FCC PART 15 SUBPART C MEASURMENT AND TEST REPORT

For

DigiLink Software, Inc.

19 Goddard, Irvine, CA 92618

E.U.T.: Smart TV Stick

Model Name: BiggiFi

Trade name: N/A

FCC ID: 2ABAE-BIGGIFI-001

Report Number: NTC1303330F-1

Test Date(s): March 27, 2013 to April 9, 2013

Report Date(s): November 04, 2013

Prepared by

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Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Dongguan NTC Co., Ltd.
The test results referenced from this report are relevant only to the sample tested.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test

The EUT is a smart TV stick with internal WiFi function operating at 2412-2462MHz for IEEE 802.11 b/g/n(HT20). It's powered by DC 5V through Mini USB port. For more details features, please refer to User's Manual.

Manufacturer	:	DigiLink Software, Inc.
Address	:	19 Goddard, Irvine, CA 92618
RF Operation Frequency:	:	2412-2462MHz for 802.11b/g/n(HT20)
Modulation	:	CCK, DQPSK, DBPSK for 802.11b OFDM for 802.11g/n
Number of Channel	:	11 for 802.11b/g/n(HT20)
Channel space	:	5MHz
Date Rate	:	802.11b:1~11Mbps, 802.11g:6~54Mbps 802.11n: 6.5~65Mbps
Antenna Type	:	PIFA Antenna
Antenna Gain	:	1.2 dBi (declared by manufacturer)
Power Supply	:	DC 5V come from external adaptor
Model name	:	BiggiFi
Note:	:	This report was an additional report based on original report NTC1303330F. Both of them are the same except for this report updates model number, product name and applicant.

Channel List

802.11 b/g/n(HT20)	
Channel	**Frequency MHz**
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

Note: According to section 15.31(m), regards to the operating frequency range over 10MHz, the Lowest, middle, and the Highest frequency of channel were selected to perform the test. The selected frequency see below:

802.11b/g/n(HT20)	
Channel	**Frequency MHz**
1	2412
6	2437
11	2462

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2ABAE-BIGGIFI-001 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rule.

1.3 Test Methodology

AC mains line-conducted, antenna port conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003) and KDB558074(v02). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters. All other measurements were made in accordance with the procedures in 47 CFR part 2.

1.4 Equipment Modifications

Not available for this EUT intended for grant.

1.5 Support Device

LED TV	:	Manufacturer: Express Luck Industrial Ltd. M/N: LE-2210
Switching Adapter (Provid by manufacturer)	:	M/N: JY-05100 Input: AC 100-240V 50/60Hz 0.3A Output: 5V 1000mA

1.6 Test Facility and Location

Listed by FCC, August 02, 2011
The Certificate Registration Number is 665078.

Listed by Industry Canada, July 01, 2011
The Certificate Registration Number is 46405-9743.

Dongguan NTC Co., Ltd.

Building D, Gaosheng Science and Technology Park,
Hongtu Road, Nancheng District, Dongguan City,
Guangdong Province, China

1.7 Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207 (a)	AC Power Conducted Emission	Compliance
§15.247(b)(3)	Max. Conducted Output Power	Compliance
§15.247(a)(2)	6dB Bandwidth	Compliance
§15.247(e)	Power Spectral Density	Compliance
§15.247(d)	Band Edge and Conducted Spurious Emissions	Compliance
§15.247(d),§15.209, §15.205	Radiated Spurious Emissions and Restricted Bands	Compliance
§15.203	Antenna Requirement	Compliance

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 Special Accessories

Not available for this EUT intended for grant.

2.3 Description of test modes

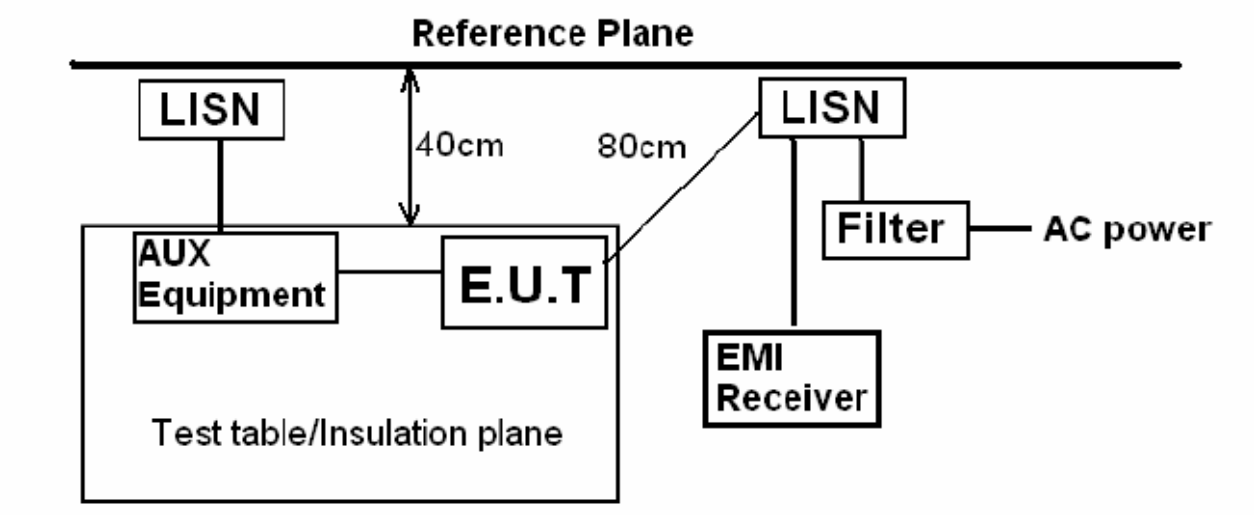
The EUT has been tested under continuous operating condition. Test program used to control the EUT staying in continuous transmitting mode. The Lowest, middle and highest channel were chosen for testing, and modulation type CCK, DQPSK, DBPSK, OFDM and all data rate were tested, but only the worst case data is shown in this report.

2.4 EUT Exercise

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

3. Conducted Emissions Test

3.1 Test SET-UP (Block Diagram of Configuration)



3.2 Test Condition

Test Requirement: FCC Part 15.207

Frequency Range: 150KHz ~ 30MHz

Detector: RBW 9KHz, VBW 30KHz

Operation Mode: TX

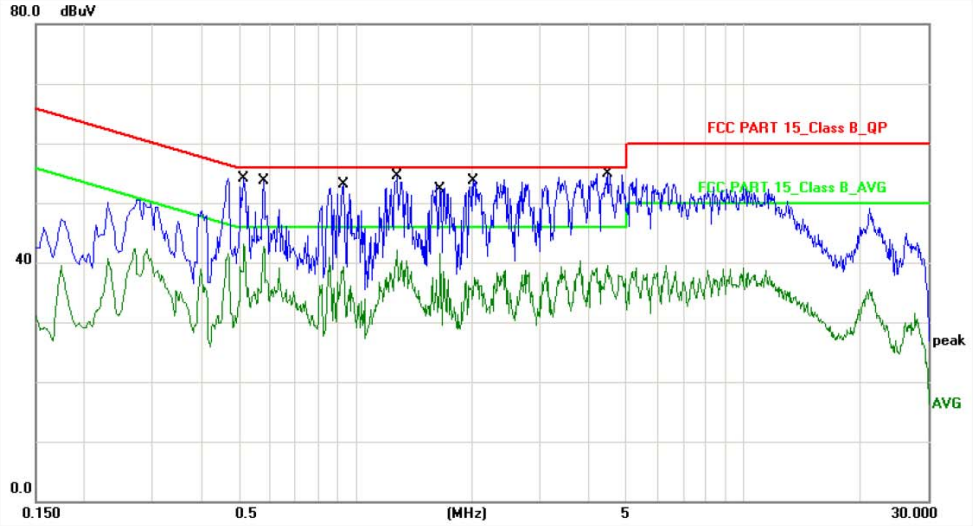
3.3 Measurement Results

Please refer to following the worst case (802.11b) plots.

Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: Http://www.ntc-c.com

Site: Conduction

Test Time: 2013-4-8 19:16:46



Report No.: Smart TV Stick
Test Standard: FCC PART 15_Class B_QP
Test item: Conducted Emission
Phase: L1
Applicant: DigiLink Software, Inc.
Temp.( )/Hum.(%): 24(C) / 53 %
Product: Smart TV Stick
Power Rating: AC 120V/60Hz
Model No.: BiggiFi
Test Engineer: Think

Test Mode: TX
Remark: 802.11b

No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.5180	10.80	40.60	51.40	56.00	-4.60	QP	P	
2	0.5180	10.80	29.60	40.40	46.00	-5.60	AVG	P	
3	0.5820	10.80	39.31	50.11	56.00	-5.89	QP	P	
4	0.5820	10.80	31.85	42.65	46.00	-3.35	AVG	P	
5	0.9340	10.80	38.44	49.24	56.00	-6.76	QP	P	
6	0.9340	10.80	28.41	39.21	46.00	-6.79	AVG	P	
7	1.2860	10.80	38.60	49.40	56.00	-6.60	QP	P	
8	1.2860	10.80	27.50	38.30	46.00	-7.70	AVG	P	
9	1.6540	10.80	38.96	49.76	56.00	-6.24	QP	P	
10	1.6540	10.80	30.76	41.56	46.00	-4.44	AVG	P	
11	2.0220	10.80	39.92	50.72	56.00	-5.28	QP	P	
12	2.0220	10.80	26.69	37.49	46.00	-8.51	AVG	P	
13	4.4818	10.80	39.24	50.04	56.00	-5.96	QP	P	
14	4.4818	10.80	28.70	39.50	46.00	-6.50	AVG	P	

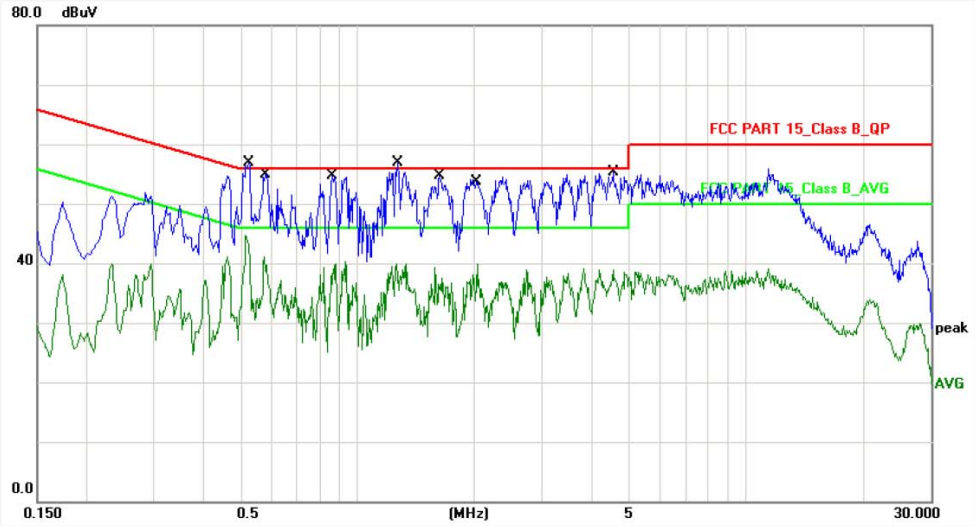
Note: Level=Reading+Factor.
Margin=Limit-Level.

File:Smart TV Stick\ #5 *Page: 1*

Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: Http://www.ntc-c.com

Site: Conduction

Test Time: 2013-4-8 19:22:20



Report No.: Smart TV Stick
Test Standard: FCC PART 15_Class B_QP
Test item: Conducted Emission
Phase: N
Applicant: DigiLink Software, Inc.
Temp.( )/Hum.(%): 24(C) / 53 %
Product: Smart TV Stick
Power Rating: AC 120V/60Hz
Model No.: BiggiFi
Test Engineer: Think

Test Mode: TX
Remark: 802.11b

No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.5260	10.80	40.40	51.20	56.00	-4.80	QP	P	
2	0.5260	10.80	25.00	35.80	46.00	-10.20	AVG	P	
3	0.5780	10.80	39.16	49.96	56.00	-6.04	QP	P	
4	0.5780	10.80	30.22	41.02	46.00	-4.98	AVG	P	
5	0.8660	10.80	38.70	49.50	56.00	-6.50	QP	P	
6	0.8660	10.80	23.20	34.00	46.00	-12.00	AVG	P	
7	1.2700	10.80	40.63	51.43	56.00	-4.57	QP	P	
8	1.2700	10.80	29.08	39.88	46.00	-6.12	AVG	P	
9	1.6300	10.80	38.22	49.02	56.00	-6.98	QP	P	
10	1.6300	10.80	26.75	37.55	46.00	-8.45	AVG	P	
11	2.0260	10.80	37.95	48.75	56.00	-7.25	QP	P	
12	2.0260	10.80	29.05	39.85	46.00	-6.15	AVG	P	
13	4.5619	10.80	39.22	50.02	56.00	-5.98	QP	P	
14	4.5619	10.80	28.12	38.92	46.00	-7.08	AVG	P	

Note: Level=Reading+Factor.
Margin=Limit-Level.

File:Smart TV Stick\ #6 *Page: 1*

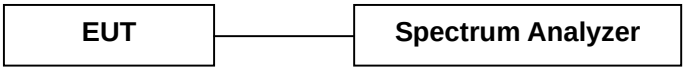
4. Max. Conducted Output Power

4.1 Measurement Procedure

Maximum Conducted Output power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set according to the FCC KDB 558074(v02) spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges and power was read directly in dBm. External attenuation and cable loss were compensated from the measured value.

4.2 Test SET-UP (Block Diagram of Configuration)



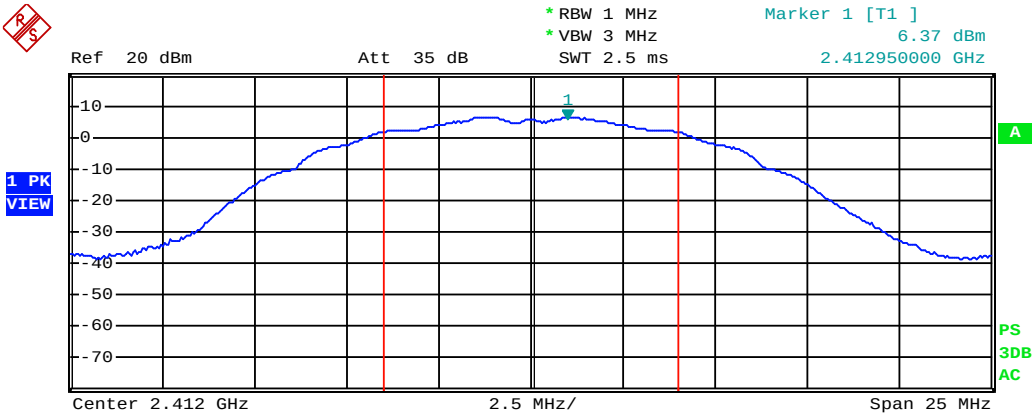
4.3 Measurement Results

Please refer to following table and plots.

Temperature :	24 ℃	Humidity :	53 %	
Test By:	Think	Test Date :	April 8, 2013	
Test Result:	PASS			
Frequency MHz	Data Rate Mbps	PK Output Power dBm	AVG Output Power dBm	Limit dBm
IEEE 802.11b Mode (CCK, Antenna Gain=1.2dBi)				
Low Channel: 2412	1	12.83	9.91	30
Middle Channel: 2437	1	12.72	9.73	30
High Channel: 2462	1	12.89	9.89	30
IEEE 802.11g Mode (OFDM, Antenna Gain=1.2dBi)				
Low Channel: 2412	6	16.04	9.05	30
Middle Channel: 2437	6	16.08	9.16	30
High Channel: 2462	6	16.26	9.33	30
IEEE 802.11n(HT20) Mode (OFDM, Antenn Gain=1.2dBi)				
Low Channel: 2412	6.5	14.41	7.54	30
Middle Channel: 2437	6.5	14.45	7.47	30
High Channel: 2462	6.5	14.65	7.72	30

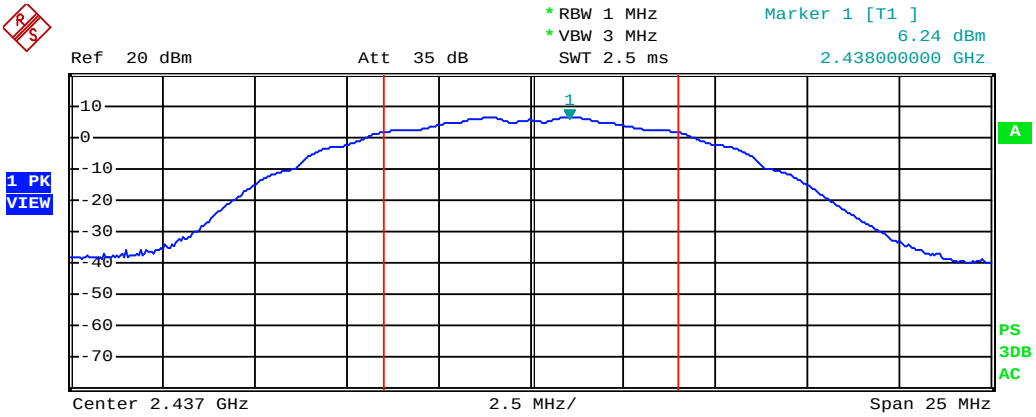
Maximum Peak Conducted Output Power

802.11b Low Channel



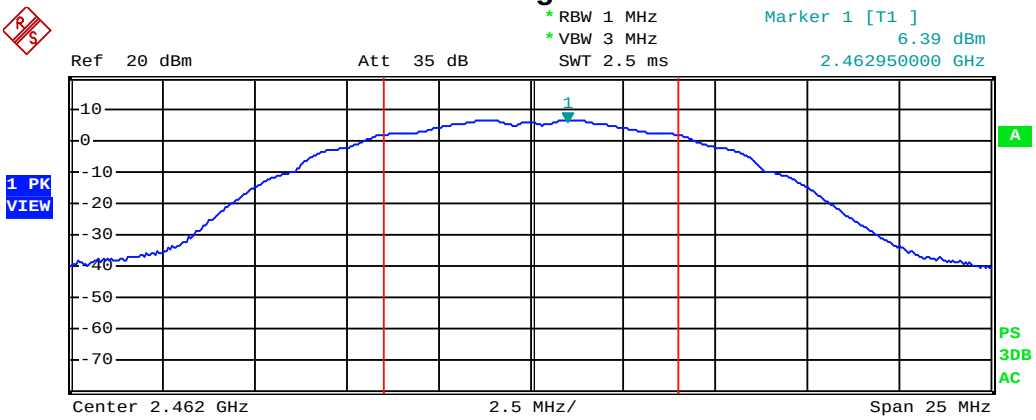
Tx Channel
Bandwidth 8 MHz Power 12.83 dBm

802.11b Middle Channel



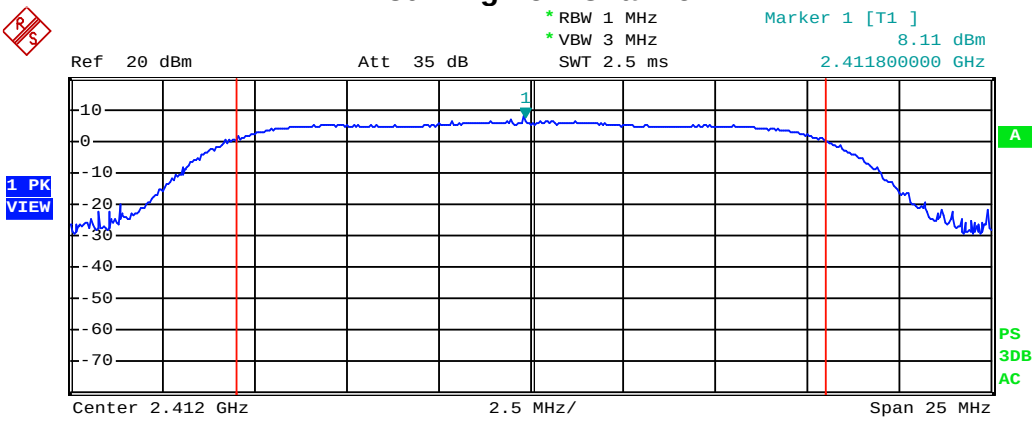
Tx Channel
Bandwidth 8 MHz Power 12.72 dBm

802.11b High Channel



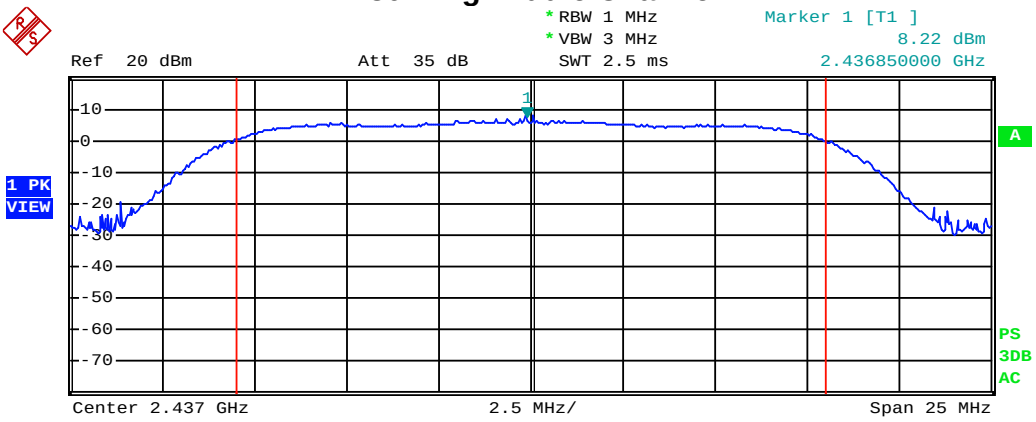
Tx Channel
Bandwidth 8 MHz Power 12.89 dBm

802.11g Low Channel



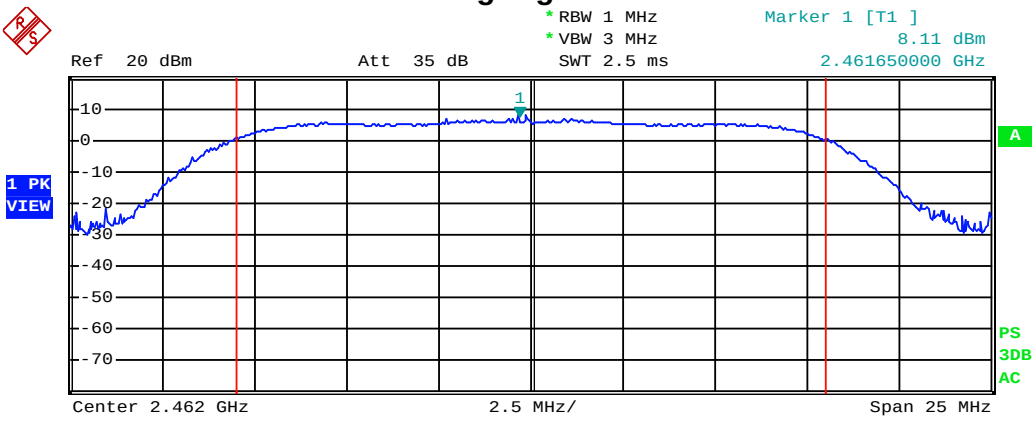
Tx Channel
Bandwidth 16 MHz Power 16.04 dBm

802.11g Middle Channel



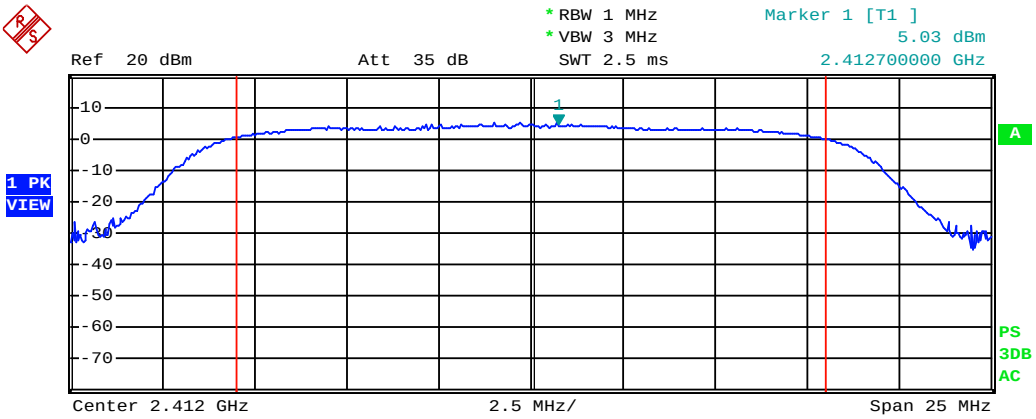
Tx Channel
Bandwidth 16 MHz Power 16.08 dBm

802.11g High Channel



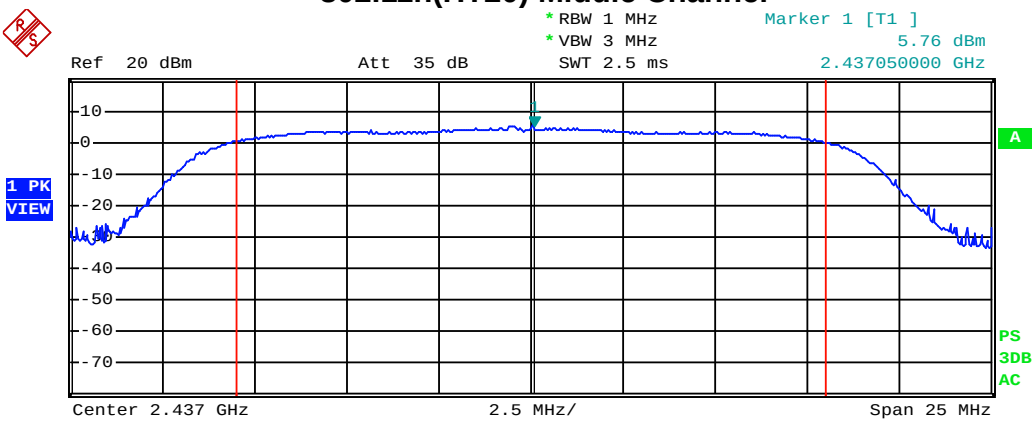
Tx Channel
Bandwidth 16 MHz Power 16.26 dBm

802.11n(HT20) Low Channel



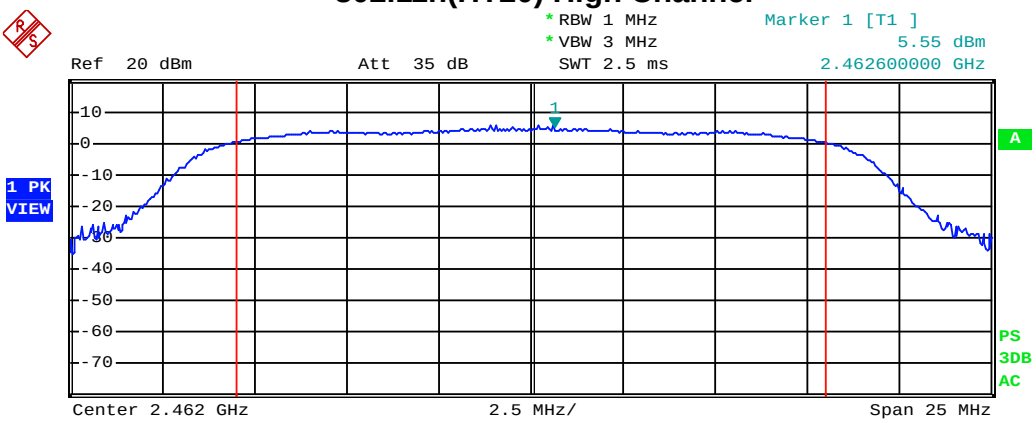
Tx Channel
Bandwidth 16 MHz Power 14.41 dBm

802.11n(HT20) Middle Channel



Tx Channel
Bandwidth 16 MHz Power 14.45 dBm

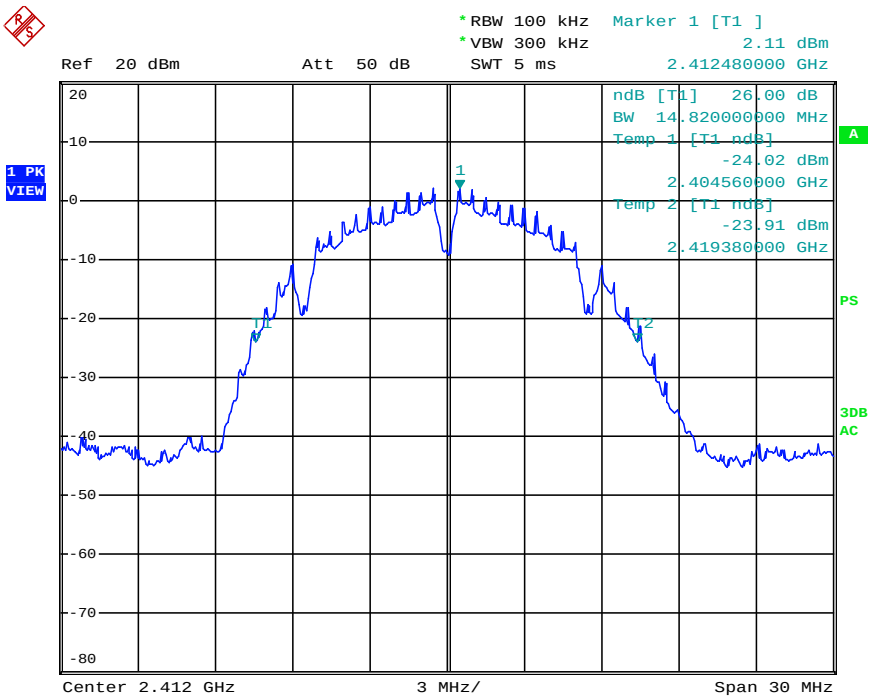
802.11n(HT20) High Channel



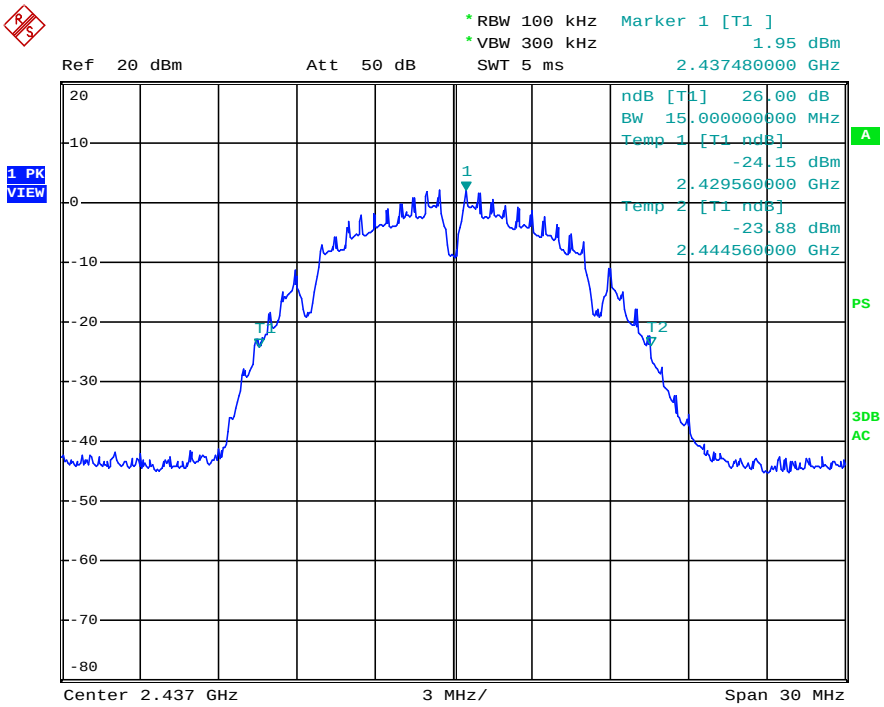
Tx Channel
Bandwidth 16 MHz Power 14.65 dBm

26dB Bandwidth

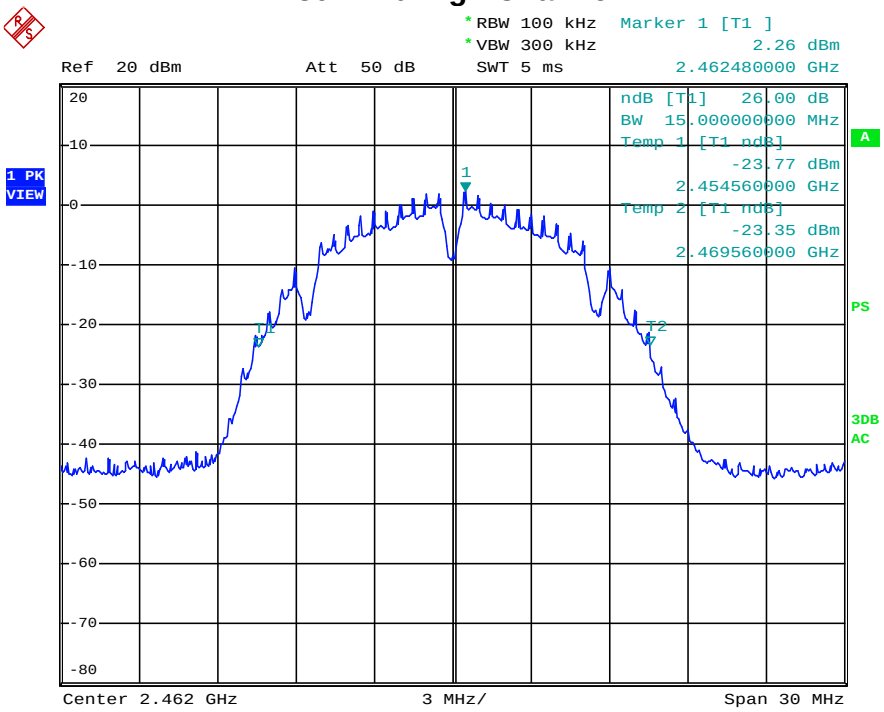
802.11b Low Channel



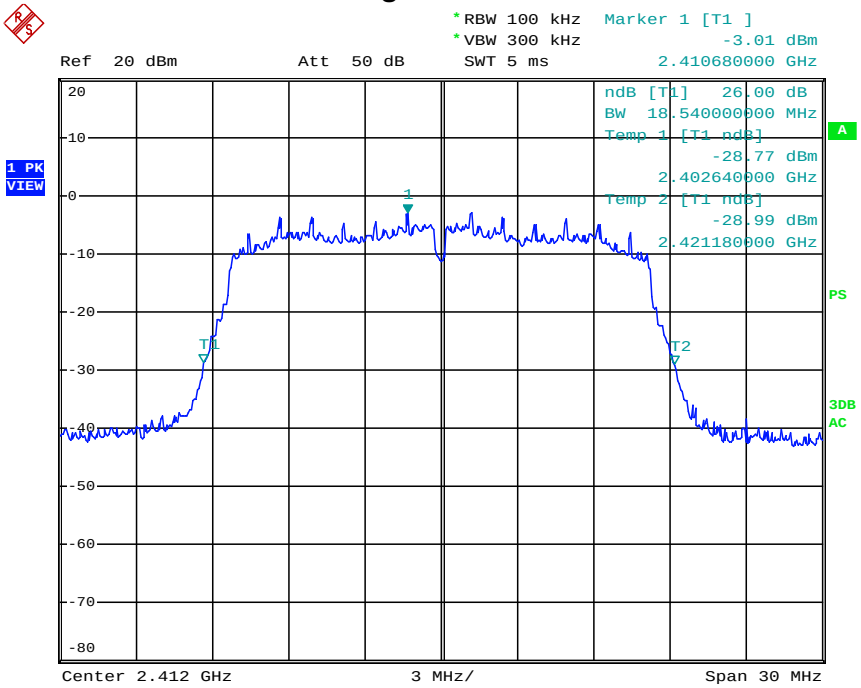
802.11b Middle Channel



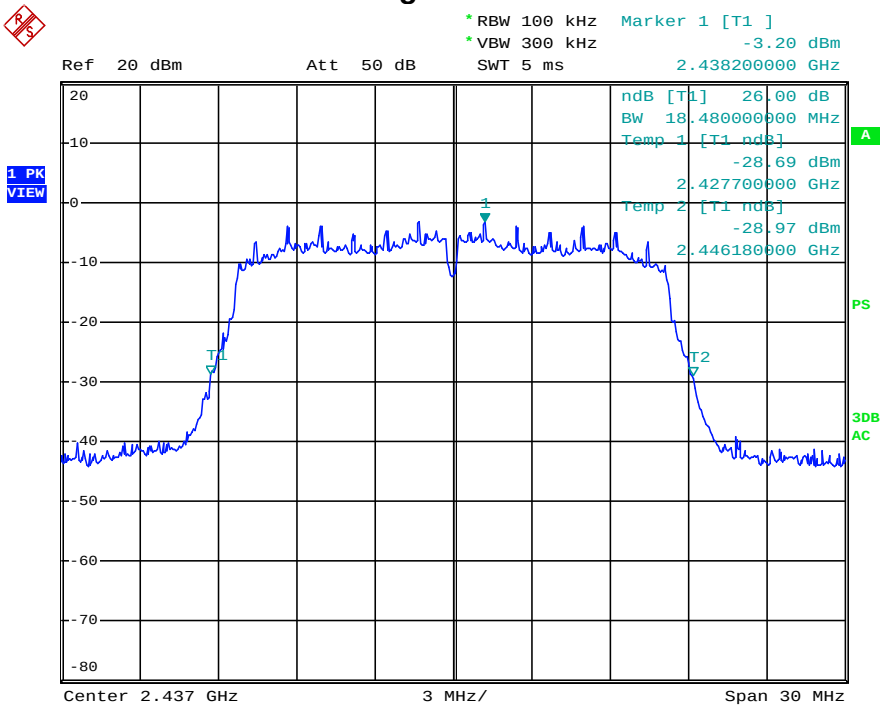
802.11b High Channel



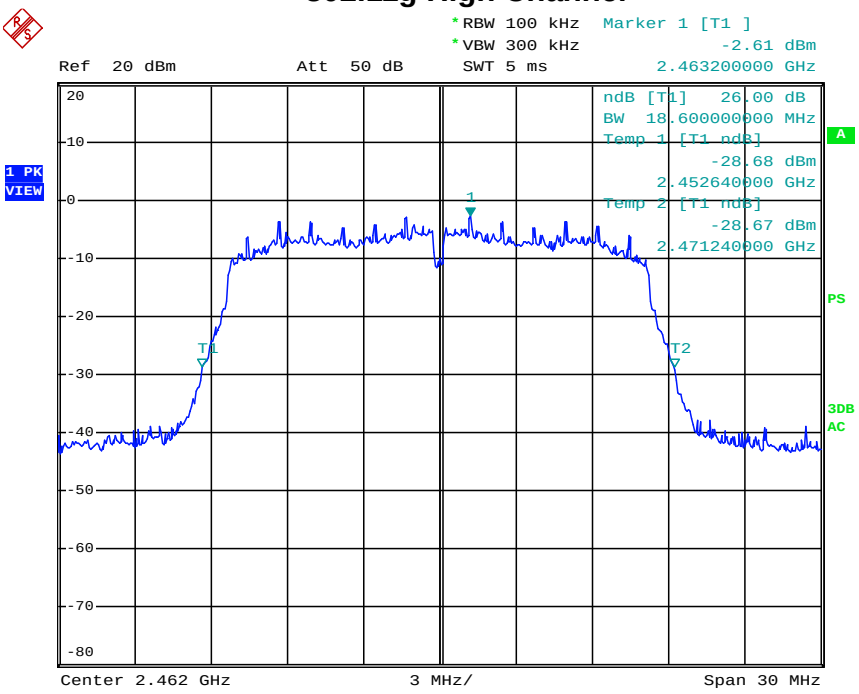
802.11g Low Channel



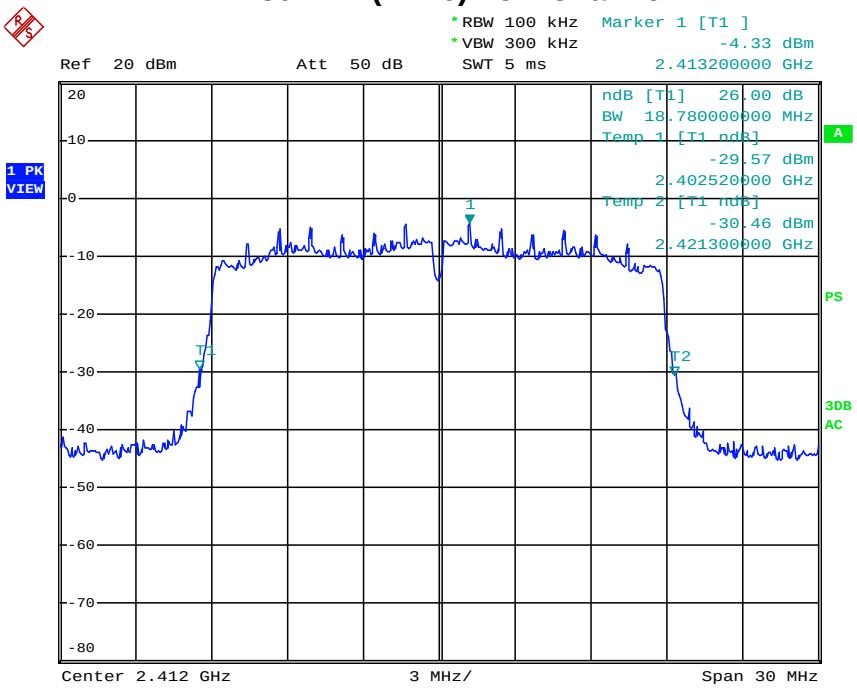
802.11g Middle Channel



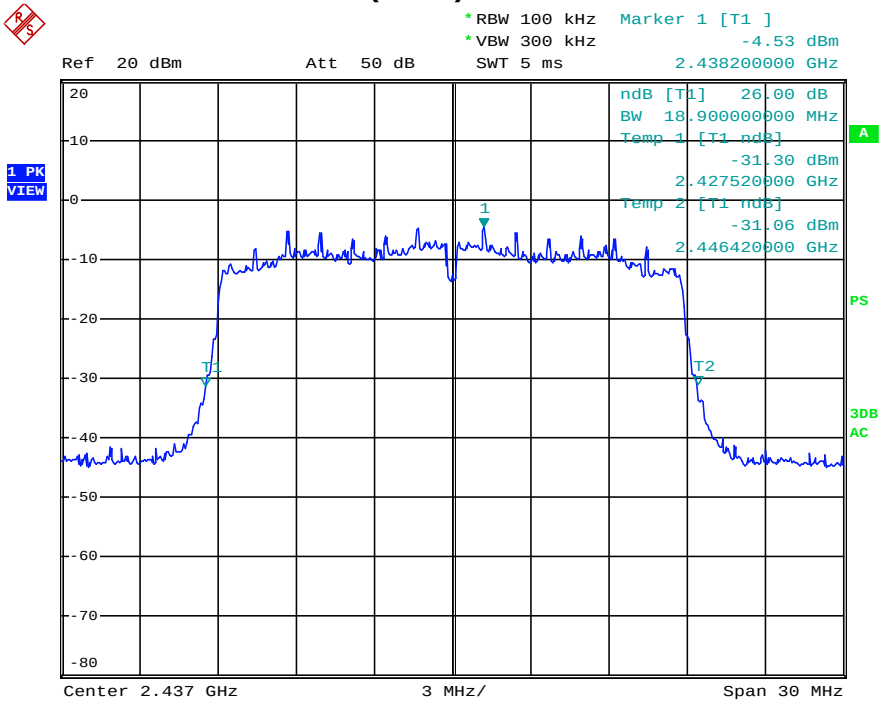
802.11g High Channel



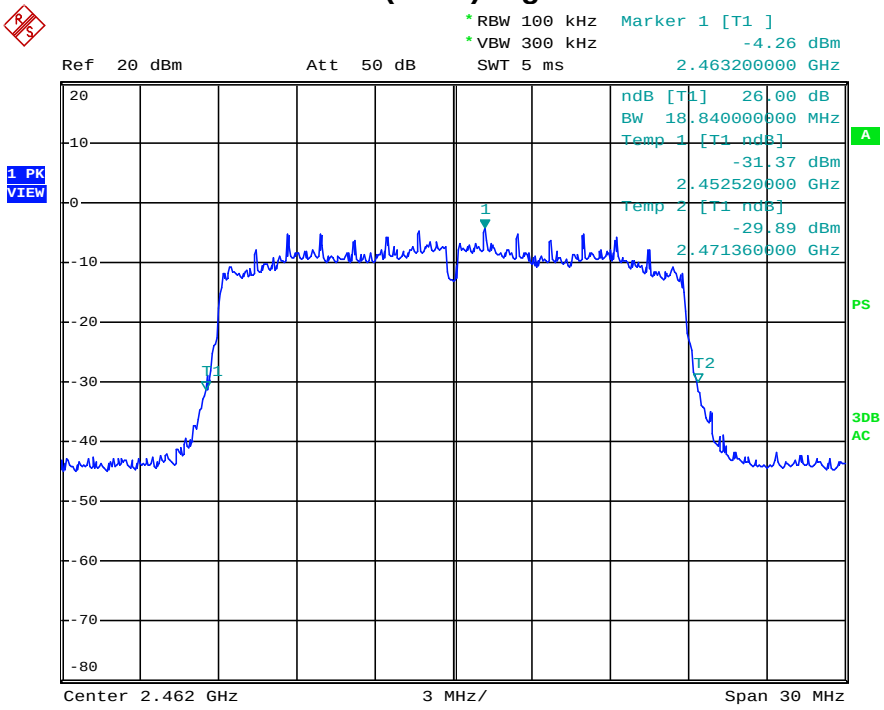
802.11n(HT20) Low Channel



802.11n(HT20) Middle Channel

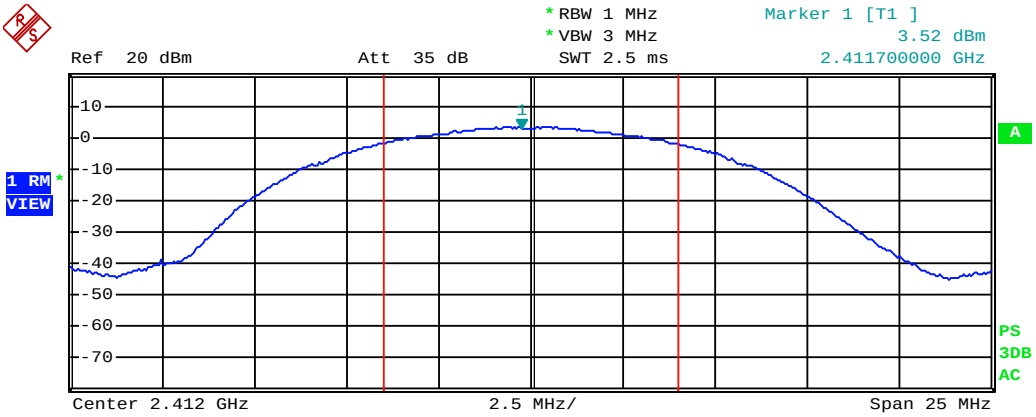


802.11n(HT20) High Channel



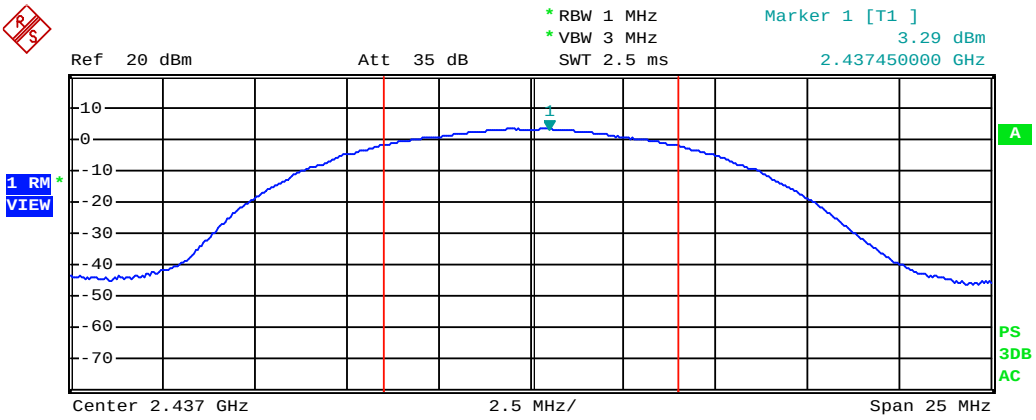
Maximum AVG Conducted Output Power

802.11b Low Channel



Tx Channel
Bandwidth 8 MHz Power 9.91 dBm

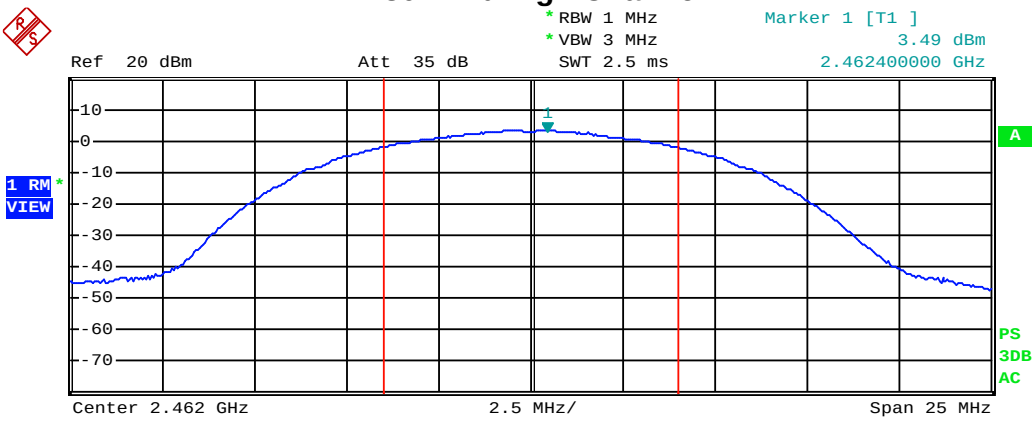
802.11b Middle Channel



Tx Channel

Bandwidth	8 MHz	Power	9.73 dBm

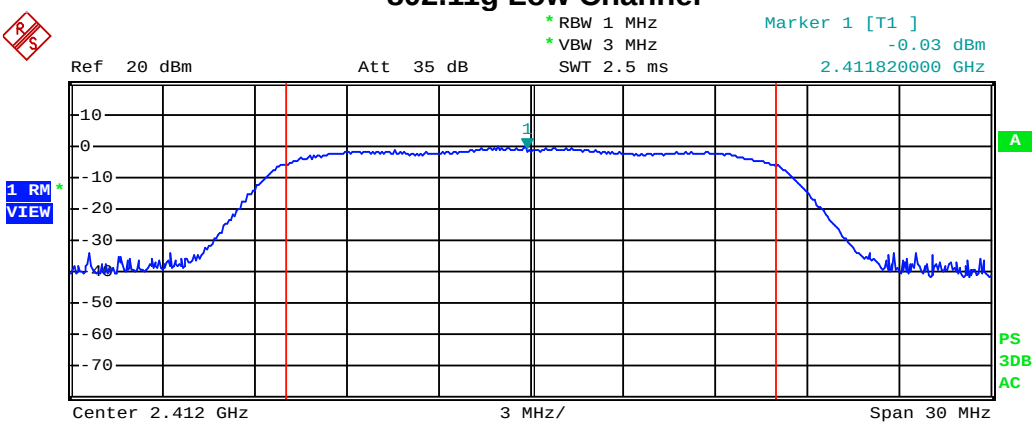
802.11b High Channel



Tx Channel

Bandwidth	8 MHz	Power	9.89 dBm

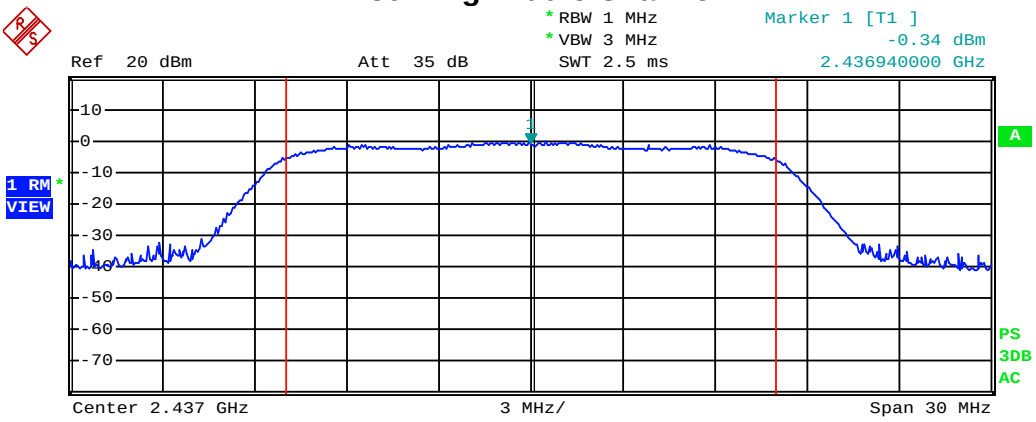
802.11g Low Channel



Tx Channel

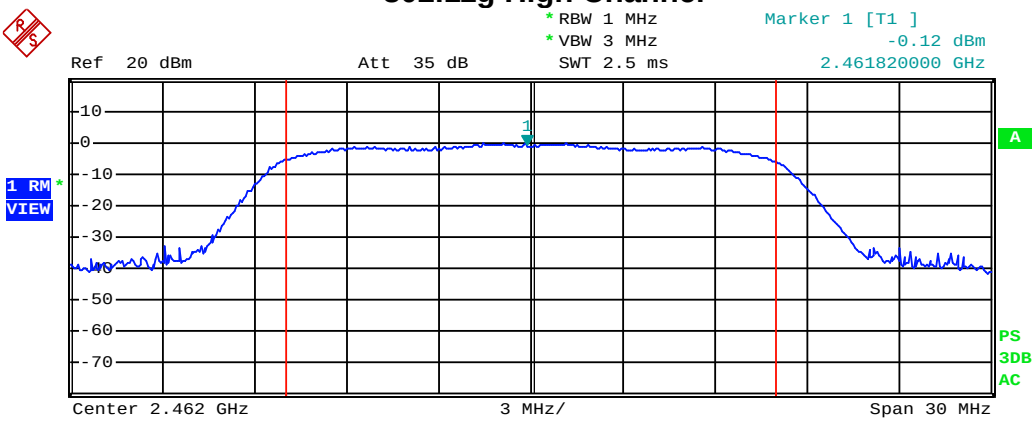
Bandwidth	16 MHz	Power	9.05 dBm

802.11g Middle Channel



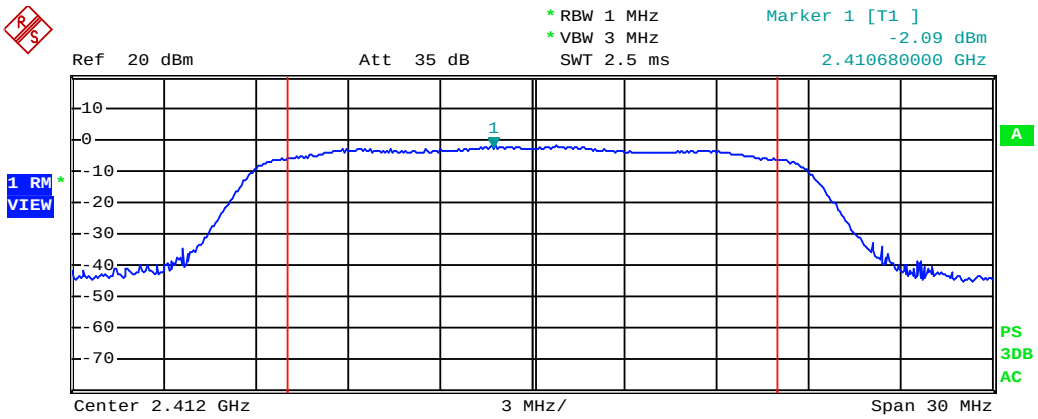
Tx Channel
Bandwidth 16 MHz Power 9.16 dBm

802.11g High Channel



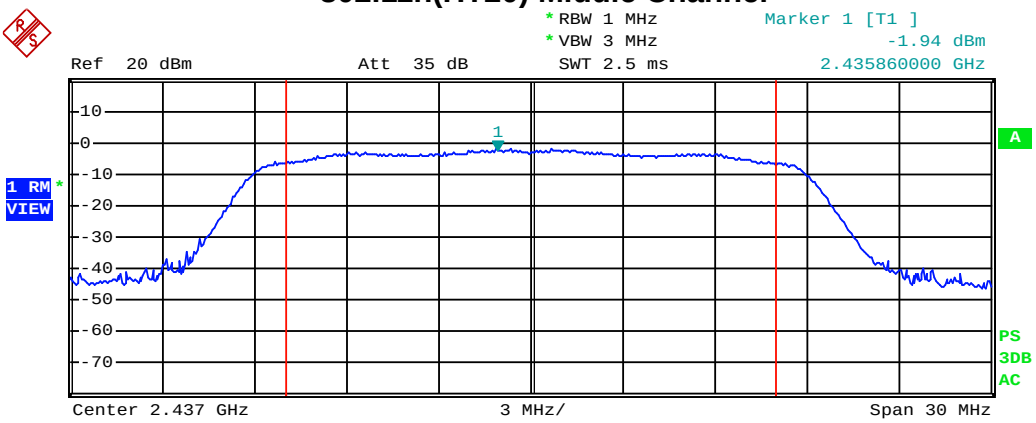
Tx Channel
Bandwidth 16 MHz Power 9.33 dBm

802.11n(HT20) Low Channel



Tx Channel
Bandwidth 16 MHz Power 7.54 dBm

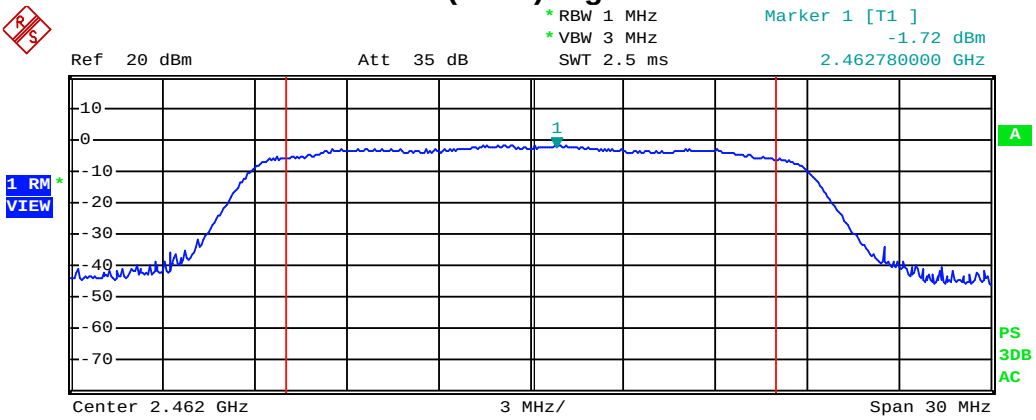
802.11n(HT20) Middle Channel



Tx Channel

Bandwidth	16 MHz	Power	7.47 dBm

802.11n(HT20) High Channel



Tx Channel

Bandwidth	16 MHz	Power	7.72 dBm

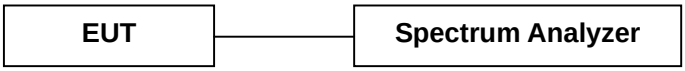
5. 6dB Bandwidth

5.1 Measurement Procedure

DTS 6dB Channel Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 1-5 % of the emission bandwidth(not to exceed 100KHz) according to FCC KDB 558074(v02). For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line

5.2 Test SET-UP (Block Diagram of Configuration)

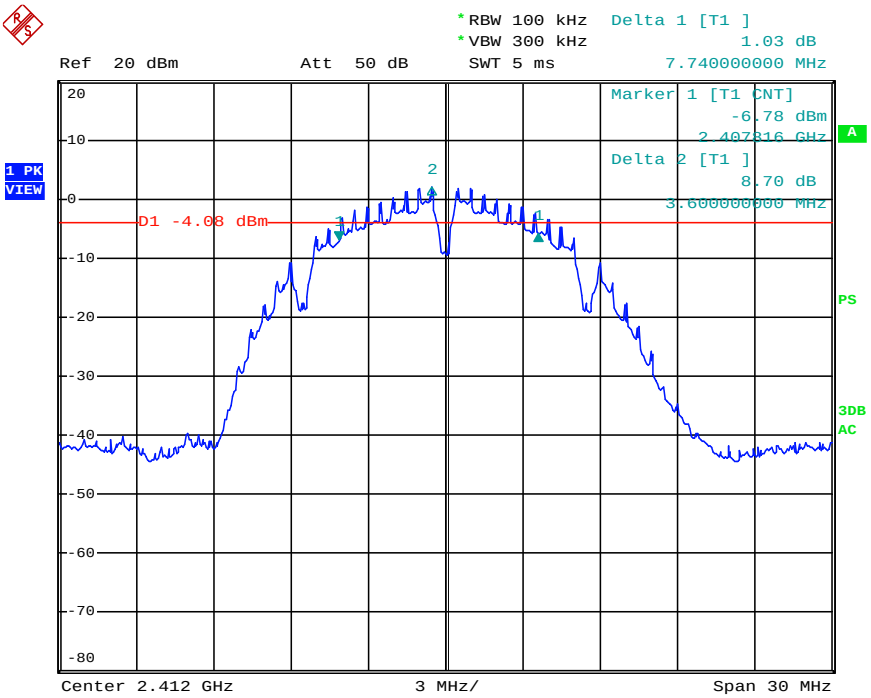


5.3 Measurement Results

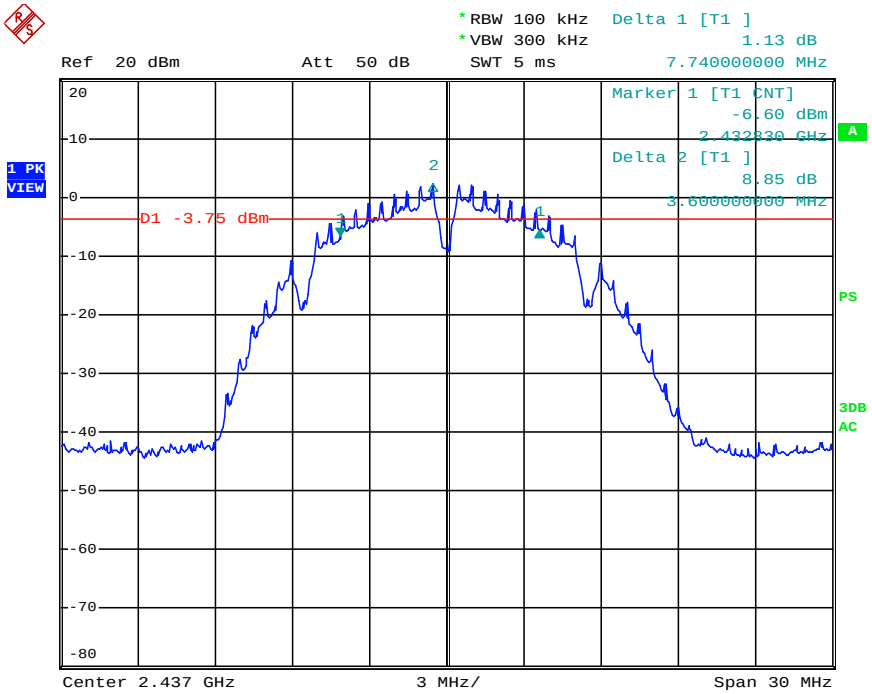
Please refer to following table and plots.

Temperature :	24 ℃	Humidity :	53 %
Test By:	Think	Test Date :	April 8, 2013
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	6dB Bandwidth MHz	Limit
IEEE 802.11b Mode (CCK)			
Low Channel: 2412	1	7.74	>500KHz
Middle Channel: 2437	1	7.74	>500KHz
High Channel: 2462	1	7.68	>500KHz
IEEE 802.11g Mode (OFDM)			
Low Channel: 2412	6	15.54	>500KHz
Middle Channel: 2437	6	15.54	>500KHz
High Channel: 2462	6	15.54	>500KHz
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 2412	6.5	15.24	>500KHz
Middle Channel: 2437	6.5	15.30	>500KHz
High Channel: 2462	6.5	15.24	>500KHz

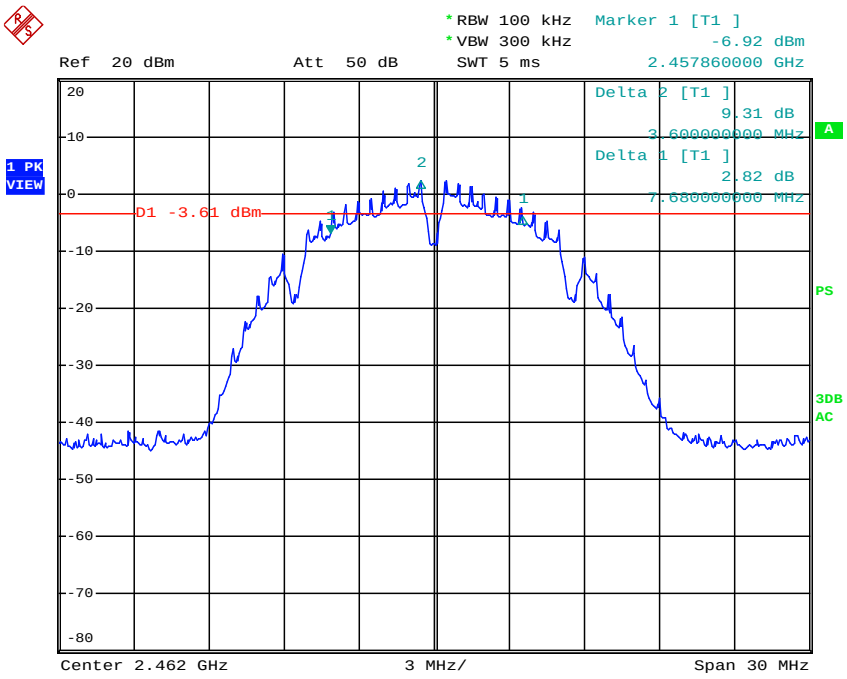
802.11b Low Channel



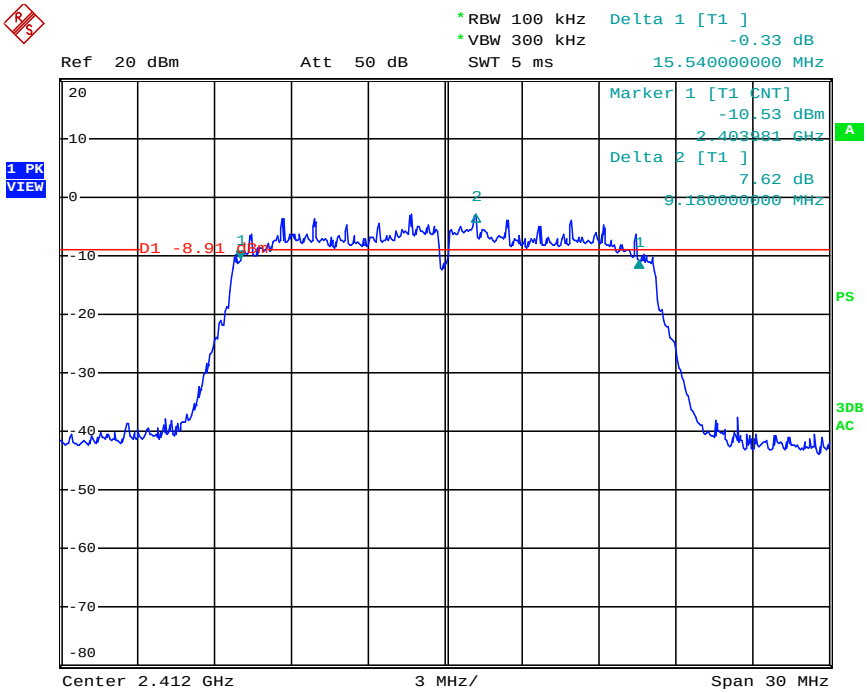
802.11b Middle Channel



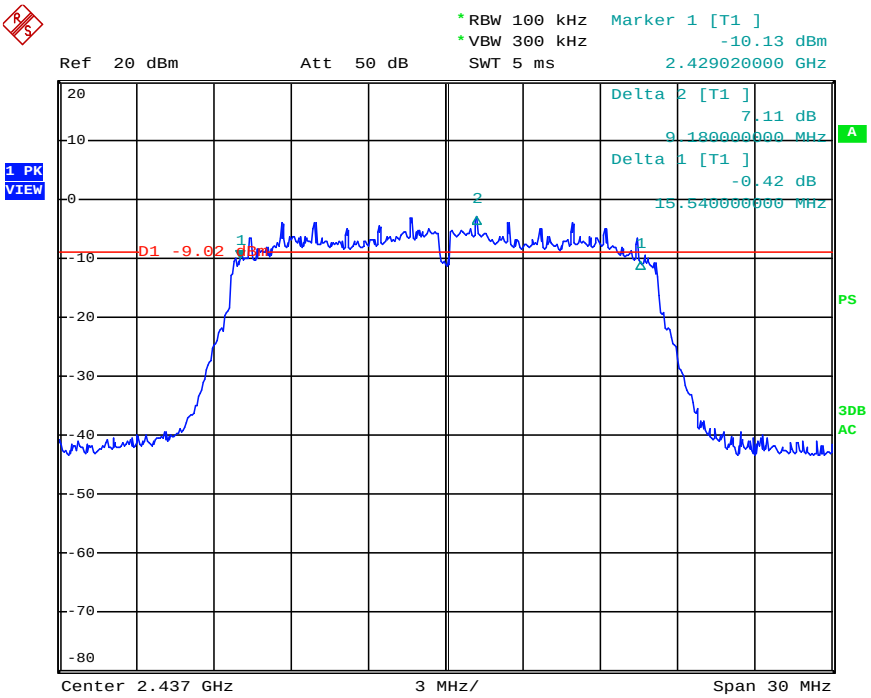
802.11b High Channel



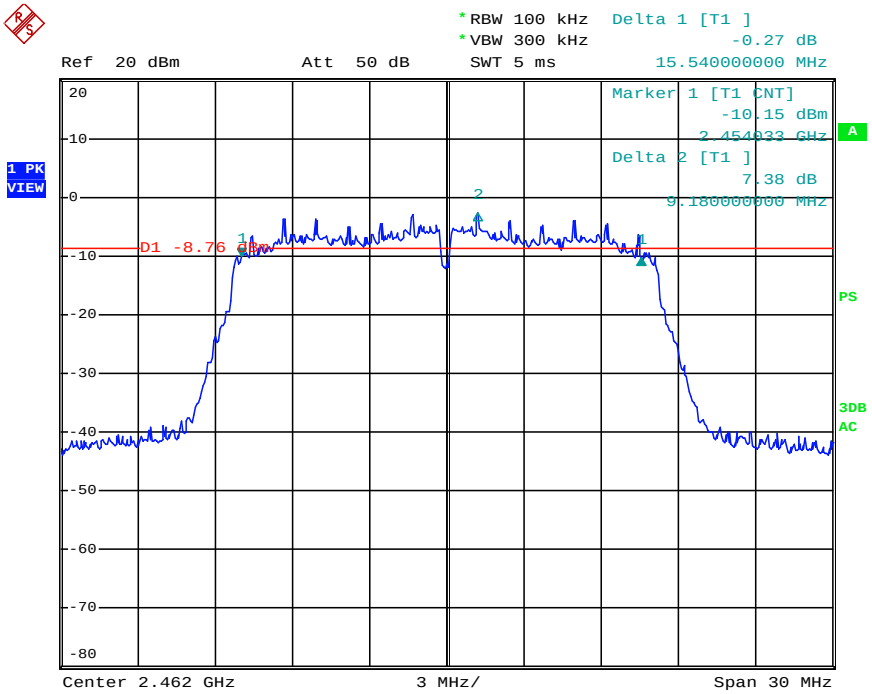
802.11g Low Channel



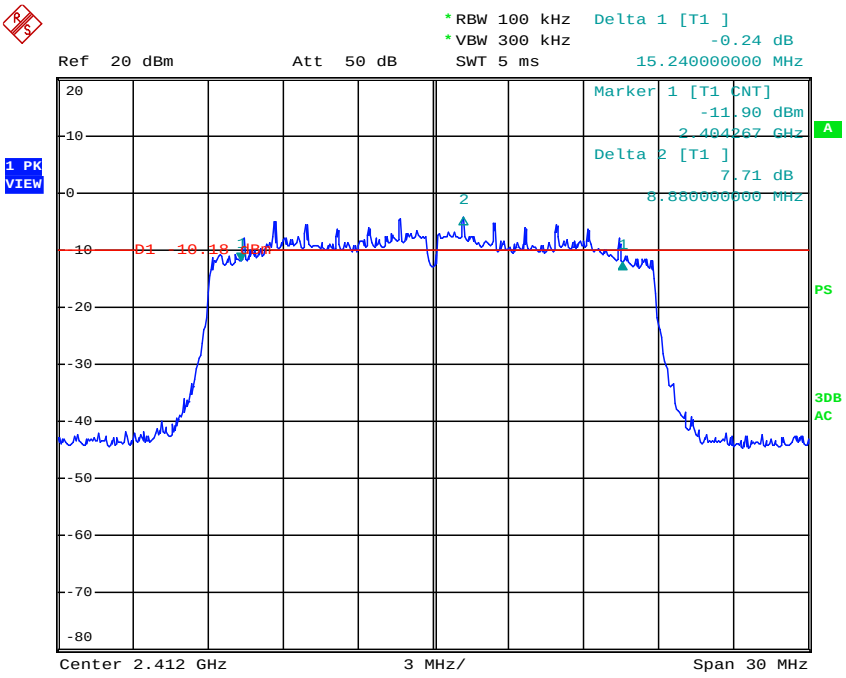
802.11g Middle Channel



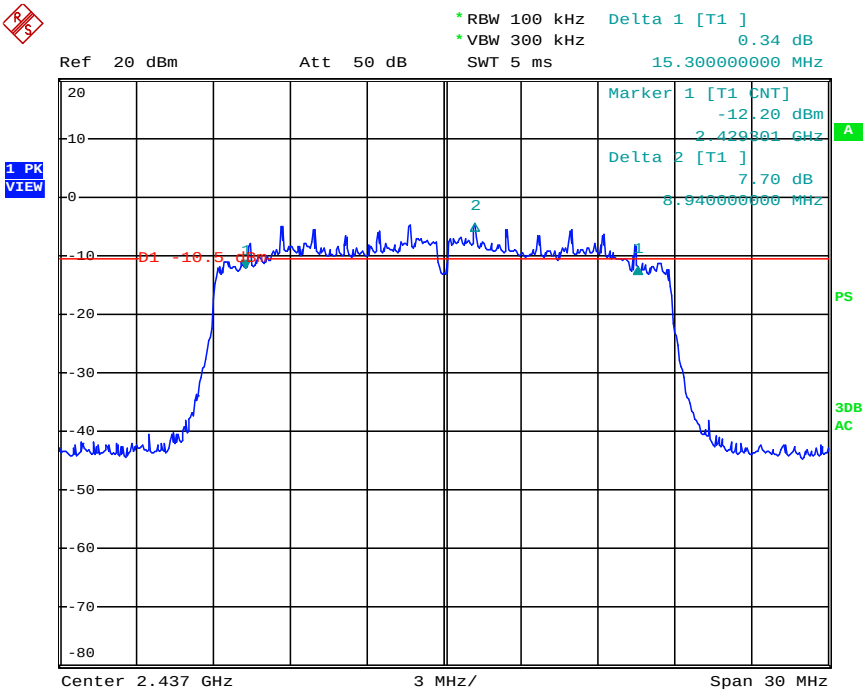
802.11g High Channel



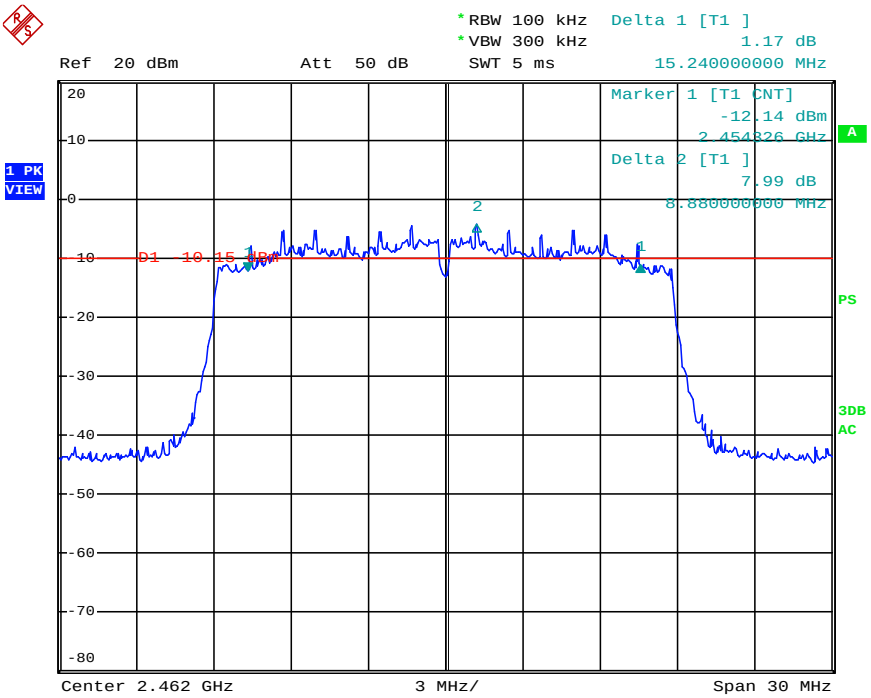
802.11n(HT20) Low Channel



802.11n(HT20) Middle Channel



802.11n(HT20) High Channel



6. Power Spectral Density

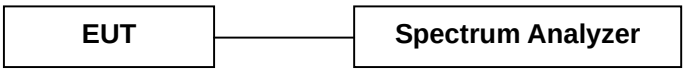
6.1 Measurement Procedure

DTS 6dB Channel Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below according to FCC KDB558074(v02):

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ⩾ 3 kHz.
4. Set the VBW ⩾ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.2 Test SET-UP (Block Diagram of Configuration)

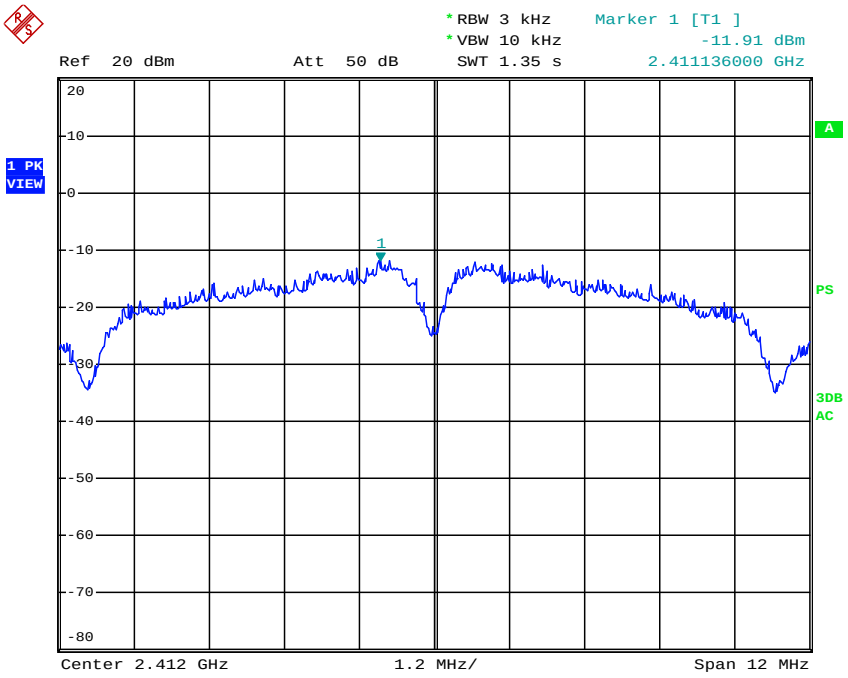


6.3 Measurement Results

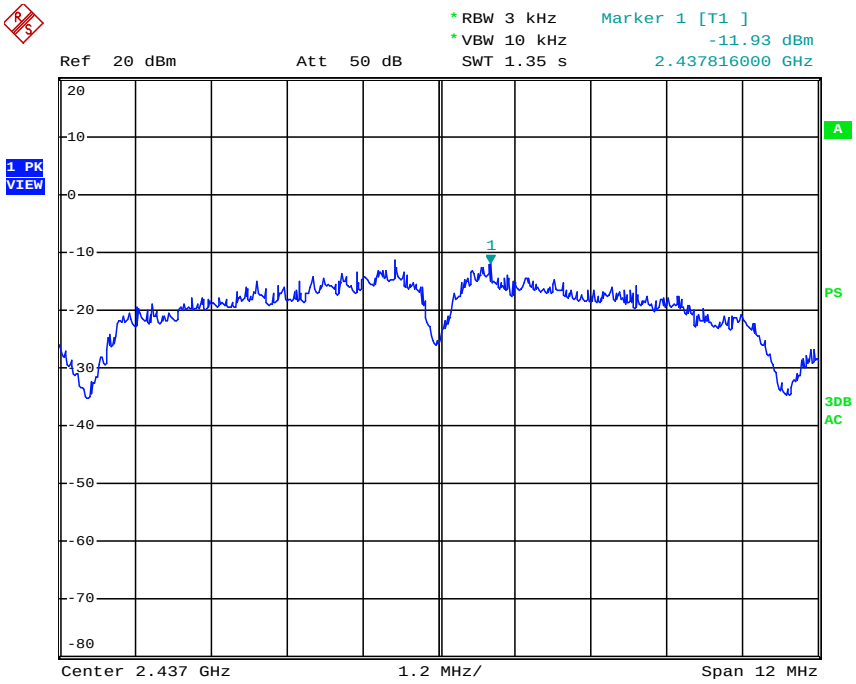
Please refer to following table and plots.

Temperature :	24 ℃	Humidity :	53 %
Test By:	Think	Test Date :	April 8, 2013
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	PSD dBm	Limit dBm
IEEE 802.11b Mode (CCK)			
Low Channel: 2412	1	-11.91	8
Middle Channel: 2437	1	-11.93	8
High Channel: 2462	1	-11.76	8
IEEE 802.11g Mode (OFDM)			
Low Channel: 2412	6	-16.86	8
Middle Channel: 2437	6	-16.86	8
High Channel: 2462	6	-15.55	8
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 2412	6.5	-18.70	8
Middle Channel: 2437	6.5	-17.97	8
High Channel: 2462	6.5	-17.68	8

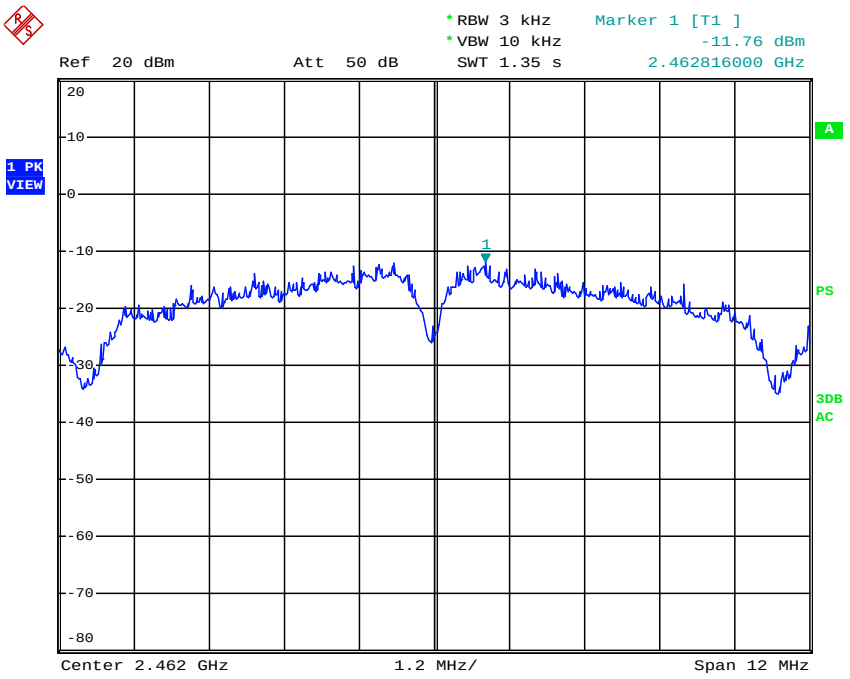
802.11b Low Channel



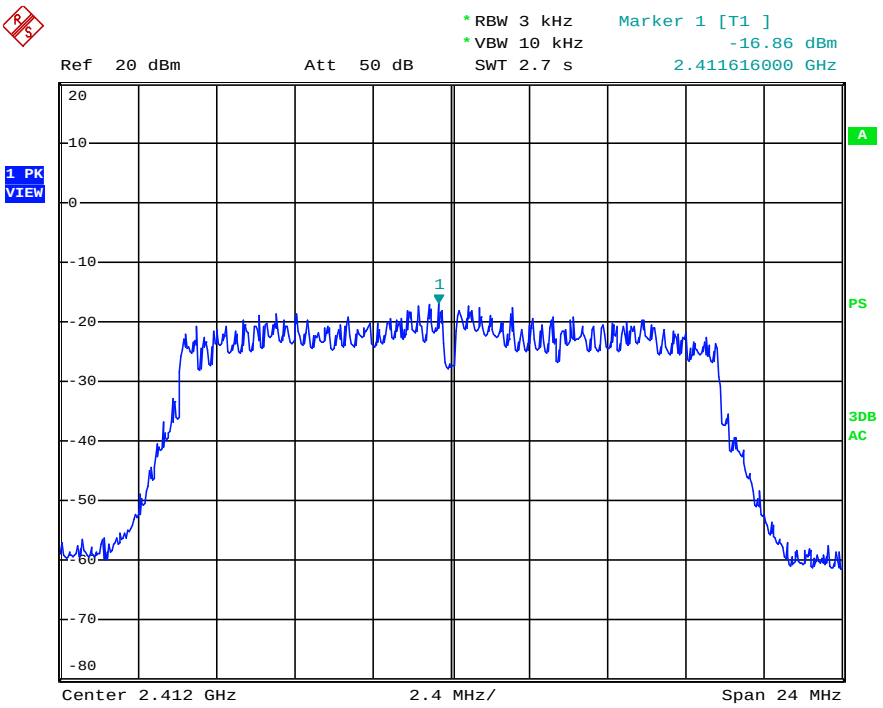
802.11b Middle Channel



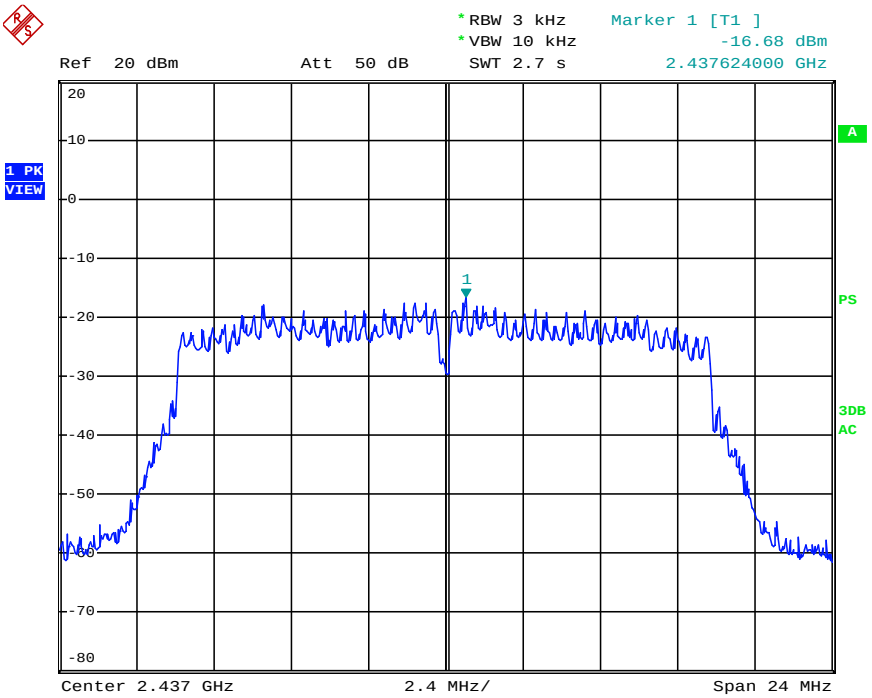
802.11b High Channel



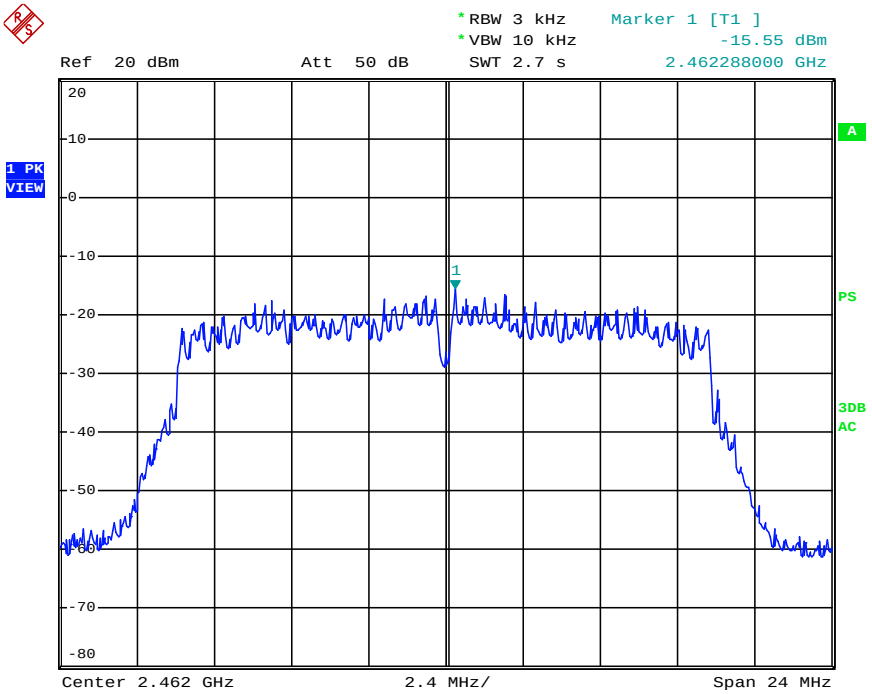
802.11g Low Channel



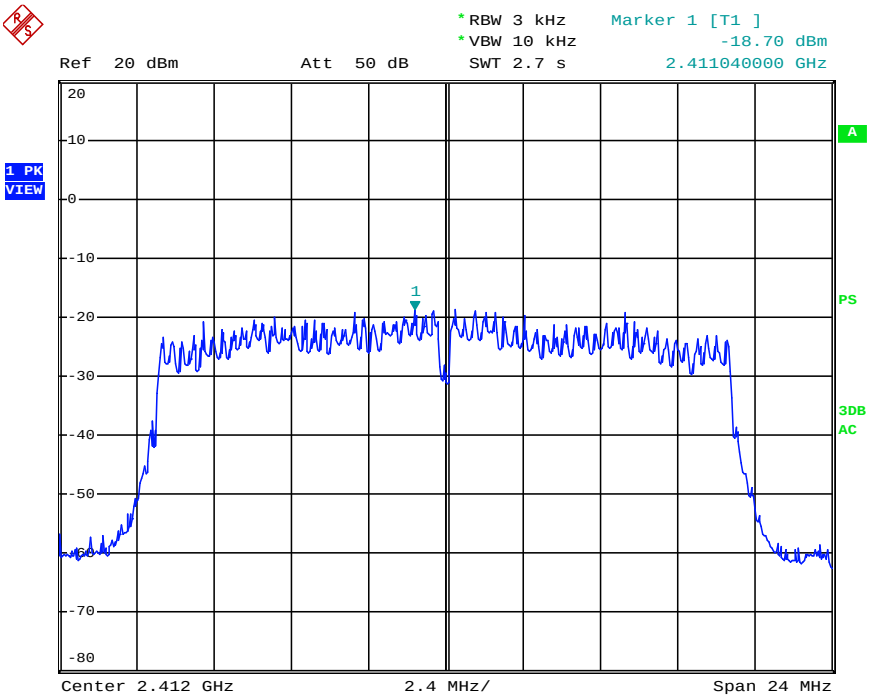
802.11g Middle Channel



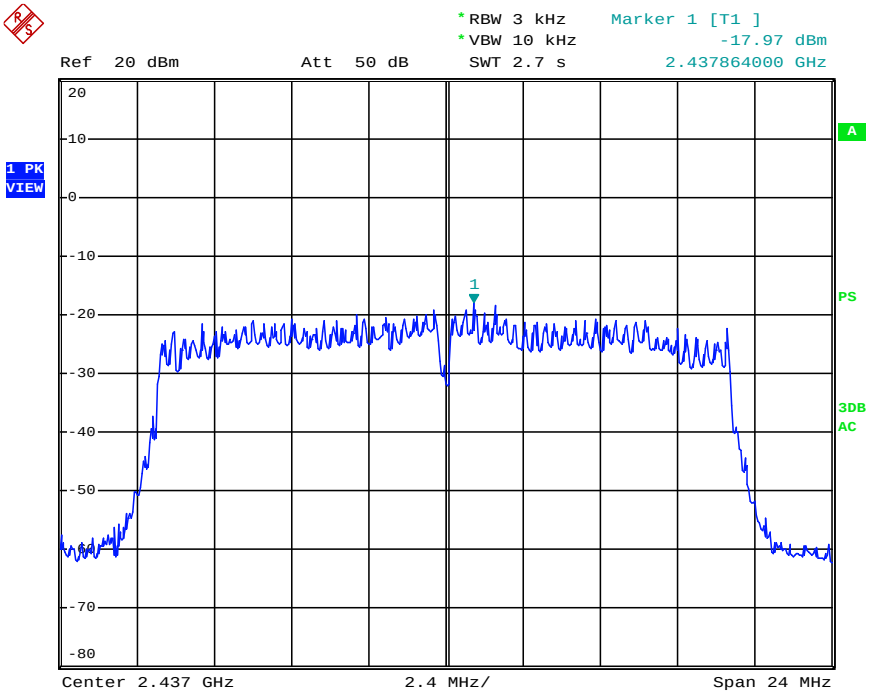
802.11g High Channel



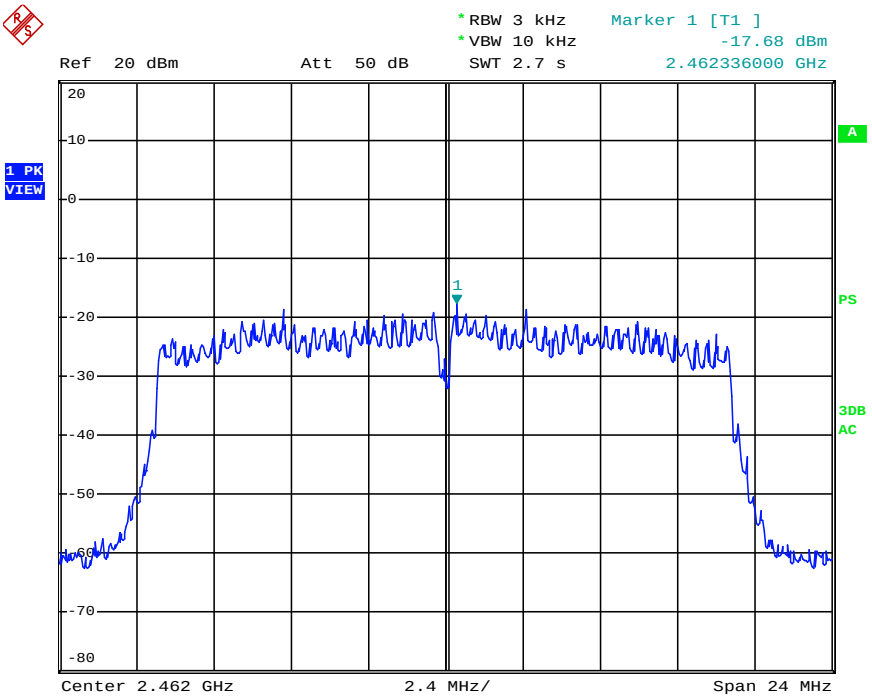
802.11n(HT20) Low Channel



802.11n(HT20) Middle Channel



802.11n(HT20) High Channel



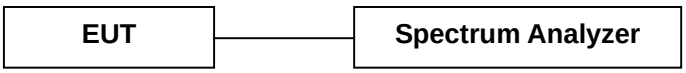
7. Band Edge and Conducted Spurious Emissions

7.1 Requirement and Measurement Procedure

In any 100KHz bandwidth outside the frequency band in which the spread spectrum 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.
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below according to FCC KDB558074(v02):

1. Set start frequency to DTS channel edge frequency.
2. Set stop frequency so as to encompass the spectrum to be examined.
3. Set RBW = 100 kHz.
4. Set VBW ⩾ 300 kHz.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

7.2 Test SET-UP (Block Diagram of Configuration)

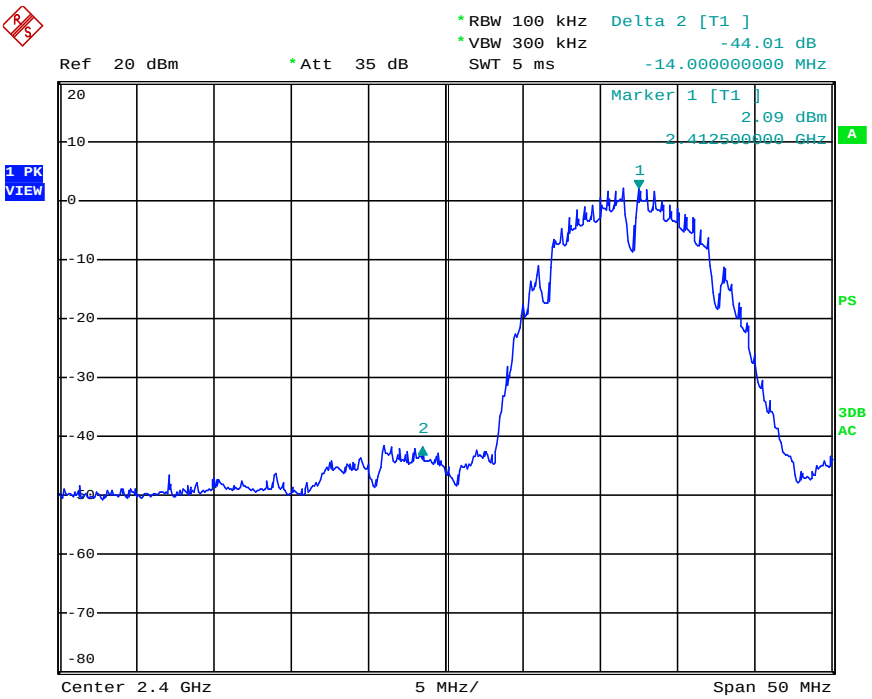


7.3 Measurement Results

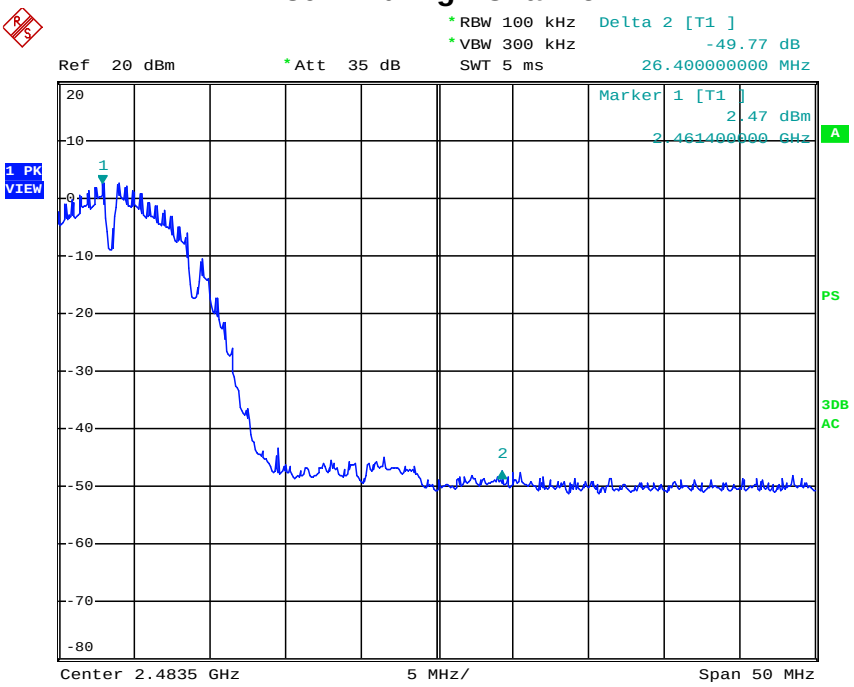
The test plots showed all spurious emission and up to the tenth harmonic was measured and they were found to be at least 20dB below the highest level of the desired power in the passband. Please refer to below plots.

Band Edge

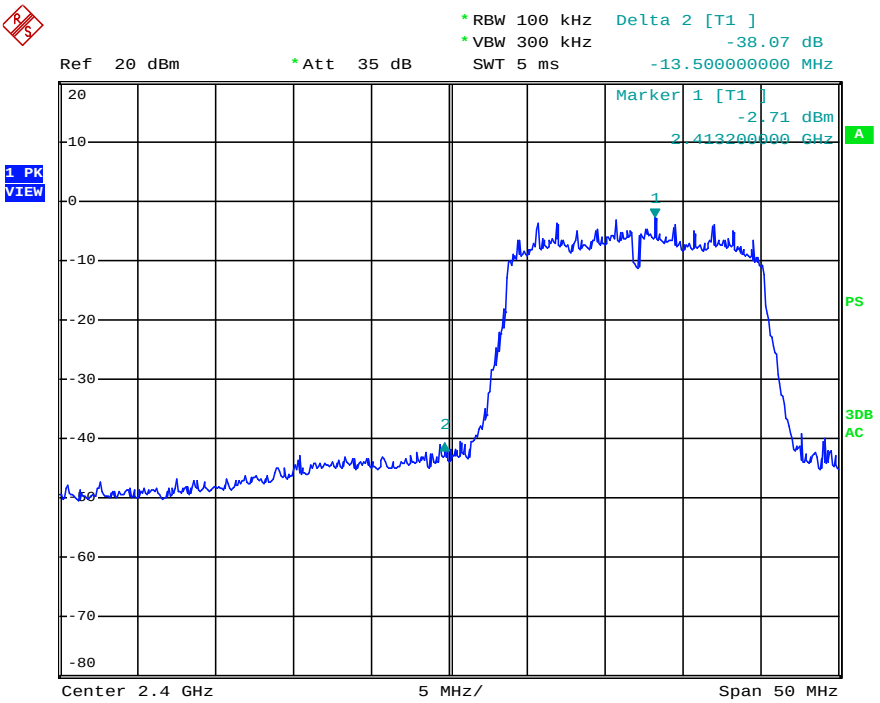
802.11b Low Channel



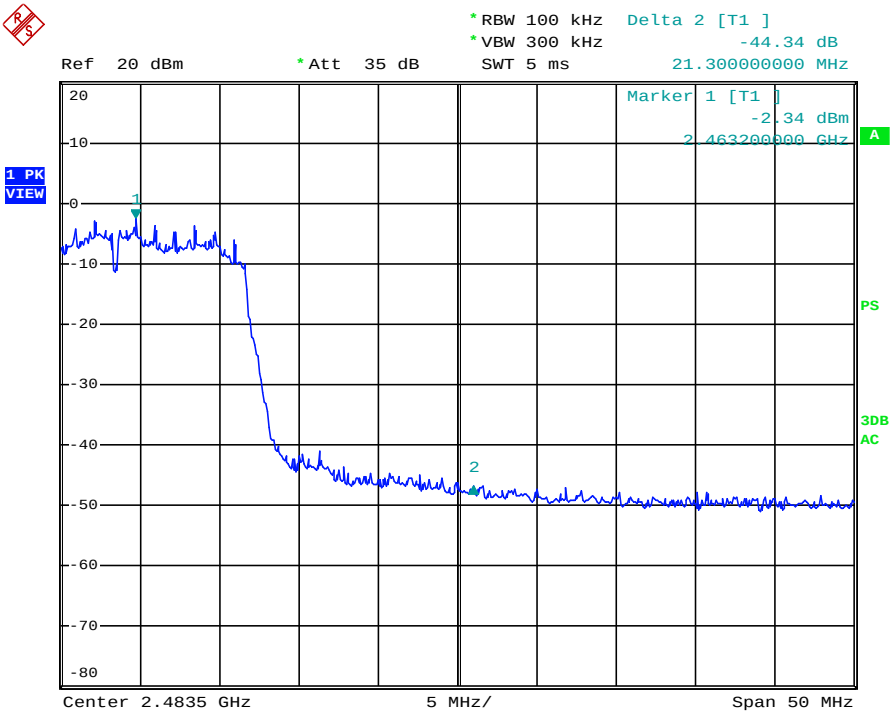
802.11b High Channel



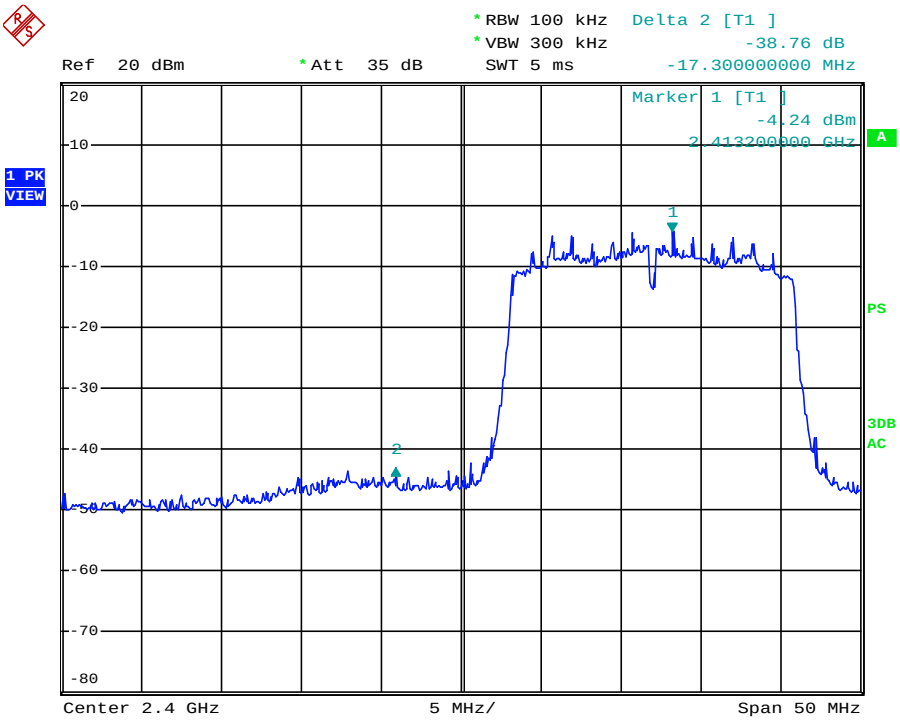
802.11g Low Channel



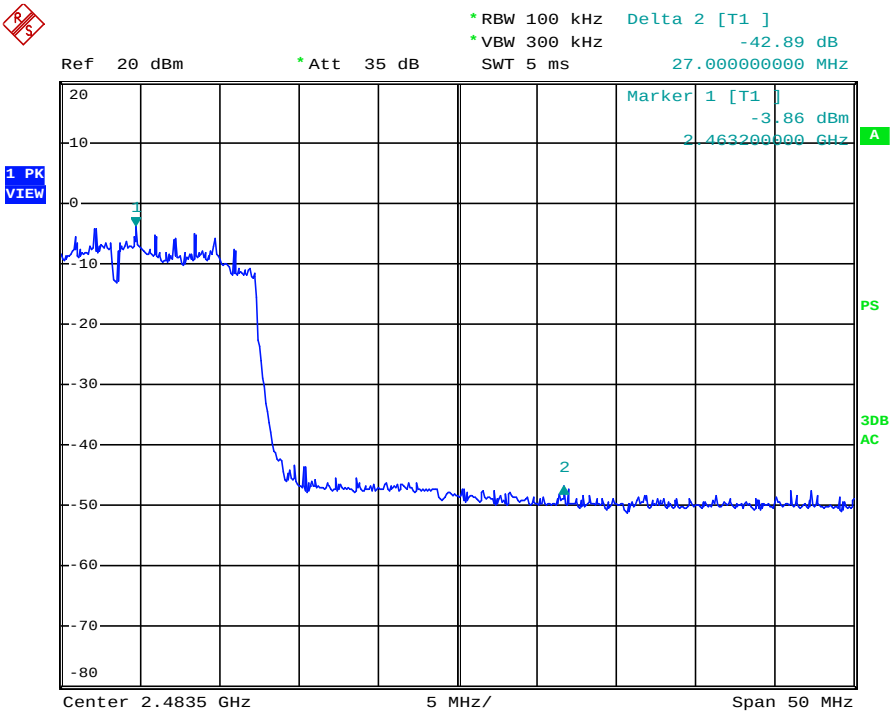
802.11g High Channel



802.11n(HT20) Low Channel

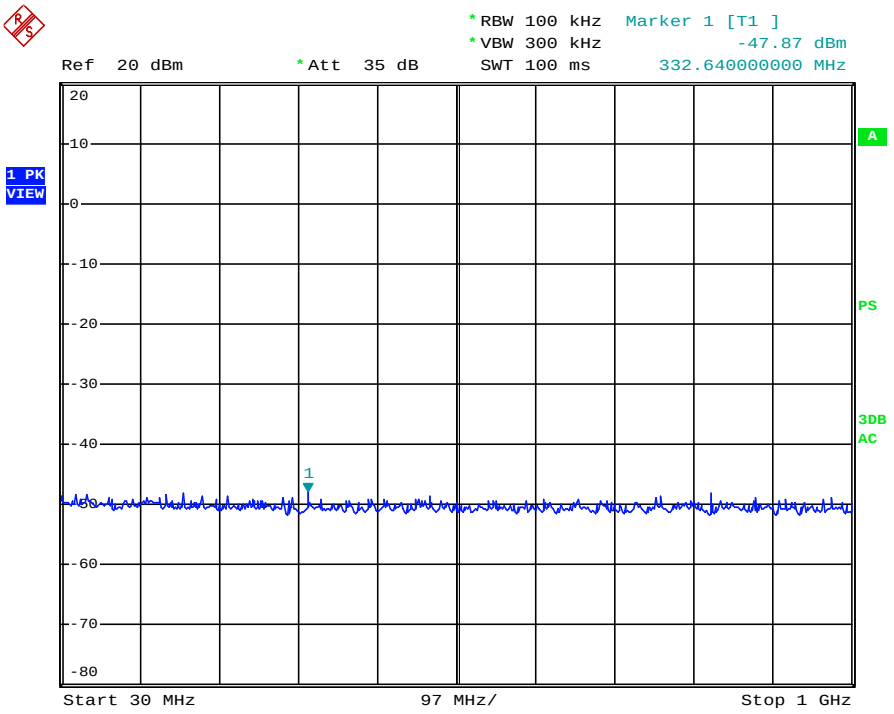


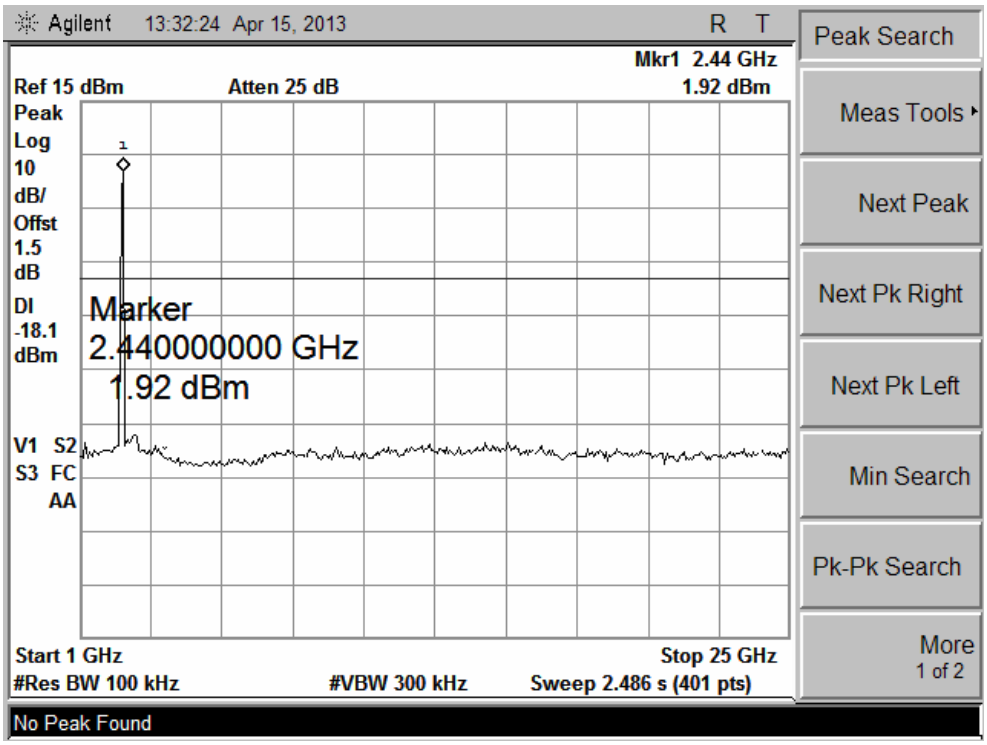
802.11n(HT20) High Channel



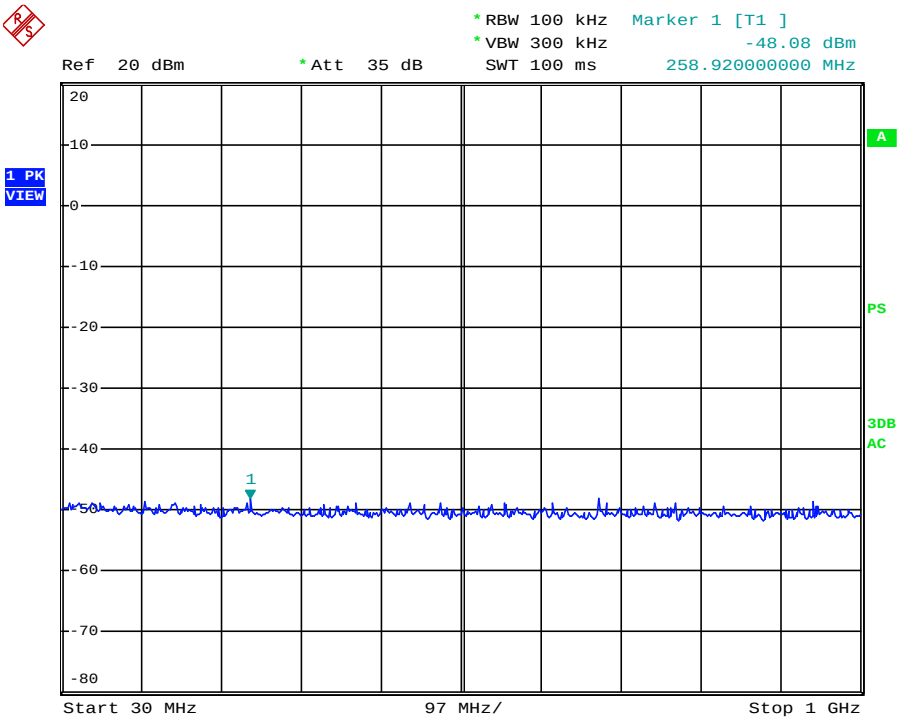
Conducted Spurious Emissions

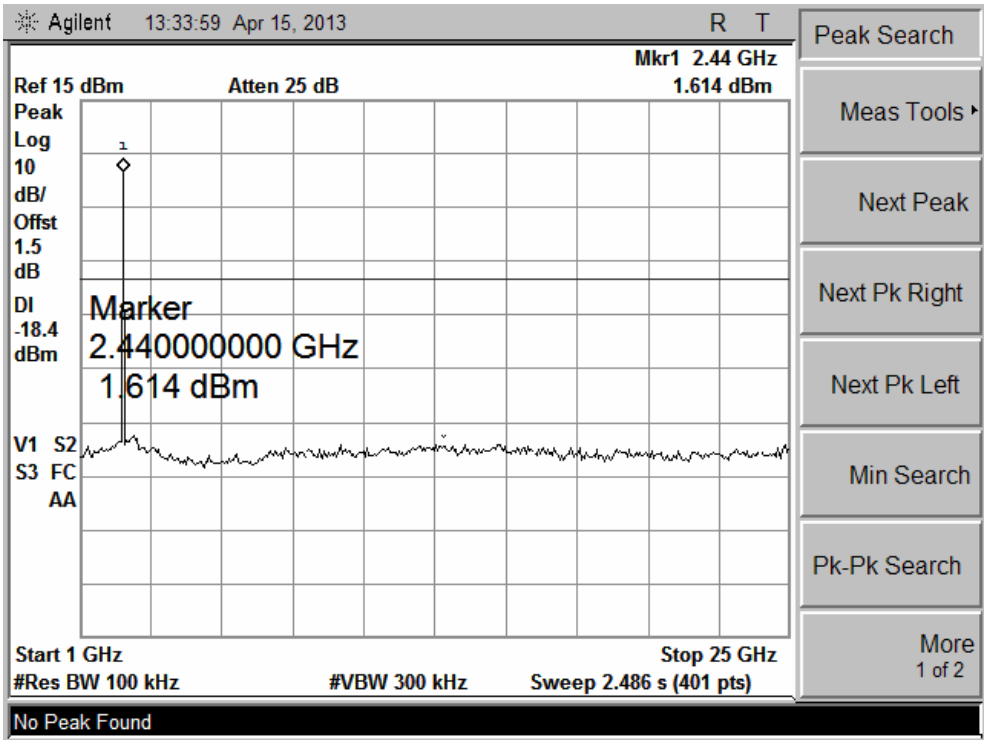
802.11b Low Channel



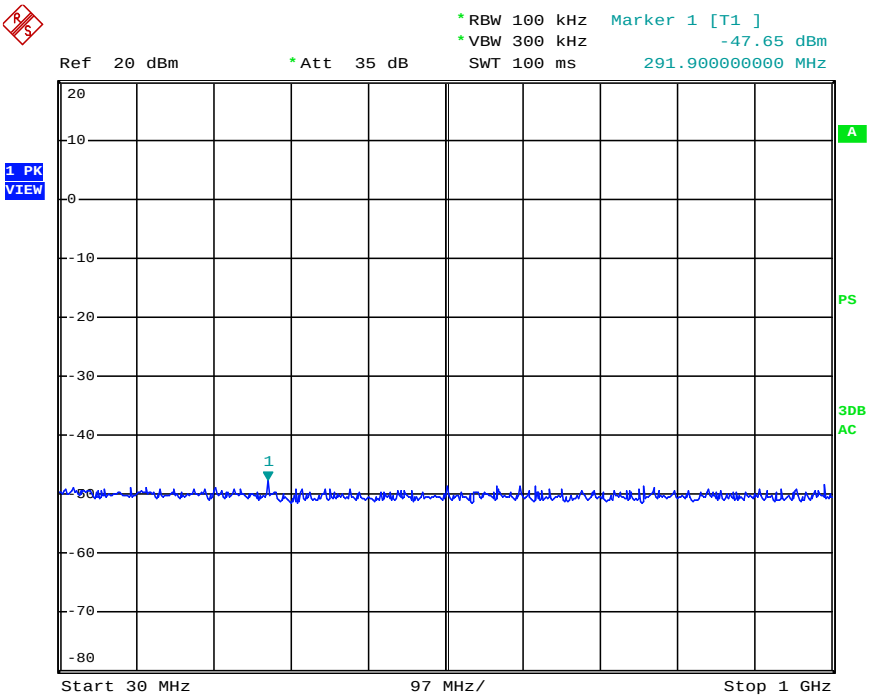


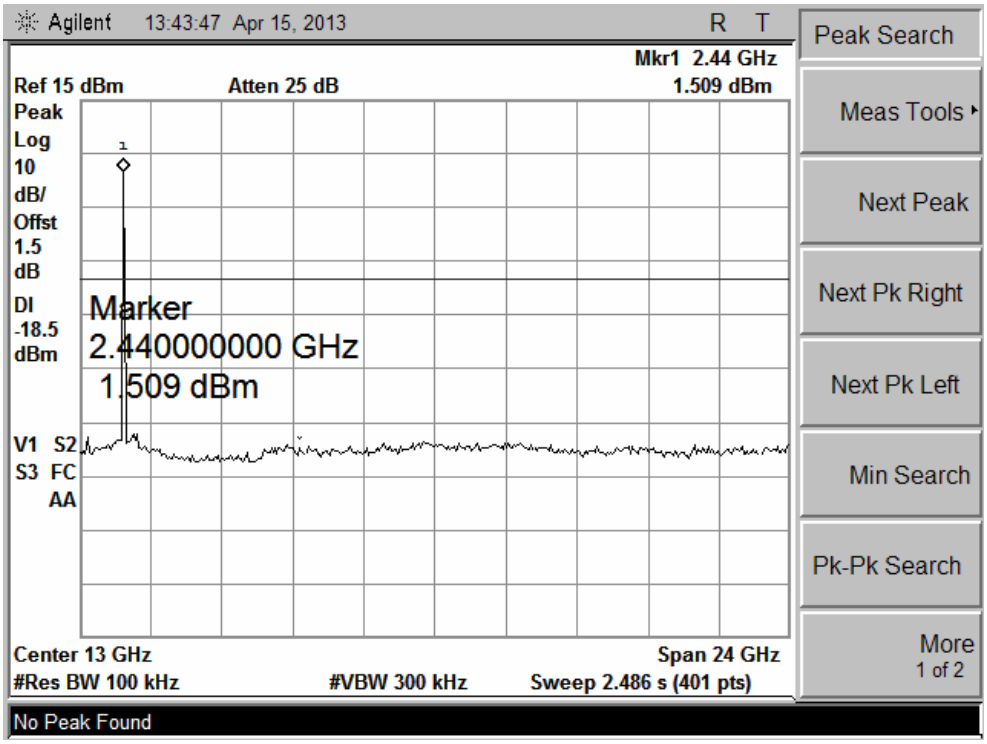
802.11b Middle Channel



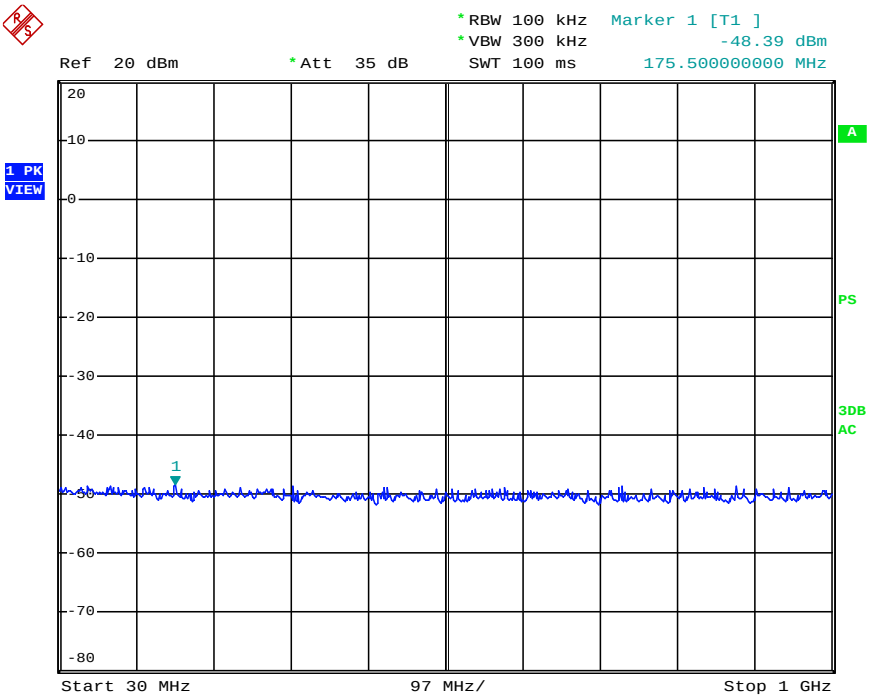


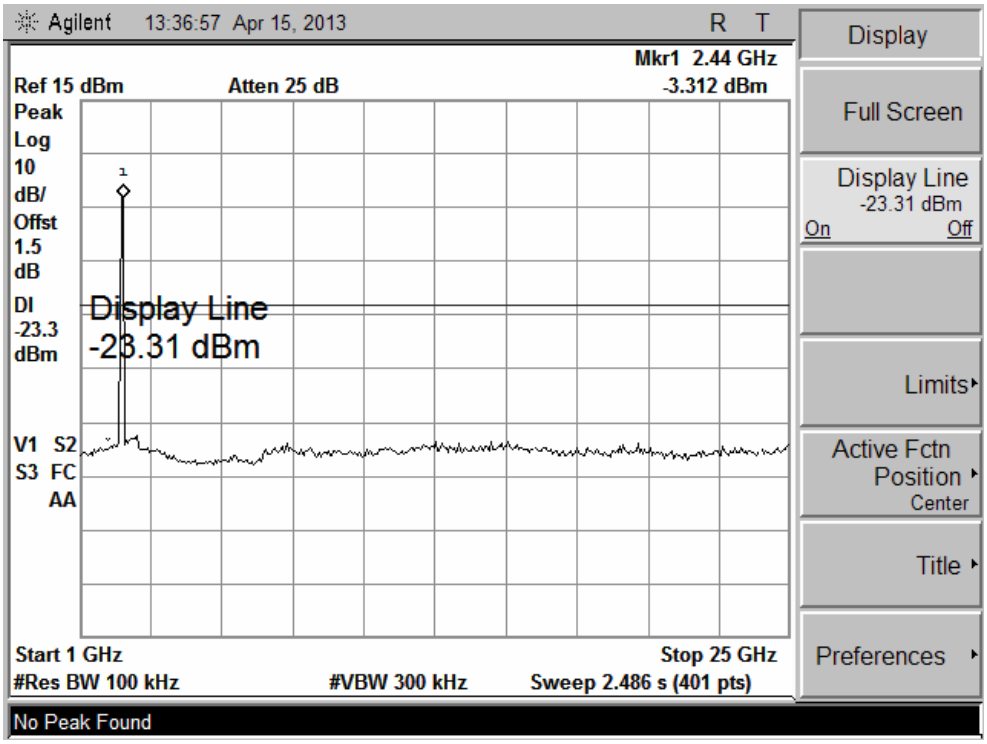
802.11b High Channel



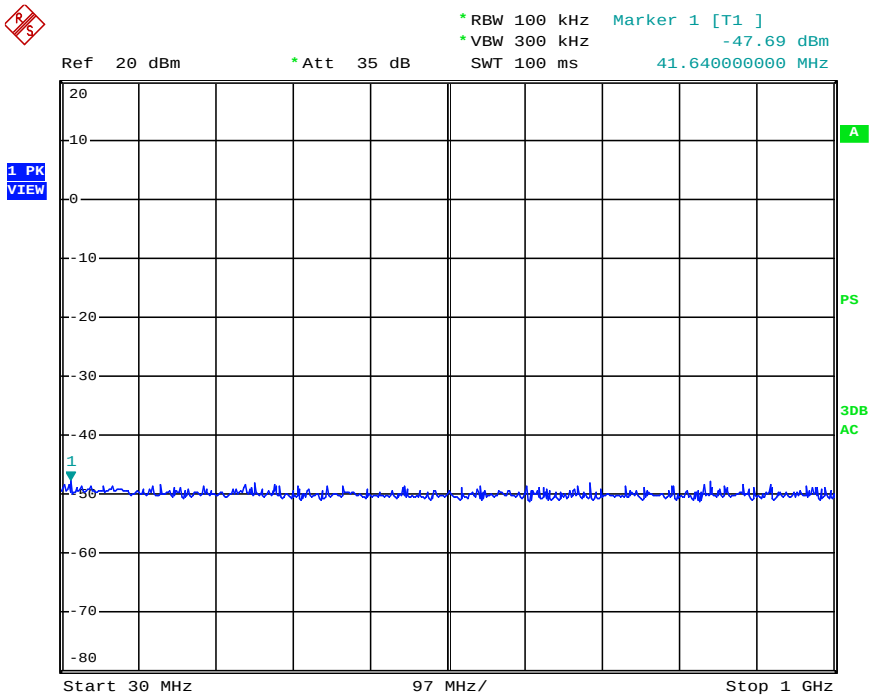


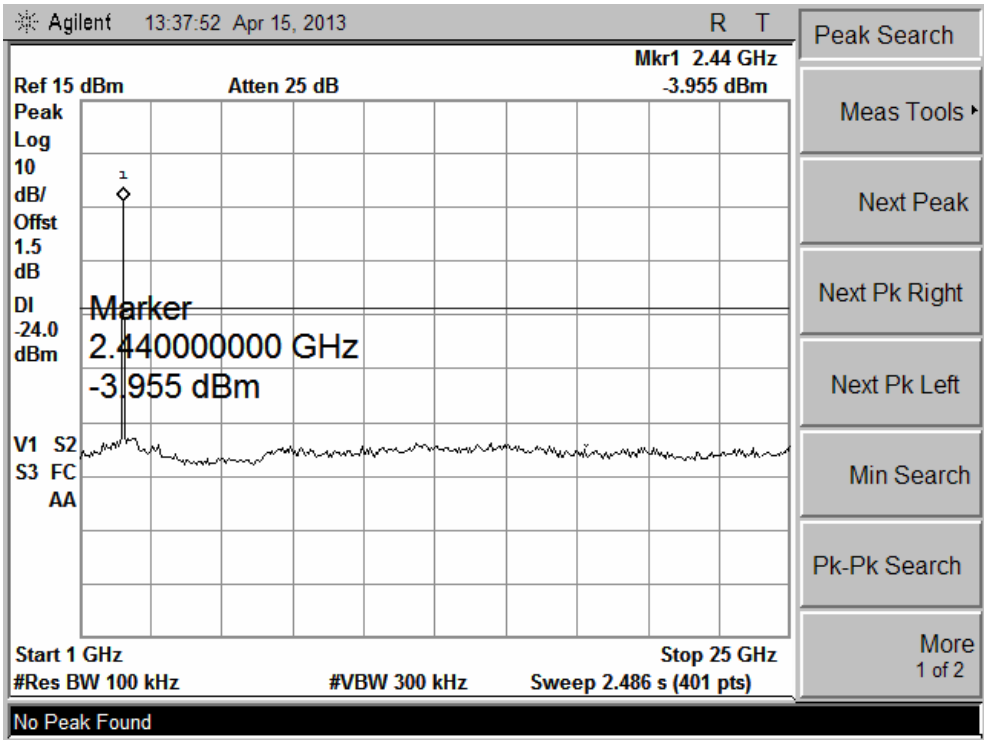
802.11g Low Channel



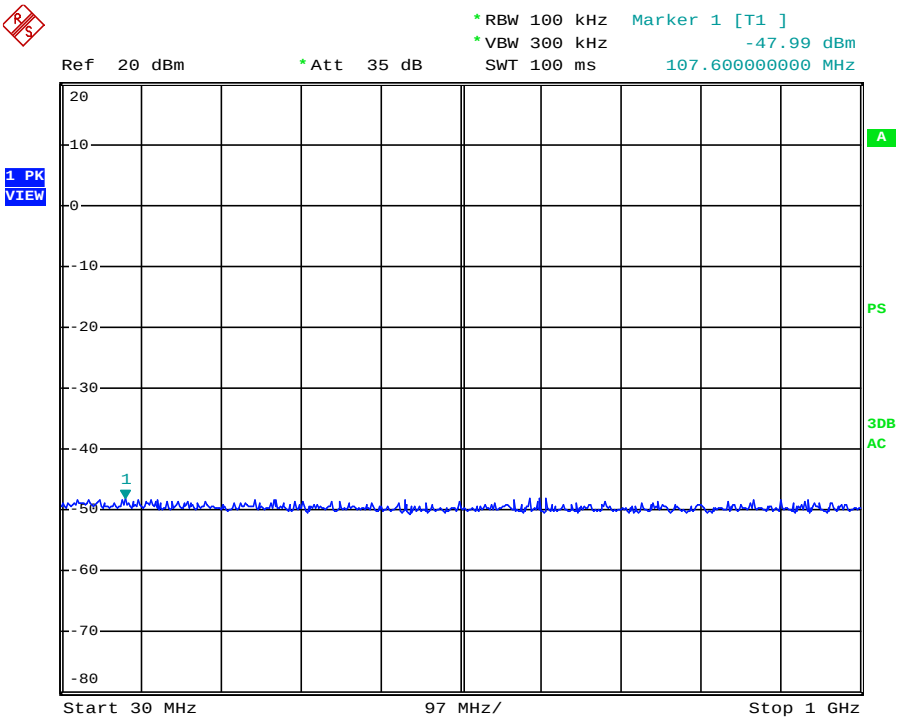


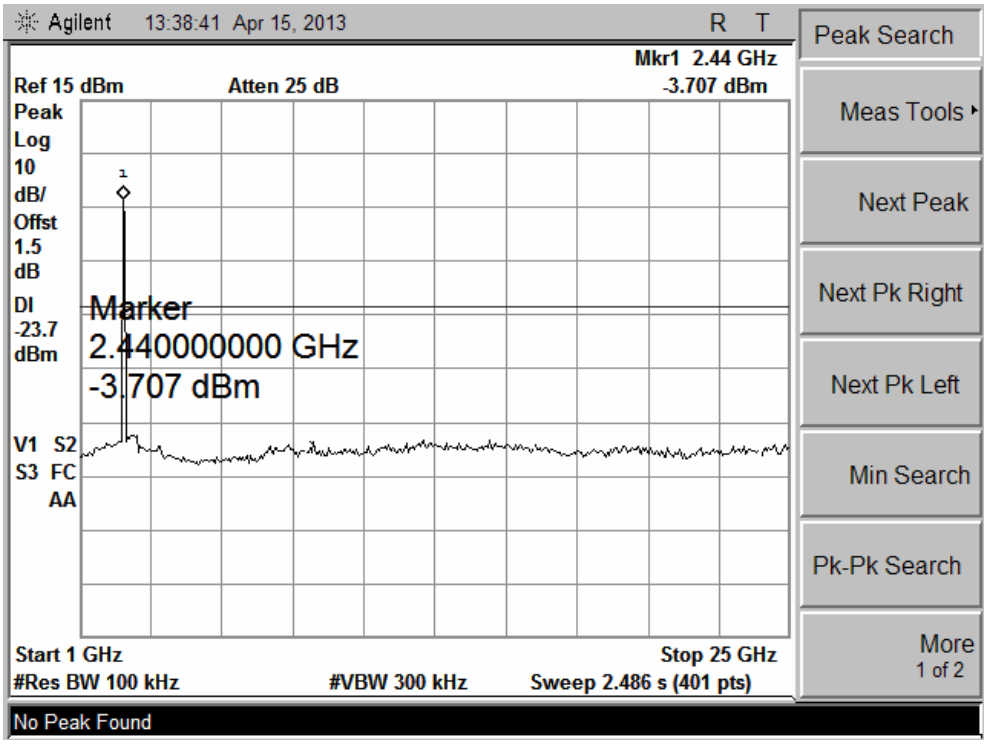
802.11g Middle Channel



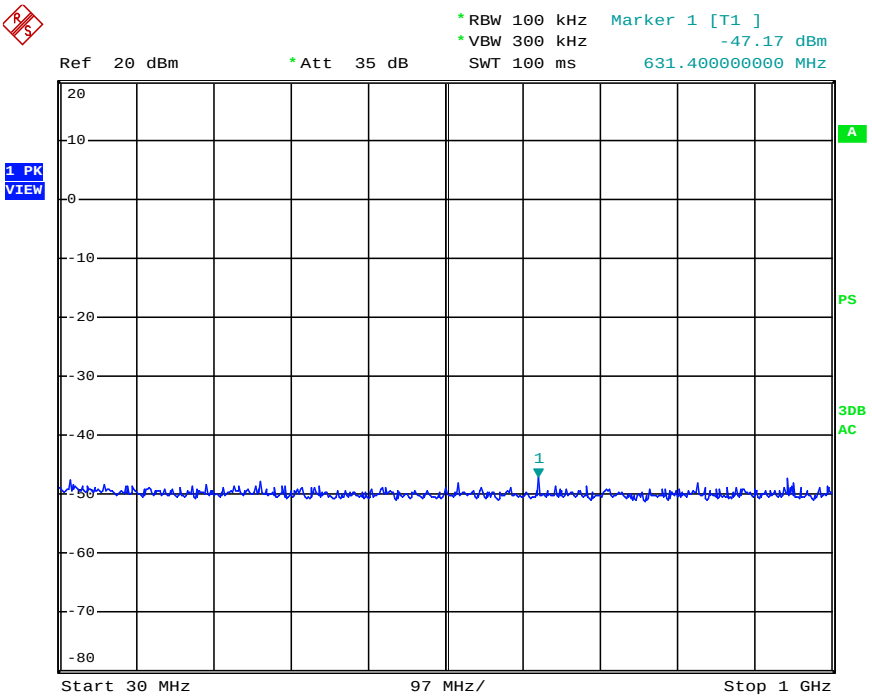


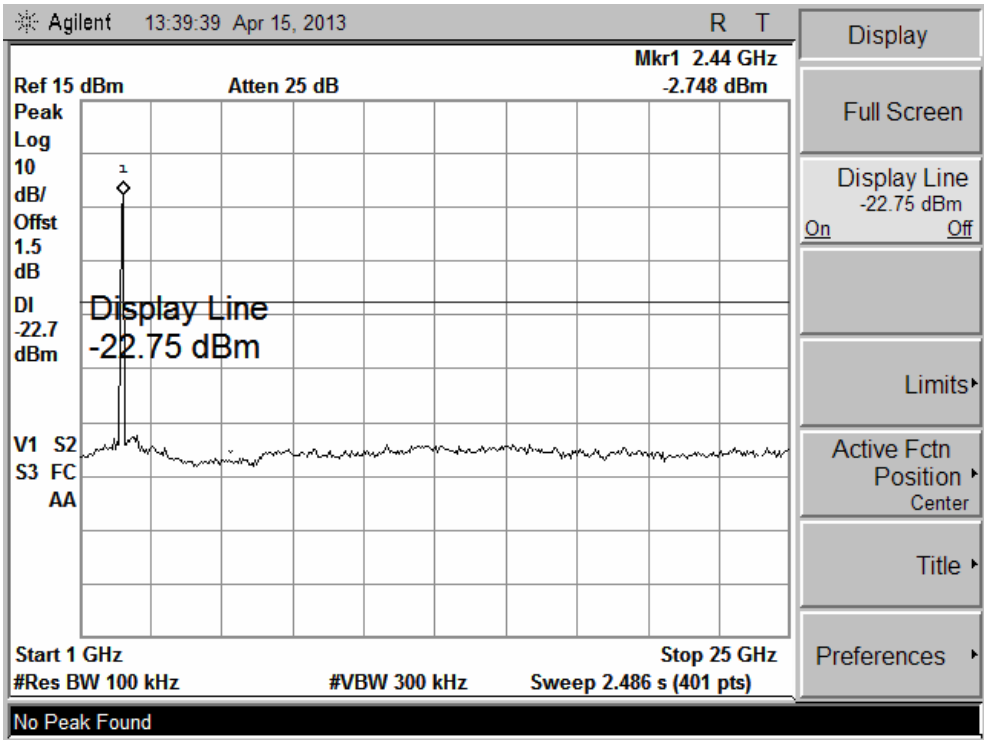
802.11g High Channel



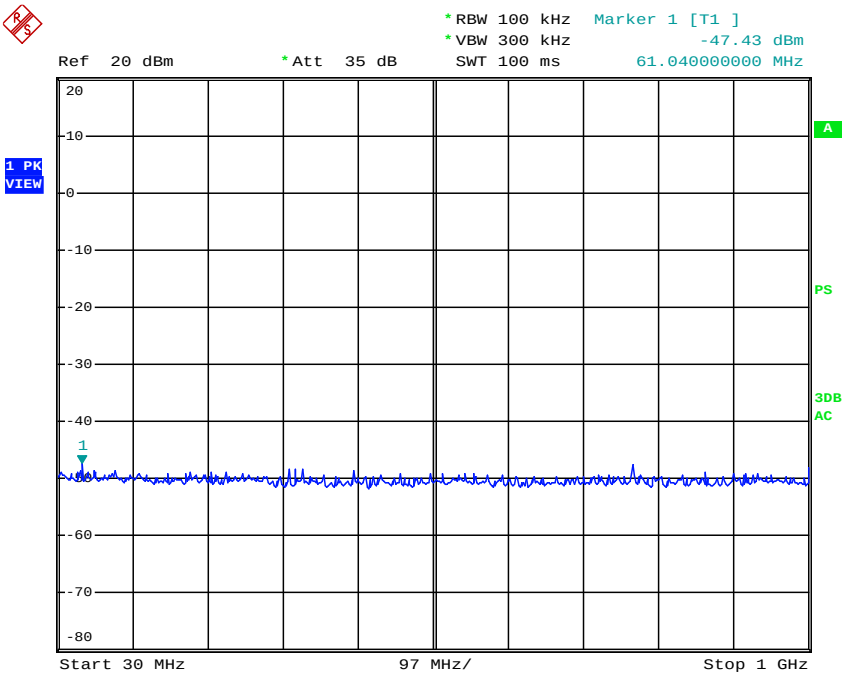


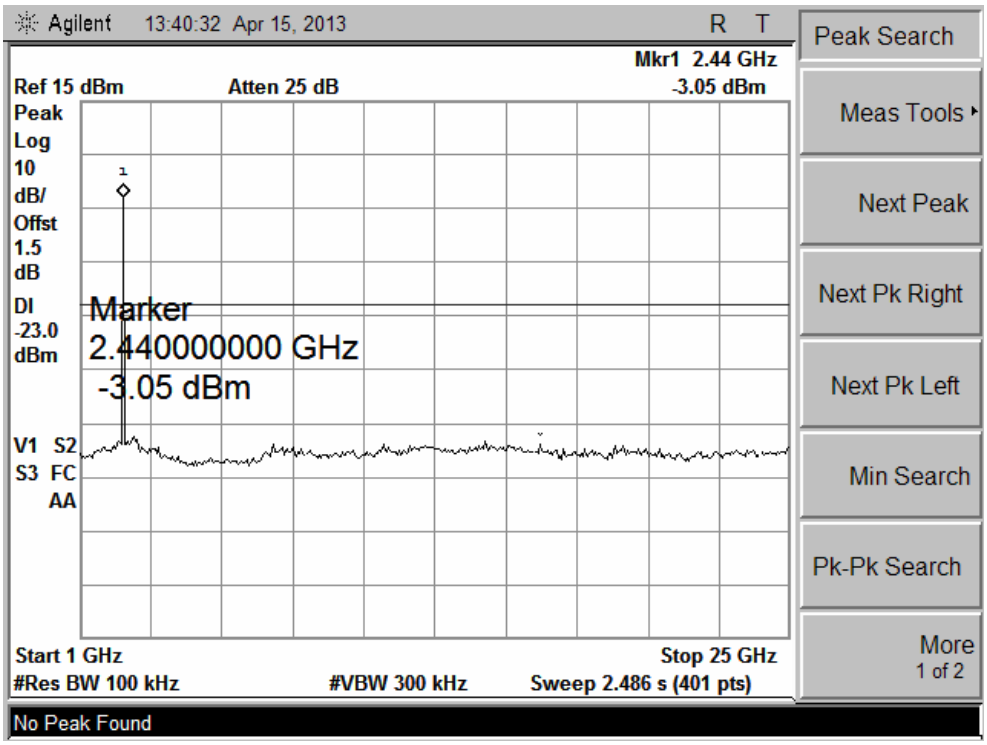
802.11n(HT20) Low Channel



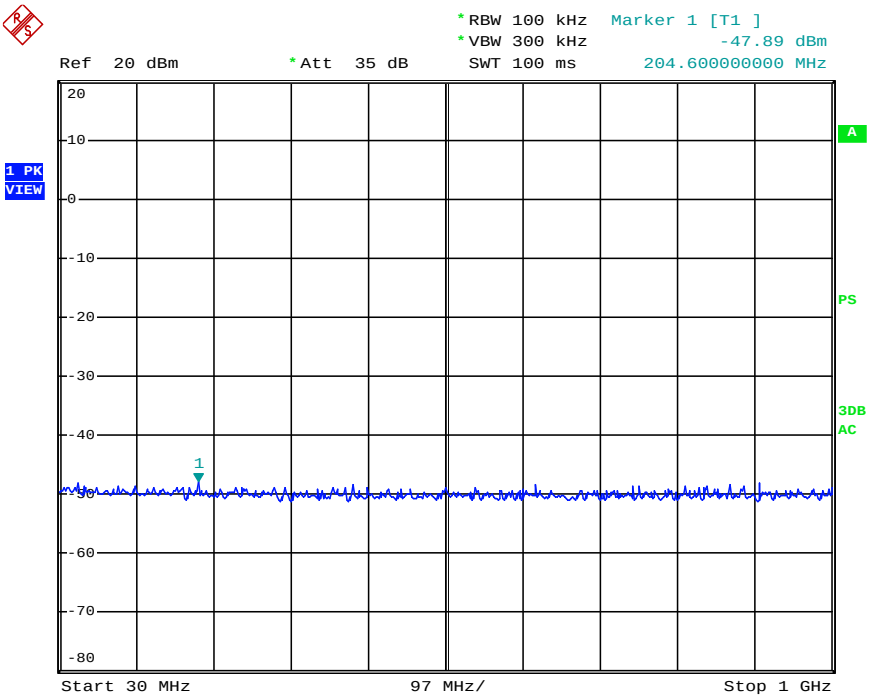


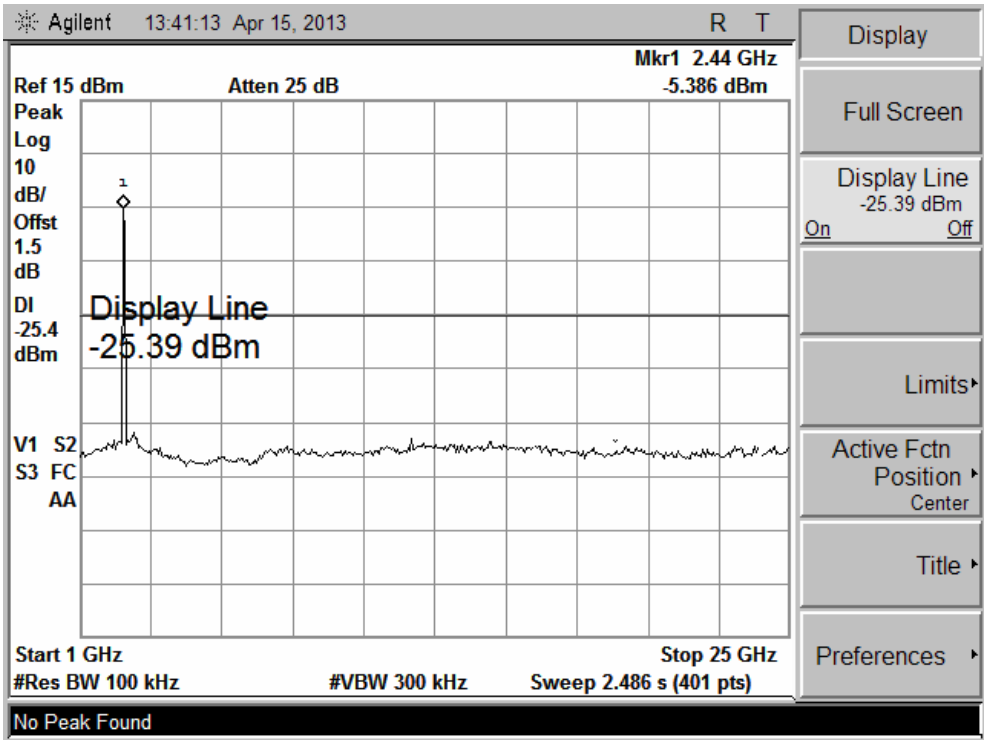
802.11n(HT20) Middle Channel





802.11n(HT20) High Channel

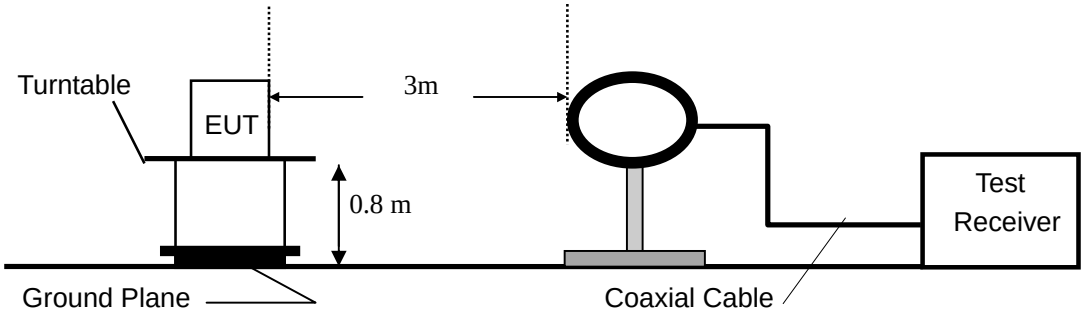


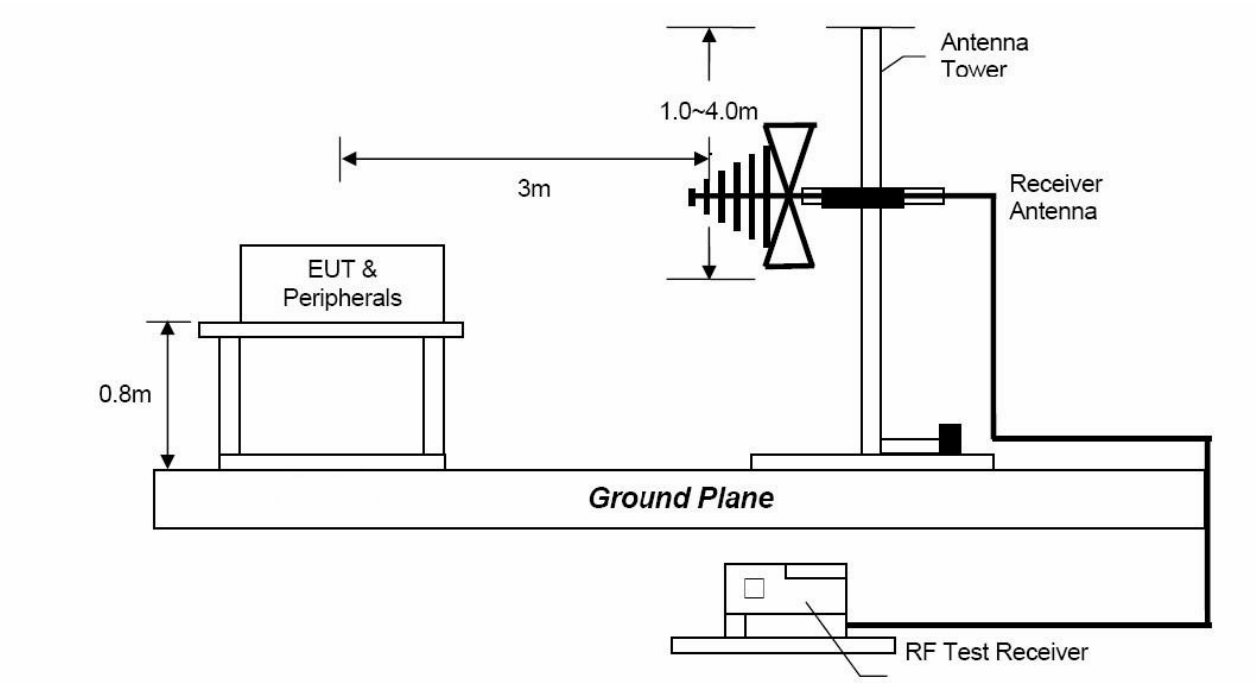


8. Radiated Spurious Emissions and Restricted Bands

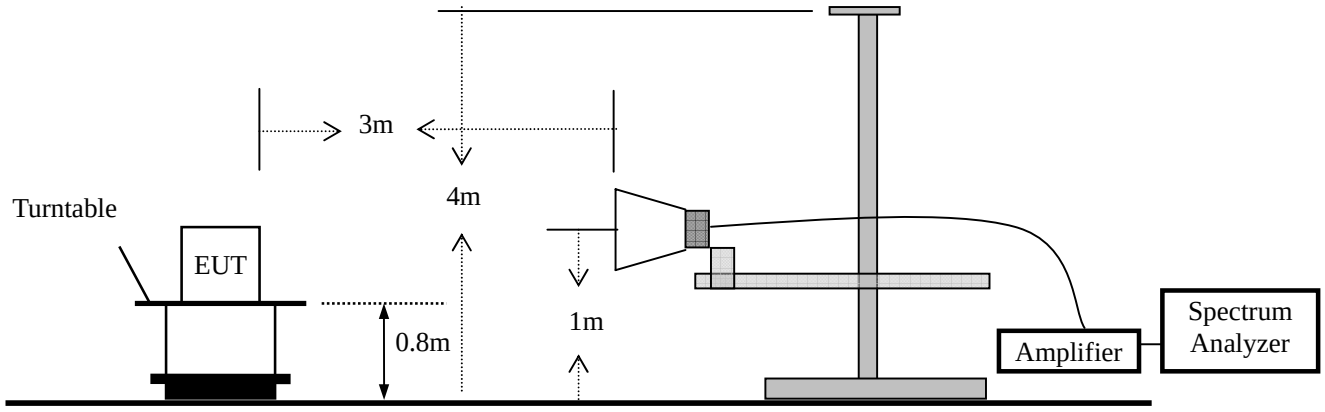
8.1 Test SET-UP (Block Diagram of Configuration)

8.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz





8.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz



8.2 Measurement Procedure

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.

8.3 Limit

Frequency range MHz	Distance Meters	Field Strengths Limt (15.209) μV/m
0.009 ~ 0.490	300	2400/F(kHz)
0.490 ~ 1.705	30	24000/F(kHz)
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

Remark：(1) Emission level (dB)μV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

(4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

(5) §15.247(d) specifies that emissions which fall in the restricted bands, as defined in §15.205 comply with radiated emission limits specified in §15.209.

8.4 Measurement Results

Test Mode:	802.11b(the worst case)		
Frequency Range:	Below 1GHz	Temperature :	23 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think
Test Date :	April 8, 2013		

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
41.6400	V	33.48	40.00	-6.52	QP
101.7800	V	34.13	43.50	-9.37	QP
239.5200	V	26.31	46.00	-19.69	QP
344.2800	V	25.47	46.00	-20.53	QP
575.1400	V	30.58	46.00	-15.42	QP
666.3200	V	32.60	46.00	-13.40	QP
107.6000	H	35.80	43.50	-7.70	QP
241.4600	H	35.13	46.00	-10.87	QP
480.0799	H	31.24	46.00	-14.76	QP
600.3600	H	31.88	46.00	-14.12	QP
666.3200	H	32.38	46.00	-13.62	QP
725.4900	H	32.86	46.00	-13.14	QP

Other emissions are lower than 10dB below the allowable limit.

Note: (1) Quasi-Peak detector is used except for others stated.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB.

Test Mode:	802.11b		
Operation Mode:	TX Mode (Low)	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4824	V	57.61	43.52	74.00	54.00	-16.39	-10.48
7236	V	56.42	42.14	74.00	54.00	-17.58	-11.86
9648	V	56.79	42.51	74.00	54.00	-17.21	-11.49
4824	H	56.93	42.65	74.00	54.00	-17.07	-11.35
7236	H	56.35	41.97	74.00	54.00	-17.65	-12.03
9648	H	57.33	43.18	74.00	54.00	-16.68	-10.82

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Test Mode:	802.11b		
Operation Mode:	TX Mode (Mid)	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4874	V	55.93	41.88	74.00	54.00	-18.07	-12.12
7311	V	56.05	41.79	74.00	54.00	-17.95	-12.21
9748	V	56.86	42.60	74.00	54.00	-17.14	-11.40
4874	H	56.38	42.03	74.00	54.00	-17.62	-11.97
7311	H	56.74	42.45	74.00	54.00	-17.26	-11.55
9748	H	57.64	43.37	74.00	54.00	-16.36	-10.63

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Test Mode:	802.11b		
Operation Mode:	TX Mode (High)	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4924	V	55.49	41.63	74.00	54.00	-18.51	-12.37
7386	V	55.96	42.02	74.00	54.00	-18.04	-11.98
9848	V	56.84	42.49	74.00	54.00	-17.16	-11.51
4924	H	56.46	42.68	74.00	54.00	-17.54	-11.32
7386	H	57.02	42.81	74.00	54.00	-16.98	-11.19
9848	H	57.67	43.22	74.00	54.00	-16.33	-10.78

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Spurious Emission in restricted band:

Test Mode:	802.11b		
Operation Mode:	TX	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2390	V	58.67	43.85	74.00	54.00	-15.33	-10.15
2483.5	V	48.73	35.16	74.00	54.00	-25.27	-18.84
2390	H	57.52	44.08	74.00	54.00	-16.48	-9.92
2483.5	H	49.06	35.97	74.00	54.00	-24.94	-18.03

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Test Mode:	802.11g		
Operation Mode:	TX Mode (Low)	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4824	V	55.92	42.13	74.00	54.00	-18.08	-11.87
7236	V	56.13	42.30	74.00	54.00	-17.87	-11.70
9648	V	56.88	42.51	74.00	54.00	-17.12	-11.49
4824	H	57.05	43.64	74.00	54.00	-16.95	-10.36
7236	H	56.47	42.25	74.00	54.00	-17.53	-11.75
9648	H	57.34	43.78	74.00	54.00	-16.66	-10.22

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Test Mode:	802.11g		
Operation Mode:	TX Mode (Mid)	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4874	V	55.68	42.13	74.00	54.00	-18.32	-10.87
7311	V	56.44	42.07	74.00	54.00	-17.56	-11.93
9748	V	56.75	42.35	74.00	54.00	-17.25	-11.65
4874	H	56.45	42.12	74.00	54.00	-17.55	-11.88
7311	H	56.39	42.01	74.00	54.00	-17.61	-11.99
9748	H	57.11	43.81	74.00	54.00	-16.89	-10.19

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Test Mode:	802.11g		
Operation Mode:	TX Mode (High)	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4924	V	56.12	41.98	74.00	54.00	-17.88	-12.02
7386	V	56.48	42.27	74.00	54.00	-17.52	-11.73
9848	V	56.67	42.39	74.00	54.00	-17.33	-11.61
4924	H	56.39	42.14	74.00	54.00	-17.61	-11.86
7386	H	57.06	42.75	74.00	54.00	-16.94	-11.25
9848	H	57.61	43.43	74.00	54.00	-16.39	-10.57

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Spurious Emission in restricted band:

Test Mode:	802.11g		
Operation Mode:	TX	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2390	V	57.32	43.66	74.00	54.00	-16.68	-10.34
2483.5	V	47.49	34.03	74.00	54.00	-26.51	-19.97
2390	H	56.96	43.14	74.00	54.00	-17.04	-10.86
2483.5	H	48.62	35.78	74.00	54.00	-25.38	-18.22

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Test Mode:	802.11n(HT20)		
Operation Mode:	TX Mode (Low)	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4824	V	56.08	41.65	74.00	54.00	-17.92	-12.35
7236	V	56.47	42.12	74.00	54.00	-17.53	-11.88
9648	V	56.95	43.04	74.00	54.00	-17.05	-10.96
4824	H	56.74	42.43	74.00	54.00	-17.26	-11.57
7236	H	56.63	42.29	74.00	54.00	-17.37	-11.71
9648	H	57.42	43.72	74.00	54.00	-16.58	-10.28

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Test Mode:	802.11n(HT20)		
Operation Mode:	TX Mode (Mid)	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4874	V	55.56	41.68	74.00	54.00	-18.44	-12.32
7311	V	56.09	41.96	74.00	54.00	-17.91	-12.04
9748	V	56.78	42.30	74.00	54.00	-17.22	-11.70
4874	H	56.15	42.11	74.00	54.00	-17.85	-11.89
7311	H	56.62	42.29	74.00	54.00	-17.38	-11.71
9748	H	57.47	43.86	74.00	54.00	-16.53	-10.14

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Test Mode:	802.11n(HT20)		
Operation Mode:	TX Mode (High)	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4924	V	56.01	41.49	74.00	54.00	-17.99	-12.51
7386	V	56.44	42.05	74.00	54.00	-17.56	-11.95
9848	V	57.13	42.93	74.00	54.00	-16.87	-11.07
4924	H	56.40	42.24	74.00	54.00	-17.60	-11.76
7386	H	56.65	42.46	74.00	54.00	-17.35	-11.54
9848	H	57.18	43.60	74.00	54.00	-16.82	-10.40

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

Spurious Emission in restricted band:

Test Mode:	802.11n(HT20)		
Operation Mode:	TX	Test Date :	April 8, 2013
Frequency Range:	Above 1GHz	Temperature :	24 ℃
Test Result:	PASS	Humidity :	54 %
Measured Distance:	3m	Test By:	Think

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2390	V	58.50	44.98	74.00	54.00	-15.50	-9.02
2483.5	V	48.23	35.12	74.00	54.00	-25.77	-18.88
2390	H	56.72	43.10	74.00	54.00	-17.28	-10.90
2483.5	H	48.95	36.04	74.00	54.00	-25.05	-17.96

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) Measurement uncertainty : ±3.7dB

9. Antenna Application

9.1 Antenna requirement

According to of FCC part 15C section 15.203 and 15.240:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
Systems operating in the 2400-2483.5MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

9.2 Measurement Results

The antenna is PIFA antenna that no antenna other than that furnished by the responsible party shall be used with the device, and the best case gain of the antenna is 1.2 dBi. So, the antenna is consider meet the requirement.

10. Test Equipment List

Description	Manfucaturer	Model Number	Serial Number	Calibration Date	Calibration Due Date
Test Receiver	Rohde & Schwarz	ESCI7	100837	Nov. 05, 2012	Nov. 04, 2013
Antenna	Schwarzbeck	VULB9162	9162-010	Nov. 28, 2012	Nov. 27, 2013
Positioning Controller	UC	UC 3000	N/A	N/A	N/A
Color Monitor	SUNSPO	SP-140A	N/A	N/A	N/A
Single Phase Power Line Filter	SAEMC	PF201A-32	110210	N/A	N/A
3 Phase Power Line Filter	SAEMC	PF401A-200	110318	N/A	N/A
DC Power Filter	SAEMC	PF301A-200	110245	N/A	N/A
Cable	Huber+Suhner	CBL2-NN-1M	22320001	Nov. 05, 2012	Nov. 04, 2013
Cable	Huber+Suhner	CIL02	N/A	Nov. 05, 2012	Nov. 04, 2013
Power Amplifier	HP	HP 8447D	1145A00203	Nov. 05, 2012	Nov. 04, 2013
L.I.S.N	Rohde & Schwarz	ENV 216	101317	Nov. 05, 2012	Nov. 04, 2013
Horn Antenna	COM-Power	AH-118	071078	Nov. 17, 2012	Nov. 16, 2013
Horn Antenna	Schwarzbeck	BBHA9170	9170-372	Oct. 24, 2012	Oct. 23, 2013
Loop antenna	Daze	ZA30900A	0708	Oct.16, 2012	Oct.15, 2013
Spectrum Analyzer	Agilent	E4408B	MY41440717	Nov. 05, 2012	Nov 04, 2013
Cable	Schwarzbeck	CIL02	N/A	Nov. 05, 2012	Nov. 04, 2013
Pre-Amplifier	Agilent	8449B	3008A02964	Dec. 19, 2013	Dec. 18, 2013