



FCC TEST REPORT

Prepared For :	ZMOD0 Technology Corp. Ltd.
Product Name:	NVR
Model :	ZH-NA04-W, ZH-NA14-W, ZP-NG04, ZP-NG14
Prepared By :	Shenzhen BATT Testing Technology Co., Ltd. 11F, Bldg.B, Xinbaoyuan, Xinnanhu Commercial city, Bao'an D Shenzhen, Guangdong, China. Tel: 86-755-27753991 Fax: 86-755-27754182
Test Date:	April 07 to April 17, 2013
Date of Report :	April 17, 2013
Report No.:	BATT201303088FCC

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TABLE OF CONTENTS

1.0	TEST CERTIFICATION.....	3
2.0	Test Equipment.....	5
3.0	Technical Details.....	7
4.0	Test Lab Details.....	7
5.0	Power Line Conducted Emission Test.....	8
5.1	Schematics of the Test.....	8
5.2	Test Method and Test Procedure.....	8
5.3	Configuration of the EUT.....	8
5.4	EUT Operating Condition.....	9
5.5	Conducted Emission Limit.....	9
5.6	Test Result.....	9
6.0	Radiated Emission test.....	12
6.1	Test Method and Test Procedure.....	12
6.2	Configuration of the EUT.....	13
6.3	EUT Operation Condition.....	13
6.4	Radiated Emission Limit.....	13
7.0	6dB Bandwidth Measurement.....	41
8.0	Maximum Peak Output Power.....	59
9.0	Power Spectral Density Measurement.....	64
10.0	Out of Band Measurement.....	83
11.0	Antenna Requirement.....	94
12.0	RF Exposure.....	95
13.0	FCC ID Label.....	97
14.0	Photo of Test Setup and EUT View.....	98



1 TEST CERTIFICATION

Product:	NVR
Model:	ZH-NA04-W, ZH-NA14-W, ZP-NG04, ZP-NG14
Applicant:	ZMOD0 Technology Corp. Ltd. 17F, Finance Technology Building, 11 Keyuan Road, Hi-Tech Park, Nanshan District, Shenzhen, P.R.China
Factory:	ZMOD0 Technology Corp. Ltd. 17F, Finance Technology Building, 11 Keyuan Road, Hi-Tech Park, Nanshan District, Shenzhen, P.R.China
Trade Mark:	N/A
Tested:	April 02, 2013 to April 17, 2013
Test Voltage:	DC12V Powered by power supply
Operational Frequency Range:	IEEE 802.11b/g, 802.11n HT20: 2412-2462MHz IEEE 802.11n HT40 : 2422MHz-2452MHz
Modulation Type:	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g : OFDM (64QAM, 16AQM, QPSK, BPSK) IEEE 802.11n HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel Spacing	IEEE 802.11b/g/n: 5MHz
Air Data Rate	IEEE 802.11b : 11, 5.5, 2, 1 Mbps IEEE 802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT20 : 150, 117 ,104, 78, 65, 58.5, 52, 39, 26, 19.5, 13, 6 Mbps IEEE 802.11n HT40 : 150, 117 ,104, 78, 65, 58.5, 52, 39, 26, 19.5, 13, 6 Mbps
Frequency Selection	By software
Channel Number	IEEE 802.11b/g ,802.11n HT20 : 11 Channels IEEE 802.11n HT40 : 7 Channels
Antenna:	Dipole Antenna with Gain 5.0dBi
Power Supply:	Model:RS-300/120-S325;Input:100-240V~, 50-60Hz, 0.7A MAX;Output:DC12V, 3A
FCC ID:	ZK8-NA04-W
Applicable Standards:	FCC Part 15.247

The test report was prepared by Shenzhen BATT Testing Technology Co., Ltd.and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.



Prepared by :

Hellen Xiao

Hellen Xiao Assistant

Reviewer :

Mike Yong

Mike Yong/Supervisor

Approved & Authorized Signer :

Jones Song

Jones Song/ Manager



2.0 Test Equipments

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWA RZ	ESPI 3	100379	2012-05-29	2013-05-28
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	2012-05-29	2013-05-28
Impuls-Begrenzer	ROHDE&SCHWA RZ	ESH3-Z2	100281	2012-05-29	2013-05-28
Loop Antenna	EMCO	6502	00042960	2012-05-29	2013-05-28
ESPI Test Receiver	ROHDE&SCHW ARZ	ESI26	838786/013	2012-05-29	2013-05-28
3m OATS	--	--	N/A	2012-05-29	2013-05-28
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170399	2012-05-29	2013-05-28
Horn Antenna	SCHWARZBECK	BBHA 9120	D143	2012-05-29	2013-05-28
Power meter	Anritsu	ML2487A	6K00003613	2012-05-29	2013-05-28
Power sensor	Anritsu	MA2491A	32263	2012-05-29	2013-05-28
Bilog Antenna	Schwarebeck	VULB916 3	9163/142	2012-05-29	2013-05-28
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2012-05-29	2013-05-28
9*6*6 Anechoic	--	--	N/A	2012-05-29	2013-05-28
EMI Test Receiver	RS	ESCS30	100139	2012-05-29	2013-05-28
LISN	RS	ESH2-Z5	100225	2012-05-29	2013-05-28
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2012-05-29	2013-05-28
Pre-Amplifier	A.H.	PAM-0126	1415261	2012-05-29	2013-05-28



3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107 & 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.247(a)(2) Limit	Spectrum bandwidth of a Orthogonal Frequency Division Multiplex System Limit: 6dB bandwidth>500kHz	PASS	Complies
FCC Part 15, Paragraph 15.247(b)	Maximum peak output power Limit: max. 30dBm	PASS	Complies
FCC Part 15, Paragraph 15.109,15.205 & 15.209	Transmitter Radiated Emission Limit: Table 15.209	PASS	Complies
FCC Part 15, Paragraph 15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Complies
FCC Part 15, Paragraph 15.247(d)	Out of Band Emission and Restricted Band Radiation Limit: 20dB less than peak value of fundamental frequency Restricted band limit: Table 15.209	PASS	Complies

4.0 Test LAB Details

All Tests Performed at

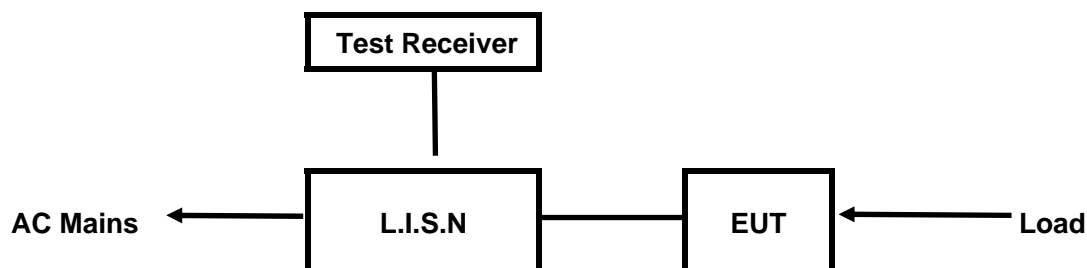
Name: Shenzhen Emtex Co., Ltd.

Address: Bldg. 69, Majialong Industry Zone,,Nanshan District,Shenzhen, Guangdong, 518052China

FCC Registration Number: 406365

5. Power Line Conducted Emission Test

5.1 Schematics of the test

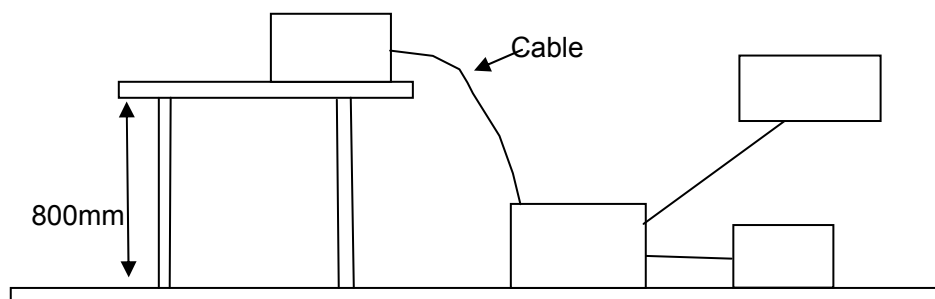


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 -2003.

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

79 channels are provided to the EUT

A. EUT

Device	Manufacturer	Model	FCC ID
NVR	ZMODO Technology Corp. Ltd.	ZH-NA04-W	ZK8-NA04-W



B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
--	--	--	--	--

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.107, 15.207

Frequency (MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

- Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

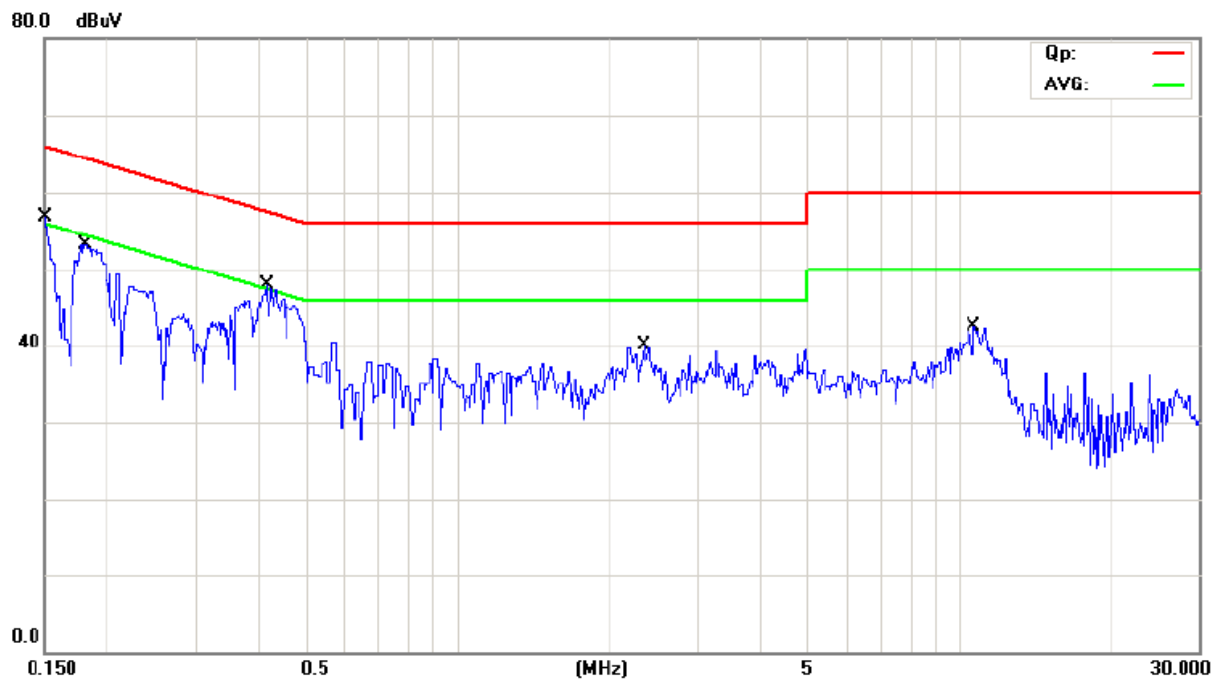
The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

A: Conducted Emission on Live Terminal (150kHz to 30MHz)
EUT Operating Environment

Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Transmitting
Equipment Level: Class B
Results: Pass

Please refer to following diagram for individual



Frequency (MHz)	Line	Reading(dBμV)		Limit(dBμV)	
		Quasi-peak	Average	Quasi-peak	Average
0.414	Live	43.28	21.28	57.56	47.56
0.178	Live	40.73	11.63	64.57	54.57
0.150	Live	56.69	15.49	66.00	56.00
2.356	Live	34.01	15.01	56.00	46.00
10.687	Live	34.54	12.54	60.00	50.00

B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

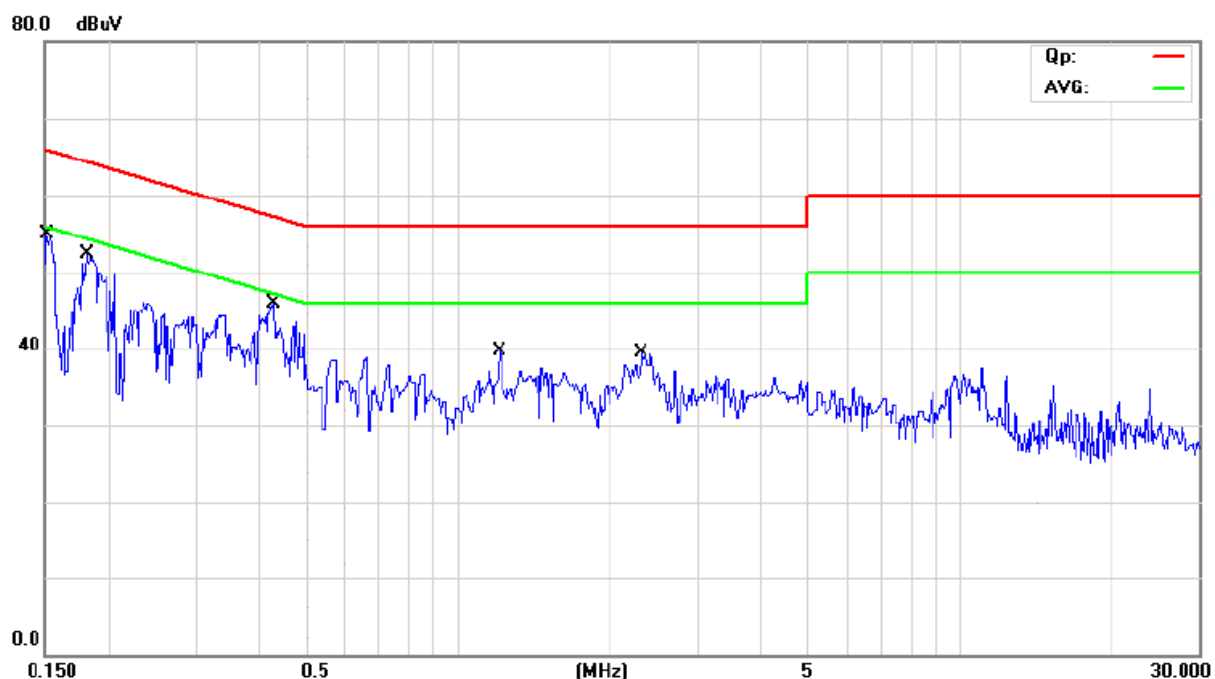
Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



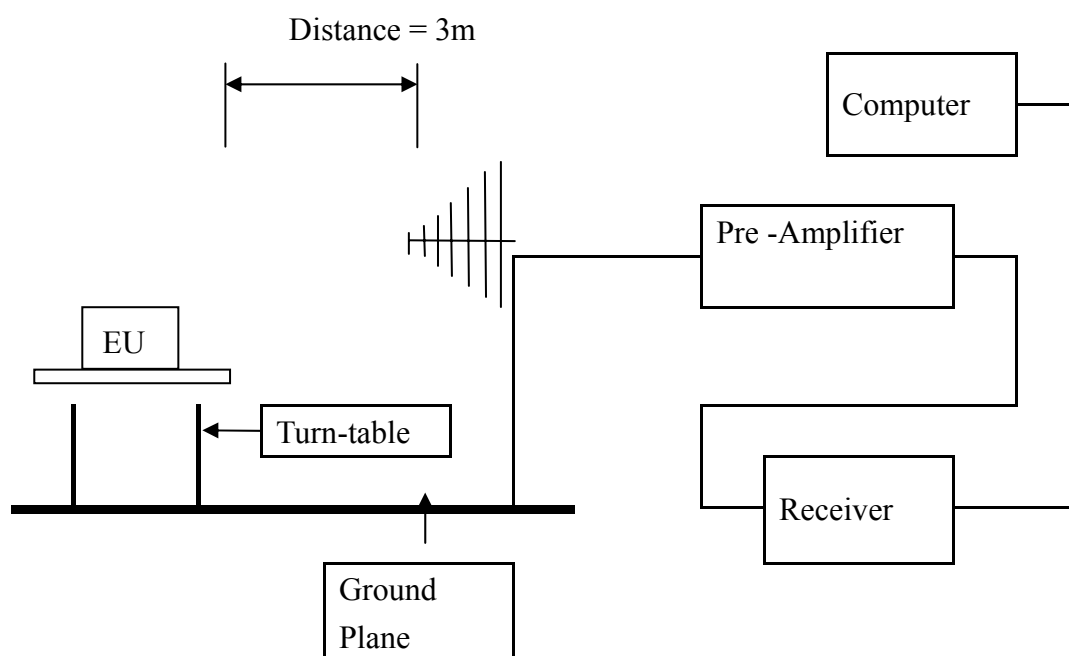
Frequency (MHz)	Line	Reading(dBμV)		Limit(dBμV)	
		Quasi-peak	Average	Quasi-peak	Average
0.150	Neutral	54.83	30.53	65.96	55.96
0.182	Neutral	52.30	31.40	64.38	54.38
0.426	Neutral	41.91	22.61	57.32	47.32
2.311	Neutral	39.42	21.42	56.00	46.00
1.220	Neutral	39.77	19.77	56.00	46.00

6 Radiated Emission Test

6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

Block diagram of Test setup



6.2 Configuration of The EUT

Same as section 5.3 of this report

**6.3 EUT Operating Condition**

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.209 and 15.109

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

- Note:
1. RF Voltage (dBuV) = 20 log RF Voltage (μ V)
 2. In the Above Table, the higher limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
 4. Worse case was recorded

**Test result****General Radiated Emission Data and Harmonics Radiated Emission Data****Radiated Emission In Horizontal (30MHz----1000MHz)**

EUT set Condition: Keep Transmitting

Results: Pass

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
199.520	35.29	H	43.50
266.000	41.17	H	46.00
297.000	44.11	H	46.00
465.480	45.05	H	46.00
139.640	39.24	V	43.50
297.000	36.51	V	46.00
359.920	37.99	V	46.00
465.480	44.46	V	46.00

Test Figure:

H



MARKER 3

297 MHz

Att 10 dB

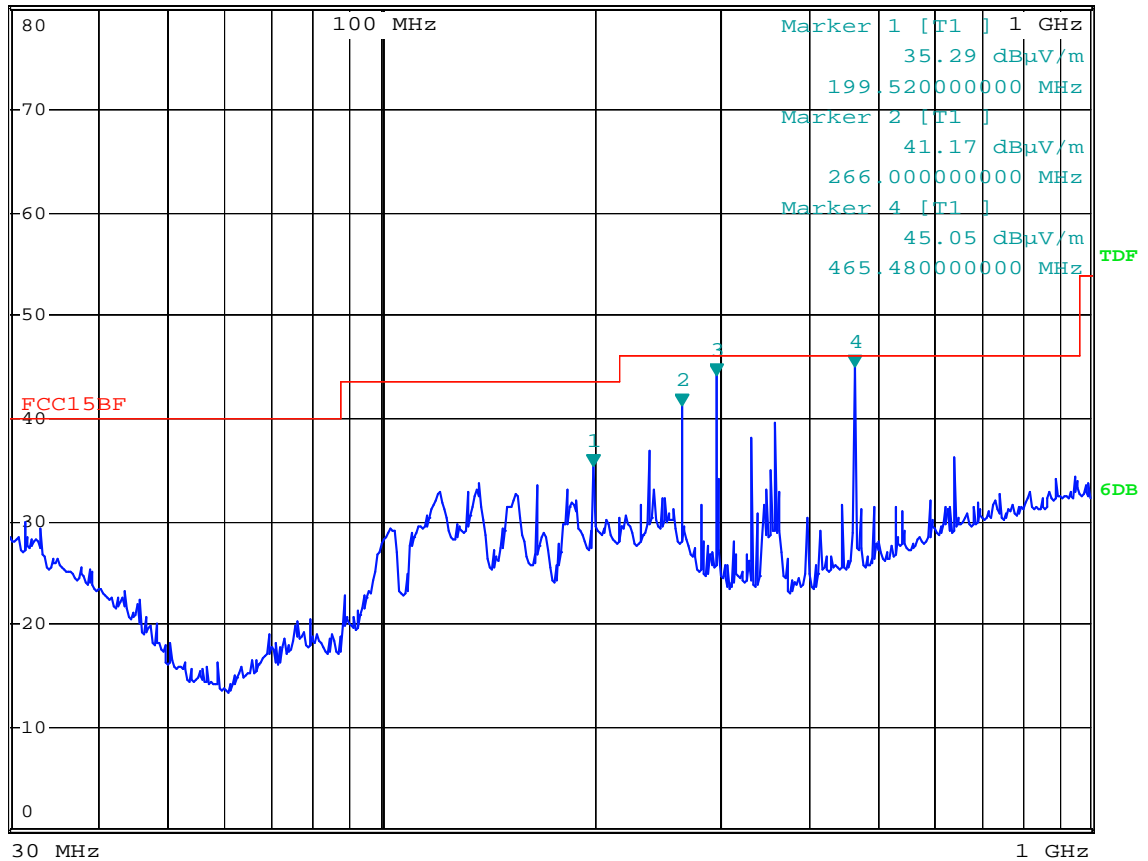
RBW 120 kHz Marker 3 [T1]

MT 50 μ s 44.11 dB μ V/m

PREAMP ON 297.000000000 MHz

dB μ V
/m

1 PK
MAXH



Date: 26.FEB.2013 09:50:17

Test Figure:

V



RECEIVER FREQUENCY

139.64 MHz

Att 10 dB

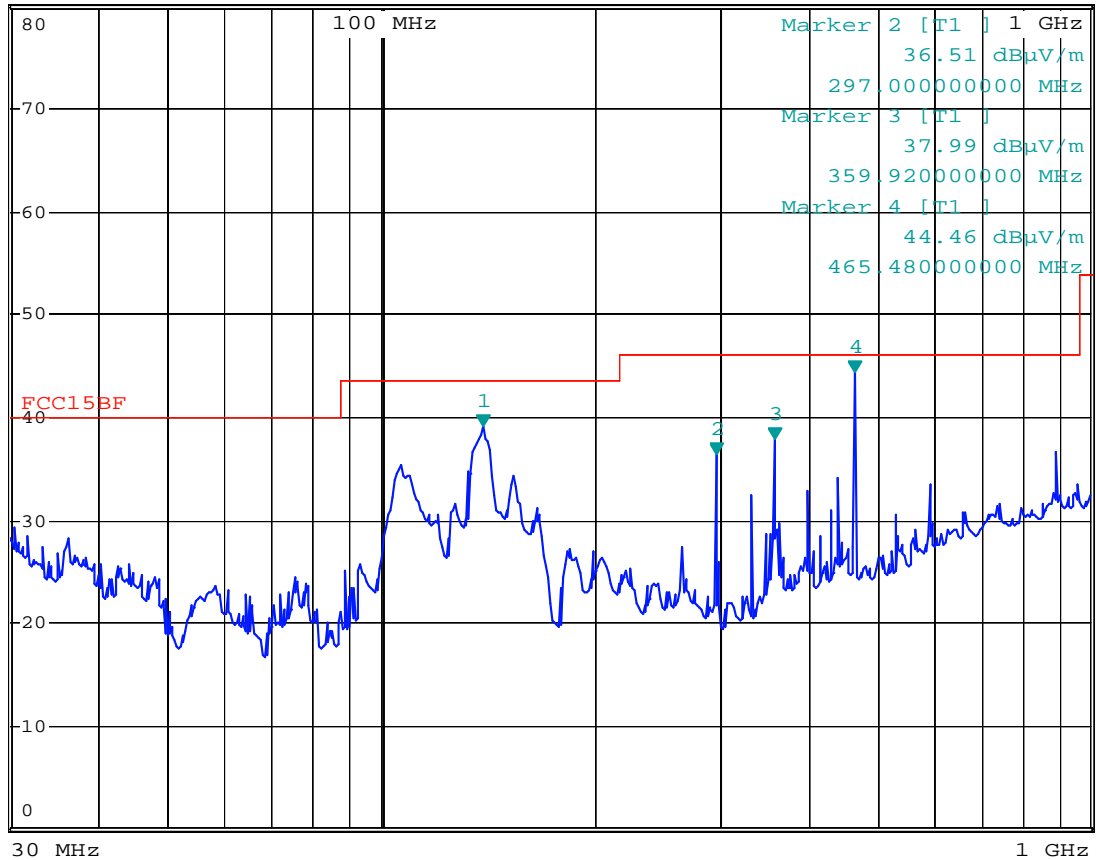
RBW 120 kHz Marker 1 [T1]

MT 100 ms 39.24 dBμV/m

PREAMP ON 139.64000000 MHz

dBμV
/m

1 PK
MAXH



TDF

6DB

Date: 26.FEB.2013 09:54:14



Operation Mode: Transmitting & Receiving under CH01 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2412.00	96.36 (PK)	H	Fundamental Frequency
2412.00	96.42 (PK)	V	
4824.00	--	H	--
4824.00	--	V	
7236.00	--	H/V	74(Peak)/ 54(AV)
9648.00	--	H/V	74(Peak)/ 54(AV)
12060	--	H/V	74(Peak)/ 54(AV)
14472	--	H/V	74(Peak)/ 54(AV)
16884	--	H/V	74(Peak)/ 54(AV)
19296	--	H/V	74(Peak)/ 54(AV)
21708	--	H/V	74(Peak)/ 54(AV)
24120	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11b mode at 11Mbps

Operation Mode: Transmitting & Receiving under CH06 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2437.00	96.55 (PK)	H	Fundamental Frequency
2437.00	95.51 (PK)	V	
4874.00	--	H	--
4874.00	--	V	
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11b mode at 11Mbps

Operation Mode: Transmitting & Receiving under CH11 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2462.00	95.62 (PK)	H	Fundamental Frequency
2462.00	96.31 (PK)	V	
4924	--	H	--
4924	--	V	
7386	--	H/V	74(Peak)/ 54(AV)
9848	--	H/V	74(Peak)/ 54(AV)
12310	--	H/V	74(Peak)/ 54(AV)
14772	--	H/V	74(Peak)/ 54(AV)
17234	--	H/V	74(Peak)/ 54(AV)
19696	--	H/V	74(Peak)/ 54(AV)
22158	--	H/V	74(Peak)/ 54(AV)
24620	--	H/V	74(Peak)/ 54(AV)

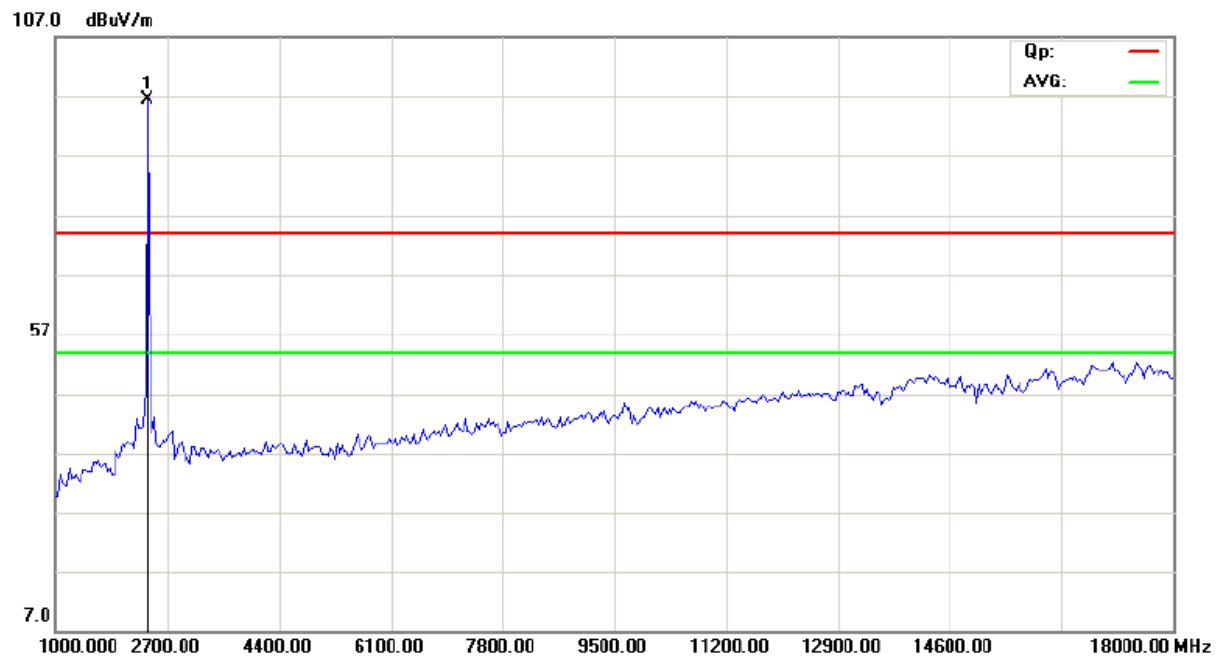
Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

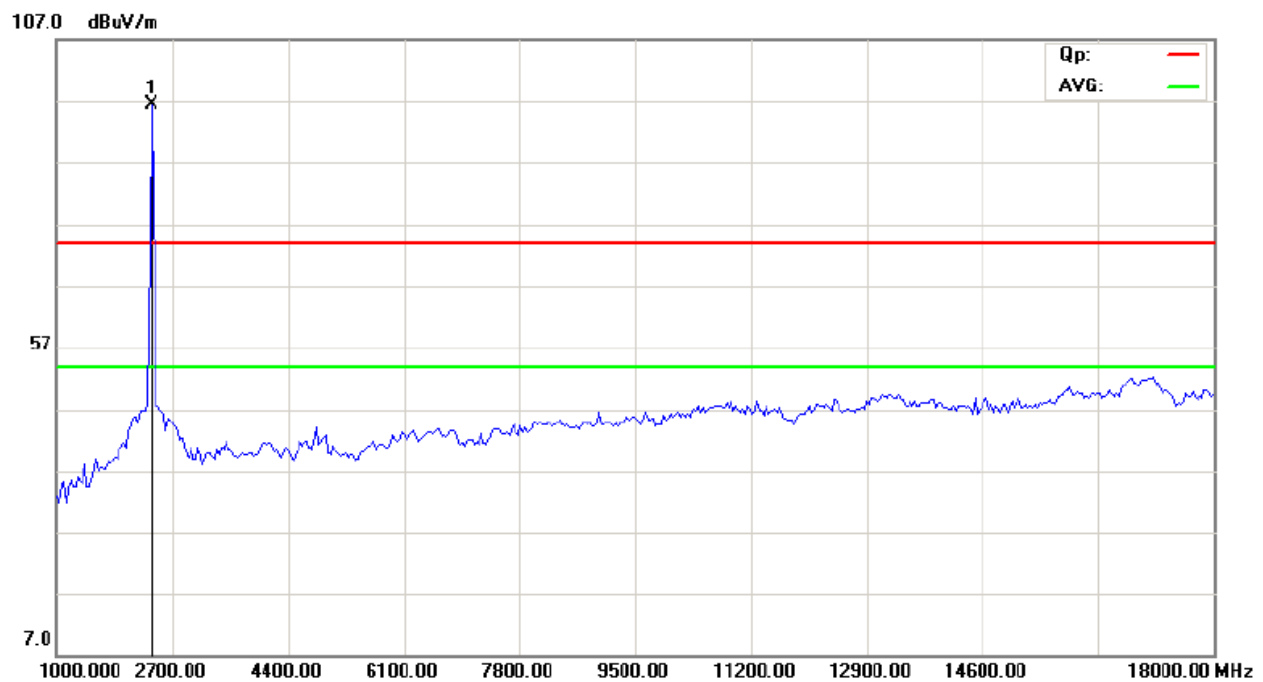
3. For 802.11b mode at 11Mbps

Please refer to the following test plots for details:

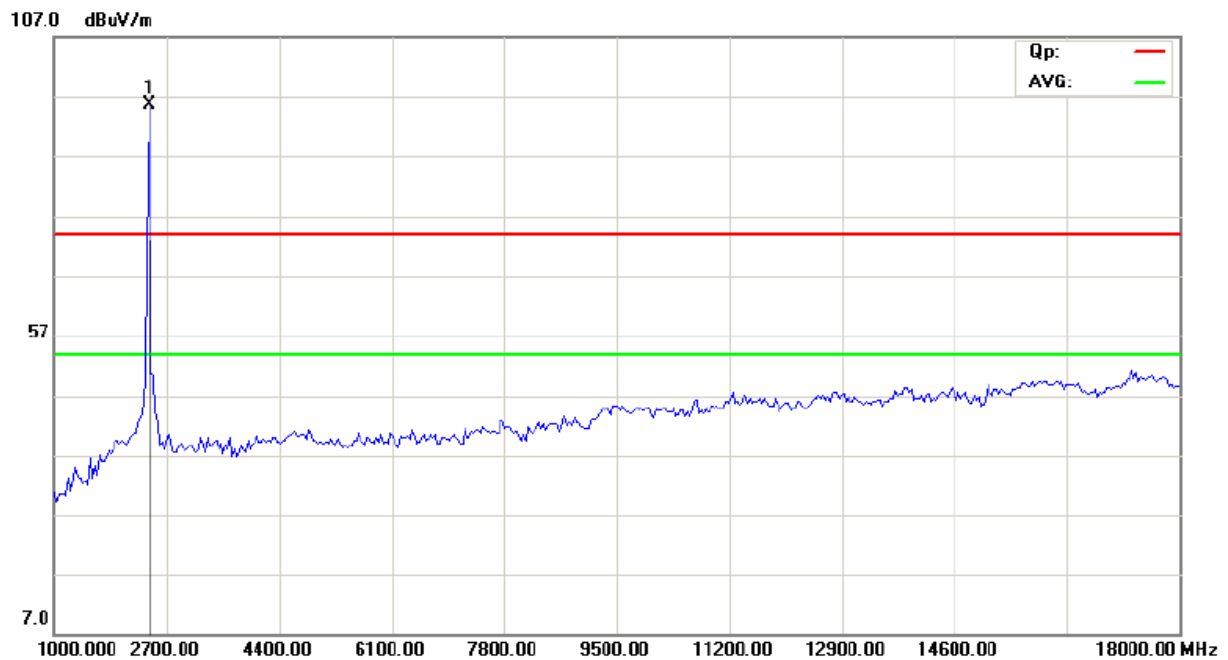
CH01 at 11Mbps: Horizontal



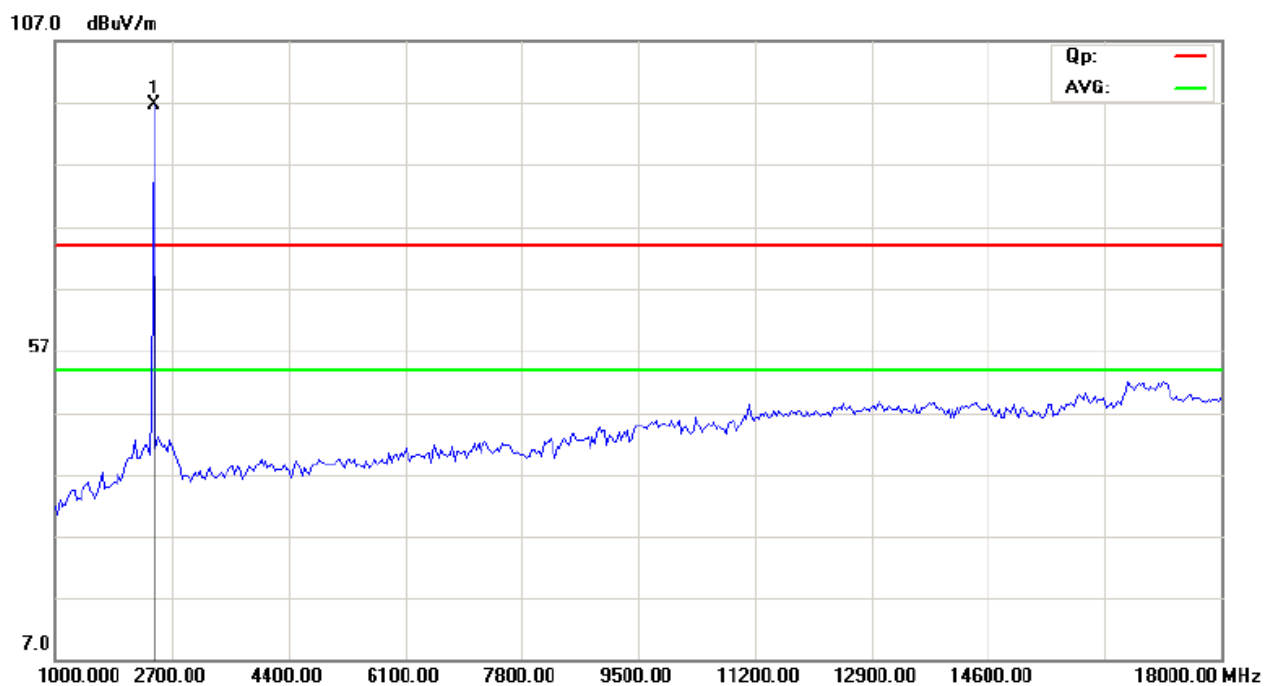
CH01 at 11Mbps: Vertical



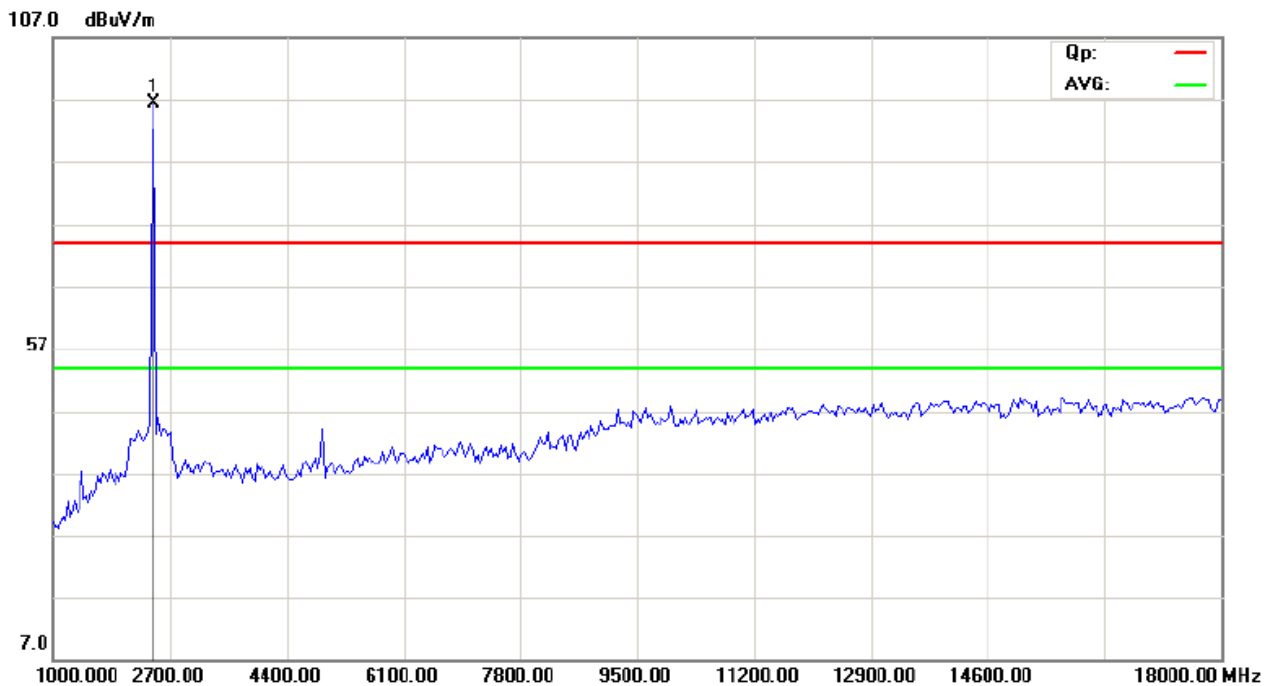
CH06 at 11Mbps: Vertical



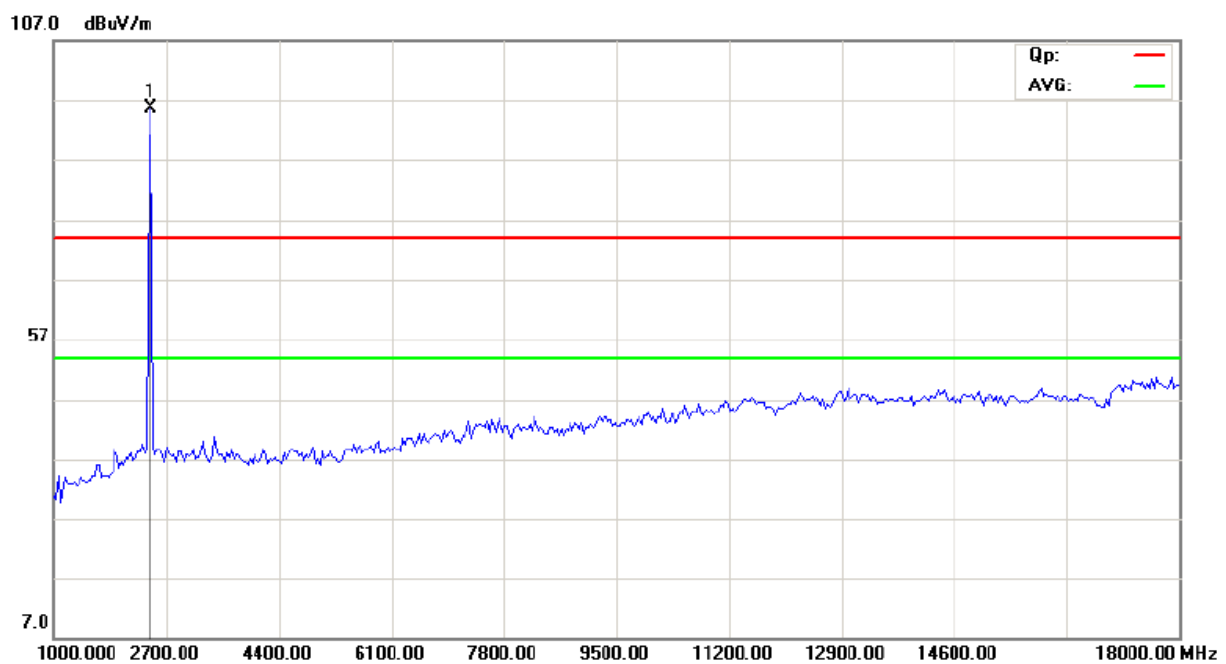
CH06 at 11Mbps: Horizontal



CH11 at 11Mbps: Vertical



CH11at 11Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

Operation Mode: Transmitting & Receiving under CH01 for 11g at 54 Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2412.00	96.51 (PK)	H	Fundamental Frequency
2412.00	96.94 (PK)	V	
4824.00	--	H	--
4824.00	--	V	
7236.00	--	H/V	74(Peak)/ 54(AV)
9648.00	--	H/V	74(Peak)/ 54(AV)
12060	--	H/V	74(Peak)/ 54(AV)
14472	--	H/V	74(Peak)/ 54(AV)
16684	--	H/V	74(Peak)/ 54(AV)
19296	--	H/V	74(Peak)/ 54(AV)
21708	--	H/V	74(Peak)/ 54(AV)
24120	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11g mode 54Mbps

**Operation Mode: Transmitting & Receiving under CH06 for 11g at 54 Mbps**

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2437.00	94.72 (PK)	H	Fundamental Frequency
2437.00	98.15 (PK)	V	
4874.00	--	H	--
4874.00	42.46 (PK)	V	
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11g mode 54Mbps

Operation Mode: Transmitting & Receiving under CH11 for 11g at 54 Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2462.00	97.10 (PK)	H	Fundamental Frequency
2462.00	97.19 (PK)	V	
4924	--	H	--
4924	--	V	
7386	--	H/V	74(Peak)/ 54(AV)
9848	--	H/V	74(Peak)/ 54(AV)
12310	--	H/V	74(Peak)/ 54(AV)
14772	--	H/V	74(Peak)/ 54(AV)
17234	--	H/V	74(Peak)/ 54(AV)
19696	--	H/V	74(Peak)/ 54(AV)
22158	--	H/V	74(Peak)/ 54(AV)
24620	--	H/V	74(Peak)/ 54(AV)

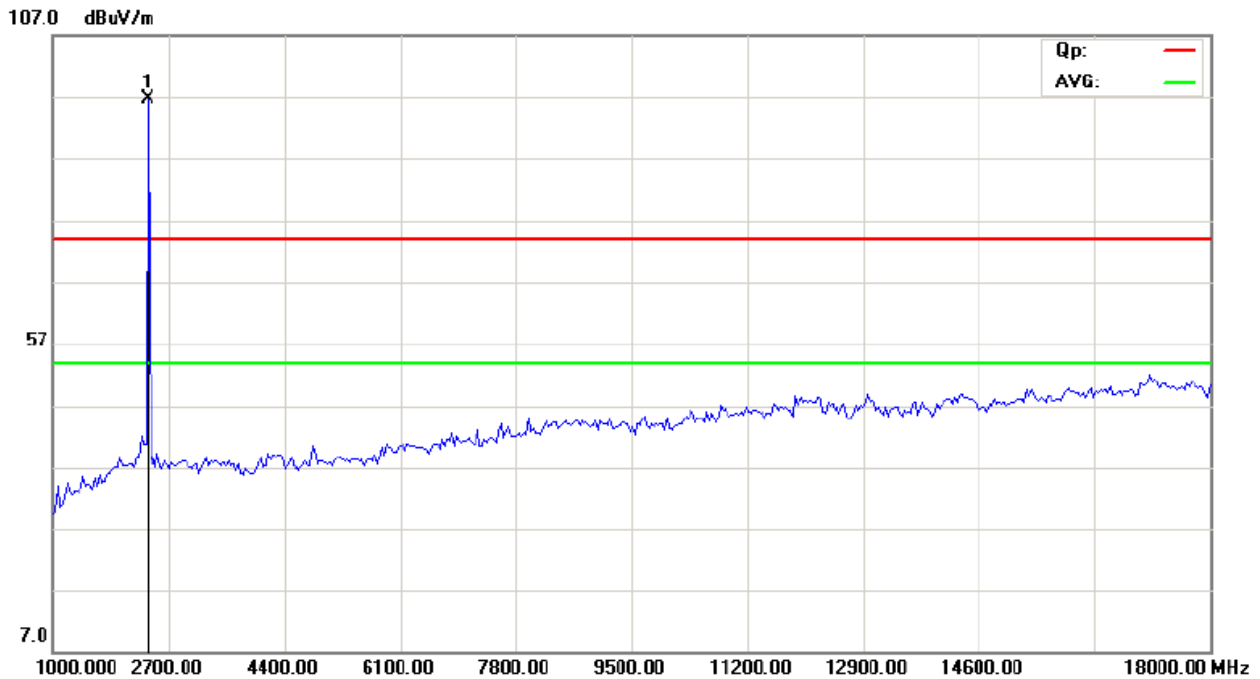
Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

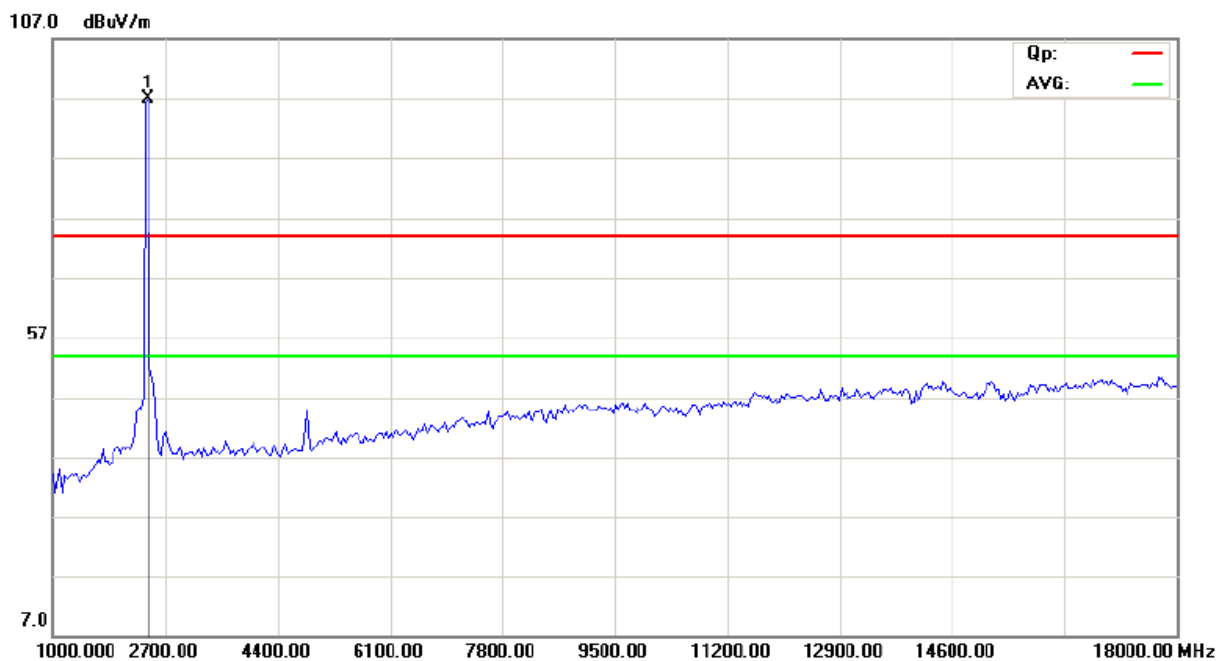
3. For 802.11g mode 54Mbps

Please refer to the following test plots for details:

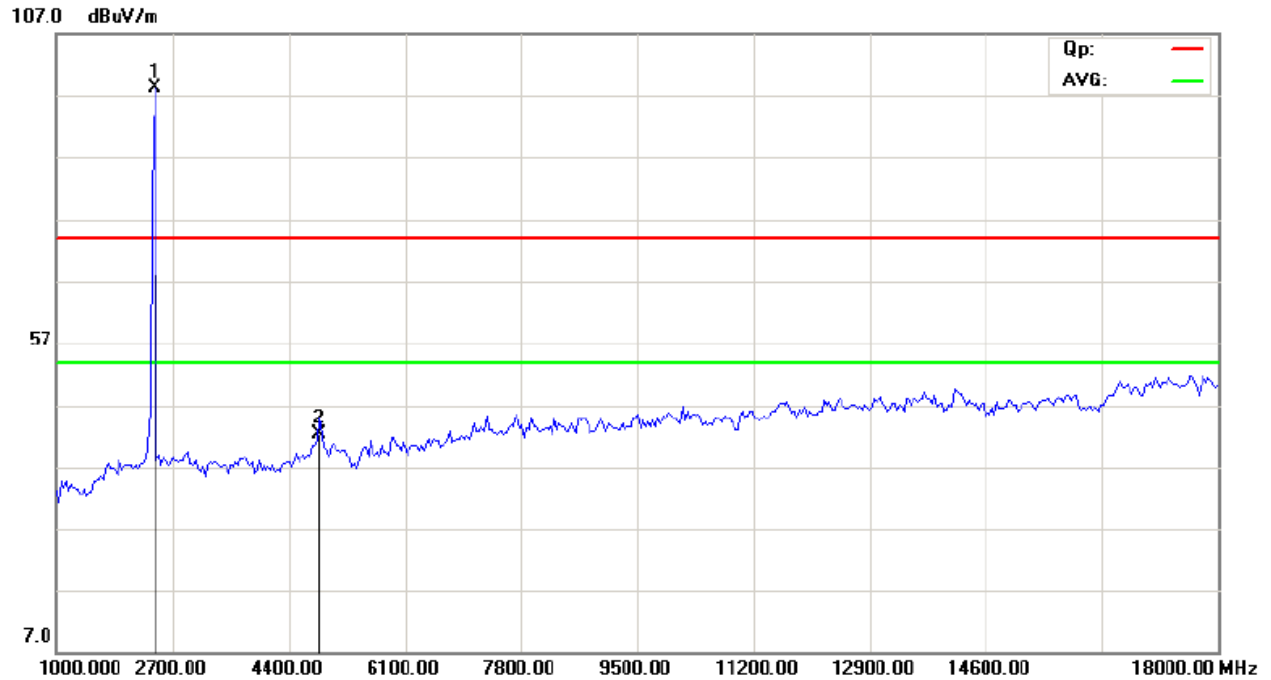
CH01 at 54Mbps: Horizontal



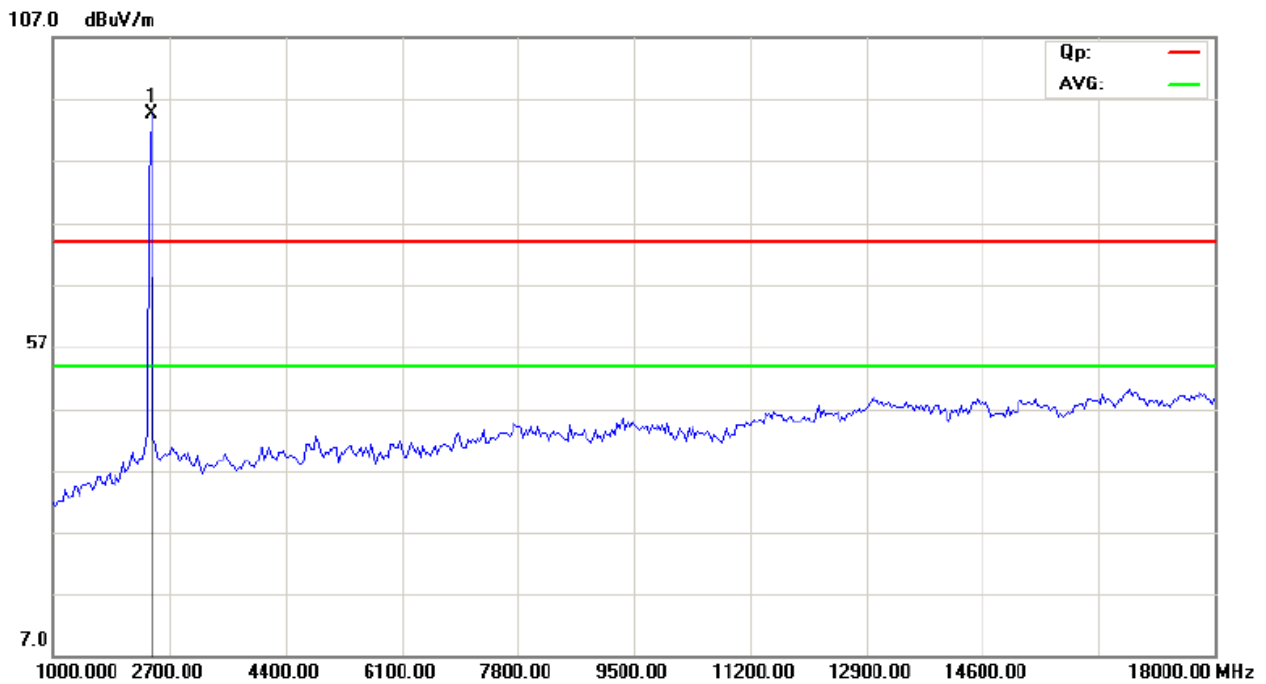
CH01 at 54Mbps: Vertical



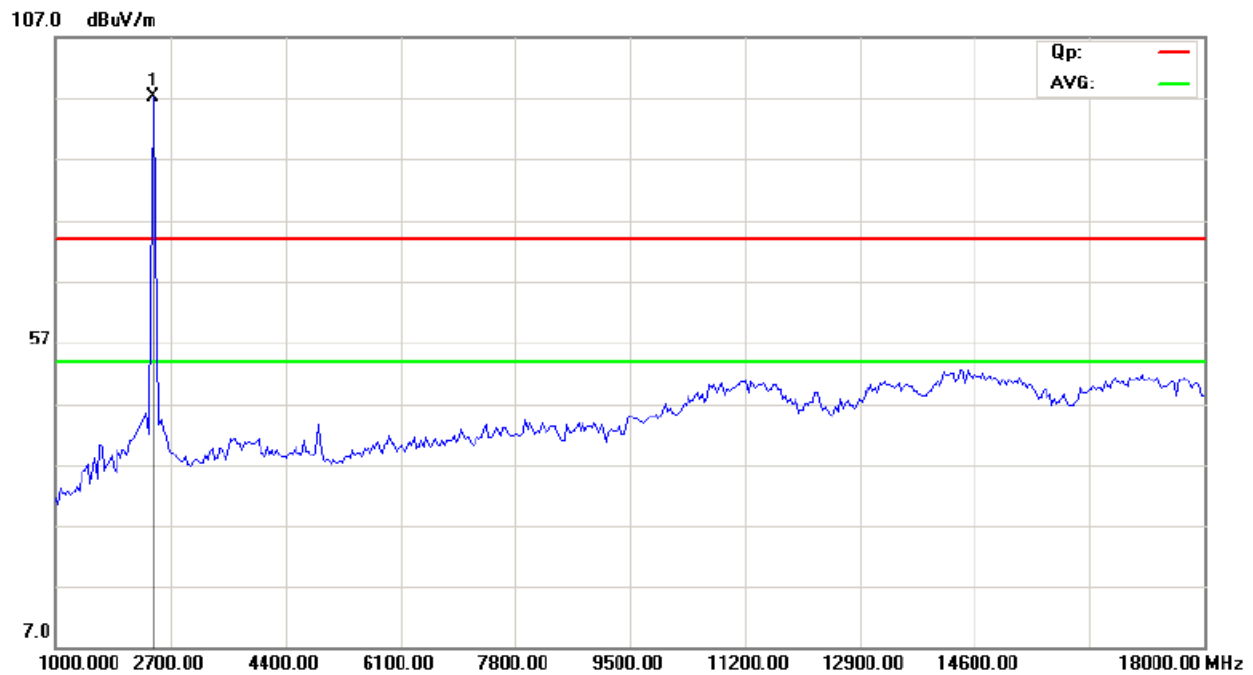
CH06 at 54Mbps: Vertical



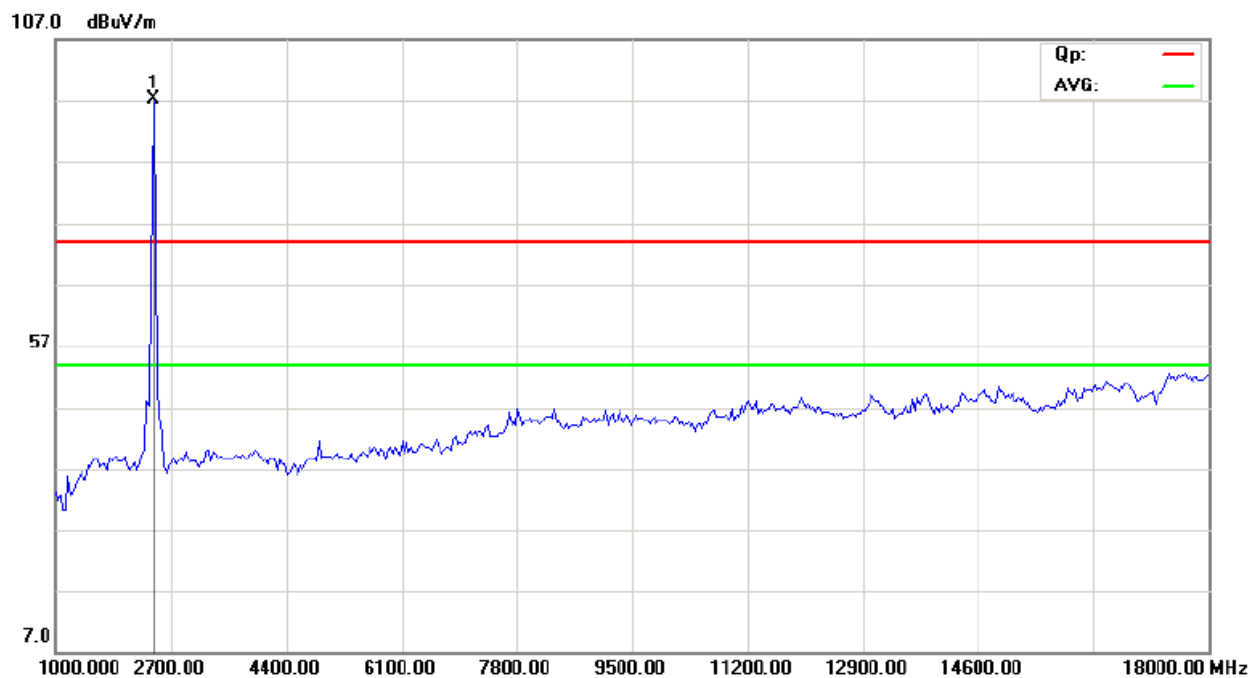
CH06 at 54Mbps: Horizontal



CH11 at 54Mbps: Vertical



CH11 at 54 Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

Operation Mode: Transmitting & Receiving under CH01 for 11n HT20 at 65Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2412.00	95.76 (PK)	H	Fundamental Frequency
2412.00	96.26 (PK)	V	
4824.00	--	H	74(Peak)/ 54(AV)
4824.00	--	V	74(Peak)/ 54(AV)
7236.00	--	H/V	74(Peak)/ 54(AV)
9648.00	--	H/V	74(Peak)/ 54(AV)
12060	--	H/V	74(Peak)/ 54(AV)
14472	--	H/V	74(Peak)/ 54(AV)
16684	--	H/V	74(Peak)/ 54(AV)
19296	--	H/V	74(Peak)/ 54(AV)
21708	--	H/V	74(Peak)/ 54(AV)
24120	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11n HT20 at 65Mbps

Operation Mode: Transmitting & Receiving under CH06 for 11n HT20 at 65Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2437.00	96.13 (PK)	H	Fundamental Frequency
2437.00	96.15 (PK)	V	
4874.00	--	H	74(Peak)/ 54(AV)
4874.00	--	V	74(Peak)/ 54(AV)
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802. 11n HT20 at 65bps

Operation Mode: Transmitting & Receiving under CH11 for 11n HT20 at 65Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2462.00	97.38 (PK)	H	Fundamental Frequency
2462.00	96.17 (PK)	V	
4924	44.29 (PK)	H	74(Peak)/ 54(AV)
4924	--	V	74(Peak)/ 54(AV)
7386	--	H/V	74(Peak)/ 54(AV)
9848	--	H/V	74(Peak)/ 54(AV)
12310	--	H/V	74(Peak)/ 54(AV)
14772	--	H/V	74(Peak)/ 54(AV)
17234	--	H/V	74(Peak)/ 54(AV)
19696	--	H/V	74(Peak)/ 54(AV)
22158	--	H/V	74(Peak)/ 54(AV)
24620	--	H/V	74(Peak)/ 54(AV)

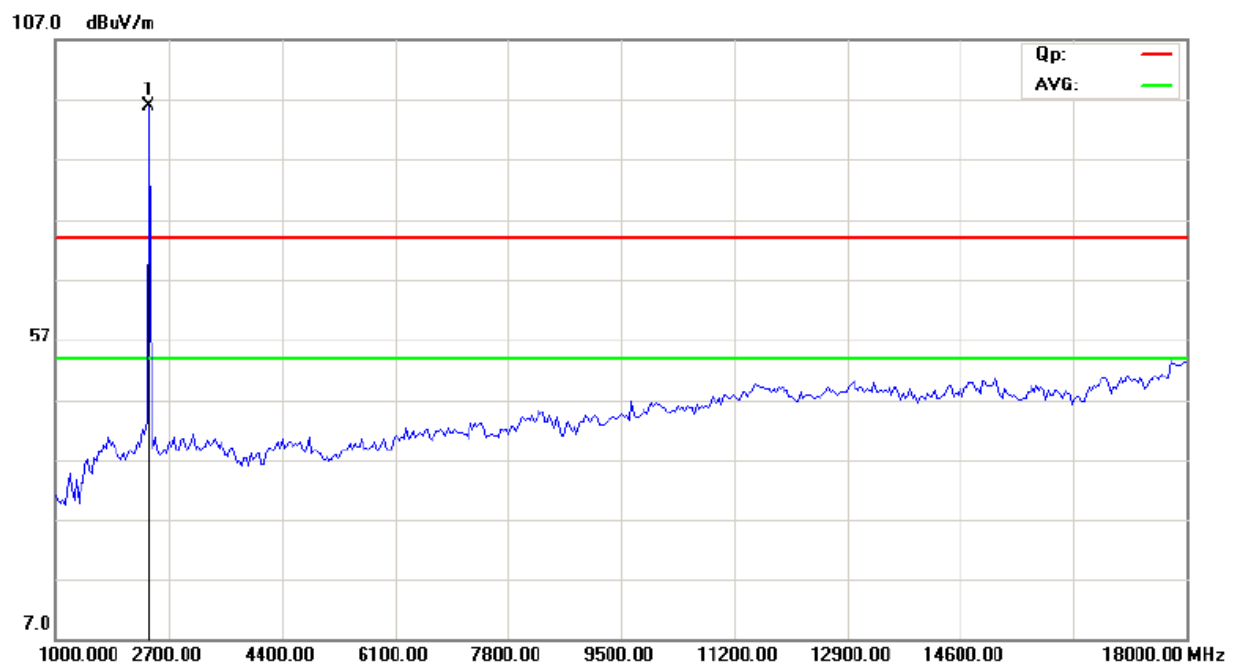
Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

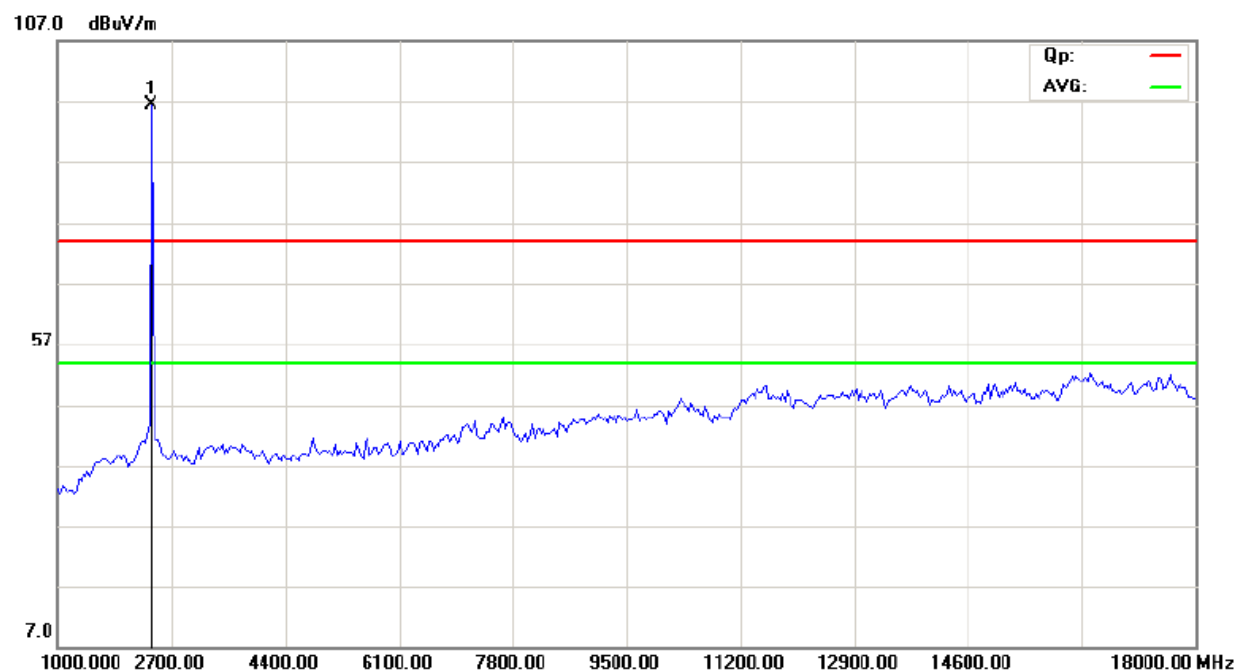
3. For 802. 11n HT20 at 65bps

Please refer to the following test plots for details:

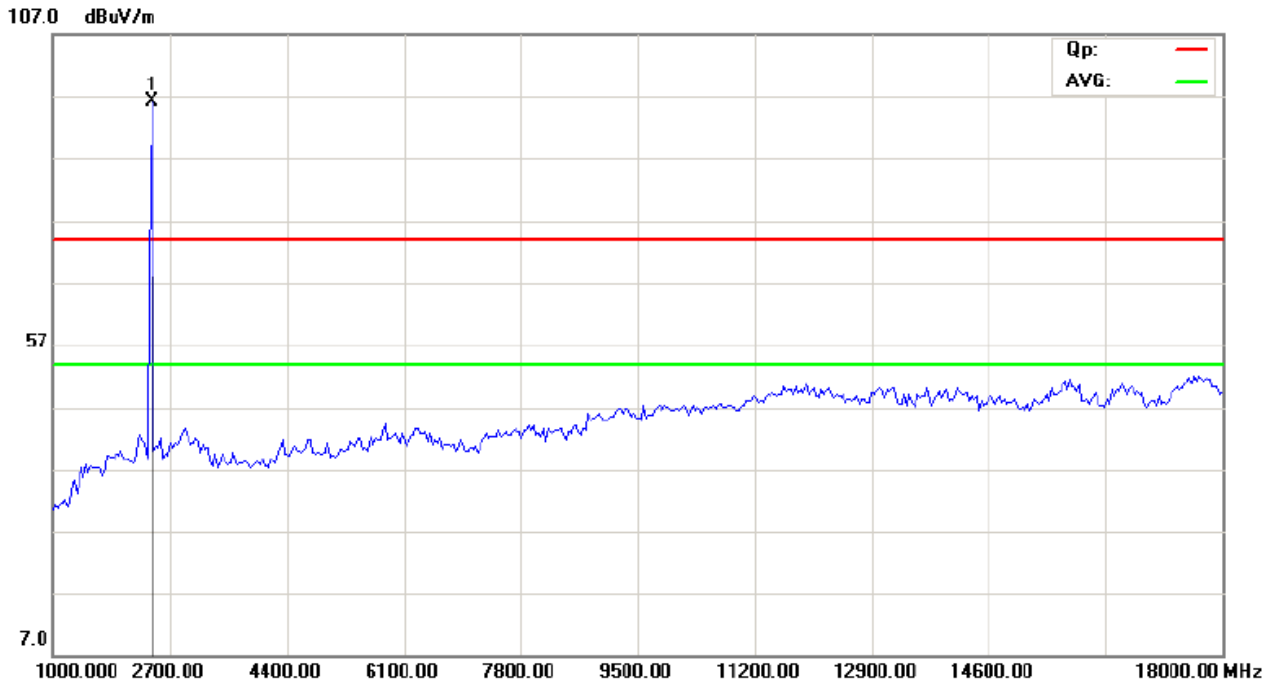
CH01 at 11n HT20: Horizontal



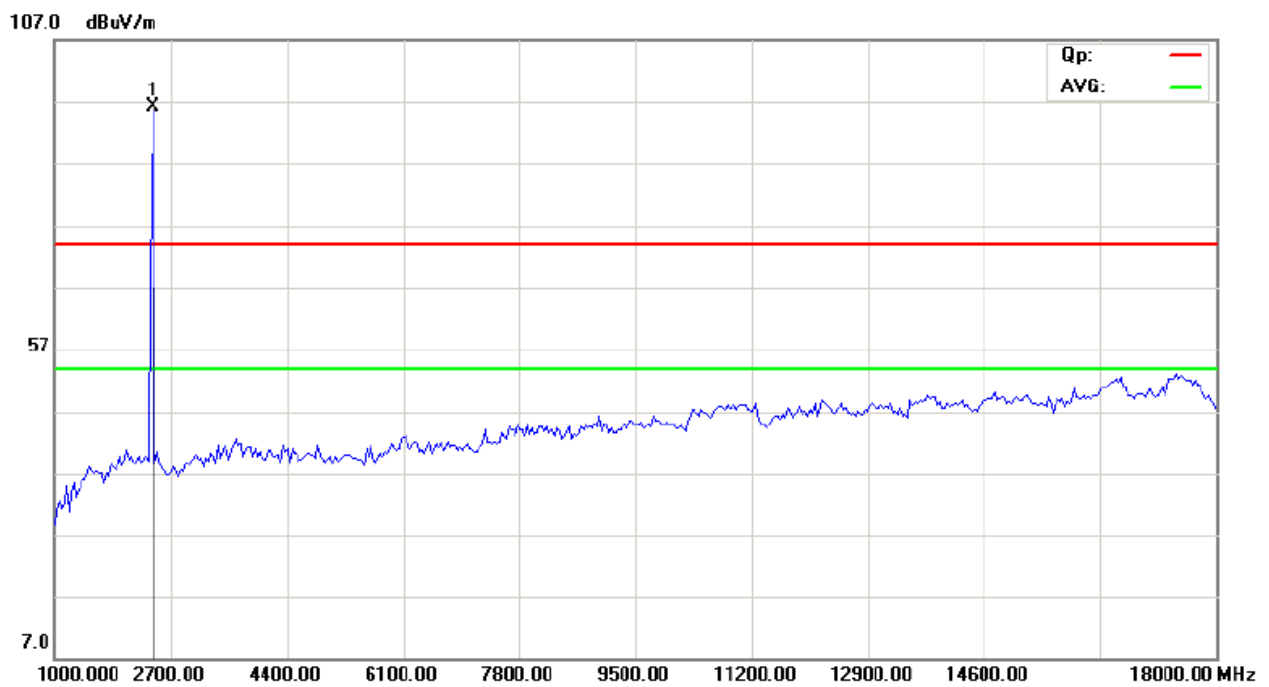
CH01 at 11n HT20: Vertical



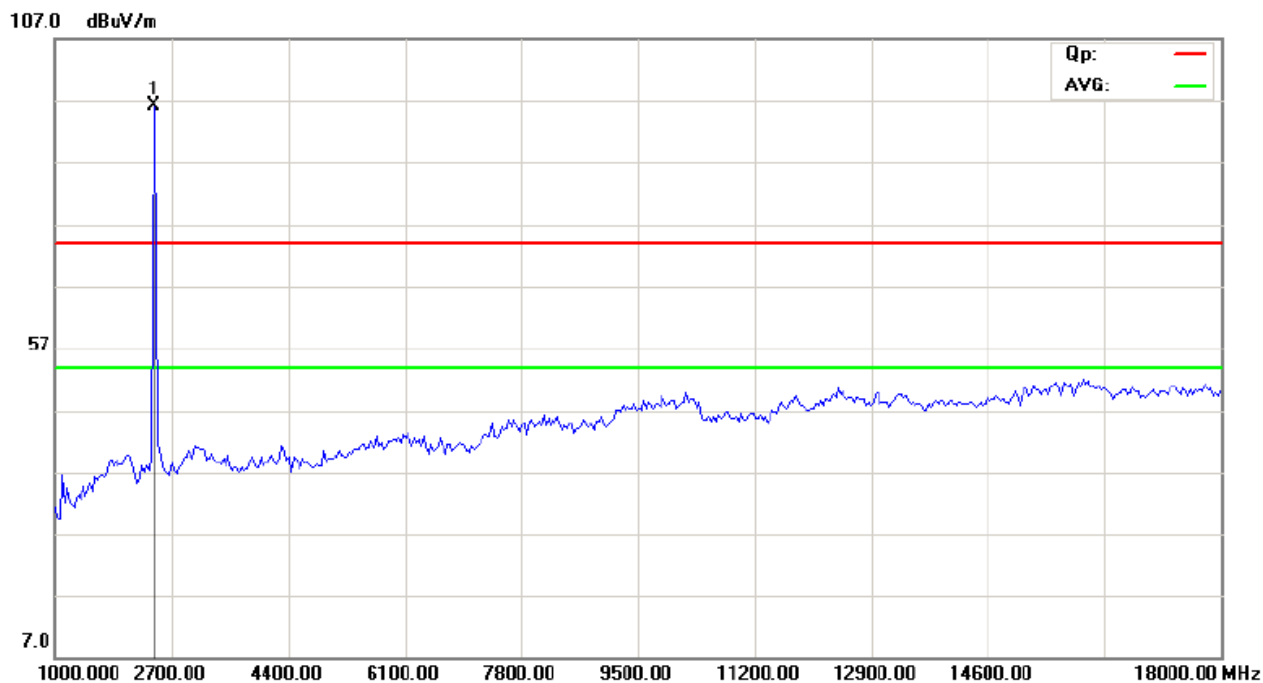
CH06 at 11n HT20: Vertical



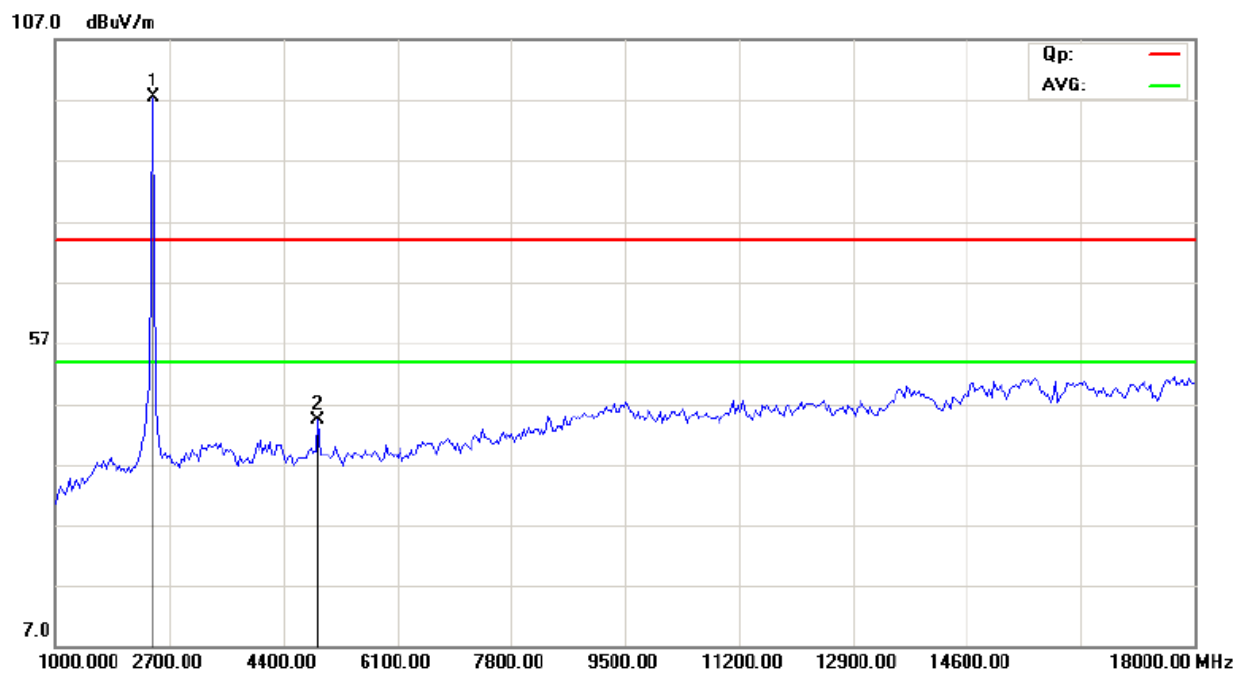
CH06 at 11n HT20: Horizontal



CH11 at 11n HT20: Vertical



CH11 at 11n HT20: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

Operation Mode: Transmitting & Receiving under CH01 for 11n HT40 at 65Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2422.00	97.39 (PK)	H	Fundamental Frequency
2422.00	97.69 (PK)	V	
4844.00	46.78 (PK)	H	--
4844.00	--	V	
7266.00	--	H/V	74(Peak)/ 54(AV)
9688.00	--	H/V	74(Peak)/ 54(AV)
12110	--	H/V	74(Peak)/ 54(AV)
14532	--	H/V	74(Peak)/ 54(AV)
16954	--	H/V	74(Peak)/ 54(AV)
19376	--	H/V	74(Peak)/ 54(AV)
21798	--	H/V	74(Peak)/ 54(AV)
24220	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11n HT40 at 65bps

Operation Mode: Transmitting & Receiving under CH04 for 11n HT40 at 65Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2437.00	95.47 (PK)	V	Fundamental Frequency
2437.00	97.44 (PK)	H	
4874.00	--	V	--
4874.00	--	H	
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802. 11n HT40 at 65bps

Operation Mode: Transmitting & Receiving under CH07 for 11n HT40 at 65Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2452.00	94.93 (PK)	H	Fundamental Frequency
2452.00	97.86 (PK)	V	
4904	--	H	--
4904	--	V	
7356	--	H/V	74(Peak)/ 54(AV)
9808	--	H/V	74(Peak)/ 54(AV)
12260	--	H/V	74(Peak)/ 54(AV)
14712	--	H/V	74(Peak)/ 54(AV)
17164	--	H/V	74(Peak)/ 54(AV)
19616	--	H/V	74(Peak)/ 54(AV)
22068	--	H/V	74(Peak)/ 54(AV)
24520	--	H/V	74(Peak)/ 54(AV)

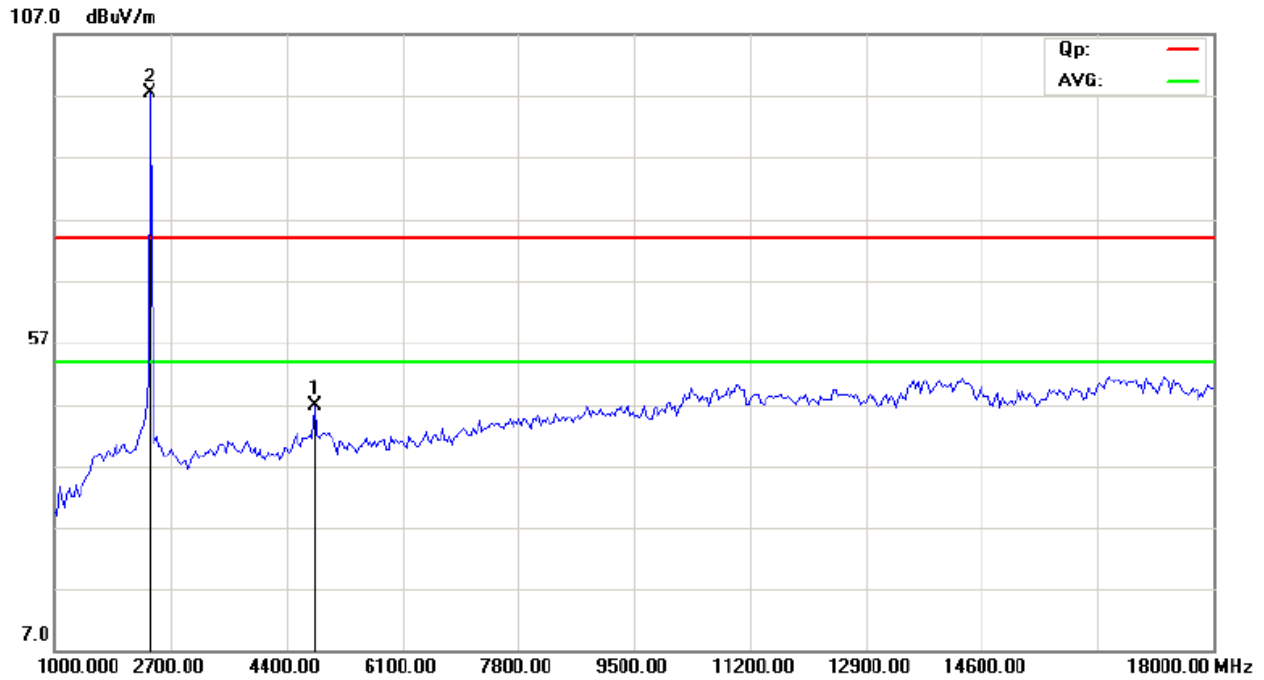
Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

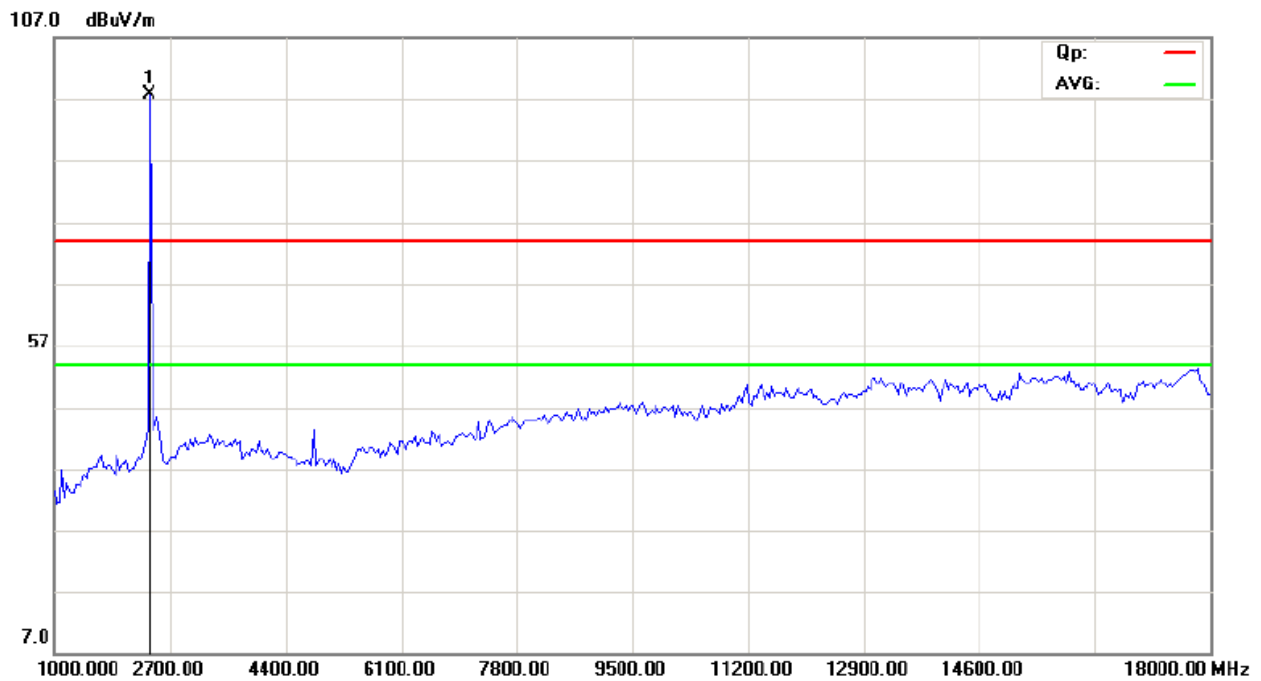
3. For 802. 11n HT40 at 65bps

Please refer to the following test plots for details:

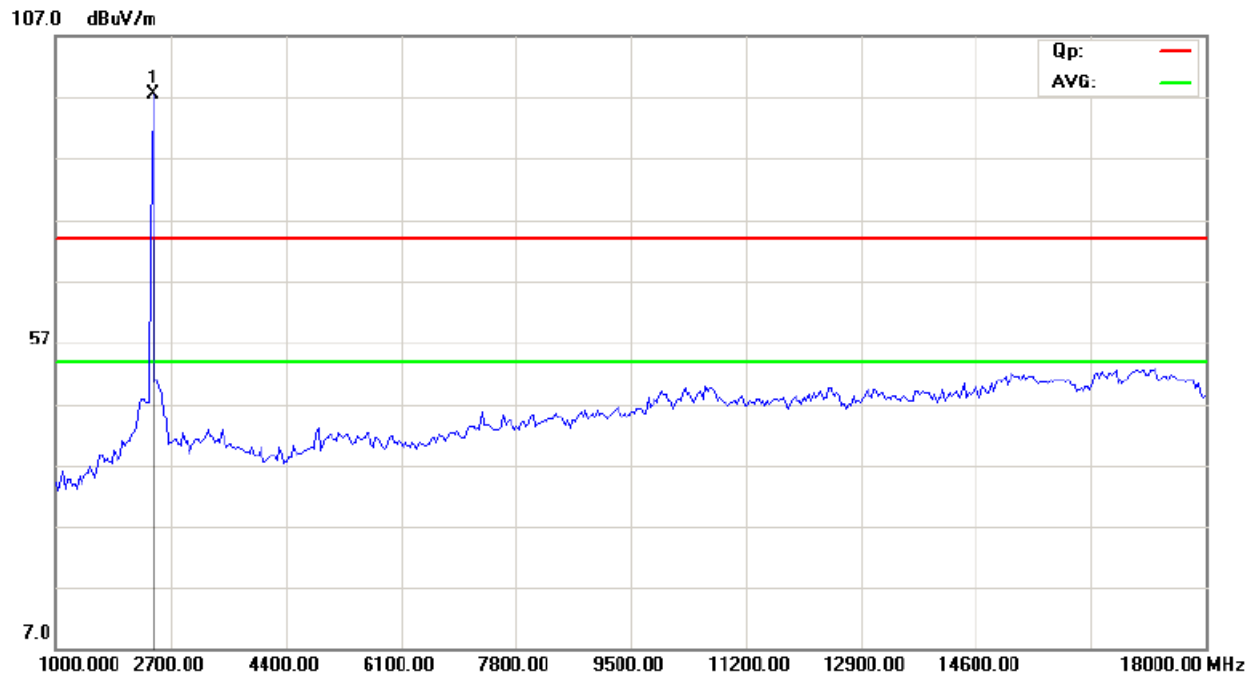
CH01 at 11n HT40: Horizontal



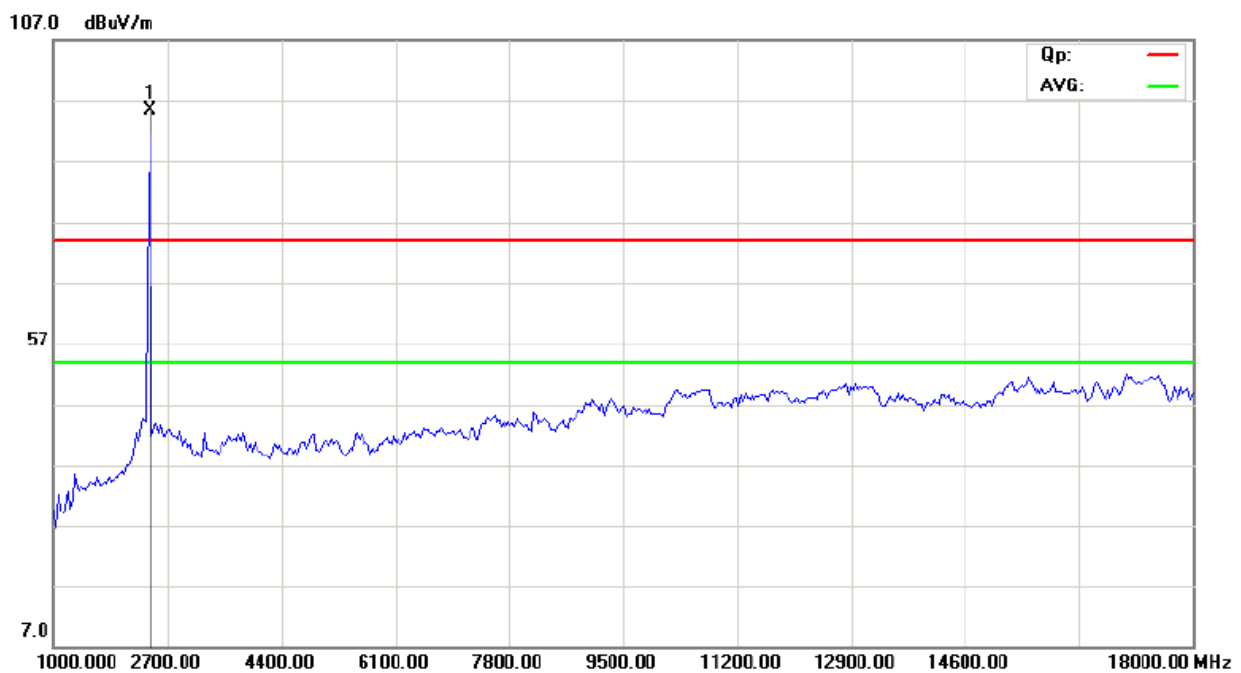
CH01 at 11n HT40: Vertical



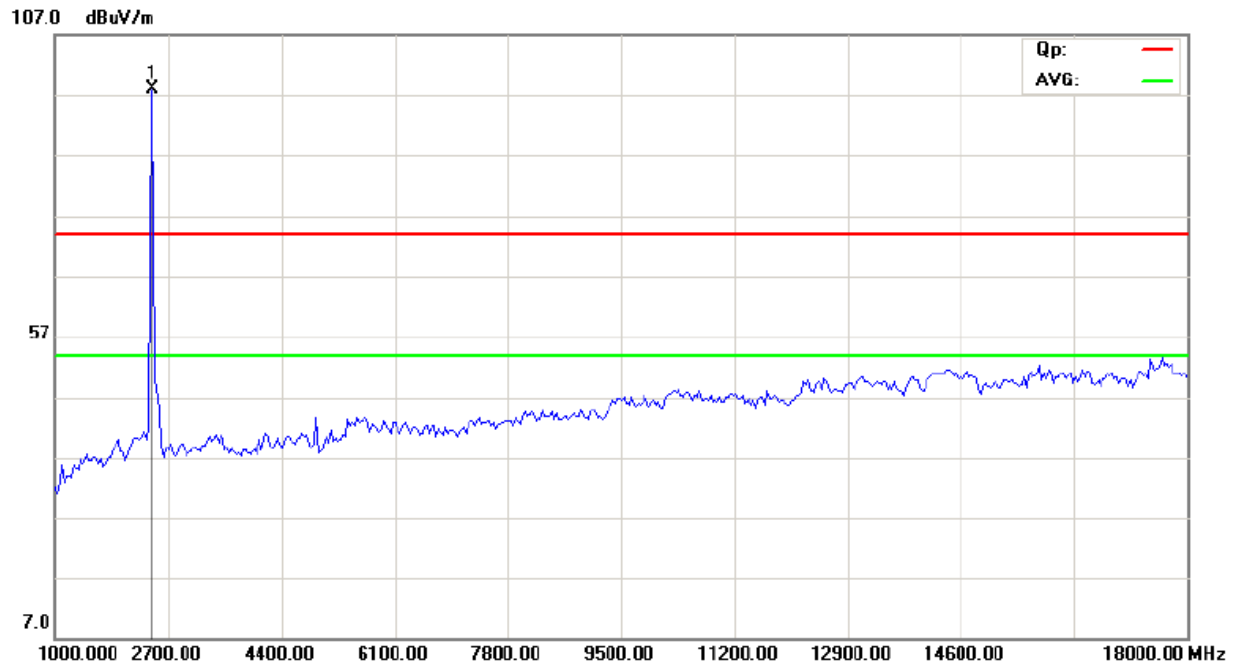
CH04 at 11n HT40: Vertical



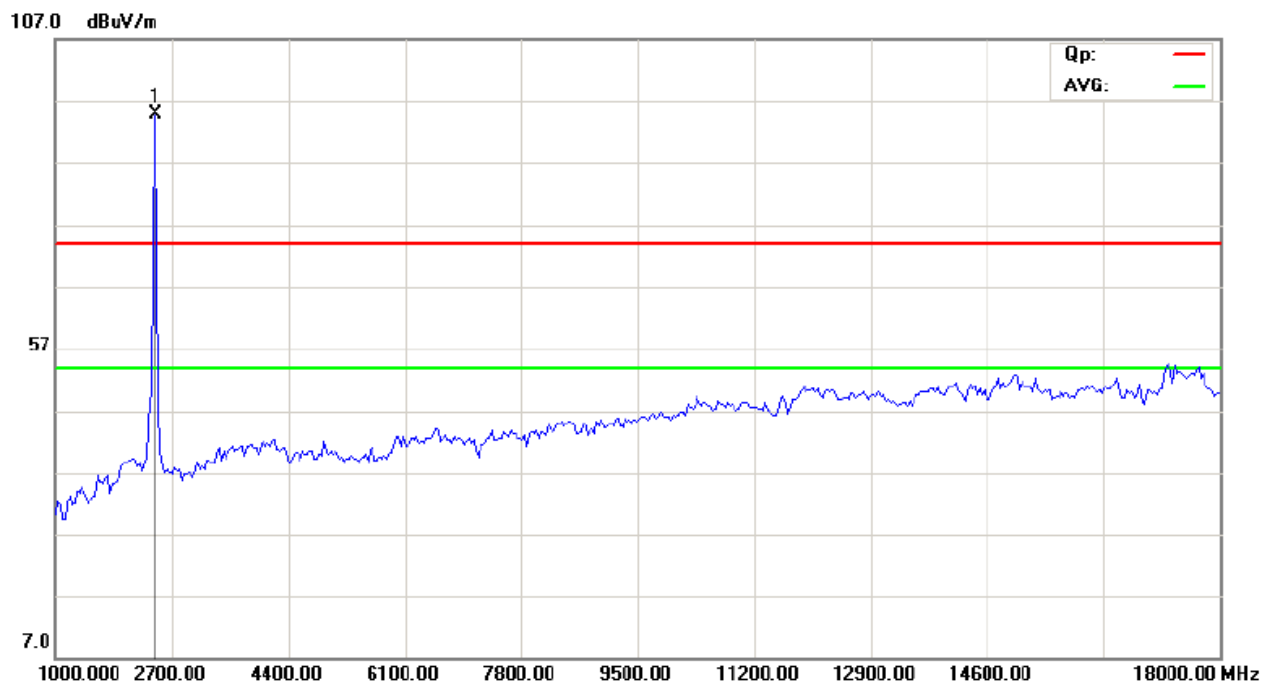
CH04 at 11n HT40: Horizontal



CH07 at 11n HT40: Vertical



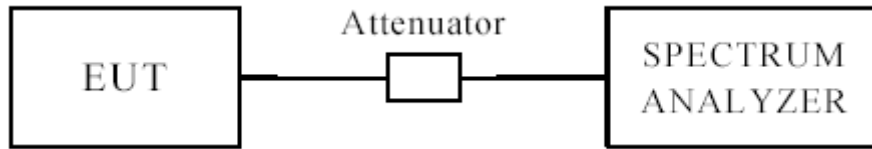
CH07 at 11n HT40: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

7.0 6dB Bandwidth Measurement

7.1 Test Setup



7.2 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is >500kHz

7.3 Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.4 Test Result



EUT	NVR		Model	ZH-NA04-W	
Mode	802.11b		Input Voltage	AC 120V	
Temperature	24 deg. C,		Humid Pity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412	1	10.08	0.5	Pass
6	2437	1	10.08	0.5	Pass
11	2462	1	10.08	0.5	Pass
1	2412	11	9.36	0.5	Pass
6	2437	11	9.36	0.5	Pass
11	2462	11	9.30	0.5	Pass

EUT	NVR		Model	ZH-NA04-W	
Mode	802.11g		Input Voltage	AC 120V	
Temperature	24 deg. C,		Humid Pity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412	54	16.38	0.5	Pass
6	2437	54	16.38	0.5	Pass
11	2462	54	16.38	0.5	Pass



EUT		NVR		Model	ZH-NA04-W
Mode		802.11n		Input Voltage	AC 120V
Temperature		24 deg. C,		Humid Pity	56% RH
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412	HT20	17.58	0.5	Pass
6	2437	HT20	17.58	0.5	Pass
11	2462	HT20	17.40	0.5	Pass
1	2422	HT40	35.42	0.5	Pass
4	2437	HT40	35.42	0.5	Pass
7	2452	HT40	35.42	0.5	Pass

**1. 802.11b at 1Mbps of CH01****DELTA MARKER 2**

10.08 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

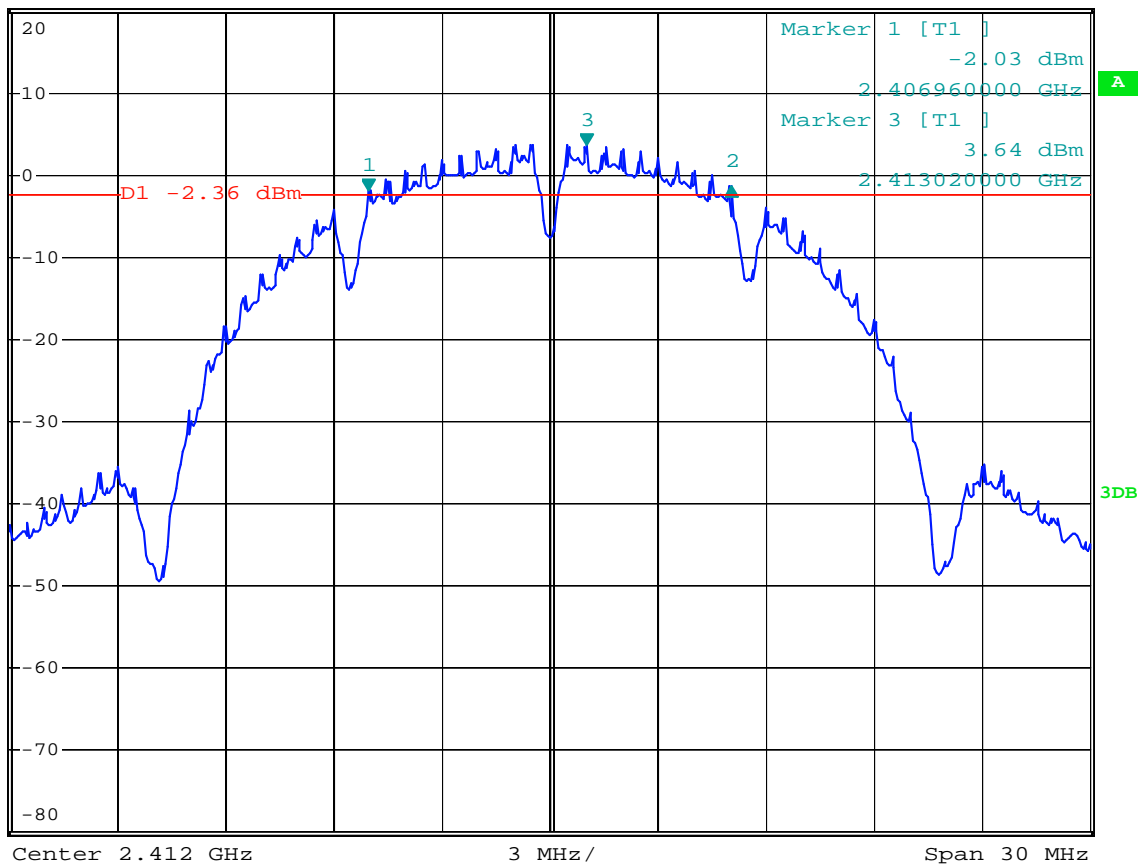
Delta 2 [T1]

* VBW 300 kHz

0.70 dB

SWT 5 ms

10.08000000 MHz

**1 PK
VIEW**

Date: 11.APR.2013 14:44:57

**2. 802.11b at 1Mbps of CH06****DELTA MARKER 2**

10.08 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

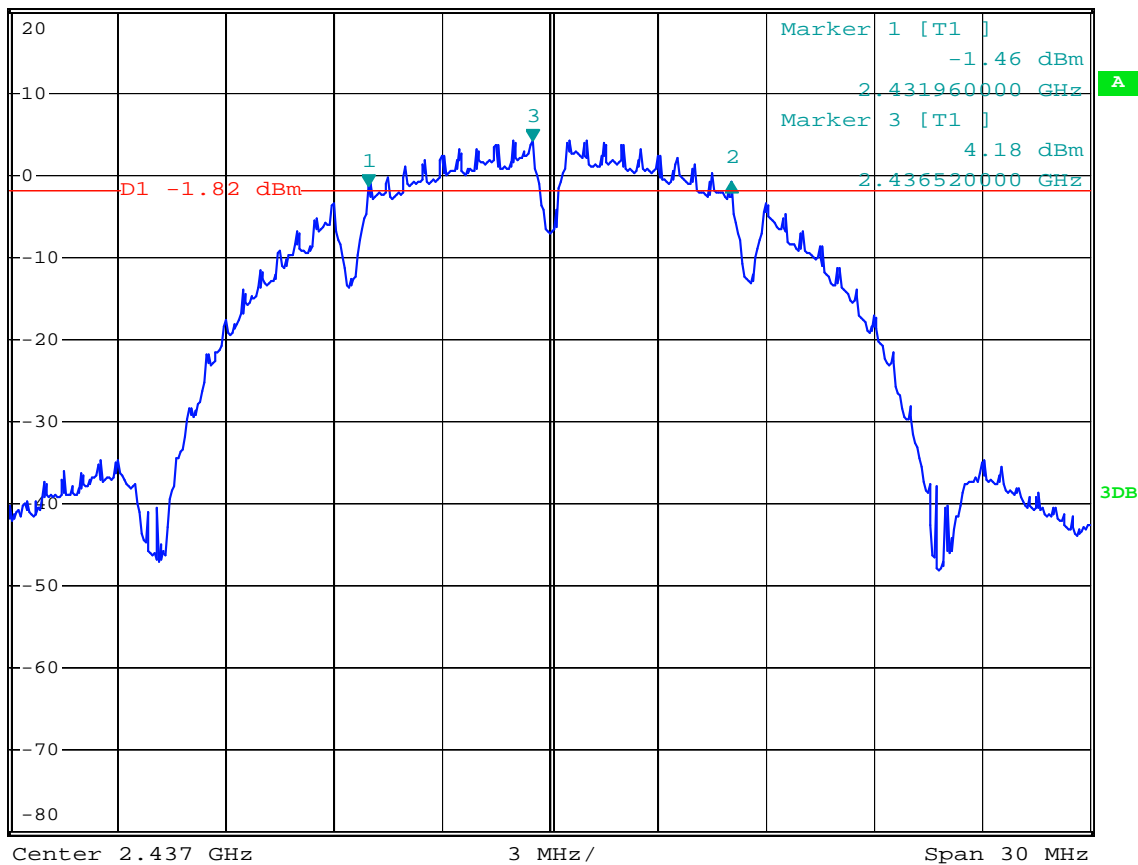
Delta 2 [T1]

* VBW 300 kHz

0.59 dB

SWT 5 ms

10.080000000 MHz

**1 PK
VIEW**

Date: 11.APR.2013 14:47:29



3. 802.11b at 1Mbps of CH11

**DELTA MARKER 2**

10.08 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

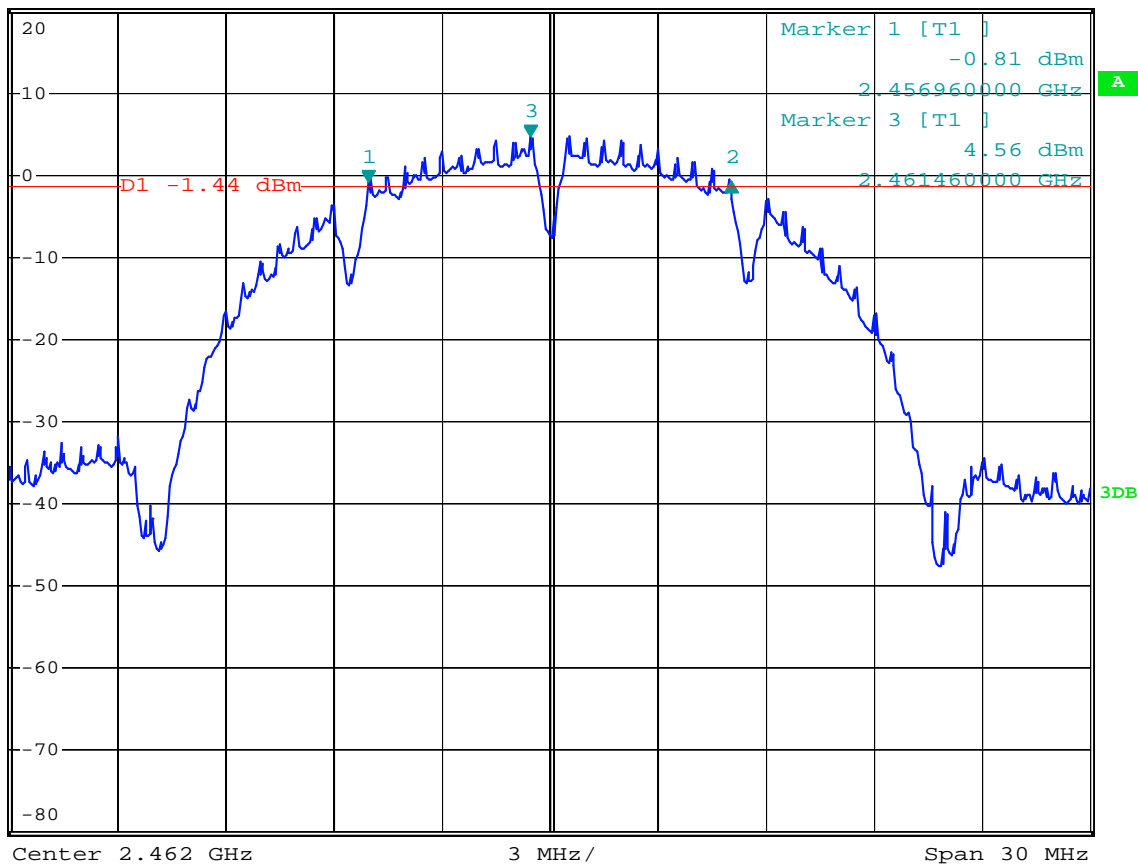
Delta 2 [T1]

* VBW 300 kHz

0.02 dB

SWT 5 ms

10.080000000 MHz

**1 PK
VIEW**

Date: 11.APR.2013 14:48:53

4. 802.11b at 11Mbps of CH01



DELTA MARKER 2

9.36 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

Delta 2 [T1]

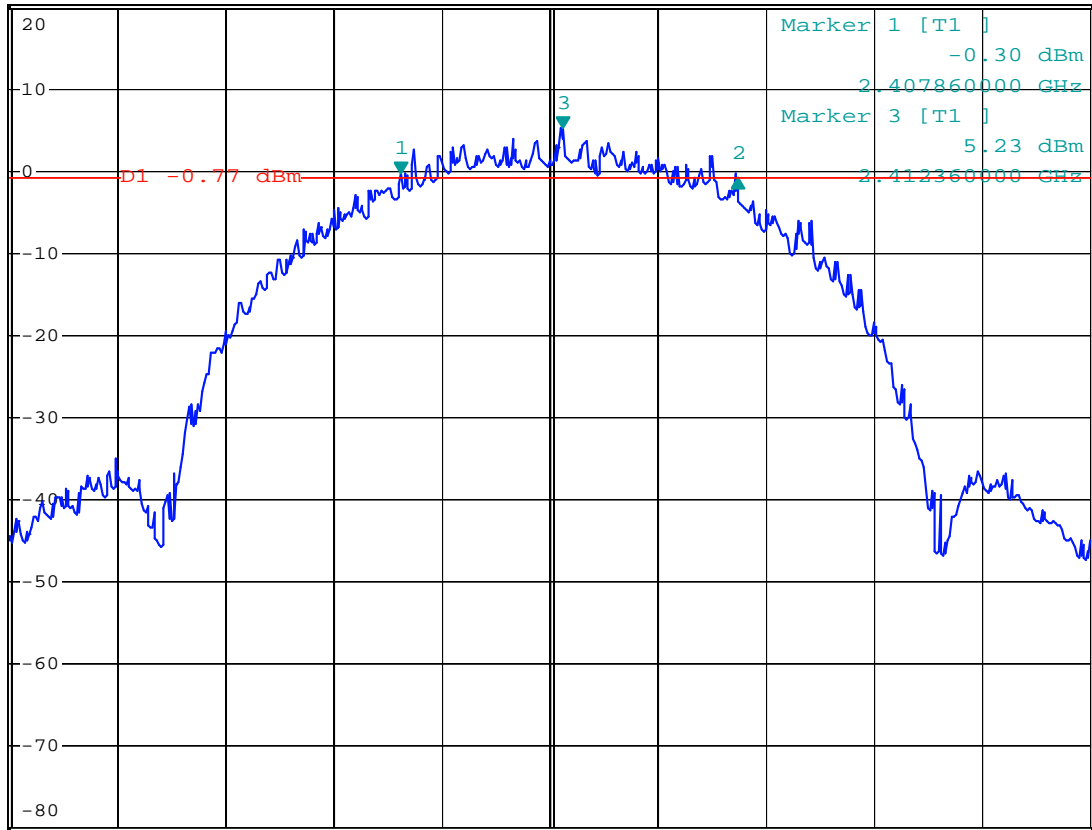
* VBW 300 kHz

-0.46 dB

SWT 5 ms

9.360000000 MHz

1 PK
VIEW



Center 2.412 GHz

3 MHz /

Span 30 MHz

Date: 11.APR.2013 14:53:15

5. 802.11b at 11Mbps of CH06



DELTA MARKER 2

9.36 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

Delta 2 [T1]

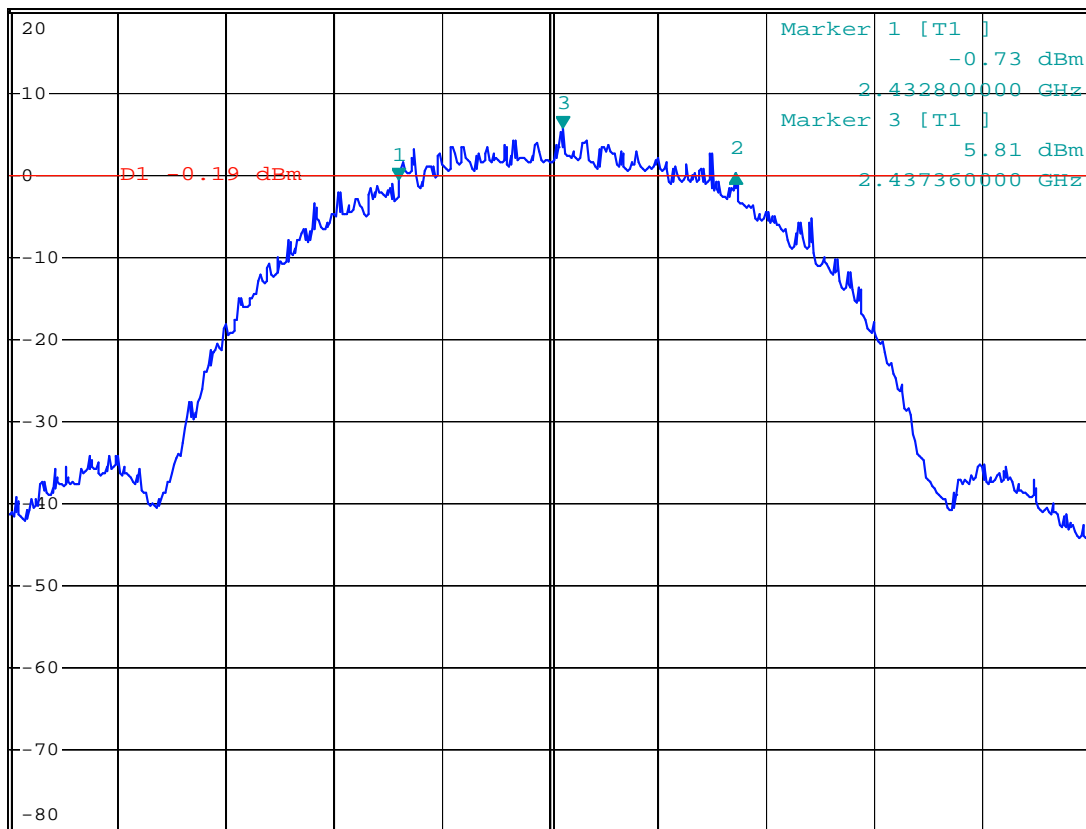
* VBW 300 kHz

1.01 dB

SWT 5 ms

9.360000000 MHz

1 PK
MAXH



Center 2.437 GHz

3 MHz /

Span 30 MHz

Date: 11.APR.2013 14:54:18



6. 802.11b at 11Mbps of CH11

**DELTA MARKER 2**

9.3 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

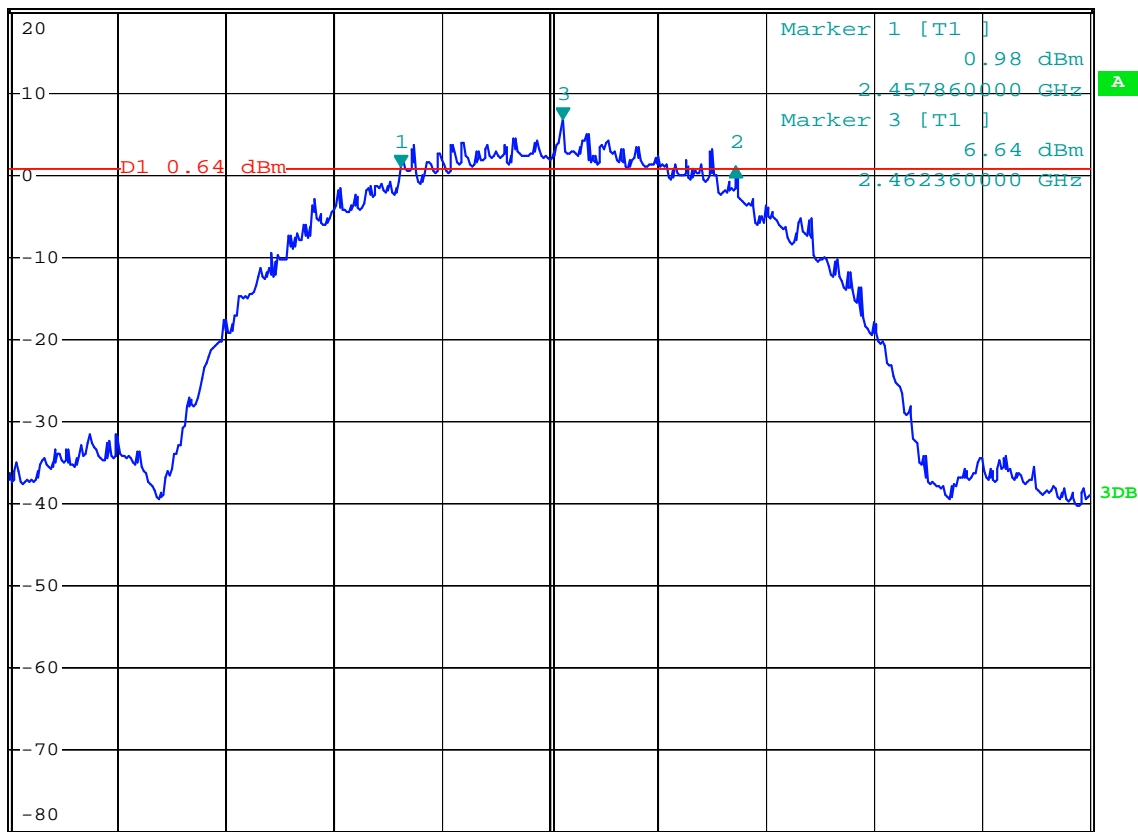
Delta 2 [T1]

* VBW 300 kHz

0.12 dB

SWT 5 ms

9.300000000 MHz

**1 PK
MAXH**

Center 2.462 GHz

3 MHz /

Span 30 MHz

Date: 11.APR.2013 14:55:09

**7. 802.11g at 54 Mbps of CH01****DELTA MARKER 2**

16.38 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

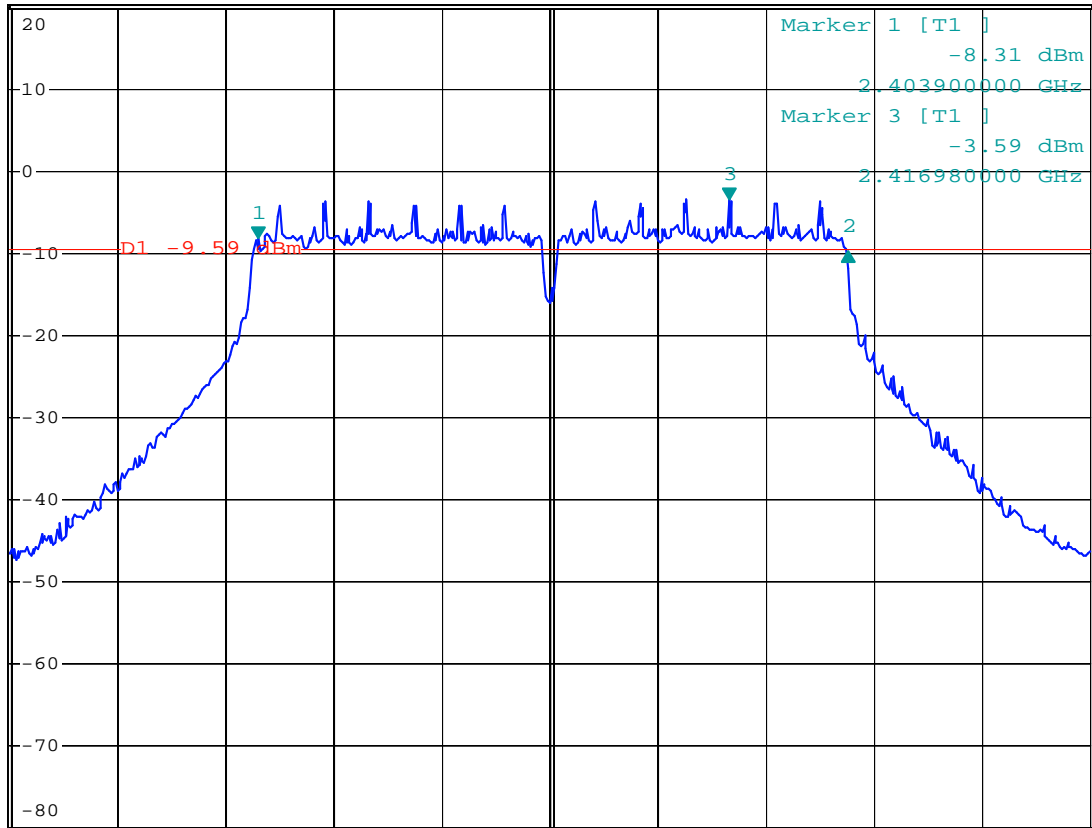
Delta 2 [T1]

* VBW 300 kHz

-1.54 dB

SWT 5 ms

16.38000000 MHz

1 PK
MAXH

Center 2.412 GHz

3 MHz /

Span 30 MHz

Date: 11.APR.2013 14:52:11



8. 802.11g at 54 Mbps of CH06



DELTA MARKER 2

16.38 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

Delta 2 [T1]

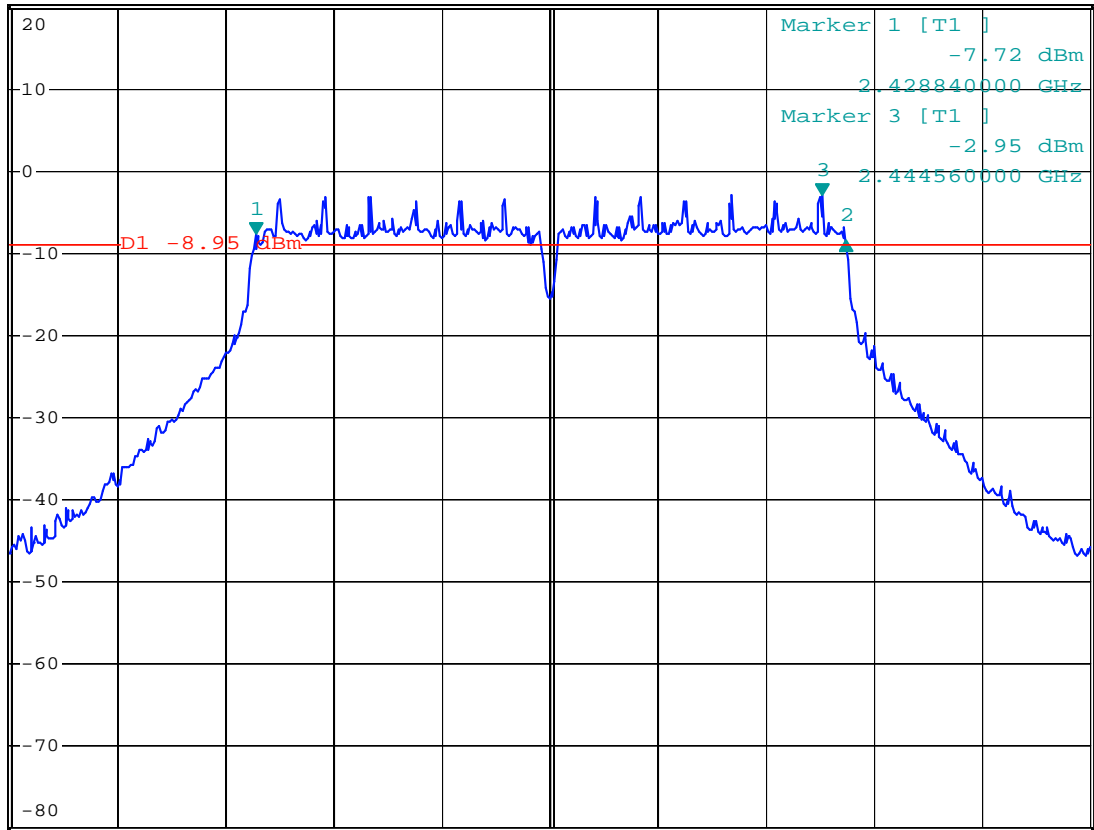
* VBW 300 kHz

-0.77 dB

SWT 5 ms

16.380000000 MHz

1 PK
MAXH



Center 2.437 GHz

3 MHz /

Span 30 MHz

Date: 11.APR.2013 14:51:06

**9. 802.11g at 54 Mbps of CH11****DELTA MARKER 2**

16.38 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

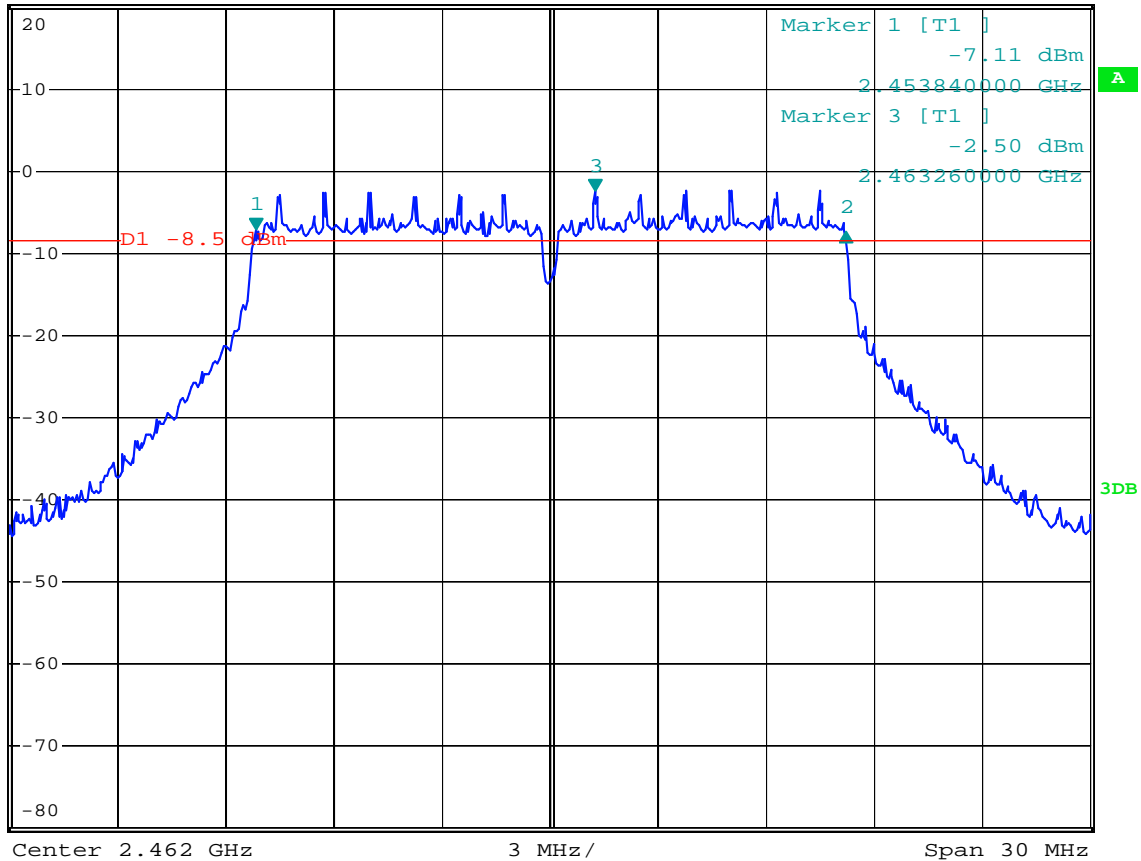
Delta 2 [T1]

* VBW 300 kHz

-0.19 dB

SWT 5 ms

16.38000000 MHz

1 PK
MAXH

Date: 11.APR.2013 14:50:08

**10. 802.11n at HT20 of CH01****DELTA MARKER 2**

17.58 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

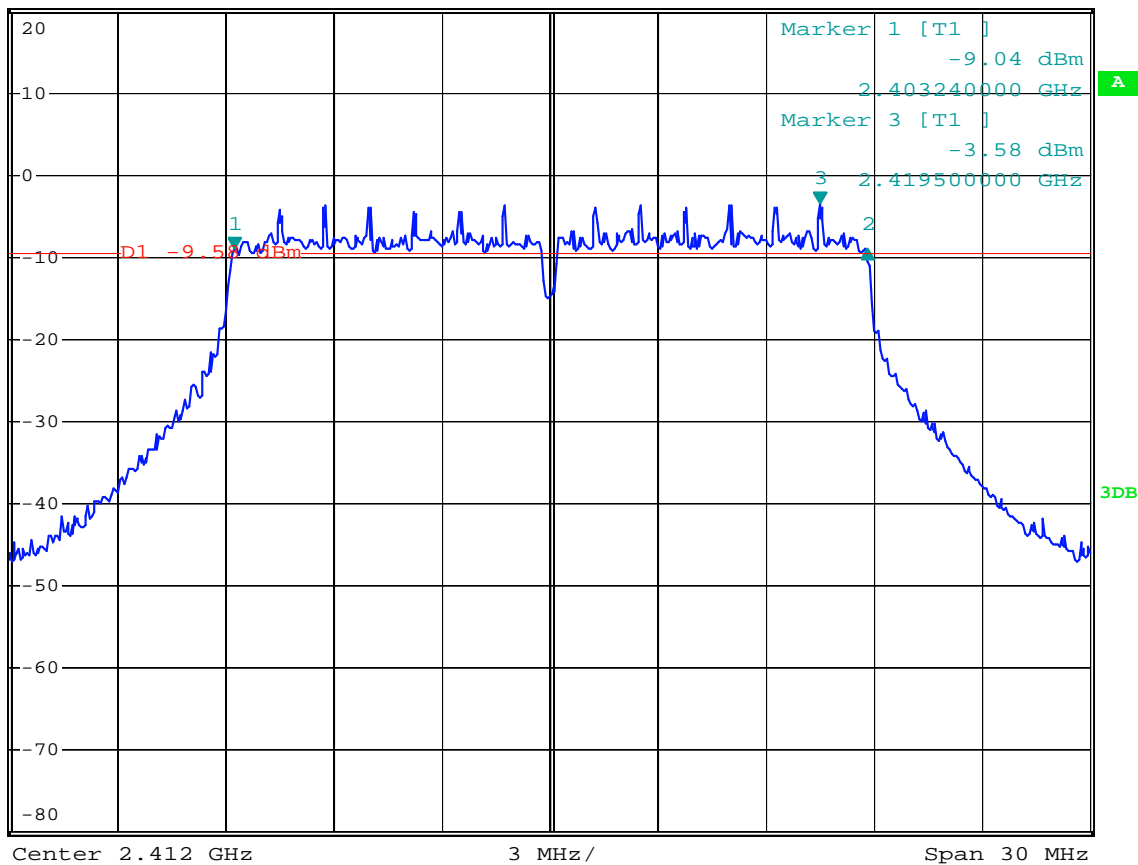
Delta 2 [T1]

* VBW 300 kHz

0.01 dB

SWT 5 ms

17.580000000 MHz

1 PK
MAXH

Date: 11.APR.2013 14:58:44

**11. 802.11n at HT20 of CH06****DELTA MARKER 2**

17.58 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

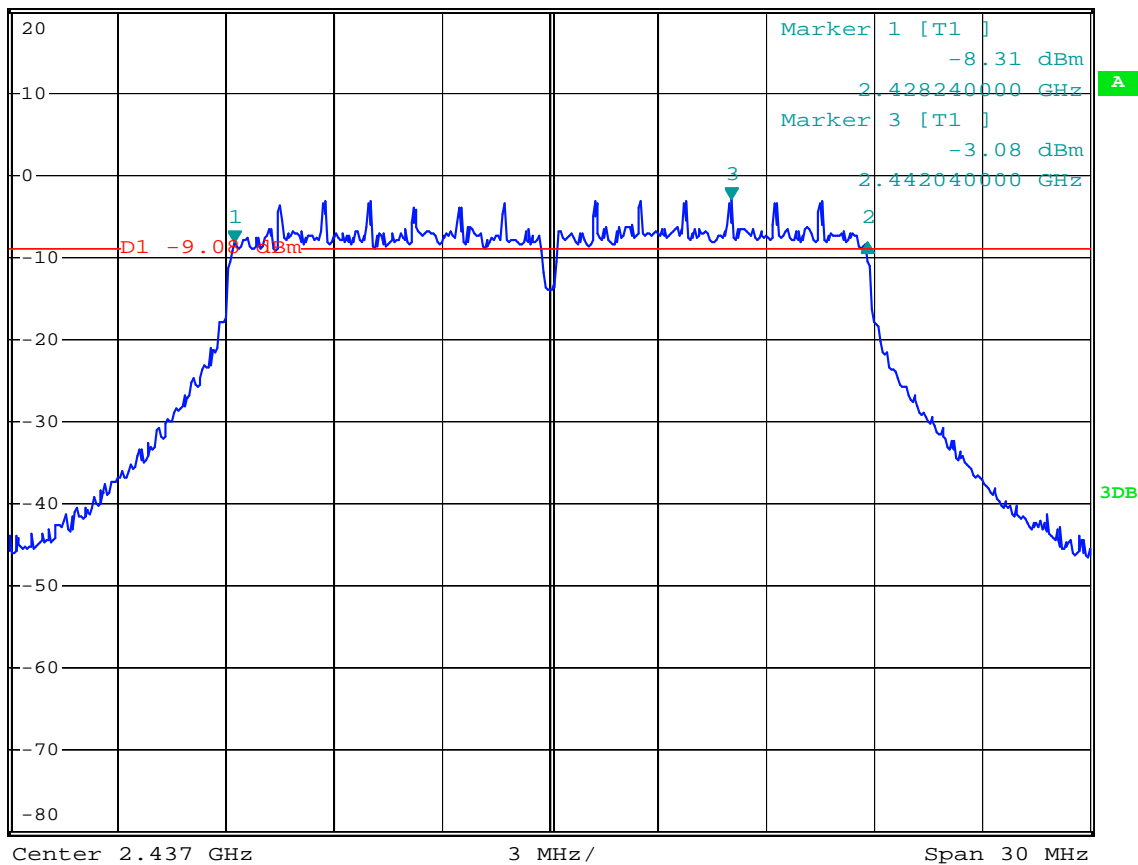
Delta 2 [T1]

* VBW 300 kHz

0.20 dB

SWT 5 ms

17.580000000 MHz

1 PK
MAXH

Date: 11.APR.2013 14:57:28

**12. 802.11n at HT20 of CH11****DELTA MARKER 2**

17.4 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

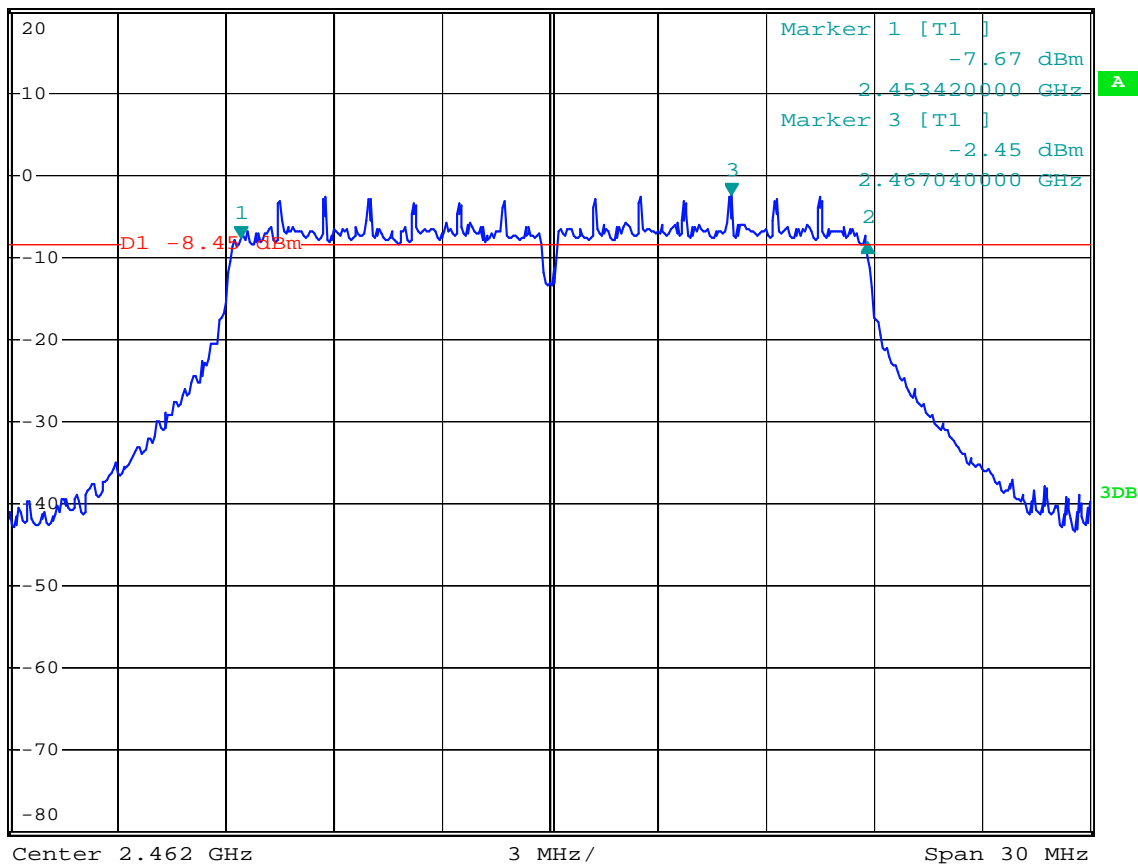
Delta 2 [T1]

* VBW 300 kHz

-0.62 dB

SWT 5 ms

17.40000000 MHz

1 PK
MAXH

Date: 11.APR.2013 14:56:16

13. 802.11n at HT40 of CH01



DELTA MARKER 2

35.42 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

Delta 2 [T1]

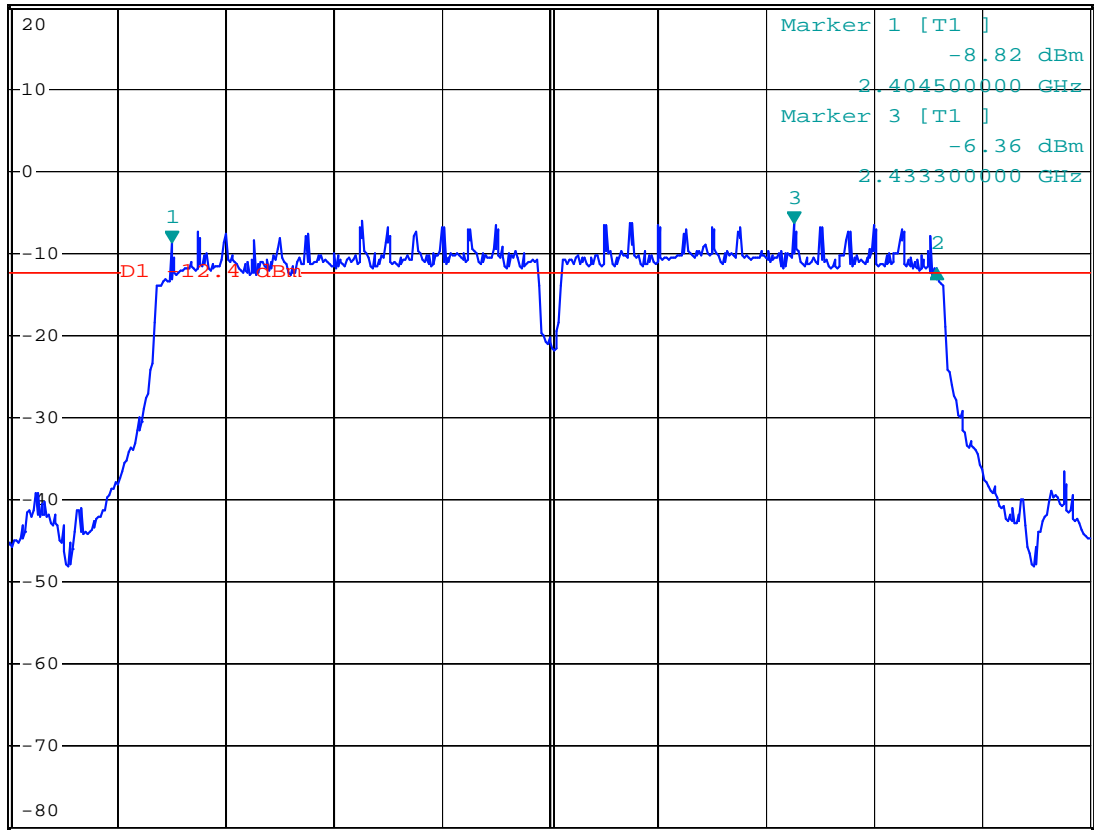
* VBW 300 kHz

-3.07 dB

SWT 5 ms

35.42000000 MHz

1 PK
MAXH



Center 2.422 GHz

5 MHz /

Span 50 MHz

Date: 11.APR.2013 15:00:07

14. 802.11n at HT40 of CH04



DELTA MARKER 2

35.42 MHz

Ref 20 dBm

* Att 30 dB

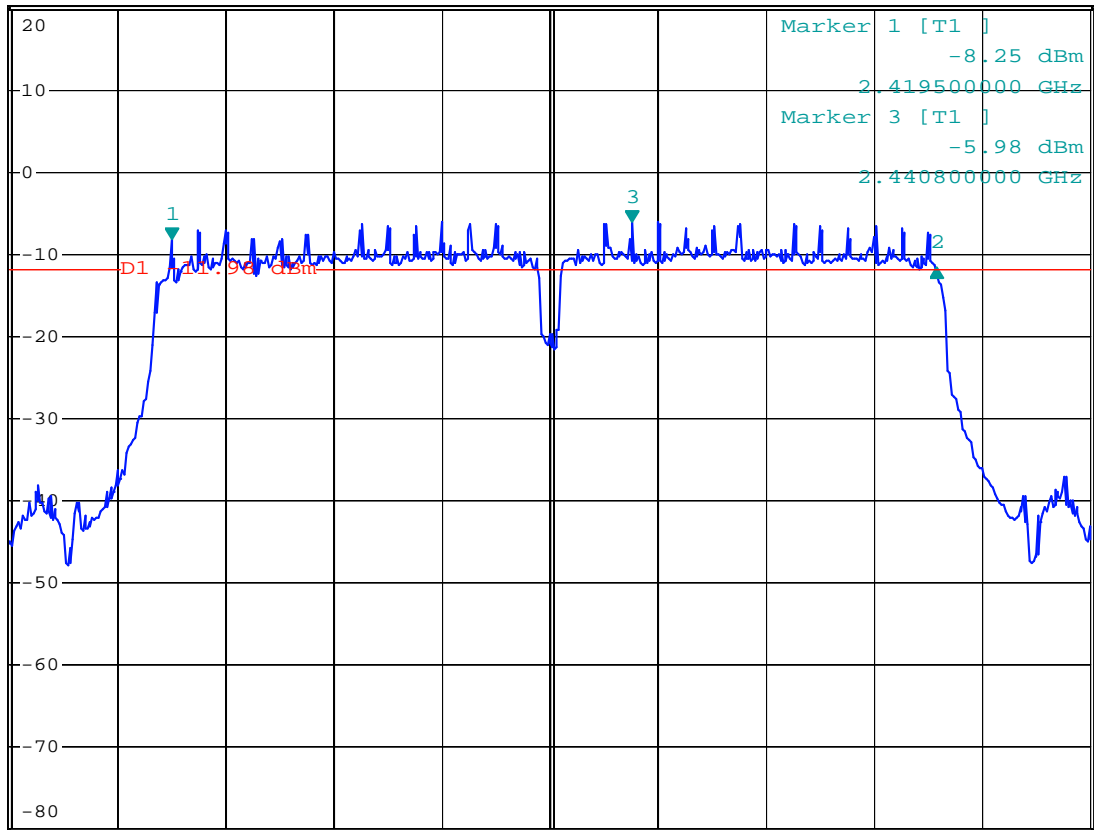
* RBW 100 kHz Delta 2 [T1]

* VBW 300 kHz -3.26 dB

SWT 5 ms

35.42000000 MHz

1 PK
MAXH



Center 2.437 GHz

5 MHz /

Span 50 MHz

Date: 11.APR.2013 15:01:20



15. 802.11n at HT40 of CH07



DELTA MARKER 2

35.42 MHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

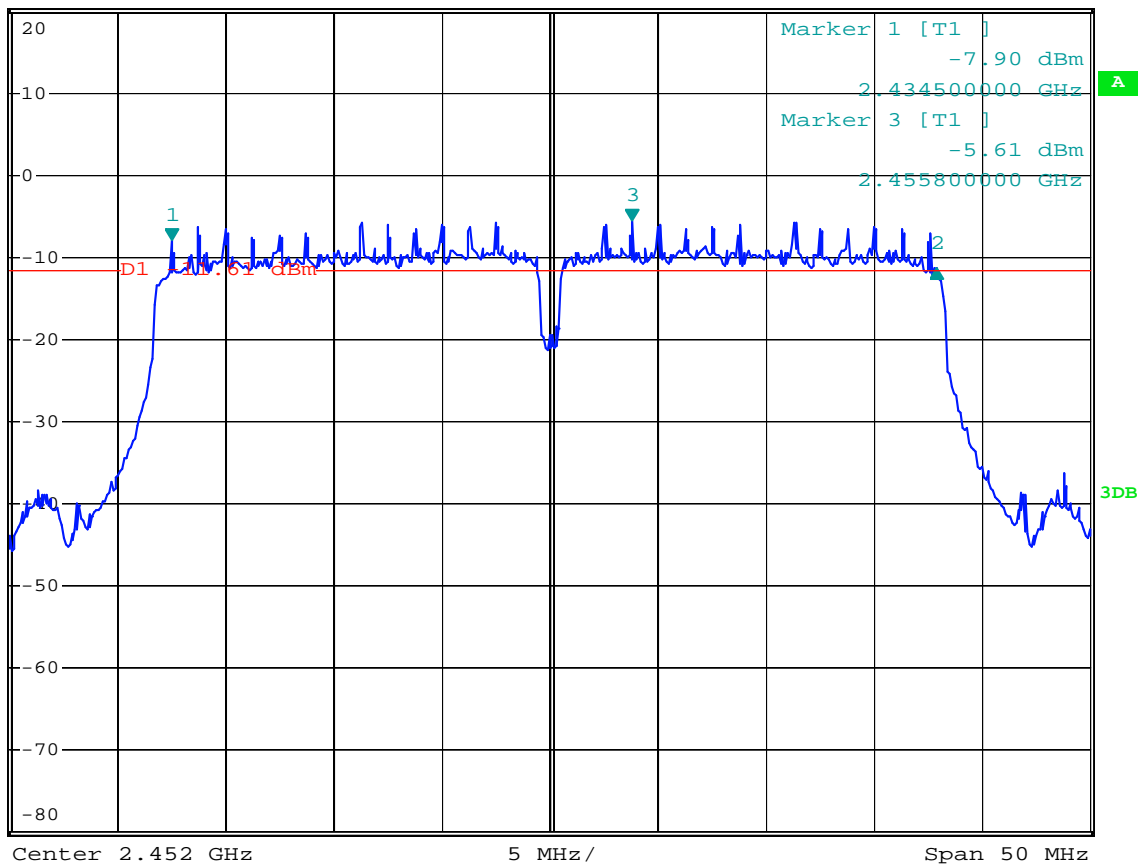
Delta 2 [T1]

* VBW 300 kHz

-3.49 dB

SWT 5 ms

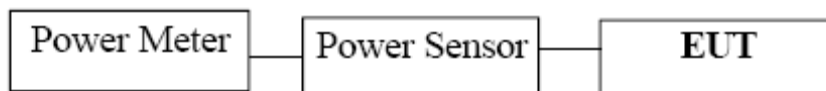
35.42000000 MHz

1 PK
MAXH

Date: 11.APR.2013 15:02:54

8. Maximum Peak Output Power

8.1 Test Setup



8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

8.3 Test Procedure

The RF power output was measured with a Power meter connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate centre frequency.

Note: the peak power was measured

**8.4 Test Results**

EUT	NVR		Model	ZH-NA04-W
Mode	802.11b 11Mbps		Input Voltage	See Below
Temperature	24 deg. C,		Humid Pity	56% RH
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Test Voltage: 120V~				
1	2412	18.34	30	Pass
6	2437	18.37	30	Pass
11	2462	18.48	30	Pass
Test Voltage: 138V~				
1	2412	18.30	30	Pass
6	2437	18.41	30	Pass
11	2462	18.39	30	Pass
Test Voltage: 102V~				
1	2412	18.34	30	Pass
6	2437	18.45	30	Pass
11	2462	18.40	30	Pass

Note: 1. At final test to get the worst-case emission at 11Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$



EUT	NVR		Model	ZH-NA04-W
Mode	802.11g		Input Voltage	See Below
Temperature	24 deg. C,		Humid Pity	56% RH
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Test Voltage:120V~				
1	2412	15.46	30	Pass
6	2437	15.50	30	Pass
11	2462	15.75	30	Pass
Test Voltage:138V~				
1	2412	15.50	30	Pass
6	2437	15.55	30	Pass
11	2462	15.89	30	Pass
Test Voltage:102V~				
1	2412	15.58	30	Pass
6	2437	15.58	30	Pass
11	2462	15.82	30	Pass

Note: 1. At final test to get the worst-case emission at 54Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator



EUT	NVR		Model	ZH-NA04-W
Mode	802.11n HT20		Input Voltage	See Below
Temperature	24 deg. C,		Humid Pity	56% RH
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Test Voltage:120V~				
1	2412	15.02	30	Pass
6	2437	14.95	30	Pass
11	2462	15.58	30	Pass
Test Voltage:138V~				
1	2412	15.06	30	Pass
6	2437	14.92	30	Pass
11	2462	15.58	30	Pass
Test Voltage:102V~				
1	2412	15.05	30	Pass
6	2437	14.93	30	Pass
11	2462	15.62	30	Pass

Note: 1. At finial test to get the worst-case emission at 65Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator



EUT	NVR		Model	ZH-NA04-W
Mode	802.11n HT40		Input Voltage	See Below
Temperature	24 deg. C,		Humid Pity	56% RH
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Test Voltage:120V~				
1	2422	14.33	30	Pass
5	2437	14.39	30	Pass
7	2452	14.63	30	Pass
Test Voltage:138V~				
1	2422	14.45	30	Pass
5	2437	14.50	30	Pass
7	2452	14.52	30	Pass
Test Voltage:102V~				
1	2422	14.29	30	Pass
5	2437	14.56	30	Pass
7	2452	14.68	30	Pass

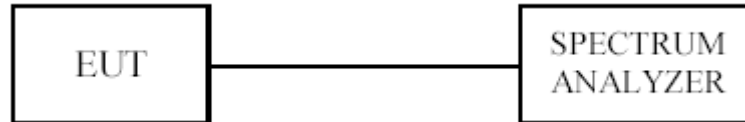
Note: 1. At final test to get the worst-case emission at 65Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$

9. Power Spectral Density Measurement

9.1 Test Setup



9.2 Limits of Power Spectral Density Measurement

The Maximum Power Spectral Density Measurement is 8dBm.

9.3 Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 10 kHz.
3. Set the VBW \geq 30 kHz.
4. Set the span to 1.5 times the DTS channel bandwidth.
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.
11. The resulting peak PSD level must be \leq 8 dBm.

9.4 Test Result

EUT	NVR		Model	ZH-NA04-W
Mode	802.11b 1Mbps		Input Voltage	AC 120V
Temperature	24 deg. C,		Humid Pity	56% RH
Channel	Channel Frequency (MHz)	Final RF Power Level in 3kHz BW (dBm)	Maximum Limit (dBm)	Pass/ Fail
1Mbps				
1	2412	-5.45	8	Pass
6	2437	-4.73	8	Pass
11	2462	-5.51	8	Pass

Note: At finial test to get the worst-case emission at 1Mbps for CH01, CH06 and CH11

EUT	NVR		Model	ZH-NA04-W
Mode	802.11b 11Mbps		Input Voltage	AC 120V
Temperature	24 deg. C,		Humid Pity	56% RH
Channel	Channel Frequency (MHz)	Final RF Power Level in 3kHz BW (dBm)	Maximum Limit (dBm)	Pass/ Fail
11Mbps				
1	2412	-4.80	8	Pass
6	2437	-4.31	8	Pass
11	2462	-3.97	8	Pass

Note: At finial test to get the worst-case emission at 11Mbps for CH01, CH06 and CH11

EUT	NVR		Model	ZH-NA04-W
Mode	802.11g		Input Voltage	AC 120V
Temperature	24 deg. C,		HuWIFI Router/APity	56% RH
Channel	Channel Frequency (MHz)	Final RF Power Level in 3kHz BW (dBm)	Maximum Limit (dBm)	Pass/ Fail
54Mbps				
1	2412	-10.67	8	Pass
6	2437	-10.30	8	Pass
11	2462	-10.21	8	Pass

Note: At final test to get the worst-case emission at 54Mbps for CH01, CH06 and CH11

EUT	NVR		Model	ZH-NA04-W
Mode	802.11n HT20		Input Voltage	AC 120V
Temperature	24 deg. C,		HuWIFI Router/APity	56% RH
Channel	Channel Frequency (MHz)	Final RF Power Level in 3kHz BW (dBm)	Maximum Limit (dBm)	Pass/ Fail
11n HT20				
1	2412	-9.23	8	Pass
6	2437	-9.97	8	Pass
11	2462	-10.13	8	Pass

Note: At final test to get the worst-case emission at 65M for CH01, CH06 and CH11



EUT	NVR		Model	ZH-NA04-W
Mode	802.11n HT40		Input Voltage	AC 120V
Temperature	24 deg. C,		HuWIFI Router/APity	56% RH
Channel	Channel Frequency (MHz)	Final RF Power Level in 3kHz BW (dBm)	Maximum Limit (dBm)	Pass/ Fail
11n HT40				
1	2422	-11.41	8	Pass
5	2437	-11.90	8	Pass
7	2452	-10.91	8	Pass

Note: At final test to get the worst-case emission at 65Mfor CH01, CH04 and CH07



9.5 Photo of Power Spectral Density Measurement

1. 802.11b at 1Mbps of CH01



MARKER 1

2.4114 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

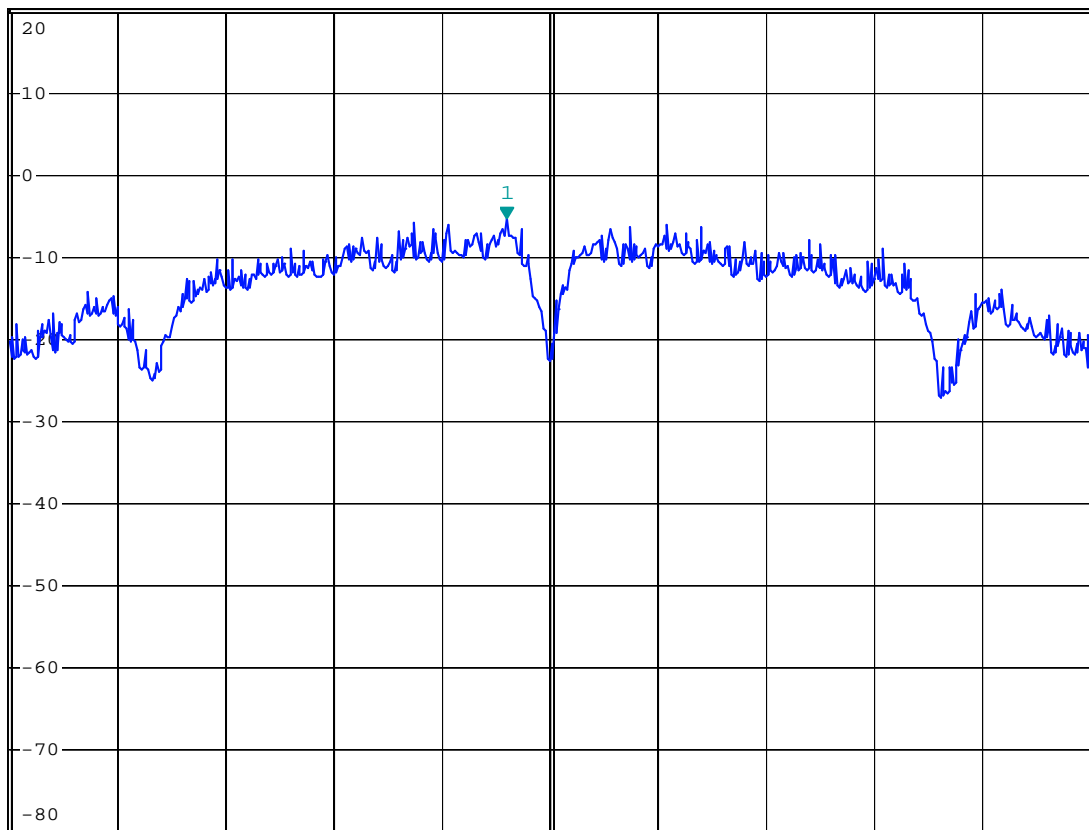
SWT 150 ms

Marker 1 [T1]

-5.45 dBm

2.411400000 GHz

1 PK
VIEW



Center 2.412 GHz

1.5 MHz/

Span 15 MHz

Date: 11.APR.2013 17:45:27

2. 802.11b at 1Mbps of CH06



MARKER 1

2.4376 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

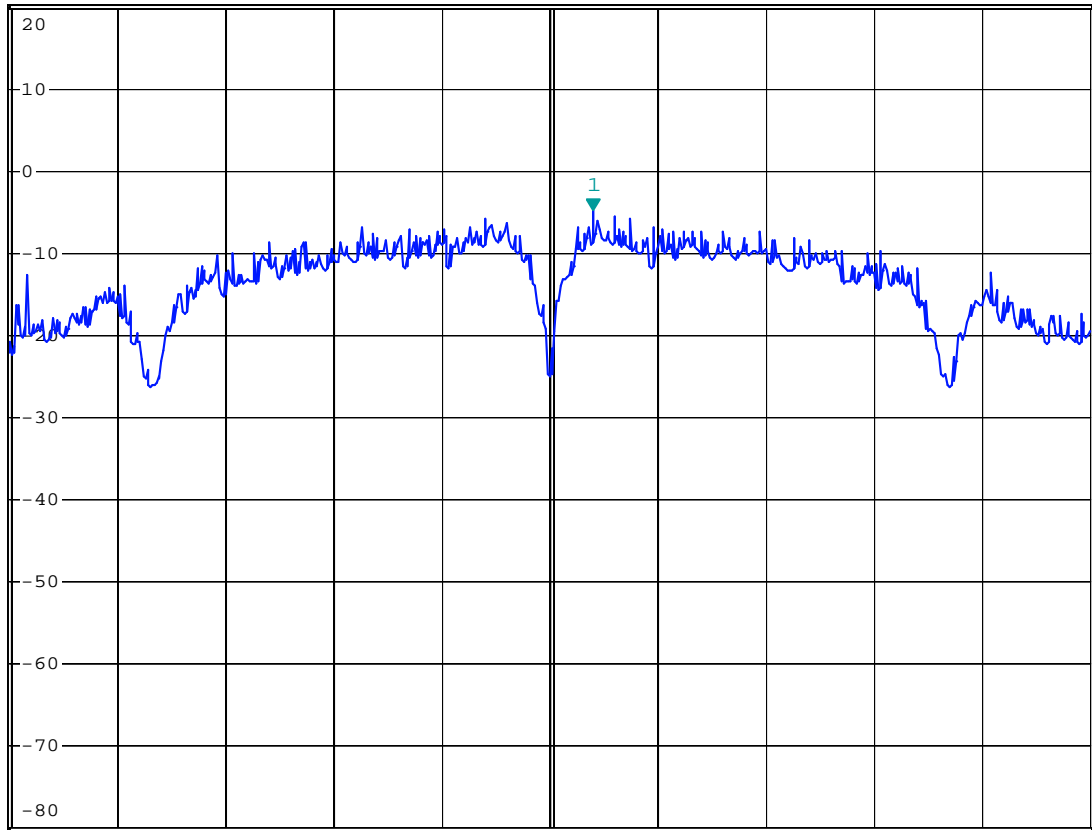
SWT 150 ms

Marker 1 [T1]

-4.73 dBm

2.437600000 GHz

1 PK
VIEW



Center 2.437 GHz

1.5 MHz/

Span 15 MHz

Date: 11.APR.2013 17:46:24



3. 802.11b at 1Mbps of CH11



MARKER 1

2.46311 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

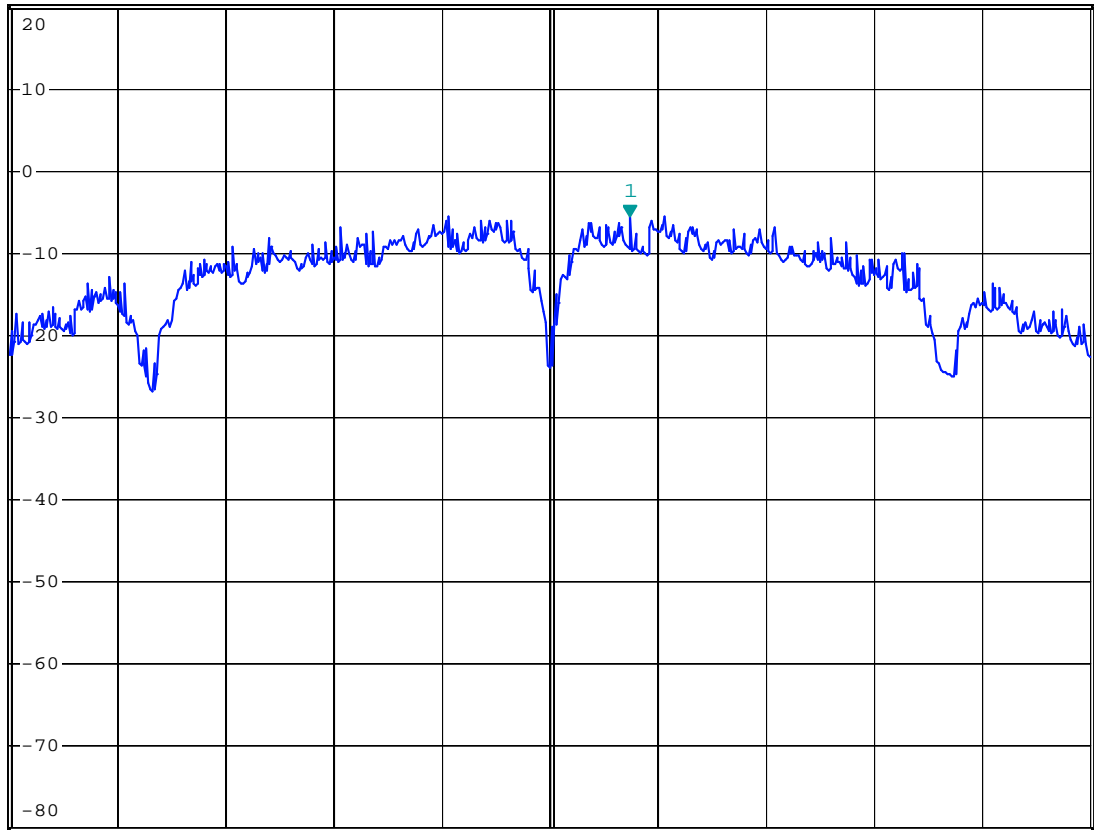
SWT 150 ms

Marker 1 [T1]

-5.51 dBm

2.463110000 GHz

1 PK
VIEW



Center 2.462 GHz

1.5 MHz/

Span 15 MHz

Date: 11.APR.2013 17:46:53



4. 802.11b at 11Mbps of CH01



MARKER 1

2.41296 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

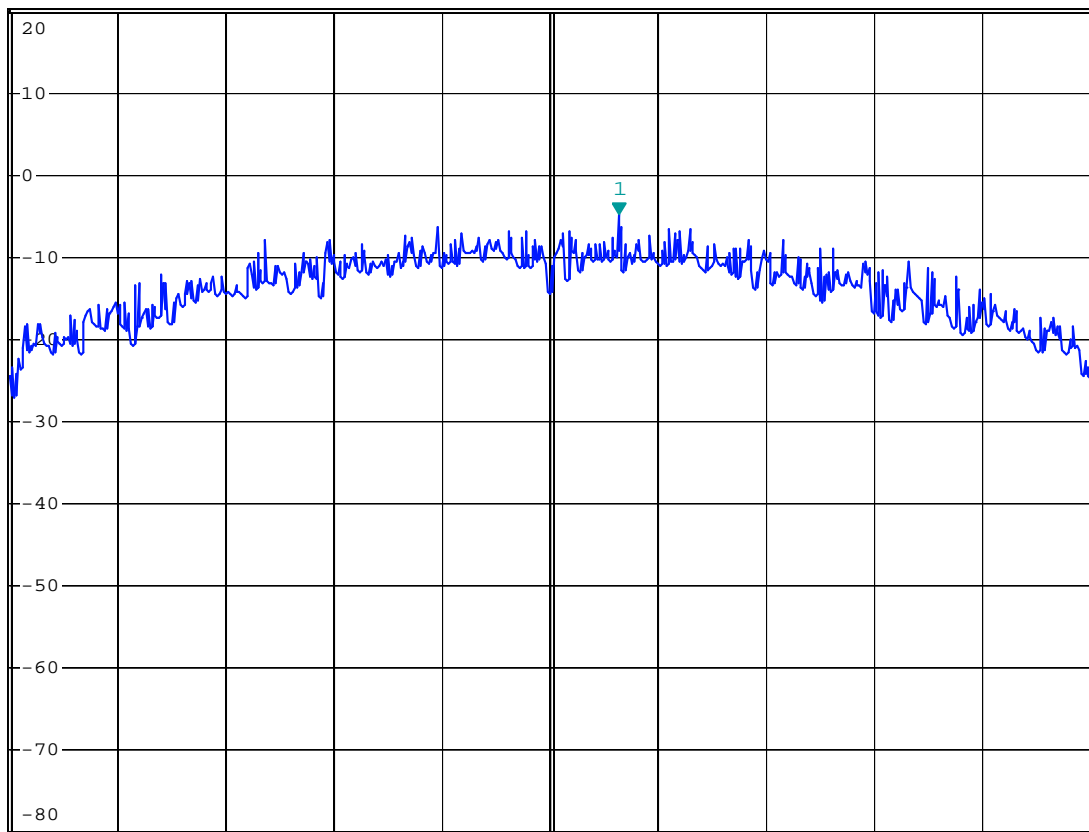
SWT 150 ms

Marker 1 [T1]

-4.80 dBm

2.412960000 GHz

1 PK
VIEW



Center 2.412 GHz

1.5 MHz/

Span 15 MHz

Date: 11.APR.2013 17:49:51



5. 802.11b at 11Mbps of CH06



MARKER 1

2.43796 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

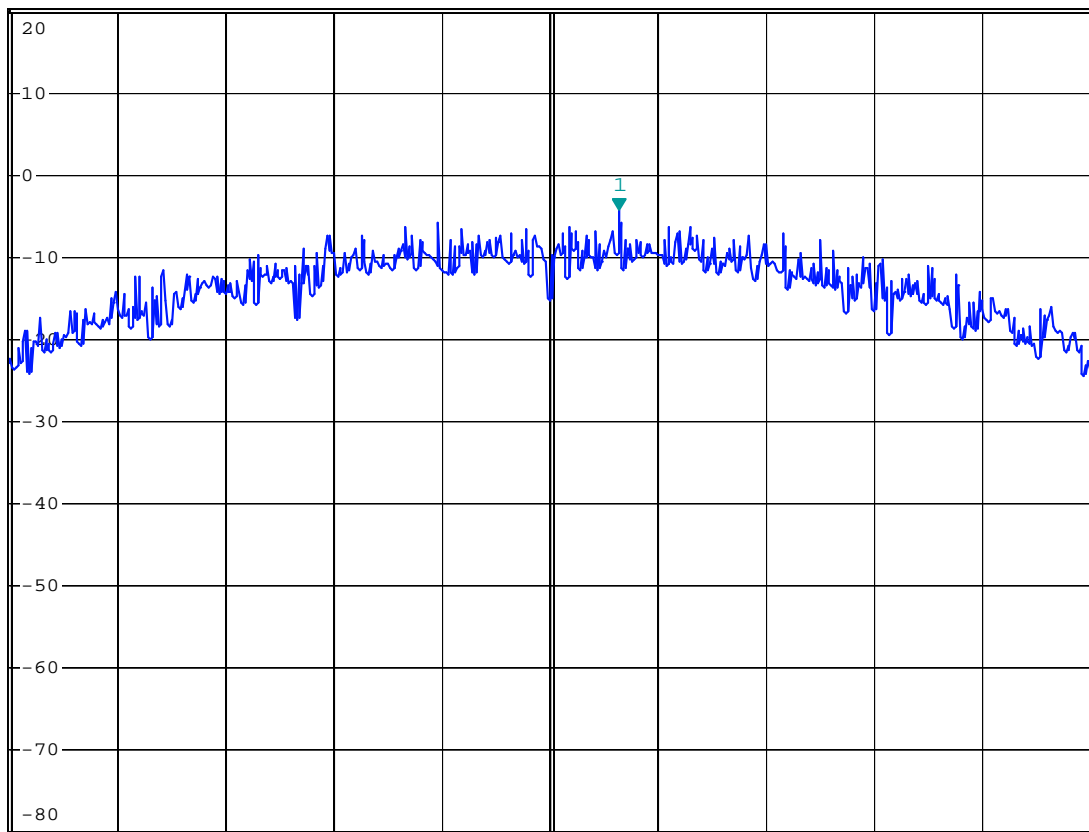
SWT 150 ms

Marker 1 [T1]

-4.31 dBm

2.437960000 GHz

1 PK
VIEW



3DB

Center 2.437 GHz

1.5 MHz/

Span 15 MHz

Date: 11.APR.2013 17:49:06



6. 802.11b at 11Mbps of CH11



MARKER 1

2.46296 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

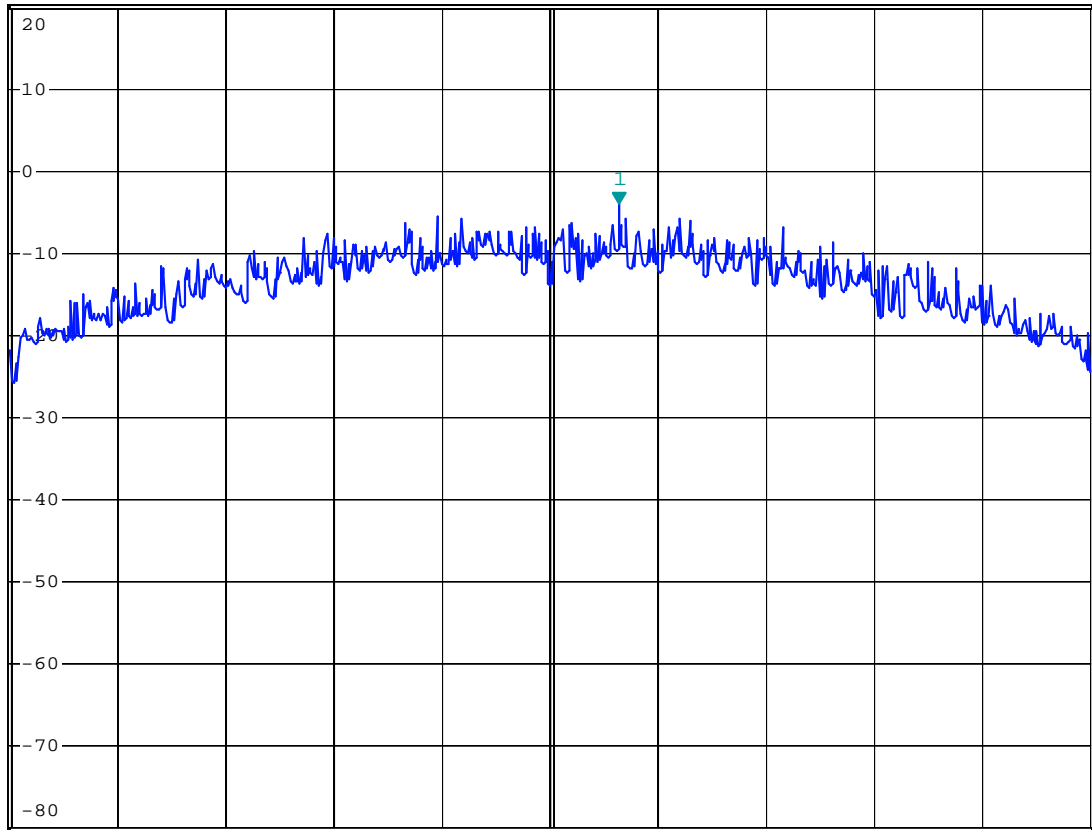
SWT 150 ms

Marker 1 [T1]

-3.97 dBm

2.462960000 GHz

1 PK
VIEW



Center 2.462 GHz

1.5 MHz/

Span 15 MHz

Date: 11.APR.2013 17:48:08



7. 802.11g at 54Mbps of CH1



MARKER 1

2.41425 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

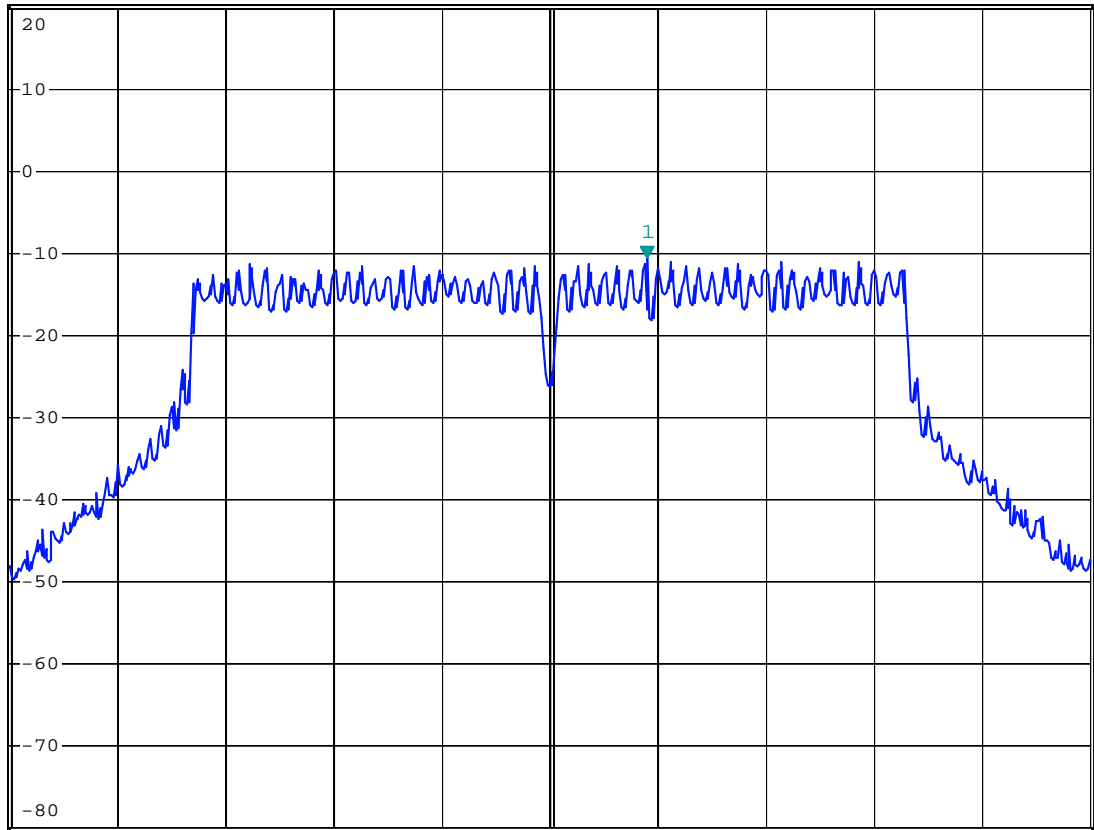
SWT 250 ms

Marker 1 [T1]

-10.67 dBm

2.414250000 GHz

1 PK
MAXH



Center 2.412 GHz

2.5 MHz/

Span 25 MHz

Date: 17.APR.2013 10:57:44



8. 802.11g at 54Mbps of CH6



MARKER 1

2.43925 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

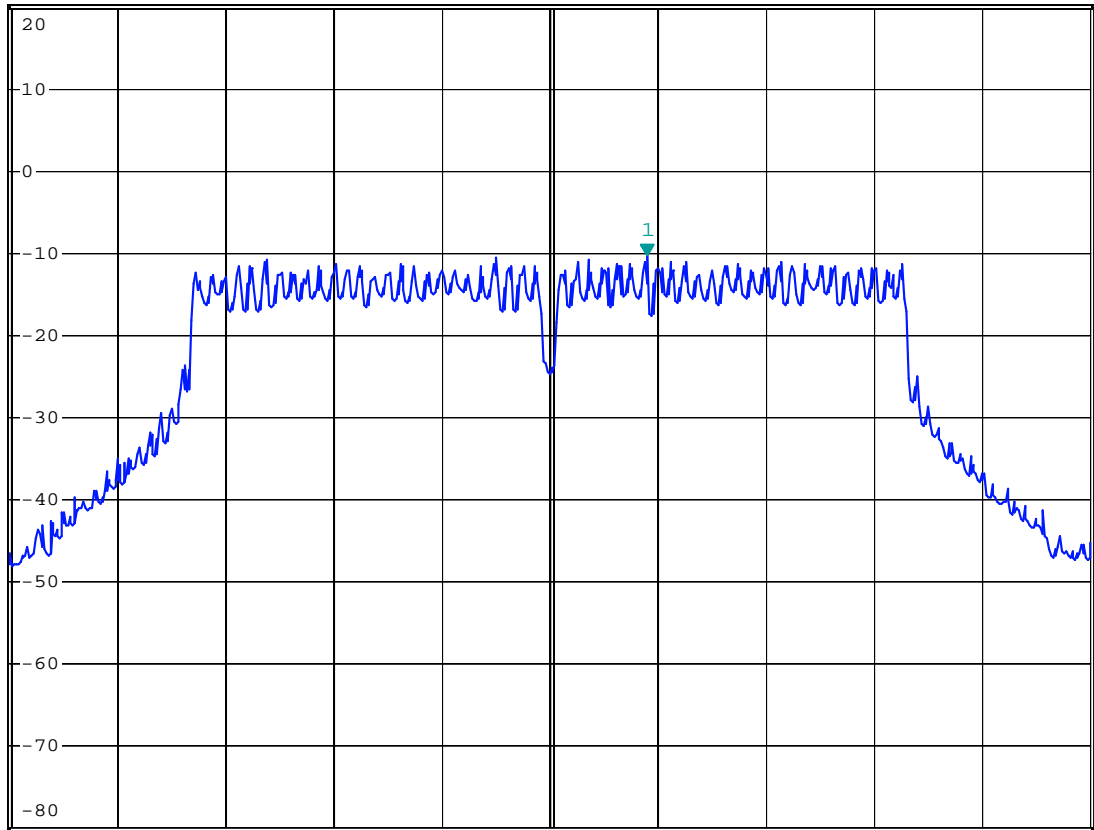
SWT 250 ms

Marker 1 [T1]

-10.30 dBm

2.439250000 GHz

1 PK
MAXH



A

3DB

Center 2.437 GHz

2.5 MHz/

Span 25 MHz

Date: 17.APR.2013 10:58:12



9. 802.11g at 54Mbps of CH11



MARKER 1

2.4645 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

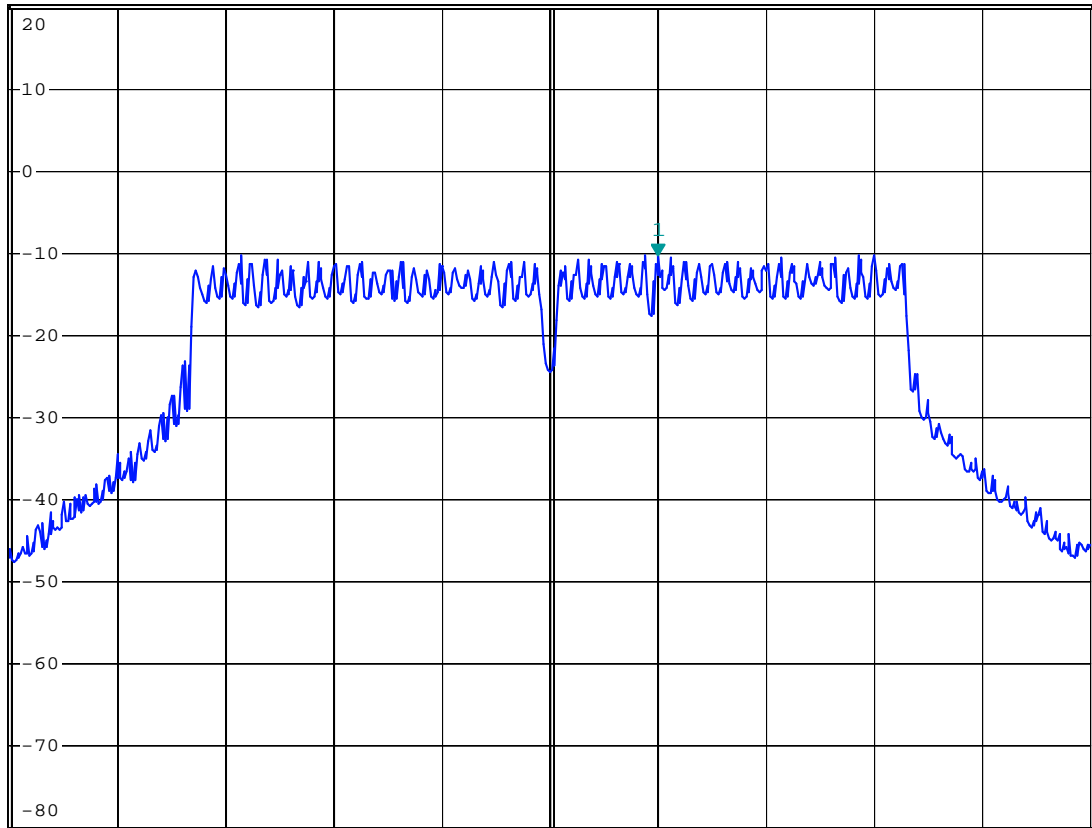
SWT 250 ms

Marker 1 [T1]

-10.21 dBm

2.464500000 GHz

1 PK
MAXH



Center 2.462 GHz

2.5 MHz/

Span 25 MHz

Date: 17.APR.2013 10:58:36



10. 802.11n at HT20 of CH01 65Mbps



MARKER 1

2.4195 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

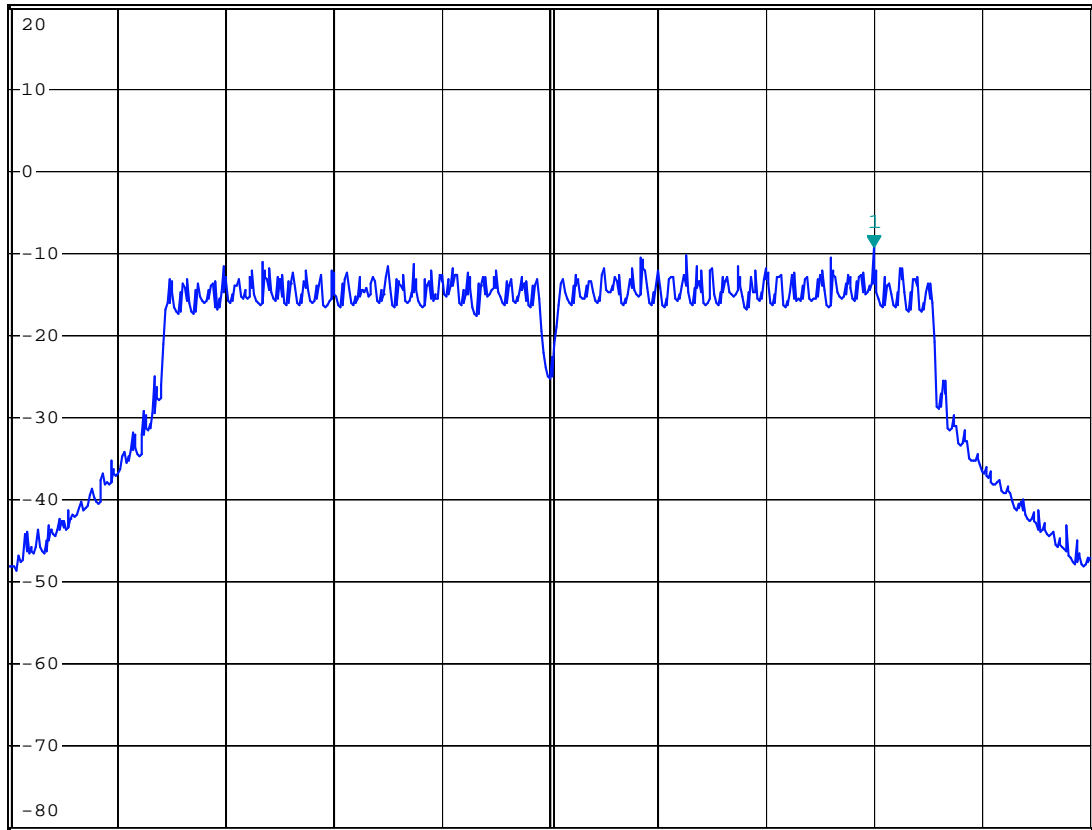
SWT 250 ms

Marker 1 [T1]

-9.23 dBm

2.419500000 GHz

1 PK
MAXH



Center 2.412 GHz

2.5 MHz/

Span 25 MHz

Date: 17.APR.2013 10:56:29



11. 802.11n at HT20 of CH06 65Mbps



MARKER 1

2.4445 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

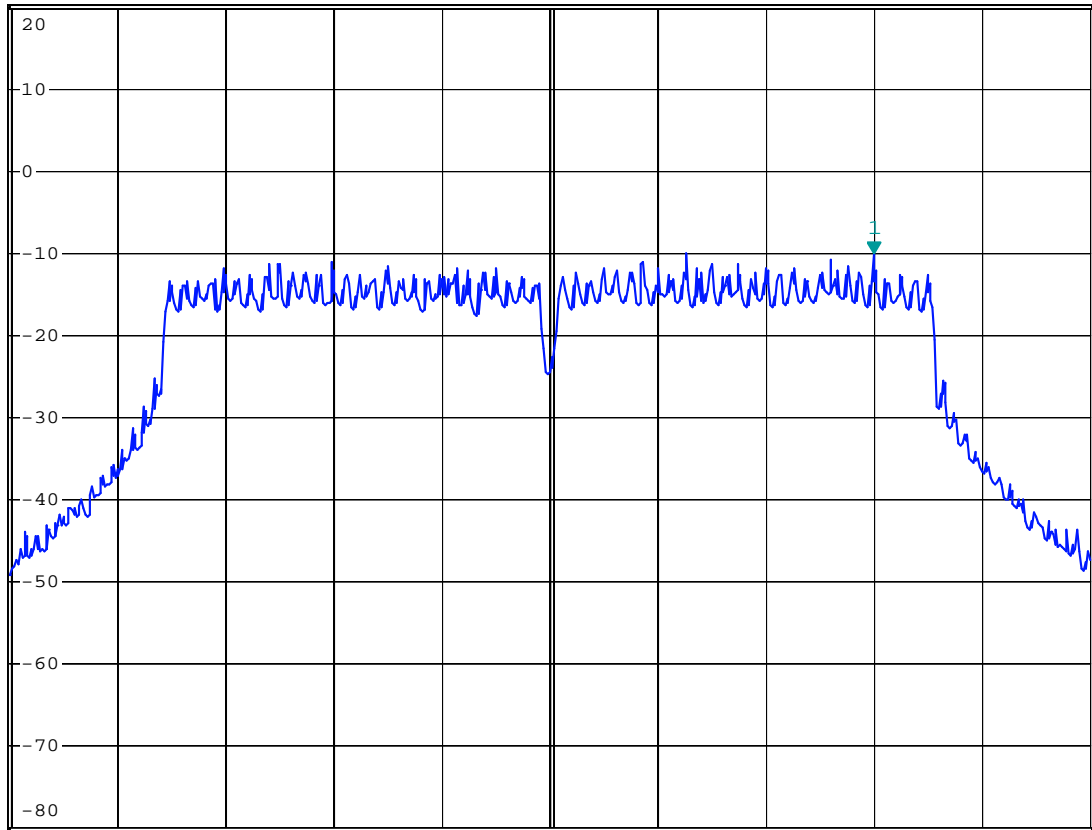
SWT 250 ms

Marker 1 [T1]

-9.97 dBm

2.444500000 GHz

1 PK
MAXH



Center 2.437 GHz

2.5 MHz/

Span 25 MHz

Date: 17.APR.2013 10:55:33



12. 802.11n at HT20 of CH11 65Mbps



MARKER 1

2.46415 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

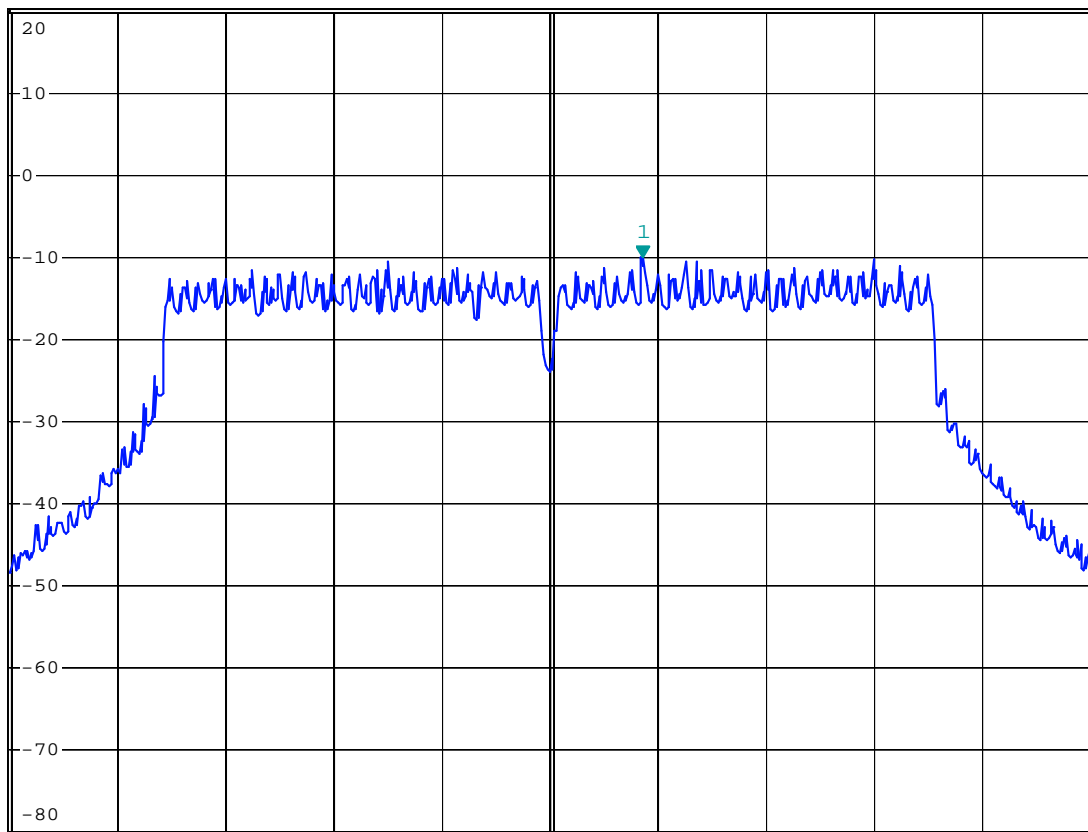
SWT 250 ms

Marker 1 [T1]

-10.13 dBm

2.464150000 GHz

1 PK
MAXH



Center 2.462 GHz

2.5 MHz/

Span 25 MHz

Date: 17.APR.2013 10:54:30

13. 802.11n at HT40 of CH01 65Mbps



MARKER 1

2.4295 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

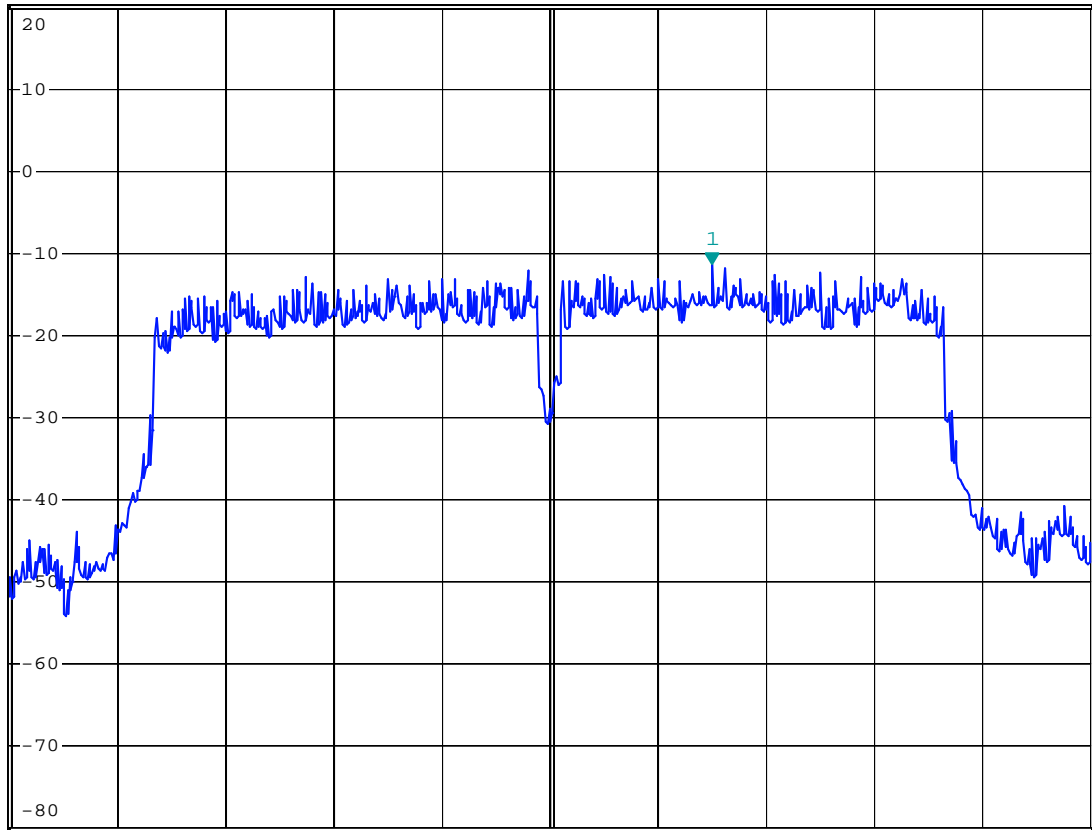
SWT 500 ms

Marker 1 [T1]

-11.41 dBm

2.429500000 GHz

1 PK
MAXH



Center 2.422 GHz

5 MHz /

Span 50 MHz

Date: 17.APR.2013 11:10:55



14. 802.11n at HT40 of CH04 65Mbps



MARKER 1

2.4389 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

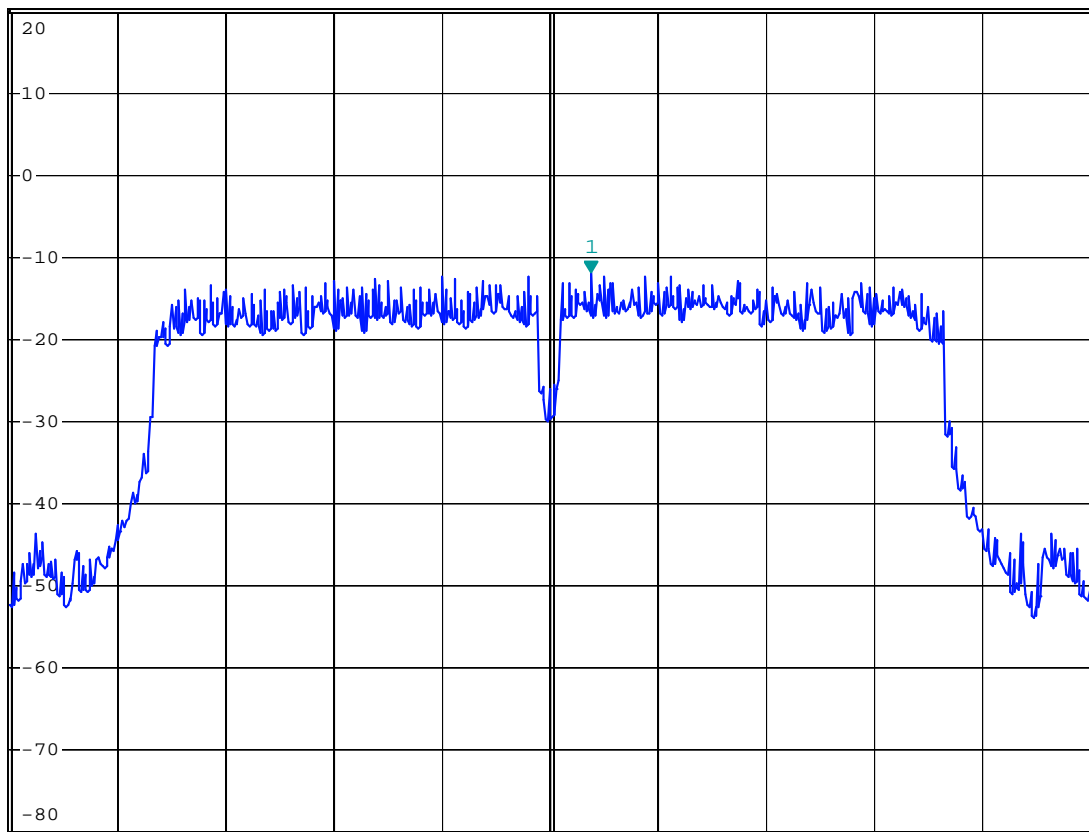
SWT 500 ms

Marker 1 [T1]

-11.90 dBm

2.438900000 GHz

1 PK
MAXH



Center 2.437 GHz

5 MHz /

Span 50 MHz

Date: 17.APR.2013 10:52:21



15. 802.11n at HT40 of CH07 65Mbps



MARKER 1

2.4601 GHz

Ref 20 dBm

* Att 30 dB

* RBW 10 kHz

* VBW 30 kHz

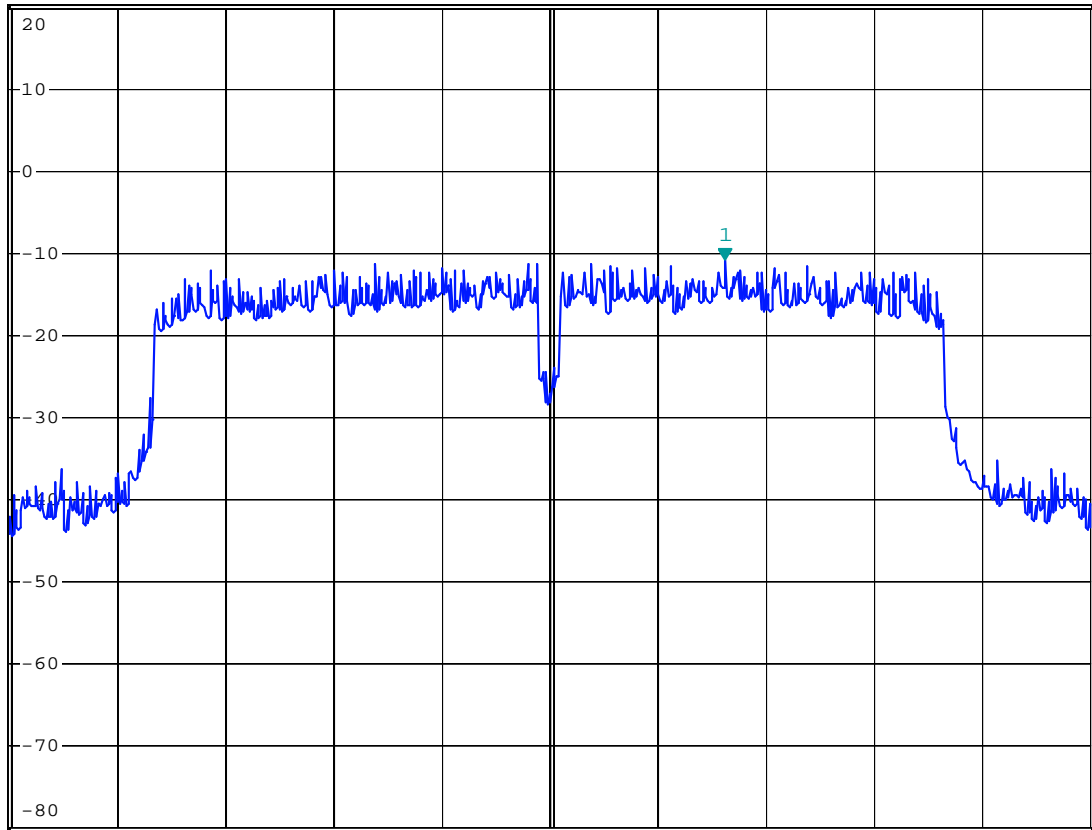
SWT 500 ms

Marker 1 [T1]

-10.91 dBm

2.460100000 GHz

1 PK
MAXH



A

3DB

Center 2.452 GHz

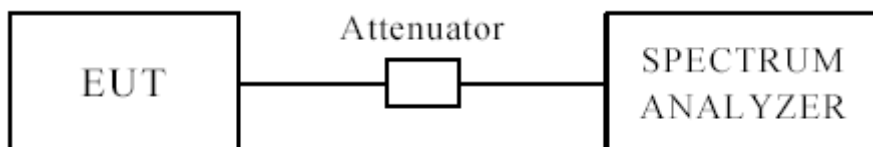
5 MHz /

Span 50 MHz

Date: 17.APR.2013 11:12:02

10 Out of Band Measurement

10.1 Test Setup for band edge



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

10.2 Limits of Out of Band Emissions Measurement

1. Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

10.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test.(Peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector)

For bandage test, the spectrum set as follows: RBW=VBW=100 kHz. A conducted measurement used

10.4 Test Result

Please see next pages

Note: For band-edge measurement, the frequency from 30MHz-25GHz was tested. The worse case was recorded. And It met the FCC rule.

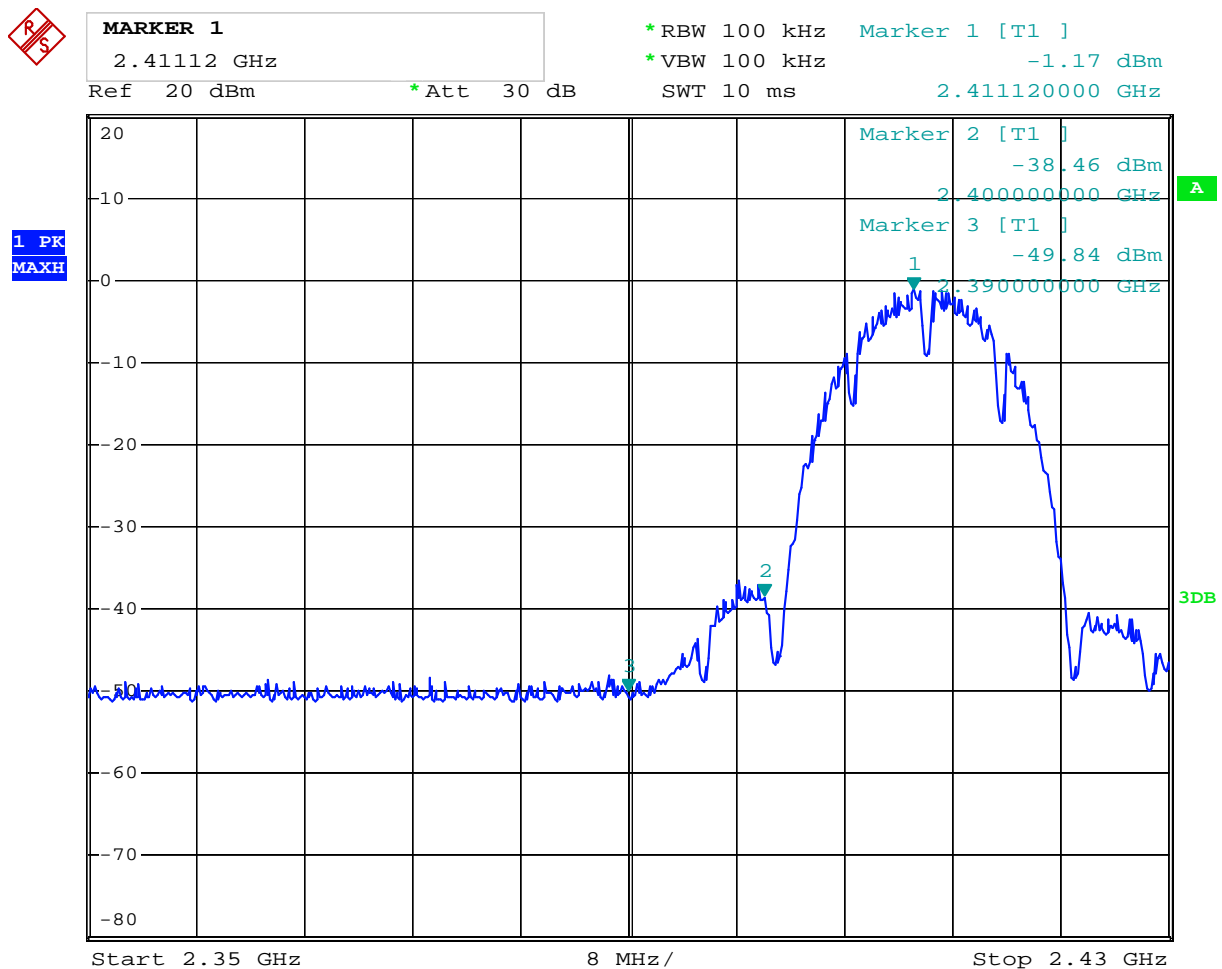


For 802.11b mode

CH01 at 1Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humid Pity	56% RH
Test Result:	Pass		Detector	PK
2400MHz	PK (dBμV/m)	48.85	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)
2390MHz	PK (dBμV/m)	40.06	Limit	74(dBμV/m)
	AV (dBμV/m)			54(dBμV/m)

Test Figure:

Date: 11.APR.2013 18:00:38



CH11 at 1Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humid Pity	56% RH
Test Result:	Pass		Detector	PK
2483.5	PK (dB μ V/m)	41.08	Limit	74(dB μ V/m)
	AV (dB μ V/m)	--		54(dB μ V/m)

Test Figure:**MARKER 1**

2.4616 GHz

Ref 20 dBm

* Att 30 dB

* RBW 100 kHz

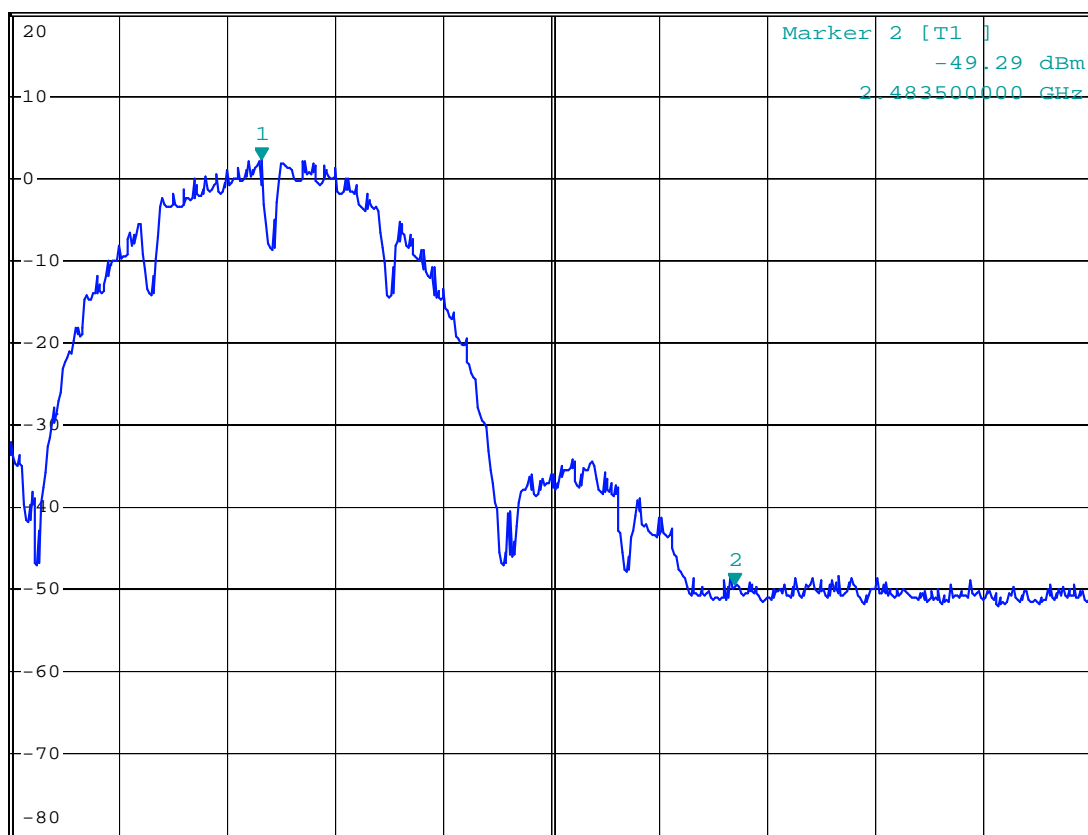
Marker 1 [T1]

* VBW 100 kHz

2.27 dBm

SWT 5 ms

2.461600000 GHz

1 PK
MAXH

Start 2.45 GHz

5 MHz/

Stop 2.5 GHz

Date: 12.APR.2013 10:20:11

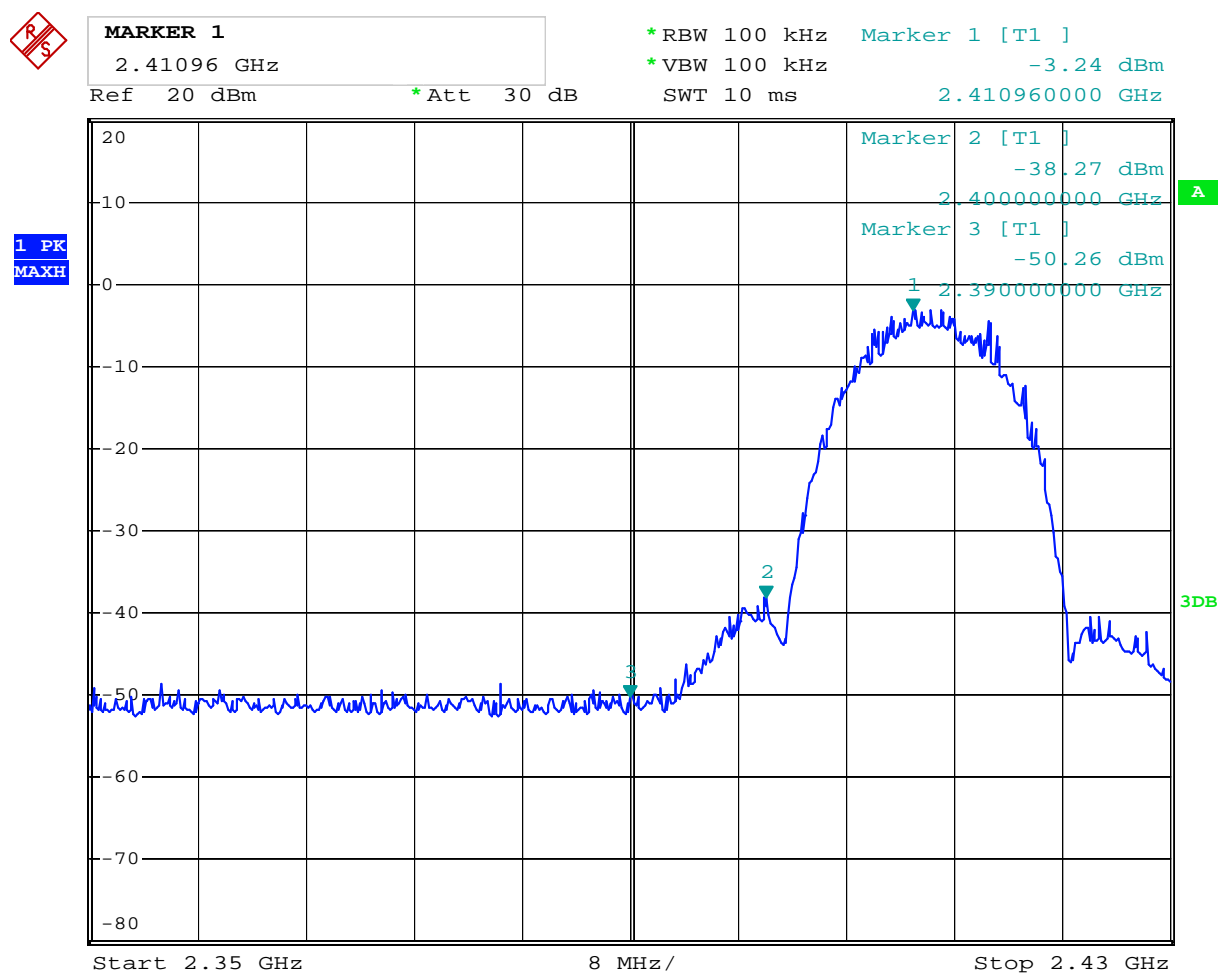


For 802.11b mode

CH01 at 11Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humid Pity	56% RH
Test Result:	Pass		Detector	PK
2400MHz	PK (dBμV/m)	49.65	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)
2390MHz	PK (dBμV/m)	40.09	Limit	74(dBμV/m)
	AV (dBμV/m)			54(dBμV/m)

Test Figure:

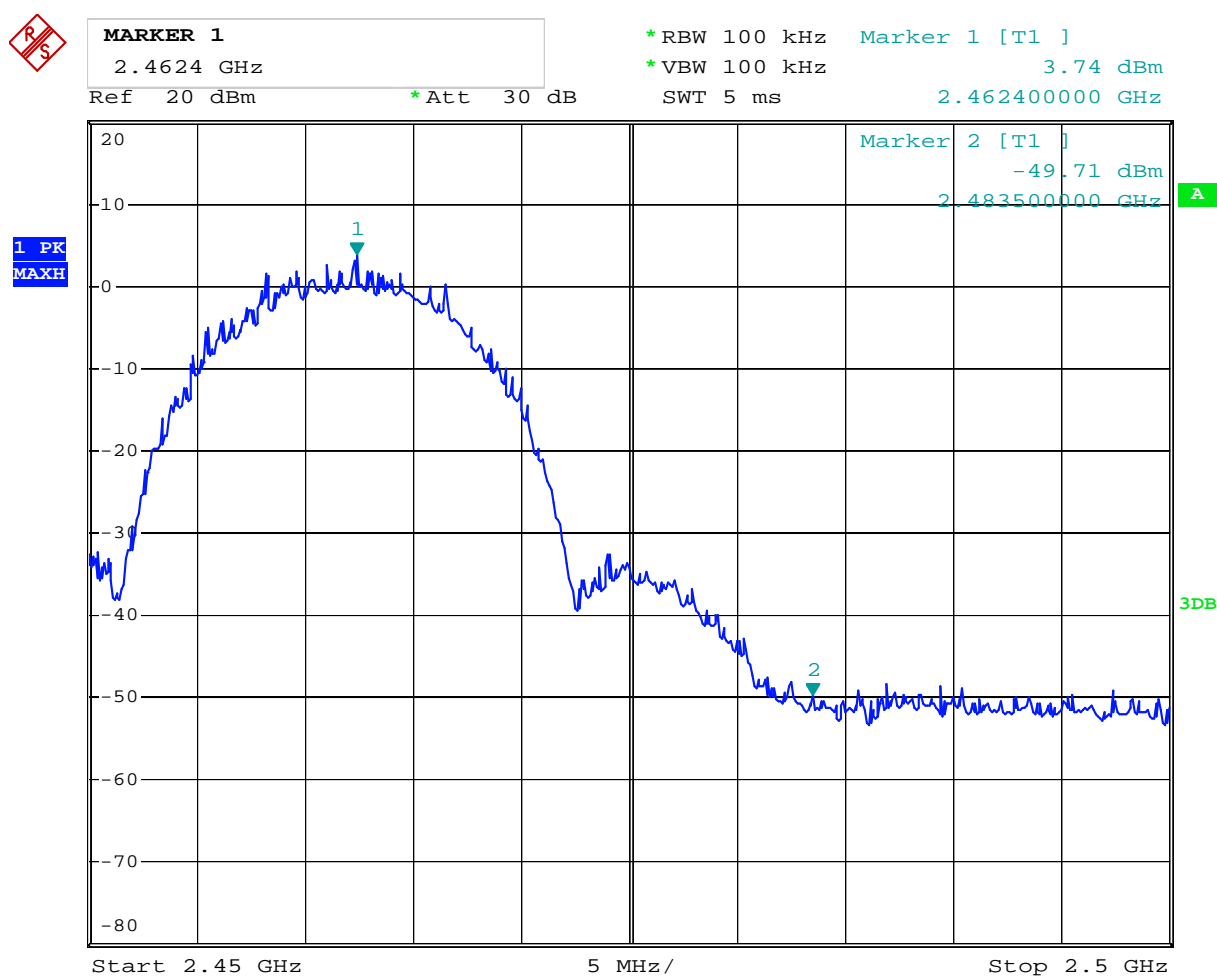
Date: 11.APR.2013 18:01:09



CH11 at 11Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Hmid Pity	56% RH
Test Result:	Pass		Detector	PK
2483.5	PK (dBμV/m)	43.33	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)

Test Figure:

Date: 12.APR.2013 10:24:30

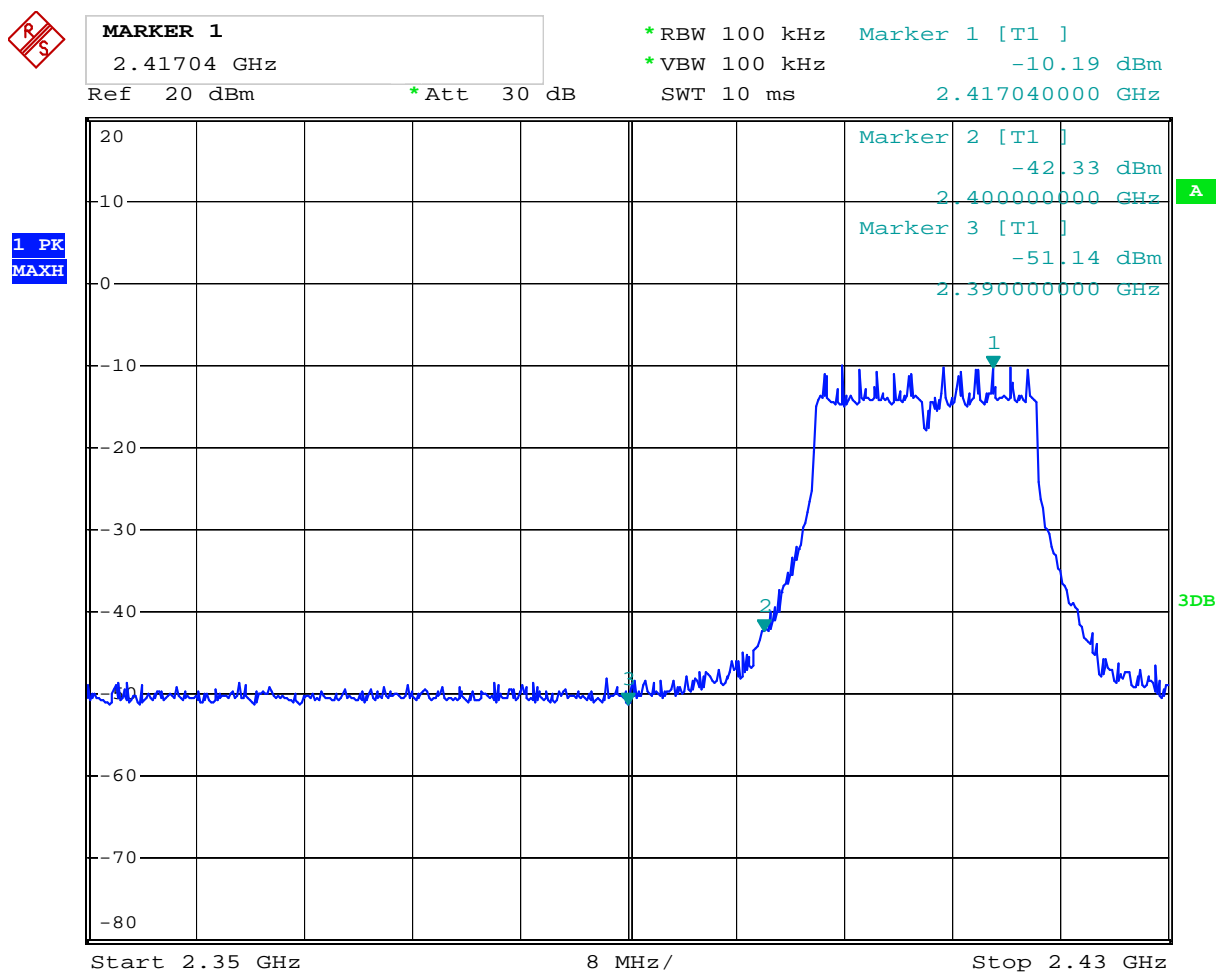


For 802.11g mode

CH01 at 54Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humid Pity	56% RH
Test Result:	Pass		Detector	PK
2400MHz	PK (dBμV/m)	46.89	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)
2390MHz	PK (dBμV/m)	40.45	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)

Test Figure:

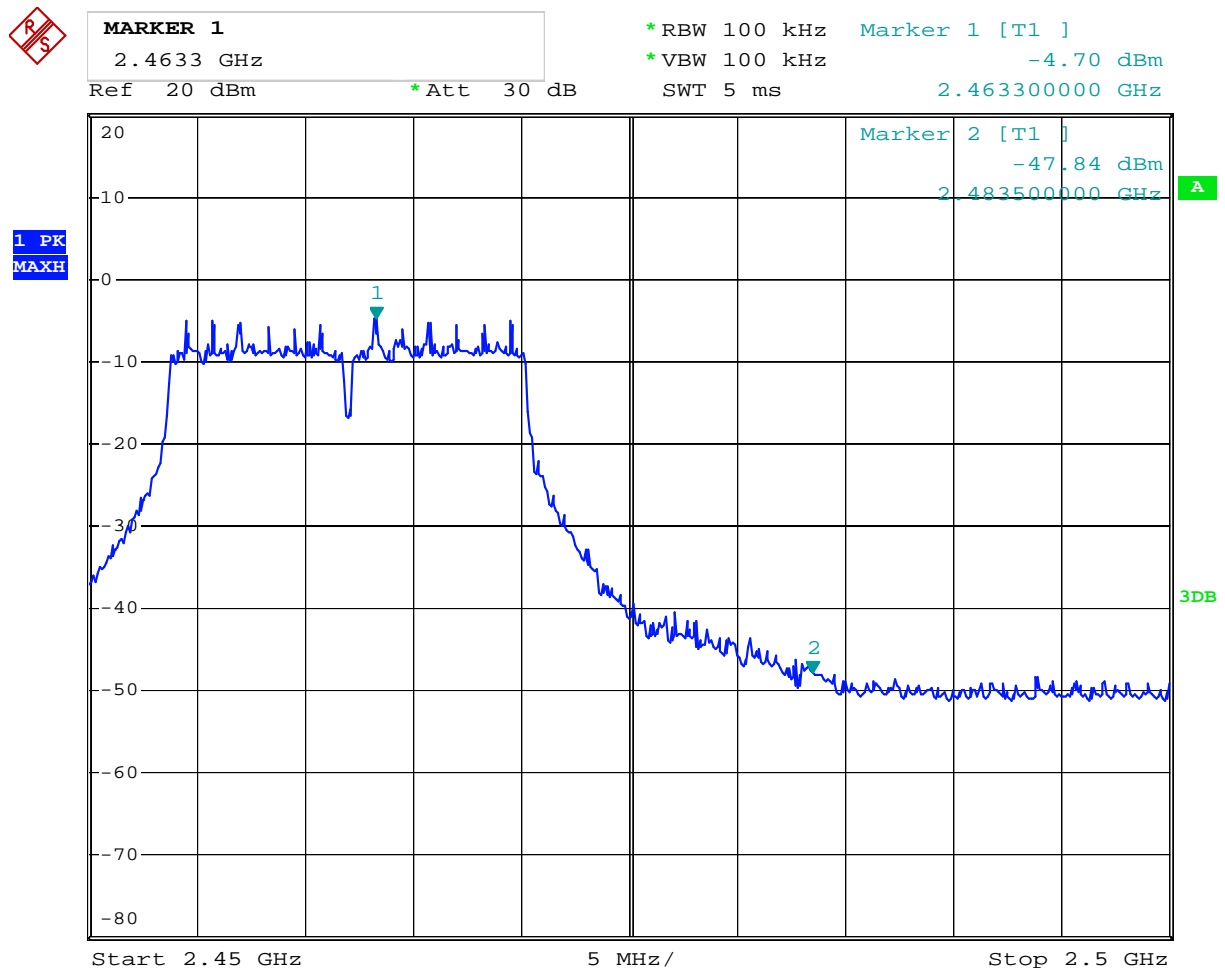
Date: 11.APR.2013 18:02:04

CH11 at 54Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Hmid Pity	56% RH
Test Result:	Pass		Detector	PK
2483.5	PK (dBμV/m)	43.12	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)

Test Figure:



Date: 12.APR.2013 10:24:09



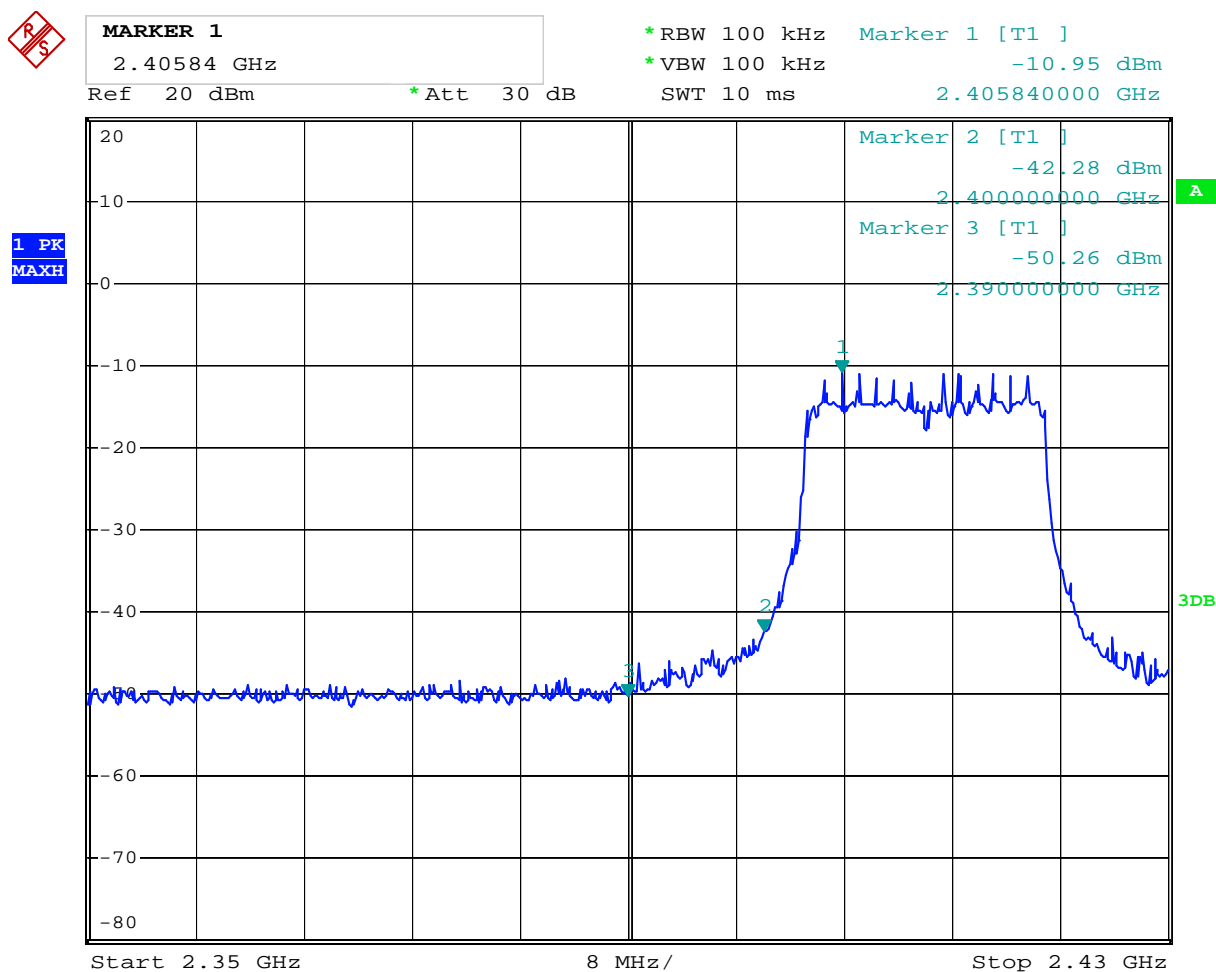
For 802.11n mode

CH01 at HT20 65Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humid Pity	56% RH
Test Result:	Pass		Detector	PK
2400MHz	PK (dBμV/m)	48.15	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)
2390MHz	PK (dBμV/m)	39.35	Limit	74(dBμV/m)
	AV (dBμV/m)			54(dBμV/m)

Test Figure:



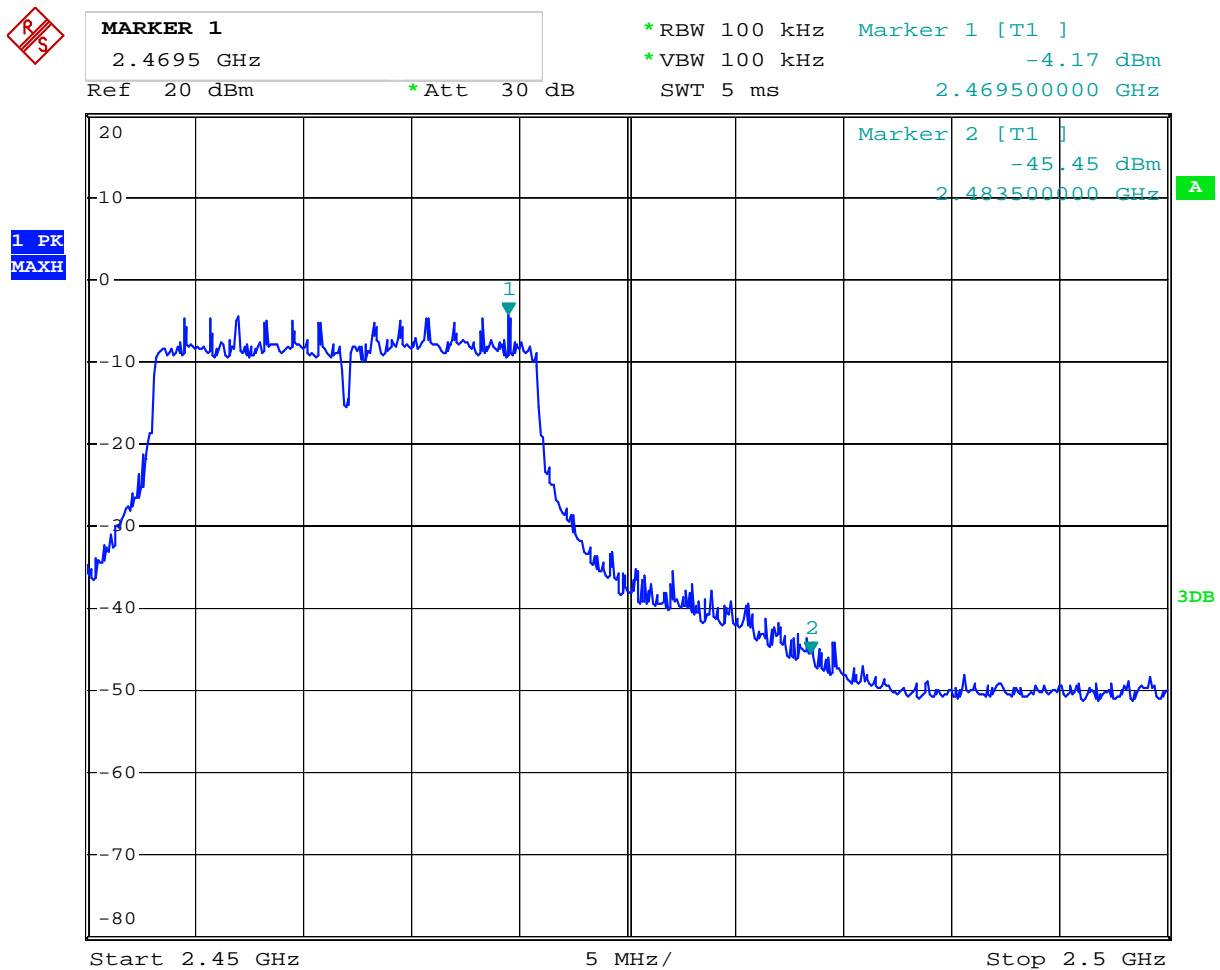
Date: 11.APR.2013 18:03:08

CH11 at HT20 65Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Hmid Pity	56% RH
Test Result:	Pass		Detector	PK
2483.5	PK (dBμV/m)	43.72	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)

Test Figure:



Date: 12.APR.2013 10:19:45

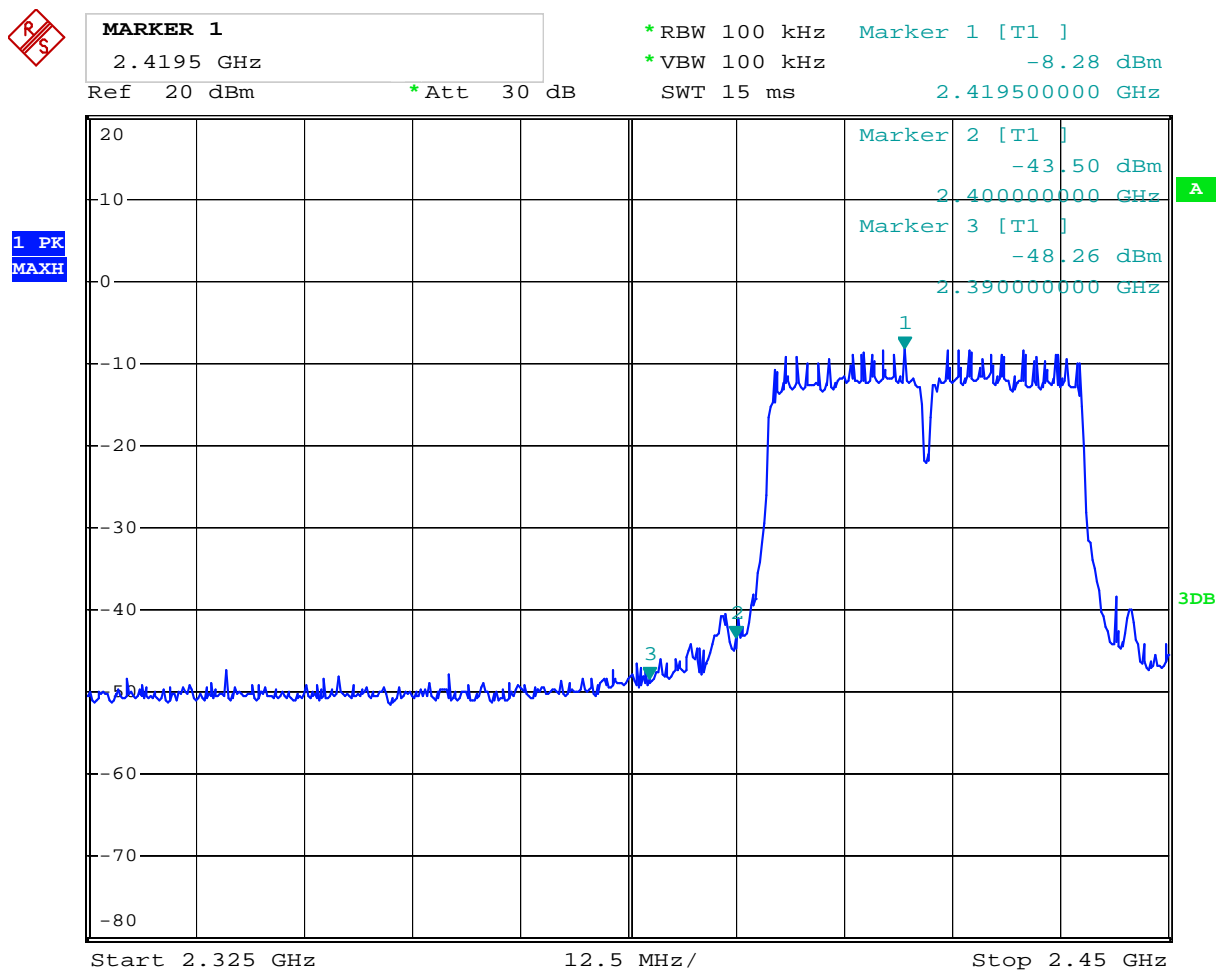
For 802.11n mode

CH01 at HT40 65Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humid Pity	56% RH
Test Result:	Pass		Detector	PK
2400MHz	PK (dBμV/m)	47.19	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)
2390MHz	PK (dBμV/m)	38.85	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)

Test Figure:



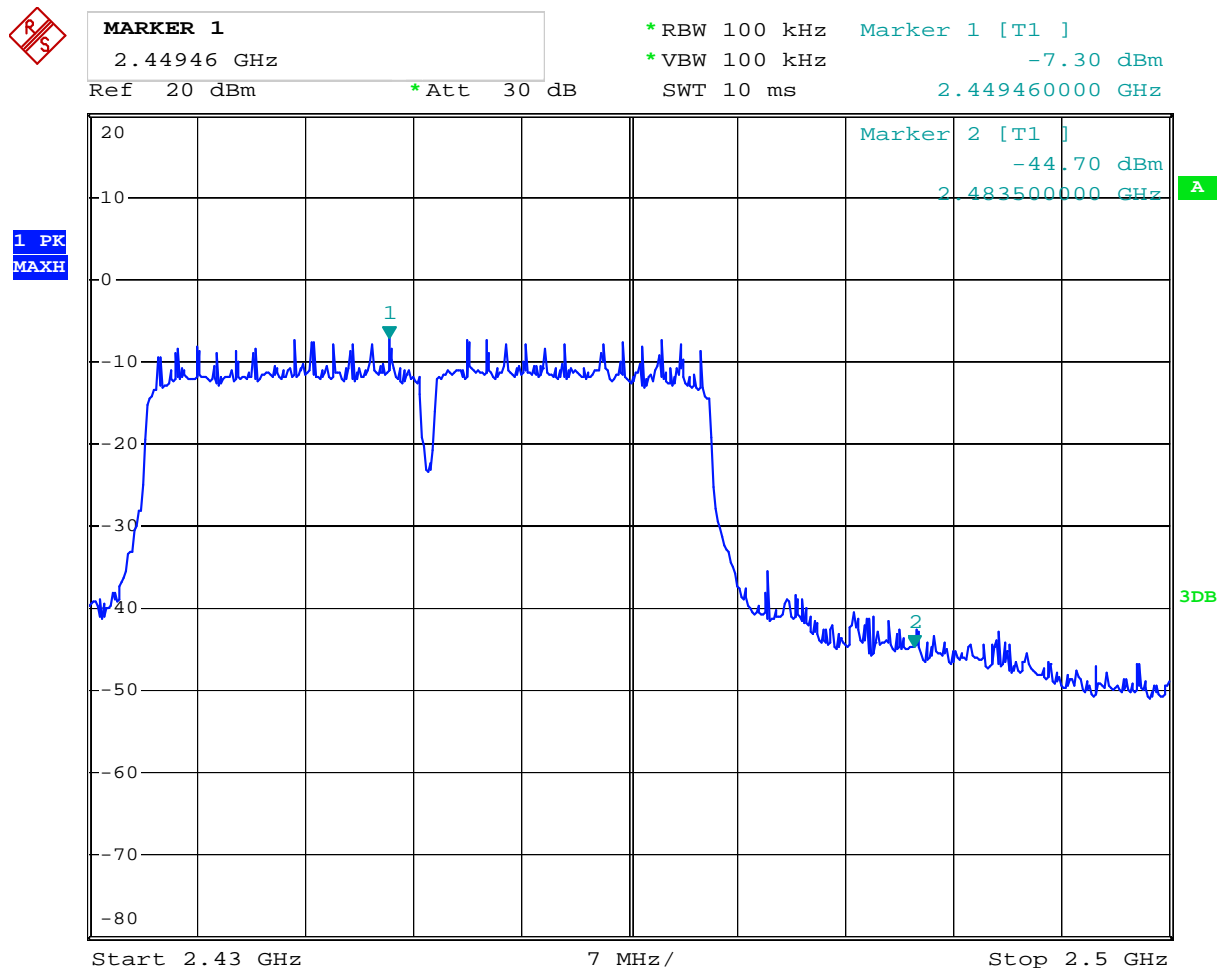
Date: 12.APR.2013 10:25:36

CH11 at HT40 65Mbps

10.4 Band-edge Measurement

EUT	NVR		Model	ZH-NA04-W
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Hmid Pity	56% RH
Test Result:	Pass		Detector	PK
2483.5	PK (dBμV/m)	40.13	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)

Test Figure:



Date: 12.APR.2013 10:17:38



11.0 Antenna Requirement

11.1 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 transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected construction

Dipole antenna used. An RF Cable is used to connect the antenna to the reverse polarity SMA connector. The maximum Gain of the antennas is 5.0dBi.

12.0 Maximum Permissible Exposure

Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

(a) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100000			1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

MPE Calculation Method

$$E \text{ (V/m)} = (30 * P * G)^{0.5} / d \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = E^2 / 377$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to



$$Pd = (30 * P * G) / (377 * d^2)$$

From the peak EUT RF output power, the minimum mobile separation distance, $d=0.2\text{m}$, as well as the gain of the used antenna, the RF power density can be obtained.

Calculated Result and Limit

Antenna Gain: 5.0dBi

Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.162	18.48	70.47	0.044	1	Compiles

Note: the worse case was recorded.

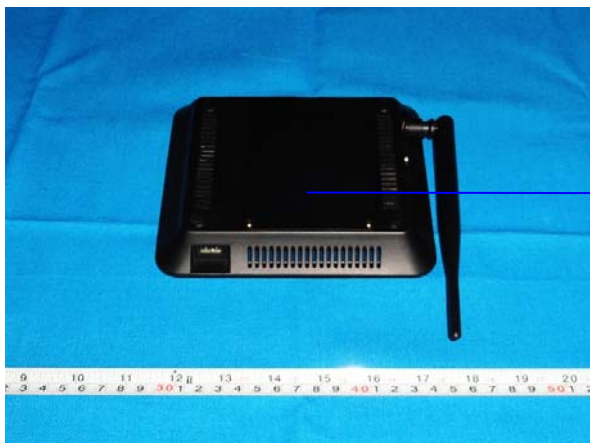
13.0 FCC ID Label

FCC ID: ZK8-NA04-W

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.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

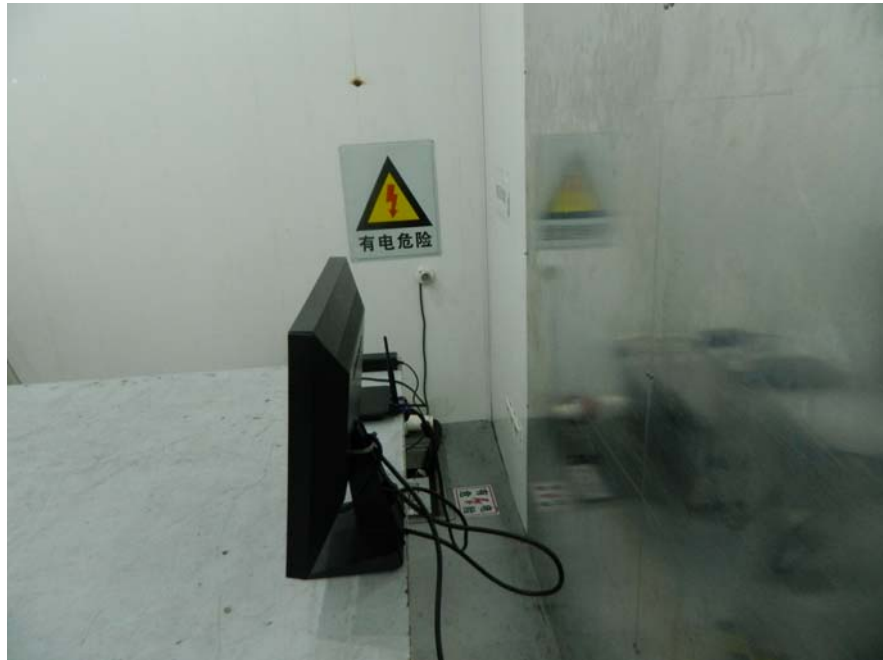
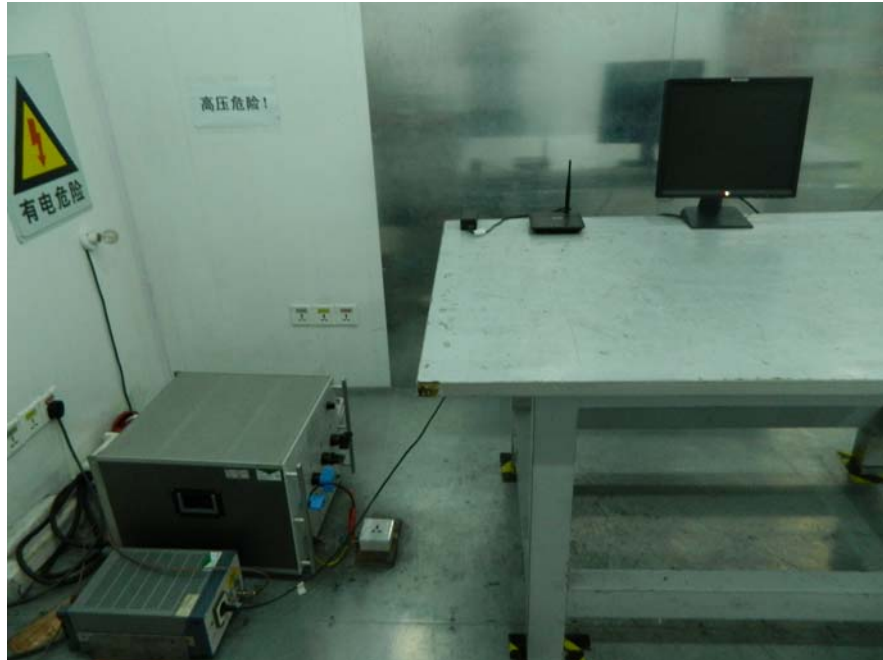
Mark Location:



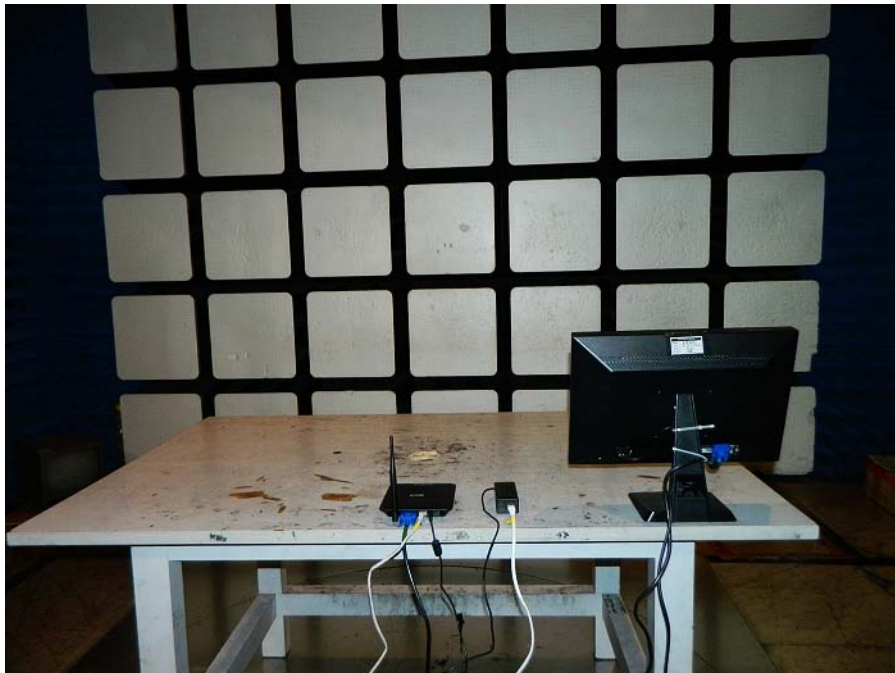
FCC ID Label

14 PHOTOGRAPHS OF THE TEST CONFIGURATION

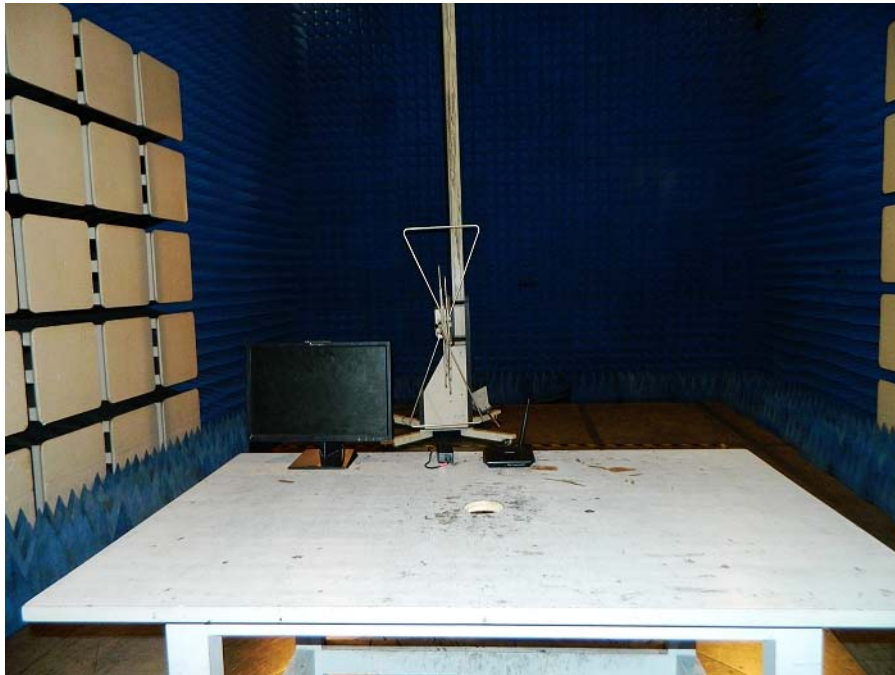
Conducted Emissions



Radiated Emissions



Radiated Emissions



PHOTOGRAPHS OF EUT



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9

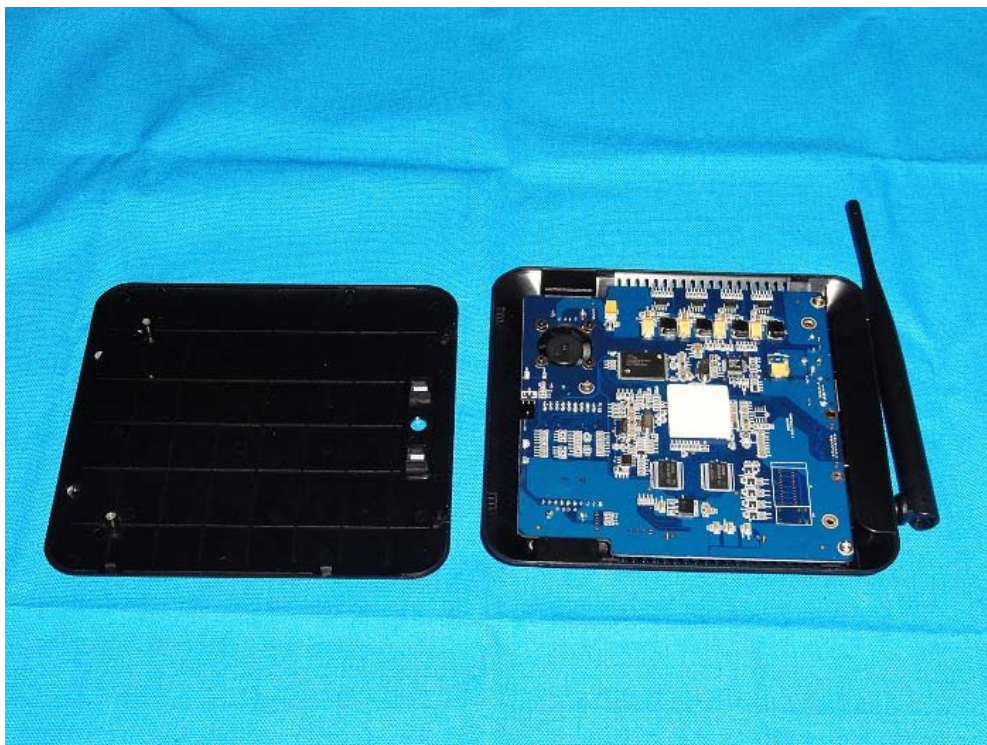


Photo 10

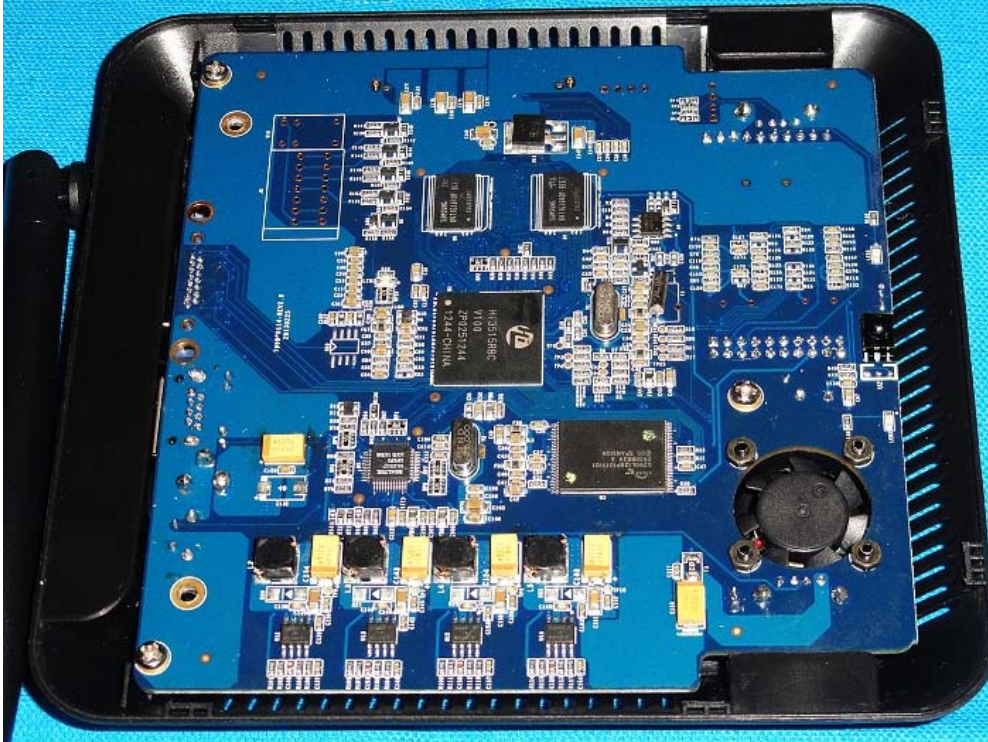


Photo 11

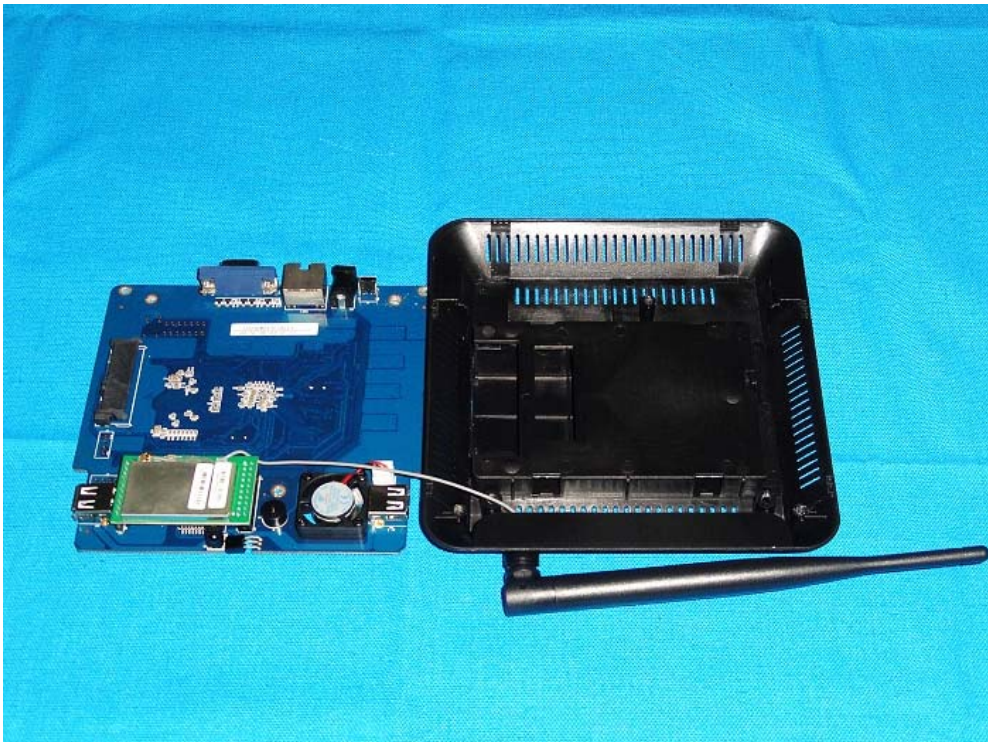


Photo 12

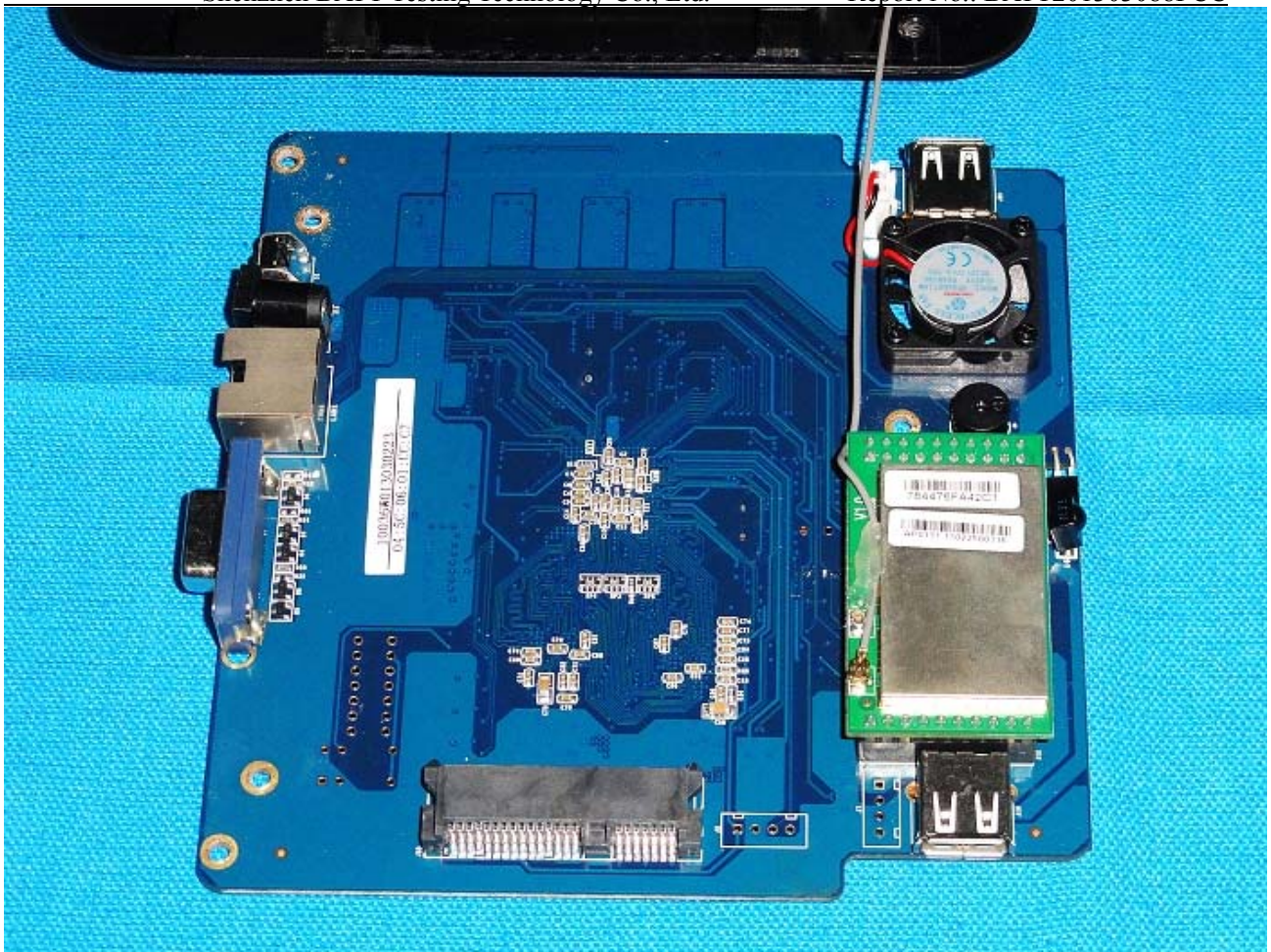


Photo 13



Photo 14

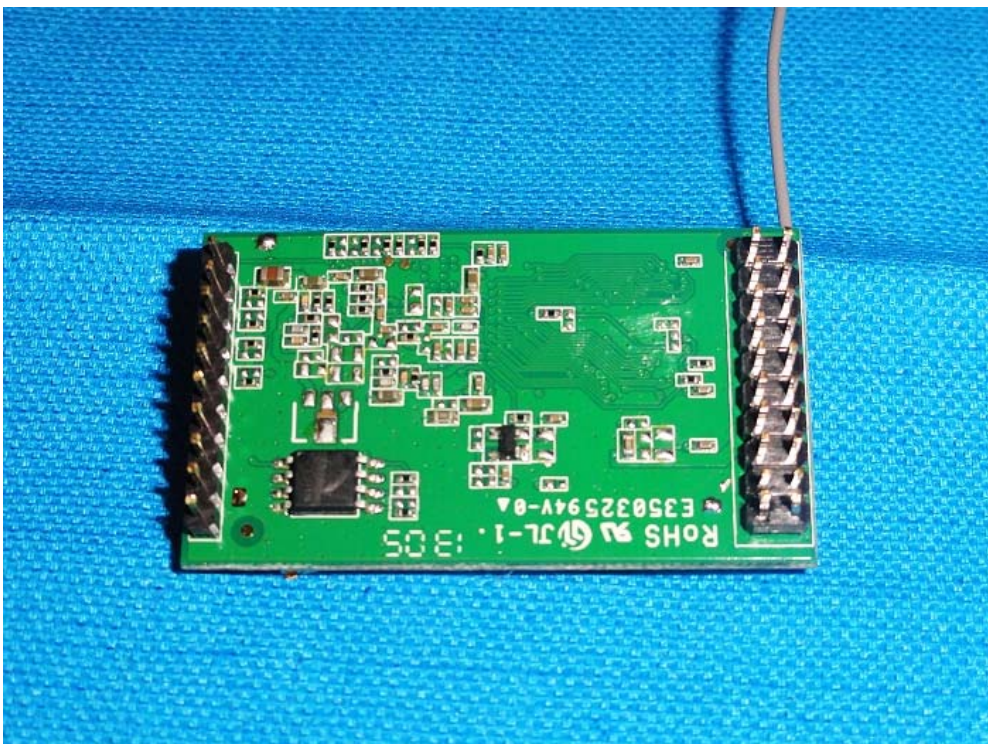


Photo 15



Photo 16

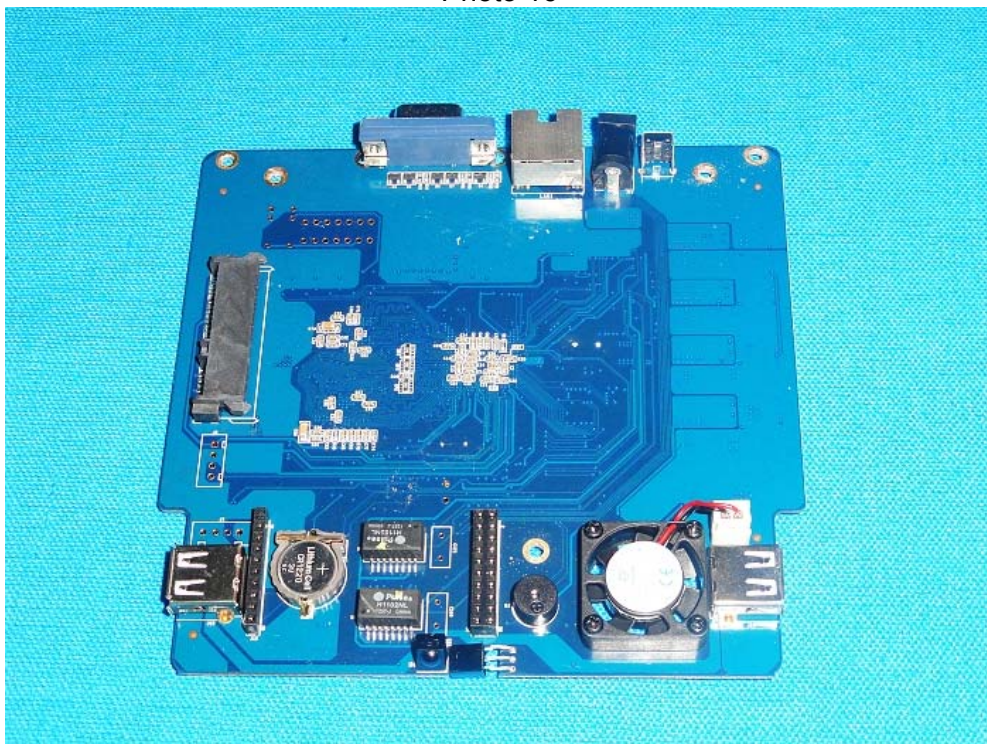


Photo 17

The Report End