

FCC PART 15.227
EMI MEASUREMENT AND TEST REPORT

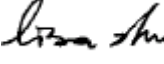
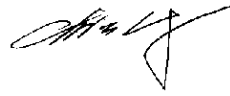
For

EASTERN TIMES TECHNOLOGY CO., LTD

BUILDING 5, PENGHUA INDUSTRY PARK, HEPING ROAD (W), LONGHUA TOWN, SHENZHEN, CHINA

FCC ID: RNKDS-2101

March 31, 2005

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Transmitter, Mini RF Wireless Optical Mouse
Test Engineer: Lisa Zhu 	
Report No.: RSZ04123103	
Test Date: January 11, 2005	
Reviewed By: Chris Zeng 	
Prepared By: Bay Area Compliance Lab Corp. (ShenZhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China Tel: +86-755-33320018 Fax: +86-755-33320008	

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.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The EASTERN TIMES TECHNOLOGY CO., LTD's product, model number: DS-2101 or the "EUT" as referred to in this report is a Transmitter of Mini RF Wireless Optical Mouse Transmitter. The EUT is measured approximately 9.1cm L x 4.6cm W x 3.0cm H. rated input voltage: DC 3V battery.

** The test data gathered are from production sample, serial number: 2009050000001, provided by the manufacturer.*

Objective

This Type approval report is prepared on behalf of *EASTERN TIMES TECHNOLOGY CO., 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 Laboratory Corp. 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.

SYSTEM TEST CONFIGURATION

Justification

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

Block Diagram/Schematics

N/A.

Equipment Modifications

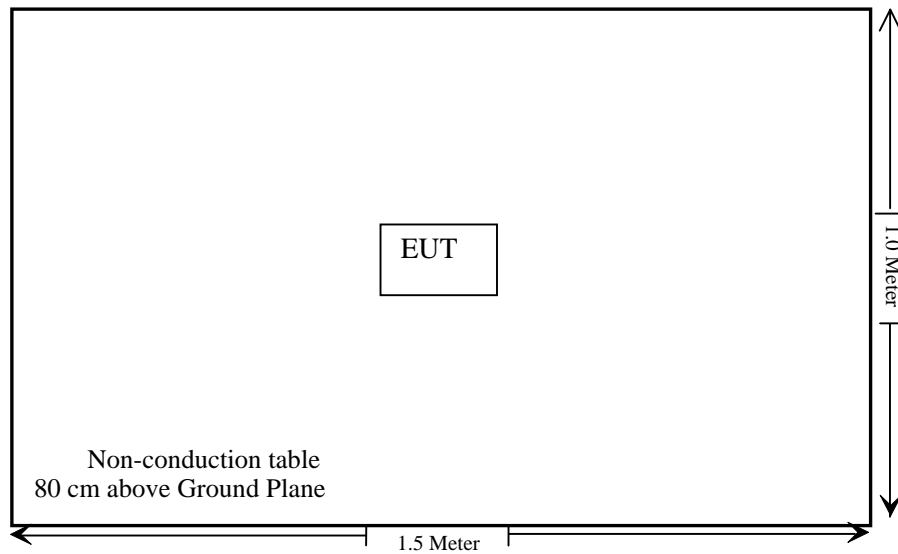
BACL has not done any modification on the EUT.

Configuration of Test Setup



Mini RF Wireless Optical Mouse Transmitter

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: 2009050000001.

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)	Out of Band Emission	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 BAEL 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 section 15.227 limits.

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 test Receiver was set with the following configurations:

<i><u>Frequency Range</u></i>	<i><u>RBW</u></i>	<i><u>Video B/W</u></i>
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
Rohde & Schwarz	Test Receiver	ESCI	100035	2004-9-15	2005-9-14
HP	Amplifier	8447E	1937A01046	2004-9-1	2005-8-31
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2004-4-19	2005-4-18

* **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 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:

-12.6 dB at 270.450 MHz in the Horizontal polarization.

Test Data**Environmental Conditions**

Temperature:	22° C
Relative Humidity:	58%
ATM Pressure:	1016mbar

Testing was performed by Lisa Zhu on 2005-01-11.

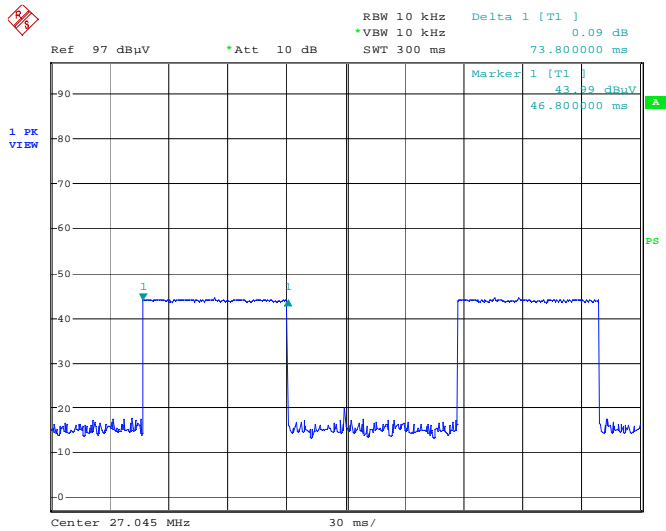
Test Mode: Transmitting

INDICATED		TABLE Angle Degree	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE Corr. Ampl. dBμV/m	FCC PART 15.227&15.209		
Frequency MHz	Ampl. dBμV/m		Height Meter	Polar H/ V	Antenna dB/m	Cable dB	Amp. dB		Limit dBμV/ m	Margin dB	Remark
270.450	47.32	154	3.1	H	12.3	1.4	27.6	33.4	46.0	-12.6	HARMONICS
243.405	45.53	61	3.1	H	12.3	1.3	27.7	31.4	46.0	-14.6	HARMONICS
270.450	44.71	180	1.0	v	12.3	1.4	27.6	30.8	46.0	-15.2	HARMONICS
297.495	42.41	45	1.0	H	13.8	1.6	27.6	30.2	46.0	-15.8	HARMONICS
189.315	41.75	60	3.0	H	11.7	1.3	28.1	26.7	43.5	-16.9	HARMONICS
243.405	42.69	45	1.2	v	12.3	1.3	27.7	28.6	46.0	-17.4	HARMONICS
81.135	41.56	90	1.2	v	8.4	0.9	28.7	22.1	40.0	-17.9	HARMONICS
324.540	39.27	60	1.2	H	14.3	1.7	27.7	27.6	46.0	-18.4	HARMONICS
54.090	38.90	45	1.2	v	8.5	0.7	28.7	19.4	40.0	-20.6	HARMONICS
27.045	54.94	270	1.0	v	24.1	0.6	28.8	50.8	100.0	-49.2	FUND(PK)
27.045	50.78	60	3.0	H	24.1	0.6	28.8	46.6	100.0	-53.4	FUND(PK)
27.045	AVE=PEAK*DUTY CYCLE=345.94μV/m *0.461=159.48μV/m							44.1	80.0	-35.9	FUND(AV)
27.045	AVE=PEAK*DUTY CYCLE=557.19μV/m *0.461=256.86μV/m							48.2	80.0	-31.8	FUND(AV)

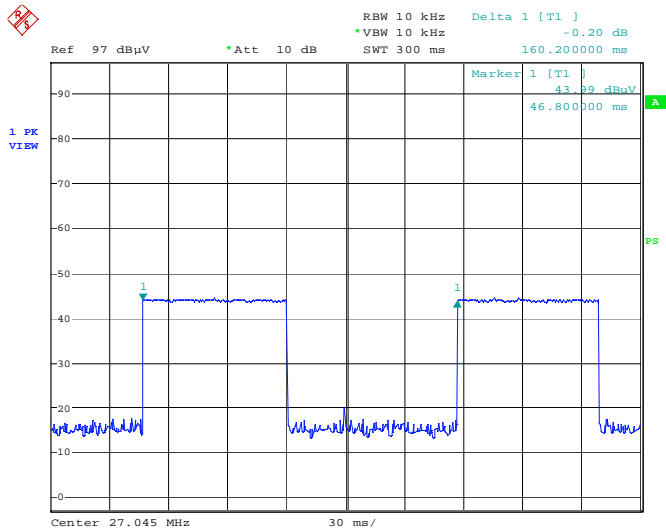
Test Result: Pass

Duty Cycle

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



A
 Date: 25.MAR.2005 11:17:42



A
 Date: 25.MAR.2005 11:14:33

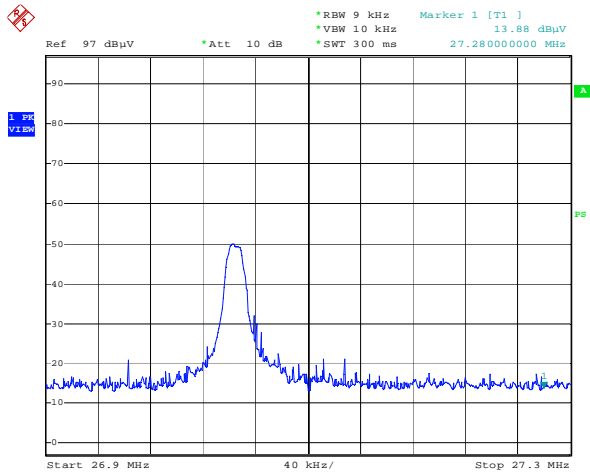
$$\begin{aligned} \text{Duty cycle} &= \text{TX On}/(\text{TX Off}+\text{TX On}) \\ &= 73.8/160.2 \\ &= 46.1\% \end{aligned}$$

§15.227(b) - Out of Band Emission

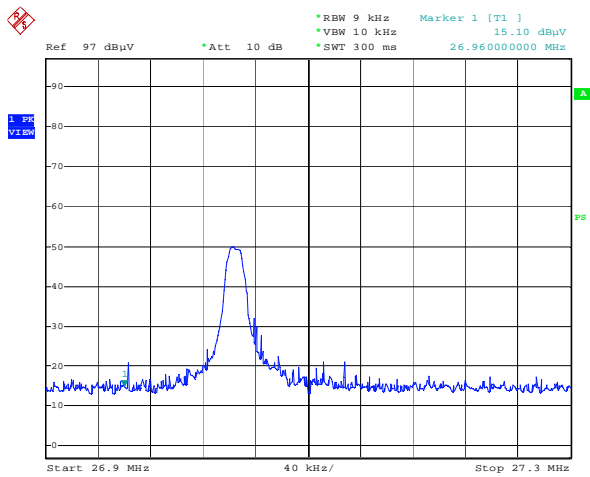
The result has been complied with the 15.227(b), see the following plot:

Frequency MHz	Emission dB μ V/m	Limit dB μ V/m
26.96	15.10	40
27.28	13.88	40

Test Result: Pass



Date: 19.APR.2005 11:23:46



Date: 19.APR.2005 11:23:11