FCC 47 CFR PART15 SUBPART E

Test Report

For

Product Name: Wireless digital flat panel detector
Brand Name: N/A
Model No.: Mars1717XU-VSI
Series Model.: N/A
FCC ID: 2AQ9VMARS1717XU
Test Report Number:
C180928E08-RPW2

Issued for

Shanghai United Imaging Healthcare Co., Ltd.
2258 Chengbei Rd., Jiading District, Shanghai

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
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TESTING CERT #2541.01

TABLE OF CONTENTS

Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	November 9, 2018	C180928E08-RPW2	ALL	N/A
01	December 11, 2018	C180928E08-RPW2	P5; P9; P11-P13; P38; P69; P70; P73-P74; P88	Update power rating; Add channel list; Update duty cycle plot; Revise the version of KDB789033; Update data of frequency stability and radiated emissions below 1GHz; Revise the equation in page88.
02	December 17, 2018	C180928E08-RPW2	P5; P9	Add test voltage and the worst-case test mode.
03	December 19, 2018	C180928E08-RPW2	P5; P69	Add notes for test voltage.

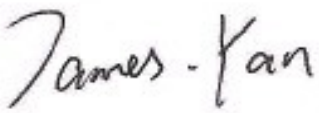
1 TEST RESULT CERTIFICATION

Product Name:	Wireless digital flat panel detector
Trade Name:	N/A
Model Name.:	Mars1717XU-VSI
Series Model:	N/A
Applicant Discrepancy:	Initial
Date of Test:	October 30, 2018~November 5, 2018 and December 11, 2018
Applicant:	**Shanghai United Imaging Healthcare Co., Ltd.** 2258 Chengbei Rd., Jiading District, Shanghai
Manufacturer:	**iRay Technology Co., Ltd.** RM202,Building 7 No. 590,Ruiqing RD. Zhangjiang East, Pudong 201201 Shanghai,China
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 C63.10: 2013 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.
The test results of this report relate only to the tested sample EUT identified in this report.

Approved by: ***Reviewed by:***



Jeff.Fang
Manager
Compliance Certification Services Inc.

James.Yan
RF Section Manager
Compliance Certification Services Inc.

2 EUT DESCRIPTION

Product Name:	Wireless digital flat panel detector	
Brand Name:	N/A	
Model Name:	Mars1717XU-VSI	
Series Model:	N/A	
Model Discrepancy:	N/A	
Power Rating:	Input: 12V⎓2.5A Capacitance 1: 3.8V-2.2V 2100F 2.8Wh Capacitance 2: 3.8V-2.2V 2100F 2.8Wh Capacitance 1+ Capacitance 2: 7.6V-4.4V	
Test Voltage:	DC 7.6V (full charge) AC120V/60Hz (see remark 3)	
Frequency Range :	5725MHz-5850MHz	
Transmit Power:	IEEE802.11a mode: 13.29dBm IEEE802.11n HT20 mode: 15.19dBm IEEE802.11n HT40 mode: 13.54dBm IEEE802.11ac VHT20 mode: 14.98 dBm IEEE802.11ac VHT40 mode: 13.55 dBm	
Modulation Technique:	IEEE802.11a mode: OFDM (6,9,12,18,24,36,48 and 54 Mbps) IEEE802.11n HT20 mode: OFDM (MCS0~MCS15) IEEE802.11n HT40 mode: OFDM (MCS0~MCS15) IEEE802.11ac VHT20 mode: OFDM (VHTMCS0~VHTMCS9) IEEE802.11ac VHT40 mode: OFDM (VHTMCS0~VHTMCS9)	
Number of Channels:	IEEE 802.11a/n HT20/ac VHT20: 5 Channels IEEE 802.11n HT40/ac VHT40:2 Channels	
Antenna Specification:		Gain(dBi)
		BandIV
	Antenna 1	6.7
	Antenna 2	6.1
	Directional gain	9.42

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: 2AQ9VMARS1717XU*** filing to comply with FCC Part 15, Subpart E Rules.
3. Only for powerline conducted test.

3 SUMMARY OF THE TEST RESULT

FCC 47 CFR Part 15, Subpart E 15.407			
Part	**Rule section**	**Description of Test**	**Result**
8.1	47 CFR Part 15, Subpart E 15.407	6 dB Bandwidth Measurement	Compliance
8.2	47 CFR Part 15, Subpart E 15.407	Maximum Conducted Output Power	Compliance
8.3	47 CFR Part 15, Subpart E 15.407	Band Edges Measurement	Compliance
8.4	47 CFR Part 15, Subpart E 15.407	Power Spectral Density	Compliance
8.5	47 CFR Part 15, Subpart E 15.407	Frequency Stability Measurement	Compliance
8.6	47 CFR Part 15, Subpart E 15.407	Radiated Undesirable Emission	Compliance
8.7	47 CFR Part 15, Subpart E 15.407	Powerline Conducted Emissions	Compliance

4 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10:2013 and FCC CFR 47 15.207, 15.209, 15.407 and KDB 789033, KDB 662911.

4.1 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.

4.2 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.

4.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10 2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

Under 1GHz

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.4 & 6.5 of ANSI C63.10:2013.

Above 1GHz

The EUT is placed on a turn table, which is 1.5 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.6 of ANSI C63.10:2013.

4.4 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.

4.5 DESCRIPTION OF TEST MODES

Description	Modulation Technology	Modulation Type
6dB Bandwidth	OFDM	BPSK
Maximum conducted output power	OFDM	BPSK
Band edges measurement	OFDM	BPSK
Peak Power Spectral Density	OFDM	BPSK
Radiated undesirable emission	OFDM	BPSK
Powerline conducted emission	OFDM	BPSK

Test Mode	Antenna 1	Antenna 2	Antenna 1+2
802.11a	√	√	x
802.11n HT20	√	√	√
802.11n HT40	√	√	√
802.11ac VHT20	√	√	√
802.11ac VHT40	√	√	√

The worst-case for conducted:

Test Mode	SISO Antenna 1	SISO Antenna 2	MIMO at both Antennas 1 and 2
802.11a	√	√	x
802.11n HT20	x	x	√
802.11n HT40	x	x	√
802.11ac VHT20	x	x	√
802.11ac VHT40	x	x	√

The worst-case for radiated and powerline conducted:

Test Mode	SISO Antenna 1	SISO Antenna 2	MIMO at both Antennas 1 and 2
802.11a	√	x	x
802.11n HT20	x	x	√
802.11n HT40	x	x	√
802.11ac VHT20	x	x	√
802.11ac VHT40	x	x	√

Operated in 5725MHz~5850MHz band:

5 channels are used for 802.11a, 802.11n HT20, 802.11ac VHT20:

Channel Frequency	Channel Frequency
149	5745 MHz
153	5765 MHz
157	5785 MHz
161	5805 MHz
165	5825 MHz

2 channels are used for 802.11n HT40, 802.11ac VHT40:

Channel Frequency	Channel Frequency
151	5755 MHz
159	5795 MHz

IEEE 802.11a mode:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT20 mode:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with MCS0 data rate were chosen for full testing.

IEEE 802.11n HT40 mode:

Channel Low (5755MHz) and Channel High (5795MHz) with MCS0 data rate were chosen for full testing.

IEEE 802.11ac VHT20 mode:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with VHTMCS0 data rate were chosen for full testing.

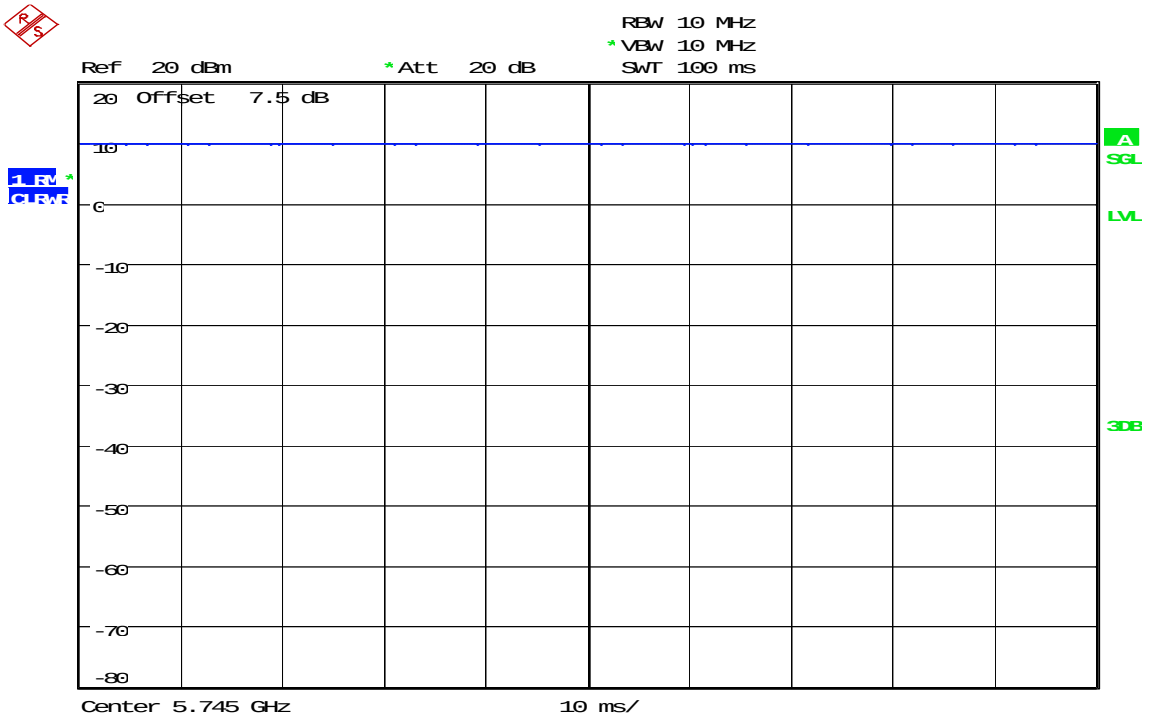
IEEE 802.11ac VHT40 mode:

Channel Low (5755MHz) and Channel High (5795MHz) with VHTMCS0 data rate were chosen for full testing.

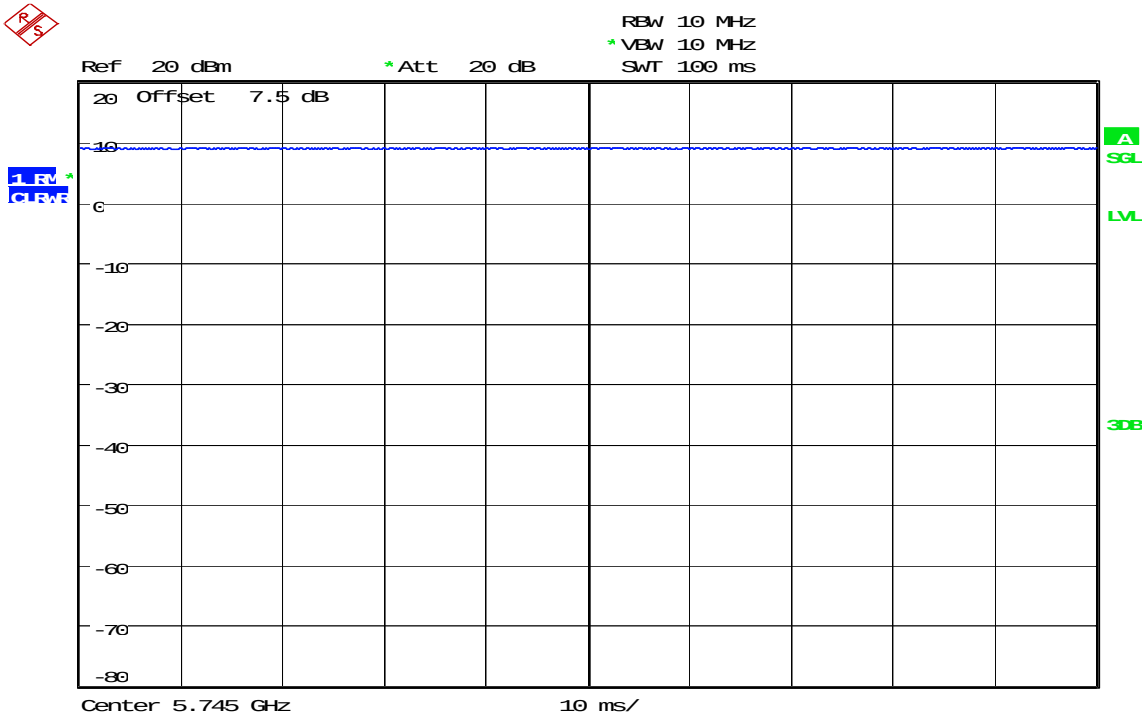
4.6 DUTY CYCLE

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
IEEE 802.11 a	100	-	-	10Hz
IEEE 802.11n HT20	100	-	-	10Hz
IEEE 802.11n HT40	100	-	-	10Hz
IEEE 802.11ac VHT20	100	-	-	10Hz
IEEE 802.11ac VHT40	100	-	-	10Hz

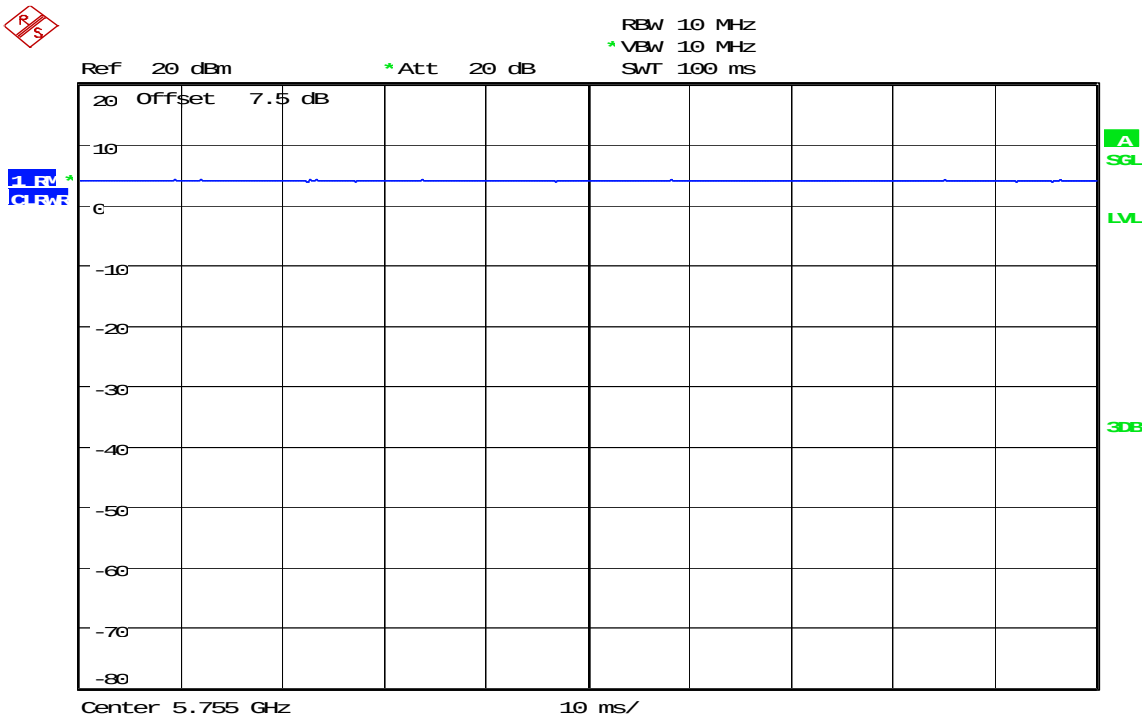
IEEE 802.11 a



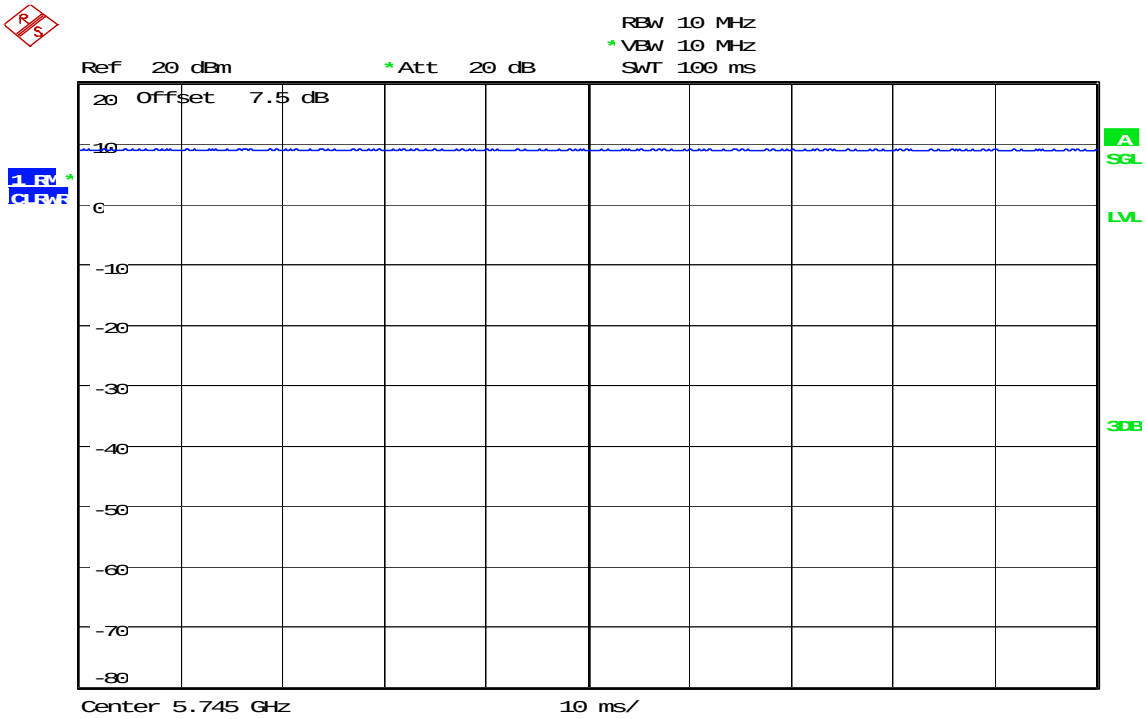
IEEE 802.11n HT20



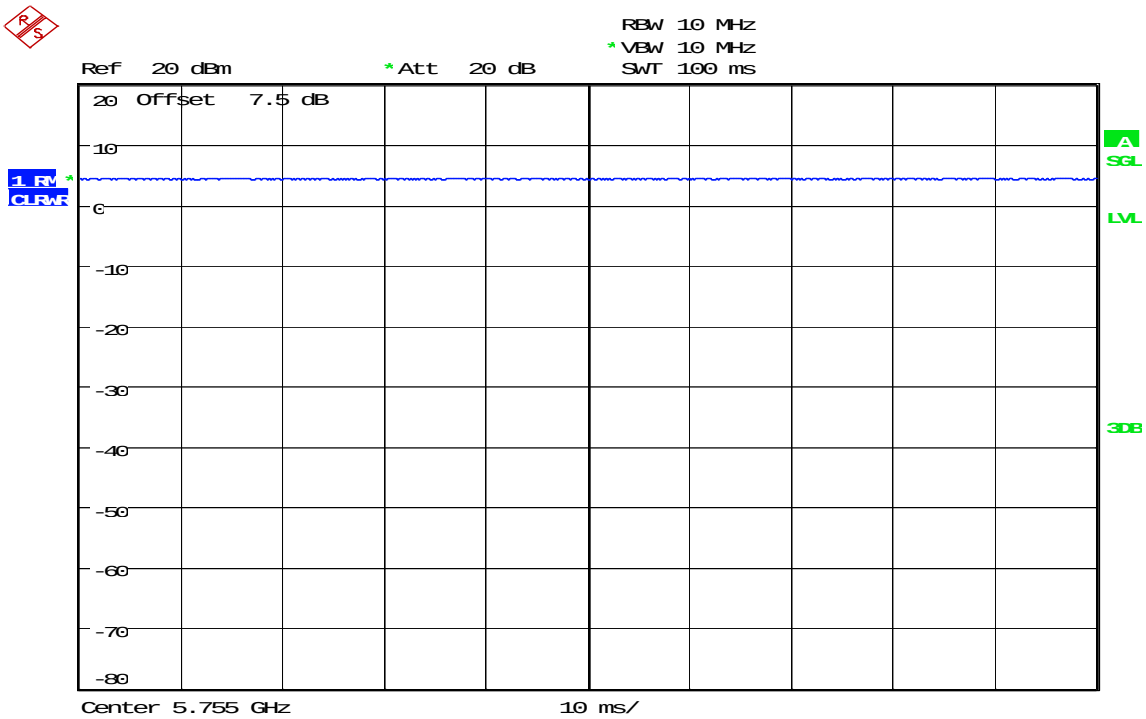
IEEE 802.11n HT40



IEEE 802.11ac VHT20

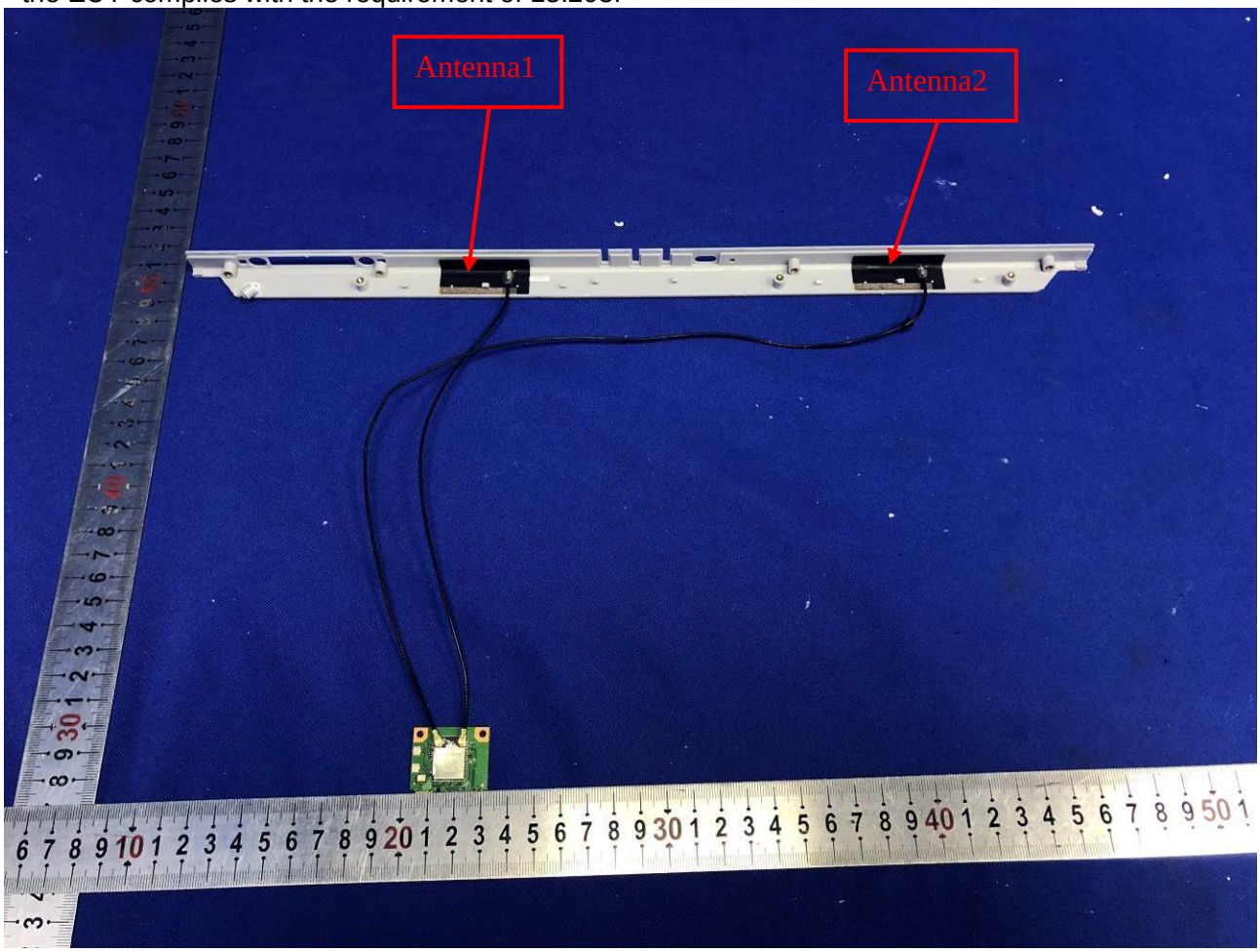


IEEE 802.11ac VHT40



4.7 ANTENNA DESCRIPTION

an intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached or an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section”
* the antenna of this EUT is a unique(FPC Antenna for WLAN)
* the EUT complies with the requirement of 15.203.



5 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.

5.1 MEASUREMENT EQUIPMENT USED

Conducted Emissions Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Data**	**Calibration Due**
Spectrum Analyzer	RS	FSU26	200789	2018-7-13	2019-7-12
Power meter	Anritsu	ML2495A	1445010	2018-4-26	2019-4-25
Power sensor	Anritsu	MA2411B	1339220	2018-4-26	2019-4-25
Power SPLITTER	Mini-Circuits	ZN2PD-9G	SF078500430	N.C.R	N.C.R
DC Power Supply	AGILENT	E3632A	MY50340053	N.C.R	N.C.R
Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	2018-4-23	2019-4-22
Cable	N/A	Cable-05	N/A	2018-4-24	2019-4-23
Cable	N/A	Cable-06	N/A	2018-4-24	2019-4-23
6dB Attenuator	N/A	N/A	N/A	2018-4-24	2019-4-23
Temp. / Humidity Gauge	Anymetre	TH603	CCS007	2018-10-30	2019-10-29

Conducted Emission					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EMI TEST RECEIVER	R&S	ESCI	100781	2018-2-26	2019-2-25
V (V-LISN)	SCHWARZBECK	NNLK 8129	8129-143	2018-10-28	2019-10-27
TWO-LINE V-NETWORK	R&S	ENV216	101604	2018-10-28	2019-10-27
Pulse LIMITER	R&S	ESH3-Z2	100524	2017-12-27	2018-12-26
Cable	Thermax	Cable-02	14	2017-12-27	2018-12-26
Test Software			EZ-EMC ver.3A1		

977 Chamber					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Data**	**Calibration Due**
Spectrum Analyzer	RS	FSU26	200789	2018-7-13	2019-7-12
Spectrum Analyzer	RS	FSV40	101493	2017-12-18	2018-12-17
EMI Test Receiver	R&S	ESCI	101378	2017-12-27	2018-12-26
Amplifier	COM-POWER	PAM-840A	461332	2017-11-29	2018-11-28
Amplifier	COM-POWER	PAM-118A	551044	2018-4-26	2019-4-25
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9170	9170-515	2018-2-27	2019-2-26
Bilog Antenna	SCHAFFNER	CBL6112D	36996	2018-7-7	2019-7-6
Loop Antenna	COM-POWER	AL-130R	10160008	2018-5-8	2019-5-7
Horn-antenna	SCHWARZBECK	9120D	D:266	2018-2-26	2019-2-25
Turn Table	CT	CT123	4165	N.C.R	N.C.R
Antenna Tower	CT	CTERG23	3256	N.C.R	N.C.R
Controller	CT	CT1OO	95637	N.C.R	N.C.R
Cable	REBES MICROWAVE	Cable-93	N/A	2018-10-28	2019-10-27
Cable	REBES MICROWAVE	Cable-94	N/A	2018-10-28	2019-10-27
Cable	REBES MICROWAVE	Cable-95	N/A	2018-10-28	2019-10-27
Cable	N/A	Cable-03	N/A	2018-4-24	2019-4-23
Cable	N/A	Cable-04	N/A	2018-4-24	2019-4-23
2.4G Filter	N/A	N/A	N/A	2018-4-24	2019-4-23
Test Software			EZ-EMC ver.3A1		

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

5.2 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
RF output power, conducted	±1.129dB
Unwanted Emissions, conducted	±2.406dB
RF Power density, conducted	±2.379dB
Conducted emissions	±2.582dB
All emissions, radiated (Below 1GHz)	±4.725dB
All emissions, radiated (Above 1GHz)	± 4.818dB
Temperature	±0.3dB
Supply voltages	±0.2%

6 FACILITIES AND ACCREDITATIONS

6.1 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 C63.10:2013 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6.2 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.”

6.3 TABLE OF ACCREDITATIONS AND LISTINGS

FCC –Designation Number: CN1172.

Compliance Certification Services Inc. Kun shan Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Designation Number: CN1172.

6.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	47 CFR FCC, Part 15,Subpart B (using ANSI 63.4 :2009 and ANSI C63.4:2014);ICES-003; 47 CFR FCC, Part 18(using MP-5:1986);ICES-001;VCCI - V3; VCCI-CISPR-32(up to 6GHz);VCCI 32-1;CNS 13438(up to 6GHz); CNS 13439; CNS 13803; CISPR 11; EN 55011; CISPR 13; EN 55013; CISPR 22; EN 55022; AS/NZS CISPR 22;CISPR32;EN55032; AS/NZS CISPR 32;EN55014-1(excluding clicks);CISPR 14-1(excluding clicks);EN55015;CISPR 15; IEC 61000-3-2; EN 61000-3-2; AS/NZS 61000.3.2 IEC 61000-3-3; EN 61000-3-3; AS/NZS 61000.3.3 IEC 61000-4-2; EN 61000-4-2; AS/NZS 61000.4.2 IEC 61000-4-3; EN 61000-4-3; AS/NZS 61000.4.3 IEC 61000-4-4; EN 61000-4-4; AS/NZS 61000.4.4 IEC 61000-4-5; EN 61000-4-5; AS/NZS 61000.4.5 IEC 61000-4-6; EN 61000-4-6; AS/NZS 61000.4.6 IEC 61000-4-8; EN 61000-4-8; AS/NZS 61000.4.8 IEC 61000-4-11; EN 61000-4-11; AS/NZS 61000.4.11 EN 61000-6-1; EN 61000-6-2; EN 61000-6-3 (excluding discontinuous interference); EN 61000-6-4; IEC 61000-6-1; IEC 61000-6-2; IEC 61000-6-3 (excluding discontinuous interference); IEC 61000-6-4; AS/NZS 61000.6.1; AS/NZS 61000.6.2; AS/NZS 61000.6.3 (excluding discontinuous interference); AS/NZS 61000.6.4; EN 55024; CISPR 24; AS/NZS CISPR 24; EN 61547; IEC 61547; EN 60601-1-2; IEC 60601-1-2; EN 50130-4; EN 55014-2; CISPR 14-2; EN 62040-2; IEC 62040-2; EN 61204-3; IEC 61204-3; EN 50121-1; EN 50121-3-2; EN 50121-4; EN 50121-5; EN 50155 (clauses 5.4 and 5.5); EN 61326-1; IEC 61326-1; EN 50083-2; EN 300 386; EN 301 489-1 (excluding Section 9.6); EN 301 489-3; EN 301 489-7; EN 301 489-17; EN 301 489-19; EN 301 489-24; EN 301 489-25; EN 301 489-34 FCC Part 15, Subparts 15C, 15E (KDB 905462 D03 (v01r02))(using ANSI C63.4:2009, ANSI C63.4:2014 and ANSI C63.10:2013) FCC Parts 22E, 24E (using ANSI/TIA-603-D) RSS-132; RSS-133; RSS-210; RSS-247 (excluding DFS testing) EN 300 220-1; EN 300 220-2; EN 300 328; EN 300 330-1; EN 300 330-2; EN 300 440-1; EN 300 440-2; EN 301 893 (excluding DFS testing); EN 301 511(clauses 4.2.12 to 4.2.19, and 5.2.12 to 5.2.19);	 TESTING CERT #2541.01

		EN 301 908-1 (clauses 4.2.2, 4.2.3, 5.3.1, and 5.3.2); EN 301 908-2 (clauses 4.2.4, 4.2.10, 5.3.3, and 5.3.9) AS/NZS 4268 IEEE Std 1528:2013; EN 50360; EN 50566; EN 62479; EN 50383; EN 50385; EN 62311; IEC 62209-1; EN 62209-1; IEC 62209-2; EN 62209-2; CNS 14958-1; CNS 14959; RSS-102; ACMA Radio Communications (Electromagnetic Radiation – Human Exposure) Standard 2014	
USA	FCC	3/10 meter Sites to perform FCC Part 15/18 measurements	CN1172
Japan	VCCI	3/10 meter Sites and conducted test sites to perform radiated/conducted measurements	R-1600 C-1707 G-216

** No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*

7 SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Setup photo for the actual connections between EUT and support equipment.

7.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID
1	Adapter	TDK	HWS100A-12/MEA	N/A	N/A

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.

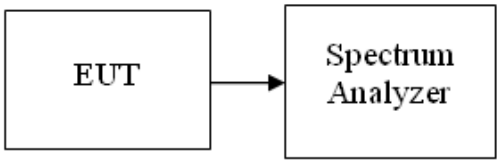
8 FCC PART 15 REQUIREMENTS

8.1 6 DB BANDWIDTH MEASUREMENT

LIMIT

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 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 1

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	16.704	0.5
Mid	5785	16.704	0.5
High	5825	16.640	0.5

Test mode: IEEE 802.11a mode/ Chain 2

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	16.704	0.5
Mid	5785	16.512	0.5
High	5825	16.704	0.5

Test mode: IEEE 802.11n HT20 mode/ Chain 1

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.792	0.5
Mid	5785	17.920	0.5
High	5825	17.792	0.5

Test mode: IEEE 802.11n HT20 mode/ Chain 2

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.856	0.5
Mid	5785	17.792	0.5
High	5825	17.792	0.5

Test mode: IEEE 802.11n HT40 mode/ Chain 1

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	36.736	0.5
High	5795	36.864	0.5

Test mode: IEEE 802.11n HT40 mode/ Chain 2

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	36.736	0.5
High	5795	35.456	0.5

Test mode: IEEE 802.11ac VHT20 mode/ Chain 1

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.856	0.5
Mid	5785	17.792	0.5
High	5825	17.856	0.5

Test mode: IEEE 802.11ac VHT20 mode/ Chain 2

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5745	17.792	0.5
Mid	5785	17.792	0.5
High	5825	17.792	0.5

Test mode: IEEE 802.11ac VHT40 mode/ Chain 1

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	36.608	0.5
High	5795	36.864	0.5

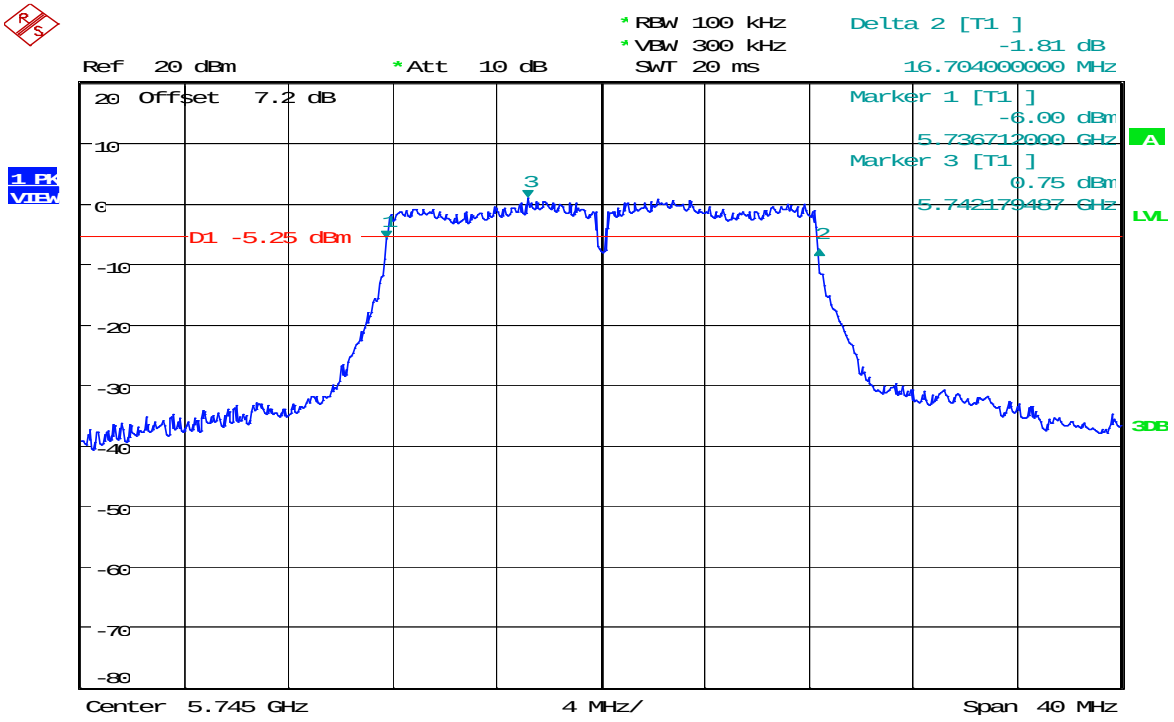
Test mode: IEEE 802.11ac VHT40 mode/ Chain 2

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC 6 dB Bandwidth Min. Limit (MHz)
Low	5755	36.608	0.5
High	5795	36.352	0.5

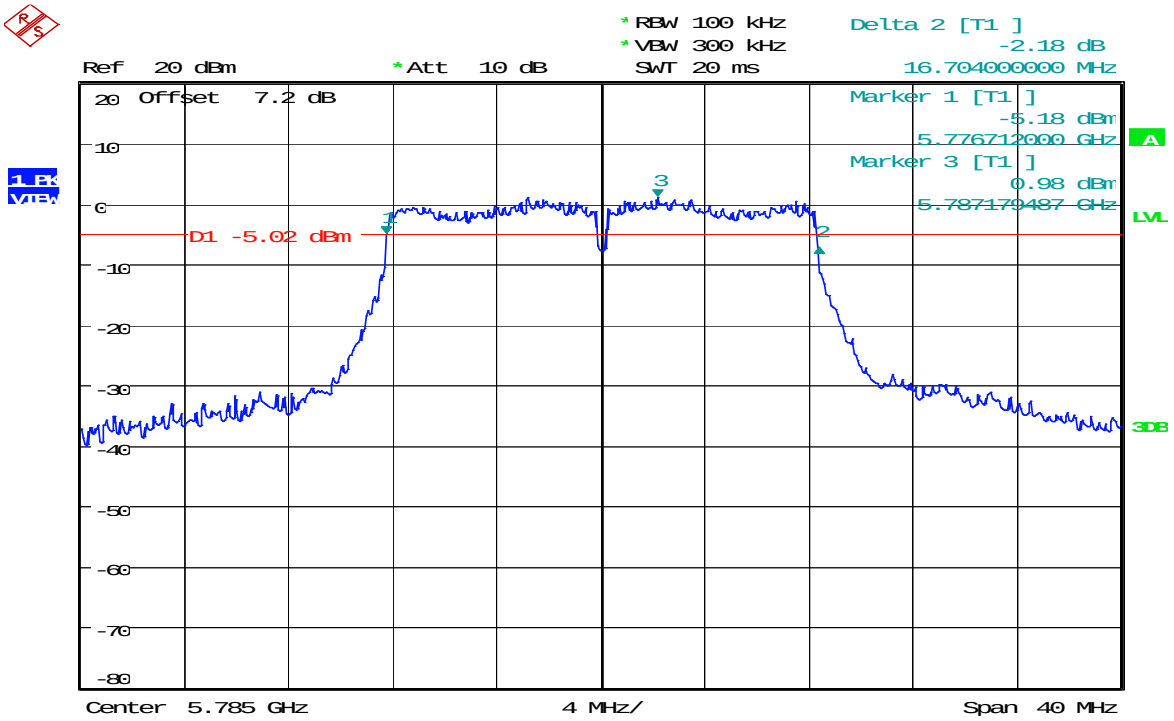
Test Plot

IEEE 802.11a mode/Chain 1:

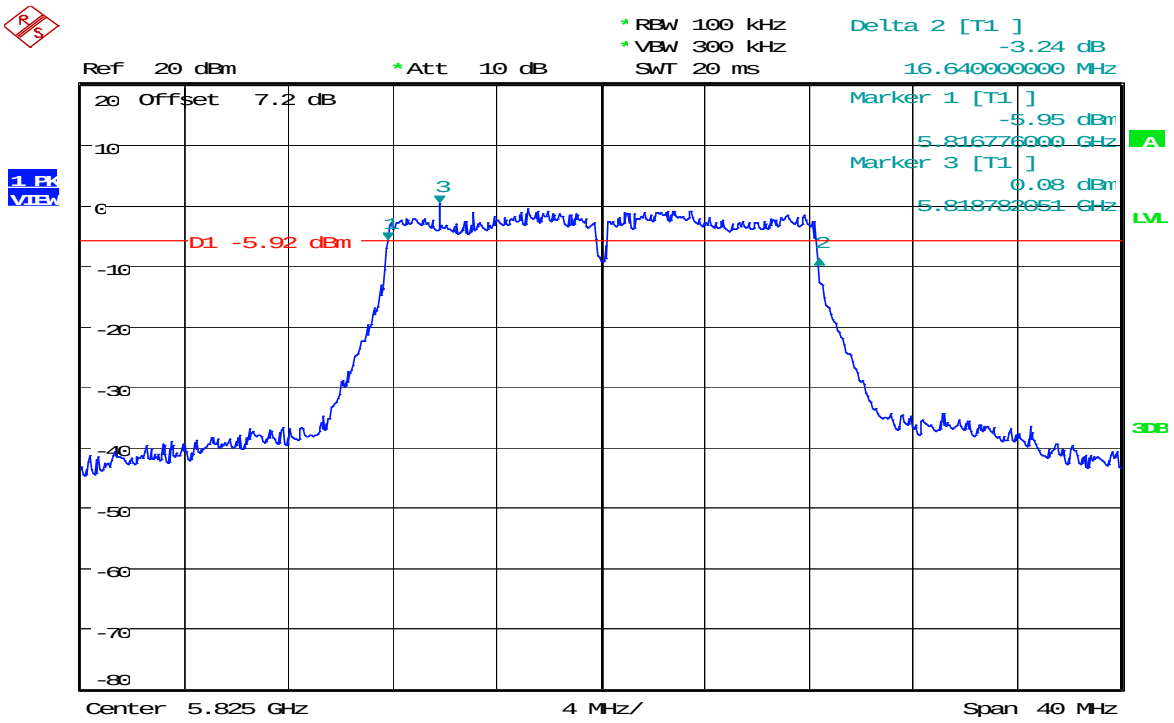
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

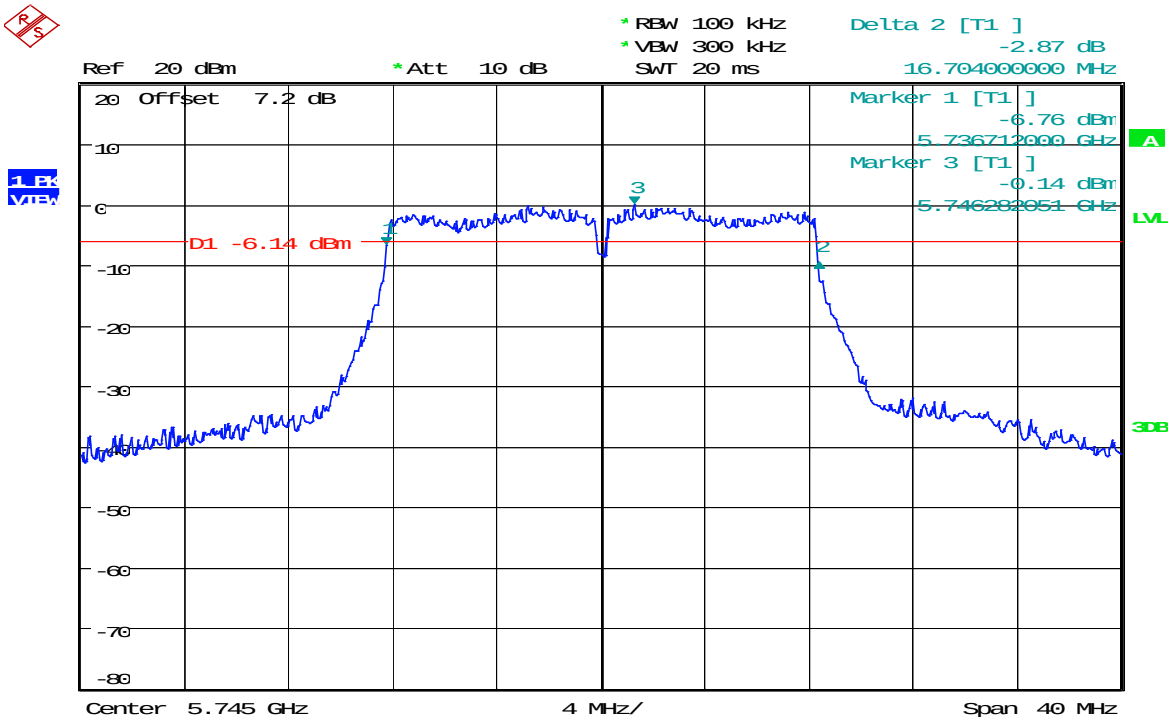


6dB Bandwidth (CH High)

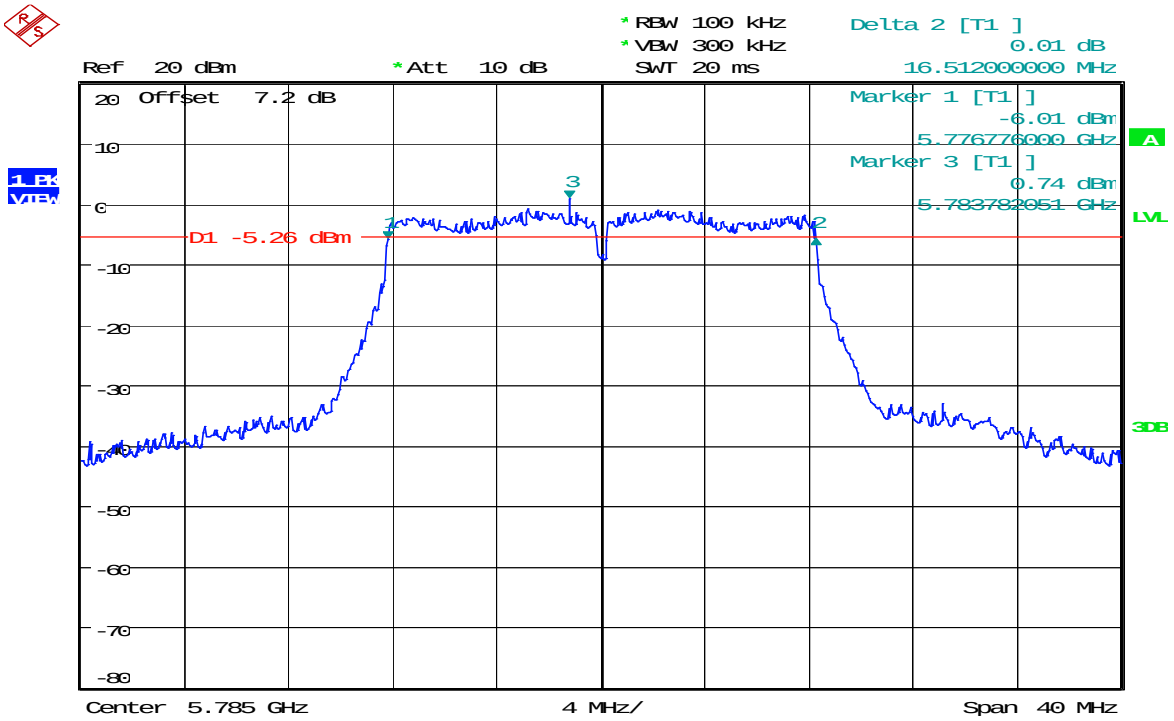


IEEE 802.11a mode/Chain 2:

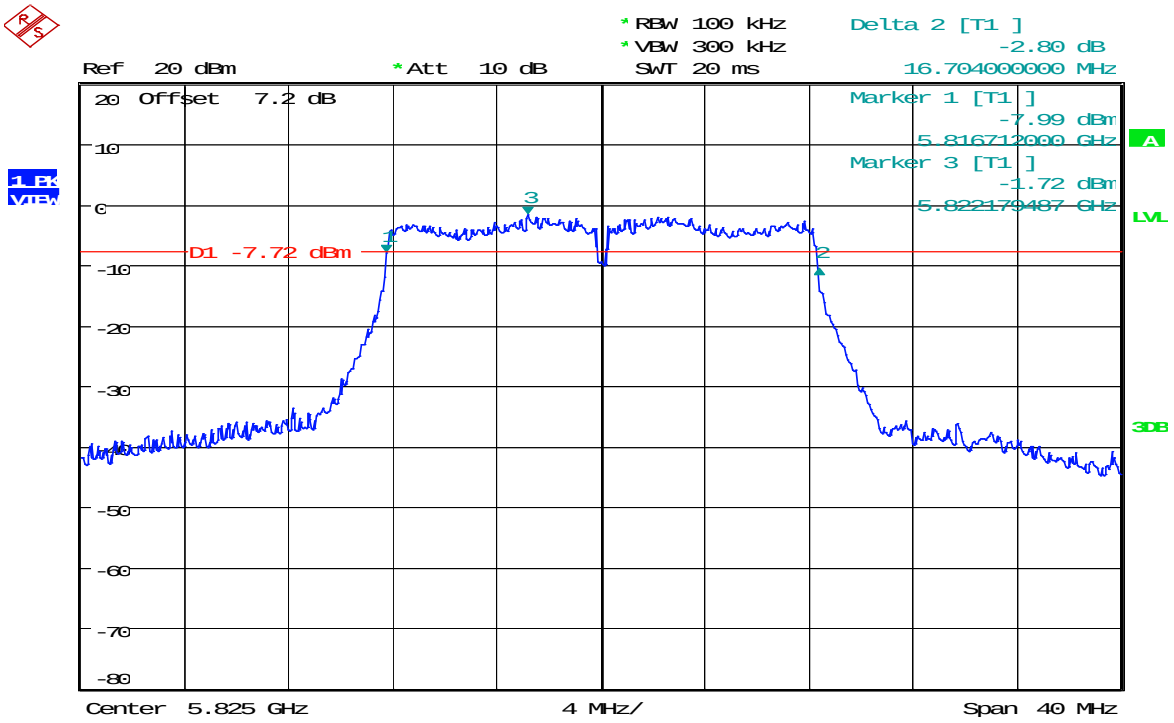
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

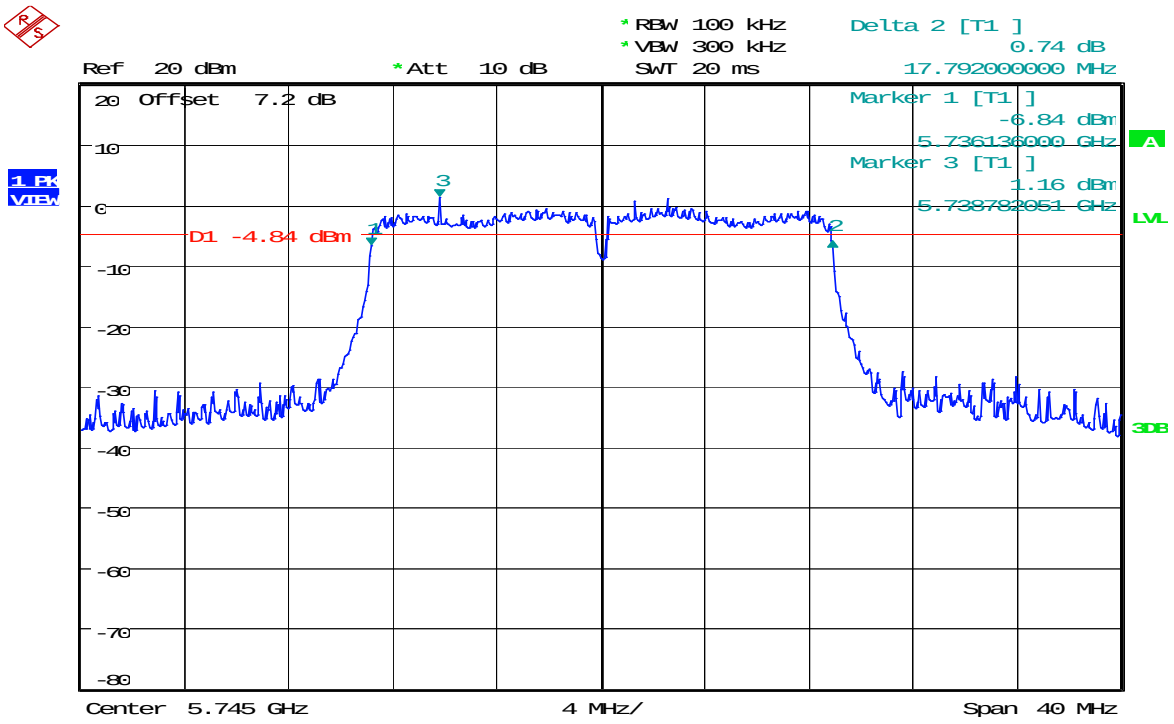


6dB Bandwidth (CH High)

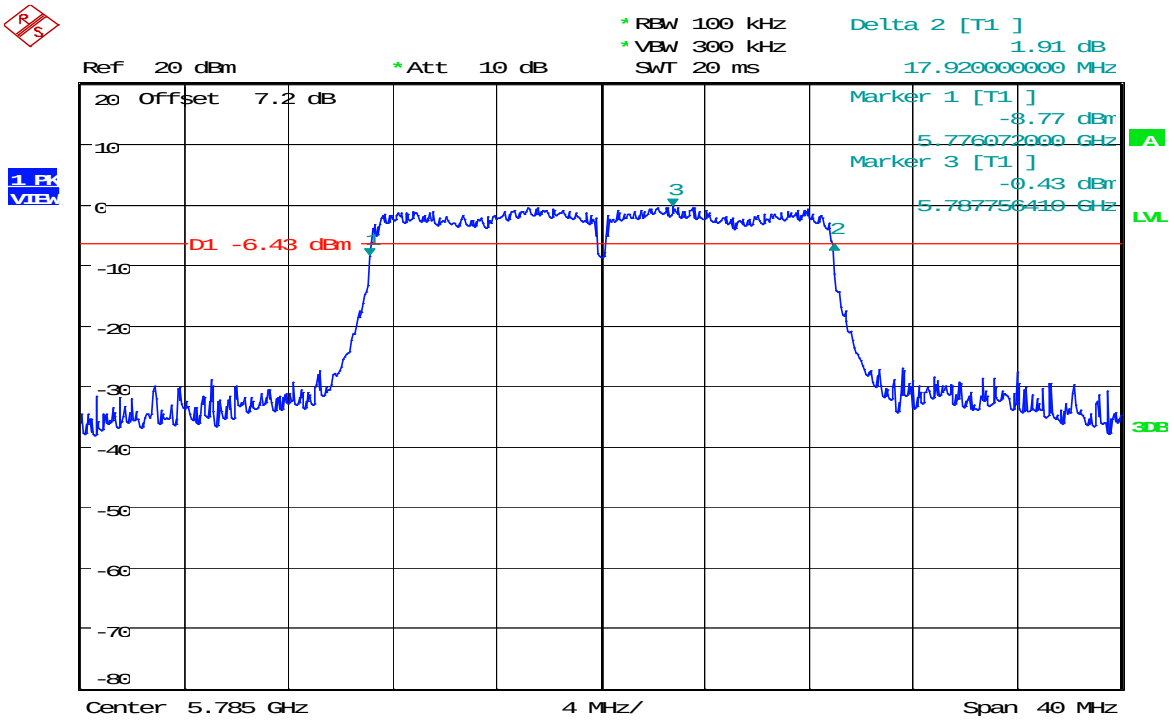


IEEE 802.11n HT20 mode/Chain 1:

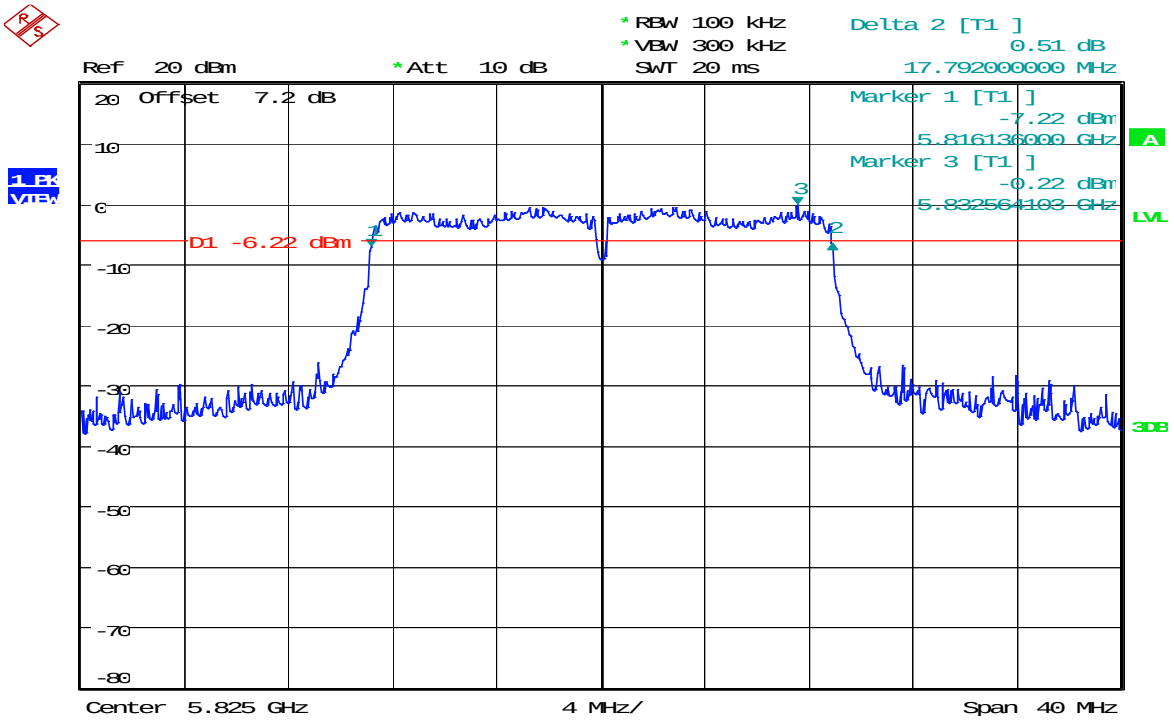
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

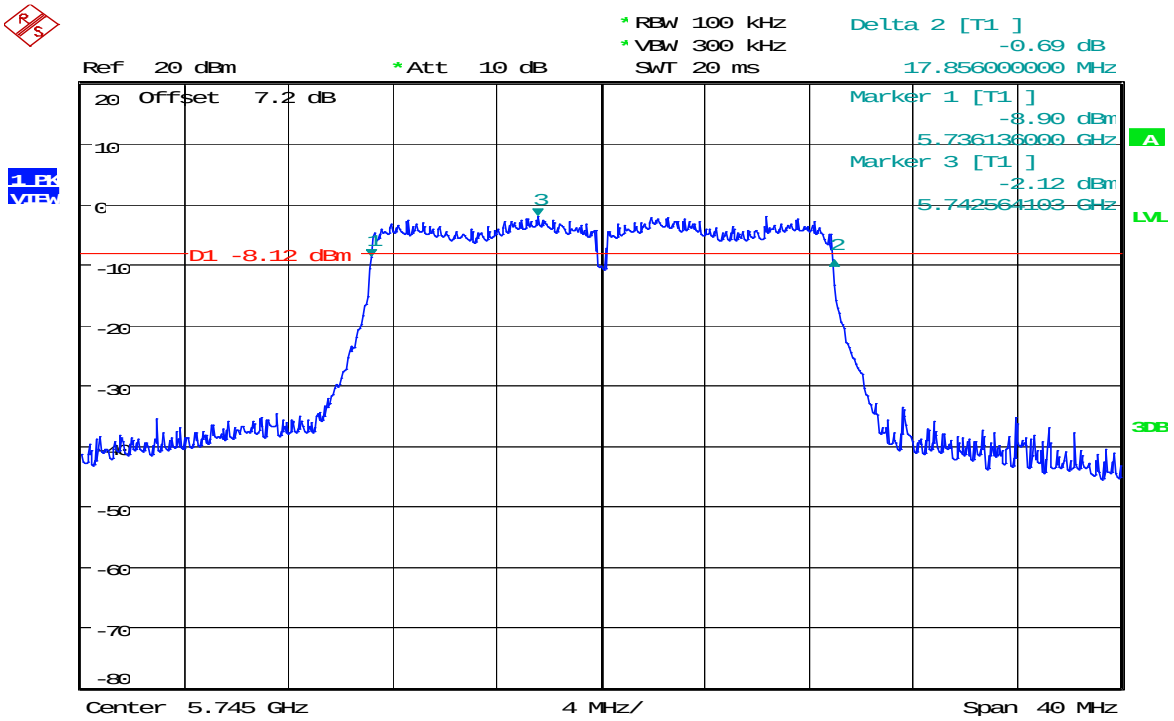


6dB Bandwidth (CH High)

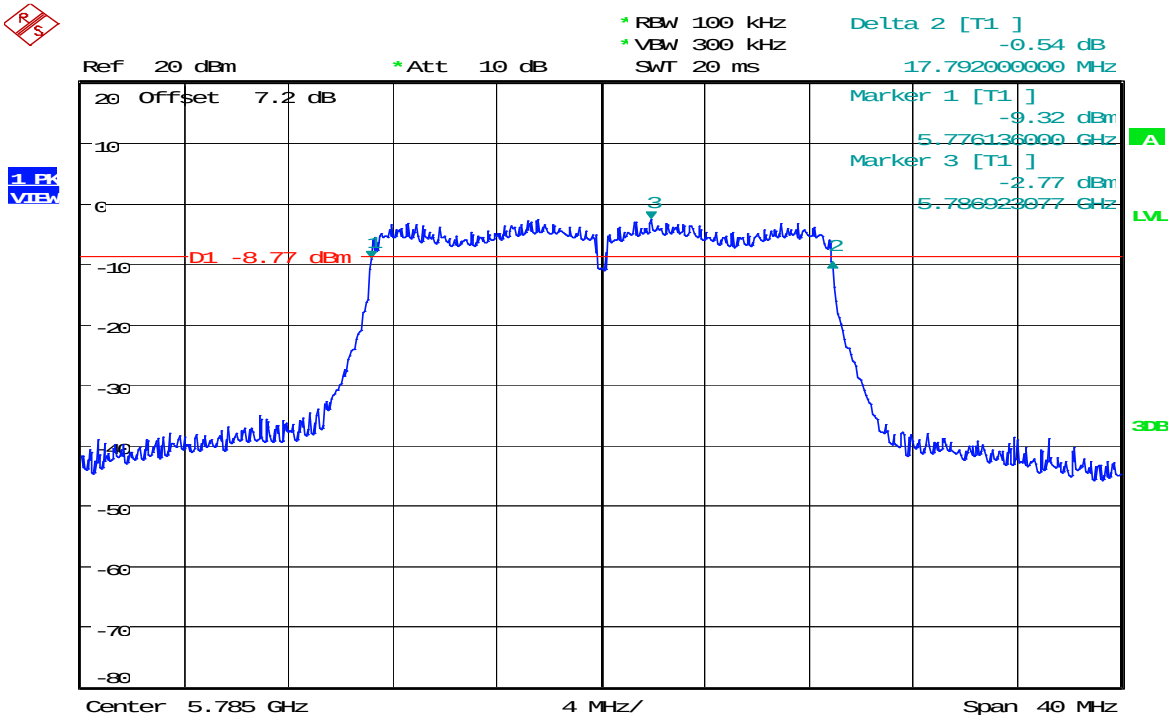


IEEE 802.11n HT20 mode/Chain 2:

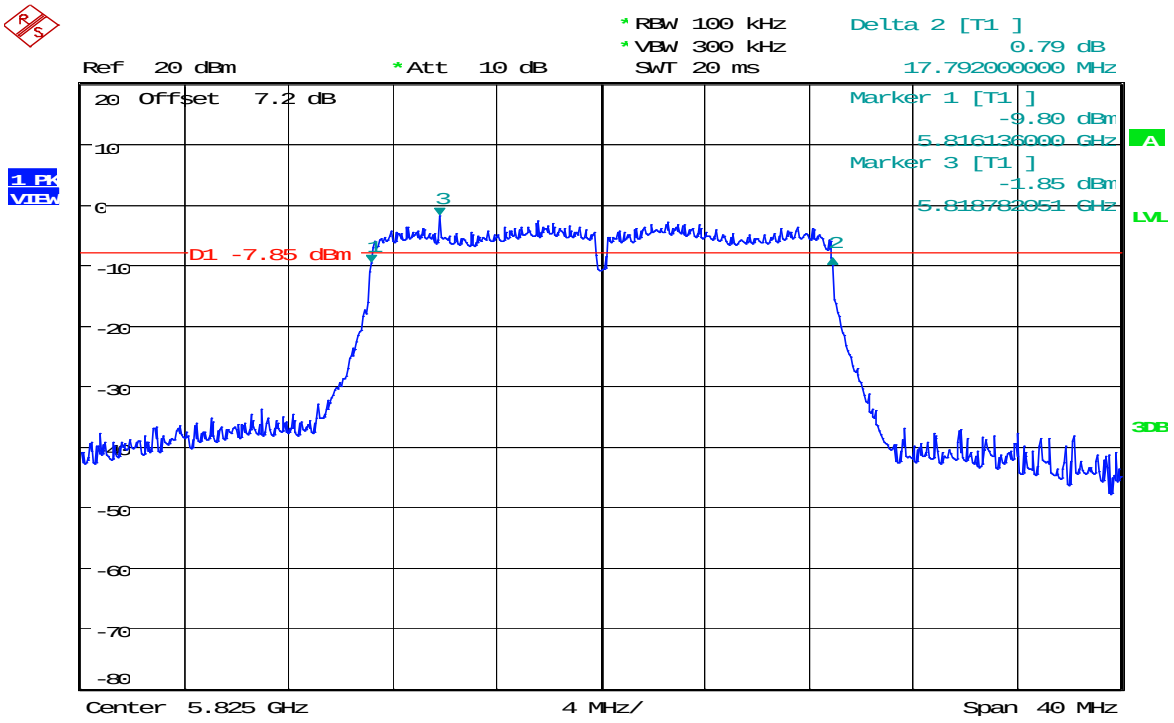
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

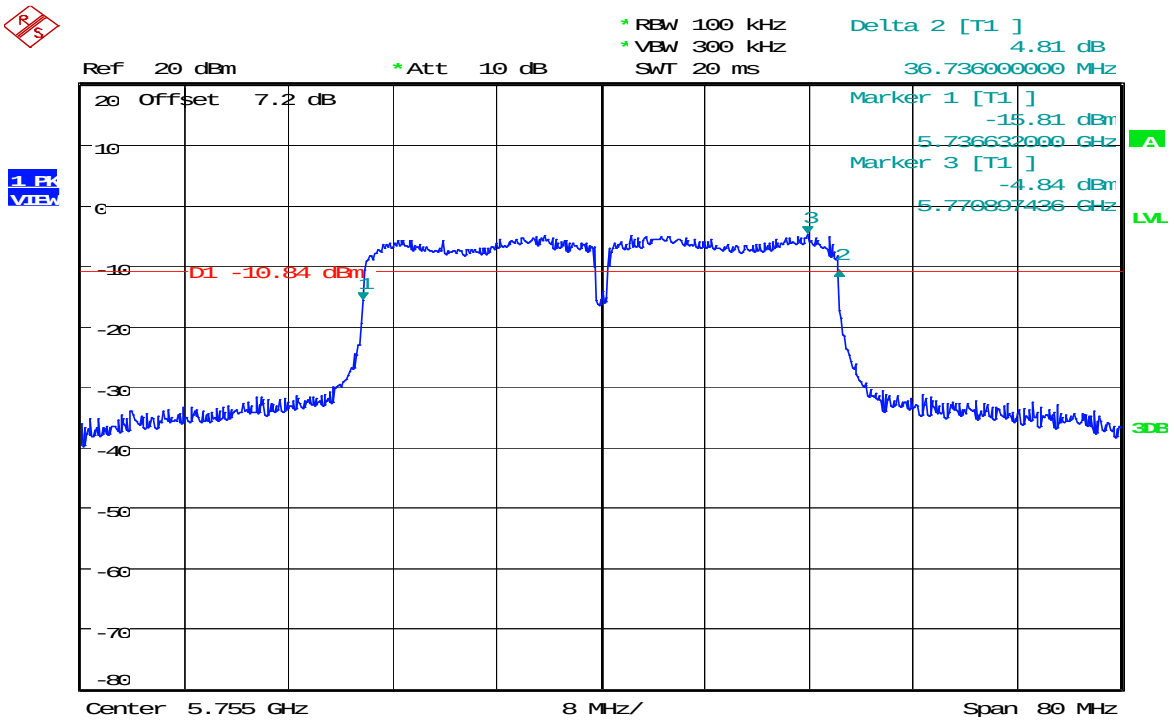


6dB Bandwidth (CH High)

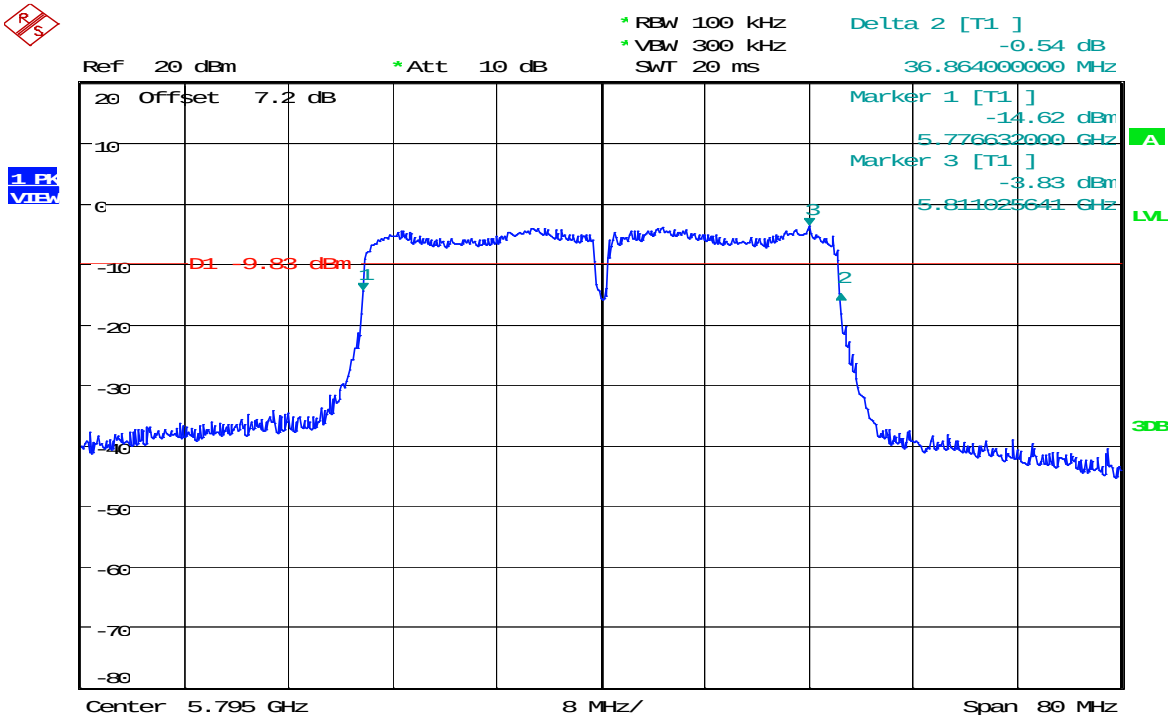


IEEE 802.11n HT40 mode/Chain 1:

6dB Bandwidth (CH Low)

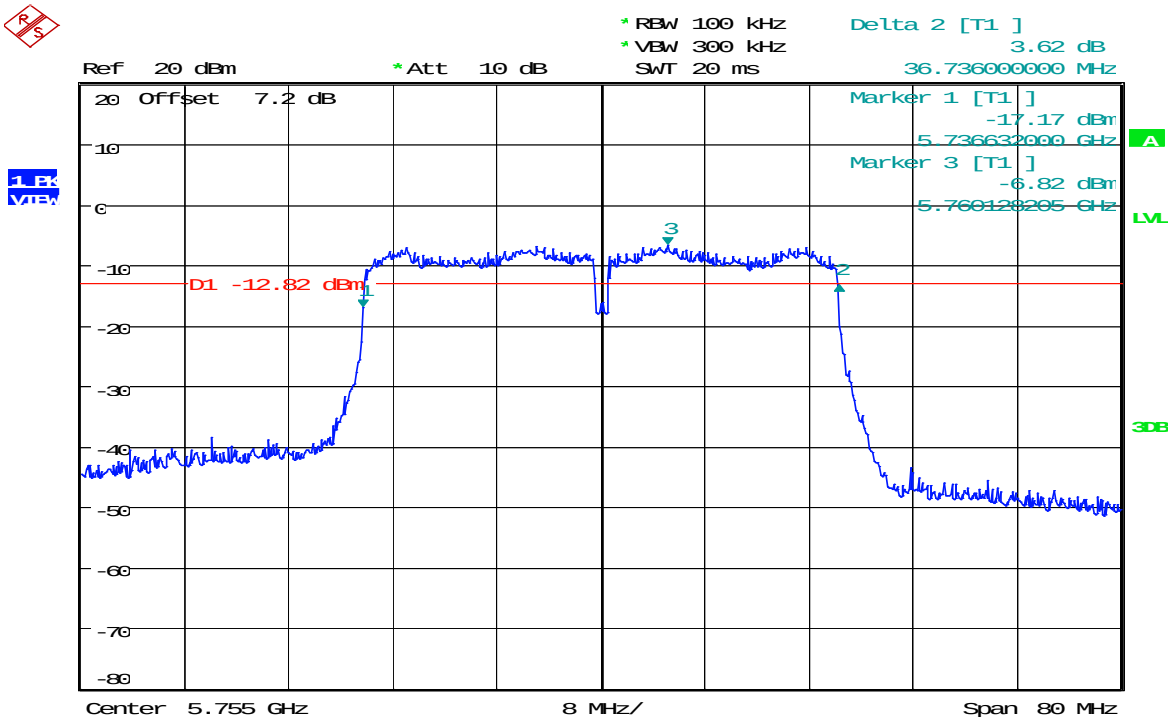


6dB Bandwidth (CH High)

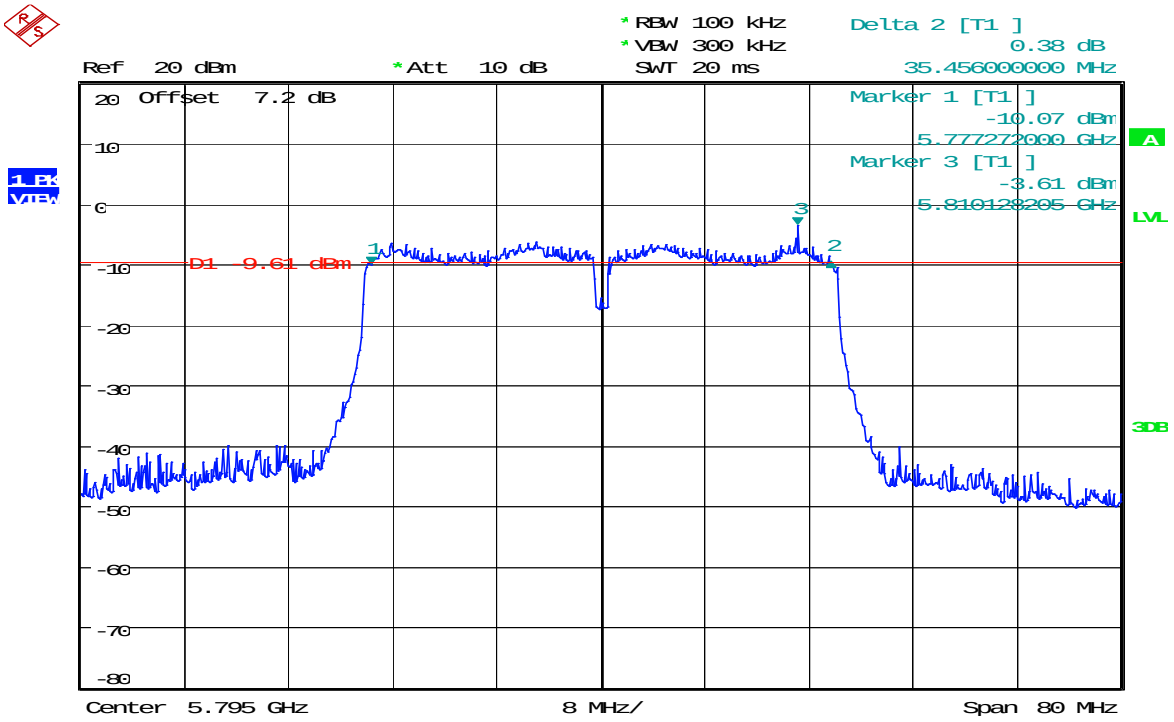


IEEE 802.11n HT40 mode/Chain 2:

6dB Bandwidth (CH Low)

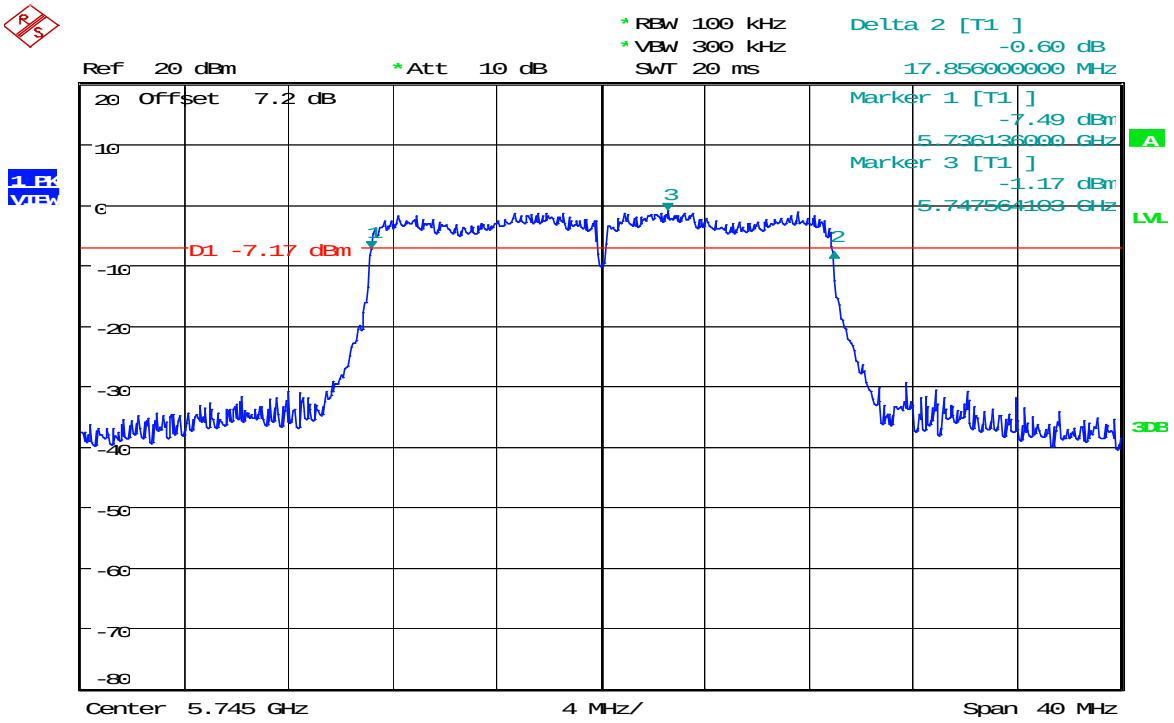


6dB Bandwidth (CH High)

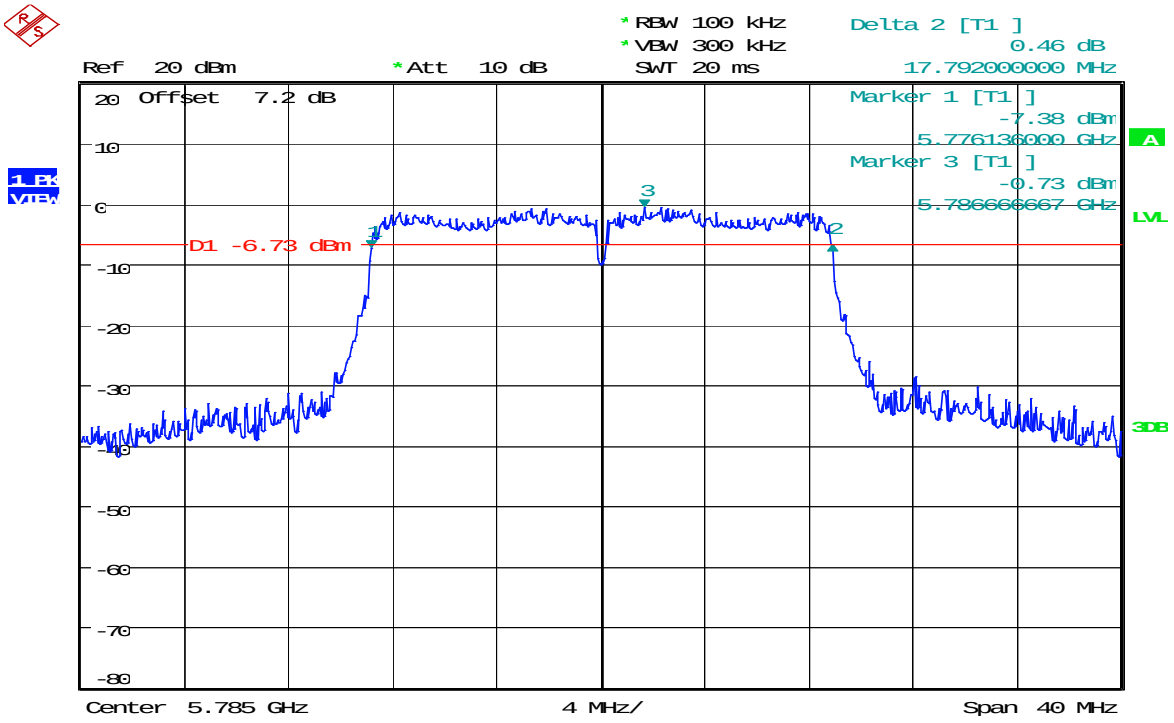


IEEE 802.11ac VHT20 mode/Chain 1:

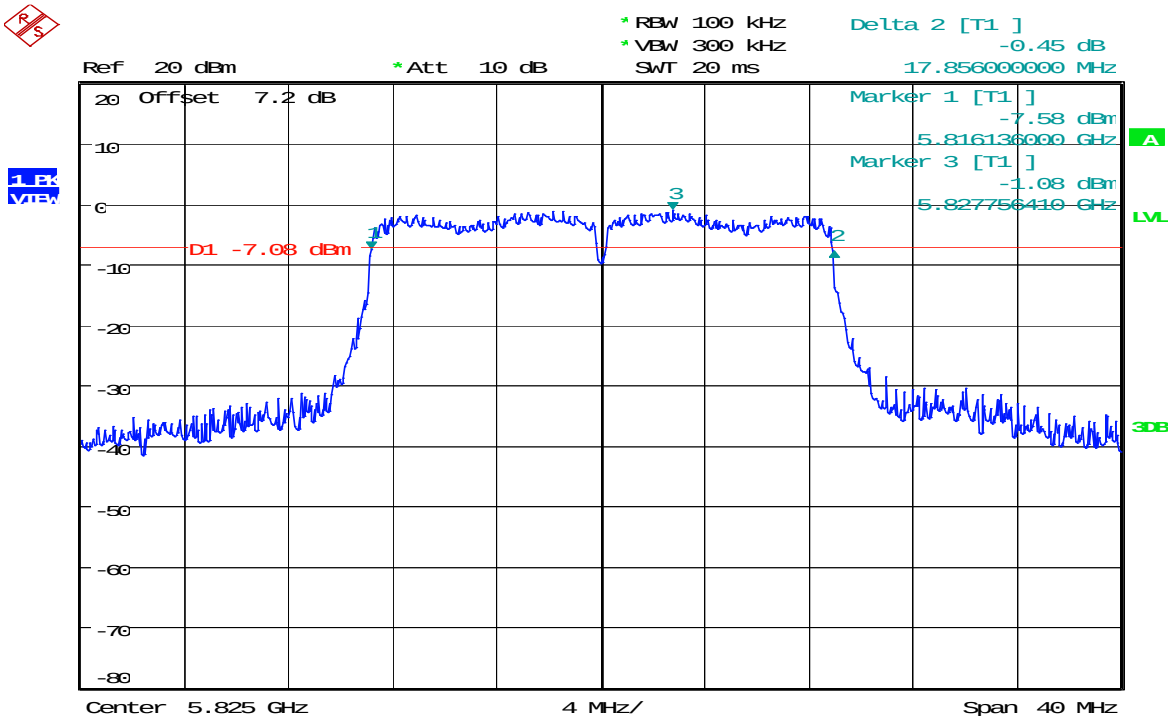
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

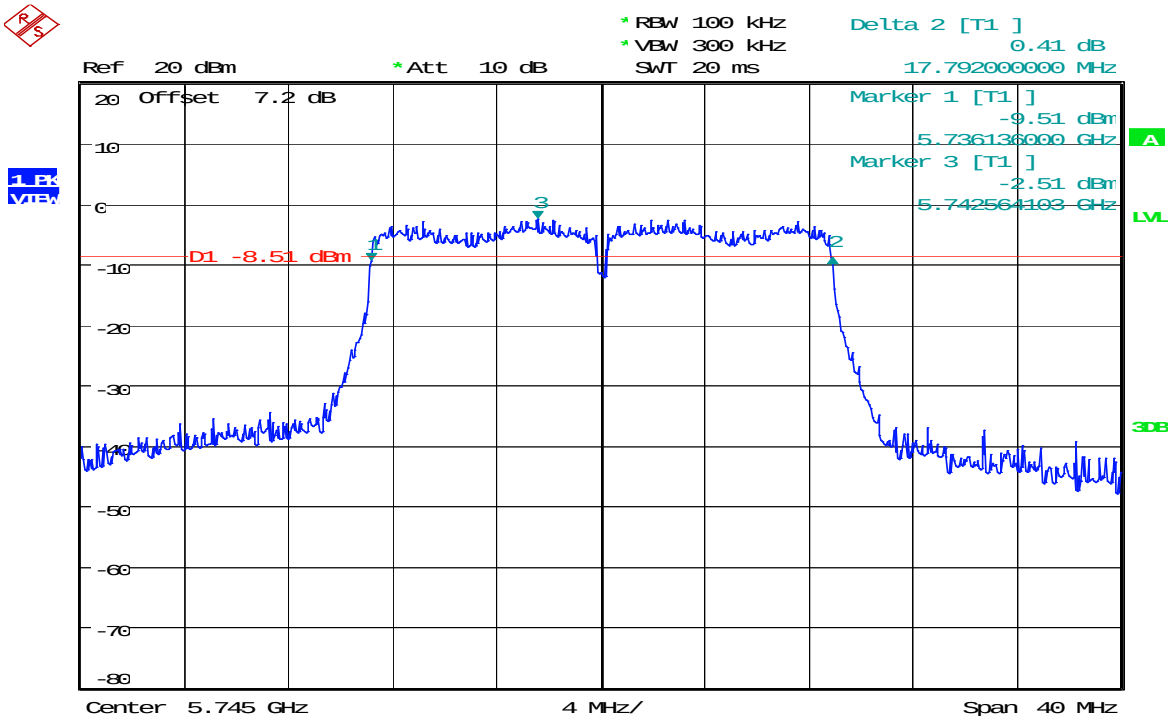


6dB Bandwidth (CH High)

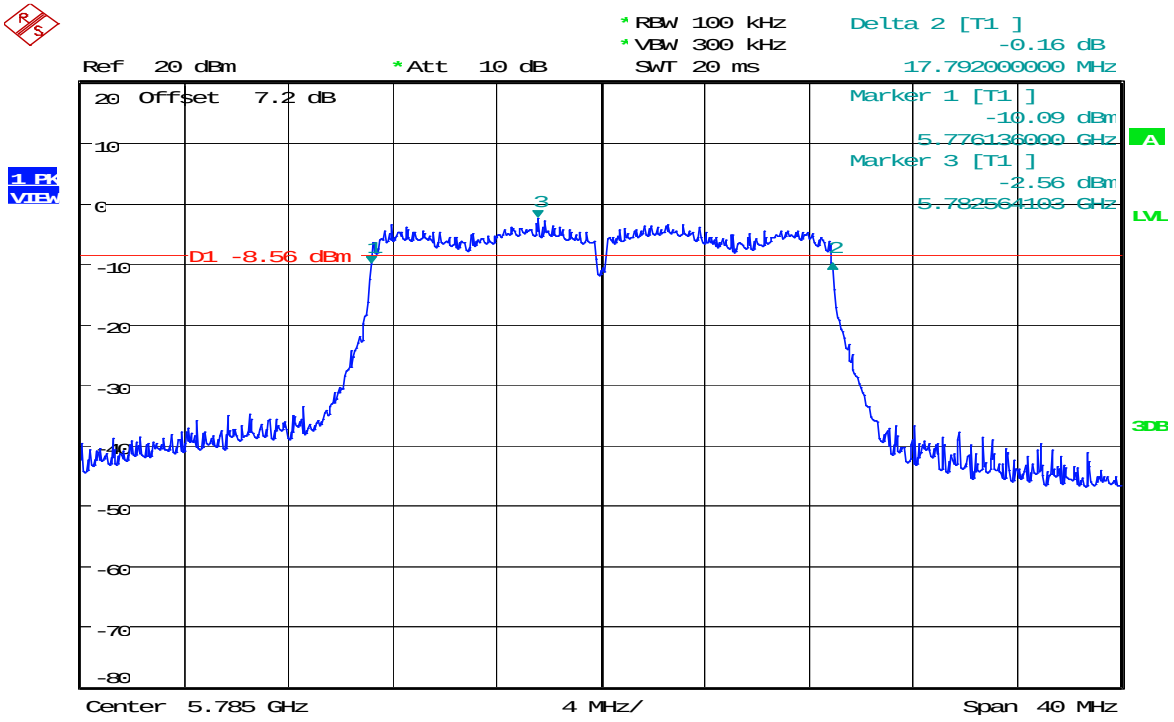


IEEE 802.11ac VHT20 mode/Chain 2:

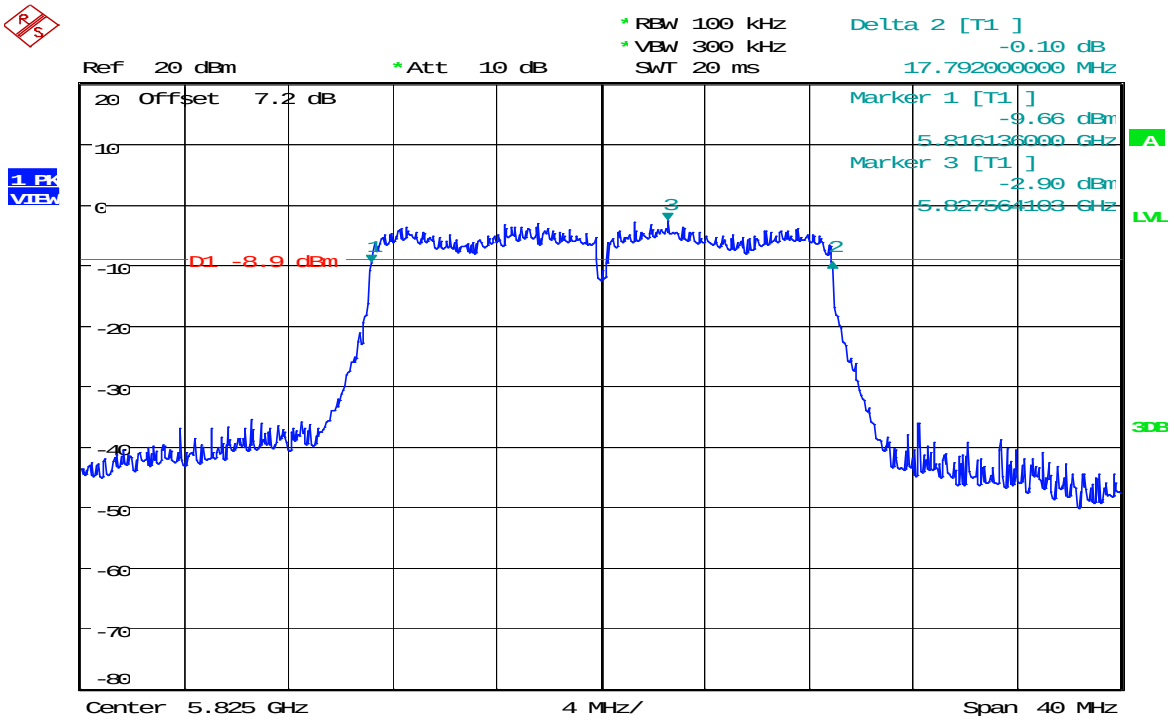
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

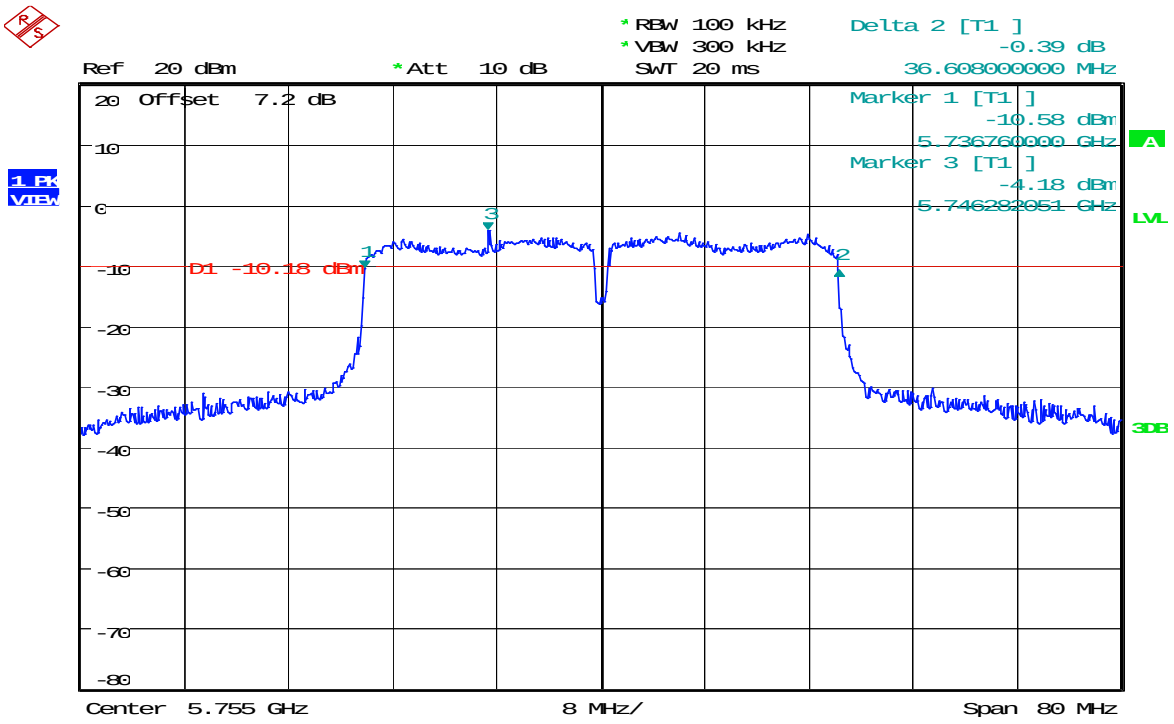


6dB Bandwidth (CH High)

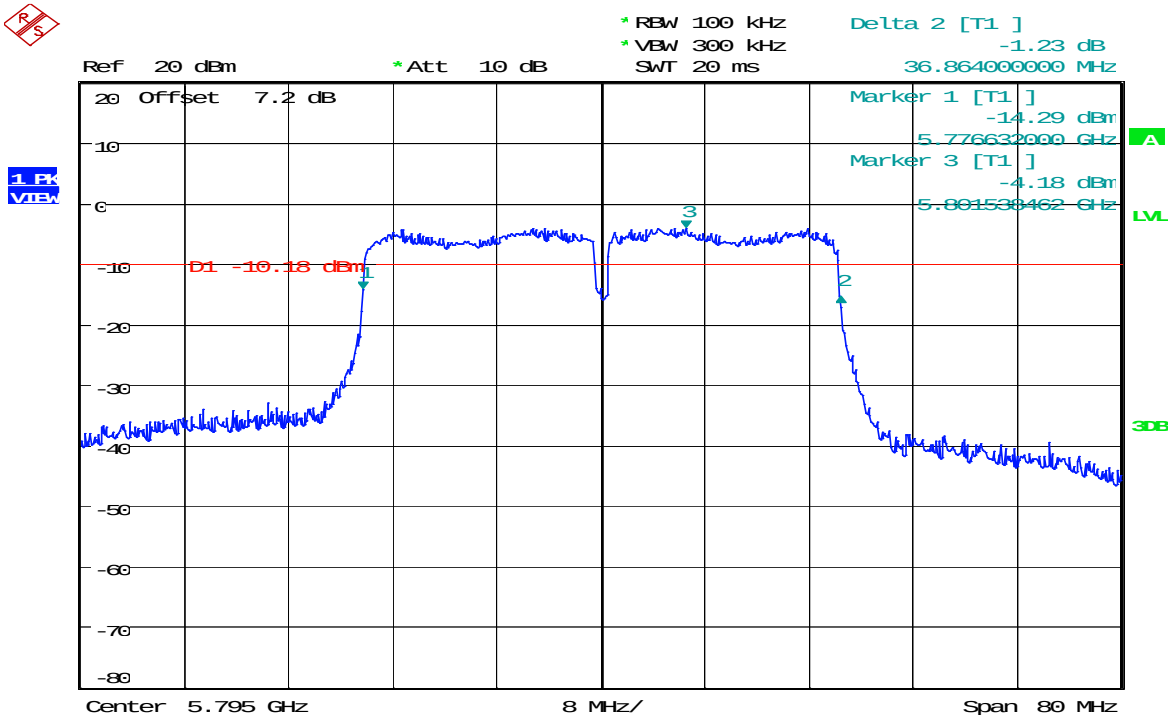


IEEE 802.11ac VHT40 mode/Chain 1:

6dB Bandwidth (CH Low)

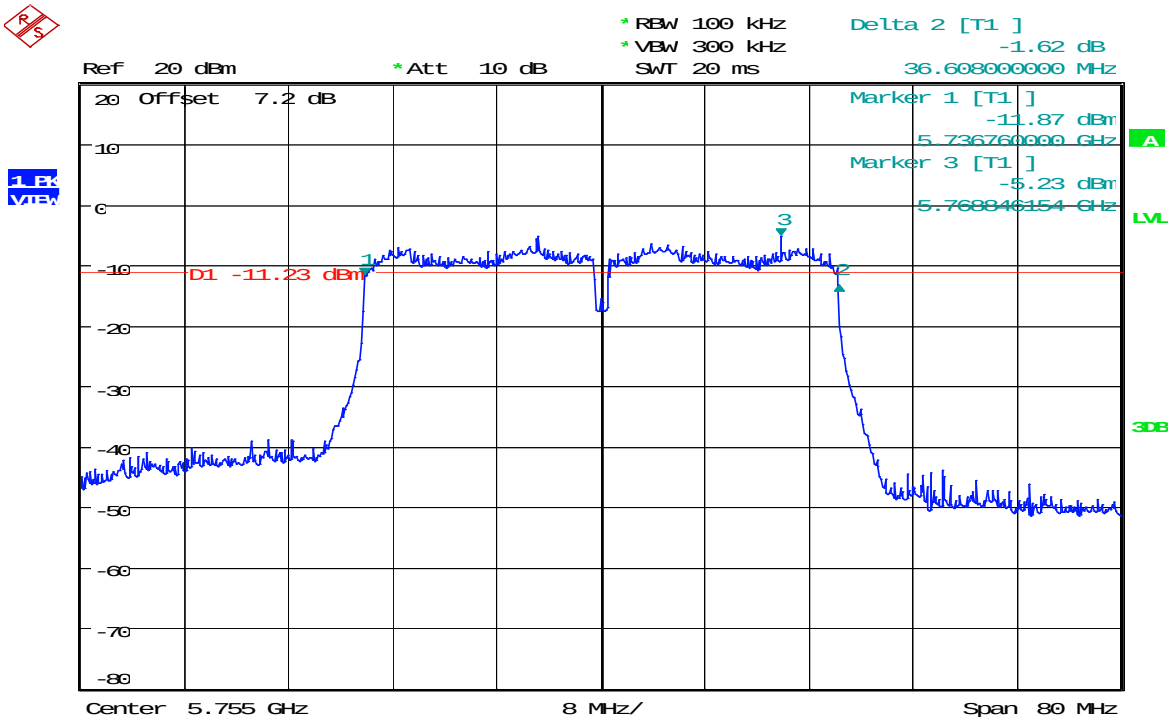


6dB Bandwidth (CH High)

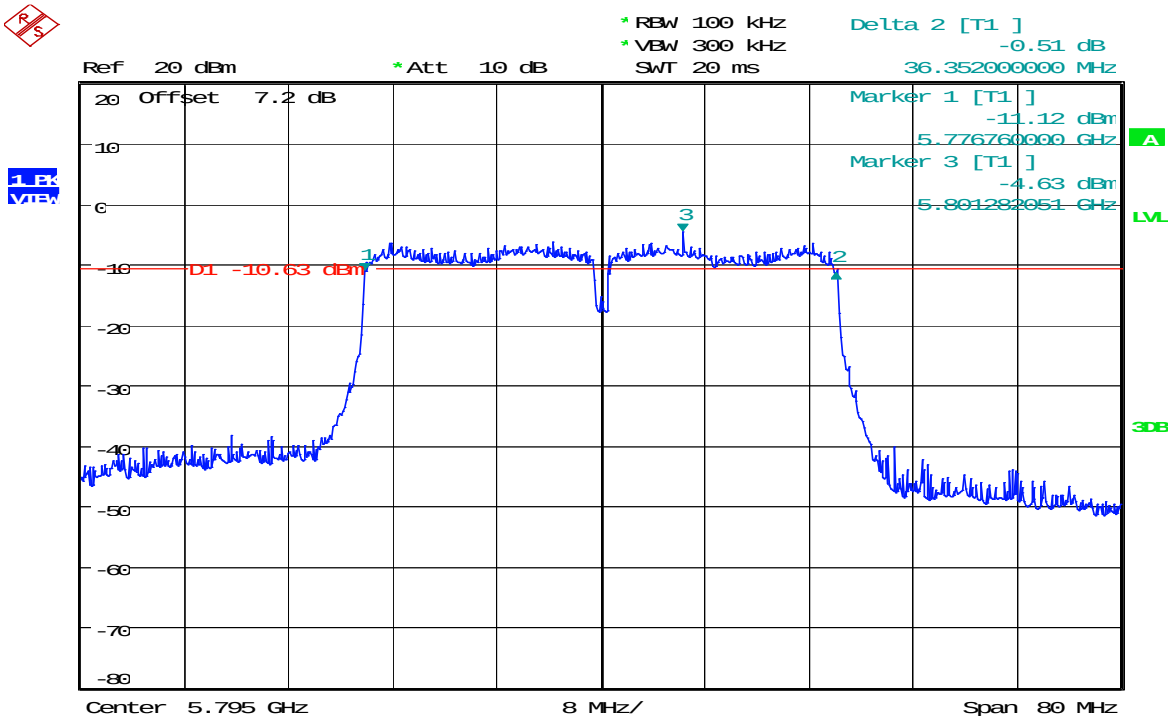


IEEE 802.11ac VHT40 mode/Chain 2:

6dB Bandwidth (CH Low)



6dB Bandwidth (CH High)



8.2 MAXIMUM CONDUCTED OUTPUT POWER

LIMIT

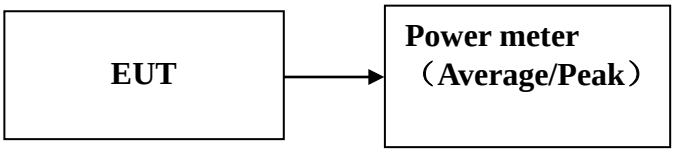
According to §15.407(a),

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.

Antenna 1 Gain=6.7dBi>6dBi
Chain 1 Limit=30.00dBm-(6.7-6) dB=29.30dBm
Antenna 2 Gain=6.1dBi>6dBi
Chain 2 Limit=30.00dBm-(6.1-6) dB=29.90dBm
Directional Gain= 9.42dBi>6dBi
MIMO Limit=30.00dBm-(9.42-6) dB=26.58dBm

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 v02r01.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

5725~5850MHz

Channel	Frequency (MHz)	Chain 1 Average Output Power (dBm)	Chain 1 Limit (dBm)	Chain 2 Average Output Power (dBm)	Chain 2 Limit (dBm)
Low	5745	12.93	29.30	12.57	29.90
Mid	5785	13.29	29.30	12.51	29.90
High	5825	12.10	29.30	12.06	29.90

Test mode: IEEE 802.11n HT20 mode
5725~5850MHz

Channel	Frequency (MHz)	Chain 1 Average Output Power (dBm)	Chain 2 Average Output Power (dBm)	Total Maximum Conducted Average Output Power (dBm)	MIMO Limit (dBm)
Low	5745	12.50	11.05	14.85	26.58
Mid	5785	12.76	11.50	15.19	26.58
High	5825	12.89	11.05	15.08	26.58

Test mode: IEEE 802.11n HT40 mode
5725~5850MHz

Channel	Frequency (MHz)	Chain 1 Average Output Power (dBm)	Chain 2 Average Output Power (dBm)	Total Maximum Conducted Average Output Power (dBm)	MIMO Limit (dBm)
Low	5755	10.81	10.22	13.54	26.58
High	5795	10.69	10.30	13.51	26.58

Test mode: IEEE 802.11ac VHT20 mode
5725~5850MHz

Channel	Frequency (MHz)	Chain 1 Average Output Power (dBm)	Chain 2 Average Output Power (dBm)	Total Maximum Conducted Average Output Power (dBm)	MIMO Limit (dBm)
Low	5745	12.11	11.20	14.69	26.58
Mid	5785	12.47	10.80	14.73	26.58
High	5825	12.52	11.33	14.98	26.58

Test mode: IEEE 802.11ac VHT40 mode
5725~5850MHz

Channel	Frequency (MHz)	Chain 1 Average Output Power (dBm)	Chain 2 Average Output Power (dBm)	Total Maximum Conducted Average Output Power (dBm)	MIMO Limit (dBm)
Low	5755	10.75	10.05	13.42	26.58
High	5795	10.87	10.18	13.55	26.58

***Remark**: 1*.Total Output Power (dBm) = 10*LOG(10^(Chain 1 Output Power / 10)+10^(Chain 2 *Output Power /10))*
2.Duty factor has been offset with cable loss

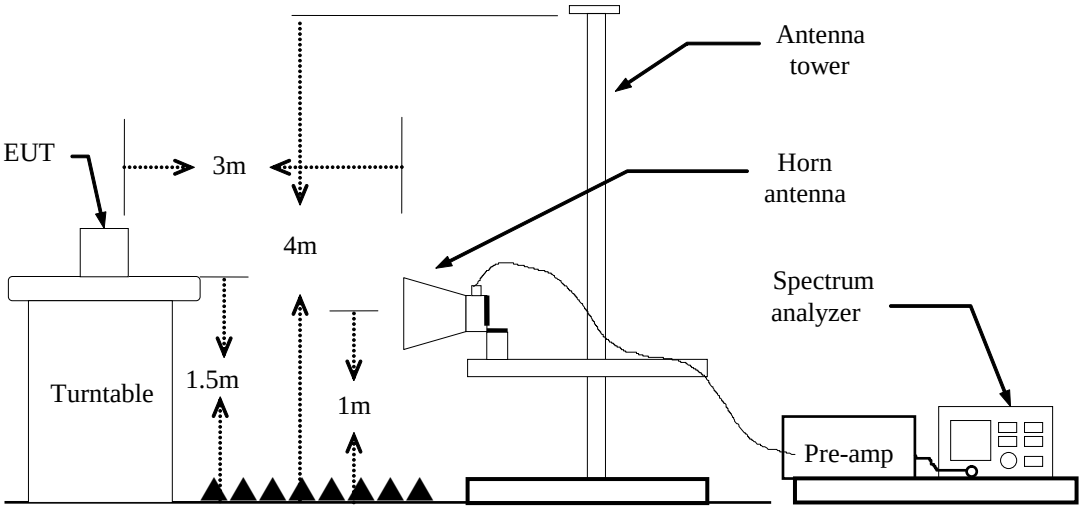
8.3 BAND EDGES MEASUREMENT

LIMIT

According to §15.407(b)(4)(i),
(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.

All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 1.5m 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 / Sweep=AUTO

   VBW=10Hz,when duty cycle is no less than 98 percent.

   VBW≧1/T,when duty cycle is less than 98 percent,where T is the minimum

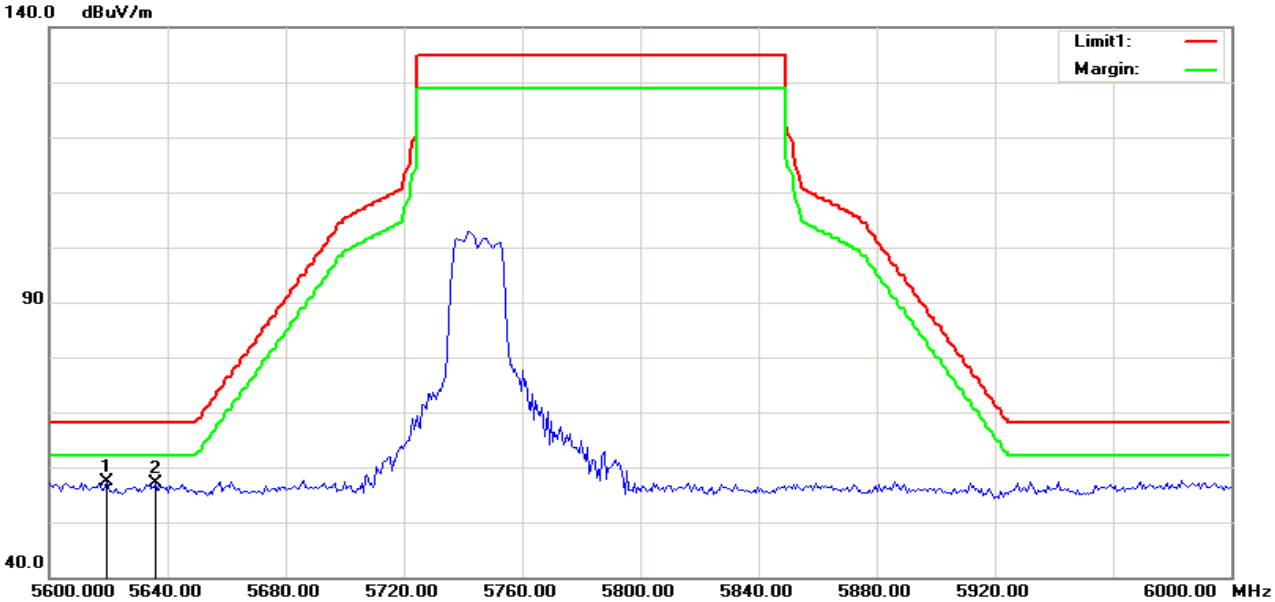
transmission duration over which the transmitter is on and is transmitting at its maximun power control level for the tested mode of operation.

5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

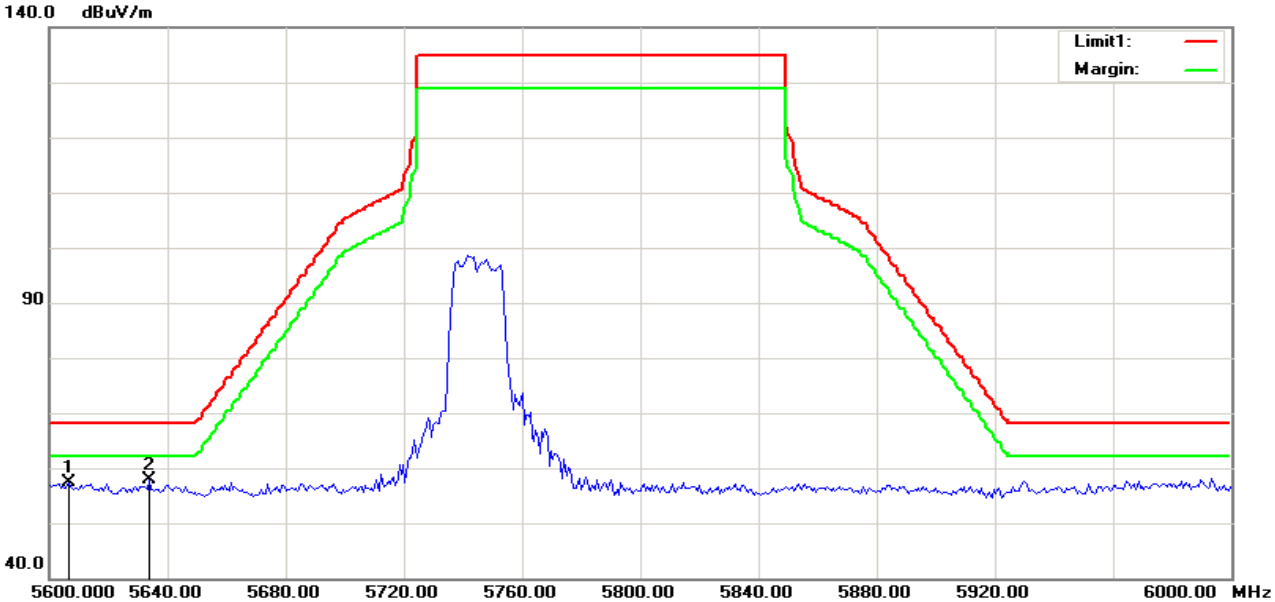
Band Edges (IEEE 802.11a mode ch low)

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	5619.231	56.21	1.10	57.31	68.20	-10.89	100	55	peak
2	5635.897	55.91	1.12	57.03	68.20	-11.17	100	0	peak

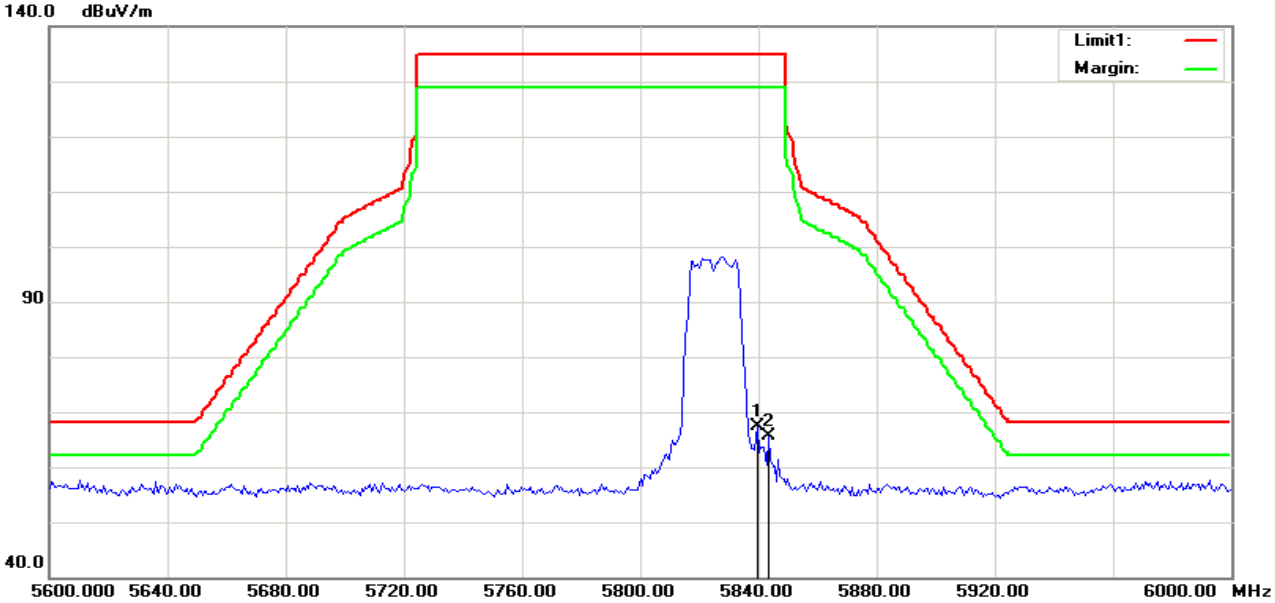
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5606.410	56.19	1.08	57.27	68.20	-10.93	200	116	peak
2	5633.974	56.76	1.12	57.88	68.20	-10.32	200	101	peak

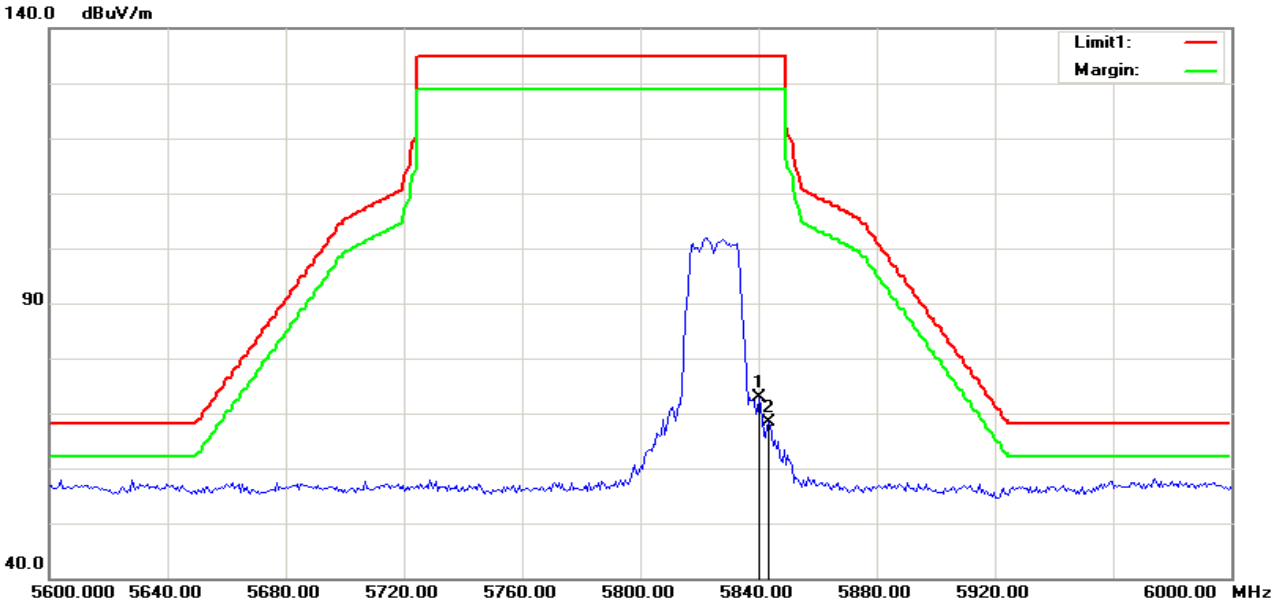
Band Edges (IEEE 802.11a mode ch high)

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	5839.744	66.00	1.45	67.45	135.00	-67.55	100	145	peak
2	5843.590	64.18	1.45	65.63	135.00	-69.37	100	147	peak

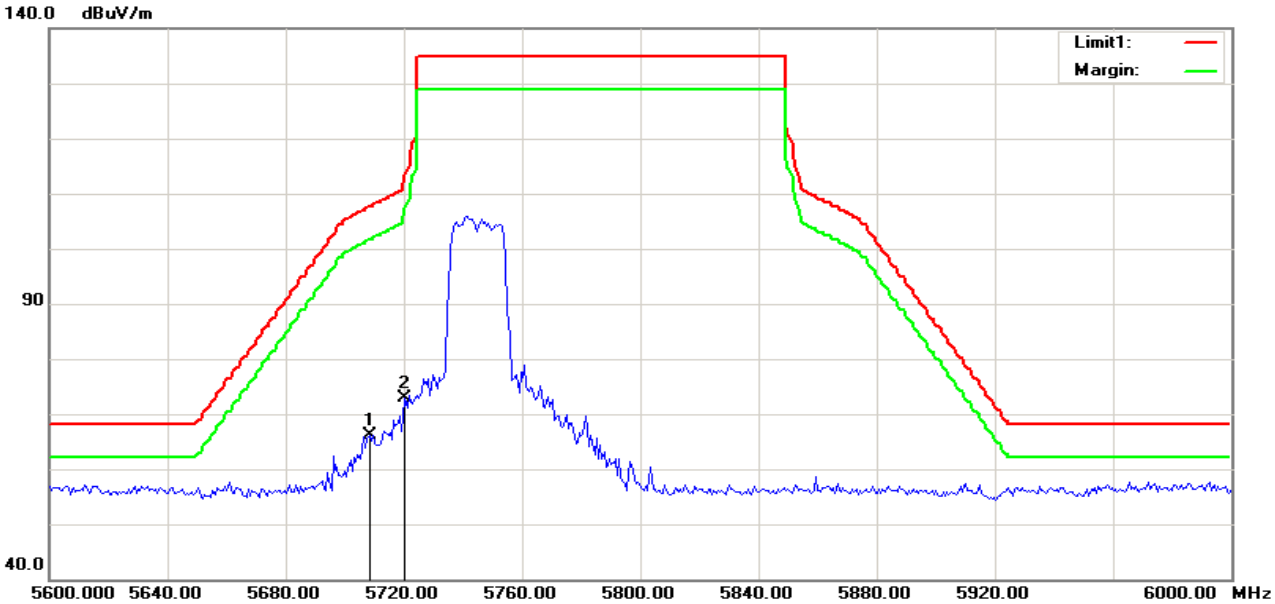
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5840.385	71.53	1.45	72.98	135.00	-62.02	100	198	peak
2	5843.590	66.88	1.45	68.33	135.00	-66.67	100	158	peak

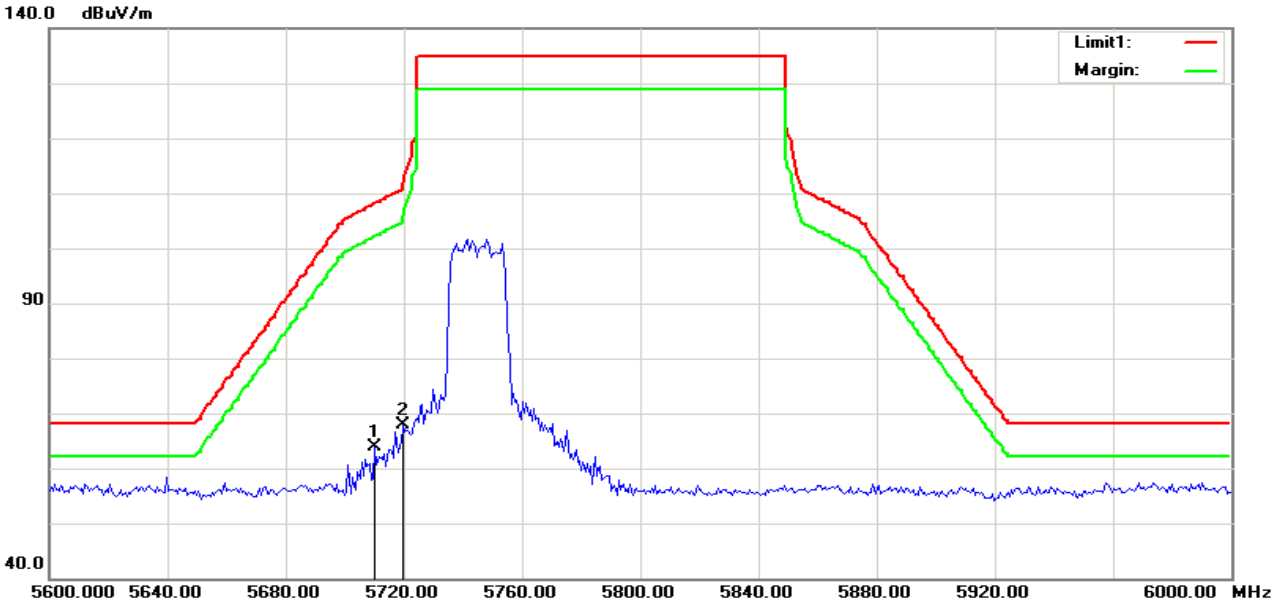
Band Edges (IEEE 802.11n HT20 mode ch low)

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	5708.333	64.89	1.24	66.13	107.53	-41.40	100	197	peak
2	5720.513	71.69	1.26	72.95	111.97	-39.02	100	201	peak

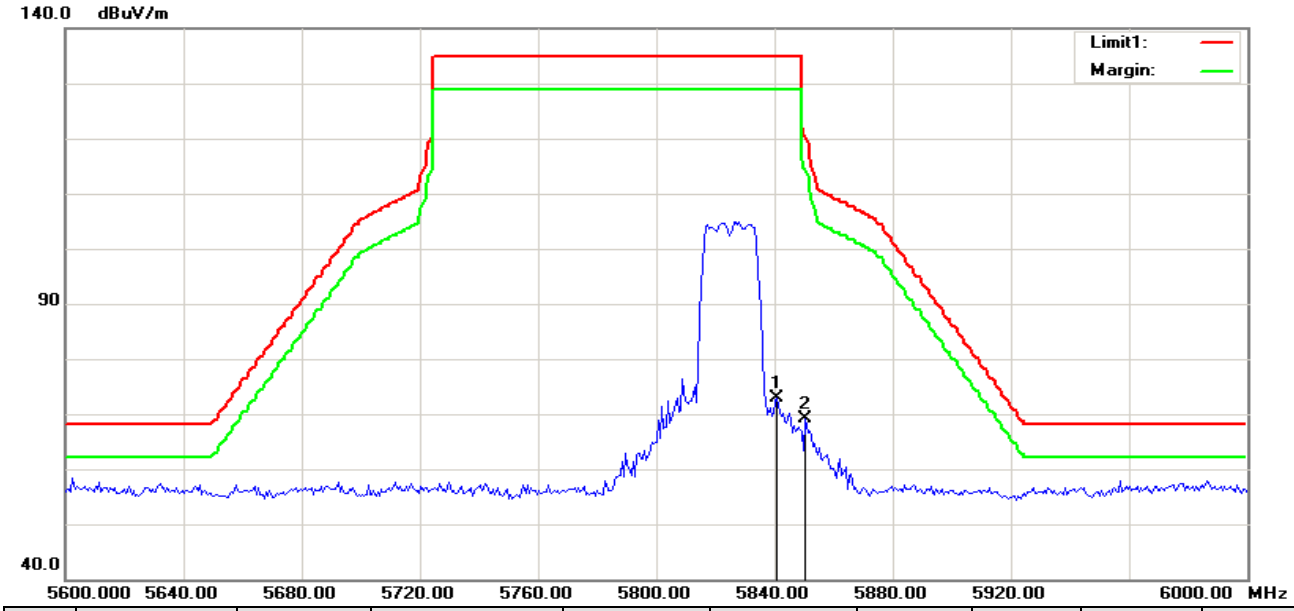
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5710.256	62.63	1.24	63.87	108.07	-44.20	100	100	peak
2	5719.872	66.63	1.26	67.89	110.76	-42.87	100	114	peak

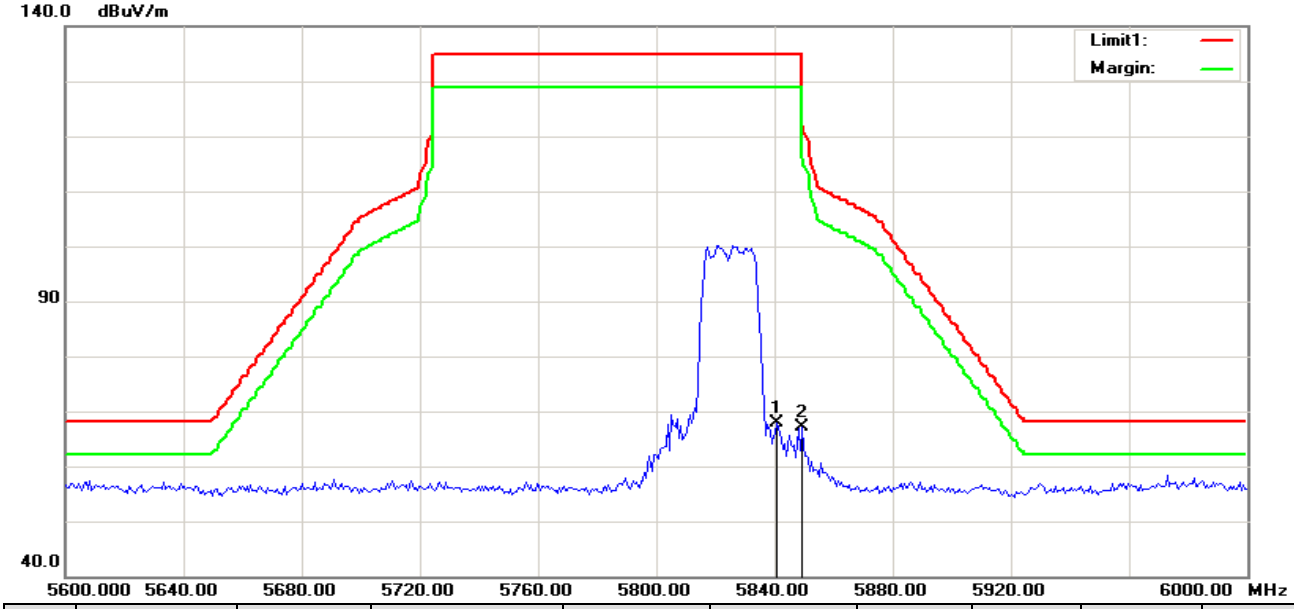
Band Edges (IEEE 802.11n HT20 mode ch high)

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	5841.026	71.53	1.45	72.98	135.00	-62.02	100	349	peak
2	5850.641	67.66	1.46	69.12	120.74	-51.62	200	181	peak

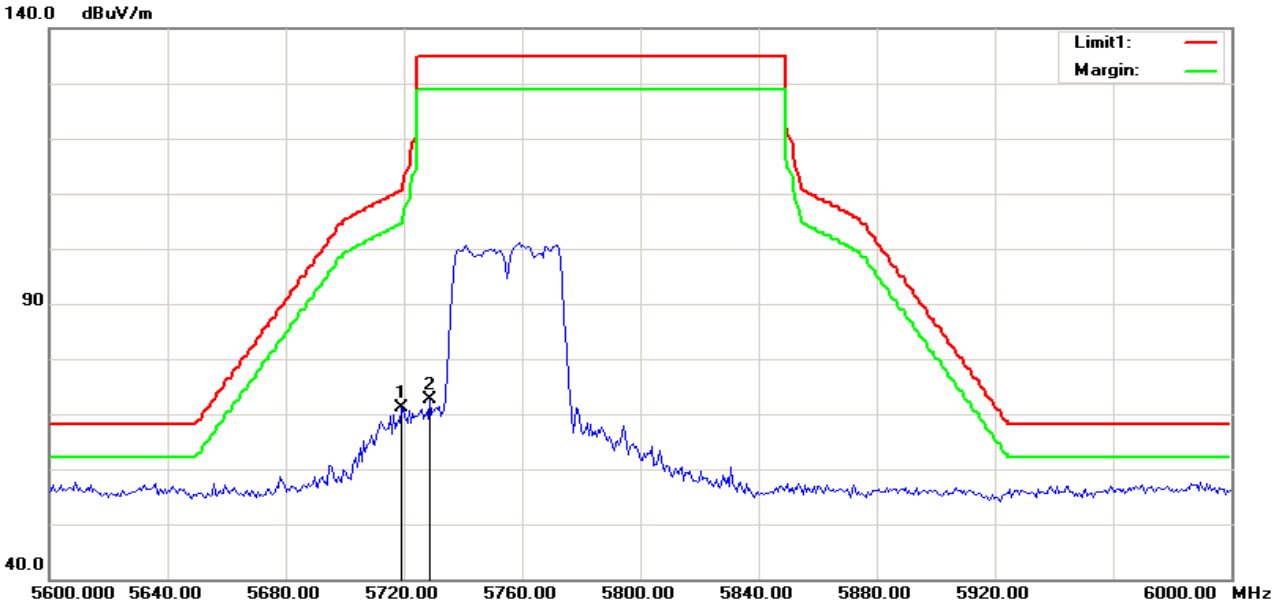
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5841.026	66.40	1.45	67.85	135.00	-67.15	200	253	peak
2	5849.359	65.64	1.46	67.10	135.00	-67.90	100	111	peak

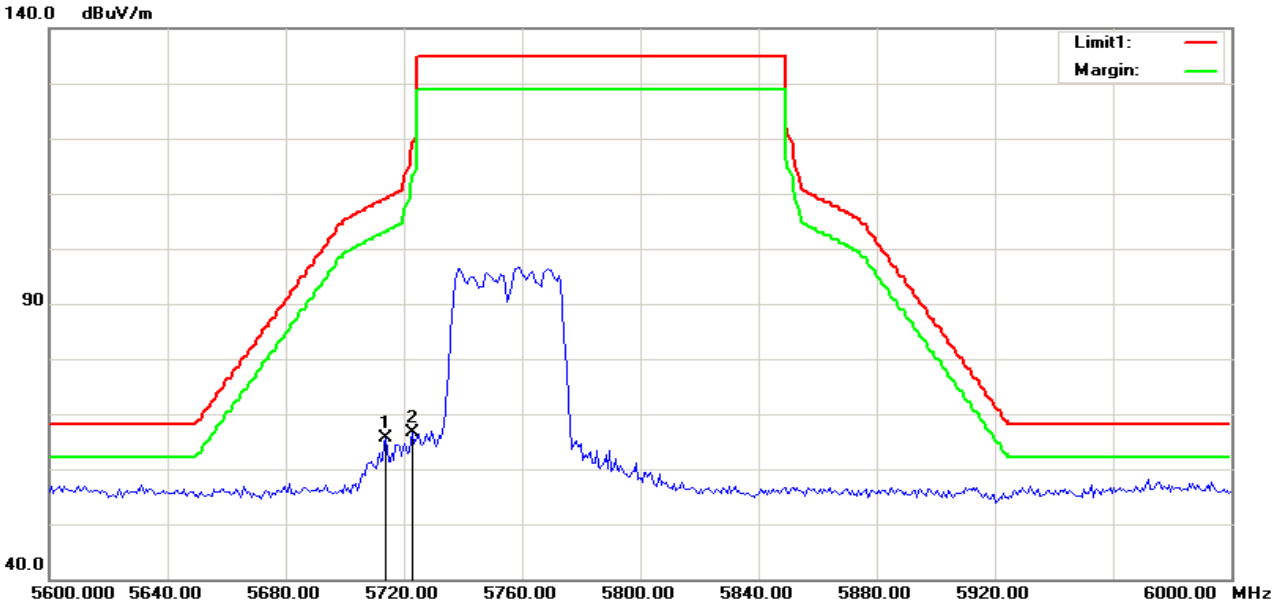
Band Edges (IEEE 802.11n HT40 mode ch low)

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	5719.231	69.80	1.26	71.06	110.58	-39.52	100	0	peak
2	5728.846	71.40	1.27	72.67	135.00	-62.33	100	171	peak

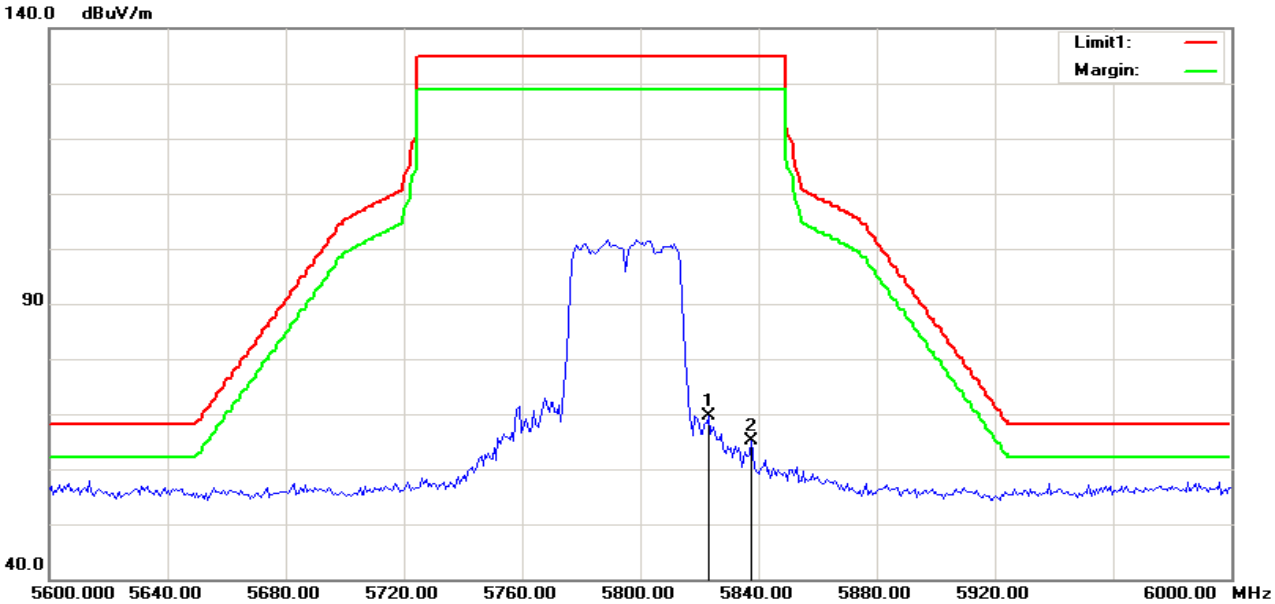
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5714.103	64.26	1.25	65.51	109.15	-43.64	100	128	peak
2	5723.077	65.35	1.26	66.61	117.82	-51.21	100	92	peak

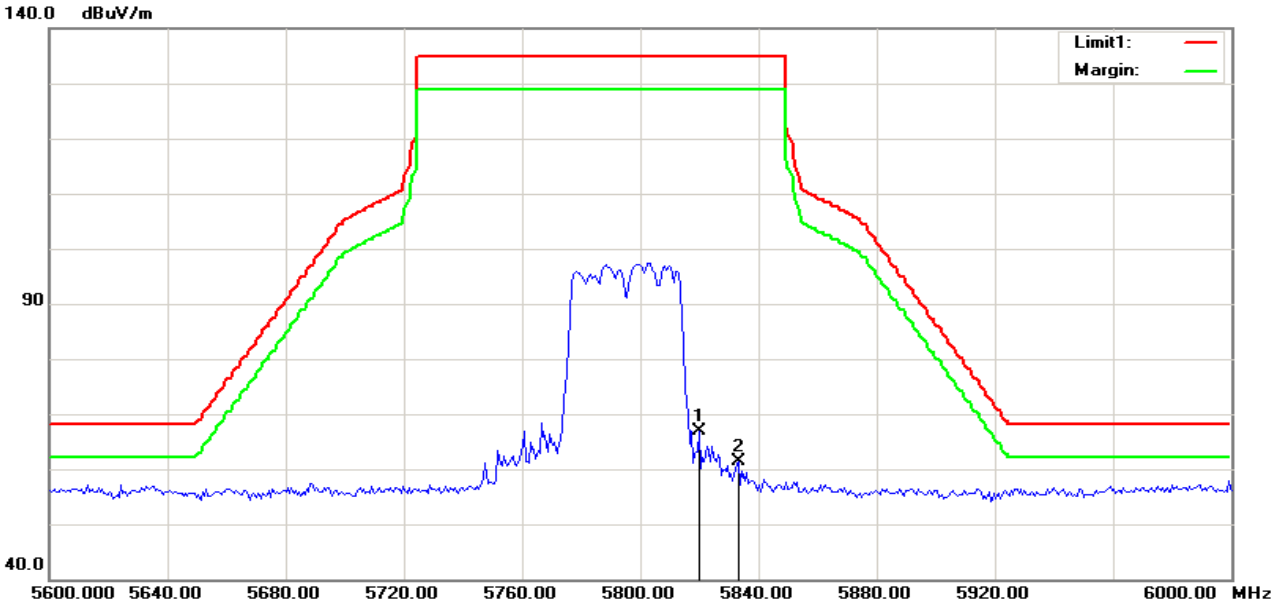
Band Edges (IEEE 802.11n HT40 mode ch high)

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	5823.077	68.25	1.42	69.67	135.00	-65.33	100	167	peak
2	5837.820	63.62	1.44	65.06	135.00	-69.94	100	186	peak

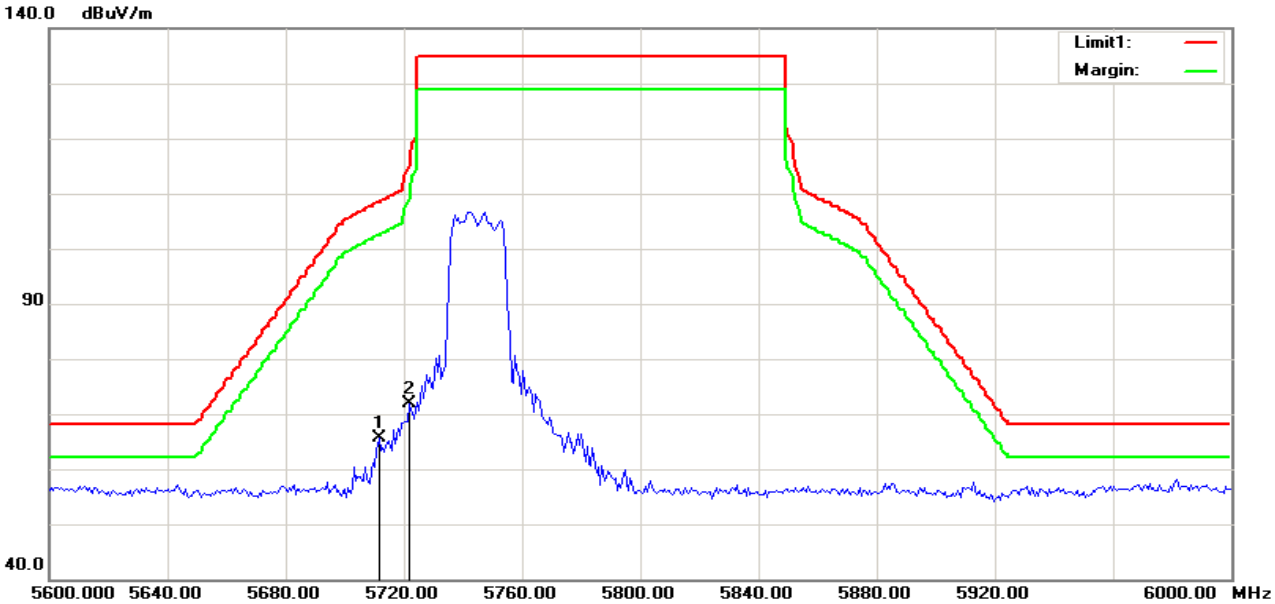
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5819.872	65.42	1.42	66.84	135.00	-68.16	100	124	peak
2	5833.333	60.03	1.44	61.47	135.00	-73.53	100	109	peak

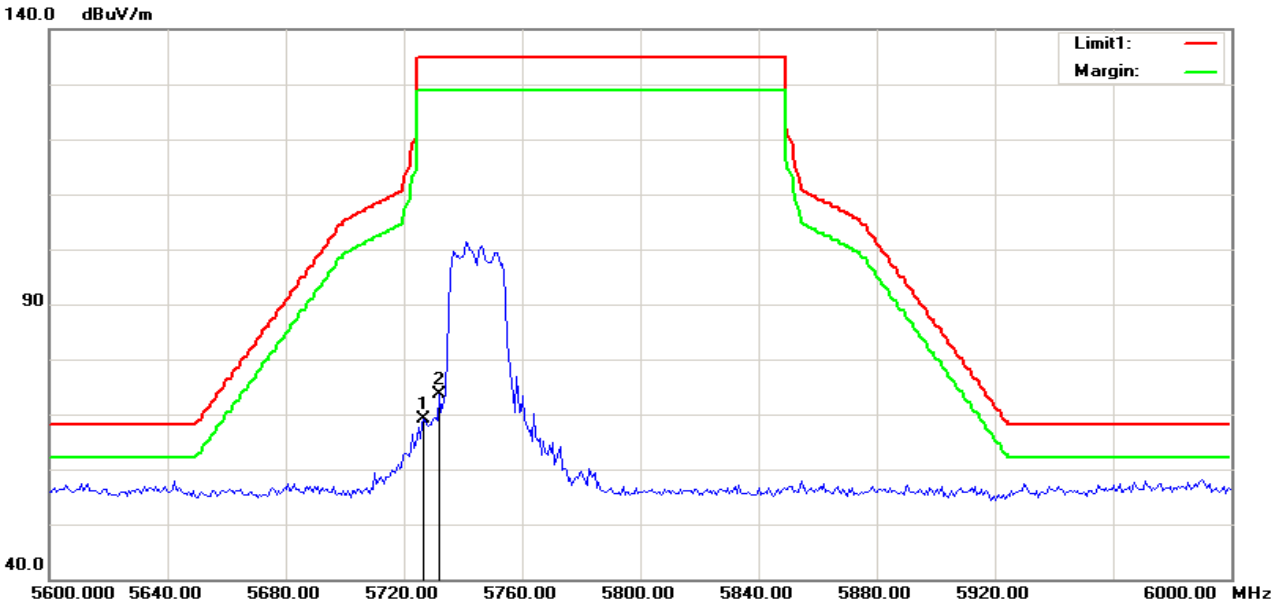
Band Edges (IEEE 802.11ac VHT20 mode ch low)

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	5711.538	64.31	1.24	65.55	108.43	-42.88	100	193	peak
2	5721.795	70.63	1.26	71.89	114.89	-43.00	200	164	peak

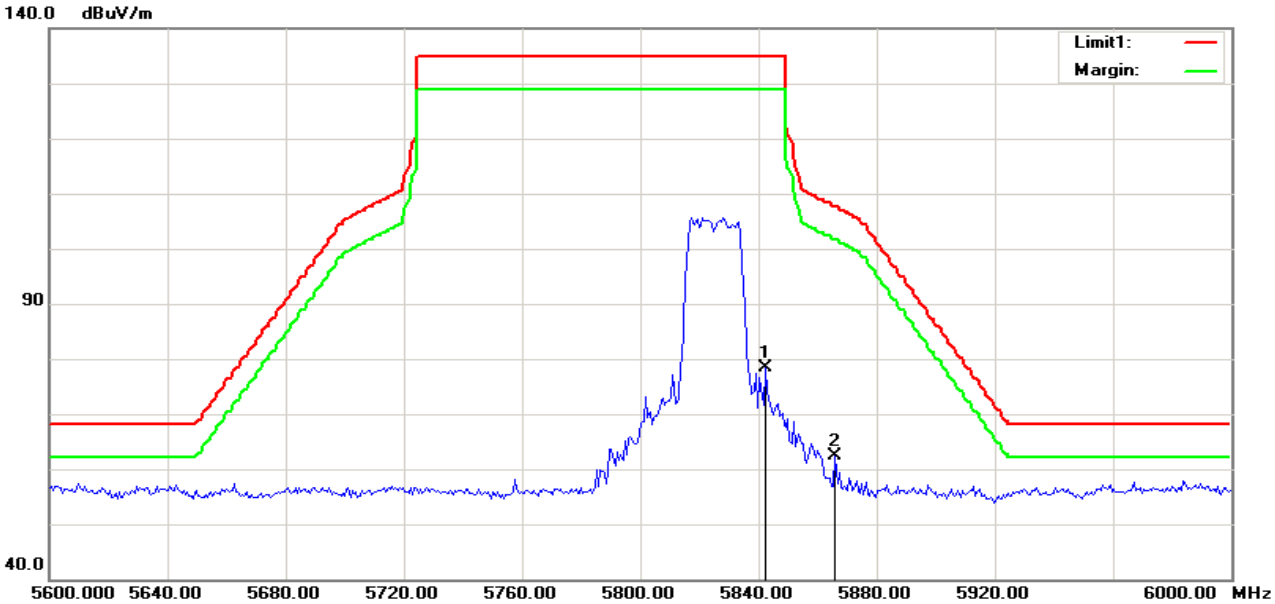
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5726.923	67.81	1.27	69.08	135.00	-65.92	100	135	peak
2	5732.051	72.39	1.28	73.67	135.00	-61.33	100	120	peak

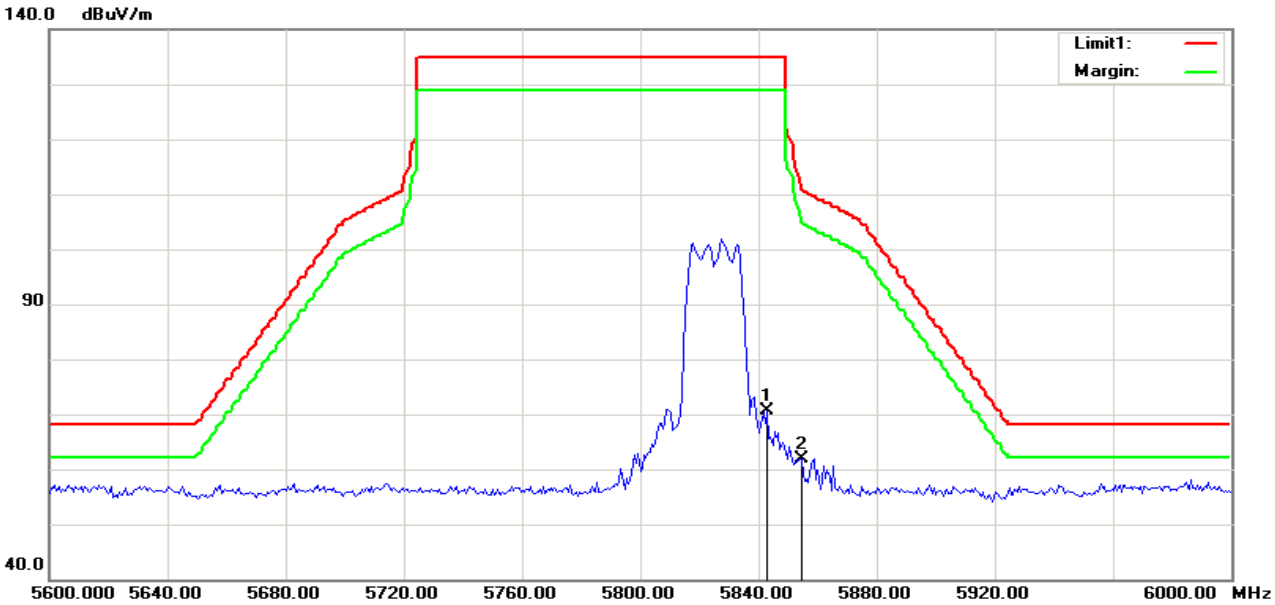
Band Edges (IEEE 802.11ac VHT20 mode ch high)

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	5842.308	76.99	1.45	78.44	135.00	-56.56	100	171	peak
2	5866.026	60.98	1.49	62.47	107.71	-45.24	100	162	peak

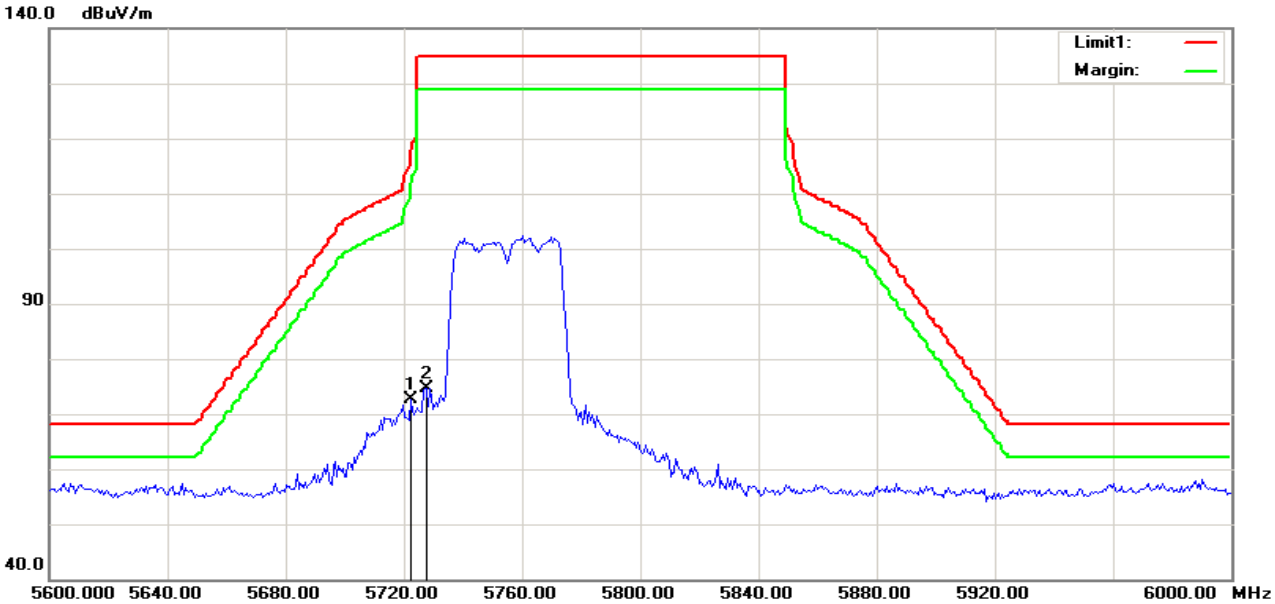
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5842.949	69.12	1.45	70.57	135.00	-64.43	100	168	peak
2	5854.487	60.47	1.47	61.94	111.97	-50.03	100	133	peak

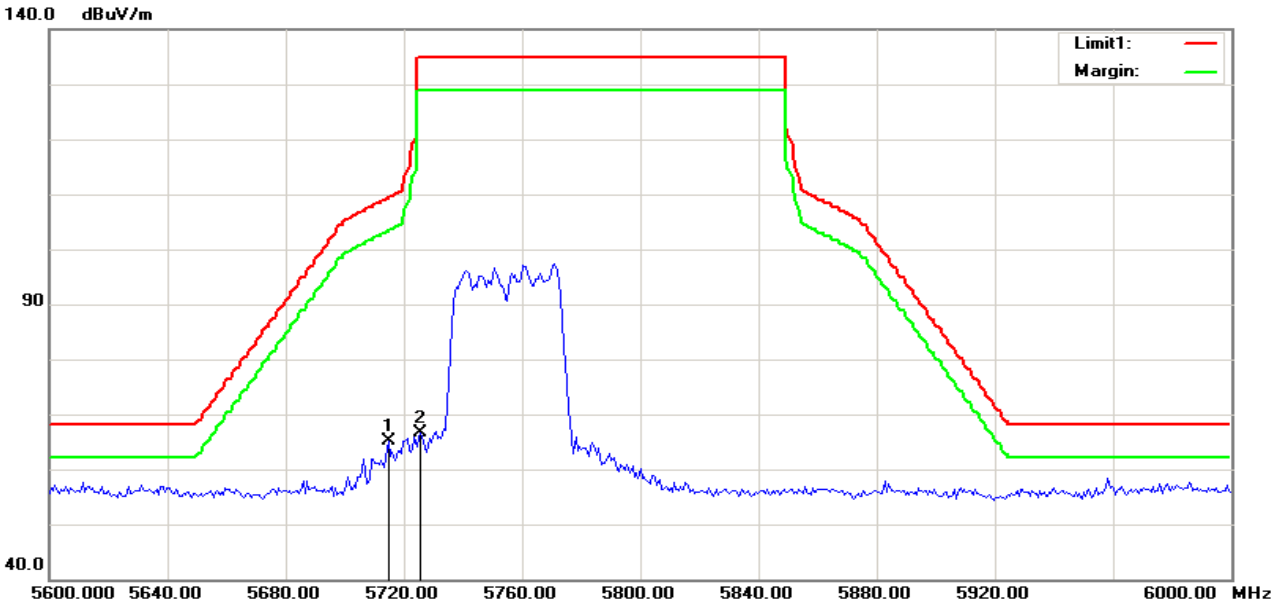
Band Edges (IEEE 802.11ac VHT40 mode ch low)

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	5722.436	71.31	1.26	72.57	116.35	-43.78	100	165	peak
2	5727.564	73.33	1.27	74.60	135.00	-60.40	100	191	peak

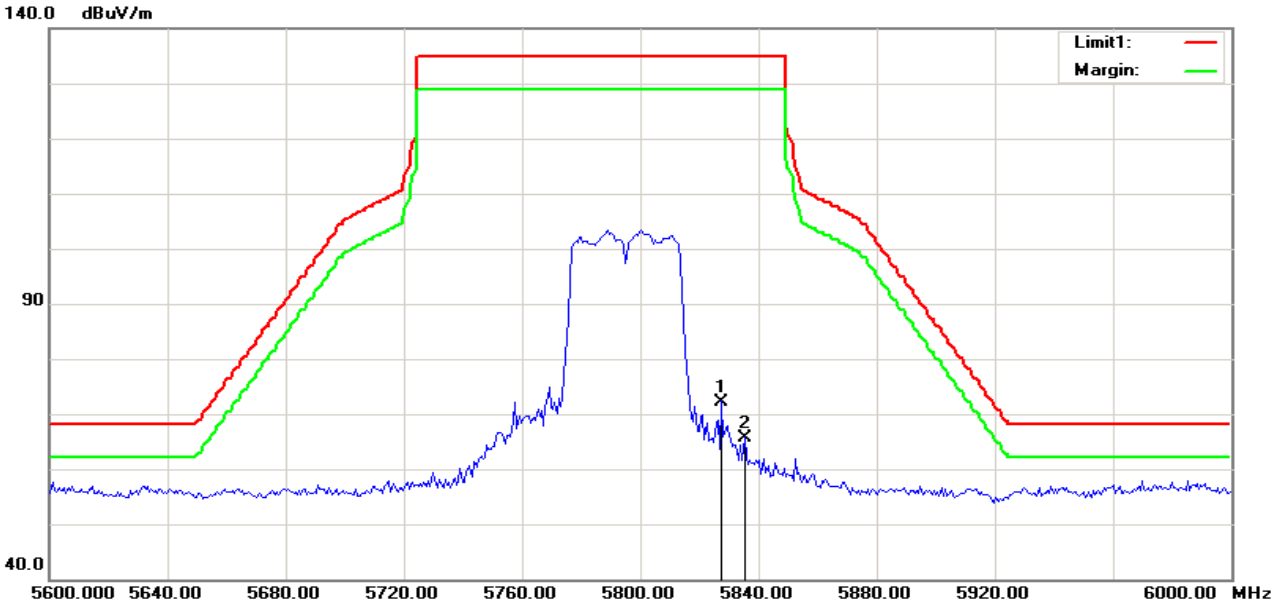
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5714.744	63.80	1.25	65.05	109.33	-44.28	100	116	peak
2	5725.641	65.37	1.27	66.64	135.00	-68.36	200	247	peak

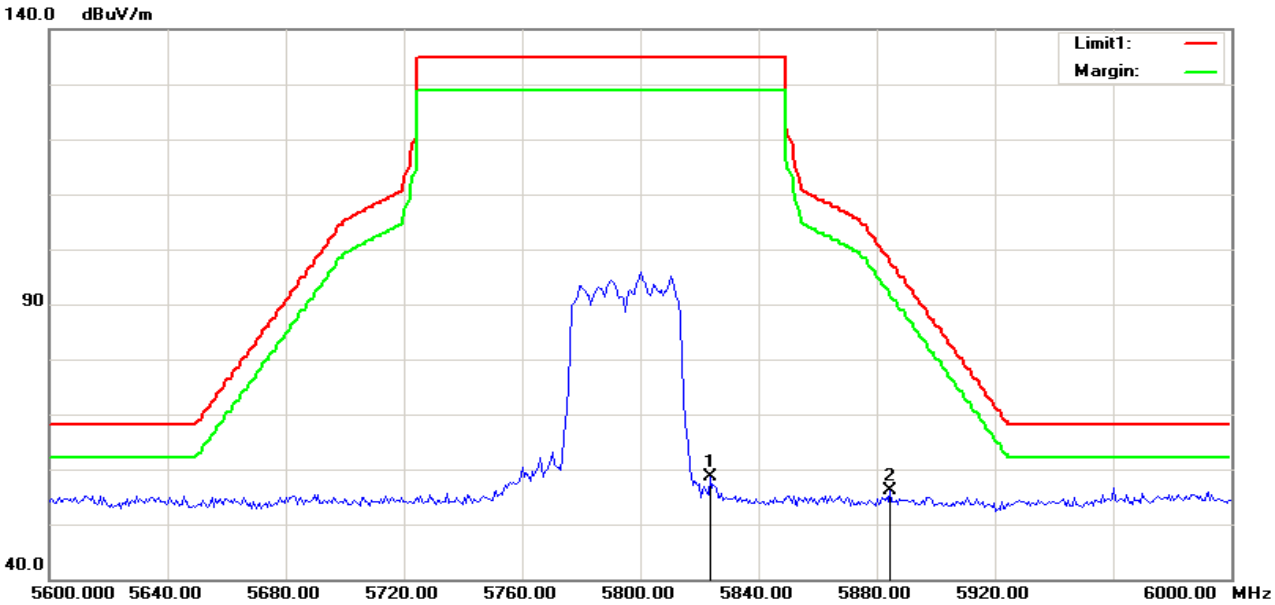
Band Edges (IEEE 802.11ac VHT40 mode ch high)

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	5827.564	70.82	1.43	72.25	135.00	-62.75	100	197	peak
2	5835.256	64.31	1.44	65.75	135.00	-69.25	100	186	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	5823.718	57.30	1.42	58.72	135.00	-76.28	100	280	peak
2	5884.615	54.61	1.52	56.13	98.08	-41.95	100	227	peak

8.4 POWER SPECTRAL DENSITY

LIMIT

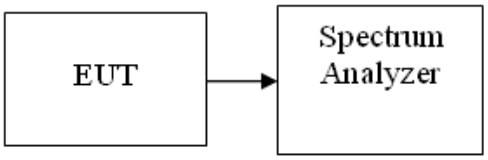
According to §15.407(a),

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.*

Antenna 1 Gain=6.7dBi>6dBi
Chain 1 Limit=30.00dBm-(6.7-6) dB=29.30dBm
Antenna 2 Gain=6.1dBi>6dBi
Chain 2 Limit=30.00dBm-(6.1-6) dB=29.90dBm
Directional Gain= 9.42dBi>6dBi
MIMO Limit=30.00dBm-(9.42-6) dB=26.58dBm

Test Configuration



TEST PROCEDURE

1. The testing follows Method SA-2 of FCC KDB 789033 D02 General UNII Test Procedures v02r01.
2. Measure the duty cycle, Set span to encompass the entire emission bandwidth (EBW) of the signal. Set RBW = 500 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(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
5725~5850MHz

Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 1 Limit (dBm)	Chain 2 PPSD (dBm)	Chain 2 Limit (dBm)	Result
Low	5745	0.10	29.30	-0.90	29.90	PASS
Mid	5785	0.23	29.30	-1.62	29.90	PASS
High	5825	-1.53	29.30	-2.55	29.90	PASS

Test mode: IEEE 802.11n HT20 mode
5725~5850MHz

Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	Total PPSD (dBm)	MIMO Limit (dBm)	Result
Low	5745	-0.92	-2.93	1.20	26.58	PASS
Mid	5785	-0.86	-3.74	0.94	26.58	PASS
High	5825	-1.16	-4.00	0.66	26.58	PASS

Test mode: IEEE 802.11n HT40 mode
5725~5850MHz

Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	Total PPSD (dBm)	MIMO Limit (dBm)	Result
Low	5755	-5.40	-7.60	-3.35	26.58	PASS
High	5795	-4.55	-7.31	-2.70	26.58	PASS

Test mode: IEEE 802.11ac VHT20 mode
5725~5850MHz

Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	Total PPSD (dBm)	MIMO Limit (dBm)	Result
Low	5745	-1.08	-2.94	1.10	26.58	PASS
Mid	5785	-0.91	-3.68	0.93	26.58	PASS
High	5825	-1.29	-3.82	0.64	26.58	PASS

Test mode: IEEE 802.11ac VHT40 mode
5725~5850MHz

Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	Total PPSD (dBm)	MIMO Limit (dBm)	Result
Low	5755	-5.51	-7.62	-3.43	26.58	PASS
High	5795	-4.60	-7.54	-2.82	26.58	PASS

***Remark**:* 1.Total PPSD(dBm) = 10*LOG(10^(Chain 1 PPSD / 10)+10^(Chain 2 PPSD /10))

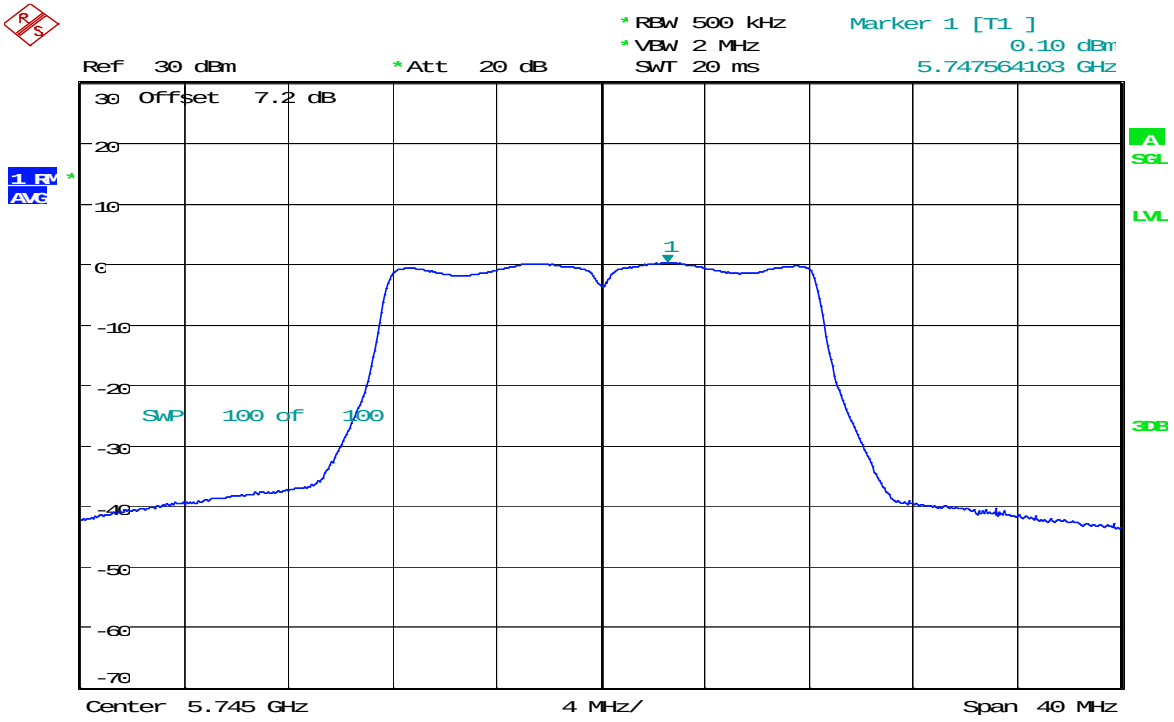
2.Duty factor has been offset with cable loss

Test Plot

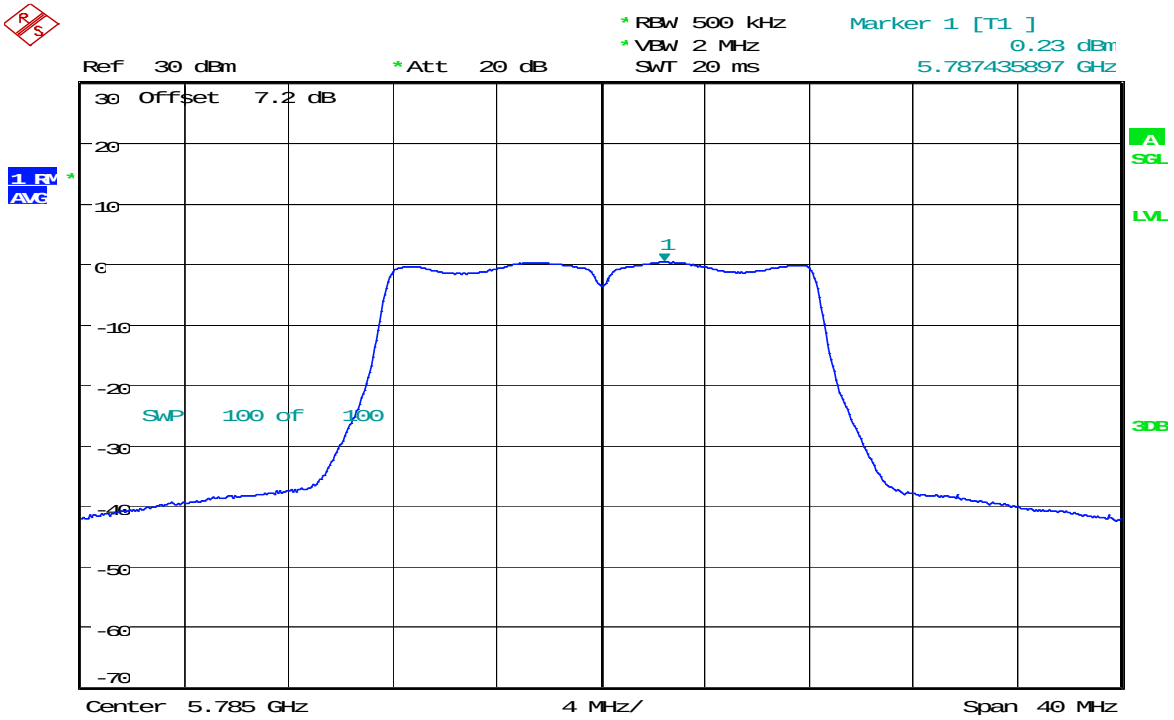
IEEE 802.11a mode/Chain 1

5725~5850MHz

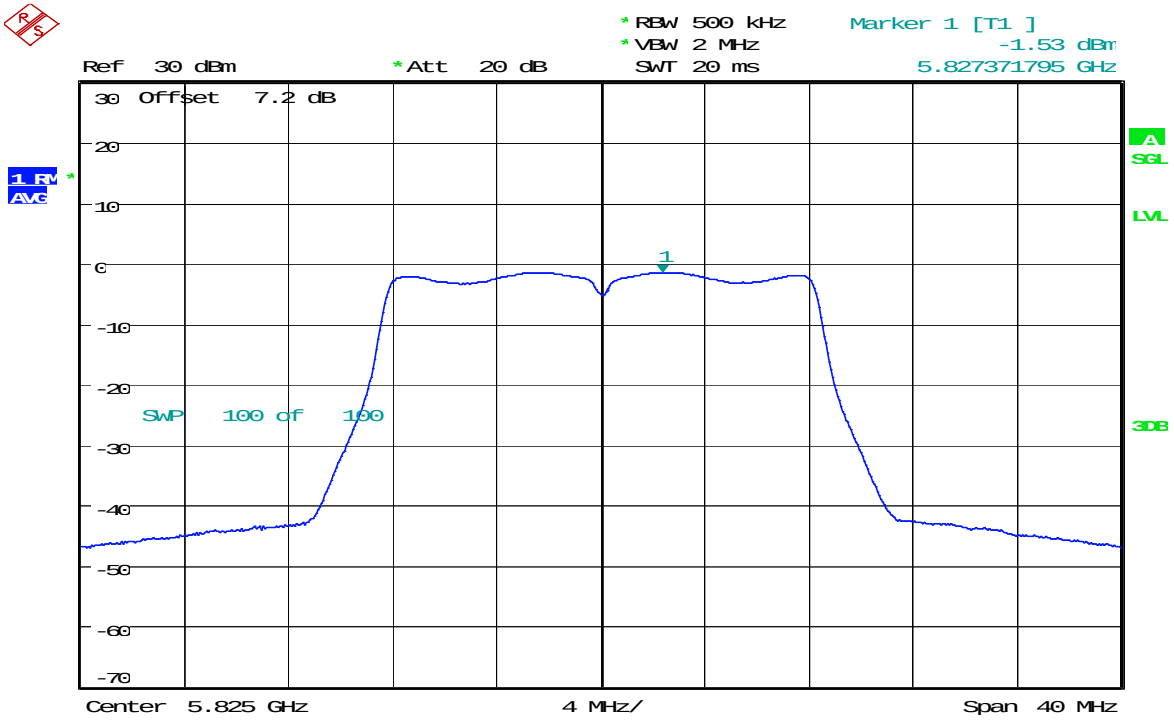
CH Low



CH Mid



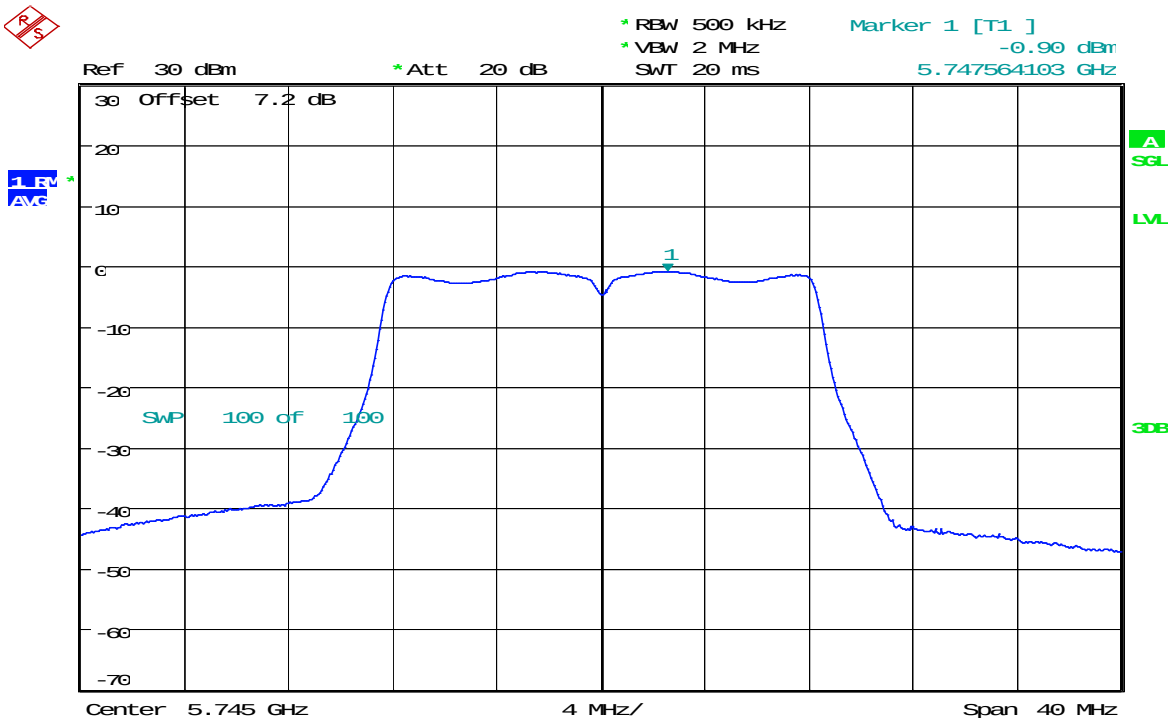
CH High



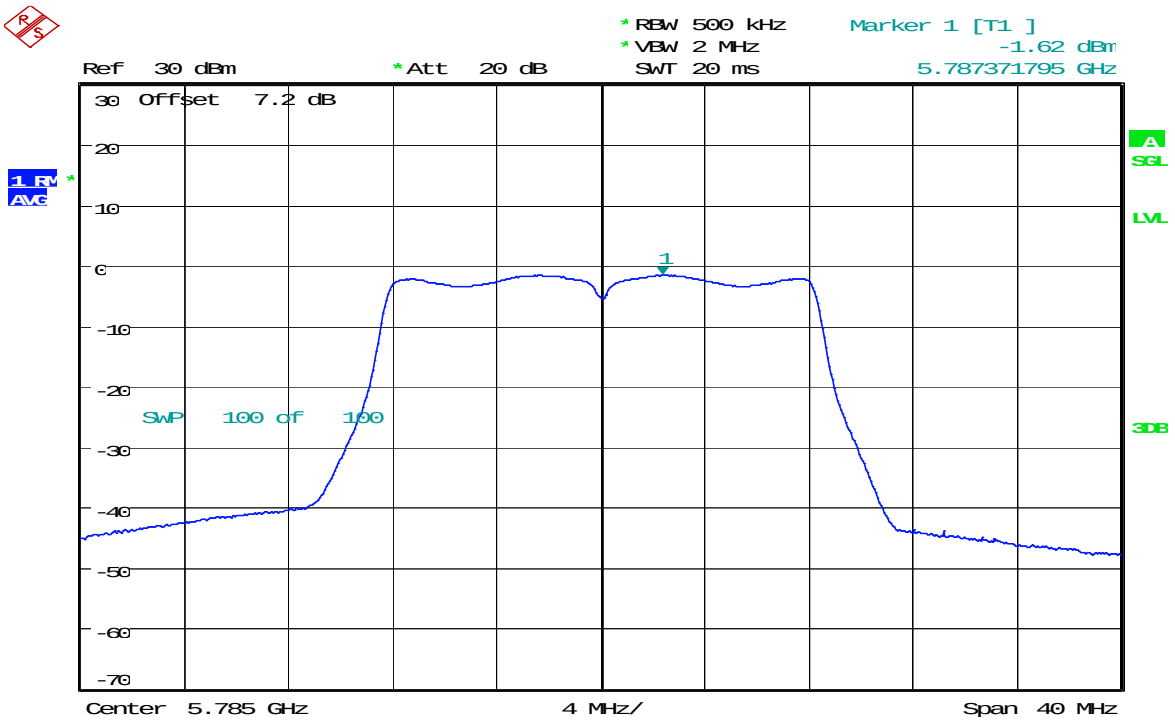
IEEE 802.11a mode/Chain 2

5725~5850MHz

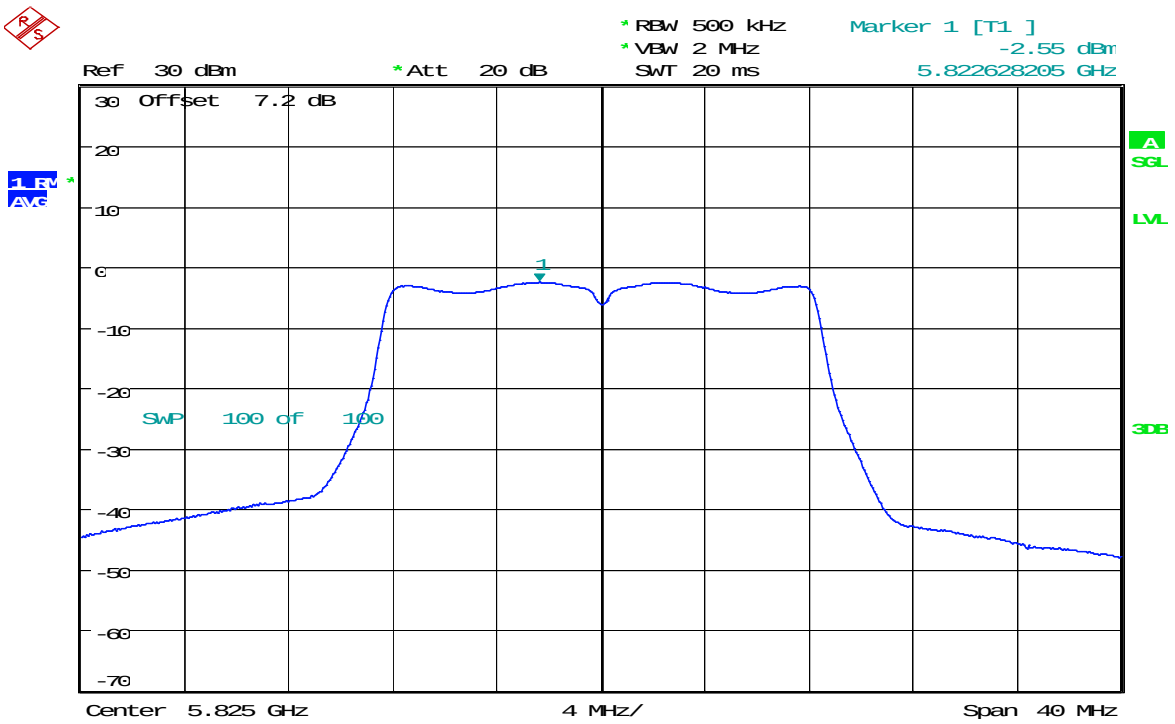
CH Low



CH Mid

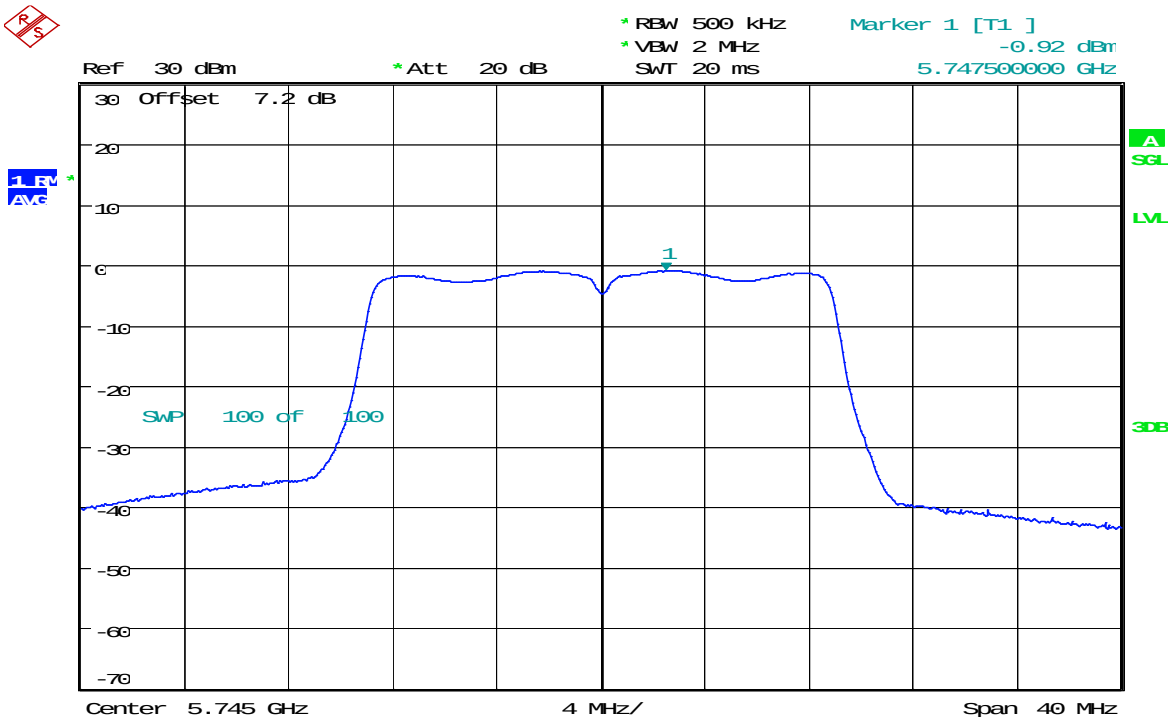


CH High

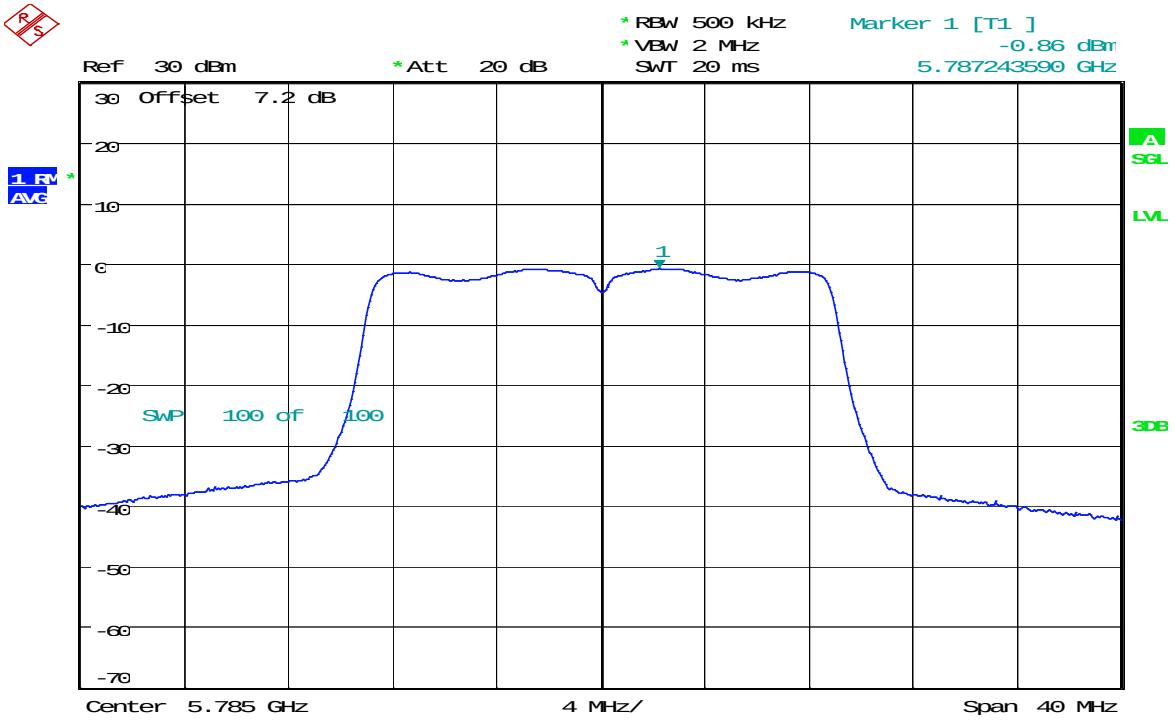


IEEE 802.11n HT20 mode/Chain 1
5725~5850MHz

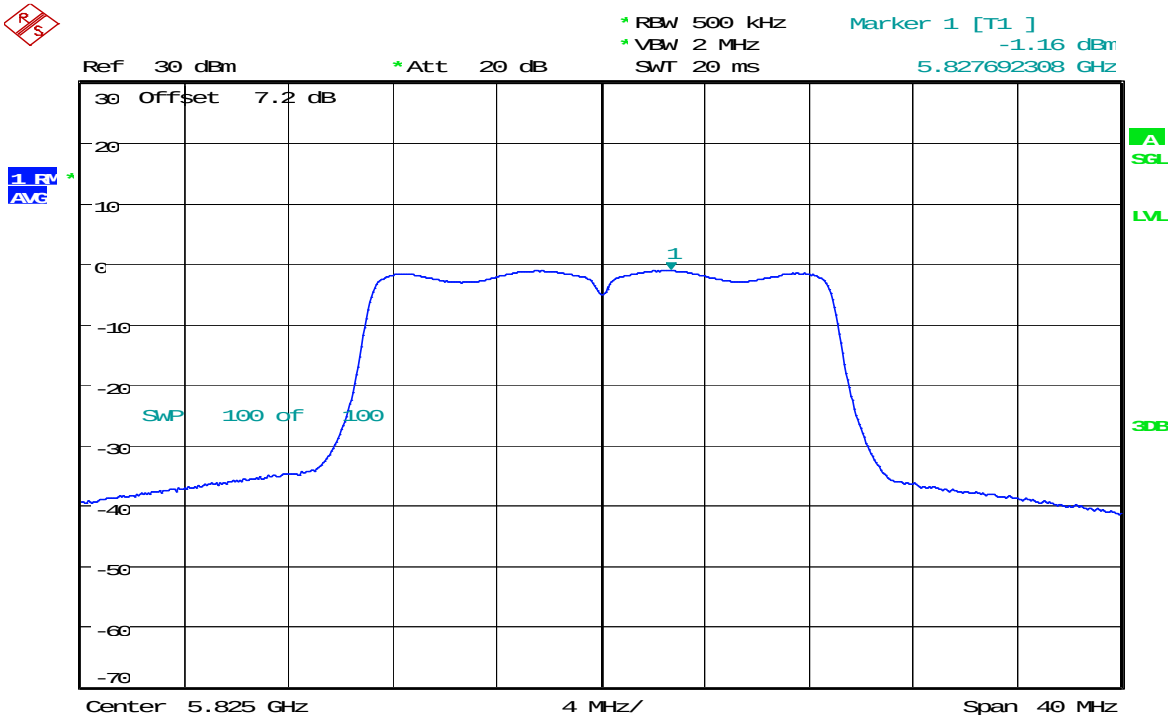
CH Low



CH Mid



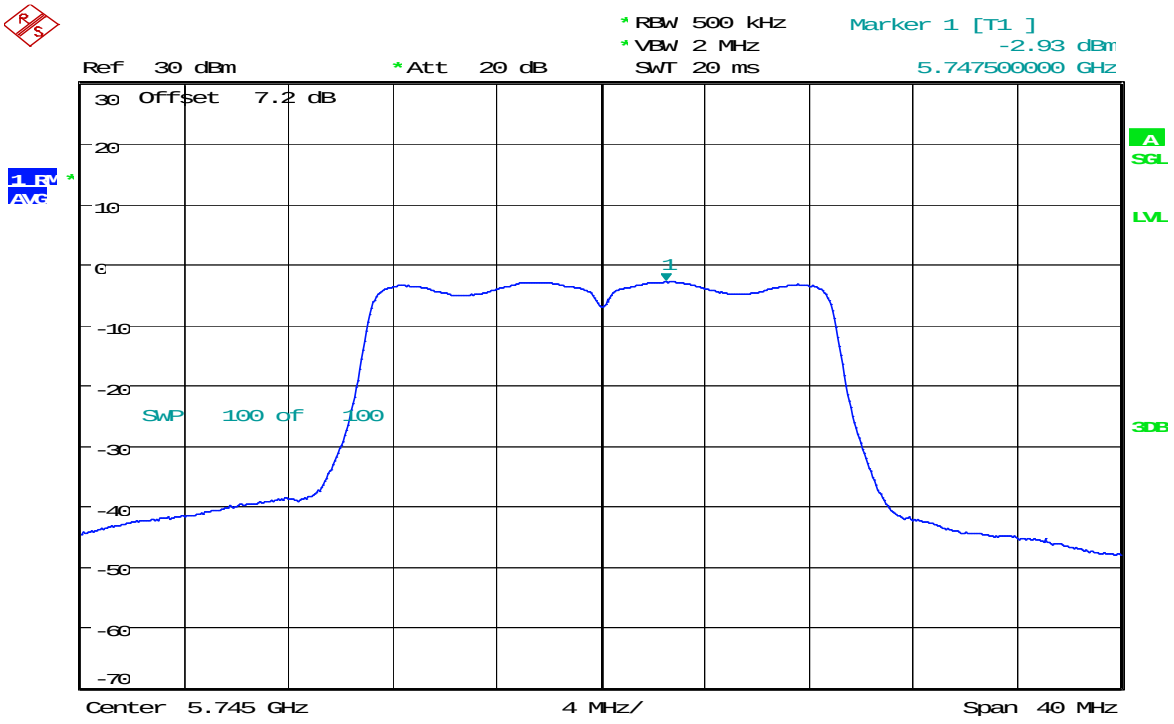
CH High



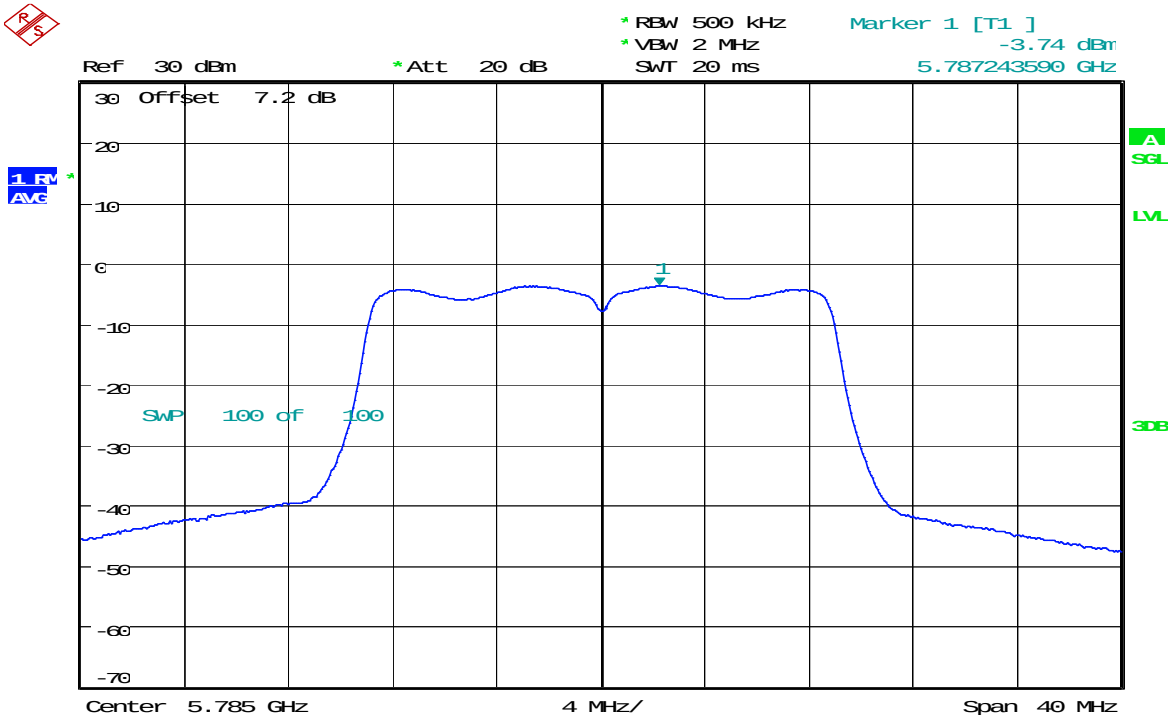
IEEE 802.11n HT20 mode/Chain 2

5725~5850MHz

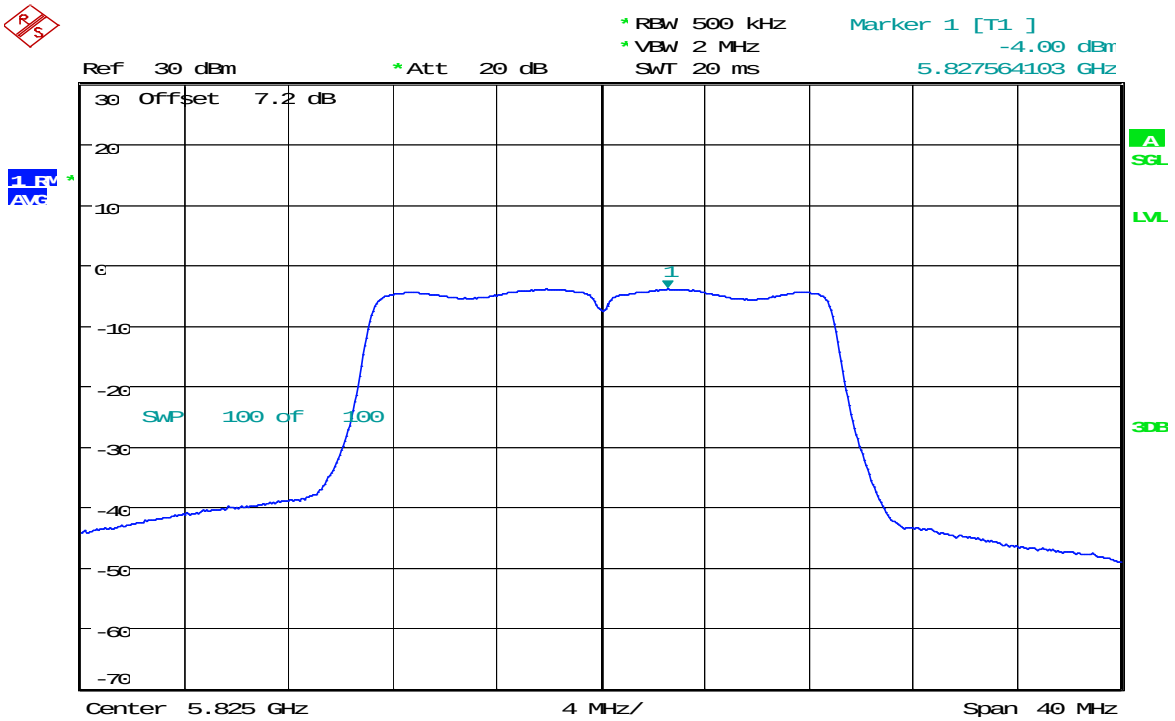
CH Low



CH Mid

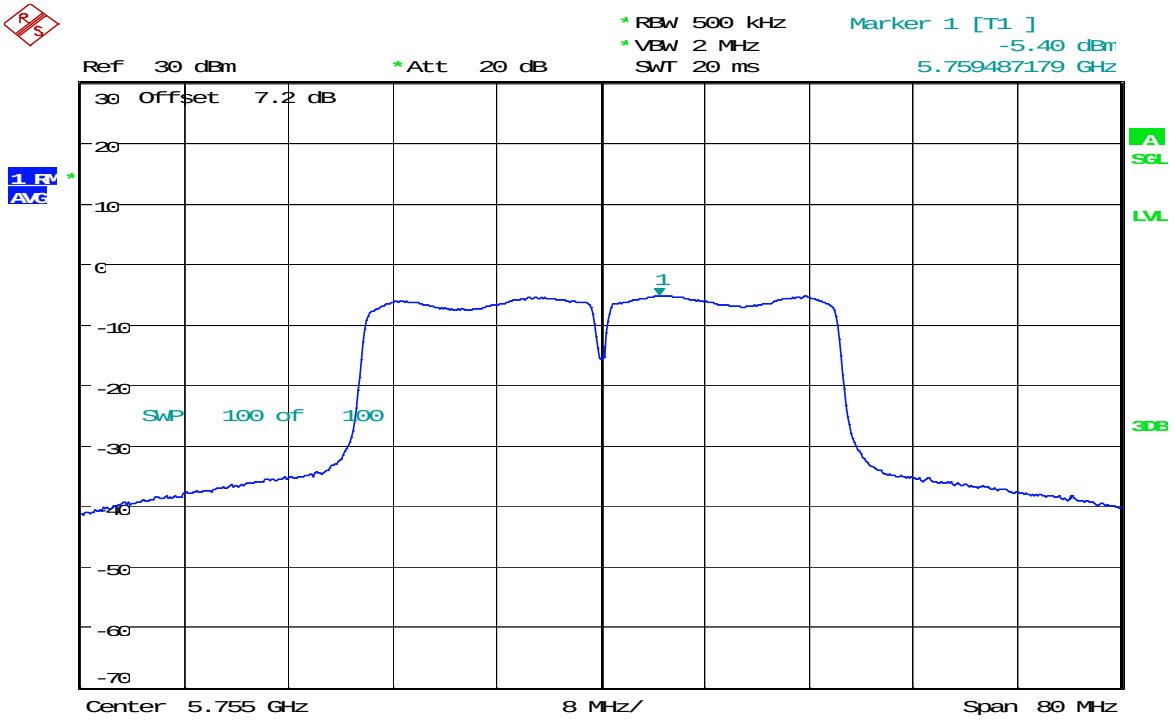


CH High

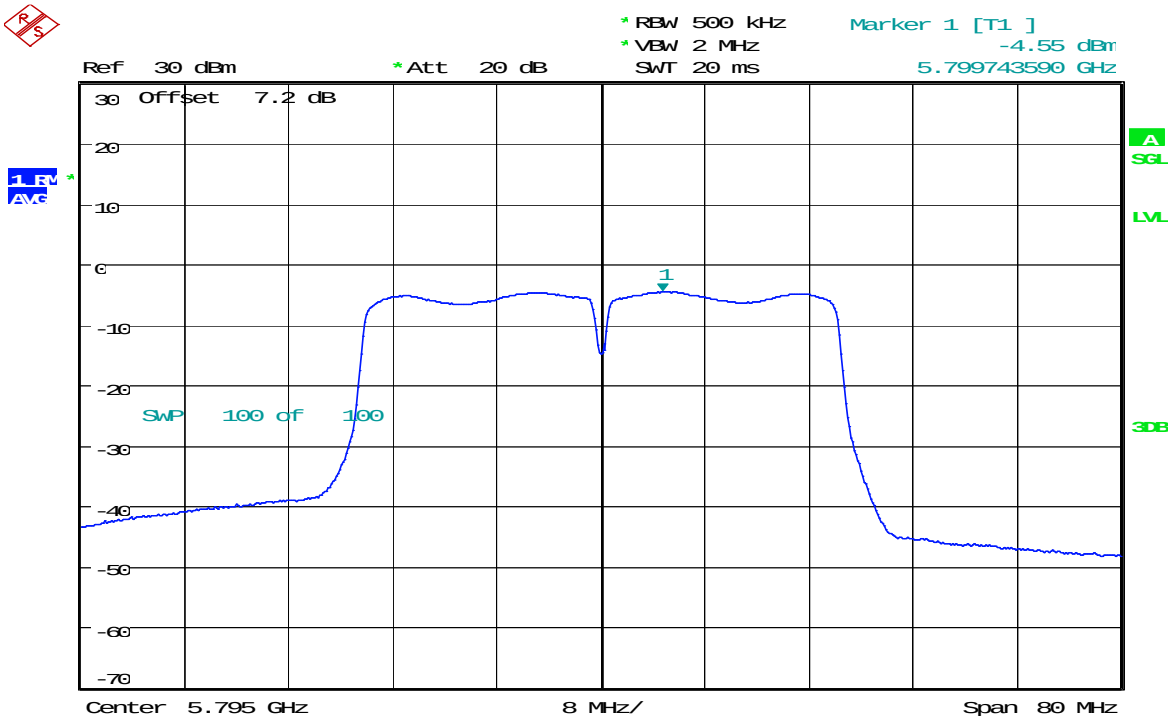


IEEE 802.11n HT40 mode/Chain 1
5725~5850MHz

CH Low

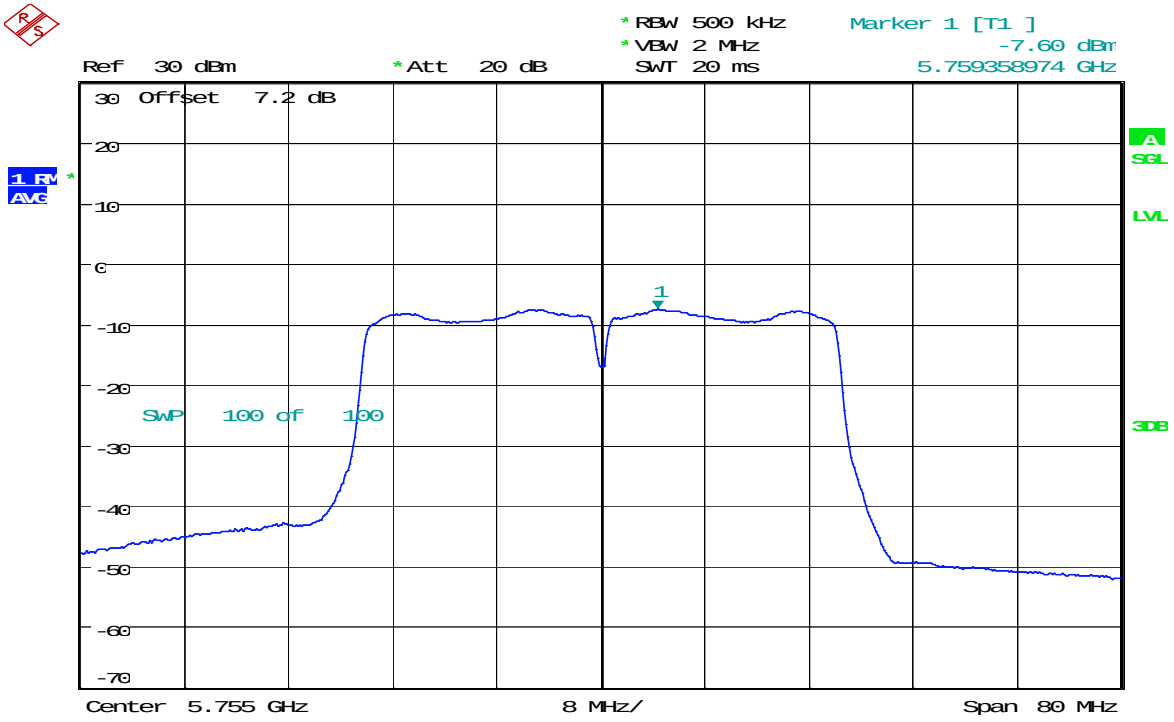


CH High

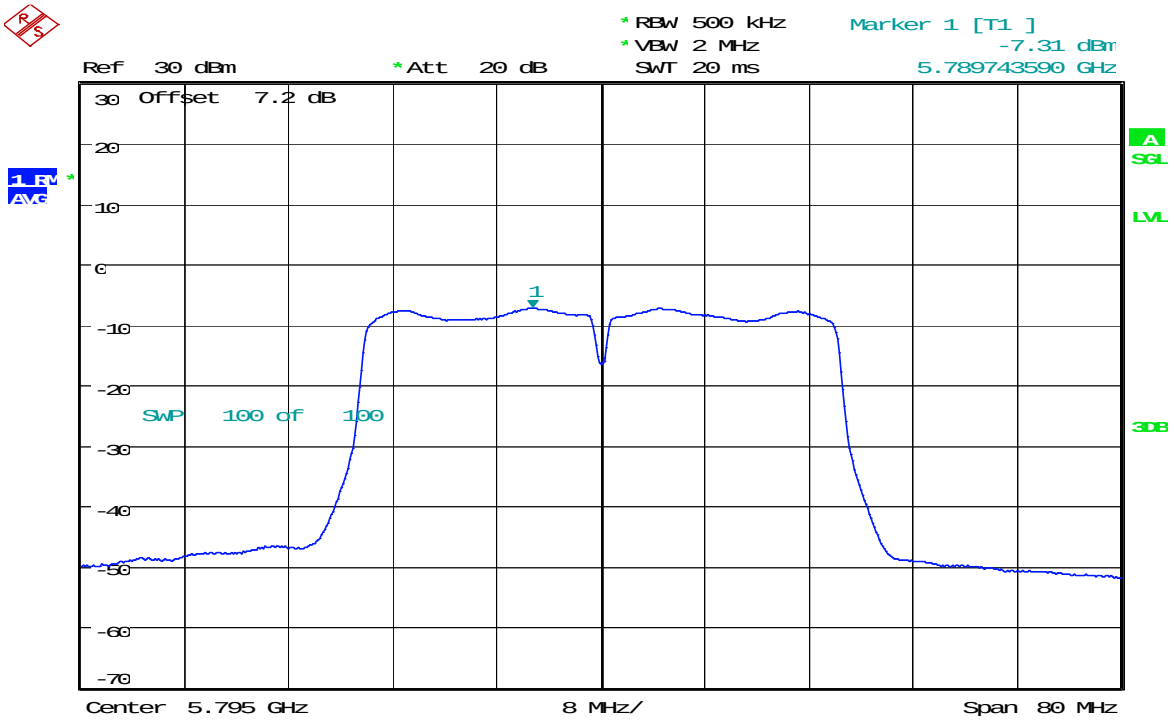


IEEE 802.11n HT40 mode/Chain 2
5725~5850MHz

CH Low

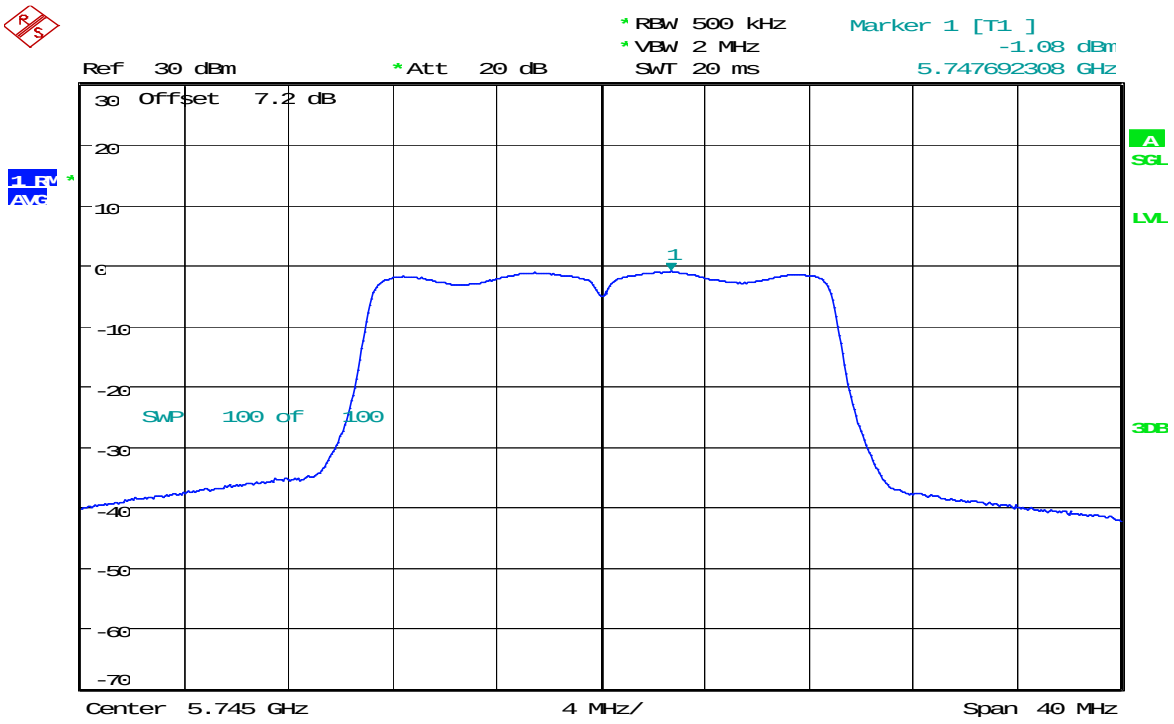


CH High

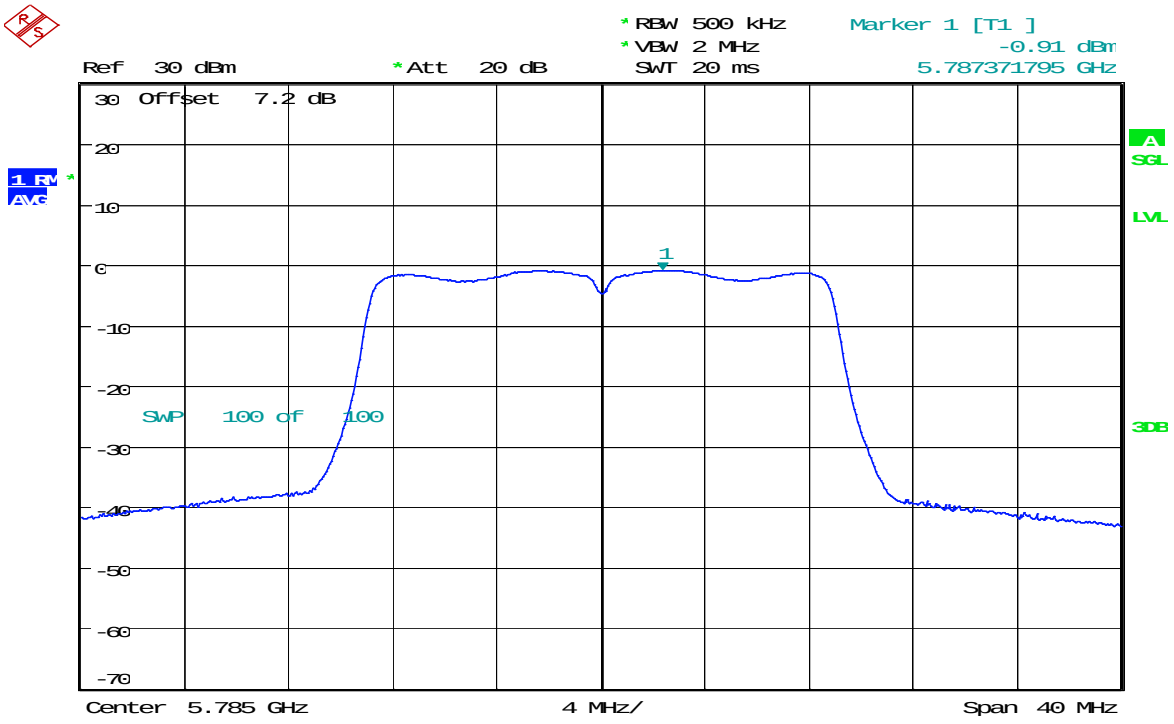


IEEE 802.11ac VHT20 mode/Chain 1:

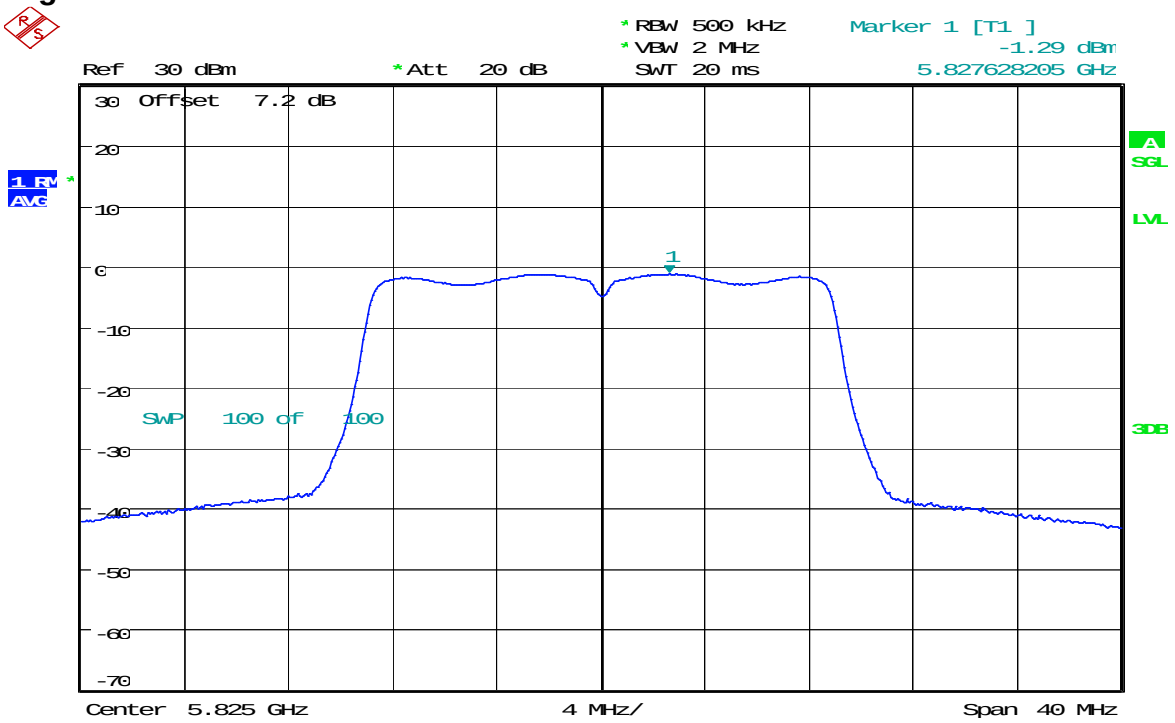
CH Low



CH Mid

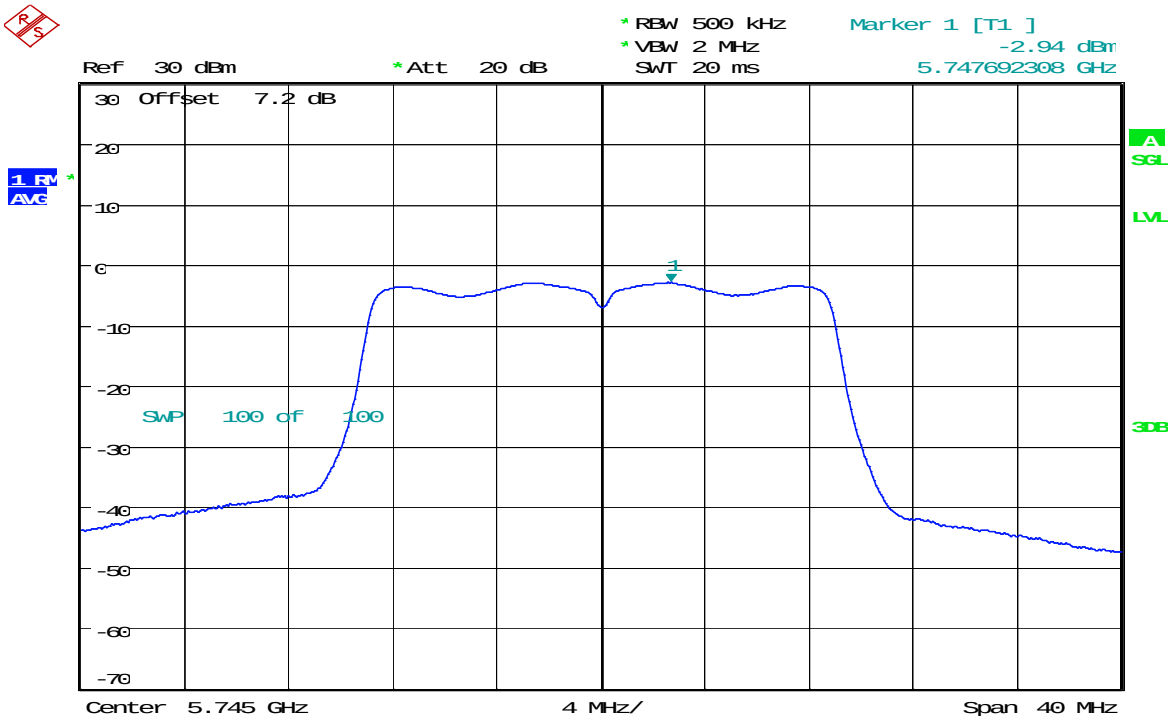


CH High

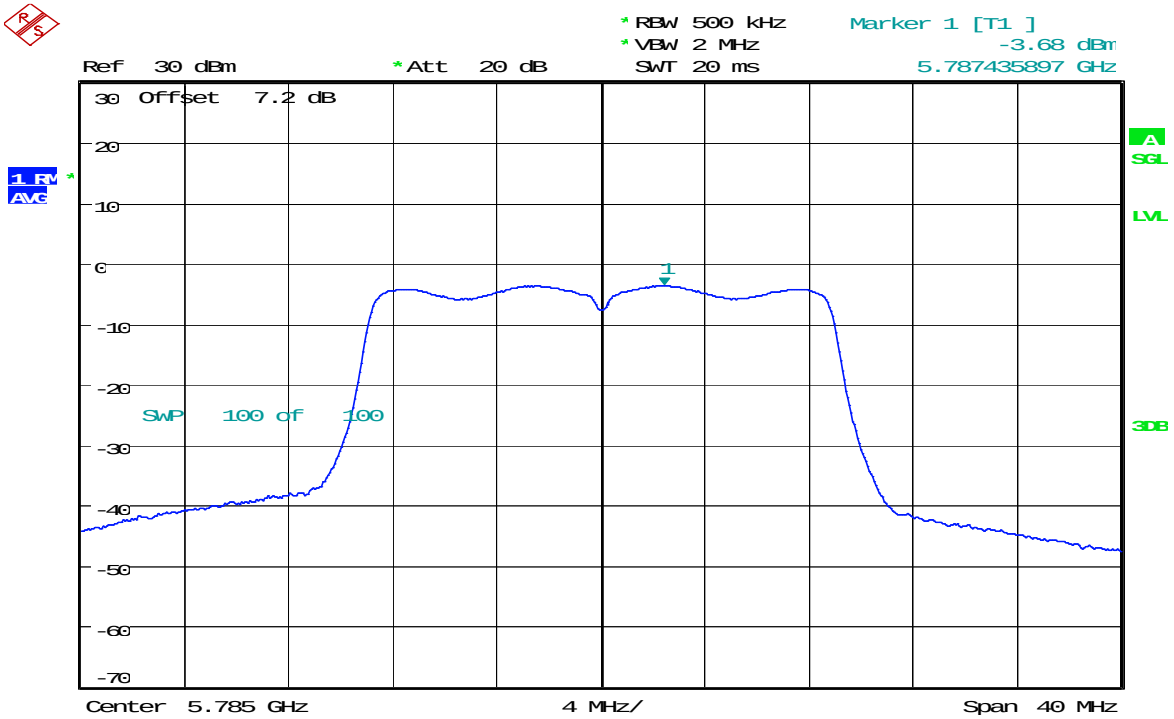


IEEE 802.11ac VHT20 mode/Chain 2:

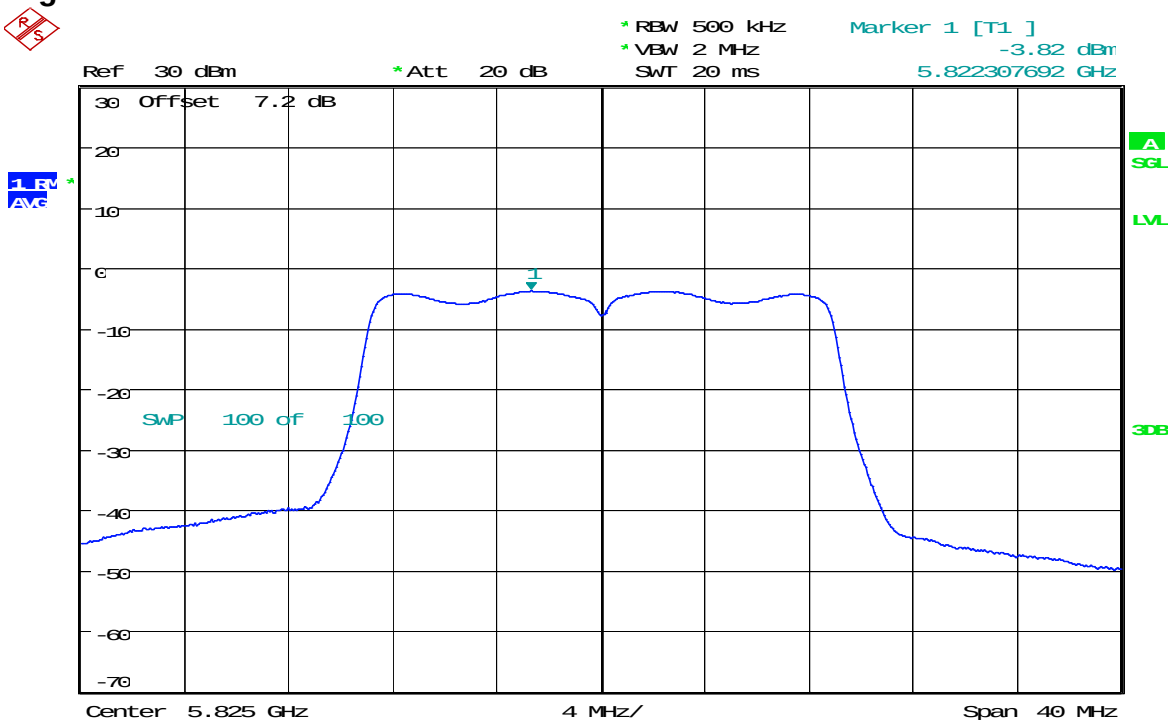
CH Low



CH Mid

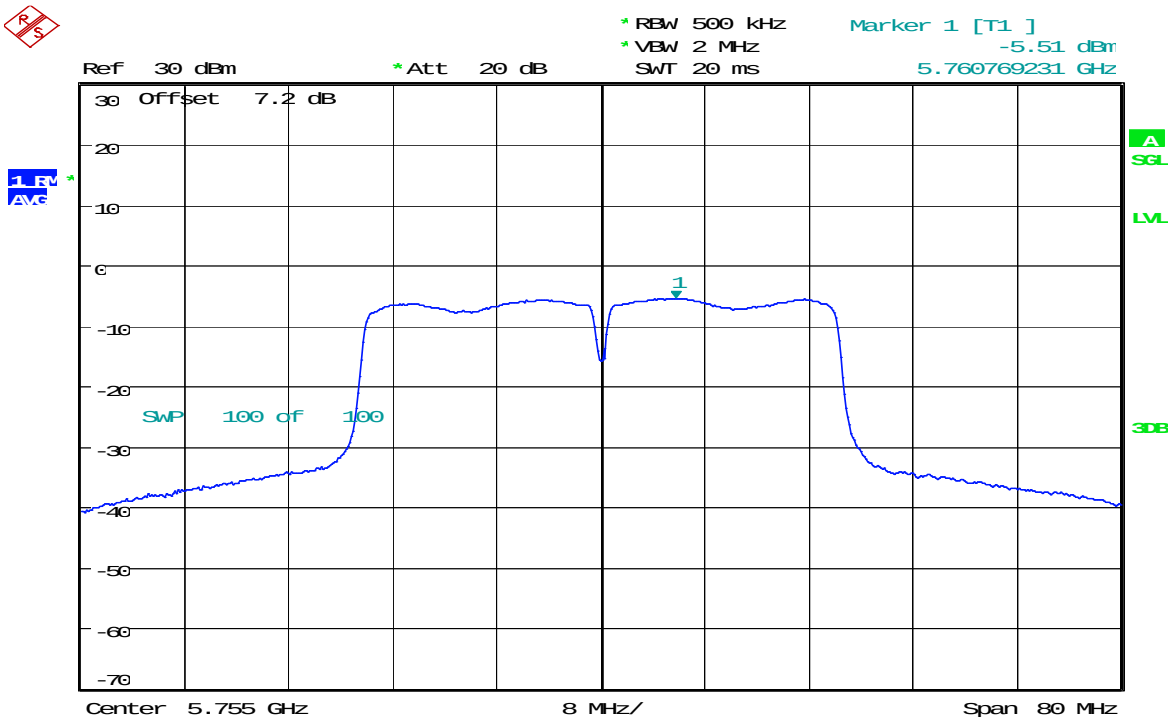


CH High

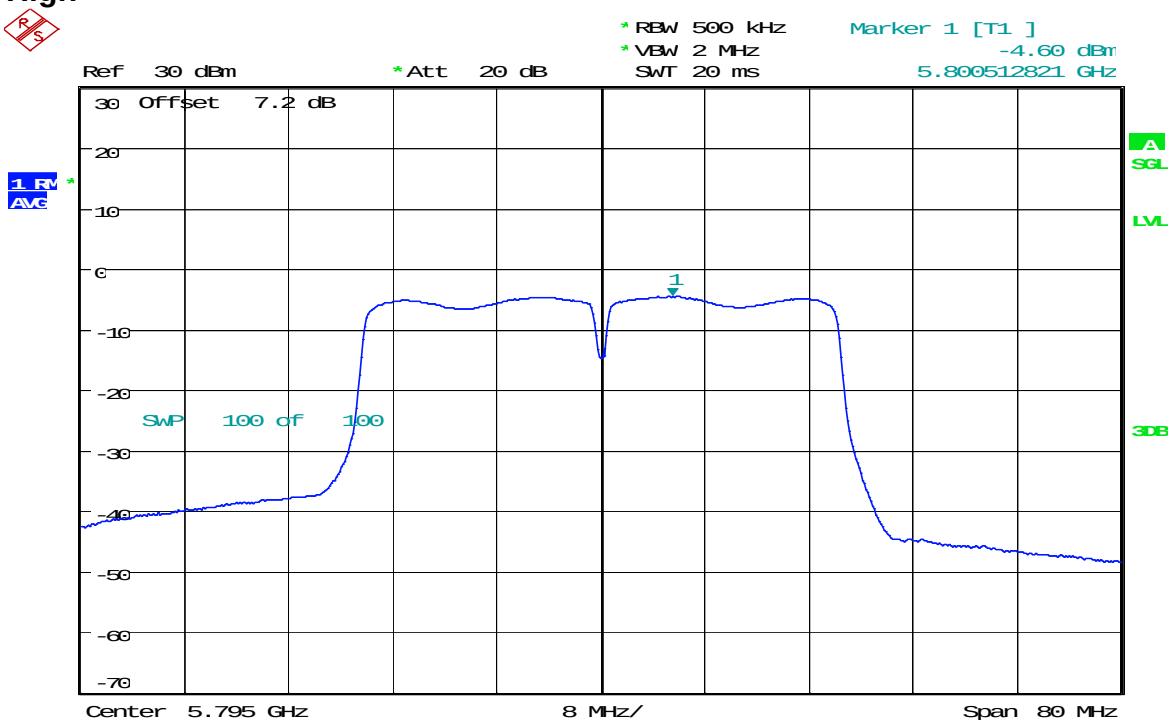


IEEE 802.11ac VHT40 mode/Chain 1:

CH Low

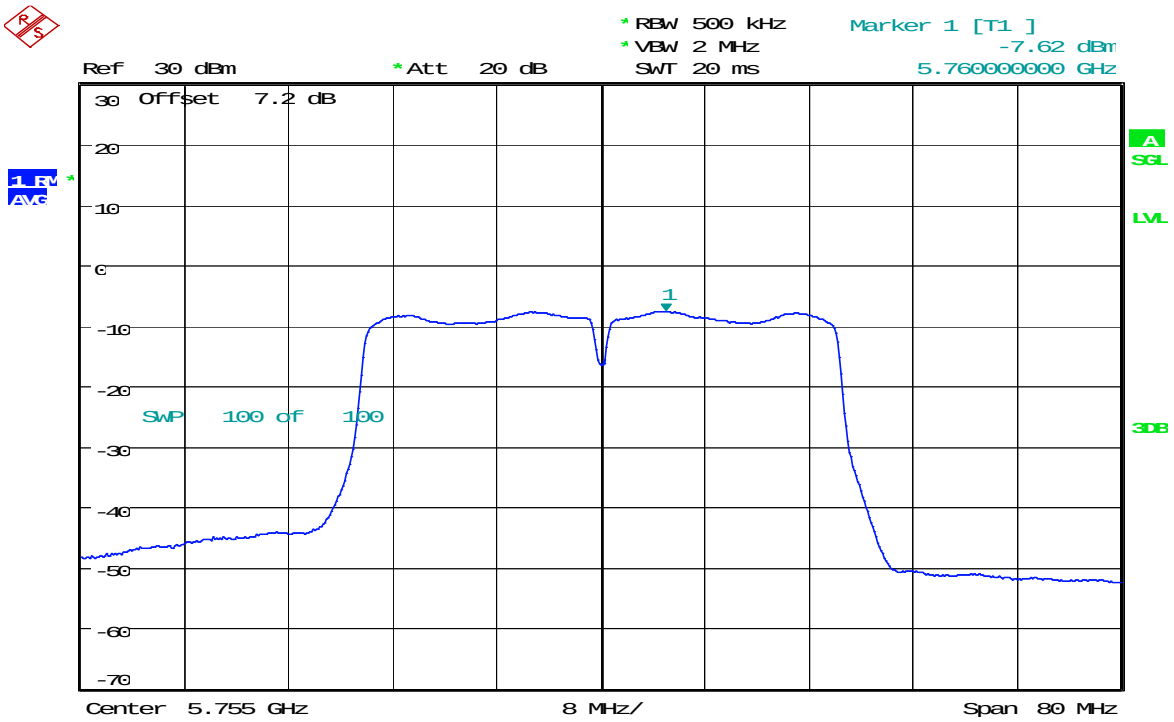


CH High

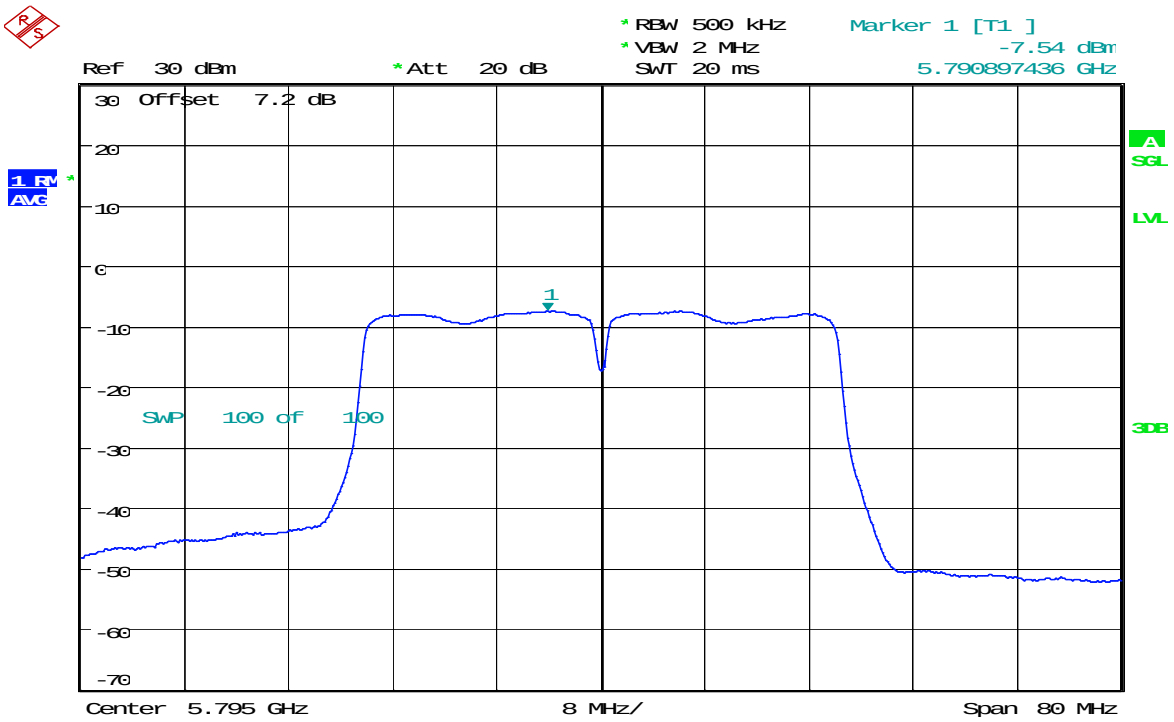


IEEE 802.11ac VHT40 mode/Chain 2:

CH Low



CH High

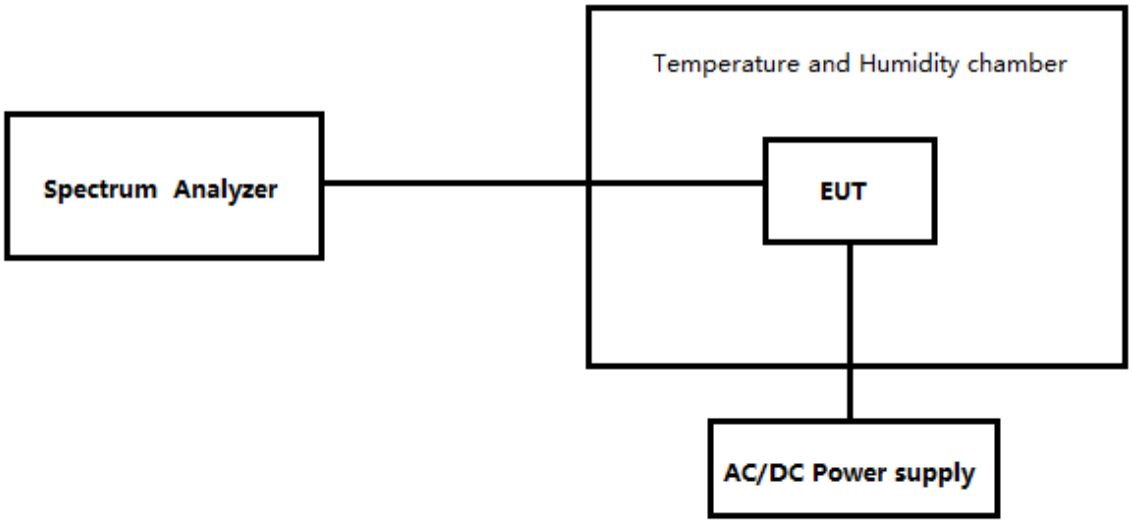


8.5 FREQUENCY STABILITY MEASUREMENT

LIMIT

According to §15.407(g),Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

TEST CONFIGURATION



TEST PROCEDURE

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

TEST RESULTS

U-NII-3-(5725MHz-5850MHz)					
Freq.(MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
5745	5745.020520	0.021	3.57	25	V_{min} (4.4V)
5745	5745.021580	0.022	3.76	25	V_{max} (7.6V)
5745	5745.033980	0.034	5.91	5	V_{nor} (6V)
5745	5745.020520	0.021	3.57	15	V_{nor} (6V)
5745	5745.020520	0.021	3.57	25	V_{nor} (6V)
5745	5745.053250	0.053	9.27	35	V_{nor} (6V)

8.6 RADIATED UNDESIRABLE EMISSION

LIMIT

Radiated emissions from 9 kHz to 40GHz were measured according to the methods defines in ANSI C63.10-2013. The EUT was placed above the ground plane, 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

1. For transmitters operating in the 5725-5850 MHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBμV/m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBμV/m).
2. KDB789033 v02r01 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.
3. According to APPENDIX A Final Rules of FCC-16-24A1,For transmitters operating in the 5.725-5.85 GHz band:
   All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
4. 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

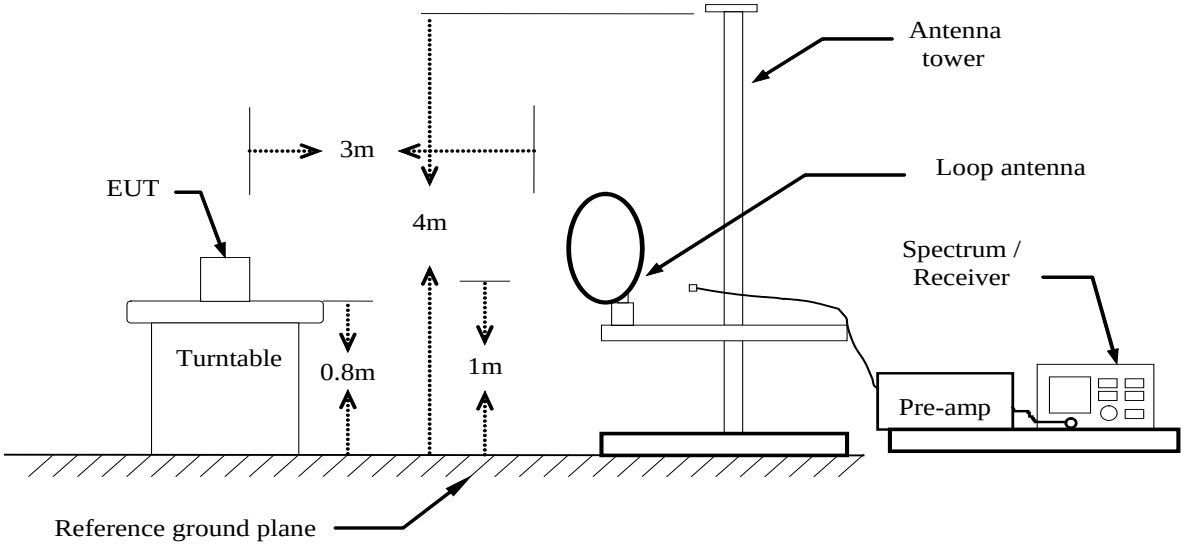
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

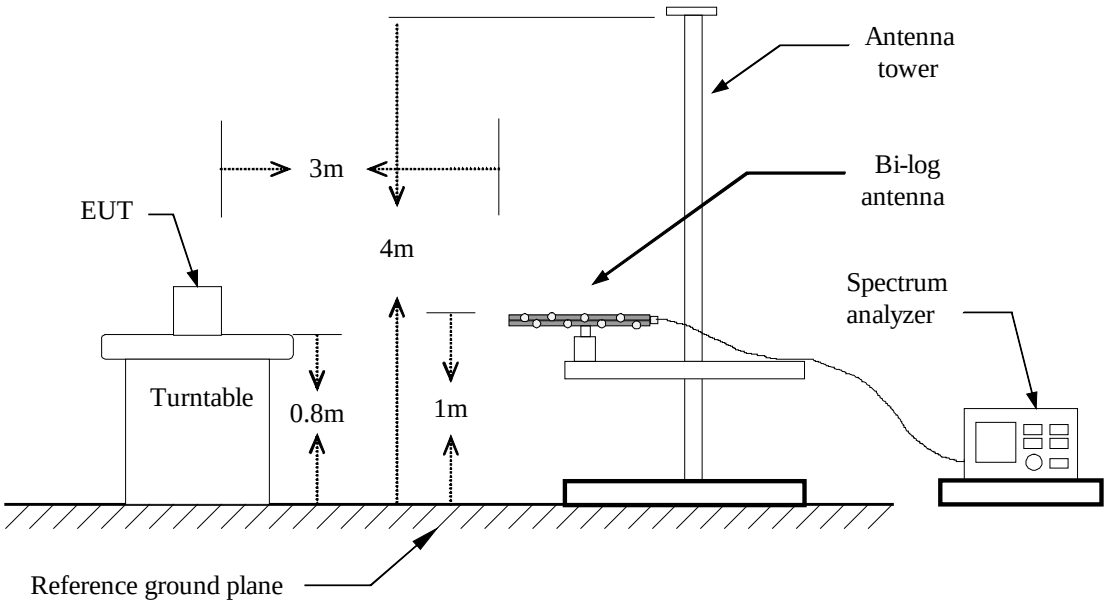
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

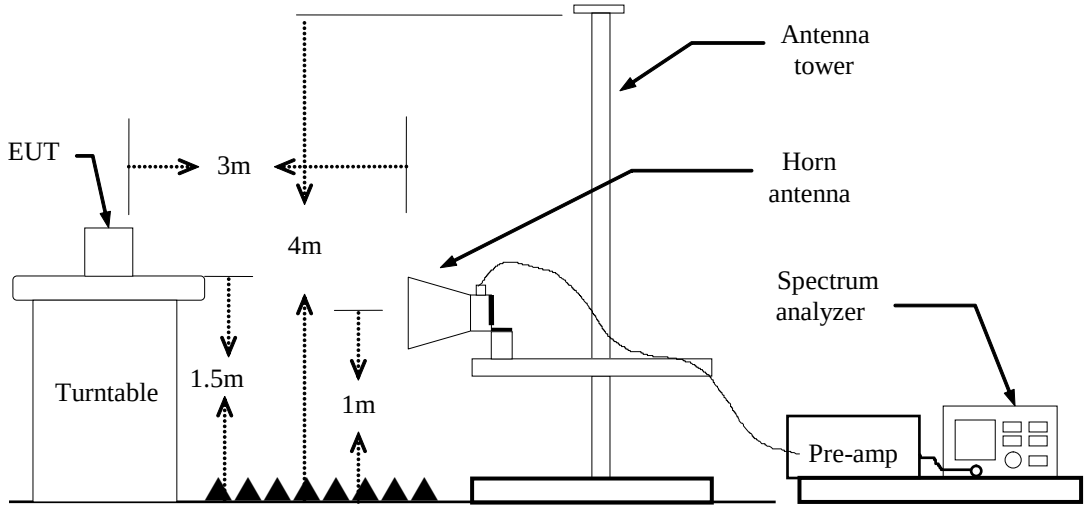
Below 30MHz



Below 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable above ground plane, which is 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz.
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 / Sweep=AUTO

VBW=10Hz,when duty cycle is no less than 98 percent.

VBW≧1/T,when duty cycle is less than 98 percent,where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximun power control level for the tested mode of operation.

7. Repeat above procedures until the measurements for all frequencies are complete.

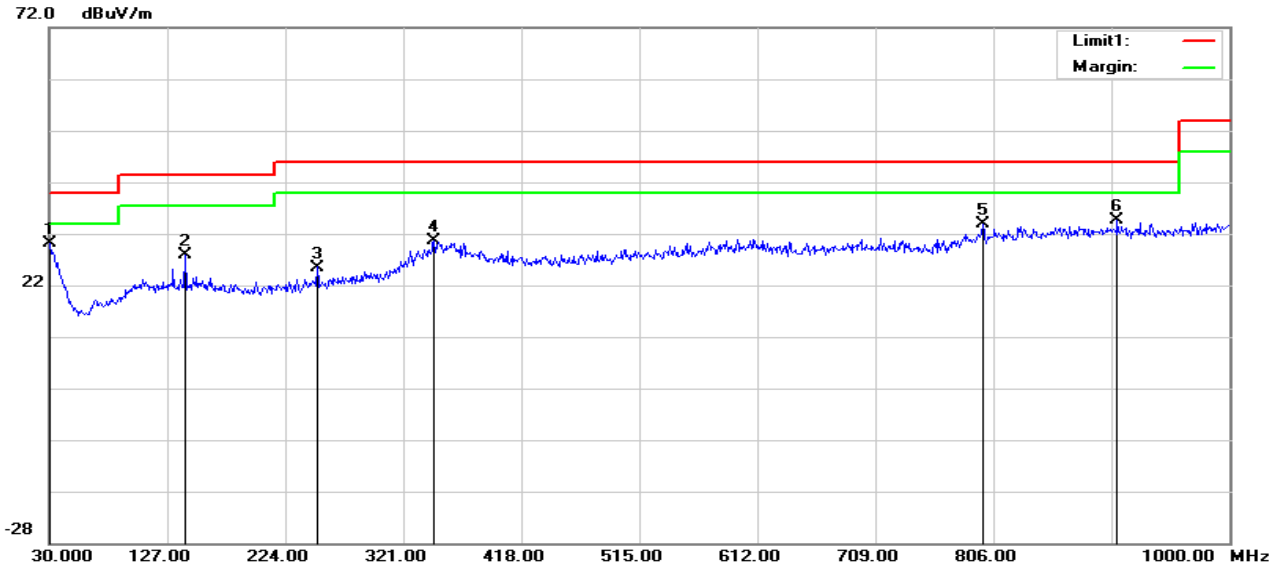
Test Result of Radiated Emission

Below 30MHz

Below 30MHz and above 18GHz. The measured value have enough margin over 20dB than the limit, therefore they are not reported.

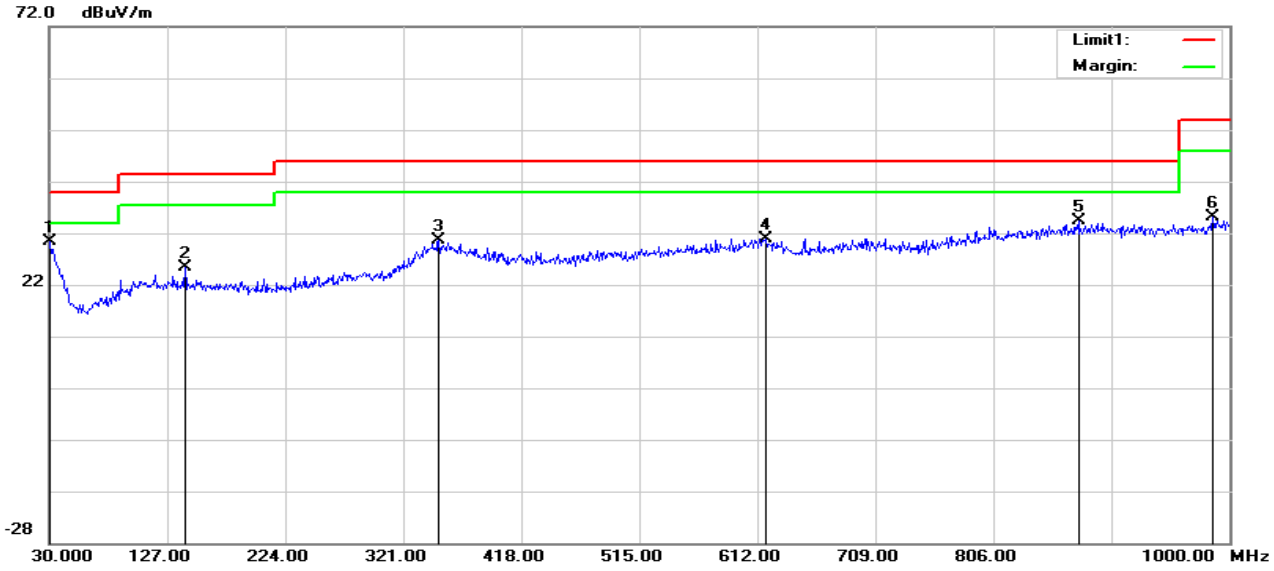
30MHz-1GHz

Operation Mode:	IEEE 802.11a mode	**Test Date:**	2018-12-11
Temperature:	25°C	**Tested by:**	Wendy.Wei
Humidity:	51% RH	**Polarity:**	Hor.



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.9700	5.00	25.09	30.09	40.00	-9.91	100	358	peak
2	141.5500	9.93	17.86	27.79	43.50	-15.71	100	250	peak
3	250.1900	6.86	18.64	25.50	46.00	-20.50	200	278	peak
4	346.2200	4.84	25.84	30.68	46.00	-15.32	200	274	peak
5	797.2700	6.34	27.46	33.80	46.00	-12.20	100	107	peak
6	907.8500	5.59	28.92	34.51	46.00	-11.49	100	91	peak

Operation Mode:	IEEE 802.11a mode	Test Date:	2018-12-11
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver.



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.0000	4.52	25.76	30.28	40.00	-9.72	100	0	peak
2	141.5500	7.56	17.86	25.42	43.50	-18.08	200	25	peak
3	350.1000	4.28	26.30	30.58	46.00	-15.42	100	0	peak
4	618.7900	5.33	25.55	30.88	46.00	-15.12	300	13	peak
5	875.8400	5.70	28.73	34.43	46.00	-11.57	100	68	peak
6	986.4200	5.57	29.61	35.18	54.00	-18.82	100	172	peak

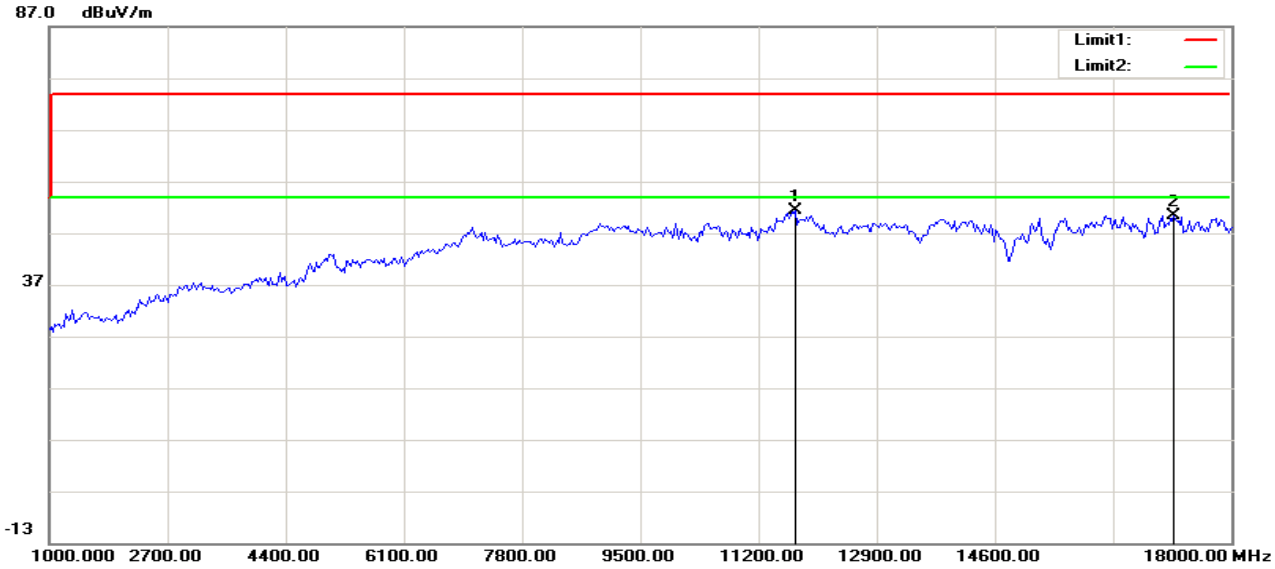
Remark:

1. Measuring frequencies from 30 MHz to the 1GHz.(no emission found from the lowest internal used/generated frequency to 30MHz)
2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. 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.
5. Margin (dB) = Result (dBuV/m) – Limit (dBuV/m).

Above 1 GHz

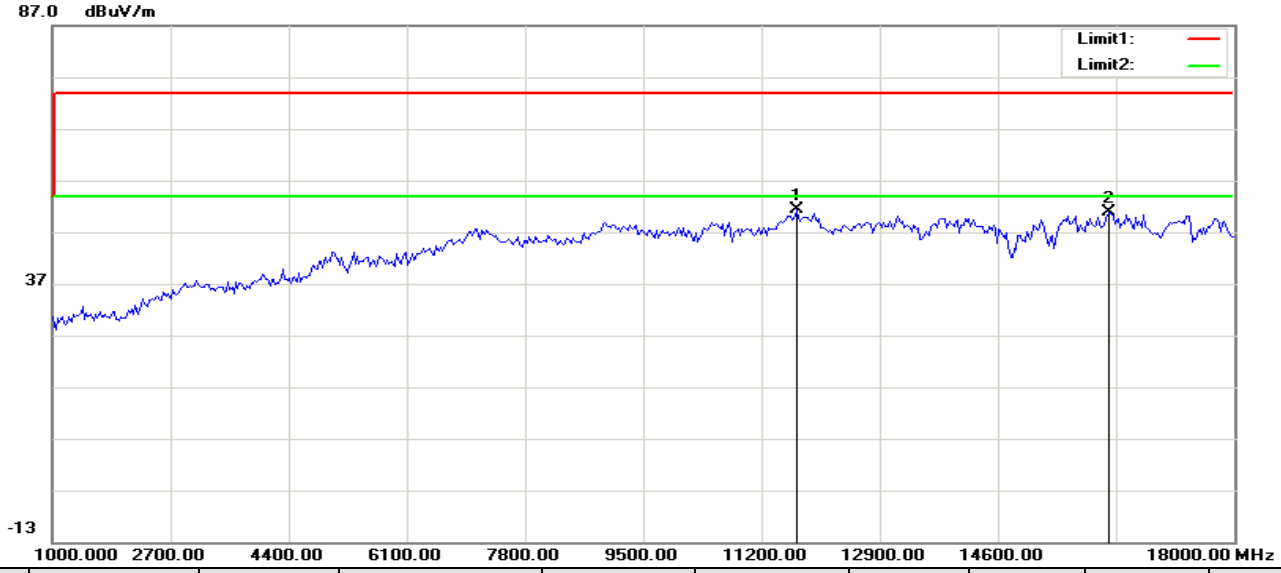
Operation Mode:	Tx / IEEE 802.11a mode CH Low	**Test Date:**	2018-11-5
Temperature:	25°C	**Tested by:**	Wendy.Wei
Humidity:	51% RH	**Polarity:**	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11733.974	39.58	11.69	51.27	74.00	-22.73	100	90	peak
2	17182.692	34.14	16.35	50.49	74.00	-23.51	100	248	peak

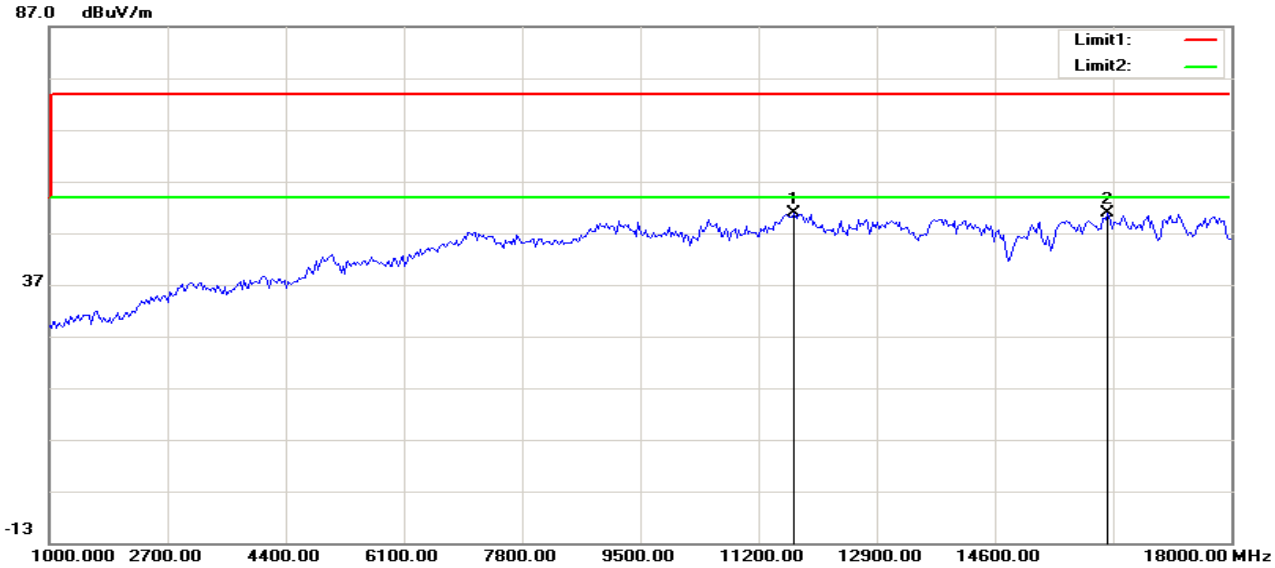
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11706.731	39.68	11.64	51.32	74.00	-22.68	200	0	peak
2	16201.923	36.42	14.37	50.79	74.00	-23.21	100	294	peak

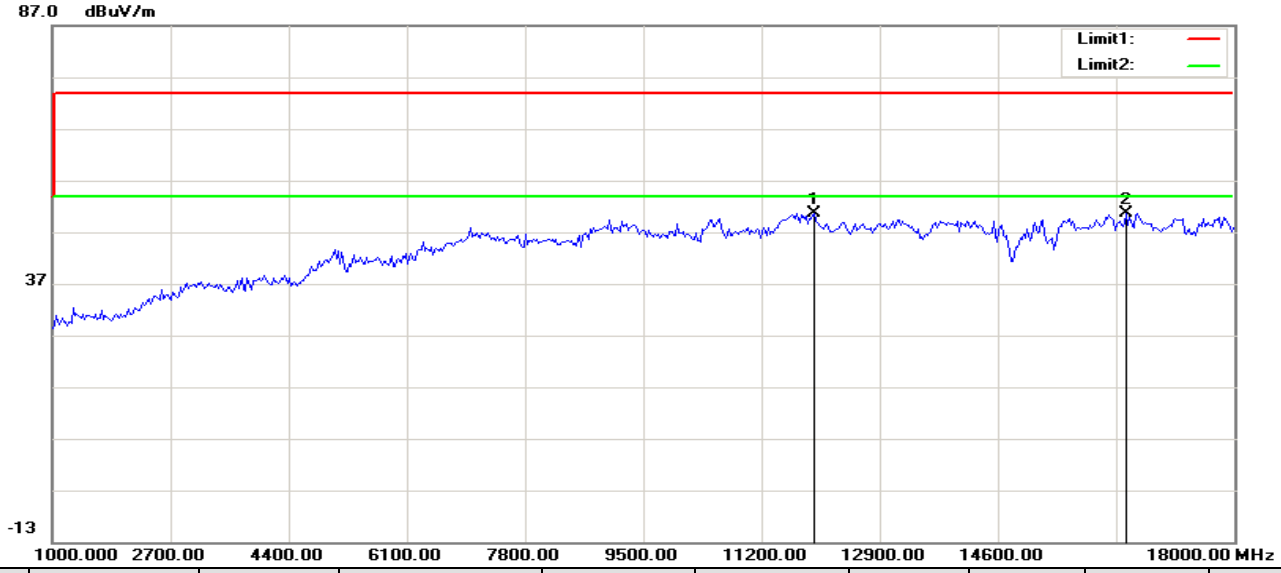
Operation Mode:	Tx / IEEE 802.11a mode CH Mid	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11706.731	39.17	11.64	50.81	74.00	-23.19	100	58	peak
2	16229.167	36.56	14.38	50.94	74.00	-23.06	200	0	peak

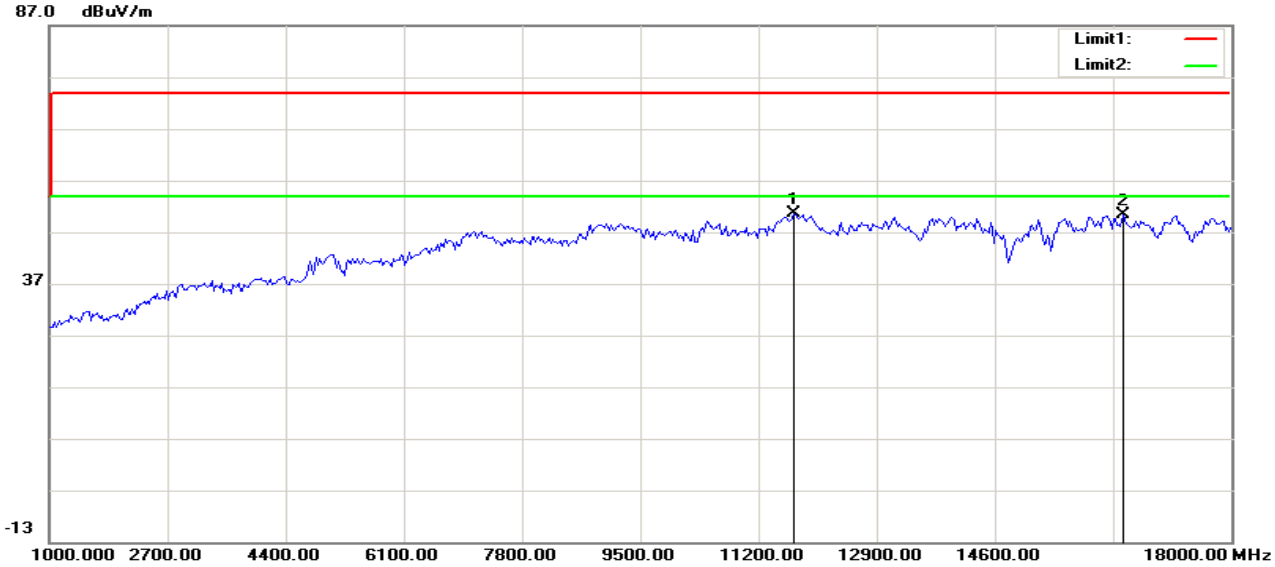
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11951.923	38.64	12.06	50.70	74.00	-23.30	100	322	peak
2	16447.115	36.10	14.45	50.55	74.00	-23.45	100	358	peak

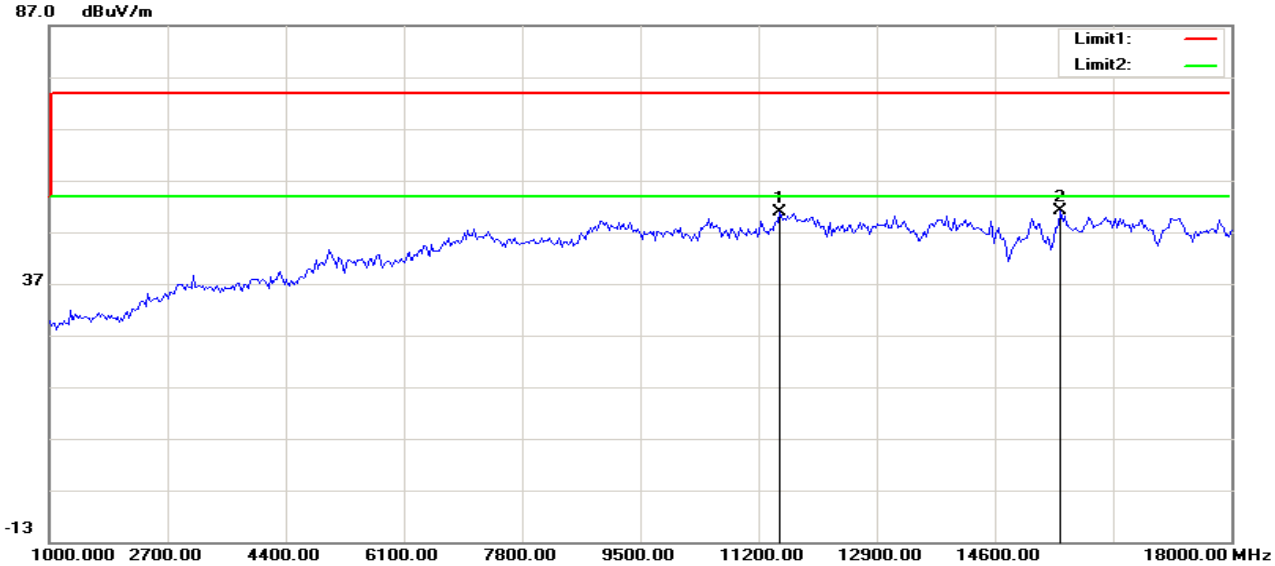
Operation Mode:	Tx / IEEE 802.11a mode CH High	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11706.731	39.01	11.64	50.65	74.00	-23.35	100	358	peak
2	16447.115	35.81	14.45	50.26	74.00	-23.74	100	359	peak

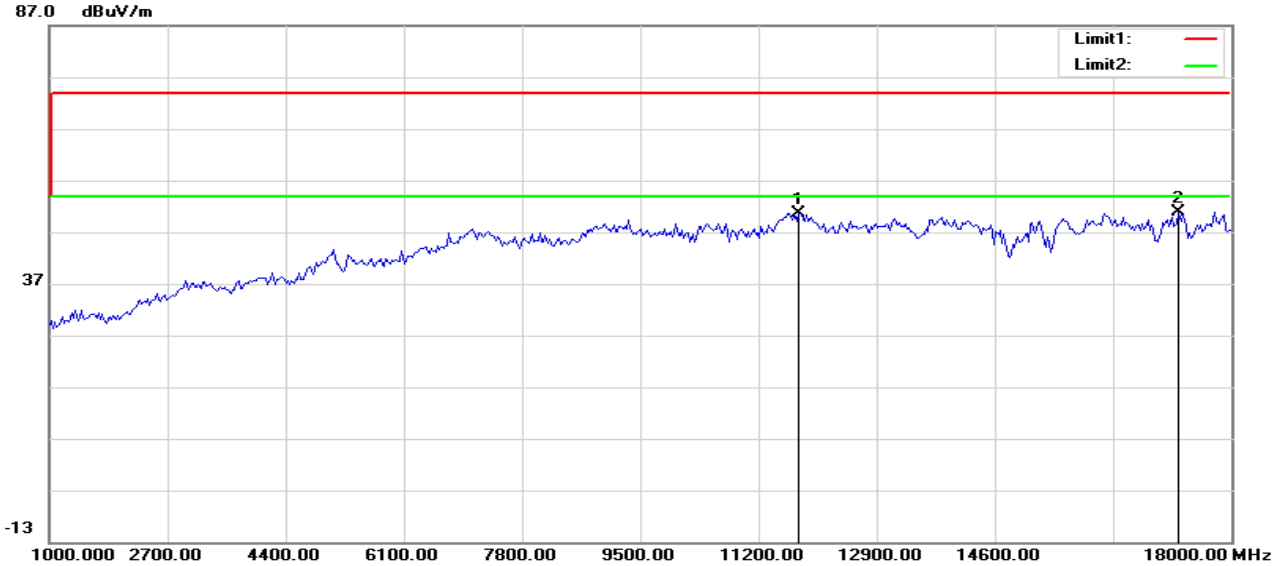
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11516.026	39.50	11.32	50.82	74.00	-23.18	100	313	peak
2	15548.077	37.42	13.81	51.23	74.00	-22.77	100	229	peak

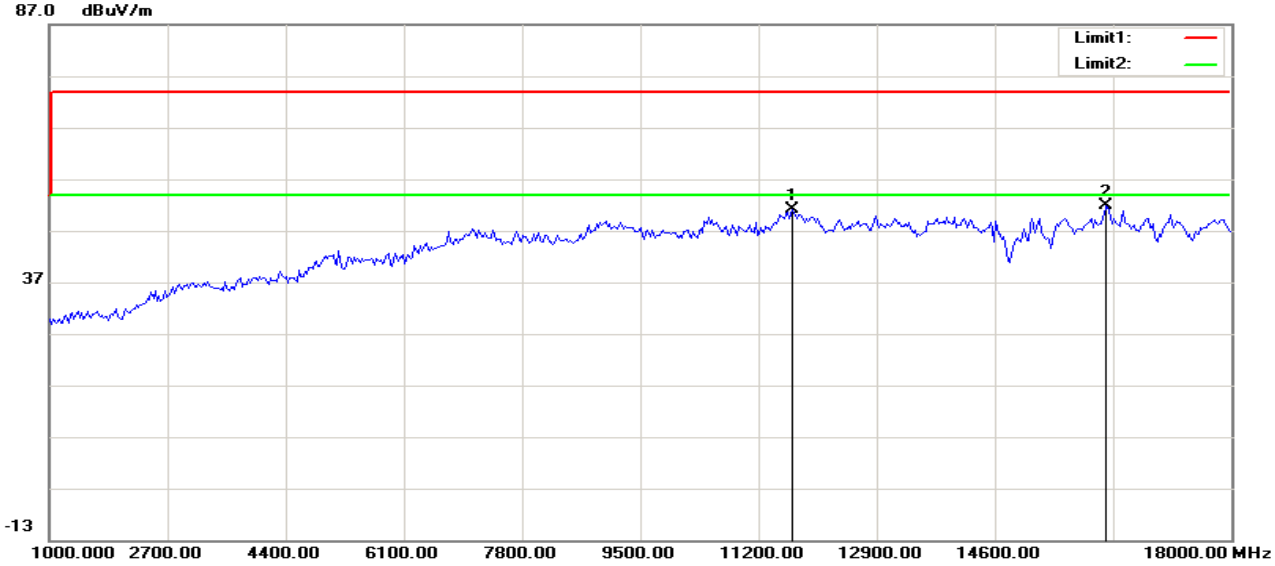
Operation Mode:	TX / IEEE 802.11n HT20 mode /CH Low	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11788.461	38.88	11.78	50.66	74.00	-23.34	100	0	peak
2	17237.179	34.42	16.56	50.98	74.00	-23.02	100	18	peak

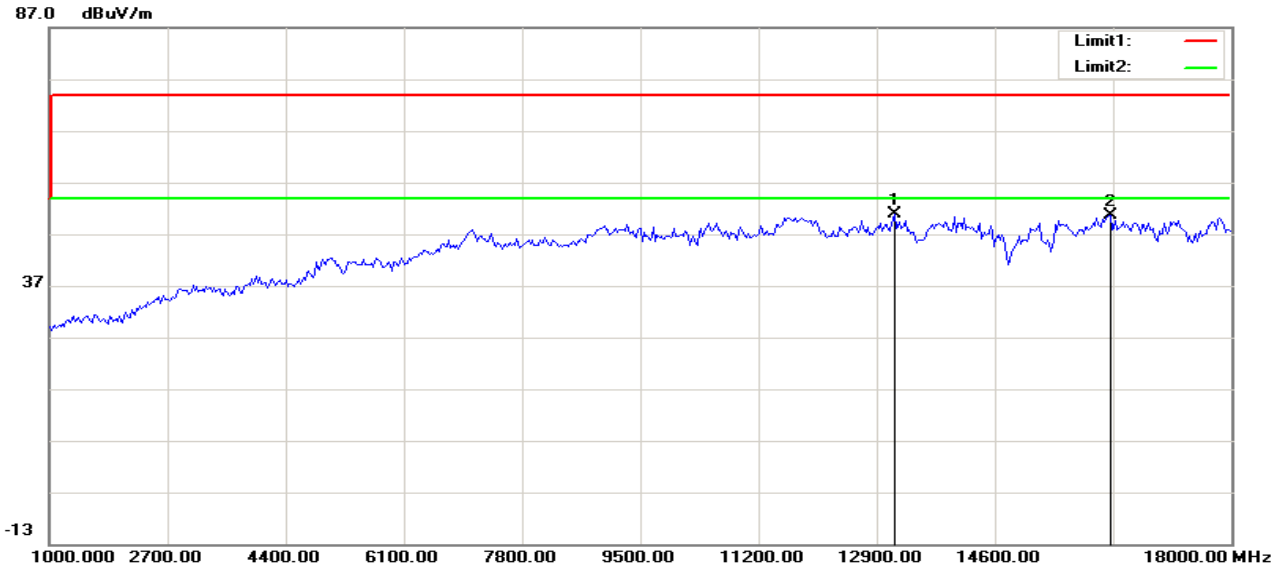
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11679.487	39.53	11.60	51.13	74.00	-22.87	100	242	peak
2	16201.923	37.61	14.37	51.98	74.00	-22.02	100	360	peak

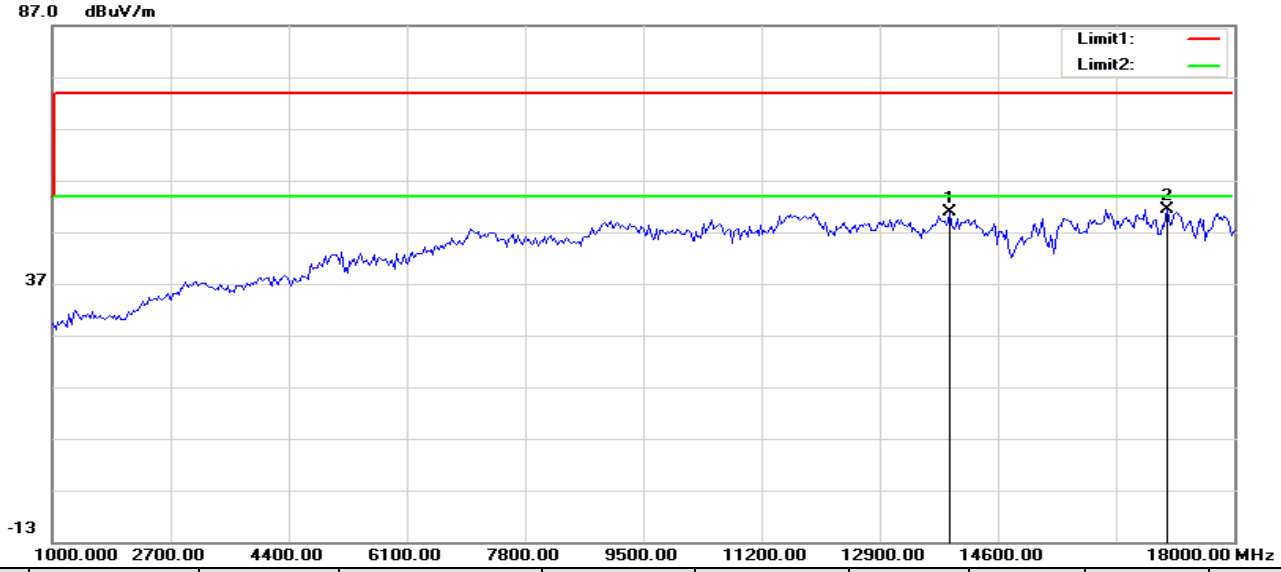
Operation Mode:	TX / IEEE 802.11n HT20 mode /CH Mid	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	13150.641	39.16	11.81	50.97	74.00	-23.03	100	145	peak
2	16256.410	36.20	14.39	50.59	74.00	-23.41	100	299	peak

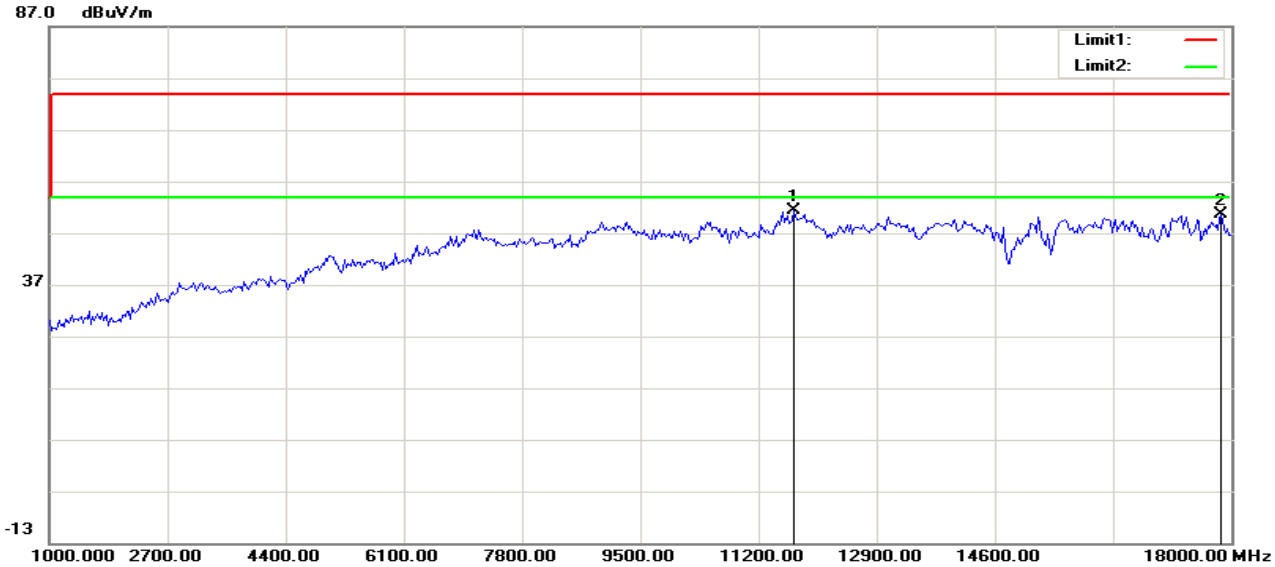
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	13913.461	38.16	12.66	50.82	74.00	-23.18	100	180	peak
2	17046.474	35.68	15.80	51.48	74.00	-22.52	100	0	peak

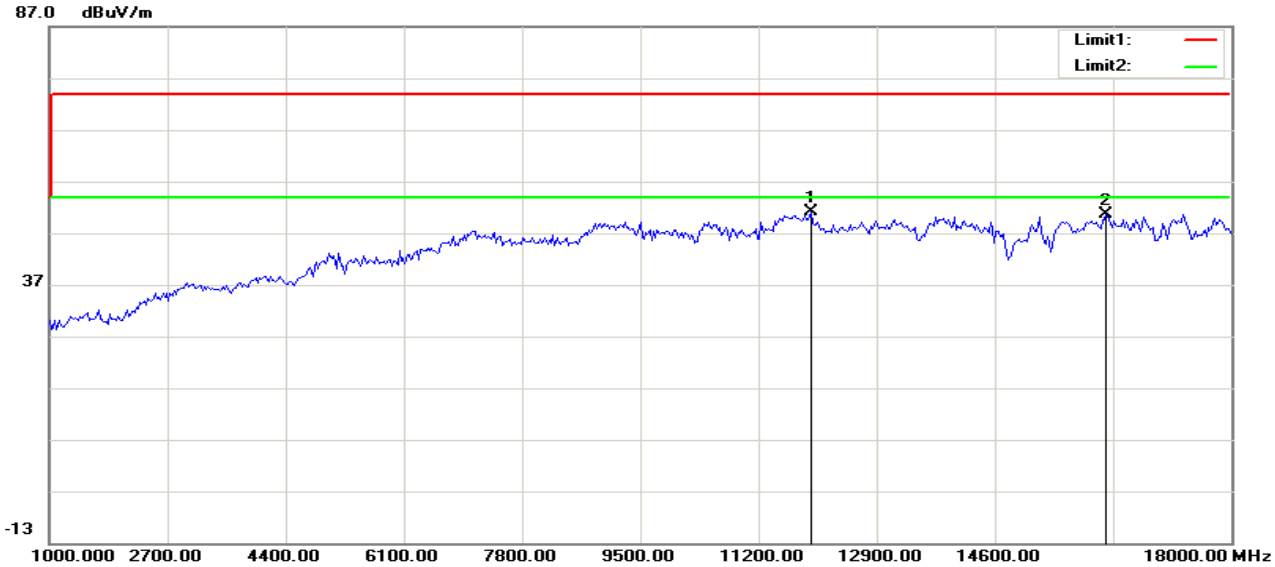
Operation Mode:	TX / IEEE 802.11n HT20 mode /CH High	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11706.731	39.66	11.64	51.30	74.00	-22.70	100	0	peak
2	17863.782	32.52	17.99	50.51	74.00	-23.49	100	166	peak

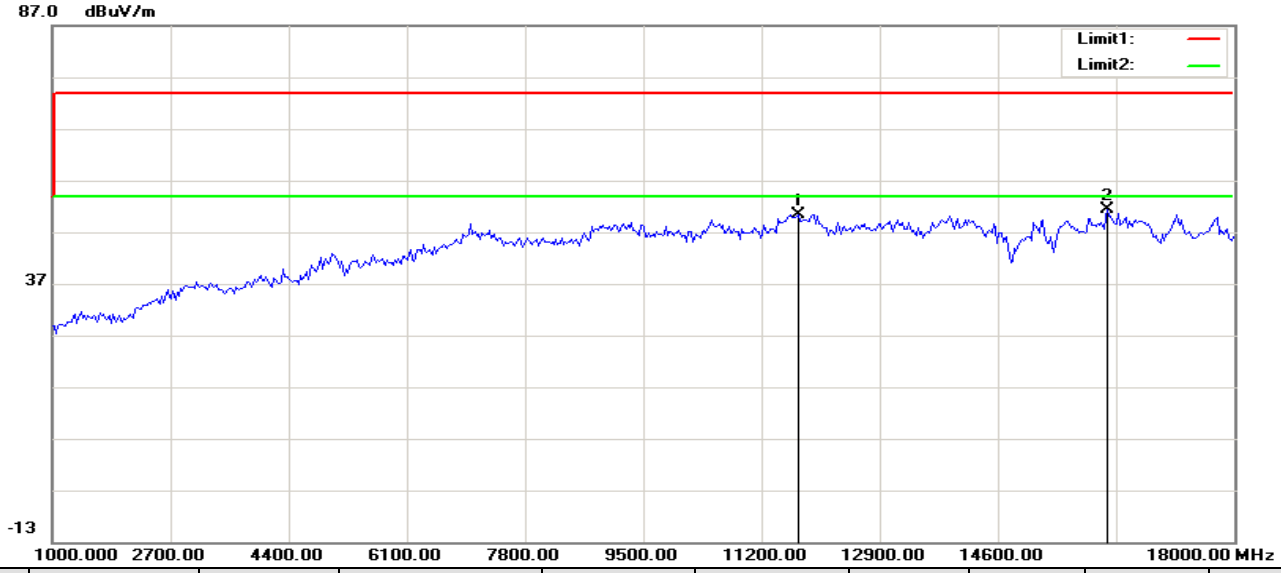
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11951.923	39.03	12.06	51.09	74.00	-22.91	100	346	peak
2	16201.923	36.29	14.37	50.66	74.00	-23.34	200	0	peak

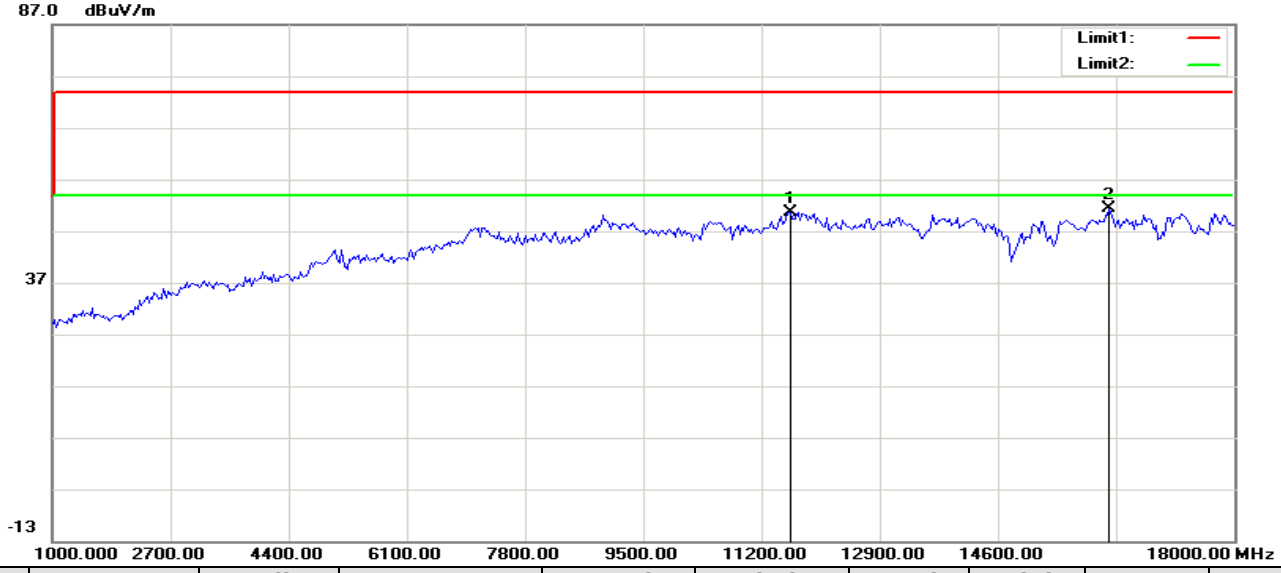
Operation Mode:	TX / IEEE 802.11n HT40 mode /CH Low	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11733.974	38.79	11.69	50.48	74.00	-23.52	100	336	peak
2	16174.680	37.11	14.36	51.47	74.00	-22.53	100	250	peak

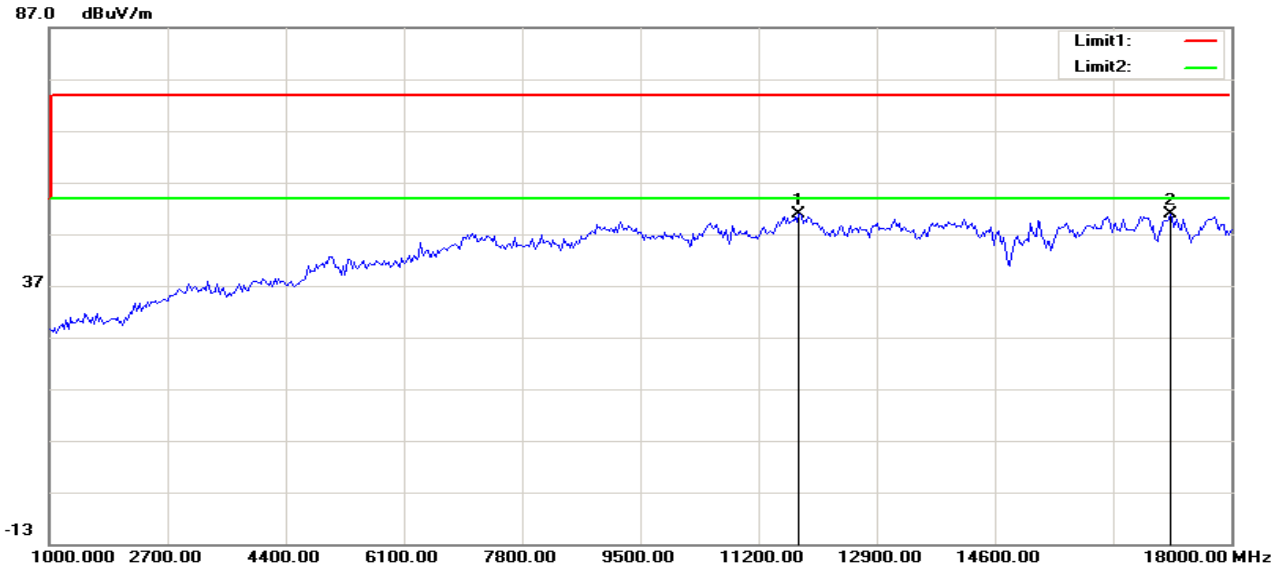
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11625.000	39.21	11.50	50.71	74.00	-23.29	100	111	peak
2	16201.923	37.00	14.37	51.37	74.00	-22.63	100	4	peak

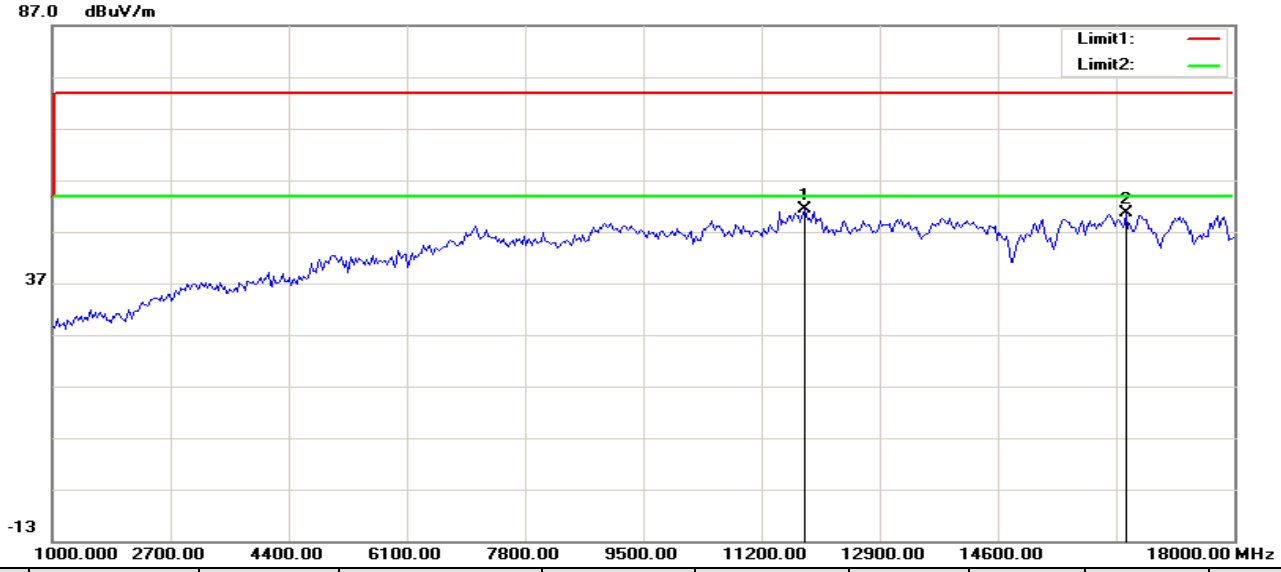
Operation Mode:	TX / IEEE 802.11n HT40 mode /CH High	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11788.461	38.99	11.78	50.77	74.00	-23.23	100	360	peak
2	17128.205	34.73	16.13	50.86	74.00	-23.14	100	298	peak

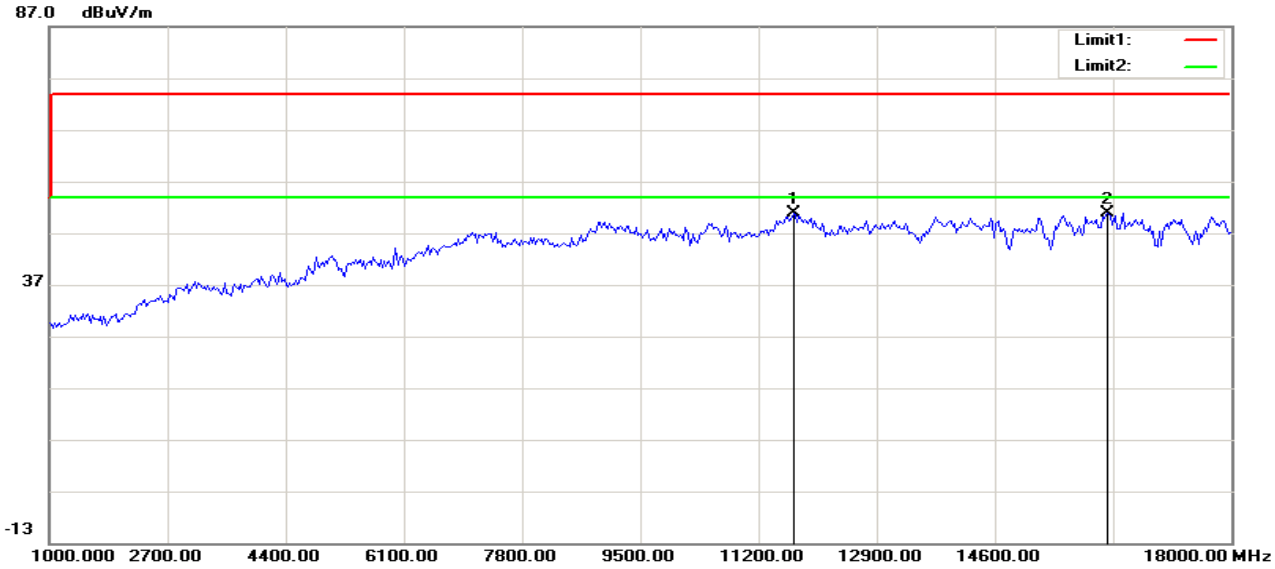
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11815.705	39.52	11.83	51.35	74.00	-22.65	100	148	peak
2	16447.115	36.14	14.45	50.59	74.00	-23.41	100	359	peak

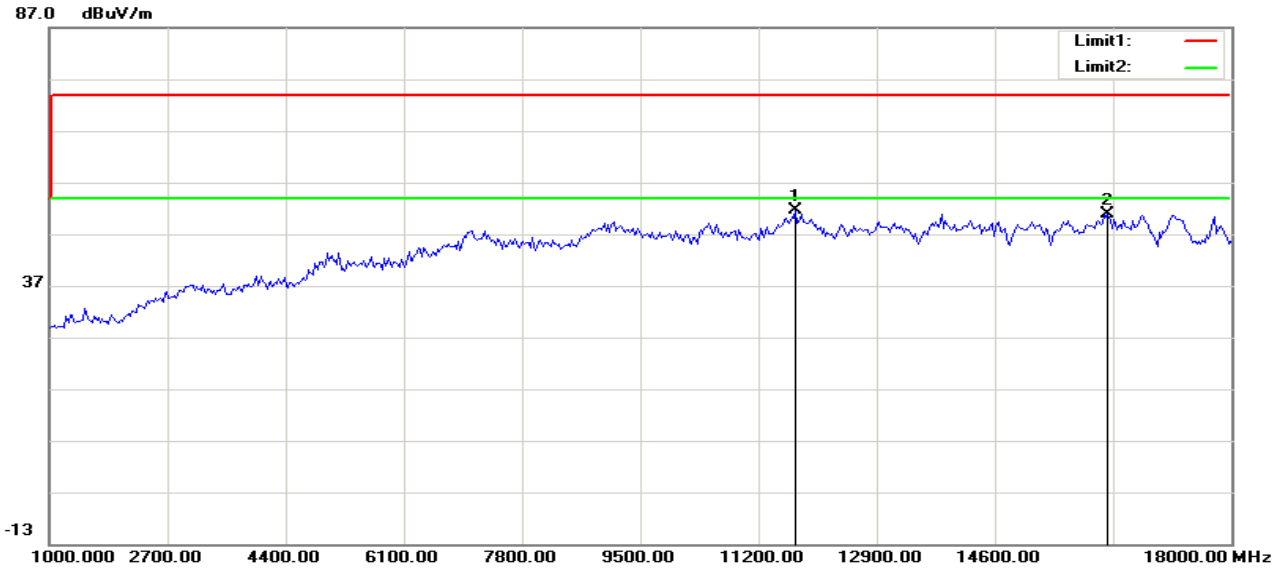
Operation Mode:	Tx / IEEE 802.11ac VHT20mode CH Low	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11706.731	39.15	11.64	50.79	74.00	-23.21	100	135	peak
2	16229.167	36.54	14.38	50.92	74.00	-23.08	100	219	peak

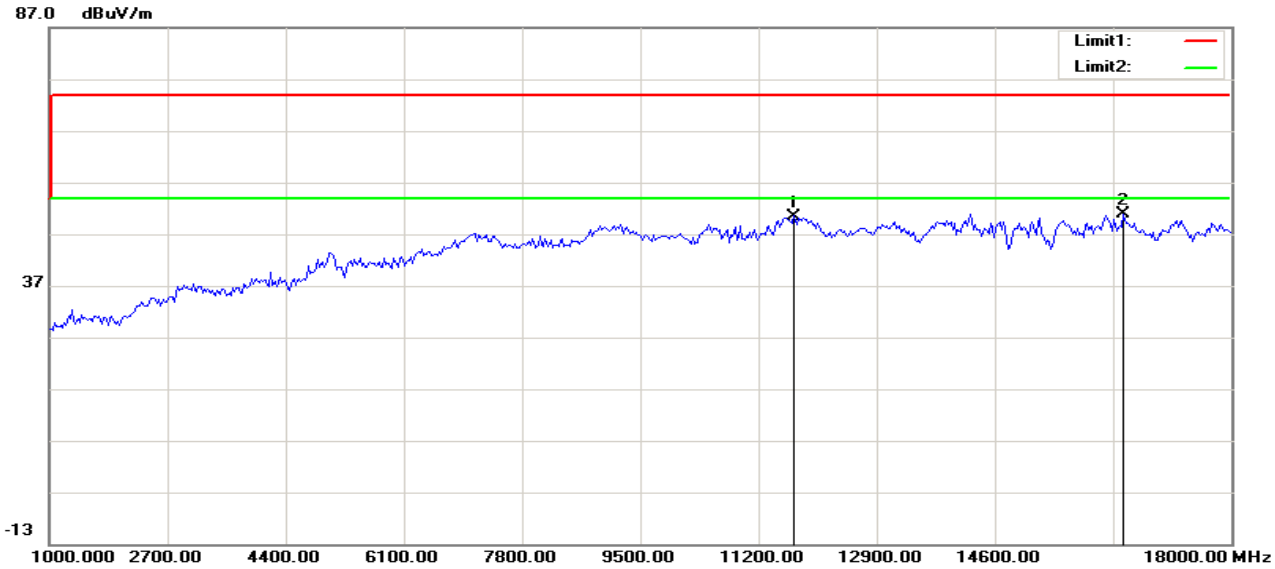
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11733.974	39.84	11.69	51.53	74.00	-22.47	100	340	peak
2	16229.167	36.43	14.38	50.81	74.00	-23.19	100	359	peak

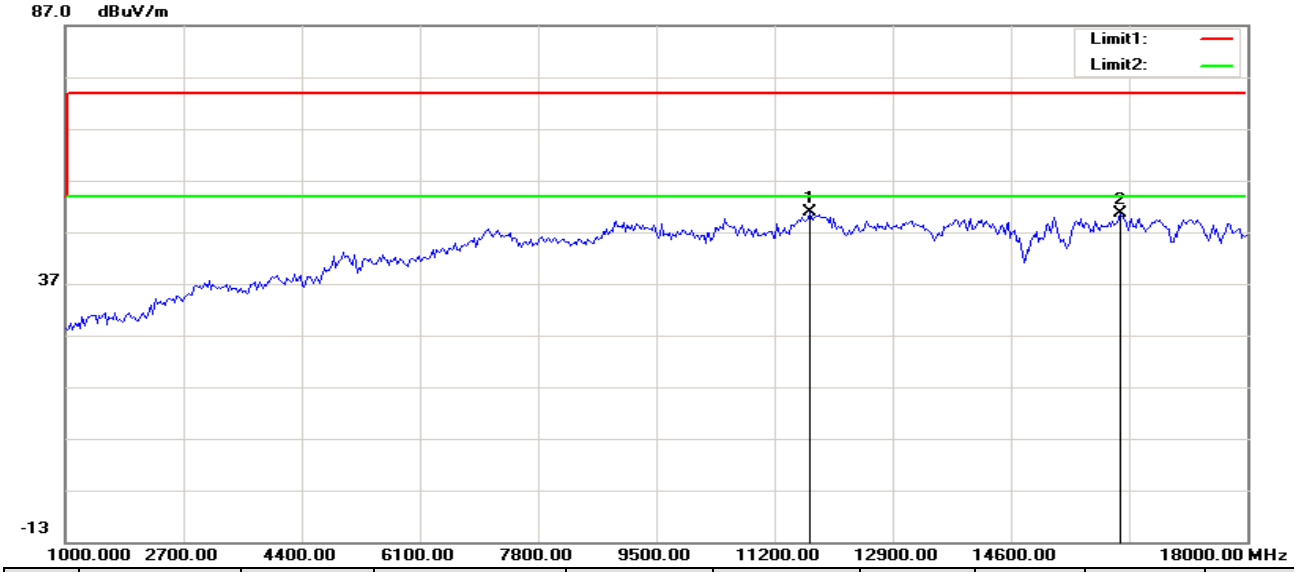
Operation Mode:	Tx / IEEE 802.11ac VHT20mode CH Mid	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11706.731	38.86	11.64	50.50	74.00	-23.50	100	180	peak
2	16447.115	36.49	14.45	50.94	74.00	-23.06	100	168	peak

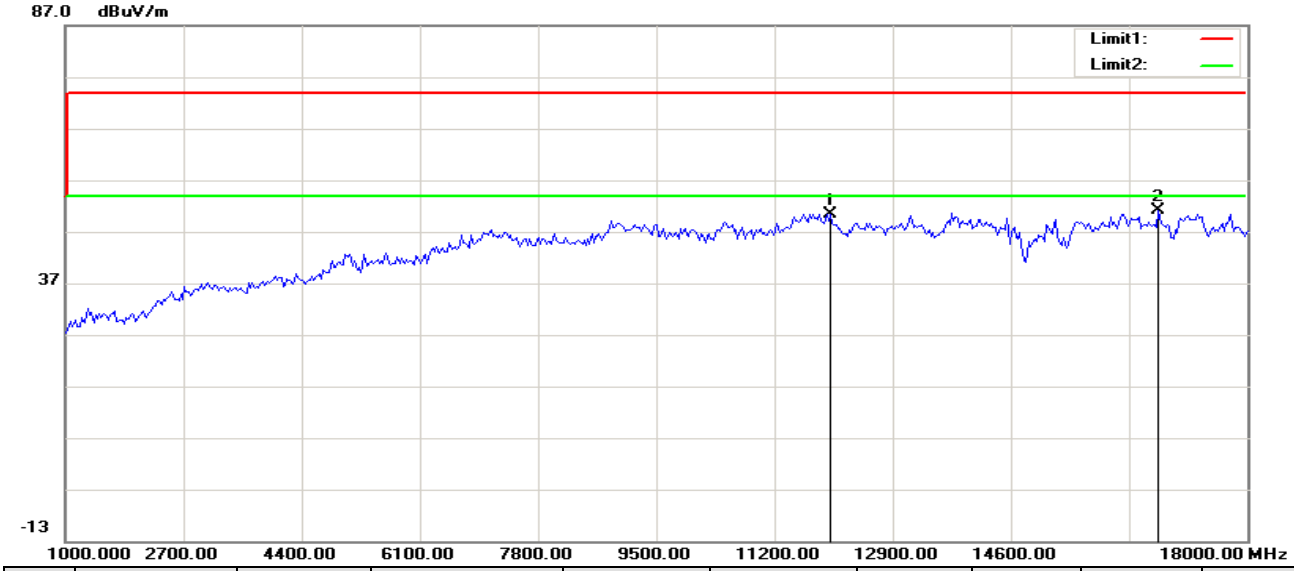
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11706.731	39.18	11.64	50.82	74.00	-23.18	100	6	peak
2	16174.680	36.17	14.36	50.53	74.00	-23.47	100	297	peak

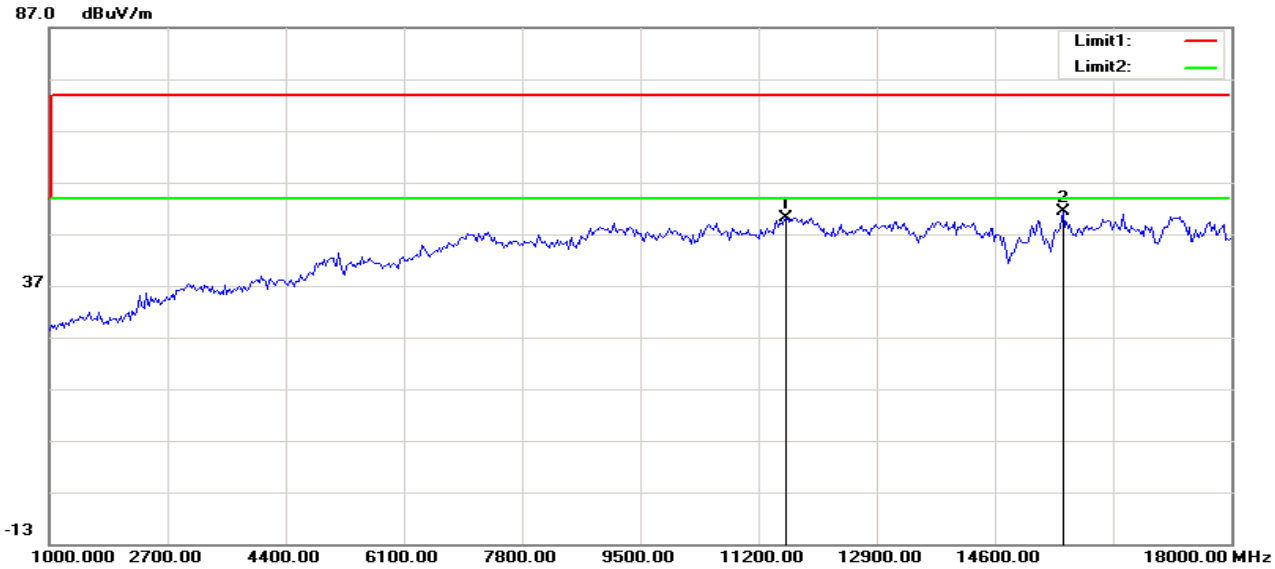
Operation Mode:	Tx / IEEE 802.11ac VHT20mode CH High	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	12006.410	38.31	12.14	50.45	74.00	-23.55	100	82	peak
2	16719.551	36.16	14.97	51.13	74.00	-22.87	100	320	peak

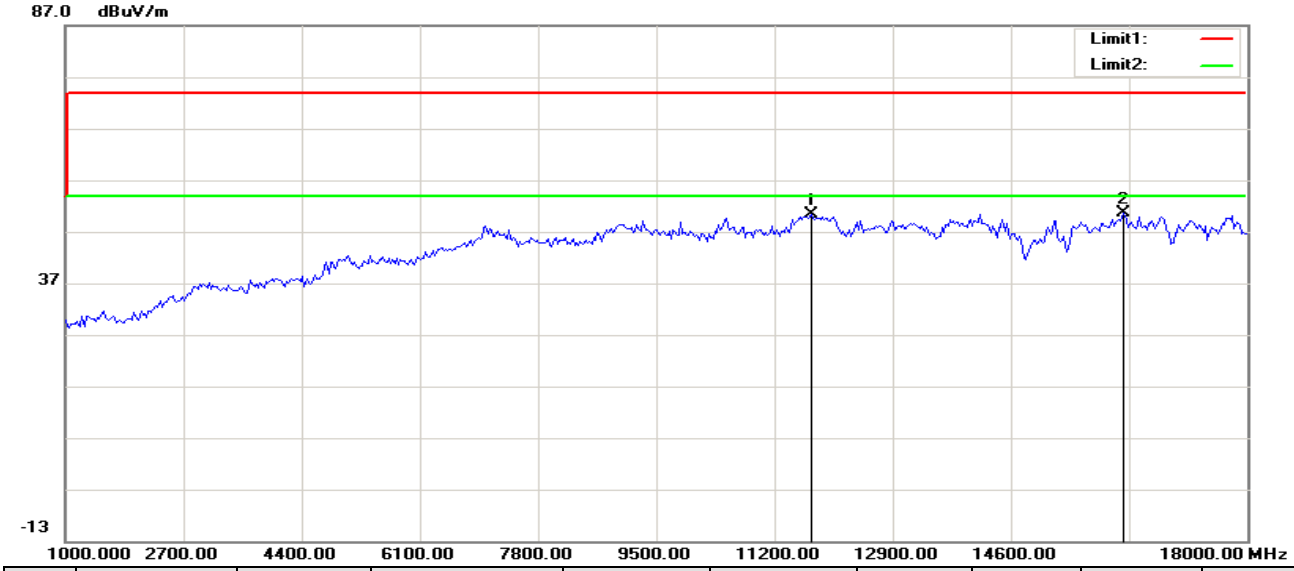
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11597.756	38.78	11.46	50.24	74.00	-23.76	100	163	peak
2	15575.320	37.56	13.84	51.40	74.00	-22.60	100	45	peak

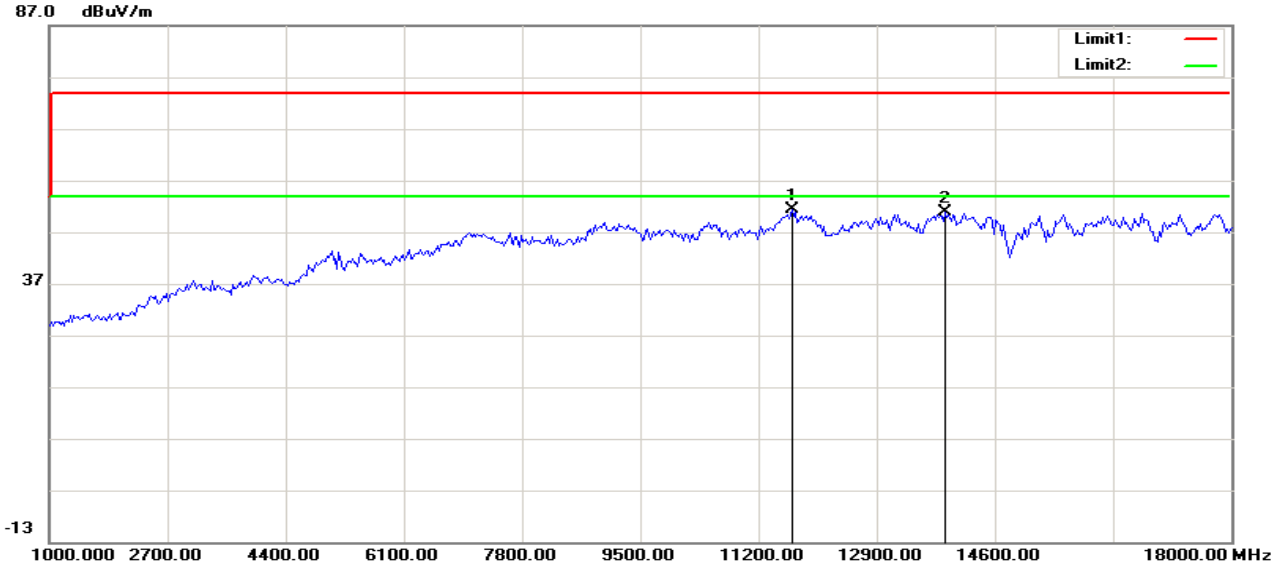
Operation Mode:	TX / IEEE 802.11ac VHT40 mode /CH Low	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11733.974	38.75	11.69	50.44	74.00	-23.56	100	229	peak
2	16229.167	36.18	14.38	50.56	74.00	-23.44	100	290	peak

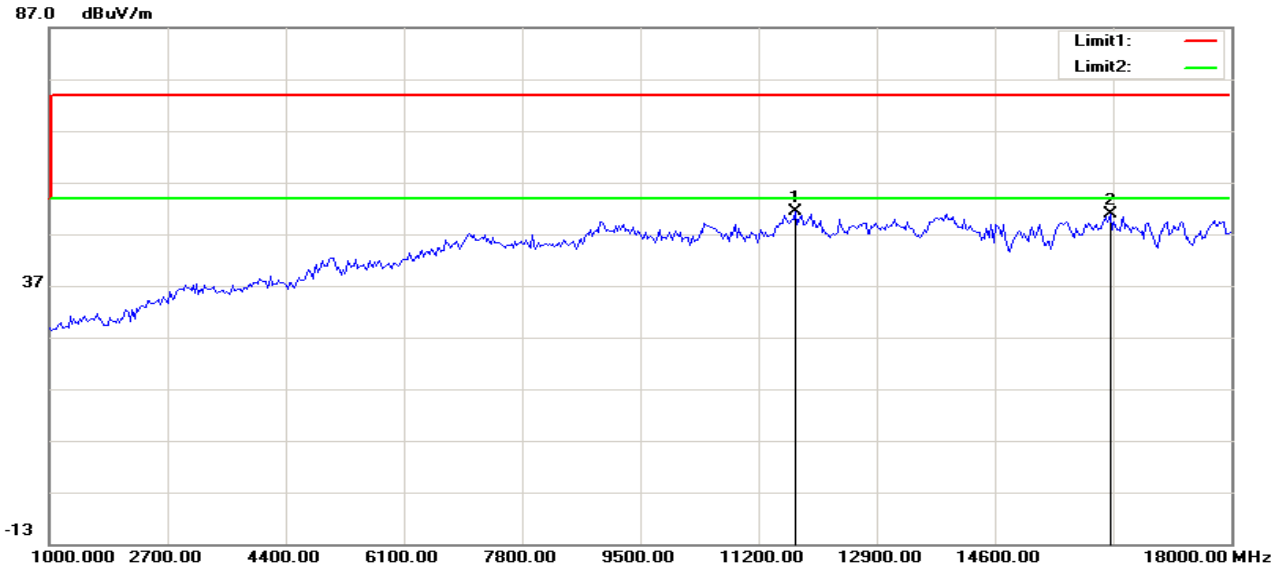
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11679.487	39.77	11.60	51.37	74.00	-22.63	100	19	peak
2	13886.218	38.37	12.49	50.86	74.00	-23.14	100	339	peak

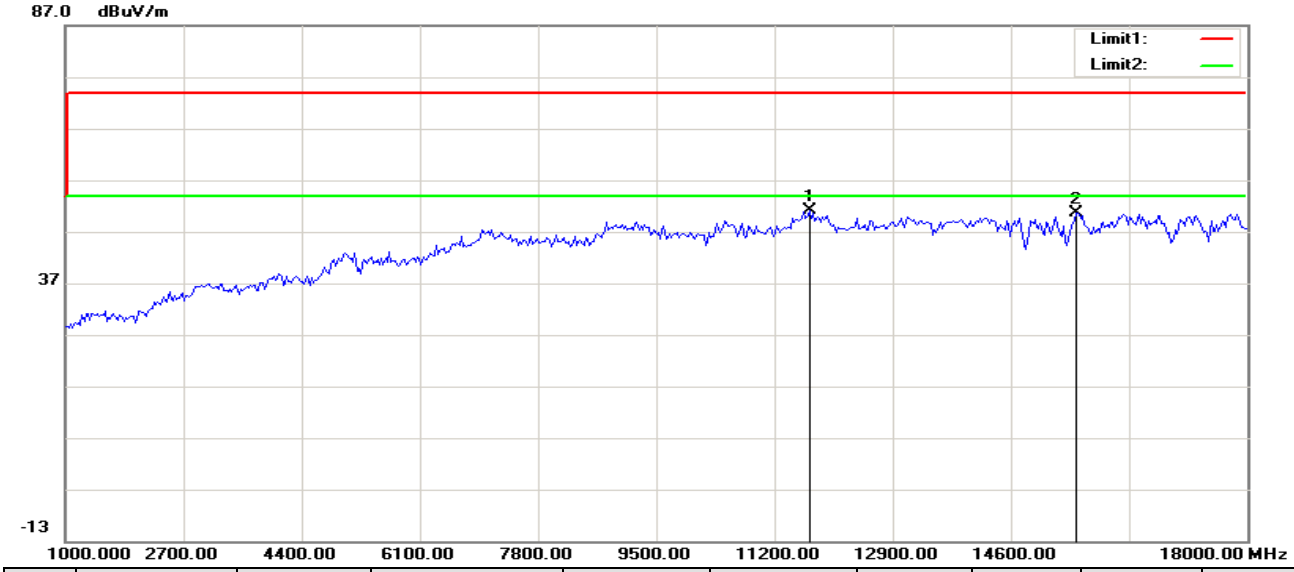
Operation Mode:	TX / IEEE 802.11ac VHT40 mode /CH High	Test Date:	2018-11-5
Temperature:	25°C	Tested by:	Wendy.Wei
Humidity:	51% RH	Polarity:	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11733.974	39.66	11.69	51.35	74.00	-22.65	100	265	peak
2	16256.410	36.60	14.39	50.99	74.00	-23.01	100	170	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	11706.731	39.53	11.64	51.17	74.00	-22.83	100	351	peak
2	15548.077	36.91	13.81	50.72	74.00	-23.28	100	317	peak

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) = Result (dBuV/m) – Limit (dBuV/m).*

8.7 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 Setup photo 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.

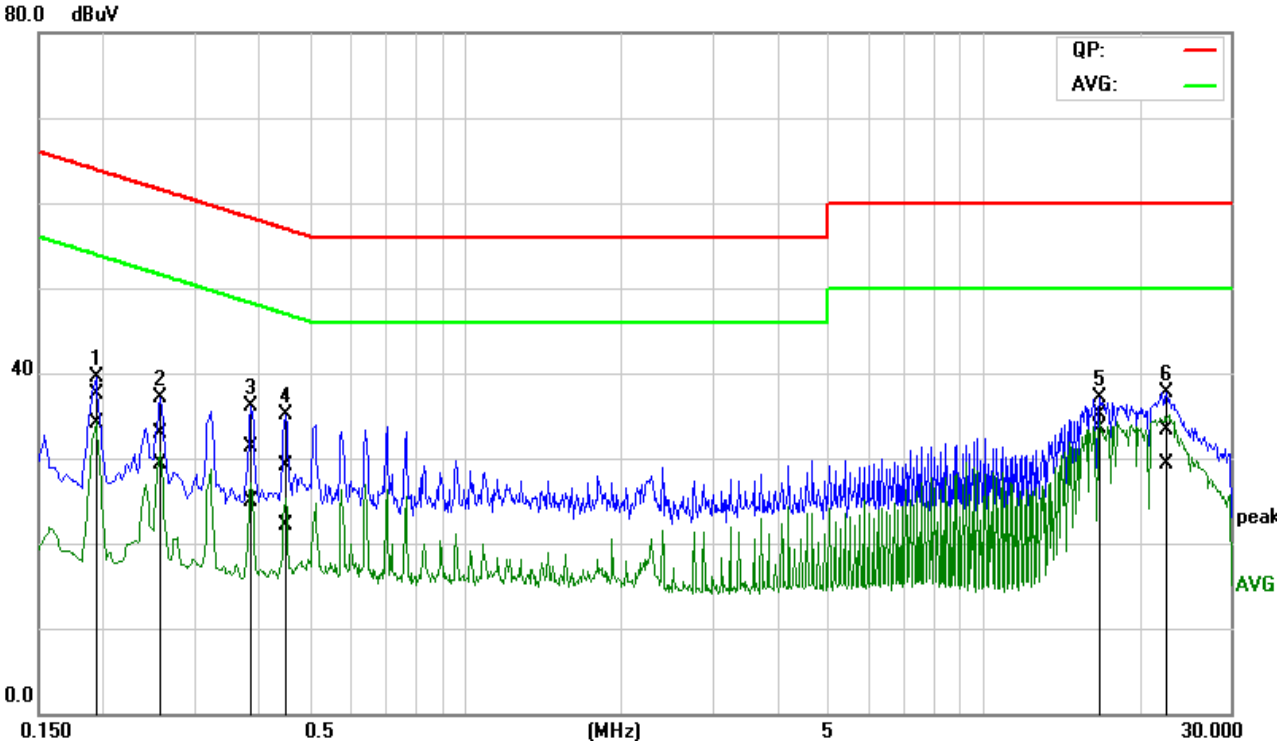
TEST RESULTS

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.:	C180928E08	Date:	2018/11/5
Model No.:	Mars1717XU-VSI	Time:	9:14:31
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/41%
Test item:	Conduction test	Test By:	Wendy.Wei
Line:	L1	Test Voltage:	AC 120V/60Hz
Model:		Description:	

L1

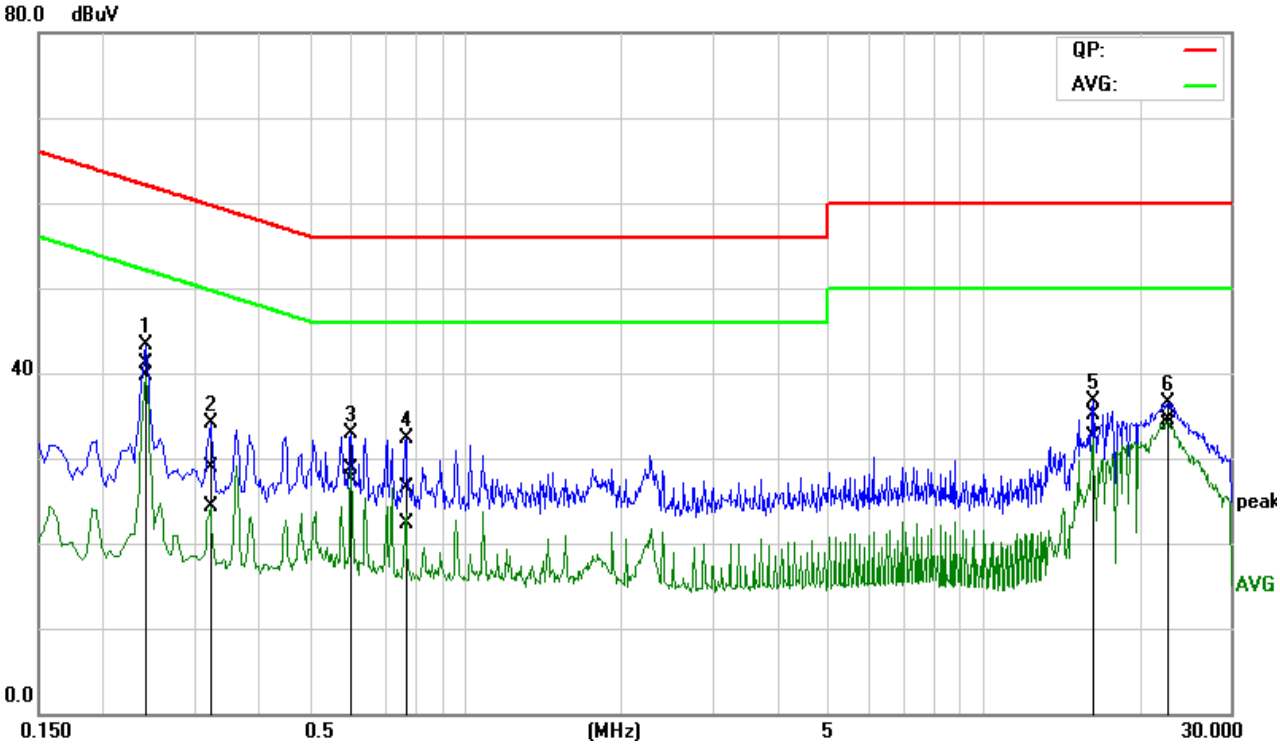


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1927	18.01	14.67	19.45	37.46	34.12	63.92	53.92	-26.46	-19.80	Pass
2	0.2586	13.45	9.89	19.47	32.92	29.36	61.48	51.48	-28.56	-22.12	Pass
3	0.3876	11.84	5.41	19.49	31.33	24.90	58.11	48.11	-26.78	-23.21	Pass
4	0.4523	9.59	2.56	19.49	29.08	22.05	56.83	46.83	-27.75	-24.78	Pass
5*	16.8426	15.03	13.43	20.06	35.09	33.49	60.00	50.00	-24.91	-16.51	Pass
6	22.6191	13.18	9.13	20.08	33.26	29.21	60.00	50.00	-26.74	-20.79	Pass

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

Job No.:	C180928E08	Date:	2018/11/5
Model No.:	Mars1717XU-VSI	Time:	9:21:22
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/41%
Test item:	Conduction test	Test By:	Wendy.Wei
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*	0.2410	21.74	20.30	19.45	41.19	39.75	62.06	52.06	-20.87	-12.31	Pass
2	0.3211	9.35	4.81	19.47	28.82	24.28	59.68	49.68	-30.86	-25.40	Pass
3	0.6037	9.29	7.96	19.49	28.78	27.45	56.00	46.00	-27.22	-18.55	Pass
4	0.7706	7.00	2.76	19.53	26.53	22.29	56.00	46.00	-29.47	-23.71	Pass
5	16.2290	15.20	12.52	20.00	35.20	32.52	60.00	50.00	-24.80	-17.48	Pass
6	22.7383	14.53	13.81	20.03	34.56	33.84	60.00	50.00	-25.44	-16.16	Pass

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

*Re*mark:

1.The measuring frequencies range between 0.15 MHz and 30 MHz.

2.The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.

3."---" denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.

4.The IF bandwidth of SPA between 0.15MHz and 30MHz was 10KHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.

END OF REPORT