FCC PART 15 SUBPART C

IC RSS-210, ISSUE 8, DEC 2010

TEST AND MEASUREMENT REPORT

For

Bluegiga Technologies Inc.

Sinikalliontie 5 A, FI-02630 Espoo, Finland

FCC ID: QOQWT11I
IC: 5123A-BGTWT11I

Report Type:	**Product Type:**
CIIPC	Bluetooth Module

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Report Number: R1312101-247

Report Date: 2014-02-21

Reviewed By: Bo Li, Test Engineer

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1312101-247	CIIPC	2014-02-21

1 General Information

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of *Bluegiga Technologies Inc.,* and their product, FCC ID: QOQWT11I IC: 5123A-BGTWT11I, model number: *WT11I-E,* or the "EUT" as referred to in this report, is a class 1 Bluetooth module.

1.2 Mechanical Description of EUT

The EUT measures 35.8mm (L) x 14.5mm (W) x 2.6mm (H) and weighs 10g.

The data gathered are from a production sample provided by the manufacturer, serial number: R1312101-01 (Serial number assigned by BACL)

1.3 Objective

This report is prepared on behalf of *Bluegiga Technologies Inc.* in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commissions rules and IC RSS-210 Issue 8, Dec 2010.

The objective is to comply with CIIPC by adding a new antenna manufactured by Tyco with a maximum gain of 5 dBi. The module was tested with Trimble Navigation Limit R7 GNSS system.

1.4 Related Submittal(s)/Grant(s)

None.

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2009

1.6 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.

1.7 Test Facility

Bay area compliance Laboratories Corp. (BACL) is:
1- An independent Commercial Test Laboratory accredited to **ISO 17025: 2005** by **A2LA**, in the fields of: Electromagnetic Compatibility & Telecommunications covering Emissions, Immunity, Radio, RF Exposure, Safety and Telecom. This includes NEBS (Network Equipment Building System), Wireless RF, Telecommunications Terminal Equipment (TTE); Network Equipment; Information Technology Equipment (ITE); Medical Electrical Equipment; Industrial, Commercial, and Medical Test Equipment; Professional Audio and Video Equipment; Electronic (Digital) Products; Industrial and Scientific Instruments; Cabled Distribution Systems and Energy Efficiency Lighting.

2- An ENERGY STAR Recognized Laboratory, for the LM80 Testing, a wide variety of Luminares and Computers.

3- A NIST Designated Phase-I and Phase-II CAB including: ACMA (Australian Communication and Media Authority), BSMI (Bureau of Standards, Metrology and Inspection of Taiwan), IDA (Infocomm Development Authority of Singapore), IC(Industry Canada), Korea (Ministry of Communications Radio Research Laboratory), NCC (Formerly DGT; Directorate General of Telecommunication of Chinese Taipei) OFTA (Office of the Telecommunications Authority of Hong Kong), Vietnam, VCCI - Voluntary Control Council for Interference of Japan and a designated EU CAB (Conformity Assessment Body) (Notified Body) for the EMC and R&TTE Directives.

4- A Product Certification Body accredited to **ISO Guide 65: 1996** by **A2LA** to certify:
1- Unlicensed, Licensed radio frequency devices and Telephone Terminal Equipment for the FCC. Scope A1, A2, A3, A4, B1, B2, B3, B4 & C.
2. Radio Standards Specifications (RSS) in the Category I Equipment Standards List and All Broadcasting Technical Standards (BETS) in Category I Equipment Standards List for Industry Canada.
3. Radio Communication Equipment for Singapore.
4. Radio Equipment Specifications, GMDSS Marine Radio Equipment Specifications, and Fixed Network Equipment Specifications for Hong Kong.
5. Japan MIC Telecommunication Business Law (A1, A2) and Radio Law (B1, B2 and B3).
6. Audio/Video, Battery Charging Systems, Computers, Displays, Enterprise Servers, Imaging Equipment, Set-Top Boxes, Telephony, Televisions, Ceiling Fans, CFLs (Including GU24s),Decorative Light Strings, Integral LED Lamps, Luminaires, Residential Ventilating Fans.

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has 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 test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2009, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: A-0027. 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 Corp. is an American Association for Laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b

2 System Test Configuration

2.1 Justification

The system was configured for testing in accordance with ANSI C63.4-2009.
The EUT was tested in the testing mode to represent *worst*-case results during the final qualification test.

2.2 Special Accessories

N/A.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Local Support Equipment

Manufacturer	Description	Model No.	Serial No.
Lenovo ThinkPad	Laptop	E430	N/A

2.5 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
Delta Electronics Inc	AC/DC Adapter	ADP-85JH	67JW1CG01K7

2.6 Interface Ports and Cabling

Cable Description	Length (m)	From	To
USB cable	< 1.0	Laptop	EUT
RF Cable	< 1.0	EUT	Spectrum Analyzer

3 Summary of Test Results

FCC & IC Rules	Description of Test	Results
FCC §15.247 (i), §2.1091 IC RSS-102	RF Exposure	Compliant
FCC §15.203 IC RSS-Gen §7.1.2	Antenna Requirements	Compliant
FCC §15.207 (a) IC RSS-Gen §7.2.4	AC Line Conducted Emissions	Note
FCC §15.247(d) IC RSS-210 §A8.5	Spurious Emissions at Antenna Port	Note
FCC §15.205, §15.209, §15.247(d) IC RSS-210 §2.2, §2.6, §A8.5	Restricted Bands, Spurious Radiated Emissions	Compliant
FCC §15.247 (a)(1) IC RSS-210 §A8.1	20 dB Channel Bandwidth	Note
FCC §15.247 (a)(1) IC RSS-210 §A8.1(b)	Hopping Channel Separation	Note
FCC §15.247 (a)(1) IC RSS-210 §A8.1(d)	Dwell Time	Note
FCC §15.247(a)(1) IC RSS-210 §A8.1	Number of Hopping Channels	Note
FCC §15.247(a) IC RSS-210 §A8.1	Maximum Peak Output Power	Compliant
FCC §15.247(d) IC RSS-210 §A8.5	Band Edge	Note
FCC Part 15.109 IC RSS-Gen §6	Receiver Spurious Emission	Compliant

Note: please refer to Module report with FCC ID: QOQWT11I.

4 FCC §15.203 & IC RSS-Gen §7.1.2 – Antenna Requirements

4.1 Applicable Standard

For intentional device, 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.

Per IC RSS-Gen §7.1.2, A transmitter can only be sold or operated with antennas with which it was certified. A transmitter maybe certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in IC RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to IC RSS-210 Annex 8 or RSS-210 Annex 9, the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to IC RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

4.2 Antenna List

Manufacturers	Models/Name	Antenna Gain (dBi) @ 2.4 GHz
Tyco Electronics	Bluetooth 802.11b Antenna	5 dBi

The antenna is a wide bandwidth and high gain in a compact size, enhanced hemispherical pattern improves RF link reliability of portable devices, minimum matching circuits required.

5 FCC §15.205, §15.209, §15.247(d) & IC RSS-210 §2.2, §A8.5 – Spurious Radiated Emissions

5.1 Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As per FCC §15.209(a) and RSS-210: 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/meter)	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) 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 0.495 – 0.505 2.1735 – 2.1905 4.125 – 4.128 4.17725 – 4.17775 4.20725 – 4.20775 6.215 – 6.218 6.26775 – 6.26825 6.31175 – 6.31225 8.291 – 8.294 8.362 – 8.366 8.37625 – 8.38675 8.41425 – 8.41475 12.29 – 12.293 12.51975 – 12.52025 12.57675 – 12.57725 13.36 – 13.41	16.42 – 16.423 16.69475 – 16.69525 25.5 – 25.67 37.5 – 38.25 73 – 74.6 74.8 – 75.2 108 – 121.94 123 – 138 149.9 – 150.05 156.52475 – 156.52525 156.7 – 156.9 162.0125 –167.17 167.72 – 173.2 240 – 285 322 – 335.4 399.9 – 410 608 – 614	960 – 1240 1300 – 1427 1435 – 1626.5 1645.5 – 1646.5 1660 – 1710 1718.8 – 1722.2 2200 – 2300 2310 – 2390 2483.5 – 2500 2690 – 2900 3260 – 3267 3.332 – 3.339 3 3458 – 3 358 3.600 – 4.400	4. 5 – 5. 15 5. 35 – 5. 46 7.25 – 7.75 8.025 – 8.5 9.0 – 9.2 9.3 – 9.5 10.6 – 12.7 13.25 – 13.4 14.47 – 14.5 15.35 – 16.2 17.7 – 21.4 22.01 – 23.12 23.6 – 24.0 31.2 – 31.8 36.43 – 36.5 Above 38.6

As per FCC §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) (see §15.205(c).

As per IC RSS-210 A8.5 Out-of-band Emissions, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section A8.4 (4), the
attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

5.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.4-2009. The specification used was the FCC 15 Subpart C and IC RSS-210 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.

5.3 Test Procedure

For the radiated emissions test, the EUT host, 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 meter away from the testing antenna, which is varied from 1-4 meter, 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

5.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

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

Margin = Corrected Amplitude - Limit

5.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Sunol Science Corp	System Controller	SC99V	122303-1	N/R	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-2	2013-07-11	1 year
Hewlett-Packard	Pre-amplifier	8447D	2944A07030	2013-04-09	1 year
MiniCircuits	Pre-amplifier	ZVA-183-S	570400946	2013-05-09	1 year
Agilent	Spectrum Analyzer	E4446A	US44300386	2013-10-22	1 year
EMCO	Antenna, Horn	3115	9511-4627	2013-10-27	1 year
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2013-03-22	1 year

***Statement of Traceability: BACL** attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.*

5.6 Test Environmental Conditions

Temperature:	23° C
Relative Humidity:	46 %
ATM Pressure:	102.4 kPa

The testing was performed by Chen Ge on 2014-02-4 at 5 meter 3.

5.7 Summary of Test Results

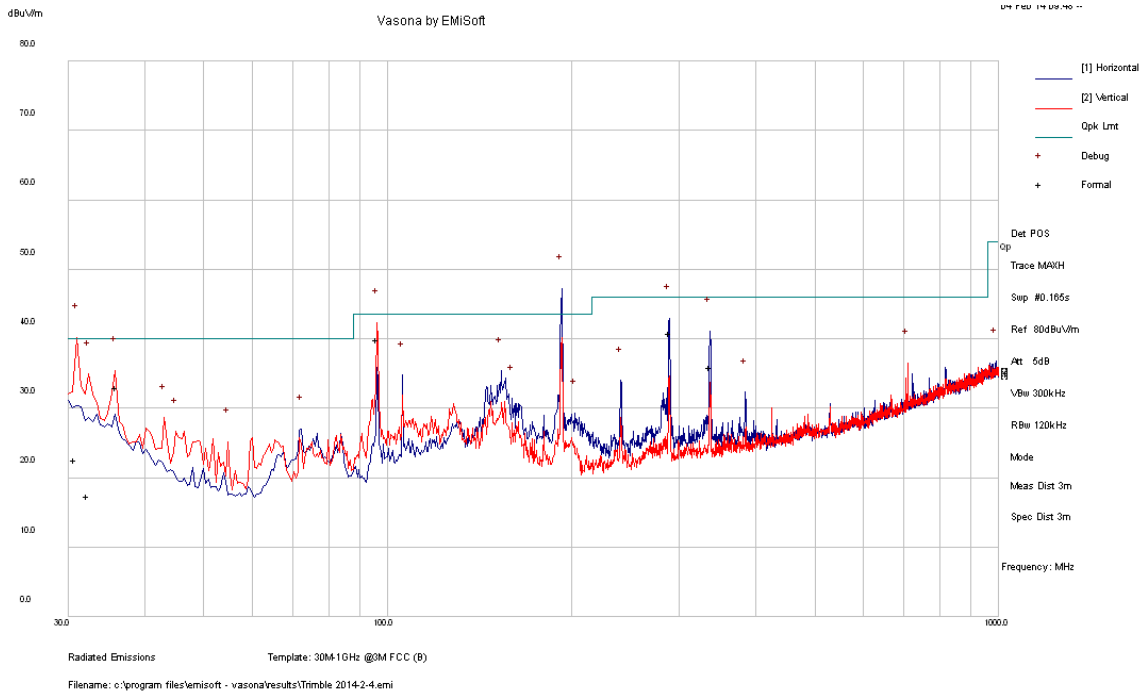
According to the data hereinafter, the EUT complied with the FCC Part 15C and IC RSS-210 standard's radiated emissions limits, and had the worst margin of:

-3.54 dB at frequency 96.2035 MHz, Vertical Polarization

5.8 Test Results

1) 30 MHz -1 GHz, measured at 3 meters

GFSK, Low Channel, Frequency=2402MHz



Frequency (MHz)	Corrected Amplitude (dB)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
96.2035	40.8	115	V	115	43.5	-3.54
289.03	37.55	127	H	127	46	-5.13
36.005	26.11	113	H	113	40	-7.01
336.8105	31.85	100	V	100	46	-10.05
30.782	11.72	109	H	109	40	-17.45
32.285	7.67	367	H	367	40	-22.60

2) Above 1 GHz, measured at 3 meters

GFSK

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
GFSK, Low Channel, 2402 MHz, measured at 3 meters											
2402	56.26	86	118	V	28.956	3.12	0	88.336	N/A	N/A	Peak
2402	55.41	229	122	H	28.956	3.12	0	87.486	N/A	N/A	Peak
2402	34.03	86	118	V	28.956	3.12	0	66.106	N/A	N/A	Ave
2402	33.57	229	122	H	28.956	3.12	0	65.646	N/A	N/A	Ave
2390	26.51	0	100	V	28.192	3.12	0	57.822	74	-16.178	Peak
2390	26.24	0	100	H	28.192	3.12	0	57.552	74	-16.448	Peak
2390	14.89	0	100	V	28.192	3.12	0	46.202	54	-7.798	Ave
2390	13.95	0	100	H	28.192	3.12	0	45.262	54	-8.738	Ave
4804	39.38	180	100	V	33.097	4.56	27.7	49.337	74	-24.663	Peak
4804	41.9	205	100	H	33.097	4.56	27.7	51.857	74	-22.143	Peak
4804	22.85	180	100	V	33.097	4.56	27.7	32.807	54	-21.193	Ave
4804	24.98	205	100	H	33.097	4.56	27.7	34.937	54	-19.063	Ave
7206	32.38	0	100	V	35.928	5.49	27.58	46.218	68.336	-22.118	Peak
7206	31.21	0	100	H	35.928	5.49	27.58	45.048	67.486	-22.438	Peak
7206	17.54	0	100	V	35.928	5.49	27.58	31.378	46.106	-14.728	Ave
7206	19.82	0	100	H	35.928	5.49	27.58	33.658	45.646	-11.988	Ave
9608	33.06	0	100	V	37.954	6.54	27.06	50.494	68.336	-17.842	Peak
9608	32.87	0	100	H	37.954	6.54	27.06	50.304	67.486	-17.182	Peak
9608	18.86	0	100	V	37.954	6.54	27.06	36.294	46.106	-9.812	Ave
9608	18.88	0	100	H	37.954	6.54	27.06	36.314	45.646	-9.332	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
GFSK, Middle Channel, 2441 MHz, measured at 3 meters											
2441	59.61	89	105	V	28.956	3.12	0	91.686	N/A	N/A	Peak
2441	58.02	178	108	H	28.956	3.12	0	90.096	N/A	N/A	Peak
2441	35.7	89	105	V	28.956	3.12	0	67.776	N/A	N/A	Ave
2441	33.48	178	108	H	28.956	3.12	0	65.556	N/A	N/A	Ave
4882	35.24	225	100	V	33.327	4.54	27.76	45.347	74	-28.653	Peak
4882	40.09	180	100	H	33.327	4.54	27.76	50.197	74	-23.803	Peak
4882	21.34	225	100	V	33.327	4.54	27.76	31.447	54	-22.553	Ave
4882	23.83	180	100	H	33.327	4.54	27.76	33.937	54	-20.063	Ave
7323	31.51	0	100	V	36.369	5.57	27.51	45.939	74	-28.061	Peak
7323	31.54	0	100	H	36.369	5.57	27.51	45.969	74	-28.031	Peak
7323	18.7	0	100	V	36.369	5.57	27.51	33.129	54	-20.871	Ave
7323	18.95	0	100	H	36.369	5.57	27.51	33.379	54	-20.621	Ave
9764	31.32	0	100	V	38.287	6.62	26.98	49.247	74	-24.753	Peak
9764	31.15	0	100	H	38.287	6.62	26.98	49.077	74	-24.923	Peak
9764	18.64	0	100	V	38.287	6.62	26.98	36.567	54	-17.433	Ave
9764	18.32	0	100	H	38.287	6.62	26.98	36.247	54	-17.753	Ave
GFSK, High Channel, 2480 MHz, measured at 3 meters											
2480	64.56	140	108	V	29.155	3.25	0	96.965	N/A	N/A	Peak
2480	64.55	264	151	H	29.155	3.25	0	96.955	N/A	N/A	Peak
2480	37.27	140	108	V	29.155	3.25	0	69.675	N/A	N/A	Ave
2480	37.14	264	151	H	29.155	3.25	0	69.545	N/A	N/A	Ave
2483.5	27.89	0	100	V	29.155	3.25	0	60.295	74	-13.705	Peak
2483.5	27.07	0	100	H	29.155	3.25	0	59.475	74	-14.525	Peak
2483.5	14.82	0	100	V	29.155	3.25	0	47.225	54	-6.775	Ave
2483.5	13.88	0	100	H	29.155	3.25	0	46.285	54	-7.715	Ave
4960	37.81	110	100	V	33.327	4.52	27.75	47.907	74	-26.093	Peak
4960	39.57	169	100	H	33.327	4.52	27.75	49.667	74	-24.333	Peak
4960	23.81	110	100	V	33.327	4.52	27.75	33.907	54	-20.093	Ave
4960	24.04	169	100	H	33.327	4.52	27.75	34.137	54	-19.863	Ave
7440	33.35	0	100	V	36.565	5.62	27.51	48.025	74	-25.975	Peak
7440	33.54	0	100	H	36.565	5.62	27.51	48.215	74	-25.785	Peak
7440	20.94	0	100	V	36.565	5.62	27.51	35.615	54	-18.385	Ave
7440	20.54	0	100	H	36.565	5.62	27.51	35.215	54	-18.785	Ave
9920	32.41	0	100	V	38.287	6.55	26.98	50.267	74	-23.733	Peak
9920	31.49	0	100	H	38.287	6.55	26.98	49.347	74	-24.653	Peak
9920	21.21	0	100	V	38.287	6.55	26.98	39.067	54	-14.933	Ave
9920	20.65	0	100	H	38.287	6.55	26.98	38.507	54	-15.493	Ave

QPSK

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
QPSK, Low Channel, 2402 MHz, measured at 3 meters											
2402	53.48	80	113	V	28.956	3.12	0	85.556	N/A	N/A	Peak
2402	52.86	230	142	H	28.956	3.12	0	84.936	N/A	N/A	Peak
2402	27.52	80	113	V	28.956	3.12	0	59.596	N/A	N/A	Ave
2402	26.33	230	142	H	28.956	3.12	0	58.406	N/A	N/A	Ave
2390	28	0	100	V	28.192	3.12	0	59.312	74	-14.688	Peak
2390	27.56	0	100	H	28.192	3.12	0	58.872	74	-15.128	Peak
2390	13.86	0	100	V	28.192	3.12	0	45.172	54	-8.828	Ave
2390	13.47	0	100	H	28.192	3.12	0	44.782	54	-9.218	Ave
4804	35.73	201	100	V	33.097	4.56	27.7	45.687	74	-28.313	Peak
4804	39.4	220	100	H	33.097	4.56	27.7	49.357	74	-24.643	Peak
4804	20.23	201	100	V	33.097	4.56	27.7	30.187	54	-23.813	Ave
4804	24.42	220	100	H	33.097	4.56	27.7	34.377	54	-19.623	Ave
7206	33.52	0	100	V	35.928	5.49	27.58	47.358	74	-26.642	Peak
7206	33.12	0	100	H	35.928	5.49	27.58	46.958	74	-27.042	Peak
7206	19.86	0	100	V	35.928	5.49	27.58	33.698	54	-20.302	Ave
7206	18.21	0	100	H	35.928	5.49	27.58	32.048	54	-21.952	Ave
9608	33.28	0	100	V	37.954	6.54	27.06	50.714	74	-23.286	Peak
9608	33.86	0	100	H	37.954	6.54	27.06	51.294	74	-22.706	Peak
9608	18.99	0	100	V	37.954	6.54	27.06	36.424	54	-17.576	Ave
9608	18.45	0	100	H	37.954	6.54	27.06	35.884	54	-18.116	Ave
QPSK, Middle Channel, 2441 MHz, measured at 3 meters											
2441	52.55	39	110	V	28.956	3.12	0	84.626	N/A	N/A	Peak
2441	53.81	171	110	H	28.956	3.12	0	85.886	N/A	N/A	Peak
2441	25.97	39	100	V	28.956	3.12	0	58.046	N/A	N/A	Ave
2441	26.74	171	110	H	28.956	3.12	0	58.816	N/A	N/A	Ave
4882	34.59	154	100	V	33.327	4.54	27.76	44.697	74	-29.303	Peak
4882	34.95	135	100	H	33.327	4.54	27.76	45.057	74	-28.943	Peak
4882	19.68	154	100	V	33.327	4.54	27.76	29.787	54	-24.213	Ave
4882	20.05	135	100	H	33.327	4.54	27.76	30.157	54	-23.843	Ave
7323	32.86	0	100	V	36.369	5.57	27.51	47.289	74	-26.711	Peak
7323	31.99	0	100	H	36.369	5.57	27.51	46.419	74	-27.581	Peak
7323	18.74	0	100	V	36.369	5.57	27.51	33.169	54	-20.831	Ave
7323	18.91	0	100	H	36.369	5.57	27.51	33.339	54	-20.661	Ave
9764	33.11	0	100	V	38.287	6.62	26.98	51.037	74	-22.963	Peak
9764	33.26	0	100	H	38.287	6.62	26.98	51.187	74	-22.813	Peak
9764	18.07	0	100	V	38.287	6.62	26.98	35.997	54	-18.003	Ave
9764	18.17	0	100	H	38.287	6.62	26.98	36.097	54	-17.903	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
QPSK, High Channel, 2480 MHz, measured at 3 meters											
2480	57.95	103	104	V	29.155	3.25	0	90.355	N/A	N/A	Peak
2480	60.08	170	100	H	29.155	3.25	0	92.485	N/A	N/A	Peak
2480	27.62	103	104	V	29.155	3.25	0	60.025	N/A	N/A	Ave
2480	30.07	170	100	H	29.155	3.25	0	62.475	N/A	N/A	Ave
2483.5	27.66	0	104	V	29.155	3.25	0	60.065	74	-13.935	Peak
2483.5	26.98	0	174	H	29.155	3.25	0	59.385	74	-14.615	Peak
2483.5	13.88	0	104	V	29.155	3.25	0	46.285	54	-7.715	Ave
2483.5	13.91	0	174	H	29.155	3.25	0	46.315	54	-7.685	Ave
4960	34.88	210	110	V	33.327	4.52	27.75	44.977	74	-29.023	Peak
4960	36.87	235	121	H	33.327	4.52	27.75	46.967	74	-27.033	Peak
4960	20.69	210	110	V	33.327	4.52	27.75	30.787	54	-23.213	Ave
4960	22.24	235	121	H	33.327	4.52	27.75	32.337	54	-21.663	Ave
7440	32.62	0	100	V	36.565	5.62	27.51	47.295	74	-26.705	Peak
7440	32.41	0	100	H	36.565	5.62	27.51	47.085	74	-26.915	Peak
7440	18.19	0	100	V	36.565	5.62	27.51	32.865	54	-21.135	Ave
7440	18.9	0	100	H	36.565	5.62	27.51	33.575	54	-20.425	Ave
9920	30.33	0	100	V	38.287	6.55	26.98	48.187	74	-25.813	Peak
9920	31.27	0	100	H	38.287	6.55	26.98	49.127	74	-24.873	Peak
9920	16.58	0	100	V	38.287	6.55	26.98	34.437	54	-19.563	Ave
9920	17.65	0	100	H	38.287	6.55	26.98	35.507	54	-18.493	Ave

8PSK

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
8PSK, Low Channel, 2402 MHz, measured at 3 meters											
2402	53.59	80	132	V	28.956	3.12	0	85.666	N/A	N/A	Peak
2402	52.72	51	145	H	28.956	3.12	0	84.796	N/A	N/A	Peak
2402	26.87	80	132	V	28.956	3.12	0	58.946	N/A	N/A	Ave
2402	26.52	51	145	H	28.956	3.12	0	58.596	N/A	N/A	Ave
2390	27.21	0	100	V	28.192	3.12	0	58.522	74	-15.478	Peak
2390	27.91	0	100	H	28.192	3.12	0	59.222	74	-14.778	Peak
2390	14.39	0	100	V	28.192	3.12	0	45.702	54	-8.298	Ave
2390	14.28	0	100	H	28.192	3.12	0	45.592	54	-8.408	Ave
4804	35.77	213	100	V	33.097	4.56	27.7	45.727	74	-28.273	Peak
4804	39.2	200	100	H	33.097	4.56	27.7	49.157	74	-24.843	Peak
4804	20.94	213	100	V	33.097	4.56	27.7	30.897	54	-23.103	Ave
4804	23.29	200	100	H	33.097	4.56	27.7	33.247	54	-20.753	Ave
7206	32.15	0	100	V	35.928	5.49	27.58	45.988	74	-28.012	Peak
7206	31.58	0	100	H	35.928	5.49	27.58	45.418	74	-28.582	Peak
7206	19.88	0	100	V	35.928	5.49	27.58	33.718	54	-20.282	Ave
7206	18.99	0	100	H	35.928	5.49	27.58	32.828	54	-21.172	Ave
9608	31.1	0	100	V	37.954	6.54	27.06	48.534	74	-25.466	Peak
9608	32.32	0	100	H	37.954	6.54	27.06	49.754	74	-24.246	Peak
9608	18.91	0	100	V	37.954	6.54	27.06	36.344	54	-17.656	Ave
9608	19.62	0	100	H	37.954	6.54	27.06	37.054	54	-16.946	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
8PSK, Middle Channel, 2441 MHz, measured at 3 meters											
2441	55.81	96	137	V	28.956	3.12	0	87.886	N/A	N/A	Peak
2441	56.47	123	118	H	28.956	3.12	0	88.546	N/A	N/A	Peak
2441	28.39	96	137	V	28.956	3.12	0	60.466	N/A	N/A	Ave
2441	29.43	123	118	H	28.956	3.12	0	61.506	N/A	N/A	Ave
4882	35.05	137	100	V	33.327	4.54	27.76	45.157	74	-28.843	Peak
4882	39.79	220	100	H	33.327	4.54	27.76	49.897	74	-24.103	Peak
4882	21.2	137	100	V	33.327	4.54	27.76	31.307	54	-22.693	Ave
4882	23.97	220	100	H	33.327	4.54	27.76	34.077	54	-19.923	Ave
7323	31.41	0	100	V	36.369	5.57	27.51	45.839	74	-28.161	Peak
7323	30.59	0	100	H	36.369	5.57	27.51	45.019	74	-28.981	Peak
7323	19.09	0	100	V	36.369	5.57	27.51	33.519	54	-20.481	Ave
7323	19.54	0	100	H	36.369	5.57	27.51	33.969	54	-20.031	Ave
9764	31.25	0	100	V	38.287	6.62	26.98	49.177	74	-24.823	Peak
9764	30.92	0	100	H	38.287	6.62	26.98	48.847	74	-25.153	Peak
9764	19.87	0	100	V	38.287	6.62	26.98	37.797	54	-16.203	Ave
9764	18.62	0	100	H	38.287	6.62	26.98	36.547	54	-17.453	Ave
8PSK, High Channel, 2480 MHz, measured at 3 meters											
2480	58.47	99	111	V	29.155	3.25	0	90.875	N/A	N/A	Peak
2480	57.52	37	102	H	29.155	3.25	0	89.925	N/A	N/A	Peak
2480	28.88	99	111	V	29.155	3.25	0	61.285	N/A	N/A	Ave
2480	27.91	37	102	H	29.155	3.25	0	60.315	N/A	N/A	Ave
2483.5	27.82	0	100	V	29.155	3.25	0	60.225	74	-13.775	Peak
2483.5	28.12	0	100	H	29.155	3.25	0	60.525	74	-13.475	Peak
2483.5	13.91	0	100	V	29.155	3.25	0	46.315	54	-7.685	Ave
2483.5	13.83	0	100	H	29.155	3.25	0	46.235	54	-7.765	Ave
4960	34.05	221	100	V	33.327	4.52	27.75	44.147	74	-29.853	Peak
4960	36.64	179	100	H	33.327	4.52	27.75	46.737	74	-27.263	Peak
4960	24.28	0	100	V	33.327	4.52	27.75	34.377	54	-19.623	Ave
4960	23.02	179	100	H	33.327	4.52	27.75	33.117	54	-20.883	Ave
7440	32.73	0	100	V	36.565	5.62	27.51	47.405	74	-26.595	Peak
7440	32.02	0	100	H	36.565	5.62	27.51	46.695	74	-27.305	Peak
7440	18.42	0	100	V	36.565	5.62	27.51	33.095	54	-20.905	Ave
7440	18.32	0	100	H	36.565	5.62	27.51	32.995	54	-21.005	Ave
9920	31.08	0	100	V	38.287	6.55	26.98	48.937	74	-25.063	Peak
9920	32.01	0	100	H	38.287	6.55	26.98	49.867	74	-24.133	Peak
9920	18.54	0	100	V	38.287	6.55	26.98	36.397	54	-17.603	Ave
9920	18.63	0	100	H	38.287	6.55	26.98	36.487	54	-17.513	Ave

6 FCC §15.247(b) & IC RSS-210 §A8.4 – Maximum Peak Output Power

6.1 Applicable Standard

According to FCC §15.247(b) (1), for frequency hopping systems in the 2400-2483.5MHz band employing at least 75 hopping channels, and all direct sequence systems, the maximum peak output power of the transmitter shall not exceed 1 Watt. For all other frequency hopping system in the 2400 – 2483.5 MHz band, the maximum peak output power of the transmitter shall not exceed 0.125 Watt.

According to IC RSS-210 §8.4(2), For frequency hopping systems operating in the band 2400-2483.5 MHz employing at least 75 hopping channels, the maximum peak conducted output power shall not exceed 1 W; for all other frequency hopping systems in the band, the maximum peak conducted output power shall not exceed 0.125 W.

6.2 Measurement Procedure

1. Place the EUT on the turntable and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

6.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2013-10-22	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

6.4 Test Environmental Conditions

Temperature:	23° C
Relative Humidity:	46 %
ATM Pressure:	102.4 kPa

The testing was performed by Chen Ge on 2014-02-04 at RF site.

6.5 Test Results

GFSK:

Channel	Frequency (MHz)	Max Peak Output Power		Limit (mw)	Result
		(dBm)	(mw)		
Low	2402	16.03	40.08	125	Pass
Mid	2441	15.61	36.39	125	Pass
High	2480	16.23	41.97	125	Pass

QPSK:

Channel	Frequency (MHz)	Max Peak Output Power		Limit (mw)	Result
		(dBm)	(mw)		
Low	2402	11.94	15.63	125	Pass
Mid	2441	11.64	14.58	125	Pass
High	2480	12.16	16.44	125	Pass

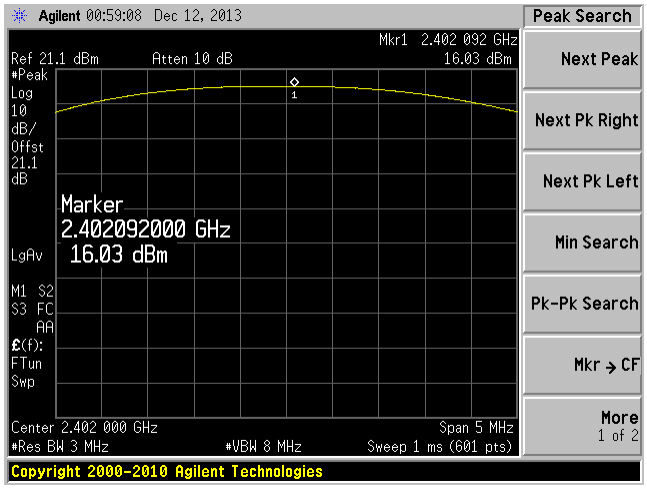
8PSK:

Channel	Frequency (MHz)	Max Peak Output Power		Limit (mw)	Result
		(dBm)	(mw)		
Low	2402	12.92	19.58	125	Pass
Mid	2441	12.11	16.25	125	Pass
High	2480	12.51	17.82	125	Pass

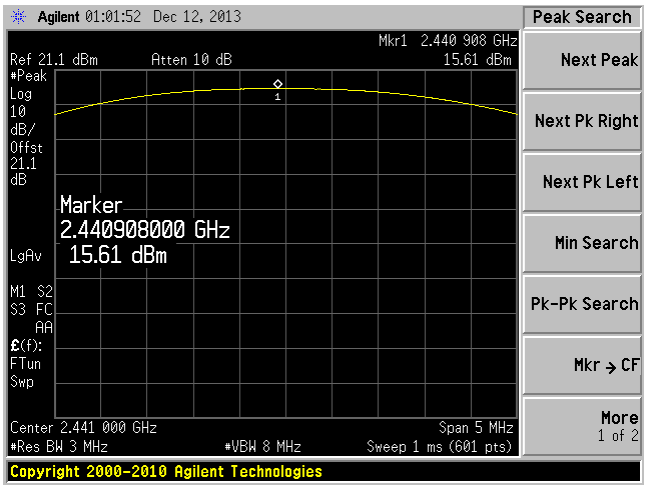
Please refer to the following figures:

Modulation GFSK:

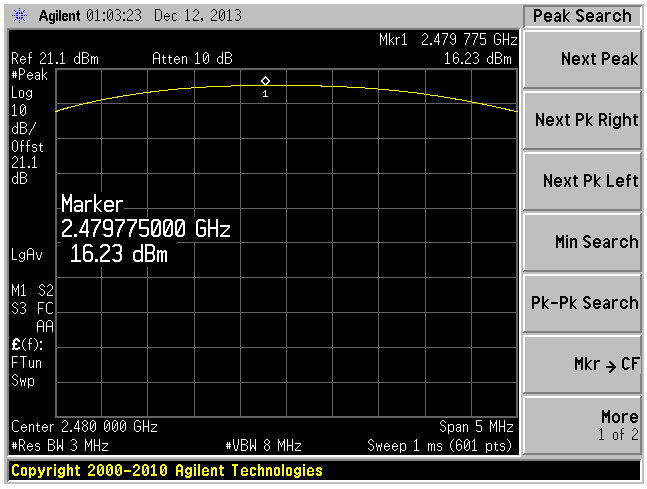
Low Channel 2402 MHz



Middle Channel 2441 MHz

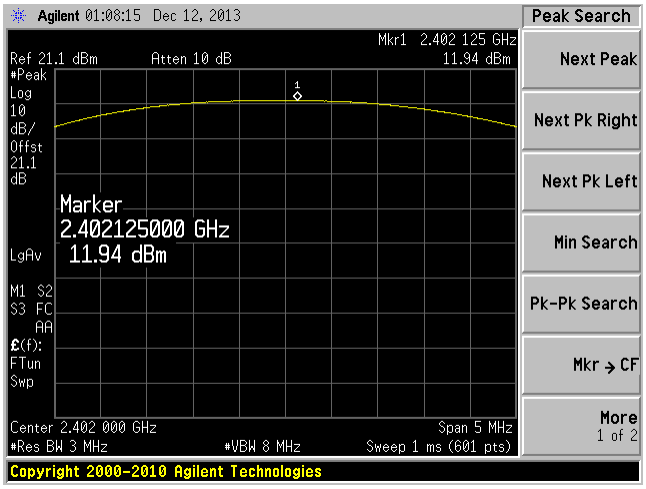


High Channel 2480 MHz

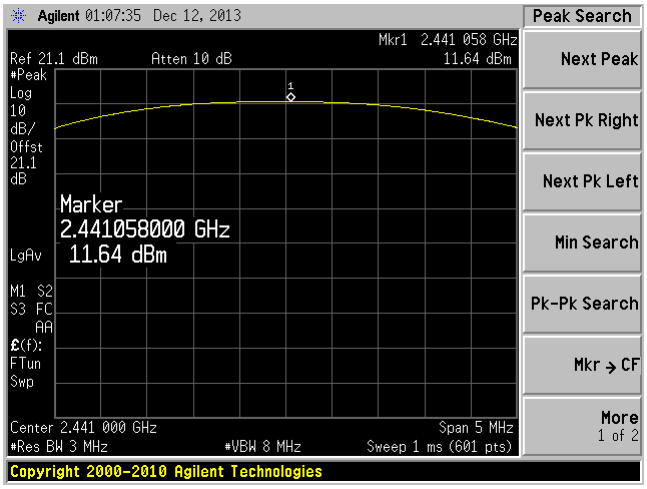


Modulation QPSK:

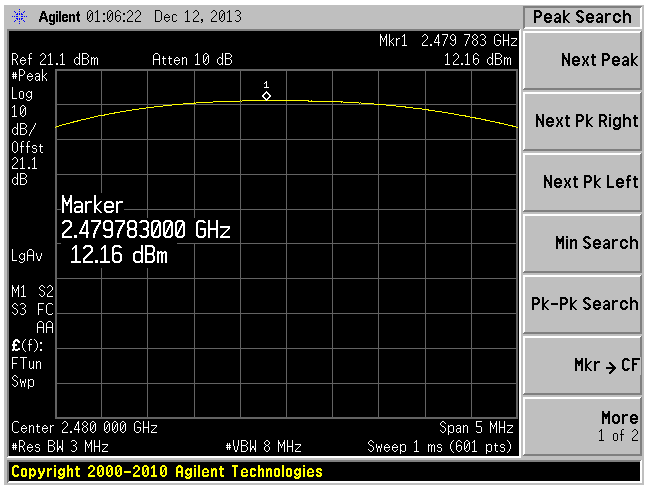
Low Channel 2402 MHz



Middle Channel 2441 MHz

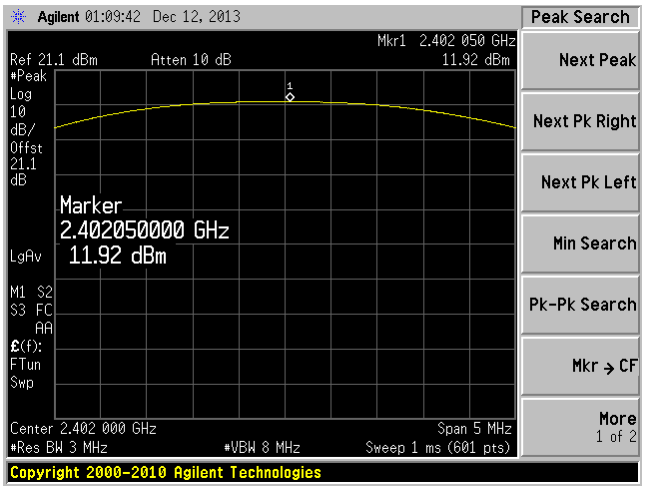


High Channel 2480MHz

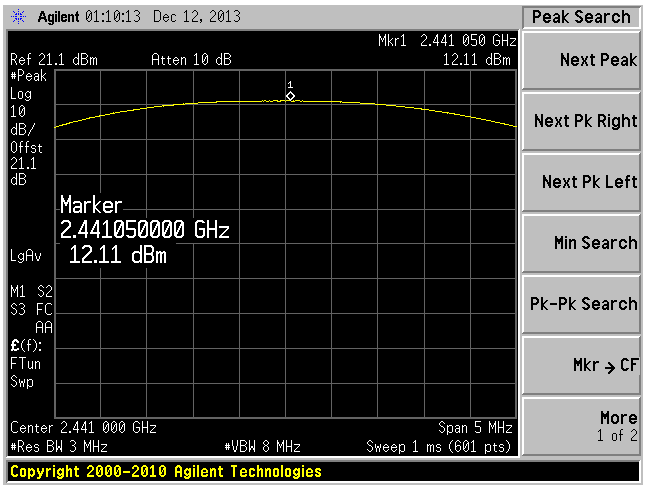


Modulation 8PSK:

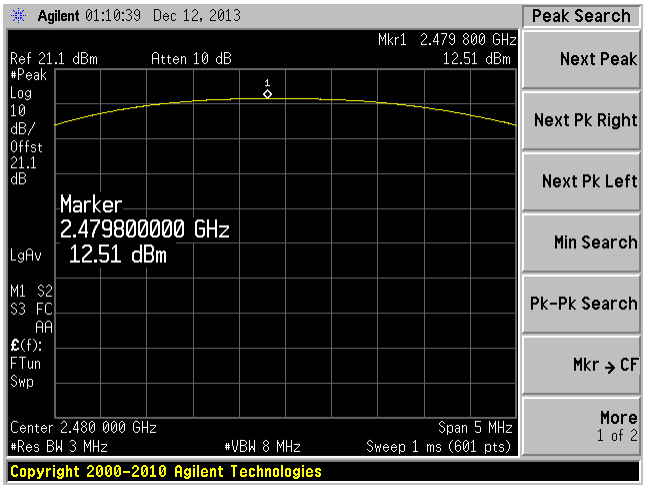
Low Channel 2402 MHz



Middle Channel 2441 MHz



High Channel 2480 MHz



7 FCC §15.109 & IC RSS-Gen §6 - Receiver Radiated Spurious Emissions

7.1 Applicable Standard

According to IC RSS-Gen §4.10, the receiver shall be operated in the normal receive mode near the mid-point of the band over which the receiver is designed to operate.

Unless otherwise specified in the applicable RSS, the radiated emission measurement is the standard measurement method (with the device's antenna in place) to measure receiver spurious emissions.

Radiated emission measurements are to be performed using a calibrated open-area test site.

For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

For emissions below 1 GHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector with the same measurement bandwidth as that for CISPR quasi-peak measurements. Above 1 GHz, measurements shall be performed using an average detector and a resolution bandwidth of 300 kHz to 1 MHz.

According to RSS-Gen §6.1, Tables 2 show the general field strength limits of receiver spurious emissions

Table 2: Radiated Limits of Receiver Spurious Emissions

Frequency (MHz)	Field Strength (Microvolts/m at 3 meters)
30-88	100
88-216	150
216-960	200
Above 960	500

7.2 EUT Setup

The radiated emissions tests were performed in the 3 meter chamber, using the setup in accordance with ANSI C63.4-2009.

7.3 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.

7.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

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

Margin = Corrected Amplitude - Limit

7.5 Test Equipment Lists and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Sunol Science Corp	System Controller	SC99V	122303-1	N/R	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-2	2013-07-11	1 year
Hewlett-Packard	Pre-amplifier	8447D	2944A07030	2013-04-09	1 year
MiniCircuits	Pre-amplifier	ZVA-183-S	570400946	2013-05-09	1 year
Agilent	Spectrum Analyzer	E4446A	US44300386	2013-10-22	1 year
EMCO	Antenna, Horn	3115	9511-4627	2013-10-27	1 year
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2013-03-22	1 year

Statement of Traceability: *BACL attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.*

7.6 Test Environmental Conditions

Temperature:	23° C
Relative Humidity:	46 %
ATM Pressure:	102.4 kPa

The testing was performed by Chen Ge on 2014-02-05 at 5 meter 3.

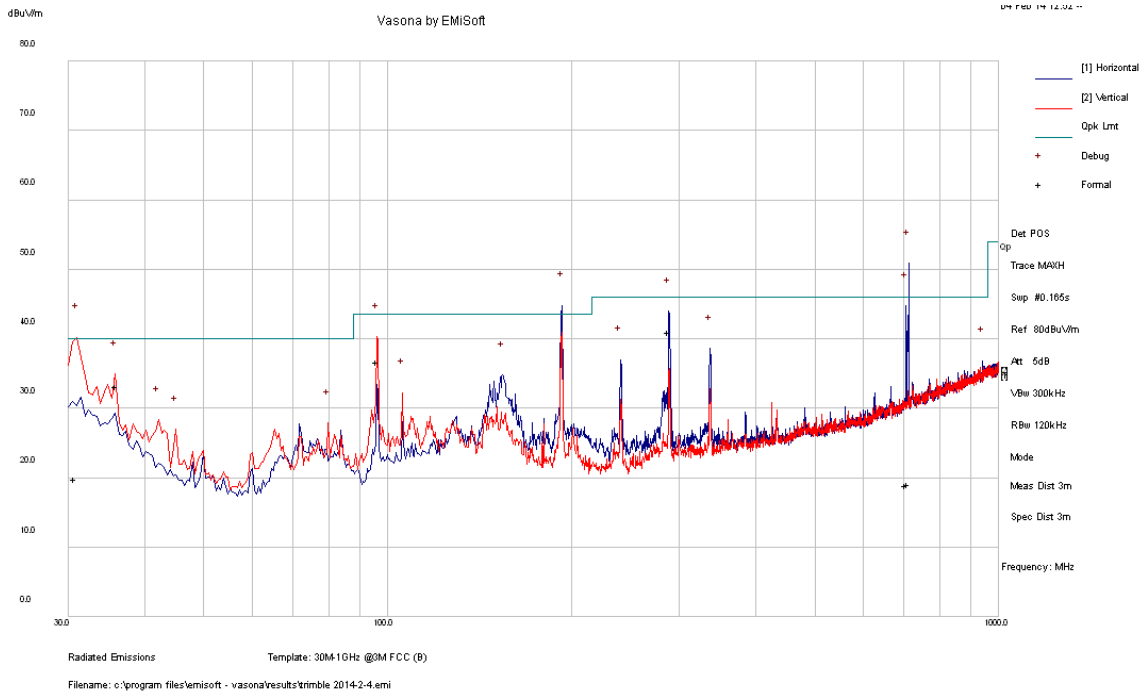
7.7 Summary of Test Results

According to the test data, the EUT complied with the RSS-210, with the closest margins from the limit listed below:

-4.93 dB at frequency 288.5085MHz, Horizontal Polarization

7.8 Test Results

1) 30 MHz – 1 GHz measured at 3 meters



Frequency (MHz)	Corrected Amplitude (dB)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
288.5085	37.76	109	H	344	46	-4.93
96.13475	37.53	120	V	306	43.5	-6.83
36.0005	26.23	98	V	77	40	-6.88
30.74025	9	329	V	147	40	-20.12
712.33925	8	265	H	303	46	-26.88
704.916	7.97	376	H	223	46	-27.13

2) Above 1 GHz, measured at 3 meters

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
1202.67	42.44	14	100	V	25.491	2	27.57	42.361	74	-31.639	Peak
1202.67	39	295	100	H	25.535	2	27.57	38.965	74	-35.035	Peak
1202.67	28.32	14	100	V	25.491	2	27.57	28.241	54	-25.759	Ave
1202.67	24.54	295	100	H	25.535	2	27.57	24.505	54	-29.495	Ave
1996.37	52.26	0	100	V	27.784	2.31	27.44	54.914	74	-19.086	Peak
1996.37	48.36	246	100	H	27.7	2.31	27.44	50.93	74	-23.07	Peak
1996.37	25.75	0	100	V	27.784	2.31	27.44	28.404	54	-25.596	Ave
1996.37	24.58	246	100	H	27.7	2.31	27.44	27.15	54	-26.85	Ave

8 FCC §15.247(i), §2.1091 & IC RSS-102 - RF Exposure Information

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.

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 IC RSS-102 must be followed concerning the exposure of humans to RF fields.

According to IC RSS-102 Issue 4 section 4.2, 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/m2)	Time Averaging (min)
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

8.1 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

8.2 MPE Results

Maximum peak output power at antenna input terminal (dBm):	16.23
Maximum peak output power at antenna input terminal (mW):	41.97
Prediction distance (cm):	20
Prediction frequency (MHz):	2480
Maximum Antenna Gain, typical (dBi):	5.0
Maximum Antenna Gain (numeric):	3.162
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.0264
Power density of prediction frequency at 20.0 cm (W/m^2):	0.264
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

The device is compliant with the requirement MPE limit for uncontrolled exposure at 20 cm distance.

9 Exhibit A - FCC & IC Equipment Labeling Requirements

9.1 FCC ID Label Requirements

As per FCC §2.925,

(a) Each equipment covered in an application for equipment authorization shall bear a nameplate or label listing the following:

(1) FCC Identifier consisting of the two elements in the exact order specified in §2.926. The FCC Identifier shall be preceded by the term FCC ID in capital letters on a single line, and shall be of a type size large enough to be legible without the aid of magnification.

Example: FCC ID: XXX123

Where: XXX—Grantee Code, 123—Equipment Product Code

As per FCC §15.19,

(a) In addition to the requirements in part 2 of this chapter, a device subject to certification, or verification shall be labeled as follows:

(3) All other devices shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified above is required to be affixed only to the main control unit. If the EUT is integrated within another device then a label affixed to the host shall also state, “Contains FCC ID: XXXXXX”

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

9.2 IC Label Requirements

As per IC RSS-Gen §5, the certification number shall appear as follows:

IC: XXXXXX-YYYYYYYY

Where:

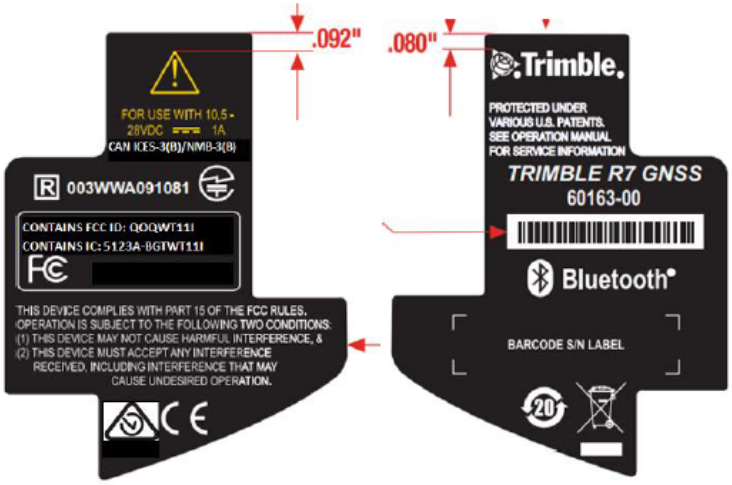
- "XXXXXX-YYYYYYYY" is the certification number
- "XXXXXX" is the Certificate Holder Number (CHN), made of at most 6 alphanumeric characters (A-Z, 0-9), assigned by Industry Canada; and
- "YYYYYYYY" is the Unique Product Number (UPN), made of at most 11 alphanumeric characters (A-Z, 0-9) assigned by the applicant.
- Note 1: The term "IC" before the equipment certification number only signifies that the Industry Canada technical specifications were met.
- Note 2: Note 1 shall be conspicuously placed in the equipment user manual.
- Note 3: Permitted alphanumeric characters used in the CHN and UPN are limited to capital letters (A-Z) and digits (0-9). Other characters, such as "#", "/" or "-", shall not be used.

As per IC RSS-Gen §5.2 Equipment Labeling:

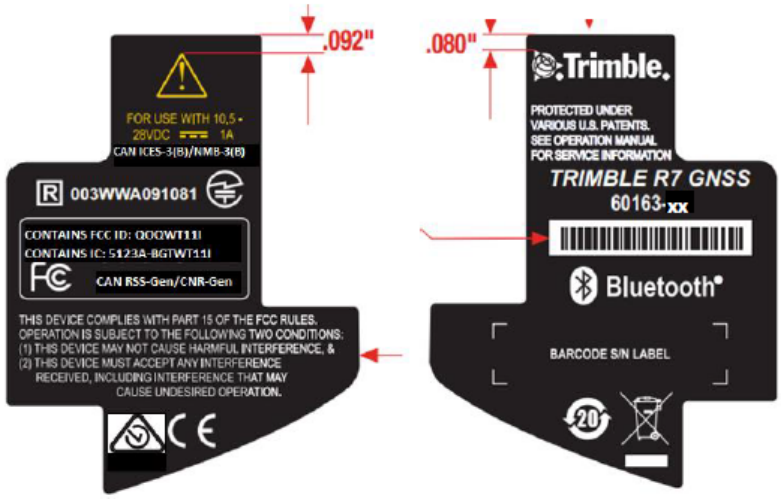
Equipment subject to certification under the applicable RSS, shall be permanently labeled on each item, or as an inseparable combination. The label must contain the following information for full compliance:
(a) the certification number, prefixed by the term “IC:”;
(b) the manufacturer's name, trade name or brand name; and
(c) a model name or number.
Equipment for which a certificate has been issued is not considered certified if it is not properly labeled.
The information on the Canadian label can be combined with the manufacturer’s other labeling requirements.
If the device size is too small to put a label, the label can be included in the user’s manual, upon agreement with Industry Canada.

9.3 FCC ID & IC Label Location on the Host

60163-00

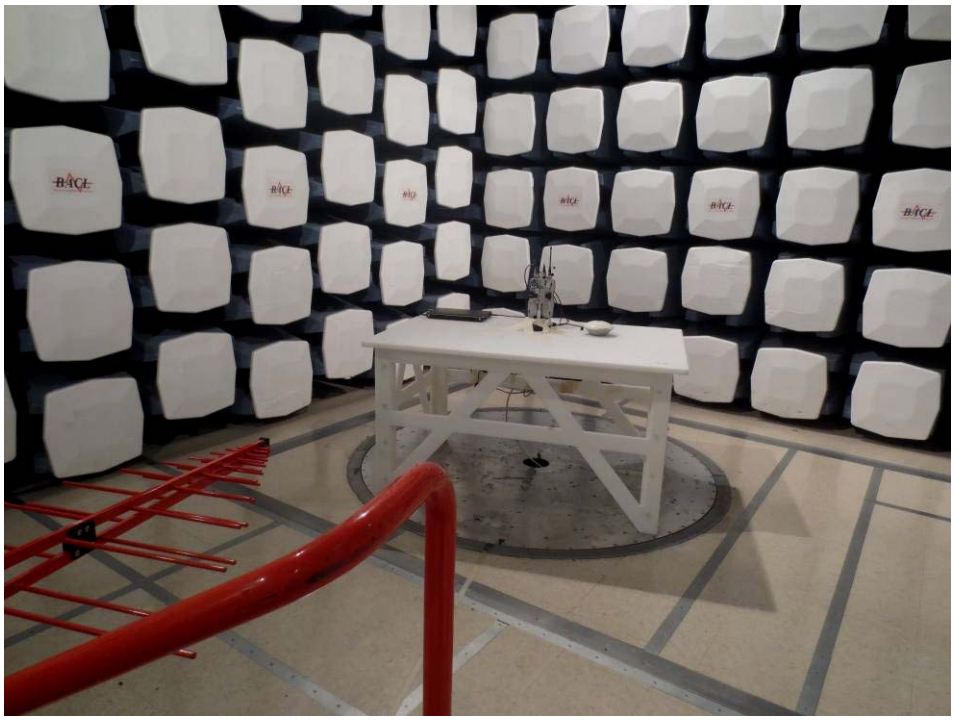


60163-42/44/46



10 Exhibit B - Test Setup Photographs

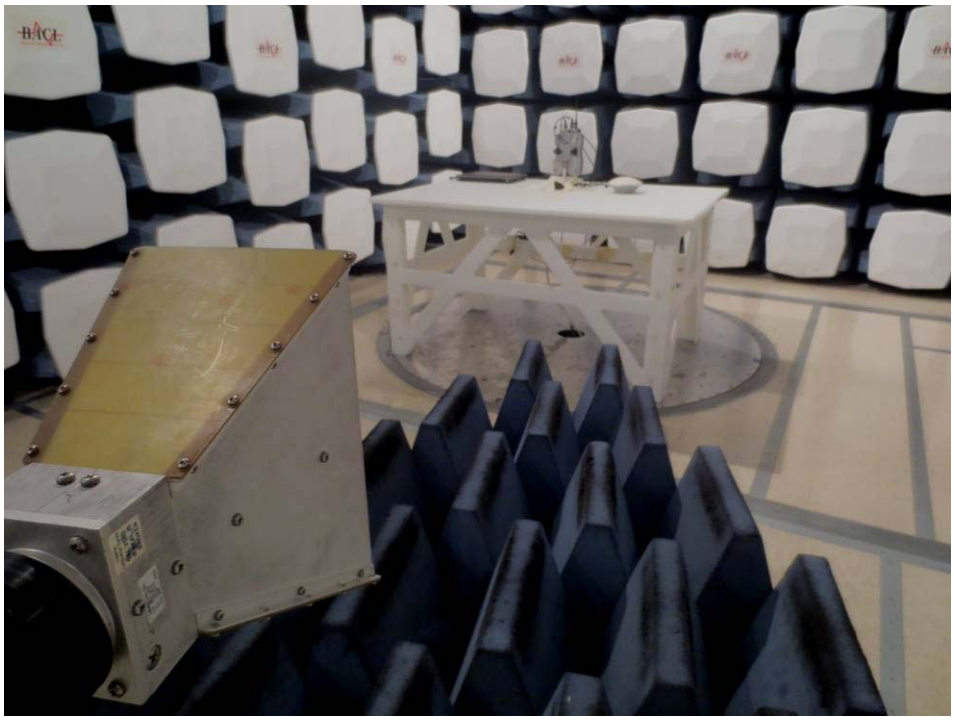
10.1 Radiated Emission below 1 GHz Front View at 3 Meter



10.2 Radiated Emission below 1 GHz Rear View at 3 Meter

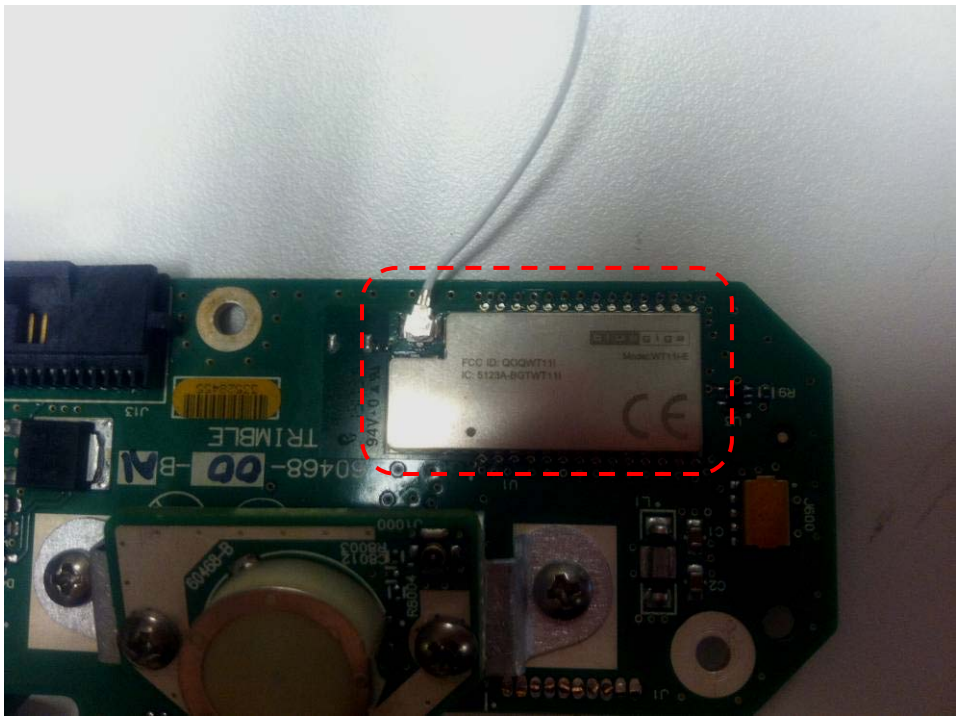
10.3 Radiated Emission above 1 GHz Rear View at 3 Meter

10.4 Radiated Emission above 1 GHz Front View at 3 Meter

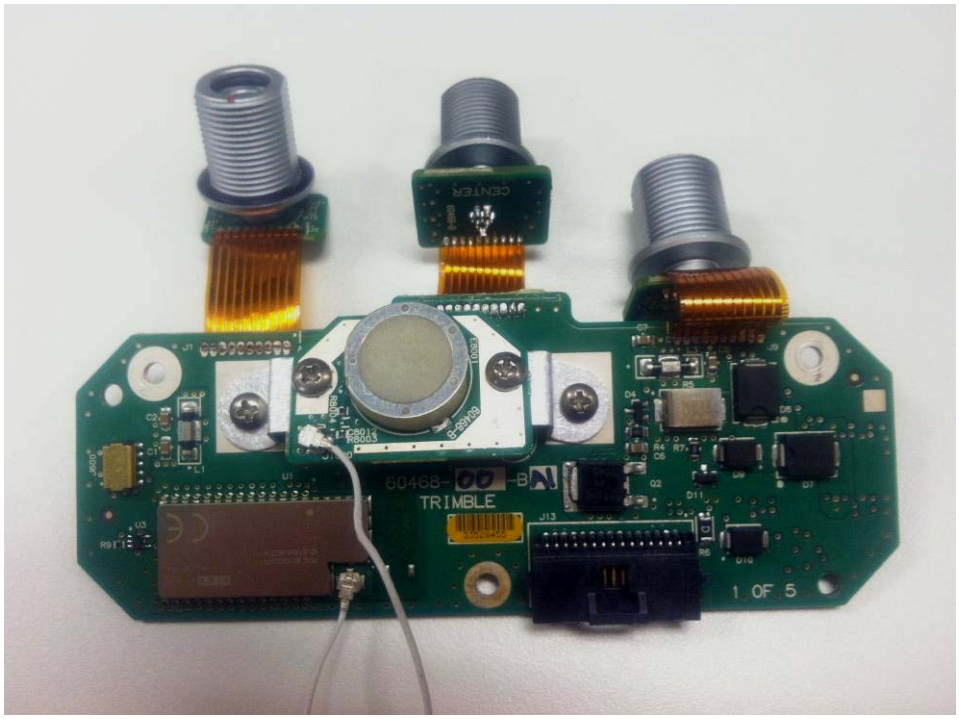


11 Exhibit C – EUT Photographs

11.1 EUT –Bluetooth Module on the Board



11.2 EUT –Bluetooth Module & Antenna



11.3 Trimble R7 GNSS Host – Top View

11.4 Trimble R7 GNSS Host – Bottom View

11.5 Trimble R7 GNSS Host – Side View (1)

11.6 Trimble R7 GNSS Host – Side View (2)

11.7 Trimble R7 GNSS Host – Side View (3)

11.8 Trimble R7 GNSS Host – GPS Antenna

--- END OF REPORT ---