

# FCC Part 15.249 Measurement and Test Report

For

**IDEalltech Technology Corp**

**Rm 706, Yongjingting Building-C, Jianyi Paradise, HengGangTou, Chang An  
Town, Dongguan, China**

**FCC ID: WQFIDL0015**

<b>Report Concerns:</b> Original Report	<b>Equipment Type:</b> Wireless Mouse
<b>Model:</b>	<u>WM0015</u>
<b>Report No.:</b>	<u>STR08118003I</u>
<b>Test/Witness Engineer:</b>	<i>Seven Song</i>
<b>Test Date:</b>	<u>2008-11-03 to 2008-11-07</u>
<b>Issued Date:</b>	<u>2008-11-08</u>
<b>Prepared By:</b>	<p><b>SEM.Test Compliance Service Co., Ltd.</b> 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101)</p>
<b>Approved &amp; Authorized By:</b>	<div style="text-align: right;">   <hr style="width: 20%; margin: 0 auto;"/> <p>Jandy So / PSQ Manager</p> </div>

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**

**1. GENERAL INFORMATION.....3**

1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....3

1.2 TEST STANDARDS .....3

1.3 RELATED SUBMITTAL(S)/GRANT(S).....3

1.4 TEST METHODOLOGY .....4

1.5 TEST FACILITY .....4

1.6 EUT EXERCISE SOFTWARE.....4

1.7 ACCESSORIES EQUIPMENT LIST AND DETAILS .....4

1.8 EUT CABLE LIST AND DETAILS .....4

**2. SUMMARY OF TEST RESULTS .....5**

**3. §15.203 - ANTENNA REQUIREMENT.....6**

3.1 STANDARD APPLICABLE .....6

3.2 TEST RESULT .....6

**4. FIELD STRENGTH OF SPURIOUS EMISSIONS .....7**

4.1 MEASUREMENT UNCERTAINTY .....7

4.2 STANDARD APPLICABLE .....7

4.3 TEST EQUIPMENT LIST AND DETAILS.....8

4.4 TEST PROCEDURE.....8

4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION .....9

4.6 ENVIRONMENTAL CONDITIONS.....9

4.7 SUMMARY OF TEST RESULTS/PLOTS.....9

**5. OUT OF BAND EMISSIONS.....18**

5.1 STANDARD APPLICABLE .....18

5.2 TEST EQUIPMENT LIST AND DETAILS.....18

5.3 TEST PROCEDURE.....18

5.4 ENVIRONMENTAL CONDITIONS.....18

5.5 SUMMARY OF TEST RESULTS/PLOTS.....19

# 1. GENERAL INFORMATION

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

### Client Information

Applicant: IDEalltech Technology Corp  
 Address of applicant: Rm 706, Yongjingting Building-C, Jianyi Paradise, HengGangTou, Chang An Town, Dongguan, China

Manufacturer: IDEalltech Technology Corp  
 Address of manufacturer: Rm 706, Yongjingting Building-C, Jianyi Paradise, HengGangTou, Chang An Town, Dongguan, China

### General Description of E.U.T

Items	Description
EUT Description:	Wireless Mouse
Trade Name:	/
Model No.:	WM0015
Rated Voltage:	Battery 3V
Output Power:	<0dBm
Frequency Range:	2402~2478 MHz
Antenna Type:	Integral Antenna
Size:	10.0x5.8x3.8 cm

*Note: The test data is gathered from a production sample, provided by the manufacturer.*

## 1.2 Test Standards

The following report is prepared on behalf of the IDEalltech Technology Corp in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 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 15.249 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 Related Submittal(s)/Grant(s)

No Related Submittal(s).

### 1.4 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 equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted with Low Channel, Middle Channel and High Channel, accordingly in reference to the Operating Instructions.

### 1.5 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.

### 1.6 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components.

### 1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

### 1.8 EUT Cable List and Details

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

## 2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203	Antenna Requirement	Compliant
§ 15.209(a)	Radiated Emission	Compliant
§ 15.249(d)	Band edge	Compliant

### **3. §15.203 - ANTENNA REQUIREMENT**

---

#### **3.1 Standard Applicable**

According to FCC 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 Test Result**

This product has a permanent antenna, fulfill the requirement of this section.

## 4. FIELD STRENGTH OF SPURIOUS EMISSIONS

### 4.1 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  $\pm 3.0$  dB.

### 4.2 Standard Applicable

According to §15.249(a), 15.205 15.209(b) &15.35 (b), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Section 15.209:

- 30 - 88 MHz 40 dBuV/m @3M
- 88 -216 MHz 43.5 dBuV/m @3M
- 216 -960 MHz 46 dBuV/m @3M
- Above 960 MHz 54dBuV/m @3M

Section 15.249:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

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.

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 20 dB BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209,WHICHEVER IS THE LESSER ATTENUATION.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

### 4.3 Test Equipment List and Details

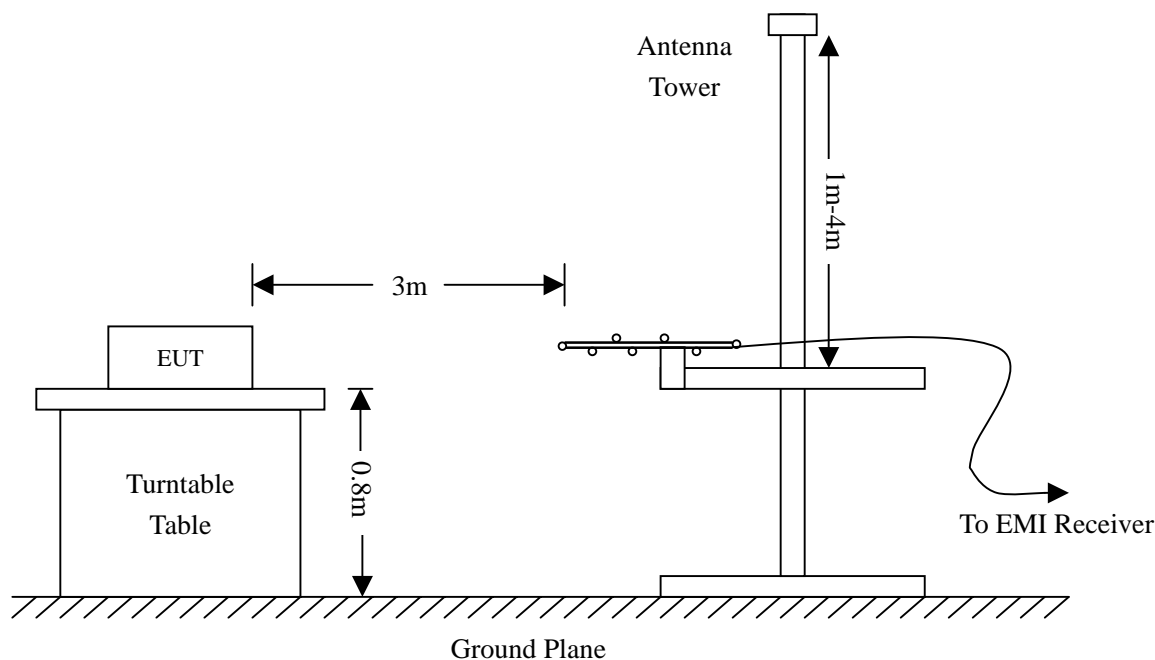
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2008-01-25	2009-01-24
Positioning Controller	C&C	CC-C-1F	N/A	2008-01-25	2009-01-24
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2008-01-25	2009-01-24
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2008-01-25	2009-01-24
RF Switch	EM	EMSW18	SW060023	2008-01-25	2009-01-24
Amplifier	Agilent	8447F	3113A06717	2008-01-25	2009-01-24
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2008-01-25	2009-01-24
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2008-01-25	2009-01-24
Horn Antenna	ROHDE&SCHWARZ	HF906	100013	2008-01-25	2009-01-24
EMI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/103	2008-01-25	2009-01-24

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

### 4.4 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 15.249(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.





## 4.5 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  $-6\text{dB}\mu\text{V}$  means the emission is  $6\text{dB}\mu\text{V}$  below the maximum limit for Class B. The equation for margin calculation is as follows:

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

## 4.6 Environmental Conditions

Temperature:	26 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

## 4.7 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.249 standards, and had the worst margin of:

**-5.1 dB $\mu$ V at 4804.0 MHz in the Horizontal polarization for Low Channel, 30 MHz to 25 GHz, 3Meters**

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (1G to 25GHz)										
4804.0	AV	42.6	66	H	34.1	5.2	33.0	48.9	54	-5.1
7206.0	AV	35.8	49	H	37.4	6.1	33.5	45.8	54	-8.2
4804.0	AV	36.2	135	V	34.1	5.2	33.0	42.5	54	-11.5
4804.0	PK	51.3	56	H	37.4	6.1	33.5	61.3	74	-12.7
7206.0	PK	53.7	266	H	34.1	5.2	33.0	60.0	74	-14.0
7206.0	AV	29.8	55	V	37.4	6.1	33.5	39.8	54	-14.2
4804.0	PK	52.1	60	V	34.1	5.2	33.0	58.4	74	-15.6
7206.0	PK	47.6	185	V	37.4	6.1	33.5	57.6	74	-16.4
2402.0	AV	59.7	45	H	29.1	3.7	34.0	58.5	94	-35.5
2402.0	PK	73.8	90	H	29.1	3.7	34.0	72.6	114	-41.4
2402.0	AV	52	27	V	29.1	3.7	34.0	50.8	94	-43.2
2402.0	PK	66.6	43	V	29.1	3.7	34.0	65.4	114	-48.6
Middle Channel (1G to 25GHz)										
4880.0	AV	41.2	322	H	34.1	5.2	33.0	47.5	54	-6.5
7320.0	AV	35.8	99	H	37.4	6.1	33.5	45.8	54	-8.2
4880.0	PK	52.8	333	H	37.4	6.1	33.5	62.8	74	-11.2
7320.0	PK	54.9	99	V	34.1	5.2	33.0	61.2	74	-12.8
4880.0	AV	34.6	43	V	34.1	5.2	33.0	40.9	54	-13.1
7320.0	AV	29.7	85	V	37.4	6.1	33.5	39.7	54	-14.3
4880.0	PK	49.3	43	V	37.4	6.1	33.5	59.3	74	-14.7
7320.0	PK	52.4	79	H	34.1	5.2	33.0	58.7	74	-15.3
2440.0	AV	59.3	45	H	29.1	3.7	34.0	58.1	94	-35.9
2440.0	PK	72.6	45	H	29.1	3.7	34.0	71.4	114	-42.6
2440.0	AV	51.9	44	V	29.1	3.7	34.0	50.7	94	-43.3
2440.0	PK	60.9	44	V	29.1	3.7	34.0	59.7	114	-54.3

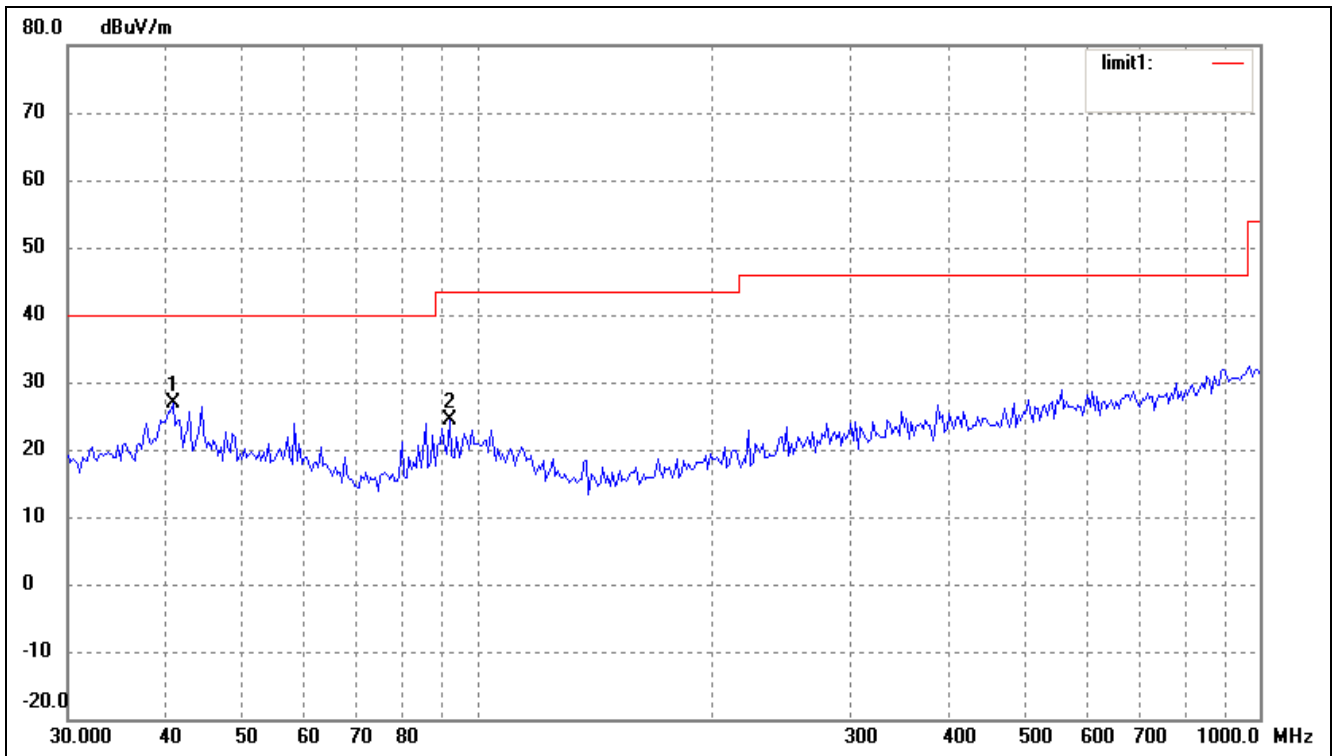
High Channel (1G to 25GHz)										
7434.0	AV	38.8	63	V	34.1	5.2	33.0	45.1	54	-8.9
4956.0	AV	34.5	43	H	37.4	6.1	33.5	44.5	54	-9.5
4956.0	PK	55.8	270	H	34.1	5.2	33.0	62.1	74	-11.9
7434.0	PK	51.3	95	V	37.4	6.1	33.5	61.3	74	-12.7
4956.0	AV	29.9	45	V	37.4	6.1	33.5	39.9	54	-14.1
7434.0	AV	32.7	359	H	34.1	5.2	33.0	39.0	54	-15.0
4956.0	PK	50.7	35	V	34.1	5.2	33.0	57.0	74	-17.0
7434.0	PK	46.9	76	H	37.4	6.1	33.5	56.9	74	-17.1
2478.0	PK	72.6	0	H	29.1	3.7	34.0	71.4	114	-42.6
2478.0	AV	52.2	85	H	29.1	3.7	34.0	51.0	94	-43.0
2478.0	AV	47.6	63	V	29.1	3.7	34.0	46.4	94	-47.6
2478.0	PK	60.9	63	V	29.1	3.7	34.0	59.7	114	-54.3

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 5<sup>th</sup> Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

From 30 MHz to 1 GHz

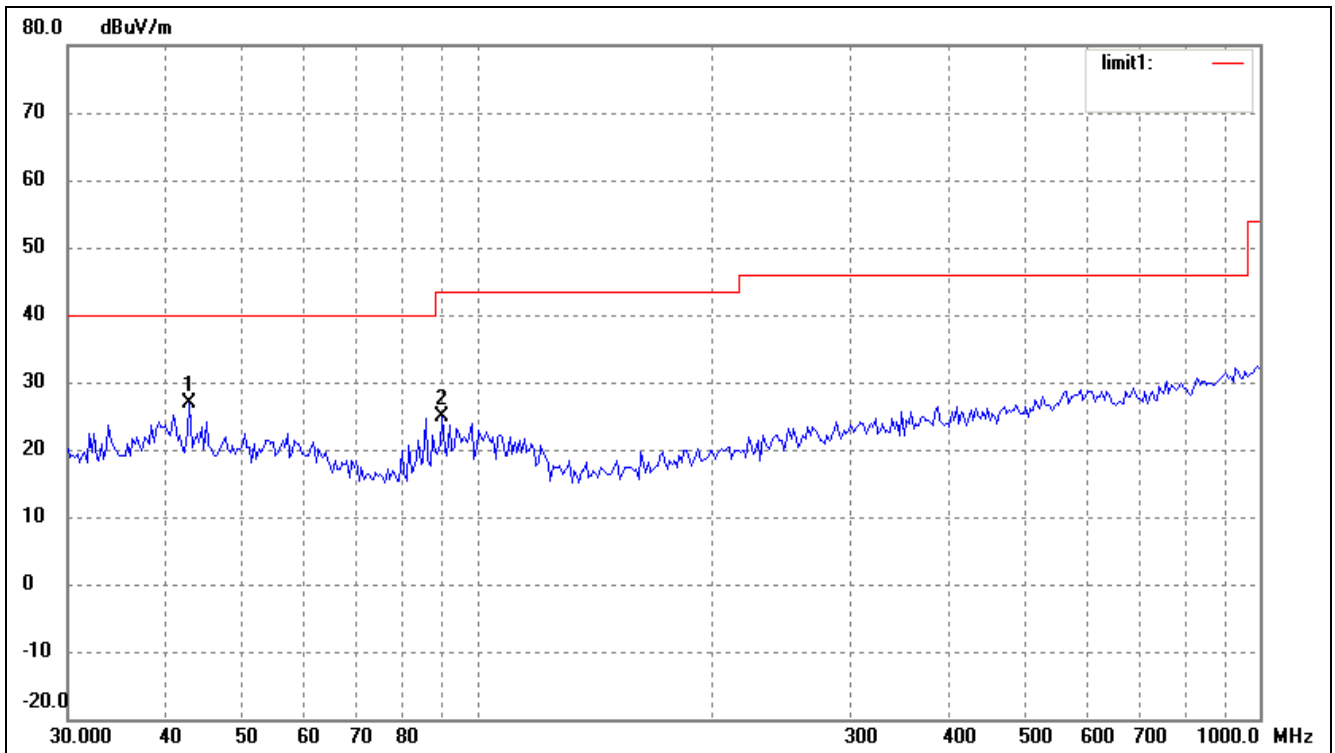
Low CH

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	40.8699	19.04	7.94	26.98	40.00	-13.02	169	100	peak
2	92.3462	17.32	6.97	24.29	43.50	-19.21	75	100	peak

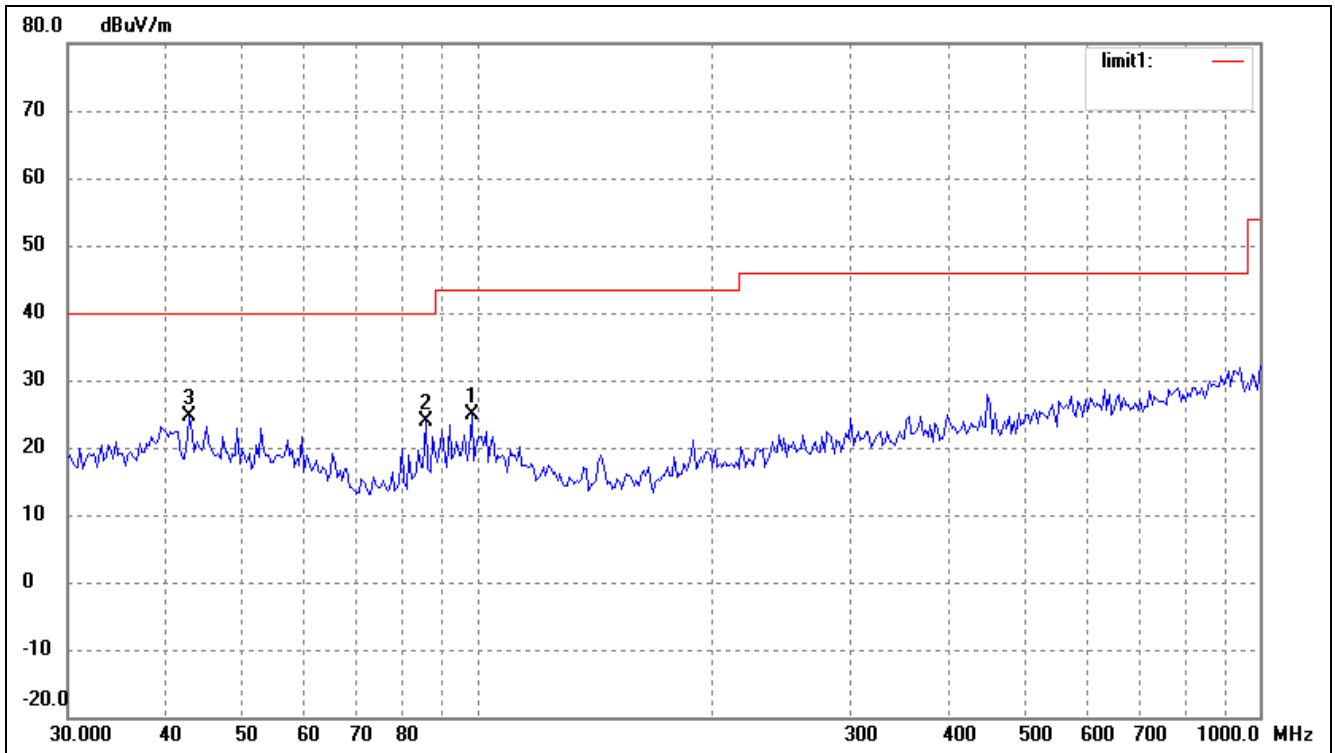
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	42.9305	18.81	7.97	26.78	40.00	-13.22	36	100	peak
2	90.4198	18.35	6.61	24.96	43.50	-18.54	89	100	peak

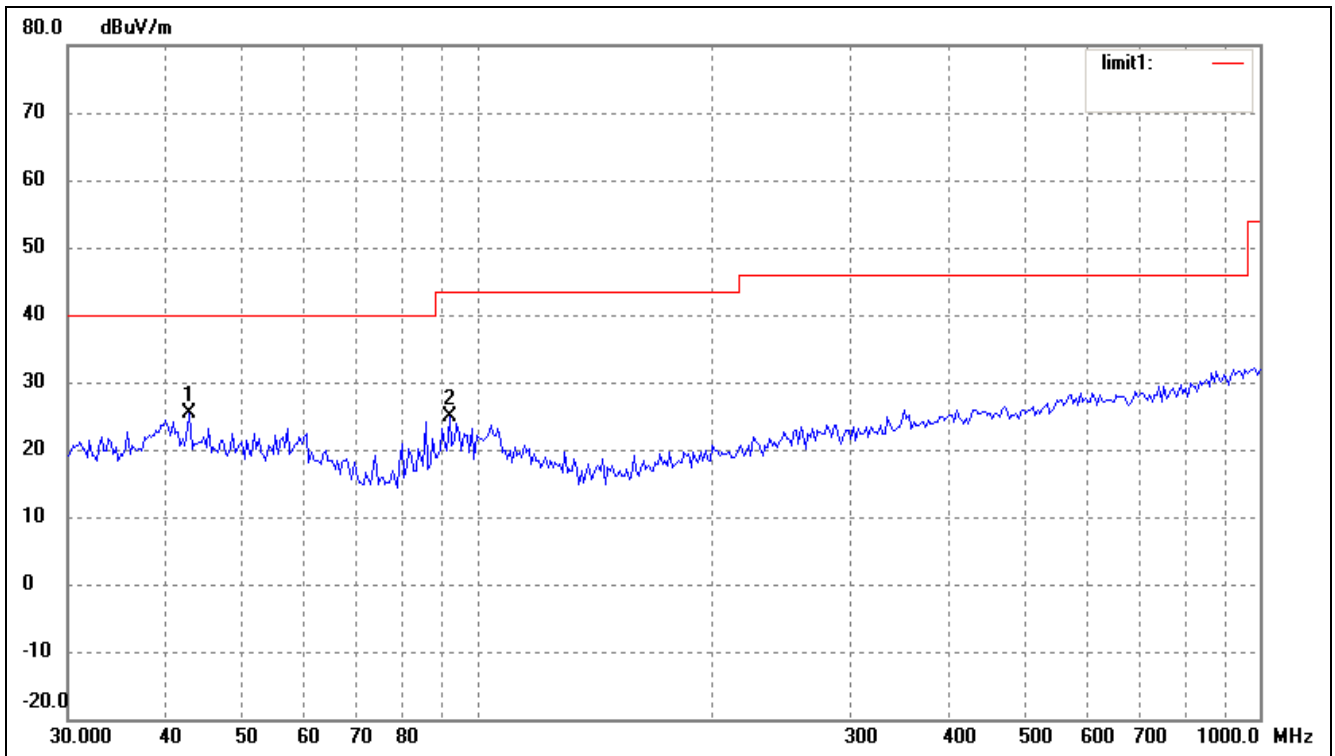
Middle CH

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	98.3752	17.14	7.70	24.84	43.50	-18.66	29	200	peak
2	86.0796	18.51	5.29	23.80	40.00	-16.20	86	100	peak
3	42.9305	16.66	7.97	24.63	40.00	-15.37	123	100	peak

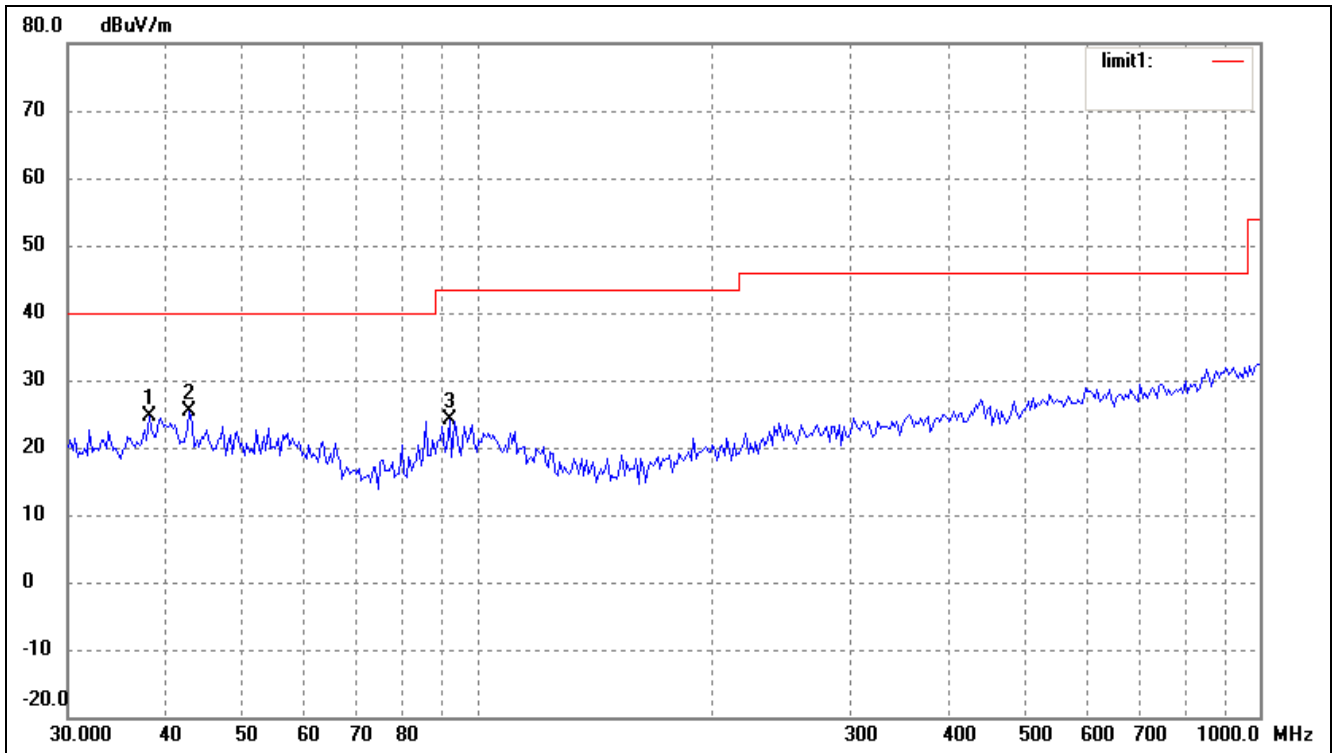
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	42.9305	17.32	7.97	25.29	40.00	-14.71	268	100	peak
2	92.3462	17.80	6.97	24.77	43.50	-18.73	47	100	peak

High CH

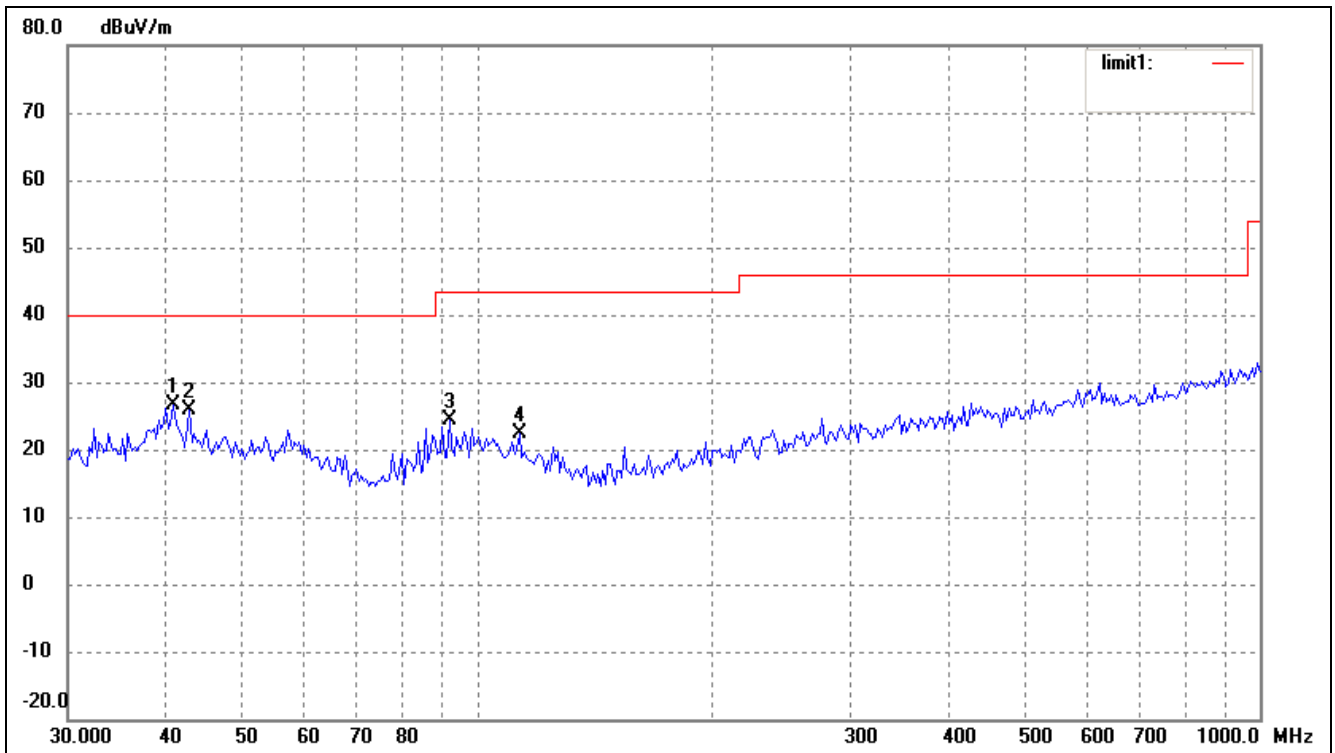
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	38.0965	17.24	7.42	24.66	40.00	-15.34	231	100	peak
2	42.9305	17.48	7.97	25.45	40.00	-14.55	111	200	peak
3	92.3462	17.23	6.97	24.20	43.50	-19.30	100	100	peak



Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	40.8699	18.72	7.94	26.66	40.00	-13.34	45	100	peak
2	42.9305	17.89	7.97	25.86	40.00	-14.14	31	200	peak
3	92.3462	17.51	6.97	24.48	43.50	-19.02	132	200	peak
4	113.2200	16.02	6.40	22.42	43.50	-21.08	74	100	peak

## 5. OUT OF BAND EMISSIONS

### 5.1 Standard Applicable

According to §15.249 (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.

### 5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2008-01-25	2009-01-24
Positioning Controller	C&C	CC-C-1F	N/A	2008-01-25	2009-01-24
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2008-01-25	2009-01-24
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2008-01-25	2009-01-24
RF Switch	EM	EMSW18	SW060023	2008-01-25	2009-01-24
Amplifier	Agilent	8447F	3113A06717	2008-01-25	2009-01-24
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2008-01-25	2009-01-24
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2008-01-25	2009-01-24
Horn Antenna	ROHDE&SCHWARZ	HF906	100013	2008-01-25	2009-01-24
EMI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/103	2008-01-25	2009-01-24

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

### 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 the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
3. Set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2438.5MHz, then mark the higher-level emission for comparing with the FCC rules.

### 5.4 Environmental Conditions

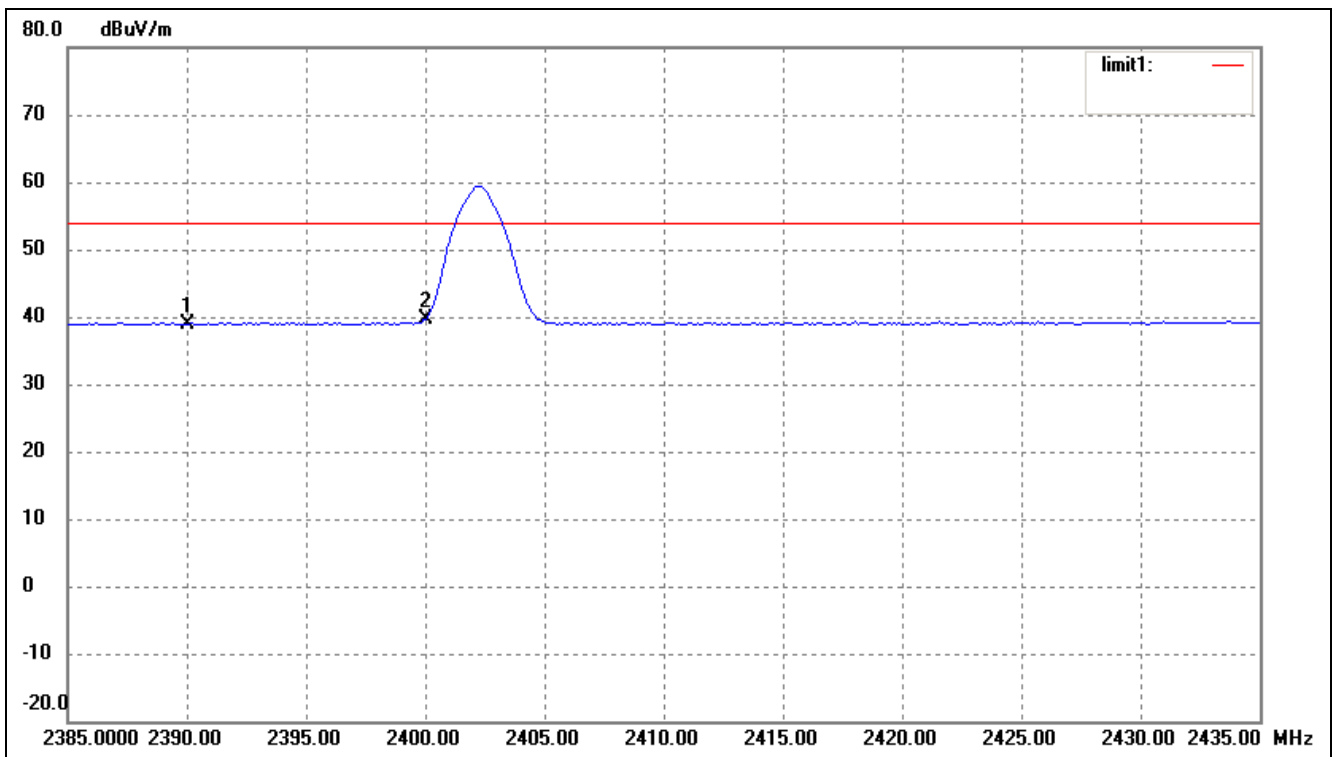
Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

### 5.5 Summary of Test Results/Plots

Frequency MHz	Limit dB	Result
Low Edge	<54dBuv	Pass
High Edge	<54dBuv	Pass

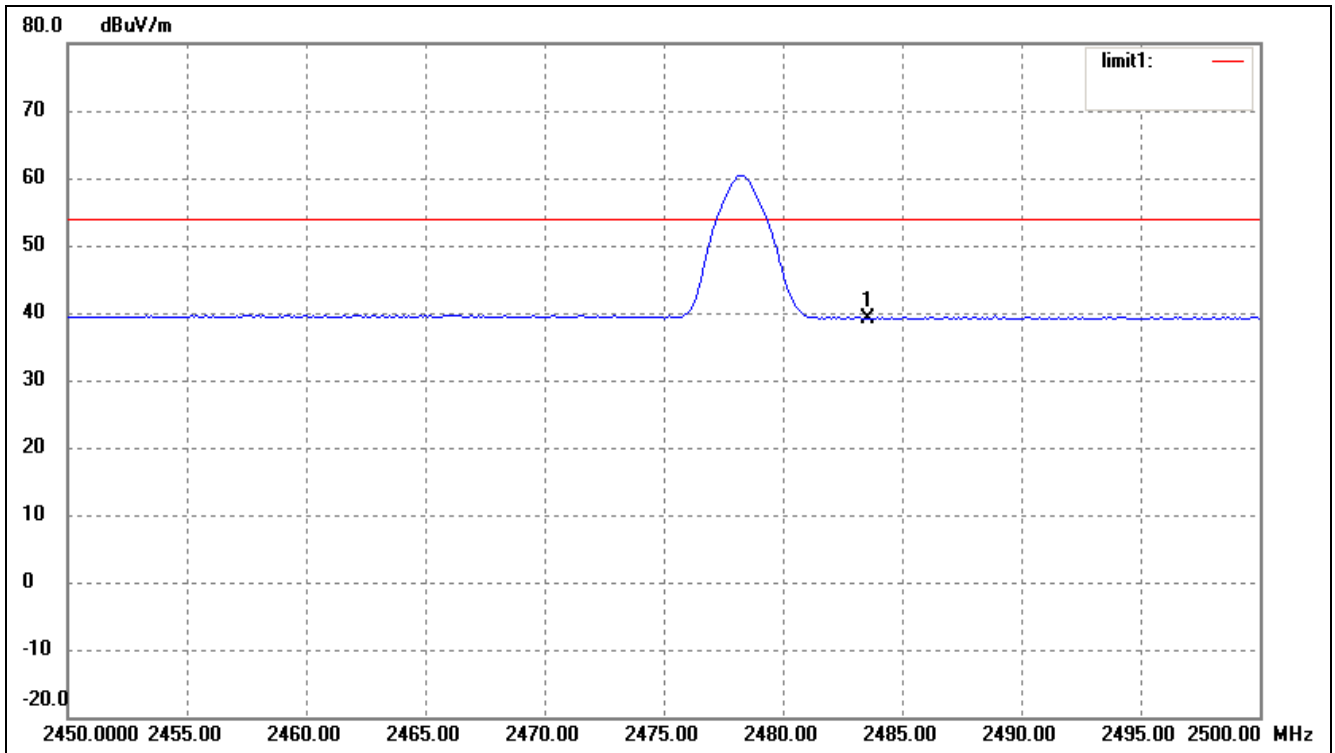
The edge emissions are below the FCC 15.209 Limits. Please refer to the test plots below.

Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	6.37	32.59	38.96	54.00	-15.04	Average Detector
2	2400.000	7.02	32.68	39.70	54.00	-14.30	Average Detector
	2400.000	20.86	32.68	53.54	74.00	-20.46	Peak Detector

Highest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	6.21	32.97	39.18	54.00	-14.82	Average Detector
	2483.500	19.91	32.97	52.88	74.00	-21.12	Peak Detector

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