

# FCC Part 15C Measurement and Test Report

For

**Insane Enterprises. Inc.**

**22631 Pacific Coast HWY, Suite 469, Malibu, CA 90265 USA**

**FCC ID: 2ADMI-SMT1**

**FCC Rule(s):** FCC Part 15C

**Product Description:** Waterproof rugged phone

**Tested Model:** SMT1

**Report No.:** STR14118070I-2

**Tested Date:** 2014-11-12 to 2014-12-06

**Issued Date:** 2014-12-08

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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 Shenzhen SEM.Test Technology Co., Ltd.

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## 1. GENERAL INFORMATION

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

#### Client Information

Applicant: Insane Enterprises. Inc.  
 Address of applicant: 22631 Pacific Coast HWY, Suite 469, Malibu, CA 90265  
 USA

Manufacturer: Insane Enterprises. Inc.  
 Address of manufacturer: 22631 Pacific Coast HWY, Suite 469, Malibu, CA 90265  
 USA

General Description of EUT	
Product Name:	Waterproof rugged phone
Brand Name:	Sierra Mountain Technology
Model No.:	SMT1
Hardware Version:	F034_V1.3
Software Version:	F034_ENGLISH_26_V0.1_EMMC_V45_20141101
IMEI:	358903321097928/358903321080536
Rated Voltage:	DC 3.7V Battery
Battery:	Capacitance: 3000mAh
Device Category:	Portable Device
<p><i>The EUT is dual band GSM850/GSM900/DCS1800/PCS1900, WCDMA Band I/V, Waterproof rugged phone. The Waterproof rugged phone is intended for speech and Multimedia Message Service (MMS) transmission. It is equipped with GPRS/EDGE class 12 for GSM850/PCS1900 and Wi-Fi, Bluetooth, GPS, and camera functions. For more information see the following datasheet.</i></p> <p><i>Note: The test data is gathered from a production sample, provided 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:	9.10dBm (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:	2.0dBi

## 1.2 Test Standards

The following report is prepared on behalf of the Insane Enterprises. Inc. 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, 2462MHz, 2467MHz, 2472MHz
TM2	802.11g	2412MHz, 2442MHz, 2462MHz, 2467MHz, 2472MHz
TM3	802.11n-HT20	2412MHz, 2442MHz, 2462MHz, 2467MHz, 2472MHz
TM4	802.11n-HT40	2412MHz, 2442MHz, 2462MHz

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	0.6	Shielded	Without Core
Earphone	1.1	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E10	LR-63C8R
Adapter	/	ETA-U90JWS	/

## 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**

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#### **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 SAR Report.

## **4. Antenna Requirement**

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### **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

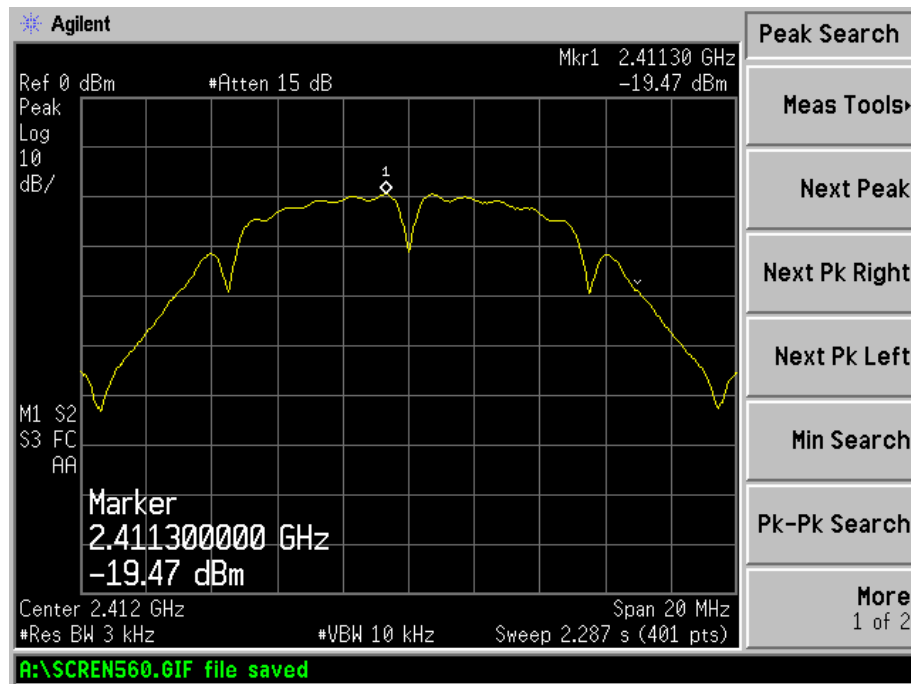
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

## 5.5 Summary of Test Results/Plots

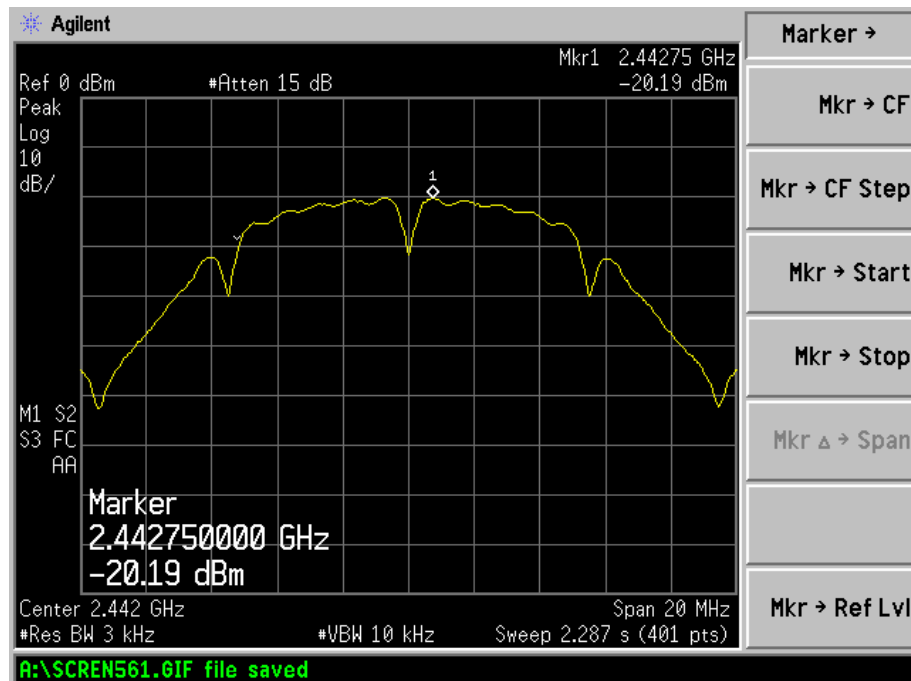
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b	2412	-19.47	8
	2442	-20.19	8
	2462	-20.15	8
	2467	-19.15	8
	2472	-20.76	8
802.11g	2412	-21.24	8
	2442	-21.92	8
	2462	-21.54	8
	2467	-21.12	8
	2472	-22.46	8
802.11n HT20	2412	-20.74	8
	2442	-20.56	8
	2462	-21.44	8
	2467	-22.51	8
	2472	-22.12	8
802.11n HT40	2422	-24.78	8
	2442	-24.60	8
	2462	-23.58	8

Please refer to the following test plots:

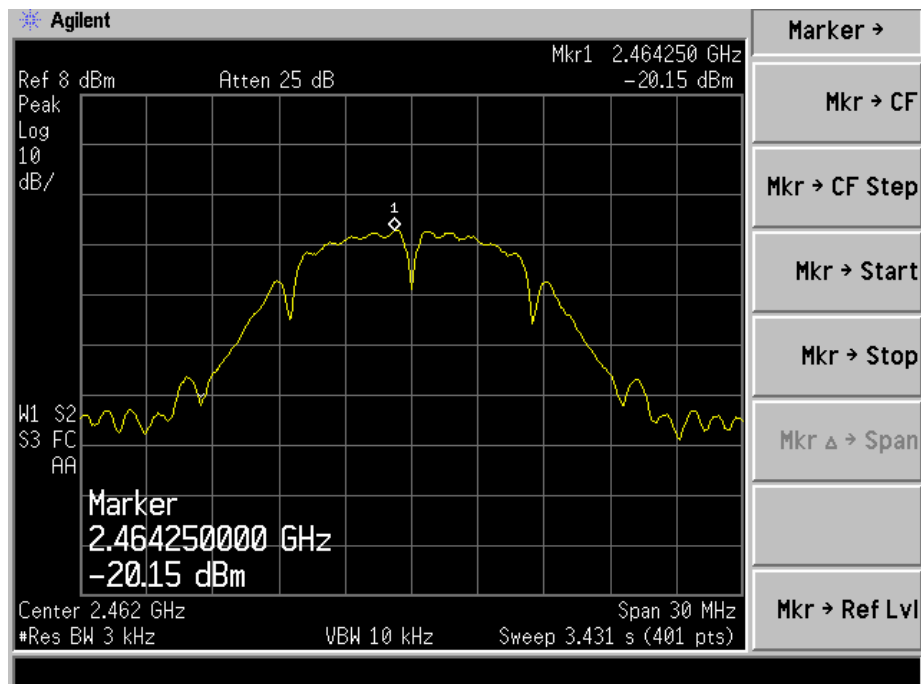
802.11b-Channel 1-2412MHz



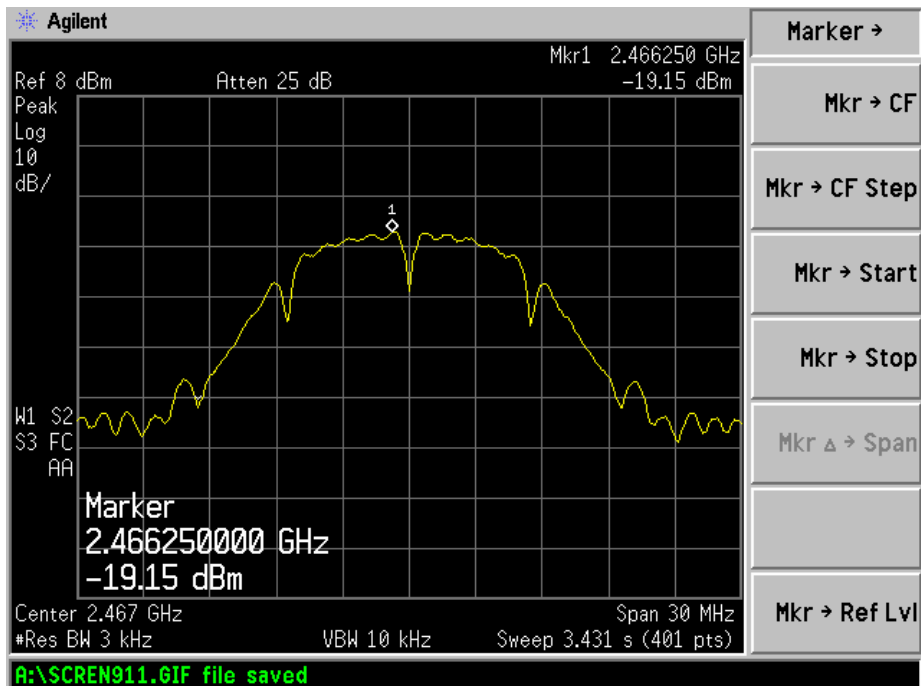
802.11b- Channel 7-2442MHz



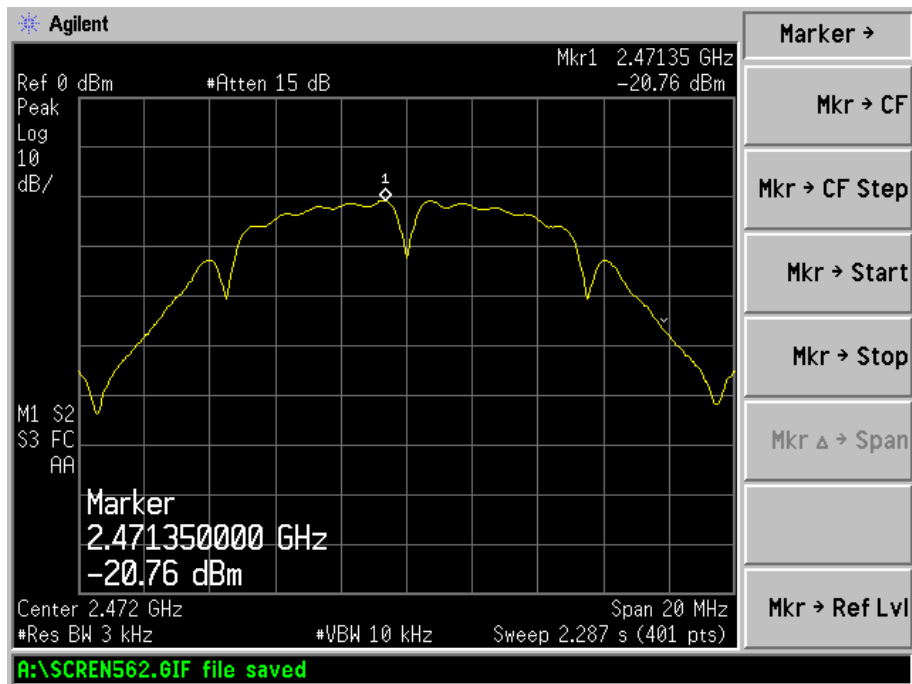
## 802.11b- Channel 11-2462MHz



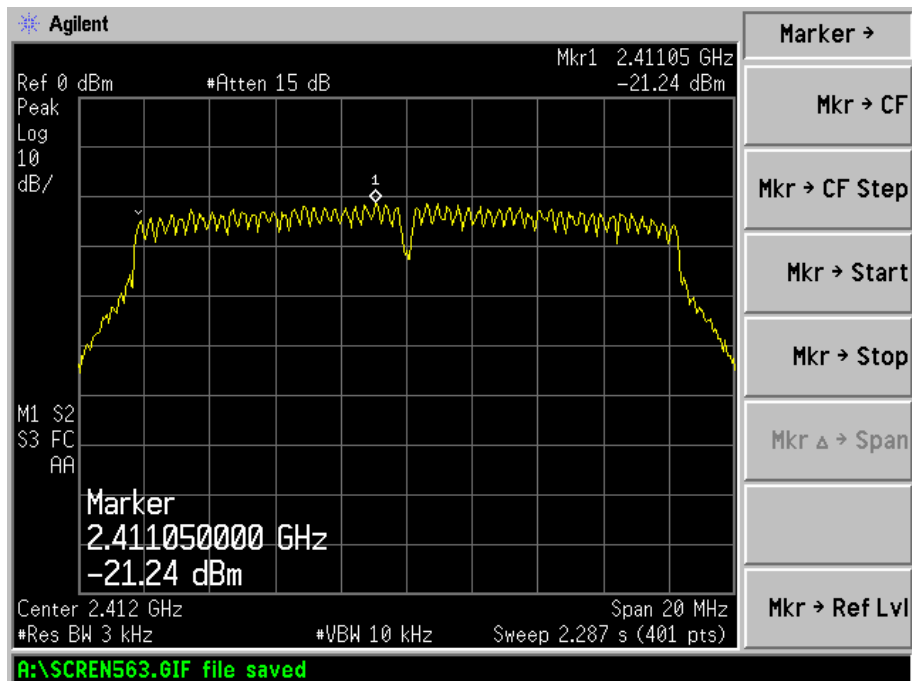
## 802.11b- Channel 12-2467MHz



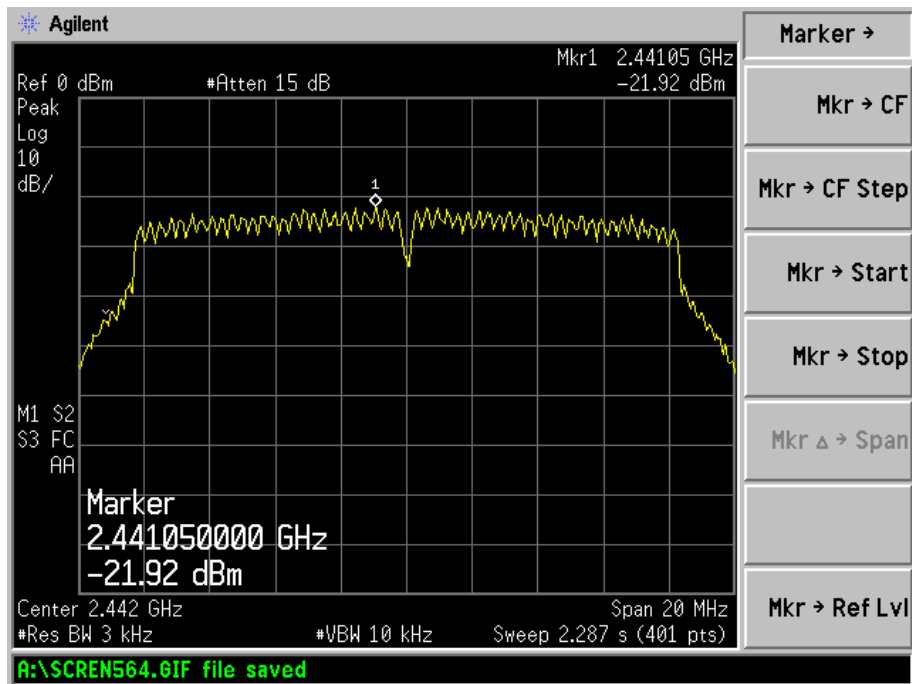
## 802.11b-Channel 13-2472MHz



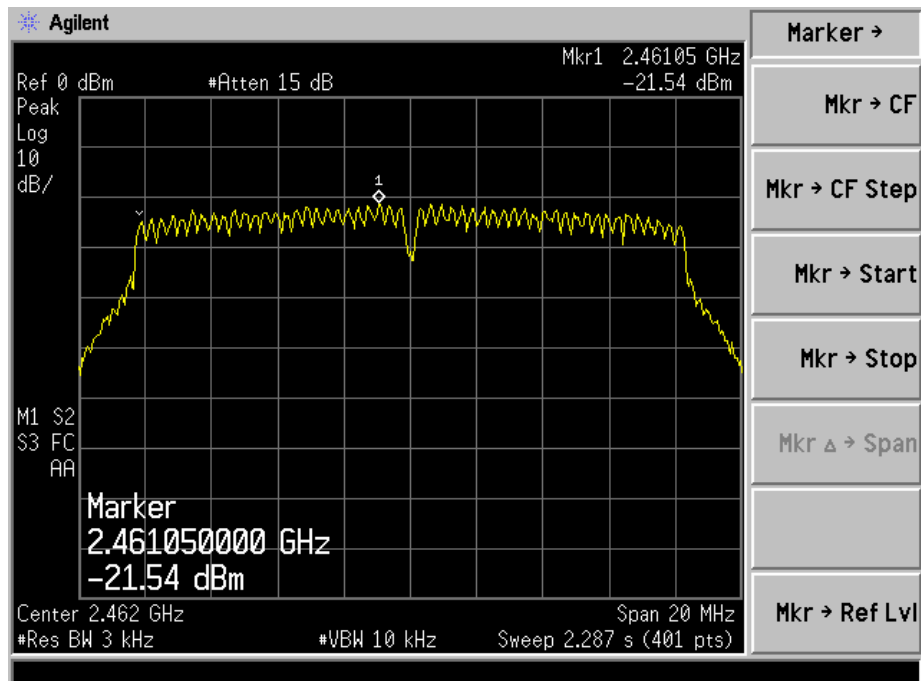
## 802.11g-Channel 1-2412MHz



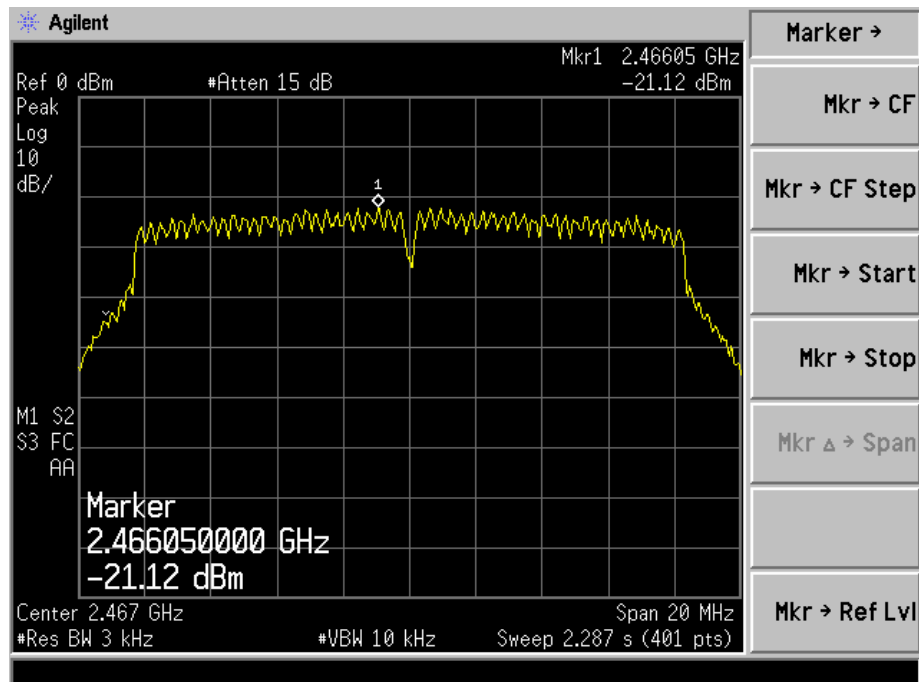
## 802.11g- Channel 7-2442MHz



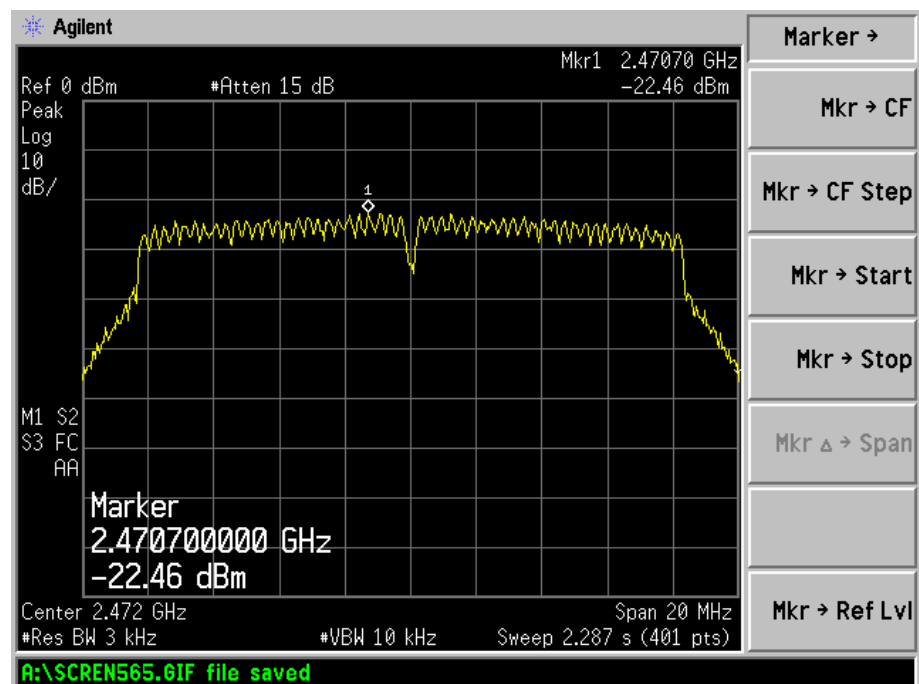
## 802.11g- Channel 11-2462MHz



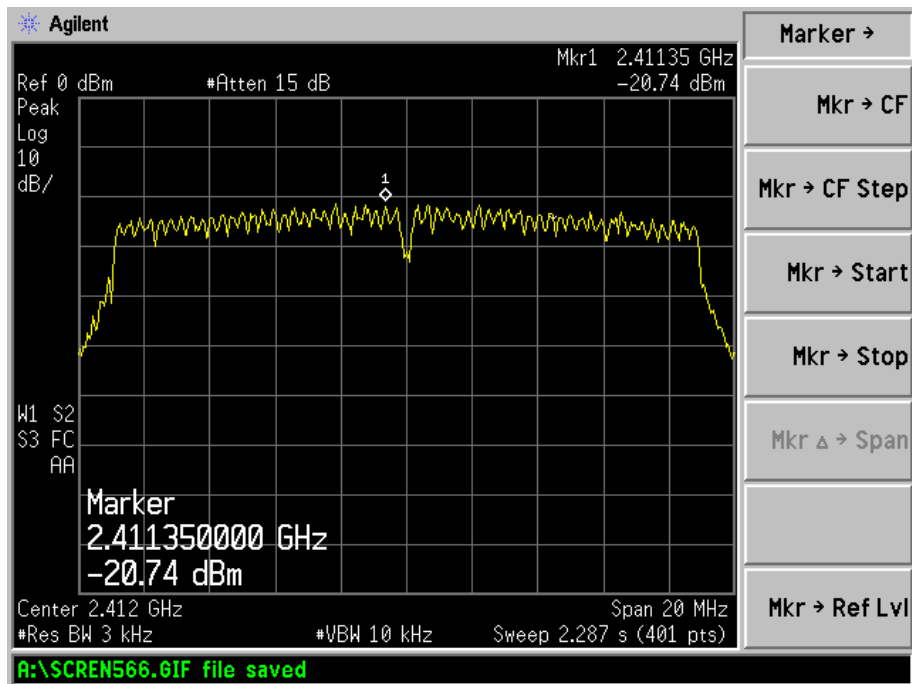
## 802.11g- Channel 12-2467MHz



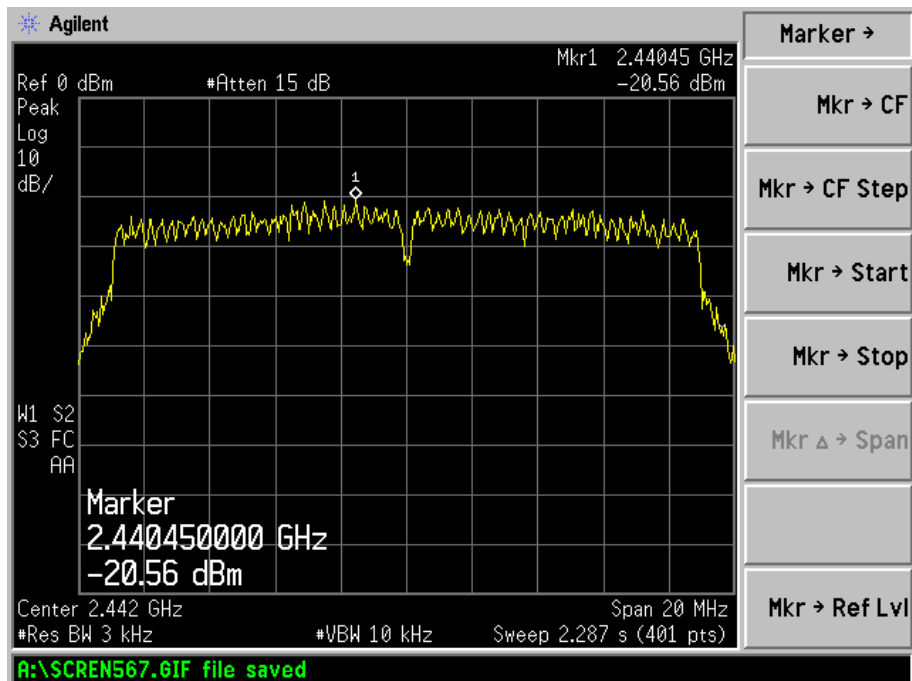
## 802.11g- Channel 13-2472MHz



## 802.11n-HT20-Channel 1-2412MHz

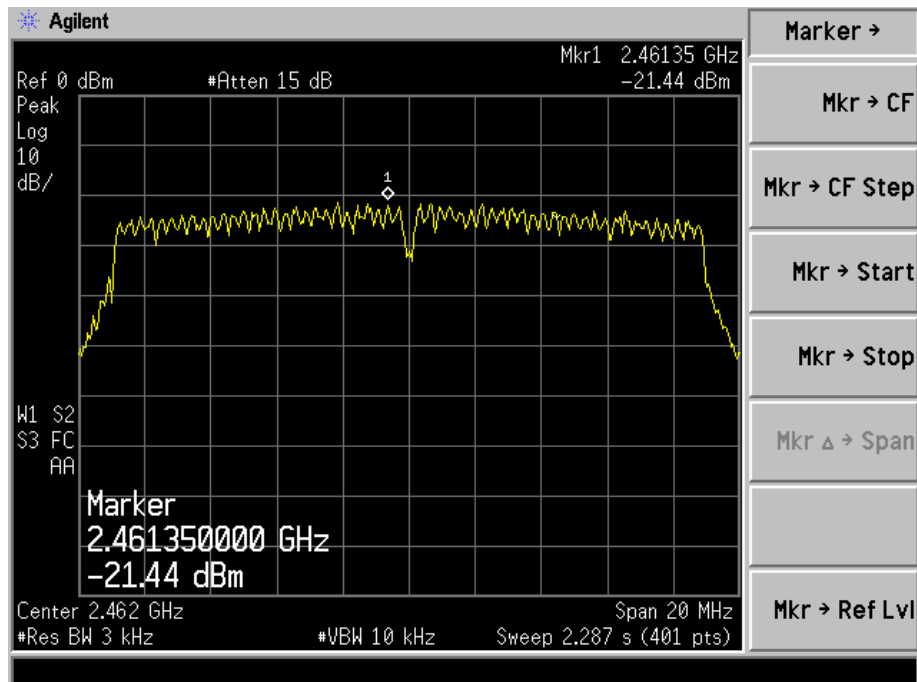


## 802.11n-HT20-Channel 7-2442MHz

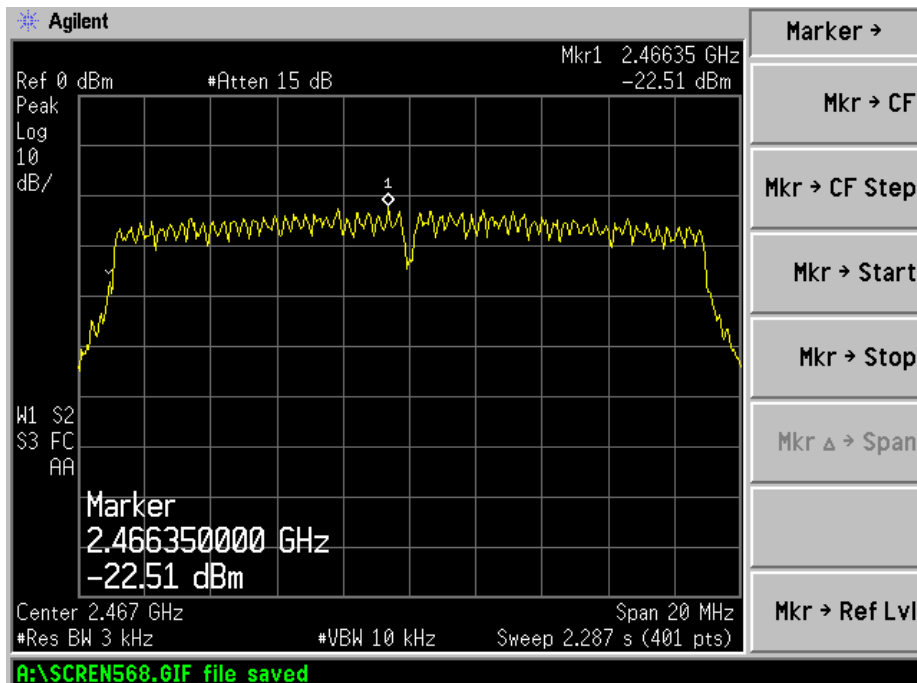




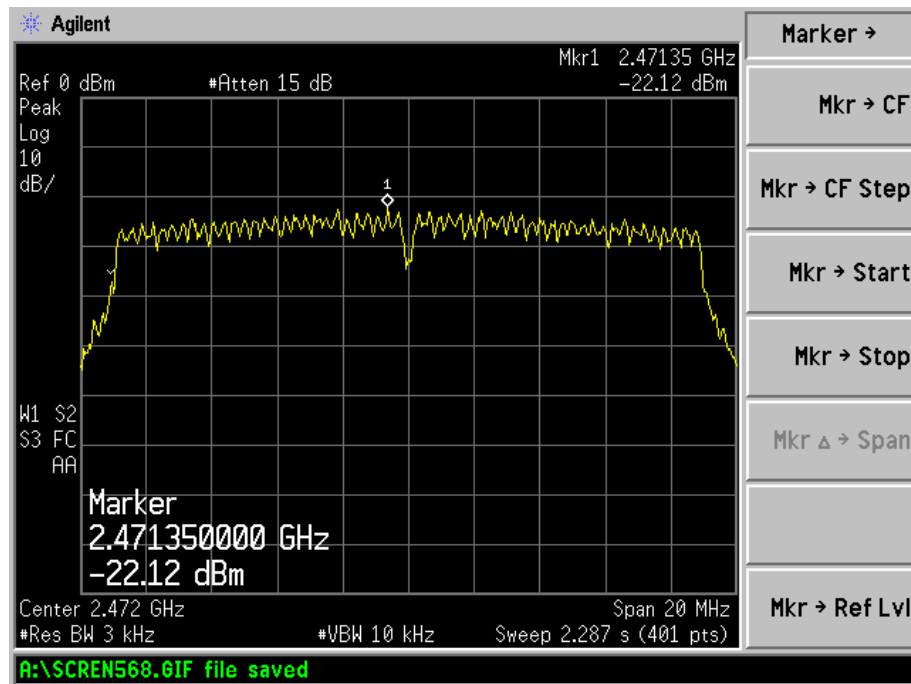
## 802.11n-HT20-Channel 11-2462MHz



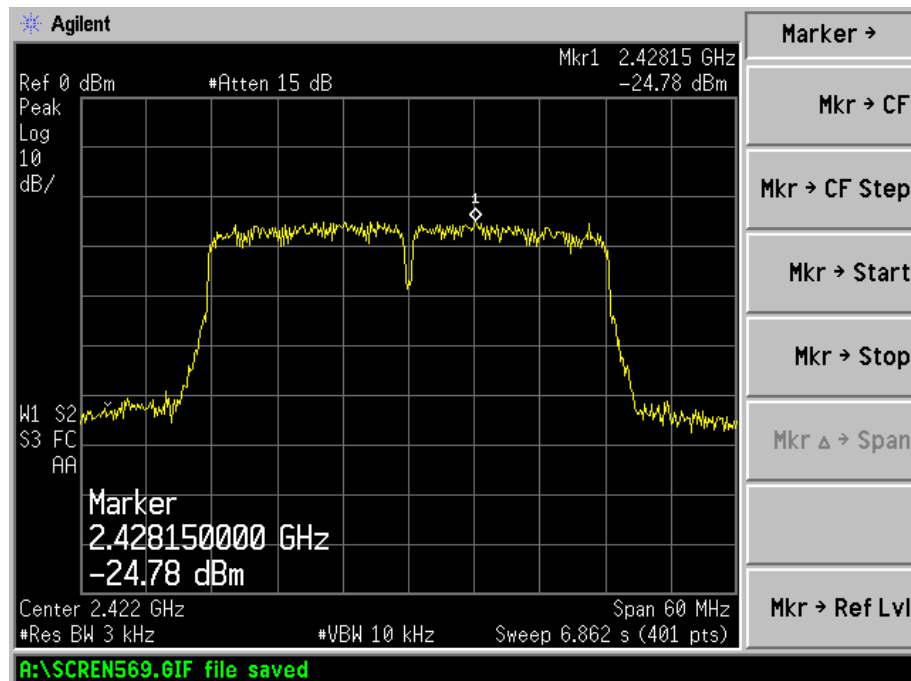
## 802.11n-HT20-Channel 12-2467MHz



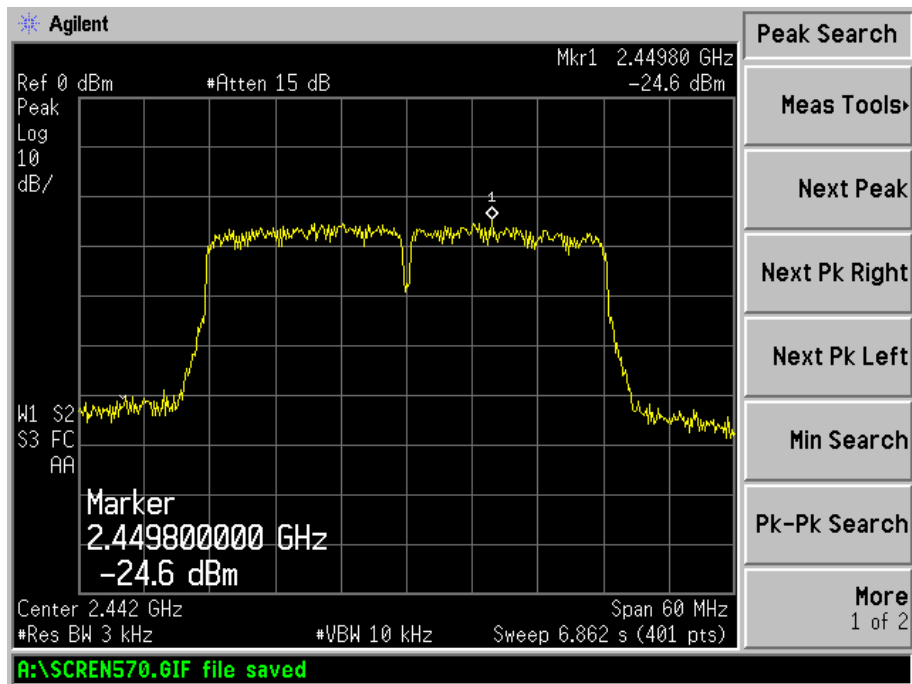
## 802.11n-HT20-Channel 13-2472MHz



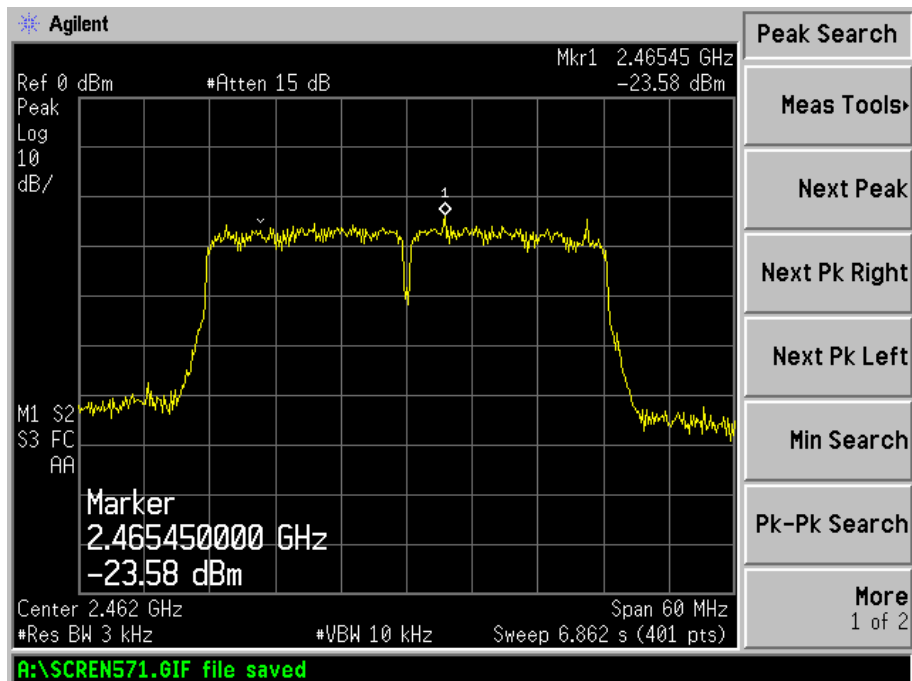
## 802.11n-HT40-Low Channel



## 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

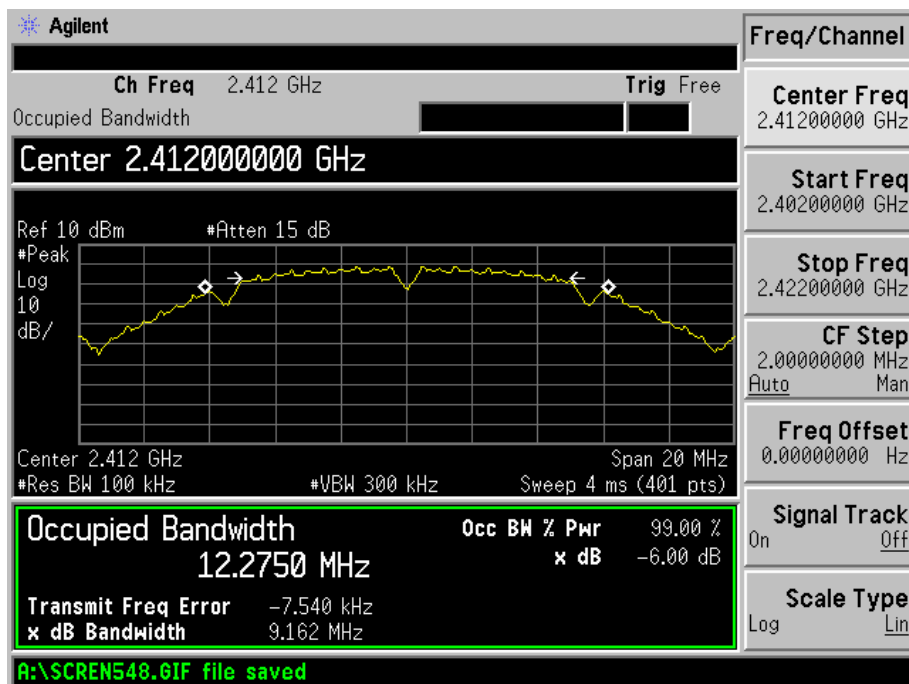
Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

## 6.5 Summary of Test Results/Plots

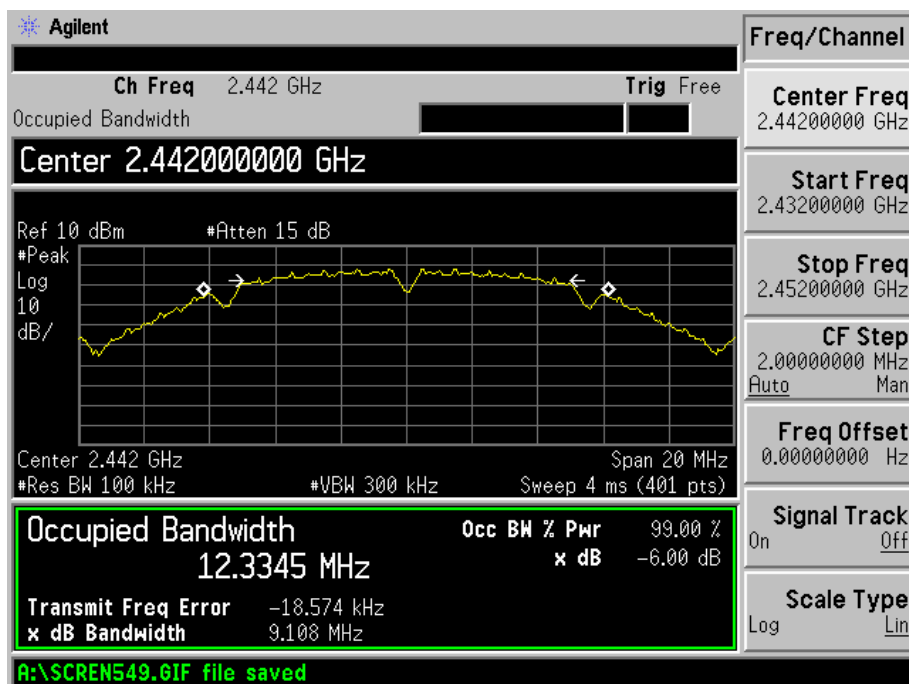
Test Mode	Test Channel MHz	6 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz
802.11b	2412	9162	12275.0	500
	2442	9108	12334.5	500
	2462	9054	12124.5	500
	2467	9183	12927.2	500
	2472	9149	12335.9	500
802.11g	2412	16398	16378.3	500
	2442	16476	16454.9	500
	2462	16151	16363.6	500
	2467	16341	16399.6	500
	2472	16446	16376.9	500
802.11n-HT20	2412	17659	17527.6	500
	2442	17640	17517.6	500
	2462	17225	17347.3	500
	2467	1765.3	17549.3	500
	2472	17654	17539.3	500
802.11n-HT40	2422	36375	35894.5	500
	2442	36423	35912.4	500
	2462	36405	35906.2	500

Please refer to the following test plots:

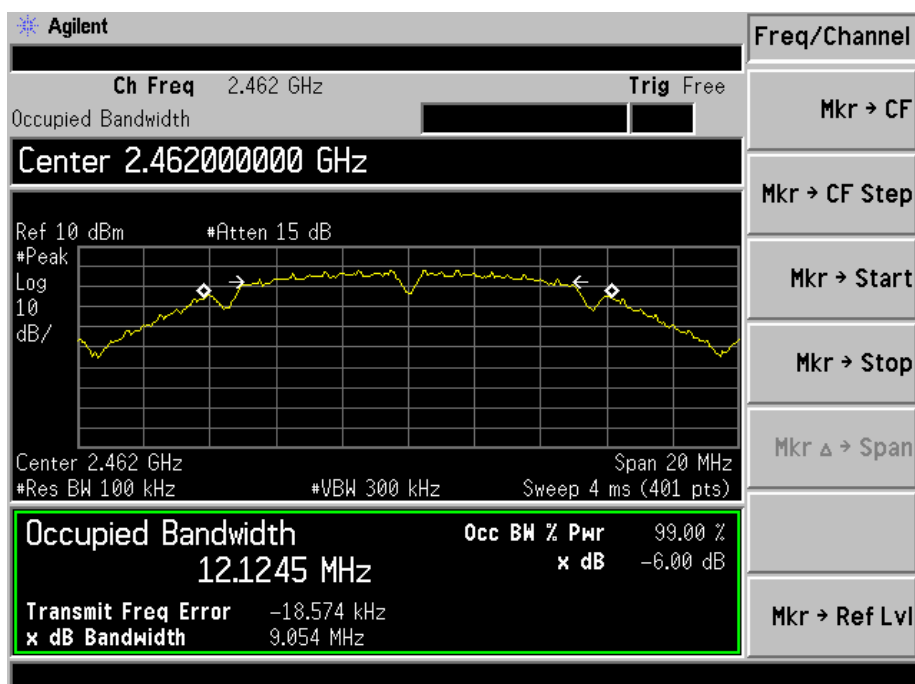
## 802.11b-Channel 1-2412MHz



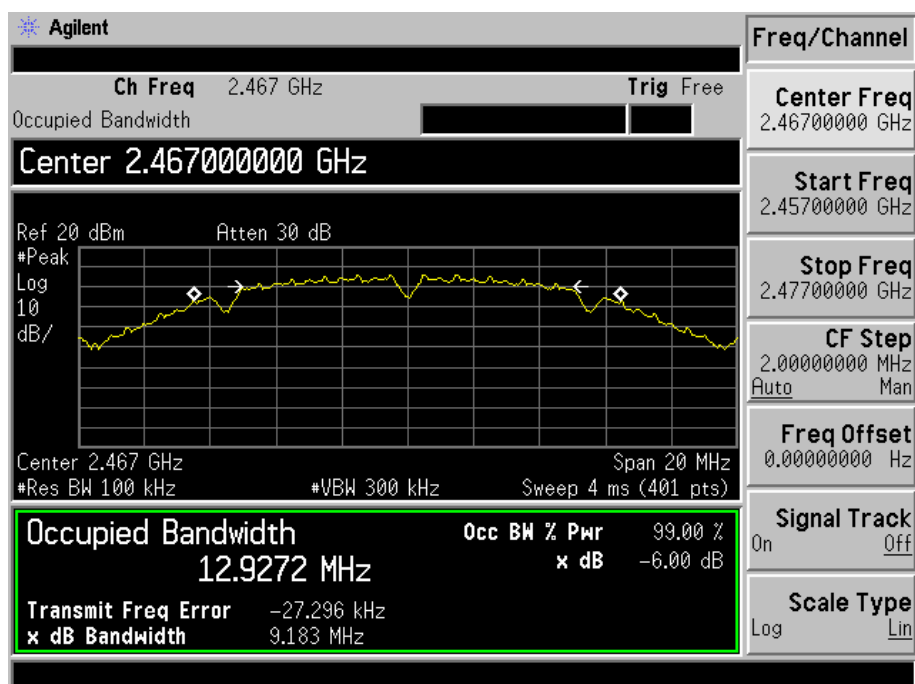
## 802.11b- Channel 7-2442MHz



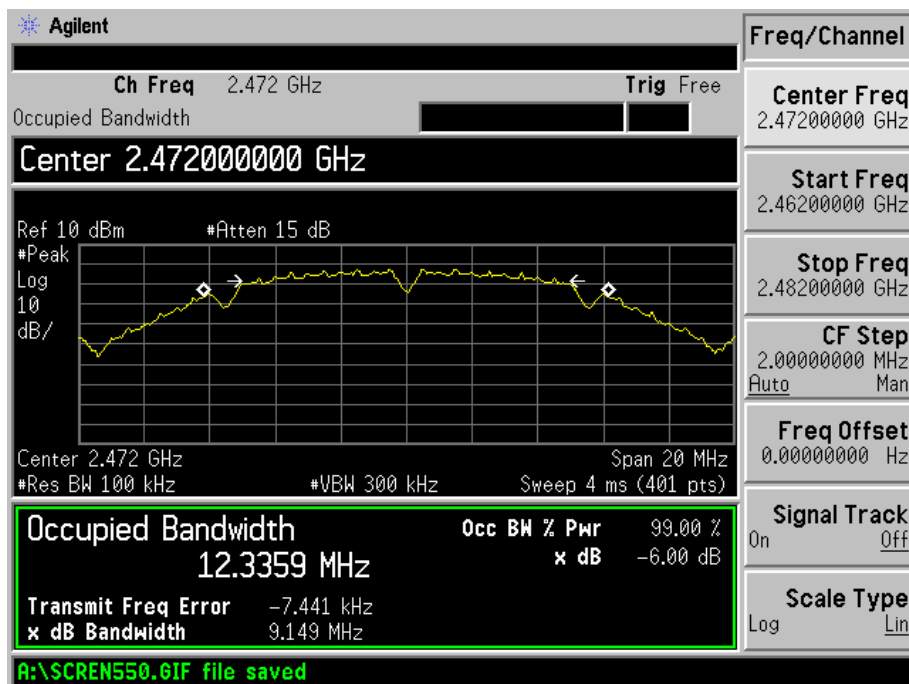
## 802.11b- Channel 11-2462MHz



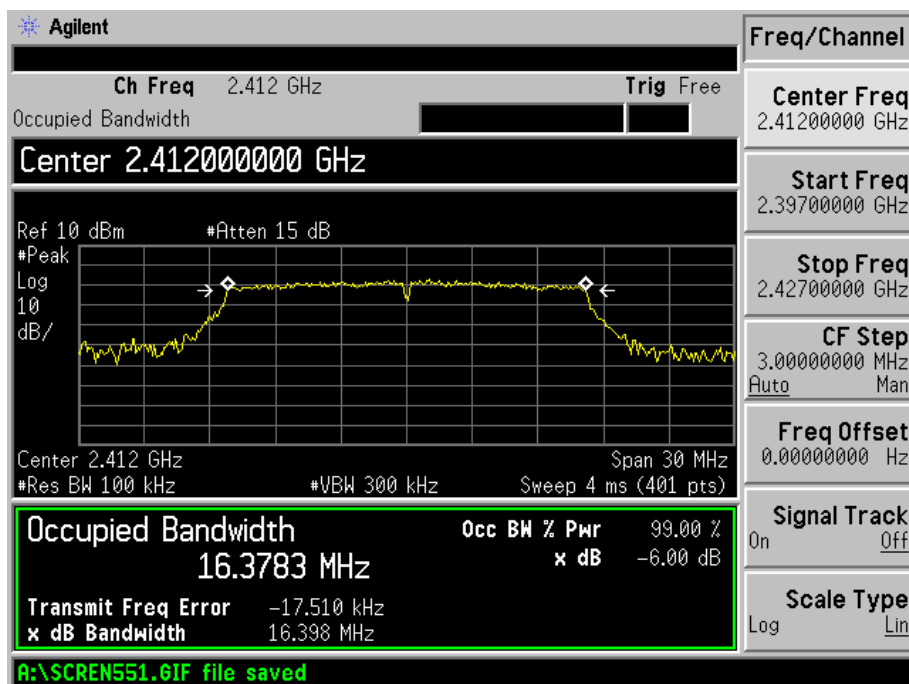
## 802.11b- Channel 12-2467MHz



## 802.11b- Channel 13-2472MHz

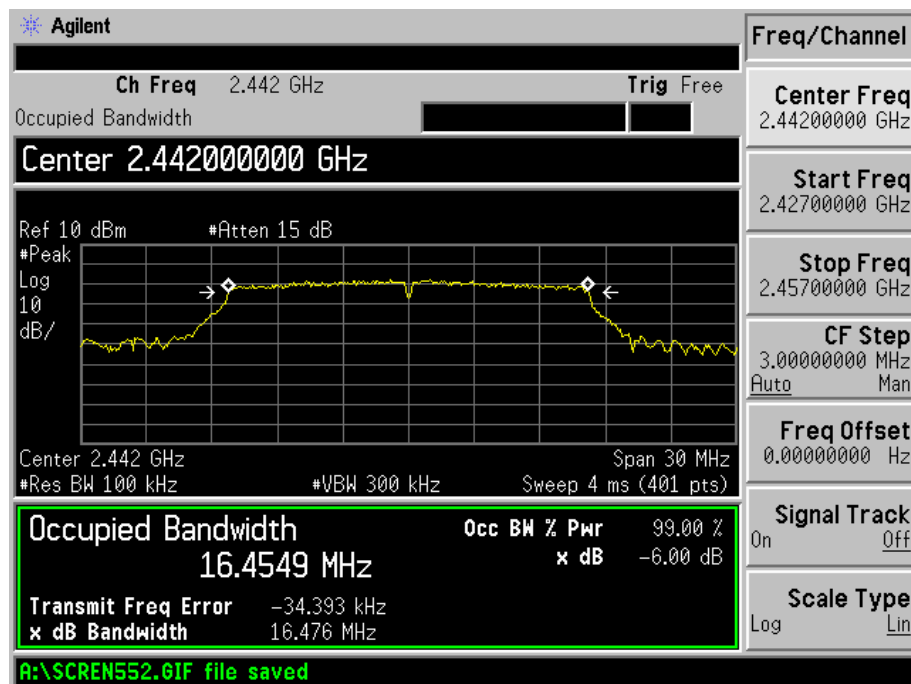


## 802.11g- Channel 1-2412MHz

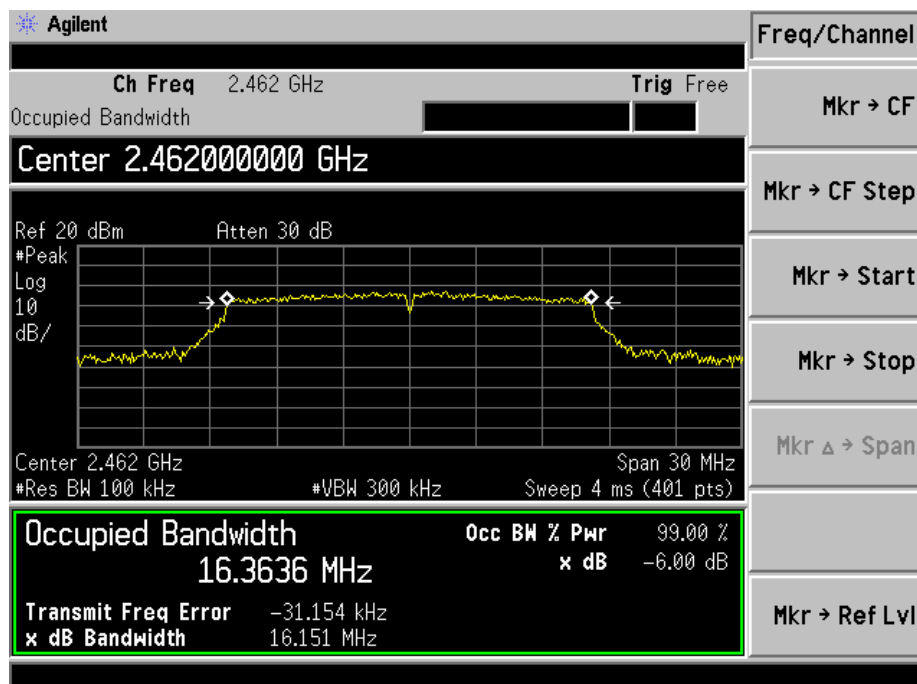




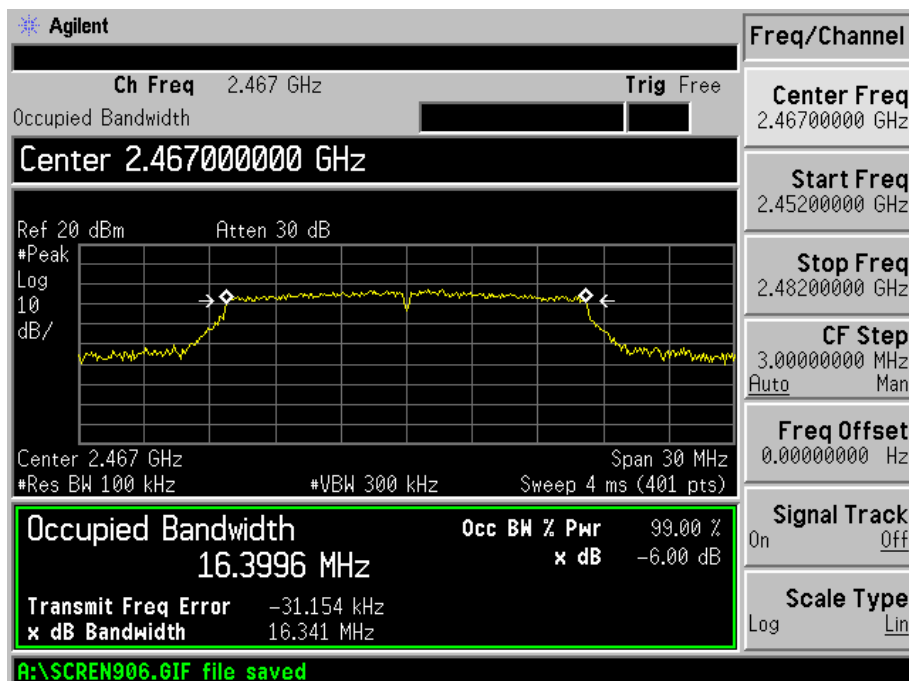
## 802.11g- Channel 7-2442MHz



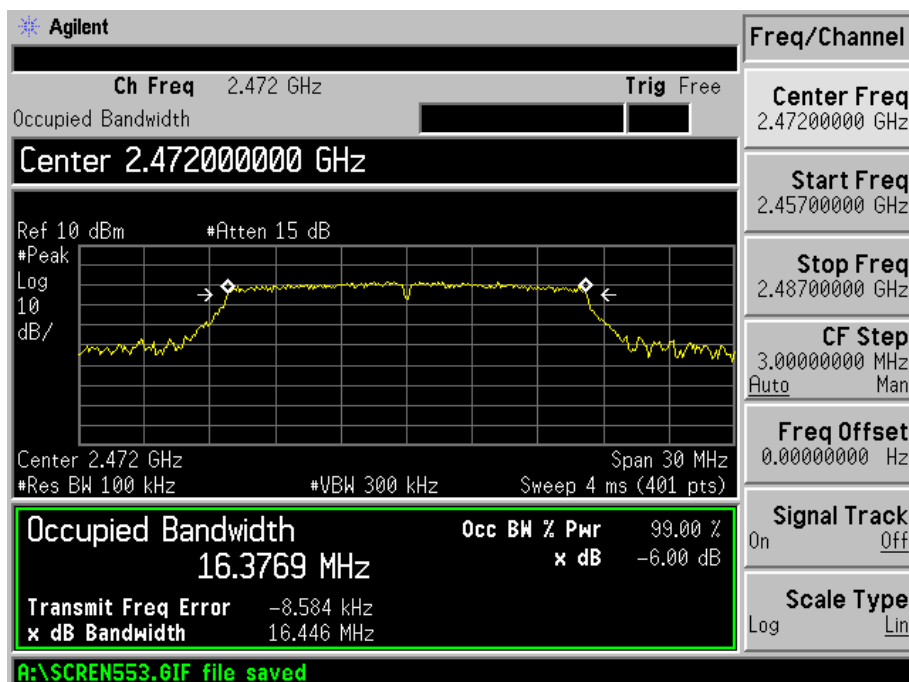
## 802.11g- Channel 11-2462MHz



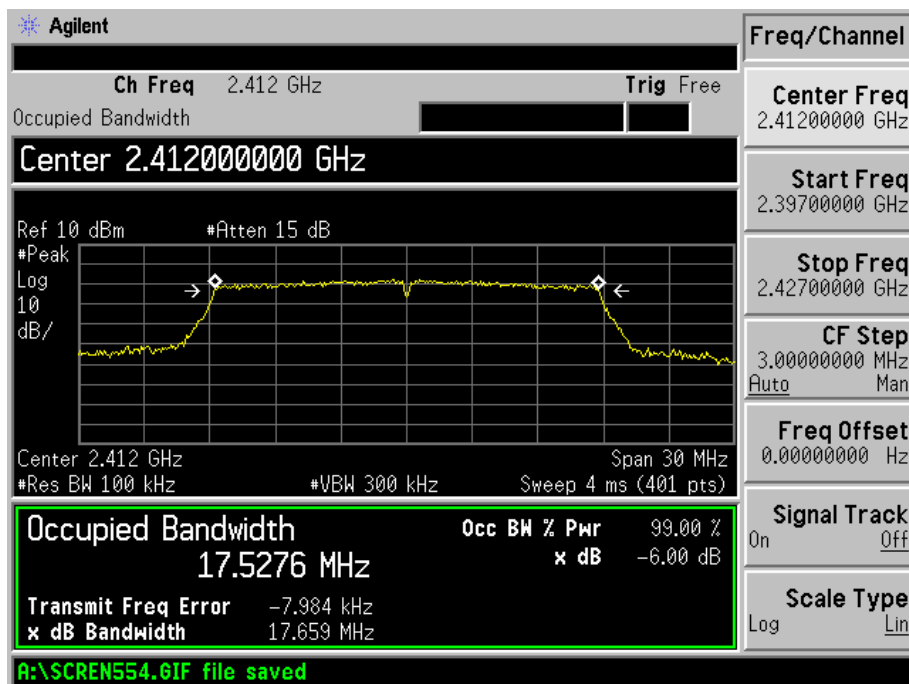
## 802.11g- Channel 12-2467MHz



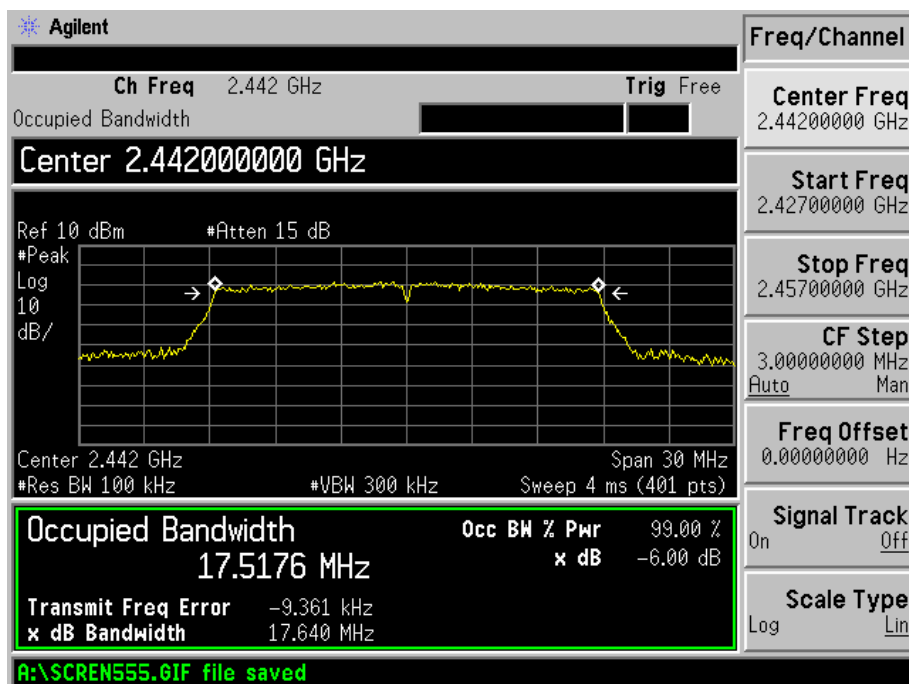
## 802.11g- Channel 13-2472MHz



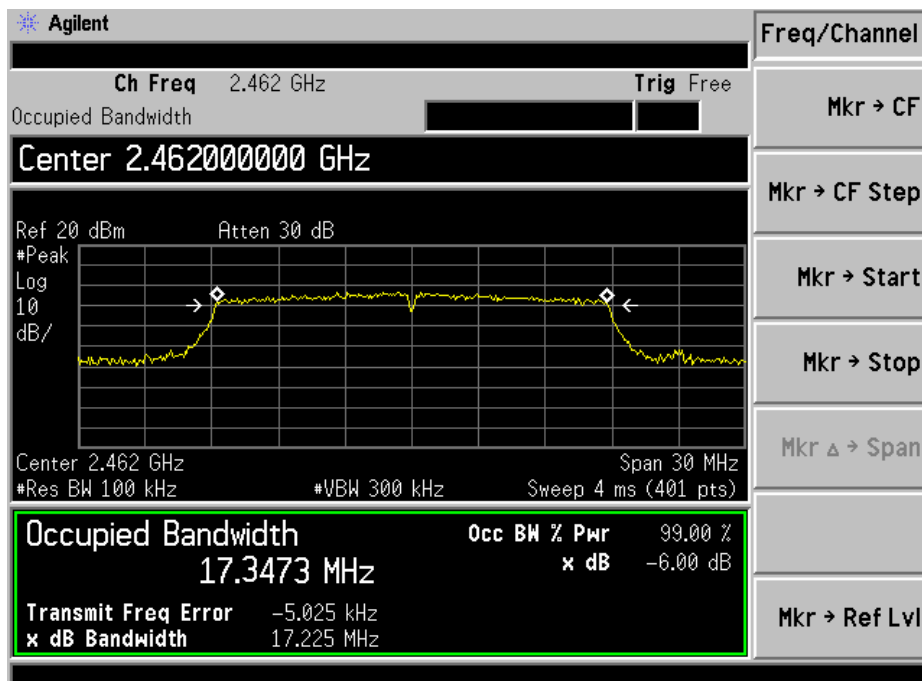
## 802.11n-HT20- Channel 1-2412MHz



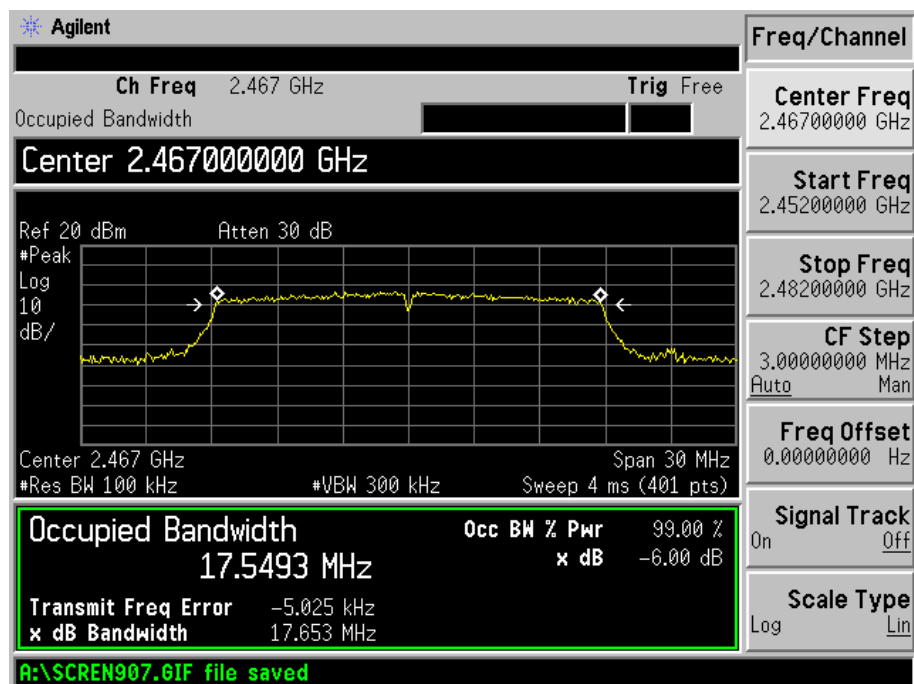
## 802.11n-HT20- Channel 7-2442MHz



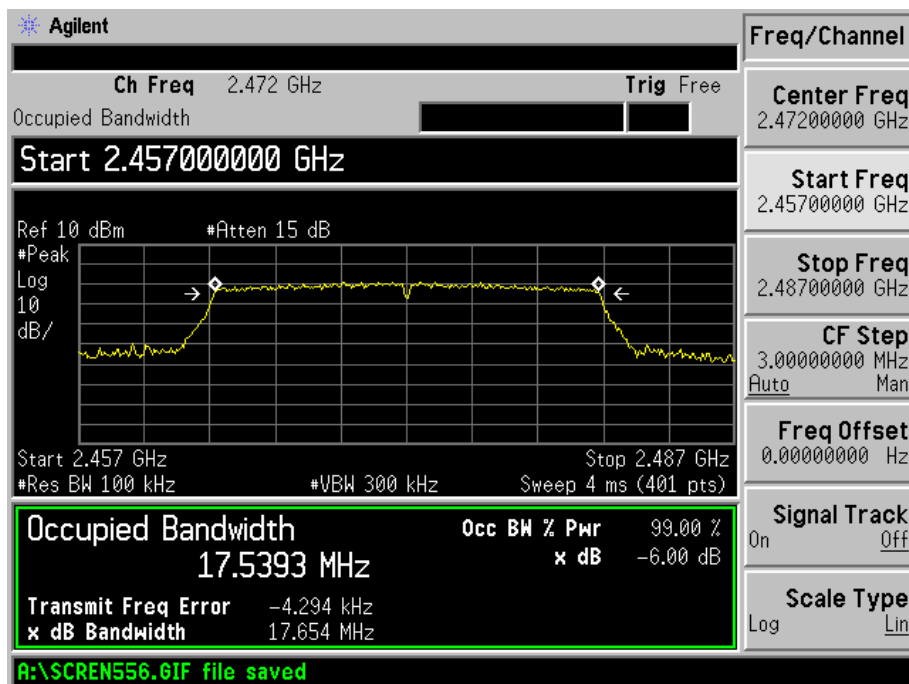
## 802.11n-HT20- Channel 11-2462MHz



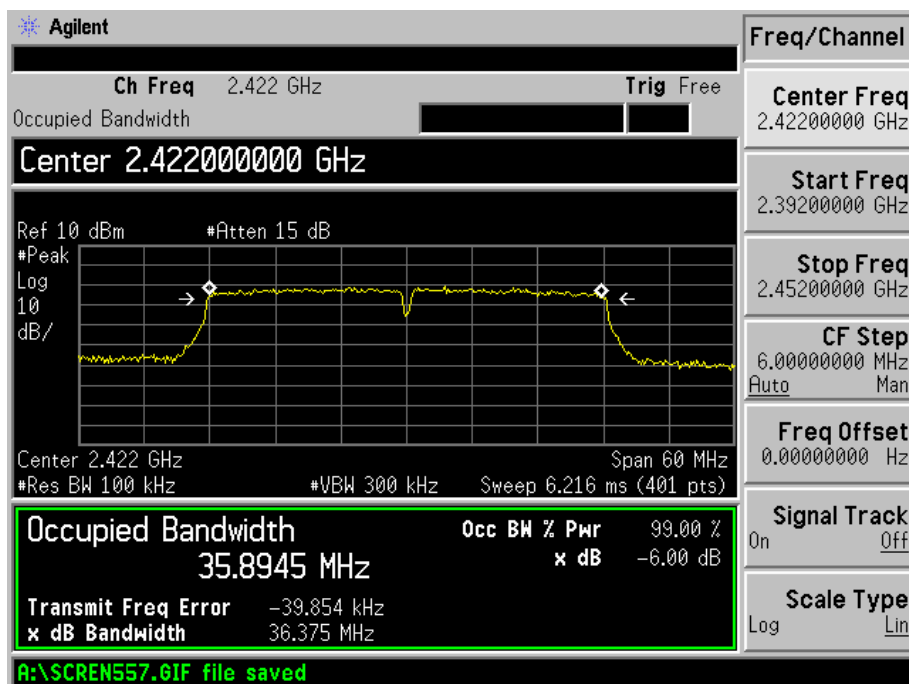
## 802.11n-HT20- Channel 12-2467MHz



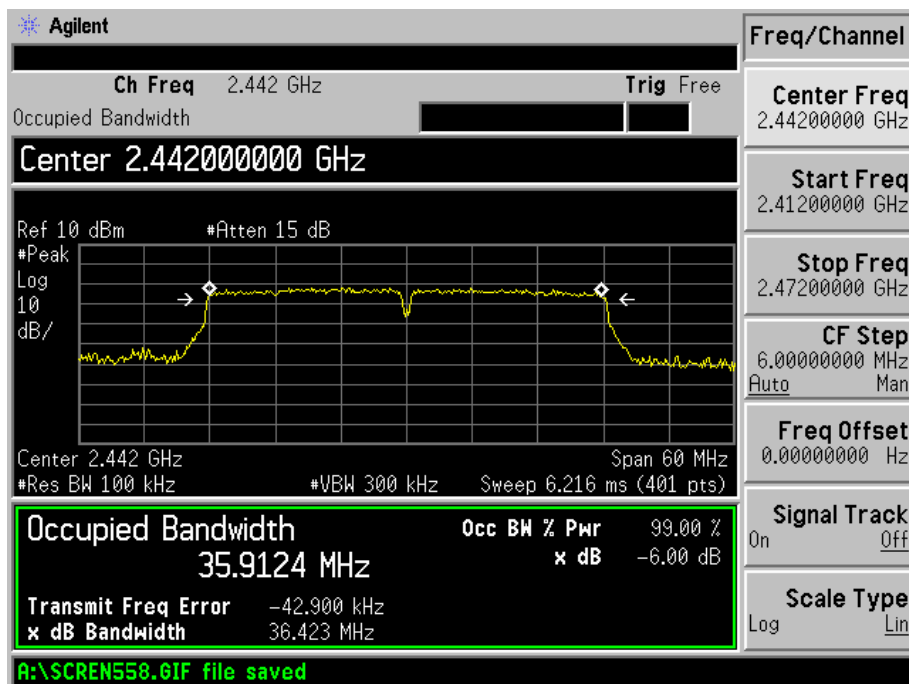
## 802.11n-HT20- Channel 13-2472MHz



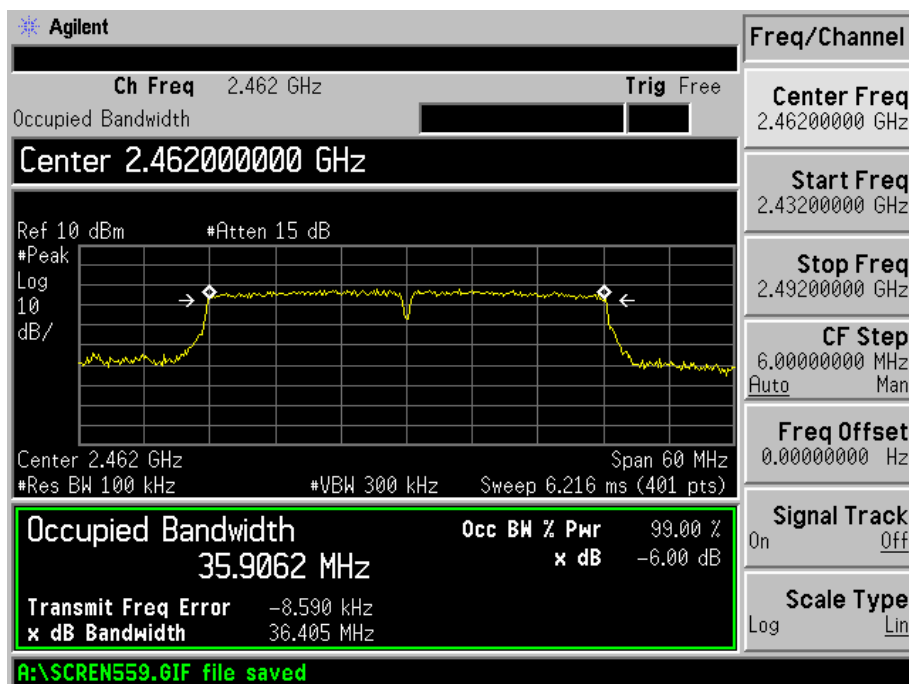
## 802.11n-HT40- Channel 3-2422MHz



## 802.11n-HT40- Channel 7-2442MHz



## 802.11n-HT40- Channel 11-2462MHz



## 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  $\geq 2 \times$  span / RBW. (This gives bin-to-bin spacing  $\leq$  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

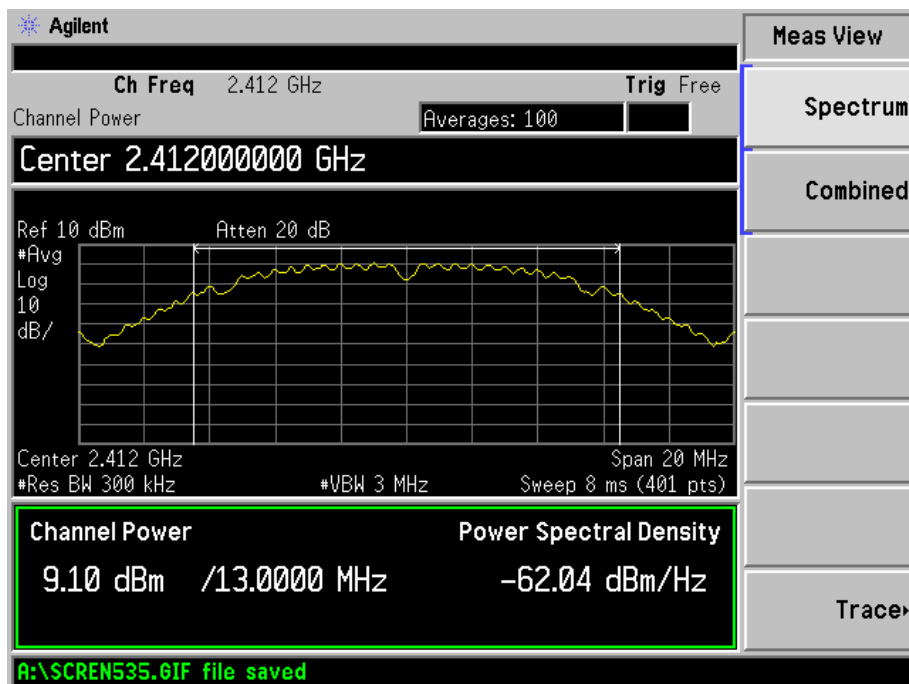
## 7.5 Summary of Test Results/Plots

Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b _ 11Mbps	2412	9.10	8.13	1000
	2442	8.35	6.84	1000
	2462	8.34	6.82	1000
	2467	8.32	6.79	1000
	2472	7.65	5.82	1000
802.11g_54Mbps	2412	6.53	4.50	1000
	2442	5.85	3.85	1000
	2462	5.60	3.63	1000
	2467	6.00	3.98	1000
	2472	5.38	3.45	1000
802.11n HT20_MCS7	2412	7.04	5.06	1000
	2442	6.27	4.24	1000
	2462	5.56	3.60	1000
	2467	5.76	3.77	1000
	2472	5.85	3.85	1000
802.11n HT40_MCS7	2422	3.95	2.48	1000
	2442	4.35	2.72	1000
	2462	3.96	2.49	1000

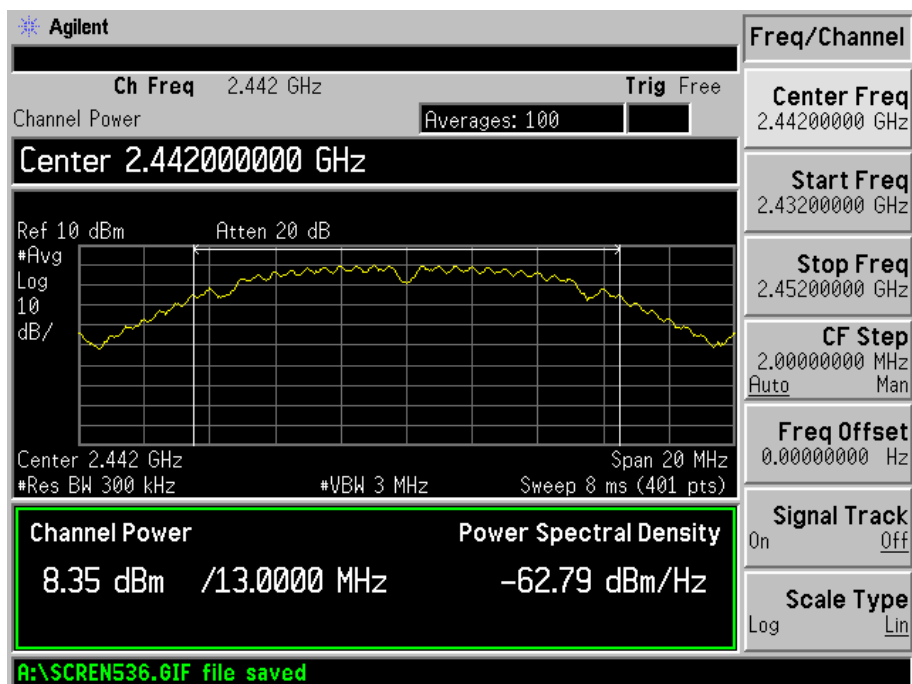
Please refer to the following test plots:



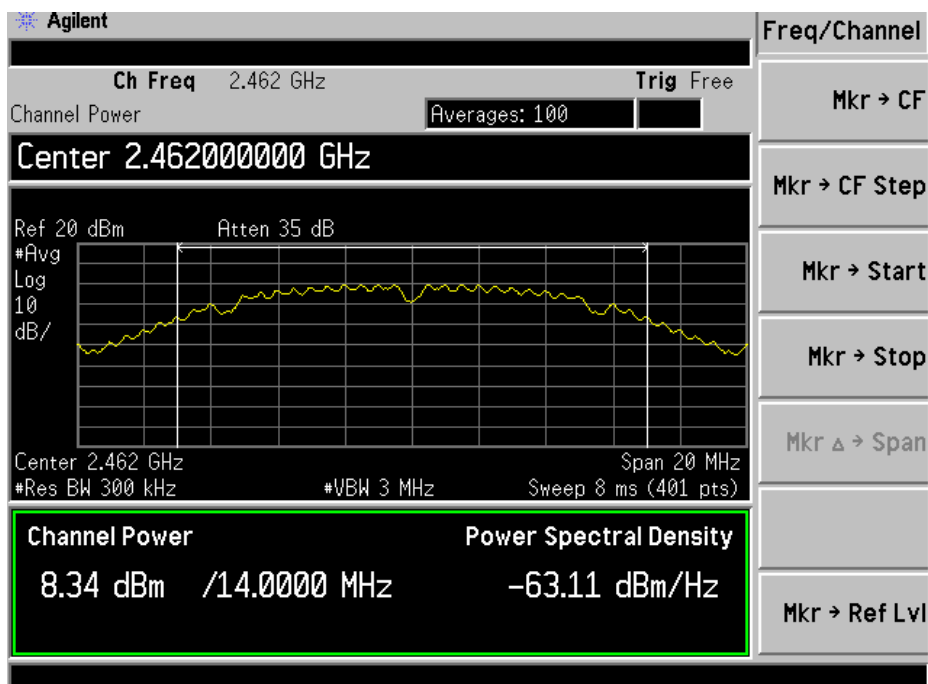
## 802.11b-11Mbps-Channel 1-2412MHz



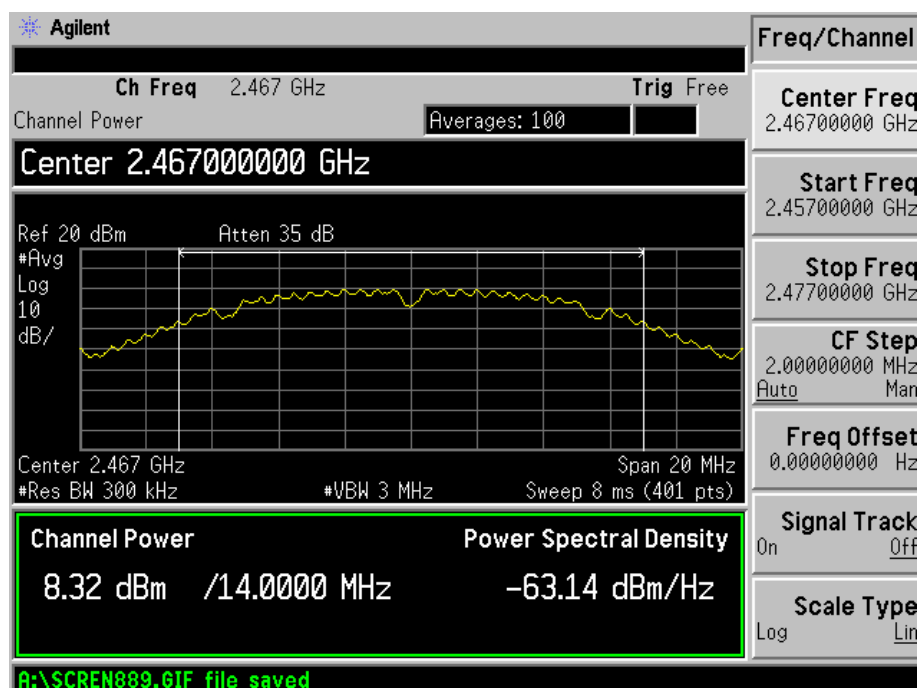
## 802.11b -11Mbps- Channel 7-2442MHz



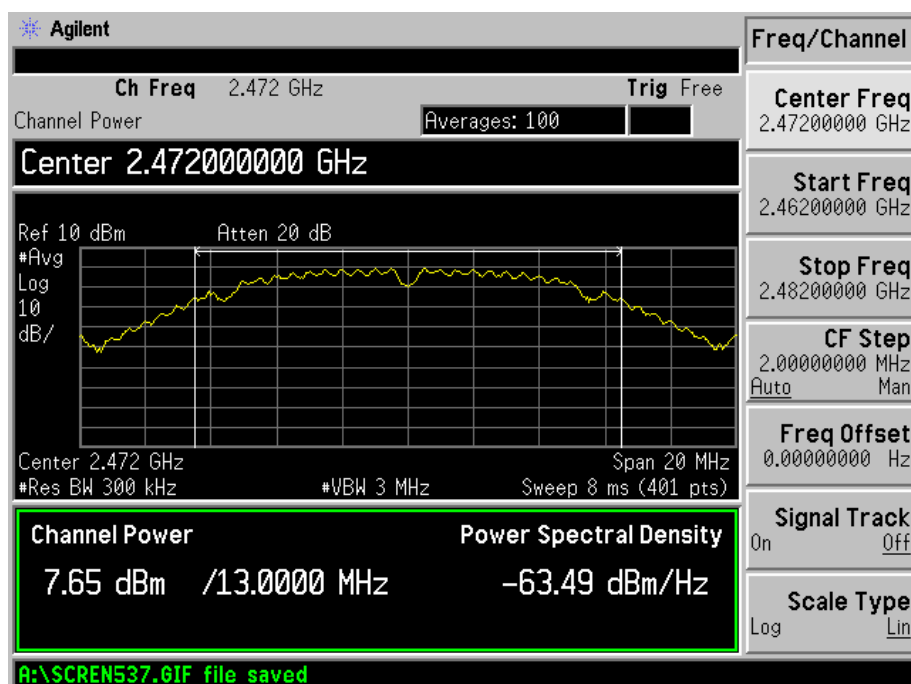
802.11b -11Mbps- Channel 11-2462MHz



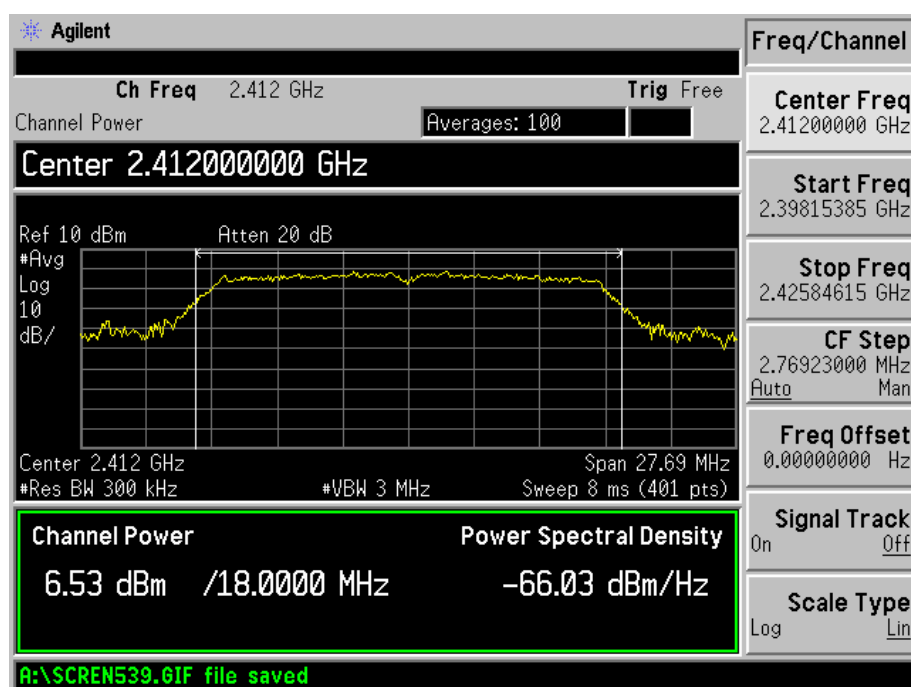
802.11b -11Mbps- Channel 12-2467MHz



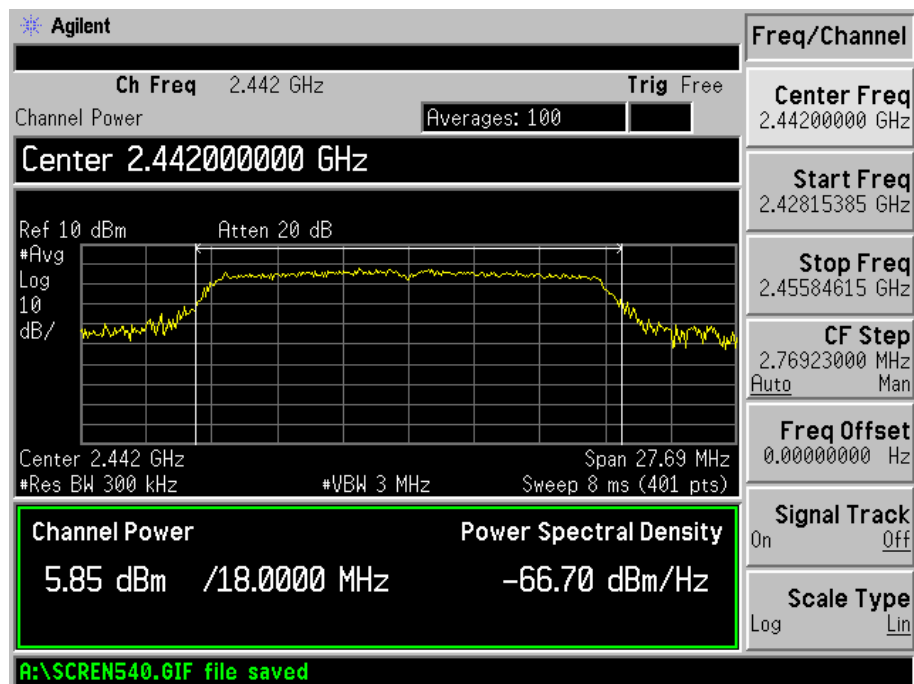
802.11b -11Mbps- Channel 13-2472MHz



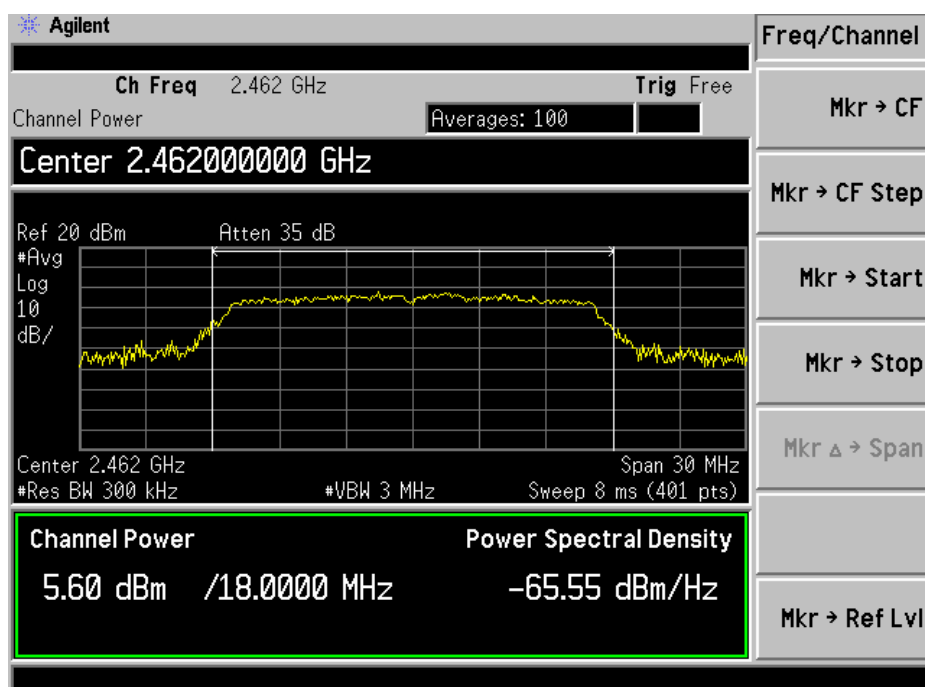
802.11g-54Mbps-Channel 1-2412MHz



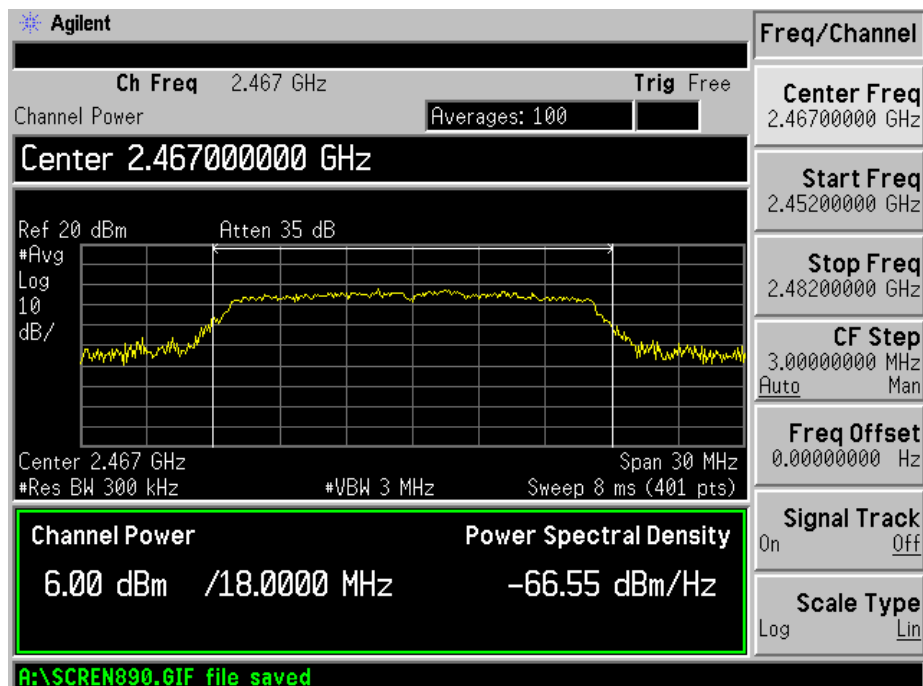
## 802.11g-54Mbps- Channel 7-2442MHz



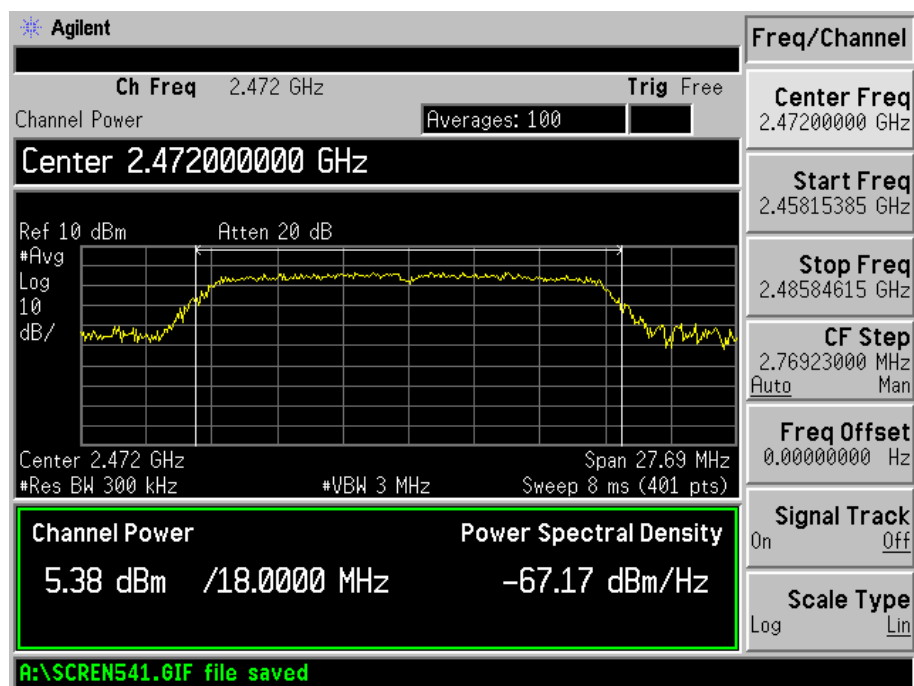
## 802.11g-54Mbps- Channel 11-2462MHz



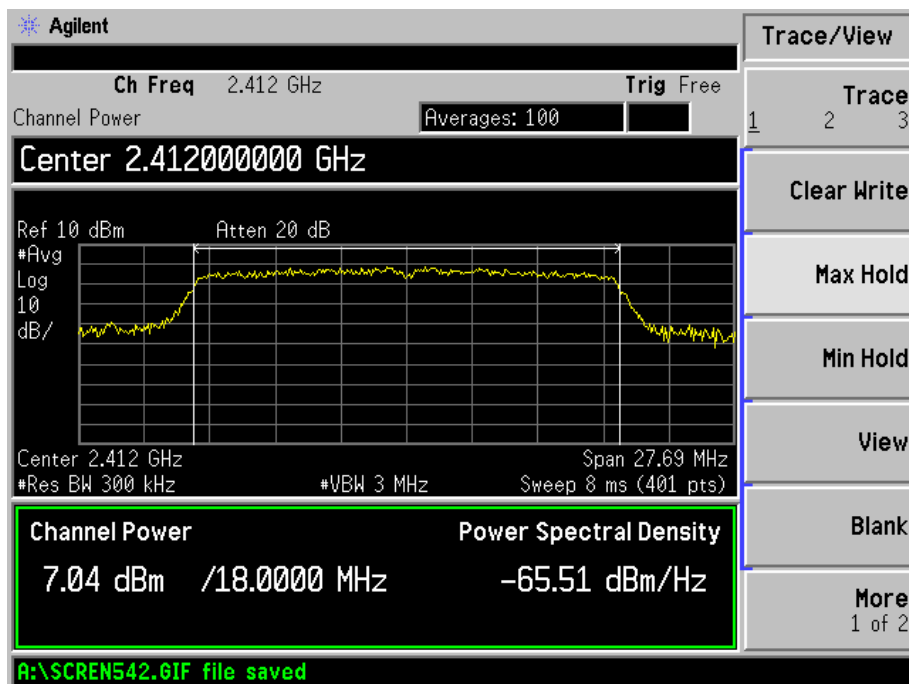
## 802.11g-54Mbps- Channel 12-2467MHz



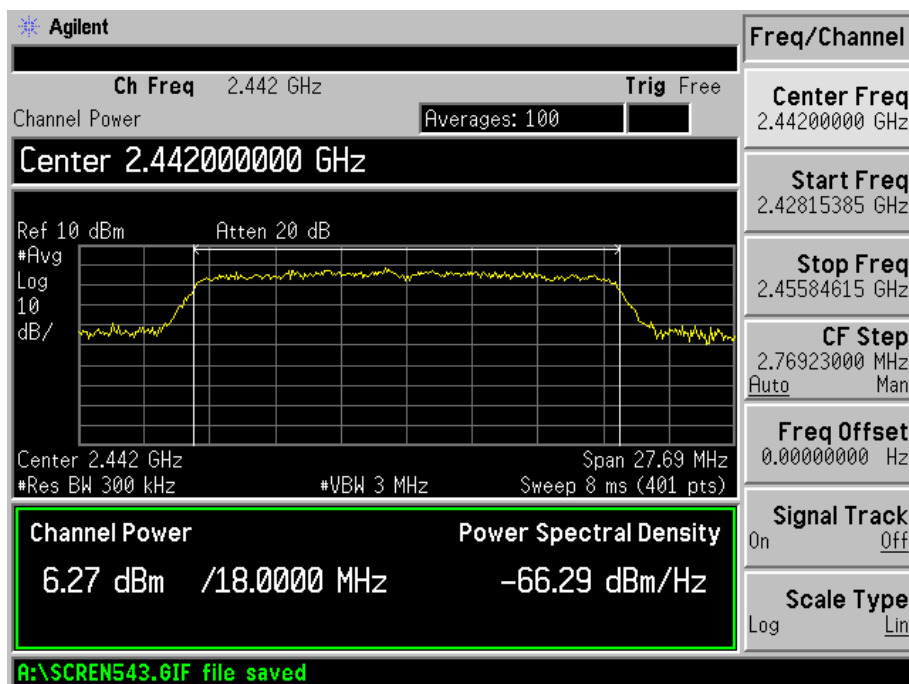
## 802.11g-54Mbps-Channel 13-2472MHz



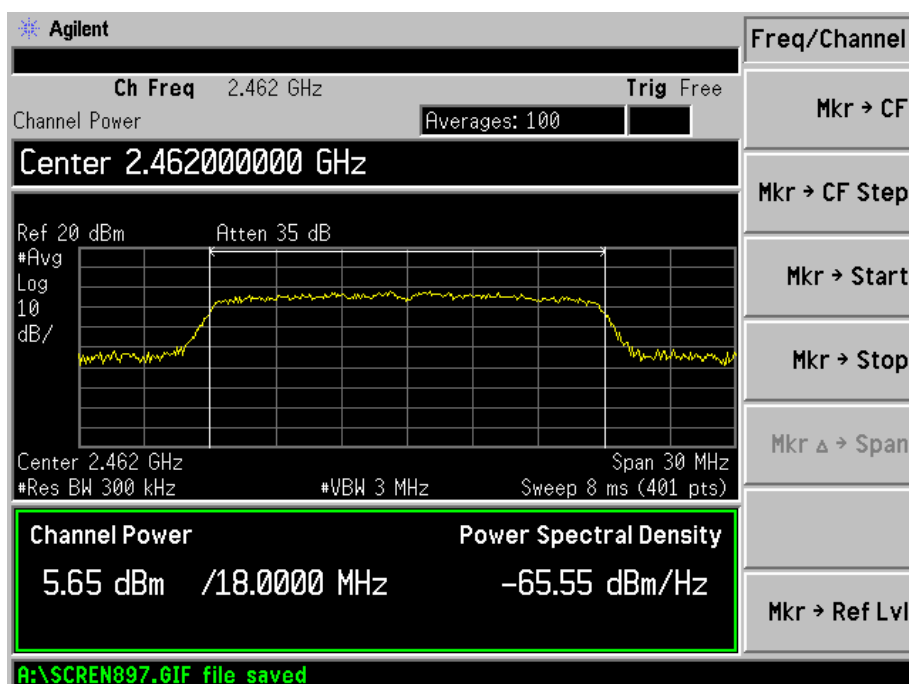
## 802.11n-HT20-MCS7- Channel 1-2412MHz



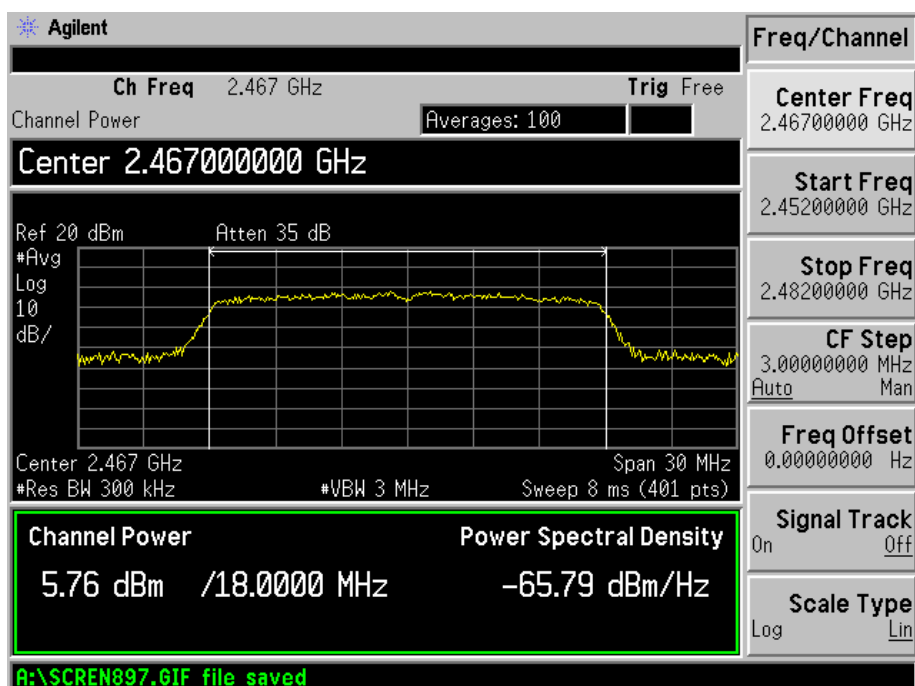
## 802.11n-HT20-MCS7- Channel 7-2442MHz



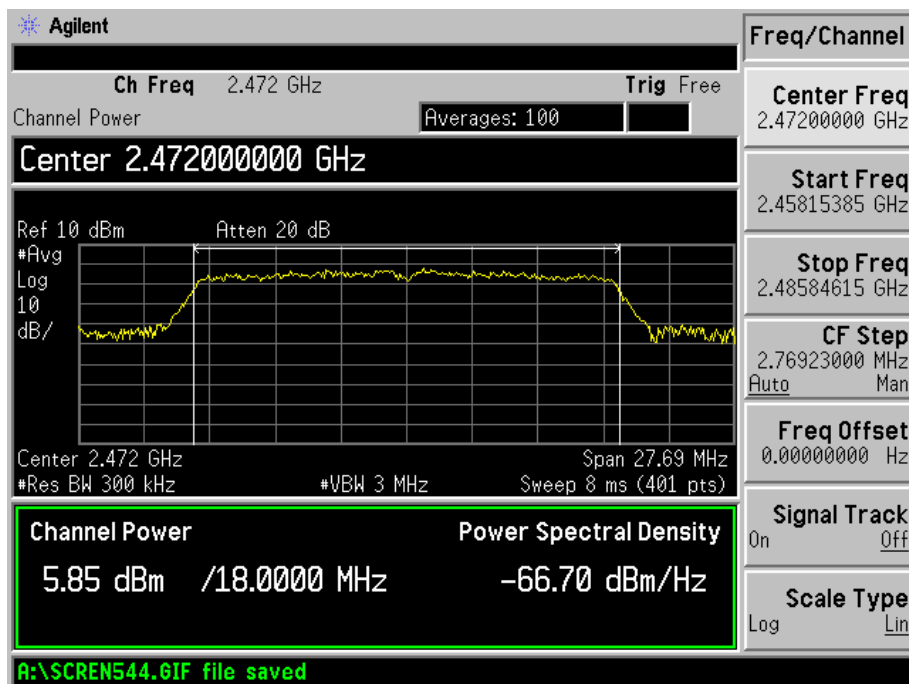
## 802.11n-HT20-MCS7- Channel 11-2462MHz



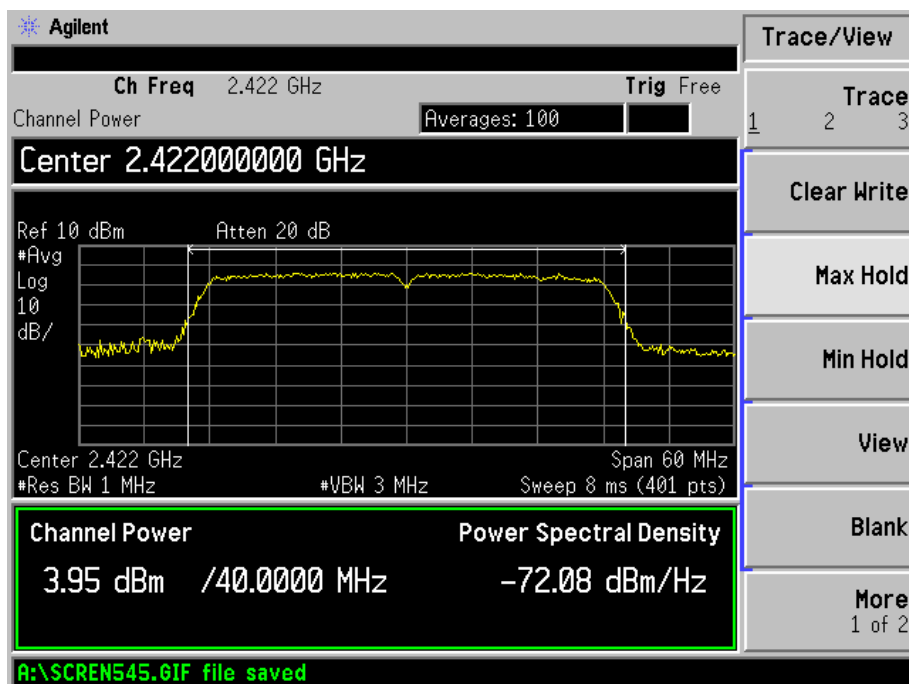
## 802.11n-HT20-MCS7- Channel 12-2467MHz



## 802.11n-HT20-MCS7- Channel 13-2472MHz

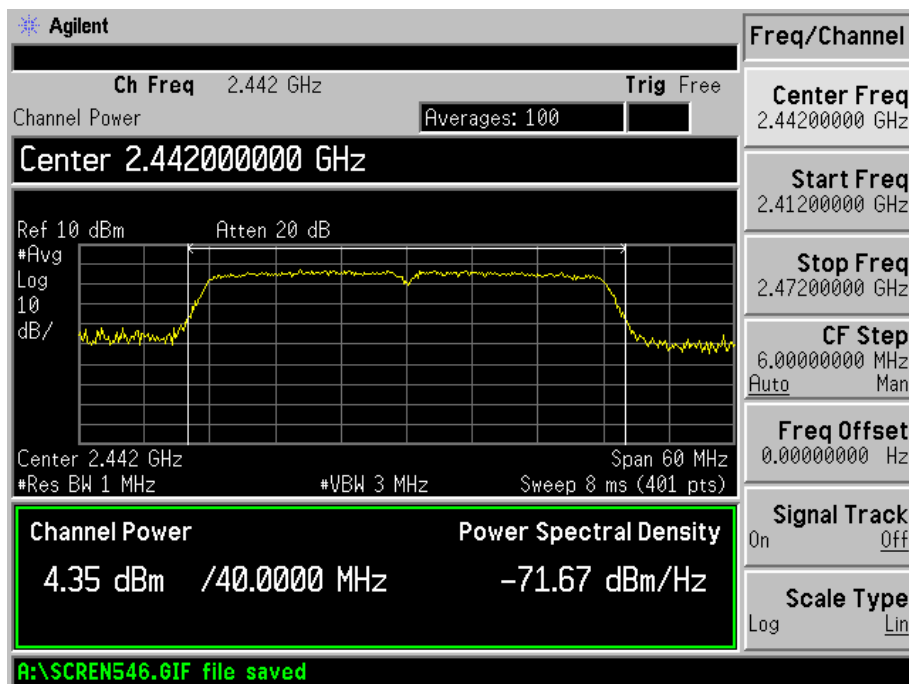


## 802.11n-HT40-MCS7-Channel 1-2422MHz

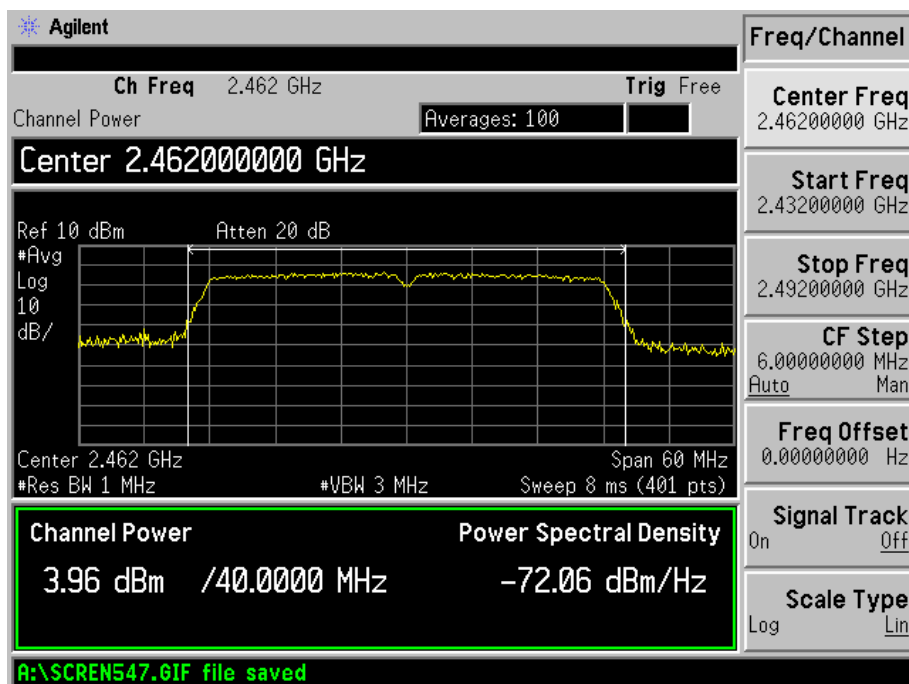




## 802.11n-HT40-MCS7- Channel 7-2442MHz



## 802.11n-HT40-MCS7- Channel 13-2462MHz



## 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

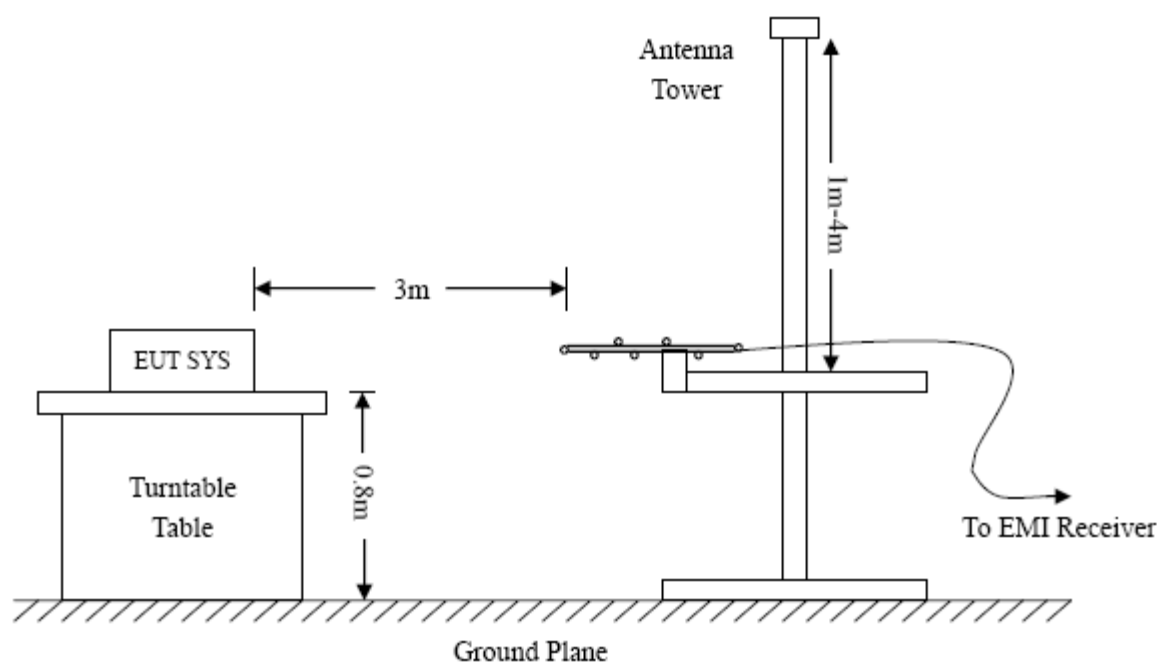
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	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:

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

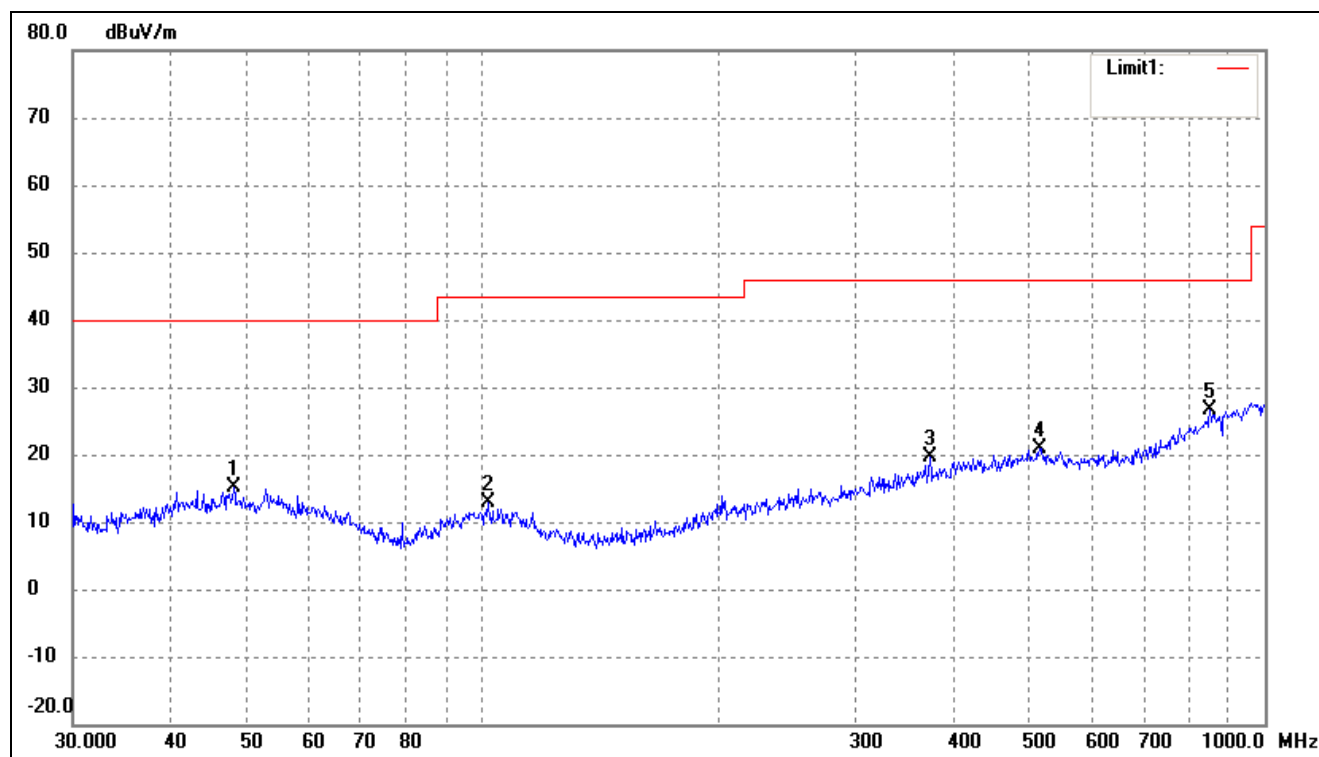
## 8.6 Environmental Conditions

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

## 8.7 Summary of Test Results/Plots

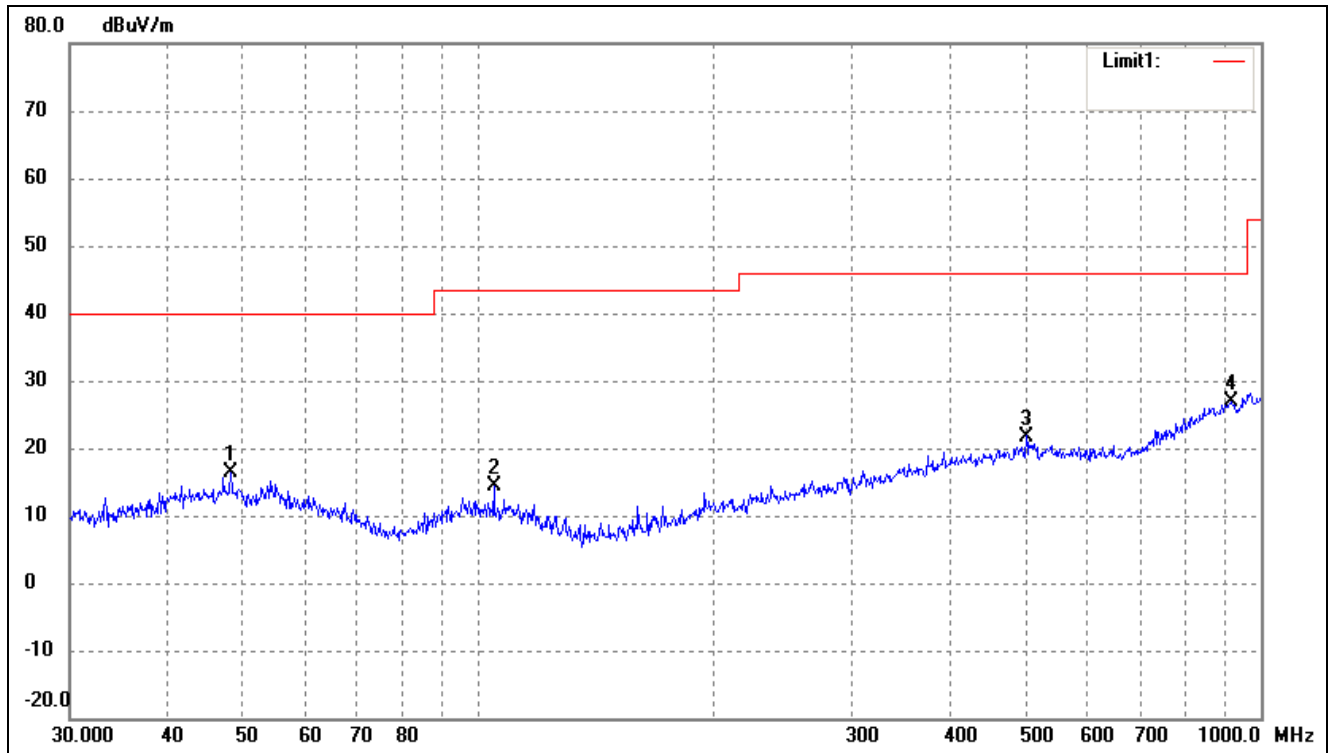
According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst cases:

*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: Waterproof rugged phone**Tested Model: SMT1**Operating Condition: 802.11b Transmitting Channel 1-2412MHz**Comment: Battery: DC3.7V**Test Specification: Horizontal*

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	48.1625	22.60	-7.46	15.14	40.00	-24.86	0	100	peak
2	101.6443	22.32	-9.56	12.76	43.50	-30.74	0	100	peak
3	373.3111	23.32	-3.75	19.57	46.00	-26.43	0	100	peak
4	515.4374	22.12	-1.19	20.93	46.00	-25.07	0	100	peak
5*	851.0353	22.62	3.92	26.54	46.00	-19.46	0	100	peak

Test Specification: Vertical

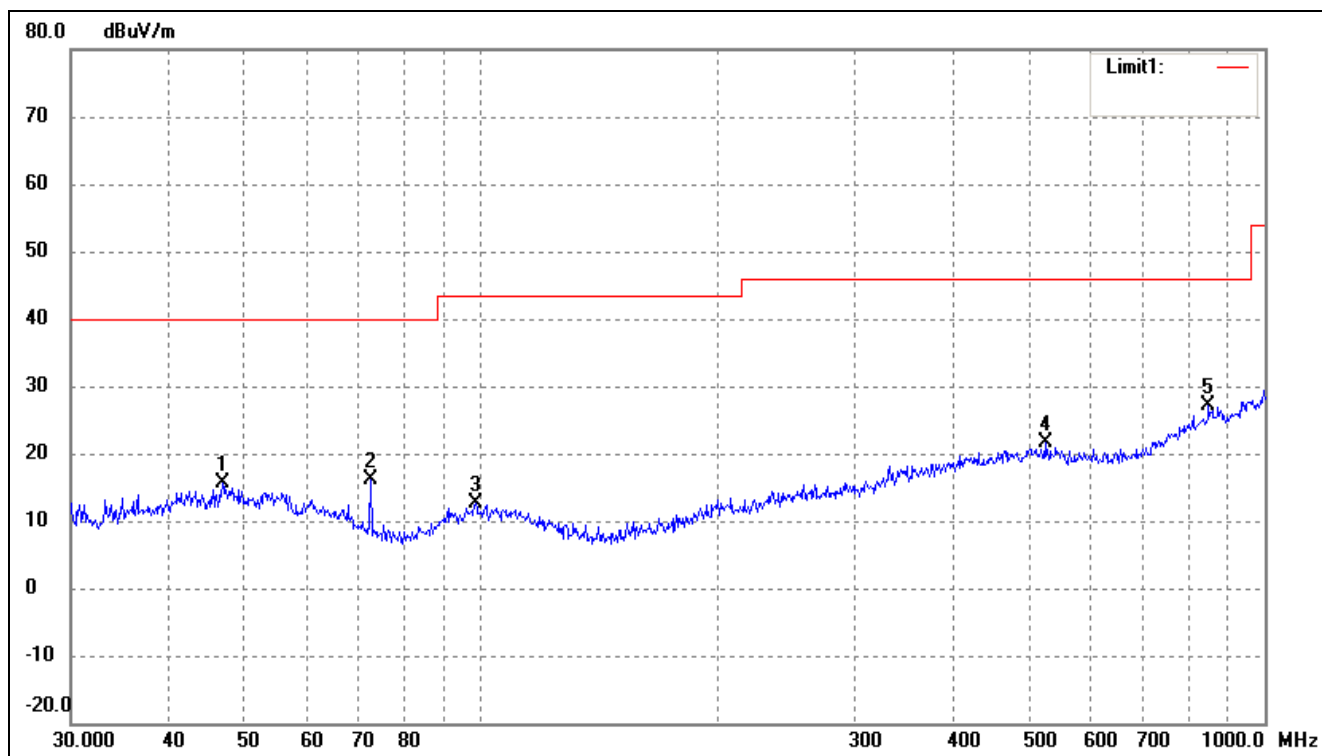


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	48.1626	23.79	-7.46	16.33	40.00	-23.67	0	100	peak
2	104.5361	23.99	-9.58	14.41	43.50	-29.09	0	100	peak
3	501.1790	22.85	-1.10	21.75	46.00	-24.25	0	100	peak
4*	916.0687	21.21	5.55	26.76	46.00	-19.24	0	100	peak

Operating Condition: 802.11b Transmitting Channel 7-2442MHz

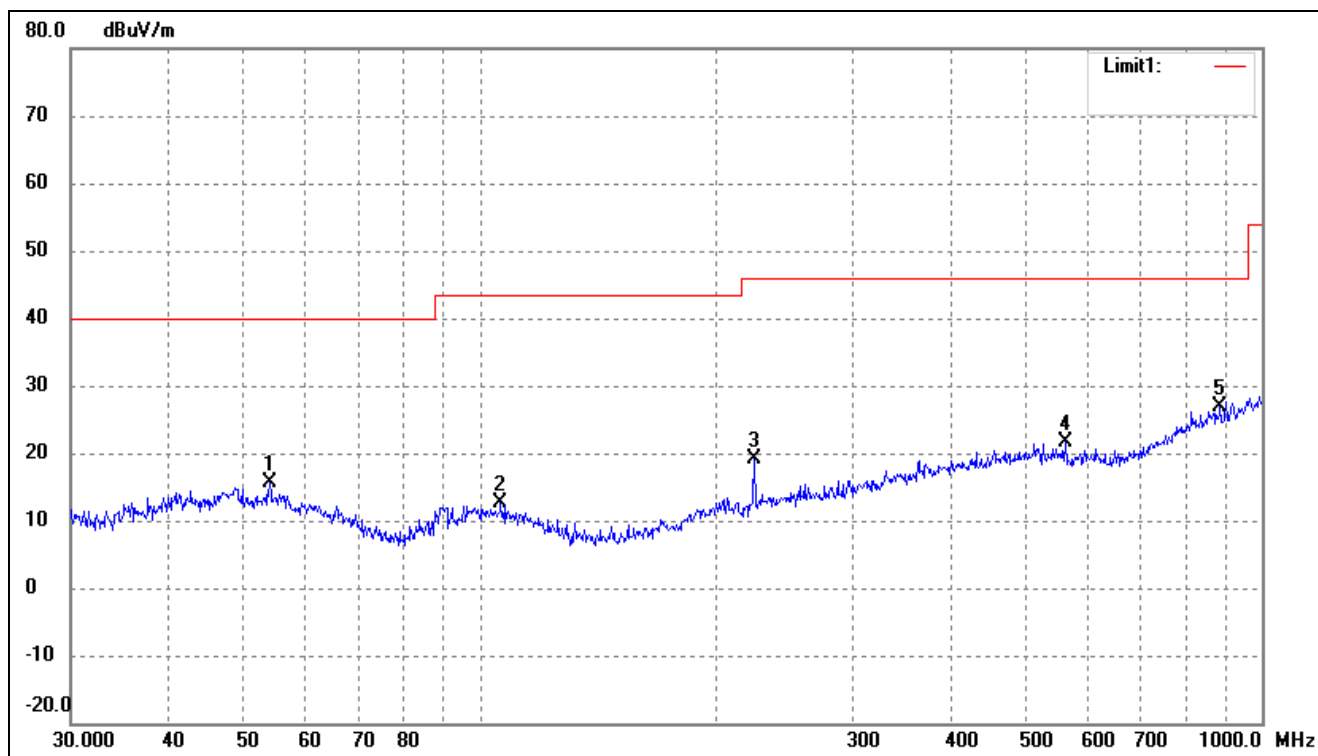
Comment: Battery: DC3.7V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	46.8303	23.12	-7.45	15.67	40.00	-24.33	21	100	peak
2	72.3376	28.63	-12.41	16.22	40.00	-23.78	21	100	peak
3	98.4865	22.48	-9.75	12.73	43.50	-30.77	21	100	peak
4	524.5541	22.75	-1.24	21.51	46.00	-24.49	21	100	peak
5*	848.0563	23.22	3.84	27.06	46.00	-18.94	21	100	peak

Test Specification: Vertical



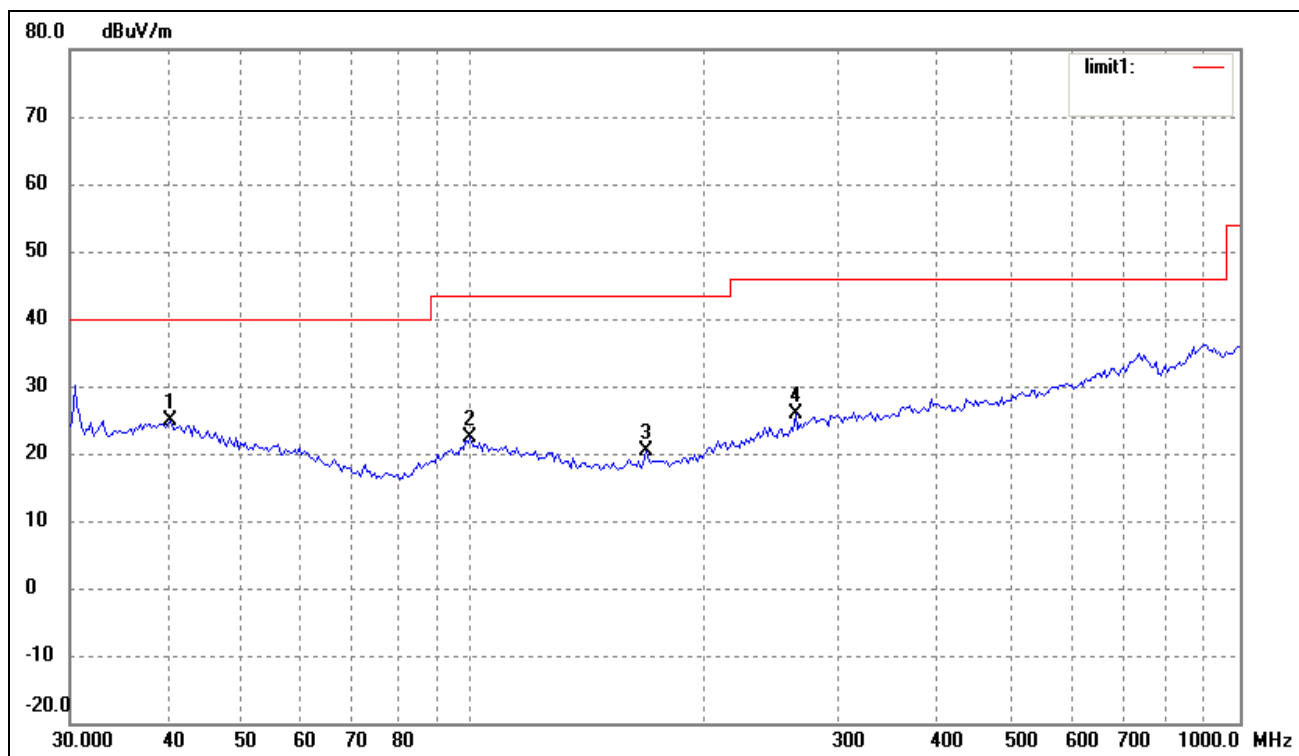
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	53.8817	23.40	-7.83	15.57	40.00	-24.43	102	100	peak
2	106.3850	22.23	-9.59	12.64	43.50	-30.86	102	100	peak
3	224.5192	27.85	-8.65	19.20	46.00	-26.80	102	100	peak
4	560.6928	23.20	-1.46	21.74	46.00	-24.26	102	100	peak
5*	884.5028	21.94	4.92	26.86	46.00	-19.14	102	100	peak



Operating Condition: 802.11b Transmitting Channel 11-2462MHz

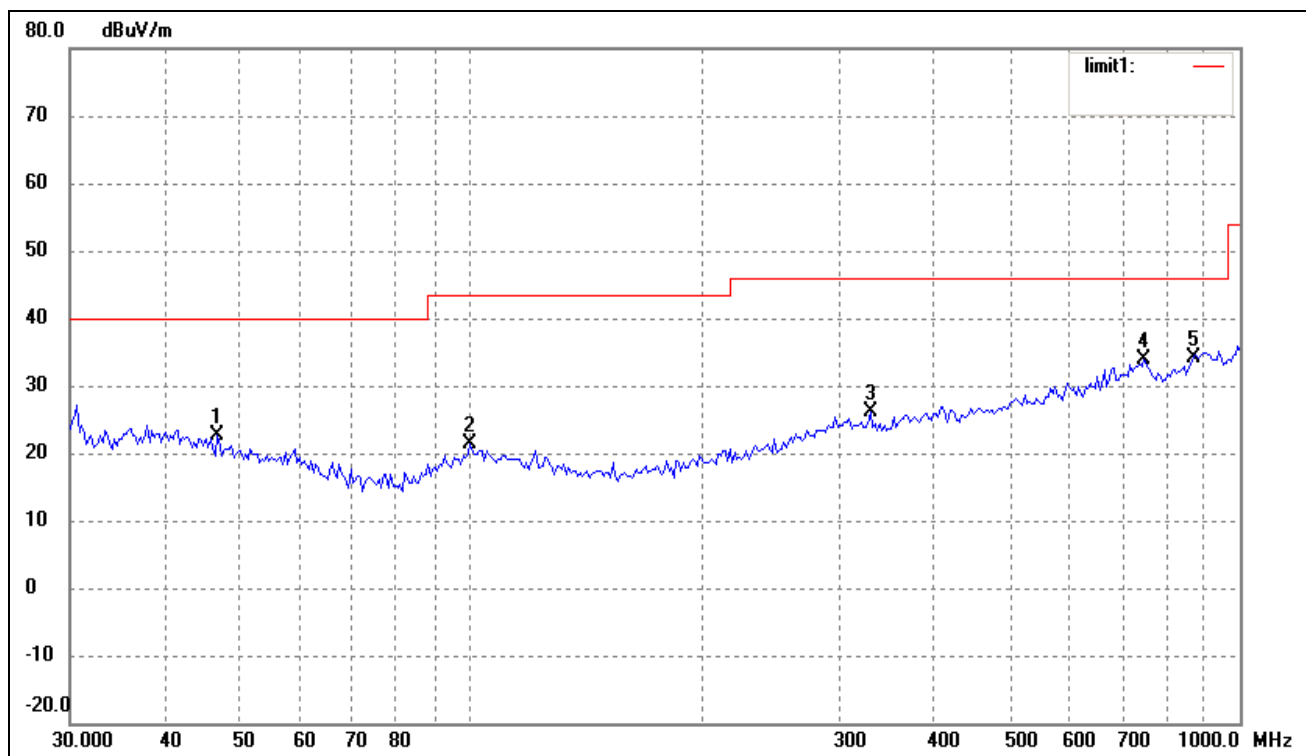
Comment: Battery: DC3.7V

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	40.5591	15.26	9.51	24.77	40.00	-15.23	360	100	peak
2	99.5281	15.60	6.72	22.32	43.50	-21.18	116	200	peak
3	168.4138	16.59	3.69	20.28	43.50	-23.22	254	100	peak
4	263.8190	17.87	8.00	25.87	46.00	-20.13	113	100	peak

Test Specification: Vertical

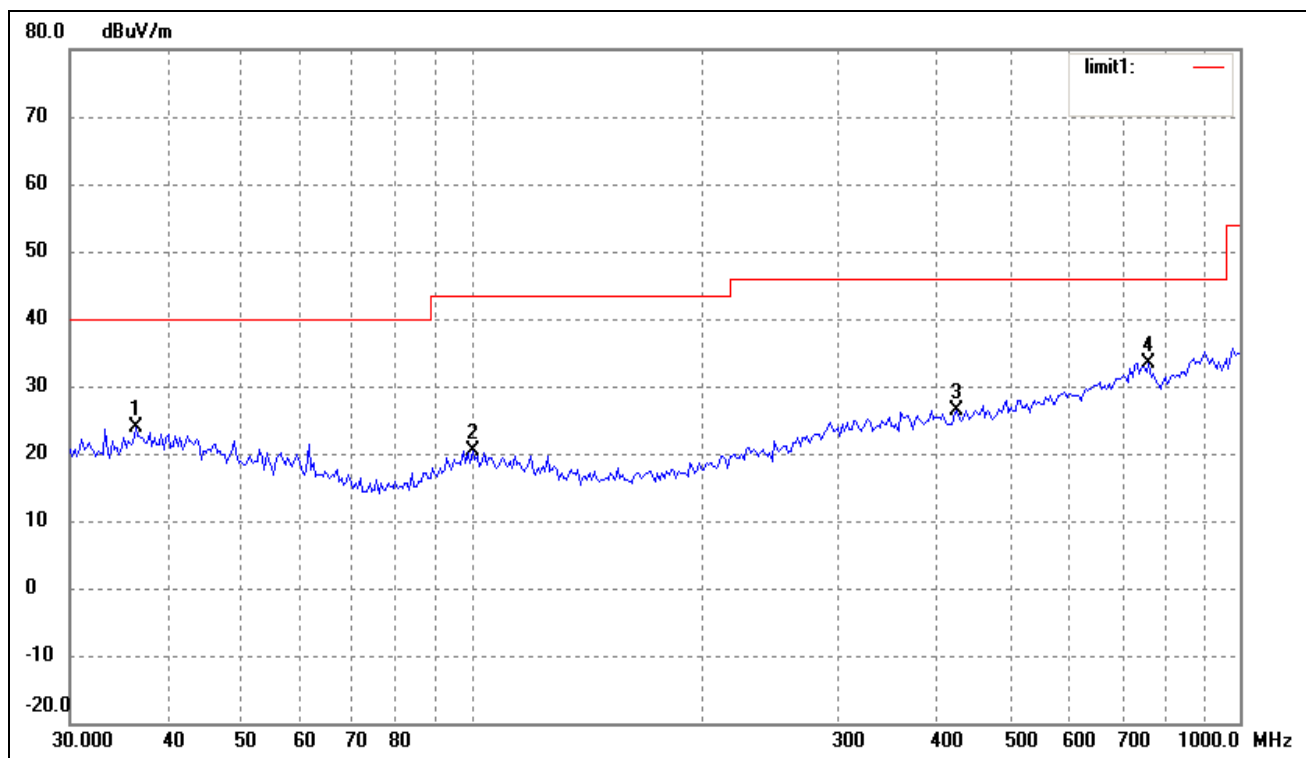


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	46.6664	14.93	7.64	22.57	40.00	-17.43	270	100	peak
2	99.5281	14.58	6.72	21.30	43.50	-22.20	360	100	peak
3	330.1949	15.74	10.28	26.02	46.00	-19.98	116	100	peak
4	750.1083	16.03	17.78	33.81	46.00	-12.19	54	100	peak
5	869.1302	15.55	18.54	34.09	46.00	-11.91	113	100	peak

Operating Condition: 802.11b Transmitting Channel 12-2467MHz

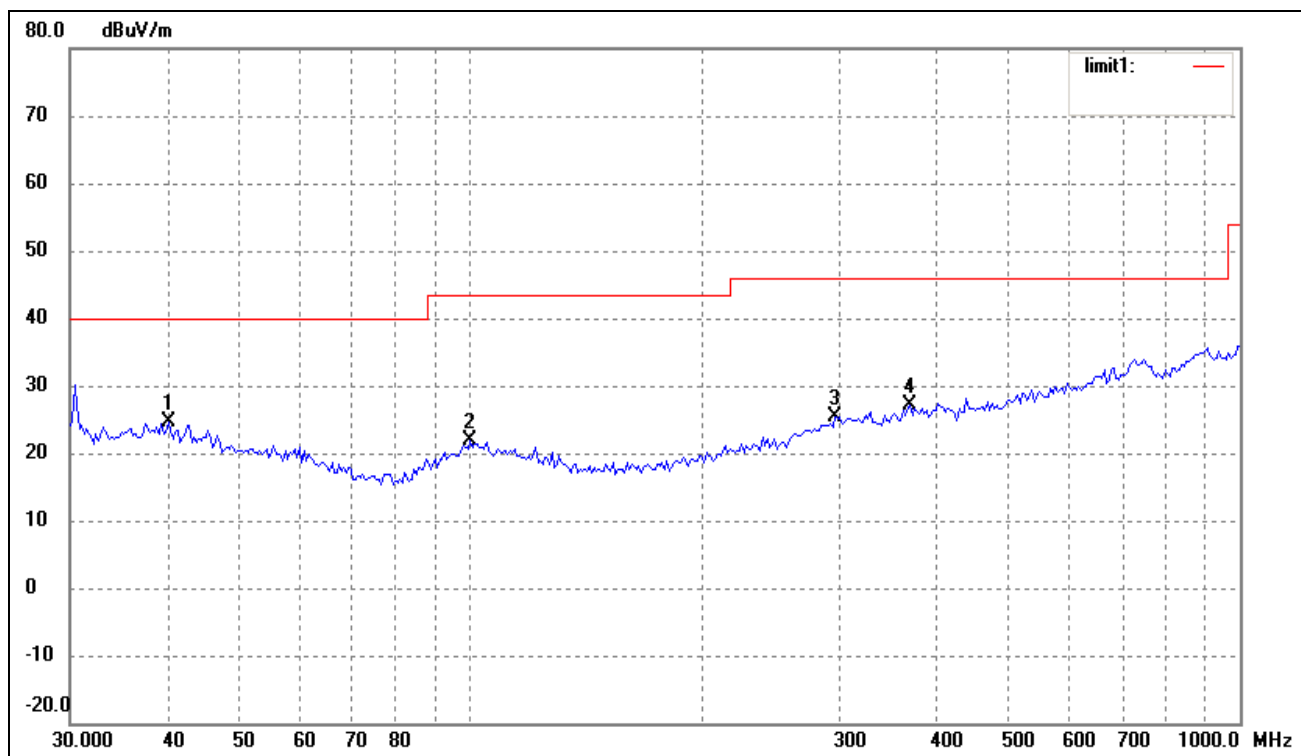
Comment: Battery: DC3.7V

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	36.5092	14.69	9.13	23.82	40.00	-16.18	160	100	peak
2	100.2286	13.48	6.81	20.29	43.50	-23.21	290	100	peak
3	428.0193	15.54	10.93	26.47	46.00	-19.53	178	100	peak
4	760.7036	16.14	17.15	33.29	46.00	-12.71	224	100	peak

Test Specification: Vertical

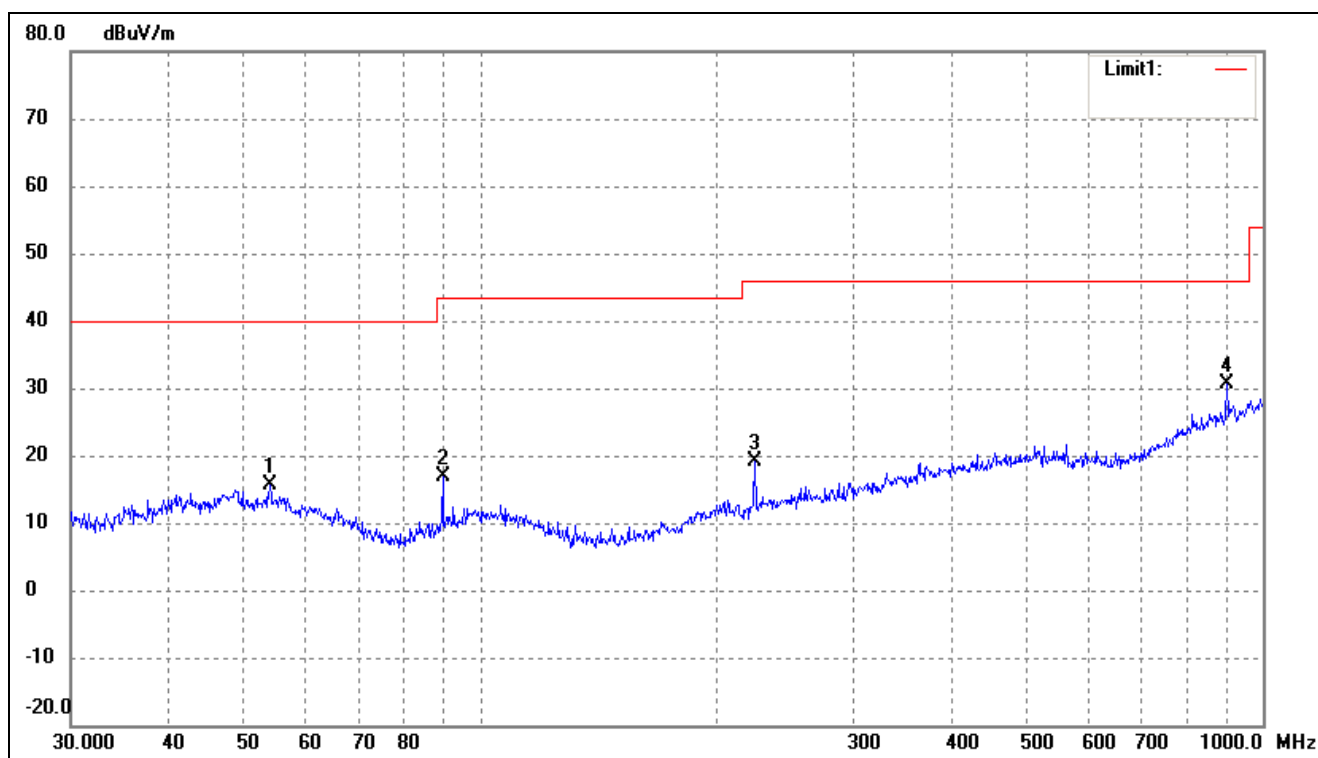


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	40.2757	15.09	9.60	24.69	40.00	-15.31	256	100	peak
2	99.5281	15.08	6.72	21.80	43.50	-21.70	360	100	peak
3	297.2241	15.23	10.04	25.27	46.00	-20.73	360	100	peak
4	372.0045	16.46	10.65	27.11	46.00	-18.89	360	100	peak

Operating Condition: 802.11b Transmitting Channel 13-2472MHz

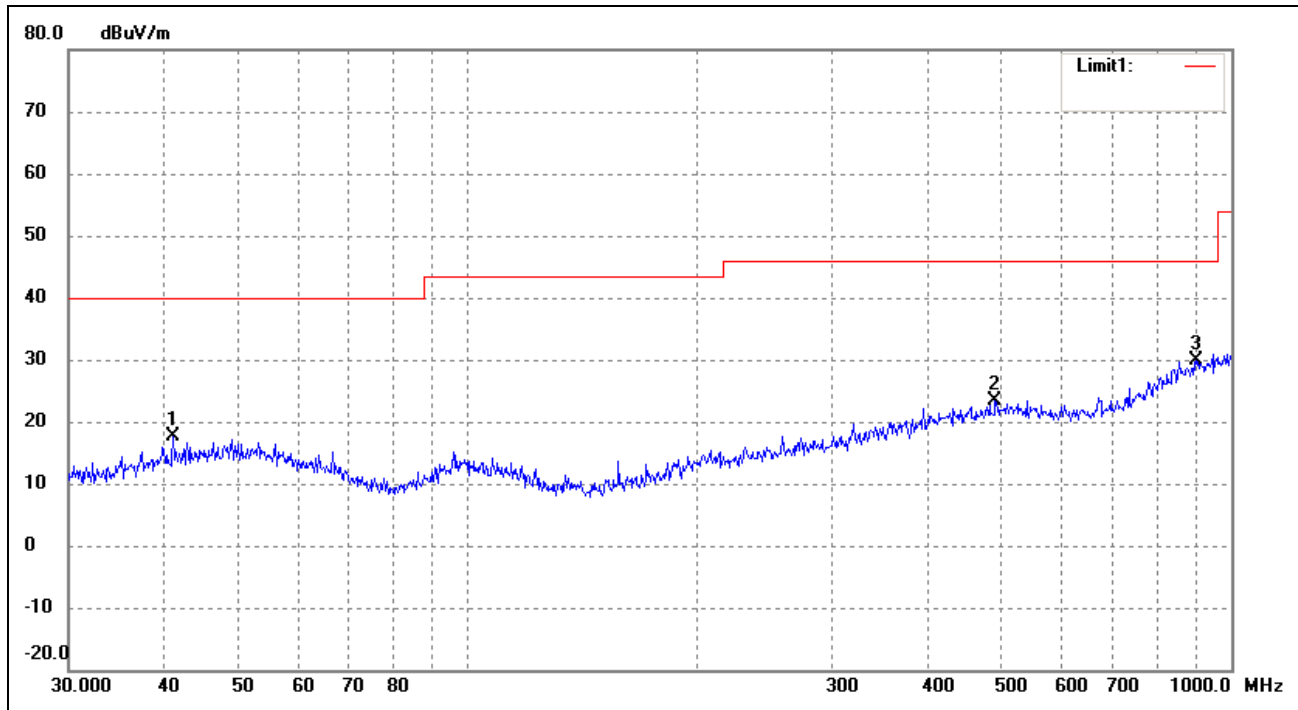
Comment: Battery: DC3.7V

Test Specification: Horizontal

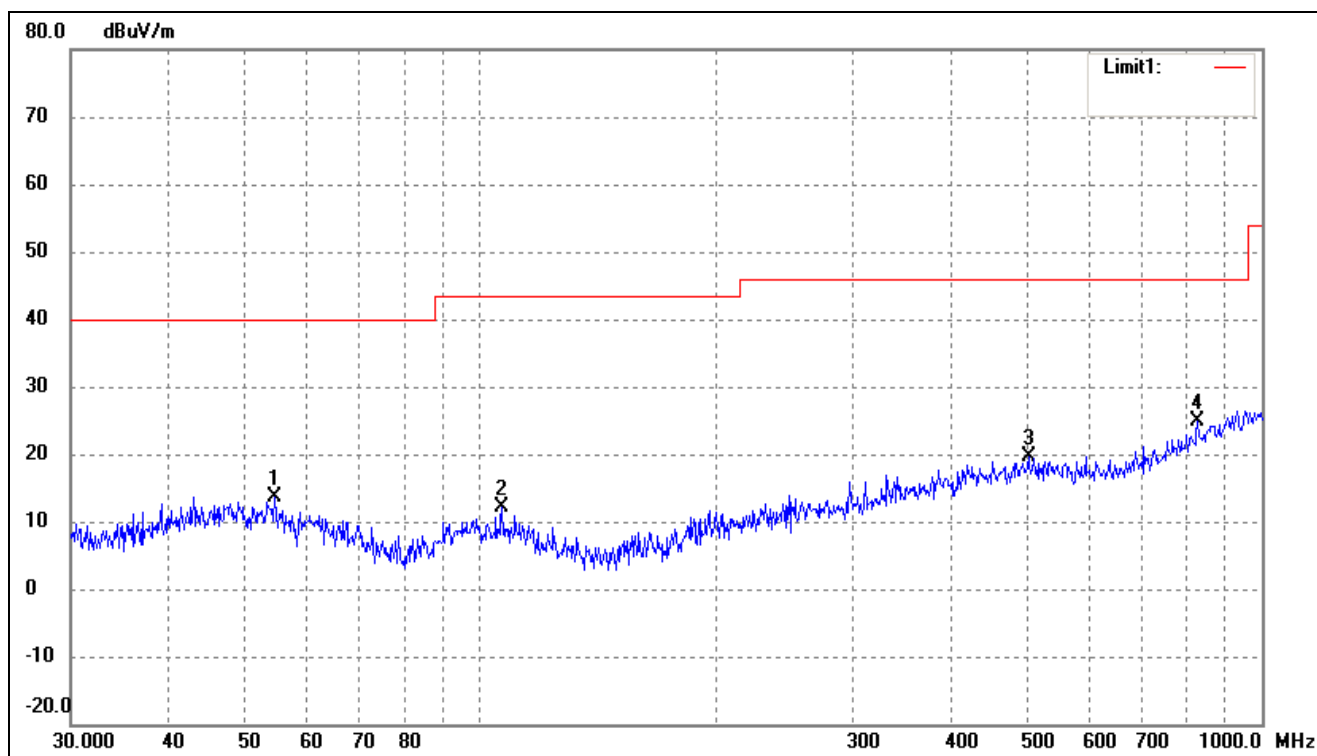


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	53.8818	23.40	-7.83	15.57	40.00	-24.43	0	100	peak
2	89.5900	28.17	-11.28	16.89	43.50	-26.61	0	100	peak
3	224.5193	27.85	-8.65	19.20	46.00	-26.80	0	100	peak
4*	900.1474	25.27	5.38	30.65	46.00	-15.35	0	100	peak

Test Specification: Vertical

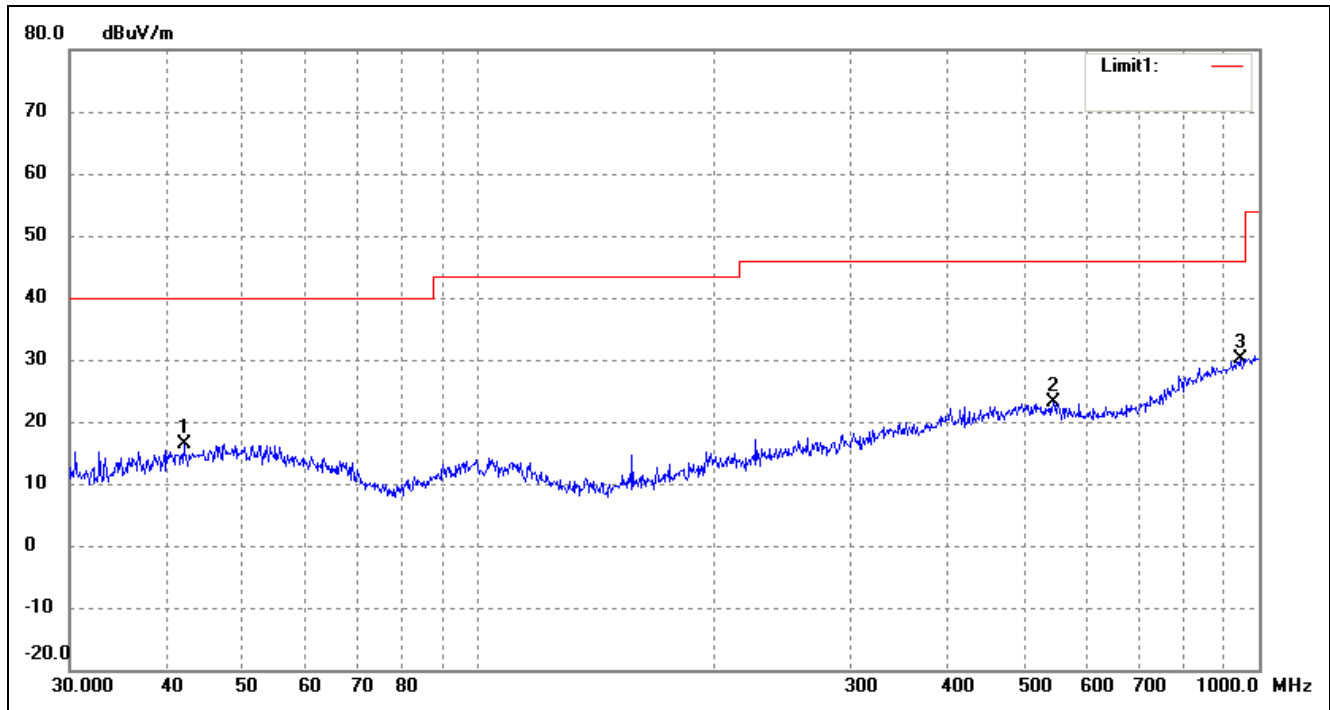


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	41.1320	25.84	-8.21	17.63	40.00	-22.37	360	100	peak
2	490.7447	24.76	-1.33	23.43	46.00	-22.57	200	100	peak
3	900.1474	24.56	5.38	29.94	46.00	-16.06	120	100	peak

**Plot of Radiated Emissions Test Data (30MHz to 1GHz)***EUT: Waterproof rugged phone**Tested Model: SMT1**Operating Condition: 802.11g Transmitting Channel 1-2412MHz**Comment: Battery: DC3.7V**Test Specification: Horizontal*

No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	54.6429	21.48	-7.91	13.57	40.00	-26.43	10	100	peak
2	106.7587	21.76	-9.59	12.17	43.50	-31.33	10	100	peak
3	502.9395	20.67	-1.05	19.62	46.00	-26.38	10	100	peak
4*	827.4933	20.83	4.09	24.92	46.00	-21.08	10	100	peak

Test Specification: Vertical



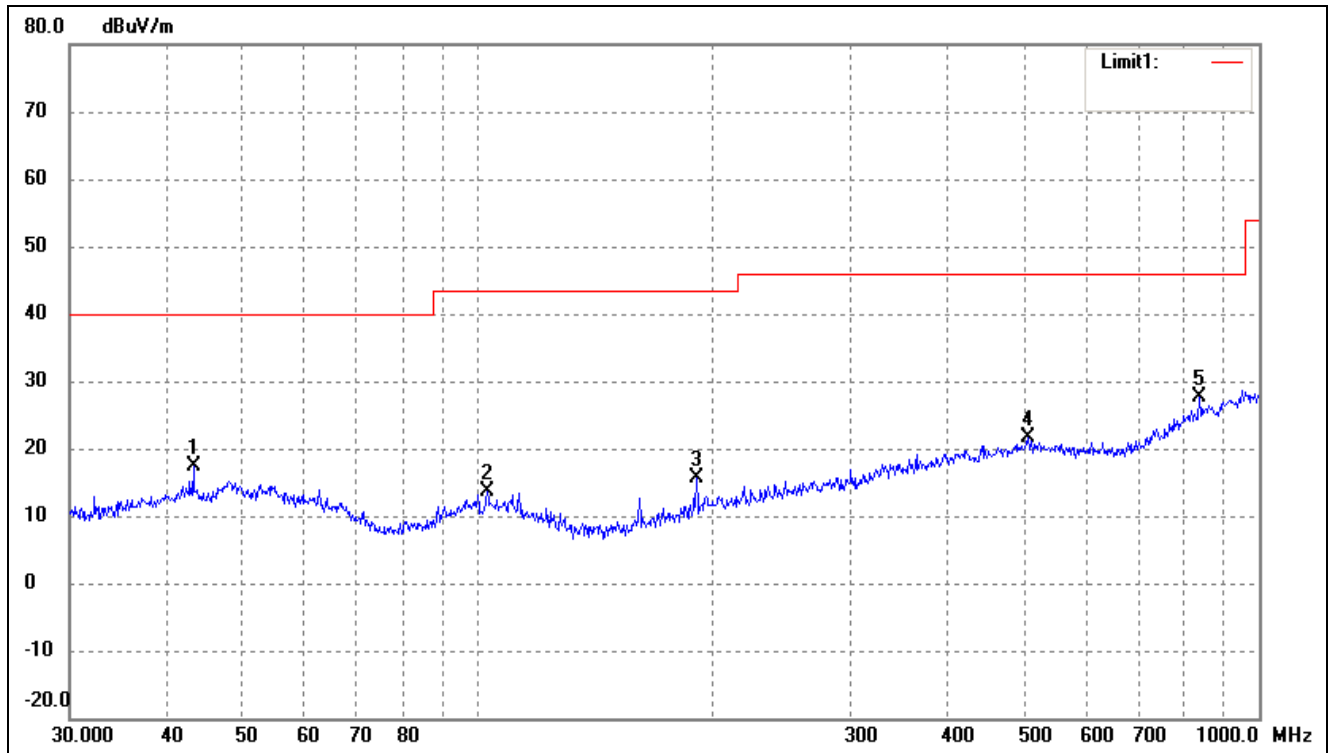
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	42.0066	24.55	-8.05	16.50	40.00	-23.50	270	100	peak
2	545.1826	23.10	0.02	23.12	46.00	-22.88	90	100	peak
3	945.4399	24.13	5.88	30.01	46.00	-15.99	360	100	peak



Operating Condition: 802.11g Transmitting Channel 7-2442MHz

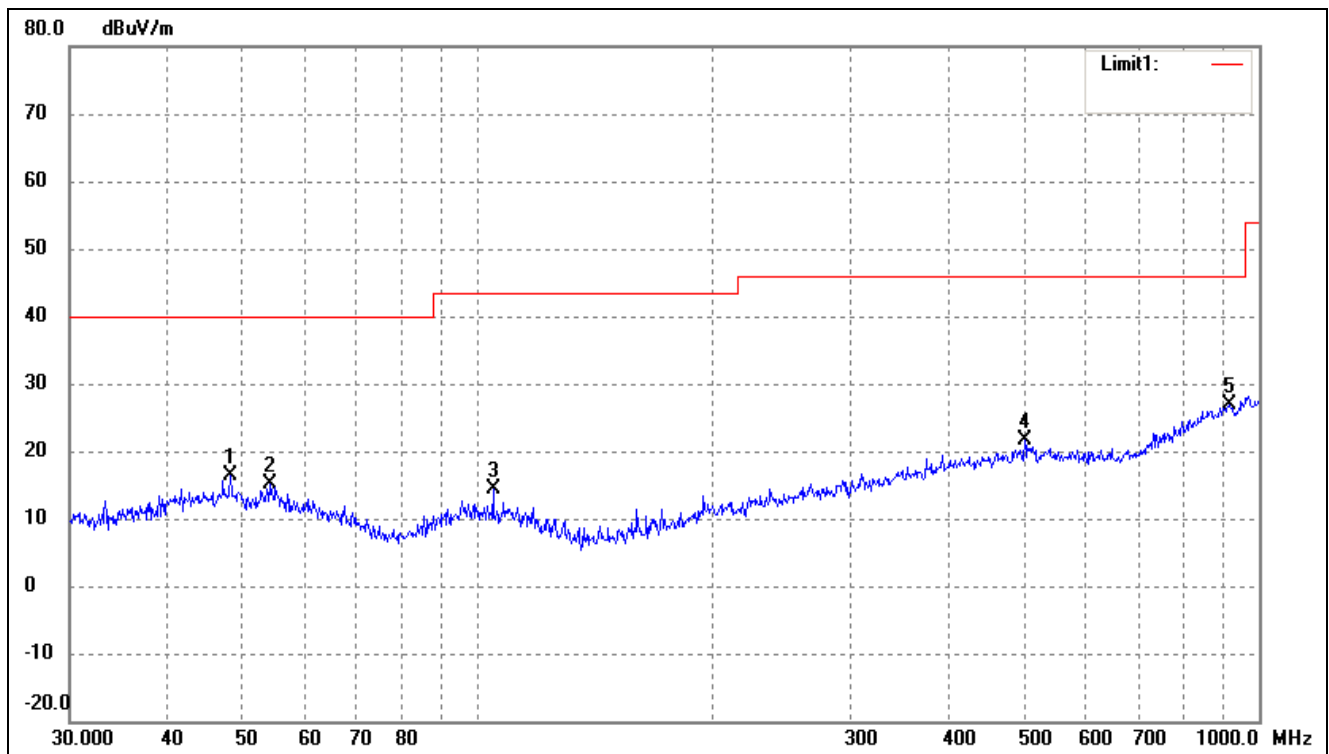
Comment: Battery: DC3.7V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	43.2017	25.28	-7.82	17.46	40.00	-22.54	10	100	peak
2	102.7192	23.11	-9.57	13.54	43.50	-29.96	10	100	peak
3	190.4050	25.56	-10.01	15.55	43.50	-27.95	10	100	peak
4	506.4791	22.71	-1.16	21.55	46.00	-24.45	10	100	peak
5*	839.1817	23.87	3.64	27.51	46.00	-18.49	10	100	peak

Test Specification: Vertical

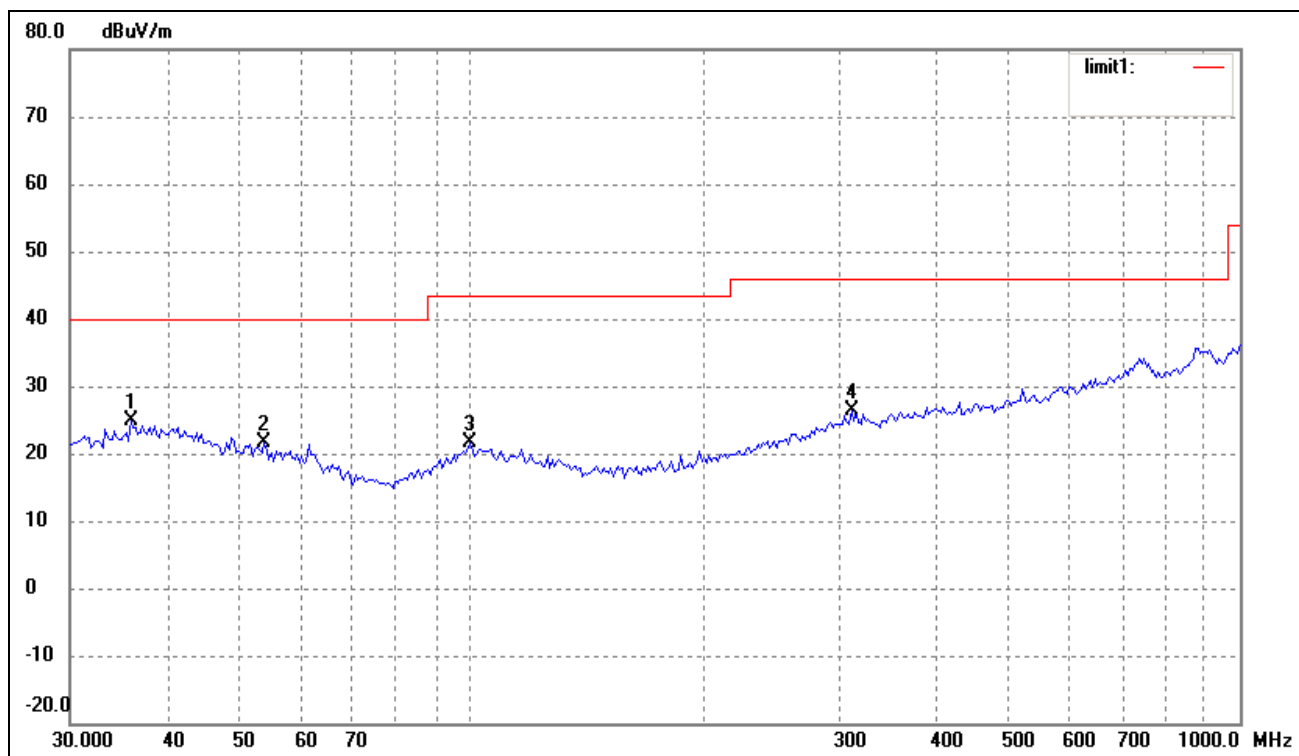


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	48.1626	23.79	-7.46	16.33	40.00	-23.67	0	100	peak
2	54.0711	22.96	-7.85	15.11	40.00	-24.89	0	100	peak
3	104.5361	23.99	-9.58	14.41	43.50	-29.09	0	100	peak
4	501.1790	22.85	-1.10	21.75	46.00	-24.25	0	100	peak
5*	916.0687	21.20	5.56	26.76	46.00	-19.24	0	100	peak

Operating Condition: 802.11g Transmitting Channel 11-2462MHz

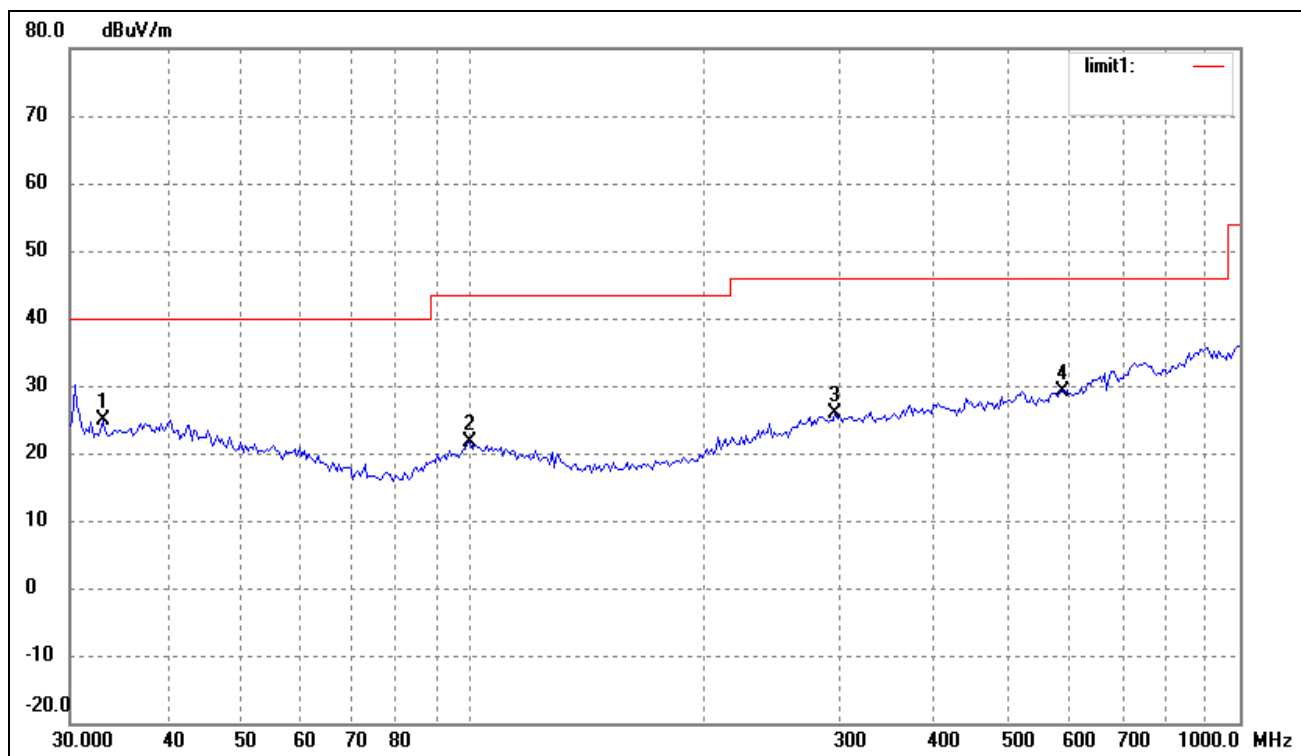
Comment: Battery: DC3.7V

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	36.0007	15.78	9.04	24.82	40.00	-15.18	360	100	peak
2	53.6932	15.24	6.28	21.52	40.00	-18.48	178	100	peak
3	99.5281	14.81	6.72	21.53	43.50	-21.97	176	100	peak
4	312.1794	16.07	10.36	26.43	46.00	-19.57	255	100	peak

Test Specification: Vertical

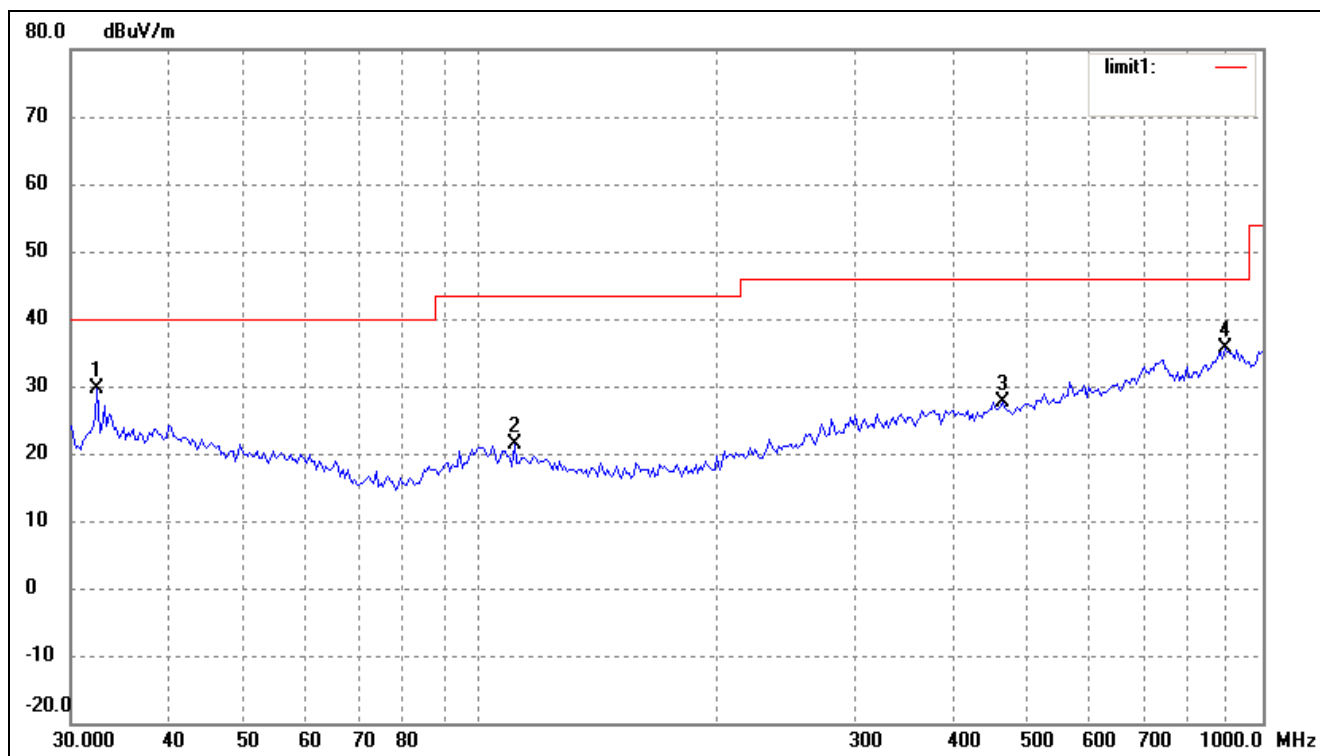


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	33.0950	16.41	8.56	24.97	40.00	-15.03	360	100	peak
2	99.5281	14.92	6.72	21.64	43.50	-21.86	225	100	peak
3	297.2241	15.73	10.04	25.77	46.00	-20.23	160	100	peak
4	586.8437	14.85	14.39	29.24	46.00	-16.76	310	100	peak

Operating Condition: 802.11g Transmitting Channel 12-2467MHz

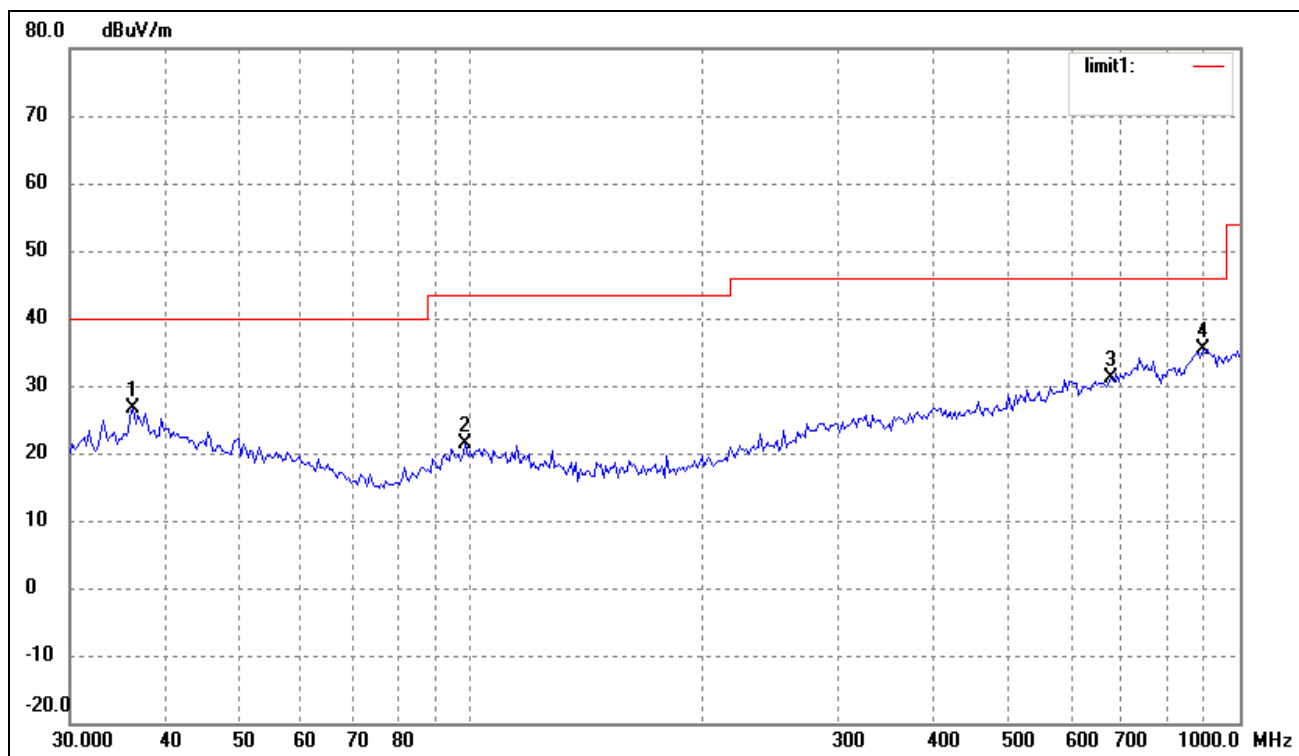
Comment: Battery: DC3.7V

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	32.4059	21.23	8.44	29.67	40.00	-10.33	174	100	peak
2	110.5687	15.56	5.80	21.36	43.50	-22.14	160	100	peak
3	465.5994	16.02	11.69	27.71	46.00	-18.29	320	100	peak
4	893.8567	16.34	19.27	35.61	46.00	-10.39	360	100	peak

Test Specification: Vertical

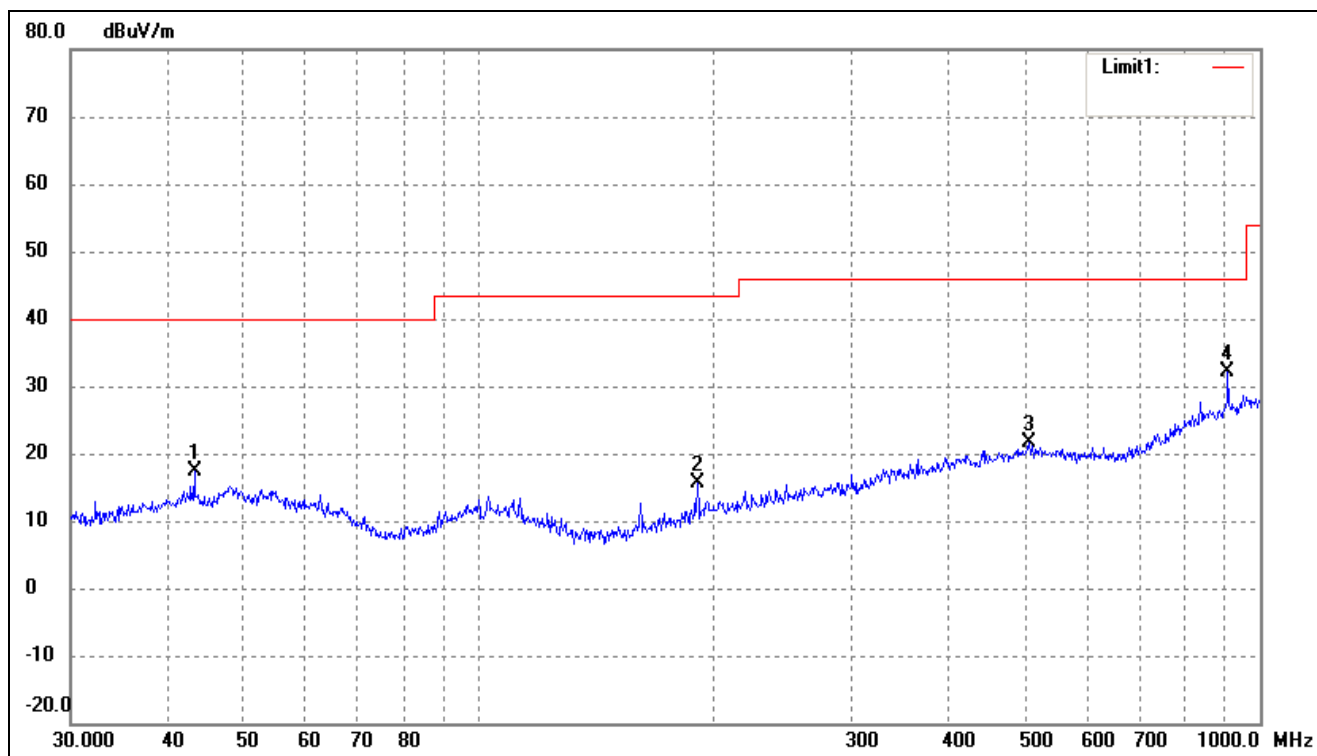


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	36.2541	17.45	9.09	26.54	40.00	-13.46	177	100	peak
2	98.1419	14.98	6.39	21.37	43.50	-22.13	90	100	peak
3	679.9600	15.48	15.55	31.03	46.00	-14.97	336	100	peak
4	893.8567	16.13	19.27	35.40	46.00	-10.60	360	100	peak

Operating Condition: 802.11g Transmitting Channel 13-2472MHz

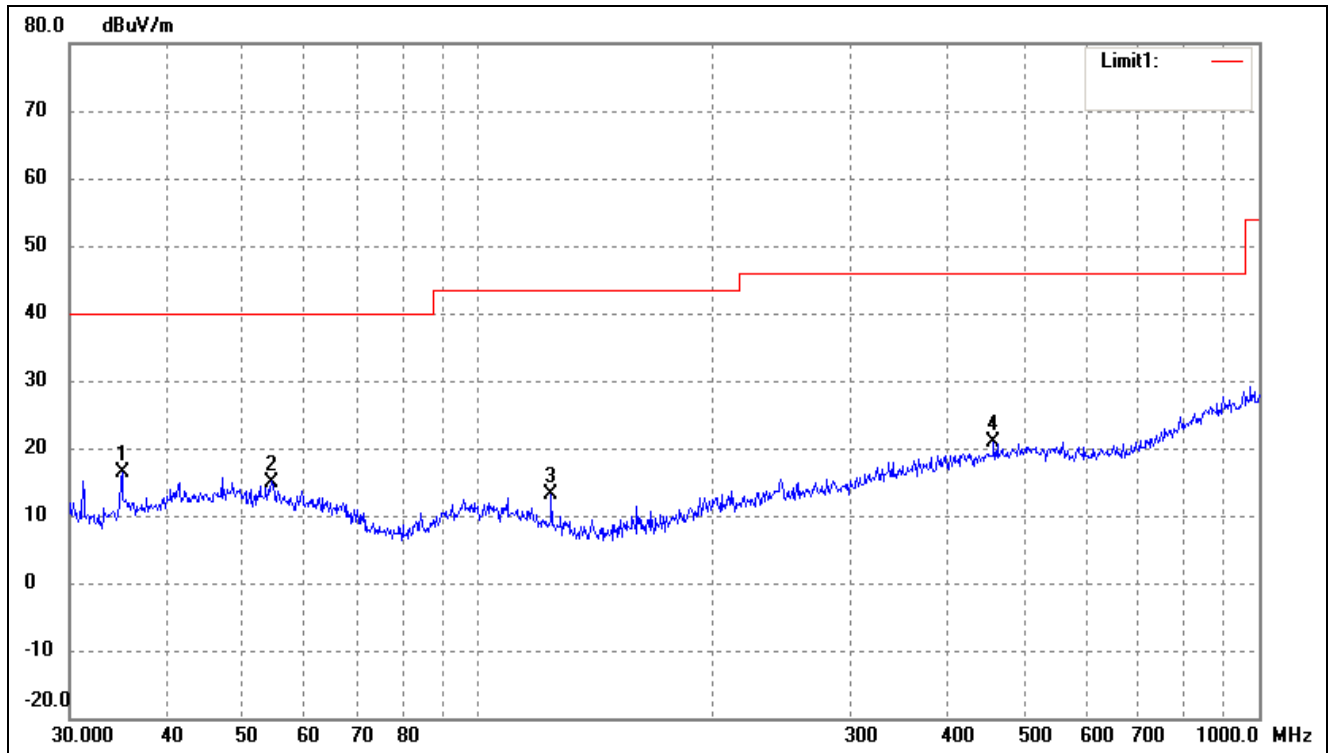
Comment: Battery: DC3.7V

Test Specification: Horizontal



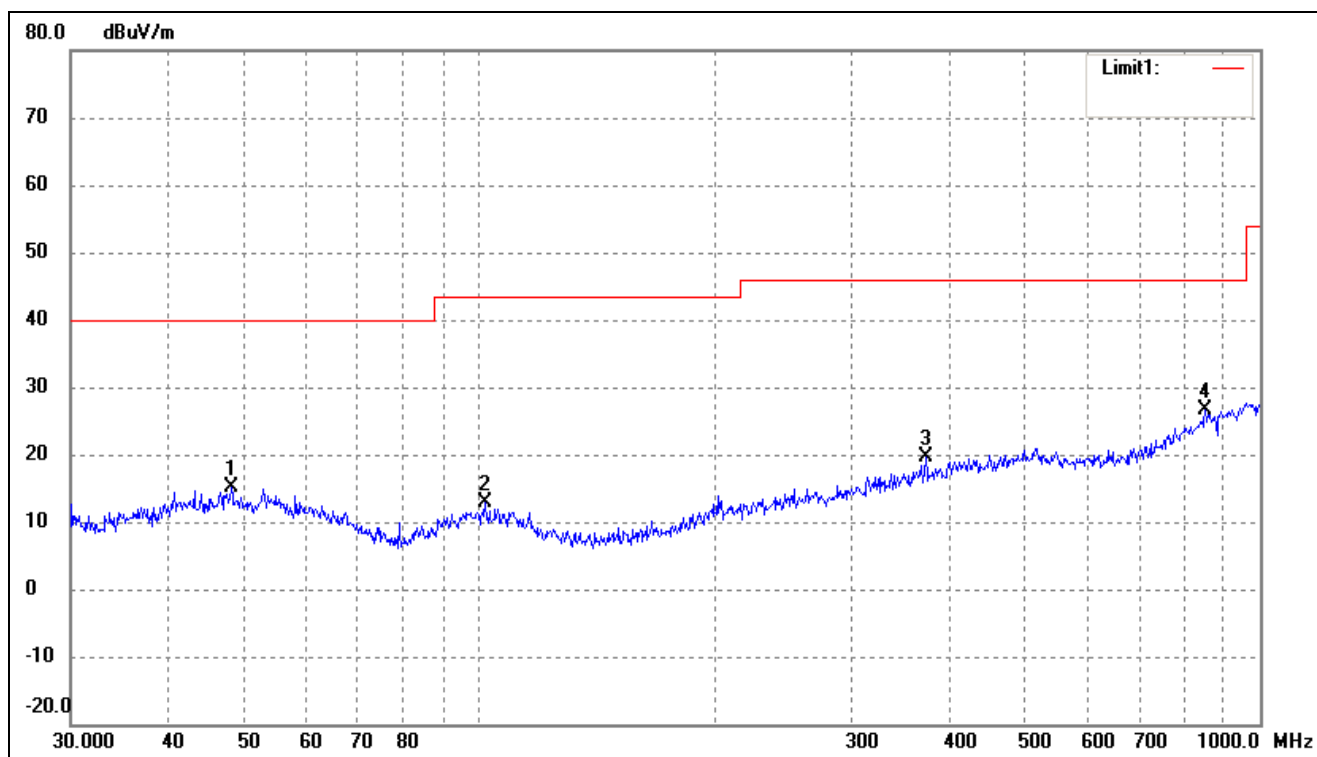
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	43.2017	25.28	-7.82	17.46	40.00	-22.54	0	100	peak
2	190.4050	25.56	-10.01	15.55	43.50	-27.95	0	100	peak
3	506.4791	22.71	-1.16	21.55	46.00	-24.45	0	100	peak
4*	909.6667	26.75	5.49	32.24	46.00	-13.76	0	100	peak

Test Specification: Vertical



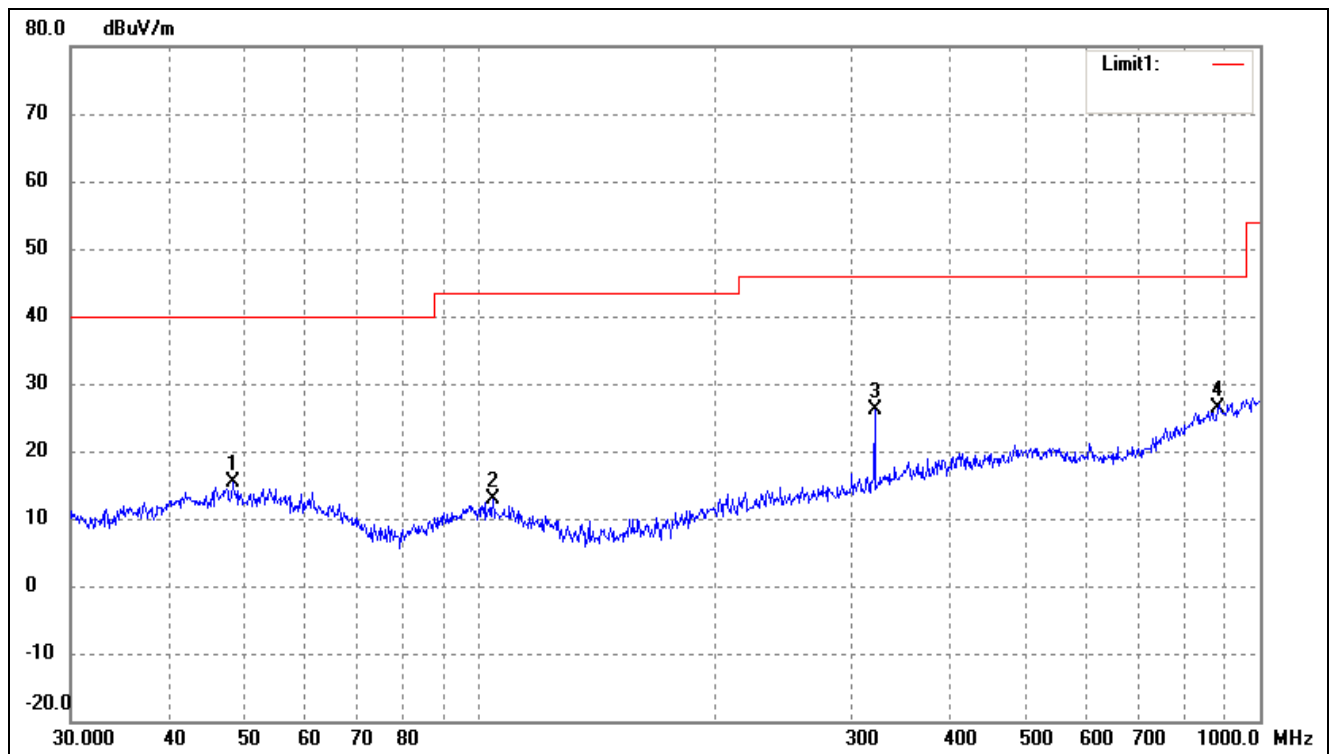
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1*	35.0048	26.42	-10.05	16.37	40.00	-23.63	32	100	peak
2	54.4516	22.90	-7.90	15.00	40.00	-25.00	32	100	peak
3	124.1330	25.07	-11.88	13.19	43.50	-30.31	32	100	peak
4	457.5073	23.03	-2.08	20.95	46.00	-25.05	32	100	peak



**Plot of Radiated Emissions Test Data (30MHz to 1GHz)***EUT:* Waterproof rugged phone*Tested Model:* SMT1*Operating Condition:* 802.11n-HT20 Transmitting Channel 1-2412MHz*Comment:* Battery: DC3.7V*Test Specification:* Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	48.1626	22.60	-7.46	15.14	40.00	-24.86	0	100	peak
2	101.6443	22.32	-9.56	12.76	43.50	-30.74	0	100	peak
3	373.3112	23.32	-3.75	19.57	46.00	-26.43	0	100	peak
4*	851.0353	22.62	3.92	26.54	46.00	-19.46	0	100	peak

Test Specification: Vertical

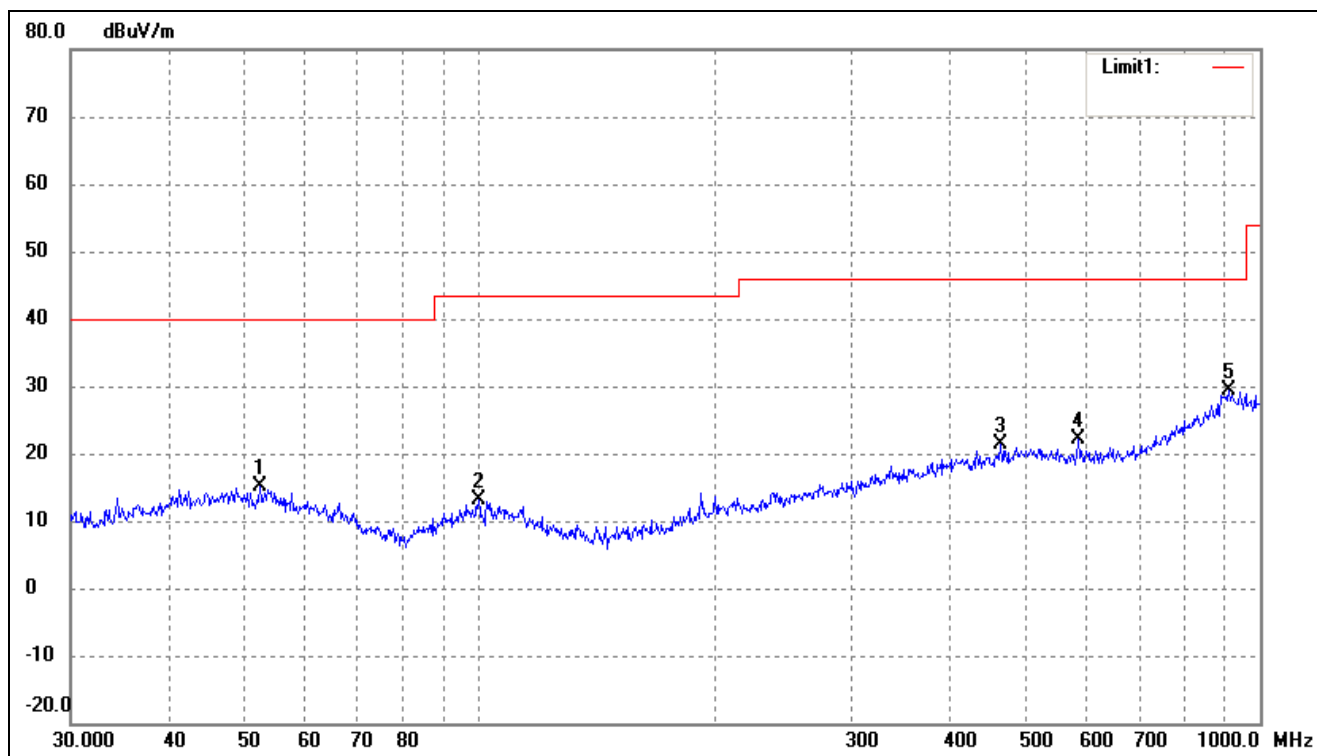


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	48.3318	22.76	-7.45	15.31	40.00	-24.69	20	100	peak
2	104.1701	22.36	-9.58	12.78	43.50	-30.72	20	100	peak
3	321.0608	31.61	-5.47	26.14	46.00	-19.86	20	100	peak
4*	881.4067	21.33	5.01	26.34	46.00	-19.66	20	100	peak

Operating Condition: 802.11n-HT20 Transmitting Channel 7-2442MHz

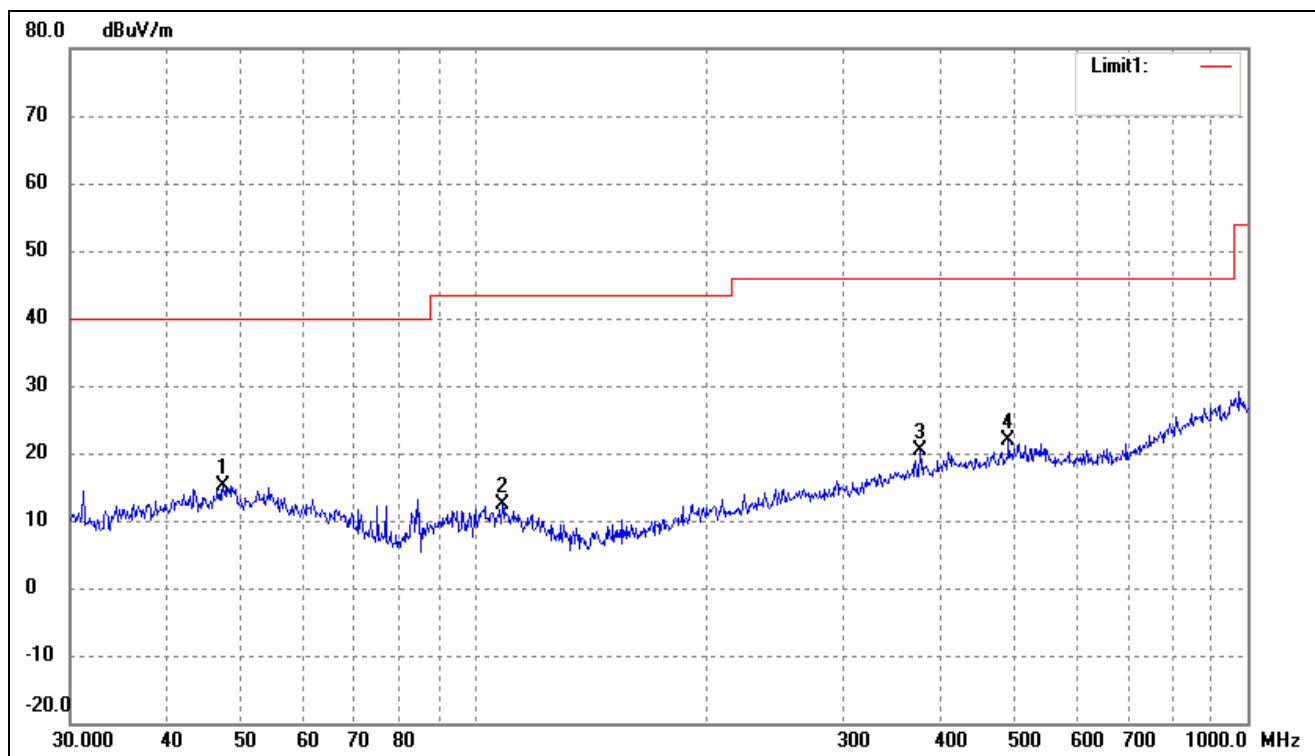
Comment: Battery: DC3.7V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	52.3912	22.71	-7.68	15.03	40.00	-24.97	250	100	peak
2	99.8777	22.76	-9.58	13.18	43.50	-30.32	250	100	peak
3	465.5994	23.31	-1.92	21.39	46.00	-24.61	250	100	peak
4	584.7895	23.76	-1.71	22.05	46.00	-23.95	250	100	peak
5*	912.8620	23.90	5.53	29.43	46.00	-16.57	250	100	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	47.3254	22.65	-7.45	15.20	40.00	-24.80	24	100	peak
2	108.6470	22.00	-9.60	12.40	43.50	-31.10	24	100	peak
3	377.2590	23.94	-3.66	20.28	46.00	-25.72	24	100	peak
4*	490.7447	23.13	-1.33	21.80	46.00	-24.20	24	100	peak

Operating Condition: 802.11n-HT20 Transmitting Channel 11-2462MHz

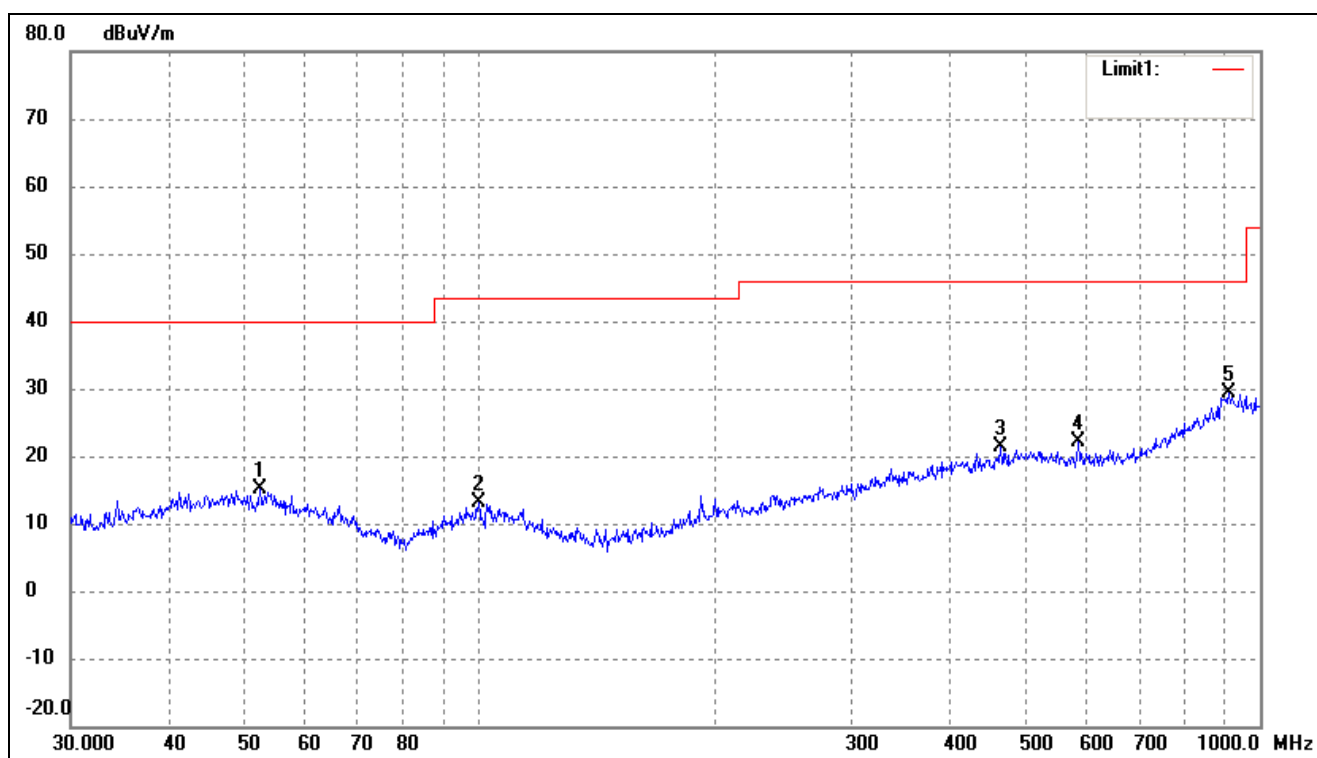
Comment: Battery: DC3.7V

Test Specification: Horizontal

Operating Condition: 802.11n-HT20 Transmitting Channel 7-2442MHz

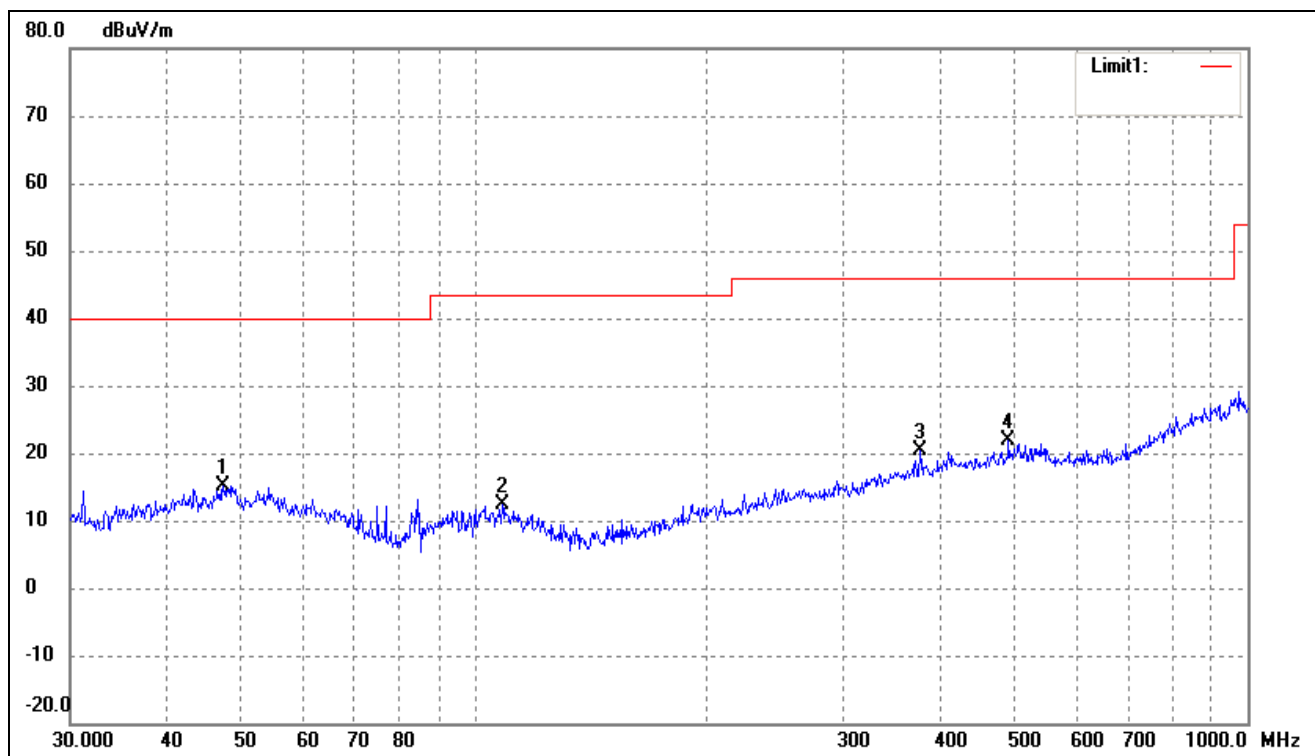
Comment: Battery: DC3.7V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	52.3912	22.71	-7.68	15.03	40.00	-24.97	250	100	peak
2	99.8777	22.76	-9.58	13.18	43.50	-30.32	250	100	peak
3	465.5994	23.31	-1.92	21.39	46.00	-24.61	250	100	peak
4	584.7895	23.76	-1.71	22.05	46.00	-23.95	250	100	peak
5*	912.8620	23.90	5.53	29.43	46.00	-16.57	250	100	peak

Test Specification: Vertical

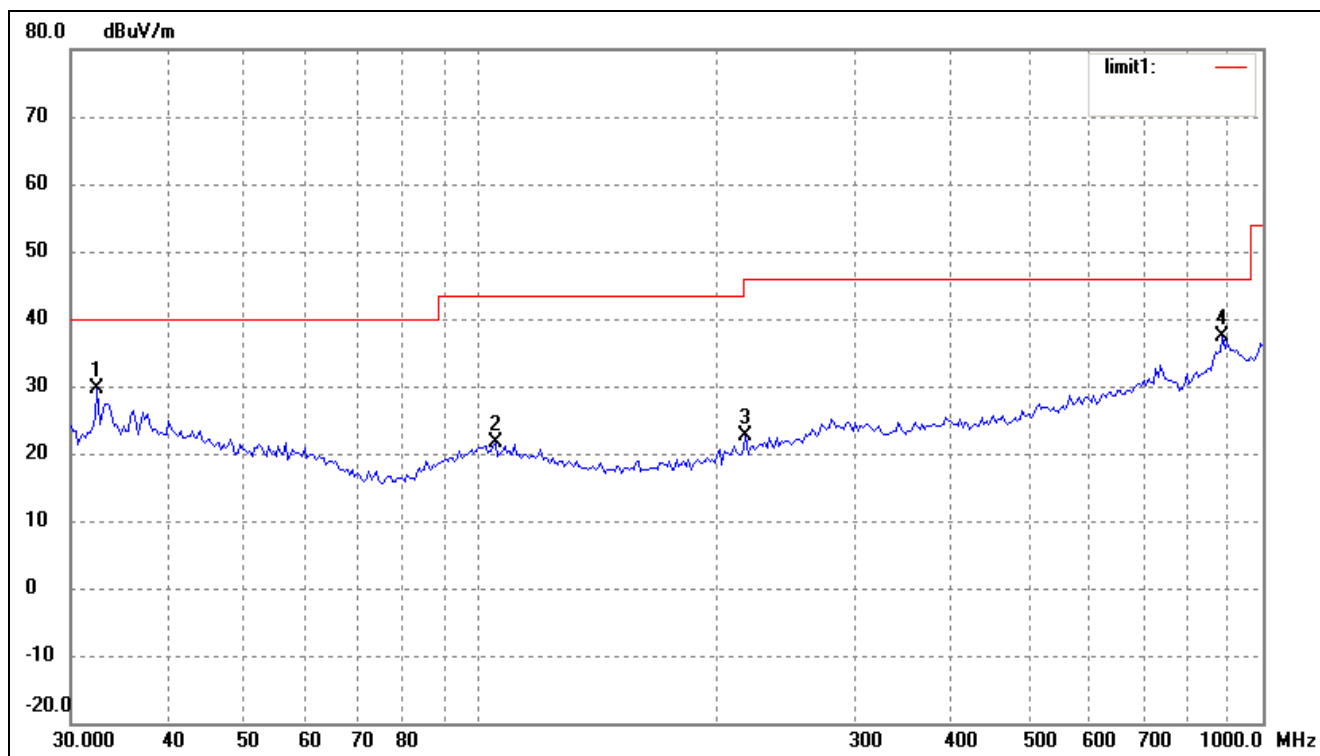


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	47.3254	22.65	-7.45	15.20	40.00	-24.80	24	100	peak
2	108.6470	22.00	-9.60	12.40	43.50	-31.10	24	100	peak
3	377.2590	23.94	-3.66	20.28	46.00	-25.72	24	100	peak
4*	490.7447	23.13	-1.33	21.80	46.00	-24.20	24	100	peak

Operating Condition: 802.11n-HT20 Transmitting Channel 12-2467MHz

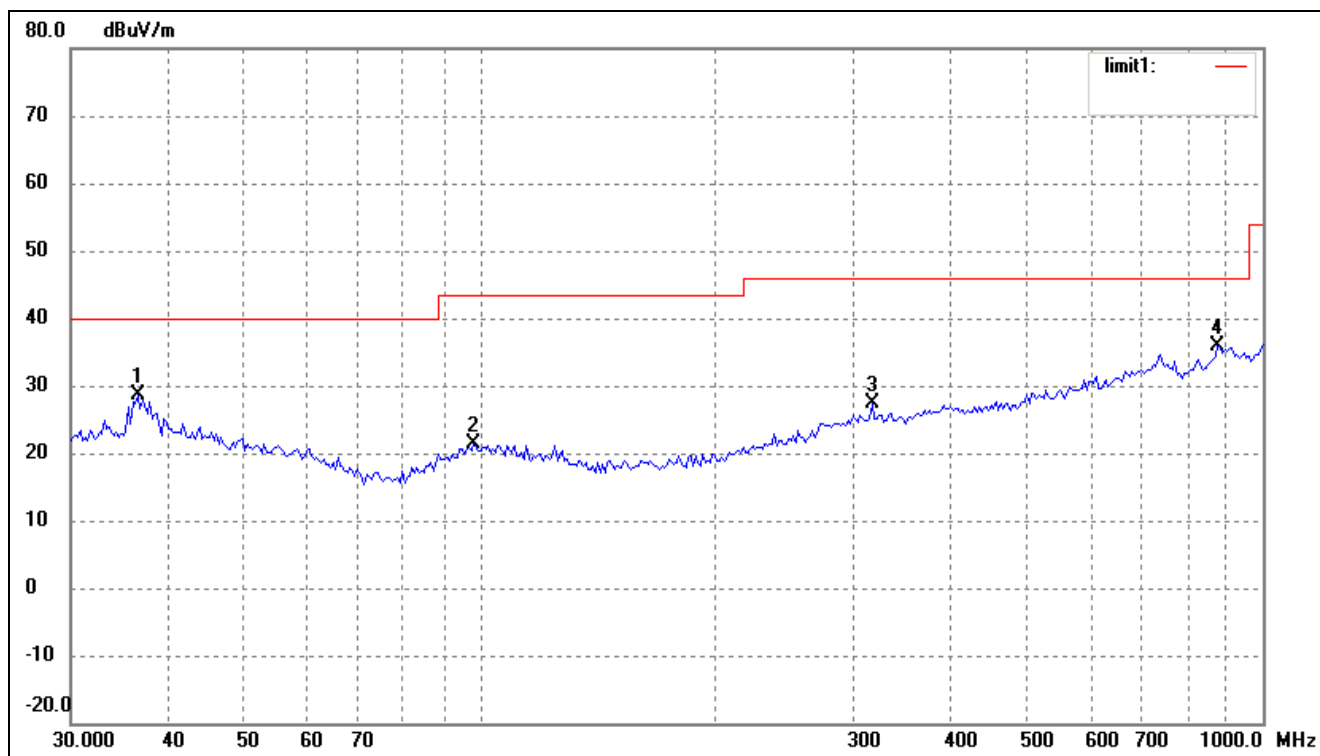
Comment: Battery: DC3.7V

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	32.4059	21.23	8.44	29.67	40.00	-10.33	270	100	peak
2	104.5361	15.27	6.39	21.66	43.50	-21.84	51	200	peak
3	218.3085	16.82	5.81	22.63	46.00	-23.37	360	200	peak
4	887.6099	18.21	19.15	37.36	46.00	-8.64	360	100	peak

Test Specification: Vertical



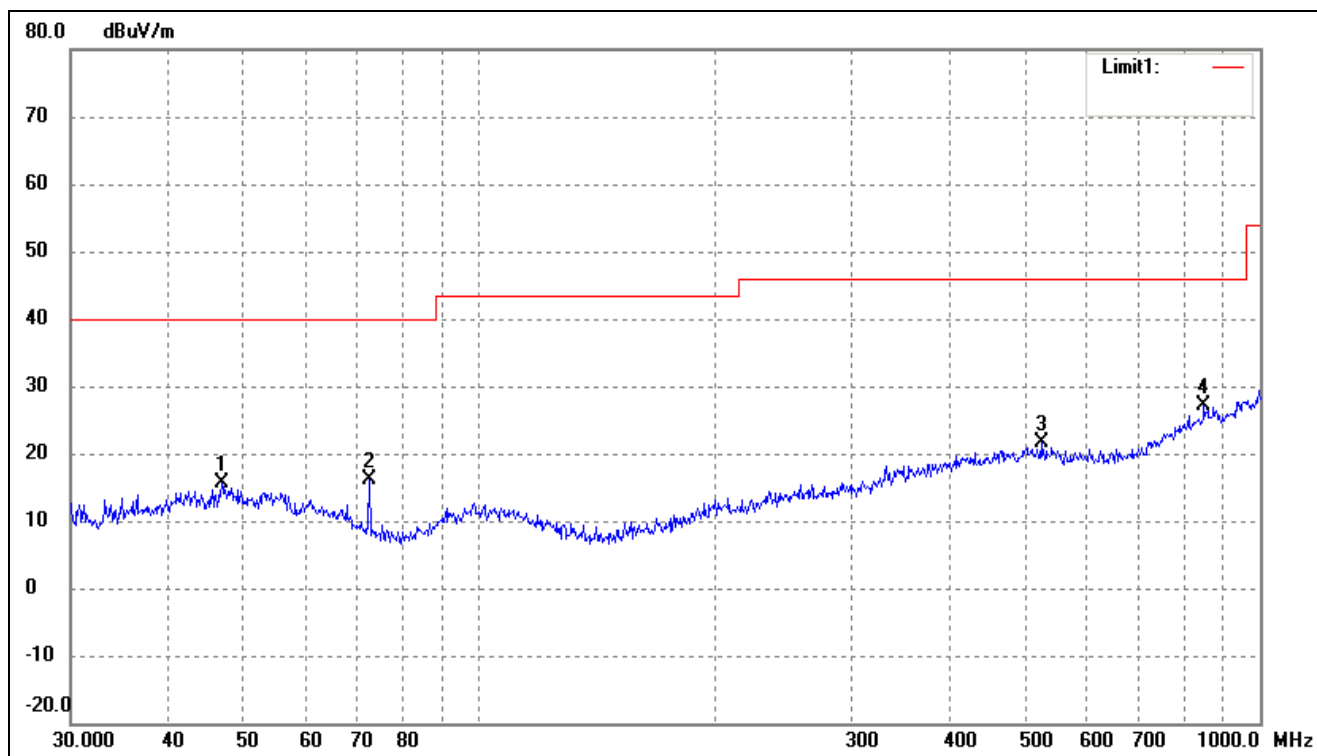
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( • )	(cm)	
1	36.5092	19.47	9.13	28.60	40.00	-11.40	360	100	peak
2	98.1419	14.98	6.39	21.37	43.50	-22.13	180	100	peak
3	316.5890	16.84	10.44	27.28	46.00	-18.72	225	100	peak
4	875.2470	17.15	18.80	35.95	46.00	-10.05	67	100	peak



Operating Condition: 802.11n-HT20 Transmitting Channel 13-2472MHz

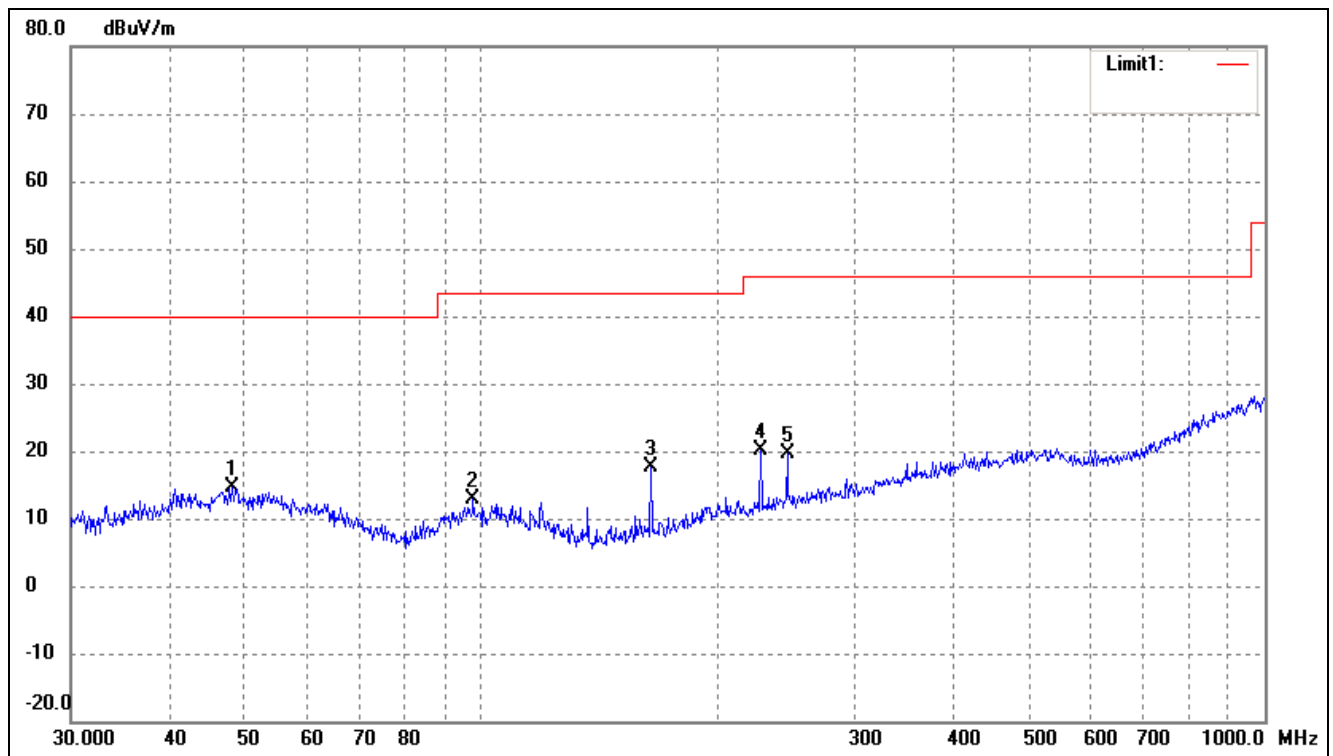
Comment: Battery: DC3.7V

Test Specification: Horizontal

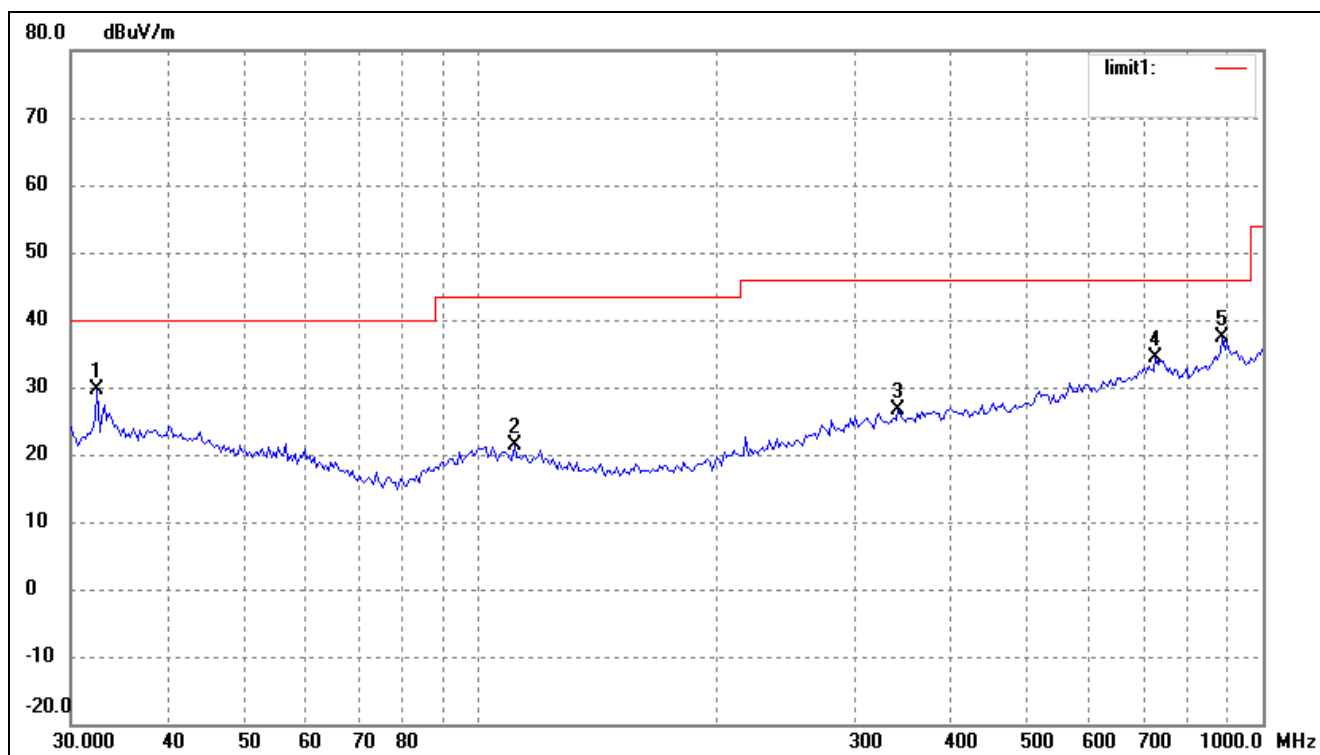


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	46.8303	23.12	-7.45	15.67	40.00	-24.33	45	100	peak
2	72.3376	28.63	-12.41	16.22	40.00	-23.78	45	100	peak
3	524.5541	22.75	-1.24	21.51	46.00	-24.49	45	100	peak
4*	848.0563	23.22	3.84	27.06	46.00	-18.94	45	100	peak

Test Specification: Vertical

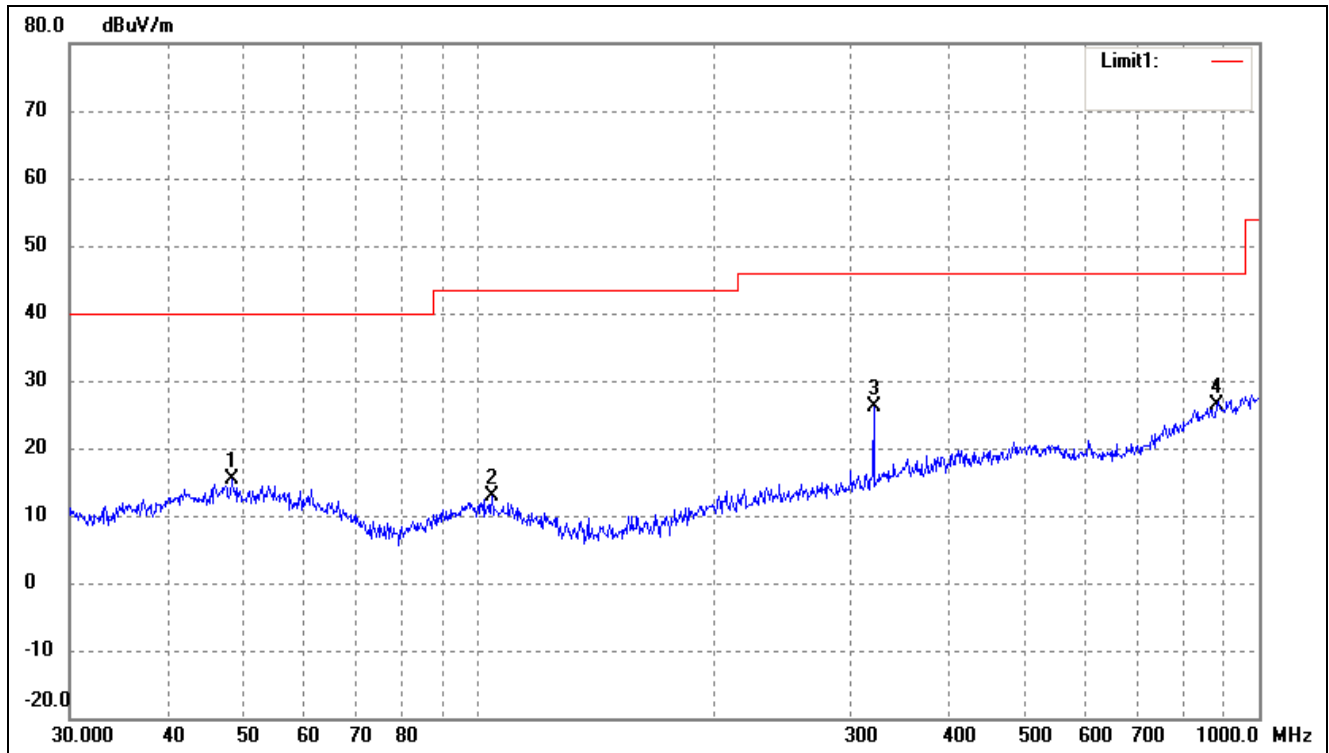


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1*	48.1626	22.10	-7.46	14.64	40.00	-25.36			peak
2	97.7983	22.59	-9.82	12.77	43.50	-30.73			peak
3	164.9075	29.81	-12.09	17.72	43.50	-25.78			peak
4	227.6906	28.71	-8.49	20.22	46.00	-25.78			peak
5	245.9509	27.34	-7.61	19.73	46.00	-26.27			peak

**Plot of Radiated Emissions Test Data (30MHz to 1GHz)***EUT:* Waterproof rugged phone*Tested Model:* SMT1*Operating Condition:* 802.11n-HT40 Transmitting Channel-2422MHz*Comment:* Battery: DC3.7V*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	32.4059	21.23	8.44	29.67	40.00	-10.33	270	100	peak
2	110.5687	15.56	5.80	21.36	43.50	-22.14	164	100	peak
3	341.9787	16.40	10.16	26.56	46.00	-19.44	228	200	peak
4	729.3583	17.11	17.31	34.42	46.00	-11.58	130	200	peak
5	887.6099	18.21	19.15	37.36	46.00	-8.64	360	100	peak

Test Specification: Vertical

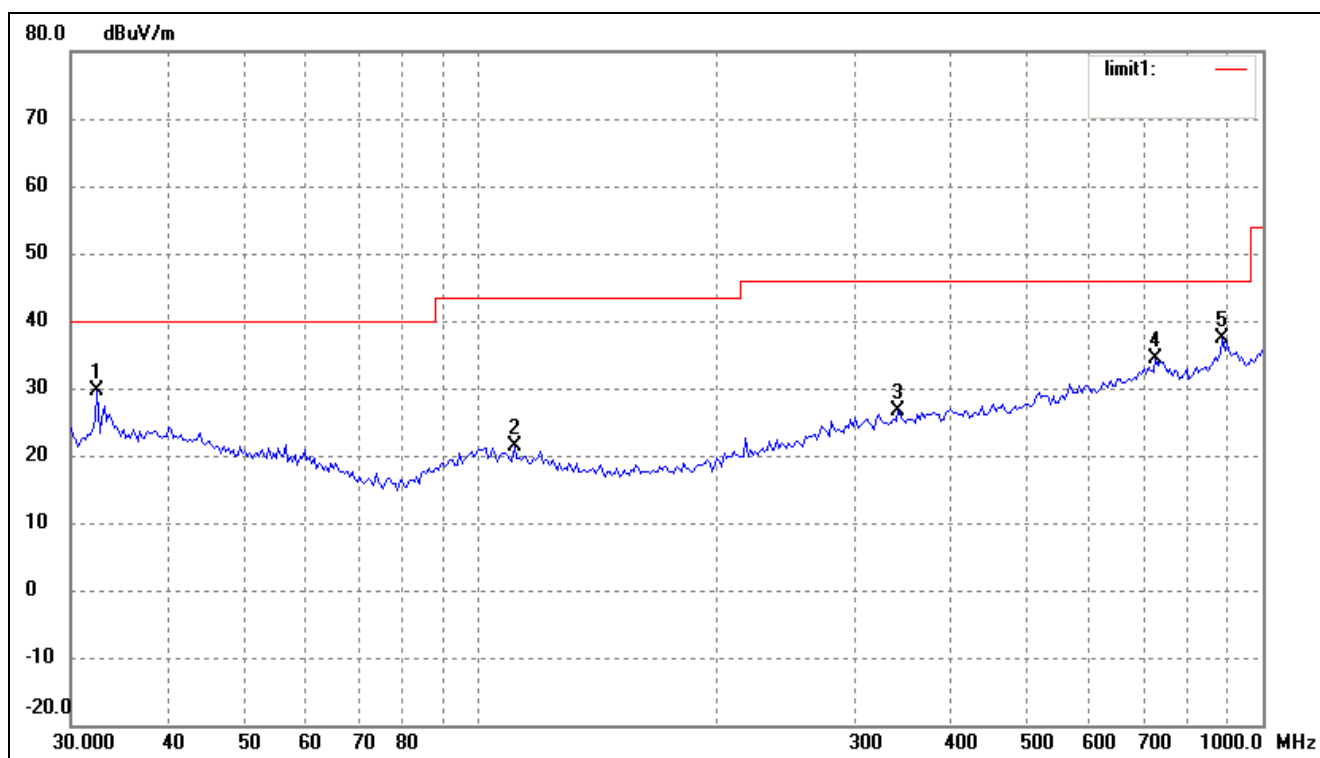


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	48.3318	22.76	-7.45	15.31	40.00	-24.69	20	100	peak
2	104.1701	22.36	-9.58	12.78	43.50	-30.72	20	100	peak
3	321.0608	31.61	-5.47	26.14	46.00	-19.86	20	100	peak
4*	881.4067	21.33	5.01	26.34	46.00	-19.66	20	100	peak

Operating Condition: 802.11n-HT40 Transmitting Channel-2442MHz

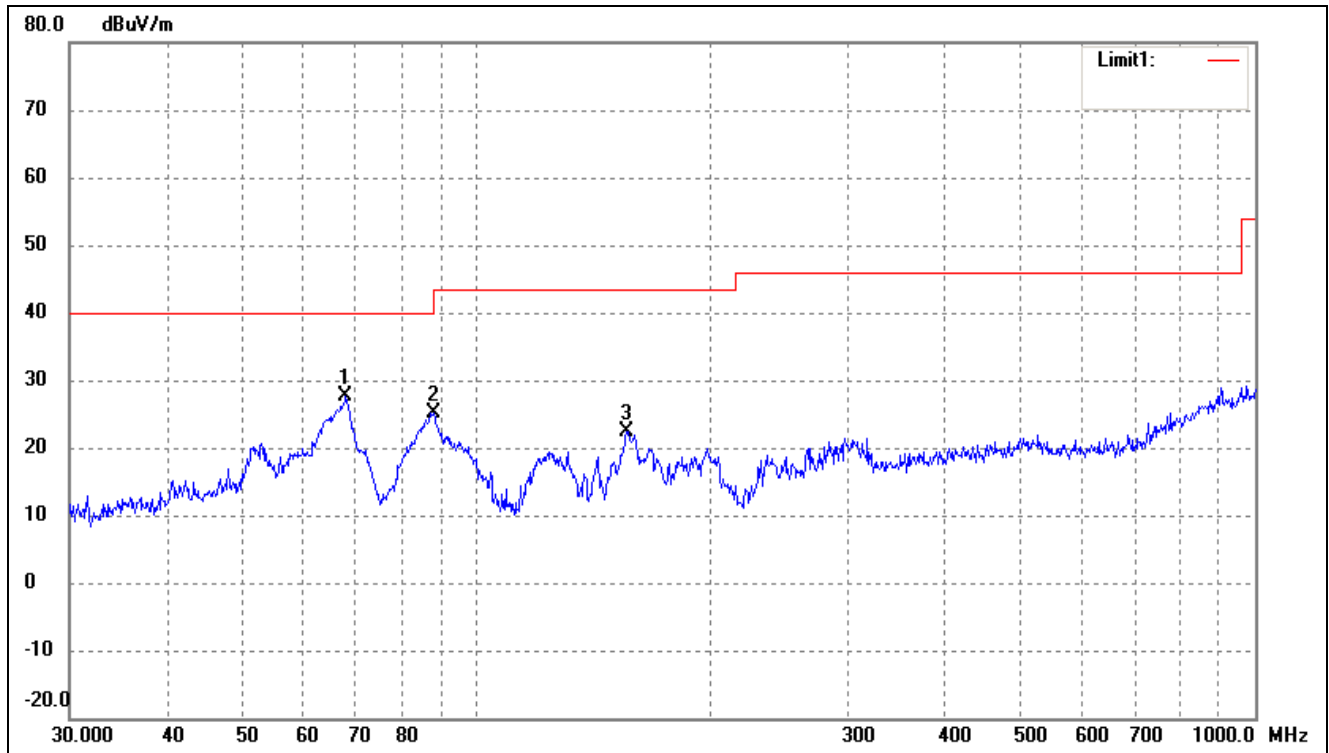
Comment: Battery: DC3.7V

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	32.4059	21.23	8.44	29.67	40.00	-10.33	270	100	peak
2	110.5687	15.56	5.80	21.36	43.50	-22.14	164	100	peak
3	341.9787	16.40	10.16	26.56	46.00	-19.44	228	200	peak
4	729.3583	17.11	17.31	34.42	46.00	-11.58	130	200	peak
5	887.6099	18.21	19.15	37.36	46.00	-8.64	360	100	peak

Test Specification: Vertical

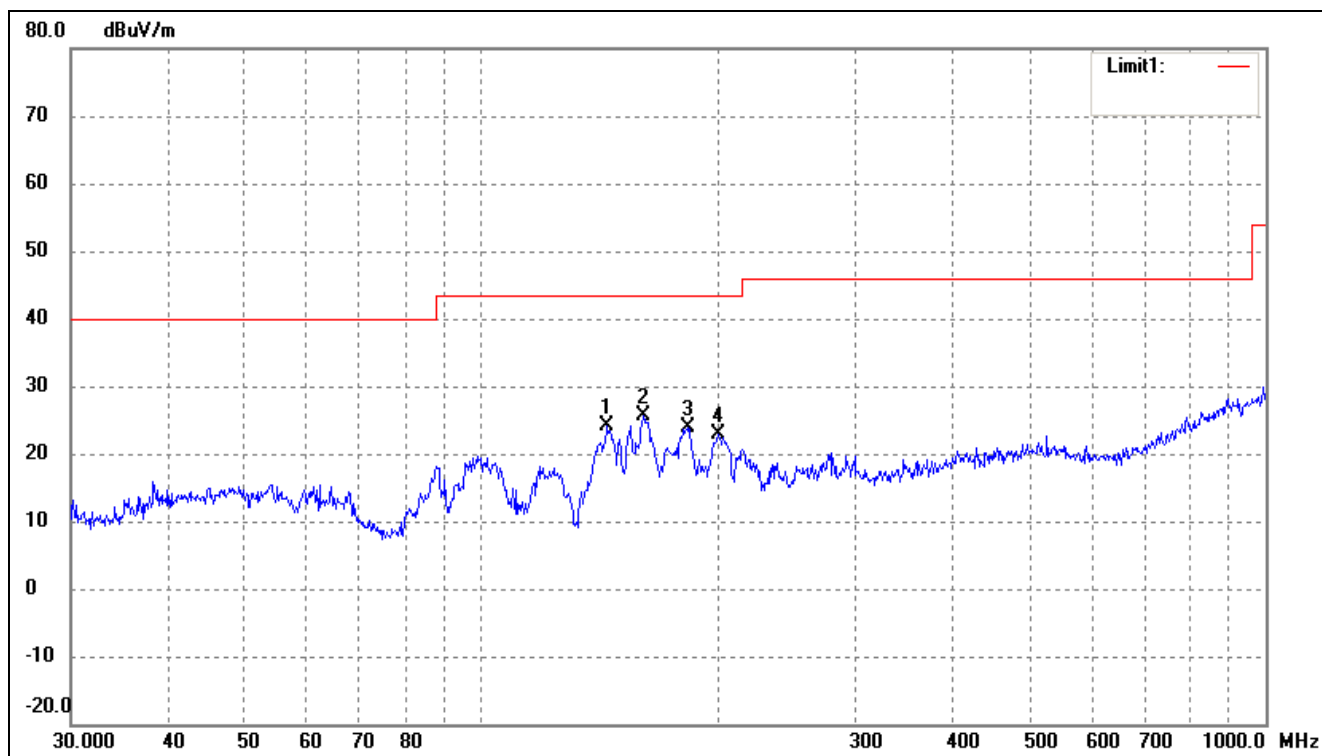


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1*	67.9129	38.48	-10.80	27.68	40.00	-12.32	10	100	peak
2	88.0329	36.81	-11.73	25.08	43.50	-18.42	10	100	peak
3	155.9101	34.99	-12.59	22.40	43.50	-21.10	10	100	peak

Operating Condition: 802.11n-HT40 Transmitting hannel-2462MHz

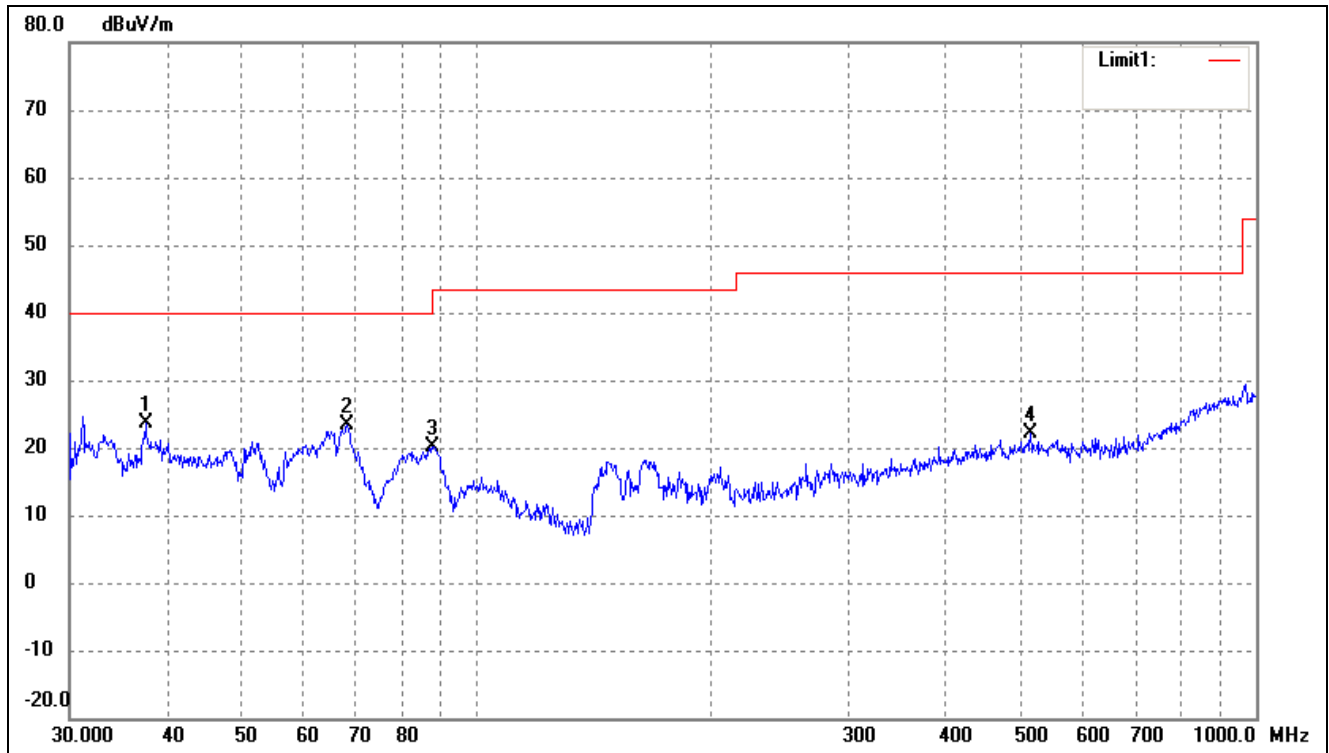
Comment: Battery: DC3.7V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Detector
1	144.8418	37.19	-13.06	24.13	43.50	-19.37	0	100	peak
2*	160.9089	37.88	-12.29	25.59	43.50	-17.91	0	100	peak
3	183.2005	34.55	-10.79	23.76	43.50	-19.74	0	100	peak
4	200.6881	31.86	-9.06	22.80	43.50	-20.70	0	100	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1*	37.5479	32.70	-9.01	23.69	40.00	-16.31			peak
2	68.1514	34.25	-10.91	23.34	40.00	-16.66			peak
3	87.7248	32.01	-11.81	20.20	40.00	-19.80			peak
4	513.6331	23.03	-0.79	22.24	46.00	-23.76			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	
Channel 1-2412MHz							
4824	41.98	12.37	54.35	74	-19.65	H	PK
4824	26.28	12.37	38.65	54	-15.35	H	AV
7236	41.25	15.49	56.74	74	-17.26	H	PK
7236	24.86	15.49	40.35	54	-13.65	H	AV
4824	37.79	12.37	50.16	74	-23.84	V	PK
4824	25.17	12.37	37.54	54	-16.46	V	AV
7236	38.09	15.49	53.58	74	-20.42	V	PK
7236	24.83	15.49	40.32	54	-13.68	V	AV
Channel 7-2442MHz							
4884	38.75	12.46	51.21	74	-22.79	H	PK
4884	24.75	12.46	37.21	54	-16.79	H	AV
7326	32.76	15.56	48.32	74	-25.68	H	PK
7326	19.01	15.56	34.57	54	-19.43	H	AV
4884	37.77	12.46	50.23	74	-23.77	V	PK
4884	24.69	12.46	37.15	54	-16.85	V	AV
7326	33.89	15.56	49.45	74	-24.55	V	PK
7326	19.99	15.56	35.55	54	-18.45	V	AV
Channel 11-2462MHz							
4924	38.86	12.49	51.35	74	-22.65	H	PK
4924	25.96	12.49	38.45	54	-15.55	H	AV
7386	34.20	15.58	49.78	74	-24.22	H	PK
7386	21.39	15.58	36.97	54	-17.03	H	AV
4924	39.74	12.49	52.23	74	-21.77	V	PK
4924	25.68	12.49	38.17	54	-15.83	V	AV
7386	32.59	15.58	48.17	74	-25.83	V	PK
7386	21.04	15.58	36.62	54	-17.38	V	AV
Channel 12-2467MHz							
4934	39.63	12.5	52.13	74	-21.87	H	PK
4934	26.29	12.5	38.79	54	-15.21	H	AV
7401	34.74	15.58	50.32	74	-23.68	H	PK
7401	21.06	15.58	36.64	54	-17.36	H	AV
4934	39.14	12.5	51.64	74	-22.36	V	PK
4934	25.87	12.5	38.37	54	-15.63	V	AV
7401	33.94	15.58	49.52	74	-24.48	V	PK
7401	19.92	15.58	35.5	54	-18.50	V	AV

High Channel-2472MHz							
4944	38.81	12.55	51.36	74	-22.64	H	PK
4944	26.99	12.55	39.54	54	-14.46	H	AV
7416	33.21	15.64	48.85	74	-25.15	H	PK
7416	21.10	15.64	36.74	54	-17.26	H	AV
4944	40.78	12.55	53.33	74	-20.67	V	PK
4944	27.57	12.55	40.12	54	-13.88	V	AV
7416	34.23	15.64	49.87	74	-24.13	V	PK
7416	21.16	15.64	36.8	54	-17.20	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	
Channel 1-2412MHz							
4824	40.15	12.37	52.52	74	-21.48	H	PK
4824	26.73	12.37	39.1	54	-14.90	H	AV
7236	33.48	15.49	48.97	74	-25.03	H	PK
7236	21.03	15.49	36.52	54	-17.48	H	AV
4824	38.04	12.37	50.41	74	-23.59	V	PK
4824	24.79	12.37	37.16	54	-16.84	V	AV
7236	34.88	15.49	50.37	74	-23.63	V	PK
7236	22.25	15.49	37.74	54	-16.26	V	AV
Channel 7-2442MHz							
4884	40.39	12.46	52.85	74	-21.15	H	PK
4884	26.86	12.46	39.32	54	-14.68	H	AV
7326	34.75	15.56	50.31	74	-23.69	H	PK
7326	21.31	15.56	36.87	54	-17.13	H	AV
4884	39.28	12.46	51.74	74	-22.26	V	PK
4884	24.22	12.46	36.68	54	-17.32	V	AV
7326	32.80	15.56	48.36	74	-25.64	V	PK
7326	19.98	15.56	35.54	54	-18.46	V	AV
Channel 11-2462MHz							
4924	37.82	12.49	50.31	74	-23.69	H	PK
4924	25.40	12.49	37.89	54	-16.11	H	AV
7386	34.76	15.58	50.34	74	-23.66	H	PK
7386	22.31	15.58	37.89	54	-16.11	H	AV
4924	39.62	12.49	52.11	74	-21.89	V	PK
4924	27.15	12.49	39.64	54	-14.36	V	AV
7386	34.52	15.58	50.1	74	-23.90	V	PK
7386	21.57	15.58	37.15	54	-16.85	V	AV

Channel 12-2467MHz							
4934	38.68	12.5	51.18	74	-22.82	H	PK
4934	26.38	12.5	38.88	54	-15.12	H	AV
7401	34.63	15.58	50.21	74	-23.79	H	PK
7401	18.99	15.58	34.57	54	-19.43	H	AV
4934	37.92	12.5	50.42	74	-23.58	V	PK
4934	26.24	12.5	38.74	54	-15.26	V	AV
7401	34.38	15.58	49.96	74	-24.04	V	PK
7401	21.09	15.58	36.67	54	-17.33	V	AV
High Channel-2472MHz							
4944	37.61	12.55	50.16	74	-23.84	H	PK
4944	27.74	12.55	40.29	54	-13.71	H	AV
7416	32.34	15.64	47.98	74	-26.02	H	PK
7416	23.95	15.64	39.59	54	-14.41	H	AV
4944	46.71	12.55	59.26	74	-14.74	V	PK
4944	27.74	12.55	40.29	54	-13.71	V	AV
7416	34.00	15.64	49.64	74	-24.36	V	PK
7416	22.69	15.64	38.33	54	-15.67	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	
Channel 1-2412MHz							
4824	39.73	12.37	52.1	74	-21.90	H	PK
4824	27.63	12.37	40	54	-14.00	H	AV
7236	34.05	15.49	49.54	74	-24.46	H	PK
7236	22.51	15.49	38	54	-16.00	H	AV
4824	45.78	12.37	58.15	74	-15.85	V	PK
4824	29.09	12.37	41.46	54	-12.54	V	AV
7236	34.61	15.49	50.1	74	-23.90	V	PK
7236	23.50	15.49	38.99	54	-15.01	V	AV
Channel 7-2442MHz							
4884	41.84	12.46	54.3	74	-19.70	H	PK
4884	26.19	12.46	38.65	54	-15.35	H	AV
7326	34.09	15.56	49.65	74	-24.35	H	PK
7326	22.06	15.56	37.62	54	-16.38	H	AV
4884	50.15	12.46	62.61	74	-11.39	V	PK
4884	32.99	12.46	45.45	54	-8.55	V	AV
7326	35.93	15.56	51.49	74	-22.51	V	PK
7326	23.00	15.56	38.56	54	-15.44	V	AV

Channel 11-2462MHz							
4924	38.64	12.49	51.13	74	-22.87	H	PK
4924	32.77	12.49	45.26	54	-8.74	H	AV
7386	37.41	15.58	52.99	74	-21.01	H	PK
7386	23.64	15.58	39.22	54	-14.78	H	AV
4924	39.74	12.49	52.23	74	-21.77	V	PK
4924	29.67	12.49	42.16	54	-11.84	V	AV
7386	36.64	15.58	52.22	74	-21.78	V	PK
7386	23.42	15.58	39	54	-15.00	V	AV
Channel 12-2467MHz							
4934	42.86	12.5	55.36	74	-18.64	H	PK
4934	33.12	12.5	45.62	54	-8.38	H	AV
7401	36.43	15.58	52.01	74	-21.99	H	PK
7401	22.67	15.58	38.25	54	-15.75	H	AV
4934	39.86	12.5	52.36	74	-21.64	V	PK
4934	35.21	12.5	47.71	54	-6.29	V	AV
7401	39.13	15.58	54.71	74	-19.29	V	PK
7401	24.76	15.58	40.34	54	-13.66	V	AV
High Channel-2472MHz							
4944	40.71	12.55	53.26	74	-20.74	H	PK
4944	32.57	12.55	45.12	54	-8.88	H	AV
7416	34.38	15.64	50.02	74	-23.98	H	PK
7416	23.34	15.64	38.98	54	-15.02	H	AV
4944	45.24	12.55	57.79	74	-16.21	V	PK
4944	29.56	12.55	42.11	54	-11.89	V	AV
7416	34.46	15.64	50.1	74	-23.90	V	PK
7416	23.25	15.64	38.89	54	-15.11	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	44.06	12.4	56.46	74	-17.54	H	PK
4844	28.81	12.4	41.21	54	-12.79	H	AV
7266	22.15	15.51	37.66	74	-36.34	H	PK
7266	33.64	15.51	49.15	54	-4.85	H	AV
4844	45.96	12.4	58.36	74	-15.64	V	PK
4844	27.75	12.4	40.15	54	-13.85	V	AV
7266	39.80	15.51	55.31	74	-18.69	V	PK
7266	22.99	15.51	38.5	54	-15.50	V	AV
Middle Channel-2442MHz							
4884	46.37	12.48	58.85	74	-15.15	H	PK
4884	29.30	12.48	41.78	54	-12.22	H	AV
7326	34.62	15.59	50.21	74	-23.79	H	PK
7326	24.35	15.59	39.94	54	-14.06	H	AV
4884	39.88	12.48	52.36	74	-21.64	V	PK
4884	33.13	12.48	45.61	54	-8.39	V	AV
7326	39.52	15.59	55.11	74	-18.89	V	PK
7326	24.46	15.59	40.05	54	-13.95	V	AV
High Channel-2462MHz							
4924	39.79	12.57	52.36	74	-21.64	H	PK
4924	28.59	12.57	41.16	54	-12.84	H	AV
7386	36.70	15.66	52.36	74	-21.64	H	PK
7386	24.60	15.66	40.26	54	-13.74	H	AV
4924	41.16	12.57	53.73	74	-20.27	V	PK
4924	29.79	12.57	42.36	54	-11.64	V	AV
7386	40.49	15.66	56.15	74	-17.85	V	PK
7386	25.45	15.66	41.11	54	-12.89	V	AV

Note: Margin= (Reading+ Correct)- Limit

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

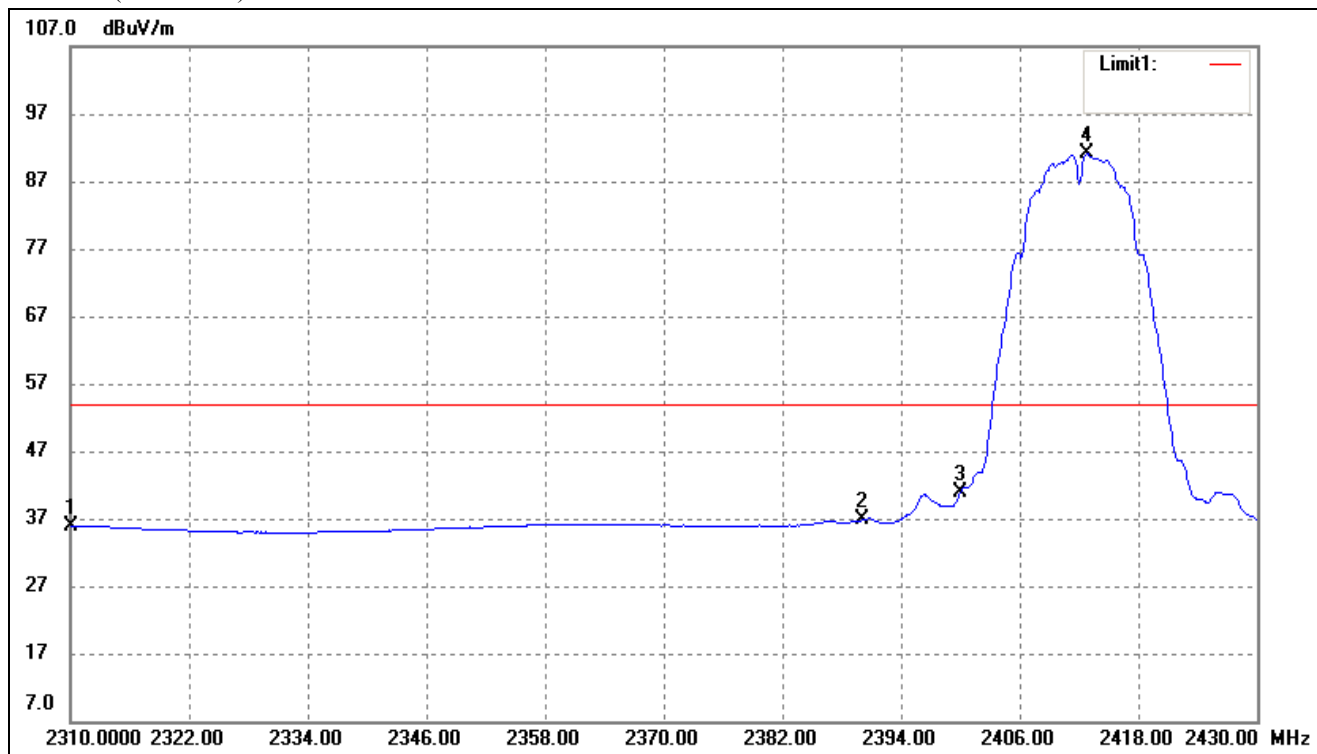
Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

#### 9.5 Summary of Test Results/Plots

Please refer to the test plots as below.

## 802.11b-Lowest Bandedge

Vertical (Worst case)

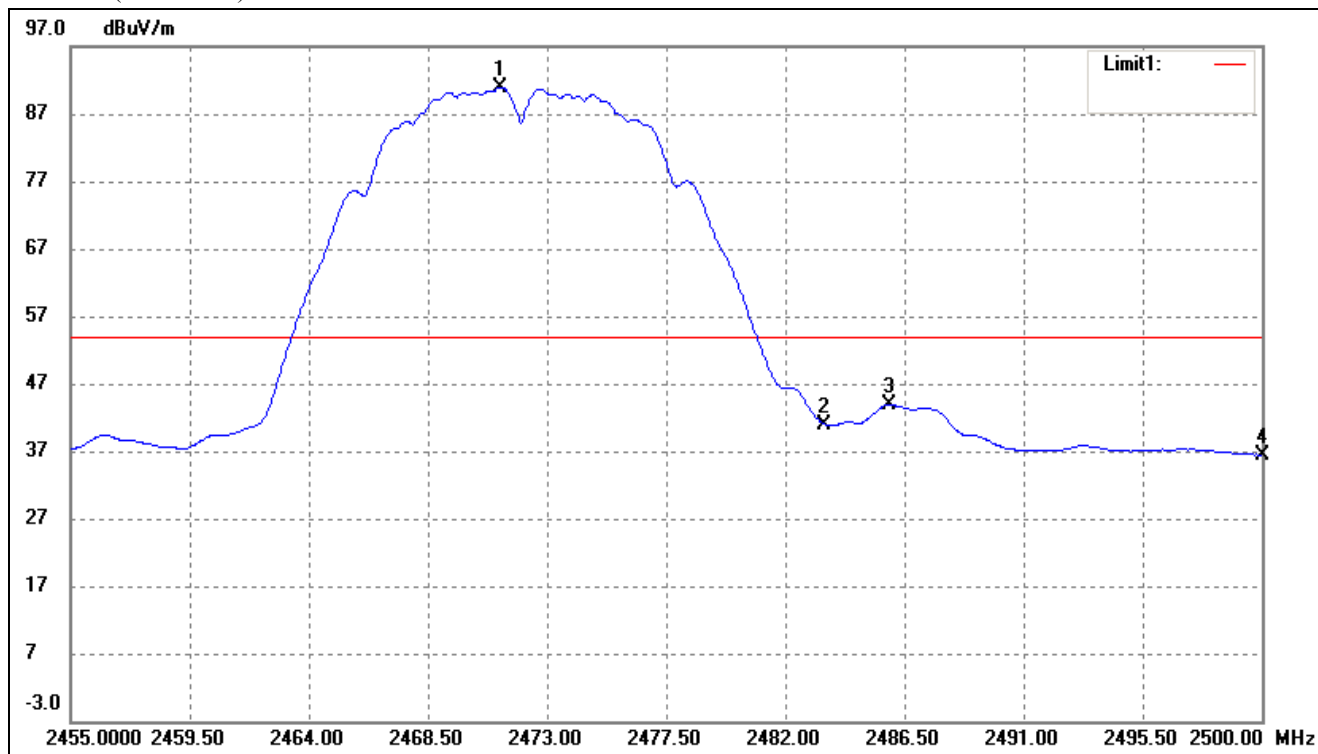


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	18.49	17.50	35.99	54.00	-18.01	Average Detector
	2310.000	36.14	17.50	53.64	74.00	-20.36	Peak Detector
2	2390.000	19.07	17.70	36.77	54.00	-17.23	Average Detector
	2390.000	36.55	17.70	54.25	74.00	-19.75	Peak Detector
3	2400.000	23.15	17.73	40.88	Delta =50.27dBc		Average Detector
4	2412.840	73.39	17.76	91.15			Average Detector



## 802.11b-Highest Bandedge

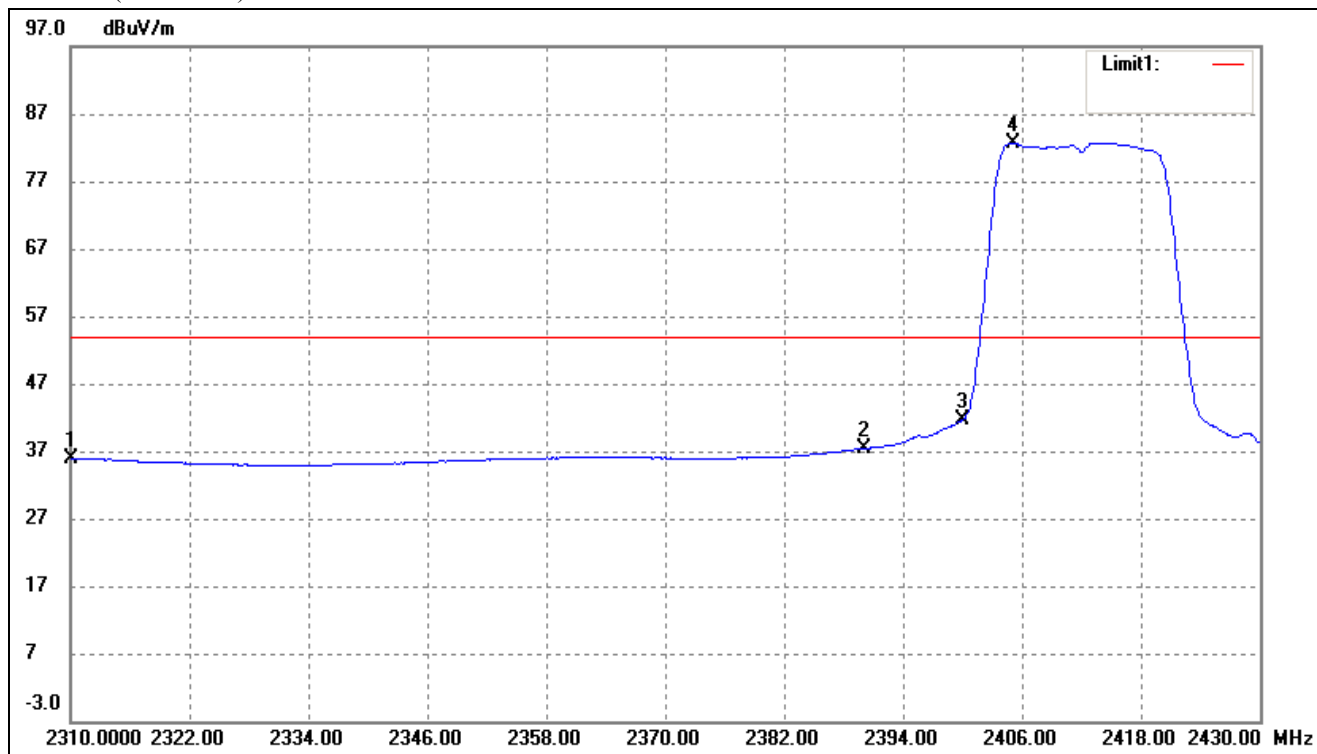
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2471.245	73.04	17.92	90.96	/	/	Average Detector
	2471.245	87.44	17.92	105.36	/	/	Peak Detector
2	2483.500	Delta = 49.97dBc		40.99	54.00	-13.01	Average Detector
	2483.500			55.39	74.00	-18.61	Peak Detector
3	2485.915	25.96	17.95	43.91	54.00	-10.09	Average Detector
	2485.915	40.41	17.95	58.36	74.00	-15.64	Peak Detector
4	2500.000	18.45	17.99	36.44	54.00	-17.56	Average Detector
5	2500.000	32.37	17.99	50.36	74.00	-23.64	Peak Detector

## 802.11g-Lowest Bandedge

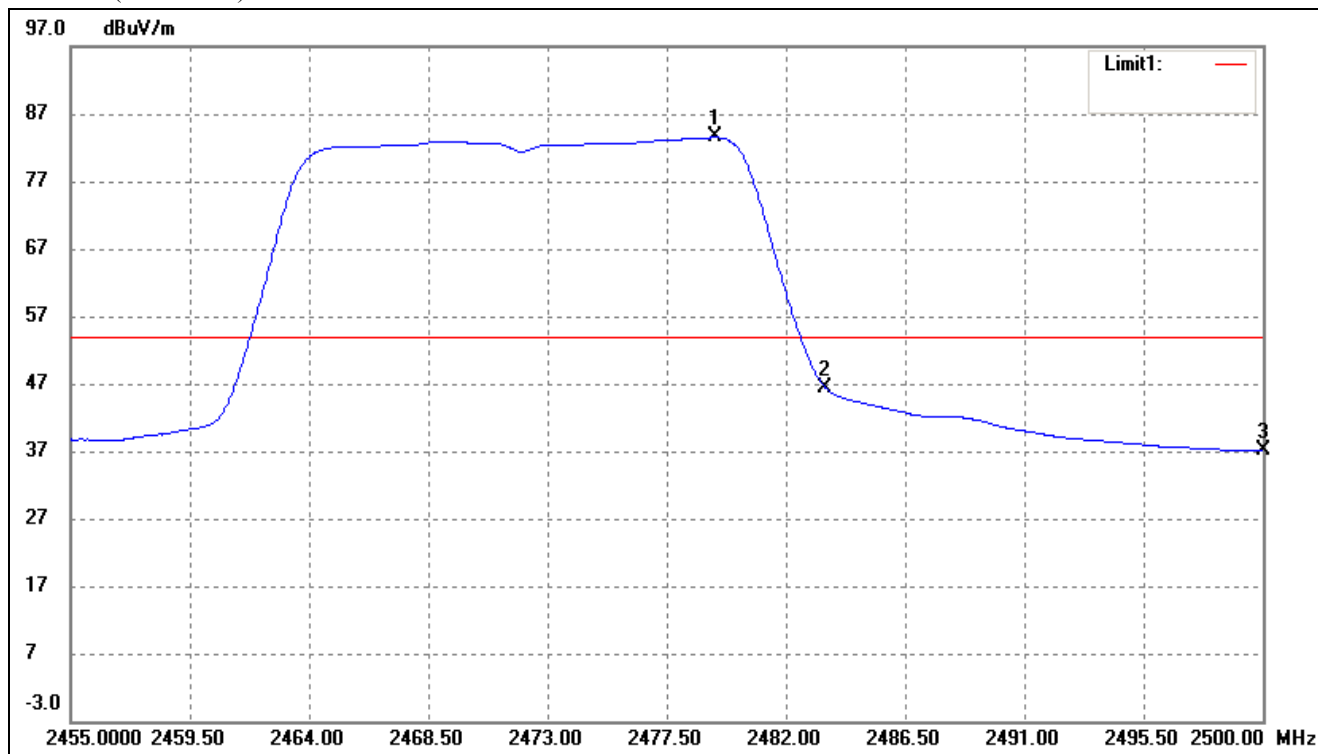
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.239	18.42	17.50	35.92	54.00	-18.08	Average Detector
	2310.239	36.88	17.50	54.38	74.00	-19.62	Peak Detector
2	2390.000	19.68	17.70	37.38	54.00	-16.62	Average Detector
	2390.000	37.66	17.70	55.36	74.00	-18.64	Peak Detector
3	2400.000	23.92	17.73	41.65	Delta =41.07dBc		Average Detector
4	2405.040	64.98	17.74	82.72			Average Detector

802.11g-Highest Bandedge

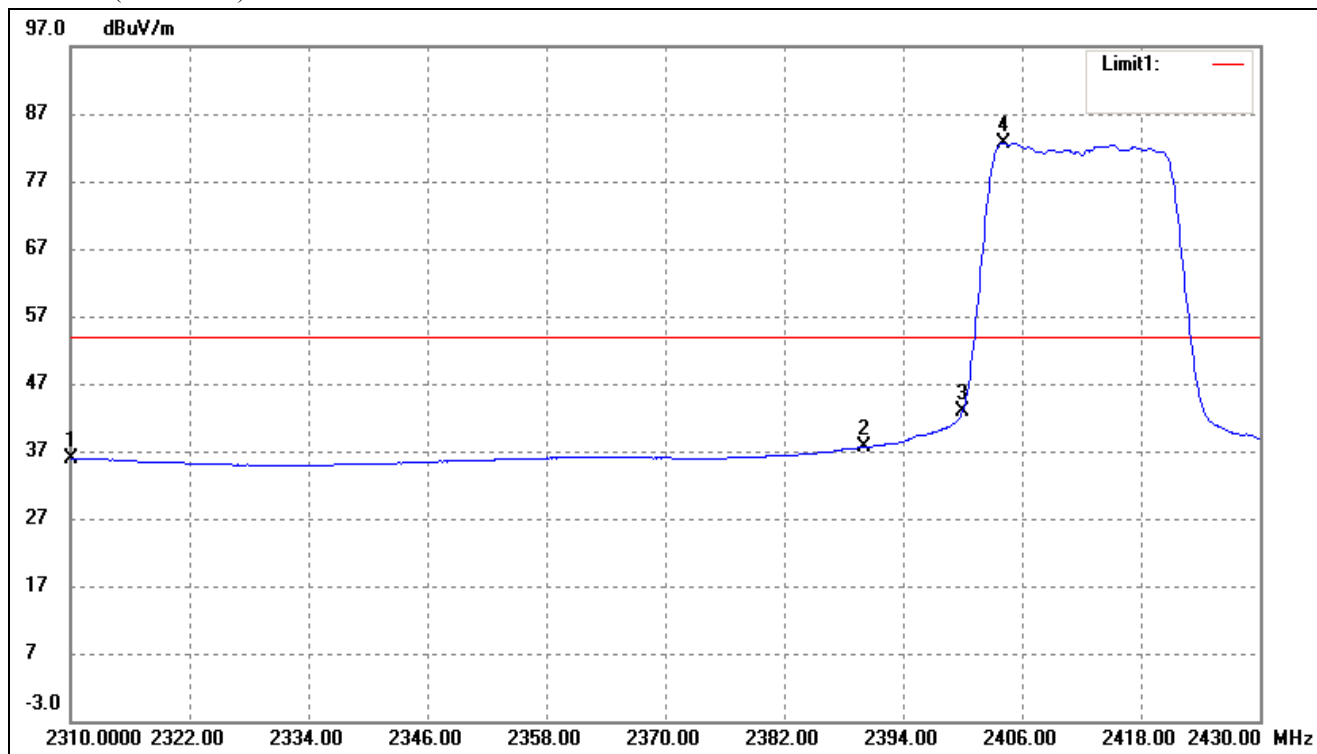
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.345	65.59	17.94	83.53	/	/	Average Detector
	2479.345	80.55	17.94	98.49	/	/	Peak Detector
2	2483.500	Delta = 37.24dBc		46.29	54.00	-7.71	Average Detector
	2483.500			61.25	74.00	-12.75	Peak Detector
3	2500.000	19.04	17.99	37.03	54.00	-16.97	Average Detector
	2500.000	34.33	17.99	52.32	74.00	-21.68	Peak Detector

## 802.11n-HT20-Lowest Bandedge

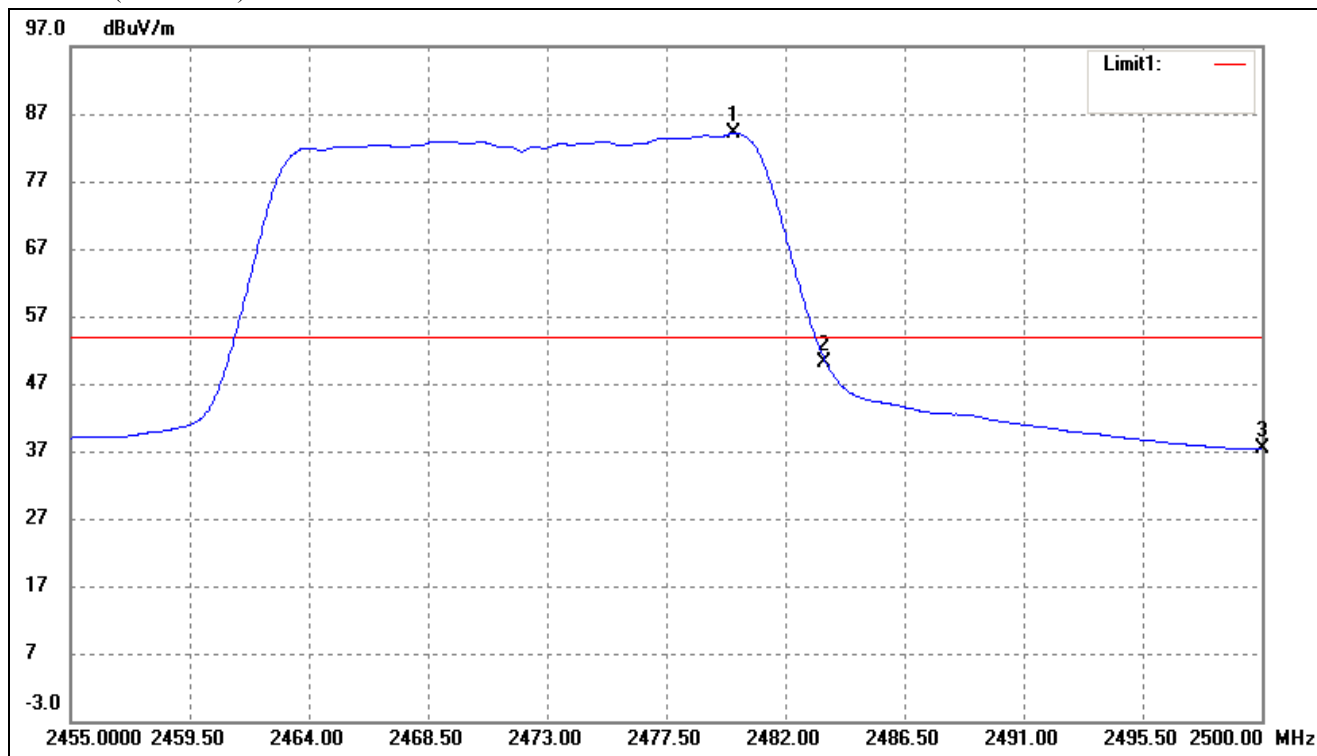
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	18.48	17.50	35.98	54.00	-18.02	Average Detector
	2310.000	33.75	17.50	51.25	74.00	-22.75	Peak Detector
2	2390.000	19.92	17.70	37.62	54.00	-16.38	Average Detector
	2390.000	35.51	17.70	53.21	74.00	-20.79	Peak Detector
3	2400.000	25.08	17.73	42.81	Delta =38.89dBc		Average Detector
4	2404.080	64.96	17.74	82.70			Average Detector

## 802.11n-HT20-Highest Bandedge

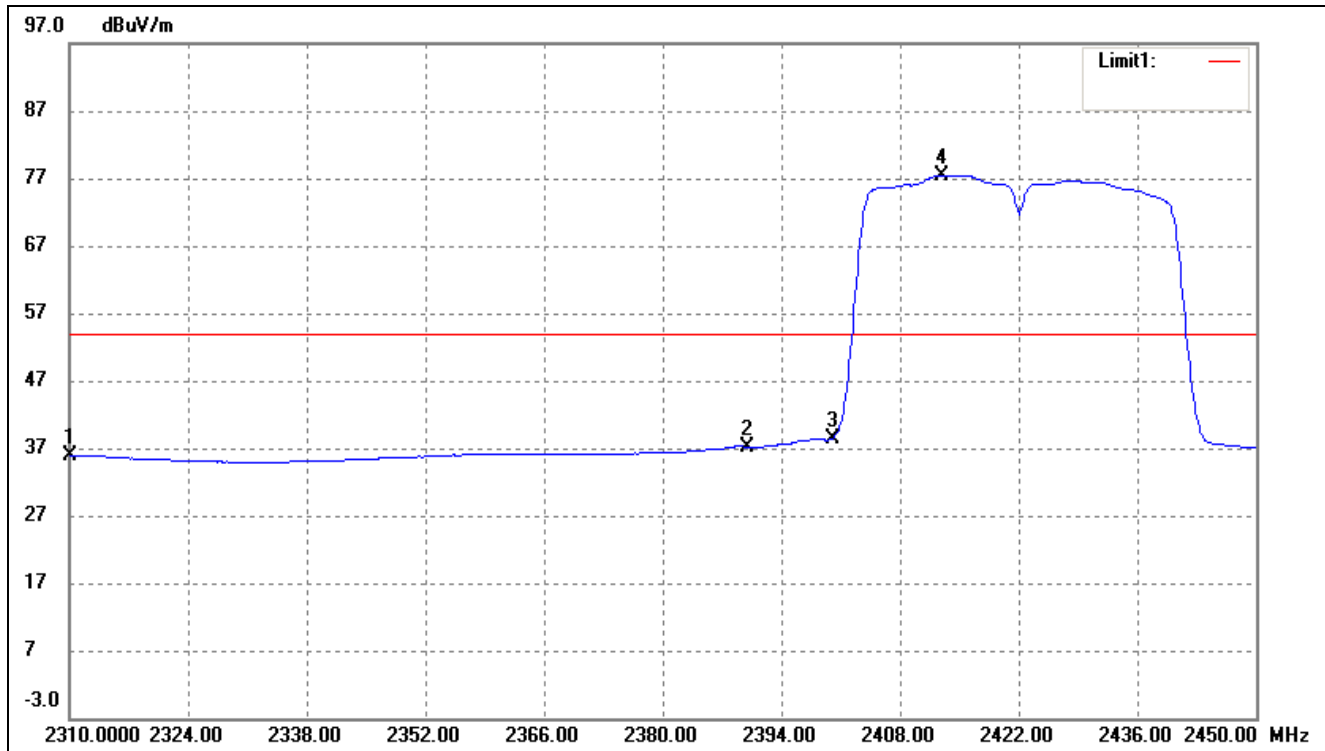
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480.065	66.16	17.94	84.10	/	/	Average Detector
	2480.065	81.30	17.94	99.24	/	/	Peak Detector
2	2483.500	Delta = 33.88dBc		50.22	54.00	-3.78	Average Detector
	2483.500			65.36	74.00	-8.64	Peak Detector
3	2500.000	19.31	17.99	37.30	54.00	-16.70	Average Detector
	2500.000	35.37	17.99	53.36	74.00	-20.64	Peak Detector

## 802.11n-HT40-Lowest Bandedge

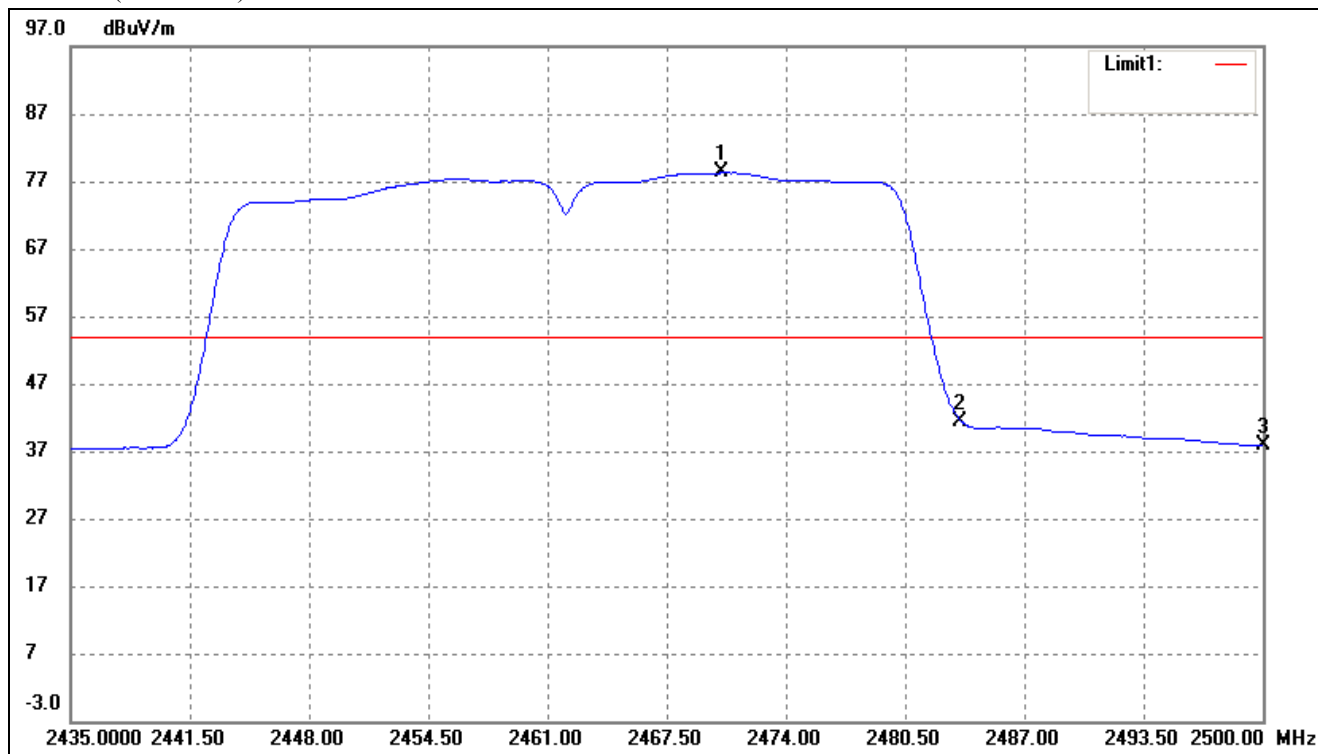
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	18.45	17.50	35.95	54.00	-18.05	Average Detector
	2310.000	34.84	17.50	52.34	74.00	-21.66	Peak Detector
2	2390.000	19.52	17.70	37.22	54.00	-16.78	Average Detector
	2390.000	35.91	17.70	53.61	74.00	-20.39	Peak Detector
3	2400.000	20.75	17.73	38.48	Delta =39.02dBc		Average Detector
4	2412.900	59.74	17.76	77.50			Average Detector

## 802.11n-HT40-Highest Bandedge

Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2470.490	60.36	17.91	78.27	/	/	Average Detector
	2470.490	74.14	17.91	92.05	/	/	Peak Detector
2	2483.500	Delta =36.80dBc		41.47	54.00	-12.53	Average Detector
	2483.500			55.25	74.00	-18.75	Peak Detector
3	2500.000	19.93	17.99	37.92	54.00	-16.08	Average Detector
	2500.000	32.26	17.99	50.25	74.00	-23.75	Peak Detector

## 10. Conducted Emissions

### 10.1 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.

### 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

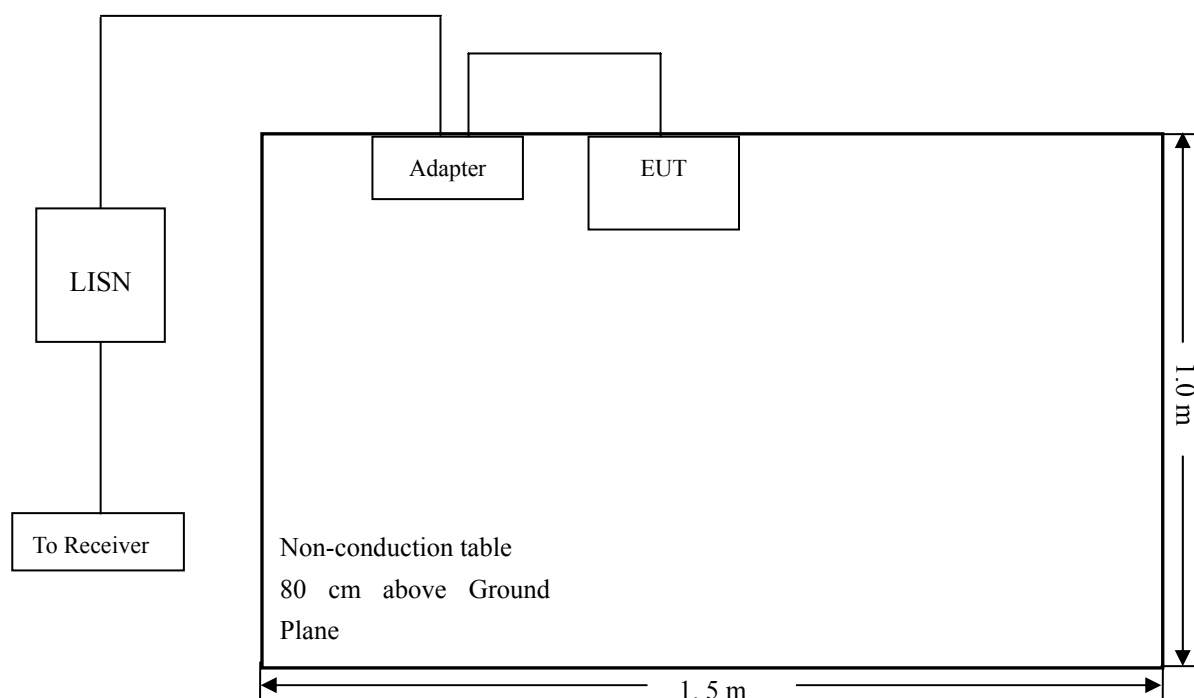
### 10.3 Test Procedure

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.

### 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:

**-3.42 dB at 0.5220 MHz** in the **Neutral, AV** detector, 0.15-30MHz

## 10.8 Conducted Emissions Test Data

**Plot of Conducted Emissions Test Data**

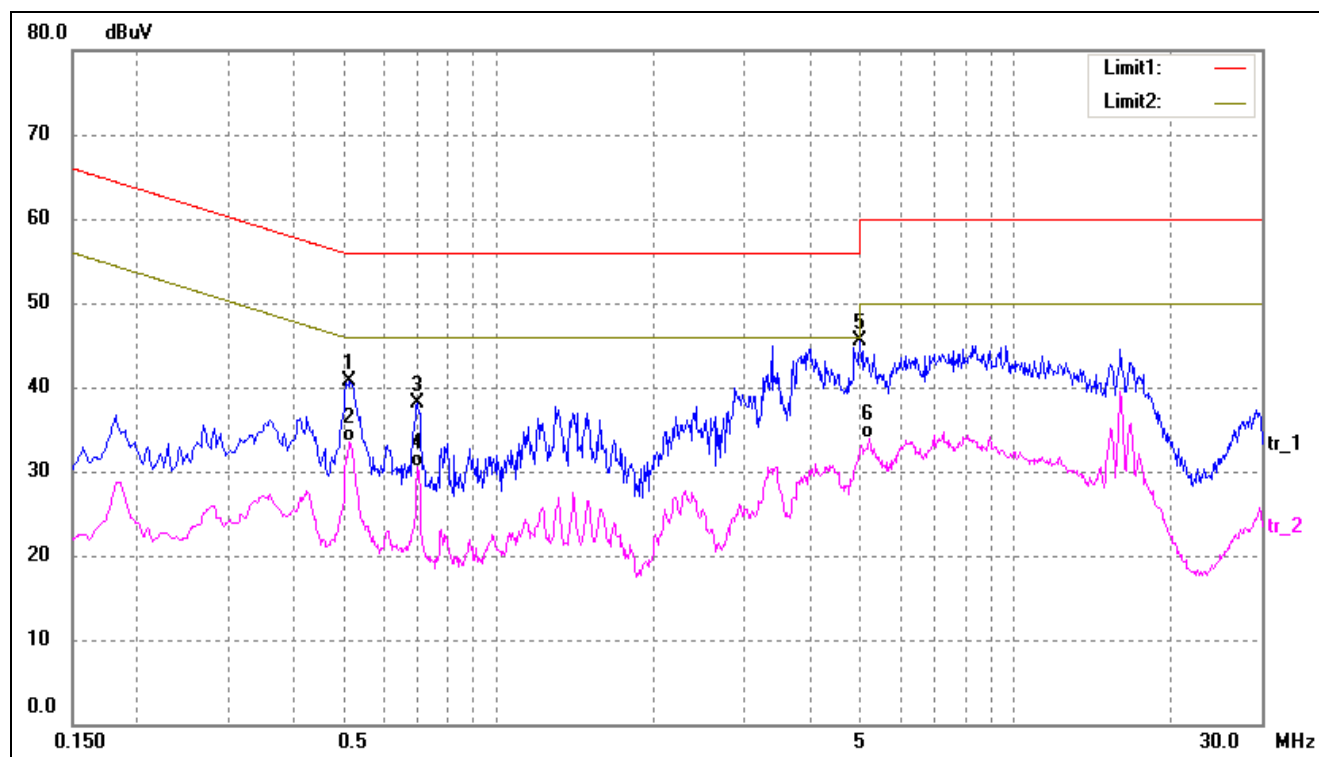
EUT: Waterproof rugged phone

Tested Model: SMT1

Operating Condition: (WIFI)Transmitting

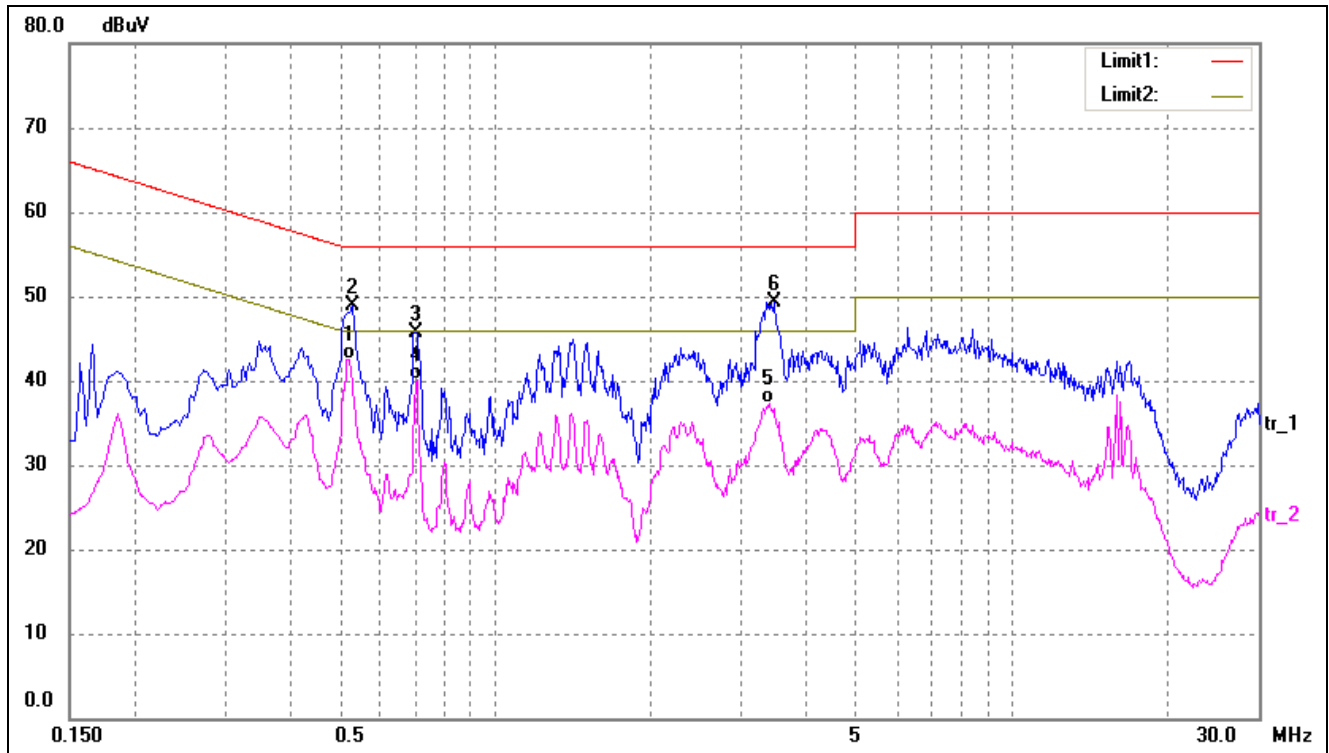
Comment: AC 120V/60Hz

Test Specification: Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.5180	31.27	9.52	40.79	56.00	-15.21	peak
2*	0.5180	23.90	9.52	33.42	46.00	-12.58	AVG
3	0.6980	28.37	9.70	38.07	56.00	-17.93	peak
4	0.6980	20.82	9.70	30.52	46.00	-15.48	AVG
5	5.0260	35.42	10.00	45.42	60.00	-14.58	peak
6	5.2460	23.81	10.00	33.81	50.00	-16.19	AVG

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.5220	33.06	9.52	42.58	46.00	-3.42	AVG
2	0.5300	39.33	9.53	48.86	56.00	-7.14	peak
3	0.7020	36.01	9.70	45.71	56.00	-10.29	peak
4	0.7060	30.31	9.71	40.02	46.00	-5.98	AVG
5	3.3820	27.25	10.00	37.25	46.00	-8.75	AVG
6	3.4580	39.34	10.00	49.34	56.00	-6.66	peak

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