Lab Code: 200167-0

FCC PART 15.247
IC RSS-210, ISSUE 7, JUNE 2007
TEST AND MEASUREMENT REPORT

For

Infineon Technologies

St. Martin Str. 53, Munich, Germany D-81541

FCC ID: Q2331308
IC: 6850A-31308

Report Type:	**Product Type:**
Class II Permissive Change	Bluetooth Module

Test Engineer:	Vang Her
Report Number:	R1003181-247
Report Date:	2010-05-05
Reviewed By:	Victor Zhang
Prepared By: (84)	Bay Area Compliance Laboratories Corp. 1274 Anvilwood Avenue, Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732 9164

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1003181-247	Original Report	2010-05-05

1 GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report has been prepared on behalf of the company *Infineon Technologies* and their product, FCC ID: Q2331308, IC: 6580A-31308, *model: Unistone PBA 31308*, which will henceforth in this report be referred to as the EUT (Equipment Under Test). The EUT is a 2.4 GHz Bluetooth module.

1.2 Mechanical Description of EUT

The EUT measures approximately 12mm L x 9mm W x 2mm H.

**The data gathered are from a production sample provided by the manufacturer, serial number: 909001 provided by the manufacturer.*

1.3 EUT Photograph

Please refer to Exhibit C for more EUT photographs.

1.4 Objective

This type approval report is prepared on behalf of *Trimble Navigation Limited* in accordance with Part 15, Subparts A, B, and C and IC RSS-210. Infineon Technologies AG authorized Trimble Navigation Limited to perform a FCC Class II Permissive change to the Infineon Bluetooth module: Unistone PBA 31308

FCC ID: Q2331308 is electronically identical to the device of the same FCC ID tested by AT4 Wireless report number 24838RET.101. The only change that has been made to the EUT is the antenna re-radiator.

1.5 Related Submittal(s)/Grant(s)

This is a Permissive Change II application; the original application was granted on 2007-01-12 by MET Laboratories, Inc.

1.6 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003.

1.7 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the values range from $\pm$2.0 for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL.

Detailed instrumentation measurement uncertainties can be found in BACL report QAP-018.

1.8 Test Facility

The semi-anechoic chambers used by BACL to collect radiated and conducted emissions measurement data is located in the building at it's facility in Sunnyvale, California, USA.

BACL's test sites have been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464 and VCCI Registration No.: C-2698 and R-2463. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm

2 SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in accordance with ANSI C63.4-2003.
The EUT was tested in the testing mode to represent *worst*-case results during the final qualification test.

2.2 EUT Exercise Software

The software is provided by customer. The EUT was pinging to a laptop PC through Ethernet, had a web browser open, updating via RS232 (serial) cable.

2.3 Special Accessories

N/A.

2.4 Equipment Modifications

The original EUT was modified with a new Bluetooth re-radiator.

2.5 Local Support Equipment

Manufacturers	Descriptions	Models	Serial Numbers
Dell	Laptop	D610	8273581345

2.6 EUT Internal Configuration

Manufacturers	Descriptions	Models	Serial Numbers
Trimble	GPS Receiver	SPSx52	GAMELC1008
Delta	AC/DC Power Supply	ADP-65JH AB	B15W0190016
Trimble	GNSS Antenna	Zephyr2	3032427

2.7 Interface Ports and Cabling

Cable Description	Length (m)	From	To
TNC RF	1	EUT	GPS Antenna
Ethernet	2	EUT	Laptop
Serial	2	EUT	Laptop

3 SUMMARY OF TEST RESULTS

FCC 15C & IC RSS-210 Rules	Description of Test	Results
FCC §15.203 IC RSS-Gen §7.1.4	Antenna Requirements	N/A*
FCC §15.207 (a) IC RSS-Gen §7.2.2	Conducted Emissions	Compliant
§15.209 (a), §15.247 (d)	Radiated Spurious Emissions	Compliant
FCC §2.1051 & 15.247(d) IC RSS-210 §A8.5 & RSS-Gen §7.2	Spurious Emissions at Antenna Port	N/A*
FCC§15.247 (a)(1) IC RSS-210 §A8.1 (a)	20 dB Bandwidth & 99% Bandwidth	N/A*
FCC§15.247 (a)(1) IC RSS-210 §A8.1(d)	Hopping Channel Separation	N/A*
FCC§15.247 (a)(1)(iii) IC RSS-210 §A8.1(d)	Number of Hopping Frequencies Used	N/A*
FCC§15.247 (a)(1)(iii) IC RSS-210 §A8.1(d)	Dwell Time	N/A*
FCC§15.247 (b)(3) IC RSS-210 §A8.4(b)	Maximum Peak Output Power	N/A*
FCC§ 15.247 (d) IC RSS-210 §A8.5	100 kHz Bandwidth of Frequency Band Edge	N/A*
IC RSS-Gen §4.10	Receiver Spurious Emissions	Compliant
FCC §15.247(i) & §2.1091 IC RSS-Gen §5.5 & RSS-102	RF Exposure	Compliant

Note: 1) Refer to FCC ID: Q2331308

4 FCC §15.207 & IC RSS-Gen §7.2.2 – Conducted Emissions

4.1 Applicable Standard

FCC §15.207, IC RSS-Gen §7.2.2

AC Line Conducted Emission Limits

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

**Decreases with the logarithm of the frequency*

4.2 EUT Setup

The conducted emissions tests were performed in the 5-meter test chamber, using the setup in accordance with ANSI C63.4-2003 measurement procedures. The specifications used were in accordance with FCC Part 15.207 and IC RSS-Gen limits.

The adapter of control board was connected to a 120 V, 60 Hz AC mains power source.

4.3 Test Procedure

During the conducted emissions test, the power cord of the EUT was connected to the mains outlet of the LISN.

Maximizing procedure was performed on the six (6) highest provided emissions of the EUT.

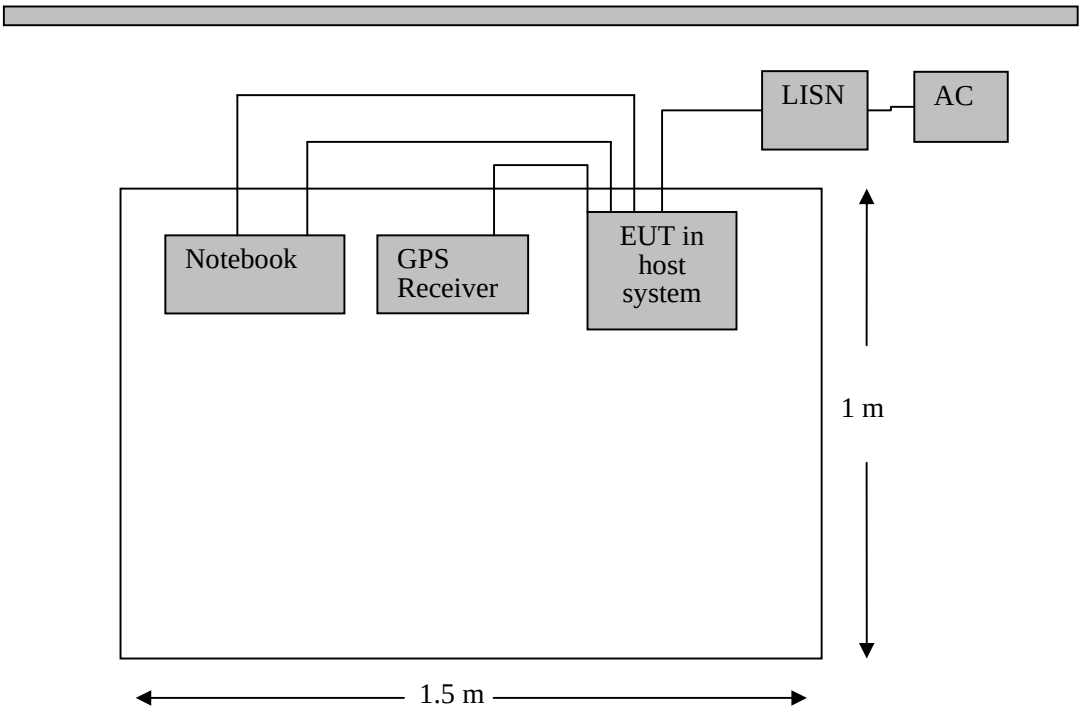
All data was recorded in the quasi-peak and average detection mode. Quasi-Peak readings are distinguished with a "QP". Average readings are distinguished with an "Ave".

4.4 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial Number	Calibration Date
Solar Electronics	LISN	9252-R-24-BNC	511205	2009-06-09
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2009-04-21

**** Statement of Traceability: BACL Corp.*** *attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.*

4.5 Test Setup Block Diagrams



4.6 Test Environmental Conditions

Temperature:	18~21 ºC
Relative Humidity:	44~50 %
ATM Pressure:	101.2~102.3kPa

**Testing was performed by Vang Her on 2010-03-18 in chamber 3.*

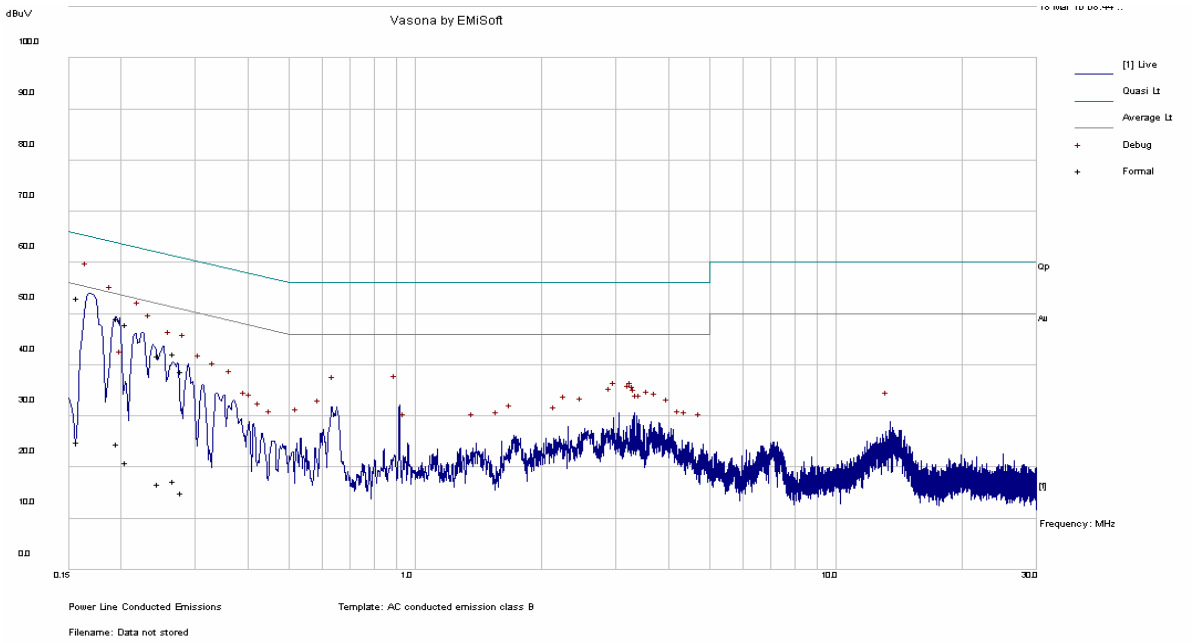
4.7 Test Result:

According to the data hereinafter, the EUT complied with the FCC Part 15.207 & IC RSS-Gen Conducted emissions limits and had the worst margin of:

-11.32 dB at **0.170 MHz** in the Neutral conductor, 120V/60Hz

4.8 Conducted Emissions Test Data

120 V/60 Hz, Line:



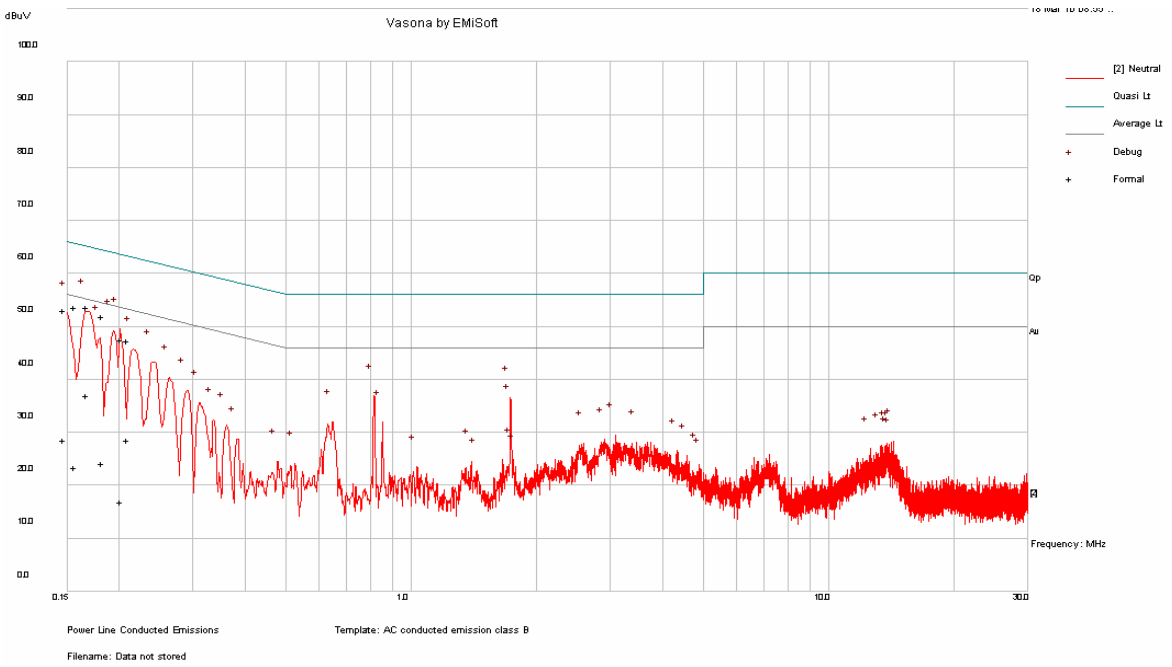
QP Measurement Results

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (L/N)	Limit (dBµV)	Margin (dB)
0.160825	53.13	L	65.42	-12.29
0.200503	49.13	L	63.59	-14.46
0.210256	47.86	L	63.2	-15.34
0.271703	42.11	L	61.07	-18.95
0.250027	41.75	L	61.76	-20
0.283391	38.8	L	60.72	-21.92

Average Measurement Results

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (L/N)	Limit (dBµV)	Margin (dB)
0.200503	24.56	L	53.59	-29.03
0.160825	24.89	L	55.42	-30.53
0.210256	20.83	L	53.2	-32.37
0.271703	17.36	L	51.07	-33.71
0.250027	16.65	L	51.76	-35.11
0.283391	14.97	L	50.72	-35.74

120 V/60 Hz, Neutral:



QP Measurement Results

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (L/N)	Limit (dBµV)	Margin (dB)
0.170776	53.60	N	64.92	-11.32
0.159734	53.67	N	65.48	-11.81
0.186355	51.92	N	64.20	-12.27
0.150248	53.13	N	65.99	-12.86
0.206203	47.60	N	63.36	-15.75
0.214175	47.25	N	63.04	-15.79

Average Measurement Results

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (L/N)	Limit (dBµV)	Margin (dB)
0.170776	37.05	N	54.92	-17.87
0.214175	28.54	N	53.04	-24.50
0.150248	28.53	N	55.99	-27.45
0.186355	24.12	N	54.20	-30.08
0.159734	23.41	N	55.48	-32.07
0.206203	16.86	N	53.36	-36.50

5 FCC §15.205, §15.247(d) & IC RSS-210 §2.2, §A8.5- Spurious Emissions

5.1 Applicable Standard

As per FCC §15.209(a) and IC RSS-210 §2.7: Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (micro volts/m)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As Per FCC §15.205(a) and IC RSS-210 §2.2 except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	960 – 1240	4. 5 – 5. 15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5. 35 – 5. 46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 –167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3 3458 – 3 358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC §15.247 (d) and IC RSS-210 §A8.5, 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) (see §15.205(c)).

5.2 Test Setup

The radiated emissions tests were performed in the 3-meter open area test site, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C and IC RSS-210.

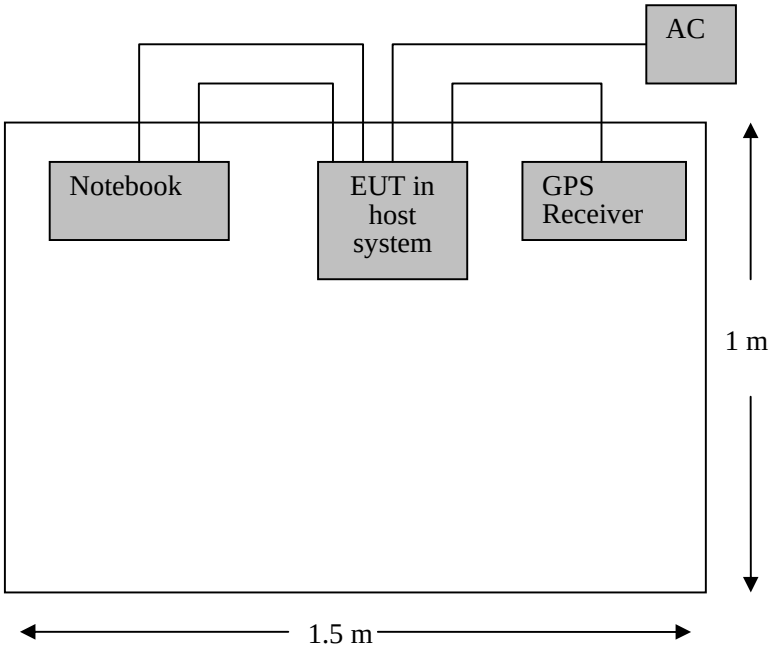
5.3 EUT Setup

The radiated emissions tests were performed using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC and IC limits.

The spacing between the peripherals was 3 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

5.4 Test Setup Block Diagram



5.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Hewlett Packard	Pre amplifier	8447D	2944A06639	2009-06-05
Sunol Science Corp	Combination Antenna	JB3	A0020106-3	2009-05-05
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2010-03-24
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
A.R.A Inc	Horn antenna	DRG-1181A	1132	2009-10-27
HP	Pre Amplifier	8449B	3147A00400	2010-02-01

* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

5.6 Test Procedure

For the radiated emissions test, the EUT was connected to the DC power source, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meters away from the testing antenna, which is varied from 1-4 meters, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

5.7 Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit.
The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Limit

5.8 Test Environmental Conditions

Temperature:	18~21 ºC
Relative Humidity:	44~50 %
ATM Pressure:	101.2~102.3kPa

**The testing was performed by Vang Her on 2010-03-18 in chamber 3.*

5.9 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC & IC requirements, and had the worst margin readings of:

Margin (dB)	Frequency (MHz)	Antenna Polarization (Horizontal/Vertical)	Frequency Range (MHz)
Low Channel: 2402 MHz			
-24.13	85.02	Vertical	30 to 1000 MHz
-	-	-	Above 1 GHz
Middle Channel: 2441 MHz			
-5.35	74.64	Horizontal	30 to 1000 MHz
-4.04	4882	Vertical	Above 1 GHz
High Channel: 2480 MHz			
-7.77	108.63	Horizontal	30 to 1000 MHz
-8.26	4960	Vertical	Above 1 GHz

5.10 Radiated Emissions Test Plot & Data

30 MHz – 1 GHz measured at 3 meters

Low Channel: 2402 MHz

Frequency (MHz)	Cord. Quasi-Peak (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Table Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
85.02	15.87	283	V	16	40	-24.13

Middle Channel: 2441 MHz

Frequency (MHz)	Cord. Quasi-Peak (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Table Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
74.64	34.65	114	H	335	40	-5.35

High Channel 2480 MHz

Frequency (MHz)	Cord. Quasi-Peak (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Table Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
66.50	25.79	323	H	138	40	-14.21
108.63	35.73	115	H	260	43.5	-7.77

Above 1 GHz:

Low Channel: 2402 MHz

Freq. (MHz)	S.A. Reading (dBuV)	Detector (PK/AV)	Table Azimuth (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC & IC	
				Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBuV/m)	Margin (dB)
-	-	-	-	-	V	-	-	-	-	-	-
-	-	-	-	-	H	-	-	-	-	-	-

***Note:** All emission levels are at the noise floor and/or more then 20 dB below the limit.

Middle Channel: 2441 MHz

Freq. (MHz)	S.A. Reading (dBuV)	Detector (PK/AV)	Table Azimuth (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC & IC	
				Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBuV/m)	Margin (dB)
4882	44.65	PK	344	171	H	32.3	5.8	36.1	46.65	74	-27.35
4882	50.6	PK	360	154	V	32.3	5.8	36.1	52.6	74	-21.4
4882	38.38	AV	344	171	H	32.3	5.8	36.1	40.38	54	-13.62
4882	47.96	AV	360	154	V	32.3	5.8	36.1	49.96	54	-4.04

High Channel: 2480 MHz

Freq. (MHz)	S.A. Reading (dBuV)	Detector (PK/AV)	Table Azimuth (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	Part 15.247/209	
				Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBuV/m)	Margin (dB)
4960	45.52	PK	347	155	V	34	8.2	36.04	51.68	74	-22.32
4960	41.39	PK	352	159	H	34	8.2	36.04	47.55	74	-26.45
4960	39.58	AV	347	155	V	34	8.2	36.04	45.74	54	-8.26
4960	32.19	AV	352	159	H	34	8.2	36.04	38.35	54	-15.65

Restricted Band:

Lowest Channel

Frequency (MHz)	S.A. Reading (dBµV)	Table Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Reading (dBµV/m)	FCC & IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
2330	45.19	360	100	V	30.3	5.2	36.48	44.21	74	-29.79	PK
2330	43.99	360	100	H	30.3	5.2	36.48	43.01	74	-30.99	PK
2330	31.08	360	100	V	30.3	5.2	36.48	30.1	54	-23.9	AV
2330	31.06	360	100	H	30.3	5.2	36.48	30.08	54	-23.92	AV

Highest Channel

Frequency (MHz)	S.A. Reading (dBµV)	Table Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Reading (dBµV/m)	FCC & IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
2495	44.58	0	100	V	28.6	5.4	36.46	42.12	74	-31.88	PK
2495	42.15	0	100	H	28.6	5.4	36.46	39.69	74	-34.31	PK
2495	38.96	0	100	V	28.6	5.4	36.46	36.5	54	-17.5	AV
2495	36.44	0	100	H	28.6	5.4	36.46	33.98	54	-20.02	AV

6 IC RSS-Gen §4.10 & RSS-210 - §2.6 Receiver Spurious Emissions

6.1 Applicable Standard

IC RSS-Gen §4.10 & RSS-210 §2.6.

General Field Strength Limits for Transmitters and Receivers at Frequencies above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 meters (watts, e.i.r.p.)	
	Transmitters	Receivers
30 - 88	100 (3 nW)	100 (3 nW)
88 - 216	150 (6.8 nW)	150 (6.8 nW)
216 - 960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

6.2 Test Setup

The radiated emissions tests were performed in the 3 meter chamber, using the setup in accordance with ANSI C63.4-2003.

6.3 Test Equipment Lists and Details

Manufacturer	Description	Model No.	Serial Number	Calibration Date
Hewlett Packard	Pre amplifier	8447D	2944A06639	2009-06-05
HP	Pre Amplifier	8449B	3147A00400	2010-02-01
Sunol Science Corp	Combination Antenna	JB3	A0020106-3	2009-05-05
A.R.A Inc	Horn antenna	DRG-1181A	1132	2009-10-27
Agilent	PSA Series Spectrum Analyzer	E4440A	MY44303352	2009-04-27
A.H Systems	Antenna, Horn	SAS-200/571	261	2009-09-23

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

6.4 Test Environmental Conditions

Temperature:	15~18 ºC
Relative Humidity:	44~50 %
ATM Pressure:	101.2~102.3kPa

**Testing was performed by Vang Her on 2010-03-18 in chamber 3.*

6.5 Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations.

All data were recorded in the peak detection mode. Quasi-peak readings was performed only when an emissions was found to be marginal (within -4 dB of specification limits), and are distinguished with a "**QP**" in the data table.

6.6 Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7 dB means the emissions are 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Limit

6.7 Summary of Test Results

According to the test data,, the EUT complied with the with the applicable IC Standards, with the closest margins from the limit listed below:

30 MHz - 1 GHz

-24.27 dB at 62 MHz in the Horizontal Polarization

Above 1 GHz

-19.19 dB at 1440 MHz in the Vertical Polarization

30-1000 MHz:

Frequency (MHz)	S.A. Reading (dBµV)	Table Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Reading (dBµV/m)	RSS-210/RSS-Gen		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
266	21.95	320	100	H	13.5	1.1	21.02	15.53	46	-30.47	QP
266	28.06	278	123	V	13.5	1.1	21.02	21.64	46	-24.36	QP
62	28.02	231	145	H	7.7	0.6	20.59	15.73	40	-24.27	QP
62	19.61	127	31	V	7.7	0.6	20.59	7.32	40	-32.68	QP

Above 1 GHz:

Frequency (MHz)	S.A. Reading (dBµV)	Table Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Reading (dBµV/m)	RSS-210/RSS-Gen		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
1440	51.4	346	129	V	26	4.02	37.06	44.36	74	-29.64	PK
1440	50.38	0	116	H	26	4.02	37.06	43.34	74	-30.66	PK
1440	41.85	346	129	V	26	4.02	37.06	34.81	54	-19.19	Ave
1440	40.43	0	116	H	26	4.02	37.06	33.39	54	-20.61	Ave

7 FCC §15.247(i) & IC RSS-102 - RF Exposure

7.1 Applicable Standard

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Before equipment certification is granted, the procedure of RSS-102 must be followed concerning the exposure of humans to RF fields.

According to IC RSS-102 Issue 2 section 4.1, RF limits used for general public will be applied to the EUT.

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Averaging Time (Minutes)
0.003 - 1	280	2.19	-	6
1 - 10	280 / f	2.19 / f	-	6
10 - 30	28	2.19 / f	-	6
30 – 300	28	0.073	2*	6
300 – 1 500	$1.585\ f^{0.5}$	$0.0042\ f^{0.5}$	f / 150	6
1 500 – 15 000	61.4	0.163	10	6
15 000 – 150 000	61.4	0.163	10	$616000 / f^{1.2}$
150 000- 300 000	$0.158\ f^{0.5}$	$4.21 \times 10^{-4}\ f^{0.5}$	$6.67 \times 10^{-5}\ f$	$616000 / f^{1.2}$

Note: *f* is frequency in MHz
* Power density limit is applicable at frequencies greater than 100 MHz

7.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal (dBm):	0.864
Maximum peak output power at antenna input terminal (mW):	1.22
Prediction distance (cm):	20
Prediction frequency (MHz):	2441
Maximum Antenna Gain, typical (dBi):	4
Maximum Antenna Gain (numeric):	2.511
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.00061
Power density of prediction frequency at 20.0 cm (W/m^2):	0.0061
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0
MPE limit for uncontrolled exposure at prediction frequency (W/m^2):	10

7.3 Test Result

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.00061 mW/cm^2 (0.0061 W/m^2).Limit is 1 mW/cm^2 (10 W/m^2).