

RADIO TEST REPORT

REPORT NO. : RE990301H01

MODEL NO. : GPS-4100M

RECEIVED : Mar. 01, 2010

TESTED : Mar. 11, 2010

ISSUED : Mar. 31, 2010

APPLICANT : Mobility Sound Technology Ltd.

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Taiwan.

ISSUED BY : Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch

LAB ADDRESS : No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung
Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307,
Taiwan

TEST LOCATION : Same as above

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1. CERTIFICATION

PRODUCT : GPSBox Series for 2 way Radio

BRAND : Mobility Sound

MODEL NO. : GPS-4100M

APPLICANT : Mobility Sound Technology Ltd.

TESTED : Mar. 11, 2010

TEST SAMPLE : ENGINEERING SAMPLE

STANDARDS : EN 300 440-1 V1.4.1 (2008-05)

EN 300 440-2 V1.2.1 (2008-05)

The above equipment (Model: GPS-4100M) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Carol Liao , **DATE:** Mar. 31, 2010
(Carol Liao, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** Mar. 31, 2010
(Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** Mar. 31, 2010
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

APPLIED STANDARD: ETSI EN 300 440-1 V1.4.1 (2008-05), EN 300 440-2 V1.2.1 (2008-05)			
Standard Subclause	Test Type and Limit	Result	Remark
	TRANSMITTER PARAMETERS		
4.2.1.1	Equivalent isotropically Radiated Power	NA	Not applicable
4.2.1.2	Permitted range of operating frequency	NA	Not applicable
4.2.1.3	Measurement radiated spurious emission	NA	Not applicable
4.2.1.3	Measurement conducted spurious emission	NA	Not applicable
4.2.1.4	Duty cycle	NA	Not applicable
	RECEIVER PARAMETERS		
4.2.2.3	Measurement conducted spurious emission	NA	-
4.2.2.3	Measurement radiated spurious emission	PASS	Applicable

2.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer	FSP 40	100036	Dec. 08, 2009	Dec. 07, 2010
Mini-Circuits Pre_Amplifier	ZFL-1000VH2	QA0838008	NA	NA
HP Pre_Amplifier	8449B	3008A01923	Nov. 09, 2009	Nov. 08, 2010
Schaffer antenna	6112B	2731	NA	NA
EMCO Horn_Antenna	3115	6787	NA	NA
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2010	Jan. 21, 2011
Software	ADT_Radiated _V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA
Anritsu Power meter	ML2495A	0824006	April 25, 2009	April 24, 2010
Anritsu Power sensor	MA2411B	0738172	April 25, 2009	April 24, 2010
Agilent Signal generator	E8241A	US42110446	Oct. 27, 2009	Oct. 26, 2010

NOTE: 1. The test was performed in RF Chamber No. C.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Parameter	Uncertainty
Radio Frequency	$\pm 1.132 \times 10^{-6}$
RF power, conducted	$\pm 1.017 \text{ dB}$
RF power density, conducted	$\pm 1.017 \text{ dB}$
Radiated emission, up to 26.5GHz	$\pm 2.855 \text{ dB}$
Temperature	$\pm 0.7^\circ \text{C}$
Humidity	$\pm 2.5\%$
DC and low frequency voltages	$\pm 0.04\%$

2.3 MAXIMUM MEASUREMENT UNCERTAINTY

For the test methods, according to ETSI EN 300 440 standard, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [7] and shall correspond to an expansion factor (coverage factor) $k = 1,96$ or $k = 2$ (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Maximum measurement uncertainty

Parameter	Uncertainty
Radio frequency	$\pm 1 \times 10^{-7}$
RF power(conducted)	$\pm 2.5 \text{ dB}$
Radiated emission of transmitter, valid to 26.5GHz	$\pm 6.0 \text{ dB}$
Radiated emission of transmitter, valid between 26.5GHz and 80GHz	$\pm 8.0 \text{ dB}$
Radiated emission of receiver, valid 26.5GHz	$\pm 6.0 \text{ dB}$
Radiated emission of receiver, valid between 26.5GHz and 80GHz	$\pm 8.0 \text{ dB}$
Temperature	$\pm 1^\circ \text{C}$
Humidity	$\pm 5.0 \%$
Voltages(DC)	$\pm 1.0 \%$
Voltages(AC, <10kHz)	$\pm 2.0 \%$

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	GPSBox Series for 2 way Radio
MODEL NO.	GPS-4100M
POWER SUPPLY	DC 12V from DC power supply or USB Cable
MODULATION TYPE	GFSK
OPERATING FREQUENCY	1575.42MHz
IF&I.O. FREQUENCY	NA
NUMBER OF CHANNEL	1
ANTENNA TYPE	Please see note 1
DATA CABLE	USB cable x 1 (Shielded, 1.58m, with one core)
I/O PORT	Radio port x 1 (control port) USB port x 1 Ant port x 1

NOTE:

1. There is one antenna provided to this EUT, please refer to the following table:

Antenna Type	Gain (dBi)	Cable Loss(dB)	Net Gain (dBi)	Frequency range (MHz)	Connector Type	Cable Length
PCB	30	5	25	1575.42MHz $\pm$ 1.02 MHz	SMA	L=500 $\pm$ 10C m

2. For Spurious Emissions test, the EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	Level-set
Mode B	Tower-set

From the above modes, the worse case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

3. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3.2 DESCRIPTION OF TEST MODES

One channel was provided to this EUT.

Channel	Frequency (MHz)
1	1575.42MHz

For spurious emissions, the EUT was tested under following test mode:

For Spurious Emissions (below 1GHz)	
Test Mode	Configuration
Mode 1	USB Cable
Mode 2	DC power Supply
For Spurious Emissions (Above 1GHz)	
Test Mode	Configuration
Mode 1	DC power Supply

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF device, according to the specifications of the manufacturers, it must comply with the requirements of the following standards:

EN 300 440-1 V1.4.1 (2008-05)

EN 300 440-2 V1.2.1 (2008-05)

All test items have been performed and recorded as per the above standards.

3.4 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.

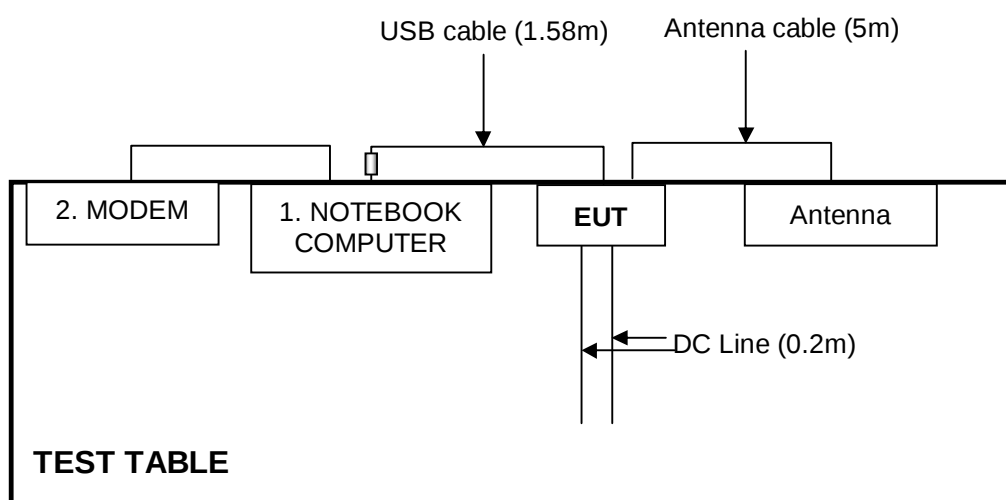
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP18L	6976685584	FCC DoC
2	MODEM	ACEEX	1414	0206026775	IFAXDM1414
3	DC POWER SUPPLY	GW	GPC-3060D	EG812707	NA

No.	Signal cable description
1	USB cable(1.58m, with one core)
2	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
3	DC line(1m)

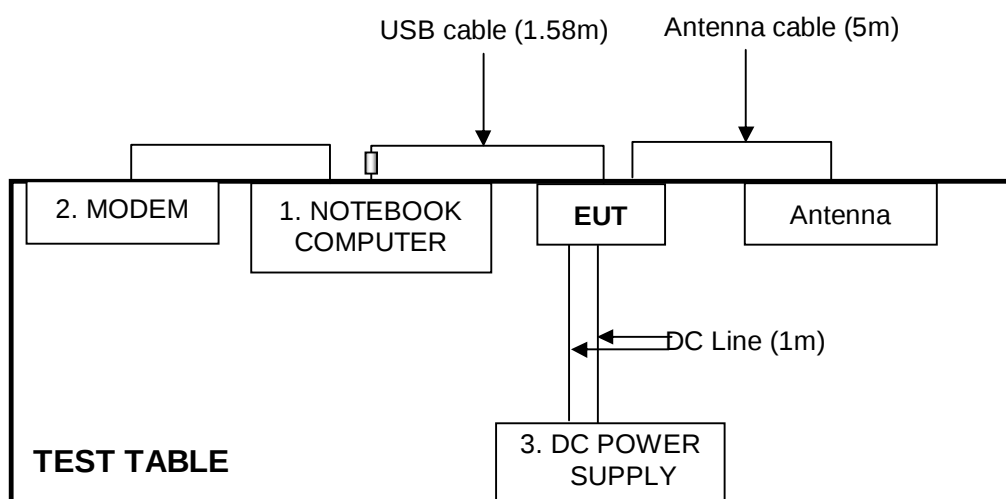
NOTE: All power cords of the above support units are non-shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

For test Mode 1:



For test Mode 2:



4. TEST PROCEDURES AND RESULTS

RECEIVER PARAMETERS

4.1 MEASUREMENT RADIATED SPURIOUS EMISSION

4.1.1 LIMIT OF MEASUREMENT RADIATED SPURIOUS EMISSION

Frequency range	Frequencies below 1GHz	Frequencies above 1GHz
Limit	2nW or -57dBm	20nW or -47dBm

4.1.2 TEST PROCEDURES

Reference to chapter 8.3.4 of ETSI EN 300 440-1 V1.4.1 (2008-05).

4.1.3 TEST SETUP

The receiver is placed on the turn-table. Switch it to the channel being tested. Make sure the receiver can receive the signal from transmitter.

For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).

4.1.4 TEST RESULTS

SPURIOUS EMISSION FREQUENCY RANGE	Below 1GHz	TEST MODE	Mode 1
ENVIRONMENTAL CONDITIONS	25 deg.C, 57% RH	TESTED BY	Frank Liu

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin
27.75	V	-70.63	-57.00	-13.63
71.75	H	-75.79	-57.00	-18.79
73.95	V	-74.00	-57.00	-17.00
76.32	H	-65.85	-57.00	-8.85
95.95	V	-75.91	-57.00	-18.91
120.01	H	-60.13	-57.00	-3.13
120.15	V	-66.17	-57.00	-9.17
125.65	H	-74.78	-57.00	-17.78
131.15	H	-72.96	-57.00	-15.96
131.70	V	-69.36	-57.00	-12.36
137.20	V	-72.50	-57.00	-15.50
168.00	H	-61.47	-57.00	-4.47
360.00	H	-65.29	-57.00	-8.29
398.59	V	-61.37	-57.00	-4.37
399.40	H	-66.04	-57.00	-9.04
480.60	V	-81.94	-57.00	-24.94
494.60	H	-81.19	-57.00	-24.19
563.20	H	-81.49	-57.00	-24.49
624.80	H	-80.95	-57.00	-23.95
624.80	V	-80.57	-57.00	-23.57
662.60	V	-83.29	-57.00	-26.29
796.54	H	-62.13	-57.00	-5.13
796.68	V	-62.06	-57.00	-5.06
998.60	V	-79.95	-57.00	-22.95

NOTE: The emission behavior belongs to narrowband spurious emission.

SPURIOUS EMISSION FREQUENCY RANGE	Below 1GHz	TEST MODE	Mode 2
ENVIRONMENTAL CONDITIONS	25 deg.C, 57% RH	TESTED BY	Frank Liu

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin
97.60	V	-66.88	-57.00	-9.88
99.25	H	-66.04	-57.00	-9.04
99.80	H	-66.93	-57.00	-9.93
101.45	V	-66.74	-57.00	-9.74
120.15	V	-69.72	-57.00	-12.72
164.15	H	-66.98	-57.00	-9.98
177.90	H	-65.32	-57.00	-8.32
191.65	V	-68.94	-57.00	-11.94
192.75	H	-65.40	-57.00	-8.40
201.55	V	-67.72	-57.00	-10.72
203.20	V	-66.40	-57.00	-9.40
215.85	H	-65.81	-57.00	-8.81
300.00	H	-80.39	-57.00	-23.39
359.99	V	-68.99	-57.00	-11.99
399.40	V	-76.01	-57.00	-19.01
399.68	H	-63.46	-57.00	-6.46
504.40	H	-82.07	-57.00	-25.07
582.80	V	-80.14	-57.00	-23.14
623.40	H	-78.94	-57.00	-21.94
624.80	V	-78.17	-57.00	-21.17
752.20	V	-80.54	-57.00	-23.54
796.44	H	-65.52	-57.00	-8.52
799.20	V	-60.08	-57.00	-3.08
998.60	H	-80.62	-57.00	-23.62

NOTE: The emission behavior belongs to narrowband spurious emission.

SPURIOUS EMISSION FREQUENCY RANGE	Above 1GHz ~ 25GHz	TEST MODE	Mode 1
ENVIRONMENTAL CONDITIONS	25 deg.C, 57% RH	TESTED BY	Frank Liu

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin
3000.45	H	-66.83	-47.00	-19.83
3000.52	V	-67.69	-47.00	-20.69
6000.59	H	-63.16	-47.00	-16.16
6000.73	V	-61.45	-47.00	-14.45

NOTE: The emission behavior belongs to narrowband spurious emission.

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

RECEIVER SPURIOUS EMISSION TEST



6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025:

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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