FCC Part 15B

Measurement and Test Report

For

KAPSYS

790 AVENUE DU DOCTEUR MAURICE DONAT – 06250 - MOUGINS –

SOPHIA ANTIPOLIS – FRANCE

Report Concerns: Original Report	**Equipment Type:** KAPTEN MOBILITY
Model:	301
Report No.:	STR11108117E-3
Test Date:	2011-10-18 to 2011-11-07
Issue Date:	2011-11-08
Tested By:	Vigoss Xiong/ Engineer
Reviewed By:	Lahm Peng / EMC Manager
Approved & Authorized By:	Jandy so / PSQ Manager
Prepared By:	**SEM.Test Compliance Service Co., Ltd** 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C.（518101） Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: KAPSYS

Address of applicant: 790 AVENUE DU DOCTEUR MAURICE DONAT – 06250 - MOUGINS – SOPHIA ANTIPOLIS – FRANCE

Manufacturer: MAG Digital Limited

Address of manufacturer: F.2 Buiding, Honghualing- North Zone, LiuxianRd., XiliTown, NanshanDist., Shenzhen, P.R.China

General Description of E.U.T

Items	Description
EUT Description:	KAPTEN MOBILITY
Trade Name:	KAPSYS
Model No.:	301
Rated Voltage:	DC 5V
Rated Current:	150mA

The test data is gathered from a production sample, provided by the manufacturer.

1.2 Test Standards

The following report is prepared on behalf of the KAPSYS in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.107, and 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

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

The equipment under test (EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

- **FCC – Registration No.: 994117**
  SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**
  The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**
  Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

1.5 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components.

1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	IBM	1843	LV14893 06/04

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	Shielded	Without Core
Earphone Cable	1.2	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.107 (a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

3. §15.107 (a) CONDUCTED EMISSIONS

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

3.2 Test Equipment List and Details

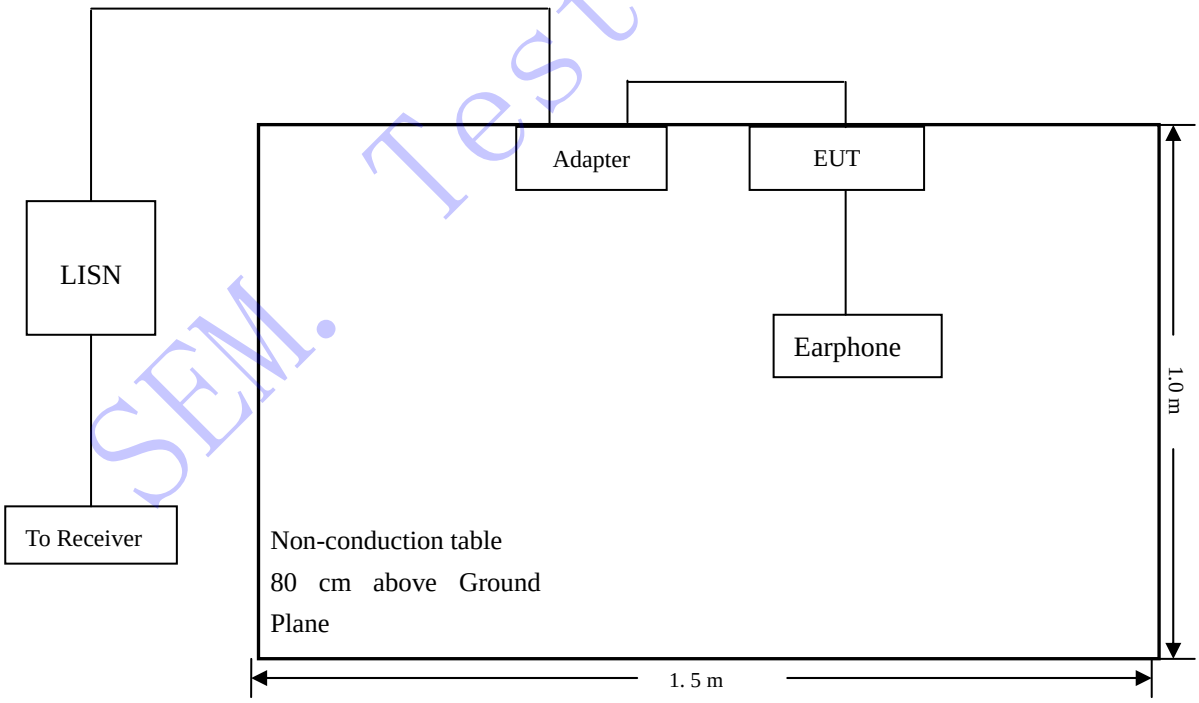
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2010-12-20	2011-12-19
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2010-12-20	2011-12-19
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2010-12-20	2011-12-19

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

3.3 Test Procedure

Test is conducting under the description of ANSI C63.4-2009, 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.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the FCC Part 15.107 Conducted margin for a Class B device, with the *worst* margin reading of:

-5.62 dBµV at **0.382 MHz** in the **Line**, **Receiving** Mode, **Qp** detector, 0.15-30MHz
-4.50 dBµV at **0.338 MHz** in the **Line**, **Downloading** Mode, **Ave** detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

Conducted Disturbance

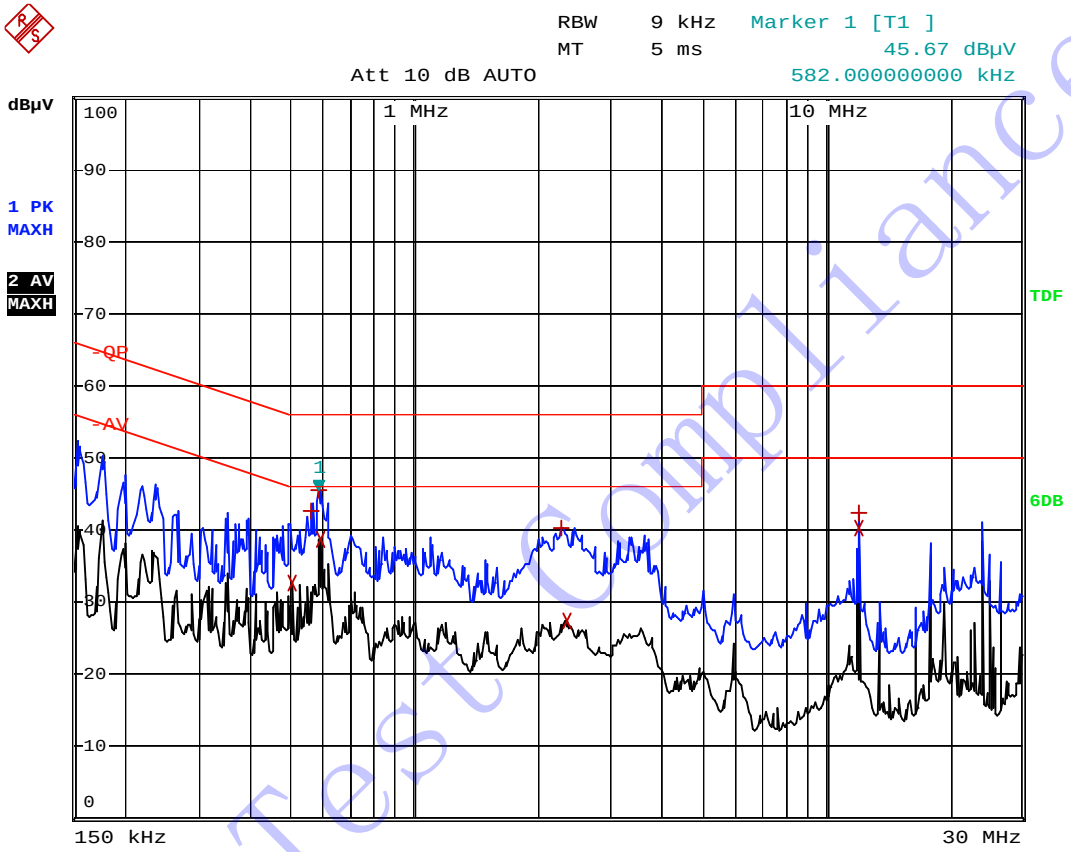
EUT: KAPTEN MOBILITY

M/N: 301

Operating Condition: Receiving (Receiving the GPS signal)

Test Specification: N

Comment: 120V/60Hz; USB 5V



EDIT PEAK LIST (Prescan Results)

Trace1: -QP
Trace2: -AV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	502 kHz	32.60	-13.39
1	Max Peak	562 kHz	42.70	-13.29
1	Max Peak	582 kHz	45.66	-10.33
2	Average	590 kHz	38.77	-7.22
1	Max Peak	2.278 MHz	40.40	-15.59
2	Average	2.366 MHz	27.53	-18.46
1	Max Peak	11.994 MHz	42.44	-17.55
2	Average	11.994 MHz	40.35	-9.64

Plot of Conducted Emissions Test Data

Conducted Disturbance

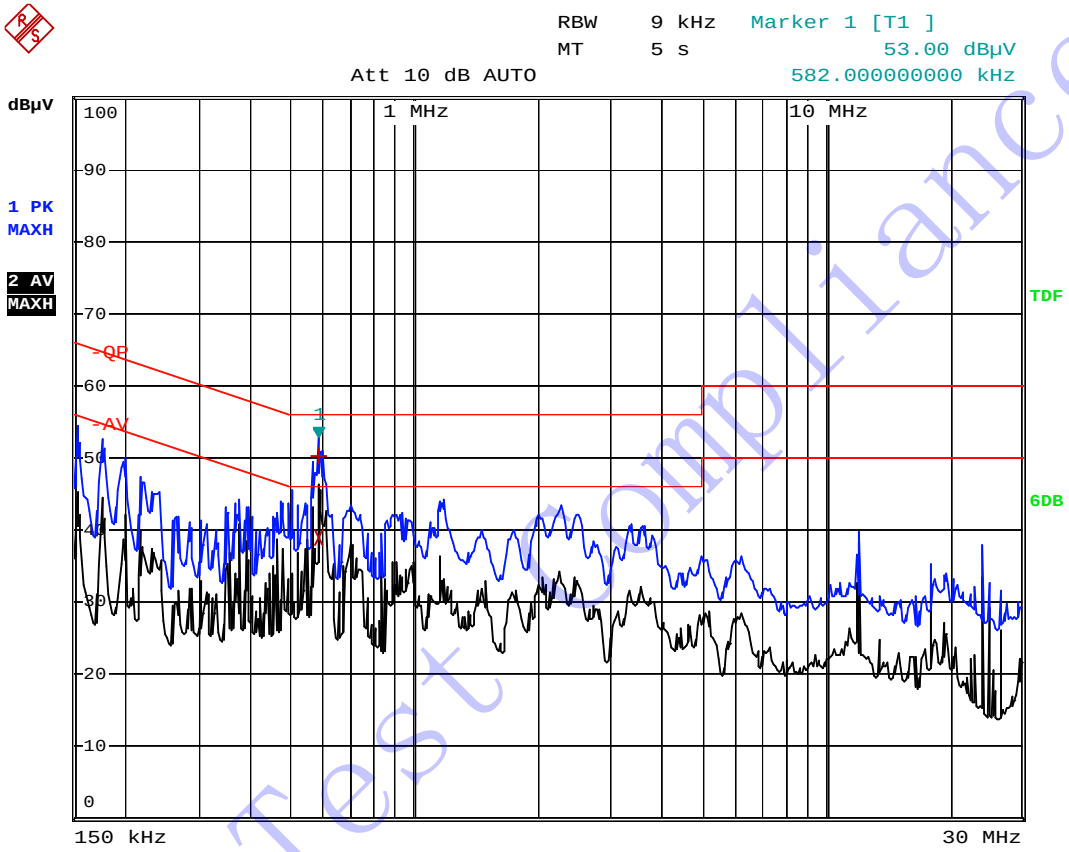
EUT: KAPTEN MOBILITY

M/N: 301

Operating Condition: Receiving (Receiving the GPS signal)

Test Specification: L

Comment: 120V/60Hz; USB 5V



EDIT PEAK LIST (Final Measurement Results)

Trace1: -QP
Trace2: -AV
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	582 kHz	50.37	-5.62
2 Average	582 kHz	39.06	-6.93

Plot of Conducted Emissions Test Data

Conducted Disturbance

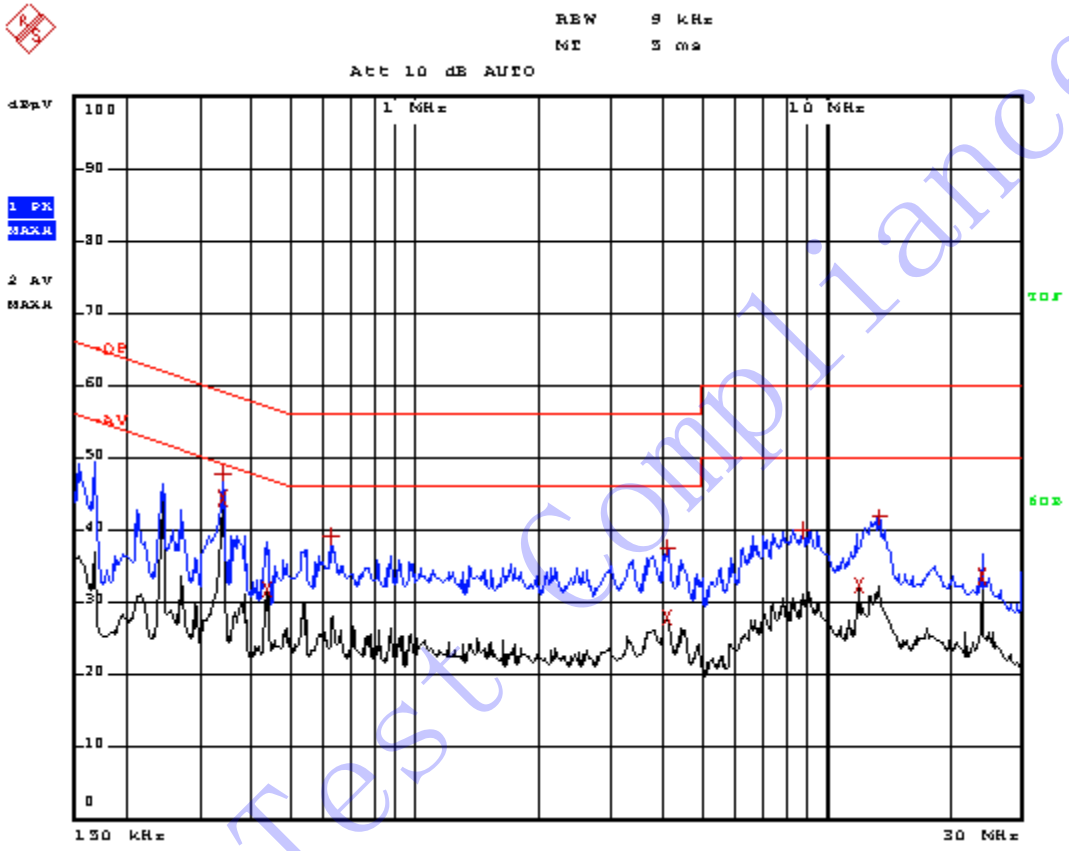
EUT: KAPTEN MOBILITY

M/N: 301

Operating Condition: Downloading (Reading and Writing the TF card via the PC)

Test Specification: N

Comment: 120V/60Hz; USB 5V



EDIT PEAK LIST (Prescan Results)

Trace1: -QP
Trace2: -AV
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	338 kHz	47.79	-11.46
2 Average	338 kHz	44.55	-4.70
2 Average	434 kHz	31.83	-15.33
1 Max Peak	626 kHz	39.27	-16.72
2 Average	4.118 MHz	27.97	-18.02
1 Max Peak	4.122 MHz	37.64	-18.35
1 Max Peak	8.754 MHz	40.10	-19.89
2 Average	11.994 MHz	32.36	-17.63
1 Max Peak	13.618 MHz	41.79	-18.20
2 Average	23.986 MHz	33.62	-16.38

Plot of Conducted Emissions Test Data

Conducted Disturbance

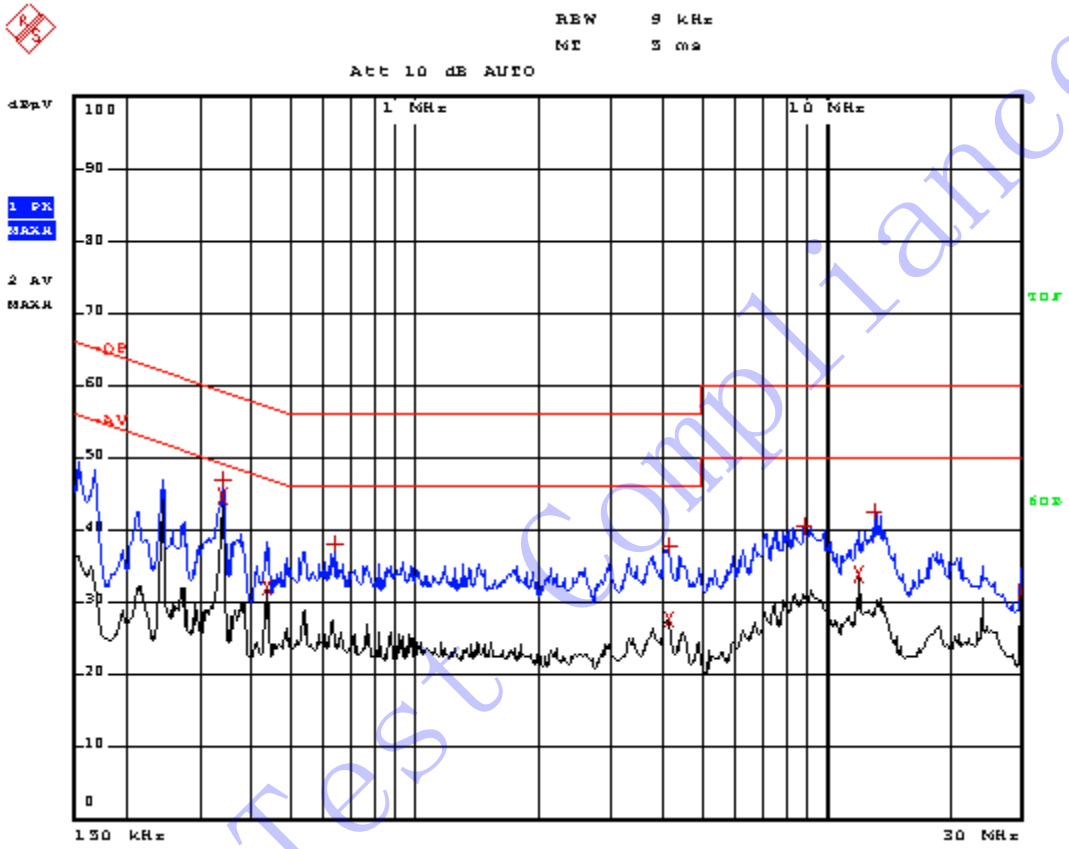
EUT: KAPTEN MOBILITY

M/N: 301

Operating Condition: Downloading (Reading and Writing the TF card via the PC)

Test Specification: L

Comment: 120V/60Hz; USB 5V



EDIT PEAK LIST (Prescan Results)

Trace1: -QP
Trace2: -AV
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	338 kHz	47.16	-12.08
2 Average	338 kHz	44.74	-4.50
2 Average	434 kHz	32.25	-14.91
1 Max Peak	634 kHz	38.20	-17.79
1 Max Peak	4.154 MHz	37.88	-18.11
2 Average	4.154 MHz	27.77	-18.22
1 Max Peak	8.874 MHz	40.67	-19.32
2 Average	11.994 MHz	34.06	-15.93
1 Max Peak	13.154 MHz	42.56	-17.43
2 Average	30 MHz	31.51	-18.48

4. §15.109(a)- RADIATED EMISSION

4.1 Measurement Uncertainty

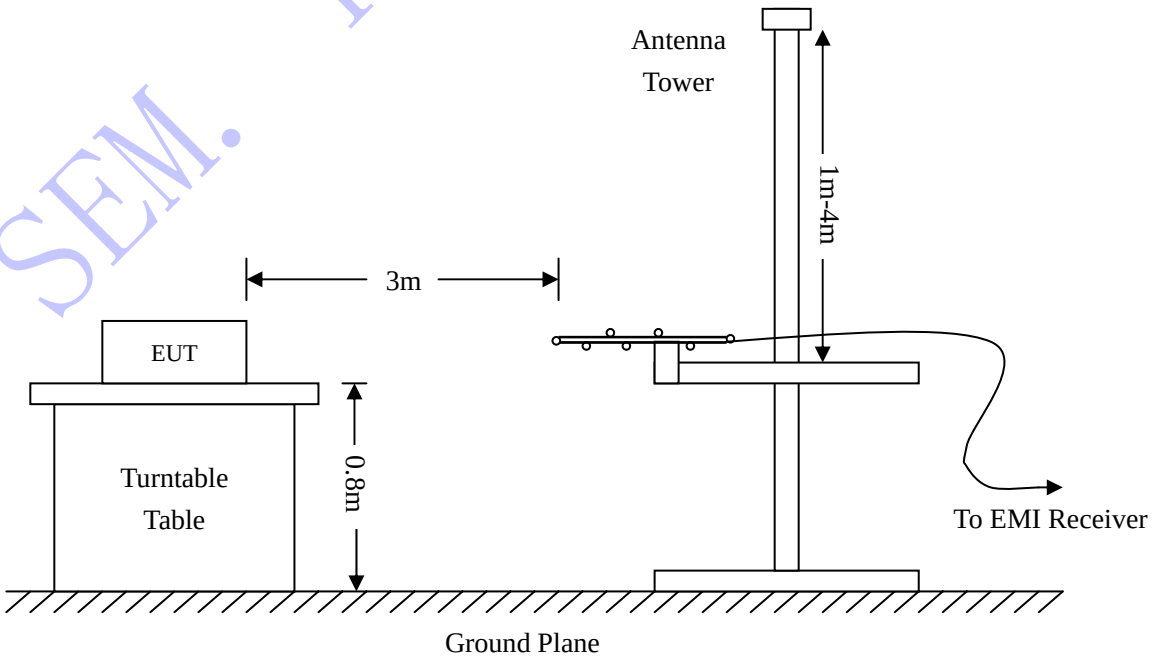
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Positioning Controller	C&C	CC-C-1F	N/A	2010-12-20	2011-12-19
RF Switch	EM	EMSW18	SW060023	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08

4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.109 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.



4.4 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:
RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:
RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

4.5 Corrected Amplitude & Margin Calculation

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

Corr. Ampl. = Indicated Reading – Corr. Factor

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBµV means the emission is 6dBµV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15B Limit

4.6 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15B Class B standards, and had the worst margin of:

-4.69 dBµV at **133.6187 MHz** in the **Horizontal** polarization, **Receiving** mode, **30 MHz to 1 GHz, 3Meters**
-2.19 dBµV at **82.9385 MHz** in the **Vertical** polarization, **Downloading** mode, **30 MHz to 1 GHz, 3Meters**

Plot of Radiation Emissions Test

Radiated Disturbance

EUT: KAPTEN MOBILITY

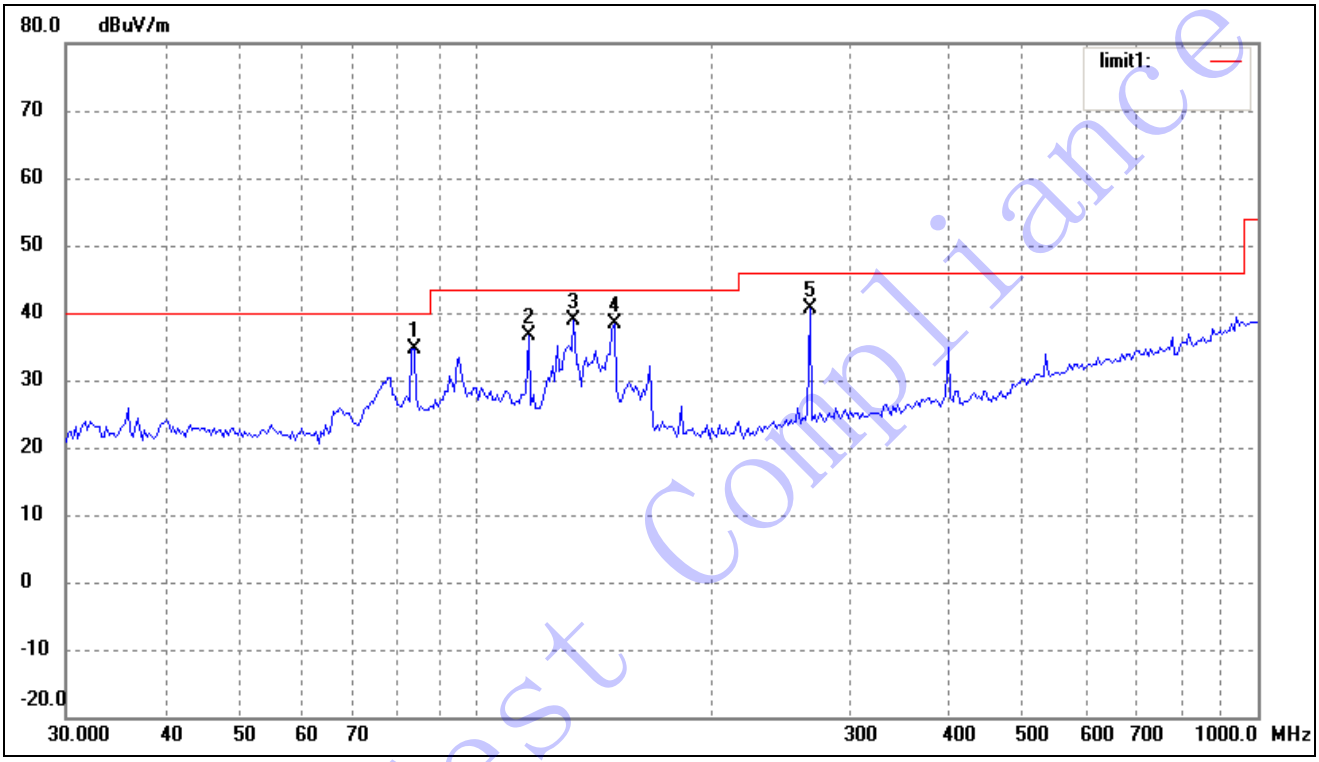
M/N: 301

Operating Condition: Receiving (Receiving the GPS signal)

Test Specification: Horizontal & Vertical

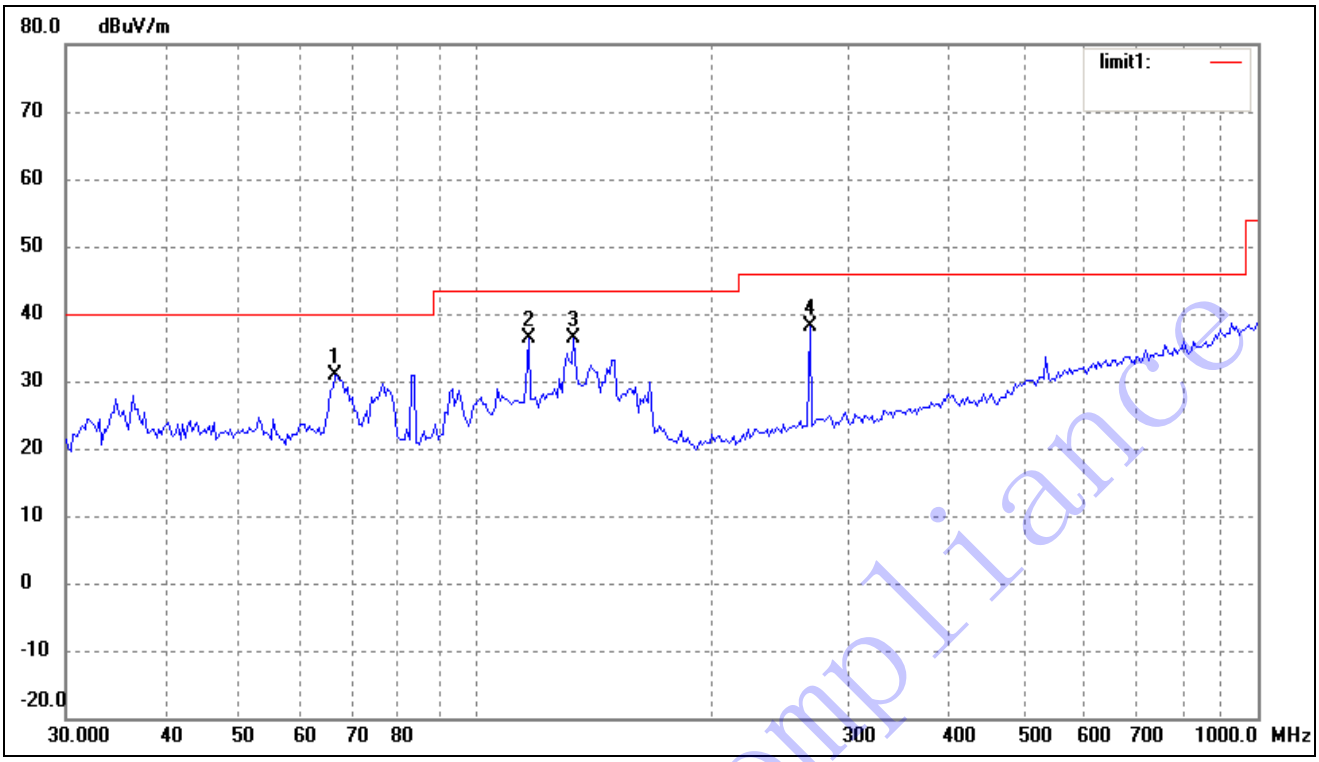
Comment: AC120V/60Hz; Adapter 5.0V

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	83.5221	29.77	4.93	34.70	40.00	-5.30	359	200	peak
2	116.9495	30.28	6.45	36.73	43.50	-6.77	359	200	peak
3	133.6187	34.46	4.35	38.81	43.50	-4.69	359	200	peak
4	150.5378	34.21	4.10	38.31	43.50	-5.19	359	200	peak
5	267.5455	31.52	9.17	40.69	46.00	-5.31	359	200	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	66.2661	25.69	5.08	30.77	40.00	-9.23	359	100	peak
2	116.9495	29.86	6.45	36.31	43.50	-7.19	359	100	peak
3	133.6187	32.09	4.35	36.44	43.50	-7.06	359	100	peak
4	267.5455	28.97	9.17	38.14	46.00	-7.86	359	100	peak

Radiated Disturbance

EUT: KAPTEN MOBILITY

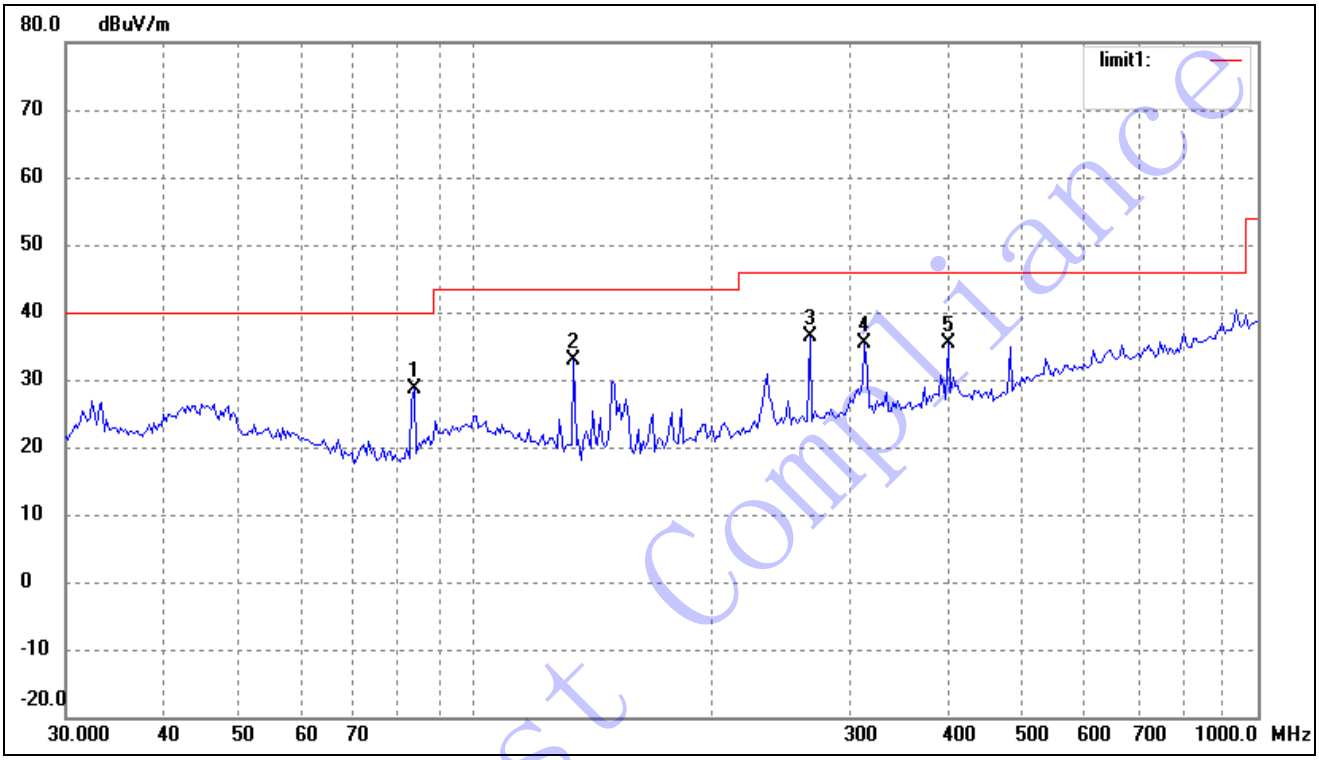
M/N: 301

Operating Condition: Downloading (Reading and Writing the TF card via the PC)

Test Specification: Horizontal & Vertical

Comment: AC120V/60Hz; USB 5.0V

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	83.5222	23.74	4.93	28.67	40.00	-11.33	359	200	peak
2	133.6188	28.45	4.35	32.80	43.50	-10.70	359	200	peak
3	267.5455	27.10	9.17	36.27	46.00	-9.73	359	200	peak
4	314.3765	25.53	9.93	35.46	46.00	-10.54	359	200	peak
5	401.8385	24.08	11.40	35.48	46.00	-10.52	359	200	peak

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	82.9385	33.11	4.70	37.81	40.00	-2.19	359	100	peak
2	235.8163	33.08	8.19	41.27	46.00	-4.73	359	100	peak
3	267.5455	33.75	9.17	42.92	46.00	-3.08	359	100	peak
4	314.3765	28.55	9.93	38.48	46.00	-7.52	359	100	peak
5	724.2611	24.36	17.86	42.22	46.00	-3.78	359	100	peak
6	906.4823	22.31	21.02	43.33	46.00	-2.67	359	100	peak

EXHIBIT 1- PRODUCT LABELING

Proposed FCC Label Format

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.

Specifications: Text is Black in color and is justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT, also it need to mark in the user manual if the EUT is small exactly.

Proposed Label Location on EUT

FCC Label Location

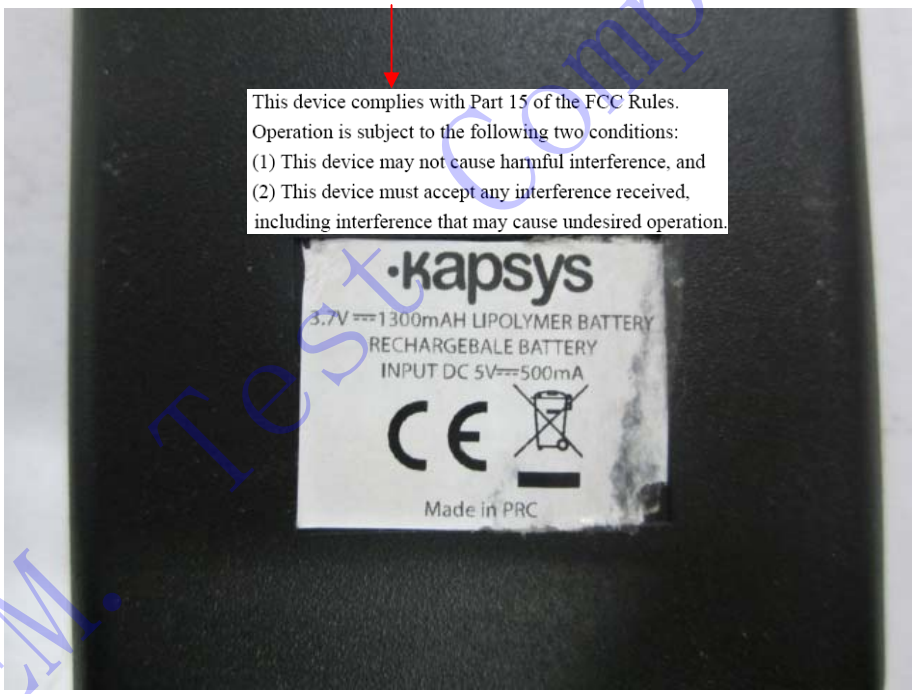


EXHIBIT 2 - EUT PHOTOGRAPHS

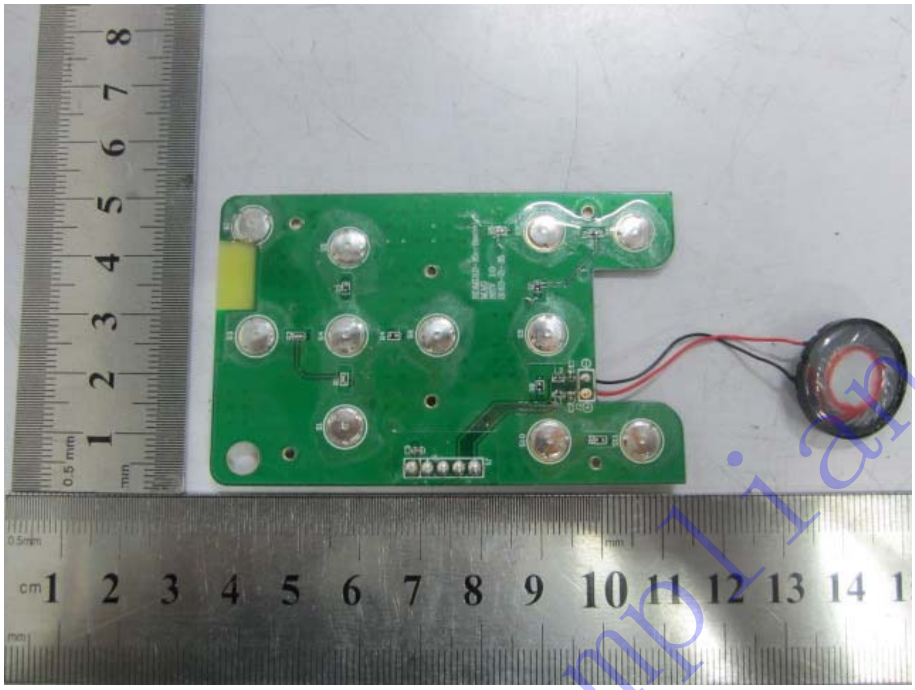
EUT View 1

EUT View 2

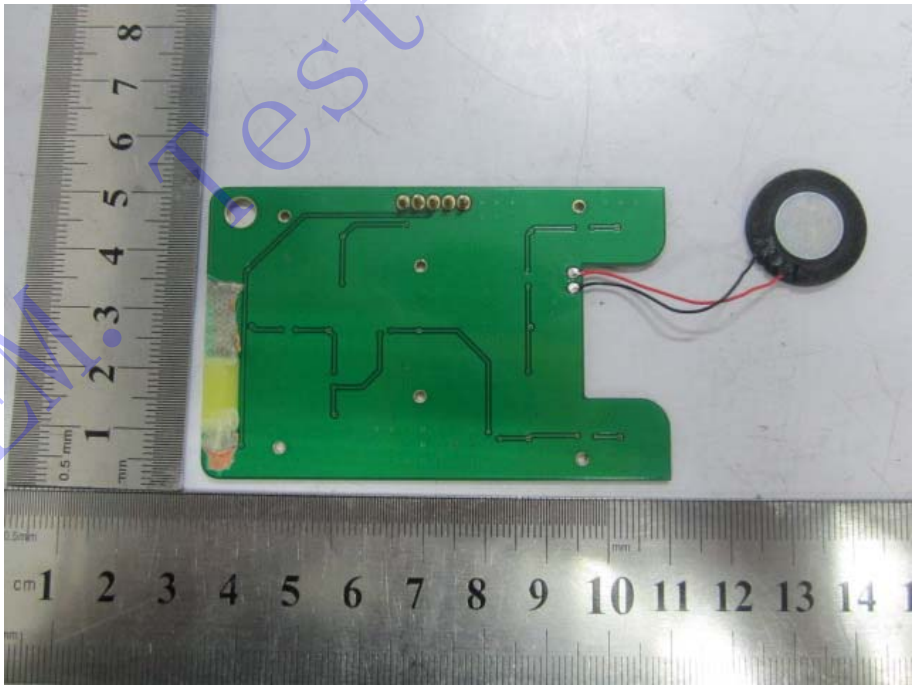
EUT View 3

EUT Housing and Board View

Solder Board-Component View 1



Solder Board-Component View 2



Solder Board-Component View 3

Solder Board-Component View 4

Solder Board-Component View 5

EXHIBIT 3 - TEST SETUP PHOTOGRAPHS

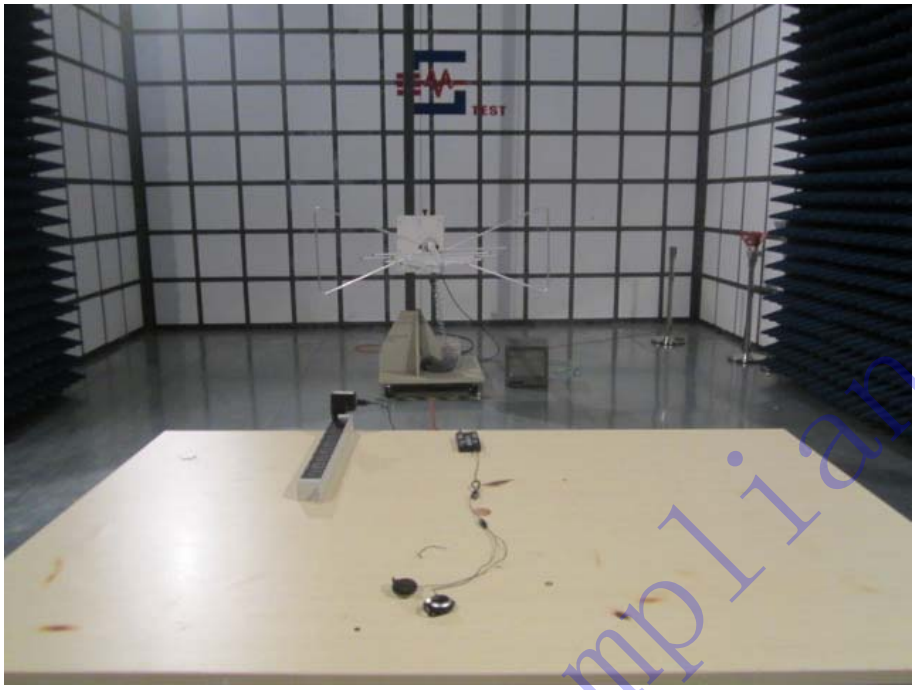
Conducted Emission

Receiving Mode

Downloading Mode

Radiated Emission

Receiving Mode



Downloading Mode

EXHIBIT 4 - SCHEMATICS

EXHIBIT 5 - USERS MANUAL

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