

# FCC Part 15C Measurement and Test Report

For

SHENZHEN ALLDOCUBE TECHNOLOGY AND SCIENCE CO., LTD

2F/17Building, Pingshan Industrial Park, Middle of Liuxian Road, Xili Town,

Nanshan District, Shenzhen, China.

**FCC ID: 2AAGQ-U35GT**

**FCC Rules:** FCC Part 15C

**Product Description:** Tablet PC

**Tested Model:** U35GT

**Report No.:** STR13068142I-1

**Tested Date:** 2013-06-14 to 2013-06-29

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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 SEM.Test Compliance Service 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. ANTENNA REQUIREMENT .....</b>	<b>7</b>
3.1 STANDARD APPLICABLE.....	7
3.2 EVALUATION INFORMATION .....	7
<b>4. POWER SPECTRAL DENSITY .....</b>	<b>8</b>
4.1 STANDARD APPLICABLE.....	8
4.2 TEST EQUIPMENT LIST AND DETAILS .....	8
4.3 TEST PROCEDURE.....	8
4.4 ENVIRONMENTAL CONDITIONS .....	8
4.5 SUMMARY OF TEST RESULTS/PLOTS .....	9
<b>5. 6DB BANDWIDTH .....</b>	<b>15</b>
5.1 STANDARD APPLICABLE.....	15
5.2 TEST EQUIPMENT LIST AND DETAILS .....	15
5.3 TEST PROCEDURE.....	15
5.4 ENVIRONMENTAL CONDITIONS .....	15
5.5 SUMMARY OF TEST RESULTS/PLOTS .....	16
<b>6. RF OUTPUT POWER.....</b>	<b>22</b>
6.1 STANDARD APPLICABLE.....	22
6.2 TEST EQUIPMENT LIST AND DETAILS .....	22
6.3 TEST PROCEDURE.....	22
6.4 ENVIRONMENTAL CONDITIONS .....	22
6.5 SUMMARY OF TEST RESULTS/PLOTS .....	23
<b>7. FIELD STRENGTH OF SPURIOUS EMISSIONS .....</b>	<b>33</b>
7.1 MEASUREMENT UNCERTAINTY .....	33
7.2 STANDARD APPLICABLE.....	33
7.3 TEST EQUIPMENT LIST AND DETAILS .....	33
7.4 TEST PROCEDURE.....	34
7.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	34
7.6 ENVIRONMENTAL CONDITIONS .....	34
7.7 SUMMARY OF TEST RESULTS/PLOTS .....	35
<b>8. OUT OF BAND EMISSIONS.....</b>	<b>57</b>
8.1 STANDARD APPLICABLE.....	57
8.2 TEST EQUIPMENT LIST AND DETAILS .....	57
8.3 TEST PROCEDURE.....	57
8.4 ENVIRONMENTAL CONDITIONS .....	58
8.5 SUMMARY OF TEST RESULTS/PLOTS .....	58
<b>9. CONDUCTED EMISSIONS .....</b>	<b>70</b>
9.1 MEASUREMENT UNCERTAINTY .....	70
9.2 TEST EQUIPMENT LIST AND DETAILS .....	70
9.3 TEST PROCEDURE.....	70
9.4 BASIC TEST SETUP BLOCK DIAGRAM.....	70
9.5 ENVIRONMENTAL CONDITIONS .....	71
9.6 TEST RECEIVER SETUP .....	71
9.7 SUMMARY OF TEST RESULTS/PLOTS .....	71
9.8 CONDUCTED EMISSIONS TEST DATA.....	71

## 1. GENERAL INFORMATION

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

#### Client Information

Applicant: SHENZHEN ALLDOUBE TECHNOLOGY AND SCIENCE CO., LTD

Address of applicant: 2F/17Building,Pingshan Industrial Park,Middle of Liuxian Road,Xili Town, Nanshan District, Shenzhen, China.

Manufacturer: SHENZHEN ALLDOUBE TECHNOLOGY AND SCIENCE CO., LTD

Address of manufacturer: 2F/17Building,Pingshan Industrial Park,Middle of Liuxian Road,Xili Town, Nanshan District, Shenzhen, China.

General Description of EUT	
Product Name:	Tablet PC
Trade Name:	Smartbook
Model No.:	U35GT
Adding Model(s):	S7904
Rated Voltage:	Charging: DC 5V, Battery: 3.7V
Rated Current:	2A
Power Adaptor Model:	P1-5.2, Input: 100-240 50/60Hz,0.5A Output: DC 5V,2A
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The other model listed in the report has different appearance only of U35GT without circuit and electronic construction changed, declared by the manufacturer</i>	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n-HT20
Frequency Range:	2412-2462MHz for 11b/g/n(HT20)
RF Output Power:	7.77 dBm (Conducted)
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Quantity of Channels:	11 for 802.11b/g/n-HT20
Channel Separation:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	2 dBi
Lowest Internal Frequency of EUT:	32.768kHz
Device Category:	Portable Device

## 1.2 Test Standards

The following report is prepared on behalf of the SHENZHEN ALLDOCUBE TECHNOLOGY AND SCIENCE 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 public notice KDB 558074 for digital transmission systems shall be performed also.

## 1.4 Test Facility

- **FCC – Registration No.: 994117**

SEM.Test Compliance Services 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 994117.

- **Industry Canada (IC) Registration No.: 7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service 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 3/F, Jinbao Commerce Building, Xin'an Fanshen 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, 2437MHz, 2462MHz
TM2	802.11g	2412MHz, 2437MHz, 2462MHz
TM3	802.11n-HT20	2412MHz, 2437MHz, 2462MHz

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Earphone Cable	1.0	Unshielded	Without Core

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenove	E23	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	Shielded	Without Core

## 2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 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)(d)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

### **3. Antenna Requirement**

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#### **3.1 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.

#### **3.2 Evaluation Information**

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

## 4. Power Spectral Density

### 4.1 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.

### 4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2013-05-07	2014-05-06
Attenuator	ATTEN	ATS100-4-20	/	2013-05-07	2014-05-06

### 4.3 Test Procedure

According to the KDB 558074 D01 V02, the test method of power spectral density as below:

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set analyzer center frequency to DTS channel center frequency.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW  $\geq 3$  kHz.
5. Set the VBW  $\geq 3 \times$  RBW.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level.
11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 4.4 Environmental Conditions

Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

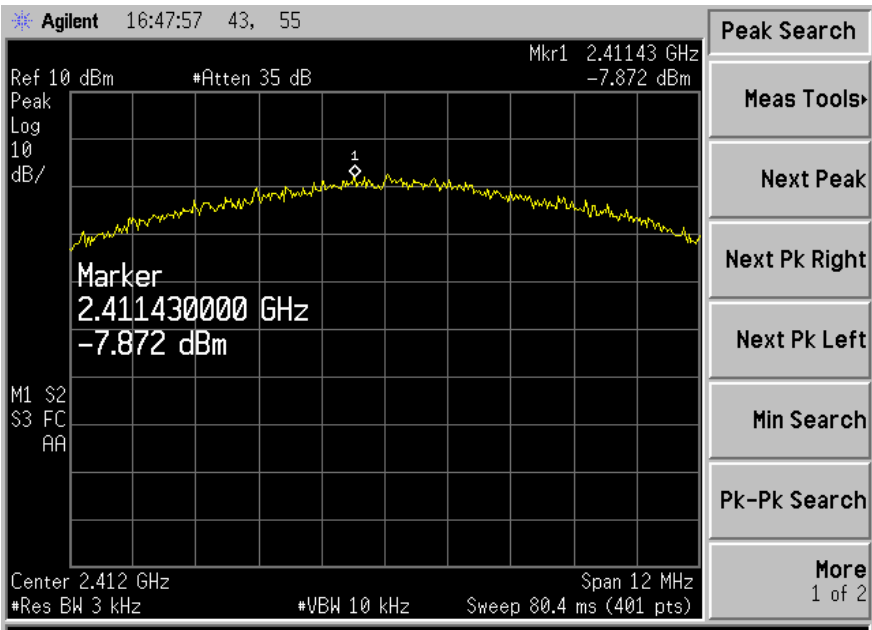


#### 4.5 Summary of Test Results/Plots

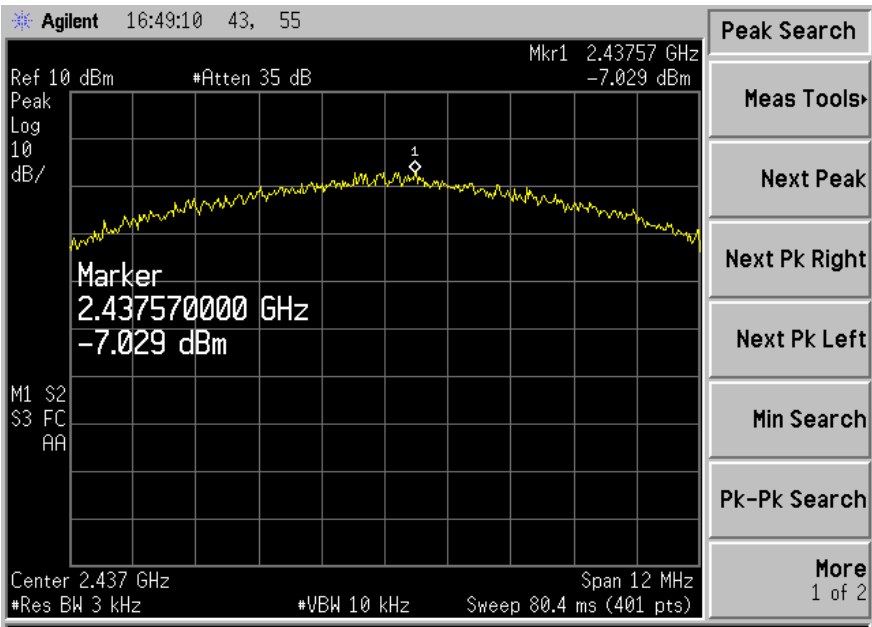
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b	2412	-7.872	8
	2437	-7.029	8
	2462	-7.205	8
802.11g	2412	-7.801	8
	2437	-7.100	8
	2462	-7.770	8
802.11n HT20	2412	-8.753	8
	2437	-8.651	8
	2462	-8.452	8

Please refer to the following test plots:

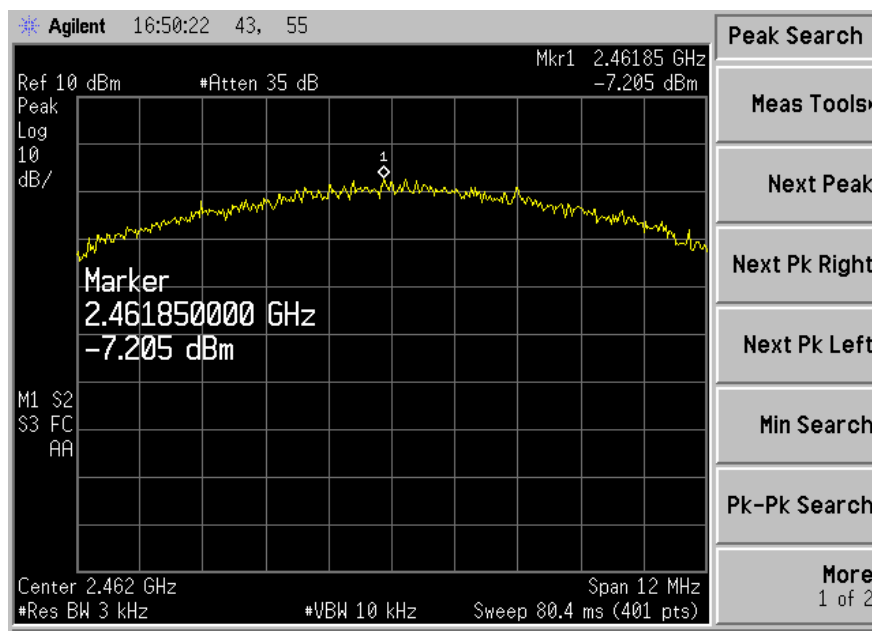
802.11b-Low Channel



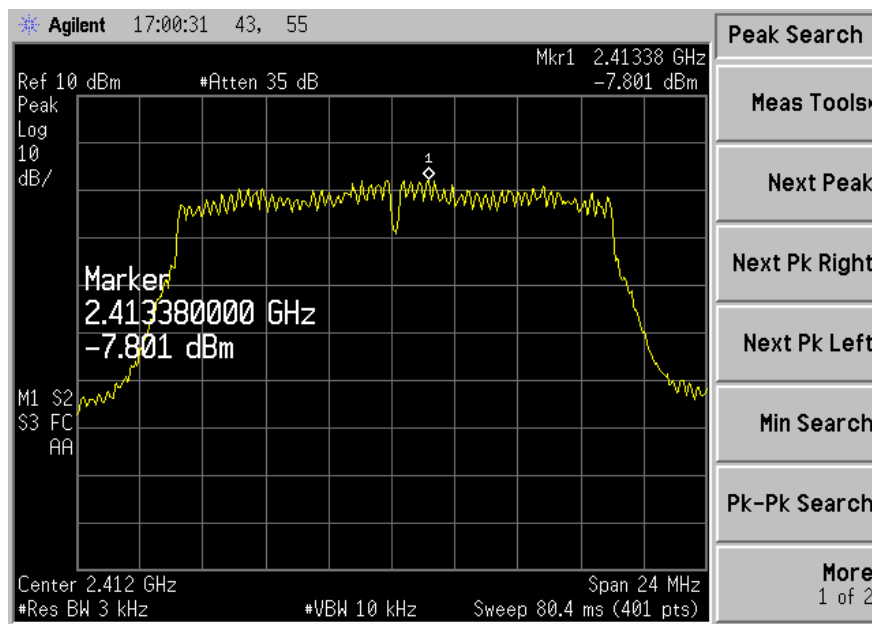
802.11b-Middle Channel



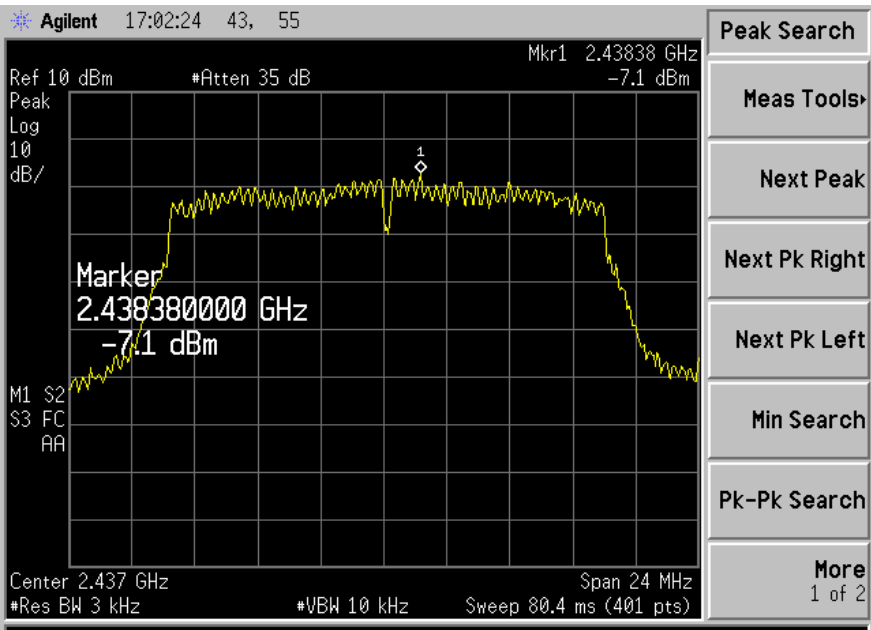
## 802.11b-High Channel



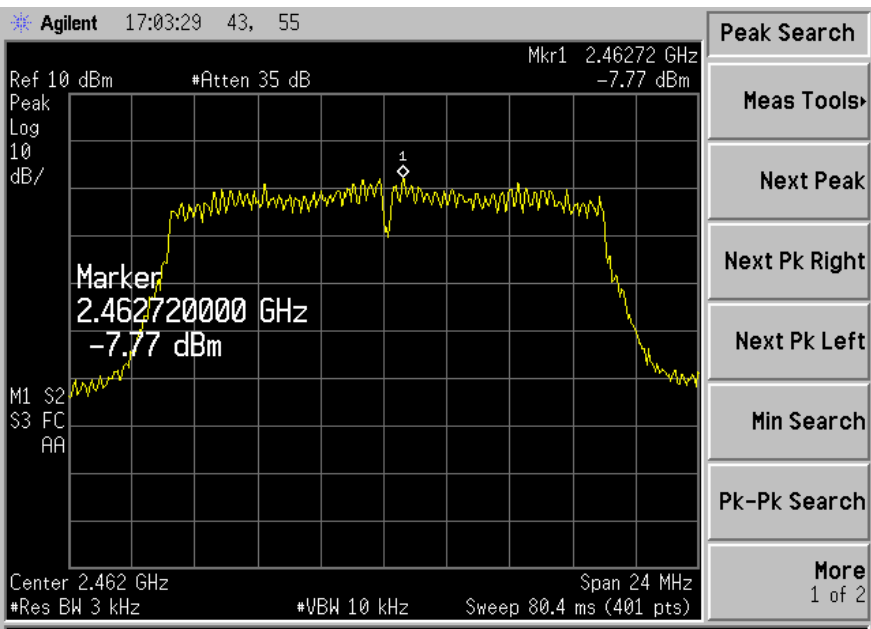
## 802.11g-Low Channel



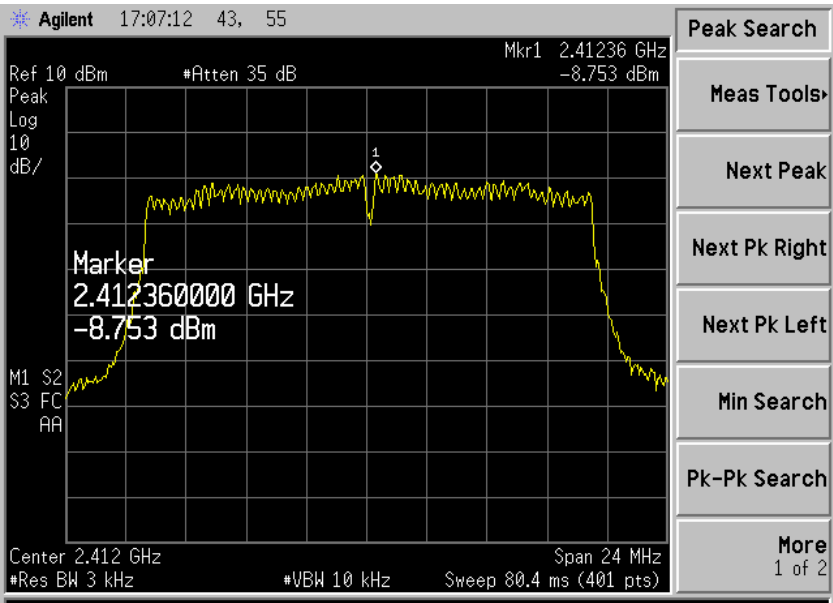
802.11g-Middle Channel



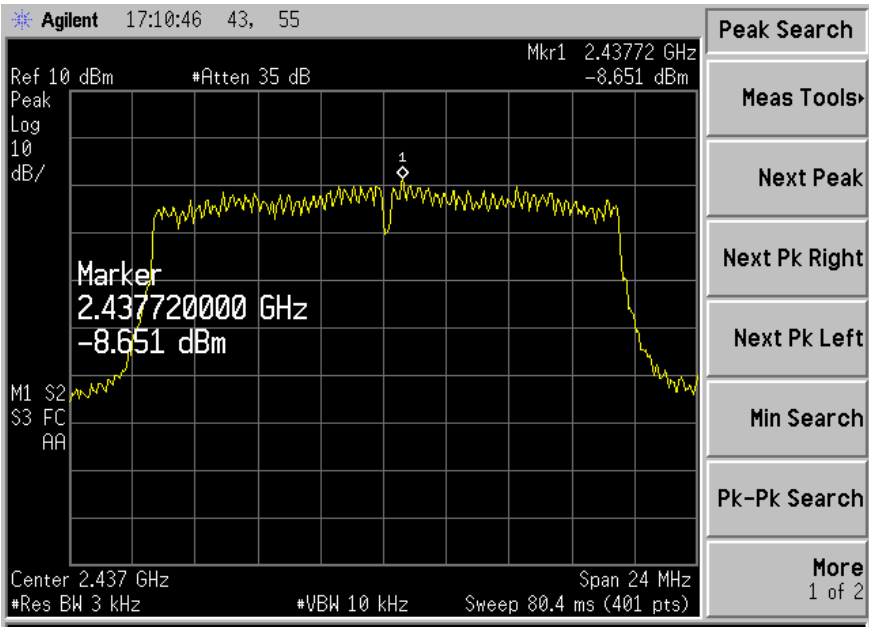
802.11g-High Channel



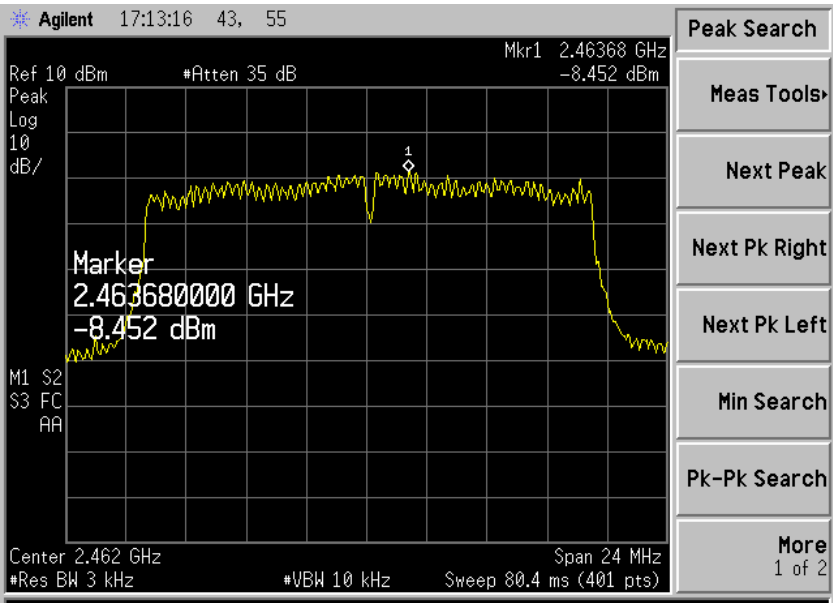
802.11n-HT20-Low Channel



802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



## 5. 6dB Bandwidth

### 5.1 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.

### 5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2013-05-07	2014-05-06
Attenuator	ATTEN	ATS100-4-20	/	2013-05-07	2014-05-06

### 5.3 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set resolution bandwidth (RBW) = 1-5% or DTS BW, not to exceed 100 kHz.
3. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. 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..

### 5.4 Environmental Conditions

Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

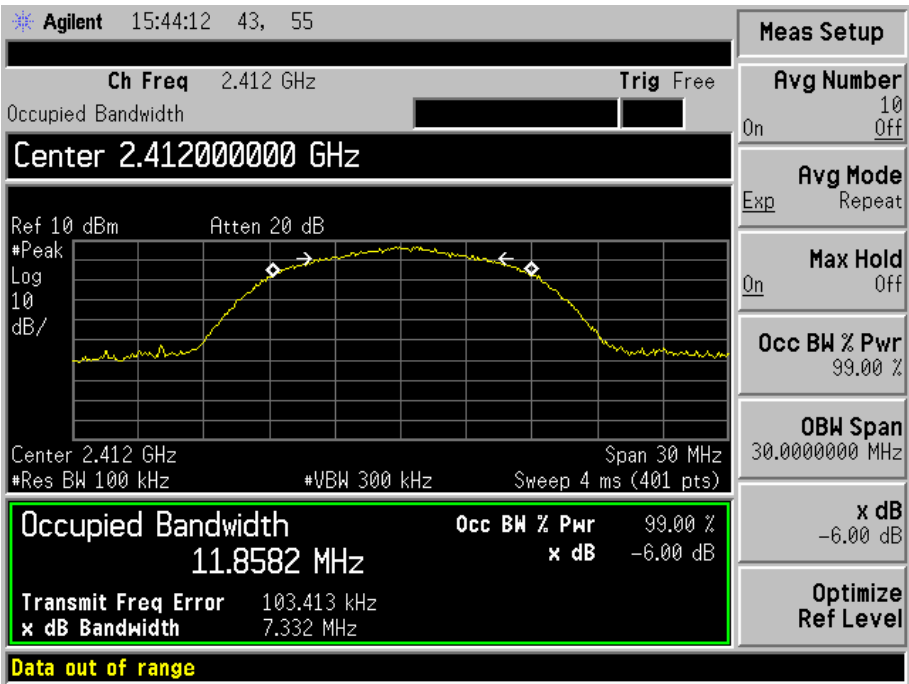
**5.5 Summary of Test Results/Plots**

<b>Test Mode</b>	<b>Test Channel MHz</b>	<b>6 dB Bandwidth kHz</b>	<b>Limit kHz</b>
802.11b	2412	7332	500
	2437	7312	500
	2462	7154	500
802.11g	2412	15081	500
	2437	15512	500
	2462	15171	500
802.11n-HT20	2412	15716	500
	2437	15975	500
	2462	15157	500

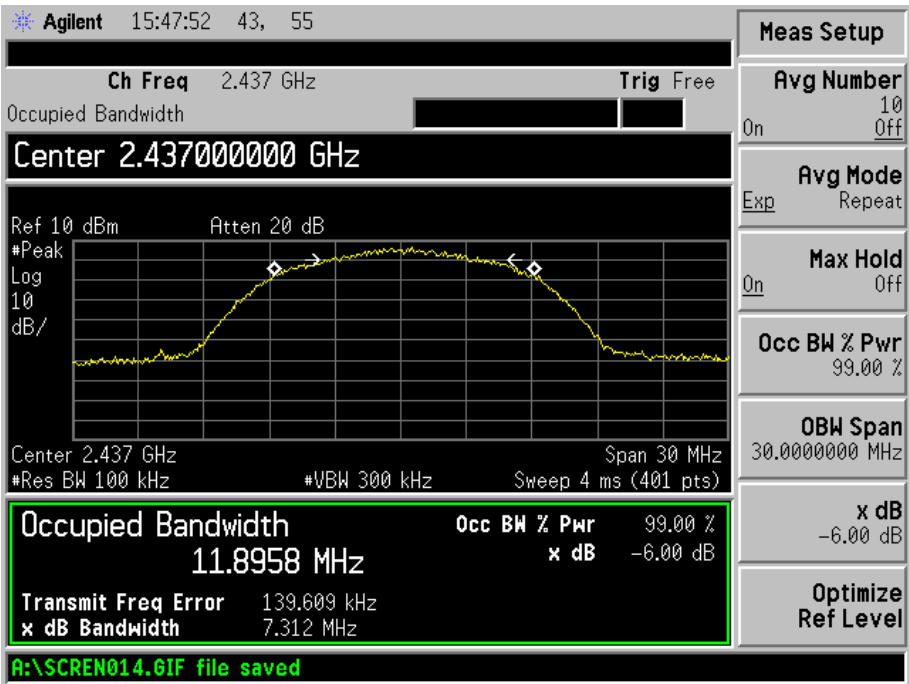
Please refer to the following test plots:



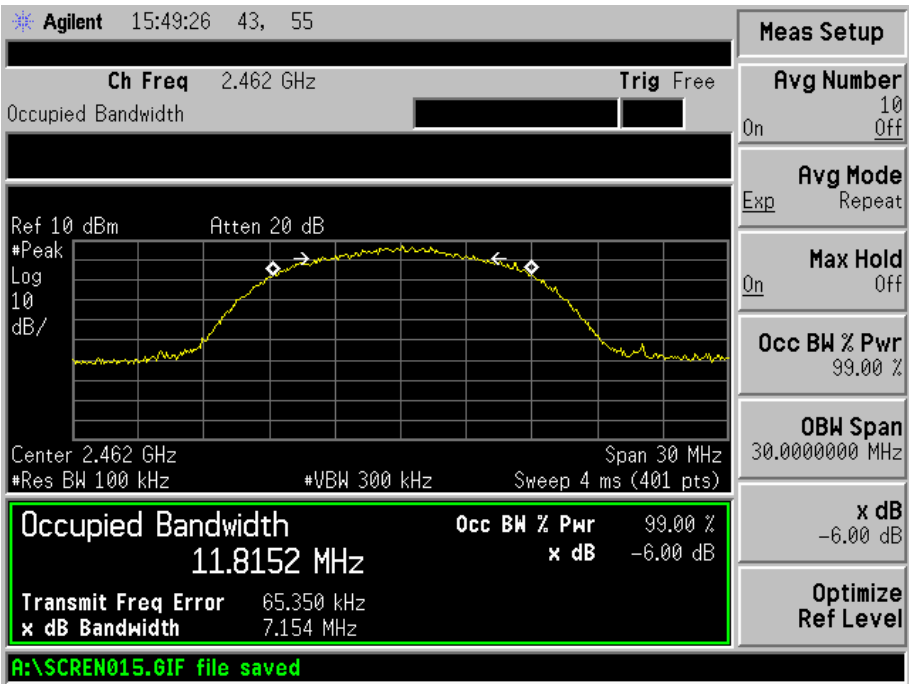
802.11b-Low Channel



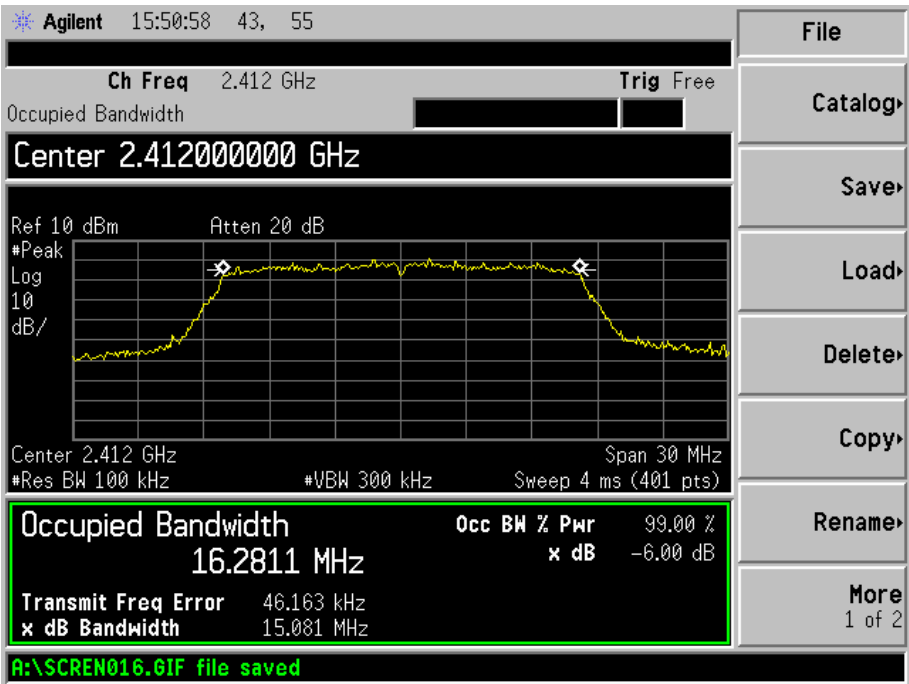
802.11b-Middle Channel



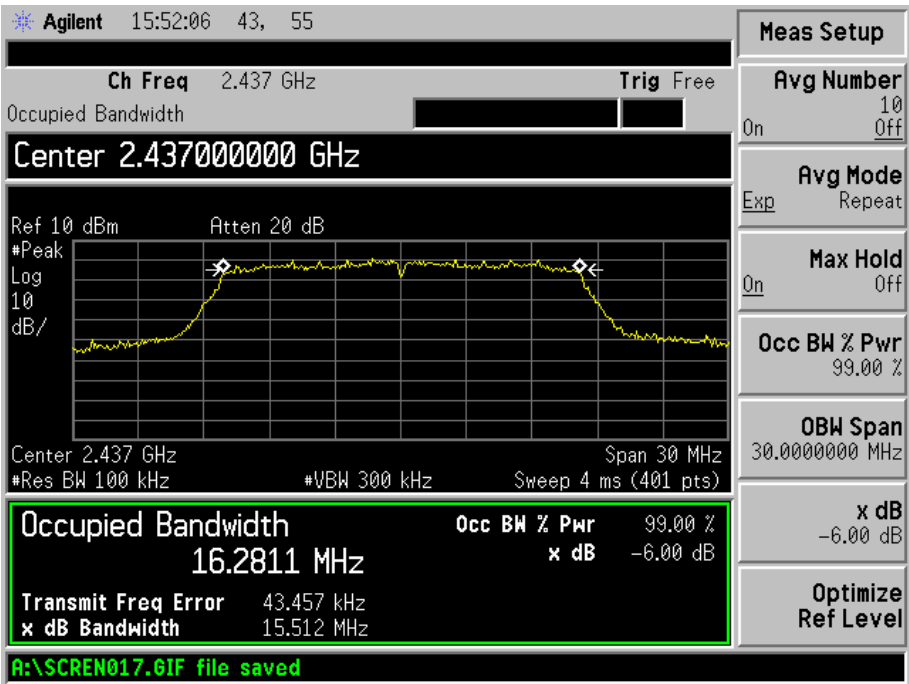
802.11b-High Channel



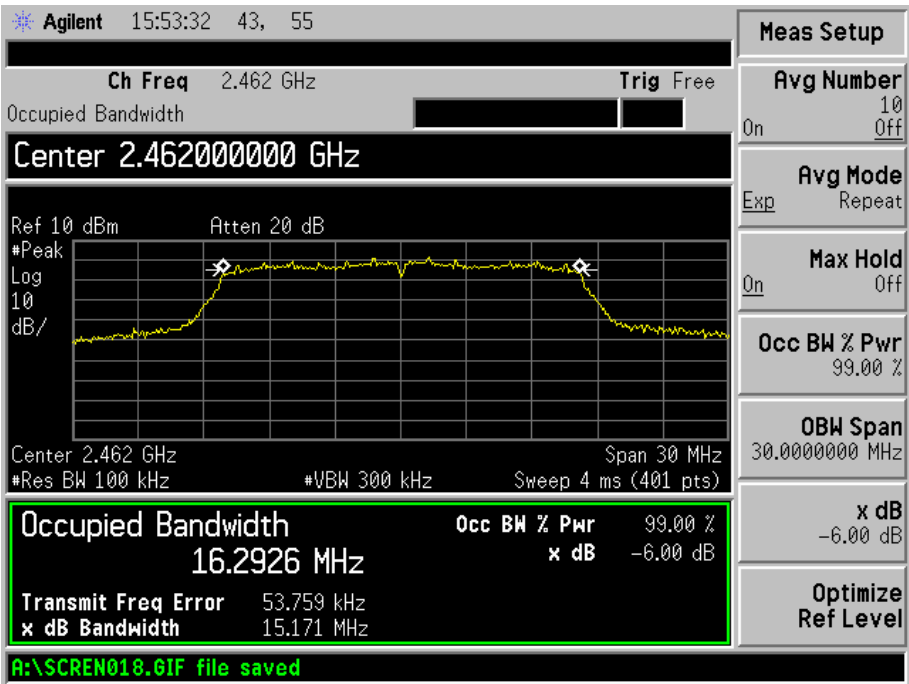
802.11g-Low Channel



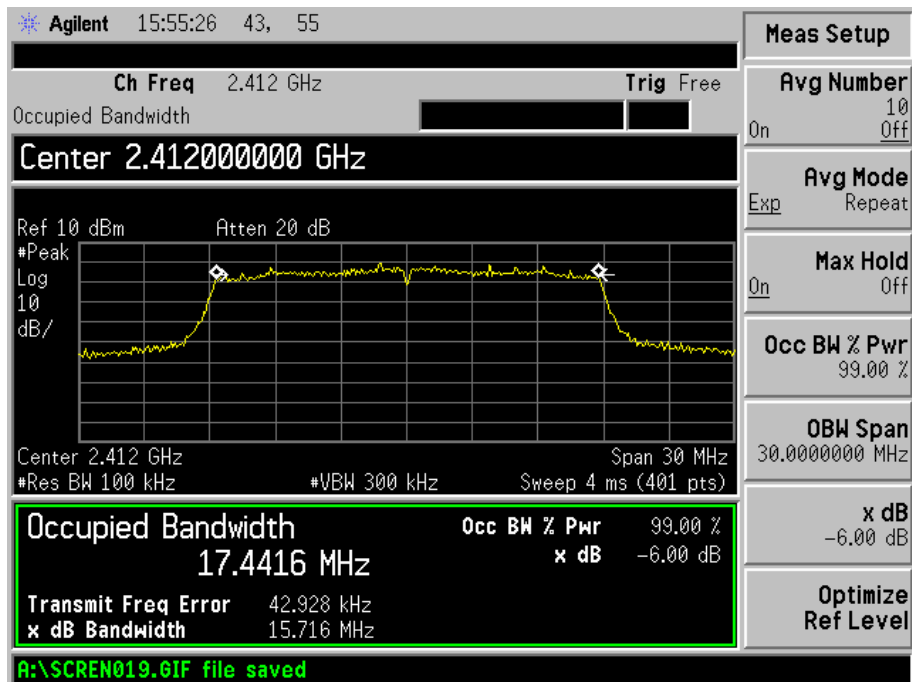
802.11g-Middle Channel



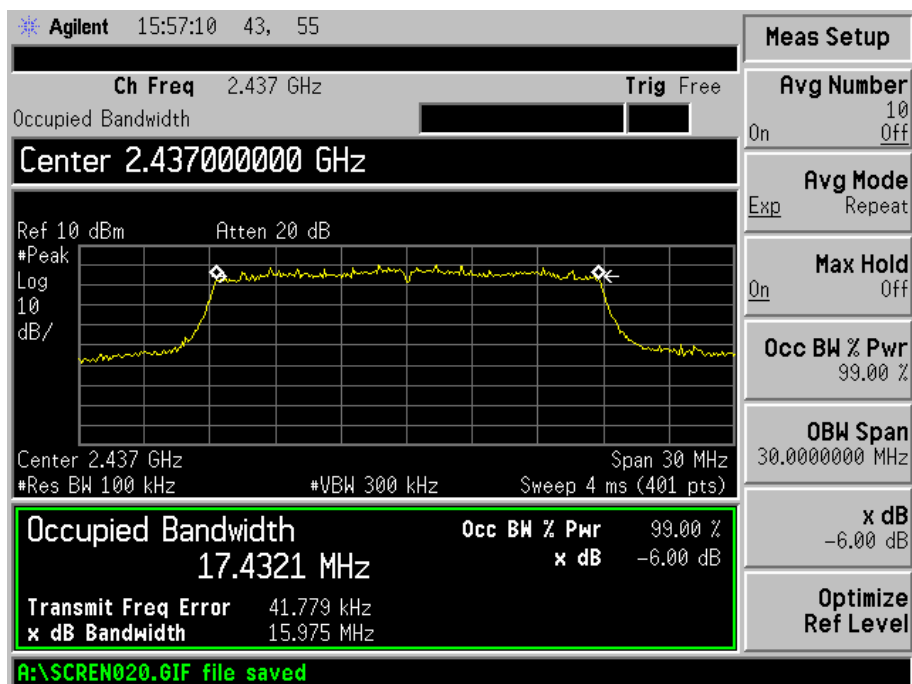
802.11g-High Channel



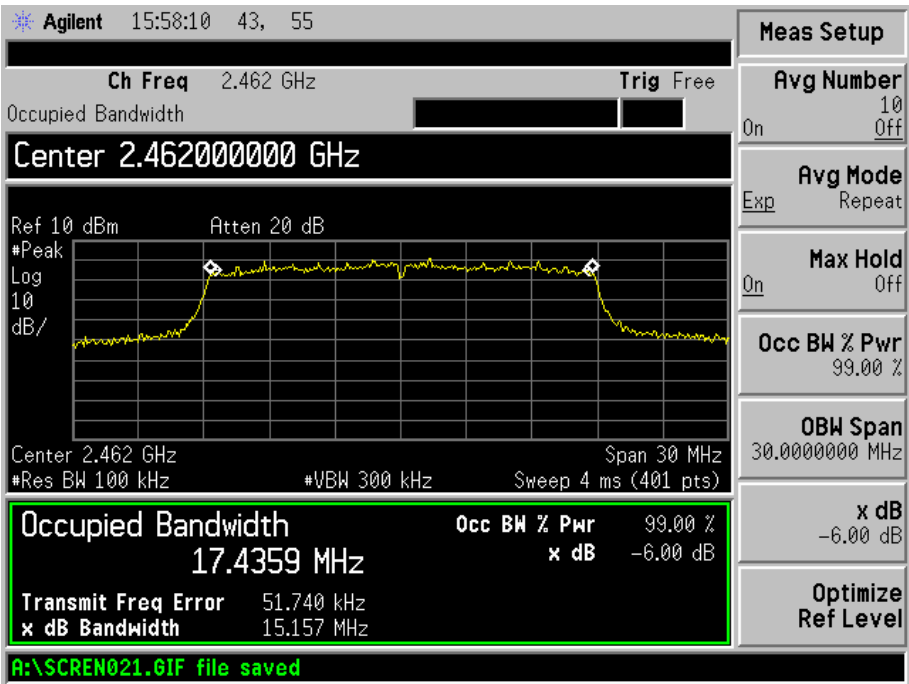
## 802.11n-HT20-Low Channel



## 802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



## 6. RF Output Power

### 6.1 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.

### 6.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2013-05-07	2014-05-06
Attenuator	ATTEN	ATS100-4-20	/	2013-05-07	2014-05-06

### 6.3 Test Procedure

According to section 15.247(b)-power output of the KDB-558074 D01 V02 (2012), 8.1.2 Option 2 (channel integration method) this procedure should only be used when the maximum available RBW of the spectrum/signal analyzer is less than the DTS bandwidth.

1. Set the RBW = maximum available (at least 1 MHz).
2. Set the VBW = 3 x RBW or maximum available setting (must be  $\geq$  RBW).
3. Set the span to fully encompass the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the spectrum analyzer's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some analyzers, this may require a manual override to ensure use of peak detector).

### 6.4 Environmental Conditions

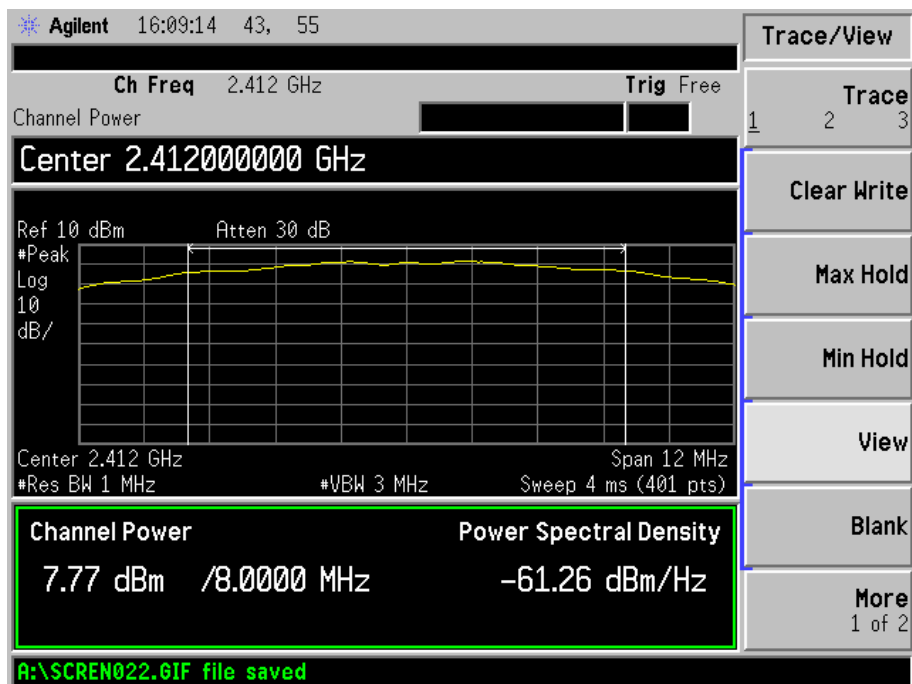
Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

## 6.5 Summary of Test Results/Plots

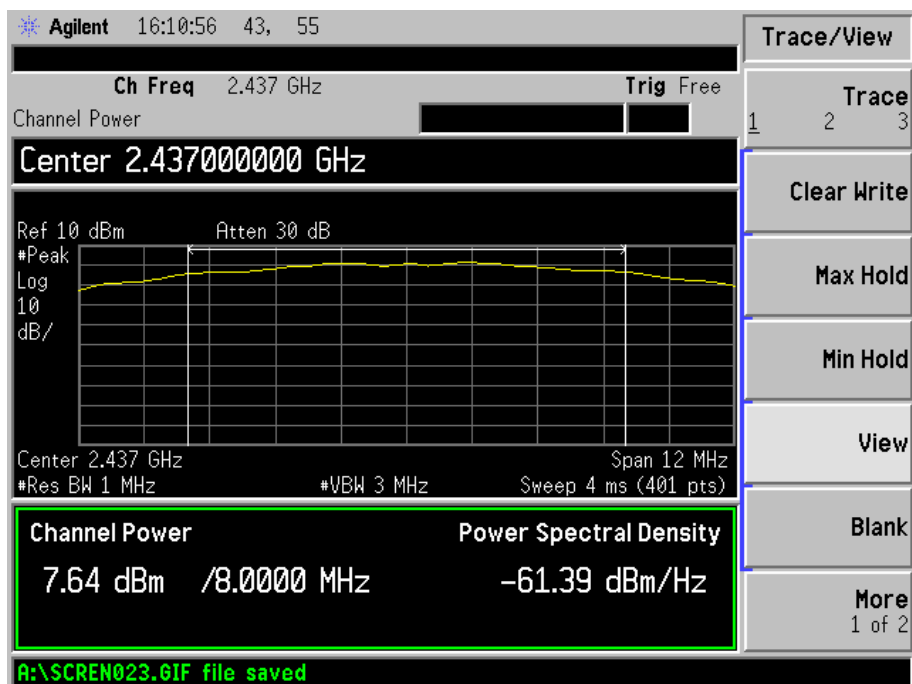
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b_1Mbps	2412	7.77	5.98	1000
	2437	7.64	5.81	1000
	2462	7.72	5.92	1000
802.11b_11Mbps	2412	7.53	5.66	1000
	2437	7.66	5.83	1000
	2462	7.61	5.77	1000
802.11g_6Mbps	2412	5.81	3.81	1000
	2437	6.11	4.08	1000
	2462	6.17	4.14	1000
802.11g_54Mbps	2412	5.47	3.52	1000
	2437	5.58	3.61	1000
	2462	5.84	3.84	1000
802.11n HT20_MCS0	2412	5.82	3.82	1000
	2437	5.86	3.85	1000
	2462	6.12	4.09	1000
802.11n HT20_MCS7	2412	5.02	3.18	1000
	2437	5.24	3.34	1000
	2462	5.44	3.50	1000

Please refer to the following test plots:

## 802.11b-1Mbps-Low Channel

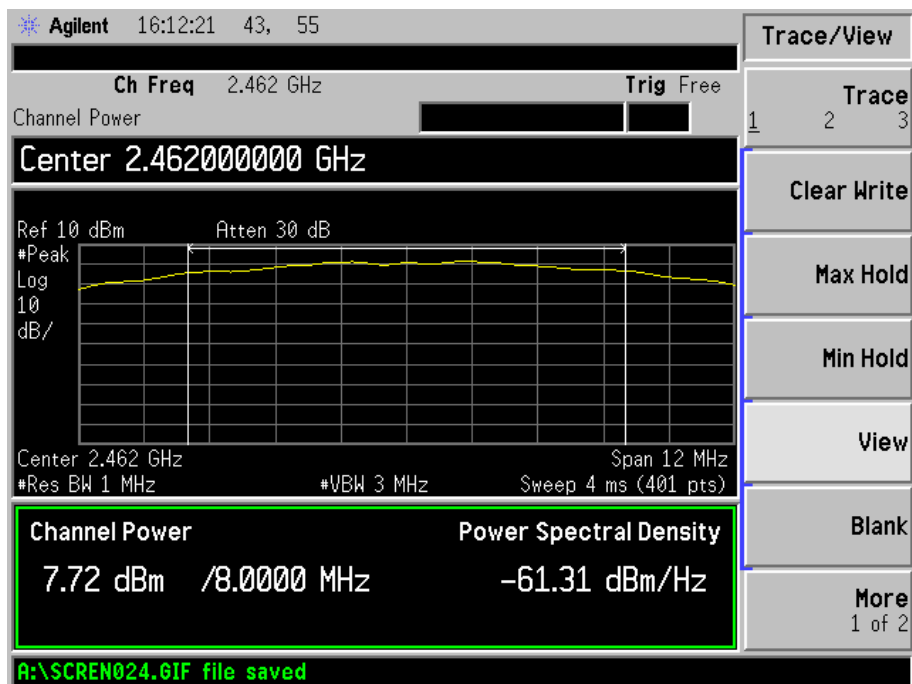


## 802.11b -1Mbps-Middle Channel

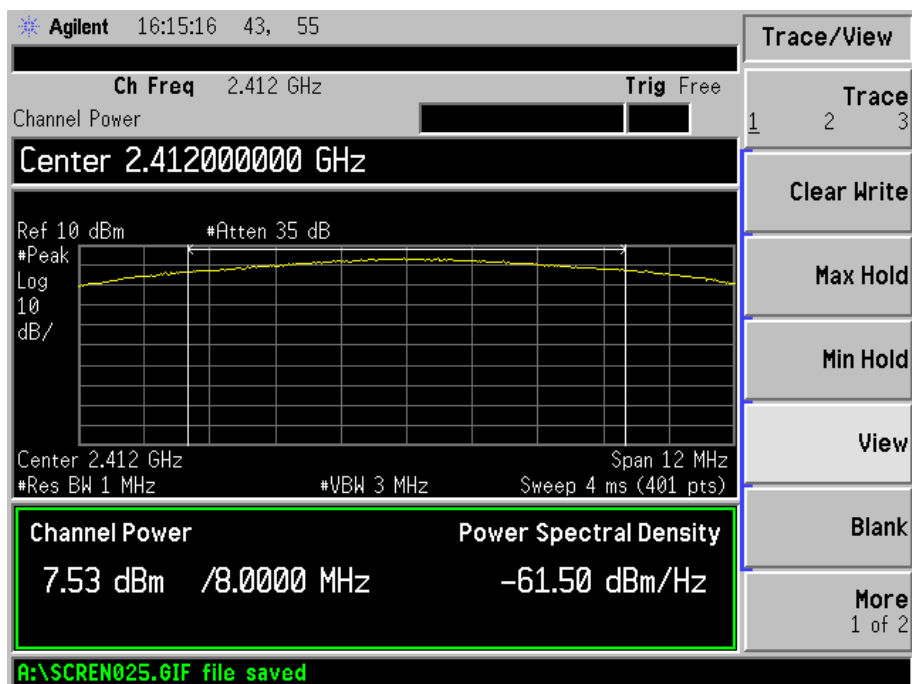




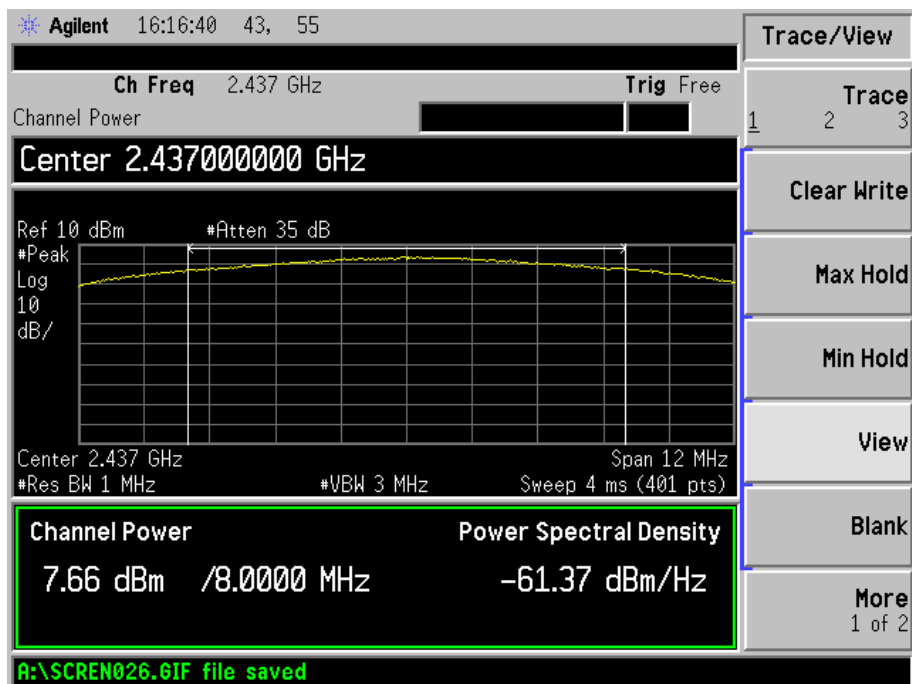
## 802.11b -1Mbps-High Channel



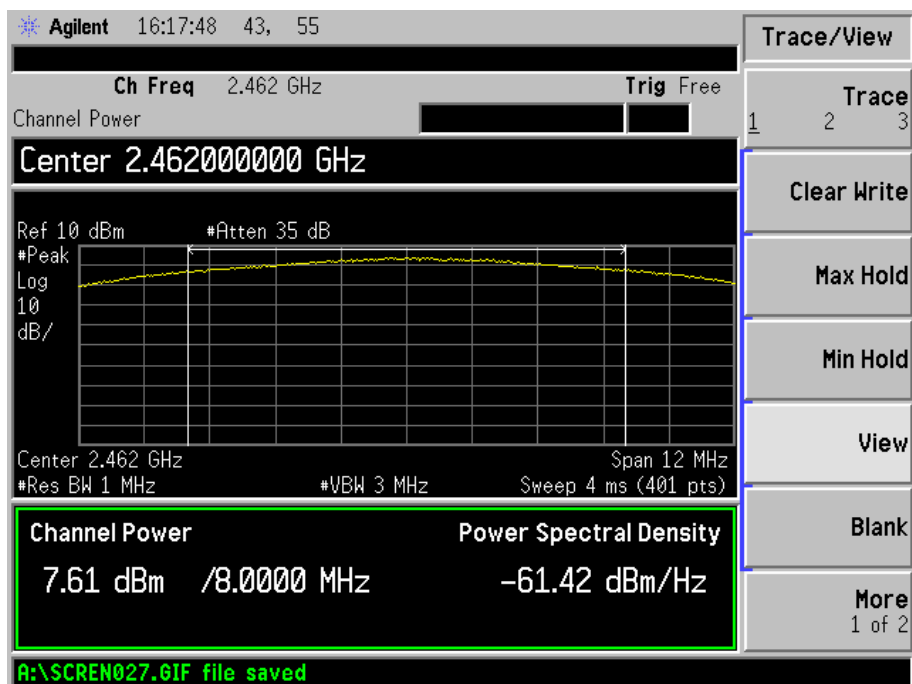
## 802.11-11Mbps-Low Channel



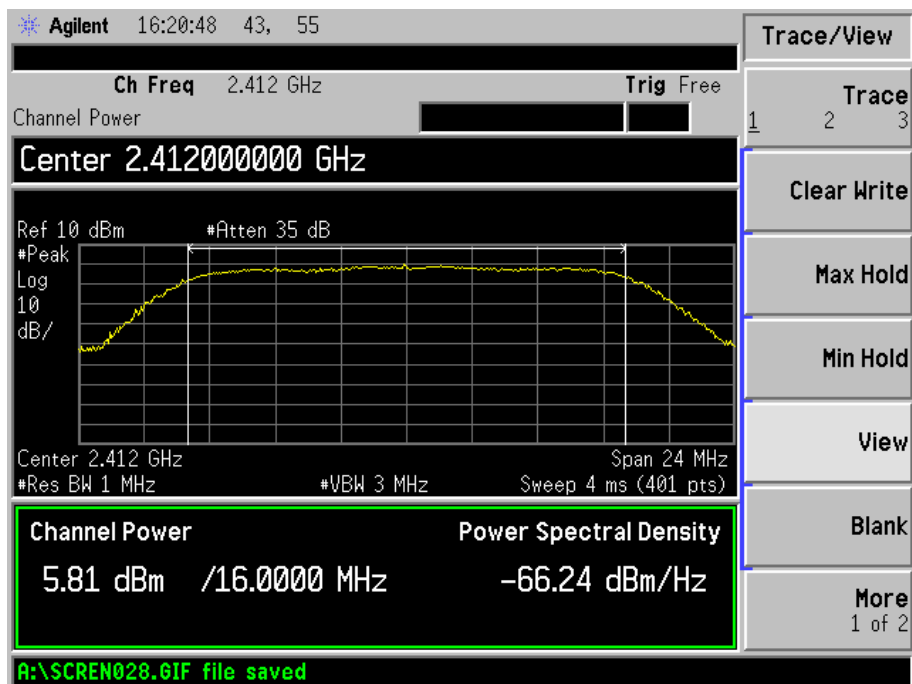
## 802.11b -11Mbps-Middle Channel



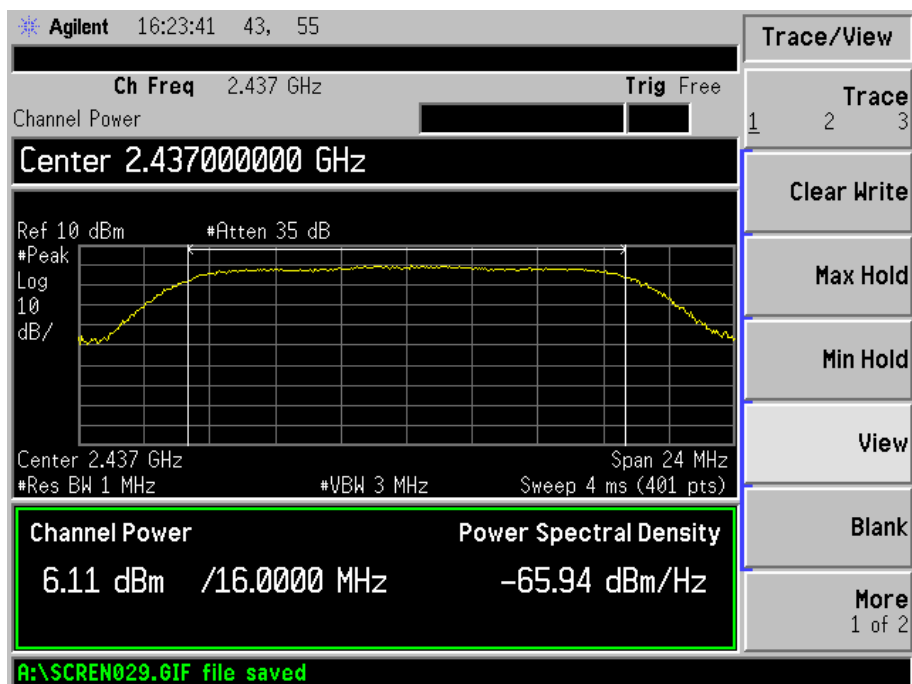
## 802.11b -11Mbps-High Channel



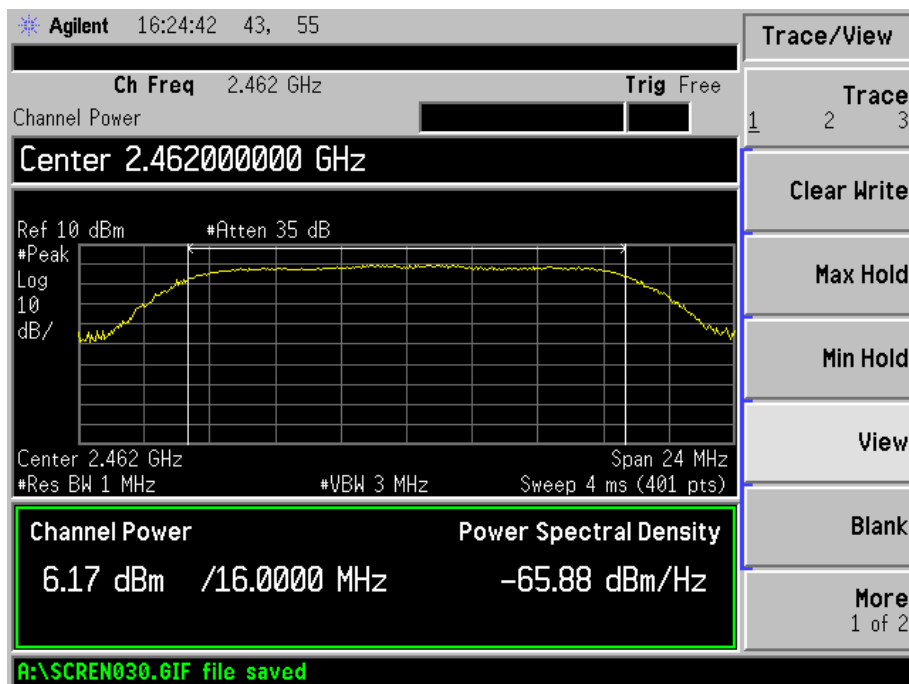
## 802.11g-6Mbps-Low Channel



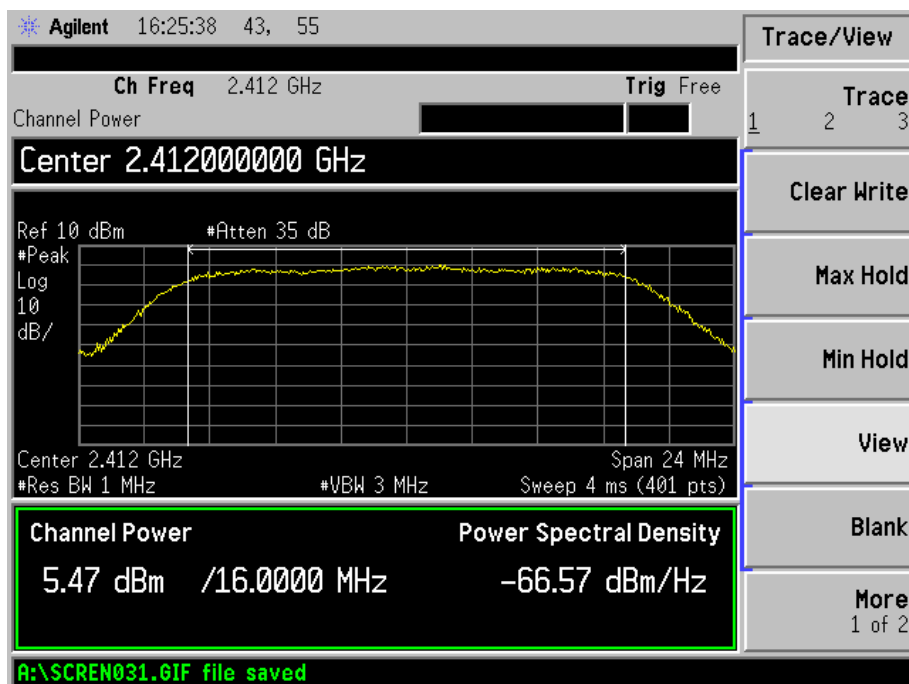
## 802.11g-6Mbps-Middle Channel



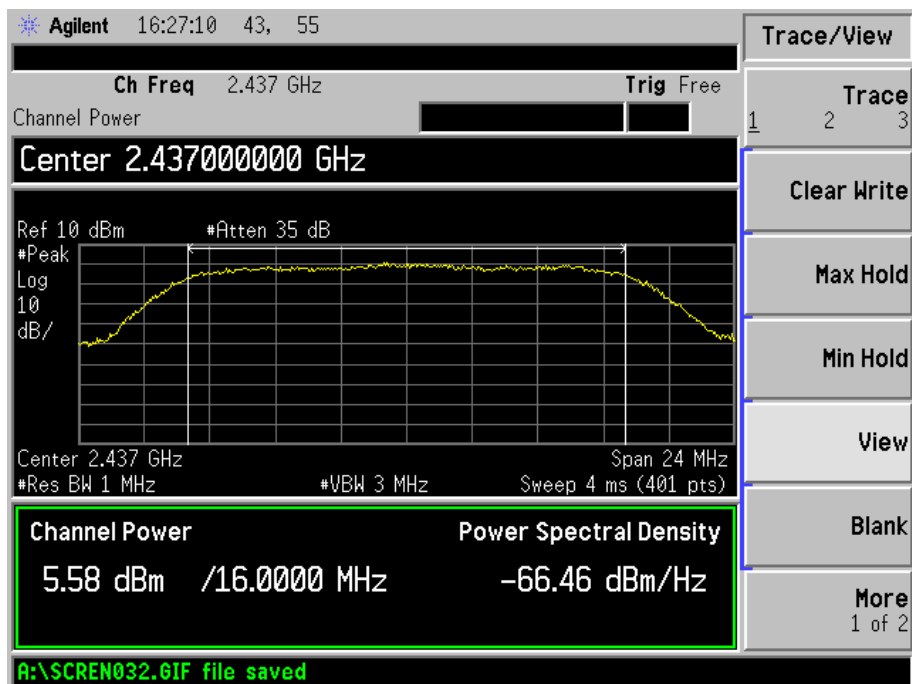
## 802.11g-6Mbps-High Channel



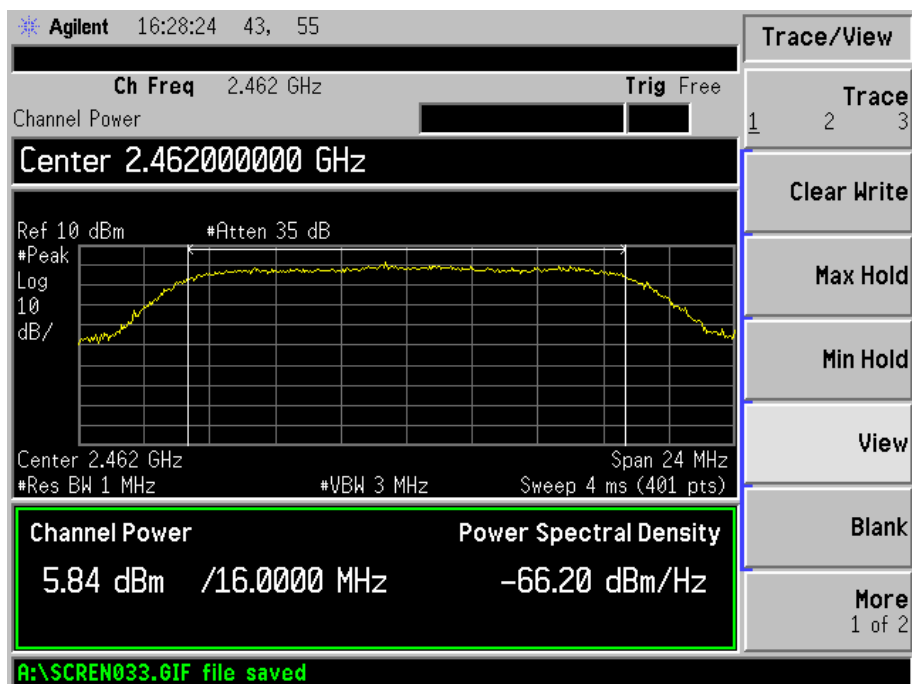
## 802.11g-54Mbps-Low Channel



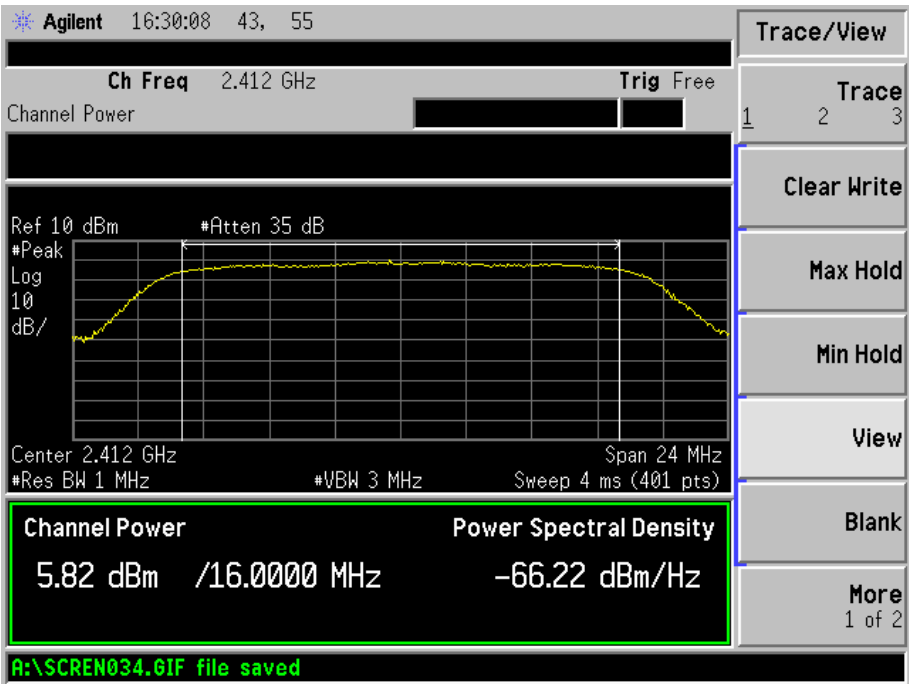
## 802.11g-54Mbps-Middle Channel



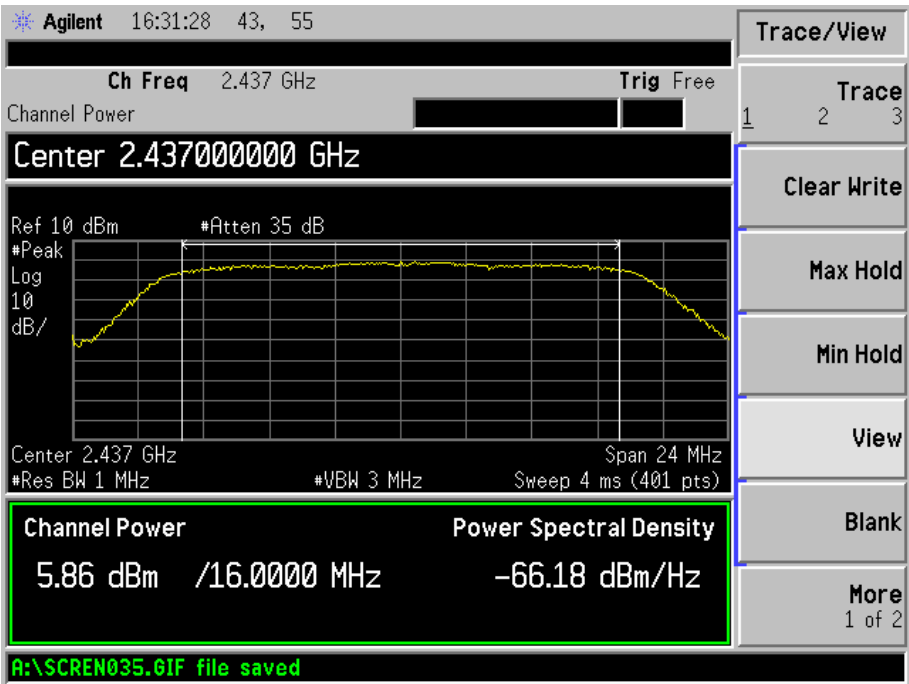
## 802.11g-54Mbps-High Channel



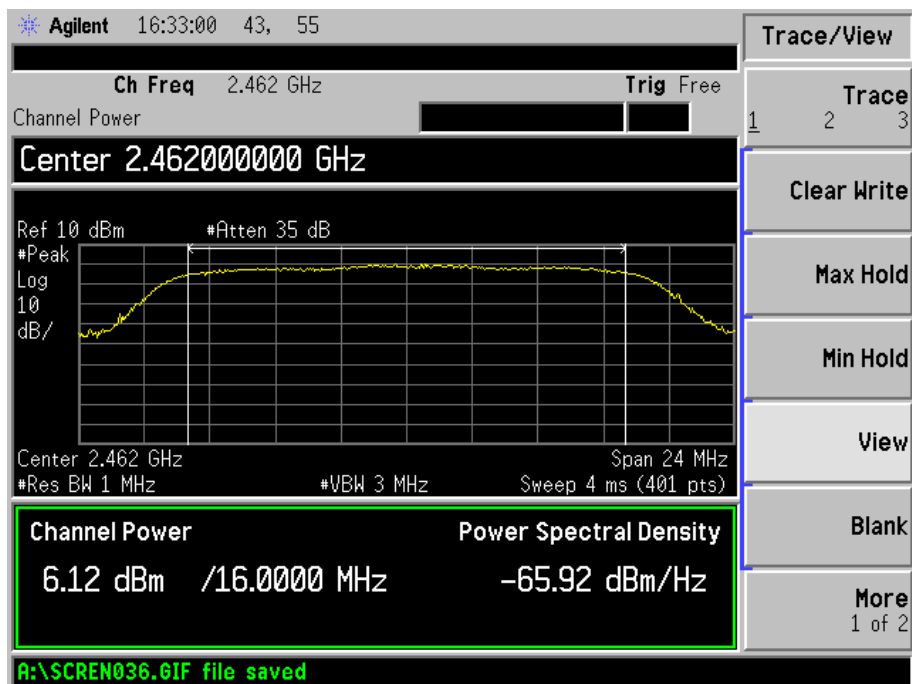
802.11n-HT20-MCS0-Low Channel



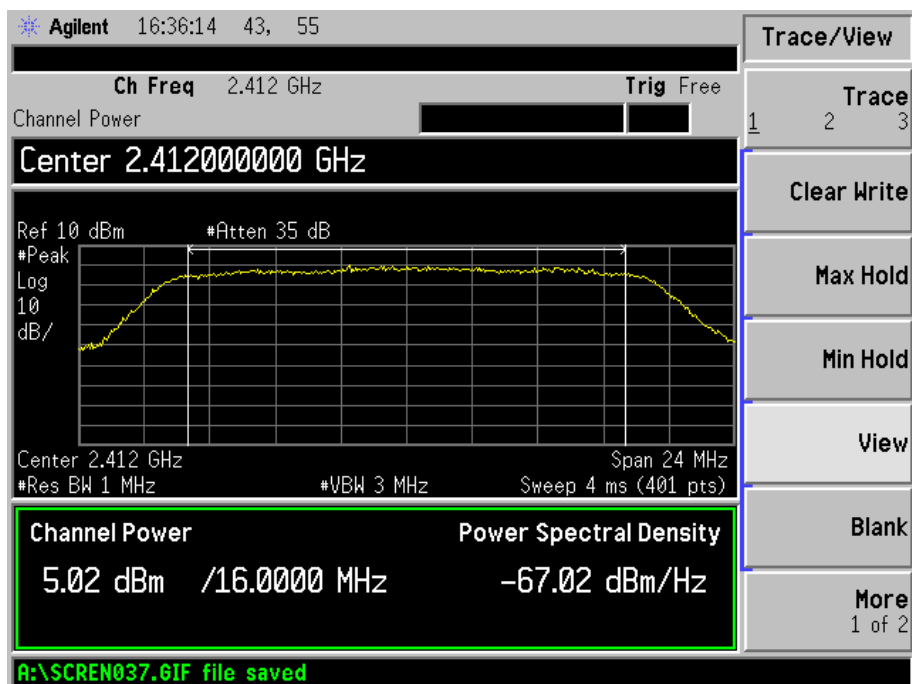
802.11n-HT20-MCS0-Middle Channel



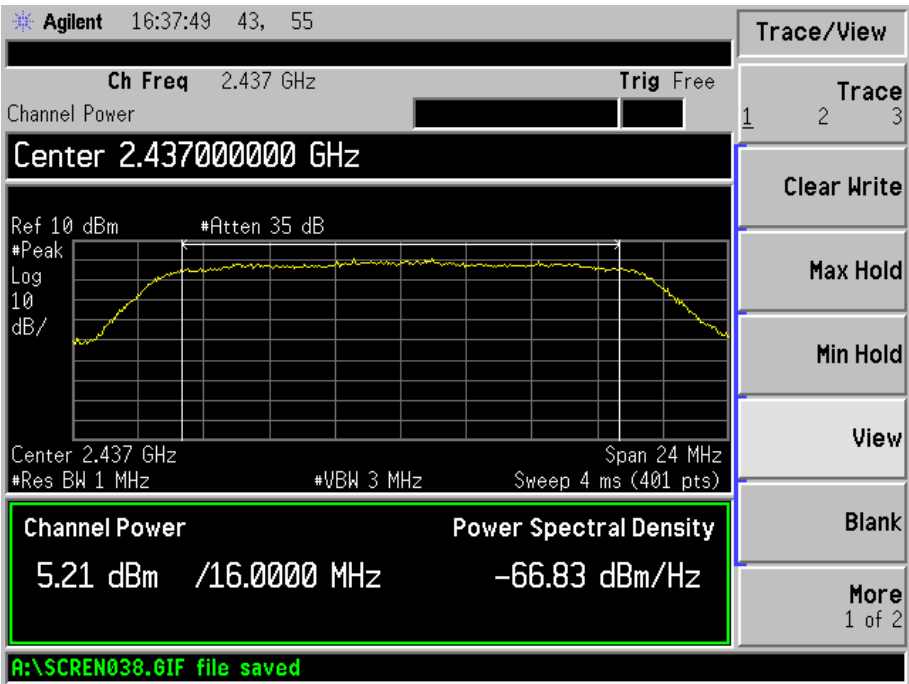
## 802.11n-HT20-MCS0-High Channel



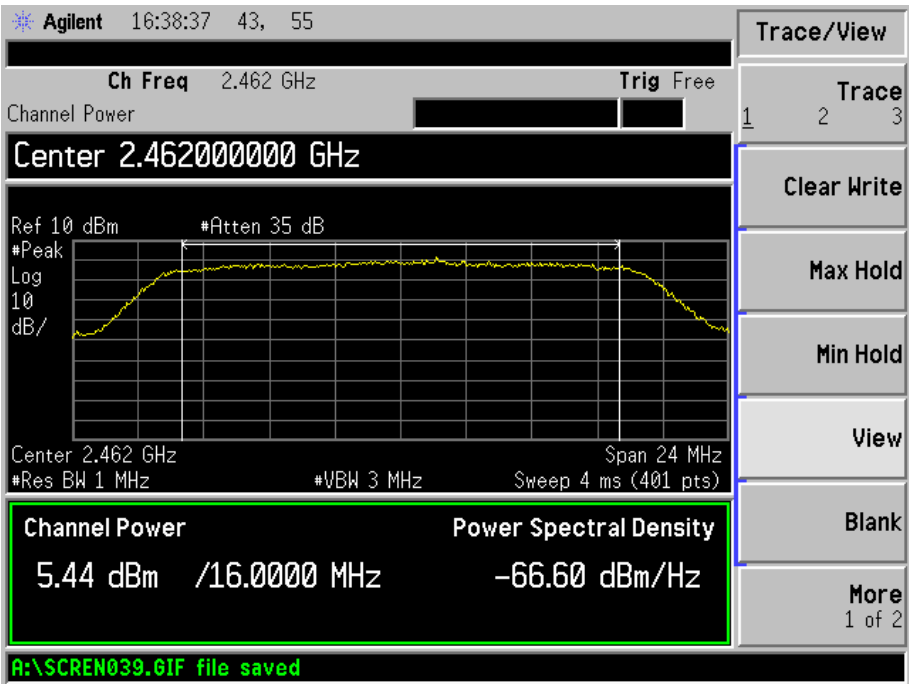
## 802.11n-HT20-MCS7-Low Channel



802.11n-HT20-MCS7-Middle Channel



802.11n-HT20-MCS7-High Channel





## 7. Field Strength of Spurious Emissions

### 7.1 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.

### 7.2 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.

### 7.3 Test Equipment List and Details

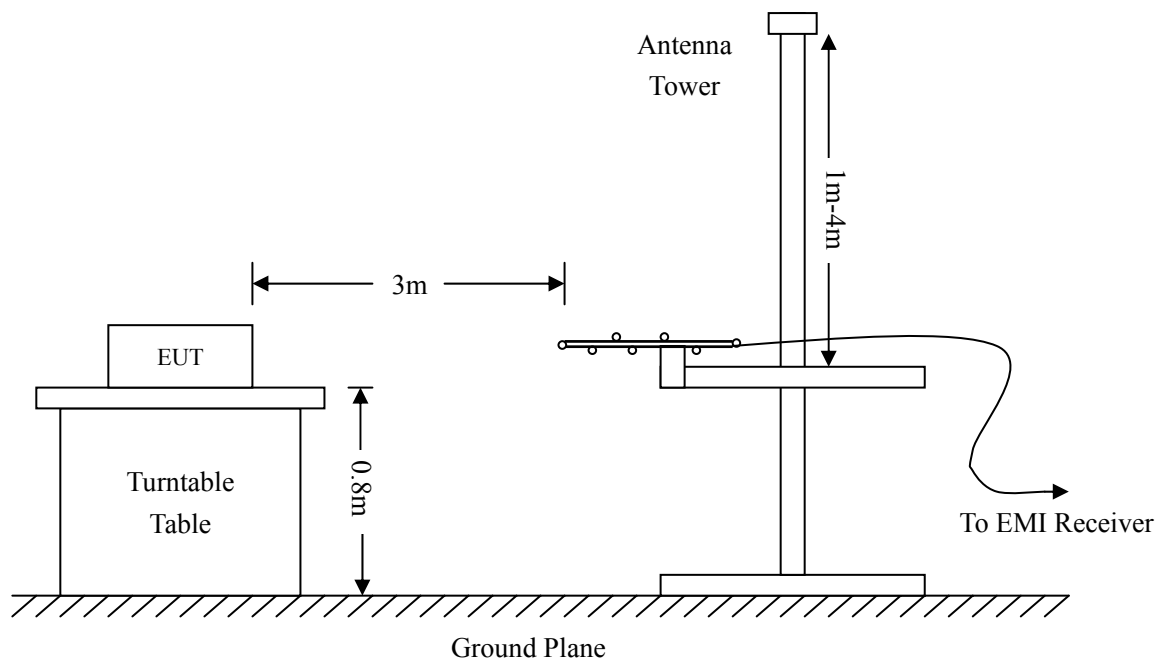
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2013-05-07	2014-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2013-05-07	2014-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2013-05-07	2014-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2013-05-07	2014-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2013-04-20	2014-04-19
Horn Antenna	ETS	3117	00086197	2013-04-20	2014-04-19
Horn Antenna	ETS	3116B	00088203	2013-04-20	2014-04-19
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2013-04-20	2014-04-19

## 7.4 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.



## 7.5 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 -6dB $\mu$ V means the emission is 6dB $\mu$ V below the maximum limit for Class B. The equation for margin calculation is as follows:

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

## 7.6 Environmental Conditions

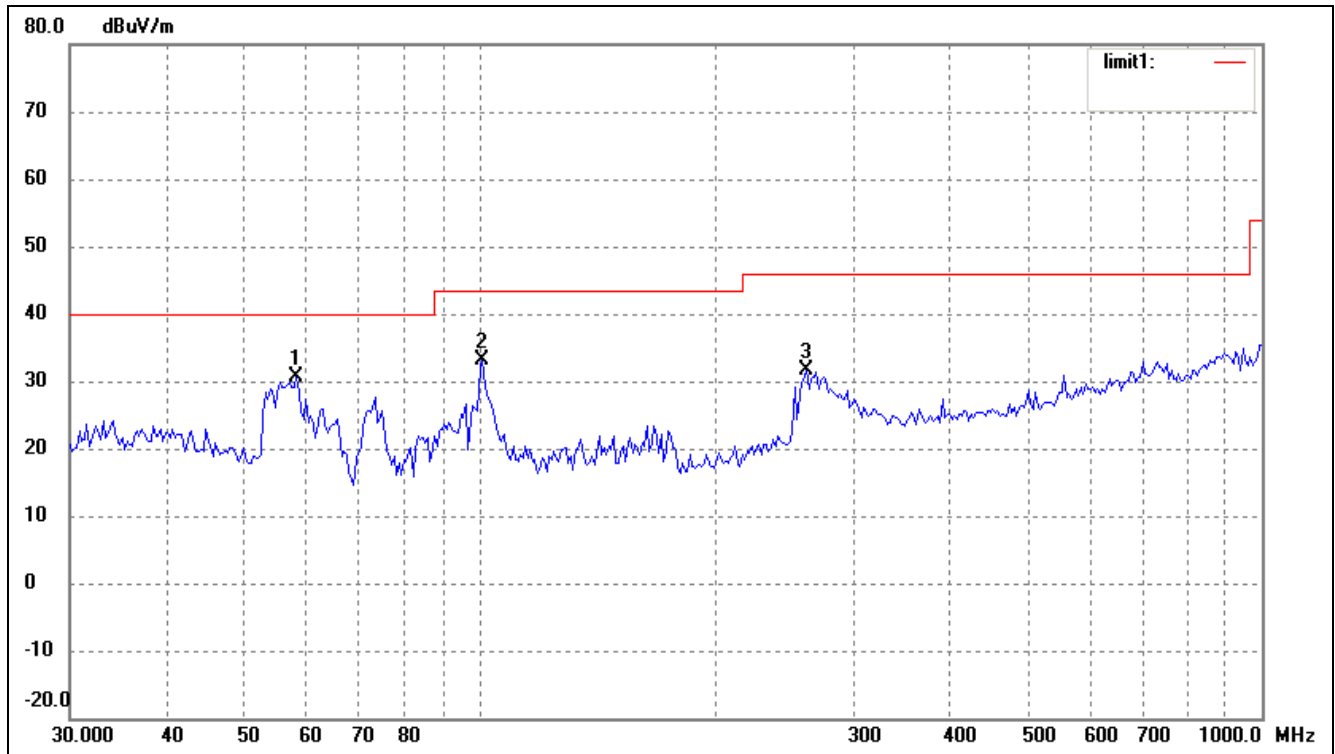
Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

## 7.7 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 margin of:

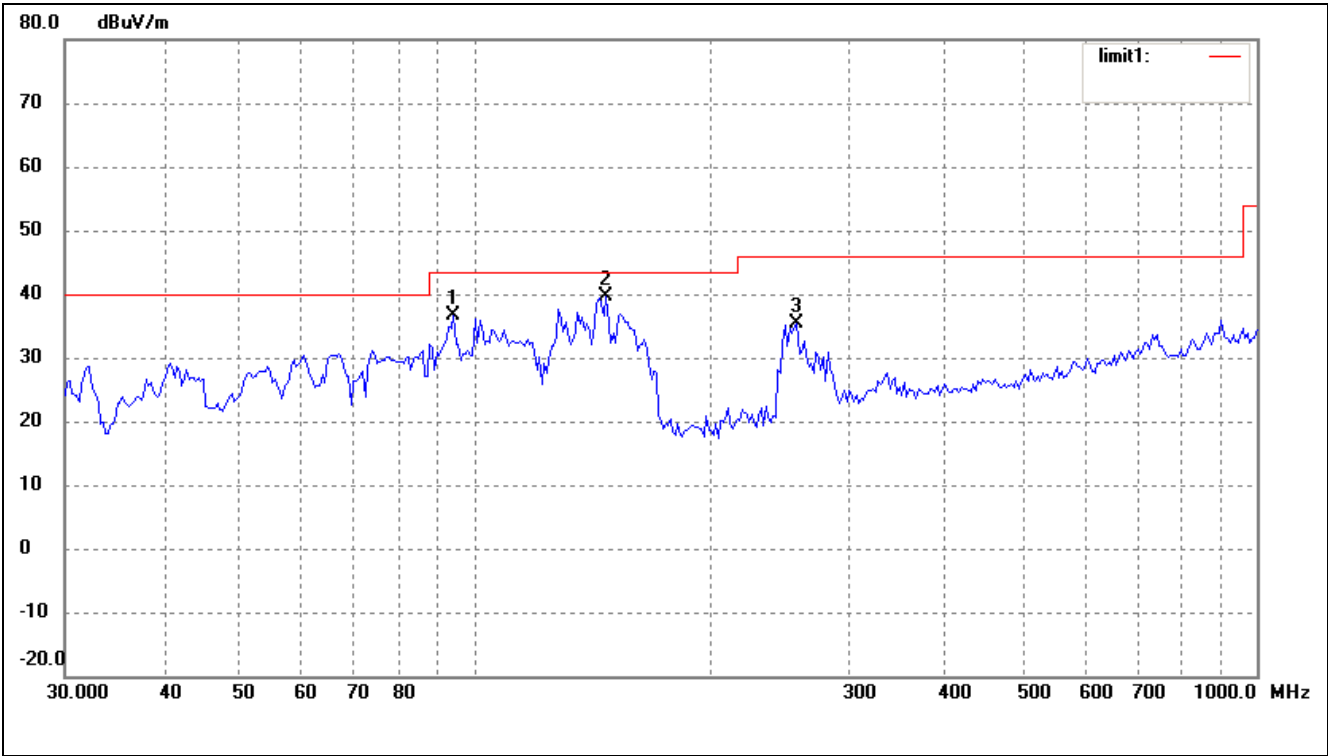
**-1.51 dB at 157.0074 MHz in the Horizontal polarization for 802.11n HT-20-High Channel, 9kHz to 25 GHz, 3 Meters**

*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:* Tablet PC*Tested Model:* U25GT*Operating Condition:* 802.11b Transmitting Low Channel-2412MHz*Comment:* DC 3.7V Lithium battery*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	58.4074	24.73	5.83	30.56	40.00	-9.44	264	100	peak
2	100.9340	26.41	6.75	33.16	43.50	-10.34	113	200	peak
3	261.9753	23.65	7.86	31.51	46.00	-14.49	287	100	peak

Test Specification: Vertical

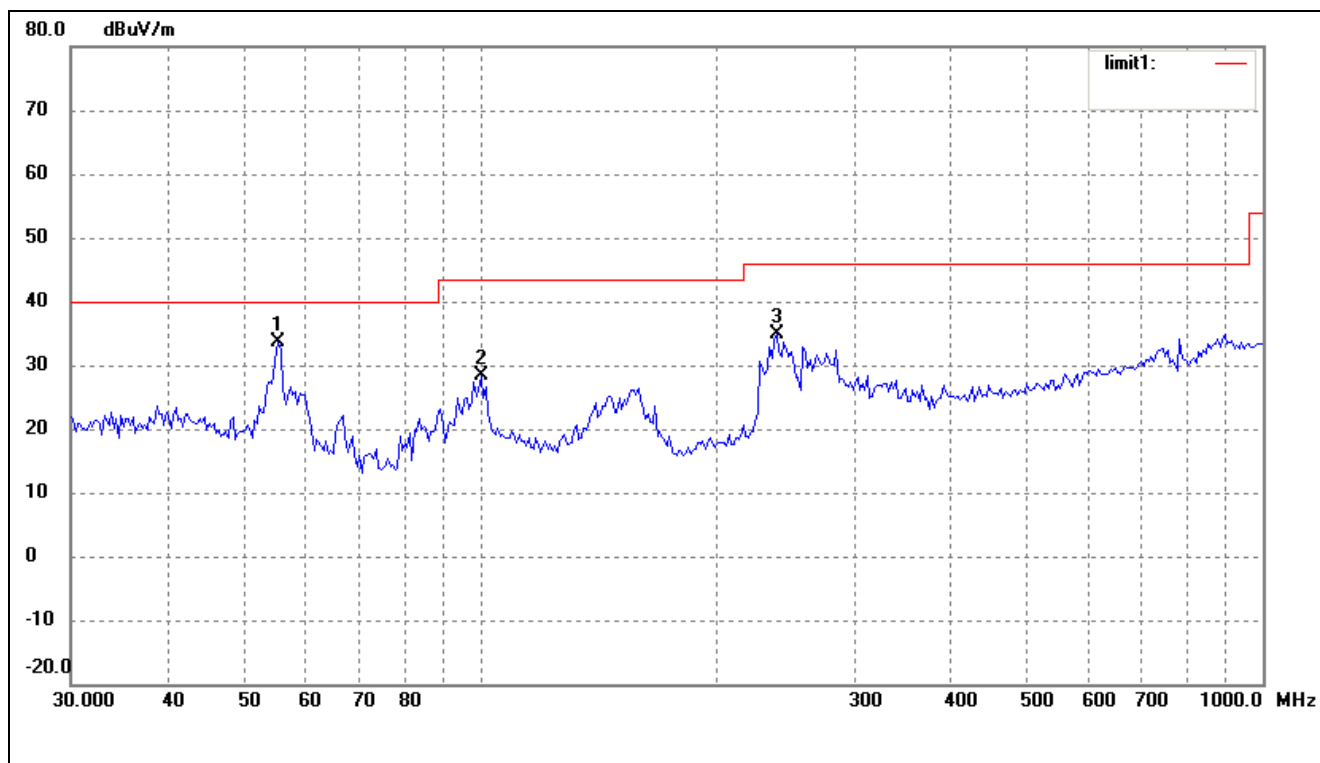


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	94.0979	31.36	5.37	36.73	43.50	-6.77	240	100	peak
2	147.4036	36.06	3.52	39.58	43.50	-3.92	187	100	peak
3	258.3264	27.77	7.64	35.41	46.00	-10.59	220	100	peak

Operating Condition: 802.11b Transmitting Middle Channel-2437MHz

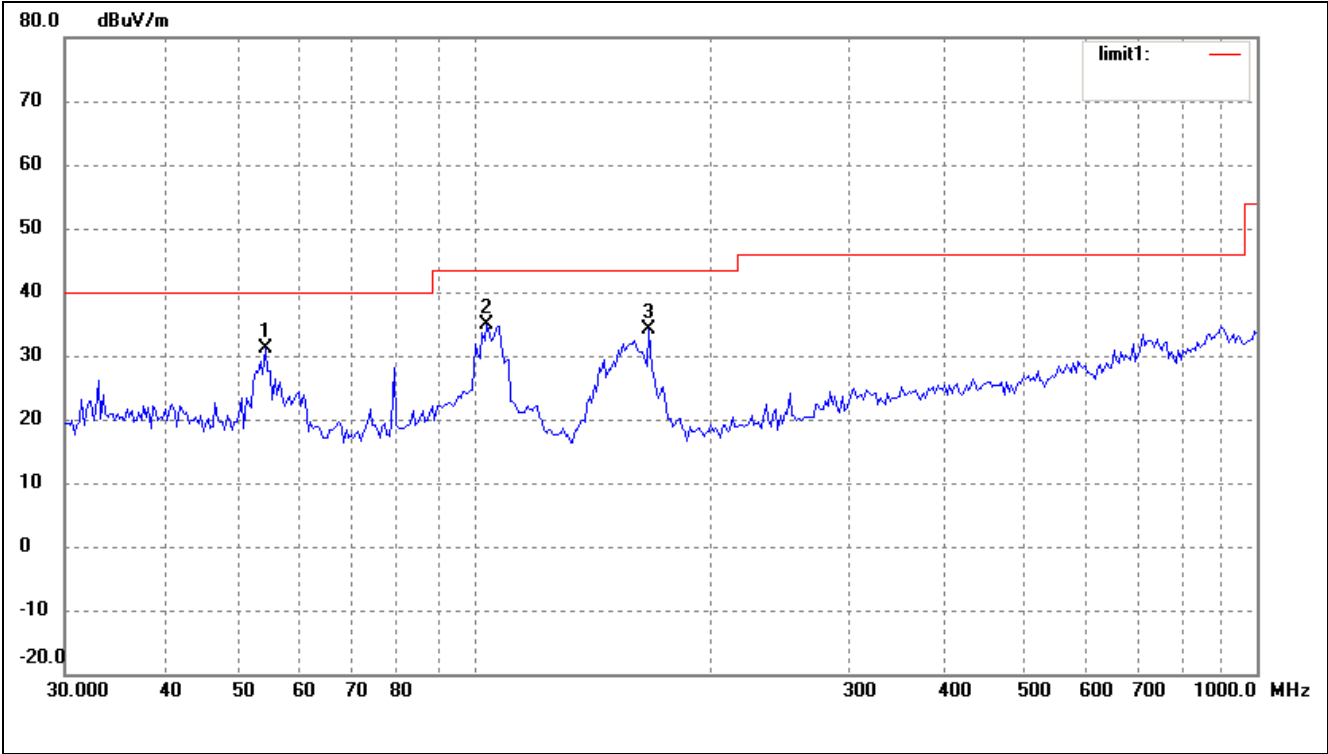
Comment: DC 3.7V Lithium battery

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	55.2207	27.60	6.14	33.74	40.00	-6.26	162	100	peak
2	100.2286	21.65	6.81	28.46	43.50	-15.04	200	100	peak
3	239.1473	27.98	6.95	34.93	46.00	-11.07	359	100	peak

Test Specification: Vertical

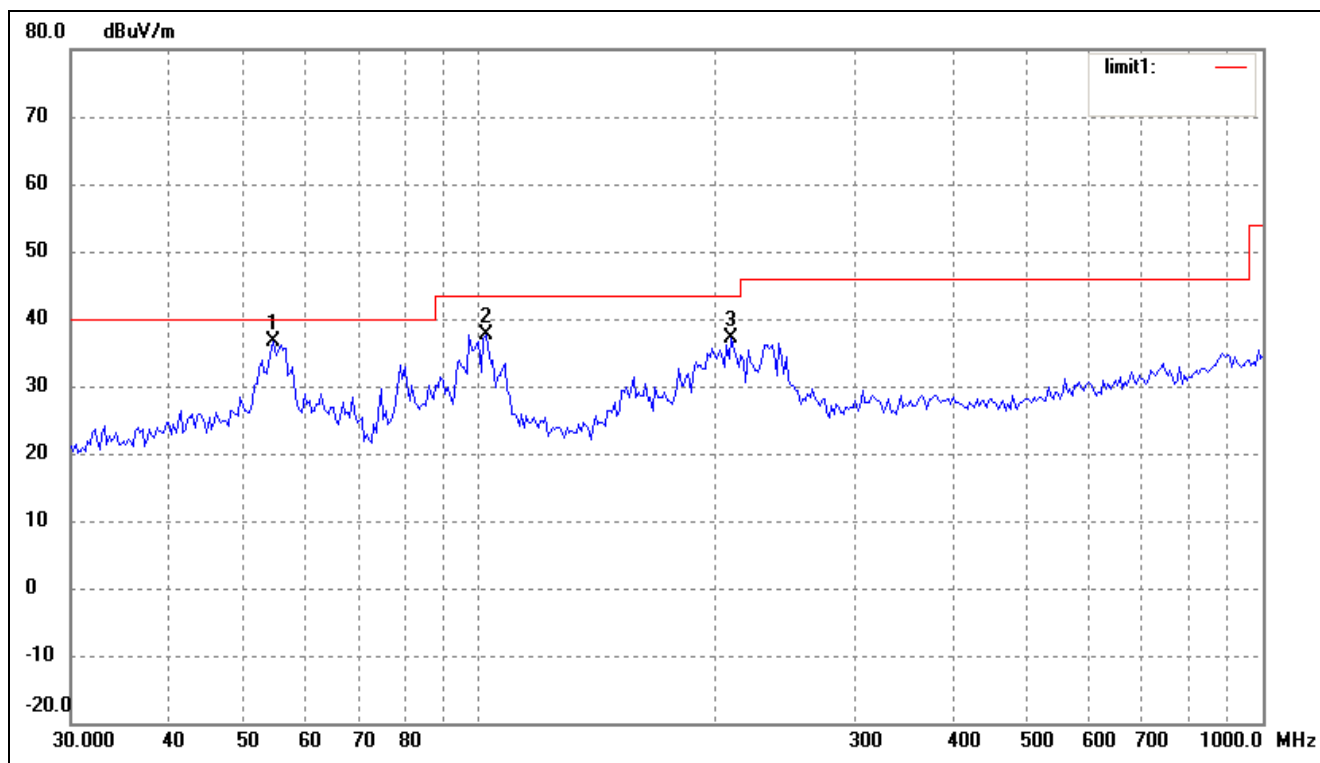


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	54.0711	24.83	6.24	31.07	40.00	-8.93	240	100	peak
2	103.8055	28.32	6.46	34.78	43.50	-8.72	187	100	peak
3	167.2368	30.35	3.68	34.03	43.50	-9.47	220	100	peak

Operating Condition: 802.11b Transmitting High Channel-2462MHz

Comment: DC 3.7V Lithium battery

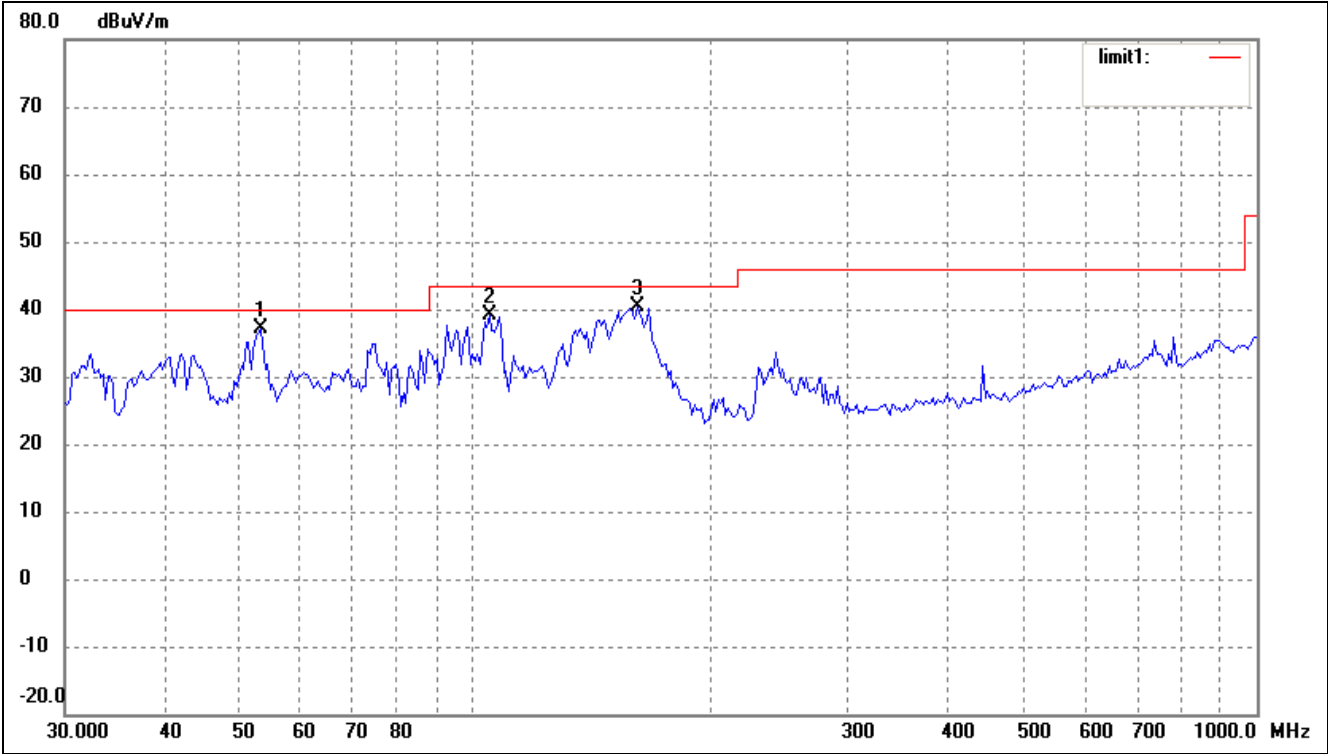
Test Specification: Horizontal



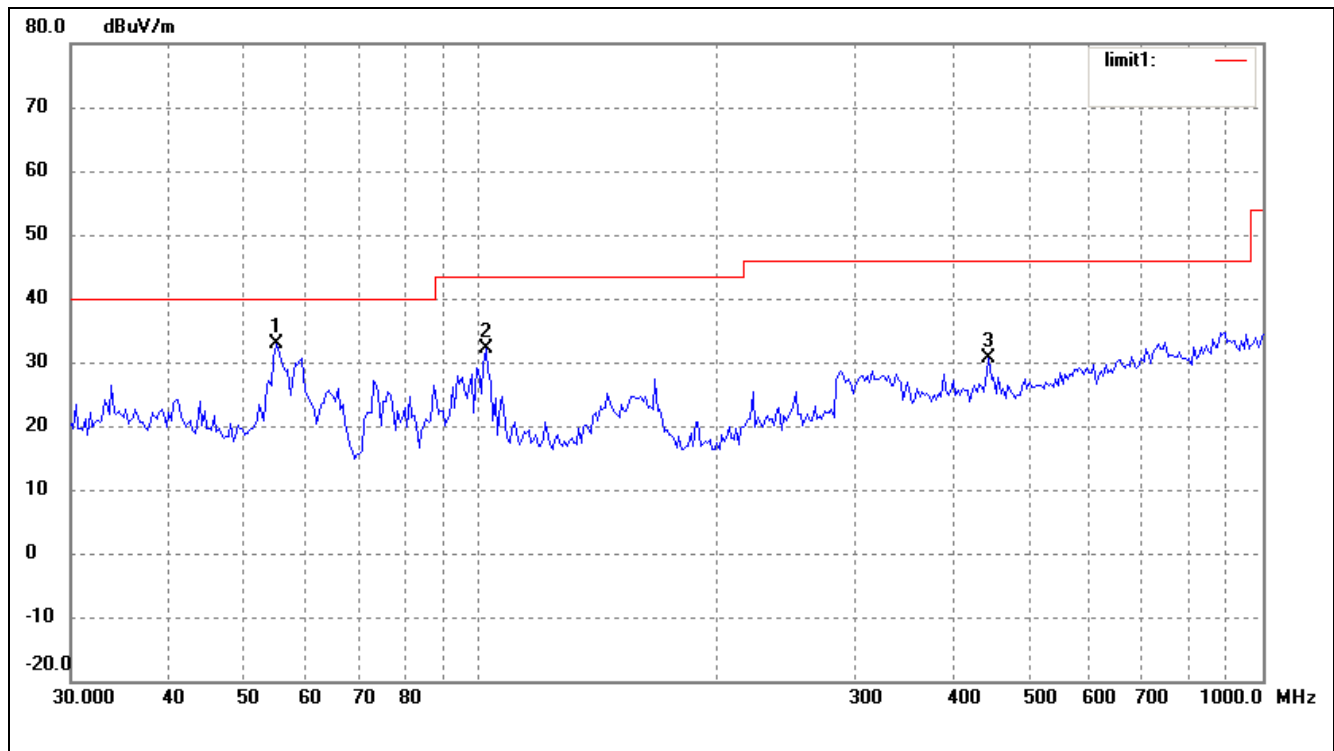
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	54.4516	30.54	6.21	36.75	40.00	-3.25	162	100	peak
2	101.6443	31.02	6.67	37.69	43.50	-5.81	200	100	peak
3	209.3129	31.83	5.25	37.08	43.50	-6.42	200	100	peak



Test Specification:            Vertical

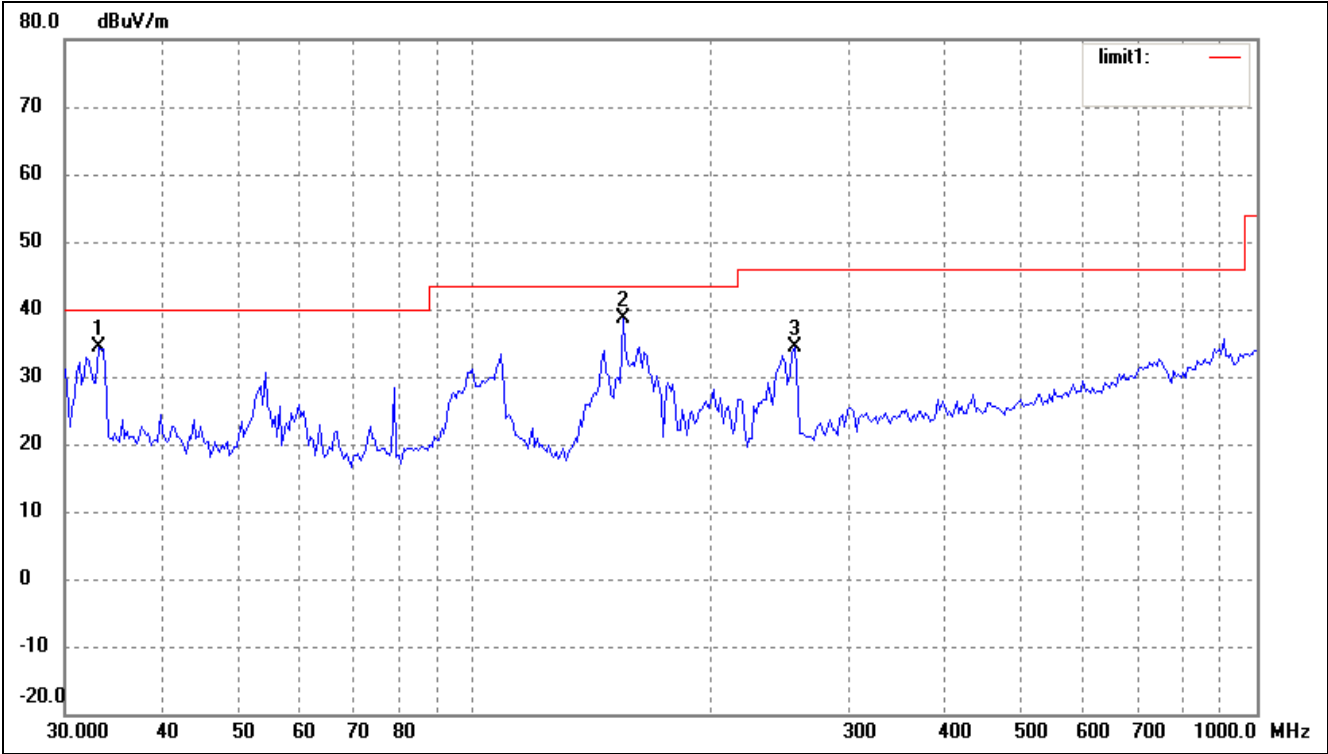


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	53.3179	30.70	6.31	37.01	40.00	-2.99	240	100	peak
2	104.5361	32.69	6.39	39.08	43.50	-4.42	187	100	peak
3	161.4742	36.77	3.66	40.43	43.50	-3.07	220	100	peak

**Plot of Radiated Emissions Test Data (30MHz to 1GHz)***EUT:* Tablet PC*Tested Model:* U25GT*Operating Condition:* 802.11g Transmitting Low Channel-2412MHz*Comment:* DC 3.7V Lithium battery*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	54.8348	26.72	6.17	32.89	40.00	-7.11	264	100	peak
2	101.6443	25.50	6.67	32.17	43.50	-11.33	113	200	peak
3	446.4141	19.34	11.41	30.75	46.00	-15.25	287	100	peak

Test Specification: Vertical

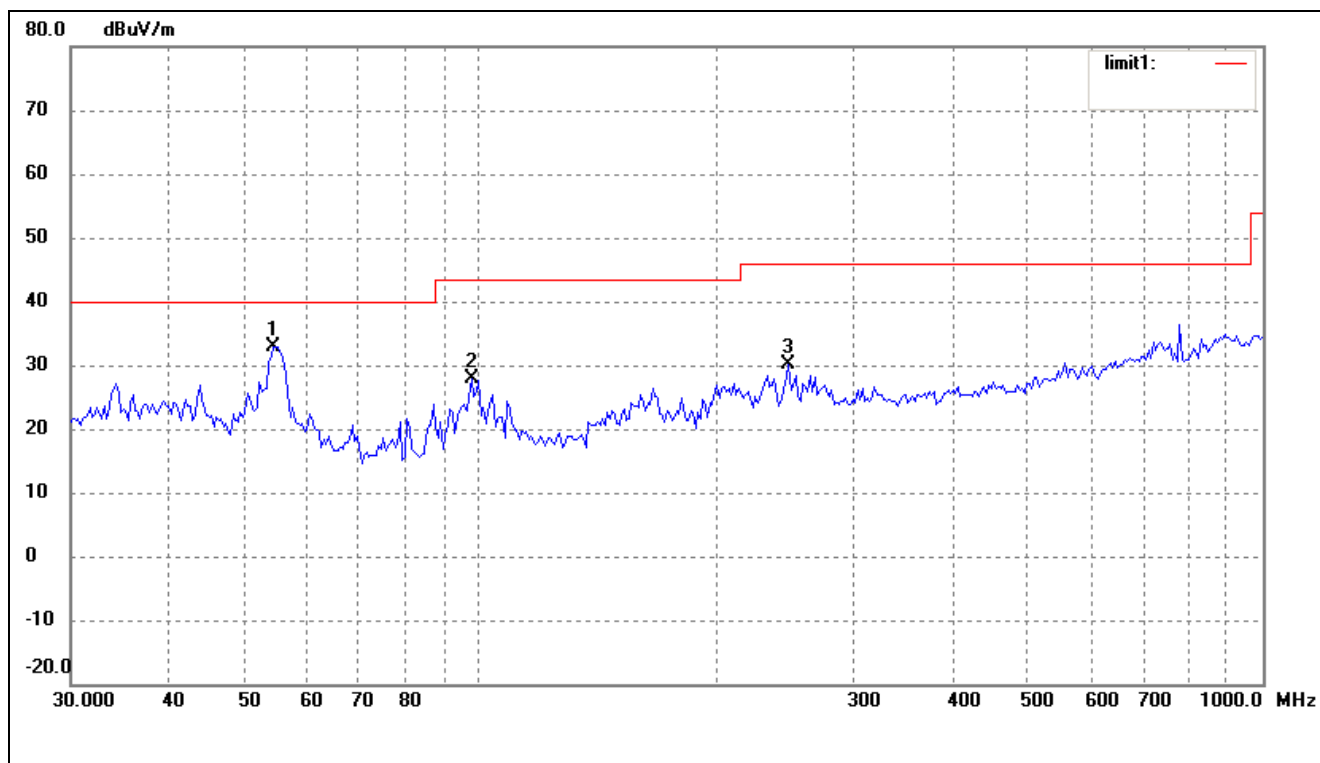


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	33.0950	25.84	8.56	34.40	40.00	-5.60	240	100	peak
2	154.8205	35.08	3.59	38.67	43.50	-4.83	187	100	peak
3	256.5211	26.80	7.56	34.36	46.00	-11.64	220	100	peak

Operating Condition: 802.11g Transmitting Middle Channel-2437MHz

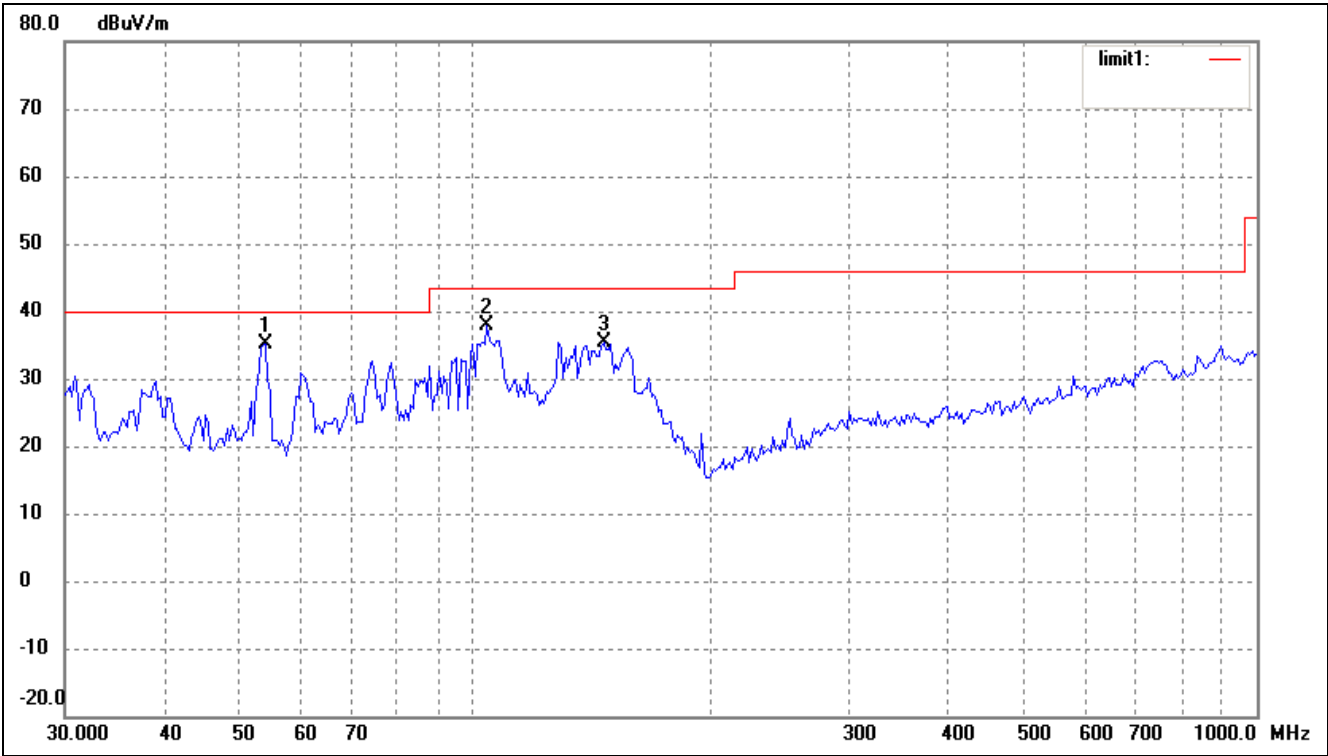
Comment: DC 3.7V Lithium battery

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	54.4516	26.76	6.21	32.97	40.00	-7.03	162	100	peak
2	97.4560	21.75	6.21	27.96	43.50	-15.54	200	100	peak
3	247.6819	22.86	7.22	30.08	46.00	-15.92	359	100	peak

Test Specification: Vertical

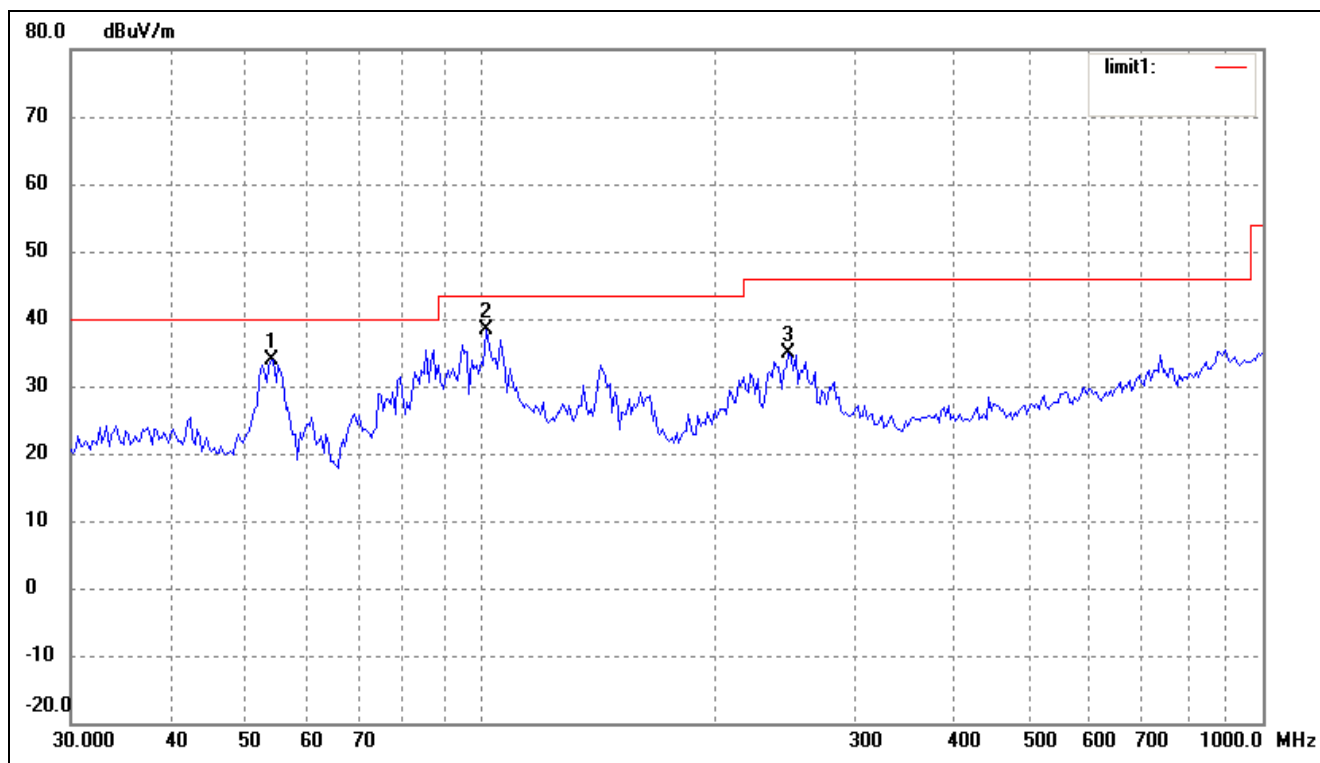


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	54.0711	28.94	6.24	35.18	40.00	-4.82	240	100	peak
2	103.8054	31.36	6.46	37.82	43.50	-5.68	187	100	peak
3	146.3735	31.94	3.49	35.43	43.50	-8.07	220	100	peak

Operating Condition: 802.11g Transmitting High Channel-2462MHz

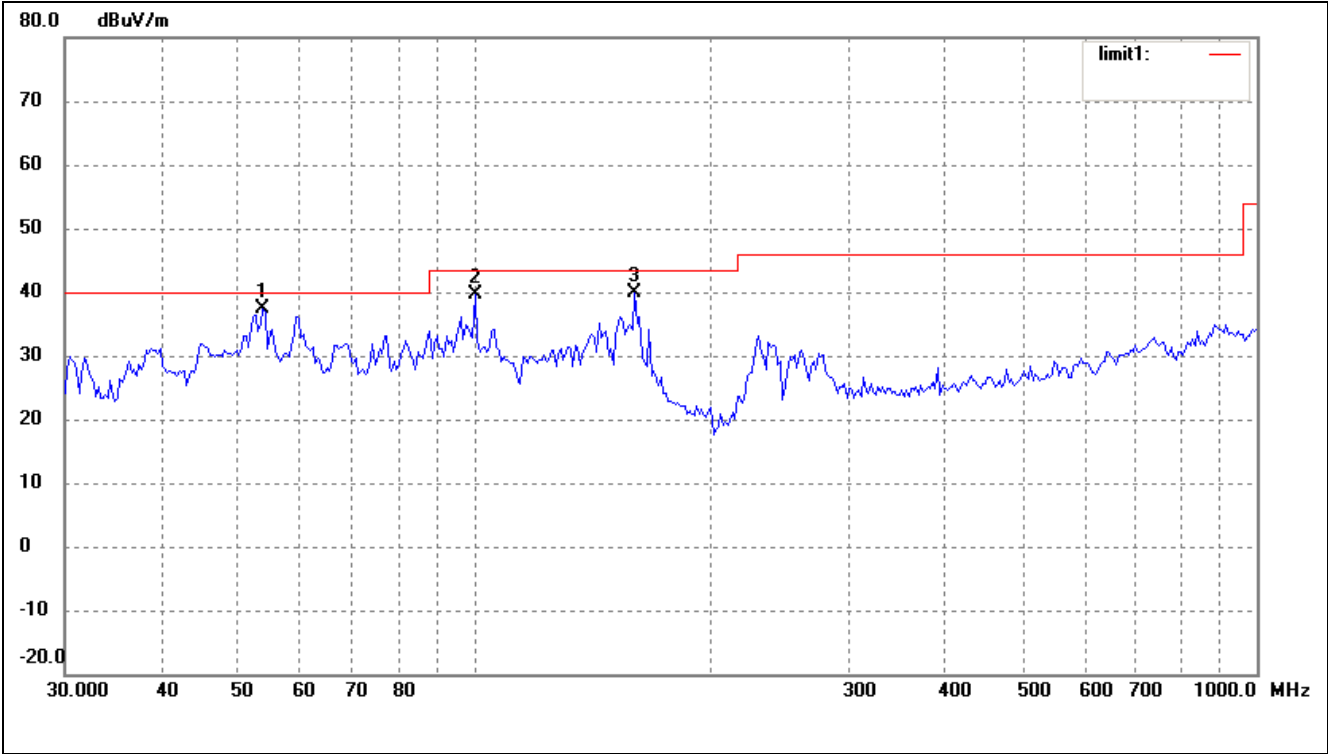
Comment: DC 3.7V Lithium battery

Test Specification: Horizontal

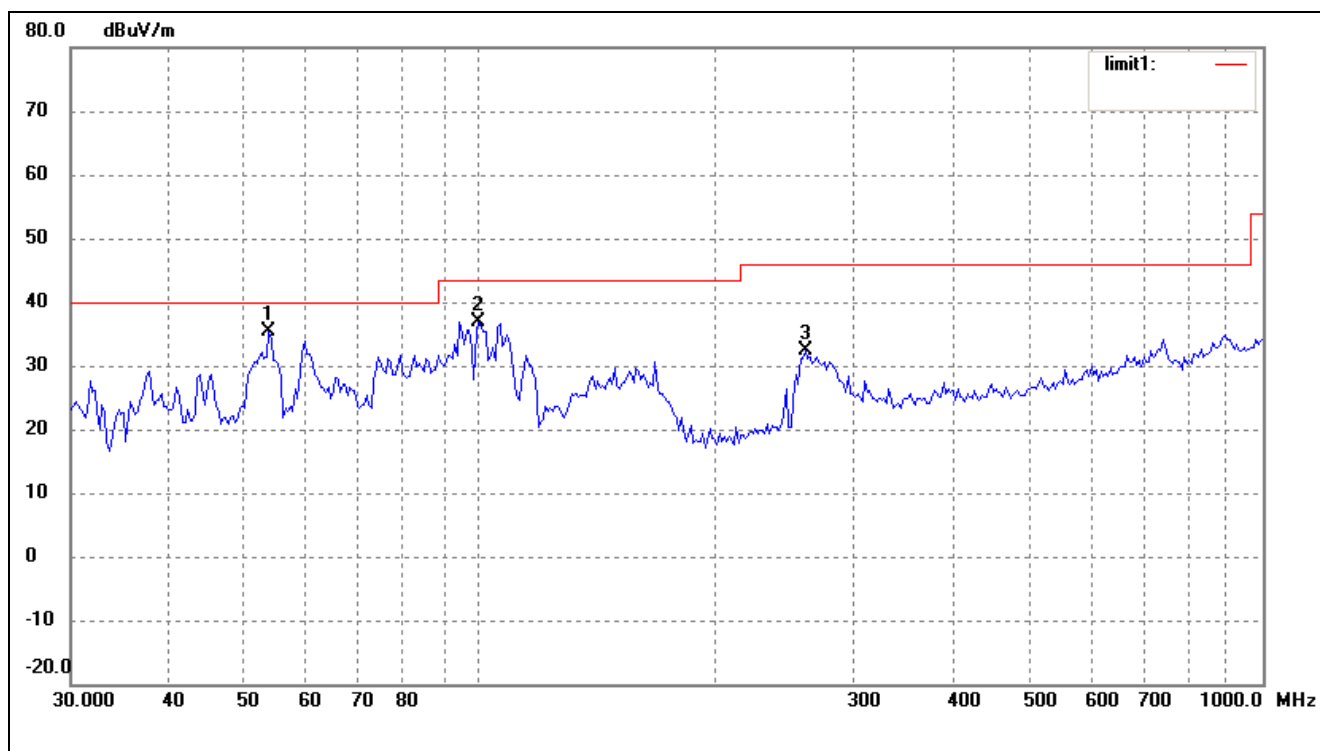


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	54.0711	27.59	6.24	33.83	40.00	-6.17	162	100	peak
2	101.6443	31.75	6.67	38.42	43.50	-5.08	200	100	peak
3	247.6819	27.74	7.22	34.96	46.00	-11.04	200	100	peak

Test Specification: Vertical



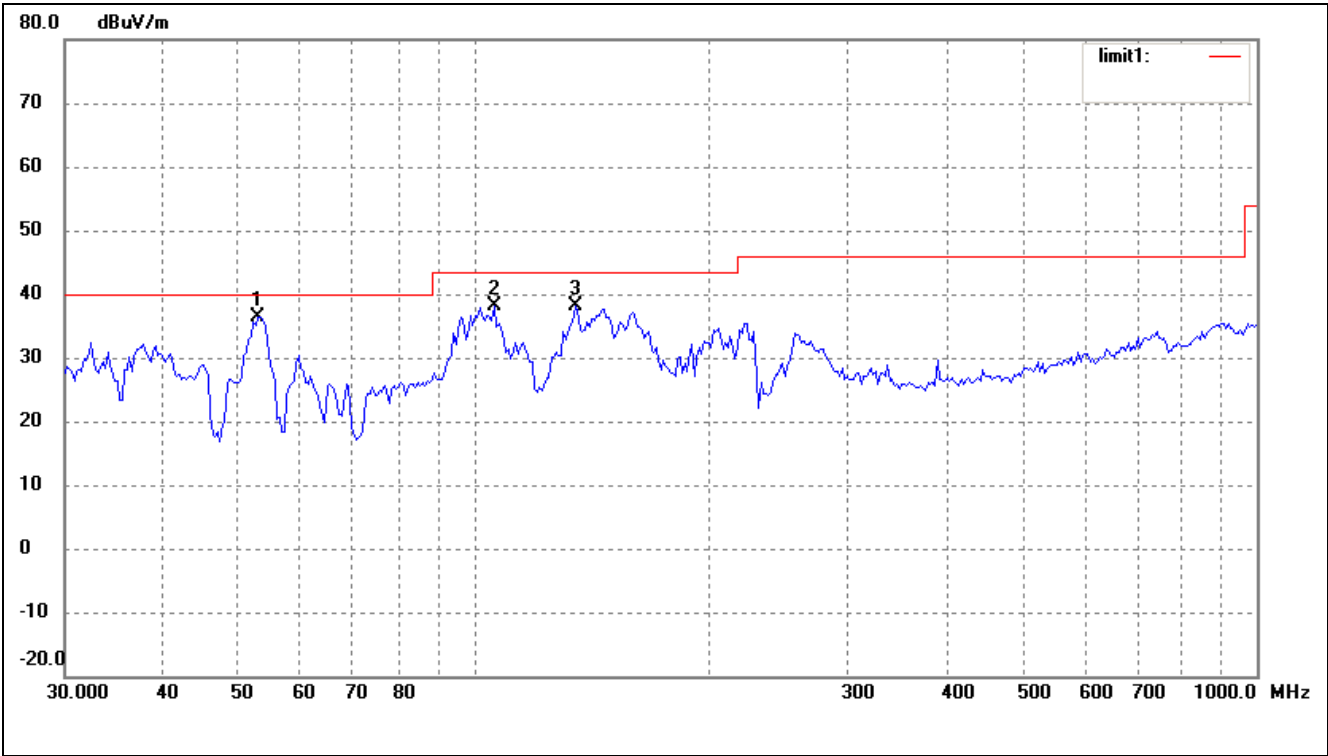
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	53.6932	30.98	6.28	37.26	40.00	-2.74	240	100	peak
2	100.2286	32.92	6.81	39.73	43.50	-3.77	187	100	peak
3	160.3457	36.19	3.65	39.84	43.50	-3.66	220	100	peak

**Plot of Radiated Emissions Test Data (30MHz to 1GHz)***EUT:* Tablet PC*Tested Model:* U25GT*Operating Condition:* 802.11n-HT20 Transmitting Low Channel-2412MHz*Comment:* DC 3.7V Lithium battery*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	53.6932	29.21	6.28	35.49	40.00	-4.51	264	100	peak
2	99.5281	30.16	6.72	36.88	43.50	-6.62	113	200	peak
3	260.1444	24.54	7.72	32.26	46.00	-13.74	287	100	peak

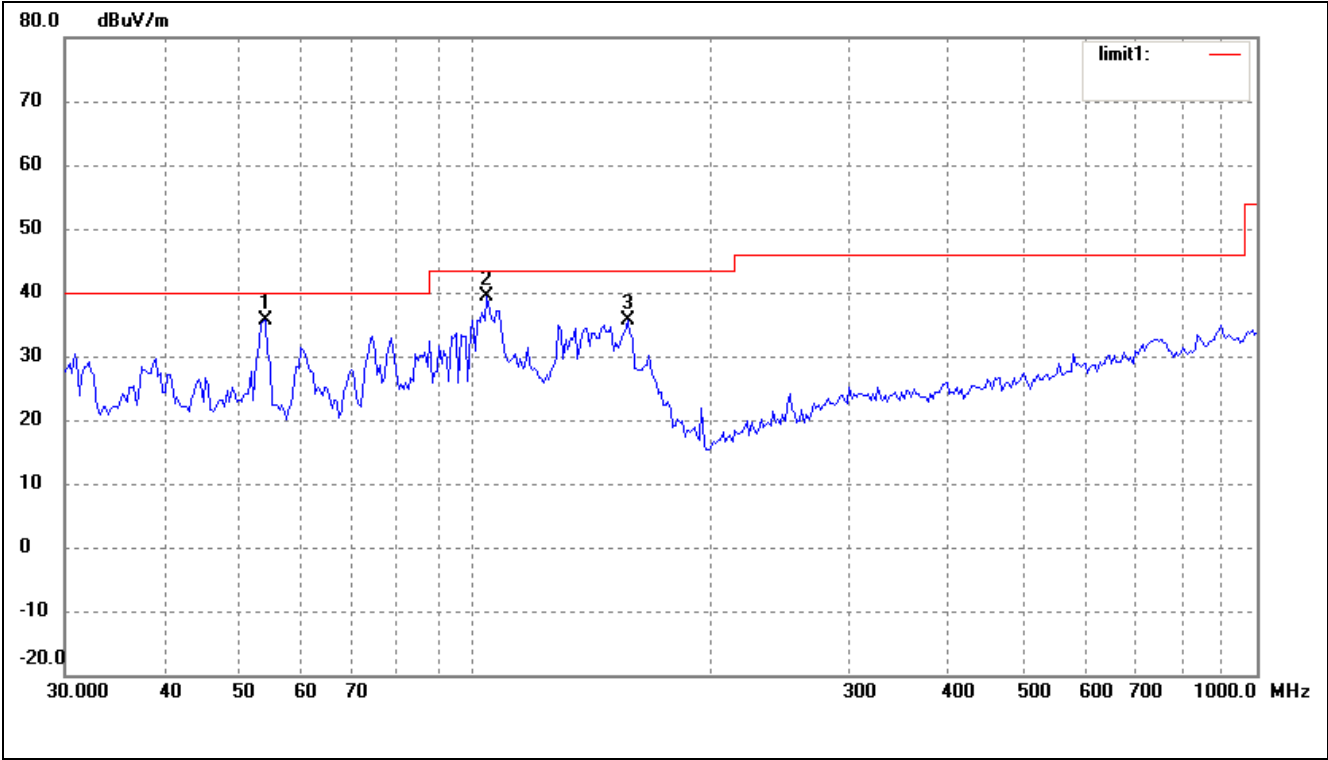


Test Specification: Vertical



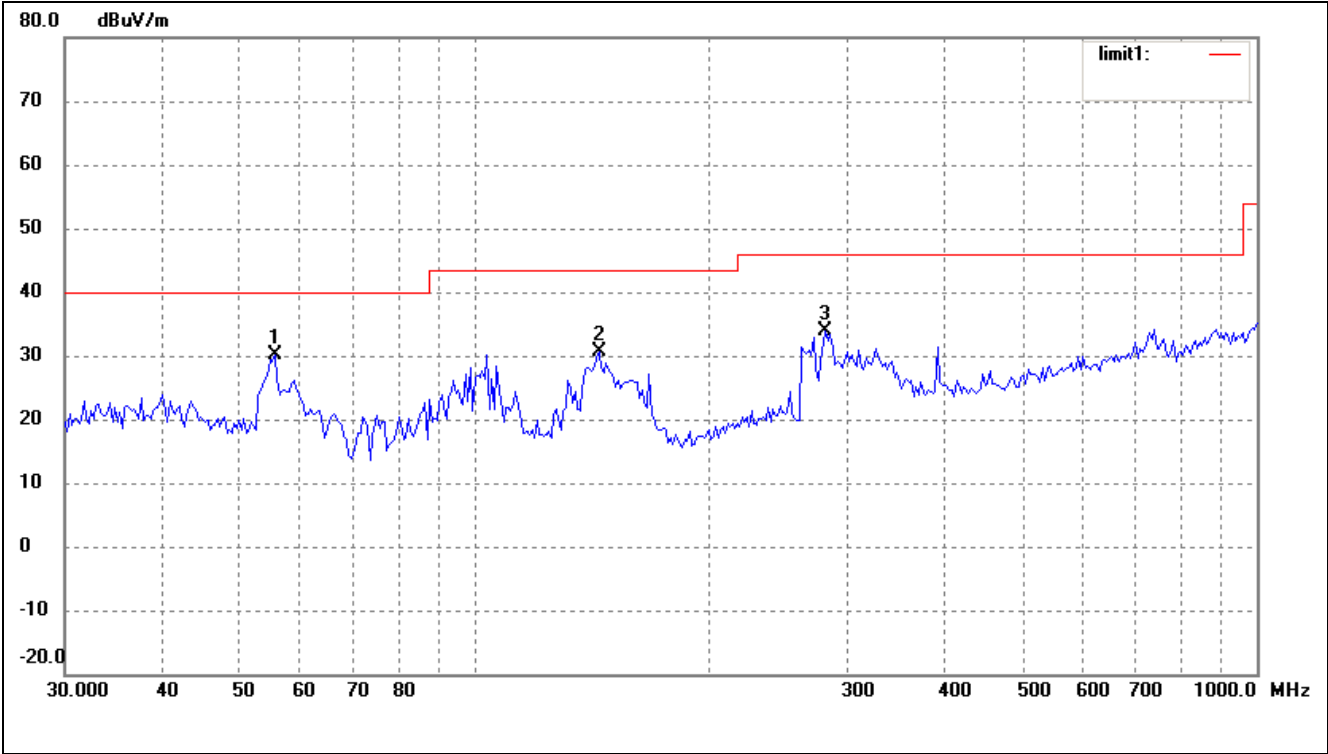
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	52.9453	30.06	6.34	36.40	40.00	-3.60	240	100	peak
2	106.0126	31.80	6.24	38.04	43.50	-5.46	187	100	peak
3	134.5592	34.24	3.78	38.02	43.50	-5.48	220	100	peak

Operating Condition: 802.11n-HT20 Transmitting Middle Channel-2437MHz  
Comment: DC 3.7V Lithium battery  
  
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	54.0711	29.44	6.24	35.68	40.00	-4.32	162	100	peak
2	103.8055	32.86	6.46	39.32	43.50	-4.18	200	100	peak
3	157.0074	32.08	3.63	35.71	43.50	-7.79	359	100	peak

Test Specification: Vertical

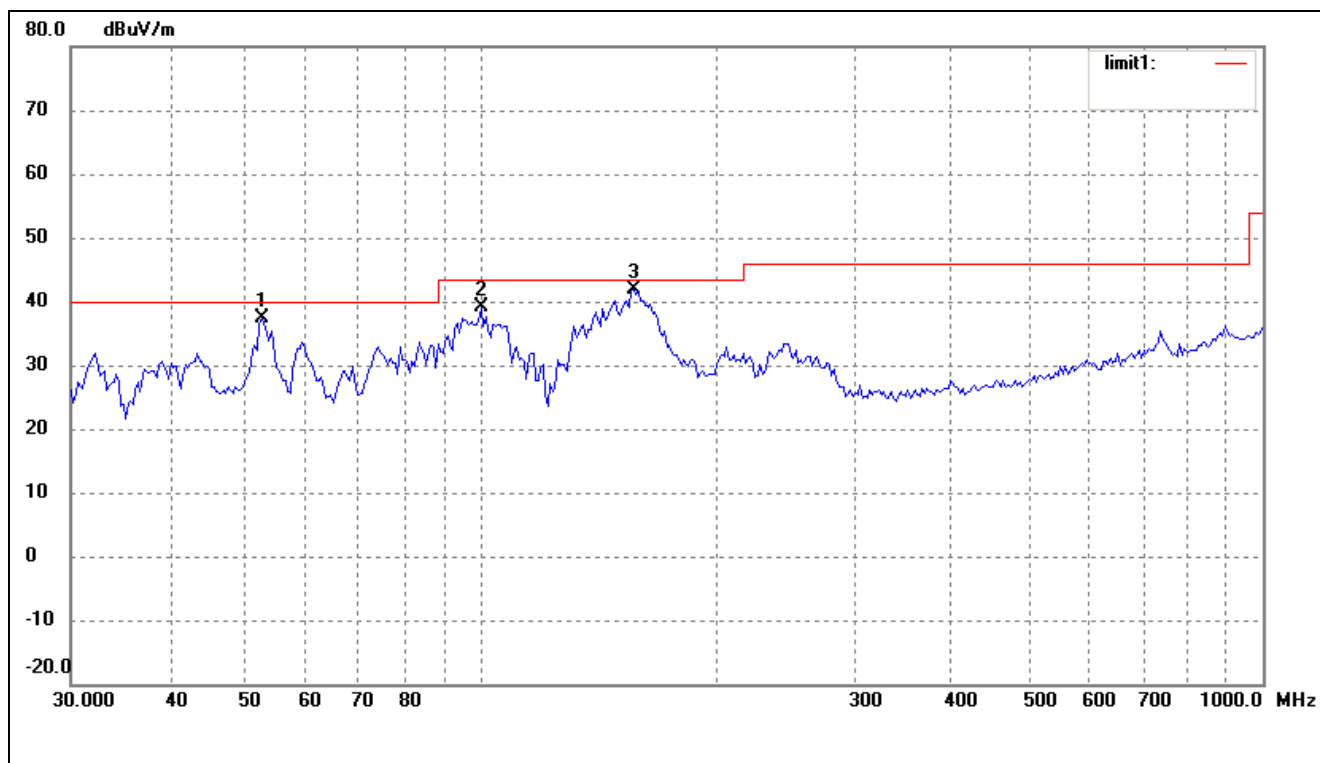


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	55.6094	24.01	6.11	30.12	40.00	-9.88	240	100	peak
2	144.3348	27.05	3.46	30.51	43.50	-12.99	187	100	peak
3	281.0075	24.62	9.29	33.91	46.00	-12.09	220	100	peak

Operating Condition: 802.11n-HT20 Transmitting High Channel-2462MHz

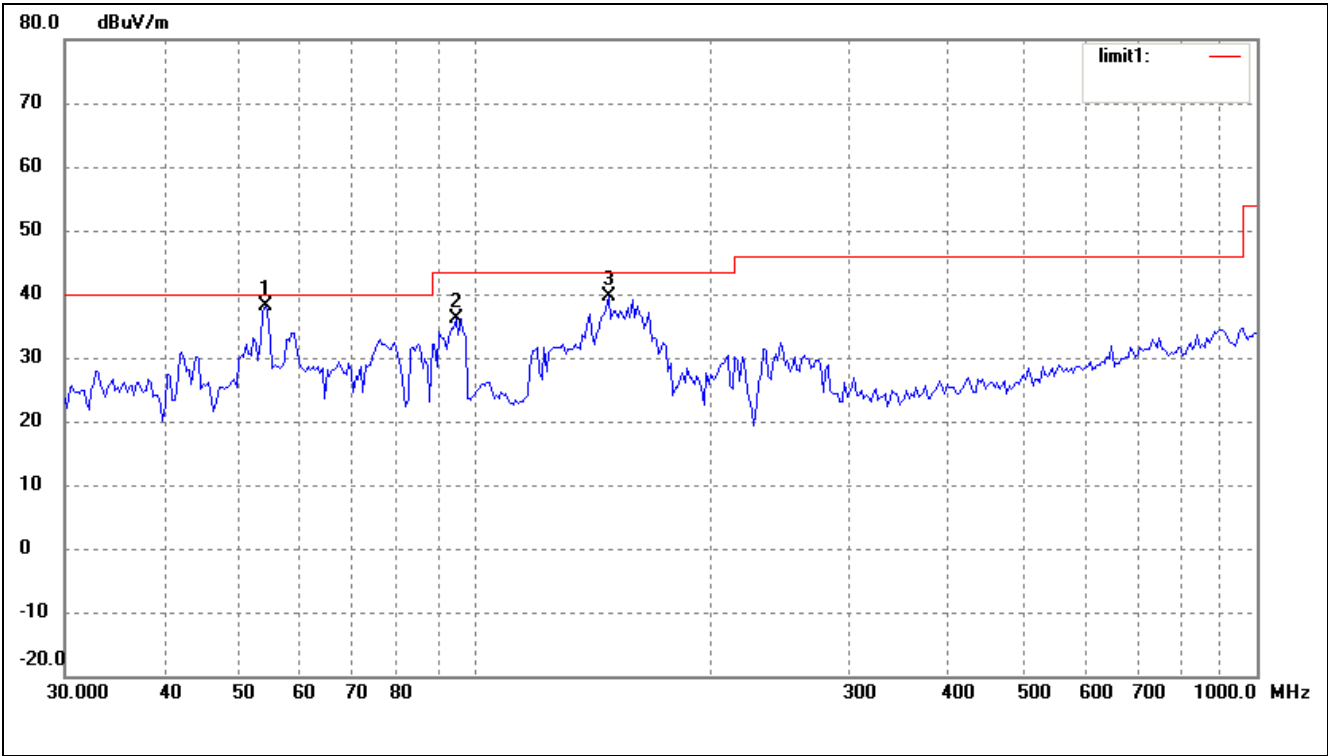
Comment: DC 3.7V Lithium battery

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	52.5753	30.99	6.38	37.37	40.00	-2.63	162	100	peak
2	100.2286	32.30	6.81	39.11	43.50	-4.39	200	100	peak
3	157.0074	38.36	3.63	41.99	43.50	-1.51	200	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	54.0711	31.90	6.24	38.14	40.00	-1.86	240	100	peak
2	94.7601	30.60	5.54	36.14	43.50	-7.36	187	100	peak
3	148.4410	36.07	3.53	39.60	43.50	-3.90	220	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	62.99	0.57	63.56	74.00	-10.44	H	PK
4824	49.89	0.57	50.46	54.00	-3.54	H	AV
7236	52.19	3.69	55.88	74.00	-18.12	H	PK
7236	37.10	3.69	40.79	54.00	-13.21	H	AV
4824	66.36	0.57	66.93	74.00	-7.07	V	PK
4824	48.78	0.57	49.35	54.00	-4.65	V	AV
7236	50.56	3.69	54.25	74.00	-19.75	V	PK
7236	36.08	3.69	38.77	54.00	-15.23	V	AV
Middle Channel-2437MHz							
4874	51.20	0.57	51.77	74.00	-22.23	H	PK
4874	34.10	0.57	34.67	54.00	-19.33	H	AV
7311	54.02	3.69	57.71	74.00	-16.29	H	PK
7311	30.45	3.69	34.14	54.00	-19.86	H	AV
4874	65.08	0.57	65.65	74.00	-8.35	V	PK
4874	46.26	0.57	46.83	54.00	-7.17	V	AV
7311	58.20	3.69	61.89	74.00	-12.11	V	PK
7311	43.09	3.69	36.78	54.00	-7.22	V	AV
High Channel-2462MHz							
4924	55.13	0.57	55.70	74.00	-18.30	H	PK
4924	37.76	0.57	38.33	54.00	-15.67	H	AV
7386	53.85	3.69	57.54	74.00	-16.46	H	PK
7386	36.50	3.69	40.19	54.00	-13.81	H	AV
4924	63.41	0.57	63.98	74.00	-10.02	V	PK
4924	45.01	0.57	45.58	54.00	-8.42	V	AV
7386	49.63	3.69	53.32	74.00	-20.68	V	PK
7386	34.22	3.69	37.91	54.00	-16.09	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	52.45	0.57	53.02	74.00	-20.98	H	PK
4824	40.31	0.57	40.88	54.00	-13.12	H	AV
7236	53.83	3.69	57.62	74.00	-16.38	H	PK
7236	41.60	3.69	45.29	54.00	-8.71	H	AV
4824	51.63	0.57	52.20	74.00	-21.80	V	PK
4824	40.66	0.57	41.23	54.00	-12.77	V	AV
7236	50.34	3.69	54.03	74.00	-19.97	V	PK
7236	41.71	3.69		54.00	-8.60	V	AV
Middle Channel-2437MHz							
4874	53.19	0.57	53.76	74.00	-20.24	H	PK
4874	40.78	0.57	41.45	54.00	-12.55	H	AV
7311	52.59	3.69	56.28	74.00	-21.32	H	PK
7311	41.55	3.69	45.24	54.00	-8.76	H	AV
4874	55.59	0.57	56.16	74.00	-17.84	V	PK
4874	41.51	0.57	42.08	54.00	-11.92	V	AV
7311	51.31	3.69	55.00	74.00	-19.00	V	PK
7311	41.47	3.69	45.16	54.00	-8.84	V	AV
High Channel-2462MHz							
4924	54.17	0.57	54.74	74.00	-19.26	H	PK
4924	44.12	0.57	44.69	54.00	-9.31	H	AV
7386	53.81	3.69	57.50	74.00	-16.50	H	PK
7386	41.53	3.69	45.22	54.00	-8.78	H	AV
4924	53.51	0.57	54.08	74.00	-19.92	V	PK
4924	43.32	0.57	43.89	54.00	-10.11	V	AV
7386	52.11	3.69	55.80	74.00	-18.20	V	PK
7386	41.50	3.69	45.19	54.00	-8.81	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	53.99	0.57	54.56	74.00	-19.44	H	PK
4824	43.37	0.57	43.94	54.00	-10.06	H	AV
7236	52.08	3.69	55.77	74.00	-18.23	H	PK
7236	42.61	3.69	46.30	54.00	-7.70	H	AV
4824	51.71	0.57	52.28	74.00	-21.72	V	PK
4824	44.61	0.57	45.18	54.00	-8.82	V	AV
7236	52.79	3.69	56.48	74.00	-17.52	V	PK
7236	41.42	3.69	45.11	54.00	-8.89	V	AV
Middle Channel-2437MHz							
4874	53.10	0.57	53.67	74.00	-20.33	H	PK
4874	43.75	0.57	44.32	54.00	-9.68	H	AV
7311	49.48	3.69	53.17	74.00	-20.83	H	PK
7311	41.40	3.69	45.09	54.00	-8.91	H	AV
4874	54.88	0.57	55.45	74.00	-18.55	V	PK
4874	41.52	0.57	42.09	54.00	-11.91	V	AV
7311	52.59	3.69	56.28	74.00	-17.72	V	PK
7311	42.46	3.69	46.15	54.00	-7.85	V	AV
High Channel-2462MHz							
4924	55.62	0.57	56.19	74.00	-17.81	H	PK
4924	43.30	0.57	43.87	54.00	-10.13	H	AV
7386	54.06	3.69	57.75	74.00	-16.25	H	PK
7386	41.53	3.69	45.22	54.00	-8.78	H	AV
4924	54.82	0.57	55.39	74.00	-18.61	V	PK
4924	40.81	0.57	41.38	54.00	-12.62	V	AV
7386	54.01	3.69	57.70	74.00	-16.30	V	PK
7386	41.48	3.69	45.17	54.00	-8.83	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.



## 8. Out of Band Emissions

### 8.1 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).

### 8.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2013-05-07	2014-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2013-05-07	2014-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2013-05-07	2014-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2013-05-07	2014-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2013-04-20	2014-04-19
Horn Antenna	ETS	3117	00086197	2013-04-20	2014-04-19

### 8.3 Test Procedure

According to the KDB 558074 D01 V02, 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 V02, 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.

#### 8.4 Environmental Conditions

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

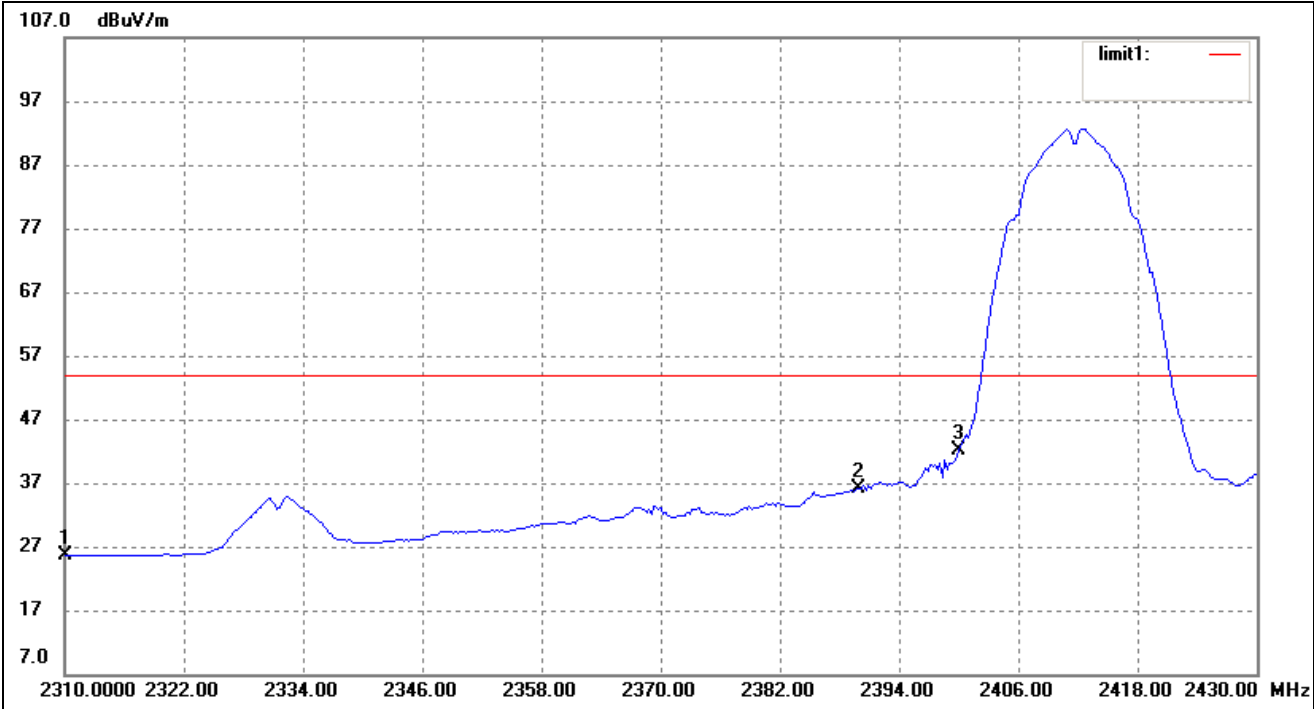
#### 8.5 Summary of Test Results/Plots

Test Mode	Test Frequency MHz	Limit dBuV / dBc	Result
802.11b	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
	2483.50	<54 dBuV	Pass
802.11g	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
	2483.50	<54 dBuV	Pass
802.11n-HT20	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
	2483.50	<54 dBuV	Pass

The edge emissions are below the FCC 15.209 Limits or complies with the 15.247(d) requirements.

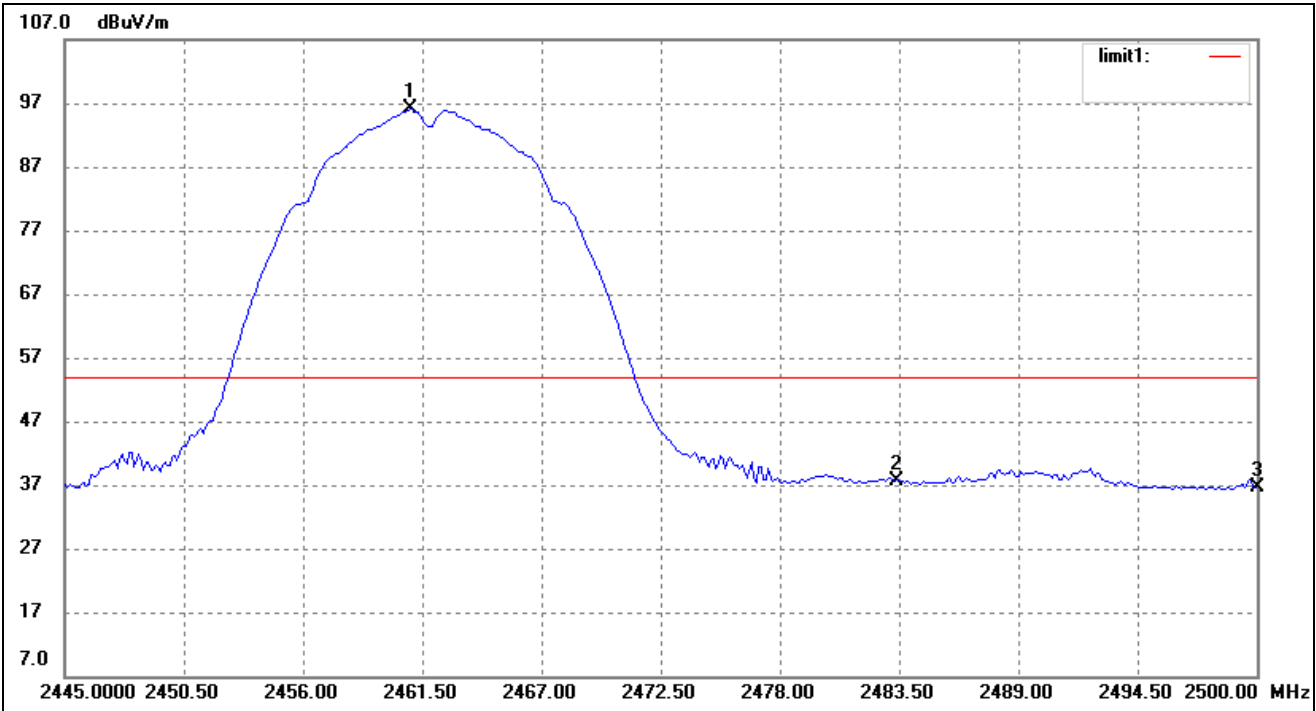
Please refer to the test plots as below.

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	29.30	-3.71	25.59	54.00	-28.41	Average Detector
	2310.000	41.38	-3.71	37.67	74.00	-36.33	Peak Detector
2	2390.000	39.72	-3.54	36.18	54.00	-17.82	Average Detector
	2390.000	52.26	-3.54	48.72	74.00	-25.28	Peak Detector
3	2400.000	45.65	-3.51	42.14	54.00	-11.86	Average Detector
	2400.000	56.04	-3.51	52.53	74.00	-21.47	Peak Detector

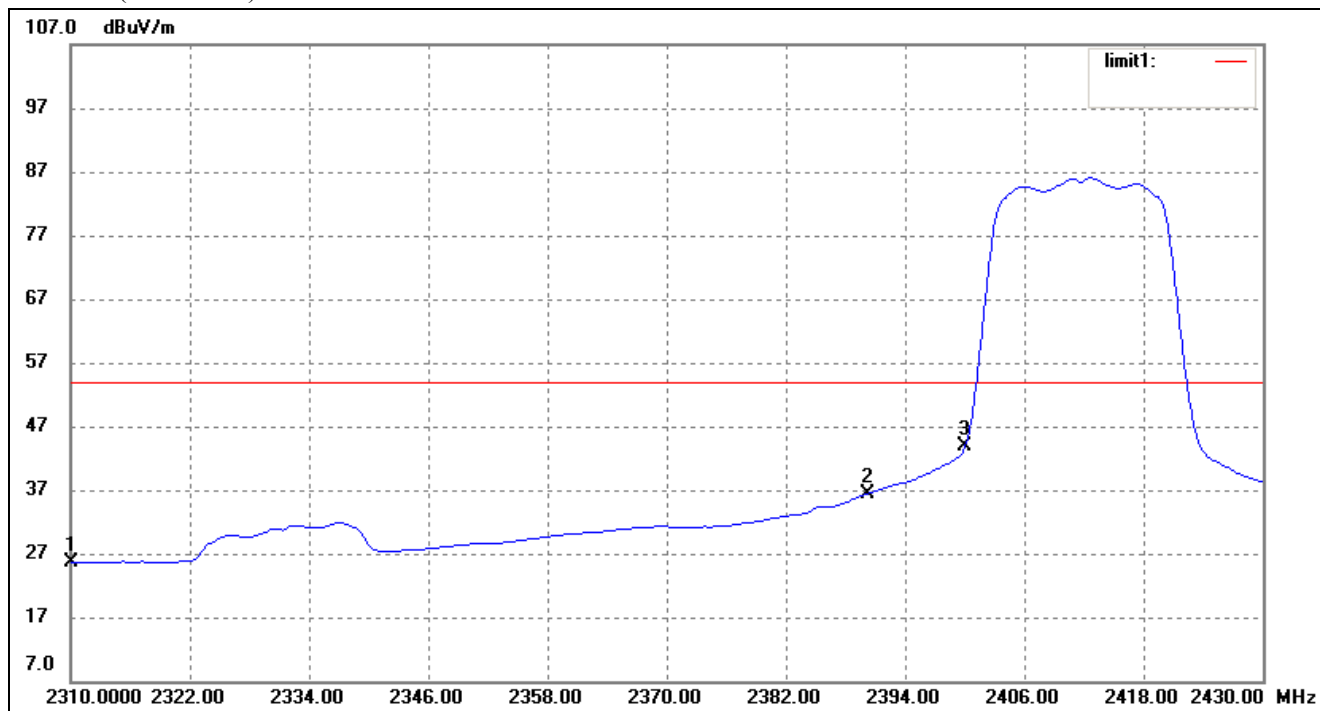
802.11b-Highest Bandedge  
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2461.043	99.42	-3.37	96.05	/	/	Average Detector
	2461.043	103.37	-3.37	100.00	/	/	Peak Detector
2	2483.500	Delta = 50.54dBc		37.75	54.00	-16.25	Average Detector
	2483.500			49.46	74.00	-24.54	Peak Detector
3	2500.000	39.88	-3.28	36.60	54.00	-17.40	Average Detector
	2500.000	51.52	-3.28	48.24	74.00	-25.76	Peak Detector

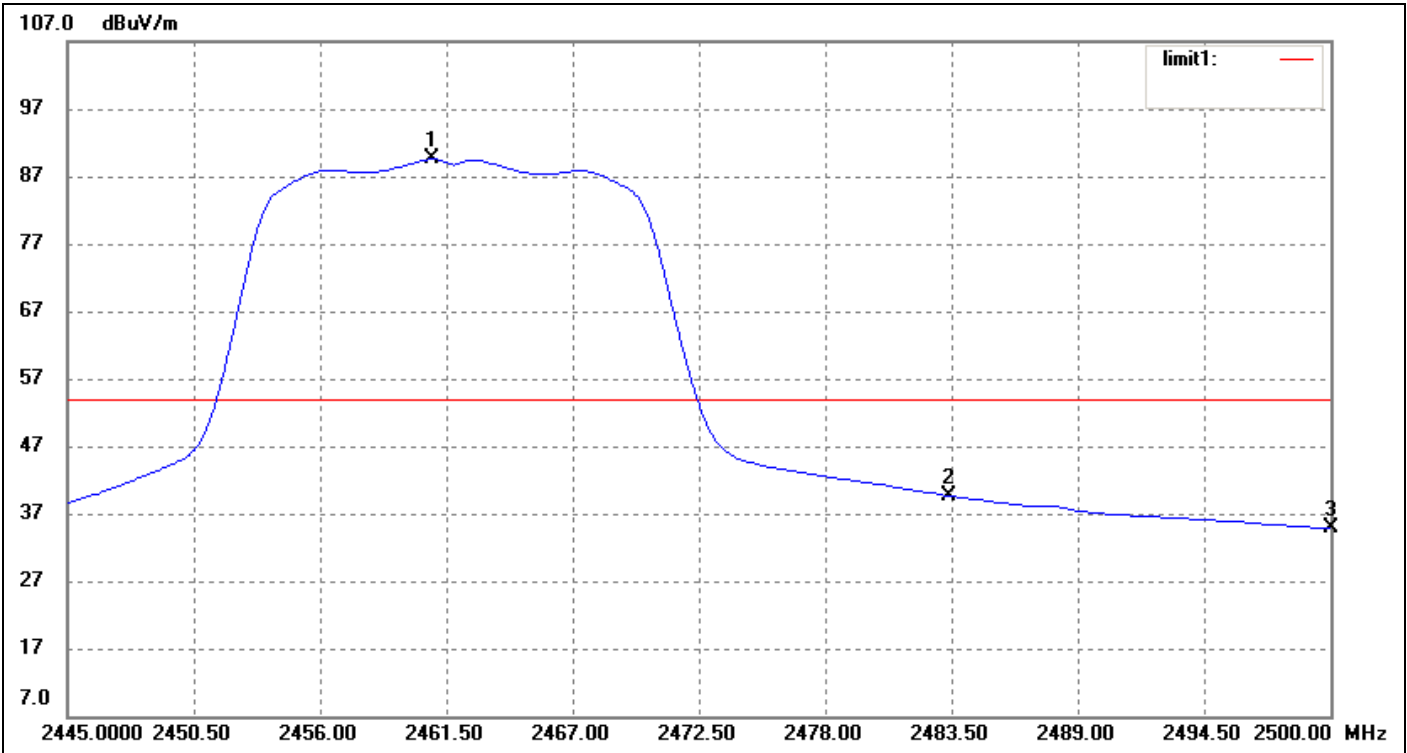
802.11g-Lowest Bandedge

Vertical (Worst case)



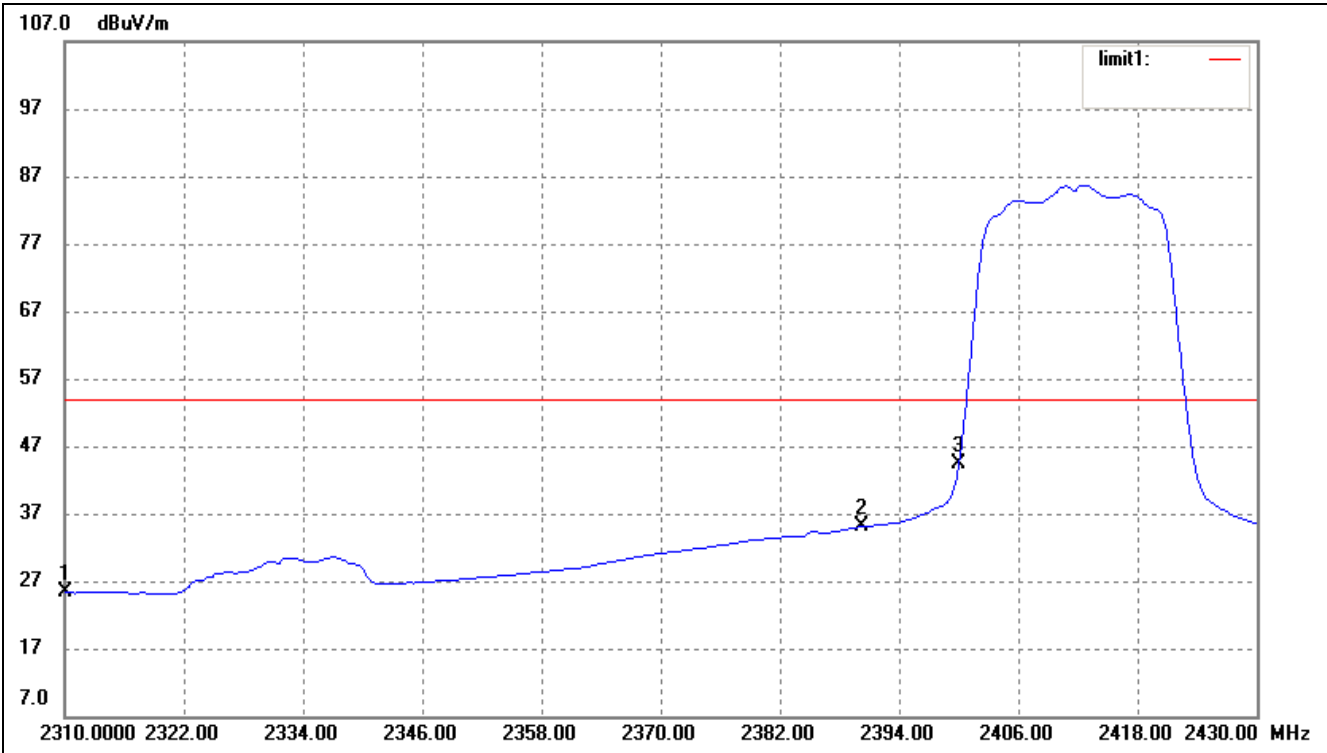
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	29.27	-3.71	25.56	54.00	-28.44	Average Detector
	2310.000	41.78	-3.71	38.07	74.00	-35.93	Peak Detector
2	2390.000	39.97	-3.54	36.43	54.00	-17.57	Average Detector
	2390.000	60.71	-3.54	57.17	74.00	-16.83	Peak Detector
3	2400.000	47.27	-3.51	43.76	54.00	-10.24	Average Detector
	2400.000	72.34	-3.51	68.83	74.00	-5.17	Peak Detector

802.11g-Highest Bandedge  
Vertical (Worst case)



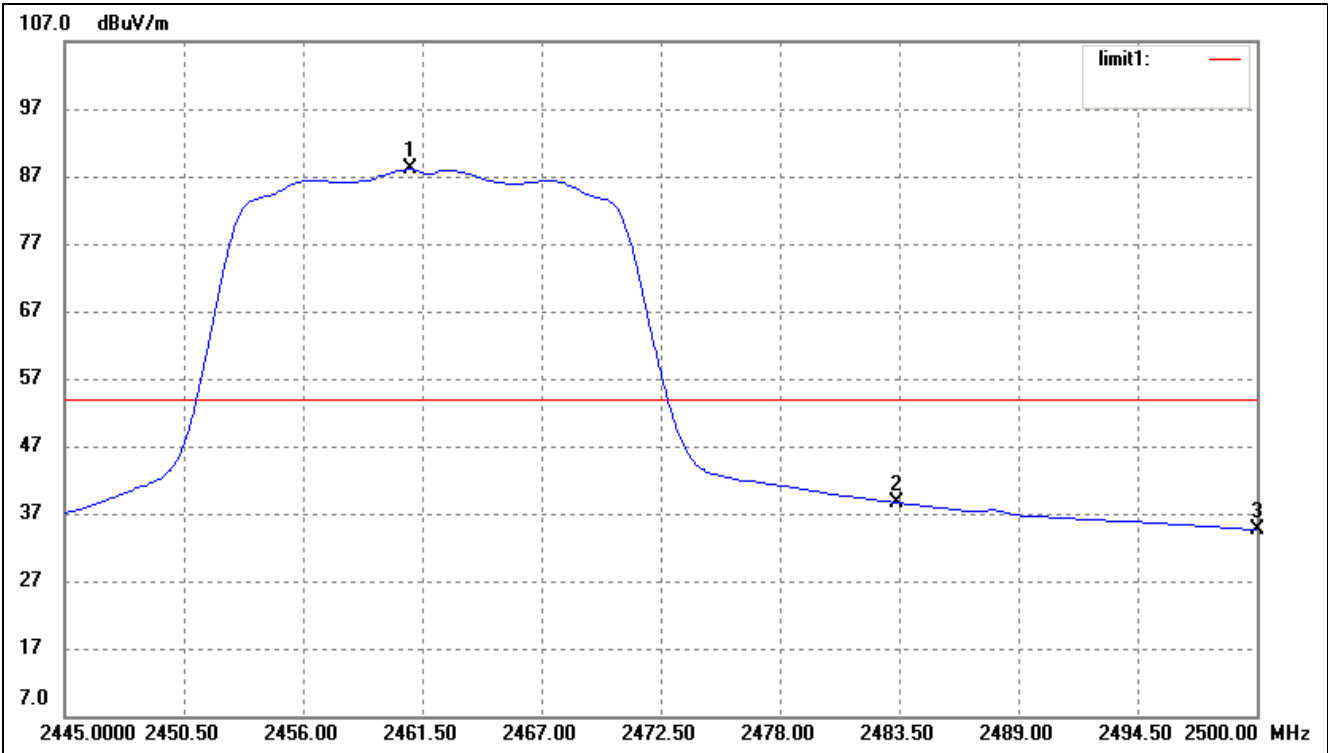
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2460.934	92.93	-3.37	89.56	/	/	Average Detector
	2460.934	104.93	-3.37	101.56	/	/	Peak Detector
2	2483.500	Delta = 40.01dBc		39.59	54.00	-14.41	Average Detector
	2483.500			61.55	74.00	-12.45	Peak Detector
3	2500.000	38.12	-3.28	34.84	54.00	-19.16	Average Detector
	2500.000	51.62	-3.28	48.34	74.00	-25.66	Peak Detector

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



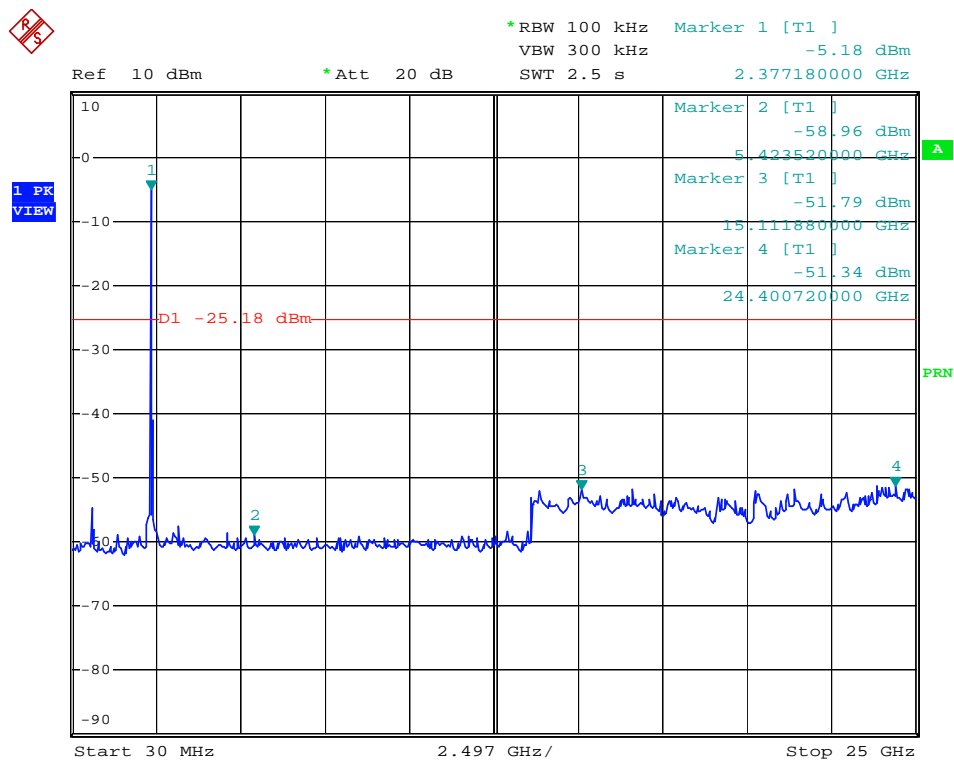
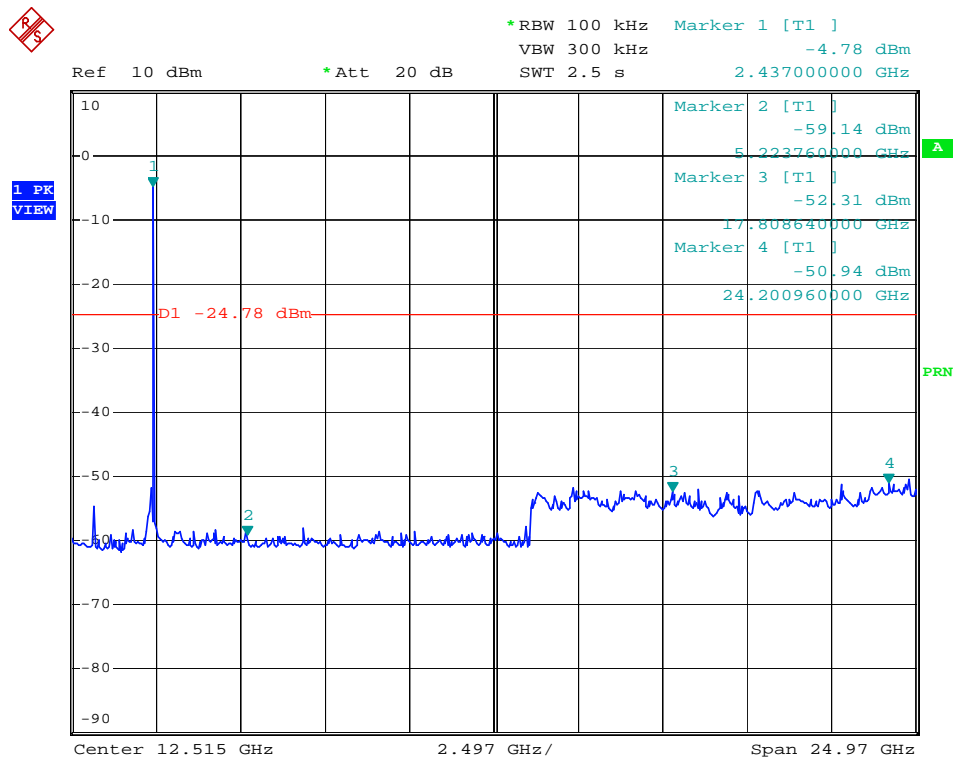
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	29.02	-3.71	25.31	54.00	-28.69	Average Detector
	2310.000	41.35	-3.71	37.64	74.00	-36.36	Peak Detector
2	2390.000	38.62	-3.54	35.08	54.00	-18.92	Average Detector
	2390.000	57.79	-3.54	54.25	74.00	-19.75	Peak Detector
3	2400.000	47.98	-3.51	44.47	54.00	-9.53	Average Detector
	2400.000	68.06	-3.51	64.55	74.00	-9.45	Peak Detector

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

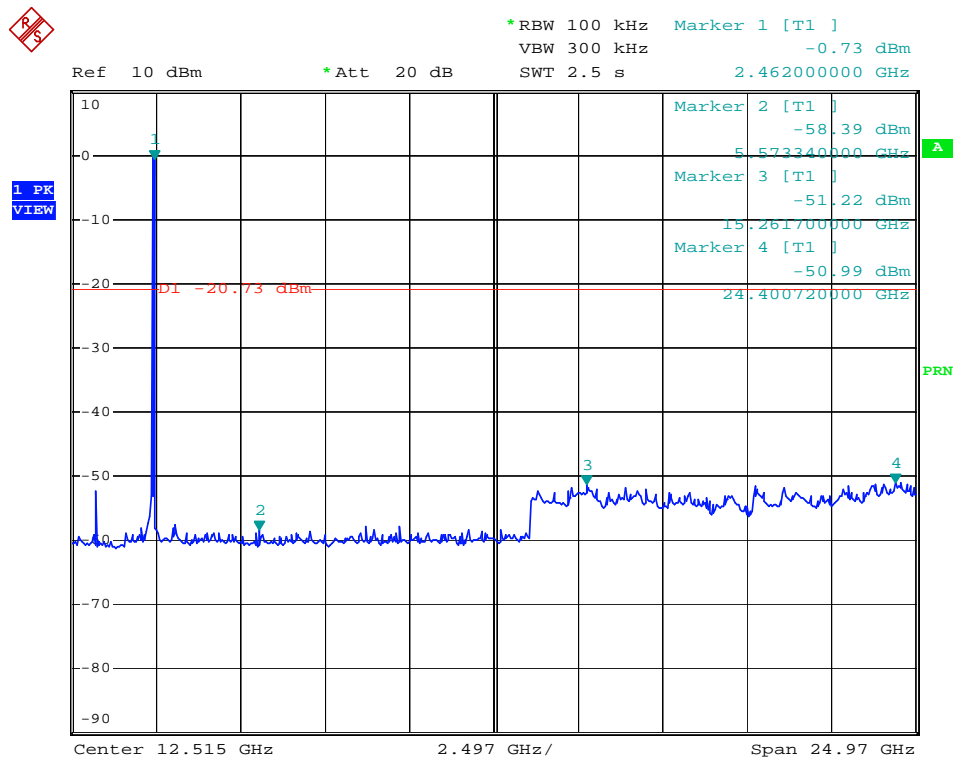


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2461.043	91.45	-3.37	88.08	/	/	Average Detector
	2461.043	102.84	-3.37	99.47	/	/	Peak Detector
2	2483.500	Delta = 41.45dBc		38.59	54.00	-15.41	Average Detector
	2483.500			58.02	74.00	-15.98	Peak Detector
3	2500.000	37.92	-3.28	34.64	54.00	-19.36	Average Detector
	2500.000	2500.000	50.07	-3.28	46.79	74.00	Peak Detector

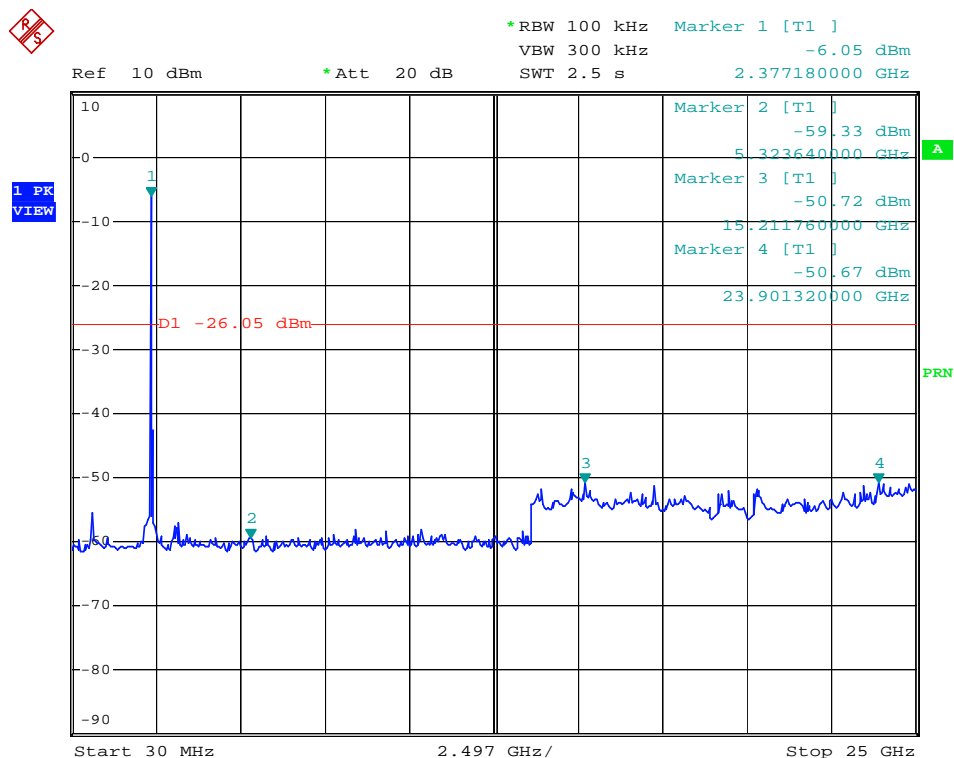


**Conducted Spurious Emissions****802.11b-Low Channel****802.11b-Middle Channel**

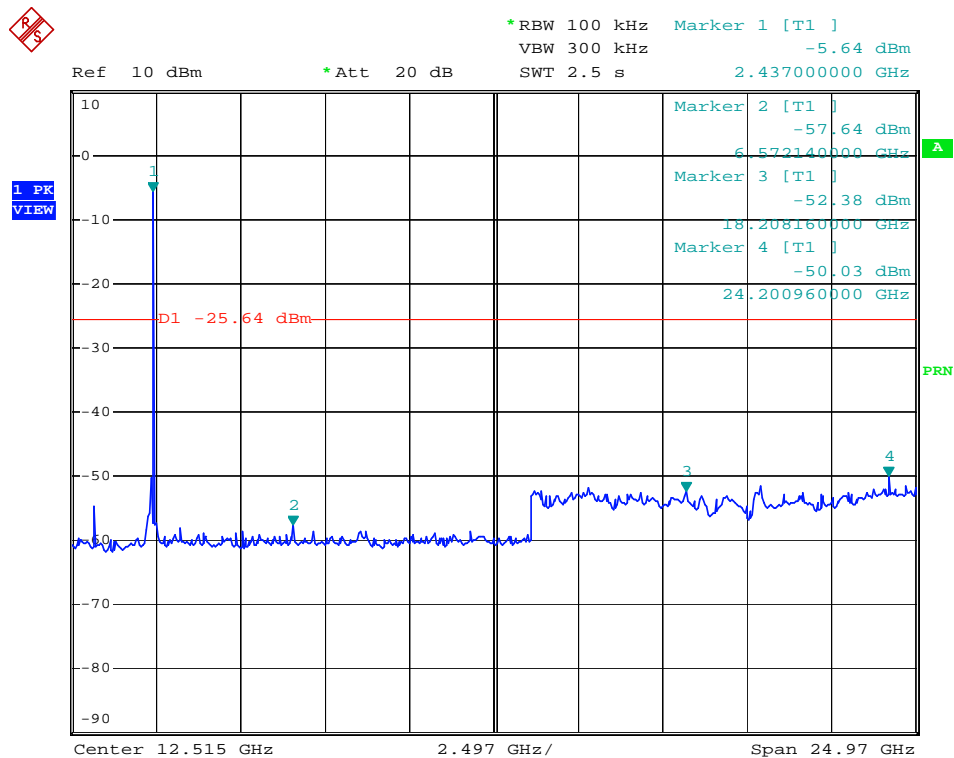
## 802.11b High Channel



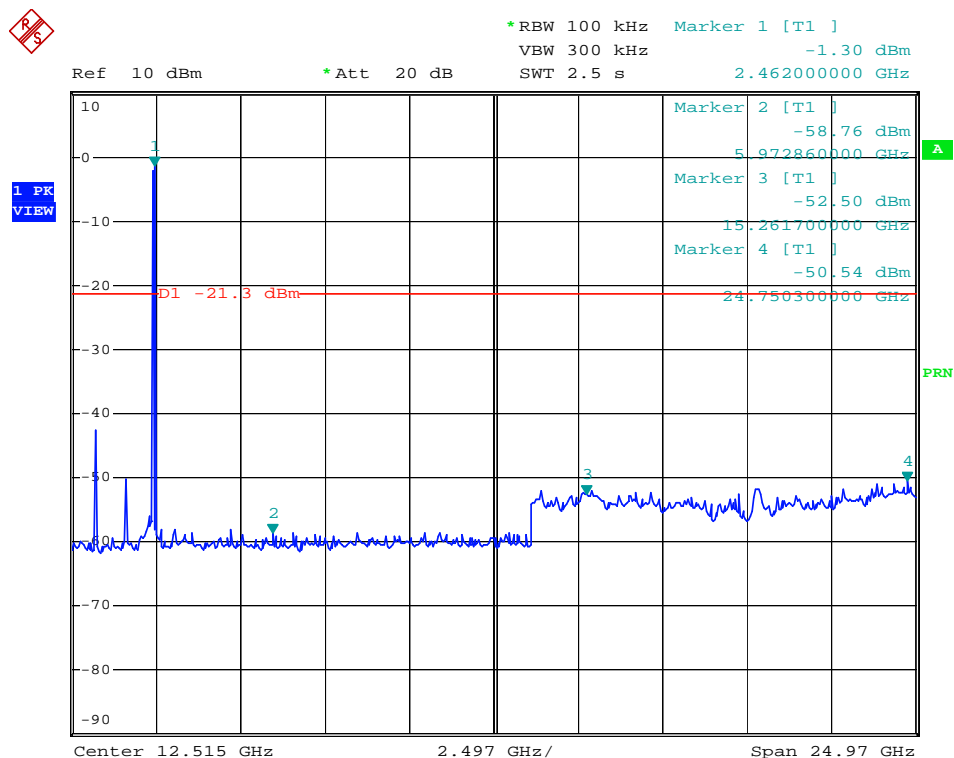
## 802.11g Low Channel



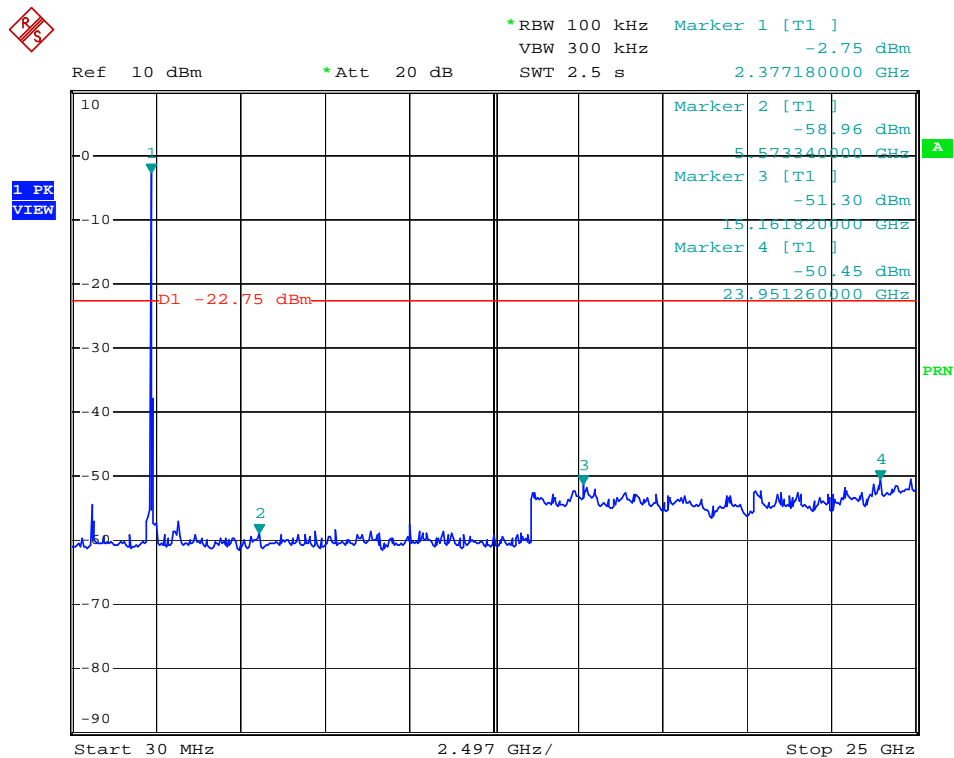
## 802.11g Middle Channel



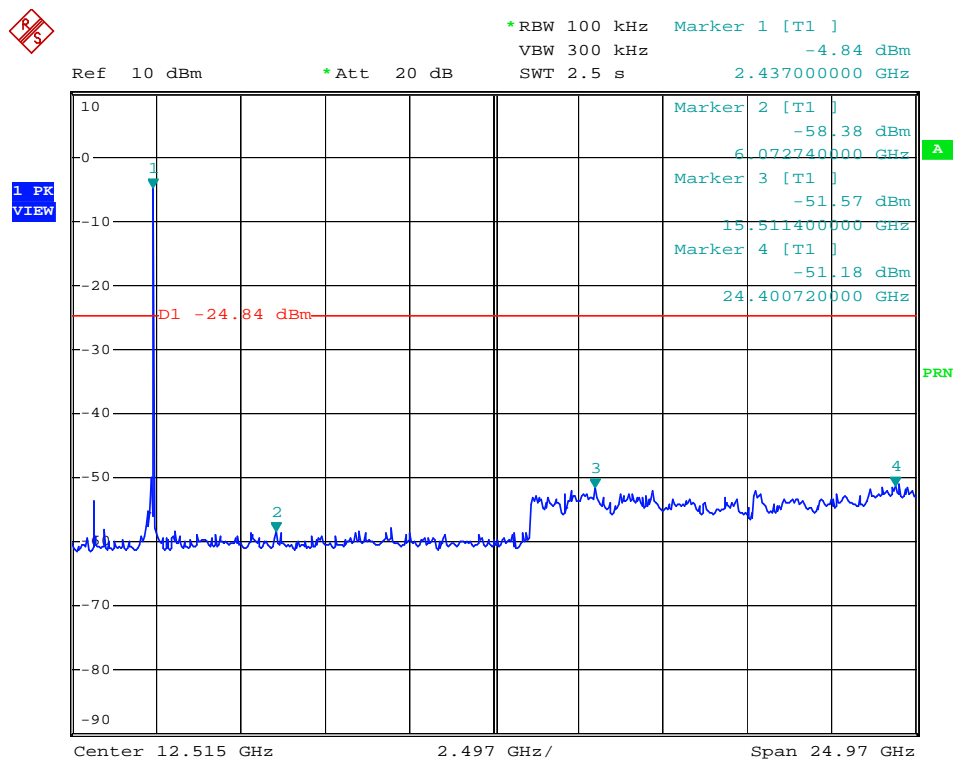
## 802.11g-High Channel



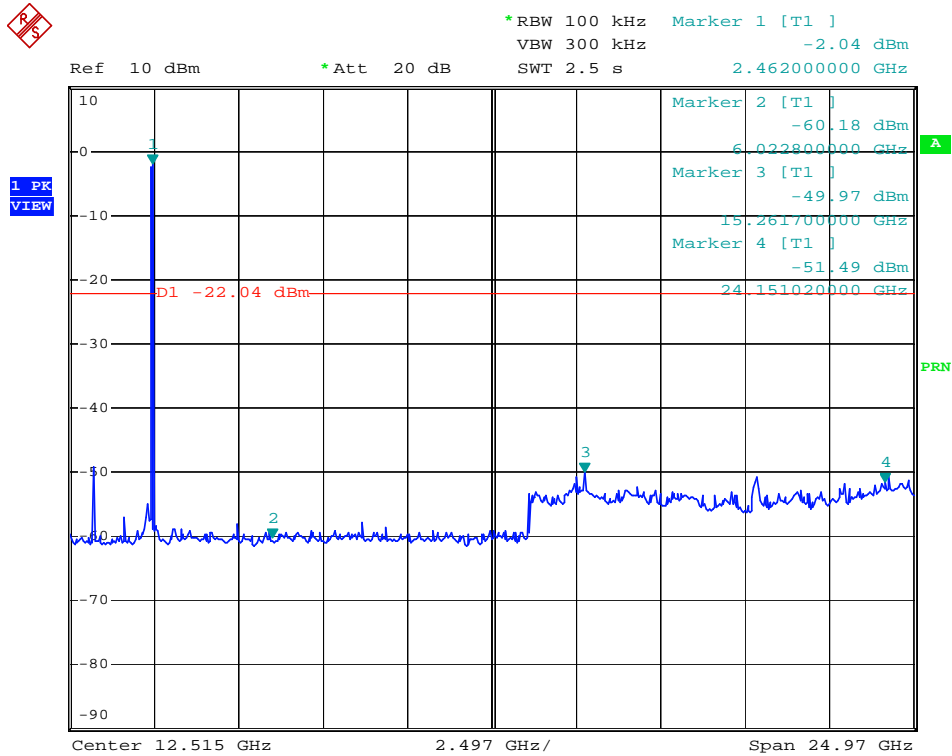
## 802.11n-HT20 Low Channel



## 802.11n-HT20 Middle Channel



802.11n-HT20 High Channel



## 9. Conducted Emissions

### 9.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is  $\pm 2.88$  dB.

### 9.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2013-05-07	2014-05-06
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2013-05-07	2014-05-06
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2013-05-07	2014-05-06

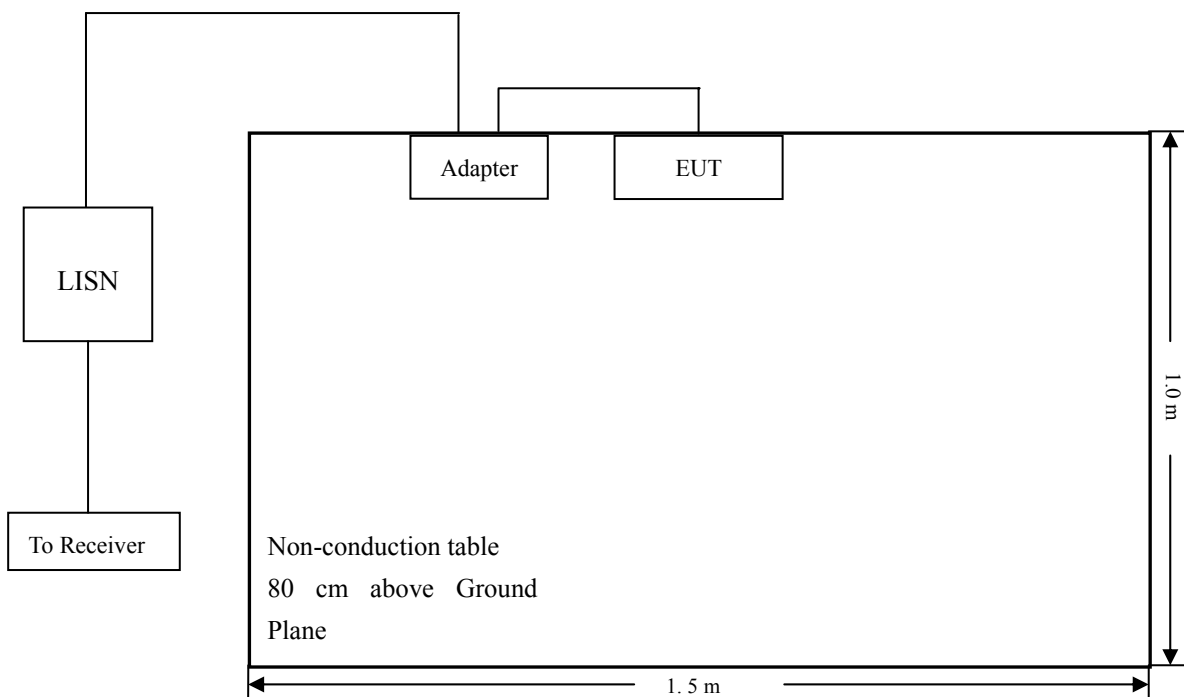
### 9.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 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.

### 9.4 Basic Test Setup Block Diagram



## 9.5 Environmental Conditions

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

## 9.6 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

## 9.7 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:

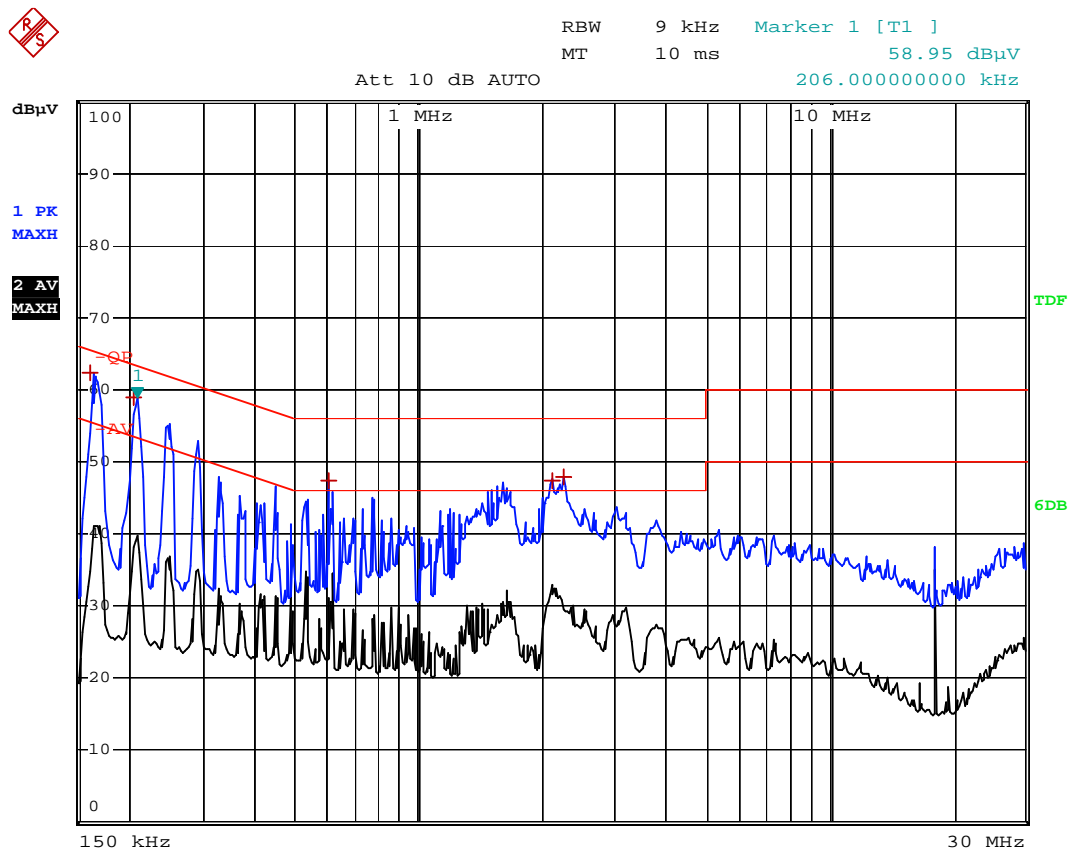
**-3.06 dB at 0.162MHz in the Neutral mode, Max peak detector, 0.15-30MHz**

## 9.8 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

EUT: Tablet PC  
Tested Model: U25GT  
Operating Condition: Charging and Transmitting  
Comment: AC 120V/60Hz, USB 5V

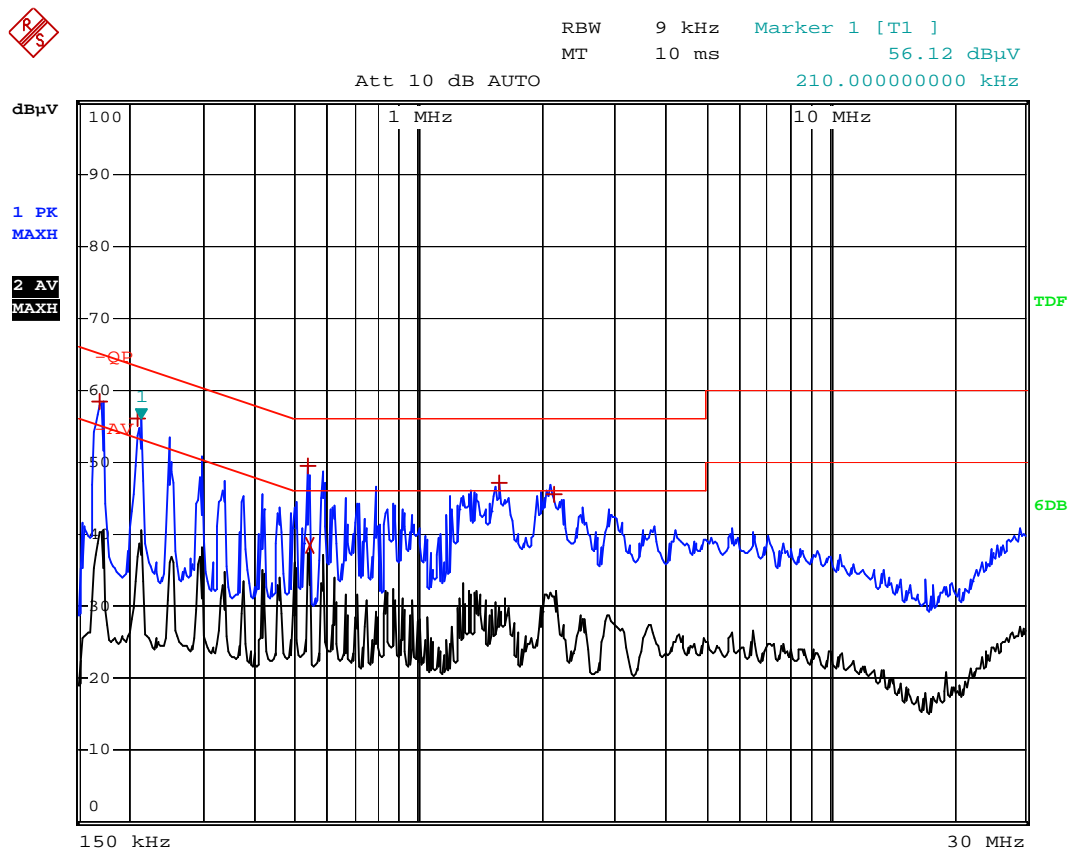
Test Specification: Neutral



EDIT PEAK LIST (Prescan Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Max Peak	162 kHz	62.29	-3.06
1 Max Peak	206 kHz	58.94	-4.41
1 Max Peak	606 kHz	47.33	-8.66
1 Max Peak	2.114 MHz	47.42	-8.57
1 Max Peak	2.25 MHz	47.78	-8.21



Test Specification: Live



EDIT PEAK LIST (Prescan Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Max Peak	170 kHz	58.47	-6.48
1 Max Peak	210 kHz	56.11	-7.08
1 Max Peak	538 kHz	49.40	-6.59
2 Average	542 kHz	38.49	-7.50
1 Max Peak	1.57 MHz	47.04	-8.95
1 Max Peak	2.134 MHz	45.59	-10.40

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