



FCC PART 15.227

EMI MEASUREMENT AND TEST REPORT

For

MANOVA International Ltd.

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FCC ID: UKWMANOVA-UM-200

August 24, 2006

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: SLIM MOUSE
Test Engineer: <u>Kamn Hu</u>	
Report No.: RSZ06080803	
Test Date: <u>August 18, 2006</u>	
Reviewed By: EMC Manager: Boni Baniquid 	
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Note: The test report is specially limited to the above company and this particular sample only. It may not be duplicated without prior written consent of Bay Area Compliance Lab Corp. (ShenZhen). This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the US Government.

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
TEST FACILITY	3
SYSTEM TEST CONFIGURATION.....	4
JUSTIFICATION	4
EUT EXERCISE SOFTWARE	4
SPECIAL ACCESSORIES.....	4
SCHEMATICS AND BLOCK DIAGRAM.....	4
EQUIPMENT MODIFICATIONS	4
CONFIGURATION OF TEST SETUP	5
BLOCK DIAGRAM OF TEST SETUP	5
SUMMARY OF TEST RESULTS	6
§15.203 - ANTENNA REQUIREMENT.....	7
STANDARD APPLICABLE	7
§15.205, §15.209, §15.227(A) - RADIATED EMISSIONS TEST	8
MEASUREMENT UNCERTAINTY	8
EUT SETUP.....	8
EMI TEST RECEIVER SETUP.....	8
TEST EQUIPMENT LIST AND DETAILS.....	9
CORRECTED AMPLITUDE & MARGIN CALCULATION	9
TEST RESULTS SUMMARY	9
TEST DATA	9
§15.227(B) - OUT OF BAND EMISSION	11
TEST EQUIPMENT LIST AND DETAILS.....	11
TEST DATA	11

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *MANOVA International Ltd.*'s product, model number: *UM-200 series* or the "EUT" as referred to in this report is a *SLIM MOUSE*. The EUT is measured approximately 10.0 cm L x 5.6 cm W x 2.0 cm H. rated input voltage: DC 3V battery.

** The test data gathered are from production sample, serial number: 0608014 provided by the manufacturer, we received EUT on 2006-8-8.*

Objective

This Type approval report is prepared on behalf of *MANOVA International Ltd.* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules, sec 15.203, 15.205, 15.209 and sec 15.227.

Related Submittal(s)/Grant(s)

No Related Submittals.

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.

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

Test Facility

The Test site used by Bay Area Compliance Lab Corp. (ShenZhen) to collect radiated and conducted emission measurement data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China.

Test site at Bay Area Compliance Lab Corp. (ShenZhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. 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 has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Lab Corp. (ShenZhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at

<http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

N/A

Special Accessories

N/A

Schematics and Block Diagram

Please refer to the Exhibit D.

Equipment Modifications

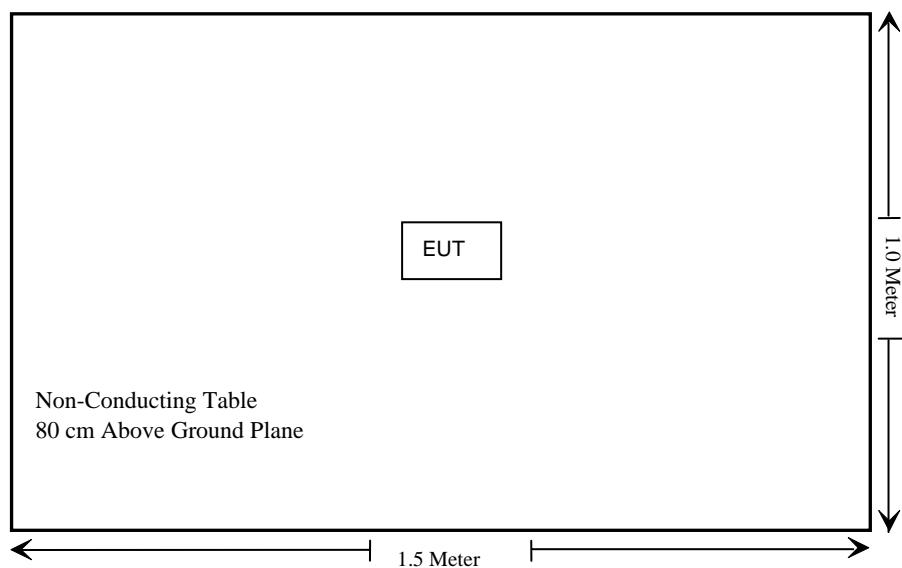
Bay Area Compliance Lab Corp. (ShenZhen) has not done any modification on the EUT.

Configuration of Test Setup



EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna requirement	Compliant
§15.205	Restricted Band of operation	Compliant
§15.209	Radiated Emission Limit	Compliant*
§15.227(a)	Field Strength	Compliant
§15.227(b)	Out of band emission	Compliant

* *Within measurement uncertainty*

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

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.

This product has a permanent antenna, fulfill the requirement of this section.

Test Result: Pass

§15.205, §15.209, §15.227(a) - RADIATED EMISSIONS TEST

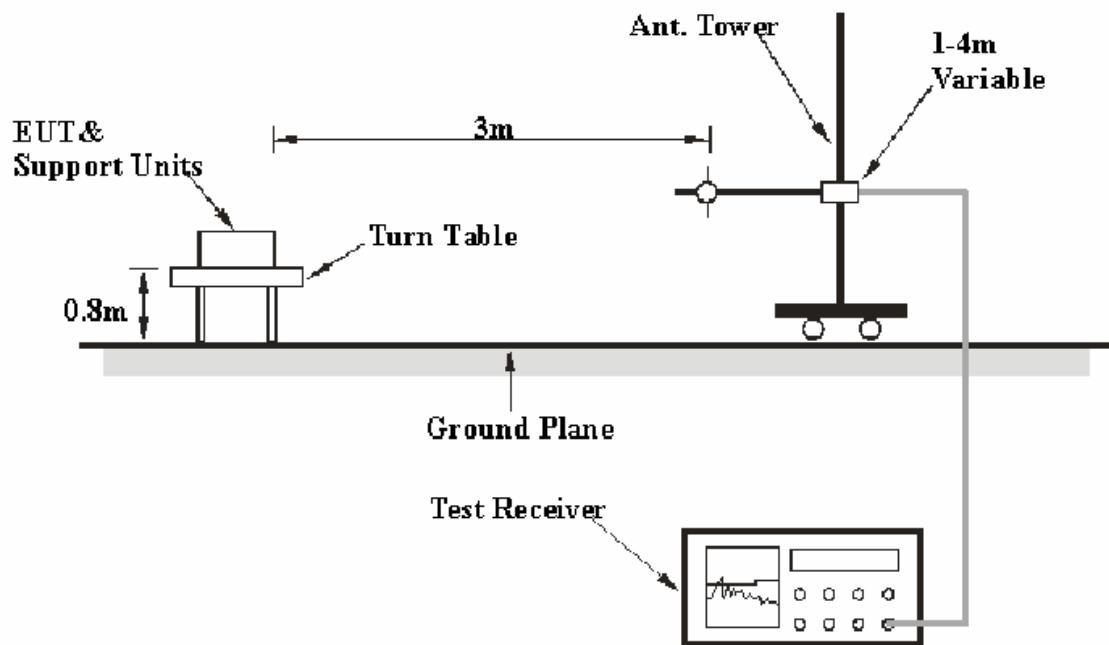
Measurement Uncertainty

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 best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Lab Corp. (ShenZhen) is ± 4.0 dB.

The fundamental data was measured in average and peak detection mode: set the VBW AVE on, then record the data.

EUT Setup



The radiated emission tests were performed in the 3-meter chamber A test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15.227 limits.

EMI Test Receiver Setup

According to FCC Rules, 47 CFR 15.33, the EUT emissions were investigated from 27 to 1000 MHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

<u>Frequency Range</u>	<u>RBW</u>	<u>Video B/W</u>
Below 30 MHz	10 kHz	30 kHz
30 – 1000 MHz	100 kHz	300 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2006-8-17	2007-8-17
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-8-17	2007-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2006-4-28	2007-4-28
ETS	Passive Loop Antenna	6512	00029604	2006-4-26	2007-4-26

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

Test Results Summary

According to the data in the following table, the EUT complied with the [FCC Part 15.227](#), with the worst margin reading of:

-3.8 dB at 785.19 MHz in the Horizontal polarization
-40.1 dB at 27.045 MHz

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	1010 mbar

The testing was performed by Kamn Hu on 2006-8-18.

Test mode: Transmitting

30MHz-1000MHz

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 15.227			
Frequency	Meter Reading		Angle	Height	Polar	Antenna Loss	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin	Detector PK/QP /AV
MHz	dBuV	Degree	Meter	H/V	dB/m	dB	dB	dBμV/m	dBμV/m	dB	dB	dB
785.19	45.7	300	1.0	H	21.3	3.3	28.1	42.2	46.0	-3.8*	QP	
378.29	52.5	45	1.2	H	15.5	1.9	27.8	42.1	46.0	-3.9*	QP	
460.36	49.9	360	1.2	H	17.4	2.3	28.4	41.2	46.0	-4.8	QP	
785.52	42.1	60	1.0	V	21.3	3.3	28.1	38.6	46.0	-7.4	QP	
758.19	41.8	120	1.5	V	21.6	3.2	28.1	38.5	46.0	-7.5	QP	
713.81	42.3	60	1.0	V	20.3	3.1	28.6	37.1	46.0	-8.9	QP	
487.82	45.0	90	1.0	V	17.9	2.3	28.5	36.7	46.0	-9.3	QP	
189.65	41.4	180	1.5	H	11.7	1.3	28.1	26.3	43.5	-17.2	QP	
54.02	39.5	45	1.0	H	8.5	0.7	28.7	20.0	40.0	-20.0	QP	
81.07	38.0	45	1.0	V	8.4	0.9	28.7	18.6	40.0	-21.4	QP	
135.3	35.2	180	1.0	V	14.2	1.1	28.5	22.0	43.5	-21.5	QP	
75.52	31.7	270	1.2	H	8.6	0.8	28.7	12.4	40.0	-27.6	QP	

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 15.227			
Frequency	Meter Reading		Angle	Height	Detector	Antenna Loss	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin	TYPE
MHz	dBuV/m	Degree	Meter	PK/QP/AV	dB	dB	dB	dBμV/m	dBμV/m	dB		
27.045	36.4	240	1.5	AV	31.7	0.6	28.8	39.9	80	-40.1	Fundamental	
27.045	36.7	180	1	PK	31.7	0.6	28.8	40.1	100	-59.9	Fundamental	

* Within measurement uncertainty

§15.227(b) - Out of Band Emission

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2006-8-17	2007-8-17
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-8-17	2007-8-17
ETS	Passive Loop Antenna	6512	00029604	2006-4-26	2007-4-26

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

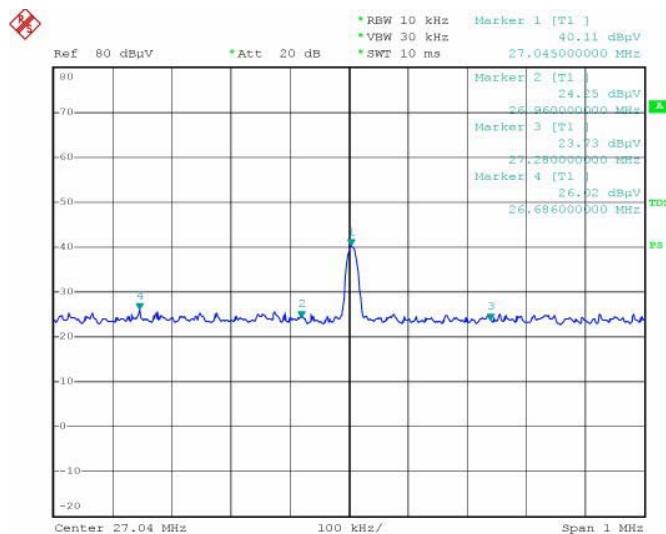
Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	1010 mbar

The testing was performed by Kamm Hu on 2006-8-16.

The result has been complied with the 15.227(b), see the following plot:



MANOVA UM-200
Date: 16.AUG.2006 15:04:52

Test Result: Pass