FCC PART 15.227

MEASUREMENT AND TEST REPORT

FOR

JUNENG ELECTRONICS TECHNOLOGY CO., LTD.

Hua Qiang Road, Xin Cheng Zone, Shi Long Town, Dong Guan City,

GuangDong, China

FCC ID: UM63201

Report Concerns: Original Report	**Equipment Type:** Wireless Optical Mouse
Model:	JM-32R
Report No.:	STR06108001I
Test/Witness Engineer:	Innaz Lee
Test Date:	2006-10-06
Prepared By:	**Shenzhen SEM.Test Compliance Service Co., Ltd** Room 609-610, Baotong Building, Baomin 1st Road, Baoan District, Shenzhen, Guangdong, P.R.C. (518133)
Approved & Authorized By:	 PSQ Manager / Jandy So

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:	JUNENG ELECTRONICS TECHNOLOGY CO., LTD.
Address of applicant:	Hua Qiang Road, Xin Cheng Zone, Shi Long Town, Dong Guan City, GuangDong, China
Manufacturer:	JUNENG ELECTRONICS TECHNOLOGY CO., LTD.
Address of manufacturer:	Hua Qiang Road, Xin Cheng Zone, Shi Long Town, Dong Guan City, GuangDong, China

General Description of E.U.T

Items	Description
EUT Description:	Wireless Optical Mouse
Trade Name:	/
Model No.:	JM-32R
Rated Voltage:	3.0V Battery
Output Power:	<-30 dBm
Frequency Range:	27.145MHz
Antenna Type:	Integral Antenna
Size:	10.0X5.0X3.0 cm
For more information refer to the circuit diagram form and the user's manual.	

The test data gathered are from a production sample, provided by the manufacturer.

1.2 Test Standards

The following report of is prepared on behalf of JUNENG ELECTRONICS TECHNOLOGY CO., LTD. in accordance with FCC Part 15, Subpart C, and section 15.203,15.205,15.209 and 15.227 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203,15.205,15.209 and 15.227 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission/immunity, 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 emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

United States of American Federal Communications Commission (**FCC**), and the registration number is **274801**(semi anechoic chamber).

Voluntary Control Council for Interference by Information Technology Equipment (**VCCI**), and the registration number is **R-1966** (semi anechoic chamber).

Industry Canada (**IC**), and the registration number is **IC4174**.

All measurement required was performed at laboratory of Shenzhen Academy of Metrology and Quality Inspection, Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China.

1.6 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components. The test software is started while the whole system is on.

1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

1.8 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Cord/Without Cord
/	/	/	/

2. 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

3. §15.203 - ANTENNA REQUIREMENT

3.1 Standard Applicable

According to FCC 15.203, 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.

3.2 Test Result

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

4. §15.205, §15.209, §15.227 (a)- RADIATED EMISSION

4.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ±4.0 dB.

4.2 Standard Applicable

According to §15.227(a), The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

According to §15.205 and §15.209 the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

FIELD STRENGTH of Fundamental:	FIELD STRENGTH of Harmonics:	Section 15.209:
902-928MHz		30 - 88 MHz 40 dBuV/m @3M
2.4-2.4835GHz	127.37dBuV/m @3m	88 -216 MHz 43.5 dBuV/m @3M
127.38dBuV/m @3m	54 dBuV/m @3m	216 -960 MHz 46 dBuV/m @3M
		Above 960 MHz 54dBuV/m @3M

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 20 dB BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209,WHICHEVER IS THE LESSER ATTENUATION.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

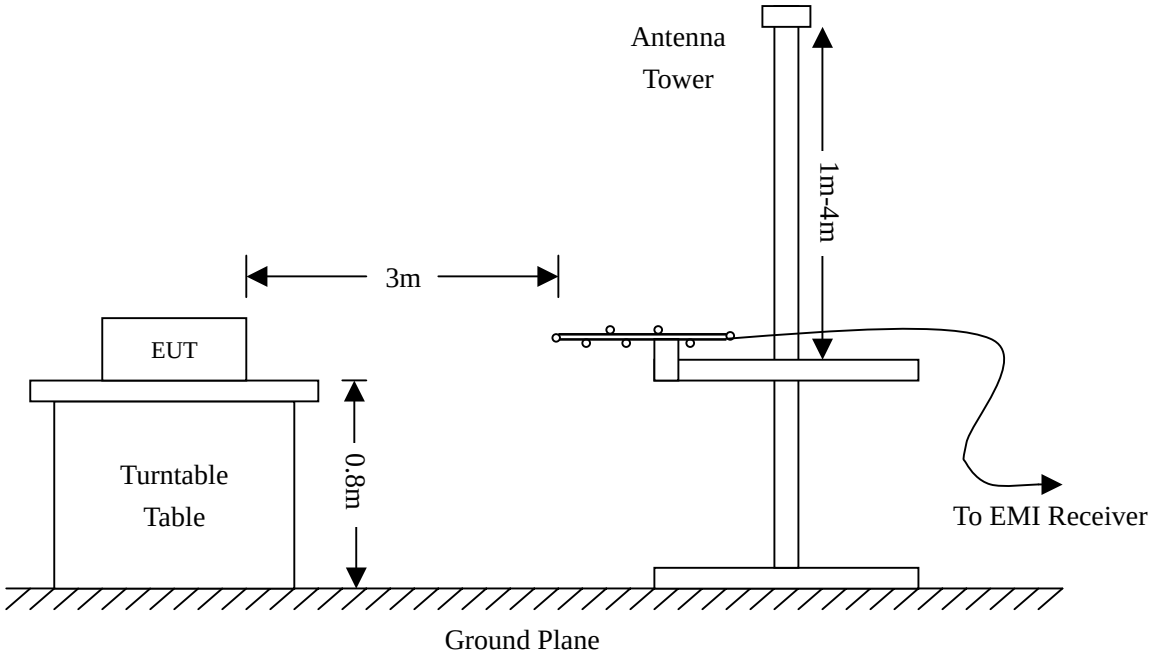
4.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESCS30	830245/009	2006-1-26	2007-1-25
Multi_Device Controller	ETS	2090	57230	2006-1-26	2007-1-25
Receiver Antenna	ETS	2175	57337	2006-1-26	2007-1-25
50 ohm Coaxial Cable	ETS	SUCOFLEX 104	25498514	2006-1-26	2007-1-25
Triple Loop Antenna	Schwarzbeck	HXYZ9170	9124	2006-1-26	2007-1-25

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

4.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 15.227(a) and FCC Part 15.209 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.



4.5 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 + Ant. Factor + Cable Loss – Ampl. Gain

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 15 Limit

4.6 Environmental Conditions

Temperature:	26° C
Relative Humidity:	52%
ATM Pressure:	1022 mbar

4.7 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.227 standards, and had the worst margin of:

-18.80 dBμV at **54.30 MHz** in the **Vertical** polarization, **30 MHz to 1 GHz, 3Meters**

Test Mode: Transmitting

Frequency	Meter Reading	Detector	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifer Gain	Corr. Ampl.	FCC Part 15.227 & 15.209	
MHz	dBuV	PK/ AV	Degree	Meter	H / V	dB	dB	dB	dBuV/m	Limit dBuV/m	Margin dB
54.30	38.3	PK	98	1.2	V	8.5	0.7	26.24	21.2	40	-18.8
27.15	60.5	AV	66	1	H	24.1	0.6	26.29	58.84	80	-21.2
54.30	35.5	PK	135	1.2	H	8.5	0.7	26.24	18.45	40	-21.6
81.44	35.0	PK	45	1	H	8.4	0.9	26.03	18.21	40	-21.8
81.44	33.0	PK	56	1.4	V	8.4	0.9	26.03	16.22	40	-23.8
108.58	33.1	PK	60	1.3	H	11.0	1.0	25.89	19.25	43.5	-24.3
108.58	31.3	PK	60	2	V	11.0	1.0	25.89	17.4	43.5	-26.1
27.15	71.4	PK	66	1	H	24.1	0.6	26.29	69.8	100	-30.2
27.15	51.0	AV	45	1.2	V	24.1	0.6	26.29	49.33	80	-30.7
27.15	58.3	PK	45	1.2	V	24.1	0.6	26.29	56.7	100	-43.3

Note: The EUT was tested in all three orthogonal planes and frequency rang 27MHz to the tenth harmonics. Emissions below 30MHz is testing with Loop Antenna, located its Horizontal and Vertical positions to catch the maximum emissions.

Plot of Radiation Emissions Test

Radiated Disturbance

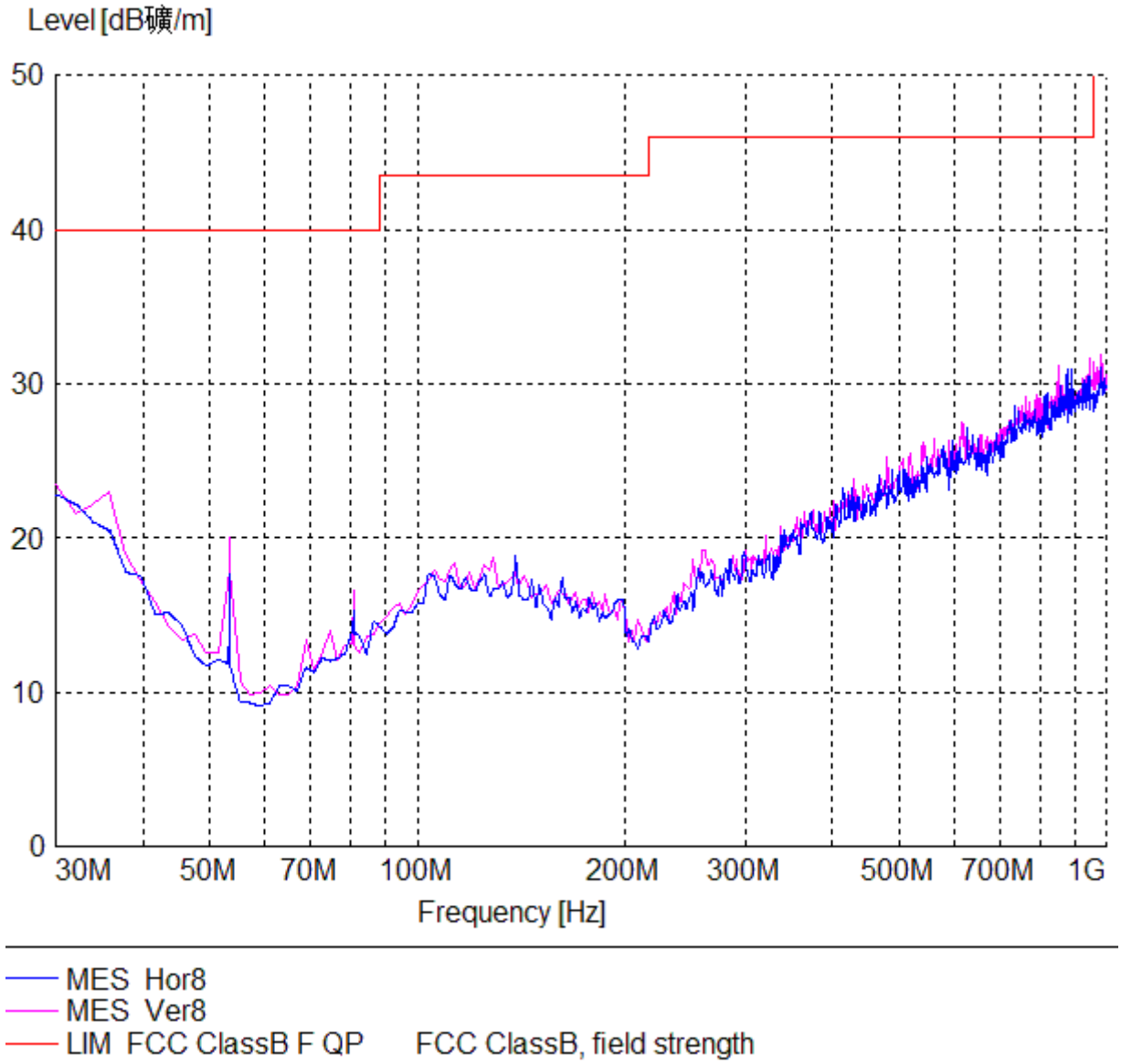
EUT: wireless mouse M/N: JM-32R

Operating Condition: Transmitting

Test Site: SMQ EMC Lab.SAC

Test Specification: Vertical & Horizontal

Comment: DC 3V Battery



5. §15.227(b) OUT OF BAND EMISSIONS

5.1 Standard Applicable

According to FCC 15.227(b), the field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209.

5.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2006-06-30	2007-06-29
Receiver Antenna	ETS	2175	57337	2006-1-26	2007-1-25
50 ohm Coaxial Cable	ETS	SUCOFLEX 104	25498514	2006-1-26	2007-1-25
Triple Loop Antenna	Schwarzbeck	HXYZ9170	9124	2006-1-26	2007-1-25

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

5.3 Test Procedure

As the radiation test, set the RBW=10kHz VBW=30kHz, observed the outside band of 26.96MHz to 27.28MHz, than mark the higher-level emission for comparing with the FCC rules.

5.4 Environmental Conditions

Temperature:	26° C
Relative Humidity:	52%
ATM Pressure:	1022 mbar

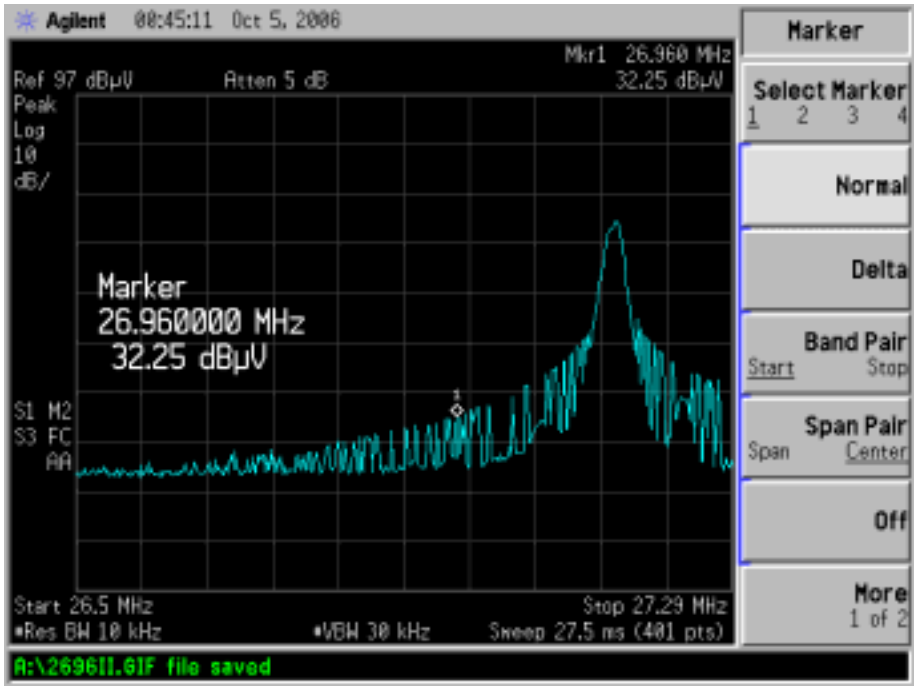
5.5 Summary of Test Results/Plots

Frequency MHz	Emission dBμV/m	Limit dBμV/m
26.96	32.25	40
27.28	38.67	40

Test Result Pass

Refer to the attached plots.

Low Bandedge



High Bandedge