

FCC 47 CFR PART 15 SUBPART E

TEST REPORT

For

Rugged Tablet

Model: IMT-BT

Trade Name:  **ADLINK**
TECHNOLOGY INC.

Issued to

ADLINK TECHNOLOGY INC.
9F, No.166, Jian Yi Rd., Zhonghe Dist., New Taipei City, 235 Taiwan

Issued by

Compliance Certification Services Inc.
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
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Issued Date: August 31, 2016



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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 31, 2016	Initial Issue	ALL	Becca Chen
01	October 21, 2016	1. Modify FCC ID. 2. Added EUT Antenna Transmitter description. (P6)	ALL	Becca Chen

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1. TEST RESULT CERTIFICATION

Applicant: ADLINK TECHNOLOGY INC.
 9F, No.166, Jian Yi Rd., Zhonghe Dist., New Taipei City, 235
 Taiwan

Manufacturer: ADLINK TECHNOLOGY INC.
 9F, No.166, Jian Yi Rd., Zhonghe Dist., New Taipei City, 235
 Taiwan

Equipment Under Test: Rugged Tablet

Model Number: IMT-BT

Trade Name: 

Date of Test: August 10 ~ 25, 2016

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

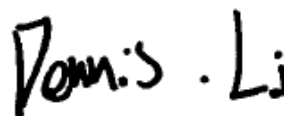
We hereby certify that:

Compliance Certification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The test results of this report relate only to the tested sample identified in this report.

Approved by:


Tested by:

Miller Lee
 Manager
 Compliance Certification Services Inc.

Dennis Li
 Engineer
 Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	Rugged Tablet
Model Number	IMT-BT
Trade Name	
Model Discrepancy	N/A
Received Date	April 20, 2016
Power supply	<ol style="list-style-type: none"> VDC from Power Adapter SINPRO / HPU32A-105 I/P: 100-240Vac ~ 47-63Hz, 0.6-0.4A O/P: +12Vdc, 2.5A max. Power from Battery ADLINK / IMTBT-B6300L-1 Rating: 7.6V, 6300mAh (47.88Wh)
Frequency Range	IEEE 802.11a / IEEE 802.11n HT 20 MHz: 5745 ~ 5825 MHz IEEE 802.11n HT 40 MHz: 5755 ~ 5795 MHz IEEE 802.11ac VHT 80 mode: 5775MHz
Transmit Power	IEEE 802.11a mode: 16.16 dBm IEEE 802.11n HT 20 MHz mode: 16.09 dBm IEEE 802.11n HT 40 MHz mode: 15.73 dBm IEEE 802.11ac VHT 80 MHz mode: 13.26 dBm
Number of Channels	IEEE 802.11a mode: 5 Channels IEEE 802.11n HT 20 MHz mode: 5 Channels IEEE 802.11n HT 40 MHz mode: 2 Channels IEEE 802.11ac VHT 80 mode: 1 Channel
Antenna Specification	SINBON Main: A9702470-D / Gain: 5.38dBi Aux: A9702469-D / Gain: 4.47dBi PIFA Antenna

Note: The device is restricted to transmit in the band 5600 ~ 5650 MHz

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC CFR 47 Part 15.207, 15.209, 15.407 and KDB 789033 D02 General UNII Test Procedures New Rules v01r03.

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

According to the requirements in ANSI C63.10: 2013, 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 1.5 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 ANSI C63.10: 2013.

EUT Antenna Transmitter description

Antenna	TX	RX
Main	V	X
Aux	X	V

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	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 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	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

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

The EUT (model: IMT-BT) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving 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 / 5745 ~ 5825MHz

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

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

Channel Low (5755MHz) and Channel High (5795MHz) with 13.5Mbps data rate were chosen for full testing.

IEEE 802.11ac VHT 80 MHz mode / 5775MHz

Channel Mid (5775MHz) with 6.5Mbps data rate was chosen for full testing.

For Conducted & Conduction

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

For Radiated

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (Y axis) and the worst case was recorded.

4. INSTRUMENT CALIBRATION

4.1 MEASURING 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.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Conducted Emissions Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power Meter	Anritsu	ML2495A	1012009	2016/07/04	2017/07/03
Power Meter	Anritsu	MA2411B	917072	2016/07/04	2017/07/03
Spectrum Analyzer	R&S	FSV 40	101073	2016/08/01	2017/07/31

Wugu 966 Chamber A					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	2015/12/08	2016/12/07
Loop Ant	COM-POWER	AL-130	121051	2016/02/25	2017/02/24
Bilog Antenna	Sunol Sciences	JB1	A052609	2016/03/20	2017/03/21
Pre-Amplifier	EMEC	EM330	60609	2016/06/08	2017/06/07
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2015/09/02	2016/09/01
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R

Conducted Emission Room # B					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
LISN	R&S	ENV216	101054	2016/05/11	2017/05/10
Receiver	R&S	ESCI	101073	2015/09/09	2016/09/08
Software	CCS-3A1-CE				

Remark:

- Each piece of equipment is scheduled for calibration once a year and Precision Dipole is scheduled for calibration once three years.
- N.C.R. = No Calibration Required.

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.2575
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029
- No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 248, Taiwan (R.O.C.)
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045
- No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.
Tel: 886-3-324-0332 / Fax: 886-3-324-5235




The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10: 2013 and CISPR Publication 22.

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

5.2 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, IC 2324G-2 for 3M Semi Anechoic Chamber B.

5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-247, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

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

6 SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

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

6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A						

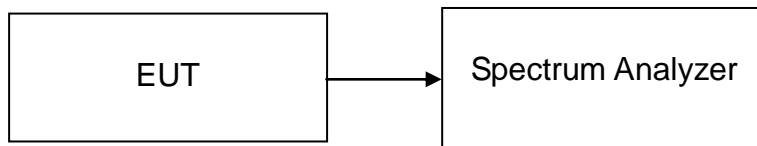
Remark:

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.*

7 FCC PART 15 REQUIREMENTS

7.1 99%BANDWIDTH

Test Configuration



TEST PROCEDURE

The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold.

TEST RESULTS

No non-compliance noted.

Test Data

Test mode: IEEE 802.11a mode / 5745~ 5825 MHz

Channel	Frequency (MHz)	99%Bandwidth (MHz)
Low	5745	16.4978
Mid	5785	16.5412
High	5825	16.5412

Test mode: IEEE 802.11n HT 20 MHz mode / 5745~ 5825 MHz

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.6700
Mid	5785	17.6700
High	5825	17.7134

Test mode: IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795 MHz

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5755	36.2373
High	5795	36.3531

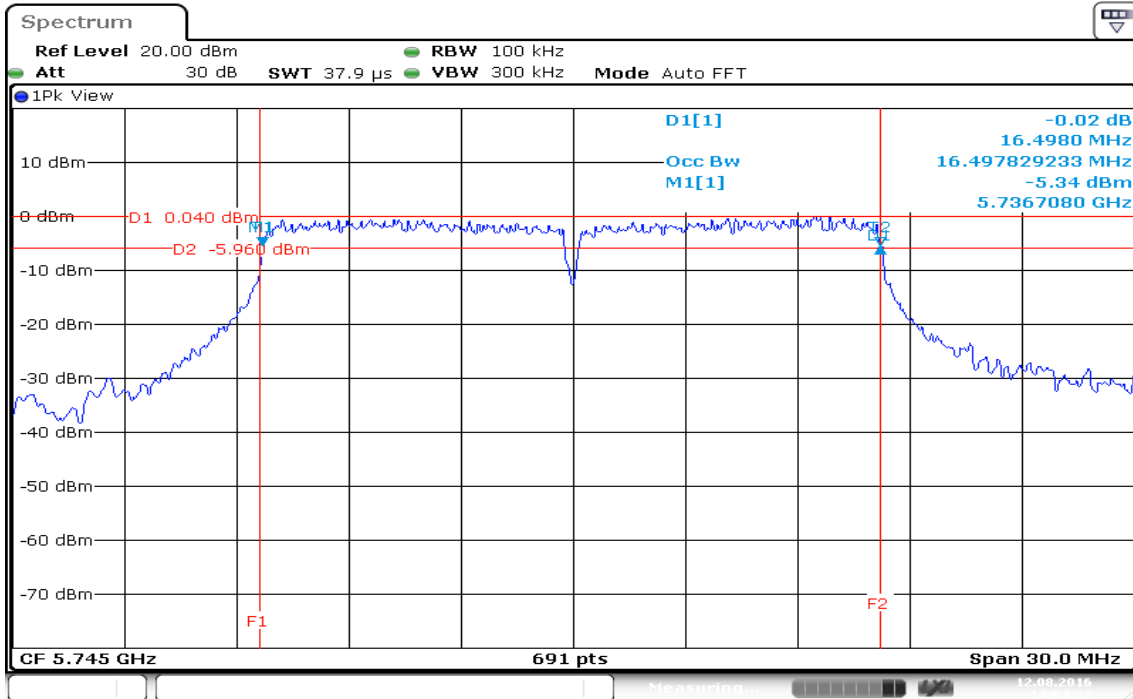
Test mode: IEEE 802.11ac VHT 80 MHz mode / 5775 MHz

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5755	75.2532

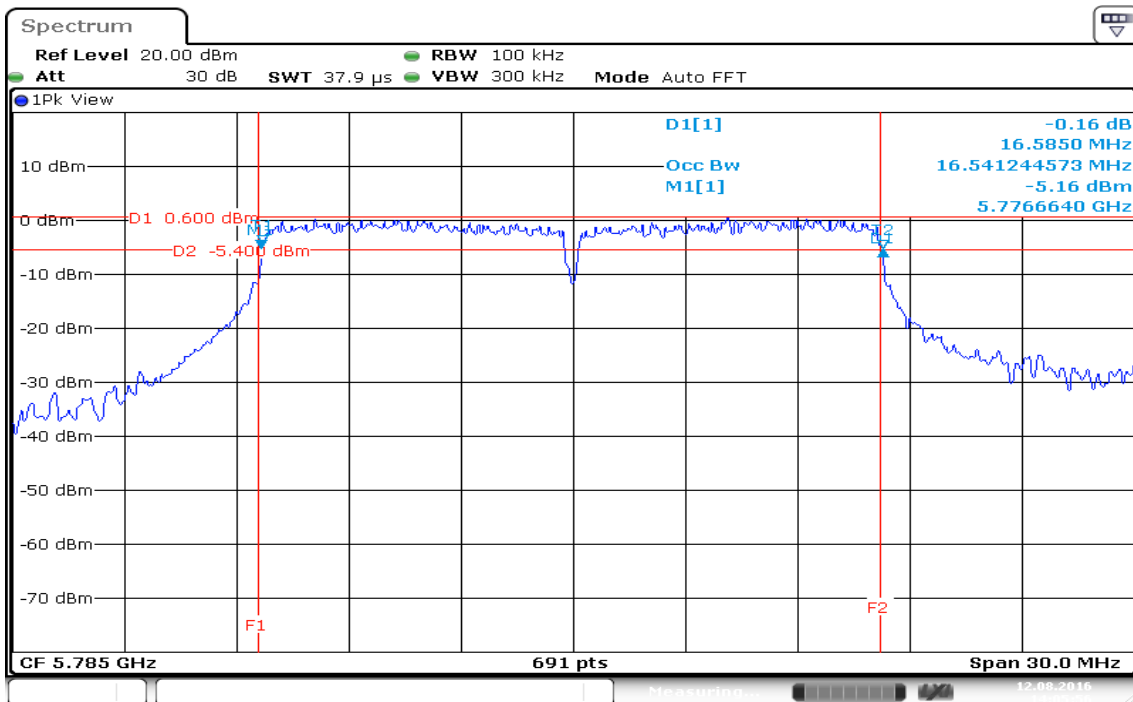
Test Plot

IEEE 802.11a mode / 5745 ~ 5825MHz

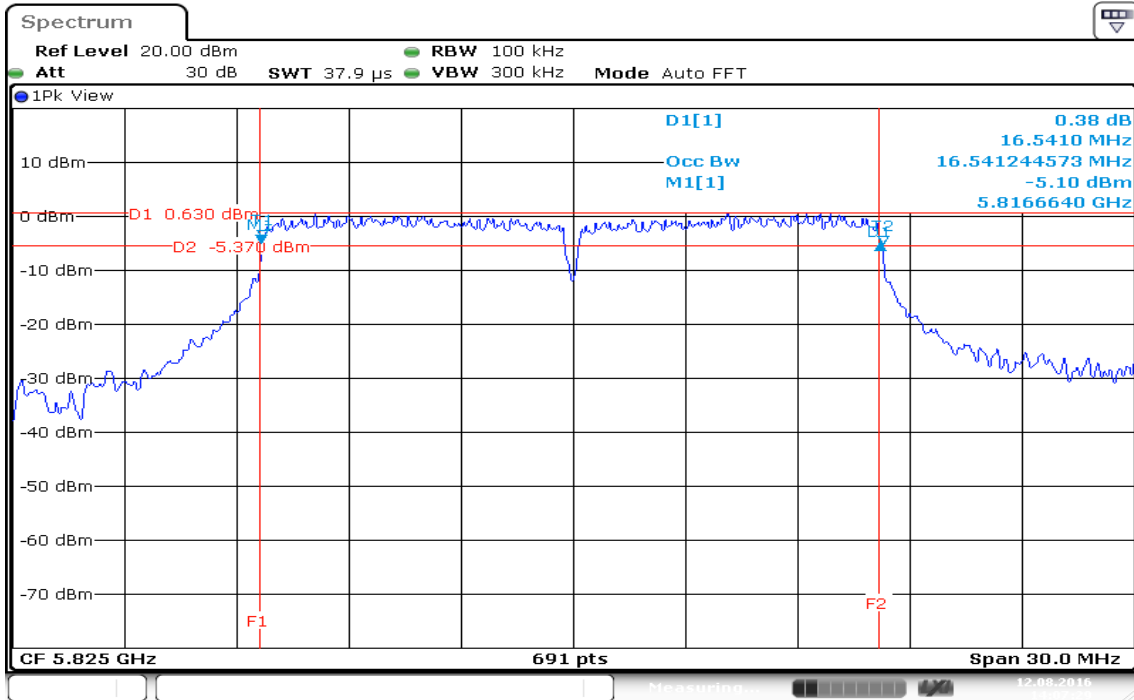
99% Bandwidth (CH Low)



99% Bandwidth (CH Mid)

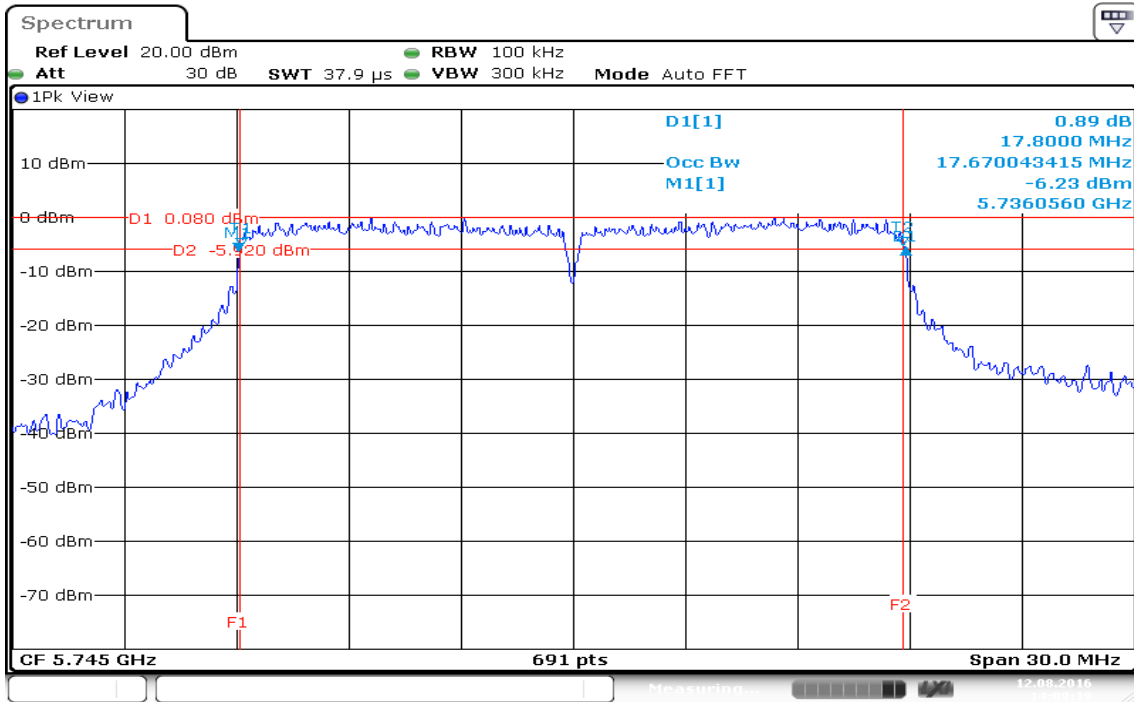


99% Bandwidth (CH High)



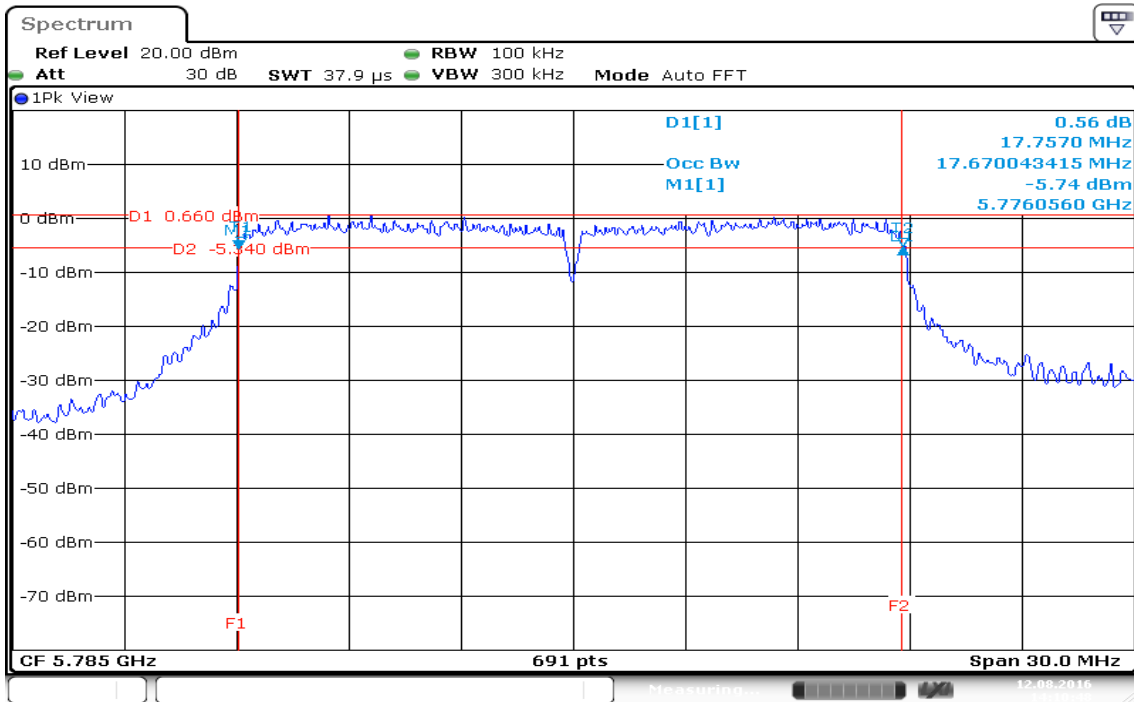
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IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz
99% Bandwidth (CH Low)



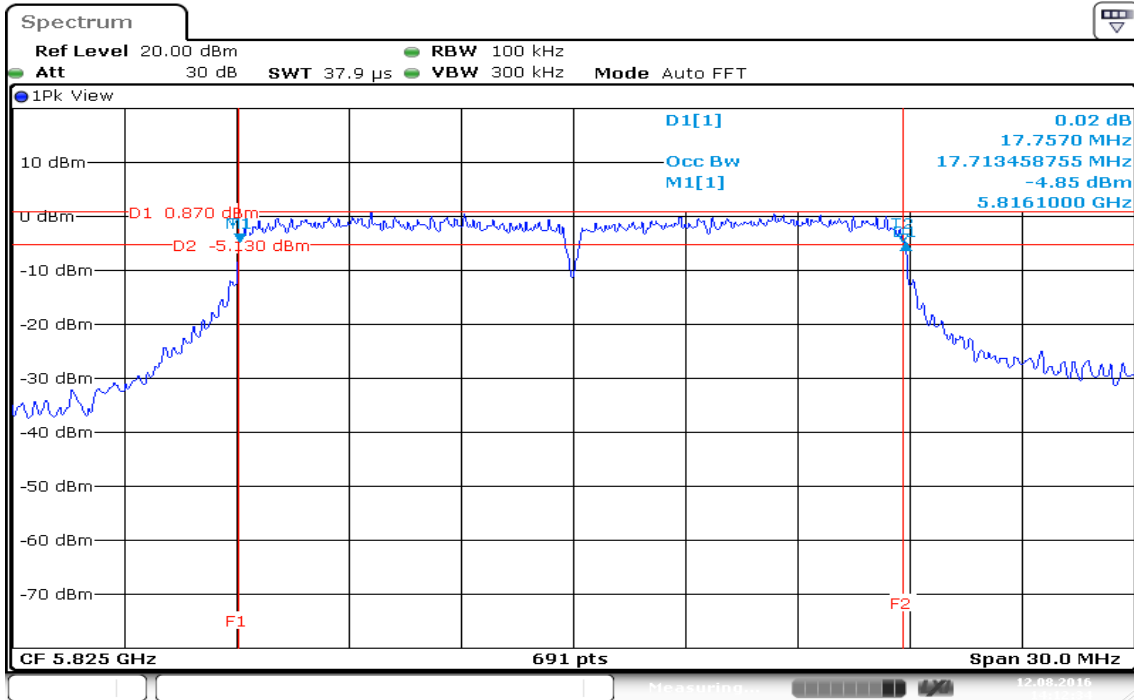
Date: 12.AUG.2016 14:09:19

99% Bandwidth (CH Mid)



Date: 12.AUG.2016 14:10:48

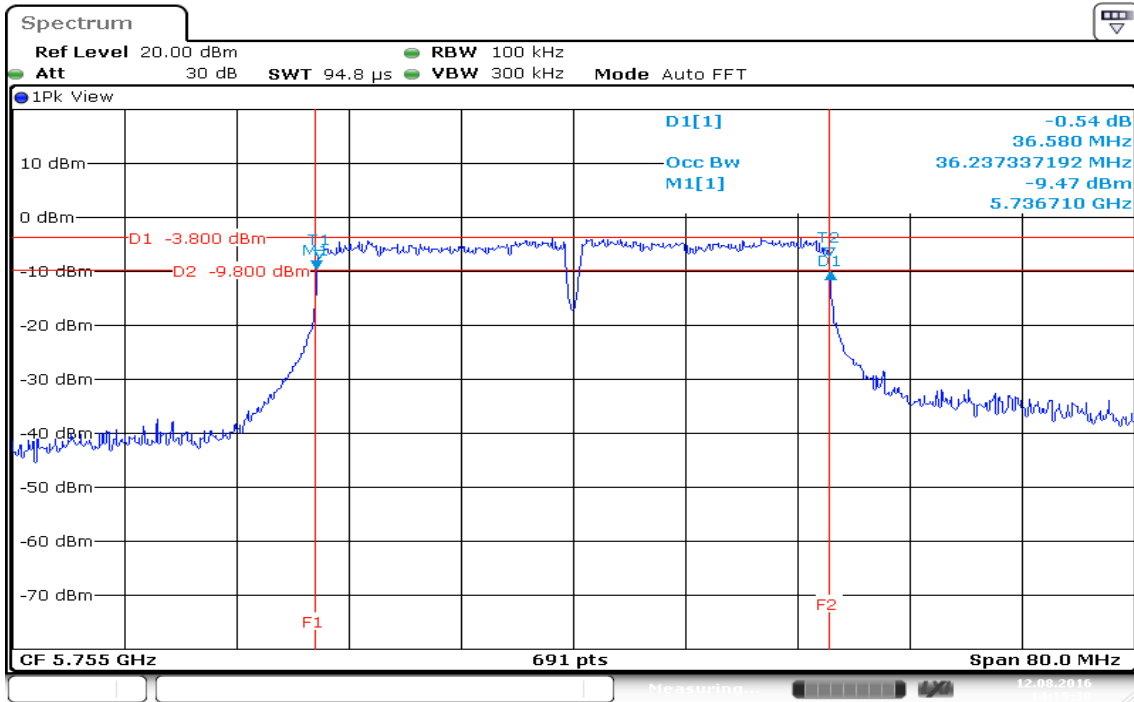
99% Bandwidth (CH High)



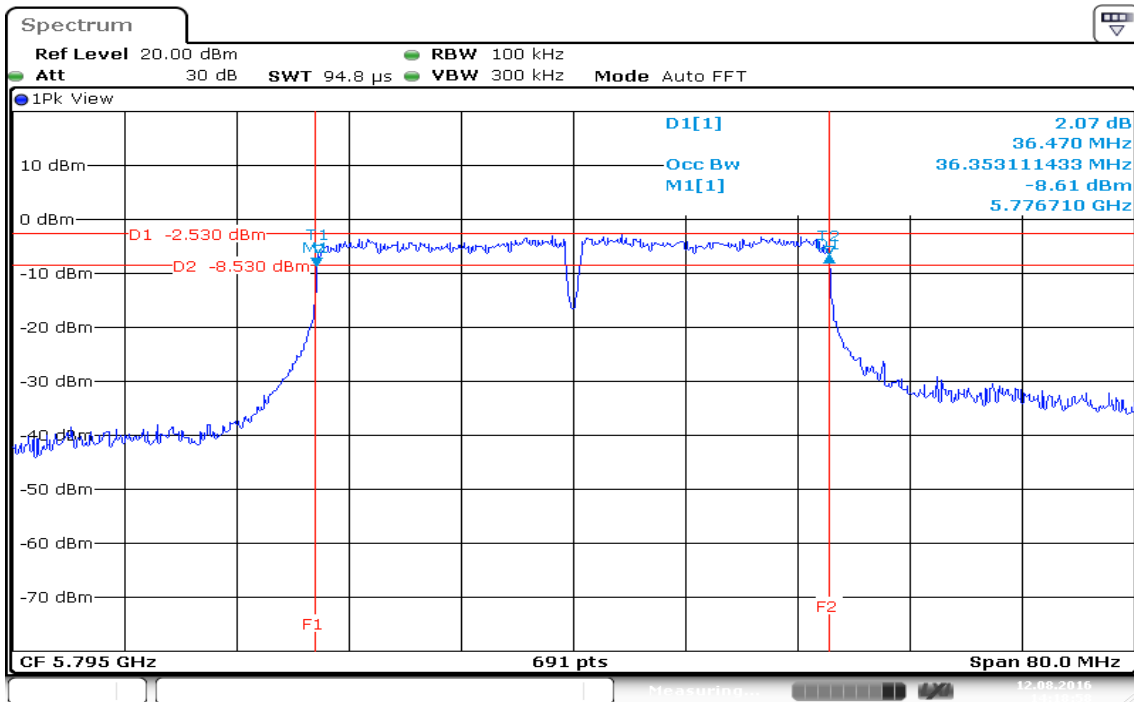
Date: 12.AUG.2016 14:12:34

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

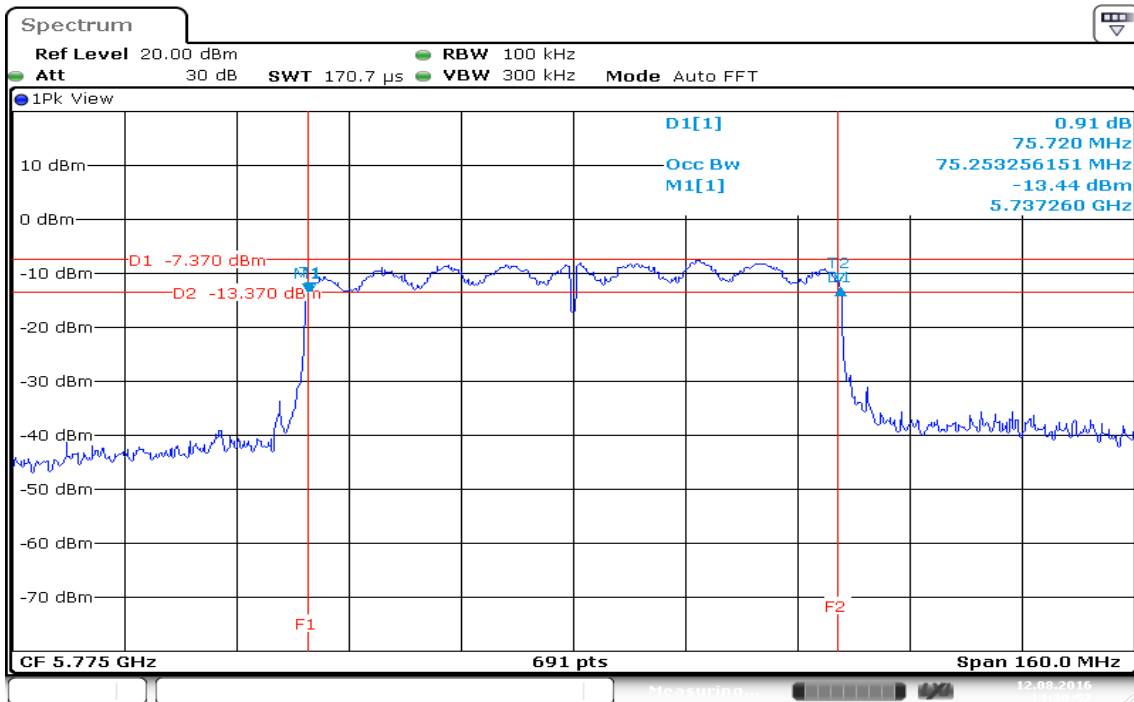
99% Bandwidth (CH Low)



99% Bandwidth (CH High)



IEEE 802.11ac VHT 80 MHz mode / 5775MHz
99% Bandwidth (CH Mid)

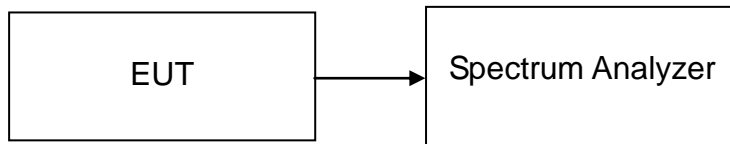


7.2 6DB BANDWIDTH

LIMIT

According to §15.407, systems using digital modulation techniques may operate in the 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

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 = 3 x RBW, Span = 50MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode / 5745~ 5825 MHz

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	16.4980	>500	PASS
Mid	5785	16.5850		PASS
High	5825	16.5410		PASS

Test mode: IEEE 802.11n HT 20 MHz mode / 5745~ 5825 MHz

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.8000	>500	PASS
Mid	5785	17.7570		PASS
High	5825	17.7570		PASS

Test mode: IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795 MHz

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5755	36.580	>500	PASS
High	5795	36.470		PASS

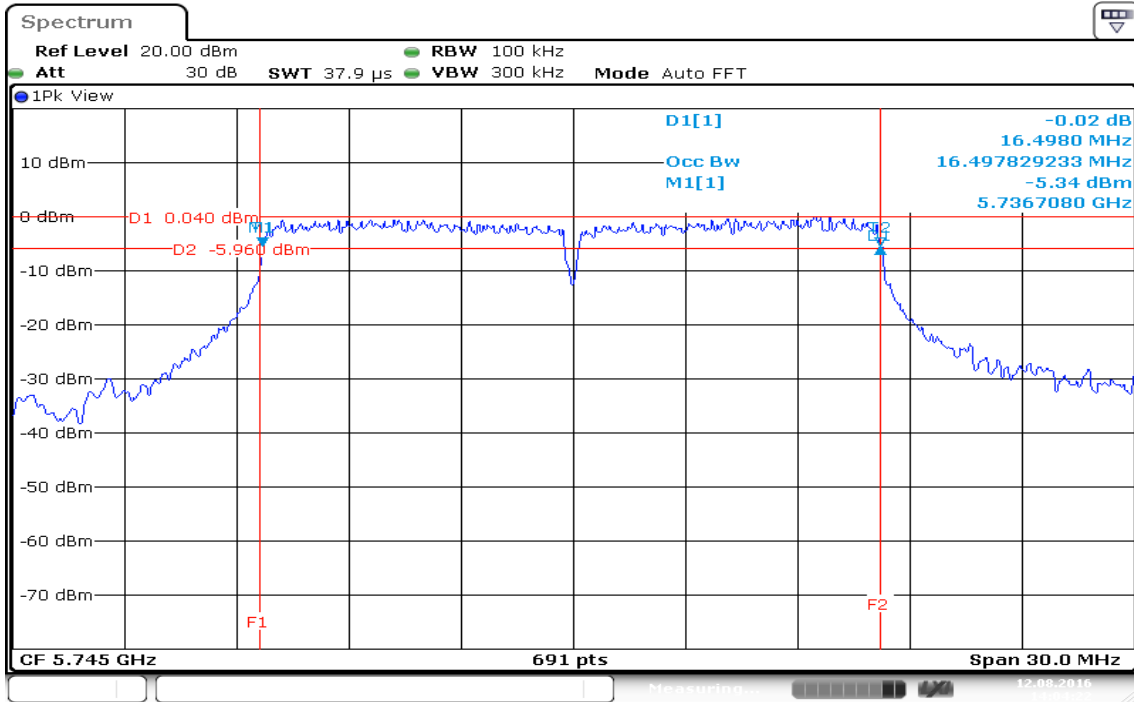
Test mode: IEEE 802.11ac VHT 80 MHz mode / 5775MHz

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Mid	5755	75.720	>500	PASS

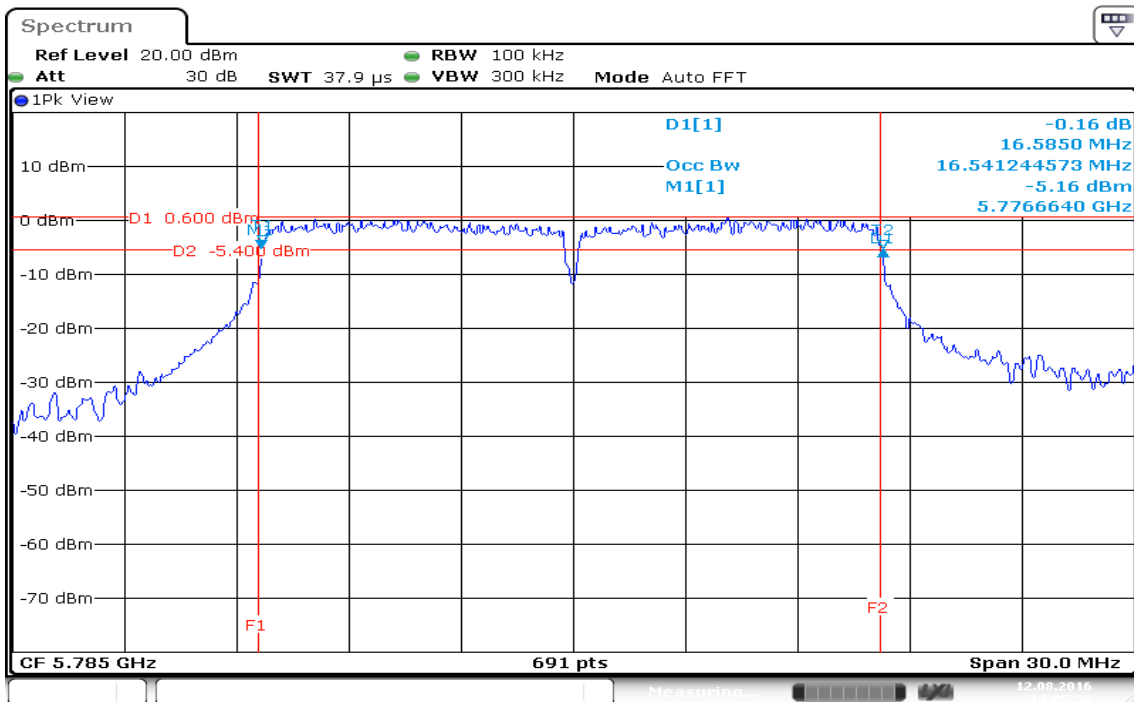
Test Plot

IEEE 802.11a mode / 5745 ~ 5825MHz

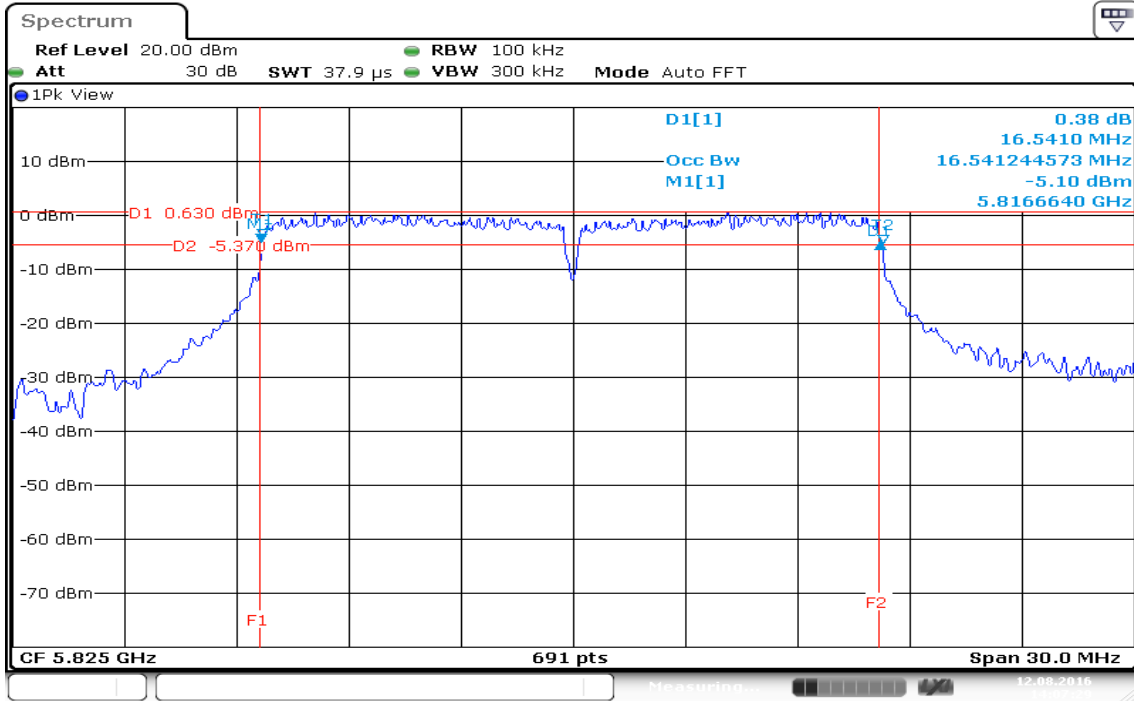
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

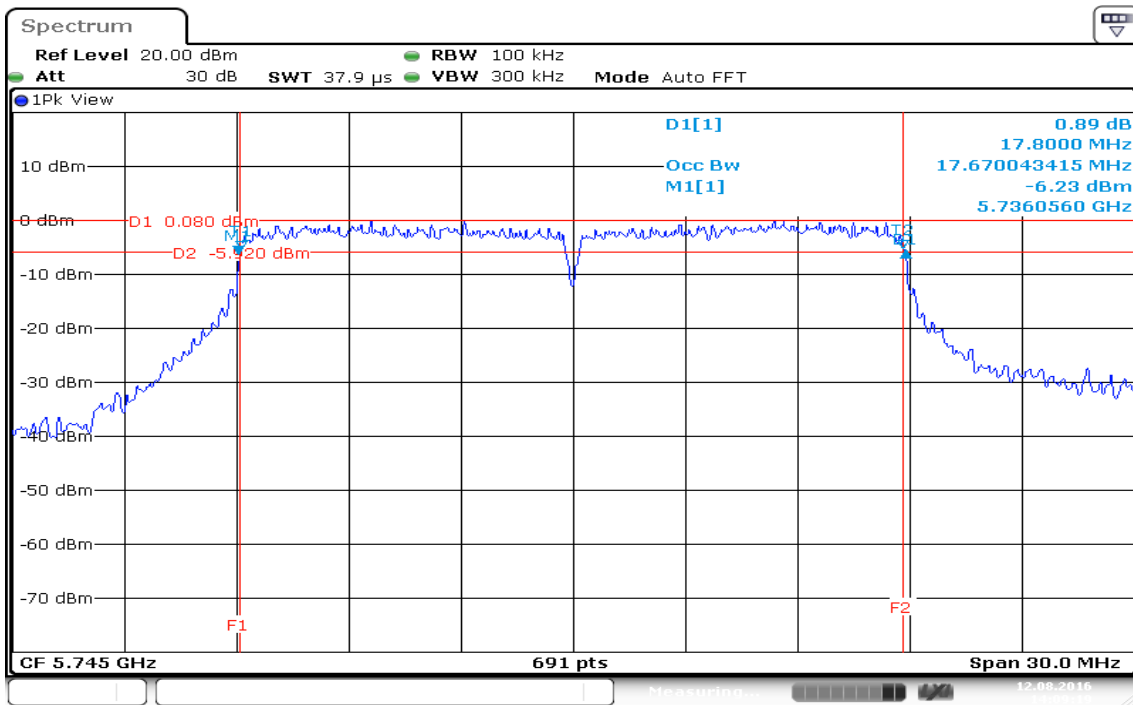


6dB Bandwidth (CH High)

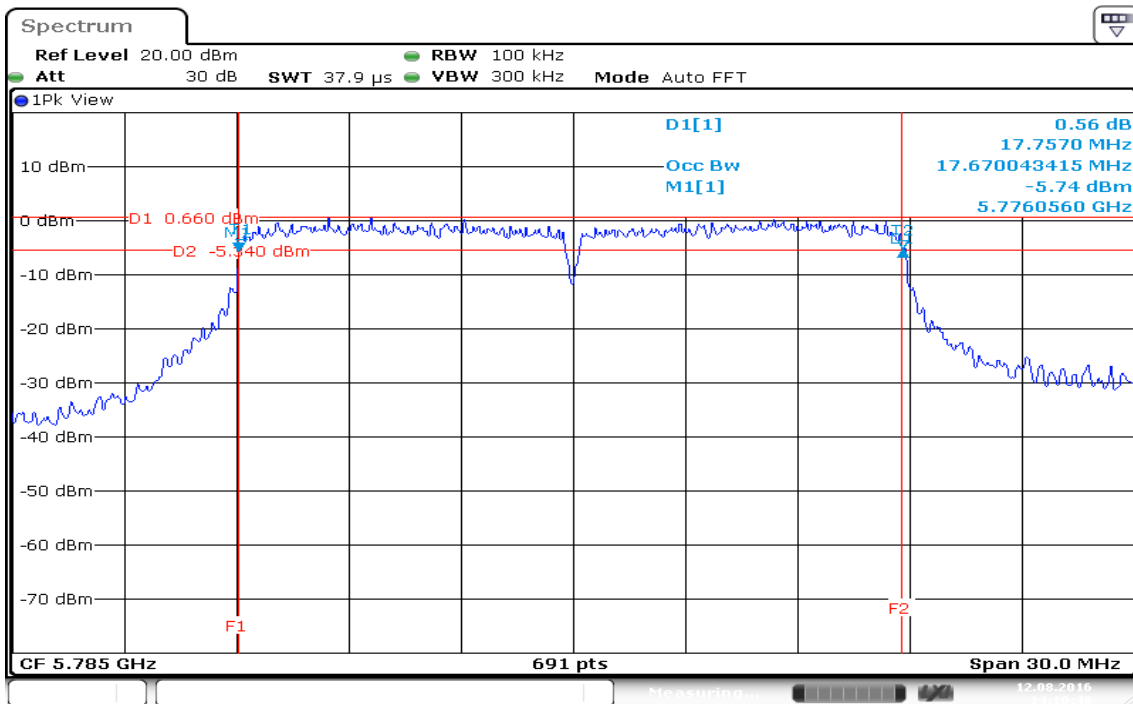


IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

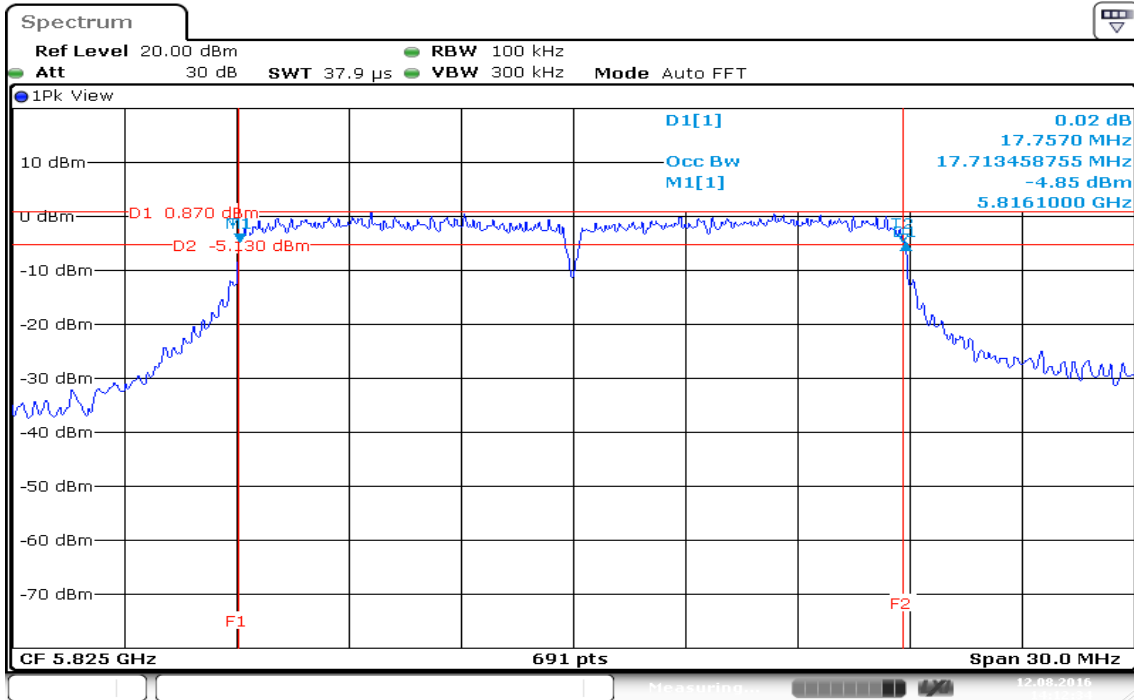
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



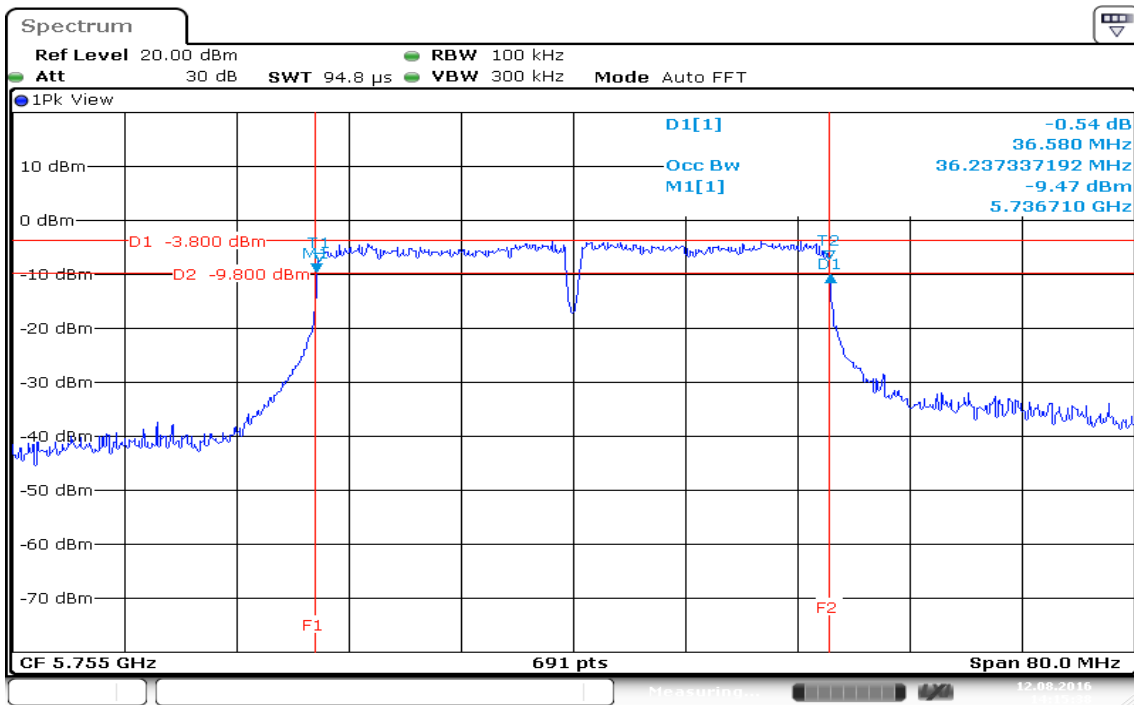
6dB Bandwidth (CH High)



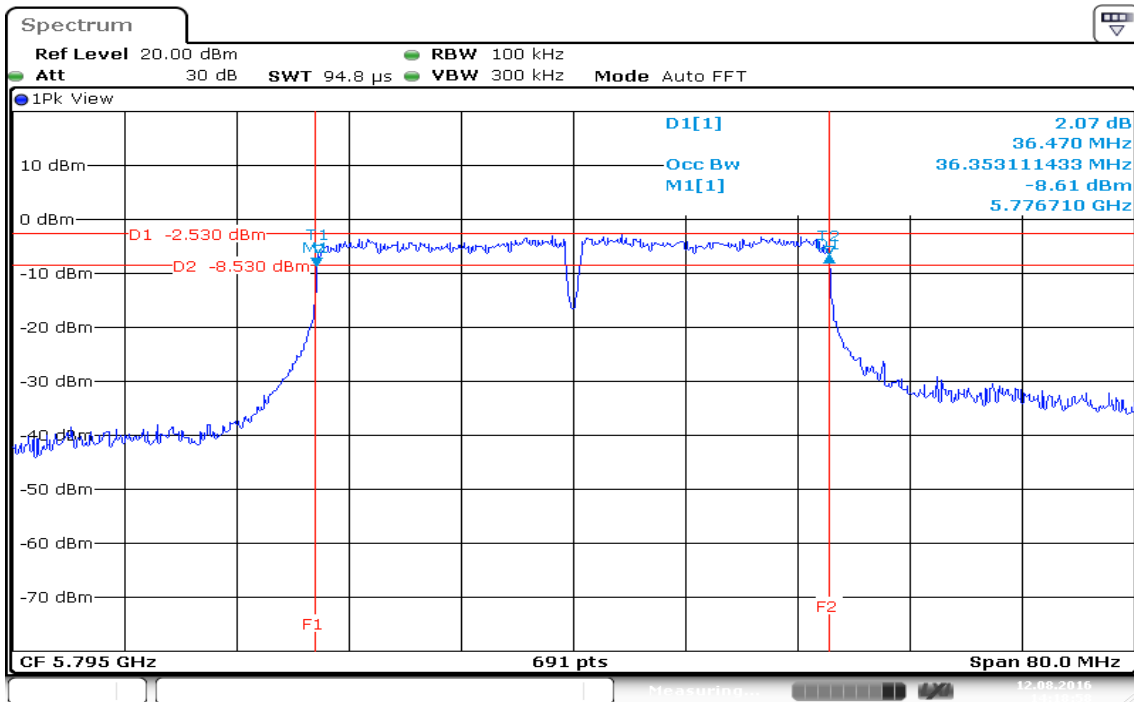
Date: 12.AUG.2016 14:12:34

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

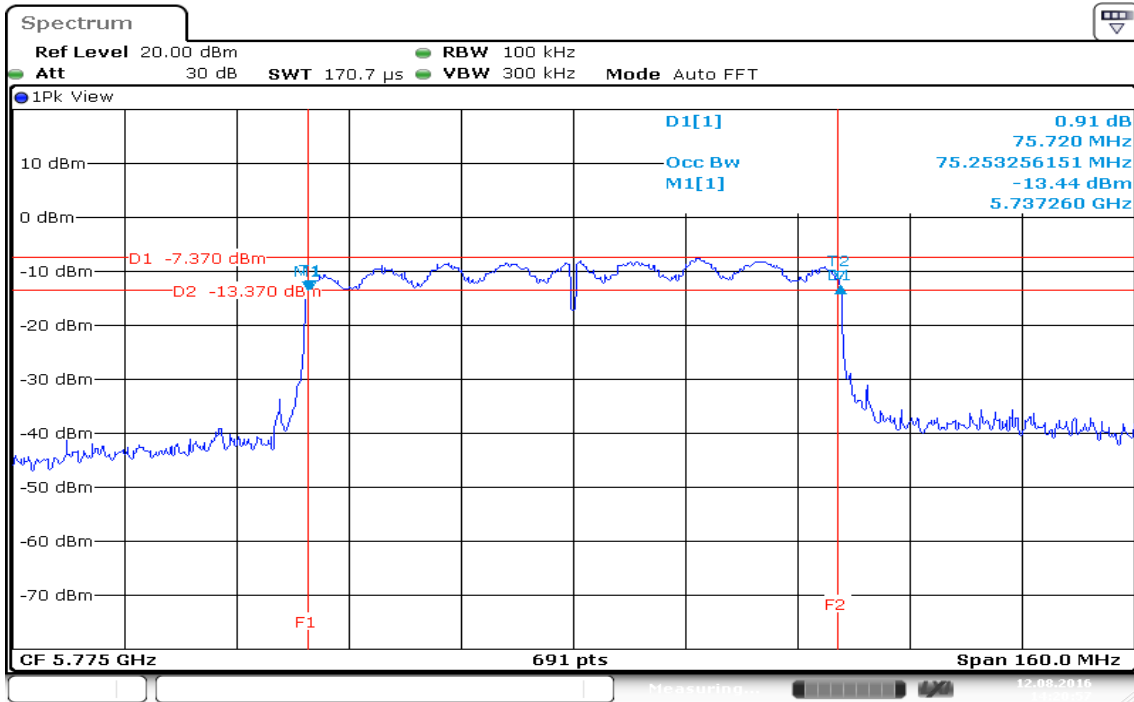
6dB Bandwidth (CH Low)



6dB Bandwidth (CH High)



IEEE 802.11ac VHT 80 MHz mode / 5775MHz 6dB Bandwidth (CH Mid)



Date: 12.AUG.2016 14:20:57

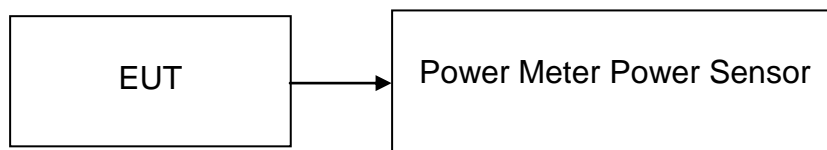
7.3 MAXIMUM CONDUCTED OUTPUT POWER

LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.407, for systems using digital modulation in the bands of 5725-5850 MHz: 1 Watt.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (dBm)
Low	5745	16.09	0.0406	30
Mid	5785	*16.16	0.0413	30
High	5825	16.13	0.0410	30

Test mode: IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (dBm)
Low	5745	16.05	0.0403	30
Mid	5785	15.98	0.0396	30
High	5825	*16.09	0.0406	30

Test mode: IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (dBm)
Low	5755	15.25	0.0335	30
High	5795	*15.73	0.0374	30

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5775MHz

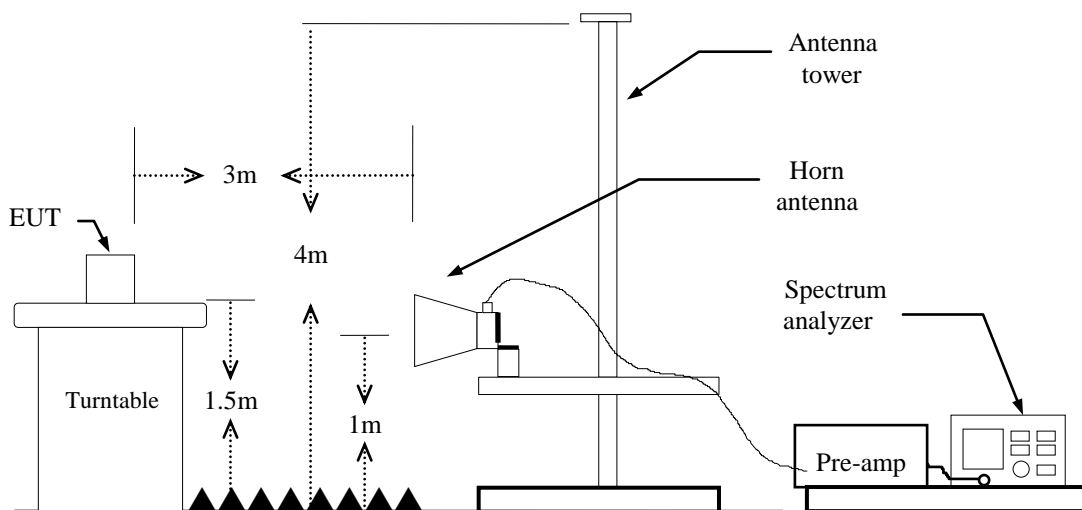
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (dBm)
Mid	5775	*13.26	0.0212	30

7.4 BAND EDGES MEASUREMENT

LIMIT

According to §15.407(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

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,
if duty cycle \geq 98%, VBW=10Hz.
if duty cycle < 98% VBW=1/T.

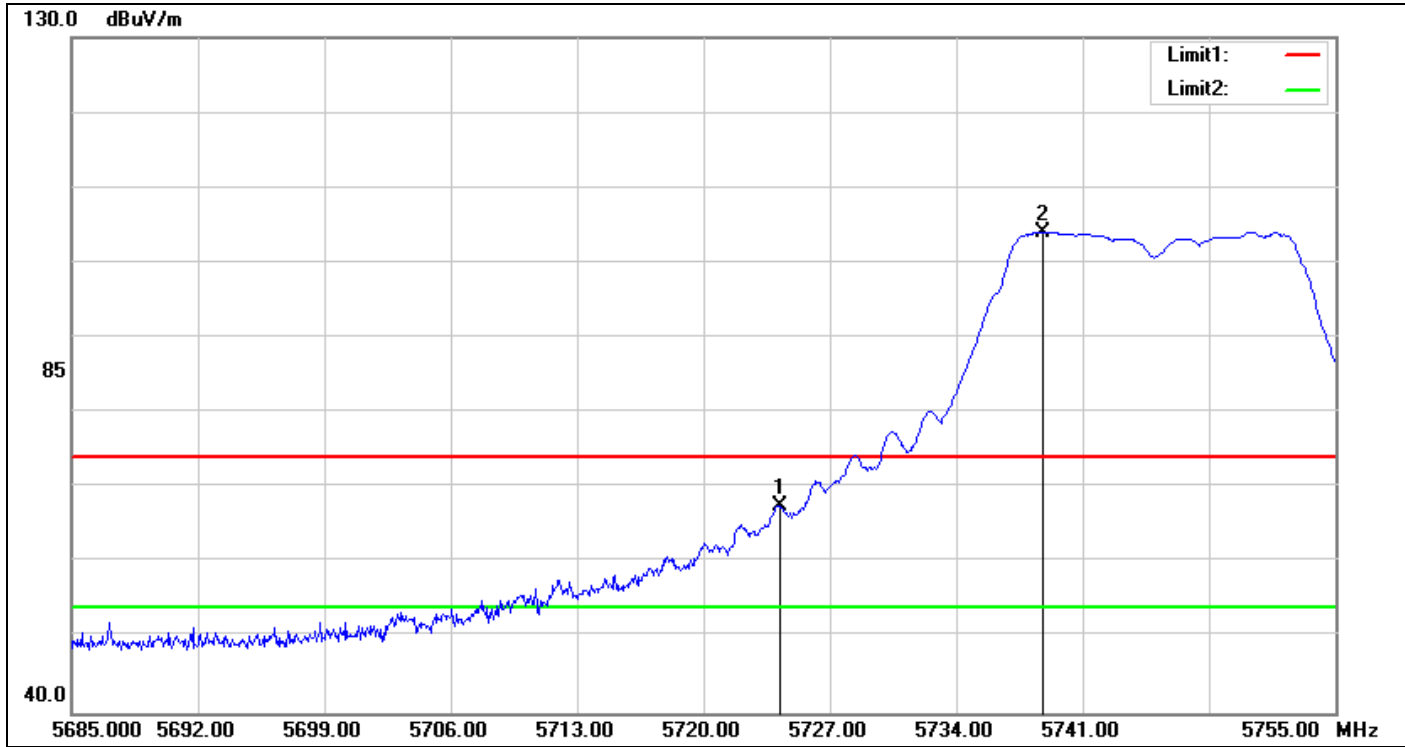
IEEE 802.11a mode: =98%, VBW=10Hz
IEEE 802.11n HT 20 MHz mode: =98%, VBW=10Hz
IEEE 802.11n HT 40 MHz mode: =98%, VBW=10Hz
IEEE 802.11ac VHT 80 MHz mode: =98%, VBW=10Hz
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.
6. Result = Spectrum Reading + cable loss(spectrum to Amp) - Amp Gain + Cable loss(Amp to receive Ant)+ Receive Ant

TEST RESULTS

Refer to attach spectrum analyzer data chart.

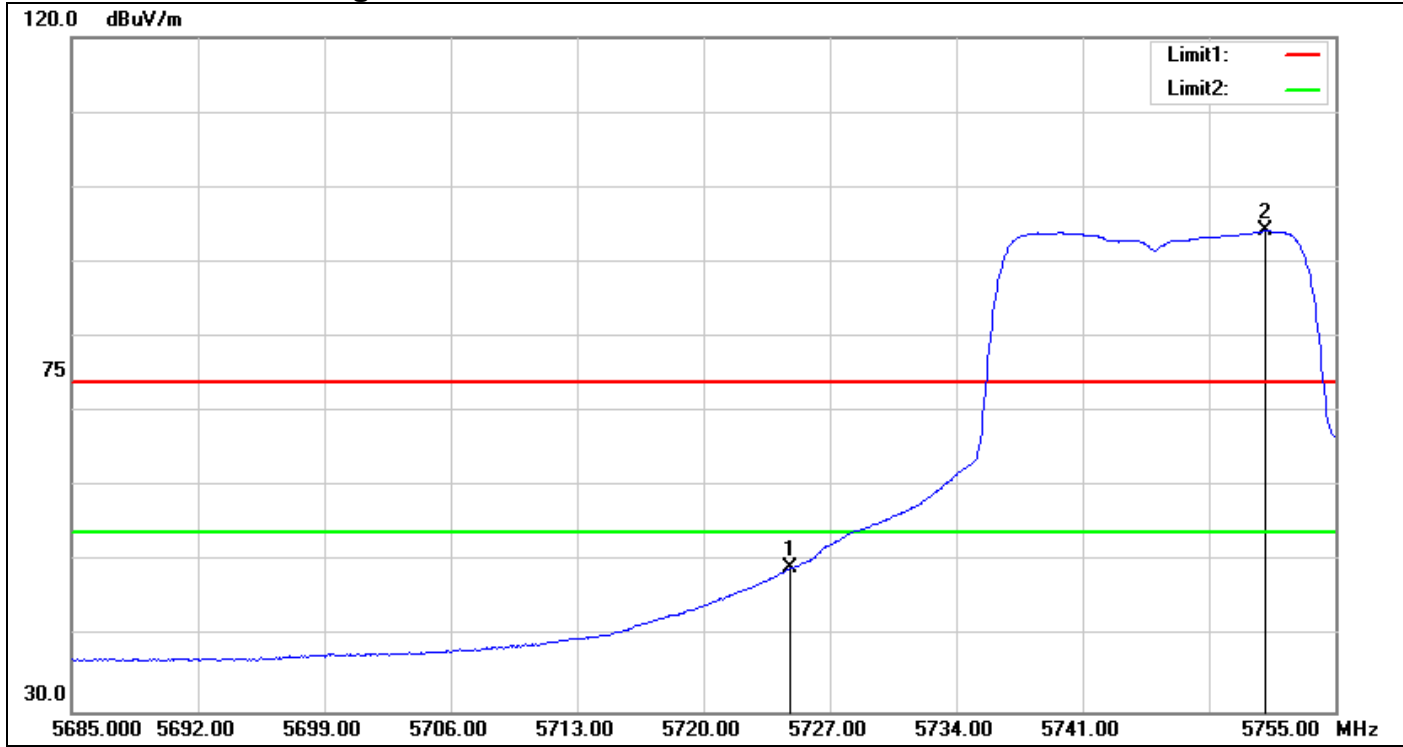
Band Edges (IEEE 802.11a mode / CH Low)

Detector mode: Peak



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5724.200	61.37	6.21	67.58	74.00	-6.42	peak
2	5738.830	97.84	6.27	104.11	--	--	peak

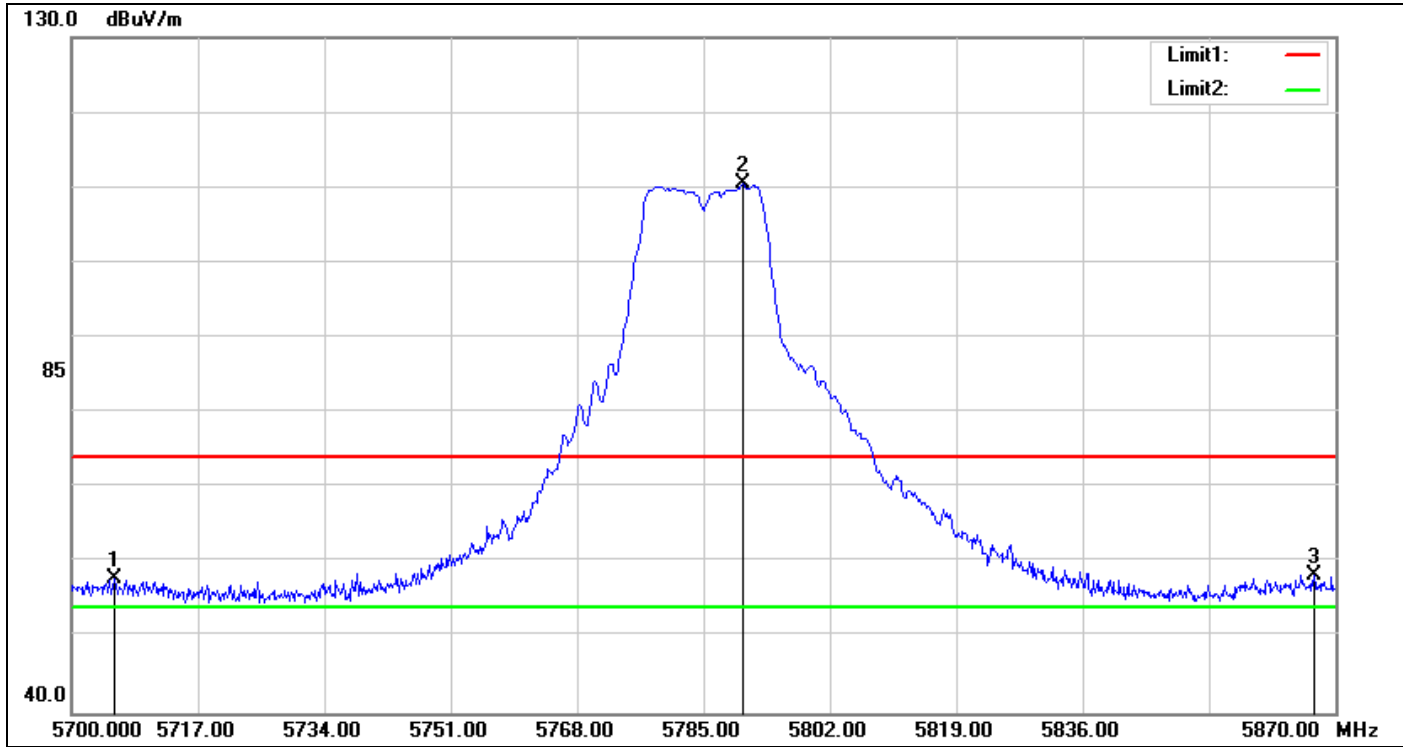
Detector mode: Average



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5724.830	43.08	6.21	49.29	54.00	-4.71	AVG
2	5751.150	87.85	6.32	94.17	--	--	AVG

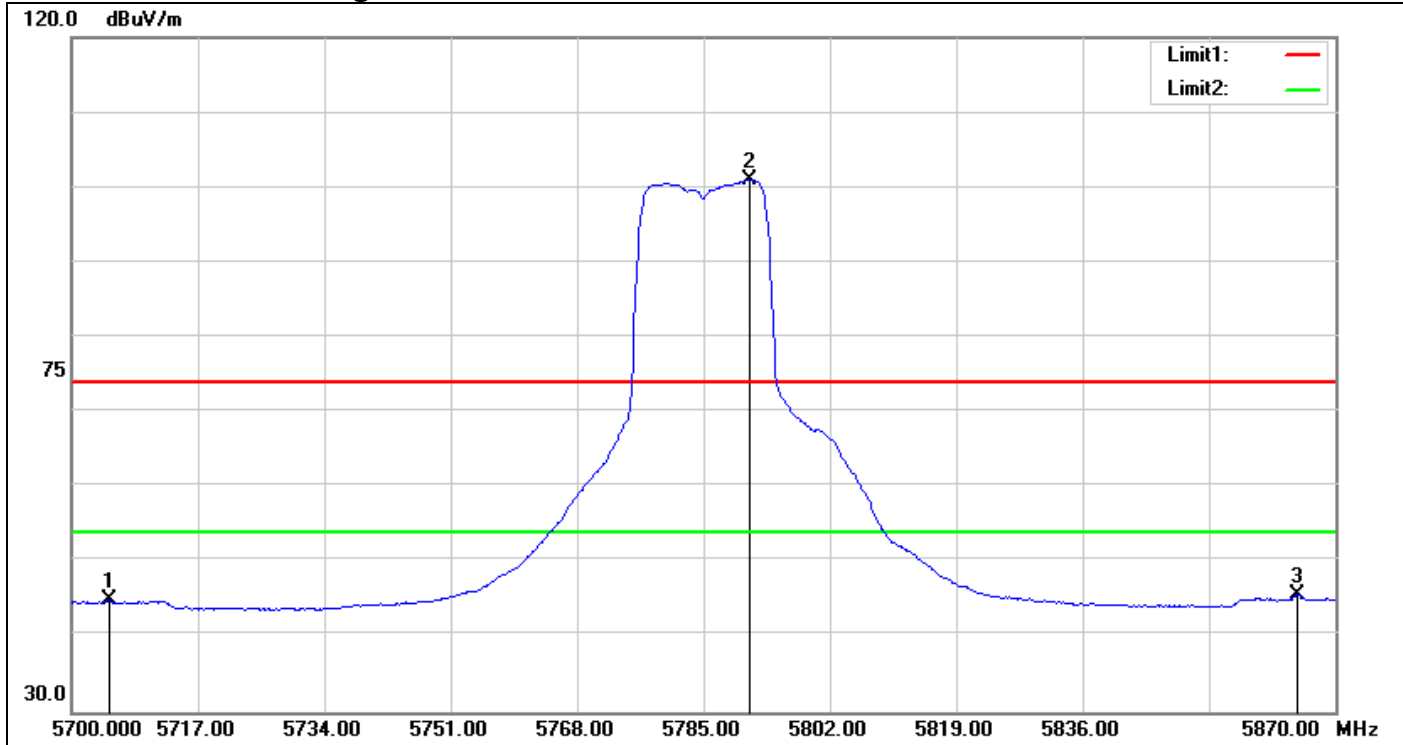
Band Edges (IEEE 802.11a mode / CH Mid)

Detector mode: Peak



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5705.780	51.67	6.13	57.80	74.00	-16.20	peak
2	5790.270	103.94	6.49	110.43	--	--	peak
3	5867.110	51.46	6.81	58.27	74.00	-15.73	peak

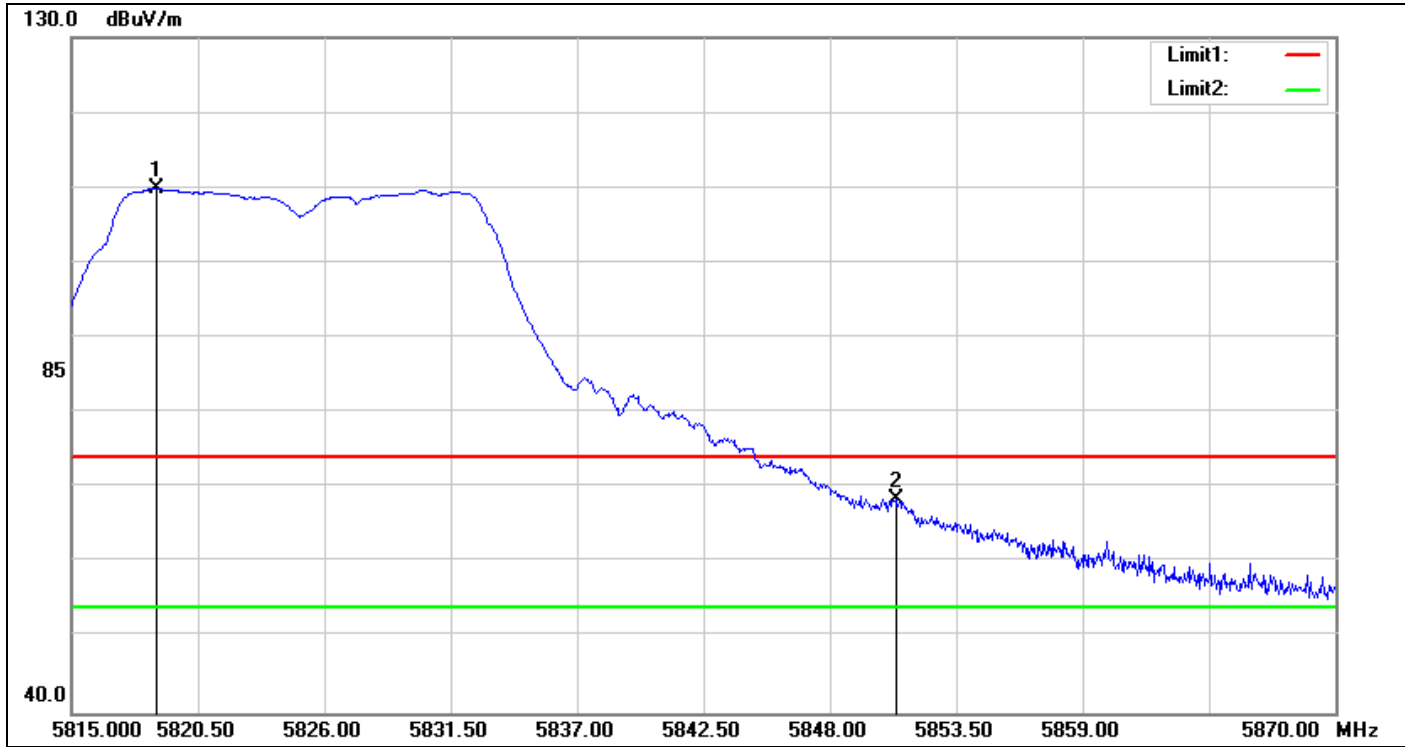
Detector mode: Average



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5705.100	38.79	6.12	44.91	54.00	-9.09	AVG
2	5791.120	94.54	6.49	101.03	--	--	AVG
3	5864.900	38.94	6.80	45.74	54.00	-8.26	AVG

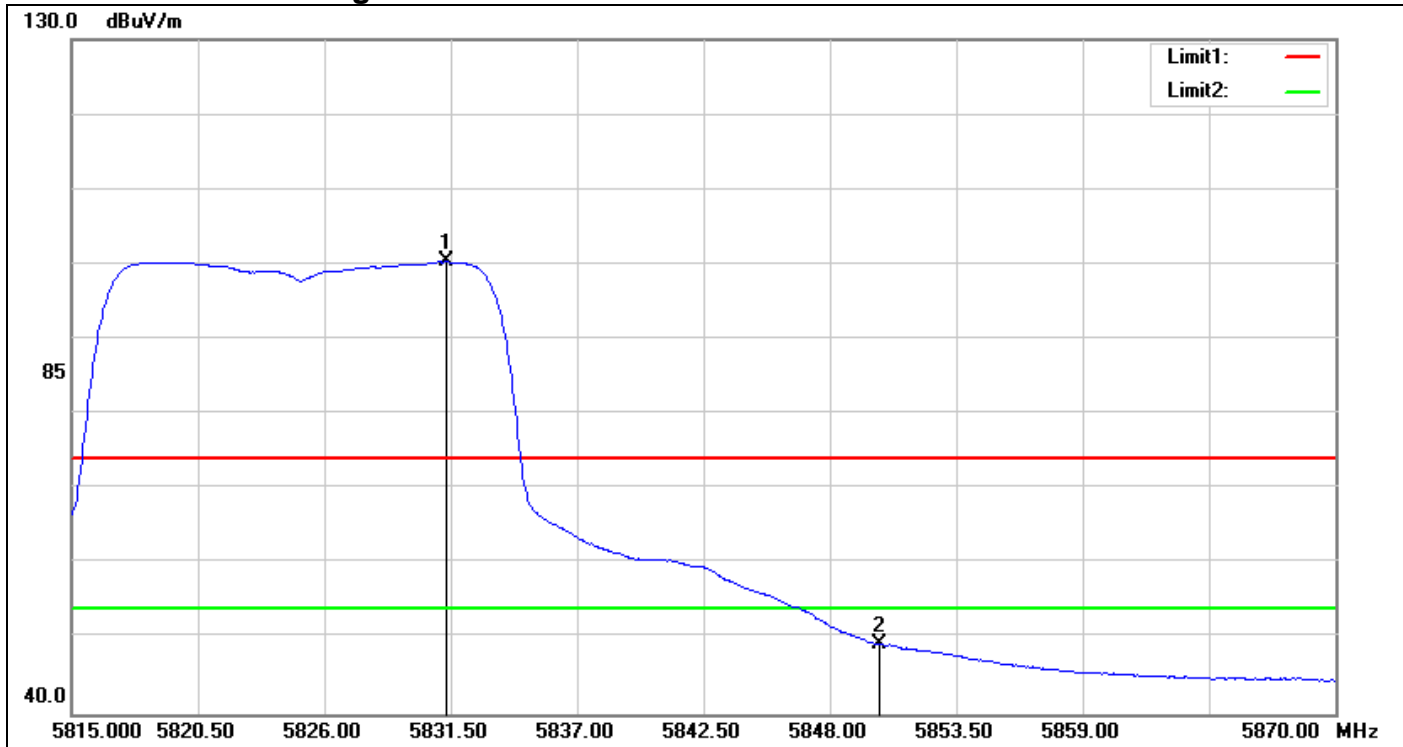
Band Edges (IEEE 802.11a mode / CH High)

Detector mode: Peak



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5818.685	103.20	6.61	109.81	--	--	peak
2	5850.860	61.82	6.74	68.56	74.00	-5.44	peak

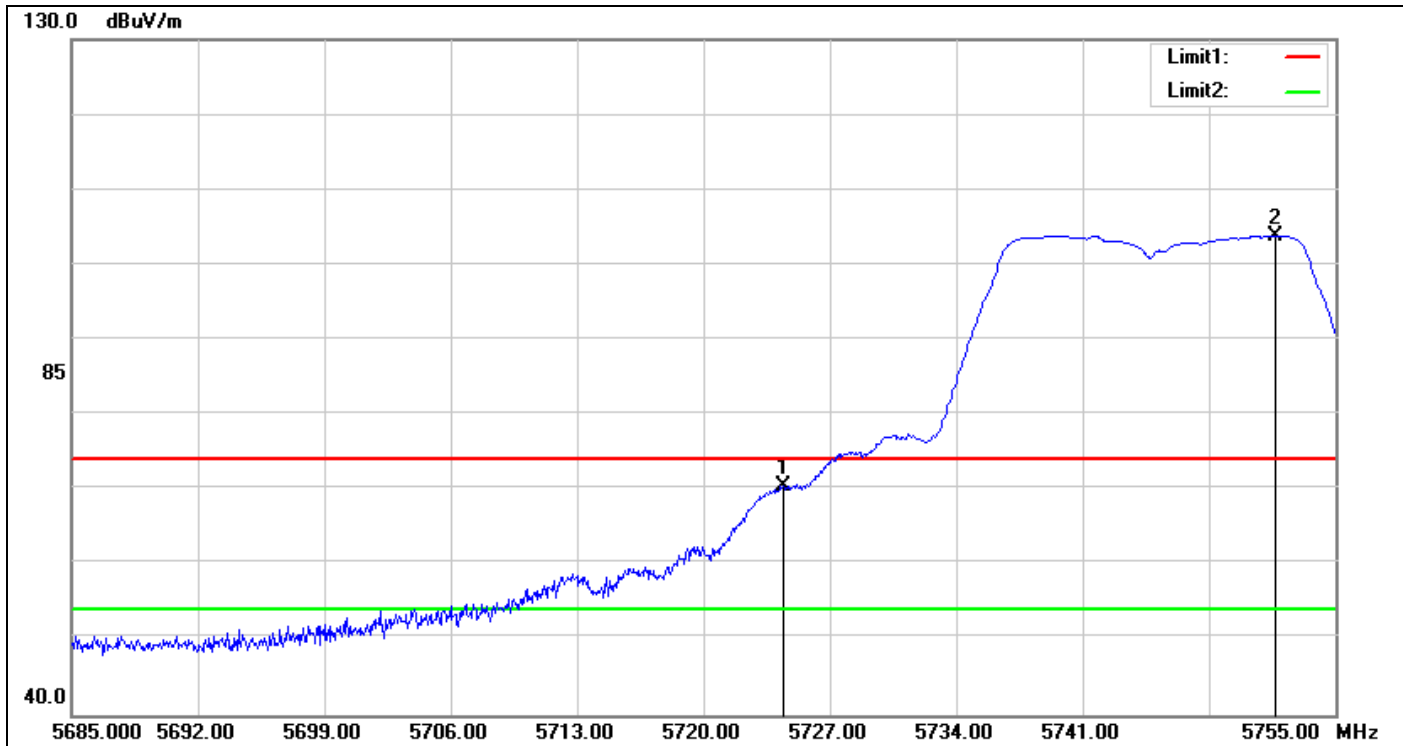
Detector mode: Average



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5831.280	93.67	6.66	100.33	--	--	AVG
2	5850.145	42.61	6.74	49.35	54.00	-4.65	AVG

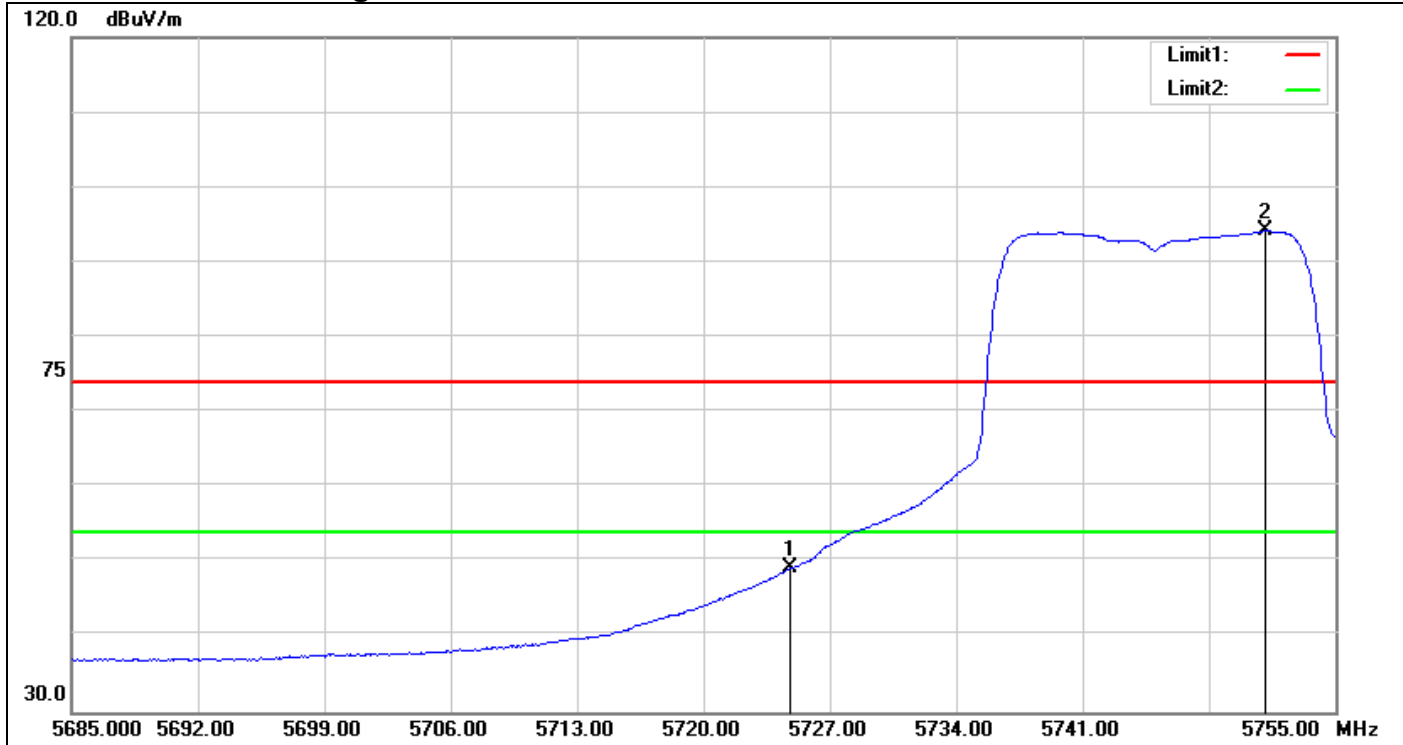
Band Edges (IEEE 802.11n HT 20 MHz mode / CH Low)

Detector mode: Peak



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5724.410	64.34	6.21	70.55	74.00	-3.45	peak
2	5751.640	97.56	6.32	103.88	--	--	peak

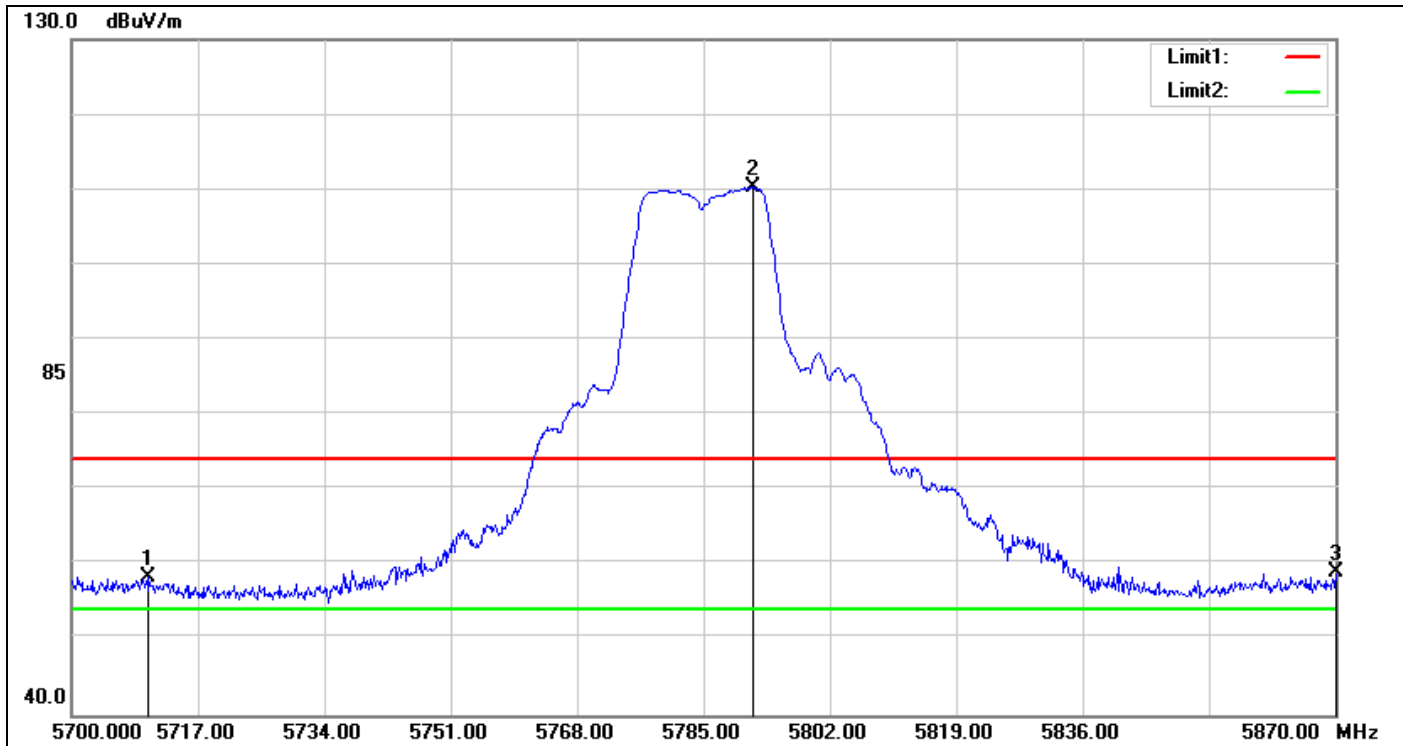
Detector mode: Average



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5724.830	43.08	6.21	49.29	54.00	-4.71	AVG
2	5751.150	87.85	6.32	94.17	--	--	AVG

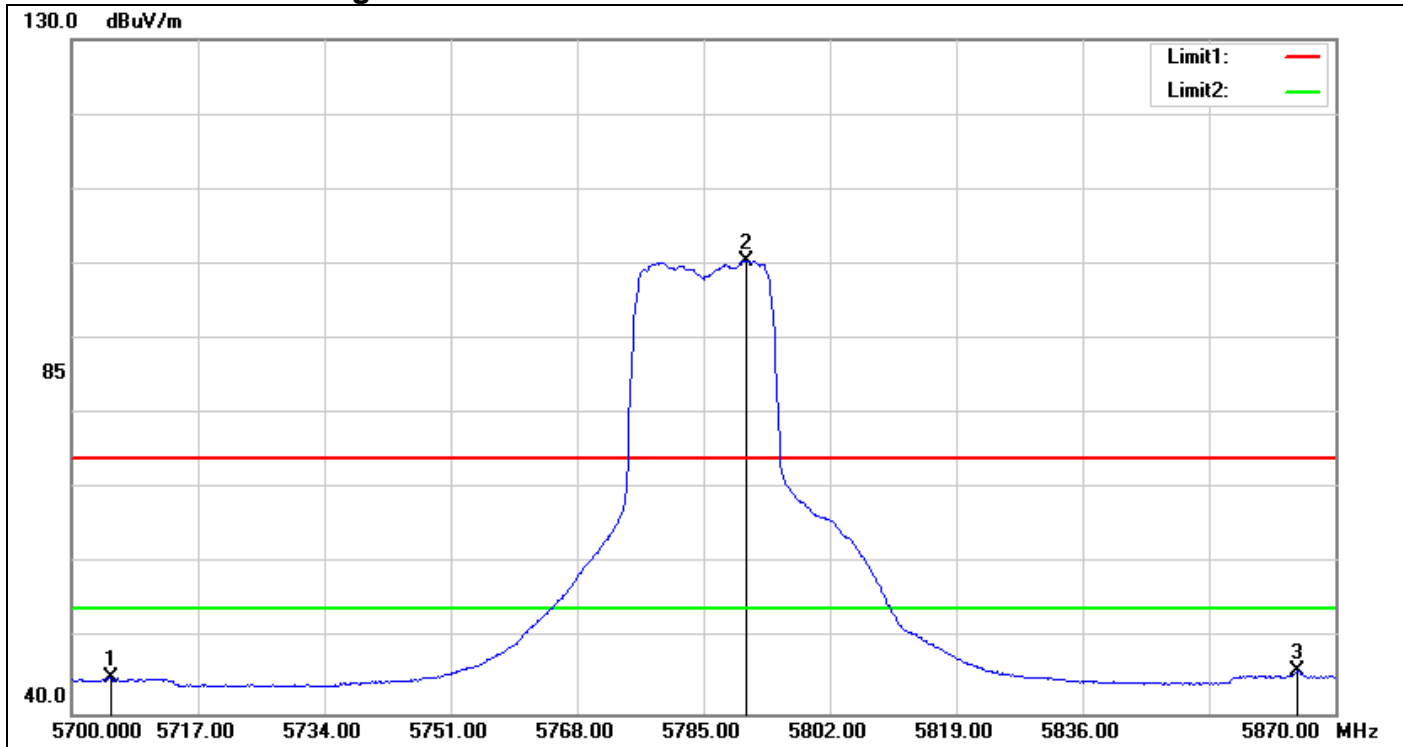
Band Edges (IEEE 802.11n HT 20 MHz mode / CH Mid)

Detector mode: Peak



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5710.200	52.26	6.15	58.41	74.00	-15.59	peak
2	5791.630	103.82	6.49	110.31	--	--	peak
3	5870.000	52.14	6.83	58.97	74.00	-15.03	peak

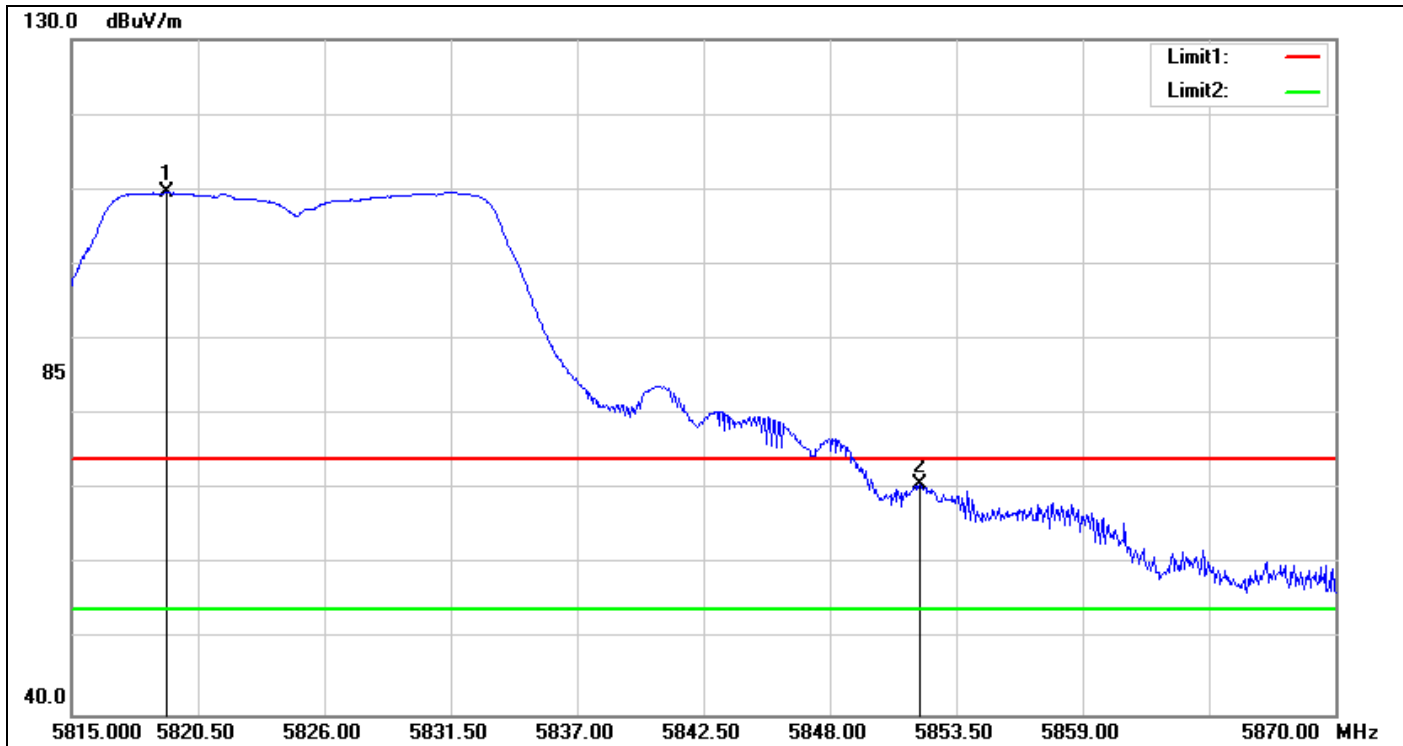
Detector mode: Average



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5705.270	38.72	6.12	44.84	54.00	-9.16	AVG
2	5790.780	94.01	6.49	100.50	--	--	AVG
3	5864.900	38.85	6.80	45.65	54.00	-8.35	AVG

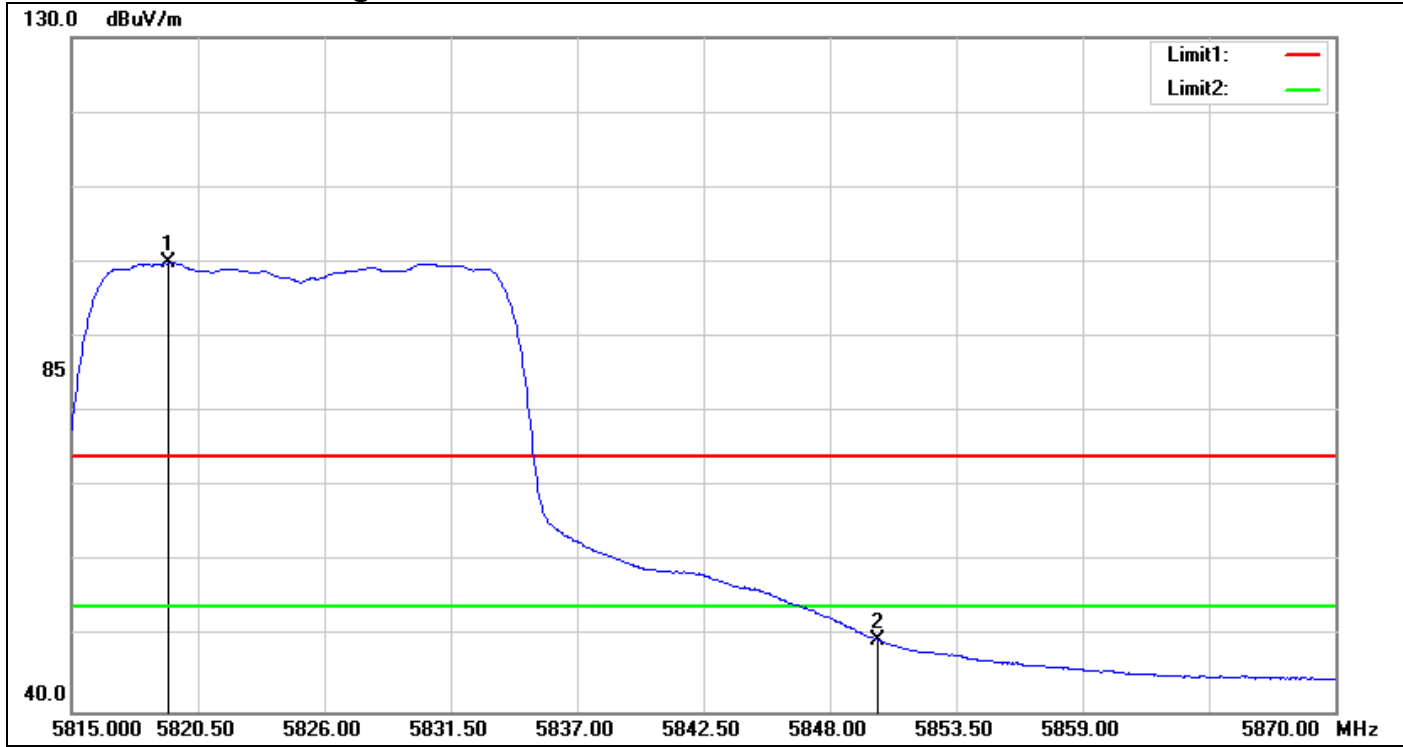
Band Edges (IEEE 802.11n HT 20 MHz mode / CH High)

Detector mode: Peak



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5819.125	102.98	6.61	109.59	--	--	peak
2	5851.905	63.97	6.75	70.72	74.00	-3.28	peak

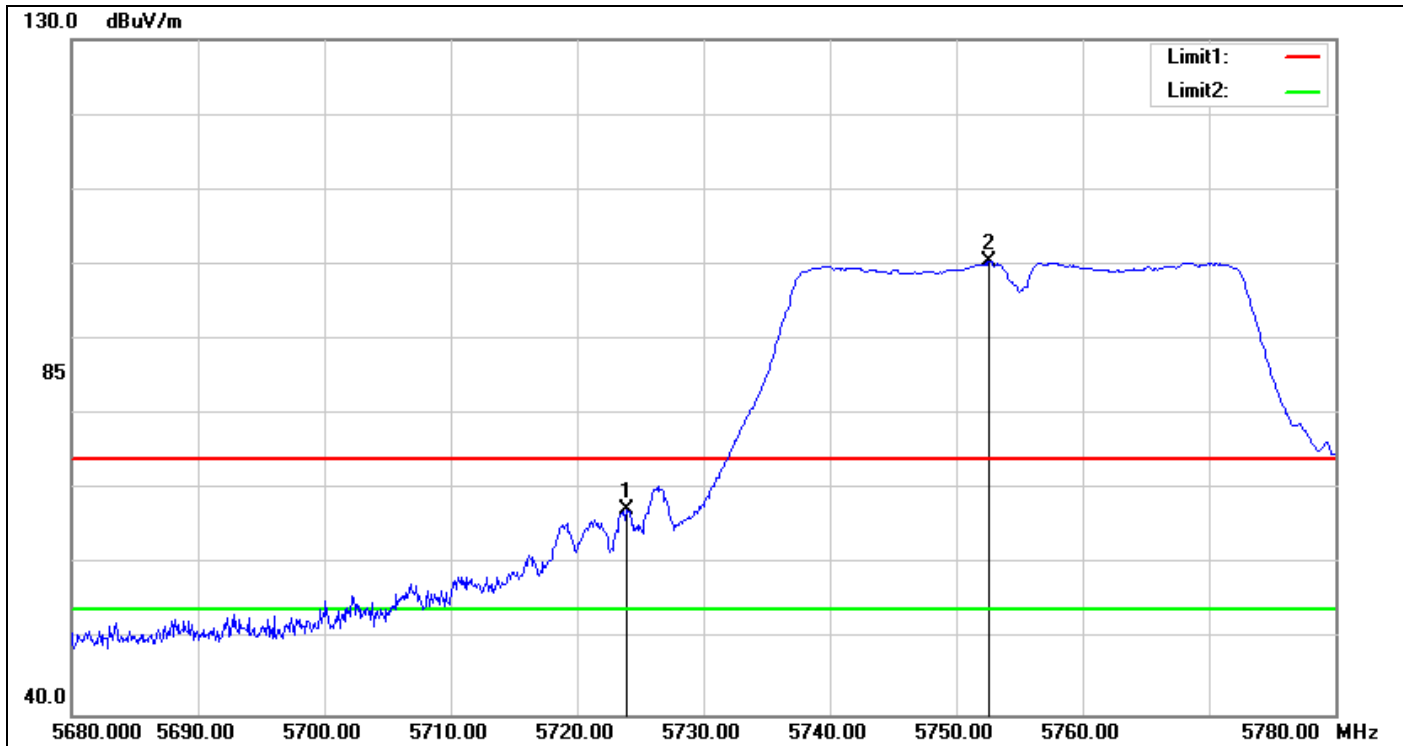
Detector mode: Average



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5819.180	93.31	6.61	99.92	--	--	AVG
2	5850.090	42.91	6.74	49.65	54.00	-4.35	AVG

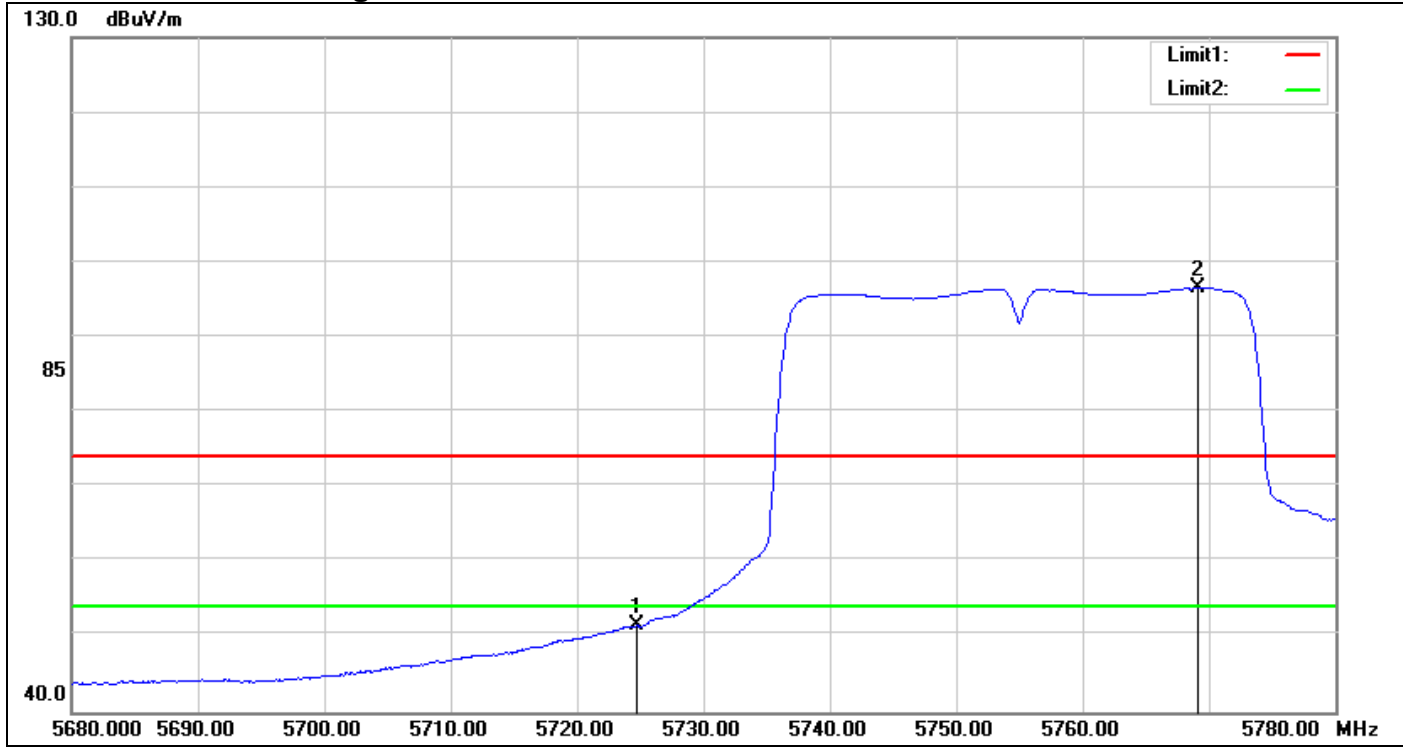
Band Edges (IEEE 802.11n HT 40 MHz mode / CH Low)

Detector mode: Peak



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5723.900	61.10	6.20	67.30	74.00	-6.70	peak
2	5752.600	94.13	6.33	100.46	--	--	peak

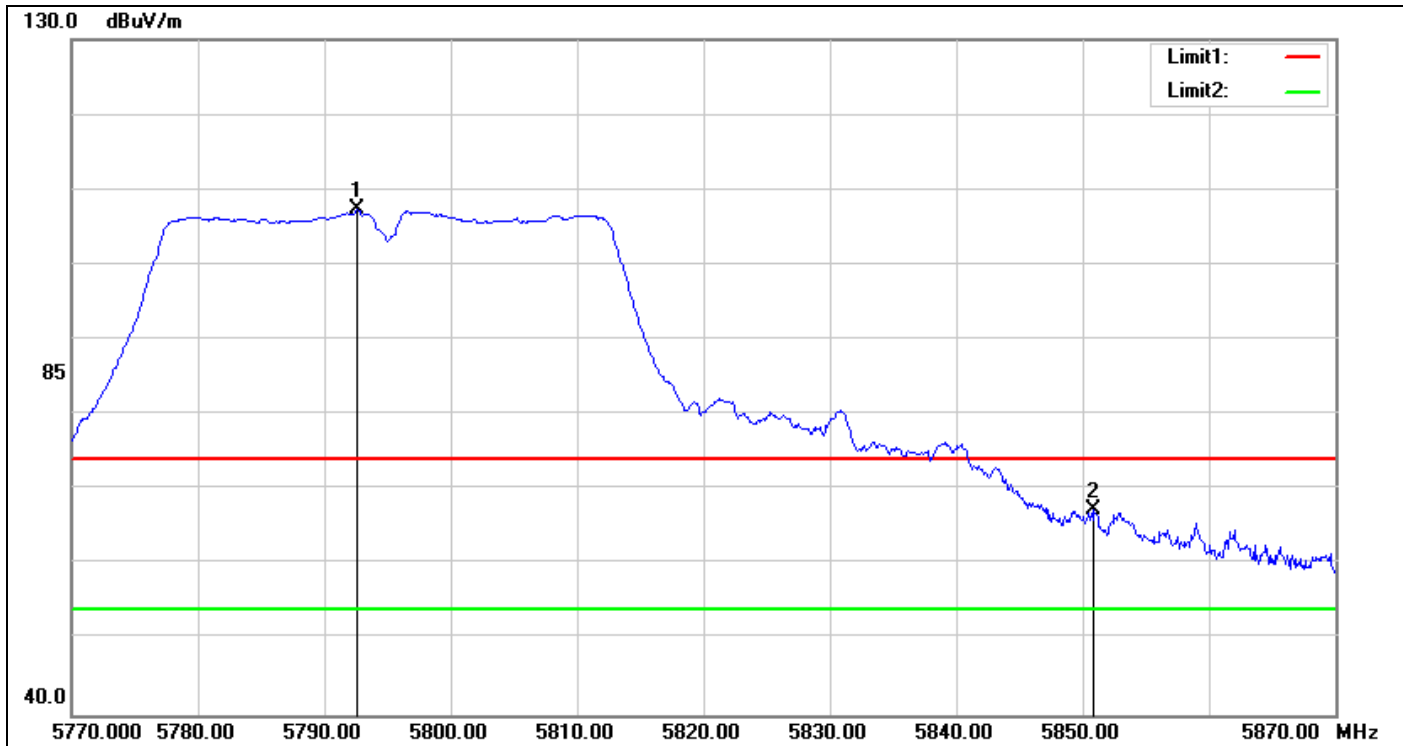
Detector mode: Average



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5724.700	45.37	6.21	51.58	54.00	-2.42	AVG
2	5769.100	90.19	6.40	96.59	--	--	AVG

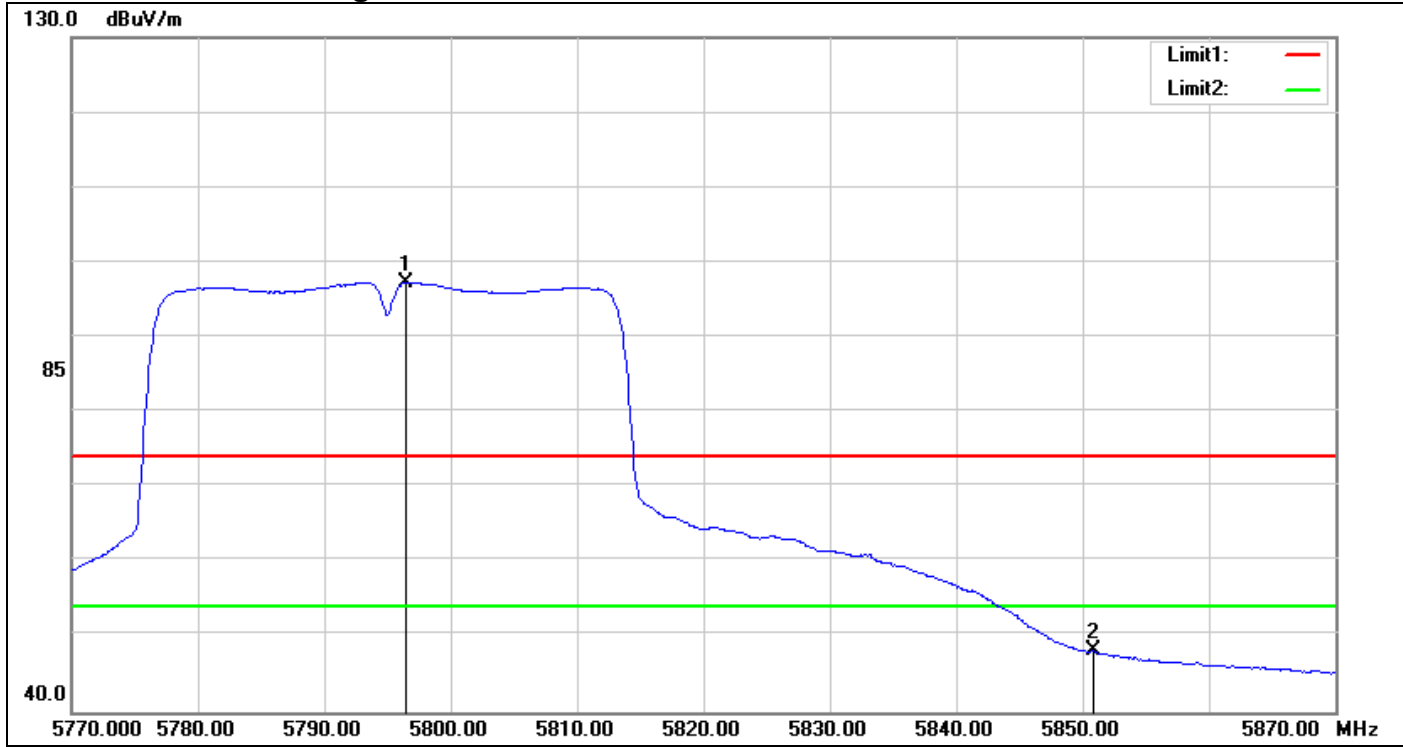
Band Edges (IEEE 802.11n HT 40 MHz mode / CH High)

Detector mode: Peak



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5792.600	100.80	6.50	107.30	--	--	peak
2	5850.900	60.50	6.74	67.24	74.00	-6.76	peak

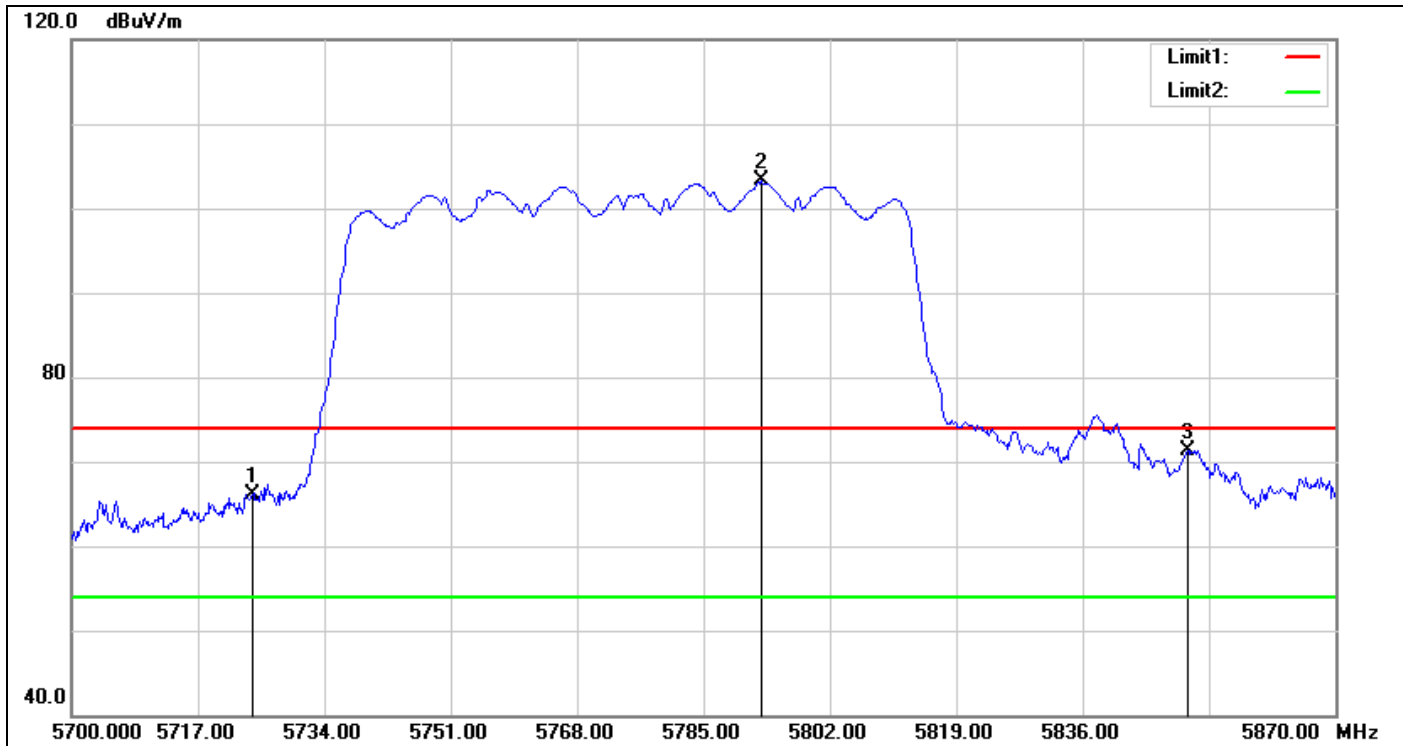
Detector mode: Average



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5796.500	90.83	6.51	97.34	--	--	AVG
2	5850.800	41.44	6.74	48.18	54.00	-5.82	AVG

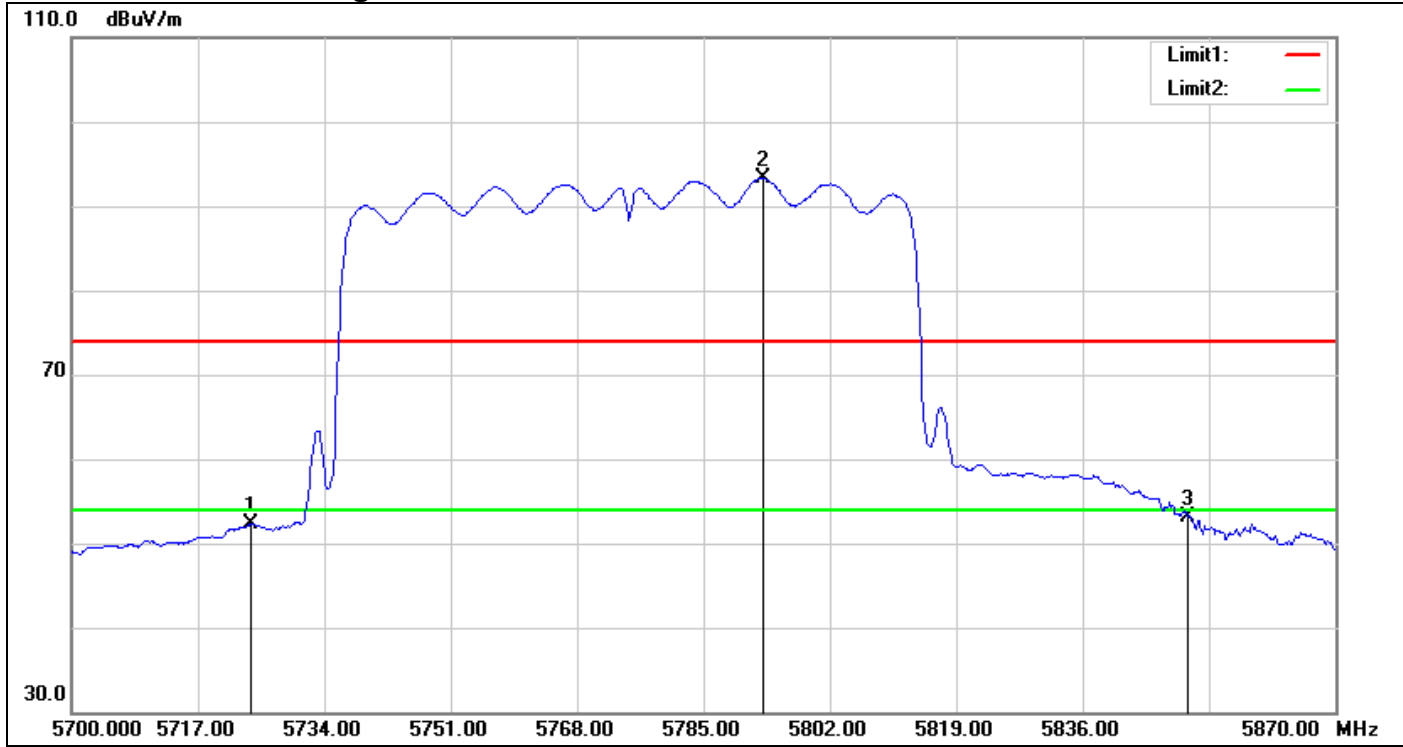
Band Edges (IEEE 802.11ac VHT 80 MHz mode / CH Mid)

Detector mode: Peak



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5724.310	59.87	6.21	66.08	74.00	-7.92	peak
2	5792.820	96.71	6.50	103.21	--	--	peak
3	5850.110	64.65	6.74	71.39	74.00	-2.61	peak

Detector mode: Average



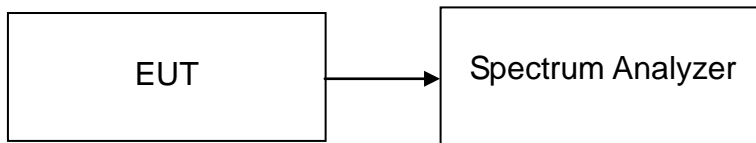
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5724.140	46.19	6.20	52.39	54.00	-1.61	AVG
2	5792.990	86.89	6.50	93.39	--	--	AVG
3	5850.110	46.39	6.74	53.13	54.00	-0.87	AVG

7.5 PEAK POWER SPECTRAL DENSITY

LIMIT

1. According to §15.407, for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 30 dBm in any 500 kHz band during any time interval of continuous transmission.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 500kHz, VBW = 3 x RBW, Span = 1.5 x bandwidth, Sweep=auto
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode/ 5745 ~ 5825MHz

Channel	Frequency (MHz)	PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Result
Low	5745	8.39	30.00	PASS
Mid	5785	8.93		PASS
High	5825	8.83		PASS

Test mode: IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Result
Low	5745	8.19	30.00	PASS
Mid	5785	8.65		PASS
High	5825	8.68		PASS

Test mode: IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Result
Low	5755	4.64	30.00	PASS
High	5795	5.69		PASS

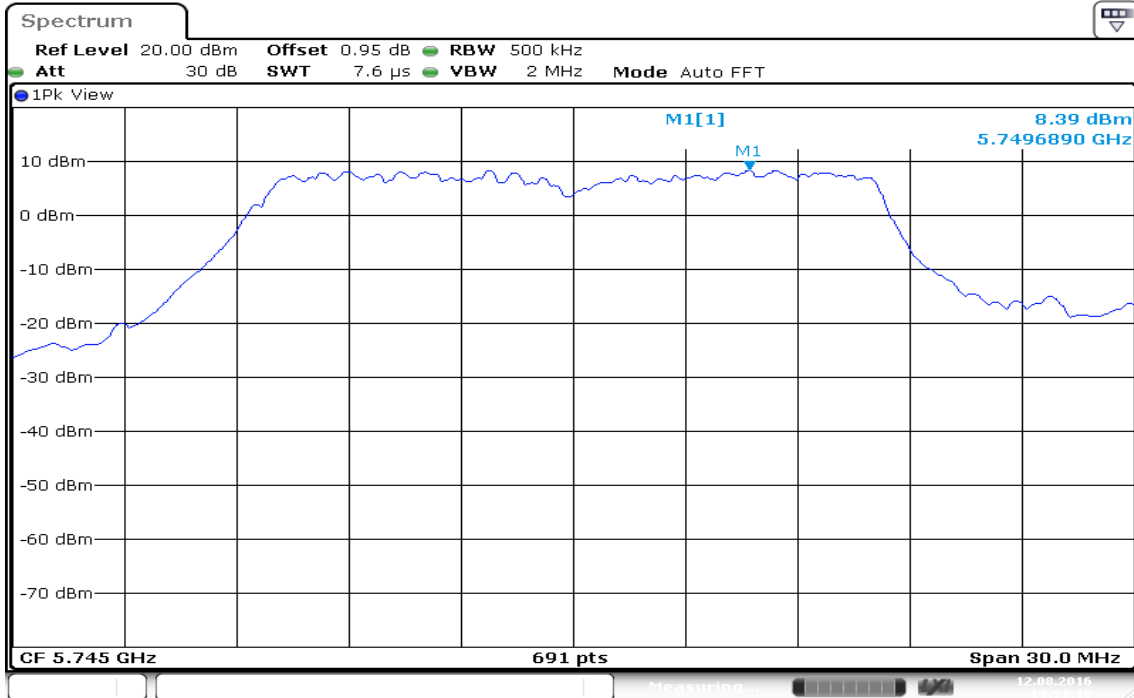
Test mode: IEEE 802.11ac VHT 80 MHz mode / 5775MHz

Channel	Frequency (MHz)	PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Result
Mid	5775	4.64	30.00	PASS

Test Plot

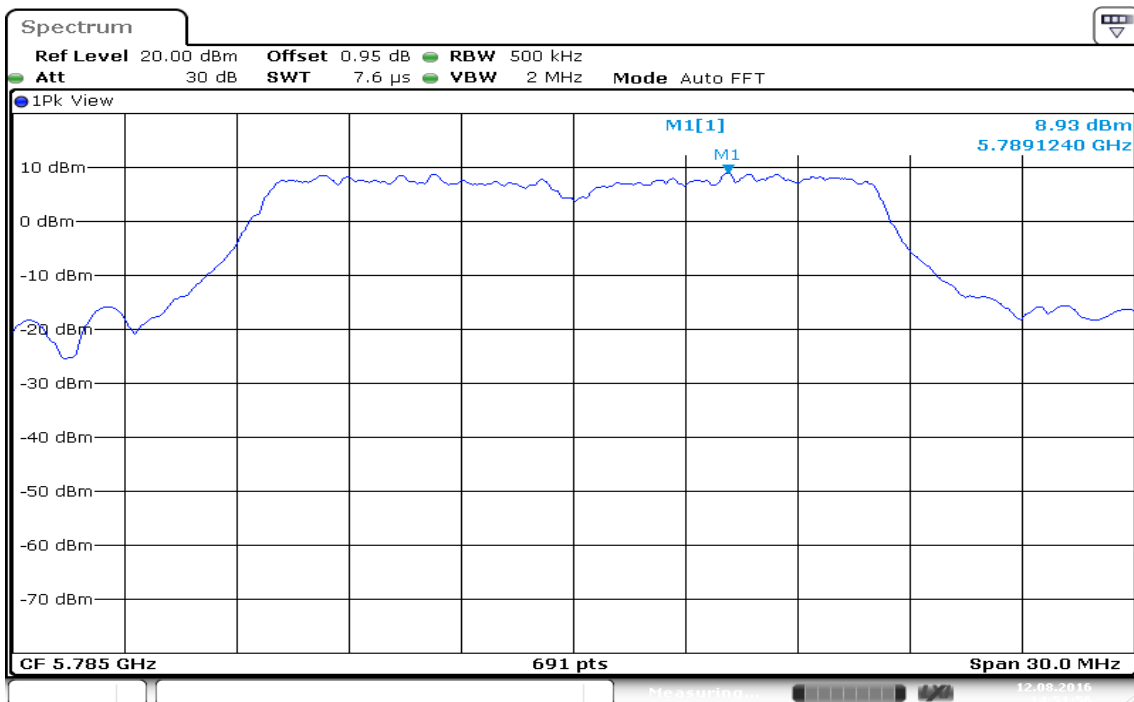
IEEE 802.11a MHz mode / 5745 ~ 5825MHz

PPSD (CH Low)



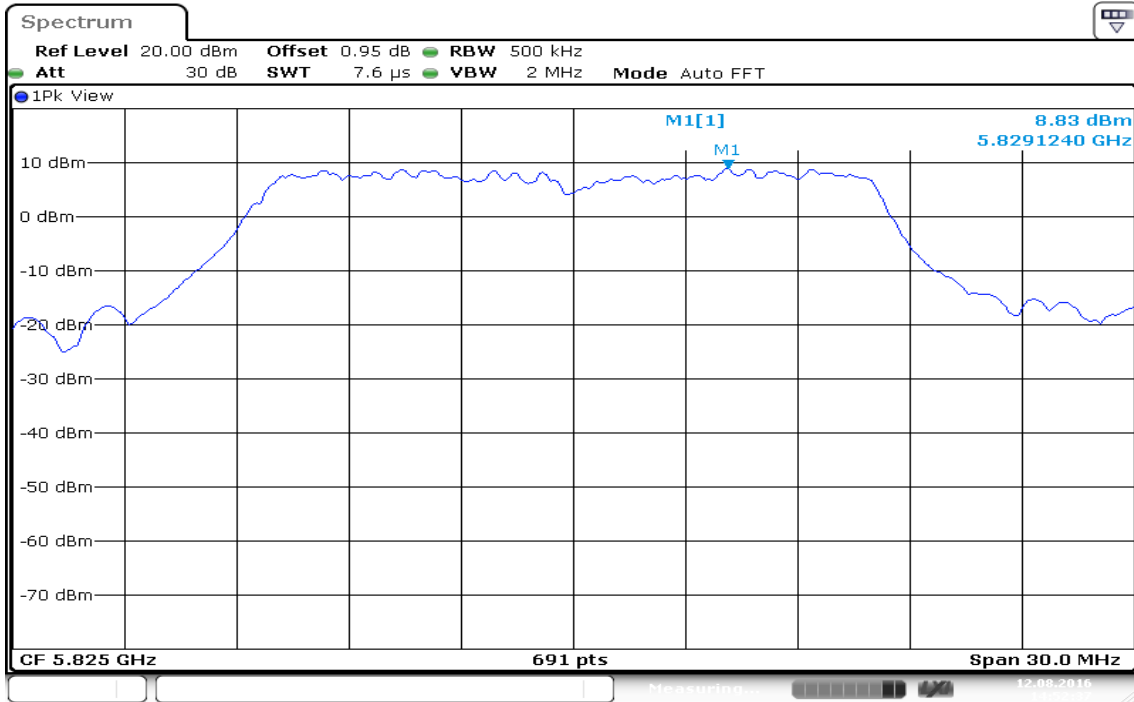
Date: 12.AUG.2016 14:51:18

PPSD (CH Mid)



Date: 12.AUG.2016 14:51:56

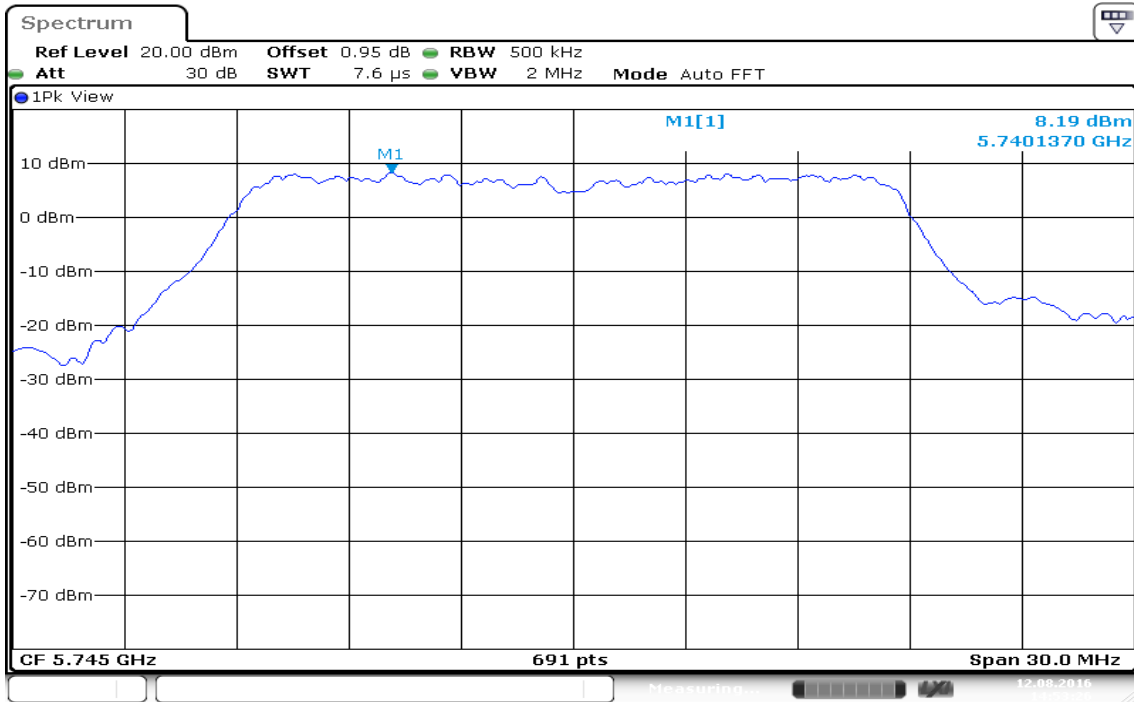
PPSD (CH High)



Date: 12.AUG.2016 14:52:37

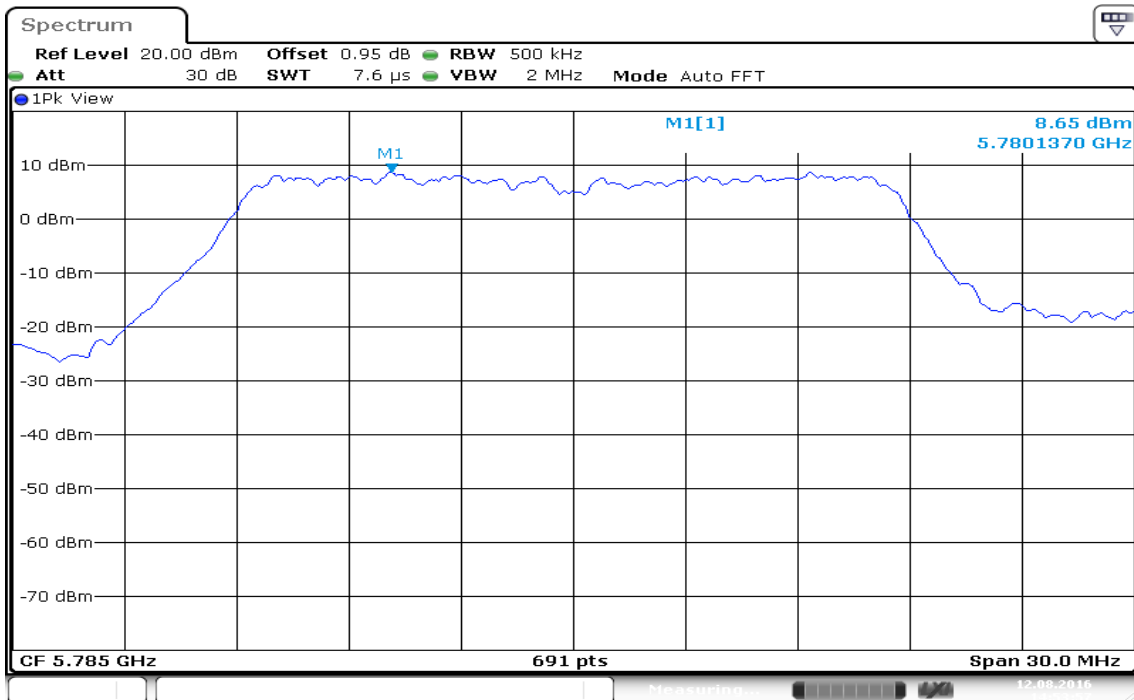
IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

PPSD (CH Low)



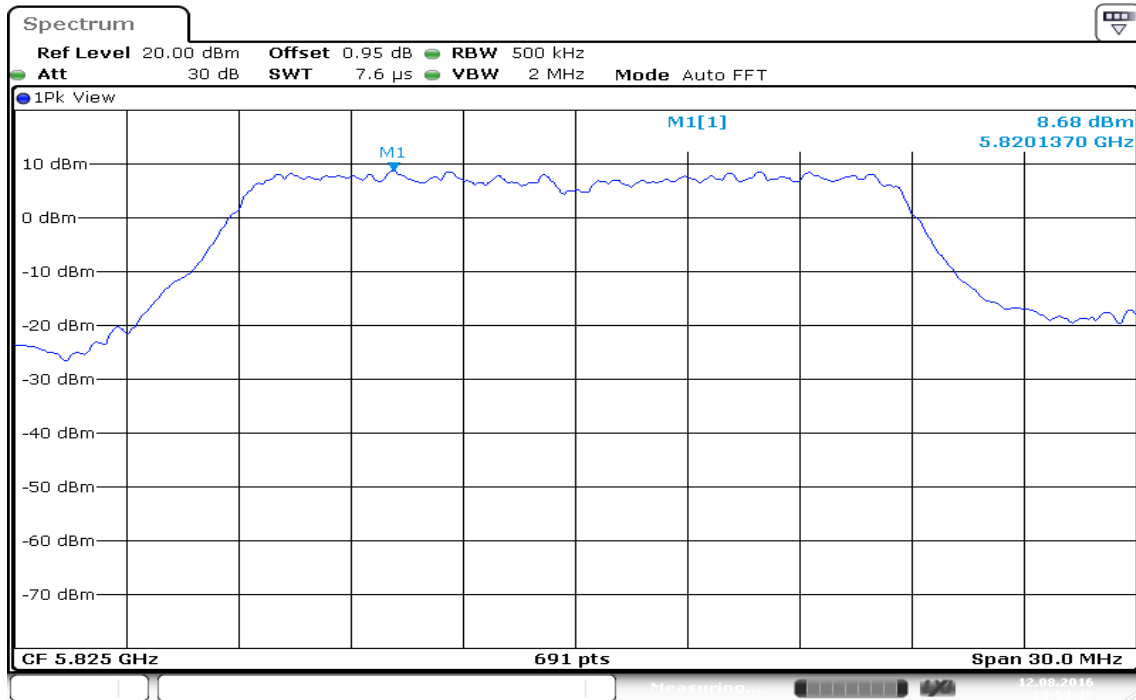
Date: 12.AUG.2016 14:53:26

PPSD (CH Mid)



Date: 12.AUG.2016 14:53:57

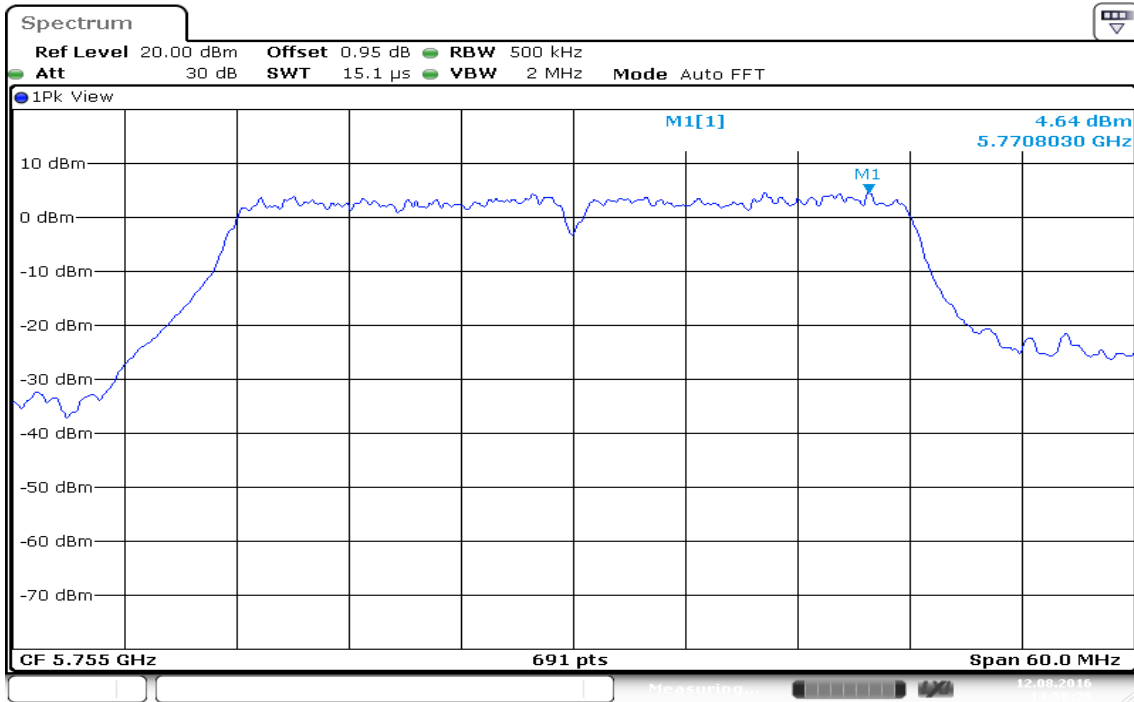
PPSD (CH High)



Date: 12.AUG.2016 14:54:35

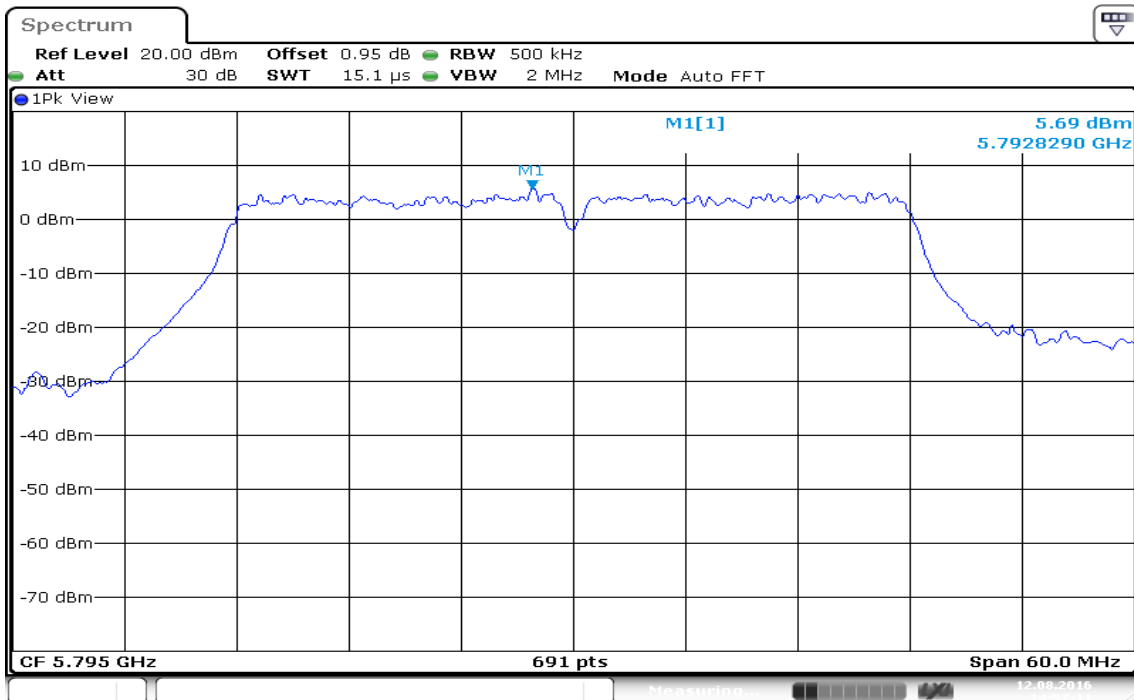
IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

PPSD (CH Low)



Date: 12.AUG.2016 14:56:26

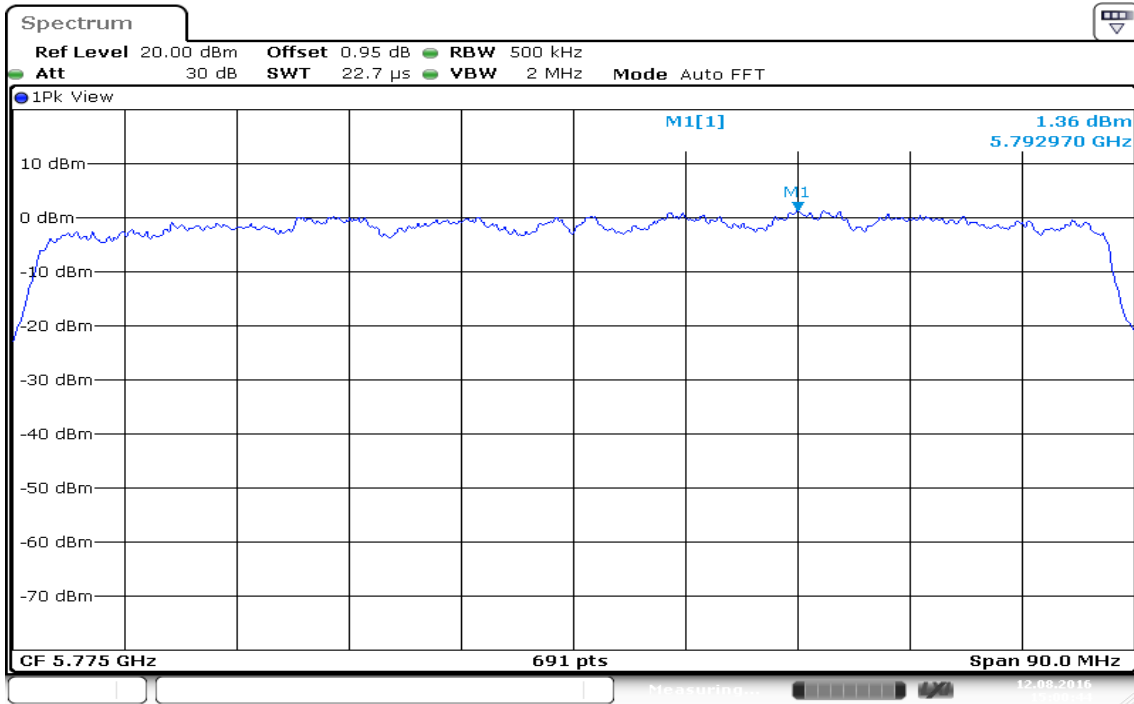
PPSD (CH High)



Date: 12.AUG.2016 14:57:11

IEEE 802.11ac VHT 80 MHz mode / 5775MHz

PPSD (CH Mid)



Date: 12.AUG.2016 15:00:44

7.6 RADIATED EMISSIONS

LIMIT

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:

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
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

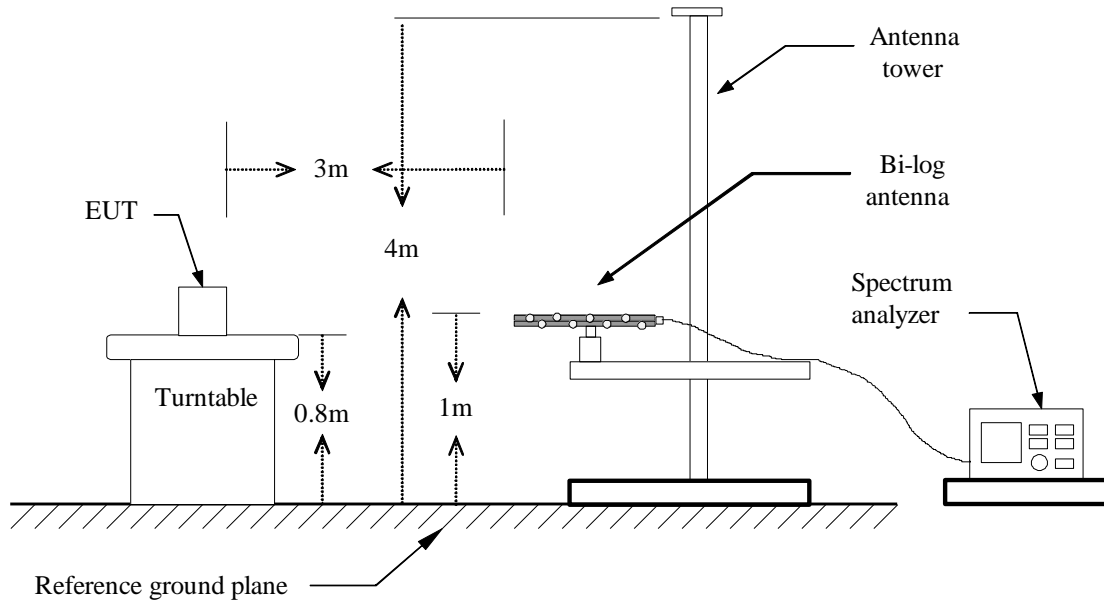
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

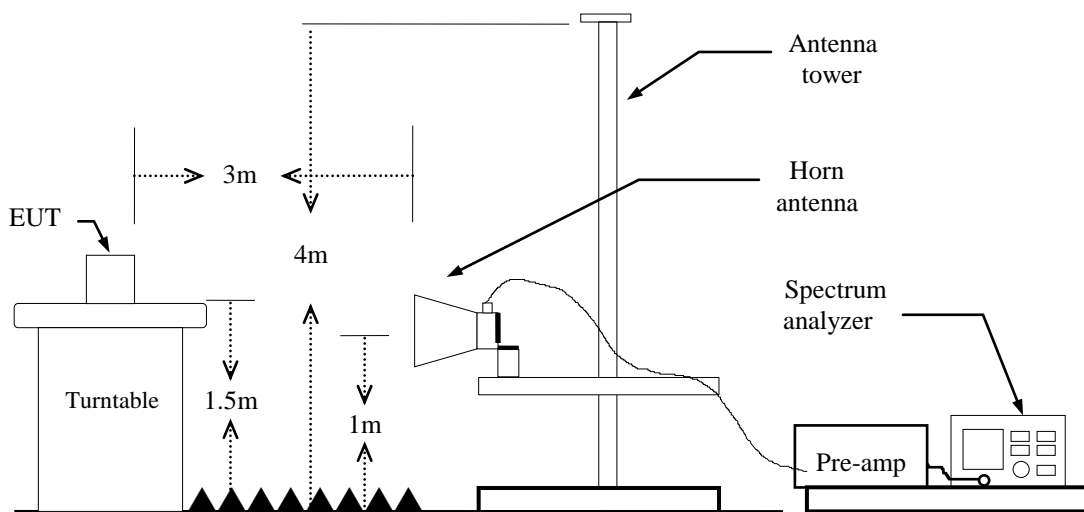
Frequency (MHz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
0.009 - 0.490	2400/F(kHz) +80	20LOG((2400/F(kHz))+80)
0.490 - 1.705	24000/F(kHz) +40	20LOG((24000/F(kHz))+40)
1.705 – 30.0	30	69.54
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

30MHz ~ 1GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m high and below 1 GHz is 0.8m high 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,
if duty cycle \geq 98%, VBW=10Hz.
if duty cycle < 98% VBW=1/T.

IEEE 802.11a mode: =98%, VBW=10Hz

IEEE 802.11n HT 20 MHz mode: =98%, VBW=10Hz

IEEE 802.11n HT 40 MHz mode: =98%, VBW=10Hz

IEEE 802.11ac VHT 80 MHz mode: =98%, VBW=10Hz

7. Repeat above procedures until the measurements for all frequencies are complete.
8. Result = Spectrum Reading + cable loss(spectrum to Amp) - Amp Gain + Cable loss(Amp to receive Ant)+ Receive Ant

Note: We checked every harmonics frequencies from Fundamental frequencies with reduced VBW, and we mark a point to prove pass or not if we find any emission. For this case, there are no emissions hidden in the noise floor.

Below 1 GHz

Operation Mode: Normal Link

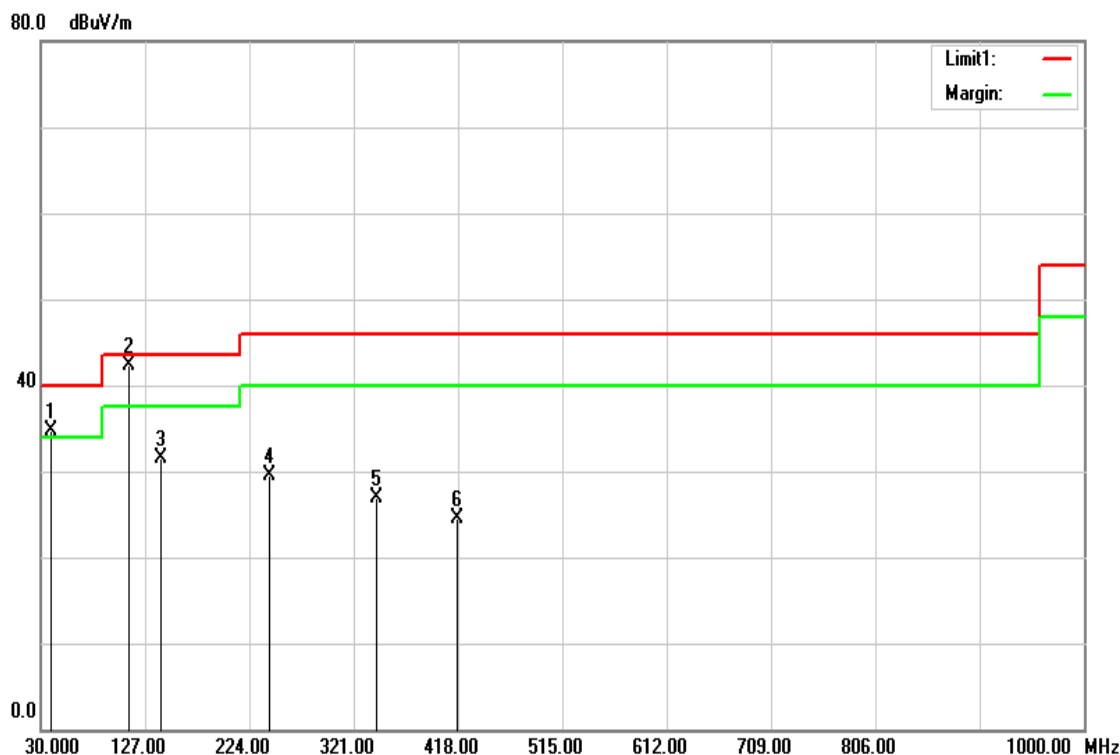
Test Date: August 11, 2016

Temperature: 27°C

Tested by: Dennis Li

Humidity: 53% RH

Polarity: Ver.



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
39.7000	49.78	-15.12	34.66	40.00	-5.34	peak	V
112.4500	59.16	-16.83	42.33	43.50	-1.17	peak	V
141.5500	47.30	-15.82	31.48	43.50	-12.02	peak	V
242.4300	45.94	-16.45	29.49	46.00	-16.51	peak	V
342.3400	40.07	-13.10	26.97	46.00	-19.03	peak	V
417.0300	35.73	-11.19	24.54	46.00	-21.46	peak	V

Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz 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) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

Operation Mode: Normal Link

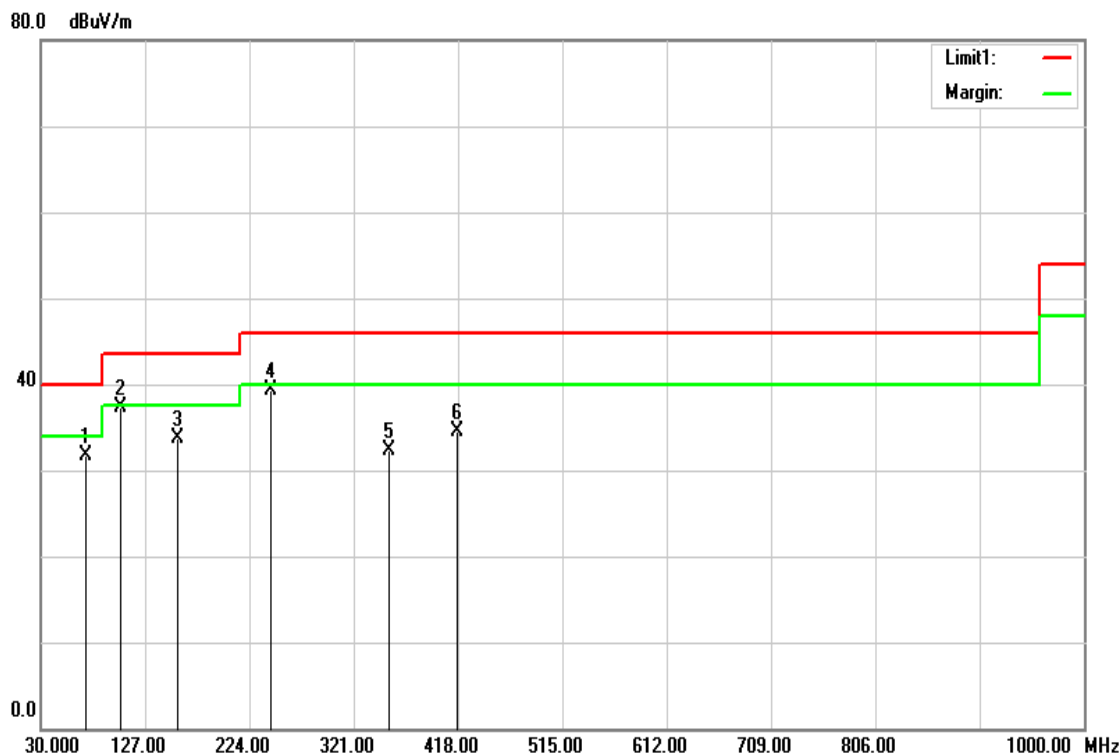
Test Date: August 11, 2016

Temperature: 27°C

Tested by: Dennis Li

Humidity: 53% RH

Polarity: Hor.



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
71.7100	52.56	-20.81	31.75	40.00	-8.25	peak	H
104.6600	55.43	-18.21	37.22	43.50	-6.28	peak	H
157.0700	50.05	-16.28	33.77	43.50	-9.73	peak	H
243.4000	55.73	-16.43	39.30	46.00	-6.70	peak	H
353.9800	45.06	-12.80	32.26	46.00	-13.74	peak	H
417.0300	45.69	-11.19	34.50	46.00	-11.50	peak	H

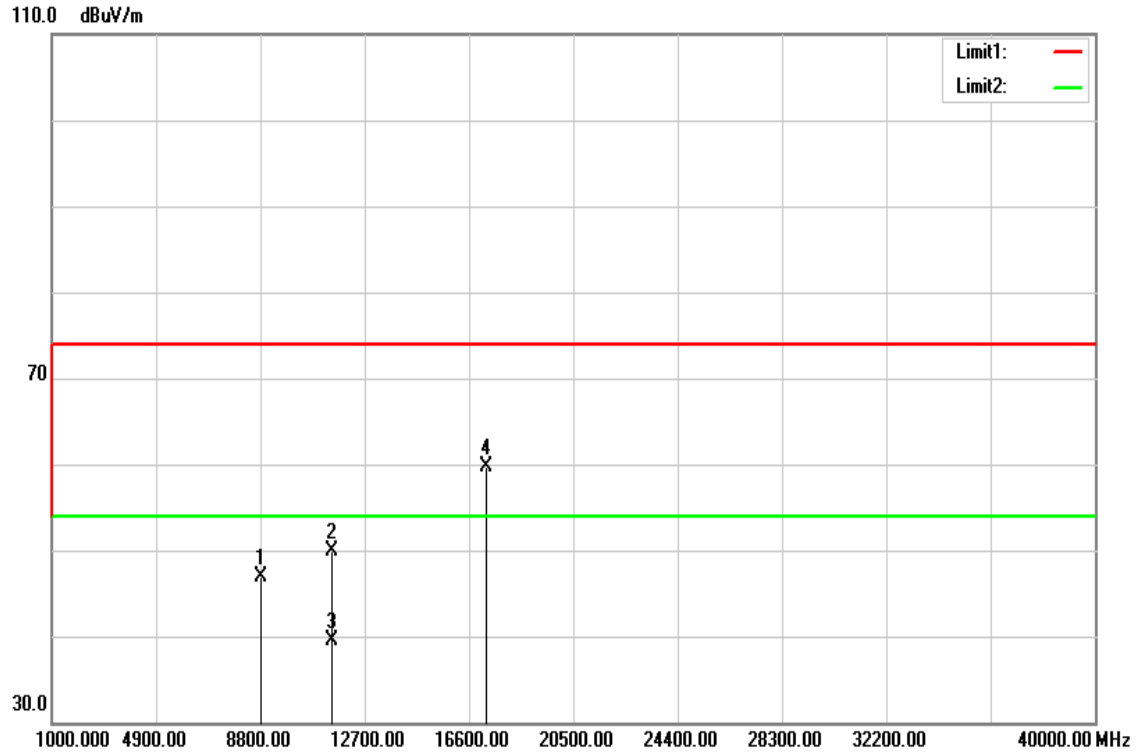
Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz 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) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

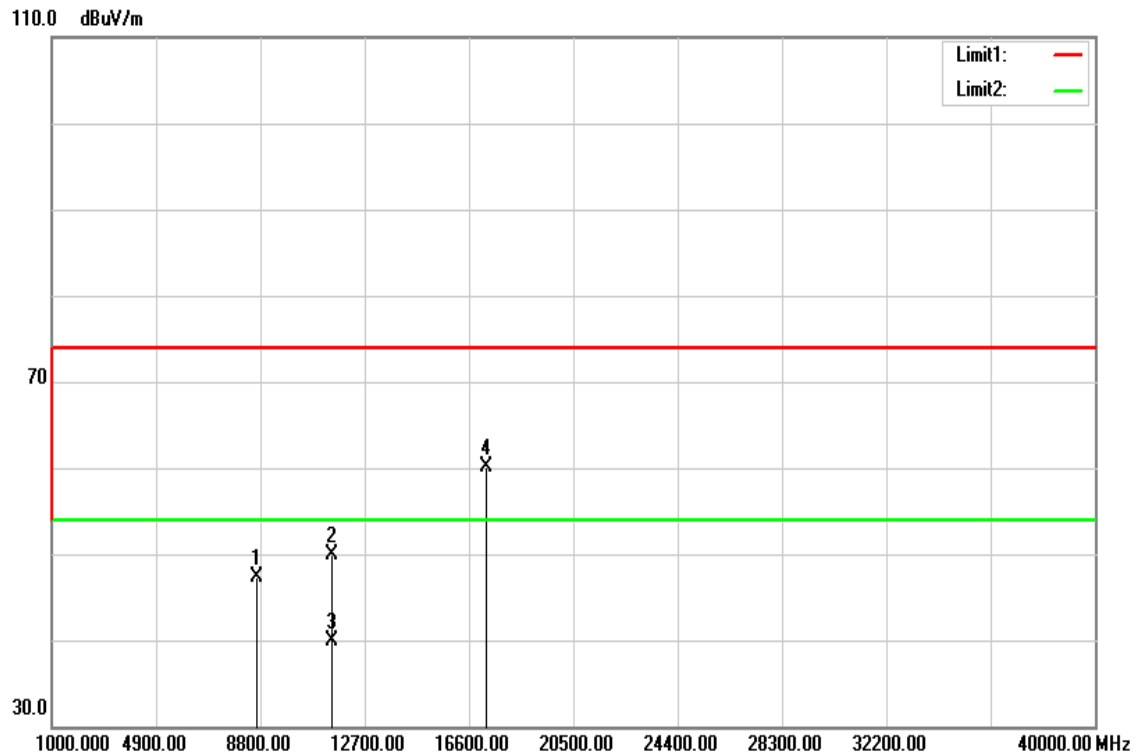
Above 1 GHz

TX / IEEE 802.11a mode / CH Low

Polarity: Vertical



Polarity: Horizontal



Operation Mode: TX / IEEE 802.11a mode / CH Low **Test Date:** August 25, 2016
Temperature: 27°C **Tested by:** Dennis Li
Humidity: 53% RH **Polarity:** Ver. / Hor.

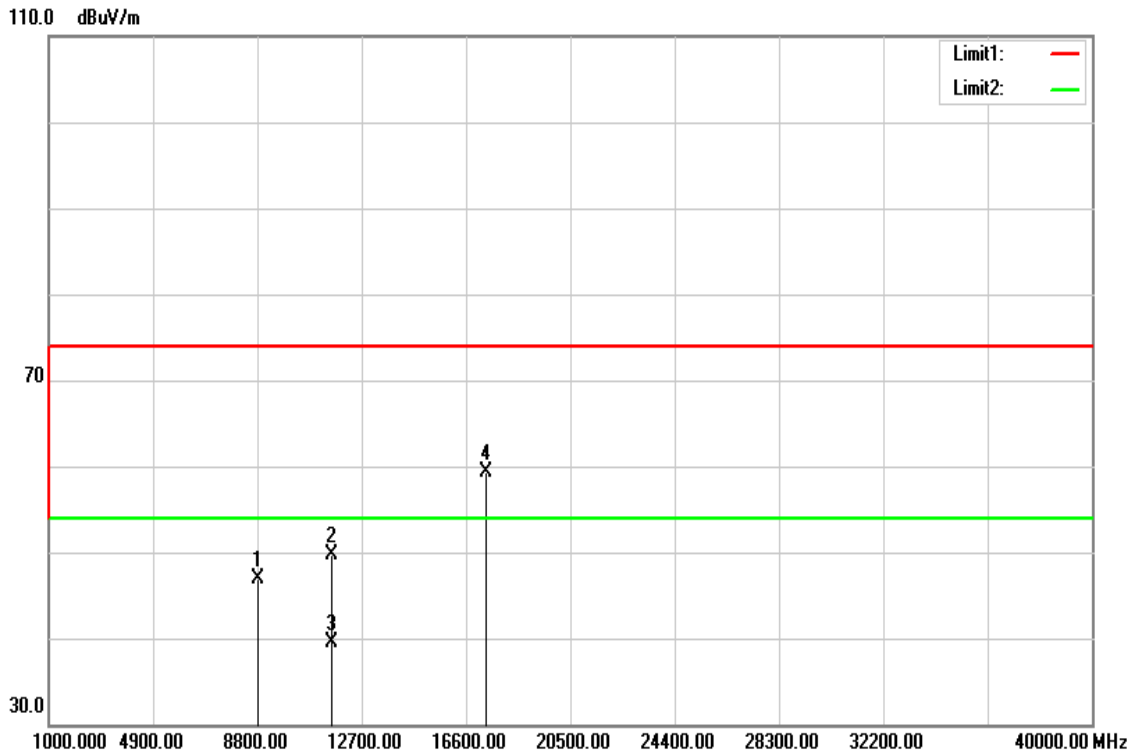
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
8850.000	33.06	13.80	46.86	74.00	-27.14	peak	V
11490.000	33.08	16.78	49.86	74.00	-24.14	peak	V
11490.000	22.78	16.78	39.56	54.00	-14.44	AVG	V
17235.000	34.41	25.28	59.69	74.00	-14.31	peak	V
N/A							
8690.000	33.55	13.73	47.28	74.00	-26.72	peak	H
11490.000	33.20	16.78	49.98	74.00	-24.02	peak	H
11490.000	23.09	16.78	39.87	54.00	-14.13	AVG	H
17235.000	34.86	25.28	60.14	74.00	-13.86	peak	H
N/A							

Remark:

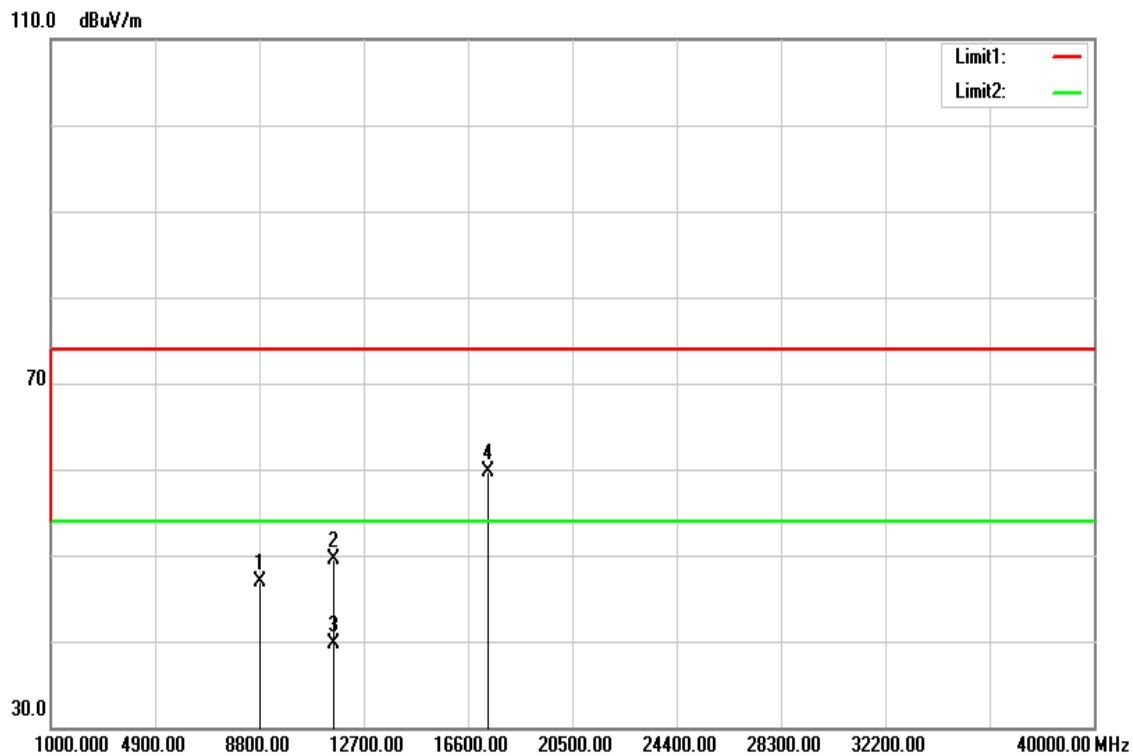
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
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 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

TX / IEEE 802.11a mode / CH Mid

Polarity: Vertical



Polarity: Horizontal



Operation Mode: TX / IEEE 802.11a mode / CH Mid **Test Date:** August 25, 2016
Temperature: 27°C **Tested by:** Dennis Li
Humidity: 53% RH **Polarity:** Ver. / Hor.

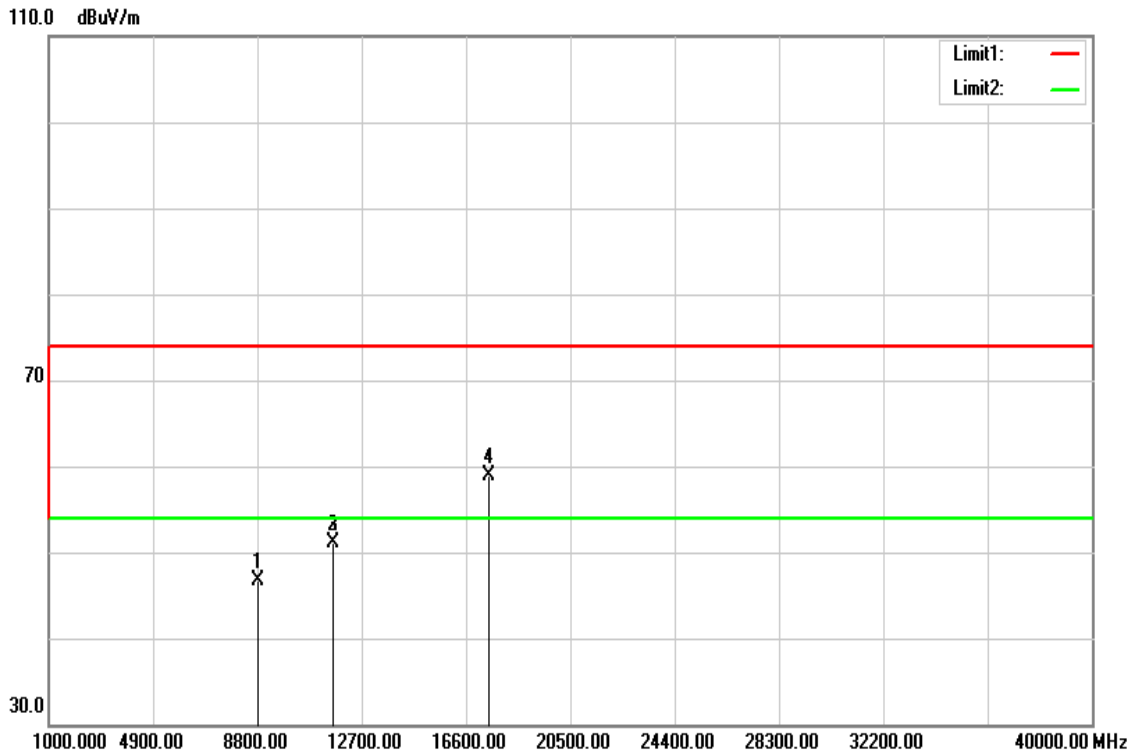
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
8850.000	33.05	13.80	46.85	74.00	-27.15	peak	V
11570.000	32.85	16.84	49.69	74.00	-24.31	peak	V
11570.000	22.75	16.84	39.59	54.00	-14.41	AVG	V
17355.000	33.54	25.75	59.29	74.00	-14.71	peak	V
N/A							
8850.000	33.10	13.80	46.90	74.00	-27.10	peak	H
11570.000	32.76	16.84	49.60	74.00	-24.40	peak	H
11570.000	22.84	16.84	39.68	54.00	-14.32	AVG	H
17355.000	34.04	25.75	59.79	74.00	-14.21	peak	H
N/A							

Remark:

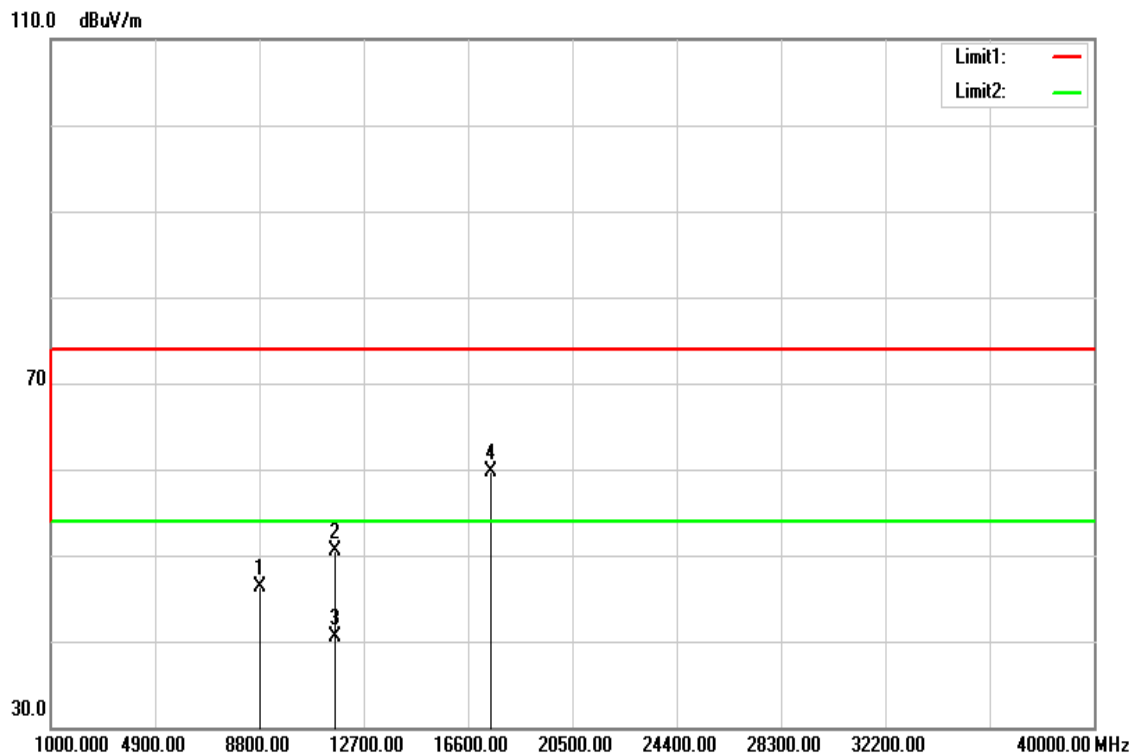
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
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 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

TX / IEEE 802.11a mode / CH High

Polarity: Vertical



Polarity: Horizontal



Operation Mode: TX / IEEE 802.11a mode / CH High **Test Date:** August 25, 2016
Temperature: 27°C **Tested by:** Dennis Li
Humidity: 53% RH **Polarity:** Ver. / Hor.

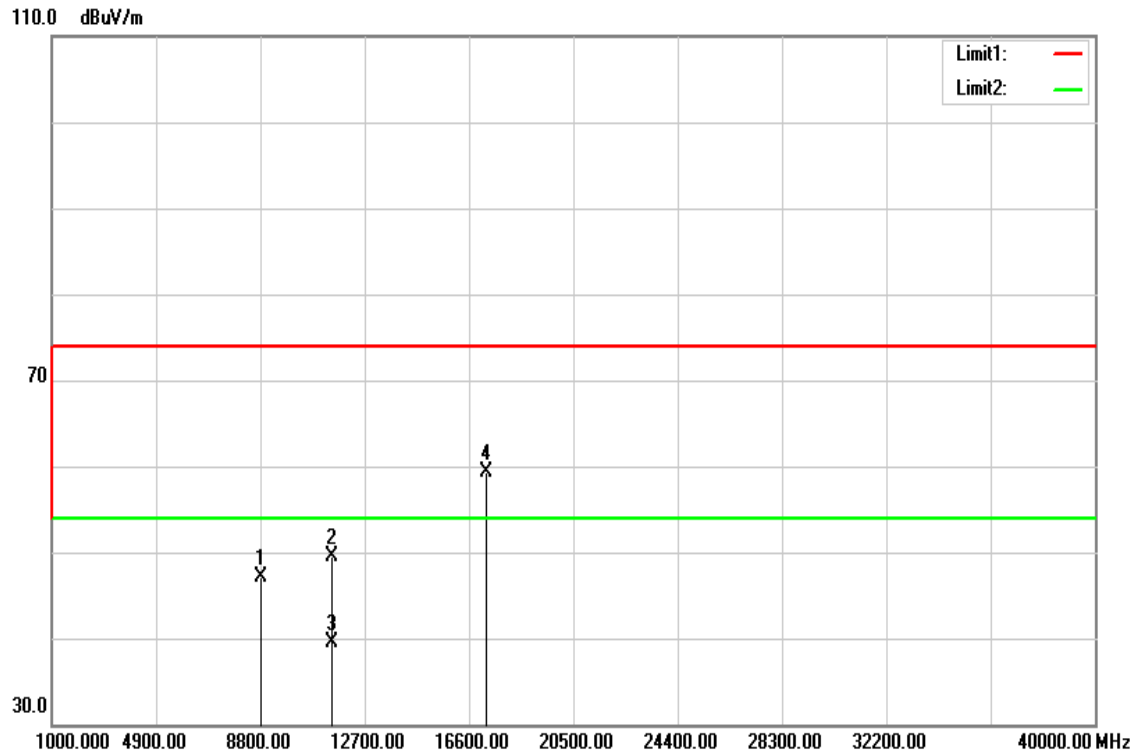
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
8850.000	32.88	13.80	46.68	74.00	-27.32	peak	V
11650.000	34.14	16.91	51.05	74.00	-22.95	peak	V
11650.000	34.14	16.91	51.05	54.00	-2.95	AVG	V
17475.000	32.75	26.22	58.97	74.00	-15.03	peak	V
N/A							
8850.000	32.44	13.80	46.24	74.00	-27.76	peak	H
11650.000	33.59	16.91	50.50	74.00	-23.50	peak	H
11650.000	23.59	16.91	40.50	54.00	-13.50	AVG	H
17475.000	33.41	26.22	59.63	74.00	-14.37	peak	H
N/A							

Remark:

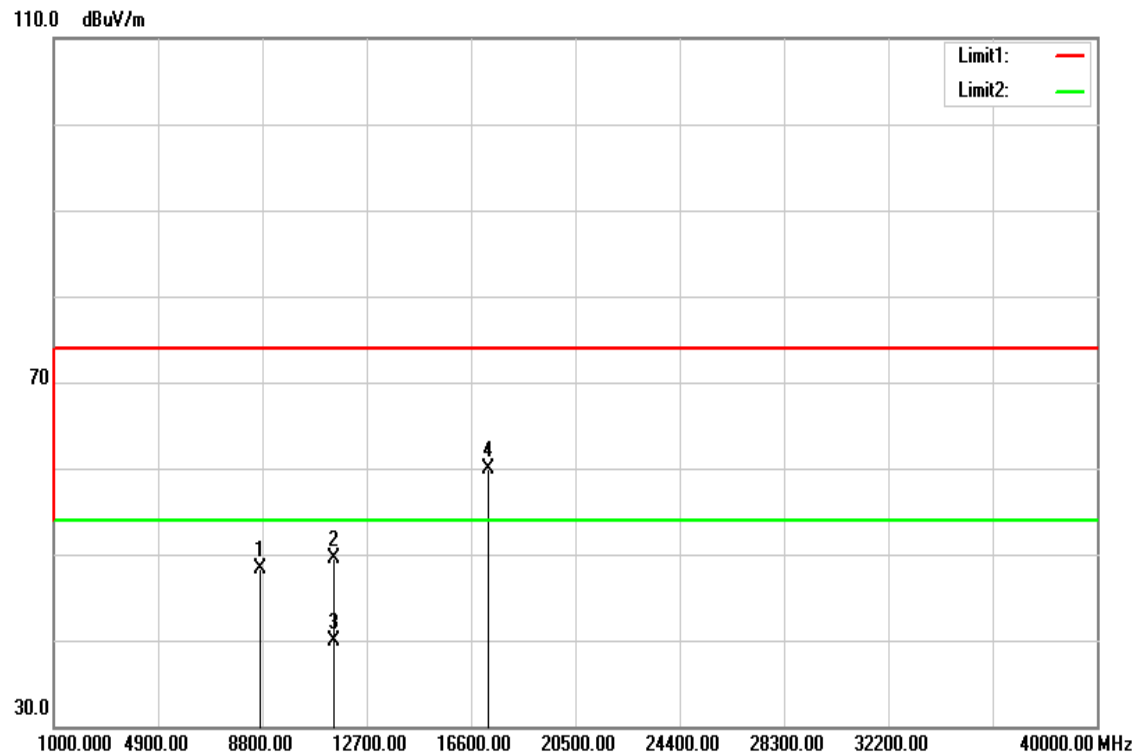
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
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 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

TX / IEEE 802.11n HT 20 MHz mode / CH Low

Polarity: Vertical



Polarity: Horizontal



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH Low **Test Date:** August 25, 2016

Temperature: 27°C

Tested by: Dennis Li

Humidity: 53% RH

Polarity: Ver. / Hor.

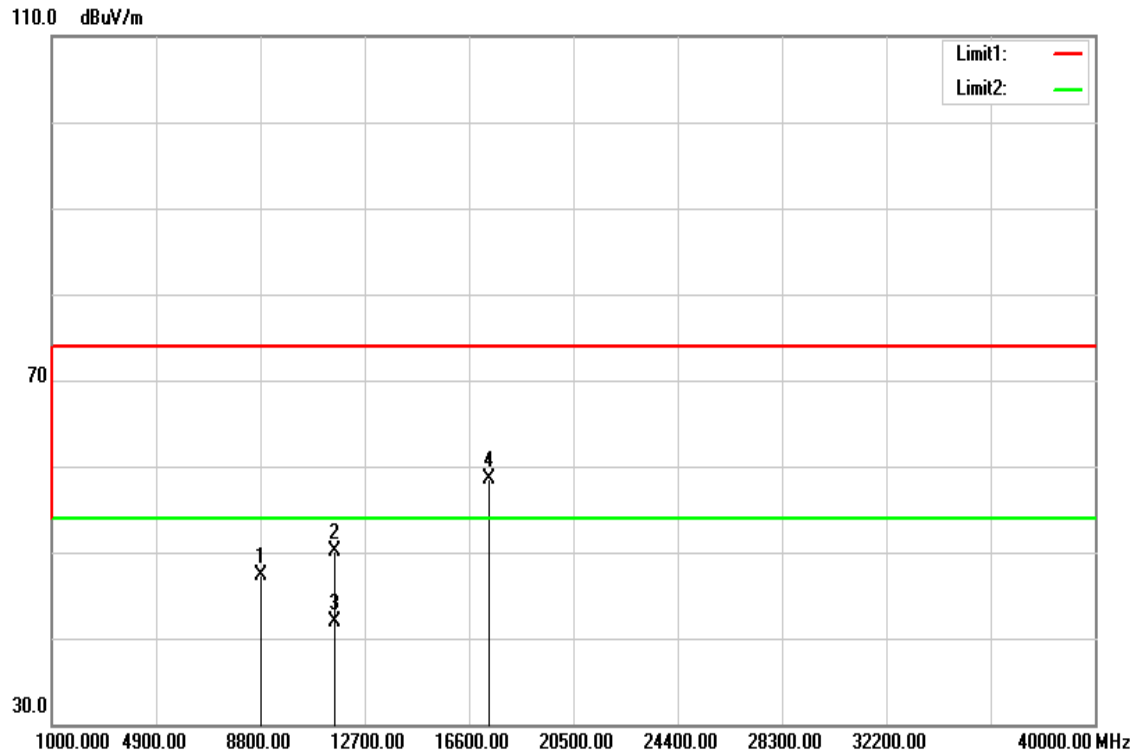
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
8850.000	33.26	13.80	47.06	74.00	-26.94	peak	V
11490.000	32.81	16.78	49.59	74.00	-24.41	peak	V
11490.000	22.79	16.78	39.57	54.00	-14.43	AVG	V
17235.000	33.93	25.28	59.21	74.00	-14.79	peak	V
N/A							
8700.000	34.57	13.73	48.30	74.00	-25.70	peak	H
11490.000	32.67	16.78	49.45	74.00	-24.55	peak	H
11490.000	23.08	16.78	39.86	54.00	-14.14	AVG	H
17235.000	34.63	25.28	59.91	74.00	-14.09	peak	H
N/A							

Remark:

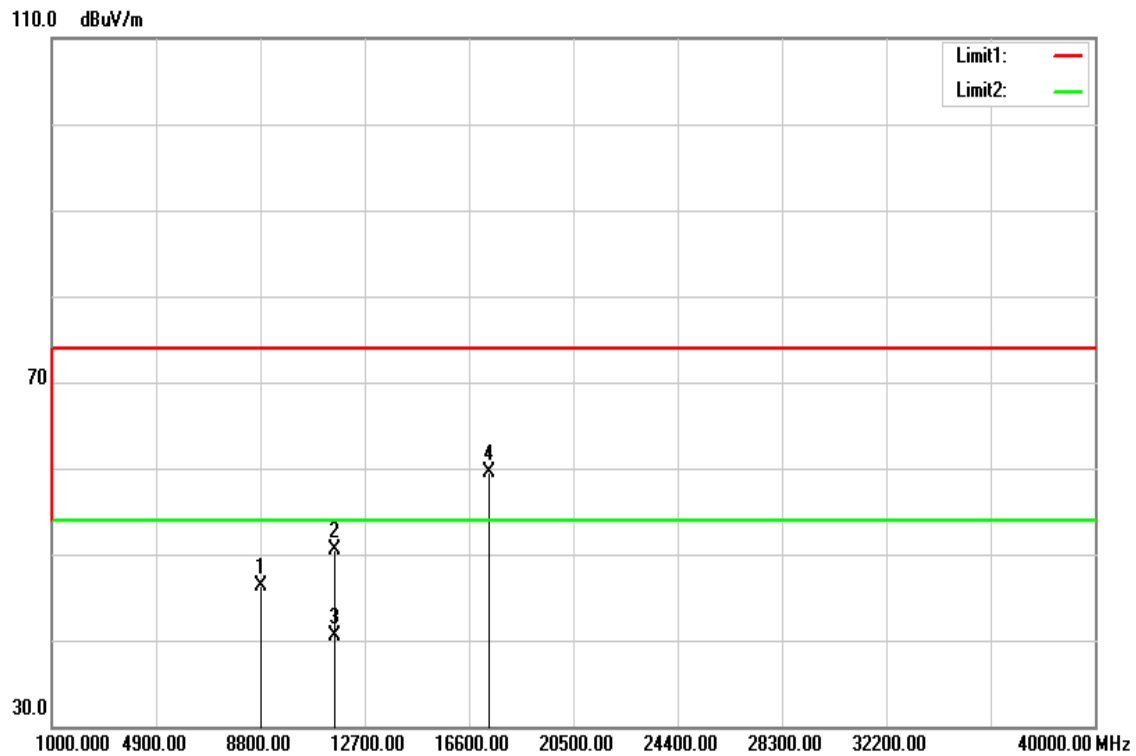
1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
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 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.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

TX / IEEE 802.11n HT 20 MHz mode / CH Mid

Polarity: Vertical



Polarity: Horizontal



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH Mid **Test Date:** August 25, 2016

Temperature: 27°C

Tested by: Dennis Li

Humidity: 53% RH

Polarity: Ver. / Hor.

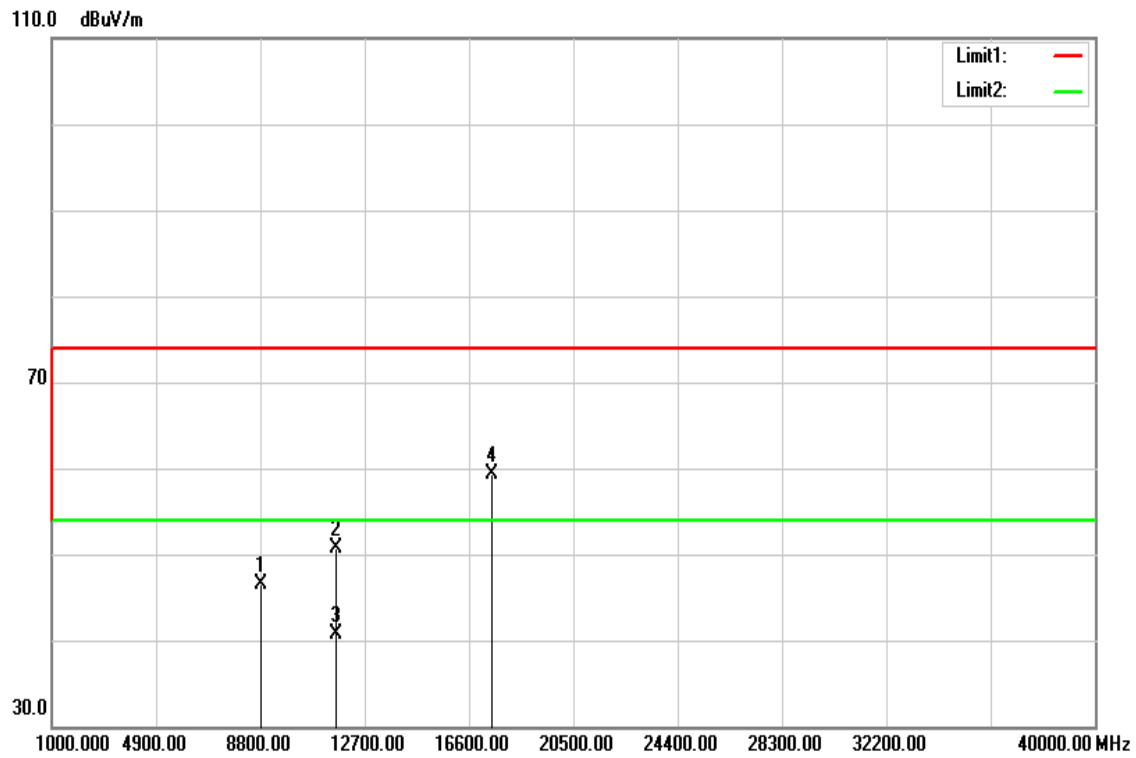
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
8850.000	33.58	13.80	47.38	74.00	-26.62	peak	V
11570.000	33.31	16.84	50.15	74.00	-23.85	peak	V
11570.000	25.12	16.84	41.96	54.00	-12.04	AVG	V
17355.000	32.77	25.75	58.52	74.00	-15.48	peak	V
N/A							
8850.000	32.59	13.80	46.39	74.00	-27.61	peak	H
11570.000	33.65	16.84	50.49	74.00	-23.51	peak	H
11570.000	23.69	16.84	40.53	54.00	-13.47	AVG	H
17355.000	33.73	25.75	59.48	74.00	-14.52	peak	H
N/A							

Remark:

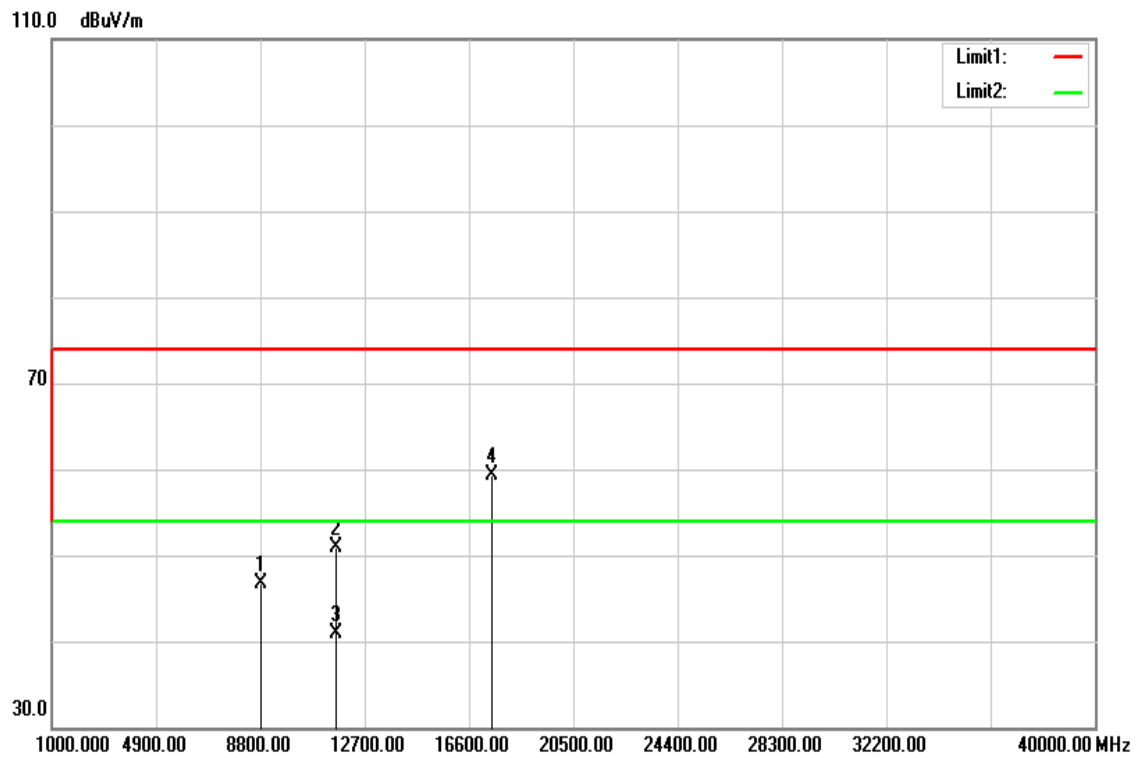
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
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 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

TX / IEEE 802.11n HT 20 MHz mode / CH High

Polarity: Vertical



Polarity: Horizontal



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH High **Test Date:** August 25, 2016

Temperature: 27°C

Tested by: Dennis Li

Humidity: 53% RH

Polarity: Ver. / Hor.

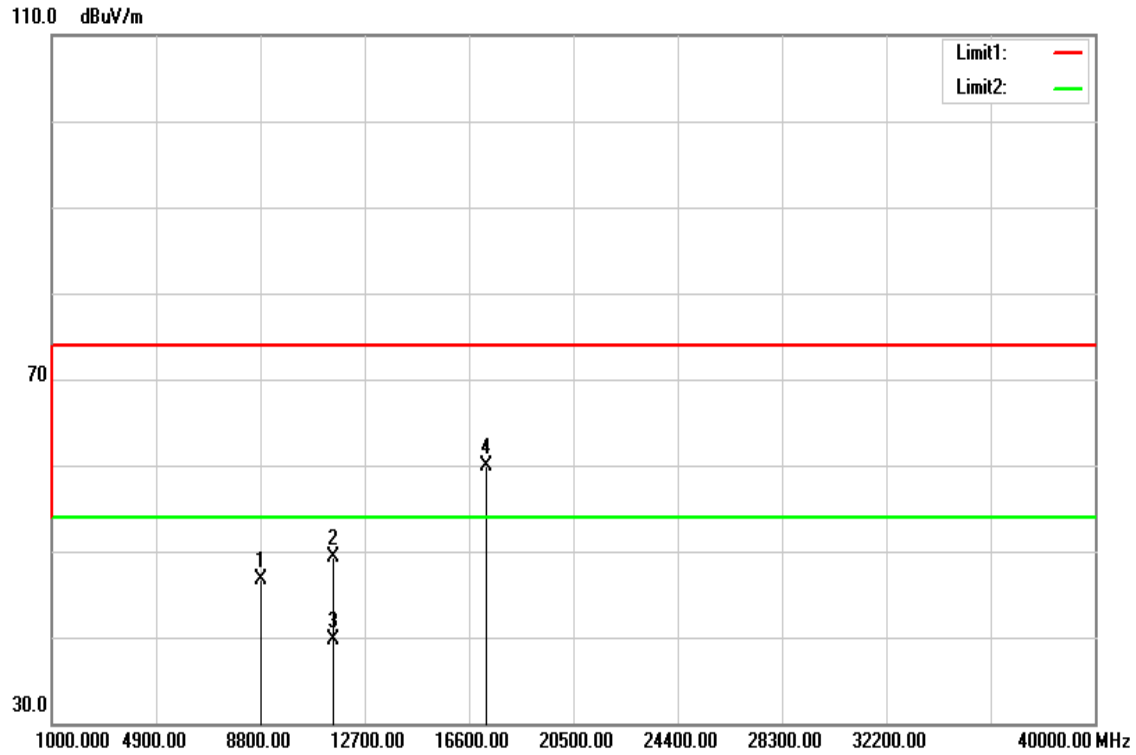
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
8850.000	32.78	13.80	46.58	74.00	-27.42	peak	V
11650.000	33.88	16.91	50.79	74.00	-23.21	peak	V
11650.000	23.89	16.91	40.80	54.00	-13.20	AVG	V
17475.000	33.12	26.22	59.34	74.00	-14.66	peak	V
N/A							
8850.000	32.97	13.80	46.77	74.00	-27.23	peak	H
11650.000	33.91	16.91	50.82	74.00	-23.18	peak	H
11650.000	23.94	16.91	40.85	54.00	-13.15	AVG	H
17475.000	33.16	26.22	59.38	74.00	-14.62	peak	H
N/A							

Remark:

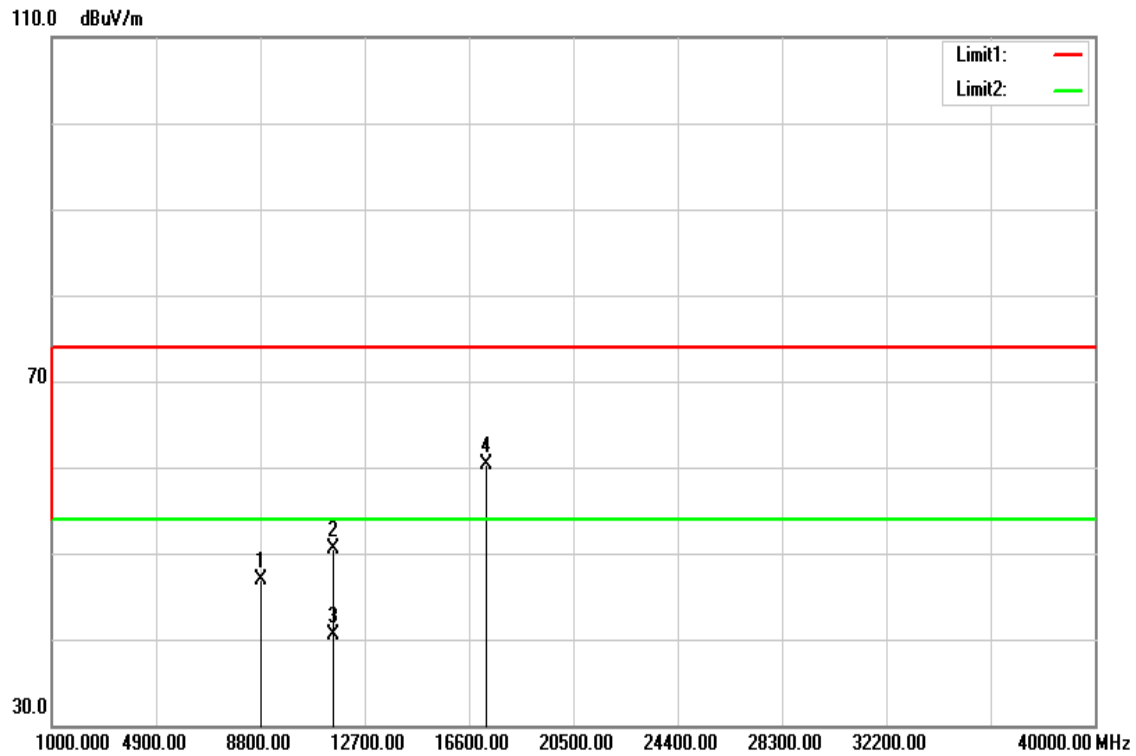
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
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 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

TX / IEEE 802.11n HT 40 MHz mode / CH Low

Polarity: Vertical



Polarity: Horizontal



Operation Mode: TX / IEEE 802.11n HT 40 MHz mode / CH Low **Test Date:** August 25, 2016

Temperature: 27°C

Tested by: Dennis Li

Humidity: 53% RH

Polarity: Ver. / Hor.

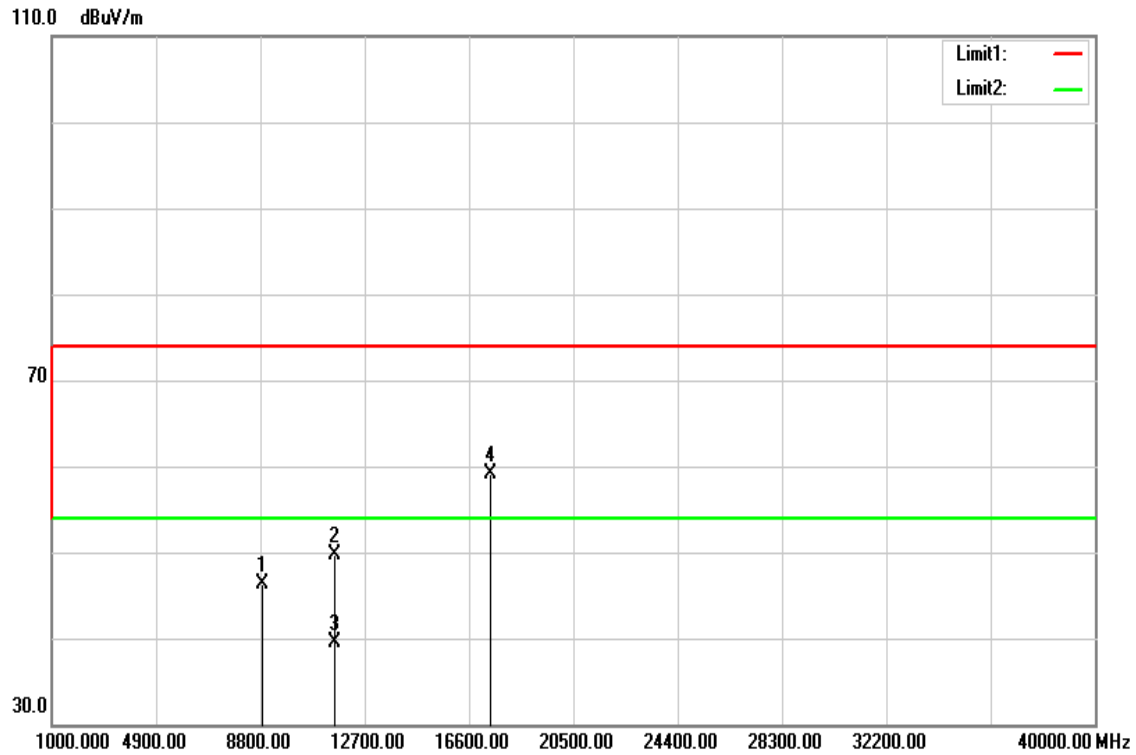
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
8850.000	32.84	13.80	46.64	74.00	-27.36	peak	V
11510.000	32.55	16.79	49.34	74.00	-24.66	peak	V
11510.000	22.96	16.79	39.75	54.00	-14.25	AVG	V
17265.000	34.54	25.40	59.94	74.00	-14.06	peak	V
N/A							
8850.000	33.12	13.80	46.92	74.00	-27.08	peak	H
11510.000	33.62	16.79	50.41	74.00	-23.59	peak	H
11510.000	23.74	16.79	40.53	54.00	-13.47	AVG	H
17265.000	34.83	25.40	60.23	74.00	-13.77	peak	H
N/A							

Remark:

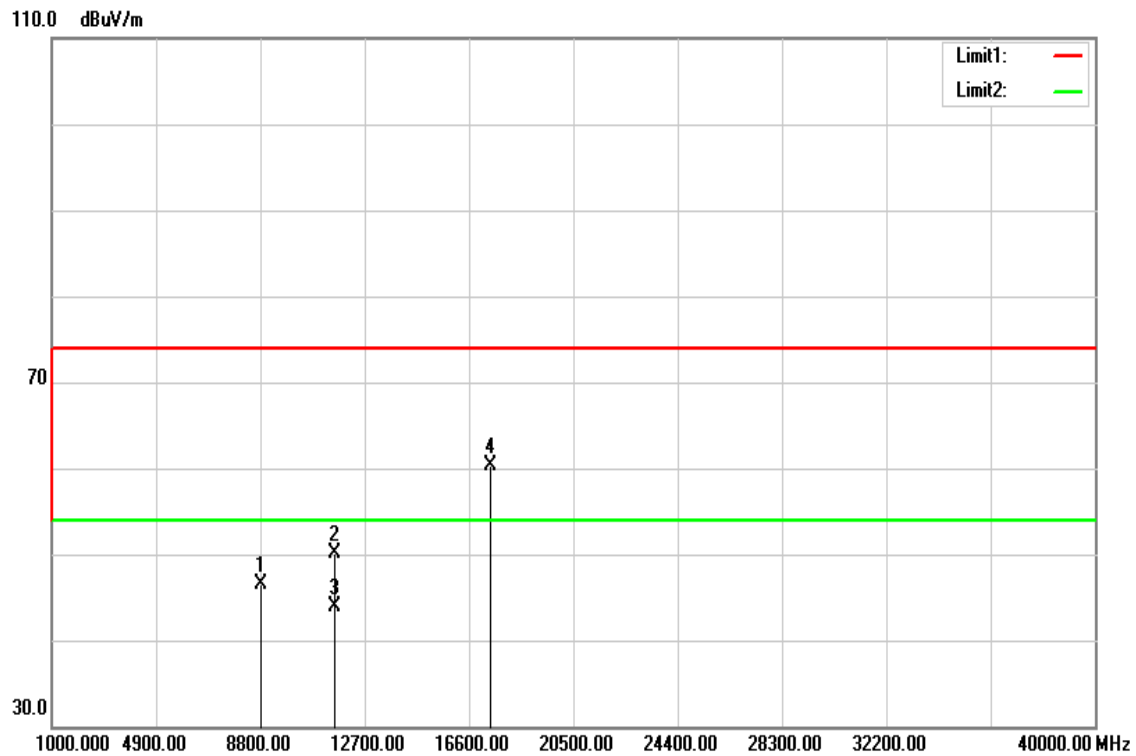
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
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 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

TX / IEEE 802.11n HT 40 MHz mode / CH High

Polarity: Vertical



Polarity: Horizontal



Operation Mode: TX / IEEE 802.11n HT 40 MHz mode / CH High **Test Date:** August 25, 2016

Temperature: 27°C

Tested by: Dennis Li

Humidity: 53% RH

Polarity: Ver. / Hor.

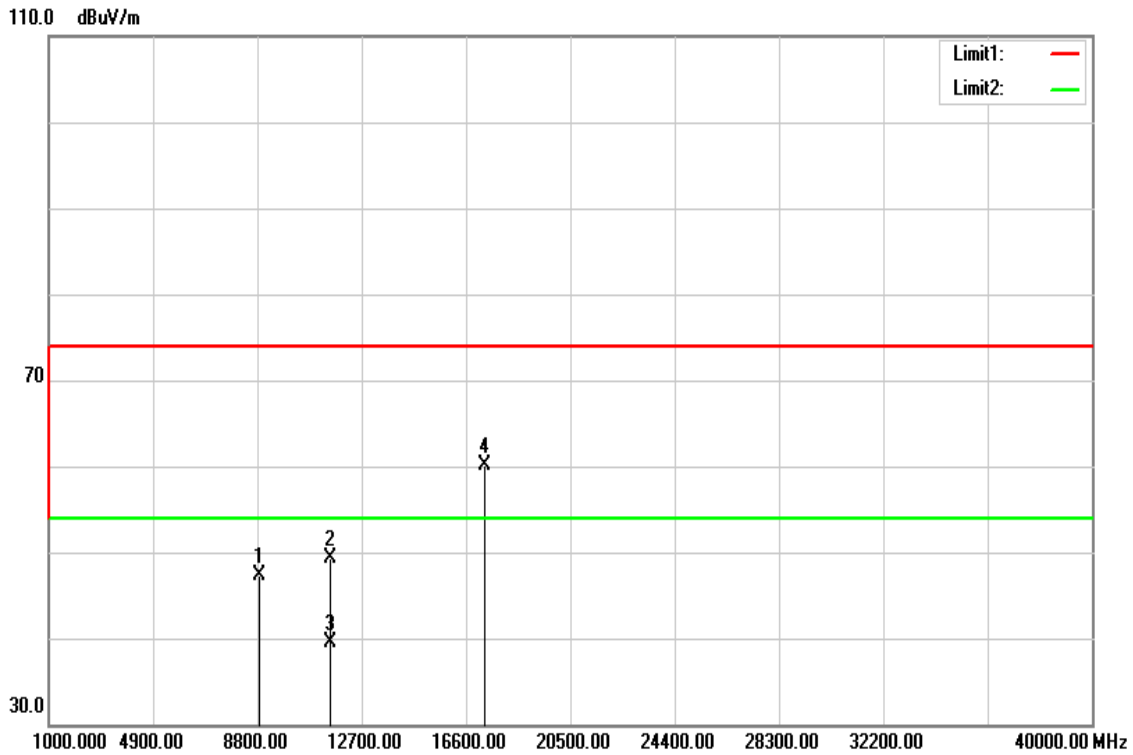
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
8860.000	32.57	13.81	46.38	74.00	-27.62	peak	V
11590.000	32.94	16.86	49.80	74.00	-24.20	peak	V
11590.000	22.59	16.86	39.45	54.00	-14.55	AVG	V
17385.000	33.30	25.87	59.17	74.00	-14.83	peak	V
N/A							
8850.000	32.75	13.80	46.55	74.00	-27.45	peak	H
11590.000	33.20	16.86	50.06	74.00	-23.94	peak	H
11590.000	27.00	16.86	43.86	54.00	-10.14	AVG	H
17385.000	34.36	25.87	60.23	74.00	-13.77	peak	H
N/A							

Remark:

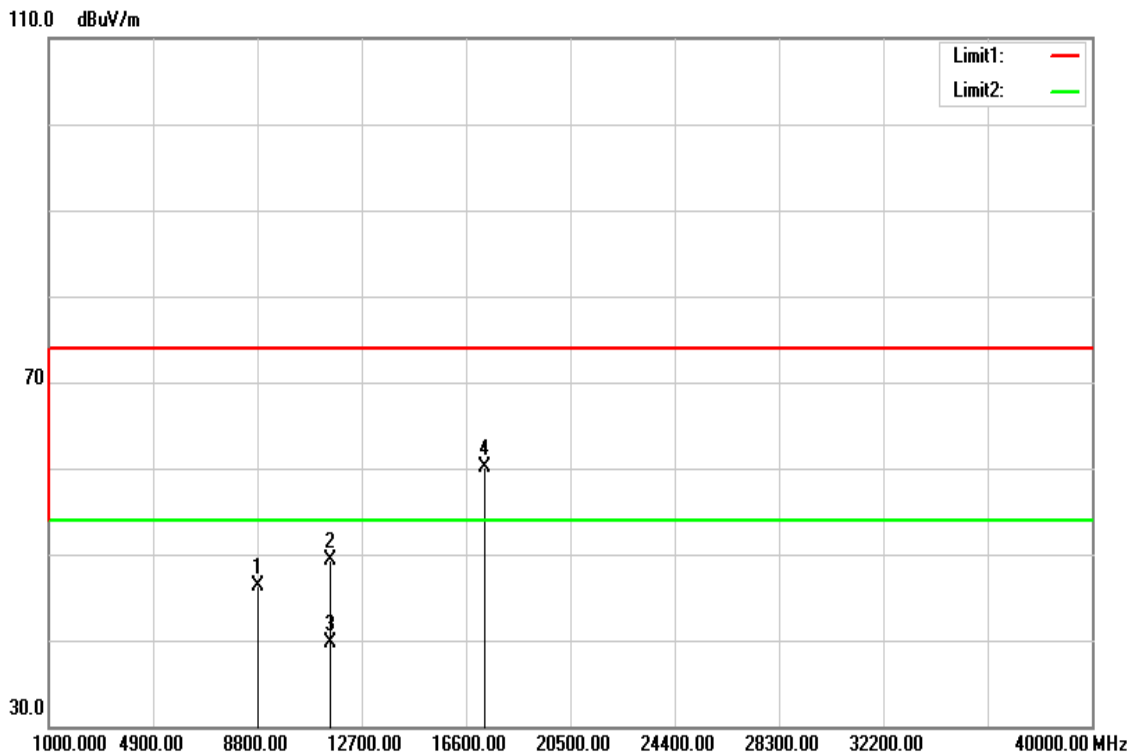
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
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 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Tx / IEEE 802.11ac VHT 80 MHz mode / CH Mid

Polarity: Vertical



Polarity: Horizontal



Operation Mode: Tx / IEEE 802.11ac VHT 80 MHz mode / CH Mid **Test Date:** August 25, 2016

Temperature: 27°C

Tested by: Dennis Li

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
8870.000	33.58	13.81	47.39	74.00	-26.61	peak	V
11550.000	32.53	16.82	49.35	74.00	-24.65	peak	V
11550.000	22.74	16.82	39.56	54.00	-14.44	AVG	V
17325.000	34.43	25.63	60.06	74.00	-13.94	peak	V
N/A							
8850.000	32.47	13.80	46.27	74.00	-27.73	peak	H
11550.000	32.45	16.82	49.27	74.00	-24.73	peak	H
11550.000	22.93	16.82	39.75	54.00	-14.25	AVG	H
17325.000	34.48	25.63	60.11	74.00	-13.89	peak	H
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 or as required by the applicant.
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 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

7.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator 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, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB μ V)	
	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

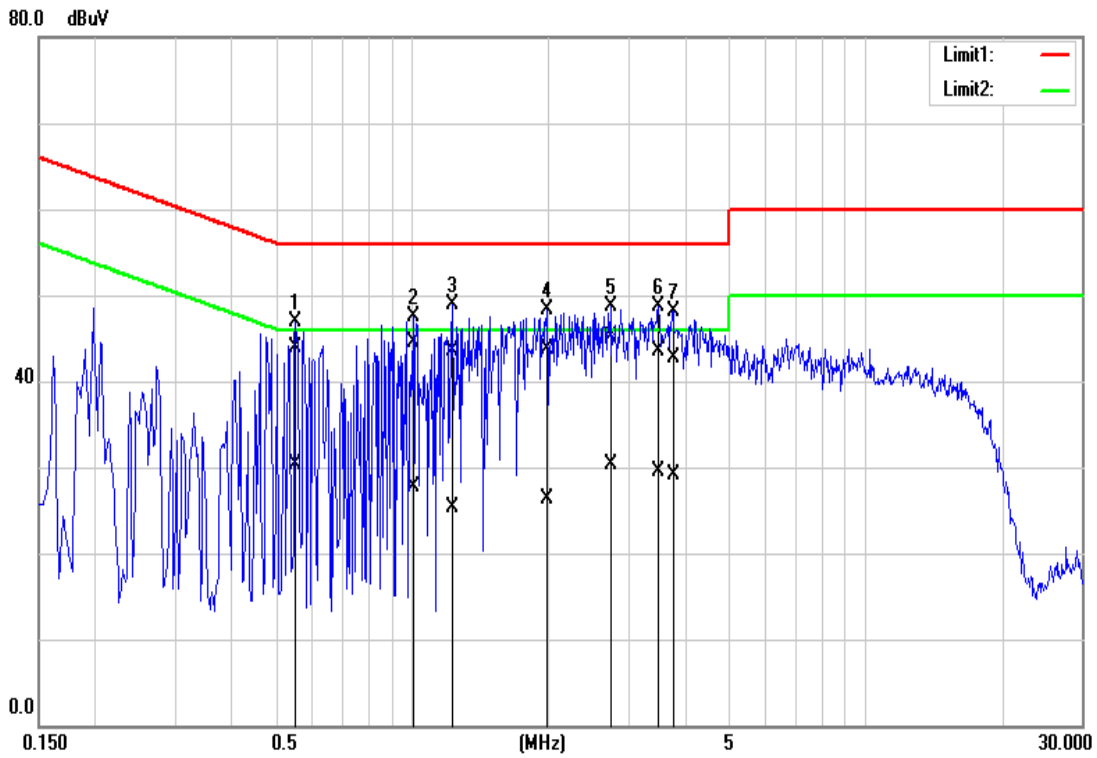
See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

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 Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)

