

MEASUREMENT REPORT

(FCC : Part 15 Subpart C (15.247) / ANSI C63.4-2014)



Product.....: Scan Kiosk
Trade Name.....: **CHAMPTEK** SCANTECH ID
Model No.: SK-100
SK-101, SK-102, SK-103, SK-104,
Series Model No.....: SK-105, SK-106
Applicant.....: Champtek Incorporated
Applicant Address.....: 5/F, No. 2, Alley 2, Shih-Wei Lane, Chung
Cheng Rd., Hsin Tien City, Taiwan

Report Number	MLT1804P15001
Applicant	Champtek Incorporated
Product	Scan Kiosk
Sample Received Date	2018/3/21
Sample Tested Date	2018/4/9~ 2018/4/30

Report Prepared By	Jesse Tien
Signature	<i>Jesse Tien</i>
Date Prepared	2018/5/29

Report Authorized By	Roger Chen
Signature	<i>Roger Chen</i>
Date Authorized	2018/5/29

Test By

Max Light Technology Co., Ltd.
Room 5, 8F, No.125, Section 3 Roosevelt Road,
Taipei, Taiwan., R.O.C.
Office : Tel: 886-2-2363-2447 Fax: 886-2-2363-2597
Lab. : Tel: 886-2-2663-3486 Fax: 886-2-2663-3582
Designation Number: TW0015

It may be duplicated completely for legal use with the allowance of the applicant.
It shall not be reproduced except in full, without the written approval of our
laboratory.

Contents

History of Test Report.....	5
1. General Information	7
2. Report of Measurements and Examinations	9
2.1 List of Measurements and Examinations	9
3. Test Configuration of Equipment under Test	10
3.1 Carrier Frequency of Channels	10
3.2 Test Mode and Test Software	11
3.3 TEST Methodology & General Test Procedures	12
3.4 Measurement Uncertainty	13
3.5 Description of the Support Equipments	13
4. Test and measurement equipment	14
4.1 Calibration	14
4.2 Equipment	14
5. Antenna Requirements	16
5.1 Standard Applicable	16
5.2 Antenna Construction and Directional Gain	16
6. Test of Conducted Emission	17
6.1 Test Limit	17
6.2 Test Procedures	17
6.3 Typical Test Setup	18
6.4 Test Result and Data	19
7. Test of Radiated Emission	21
7.1 Test Limit	21
7.2 Test Procedures	21
7.3 Typical Test Setup	22
7.4 Test Result and Data (9kHz ~ 30MHz)	23
7.5 Test Result and Data (30MHz ~ 1GHz, worst emissions found)	23
7.6 Test Result and Data (Above 1GHz)	24
8. 6dB Bandwidth	37
8.1 Test Limit	37
8.2 Test Procedures	37
8.3 Test Setup Layout	37
8.4 Test Result and Data	38
9. Maximum Peak and Average Output Power	46
9.1 Test Limit	46
9.2 Test Procedures	46
9.3 Test Setup Layout	46
9.4 Test Result and Data	47



10.Power Spectral Density	64
10.1 Test Limit.....	64
10.2 Test Procedures	64
10.3 Test Setup Layout	64
10.4 Test Result and Data.....	65
11.Band Edges	73
11.1 Test Limit.....	73
11.2 Test Procedure	73
11.3 Test Setup Layout	73
11.4 Test Result and Data.....	74
11.5 Restrict Band Emission Measurement Data	83
12.Restricted Bands of Operation	92
12.1 Labeling Requirement.....	92

APPENDIX 1 PHOTOS OF TEST CONFIGURATION

APPENDIX 2 PHOTOS OF EUT

History of Test Report

Original Report Issue Date: 2018/05/29

☒ No additional attachment

☐ Additional attachments were issued as in the following record:

Attachment No.	Issue Date	Description
MLT1804P15001	2018/05/29	Original Report

CERTIFICATION

We here by verify that :

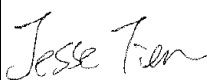
The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4-2014. All test were conducted by


MLT(Max Light Technology Co., Ltd) Room 5, 8F, No.125, Section 3 Roosevelt Road, Taipei, Taiwan, R.O.C Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is in compliance with Class B radiated and conducted emission limit of FCC Rules Part 15 Subpart C (15.247).

Applicant Name	Champtek Incorporated
Applicant Address	5/F, No. 2, Alley 2, Shih-Wei Lane, Chung Cheng Rd., Hsin Tien City, Taiwan
Manufacturer Name	Champtek Incorporated
Manufacturer Address	5/F, No. 2, Alley 2, Shih-Wei Lane, Chung-Cheng Rd., Xindian Dist., New Taipei City, Taiwan

Equipment	Scan Kiosk
Model No	SK-100
Series Model No	SK-101, SK-102, SK-103, SK-104, SK-105, SK-106
Different	Model difference among serial models shown above is only for marketing purpose.
FCC ID	WOISK100

Report Prepared By	Jesse Tien
Signature	

Report Authorized By	Roger Chen
Signature	

1. General Information

1.1 Introduction

The following measurement report is submitted on behalf of Champtek Incorporated In support of a Class B Digital Device certification in accordance with Part2 Subpart J and Part 15 Subpart C of the Commission's and Regulations.

1.2 Customer Details

Applicant Name	Champtek Incorporated
Applicant Address	5/F, No. 2, Alley 2, Shih-Wei Lane, Chung Cheng Rd., Hsin Tien City, Taiwan
Manufacturer Name	Champtek Incorporated
Manufacturer Address	5/F, No. 2, Alley 2, Shih-Wei Lane, Chung-Cheng Rd., Xindian Dist., New Taipei City, Taiwan

1.3 Technical data of EUT

Equipment	Scan Kiosk
Model No	SK-100
FCC ID	WOISK100
Power Type	Adapter ---- Manufacture: Powertron Electronics Corp. Model No.: PA1015-120IB200 Input: AC 100-240V, 50-60Hz, 0.4A Output: DC 12V, 2A, 24W Max
Type of Modulation	CCK, OFDM
Transfer rate	270 Mbps
Type of Antenna	PCB Antenna
Frequency of Channel	2.412 ~2.462 GHz

During testing the EUT was operated at Tx or Rx mode for each emission measured. This was done in order to ensure that maximum emission levels were attained.



2. Report of Measurements and Examinations

2.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.203	. Antenna Requirement	Pass
15.207	. Conducted Emission	Pass
15.209 15.247(d)	. Radiated Emission	Pass
15.247(a)(2)	. 6dB Bandwidth	Pass
15.247(b)	. Maximum Peak Output Power	Pass
15.247(d)	. 100kHz Bandwidth of Frequency Band Edges	Pass
15.247(e)	. Power Spectral Density	Pass

3. Test Configuration of Equipment under Test

3.1 Carrier Frequency of Channels

Channel	Frequency(MHz)
01	2412
02	2417
03	2422
04	2427
05	2432
06	2437
07	2442
08	2447
09	2452
10	2457
11	2462

3.2 Test Mode and Test Software

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4 and C63.10.
- b. The complete test system included Notebook and EUT for RF test.
- c. Test Software: REALTEK PCIE WLAN NIC Massproduction Kit.
- d. New Battery was used for all testing and the worst radiated emission case from X, Y and Z axis evaluation was selected for testing.
- e. The following test modes were performed for test:
 - 802.11b/g/n, HT20: CH01: 2412MHz, CH06: 2442MHz, CH11: 2462MHz
 - 802.11n, HT40: CH03: 2422MHz, CH06: 2442MHz, CH09: 2452MHz

3.3 TEST Methodology & General Test Procedures

All testing as described bellowed were performed in accordance ANSI C63.4:2014, C63.10:2013, KDB 558074 D01v04 and FCC CFR 47 Part 15 Subpart C.

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8m above ground plane acceding to clause 15.207 and requirements of ANSI C63.4 and C63.10. Conducted emissions from the EUT measured in the frequency range between 0.15MHz and 30MHz are using CISPR Quasi-Peak / Average detectors. The resolution bandwidth of test receiver/spectrum analyzer is 9kHz and video bandwidth is 120kHz.

Radiated Emissions

The EUT is a placed on a turn table, which is 0.8m (1.5m for above 1GHz) above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

- 1) Putting the EUT on the platform and turning on the EUT (on/off button on the bottom of the EUT).
- 2) Setting test channel described as “Channel setting and operating condition”, and testing channel by channel.
- 3) For the spurious emission test based on ANSI C63.4 and C63.10, the resolution bandwidth of test receiver/spectrum analyzer is 120kHz and video bandwidth is 300kHz for Quasi-peak detection at frequency 30MHz~1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz RMS detector for Average Value at frequency above 1GHz

3.4 Measurement Uncertainty

Measurement Item	Uncertainty
Conducted emissions	± 2.24 dB
Radiated emissions (30MHz ~ 1GHz)	± 3.96 dB
Radiated emissions (above 1GHz)	± 3.74 dB

3.5 Description of the Support Equipments

Setup Diagram

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

4. Test and measurement equipment

4.1 Calibration

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2 Equipment

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

TABLELIST OF TEST AND MEASUREMENT EQUIPMENT

Item	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
1.	EMI Receiver	R&S	ESPI	100085	2018/12/20
2.	Pre Amplifier	MLT	PREAMP6G-01	20110209	2019/04/10
3.	Biconilog Antenna	EMCO	3142C	00044568	2018/12/02
4.	Spectrum Analyzer	HP	E7403A	US40240137	2019/03/23
5.	LISN	EMCO	3825/2	2658	2018/12/11
6.	Spectrum Analyzer	Agilent	E4446A	US44300422	2019/03/08
7.	Biconilog Antenna	EMCO	3142C	00059739	2018/12/13
8.	Home Antenna	SCHWARZBECK	BBHA 9120D	304	2018/12/13
9.	Home Antenna	SCHWARZBECK	BBHA 9170	181	2018/12/13
10.	TA	Pre Amplifier	0.10~19.1GHz 60dBm	RF01	2019/03/23
11.	Herotek	Pre Amplifier	A402-417	30690	2018/12/15
12.	Spectrum Analyzer	Agilent	N9010A	MY50060164	2018/09/04

★ Calibration interval of instruments listed above is one year

5. Antenna Requirements

5.1 Standard Applicable

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.

5.2 Antenna Construction and Directional Gain

Antenna Type: PCB Antenna

Antenna Gain: 2.5 dBi

6. Test of Conducted Emission

6.1 Test Limit

Conducted Emissions were measured from 150kHz to 30MHz with a bandwidth of 9KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4:2014. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

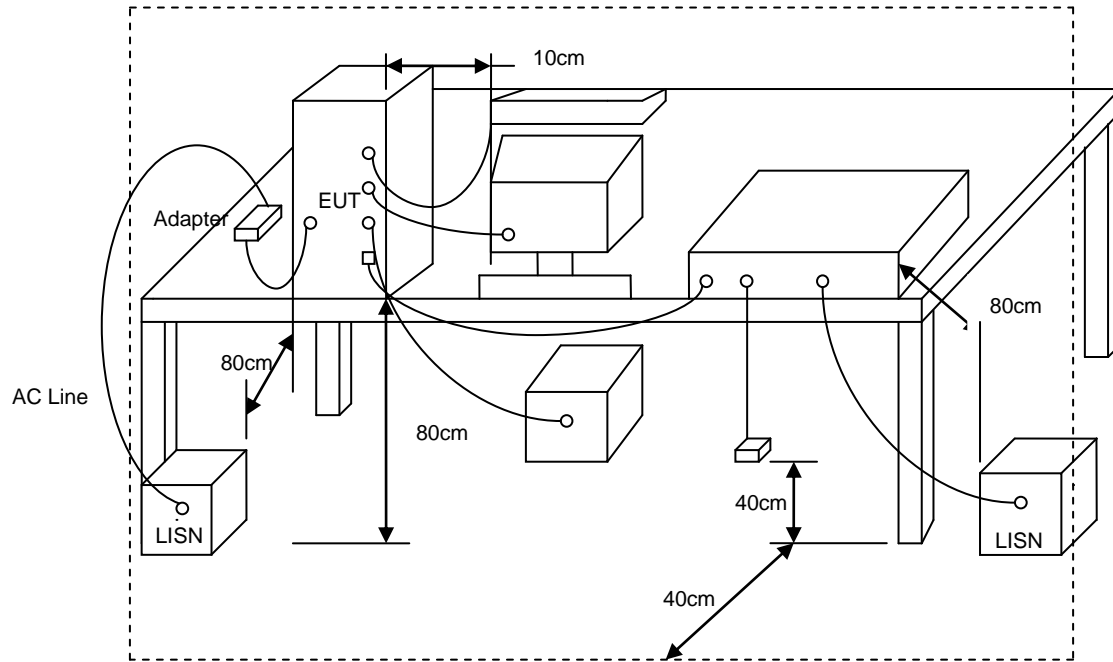
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

6.2 Test Procedures

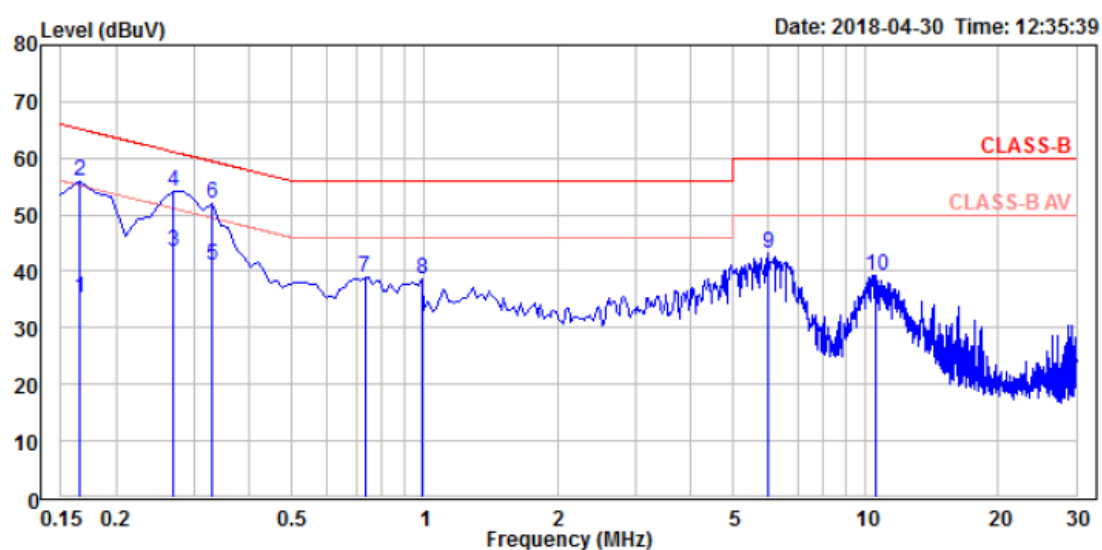
- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

6.3 Typical Test Setup



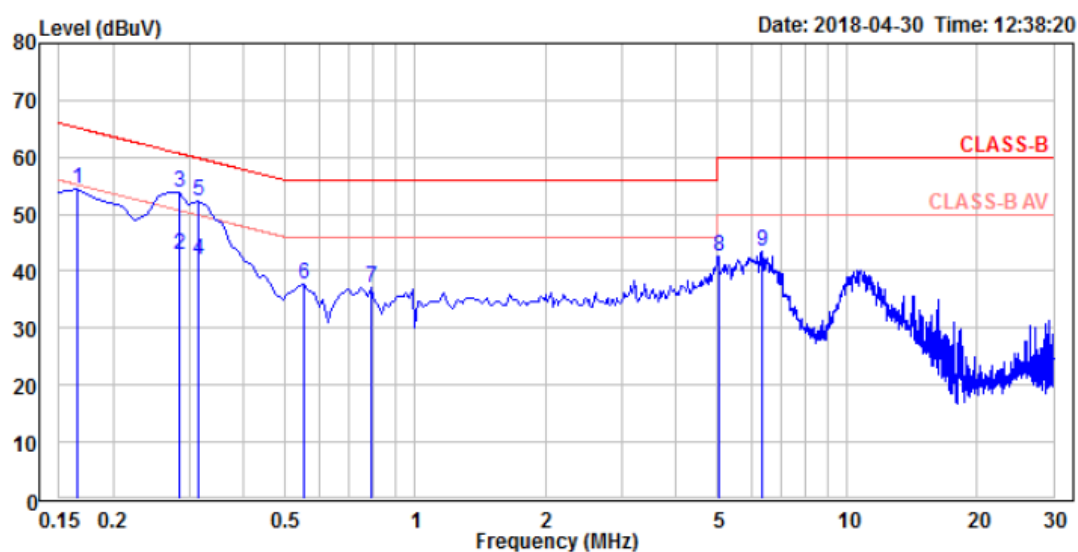
6.4 Test Result and Data

Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: 802.11b, CH1	Temperature	: 25 °C
Test Date	: Apr. 30, 2018	Humidity	: 70 %
Memo	:		



	Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.165	34.94	0.28	35.22	55.21	-19.99 Average
2	0.165	55.82	0.28	56.10	65.21	-9.11 Peak
3	0.269	43.34	0.28	43.62	51.14	-7.52 Average
4	0.269	53.92	0.28	54.20	61.14	-6.94 Peak
5	0.329	40.83	0.28	41.11	49.47	-8.36 Average
6	0.329	51.61	0.28	51.89	59.47	-7.58 Peak
7	0.732	38.69	0.29	38.98	56.00	-17.02 Peak
8	0.986	38.25	0.30	38.55	56.00	-17.45 Peak
9	6.016	42.67	0.42	43.09	60.00	-16.91 Peak
10	10.508	38.90	0.47	39.37	60.00	-20.63 Peak

Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode	: 802.11b, CH1	Temperature	: 25 °C
Test Date	: Apr. 30, 2018	Humidity	: 70 %
Memo	:		



	Freq	Read		Limit	Over	
	MHz	Level	Factor	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.165	54.08	0.34	54.42	65.21	-10.79 Peak
2	0.284	42.52	0.34	42.86	50.69	-7.83 Average
3	0.284	53.58	0.34	53.92	60.69	-6.77 Peak
4	0.314	41.72	0.34	42.06	49.86	-7.80 Average
5	0.314	52.12	0.34	52.46	59.86	-7.40 Peak
6	0.553	37.24	0.34	37.58	56.00	-18.42 Peak
7	0.792	36.84	0.36	37.20	56.00	-18.80 Peak
8	5.030	42.16	0.44	42.60	60.00	-17.40 Peak
9	6.329	42.98	0.46	43.44	60.00	-16.56 Peak

7. Test of Radiated Emission

7.1 Test Limit

Radiated Emissions were measured from 9KHz to 25GHz and return leads of the EUT according to the methods defined in ANSI C63.4:2014, C63.10:2013 and KDB 558074 D01v04. In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

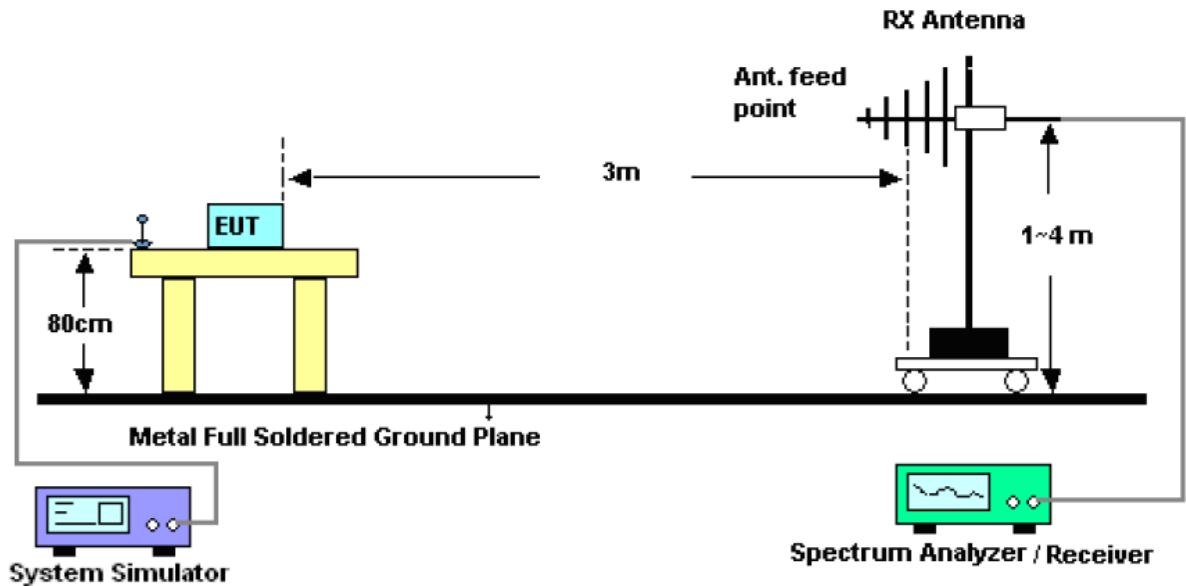
Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

7.2 Test Procedures

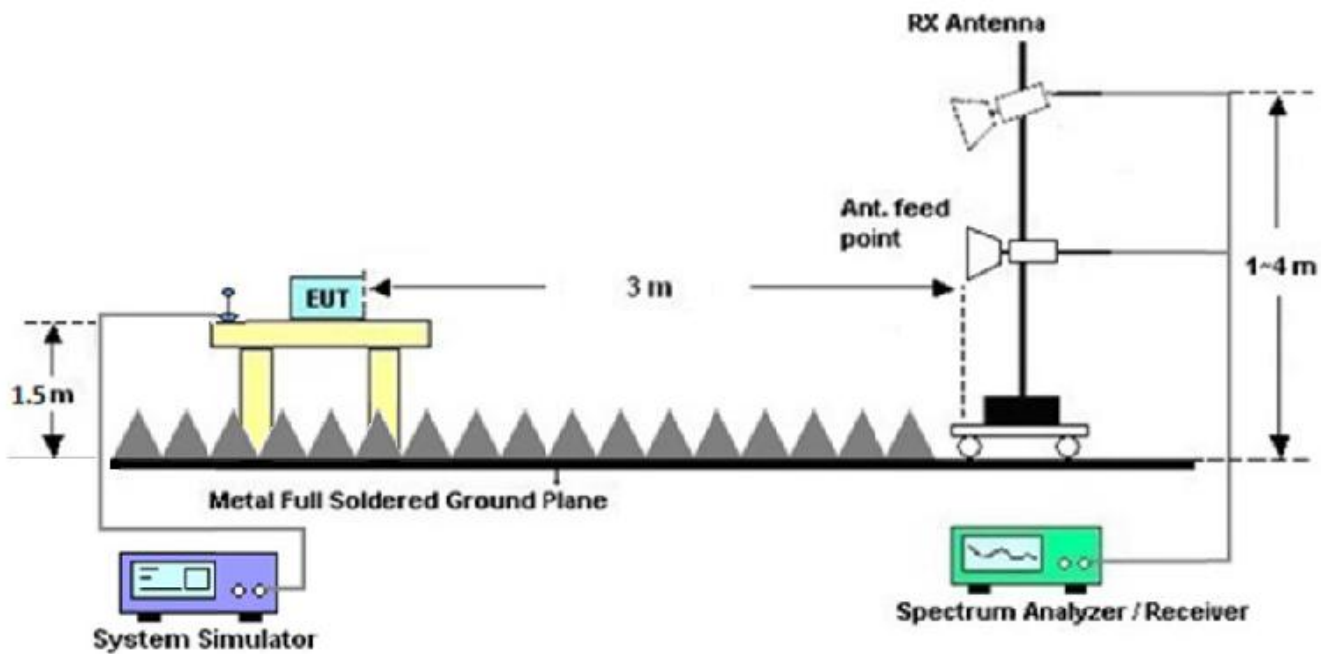
- The EUT was placed on a rotatable table top 0.8 meter above ground (1.5 meter for above 1GHz).
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1M to 4M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3dB margin will be repeated one by one using the quasi-peak method and reported.
- For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

7.3 Typical Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



7.4 Test Result and Data (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

7.5 Test Result and Data (30MHz ~ 1GHz, worst emissions found)

Power	:	AC 120V		
Test Mode	:	802.11b, CH1	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)					
Frequency (MHz)	Read (dBuV/m)	Factor	Amplitude (dBuV/m)	Limits (dBuV/m)	Margin (dB)
48.43	47.10	-27.41	19.69	40	-20.31
65.72	50.75	-29.59	21.16	40	-18.84
150.30	49.30	-29.84	19.46	43.5	-24.04
186.20	50.26	-27.53	22.73	43.5	-20.77
250.00	55.70	-25.26	30.44	46	-15.56
480.00	41.55	-17.80	23.75	46	-22.25

Radiated Emissions (HORIZONTAL)					
Frequency (MHz)	Read (dBuV/m)	Factor	Amplitude (dBuV/m)	Limits (dBuV/m)	Margin (dB)
132.00	44.25	-30.37	13.88	43.5	-29.62
156.10	41.70	-29.03	12.67	43.5	-30.83
250.00	55.24	-25.26	29.98	46	-16.02
288.00	45.94	-24.39	21.55	46	-24.45
413.20	38.51	-20.48	18.03	46	-27.97
480.00	44.81	-18.49	26.32	46	-19.68

7.6 Test Result and Data (Above 1GHz)

Power	:	AC 120V		
Test Mode	:	802.11b, CH1	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3892.50	68.00	--	-29.71	38.29	--	74	54	-35.71	--
4824.50	66.36	--	-28.14	38.22	--	74	54	-35.78	--
4997.50	73.36	--	-27.82	45.54	--	74	54	-28.46	--
5998.50	66.49	--	-23.40	43.09	--	74	54	-30.91	--
6388.50	66.02	--	-23.14	42.88	--	74	54	-31.12	--
7236.50	62.95	--	-21.45	41.50	--	74	54	-32.50	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3210.00	69.18	--	-31.23	37.95	--	74	54	-36.05	--
3931.50	67.58	--	-29.50	38.08	--	74	54	-35.92	--
4824.50	68.01	--	-28.14	39.87	--	74	54	-34.13	--
4991.00	68.24	--	-27.88	40.36	--	74	54	-33.64	--
6648.50	64.99	--	-23.19	41.80	--	74	54	-32.20	--
7236.50	63.52	--	-21.45	42.07	--	74	54	-31.93	--

Power	:	AC 120V		
Test Mode	:	802.11b, CH6	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3645.50	69.15	--	-30.59	38.56	--	74	54	-35.44	--
4250.00	69.14	--	-28.99	40.15	--	74	54	-33.85	--
4874.50	66.87	--	-28.14	38.73	--	74	54	-35.27	--
4997.50	73.50	--	-27.82	45.68	--	74	54	-28.32	--
5998.50	67.23	--	-23.40	43.83	--	74	54	-30.17	--
7311.50	63.46	--	-21.41	42.05	--	74	54	-31.95	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3229.50	70.26	--	-31.49	38.77	--	74	54	-35.23	--
3918.50	67.67	--	-29.54	38.13	--	74	54	-35.87	--
4874.50	66.54	--	-28.14	38.40	--	74	54	-35.60	--
4991.00	68.36	--	-27.88	40.48	--	74	54	-33.52	--
5998.50	66.23	--	-23.40	42.83	--	74	54	-31.17	--
7311.50	61.82	--	-21.41	40.41	--	74	54	-33.59	--

Power	:	AC 120V		
Test Mode	:	802.11b, CH11	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3242.50	69.84	--	-31.65	38.19	--	74	54	-35.81	--
4256.50	68.55	--	-29.00	39.55	--	74	54	-34.45	--
4924.50	67.01	--	-28.04	38.97	--	74	54	-35.03	--
4997.50	73.14	--	-27.82	45.32	--	74	54	-28.68	--
6395.00	65.18	--	-23.13	42.05	--	74	54	-31.95	--
7386.50	60.84	--	-21.26	39.58	--	74	54	-34.42	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3931.50	67.61	--	-29.50	38.11	--	74	54	-35.89	--
4924.50	67.49	--	-28.04	39.45	--	74	54	-34.55	--
4991.00	67.72	--	-27.88	39.84	--	74	54	-34.16	--
5517.50	68.23	--	-26.89	41.34	--	74	54	-32.66	--
5998.50	67.23	--	-23.40	43.83	--	74	54	-30.17	--
7386.50	62.11	--	-21.26	40.85	--	74	54	-33.15	--

Power	:	AC 120V		
Test Mode	:	802.11g, CH1	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3216.50	70.58	--	-31.32	39.26	--	74	54	-34.74	--
4256.50	69.33	--	-29.00	40.33	--	74	54	-33.67	--
4824.50	67.51	--	-28.14	39.37	--	74	54	-34.63	--
4997.50	73.96	--	-27.82	46.14	--	74	54	-27.86	--
5998.50	66.57	--	-23.40	43.17	--	74	54	-30.83	--
7236.50	63.90	--	-21.45	42.45	--	74	54	-31.55	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3223.00	69.44	--	-31.40	38.04	--	74	54	-35.96	--
4035.50	68.66	--	-29.57	39.09	--	74	54	-34.91	--
4824.50	66.01	--	-28.14	37.87	--	74	54	-36.13	--
4991.00	67.86	--	-27.88	39.98	--	74	54	-34.02	--
5998.50	66.33	--	-23.40	42.93	--	74	54	-31.07	--
7236.50	63.79	--	-21.45	42.34	--	74	54	-31.66	--

Power	:	AC 120V		
Test Mode	:	802.11g, CH6	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3229.50	70.08	--	-31.49	38.59	--	74	54	-35.41	--
4256.50	68.48	--	-29.00	39.48	--	74	54	-34.52	--
4874.50	67.12	--	-28.14	38.98	--	74	54	-35.02	--
4984.50	72.89	--	-27.96	44.93	--	74	54	-29.07	--
5998.50	65.47	--	-23.40	42.07	--	74	54	-31.93	--
7311.50	63.23	--	-21.41	41.82	--	74	54	-32.18	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3236.00	69.91	--	-31.57	38.34	--	74	54	-35.66	--
4178.50	67.42	--	-29.33	38.09	--	74	54	-35.91	--
4874.50	66.84	--	-28.14	38.70	--	74	54	-35.30	--
4984.50	67.95	--	-27.96	39.99	--	74	54	-34.01	--
5998.50	65.01	--	-23.40	41.61	--	74	54	-32.39	--
7311.50	63.43	--	-21.41	42.02	--	74	54	-31.98	--

Power	:	AC 120V		
Test Mode	:	802.11g, CH11	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2950.00	70.15	--	-31.83	38.32	--	74	54	-35.68	--
4256.50	69.02	--	-29.00	40.02	--	74	54	-33.98	--
4924.50	66.35	--	-28.04	38.31	--	74	54	-35.69	--
4991.00	72.34	--	-27.88	44.46	--	74	54	-29.54	--
5998.50	65.52	--	-23.40	42.12	--	74	54	-31.88	--
7386.50	62.81	--	-21.26	41.55	--	74	54	-32.45	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3496.00	69.02	--	-31.34	37.68	--	74	54	-36.32	--
3931.50	67.57	--	-29.50	38.07	--	74	54	-35.93	--
4924.50	66.08	--	-28.04	38.04	--	74	54	-35.96	--
4997.50	67.77	--	-27.82	39.95	--	74	54	-34.05	--
5998.50	66.60	--	-23.40	43.20	--	74	54	-30.80	--
7386.50	63.04	--	-21.26	41.78	--	74	54	-32.22	--

Power	:	AC 120V		
Test Mode	:	802.11n HT20, CH1	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3086.50	69.68	--	-31.38	38.30	--	74	54	-35.70	--
4263.00	69.69	--	-28.99	40.70	--	74	54	-33.30	--
4824.50	66.69	--	-28.14	38.55	--	74	54	-35.45	--
4978.00	73.51	--	-28.02	45.49	--	74	54	-28.51	--
5998.50	65.96	--	-23.40	42.56	--	74	54	-31.44	--
7236.50	63.45	--	-21.45	42.00	--	74	54	-32.00	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3223.00	69.63	--	-31.40	38.23	--	74	54	-35.77	--
3944.50	67.59	--	-29.61	37.98	--	74	54	-36.02	--
4824.50	67.33	--	-28.14	39.19	--	74	54	-34.81	--
4978.00	67.70	--	-28.02	39.68	--	74	54	-34.32	--
5998.50	66.15	--	-23.40	42.75	--	74	54	-31.25	--
7236.50	63.44	--	-21.45	41.99	--	74	54	-32.01	--

Power	:	AC 120V		
Test Mode	:	802.11n HT20, CH6	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3080.00	69.31	--	-31.38	37.93	--	74	54	-36.07	--
4256.50	69.64	--	-29.00	40.64	--	74	54	-33.36	--
4874.50	66.38	--	-28.14	38.24	--	74	54	-35.76	--
4984.50	73.04	--	-27.96	45.08	--	74	54	-28.92	--
6382.00	64.75	--	-23.14	41.61	--	74	54	-32.39	--
7311.50	64.08	--	-21.41	42.67	--	74	54	-31.33	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3093.00	69.07	--	-31.38	37.69	--	74	54	-36.31	--
3925.00	66.87	--	-29.50	37.37	--	74	54	-36.63	--
4874.50	66.76	--	-28.14	38.62	--	74	54	-35.38	--
4997.50	68.51	--	-27.82	40.69	--	74	54	-33.31	--
5998.50	67.28	--	-23.40	43.88	--	74	54	-30.12	--
7311.50	62.64	--	-21.41	41.23	--	74	54	-32.77	--

Power	:	AC 120V		
Test Mode	:	802.11n HT20, CH11	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3216.50	69.34	--	-31.32	38.02	--	74	54	-35.98	--
4250.00	69.16	--	-28.99	40.17	--	74	54	-33.83	--
4924.50	67.35	--	-28.04	39.31	--	74	54	-34.69	--
4991.00	73.85	--	-27.88	45.97	--	74	54	-28.03	--
5998.50	65.56	--	-23.40	42.16	--	74	54	-31.84	--
7386.50	62.98	--	-21.26	41.72	--	74	54	-32.28	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3093.00	68.97	--	-31.38	37.59	--	74	54	-36.41	--
3795.00	68.64	--	-30.13	38.51	--	74	54	-35.49	--
4924.50	66.03	--	-28.04	37.99	--	74	54	-36.01	--
4991.00	68.12	--	-27.88	40.24	--	74	54	-33.76	--
5998.50	66.59	--	-23.40	43.19	--	74	54	-30.81	--
7386.50	62.76	--	-21.26	41.50	--	74	54	-32.50	--

Power	:	AC 120V		
Test Mode	:	802.11n HT40, CH3	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3619.50	67.02	--	-30.69	36.33	--	74	54	-37.67	--
4256.50	68.83	--	-29.00	39.83	--	74	54	-34.17	--
4844.50	67.12	--	-28.17	38.95	--	74	54	-35.05	--
4991.00	72.75	--	-27.88	44.87	--	74	54	-29.13	--
6388.50	65.37	--	-23.14	42.23	--	74	54	-31.77	--
7266.50	63.47	--	-21.61	41.86	--	74	54	-32.14	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3229.50	70.16	--	-31.49	38.67	--	74	54	-35.33	--
4074.50	68.15	--	-29.15	39.00	--	74	54	-35.00	--
4844.50	66.98	--	-28.17	38.81	--	74	54	-35.19	--
4991.00	68.42	--	-27.88	40.54	--	74	54	-33.46	--
5998.50	66.34	--	-23.40	42.94	--	74	54	-31.06	--
7266.50	63.37	--	-21.61	41.76	--	74	54	-32.24	--

Power	:	AC 120V		
Test Mode	:	802.11n HT40, CH6	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3223.00	69.27	--	-31.40	37.87	--	74	54	-36.13	--
4256.50	68.94	--	-29.00	39.94	--	74	54	-34.06	--
4874.50	66.38	--	-28.14	38.24	--	74	54	-35.76	--
4991.00	72.84	--	-27.88	44.96	--	74	54	-29.04	--
5998.50	65.76	--	-23.40	42.36	--	74	54	-31.64	--
7311.50	63.21	--	-21.41	41.80	--	74	54	-32.20	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3216.50	69.52	--	-31.32	38.20	--	74	54	-35.80	--
3756.00	67.97	--	-30.25	37.72	--	74	54	-36.28	--
4874.50	66.42	--	-28.14	38.28	--	74	54	-35.72	--
4991.00	69.46	--	-27.88	41.58	--	74	54	-32.42	--
5998.50	66.23	--	-23.40	42.83	--	74	54	-31.17	--
7311.50	62.50	--	-21.41	41.09	--	74	54	-32.91	--

Power	:	AC 120V		
Test Mode	:	802.11n HT40, CH9	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3216.50	69.86	--	-31.32	38.54	--	74	54	-35.46	--
4263.00	69.48	--	-28.99	40.49	--	74	54	-33.51	--
4904.50	66.70	--	-28.09	38.61	--	74	54	-35.39	--
4991.00	72.84	--	-27.88	44.96	--	74	54	-29.04	--
5998.50	66.88	--	-23.40	43.48	--	74	54	-30.52	--
7356.50	62.70	--	-21.23	41.47	--	74	54	-32.53	--

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
3093.00	68.13	--	-31.38	36.75	--	74	54	-37.25	--
3652.00	68.71	--	-30.58	38.13	--	74	54	-35.87	--
4904.50	67.24	--	-28.09	39.15	--	74	54	-34.85	--
4991.00	67.82	--	-27.88	39.94	--	74	54	-34.06	--
5998.50	65.66	--	-23.40	42.26	--	74	54	-31.74	--
7356.50	61.97	--	-21.23	40.74	--	74	54	-33.26	--

Notes:

1. Amplitude = Reading Amplitude + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier Gain
3. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz and video bandwidth is 300kHz for Quasi-peak detection at frequency 30 MHz~1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz RMS detector for Average Value at frequency above 1GHz
6. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
7. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement at frequency above 1GHz.

8. 6dB Bandwidth

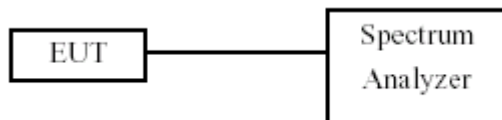
8.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

8.2 Test Procedures

- a. According to KDB 558074 D01v04 clause 8.1.
- b. The transmitter output was connected to the spectrum analyzer.
- c. Set at RBW 100kHz and 300kHz VBW.
- d. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.
- e. The 6dB Bandwidth was measured and recorded.

8.3 Test Setup Layout



8.4 Test Result and Data

Test Date: Apr. 20, 2018

Temperature: 26°C

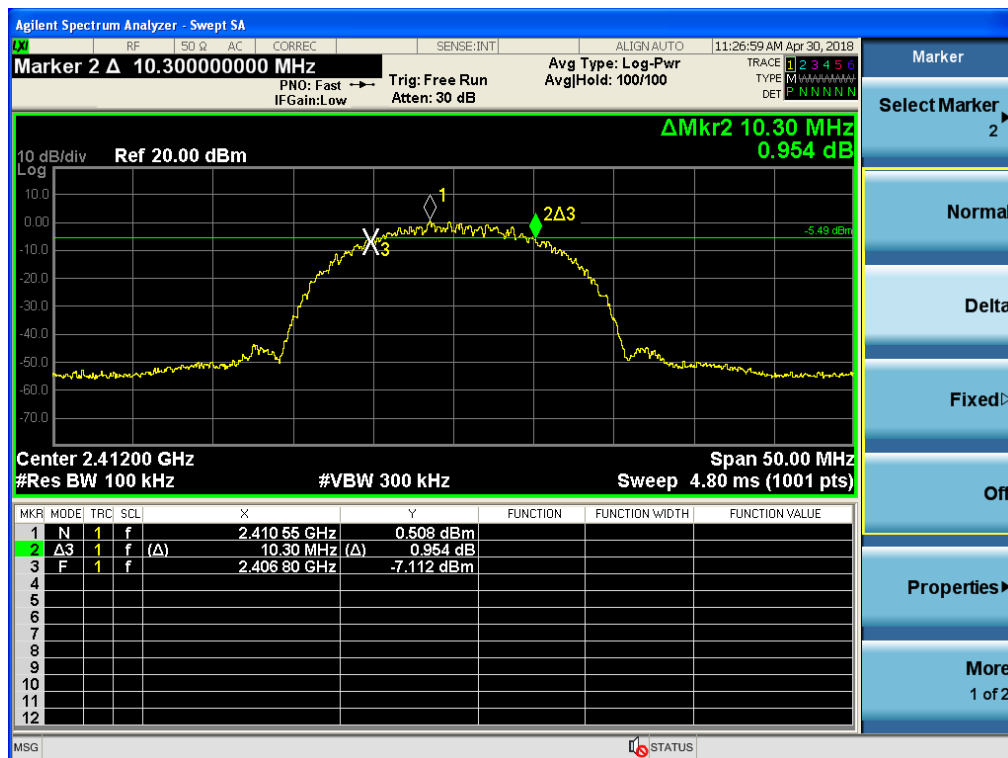
Atmospheric pressure: 1000 hPa

Humidity: 60%

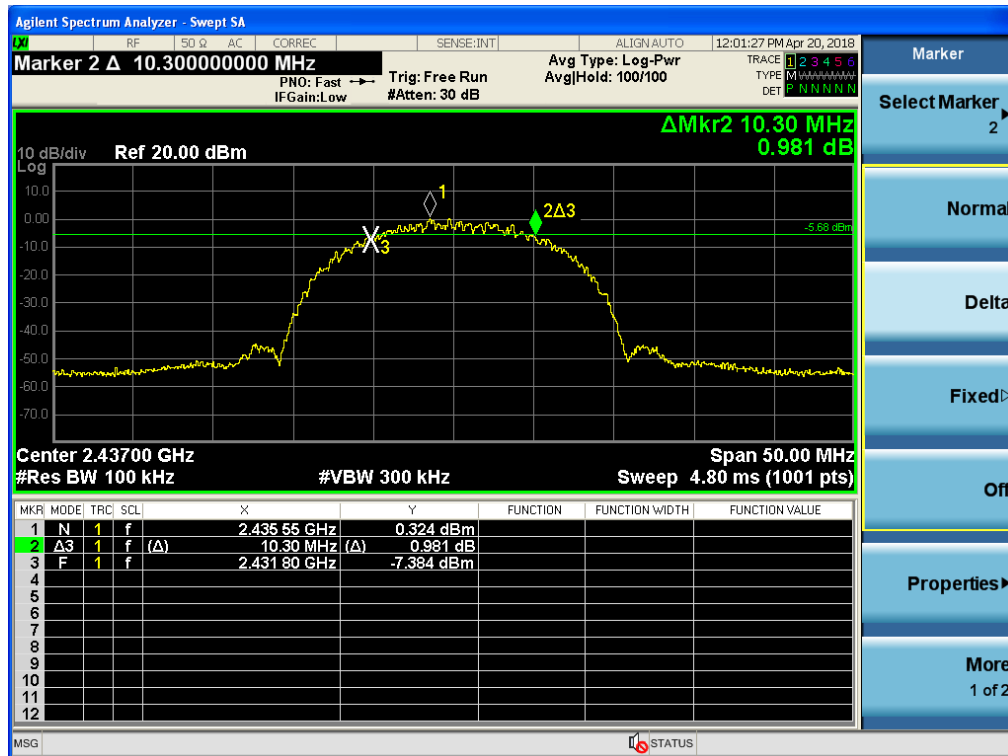
Modulation Standard	Channel	Frequency (MHz)	6dB Bandwidth (MHz)
802.11b (11Mbps)	01	2412	10.30
	06	2437	10.30
	11	2462	10.30
802.11g (6Mbps)	01	2412	16.65
	06	2437	16.60
	11	2462	16.70
802.11n HT20 (6.5Mbps)	01	2412	17.85
	06	2437	17.85
	11	2462	17.85
802.11n HT40 (13.5Mbps)	03	2422	36.60
	06	2437	36.60
	09	2452	36.60

Modulation Standard: 802.11b

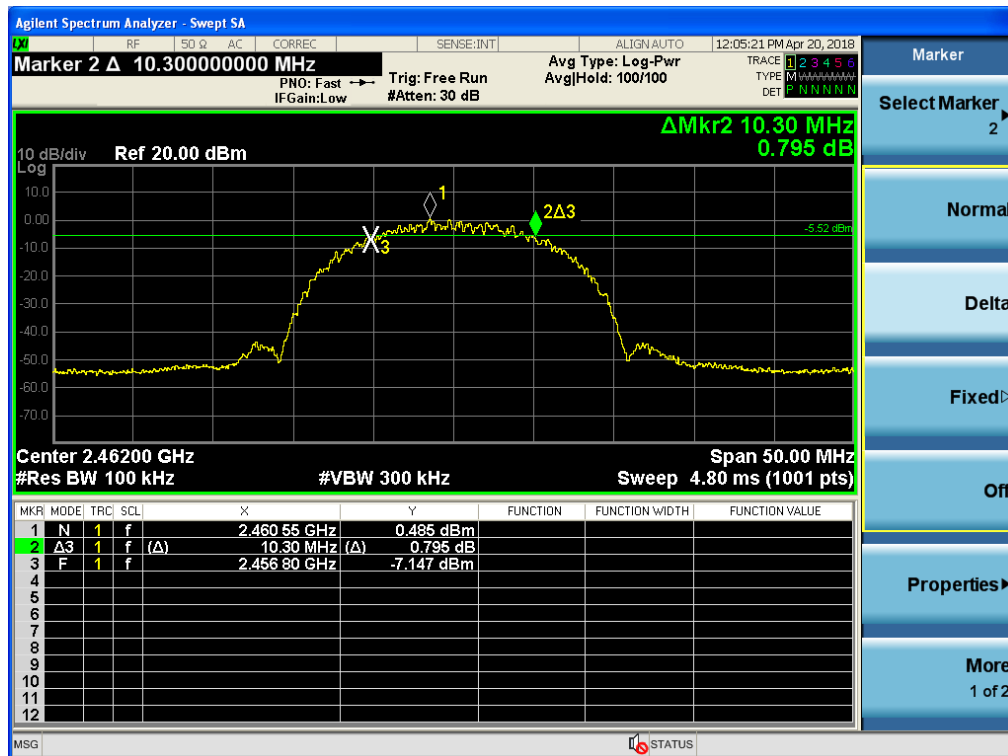
Channel: 01



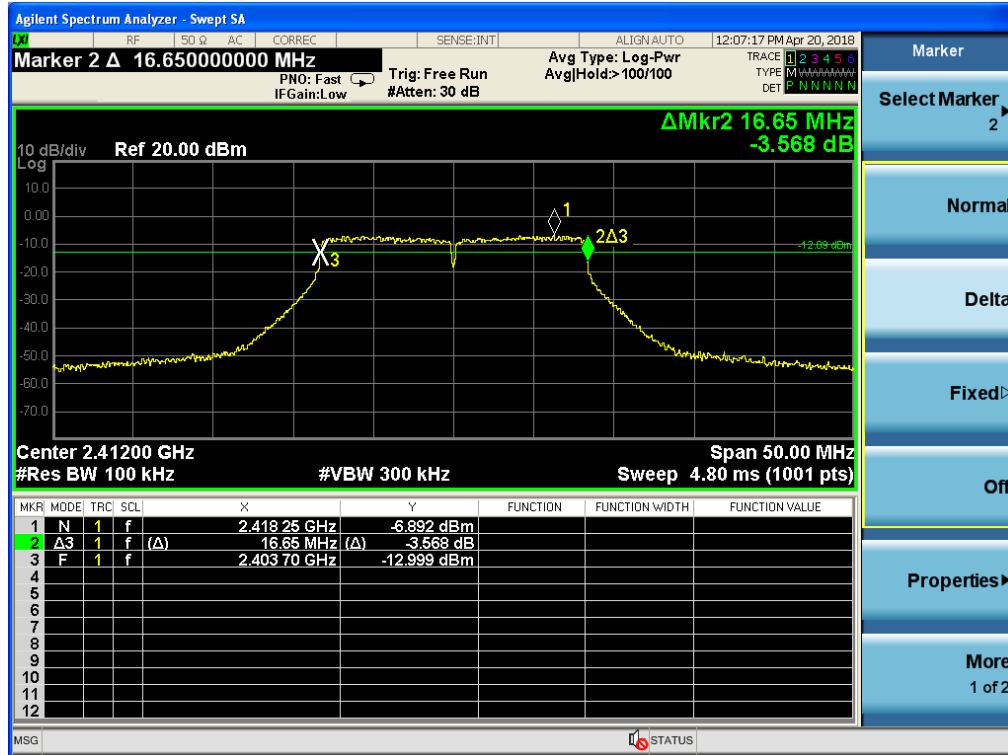
Modulation Standard: 802.11b
Channel: 06



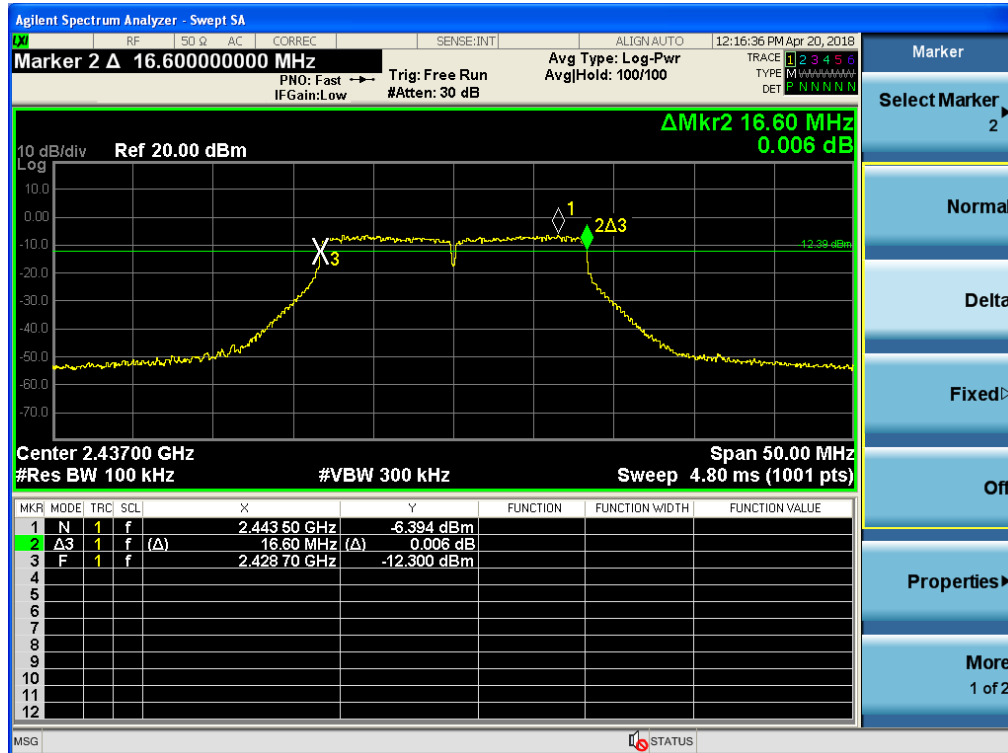
Modulation Standard: 802.11b
Channel: 11



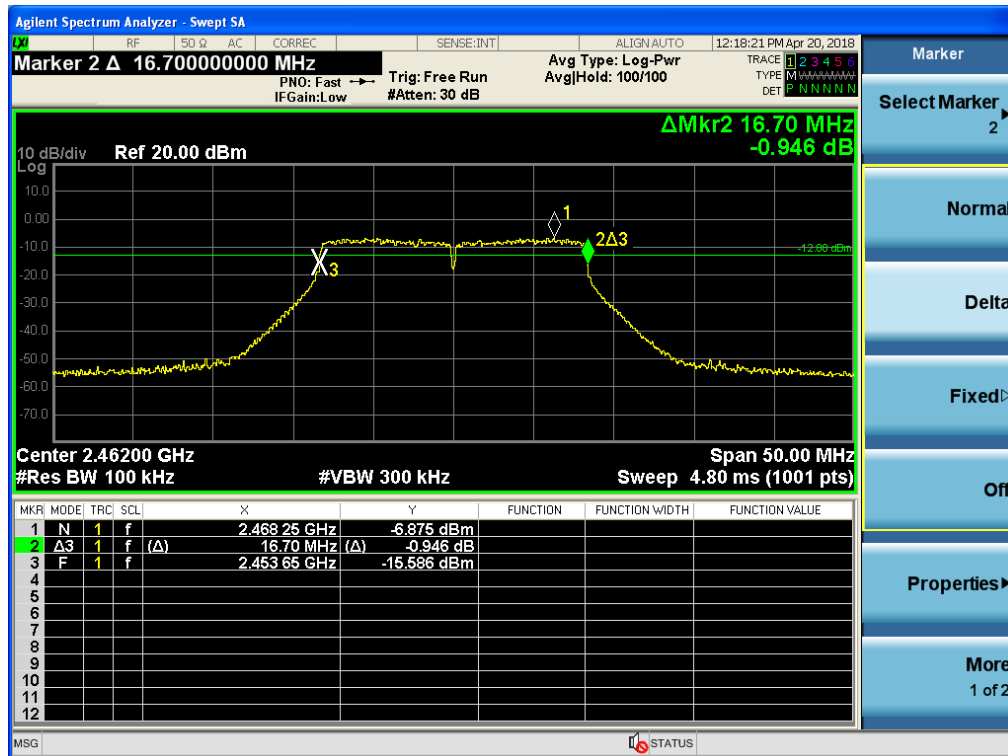
Modulation Standard: 802.11g
Channel: 01



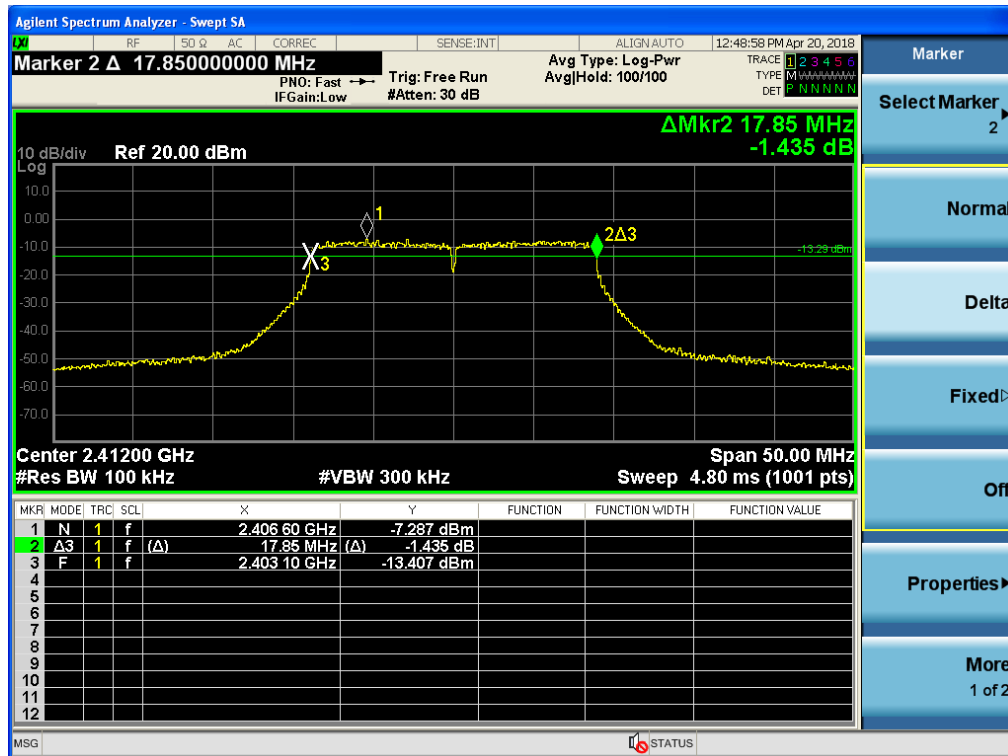
Modulation Standard: 802.11g
Channel: 06



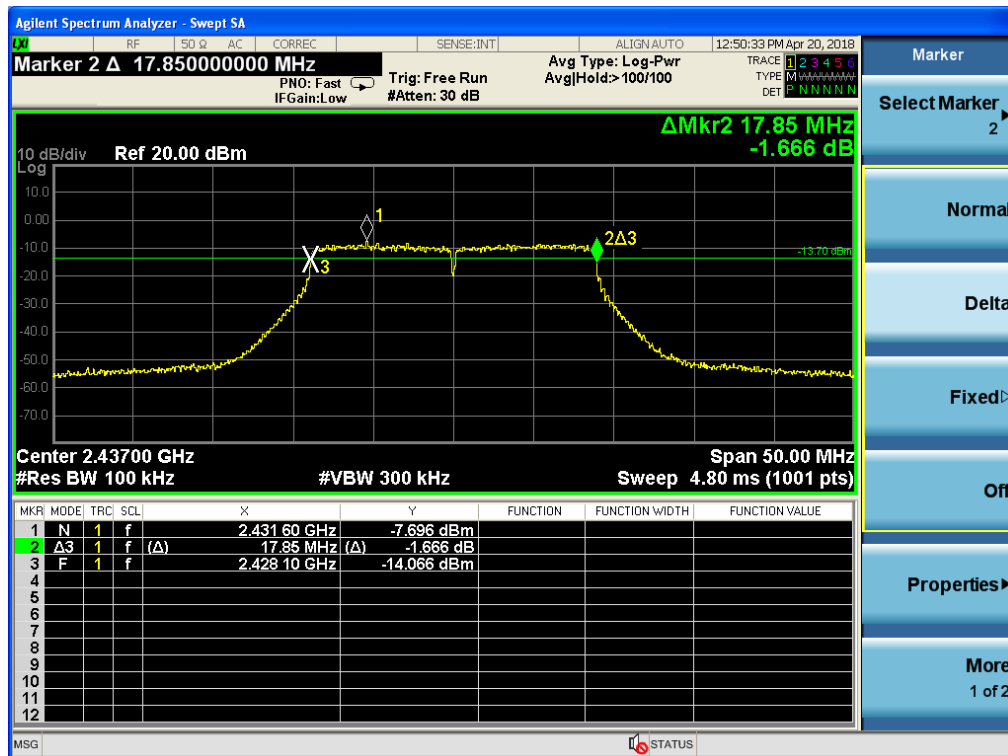
Modulation Standard: 802.11g
Channel: 11



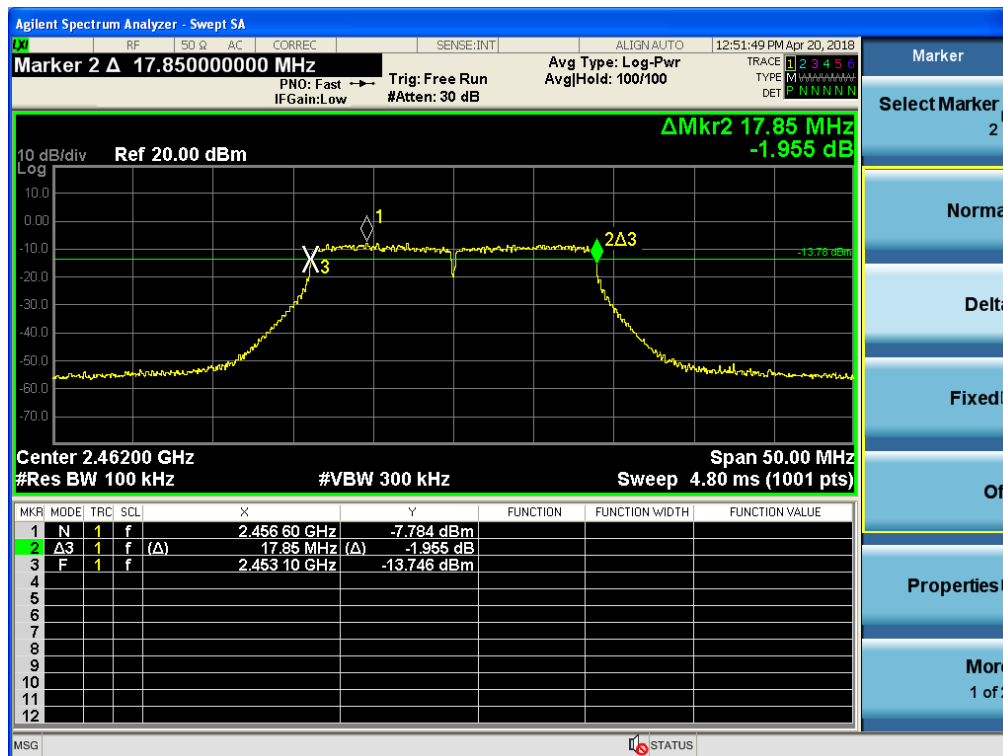
Modulation Standard: 802.11n HT20
Channel: 01



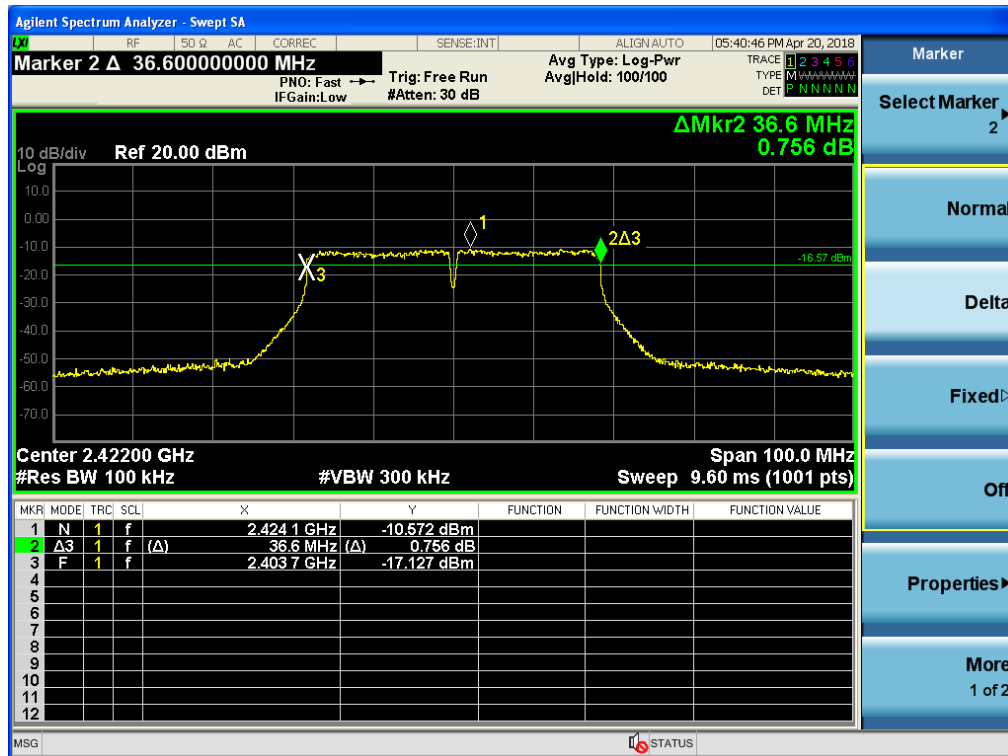
Modulation Standard: 802.11n HT20
Channel: 06



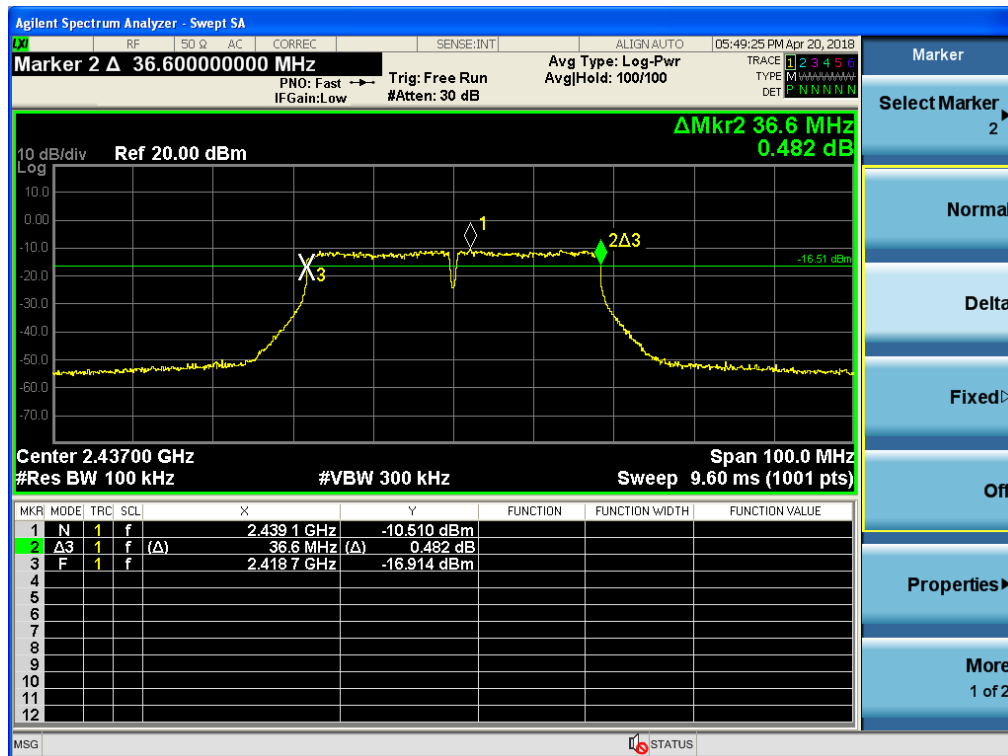
Modulation Standard: 802.11n HT20
Channel: 11



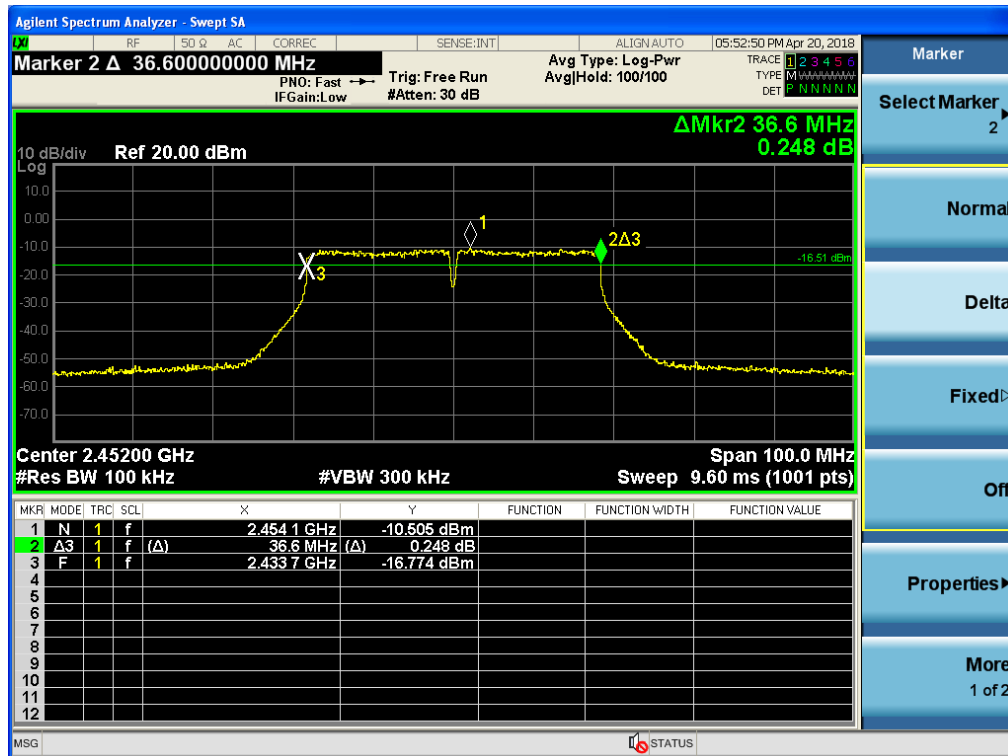
Modulation Standard: 802.11n HT40
Channel: 03



Modulation Standard: 802.11n HT40
Channel: 06



Modulation Standard: 802.11n HT40
Channel: 09



9. Maximum Peak and Average Output Power

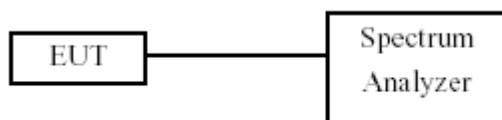
9.1 Test Limit

The Maximum Peak and Average Output Power Measurement is 30dBm.

9.2 Test Procedures

- a. According to KDB 558074 D01v04 clause 9.1.2 and clause 9.2.2.2.
- b. The transmitter output was connected to spectrum analyzer.
- c. The spectrum analyzer's resolution bandwidth were set at 1MHz RBW and 3MHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
- d. Use the spectrum analyzer's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some analyzers, this may require a manual override to ensure use of peak detector).
- e. Employ trace averaging in power averaging (RMS) mode over a minimum of 100 traces.
- f. Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges.
- g. The peak and average output power was measured and recorded.

9.3 Test Setup Layout



9.4 Test Result and Data

Test Date: Apr. 20, 2018

Temperature: 26°C

Atmospheric pressure: 1000 hPa

Humidity: 60%

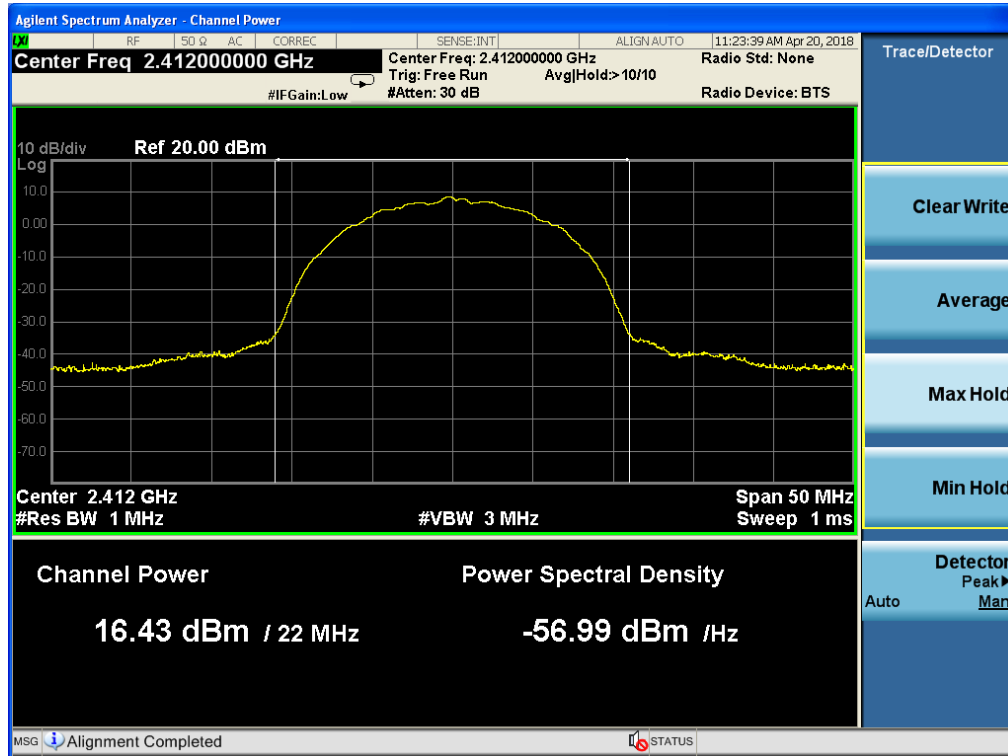
Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
802.11b (11Mbps)	01	2412	16.43	43.95
	06	2437	16.01	39.90
	11	2462	16.15	41.21
802.11g (6Mbps)	01	2412	14.98	31.48
	06	2437	15.35	34.28
	11	2462	15.12	32.51
802.11n HT20 (6.5Mbps)	01	2412	14.61	28.91
	06	2437	13.85	24.27
	11	2462	14.05	25.41
802.11n HT40 (13.5Mbps)	03	2422	14.10	25.70
	06	2437	14.32	27.04
	09	2452	14.40	27.54

Modulation Standard	Channel	Frequency (MHz)	Average Power Output (dBm)	Average Power Output (mW)
802.11b (11Mbps)	01	2412	14.81	30.27
	06	2437	14.39	27.48
	11	2462	14.55	28.51
802.11g (6Mbps)	01	2412	12.50	17.78
	06	2437	12.97	19.82
	11	2462	12.53	17.91
802.11n HT20 (6.5Mbps)	01	2412	12.20	16.60
	06	2437	11.48	14.06
	11	2462	11.57	14.35
802.11n HT40 (13.5Mbps)	03	2422	11.59	14.42
	06	2437	11.80	15.14
	09	2452	11.97	15.74

Peak Output Power

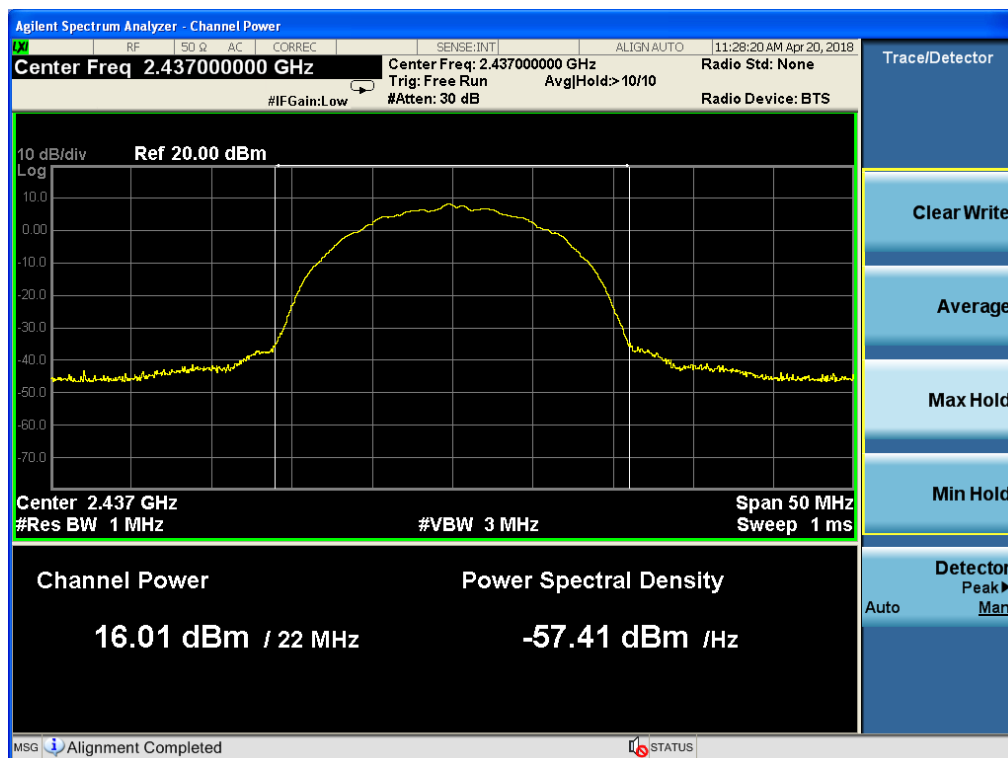
Modulation Standard: 802.11b

Channel: 01

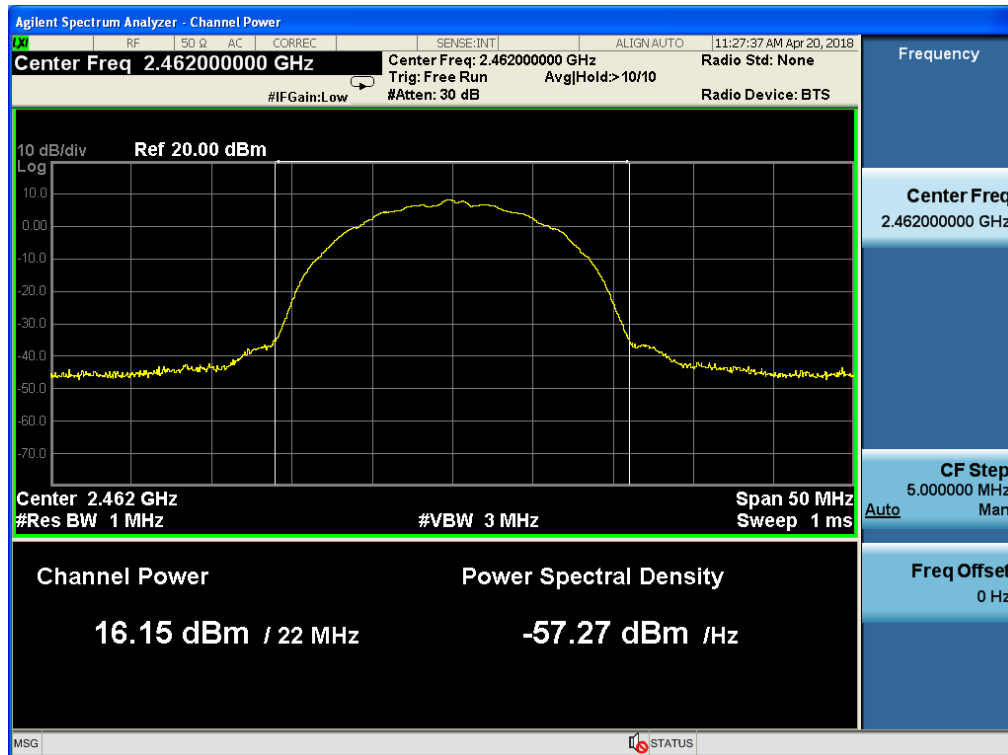


Modulation Standard: 802.11b

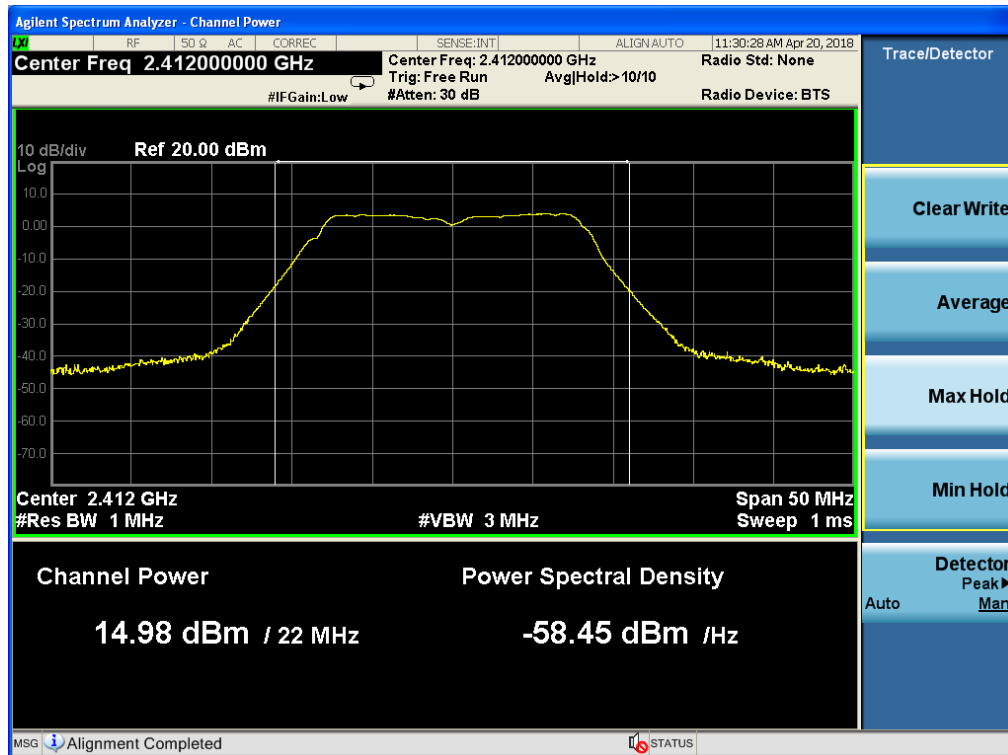
Channel: 06



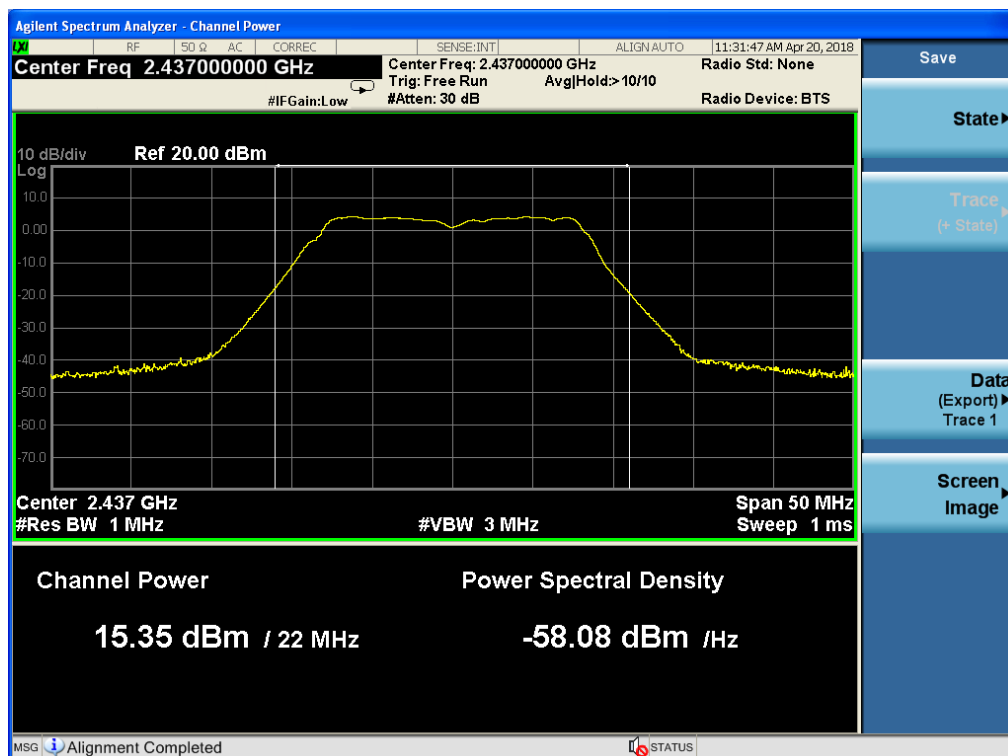
Modulation Standard: 802.11b
Channel: 11



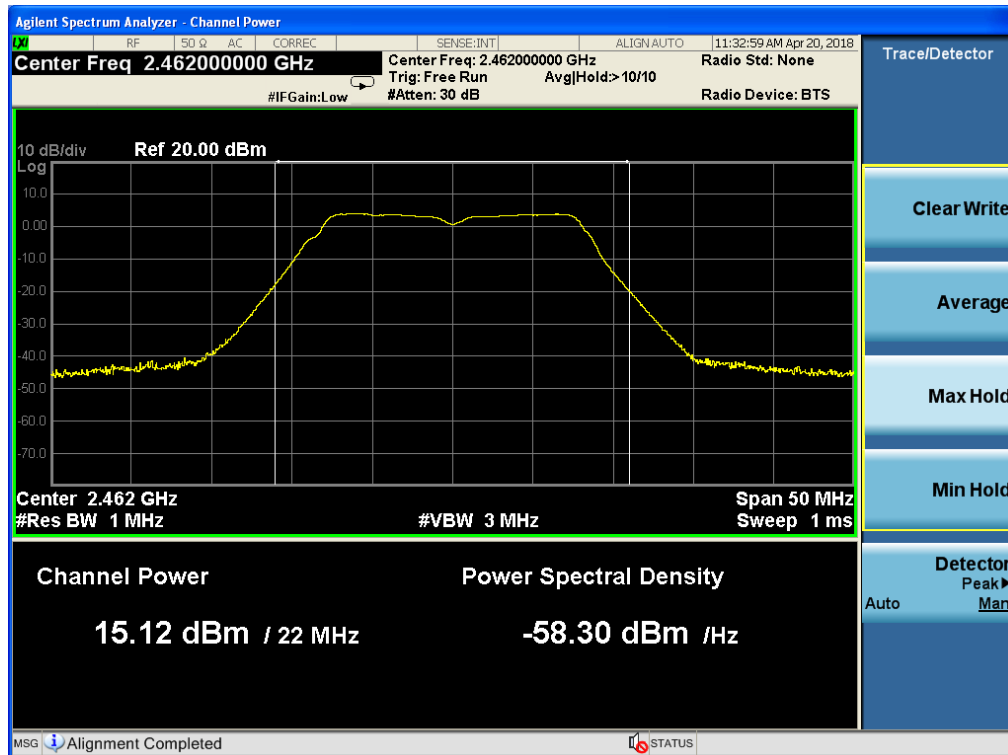
Modulation Standard: 802.11g
Channel: 01



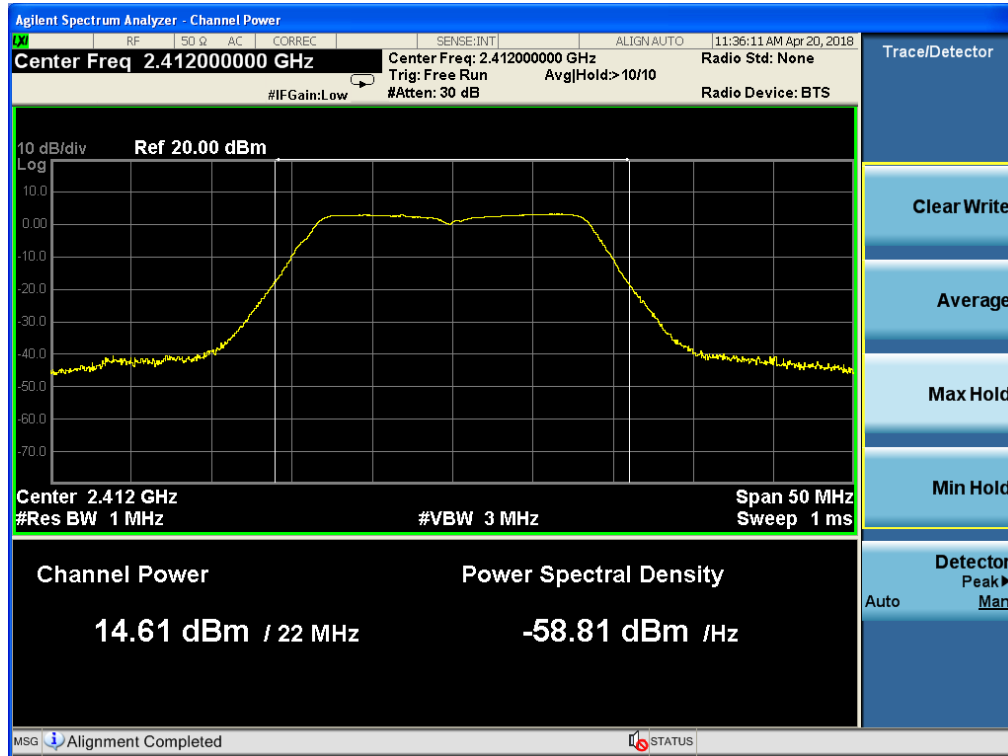
Modulation Standard: 802.11g
Channel: 06



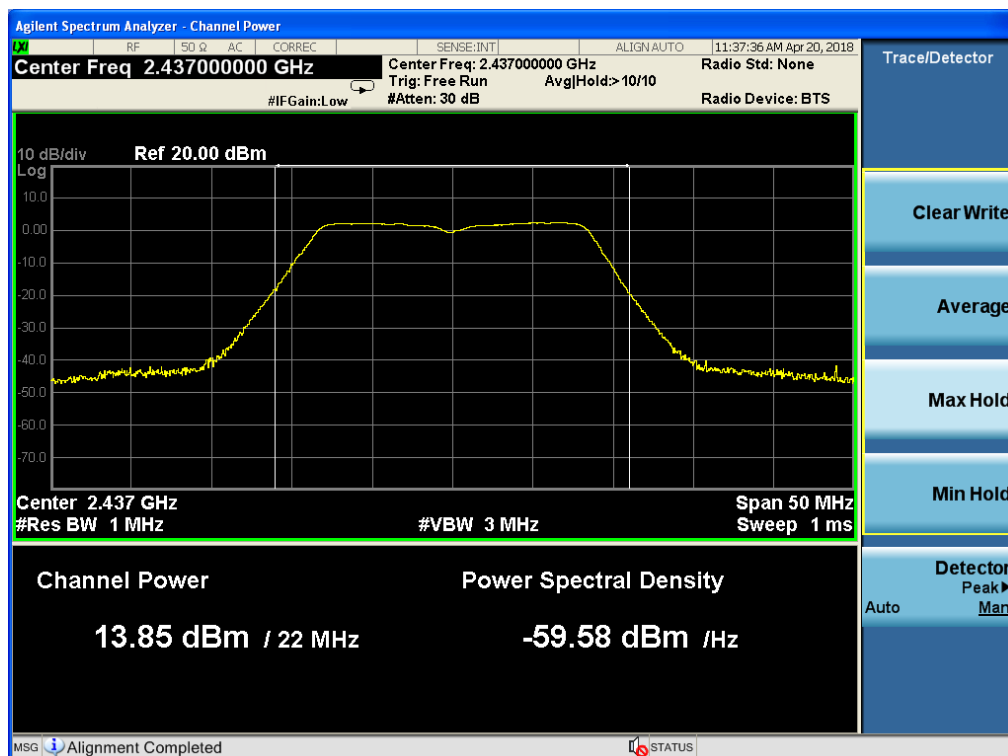
Modulation Standard: 802.11g
Channel: 11



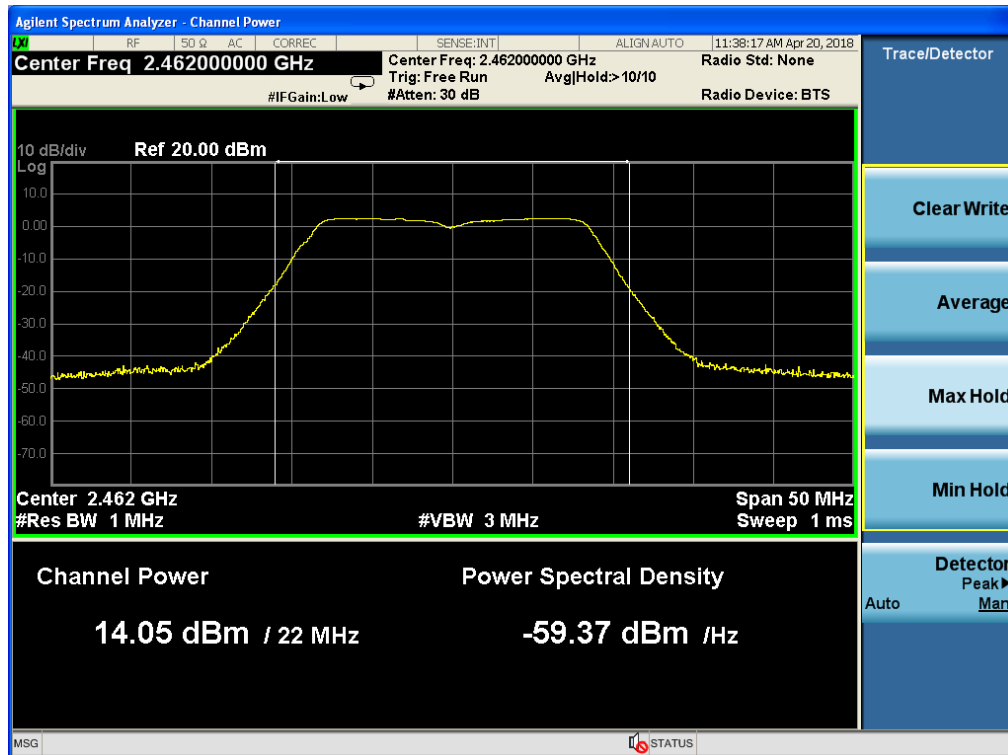
Modulation Standard: 802.11n HT20
Channel: 01



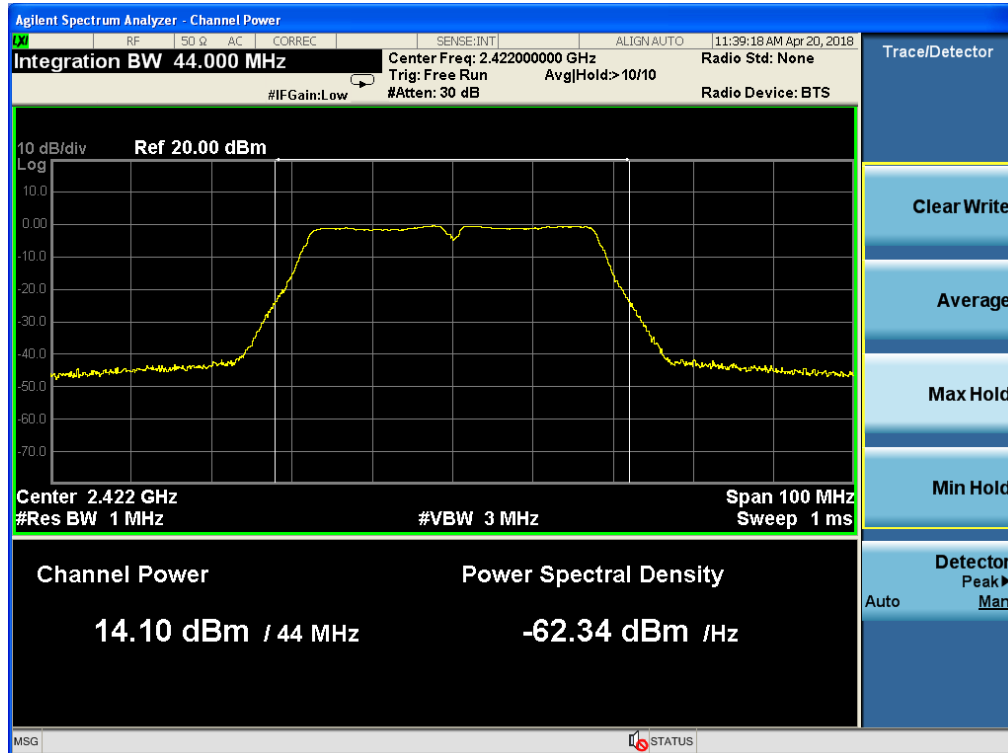
Modulation Standard: 802.11n HT20
Channel: 06



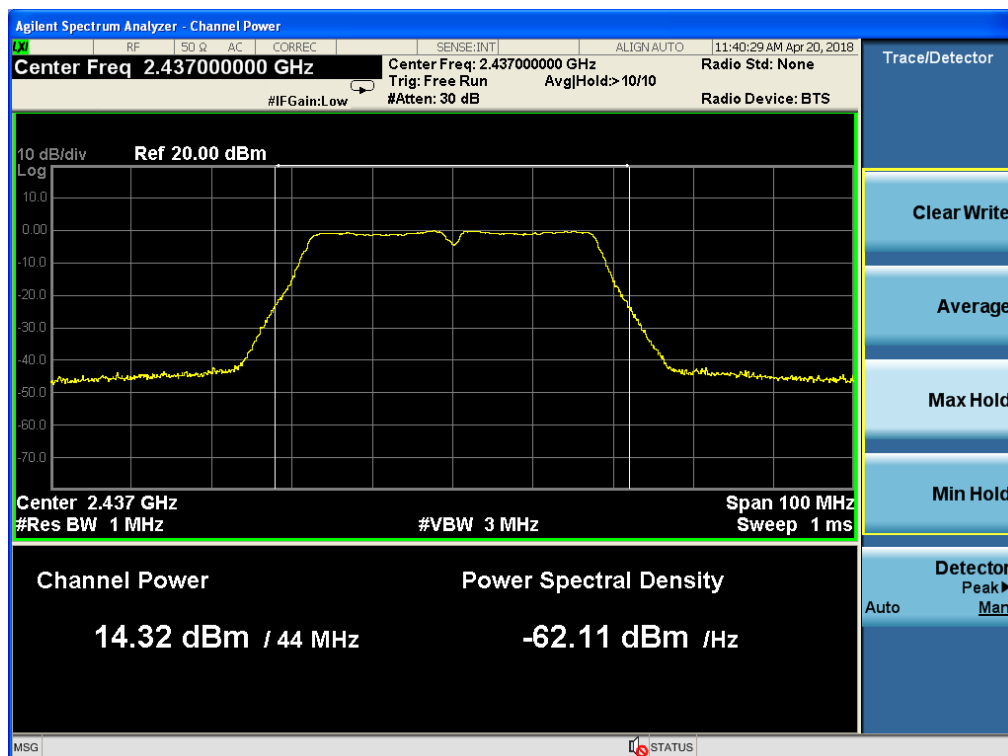
Modulation Standard: 802.11n HT20
Channel: 11



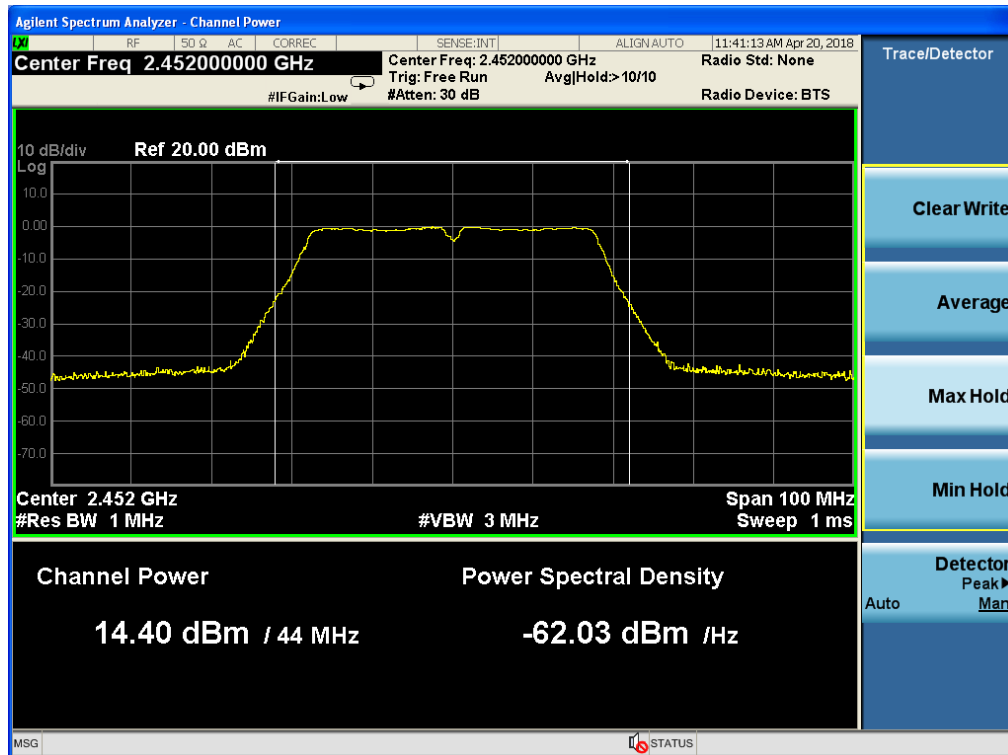
Modulation Standard: 802.11n HT40
Channel: 03



Modulation Standard: 802.11n HT40
Channel: 06



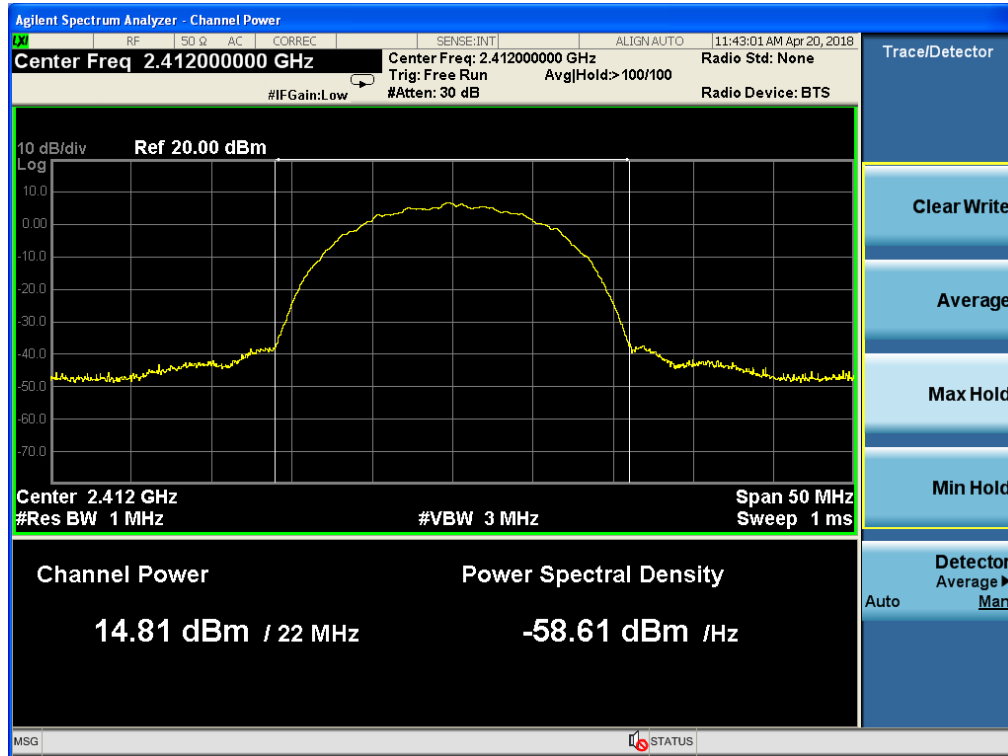
Modulation Standard: 802.11n HT40
Channel: 09



Average Output Power

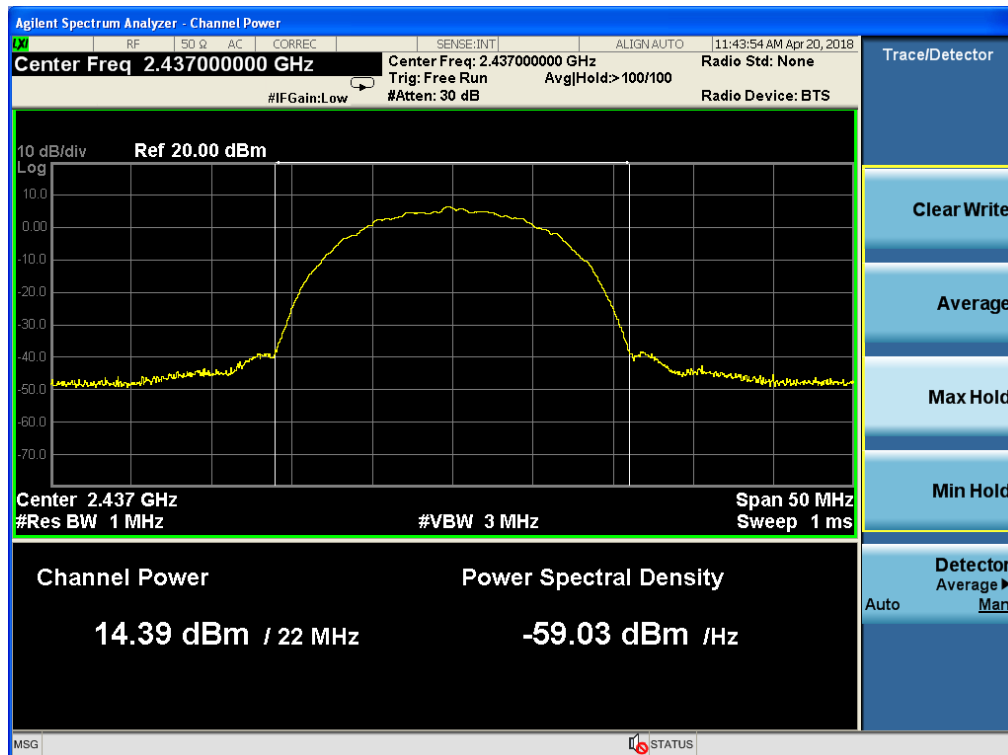
Modulation Standard: 802.11b

Channel: 01

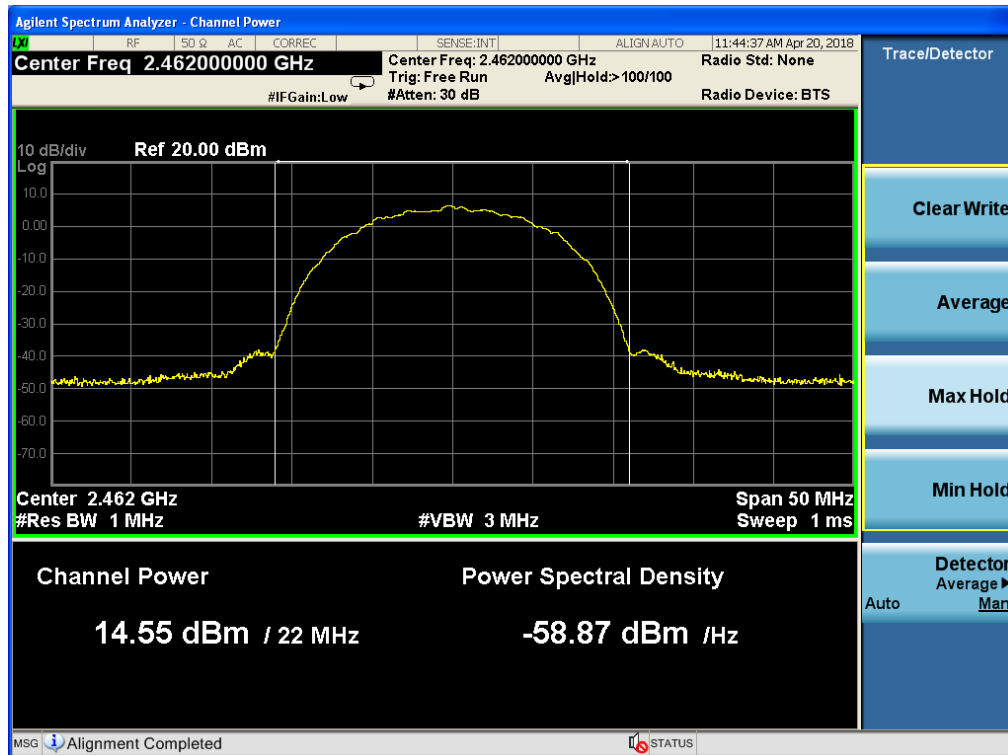


Modulation Standard: 802.11b

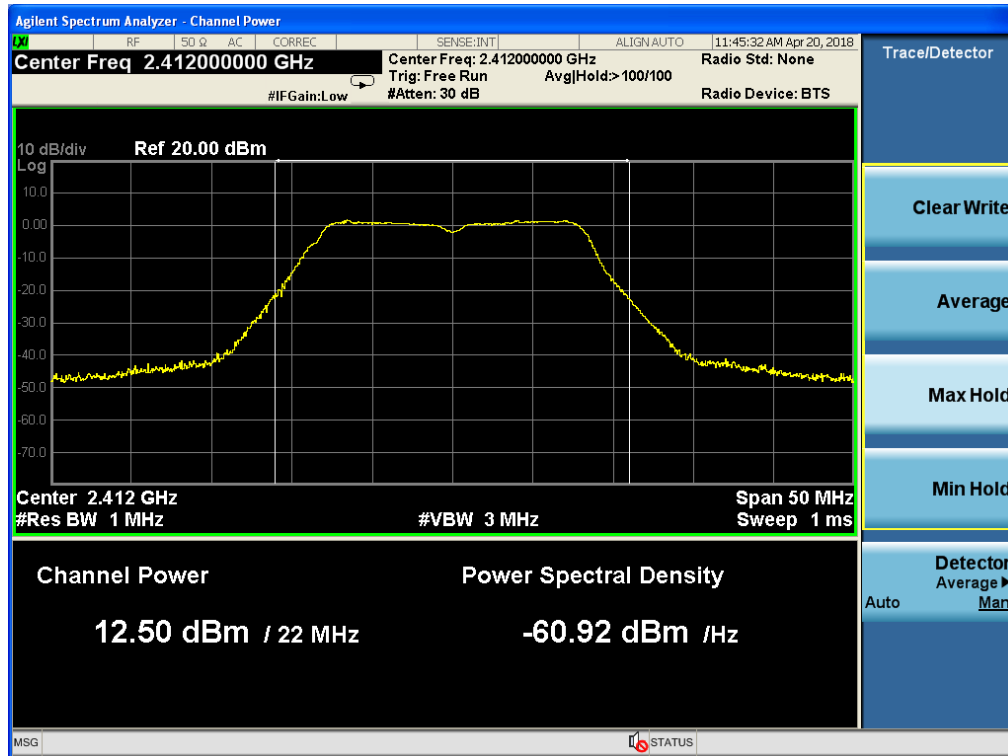
Channel: 06



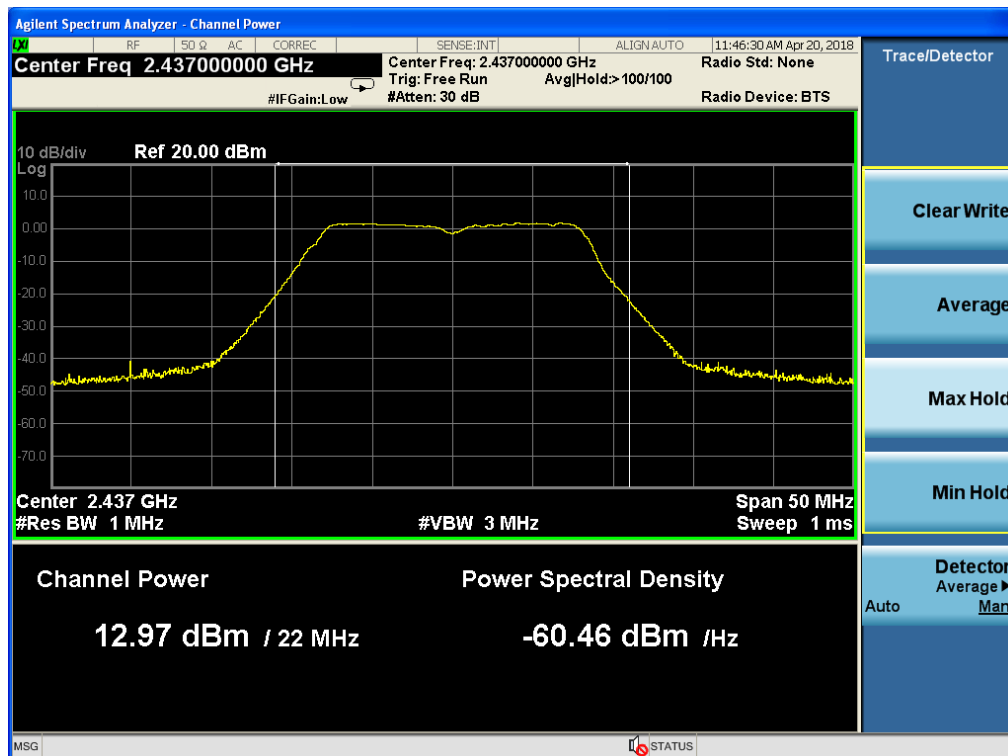
Modulation Standard: 802.11b
Channel: 11



Modulation Standard: 802.11g
Channel: 01

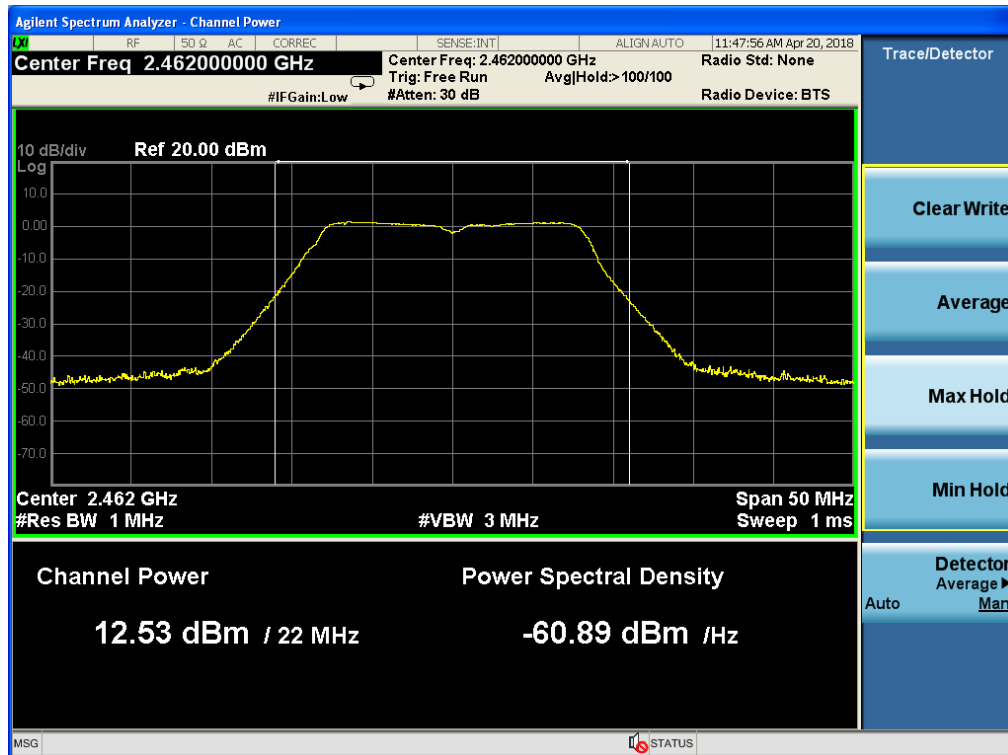


Modulation Standard: 802.11g
Channel: 06



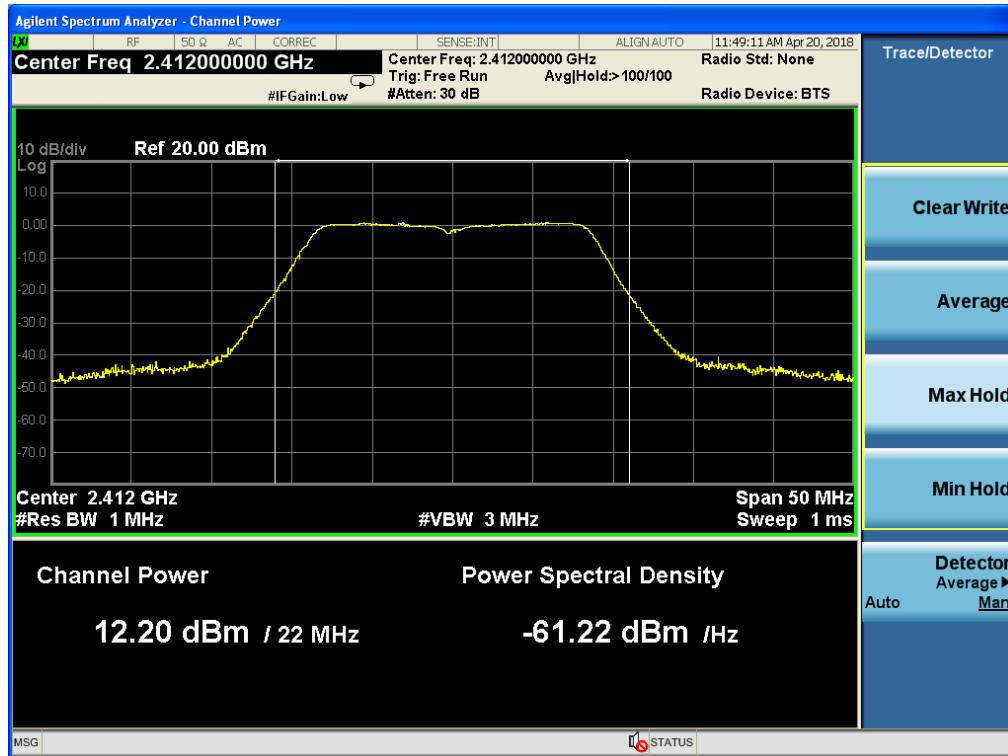
Modulation Standard: 802.11g

Channel: 11



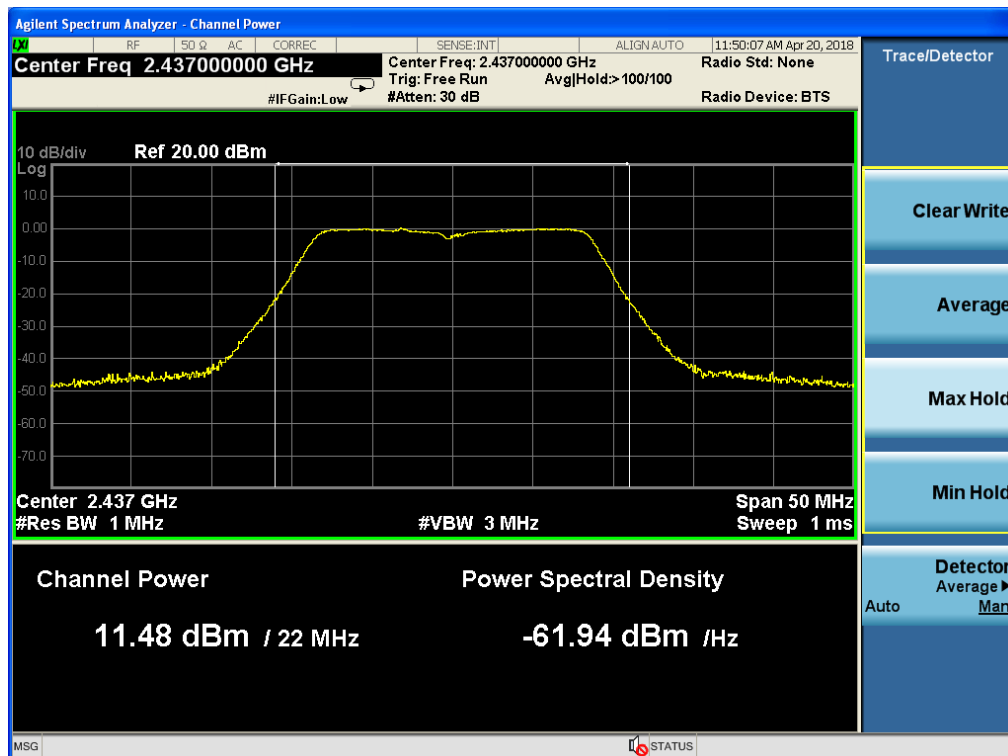
Modulation Standard: 802.11n HT20

Channel: 01



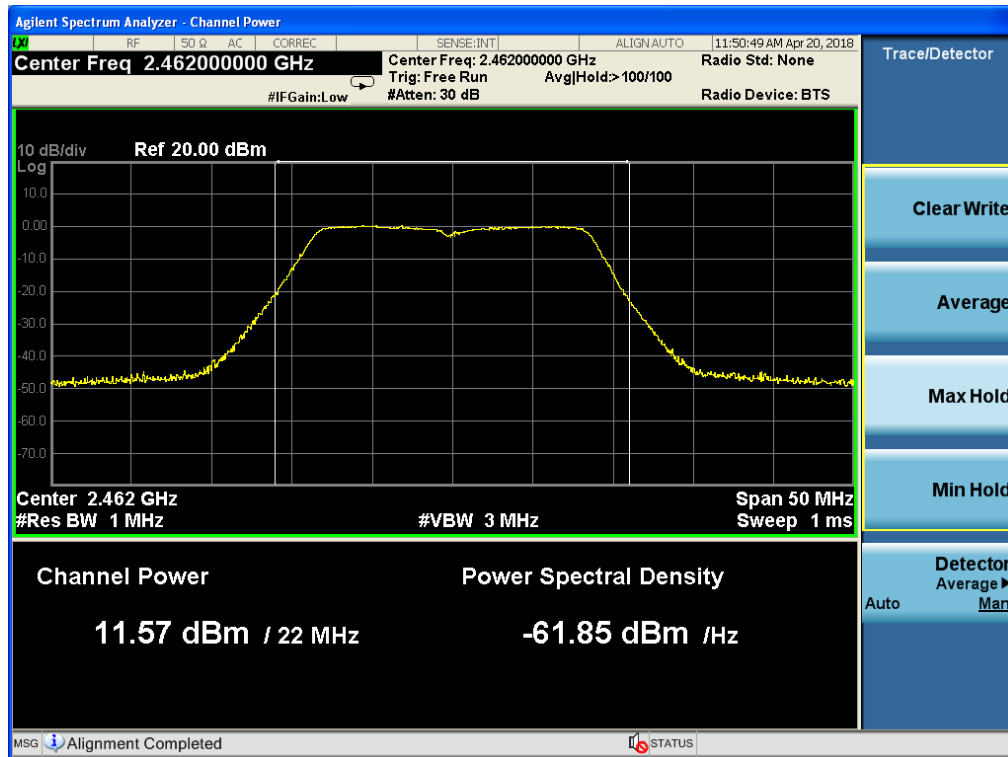
Modulation Standard: 802.11n HT20

Channel: 06

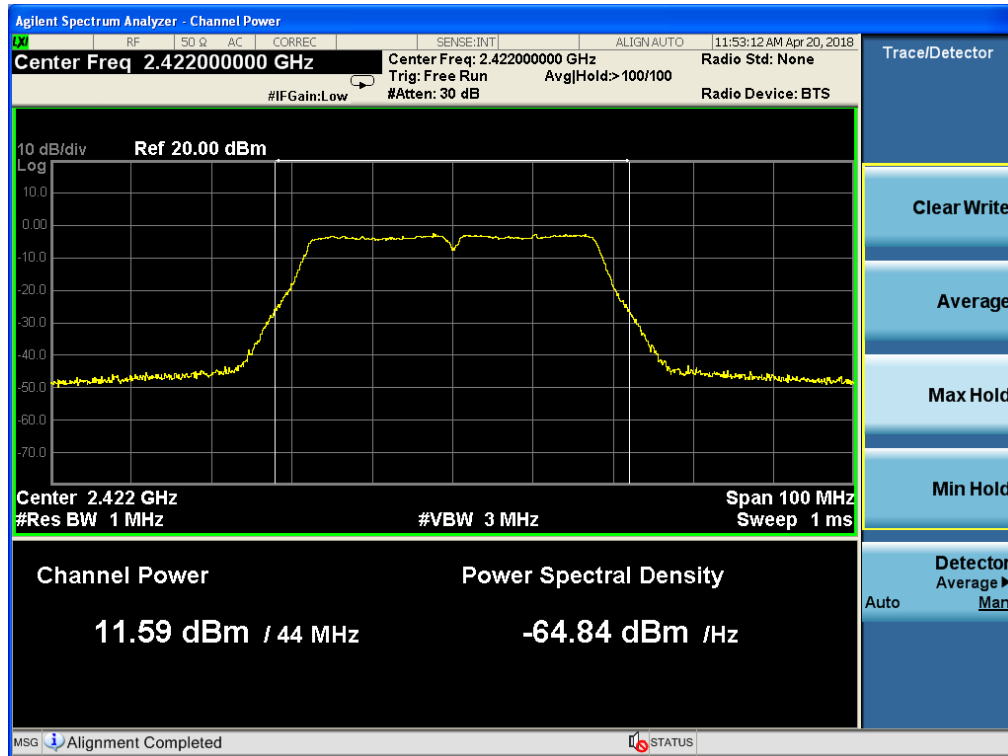


Modulation Standard: 802.11n HT20

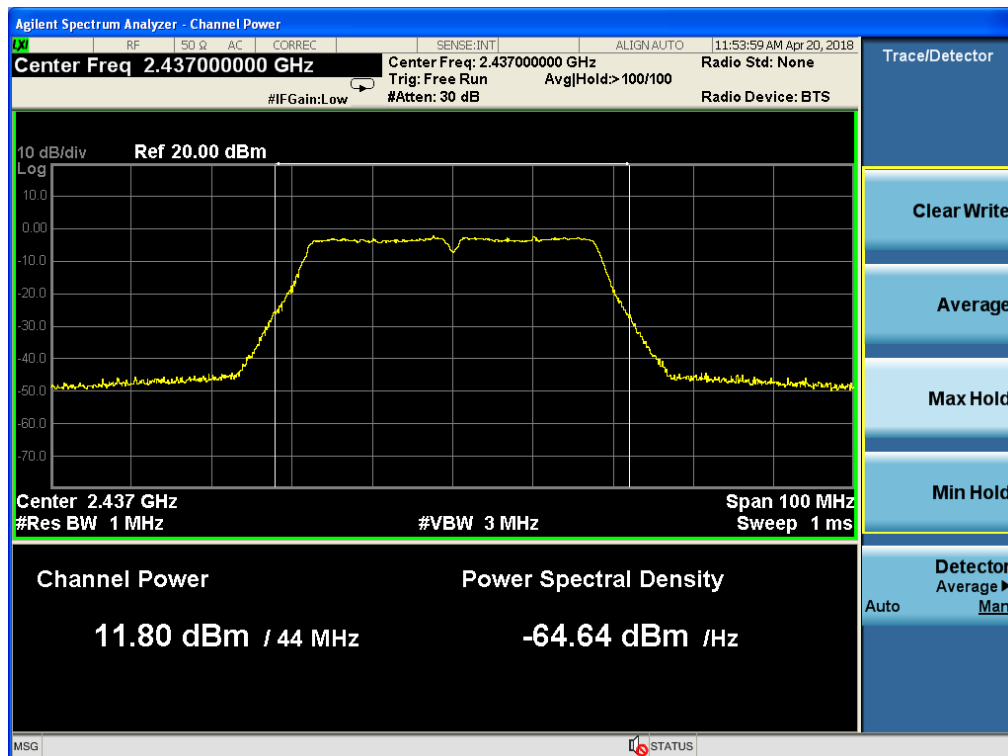
Channel: 11



Modulation Standard: 802.11n HT40
Channel: 03

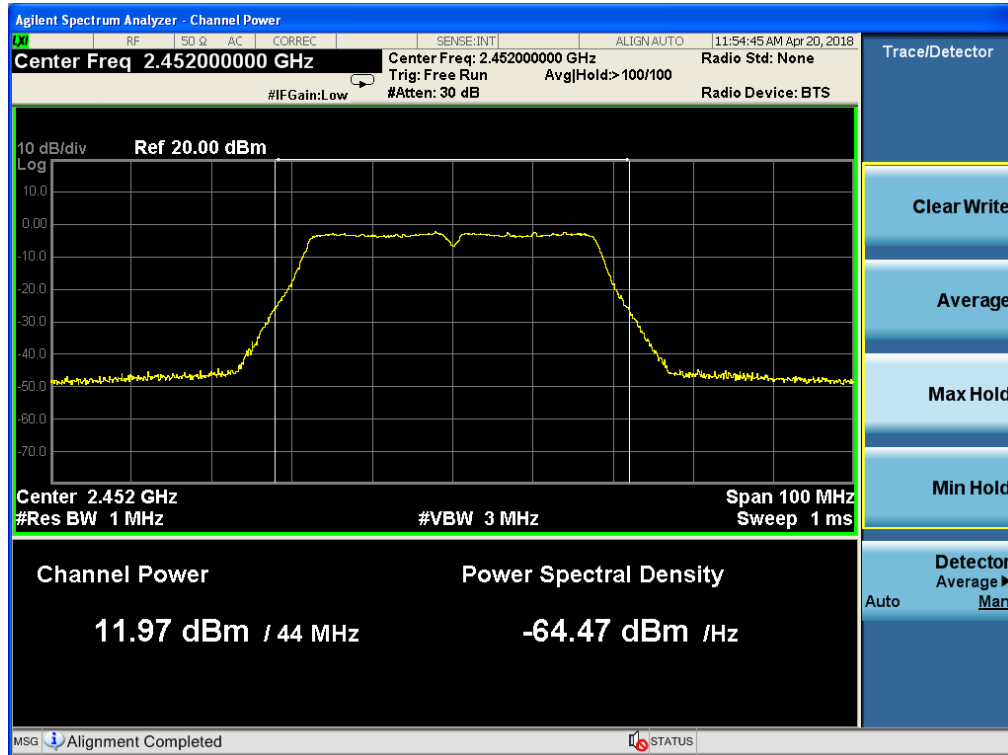


Modulation Standard: 802.11n HT40
Channel: 06



Modulation Standard: 802.11n HT40

Channel: 09



10. Power Spectral Density

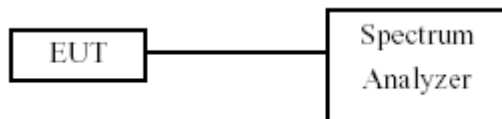
10.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm

10.2 Test Procedures

- a. According to KDB 558074 D01v04 clause 10.2.
- b. The transmitter output was connected to spectrum analyzer.
- c. The spectrum analyzer's resolution bandwidth were set at 3kHz RBW and 30kHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
- d. The power spectral density was measured and recorded.

10.3 Test Setup Layout



10.4 Test Result and Data

Test Date: Apr. 20, 2018

Temperature: 26°C

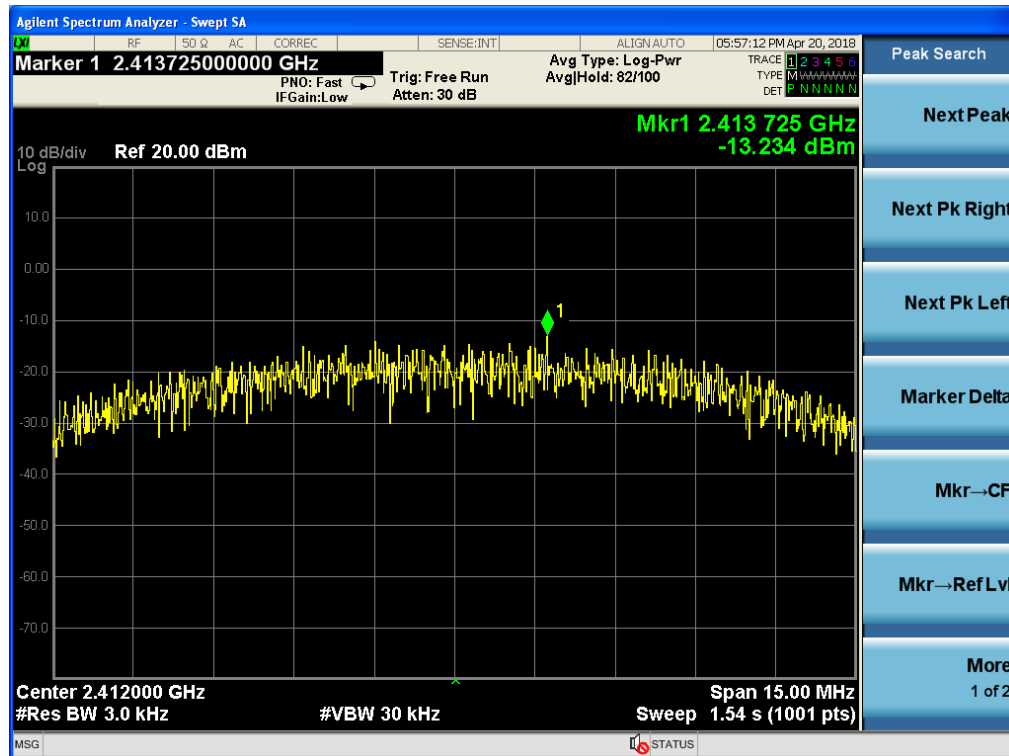
Atmospheric pressure: 1000 hPa

Humidity: 60%

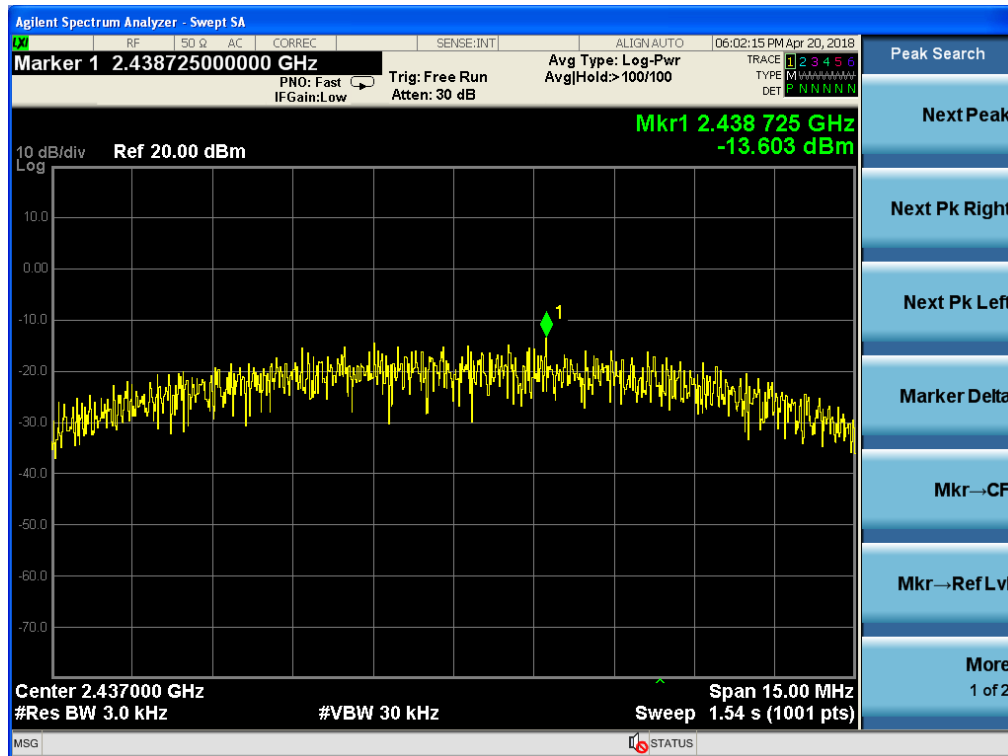
Modulation Standard	Channel	Frequency (MHz)	Measured Power Density (dBm)
802.11b (11Mbps)	01	2412	-13.23
	06	2437	-13.60
	11	2462	-13.55
802.11g (6Mbps)	01	2412	-20.84
	06	2437	-20.69
	11	2462	-21.12
802.11n HT20 (6.5Mbps)	01	2412	-20.39
	06	2437	-21.89
	11	2462	-20.95
802.11n HT40 (13.5Mbps)	03	2422	-23.82
	06	2437	-22.13
	09	2452	-21.71

Modulation Standard: 802.11b

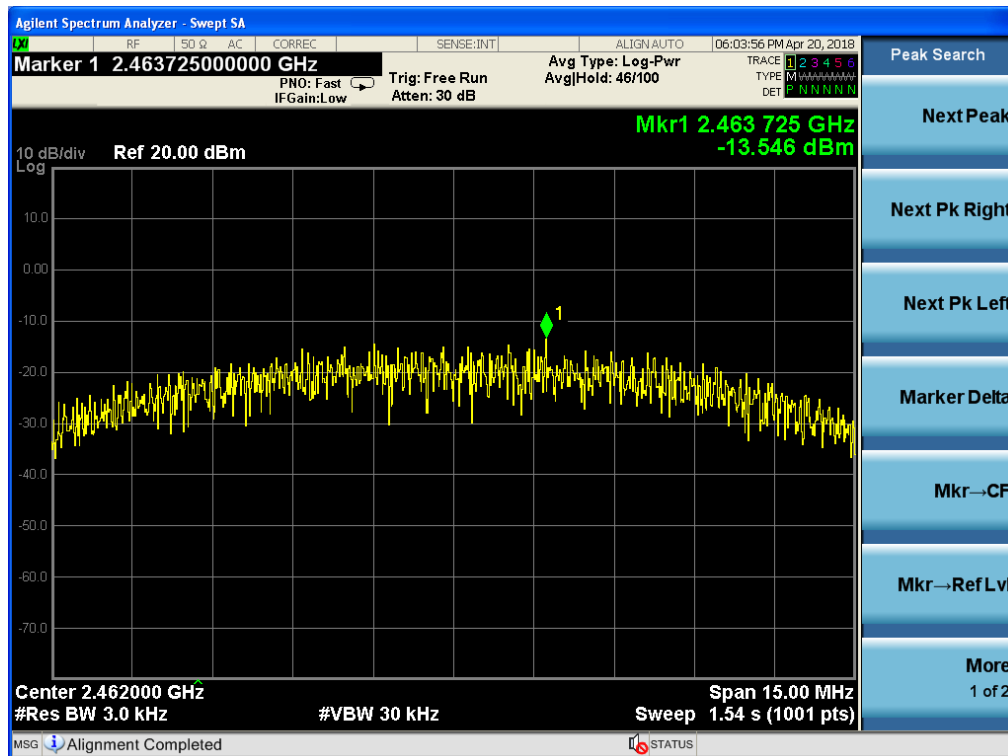
Channel: 01



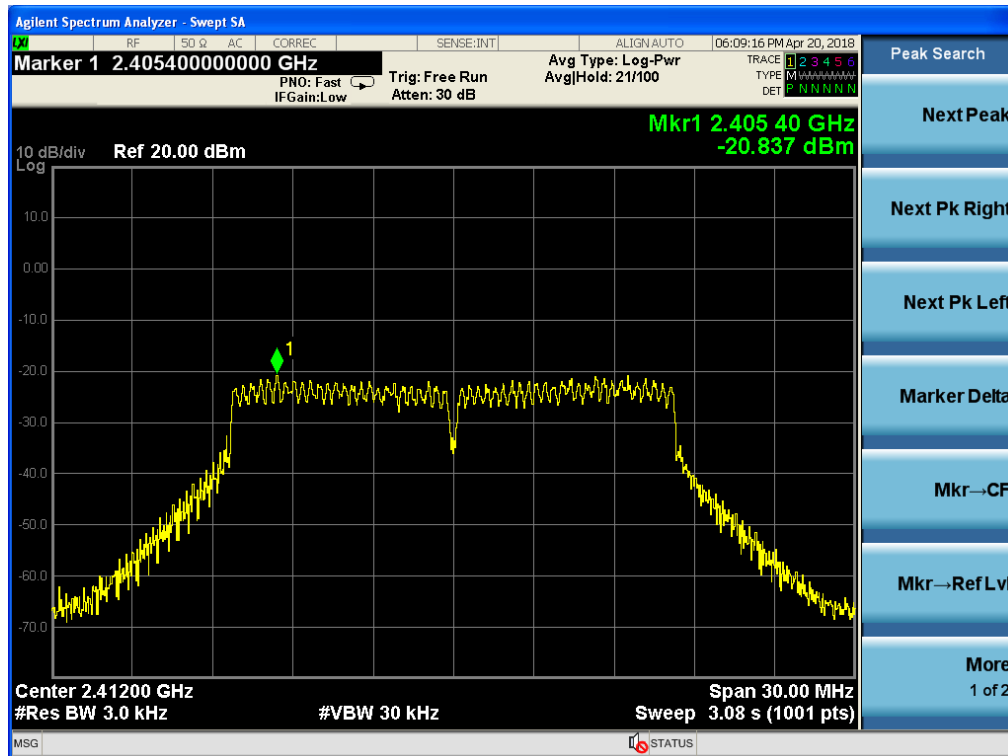
Modulation Standard: 802.11b
Channel: 06



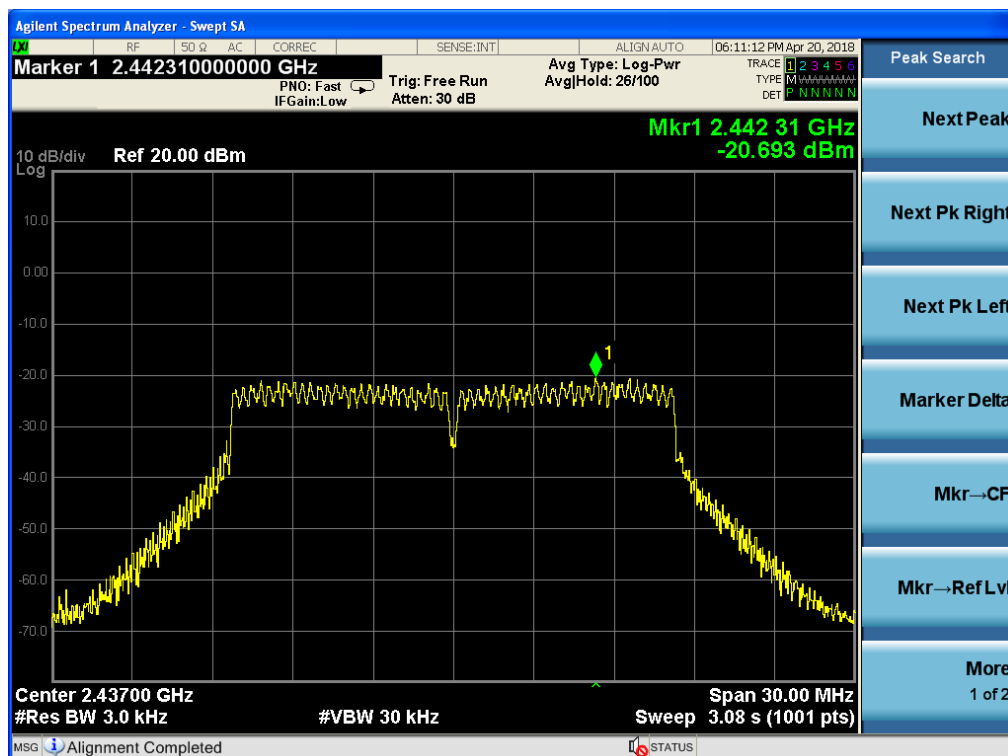
Modulation Standard: 802.11b
Channel: 11



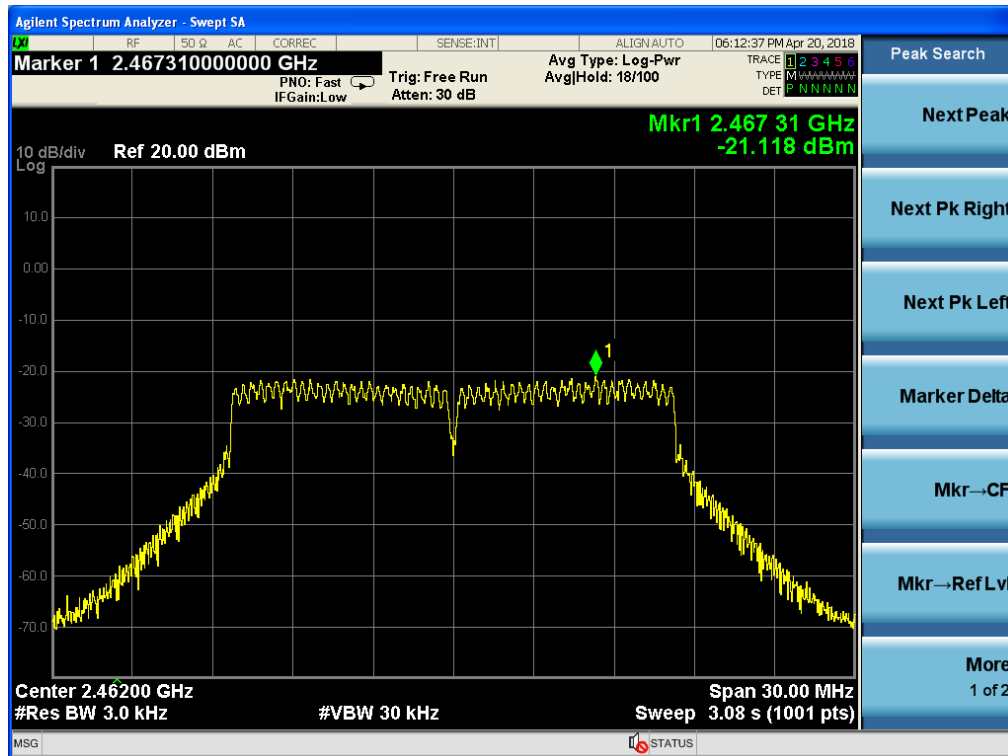
Modulation Standard: 802.11g
Channel: 01



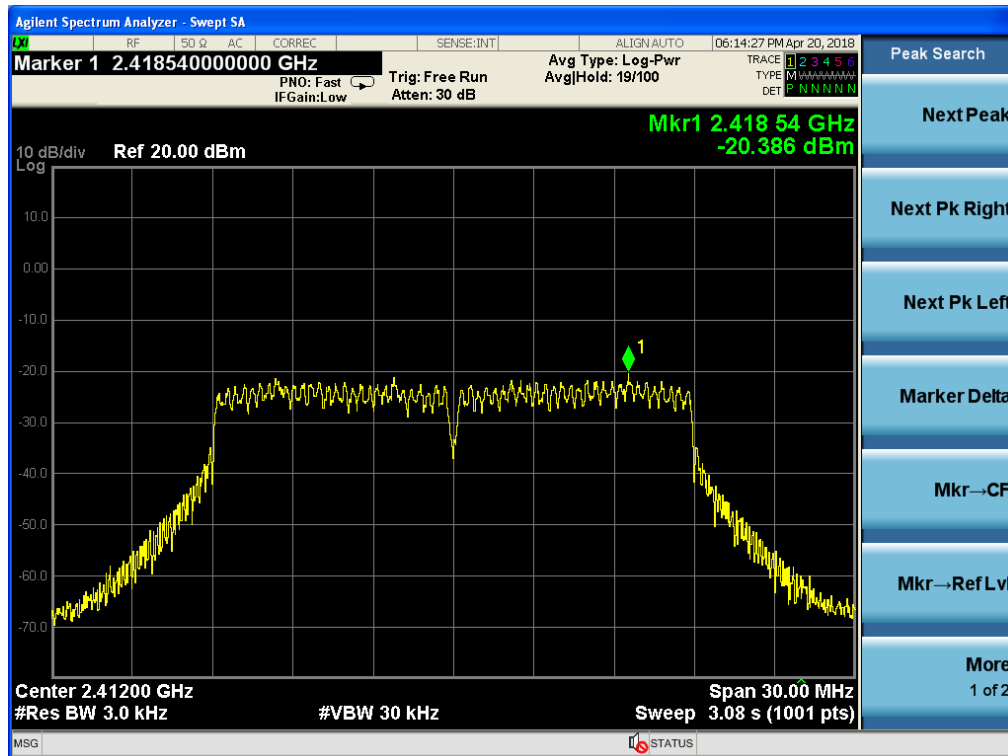
Modulation Standard: 802.11g
Channel: 06



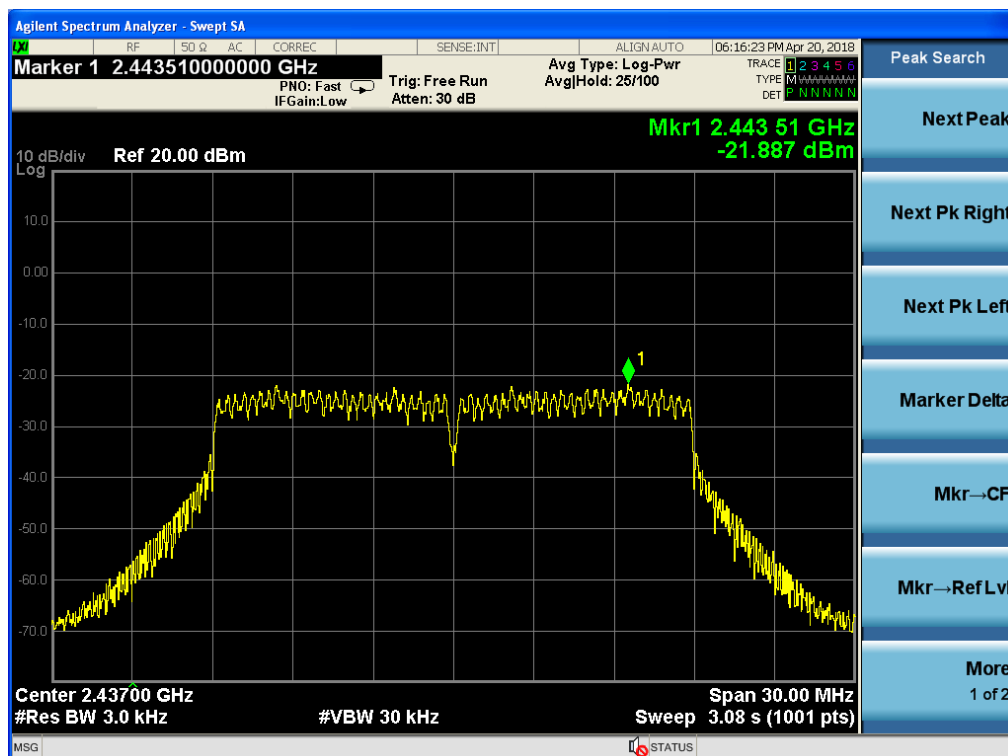
Modulation Standard: 802.11g
Channel: 11



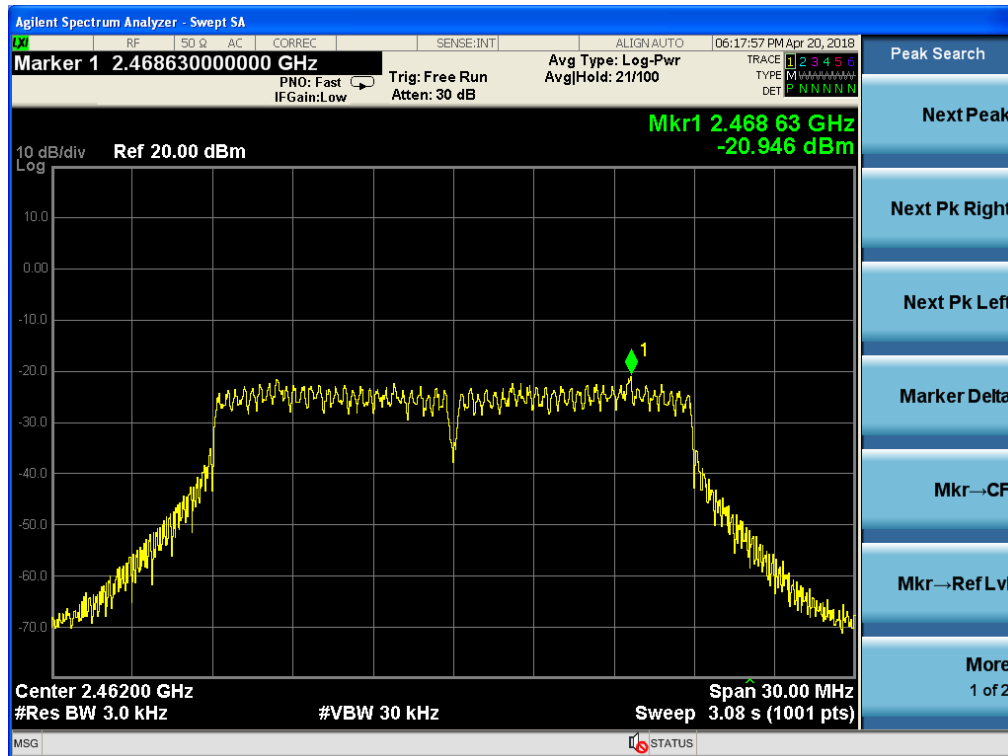
Modulation Standard: 802.11n HT20
Channel: 01



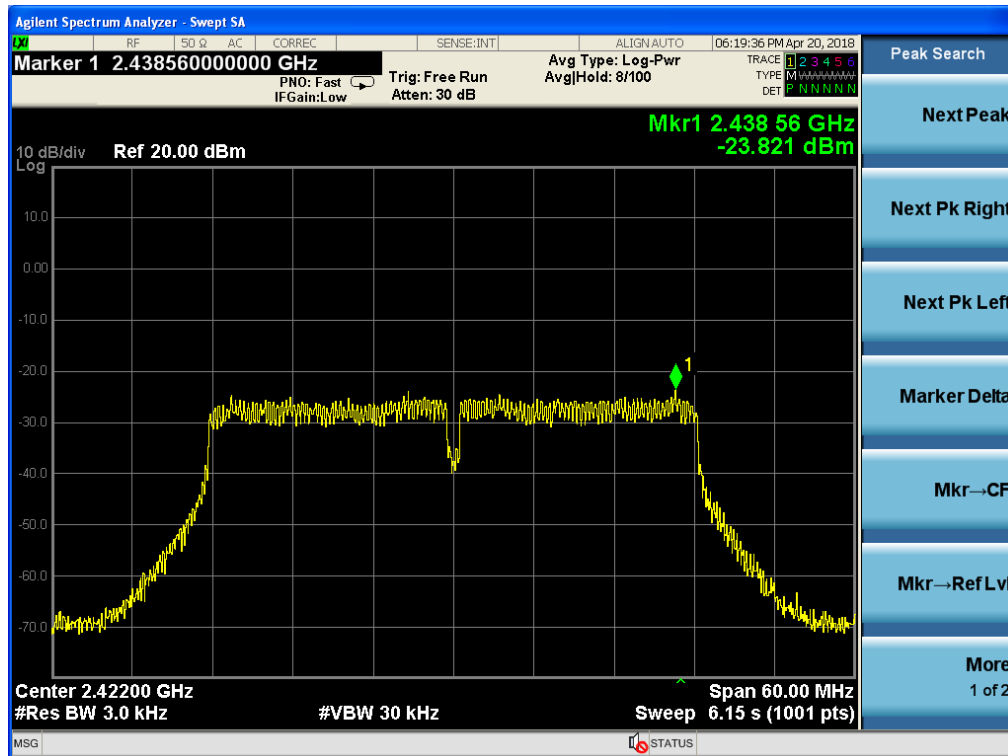
Modulation Standard: 802.11n HT20
Channel: 06



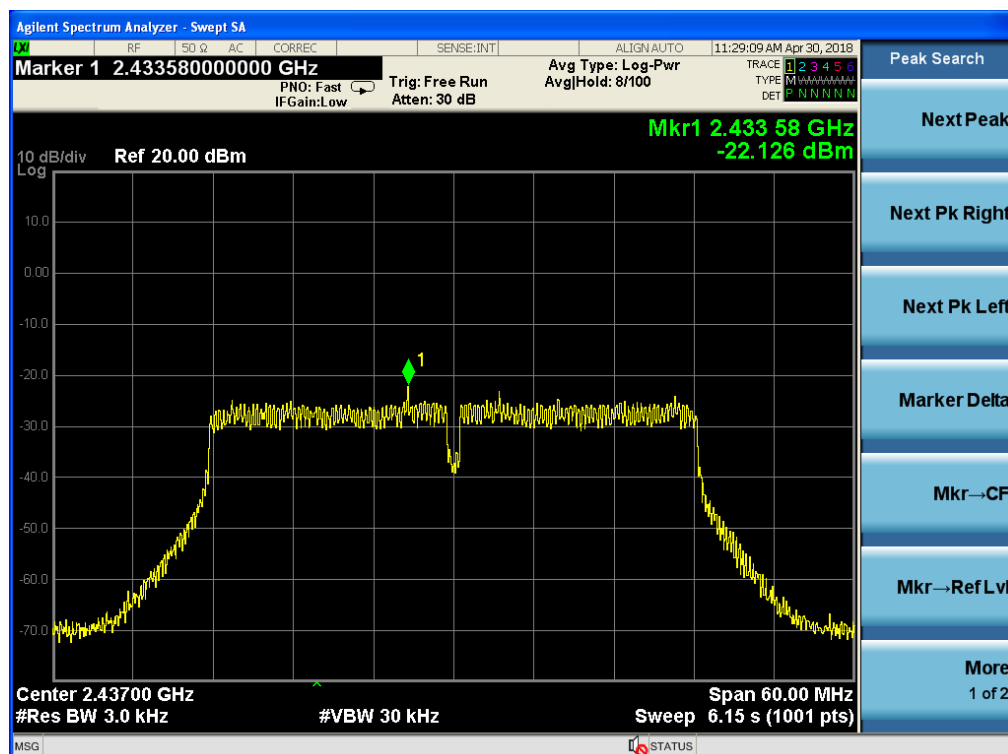
Modulation Standard: 802.11n HT20
Channel: 11



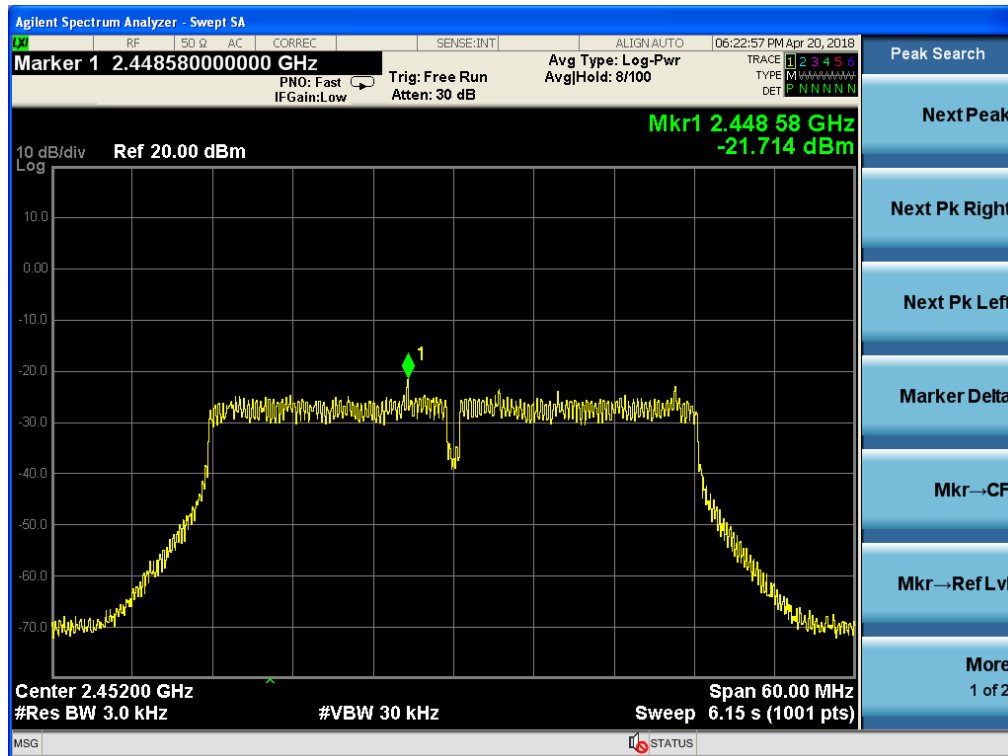
Modulation Standard: 802.11n HT40
Channel: 03



Modulation Standard: 802.11n HT40
Channel: 06



Modulation Standard: 802.11n HT40
Channel: 09



11. Band Edges

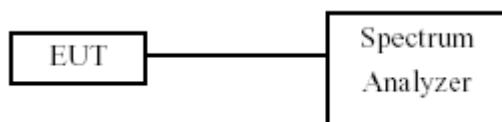
11.1 Test Limit

Below -20dB of the highest emission level of operating band (In 100kHz Resolution Bandwidth)

11.2 Test Procedure

- a. According to KDB 558074 D01v04 clause 11.2 and 11.3.
- b. The transmitter output was connected to the spectrum analyzer via a low lose cable.
- c. Set RBW of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with convenient frequency span including 100kHz bandwidth from band edge.
- d. Peak conducted output power measured within any 100kHz outside the authorized frequency band shall be attenuated by at least 20dB relative to the maximum measured in-band peak PSD level.
- e. The band edges was measured and recorded.

11.3 Test Setup Layout



11.4 Test Result and Data

Test Date: Apr. 20, 2018

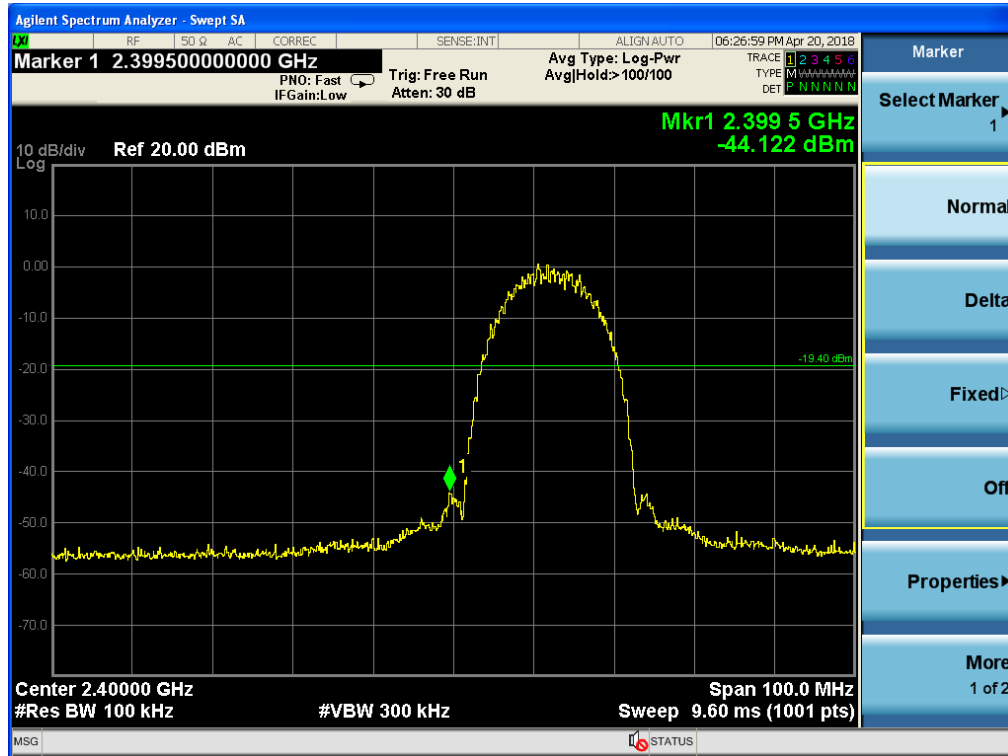
Temperature: 26°C

Atmospheric pressure: 1000 hPa

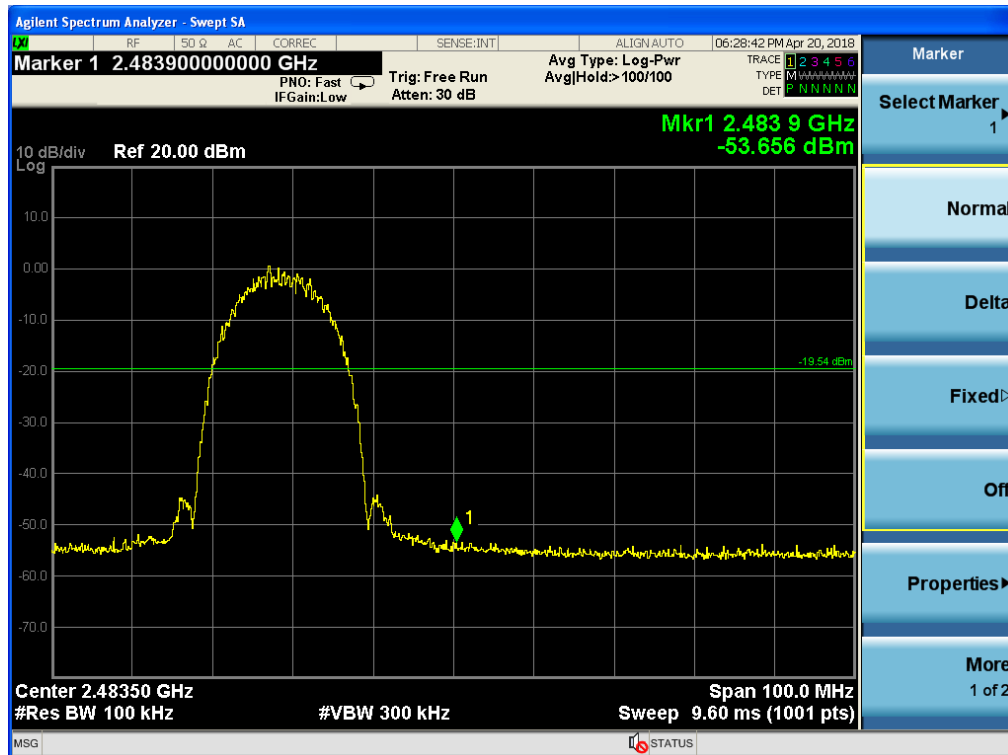
Humidity: 60%

Modulation Standard	Channel	Frequency (MHz)	maximum value in frequency (MHz)	maximum value (dBm)
802.11b (11Mbps)	01	2412	24750.00	-38.34
	11	2462	24775.00	-38.46
802.11g (6Mbps)	01	2412	24750.00	-37.73
	11	2462	24800.00	-37.75
802.11n HT20 (6.5Mbps)	01	2412	24725.00	-37.85
	11	2462	24875.00	-37.41
802.11n HT40 (13.5Mbps)	03	2422	24800.00	-37.64
	09	2452	24709.00	-37.11

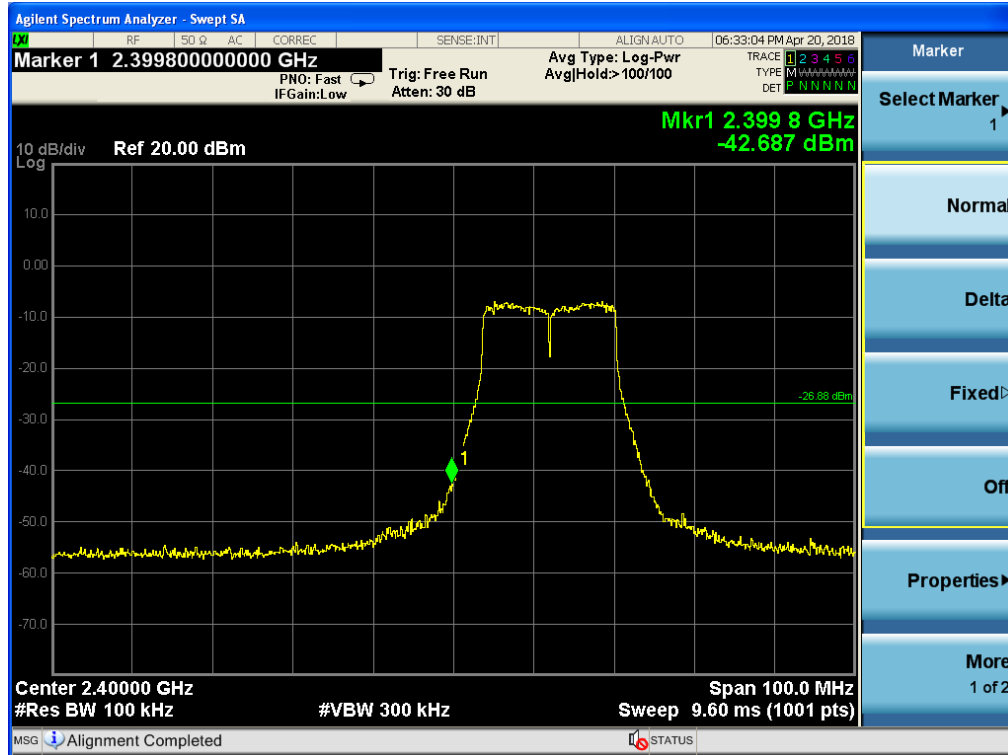
Modulation Standard: 802.11b
Channel: 01



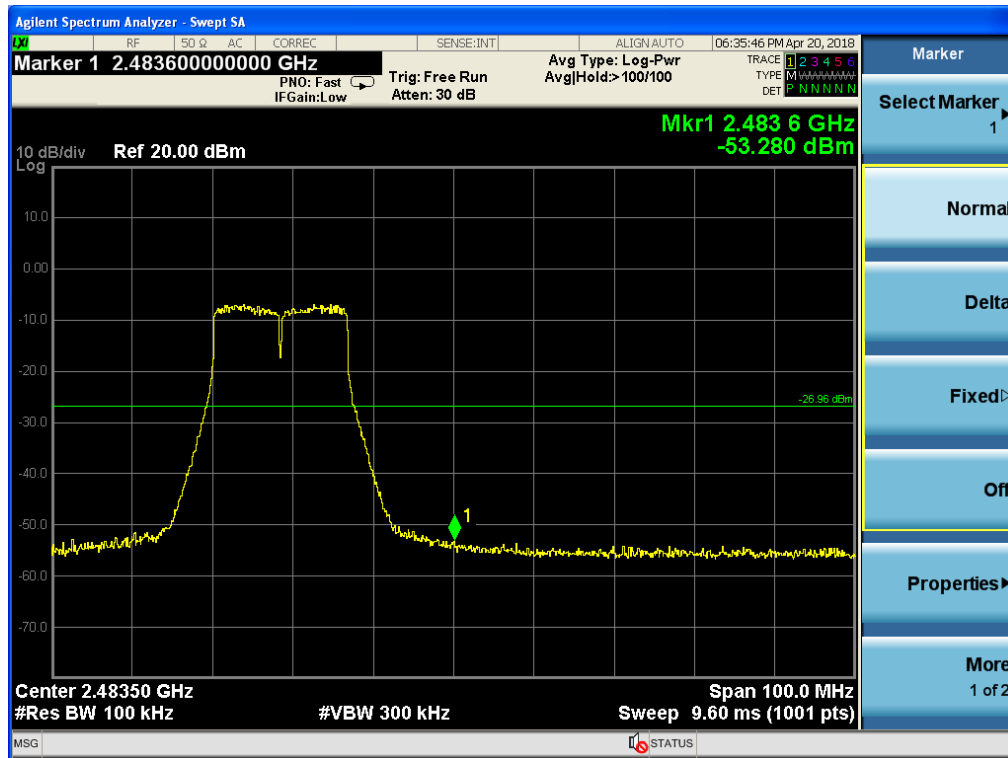
Modulation Standard: 802.11b
Channel: 11



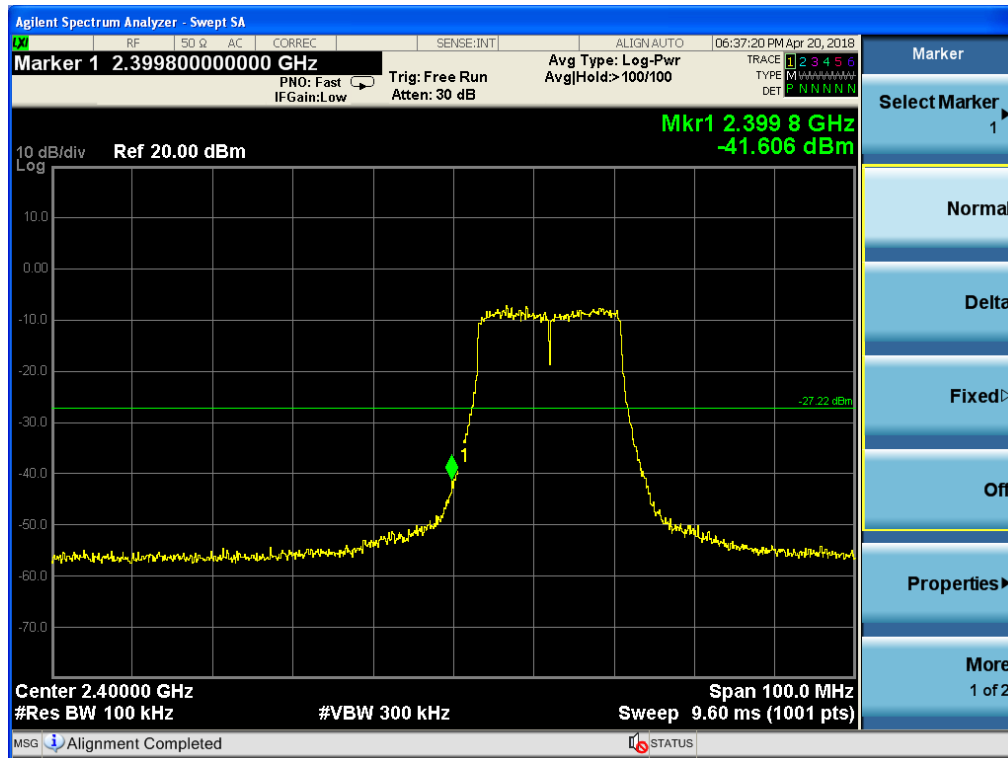
Modulation Standard: 802.11g
Channel: 01



Modulation Standard: 802.11g
Channel: 11

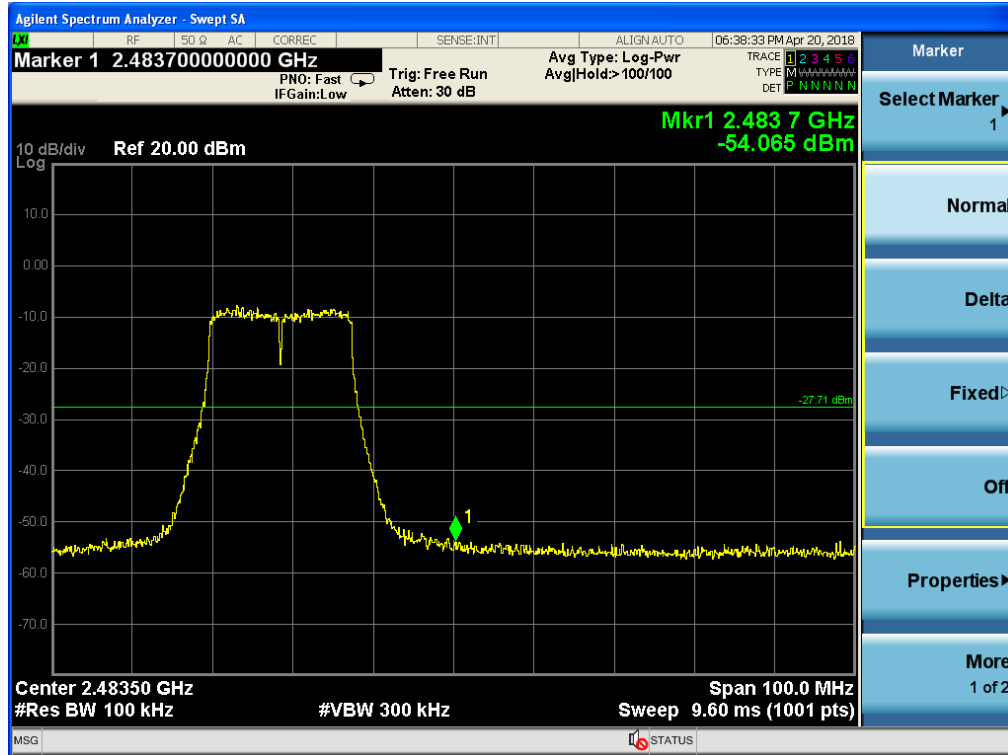


Modulation Standard: 802.11n HT20
Channel: 01



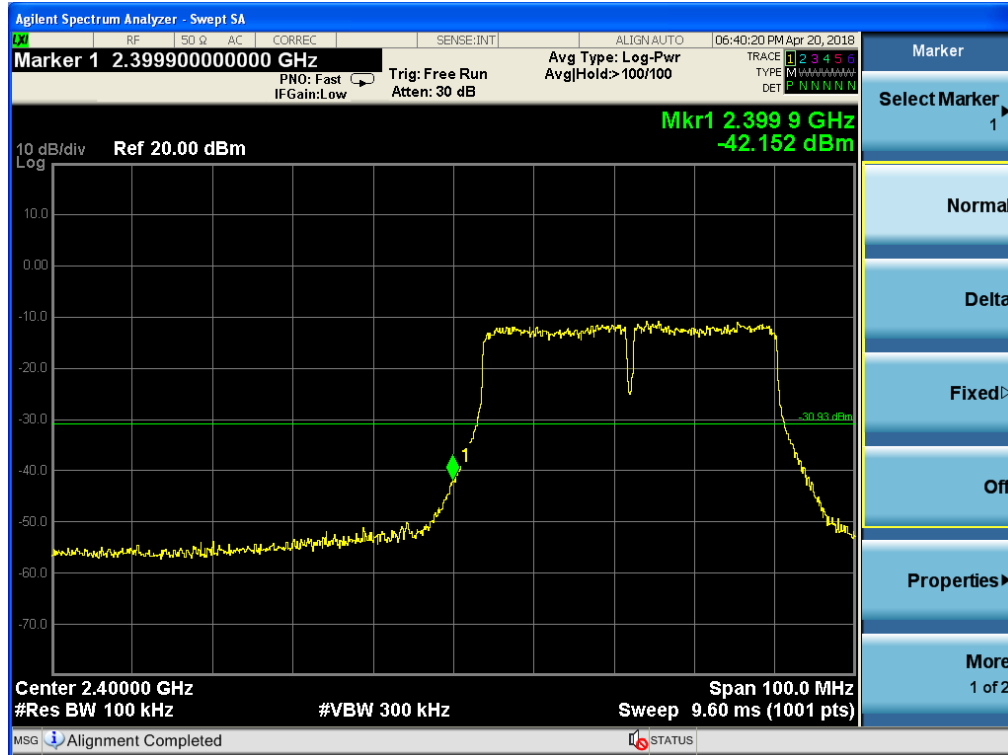
Modulation Standard: 802.11n HT20

Channel: 11



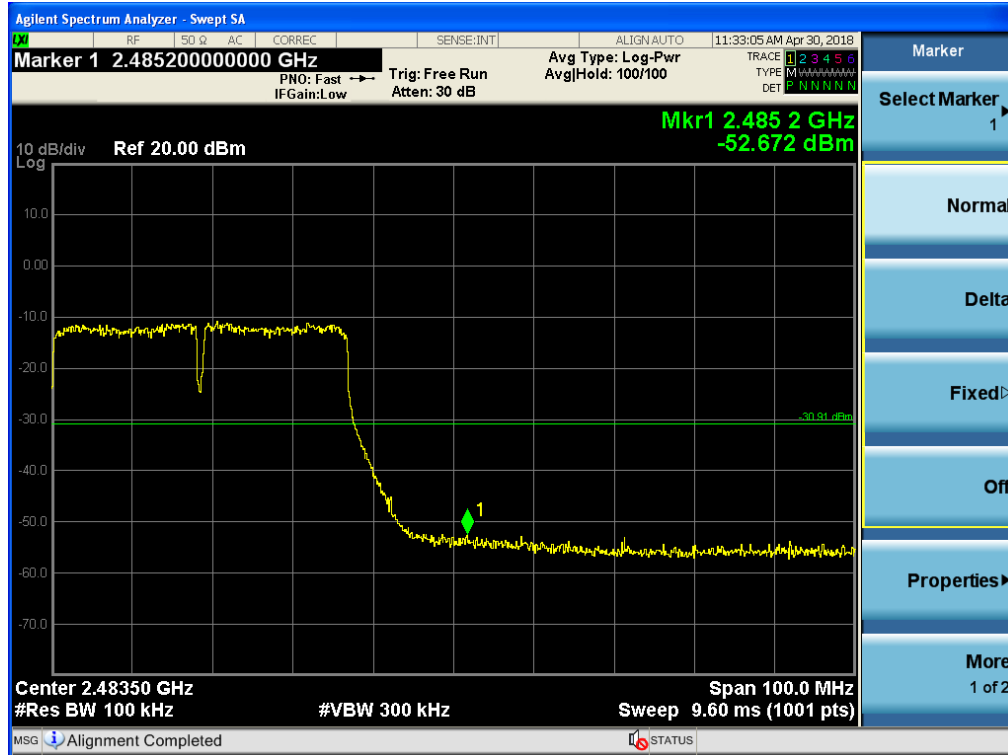
Modulation Standard: 802.11n HT40

Channel: 03



Modulation Standard: 802.11n HT40

Channel: 09



11.5 Restrict Band Emission Measurement Data

Power	:	AC 120V		
Test Mode	:	802.11b, CH1	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2385.89	95.44	81.71	-32.96	62.48	48.75	74	54	-11.52	-5.25

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2385.79	97.84	85.07	-32.96	64.88	52.11	74	54	-9.12	-1.89

Power	:	AC 120V		
Test Mode	:	802.11b, CH11	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2487.88	95.57	81.34	-32.72	62.85	48.62	74	54	-11.15	-5.38

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2488.11	97.49	85.07	-32.72	64.77	52.35	74	54	-9.23	-1.65

Power	:	AC 120V		
Test Mode	:	802.11g, CH1	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2388.74	95.99	81.05	-32.96	63.03	48.09	74	54	-10.97	-5.91

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2388.64	99.73	85.25	-32.96	66.77	52.29	74	54	-7.23	-1.71

Power	:	AC 120V		
Test Mode	:	802.11g, CH11	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2486.28	99.62	81.91	-32.73	66.89	49.18	74	54	-7.11	-4.82

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2486.21	101.30	85.71	-32.73	68.57	52.98	74	54	-5.43	-1.02

Power	:	AC 120V		
Test Mode	:	802.11n HT20, CH1	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2389.15	98.97	85.93	-32.95	66.02	52.98	74	54	-7.98	-1.02

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2389.15	100.29	85.26	-32.95	67.34	52.31	74	54	-6.66	-1.69

Power	:	AC 120V		
Test Mode	:	802.11n HT20, CH11	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2485.75	101.28	85.38	-32.74	68.54	52.64	74	54	-5.46	-1.36

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2485.56	100.52	85.24	-32.74	67.78	52.50	74	54	-6.22	-1.50

Power	:	AC 120V		
Test Mode	:	802.11n HT40, CH3	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2386.09	101.64	85.88	-32.96	68.68	52.92	74	54	-5.32	-1.08

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2385.89	100.57	85.56	-32.96	67.61	52.60	74	54	-6.39	-1.40

Power	:	AC 120V		
Test Mode	:	802.11n HT40, CH9	Temperature	: 26 °C
Test Date	:	Apr. 19, 2018	Humidity	: 70 %
Memo	:			

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2494.60	100.87	85.67	-32.74	68.13	52.93	74	54	-5.87	-1.07

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)		Factor	Amplitude (dBuV/m)		Limits (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
2486.13	101.20	85.69	-32.73	68.47	52.96	74	54	-5.53	-1.04

Notes:

1. Amplitude = Reading Amplitude + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier Gain
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz RMS detector for Average Value at frequency above 1GHz
5. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
6. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

12. Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2690.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

12.1 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.