

FCC CERTIFICATION
On Behalf of
Eastern Times Technology Co., Ltd.

Wireless Optical Mouse
Model No.: DS-2118

FCC ID: TUVDS2118B

Prepared for : Eastern Times Technology Co., Ltd.
Address : Building D, Nan An Industry Park, Youganpu Village,
Fenggang Town Dongguan City, Guangdong, China

Prepared by : ACCURATE TECHNOLOGY CO. LTD
Address : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.
Science & Industry Park, Nanshan, Shenzhen, Guangdong
P.R. China

Tel: (0755) 26503290
Fax: (0755) 26503396

Report Number : ATE20111389
Date of Test : August 1, 2011
Date of Report : August 5, 2011

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APPENDIX I (TEST CURVES) (3 pages)

Test Report Certification

Applicant : Eastern Times Technology Co., Ltd.
Manufacturer : Eastern Times Technology Co., Ltd.
EUT Description : Wireless Optical Mouse
(A) MODEL NO.: DS-2118
(B) SERIAL NO.: N/A
(C) POWER SUPPLY: DC 3V (“AAA” batteries 2×)


Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.227 ANSI C63.4: 2003

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.227 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : August 1, 2011

Prepared by : 
(Kitty Chen, Engineer)

Approved & Authorized Signer : 
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	Wireless Optical Mouse
Model Number	:	DS-2118
Operation Frequency	:	27.045MHz
Power Supply	:	DC 3V (“AAA” batteries 2×)
Applicant Address	:	Eastern Times Technology Co., Ltd. Building D, Nan An Industry Park, Youganpu Village, Fenggang Town Dongguan City, Guangdong, China
Manufacturer Address	:	Eastern Times Technology Co., Ltd. Building D, Nan An Industry Park, Youganpu Village, Fenggang Town Dongguan City, Guangdong, China
Date of sample received	:	July 22, 2011
Date of Test	:	August 1, 2011

1.2. Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen
		Listed by FCC The Registration Number is 752051
		Listed by Industry Canada The Registration Number is 5077A-2
		Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
Name of Firm	:	ACCURATE TECHNOLOGY CO. LTD
Site Location	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China

1.3.Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty
(9kHz-30MHz) = 3.08dB, k=2

Radiated emission expanded uncertainty
(30MHz-1000MHz) = 4.42dB, k=2

Radiated emission expanded uncertainty
(Above 1GHz) = 4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 15, 2012
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 15, 2012
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 15, 2012
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 15, 2012
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2012
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2012
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2012
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 15, 2012
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 15, 2012
LISN	Schwarzbeck	NLSK8126	8126431	Jan. 15, 2012

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission	N/A
Section 15.209 Section 15.227(b)	Radiated Emission	Compliant
Section 15.227(a)	Fundamental Radiated Emission	Compliant
Section 15.227	Band Edge	Compliant

Remark: "N/A" means "Not applicable".

4. RADIATED EMISSION FOR FCC PART 15 SECTION 15.227(B)

4.1. Block Diagram of Test Setup

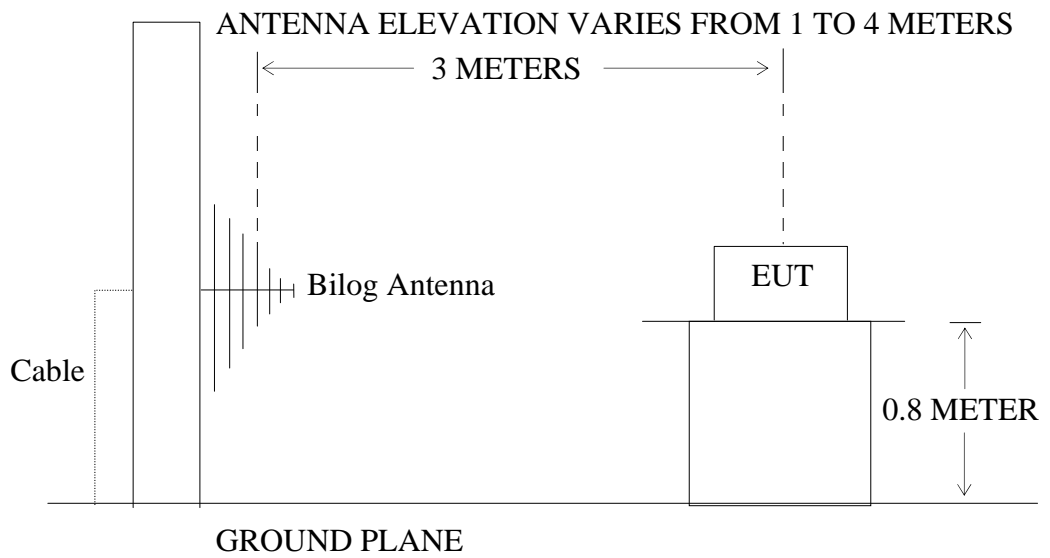
4.1.1. Block diagram of connection between the EUT and simulators



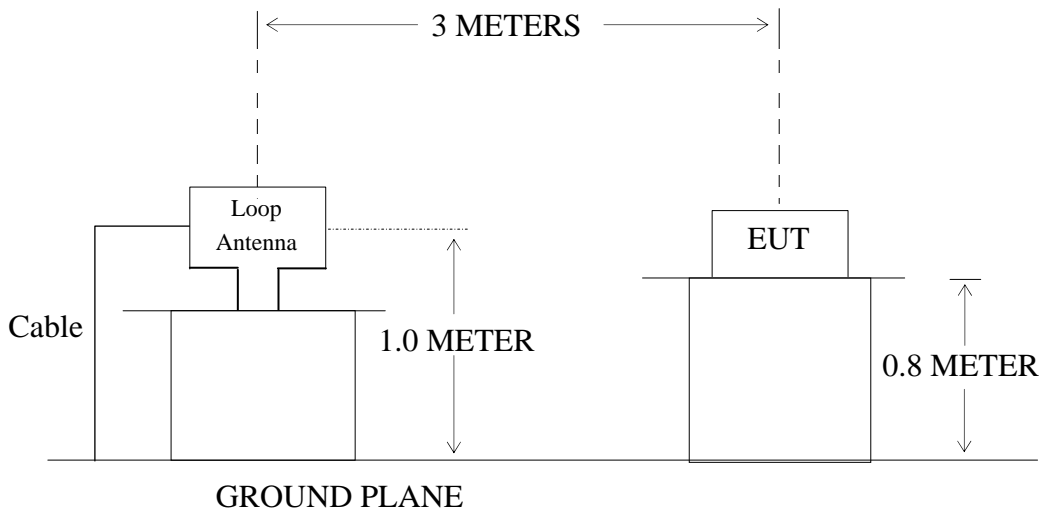
(EUT: Wireless Optical Mouse)

4.1.2. Semi-Anechoic Chamber Test Setup Diagram

4.1.2.1. Above 30MHz



4.1.2.2. Below 30MHz



(EUT: Wireless Optical Mouse)

4.2. The Field Strength of Radiation Emission Measurement Limits

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

Radiation Emission Measurement Limits According to Section 15.209(a)

Below 30MHz

Frequency (fundamental or spurious)	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490kHz	2400/F (F in kHz)	2400/377(F in kHz)	300
490-1705kHz	24000/F (F in kHz)	24000/377(F in kHz)	30
1705-30MHz	30	N/A	30

Above 30MHz

Frequency (MHz)	Limit		The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dB μ V/m)	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	

4.3. Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.3.1. Wireless Optical Mouse (EUT)

Model Number : DS-2118
 Serial Number : N/A
 Manufacturer : Eastern Times Technology Co., Ltd.

4.4. Operating Condition of EUT

4.4.1. Setup the EUT and simulator as shown as Section 4.1.

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in TX modes and measure it.

4.5. Test Procedure

4.5.1. **Above 30MHz:** The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C 63.4: 2003 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 120kHz in 30-1000MHz.

The frequency range from 30MHz to 1000MHz is checked.

4.5.2. **Below 30MHz:** The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. calibrated Loop antenna is used as receiving antenna. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C 63.4: 2003 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 9kHz in 9kHz-30MHz

The frequency range from 9kHz to 3MHz is checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

4.6. The Field Strength of Radiation Emission Measurement Results

PASS.

The frequency range 30MHz to 1000MHz is investigated.

Date of Test:	<u>August 1, 2011</u>	Temperature:	<u>25°C</u>
EUT:	<u>Wireless Optical Mouse</u>	Humidity:	<u>52%</u>
Model No.:	<u>DS-2118</u>	Power Supply:	<u>DC 3V</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>PEI</u>

Below 30MHz:

Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	-	-	-	-	-	-
Vertical	-	-	-	-	-	-

Above 30MHz:

Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	81.1219	14.09	13.47	27.56	40.00	-12.44
Horizontal	162.2670	22.42	14.63	37.05	43.50	-6.45
Horizontal	216.3788	23.49	16.57	40.06	46.00	-5.94
Horizontal	243.3964	23.30	16.98	40.28	46.00	-5.72
Horizontal	270.4470	24.20	18.20	42.40	46.00	-3.60
Horizontal	297.5225	23.98	18.63	42.61	46.00	-3.39
Horizontal	351.6070	22.04	20.89	42.93	46.00	-3.07
Vertical	81.1440	14.68	13.80	28.48	40.00	-11.52
Vertical	108.1832	18.36	14.16	32.52	43.50	-10.98
Vertical	135.2229	18.48	14.67	33.15	43.50	-10.35
Vertical	216.3619	16.42	16.57	32.99	46.00	-13.01
Vertical	297.5262	17.52	18.63	36.15	46.00	-9.85
Vertical	351.5988	15.97	20.89	36.86	46.00	-9.14

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

$$\text{Where Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$

3. The spectral diagrams attached in next pages display the measurement of peak values.



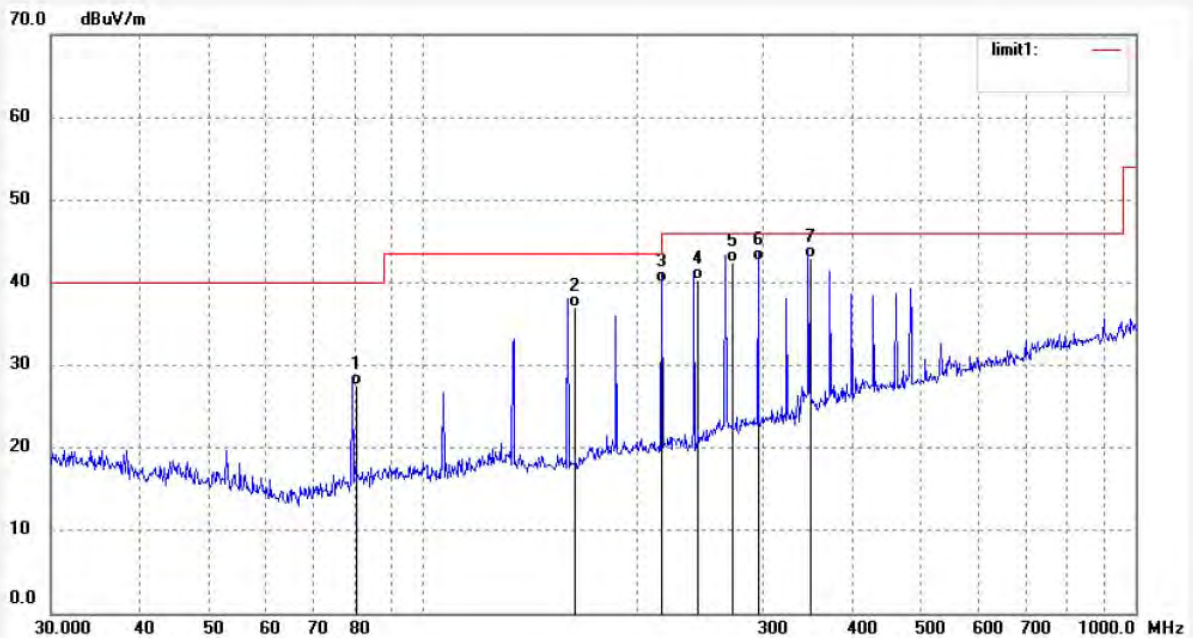
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: pei #5101	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 2011/08/01
Temp.(C)/Hum.(%) 24 C / 48 %	Time: 21:28:49
EUT: Wireless Optical Mouse	Engineer Signature: PEI
Mode: TX	Distance: 3m
Model: DS-2118	
Manufacturer: Eastern Times	

Note: Report No.:ATE20111389



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	81.1219	14.09	13.47	27.56	40.00	-12.44	QP			
2	162.2670	22.42	14.63	37.05	43.50	-6.45	QP			
3	216.3788	23.49	16.57	40.06	46.00	-5.94	QP			
4	243.3964	23.30	16.98	40.28	46.00	-5.72	QP			
5	270.4470	24.20	18.20	42.40	46.00	-3.60	QP			
6	297.5225	23.98	18.63	42.61	46.00	-3.39	QP			
7	351.6070	22.04	20.89	42.93	46.00	-3.07	QP			



ACCURATE TECHNOLOGY CO., LTD.

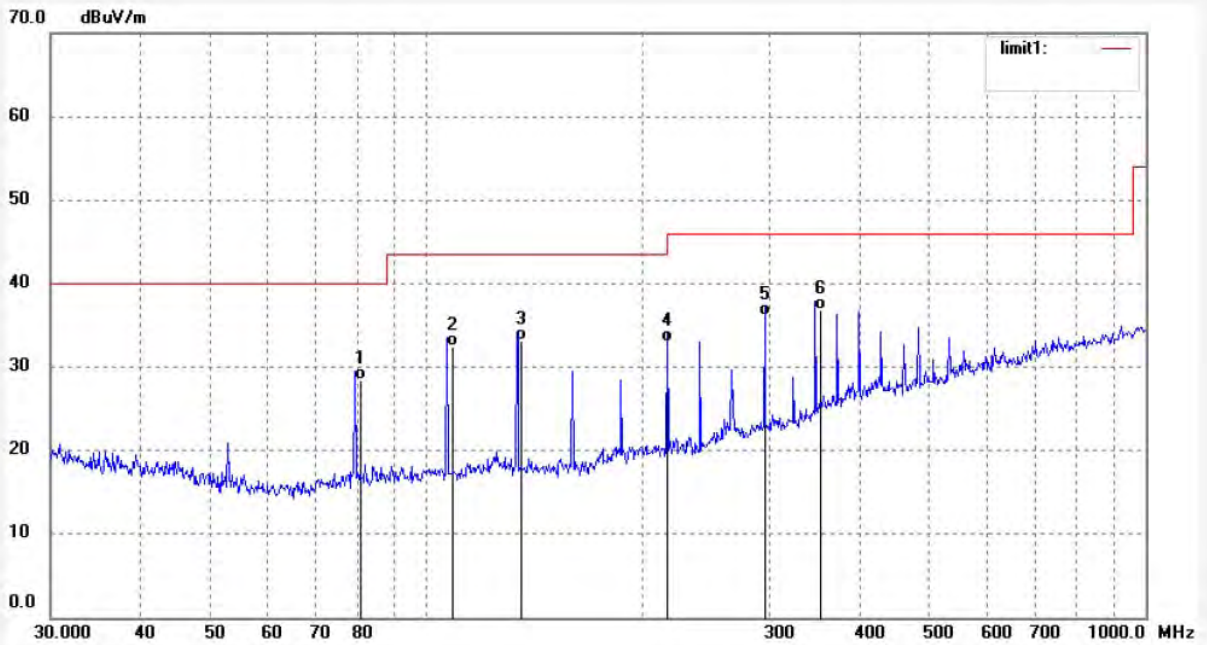
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: pei #5099
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 24 C / 48 %
EUT: Wireless Optical Mouse
Mode: TX
Model: DS-2118
Manufacturer: Eastern Times

Polarization: Vertical
Power Source: DC 3V
Date: 2011/08/01
Time: 21:16:19
Engineer Signature: PEI
Distance: 3m

Note: Report No.:ATE20111389



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	81.1440	14.68	13.80	28.48	40.00	-11.52	QP			
2	108.1832	18.36	14.16	32.52	43.50	-10.98	QP			
3	135.2229	18.48	14.67	33.15	43.50	-10.35	QP			
4	216.3619	16.42	16.57	32.99	46.00	-13.01	QP			
5	297.5262	17.52	18.63	36.15	46.00	-9.85	QP			
6	351.5988	15.97	20.89	36.86	46.00	-9.14	QP			

5. FUNDAMENTAL RADIATED EMISSION FOR FCC PART 15

SECTION 15.227(A)

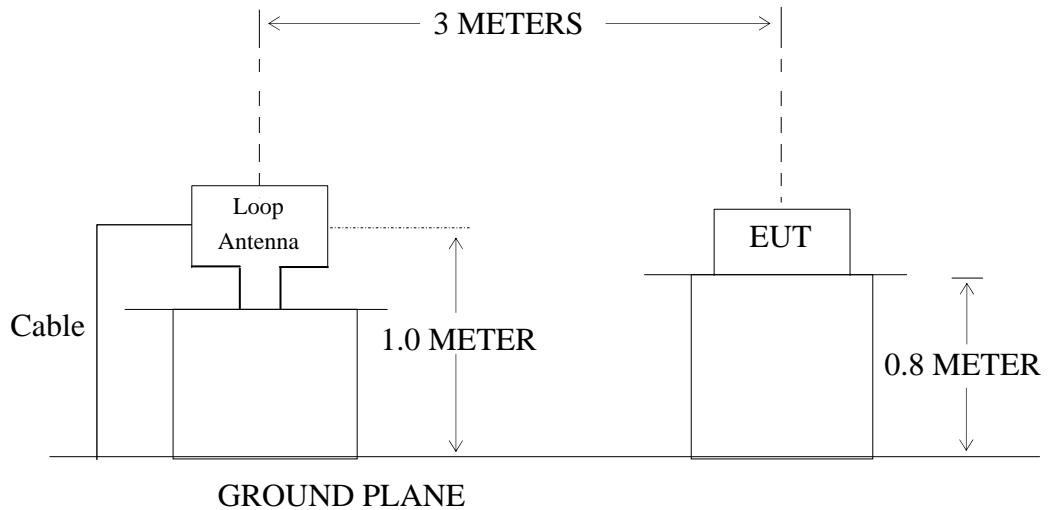
5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Optical Mouse)

5.1.2. Semi-Anechoic Chamber Test Setup Diagram



(EUT: Wireless Optical Mouse)

5.2. The Emission Limit For Section 15.227(a)

5.2.1. 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 Section 15.35 for limiting peak emission apply.

5.3.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.3.1.Wireless Optical Mouse (EUT)

Model Number : DS-2118
Serial Number : N/A
Manufacturer : Eastern Times Technology Co., Ltd.

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in TX mode and measure it.

5.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. A calibrated Loop antenna is used as receiving antenna. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C 63.4: 2003 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver (R&S ESCS30) is set at 9kHz in 9kHz-30MHz.

5.6.The Emission Measurement Result

PASS.

Date of Test:	August 1, 2011	Temperature:	25°C
EUT:	Wireless Optical Mouse	Humidity:	50%
Model No.:	DS-2118	Power Supply:	DC 3V
Test Mode:	TX	Test Engineer:	PEI

Fundamental Radiated Emissions

Test conditions		Fundamental Frequency	
		27.045MHz	
T _{nom} (25°C)	V _{nom} (DC 3V)	(dBμV/m)/ (μ V/m)	(dBμV/m)/(μ V/m)
		PEAK	AV
		61.96/1253.14	58.42/833.68
limit		100/100,000	80/10,000
Note: Measurement was performed with modulated signal with average detector and peak detector.			

6. BAND EDGES

6.1.The Requirement

6.1.1.The wanted emission within the band 26.95-27.20MHz.

6.2.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.2.1.Wireless Optical Mouse (EUT)

Model Number : DS-2118
Serial Number : N/A
Manufacturer : Eastern Times Technology Co., Ltd.

6.3.Operating Condition of EUT

6.3.1.Setup the EUT and simulator as shown as Section 5.1.

6.3.2.Turn on the power of all equipment.

6.3.3.Let the EUT work in TX mode and measure it.

6.4.Test Procedure

The transmitter output was fed into the spectrum analyzer and photo was taken. The vertical scale is set to 10dB per division; the horizontal scale is set to 25kHz per division. Start frequency are 26.95MHz, stop frequency are 27.20MHz. RBW are 3kHz, VBW are 10kHz.

6.5. The Measurement Result

The EUT does meet the requirement.

The spectral diagrams attached in next page.

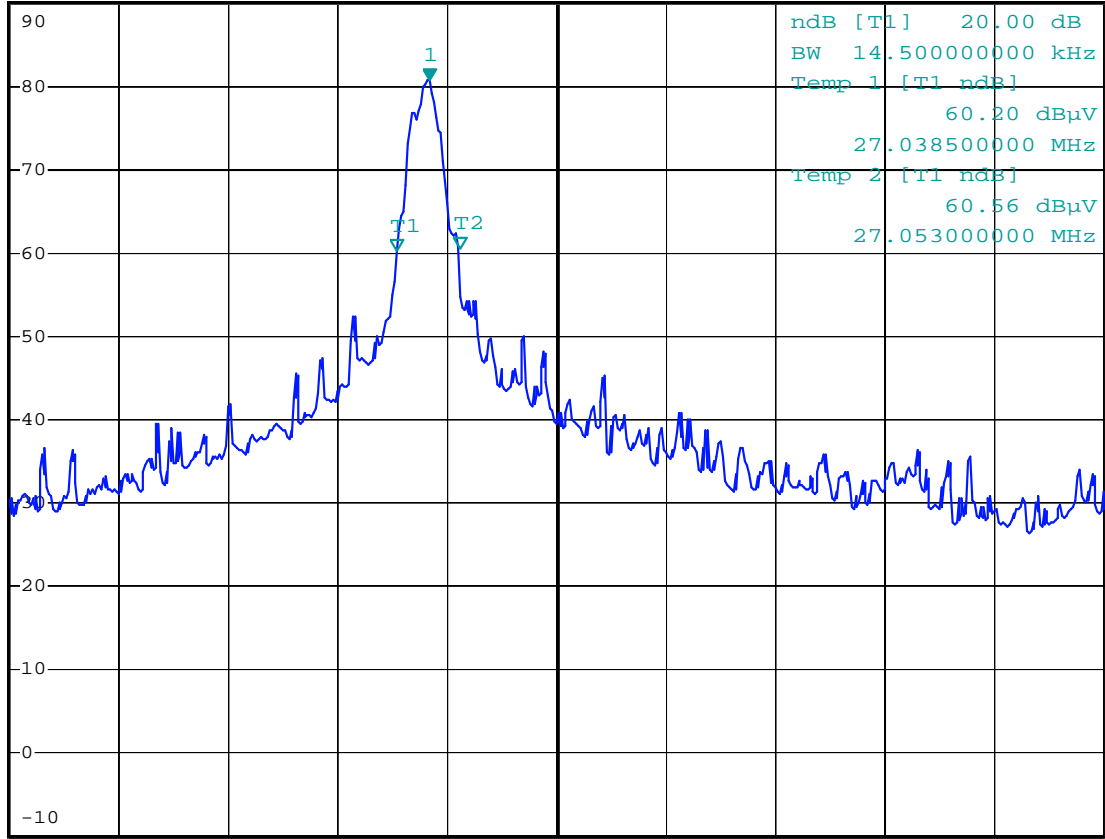


*RBW 3 kHz Marker 1 [T1]
VBW 10 kHz 80.66 dBμV
*SWT 40 ms 27.046000000 MHz

Ref 90 dBμV

Att 20 dB

1 PK
MAXH



Start 26.95 MHz

25 kHz/

Stop 27.2 MHz

A

3DB

Date: 1.AUG.2011 13:46:09