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**FEDERAL COMMUNICATIONS COMMISSION**  
Registration number: 556682

Report No.: SZEMO09070439801  
Page: 1 of 17

## TEST REPORT

**Application No.:** SZEMO090704398RF  
**Applicant:** Shenzhen Fuyeda Industry Development Corp.  
**Manufacturer/ Factory:** Shenzhen Fuyeda Industry Development Corp.  
**Buyer:** Lenovo (Beijing) Limited  
**FCC ID:** V4P-MS169OR  
**Fundamental Carrier Frequency :** 2.402GHz to 2.480GHz

**Equipment Under Test (EUT):**

Name: MOUSE

Model: N201/MS-169OR♣



Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.

**Standards:** FCC PART 15: 2008

**Date of Receipt:** 30 July 2009

**Date of Test:** 05 to 13 August 2009

**Date of Issue:** 17 August 2009

<b>Test Result :</b>	<b>PASS *</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo  
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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## 2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Flid Strength of Fundamental	FCC PART 15 : 2008	Section 15.249 (a)	PASS
Flid Strength of Harmonics or other Frequency Emission	FCC PART 15 : 2008	Section 15.249 (a) Section 15.209/15.205	PASS

Remark:

Item No.: N201/MS-169OR

Only the Item N201 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above items.



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## 4 General Information

### 4.1 Client Information

Applicant: Shenzhen Fuyeda Industry Development Corp.  
Manufacturer/ Factory: Shenzhen Fuyeda Industry Development Corp.  
Address of Applicant: No.1 NEWMEN ROAD. TONGSHENG VILLAGE, DALANG STREET, BAO'AN, SHENZHEN, CHINA  
Address of Manufacturer/ Factory: No.1 NEWMEN ROAD. TONGSHENG VILLAGE, DALANG STREET, BAO'AN, SHENZHEN, CHINA  
Buyer: Lenovo (Beijing) Limited  
Address of Buyer: No.6 Shang Di Chuang Ye Road, Haidian District, Beijing, China

### 4.2 General Description of E.U.T

Product Name: MOUSE  
Model: N201/MS-169OR  
Power Supply: DC3.0V(2\*1.5V"AA"Size Batteries)  
Power Cord: N/A-

### 4.3 Description of Support Units

The EUT was tested with associated equipment below:

Description	Manufacturer	Model No.
PC	DELL	OPTIPLEX 755
LCD-displaying	DELL	E1909WF
KEYBOARD	DELL	SK-8115

### 4.4 Standards Applicable for Testing

The customer requested FCC tests for a 2.4G wireless mouse

The standard used was FCC PART 15, SUBPART C: 2008 section 15.249.

### 4.5 Test Location

All tests were performed at:

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, District Shenzhen, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

### 4.6 Other Information Requested by the Customer

None.



## **4.7 Test Facility**

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

- **CNAS (No. CNAS L2929)**  
CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.
- **VCCI**  
The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.  
Date of Registration: September 29, 2008. Valid until September 28, 2011.
- **FCC – Registration No.: 556682**  
SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 556682, June 27, 2008.
- **Industry Canada (IC)**  
The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

## 5 Test Results

### 5.1 Test Instruments

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	16-06-2008	15-06-2010
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	12-12-2008	11-12-2009
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	18-06-2009	17-06-2010
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0014	12-08-2008	11-08-2009
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	18-06-2009	17-06-2010
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0005	12-08-2008	11-08-2009
8	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	12-08-2008	11-08-2009
9	Pre-amplifier (1-18GHz)	Rohde & Schwarz	AFS42-00101 800-25-S-42	SEL0081	18-06-2009	17-06-2010
10	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	SEL0080	18-06-2009	17-06-2010
11	Band filter	Amindeon	82346	SEL0094	18-06-2009	17-06-2010
12	Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	15-06-2009	14-06-2010



## **5.2 E.U.T. Operation**

Input voltage:	DC3.0V(2*1.5V"AA"Size Batteries)
Operating Environment:	
Temperature:	24°C
Humidity:	50 % RH
Atmospheric Pressure:	1010 mbar
EUT Operation:	Test in transmitting mode:
	1. For channel 1: 2.402GHz.
	2. For channel 3: 2.441GHz.
	3. For channel 4: 2.480GHz.

## 5.3 Test Procedure & Measurement Data

### 5.3.1 Radiated Emissions

#### 5.3.1.1 Test in transmitting mode

Test Requirement: FCC Part15.249,15.209 and 15.205

Test Method: ANSI C63.4: 2003

Measurement Distance: 3m (Semi-Anechoic Chamber)

Frequency range 30 MHz – 25GHz

Test instrumentation resolution bandwidth

Frequency Range	Detector	RBW/VBW
30MHz to 1000MHz	Quasi-Peak	120KHz/300KHz
1GHz to 25GHz	Peak & Average	1MHz/3MHz

Operation: Receive antenna scan height 1 - 4 m, polarization Vertical/ Horizontal

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m @ 3m)	Field Strength of Harmonics and Spurious Emissions (dBuV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

The fundamental frequency of the EUT is 2.402GHz to 2.480GHz

The limit for average field strength dBuV/m for the fundamental frequency = 94.0 dBuV/m.

No fundamental is allowed in the restricted bands.

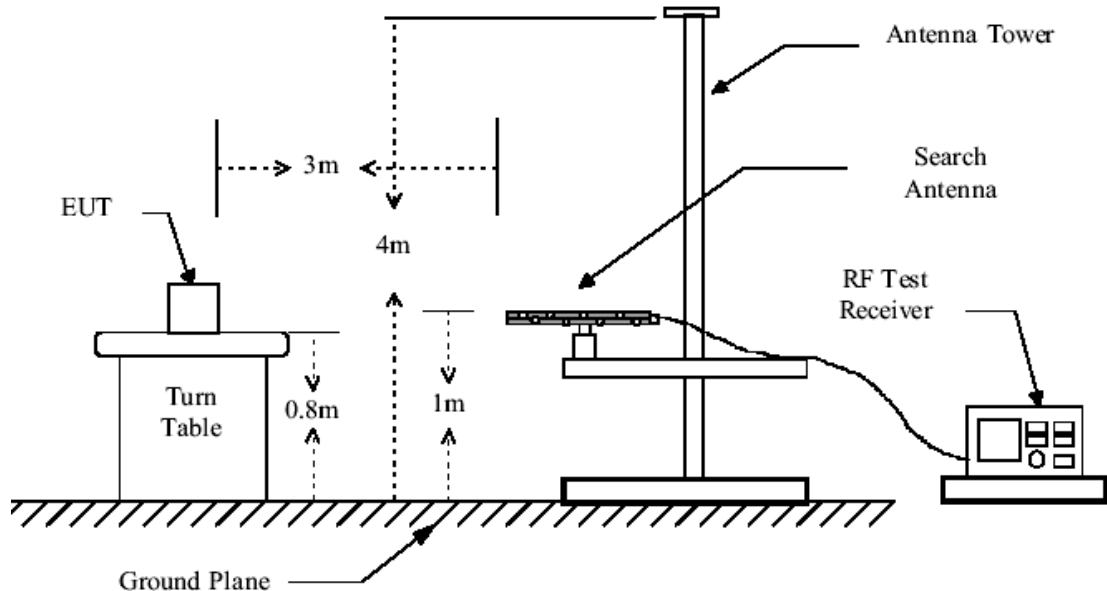
Test Procedure:

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
- 7 The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

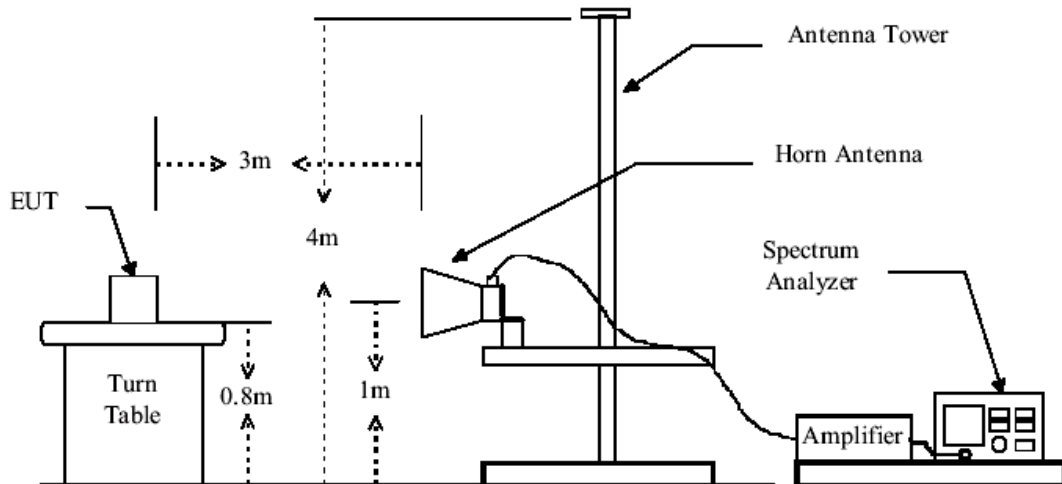


### Test Configuration:

Below 1GHz



Above 1GHz





The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

The following test results were performed on the EUT:

1. The following test results were performed at 30MHz—1GHz

Vertical:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
70.740	0.82	6.97	28.00	31.94	11.73	40.00	-28.27
106.630	1.22	8.77	27.81	32.08	14.26	43.50	-29.24
125.060	1.26	7.80	27.64	34.12	15.54	43.50	-27.96
230.790	1.58	11.70	27.00	27.18	13.46	46.00	-32.54
563.500	2.67	19.02	27.65	27.27	21.31	46.00	-24.69
796.300	3.19	22.08	26.95	35.17	33.49	46.00	-12.51

Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
97.900	1.18	9.02	27.89	27.65	9.96	43.50	-33.54
179.380	1.37	9.87	27.26	27.41	11.39	43.50	-32.11
311.300	1.94	14.33	26.81	25.70	15.16	46.00	-30.84
435.460	2.35	16.62	27.52	27.69	19.14	46.00	-26.86
634.310	2.77	20.54	27.49	31.15	26.97	46.00	-19.03
935.980	3.64	23.30	26.43	29.56	30.07	46.00	-15.93



2. The following test results were performed at above 1GHz

For 2402MHz:

Harmonics & Spurious Emissions

Peak Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamplifier factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
2402	4.97	32.25	0	62.31	99.53	114	-14.47	Vertical
2394	4.97	32.24	37.65	60.08	59.64	74	-14.36	Vertical
4804	6.61	34.04	38.18	65.99	68.46	74	-5.54	Vertical
7222	7.63	36.29	38.55	45.61	50.98	74	-23.02	Vertical
9687	8.58	37.06	39.16	44.91	51.39	74	-22.61	Vertical
11982	10.09	38.76	38.81	43.66	53.7	74	-20.3	Vertical
2402	4.97	32.25	0	58.77	95.99	114	-18.01	Horizontal
2394	4.97	32.24	37.65	60.16	59.72	74	-14.28	Horizontal
4774	6.6	34.04	38.16	60.55	63.03	74	-10.97	Horizontal
7239	7.62	36.25	38.54	44.04	49.37	74	-24.63	Horizontal
9619	8.53	36.99	39.13	44.65	51.04	74	-22.96	Horizontal
12169	10.16	38.91	38.6	44.59	55.06	74	-18.94	Horizontal



Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamplifier factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
2402	4.97	32.25	0	44.88	82.10	94	-11.90	Vertical
2394	4.97	32.24	37.65	40.4	39.96	54	-14.04	Vertical
4774	6.6	34.04	38.16	41.08	43.56	54	-10.44	Vertical
7222	7.63	36.29	38.55	32.08	37.45	54	-16.55	Vertical
9619	8.53	36.99	39.13	32.97	39.36	54	-14.64	Vertical
12067	10.12	38.84	38.75	31.59	41.8	54	-12.2	Vertical
2402	4.97	32.25	0	46.66	83.88	94	-10.12	Horizontal
2394	4.97	32.24	37.65	39.30	38.86	54	-15.14	Horizontal
4774	6.6	34.04	38.16	40.72	43.2	54	-10.8	Horizontal
7222	7.63	36.29	38.55	32.02	37.39	54	-16.61	Horizontal
9619	8.53	36.99	39.13	32.91	39.3	54	-14.7	Horizontal
12067	10.12	38.84	38.75	31.6	41.81	54	-12.19	Horizontal

For 2441MHz:

. Harmonics & Spurious Emissions

Peak Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamplifier factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
2441	5.08	32.29	0	62.34	99.71	114	-14.29	Vertical
2496	5.1	32.3	37.64	55.69	55.45	74	-18.55	Vertical
4876	6.64	34.02	38.23	50.81	53.24	74	-20.76	Vertical
7443	7.52	35.91	38.47	43.37	48.33	74	-25.67	Vertical
9976	8.82	37.28	39.29	44.93	51.74	74	-22.26	Vertical
12611	10.48	39.12	38.07	43.48	55.01	74	-18.99	Vertical
2441	4.99	32.25	0	68.98	106.22	114	-7.78	Horizontal
2496	5.10	32.3	37.64	45.73	45.49	74	-28.51	Horizontal
4859	6.63	34.03	38.22	57.11	59.55	74	-14.45	Horizontal
7239	7.62	36.25	38.54	44.67	50.00	74	-24	Horizontal
9738	8.62	37.08	39.18	45.43	51.95	74	-22.05	Horizontal
12322	10.20	38.99	38.41	44.23	55.01	74	-18.99	Horizontal



Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamplifier factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
2441	4.99	32.25	0	42.25	79.49	94	-14.51	Vertical
2496	5.1	32.3	37.64	33.62	33.38	54	-20.62	Vertical
4842	6.62	34.03	38.21	31.95	34.39	54	-19.61	Vertical
7307	7.59	36.14	38.52	31.9	37.11	54	-16.89	Vertical
10010	8.85	37.3	39.3	32.53	39.38	54	-14.62	Vertical
12509	10.29	39.1	38.21	31.45	42.63	54	-11.37	Vertical
2441	4.99	32.25	0	39.92	77.16	94	-16.84	Horizontal
2496	5.10	32.3	37.64	33.87	33.63	54	-20.37	Horizontal
4876	6.64	34.02	38.23	36.64	39.07	54	-14.93	Horizontal
7273	7.61	36.21	38.53	32.14	37.43	54	-16.57	Horizontal
9738	8.62	37.08	39.18	33.21	39.73	54	-14.27	Horizontal
12220	10.17	38.93	38.56	31.69	42.23	54	-11.77	Horizontal

For 2480MHz:

Harmonics & Spurious Emissions

Peak Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamplifier factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
2480	5.08	32.25	0	58.56	95.89	114	-18.11	Vertical
2483.5	5.08	32.29	37.64	59.55	59.28	74	-14.72	Vertical
2496	5.1	32.3	37.64	54.70	54.46	74	-19.54	Vertical
4944	6.67	34.01	38.29	45.59	47.98	74	-26.02	Vertical
7358	7.57	36.06	38.5	44.06	49.19	74	-24.81	Vertical
9976	8.82	37.28	39.29	45.05	51.86	74	-22.14	Vertical
12424	10.24	39.06	38.31	43.77	54.76	74	-19.24	Vertical
2480	5.08	32.29	0	56.92	94.29	114	-19.71	Horizontal
2483.5	5.08	32.29	37.64	62.47	62.2	74	-11.80	Horizontal
2496	5.1	32.3	37.64	55.99	55.75	74	-18.25	Horizontal
4944	6.67	34.01	38.29	45.57	47.96	74	-26.04	Horizontal
7392	7.55	35.99	38.49	43.96	49.01	74	-24.99	Horizontal
10010	8.85	37.3	39.3	44.97	51.82	74	-22.18	Horizontal
12509	10.29	39.1	38.21	43.56	54.74	74	-19.26	Horizontal



Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
2480	5.08	32.29	0	44.32	81.69	94	-12.31	Vertical
2483.5	5.08	32.29	37.64	46.73	46.46	54	-7.54	Vertical
2496	5.1	32.3	37.64	40.98	40.74	54	-13.26	Vertical
4944	6.67	34.01	38.29	32.84	35.23	54	-18.77	Vertical
7443	7.52	35.91	38.47	31.13	36.09	54	-17.91	Vertical
9925	8.77	37.23	39.26	32.43	39.17	54	-14.83	Vertical
12560	10.39	39.11	38.11	30.92	42.31	54	-11.69	Vertical
2480	5.08	32.29	0	42.34	79.71	94	-14.29	Horizontal
2483.5	5.08	32.29	37.64	44.66	44.39	54	-9.61	Horizontal
2496	5.1	32.3	37.64	39.6	39.36	54	-14.64	Horizontal
4944	6.67	34.01	38.29	32.79	35.18	54	-18.82	Horizontal
7358	7.57	36.06	38.5	31.91	37.04	54	-16.96	Horizontal
9976	8.82	37.28	39.29	32.44	39.25	54	-14.75	Horizontal
12509	10.29	39.1	38.21	31.44	42.62	54	-11.38	Horizontal





N/A: refer to remark 1).

Remark:

- 1). For this intentional radiator operates below 10 GHz, the spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the fifth harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 5<sup>th</sup> harmonic.
- 2). According to 15.249 (e) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

TEST RESULTS: The unit does meet the FCC requirements.