FCC Part 15B

Measurement and Test Report

For

Kapsys

790 avenue Maurice Donat 06250 Mougins Sophia Anitpolis-France

Report Concerns:	**Equipment Type:**
Original Report	GPS

Kapten NG

Report No.: STR09118081E-3

Test/Witness Engineer: John shi

Test Date: 2009-11-19 to 2009-11-23

Issue Date: 2009-11-23

Prepared By:

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Approved & Authorized By: Jandy80

Jandy So / PSQ Manager

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 Maurice Donat 06250 Mougins Sophia Antipolis-France

Manufacturer: MAG Digital Limited

Address of manufacturer: Room 918, 9/F, Block East, Shenzhen Shopping Plaza, 123#, Shennan Dong RD., Luohu District, Shenzhen, China

General Description of E.U.T

Items	Description
EUT Description:	GPS
Trade Name:	Kapsys
Model Tested:	Kapten NG
Adding model:	/
Rated Voltage:	DC 5V
Rated Current:	300mA
Size:	10.0X5.5X1.3 cm
Comment: The EUT is a GPS receiver. For more information refer to the circuit diagram form and the user's manual.	

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 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 Test Methodology

All measurements contained in this report were conducted 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.

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.

1.5 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.

1.6 EUT Exercise Software

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

1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
IBM	Notebook	T22	LV14893
TP-LINK	Modem	TM-EC5658V	KT99CTQC-508
Lenovo	Printer	3110	OD65133711480

1.8 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	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 ± 1.5 dB.

3.2 Test Equipment List and Details

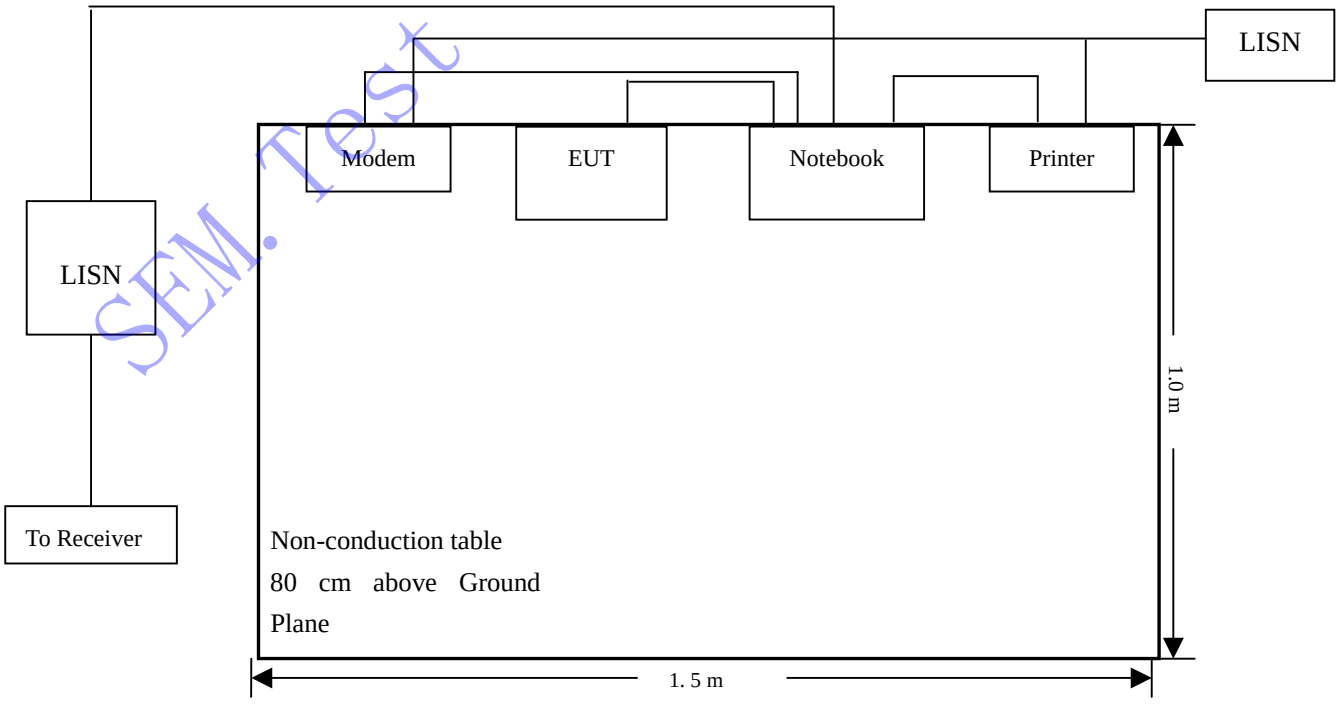
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2009-08-12	2010-08-11
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2009-08-12	2010-08-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2009-08-12	2010-08-11
AMN	Rohde & Schwarz	ESH3-Z5	828304/014	2009-08-12	2010-08-11

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 C63.4-2003, 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.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

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

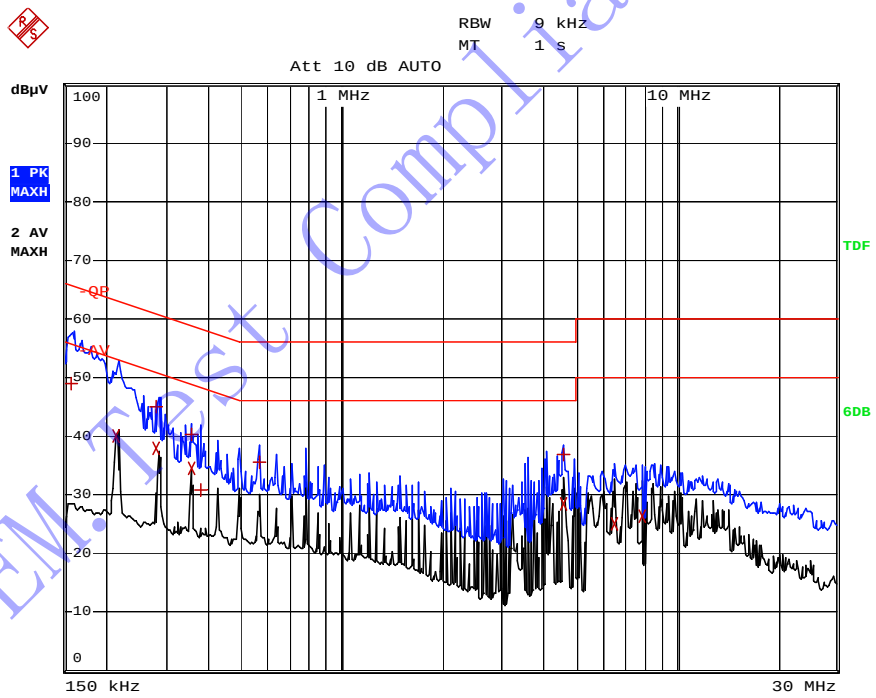
3.6 Summary of Test Results/Plots

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

-11.99 dBµV at 0.366 MHz in the **Line** mode**, QP** detector, **0.15-30MHz**

3.7 Conducted Emissions Test Plot /Data

Conducted Disturbance
EUT: GPS
M/N: Kapten NG
Operating Condition: Charginging Mode
Test Specification: N
Comment: AC 120V/60Hz/USB 5V



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EDIT PEAK LIST (Final Measurement Results)

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

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	158 kHz	49.06	-16.49
2	Average	214 kHz	40.06	-12.97
1	Quasi Peak	282 kHz	44.88	-15.87
2	Average	282 kHz	37.86	-12.89
1	Quasi Peak	354 kHz	40.25	-18.61
2	Average	354 kHz	34.55	-14.31
1	Quasi Peak	378 kHz	30.80	-27.52
1	Quasi Peak	566 kHz	35.59	-20.41
1	Quasi Peak	4.598 MHz	36.96	-19.03
2	Average	4.598 MHz	28.51	-17.48
2	Average	6.506 MHz	25.03	-24.96
2	Average	7.994 MHz	26.27	-23.72

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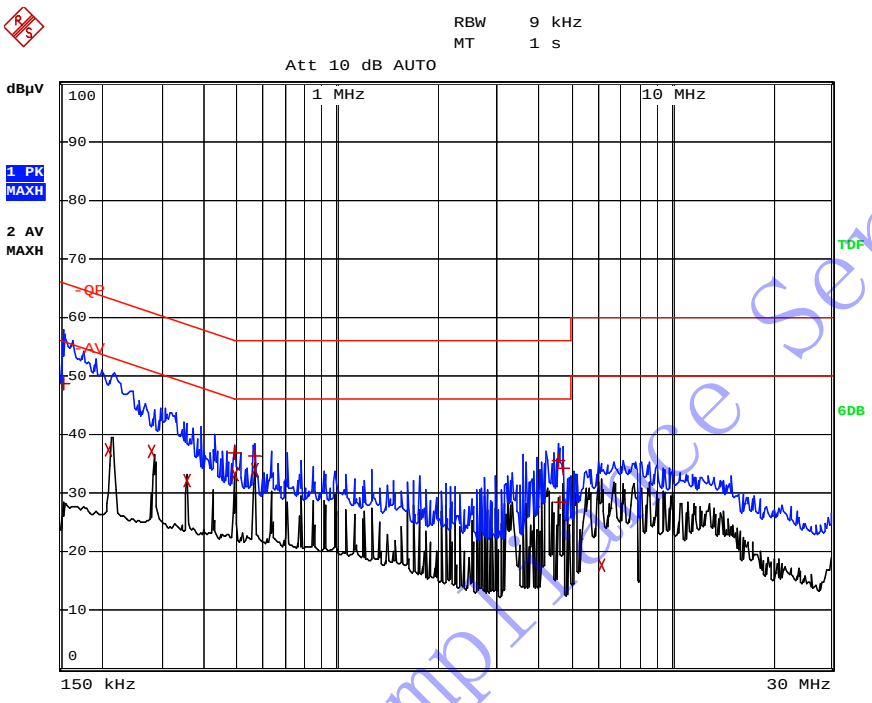
Conducted Disturbance
EUT: GPS
M/N: Kapten NG
Operating Condition: Chagrining Mode
Test Specification: L
Comment: AC 120V/60Hz /USB 5V



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EDIT PEAK LIST (Final Measurement Results)

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

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	154 kHz	48.72	-17.05
2	Average	210 kHz	37.38	-15.82
2	Average	282 kHz	37.06	-13.68
2	Average	354 kHz	32.13	-16.72
1	Quasi Peak	494 kHz	36.81	-19.29
2	Average	494 kHz	33.16	-12.93
1	Quasi Peak	566 kHz	36.34	-19.66
2	Average	566 kHz	34.00	-11.99
1	Quasi Peak	4.598 MHz	35.66	-20.34
1	Quasi Peak	4.662 MHz	28.49	-27.50
1	Quasi Peak	4.738 MHz	34.37	-21.62
2	Average	6.154 MHz	17.83	-32.17

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4. §15.109(a)- RADIATED EMISSION

4.1 Measurement Uncertainty

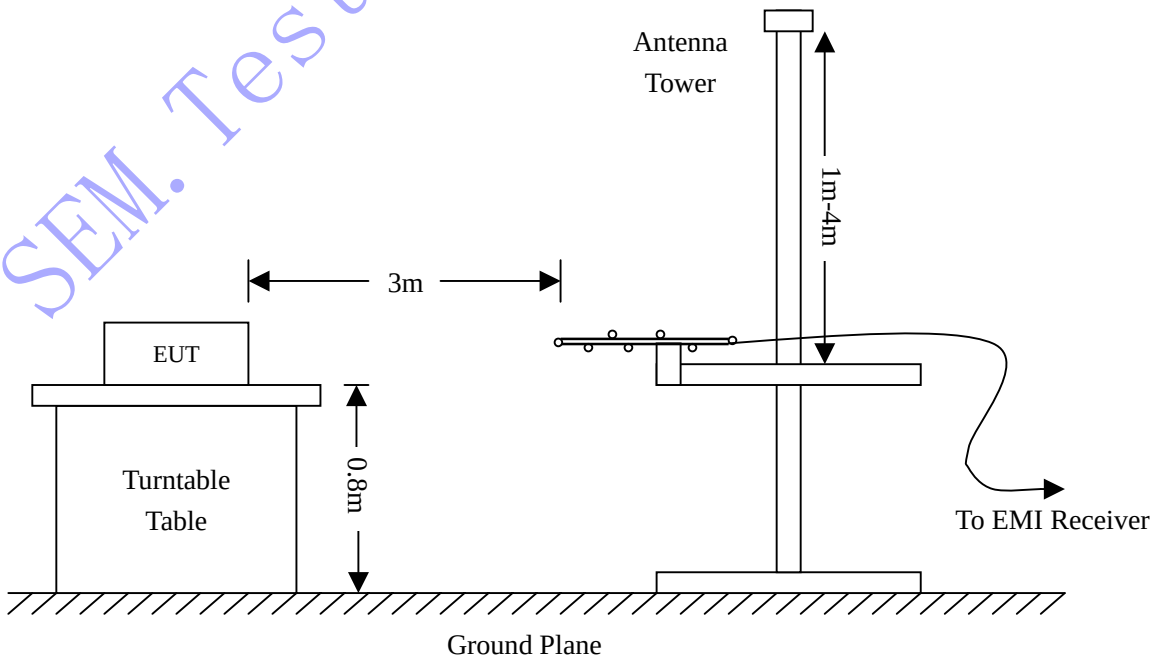
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 3.0 dB.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2009-08-12	2010-08-11

4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 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 conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 30 MHz
Stop Frequency..... 1000 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth ..... 120 kHz
Quasi-Peak Adapter Mode ..... Normal

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 15B Class B standards, and had the worst margin of:

-6.86 dBμV at **787.8513 MHz** in the **Horizontal** polarization, **Connect to PC** mode, **30 MHz to 1 GHz, 3Meters**

-4.07 dBμV at **267.5455 MHz** in the **Horizontal** polarization, **Connect to PC** mode, **30 MHz to 1 GHz, 3Meters**

Plot of Radiation Emissions Test

Radiated Disturbance

Radiated Emission

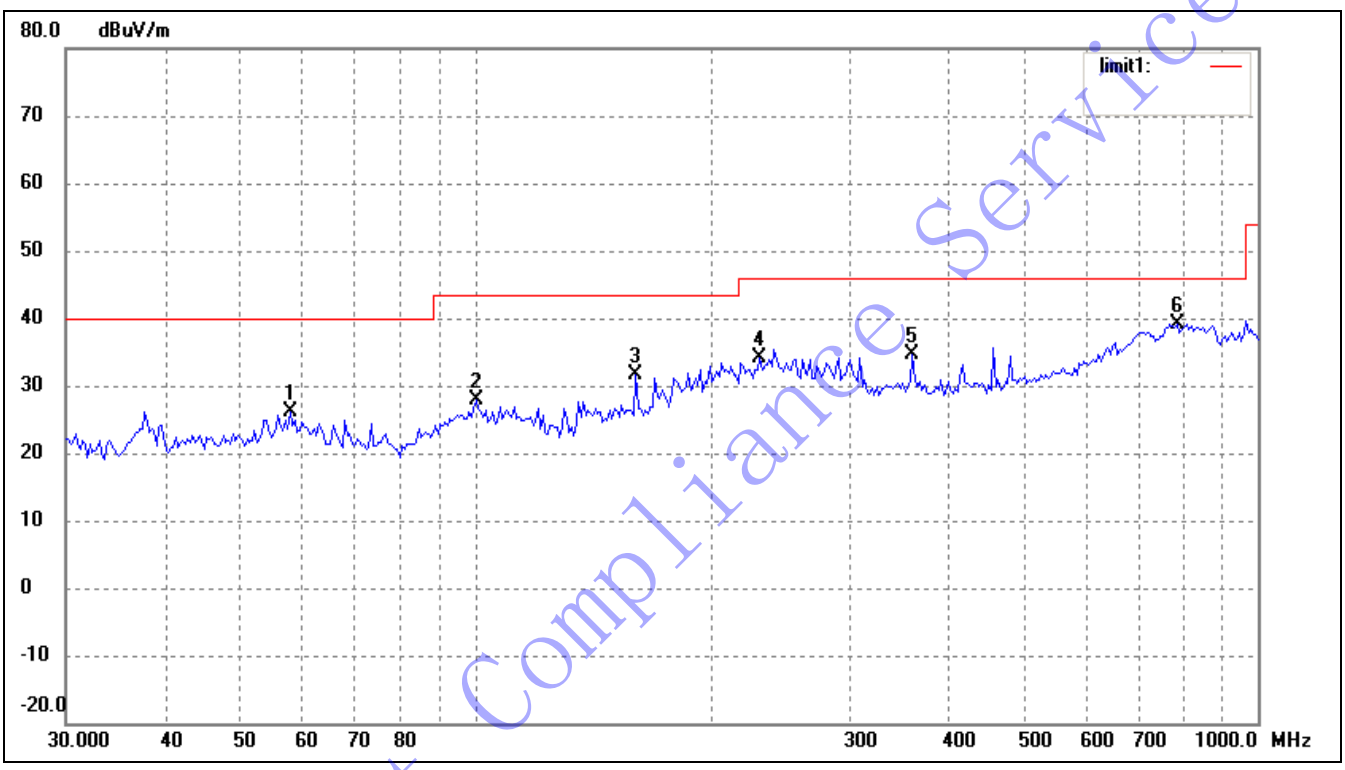
EUT: GPS

M/N: Kapten NG

Operating Condition: Receiving

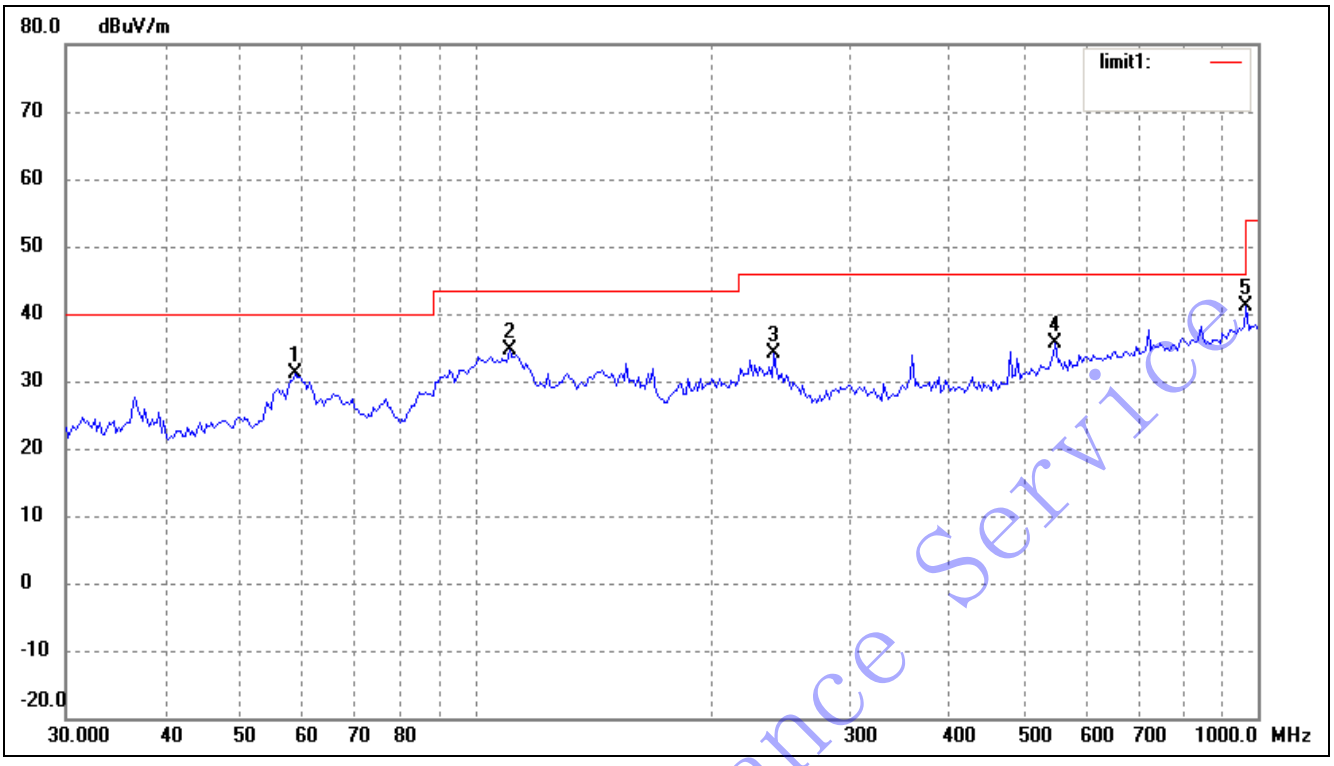
Test Specification: Horizontal & Vertical

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	57.9992	18.49	7.63	26.12	40.00	-13.88	360	100	peak
2	100.2286	19.47	8.41	27.88	43.50	-15.62	360	100	peak
3	160.3456	27.04	4.55	31.59	43.50	-11.91	360	100	peak
4	230.9068	25.78	8.31	34.09	46.00	-11.91	360	100	peak
5	361.7139	22.61	12.10	34.71	46.00	-11.29	360	100	peak
6	787.8513	20.69	18.45	39.14	46.00	-6.86	360	100	peak

Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.8185	23.50	7.59	31.09	40.00	-8.91	360	100	peak
2	110.5687	27.10	7.50	34.60	43.50	-8.90	360	100	peak
3	240.8302	25.41	8.84	34.25	46.00	-11.75	360	100	peak
4	550.9479	20.46	15.06	35.52	46.00	-10.48	360	100	peak
5	965.5421	19.88	21.29	41.17	54.00	-12.83	360	100	peak

Plot of Radiation Emissions Test

Radiated Disturbance

Radiated Emission

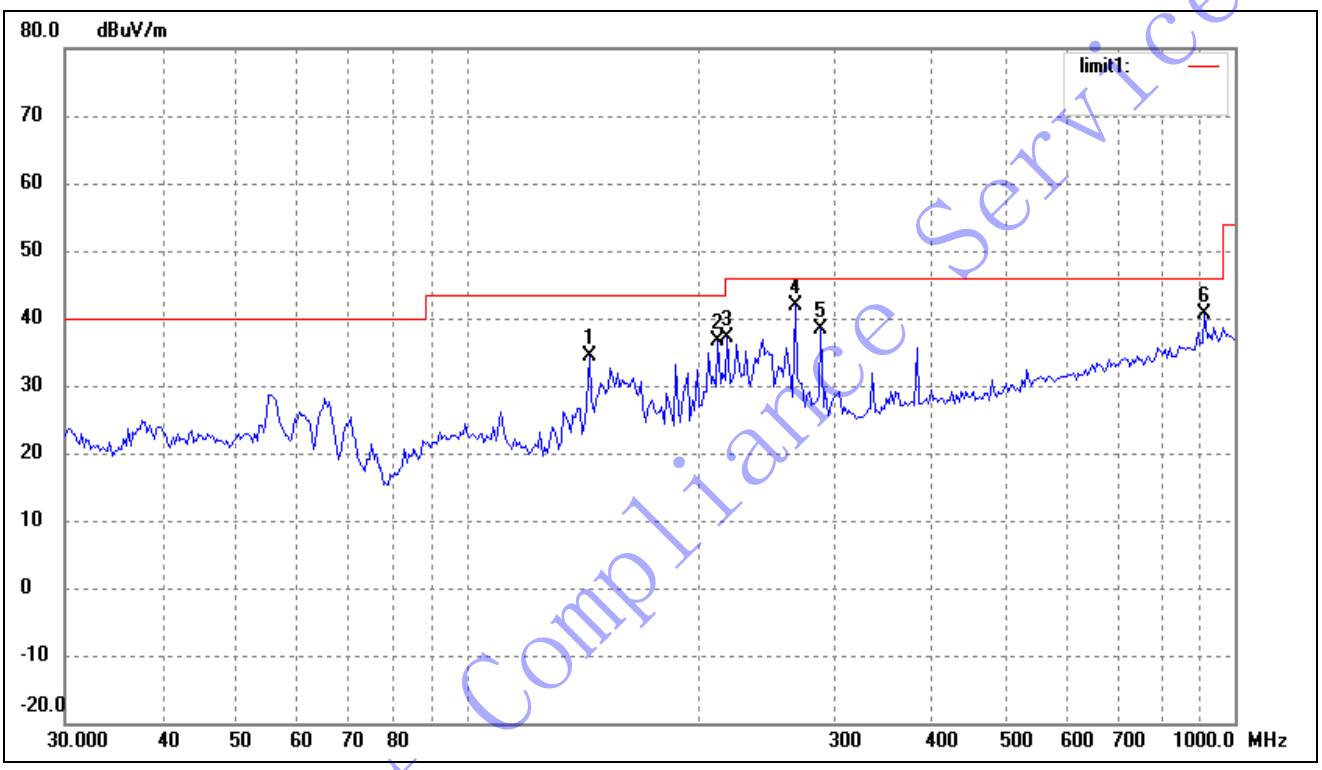
EUT: GPS

M/N: Kapten NG

Operating Condition: Connect to PC

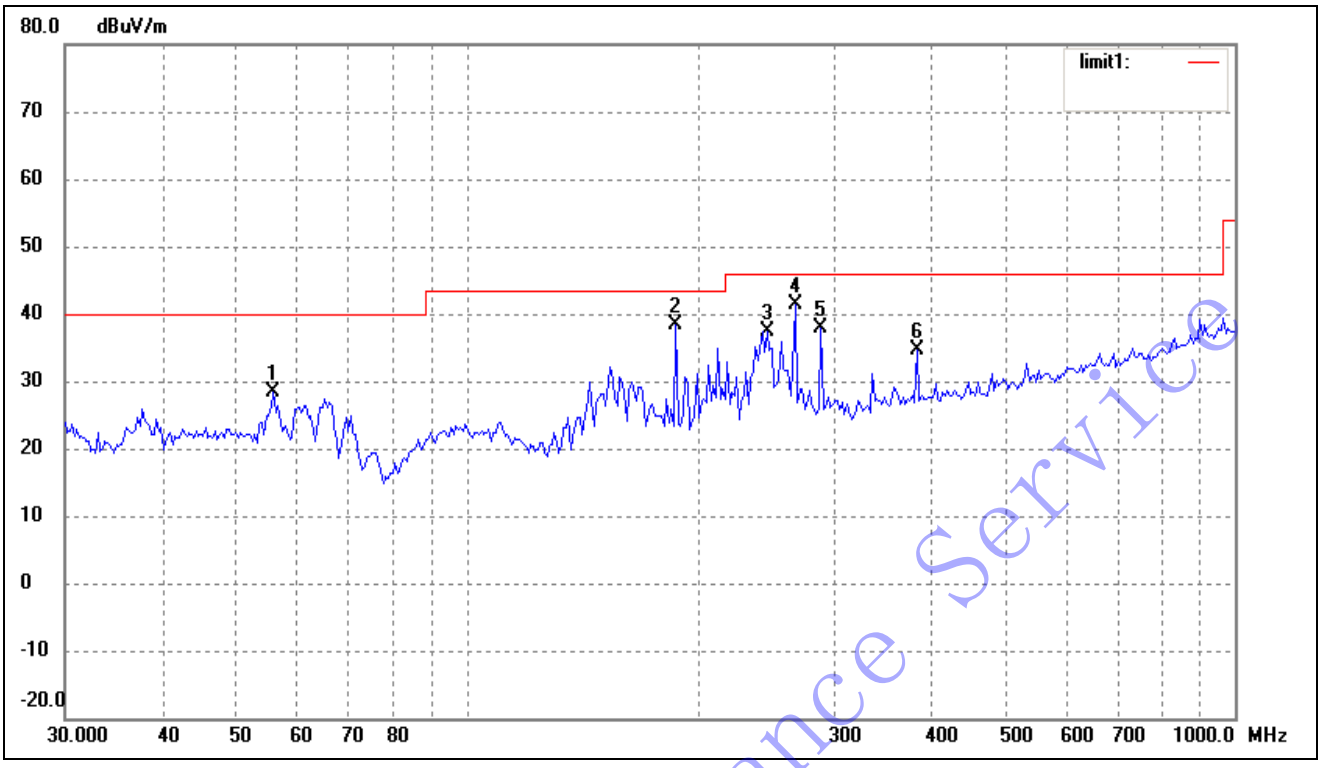
Test Specification: Horizontal & Vertical

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	144.3348	30.45	4.01	34.46	43.50	-9.04	360	100	peak
2	212.2695	29.16	7.37	36.53	43.50	-6.97	360	100	peak
3	218.3085	29.42	7.62	37.04	46.00	-8.96	360	100	peak
4	267.5455	32.57	9.36	41.93	46.00	-4.07	332	150	QP
5	289.0021	28.19	10.31	38.50	46.00	-7.50	360	100	peak
6	912.8620	19.91	20.81	40.72	46.00	-5.28	4	100	QP

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	56.0007	20.71	7.73	28.44	40.00	-11.56	360	100	peak
2	187.0958	31.91	6.49	38.40	43.50	-5.10	135	120	QP
3	245.9509	28.57	8.86	37.43	46.00	-8.57	360	100	peak
4	267.5455	32.03	9.36	41.39	46.00	-4.61	12	200	QP
5	289.0021	27.50	10.31	37.81	46.00	-8.19	360	100	peak
6	385.2805	22.30	12.22	34.52	46.00	-11.48	360	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

EXHIBIT 2 - EUT PHOTOGRAPHS

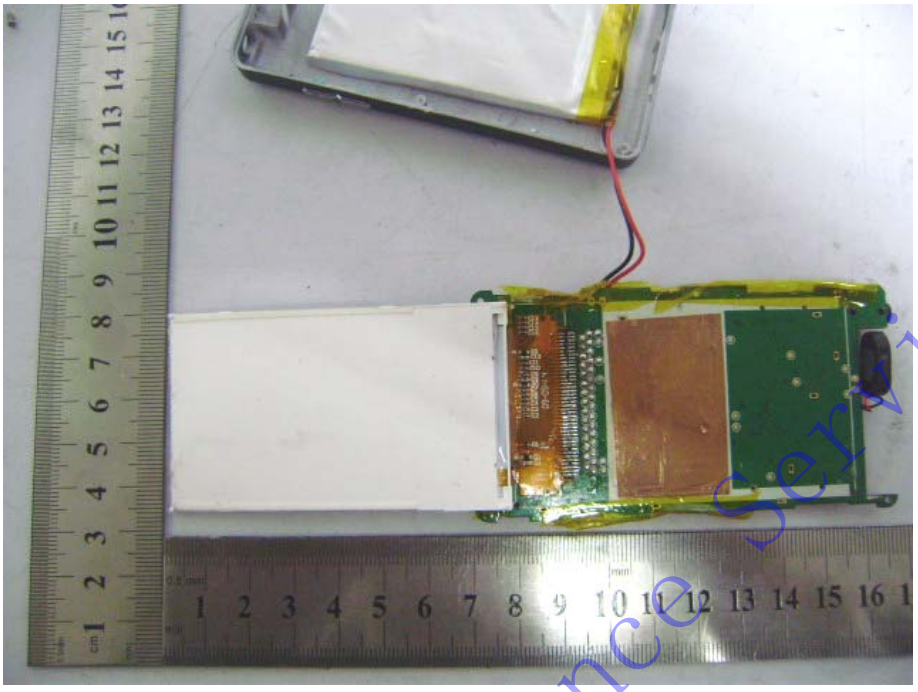
EUT View 1

EUT View 2

EUT View 3

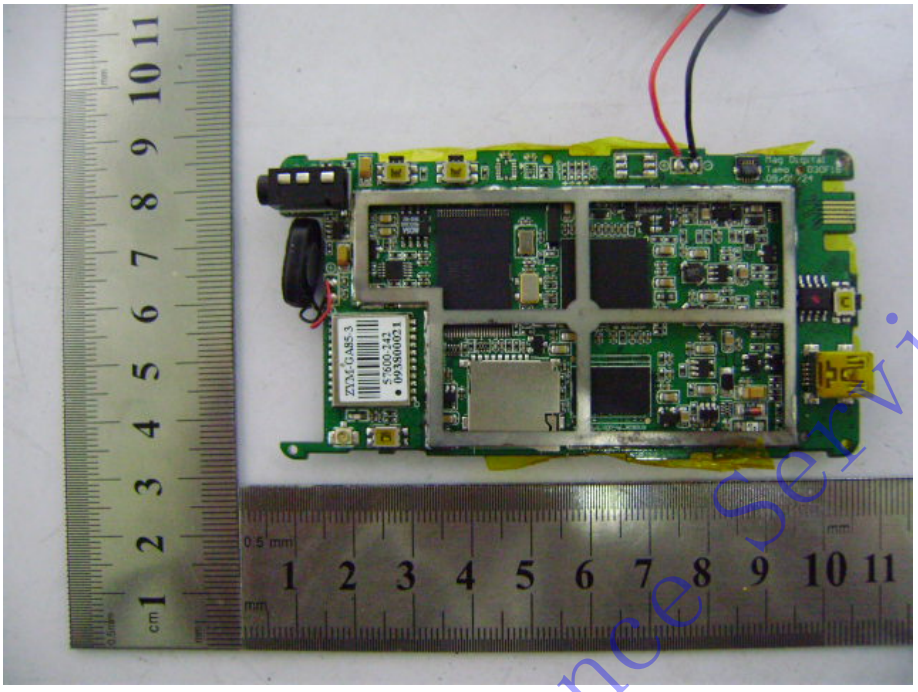
EUT Housing and Board View

Solder Board-Component View 1



Solder Board-Component View 2

Solder Board-Component View 3



Solder Board-Component View 4

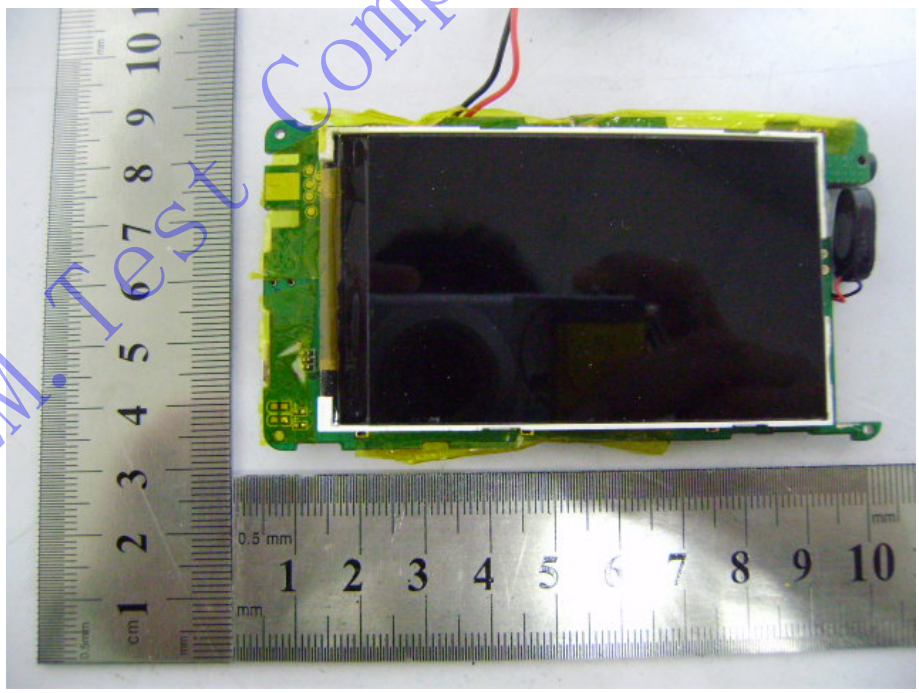
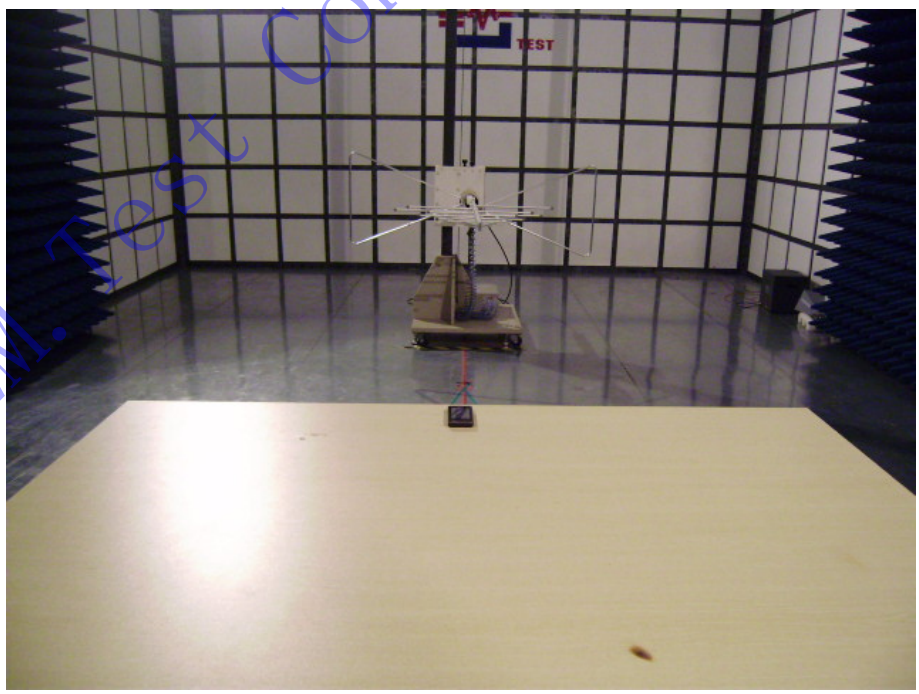


EXHIBIT 3 - TEST SETUP PHOTOGRAPHS

Conducted Emission

Radiated Emission

Test Mode: Receiving



Test Mode: Connect to PC

EXHIBIT 4 –SCHEMATICS

EXHIBIT 5 –USERS MANUAL

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