

# FCC Part 15C

## Measurement and Test Report

For

**Shenzhen WeDo Century Industrial Co.,Ltd**

**3rd Building, 6th, QingNingRoad, QingHu Village. LongHua, ShenZhen,**

**518109, China**

**FCC ID: 2AC9AHD22**

<b>FCC Rule(s):</b>	<u>FCC Part 15C</u>
<b>Product Description:</b>	<u>TV BOX</u>
<b>Tested Model:</b>	<u>HD22</u>
<b>Report No.:</b>	<u>STR14098131I-1</u>
<b>Tested Date:</b>	<u>2014-09-17 to 2014-11-20</u>
<b>Issued Date:</b>	<u>2014-11-21</u>
<b>Tested By:</b>	<u>Vigoss Liang / Engineer</u>
<b>Reviewed By:</b>	<u>Lahm Peng / EMC Manager</u>
<b>Approved &amp; Authorized By:</b>	<u>Jandy so / PSQ Manager</u>
<b>Prepared By:</b>	

**Shenzhen SEM.Test Technology Co., Ltd.**

1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,  
Bao'an District, Shenzhen, P.R.C. (518101)

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

**TABLE OF CONTENTS**

<b>1. GENERAL INFORMATION.....</b>	<b>3</b>
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	4
1.3 TEST METHODOLOGY.....	4
1.4 TEST FACILITY.....	4
1.5 EUT SETUP AND TEST MODE.....	5
<b>2. SUMMARY OF TEST RESULTS .....</b>	<b>6</b>
<b>3. RF EXPOSURE .....</b>	<b>7</b>
3.1 STANDARD APPLICABLE.....	7
3.2 TEST RESULT.....	7
<b>4. ANTENNA REQUIREMENT .....</b>	<b>8</b>
4.1 STANDARD APPLICABLE.....	8
4.2 EVALUATION INFORMATION .....	8
<b>5. POWER SPECTRAL DENSITY .....</b>	<b>9</b>
5.1 STANDARD APPLICABLE.....	9
5.2 TEST EQUIPMENT LIST AND DETAILS .....	9
5.3 TEST PROCEDURE.....	9
5.4 ENVIRONMENTAL CONDITIONS .....	9
5.5 SUMMARY OF TEST RESULTS/PLOTS .....	10
<b>6. 6DB BANDWIDTH .....</b>	<b>17</b>
6.1 STANDARD APPLICABLE.....	17
6.2 TEST EQUIPMENT LIST AND DETAILS .....	17
6.3 TEST PROCEDURE.....	17
6.4 ENVIRONMENTAL CONDITIONS .....	17
6.5 SUMMARY OF TEST RESULTS/PLOTS .....	18
<b>7. RF OUTPUT POWER.....</b>	<b>25</b>
7.1 STANDARD APPLICABLE.....	25
7.2 TEST EQUIPMENT LIST AND DETAILS .....	25
7.3 TEST PROCEDURE.....	25
7.4 ENVIRONMENTAL CONDITIONS .....	25
7.5 SUMMARY OF TEST RESULTS/PLOTS .....	26
<b>8. FIELD STRENGTH OF SPURIOUS EMISSIONS .....</b>	<b>33</b>
8.1 MEASUREMENT UNCERTAINTY .....	33
8.2 STANDARD APPLICABLE.....	33
8.3 TEST EQUIPMENT LIST AND DETAILS .....	33
8.4 TEST PROCEDURE.....	34
8.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	34
8.6 ENVIRONMENTAL CONDITIONS .....	35
8.7 SUMMARY OF TEST RESULTS/PLOTS .....	35
<b>9. OUT OF BAND EMISSIONS.....</b>	<b>64</b>
9.1 STANDARD APPLICABLE.....	64
9.2 TEST EQUIPMENT LIST AND DETAILS .....	64
9.3 TEST PROCEDURE.....	64
9.4 ENVIRONMENTAL CONDITIONS .....	65
9.5 SUMMARY OF TEST RESULTS/PLOTS .....	65
<b>10. CONDUCTED EMISSIONS .....</b>	<b>74</b>
10.1 MEASUREMENT UNCERTAINTY .....	74
10.2 TEST EQUIPMENT LIST AND DETAILS .....	74
10.3 TEST PROCEDURE.....	74
10.4 BASIC TEST SETUP BLOCK DIAGRAM.....	74
10.5 ENVIRONMENTAL CONDITIONS .....	75
10.6 TEST RECEIVER SETUP .....	75
10.7 SUMMARY OF TEST RESULTS/PLOTS .....	75
10.8 CONDUCTED EMISSIONS TEST DATA.....	75

## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: Shenzhen WeDo Century Industrial Co.,Ltd  
 Address of applicant: 3rd Building, 6th, QingNingRoad, QingHu Village. LongHua, ShenZhen, 518109, China  
 Manufacturer: Shenzhen WeDo Century Industrial Co.,Ltd  
 Address of manufacturer: 3rd Building, 6th, QingNingRoad, QingHu Village. LongHua, ShenZhen, 518109, China

General Description of EUT	
Product Name:	TV BOX
Trade Name:	WellDo
Model No.:	HD22
Adding Model(s):	AllCamHD22
Rated Voltage:	Adapter DC 5V
Power Adaptor:	CH0515000C
	Input: AC100-240V~50/60Hz; Output: DC 5V, 1.5A
<p><i>Note: The test data is gathered from a production sample provided by the manufacturer. The appearance of others models listed in the report is different from main-test model HD22, but the circuit and the electronic construction do not change, declared by the manufacturer.</i></p>	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2472MHz for 802.11b/g/n(HT20) 2422-2462MHz for 802.11n(HT40)
RF Output Power:	13.57dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	13 for 802.11b/g/n(HT20); 9 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	2dBi
Lowest Internal Frequency	32.768 KHz

## 1.2 Test Standards

The following report is prepared on behalf of the Shenzhen WeDo Century Industrial Co.,Ltd in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. The measurement guide KDB 558074 D01 V03r02 for digital transmission systems shall be performed also.

## 1.4 Test Facility

### **FCC – Registration No.: 934118**

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

### **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

### **CNAS Registration No.: L4062**

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2<sup>nd</sup> Road, Bao'an District, Shenzhen, P.R.C (518101).

## 1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11b	2412MHz, 2442MHz, 2472MHz
TM2	802.11g	2412MHz, 2442MHz, 2472MHz
TM3	802.11n-HT20	2412MHz, 2442MHz, 2472MHz
TM4	802.11n-HT40	2422MHz, 2442MHz, 2462MHz

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
OTG/USB Cable	0.15	Shielded	Without Ferrite
USB/DC Cable	1.20	Unshielded	Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
HDMI	2.40	Shielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Display	DELL	U2410f	50642P246601H(B) ZL
USB Disk	SONY	8GB	/
TF Card	/	1GB	/
Mouse	Lenovo	/	/

## 2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 2.1093	RF Exposure	Compliant
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

### **3. RF Exposure**

---

#### **3.1 Standard Applicable**

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

#### **3.2 Test Result**

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.

## **4. Antenna Requirement**

---

### **4.1 Standard Applicable**

According to FCC Part 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

### **4.2 Evaluation Information**

This product has an integral antenna, fulfill the requirement of this section.



## 5. Power Spectral Density

### 5.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2014-05-28	2015-05-27
Attenuator	ATTEN	ATS100-4-20	/	2014-05-28	2015-05-27

### 5.3 Test Procedure

According to the KDB 558074 D01 V03r02, such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. The test method of power spectral density as below:

- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- Set VBW  $\geq 3 \times \text{RBW}$ .
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span/RBW}$ .
- Sweep time = auto couple.
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

### 5.4 Environmental Conditions

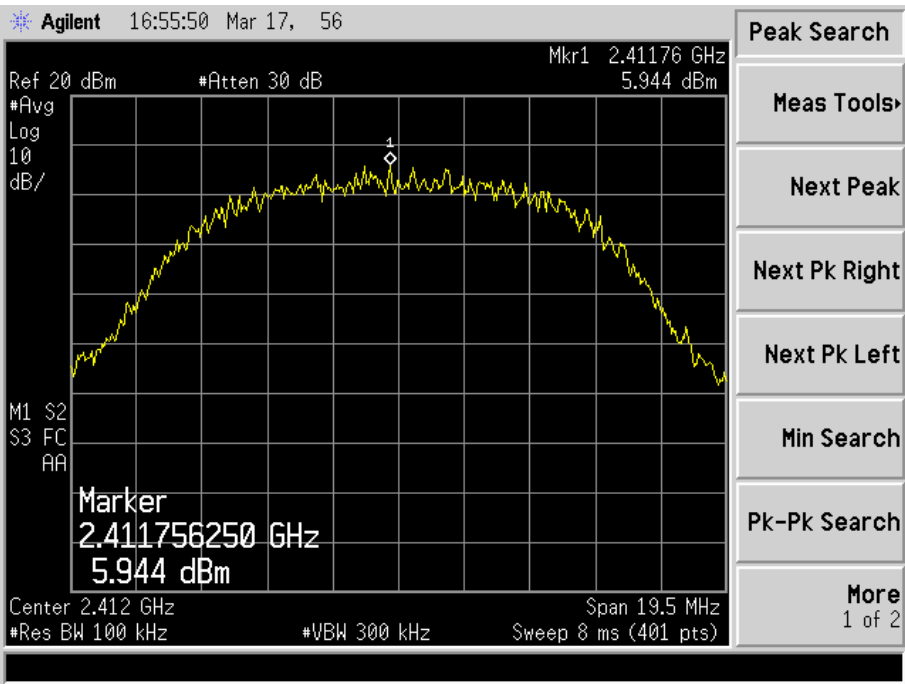
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

## 5.5 Summary of Test Results/Plots

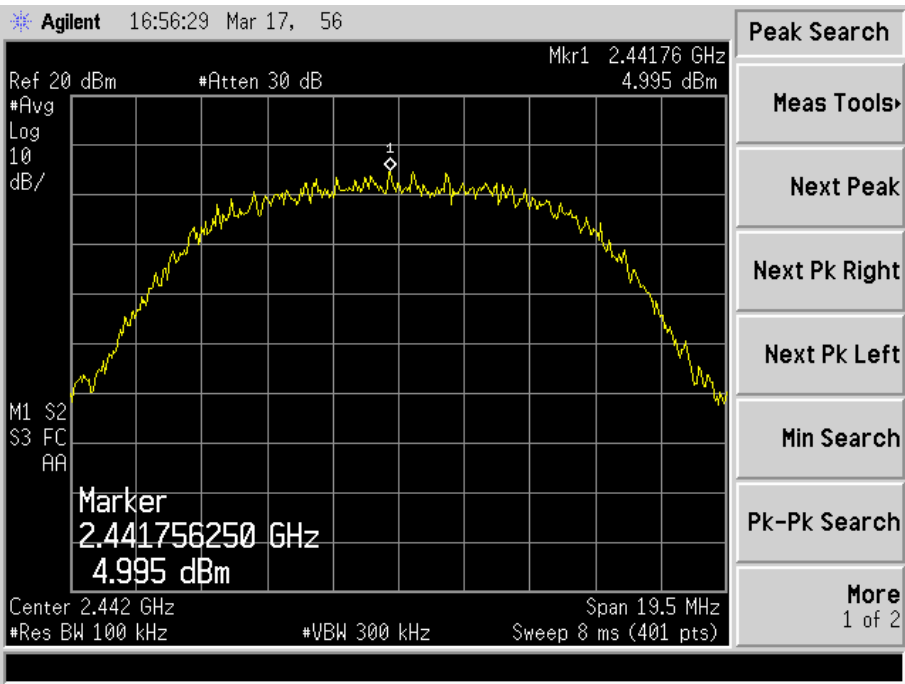
Test Mode	Test Channel MHz	Power Spectral Density dBm/100kHz	Limit dBm/3kHz
802.11b	2412	5.944	8
	2442	4.995	8
	2472	3.171	8
802.11g	2412	-0.889	8
	2442	-1.414	8
	2472	-1.120	8
802.11n HT20	2412	-0.674	8
	2442	-1.773	8
	2472	-1.857	8
802.11n HT40	2422	-5.263	8
	2442	-5.426	8
	2462	-6.060	8

Please refer to the following test plots:

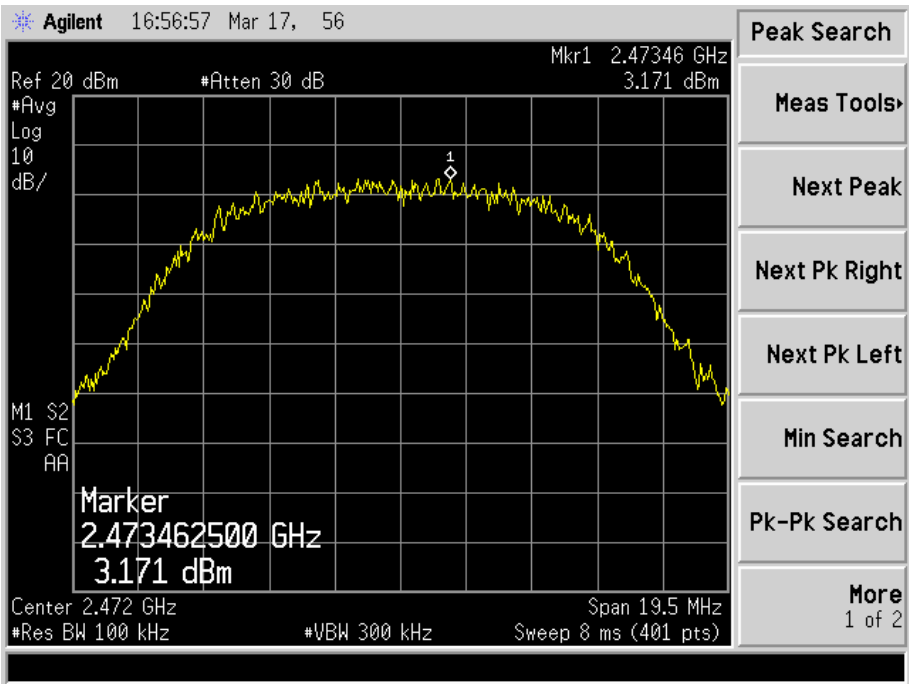
802.11b-Low Channel



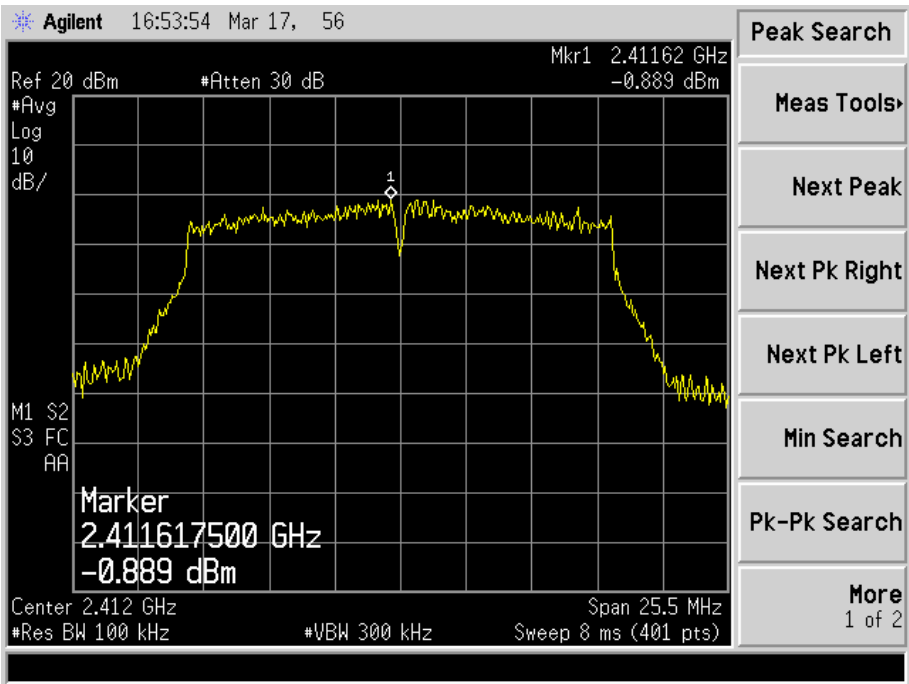
802.11b-Middle Channel



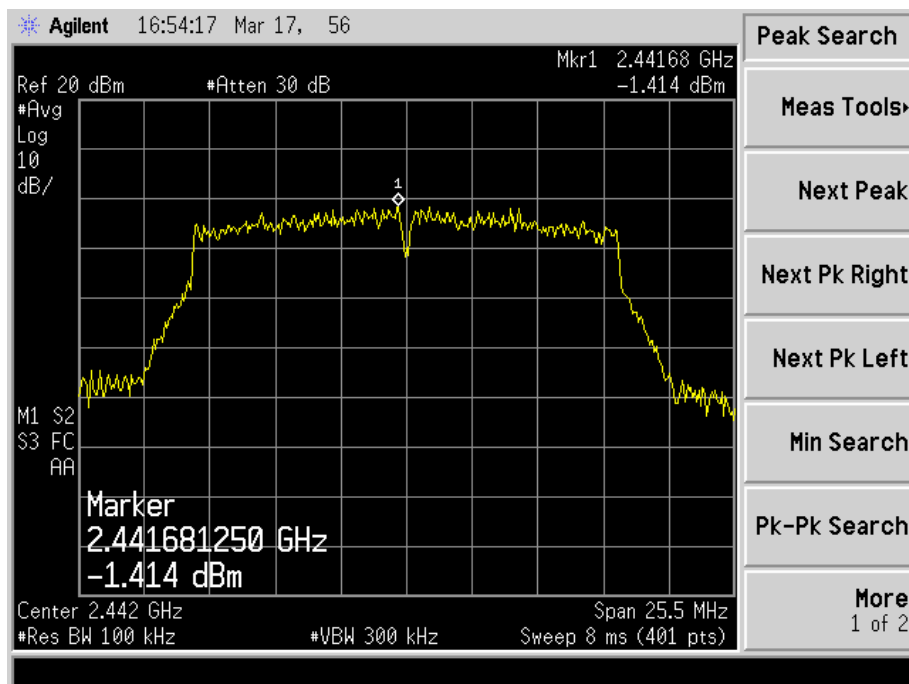
802.11b-High Channel



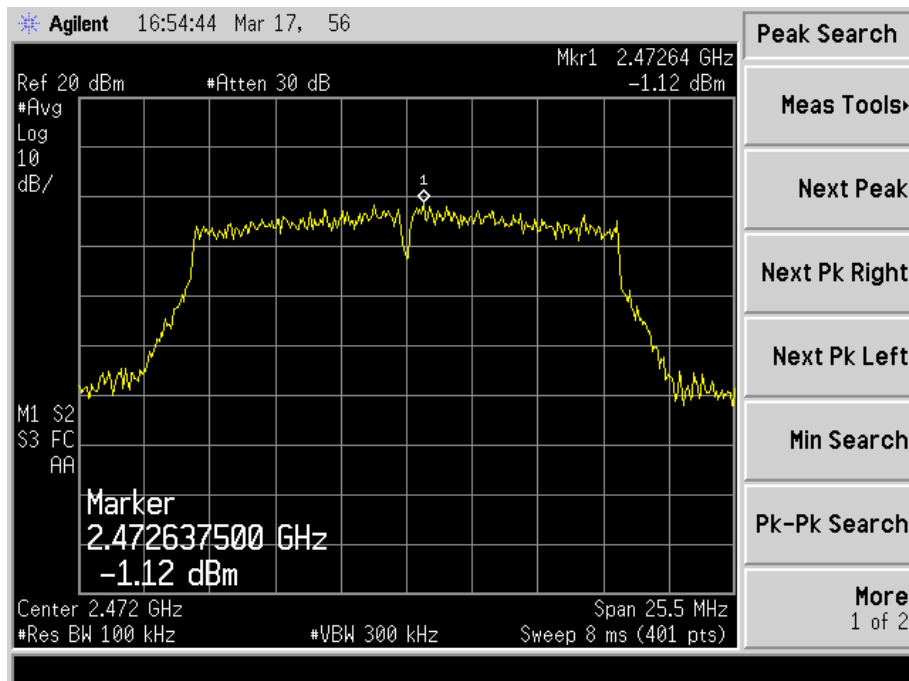
802.11g-Low Channel



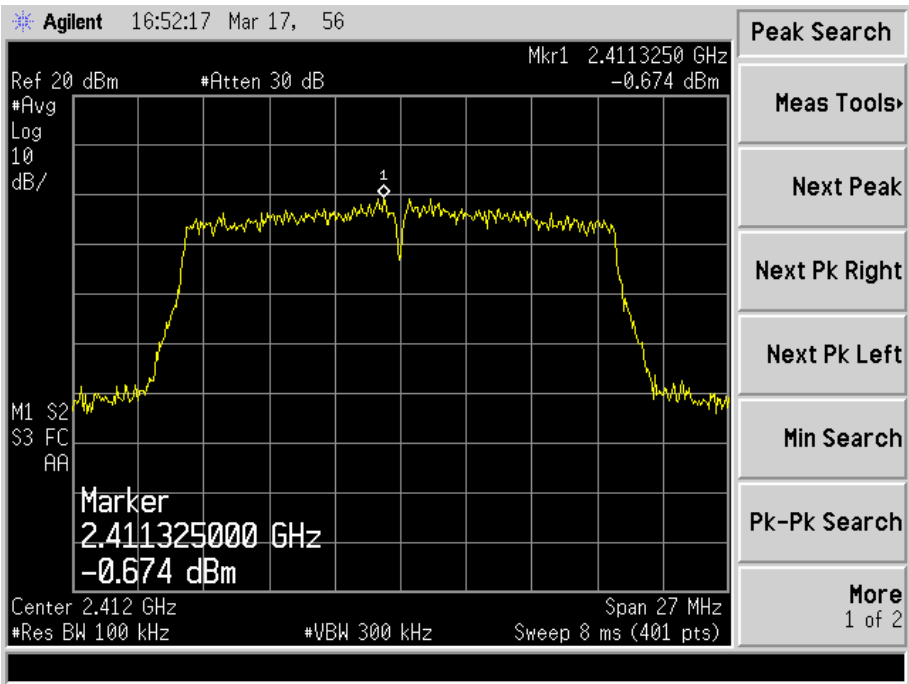
## 802.11g-Middle Channel



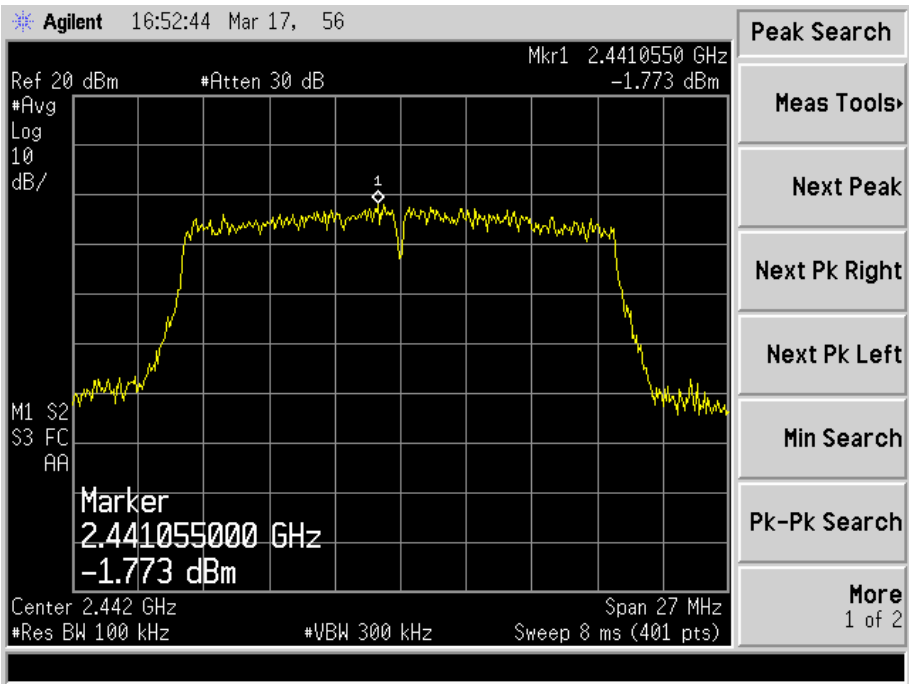
## 802.11g-High Channel



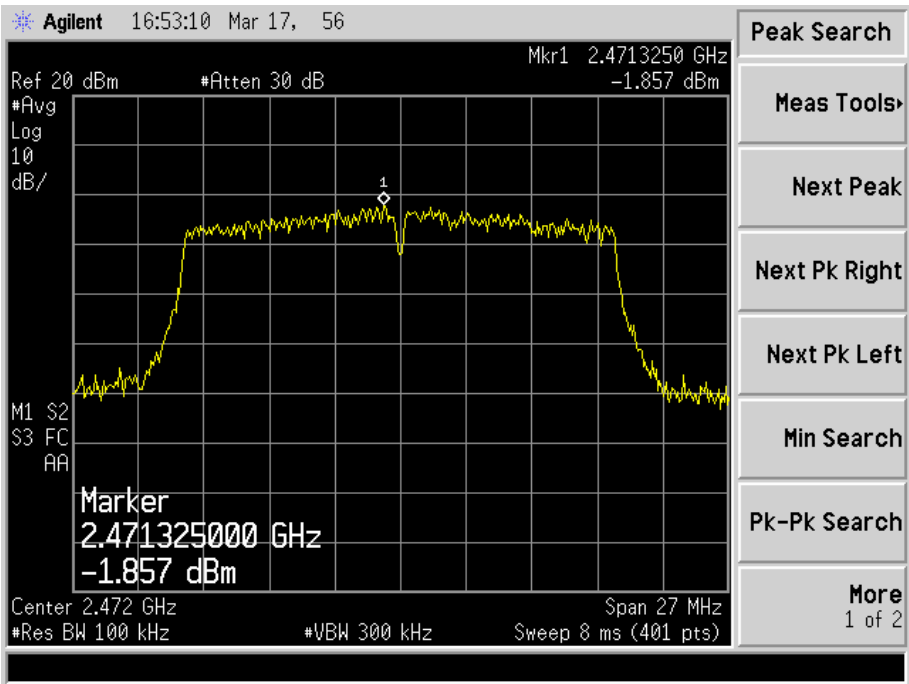
802.11n-HT20-Low Channel



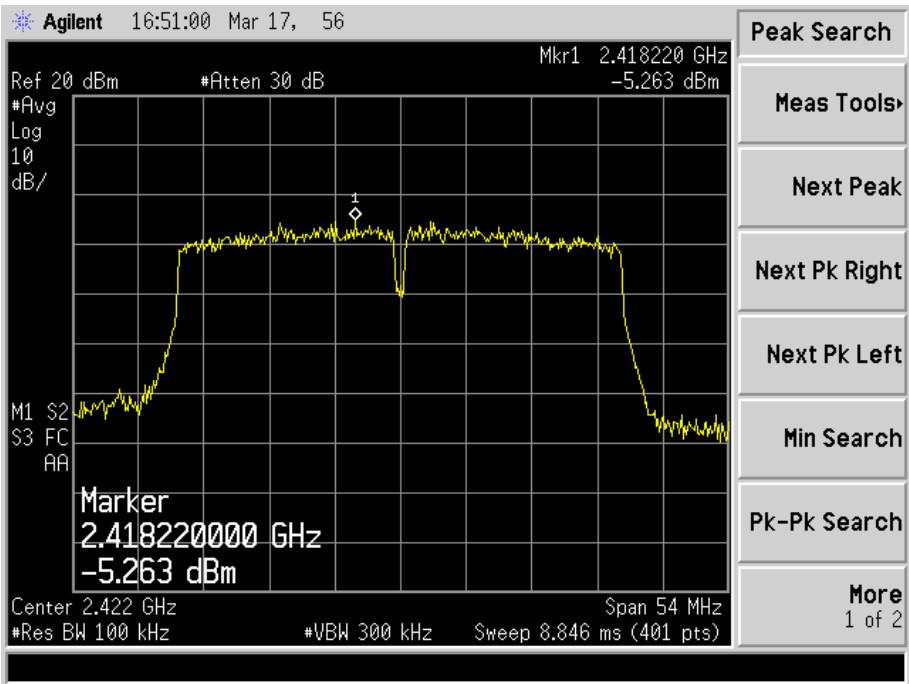
802.11n-HT20-Middle Channel



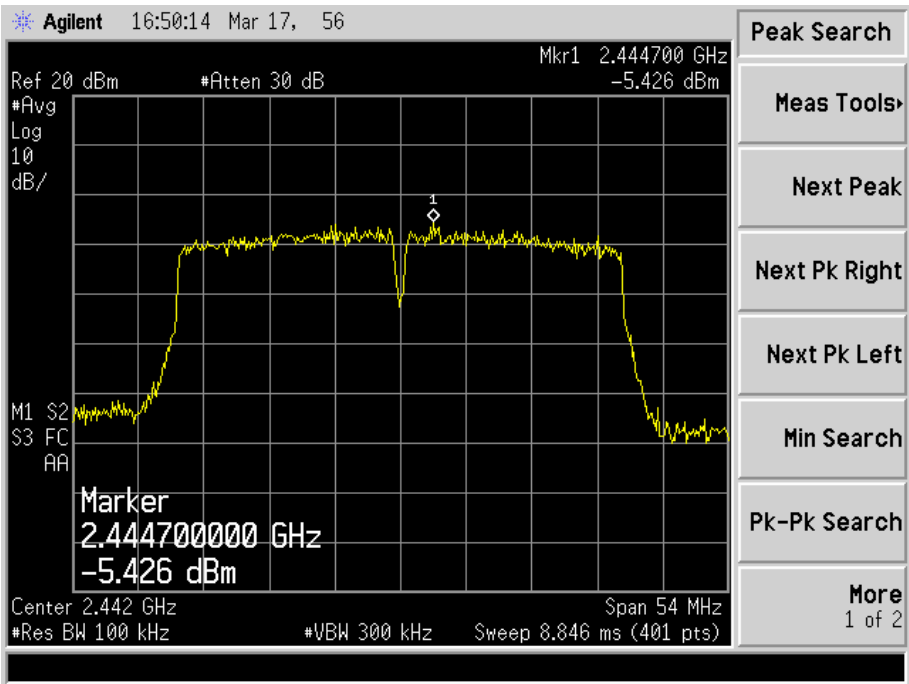
802.11n-HT20-High Channel



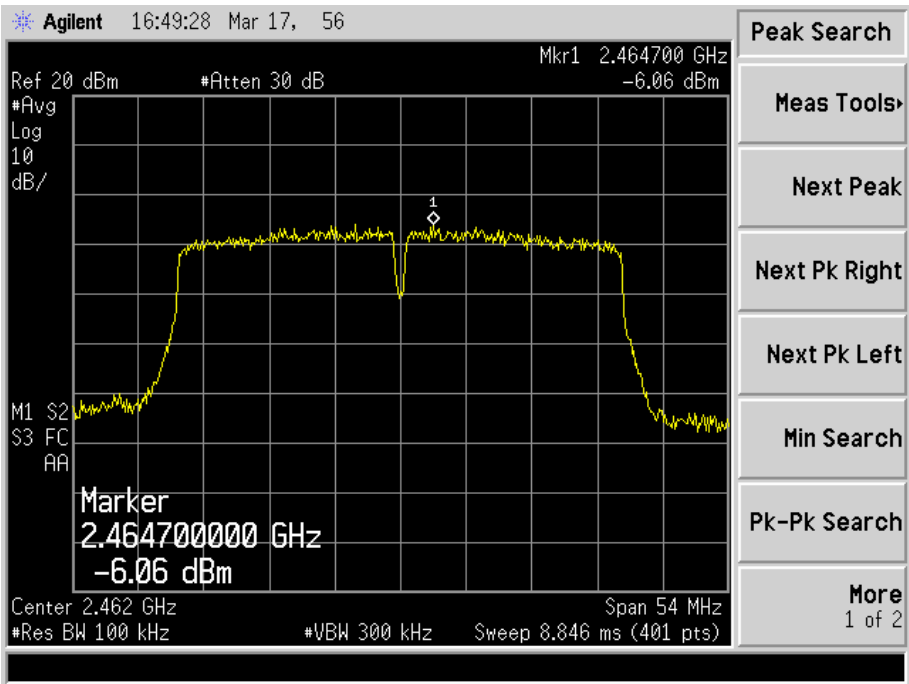
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel



802.11n-HT40-High Channel





## 6. 6dB Bandwidth

### 6.1 Standard Applicable

According to 15.247(a)(2). Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

### 6.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2014-05-28	2015-05-27
Attenuator	ATTEN	ATS100-4-20	/	2014-05-28	2015-05-27

### 6.3 Test Procedure

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

### 6.4 Environmental Conditions

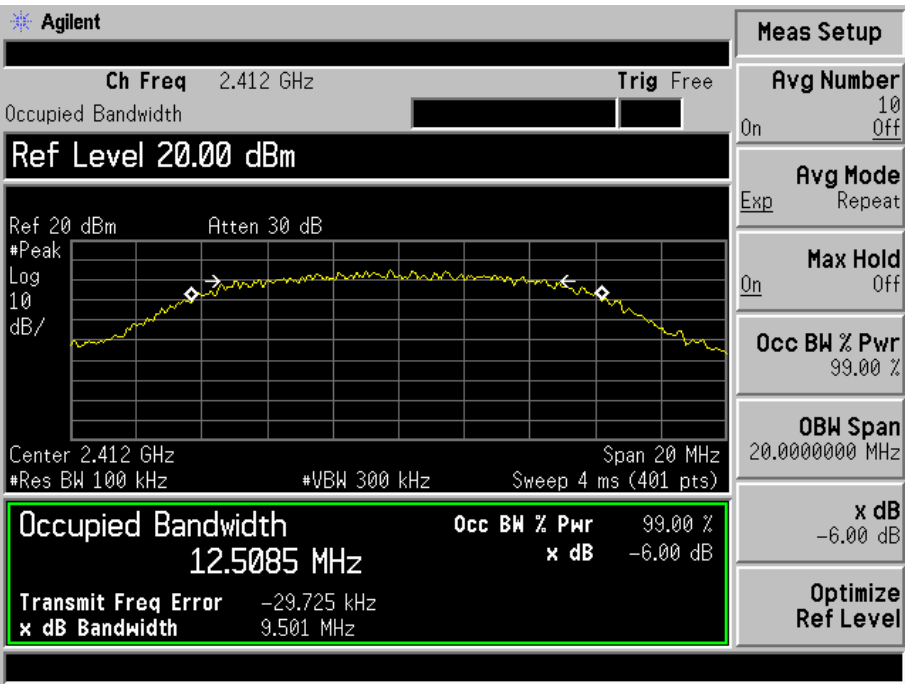
Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

## 6.5 Summary of Test Results/Plots

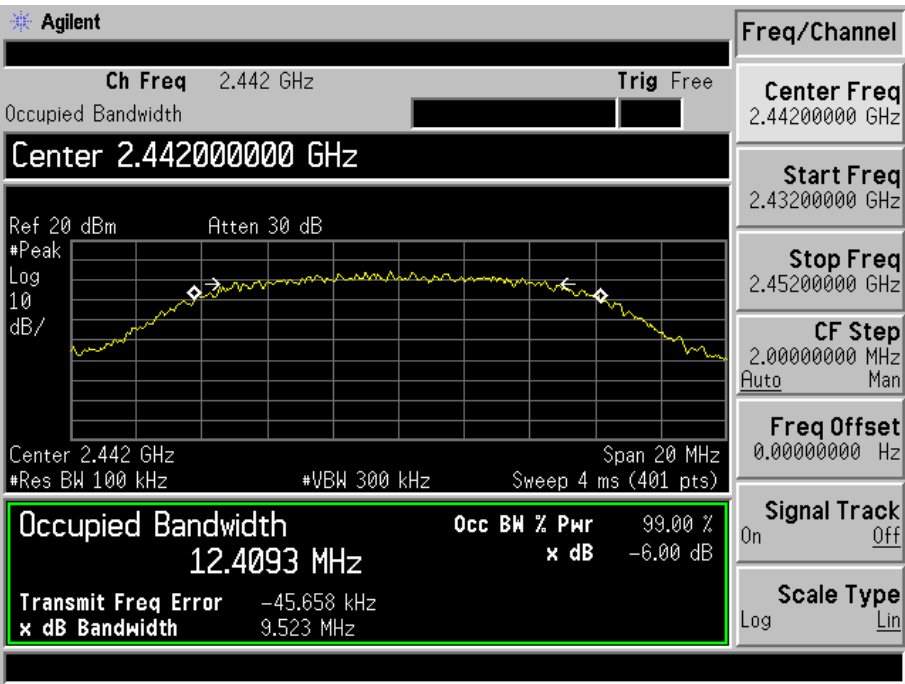
Test Mode	Test Channel MHz	6 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz
802.11b	2412	9501	12508.5	500
	2442	9523	12409.3	500
	2472	9508	12373.1	500
802.11g	2412	16438	16345.2	500
	2442	16496	16373.2	500
	2472	16489	16364.3	500
802.11n-HT20	2412	17671	17537.5	500
	2442	17636	17526.0	500
	2472	17668	17534.9	500
802.11n-HT40	2422	36361	35794.6	500
	2442	36321	35809.4	500
	2462	36261	35802.4	500

Please refer to the following test plots:

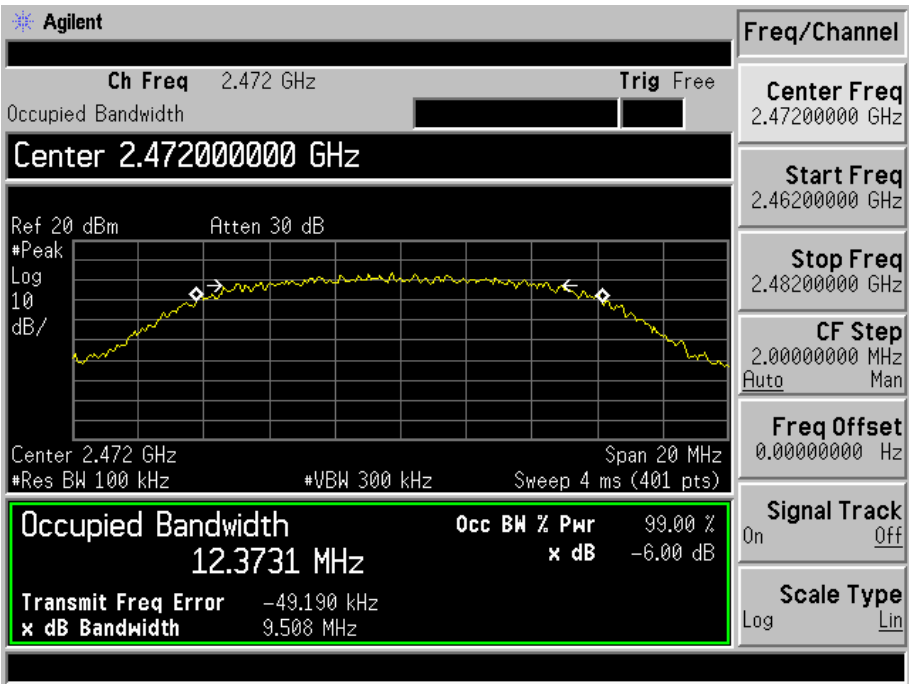
802.11b-Low Channel



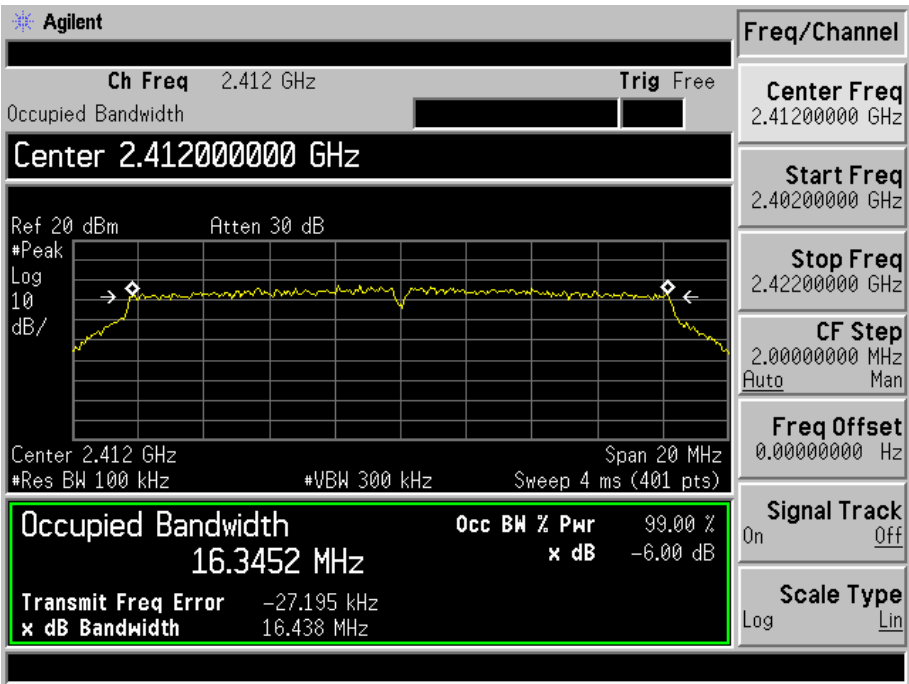
802.11b-Middle Channel



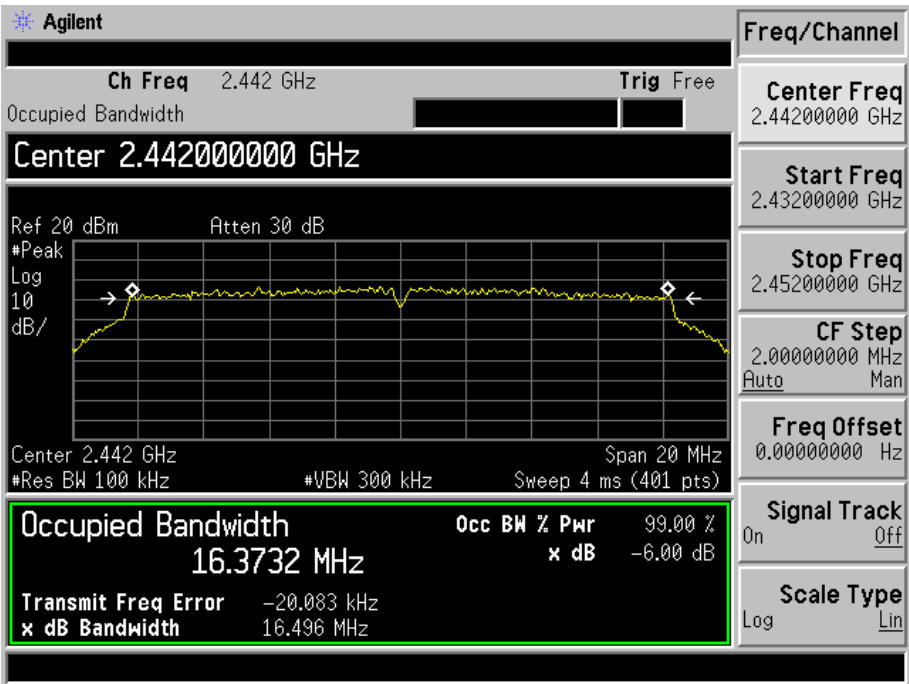
802.11b-High Channel



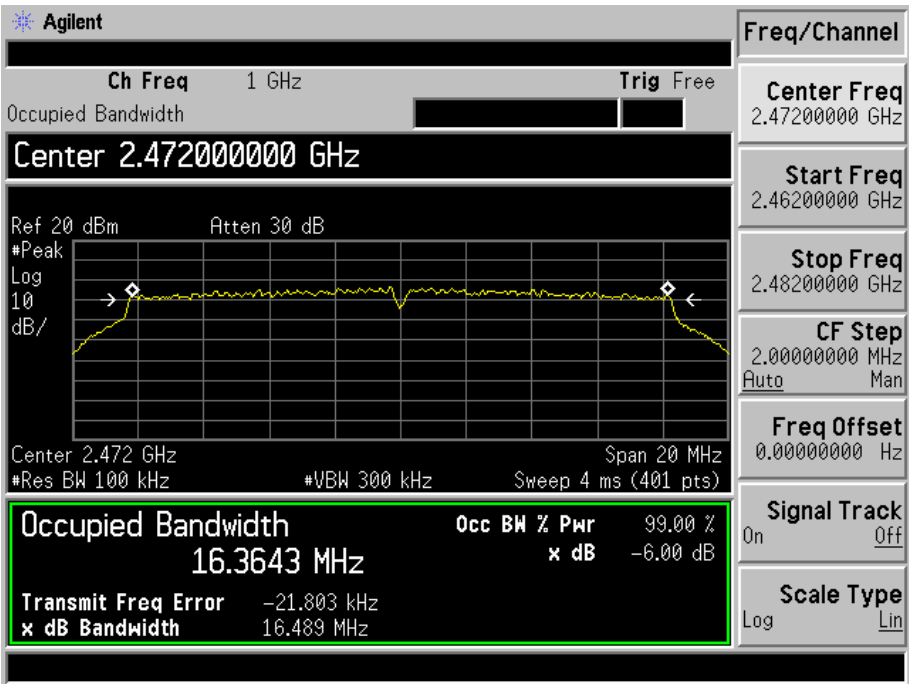
802.11g-Low Channel



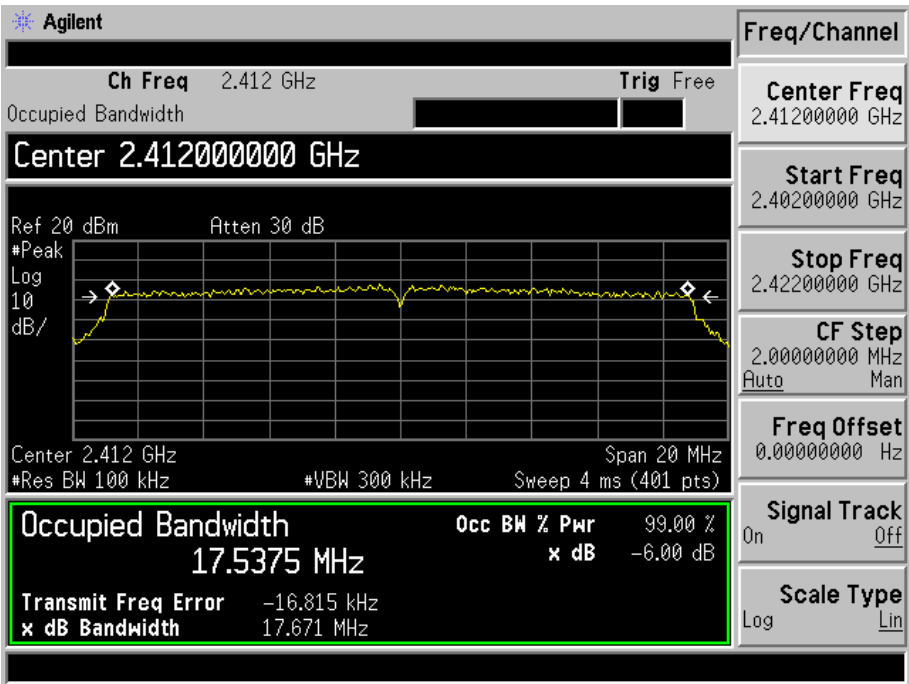
802.11g-Middle Channel



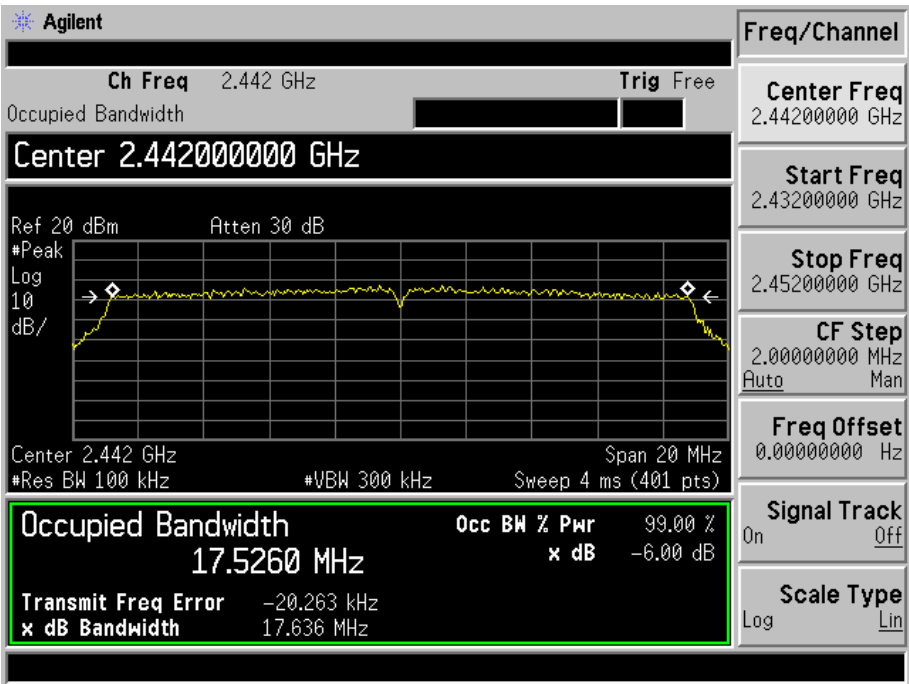
802.11g-High Channel



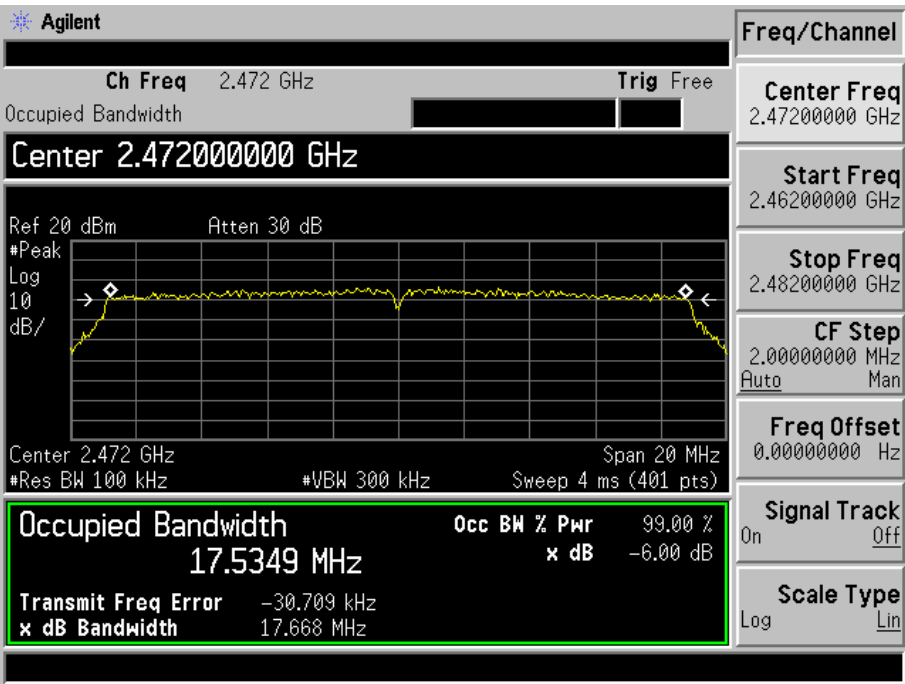
802.11n-HT20-Low Channel



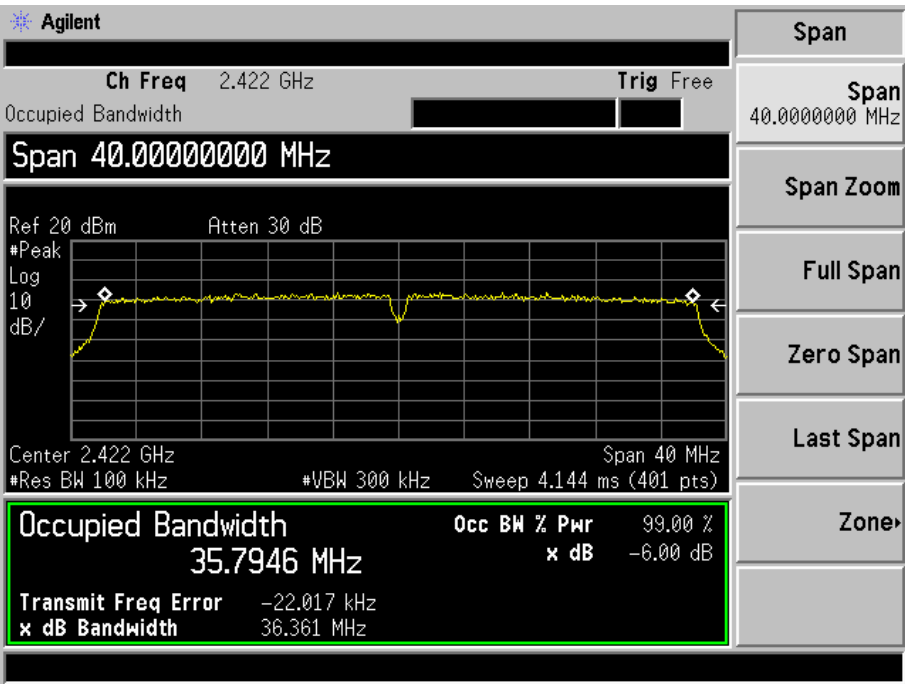
802.11n-HT20-Middle Channel



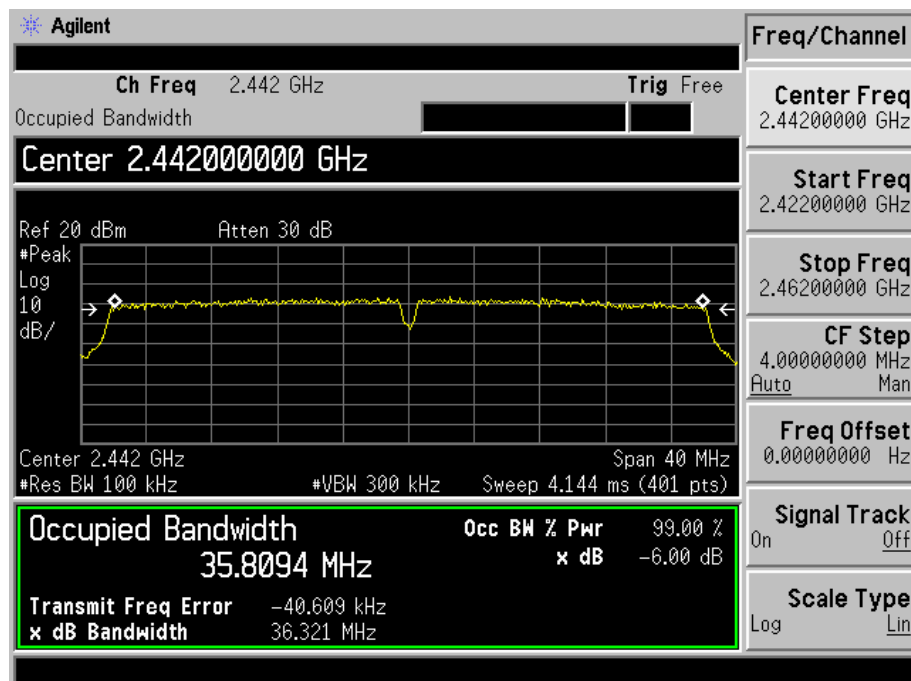
802.11n-HT20-High Channel



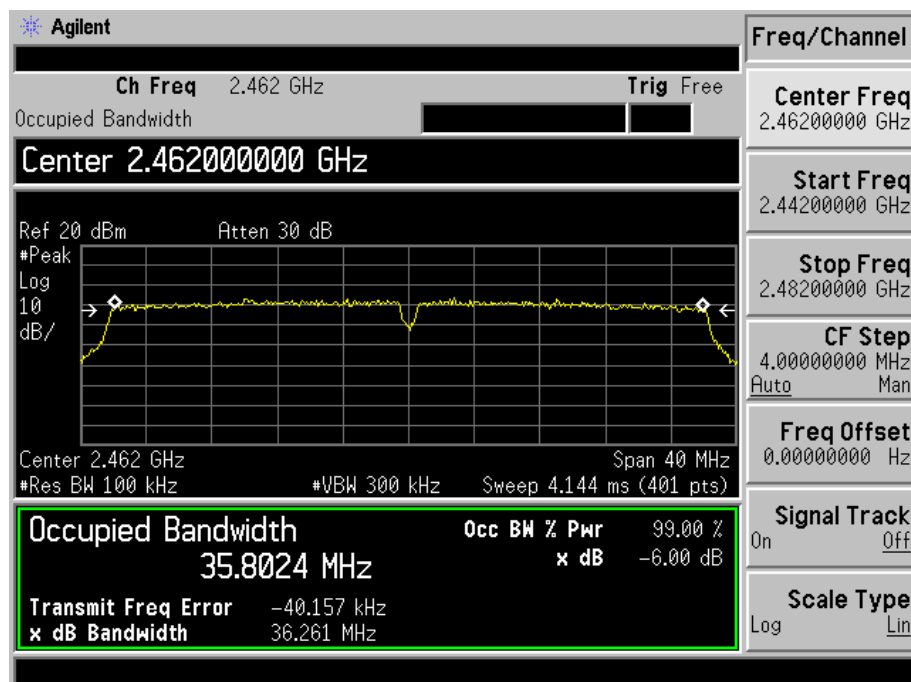
802.11n-HT40-Low Channel



## 802.11n-HT40-Middle Channel



## 802.11n-HT40-High Channel





## 7. RF Output Power

### 7.1 Standard Applicable

According to 15.247(b)(3). For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

### 7.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2014-05-28	2015-05-27
Attenuator	ATTEN	ATS100-4-20	/	2014-05-28	2015-05-27

### 7.3 Test Procedure

According to section 15.247(b)-power output of the KDB-558074 D01 V03r02, 9.2.2.2 (channel integration method) When this option is exercised, the measured power is to be referenced to the OBW rather than the DTS bandwidth

- Set span to at least 1.5 times the OBW.
- Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
- Set VBW  $\geq 3 \times$  RBW.
- Number of points in sweep  $\geq 2 \times \text{span} / \text{RBW}$ . (This gives bin-to-bin spacing  $\leq \text{RBW}/2$ , so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto.
- Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle  $\geq 98$  %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run” .
- Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

### 7.4 Environmental Conditions

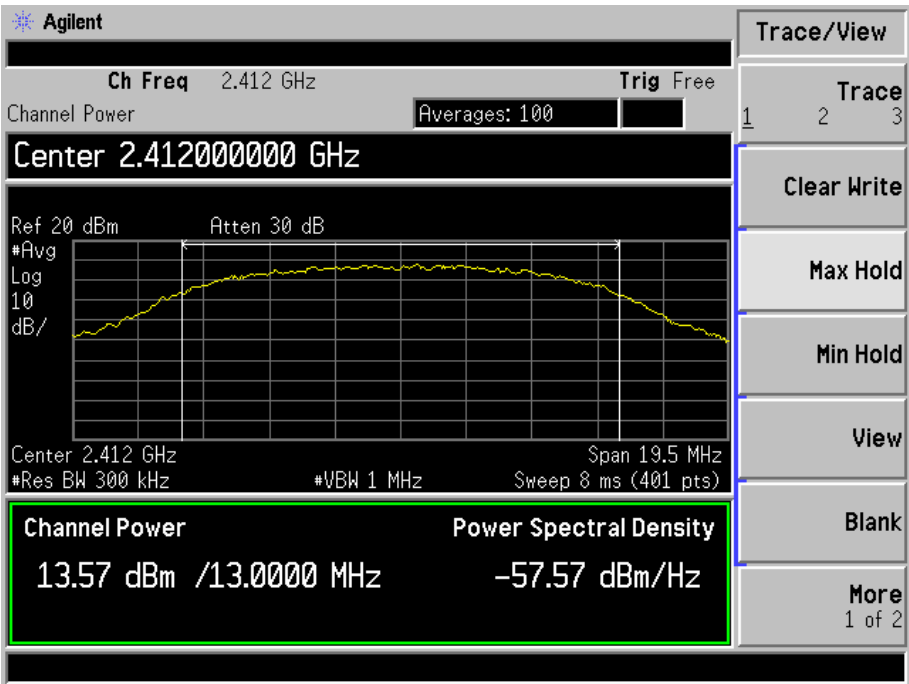
Temperature:	26° C
Relative Humidity:	57%
ATM Pressure:	1011 mbar

**7.5 Summary of Test Results/Plots**

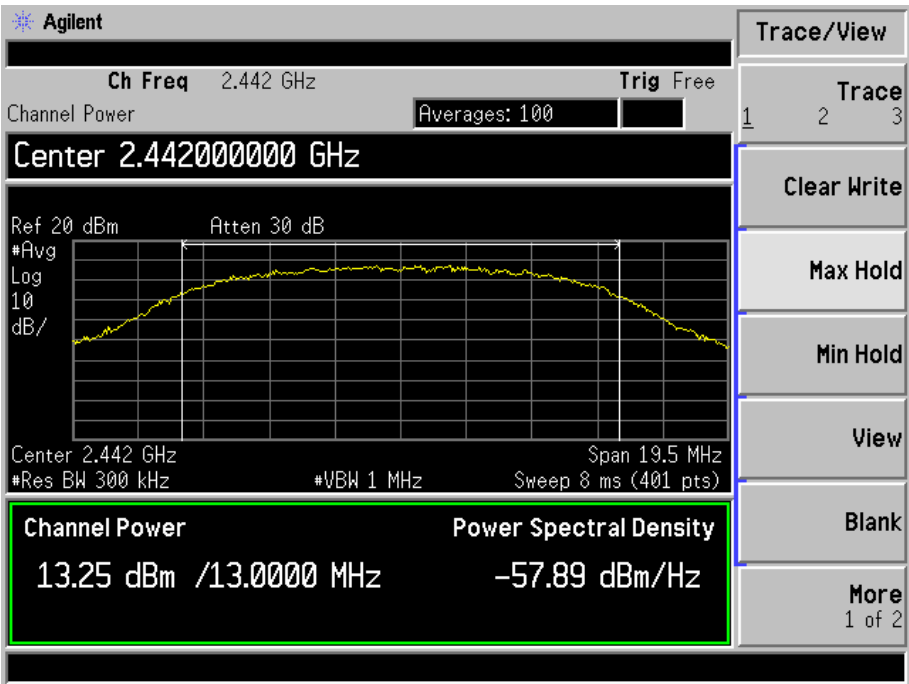
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b _ 11Mbps	2412	13.57	22.75	1000
	2442	13.25	21.13	1000
	2472	12.73	18.75	1000
802.11g_54Mbps	2412	9.33	8.57	1000
	2442	9.04	8.02	1000
	2472	8.44	6.98	1000
802.11n HT20_MCS7	2412	9.60	9.12	1000
	2442	9.35	8.61	1000
	2472	8.66	7.35	1000
802.11n HT40_MCS7	2422	8.65	7.33	1000
	2442	8.52	7.11	1000
	2462	7.81	6.04	1000

Please refer to the following test plots:

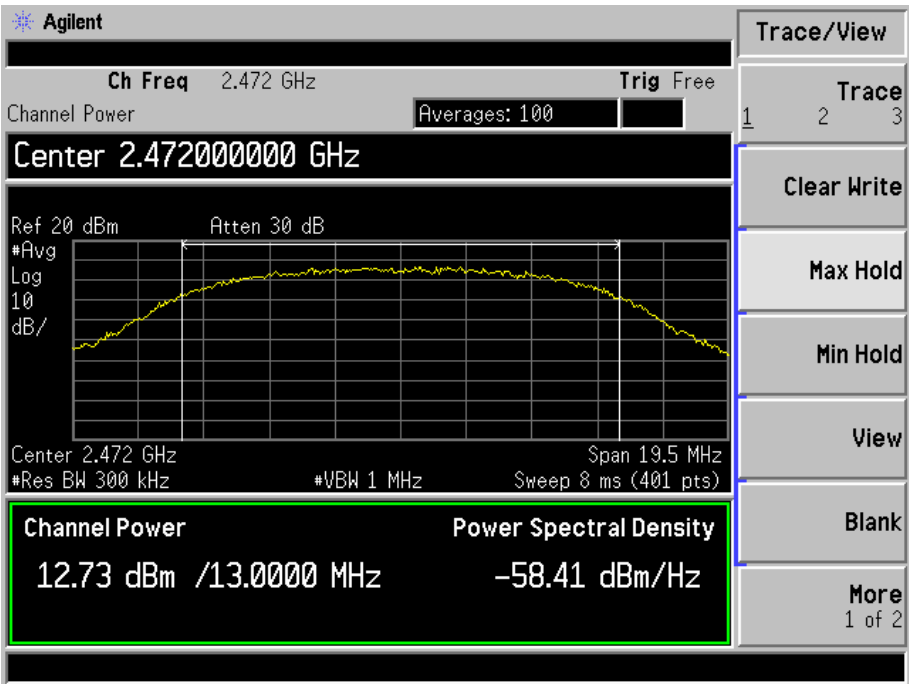
802.11-11Mbps-Low Channel



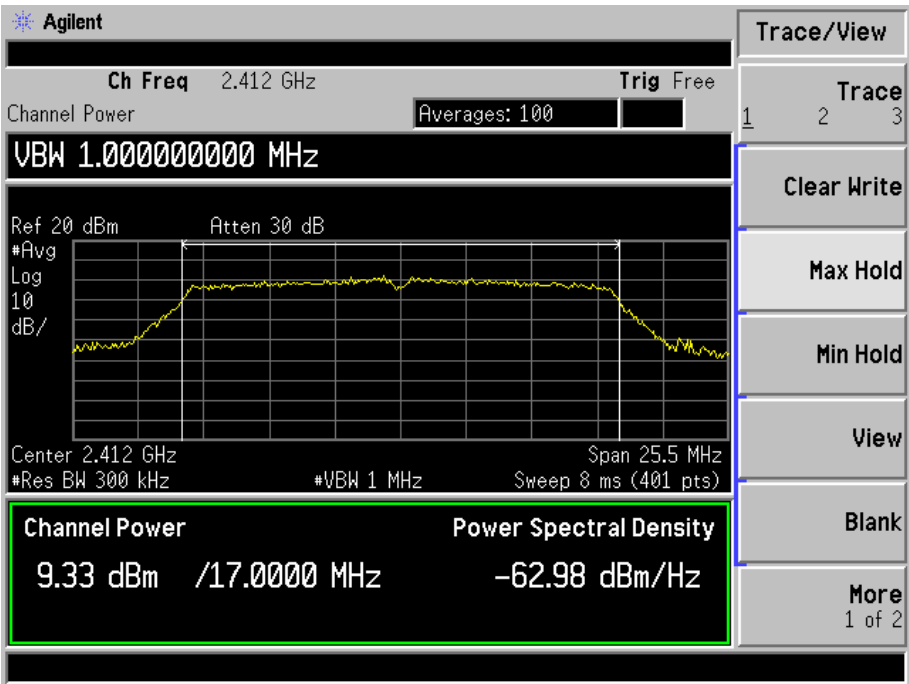
802.11b -11Mbps-Middle Channel



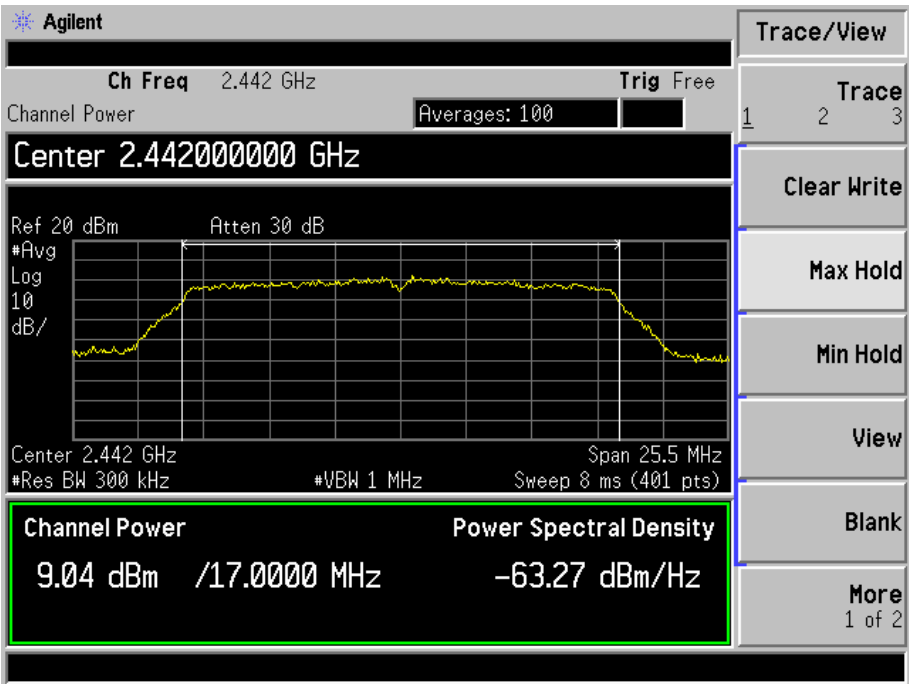
802.11b -11Mbps-High Channel



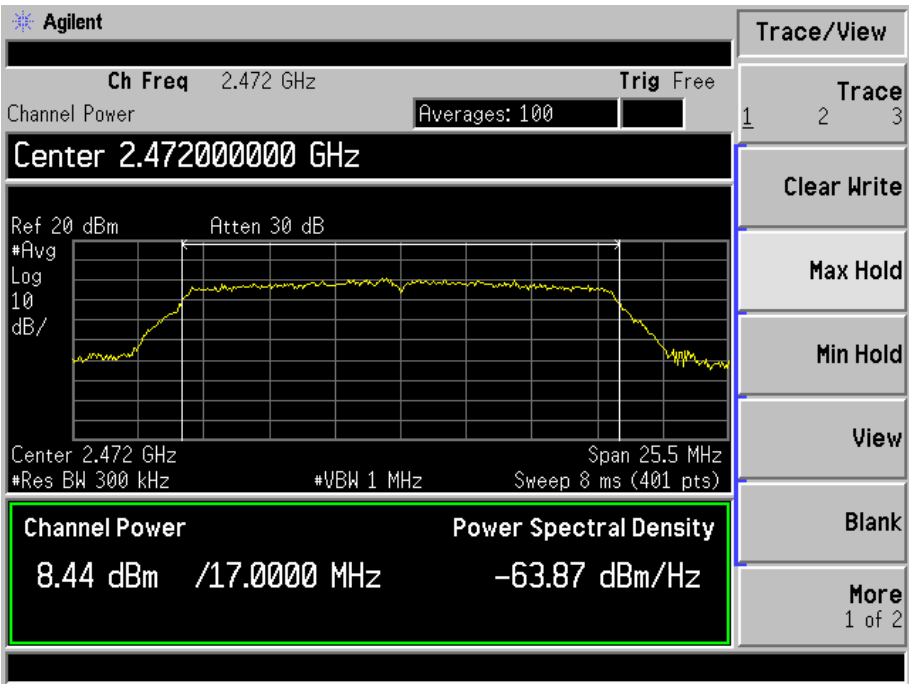
802.11g-54Mbps-Low Channel



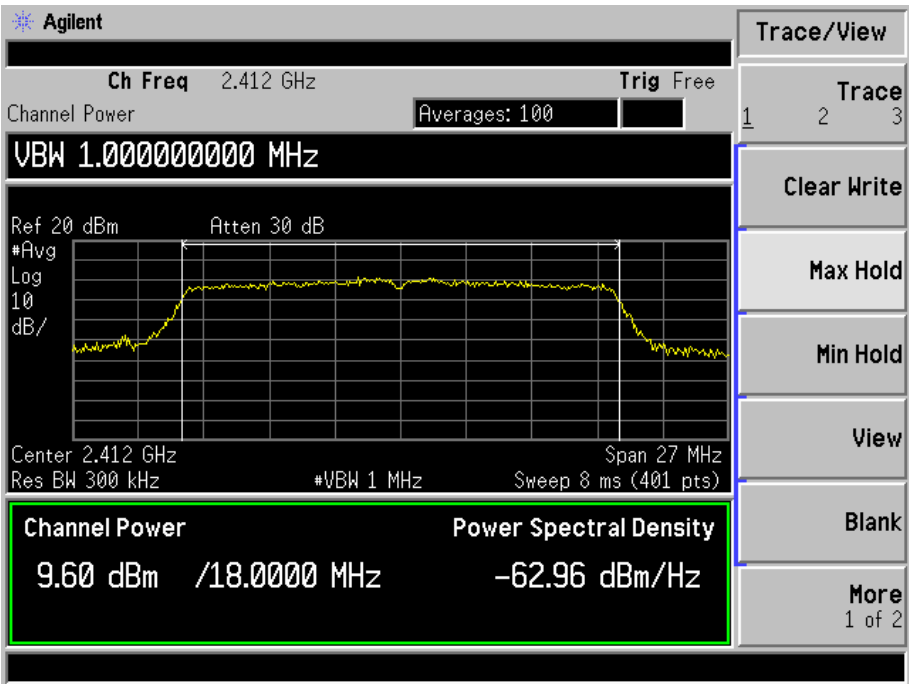
802.11g-54Mbps-Middle Channel



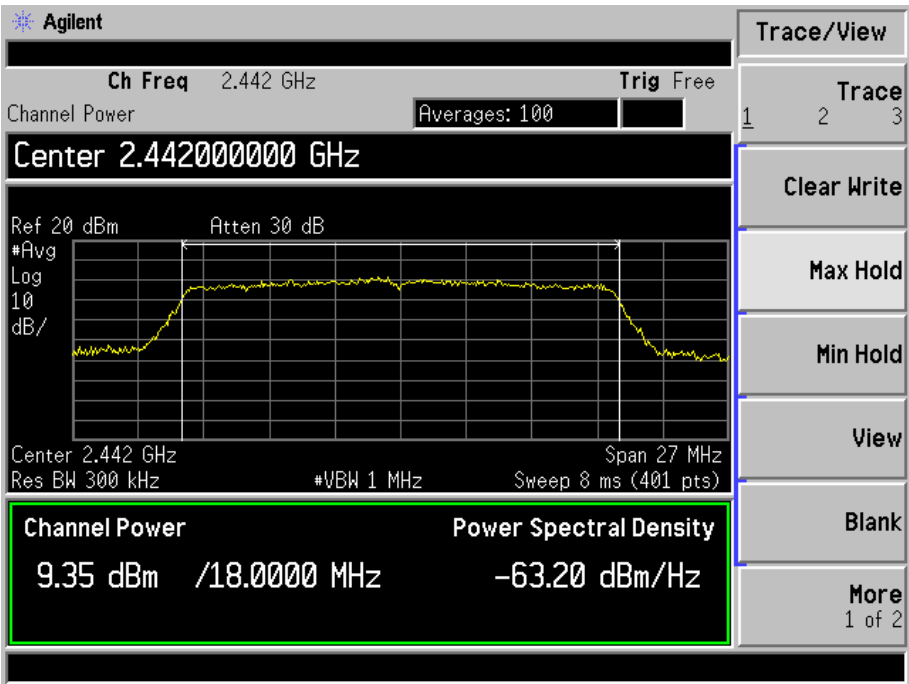
802.11g-54Mbps-High Channel



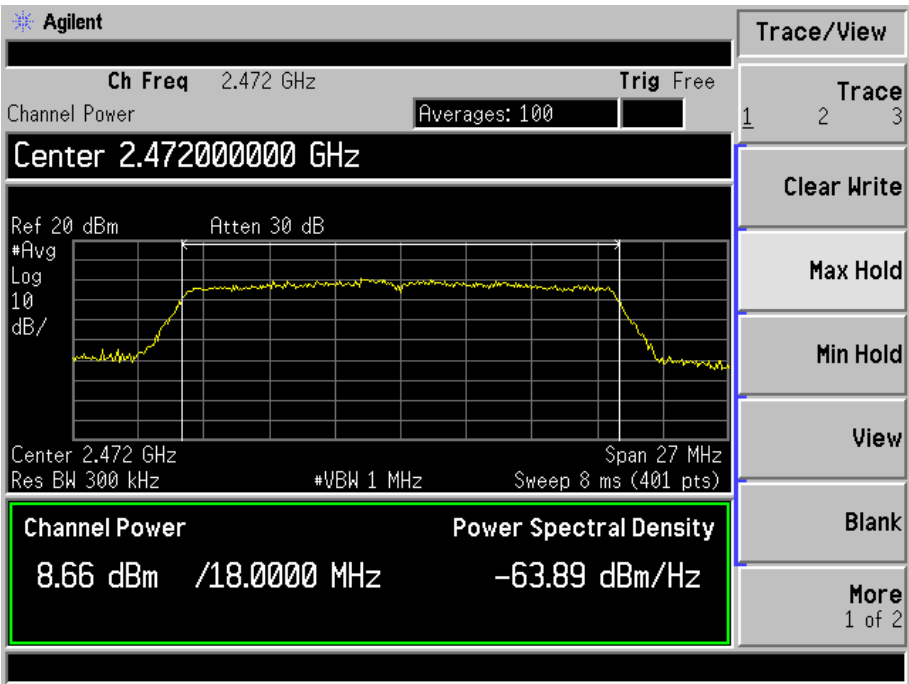
802.11n-HT20-MCS7-Low Channel



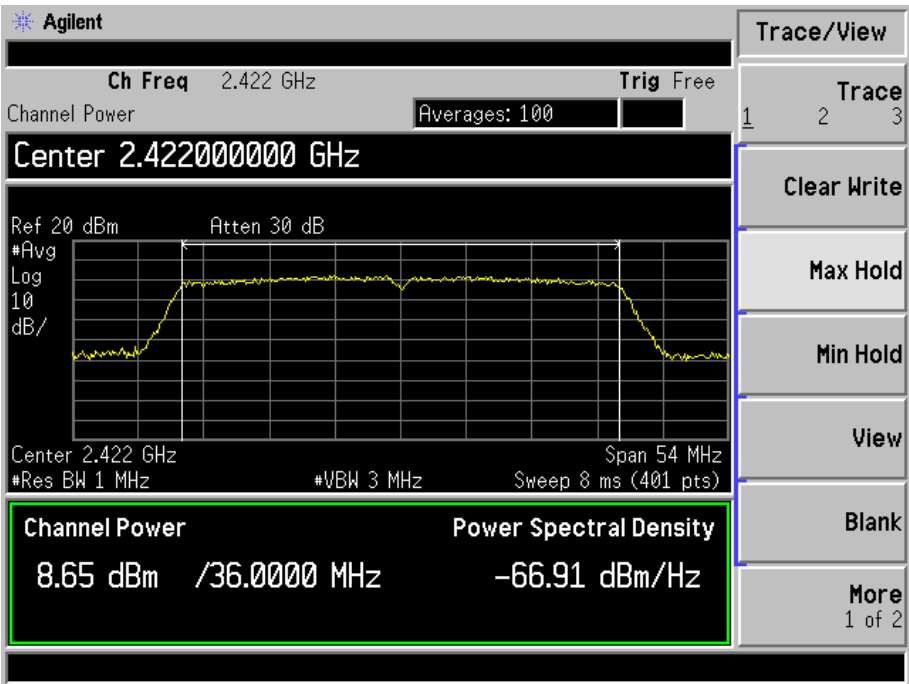
802.11n-HT20-MCS7-Middle Channel



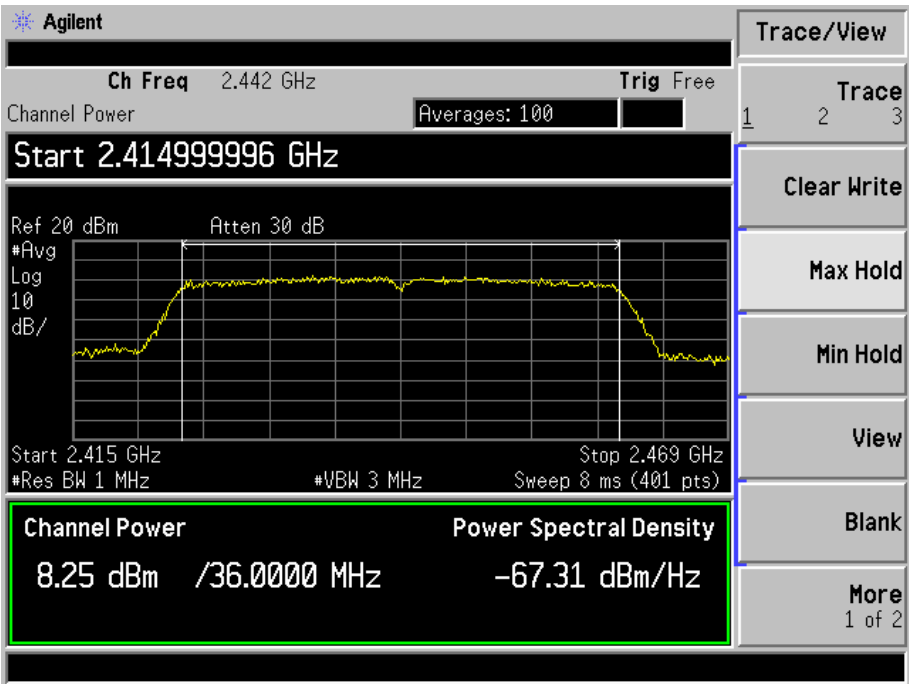
802.11n-HT20-MCS7-High Channel



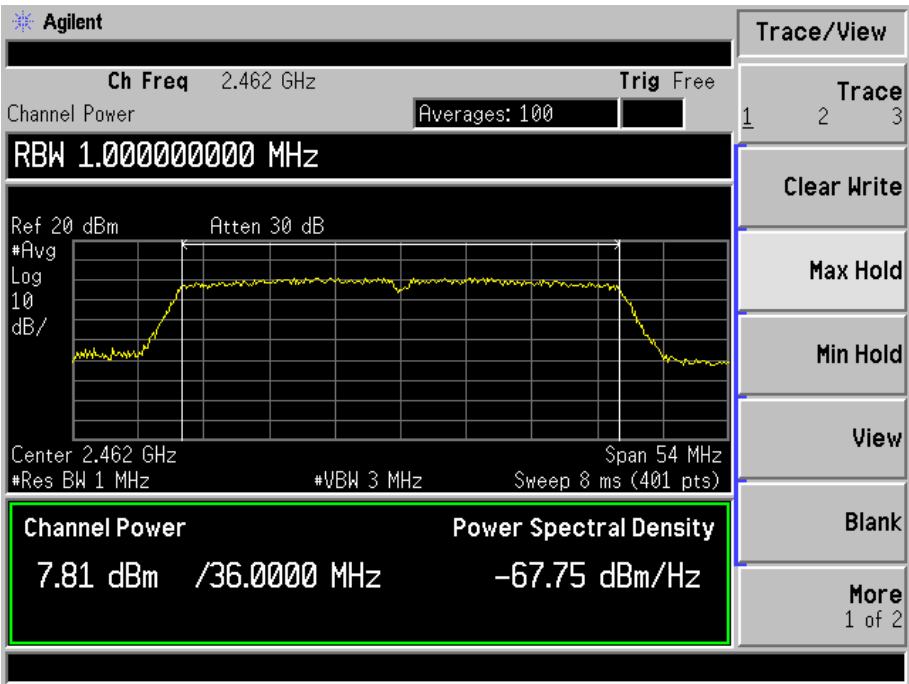
802.11n-HT40-MCS7-Low Channel



802.11n-HT40-MCS7-Middle Channel



802.11n-HT40-MCS7-High Channel





## 8. Field Strength of Spurious Emissions

### 8.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is  $\pm 5.10$  dB.

### 8.2 Standard Applicable

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

### 8.3 Test Equipment List and Details

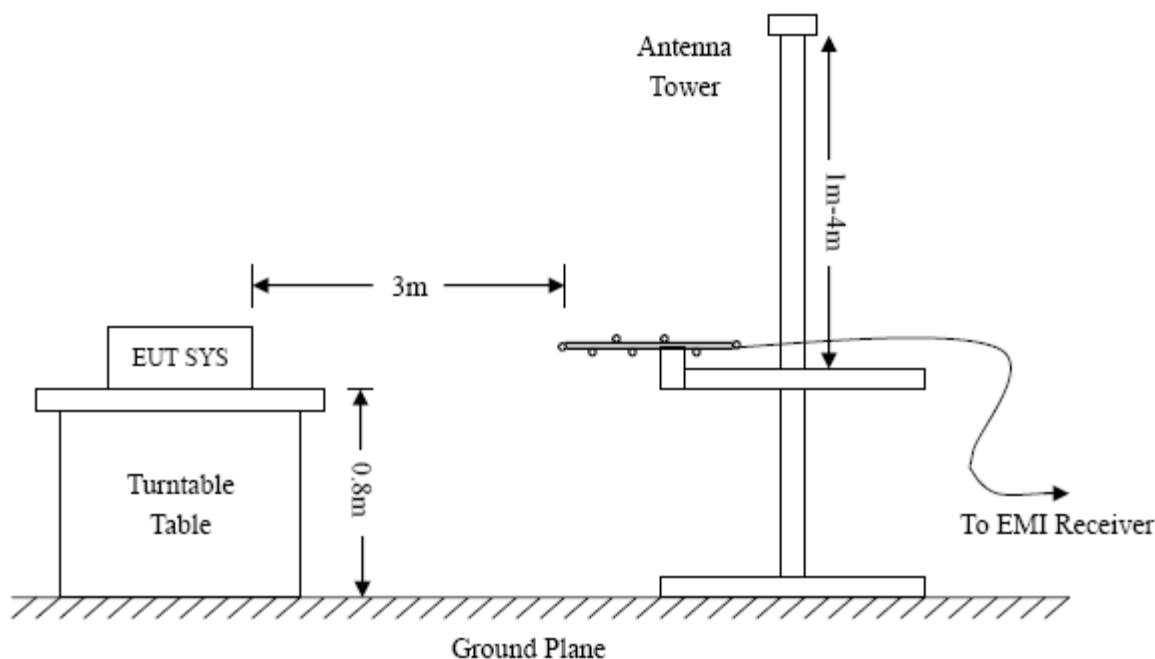
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	2015-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-24	2015-05-23
Horn Antenna	ETS	3117	00086197	2014-05-24	2015-05-23
Horn Antenna	ETS	3116B	00088203	2014-05-24	2015-05-23
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2014-05-24	2015-05-23

## 8.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

## 8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

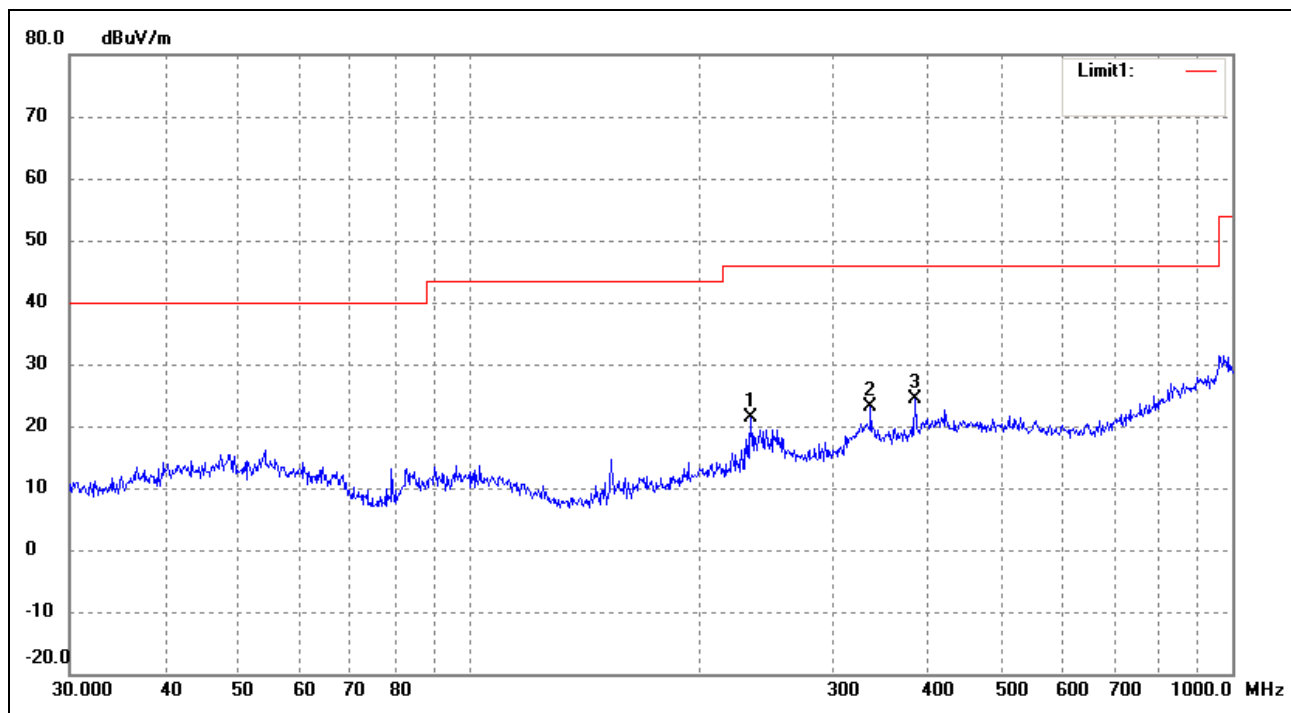
## 8.6 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

## 8.7 Summary of Test Results/Plots

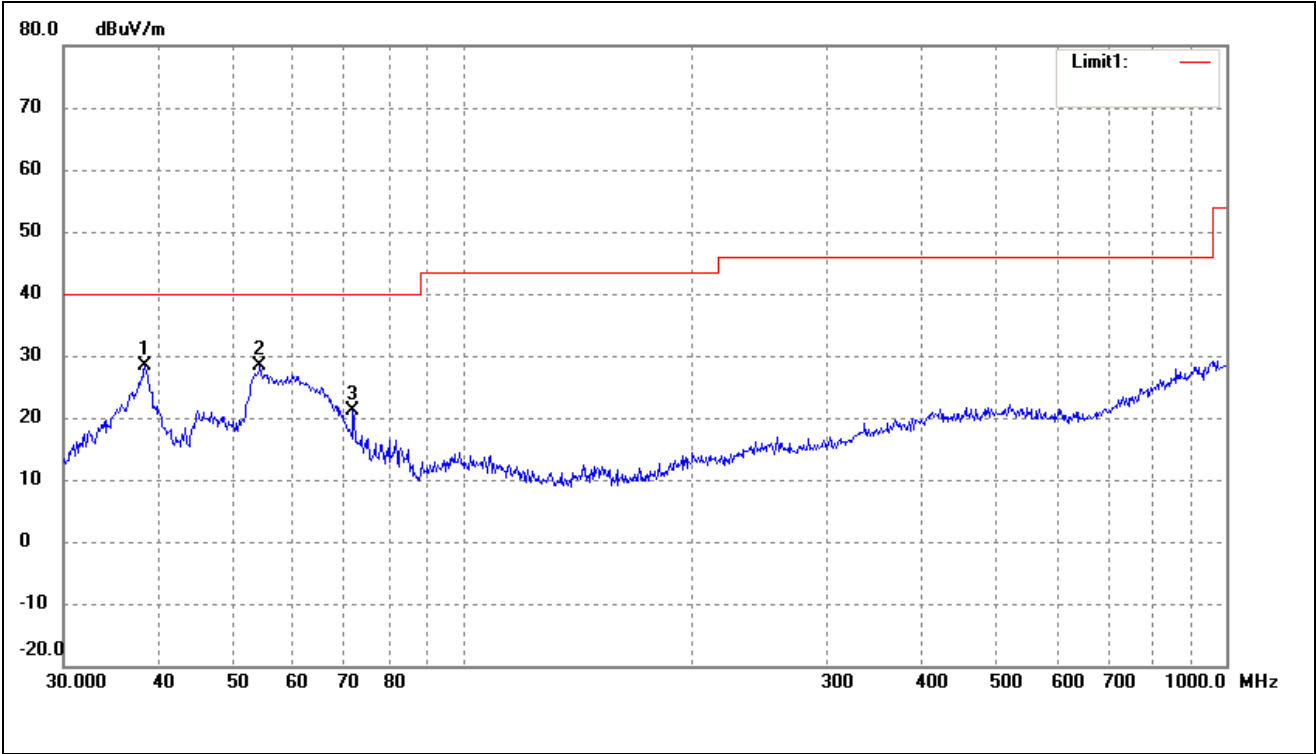
According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst cases:

*Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

**Plot of Radiated Emissions Test Data (30MHz to 1GHz)***EUT:* TV BOX*Tested Model:* HD22*Operating Condition:* 802.11b Transmitting Low Channel-2412MHz*Comment:* AC120V/60Hz; Adapter Dc 5V*Test Specification:* Horizontal

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	234.1684	29.48	-8.12	21.36	46.00	-24.64	254	100	peak
2	336.0352	27.76	-4.69	23.07	46.00	-22.93	113	100	peak
3	383.9318	27.82	-3.46	24.36	46.00	-21.64	284	100	peak

Test Specification: Vertical

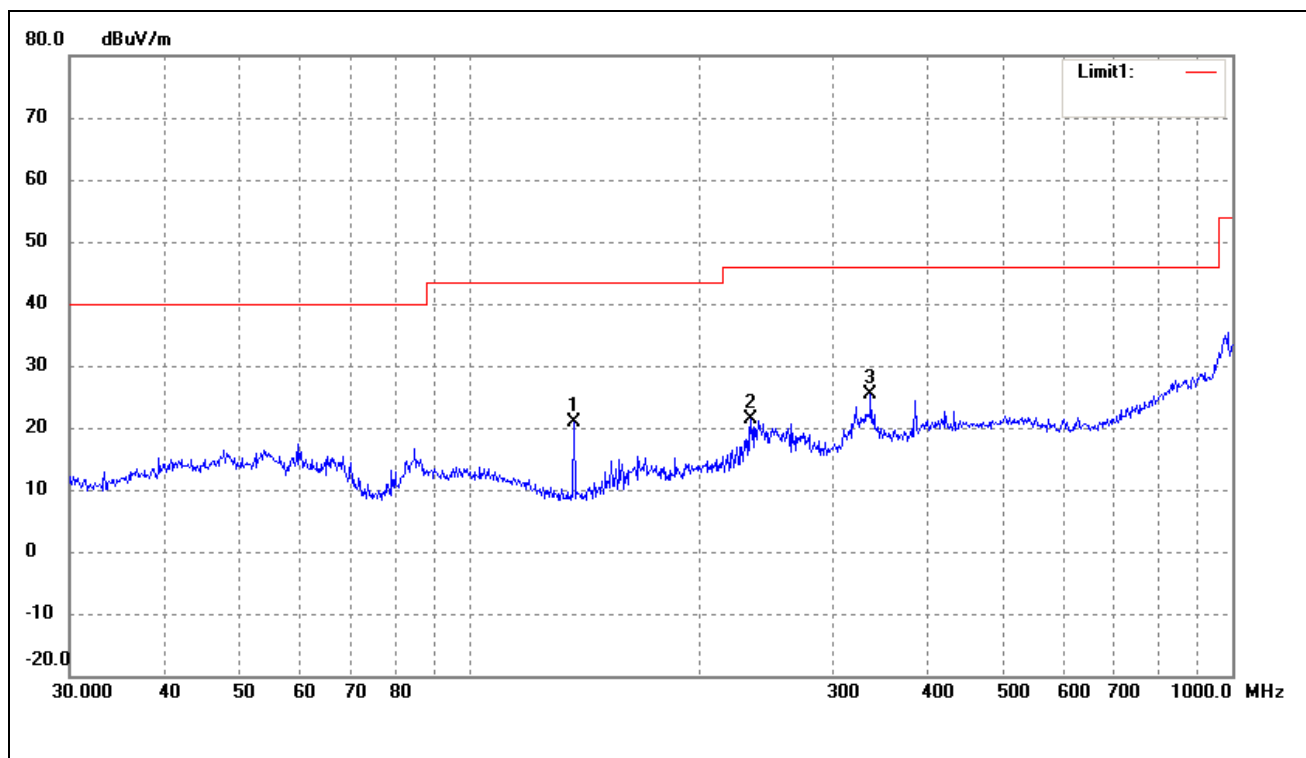


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.3462	37.22	-8.77	28.45	40.00	-11.55	114	100	peak
2	54.2610	36.16	-7.88	28.28	40.00	-11.72	270	100	peak
3	71.8320	33.49	-12.26	21.23	40.00	-18.77	360	100	peak

Operating Condition: 802.11b Transmitting Middle Channel-2442MHz

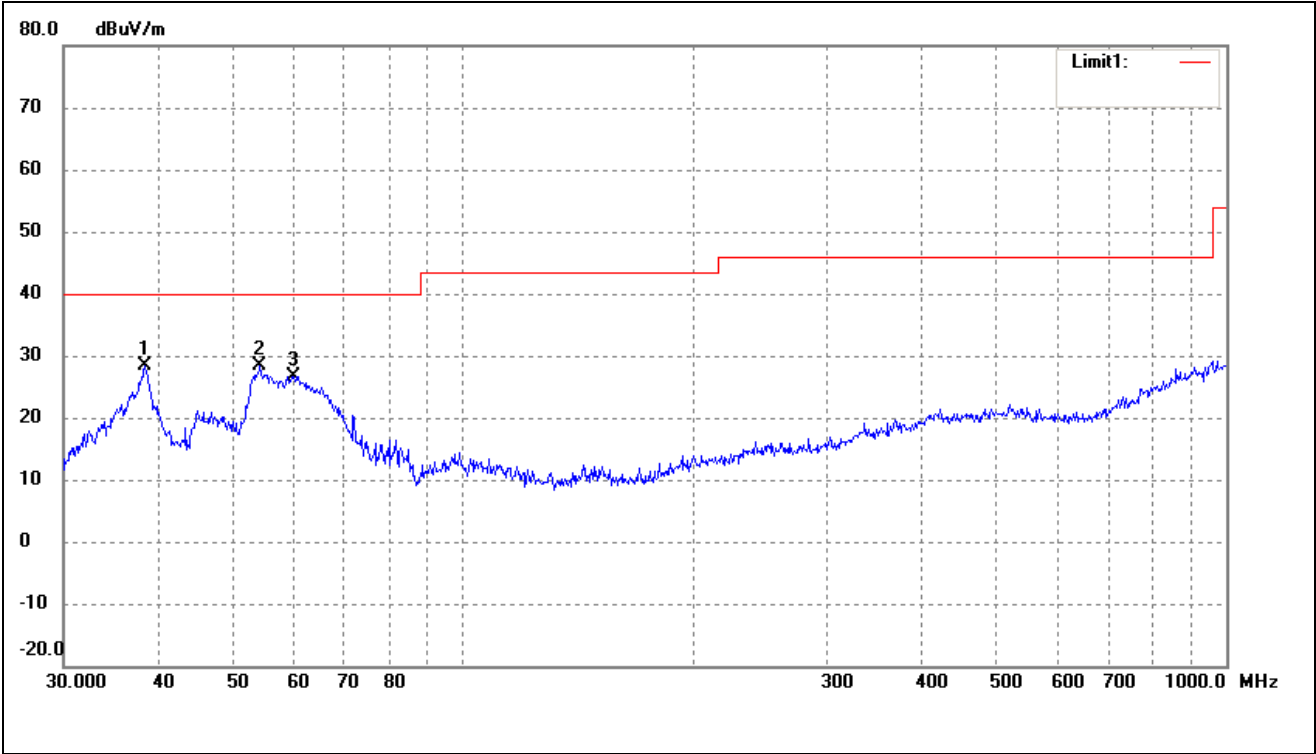
Comment: AC120V/60Hz; Adapter Dc 5V

Test Specification: Horizontal



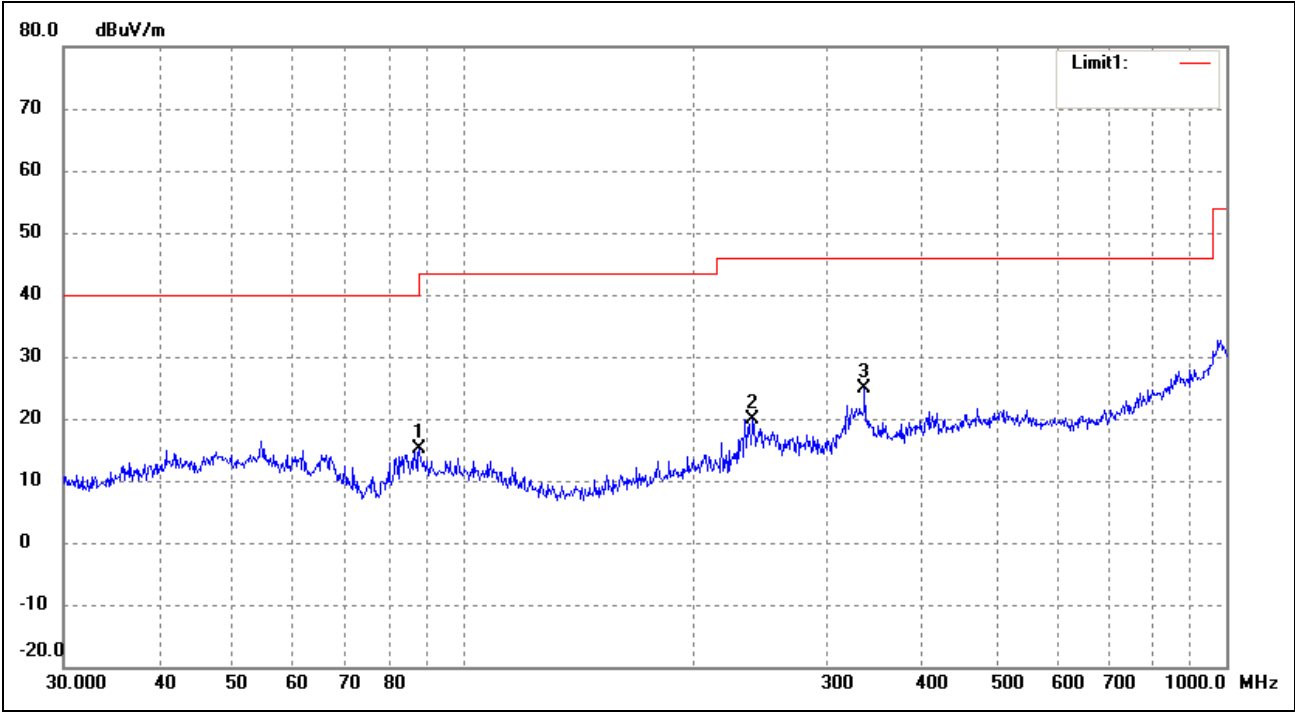
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	137.4202	34.04	-13.05	20.99	43.50	-22.51	178	100	peak
2	234.1684	29.48	-8.12	21.36	46.00	-24.64	224	100	peak
3	336.0352	30.07	-4.69	25.38	46.00	-20.62	160	100	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.3462	37.09	-8.77	28.32	40.00	-11.68	256	100	peak
2	54.2610	36.16	-7.88	28.28	40.00	-11.72	360	100	peak
3	60.0691	35.64	-9.04	26.60	40.00	-13.40	360	100	peak

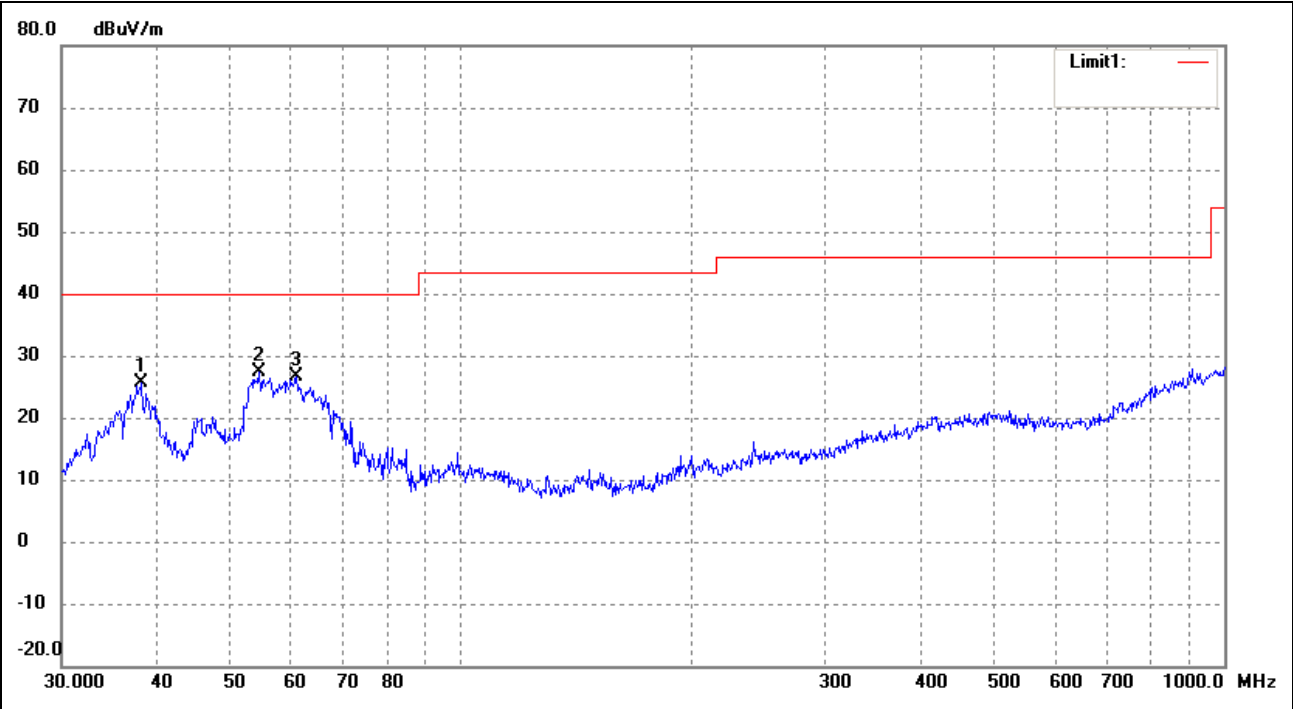
Operating Condition: 802.11b Transmitting High Channel-2472MHz  
Comment: AC120V/60Hz; Adapter Dc 5V  
  
Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	87.7248	26.90	-11.81	15.09	40.00	-24.91	176	100	peak
2	239.9874	27.59	-7.79	19.80	46.00	-26.20	255	100	peak
3	336.0352	29.48	-4.69	24.79	46.00	-21.21	360	100	peak



Test Specification: Vertical

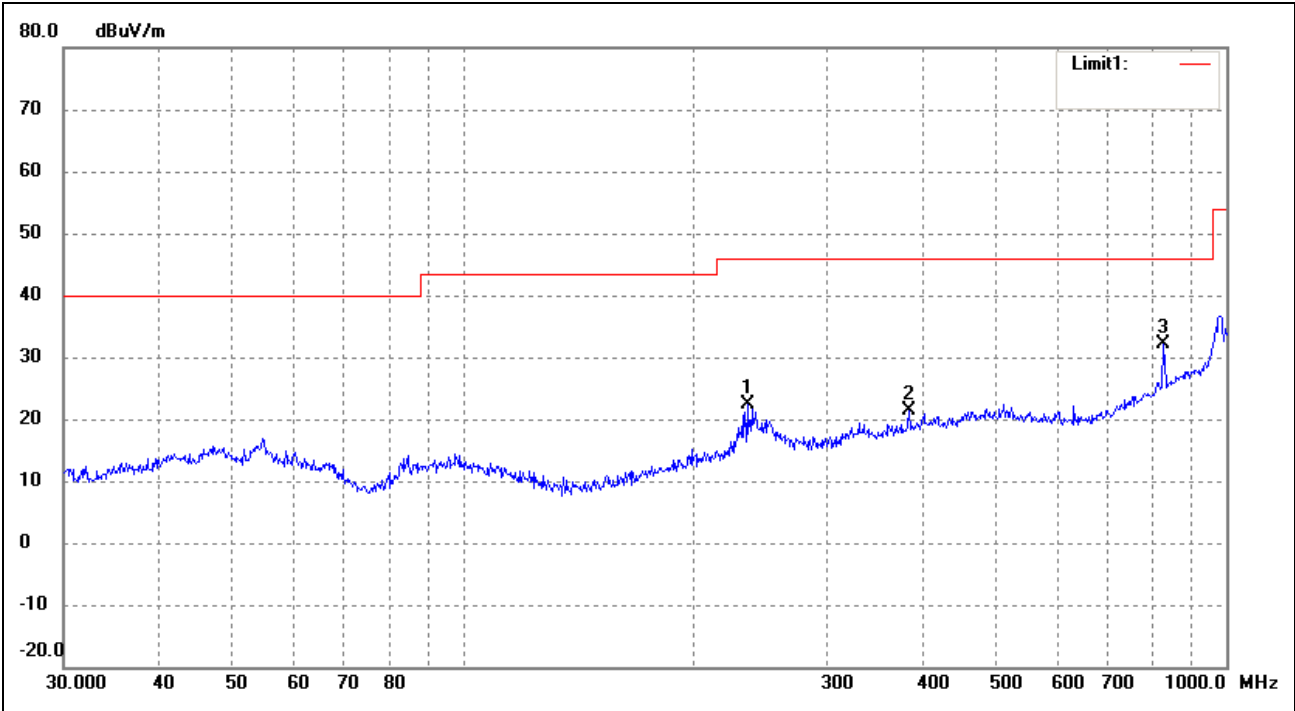


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.2120	34.35	-8.80	25.55	40.00	-14.45	360	100	peak
2	54.4516	35.22	-7.90	27.32	40.00	-12.68	225	100	peak
3	60.9176	35.69	-9.18	26.51	40.00	-13.49	160	100	peak

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

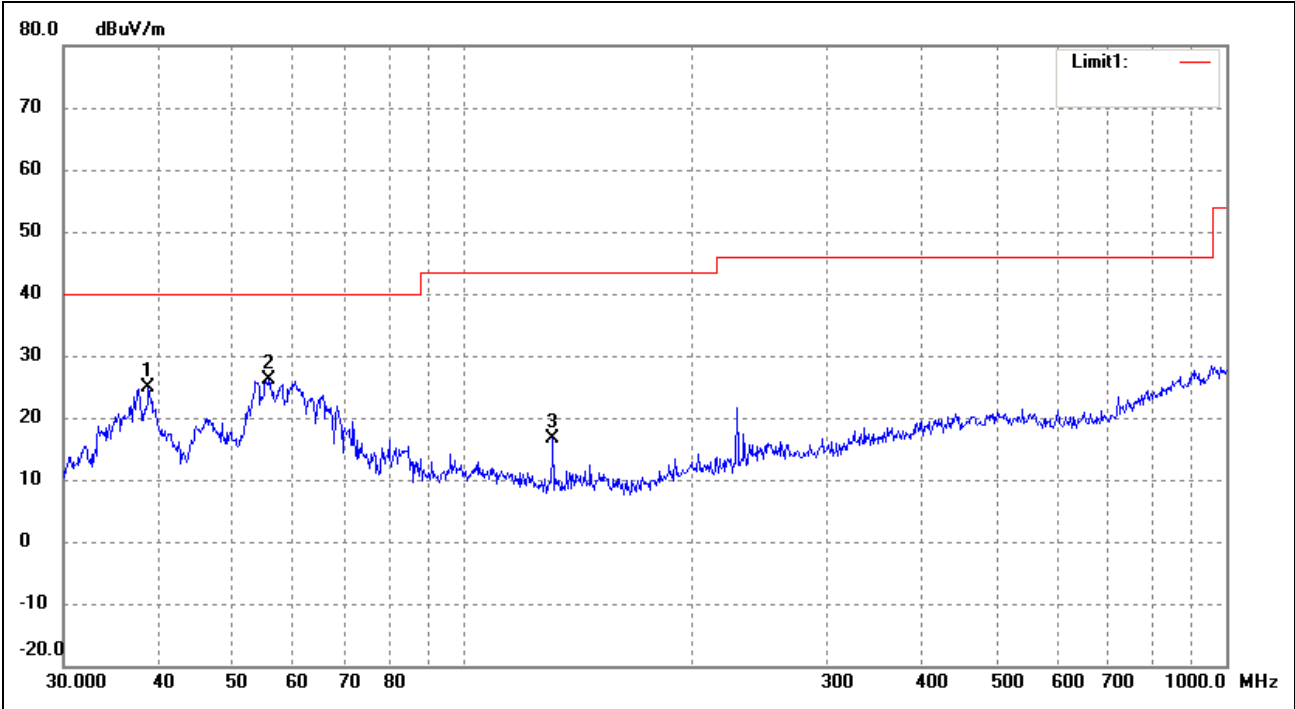
EUT: TV BOX  
Tested Model: HD22  
Operating Condition: 802.11g Transmitting Low Channel-2412MHz  
Comment: AC120V/60Hz; Adapter Dc 5V

Test Specification: Horizontal



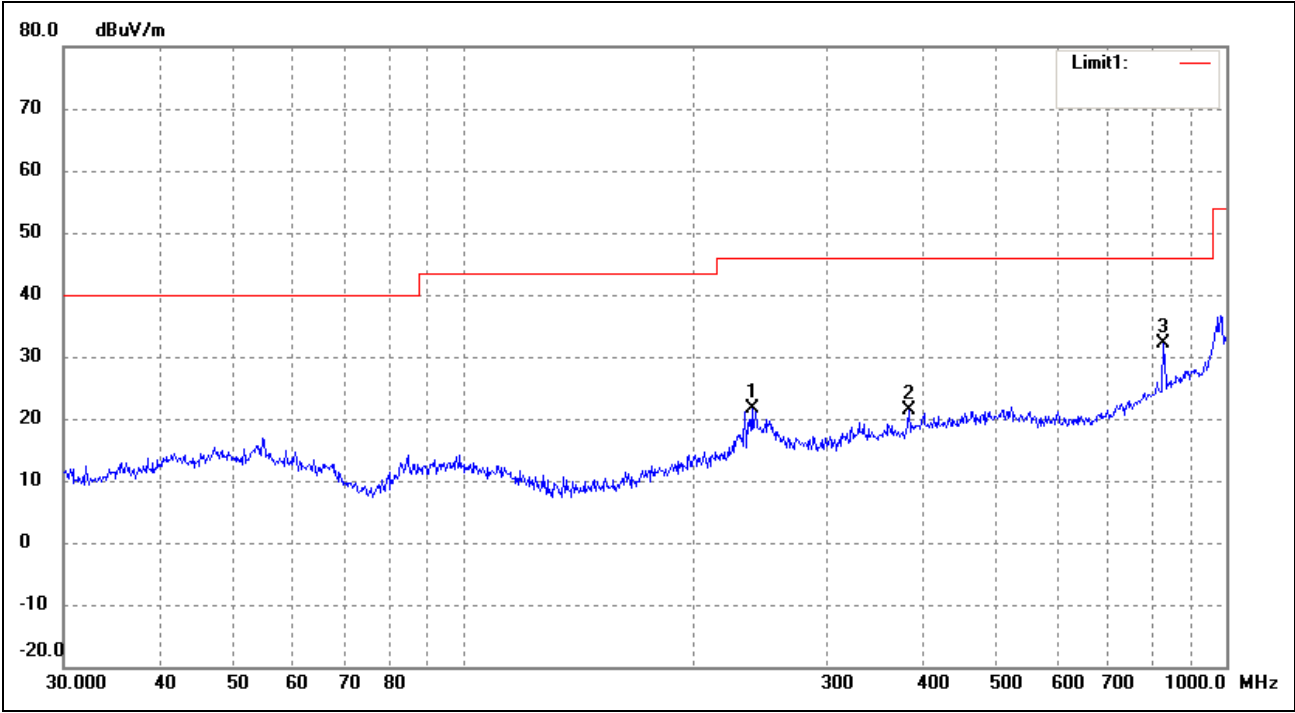
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	235.8164	30.36	-8.02	22.34	46.00	-23.66	174	100	peak
2	383.9318	24.79	-3.46	21.33	46.00	-24.67	160	100	peak
3	827.4934	28.66	3.37	32.03	46.00	-13.97	320	100	peak

Test Specification: Vertical



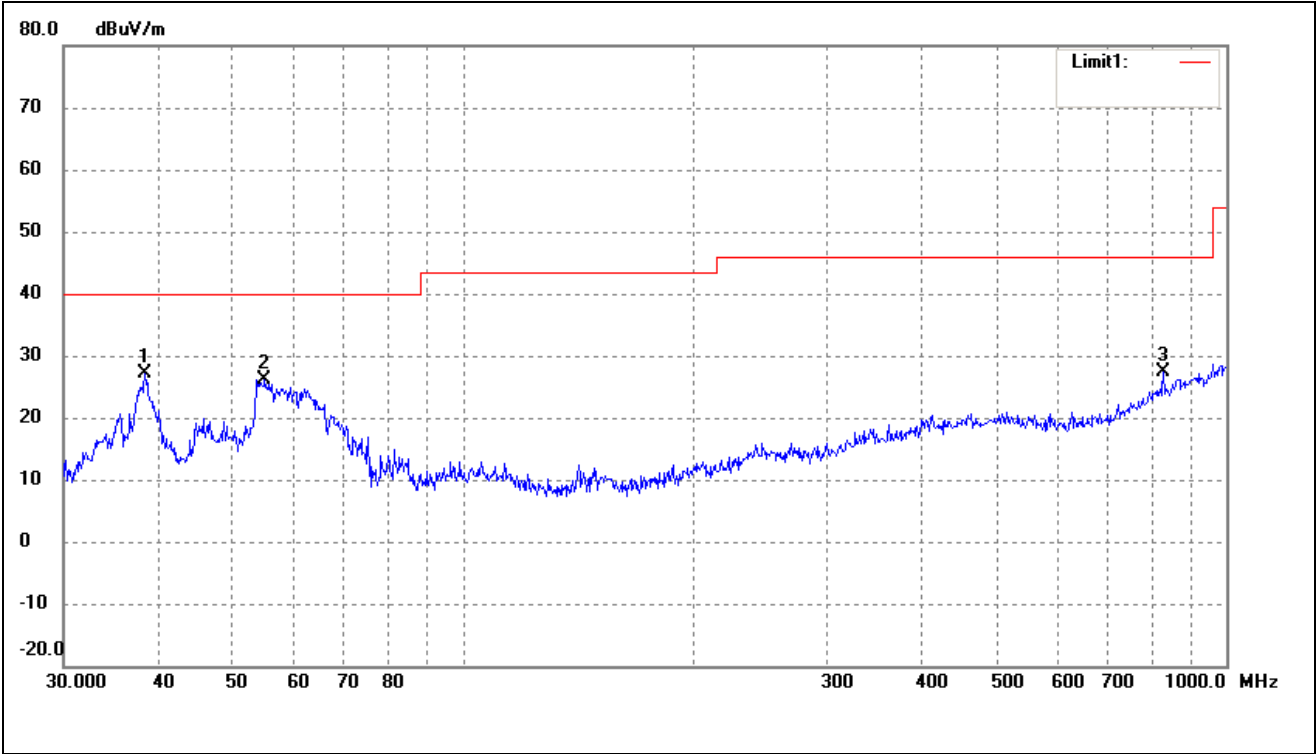
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.7518	33.67	-8.70	24.97	40.00	-15.03	177	100	peak
2	55.6094	34.03	-8.02	26.01	40.00	-13.99	90	100	peak
3	131.2965	29.38	-12.79	16.59	43.50	-26.91	336	100	peak

Operating Condition: 802.11g Transmitting Middle Channel-2442MHz  
Comment: AC120V/60Hz; Adapter Dc 5V  
  
Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	239.1473	29.53	-7.83	21.70	46.00	-24.30	270	100	peak
2	383.9318	24.79	-3.46	21.33	46.00	-24.67	164	100	peak
3	827.4934	28.66	3.37	32.03	46.00	-13.97	228	200	peak

Test Specification: Vertical

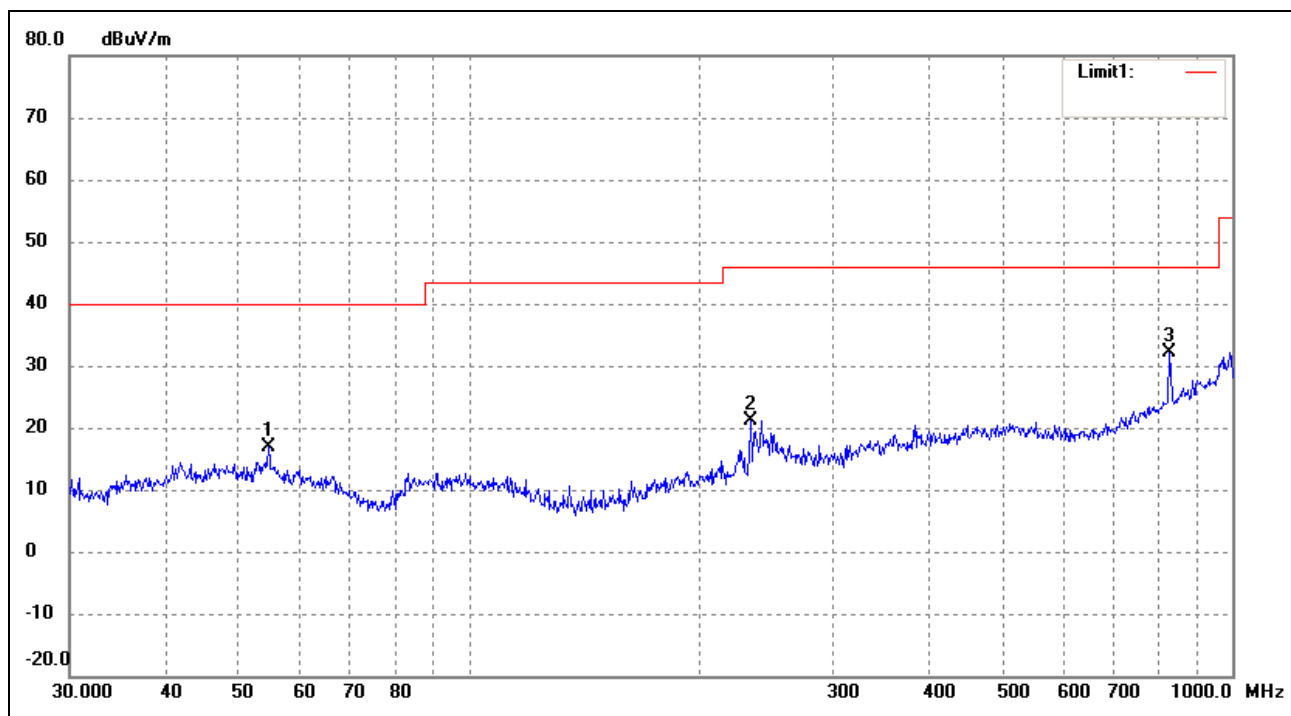


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.3462	35.97	-8.77	27.20	40.00	-12.80	360	100	peak
2	55.0274	34.11	-7.95	26.16	40.00	-13.84	255	100	peak
3	827.4934	23.17	4.09	27.26	46.00	-18.74	270	100	peak

Operating Condition: 802.11g Transmitting High Channel-2472MHz

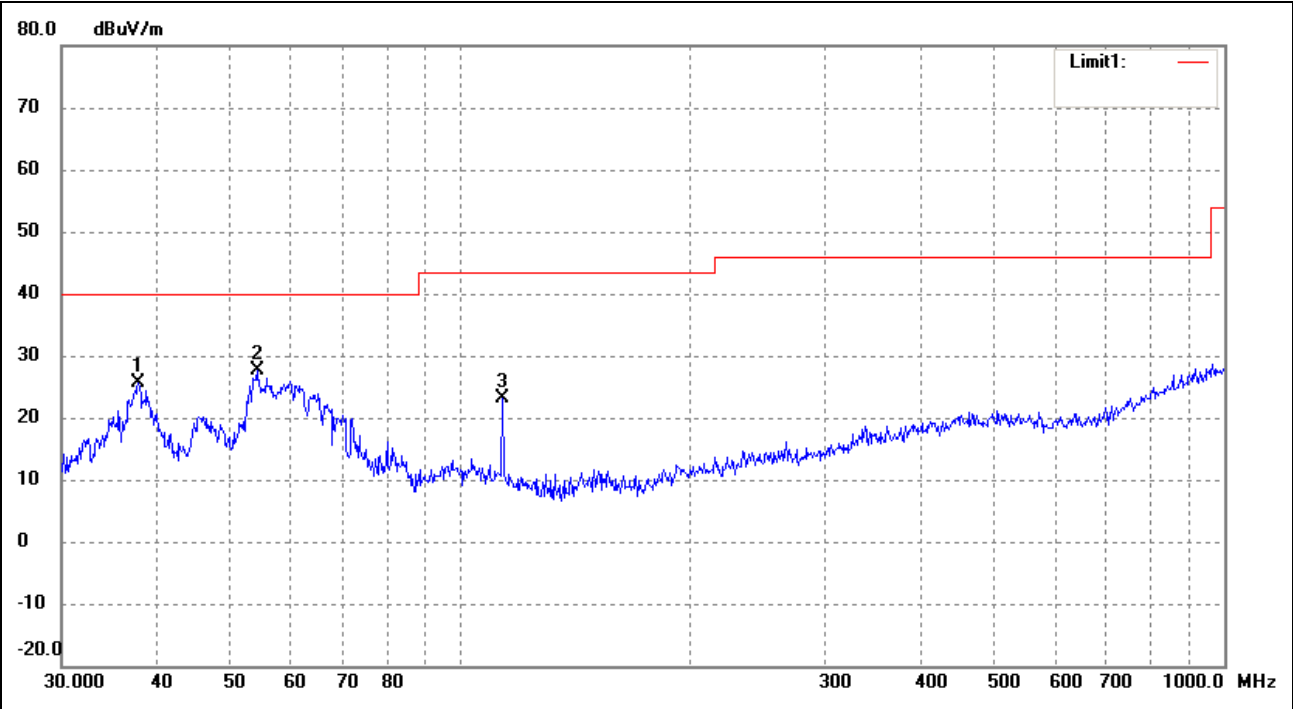
Comment: AC120V/60Hz; Adapter Dc 5V

Test Specification: Horizontal

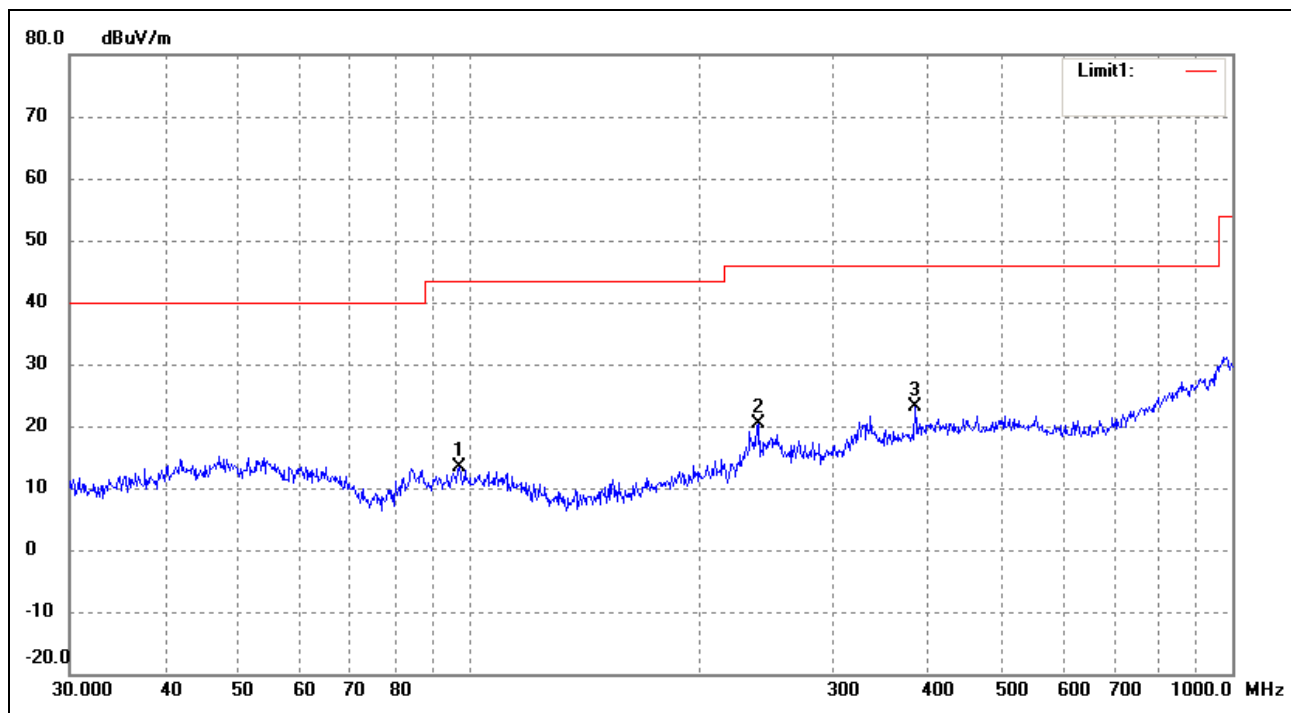


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	54.6429	24.68	-7.91	16.77	40.00	-23.23	270	100	peak
2	234.1684	29.30	-8.12	21.18	46.00	-24.82	51	200	peak
3	827.4934	28.66	3.37	32.03	46.00	-13.97	360	200	peak

Test Specification: Vertical



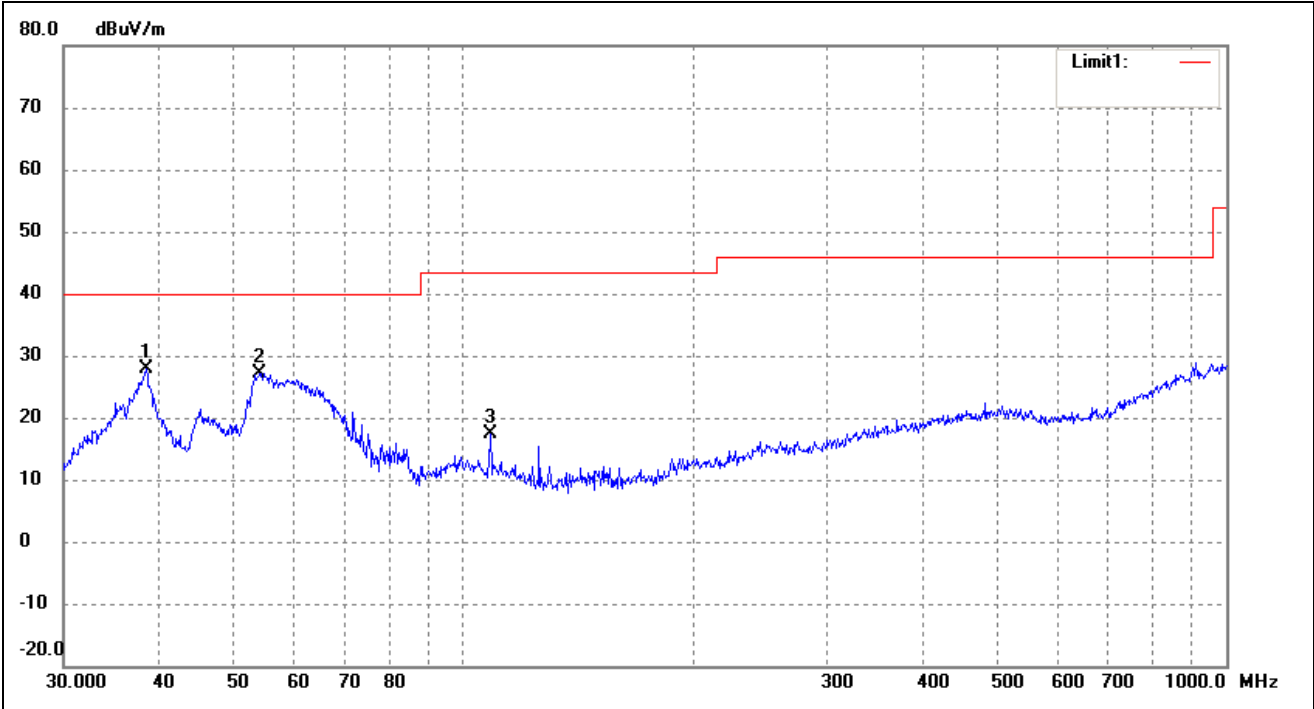
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	37.8121	34.63	-8.92	25.71	40.00	-14.29	360	100	peak
2	54.0711	35.56	-7.85	27.71	40.00	-12.29	180	100	peak
3	113.3163	33.38	-10.15	23.23	43.50	-20.27	225	100	peak

**Plot of Radiated Emissions Test Data (30MHz to 1GHz)***EUT:* TV BOX*Tested Model:* HD22*Operating Condition:* 802.11n-HT20 Transmitting Low Channel-2412MHz*Comment:* AC120V/60Hz; Adapter Dc 5V*Test Specification:* Horizontal

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	97.1148	23.20	-9.91	13.29	43.50	-30.21	260	100	peak
2	239.9874	28.18	-7.79	20.39	46.00	-25.61	131	200	peak
3	383.9318	26.47	-3.46	23.01	46.00	-22.99	285	200	peak

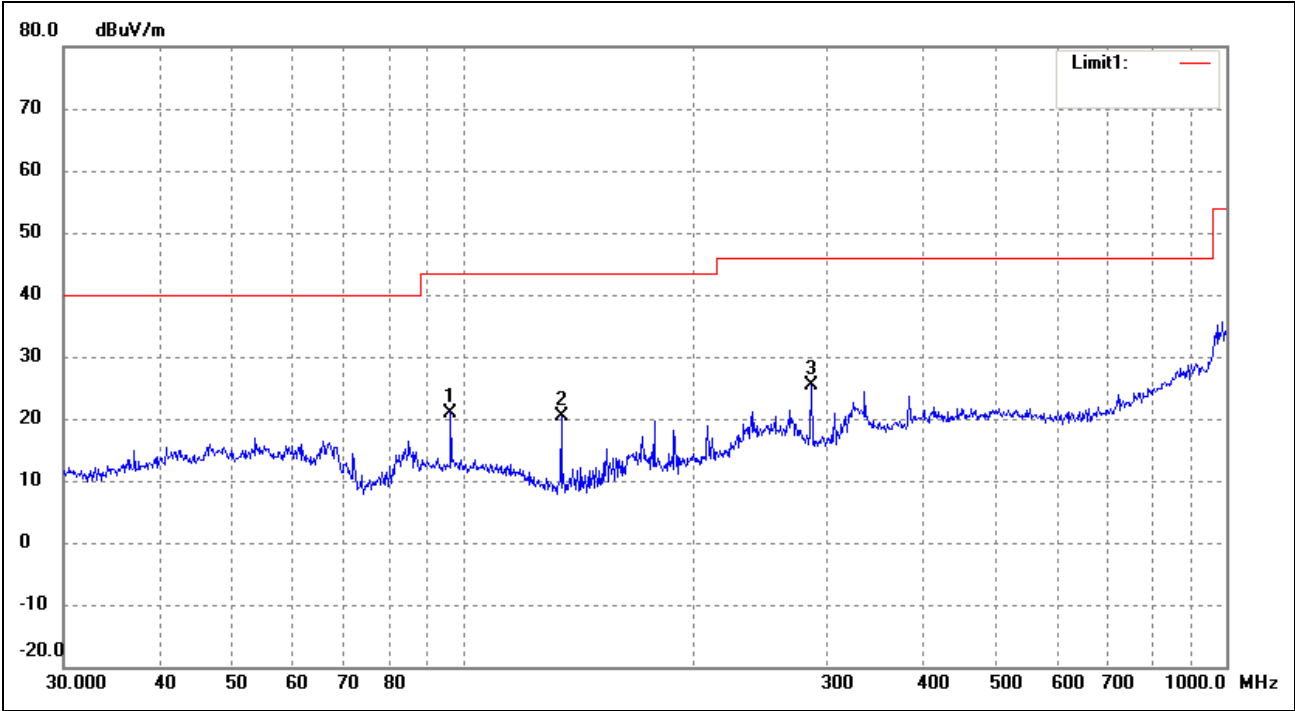


Test Specification: Vertical



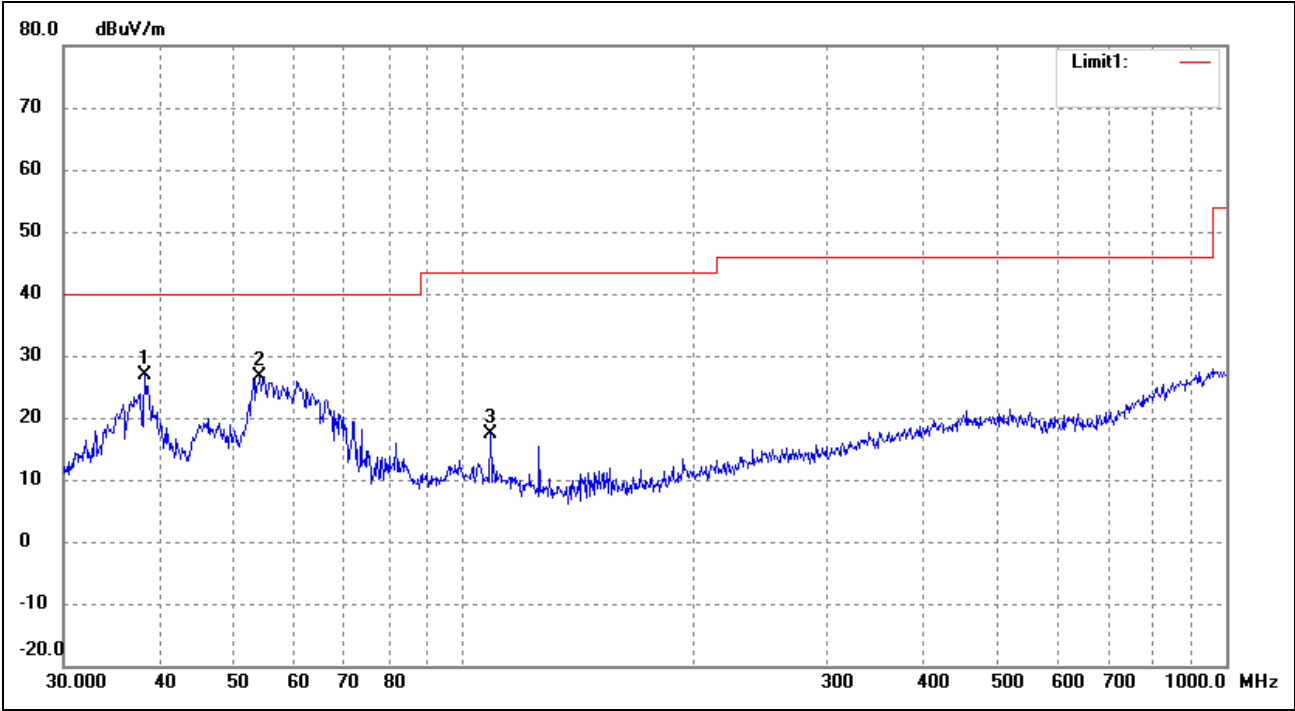
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.4809	36.70	-8.74	27.96	40.00	-12.04	155	100	peak
2	54.2610	35.11	-7.88	27.23	40.00	-12.77	197	100	peak
3	108.6470	26.93	-9.60	17.33	43.50	-26.17	310	100	peak

Operating Condition: 802.11n-HT20 Transmitting Middle Channel-2442MHz  
Comment: AC120V/60Hz; Adapter Dc 5V  
  
Test Specification: Horizontal



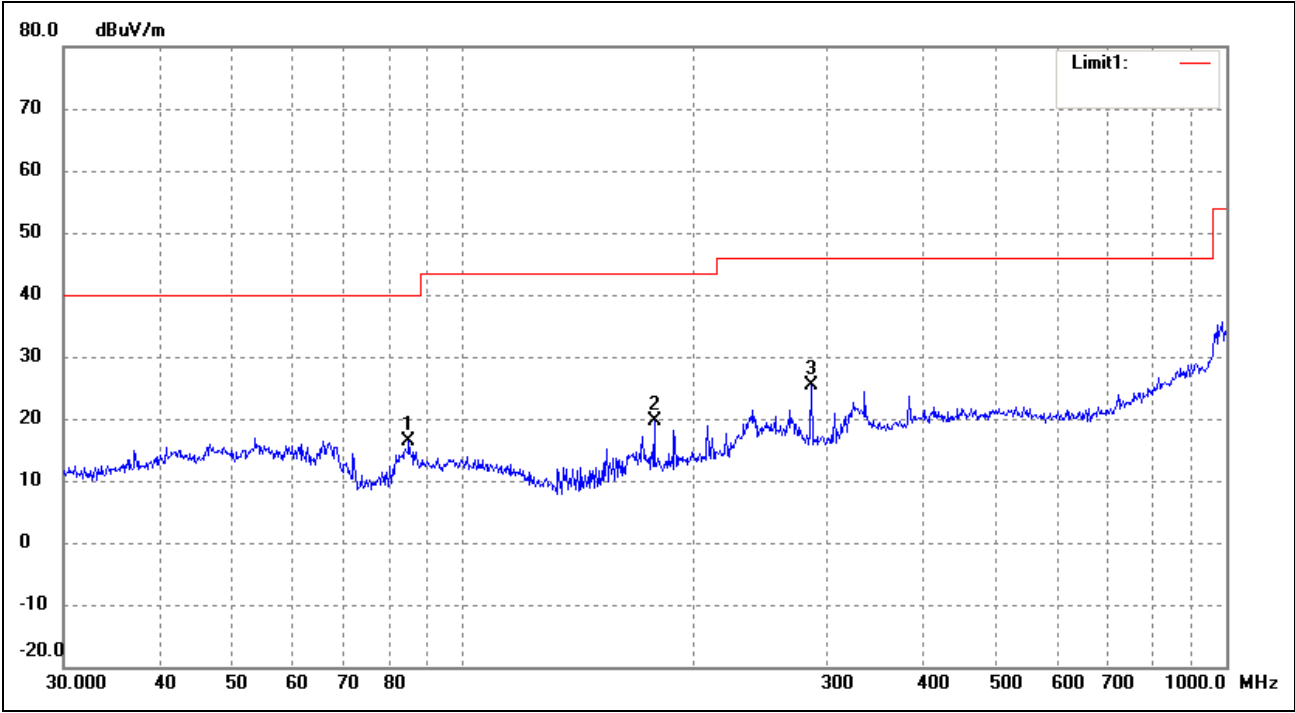
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	96.4362	30.99	-9.99	21.00	43.50	-22.50	274	100	peak
2	134.5592	33.38	-12.93	20.45	43.50	-23.05	116	100	peak
3	285.9778	31.96	-6.54	25.42	46.00	-20.58	82	100	peak

Test Specification: Vertical



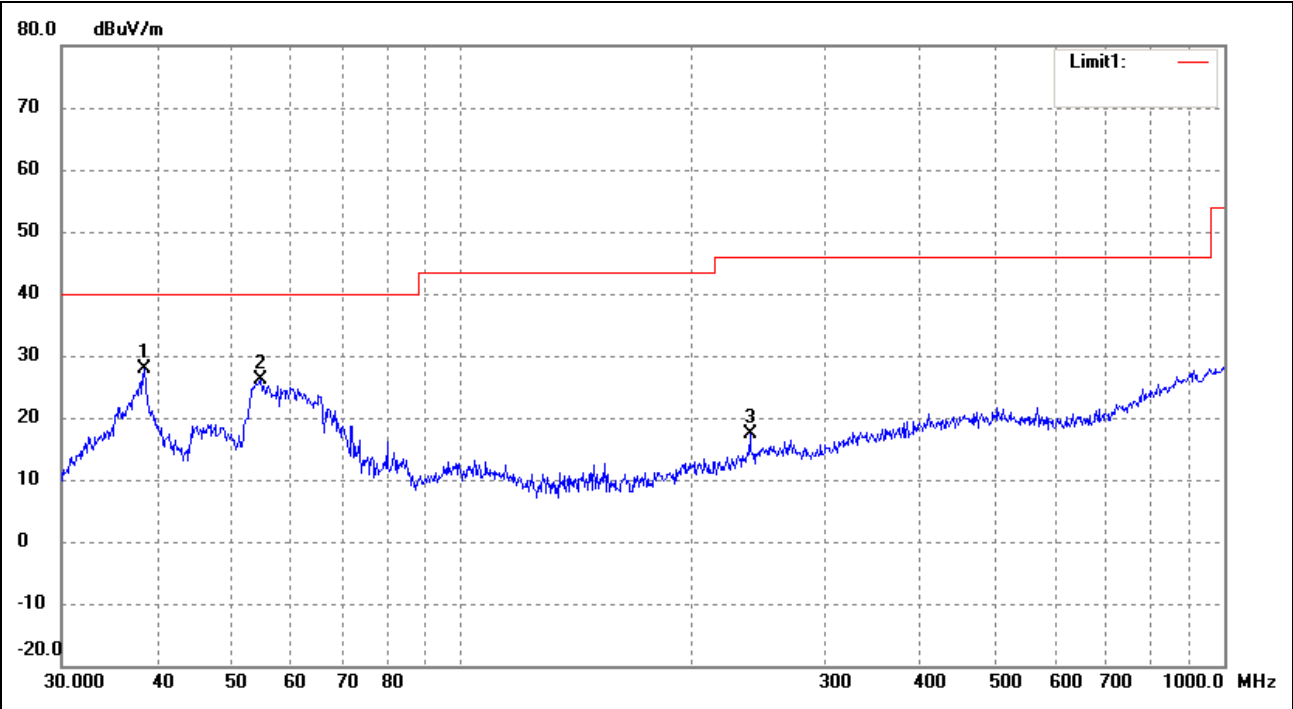
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.3462	35.57	-8.77	26.80	40.00	-13.20	264	100	peak
2	54.2610	34.52	-7.88	26.64	40.00	-13.36	110	100	peak
3	108.6470	26.93	-9.60	17.33	43.50	-26.17	136	100	peak

Operating Condition: 802.11n-HT20 Transmitting High Channel-2472MHz  
Comment: AC120V/60Hz; Adapter Dc 5V  
  
Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	84.9995	28.94	-12.50	16.44	40.00	-23.56	360	100	peak
2	178.1327	30.96	-11.28	19.68	43.50	-23.82	112	100	peak
3	285.9778	31.96	-6.54	25.42	46.00	-20.58	180	200	peak

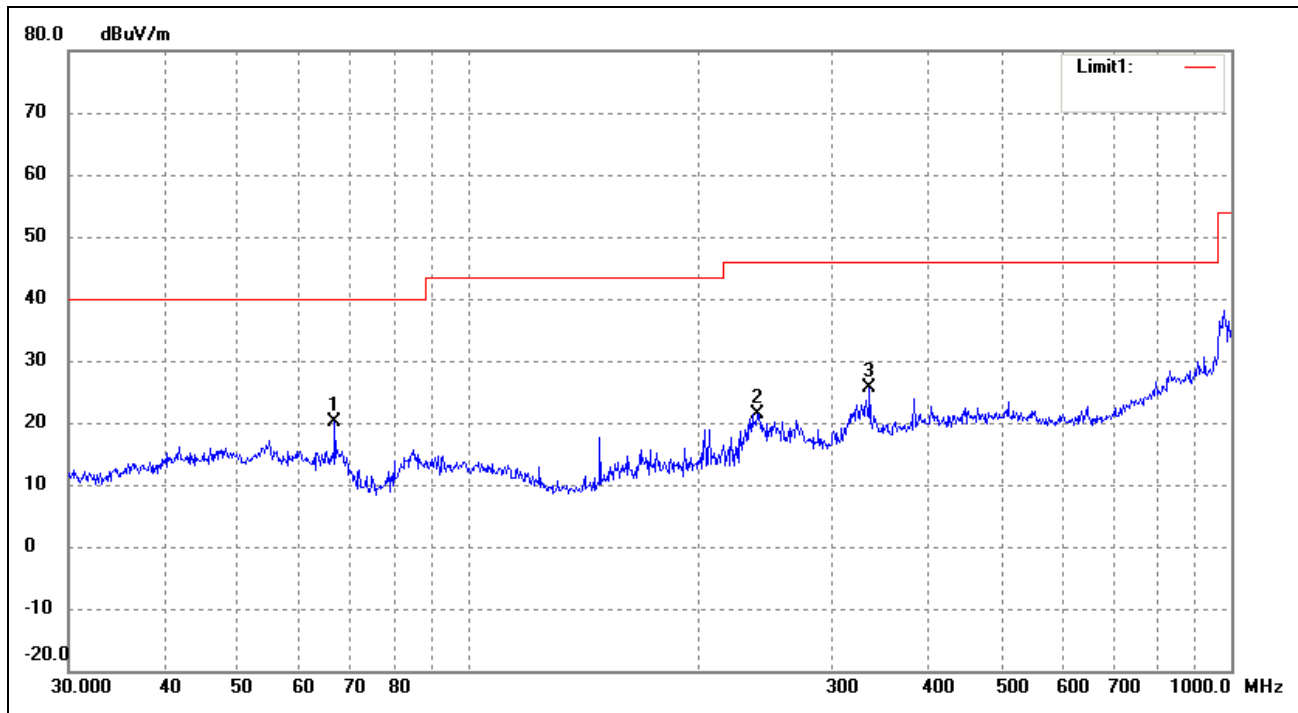
Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.4809	36.64	-8.74	27.90	40.00	-12.10	267	100	peak
2	54.6429	34.08	-7.91	26.17	40.00	-13.83	116	100	peak
3	239.1473	25.26	-7.83	17.43	46.00	-28.57	360	100	peak

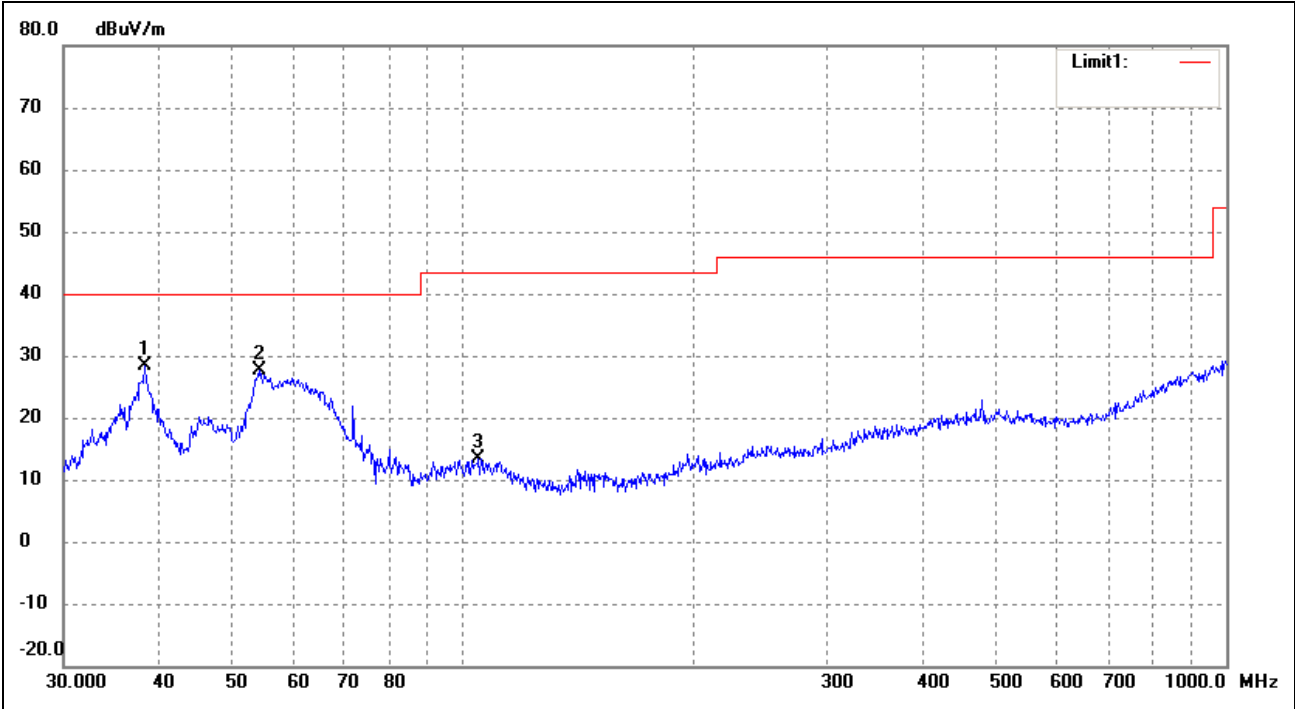
EUT: TV BOX  
 Tested Model: HD22  
 Operating Condition: 802.11n-HT40 Transmitting Low Channel-2422MHz  
 Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



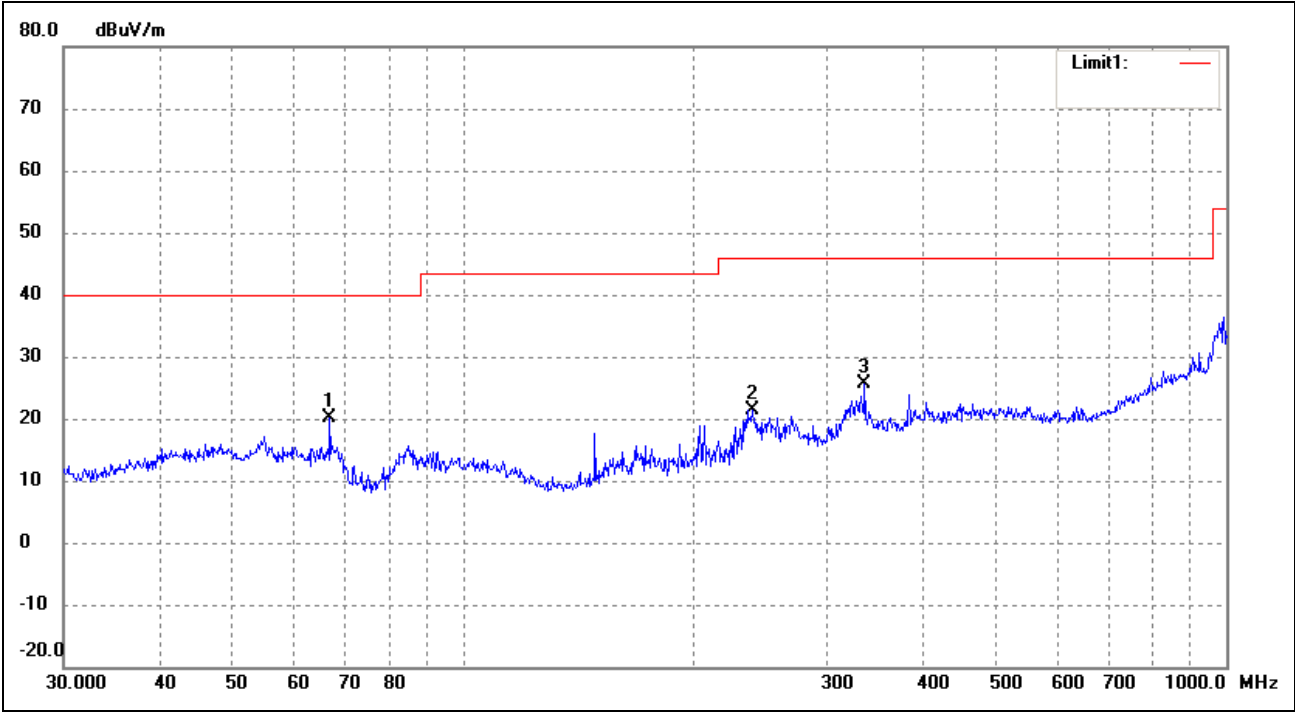
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	66.9669	30.56	-10.41	20.15	40.00	-19.85	267	100	peak
2	239.1473	29.29	-7.83	21.46	46.00	-24.54	114	200	peak
3	336.0352	30.39	-4.69	25.70	46.00	-20.30	35	200	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.3462	37.08	-8.77	28.31	40.00	-11.69	360	100	peak
2	54.0711	35.37	-7.85	27.52	40.00	-12.48	258	100	peak
3	104.9033	23.08	-9.58	13.50	43.50	-30.00	347	100	peak

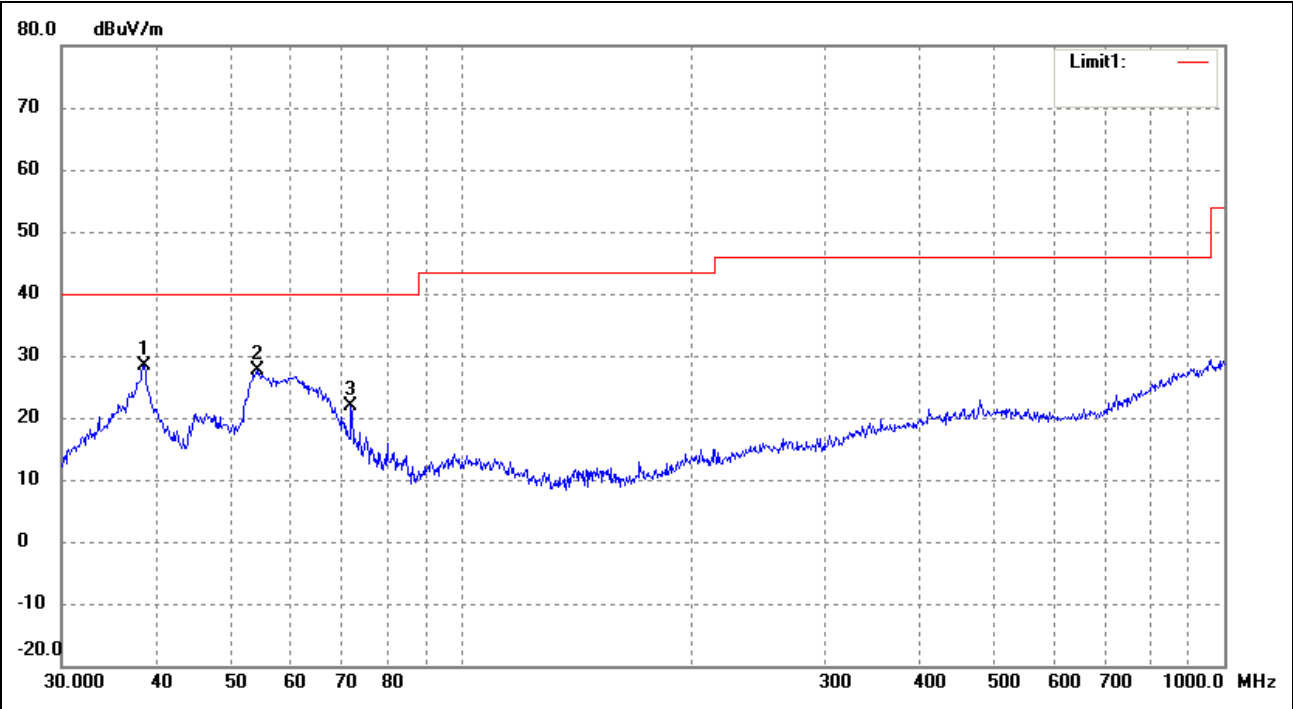
Operating Condition: 802.11n-HT40 Transmitting Middle Channel-2442MHz  
Comment: AC120V/60Hz; Adapter DC 5V  
  
Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	66.9669	30.56	-10.41	20.15	40.00	-19.85	251	100	peak
2	239.1473	29.29	-7.83	21.46	46.00	-24.54	167	100	peak
3	336.0352	30.39	-4.69	25.70	46.00	-20.30	44	100	peak

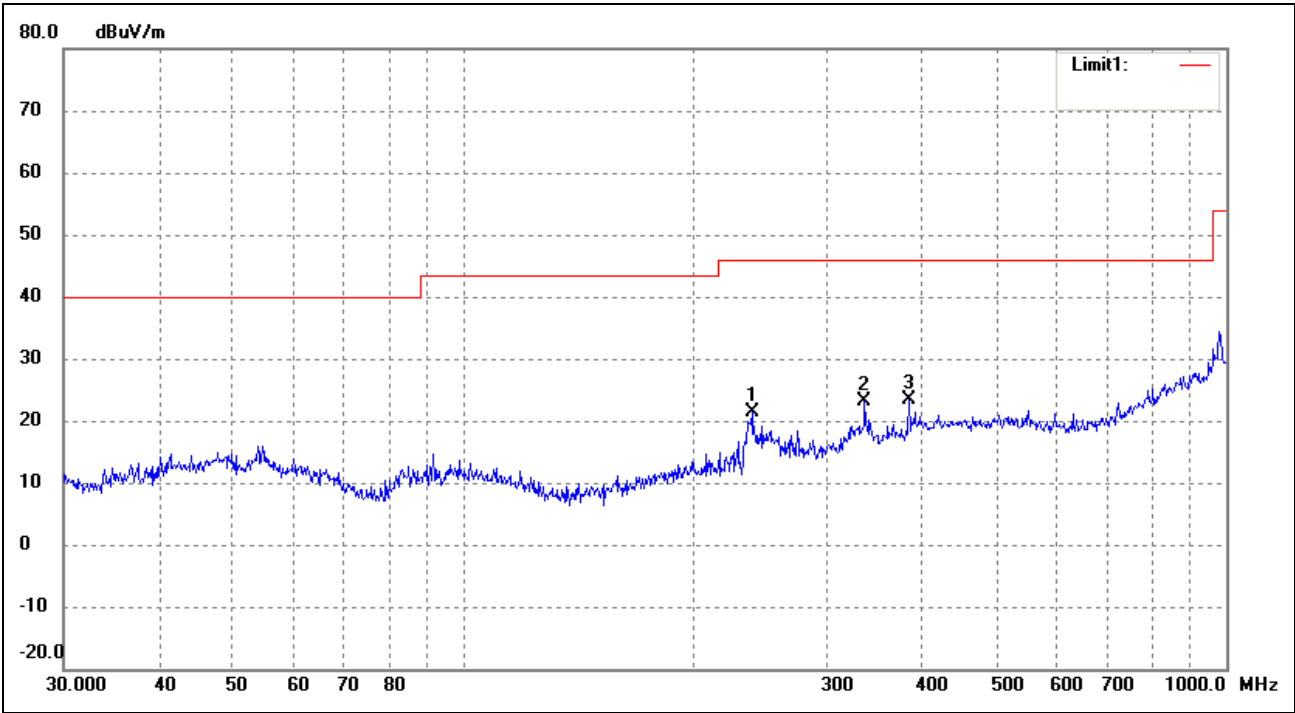


Test Specification: Vertical



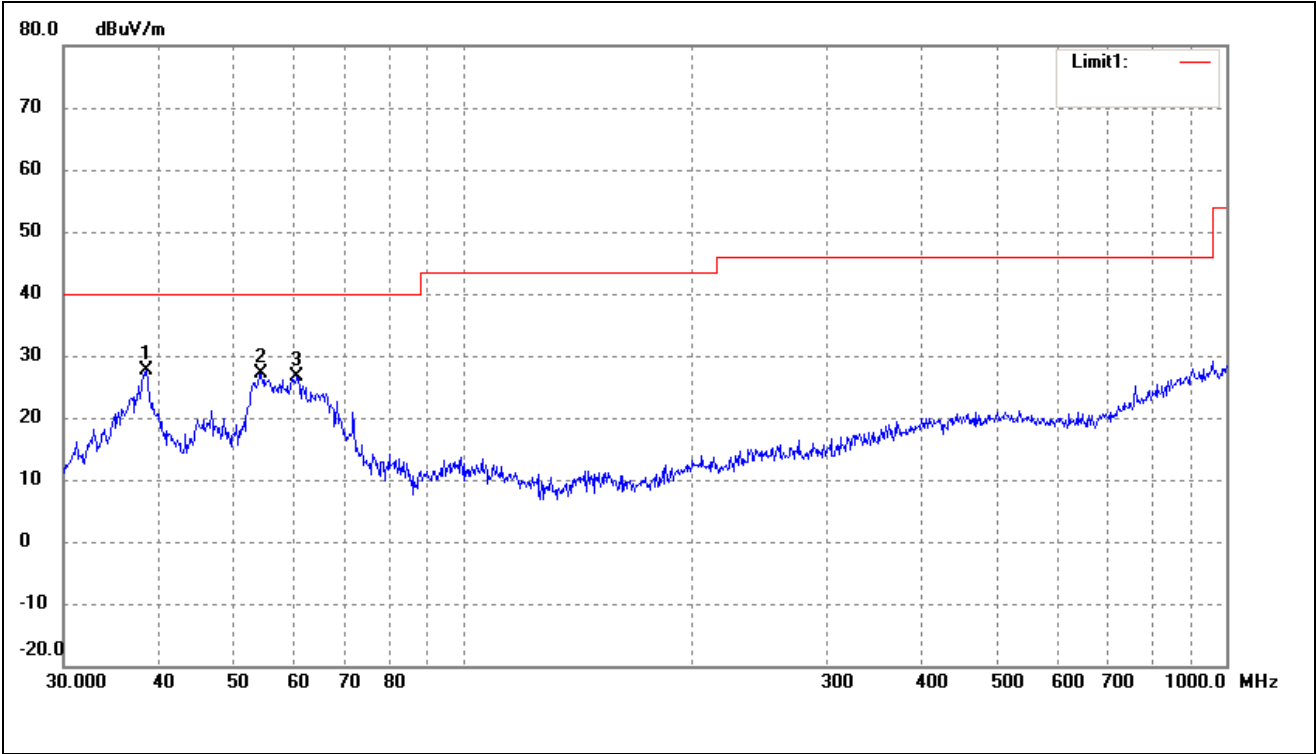
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.4809	37.11	-8.74	28.37	40.00	-11.63	47	100	peak
2	54.0711	35.37	-7.85	27.52	40.00	-12.48	264	100	peak
3	71.8320	34.20	-12.26	21.94	40.00	-18.06	225	100	peak

Operating Condition: 802.11n-HT40 Transmitting High Channel-2462MHz  
Comment: AC120V/60Hz; Adapter DC 5V  
  
Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	239.1473	29.29	-7.83	21.46	46.00	-24.54	360	100	peak
2	336.0352	27.87	-4.69	23.18	46.00	-22.82	287	100	peak
3	383.9318	26.91	-3.46	23.45	46.00	-22.55	168	100	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	38.4809	36.27	-8.74	27.53	40.00	-12.47	78	100	peak
2	54.4516	35.10	-7.90	27.20	40.00	-12.80	136	100	peak
3	60.7044	35.66	-9.14	26.52	40.00	-13.48	284	100	peak

*Spurious Emissions Above 1GHz**Test Mode: 802.11b*

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	54.09	-3.87	50.22	74.00	-23.78	H	PK
4824.000	38.84	-3.87	34.97	54.00	-19.03	H	AV
7236.000	46.30	1.14	47.44	74.00	-26.56	H	PK
7236.000	34.98	1.19	36.17	54.00	-17.83	H	AV
4824.000	57.31	-3.86	53.45	74.00	-20.55	V	PK
4824.000	40.50	-3.86	36.64	54.00	-17.36	V	AV
7236.000	49.11	1.10	50.21	74.00	-23.79	V	PK
7236.000	37.44	1.10	38.54	54.00	-15.46	V	AV
Middle Channel-2442MHz							
4884.000	54.74	-3.74	51.00	74.00	-23.00	H	PK
4884.000	39.99	-3.74	36.25	54.00	-17.75	H	AV
7326.000	47.77	1.47	49.24	74.00	-24.76	H	PK
7326.000	33.10	1.47	34.57	54.00	-19.43	H	AV
4884.000	53.97	-3.74	50.23	74.00	-23.77	V	PK
4884.000	40.89	-3.74	37.15	54.00	-16.85	V	AV
7326.000	47.98	1.47	49.45	74.00	-24.55	V	PK
7326.000	34.08	1.47	35.55	54.00	-18.45	V	AV
High Channel-2472MHz							
4944.000	55.82	-3.59	52.23	74.00	-21.77	H	PK
4944.000	41.76	-3.59	38.17	54.00	-15.83	H	AV
7416.000	46.38	1.79	48.17	74.00	-25.83	H	PK
7416.000	34.83	1.79	36.62	54.00	-17.38	H	AV
4944.000	54.94	-3.59	51.35	74.00	-22.65	V	PK
4944.000	42.04	-3.59	38.45	54.00	-15.55	V	AV
7416.000	47.99	1.79	49.78	74.00	-24.22	V	PK
7416.000	35.18	1.79	36.97	54.00	-17.03	V	AV

*Test Mode: 802.11g*

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	55.50	-3.86	51.64	74.00	-22.36	H	PK
4824.000	42.23	-3.86	38.37	54.00	-15.63	H	AV
7236.000	48.42	1.10	49.52	74.00	-24.48	H	PK
7236.000	34.40	1.10	35.50	54.00	-18.50	H	AV
4824.000	55.99	-3.86	52.13	74.00	-21.87	V	PK
4824.000	42.65	-3.86	38.79	54.00	-15.21	V	AV
7236.000	49.22	1.10	50.32	74.00	-23.68	V	PK
7236.000	35.54	1.10	36.64	54.00	-17.36	V	AV
Middle Channel-2442MHz							
4884.000	55.10	-3.74	51.36	74.00	-22.64	H	PK
4884.000	43.28	-3.74	39.54	54.00	-14.46	H	AV
7326.000	47.38	1.47	48.85	74.00	-25.15	H	PK
7326.000	35.27	1.47	36.74	54.00	-17.26	H	AV
4884.000	57.07	-3.74	53.33	74.00	-20.67	V	PK
4884.000	43.86	-3.74	40.12	54.00	-13.88	V	AV
7326.000	48.40	1.47	49.87	74.00	-24.13	V	PK
7326.000	35.33	1.47	36.80	54.00	-17.20	V	AV
High Channel-2472MHz							
4944.000	54.00	-3.59	50.41	74.00	-23.59	H	PK
4944.000	40.75	-3.59	37.16	54.00	-16.84	H	AV
7416.000	47.18	1.79	48.97	74.00	-25.03	H	PK
7416.000	34.73	1.79	36.52	54.00	-17.48	H	AV
4944.000	56.11	-3.59	52.52	74.00	-21.48	V	PK
4944.000	42.69	-3.59	39.10	54.00	-14.90	V	AV
7416.000	48.58	1.79	50.37	74.00	-23.63	V	PK
7416.000	35.95	1.79	37.74	54.00	-16.26	V	AV

Test Mode: 802.11n-HT20

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	55.60	-3.86	51.74	74.00	-22.26	H	PK
4824.000	40.54	-3.86	36.68	54.00	-17.32	H	AV
7236.000	47.26	1.10	48.36	74.00	-25.64	H	PK
7236.000	34.44	1.10	35.54	54.00	-18.46	H	AV
4824.000	56.71	-3.86	52.85	74.00	-21.15	V	PK
4824.000	43.18	-3.86	39.32	54.00	-14.68	V	AV
7236.000	49.21	1.10	50.31	74.00	-23.69	V	PK
7236.000	35.77	1.10	36.87	54.00	-17.13	V	AV
Middle Channel-2442MHz							
4884.000	54.16	-3.74	50.42	74.00	-23.58	H	PK
4884.000	42.48	-3.74	38.74	54.00	-15.26	H	AV
7326.000	48.74	1.47	50.21	74.00	-23.79	H	PK
7326.000	33.10	1.47	34.57	54.00	-19.43	H	AV
4884.000	54.92	-3.74	51.18	74.00	-22.82	V	PK
4884.000	42.62	-3.74	38.88	54.00	-15.12	V	AV
7326.000	48.49	1.47	49.96	74.00	-24.04	V	PK
7326.000	35.20	1.47	36.67	54.00	-17.33	V	AV
High Channel-2472MHz							
4944.000	53.90	-3.59	50.31	74.00	-23.69	H	PK
4944.000	43.23	-3.59	39.64	54.00	-14.36	H	AV
7416.000	48.31	1.79	50.10	74.00	-23.90	H	PK
7416.000	36.10	1.79	37.89	54.00	-16.11	H	AV
4944.000	55.70	-3.59	52.11	74.00	-21.89	V	PK
4944.000	41.48	-3.59	37.89	54.00	-16.11	V	AV
7416.000	48.55	1.79	50.34	74.00	-23.66	V	PK
7416.000	35.36	1.79	37.15	54.00	-16.85	V	AV

Test Mode: 802.11n-HT40

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2422MHz							
4844.000	53.25	-3.90	49.35	74.00	-24.65	H	PK
4844.000	38.25	-3.90	34.35	54.00	-19.65	H	AV
7266.000	46.48	1.06	47.54	74.00	-26.46	H	PK
7266.000	32.56	1.06	33.62	54.00	-20.38	H	AV
4884.000	54.22	-3.90	50.32	74.00	-23.68	V	PK
4884.000	39.42	-3.90	35.52	54.00	-18.48	V	AV
7266.000	48.81	1.06	49.87	74.00	-24.13	V	PK
7266.000	34.78	1.06	35.84	54.00	-18.16	V	AV
Middle Channel-2442MHz							
4874.000	52.53	-3.74	48.79	74.00	-25.21	H	PK
4874.000	37.88	-3.74	34.14	54.00	-19.86	H	AV
7311.000	44.88	1.47	46.35	74.00	-27.65	H	PK
7311.000	32.03	1.47	33.50	54.00	-20.50	H	AV
4874.000	53.74	-3.74	50.00	74.00	-24.00	V	PK
4874.000	39.95	-3.74	36.21	54.00	-17.79	V	AV
7311.000	45.78	1.47	47.25	74.00	-26.75	V	PK
7311.000	34.00	1.47	35.47	54.00	-18.53	V	AV
High Channel-2462MHz							
4924.000	52.65	-3.63	49.02	74.00	-24.98	H	PK
4924.000	39.37	-3.63	35.74	54.00	-18.26	H	AV
7386.000	45.63	1.62	47.25	74.00	-26.75	H	PK
7386.000	30.73	1.62	32.35	54.00	-21.65	H	AV
4924.000	54.84	-3.63	51.21	74.00	-22.79	V	PK
4924.000	40.83	-3.63	37.20	54.00	-16.80	V	AV
7386.000	48.18	1.62	49.80	74.00	-24.20	V	PK
7386.000	35.12	1.62	36.74	54.00	-17.26	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3<sup>th</sup> Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20dB below the limit from 9kHz to 30MHz.

## 9. Out of Band Emissions

### 9.1 Standard Applicable

According to §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

### 9.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	2015-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-24	2015-05-23
Horn Antenna	ETS	3117	00086197	2014-05-24	2015-05-23

### 9.3 Test Procedure

According to the KDB 558074D01 v03r02, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)

RBW = 1MHz, VBW = 1MHz for peak value measured

RBW = 1MHz, VBW = 10Hz for average value measured

Sweep = auto; Detector function = peak/average; Trace = max hold

All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.



According to the KDB 558074 D01 V03r02, the conducted spurious emissions test method as follows:

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

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

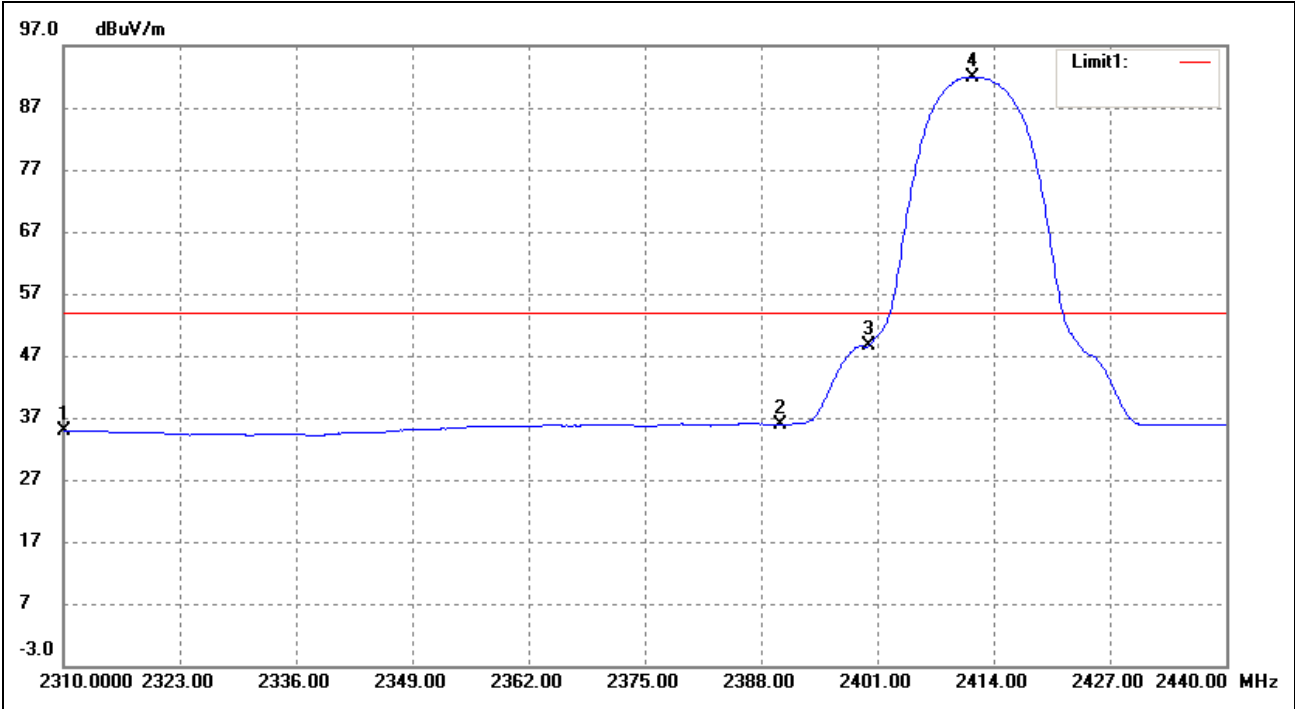
#### 9.4 Environmental Conditions

Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

#### 9.5 Summary of Test Results/Plots

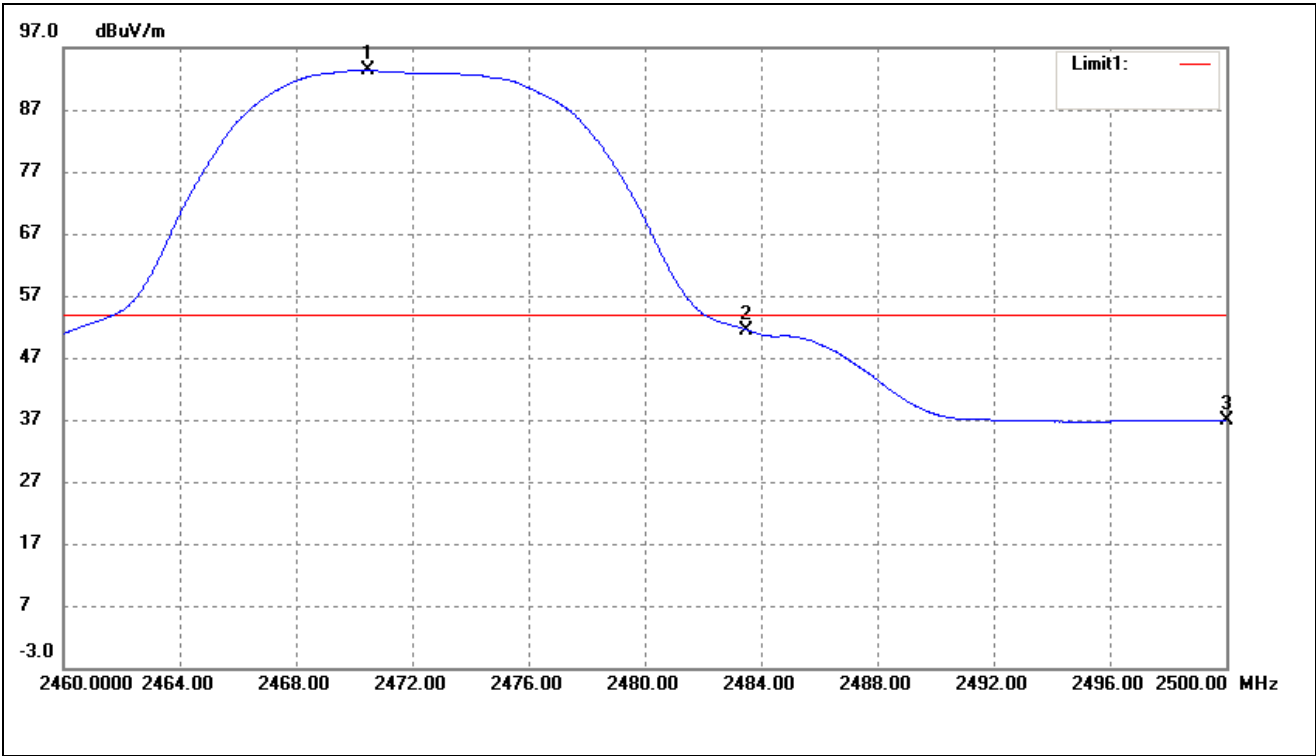
Please refer to the test plots as below.

802.11b-Lowest Bandedge  
Vertical (Worst case)



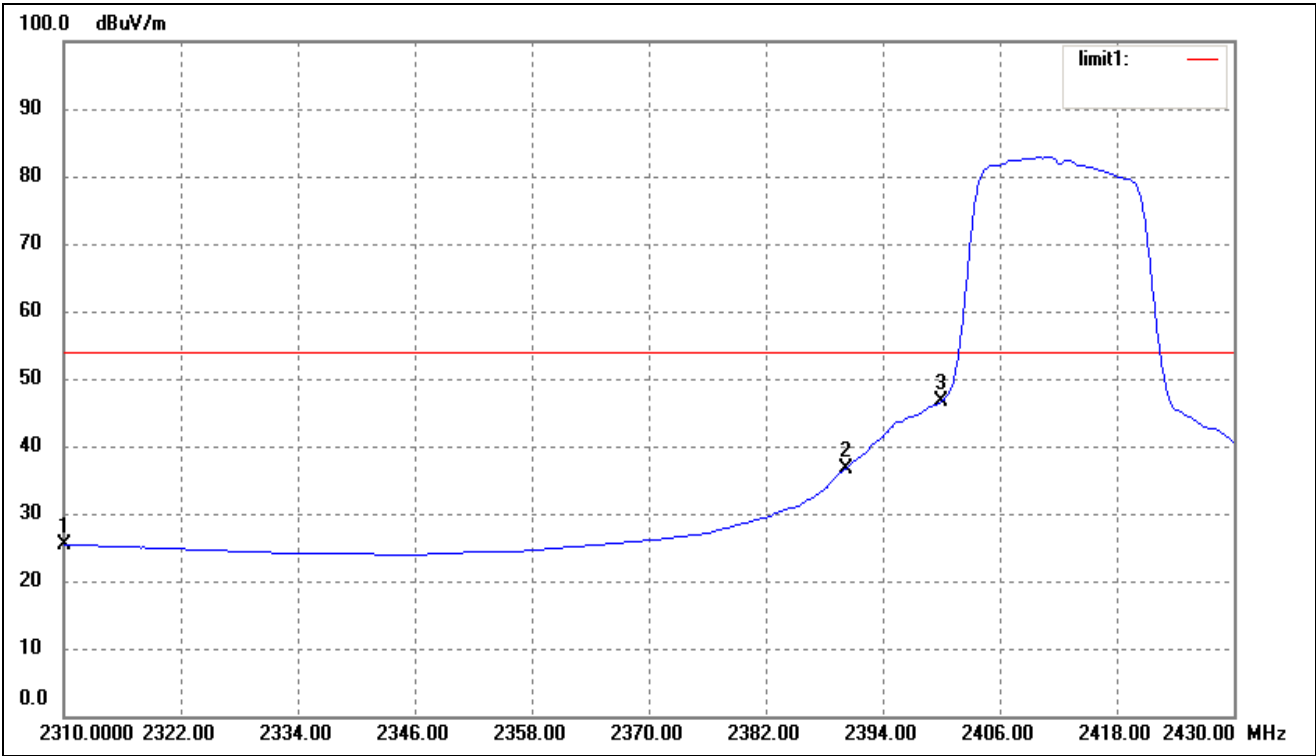
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	18.55	16.34	34.89	54.00	-19.11	Average Detector
	2310.000	30.15	16.34	46.49	74.00	-27.51	Peak Detector
2	2390.000	18.89	17.03	35.92	54.00	-18.08	Average Detector
	2390.000	30.45	17.03	47.48	74.00	-26.52	Peak Detector
3	2400.000	31.60	17.11	48.71	Delta=43.22dBc		Average Detector
4	2411.660	74.73	17.20	91.93			Average Detector

802.11b-Highest Bandedge  
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2470.480	75.74	17.63	93.37	/	/	Average Detector
	2469.200	84.06	17.62	101.68	/	/	Peak Detector
2	2483.500	Delta =41.88dBc		51.49	54.00	-2.51	Average Detector
	2483.500			61.89	74.00	-12.11	Peak Detector
3	2500.000	18.94	17.86	36.80	54.00	-17.20	Average Detector
	2500.000	31.79	17.85	49.64	74.00	-24.36	Peak Detector

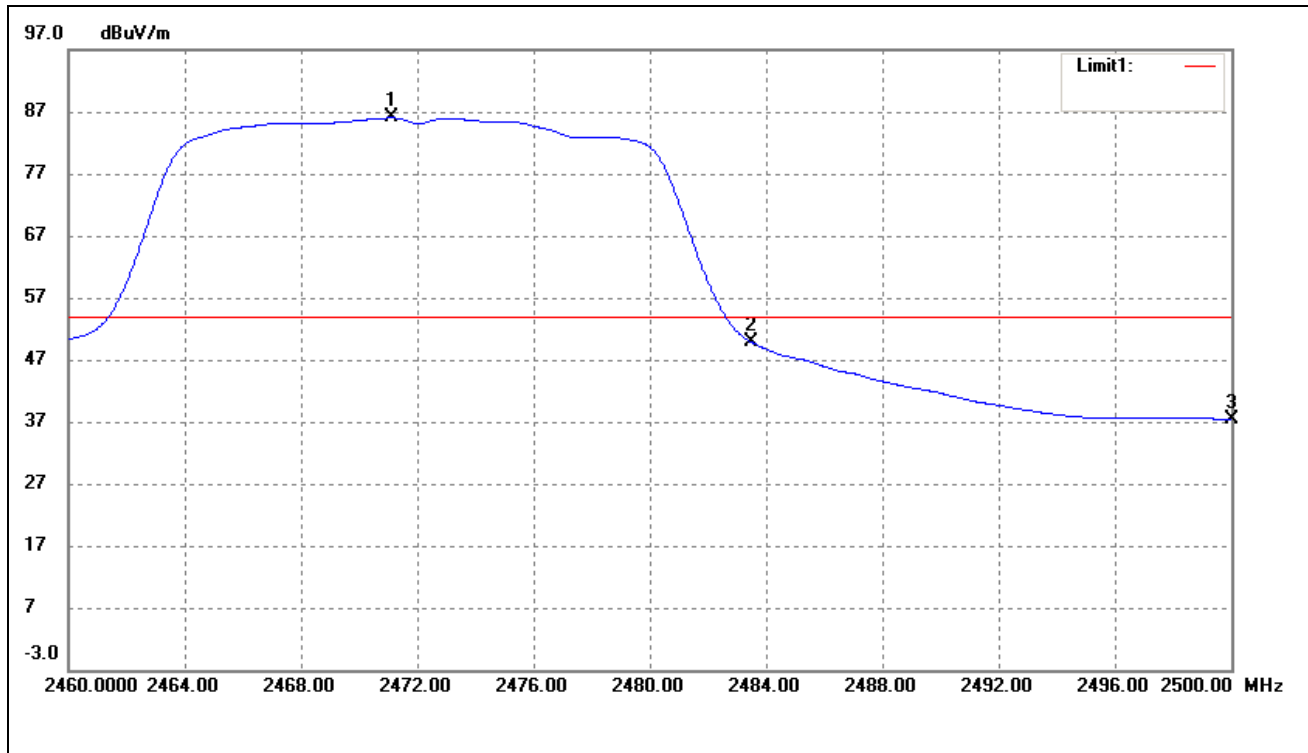
802.11g-Lowest Bandedge  
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	18.65	16.34	34.99	54.00	-19.01	Average Detector
	2310.000	30.58	16.34	46.92	74.00	-27.08	Peak Detector
2	2390.000	22.00	17.03	39.03	54.00	-14.97	Average Detector
	2390.000	38.58	17.03	55.61	74.00	-18.39	Peak Detector
3	2400.000	33.18	17.11	50.29	Delta=36.76dBc		Average Detector
	2411.140	69.86	17.19	87.05			Average Detector

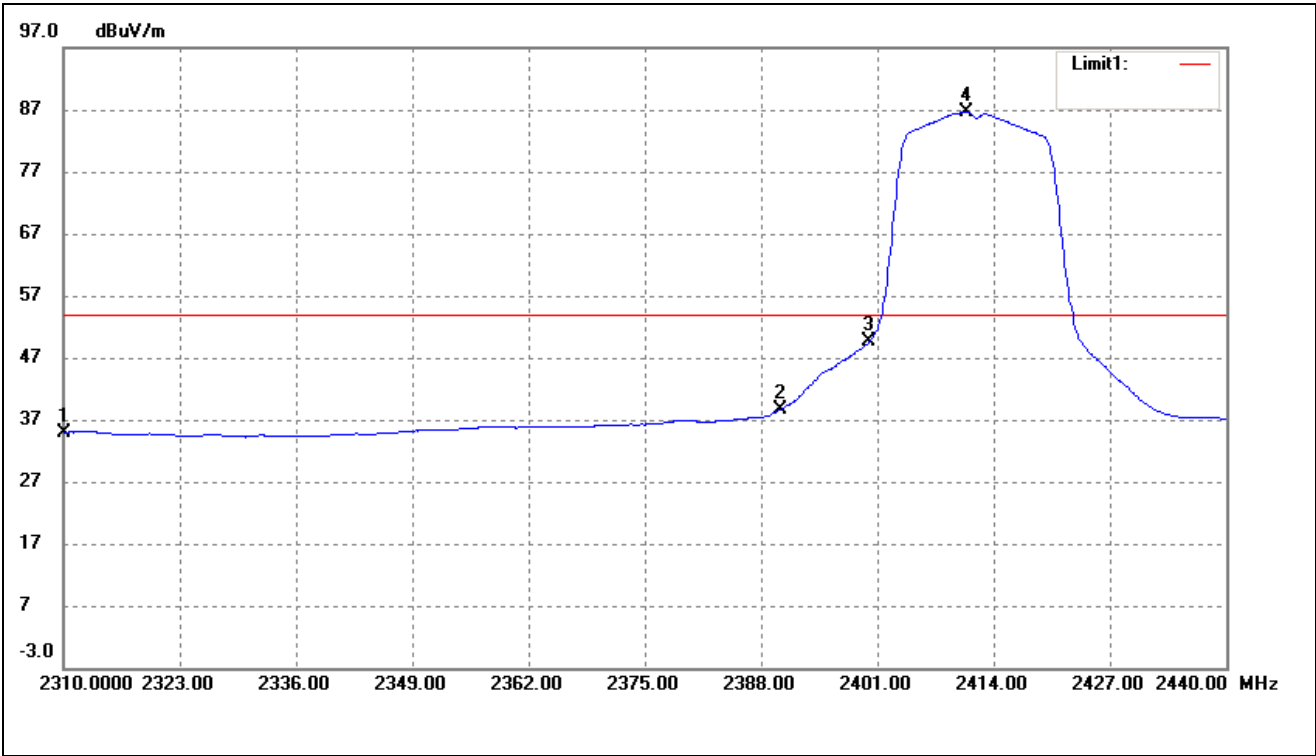
802.11g-Highest Bandedge

Vertical (Worst case)



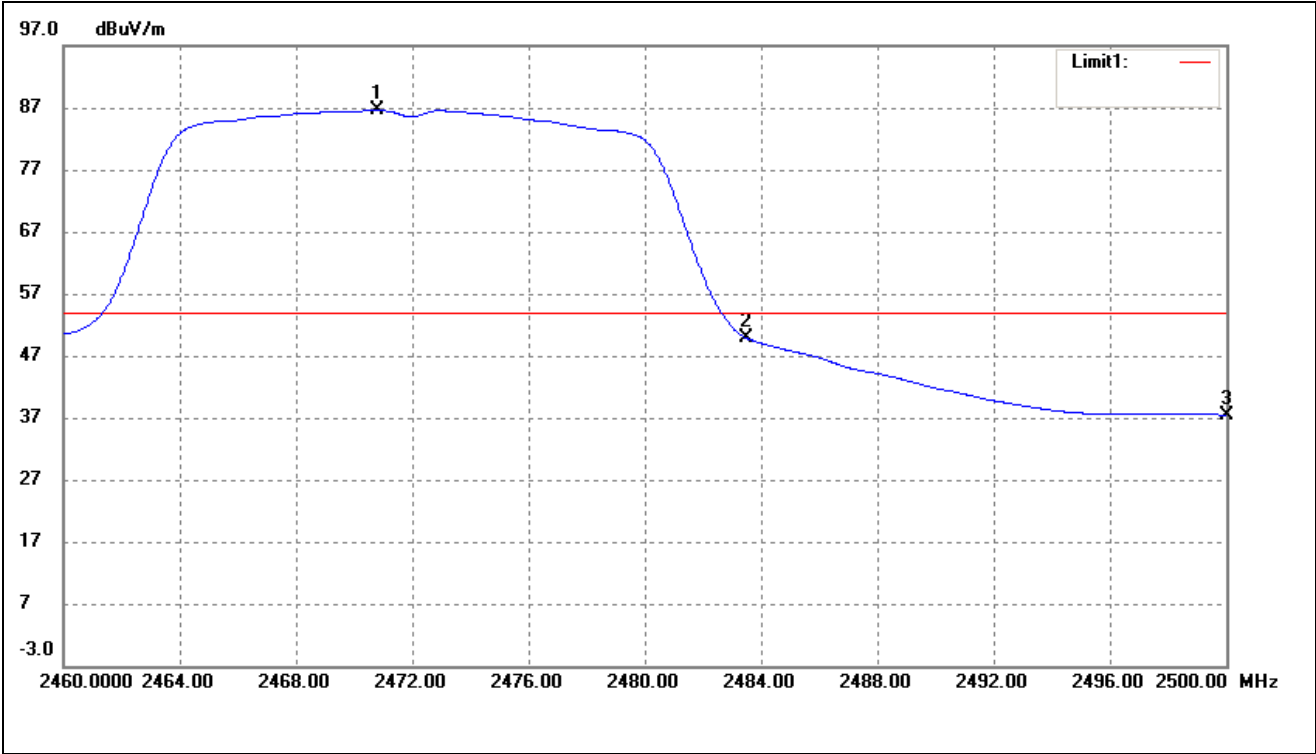
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	2471.120	68.39	17.64	86.03	/	/	Average Detector
	2473.480	79.51	17.66	97.17	/	/	Peak Detector
1	2483.500	Delta = 36.25dBc		49.78	54.00	-4.22	Average Detector
	2483.500			62.27	74.00	-11.73	Peak Detector
3	2500.000	19.58	17.86	37.44	54.00	-16.56	Average Detector
	2500.000	31.52	17.86	49.38	74.00	-24.62	Peak Detector

802.11n-HT20-Lowest Bandedge  
Vertical (Worst case)



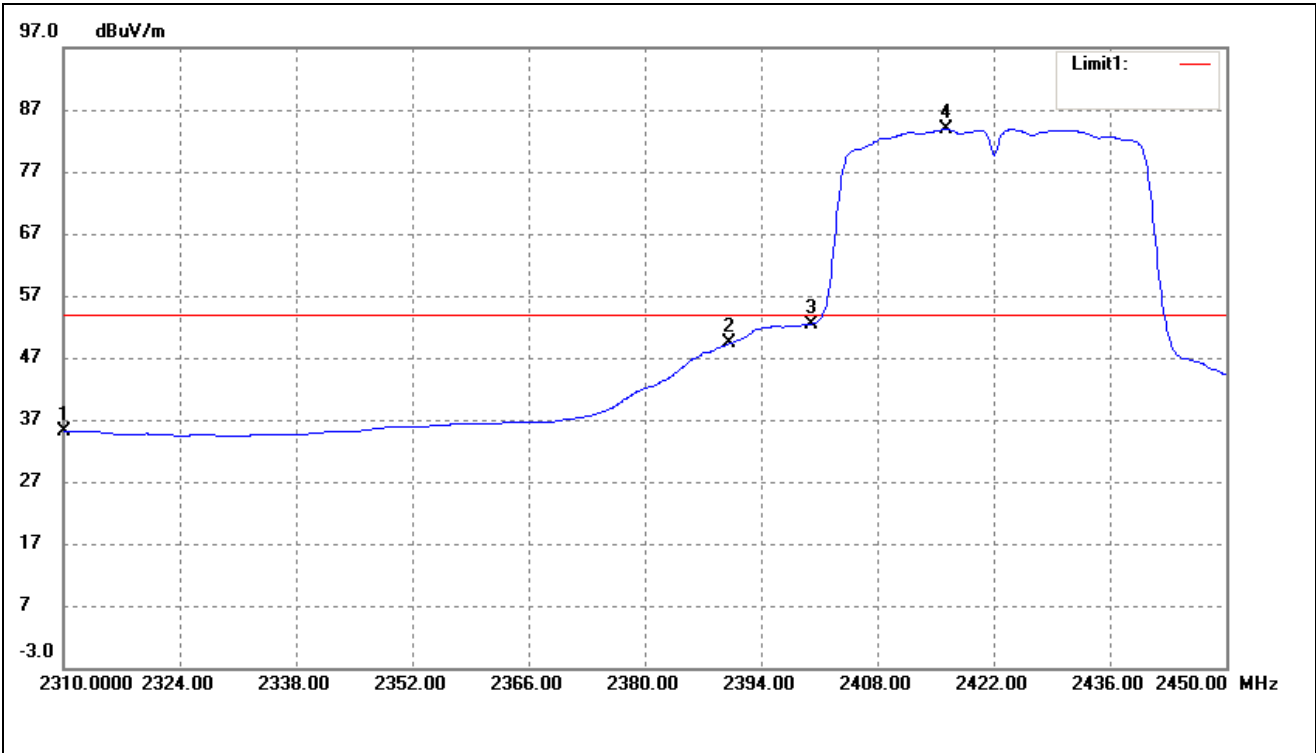
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	18.62	16.34	34.96	54.00	-19.04	Average Detector
	2310.000	30.85	16.34	47.19	74.00	-26.81	Peak Detector
2	2390.000	21.63	17.03	38.66	54.00	-15.34	Average Detector
	2390.000	38.10	17.03	55.13	74.00	-18.87	Peak Detector
3	2400.000	32.47	17.11	49.58	Delta=37.09dBc		Average Detector
4	2411.010	69.48	17.19	86.67			Average Detector

802.11n-HT20-Highest Bandedge  
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2470.800	68.94	17.64	86.58	/	/	Average Detector
	2472.960	78.95	17.66	96.61	/	/	Peak Detector
2	2483.500	Delta = 36.81dBc		49.77	54.00	-4.23	Average Detector
	2483.500			62.42	74.00	-11.58	Peak Detector
3	2500.000	19.61	17.86	37.47	54.00	-16.53	Average Detector
	2500.000	32.10	17.86	49.96	74.00	-24.04	Peak Detector

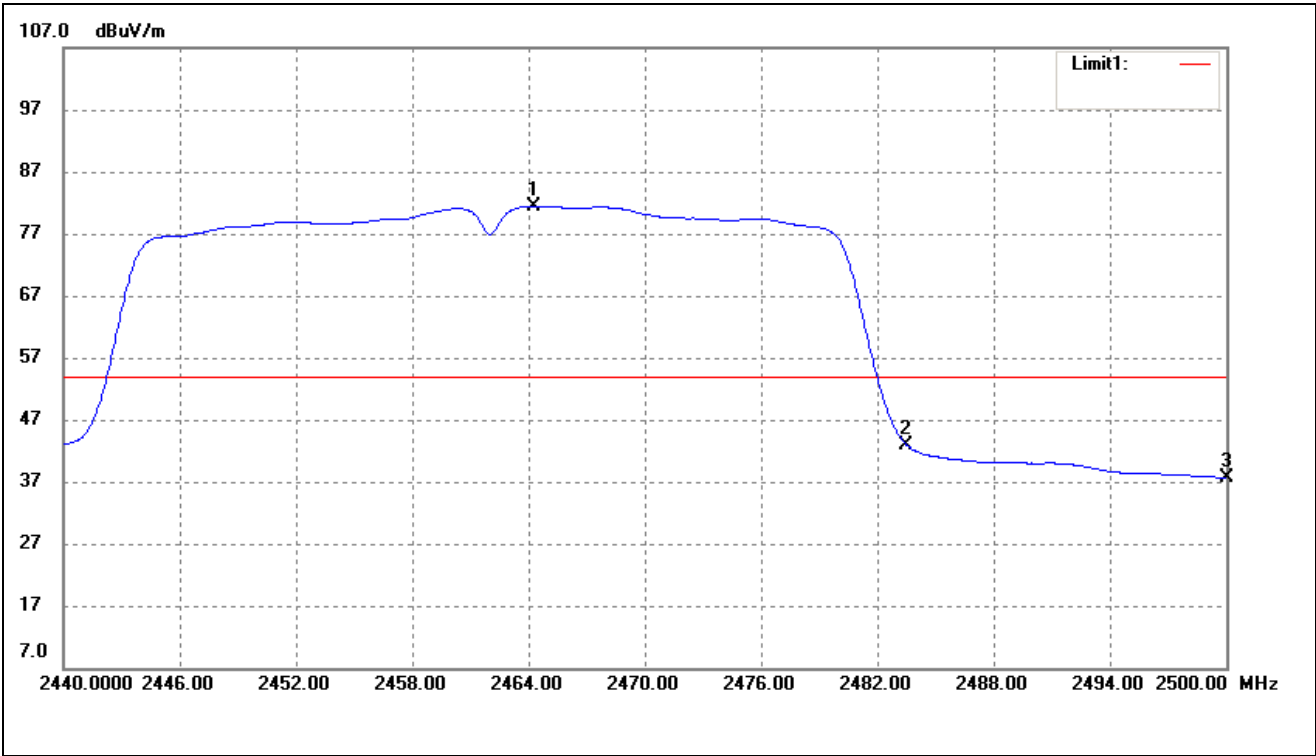
802.11n-HT40-Lowest Bandedge  
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	18.78	16.34	35.12	54.00	-18.88	Average Detector
	2310.000	30.81	16.34	47.15	74.00	-26.85	Peak Detector
2	2390.000	32.24	17.03	49.27	54.00	-4.73	Average Detector
	2390.000	42.72	17.03	59.75	74.00	-14.25	Peak Detector
3	2400.000	35.37	17.11	52.48	Delta=31.35dBc		Average Detector
4	2416.260	66.60	17.23	83.83			Average Detector



802.11n-HT40-Highest Bandedge  
Vertical (Worst case)



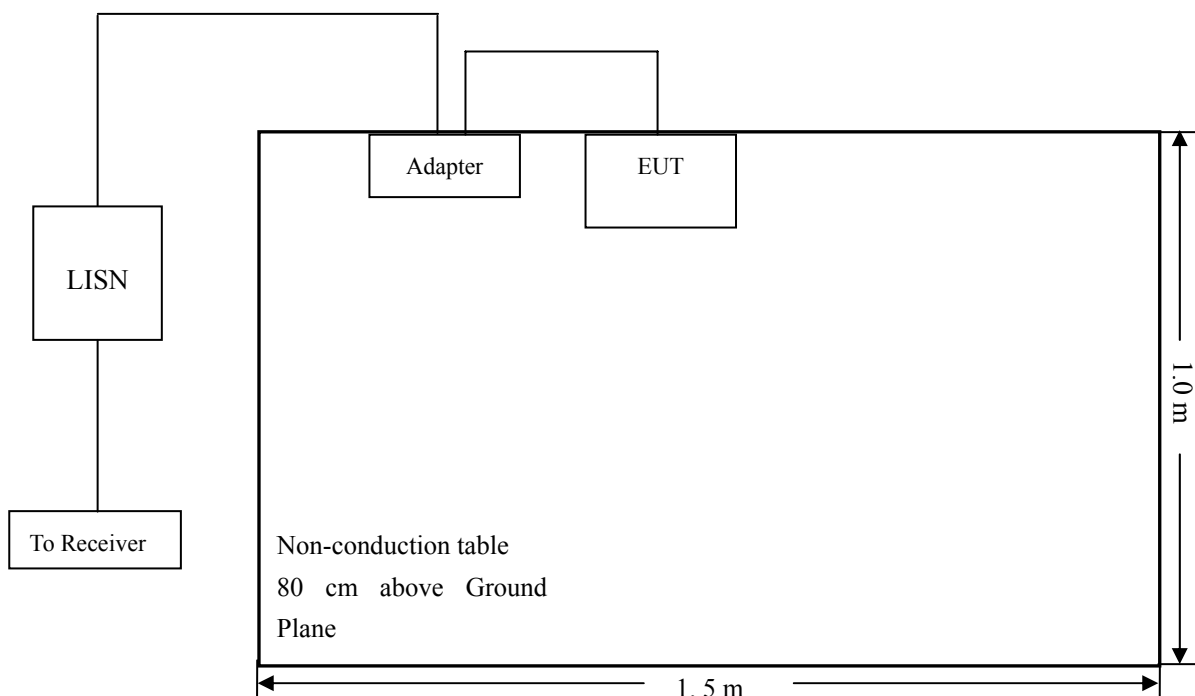
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
3	2464.240	63.84	17.58	81.42	/	/	Average Detector
	2465.200	75.01	17.59	92.60	/	/	Peak Detector
1	2483.500	Delta = 38.43dBc		42.99	54.00	-11.01	Average Detector
	2483.500			57.65	74.00	-16.35	Peak Detector
2	2500.000	19.72	17.86	37.58	54.00	-16.42	Average Detector
	2500.000	32.02	17.86	49.88	74.00	-24.12	Peak Detector

## 10.1 Measurement Uncertainty

## 10.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2014-05-28	2015-05-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2014-05-28	2015-05-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2014-05-28	2015-05-27

## 10.4 Basic Test Setup Block Diagram



## 10.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

## 10.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

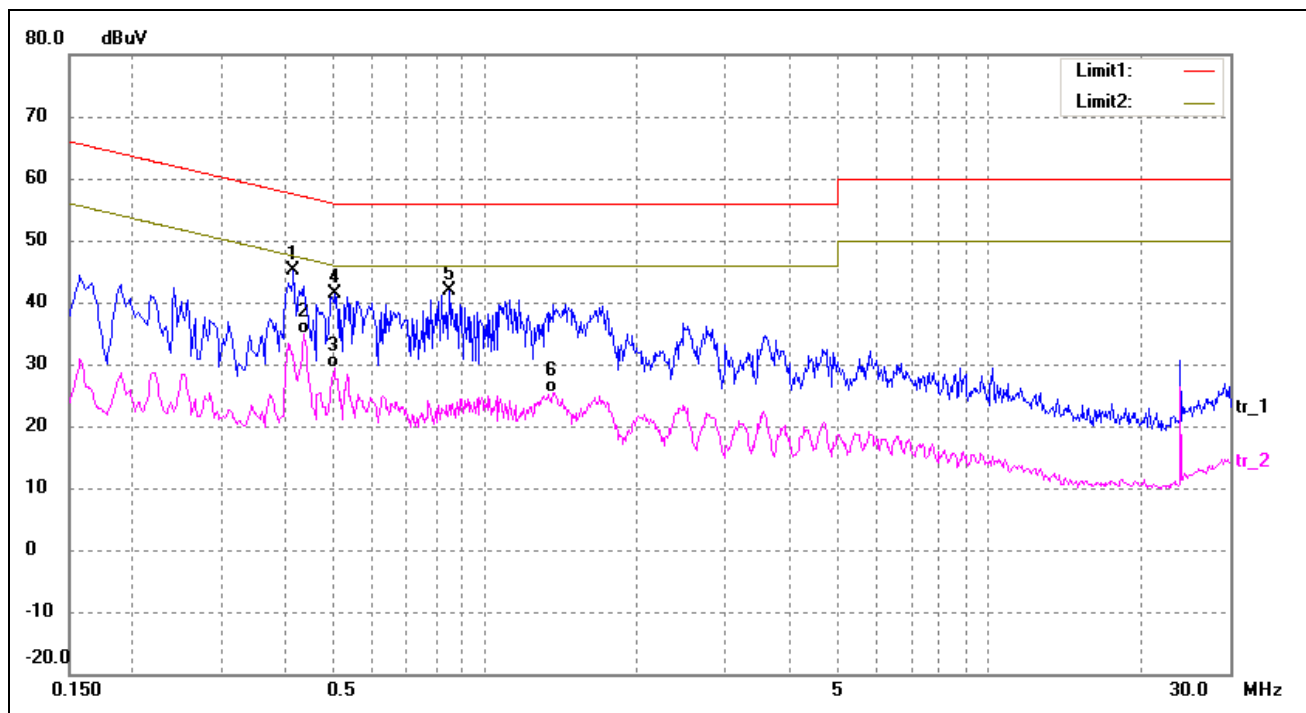
Start Frequency ..... 150 kHz  
Stop Frequency..... 30 MHz  
Sweep Speed ..... Auto  
IF Bandwidth..... 10 kHz  
Quasi-Peak Adapter Bandwidth ..... 9 kHz  
Quasi-Peak Adapter Mode ..... Normal

## 10.7 Summary of Test Results/Plots

According to the data in section 9.8, the EUT complied with the FCC Part 15.207 Conducted margin for a Class B device, with the *worst* margin reading of:

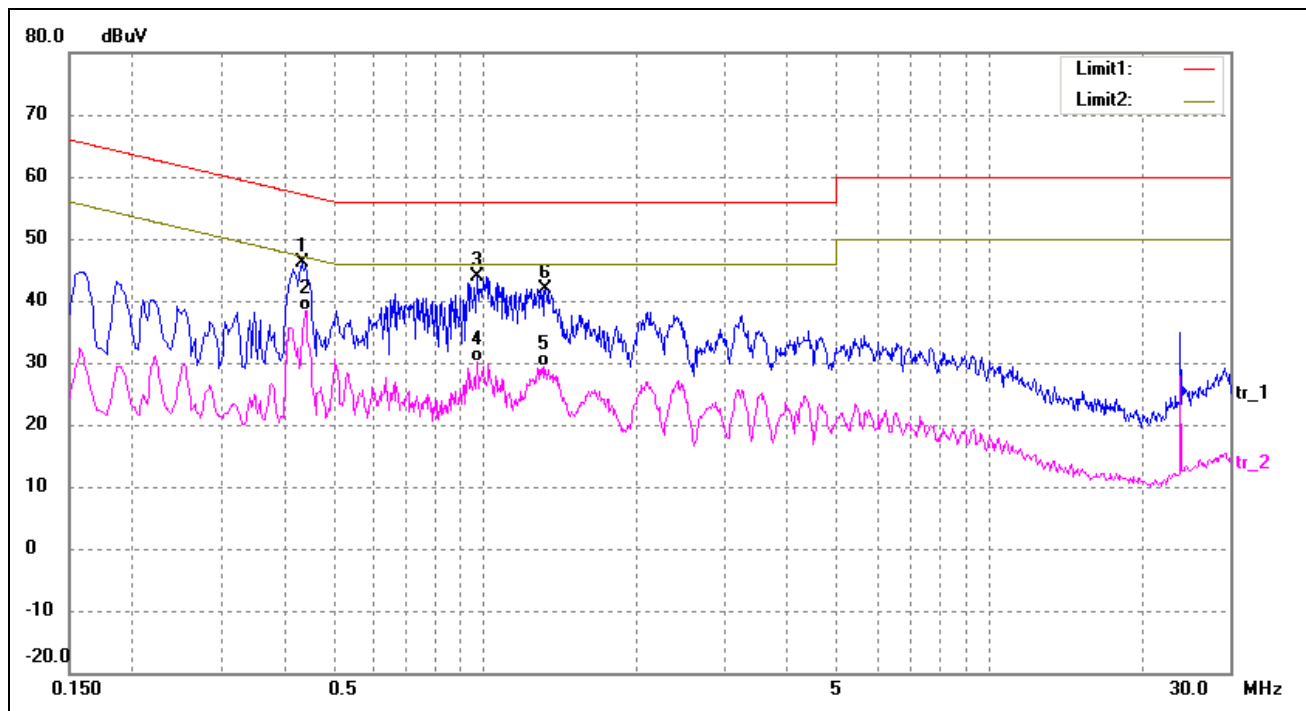
**-8.535 dB at 0.4420 MHz in the Neutral mode, AVG detector, 0.15-30MHz**

## 10.8 Conducted Emissions Test Data

**Plot of Conducted Emissions Test Data***EUT:* TV BOX*Tested Model:* HD22*Operating Condition:* Transmitting(Wi-Fi)*Comment:* AC120V/60Hz; Adapter DC 5V*Test Specification:* Neutral

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4180	35.61	9.50	45.11	57.49	-12.38	peak
2	0.4380	25.34	9.50	34.84	47.10	-12.26	AVG
3	0.5020	19.77	9.50	29.27	46.00	-16.73	AVG
4	0.5060	31.98	9.51	41.49	56.00	-14.51	peak
5	0.8500	31.95	9.85	41.80	56.00	-14.20	peak
6	1.3660	15.43	10.00	25.43	46.00	-20.57	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4340	36.74	9.50	46.24	57.18	-10.94	peak
2	0.4420	28.99	9.50	38.49	47.02	-8.53	AVG
3	0.9660	33.88	9.97	43.85	56.00	-12.15	peak
4	0.9660	20.19	9.97	30.16	46.00	-15.84	AVG
5	1.3100	19.43	10.00	29.43	46.00	-16.57	AVG
6	1.3180	32.00	10.00	42.00	56.00	-14.00	peak

\*\*\*\*\* END OF REPORT \*\*\*\*\*