FCC TEST REPORT

for

DEI Sales Inc. dba Definitive Technology

Home theater with wireless subwoofer

Model Number: W Studio

FCC ID: IPUSTUDIOBAR
IC: 10392A-WSTUDIOBAR

Prepared for : DEI Sales Inc. dba Definitive Technology
Address : 1 Viper Way Vista,CA 92081 USA

Prepared by : Keyway Testing Technology Co., Ltd.
Address : Baishun Industrial Zone, Zhangmutou Town,
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Report No. : 14KWE05145303F
Date of Test : May 11~17, 2014
Date of Report : May 17, 2014

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Keyway Testing Technology Co., Ltd.

Applicant: **Address:**	DEI Sales Inc. dba Definitive Technology 1 Viper Way Vista,CA 92081 USA		
Manufacturer: **Address:**	DEI Sales Inc. dba Definitive Technology 1 Viper Way Vista,CA 92081 USA		
E.U.T:	Home theater with wireless subwoofer		
Model Number:	W Studio		
Trade Name:	Definitive Technology	**Serial No.:**	------
Date of Receipt:	May 10 , 2014	**Date of Test:**	May 11~17 , 2014
Test Specification:	FCC Part 15, Subpart 15.407: Oct. 1, 2013 ANSI C63.4:2009 RSS 210 Issue 8.0:2010		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied. **Issue Date: May 17, 2014**		

Tested by:	Reviewed by:	Approved by:
Andy Gao / Engineer	Jade Yang/ Supervisor	Chris Du / Manager

Other Aspects:
None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

1.TEST SUMMARY

Test Items	Test Requirement	Result
Conducted Emissions	15.207 RSS-GEN, Section 7.2.2	PASS
Radiated Emissions	15.407(b), 15.209 RSS-210, A9.2, A9.4	PASS
26dB bandwidth and 99%dB Bandwidth	15.407 (a) RSS-210, A9.2, A9.4	PASS
Power density	15.407 (a) RSS-210, A9.2	PASS
Maximum Peak Output Power	15.407 (a) RSS-210, A9.2	PASS
Emissions from out of band	15.407 (b) RSS-210, A9.2	PASS
Peak Excursion	15.407 (a)	PASS
Antenna Requirement	15.203	PASS

2.GENERAL PRODUCT INFORMATION

2.1. Product Function

Refer to Technical Construction Form and User Manual.

2.2. Description of Device (EUT)

Product Name:	Home theater with wireless subwoofer
Model No.:	W Studio
Operation Frequency:	2412MHz~2462MHz (802.11b/802.11g/802.11n(H20)) 2422MHz~2452MHz (802.11n(H40)) 5180-5240 MHz; 5745-5805 MHz(5G 802.11a/n(HT20)) 5190-5230 MHz; 5755-5795 MHz(802.11n(HT40)) 2403.5MHz~2477.3MHz
Channel numbers:	11 for 802.11b/802.11g/802.11n(H20) ,7 for 802.11n(H40) 49 Channels for FSK 7channels for 5G 802.11a/n(HT20) 8channels for 802.11n(HT40)
Modulation technology:	Direct Sequence Spread Spectrum (DSSS) for (IEEE 802.11b) Orthogonal Frequency Division Multiplexing(OFDM) for (IEEE 802.11g/802.11n) FSK
Data speed (IEEE 802.11b):	1Mbps, 2Mbps, 5.5Mbps, 11Mbps
Data speed (IEEE 802.11g):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps
Data speed (IEEE 802.11n):	Up to 150Mbps(MCS0~MCS7)
Antenna Type:	Internal
Antenna gain:	3.3dBi for wifi(declare by Applicant) 3.25dBi for FSK
Power supply:	AC 120V/60Hz

2.3. Test Supporting System

Adapter

Manufacturer	:	EDAC
Model No.	:	EA11001B
Input	:	AC 100~240V 2.5A 50-60Hz
Output	:	DC 19-24 5.2A

2.4. Independent Operation Modes

The basic operation modes are:

These is Digital Transmission system (DTS) and have modulation OFDM, DSSS, DBPSK, DQPSK, CCK, 16QAM, 64QAM. According exploratory test, EUT will have maximum output power in those data rate (802.11a/n: MCS0), so those data rate were used for all test. The equipment enables high-speed access without wires to network assets. This adapter uses the IEEE 802.11 protocol to enable wireless communications between the host and Wireless rooter.

For 802.11a/n(HT20):

1.lowest channel : 5180MHz (Channel 36)

2.middle channel : 5200MHz (Channel 40)

3. highest channel : 5240MHz (Channel 48)

For 802.11n(HT40):

4. For lowest channel : 5190MHz (Channel 38)

5. highest channel : 5230MHz (Channel 46)

For 802.11a/n(HT20):

6.lowest channel : 5745MHz (Channel 149)

7. middle channel : 5765MHz (Channel 153)

8. highest channel : 5805MHz (Channel 161)

For 802.11n(HT40):

9. lowest channel : 5755MHz (Channel 151)

10. For highest channel : 5795MHz (Channel 159)

Note: for conducted emission test, we pretest all mode,the worst mode was 802.11a channel 36.
for radiated emissions test, we pretest all mode,the worst mode was 802.11a.
The worst mode's data was recording and show in the test report.

2.5. TEST SITES

2.5.1. Test Facilities

Lab Qualifications : Certificated by Industry Canada
Registration No.: 9868A
Date of registration: December 8, 2011

Certificated by FCC, USA
Registration No.: 370994
Date of registration: February 21, 2012

Certificated by CNAS China
Registration No.: CNAS L5783
Date of registration: August 8, 2012

2.6. List of Test and Measurement Instruments

2.6.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 27,14	Apr. 27,15
Artificial Mains Network	Rohde&Schwarz	ENV216	101315	Apr. 27,14	Apr. 27,15
Artificial Mains Network (AUX)	Rohde&Schwarz	ENV216	101314	Apr. 27,14	Apr. 27,15
RF Cable	FUJIKURA	3D-2W	944 Cable	Apr. 27,14	Apr. 27,15

2.6.2. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 27,14	Apr. 27,15
System Simulator	Agilent	E5515C	GB43130245	Apr. 27,14	Apr. 27,15
Power Splitter	Weinschel	1506A	NW425	Apr. 27,14	Apr. 27,15
Bilog Antenna	ETS-LINDGREEN	3142D	135452	Apr. 27,14	Apr. 27,15
Spectrum Analyzer	Agilent	E4411B	MY4511304	Apr. 27,14	Apr. 27,15
Spectrum Analyzer	R&S	FSV40	132.1.3008K39 -100967	Apr. 27,14	Apr. 27,15
3m Semi-anechoic Chamber	ETS-LINDGREEN	966	KW01	Apr. 27,14	Apr. 27,15
Signal Amplifier	SONOMA	310	187016	Apr. 27,14	Apr. 27,15
Signal Amplifier	Agilent	8449B	3008A00251	Apr. 27,14	Apr. 27,15
RF Cable	IMRO	IMRO-400	966 Cable 1#	N/A	N/A
MULTI-DEVICE Controller	ETS-LINDGREEN	2090	126913	N/A	N/A
Horn Antenna	DAZE	ZN30701	11003	Apr. 27,14	Apr. 27,15
Horn Antenna	SCHWARZBECK	BBHA9170	9170-068	Apr. 27,14	Apr. 27,15
Spectrum Analyzer	Agilent	8593E	3911A04271	Apr. 27,14	Apr. 27,15
Spectrum Analyzer	Agilent	E4408B	MY44211125	Apr. 27,14	Apr. 27,15
Signal Amplifier	DAZE	ZN3380C	11001	Apr. 27,14	Apr. 27,15
High Pass filter	Micro	HPM50111	324216	Apr. 27,14	Apr. 27,15
Filter	COM-MW	ZBSF-C836.5-25-X	KW032	Apr. 27,14	Apr. 27,15
Filter	COM-MW	ZBSF-C1747.5-75-X2	KW035	Apr. 27,14	Apr. 27,15
Filter	COM-MW	ZBSF-C1880-60-X2	KW037	Apr. 27,14	Apr. 27,15
DC Power Supply	LongWei	PS-305D	010964729	Apr. 27,14	Apr. 27,15
Constant temperature and humidity box	GF	GTH-800-40-1P	MAA9906-005	Apr. 27,14	Apr. 27,15
Universal radio communication tester	Rohde&Schwarz	CMU200	3215420	Apr. 27,14	Apr. 27,15
Splitter	Agilent	11636B	0025164	Apr. 27,14	Apr. 27,15

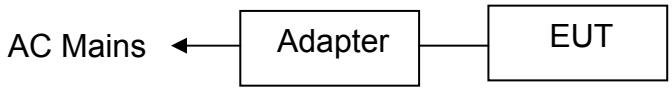
3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(EUT: Home theater with wireless subwoofer)

3.3. Test Operation Mode and Test Software

None.

3.4. Special Accessories and Auxiliary Equipment

None.

3.5. Countermeasures to Achieve EMC Compliance

None.

4. EMISSION TEST RESULTS

4.1. Conducted Emission at the Mains Terminals Test

4.1.1. Limit 15.207 limits

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

4.1.2. Test Setup

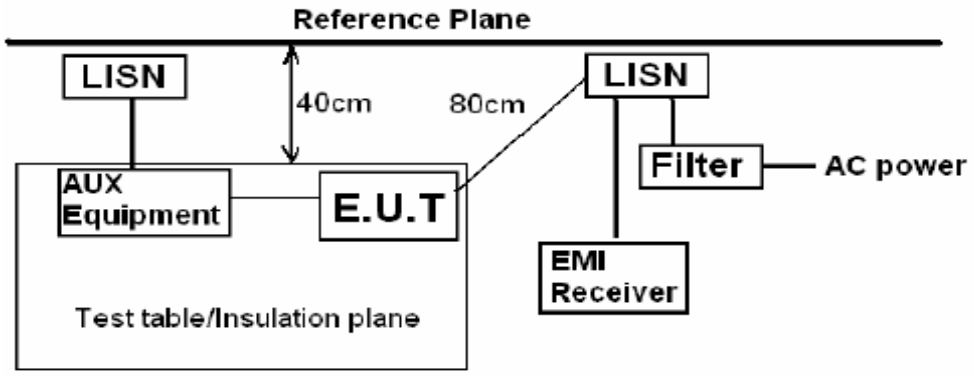
The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 0.8 m, the excess was folded back and forth parallel to the cable at the centre so as to form a bundle no longer than 0.4 m.

The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.

The frequency range from 150 kHz to 30 MHz was investigated.

The bandwidth of the test receiver was set at 9 kHz.

Pretest for all mode, The test data of the worst case condition(s) was reported on the following page.



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

Line

	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dB	
1	0.165	37.05	55.21	-18.16	Average
2	0.165	42.90	65.21	-22.31	QP
3	0.328	35.12	49.50	-14.38	Average
4	0.328	38.93	59.50	-20.57	QP
5	0.979	24.10	46.00	-21.90	Average
6	0.979	32.70	56.00	-23.30	QP

Neutral

	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dB	
1	0.165	38.12	55.21	-17.09	Average
2	0.165	45.63	65.21	-19.58	QP
3	0.336	33.81	49.31	-15.50	Average
4	0.336	39.62	59.31	-19.69	QP
5	0.654	30.24	46.00	-15.76	Average
6	0.654	35.42	56.00	-20.58	QP

4.2. Radiated Emission Test

4.2.1. Limit 15.209 limits

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

4.2.2. Restricted bands of operation

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 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

4.2.3. Test setup

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz, Both PK and AV measure, PK detector is used.

The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

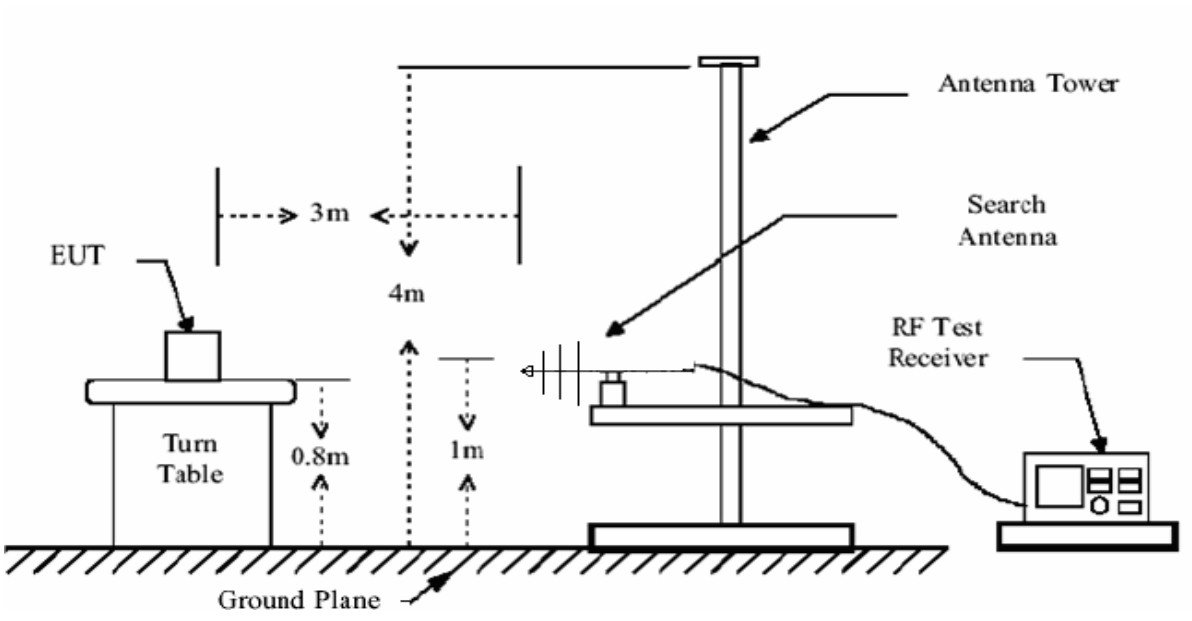
Notes: 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading-Preamp Factor.

2. Measurement Uncertainty: ±3.2 dB at a level of confidence of 95%.

3. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

4. For emissions below 1GHz, pretest for all mode, The test data of the worst case condition(s) was reported on the following pages.

5. For Both PK and AV value above 1GHz, PK detector is used.



Below 1GHz

Horizontal

		Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
		MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1		88.20	31.35	58.70	0.94	8.90	37.19	43.50	-6.31	QP
2	!	102.75	31.35	59.94	1.03	9.52	39.14	43.50	-4.36	QP
3	!	175.50	31.17	58.80	1.39	10.27	39.29	43.50	-4.21	QP
4	!	267.65	30.95	57.74	1.78	12.97	41.54	46.00	-4.46	QP
5	!	529.55	30.74	50.46	2.94	19.25	41.91	46.00	-4.09	QP
6	!	701.24	30.67	44.92	3.88	21.93	40.06	46.00	-5.94	QP

Vertical

		Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
		MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1		102.75	31.35	58.10	1.03	9.52	37.30	43.50	-6.20	QP
2	!	175.50	31.17	58.02	1.39	10.27	38.51	43.50	-4.99	QP
3	!	212.36	31.06	57.47	1.53	11.59	39.53	43.50	-3.97	QP
4	!	284.14	30.94	56.27	1.87	13.29	40.49	46.00	-5.51	QP
5		553.80	30.89	47.12	3.12	19.55	38.90	46.00	-7.10	QP
6	!	677.96	30.75	46.75	3.80	21.99	41.79	46.00	-4.21	QP

Above 1GHz
802.11a TX Channel 36
Horizontal

	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	10360.00	28.84	15.23	17.04	38.99	42.42	74.00	-31.58	Peak
2	12050.00	29.01	15.84	17.41	39.41	43.65	74.00	-30.35	Peak
3	13665.00	29.33	11.44	18.98	43.17	44.26	74.00	-29.74	Peak
4	14311.00	29.45	12.34	19.56	41.70	44.15	74.00	-29.85	Peak
5	16334.00	29.84	11.33	20.86	42.37	44.72	74.00	-29.28	Peak
6	16725.00	29.99	10.15	21.13	43.94	45.23	74.00	-28.77	Peak

Vertical

	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	10360.00	28.84	16.23	17.04	38.99	43.42	74.00	-30.58	Peak
2	12254.00	29.05	14.26	17.58	39.45	42.24	74.00	-31.76	Peak
3	13614.00	29.32	10.33	18.92	43.12	43.05	74.00	-30.95	Peak
4	14022.00	29.40	12.30	19.38	43.40	45.68	74.00	-28.32	Peak
5	14753.00	29.51	13.11	19.84	39.55	42.99	74.00	-31.01	Peak
6	17014.00	30.11	11.25	21.33	44.63	47.10	74.00	-26.90	Peak

802.11a TX Channel 40
Horizontal

	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	10401.00	28.84	14.17	17.04	39.04	41.41	74.00	-32.59	Peak
2	11489.00	28.95	14.70	17.26	39.89	42.90	74.00	-31.10	Peak
3	12934.00	29.19	13.96	18.15	40.54	43.46	74.00	-30.54	Peak
4	14073.00	29.41	9.73	19.41	43.10	42.83	74.00	-31.17	Peak
5	15161.00	29.57	15.75	20.10	38.47	44.75	74.00	-29.25	Peak
6	15739.00	29.66	15.98	20.47	39.32	46.11	74.00	-27.89	Peak

Vertical

	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	10401.00	28.84	15.00	17.04	39.04	42.24	74.00	-31.76	Peak
2	11676.00	28.97	15.04	17.30	39.73	43.10	74.00	-30.90	Peak
3	12305.00	29.06	14.42	17.62	39.46	42.44	74.00	-31.56	Peak
4	13019.00	29.20	12.02	18.24	40.78	41.84	74.00	-32.16	Peak
5	14090.00	29.41	9.99	19.43	43.00	43.01	74.00	-30.99	Peak
6	15348.00	29.60	14.96	20.23	38.43	44.02	74.00	-29.98	Peak

802.11a TX Channel 48
Horizontal

	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	10480.00	28.85	13.96	17.06	39.17	41.34	74.00	-32.66	Peak
2	11438.00	28.94	15.33	17.25	39.85	43.49	74.00	-30.51	Peak
3	12645.00	29.13	16.65	17.91	39.86	45.29	74.00	-28.71	Peak
4	14022.00	29.40	12.30	19.38	43.40	45.68	74.00	-28.32	Peak
5	15195.00	29.58	16.73	20.12	38.46	45.73	74.00	-28.27	Peak
6	15552.00	29.63	15.63	20.35	38.60	44.95	74.00	-29.05	Peak

Vertical

	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	10480.00	28.85	15.96	17.06	39.17	43.34	74.00	-30.66	Peak
2	11472.00	28.95	16.60	17.26	39.87	44.78	74.00	-29.22	Peak
3	12441.00	29.09	15.39	17.74	39.49	43.53	74.00	-30.47	Peak
4	13903.00	29.38	11.55	19.24	43.40	44.81	74.00	-29.19	Peak
5	14736.00	29.51	14.17	19.83	39.62	44.11	74.00	-29.89	Peak
6	15807.00	29.67	13.62	20.51	39.58	44.04	74.00	-29.96	Peak

5. BAND EDGE COMPLIANCE TEST

5.1. Limits

Band 5.15-5.25GHz:

FCC: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

IC: Emissions outside the band 5150-5250 MHz shall not exceed -27 dBm/MHz e.i.r.p.

Band 5.725-5.825GHz:

FCC: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.

IC: For the band 5725-5825 MHz, emissions within the frequency range from the band edges to 10 MHz above or below the band edges shall not exceed -17 dBm/MHz e.i.r.p. For frequencies more than 10 MHz above or below the band edges, emissions shall not exceed -27 dBm/MHz.

5.2. Test setup

Test method: FCC KDB 789033 G)& Parts 15.407(b)(4) & 15.209(a)

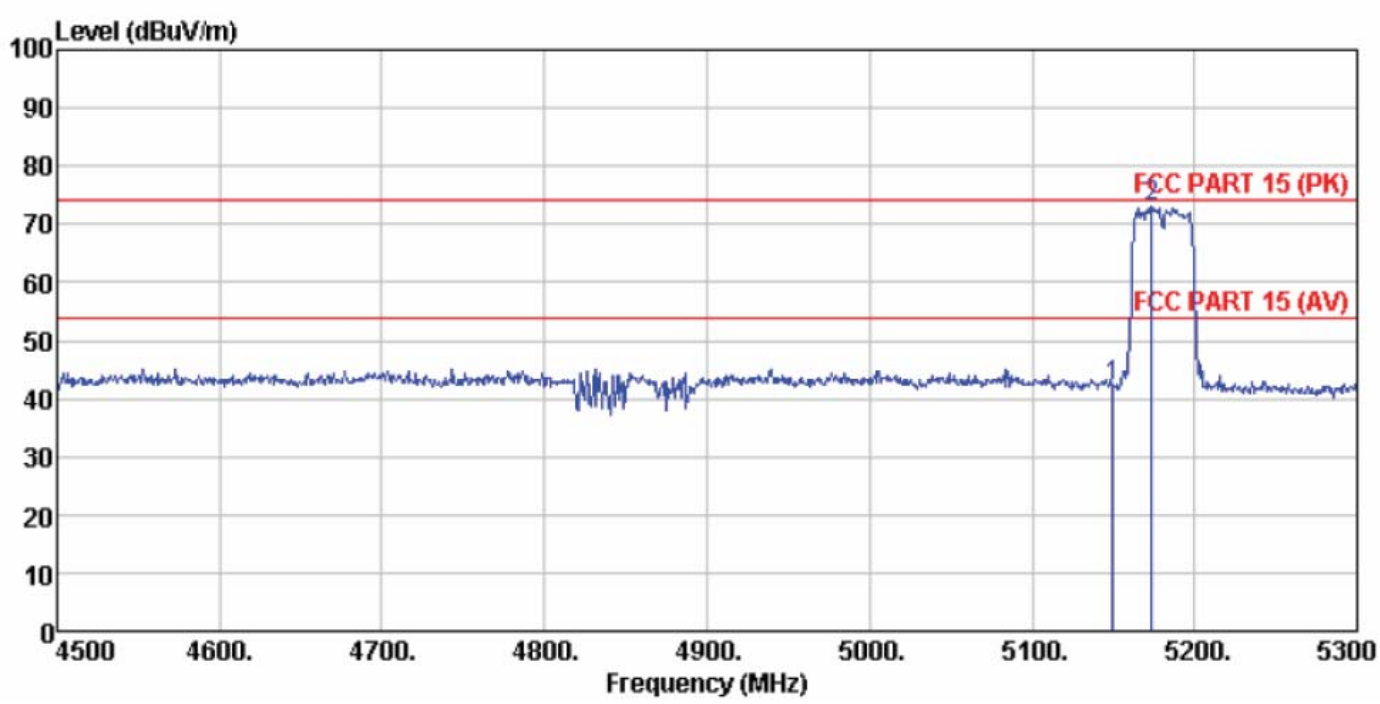
Same as Clause 4.2.

5.3. Test Data

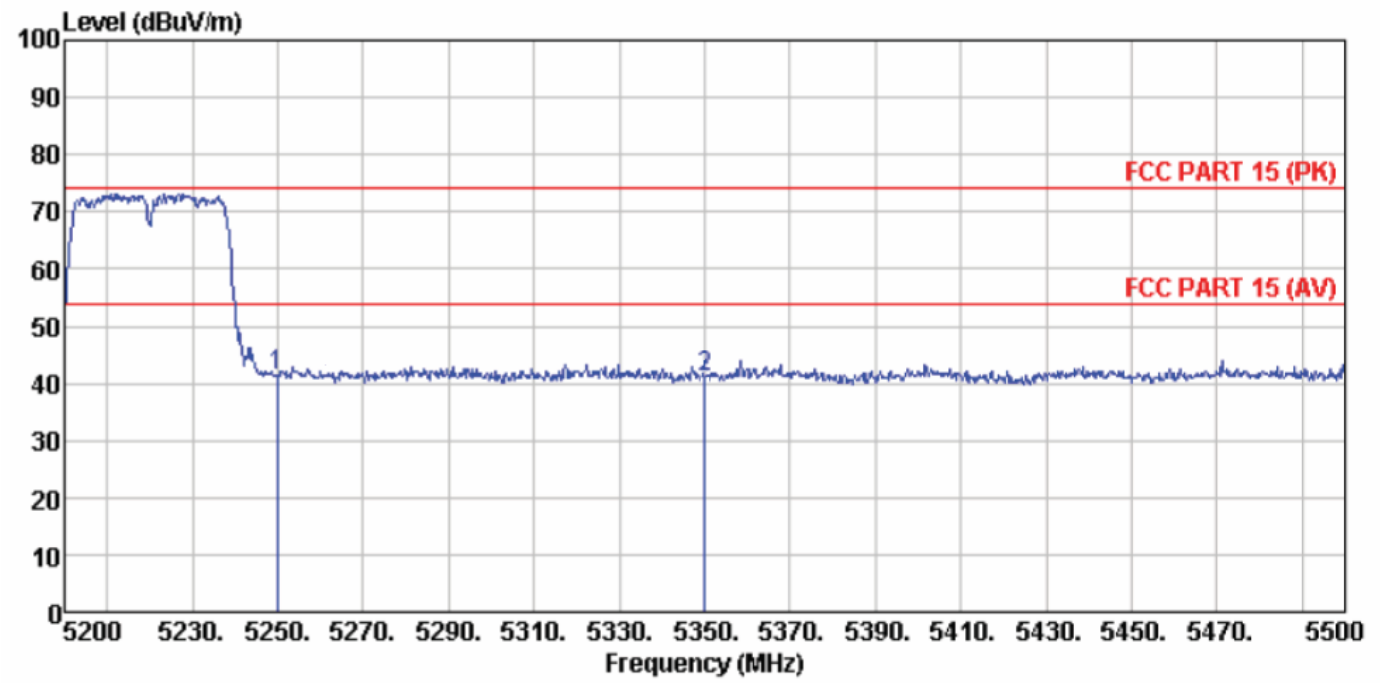
Please see data as below:

Note: we pretest horizontal and vertical, the worst was horizontal and show in the report.

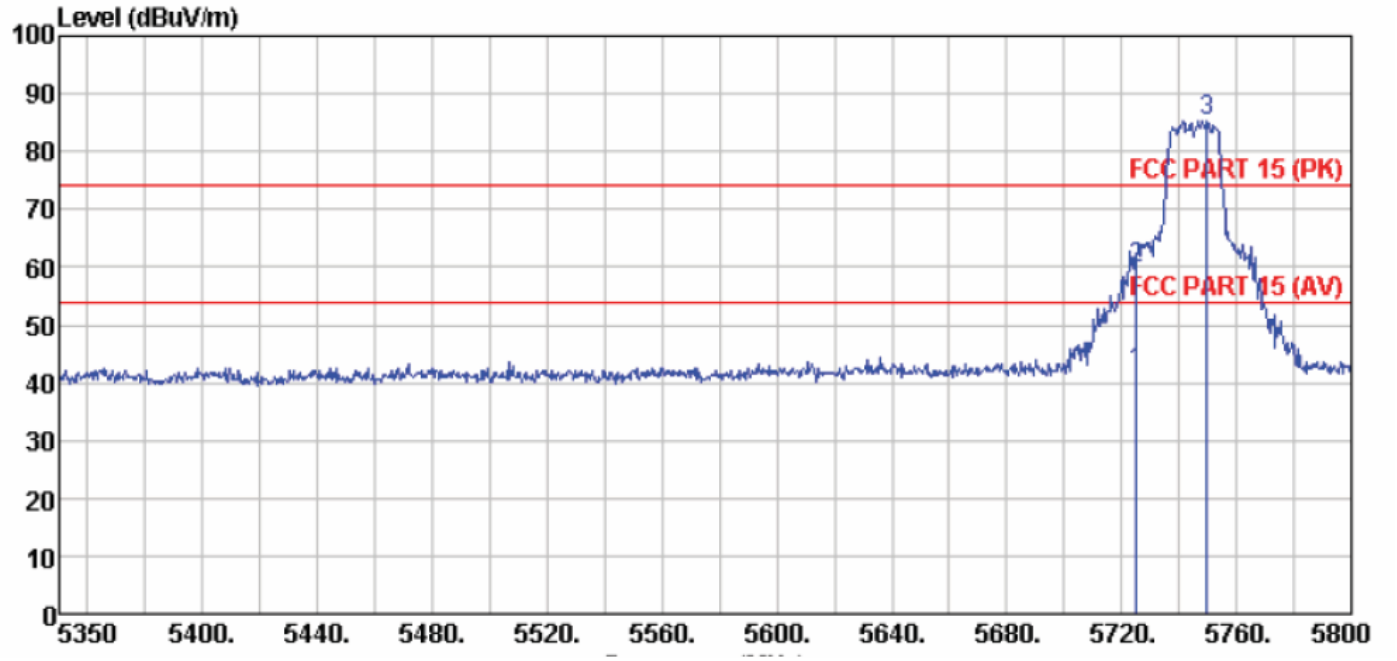
802.11a



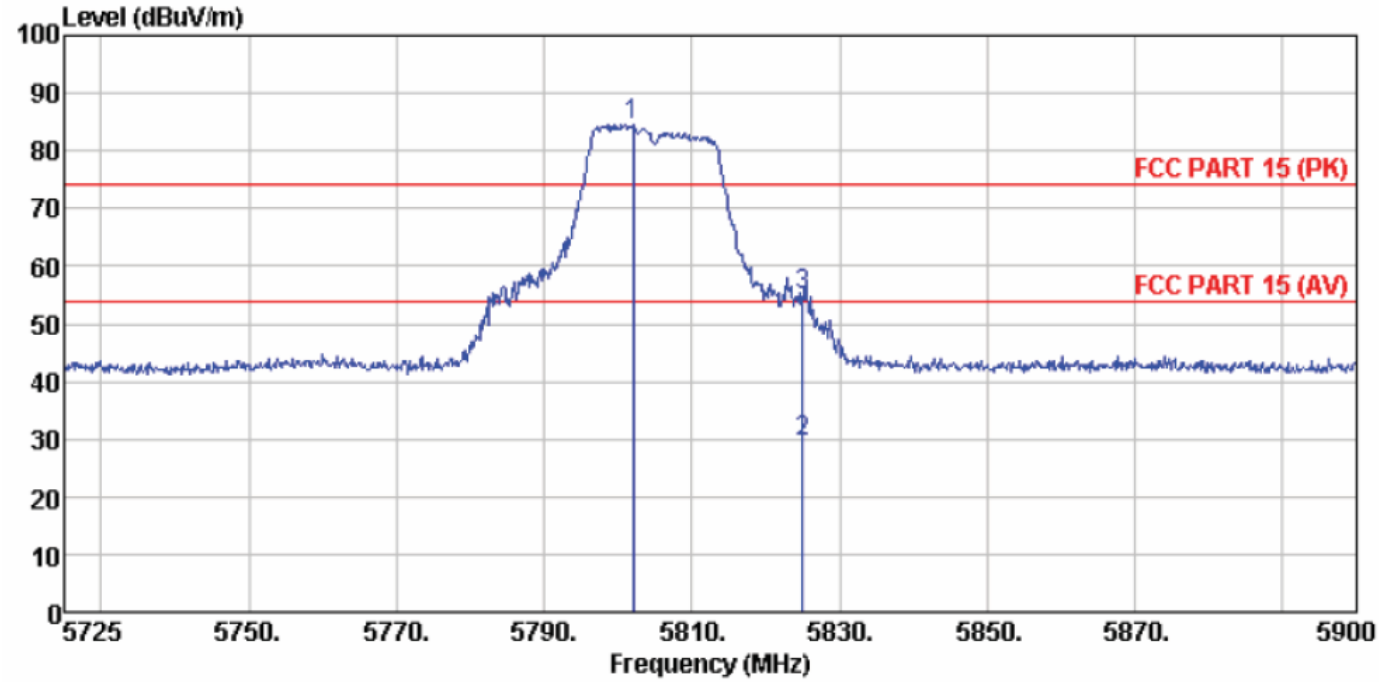
Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E[dBμV/m]=42.10 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=42.10-95.2= -53.10dBm the limit is -27dBm/MHz



Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E1 [dBμV/m]=41.37dBμV/m, E2 [dBμV/m]=40.53dBμV/m,
EIRP1[dBm] = E1[dBμV/m] - 95.2=41.37-95.2= -53.83dBm, the limit is -27dBm/MHz
EIRP2[dBm] = E2[dBμV/m] - 95.2=40.53-95.2= -54.67dBm, the limit is -27dBm/MHz

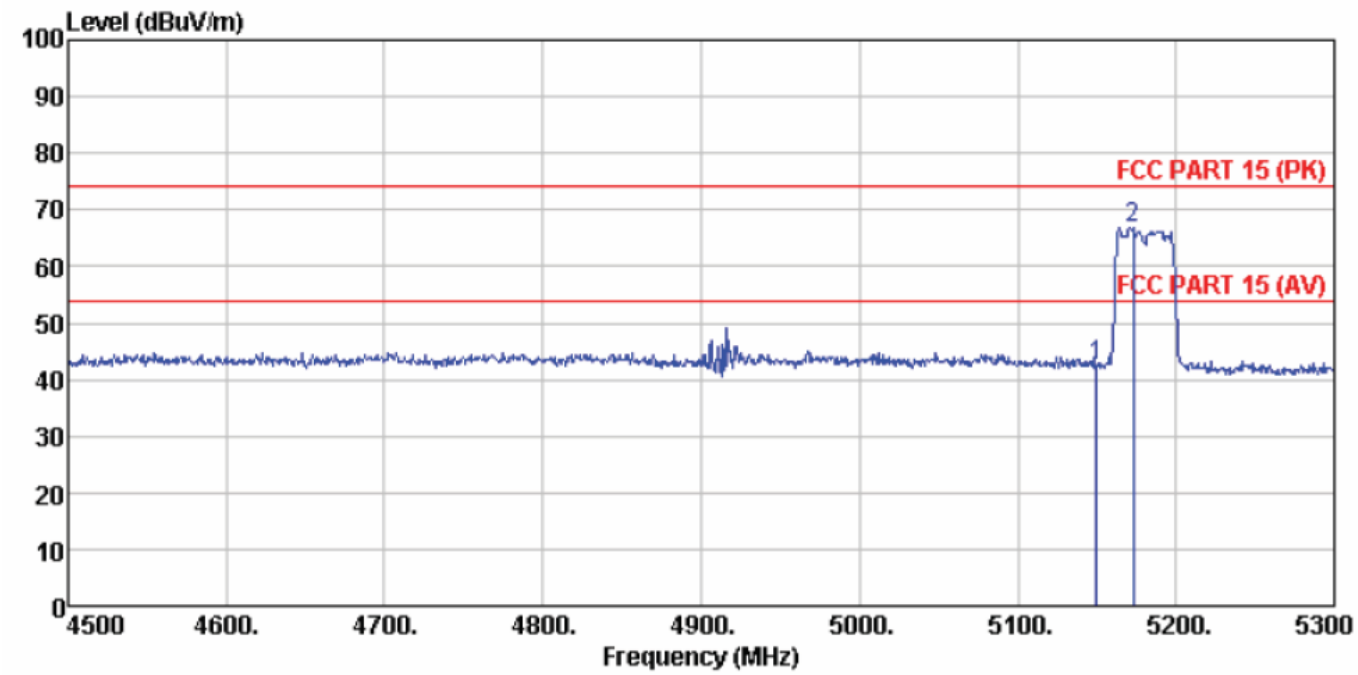


Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E[dBμV/m]=61.67 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=61.67-95.2= -33.53dBm the limit is -27dBm/MHz

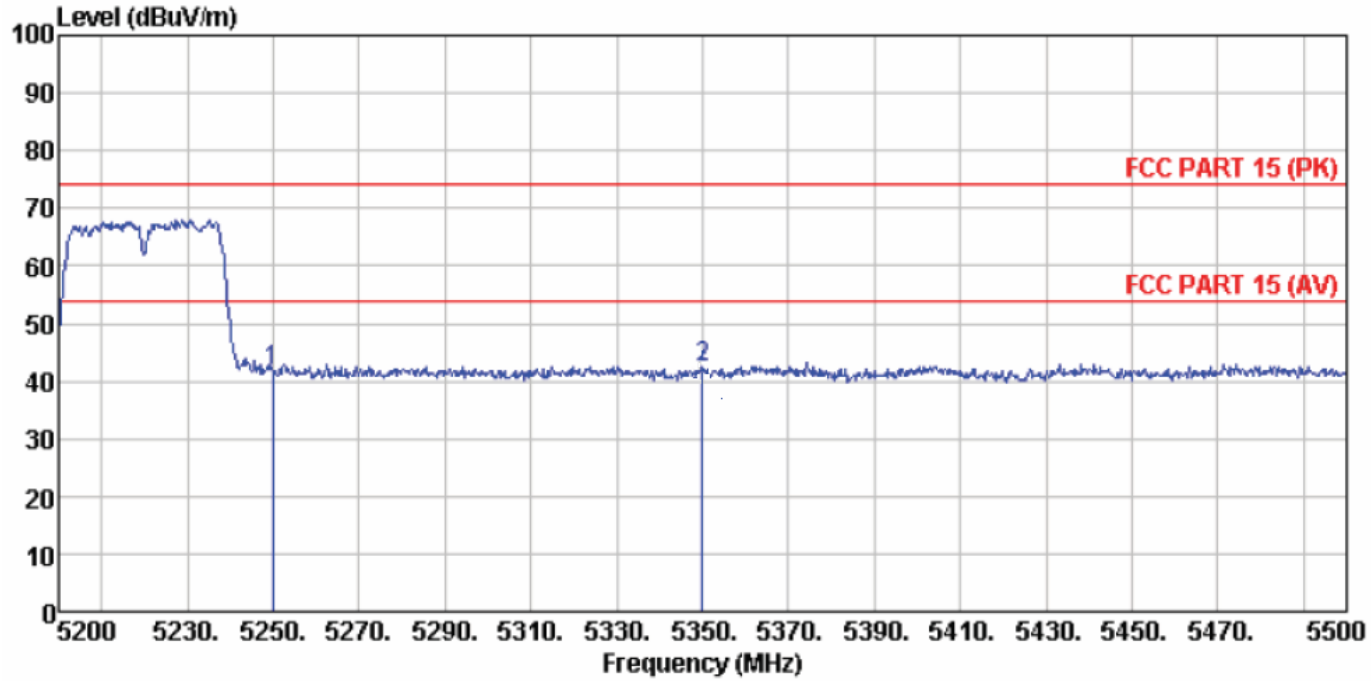


Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E[dBμV/m]=54.92 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=54.92-95.2= -40.28dBm the limit is -27dBm/MHz

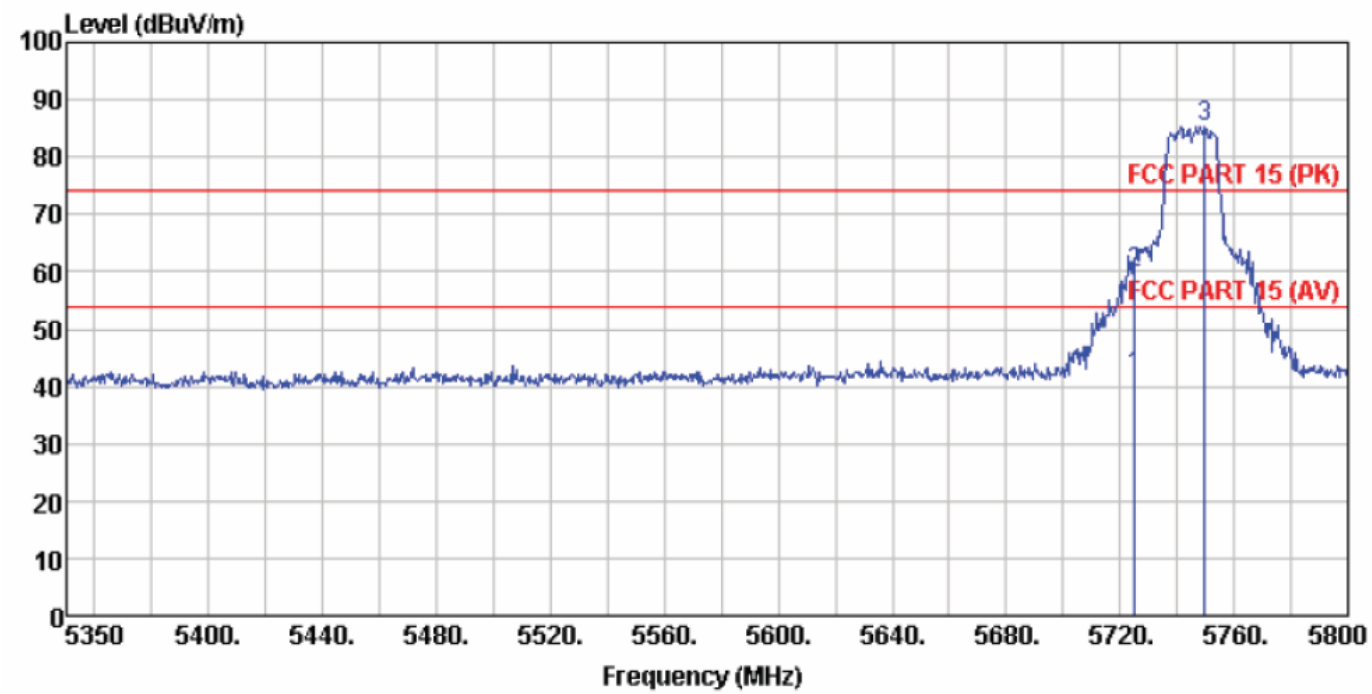
802.11n(HT20)



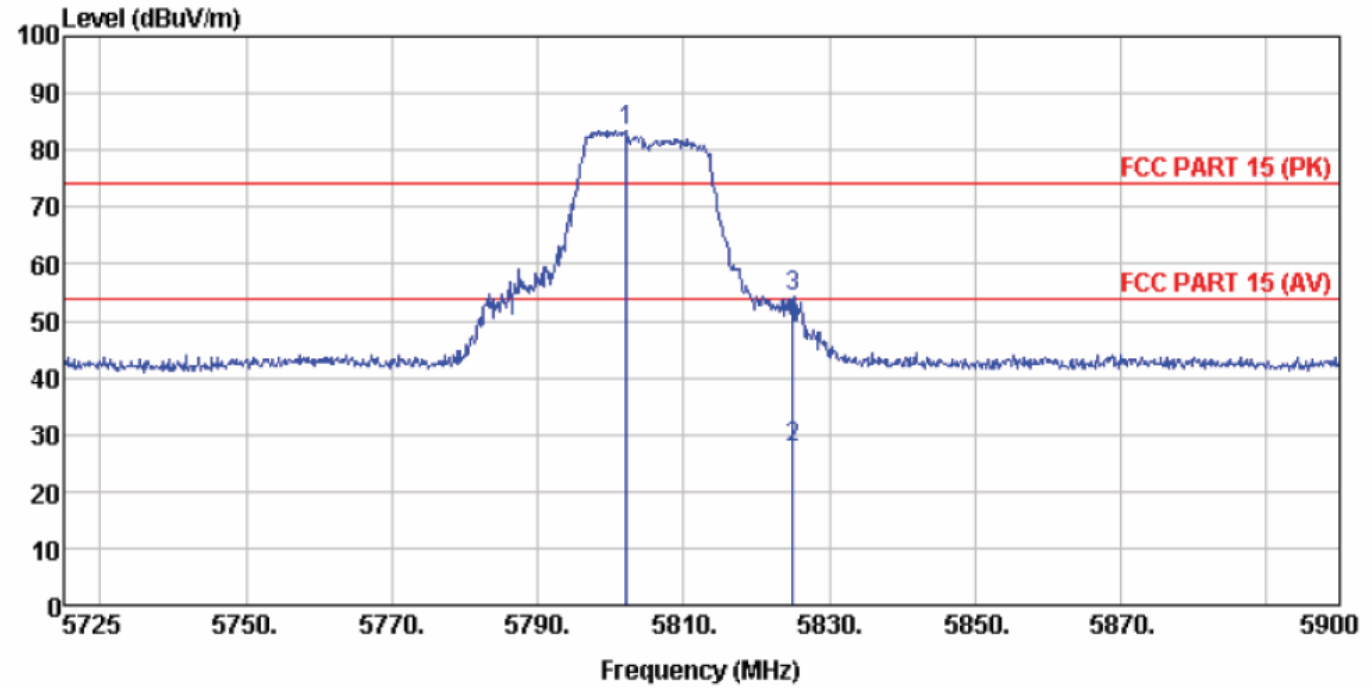
Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E[dBμV/m]=41.89 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=41.89-95.2= -53.31dBm the limit is -27dBm/MHz



Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E1 [dBμV/m]=41.52dBμV/m, E2 [dBμV/m]=41.24dBμV/m,
EIRP1[dBm] = E1[dBμV/m] - 95.2=41.52-95.2= -53.68dBm, the limit is -27dBm/MHz
EIRP2[dBm] = E2[dBμV/m] - 95.2=41.24-95.2= -53.96dBm, the limit is -27dBm/MHz

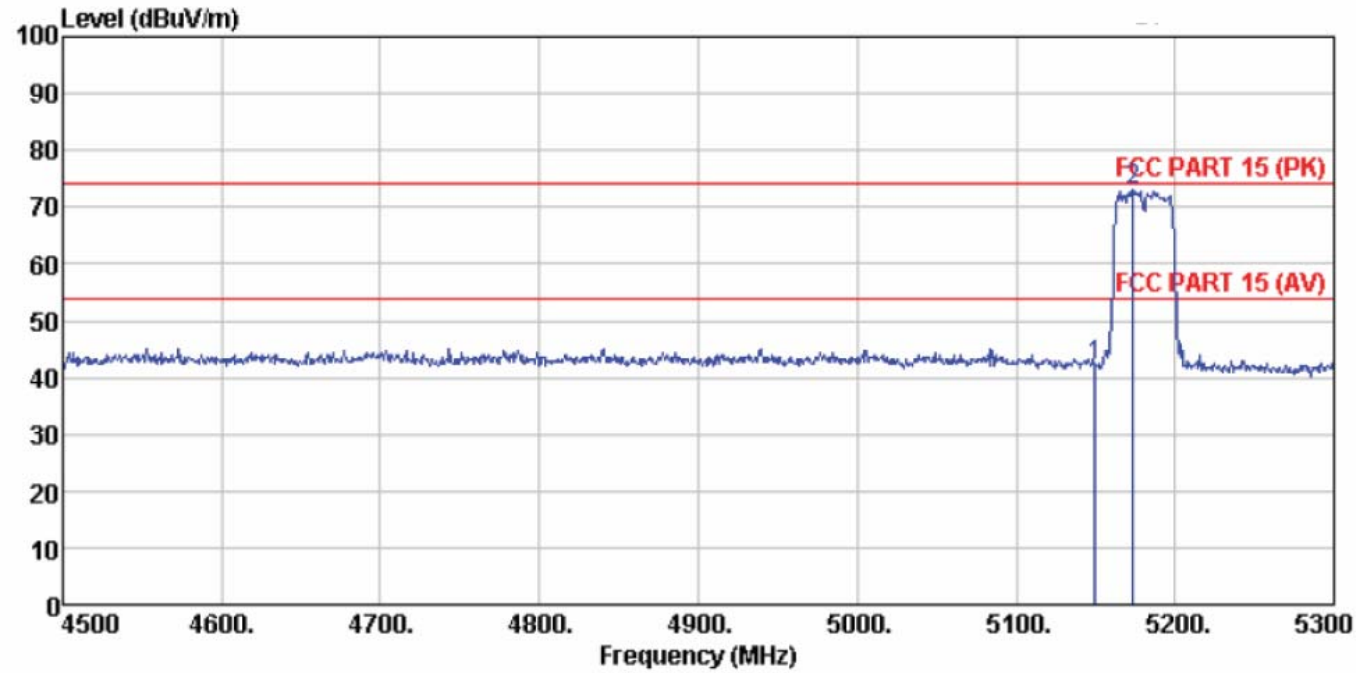


Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E[dBμV/m]=59.82 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=59.82-95.2= -35.38dBm the limit is -27dBm/MHz

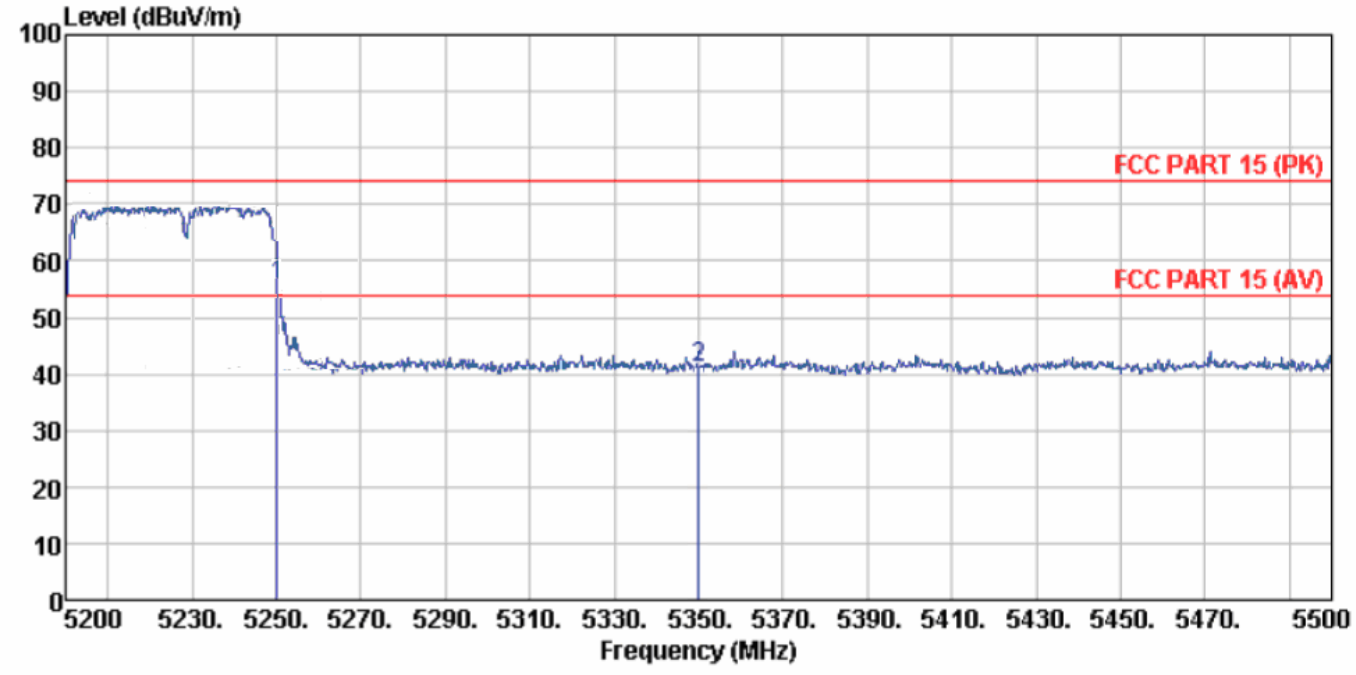


Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E[dBμV/m]=51.38dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=51.38-95.2= -43.82dBm the limit is -27dBm/MHz

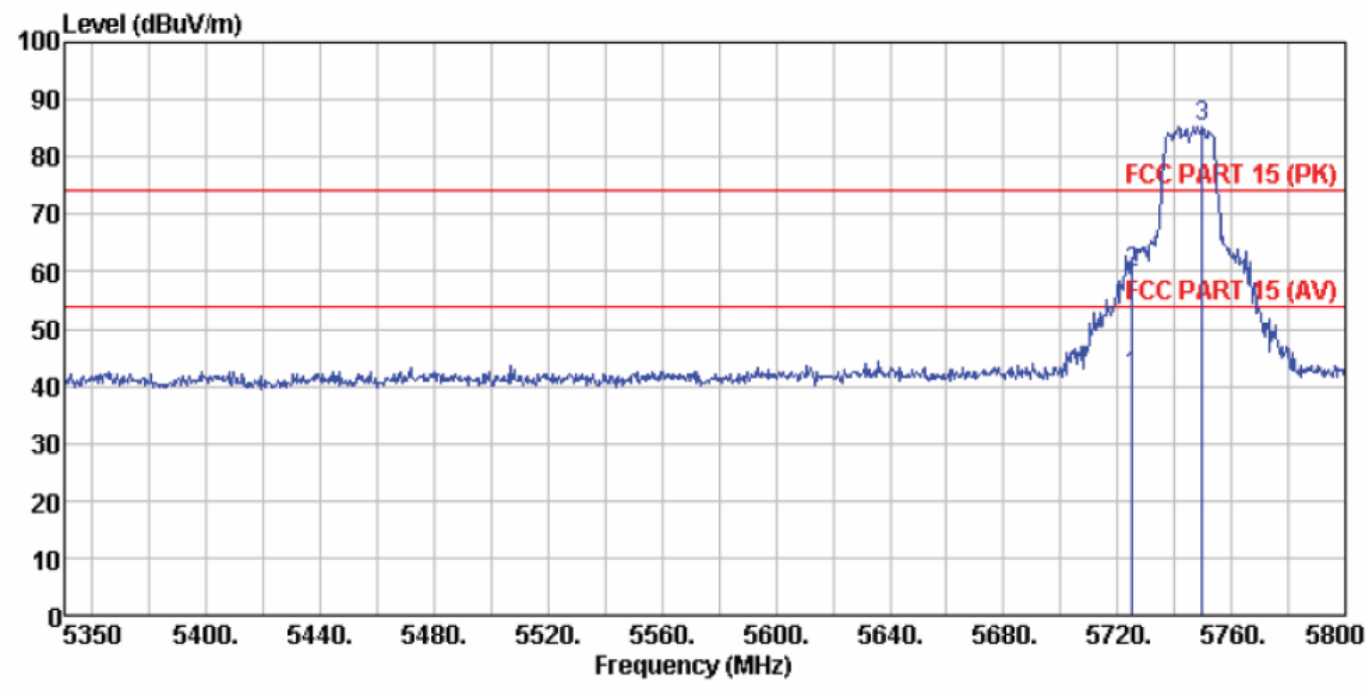
802.11n(HT40)



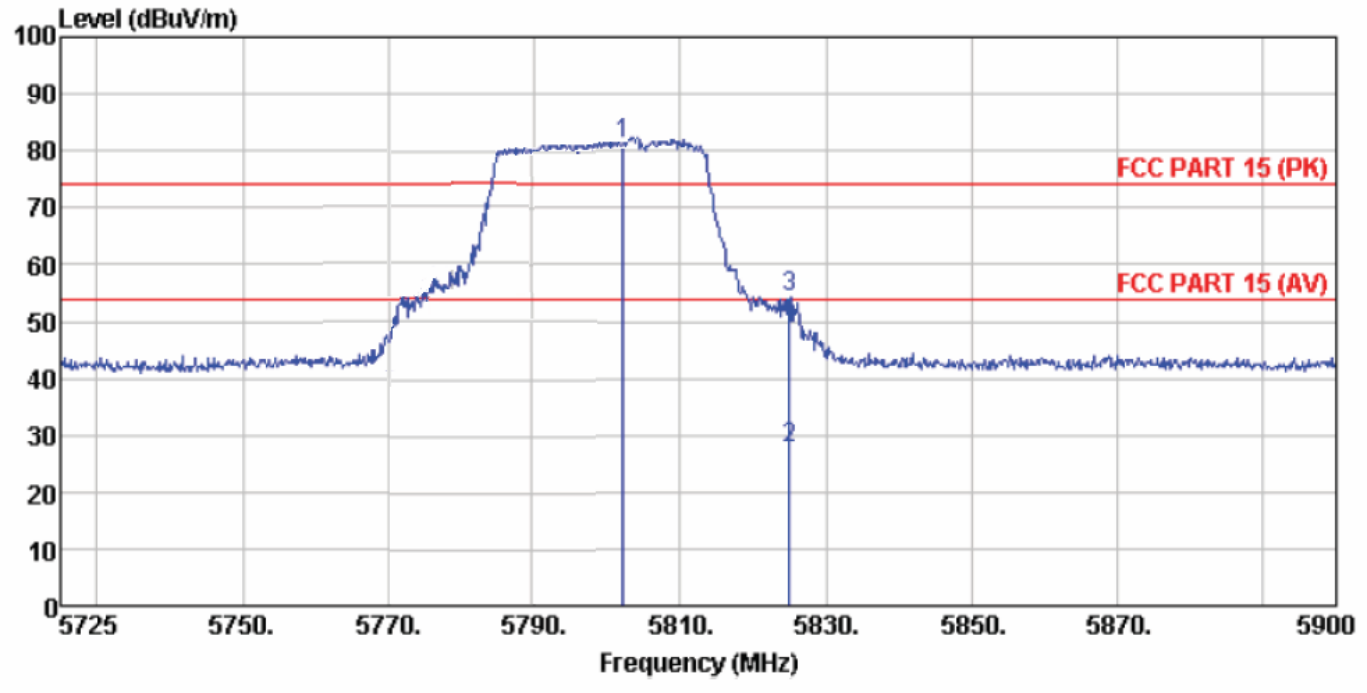
Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E[dBμV/m]=42.06 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=42.06-95.2= -53.14dBm the limit is -27dBm/MHz



Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E1[dBμV/m]=51.54 dBμV/m, E2[dBμV/m]=40.23 dBμV/m
EIRP1[dBm] = E[dBμV/m] - 95.2=51.54-95.2= -43.66dBm the limit is -27dBm/MHz
EIRP2[dBm] = E2[dBμV/m] - 95.2=40.23-95.2= -54.97dBm, the limit is -27dBm/MHz



Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E[dBμV/m]=60.71 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=60.71-95.2= -34.49dBm the limit is -27dBm/MHz



Remark: 1. According to KDB 789033 v01r03 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2
For Example, there E[dBμV/m]=52.28 dBμV/m,
EIRP[dBm] = E[dBμV/m] - 95.2=52.28-95.2= -42.92dBm the limit is -27dBm/MHz

6. 26DB AND 99% BANDWIDTH TEST

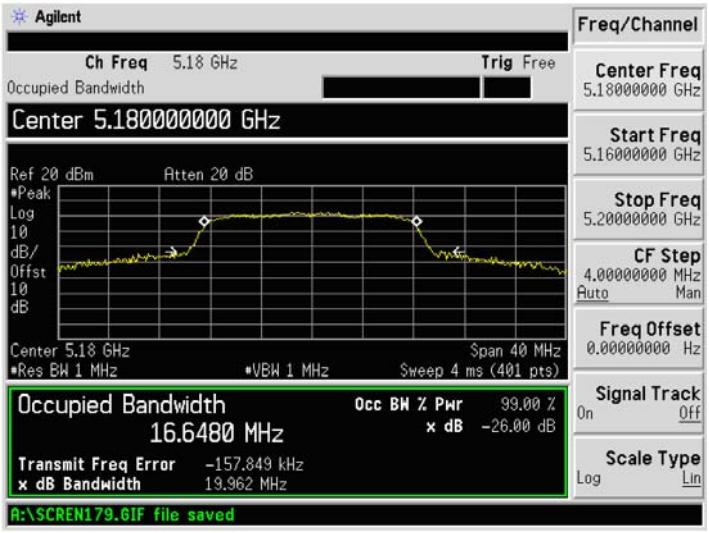
6.1. Measurement Procedure

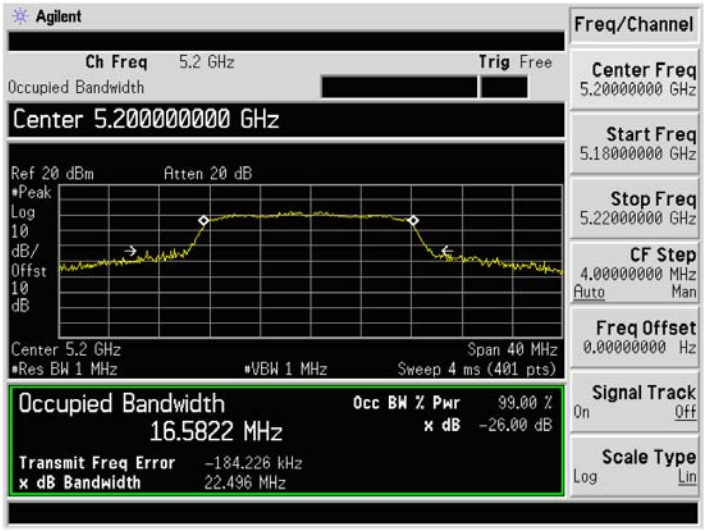
The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033, at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

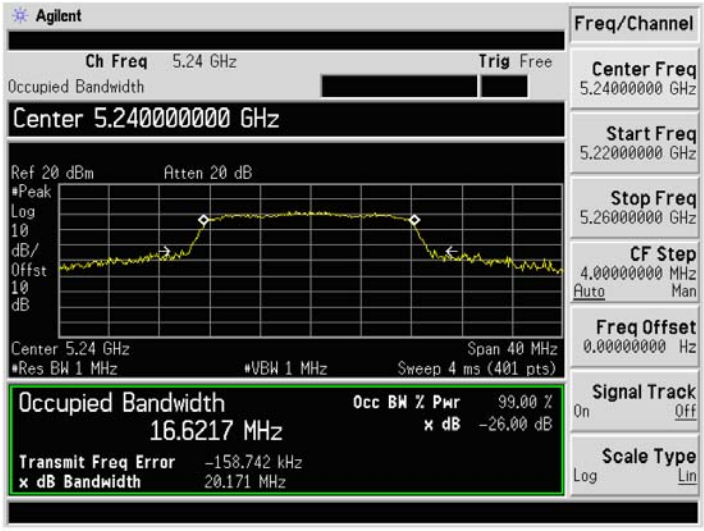
The 26 dB bandwidth is used to determine the conducted power limits.

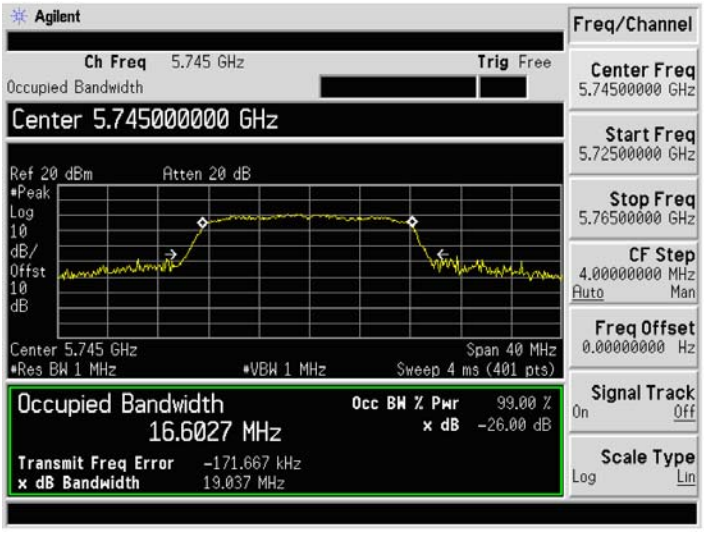
	Channel number	**Frequency (MHz)**	**26dB Bandwidth (MHz)**	**99% Bandwidth (MHz)**
802.11a	36	5180	19.962	16.648
	40	5200	22.496	16.582
	48	5240	20.171	16.622
	149	5745	19.037	16.603
	153	5765	19.118	16.547
	161	5805	18.927	16.552
802.11n (HT20)	36	5180	18.805	16.359
	40	5200	18.536	16.347
	48	5240	18.872	16.378
	149	5745	26.498	17.108
	153	5765	22.247	16.458
	161	5805	19.397	16.429
802.11n (HT40)	38	5190	38.111	35.783
	46	5230	38.322	35.860
	151	5755	39.224	35.927
	159	5795	39.397	35.790

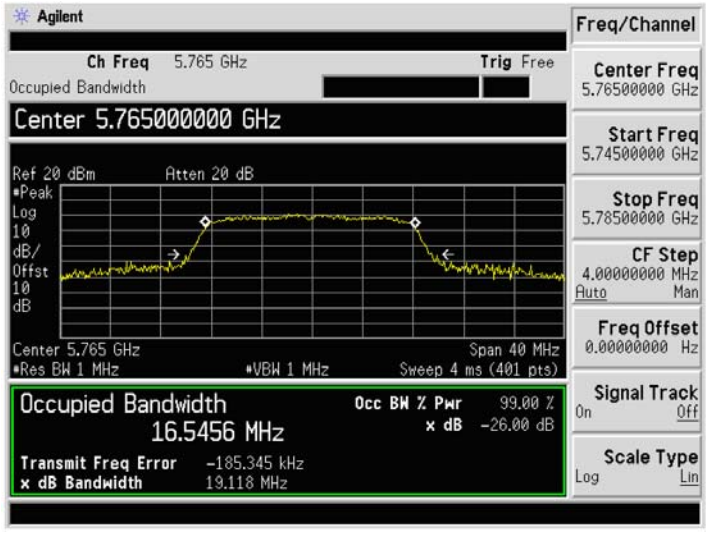
802.11a

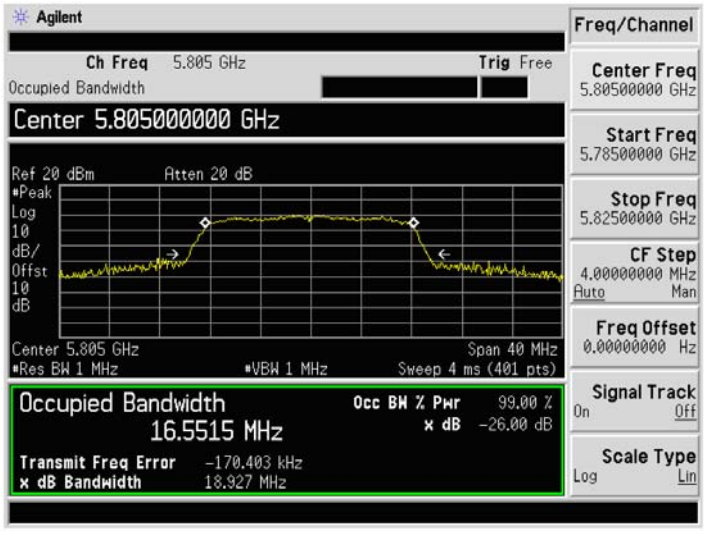

Agilent
Freq/Channel
Ch Freq 5.18 GHz
Trig Free
Occupied Bandwidth
Center 5.180000000 GHz
Ref 20 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
10
dB
Center 5.18 GHz
#Res BW 1 MHz
#VBW 1 MHz
Span 40 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
16.6480 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -157.849 kHz
x dB Bandwidth 19.962 MHz
A:\SCREN179.GIF file saved
Center Freq
5.18000000 GHz
Start Freq
5.16000000 GHz
Stop Freq
5.20000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin


Agilent
Freq/Channel
Ch Freq 5.2 GHz
Trig Free
Occupied Bandwidth
Center 5.200000000 GHz
Ref 20 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
10
dB
Center 5.2 GHz
#Res BW 1 MHz
#VBW 1 MHz
Span 40 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
16.5822 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -184.226 kHz
x dB Bandwidth 22.496 MHz
Center Freq
5.20000000 GHz
Start Freq
5.18000000 GHz
Stop Freq
5.22000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

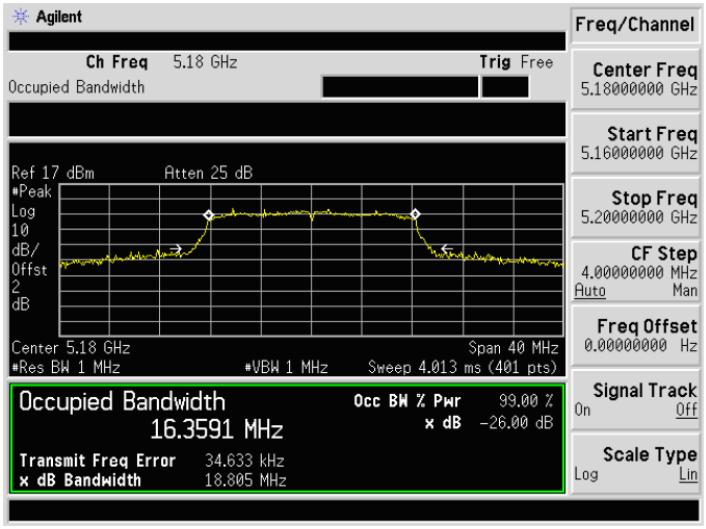

Agilent
Freq/Channel
Ch Freq 5.24 GHz
Trig Free
Occupied Bandwidth
Center 5.240000000 GHz
Ref 20 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
10
dB
Center 5.24 GHz
#Res BW 1 MHz
#VBW 1 MHz
Span 40 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
16.6217 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -158.742 kHz
x dB Bandwidth 20.171 MHz
Center Freq
5.24000000 GHz
Start Freq
5.22000000 GHz
Stop Freq
5.26000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

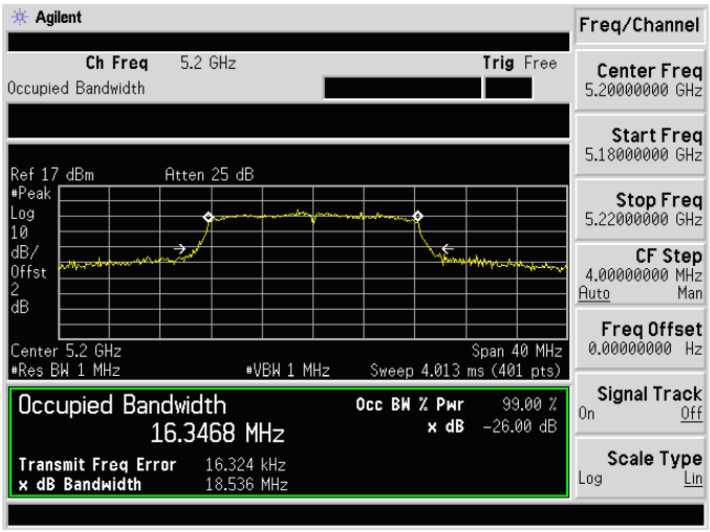

Agilent
Freq/Channel
Ch Freq 5.745 GHz
Trig Free
Occupied Bandwidth
Center 5.745000000 GHz
Ref 20 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
10
dB
Center 5.745 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
16.6027 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -171.667 kHz
x dB Bandwidth 19.037 MHz
Center Freq
5.74500000 GHz
Start Freq
5.72500000 GHz
Stop Freq
5.76500000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

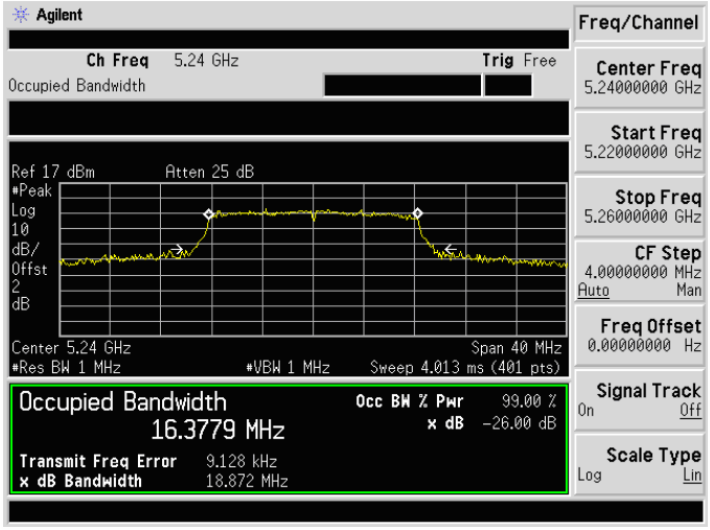

Agilent
Freq/Channel
Ch Freq 5.765 GHz
Trig Free
Occupied Bandwidth
Center 5.765000000 GHz
Ref 20 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
10
dB
Center 5.765 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
16.5456 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -185.345 kHz
x dB Bandwidth 19.118 MHz
Center Freq
5.76500000 GHz
Start Freq
5.74500000 GHz
Stop Freq
5.78500000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

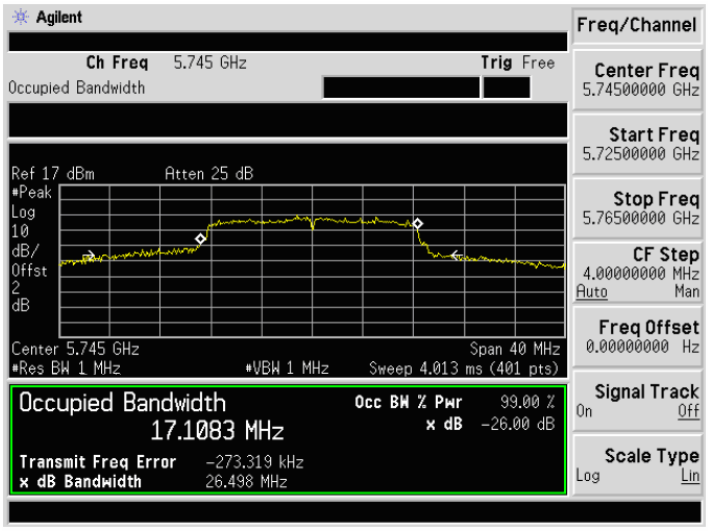

Agilent
Freq/Channel
Ch Freq 5.805 GHz
Trig Free
Occupied Bandwidth
Center 5.805000000 GHz
Ref 20 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
10
dB
Center 5.805 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
16.5515 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -170.403 kHz
x dB Bandwidth 18.927 MHz
Center Freq
5.80500000 GHz
Start Freq
5.78500000 GHz
Stop Freq
5.82500000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

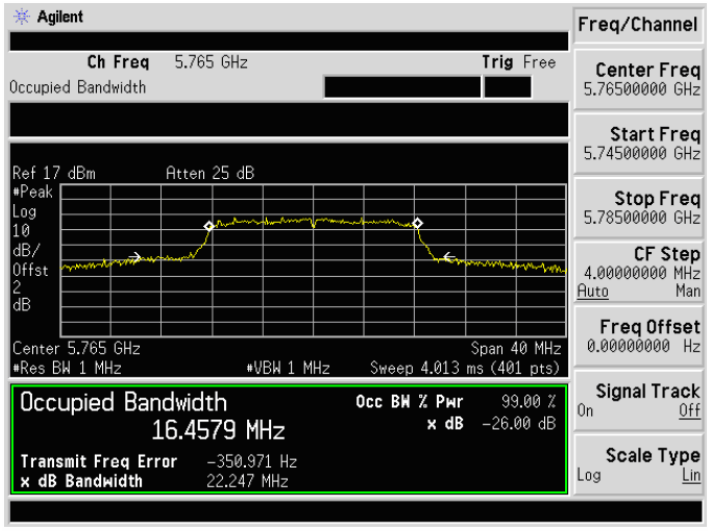
802.11n (HT20)

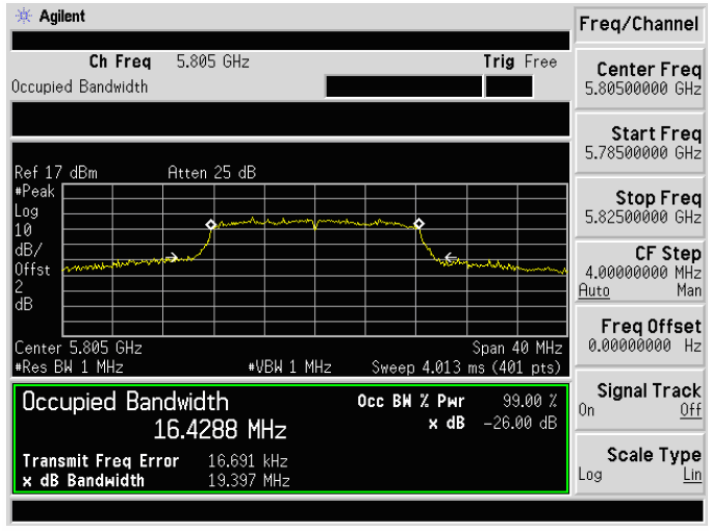

Agilent
Ch Freq 5.18 GHz
Trig Free
Occupied Bandwidth
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.18 GHz
#Res BW 1 MHz
#VBW 1 MHz
Span 40 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
16.3591 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 34.633 kHz
x dB Bandwidth 18.805 MHz
Freq/Channel
Center Freq
5.18000000 GHz
Start Freq
5.16000000 GHz
Stop Freq
5.20000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin


Agilent
Ch Freq 5.2 GHz
Trig Free
Occupied Bandwidth
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.2 GHz
#Res BW 1 MHz
#VBW 1 MHz
Span 40 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
16.3468 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 16.324 kHz
x dB Bandwidth 18.536 MHz
Freq/Channel
Center Freq
5.20000000 GHz
Start Freq
5.18000000 GHz
Stop Freq
5.22000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

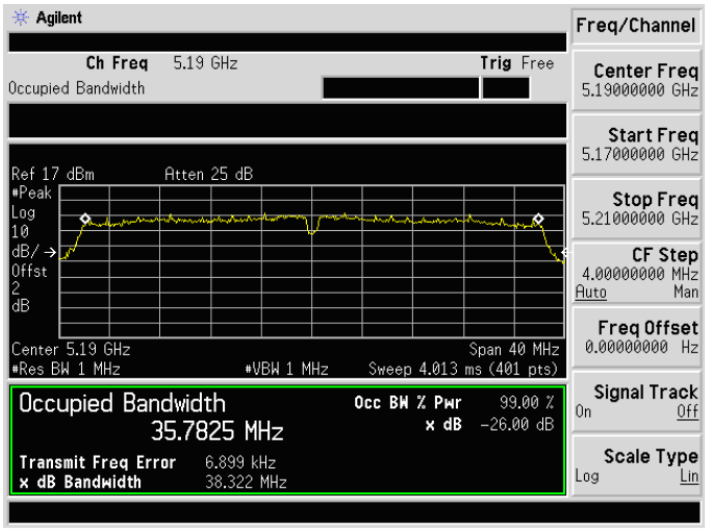

Agilent
Ch Freq 5.24 GHz
Trig Free
Occupied Bandwidth
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.24 GHz
#Res BW 1 MHz
#VBW 1 MHz
Span 40 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
16.3779 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 9.128 kHz
x dB Bandwidth 18.872 MHz
Freq/Channel
Center Freq
5.24000000 GHz
Start Freq
5.22000000 GHz
Stop Freq
5.26000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

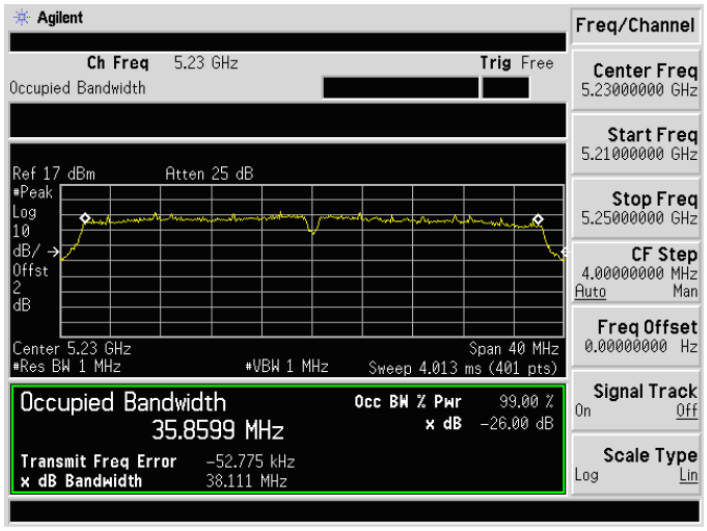

Agilent
Ch Freq 5.745 GHz
Trig Free
Occupied Bandwidth
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.745 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
17.1083 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -273.319 kHz
x dB Bandwidth 26.498 MHz
Freq/Channel
Center Freq
5.74500000 GHz
Start Freq
5.72500000 GHz
Stop Freq
5.76500000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

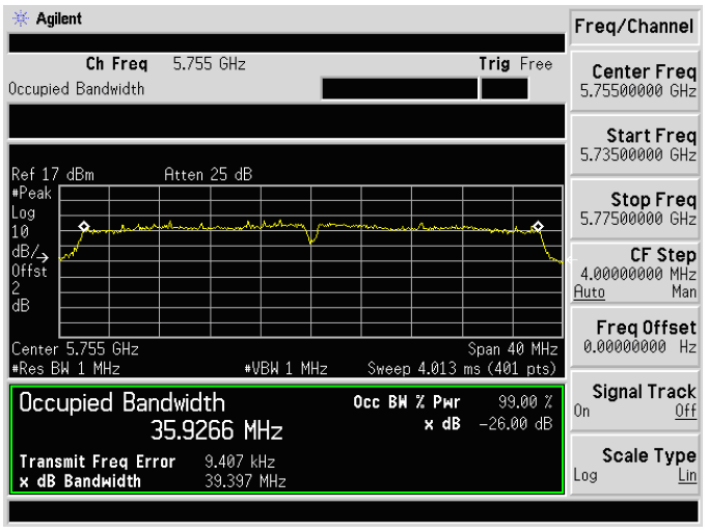

Agilent
Ch Freq 5.765 GHz
Trig Free
Occupied Bandwidth
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.765 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
16.4579 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -350.971 Hz
x dB Bandwidth 22.247 MHz
Freq/Channel
Center Freq
5.76500000 GHz
Start Freq
5.74500000 GHz
Stop Freq
5.78500000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

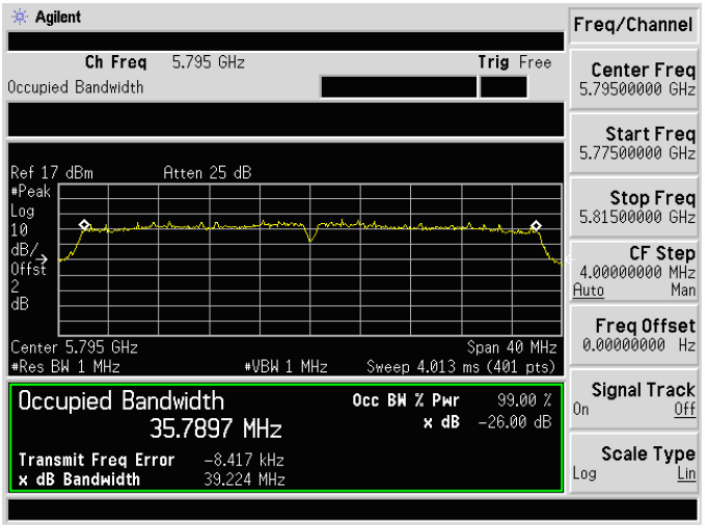

Agilent
Ch Freq 5.805 GHz
Trig Free
Occupied Bandwidth
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.805 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
16.4288 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 16.691 kHz
x dB Bandwidth 19.397 MHz
Freq/Channel
Center Freq
5.80500000 GHz
Start Freq
5.78500000 GHz
Stop Freq
5.82500000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

802.11n (HT40)


Agilent
Freq/Channel
Ch Freq 5.19 GHz
Trig Free
Occupied Bandwidth
Center Freq
5.19000000 GHz
Start Freq
5.17000000 GHz
Stop Freq
5.21000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.19 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
35.7825 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 6.899 kHz
x dB Bandwidth 38.322 MHz


Agilent
Freq/Channel
Ch Freq 5.23 GHz
Trig Free
Occupied Bandwidth
Center Freq
5.23000000 GHz
Start Freq
5.21000000 GHz
Stop Freq
5.25000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.23 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
35.8599 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -52.775 kHz
x dB Bandwidth 38.111 MHz


Agilent
Ch Freq 5.755 GHz
Trig Free
Occupied Bandwidth
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.755 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
35.9266 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 9.407 kHz
x dB Bandwidth 39.397 MHz
Freq/Channel
Center Freq
5.75500000 GHz
Start Freq
5.73500000 GHz
Stop Freq
5.77500000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin


Agilent
Ch Freq 5.795 GHz
Trig Free
Occupied Bandwidth
Ref 17 dBm
Atten 25 dB
#Peak
Log
10
dB/
Offst
2
dB
Center 5.795 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 4.013 ms (401 pts)
Occupied Bandwidth
35.7897 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -8.417 kHz
x dB Bandwidth 39.224 MHz
Freq/Channel
Center Freq
5.79500000 GHz
Start Freq
5.77500000 GHz
Stop Freq
5.81500000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

7. OUTPUT POWER TEST

7.1. Limits

Band 5.15-5.25GHz:

FCC: The maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm+10log B, where B is the-26dB emission bandwidth in MHz.

IC: The maximum e.i.r.p. shall not exceed 200 mW or 10 +10logB dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Band 5.725-5.825GHz:

FCC: the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10log B, where B is the -26dB emission bandwidth in MHz.

IC: The maximum conducted output power shall not exceed 1.0 W or 17 + 10 log10 B, dBm, whichever power is less.

7.2. Test setup

1. The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):
2. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

a. The Transmitter output (antenna port) was connected to the power meter.

b. Turn on the EUT and power meter and then record the power value.

c. Repeat above procedures on all channels needed to be tested.

7.3. Test result

For FCC

	Frequency (MHz)	Output Power (dBm)	26dB Bandwidth (MHz)	FCC Limit (dBm)	Result
802.11a	5180	8.24	19.962	17.0	Pass
	5200	8.37	22.496	17.0	Pass
	5240	8.32	20.171	17.0	Pass
	5745	8.16	19.037	29.8	Pass
	5765	8.21	19.118	29.8	Pass
	5805	8.33	18.927	29.8	Pass
802.11n (HT20)	5180	8.04	18.805	16.7	Pass
	5200	8.18	18.536	16.7	Pass
	5240	8.06	18.872	16.8	Pass
	5745	8.05	26.498	30.0	Pass
	5765	8.11	22.247	30.0	Pass
	5805	8.04	19.397	29.9	Pass
802.11n (HT40)	5190	7.94	38.111	17.0	Pass
	5230	8.11	38.322	17.0	Pass
	5755	7.89	39.224	30.0	Pass
	5795	7.95	39.397	30.0	Pass

For 5.15~5.25GHz, the limit=50 mW or 4 dBm+10log B, whichever power is less
For 5.725-5.825GHz, the limit=1 W or 17 dBm + 10log B, whichever power is less

For IC

	Frequency (MHz)	Output Power (dBm)	Antenna Gain dB	EIRP Power (dBm)	99% Bandwidth (MHz)	IC Limit (dBm)	Result
802.11a	5180	8.24	3.3	11.54	16.648	22.2	Pass
	5200	8.37	3.3	11.67	16.582	22.2	Pass
	5240	8.32	3.3	11.62	16.622	22.2	Pass
	5745	8.16	3.3	11.46	16.603	29.2	Pass
	5765	8.21	3.3	11.51	16.547	29.2	Pass
	5805	8.33	3.3	11.63	16.552	29.2	Pass
802.11n (HT20)	5180	8.04	3.3	11.34	16.359	22.1	Pass
	5200	8.18	3.3	11.48	16.347	22.1	Pass
	5240	8.06	3.3	11.36	16.378	22.1	Pass
	5745	8.05	3.3	11.35	17.108	29.3	Pass
	5765	8.11	3.3	11.41	16.458	29.2	Pass
	5805	8.04	3.3	11.34	16.429	29.2	Pass
802.11n (HT40)	5190	7.94	3.3	11.24	35.783	23.0	Pass
	5230	8.11	3.3	11.41	35.860	23.0	Pass
	5755	7.89	3.3	11.19	35.927	30.0	Pass
	5795	7.95	3.3	11.25	35.790	30.0	Pass

For 5.15~5.25GHz, the limit=200 mW or 10 +10logB dBm, whichever power is less
For 5.725-5.825GHz, the limit=1 W or 17 dBm + 10log B, whichever power is less
EIRP=output power+antenna gain

8. PEAK POWER SPECTRAL DENSITY TEST

8.1. Limits

Band 5.15-5.25GHz:

FCC: the peak power spectral density shall not exceed 4 dBm in any 1MHz band.

IC: The power spectral density shall not exceed 10dBm in any 1 MHz band.

Band 5.725-5.825GHz:

FCC: the peak power spectral density shall not exceed 17 dBm in any 1MHz band.

IC: the peak power spectral density shall not exceed 17 dBm in any 1MHz band.

8.2. Test setup

Methods refer to FCC KDB 789033

1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”.

2) Use the peak search function on the instrument to find the peak of the spectrum.

3) The result is the PPSD.

4) The above procedures make use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified in the 15.407(a)(5). That rule section also permits use of resolution bandwidths less than 1 MHz “provided that the measured power is integrated to show the total power over the measurement bandwidth” (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth

8.3. Test data

Test data as below

For FCC

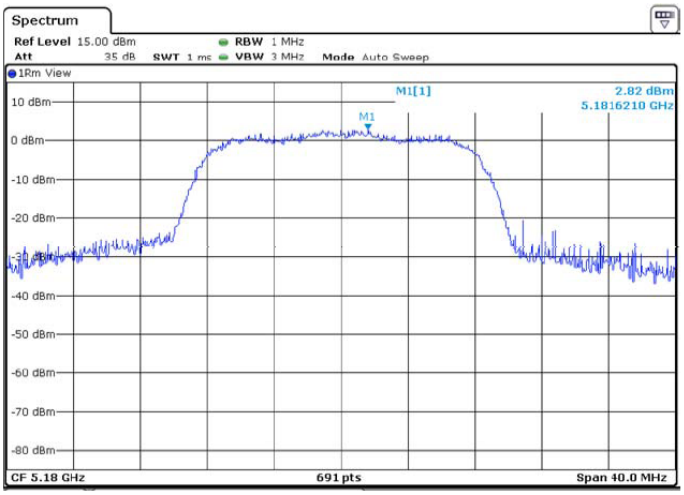
	Frequency (MHz)	Output Power(dBm)	FCC Limit (dBm)	Result
802.11a	5180	2.82	4.0	Pass
	5200	2.47	4.0	Pass
	5240	2.35	4.0	Pass
	5745	-2.13	17.0	Pass
	5765	-3.33	17.0	Pass
	5805	-4.22	17.0	Pass
802.11n (HT20)	5180	2.11	4.0	Pass
	5200	3.21	4.0	Pass
	5240	2.09	4.0	Pass
	5745	-3.70	17.0	Pass
	5765	-4.00	17.0	Pass
	5805	-4.54	17.0	Pass
802.11n (HT40)	5190	0.20	4.0	Pass
	5230	0.19	4.0	Pass
	5755	-6.72	17.0	Pass
	5795	-6.68	17.0	Pass

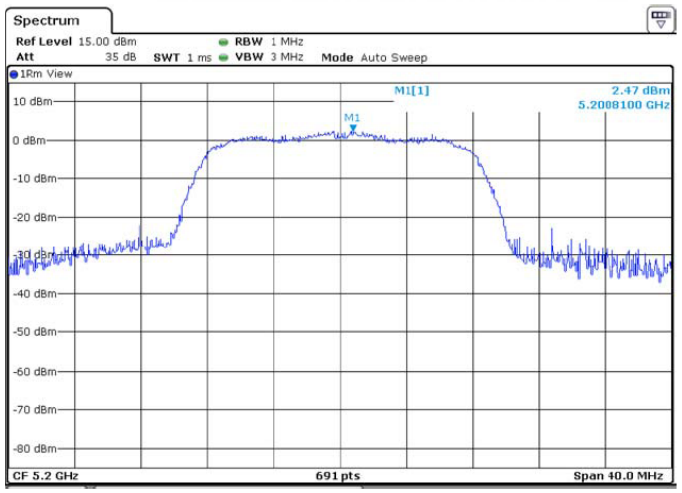
For IC

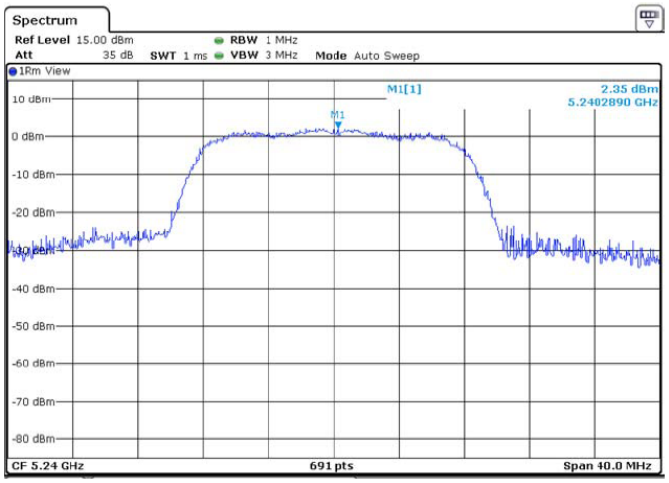
	Frequency (MHz)	Output Power (dBm)	Antenna Gain dB	EIRP Power (dBm)	IC Limit (dBm)	Result
802.11a	5180	2.82	3.3	6.12	10.0	Pass
	5200	2.47	3.3	5.77	10.0	Pass
	5240	2.35	3.3	5.65	10.0	Pass
	5745	-2.13	3.3	1.17	17.0	Pass
	5765	-3.33	3.3	-0.03	17.0	Pass
	5805	-4.22	3.3	-0.92	17.0	Pass
802.11n (HT20)	5180	2.11	3.3	5.41	10.0	Pass
	5200	3.21	3.3	6.51	10.0	Pass
	5240	2.09	3.3	5.39	10.0	Pass
	5745	-3.70	3.3	-0.40	17.0	Pass
	5765	-4.00	3.3	-0.70	17.0	Pass
	5805	-4.54	3.3	-1.24	17.0	Pass
802.11n (HT40)	5190	0.20	3.3	3.50	10.0	Pass
	5230	0.19	3.3	3.49	10.0	Pass
	5755	-6.72	3.3	-3.42	17.0	Pass
	5795	-6.68	3.3	-3.38	17.0	Pass

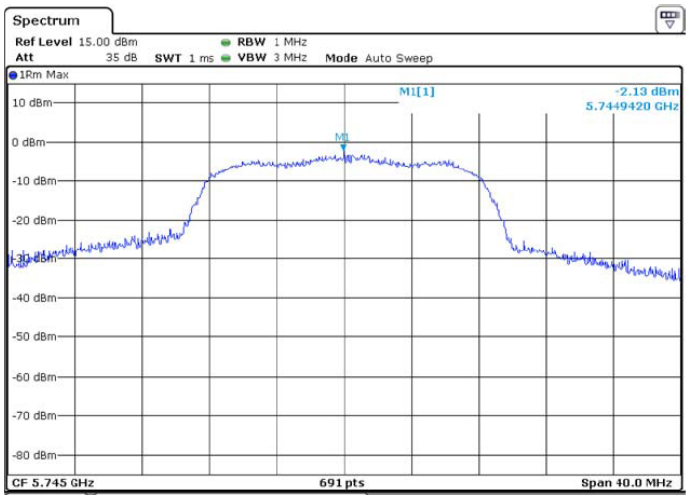
EIRP=output power+antenna gain

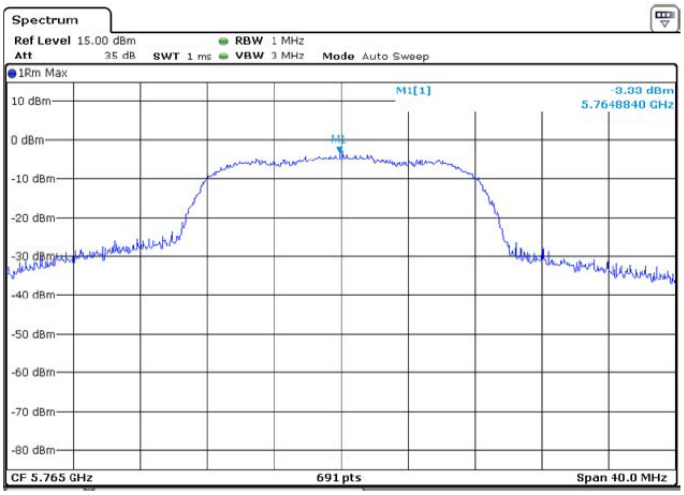
802.11a

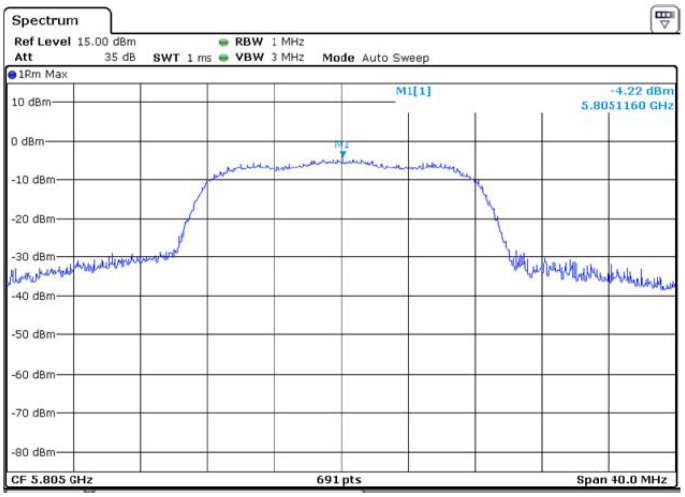

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm View
M1[1]
2.82 dBm
5.1816210 GHz
CF 5.18 GHz
691 pts
Span 40.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm View
M1[1]
2.47 dBm
5.2008100 GHz
CF 5.2 GHz
691 pts
Span 40.0 MHz

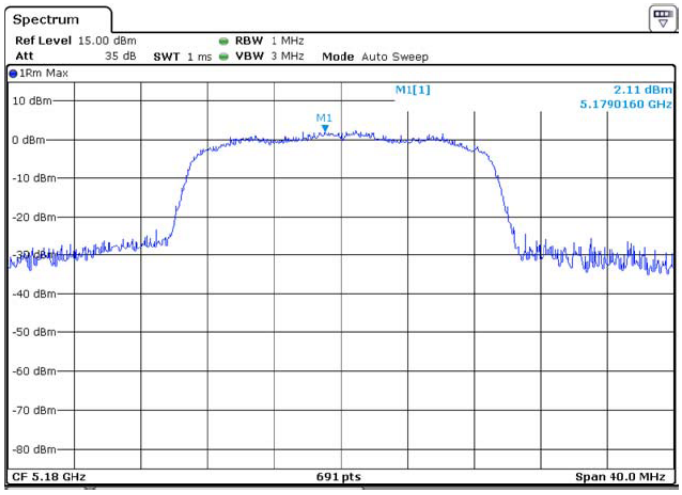

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm View
M1[1]
2.35 dBm
5.2402890 GHz
CF 5.24 GHz
691 pts
Span 40.0 MHz

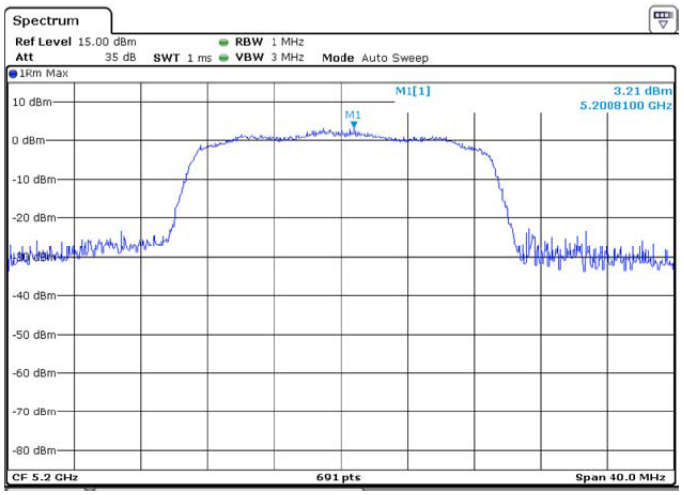

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm Max
M1[1]
-2.13 dBm
5.7449420 GHz
CF 5.745 GHz
691 pts
Span 40.0 MHz

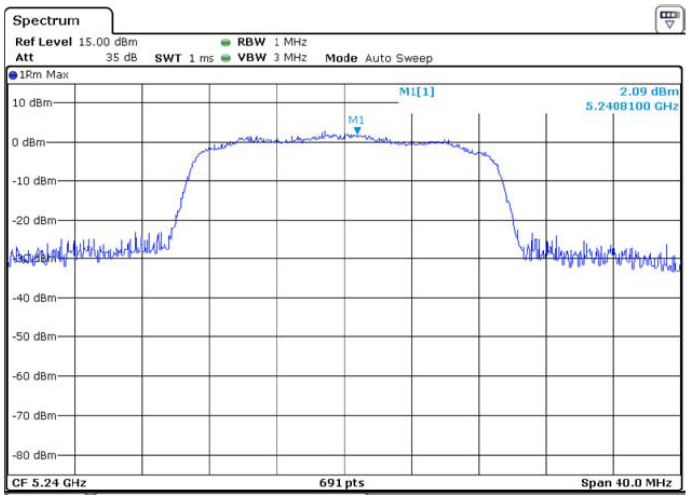

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm Max
M1[1]
-3.33 dBm
5.7648840 GHz
CF 5.765 GHz
691 pts
Span 40.0 MHz

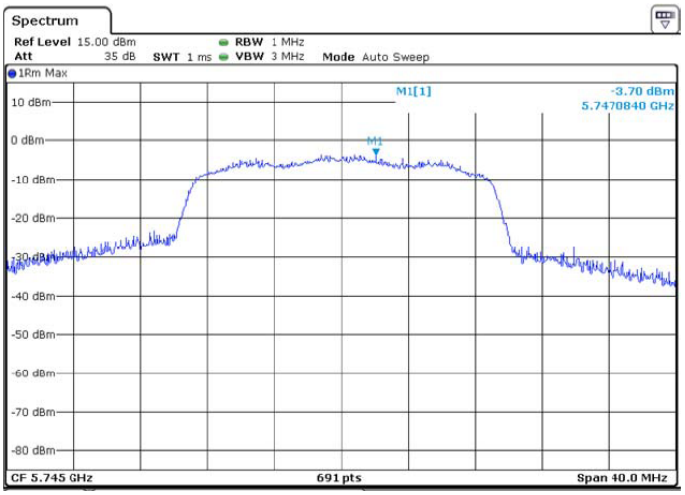

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm Max
M1[1]
-4.22 dBm
5.8051160 GHz
CF 5.805 GHz
691 pts
Span 40.0 MHz

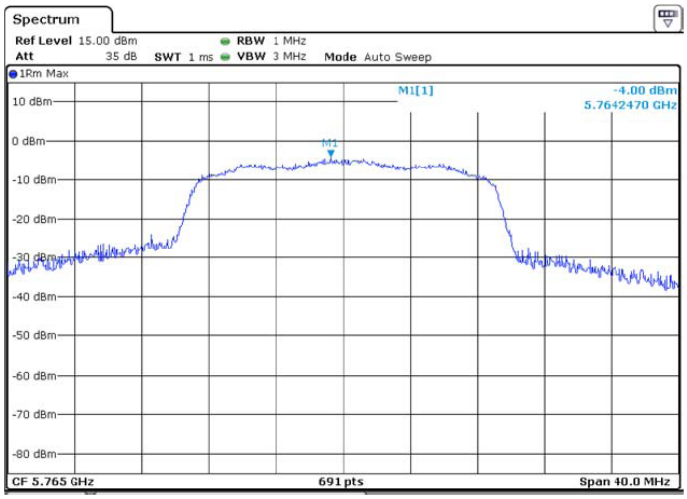
802.11n (HT20)

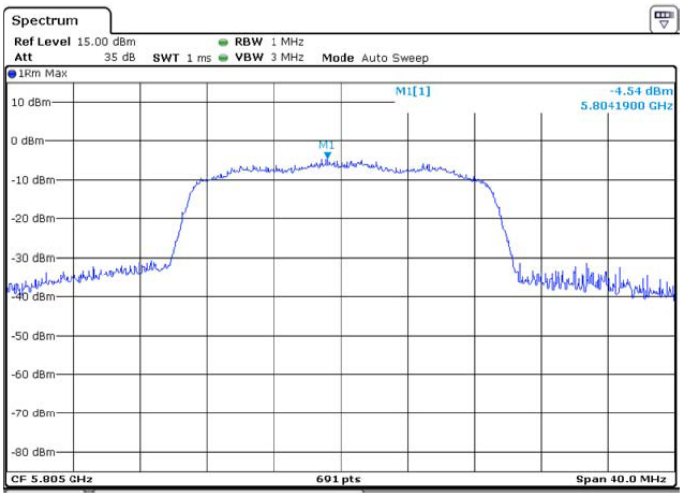

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm Max
M1[1]
2.11 dBm
5.1790160 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.18 GHz
691 pts
Span 40.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm Max
M1[1]
3.21 dBm
5.2008100 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.2 GHz
691 pts
Span 40.0 MHz

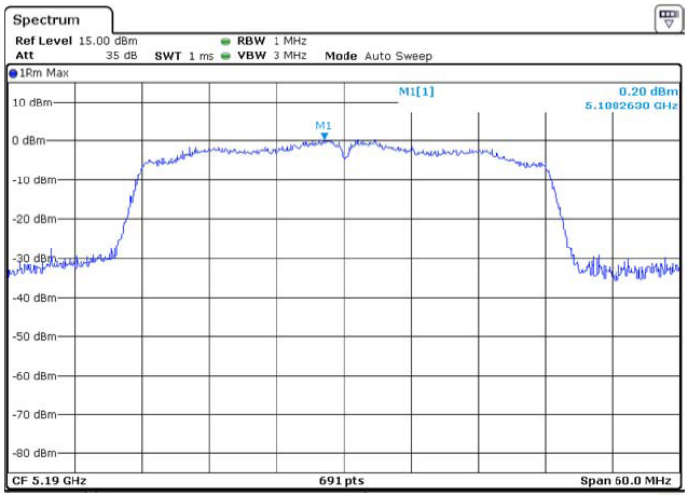

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm Max
M1[1]
2.09 dBm
5.2408100 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.24 GHz
691 pts
Span 40.0 MHz

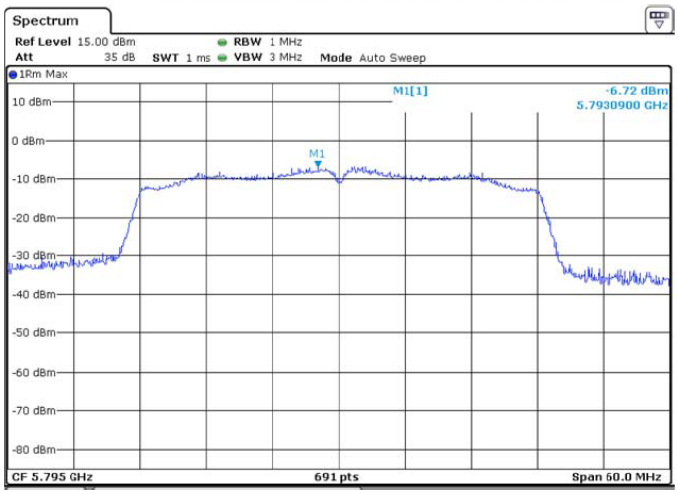

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm Max
M1[1]
-3.70 dBm
5.7470840 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.745 GHz
691 pts
Span 40.0 MHz

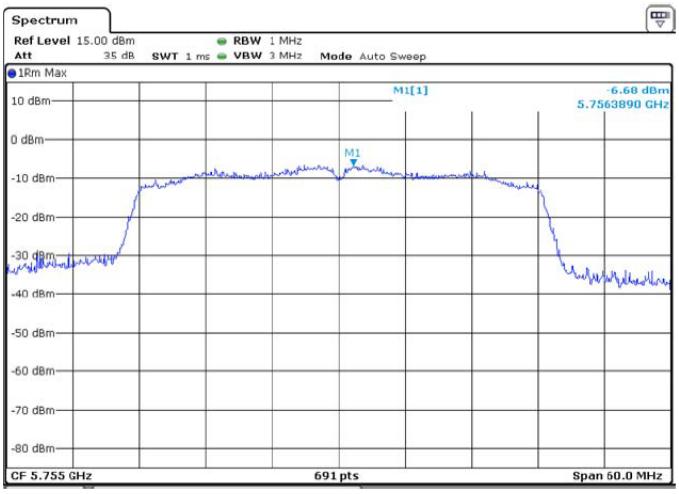

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm Max
M1[1]
-4.00 dBm
5.7642470 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.765 GHz
691 pts
Span 40.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Rm Max
M1[1]
-4.54 dBm
5.8041900 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.805 GHz
691 pts
Span 40.0 MHz

802.11 n (HT40) 2422MHz







9. TRANSMITTER PEAK EXCURSION

9.1. Limits

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

9.2. Test setup

Methods refer to FCC KDB 789033

1) Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth.

2) Find the maximum of the peak-max-hold spectrum.

a) Set RBW = 1 MHz.

b) VBW ≥ 3 MHz.

c) Detector = peak.

d) Trace mode = max-hold.

e) Allow the sweeps to continue until the trace stabilizes.

f) Use the peak search function to find the peak of the spectrum.

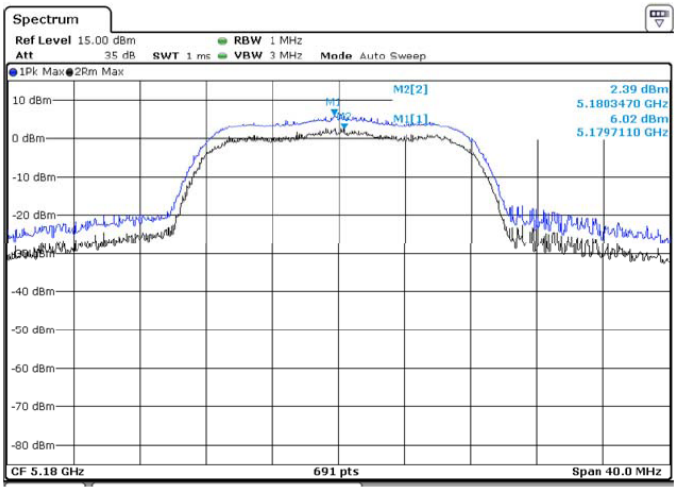
3) Use the procedure found under 4. to measure the PPSD.

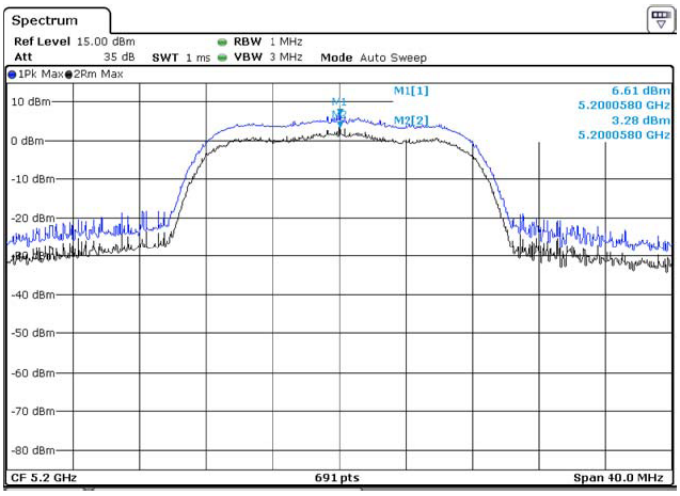
4) Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

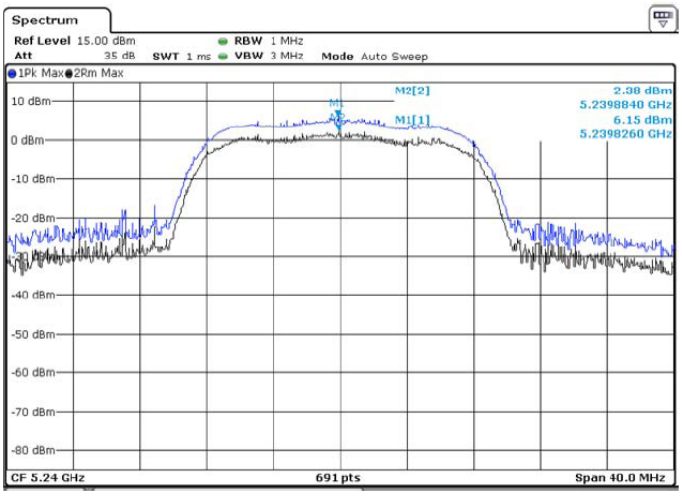
9.3. Test data

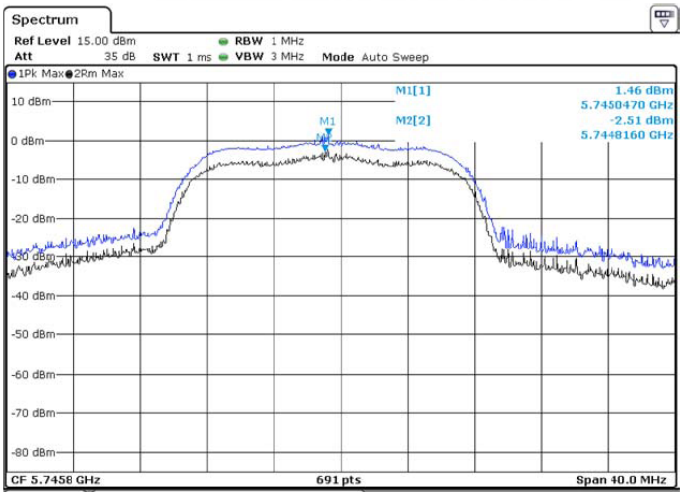
	Frequency (MHz)	Output Power(dBm)	FCC Limit (dBm)	Result
802.11a	5180	3.63	13.0	Pass
	5200	3.33	13.0	Pass
	5240	3.77	13.0	Pass
	5745	3.97	13.0	Pass
	5765	3.78	13.0	Pass
	5805	2.75	13.0	Pass
802.11n (HT20)	5180	3.27	13.0	Pass
	5200	4.21	13.0	Pass
	5240	3.59	13.0	Pass
	5745	3.35	13.0	Pass
	5765	4.30	13.0	Pass
	5805	2.92	13.0	Pass
802.11n (HT40)	5190	4.68	13.0	Pass
	5230	4.59	13.0	Pass
	5755	4.57	13.0	Pass
	5795	4.49	13.0	Pass

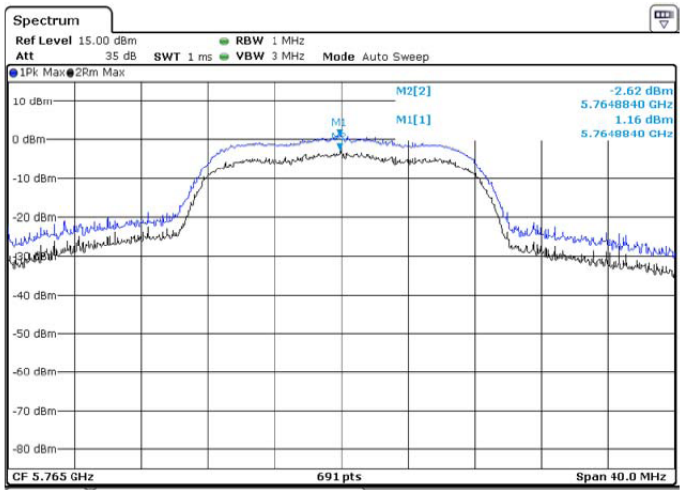
802.11a

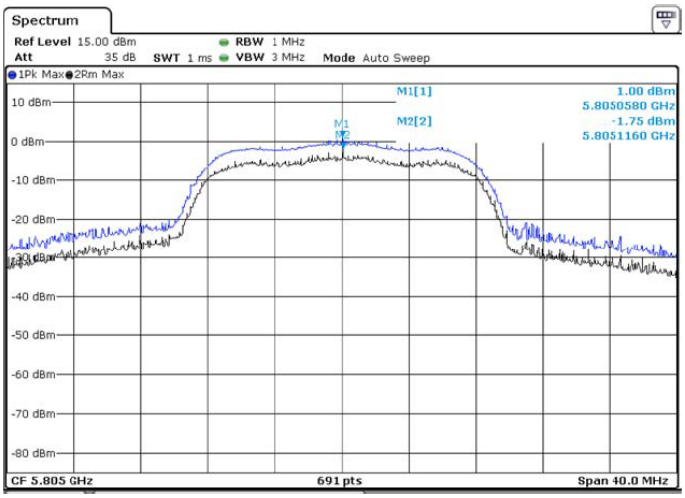

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M2[2] 2.39 dBm 5.1803470 GHz
M1[1] 6.02 dBm 5.1797110 GHz
CF 5.18 GHz
691 pts
Span 40.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M1[1] 6.61 dBm 5.2000580 GHz
M2[2] 3.28 dBm 5.2000580 GHz
CF 5.2 GHz
691 pts
Span 40.0 MHz

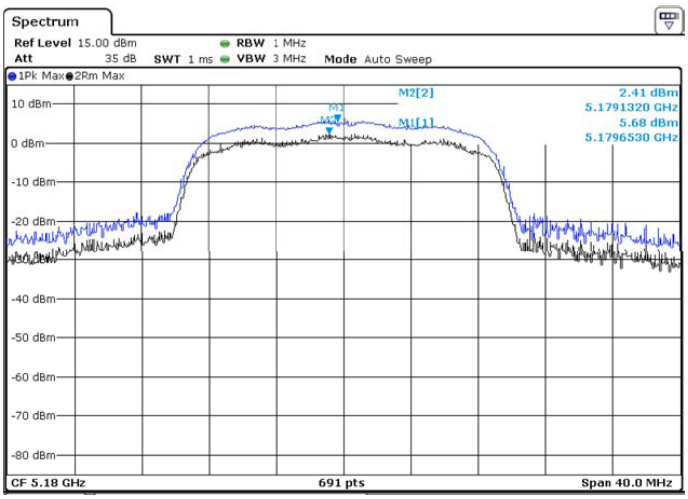

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M2[2] 2.38 dBm 5.2398840 GHz
M1[1] 6.15 dBm 5.2398260 GHz
CF 5.24 GHz
691 pts
Span 40.0 MHz

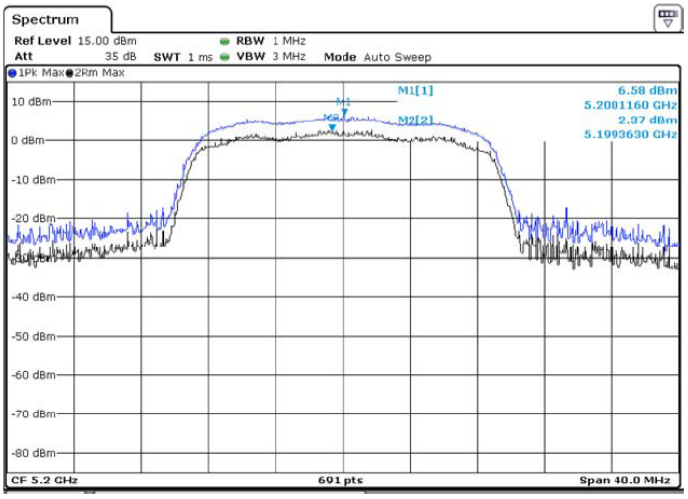

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M1[1] 1.46 dBm 5.7450470 GHz
M2[2] -2.51 dBm 5.7448160 GHz
CF 5.7458 GHz
691 pts
Span 40.0 MHz

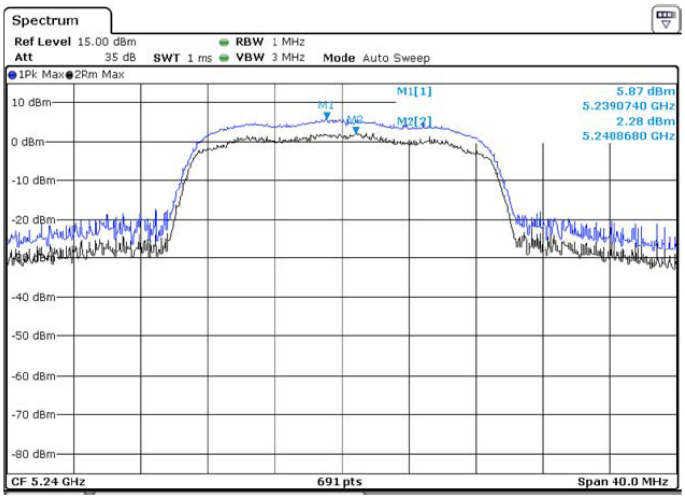

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M2[2] -2.62 dBm 5.7648840 GHz
M1[1] 1.16 dBm 5.7648840 GHz
CF 5.765 GHz
691 pts
Span 40.0 MHz

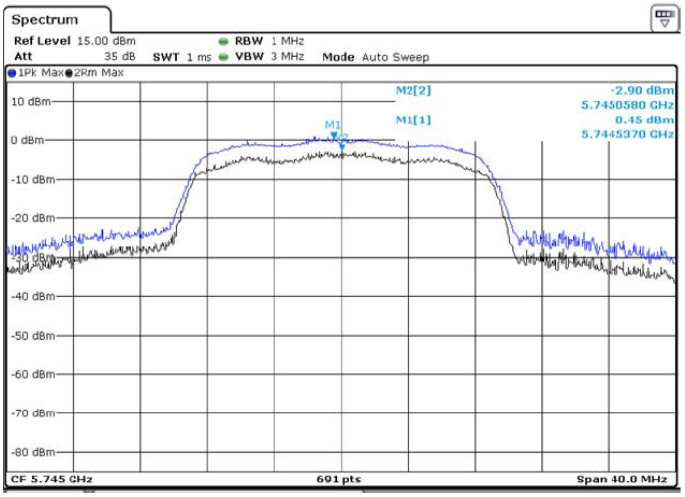

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M1[1] 1.00 dBm 5.8050580 GHz
M2[2] -1.75 dBm 5.8051160 GHz
CF 5.805 GHz
691 pts
Span 40.0 MHz

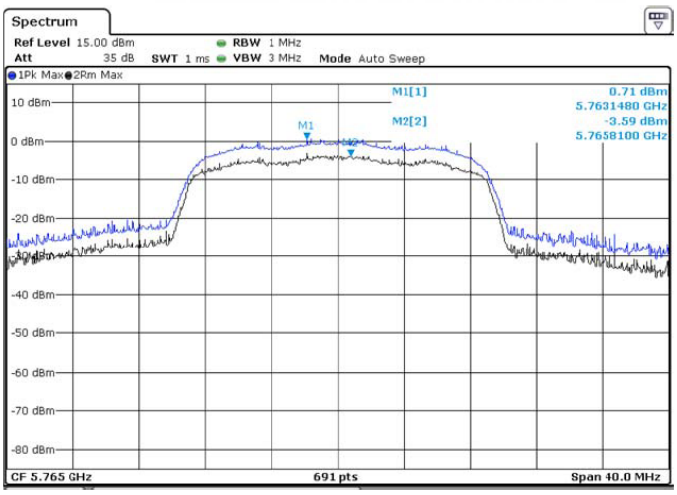
802.11n(HT20)

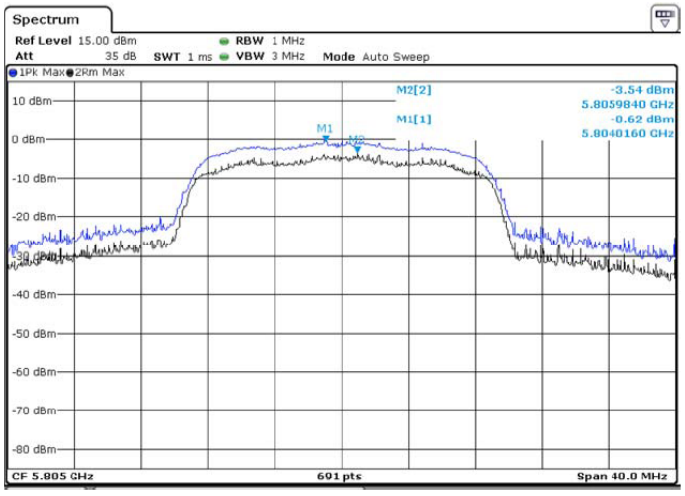

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M2[2] 2.41 dBm 5.1791320 GHz
M1[1] 5.68 dBm 5.1796530 GHz
CF 5.18 GHz
691 pts
Span 40.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M1[1] 6.58 dBm 5.2001160 GHz
M2[2] 2.97 dBm 5.1993630 GHz
CF 5.2 GHz
691 pts
Span 40.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M1[1] 5.87 dBm 5.2390740 GHz
M2[2] 2.28 dBm 5.2408680 GHz
CF 5.24 GHz
691 pts
Span 40.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M2[2] -2.90 dBm 5.7450580 GHz
M1[1] 0.45 dBm 5.7445370 GHz
CF 5.745 GHz
691 pts
Span 40.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M1[1] 0.71 dBm 5.7631480 GHz
M2[2] -3.59 dBm 5.7658100 GHz
CF 5.765 GHz
691 pts
Span 40.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M2[2] -3.54 dBm 5.8059840 GHz
M1[1] -0.62 dBm 5.8040160 GHz
CF 5.805 GHz
691 pts
Span 40.0 MHz

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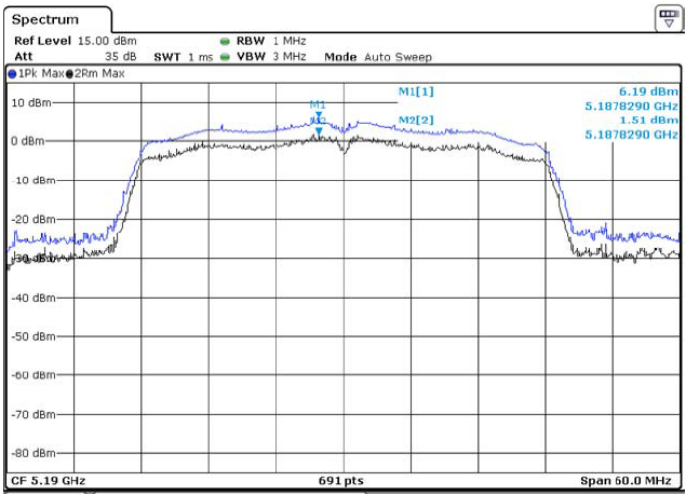
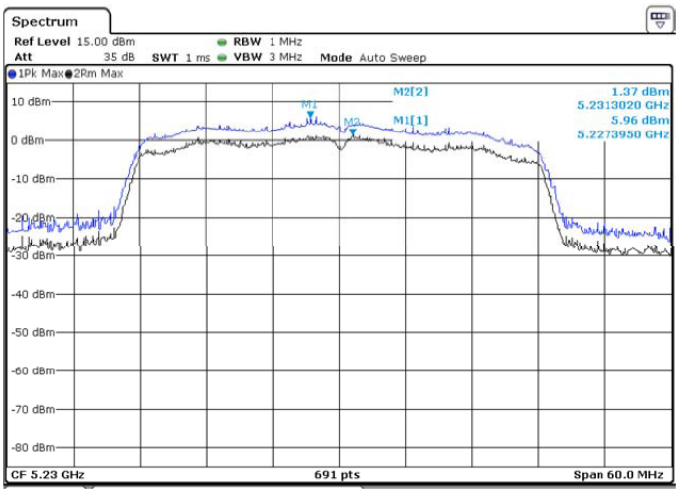
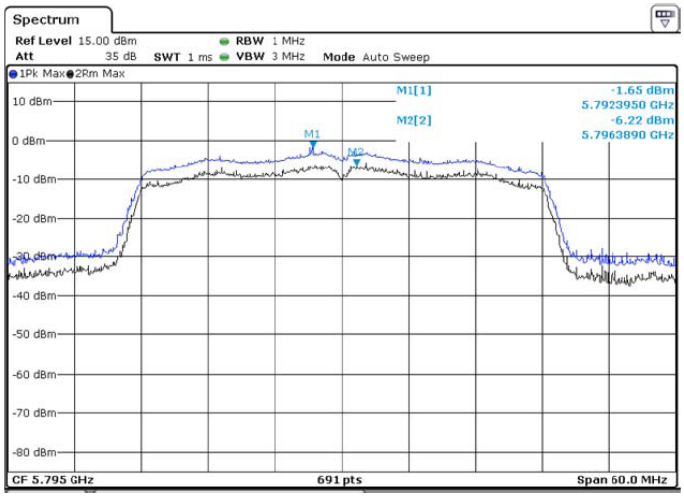
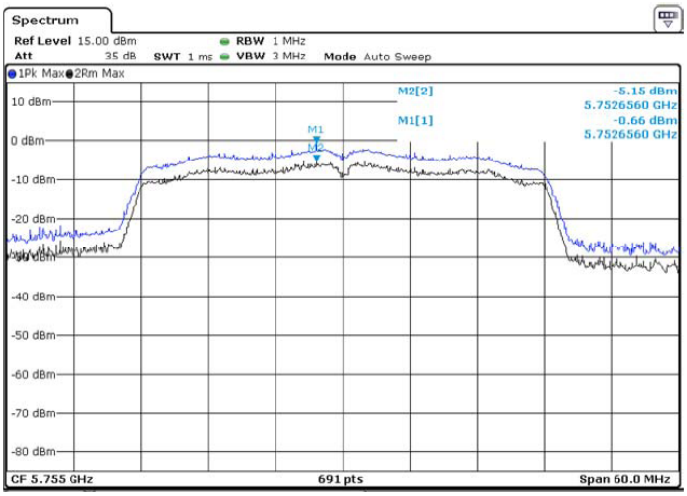

Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M1[1] 6.19 dBm 5.1878290 GHz
M2[2] 1.51 dBm 5.1878290 GHz
CF 5.19 GHz
691 pts
Span 60.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M2[2] 1.37 dBm 5.2313020 GHz
M1[1] 5.96 dBm 5.2273950 GHz
CF 5.23 GHz
691 pts
Span 60.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M1[1] -1.65 dBm 5.7923950 GHz
M2[2] -6.22 dBm 5.7963890 GHz
CF 5.795 GHz
691 pts
Span 60.0 MHz


Spectrum
Ref Level 15.00 dBm
RBW 1 MHz
Att 35 dB
SWT 1 ms
VBW 3 MHz
Mode Auto Sweep
1Pk Max 2Rm Max
M2[2] -5.15 dBm 5.7526560 GHz
M1[1] -0.66 dBm 5.7526560 GHz
CF 5.755 GHz
691 pts
Span 60.0 MHz

10. ANTENNA REQUIREMENTS

10.1. Limits

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2. Result

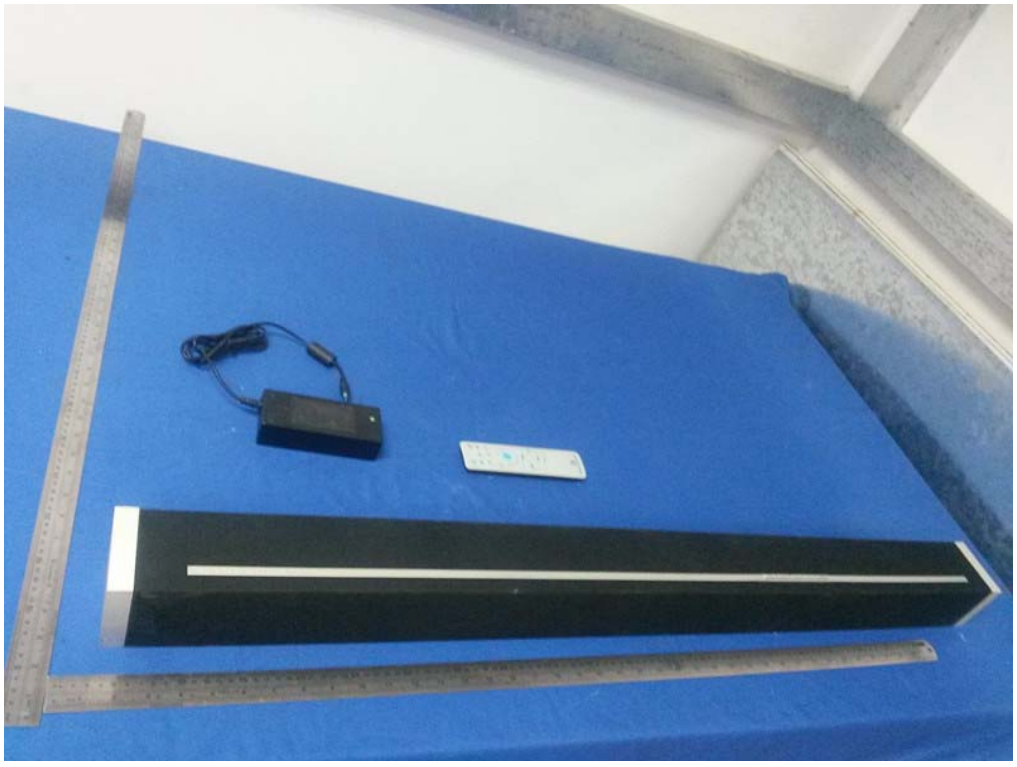
The antennas used for this product are external antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 3.3dBi.

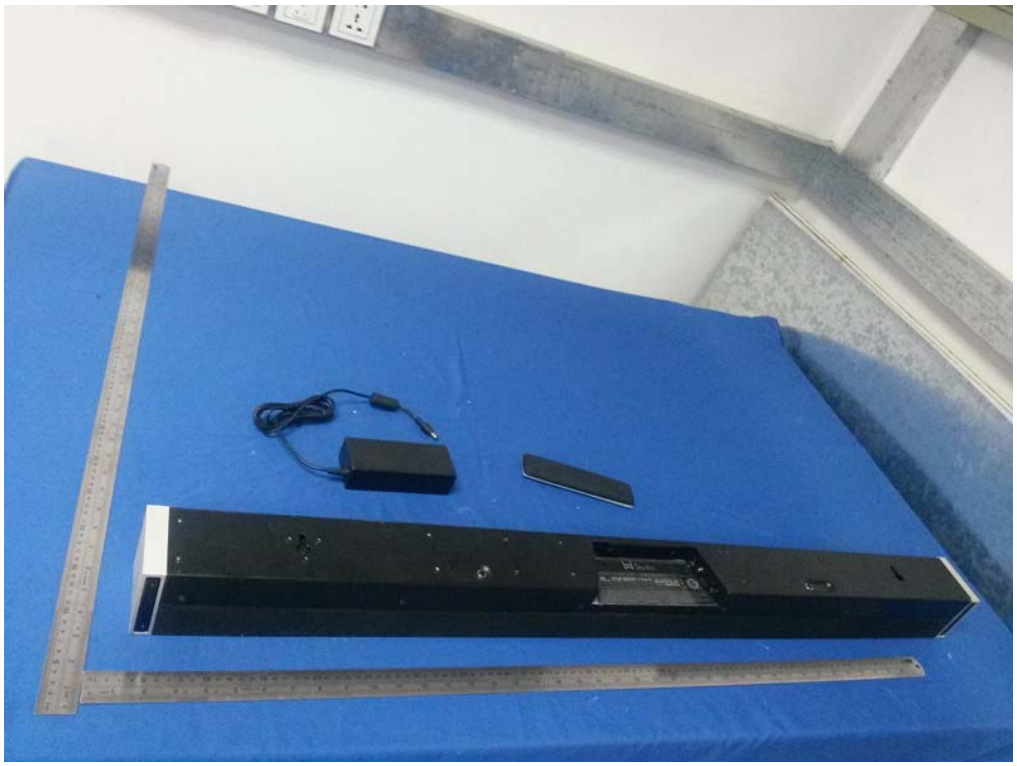
11. PHOTOGRAPHS OF TEST SET-UP

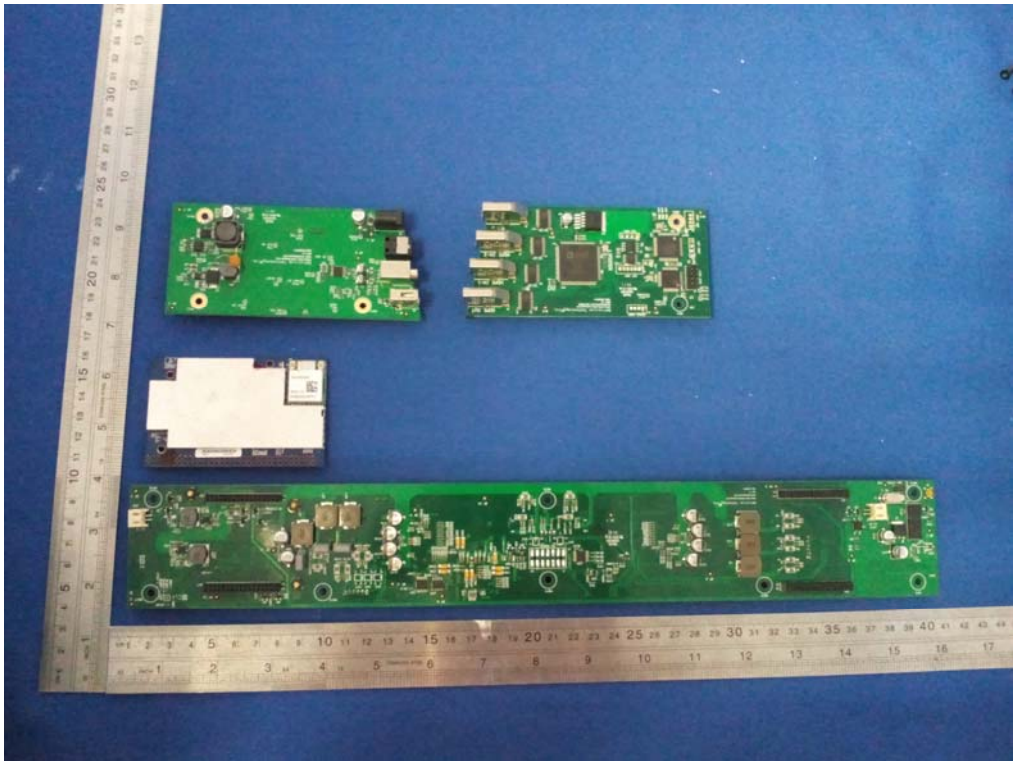
Conducted Emission

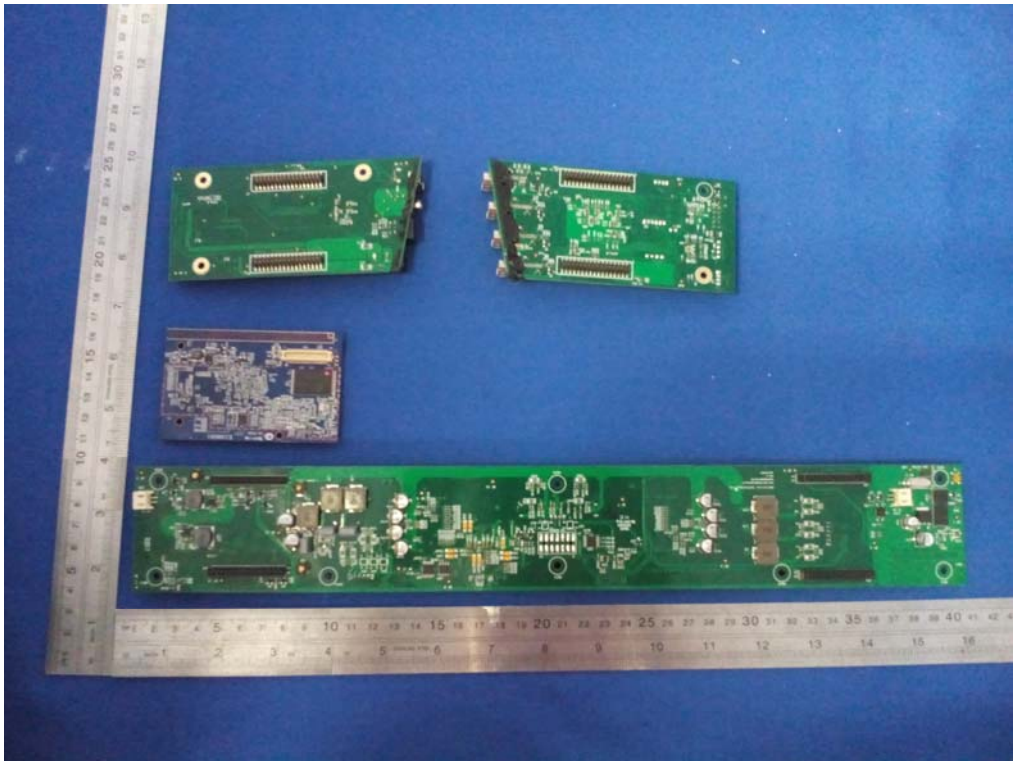
Radiated Emission Test

12. PHOTOGRAPHS OF THE EUT









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