FCC 47 CFR PART15 SUBPART E

Test Report

For

Prepared by

Product Name: Touchstone Wireless Telephony Gateway

Brand Name: ARRIS

Model No.: TG1682G

Series Model: N/A

FCC ID: UIDTG1682-2

Test Report Number:

C140925R01-RPB

Issued for

ARRIS Group, Inc.

3871 Lakefield Drive Suite 300 Suwanee, GA 30024, U.S.A

Issued by

Compliance Certification Services Inc.

Kun shan Laboratory

**No.10 Weiye Rd., Innovation park, Eco&Tec,
Development Zone, Kunshan City, Jiangsu, China**

TEL: 86-512-57355888

FAX: 86-512-57370818

ACCREDITED
TESTING CERT #2541.01

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1 TEST RESULT CERTIFICATION

Product Name:	Touchstone Wireless Telephony Gateway
Trade Name:	ARRIS
Model Name.:	TG1682G
Series Model:	N/A
Applicant Discrepancy:	Initial
Device Category:	Mobile Device
Date of Test:	October 10, 2014 ~ October 29, 2014
Applicant:	**ARRIS Group, Inc.** 3871 Lakefield Drive Suite 300 Suwanee, GA 30024, U.S.A
Manufacturer:	**ARRIS Group, Inc.** 3871 Lakefield Drive Suite 300 Suwanee, GA 30024, U.S.A
Application Type:	Certification

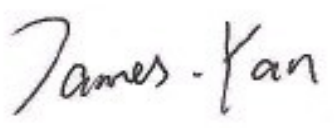
APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart E	No non-compliance noted

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.407and KDB 789033 – 20140606.
The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Jeff.Fang
RF Manager
Compliance Certification Service Inc.

Tested by:



James.Yan
Test Engineer
Compliance Certification Service Inc.

2 EUT DESCRIPTION

Product Name:	Touchstone Wireless Telephony Gateway
Brand Name:	ARRIS
Model Name:	TG1682G
Series Model:	N/A
Model Discrepancy:	N/A
Power Adapter Power Rating :	Input: AC ~115V 60Hz 0.7A
Frequency Range :	5725MHz-5850MHz
Transmit Power :	802.11a mode: 25.64 dBm 802.11an Standard-20 MHz Channel mode: 25.62 dBm 802.11an Wide-40 MHz Channel mode: 25.41 dBm 802.11ac Wide-20 MHz Channel mode: 25.59 dBm 802.11ac Wide-40 MHz Channel mode: 25.37 dBm 802.11ac Wide-80 MHz Channel mode: 25.17 dBm
Modulation Technique :	802.11a mode: OFDM (6,9,12,18,24,36,48 and 54 Mbps) 802.11an Standard-20 MHz Channel mode: OFDM (6.5,13,19.5,26,39,52,58.5 and 65 Mbps) 802.11an Wide-40 MHz Channel mode: OFDM (13.5,27,40.5,54,81,108,121.5 and 135 Mbps) 802.11ac Standard-20 MHz Channel mode: OFDM(MCS0,MCS1,MCS2,MCS3,MCS4,MCS5,MCS6,MCS7,MCS8 and MCS9) 802.11ac Wide-40 MHz Channel mode: OFDM(MCS0,MCS1,MCS2,MCS3,MCS4,MCS5,MCS6,MCS7,MCS8and MCS9) 802.11ac Wide-80 MHz Channel mode: OFDM(MCS0,MCS1,MCS2,MCS3,MCS4,MCS5,MCS6,MCS7,MCS8 and MCS9)
Number of Channels :	IEEE 802.11a mode: 5 Channels draft 802.11an 20MHz/ac 20MHz mode: 5 Channels draft 802.11an 40MHz/ac 40MHz mode: 3 Channels draft 802.11ac Wide-80 MHz Channel mode: 1 Channel
Antenna Specification:	Dipole antennas for 2.4GHz Gain 3.20 dBi and Dipole antennas for 5 GHz Gain 5.20 dBi
	Dipole antennas for 2.4GHz Gain 5.40 dBi and Dipole antennas for 5 GHz Gain 3.50 dBi

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for **FCC ID: UIDTG1682-2** filing to comply with FCC Part 15, Subpart E Rules.

3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 2009 and FCC CFR 47 15.207, 15.209 and 15.407.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

3.2 EUT EXERCISE

The EUT is operated in the engineering mode to fix the Tx frequency for the purposes of measurement.

According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.3 of ANSI C63.4, the conducted emission from the EUT is measured in the frequency range between 0.15 MHz and 30MHz, using the CISPR Quasi-Peak detector mode.

Radiated Emissions

The EUT is placed on the turntable, which is 0.8 m above the ground plane. The turntable is then rotated for 360 degrees to determine the proper orientation for the maximum emission level. The EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission level. And, each emission is to be maximized by changing the horizontal and vertical polarization of the receiving antenna. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.4 of ANSI C63.4.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.50 - 5.15
0.495 - 0.505 [1]	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960.0 - 1240	7.25 - 7.75
4.125 - 4.128	25.50 - 25.67	1300 - 1427	8.025 - 8.500
4.17725 - 4.17775	37.50 - 38.25	1435.0 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73.00 - 74.60	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.80 - 75.20	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108.00 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.90 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 – 2500.0	17.7 - 21.4
8.37625 - 8.38675	156.70 - 156.90	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.1700	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.20	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358.0	36.43 - 36.5[2]
12.57675 - 12.57725	322.0- 335.4	3600 - 4400	
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5 DESCRIPTION OF TEST MODES

Description	Modulation Technology	Modulation Type
26dB Bandwidth and 99% Bandwidth	OFDM	BPSK
Maximum conducted output power	OFDM	BPSK
Band edges measurement	OFDM	BPSK
Peak Power Spectral Density	OFDM	BPSK
Peak excursion	OFDM	BPSK
Radiated undesirable emission	OFDM	BPSK
Conducted undesirable emission	OFDM	BPSK
Powerline conducted emission	OFDM	BPSK

The EUT transmitting and receiving with three antennas simultaneously working at a/an/ac mode, so 3x3 configuration was used for all testing in this report.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

IEEE 802.11a mode:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 54Mbps data rate were chosen for full testing.

draft 802.11an Standard-20 MHz Channel mode:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 65Mbps data rate were chosen for full testing.

draft 802.11an Wide-40 MHz Channel mode:

Channel Low (5755MHz)and Channel Mid (5795MHz) with 135Mbps data rate were chosen for full testing.

draft 802.11ac Standard-20 MHz Channel mode:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with MCS9 data rate were chosen for full testing.

draft 802.11ac Wide-40 MHz Channel mode:

Channel Low (5755MHz)and Channel Mid (5795MHz) with MCS9 data rate were chosen for full testing.

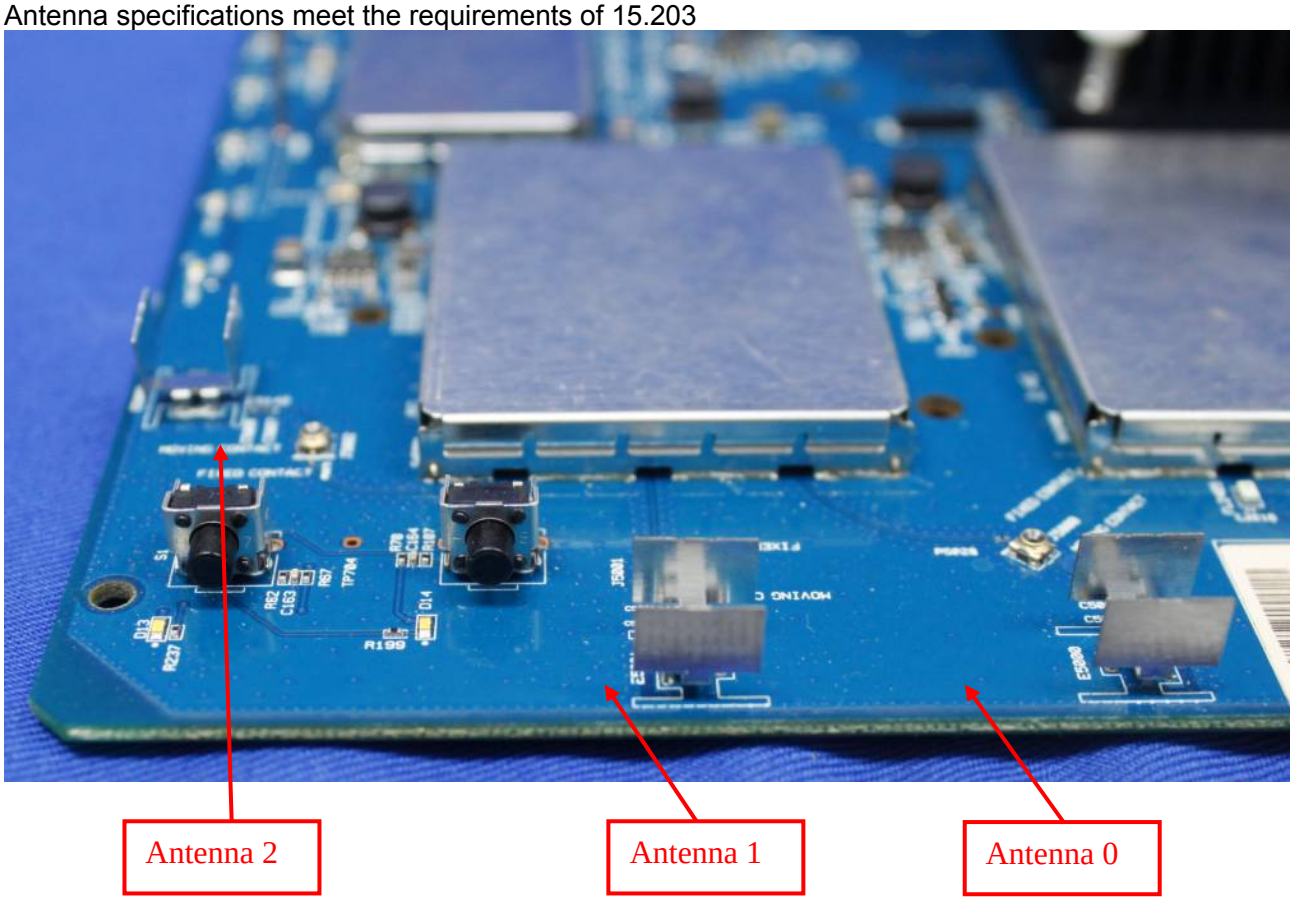
draft 802.11ac Wide-80 MHz Channel mode:

Channel (5775MHz) with MCS9 data rate were chosen for full testing.

Note: After the preliminary san the EUT 5G antenna with 5.20 dBi gain was the worst mode, which mode data was recorded.

3.6 ANTENNA DESCRIPTION

Antenna specifications meet the requirements of 15.203



4 INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.1 MEASUREMENT EQUIPMENT USED

Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	2015-4-9
Spectrum Analyzer	RS	FSU26	200789	2015-8-11
Detector negative	Agilent	8473B	MY42240176	2015-5-11
OSCILLOSCOPE	Agilent	DSO6104A	MY44002585	2015-3-16
Peak and Avg Power Sensor	Agilent	E9327A	US40441788	2015-3-17
MIMO Power Measurement Test Set	Aglient	U2021XA	MY53120005	2015-7-3
EPM-P Series Power Meter	Agilent	E4416A	GB41292714	2015-3-17
Power SPLITTER	Mini-Circuits	ZN2PD-9G	SF078500430	N.C.R
DC POWER SUPPLY	GW instek	GPS-3303C	E903131	N.C.R
Temp. / Humidity Chamber	Kingson	THS-M1	242	2015-1-22

977 Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	2015-4-9
EMI Test Receiver	R&S	ESCI	101378	2015-1-22
Pre-Amplfier	MINI	ZFL-1000VH2	d041703	2015-1-22
Pre-Amplfier	Miteq	JS41-00101800-32-10P	1675713	2015-1-22
Bilog Antenna	Sunol	JB1	A062604	2015-3-6
Horn-antenna	SCHWARZBECK	BBHA9120D	D:266	2015-3-7
Turn Table	CT	CT123	4165	N.C.R
Antenna Tower	CT	CTERG23	3256	N.C.R
Controller	CT	CT1OO	95637	N.C.R
Test Software	EZ-EMC			

Conducted Emission				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI TEST RECEIVER	R&S	ESCI	100781	2015-3-16
V (V-LISN)	SCHWARZBECK	NNLK 8129	8129-143	N.C.R
LISN (EUT)	FCC	FCC-LISN-50/250-50-2-02	05012	2015-3-16
Pulse LIMITER	R&S	ESH3-Z2	100524	2015-9-24
Test Software	EZ-EMC			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

4.2 MEASUREMENT UNCERTAINTY

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028-1 [2] and shall correspond to an expansion factor (coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 6 is based on such expansion factors.

Table 6: Maximum measurement uncertainty

Parameter	UNCERTAINTY
Radio frequency	±0.8 × 10-7
RF power, conducted	0.2054
Maximum frequency deviation: -within 300 Hz and 6 kHz of audio frequency	1.3%
-within 6 kHz and 25 kHz of audio frequency	0.65 dB
Adjacent channel power	0.2054
Conducted spurious emission of transmitter, valid up to 6 GHz	0.2892
Conducted emission of receivers	+1.2/-1.1 dB
Radiated emission of transmitter, valid up to 6 GHz	±3.94 dB
Radiated emission of receiver, valid up to 6 GHz	±3.94 dB
RF level uncertainty for a given BER	±0.3 dB
Temperature	0.1979
Humidity	±1 %

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at
☒ **No.10Weiye Rd., Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.**
The sites are constructed in conformance with the requirements of ANSI C63.4:2003 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
China	CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Japan	VCCI
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsrf.com.

6 SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Equipment	Model No.	Serial No.
1	Notebook	dell	E5430

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2.Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

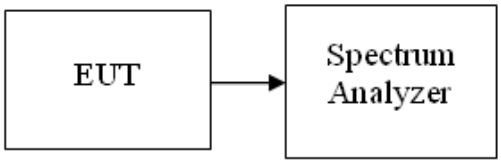
7 FCC PART 15 REQUIREMENTS

7.1 6 DB BANDWIDTH MEASUREMENT

LIMIT

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW =100KHz, VBW≥ 3RBW, Detector = Peak. Trace mode = max hold.
4. Measure the maximum width of the emission that is 6 dB down from the peak of the emission..
5. Measure and record the results in the test report

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode/chain 0

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	16.373	0.5
Mid	5785	16.332	0.5
High	5825	16.356	0.5

Test mode: IEEE 802.11a mode/chain 1

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	16.384	0.5
Mid	5785	16.362	0.5
High	5825	16.353	0.5

Test mode: IEEE 802.11a mode/chain 2

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	16.353	0.5
Mid	5785	16.348	0.5
High	5825	16.346	0.5

Test mode: draft 802.11n Standard-20 MHz Channel mode / Chain 0

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.597	0.5
Mid	5785	17.620	0.5
High	5825	17.595	0.5

Test mode: draft 802.11n Standard-20 MHz Channel mode / Chain 1

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.560	0.5
Mid	5785	17.581	0.5
High	5825	17.577	0.5

Test mode: draft 802.11n Standard-20 MHz Channel mode / Chain 2

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.580	0.5
Mid	5785	17.599	0.5
High	5825	17.584	0.5

Test mode: draft 802.11n Wide-40 MHz Channel mode / Chain 0

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	35.937	0.5
High	5795	36.097	0.5

Test mode: draft 802.11n Wide-40 MHz Channel mode / Chain 1

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	35.761	0.5
High	5795	35.962	0.5

Test mode: draft 802.11n Wide-40 MHz Channel mode / Chain 2

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	35.370	0.5
High	5795	36.075	0.5

Test mode: draft 802.11ac Standard-20 MHz Channel mode / Chain 0

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.582	0.5
Mid	5785	17.327	0.5
High	5825	17.633	0.5

Test mode: draft 802.11ac Standard-20 MHz Channel mode / Chain 1

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.559	0.5
Mid	5785	17.340	0.5
High	5825	17.580	0.5

Test mode: draft 802.11ac Standard-20 MHz Channel mode / Chain 2

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.291	0.5
Mid	5785	17.577	0.5
High	5825	17.606	0.5

Test mode: draft 802.11ac Wide-40 MHz Channel mode / Chain 0

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	35.938	0.5
High	5795	35.740	0.5

Test mode: draft 802.11ac Wide-40 MHz Channel mode / Chain 1

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	36.319	0.5
High	5795	36.100	0.5

Test mode: draft 802.11ac Wide-40 MHz Channel mode / Chain 2

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	35.708	0.5
High	5795	35.959	0.5

Test mode: draft 802.11ac Wide-80 MHz Channel mode / Chain 0

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5775	71.984	0.5

Test mode: draft 802.11ac Wide-80 MHz Channel mode / Chain 1

5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5775	73.146	0.5

Test mode: draft 802.11ac Wide-80 MHz Channel mode / Chain 2

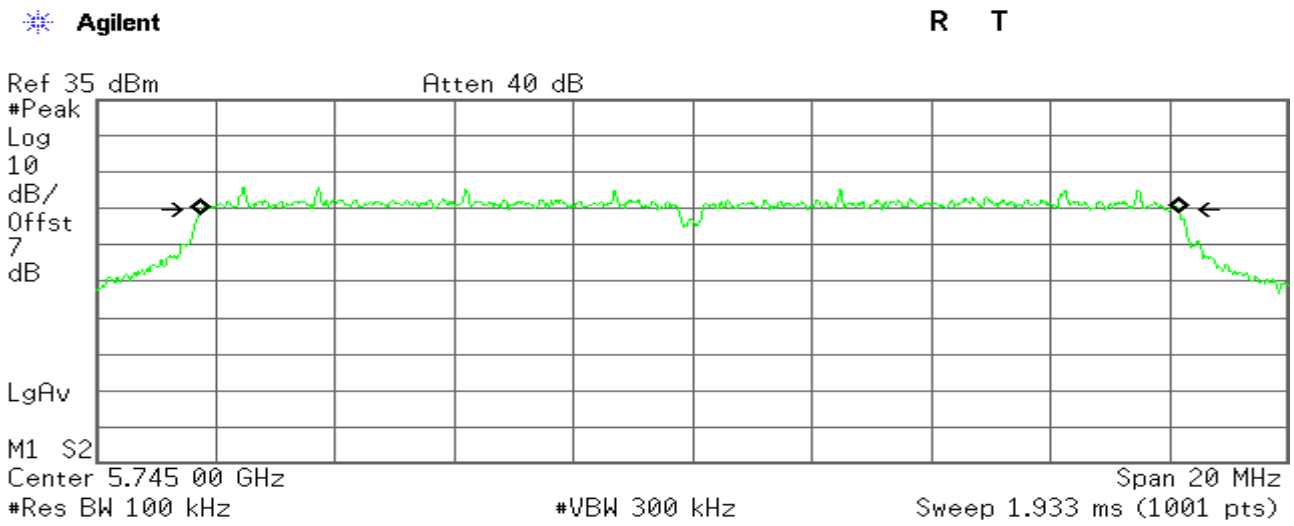
5745~5850MHz

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5775	70.700	0.5

Test Plot

IEEE 802.11a mode /Chain 0

6dB Bandwidth (CH Low)

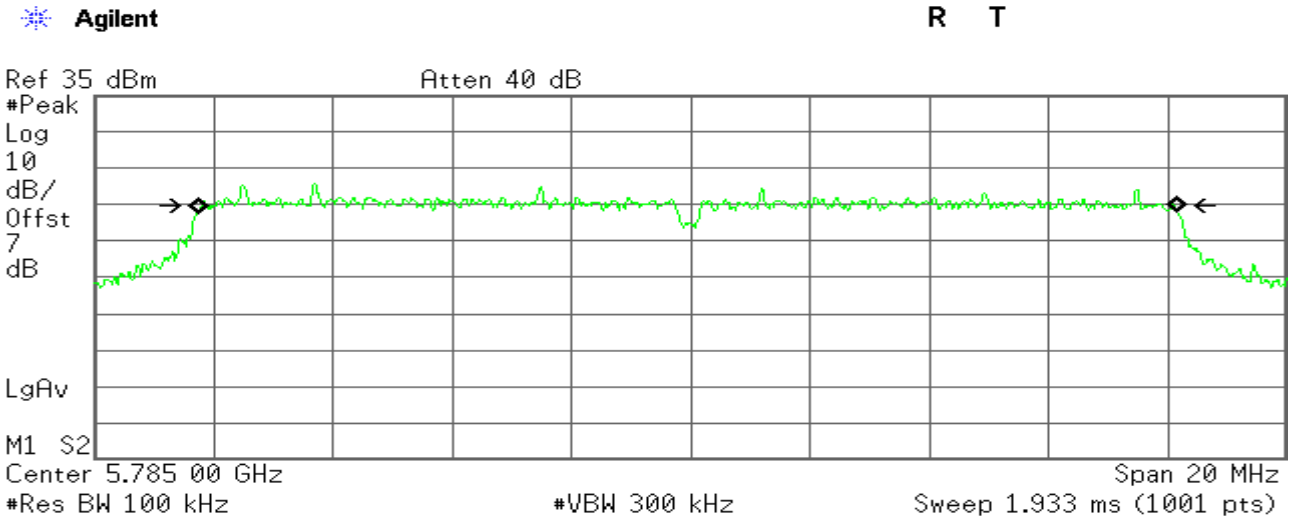


Occupied Bandwidth
16.4152 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -45.223 kHz
x dB Bandwidth 16.373 MHz

6dB Bandwidth (CH Mid)

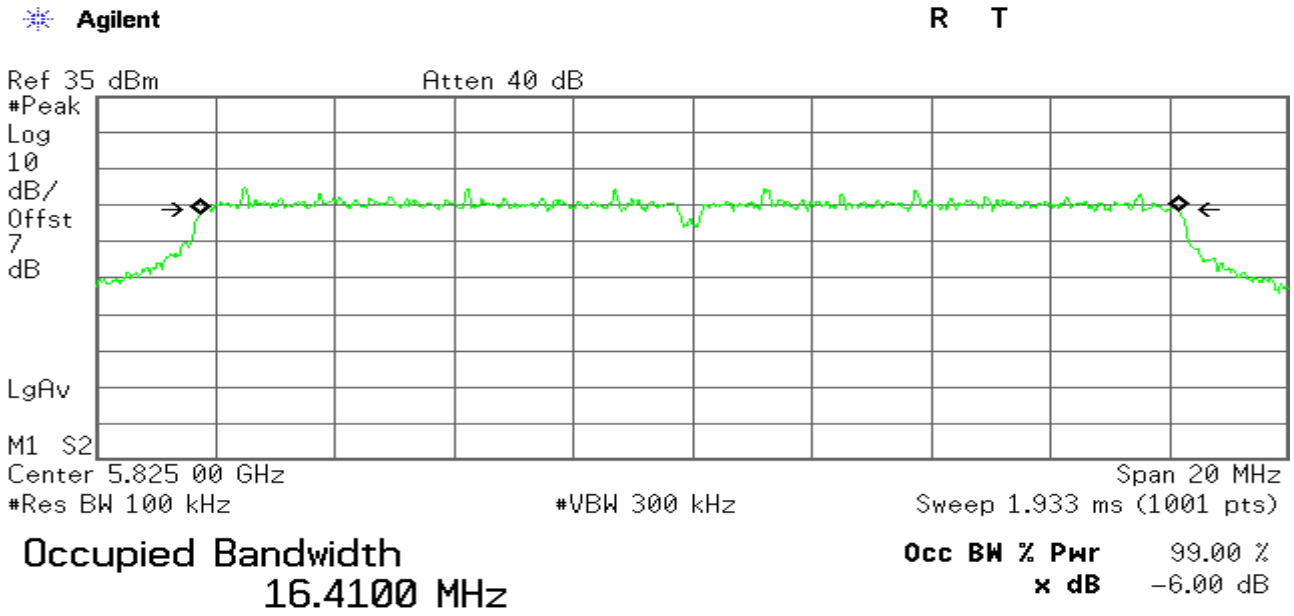


Occupied Bandwidth
16.4134 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

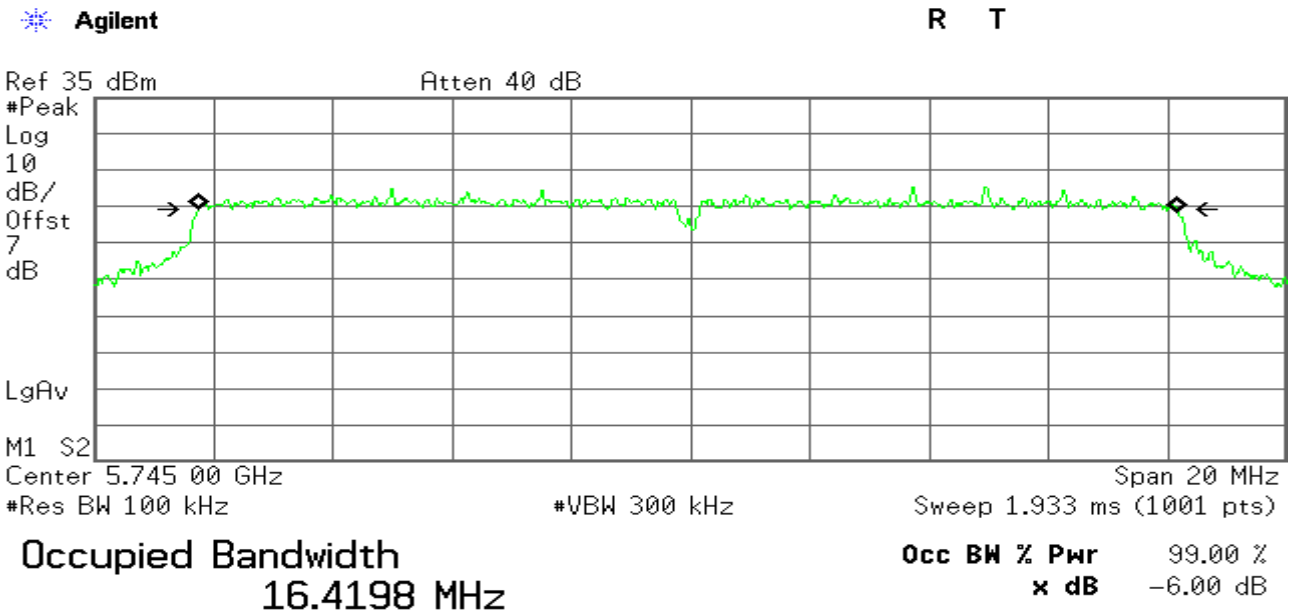
Transmit Freq Error -53.467 kHz
x dB Bandwidth 16.332 MHz

6dB Bandwidth (CH High)

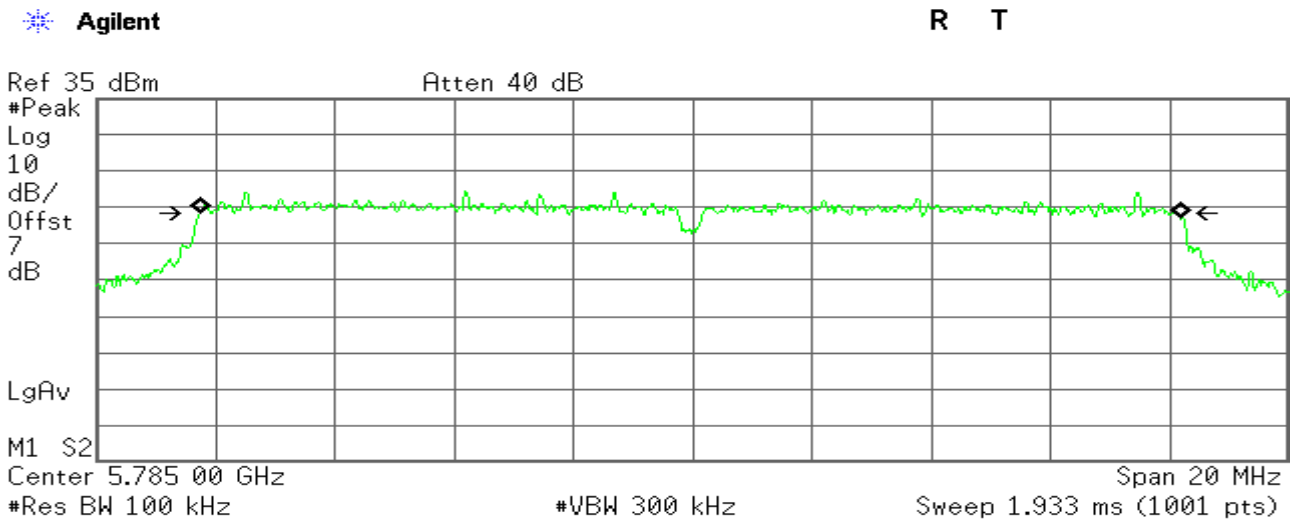


IEEE 802.11a mode /Chain 1

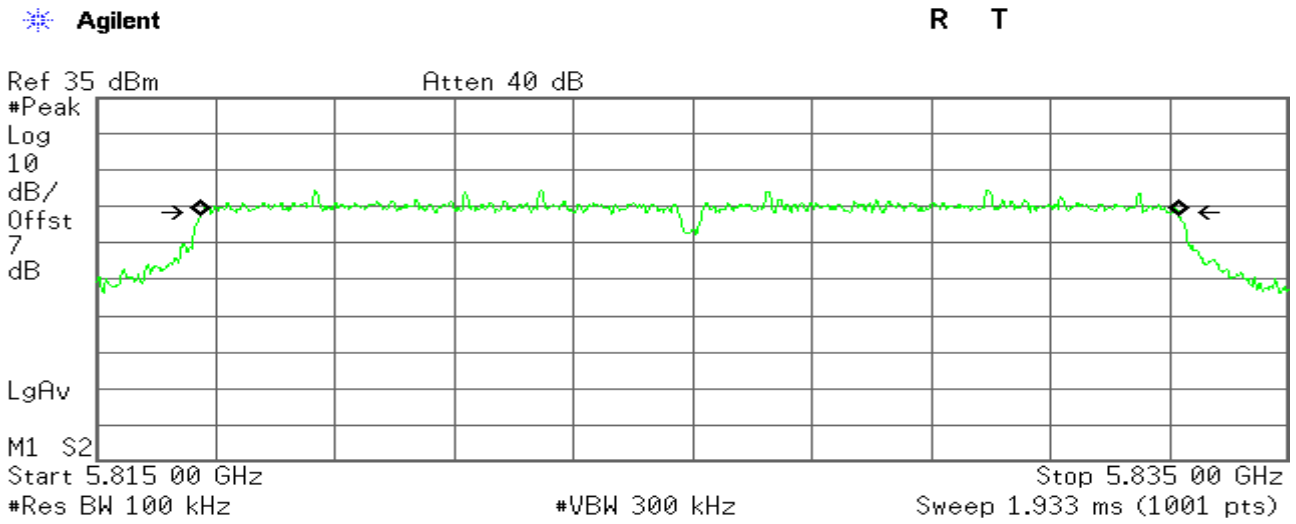
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

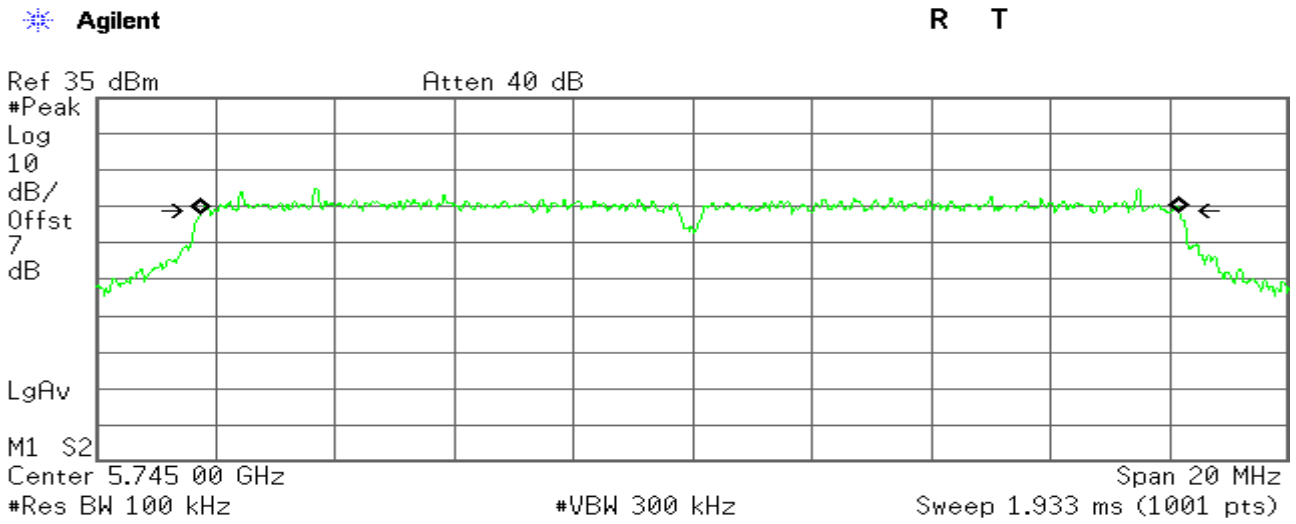


6dB Bandwidth (CH High)



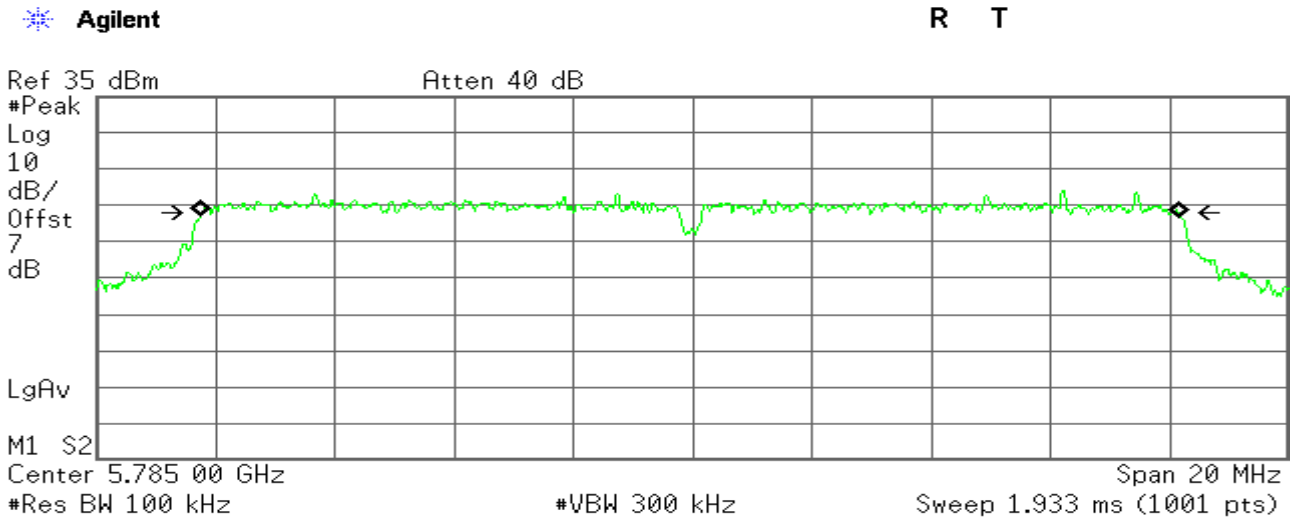
IEEE 802.11a mode /Chain 2

6dB Bandwidth (CH Low)



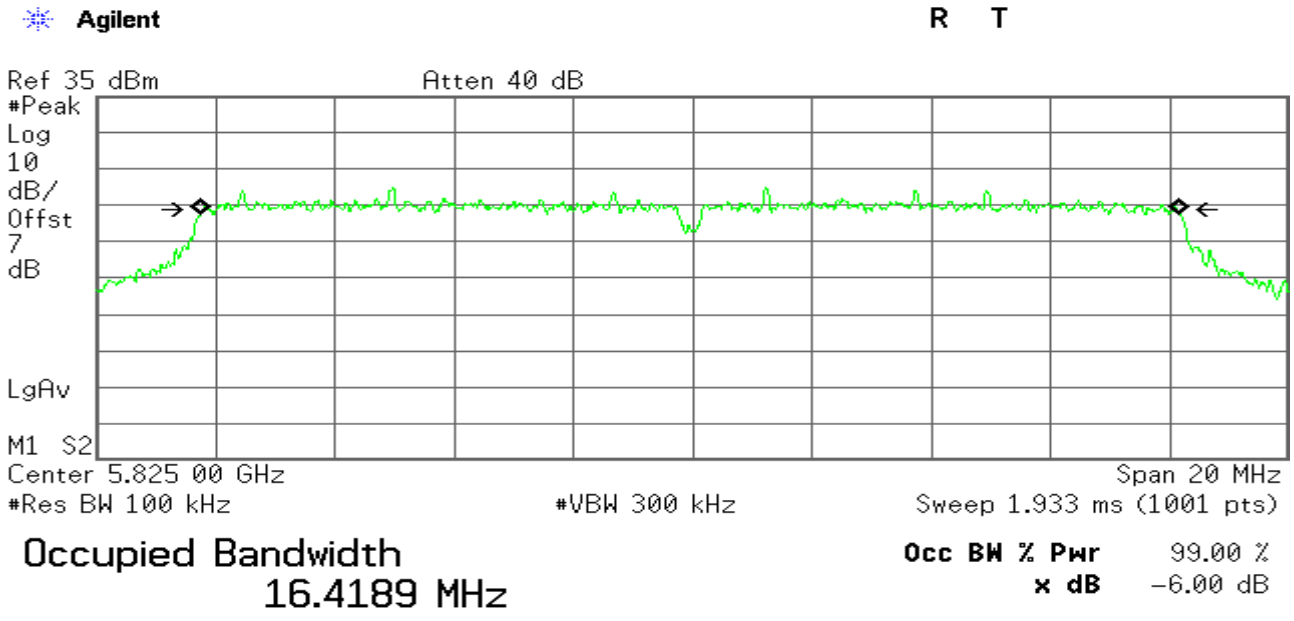
Transmit Freq Error −43.883 kHz
x dB Bandwidth 16.353 MHz

6dB Bandwidth (CH Mid)



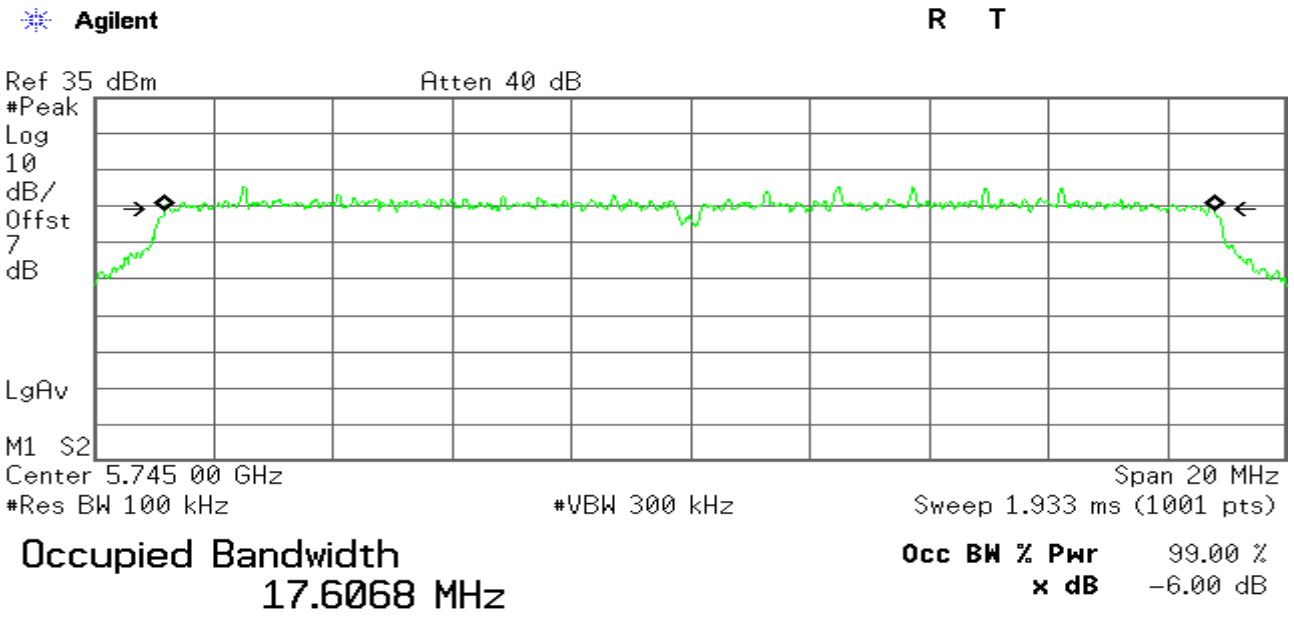
Transmit Freq Error −46.803 kHz
x dB Bandwidth 16.348 MHz

6dB Bandwidth (CH High)

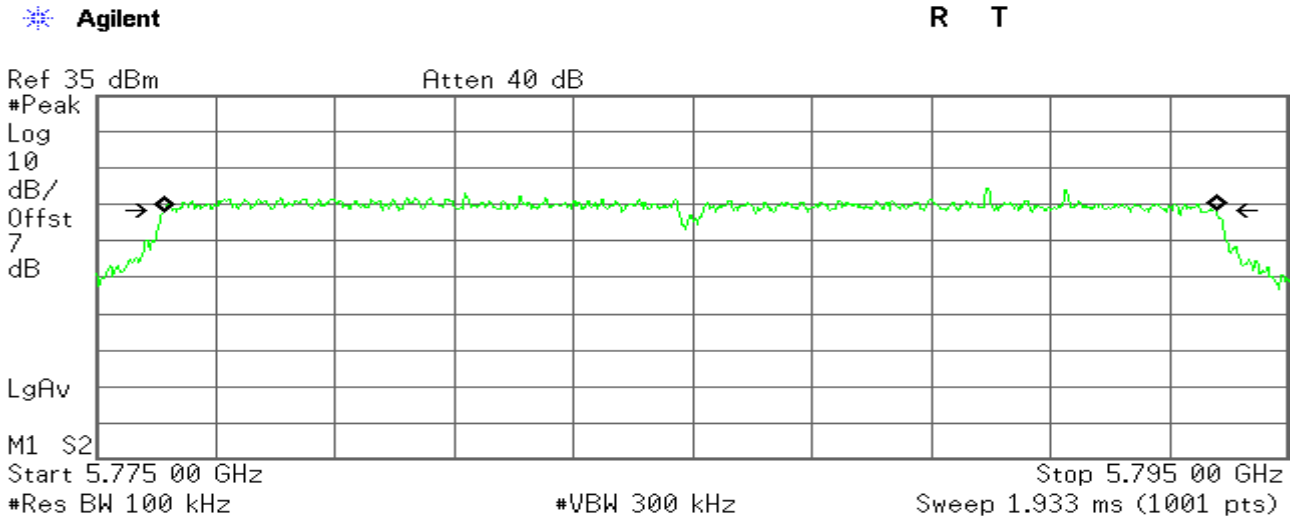


draft 802.11n Standard-20 MHz Channel mode /Chain 0

6dB Bandwidth (CH Low)

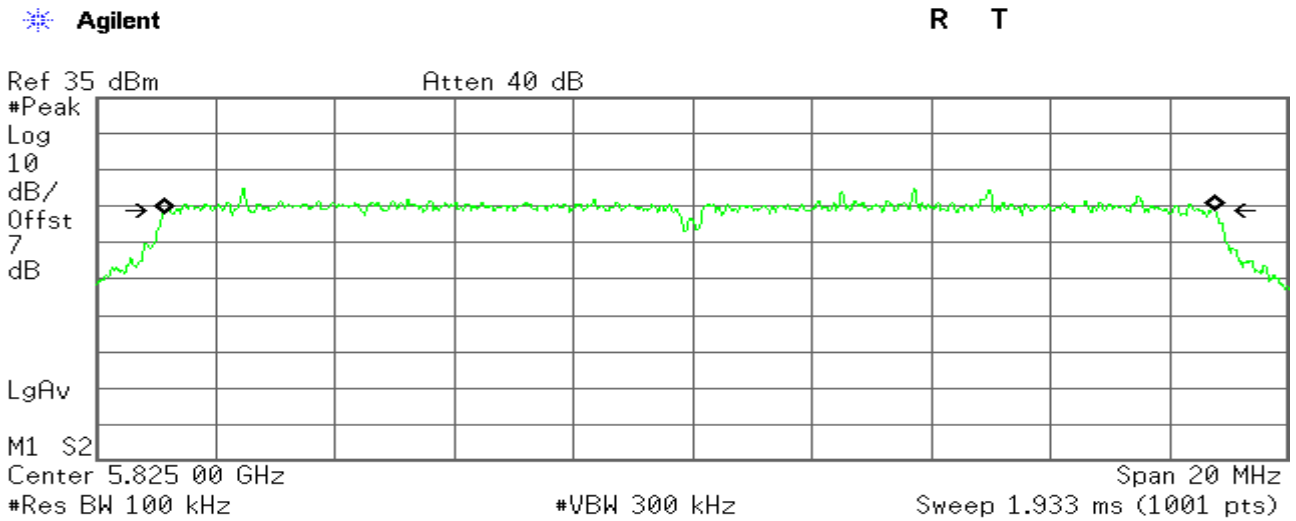


6dB Bandwidth (CH Mid)



Transmit Freq Error −42.231 kHz
x dB Bandwidth 17.620 MHz

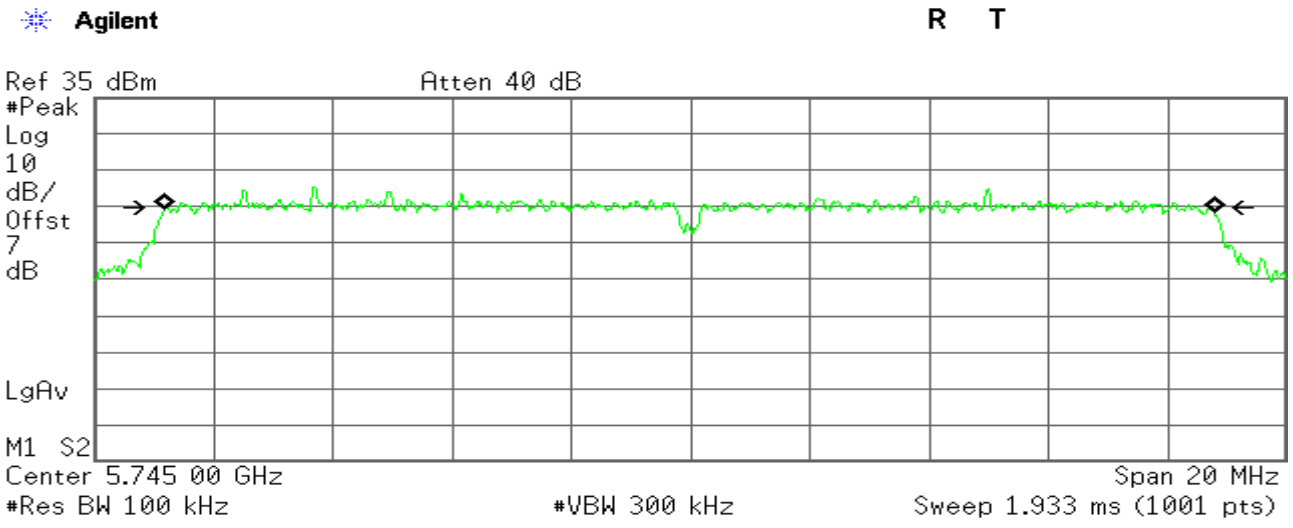
6dB Bandwidth (CH High)



Transmit Freq Error −42.098 kHz
x dB Bandwidth 17.595 MHz

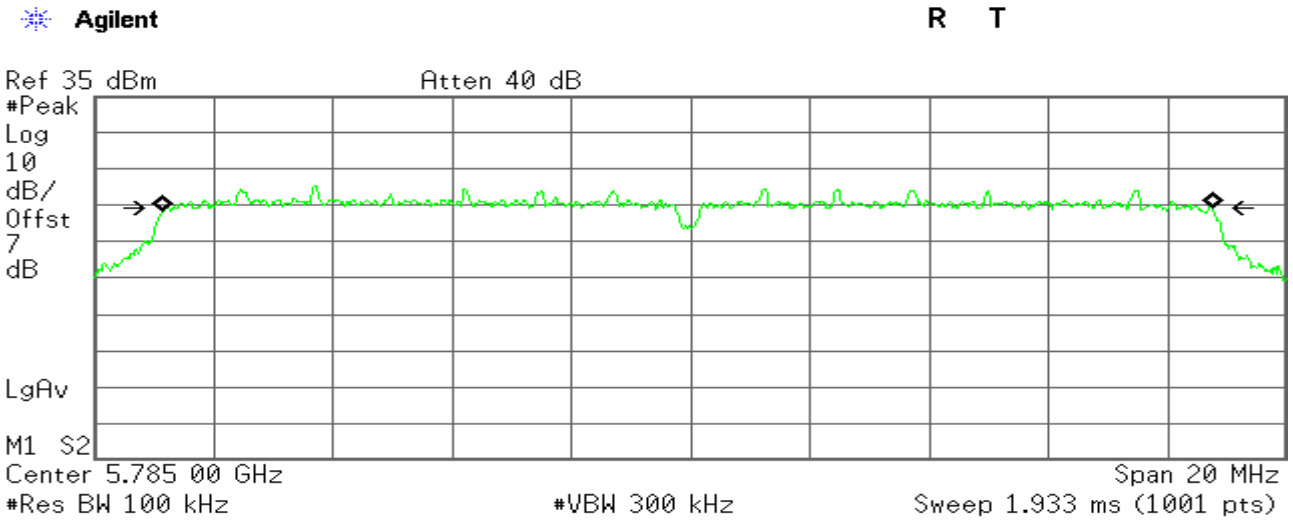
draft 802.11n Standard-20 MHz Channel mode /Chain 1

6dB Bandwidth (CH Low)



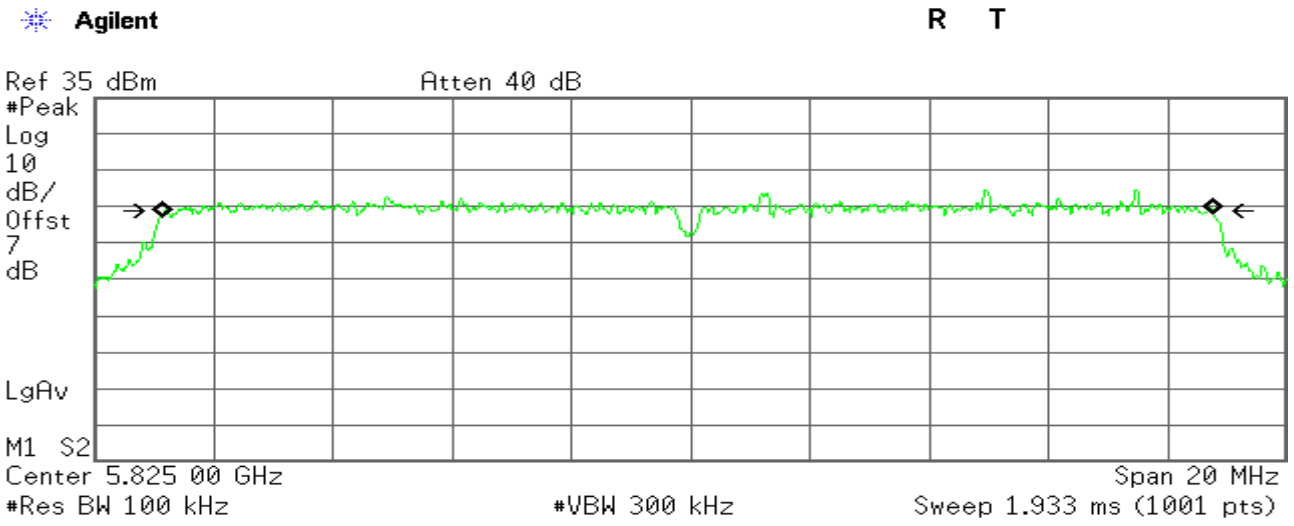
Transmit Freq Error -31.328 kHz
x dB Bandwidth 17.560 MHz

6dB Bandwidth (CH Mid)



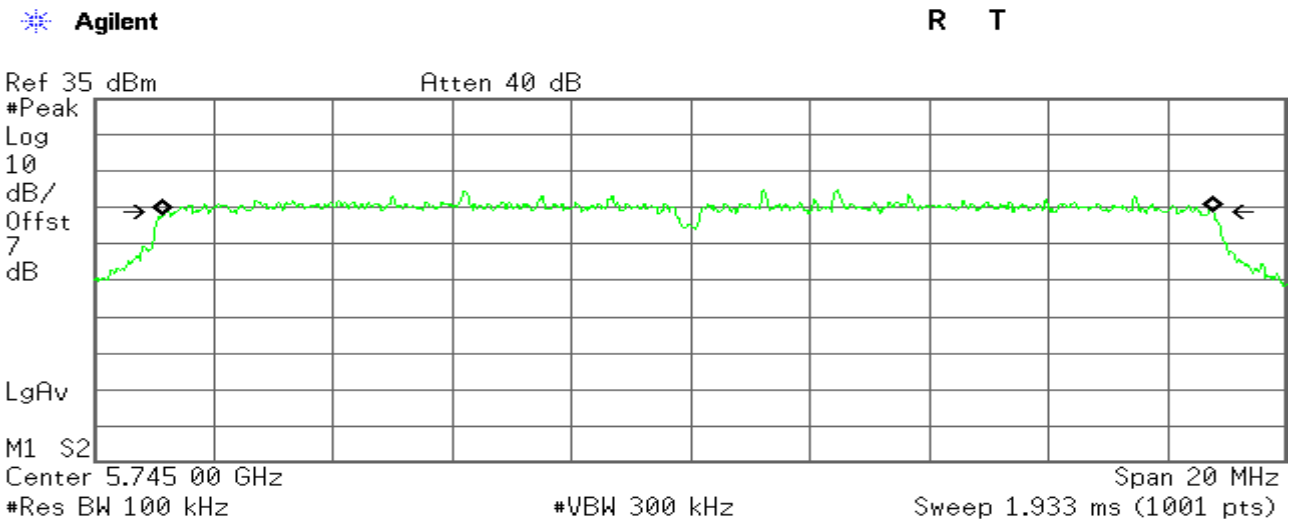
Transmit Freq Error -50.905 kHz
Occupied Bandwidth 17.581 MHz

6dB Bandwidth (CH High)

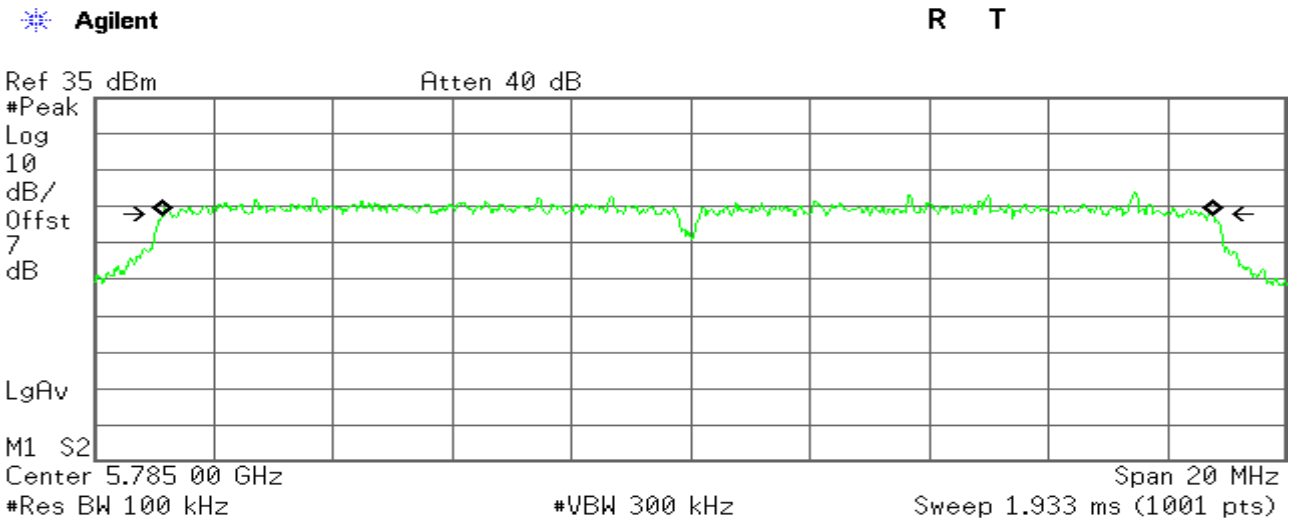


draft 802.11n Standard-20 MHz Channel mode /Chain 2

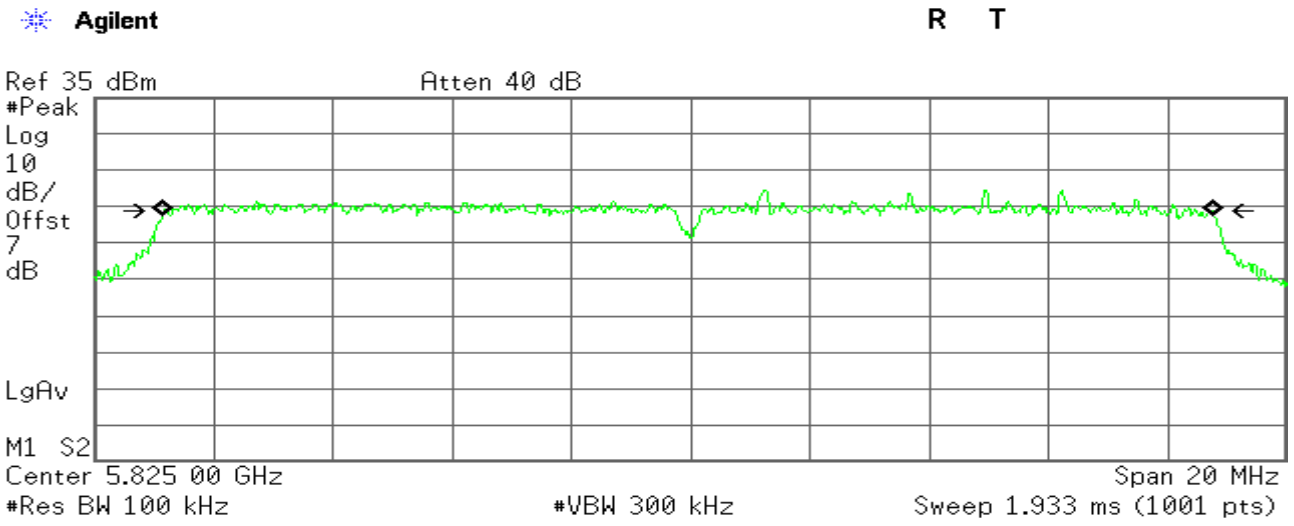
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

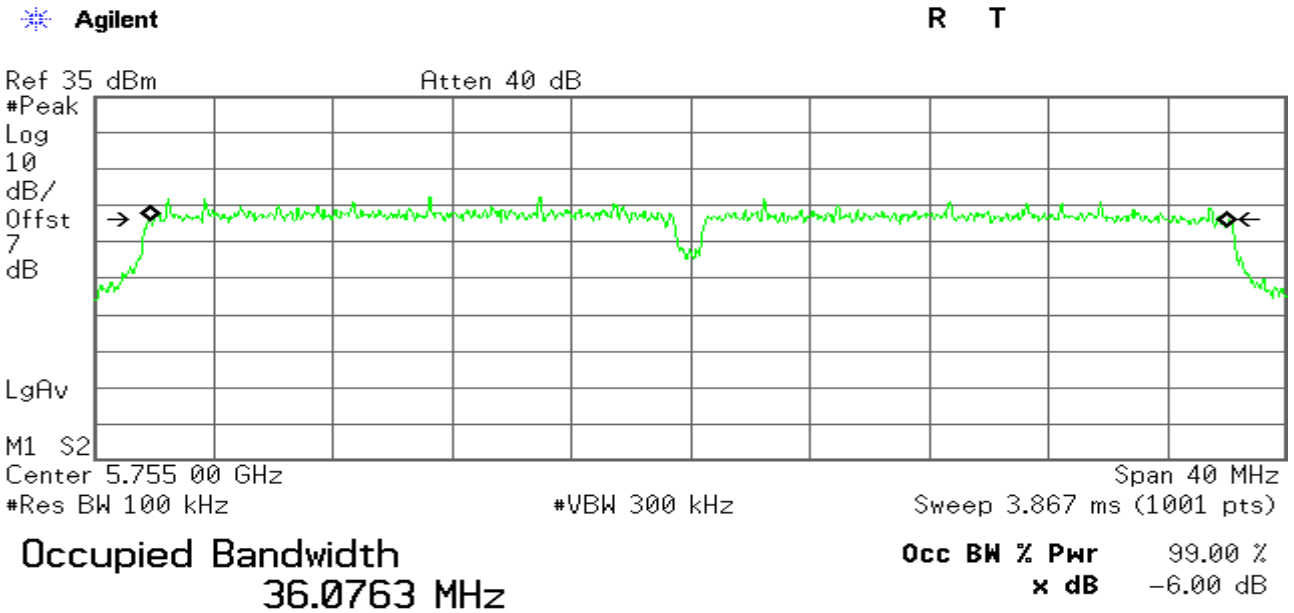


6dB Bandwidth (CH High)



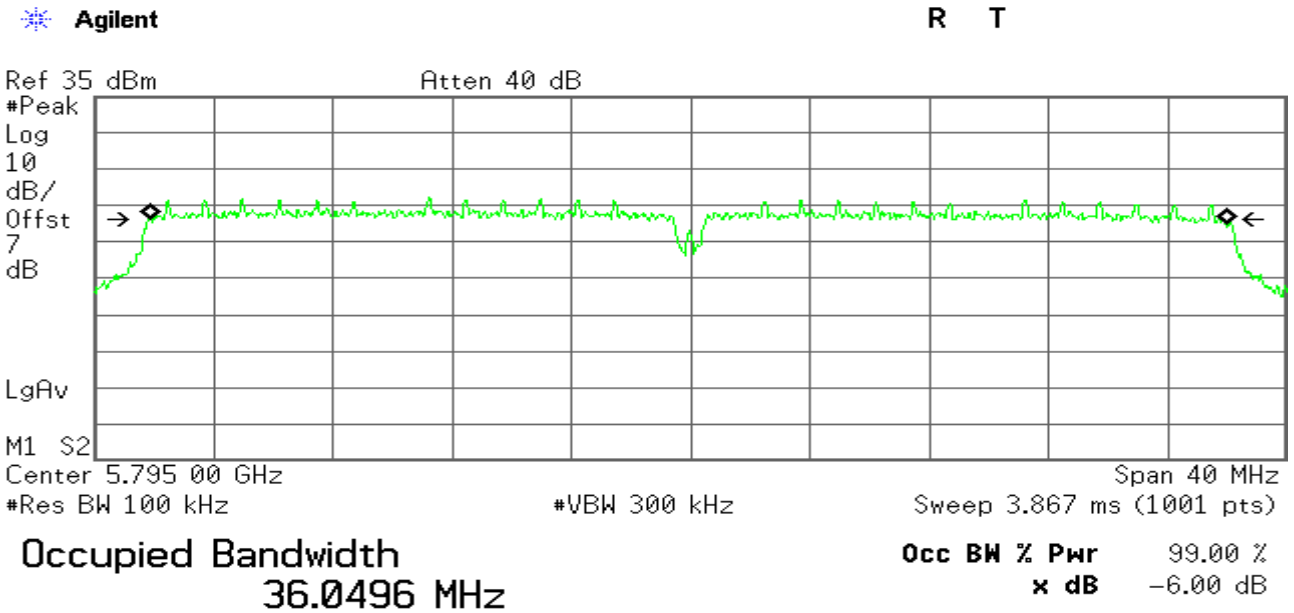
draft 802.11n Wide-40 MHz Channel mode / Chain 0

6dB Bandwidth (CH Low)



Transmit Freq Error −66.226 kHz
x dB Bandwidth 35.937 MHz

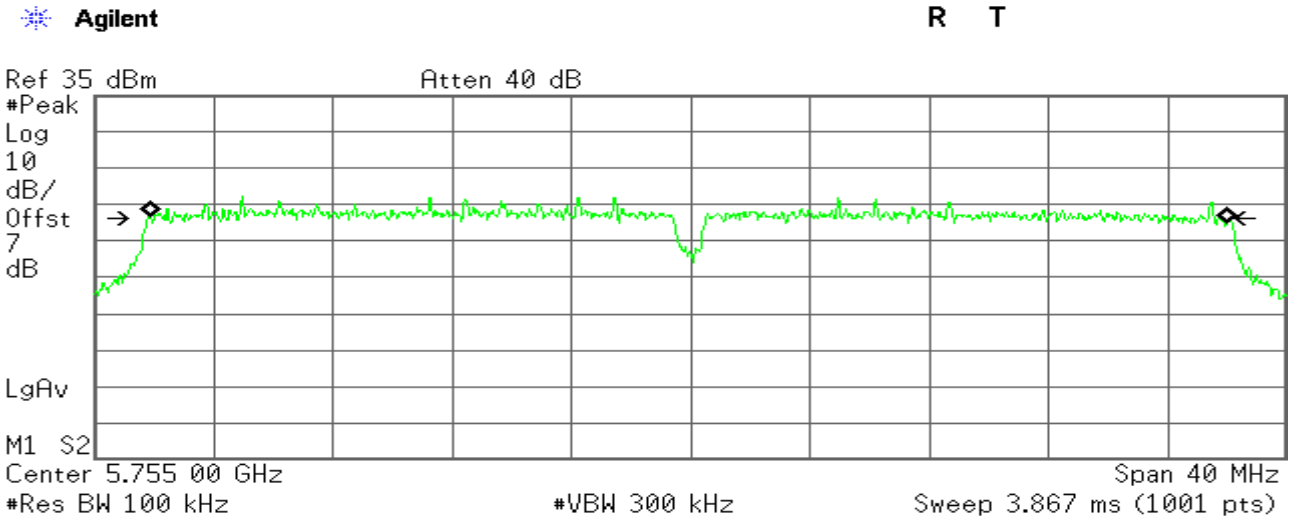
6dB Bandwidth (CH High)



Transmit Freq Error −81.818 kHz
x dB Bandwidth 36.097 MHz

draft 802.11n Wide-40 MHz Channel mode / Chain 1

6dB Bandwidth (CH Low)

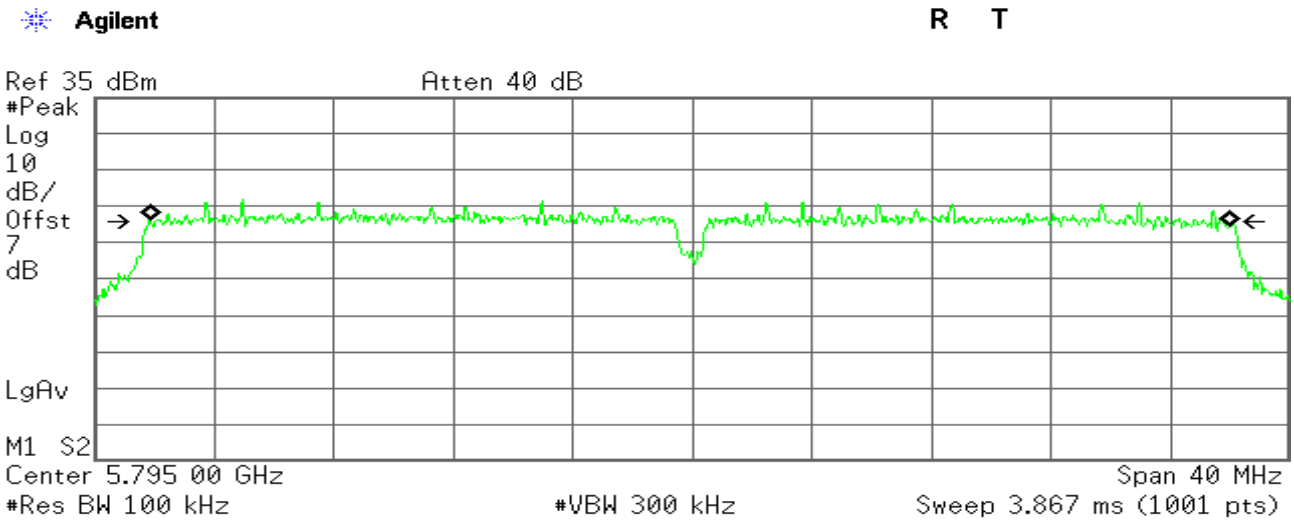


Occupied Bandwidth
36.1154 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -63.652 kHz
x dB Bandwidth 35.761 MHz

6dB Bandwidth (CH High)



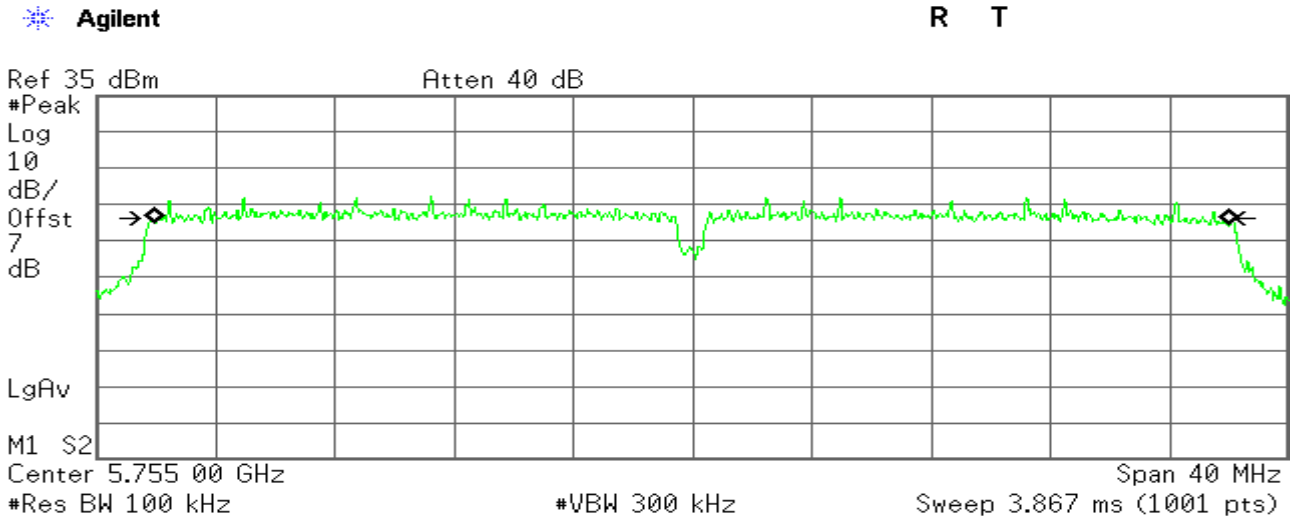
Occupied Bandwidth
36.1319 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -67.834 kHz
x dB Bandwidth 35.962 MHz

draft 802.11n Wide-40 MHz Channel mode / Chain 2

6dB Bandwidth (CH Low)

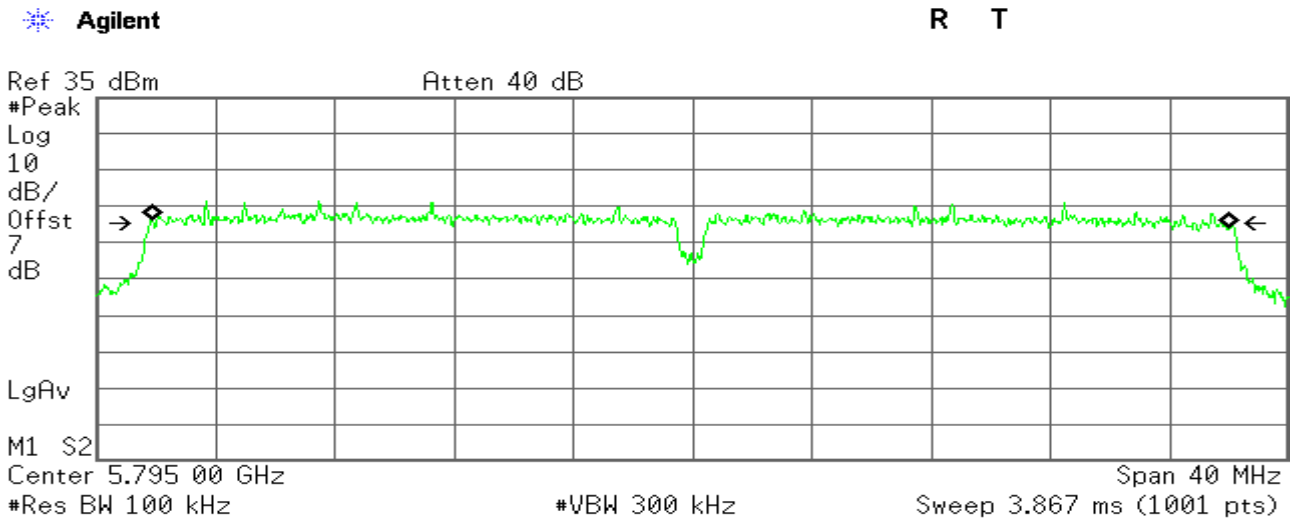


Occupied Bandwidth
36.0691 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -62.704 kHz
x dB Bandwidth 35.370 MHz

6dB Bandwidth (CH High)



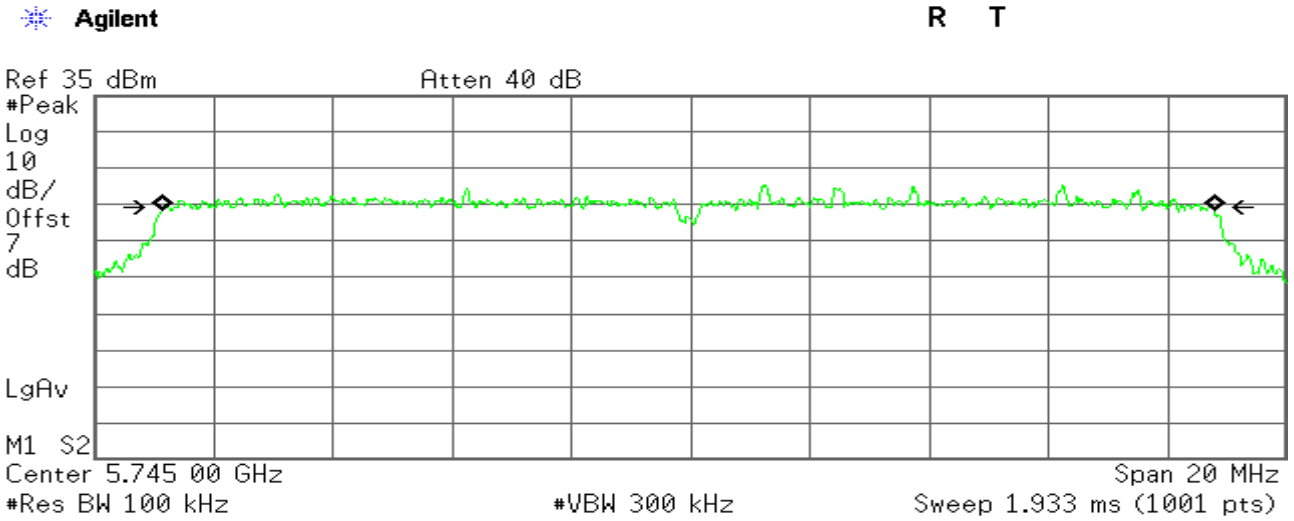
Occupied Bandwidth
36.0796 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -79.590 kHz
x dB Bandwidth 36.075 MHz

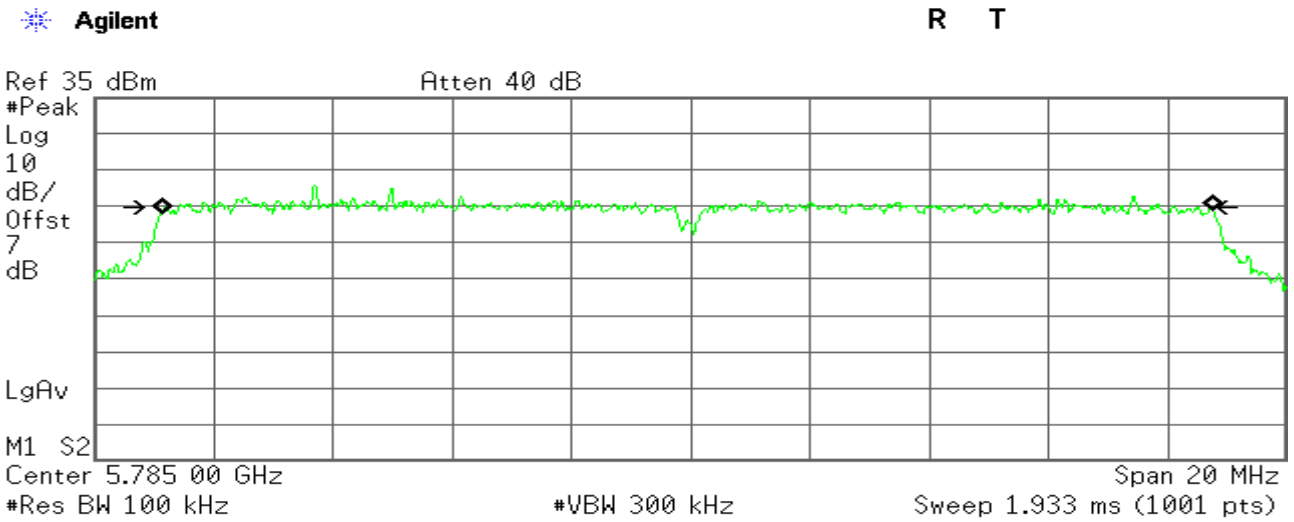
draft 802.11ac Standard-20 MHz Channel mode / Chain 0

6dB Bandwidth (CH Low)



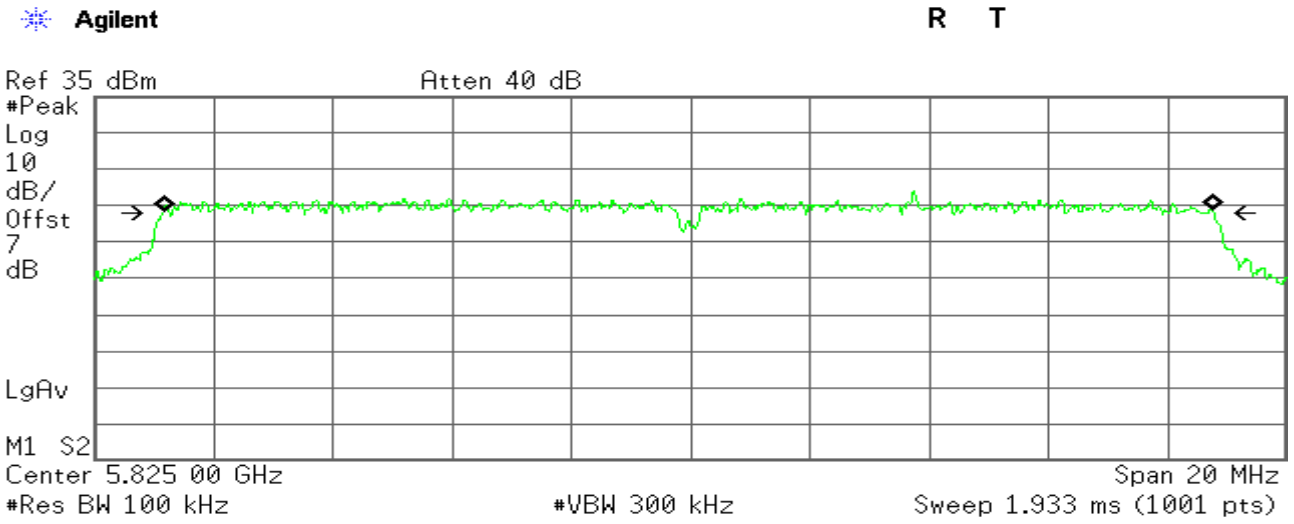
Transmit Freq Error −40.185 kHz
x dB Bandwidth 17.582 MHz

6dB Bandwidth (CH Mid)



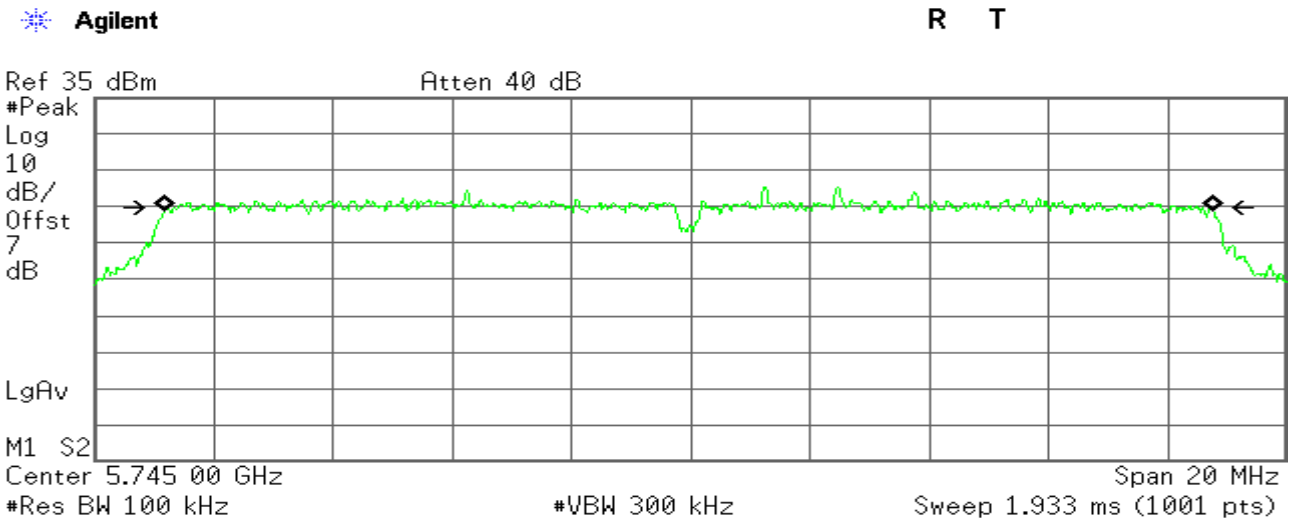
Transmit Freq Error −50.605 kHz
x dB Bandwidth 17.327 MHz

6dB Bandwidth (CH High)

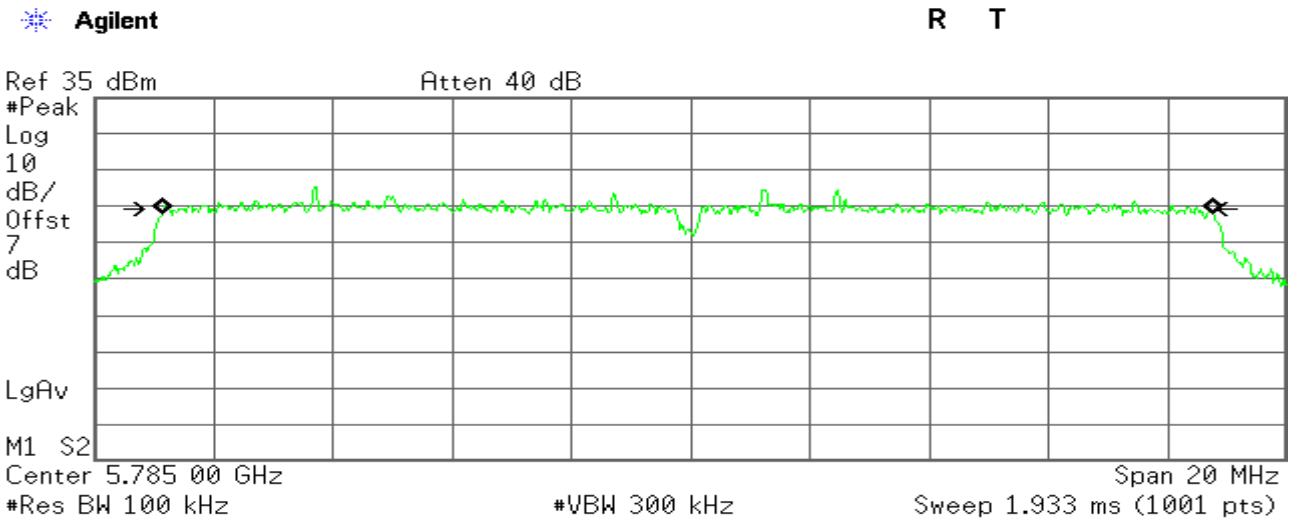


draft 802.11ac Standard-20 MHz Channel mode / Chain 1

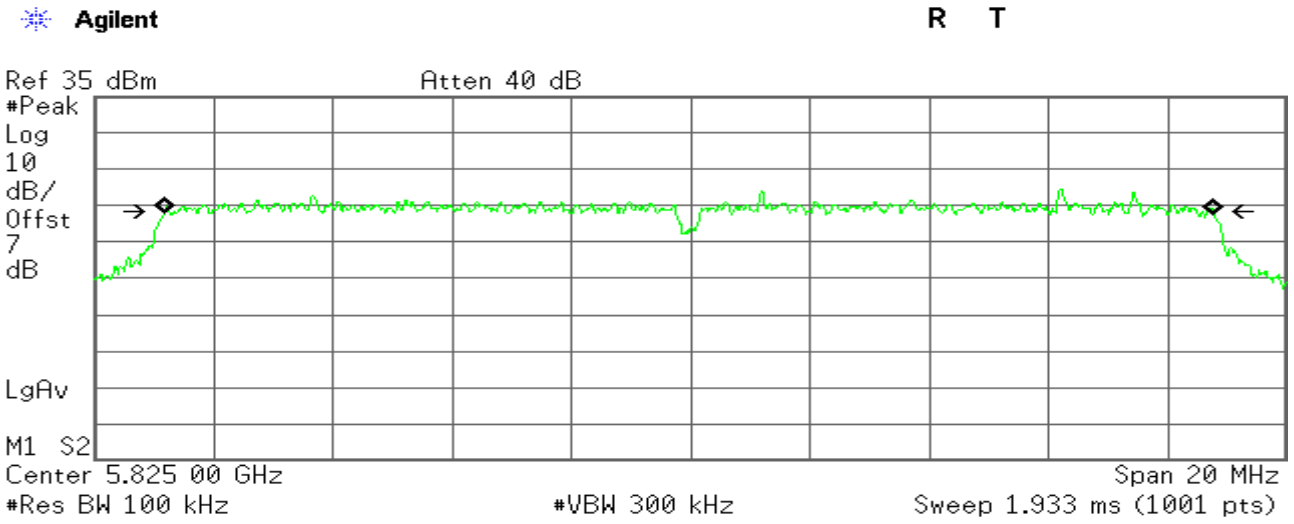
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

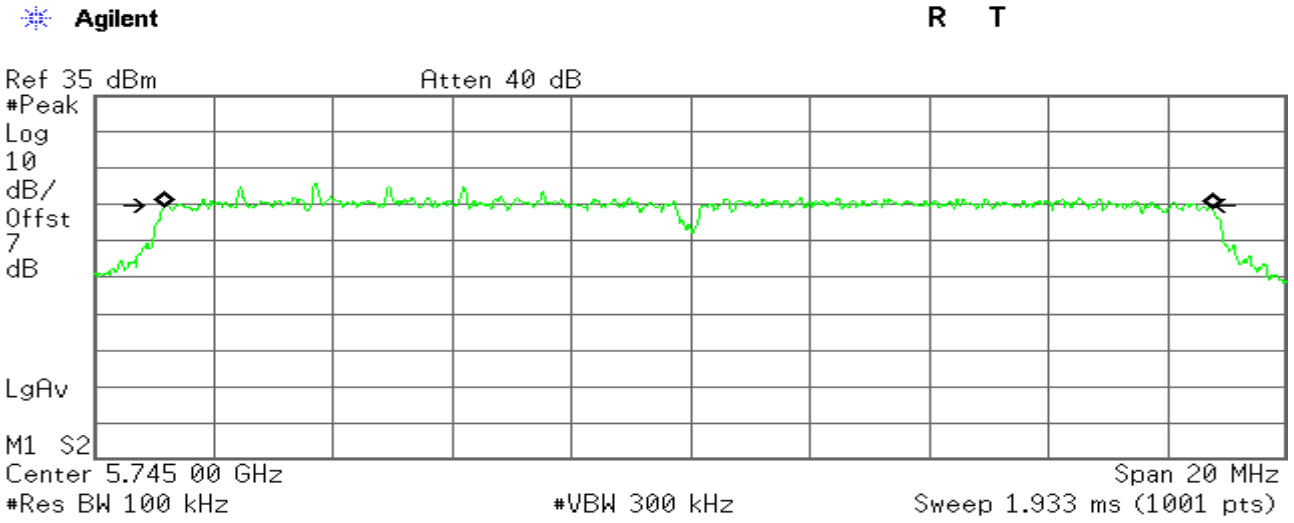


6dB Bandwidth (CH High)



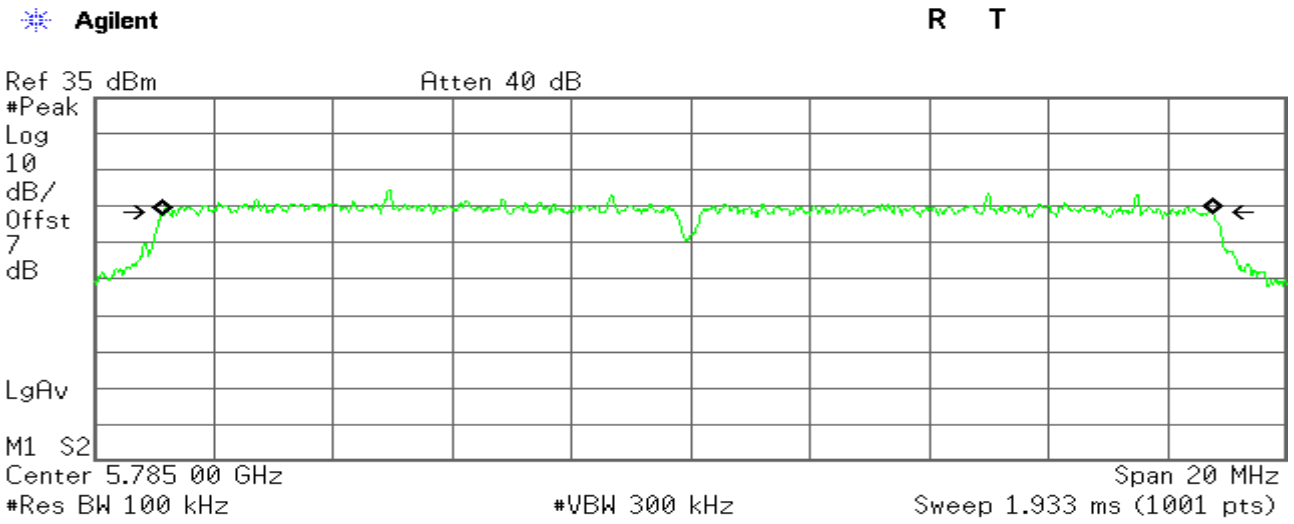
draft 802.11ac Standard-20 MHz Channel mode / Chain 2

6dB Bandwidth (CH Low)



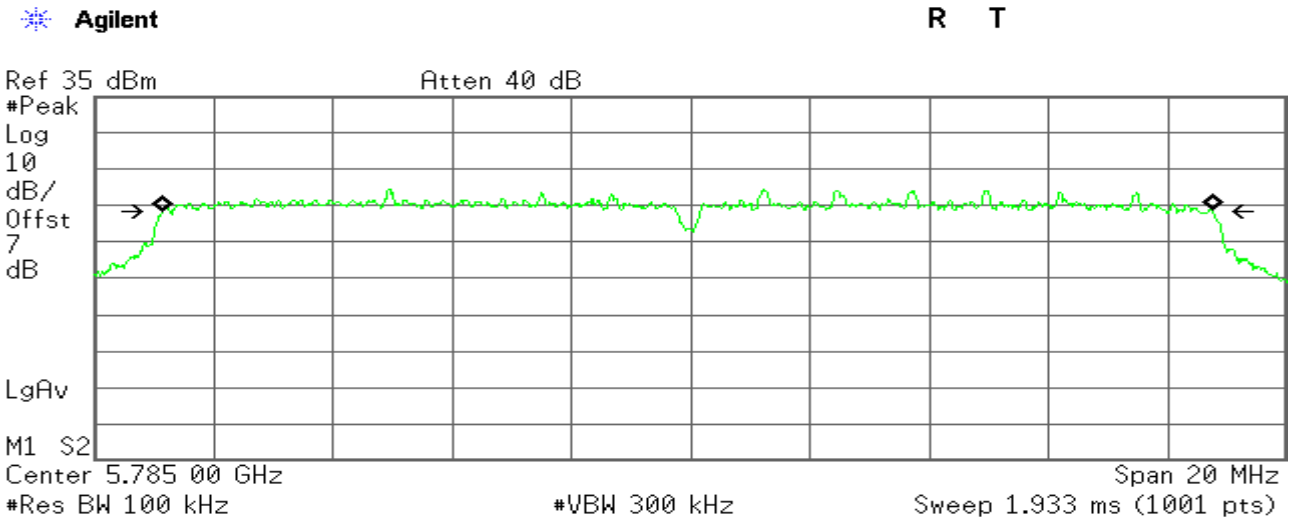
Transmit Freq Error −41.004 kHz
x dB Bandwidth 17.291 MHz

6dB Bandwidth (CH Mid)



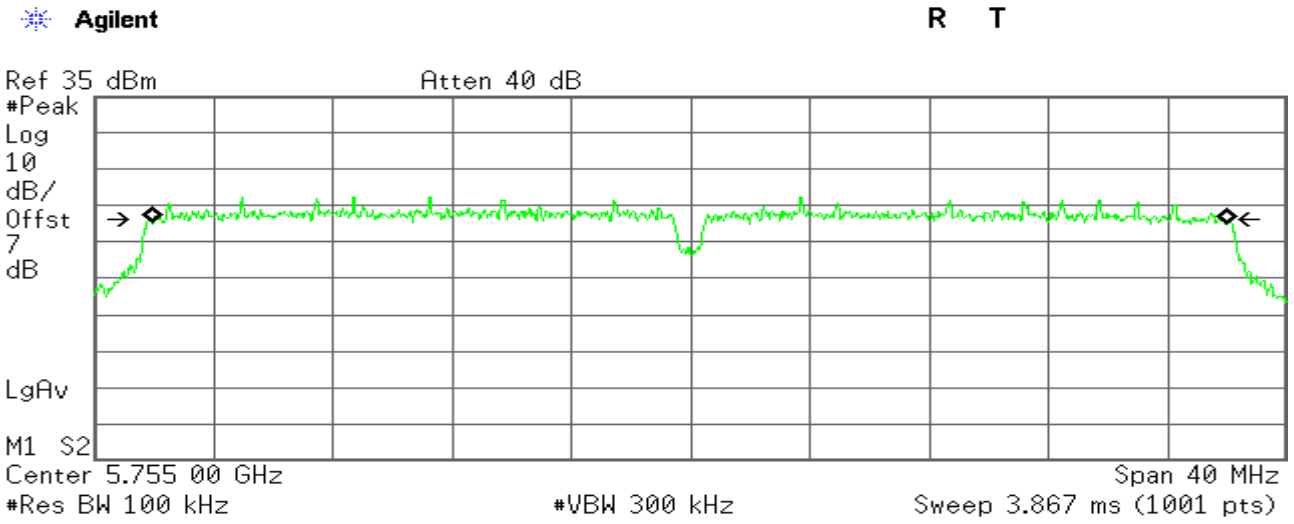
Transmit Freq Error −46.409 kHz
x dB Bandwidth 17.577 MHz

6dB Bandwidth (CH High)

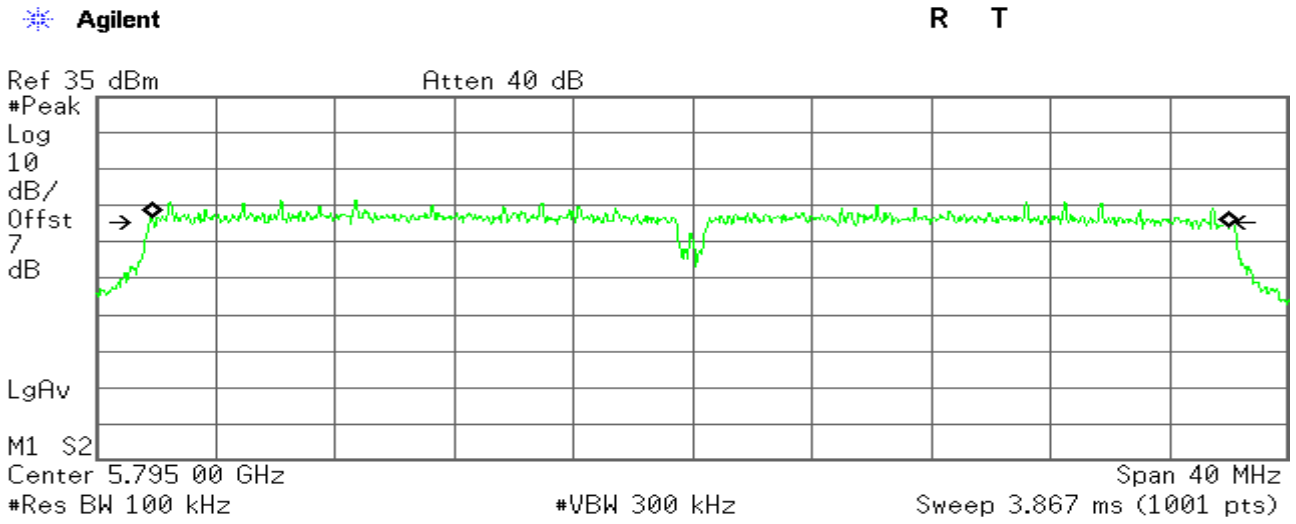


draft 802.11ac Wide-40 MHz Channel mode / Chain 0

6dB Bandwidth (CH Low)

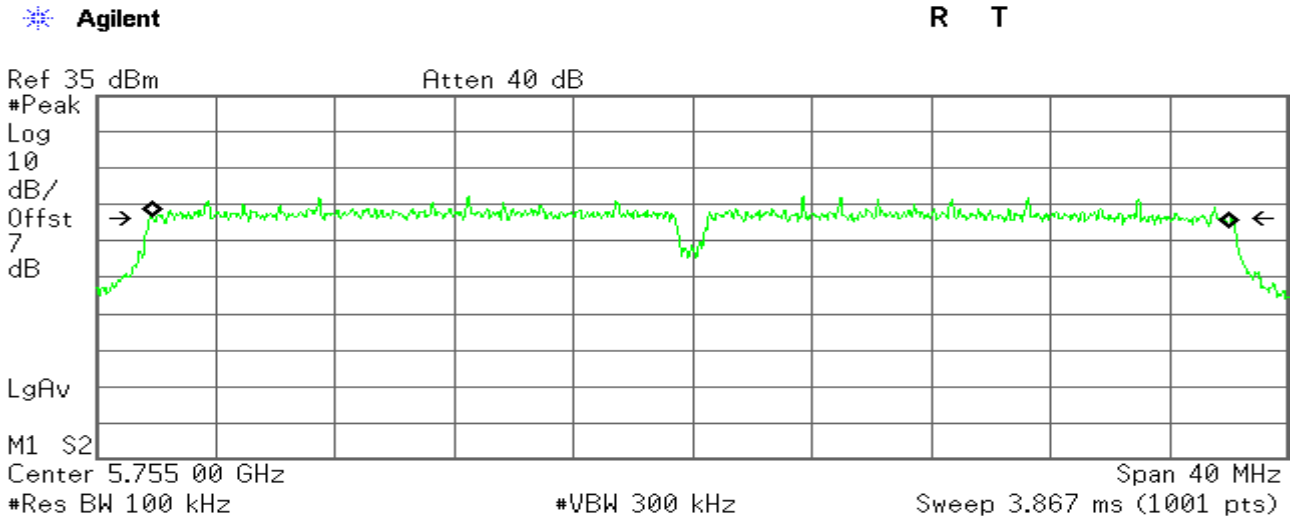


6dB Bandwidth (CH High)

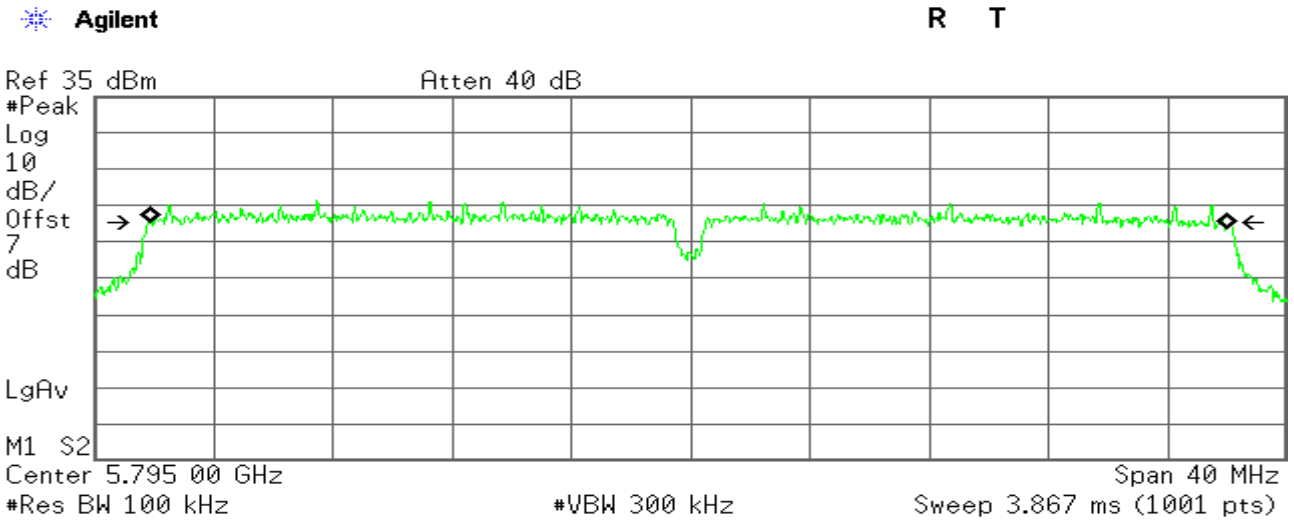


draft 802.11ac Wide-40 MHz Channel mode / Chain 1

6dB Bandwidth (CH Low)

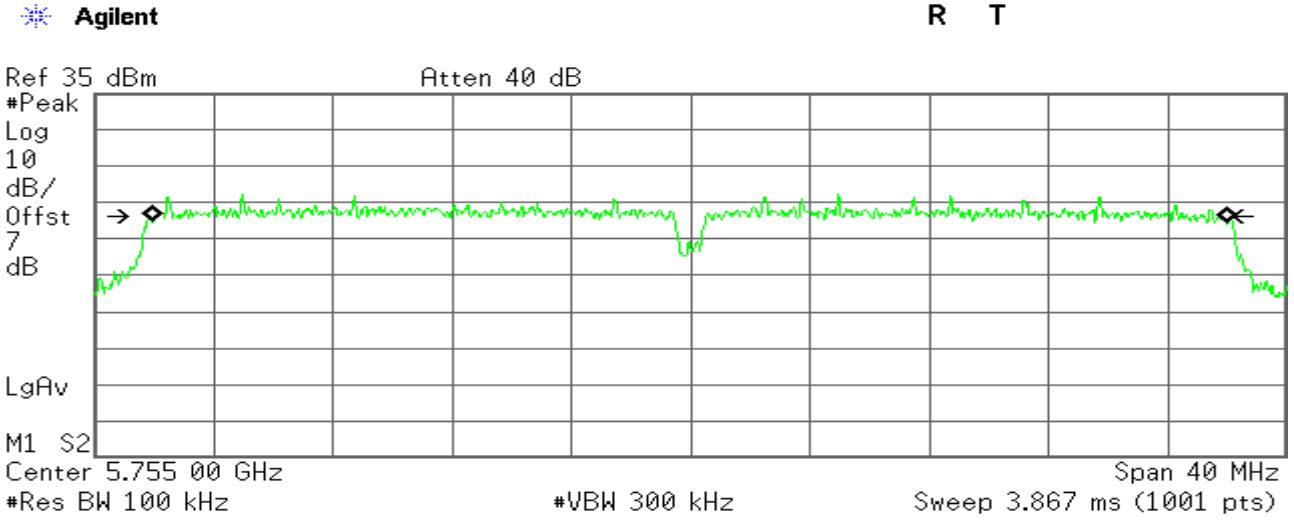


6dB Bandwidth (CH High)

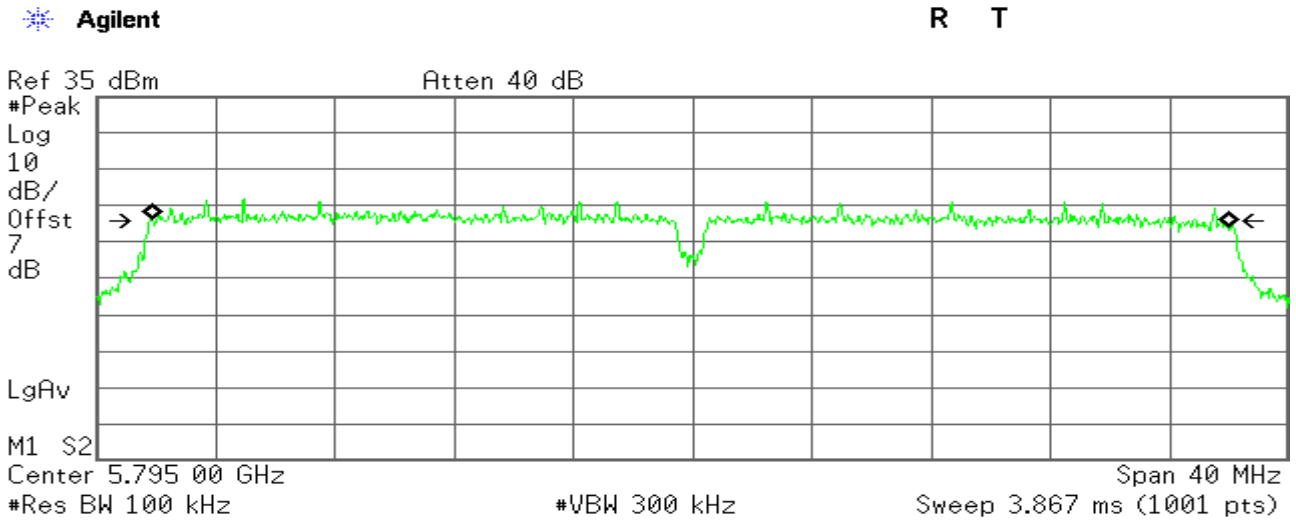


draft 802.11ac Wide-40 MHz Channel mode / Chain 2

6dB Bandwidth (CH Low)

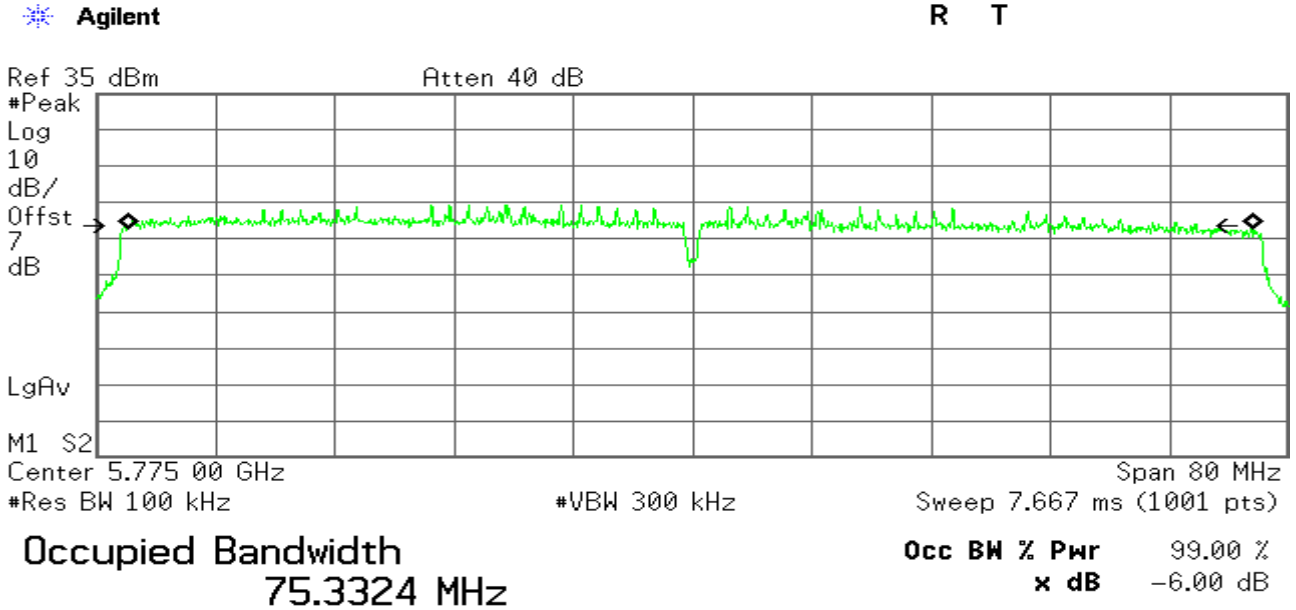


6dB Bandwidth (CH High)



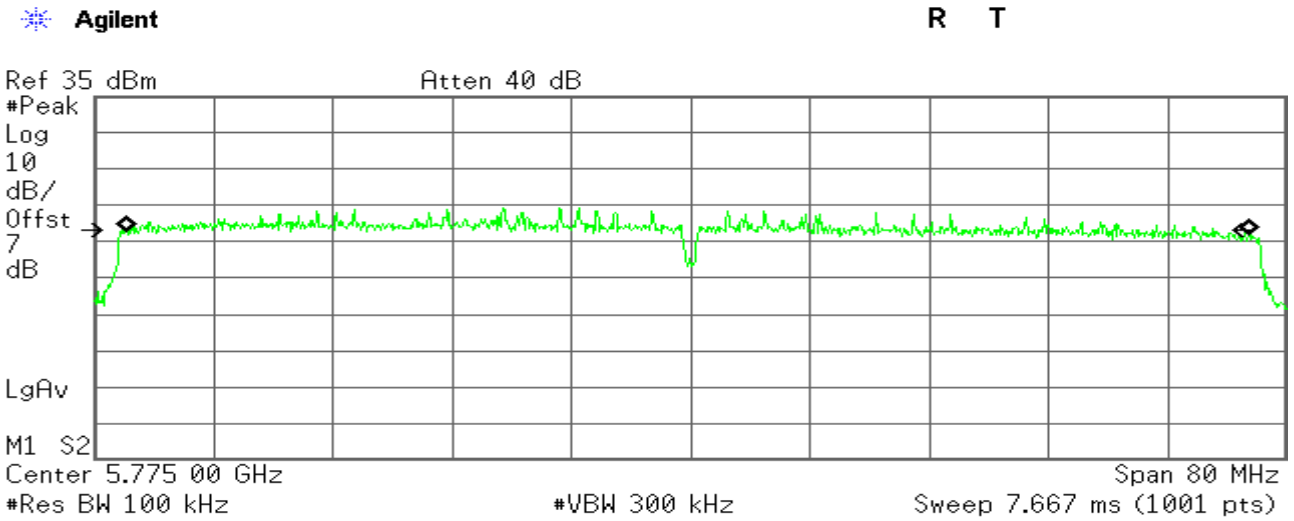
draft 802.11ac Wide-80 MHz Channel mode / Chain 0

6dB Bandwidth



draft 802.11ac Wide-80 MHz Channel mode / Chain 1

6dB Bandwidth



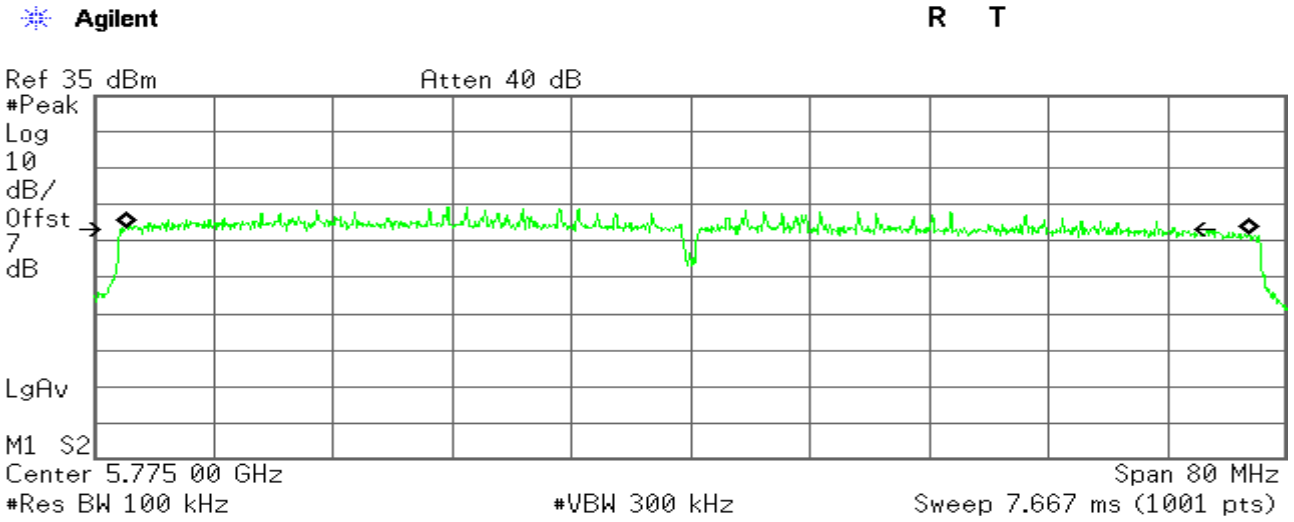
Occupied Bandwidth
75.3295 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -185.249 kHz
x dB Bandwidth 73.146 MHz

draft 802.11ac Wide-80 MHz Channel mode / Chain 2

6dB Bandwidth



Occupied Bandwidth
75.3018 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -201.793 kHz
x dB Bandwidth 70.700 MHz

7.2 MAXIMUM CONDUCTED OUTPUT POWER

LIMIT

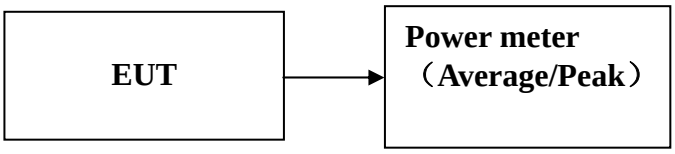
According to §15.407(a),

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

The peak power shall not exceed the limit as follow:

Test Configuration



The EUT was connected to a spectrum analyzer through a 50Ω RF cable.

TEST PROCEDURE

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, 10 log(1/x), where x is the duty cycle.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode

5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average Conducted Power (dBm)				Limit (dBm)
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power	
Low	5745	0.15	0.14	0.15	20.72	20.82	21.05	25.64	30
Mid	5785	0.15	0.14	0.15	20.82	20.53	20.59	25.42	30
High	5825	0.15	0.14	0.15	20.63	20.59	20.53	25.35	30

Test mode: draft 802.11n Standard-20 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average Conducted Power (dBm)				Limit (dBm)
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power	
Low	5745	0.14	0.14	0.15	20.84	20.75	20.95	25.62	30
Mid	5785	0.14	0.14	0.15	20.77	20.46	20.59	25.38	30
High	5825	0.14	0.14	0.15	20.56	20.61	20.54	25.34	30

Test mode: draft 802.11n Wide-40 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average Conducted Power (dBm)				Limit (dBm)
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power	
Low	5755	0.28	0.27	0.25	20.57	20.56	20.77	25.41	30
High	5795	0.28	0.27	0.25	20.30	20.39	20.28	25.10	30

Test mode: draft 802.11ac Standard-20 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average Conducted Power (dBm)				Limit (dBm)
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power	
Low	5745	0.16	0.16	0.17	20.76	20.96	20.72	25.59	30
Mid	5785	0.16	0.16	0.17	20.75	20.46	20.38	25.30	30
High	5825	0.16	0.16	0.17	20.56	20.51	20.31	25.23	30

Note:Measured power(dBm) has offiset with cable loss and duty factor

Test mode: draft 802.11ac Wide-40 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average Conducted Power (dBm)				Limit (dBm)
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power	
Low	5755	0.31	0.30	0.27	20.61	20.75	20.42	25.37	30
High	5795	0.31	0.30	0.27	20.37	20.14	20.06	24.96	30

Test mode: draft 802.11ac Wide-80 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average Conducted Power (dBm)				Limit (dBm)
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power	
Mid	5775	0.51	0.54	0.48	20.46	20.44	20.29	25.17	30

Note:Measured power(dBm) has offiset with cable loss and duty factor

Remark : Sum Power(dBm)=10log(10^(chain0 outputpower/10)+ 10^(chain1 outputpower/10)+ 10^(chain2 outputpower/10))

Test Data

Test mode: IEEE 802.11a mode

5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Peak Conducted Power (dBm)			
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power
Low	5745	0.15	0.14	0.15	24.87	24.91	24.02	29.39
Mid	5785	0.15	0.14	0.15	24.73	24.25	23.61	28.99
High	5825	0.15	0.14	0.15	24.33	24.61	23.54	28.95

Test mode: draft 802.11n Standard-20 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Peak Conducted Power (dBm)			
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power
Low	5745	0.14	0.14	0.15	24.31	24.37	24.41	29.13
Mid	5785	0.14	0.14	0.15	24.09	23.89	23.57	28.63
High	5825	0.14	0.14	0.15	22.61	23.72	23.54	28.09

Test mode: draft 802.11n Wide-40 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Peak Conducted Power (dBm)			
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power
Low	5755	0.28	0.27	0.25	24.11	23.68	23.99	28.70
High	5795	0.28	0.27	0.25	23.44	23.56	23.51	28.27

Test mode: draft 802.11ac Standard-20 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Peak Conducted Power (dBm)			
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power
Low	5745	0.16	0.16	0.17	24.27	24.45	24.39	29.14
Mid	5785	0.16	0.16	0.17	24.05	23.85	23.69	28.64
High	5825	0.16	0.16	0.17	23.67	23.82	23.64	28.48

Note1:Measured power(dBm) has offiset with cable loss and duty factor
Note2:The peak power test data just for reference.

Test mode: draft 802.11ac Wide-40 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Peak Conducted Power (dBm)				Limit (dBm)
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power	
Low	5755	0.31	0.30	0.27	24.31	24.35	24.14	29.04	30
High	5795	0.31	0.30	0.27	23.62	23.71	23.58	28.41	30

Test mode: draft 802.11ac Wide-80 MHz Channel mode
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Peak Conducted Power (dBm)				Limit (dBm)
		Chain0	Chain1	Chain2	Chain0	Chain1	Chain2	Sum Power	
Mid	5775	0.51	0.54	0.48	23.49	23.51	23.64	28.32	30

Note1:Measured power(dBm) has offiset with cable loss and duty factor

Note2:The peak power test data just for reference.

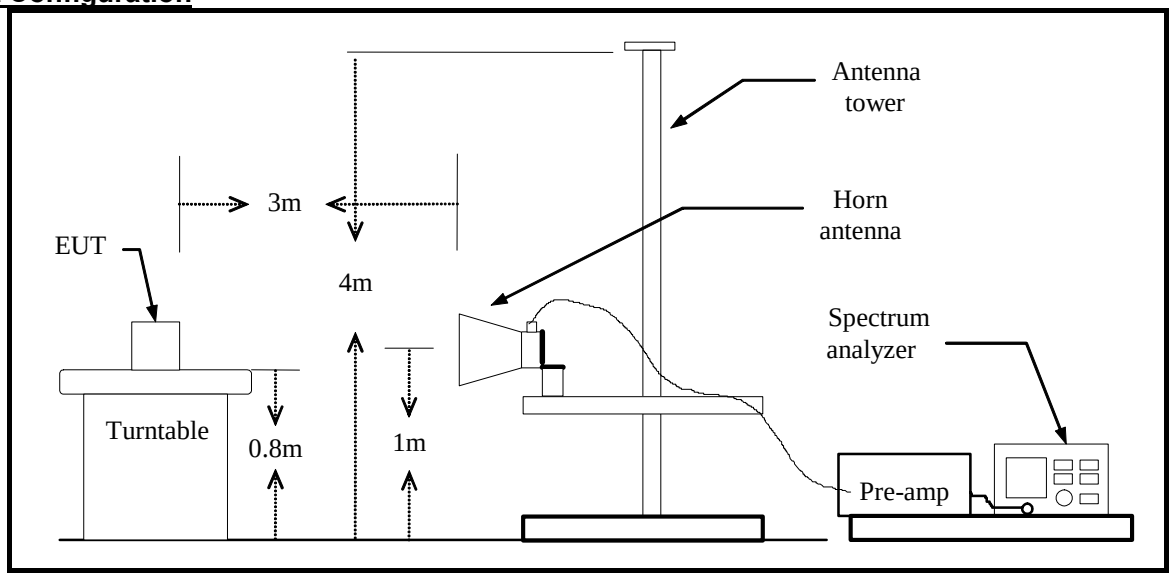
Remark : Sum Power(dBm)=10log(10^(chain0 outputpower/10)+ 10^(chain1 outputpower/10)+ 10^(chain2 outputpower/10))

7.3 BAND EDGES MEASUREMENT

LIMIT

According to §15.407(b),
(1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

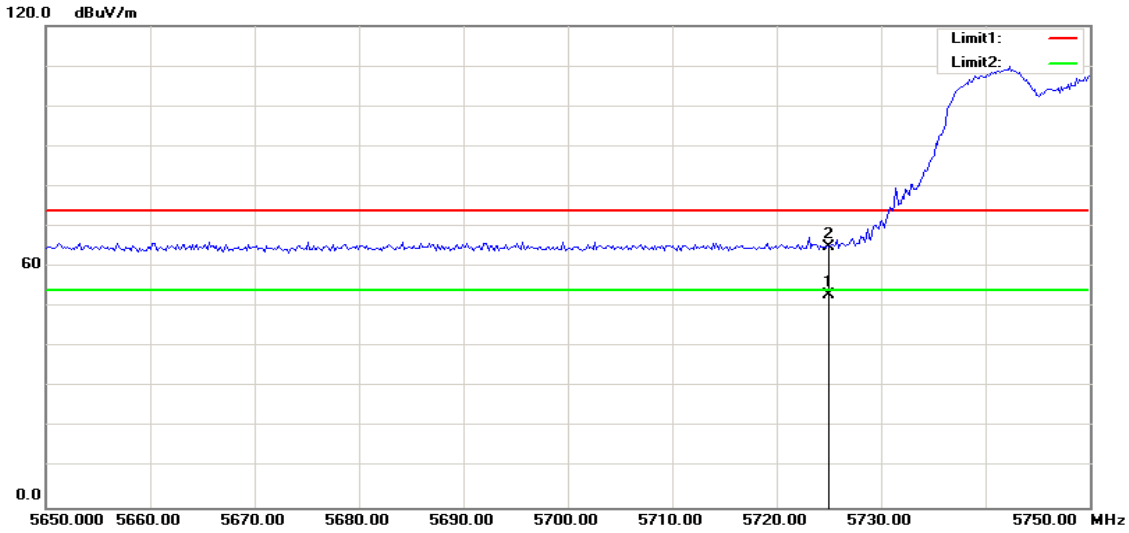
TEST RESULTS

Refer to attach spectrum analyzer data chart.

Band Edges (draft 802.11a mode)

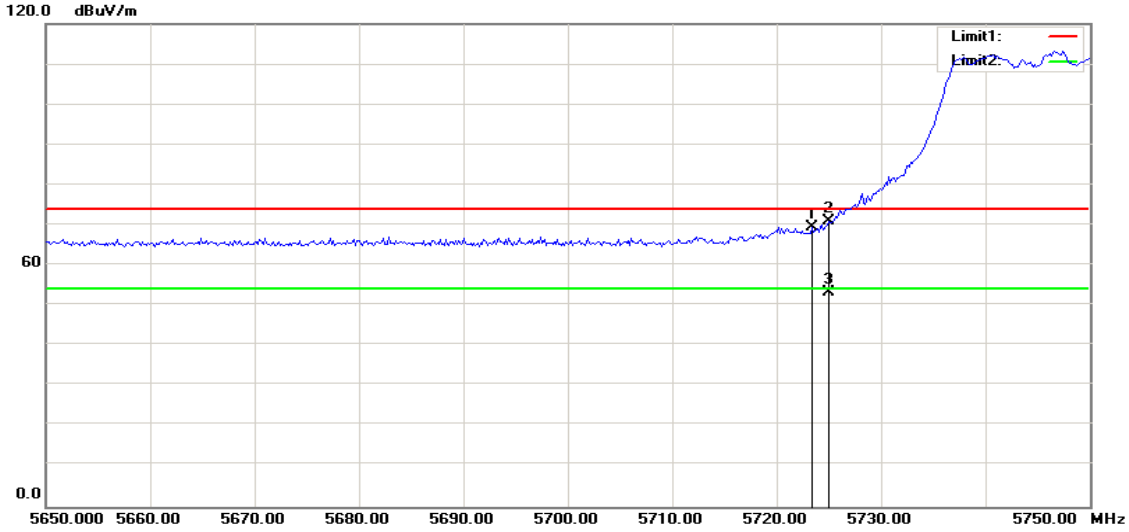
5745MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5724.950	52.03	0.88	52.91	54.00	-1.09	100	252	AVG
2	5725.000	64.21	0.88	65.09	74.00	-8.91	100	252	peak

Polarity: Horizontal

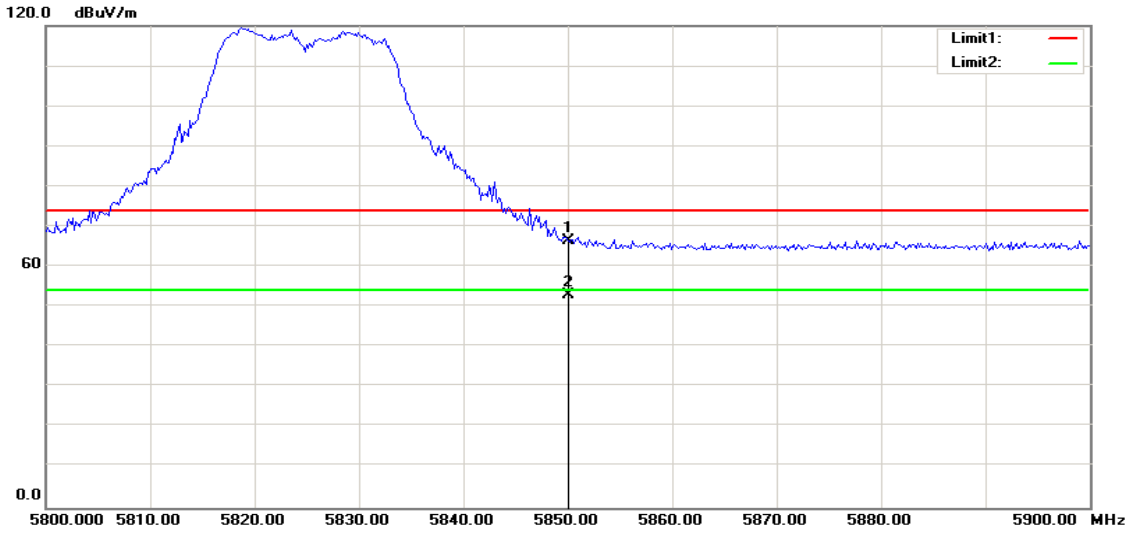


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5723.397	68.57	0.88	69.45	74.00	-4.55	100	351	peak
2	5725.000	70.13	0.88	71.01	74.00	-2.99	100	345	peak
3	5725.050	52.37	0.88	53.25	54.00	-0.75	100	344	AVG

Band Edges (draft 802.11a mode)

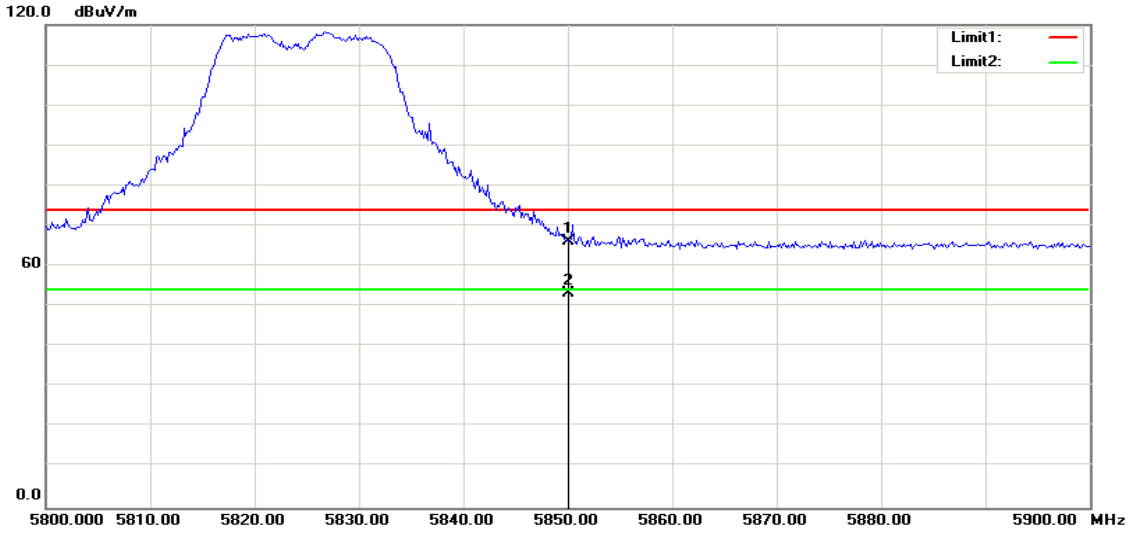
5825MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5850.000	65.36	1.02	66.38	74.00	-7.62	100	265	peak
2	5850.025	52.08	1.02	53.10	54.00	-0.90	100	265	AVG

Polarity: Horizontal

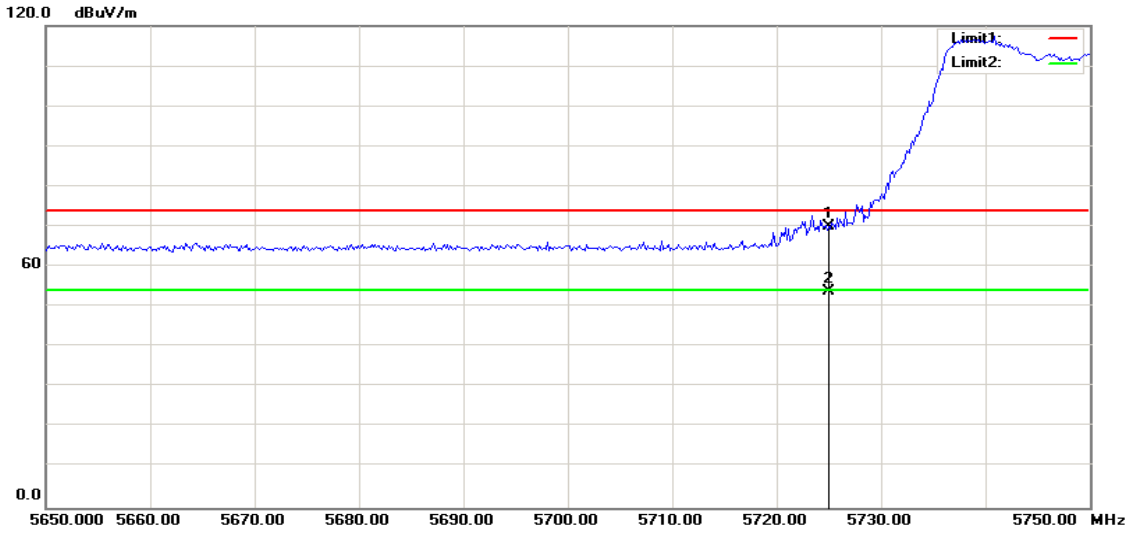


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5850.000	65.21	1.02	66.23	74.00	-7.77	101	344	peak
2	5850.025	52.34	1.02	53.36	54.00	-0.64	101	197	AVG

Band Edges (draft 802.11n Standard-20 MHz Channel mode)

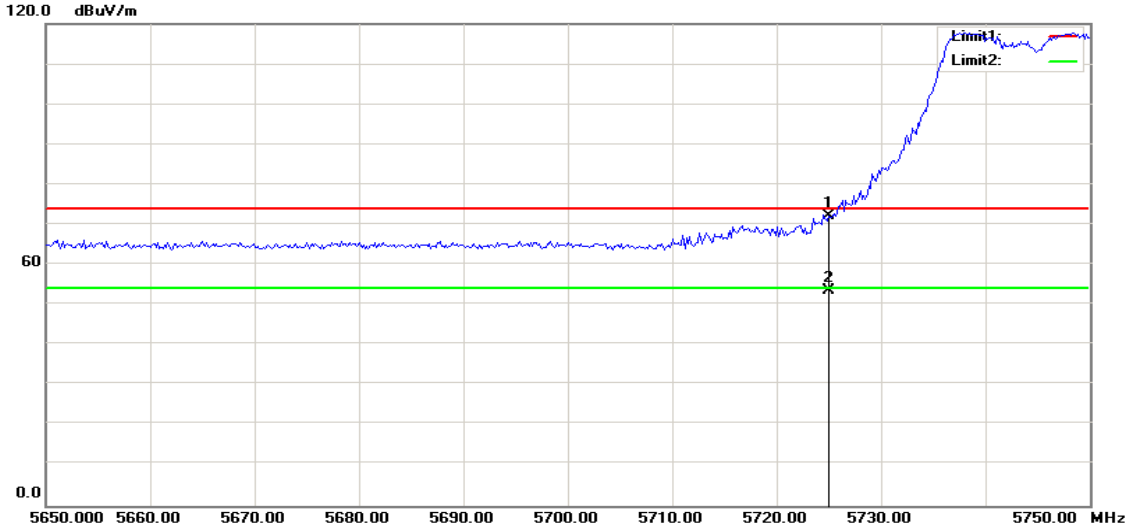
5745MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5725.000	69.29	0.88	70.17	74.00	-3.83	100	284	peak
2	5725.025	52.87	0.88	53.75	54.00	-0.25	100	285	AVG

Polarity: Horizontal

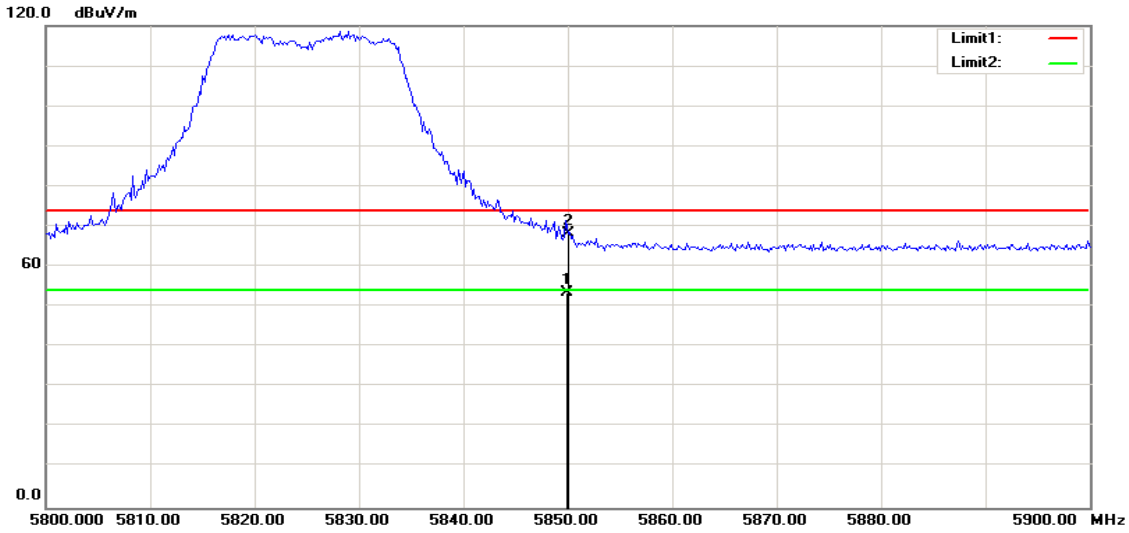


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5725.000	71.28	0.88	72.16	74.00	-1.84	100	352	peak
2	5725.050	52.60	0.88	53.48	54.00	-0.52	100	353	AVG

Band Edges (draft 802.11n Standard-20 MHz Channel mode)

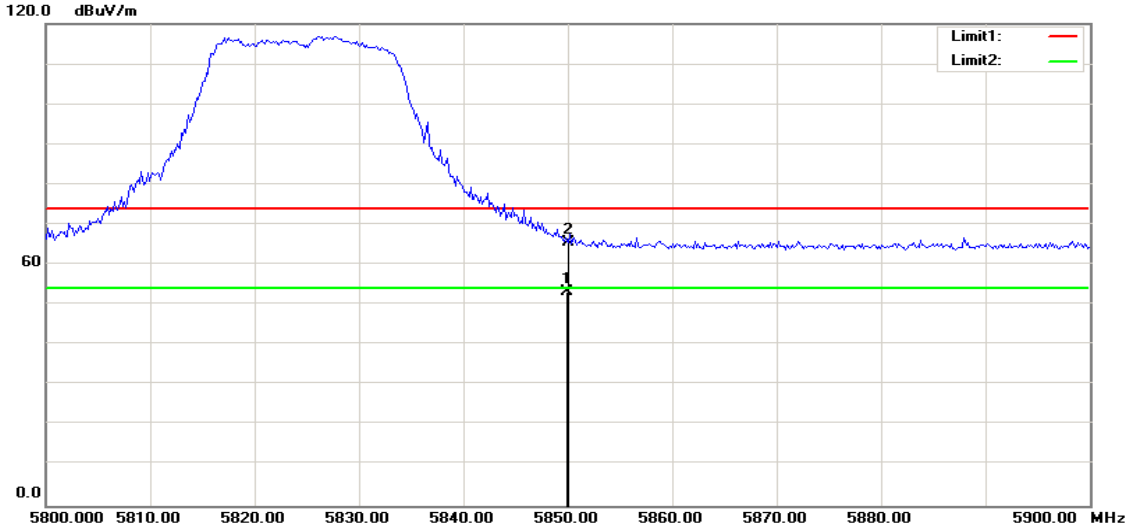
5825MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5849.950	52.42	1.02	53.44	54.00	-0.56	100	271	AVG
2	5850.000	67.30	1.02	68.32	74.00	-5.68	100	270	peak

Polarity: Horizontal

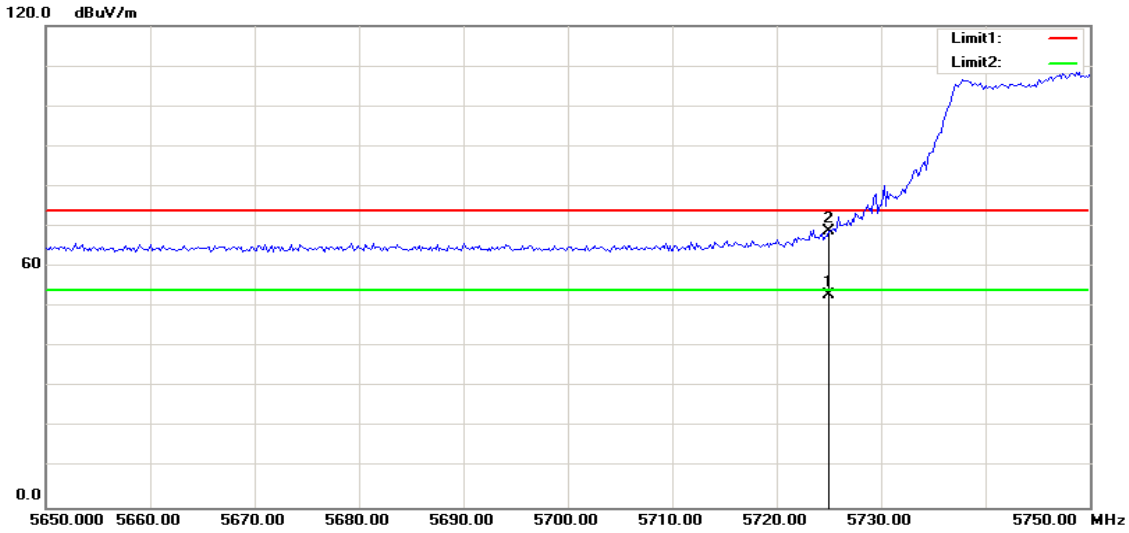


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5849.950	52.23	1.02	53.25	54.00	-0.75	100	214	AVG
2	5850.000	64.65	1.02	65.67	74.00	-8.33	100	213	peak

Band Edges (draft 802.11n Wide-40 MHz Channel mode)

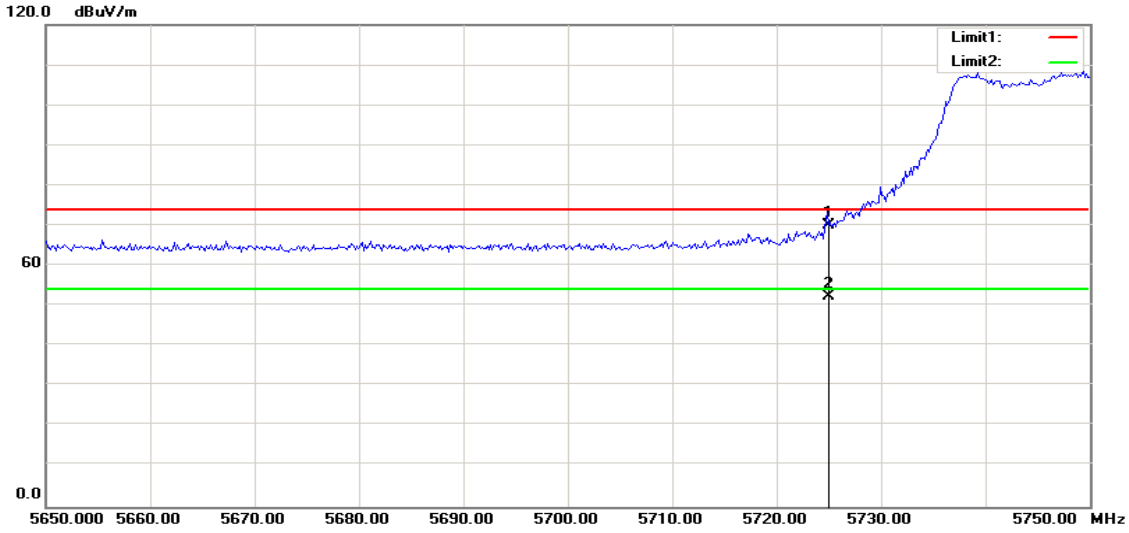
5755MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5724.950	52.04	0.88	52.92	54.00	-1.08	100	151	AVG
2	5725.000	67.84	0.88	68.72	74.00	-5.28	100	326	peak

Polarity: Horizontal

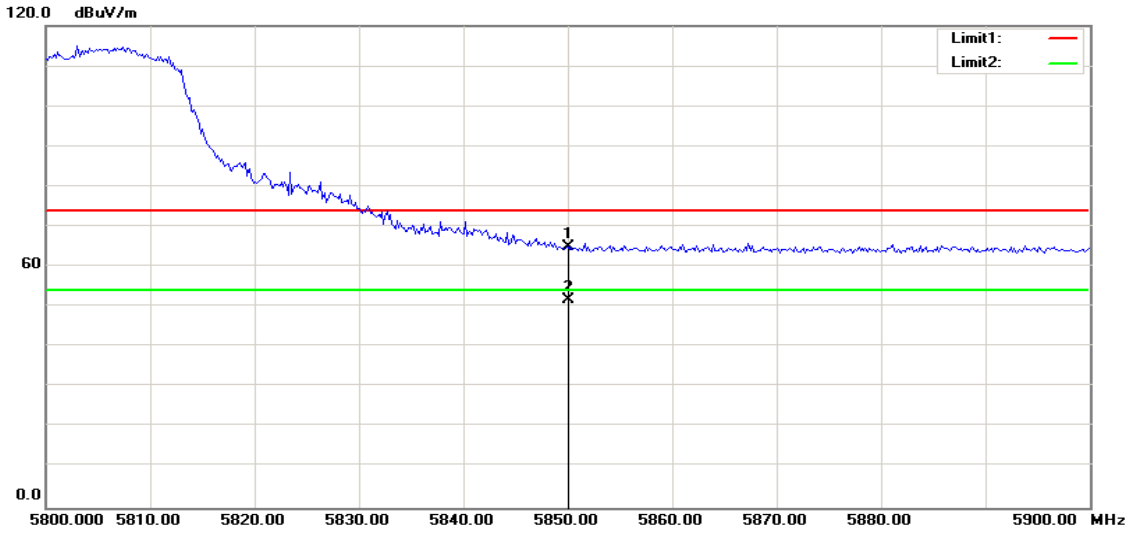


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5725.000	69.03	0.88	69.91	74.00	-4.09	100	254	peak
2	5725.025	51.42	0.88	52.30	54.00	-1.70	100	255	AVG

Band Edges (draft 802.11n Wide-40 MHz Channel mode)

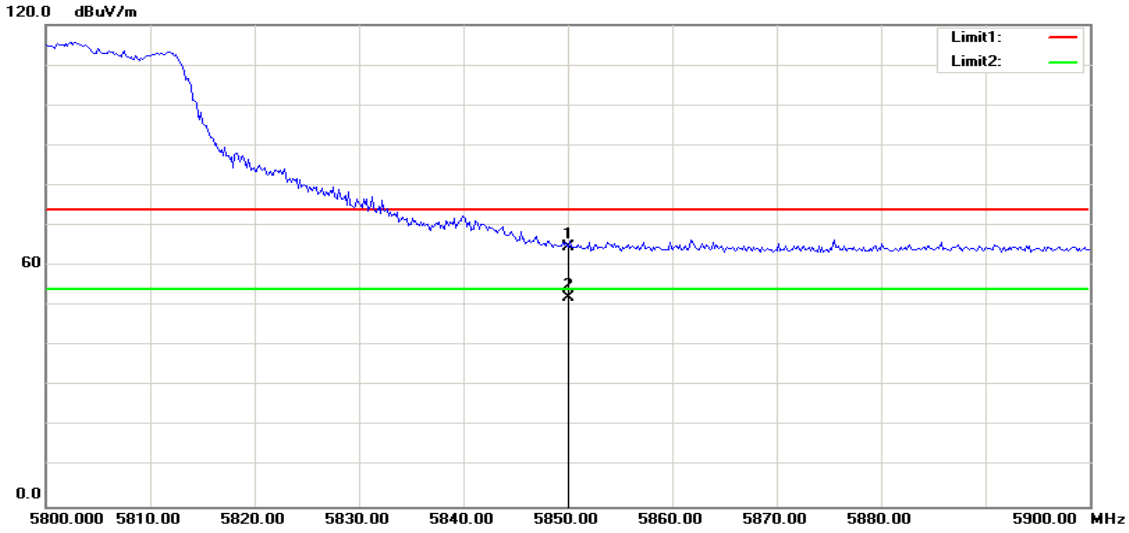
5795MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5850.000	63.93	1.02	64.95	74.00	-9.05	100	268	peak
2	5850.008	50.88	1.02	51.90	54.00	-2.10	100	213	AVG

Polarity: Horizontal

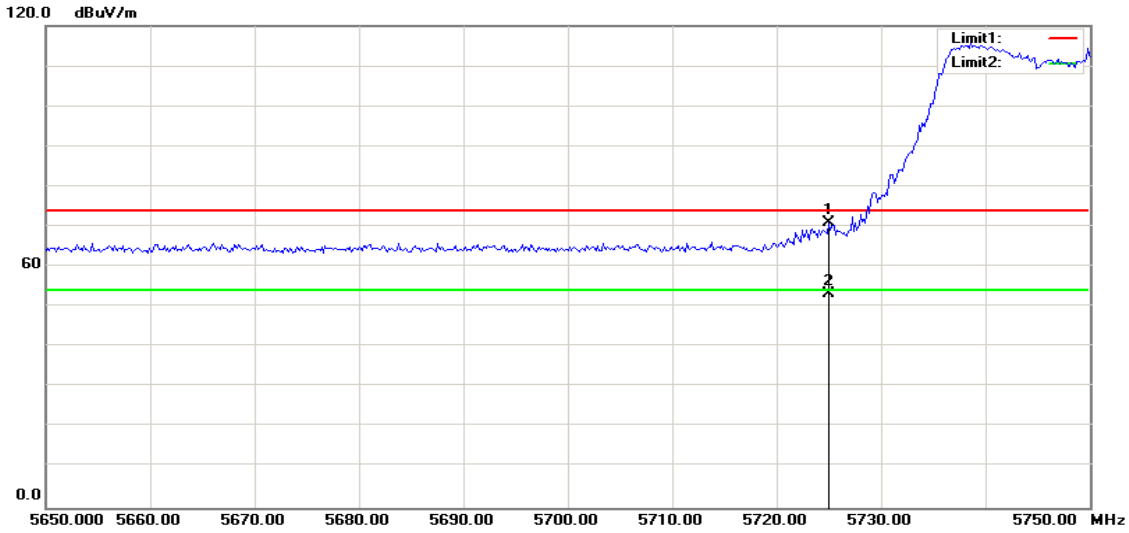


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5850.000	63.50	1.02	64.52	74.00	-9.48	100	296	peak
2	5850.025	50.90	1.02	51.92	54.00	-2.08	100	295	AVG

Band Edges (draft 802.11ac Standard-20 MHz Channel mode)

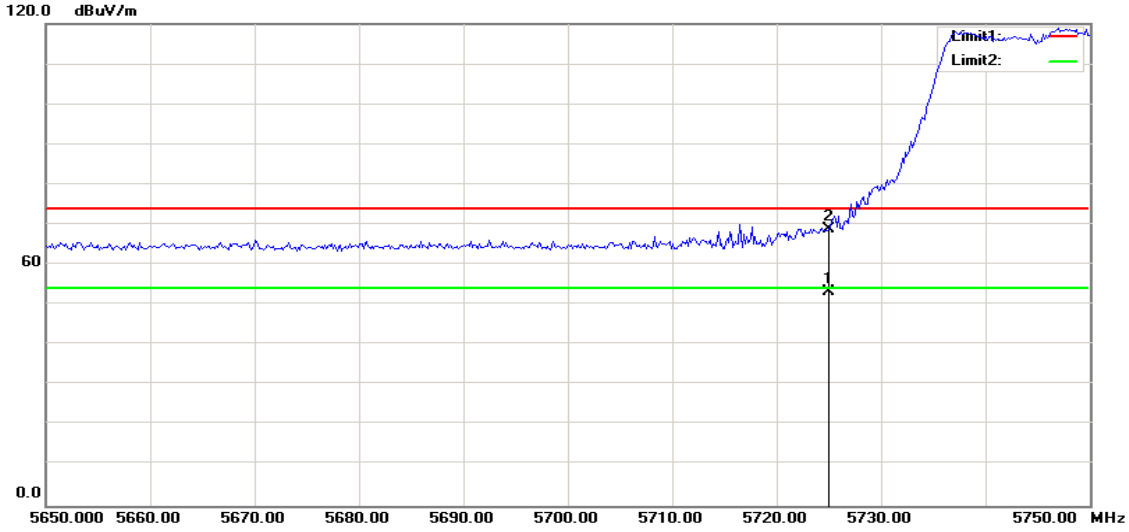
5745MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5725.000	70.14	0.88	71.02	74.00	-2.98	100	284	peak
2	5725.025	52.50	0.88	53.38	54.00	-0.62	100	285	AVG

Polarity: Horizontal

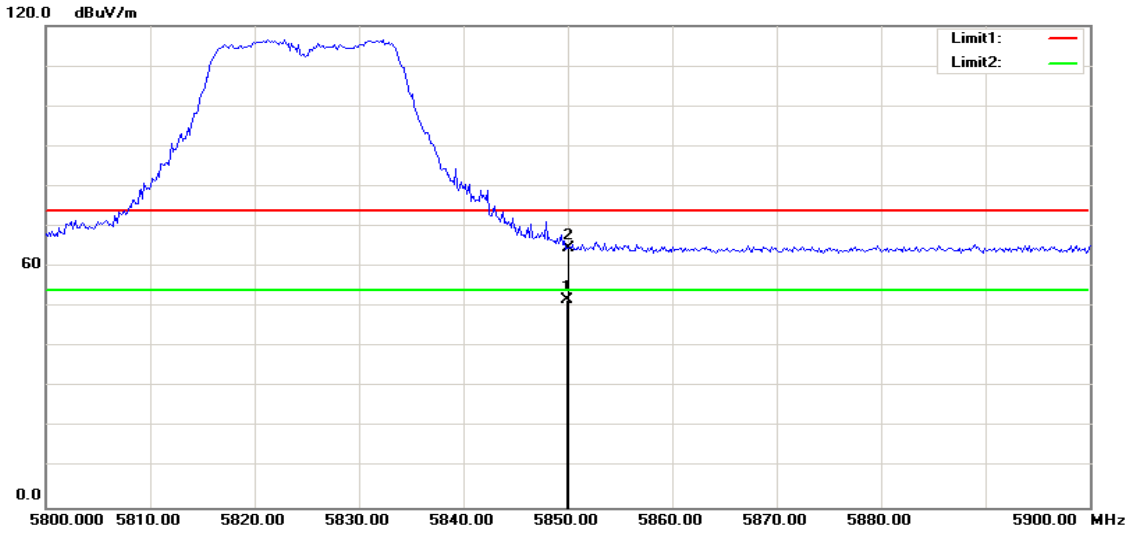


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5724.975	52.30	0.88	53.18	54.00	-0.82	100	342	AVG
2	5725.000	67.95	0.88	68.83	74.00	-5.17	100	341	peak

Band Edges (draft 802.11ac Standard-20 MHz Channel mode)

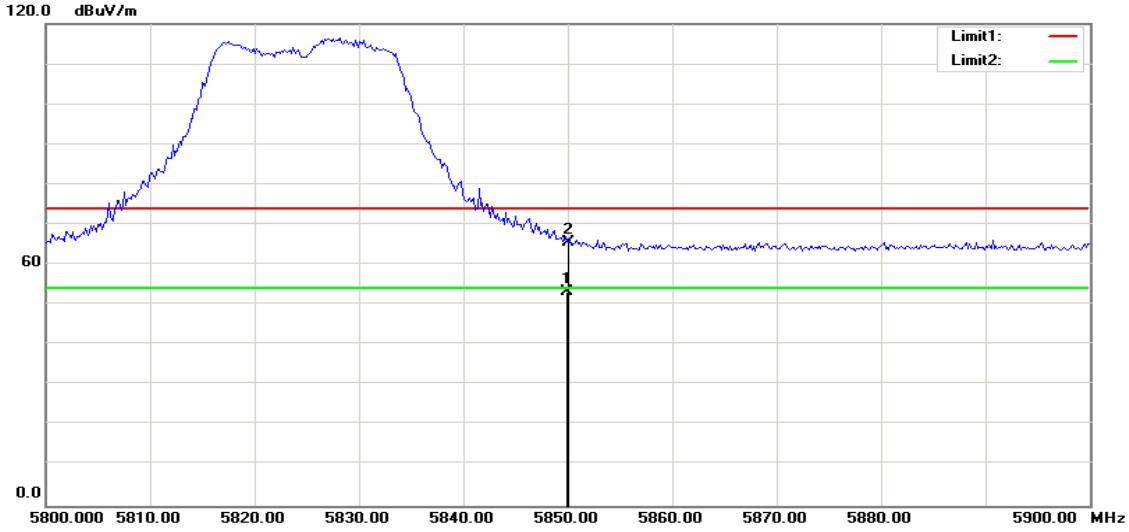
5825MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5849.975	50.66	1.02	51.68	54.00	-2.32	100	228	AVG
2	5850.000	63.70	1.02	64.72	74.00	-9.28	100	227	peak

Polarity: Horizontal

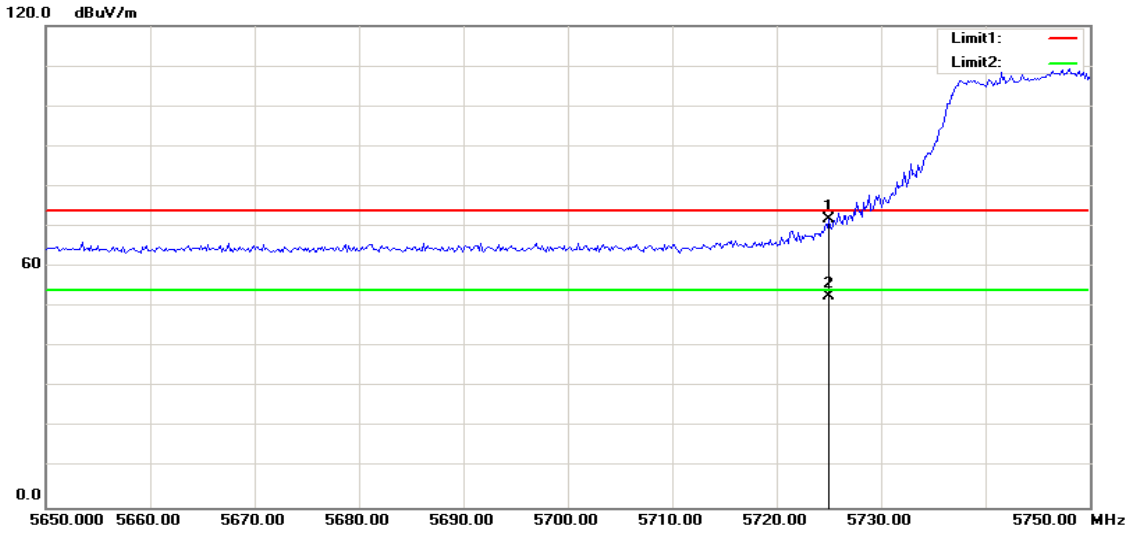


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5849.975	52.13	1.02	53.15	54.00	-0.85	100	356	AVG
2	5850.000	64.55	1.02	65.57	74.00	-8.43	100	355	peak

Band Edges (draft 802.11ac Wide-40 MHz Channel mode)

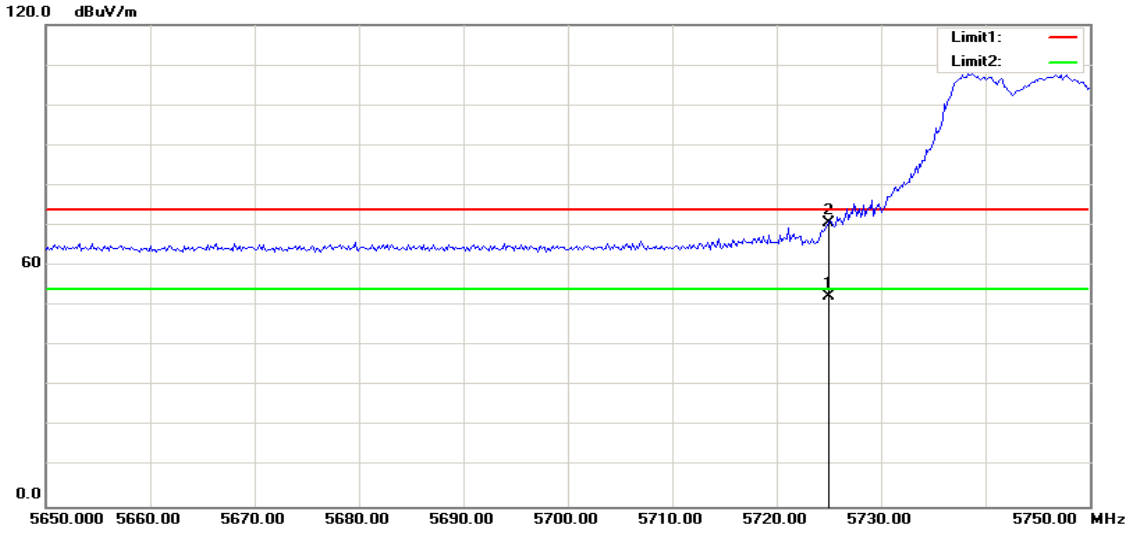
5755MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5725.000	71.11	0.88	71.99	74.00	-2.01	100	323	peak
2	5725.025	51.74	0.88	52.62	54.00	-1.38	100	322	AVG

Polarity: Horizontal

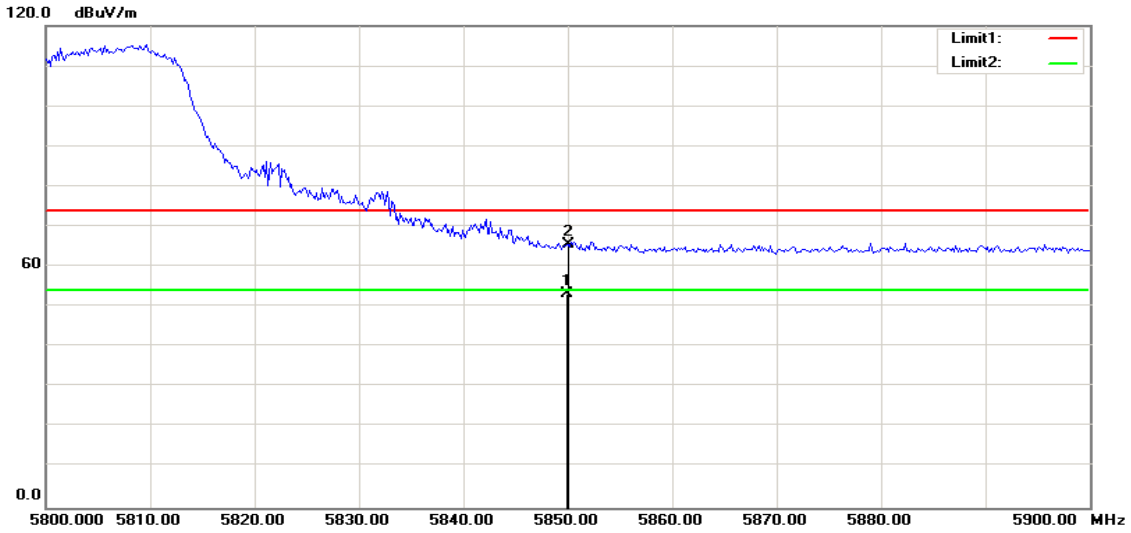


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5724.997	51.55	0.88	52.43	54.00	-1.57	100	259	AVG
2	5725.000	69.84	0.88	70.72	74.00	-3.28	100	258	peak

Band Edges (draft 802.11ac Wide-40 MHz Channel mode)

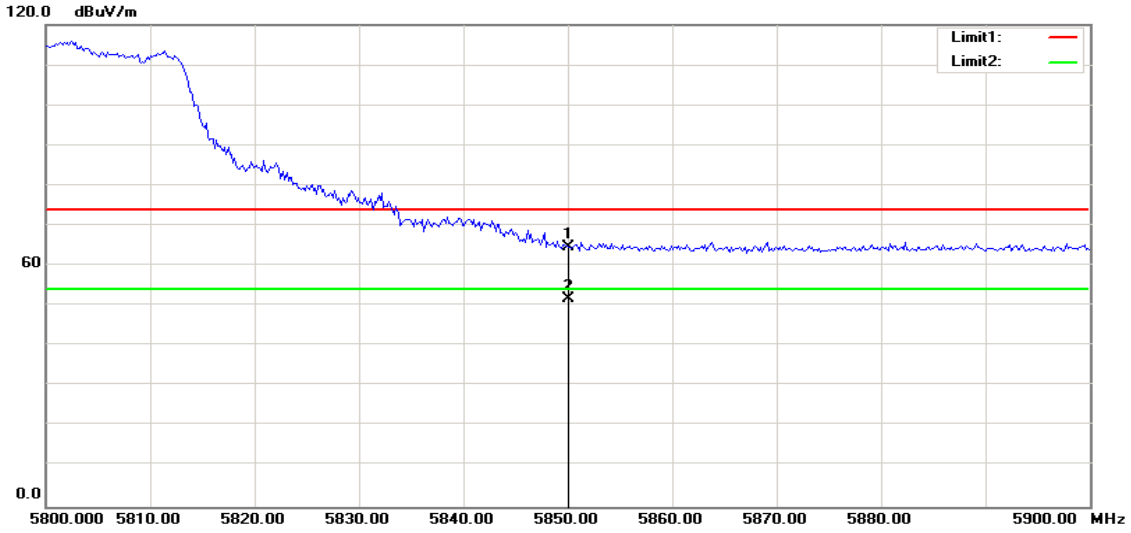
5795MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5849.950	52.17	1.02	53.19	54.00	-0.81	100	266	AVG
2	5850.000	64.39	1.02	65.41	74.00	-8.59	100	266	peak

Polarity: Horizontal

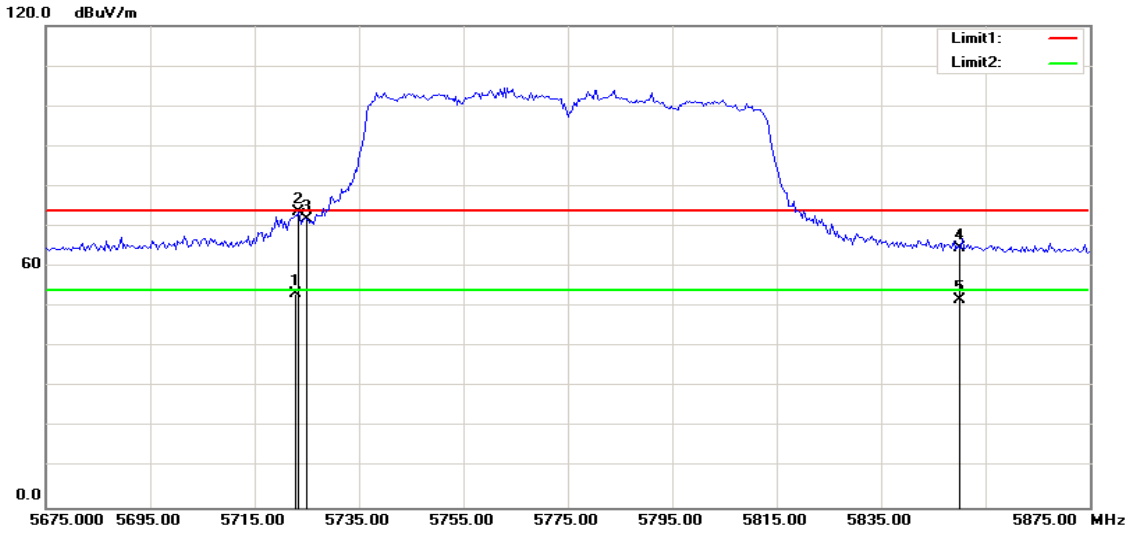


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5850.000	63.65	1.02	64.67	74.00	-9.33	100	303	peak
2	5850.025	50.81	1.02	51.83	54.00	-2.17	100	304	AVG

Band Edges (draft 802.11ac wide-80 MHz Channel mode)

5775MHz

Polarity: Vertical

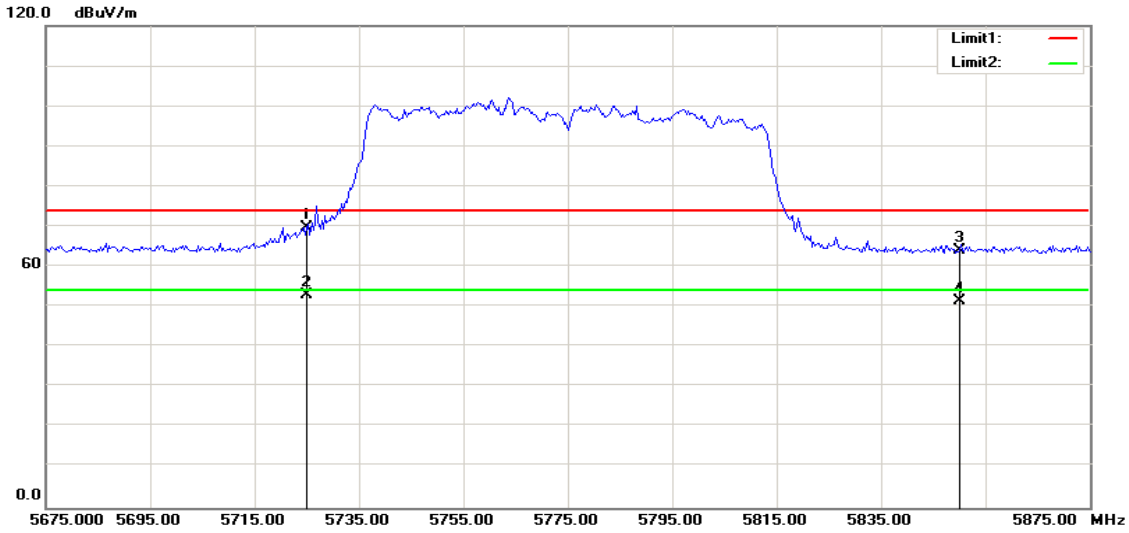


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5722.897	52.43	0.88	53.31	54.00	-0.69	100	286	AVG
2	5723.397	72.65	0.88	73.53	74.00	-0.47	100	287	peak
3	5725.000	70.89	0.88	71.77	74.00	-2.23	100	270	peak
4	5850.000	63.71	1.02	64.73	74.00	-9.27	100	288	peak
5	5850.025	50.68	1.02	51.70	54.00	-2.30	104	289	AVG

Band Edges (draft 802.11ac wide-80 MHz Channel mode)

5775MHz

Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5725.000	68.73	0.88	69.61	74.00	-4.39	100	337	peak
2	5725.008	51.96	0.88	52.84	54.00	-1.16	100	0	AVG
3	5850.000	63.00	1.02	64.02	74.00	-9.98	100	295	peak
4	5850.025	50.56	1.02	51.58	54.00	-2.42	100	296	AVG

7.4 POWER SPECTRAL DENSITY

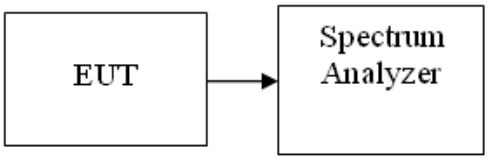
LIMIT

According to §15.407(a),

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

If transmitting antennas of directional gain greater than 6dBi are used, both the maximum *transmit power and the* maximum *power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.*

Test Configuration



TEST PROCEDURE

1. The testing follows Method SA-2 of FCC KDB 789033 D01 General UNII Test Procedures v01r03.
2. Measure the duty cycle, Set span to encompass the entire emission bandwidth (EBW) of the signal. Set RBW = 300 kHz. Set VBW ≥ 1 MHz. Number of points in sweep ≥ 2 Span / RBW. Sweep time = auto. Detector = RMS, Trace average at least 100 traces in power averaging mode. Add 10 log(500kHz/RBW) to the test result. Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.
3. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
4. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (1): Measure and sum the spectra across the outputs. The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode

5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average PSD (dBm/500kHz)			10log (500kHz/ RBW) Factor(dB)	Total PPSD (dBm)	Average PSD Limit (dBm/500kHz)	Result
		Chain 0	Chain 1	Chain 2	Chain 0	Chain 1	Chain 2				
Low	5745	0.15	0.14	0.15	1.35	0.16	0.59	2.22	6.64	30.00	PASS
Mid	5785	0.15	0.14	0.15	1.56	1.54	0.83	2.22	6.81	30.00	PASS
High	5825	0.15	0.14	0.15	0.49	0.48	0.15	2.22	6.10	30.00	PASS

Test mode: draft 802.11n Standard-20 MHz Channel mode

5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average PSD (dBm/500kHz)			10log (500kHz/ RBW) Factor(dB)	Total PPSD (dBm)	Average PSD Limit (dBm/500kHz)	Result
		Chain 0	Chain 1	Chain 2	Chain 0	Chain 1	Chain 2				
Low	5745	0.14	0.14	0.15	1.35	1.54	0.45	2.22	6.60	30.00	PASS
Mid	5785	0.14	0.14	0.15	1.40	0.90	0.21	2.22	6.56	30.00	PASS
High	5825	0.14	0.14	0.15	0.30	0.50	0.09	2.22	5.99	30.00	PASS

Test mode: draft 802.11n Wide-40 MHz Channel mode

5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average PSD (dBm/500kHz)			10log (500kHz/ RBW) Factor(dB)	Total PPSD (dBm)	Average PSD Limit (dBm/500kHz)	Result
		Chain 0	Chain 1	Chain 2	Chain 0	Chain 1	Chain 2				
Low	5755	0.28	0.27	0.25	-3.68	-2.37	-3.01	2.22	3.84	30.00	PASS
High	5795	0.28	0.27	0.25	-2.65	-2.85	-3.18	2.22	4.15	30.00	PASS

Test mode: draft 802.11ac Standard-20 MHz Channel mode

5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average PSD (dBm/500kHz)			10log (500kHz/ RBW) Factor(dB)	Total PPSD (dBm)	Average PSD Limit (dBm/500kHz)	Result
		Chain 0	Chain 1	Chain 2	Chain 0	Chain 1	Chain 2				
Low	5745	0.16	0.16	0.17	1.25	0.53	0.62	2.22	6.61	30.00	PASS
Mid	5785	0.16	0.16	0.17	1.22	1.22	0.48	2.22	6.56	30.00	PASS
High	5825	0.16	0.16	0.17	-0.22	-0.44	0.13	2.22	5.79	30.00	PASS

Test mode: draft 802.11ac Wide-40 MHz Channel mode

5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average PSD (dBm/500kHz)			10log (500kHz/ RBW) Factor(dB)	Total PPSD (dBm)	Average PSD Limit (dBm/500kHz)	Result
		Chain 0	Chain 1	Chain 2	Chain 0	Chain 1	Chain 2				
Low	5755	0.31	0.30	0.27	-2.43	-3.19	-3.08	2.22	4.29	30.00	PASS
High	5795	0.31	0.30	0.27	-2.17	-3.21	-2.85	2.22	4.44	30.00	PASS

Test mode: draft 802.11ac Wide-80 MHz Channel mode

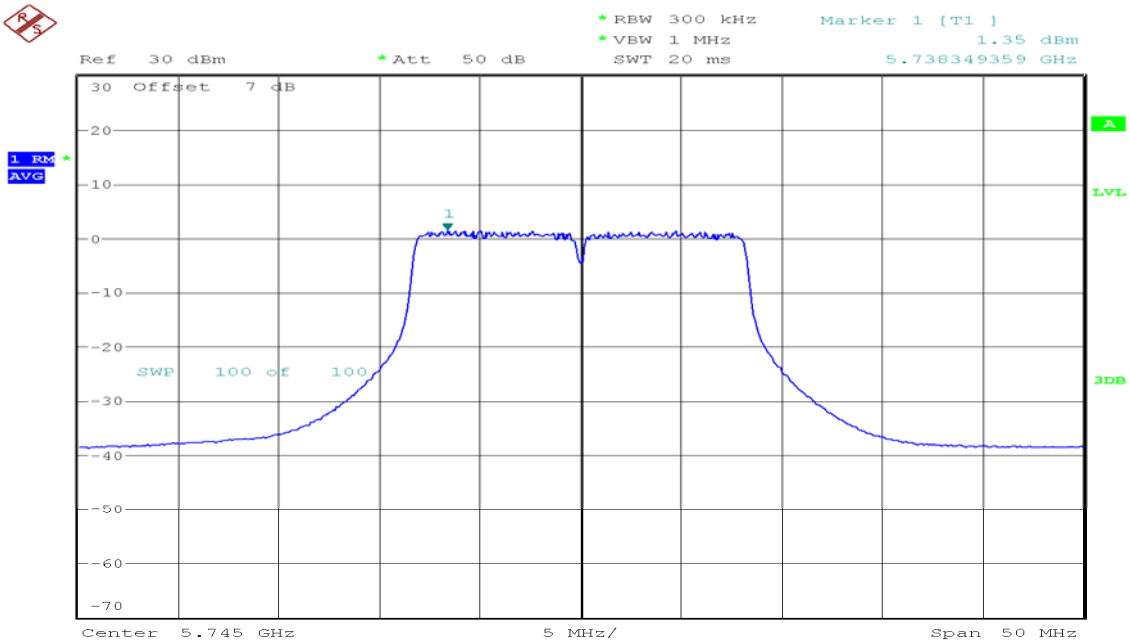
5745~5850MHz

Channel	Frequency (MHz)	Duty factor (dB)			Average PSD (dBm/500kHz)			10log (500kHz/ RBW) Factor(dB)	Total PPSD (dBm)	Average PSD Limit (dBm/500kHz)	Result
		Chain 0	Chain 1	Chain 2	Chain 0	Chain 1	Chain 2				
Mid	5775	0.51	0.54	0.48	-6.19	-5.06	-6.65	2.22	2.92	30.00	PASS

Test Plot
IEEE 802.11a mode/chain 0:

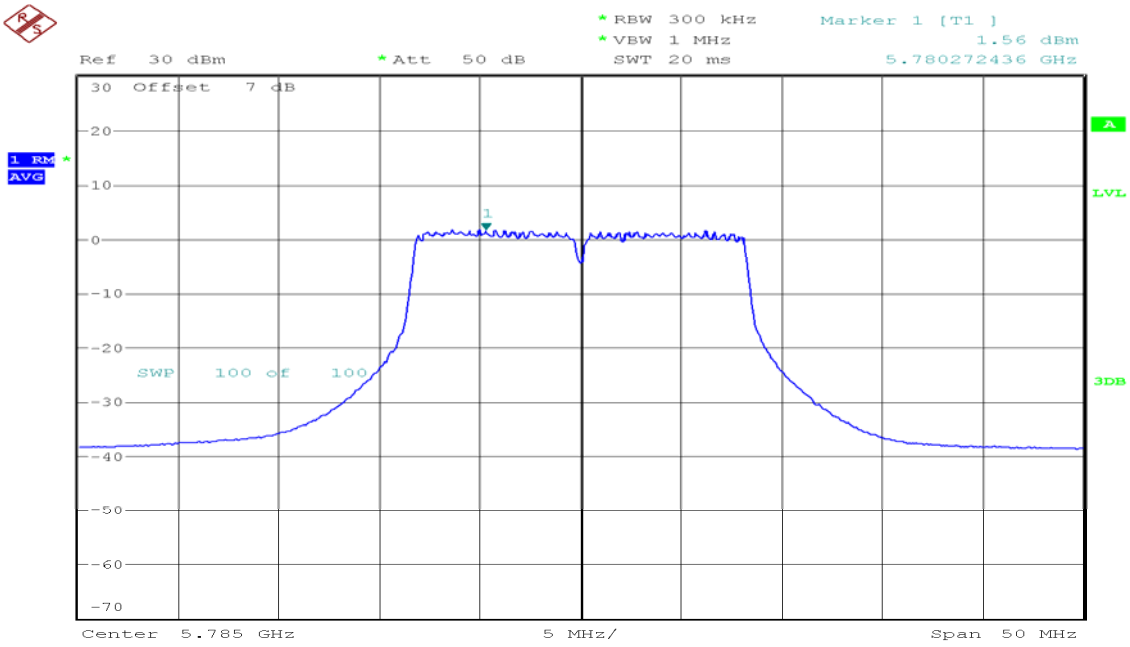
5745~5850MHz

CH Low



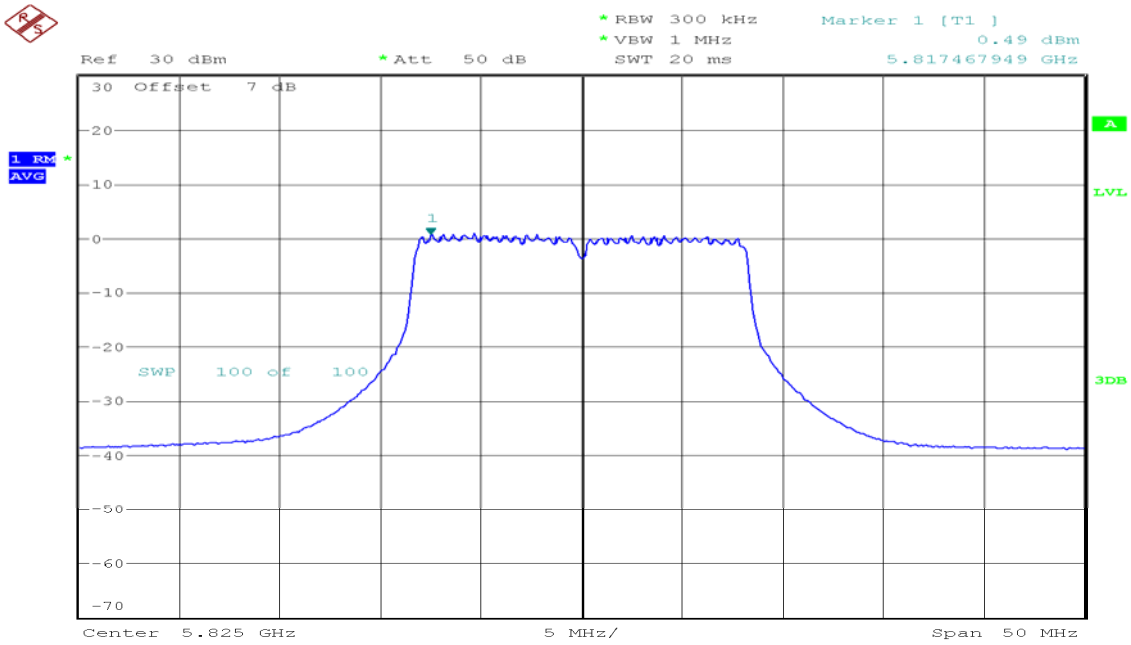
Date: 29.OCT.2014 10:03:51

CH Mid



Date: 29.OCT.2014 10:05:09

CH High

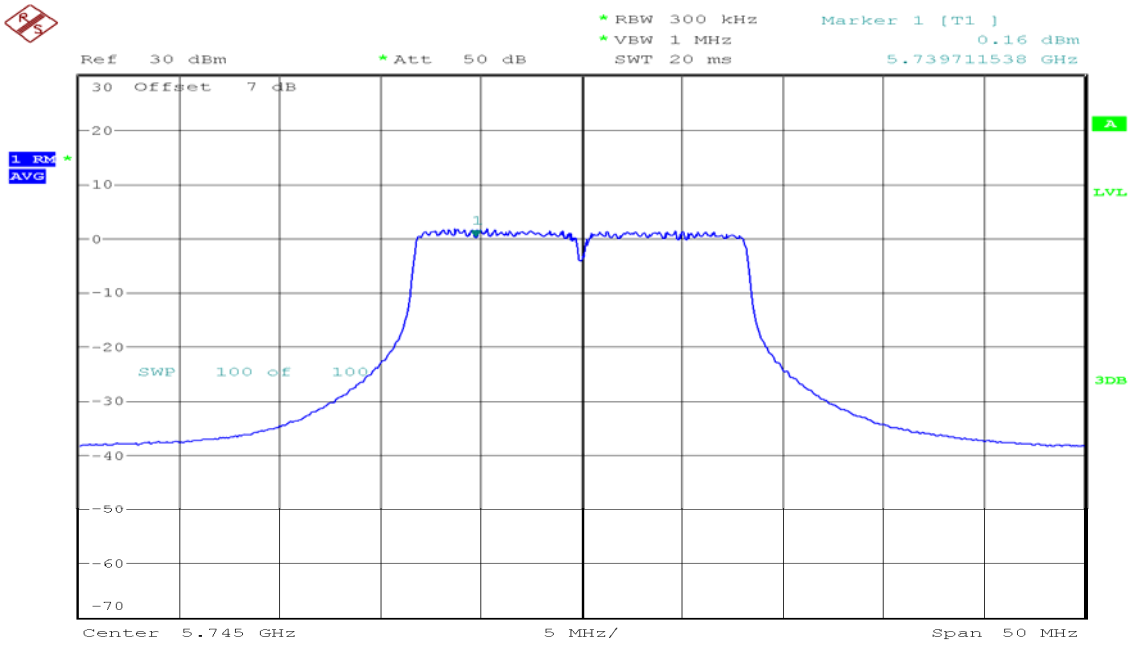


Date: 29.OCT.2014 10:06:18

IEEE 802.11a mode/chain 1:

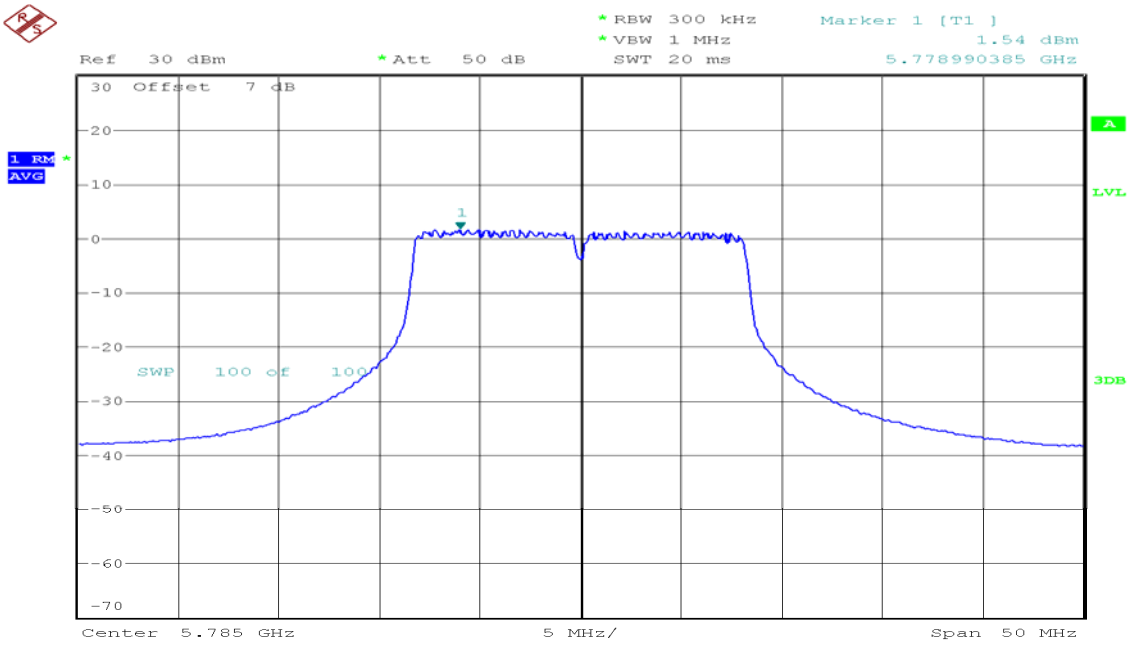
5745~5850MHz

CH Low



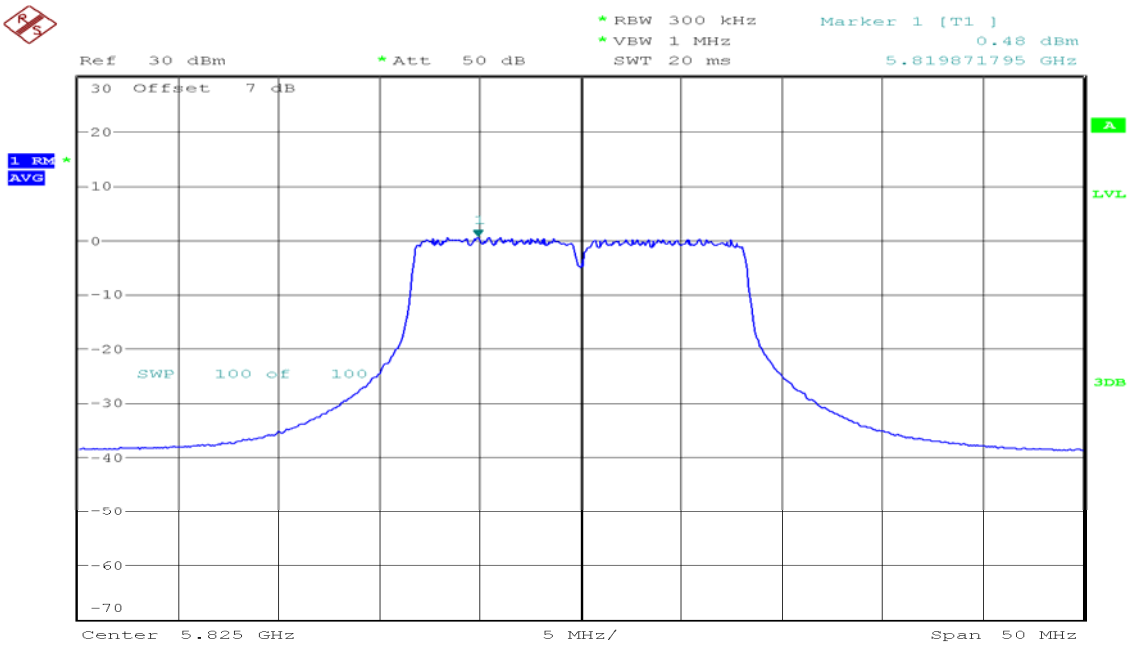
Date: 29.OCT.2014 10:07:51

CH Mid



Date: 29.OCT.2014 10:08:45

CH High

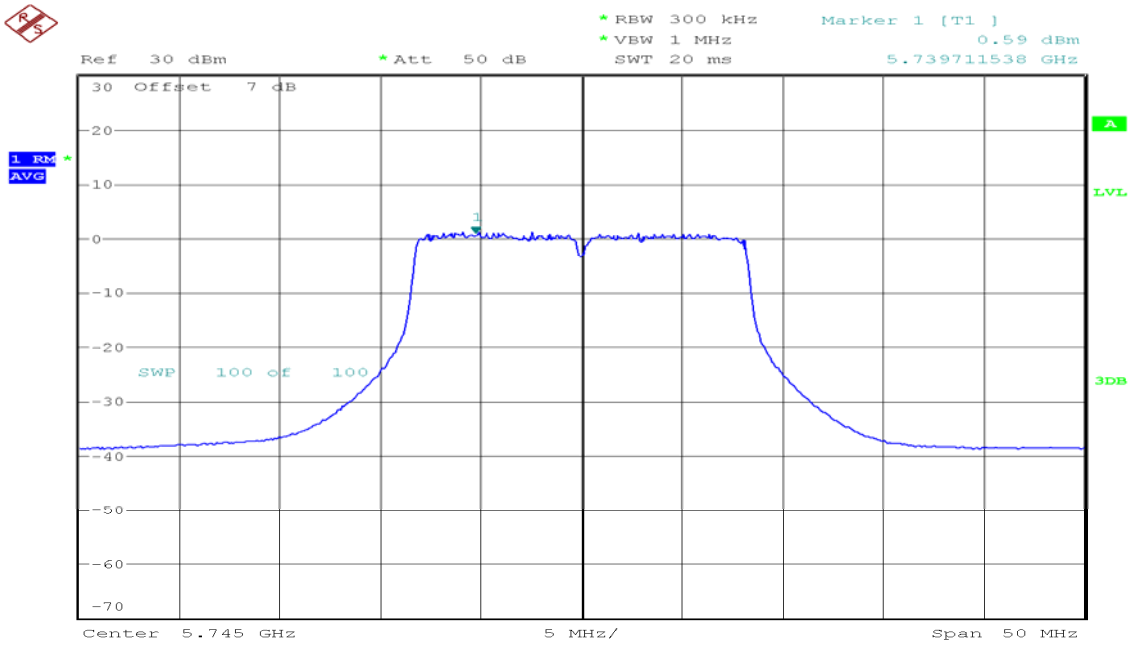


Date: 29.OCT.2014 10:09:41

IEEE 802.11a mode/chain 2:

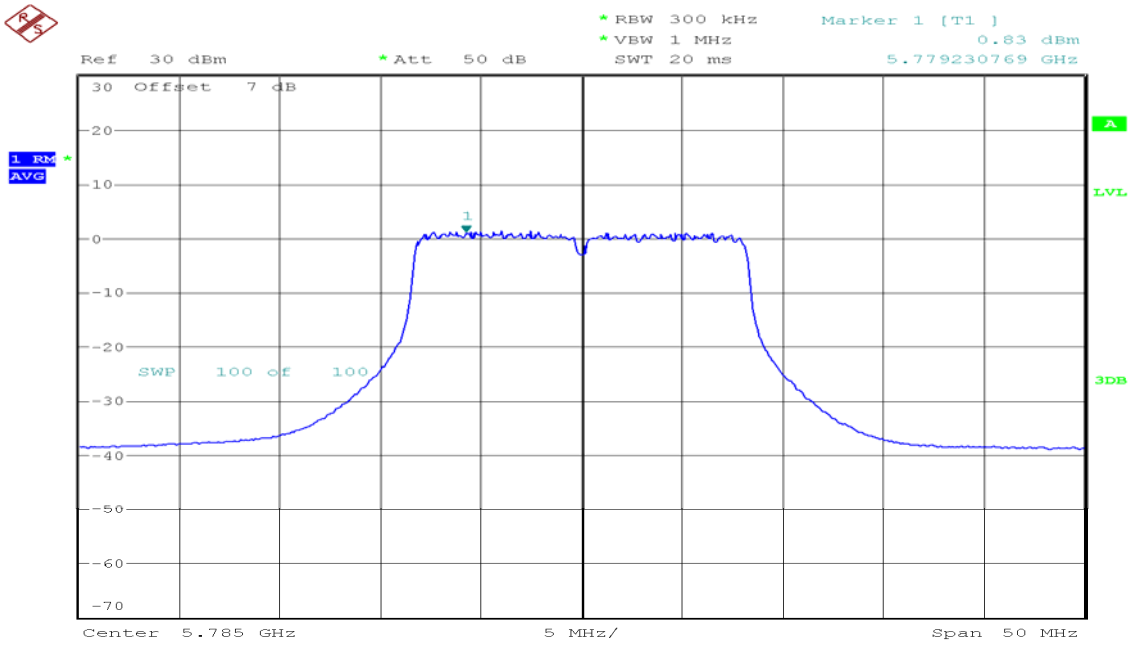
5745~5850MHz

CH Low



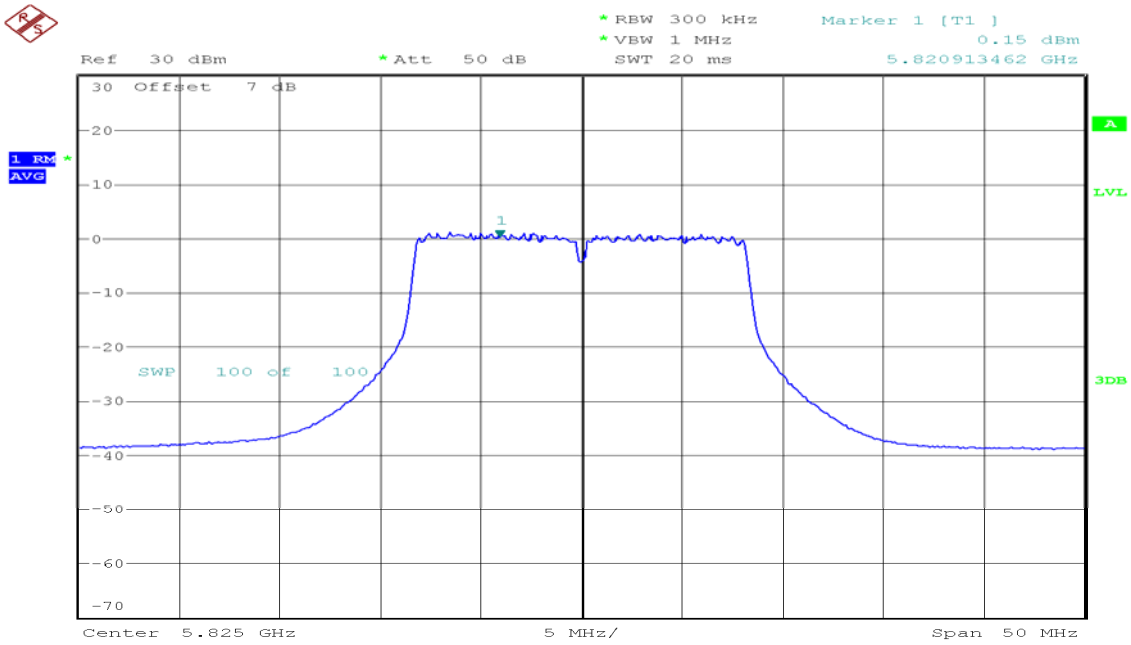
Date: 29.OCT.2014 10:11:02

CH Mid



Date: 29.OCT.2014 10:11:48

CH High

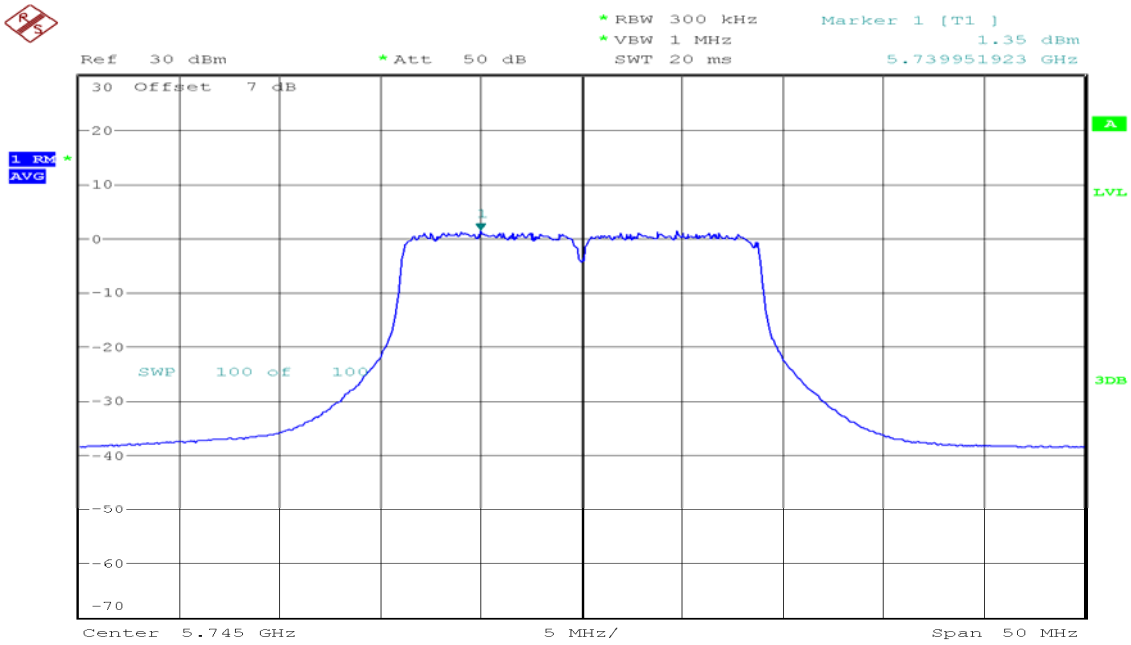


Date: 29.OCT.2014 10:12:43

draft 802.11n Standard-20 MHz Channel mode / Chain 0

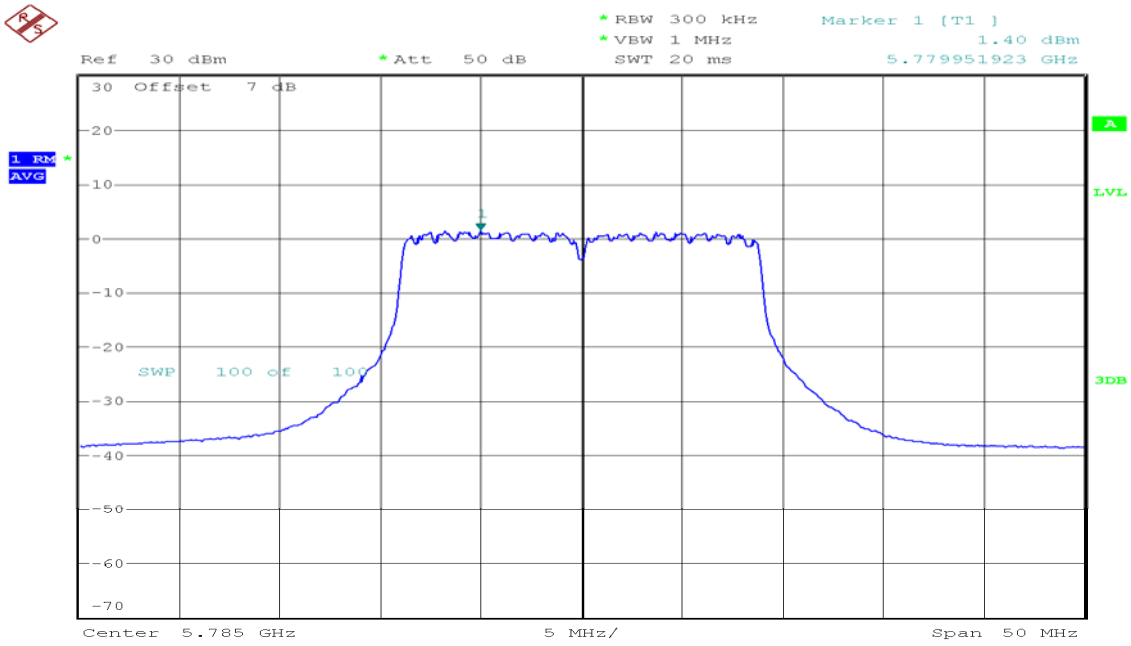
5745~5850MHz

CH Low



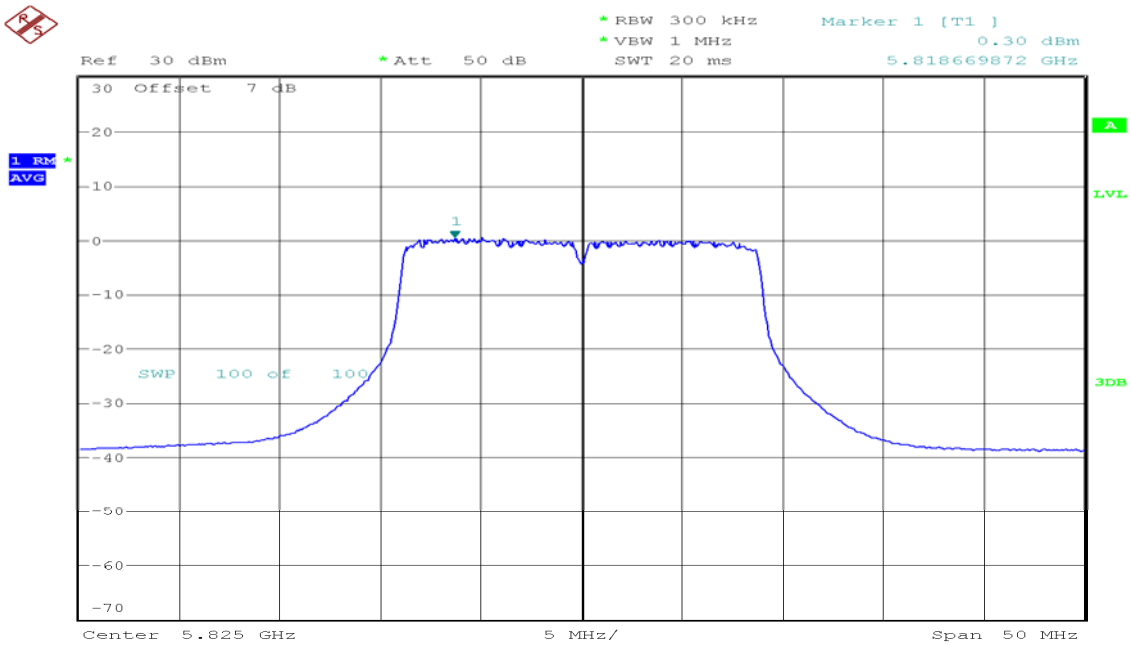
Date: 29.OCT.2014 10:14:50

CH Mid



Date: 29.OCT.2014 10:15:48

CH High

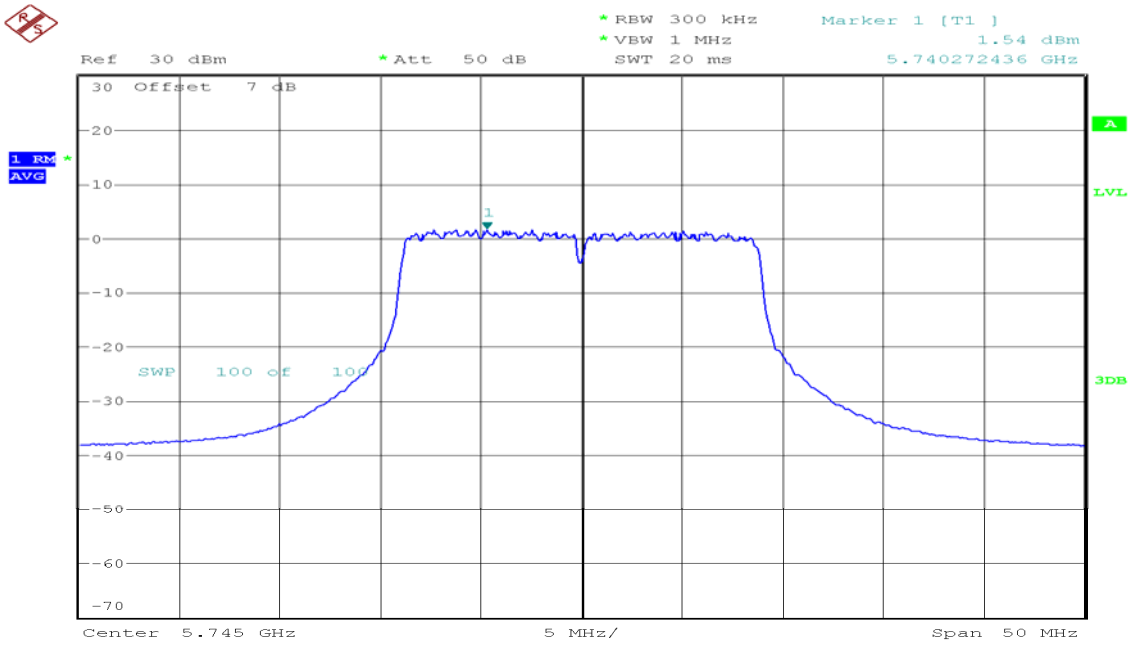


Date: 29.OCT.2014 10:16:36

draft 802.11n Standard-20 MHz Channel mode / Chain 1

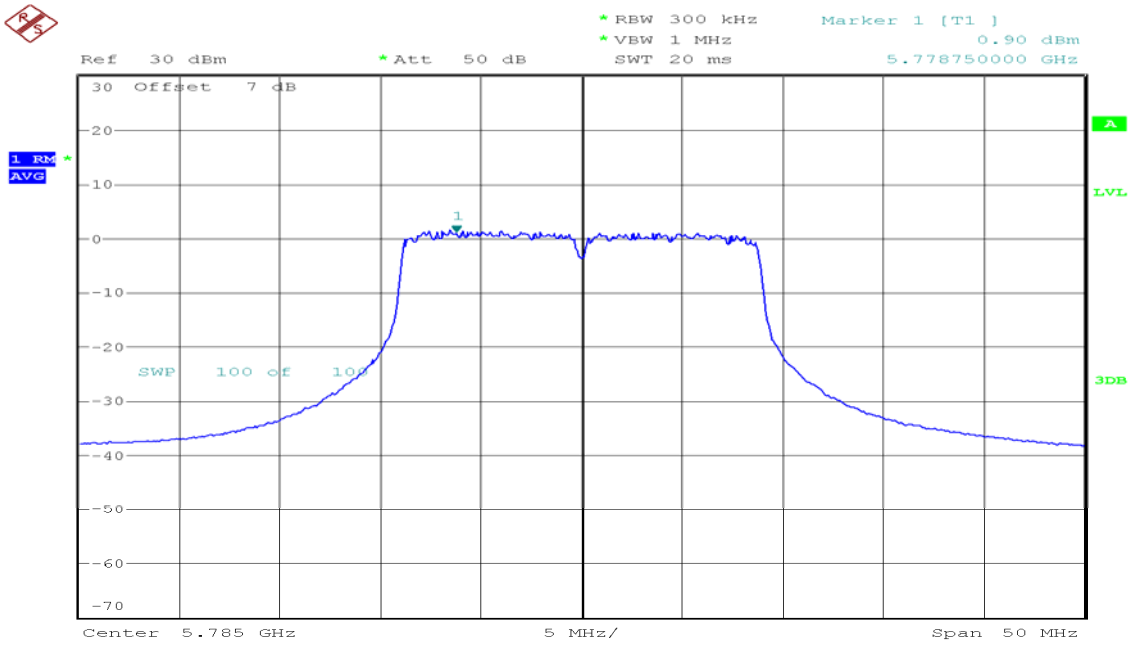
5745~5850MHz

CH Low



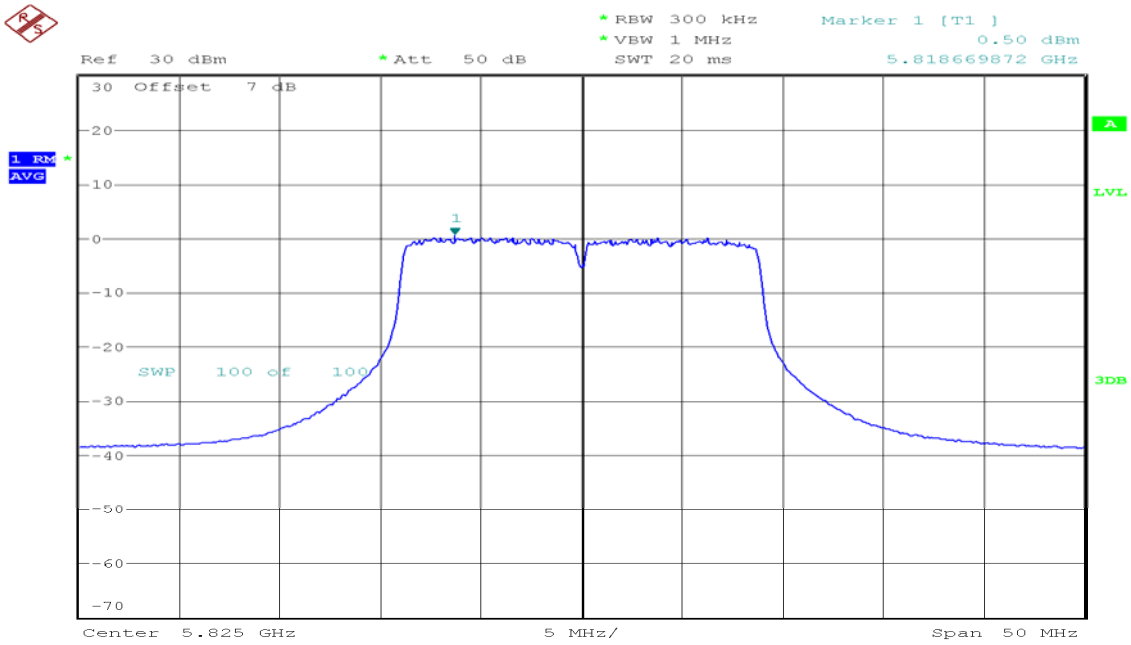
Date: 29.OCT.2014 10:18:01

CH Mid



Date: 29.OCT.2014 10:18:42

CH High

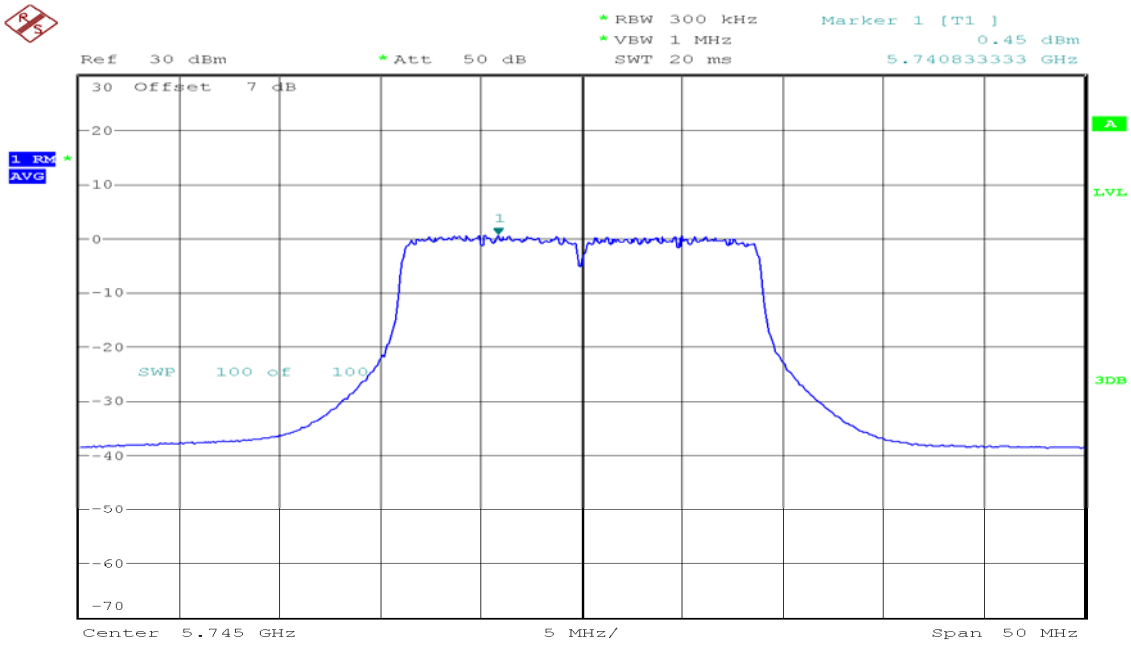


Date: 29.OCT.2014 10:19:22

draft 802.11n Standard-20 MHz Channel mode / Chain 2

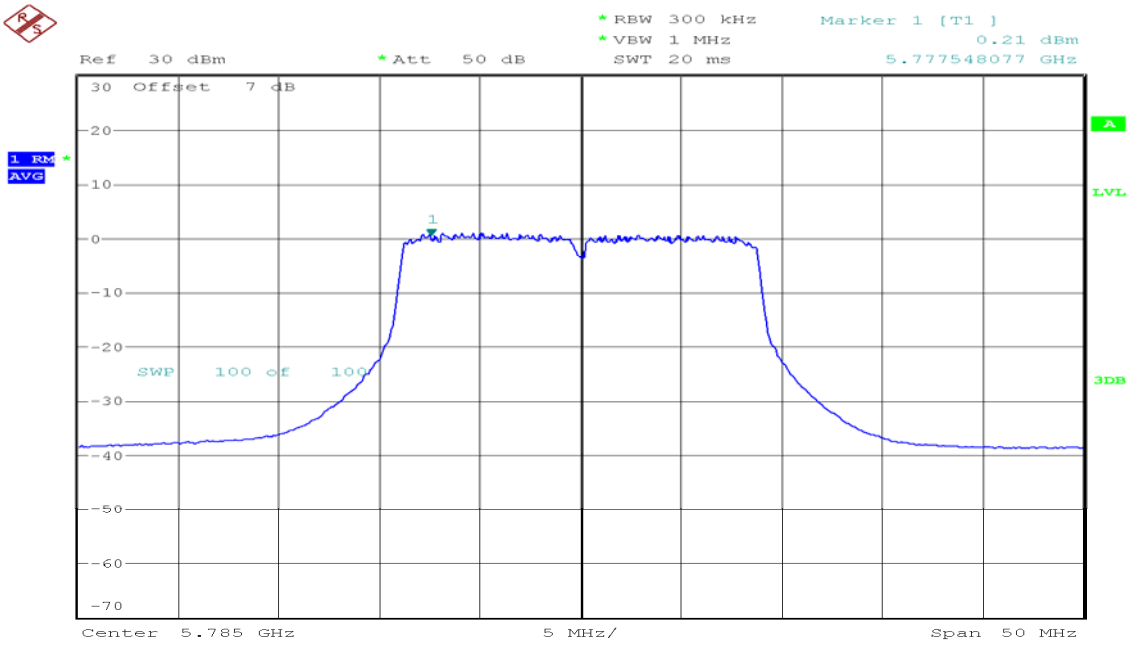
5745~5850MHz

CH Low



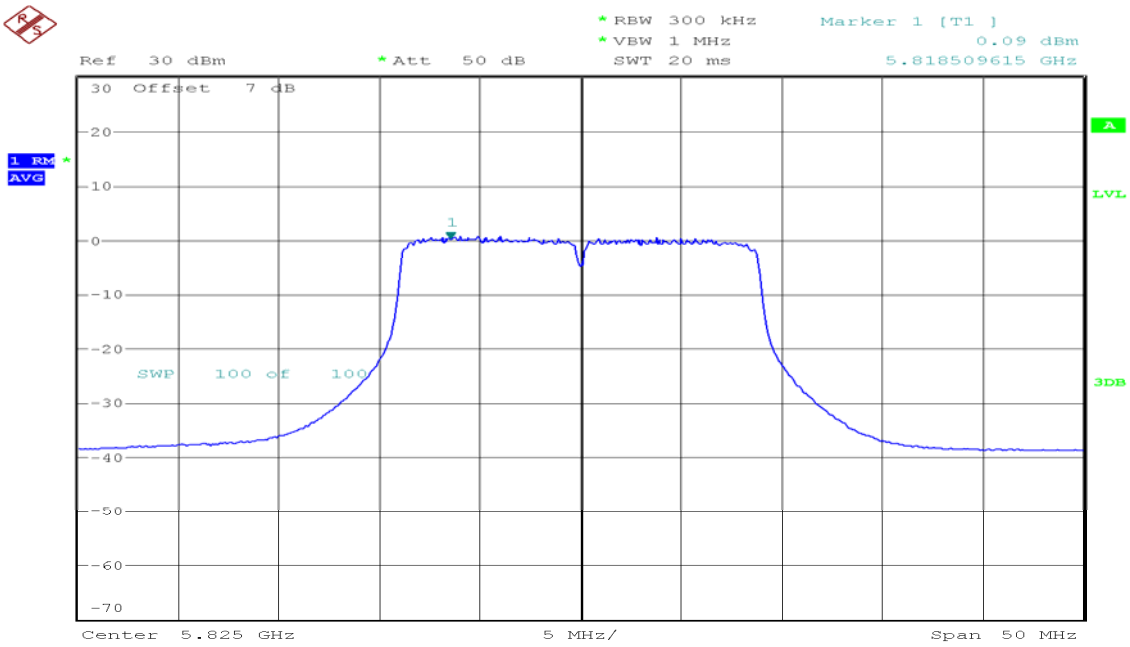
Date: 29.OCT.2014 10:20:28

CH Mid



Date: 29.OCT.2014 10:21:18

CH High

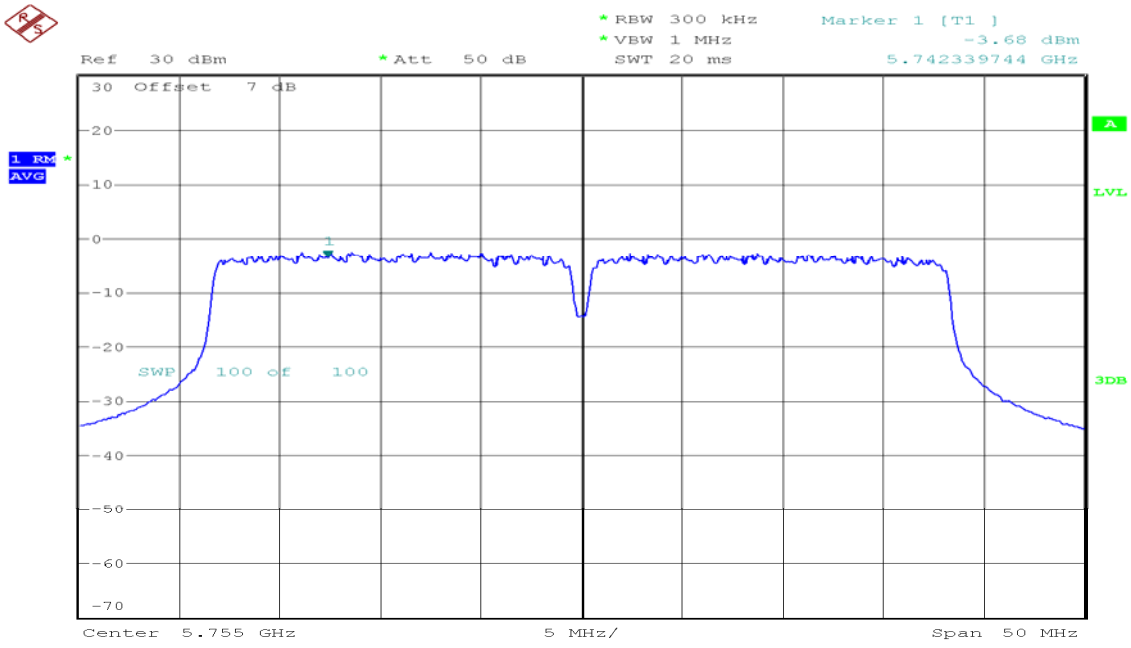


Date: 29.OCT.2014 10:22:15

draft 802.11n Wide-40 MHz Channel mode / Chain 0

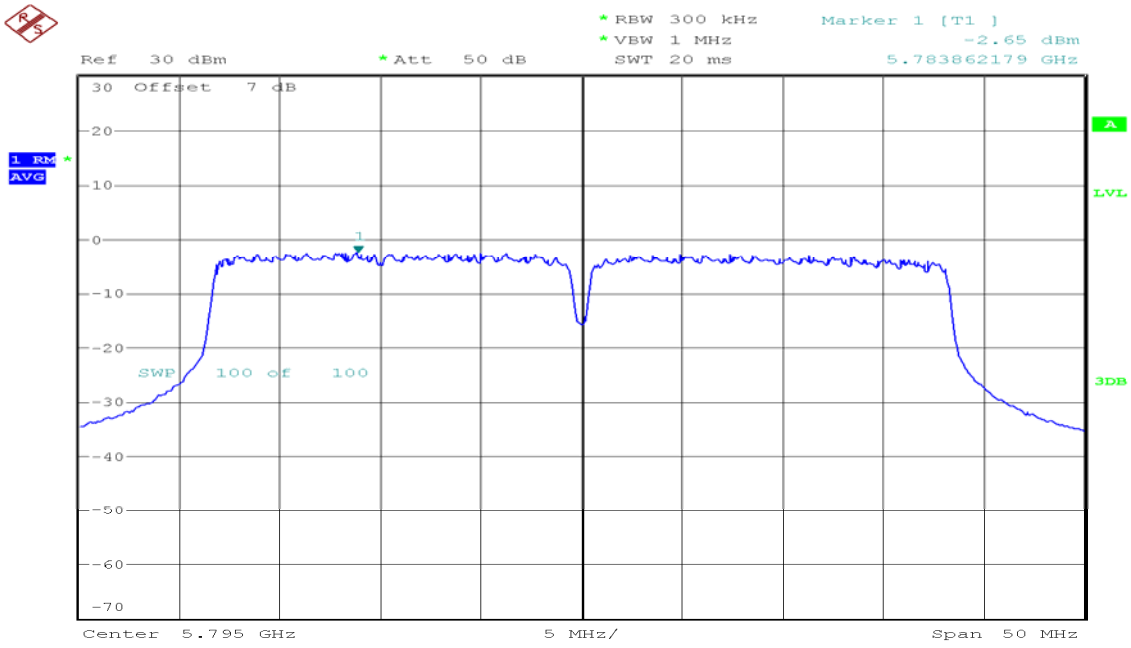
5745~5850MHz

CH Low



Date: 29.OCT.2014 10:26:12

CH High

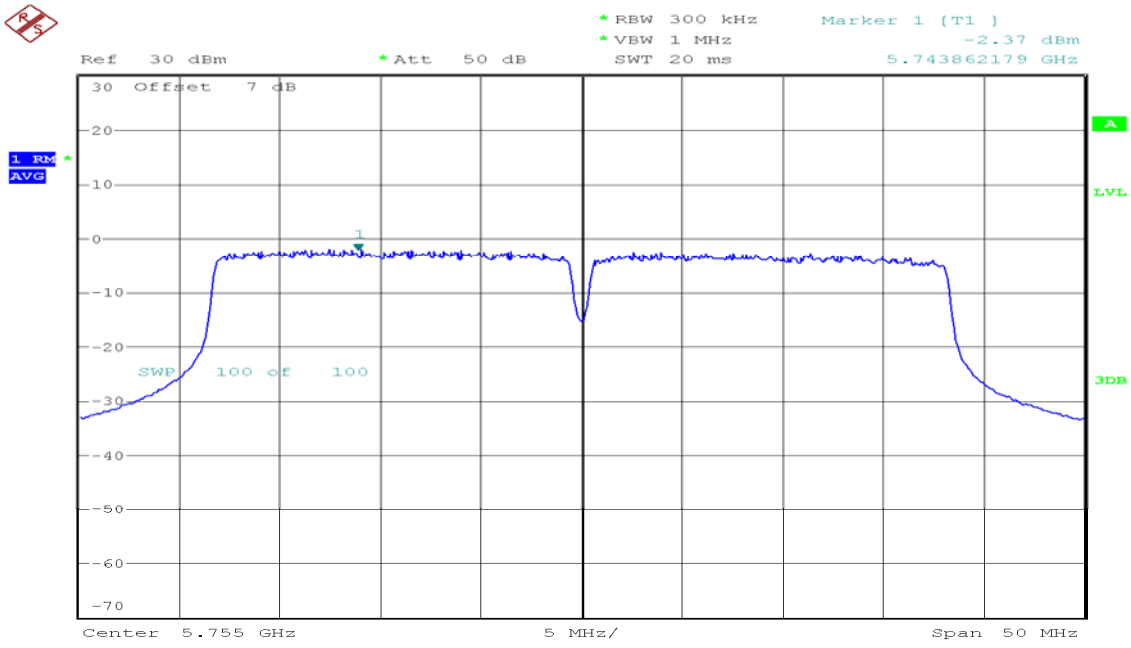


Date: 29.OCT.2014 10:27:21

draft 802.11n Wide-40 MHz Channel mode / Chain 1

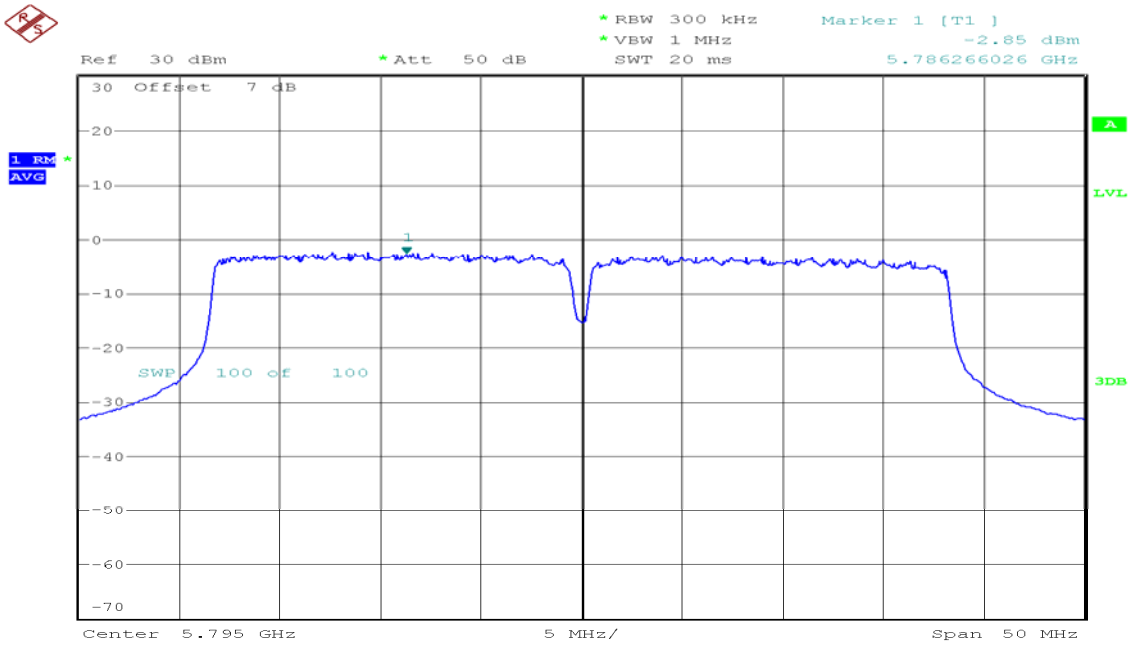
5745~5850MHz

CH Low



Date: 29.OCT.2014 10:28:26

CH High

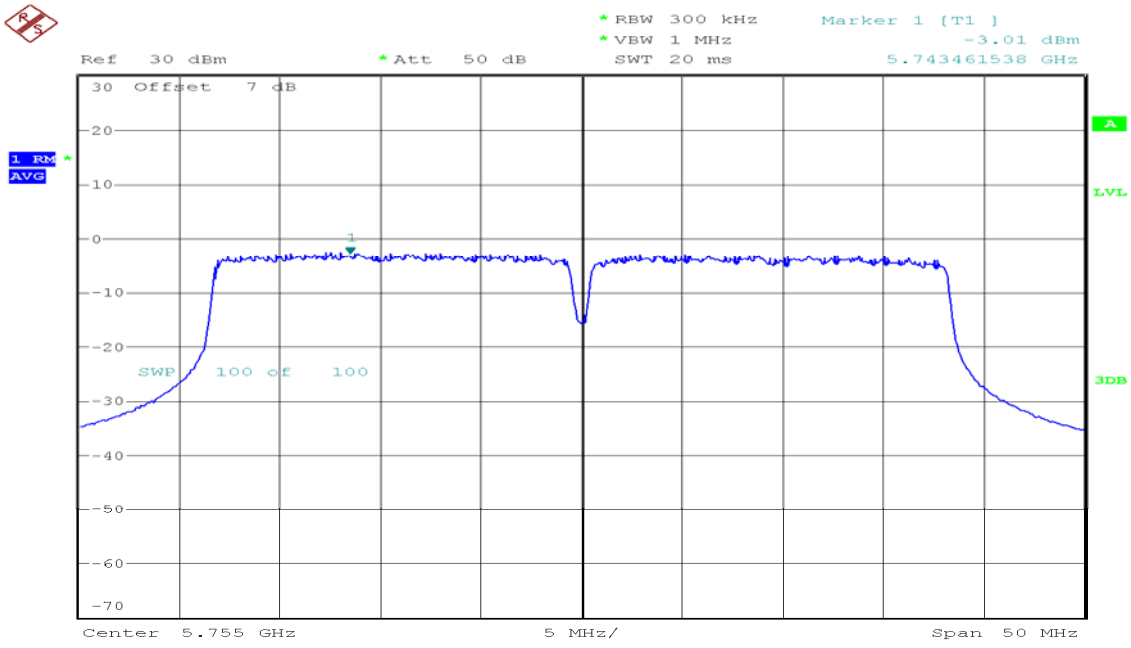


Date: 29.OCT.2014 10:34:51

draft 802.11n Wide-40 MHz Channel mode / Chain 2

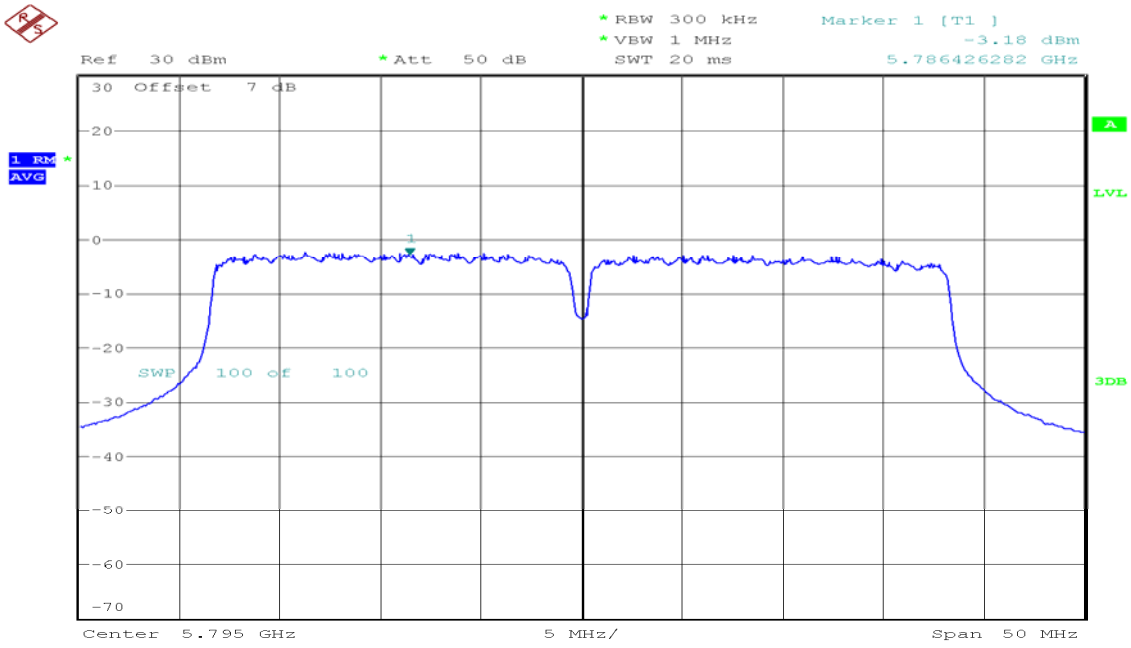
5745~5850MHz

CH Low



Date: 29.OCT.2014 10:36:05

CH High

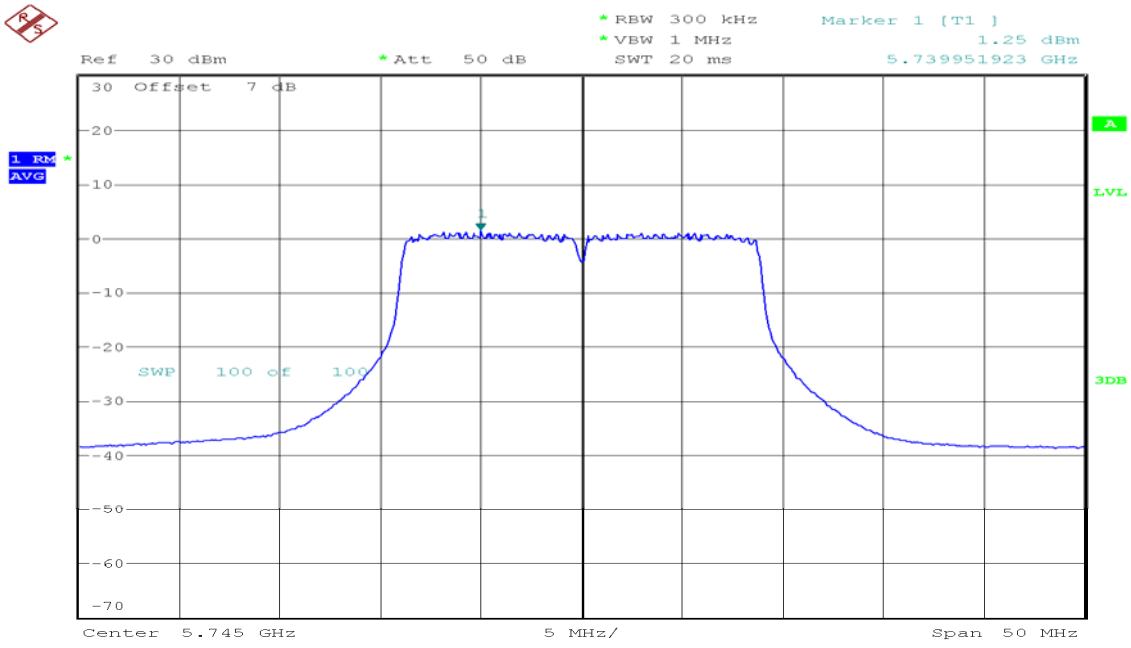


Date: 29.OCT.2014 10:36:53

draft 802.11ac Standard-20 MHz Channel mode / Chain 0

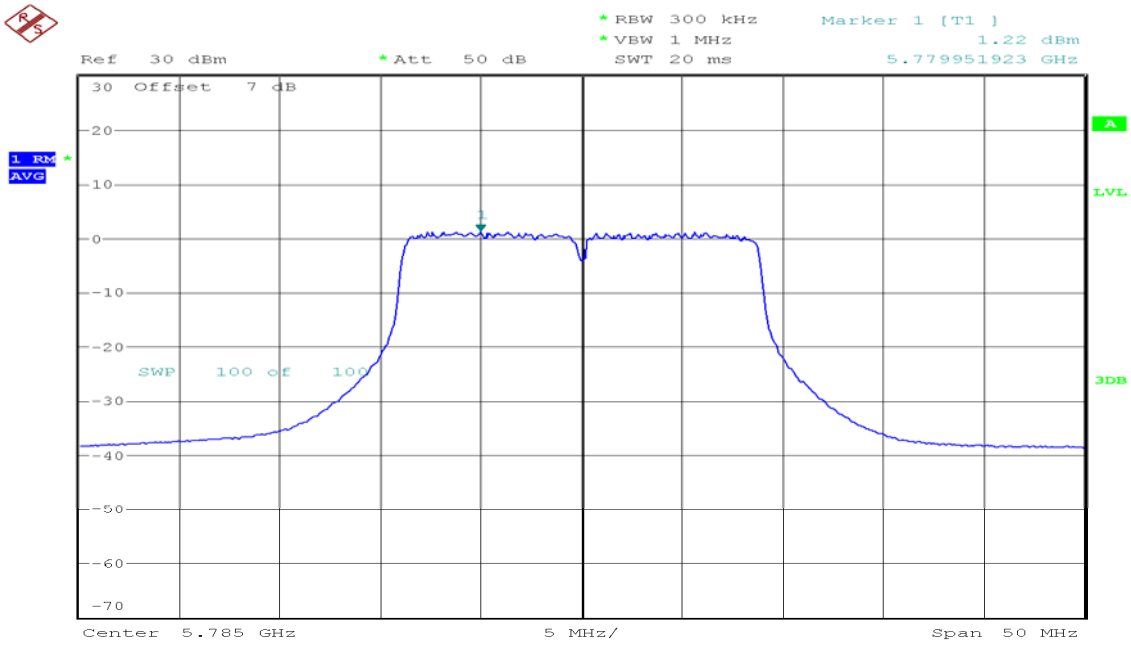
5745~5850MHz

CH Low



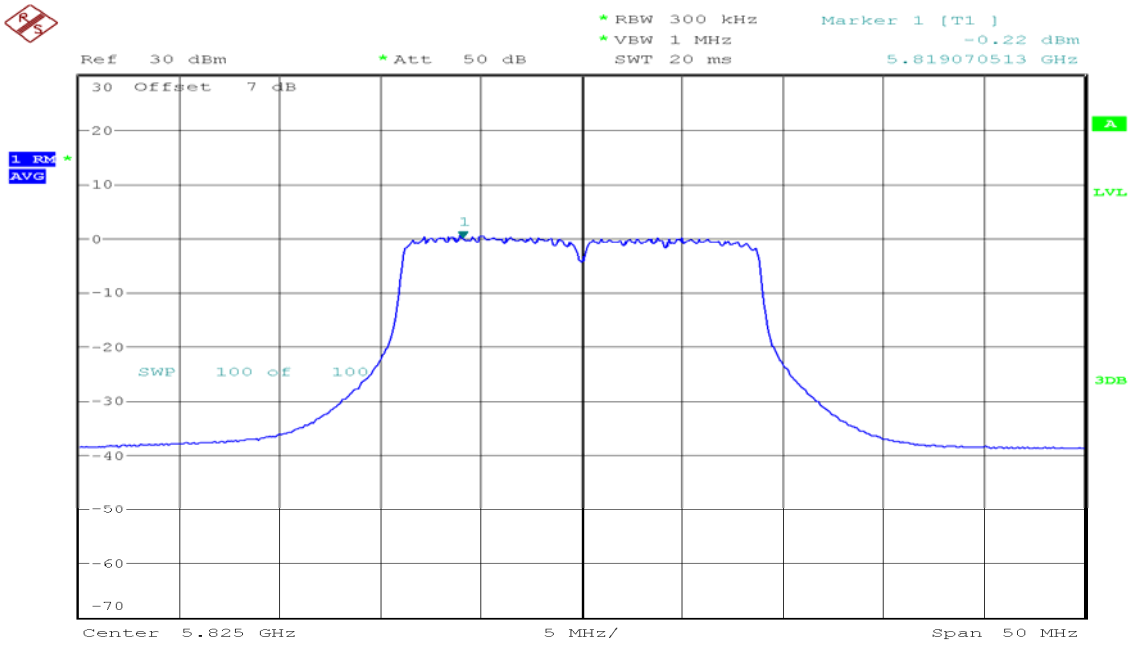
Date: 29.OCT.2014 10:38:09

CH Mid



Date: 29.OCT.2014 10:39:23

CH High

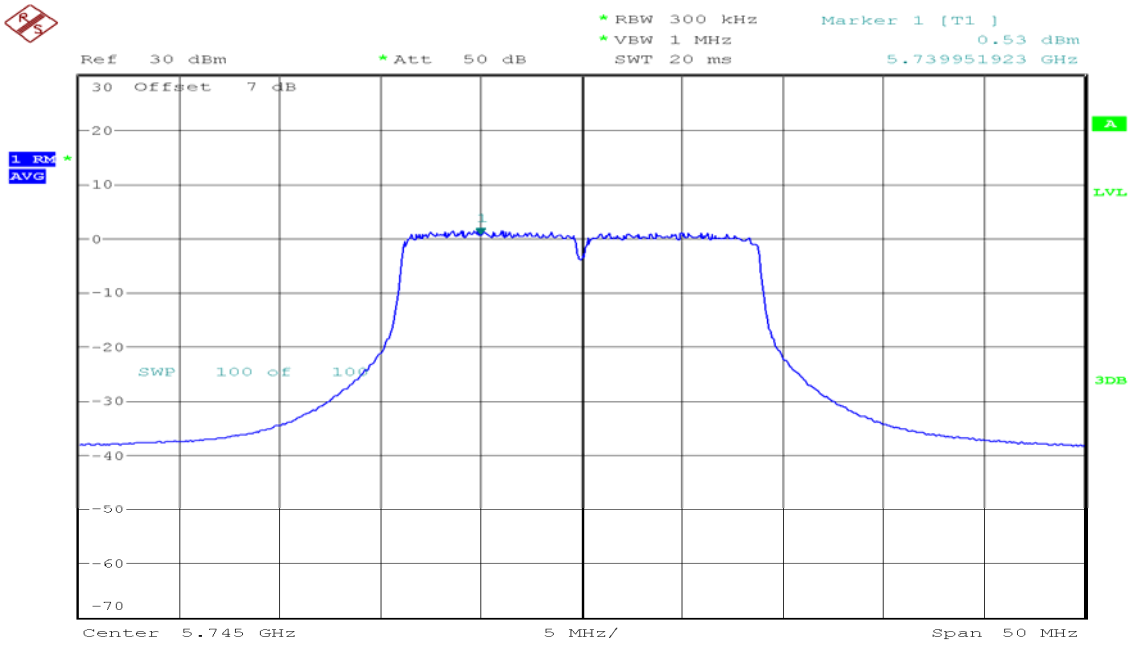


Date: 29.OCT.2014 10:40:09

draft 802.11ac Standard-20 MHz Channel mode / Chain 1

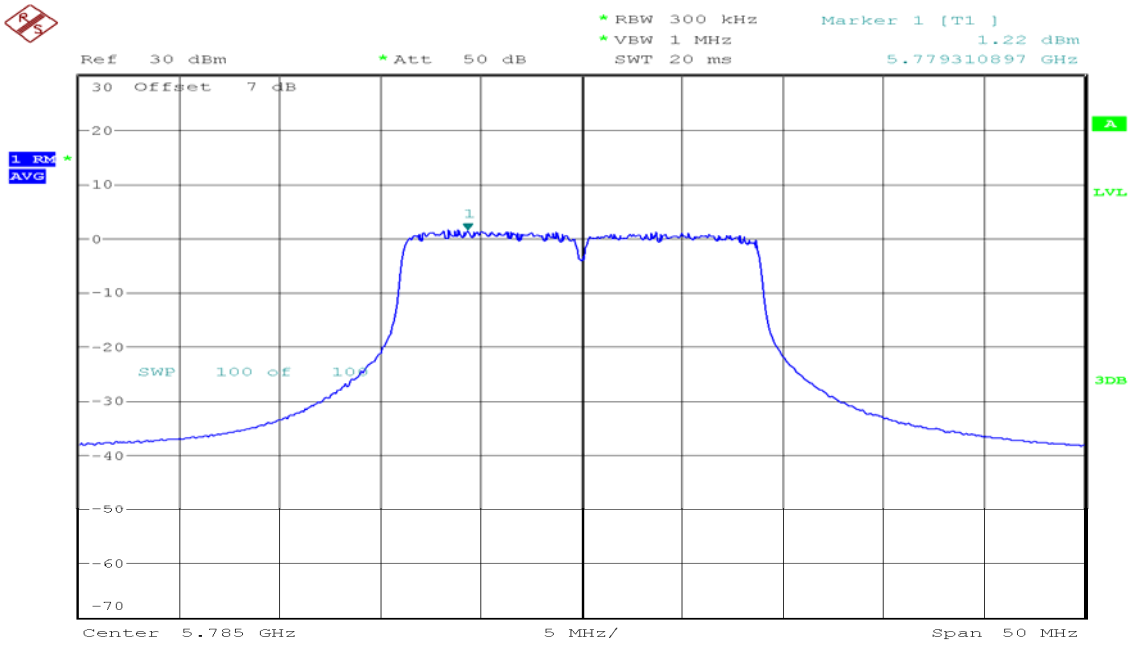
5745~5850MHz

CH Low



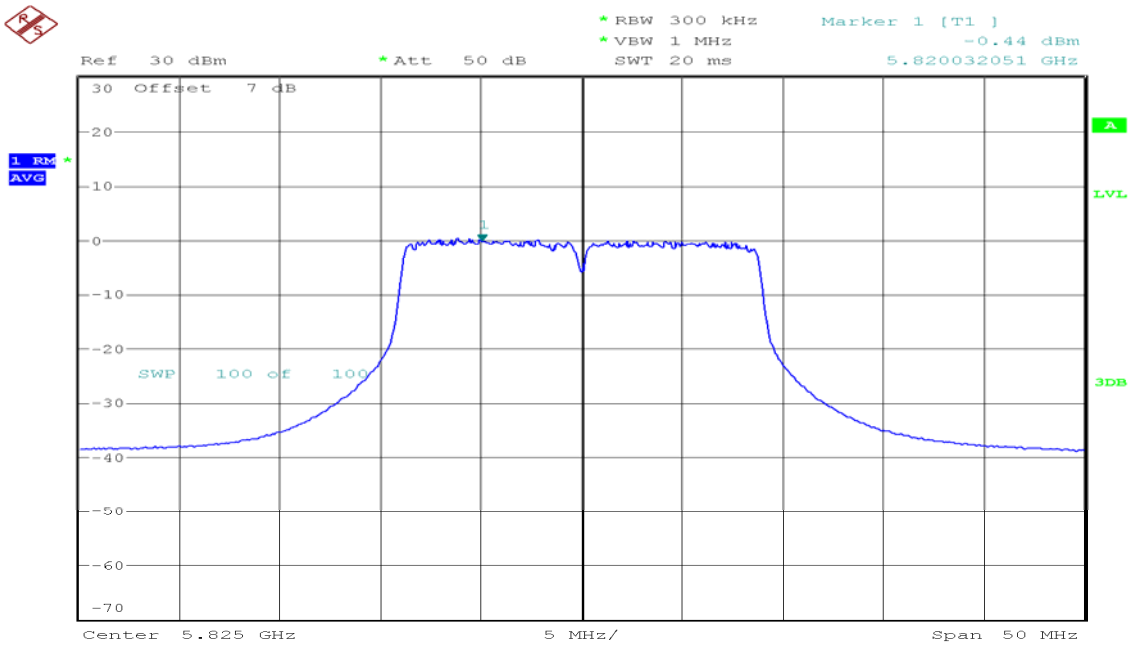
Date: 29.OCT.2014 10:41:09

CH Mid



Date: 29.OCT.2014 10:41:50

CH High

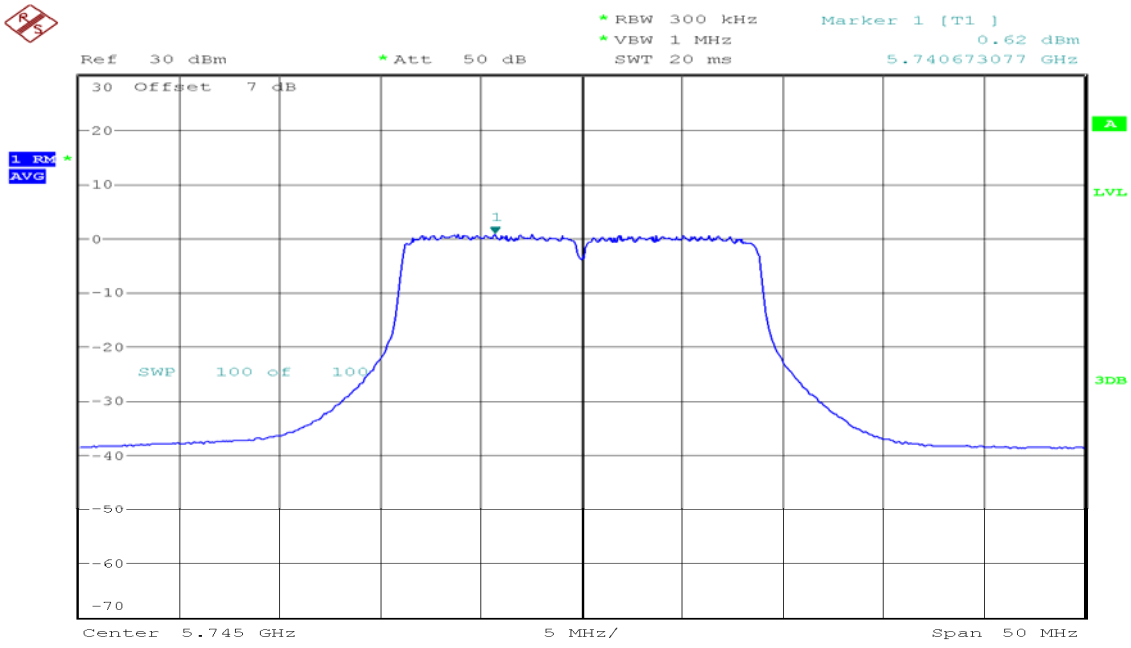


Date: 29.OCT.2014 10:42:34

draft 802.11ac Standard-20 MHz Channel mode / Chain 2

5745~5850MHz

CH Low



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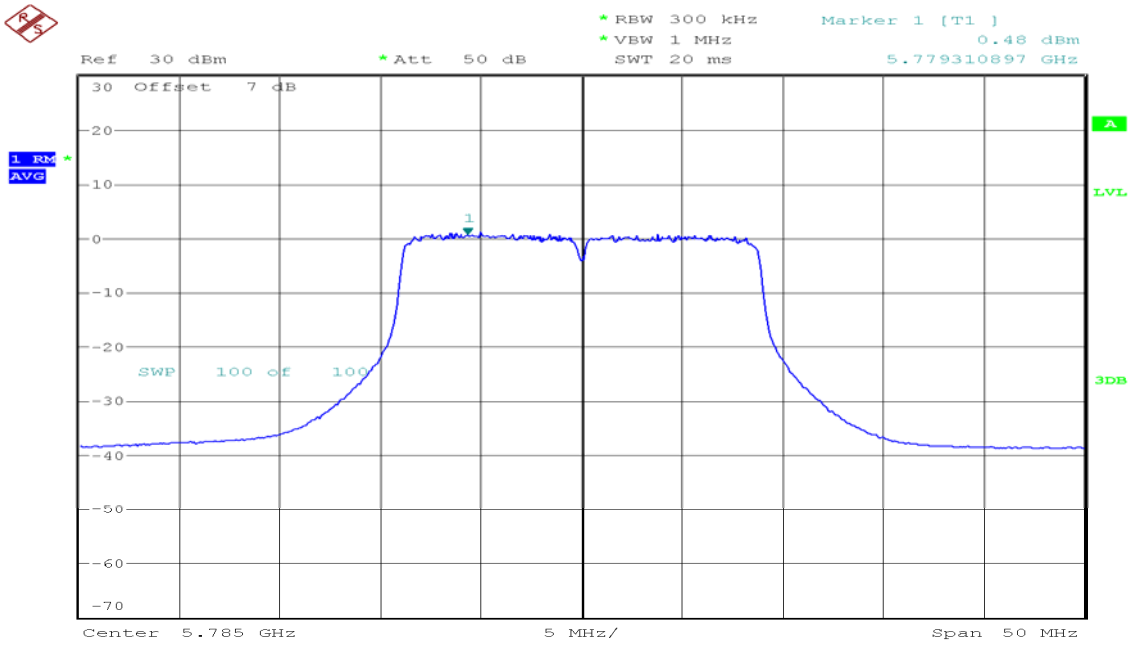
CH Mid



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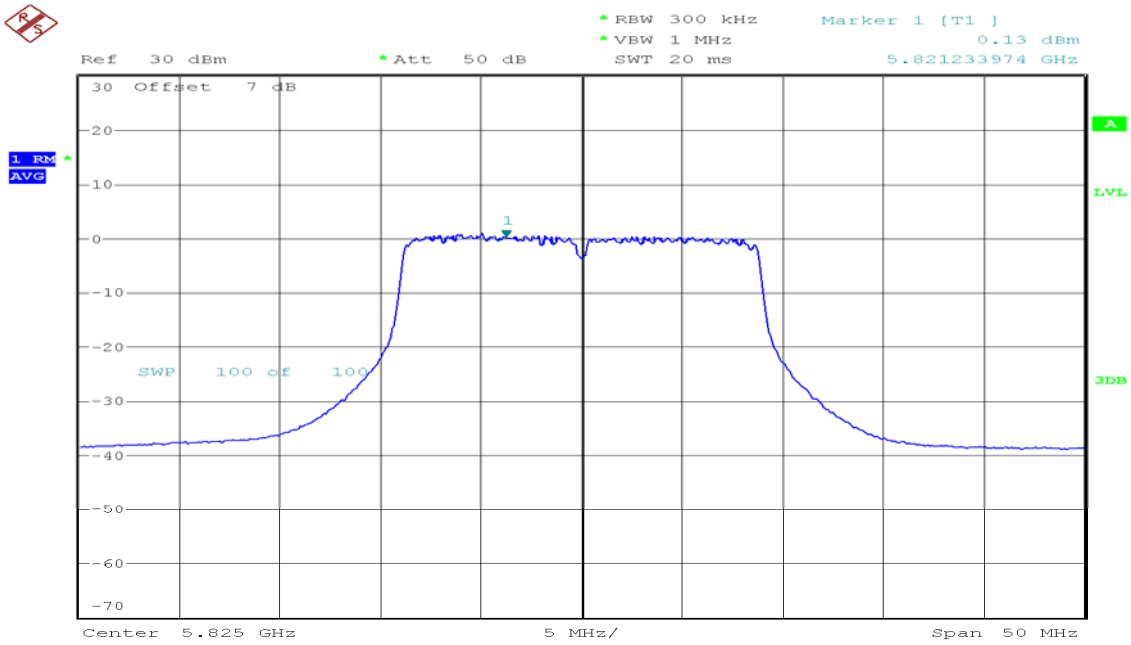
CH High

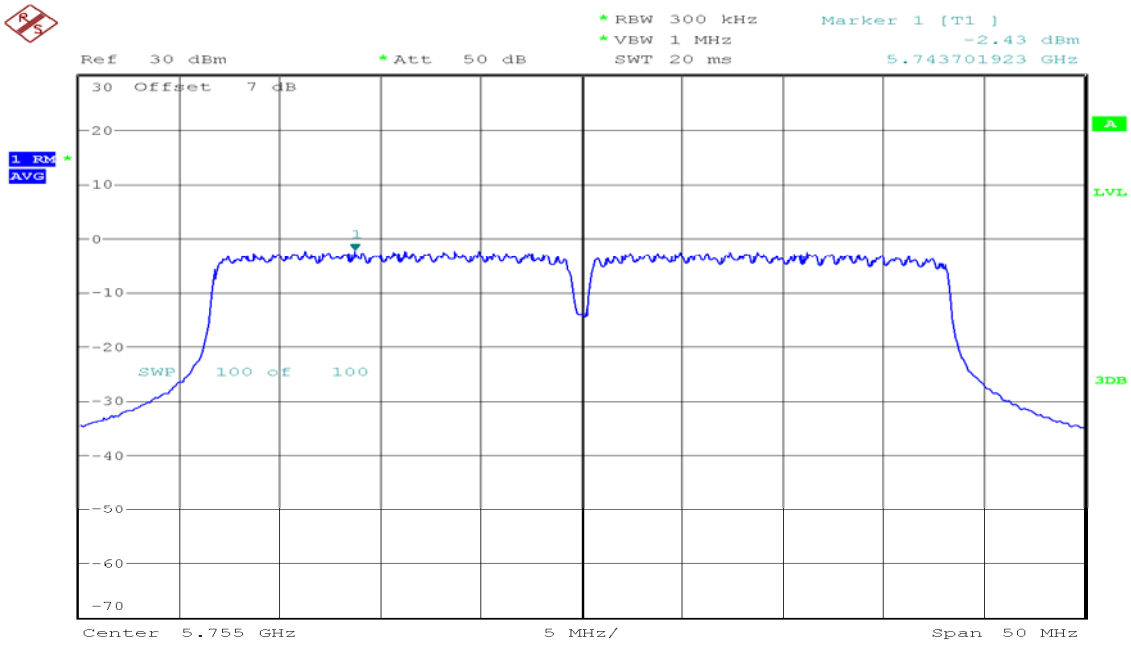


Date: 29.OCT.2014 10:44:49

draft 802.11ac Wide-40 MHz Channel mode / Chain 0

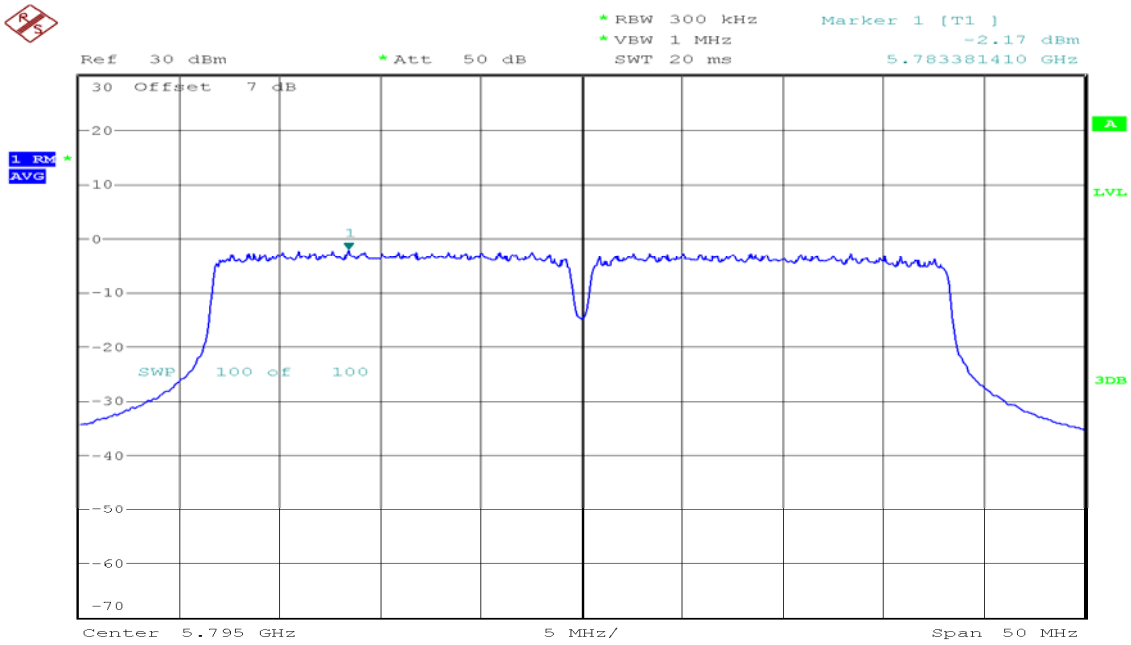
5745~5850MHz

CH Low



Date: 29.OCT.2014 10:45:50

CH High

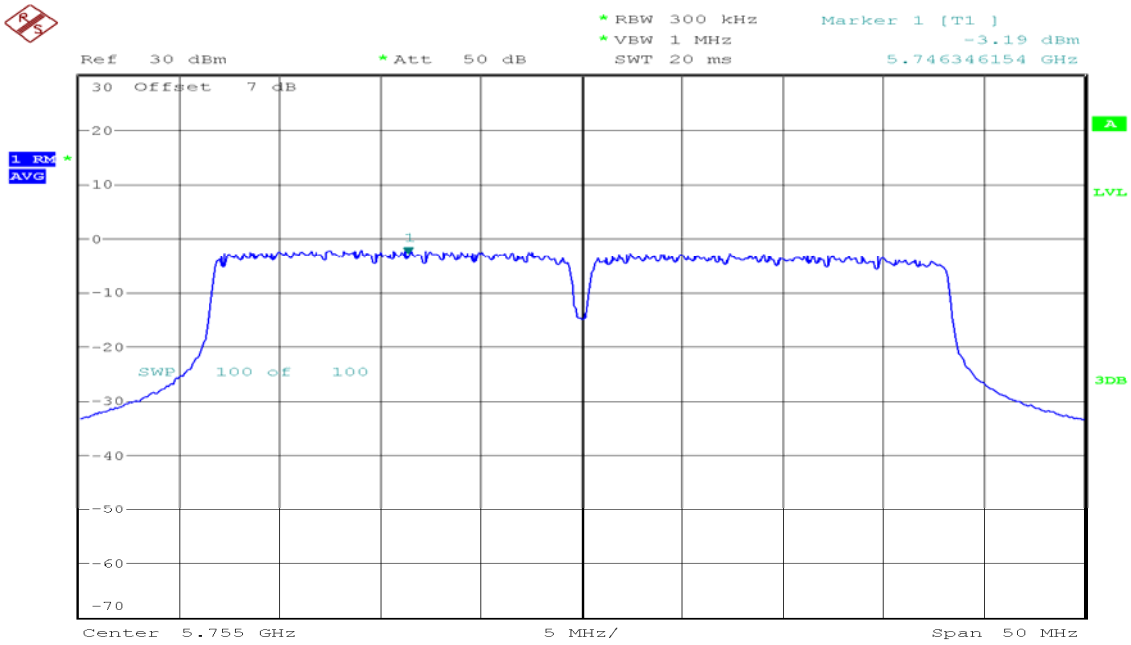


Date: 29.OCT.2014 10:46:34

draft 802.11ac Wide-40 MHz Channel mode / Chain 1

5745~5850MHz

CH Low



Date: 29.OCT.2014 10:47:30

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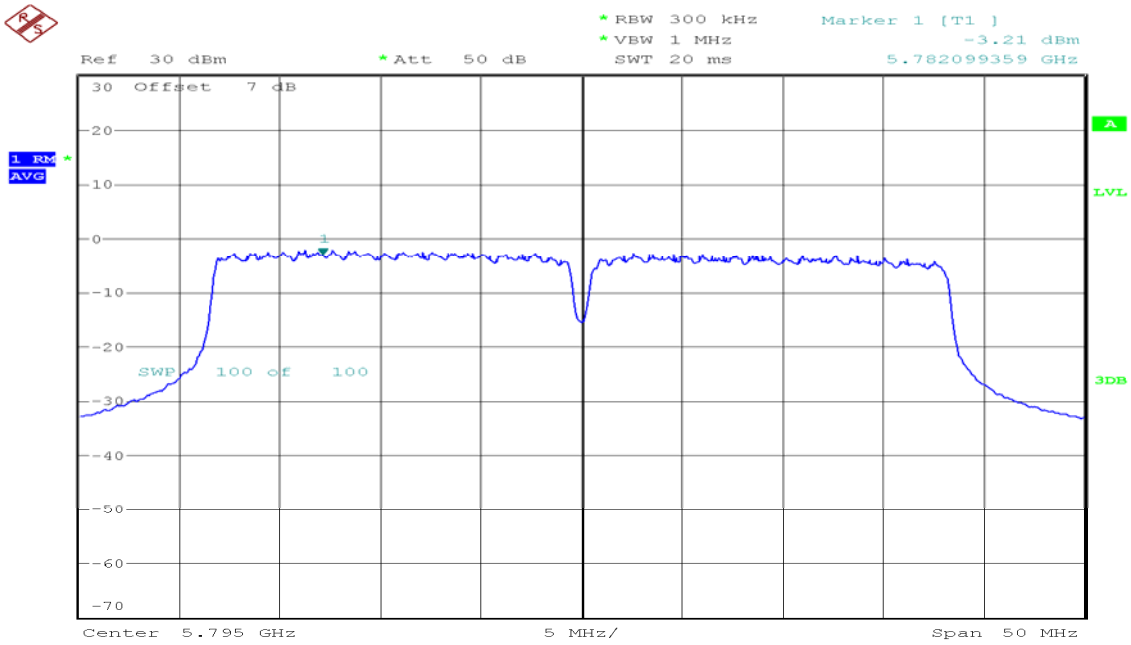
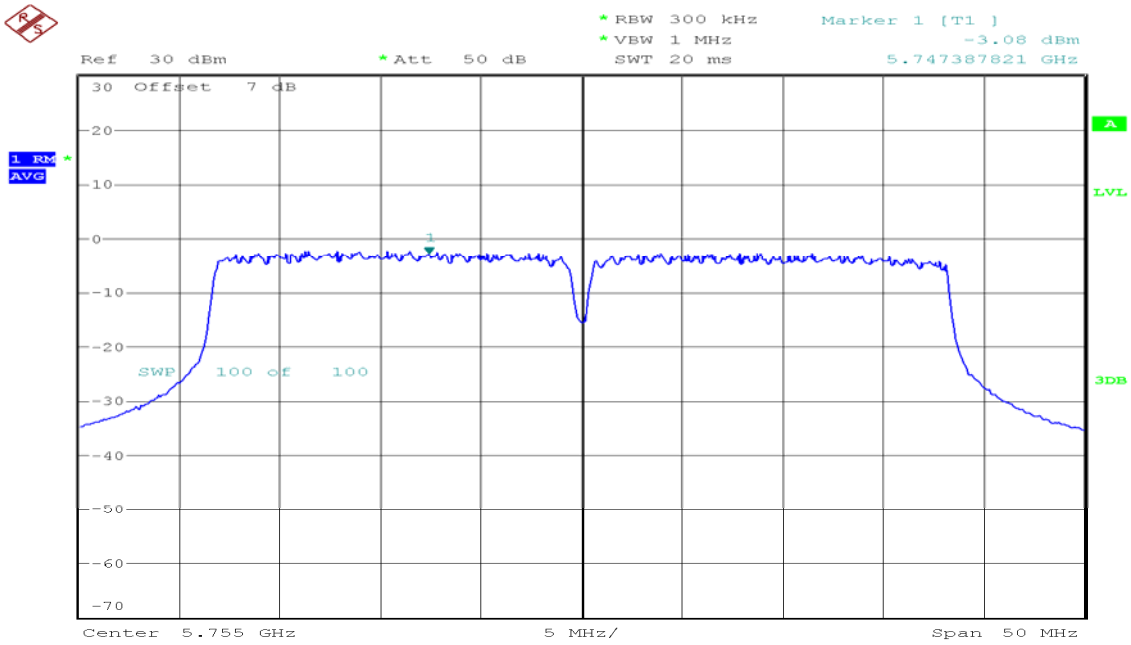


Date: 29.OCT.2014 10:48:13

draft 802.11ac Wide-40 MHz Channel mode / Chain 2

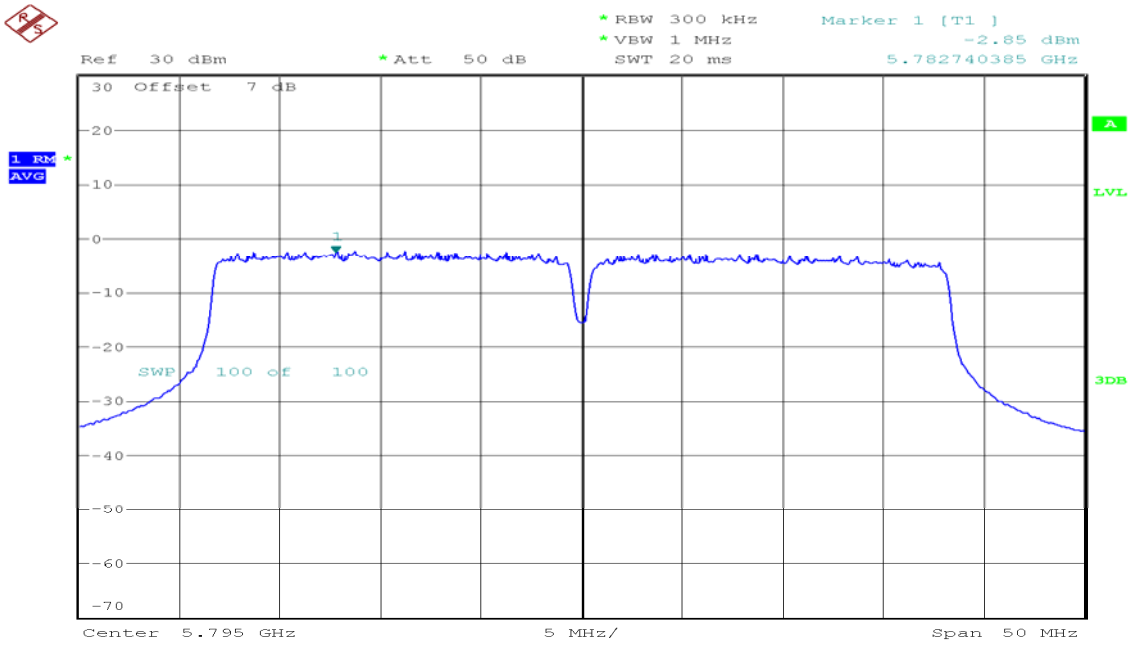
5745~5850MHz

CH Low



Date: 29.OCT.2014 10:49:16

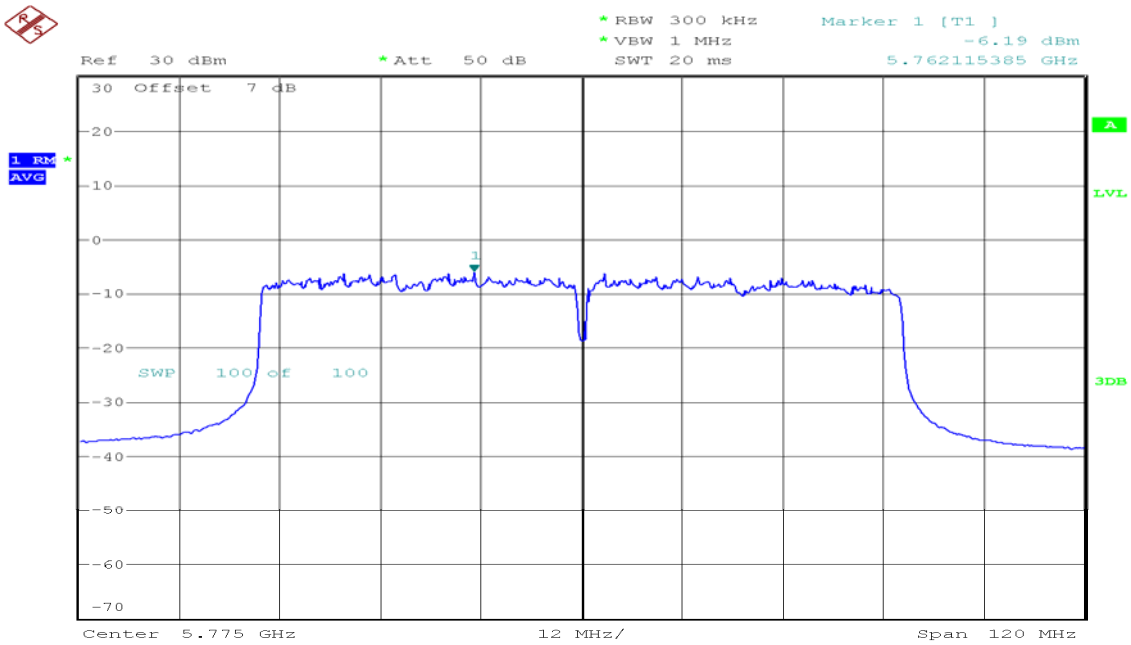
CH High



Date: 29.OCT.2014 10:50:07

draft 802.11ac Wide-80 MHz Channel mode / Chain 0

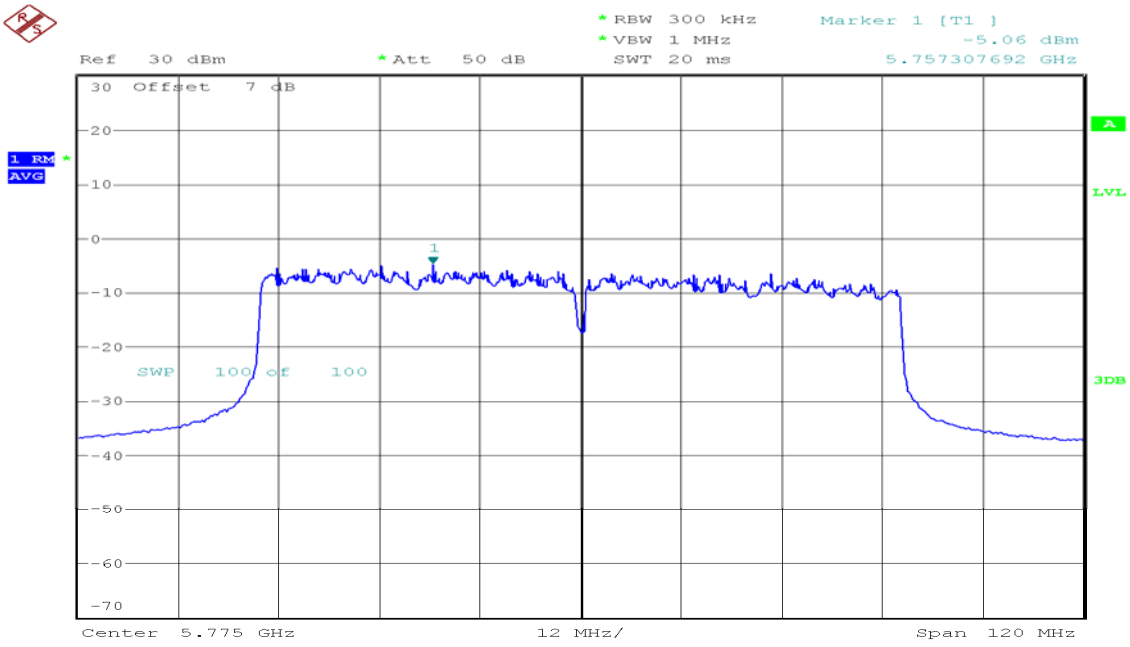
5745~5850MHz



Date: 29.OCT.2014 10:51:33

draft 802.11ac Wide-80 MHz Channel mode / Chain 1

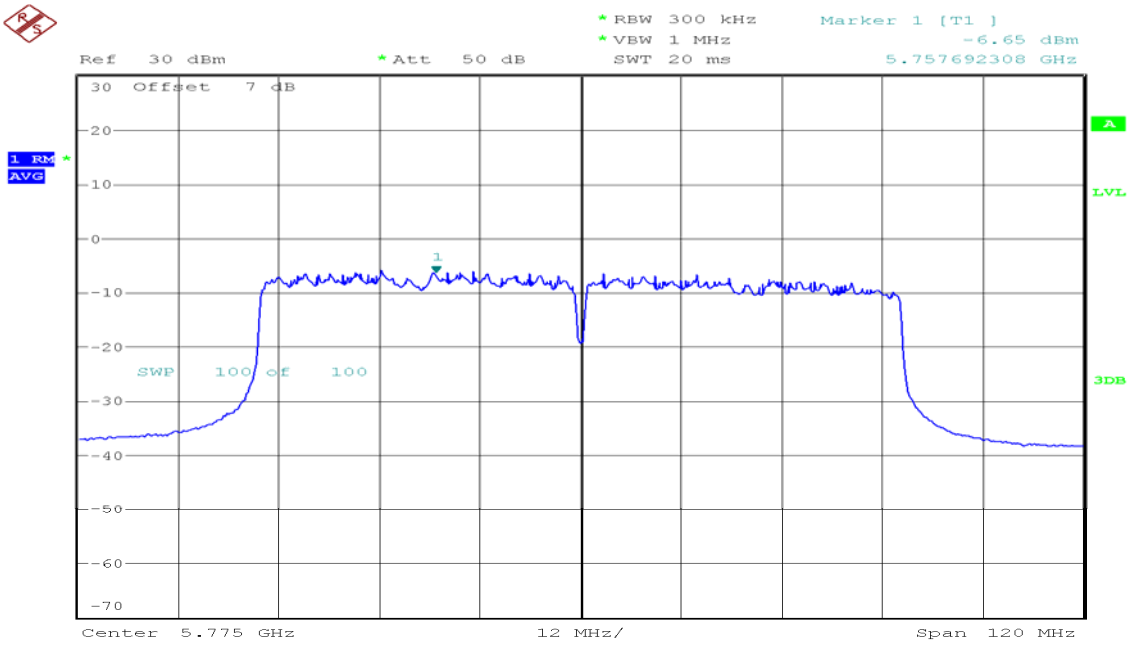
5745~5850MHz



Date: 29.OCT.2014 10:52:42

draft 802.11ac Wide-80 MHz Channel mode / Chain 2

5745~5850MHz



Date: 29.OCT.2014 10:53:44

7.5 RADIATED UNDESIRABLE EMISSION

LIMIT

Radiated emissions from 9 kHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2009. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

1. According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCIES(MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE(meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

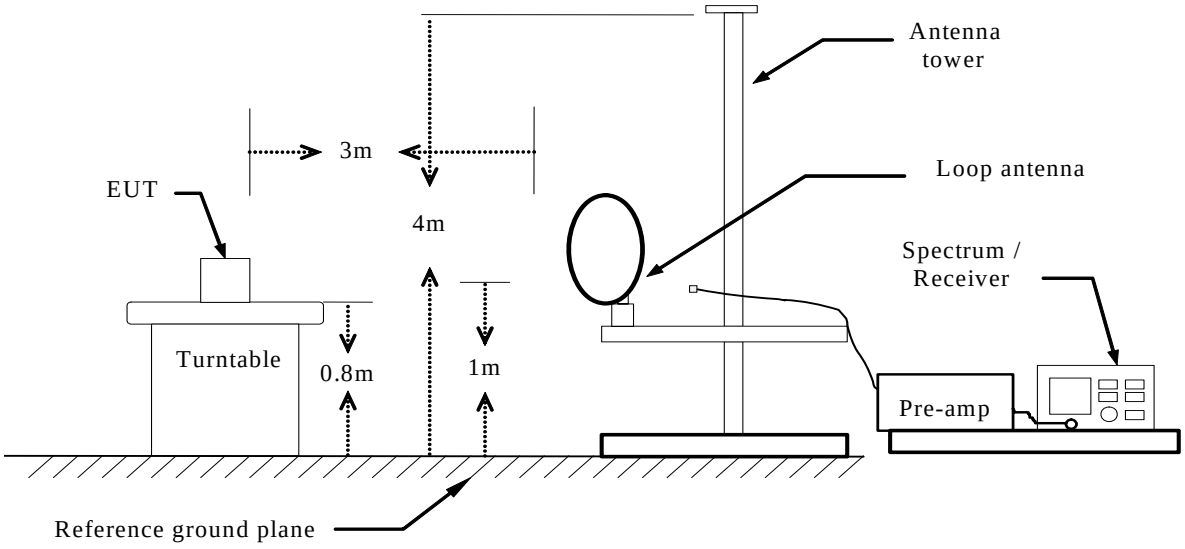
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2. In the emission table above, the tighter limit applies at the band edges.

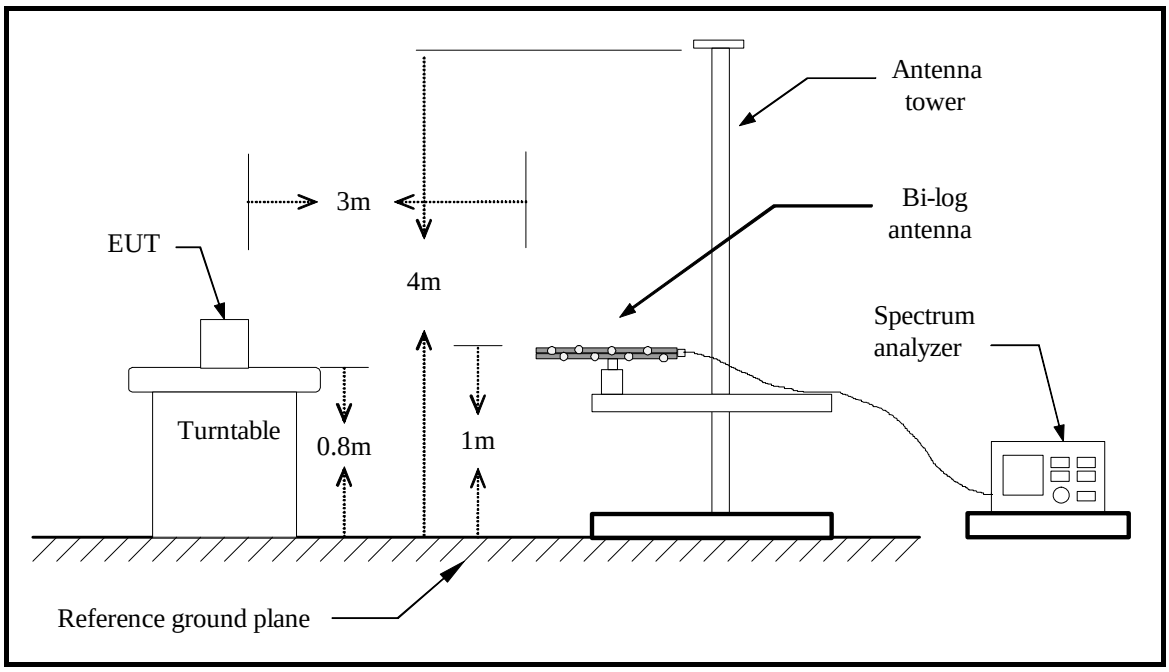
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

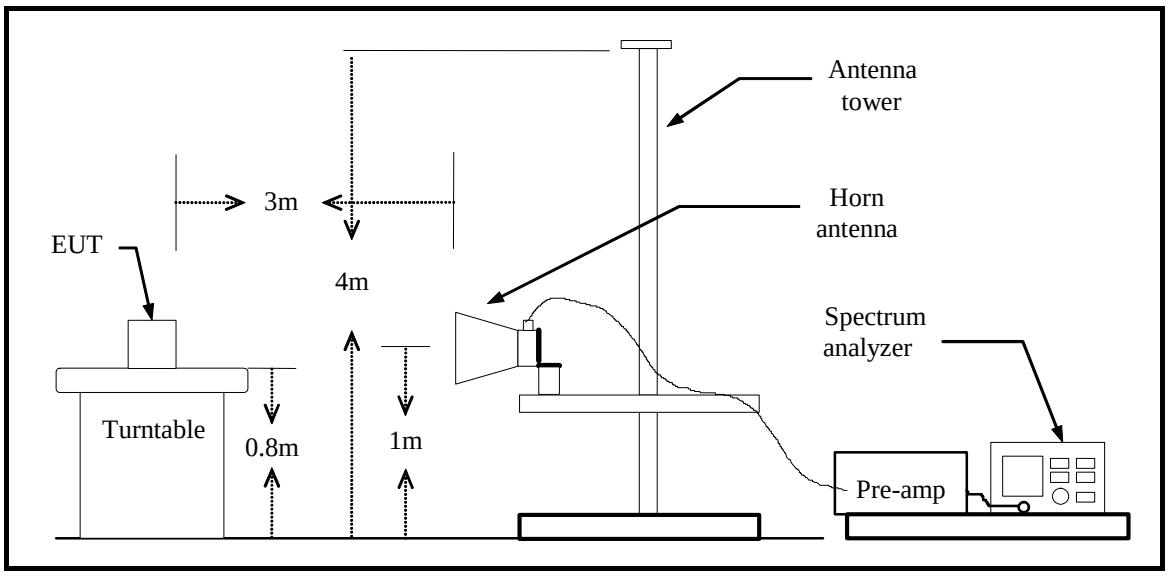
Below 30MHz



Below 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz / VBW=300kHz / Sweep=AUTO

   Above 1GHz:

   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

Below 1 GHz

Operation Mode:	Normal Link	**Test Date:**	2014-10-27
Temperature:	25°C	Tested by:	James.Yan
Humidity:	48% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
44.5500	V	20.91	12.48	33.39	40.00	-6.61	Peak
58.1300	V	28.12	8.09	36.21	40.00	-3.79	Peak
156.1000	V	17.27	13.48	30.75	43.50	-12.75	Peak
375.3200	V	21.47	17.45	38.92	46.00	-7.08	Peak
625.5800	V	17.07	21.39	38.46	46.00	-7.54	Peak
828.3100	V	13.48	24.69	38.17	46.00	-7.83	Peak
58.1300	H	28.42	8.09	36.51	40.00	-3.49	Peak
219.1500	H	19.23	13.33	32.56	46.00	-13.44	Peak
293.8400	H	21.76	14.94	36.70	46.00	-9.30	Peak
625.5800	H	15.04	21.39	36.43	46.00	-9.57	Peak
832.1900	H	14.48	24.82	39.30	46.00	-6.70	Peak
935.9800	H	15.10	25.30	40.40	46.00	-5.60	Peak

Remark:

4. Measuring frequencies from 30 MHz to the 1GHz.(no emission found from the lowest internal used/generated frequency to 30MHz)
5. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
6. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
7. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
8. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

Above 1 GHz

Operation Mode:	Tx / IEEE 802.11a mode CH Low	**Test Date:**	October 27, 2014
Temperature:	25°C	**Tested by:**	James.Yan
Humidity:	55% RH	**Polarity:**	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	1867.000	55.60	-10.04	45.56	74.00	-28.44	100	133	peak
2	3244.000	55.58	-6.14	49.44	74.00	-24.56	100	77	peak
3	3261.000	46.92	-6.11	40.81	54.00	-13.19	100	77	AVG
4	5403.000	45.85	-0.25	45.60	54.00	-8.40	100	345	AVG
5	5420.000	57.30	-0.17	57.13	74.00	-16.87	100	336	peak
6	11489.000	46.73	9.40	56.13	74.00	-17.87	100	46	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2122.000	55.34	-9.41	45.93	74.00	-28.07	100	100	peak
2	3244.000	52.10	-6.14	45.96	74.00	-28.04	100	140	peak
3	5420.000	51.21	-0.17	51.04	74.00	-22.96	100	359	peak
4	5454.000	49.24	-0.02	49.22	54.00	-4.78	100	24	AVG
5	11489.000	46.56	9.40	55.96	74.00	-18.04	100	85	peak
6	11490.000	39.31	9.39	48.70	54.00	-5.30	100	80	AVG

Operation Mode:	Tx / IEEE 802.11a mode CH Mid	**Test Date:**	October 27, 2014
Temperature:	25°C	**Tested by:**	James.Yan
Humidity:	55% RH	**Polarity:**	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2122.000	56.46	-9.41	47.05	74.00	-26.95	100	34	peak
2	3244.000	54.58	-6.14	48.44	74.00	-25.56	100	135	peak
3	5470.000	46.35	0.05	46.40	54.00	-7.60	100	343	AVG
4	5471.000	55.35	0.05	55.40	74.00	-18.60	100	343	peak
5	11574.000	41.86	8.80	50.66	74.00	-23.34	100	49	peak
6	17218.000	36.89	14.15	51.04	74.00	-22.96	100	313	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2122.000	55.75	-9.41	46.34	74.00	-27.66	100	97	peak
2	5471.000	52.22	0.05	52.27	74.00	-21.73	100	12	peak
3	5471.000	47.22	0.05	47.27	54.00	-6.73	100	12	AVG
4	11574.000	44.47	8.80	53.27	74.00	-20.73	100	72	peak
5	17320.000	36.86	14.15	51.01	74.00	-22.99	100	68	peak
N/A									

Operation Mode:	Tx / IEEE 802.11a mode CH High	**Test Date:**	October 27, 2014
Temperature:	25°C	**Tested by:**	James.Yan
Humidity:	55% RH	**Polarity:**	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3244.000	54.12	-6.14	47.98	74.00	-26.02	100	143	peak
2	5504.000	47.08	0.20	47.28	54.00	-6.72	100	336	AVG
3	5505.000	55.95	0.20	56.15	74.00	-17.85	100	336	peak
4	10622.000	39.21	8.94	48.15	74.00	-25.85	100	52	peak
5	14753.000	39.99	10.15	50.14	74.00	-23.86	100	83	peak
6	17252.000	37.32	14.15	51.47	74.00	-22.53	100	239	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2122.000	54.54	-9.41	45.13	74.00	-28.87	100	94	peak
2	3244.000	51.63	-6.14	45.49	74.00	-28.51	100	125	peak
3	5502.000	46.92	0.19	47.11	54.00	-6.89	100	23	AVG
4	5505.000	51.43	0.20	51.63	74.00	-22.37	100	18	peak
5	11642.000	41.51	8.71	50.22	74.00	-23.78	100	94	peak
6	17303.000	37.68	14.15	51.83	74.00	-22.17	100	333	peak

Operation Mode:	TX / draft 802.11n Standard-20 MHz Channel mode /CH Low	**Test Date:**	October 27, 2014
Temperature:	25°C	**Tested by:**	James.Yan
Humidity:	55% RH	**Polarity:**	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2122.000	60.36	-9.41	50.95	74.00	-23.05	100	24	peak
2	5420.000	56.37	-0.17	56.20	74.00	-17.80	100	334	peak
3	5437.000	46.93	-0.10	46.83	54.00	-7.17	100	344	AVG
4	11488.000	37.91	9.40	47.31	54.00	-6.69	100	85	AVG
5	11489.000	47.95	9.40	57.35	74.00	-16.65	100	85	peak
6	17269.000	37.44	14.15	51.59	74.00	-22.41	100	156	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3244.000	53.17	-6.14	47.03	74.00	-26.97	100	133	peak
2	5330.000	47.35	-0.88	46.47	54.00	-7.53	100	6	AVG
3	5335.000	55.77	-0.84	54.93	74.00	-19.07	100	0	peak
4	11488.000	41.52	9.40	50.92	54.00	-3.08	100	92	AVG
5	11489.000	49.59	9.40	58.99	74.00	-15.01	100	92	peak
6	17337.000	37.48	14.15	51.63	74.00	-22.37	100	214	peak

Operation Mode:	TX / draft 802.11n Standard-20 MHz Channel mode /CH Mid	Test Date:	October 27, 2014
Temperature:	25°C	Tested by:	James.Yan
Humidity:	55% RH	Polarity:	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3244.000	55.93	-6.14	49.79	74.00	-24.21	100	77	peak
2	5403.000	56.75	-0.25	56.50	74.00	-17.50	100	335	peak
3	5407.000	47.82	-0.23	47.59	54.00	-6.41	100	346	AVG
4	11574.000	43.60	8.80	52.40	74.00	-21.60	100	87	peak
5	17303.000	37.04	14.15	51.19	74.00	-22.81	100	234	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3006.000	52.73	-6.80	45.93	74.00	-28.07	100	85	peak
2	5452.000	46.14	-0.03	46.11	54.00	-7.89	100	4	AVG
3	5454.000	55.12	-0.02	55.10	74.00	-18.90	100	4	peak
4	11574.000	42.66	8.80	51.46	74.00	-22.54	100	90	peak
5	17337.000	37.43	14.15	51.58	74.00	-22.42	100	131	peak
N/A									

Operation Mode:	TX / draft 802.11n Standard-20 MHz Channel mode /CH High	Test Date:	October 27, 2014
Temperature:	25°C	Tested by:	James.Yan
Humidity:	55% RH	Polarity:	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3244.000	56.06	-6.14	49.92	74.00	-24.08	100	77	peak
2	5328.000	49.74	-0.90	48.84	54.00	-5.16	100	340	AVG
3	5335.000	57.21	-0.84	56.37	74.00	-17.63	100	346	peak
4	11642.000	40.45	8.71	49.16	74.00	-24.84	100	87	peak
5	17218.000	36.73	14.15	50.88	74.00	-23.12	100	118	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3006.000	53.43	-6.80	46.63	74.00	-27.37	100	90	peak
2	5386.000	55.43	-0.38	55.05	74.00	-18.95	100	360	peak
3	5396.000	48.34	-0.30	48.04	54.00	-5.96	100	360	AVG
4	11659.000	44.36	8.75	53.11	74.00	-20.89	100	96	peak
5	17303.000	37.68	14.15	51.83	74.00	-22.17	100	360	peak
N/A									

Operation Mode:	TX / draft 802.11n Wide-40 MHz Channel mode/CH Low	**Test Date:**	October 27, 2014
Temperature:	25°C	**Tested by:**	James.Yan
Humidity:	55% RH	**Polarity:**	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5420.000	54.89	-0.17	54.72	74.00	-19.28	100	340	peak
2	5423.000	47.81	-0.16	47.65	54.00	-6.35	100	325	AVG
3	11370.000	38.05	9.94	47.99	74.00	-26.01	100	299	peak
4	17337.000	37.30	14.15	51.45	74.00	-22.55	100	304	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5403.000	51.98	-0.25	51.73	74.00	-22.27	100	351	peak
2	5406.000	48.48	-0.23	48.25	54.00	-5.75	100	351	AVG
3	11438.000	38.83	9.75	48.58	74.00	-25.42	100	306	peak
4	17286.000	36.52	14.15	50.67	74.00	-23.33	100	245	peak
N/A									

Operation Mode:	TX / draft 802.11n Wide-40 MHz Channel mode /CH High	**Test Date:**	October 27, 2014
Temperature:	25°C	**Tested by:**	James.Yan
Humidity:	55% RH	**Polarity:**	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5335.000	49.93	-0.84	49.09	54.00	-4.91	100	341	AVG
2	5369.000	53.57	-0.53	53.04	74.00	-20.96	100	331	peak
3	11353.000	39.36	9.90	49.26	74.00	-24.74	100	321	peak
4	17286.000	37.01	14.15	51.16	74.00	-22.84	100	325	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5454.000	46.33	-0.02	46.31	54.00	-7.69	100	23	AVG
2	5471.000	51.39	0.05	51.44	74.00	-22.56	100	23	peak
3	11591.000	42.13	8.68	50.81	74.00	-23.19	100	94	peak
4	17252.000	36.98	14.15	51.13	74.00	-22.87	100	3	peak
N/A									

Operation Mode:	TX / draft 802.11ac Standard-20 MHz Channel mode /CH Low	Test Date:	October 27, 2014
Temperature:	25°C	Tested by:	James.Yan
Humidity:	55% RH	Polarity:	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2377.000	55.50	-8.51	46.99	74.00	-27.01	100	145	peak
2	5383.000	48.74	-0.41	48.33	54.00	-5.67	100	168	AVG
3	5386.000	55.12	-0.38	54.74	74.00	-19.26	100	99	peak
4	11506.000	43.06	9.28	52.34	74.00	-21.66	100	15	peak
5	17269.000	36.47	14.15	50.62	74.00	-23.38	100	56	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2666.000	51.09	-7.66	43.43	74.00	-30.57	100	164	peak
2	5369.000	48.61	-0.53	48.08	54.00	-5.92	100	159	AVG
3	5370.000	50.81	-0.53	50.28	74.00	-23.72	100	225	peak
4	11438.000	38.32	9.75	48.07	74.00	-25.93	100	56	peak
5	17167.000	35.08	14.15	49.23	74.00	-24.77	100	358	peak
N/A									

Operation Mode:	TX / draft 802.11ac Standard-20 MHz Channel mode/ CH Mid	Test Date:	October 27, 2014
Temperature:	25°C	Tested by:	James.Yan
Humidity:	55% RH	Polarity:	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	1867.000	55.98	-10.04	45.94	74.00	-28.06	100	147	peak
2	4128.000	51.69	-3.71	47.98	74.00	-26.02	100	158	peak
3	5502.000	52.07	0.19	52.26	74.00	-21.74	100	330	peak
4	5505.000	47.50	0.20	47.70	54.00	-6.30	100	255	AVG
5	11591.000	36.76	8.68	45.44	74.00	-28.56	100	64	peak
6	17303.000	36.57	14.15	50.72	74.00	-23.28	100	65	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2666.000	53.31	-7.66	45.65	74.00	-28.35	100	145	peak
2	5386.000	47.49	-0.38	47.11	54.00	-6.89	100	65	AVG
3	5388.000	49.43	-0.37	49.06	74.00	-24.94	100	32	peak
4	11591.000	37.95	8.68	46.63	74.00	-27.37	100	330	peak
5	17286.000	35.73	14.15	49.88	74.00	-24.12	100	54	peak
N/A									

Operation Mode:	TX / draft 802.11ac Standard-20 MHz Channel mode /CH High	Test Date:	October 27, 2014
Temperature:	25°C	Tested by:	James.Yan
Humidity:	55% RH	Polarity:	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3380.000	53.45	-5.94	47.51	74.00	-26.49	100	147	peak
2	5437.000	54.29	-0.10	54.19	74.00	-19.81	100	51	peak
3	5440.000	48.17	-0.08	48.09	54.00	-5.91	100	65	AVG
4	10571.000	38.27	8.66	46.93	74.00	-27.07	100	66	peak
5	14685.000	37.72	10.42	48.14	74.00	-25.86	100	315	peak
6	17286.000	36.41	14.15	50.56	74.00	-23.44	100	55	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3006.000	49.61	-6.80	42.81	74.00	-31.19	100	10	peak
2	5402.000	47.89	-0.25	47.64	54.00	-6.36	100	169	AVG
3	5403.000	50.02	-0.25	49.77	74.00	-24.23	100	44	peak
4	11659.000	40.44	8.75	49.19	74.00	-24.81	100	310	peak
5	17235.000	36.02	14.15	50.17	74.00	-23.83	100	65	peak
N/A									

Operation Mode:	TX / draft 802.11ac Wide-40 MHz Channel mode /CH Low	Test Date:	October 27, 2014
Temperature:	25°C	Tested by:	James.Yan
Humidity:	55% RH	Polarity:	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5368.000	49.55	-0.54	49.01	54.00	-4.99	100	49	AVG
2	5369.000	53.19	-0.53	52.66	74.00	-21.34	100	258	peak
3	11387.000	37.33	9.99	47.32	74.00	-26.68	100	33	peak
4	17286.000	35.83	14.15	49.98	74.00	-24.02	100	167	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5384.000	48.01	-0.40	47.61	54.00	-6.39	100	97	AVG
2	5386.000	50.65	-0.38	50.27	74.00	-23.73	100	184	peak
3	11370.000	37.98	9.94	47.92	74.00	-26.08	100	66	peak
4	17269.000	36.33	14.15	50.48	74.00	-23.52	100	240	peak
N/A									

Operation Mode:	TX / draft 802.11ac Wide-40 MHz Channel mode /CH High	Test Date:	October 27, 2014
Temperature:	25°C	Tested by:	James.Yan
Humidity:	55% RH	Polarity:	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5434.000	54.45	-0.11	54.34	74.00	-19.66	100	165	peak
2	5437.000	48.57	-0.10	48.47	54.00	-5.53	100	356	AVG
3	11421.000	37.43	9.87	47.30	74.00	-26.70	100	321	peak
4	17235.000	36.46	14.15	50.61	74.00	-23.39	100	22	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5402.000	48.34	-0.25	48.09	54.00	-5.91	100	46	AVG
2	5403.000	51.68	-0.25	51.43	74.00	-22.57	100	65	peak
3	11557.000	36.00	8.92	44.92	74.00	-29.08	100	0	peak
4	17218.000	36.42	14.15	50.57	74.00	-23.43	100	154	peak
N/A									

Operation Mode:	TX / draft 802.11ac wide-80 MHz Channel mode	Test Date:	October 27, 2014
Temperature:	25°C	Tested by:	James.Yan
Humidity:	55% RH	Polarity:	Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2122.000	59.70	-9.41	50.29	74.00	-23.71	100	164	peak
2	5335.000	50.50	-0.84	49.66	54.00	-4.34	100	11	AVG
3	5339.000	55.86	-0.80	55.06	74.00	-18.94	100	65	peak
4	11489.000	37.76	9.40	47.16	74.00	-26.84	100	321	peak
5	17218.000	36.38	14.15	50.53	74.00	-23.47	100	264	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3244.000	51.91	-6.14	45.77	74.00	-28.23	100	2	peak
2	5366.000	54.51	-0.56	53.95	74.00	-20.05	100	355	peak
3	5369.000	51.27	-0.53	50.74	54.00	-3.26	100	55	AVG
4	11591.000	37.87	8.68	46.55	74.00	-27.45	100	254	peak
5	17286.000	36.58	14.15	50.73	74.00	-23.27	100	25	peak
N/A									

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 3 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

7.6 POWERLINE CONDUCTED EMISSIONS

LIMIT

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

** Decreases with the logarithm of the frequency.*

TEST CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

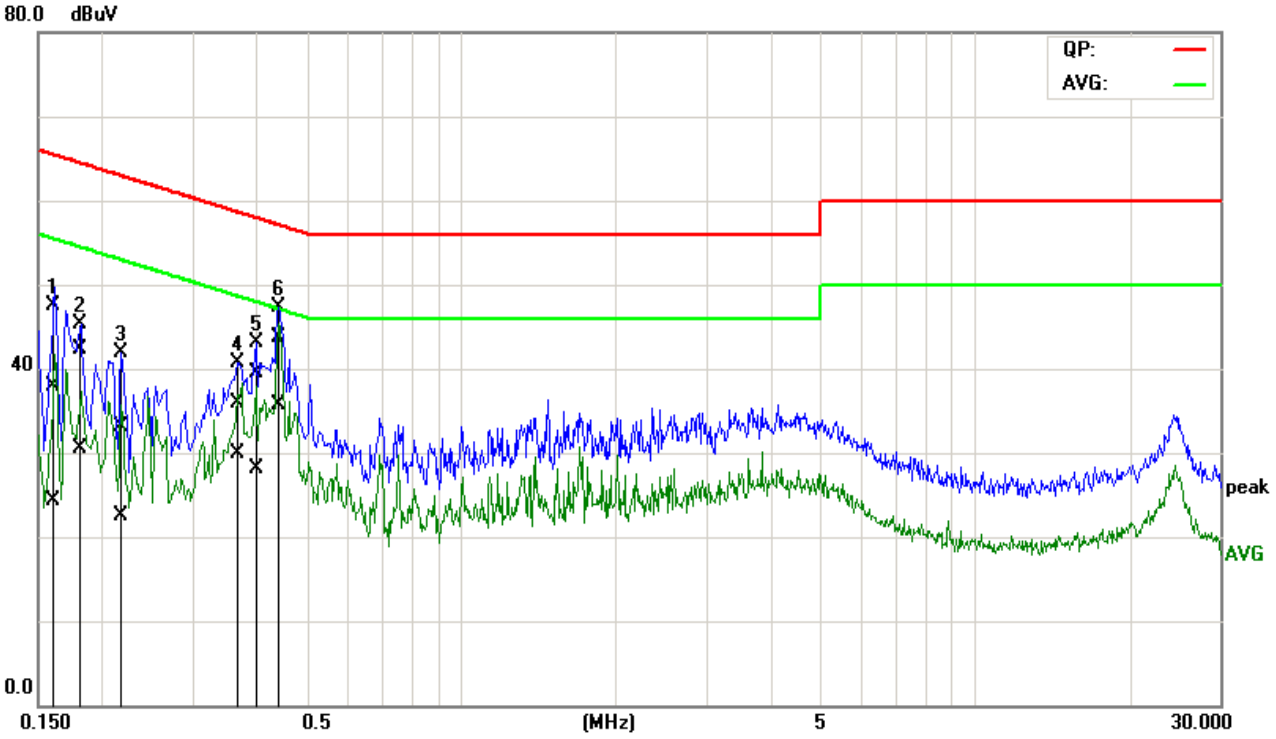
TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Test Data

Job No.:	C140925R01	Date:	2014-10-27
Model No.:	TG1682G	Time:	15:32:29
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	James.Yan
Line:	L1	Test Voltage:	AC 120V/60Hz
Model:		Description:	

L1

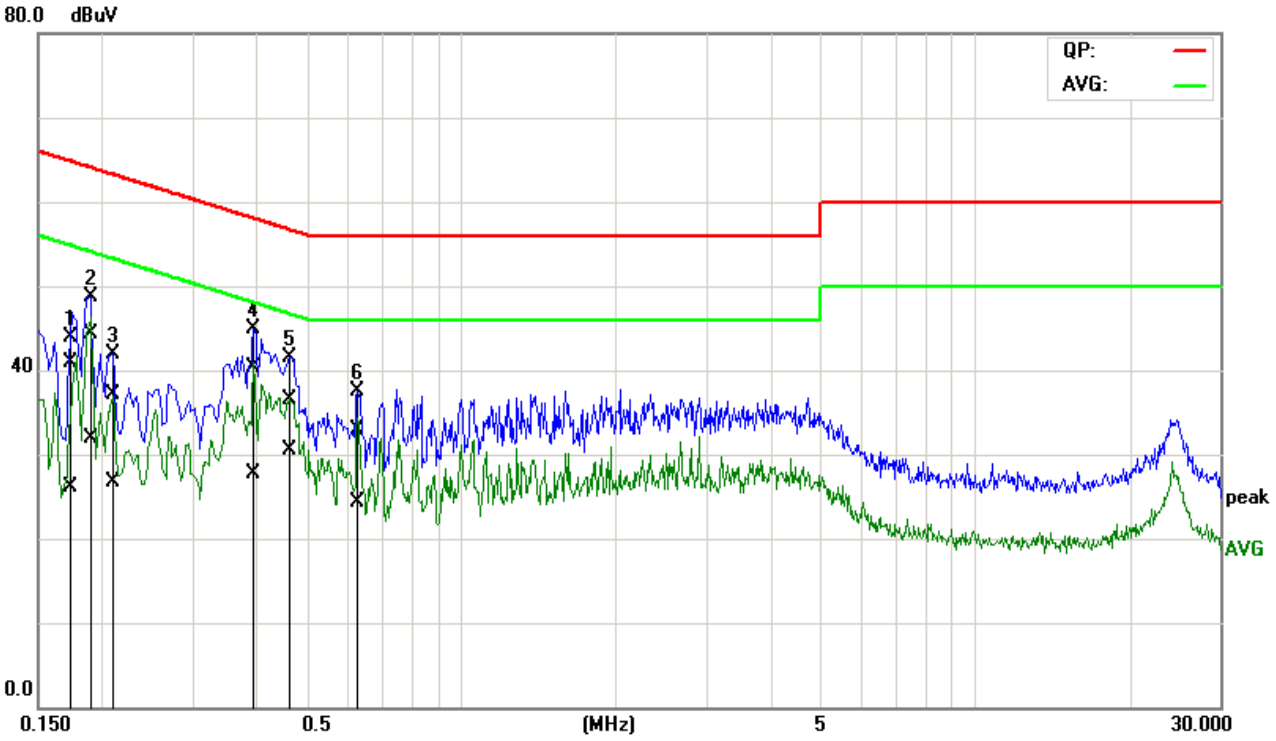


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1585	18.16	4.56	19.77	37.93	24.33	65.54	55.54	-27.61	-31.21	Pass
2	0.1813	22.62	10.75	19.68	42.30	30.43	64.43	54.43	-22.13	-24.00	Pass
3	0.2197	13.55	2.80	19.62	33.17	22.42	62.83	52.83	-29.66	-30.41	Pass
4	0.3662	16.26	10.22	19.73	35.99	29.95	58.59	48.59	-22.60	-18.64	Pass
5*	0.3983	19.82	8.32	19.75	39.57	28.07	57.89	47.89	-18.32	-19.82	Pass
6	0.4388	23.84	15.85	19.78	43.62	35.63	57.08	47.08	-13.46	-11.45	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Job No.:	C140925R01	Date:	2014-10-27
Model No.:	TG1682G	Time:	15:36:59
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	James.Yan
Line:	L2	Test Voltage:	AC 120V/60Hz
Model:		Description:	

L2



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1704	21.25	6.49	19.69	40.94	26.18	64.94	54.94	-24.00	-28.76	Pass
2	0.1894	24.67	12.23	19.66	44.33	31.89	64.06	54.06	-19.73	-22.17	Pass
3	0.2087	17.45	7.13	19.65	37.10	26.78	63.26	53.26	-26.16	-26.48	Pass
4	0.3930	20.54	7.94	19.78	40.32	27.72	58.00	48.00	-17.68	-20.28	Pass
5*	0.4634	16.63	10.71	19.82	36.45	30.53	56.63	46.63	-20.18	-16.10	Pass
6	0.6233	13.00	4.49	19.84	32.84	24.33	56.00	46.00	-23.16	-21.67	Pass

END OF REPORT