

FCC Part 15C

Measurement and Test Report

For

ATI Electronics (ShenZhen) Co., LTD.

2/F, A Tower, Tangyanshan Industrial Park, Tangkeng Village, Shiyan Town,
Shenzhen, China

FCC ID: SF4-ATI8860

Report Concerns: Original Report	Equipment Type: Bluetooth Headset
Model:	<u>8860</u>
Report No.:	<u>STR10068359I</u>
Test Date:	<u>2010-06-30 to 2010-07-10</u>
Issue Date:	<u>2010-07-22</u>
Test Engineer:	<u>Jason Chen</u> <i>Jason chen</i>
Reviewed By:	<u>Lahm Peng</u> <i>Lahm peng</i>
Approved & Authorized By:	<u>Jandy so/PSQ Manager</u> <i>Jandyso</i>
Prepared By:	
<p>SEM.Test Compliance Service Co., Ltd 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101) Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn</p>	

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	4
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
1.2 TEST STANDARDS.....	4
1.3 RELATED SUBMITTAL(S)/GRANT(S).....	4
1.4 TEST METHODOLOGY.....	5
1.5 TEST FACILITY.....	5
1.6 EUT EXERCISE SOFTWARE.....	5
1.7 ACCESSORIES EQUIPMENT LIST AND DETAILS.....	5
1.8 EUT CABLE LIST AND DETAILS.....	5
2. SUMMARY OF TEST RESULTS	6
3. §15.203 - ANTENNA REQUIREMENT	7
3.1 STANDARD APPLICABLE.....	7
3.2 TEST RESULT.....	7
4. §15.207 (A) CONDUCTED EMISSIONS	8
4.1 MEASUREMENT UNCERTAINTY.....	8
4.2 TEST EQUIPMENT LIST AND DETAILS.....	8
4.3 TEST PROCEDURE.....	8
4.4 BASIC TEST SETUP BLOCK DIAGRAM.....	8
4.5 ENVIRONMENTAL CONDITIONS.....	9
4.6 SUMMARY OF TEST RESULTS/PLOTS.....	9
4.7 CONDUCTED EMISSIONS TEST DATA.....	9
5. NUMBER OF HOPPING CHANNELS AND CHANNEL SPACING	12
5.1 STANDARD APPLICABLE.....	12
5.2 TEST EQUIPMENT LIST AND DETAILS.....	12
5.3 TEST PROCEDURE.....	12
5.4 ENVIRONMENTAL CONDITIONS.....	12
5.5 SUMMARY OF TEST RESULTS/PLOTS.....	13
6. DWELL TIME OF A HOPPING CHANNEL	15
6.1 STANDARD APPLICABLE.....	15
6.2 TEST EQUIPMENT LIST AND DETAILS.....	15
6.3 TEST PROCEDURE.....	15
6.4 ENVIRONMENTAL CONDITIONS.....	15
6.5 SUMMARY OF TEST RESULTS/PLOTS.....	16
7. 20-DB BANDWIDTH	18
7.1 STANDARD APPLICABLE.....	18
7.2 TEST EQUIPMENT LIST AND DETAILS.....	18
7.3 TEST PROCEDURE.....	18
7.4 ENVIRONMENTAL CONDITIONS.....	18
7.5 SUMMARY OF TEST RESULTS/PLOTS.....	19
8. POWER OUTPUT	21
8.1 STANDARD APPLICABLE.....	21
8.2 TEST EQUIPMENT LIST AND DETAILS.....	21
8.3 TEST PROCEDURE.....	21
8.4 ENVIRONMENTAL CONDITIONS.....	21
8.5 SUMMARY OF TEST RESULTS/PLOTS.....	22
9. FIELD STRENGTH OF SPURIOUS EMISSIONS	23
9.1 MEASUREMENT UNCERTAINTY.....	23
9.2 STANDARD APPLICABLE.....	23
9.3 TEST EQUIPMENT LIST AND DETAILS.....	23
9.4 TEST PROCEDURE.....	24
9.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	24
9.6 ENVIRONMENTAL CONDITIONS.....	24
9.7 SUMMARY OF TEST RESULTS/PLOTS.....	25
10. OUT OF BAND EMISSIONS	35

10.1 STANDARD APPLICABLE.....35
10.2 TEST EQUIPMENT LIST AND DETAILS35
10.3 TEST PROCEDURE.....35
10.4 ENVIRONMENTAL CONDITIONS35
10.5 SUMMARY OF TEST RESULTS/PLOTS36

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: ATI Electronics (ShenZhen) Co., LTD.
 Address of applicant: 2/F, A Tower, Tangyanshan Industrial Park, Tangkeng Village, Shiyan Town, Shenzhen, China

Manufacturer: ATI Electronics (ShenZhen) Co., LTD.
 Address of manufacturer: 2/F, A Tower, Tangyanshan Industrial Park, Tangkeng Village, Shiyan Town, Shenzhen, China

General Description of E.U.T

Items	Description
EUT Description:	Bluetooth Headset
Trade Name:	/
Model No.:	8860
Rated Voltage:	DC 3.7V
Max. Output Power	-6~4 dBm
Frequency range:	2402-2480MHz
Number of channels:	79
Channel Separation:	1MHz
Type of Antenna:	Integral Antenna
Size:	5X2X2.4 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 ATI Electronics (ShenZhen) Co., LTD. in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

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

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

1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 Test Methodology

All measurements contained in this report were conducted with measurement guidelines DA 00-705 for frequency hopping spread spectrum systems and 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
ASUS	Notebook	XR55	/

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; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§ 15.207	Conducted Emissions	Compliant
§ 15.247(a)(1)(iii)	Quantity of Hopping Channel	Compliant
§ 15.247(a)(1)	Channel Separation	Compliant
§ 15.247(a)(1)(iii)	Time of Occupancy (Dwell time)	Compliant
§ 15.247(a)	20dB Bandwidth	Compliant
§ 15.247(b)(1)	Power Output	Compliant
§ 15.209(a)(f)	Radiated Emission	Compliant
§ 15.247(c)	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. §15.207 (a) CONDUCTED EMISSIONS

4.1 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 ± 2.88 dB.

4.2 Test Equipment List and Details

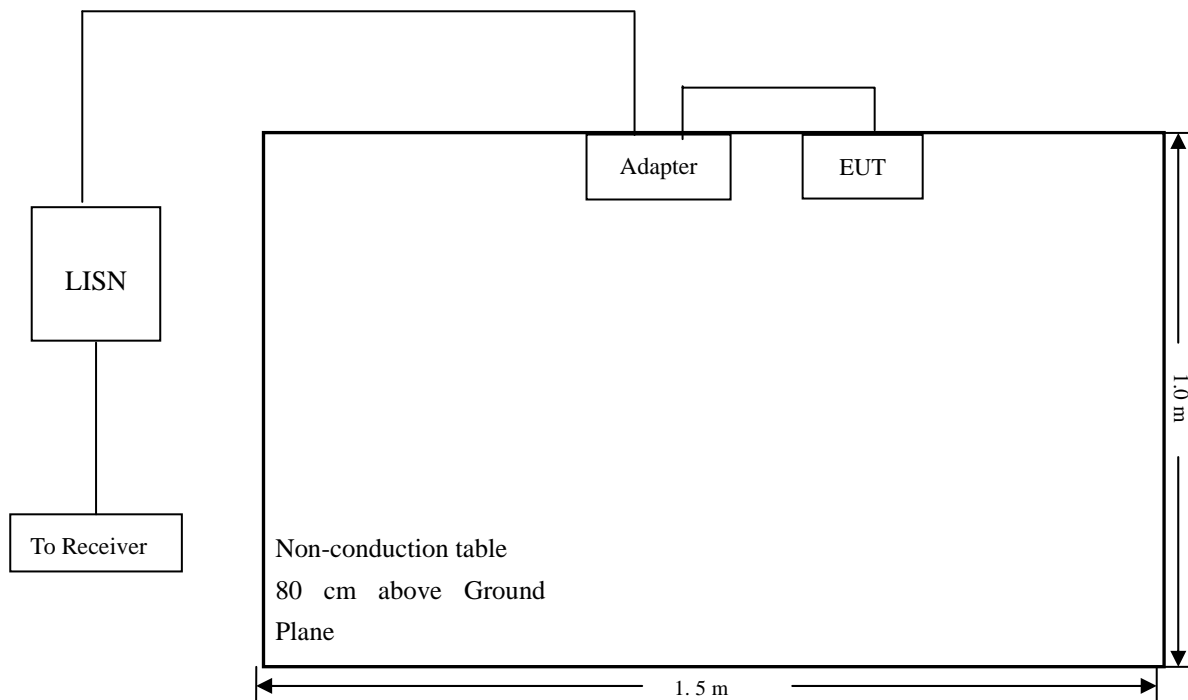
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2009-08-12	2010-08-11
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2009-08-12	2010-08-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2009-08-12	2010-08-11

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

4.3 Test Procedure

Test is conducting under the description of ANSI C63.4-2009, 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.

4.4 Basic Test Setup Block Diagram



4.5 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

4.6 Summary of Test Results/Plots

According to the data in section 4.7, the EUT complied with the FCC 15.207 Conducted margin for a Class B device, with the *worst* margin reading of:

-2.57dB μ V at **0.638MHz** in the **Line, Peak** detector, 0.15-30MHz

4.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

Conducted Disturbance

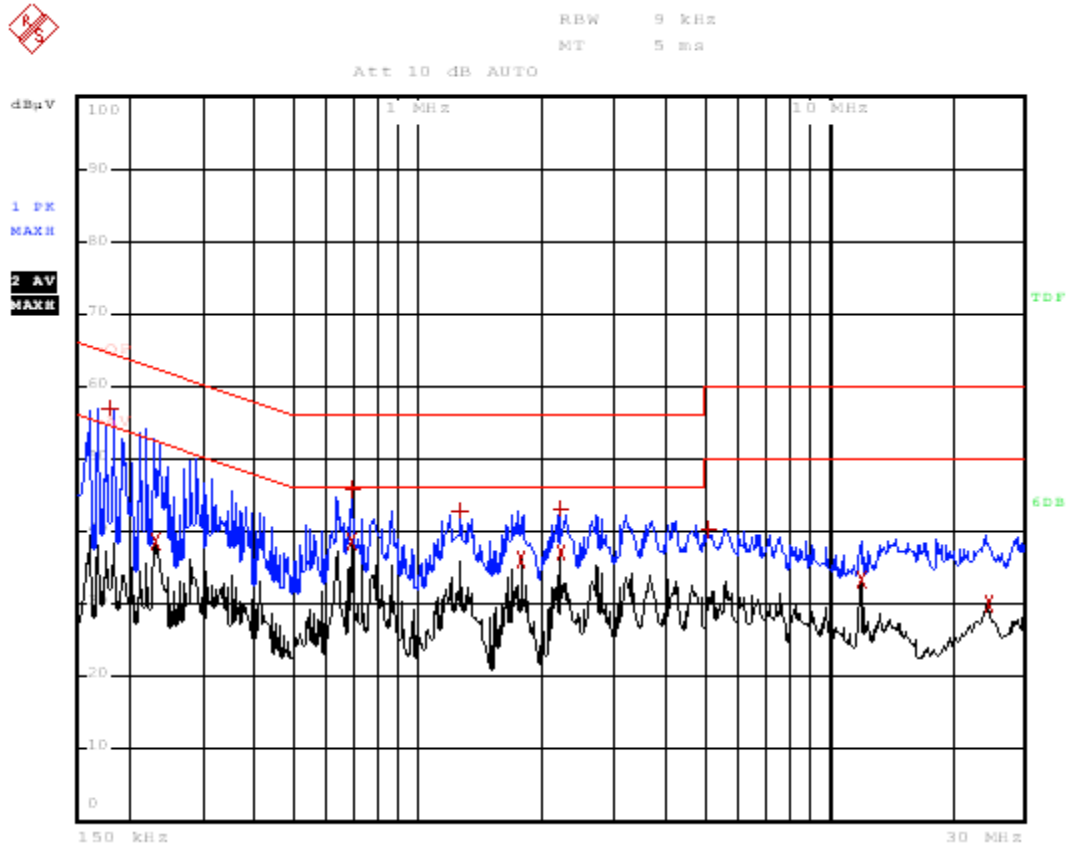
EUT: Bluetooth Headset

M/N: 8860

Operating Condition: Charging

Test Specification: N

Comment: 120V/60Hz;



EDIT PEAK LIST (Prescan Results)			
TRACE		FREQUENCY	LEVEL dBµV
Trace1:		-QP	
Trace2:		-AV	
Trace3:		---	
1	Max Peak	182 kHz	56.96
2	Average	230 kHz	38.69
1	Max Peak	690 kHz	45.71
2	Average	690 kHz	38.82
1	Max Peak	1.266 MHz	42.89
2	Average	1.786 MHz	36.18
1	Max Peak	2.238 MHz	43.27
2	Average	2.238 MHz	37.16
1	Max Peak	5.13 MHz	40.41
2	Average	11.994 MHz	33.50
2	Average	24.578 MHz	30.12

Plot of Conducted Emissions Test Data

Conducted Disturbance

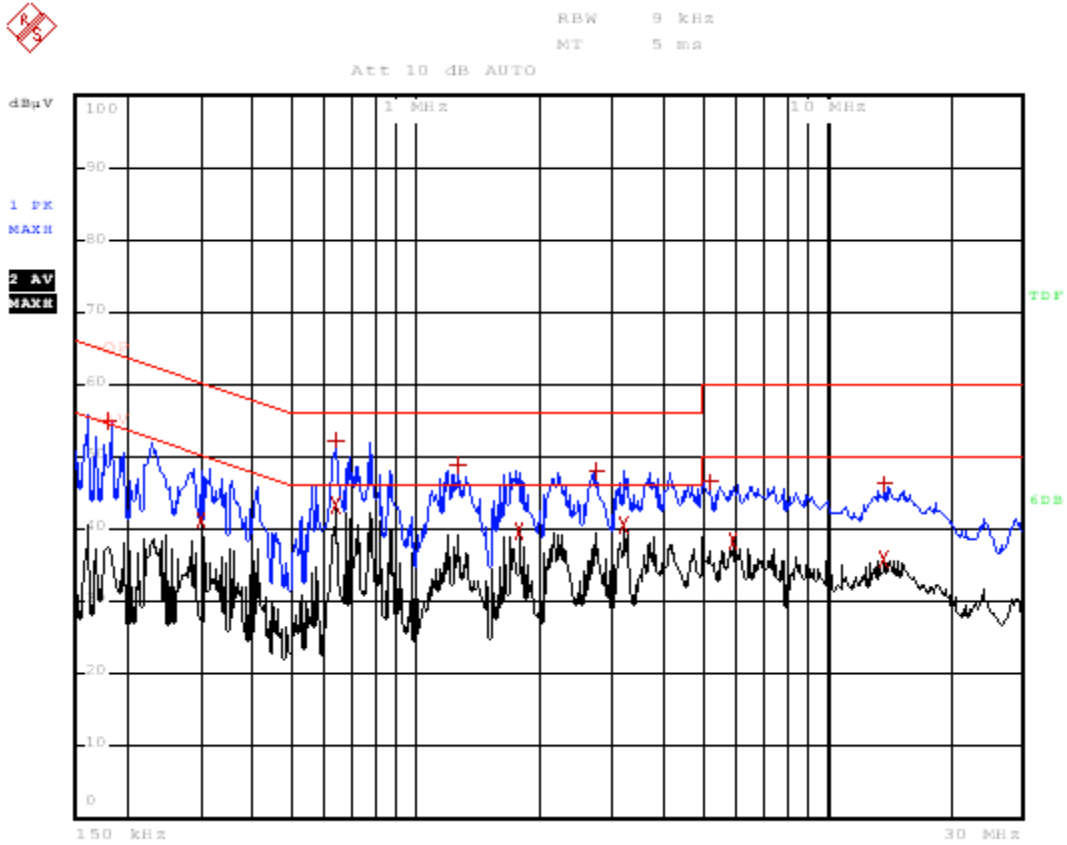
EUT: Bluetooth Headset

M/N: 8860

Operating Condition: Charging

Test Specification: L

Comment: 120V/60Hz;



EDIT PEAK LIST (Prescan Results)			
TRACE	FREQUENCY	LEVEL dbµV	DELTA LIMIT dB
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
1 Max Peak	182 kHz	54.89	-9.50
2 Average	298 kHz	41.42	-8.87
1 Max Peak	638 kHz	52.29	-3.70
2 Average	638 kHz	43.42	-2.57
1 Max Peak	1.27 MHz	48.86	-7.13
2 Average	1.794 MHz	39.75	-6.24
1 Max Peak	2.754 MHz	48.18	-7.81
2 Average	3.194 MHz	40.51	-5.48
1 Max Peak	5.214 MHz	46.53	-13.46
2 Average	5.954 MHz	38.56	-11.43
1 Max Peak	13.862 MHz	46.24	-13.75
2 Average	13.906 MHz	35.70	-14.29

5. NUMBER OF HOPPING CHANNELS AND CHANNEL SPACING

5.1 Standard Applicable

According to FCC 15.247(a)(1), frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, and frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

5.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B-ESA	US41192821	2009-08-12	2010-08-11
SCHWARZBECK	Trilog Broadband Antenna	VULB9163	9163-333	2009-07-21	2010-07-20

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

5.3 Test Procedure

According to measurement guidelines of the DA 00-705 for frequency hopping spread spectrum systems, the EUT must have its hopping function enabled.

Use the following spectrum analyzer settings for number of hopping channel testing:

Span = the frequency band of operation

RBW \geq 1% of the span

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

Use the following spectrum analyzer settings for spacing testing:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) \geq 1% of the span

Video (or Average) Bandwidth (VBW) \geq RBW

Sweep = auto

Detector function = peak

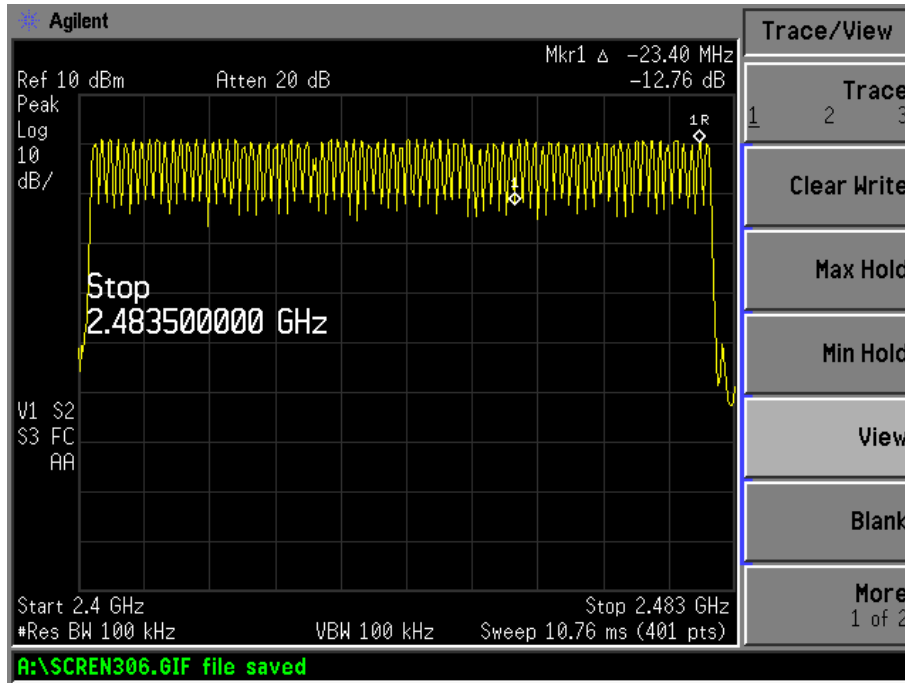
Trace = max hold

5.4 Environmental Conditions

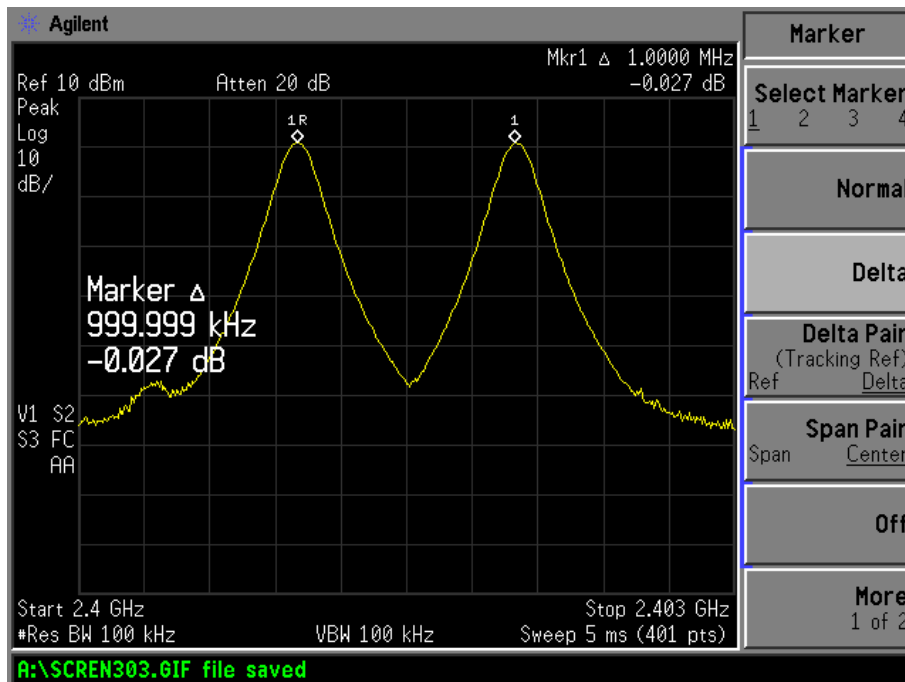
Temperature:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.5 Summary of Test Results/Plots

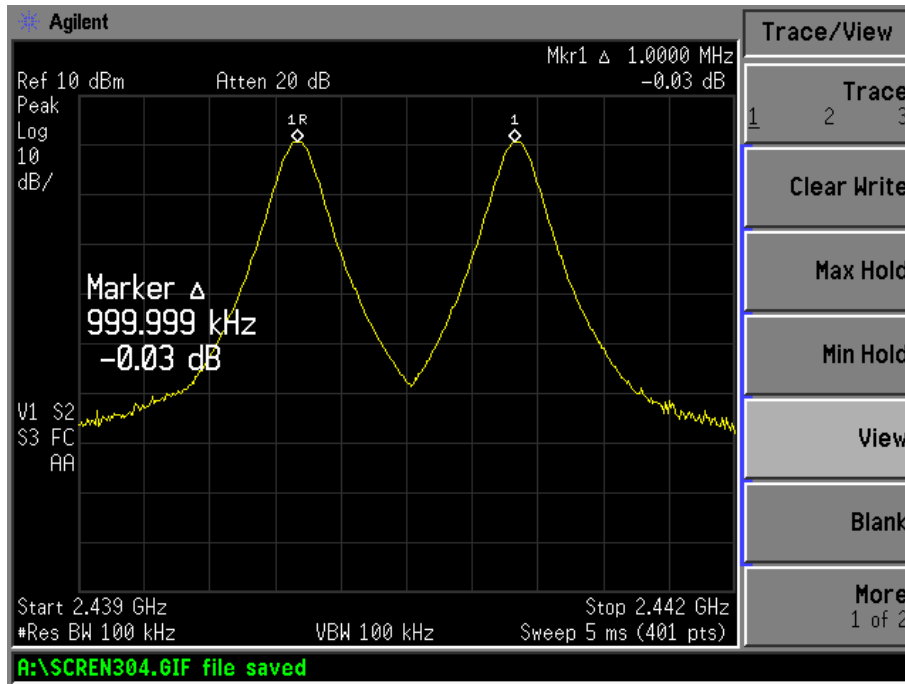
No. of Channel=79



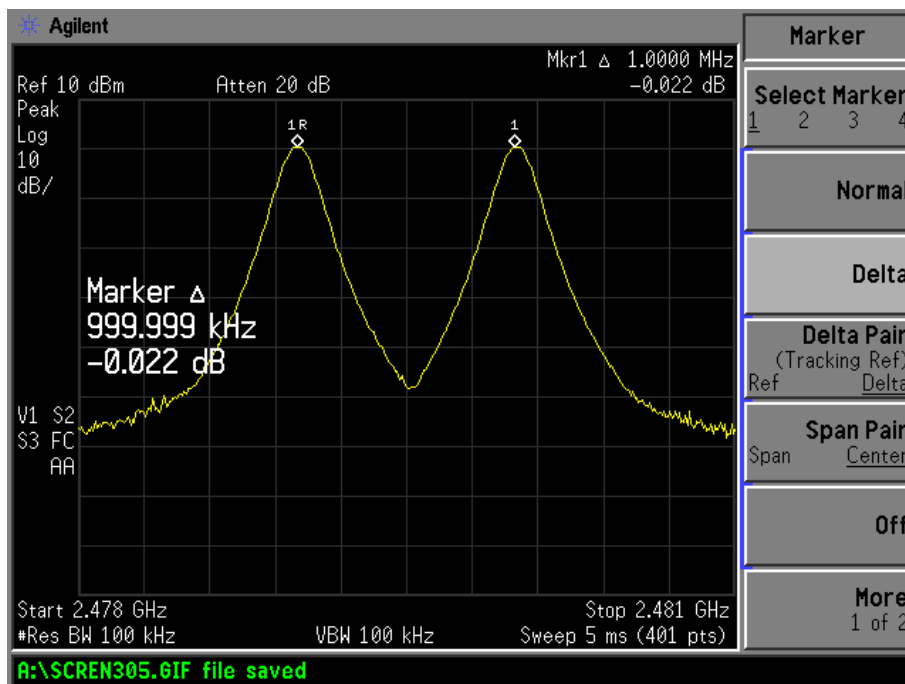
Channel Spacing (Low CH=1MHz)



Channel Spacing (Middle CH=1MHz)



Channel Spacing (High CH=1MHz)



6. DWELL TIME OF A HOPPING CHANNEL

6.1 Standard Applicable

According to 15.247(a)(1)(iii), Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

6.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B-ESA	US41192821	2009-08-12	2010-08-11
SCHWARZBECK	Trilog Broadband Antenna	VULB9163	9163-333	2009-07-21	2010-07-20

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

6.3 Test Procedure

According to measurement guidelines of the DA 00-705 for frequency hopping spread spectrum systems. The EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = zero span, centered on a hopping channel

RBW = 1 MHz

VBW \geq RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

6.4 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

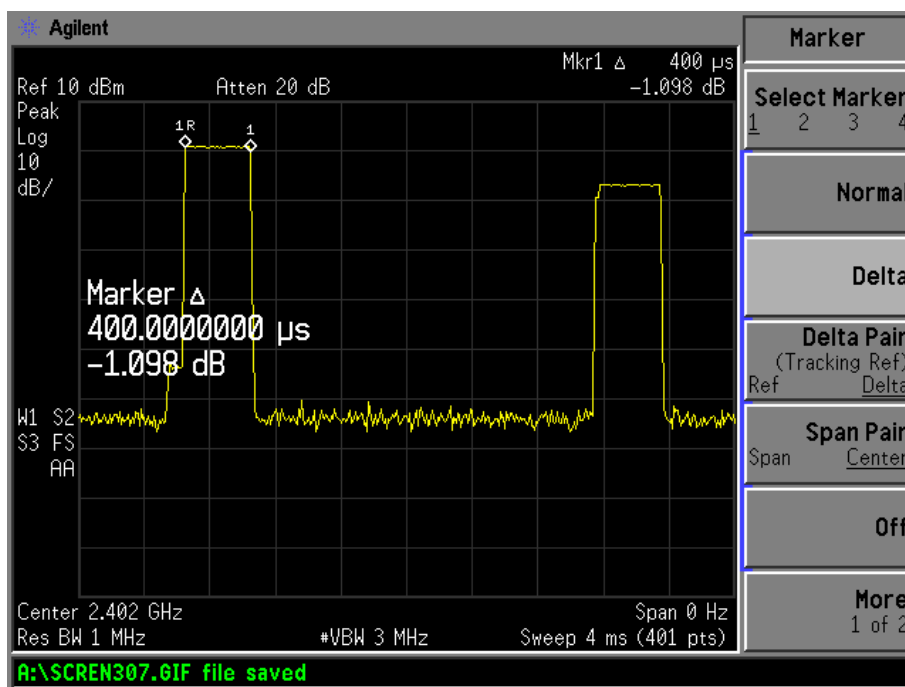
6.5 Summary of Test Results/Plots

The dwell time within a 31.6 second period in data mode is independent from the packet type (packet length). The calculation for a 31.6 second period is as follows:

$$\text{Dwell time} = \text{time slot length} * \text{hop rate} / \text{number of hopping channels} * 31.6\text{s}$$

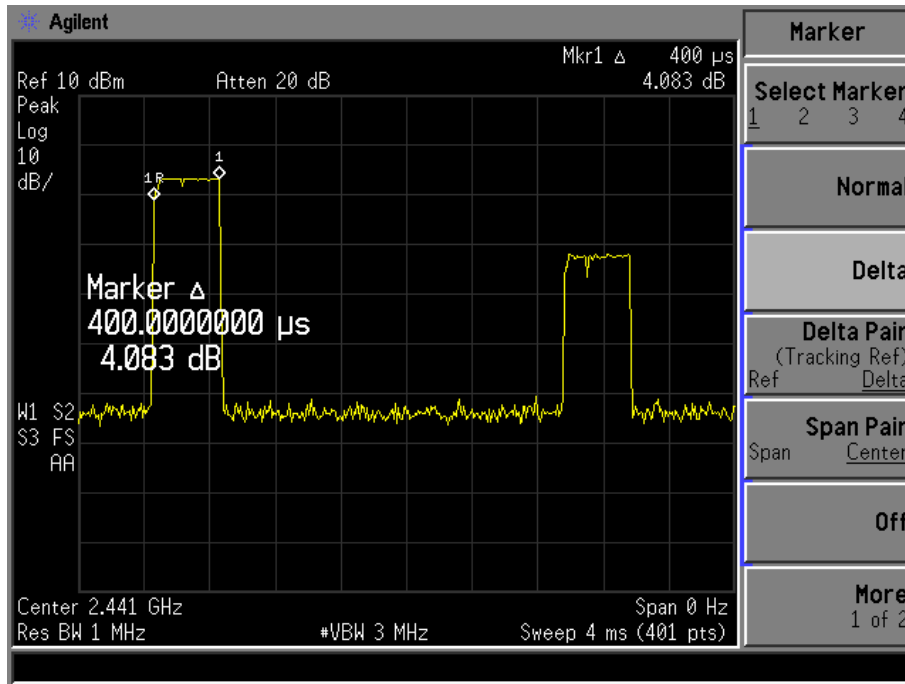
Test data is corrected with the worse case, which the packet length is DH1.

CH Low:



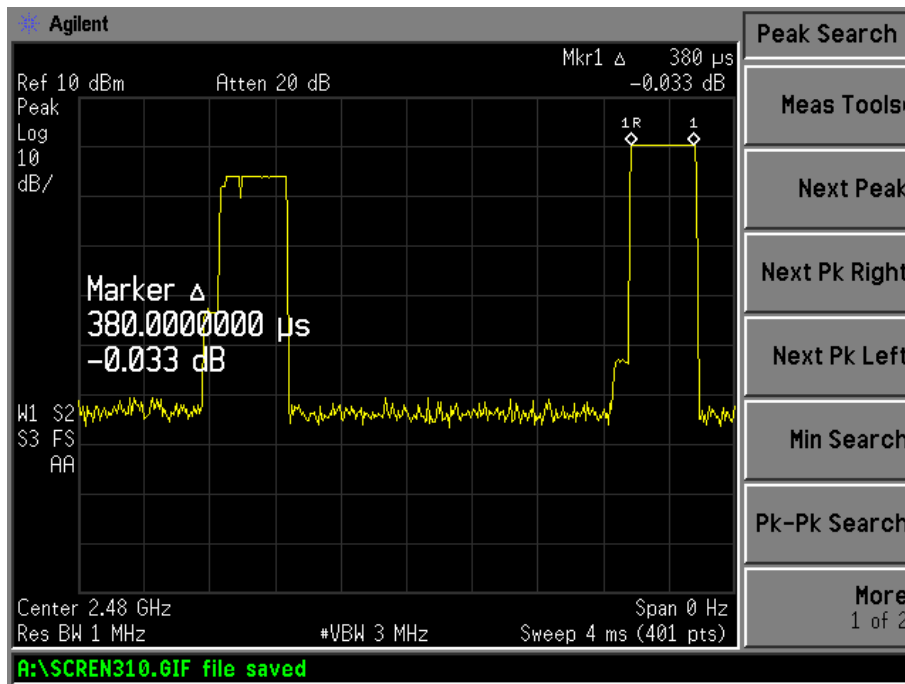
$$\text{DH1 time slot} = 0.40 \text{ (ms)} * (1600/(79)) * 31.6 = 256 \text{ (ms)} < 400 \text{ (ms)}$$

CH Mid:



$$DH1 \text{ time slot} = 0.40 \text{ (ms)} * (1600/(79)) * 31.6 = 256 \text{ (ms)} < 400 \text{ (ms)}$$

CH High:



$$DH1 \text{ time slot} = 0.40 \text{ (ms)} * (1600/(79)) * 31.6 = 243.2 \text{ (ms)} < 400 \text{ (ms)}$$

7. 20-dB BANDWIDTH

7.1 Standard Applicable

According to 15.247(a)(1)(iii). For frequency hopping systems operating in the 2400MHz-2483.5 MHz no limit for 20dB bandwidth.

7.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B-ESA	US41192821	2009-08-12	2010-08-11
SCHWARZBECK	Trilog Broadband Antenna	VULB9163	9163-333	2009-07-21	2010-07-20

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

7.3 Test Procedure

According to measurement guidelines of the DA 00-705 for frequency hopping spread spectrum systems.

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW \geq 1% of the 20 dB bandwidth

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the markerdelta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

7.4 Environmental Conditions

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

7.5 Summary of Test Results/Plots

Frequency MHz	20 dB Bandwidth kHz	Limit dB
2402	1060	/
2441	1060	/
2480	1060	/

CH Low:



CH Mid:



CH High:



8. POWER OUTPUT

8.1 Standard Applicable

According to 15.247(b)(1). For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

8.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Spectrum Analyzer	Agilent	E4402B	US41192821	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
Spectrum Analyzer	ROHDE&SCHWARZ	FSP	N/A	2010-04-16	2011-04-15

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

8.3 Test Procedure

According to measurement guidelines of the DA 00-705 for frequency hopping spread spectrum systems, the EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

RBW > the 20 dB bandwidth of the emission being measured

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

8.4 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

8.5 Summary of Test Results/Plots

2402 MHz 1.1819 mW EIRP

2441 MHz 1.1765 mW EIRP

2480 MHz 1.0972 mW EIRP

Note: The Antenna Gain is under considering.

9. FIELD STRENGTH OF SPURIOUS EMISSIONS

9.1 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 ± 5.10 dB.

9.2 Standard Applicable

According to §15.247(c), 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

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.

9.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
Spectrum Analyzer	ROHDE&SCHWARZ	FSP	N/A	2010-04-16	2011-04-15

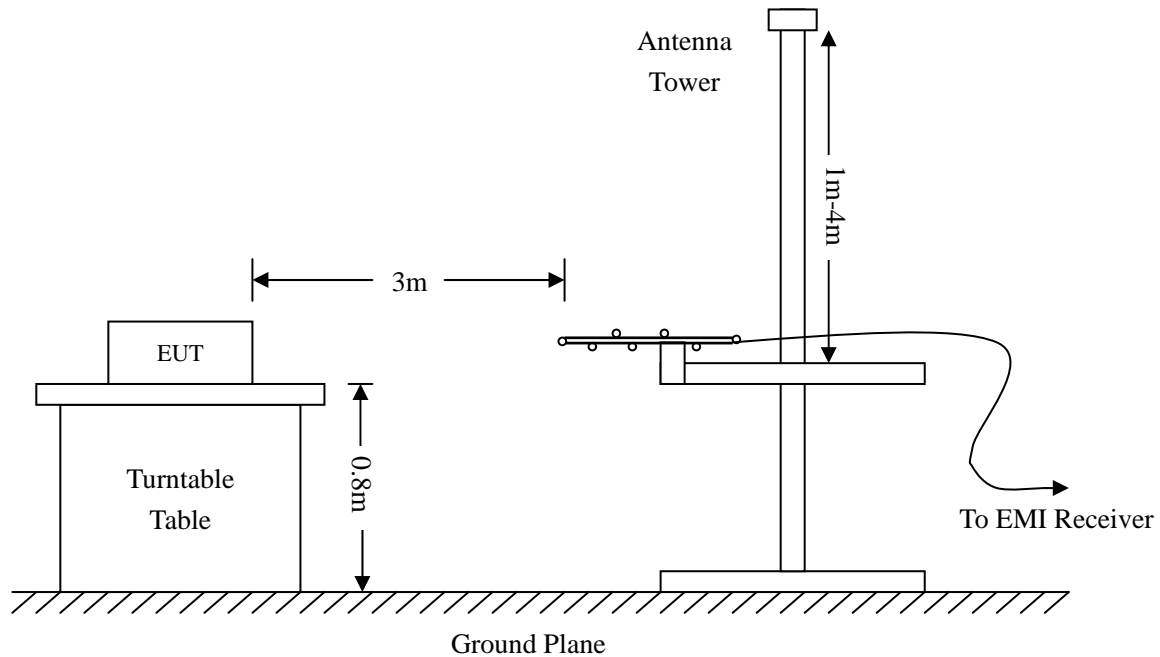
Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

9.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure and DA 00-705. 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.



9.5 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:

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

9.6 Environmental Conditions

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

9.7 Summary of Test Results/Plots

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

-1.55 dB μ V at 42.4215 MHz in the Vertical polarization, Charging mode, 30 MHz to 1 GHz, 3Meters

-1.8dB μ V at 4960.00MHz in the Horizontal polarization for High Channel, Transmitting mode, 30 MHz to 25 GHz, 3 Meters

Plot of Radiation Emissions Test

Radiated Disturbance

EUT: Bluetooth Headset

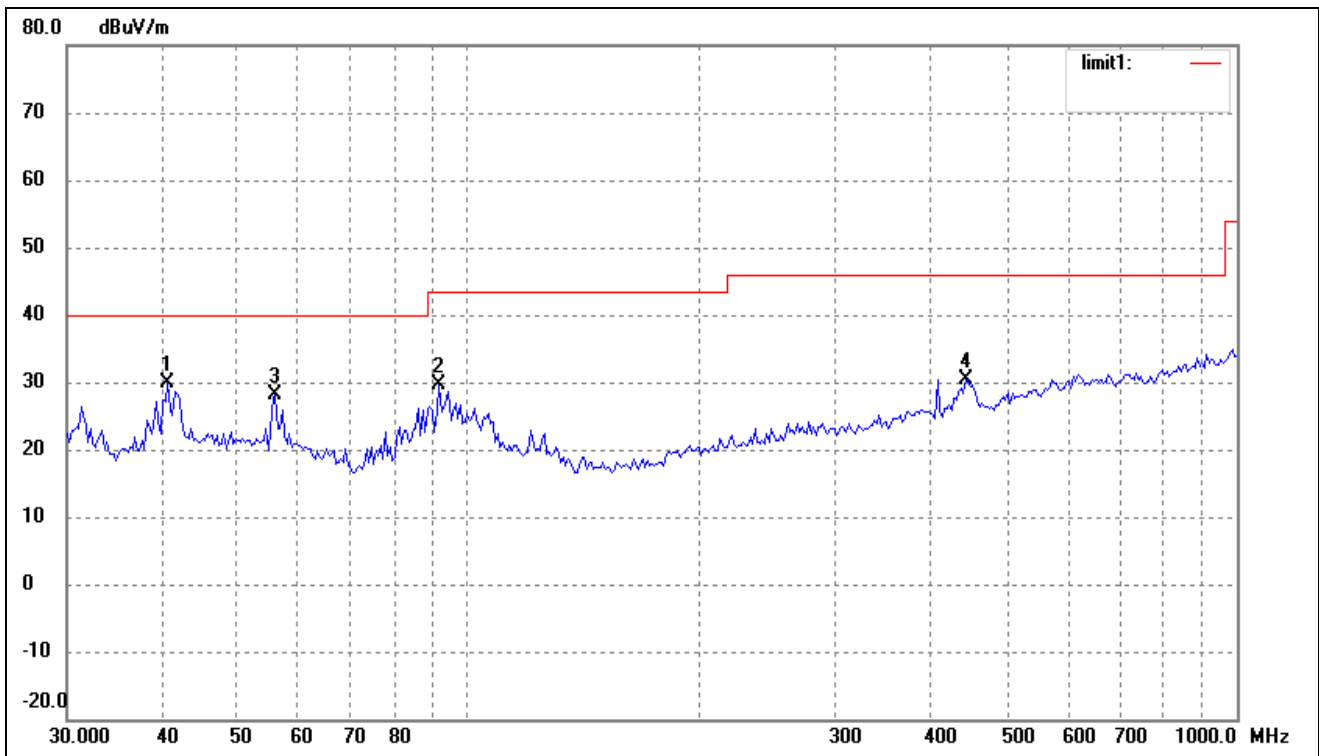
M/N: 8860

Operating Condition: Charging

Test Specification: Horizontal & Vertical

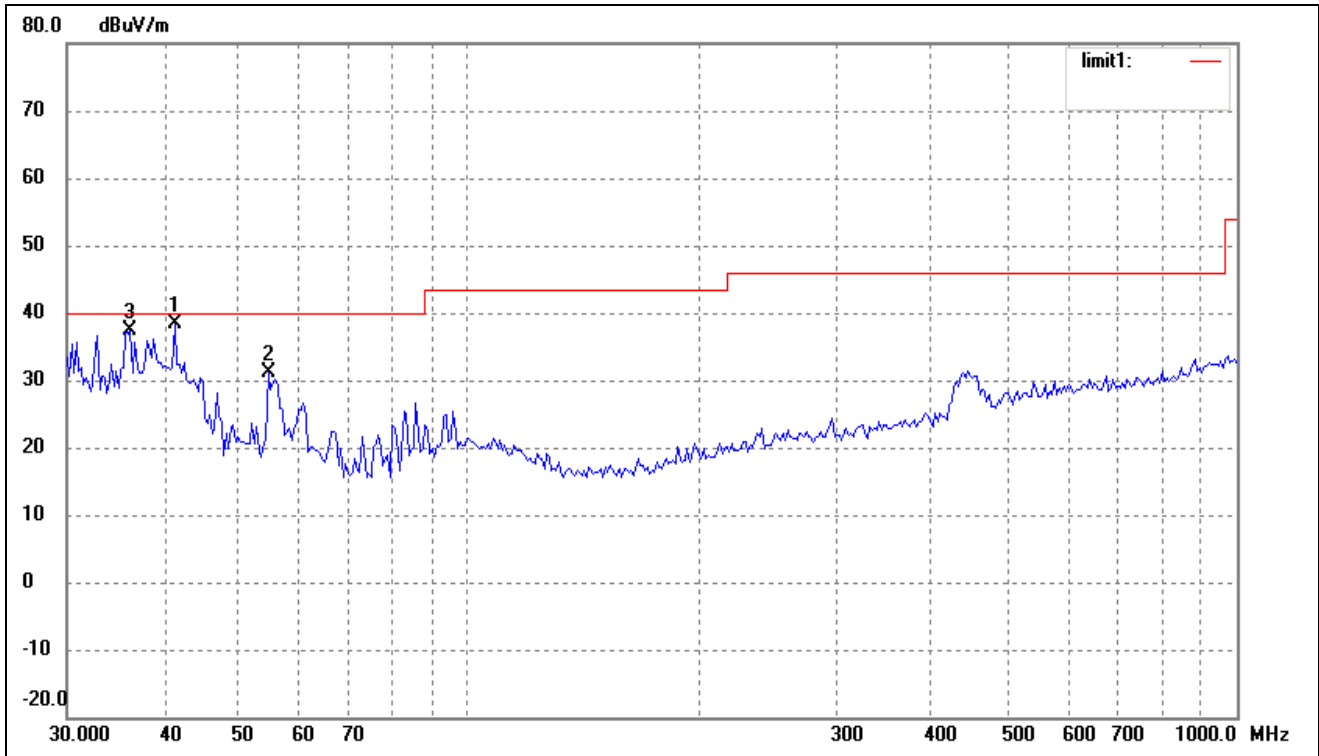
Comment: Connect to Adapter

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	21.98	7.94	29.92	40.00	-10.08	360	100	peak
2	91.4949	22.91	6.81	29.72	43.50	-13.78	0	200	peak
3	56.0007	20.81	7.41	28.22	40.00	-11.78	0	100	peak
4	443.2943	19.74	10.73	30.47	46.00	-15.53	360	200	peak

Vertical

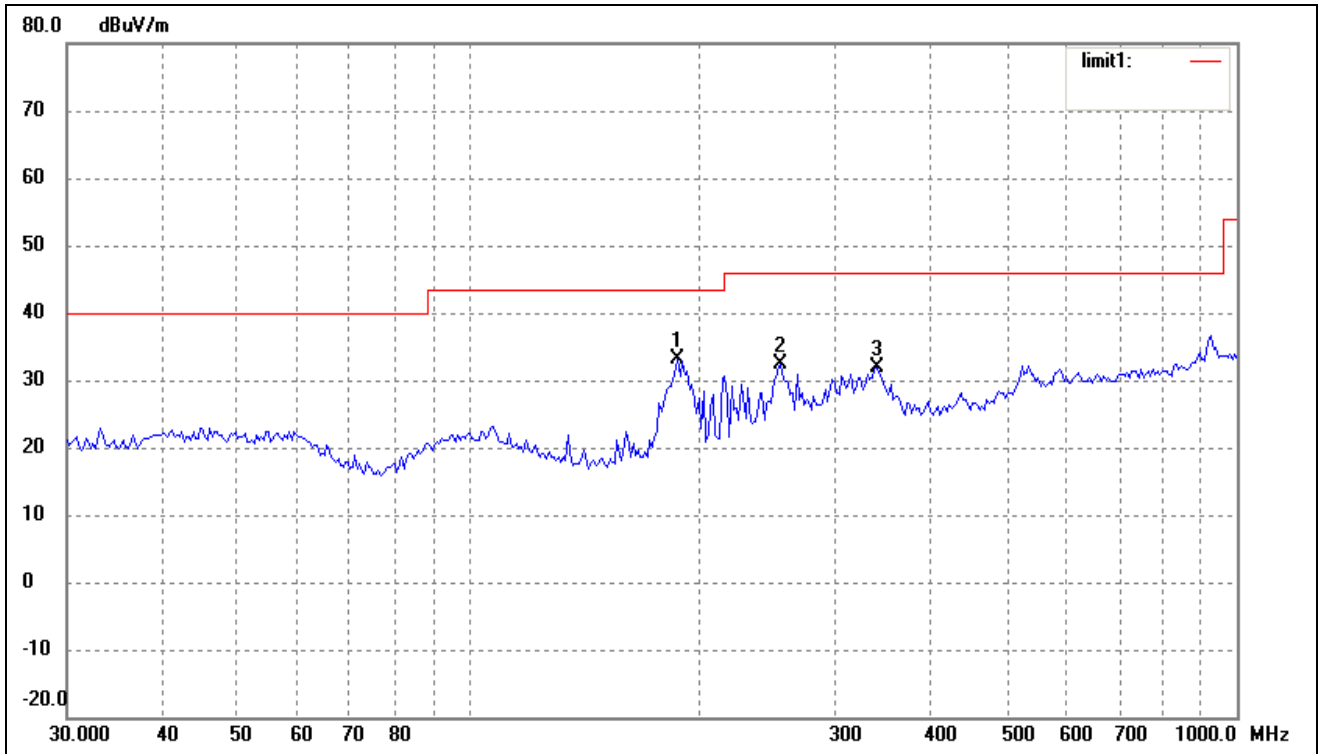


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	41.4215	30.50	7.95	38.45	40.00	-1.55	236	124	QP
2	54.8348	23.75	7.47	31.22	40.00	-8.78	360	0	peak
3	36.2541	30.42	6.93	37.35	40.00	-2.65	221	105	QP

From 30 MHz to 1 GHz

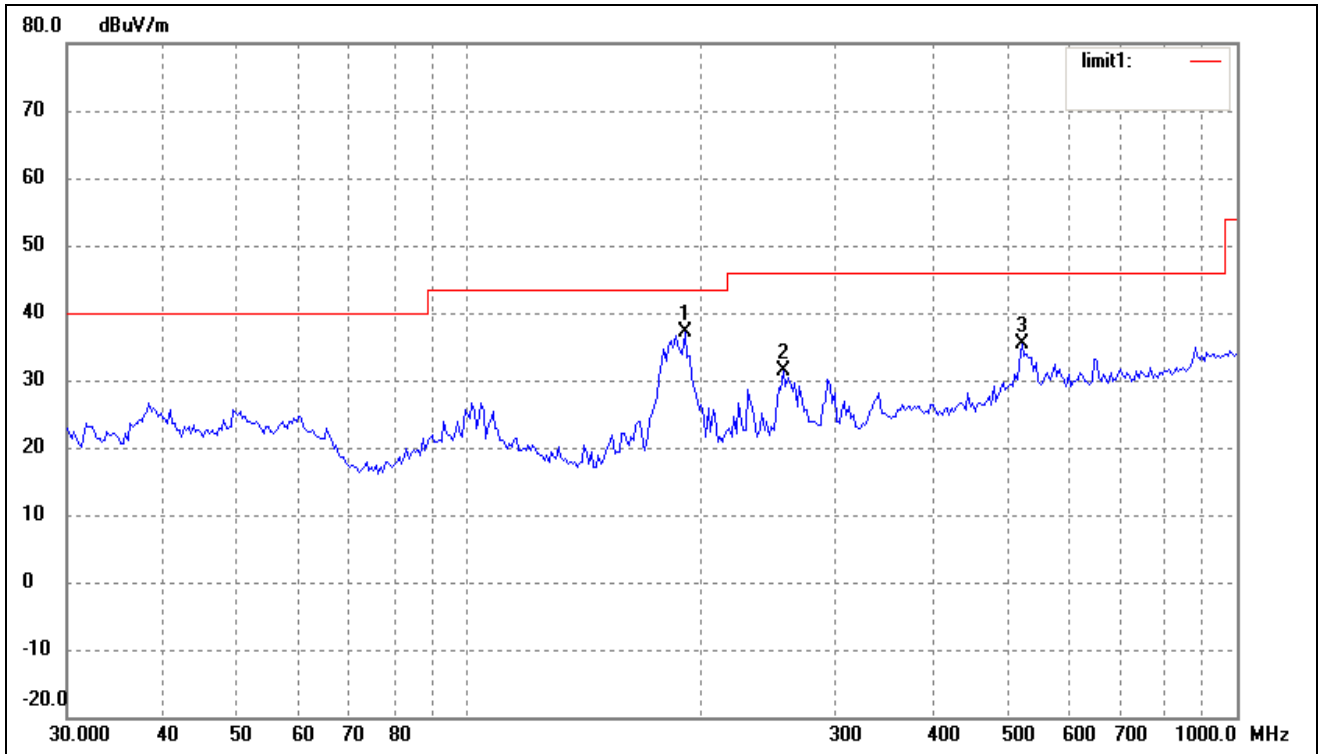
Test Mode: Transmitting-Low channel

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	187.0958	27.82	5.40	33.22	43.50	-10.28	360	200	peak
2	254.7284	24.61	7.80	32.41	46.00	-13.59	0	100	peak
3	339.5888	22.55	9.22	31.77	46.00	-14.23	0	200	peak

Vertical

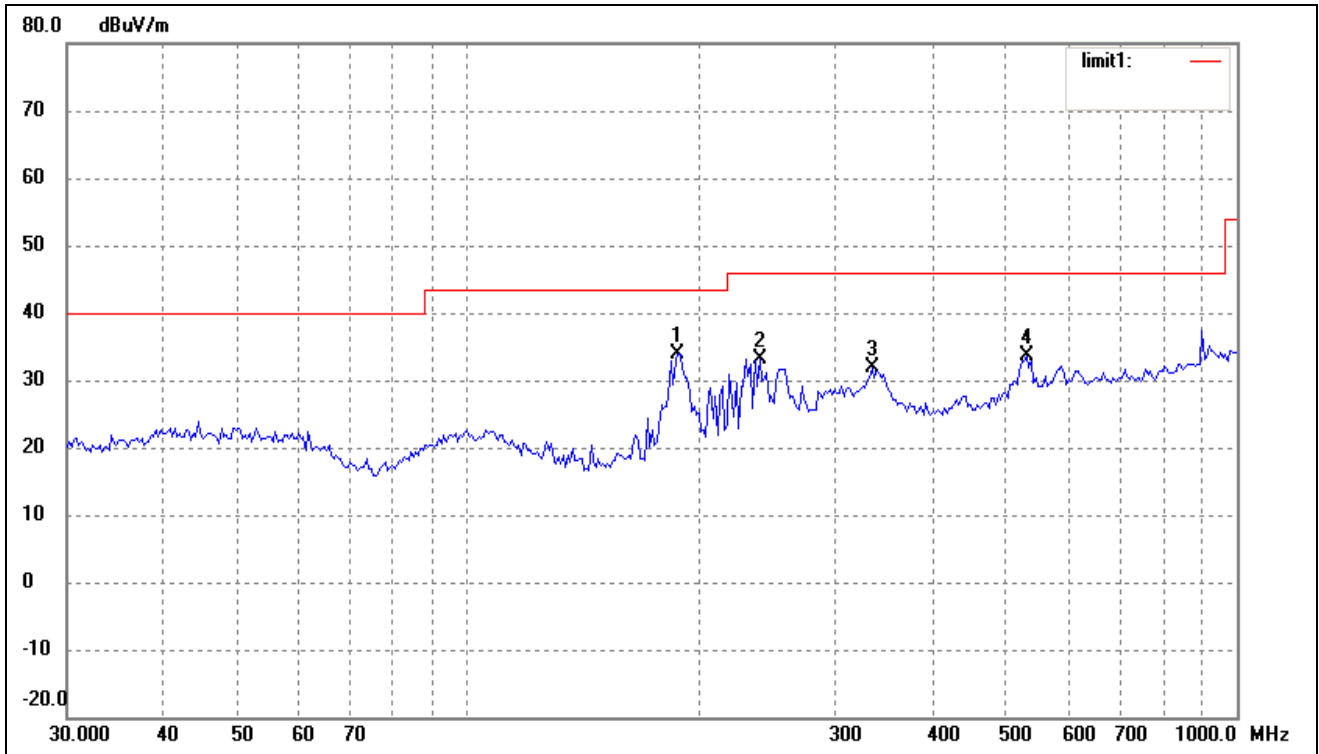


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	191.0738	31.53	5.66	37.19	43.50	-6.31	0	100	peak
2	256.5211	23.63	7.83	31.46	46.00	-14.54	360	200	peak
3	524.5541	22.13	13.24	35.37	46.00	-10.63	0	100	peak

From 30 MHz to 1 GHz

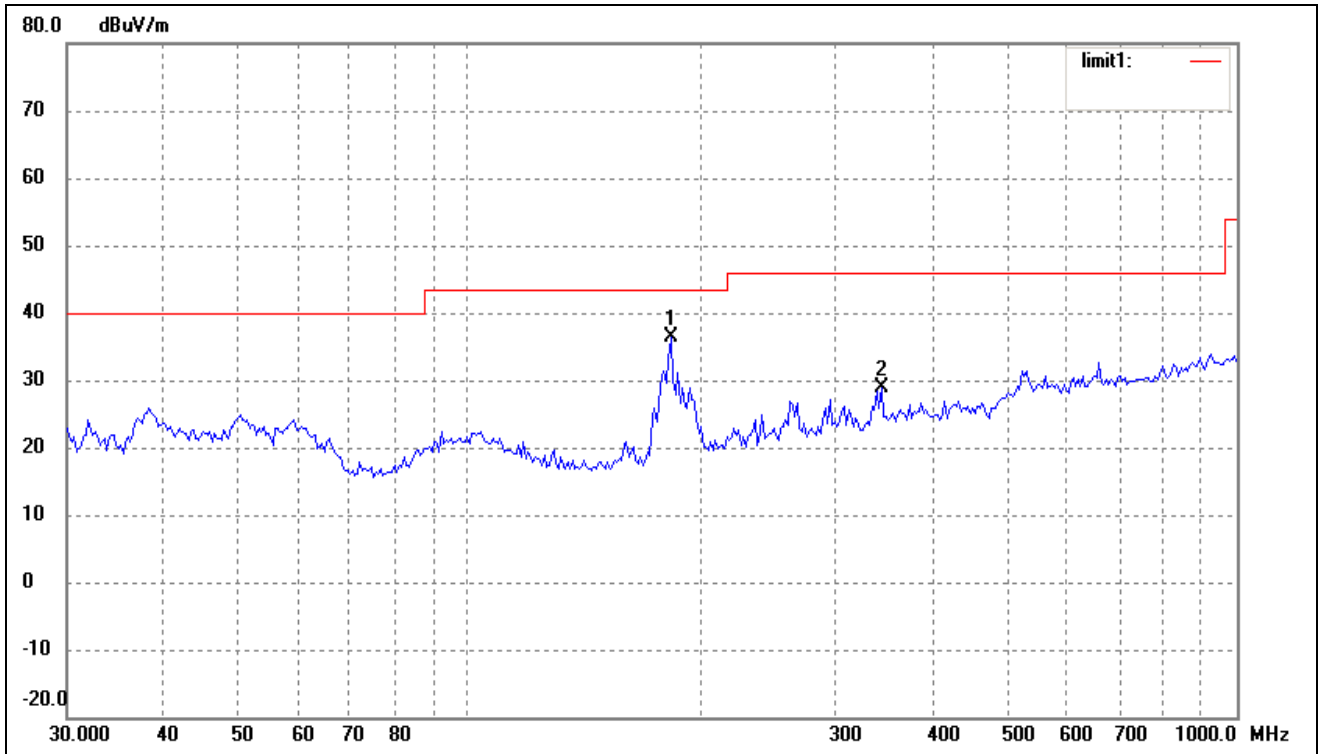
Test Mode: Transmitting-Middle channel

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	187.0958	28.48	5.40	33.88	43.50	-9.62	360	100	peak
2	239.1473	25.83	7.39	33.22	46.00	-12.78	0	100	peak
3	334.8589	22.83	9.12	31.95	46.00	-14.05	0	200	peak
4	531.9635	20.73	12.97	33.70	46.00	-12.30	360	100	peak

Vertical

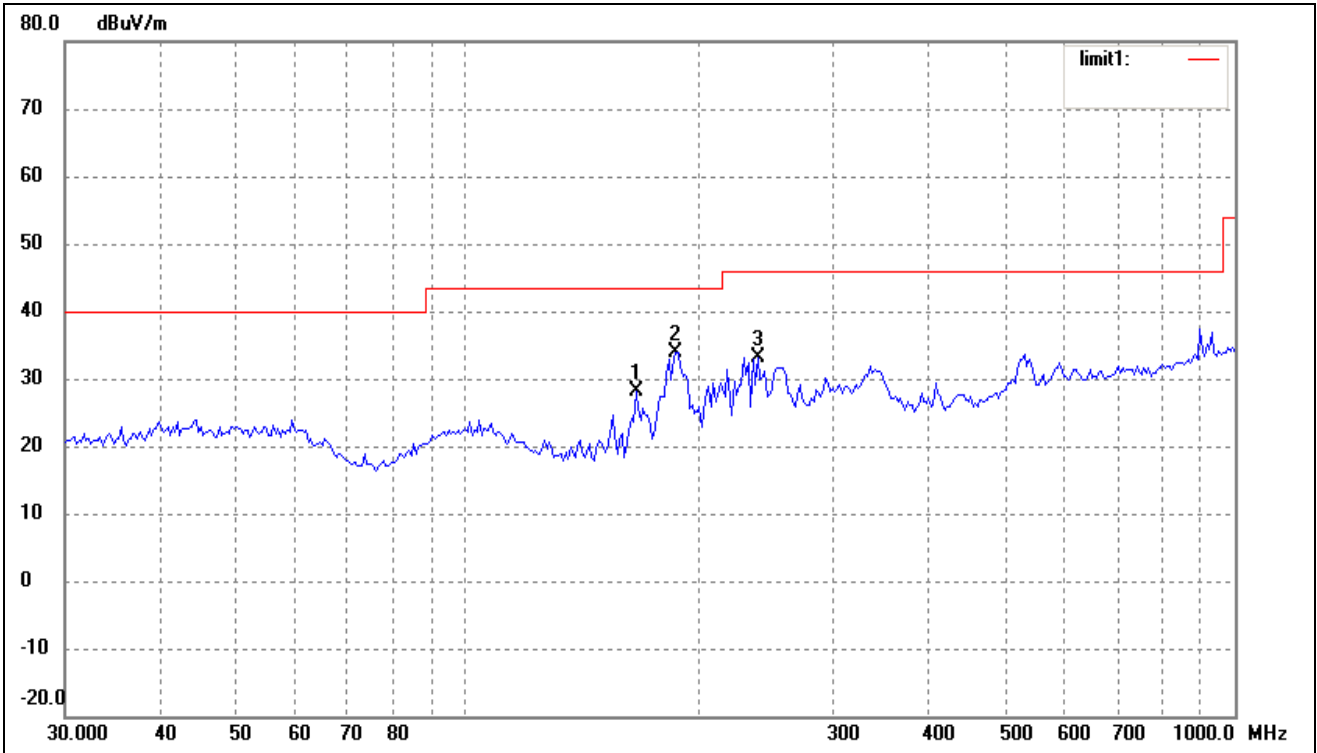


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	183.2005	31.23	5.06	36.29	43.50	-7.21	360	100	peak
2	344.3855	19.51	9.32	28.83	46.00	-17.17	0	200	peak

From 30 MHz to 1 GHz

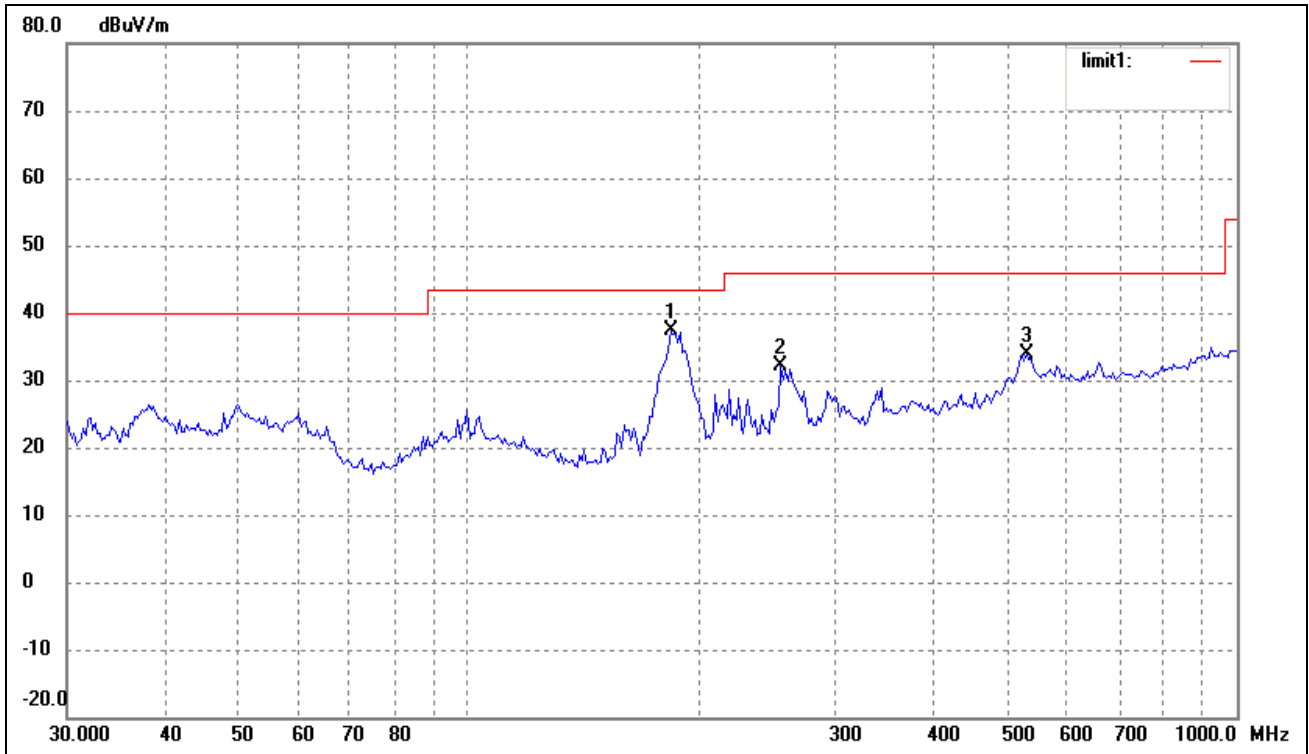
Test Mode: Transmitting-High channel

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	166.0680	24.31	3.93	28.24	43.50	-15.26	0	100	peak
2	187.0958	28.48	5.40	33.88	43.50	-9.62	0	200	peak
3	239.1473	25.83	7.39	33.22	46.00	-12.78	360	200	peak

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	183.2005	32.33	5.06	37.39	43.50	-6.11	0	200	peak
2	254.7284	24.29	7.80	32.09	46.00	-13.91	360	100	peak
3	531.9635	20.65	13.32	33.97	46.00	-12.03	0	200	peak

Spurious emissions above 1GHz

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	43.6	57	H	34.1	5.2	33.0	49.9	54	-4.1
4804.0	AV	41.6	35	V	34.1	5.2	33.0	47.9	54	-6.1
7206.0	AV	34.2	60	H	37.4	6.1	33.5	44.2	54	-9.8
7206.0	AV	30.6	79	V	37.4	6.1	33.5	40.6	54	-13.4
2402.0	AV	89.6	45	H	29.1	3.7	34.0	88.4		(Fund.)
2402.0	AV	83.2	359	V	29.1	3.7	34.0	82.0		(Fund.)
4804.0	PK	48.6	65	H	34.1	5.2	33.0	54.9	74	-19.1
4804.0	PK	47.2	98	V	34.1	5.2	33.0	53.5	74	-20.5
7206.0	PK	43.2	256	H	37.4	6.1	33.5	53.2	74	-20.8
7206.0	PK	39.3	185	V	37.4	6.1	33.5	49.3	74	-24.7
2402.0	PK	87.8	78	H	29.1	3.7	34.0	86.6		(Fund.)
2402.0	PK	86.2	44	V	29.1	3.7	34.0	85.0		(Fund.)
Middle Channel (1G to 25GHz)										
4882.0	AV	45.3	21	H	34.1	5.2	33.0	51.6	54	-2.4
4882.0	AV	44.2	34	V	34.1	5.2	33.0	50.5	54	-3.5
7323.0	AV	38.5	342	H	37.4	6.1	33.5	48.5	54	-5.5
7323.0	AV	33.1	30	V	37.4	6.1	33.5	43.1	54	-10.9
2441.0	AV	87.4	98	H	29.1	3.7	34.0	86.2		(Fund.)
2441.0	AV	85.1	72	V	29.1	3.7	34.0	83.9		(Fund.)
4882.0	PK	49.2	237	H	37.4	6.1	33.5	59.2	74	-14.8
4882.0	PK	46.7	354	V	37.4	6.1	33.5	56.7	74	-17.3
7323.0	PK	44.1	264	H	34.1	5.2	33.0	50.4	74	-23.6
7323.0	PK	40.7	187	V	34.1	5.2	33.0	47.0	74	-27.0
2441.0	PK	89.5	55	H	29.1	3.7	34.0	88.3		(Fund.)
2441.0	PK	86.3	49	V	29.1	3.7	34.0	85.1		(Fund.)

High Channel (1G to 25GHz)										
4960.0	AV	42.2	17	H	37.4	6.1	33.5	52.2	54	-1.8
4960.0	AV	36.2	13	V	37.4	6.1	33.5	46.2	54	-7.8
7440.0	AV	34.5	355	H	34.1	5.2	33.0	40.8	54	-13.2
7440.0	AV	32.3	66	V	34.1	5.2	33.0	38.6	54	-15.4
2480.0	AV	83.4	63	H	29.1	3.7	34.0	82.2		(Fund.)
2480.0	AV	80.1	85	V	29.1	3.7	34.0	78.9		(Fund.)
4960.0	PK	56.8	50	H	34.1	5.2	33.0	63.1	74	-10.4
4960.0	PK	50.4	59	V	34.1	5.2	33.0	56.7	74	-17.3
7440.0	PK	37.3	269	H	37.4	6.1	33.5	47.3	74	-26.7
7440.0	PK	34.8	64	V	37.4	6.1	33.5	44.8	74	-29.2
2480.0	PK	88.3	85	H	29.1	3.7	34.0	87.1		(Fund.)
2480.0	PK	83.6	55	V	29.1	3.7	34.0	82.4		(Fund.)

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

10. OUT OF BAND EMISSIONS

10.1 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.

10.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
Spectrum Analyzer	ROHDE&SCHWARZ	FSP	N/A	2010-04-16	2011-04-15

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

10.3 Test Procedure

According to measurement guidelines of the DA 00-705 for frequency hopping spread spectrum systems

10.4 Environmental Conditions

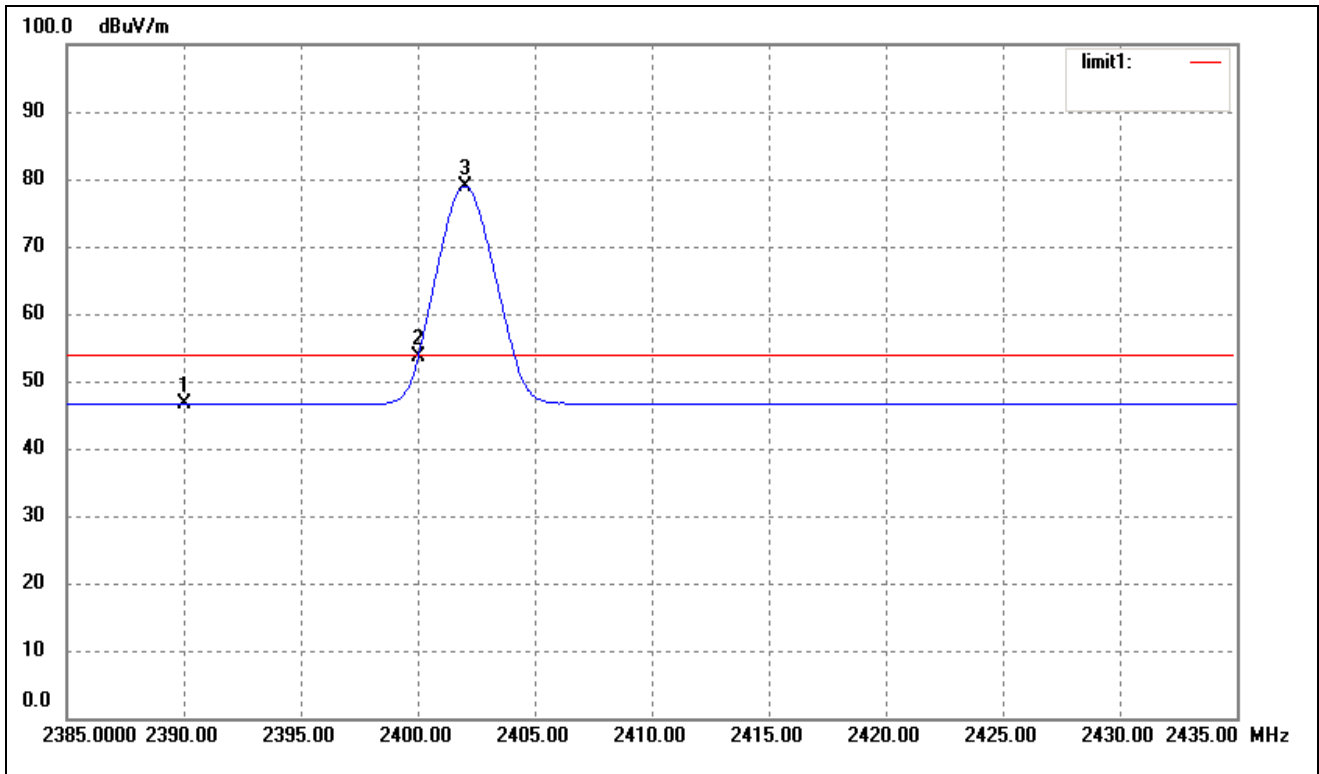
Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

10.5 Summary of Test Results/Plots

Test mode	Frequency MHz	Limit dBuV /dB	Result
Lowest	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
Highest	2483.50	<54dBuv	Pass

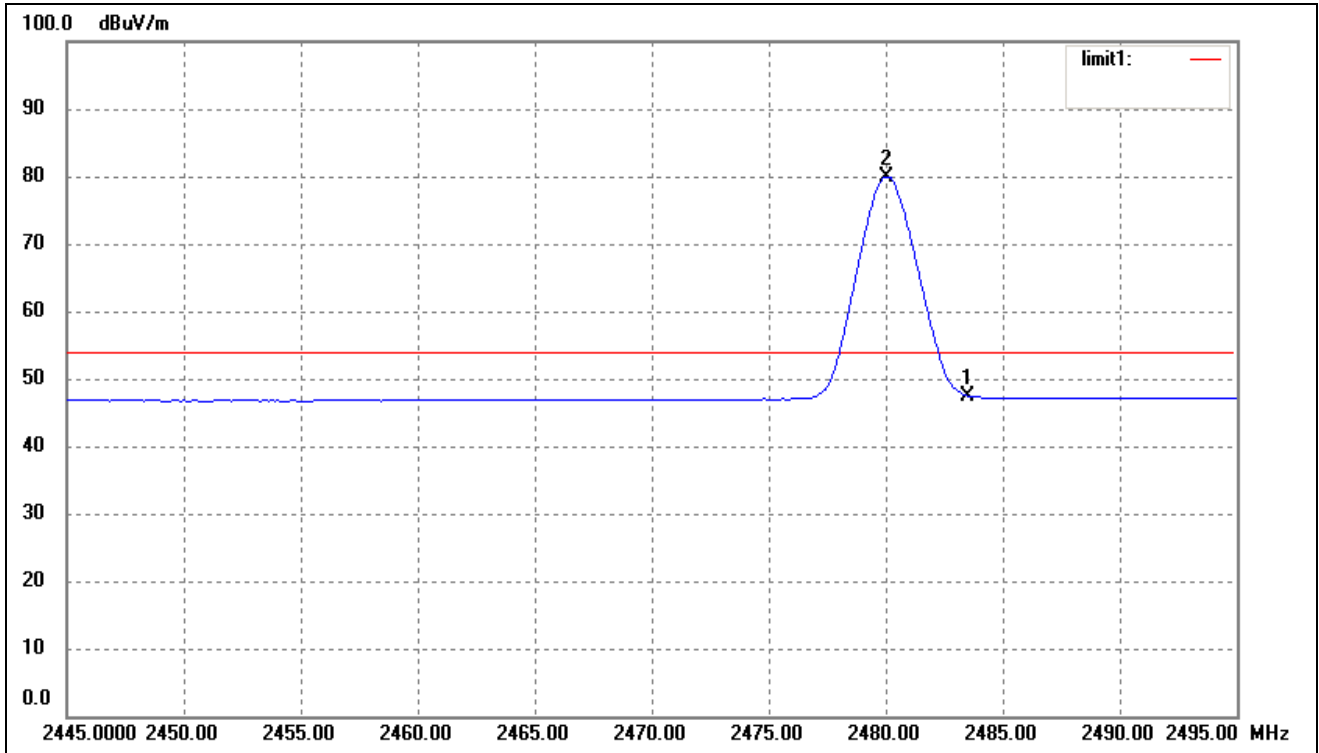
The edge emissions are below the FCC 15.209 Limits. Please refer to the test plots below.

Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	12.01	34.59	46.60	54.00	-7.40	Average Detector
	2390.000	21.95	34.59	56.54	74.00	-17.46	Peak Detector
2	2400.000	18.89	34.68	53.57	/	/	Average Detector
3	2402.000	44.22	34.69	78.91	/	/	Average Detector

Highest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	12.49	34.97	47.46	54.00	-6.54	Average Detector
	2483.500	24.21	34.97	59.18	74.00	-14.82	Peak Detector
2	2480.000	44.99	34.96	79.95	/	/	Average Detector

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