



47 CFR PART 15 SUBPART B

TEST REPORT

of

Portable GNSS receiver

Model Name: MobileMapper 10
Trade Name: ASHTECH
Brand Name: ASHTECH
Report No.: SH11070015E02

prepared for

ASHTECH S.A.S

ZAC LA FLEURIAYE BP 60433/RUE THOMAS EDISON 44474
CARQUEFOU CEDEX FRANCE

prepared by

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LAB CODE 20081223-00

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1 TEST CERTIFICATION

Equipment under Test: Portable GNSS receiver
 Trade Name: ASHTECH
 Brand Name: ASHTECH
 Model Name: MobileMapper 10
 Applicant: ASHTECH S.A.S
 Applicant Address: ZAC LA FLEURIAYE BP 60433 RUE THOMAS EDISON
 44474 CARQUEFOU CEDEX FRANCE
 Manufacturer: Beijing UniStrong Science & Technology Co., Ltd
 Manufacturer Address: 6F East, A2 Building, #9 Jiuxianqiao East Road, Chaoyang
 District, Beijing 100015, China

Test Standards: 47 CFR Part 15 Subpart B

Test Date(s): 2011.07.15-2011.7.25

Test Result: PASS

*** We Hereby Certify That:**

The equipment under test was tested by Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related FCC rules.

The test results of this report only apply for the tested sample equipment identified above. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by: Zhang Wenjie Dated: 2011.8.4
 Zhang Wenjie

Reviewed by: Zhang Jun Dated: 2011.8.4
 Zhang Jun

Approved by: Wei Bei Dated: 2011.8.4
 Wei Bei



2 GENERAL INFORMATION

2.1 EUT Description

EUT Type : Portable GNSS receiver
Hardware Version..... : v2.6
Software Version : 01.01.02.009
Frequency..... : GSM850/1900/900/1800/ISM 2.4GHz
Modulation Type : GMSK/QPSK/8PSK
Power supply..... : Battery

Model No.: MG-4LH
Brand Name: DBK
Capacitance: 3000mAh
Rated Voltage: 3.7V
Charge Limit: 4.2V
Manufacturer: SHENZHEN DBK ELECTRONICS CO.,LTD

Ancillary Equipment : Charger for Battery

Model No.: PSAI05R-050Q
Brand Name: PHIHONG
Rated Input: AC 110-240V 300A 50/60Hz
Rated Output: DC 5V, 1000mA
Manufacturer: PHIHONG TECHNOLOGY CO.,LTD

NOTE:

1. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

No.	Identity	Document Title
1	47 CFR Part 15 (10-1-05 Edition)	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	15.107	Conducted Emission	PASS
2	15.109	Radiated Emission	PASS
3	ANSI C63.4-2003	Radiated Emission	PASS

2.3 Facilities and Accreditations

2.3.1 Facilities

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Laboratories (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

All measurement facilities used to collect the measurement data are located at Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen 518055 CHINA. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

2.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	20 – 25
Relative Humidity (%):	40 – 60
Atmospheric Pressure (kPa):	106

3 TEST CONDITIONS SETTING

3.1 Test Mode

The test modes of the EUT are showed as below:

Mode 1. EUT+PC Mode

The EUT configuration of the emission test is EUT + Micro SD card + Battery + +PC.

In this test mode, a connection was established between the EUT and a PC; data was transmitted between EUT and the PC, and maintained during the measurement.

3.2 Description Of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

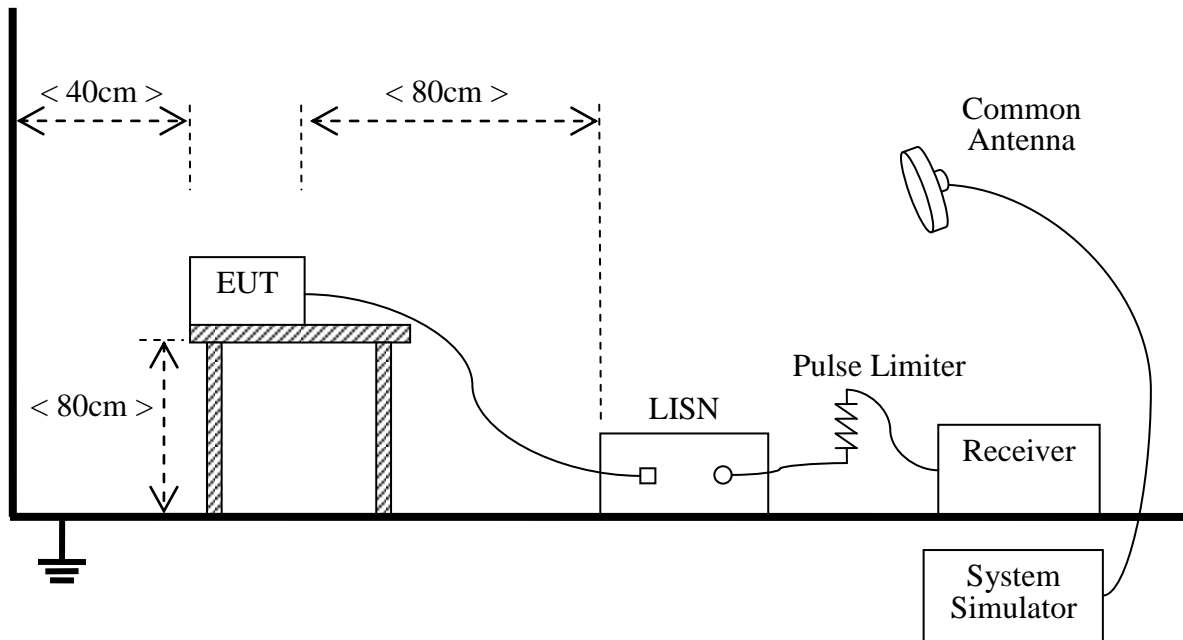
No.	Equipment	Model No.	Serial No.	Trade Name
1	PC	SL400	L3-BBB0A	LENOVO
2	Micro SD card	1#	1#	N/A

Note: Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3.3 Test Setup and Equipments List

3.3.1 Conducted Emission

A. Test Setup:



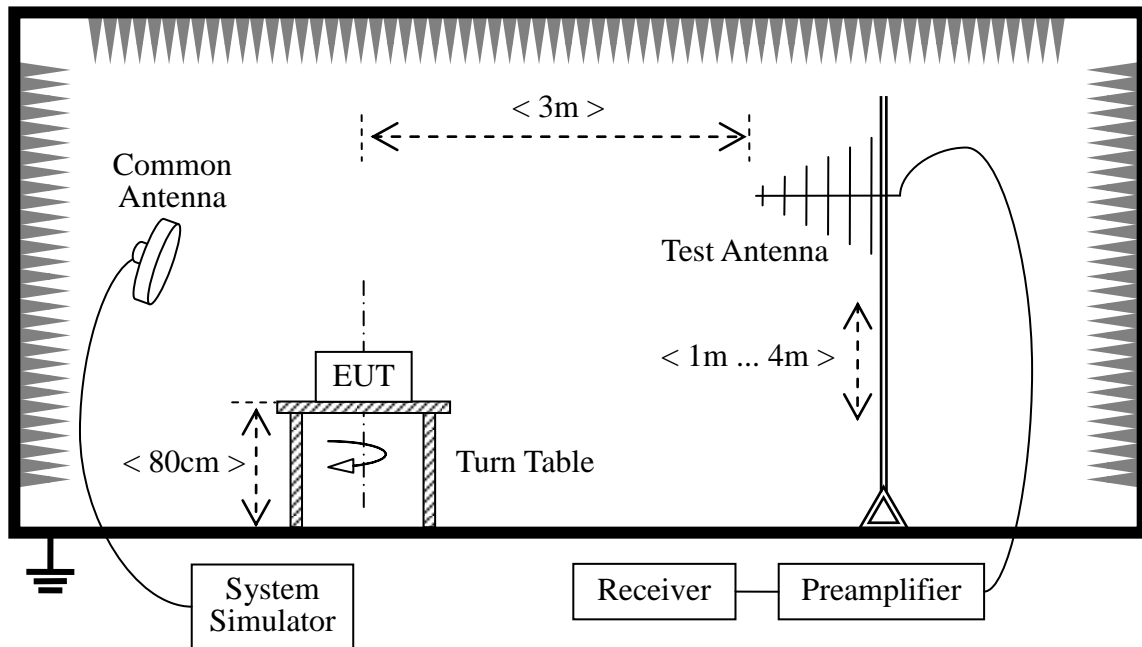
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides $50\Omega/50\mu\text{H}$ of coupling impedance for the measuring instrument. The Common Antenna is used for the call between the EUT and the System Simulator (SS). A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Rohde&Schwarz	ESCI3	100666	2010.09	1year
LISN	Rohde&Schwarz	ENV216	812744	2010.09	1year
System Simulator	Rohde&Schwarz	CMU200	105571	2010.09	1year
Personal Computer	Lenovo	(n.a.)	(n.a.)	(n.a.)	(n.a.)

3.3.2 Radiated Emission

A. Test Setup:



The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower. The Common Antenna is used for the call between the EUT and the System Simulator (SS).

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Rohde&Schwarz	ESCI3	100666	2010.09	1year
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2010.09	1year
Test Antenna - Bi-Log	Rohde&Schwarz	HL562	100385	2010.09	1year
System Simulator	Rohde&Schwarz	CMU200	105571	2010.09	1year
Personal Computer	Lenovo	(n.a.)	(n.a.)	(n.a.)	(n.a.)

47 CFR PART 15B REQUIREMENTS

4 Conducted Emission

4.1 Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE:

- The limit subjects to the Class B digital device.
- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

4.2 Test Description

See section 3.3.1 of this report.

4.3 Test Result

The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

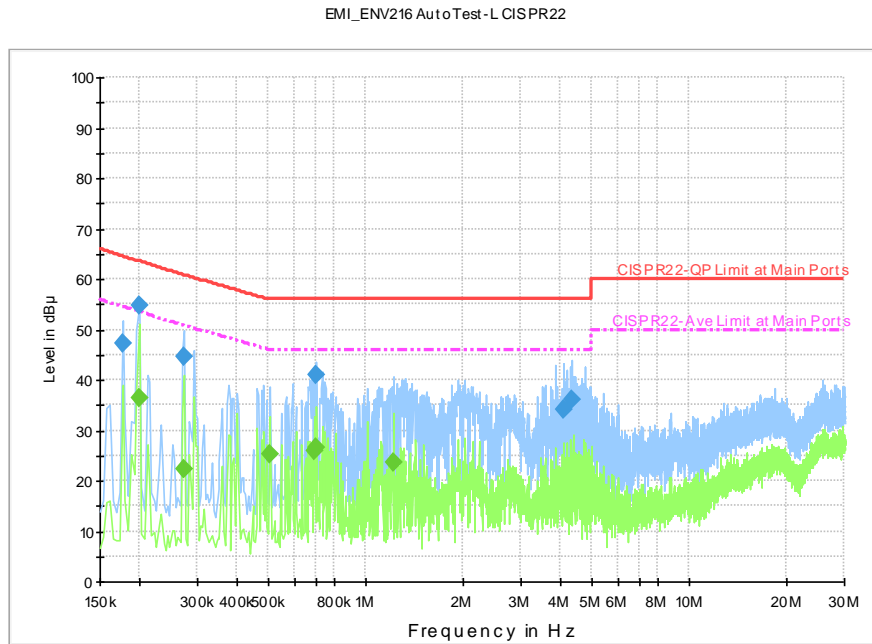


A. Test Verdict Recorded for Suspicious Points:

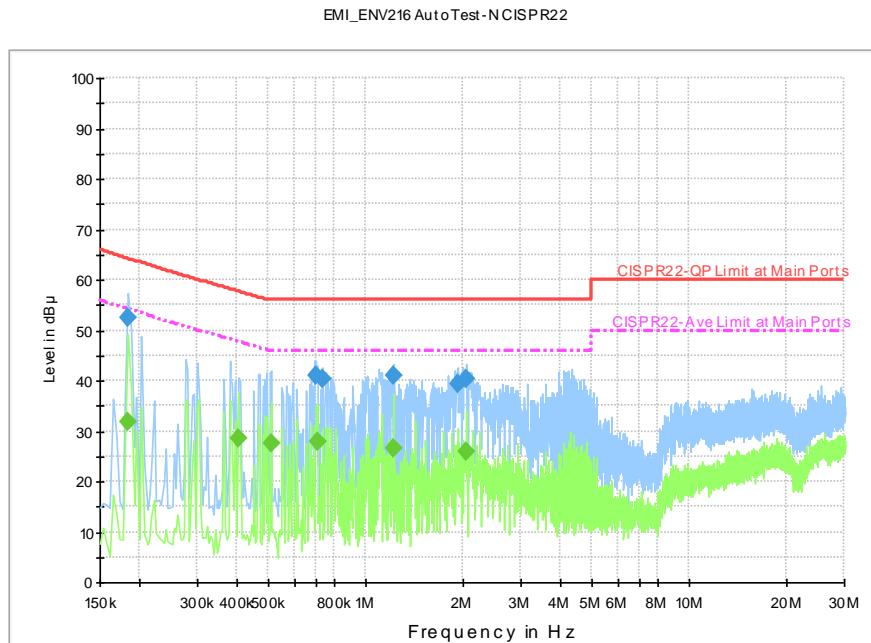
Frequency (MHz)	QuasiPeak (dBμ V)	Meas. Time (ms)	Band width (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμ V)	Comment
0.183581	52.6	150.000	9.000	N	9.6	11.6	64.2	PASS
0.698494	41.1	150.000	9.000	N	9.7	14.9	56.0	PASS
0.728344	40.4	150.000	9.000	N	9.7	15.6	56.0	PASS
1.213406	40.9	150.000	9.000	N	9.7	15.1	56.0	PASS
1.911150	39.3	150.000	9.000	N	9.7	16.7	56.0	PASS
2.034281	40.2	150.000	9.000	N	9.7	15.8	56.0	PASS
0.176119	47.2	150.000	9.000	L	9.6	17.4	64.6	PASS
0.198506	54.8	150.000	9.000	L	9.6	8.7	63.5	PASS
0.273131	44.7	150.000	9.000	L	9.7	16.1	60.8	PASS
0.702225	40.8	150.000	9.000	L	9.7	15.2	56.0	PASS
4.064081	34.2	150.000	9.000	L	9.9	21.8	56.0	PASS
4.302881	35.9	150.000	9.000	L	9.9	20.1	56.0	PASS

Frequency (MHz)	Average (dBμ V)	Meas. Time (ms)	Band width (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμ V)	Comment
0.183581	31.9	150.000	9.000	N	9.6	22.3	54.2	PASS
0.403725	28.5	150.000	9.000	N	9.7	19.1	47.6	PASS
0.508200	27.5	150.000	9.000	N	9.7	18.5	46.0	PASS
0.705956	28.0	150.000	9.000	N	9.7	18.0	46.0	PASS
1.213406	26.6	150.000	9.000	N	9.7	19.4	46.0	PASS
2.034281	25.9	150.000	9.000	N	9.7	20.1	46.0	PASS
0.198506	36.5	150.000	9.000	L	9.6	17.0	53.5	PASS
0.273131	22.4	150.000	9.000	L	9.7	28.4	50.8	PASS
0.500738	25.4	150.000	9.000	L	9.7	20.6	46.0	PASS
0.694762	26.0	150.000	9.000	L	9.7	20.0	46.0	PASS
0.702225	26.5	150.000	9.000	L	9.7	19.5	46.0	PASS
1.213406	23.5	150.000	9.000	L	9.7	22.5	46.0	PASS

B. Test Plot:



(Plot: L Phase)



(Plot: N Phase)

5 Radiated Emission

5.1 Requirement

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a certain distance shall not exceed the following values:

Frequency range (MHz)	Field Strength CLASS B (at 3m)	
	$\mu\text{V/m}$	$\text{dB } \mu\text{V/m}$
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

Frequency range (MHz)	Field Strength CLASS A (at 10m)	
	$\mu\text{V/m}$	$\text{dB } \mu\text{V/m}$
30 - 88	90	39.0
88 - 216	150	43.5
216 - 960	210	46.4
Above 960	300	49.5

NOTE:

- Field Strength ($\text{dB } \mu\text{V/m}$) = $20 \cdot \log[\text{Field Strength } (\mu\text{V/m})]$.
- In the emission tables above, the tighter limit applies at the band edges.

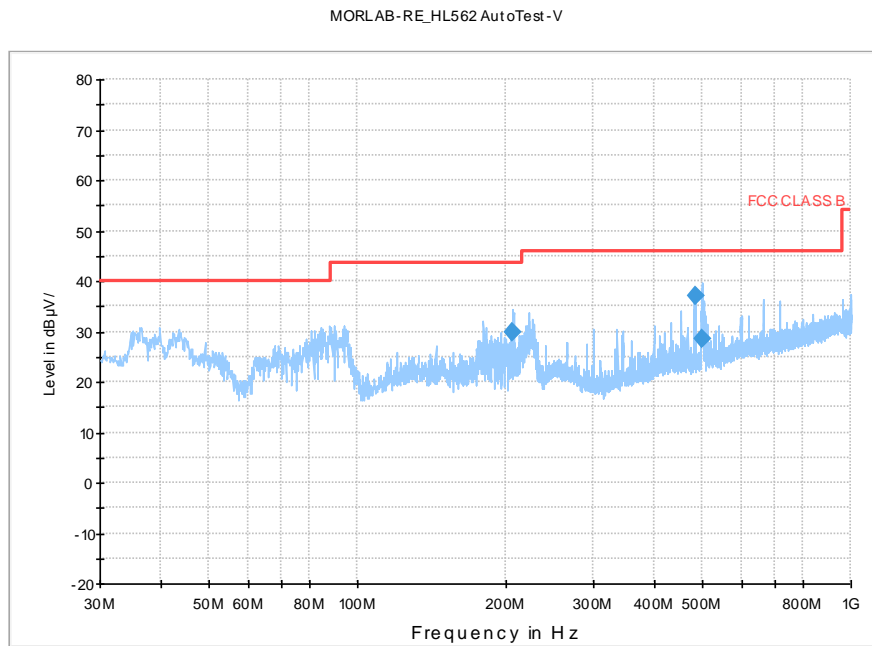
5.2 Test Description

See section 3.2.2 of this report.

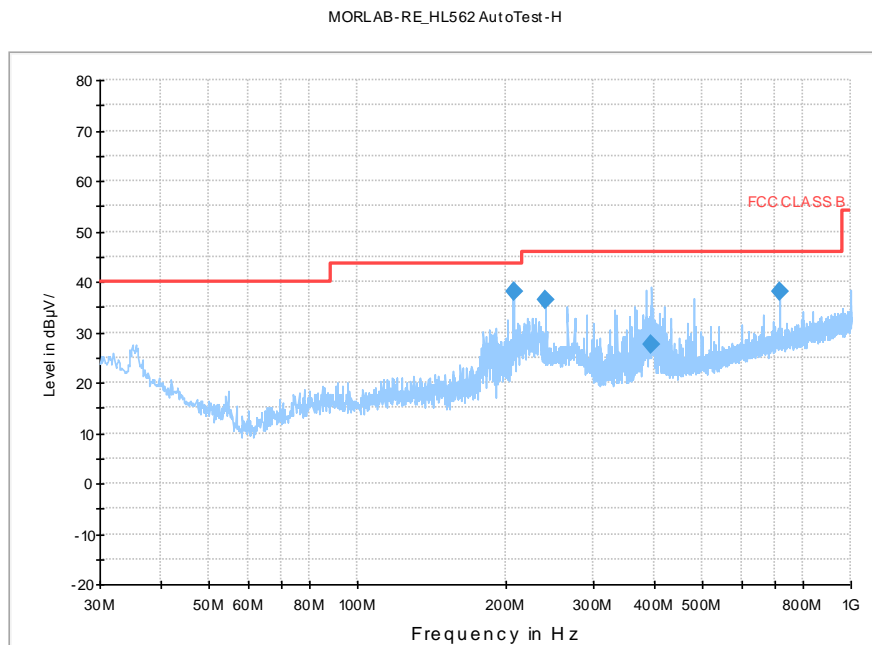
5.3 Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

A. Test Plot:



(Plot: Test Antenna Vertical)



(Plot: Test Antenna Horizontal)

**** END OF REPORT ****