Lab Code: 200167-0

FCC PART 15.249

Industry Canada RSS-210, Issue 7, June 2007

MEASUREMENT AND TEST REPORT

For

Electronics Solutions, Inc.

1355 Horizon Ave. Lafayette
CO 80026, USA

FCC ID: P7RDBMZ01
IC: 7206A-DBMZ

Report Type:	**Product Type:**
☒ Original Report	Zwave Based Motor Controller

Test Engineer:	Xiao Ming Hu
Report Number:	R0710313
Report Date:	2007-11-16
Reviewed By:	Choon Sian Ooi, Test Engineer
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1 GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

This measurement and test report has been compiled on behalf of the company *Electronics Solutions, Inc.* and their product model: DBMZ, FCC ID: P7RDBMZ01, IC: 7206A-DBMZ which will be henceforth in this report referred to as the EUT (Equipment under Test).

The DBMZ connects 7-40VDC power to a 2-wire motor via the 2-conductor connector using two relays actuated by an Atmel ATtiny44 microcontroller. The microcontroller receives motor commands through a serial data link to ZM3102 Z-Wave module, or through two momentary tactile switches, one labeled "open" and the other labeled "close".

The ZM3102N Z-Wave Module is a fully integrated RF communication module that uses the unlicensed Short-Range-Device (SRD) frequency band of 902MHz-928MHz in US. The ZM3102N is dedicated for wireless control and monitoring of residential products like lighting and appliance control, energy management, access control, security and building automation.

** All test data gathered is from a production sample, serial number: B1392, B1394 and B1395, assigned by BACL.*

1.2 Mechanical Description

The EUT is a Zwave based motor controller of plastic construction that measures approximately 98mm (L) x 52 mm (W) x 22 mm (H) and weighs approximately 277 g. It is typically powered by 24VDC with AC Adapter.

1.3 EUT Photo

Please see additional photos in exhibit C

1.4 Objective

This type approval report is prepared on behalf of Electronics Solutions, Inc. in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules, as well as IC RSS-210, Issue 7, June 2007, Low-Power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment.

The objective is to determine compliance with FCC rules for section 15.203, 15.205, 15.207, 15.209 and 15.249, and the RSS-210 standard.

1.5 Related Submittal(s)/Grant(s)

No Related Submittals

1.6 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.7 Measurement Uncertainty

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

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

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

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

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

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464, IC registration number: 3062A, and VCCI Registration Number: C-2463 and R-2698. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

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

2 SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2003.

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

2.2 EUT Exercise Software

None.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Special Accessories

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

2.5 Local Support Equipment

Manufacturer	Description	Model	Serial Number	FCC ID
Electronic Solutions Inc	48 ohm resist load	/	/	/

2.6 Remote Support Equipment

Manufacturer	Description	Model	Serial Number	FCC ID
/	/	/	/	/

2.7 Power Supply Information

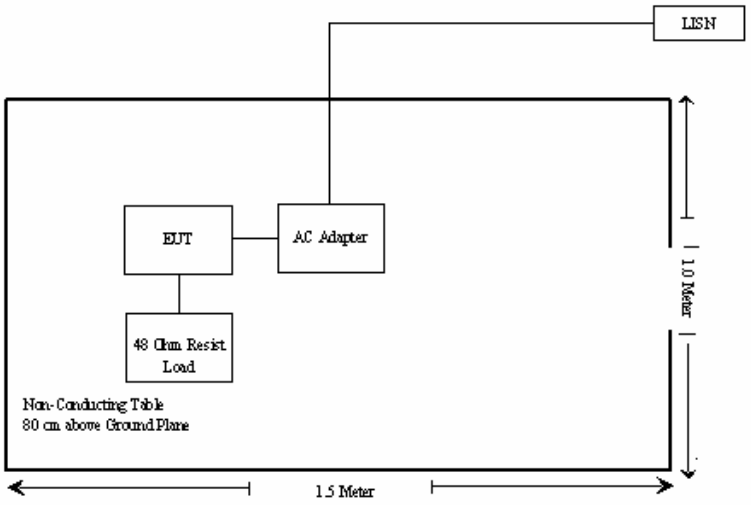
Manufacturer	Description	Model	Serial Number	FCC ID
PHIHONG	AC power adapter	PSC60W-240	P711272212D	/

2.8 External I/O Cabling List and Details

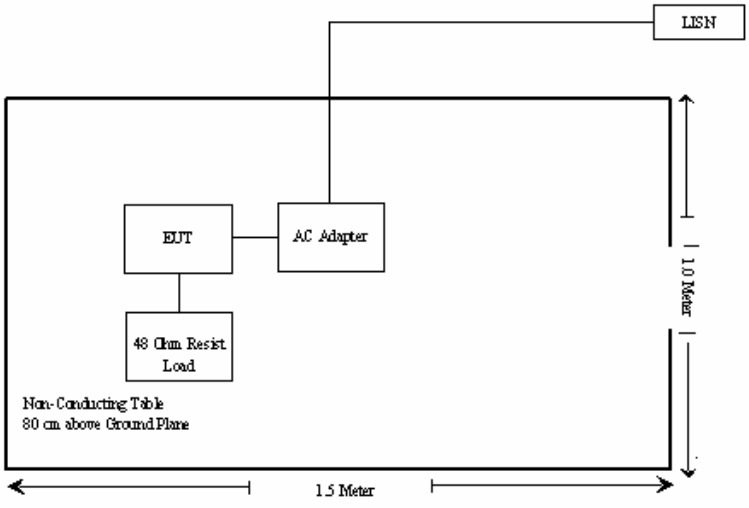
Cable Description	Length (M)	Port/From	To
/	/	/	/

2.9 Test Setup Block Diagrams

2.9.1 Conducted Emission



2.9.2 Radiated



3 SUMMARY OF TEST RESULTS

Results reported relate only to the product tested.

FCC Rules	Description of Test	Result
§15.203 & RSS-Gen 7.1.4	Antenna Requirement	Compliant
§15.207(a) & RSS-Gen 7.2.2	Conduction Emissions	Compliant
§15.205(a), §15.209(a) §15.249(a), §15.249(d) & RSS-210 2.2; 2.7 and A2.9	Restricted Bands & Spurious Radiated Emissions	Compliant
§15.109 & RSS-210 2.6	Receiver Spurious Emission	Compliant
RSS-210 A8.1	20dB Bandwidth & 99% Bandwidth	Compliant

4 FCC §15.203 & RSS-Gen 7.1.4 - ANTENNA REQUIREMENT

4.1 Applicable Standard

According to § 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 § 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 RSS-Gen 7.1.4, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be 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.

4.2 Antenna Connector Construction

The EUT antenna is integrated into the PCB construction, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

Result: Compliant.

5 FCC §15.207 & RSS-Gen 7.2.2 – AC LINE CONDUCTED EMISSIONS

5.1 FCC Section 15.207 and RSS-Gen 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.

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

** Decreases with the logarithm of the frequency.*

5.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.4 – 2003 measurement procedure. The specification used was FCC Class B limits.

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

The EUT was connected with LISN-1 as powered by connection to 120 V/ 60 Hz AC mains

5.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950 K03	100337	2007-03-08
Solar Electronics Co.	LISN	9252-50-R-24-N	0511213	2007-07-31

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

5.4 Test Procedure

During the conducted emissions test, the power cord of the EUT was connected to the mains outlet of the LISN-1.

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".

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	41 %
ATM Pressure:	101.5 kPa

**The testing was performed by Xiao Ming Hu on 2007-11-13.*

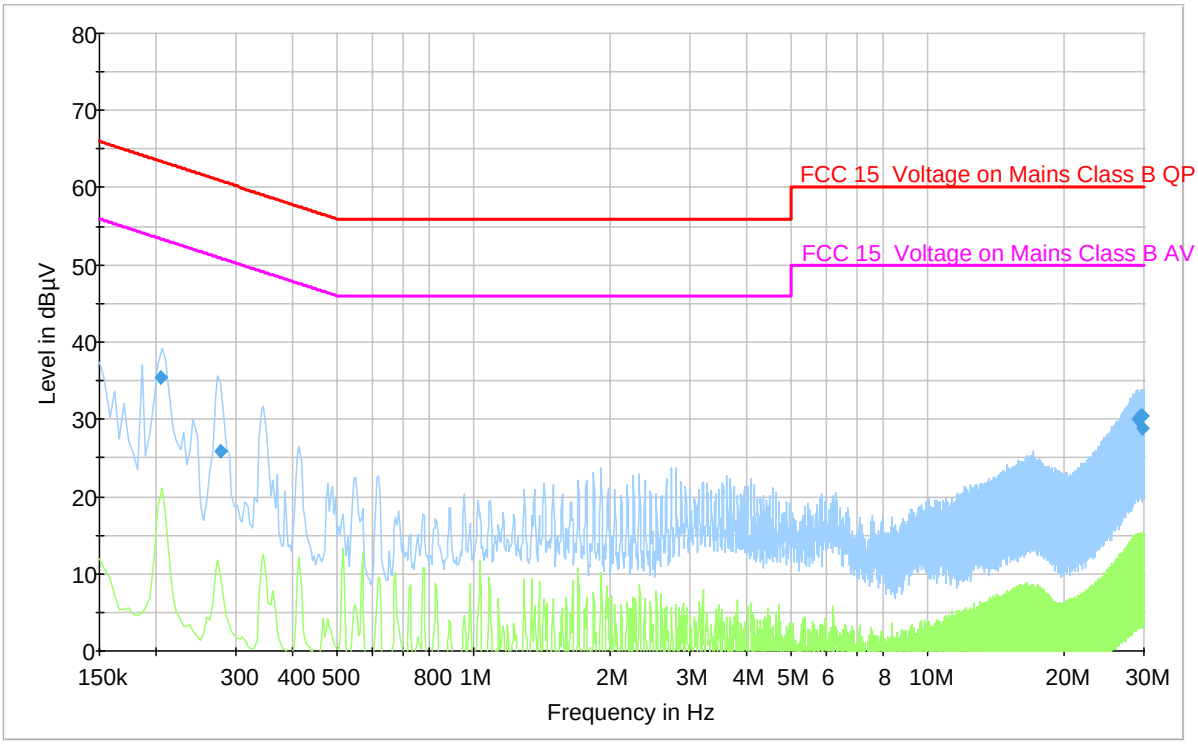
5.5 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC rules and IC standards conducted emissions limits for Class B devices, with the *worst* margin reading of:

Connection: 120 V/60 Hz AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Hot/Neutral)**	**Range (MHz)**
-26.8	17.578000	Neutral	0.150 MHz to 30 MHz

Conducted Emissions Test Plots and Data

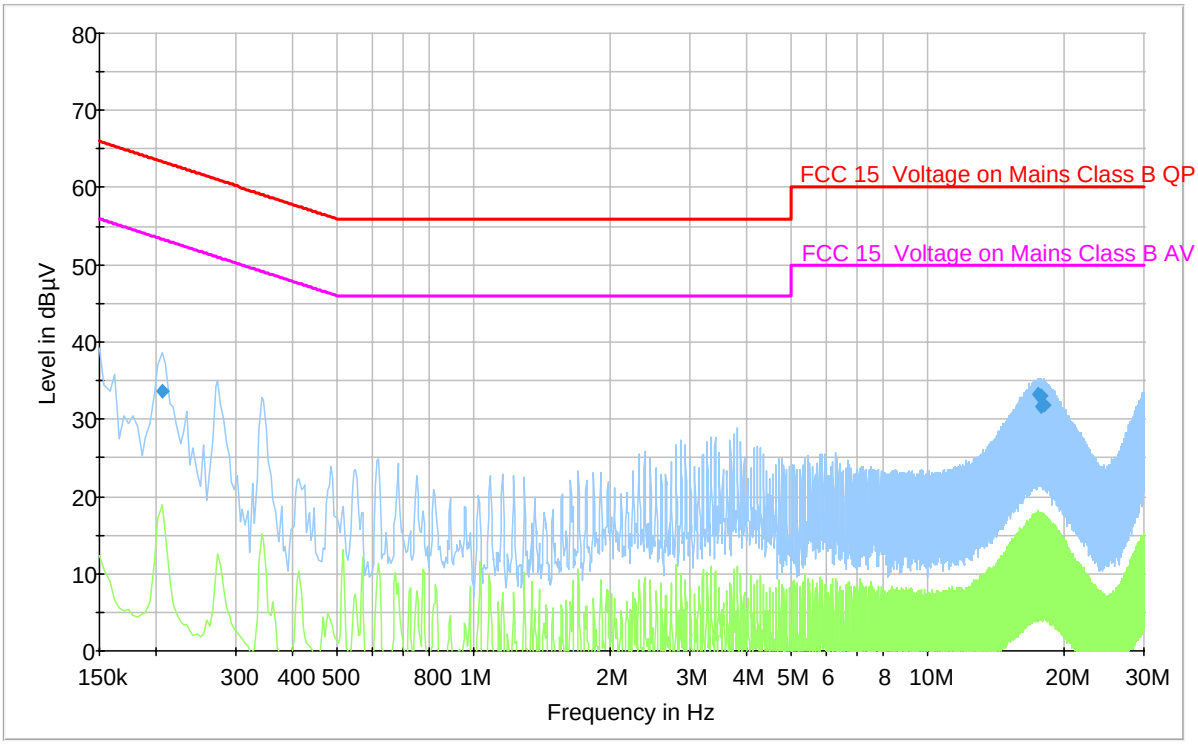
120 V, 60 Hz - Hot



Quasi-Peak Measurements

Frequency (MHz)	Quasi-peak (dBµV)	Conduction (Hot/ Neutral)	Limit (dBµV)	Margin (dB)
0.205000	35.3	Hot	63.4	-28.1
29.429000	30.4	Hot	60.0	-29.6
29.701000	30.4	Hot	60.0	-29.6
29.017000	30.1	Hot	60.0	-29.9
29.841000	28.9	Hot	60.0	-31.1
0.277000	26.0	Hot	60.9	-35.0

120 V, 60 Hz – Neutral



Quasi-peak Measurements

Frequency (MHz)	Quasi-peak (dBµV)	Conduction (Hot/ Neutral)	Limit (dBµV)	Margin (dB)
17.578000	33.2	Neutral	60.0	-26.8
17.714000	33.1	Neutral	60.0	-26.9
17.782000	33.0	Neutral	60.0	-27.0
18.126000	31.9	Neutral	60.0	-28.1
17.854000	31.7	Neutral	60.0	-28.3
0.206000	33.7	Neutral	63.4	-29.6

6 FCC §15.205 §15.209(a) §15.249(a) §15.249 & RSS-210 2.2; 2.7 and A 2.9 – RESTRICTED BANDS & SPURIOUS RADIATED EMISSIONS

6.1 Applicable Standard

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

As Per 15.249(a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation

6.2 Test Setup

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

6.3 EUT Setup

The radiated emissions tests were performed using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15C 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.

6.4 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Amplifier, Pre (.1~1300MHz)	8447D	2944A10198	2007-01-20
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950 K03	100337	2007-03-08
DRG	Horn Antenna	SAS-200/571	261	2006-04-20*
Sunol Sciences	30MHz~2GHz Antenna	JB1	A03105-3	2007-03-15
Agilent	Spectrum analyzer	8565EC	3946A00131	2007-01-24
Agilent	Pre amplifier	8449B	3008A01978	2007-08-21

** Two years calibration cycle.*

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

6.5 Test Procedure

For the radiated emissions test, the EUT, 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 mete, 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 1000MHz:

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

Above 1000MHz:

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

Corrected Amplitude & Margin Calculation

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

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

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

Margin = Corrected Amplitude - FCC Limit

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	41 %
ATM Pressure:	101.5 kPa

Testing was performed by Xiao Ming Hu on 2007-11-12.

6.6 Summary of Test Results

According to the data hereinafter, the EUT complied with the limits presented in FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.249, and had the worst margin of:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Test Range (GHz)**
-16.2	2725.2	Vertical	1 GHz – 10 GHz

6.7 Radiated Emissions data:

Measured at 3 meters

Frequency (MHz)	Meter Reading (dBuV)	Detector PK/QP/AV	Azimuth Degree	Height (m)	Polar. H / V	Antenna Factor (dB/m)	Cable loss (dB)	Pre-Amplifier Gain (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.249/15.209		
										15.209 limit (dBuV/m)	Margin (dB)	Comment
908.4000	82.7	QP	176	1.0	v	22.6	2.4	27.1	80.6	94.0	-13.4	Fund.
908.4000	85.5	QP	270	1.0	h	22.6	2.4	27.1	83.4	94.0	-10.6	Fund.
2725.2	41.2	Ave	80.0	1.3	v	28.9	2.8	35.1	37.8	54.0	-16.2	Spurious
1816.8	42.8	Ave	362.0	1.0	v	24.8	2.5	35.9	34.3	54.0	-19.7	Spurious
2725.2	36.5	Ave	190.0	1.0	h	28.9	2.8	35.1	33.2	54.0	-20.8	Spurious
1816.8	41.2	Ave	195.0	1.0	h	24.8	2.5	35.9	32.6	54.0	-21.4	Spurious
3633.6	32.3	Ave	130.0	1.4	h	30.0	3.3	34.9	30.7	54.0	-23.3	Spurious
3633.6	32.3	Ave	362.0	1.0	v	30.0	3.3	34.9	30.7	54.0	-23.3	Spurious
2725.2	48.7	Peak	80.0	1.3	v	28.9	2.8	35.1	45.3	74.0	-28.7	Spurious
2725.2	47.0	Peak	190.0	1.0	h	28.9	2.8	35.1	43.7	74.0	-30.3	Spurious
3633.6	45.2	Peak	362.0	1.0	v	30.0	3.3	34.9	43.6	74.0	-30.4	Spurious
3633.6	45.2	Peak	130.0	1.4	h	30.0	3.3	34.9	43.6	74.0	-30.4	Spurious
1816.8	50.7	Peak	362.0	1.0	v	24.8	2.5	35.9	42.1	74.0	-31.9	Spurious
1816.8	50.0	Peak	195.0	1.0	h	24.8	2.5	35.9	41.4	74.0	-32.6	Spurious

7 §15.109 & RSS-210 2.6: Receiver Spurious Emission

7.1 Applicable Standard

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of emission (MHz)	Field strength of fundamental (millivolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

7.2 Test Setup

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

7.3 EUT Setup

The radiated emissions tests were performed using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15C 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.

7.4 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Amplifier, Pre (.1~1300MHz)	8447D	2944A10198	2007-01-20
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950 K03	100337	2007-03-08
Sunol Science Corp	Combination Antenna	JB3 Antenna	A020106-3	2007-03-05

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

7.5 Test Procedure

For the radiated emissions test, the EUT, 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 mete, 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 1000MHz:

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

Corrected Amplitude & Margin Calculation

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

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

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

Margin = Corrected Amplitude - FCC Limit

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	41 %
ATM Pressure:	101.5 kPa

Testing was performed by Xiao Ming Hu on 2007-11-12.

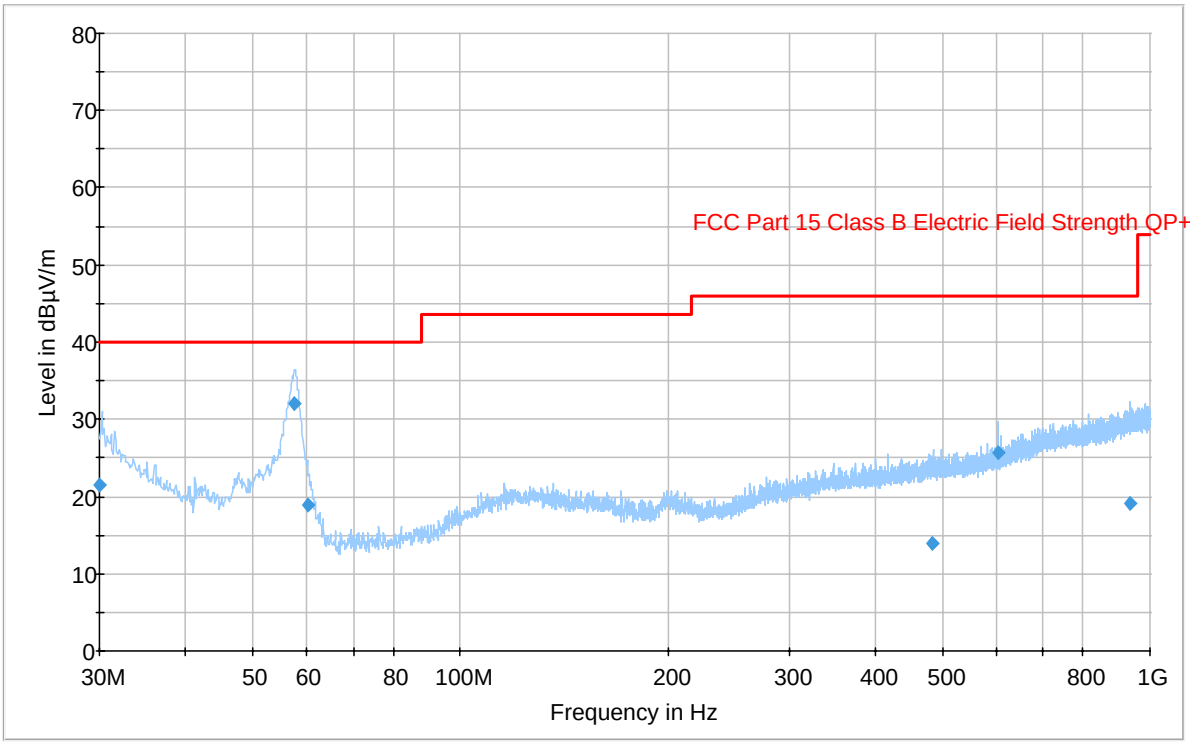
7.6 Summary of Test Results

According to the data hereinafter, the EUT complied with the limits presented in FCC Title 47, Part 15, Subpart C, section 15.109, and had the worst margin of:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Test Range (GHz)**
-8.0	57.583750	Vertical	30MHz-1GHz

7.7 Radiated Emissions data:

Measured at 3 meters



Quasi-Peak Measurements:

Frequency (MHz)	QuasiPeak (dBµV/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Limit (dBµV/m)	Margin (dB)
57.583750	32.0	159.0	V	174.0	40.0	-8.0
30.000000	21.4	122.5	V	46.0	40.0	-18.6
603.271250	25.7	238.8	H	125.0	46.0	-20.3
60.197500	18.9	190.8	V	162.0	40.0	-21.1
934.348750	19.2	150.2	V	98.0	46.0	-26.8
484.327500	14.0	303.7	H	264.0	46.0	-32.0

8 RSS-210§ A8.1 20dB Bandwidth & 99% Bandwidth

8.1 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emissions bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

8.2 Test Equipment

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum analyzer	E4446A	US44300386	2007-04-26

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

8.3 Environmental Conditions

Temperature:	20 °C
Relative Humidity:	41 %
ATM Pressure:	101.5 kPa

Testing was performed by Xiao Ming Hu on 2007-11-8.

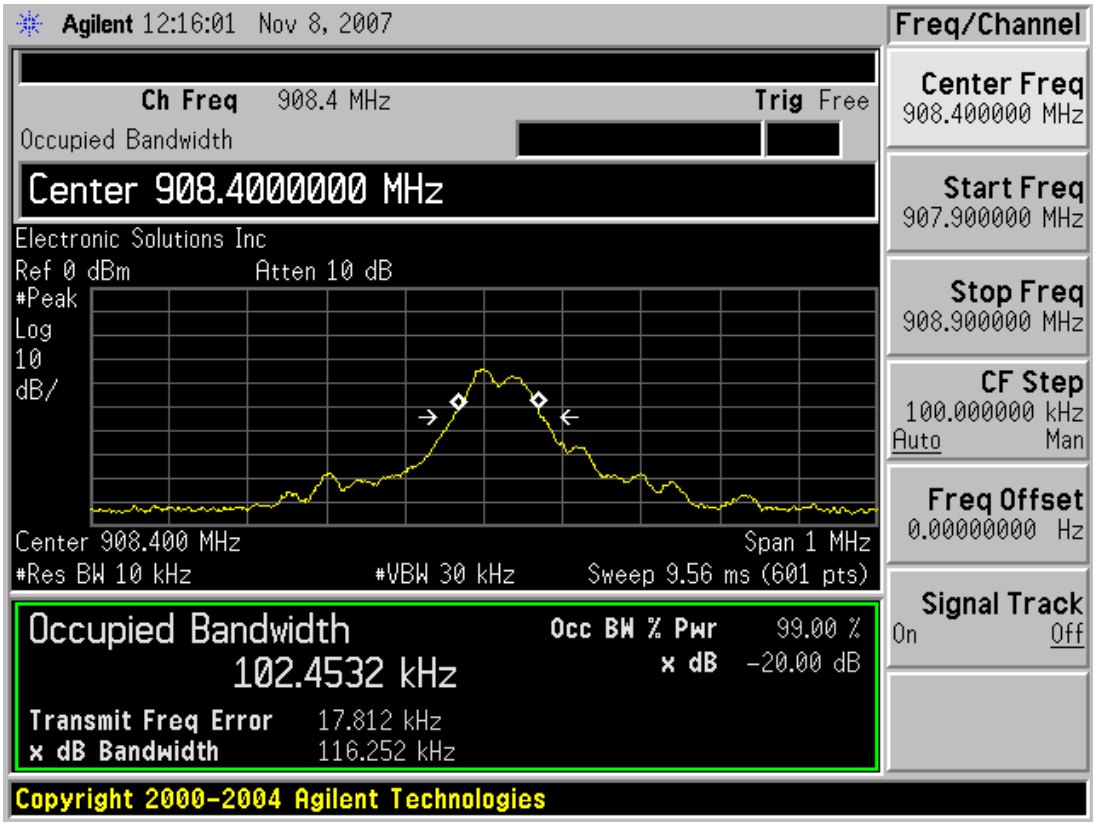
8.4 Measurement Result

Channel	Frequency MHz	20 dB Channel Bandwidth (kHz)	99% Channel Bandwidth (kHz)
Low	908.4	116.252	102.453

Please see the following plots

20 dB Channel Bandwidth (kHz)

908.4MHz



9 EXHIBIT A - FCC and IC EQUIPMENT LABEL INFORMATION

9.1 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

9.2 ID Label 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.

(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.

As per FCC §15.17 (b)(4), the label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase, as described in Section 2.925(d) of this chapter. "Permanently affixed" means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

9.3 IC Certified Terminal Equipment Label

IC: 7206A-DBMZ

9.4 Label Specification:

IC: XXXXXX-YYYYYYYY Where:

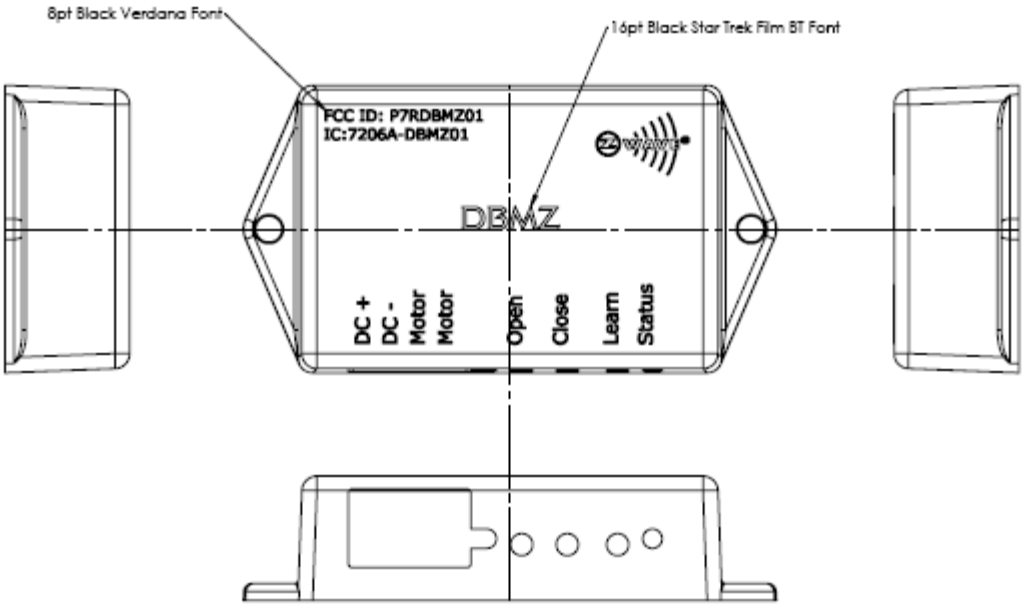
- "XXXXXX-YYYYYYYY" is the certification number
- "XXXXXX" is the Certificate Holder Number (CHN), made of at most 6 alphanumeric characters (A-Z, 0-9), assigned by Industry Canada; and
- "YYYYYYYY" is the Unique Product Number (UPN), made of at most 8 alphanumeric characters (A-Z, 0-9) assigned by the 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.

9.5 Specifications: As per RSS GEN 5.2 Equipment Labeling:

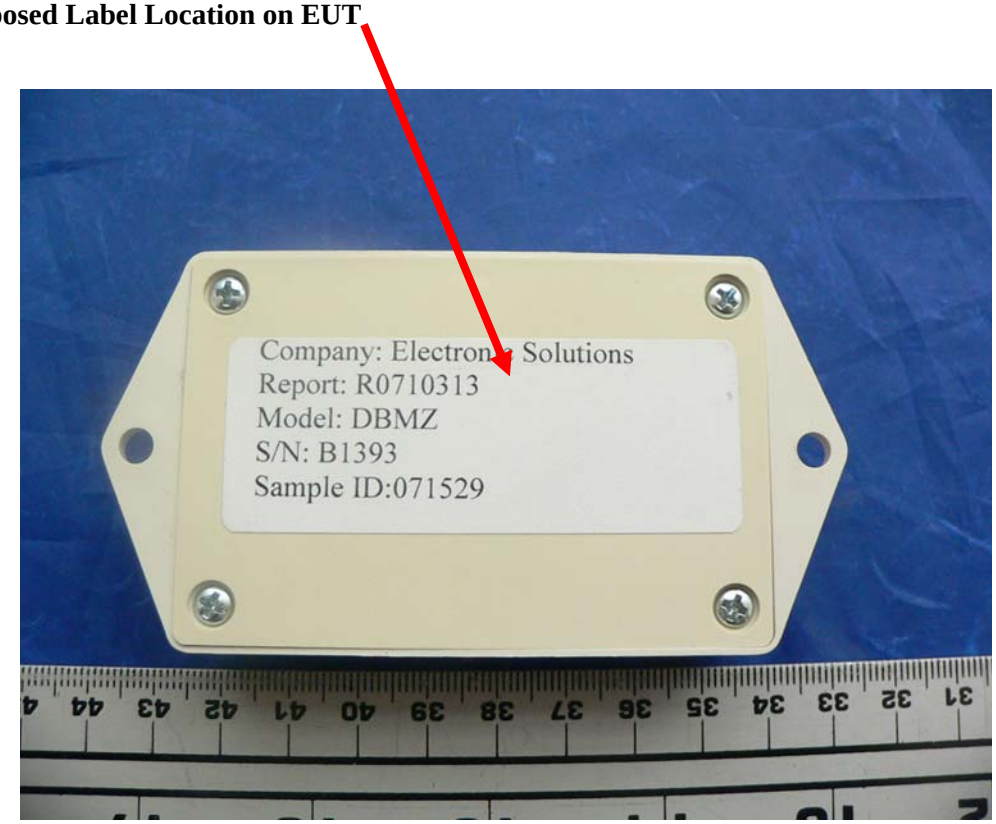
Equipment subject to certification under the applicable RSSs, shall be permanently labeled on each item, or as an inseparable combination. The label must contain the following information for full compliance:
(a) the certification number, prefixed by the term “IC:”;
(b) the manufacturer's name, trade 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.

9.6 ID Label Drawing from the Manufacturer



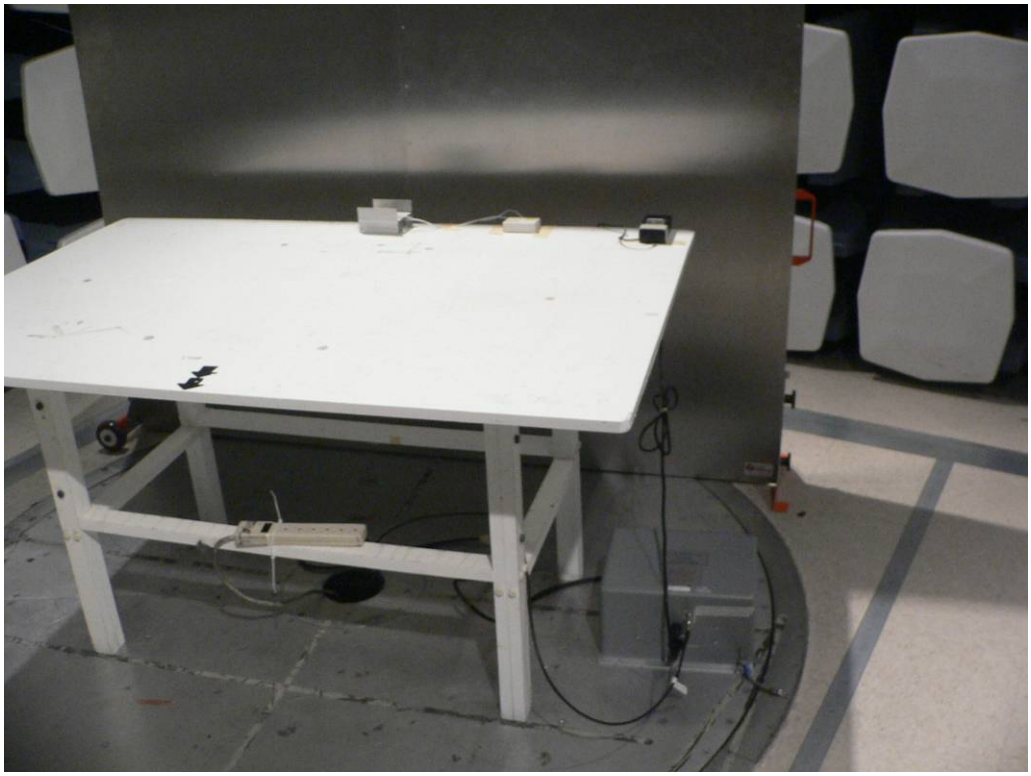
Please refer to following labeling position photo

9.7 Proposed Label Location on EUT



10 EXHIBIT B - TEST SETUP PHOTOGRAPHS

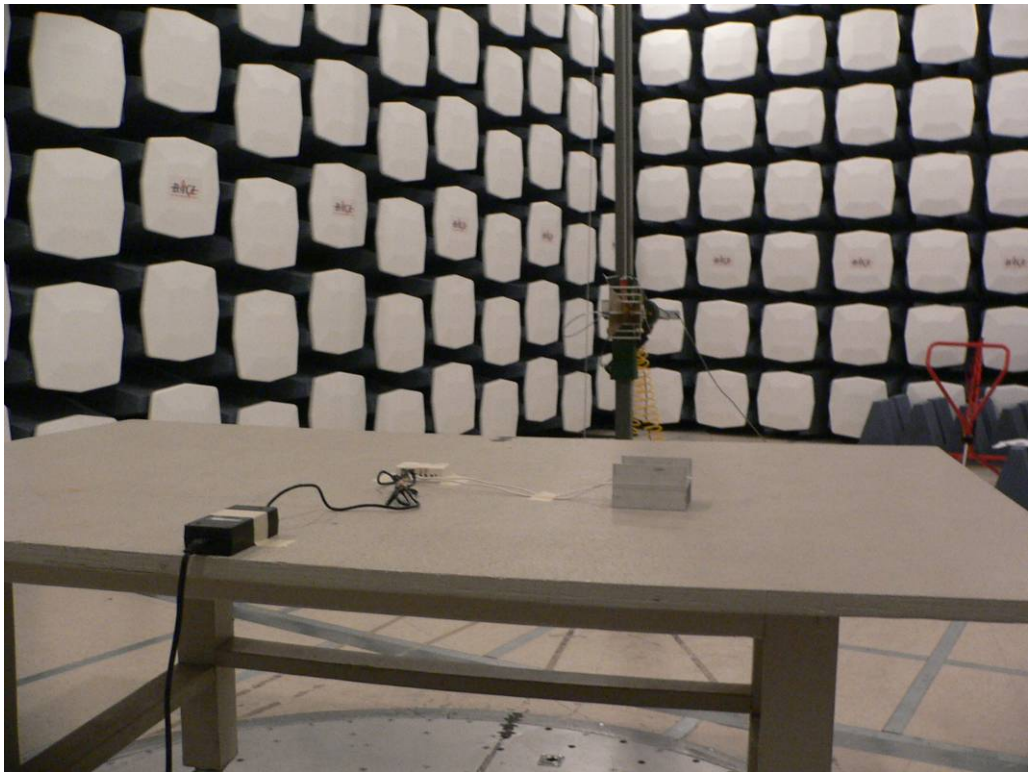
10.1 Conducted Emissions –Front View



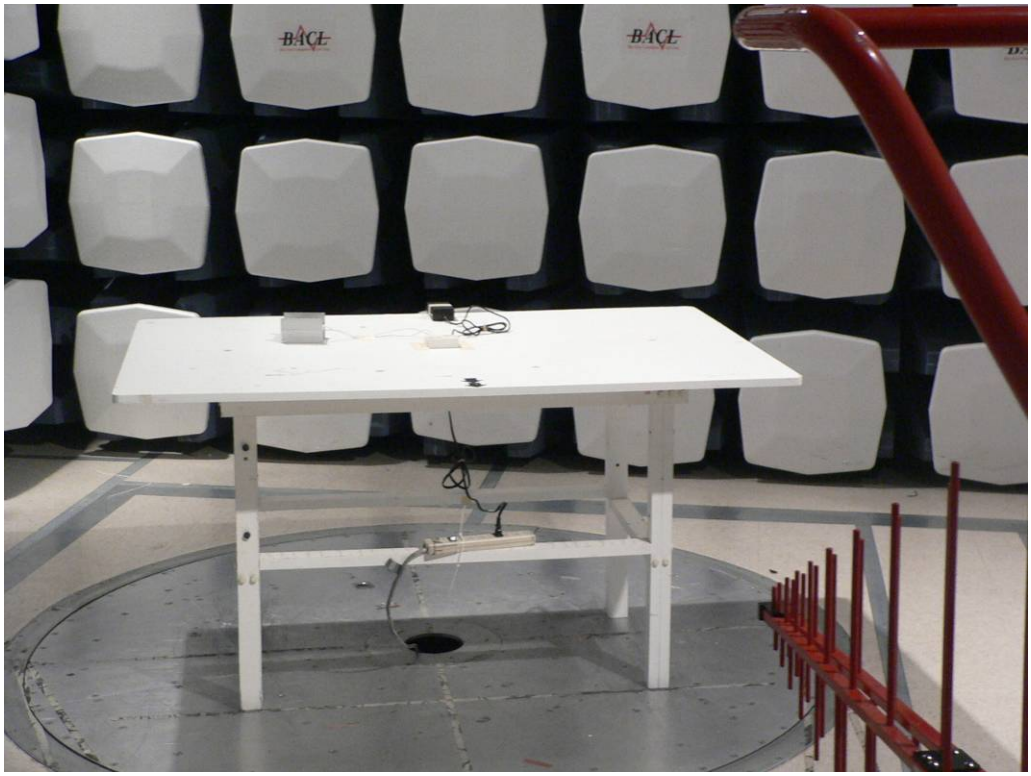
10.2 Conducted Emissions – Side View

10.3 Radiated Spurious Emissions – Front View

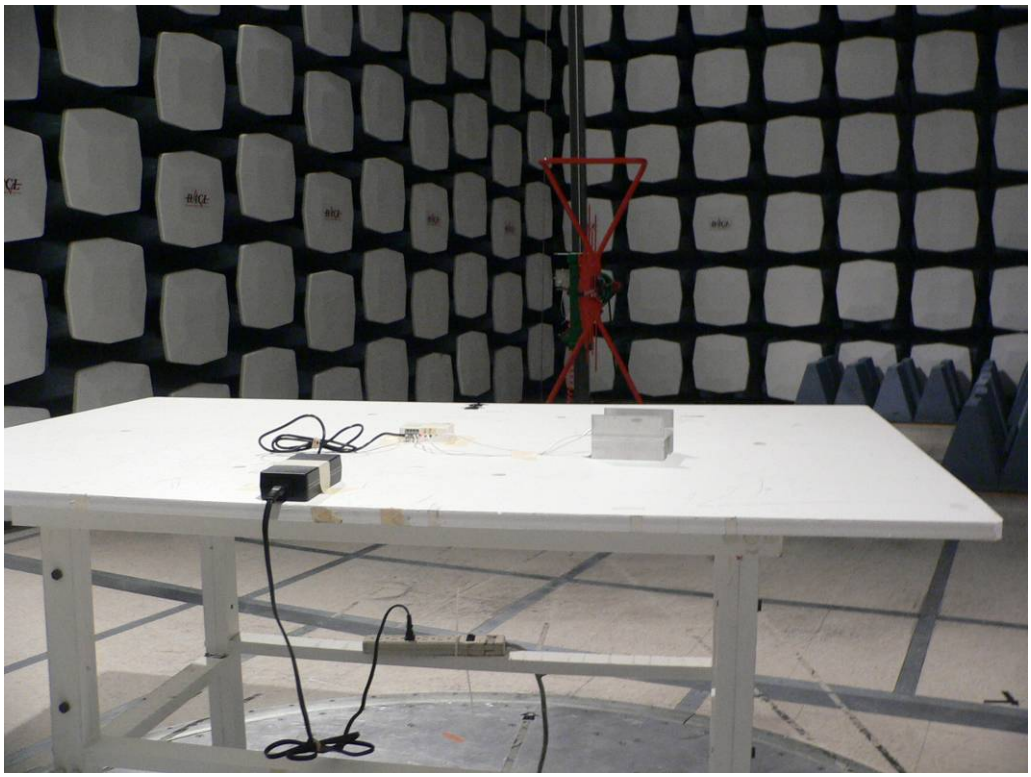
10.4 Radiated Spurious Emissions – Rear View



10.5 Receiver Spurious Emissions – Front View



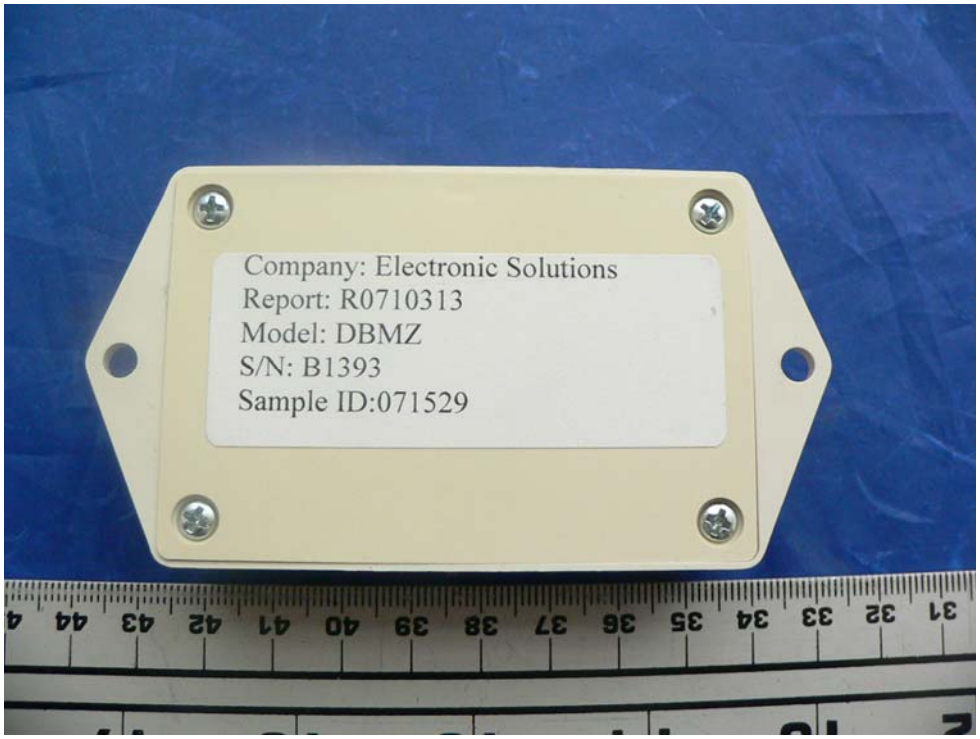
10.6 Receiver Spurious Emissions – Rear View



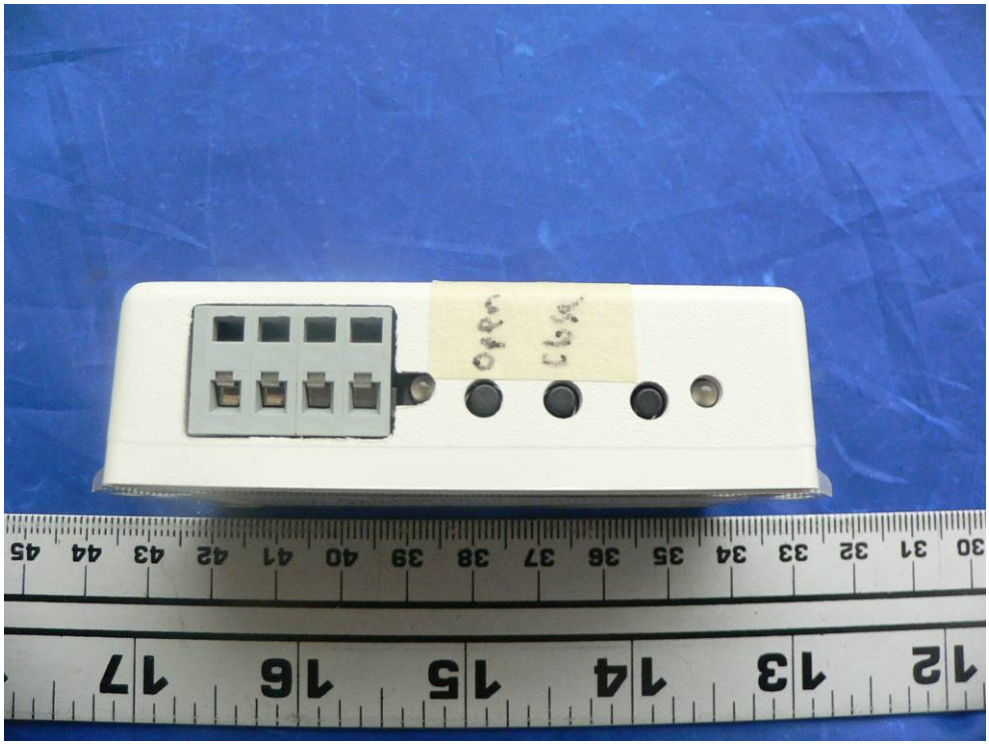
11 EXHIBIT C - EUT PHOTOGRAPHS

11.1 EUT Front View

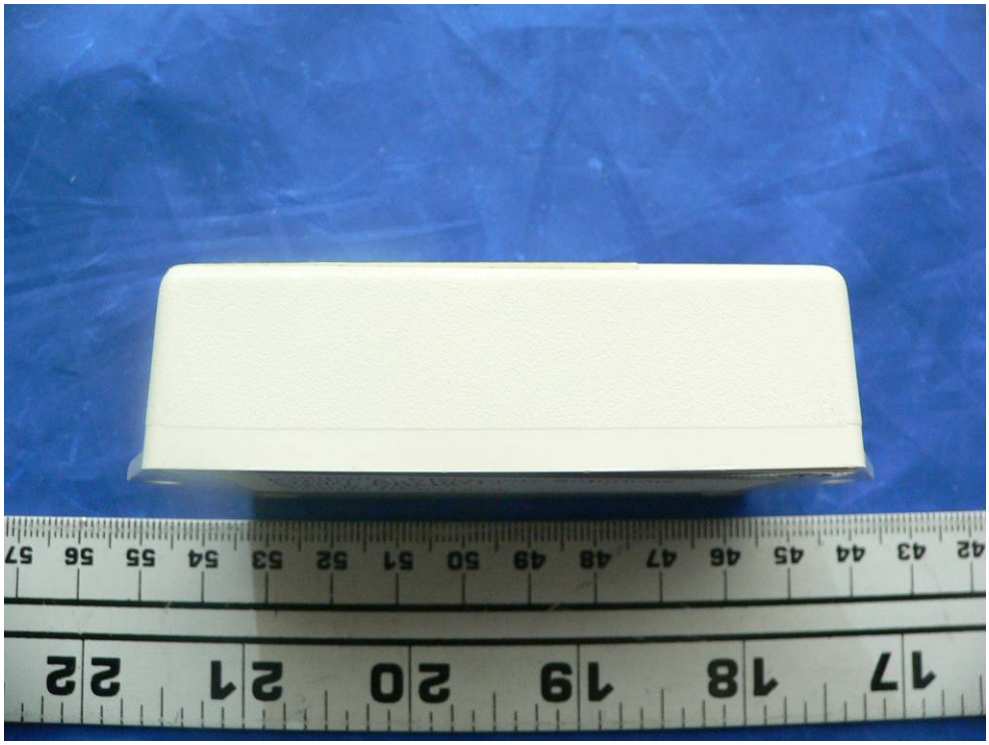
11.2 EUT Rear View



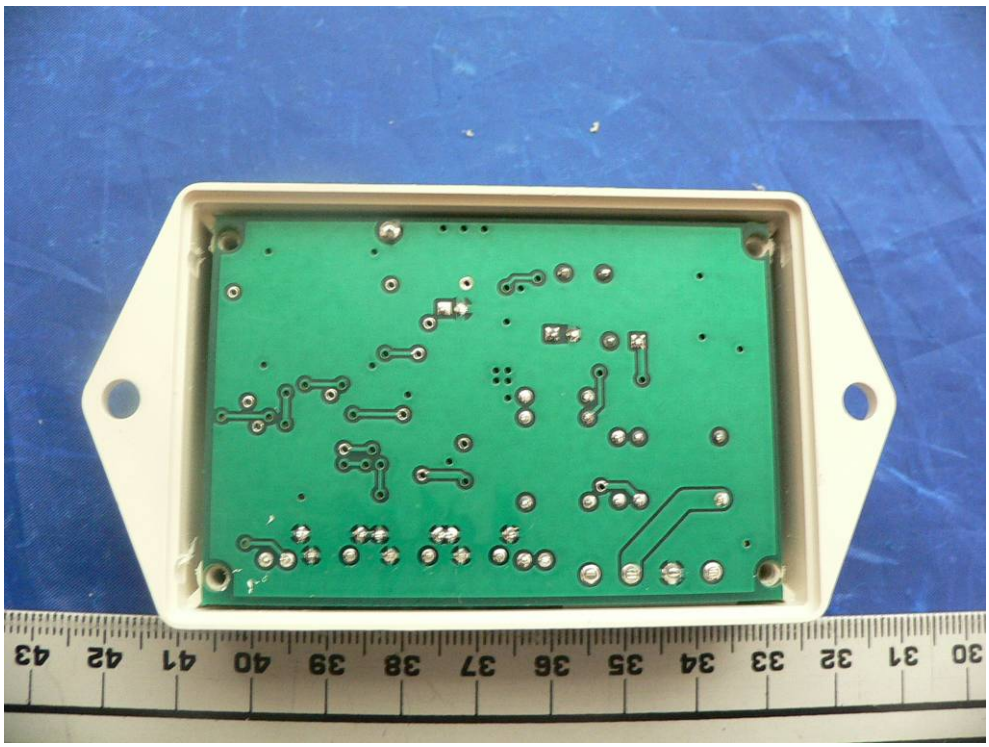
11.3 EUT Left side View



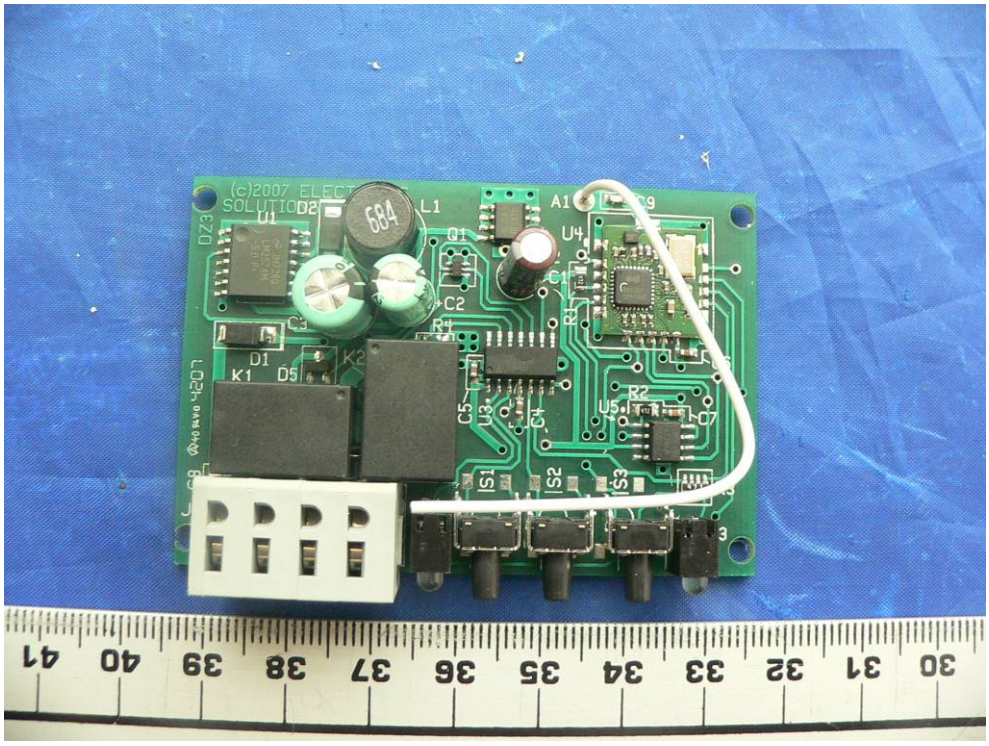
11.4 EUT Right side View



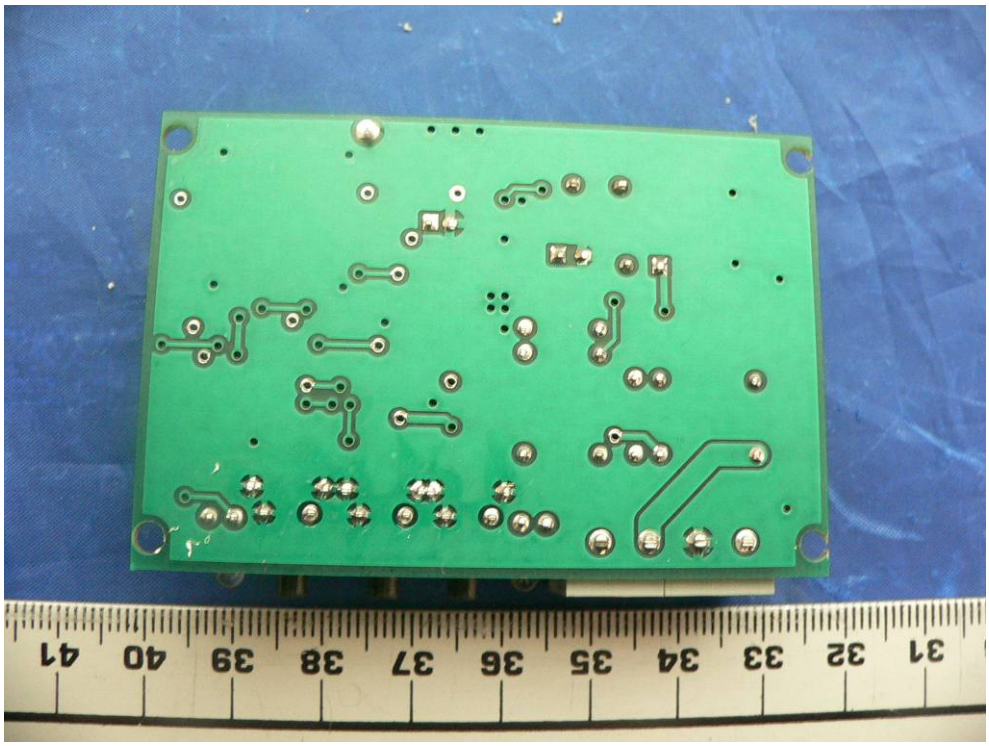
11.5 EUT Cover off View



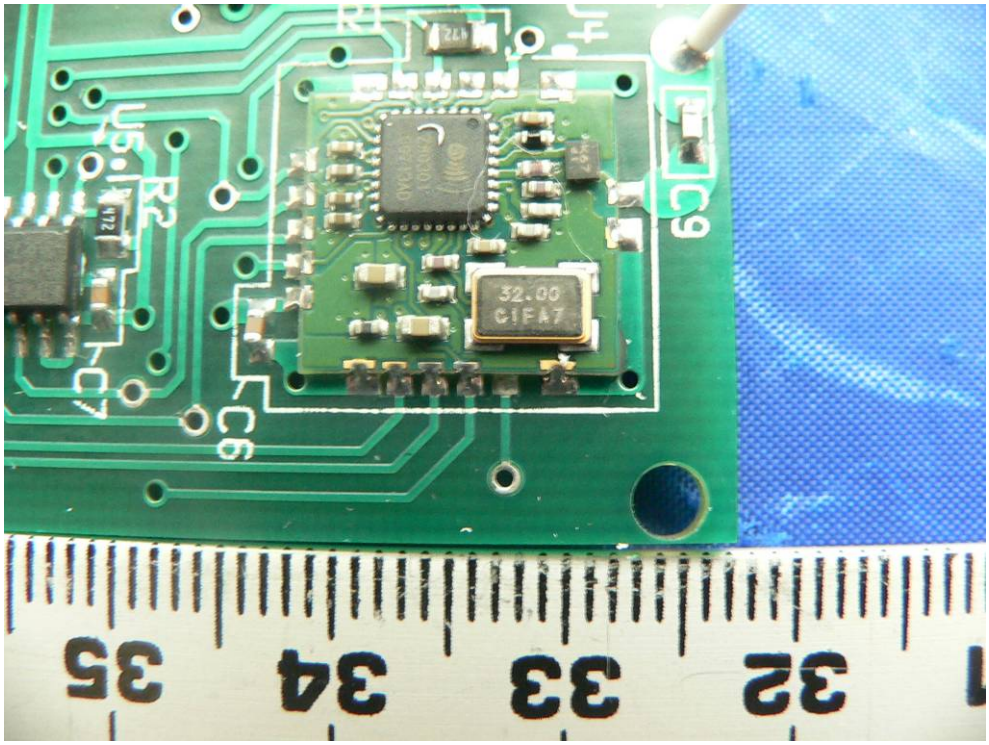
11.6 EUT Components View



11.7 EUT Solder View



11.8 RF Modular View



END OF REPORT