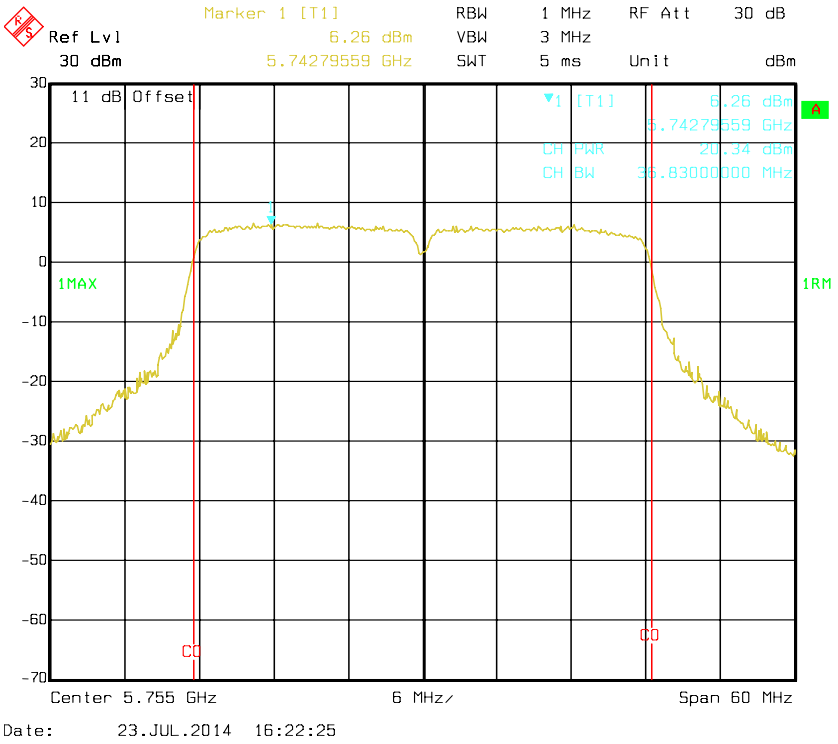
802.11n HT20 mode, Antenna 1: RF Output Power-5785 MHz



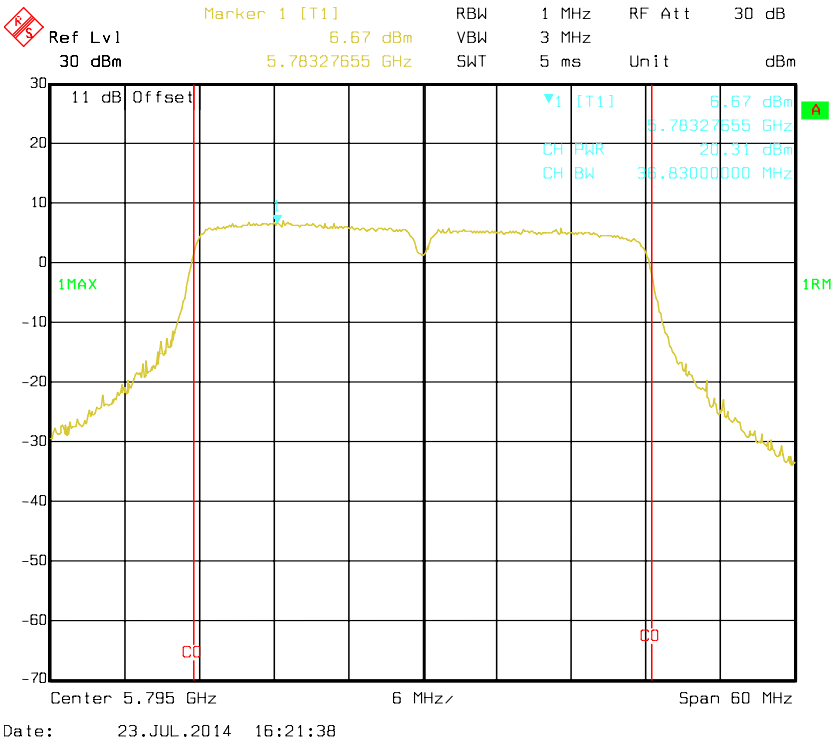
802.11n HT20 mode, Antenna 1: RF Output Power-5825 MHz



802.11n HT40 mode, Antenna 1: RF Output Power-5755 MHz



802.11n HT40 mode, Antenna 1: RF Output Power-5795 MHz



FCC §15.407(a) (3) (5) - POWER SPECTRAL DENSITY

Applicable Standard

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.

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.

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01, clause II.F 3

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set 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. Use sample detector and power averaging (not video averaging) mode. Set RBW= 500kMHz. The PPSD is the highest level found across the emission in any 1-MHz band after 100 sweeps of averaging. This method is permitted only if the transmission pulse or sequence of pulses remains at maximum transmits power throughout each of the 100 sweeps of averaging and that the interval between pulses is not included in any of the sweeps.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2013-10-17	2014-10-16

*** Statement of Traceability:** BACL (Chengdu) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	28 °C, 28 °C & 29 °C
Relative Humidity:	47 %, 45 % & 50 %
ATM Pressure:	100.5 kPa, 100.4 kPa & 100.7 kPa

The testing was performed by Fidel Zhou on 2014-07-23, 2014-07-24 & 2014-07-25.

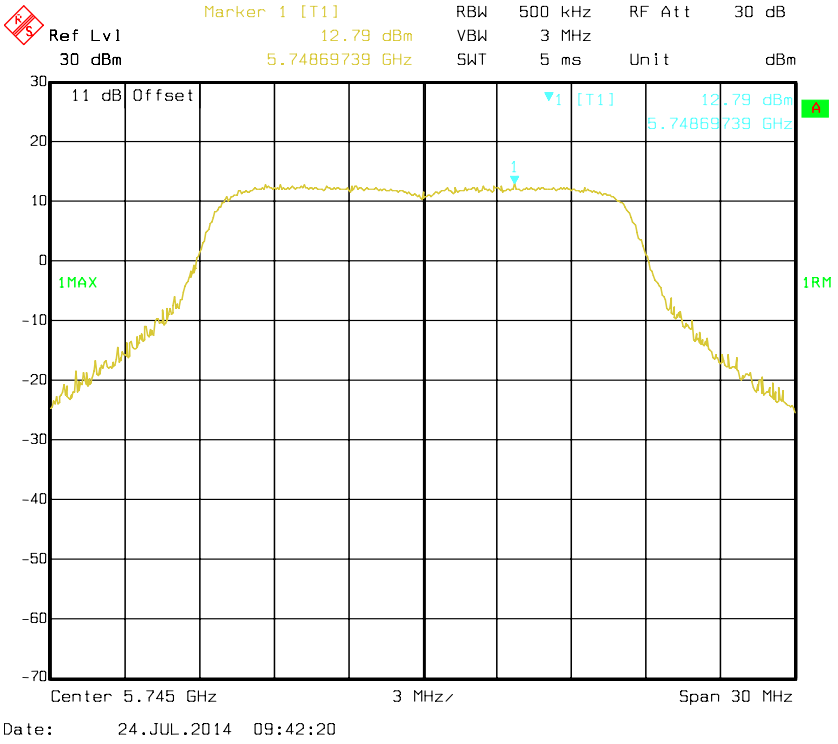
Test Mode: Transmitting

Test Result: Pass

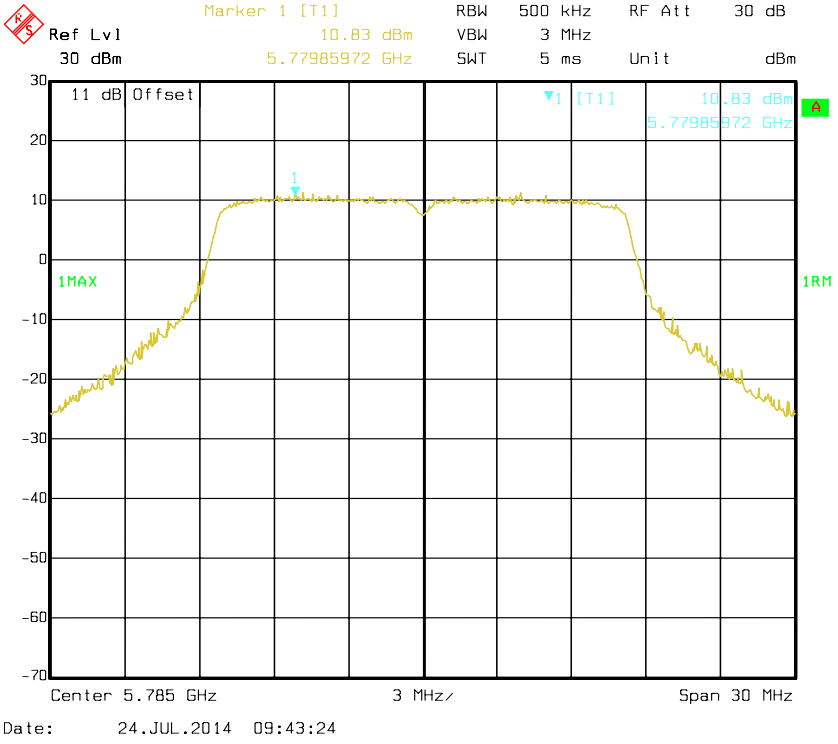
Mode	Frequency (MHz)	Power Spectral Density (dBm/500kHz)			Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 0 + Antenna 1		
802.11a	5745	12.79	11.19	/	30	Pass
	5785	10.83	11.19	/	30	Pass
	5825	11.26	9.34	/	30	Pass
802.11n HT20	5745	9.78	7.37	11.75	30	Pass
	5785	7.92	7.70	10.82	30	Pass
	5825	8.38	7.58	11.01	30	Pass
802.11n HT40	5755	4.67	4.37	7.53	30	Pass
	5795	4.60	4.85	7.74	30	Pass

Note: Duty cycle is more than 98%.

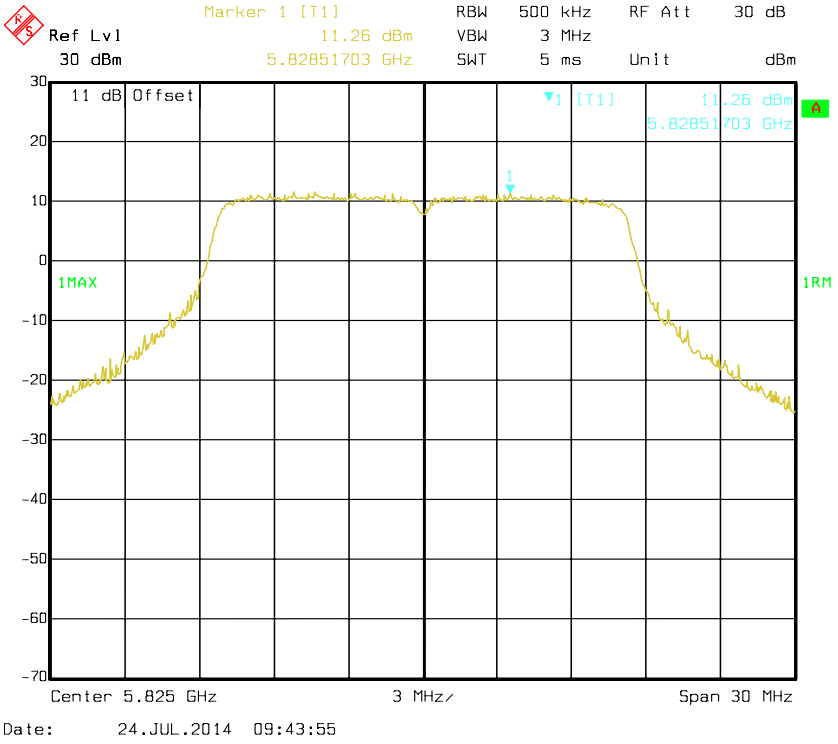
802.11a mode, Antenna 0: Power Spectral Density-5745 MHz



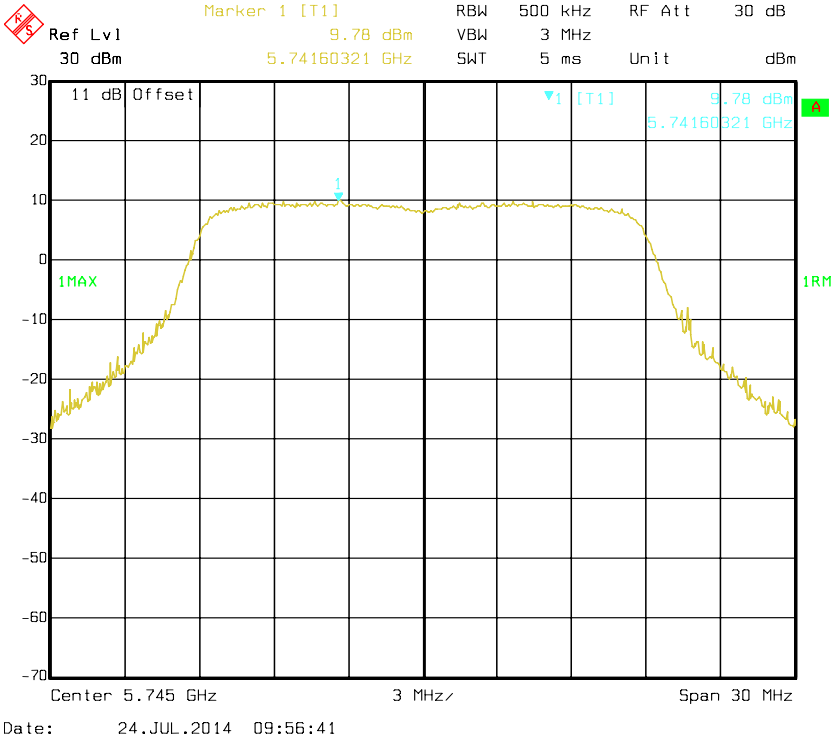
802.11a mode, Antenna 0: Power Spectral Density-5785 MHz



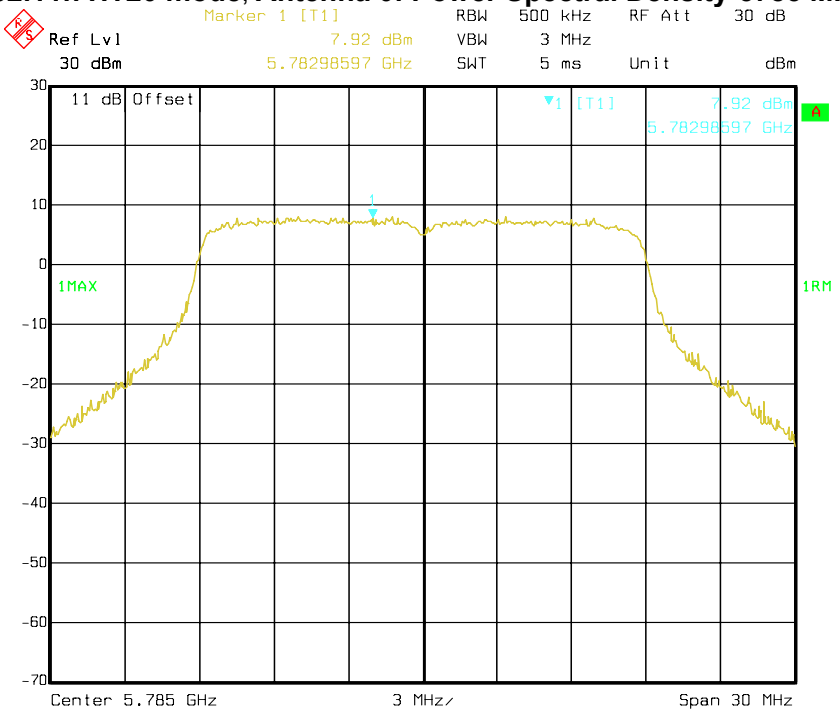
802.11a mode, Antenna 0: Power Spectral Density-5825 MHz



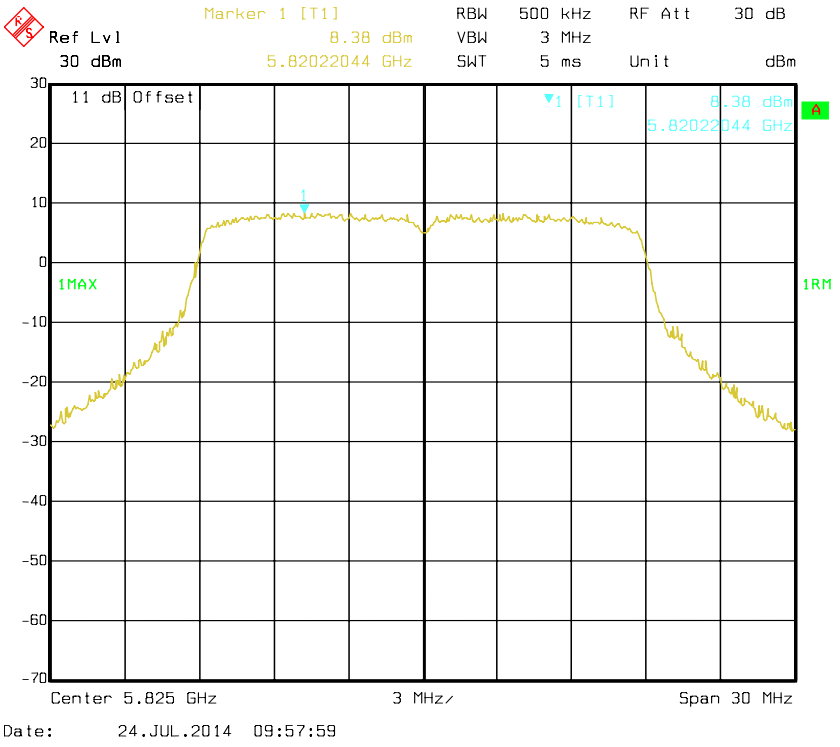
802.11n HT20 mode, Antenna 0: Power Spectral Density-5745 MHz



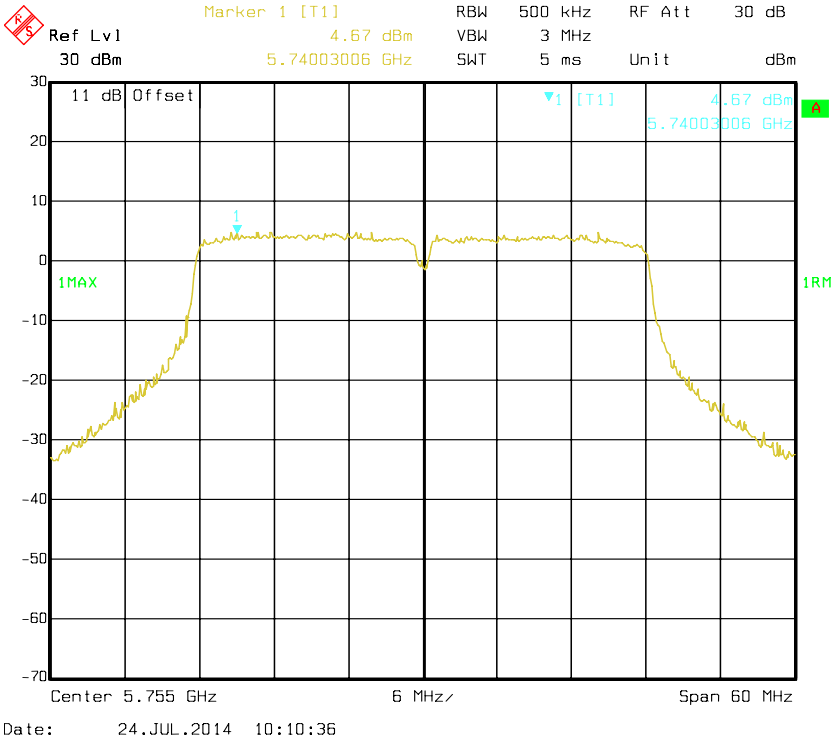
802.11n HT20 mode, Antenna 0: Power Spectral Density-5785 MHz



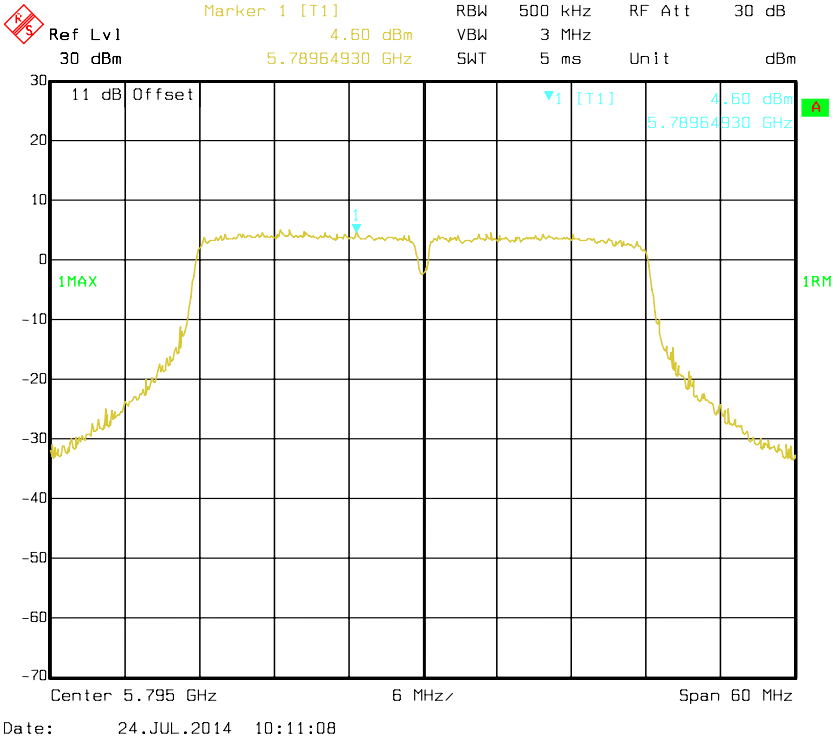
802.11n HT20 mode, Antenna 0: Power Spectral Density-5825 MHz



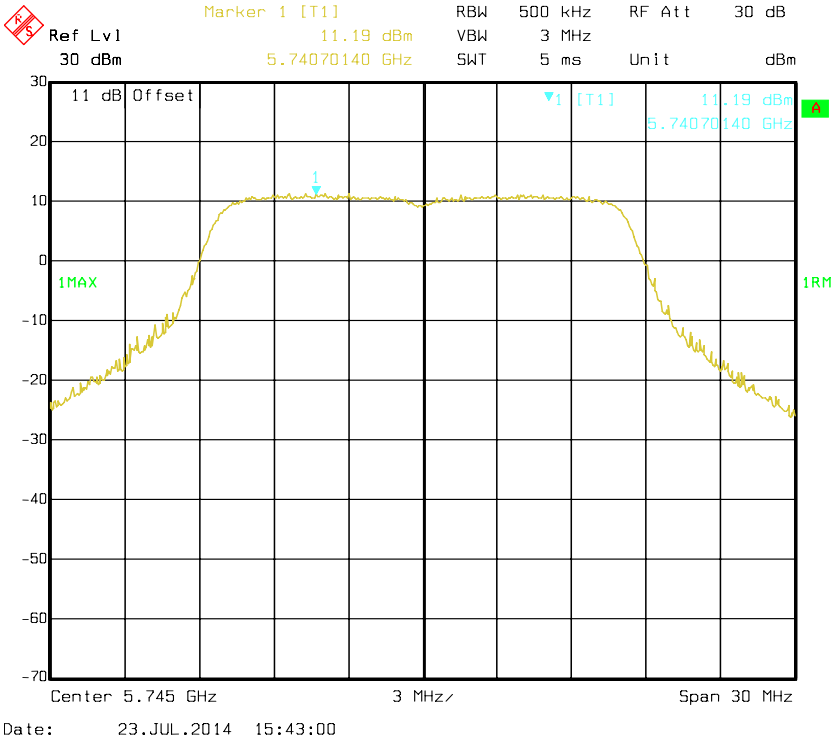
802.11n HT40 mode, Antenna 0: Power Spectral Density-5755 MHz



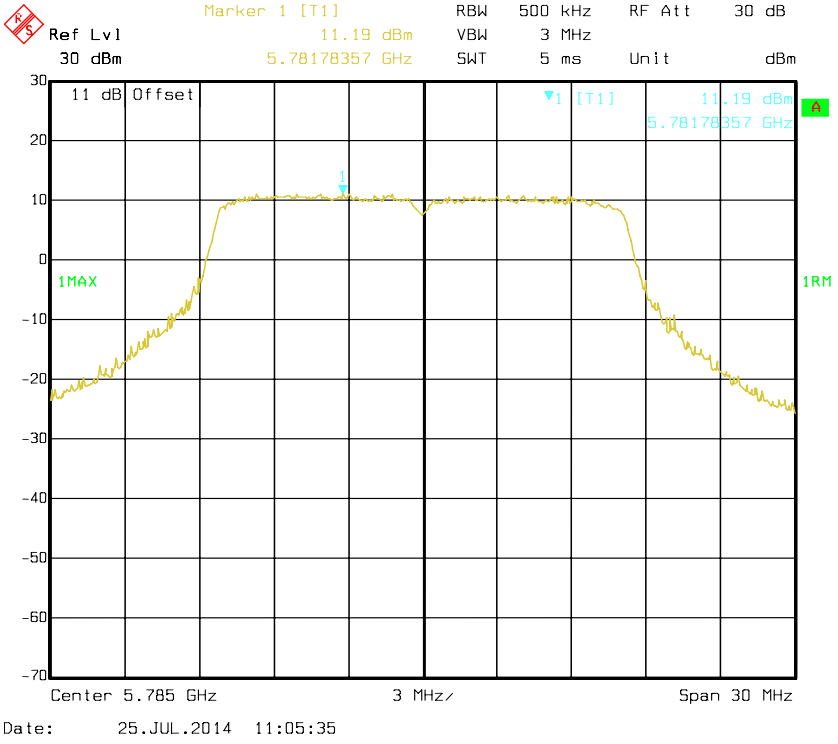
802.11n HT40 mode, Antenna 0: Power Spectral Density-5795 MHz



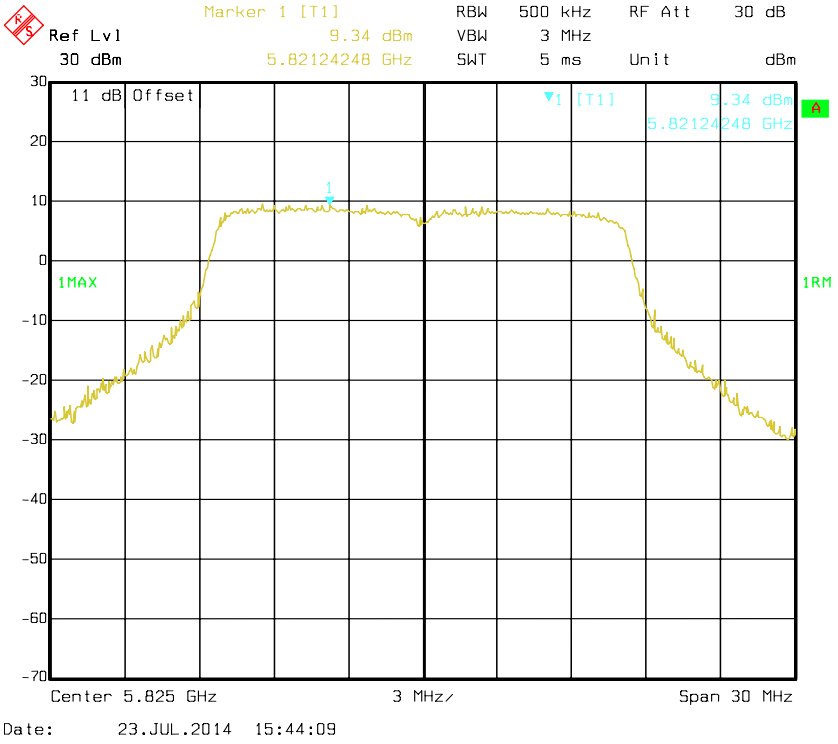
802.11a mode, Antenna 1: Power Spectral Density-5745 MHz



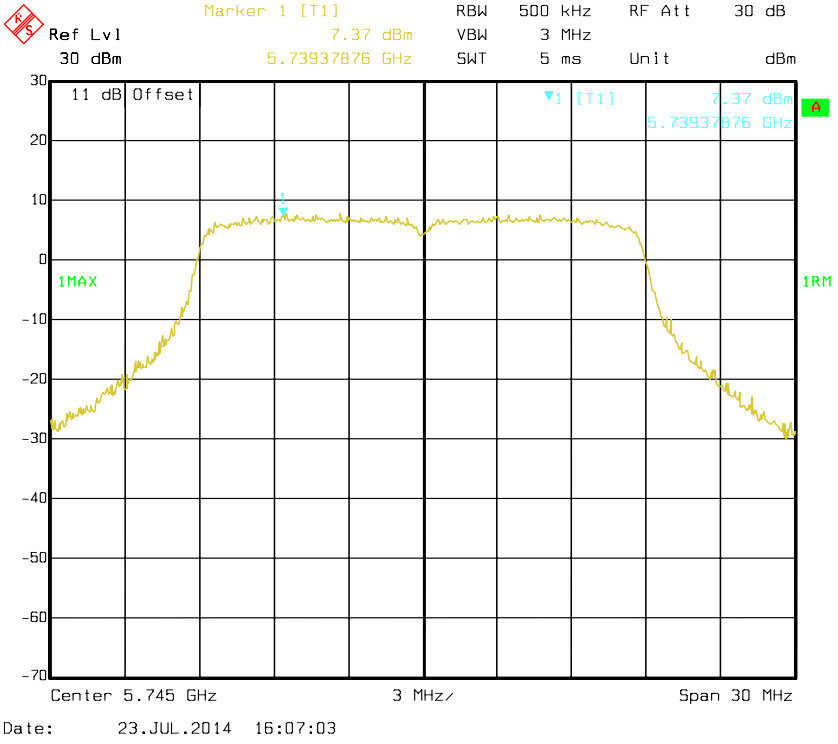
802.11a mode, Antenna 1: Power Spectral Density-5785 MHz



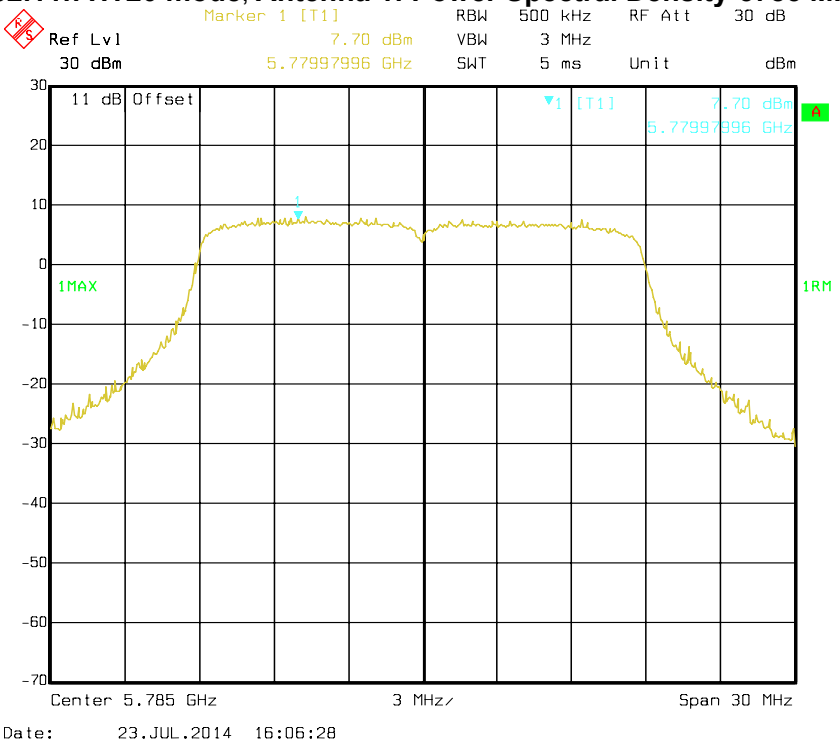
802.11a mode, Antenna 1: Power Spectral Density-5825 MHz



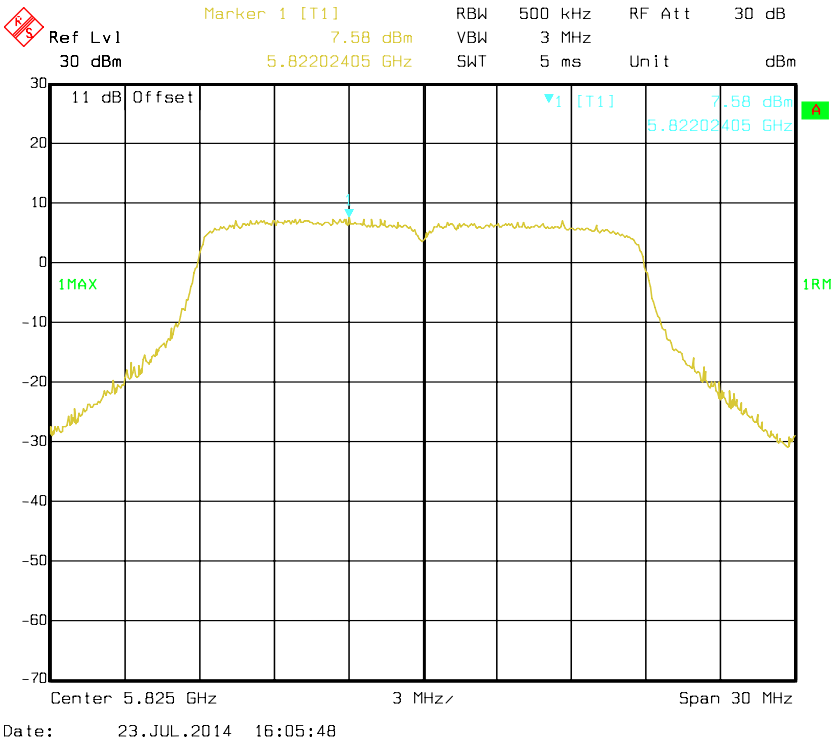
802.11n HT20 mode, Antenna 1: Power Spectral Density-5745 MHz



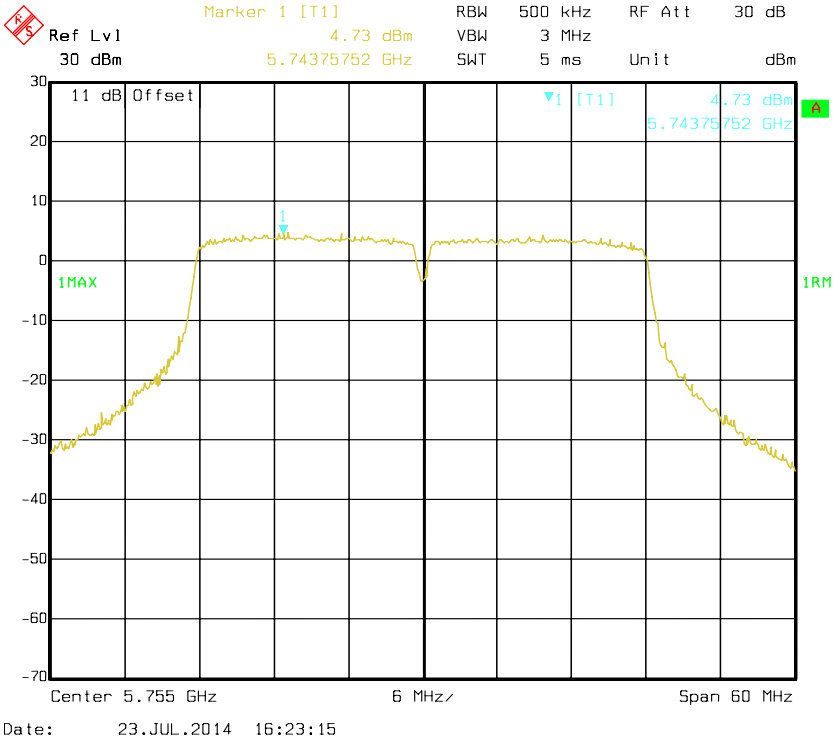
802.11n HT20 mode, Antenna 1: Power Spectral Density-5785 MHz



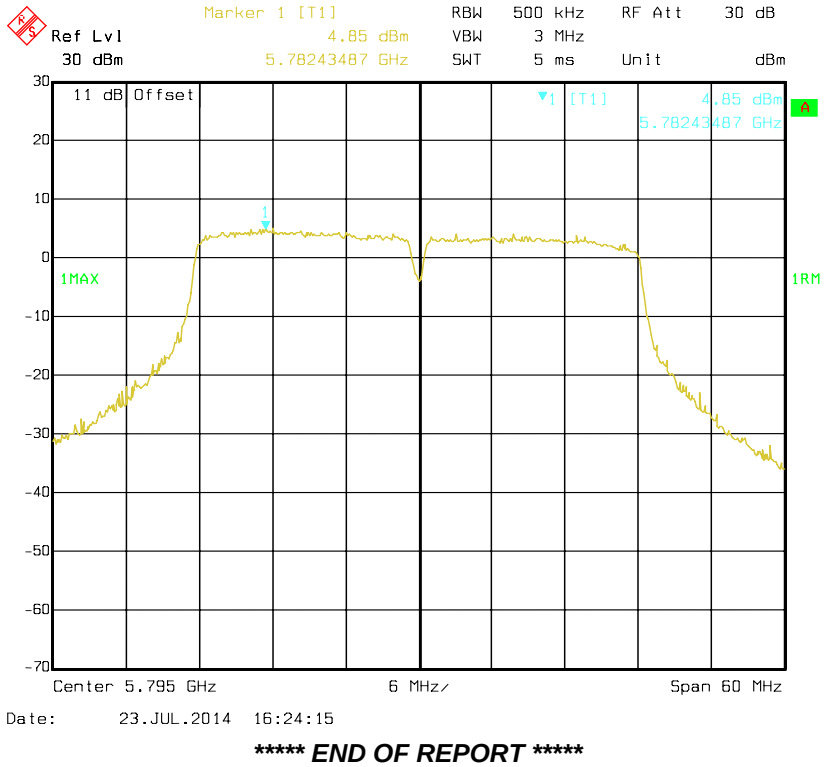
802.11n HT20 mode, Antenna 1: Power Spectral Density-5825 MHz



802.11n HT40 mode, Antenna 1: Power Spectral Density-5755 MHz



802.11n HT40 mode, Antenna 1: Power Spectral Density-5795 MHz



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