

FCC PART 15.227

EMI MEASUREMENT AND TEST REPORT

For

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FuYong, BaoAn, ShenZhen, P.R. China

FCC ID: SXGSN-222

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This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Transmitter, 3 Buttons Wireless Optical Wheel Mouse-Chargeable
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Report No.: <u>RSZ05011806</u>	
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Note: The test report is specially limited to the above company and the product model only.
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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
SCHEMATICS AND BLOCK DIAGRAM.....	4
EQUIPMENT MODIFICATIONS	4
TEST SETUP CONFIGURATION	4
SUMMARY OF TEST RESULTS	5
§15.203 - ANTENNA REQUIREMENT	6
STANDARD APPLICABLE	6
§15.205, §15.209, §15.227(A) - RADIATED EMISSIONS TEST	7
MEASUREMENT UNCERTAINTY	7
EUT SETUP	7
EMI TEST RECEIVER SETUP	7
TEST EQUIPMENT LIST AND DETAILS.....	8
CORRECTED AMPLITUDE & MARGIN CALCULATION	8
TEST DATA	8
§15.227(B) - OUT OF BAND EMISSION	9

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *SANSUN INDUSTRIAL (SHENZHEN) LIMITED*'s product, model number: *SN-222* or the "EUT" as referred to in this report is a 3 Buttons Wireless Optical Wheel Mouse-Chargeable Transmitter. The EUT is measured approximately 12.0 cm L x 6.3 cm W x 4.0 cm H. rated input voltage: DC 3V battery.

** The test data gathered are from production sample, serial number: 0501018, provided by the manufacturer.*

Objective

This Type approval report is prepared on behalf of *SANSUN INDUSTRIAL (SHENZHEN) LIMITED* 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 Laboratory Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. 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 and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to ANSI C63.4-2003.

Schematics and Block Diagram

Please refer to Appendix D.

Equipment Modifications

No modifications were made to the EUT.

Test Setup Configuration



Mouse Transmitter

SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number:0501018.

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna requirement	Pass
§15.205	Restricted Band of operation	Pass
§15.209	Radiated Emission Limit	Pass
§15.227(a)	Field Strength	Pass
§15.227(b)	Band Edge	Pass

§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 BACL is ± 4.0 dB.

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

EUT Setup

The radiated emission tests were performed in the open area 3-meter chamber, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15 Subpart C 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	10 kHz
30 – 1000 MHz	100 kHz	100 kHz
Above 1000 MHz	1 MHz	1 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JBI	A040904-1	2004-4-19	2005-4-18
HP	Amplifier	HP844TK	2944A09295	2004-4-5	2005-4-4
THERMAX	Coaxial Cable	RGS-142	EC002	2004-11-20	2005-11-19
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2004-11-20	2005-11-19
Fluke	True RMS Multimeter	187	78540402	2004-3-23	2005-3-22

* **Statement of Traceability:** BACL 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 Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

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

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 Data

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 15.227			
Frequency MHz	Ampl. dB μ V/m		Angle Degree	Height Meter	Polar H/V	Antenna dB/m	Cable dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB	Remark
135.225	54.02	45	1.2	v	14.2	1.1	28.5	40.8	43.5	-2.7		harmonics
108.180	56.87	90	1.2	v	11.0	1.0	28.5	40.4	43.5	-3.1		harmonics
81.135	55.10	61	3.1	h	8.4	0.9	28.7	35.7	40.0	-4.3		harmonics
108.180	55.13	154	3.1	h	11.0	1.0	28.5	38.6	43.5	-4.9		harmonics
162.270	52.77	60	1.2	h	12.7	1.1	28.3	38.3	43.5	-5.2		harmonics
81.135	52.95	270	1.0	v	8.4	0.9	28.7	33.5	40.0	-6.5		harmonics
270.450	53.00	270	1.0	h	12.6	1.4	27.6	39.4	46.0	-6.6		harmonics
135.225	49.20	361	46.9	h	14.2	1.1	28.5	36.0	43.5	-7.5		harmonics
162.270	49.40	180	1.0	v	12.7	1.1	28.3	34.9	43.5	-8.6		harmonics
270.450	46.45	90	1.2	v	12.6	1.4	27.6	32.9	46.0	-13.2		harmonics
27.045	69.72	45	1.2	v	24.1	0.6	28.8	65.6	80.0	-14.4	Fund(AV)	
27.045	63.80	60	3.0	h	24.1	0.6	28.8	59.7	80.0	-20.3	Fund(AV)	
27.045	72.50	45	1.2	v	24.1	0.6	28.8	68.4	100.0	-31.6	Fund(PK)	
27.045	66.40	60	3.0	h	24.1	0.6	28.8	62.3	100.0	-37.7	Fund(PK)	

Test Result: Pass

§15.227(b) - Out of Band Emission

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

Frequency MHz	Emission dB μ V/m	Limit dB μ V/m
26.96	17.25	40.0
27.28	25.35	40.0

Test Result: Pass

