



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

For

Trimble Navigation Limited

935 Stewart Drive
Sunnyvale, CA 94085, USA

FCC ID: JUP-6848090
IC: 1756A-6848090

Report Type: Original Report	Equipment Type: 900 MHz FHSS Radio Transceiver with Bluetooth
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* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" see 2

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R0809291-247	Original Report	2008-11-06

1 GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

The *Trimble Navigation Limited* product, *FCC ID: JUP-6848090, IC: 1756A-6848090, model: SNB900*, or the “EUT” as referred to this report, is a 900MHz FHSS Radio Transceiver with Bluetooth functionality. The EUT contains the Infineon PBA31308, FCC ID: Q2331308 as its Bluetooth Module. The EUT operates from 902-928 MHz with a total of 50 hopping channels available.

Features

- Transmit and receive 902-928, 915-928 or 921-929 MHz bands radio
- Compatible with Trimble 900 MHz radios/base stations

1.2 Mechanical Description of EUT

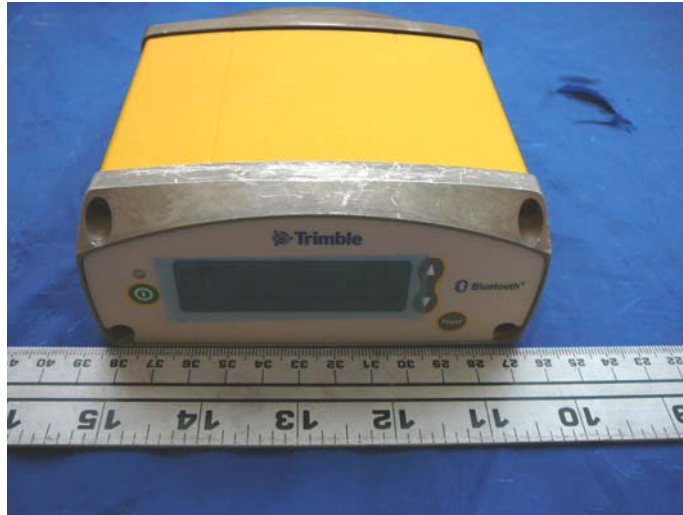
The *Trimble Navigation Ltd.* product, model: *SNB900*, measures approximately *135 mm (L) x 125 mm (W) x 50 mm (H)*, and weighs approximately *0.9 kg*. The EUT chassis is made of a metal construction.*

*The test data gathered are from prototype sample, serial number: *R0809291-001*, assigned by *BACL*.

1.3 Antenna Description

Item Number	Model/Type	
Antenna 1.	Model:	32318
	Manufacturer:	Trimble
	Frequency Range:	902-928 MHz
	Maximum Antenna Gain:	5 dBi
	Antenna Type:	Whip Antenna
	Measurement:	Approximate 32” (L)
Antenna 2.	Model:	32316
	Manufacturer:	Trimble
	Frequency Range:	902-928 MHz
	Maximum Antenna Gain:	3 dBi
	Antenna Type:	Whip Antenna
	Measurement:	Approximate 21.5” (L)
Antenna 3.	Model:	SPDA 17RP918
	Manufacturer:	Radiall/Larsen
	Frequency Range:	890-960 MHz
	Maximum Antenna Gain:	2 dBi
	Antenna Type:	Reverse Polarity TNC connector, Center Fed Dipole Antenna
	Measurement:	Approximate 8” (L)

1.4 EUT Photograph



Please refer to Exhibit C for more EUT photographs.

1.5 Objective

This report is prepared on behalf of Trimble Navigation Limited in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules and Industry Canada RSS-210 Issue 7, June 2007 standard.

The Trimble Navigation Limited product, FCC ID: JUP-6848090, IC: 1756A-6848090, model: SNB900 contains the 900 MHz FHSS Radio was tested in BACL with FCC ID: JUP-59645 and IC ID: 1756A-5855590.

The objective is to determine compliance with FCC and IC standards, rules and limits for this device including:

- Radiated Spurious Emissions
- Restricted Band

1.6 Related Submittal(s)/ Grant(s)

The 900MHz FHSS Radio was tested in BACL with FCC ID: JUP-59645 and IC ID: 1756A-5855590. Additional testing was performed.

Please refer to original report number R0703211 which was prepared by BACL for other for other FCC 15.247 radio tests which include Channel Bandwidth, Channel Output Power, Channel Separation and Number of Channels.

1.7 Test Methodology

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

1.8 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 ± 2.0 dB for Conducted Emissions tests and ± 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.

1.9 Test Facility

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, 1997 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003 & TIA/EIA-603.

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.: R-2463 and C-2698. 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 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 EUT was configured for testing according to ANSI C63.4-2003.

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

2.2 Special Accessories

As shown in following test block diagram, all interface cables used for compliance testing are shielded.

2.3 Equipment Modifications

N/A

2.4 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
SL Power & AULT	AC Adaptor (base)	PW174KA1802F02	80

2.5 Internal Configuration

Manufacturer	Description	Part Number	Serial Number
Trimble Navigation	RF Board	66483-00-A Rev 1	31048477
Trimble Navigation	Main PCB	48472-90-C Rev 3	-
Infineon	Bluetooth Module	PBA31308	-
Rose Electronics	7.4V 3600mAH Li-Ion Battery pack	48477R0344	-
Noritake iTron	Display PCB	PW-130-102K	-

2.6 Local Support Equipment List and Details

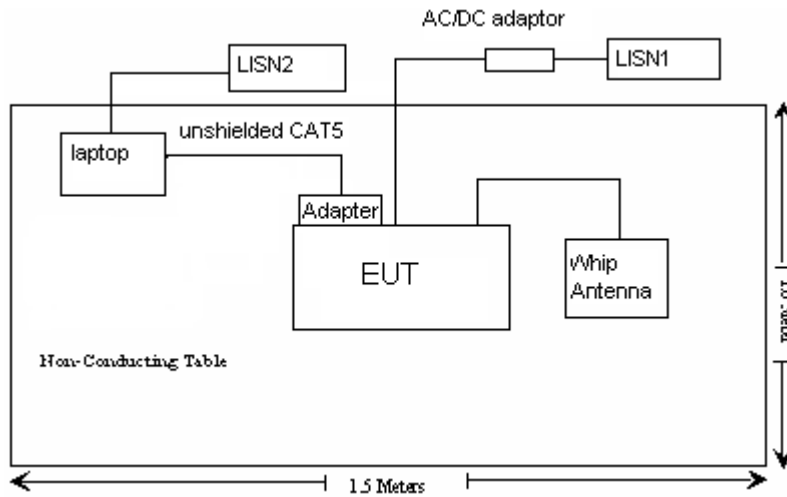
Manufacturer	Description	Model	Serial Number
Dell	Laptop	Latitude D620	-
Trimble Navigation	Ethernet Line Adapter	57168 Rev. C	E1608

2.7 Interface Ports and Cabling

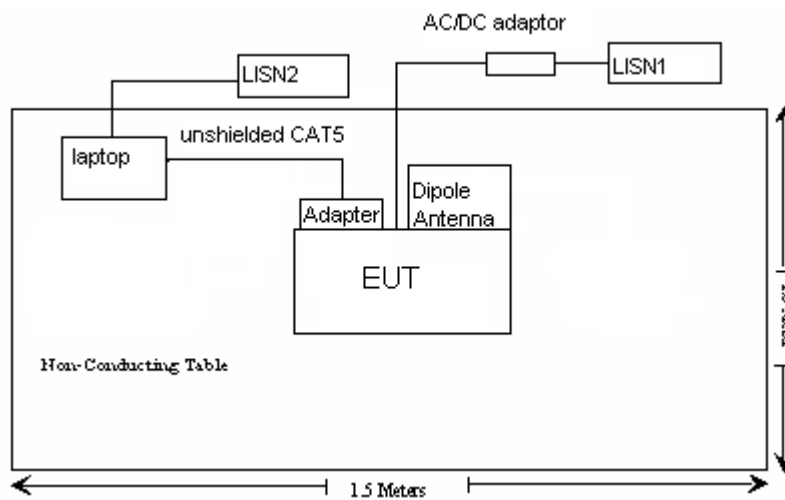
Cable Description	Part Number	Length (m)	From	To
RF Serial Cable	51980	<3m	EUT	Whip antenna
Unshielded CAT5 Cable	-	<3m	EUT Adapter	Laptop

2.8 Test Setup Block Diagrams

2.8.1 EUT with Whip Antenna



2.8.2 EUT with Dipole Antenna



3 SUMMARY OF TEST RESULTS FOR FCC PART 15C & IC RSS-210

FCC 15C / RSS-210 Rules	Description of Test	Result
FCC §15.247 (i) and §2.1091, IC RSS-Gen 5.5 & RSS-102	RF Exposure	Please refer to Original Report*
FCC §15.203, IC RSS-Gen §7.1.4	Antenna Requirement	Please refer to Original Report*
FCC §15.207 (a), IC RSS-Gen §7.2.2	Conducted Emissions	Please refer to Original Report*
FCC §2.1051 & §15.247(d), RSS210 § A8.5 & RSS-Gen §7.2	Spurious Emissions at Antenna Port	Please refer to Original Report*
FCC §15.205, §15.209 & §15.247(c), IC RSS-210 §A8.5	Radiated Spurious Emissions	Compliant
FCC §15.205, RSS-210 §A8.5	Restricted Band	Compliant
RSS-210 § 2.6	Receiver Spurious Emissions	Compliant
§15.247 (a)(1), RSS-210 §A8.1 (a)	20 dB Bandwidth & 99% Bandwidth	Please refer to Original Report*
§15.247 (a)(1), RSS-210 §A8.1(2)	Hopping Channel Separation	Please refer to Original Report*
§15.247 (a)(1)(iii), RSS-210 §A8.1(4)	Number of Hopping Frequencies Channel Used	Please refer to Original Report*
§15.247 (a)(1)(iii), RSS-210 §A8.1(4)	Dwell Time	Please refer to Original Report*
§15.247 (b)(3), RSS210 § A8.4	Maximum Peak Output Power	Please refer to Original Report*
§ 15.247 (d), RSS210 § A8.5	100 kHz Bandwidth of Frequency Band Edge	Please refer to Original Report*

* Please refer to original report number R0703211 compiled by BACL with FCC ID: JUP-59645 and IC ID: 1756A-5855590.

4 FCC §15.205, §15.209 & §15.247(c), IC RSS-210 §A8.5 - Spurious Radiated Emissions

4.1 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): 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:

F (MHz)	F (MHz)	F (MHz)	F (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	3600 – 4400	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		

IC RSS-GEN §4.9 the measurement method shall be described in the test report. The same parameter, peak power or average power, used for the transmitter output power measurement shall be used for unwanted emission measurements. The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate or carrier frequency), or from 30 MHz, whichever is the lower, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

4.2 Test Setup

The radiated emissions tests were performed in the shielded room, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15.209(a) limits.

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
Above 960	500	3

During the test, unit is set to transmitting mode; a notch filter is installed to block the fundamental frequency.

4.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
HP	Pre amplifier	8447D	2944A07030	2007-11-12
Agilent	Pre amplifier	8449B	3008A01978	2007-11-02
Sunol Science	Combination Antenna	JB1 Antenna	A013105-3	2008-03-25
Antenna Research Associates, Inc.	Horn Antenna	DRG-118/A	1132	2008-07-28
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.595 0K03	1000337	2008-04-21
Sunol Science	System Controller	SC99V	122303-1	N/A
Agilent	Spectrum analyzer	E4440A	MY44303352	2008-04-28

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

4.4 Environmental Conditions

Temperature:	20~28.5 °C
Relative Humidity:	40~45 %
ATM Pressure:	100.3~102.7kPa

*The testing was performed by Xiao Ming Hu on 2008-10-03~2008-10-07.

4.5 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.

4.6 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:

$$\text{Corrected Amplitude} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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 emissions are 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Limit}$$

4.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Part 15 sections 15.205, 15.209 and Subpart C 15.247 standards' limits, and had the margin from the limits of:

Whip Antenna

30MHz-1GHz

-7.95 dB at **124.995 MHz** in the **Vertical** polarization

Above 1GHz

-13.84 dB at **9970.231 MHz** in the **Vertical** polarization, FCC Low Channel,

-14.05 dB at **9849.175 MHz** in the **Horizontal** polarization, FCC Middle Channel,

-14.12 dB at **9879.471 MHz** in the **Vertical** polarization, FCC High Channel,

Dipole Antenna

30MHz-1GHz

-10.26 dB at **124.981 MHz** in the **Vertical** polarization

Above 1GHz

-14.27 dB at **9588.420 MHz** in the **Horizontal** polarization, FCC Low Channel,

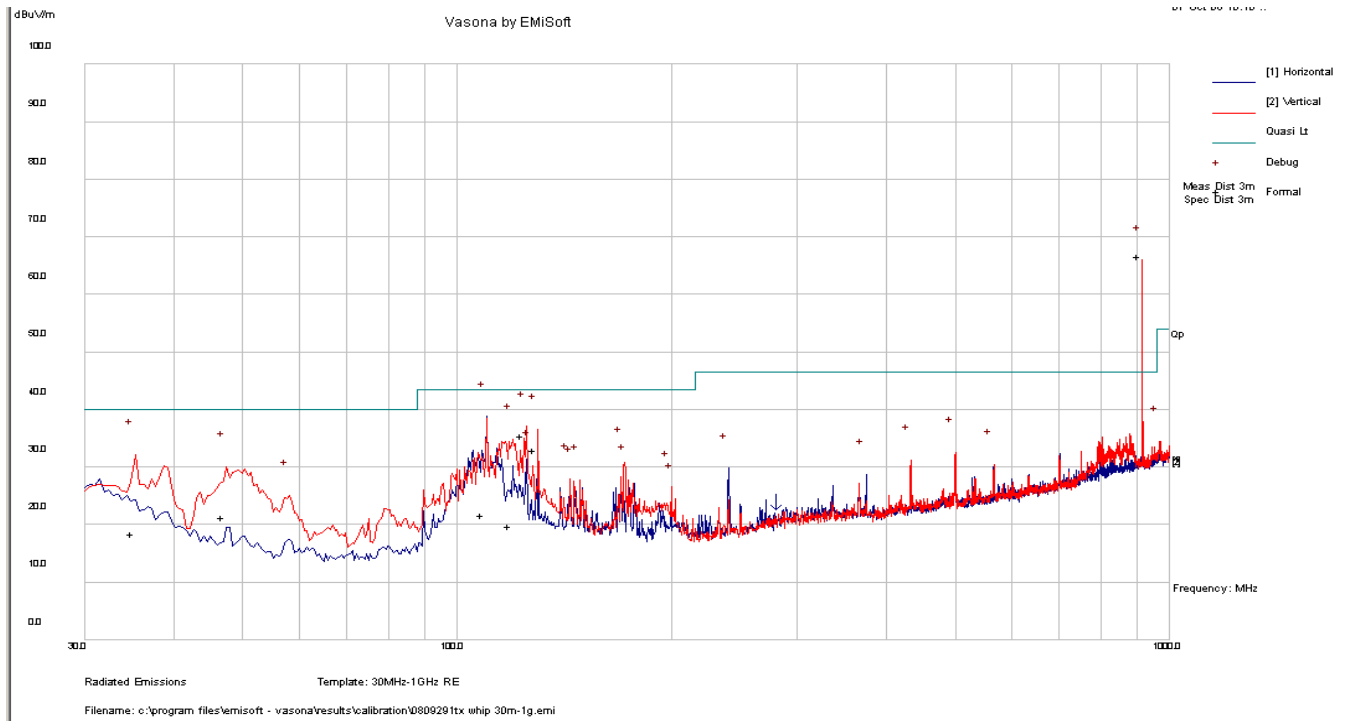
-14.41 dB at **9464.891 MHz** in the **Vertical** polarization, FCC Middle Channel,

-14.12 dB at **9849.930 MHz** in the **Vertical** polarization, FCC High Channel,

4.8 Radiated Spurious Emissions Test Data

4.8.1 Whip Antenna Test Data

30MHz-1GHz Worst Case Radiated Emissions Test Data at 3 meters



Frequency (MHz)	Corrected Reading (dBuV/m)	Measurement Type (QP/AV/PK)	Polarity (V/H)	Height (cm)	Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
914.885	66.70	QP	V	120	108	*	*
124.995	35.55	QP	V	100	205	43.5	-7.95
130.004	33.03	QP	V	109	2	43.5	-10.47
47.419	21.30	QP	V	167	173	40.0	-18.70
35.479	18.39	QP	V	197	123	40.0	-21.61
109.852	21.78	QP	H	215	219	43.5	-21.72
119.853	19.70	QP	V	107	39	43.5	-23.80

*Note: fundamental reading

Above 1GHz Radiated Emissions Test Data at 3 meters

Low Channel @ 902.621MHz

Frequency (MHz)	Reading (dBuV/m)	Cable Loss (dB)	Antenna Factor & Pre Amp Gain (dB)	Corrected Reading (dBuV/m)	Measurement Type (PK/AV)	Antenna Polarity (V/H)	Antenna Height (cm)	Antenna Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
9970.231	23.07	12.64	4.45	40.16	AV	V	262	260	54	-13.84
9970.524	38.67	12.64	4.45	55.76	PK	V	100	0	74	-18.24
1891.298	52.61	5.34	-8.38	49.57	PK	H	100	0	74	-24.43
1663.911	49.24	4.98	-10.05	44.18	PK	H	100	0	74	-29.82
1891.681	26.61	5.34	-8.37	23.57	AV	H	172	266	54	-30.43
1664.067	26.72	4.98	-10.05	21.66	AV	H	275	181	54	-32.34

Middle Channel @ 914.8496MHz

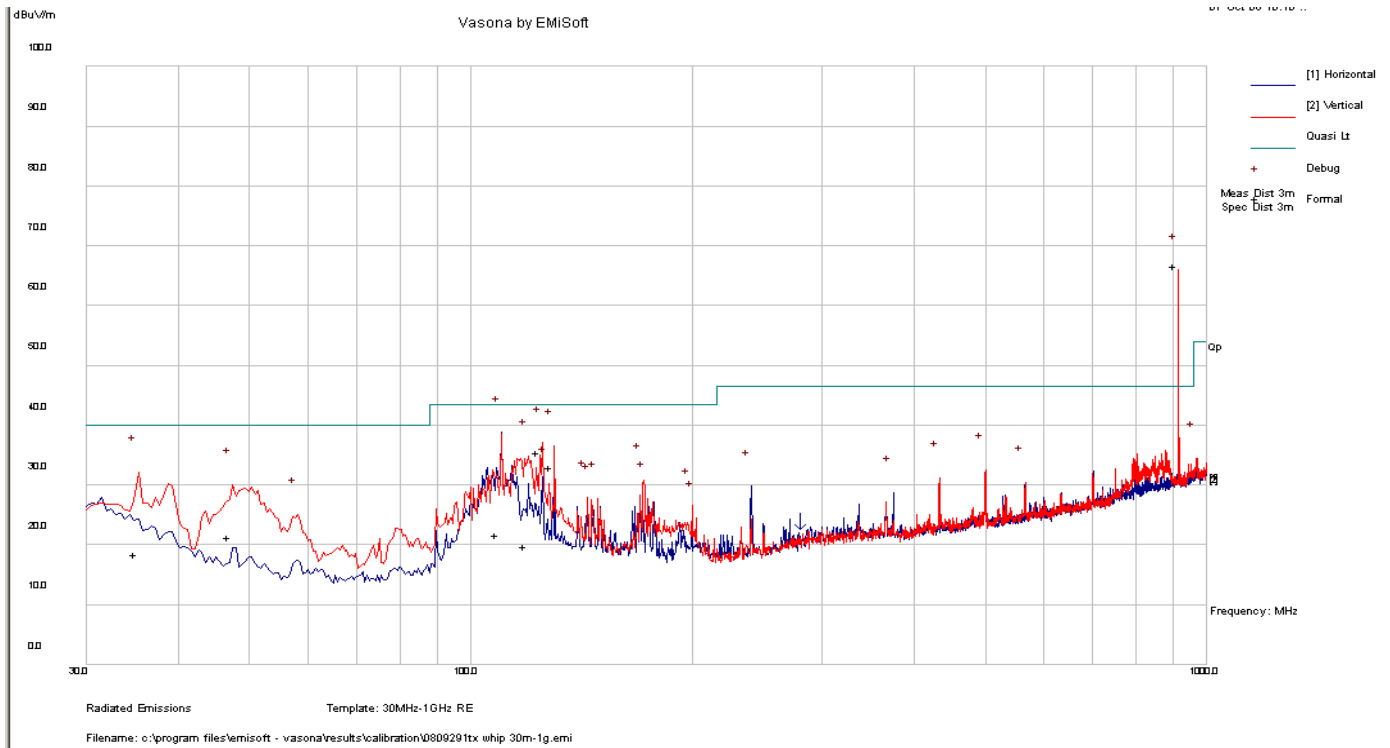
Frequency (MHz)	Reading (dBuV/m)	Cable Loss (dB)	Antenna Factor & Pre Amp Gain (dB)	Corrected Reading (dBuV/m)	Measurement Type (PK/AV)	Antenna Polarity (V/H)	Antenna Height (cm)	Antenna Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
9849.175	23.07	12.57	4.31	39.95	AV	H	99	336	54	-14.05
9849.813	39.21	12.57	4.31	56.09	PK	H	300	0	74	-17.91
1891.298	54.84	5.34	-8.38	51.80	PK	H	200	0	74	-22.20
1880.069	48.58	5.32	-8.46	45.44	PK	V	100	0	74	-28.56
1890.428	26.88	5.34	-8.38	23.83	AV	H	223	57	54	-30.17
1881.737	26.46	5.32	-8.44	23.34	AV	V	200	142	54	-30.66

High Channel @ 927.5877MHz

Frequency (MHz)	Reading (dBuV/m)	Cable Loss (dB)	Antenna Factor & Pre Amp Gain (dB)	Corrected Reading (dBuV/m)	Measurement Type (PK/AV)	Antenna Polarity (V/H)	Antenna Height (cm)	Antenna Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
9879.471	22.95	12.59	4.34	39.88	AV	V	112	4	54	-14.12
9877.885	39.21	12.59	4.34	56.13	PK	V	300	0	74	-17.87
1890.015	26.33	5.34	-8.39	23.28	AV	V	256	12	54	-30.72
1889.894	45.83	5.34	-8.39	42.77	PK	V	200	0	74	-31.23

4.8.2 Dipole Antenna Test Data

30MHz-1GHz Worst Case Radiated Emissions Test Data at 3 meters



Frequency (MHz)	Corrected Reading (dBuV/m)	Measurement Type (QP/AV/PK)	Polarity (V/H)	Height (cm)	Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
914.886	67.04	QP	V	100	226	*	*
124.981	33.24	QP	V	128	184	43.5	-10.26
130.011	33.05	QP	V	102	210	43.5	-10.45
877.666	26.95	QP	V	224	176	46.5	-19.55
114.828	22.73	QP	V	102	34	43.5	-20.77
800.000	22.45	QP	V	269	276	46.5	-24.05
127.019	19.06	QP	V	102	277	43.5	-24.44

*Note: fundamental reading

Above 1GHz Radiated Emissions Test Data at 3 meters

Low Channel @ 902.621MHz

Frequency (MHz)	Reading (dBuV/m)	Cable Loss (dB)	Antenna Factor & Pre Amp Gain (dB)	Corrected Reading (dBuV/m)	Measurement Type (PK/AV)	Antenna Polarity (V/H)	Antenna Height (cm)	Antenna Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
9588.420	23.25	12.42	4.06	39.73	AV	H	213	63	54	-14.27
9590.143	39.39	12.42	4.06	55.88	PK	H	100	0	74	-18.12
1880.069	56.82	5.32	-8.46	53.69	PK	H	300	0	74	-20.31
1889.894	53.73	5.34	-8.39	50.67	PK	H	300	0	74	-23.33
1880.953	26.68	5.32	-8.45	23.56	AV	H	288	102	54	-30.44
1890.190	26.41	5.34	-8.38	23.37	AV	H	155	18	54	-30.63

Middle Channel @ 914.8496MHz

Frequency (MHz)	Reading (dBuV/m)	Cable Loss (dB)	Antenna Factor & Pre Amp Gain (dB)	Corrected Reading (dBuV/m)	Measurement Type (PK/AV)	Antenna Polarity (V/H)	Antenna Height (cm)	Antenna Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
9464.891	23.25	12.34	3.99	39.59	AV	V	187	0	54	-14.41
9465.221	39.29	12.34	3.99	55.62	PK	V	300	0	74	-18.38
1225.613	38.30	4.21	-12.12	30.39	AV	V	110	205	54	-23.61
1332.396	33.89	4.4	-11.76	26.53	AV	V	100	220	54	-27.47
1331.254	50.97	4.4	-11.76	43.61	PK	V	100	0	74	-30.39
1224.579	49.38	4.21	-12.12	41.47	PK	V	100	0	74	-32.53

High Channel @ 927.5877MHz

Frequency (MHz)	Reading (dBuV/m)	Cable Loss (dB)	Antenna Factor & Pre Amp Gain (dB)	Corrected Reading (dBuV/m)	Measurement Type (PK/AV)	Antenna Polarity (V/H)	Antenna Height (cm)	Antenna Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
9849.930	22.97	12.57	4.31	39.86	AV	V	222	110	54	-14.14
9851.216	38.85	12.58	4.31	55.74	PK	V	300	0	74	-18.26

5 RSS-210 § 2.6 Receiver Spurious Radiated Emissions

5.1 Test Setup

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

5.2 Equipment Lists and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
HP	Pre amplifier	8447D	2944A07030	2007-11-12
Agilent	Pre amplifier	8449B	3008A01978	2007-11-02
Sunol Science	Combination Antenna	JB1 Antenna	A013105-3	2008-03-25
Antenna Research Associates, Inc.	Horn Antenna	DRG-118/A	1132	2008-07-28
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.595 0K03	1000337	2008-04-21
Sunol Science	System Controller	SC99V	122303-1	N/A
Agilent	Spectrum analyzer	E4440A	MY44303352	2008-04-28

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

5.3 Environmental Conditions

Temperature:	20~28.5 °C
Relative Humidity:	40~45 %
ATM Pressure:	100.3~102.7kPa

**The testing was performed by Xiao Ming Hu on 2008-10-03~2008-10-07.*

5.4 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.

5.5 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:

$$\text{Corrected Amplitude} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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 emissions are 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Class B Limit}$$

5.6 Summary of Test Results

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

30MHz-1GHz

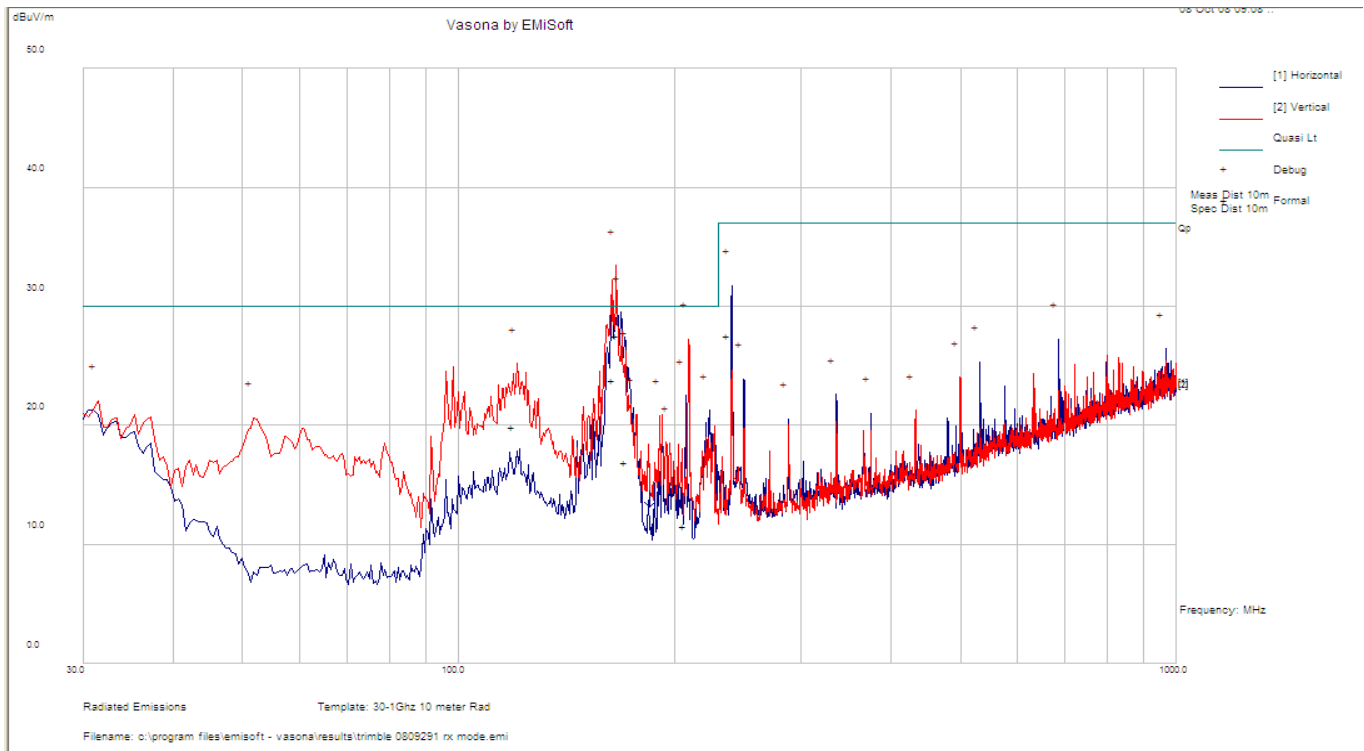
-10.26 dB at **124.981 MHz** in the **Vertical** polarization

Above 1GHz

-14.03 dB at **9849.183 MHz** in the **Horizontal** polarization

5.6.1 Receiver Spurious Emissions

30MHz-1GHz Worst Case Radiated Emissions Test Data at 3 meters



Frequency (MHz)	Corrected Reading (dBuV/m)	Measurement Type (QP/AV/PK)	Polarity (V/H)	Height (cm)	Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
168.059	24.55	QP	H	392	24	30	-5.45
165.983	20.86	QP	V	282	190	30	-9.14
240.040	24.58	QP	H	251	266	37	-12.42
120.455	16.87	QP	V	288	183	30	-13.13
172.630	13.98	QP	H	287	121	30	-16.02
208.800	8.54	QP	V	227	230	30	-21.46

Above 1GHz Worst Case Radiated Emissions Test Data at 3 meters

Frequency (MHz)	Corrected Reading (dBuV/m)	Measurement Type (PK/AV)	Antenna Polarity (V/H)	Antenna Height (cm)	Antenna Azimuth (Deg)	Limit (dBuV/m)	Margin (dB)
9849.183	39.97	AV	H	100	340	54	-14.03
1330.080	25.50	AV	V	145	271	54	-28.50
1009.843	25.40	AV	V	100	65	54	-28.60
1890.428	23.86	AV	H	223	60	54	-30.14
1881.737	23.37	AV	V	200	132	54	-30.63
1066.094	22.20	AV	V	113	230	54	-31.80

6 EXHIBIT A – FCC & IC EQUIPMENT LABELING REQUIREMENTS

6.1 FCC § 2.925 Identification of equipment

(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. XXX—Grantee Code 123—Equipment Product Code

6.2 FCC ID Labeling Requirements 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.

6.3 IC ID Labeling Requirements as per RSS-Gen § 5.2

The certification number should 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 8 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.

6.4 Suggested FCC ID & IC Label

Model: SPS850

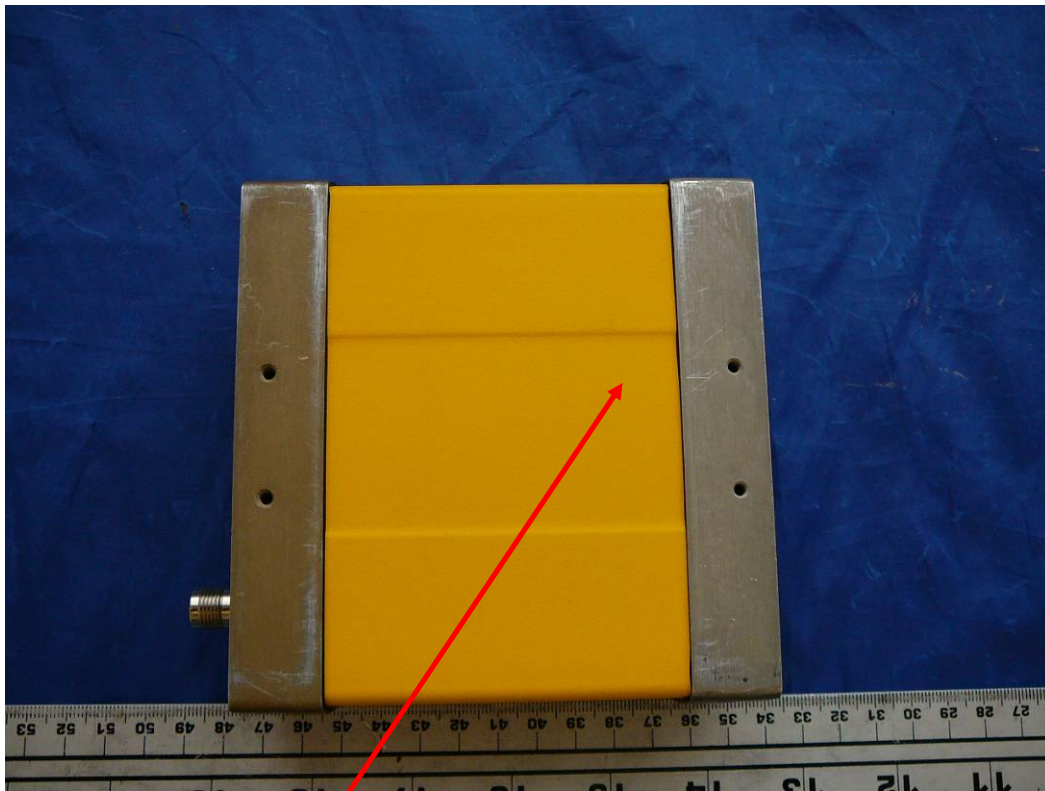
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC ID: JUP-6848090

IC: 1756A-6848090



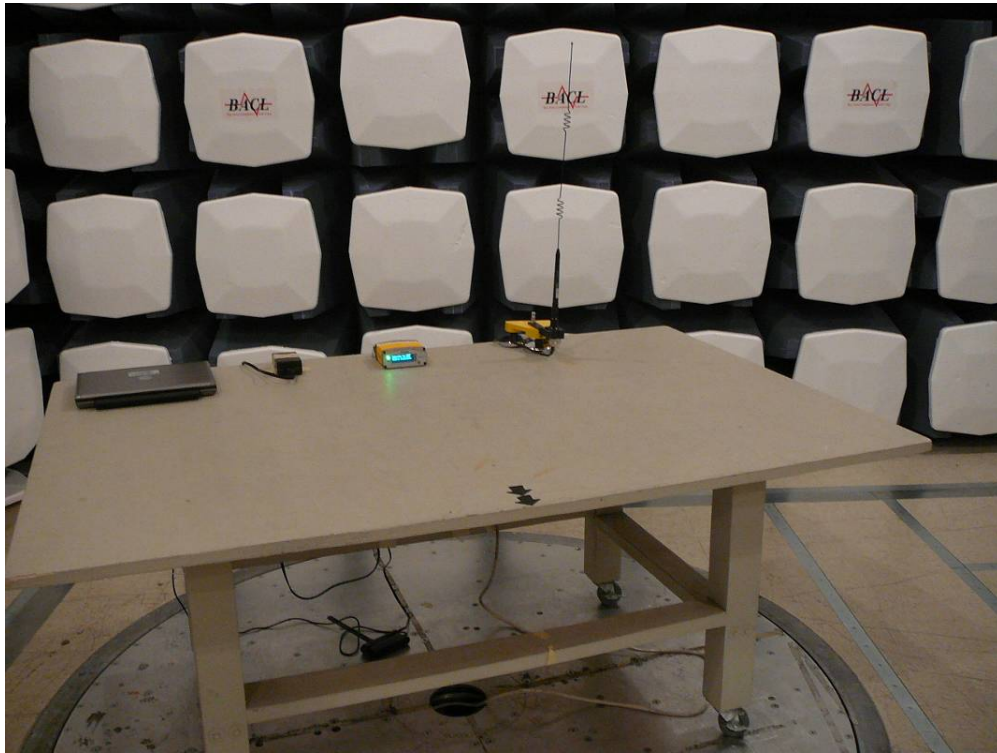
Trimble Navigation Ltd.



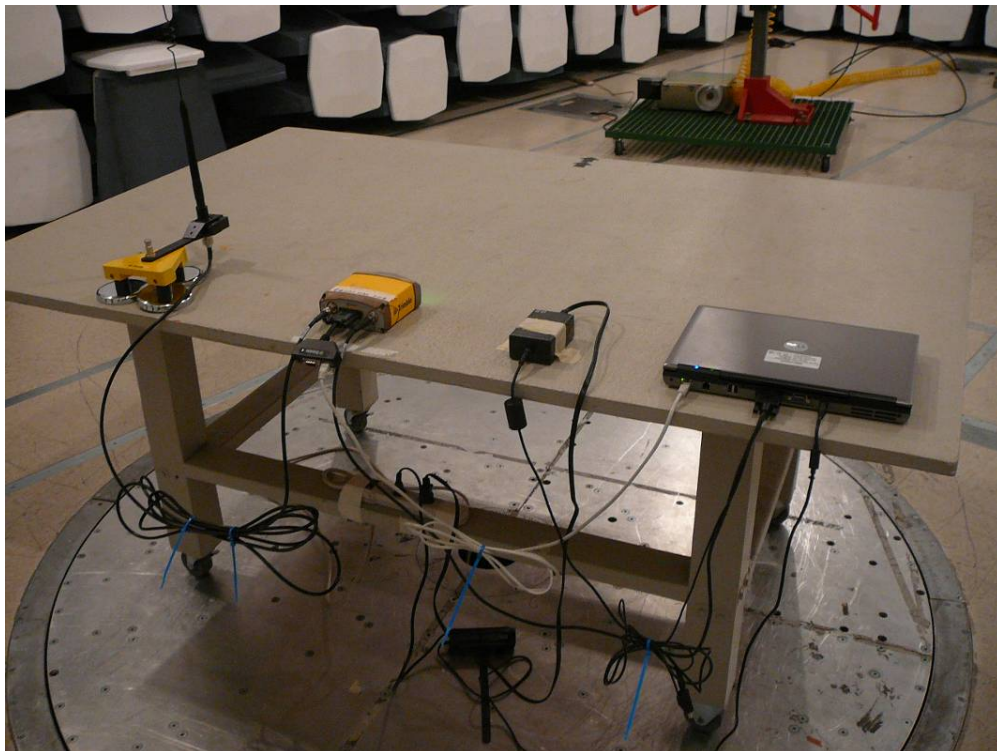
Suggested Label Location

7 EXHIBIT B TEST SETUP PHOTOS

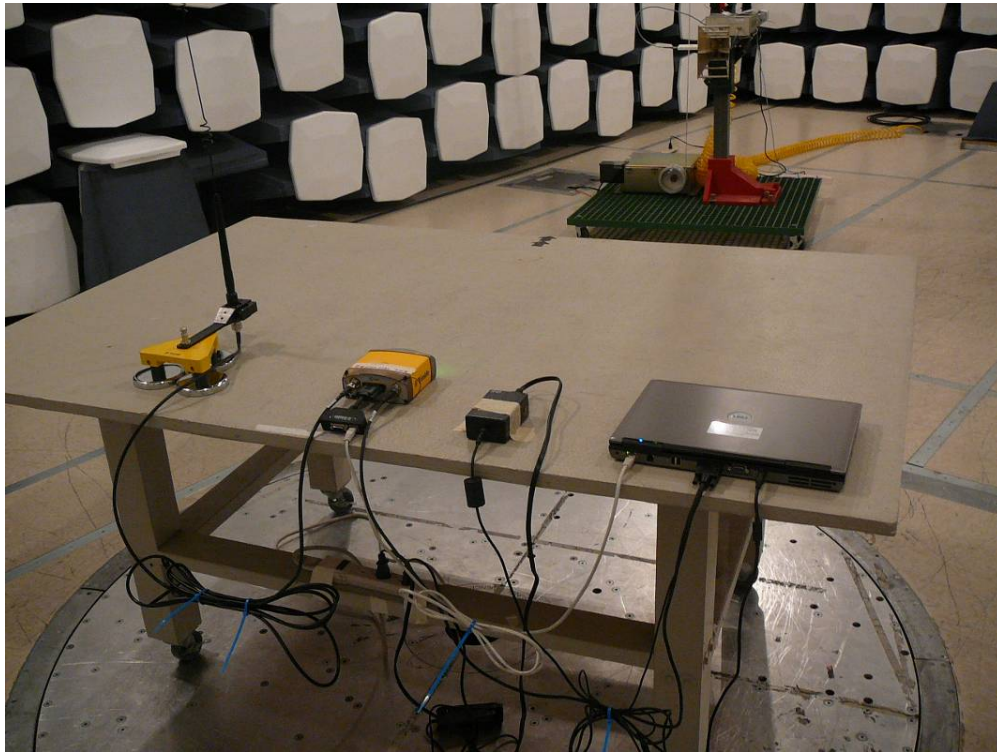
7.1 Whip Antenna Radiated Emissions – Front View



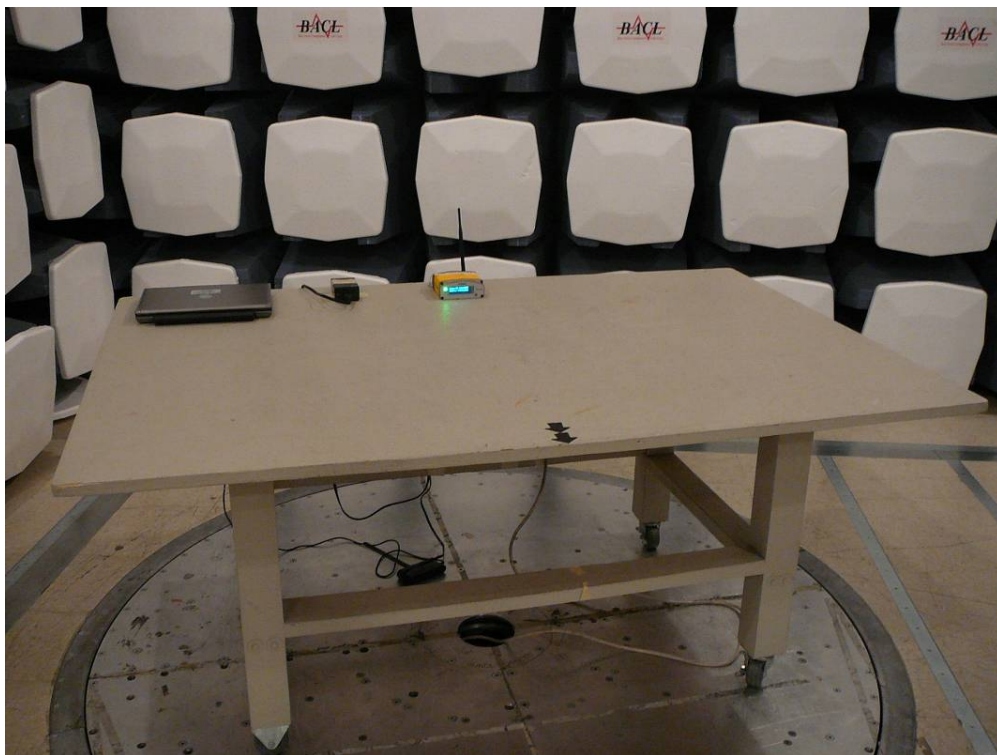
7.2 Whip Antenna Radiated Emissions – 30MHz-1GHz Rear View



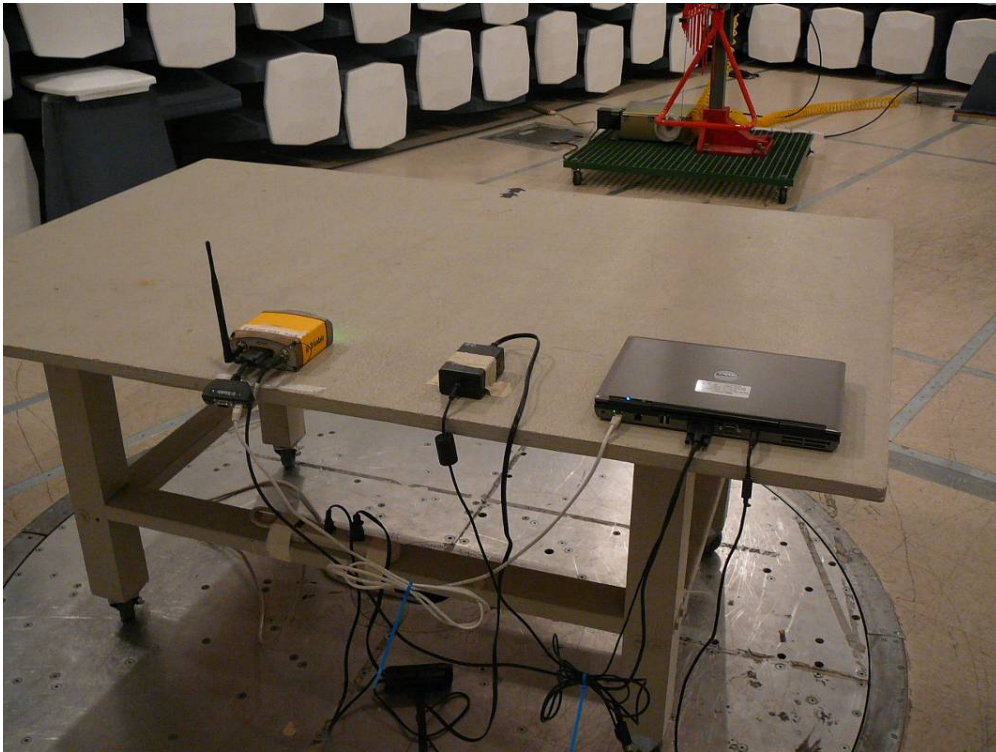
7.3 Whip Antenna Radiated Emissions – Above 1GHz Rear View



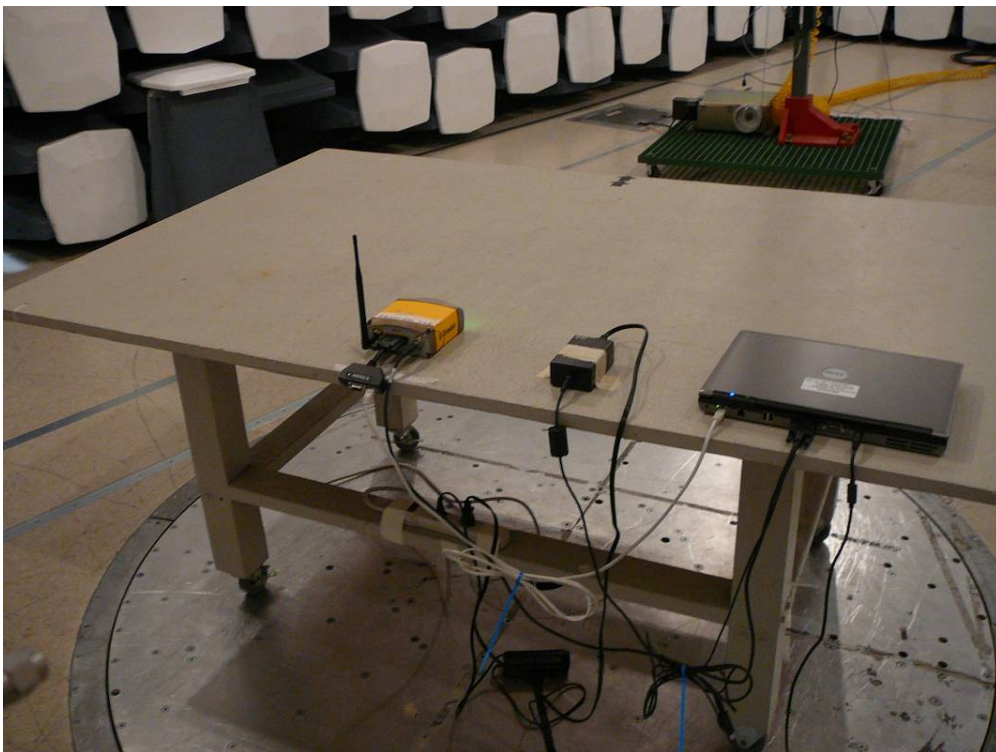
7.4 Dipole Antenna Radiated Emissions – Front View



7.5 Dipole Antenna Radiated Emissions – 30MHz-1GHz Rear View

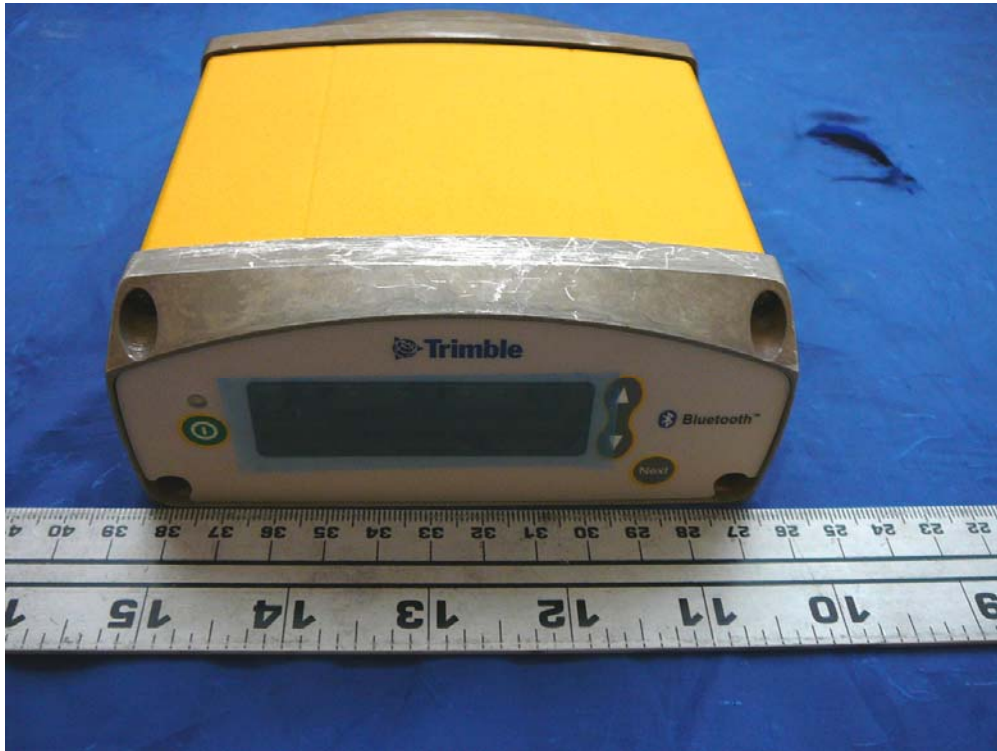


7.6 Dipole Antenna Radiated Emissions – Above 1GHz Rear View



8 EXHIBIT C - EUT PHOTOGRAPHS

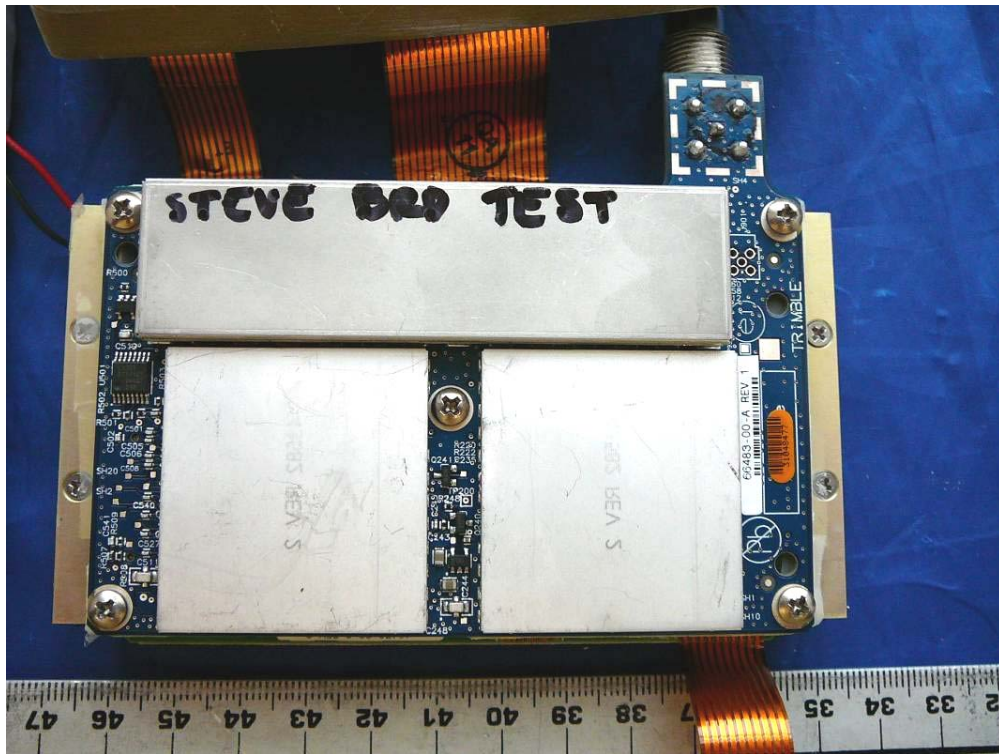
8.1 EUT- Front View



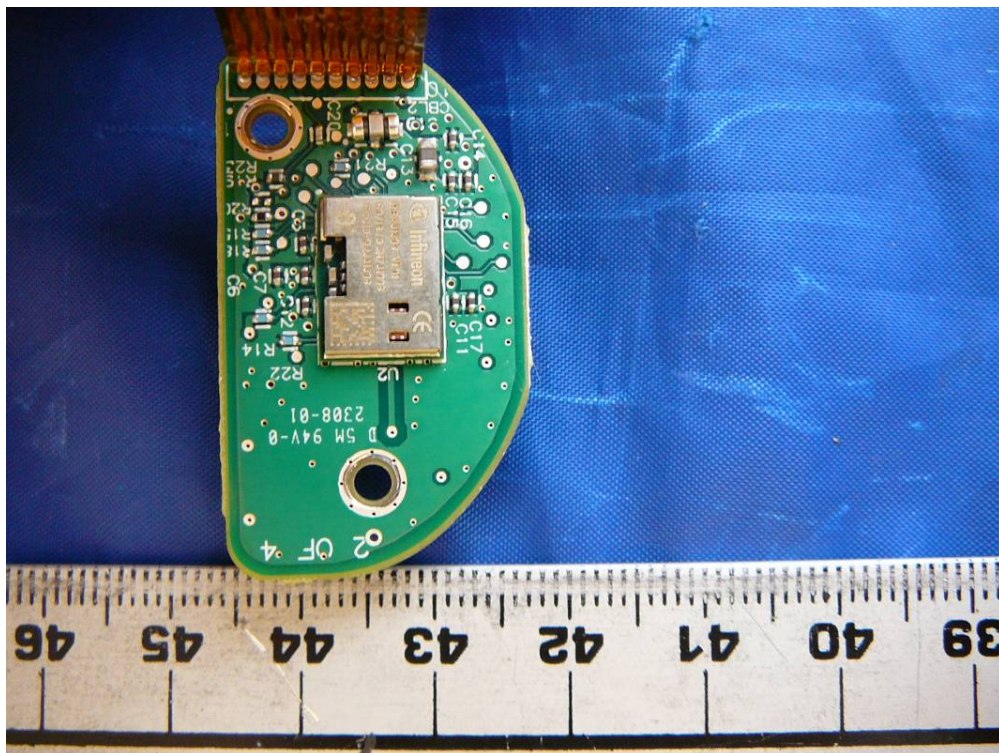
8.2 EUT- Rear View



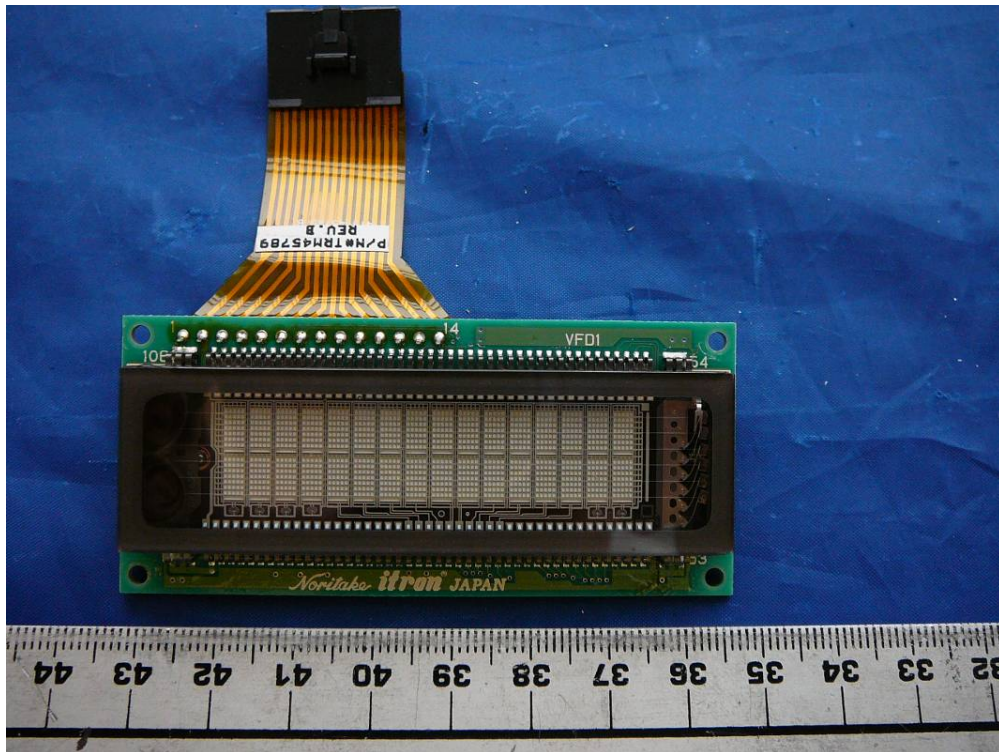
8.3 EUT- RF Module Board Component View



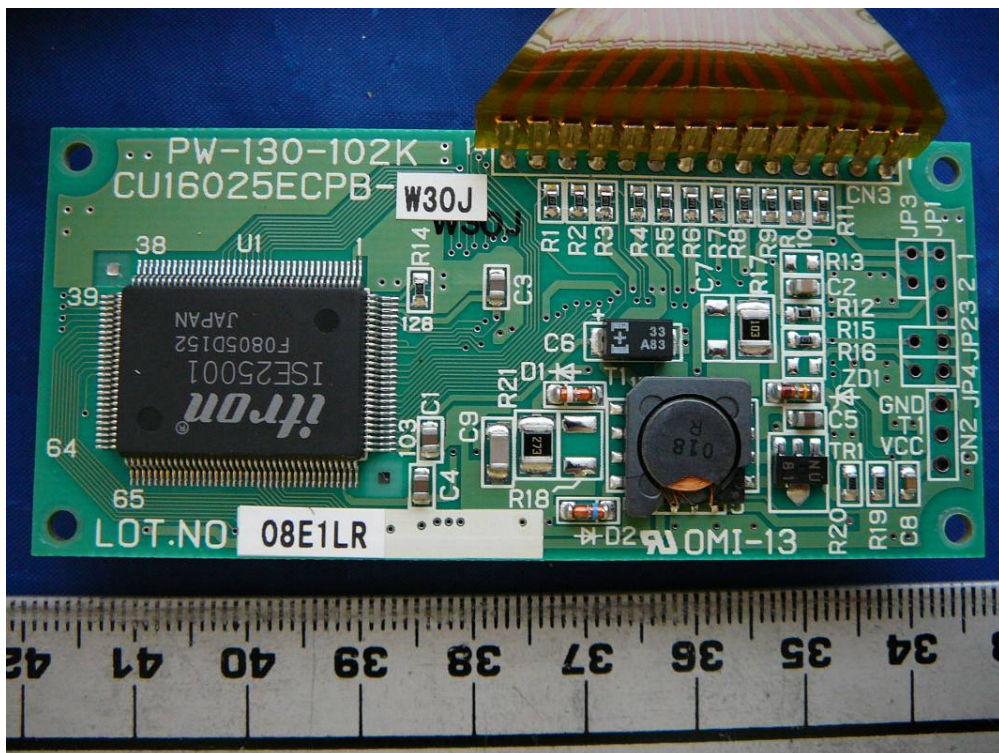
8.4 EUT- Bluetooth Board Component View



8.5 EUT- Display Board Solder View



8.6 EUT- Display Board Component View



8.7 EUT- Battery Pack



8.8 5dBi Whip Antenna



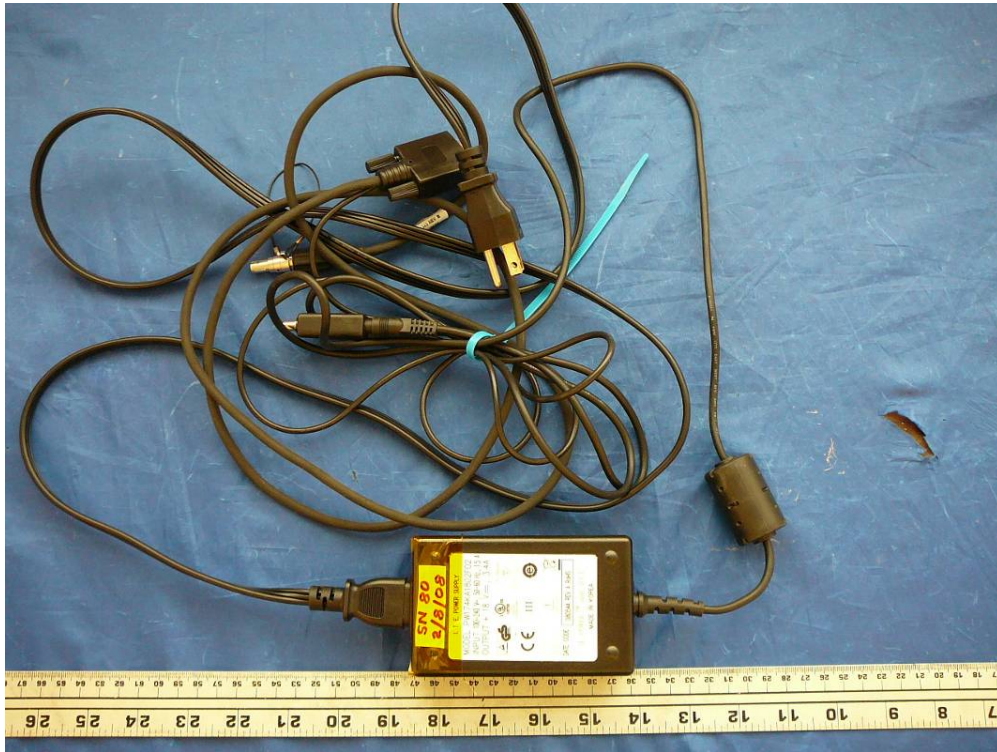
8.9 3dBi Whip Antenna



8.10 2dBi Dipole Antenna



8.11 EUT- Power Supply View 1



8.12 EUT- Power Supply View 2



8.13 EUT- Adapter



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