FCC PART 15, SUBPART C
IC RSS-247, ISSUE 1, MAY 2015

TEST AND MEASUREMENT REPORT

For

Trimble Navigation Limited

935 Stewart Drive, Sunnyvale CA 94085, USA

FCC ID: JUP-95807WFBT
IC: 1756A-95807WFBT

Report Type:	**Product Type:**
CIIPC	WLAN+ Bluetooth Combo Module

Prepared By:	Todd Moy Test Engineer
Report Number:	R1509023-247 DSS
Report Date:	2015-10-07
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1509023-247 DSS	Initial	2015-10-07

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report has been compiled on behalf of *Trimble Navigation Ltd.*, and their module, *FCC ID: JUP-95807WFBT, IC: 1756A-95807WFBT*, model number: LBEE1DARRC-519, which henceforth is referred to as the EUT (Equipment Under Test.) The EUT is an 802.11b/g mode and Bluetooth combination module.

1.2 Mechanical Description of EUT

The module measures approximately 9 mm (L) x 7.3 mm (W)x 1.1 mm (H) and weighs approximately 0.2g; The host R2 measures approximately 140 mm (L) x 140mm (W) x 114mm (H) and weights <1 kg.

The data gathered are from a production sample provided by the manufacturer, serial number: 55030S01127, assigned by customer.

1.3 Objective

This report is prepared on behalf of *Trimble Navigation Ltd.,* in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commission's and IC RSS-247, RSS-Gen rules.

The objective is to determine continue compliance with FCC Part 15.247 and IC RSS-247, RSS-Gen rules for AC Line Conducted Emissions and Radiated Spurious Emissions due to the purpose of adding a new host R2 and an antenna that is not covered in the original limited modular approval.

1.4 Related Submittal(s)/Grant(s)

None

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and FCC KDB 558074 D01 DTS Meas Guidance v03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the 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 CISPR16-4-2:2011, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$2.0 dB 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 Corp.

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:
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 C63.4-2009, ANSI C63.10-2013, 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 EUT was configured for testing according to ANSI C63.10-2013.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

The software used, CommSet: Trimble Communication Setup Program and COM1 TrimTest, provided by the client and was verified by Todd Moy to comply with the standard requirements being tested against.

2.3 Equipment Modifications

No modifications were made to the unit.

2.4 Local Support Equipment

No location support equipment was used with the unit.

2.5 EUT Internal Configuration Details

Manufacturer	Description	Model/Rev.	Serial Number
Murata	Wi-Fi/BT combo module	LBEE1DARRC-519	-

2.6 Power Supply and Line Filters

Manufacturer	Description	Model	Part Number
Delta Electronics, Inc.	AC to DC Adaptor	ADP-10HW A	-

2.7 Interface Ports and Cabling

Cable Description	Length (m)	To	From
USB Cable	<1 m	EUT	Laptop

3 Summary of Test Results

Results reported relate only to the product tested.

FCC/IC Rules	Description of Test	Results
FCC §15.203 IC RSS-Gen §8.3	Antenna Requirement	Compliant
FCC §15.247(i) IC RSS-102	RF Exposure	Compliant
FCC §15.207(a) IC RSS-Gen §8.8	AC Line Conducted Emissions	Compliant
FCC §15.209, §15.247(d) IC RSS-Gen §8.9, §8.10 & RSS-247 §5.5	Restricted Bands, Radiated Spurious Emissions	Compliant

4 FCC §15.203 & IC RSS-Gen §8.3 - Antenna Requirements

4.1 Applicable Standards

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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to FCC §15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to IC RSS-Gen §8.3: Transmitter Antenna

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the license-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

License-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the license-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of license-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. 9 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 a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

4.2 Antenna Description

Antenna Type	Maximum Antenna Gain (dBi) @ 2.4 GHz
Internal PCB	6.6

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

5.1 Applicable Standards

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 field

According to IC RSS-102 Issue 5:

2.5.2 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz[6] and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

5.2 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

5.3 MPE Results

Maximum peak output power at antenna input terminal (dBm):	2.16
Maximum peak output power at antenna input terminal (mW):	1.644
Prediction distance (cm):	20
Prediction frequency (MHz):	2402
Maximum Antenna Gain, typical (dBi):	6.6
Maximum Antenna Gain (numeric):	4.571
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.0015
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	0.015

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.0015 mW/cm^2. Limit is 1.0 mW/cm^2.

RF exposure evaluation exemption for IC:

2.16 dBm + 6.6 dBi = 8.76 dBm < $1.31\times10^{-2}f^{0.6834}$ = 2.7 W = 34.3 dBm

Therefore the RF exposure is exempted.

6 FCC §15.207 & IC RSS-Gen §8.8 - AC Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 Conducted limits:

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

According to RSS GEN §8.8

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits in Table 3.
Unless the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 3 below. The more stringent limit applies at the frequency range boundaries.
The conducted emissions shall be measured in accordance with the reference publication mentioned in Section 3.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note	56 to 46 Note
0.5-5	56	46
5-30	60	50

Note: Decreases with the logarithm of the frequency.

6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.10-2013 measurement procedure. The specification used was FCC §15.207 and IC RSS-Gen.

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

The AC/DC power adapter of the EUT was connected with LISN-1 which provided 120 V / 60 Hz AC power.

6.3 Test Procedure

During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-1 and the power cord of the support equipment was connected to LISN-2.

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

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

6.4 Corrected Amplitude & Margin Calculation

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

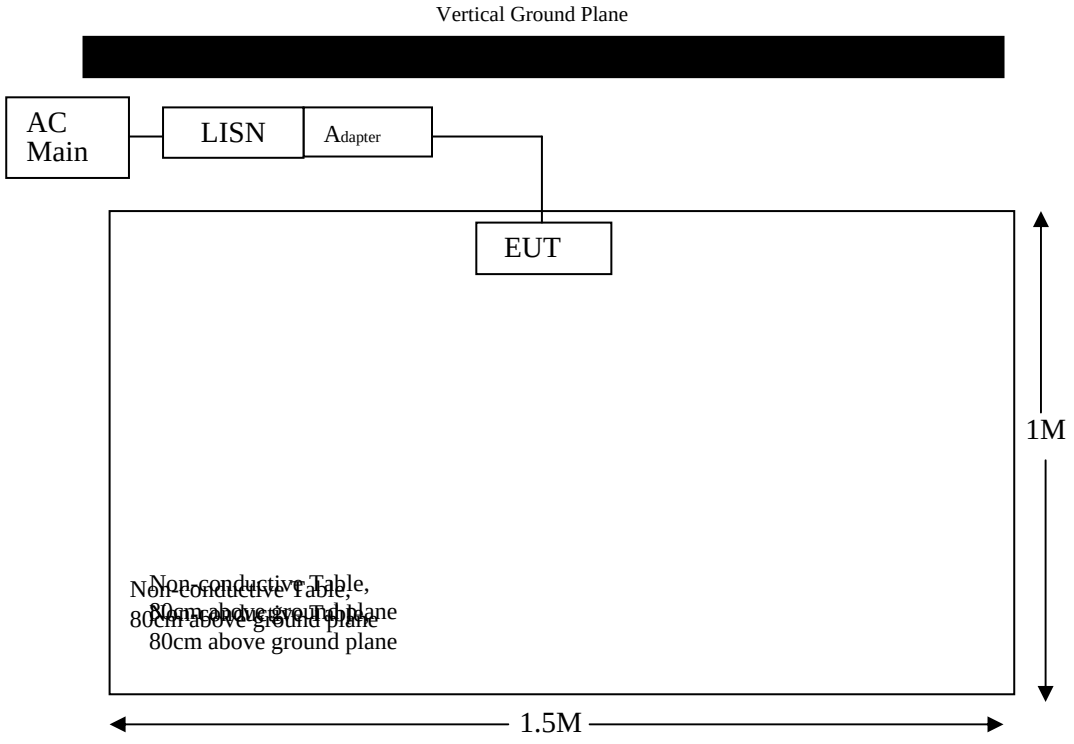
CA = Ai + CL + Atten

For example, a corrected amplitude of 46.2 dBuV = Indicated Reading (32.5 dBuV) + Cable Loss (3.7 dB) + Attenuator (10 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

6.5 Test Setup Block Diagram



6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Receiver	ESCI 1166.5950K03	100338	2014-01-20	2 year
Sunol Sciences	Controller, System	SC104V	011003-1	Cal. Not required	N/A
Keysight Technologies	RF Limiter	11867A	MY42242932	2014-12-17	1year
Rohde & Schwarz	Impulse Limiter	ESH3-Z2	101963	2015-07-15	1year
Solar Electronics Company	High Pass Filter	Type 7930-100	7.93E+09	2015-03-06	1 Year
Suirong	30 ft conductive emission cable	LMR 400	-	2015-03-05	1 year
FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160132	2015-04-07	1year

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

6.7 Test Environmental Conditions

Temperature:	23 ºC
Relative Humidity:	56 %
ATM Pressure:	101.2 kPa

The testing was performed by Todd Moy on 2015-09-14 in 5m chamber3.

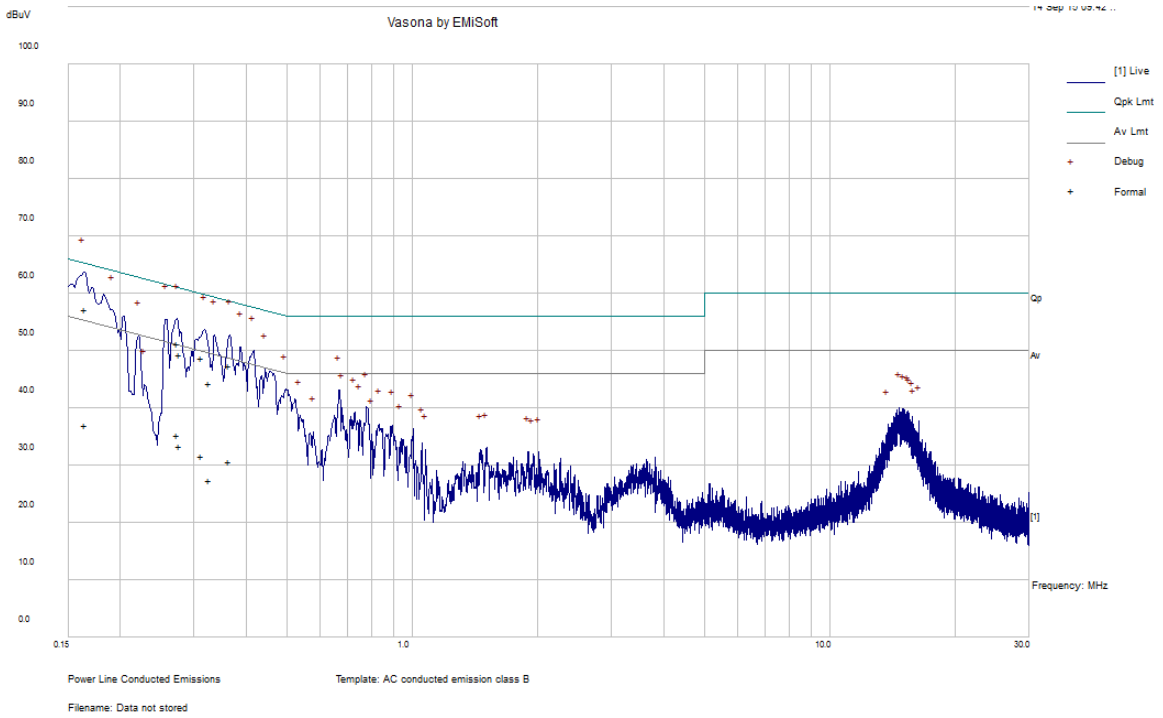
6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC 15C and IC RSS-Gen standard's conducted emissions limits, with the margin reading of:

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-6.32	0.165148	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

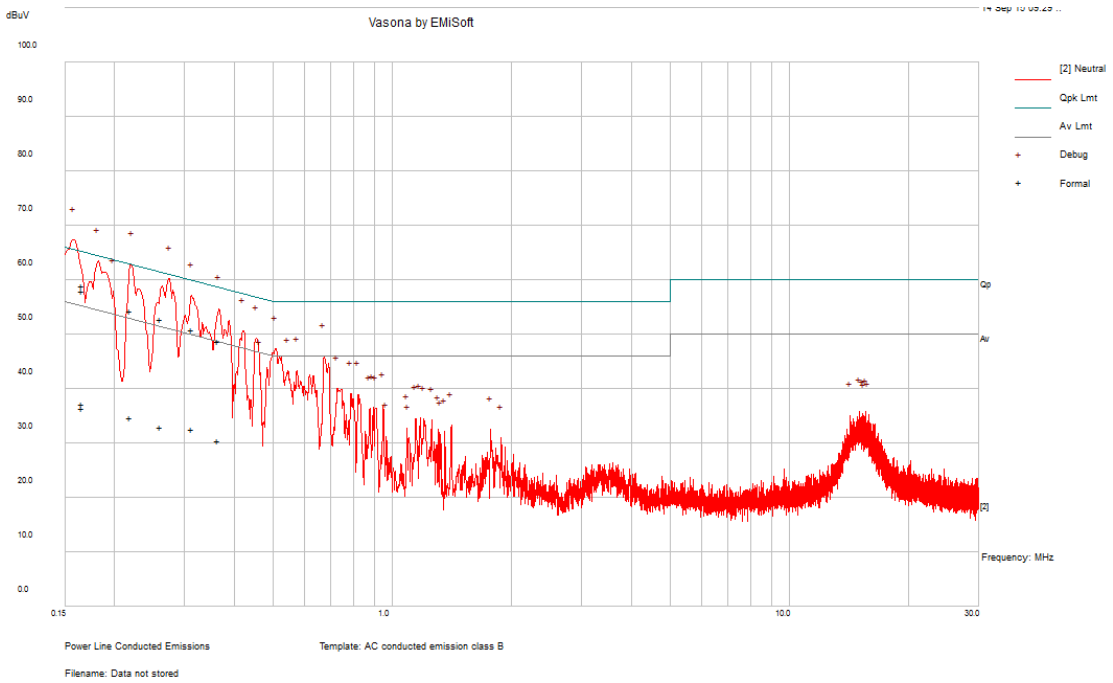
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.164877	57.25	Line	65.21	-7.97	QP
0.274687	51.25	Line	60.97	-9.73	QP
0.363662	47.45	Line	58.64	-11.19	QP
0.312081	48.69	Line	59.91	-11.23	QP
0.277047	49.37	Line	60.9	-11.53	QP
0.326776	44.31	Line	59.53	-15.22	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.274687	35.34	Line	50.97	-15.63	Ave
0.277047	33.37	Line	50.9	-17.54	Ave
0.363662	30.69	Line	48.64	-17.95	Ave
0.164877	37	Line	55.21	-18.21	Ave
0.312081	31.62	Line	49.91	-18.3	Ave
0.326776	27.35	Line	49.53	-22.19	Ave

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.165148	58.88	Neutral	65.2	-6.32	QP
0.165316	57.90	Neutral	65.19	-7.29	QP
0.218981	54.28	Neutral	62.86	-8.58	QP
0.260571	52.72	Neutral	61.41	-8.70	QP
0.313793	50.94	Neutral	59.87	-8.93	QP
0.363806	48.72	Neutral	58.64	-9.92	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.313793	32.55	Neutral	49.87	-17.32	Ave
0.165148	37.27	Neutral	55.2	-17.93	Ave
0.363806	30.61	Neutral	48.64	-18.03	Ave
0.218981	34.7	Neutral	52.86	-18.16	Ave
0.260571	32.98	Neutral	51.41	-18.43	Ave
0.165316	36.57	Neutral	55.19	-18.63	Ave

7 FCC §15.209, §15.247(d) & IC RSS-247 §5.5, RSS-Gen §8.9 & §8.10 - Spurious Radiated Emissions

7.1 Applicable Standards

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): 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-Gen 8.9,

> Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 4 or Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Table 4 – General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Above 30 MHz

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

* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

Note: Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.

As per IC RSS-247 5.5, 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 5.4(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.

As per IC RSS-Gen 8.10, Restricted bands, identified in Table 6, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following restrictions apply: (a) Fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of Table 6 except for apparatus complying under RSS-287; (b) Unwanted emissions that fall into restricted bands of Table 6 shall comply with the limits specified in RSS-Gen; and (c) Unwanted emissions that do not fall within the restricted frequency bands of Table 6 shall comply either with the limits specified in the applicable RSS or with those specified in this RSS-Gen.

7.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specification used was the FCC 15 Subpart C and IC RSS-247, RSS-Gen limits.

The spacing between the peripherals was 10 centimeters.

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

7.3 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

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 List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Receiver	ESCI 1166.5950K03	100338	2014-01-20	2 year
-	10 dB attenuator	-	-	Each time[1]	-
Suirong	30 ft conductive emission cable	LMR 400	-	2015-03-05	1 year
HP	Pre-amp	8447D	2944A06639	2015-06-08	1 year
-	6 dB attenuator	-	-	Each time[1]	-
Sunol Sciences	Antenna, Biconi-Log	JB1	A013105-3	2015-07-11	2 year
Agilent	Spectrum Analyzer	E4446A	MY48250238	2014-09-03	14 Months
-	SMA cable	-	C 006	Each time[1]	N/A
HP/ Agilant	Pre-amp	8449B OPT HO2	3008A0113	2015-05-19	1year
IW Microwave	High Frequency Cable	DC-1438	SPS-2303-3840-SPS	2014-09-24	1 year
Sunol Sciences	Antenna, Horn	DRH-118	A052704	2015-03-09	2year

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.

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

7.6 Test Environmental Conditions

Temperature:	22-24º C
Relative Humidity:	40-41 %
ATM Pressure:	103.1-104.1 kPa

The testing was performed by Todd Moy on 2015-09-08 in 5m chamber3.

7.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Part 15C and IC RSS-247 standard's radiated emissions limits, and had the worst margin of:

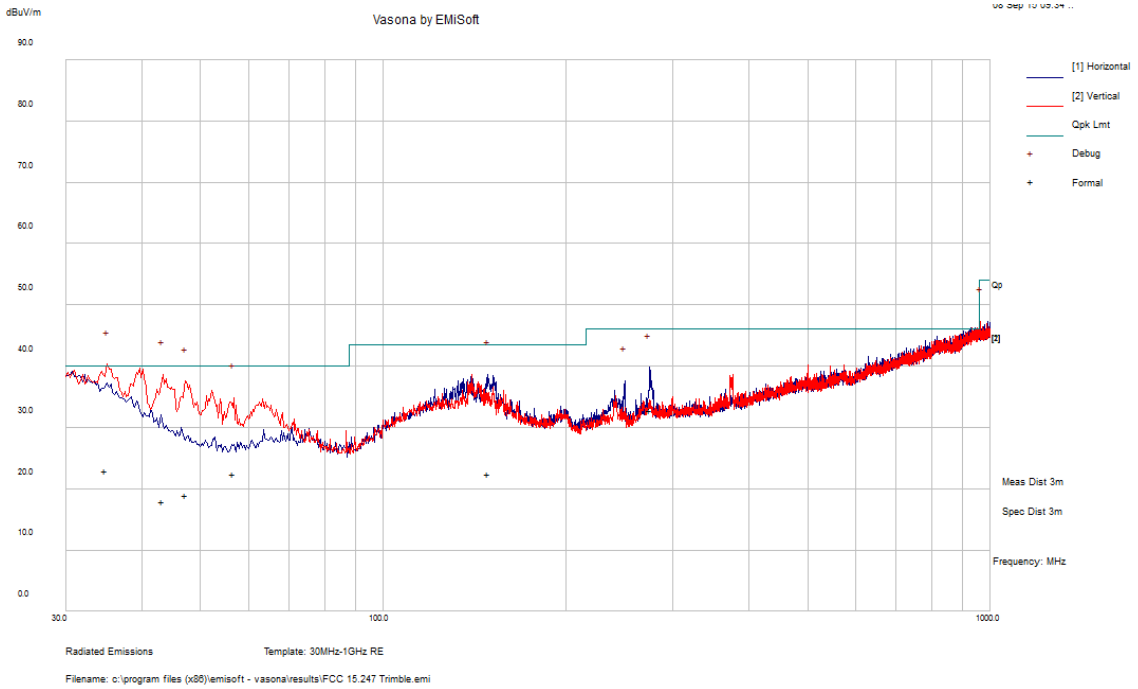
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, Channel**
-1.17	7440	Vertical	8DPSK, 2480 MHz

Please refer to the following table and plots for specific test result details

7.8 Radiated Emissions Test Data and Plots

1) 30 MHz – 1 GHz

Worst-case mode; 8DPSK, Low CH



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (PK/QP/Ave)
56.66375	22.48	245	V	312	40	-17.52	QP
148.682	22.47	278	H	290	43.5	-21.03	QP
274.43325	32.85	101	H	258	46	-13.15	QP
43.24875	18.03	179	V	186	40	-21.97	QP
47.31	19.00	212	V	182	40	-21.00	QP
34.908	22.90	217	V	141	40	-17.10	QP

2) 1–25 GHz

GFSK Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2402 MHz											
2402	62.02	207	289	V	29.04	2.86	0.00	93.93	-	-	Peak
2402	60.57	154	285	H	29.04	2.86	0.00	92.48	-	-	Peak
2402	61.74	206	286	V	29.04	2.86	0.00	93.65	-	-	Ave
2402	56.64	67	177	H	29.04	2.86	0.00	88.55	-	-	Ave
2390	26.59	207	289	V	29.04	2.86	0.00	58.50	74	-15.50	Peak
2390	27.09	154	285	H	29.04	2.86	0.00	59.00	74	-15.00	Peak
2390	15.93	206	286	V	29.04	2.86	0.00	47.84	54	-6.16	Ave
2390	15.85	67	177	H	29.04	2.86	0.00	47.76	54	-6.24	Ave
4804	47.07	0	100	V	32.47	4.30	35.86	47.98	74	-26.02	Peak
4804	47.04	0	100	H	32.47	4.30	35.86	47.95	74	-26.05	Peak
4804	36.95	0	100	V	32.47	4.30	35.86	37.86	54	-16.14	Ave
4804	36.02	0	100	H	32.47	4.30	35.86	36.93	54	-17.07	Ave
7206	48.68	43	138	V	36.69	5.67	36.01	55.04	73.93	-18.89	Peak
7206	46.93	0	100	H	36.69	5.67	36.01	53.29	72.48	-19.19	Peak
7206	40.82	310	141	V	36.69	5.67	36.01	47.18	73.65	-26.47	Ave
7206	36.82	35	100	H	36.69	5.67	36.01	43.18	68.55	-25.37	Ave
9608	48.13	0	100	V	37.77	8.70	36.04	58.56	73.93	-15.37	Peak
9608	47.41	0	100	H	37.77	8.70	36.04	57.84	72.48	-14.64	Peak
9608	36.22	0	100	V	37.77	8.70	36.04	46.65	73.65	-27.00	Ave
9608	36.39	0	100	H	37.77	8.70	36.04	46.82	68.55	-21.73	Ave
Middle Channel 2441 MHz											
2441	62.96	185	287	V	29.04	2.86	0.00	94.87	-	-	Peak
2441	59.31	294	203	H	29.04	2.86	0.00	91.22	-	-	Peak
2441	62.75	185	283	V	29.04	2.86	0.00	94.66	-	-	Ave
2441	56.37	88	100	H	29.04	2.86	0.00	88.28	-	-	Ave
4882	51.84	9	268	V	33.12	4.40	35.90	53.47	74	-20.53	Peak
4882	50.48	278	262	H	32.64	4.40	35.90	51.63	74	-22.37	Peak
4882	45.31	87	268	V	32.64	4.40	35.90	46.46	54	-7.54	Ave
4882	46.32	281	227	H	32.64	4.40	35.90	47.47	54	-6.53	Ave
7323	51.72	322	224	V	37.15	5.79	35.96	58.70	74	-15.30	Peak
7323	47.4	0	100	H	37.15	5.79	35.96	54.38	74	-19.62	Peak
7323	44.3	260	217	V	37.15	5.79	35.96	51.28	54	-2.72	Ave
7323	39.06	0	201	H	37.15	5.79	35.96	46.04	54	-7.96	Ave
9764	47.23	0	100	V	37.92	8.16	36.03	57.28	74.87	-17.59	Peak
9764	46.56	0	100	H	37.92	8.16	36.03	56.61	71.22	-14.61	Peak
9764	35.62	0	100	V	37.92	8.16	36.03	45.67	74.66	-28.99	Ave
9764	35.25	0	100	H	37.92	8.16	36.03	45.30	68.28	-22.98	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 (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2480 MHz											
2480	63.87	165	196	V	29.41	2.95	0.00	96.23	-	-	Peak
2480	59.61	339	286	H	29.41	2.95	0.00	91.97	-	-	Peak
2480	63.13	158	184	V	29.41	2.95	0.00	95.49	-	-	Ave
2480	59.2	339	282	H	29.41	2.95	0.00	91.56	-	-	Ave
2483.5	27.38	165	196	V	29.41	2.95	0.00	59.74	74	-14.26	Peak
2483.5	26.76	339	286	H	29.41	2.95	0.00	59.12	74	-14.88	Peak
2483.5	16.24	158	184	V	29.41	2.95	0.00	48.60	54	-5.40	Ave
2483.5	16.19	339	282	H	29.41	2.95	0.00	48.55	54	-5.45	Ave
4960	47.74	0	100	V	32.64	4.48	35.91	48.95	74	-25.05	Peak
4960	46.73	0	100	H	32.99	4.48	35.91	48.29	74	-25.71	Peak
4960	35.94	0	100	V	32.99	4.48	35.91	37.50	54	-16.50	Ave
4960	35.93	0	100	H	32.99	4.48	35.91	37.49	54	-16.51	Ave
7440	50.39	15	216	V	37.14	5.87	35.96	57.43	74	-16.57	Peak
7440	49.17	0	215	H	37.14	5.87	35.96	56.21	74	-17.79	Peak
7440	45.53	341	227	V	37.14	5.87	35.96	52.57	54	-1.43	Ave
7440	40.75	4	225	H	37.14	5.87	35.96	47.79	54	-6.21	Ave
9920	48.12	0	100	V	37.99	7.44	35.98	57.57	76.23	-18.66	Peak
9920	47.64	0	100	H	37.99	7.44	35.98	57.09	71.97	-14.88	Peak
9920	36.16	0	100	V	37.99	7.44	35.98	45.61	75.49	-29.88	Ave
9920	36.16	0	100	H	37.99	7.44	35.98	45.61	71.56	-25.95	Ave

DQPSK Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2402 MHz											
2402	63.06	233	263	V	29.04	2.86	0.00	94.97	-	-	Peak
2402	59.23	292	290	H	29.04	2.86	0.00	91.14	-	-	Peak
2402	51.52	240	300	V	29.04	2.86	0.00	83.43	-	-	Ave
2402	59.61	159	300	H	29.04	2.86	0.00	91.52	-	-	Ave
2390	27.05	233	263	V	29.04	2.86	0.00	58.96	74	-15.04	Peak
2390	26.9	292	290	H	29.04	2.86	0.00	58.81	74	-15.19	Peak
2390	15.89	240	300	V	29.04	2.86	0.00	47.80	54	-6.20	Ave
2390	15.99	159	300	H	29.04	2.86	0.00	47.90	54	-6.10	Ave
4804	50.11	350	222	V	32.47	4.30	35.86	51.02	74	-22.98	Peak
4804	46.81	13	100	H	32.47	4.30	35.86	47.72	74	-26.28	Peak
4804	42.2	0	213	V	32.47	4.30	35.86	43.11	54	-10.89	Ave
4804	42.3	318	291	H	32.47	4.30	35.86	43.21	54	-10.79	Ave
7206	49.66	315	127	V	36.69	5.67	36.01	56.02	74.97	-18.95	Peak
7206	47.41	0	100	H	36.69	5.67	36.01	53.77	71.14	-17.37	Peak
7206	41.74	267	159	V	36.69	5.67	36.01	48.10	63.43	-15.33	Ave
7206	40.48	249	244	H	36.69	5.67	36.01	46.84	71.52	-24.68	Ave
9608	46.97	0	100	V	37.77	8.70	36.04	57.40	74.97	-17.57	Peak
9608	48.45	0	100	H	37.77	8.70	36.04	58.88	71.14	-12.26	Peak
9608	37.19	0	100	V	37.77	8.70	36.04	47.62	63.43	-15.81	Ave
9608	36.41	0	100	H	37.77	8.70	36.04	46.84	71.52	-24.68	Ave
Middle Channel 2441 MHz											
2441	63.13	168	253	V	29.04	2.86	0.00	95.04	-	-	Peak
2441	59.85	290	285	H	29.04	2.86	0.00	91.76	-	-	Peak
2441	62.59	358	168	V	29.04	2.86	0.00	94.50	-	-	Ave
2441	57.28	90	100	H	29.04	2.86	0.00	89.19	-	-	Ave
4882	50.95	354	100	V	33.12	4.40	35.90	52.58	74	-21.42	Peak
4882	51.34	224	285	H	32.64	4.40	35.90	52.49	74	-21.51	Peak
4882	47.23	13	274	V	32.64	4.40	35.90	48.38	54	-5.62	Ave
4882	44.99	228	297	H	32.64	4.40	35.90	46.14	54	-7.86	Ave
7323	51.6	319	232	V	37.15	5.79	35.96	58.58	74	-15.42	Peak
7323	47.2	0	100	H	37.15	5.79	35.96	54.18	74	-19.82	Peak
7323	45.52	319	228	V	37.15	5.79	35.96	52.50	54.00	-1.50	Ave
7323	39.55	161	300	H	37.15	5.79	35.96	46.53	54	-7.47	Ave
9764	47.14	0	100	V	37.92	8.16	36.03	57.19	75.04	-17.85	Peak
9764	46.09	0	100	H	37.92	8.16	36.03	56.14	71.76	-15.62	Peak
9764	35.6	0	100	V	37.92	8.16	36.03	45.65	74.50	-28.85	Ave
9764	35.2	0	100	H	37.92	8.16	36.03	45.25	69.19	-23.94	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 (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2480 MHz											
2480	63.91	161	161	V	29.41	2.95	0.00	96.27	-	-	Peak
2480	59.07	339	287	H	29.41	2.95	0.00	91.43	-	-	Peak
2480	63.28	229	277	V	29.41	2.95	0.00	95.64	-	-	Ave
2480	58.91	27	287	H	29.41	2.95	0.00	91.27	-	-	Ave
2483.5	27.71	161	161	V	29.41	2.95	0.00	60.07	74	-13.93	Peak
2483.5	27.18	339	287	H	29.41	2.95	0.00	59.54	74	-14.46	Peak
2483.5	16.1	229	277	V	29.41	2.95	0.00	48.46	54	-5.54	Ave
2483.5	16.24	27	287	H	29.41	2.95	0.00	48.60	54	-5.40	Ave
4960	51.02	8	266	V	32.64	4.48	35.91	52.23	74	-21.77	Peak
4960	50	232	300	H	32.99	4.48	35.91	51.56	74	-22.44	Peak
4960	44.69	7	252	V	32.99	4.48	35.91	46.25	54	-7.75	Ave
4960	43.24	229	300	H	32.99	4.48	35.91	44.80	54	-9.20	Ave
7440	51.92	339	234	V	37.14	5.87	35.96	58.96	74	-15.04	Peak
7440	49.72	0	204	H	37.14	5.87	35.96	56.76	74	-17.24	Peak
7440	45.5	38	300	V	37.14	5.87	35.96	52.54	54	-1.46	Ave
7440	43.53	207	233	H	37.14	5.87	35.96	50.57	54	-3.43	Ave
9920	48.1	0	100	V	37.99	7.44	35.98	57.55	76.27	-18.72	Peak
9920	46.91	0	100	H	37.99	7.44	35.98	56.36	71.43	-15.07	Peak
9920	36.15	0	100	V	37.99	7.44	35.98	45.60	75.64	-30.04	Ave
9920	35.93	0	100	H	37.99	7.44	35.98	45.38	71.27	-25.89	Ave

8DPSK Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2402 MHz											
2402	63.15	285	241	V	29.04	2.86	0.00	95.06	-	-	Peak
2402	62.05	314	250	H	29.04	2.86	0.00	93.96	-	-	Peak
2402	61.01	236	223	V	29.04	2.86	0.00	92.92	-	-	Ave
2402	59.25	315	300	H	29.04	2.86	0.00	91.16	-	-	Ave
2390	27.22	285	241	V	29.04	2.86	0.00	59.13	74	-14.87	Peak
2390	26.97	314	250	H	29.04	2.86	0.00	58.88	74	-15.12	Peak
2390	15.84	236	223	V	29.04	2.86	0.00	47.75	54	-6.25	Ave
2390	15.87	315	300	H	29.04	2.86	0.00	47.78	54	-6.22	Ave
4804	49.61	350	180	V	32.47	4.30	35.86	50.52	74	-23.48	Peak
4804	48.86	33	100	H	32.47	4.30	35.86	49.77	74	-24.23	Peak
4804	42.55	204	100	V	32.47	4.30	35.86	43.46	54	-10.54	Ave
4804	42.86	275	245	H	32.47	4.30	35.86	43.77	54	-10.23	Ave
7206	49.68	230	101	V	36.69	5.67	36.01	56.04	75.06	-19.02	Peak
7206	48.33	0	100	H	36.69	5.67	36.01	54.69	73.96	-19.27	Peak
7206	43.07	268	129	V	36.69	5.67	36.01	49.43	72.92	-23.49	Ave
7206	39.11	28	100	H	36.69	5.67	36.01	45.47	71.16	-25.69	Ave
9608	48.46	0	100	V	37.77	8.70	36.04	58.89	75.06	-16.17	Peak
9608	46.58	0	100	H	37.77	8.70	36.04	57.01	73.96	-16.95	Peak
9608	37.17	0	100	V	37.77	8.70	36.04	47.60	72.92	-25.32	Ave
9608	36.04	0	100	H	37.77	8.70	36.04	46.47	71.16	-24.69	Ave
Middle Channel 2441 MHz											
2441	65.34	250	238	V	29.04	2.86	0.00	97.25	-	-	Peak
2441	63.26	268	247	H	29.04	2.86	0.00	95.17	-	-	Peak
2441	63.13	251	263	V	29.04	2.86	0.00	95.04	-	-	Ave
2441	60.72	267	246	H	29.04	2.86	0.00	92.63	-	-	Ave
4882	51.26	0	100	V	33.12	4.40	35.90	52.89	74	-21.11	Peak
4882	51.19	277	255	H	32.64	4.40	35.90	52.34	74	-21.66	Peak
4882	47.41	79	243	V	32.64	4.40	35.90	48.56	54	-5.44	Ave
4882	44.53	228	101	H	32.64	4.40	35.90	45.68	54	-8.32	Ave
7323	52.32	318	201	V	37.15	5.79	35.96	59.30	74	-14.70	Peak
7323	47.95	0	186	H	37.15	5.79	35.96	54.93	74	-19.07	Peak
7323	44.85	254	198	V	37.15	5.79	35.96	51.83	54	-2.17	Ave
7323	40.58	244	226	H	37.15	5.79	35.96	47.56	54	-6.44	Ave
9764	47.43	0	100	V	37.92	8.16	36.03	57.48	77.25	-19.77	Peak
9764	46.98	0	100	H	37.92	8.16	36.03	57.03	75.17	-18.14	Peak
9764	35.9	0	100	V	37.92	8.16	36.03	45.95	75.04	-29.09	Ave
9764	35.56	0	100	H	37.92	8.16	36.03	45.61	72.63	-27.02	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 (PK/Ave.)
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2480 MHz											
2480	65.58	251	260	V	29.41	2.95	0.00	97.94	-	-	Peak
2480	62.91	262	300	H	29.41	2.95	0.00	95.27	-	-	Peak
2480	63.04	249	234	V	29.41	2.95	0.00	95.40	-	-	Ave
2480	61.25	283	261	H	29.41	2.95	0.00	93.61	-	-	Ave
2483.5	27.65	251	260	V	29.41	2.95	0.00	60.01	74	-13.99	Peak
2483.5	26.6	262	300	H	29.41	2.95	0.00	58.96	74	-15.04	Peak
2483.5	16.06	249	234	V	29.41	2.95	0.00	48.42	54	-5.58	Ave
2483.5	16.1	283	261	H	29.41	2.95	0.00	48.46	54	-5.54	Ave
4960	50.6	6	272	V	32.64	4.48	35.91	51.81	74	-22.19	Peak
4960	49.94	277	227	H	32.99	4.48	35.91	51.50	74	-22.50	Peak
4960	44.78	9	243	V	32.99	4.48	35.91	46.34	54	-7.66	Ave
4960	43.41	231	285	H	32.99	4.48	35.91	44.97	54	-9.03	Ave
7440	46.91	337	217	V	37.14	5.87	35.96	53.95	74	-20.05	Peak
7440	41.88	0	225	H	37.14	5.87	35.96	48.92	74	-25.08	Peak
7440	45.79	39	300	V	37.14	5.87	35.96	52.83	54	-1.17	Ave
7440	42.08	0	292	H	37.14	5.87	35.96	49.12	54	-4.88	Ave
9920	48.5	0	100	V	37.99	7.44	35.98	57.95	77.94	-19.99	Peak
9920	46.56	0	100	H	37.99	7.44	35.98	56.01	75.27	-19.26	Peak
9920	36.15	0	100	V	37.99	7.44	35.98	45.60	75.40	-29.80	Ave
9920	36.43	0	100	H	37.99	7.44	35.98	45.88	73.61	-27.73	Ave