FCC TEST REPORT

According to

FCC Rules and Regulations Part 15 Subpart C

Applicant	:	ZyXEL Communications Corporation
Address	:	NO.6,Innovation Rd. II Science Based Industrial Park Hsin-Chu,Taiwan
Equipment	:	Dual WAN VDSL2 Gateway with 802.11n; Wireless N VDSL2 4-ports Gateway with USB; Wireless N VDSL2 Gateway with USB
Model No.	:	DSL-491HNU-B1B V2; DSL-401HNU-B1B V2; VMG1312-B10A; P8701T; Basic Home Station VDSL2 P8701T;DSL-401HNU-B1B V3
FCC ID	:	I88VMG1312B10A
Trade Name	:	ZyXEL

- The test result refers exclusively to the test presented test model / sample.,
- Without written approval of ***Cerpass Technology(Suzhou) Corp***. the test report shall not be reproduced except in full.
- The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.
- The test report must not be used by the clients to claim product certification approval by ***NVLAP*** or any agency of the Government.

Contents

History of this test report

■ ORIGINAL.

☐ Additional attachment as following record:

Attachment No.	Issue Date	Description
SEFI1111084	Jan 6,2012	Original
SEFI1309096	Oct 8,2013	First edition(add one product name and model name, update the shell design)

CERTIFICATE OF COMPLIANCE

According to

FCC Rules and Regulations Part 15 Subpart C

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FCC ID	:	I88VMG1312B10A
Trade Name	:	ZyXEL

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4** The equipment was ***passed*** the test performed according to **FCC Rules and Regulations Part 15 Subpart C.**

The test was carried out on Oct 8,2013 at **Cerpass Technology(Suzhou) Corp**.

Signature

Miro Chueh/ Technical director

1. Report of Measurements and Examinations

1.1 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
1.1307 1.1310 2.1091 2.1093	. RF Exposure Compliance	Pass

2. Test Configuration of Equipment under Test

2.1 Manufacturer

Wuxi MitraStar Technology Co.Ltd

Wuxi New District Minshan road 60#-E Jiangsu PRC

2.2 Feature of Equipment under Test

Dual WAN VDSL2 Gateway with 802.11n; Wireless N VDSL2 4-ports Gateway with USB; DSL-401HNU-B1B V2	Model No：	DSL-491HNU-B1B V2; DSL-401HNU-B1B V2;VMG1312-B10A; P8701T; Basic Home Station VDSL2 P8701T; DSL-401HNU-B1B V3
Adapter	Model No.:	DSA-12G-12 FUS 120120
	Input:	100~240V AC 50-60Hz 0.3A
	Output:	12V⎓1.0A
Power supply cable	Non-Shielded, 1.5m	
Remark 1	Their difference is DSL-491HNU-B1B V2 has an internal antenna and an external antenna and a WAN port circuits and It is a white shell; DSL-401HNU-B1B V2, VMG1312-B10A has two internal antennas, there is no WAN port circuit and it is a black shell.	

WLAN	Broadcom/BCM63618
Spreading	802.11b: CCK, DQPSK, DBPSK 802.11g: 64 QAM, 16 QAM, QPSK, BPSK 802.11n: BPSK, QPSK,16-QAM, 64-QAM
Frequency Range	802.11b/g/n(20MHz): 2412-2462MHz 802.11n(40MHz): 2422-2452MHz
Number of Channels	802.11b/g/n (20MHz):11 802.11n (40MHz): 7
Data Rate	802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0~MCS15
Antenna	Antenna 1 Dipole (3.1dBi) Antenna 2 Dipole (3.1dBi) Total gain (3.4 dBi)

Note: for more details, please refer to the User's manual of the EUT.

2.3 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n, HT20

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

802.11n, HT40

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
03	2422	09	2452
04	2427	---	---
05	2432	---	---
06	2437	---	---

2.4 Test Mode and Test Software

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
b. The complete test system included remote workstation and EUT. The remote workstation includes Notebook.
c. An executive program, “PA Test” under WIN XP was executed to transmit and receive data via wireless.
d. The following test mode and test software was performed for conduction and radiation test:

Test mode:

The EUT transmitting and receiving with one (chain 0) antenna working at b mode, so one antenna working configuration was used for b mode testing in this report.

The EUT transmitting and receiving with two antennas simultaneously working at g/N mode (Chain 0+Chain 1). The chip set BCM63618 supports 802.11 b + MIMO 2x2 configuration was finally used in this report.

The worst-case data rates are determined to be as follows for each mode based on investigation by measuring the average power, peak power and PPSD across all data rates, bandwidths, and modulations.

The worst-case data rates:

IEEE802.11b mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 11Mbps data rate were chosen for full testing.

IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 54Mbps data rate were chosen for full testing.

IEEE 802.11gn Standard-20 MHz Channel mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with up 300 Mbps data rate were chosen for full testing.

IEEE 802.11gn Wide-40 MHz Channel mode: Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with up 300 Mbps data rate were chosen for full testing.

Then, the EUT configuration and cable configuration of the above highest emission mode was recorded for all final test items.

2.5 Description of Test System

Device	Manufacturer	Model No.	Description
Remote workstation			
Notebook	ASUS	A8J	Power Cable, Adapter Unshielding 1.8 m

Use Cable:

Cable	Quantity	Description
RJ45	1	Unshielding, 10.0m

2.6 General Information of Test

Test Site:	Cerpass Technology (Suzhou) Co.,Ltd
Test Site Location :	No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China
NVLAP LAB Code :	200814-0
FCC Registration Number :	916572, 331395
IC Registration Number :	7290A-1, 7290A-2
VCCI Registration Number :	T-1945 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test below 1GHz G-227 for Radiated emission test above 1GHz
Frequency Range Investigated:	Conducted: from 150kHz to 30MHz Radiation: from 30MHz to 24620MHz
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.

LABORATORY ACCREDIATION

NVLAP LAB CODE 200814-0

2.7 Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE/NEUTRAL	2.71 dB
Radiated Emission	30 MHz ~ 25GHz	Vertical	4.11 dB
		Horizontal	4.10 dB
6 dB Bandwidth	---	---	7500 Hz
Maximum Peak Output Power	---	---	1.4 dB
100kHz Bandwidth of Frequency Band Edges	---	---	2.2 dB
Power Spectral Density	---	---	1.4 dB

3. Antenna Requirements

3.1 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.

3.2 Antenna Construction and Directional Gain

Antenna 1:
Antenna type: Dipole Antenna
Antenna Gain: 3.1 dBi

Antenna 2:
Antenna type: Diople Antenna
Antenna Gain: 3.1 dBi

Total gain = G_{ANT} + 10 log(N) dBi=3.4 dBi

4. Test of Conducted Emission

4.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

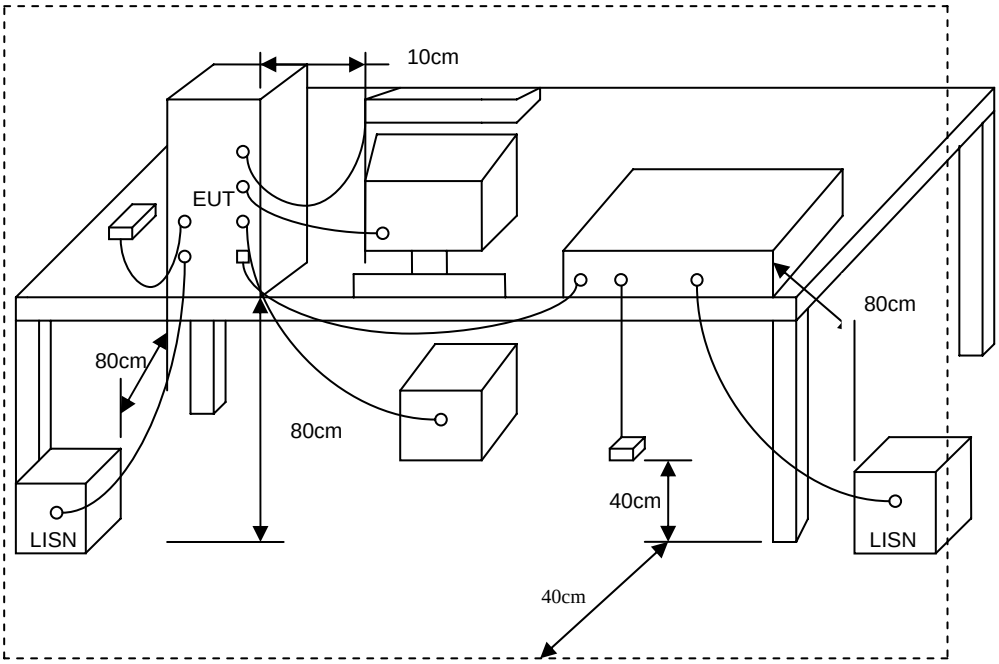
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

4.2 Test Procedures

a. 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.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

4.3 Typical Test Setup

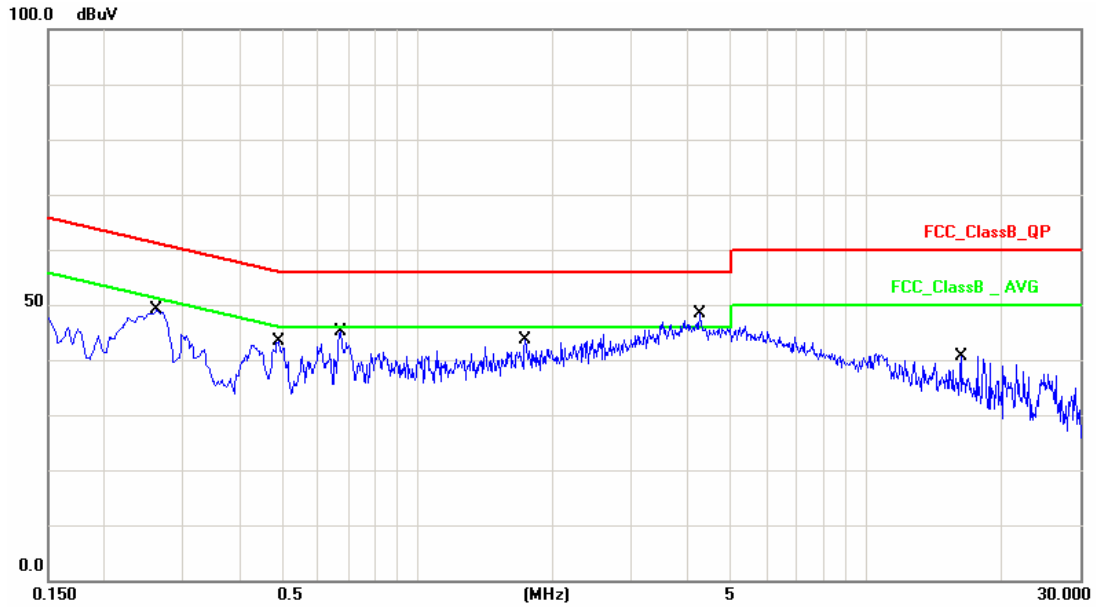


4.4 Measurement equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
Test Receiver	R&S	ESCI	100565	2011.01.15	2012.01.14
AMN	R&S	ESH2-Z5	100182	2011.03.14	2012.03.13
Two-Line V-Network	R&S	ENV216	100325	2011.03.14	2012.03.13
ISN	FCC	FCC-TLISN-T2-02	20379	2011.03.14	2012.03.13
ISN	FCC	FCC-TLISN-T4-02	20380	2011.03.14	2012.03.13
ISN	FCC	FCC-TLISN-T8-02	20381	2011.03.14	2012.03.13
Attenuator	R&S	ESH3-Z2	100529	2011.01.11	2012.01.10
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-004	2011.08.14	2012.08.13

4.5 Test Result and Data

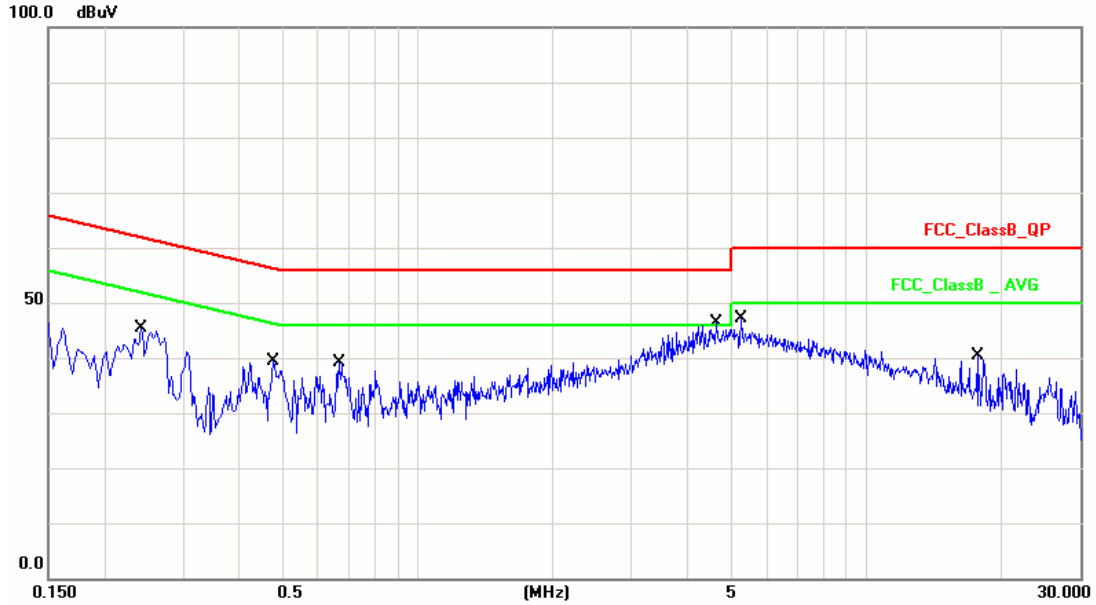
Power	:	AC 230V/50Hz	Pol/Phase	:	LINE
Test Mode 1	:	Normal Operation	Temperature	:	22 °C
Test date	:	2011/12/29	Humidity	:	50 %
Memo	:				



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2620	19.86	27.99	47.85	61.36	-13.51	QP
2	0.2620	19.86	20.47	40.33	51.36	-11.03	AVG
3	0.4900	19.85	20.31	40.16	56.17	-16.01	QP
4	0.4900	19.85	11.43	31.28	46.17	-14.89	AVG
5	0.6740	19.85	21.12	40.97	56.00	-15.03	QP
6	0.6740	19.85	14.01	33.86	46.00	-12.14	AVG
7	1.7380	19.72	17.24	36.96	56.00	-19.04	QP
8	1.7380	19.72	9.70	29.42	46.00	-16.58	AVG
9	4.2500	19.70	21.26	40.96	56.00	-15.04	QP
10	4.2500	19.70	12.88	32.58	46.00	-13.42	AVG
11	16.2300	19.75	18.08	37.83	60.00	-22.17	QP
12	16.2300	19.75	11.69	31.44	50.00	-18.56	AVG

Note: Measurement Level = Reading Level + Correct Factor

Power	:	AC 230V/50Hz	Pol/Phase	:	NEUTRAL
Test Mode 1	:	Normal Operation	Temperature	:	22 °C
Test date	:	2011/12/29	Humidity	:	50 %
Memo	:				



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2420	19.50	21.36	40.86	62.03	-21.17	QP
2	0.2420	19.50	9.96	29.46	52.03	-22.57	AVG
3	0.4780	19.50	14.01	33.51	56.37	-22.86	QP
4	0.4780	19.50	10.68	30.18	46.37	-16.19	AVG
5	0.6700	19.50	15.22	34.72	56.00	-21.28	QP
6	0.6700	19.50	6.26	25.76	46.00	-20.24	AVG
7	4.6460	19.63	18.83	38.46	56.00	-17.54	QP
8	4.6460	19.63	9.11	28.74	46.00	-17.26	AVG
9	5.2700	19.66	18.58	38.24	60.00	-21.76	QP
10	5.2700	19.66	8.59	28.25	50.00	-21.75	AVG
11	17.6940	19.94	16.72	36.66	60.00	-23.34	QP
12	17.6940	19.94	10.21	30.15	50.00	-19.85	AVG

Note: Measurement Level = Reading Level + Correct Factor

5. Test of Radiated Emission

5.1 Test Limit

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2003. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance Meters	Radiated (μ V / M)	Radiated (dB μ V/ M)
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the below table.

Frequency (MHz)	Distance Meters	Radiated (dB μ V/ M)
30-230	10	30
230-1000	10	37

5.2 Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.

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

c. The table was rotated 360 degrees to determine the position of the highest radiation.

d. 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.

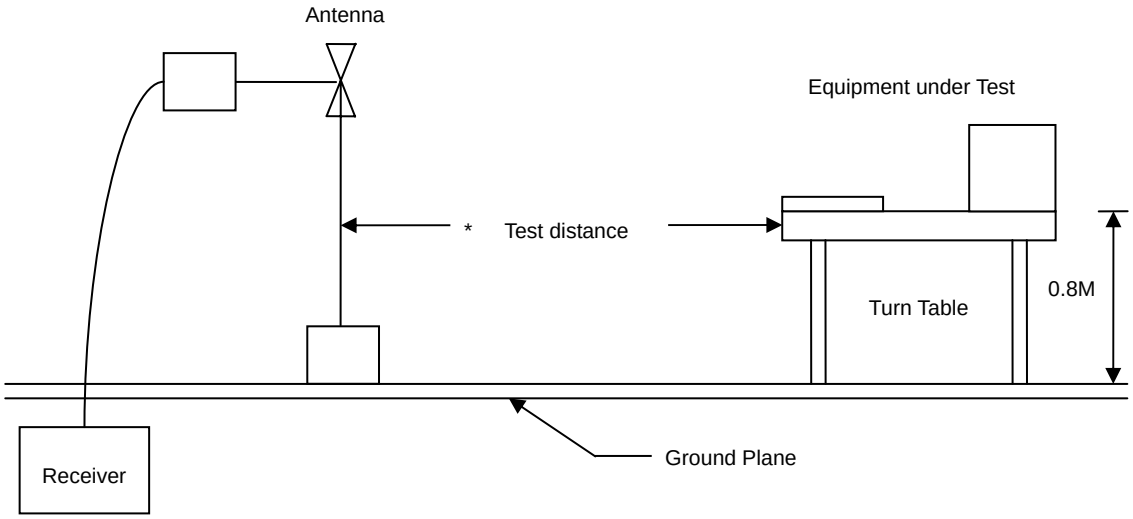
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.

f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 3 dB 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 3 dB margin will be repeated one by one using the quasi-peak method and reported.

h. 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.

5.3 Typical Test Setup



5.4 Measurement equipment

Instrument	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
EMI Test Receiver	ESCI	R&S	101183	2013.05.11	2014.05.10
H64 Amplifier	8447F	HP	3113A05582	2013.08.14	2014.08.13
Preamplifier	8449B	Agilent	3008A02342	2013.02.10	2014.02.09
Ultra Broadband Antenna	HL562	R&S	100363	2013.05.07	2014.05.06
Broad-Band Horn Antenna	BBHA9120D	Schwarzbeck	9120D-619	2013.05.07	2014.05.06
Spectrum Analyzer	FSP40	R&S	100324	2013.08.14	2014.08.13
Temperature/ Humidity Meter	ZC1-11	Zhicheng	CEP-TH-002	2013.08.17	2014.08.16

5.5 Test Result and Data

Under 1G

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: normal link	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant.Pol. H/V	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
33.12	V	43.02	-15.02	28	40.00	-12	Peak
145.82	V	44.84	-16.87	27.97	43.50	-15.53	Peak
239.92	V	45.19	-16.43	28.76	46.00	-17.24	Peak
501.77	V	44.1	-8.91	35.19	46.00	-10.81	Peak
588.91	V	41.95	-5.26	36.69	46.00	-9.31	Peak
628.95	V	45.89	-5.98	39.91	54.00	-14.09	Peak
34.82	H	47.68	-14.64	33.04	40.00	-6.96	Peak
94.81	H	46.19	-17.13	29.06	43.50	-14.44	Peak
147.84	H	42.77	-15.01	27.76	43.50	-15.74	Peak
196.01	H	48.69	-19.22	29.47	43.50	-14.03	Peak
236.85	H	50.29	-17.21	33.08	46.00	-12.92	Peak
641.72	H	35.12	-5.82	29.3	46.00	-16.7	Peak

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Above 1G

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11b (2412MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4824.00	V	43.12	36.92	6.53	49.65	43.45	74.00	54.00	-10.55	average
7230.00	V	35.92	24.19	15.48	51.40	39.67	74.00	54.00	-14.33	average
4824.56	H	43.95	33.89	6.53	50.48	40.42	74.00	54.00	-13.58	average
7233.95	H	35.99	25.01	15.48	51.47	40.49	74.00	54.00	-13.51	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11b (2437MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4872.95	V	46.95	36.09	6.85	53.80	42.94	74.00	54.00	-11.06	average
7315.23	V	41.95	27.67	15.52	57.47	43.19	74.00	54.00	-10.81	average
4874.96	H	45.96	35.06	6.85	52.81	41.91	74.00	54.00	-12.09	average
7312.21	H	38.76	27.67	15.52	54.28	43.19	74.00	54.00	-10.81	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11b (2462MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4926.67	V	47.92	35.88	6.99	54.91	42.87	74.00	54.00	-11.13	average
7380.68	V	37.68	25.91	15.60	53.28	41.51	74.00	54.00	-12.49	average
4925.24	H	45.96	36.29	6.99	52.95	43.28	74.00	54.00	-10.72	average
7384.46	H	34.79	25.86	15.60	50.39	41.46	74.00	54.00	-12.54	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11g (2412MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4824.68	V	45.92	35.92	6.53	52.45	42.45	74.00	54.00	-11.55	average
7230.78	V	40.12	28.58	15.48	55.60	44.06	74.00	54.00	-9.94	average
4825.00	H	45.92	33.29	6.53	52.45	39.82	74.00	54.00	-14.18	average
7234.31	H	37.23	28.68	15.48	52.71	44.16	74.00	54.00	-9.84	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11g (2437MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4875.12	V	44.94	35.86	6.85	51.79	42.71	74.00	54.00	-11.29	average
7315.22	V	36.92	26.45	15.52	52.44	41.97	74.00	54.00	-12.03	average
4874.28	H	44.29	35.86	6.85	51.14	42.71	74.00	54.00	-11.29	average
7315.52	H	34.03	25.45	15.52	49.55	40.97	74.00	54.00	-13.03	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11g (2462MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4924.61	V	46.93	34.23	6.99	53.92	41.22	74.00	54.00	-12.78	average
7385.21	V	36.41	25.45	15.60	52.01	41.05	74.00	54.00	-12.95	average
4924.67	H	44.27	35.84	6.99	51.26	42.83	74.00	54.00	-11.17	average
7385.00	H	35.67	24.92	15.60	51.27	40.52	74.00	54.00	-13.48	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11n (20MHz) (2412MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4826.21	V	46.12	36.78	6.53	52.65	43.31	74.00	54.00	-10.69	average
7234.56	V	38.67	27.67	15.48	54.15	43.15	74.00	54.00	-10.85	average
4824.78	H	47.41	35.93	6.53	53.94	42.46	74.00	54.00	-11.54	average
7234.96	H	36.56	26.87	15.48	52.04	42.35	74.00	54.00	-11.65	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11n (20MHz) (2437MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4875.61	V	47.35	36.39	6.85	54.20	43.24	74.00	54.00	-10.76	average
7313.46	V	37.67	25.80	15.52	53.19	41.32	74.00	54.00	-12.68	average
4876.81	H	46.78	35.78	6.85	53.63	42.63	74.00	54.00	-11.37	average
7314.57	H	35.78	25.67	15.52	51.30	41.19	74.00	54.00	-12.81	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11n (20MHz) (2462MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4925.67	V	45.72	36.56	6.99	52.71	43.55	74.00	54.00	-10.45	average
7385.24	V	38.56	27.56	15.61	54.17	43.17	74.00	54.00	-10.83	average
4924.56	H	45.78	35.75	6.99	52.77	42.74	74.00	54.00	-11.26	average
7384.78	H	36.57	26.56	15.61	52.18	42.17	74.00	54.00	-11.83	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11n (40MHz) (2422MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4844.58	V	46.78	36.21	6.61	53.39	42.82	74.00	54.00	-11.18	average
7265.35	V	36.21	25.81	15.50	51.71	41.31	74.00	54.00	-12.69	average
4844.78	H	44.21	35.67	6.61	50.82	42.28	74.00	54.00	-11.72	average
7264.77	H	36.79	26.78	15.50	52.29	42.28	74.00	54.00	-11.72	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11n (40MHz) (2437MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4874.56	V	44.56	36.78	6.85	51.41	43.63	74.00	54.00	-10.37	average
7313.56	V	39.56	26.55	15.52	55.08	42.07	74.00	54.00	-11.93	average
4875.87	H	44.56	34.91	6.85	51.41	41.76	74.00	54.00	-12.24	average
7313.45	H	35.82	25.56	15.52	51.34	41.08	74.00	54.00	-12.92	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

Site : EMC Lab AC 102	**Time : 2013/10/8**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Test mode: Transmit by 802.11n (20MHz) (2452MHz)	**Probe : VERTICAL/ HORIZONTAL**
Power : AC 120V/60Hz	

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
4905.24	V	45.67	36.92	6.92	52.59	43.84	74.00	54.00	-10.16	average
7355.67	V	36.87	27.67	15.57	52.44	43.24	74.00	54.00	-10.76	average
7355.67	H	35.82	26.81	15.57	51.39	42.38	74.00	54.00	-11.62	average
7355.67	H	35.82	26.81	15.57	51.39	42.38	74.00	54.00	-11.62	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

6. 6dB Bandwidth Measurement Data

6.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

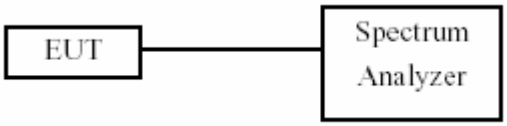
6.2 Test Procedures

a. The transmitter output was connected to the spectrum analyzer.

b. Set RBW of spectrum analyzer to 100 KHz and VBW to 100 KHz.

c. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

6.3 Test Setup Layout



6.4 Measurement equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	100324	2011.08.14	2012.08.13

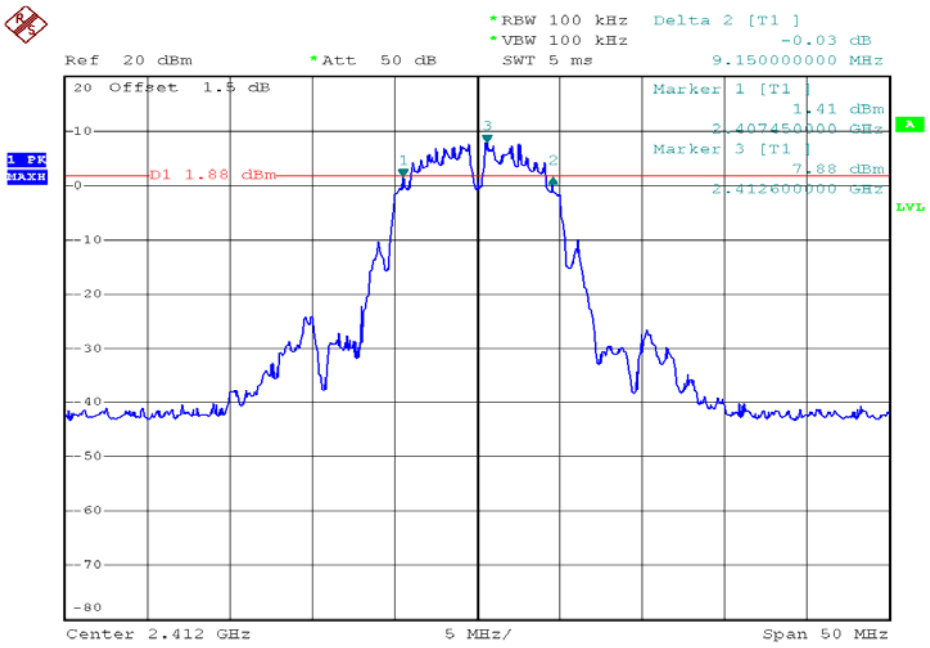
6.5 Test Result and Data

Test Date: Dec 29,2011 Temperature: 25℃

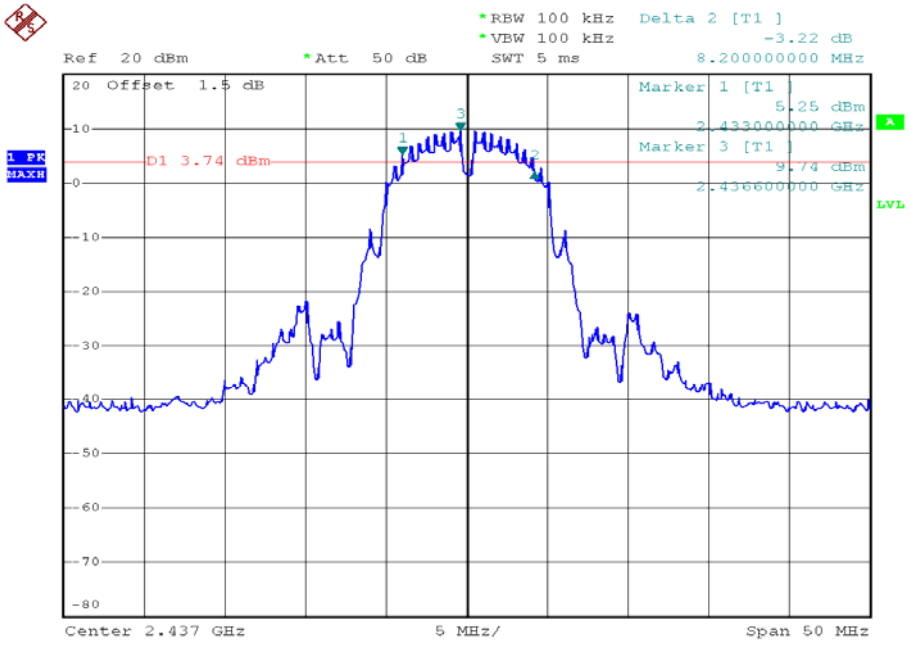
Atmospheric pressure: 1020 hPa Humidity: 46%

Modulation Standard	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	
			Chain 0	Chain 1
802.11b (11Mbps)	01	2412	9.15	N/A
	06	2437	8.20	N/A
	11	2462	8.20	N/A
802.11g (54Mbps)	01	2412	16.5	N/A
	06	2437	16.0	N/A
	11	2462	16.2	N/A
802.11n HT20 (130Mbps)	01	2412	15.2	15.2
	06	2437	15.2	17.2
	11	2462	16.2	15.2
802.11n HT40 (270Mbps)	03	2422	36.4	36.2
	06	2437	36.4	36.4
	09	2452	36.0	36.0

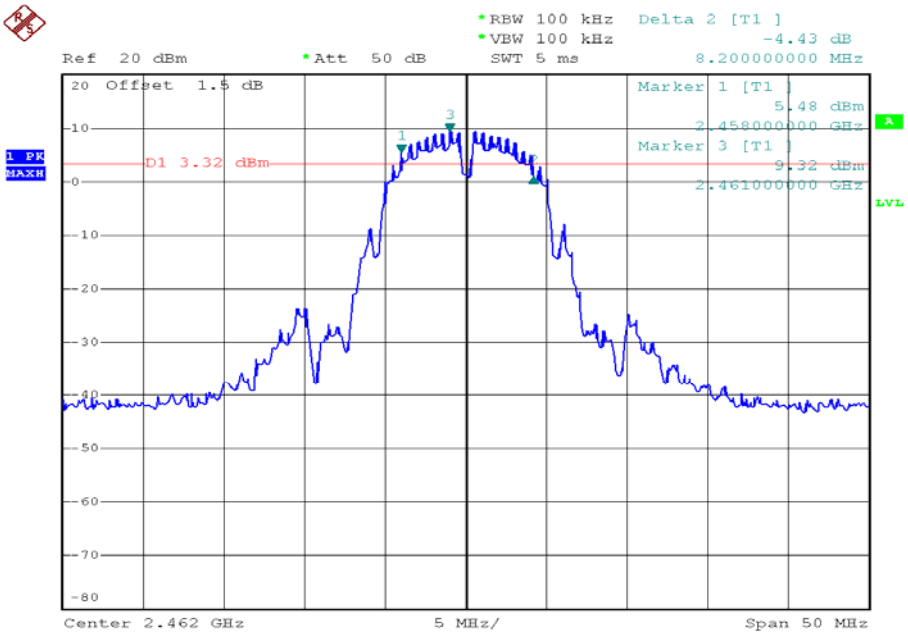
Modulation Standard: 802.11b (11Mbps)
Channel: 01



Modulation Standard: 802.11b (11Mbps),
Channel: 06

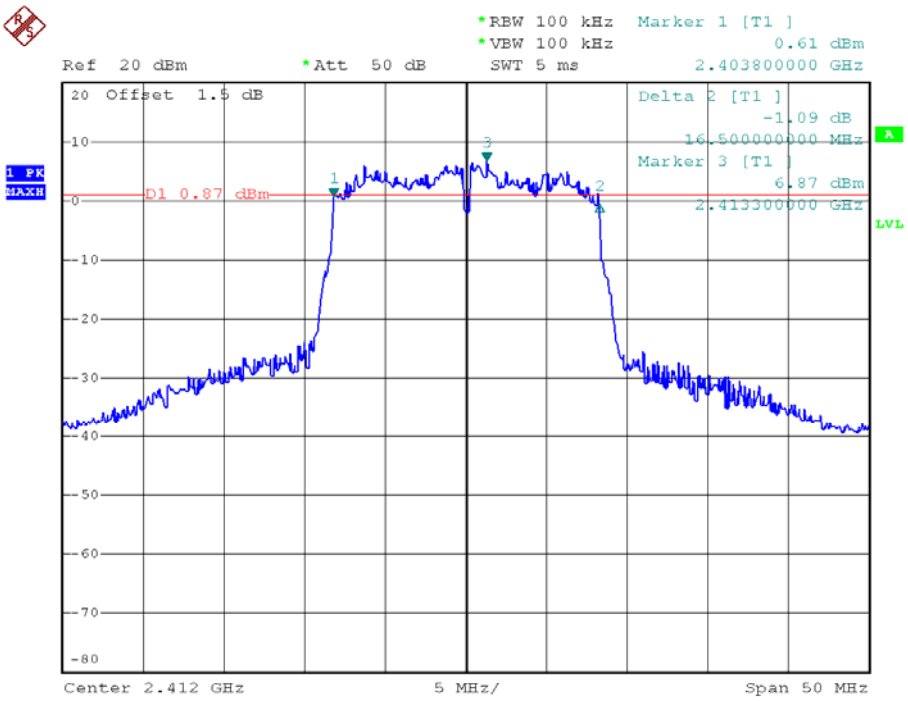


Modulation Standard: 802.11b (11Mbps)
Channel: 11



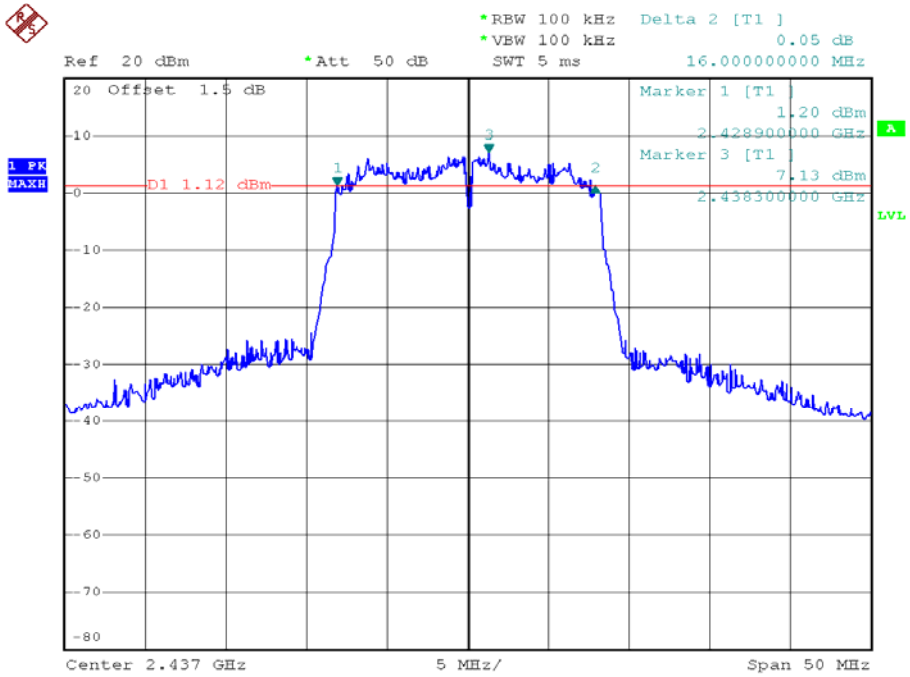
Date: 29.DEC.2011 14:48:24

Modulation Standard: 802.11g (54Mbps),
Channel: 01



Date: 29.DEC.2011 14:50:43

Modulation Standard: 802.11g (54Mbps)
Channel: 06



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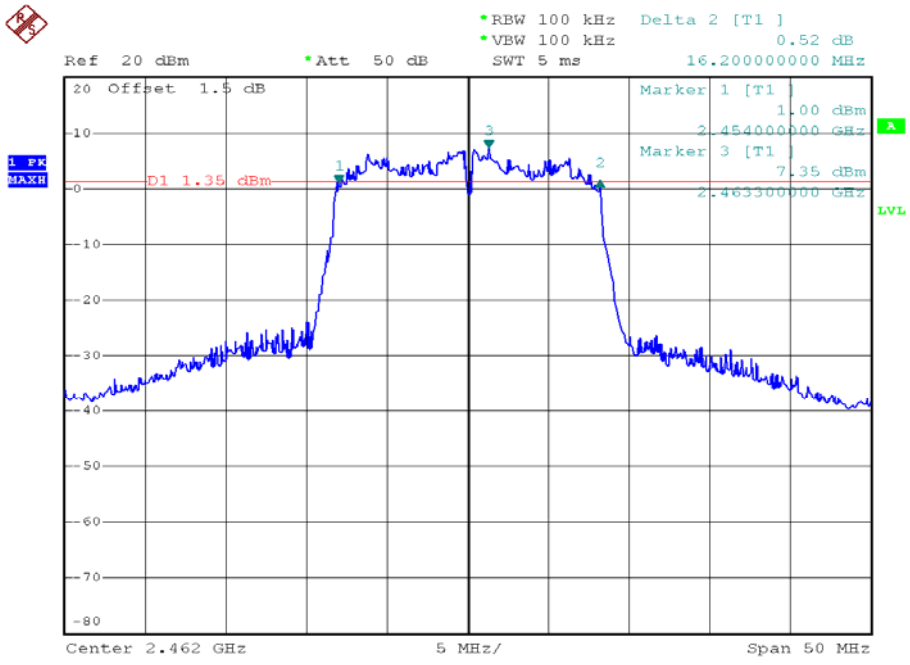
Modulation Standard: 802.11g (54Mbps), CHAIN 0
Channel: 11



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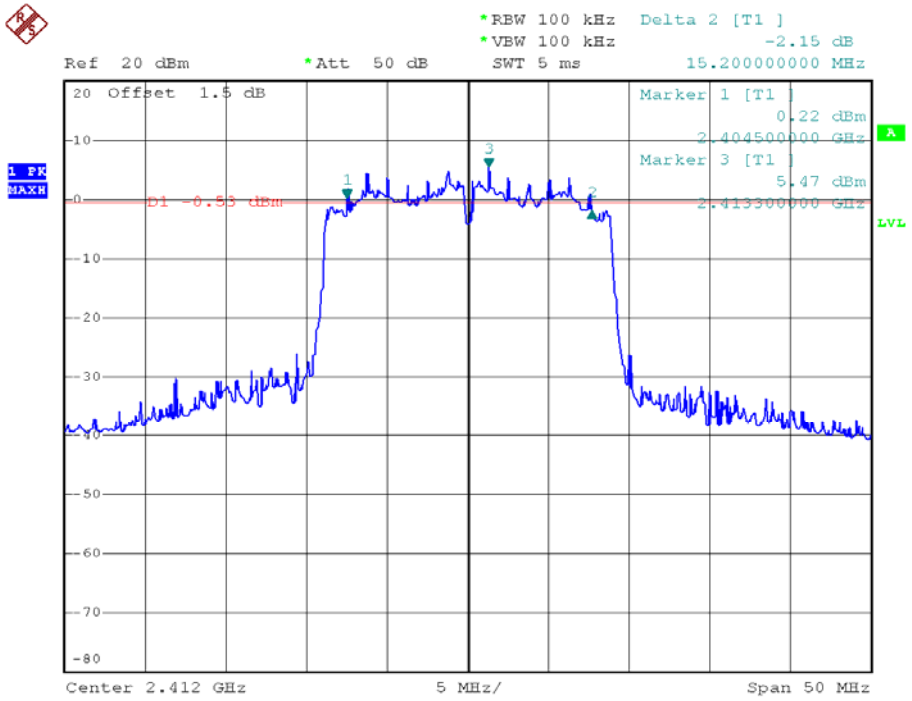
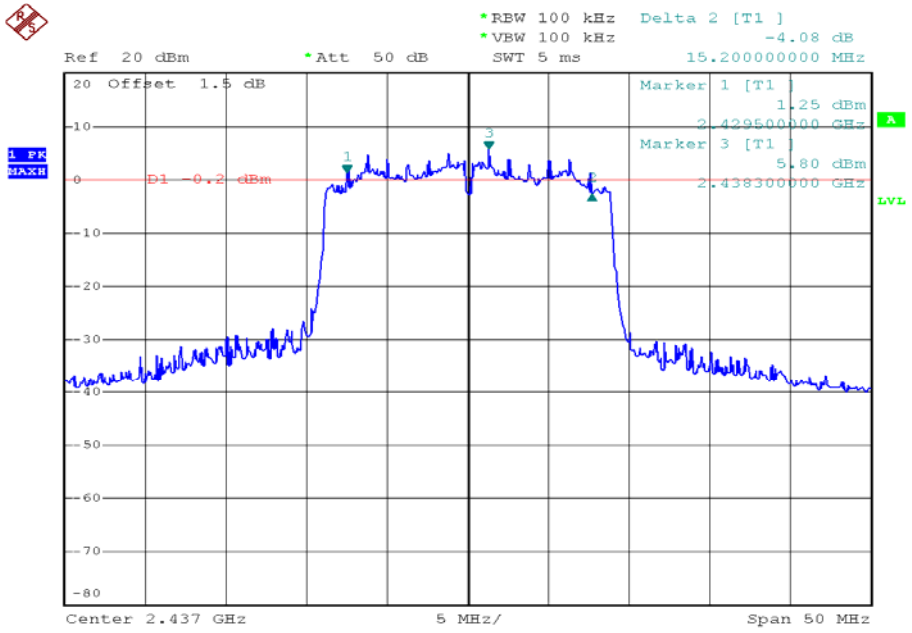
Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 01



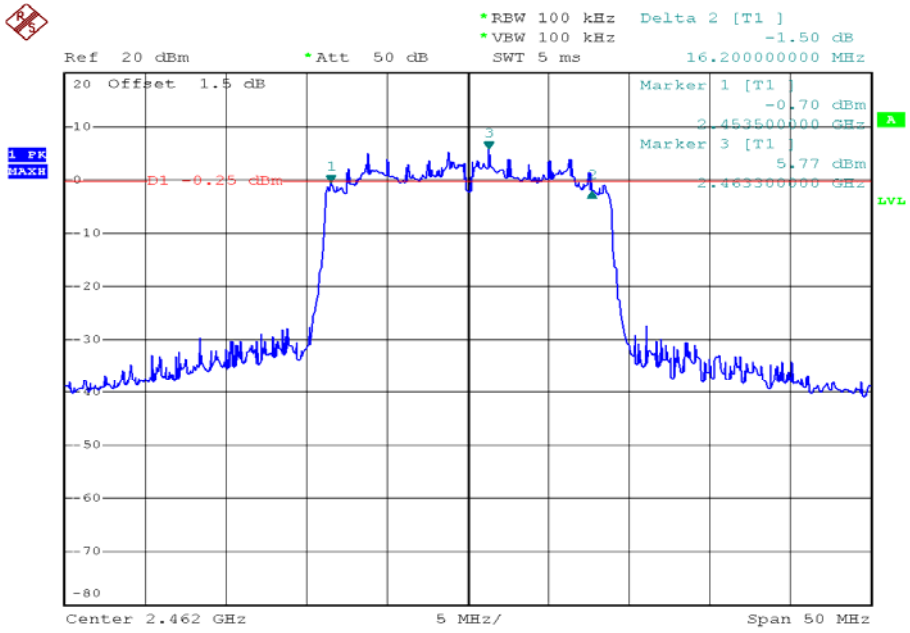
Date: 29.DEC.2011 14:58:43

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 06



Date: 29.DEC.2011 15:00:46

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 11



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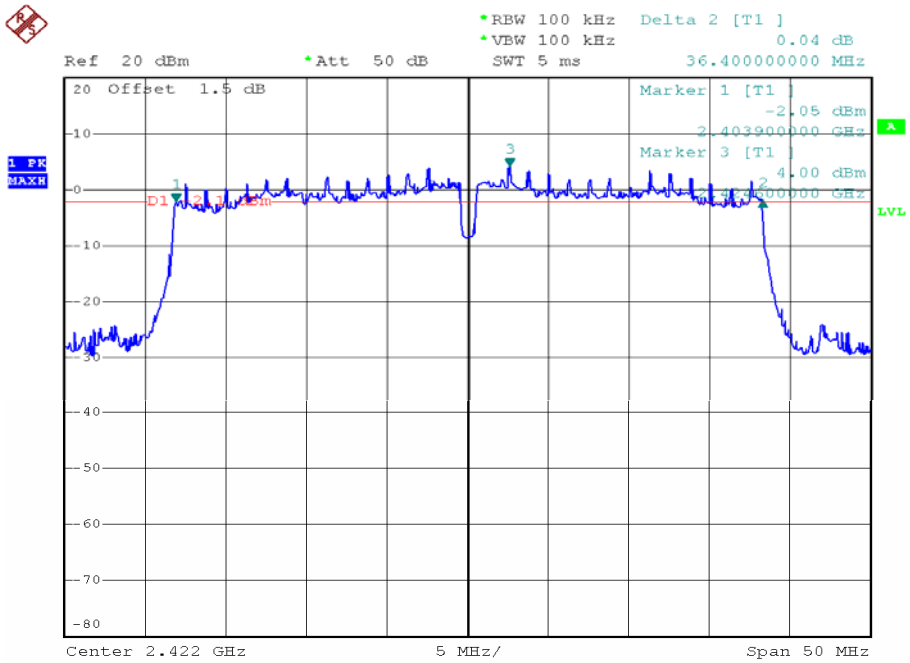
Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0
Channel: 03



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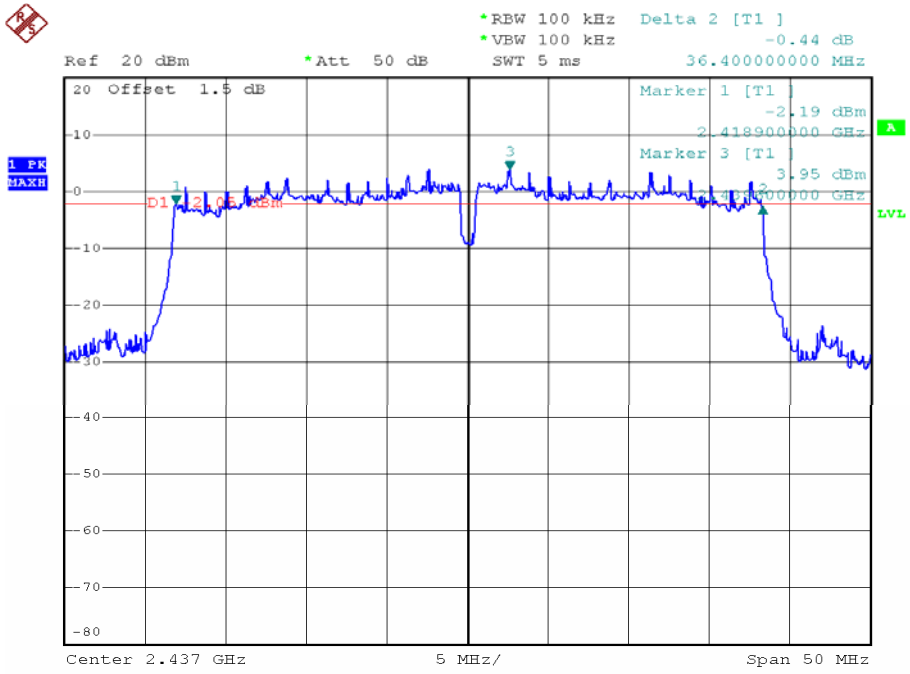
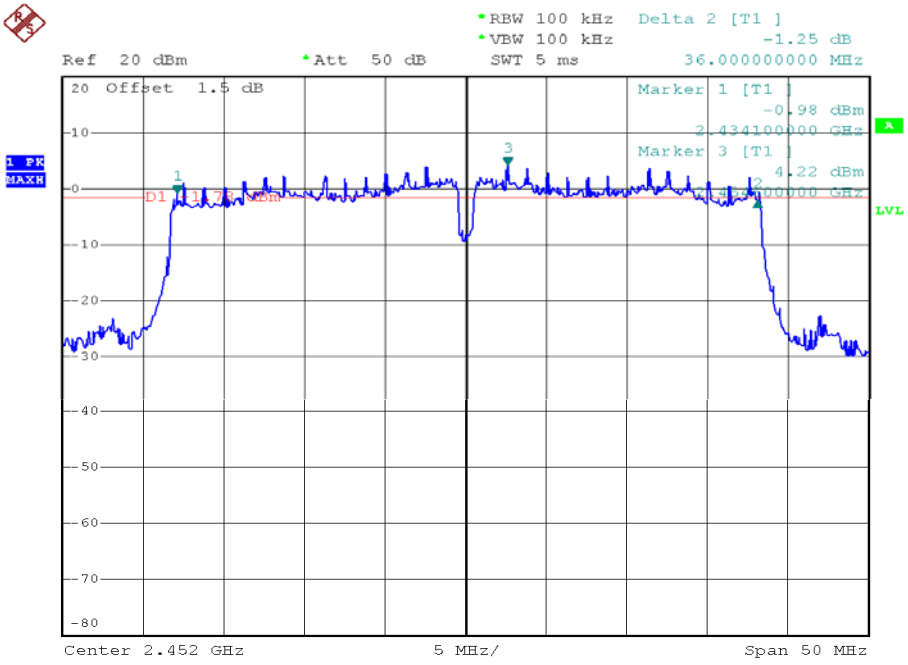
Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0
Channel: 06



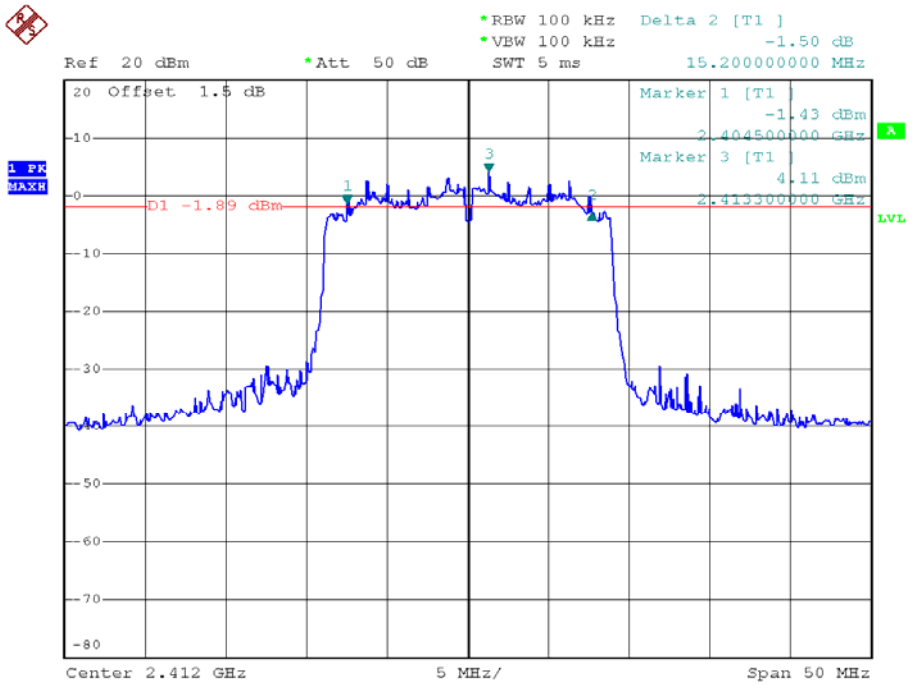
Date: 29.DEC.2011 15:18:04

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0
Channel: 09



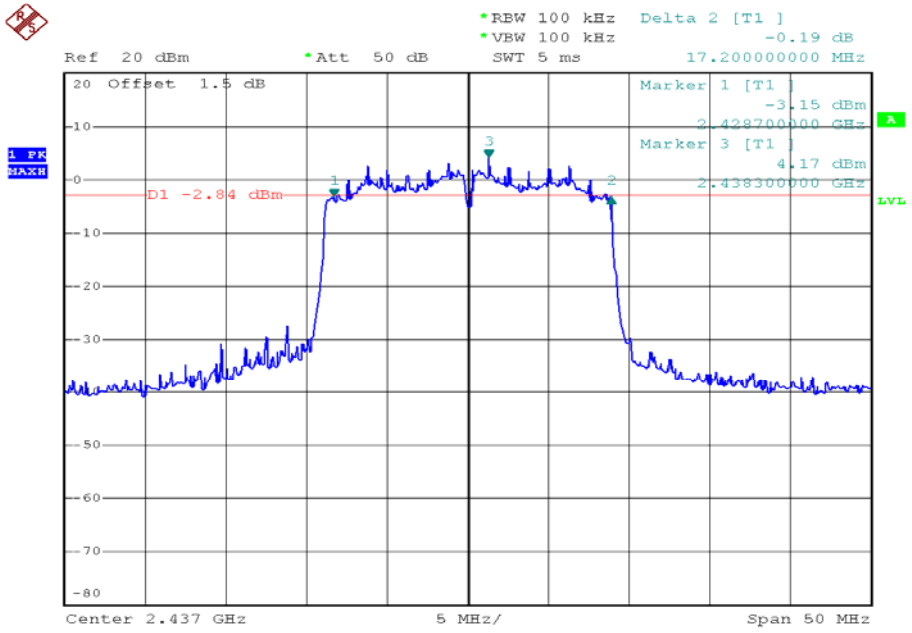
Date: 29.DEC.2011 15:16:33

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 01



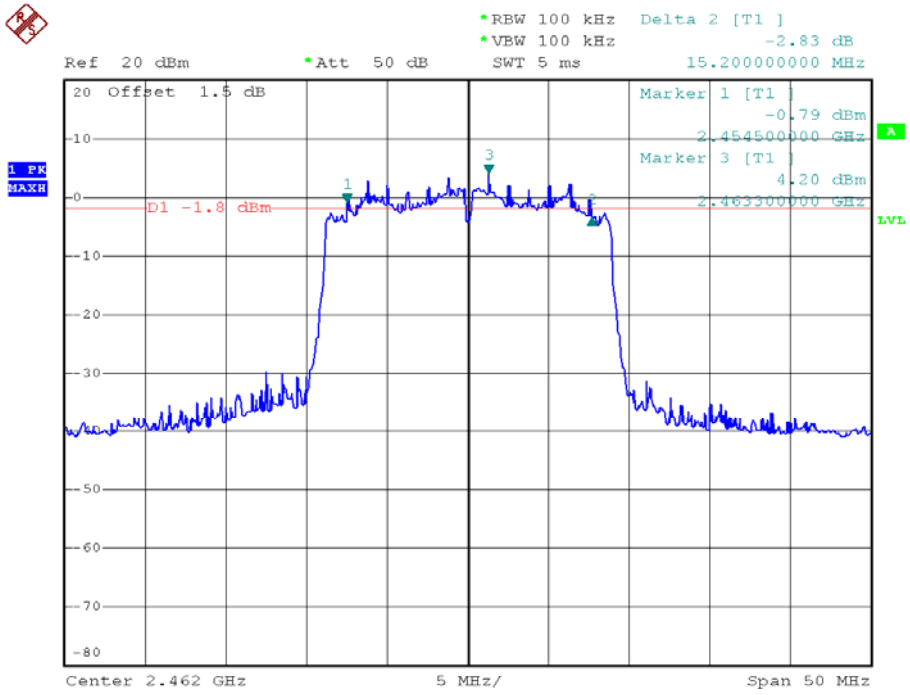
Date: 29.DEC.2011 15:09:29

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 06



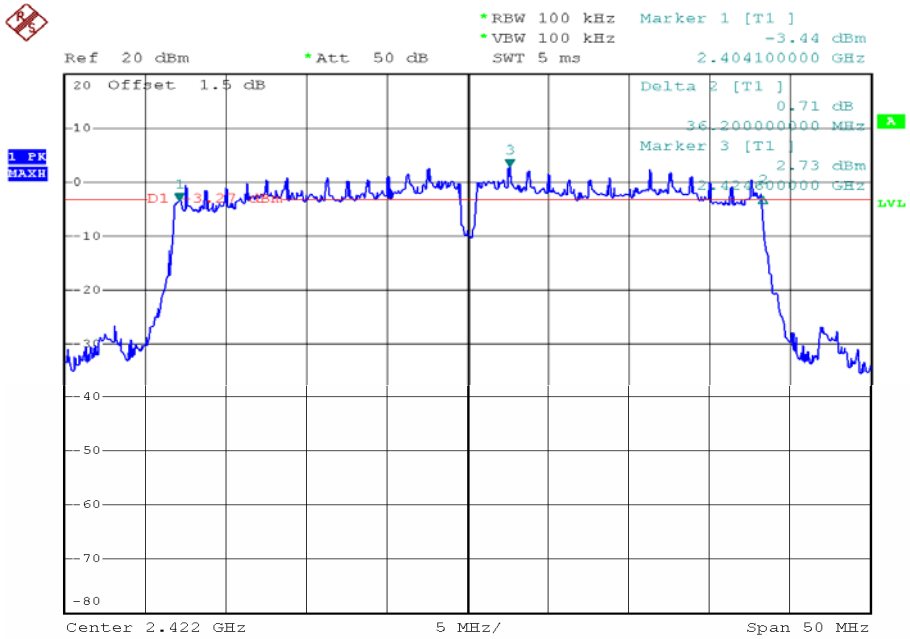
Date: 29.DEC.2011 15:05:20

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 11



Date: 29.DEC.2011 15:04:01

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 03



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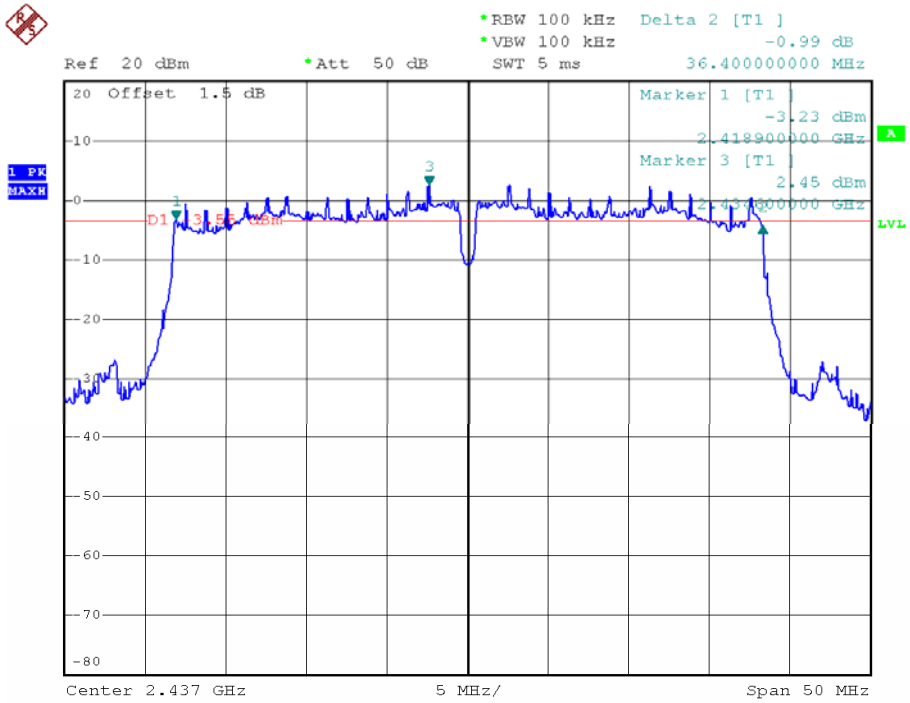
Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 06



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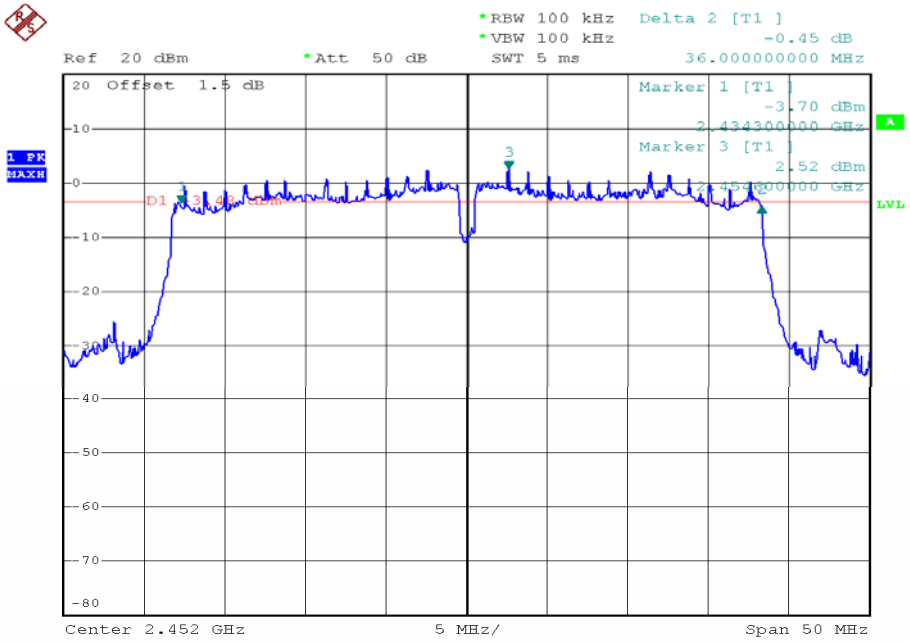
Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 09



Date: 29.DEC.2011 15:14:52

7. Maximum Peak Output Power

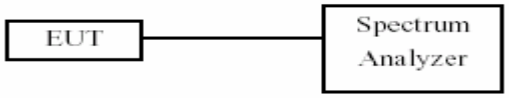
7.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

7.2 Test Procedures

The antenna port（RF output）of the EUT was connected to the input（RF input）of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

7.3 Test Setup Layout



7.4 Measurement equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	100324	2011.08.14	2012.08.13

7.5 Test Result and Data

Test Date: Dec 29,2011 Temperature: 25℃

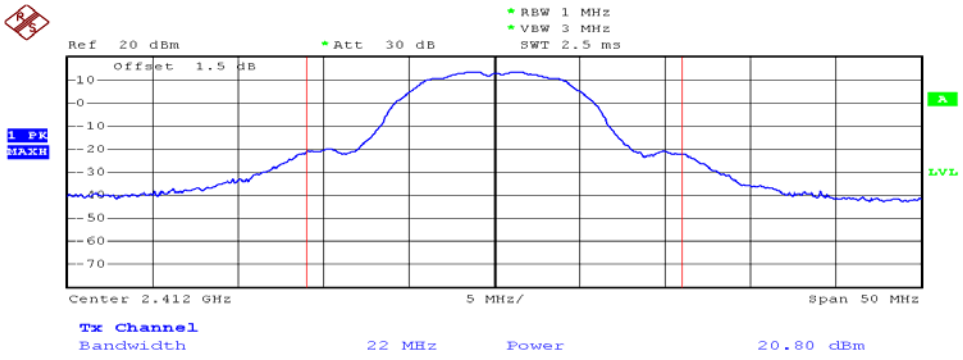
Atmospheric pressure: 1020 hPa Humidity: 46%

Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
802.11b (11Mbps)	01	2412	20.80	120.23
	06	2437	21.04	127.06
	11	2462	21.21	132.13
802.11g (54Mbps)	01	2412	21.70	147.91
	06	2437	21.91	155.24
	11	2462	22.12	162.93

Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)			Peak Power Output (mW)
			CHAIN 0	CHAIN 1	CHAIN 0+CHAIN 1	CHAIN 0+CHAIN 1
802.11n HT20 (130Mbps)	01	2412	20.74	19.08	23.00	199.53
	06	2437	20.56	19.27	22.97	198.15
	11	2462	20.49	19.62	23.09	203.70
802.11n HT40 (270Mbps)	03	2422	22.04	20.80	24.47	279.90
	06	2437	22.21	21.01	24.66	292.42
	09	2452	22.40	21.20	24.85	305.49

Note: Peak Power Output(CHAIN 0+CHAIN 1) =10*LOG10(10^(Chain 0/10)+10^(Chain 1/10))

Modulation Standard: 802.11b (11Mbps)
Channel: 01



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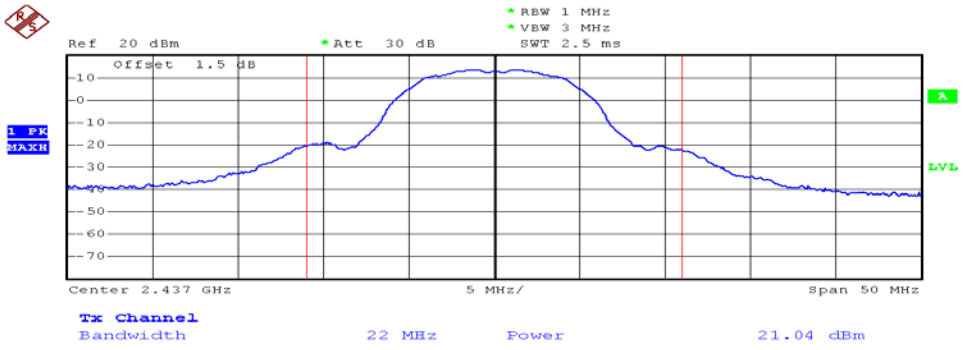
Modulation Standard: 802.11b (11Mbps)
Channel: 06



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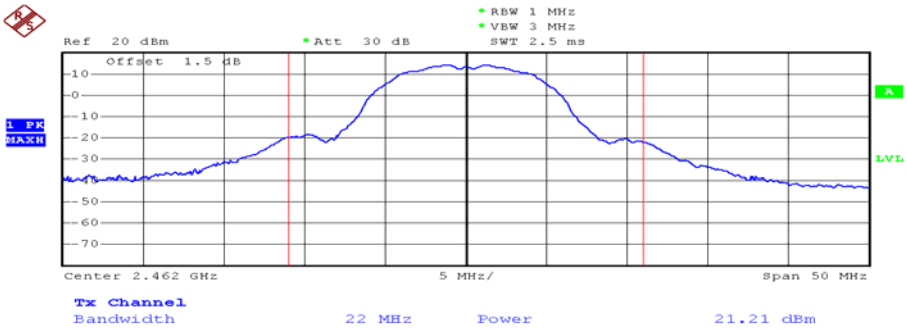
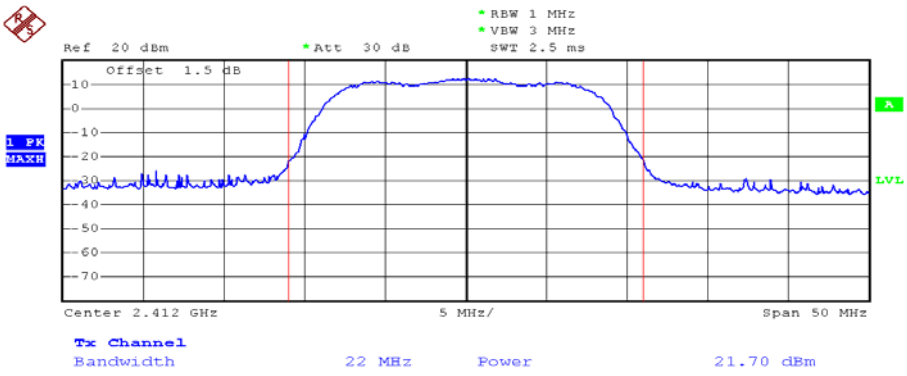
Modulation Standard: 802.11b (11Mbps)
Channel: 11



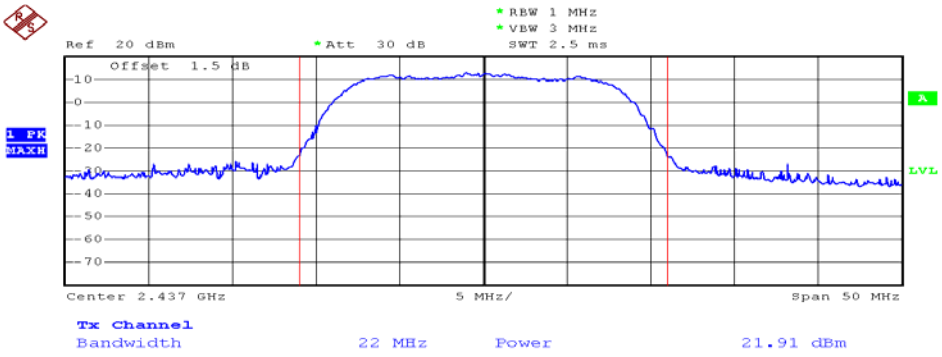
Date: 29.DEC.2011 10:38:27

Modulation Standard: 802.11g (54Mbps)
Channel: 01



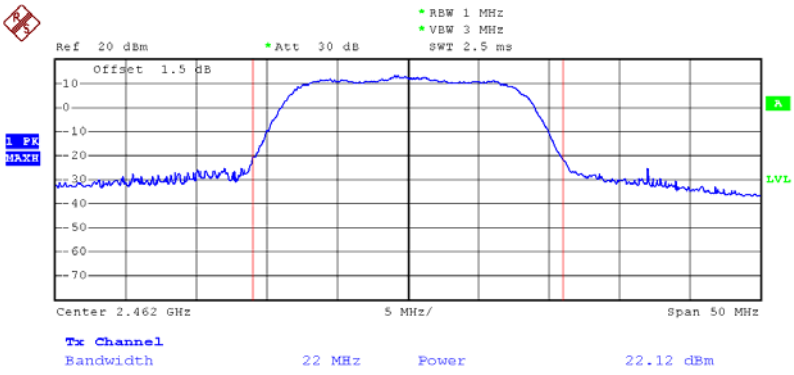
Date: 29.DEC.2011 10:42:04

Modulation Standard: 802.11g (54Mbps)
Channel: 06



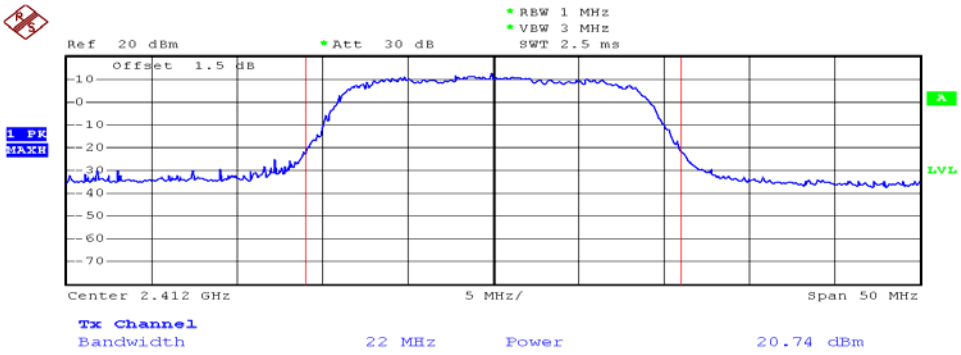
Date: 29.DEC.2011 10:43:12

Modulation Standard: 802.11g (54Mbps)
Channel: 11



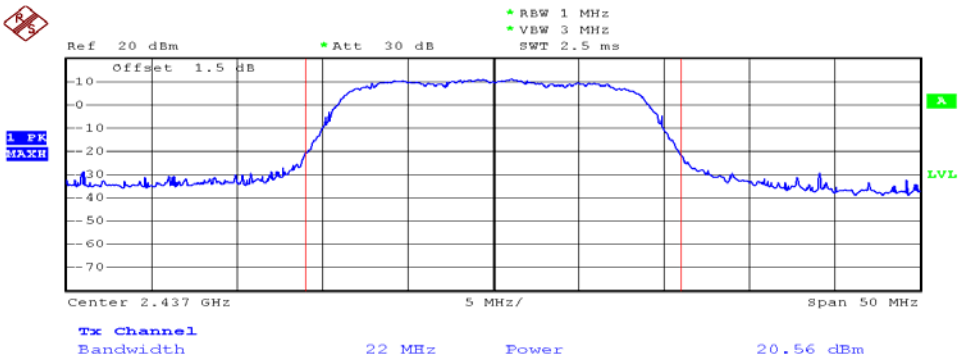
Date: 29.DEC.2011 10:44:20

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 01



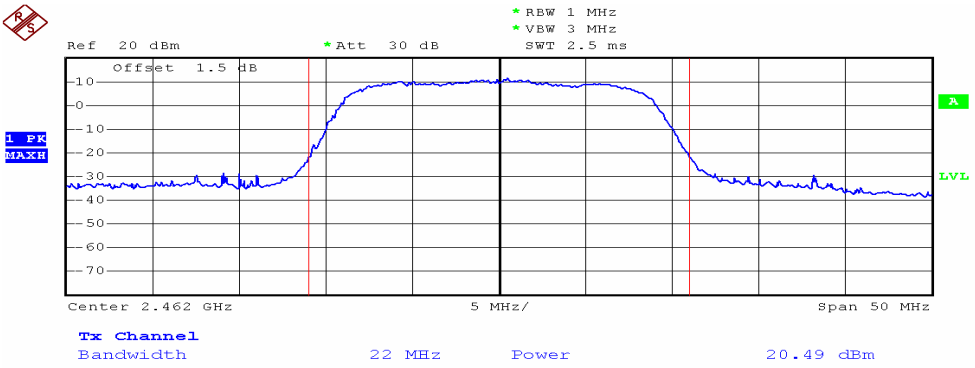
Date: 29.DEC.2011 10:47:10

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 06



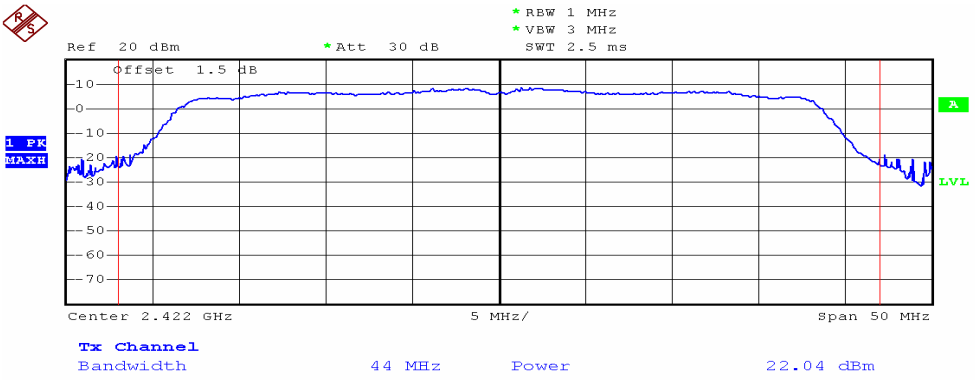
Date: 29.DEC.2011 10:48:36

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 11



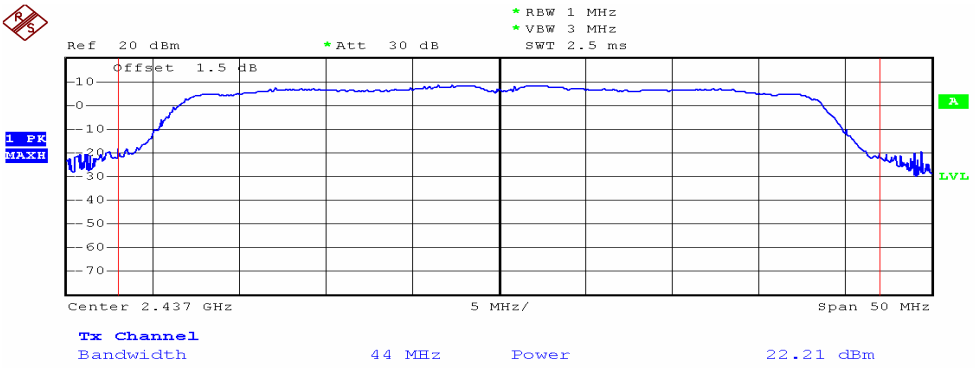
Date: 29.DEC.2011 10:50:48

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0



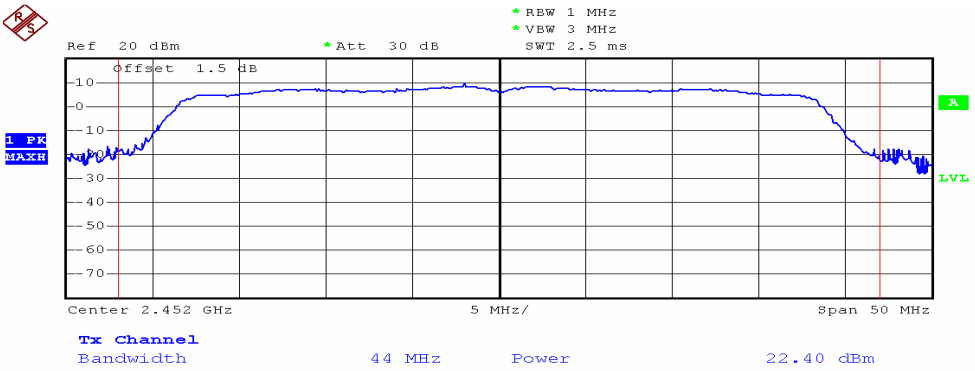
Date: 29.DEC.2011 10:53:09

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0
Channel: 06



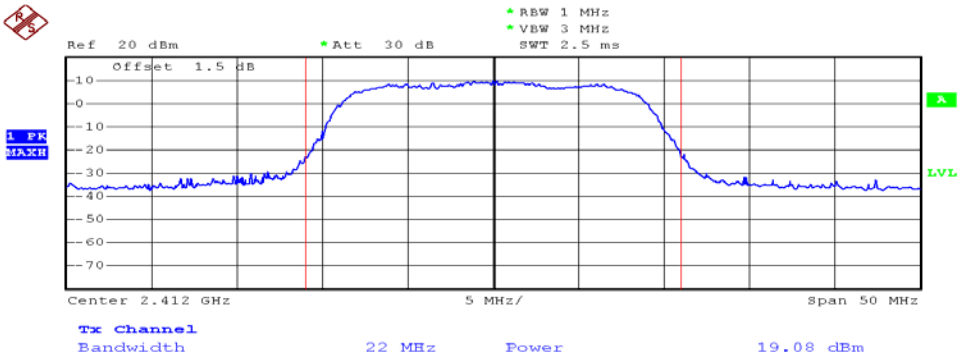
Date: 29.DEC.2011 10:54:10

Modulation Standard: 802.11n HT40 (270Mbps),CHAIN 0
Channel: 09



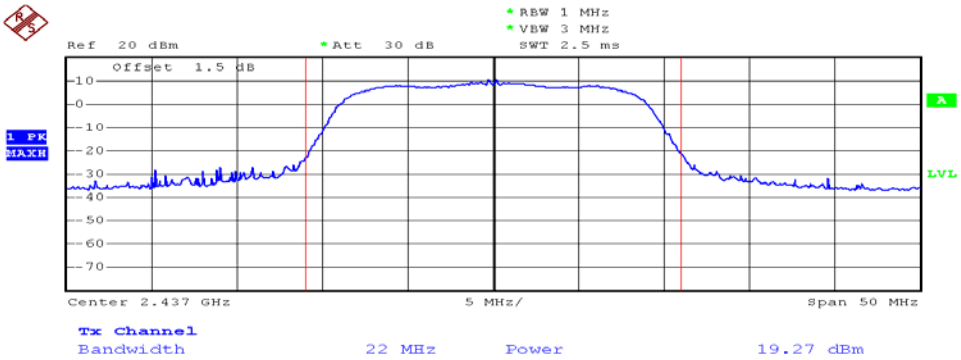
Date: 29.DEC.2011 10:55:08

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 01



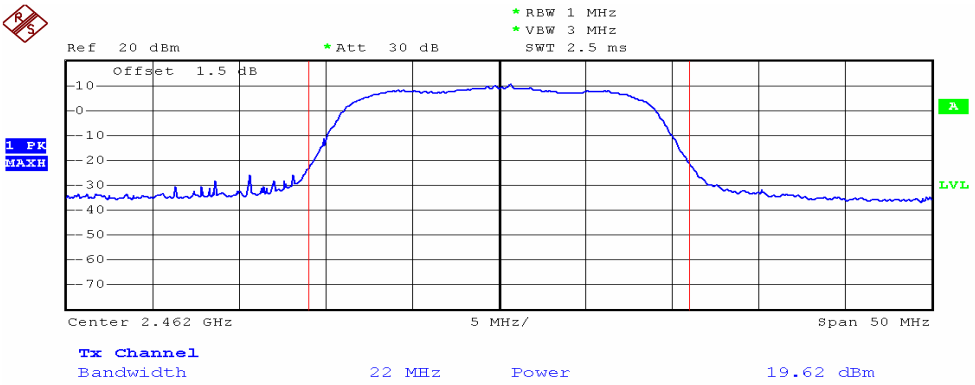
Date: 29.DEC.2011 11:03:11

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 06



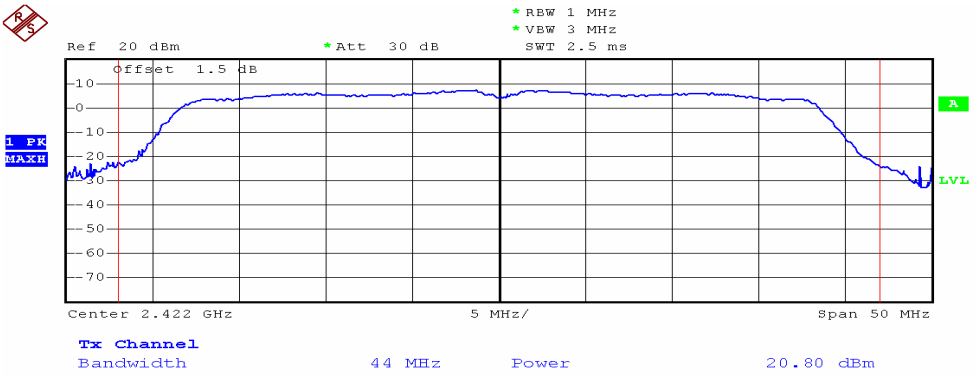
Date: 29.DEC.2011 11:04:28

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 11



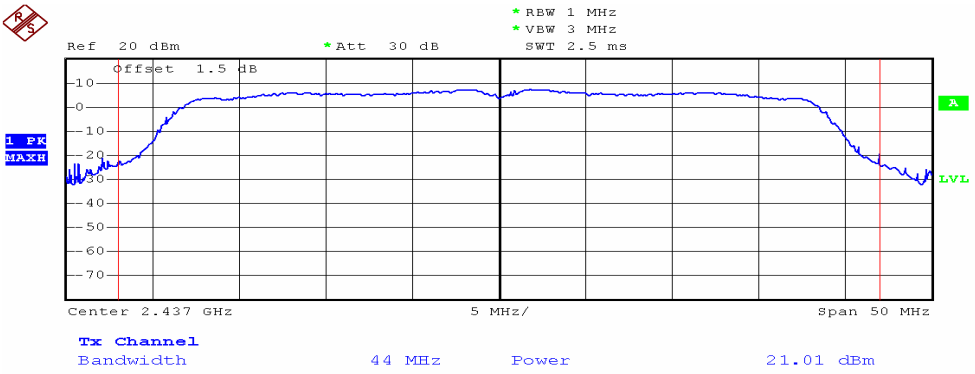
Date: 29.DEC.2011 11:05:42

Modulation Standard: 802.11n HT40 (270Mbps),CHAIN 1
Channel: 03



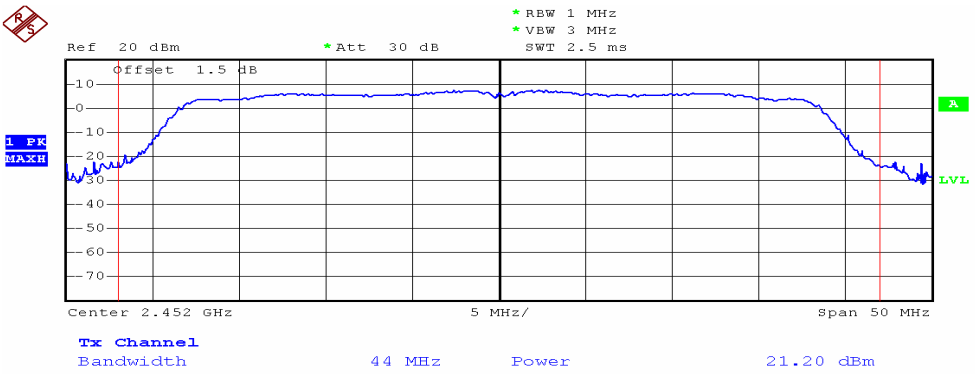
Date: 29.DEC.2011 10:57:09

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 06



Date: 29.DEC.2011 10:59:29

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 09



Date: 29.DEC.2011 11:00:50

8. Band Edges Measurement

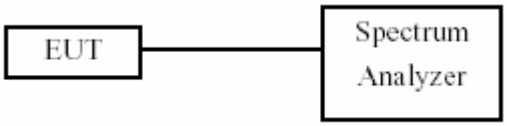
8.1 Test Limit

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

8.2 Test Procedure

a. The transmitter output was connected to the spectrum analyzer via a low lose cable.
b. Set both RBW and VBW of spectrum analyzer to 100 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
c. The band edges was measured and recorded.

8.3 Test Setup Layout



8.4 Measurement equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	100324	2011.08.14	2012.08.13

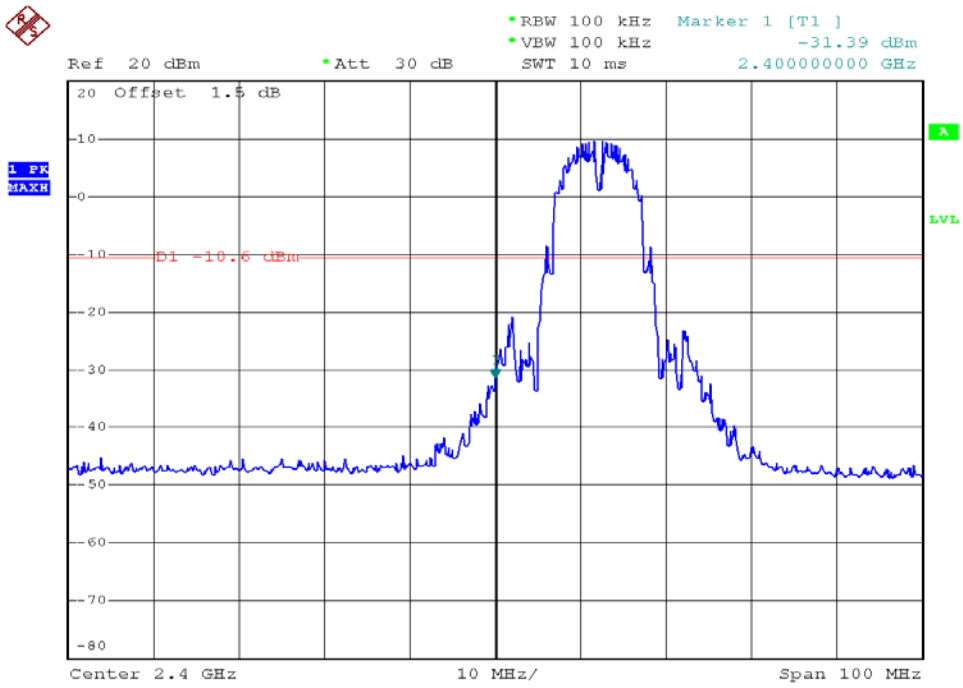
8.5 Test Result and Data

Test Date: Jan 5,2012 Temperature: 25℃

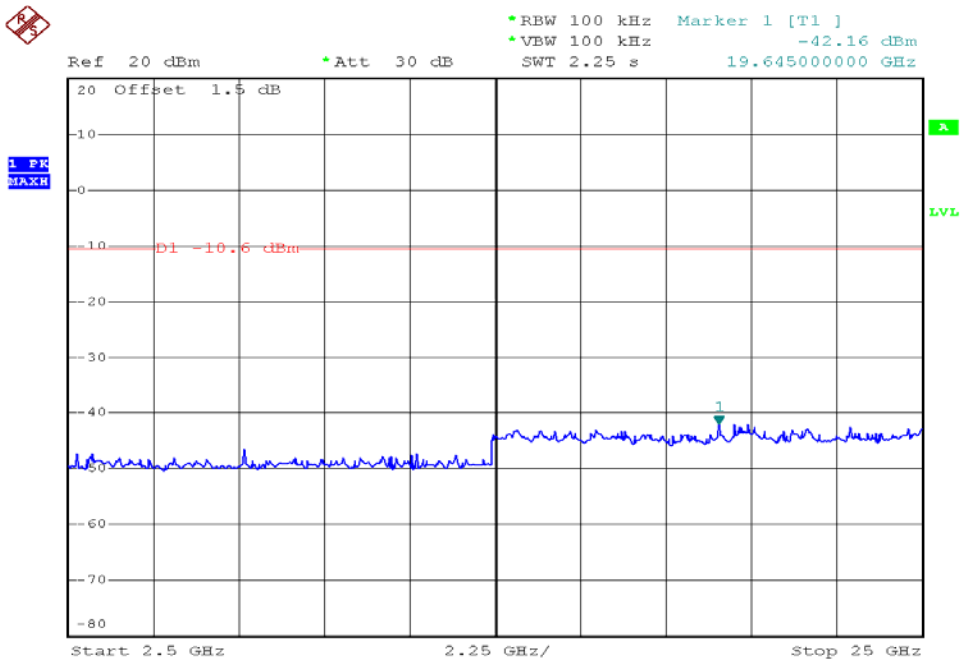
Atmospheric pressure: 1020 hPa Humidity: 46 %

Modulation Standard	Channel	Frequency (MHz)	maximum value in frequency (MHz)		maximum value (dBm)	
			CHAIN 0	CHAIN 1	CHAIN 0	CHAIN 1
802.11b (11Mbps)	01	2412	2400.0	N/A	-31.39	N/A
	11	2462	2483.5	N/A	-47.55	N/A
802.11g (54Mbps)	01	2412	2399.2	N/A	-25.61	N/A
	11	2462	2483.5	N/A	-38.55	N/A
802.11n HT20 (130Mbps)	01	2412	2400.0	2397.4	-25.85	-31.44
	11	2462	2484.9	2483.5	-37.44	-40.21
802.11n HT40 (270Mbps)	03	2422	2399.6	2400.0	-24.43	-28.41
	09	2452	2489.7	2489.5	-26.16	-30.63

Modulation Standard: 802.11b (11Mbps)
Channel: 01

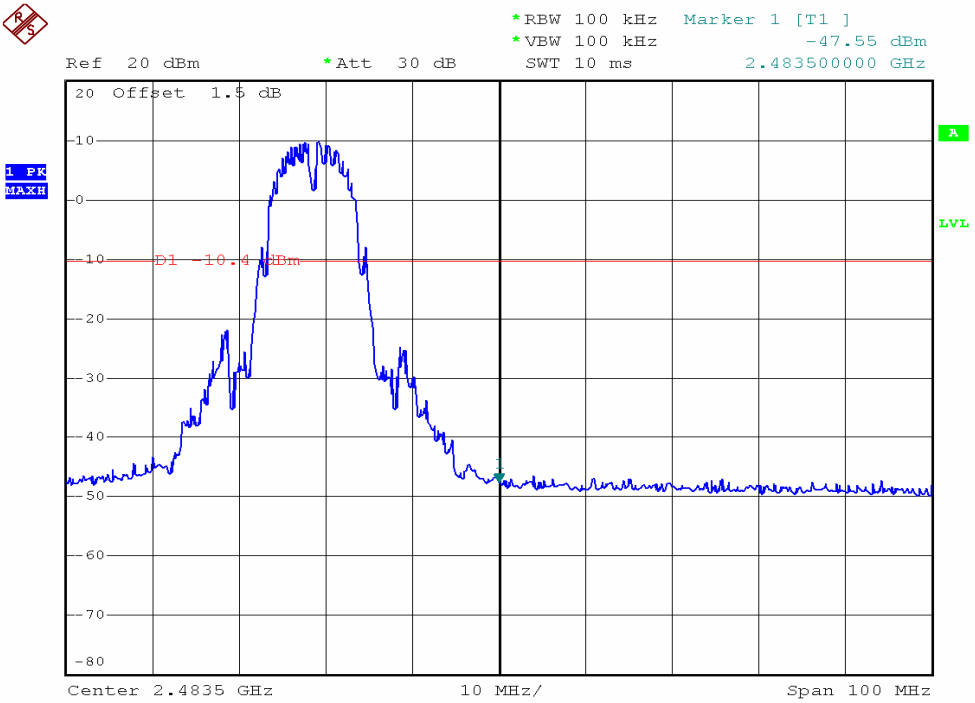


Date: 5.JAN.2012 10:43:23

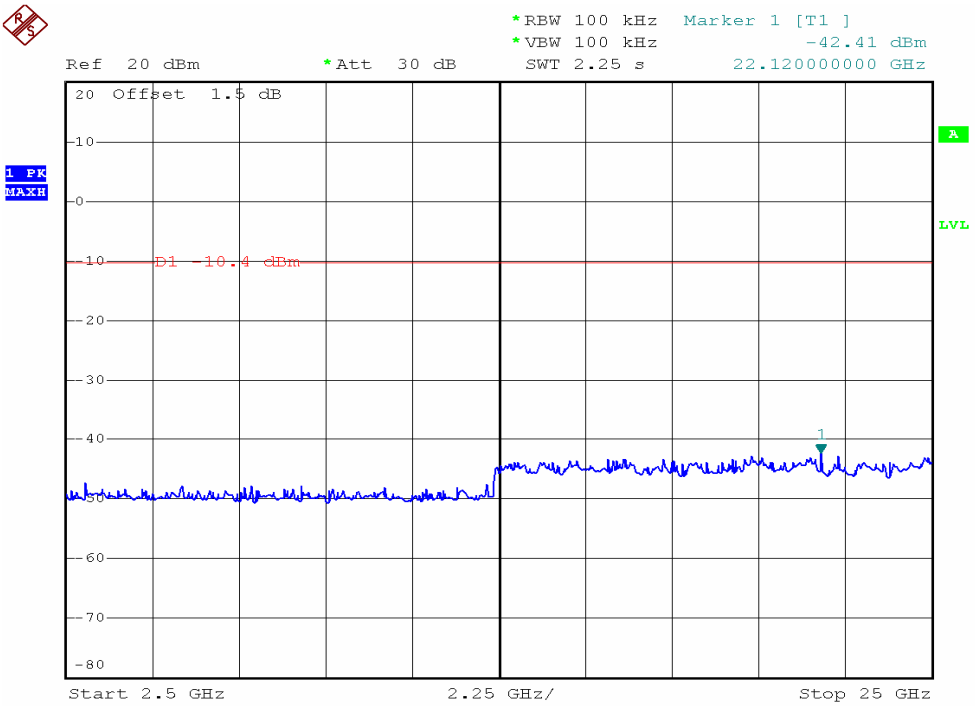


Date: 5.JAN.2012 10:45:48

Modulation Standard: 802.11b (11Mbps)
Channel: 11

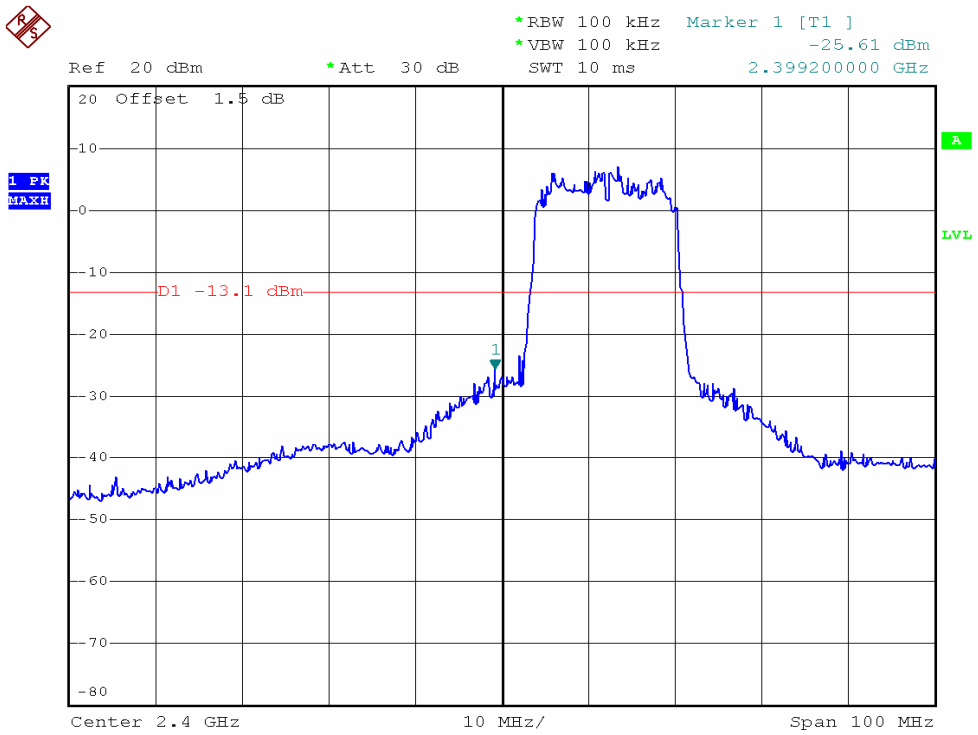


Date: 5.JAN.2012 10:49:13

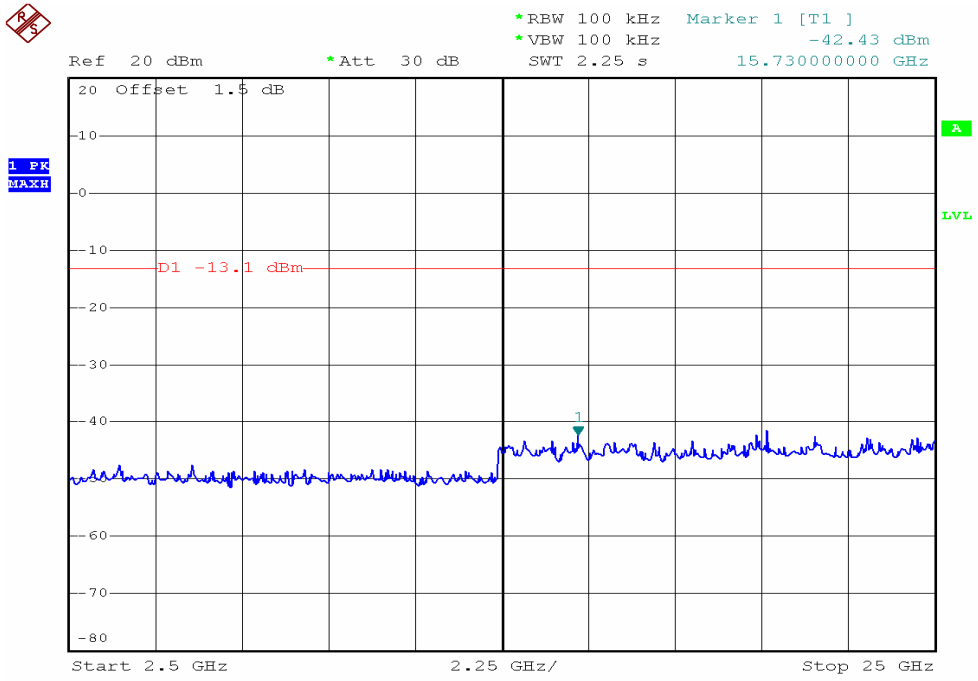


Date: 5.JAN.2012 10:49:40

Modulation Standard: 802.11g (54Mbps)
Channel: 01

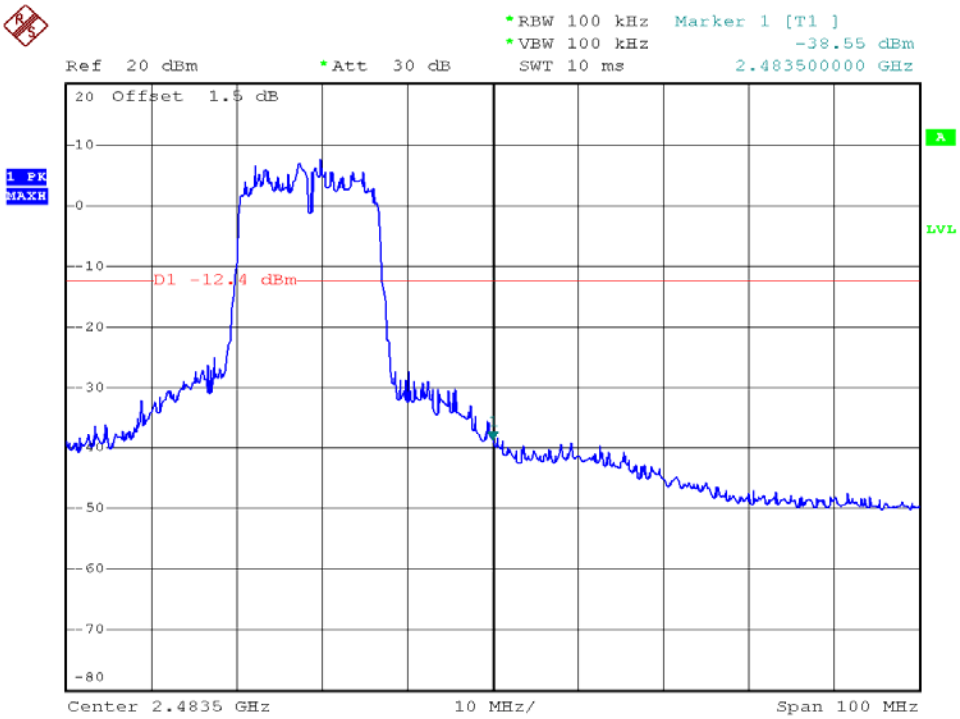


Date: 5.JAN.2012 10:51:42

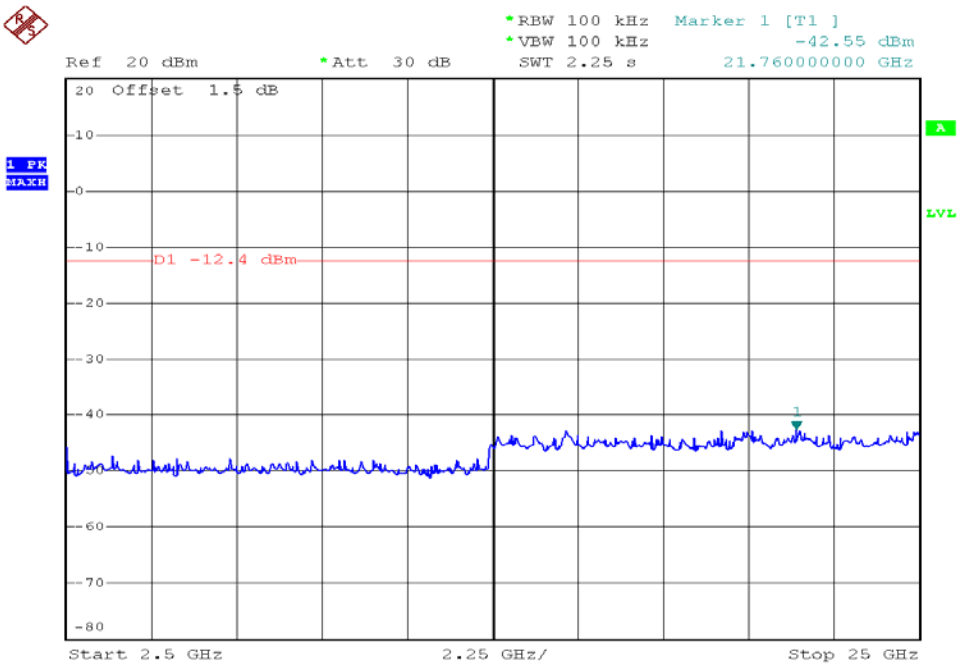


Date: 5.JAN.2012 10:52:00

Modulation Standard: 802.11g (54Mbps)
Channel: 11

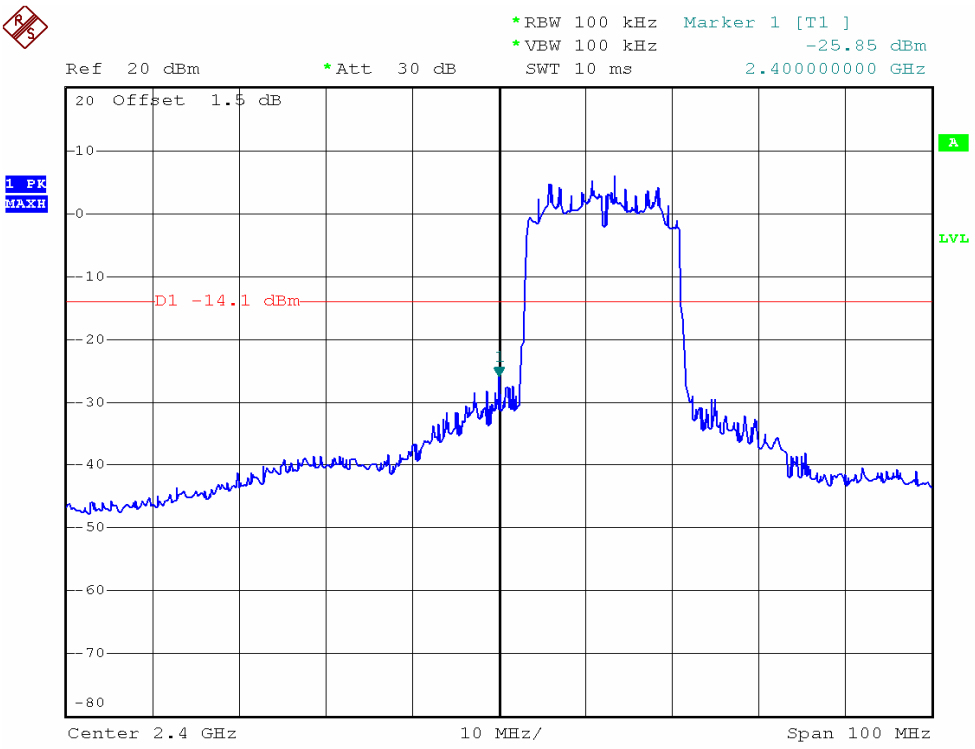


Date: 5.JAN.2012 10:53:48

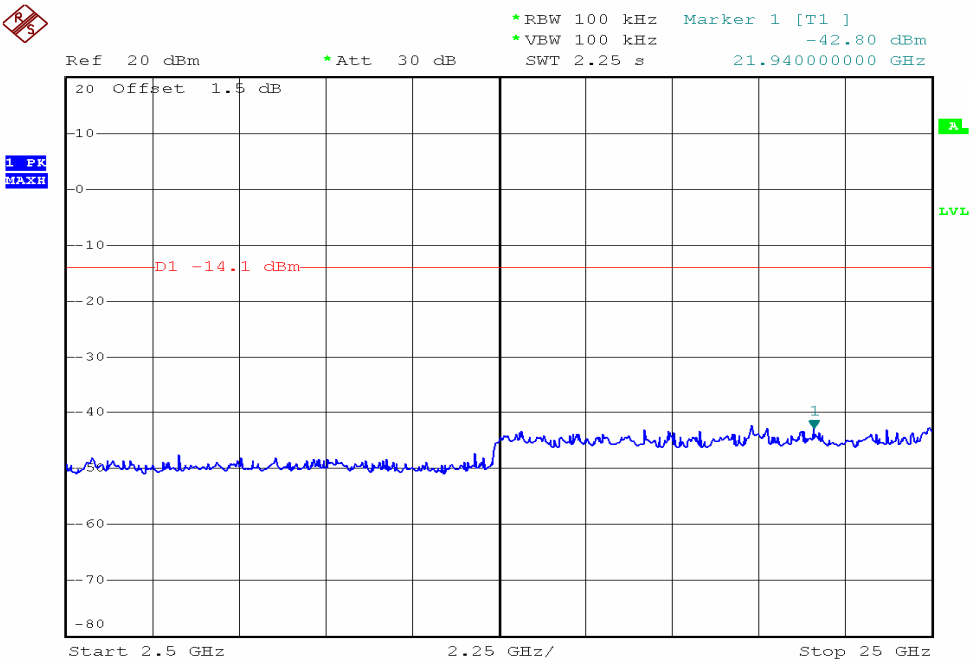


Date: 5.JAN.2012 10:54:10

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 01

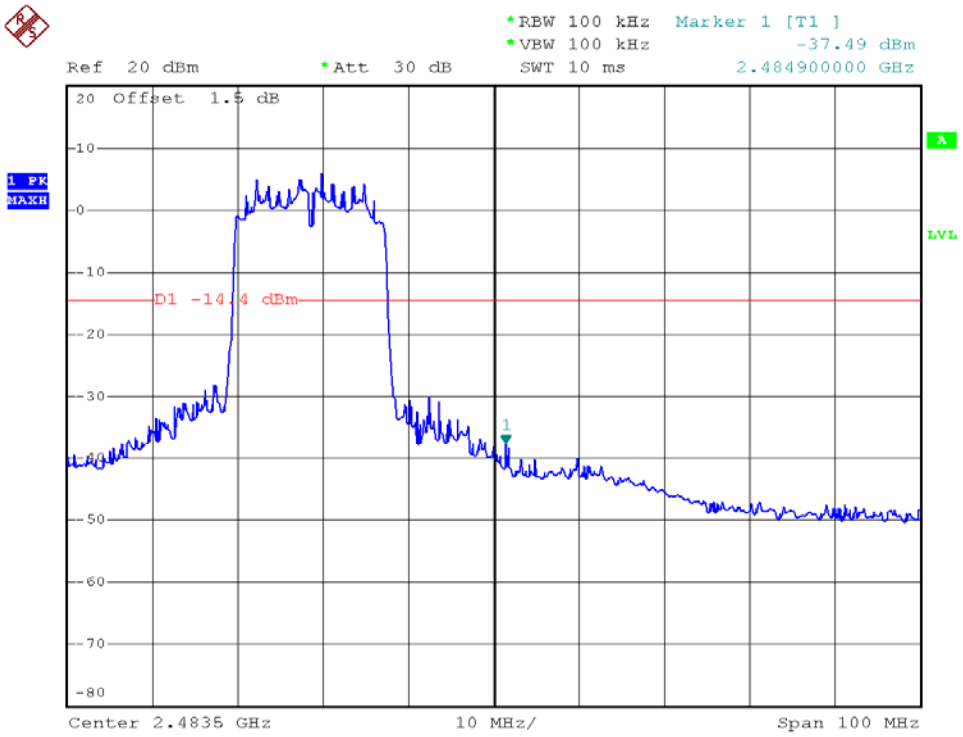


Date: 5.JAN.2012 10:56:21

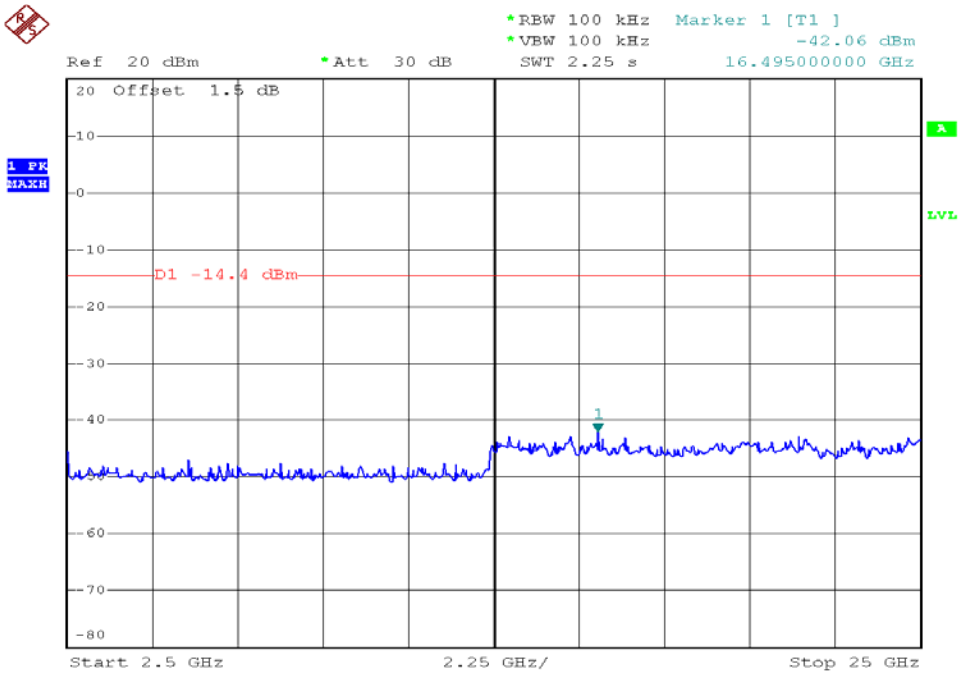


Date: 5.JAN.2012 10:56:47

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 11

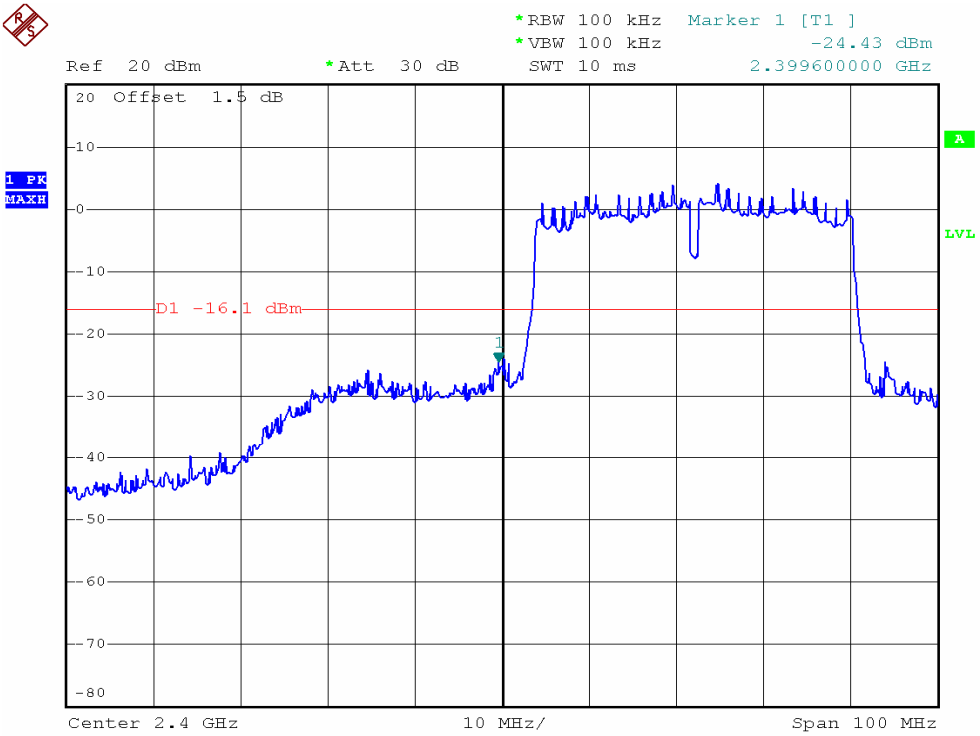


Date: 5.JAN.2012 10:58:43

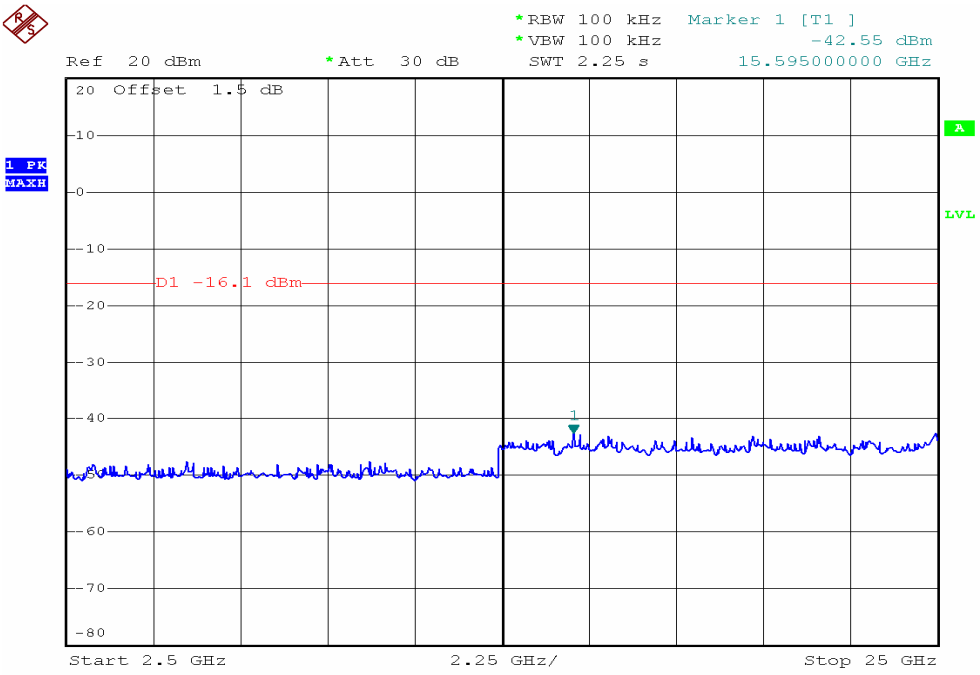


Date: 5.JAN.2012 10:59:01

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0
Channel: 03

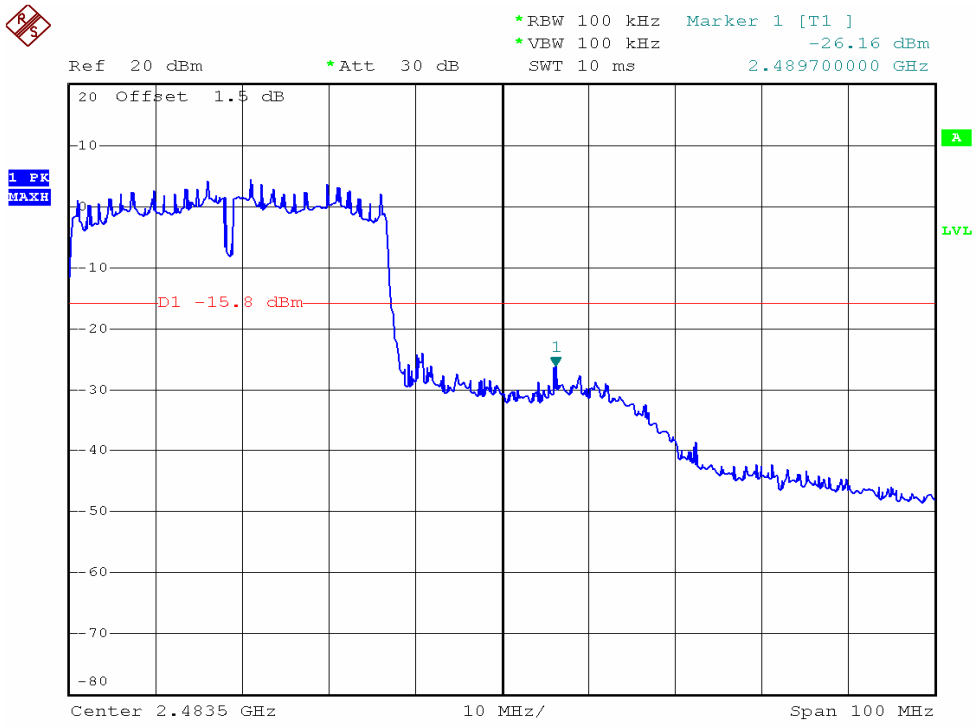


Date: 5.JAN.2012 11:01:29

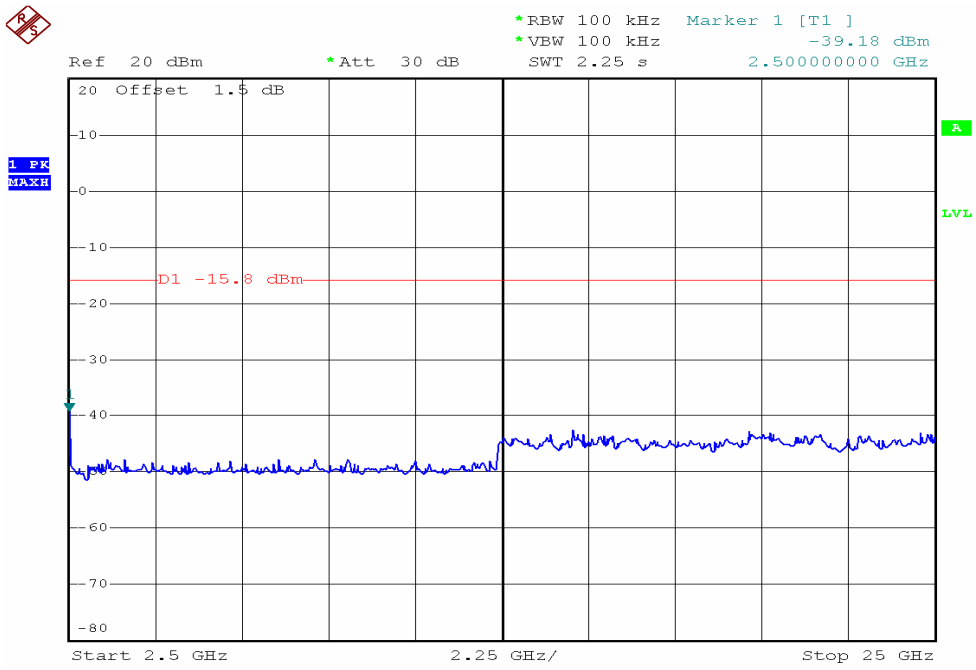


Date: 5.JAN.2012 11:01:57

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0
Channel: 09

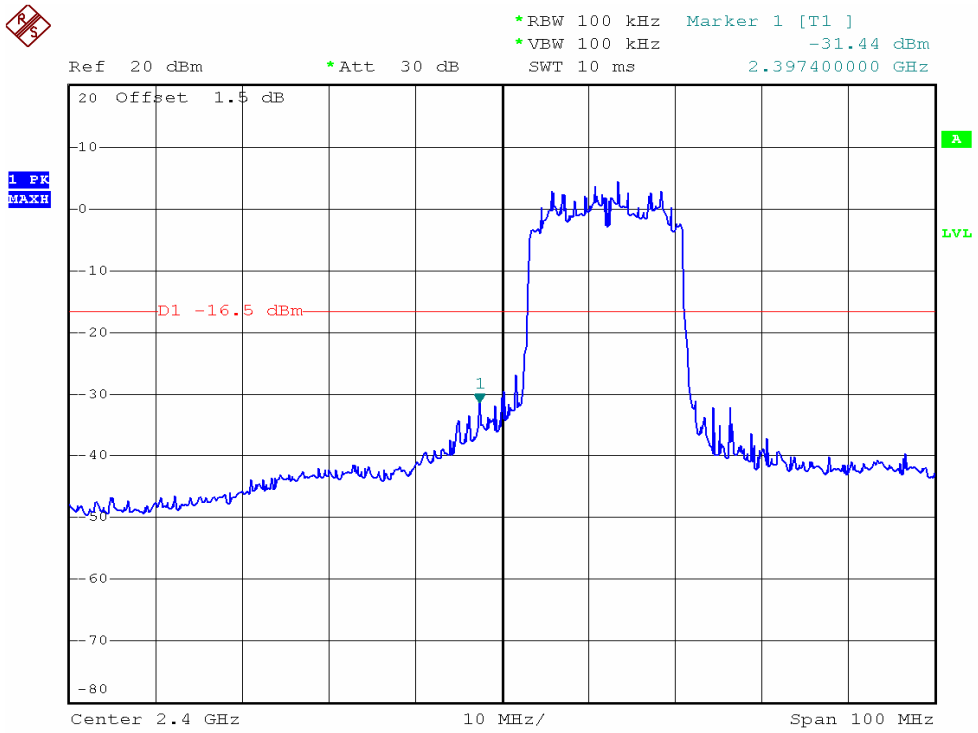


Date: 5.JAN.2012 11:03:33

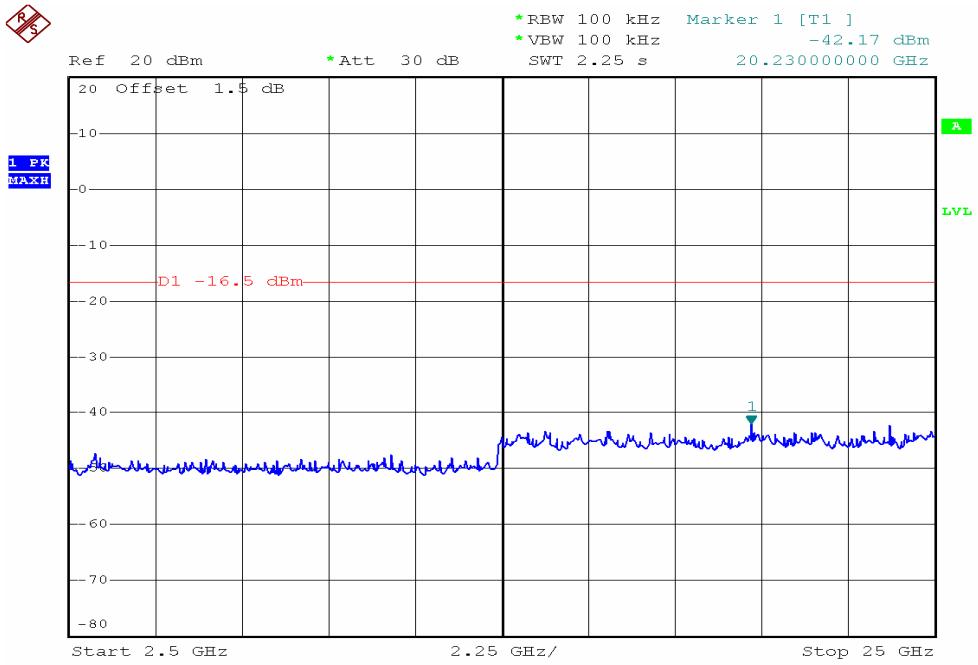


Date: 5.JAN.2012 11:04:10

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 01

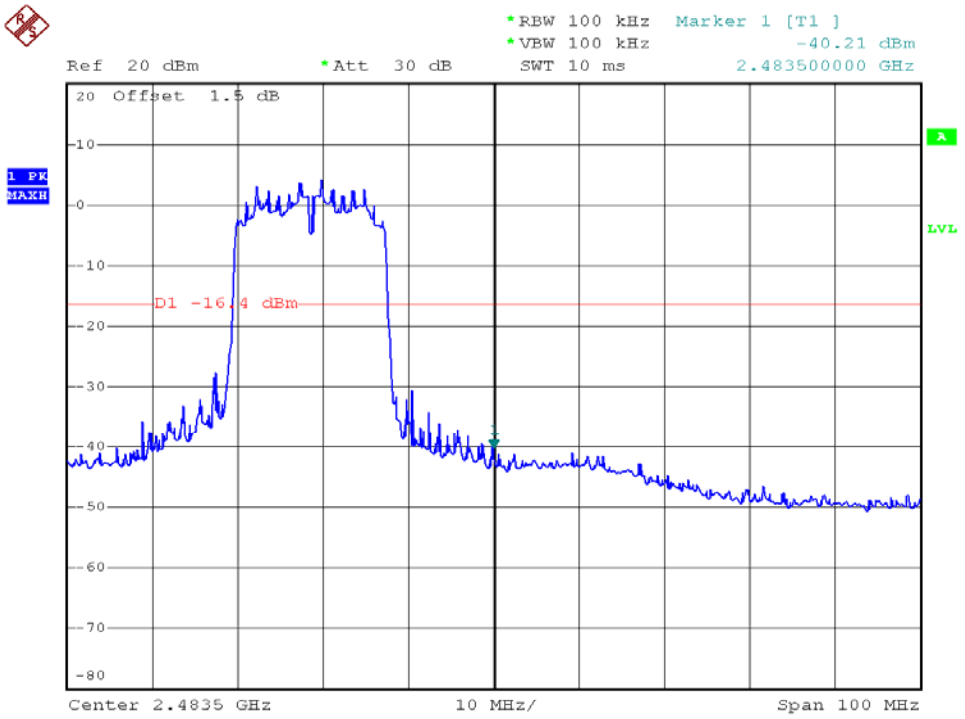


Date: 5.JAN.2012 11:07:11

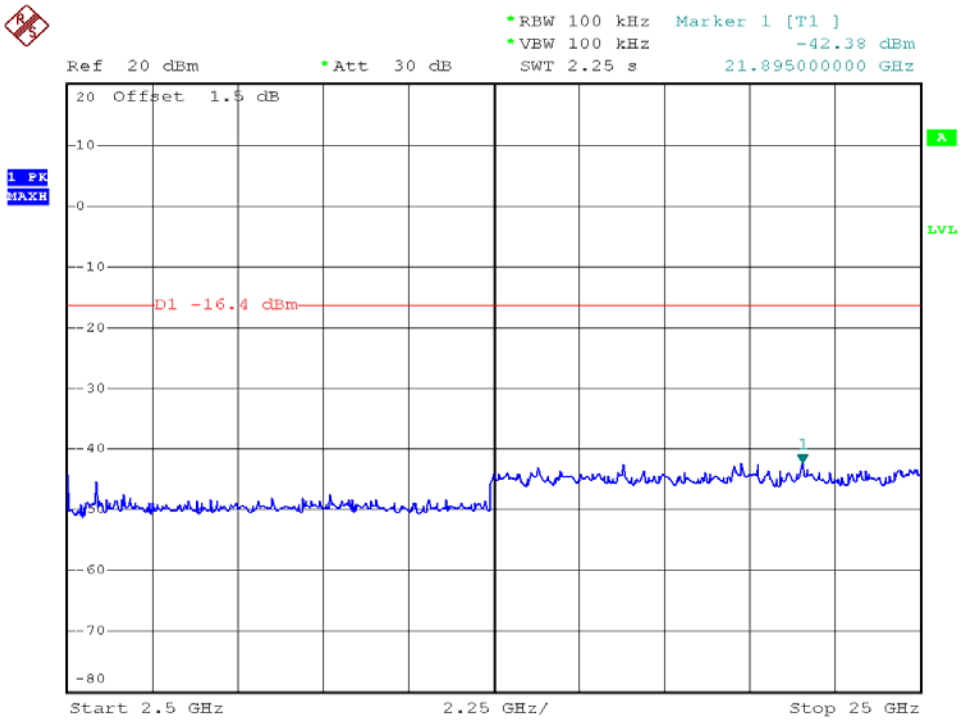


Date: 5.JAN.2012 11:07:31

Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 11

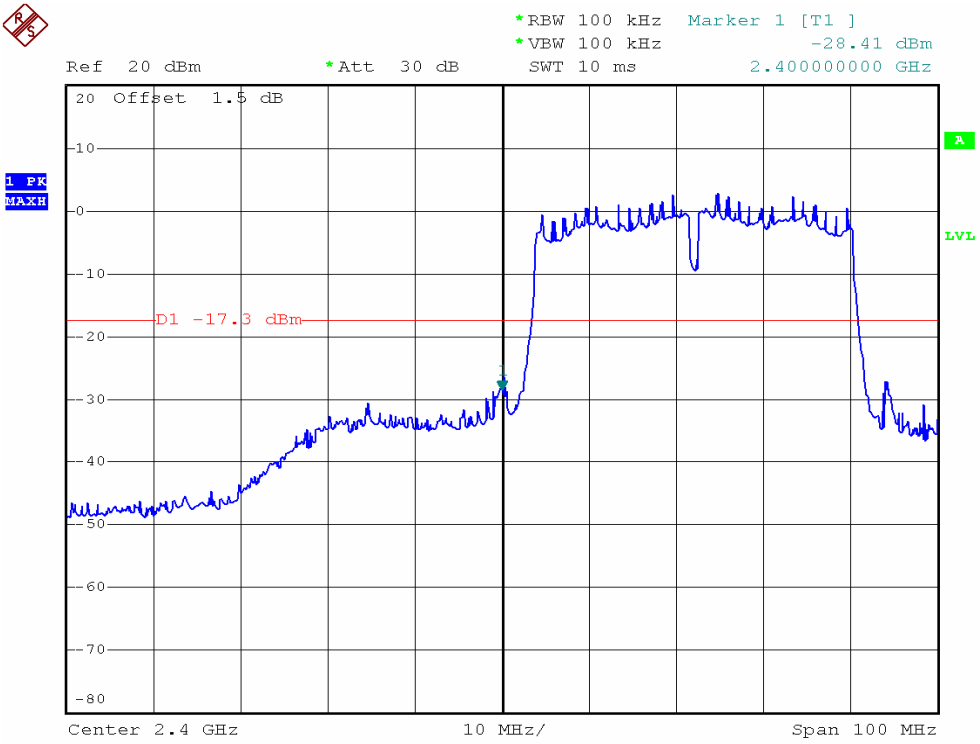


Date: 5.JAN.2012 11:08:37

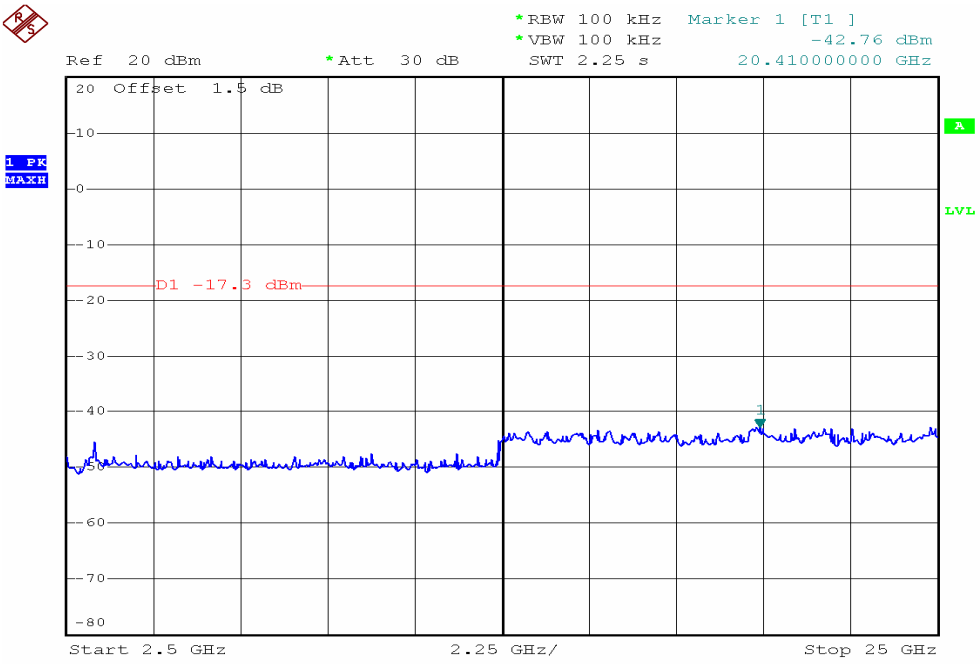


Date: 5.JAN.2012 11:09:02

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 03

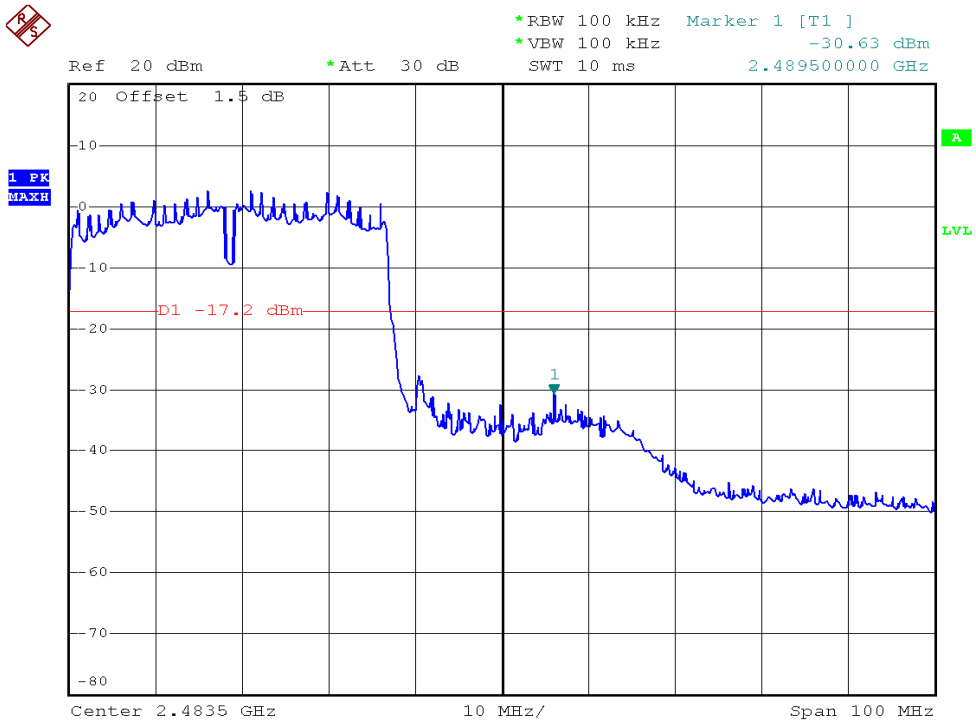


Date: 5.JAN.2012 11:10:46

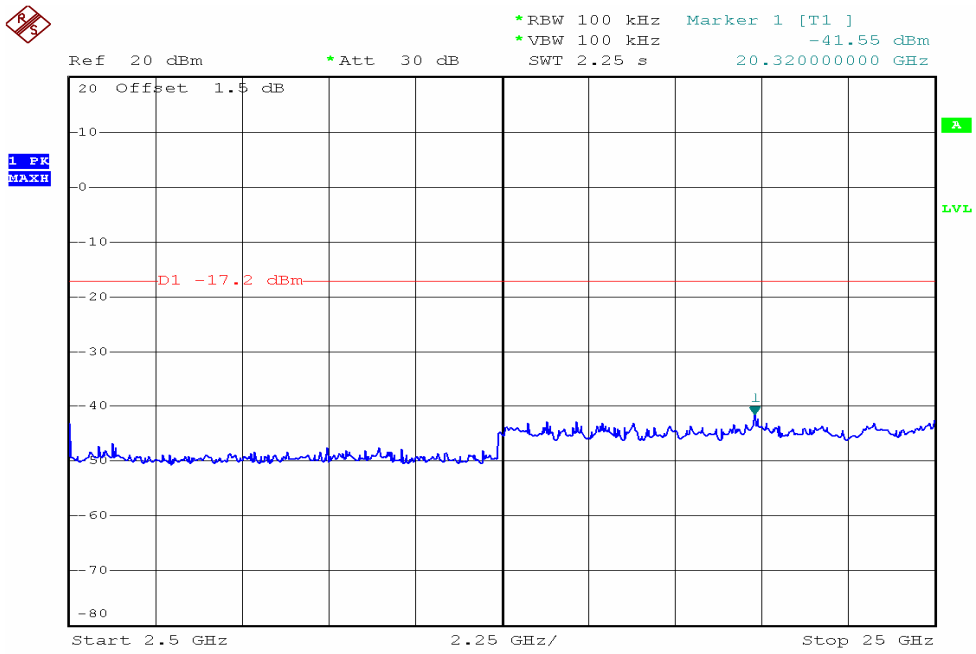


Date: 5.JAN.2012 11:11:07

Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 09



Date: 5.JAN.2012 11:12:57



Date: 5.JAN.2012 11:13:27

8.6 Restrict Band Emission Measurement Data

Test Date	:	Dec 30,2011
Temperature	:	24 ℃
Humidity	:	52 %
Atmospheric Pressure	:	1023 hPa
Test Mode 1	:	

Modulation Standard: IEEE 802.11b (11Mbps)

Channel 1										Fundamental Frequency: 2412 MHz
Frequency (MHz)	Ant-Pol H/V	Meter Reading	Corrected Factor	Result (dBuV/m)	Remark	Limit@3m (dBuV/m)		Margin (dB)	Table (Deg.)	Ant High (m)
						Peak	Ave.			
2351.71	H	53.51	10.60	64.11	Peak	74	54	-9.89	360	100
-----	H	-----	-----	-----	Ave	74	54	-----	-----	-----
2375.56	V	54.87	10.98	65.85	Peak	74	54	-8.15	360	100
2375.56	V	34.73	10.98	45.71	Ave	74	54	-8.29	0	100
Channel 11										Fundamental Frequency: 2462 MHz
2490.53	H	52.67	10.72	63.39	Peak	74	54	-10.61	50	100
-----	H	-----	-----	-----	Ave	74	54	-----	-----	-----
2485.87	V	53.77	11.02	64.79	Peak	74	54	-9.21	0	100
2485.66	V	33.67	11.02	44.69	Ave	74	54	-9.31	180	100

Modulation Standard: IEEE 802.11g (54Mbps)

Channel 1										Fundamental Frequency: 2412 MHz
Frequency (MHz)	Ant-Pol H/V	Meter Reading	Corrected Factor	Result (dBuV/m)	Remark	Limit@3m (dBuV/m)		Margin (dB)	Table (Deg.)	Ant High (m)
						Peak	Ave.			
2336.98	H	51.45	10.54	61.99	Peak	74	54	-12.01	34	100
-----	H	-----	-----	-----	Ave	74	54	-----	-----	-----
2335.47	V	52.31	10.98	63.29	Peak	74	54	-10.71	266	100
-----	V	-----	-----	-----	Ave	74	54	-----	-----	-----
Channel 11										Fundamental Frequency: 2462 MHz
2492.88	H	51.45	10.72	62.17	Peak	74	54	-11.83	360	100
-----	H	-----	-----	-----	Ave	74	54	-----	-----	-----
2494.92	V	52.31	11.02	63.33	Peak	74	54	-10.67	103	100
-----	V	-----	-----	-----	Ave	74	54	-----	-----	-----

Modulation Standard: IEEE 802.11n HT20 (130Mbps)

Channel 1										Fundamental Frequency: 2412 MHz
Frequency (MHz)	Ant-Pol H/V	Meter Reading	Corrected Factor	Result (dBuV/m)	Remark	Limit@3m (dBuV/m)		Margin (dB)	Table (Deg.)	Ant High (m)
						Peak	Ave.			
2345.56	H	52.45	10.55	63.00	Peak	74	54	-11.00	0	100
-----	H	-----	-----	-----	Ave	74	54	-----	-----	-----
2346.91	V	53.21	10.99	64.20	Peak	74	54	-9.80	360	100
-----	V	-----	-----	-----	Ave	74	54	-----	-----	-----
Channel 11										Fundamental Frequency: 2462 MHz
2495.76	H	50.56	10.71	61.27	Peak	74	54	-12.73	360	100
-----	H	-----	-----	-----	Ave	74	54	-----	-----	-----
2496.34	V	52.45	11.01	63.46	Peak	74	54	-10.54	0	100
-----	V	-----	-----	-----	Ave	74	54	-----	-----	-----

Modulation Standard: IEEE 802.11n HT40 (270Mbps)

Channel 3										Fundamental Frequency: 2422 MHz
Frequency (MHz)	Ant-Pol H/V	Meter Reading	Corrected Factor	Result (dBuV/m)	Remark	Limit@3m (dBuV/m)		Margin (dB)	Table (Deg.)	Ant High (m)
						Peak	Ave.			
2333.91	H	51.35	10.53	61.88	Peak	74	54	-12.12	0	100
-----	H	-----	-----	-----	Ave	74	54	-----	-----	-----
2380.84	V	53.84	10.97	64.81	Peak	74	54	-9.19	360	100
-----	V	-----	-----	-----	Ave	74	54	-----	-----	-----
Channel 9										Fundamental Frequency: 2452 MHz
2496.12	H	52.25	10.70	62.95	Peak	74	54	-11.05	360	100
-----	H	-----	-----	-----	Ave	74	54	-----	-----	-----
2484.67	V	53.73	11.01	64.74	Peak	74	54	-9.26	360	100
-----	V	-----	-----	-----	Ave	74	54	-----	-----	-----

Notes:

1. Result = Meter Reading + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.

9. Power Spectral Density

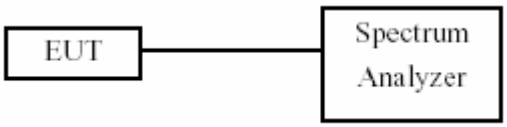
9.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm.

9.2 Test Procedures

a. The transmitter output was connected to spectrum analyzer.
b. The spectrum analyzer's resolution bandwidth were set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=span/3KHz.
c. The power spectral density was measured and recorded.
d. The Sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

9.3 Test Setup Layout



9.4 Measurement equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	100324	2011.08.14	2012.08.13

9.5 Test Result and Data

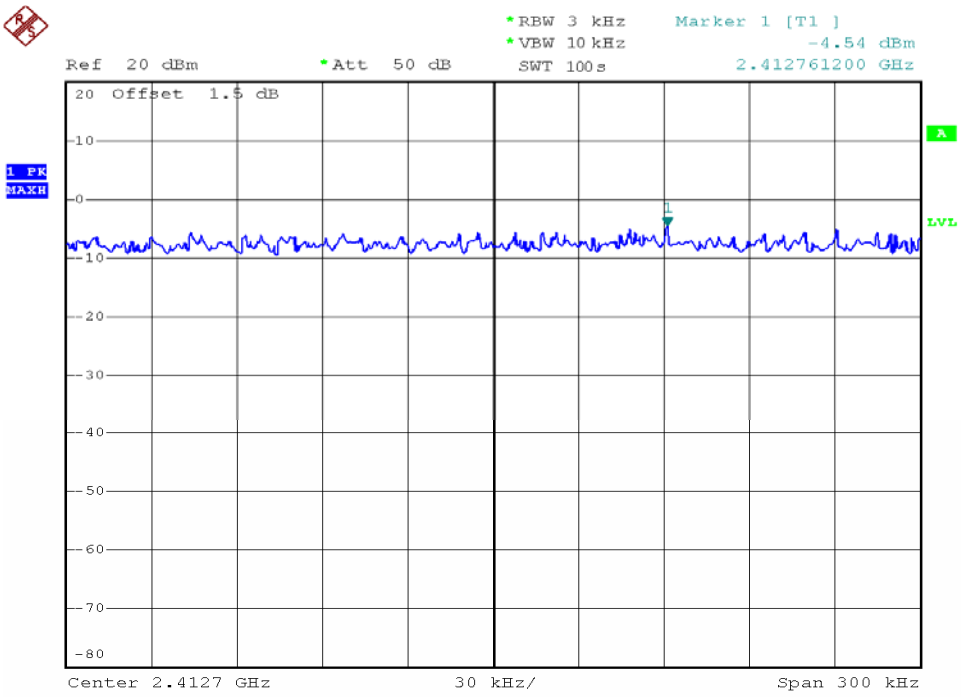
Test Date:Dec 29,2011 Temperature: 25 ℃

Atmospheric pressure: 1020 hPa Humidity: 46 %

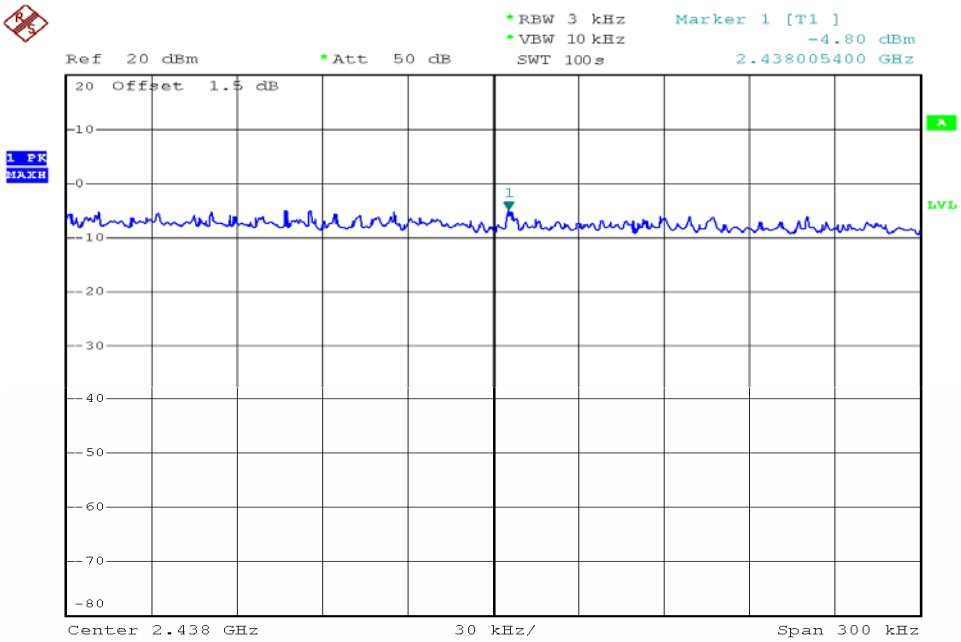
Modulation Standard	Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)
802.11b (11Mbps)	01	2412	-4.54
	06	2437	-4.80
	11	2462	-3.03
802.11g (54Mbps)	01	2412	-6.17
	06	2437	-7.96
	11	2462	-7.13

Modulation Standard	Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)		
			CHAIN 0	CHAIN 1	CHAIN 0+CHAIN 1
802.11n HT20 (130Mbps)	01	2412	-8.92	-10.22	-6.51
	06	2437	-8.82	-9.72	-6.24
	11	2462	-7.60	-9.96	-5.61
802.11n HT40 (270Mbps)	03	2422	-10.37	-12.44	-8.27
	06	2437	-10.24	-12.50	-8.21
	09	2452	-10.09	-11.15	-7.58

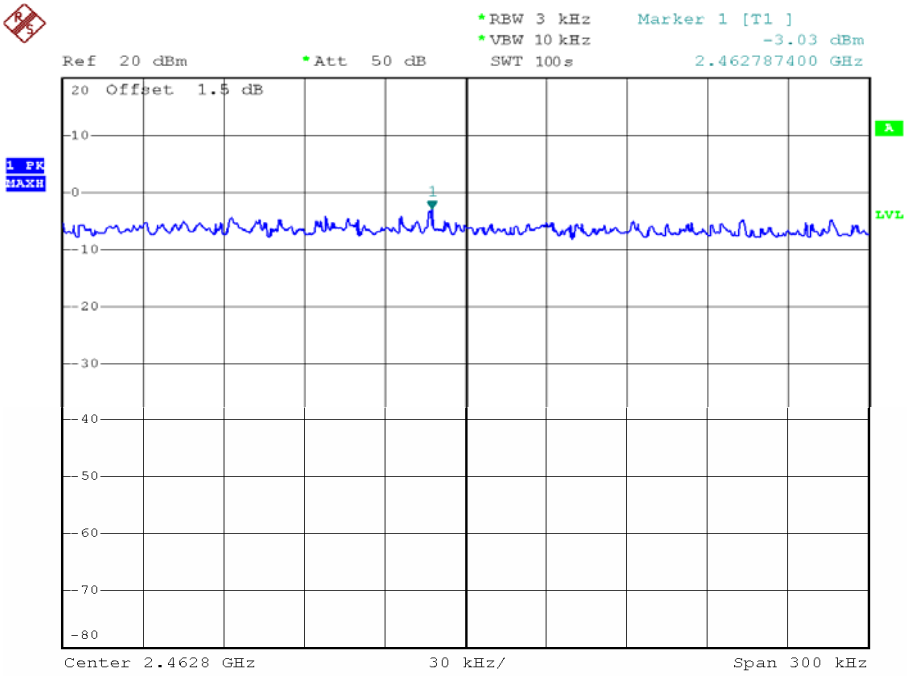
Modulation Standard: 802.11b (11Mbps)
Channel: 01



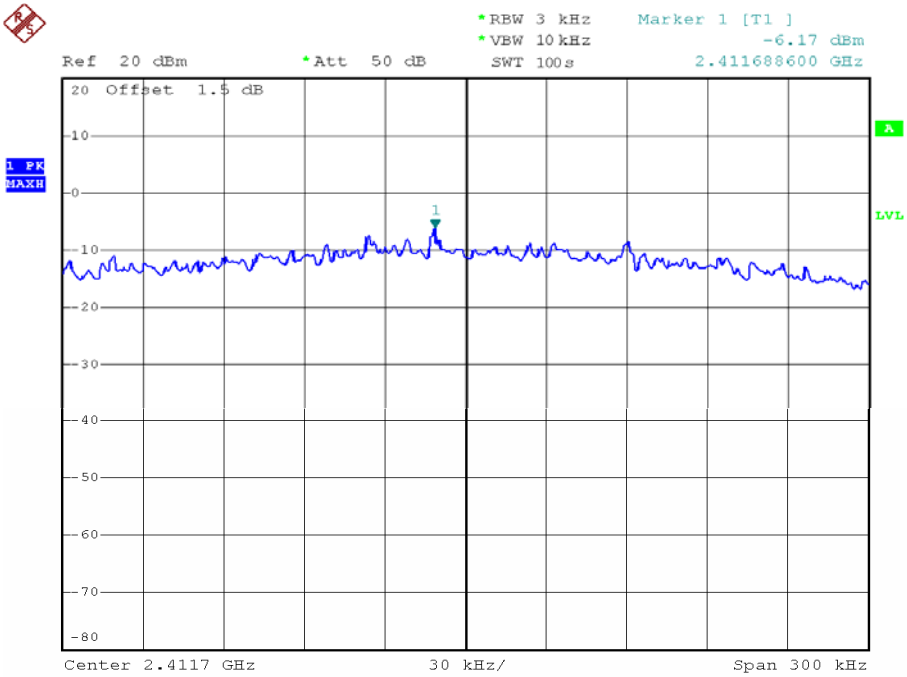
Modulation Standard: 802.11b (11Mbps)
Channel: 06



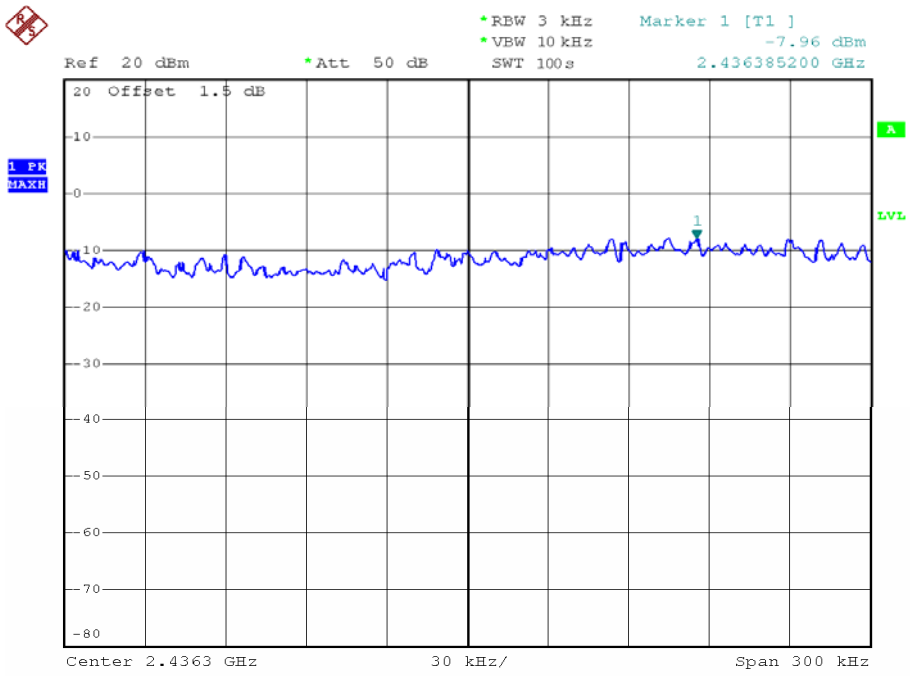
Modulation Standard: 802.11b (11Mbps)
Channel: 11



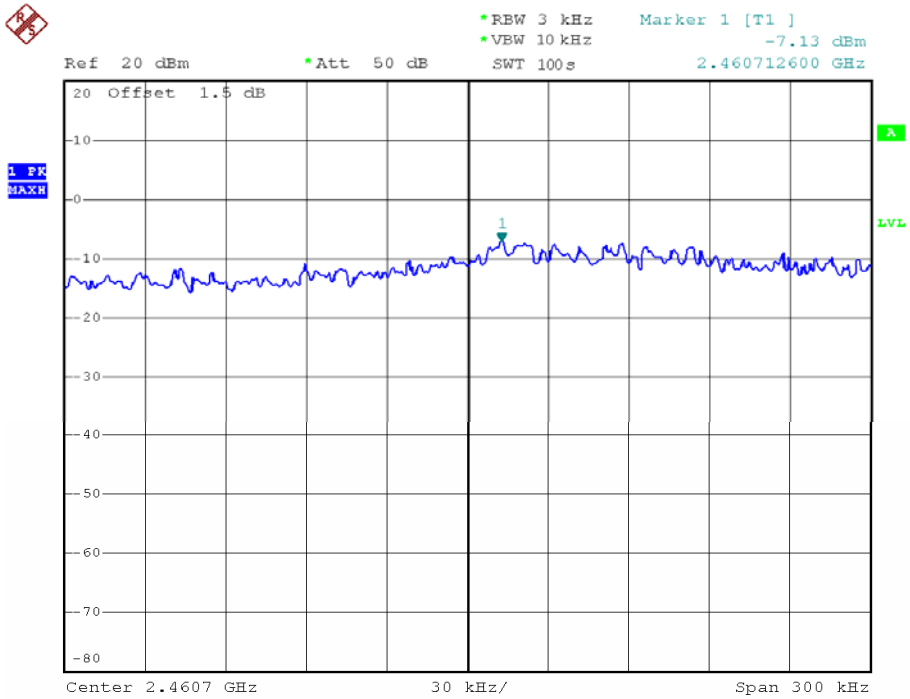
Modulation Standard: 802.11g (54Mbps)
Channel: 01



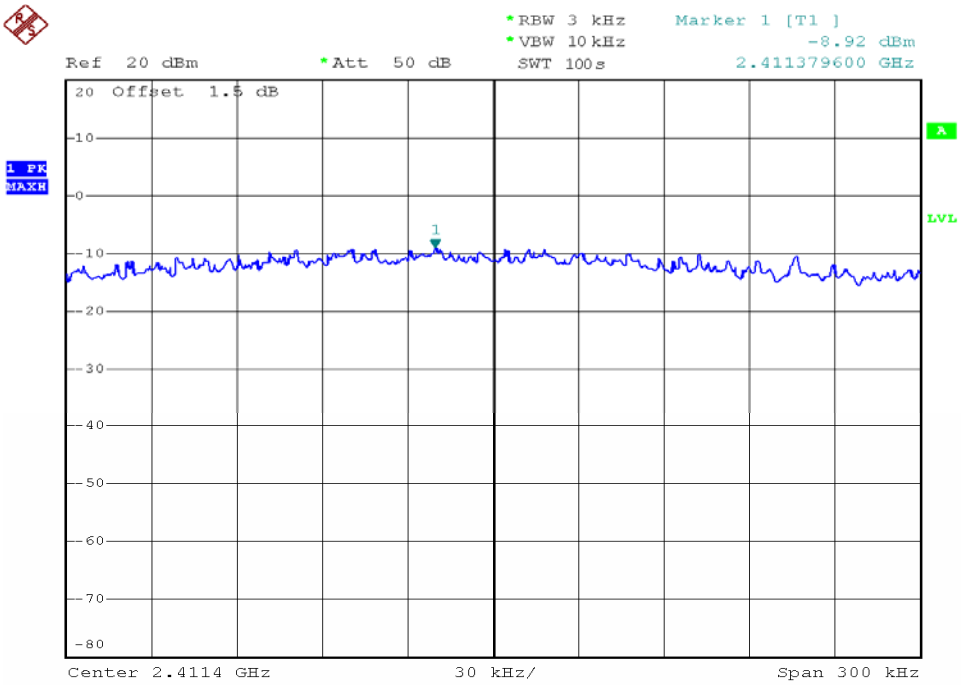
Modulation Standard: 802.11g (54Mbps)
Channel: 06



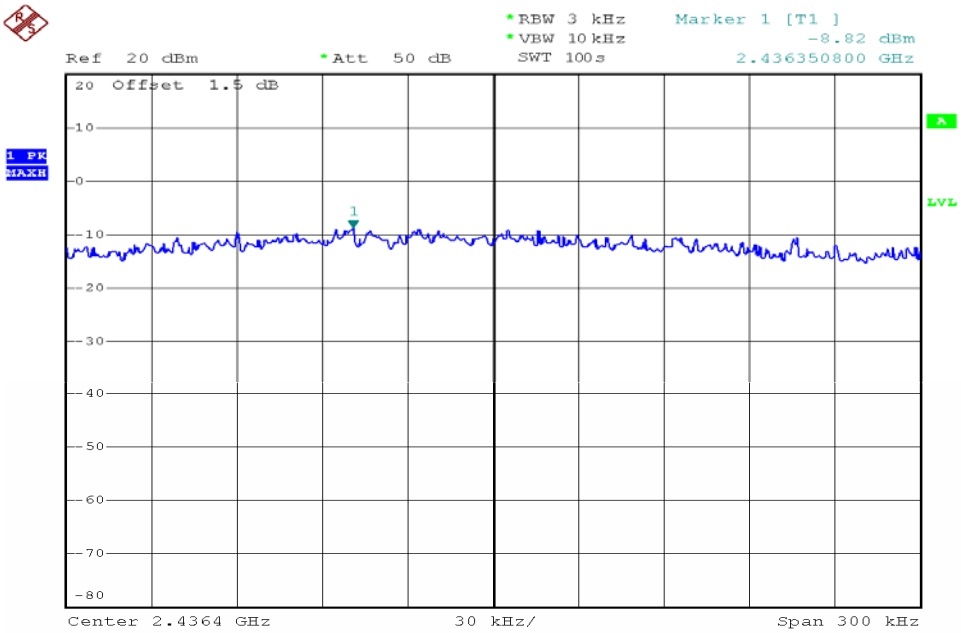
Modulation Standard: 802.11g (54Mbps), CHAIN 0
Channel: 11



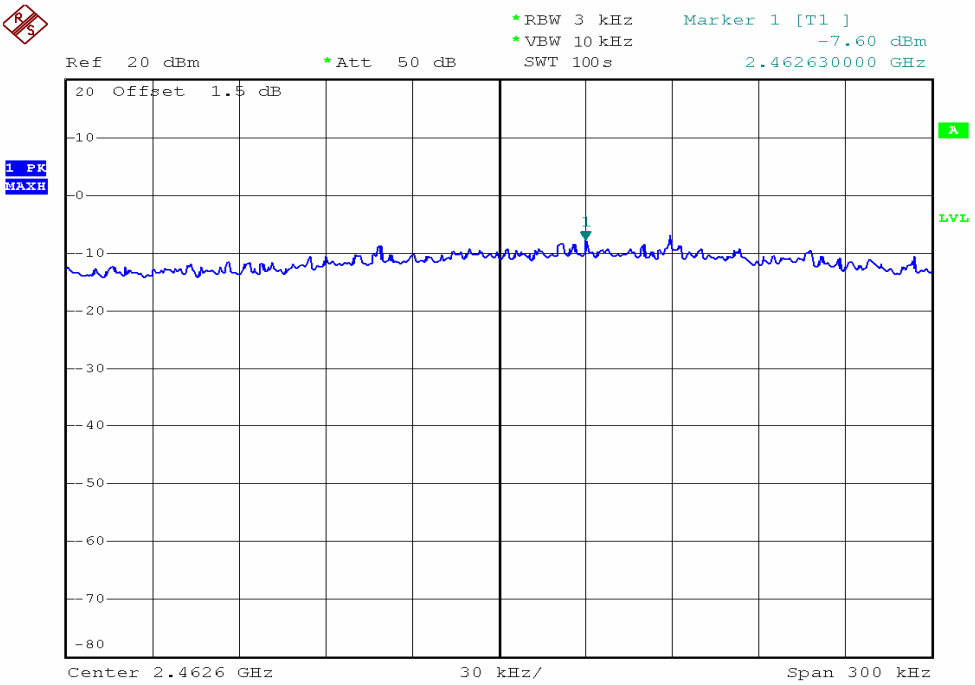
Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 01



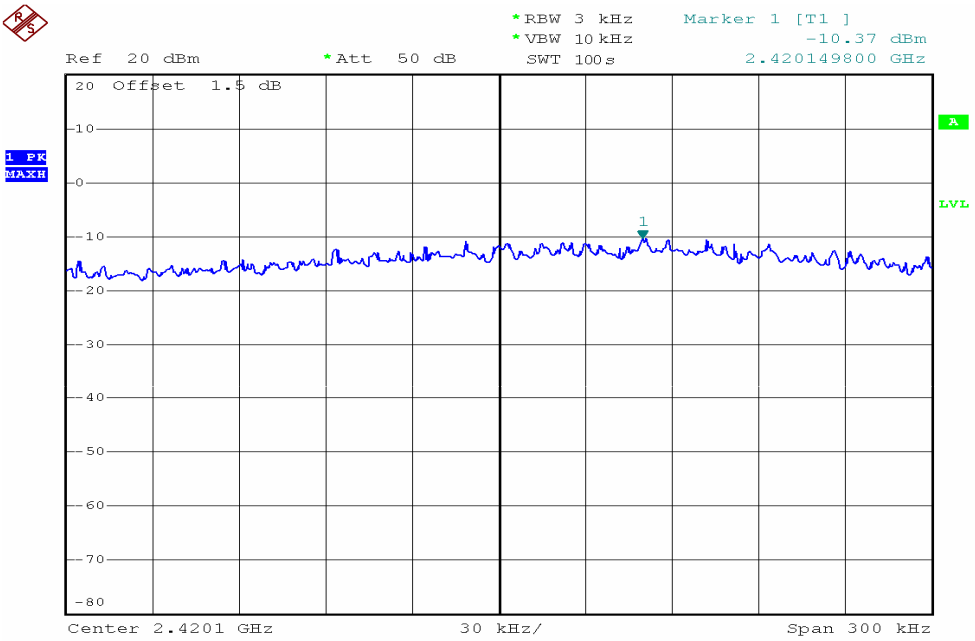
Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 06



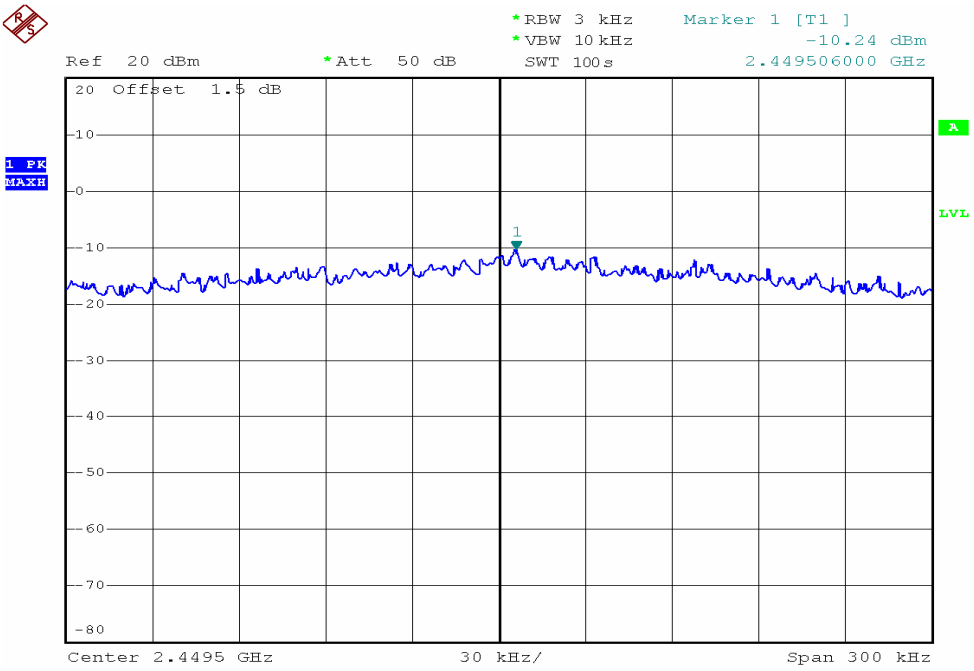
Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 0
Channel: 11



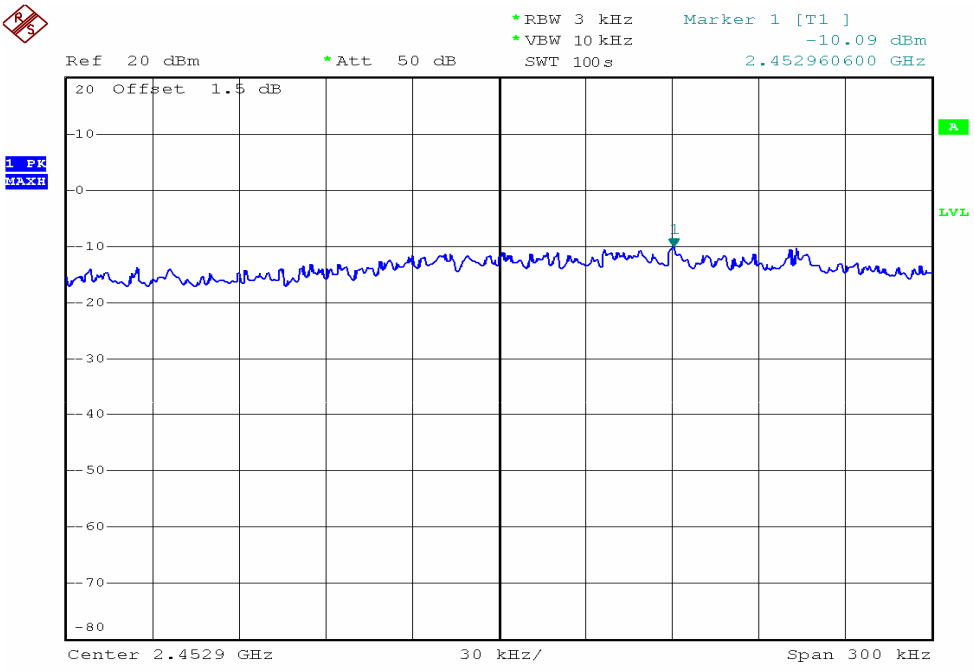
Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0
Channel: 03



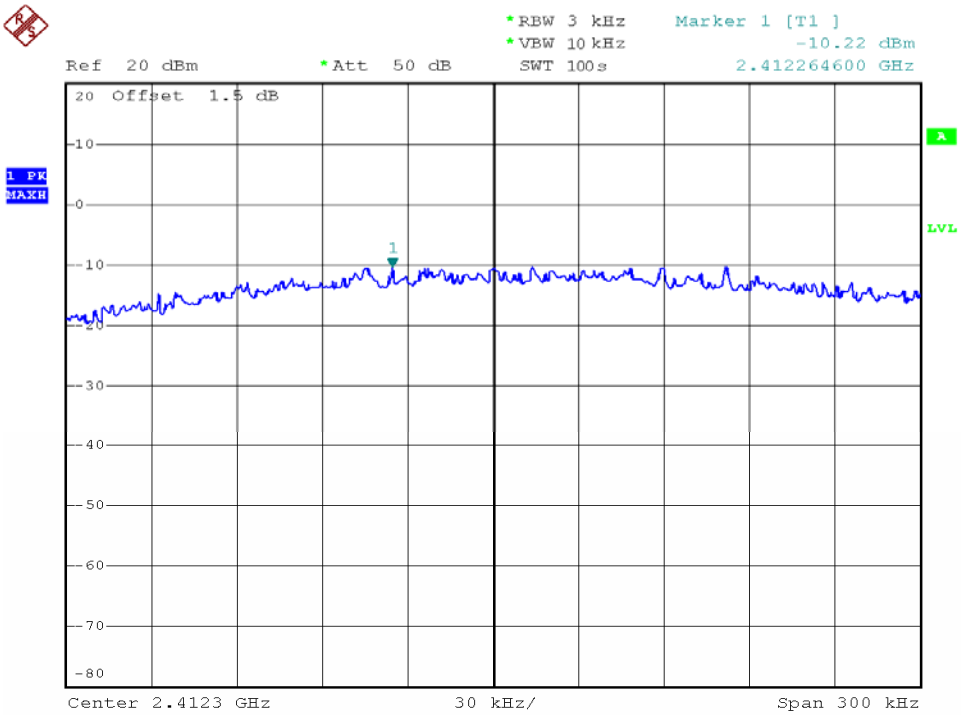
Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0
Channel: 06



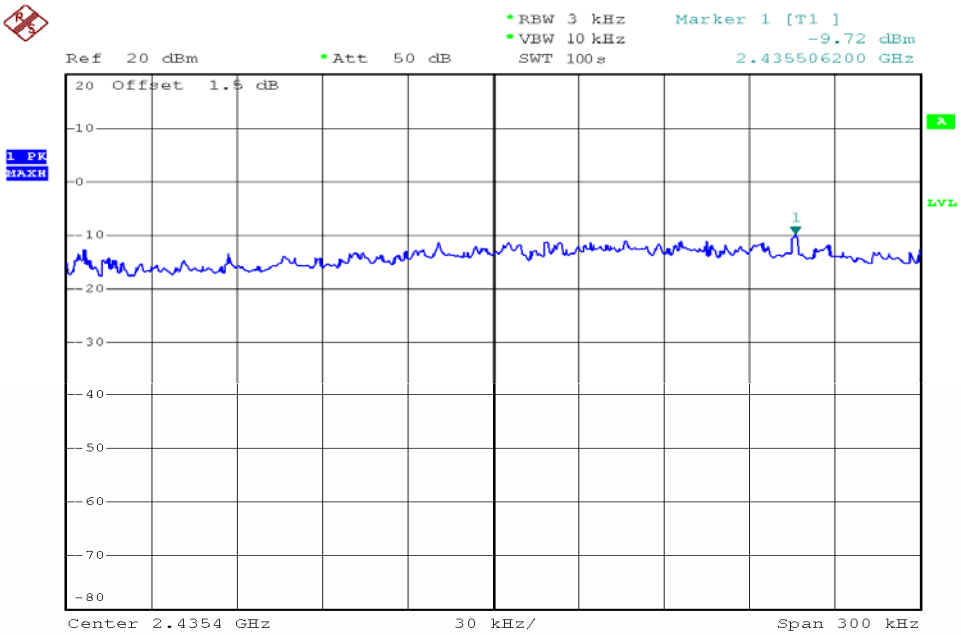
Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 0
Channel: 09



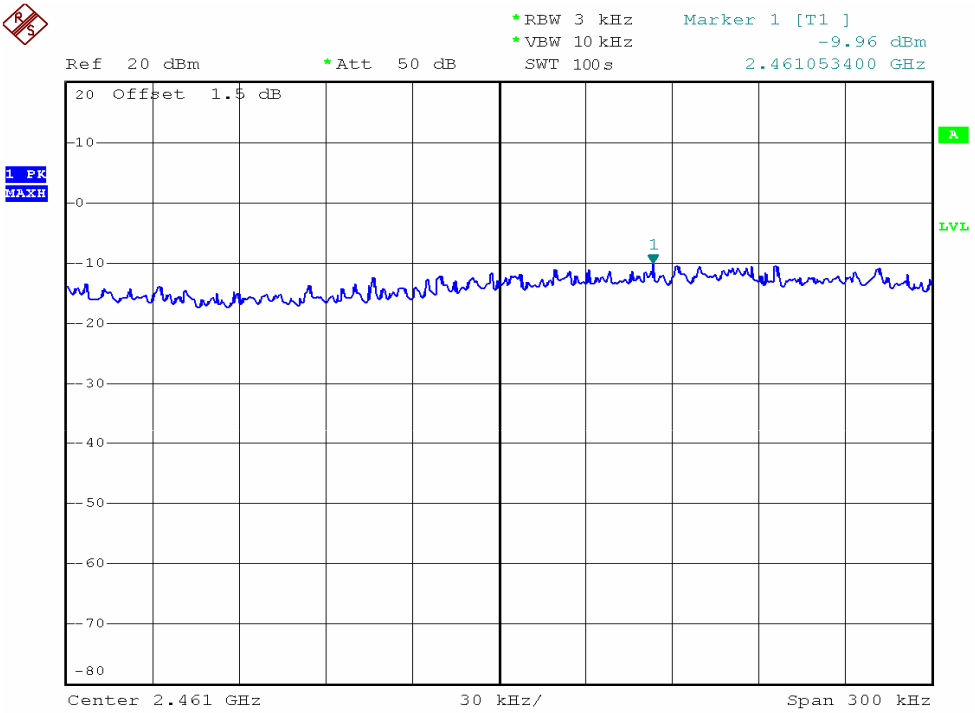
Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 01



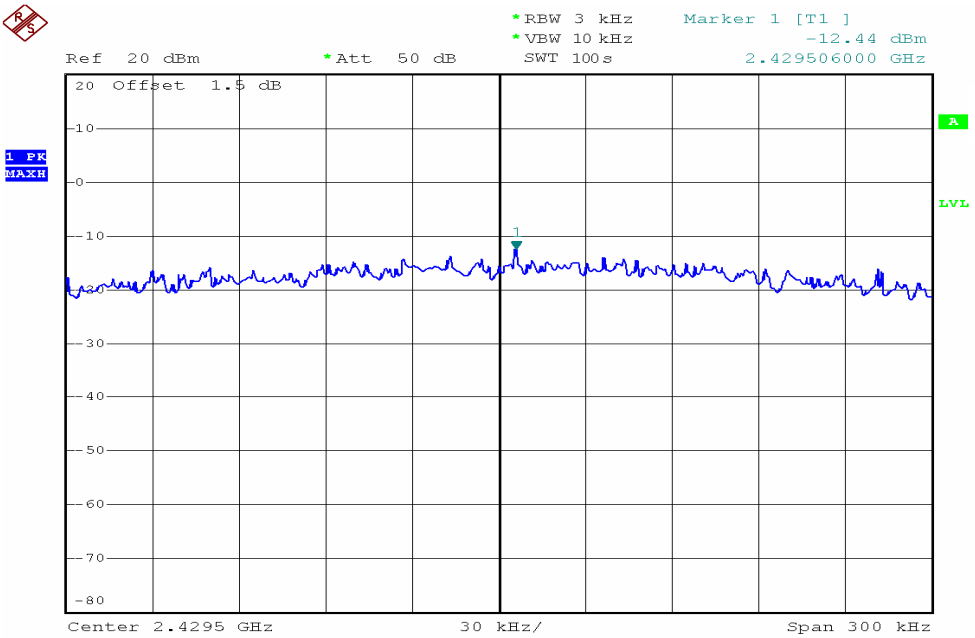
Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 06



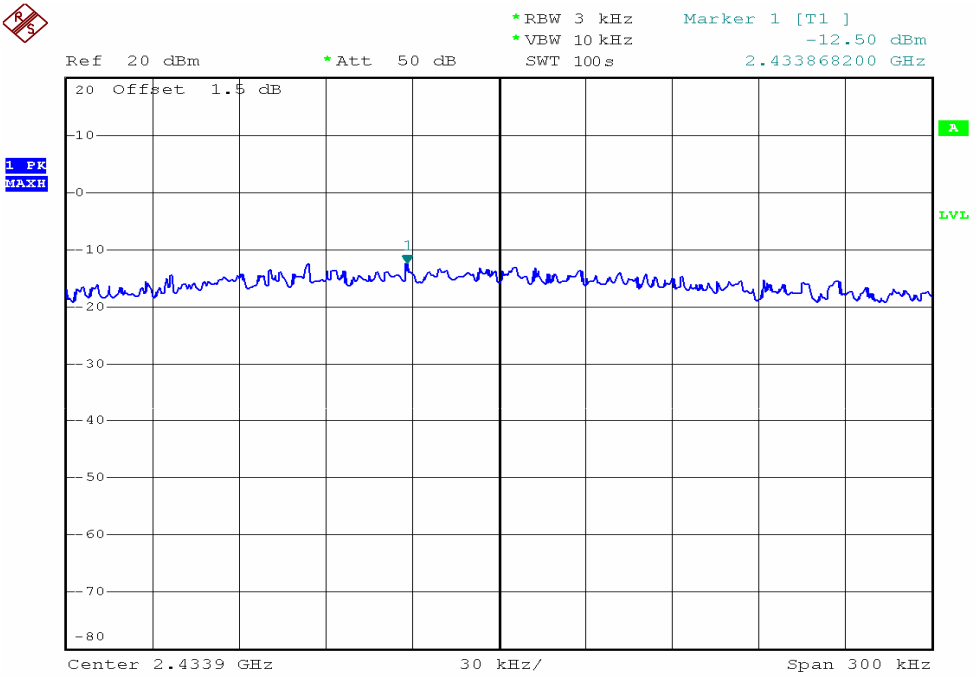
Modulation Standard: 802.11n HT20 (130Mbps), CHAIN 1
Channel: 11



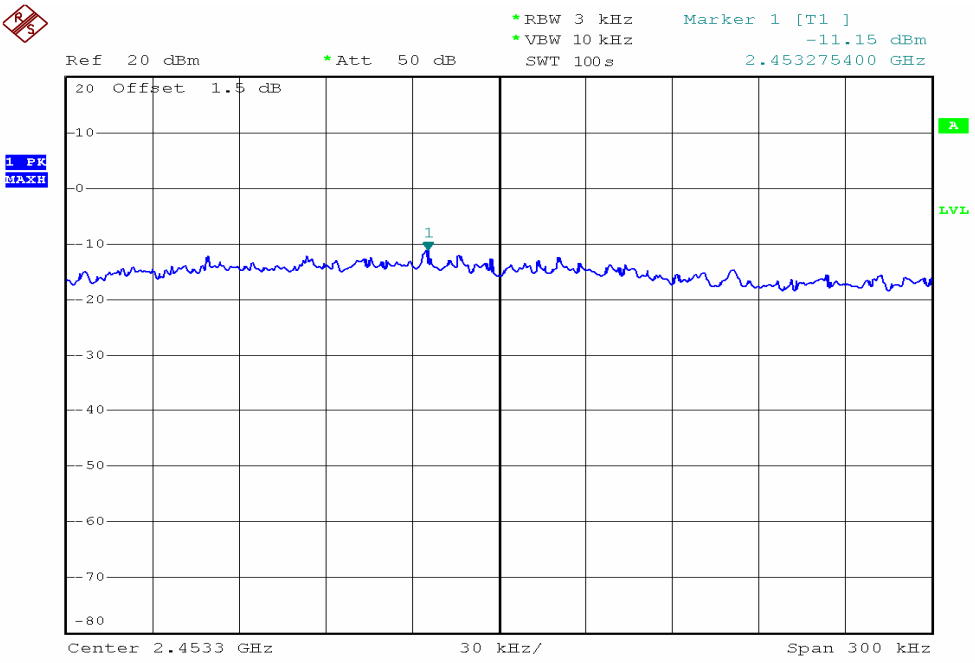
Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 03



Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 06



Modulation Standard: 802.11n HT40 (270Mbps), CHAIN 1
Channel: 09



10. 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 – 5.250
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	2655.0 – 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

10.1 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.