

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

**Traveler Rechargeable Wireless Mouse**

**MODEL No.: UM-209CH**

**Trademark: N/A**

**FCC ID: UKWMANOVA-209CH**

**REPORT NO: E0801628E**

**ISSUE DATE: March 05, 2008**

*Prepared for*

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## VERIFICATION OF COMPLIANCE

Applicant:	MANOVA International Limited Flat A, 13 <sup>th</sup> Floor, Century Industrial Centre, 33-35 Au Pui Wan Street, Fo Tan, N.T., Hong Kong
Product Description:	Traveler Rechargeable Wireless Mouse
Trademark:	N/A
Model Number:	UM-209CH
Serial Number:	N/A
File Number:	E0801628E
Date of Test:	Jan 27, 2008 to Feb 28, 2008

### We hereby certify that:

The above equipment was tested by DONGGUAN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.227.

The test results of this report relate only to the tested sample identified in this report.

*Approved By*



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*Nicol Lee / Q.A. Manager*  
**DONGGUAN EMTEK CO., LTD.**

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## **1. GENERAL INFORMATION**

### **1.1 Product Description**

The MANOVA International Limited Model: UM-209CH (referred to as the EUT in this report) The EUT is an short range, lower power, Traveler Rechargeable Wireless Mouse designed as an " Input Device. It is designed by way of utilizing the FSK modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 27.042 MHz, one channel.
- B). Modulation: Frequency Shifting Key (FSK) Modulation
- C). Antenna Designation: Non-User Replaceable (Fixed)
- D). Power Supply: 3 Vdc by AAA \*2 battery.

### **1.2 Related Submittal(s) / Grant (s)**

This submittal(s) (test report) is intended for FCC ID: UKWMANOVA-209CH filing to comply with Section 15.227 of the FCC Part 15, Subpart C Rules. The composite system (receiver) is compliance with Subpart B is authorized under a DoC procedure.

### **1.3 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

### **1.4 Special Accessories**

Not available for this EUT intended for grant.

### **1.5 Equipment Modifications**

Not available for this EUT intended for grant.

## 1.6 Test Facility

Site Description  
EMC Lab.

: Accredited by CNAS, 2005.11.02  
The certificate is valid until 2010.11  
The Laboratory has been assessed and proved to be in compliance  
with CNAS/CL01:2006(identical to ISO/IEC17025:2005)  
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Guangzhou, 2005.1  
The certificate is valid until 2009.2  
The Laboratory has been assessed according to the requirements  
ISO/IEC 17025:1999

Accredited by FCC, July 07,2005  
The Certificate Registration Number is 247565.

Accredited by Industry Canada, August 30, 2005  
The Certificate Registration Number is 46405-4480

Name of Firm  
Site Location

: DONGGUAN EMTEK CO., LTD.  
: No.281, Guantai Road, Nancheng District,  
Dongguan, Guangdong, China

## 2. System Test Configuration

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions (Not apply in the report)

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the **frequency range between 0.15 MHz and 30MHz** using **CISPR Quasi-Peak and average detector mode**.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

### 2.4 Limitation

#### (1) Conducted Emission (Not applicable in this report)

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

(2) **Radiated Emission**

- The field strength of any emission within this band (section 15.227 frequency between 26.95MHz -27.28MHz) shall not exceed 10000 micro volts/meter at 3 meters. (80dBμV at 3m) The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.
- The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209(Intentional Radiators general limit).as below.

Frequency (MHz)	Field strength μV/m	Distance(m)	Field strength at 3m dBμV/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

- Remark:
- Emission level in dBuV/m=20 log (uV/m)
  - Measurement was performed at an antenna to the closed point of EUT distance of meters.
  - Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205
  - Emission spurious frequency which appearing within the Restricted Bands specified in provision of §15.205, then the general radiated emission limits in § 15.209 apply.

## 2.5 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**

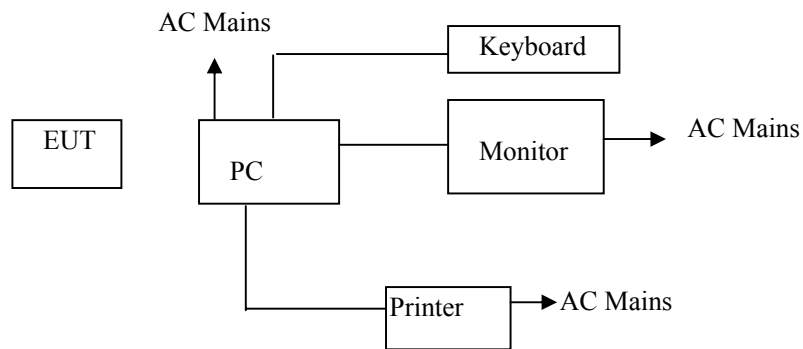


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1	Traveler Rechargeable Wireless Mouse	N/A	UM-209CH	UWKUM-209CH	N/A	<b>EUT</b>
2.	PC	lenovo	VL420 MT	N/A	CN15100363	
3.	LCD Monitor	Sony	SDM-S53	N/A	0413350	
4.	Keyboard	IBM	SK-2502C	N/A	C0111141546	
5.	Printer	HP	C89520	N/A	CN25S182N6	

**Note:**

- (1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.



### 3. Summary Of Test Results

FCC Rules	Description Of Test	Result
§ 15.207	Conducted Emission	N/A
§ 15.227	Radiated Emission	Compliant
§ 15.227	Bandwidth Test	Compliant

### 4. Description of test modes

The EUT (Traveler Rechargeable Wireless Mouse) has been tested under normal operating condition. The EUT stay in continuous transmitting mode. The Frequency 27.042MHz are chosen for testing.

**5. Conducted Emissions Test (Not applicable in this report)****5.1 Measurement Procedure:**

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

**5.2 Test SET-UP (Block Diagram of Configuration)****5.3 Measurement Equipment Used:**

Conducted Emission Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2007	05/29/2008
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	05/29/2007	05/29/2008
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	05/29/2007	05/29/2008
50ΩCoaxial Switch	Anritsu	MP59B	M20531	05/29/2007	05/29/2008

**5.4 Measurement Result:**

N/A

**5.5 Conducted Measurement Photos:**

N/A

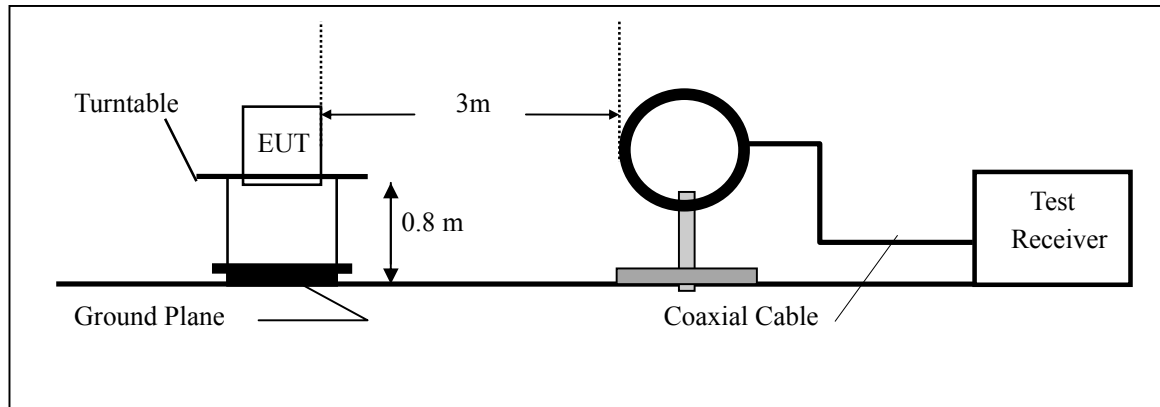
## **6. Radiated Emission Test**

### **6.1 Measurement Procedure**

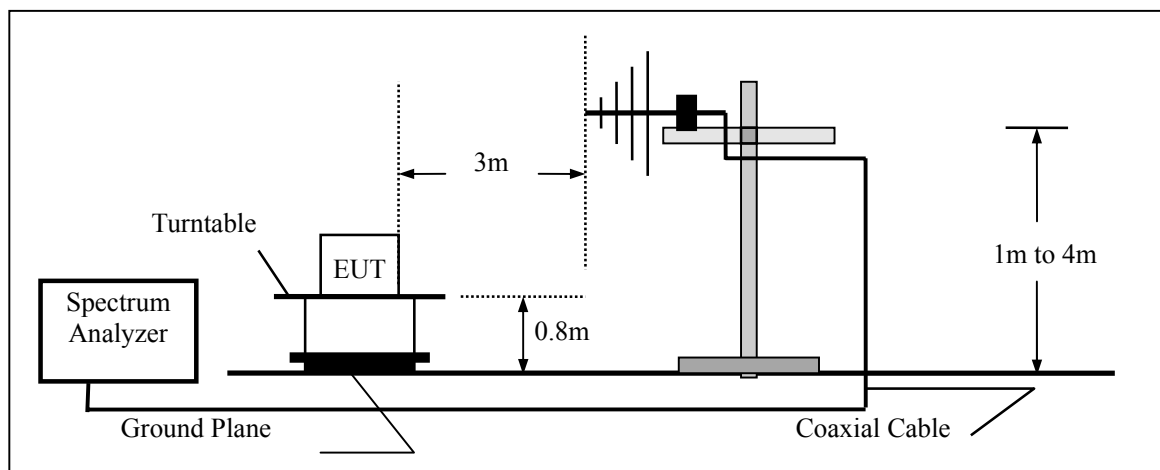
- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

## 6.2 Test SET-UP (Block Diagram of Configuration)

### (A) Radiated Emission Test Set-Up, Frequency Below 30MHz



### (B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



### 6.3 Measurement Equipment Used:

Open Area Test Site # 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	ANRITSU	MS2661C	6200140915	05/29/2007	05/29/2008
EMI Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2007	05/29/2008
Pre-Amplifier	HP	8447D	2944A07999	05/29/2007	05/29/2008
Bilog Antenna	Schwarzbeck	VULB9163	142	05/29/2007	05/29/2008
Loop Antenna	ARA	PLA-1030/B	1029	05/29/2007	05/29/2008

### 6.4 Measurement Result

#### A. Fundamental and Harmonics Radiated Emission Data

Operation Mode:	Transmitting Mode	Test Date :	Feb 27, 2008
Frequency Range:	20M-1GHz	Temperature :	28 °C
Fundamental Frequency:	27.042 MHz	Humidity :	65 %
Test Result:	PASS	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
27.042	V	62.93	100.00	-37.07	Peak
54.09	V	30.25	40.00	-9.75	Peak
81.135	V	27.13	40.00	-12.87	Peak
108.18	V	34.42	43.50	-9.08	Peak
135.225	V	31.30	43.50	-12.20	Peak
162.27	V	23.50	43.50	-20.00	Peak
189.315	V	23.40	43.50	-20.10	Peak
216.36	V	21.70	46.00	-24.30	Peak
243.405	V	22.80	46.00	-23.20	Peak
270.45	V	21.90	46.00	-24.10	Peak
297.495	V	20.60	46.00	-25.40	Peak
324.54	V	23.60	46.00	-22.40	Peak
351.585	V	26.30	46.00	-19.70	Peak
378.63	V	24.90	46.00	-21.10	Peak
405.675	V	25.70	46.00	-20.30	Peak
432.72	V	24.90	46.00	-21.10	Peak
459.765	V	25.30	46.00	-20.70	Peak
27.042	H	65.38	100.00	-34.62	Peak
54.09	H	32.50	40.00	-7.50	Peak

81.135	H	24.00	40.00	-16.00	Peak
108.18	H	27.50	43.50	-16.00	Peak
135.225	H	24.60	43.50	-18.90	Peak
162.27	H	24.80	43.50	-18.70	Peak
189.315	H	29.50	43.50	-14.00	Peak
216.36	H	29.20	46.00	-16.80	Peak
243.405	H	30.70	46.00	-15.30	Peak
270.45	H	30.20	46.00	-15.80	Peak
297.495	H	29.90	46.00	-16.10	Peak
324.54	H	31.00	46.00	-15.00	Peak
351.585	H	36.30	46.00	-9.70	Peak
378.63	H	38.00	46.00	-8.00	Peak
405.675	H	28.90	46.00	-17.10	Peak
432.72	H	32.40	46.00	-13.60	Peak
459.765	H	28.10	46.00	-17.90	Peak

**No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.227.**

**Note:** (1) All Readings are Peak Value.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss

(3) The average measurement was not performed when the peak measured data under the limit of average detection.

## B.Out of Band Radiated Measurement Result

Operation Mode: RX Mode                      Test Date : Feb 27, 2008  
Frequency Range: 30~1000MHz              Temperature : 27 °C  
Test Result: PASS                              Humidity : 65 %  
Measured Distance: 3m                        Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
35.240	V	34.20	40.00	-5.80	PK
125.360	V	32.24	43.50	-11.26	PK
436.260	V	35.26	46.00	-10.74	PK
510.103	V	32.14	46.00	-13.86	PK
702.325	V	30.14	46.00	-15.86	PK
786.927	V	32.00	46.00	-14.00	PK
105.260	H	30.27	43.50	-13.23	PK
250.140	H	32.25	46.00	-13.75	PK
357.544	H	30.19	46.00	-15.81	PK
468.590	H	38.25	46.00	-7.75	PK
586.370	H	27.20	46.00	-18.80	PK
638.752	H	30.15	46.00	-15.85	PK

**Note:** (1) All Readings are Peak Value.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

**No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.209.**

## 6.5 Radiated Measurement Photos:

Frequency Below 30MHz



Frequency Below 1000MHz





## **7. Occupied Bandwidth**

### **7.1 Measurement Procedure**

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency , RBW= 10KHz,VBW= 30KHz
4. Set SPA Max hold. Mark peak.

### **7.2 Test SET-UP (Block Diagram of Configuration)**

Same as 6.2 Radiated Emission Measurement.

### **7.3 Measurement Equipment Used:**

Same as 6.2 Radiated Emission Measurement.

### **7.4 Measurement Results:**

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209.

Refer to attached data chart.

## Band Width Test Data

