

FCC CERTIFICATION  
On Behalf of  
Sharper Innovations Ltd.

2.4G Wireless Optical Mouse  
Model No.: GL-2009W

FCC ID: TDZGL2009W

Prepared for : Sharper Innovations Ltd.  
Address : 14/F, Block A Chung Mei Centre, 15 Hing Yip Street,  
Kwun Tong, Hong Kong

Prepared by : ACCURATE TECHNOLOGY CO. LTD  
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Report Number : ATE20091554  
Date of Test : August 24, 2009  
Date of Report : August 26, 2009

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APPENDIX I ( TEST CURVES) (22 pages)

## Test Report Certification

Applicant : Sharper Innovations Ltd.  
 Manufacturer : Sharper Innovations Ltd.  
 EUT Description : 2.4G Wireless Optical Mouse  
                           (A) MODEL NO.: GL-2009W  
                           (B) SERIAL NO.: N/A  
                           (C) POWER SUPPLY: 3V DC ("AAA" batteries 2×)

Measurement Procedure Used:

### **FCC Rules and Regulations Part 15 Subpart C Section 15.249 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 15.249 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 24, 2009

Prepared by :   
 (Engineer)

Approved & Authorized Signer :   
 (Manager)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

EUT : 2.4G Wireless Optical Mouse

Model Number : GL-2009W

Power Supply : 3V DC (“AAA” batteries 2×)

Operate Frequency : 2403-2473MHz

Channel Number : 16

Applicant : Sharper Innovations Ltd.  
Address : 14/F, Block A Chung Mei Centre, 15 Hing Yip Street,  
Kwun Tong, Hong Kong

Manufacturer : Sharper Innovations Ltd.  
Address : 14/F, Block A Chung Mei Centre, 15 Hing Yip Street,  
Kwun Tong, Hong Kong

Date of sample received : August 21, 2009

Date of Test : August 24, 2009

## 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 = 3.08dB, k=2  
(9kHz-30MHz)

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

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

## 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	03.28.2010
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	03.28.2010
Spectrum Analyzer	Agilent	E7405A	MY45115511	03.28.2010
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	03.30.2010
Loop Antenna	Schwarzbeck	FMZB1516	1516131	03.28.2010
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	03.28.2010
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	12.19.2009
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	10.09.2009
LISN	Rohde&Schwarz	ESH3-Z5	100305	03.28.2010
LISN	Schwarzbeck	NSLK8126	8126431	03.28.2010

### 3. SUMMARY OF TEST RESULTS

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
Section 15.207	Conducted Emission	N/A
Section 15.249(a)	Fundamental and Harmonics Radiated Emission	Compliant
Section 15.249(d)	Radiated Spurious Emission	Compliant
Section 15.249(d)	Band Edge	Compliant

Remark: “N/A” means “Not applicable”.

# 4. FUNDAMENTAL AND HARMONICS RADIATED EMISSION FOR SECTION 15.249(A)

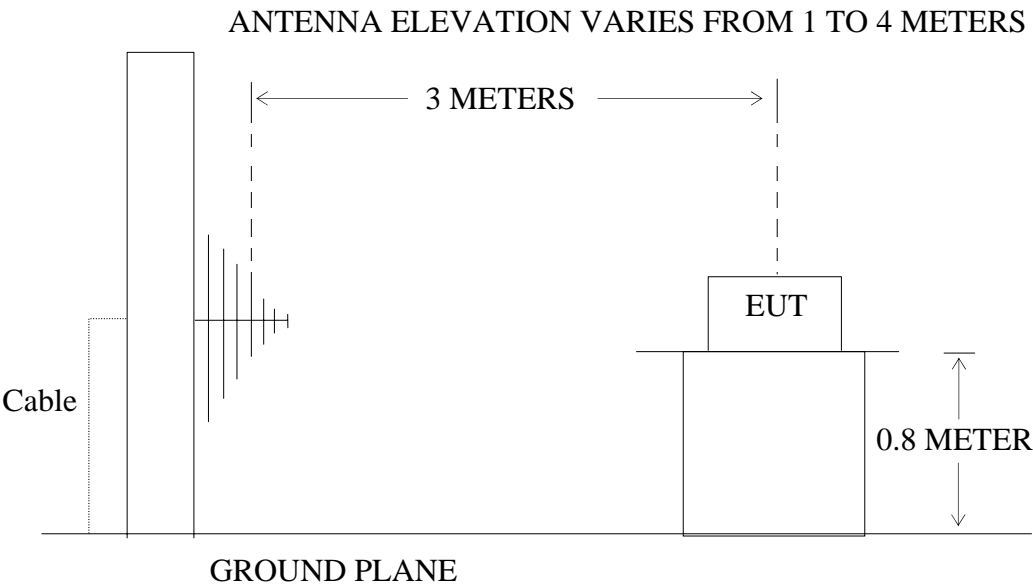
## 4.1. Block Diagram of Test Setup

### 4.1.1. Block diagram of connection between the EUT and simulators



(EUT: 2.4G Wireless Optical Mouse)

### 4.1.2. Semi-Anechoic Chamber Test Setup Diagram



(EUT: 2.4G Wireless Optical Mouse)



## 4.2.The Emission Limit

4.2.1.For intentional radiators, According to section 15.249(a), Operation within the frequency band of 2.4 to 2.4835GHz, The fundamental field strength shall not exceed 94 dB $\mu$ V/m and the harmonics shall not exceed 54 dB $\mu$ V/m.

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of harmonics (microvolts/meter)
902-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

4.2.2.According to section 15.249(e), as shown in section 15.35(b), 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.

## 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. 2.4G Wireless Optical Mouse (EUT)

Model Number : GL-2009W  
 Serial Number : N/A  
 Manufacturer : Sharper Innovations 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 measure it. The transmit frequency are 2403-2473MHz. We are select 2403MHz, 2443MHz, 2473MHz TX frequency to transmit.

#### 4.5. 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. 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 C63.4: 2003 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 1MHz.

## 4.6.The Field Strength of Radiation Emission Measurement Results

### PASS.

Date of Test:	August 24, 2009	Temperature:	25°C
EUT:	2.4G Wireless Optical Mouse	Humidity:	50%
Model No.:	GL-2009W	Power Supply:	3V DC (“AAA” batteries 2×)
Test Mode:	TX 2403MHz	Test Engineer:	Joe

### Fundamental Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2402.996	91.66	96.82	-7.45	84.21	89.37	94	114	-9.79	-24.63	Vertical
2402.996	84.70	99.88	-7.45	87.25	92.43	94	114	-6.75	-21.57	Horizontal

### Harmonics Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
4805.982	47.93	53.11	-0.28	47.65	52.83	54	74	-6.35	-21.17	Vertical
4805.982	48.08	53.23	-0.28	47.80	52.95	54	74	-6.20	-21.05	Horizontal

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:  

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

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain
3. The spectral diagrams in appendix I display the measurement of peak values.
4. All emission was scanned up 25GHz.

Date of Test:	August 24, 2009	Temperature:	25°C
EUT:	2.4G Wireless Optical Mouse	Humidity:	50%
Model No.:	GL-2009W	Power Supply:	3V DC ("AAA" batteries 2 ×)
Test Mode:	TX 2443MHz	Test Engineer:	Joe

### Fundamental Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2442.994	91.35	86.53	-7.35	84	89.18	94	114	-10.00	-24.82	Vertical
2442.994	94.82	100.02	-7.35	87.47	92.67	94	114	-6.53	-21.33	Horizontal

### Harmonics Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
4885.980	42.24	47.60	0.16	42.40	47.76	54	74	-11.60	-26.24	Vertical
4885.980	42.40	47.43	0.16	42.56	47.59	54	74	-11.44	-26.41	Horizontal

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 in appendix I display the measurement of peak values.
4. All emission was scanned up 25GHz.

Date of Test:	August 24, 2009	Temperature:	25°C
EUT:	2.4G Wireless Optical Mouse	Humidity:	50%
Model No.:	GL-2009W	Power Supply:	3V DC ("AAA" batteries 2 ×)
Test Mode:	TX 2473MHz	Test Engineer:	Joe

### Fundamental Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2472.996	91.68	96.80	-7.36	84.32	89.44	94	114	-9.68	-24.56	Vertical
2472.996	94.68	99.81	-7.36	87.32	92.45	94	114	-6.68	-21.55	Horizontal

### Harmonics Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
4945.968	44.41	49.55	0.46	44.87	50.01	54	74	-9.13	-23.99	Vertical
4945.968	43.45	48.58	0.46	43.91	49.04	54	74	-10.09	-24.96	Horizontal

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 in appendix I display the measurement of peak values.
4. All emission was scanned up 25GHz.

## 5. RADIATED SPURIOUS EMISSION FOR SECTION 15.249(D)

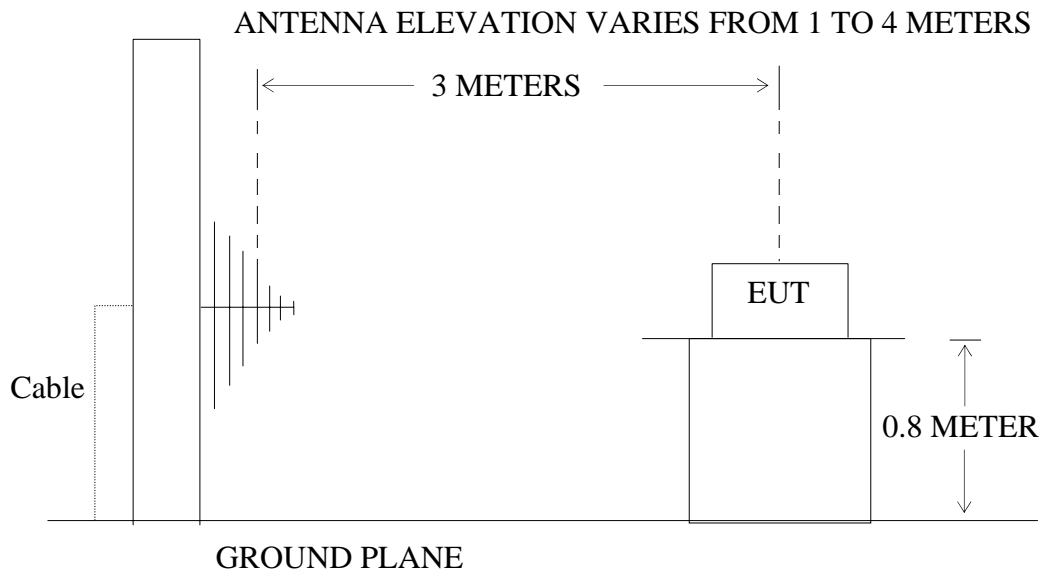
### 5.1. Block Diagram of Test Setup

#### 5.1.1. Block diagram of connection between the EUT and simulators



(EUT: 2.4G Wireless Optical Mouse)

#### 5.1.2. Semi-Anechoic Chamber Test Setup Diagram



(EUT: 2.4G Wireless Optical Mouse)

## 5.2.The Emission Limit For Section 15.249(d)

5.2.1.Emission radiated outside of the specified frequency bands, except for harmonics, shall be comply with the general radiated emission limits in Section 15.209.

Radiation Emission Measurement Limits According to Section 15.209

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 (dBμV/m)	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	

## 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. 2.4G Wireless Optical Mouse (EUT)

Model Number : GL-2009W  
 Serial Number : N/A  
 Manufacturer : Sharper Innovations 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 modes measure it. The transmit frequency are 2403-2473MHz. We are select 2403MHz, 2443MHz, 2473MHz TX frequency to transmit.

## 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. 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 C63.4: 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. and set at 1MHz in above 1000MHz.

The frequency range from 30MHz to 25000MHz 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.



## 5.6.The Emission Measurement Result

**PASS.**

Date of Test:	<u>August 24, 2009</u>	Temperature:	<u>25°C</u>
EUT:	<u>2.4G Wireless Optical Mouse</u>	Humidity:	<u>50%</u>
Model No.:	<u>GL-2009W</u>	Power Supply:	<u>3V DC (“AAA” batteries 2×)</u>
Test Mode:	<u>TX 2403MHz</u>	Test Engineer:	<u>Joe</u>

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

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 in appendix I display the measurement of peak values.

Date of Test:	August 24, 2009	Temperature:	25°C
EUT:	2.4G Wireless Optical Mouse	Humidity:	50%
Model No.:	GL-2009W	Power Supply:	3V DC (“AAA” batteries 2×)
Test Mode:	TX 2443MHz	Test Engineer:	Joe

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

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 in appendix I display the measurement of peak values.

Date of Test:	August 24, 2009	Temperature:	25°C
EUT:	2.4G Wireless Optical Mouse	Humidity:	50%
Model No.:	GL-2009W	Power Supply:	3V DC (“AAA” batteries 2×)
Test Mode:	TX 2473MHz	Test Engineer:	Joe

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

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 in appendix I display the measurement of peak values.

## 6. BAND EDGES

### 6.1.The Requirement

6.1.1.Band Edge from 2400MHz to 2483.5MHz. Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

### 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. 2.4G Wireless Optical Mouse (EUT)

Model Number : GL-2009W  
Serial Number : N/A  
Manufacturer : Sharper Innovations Ltd.

### 6.3.Operating Condition of EUT

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

6.3.2.Turn on the power of all equipment.

6.3.3. Let the EUT work in TX modes measure it. The transmit frequency are 2403-2473MHz. We are select 2403MHz, 2473MHz TX frequency to transmit.

### 6.4.Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was 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 emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:  
RBW=1MHz, VBW=1MHz

## 6.5.The Measurement Result

**Pass.**

Date of Test:	August 24, 2009	Temperature:	25°C
EUT:	2.4G Wireless Optical Mouse	Humidity:	50%
Model No.:	GL-2009W	Power Supply:	3V DC (“AAA” batteries 2×)
Test Mode:	TX 2403MHz	Test Engineer:	Joe

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
-	-	-	-	-	-	-	-	-	-	Vertical
-	-	-	-	-	-	-	-	-	-	Horizontal

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 in appendix I display the measurement of peak values.

Date of Test:	August 24, 2009	Temperature:	25°C
EUT:	2.4G Wireless Optical Mouse	Humidity:	50%
Model No.:	GL-2009W	Power Supply:	3V DC ("AAA" batteries 2×)
Test Mode:	TX 2473MHz	Test Engineer:	Joe

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
-	-	-	-	-	-	-	-	-	-	Vertical
-	-	-	-	-	-	-	-	-	-	Horizontal

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 in appendix I display the measurement of peak values.

## 7. ANTENNA REQUIREMENT

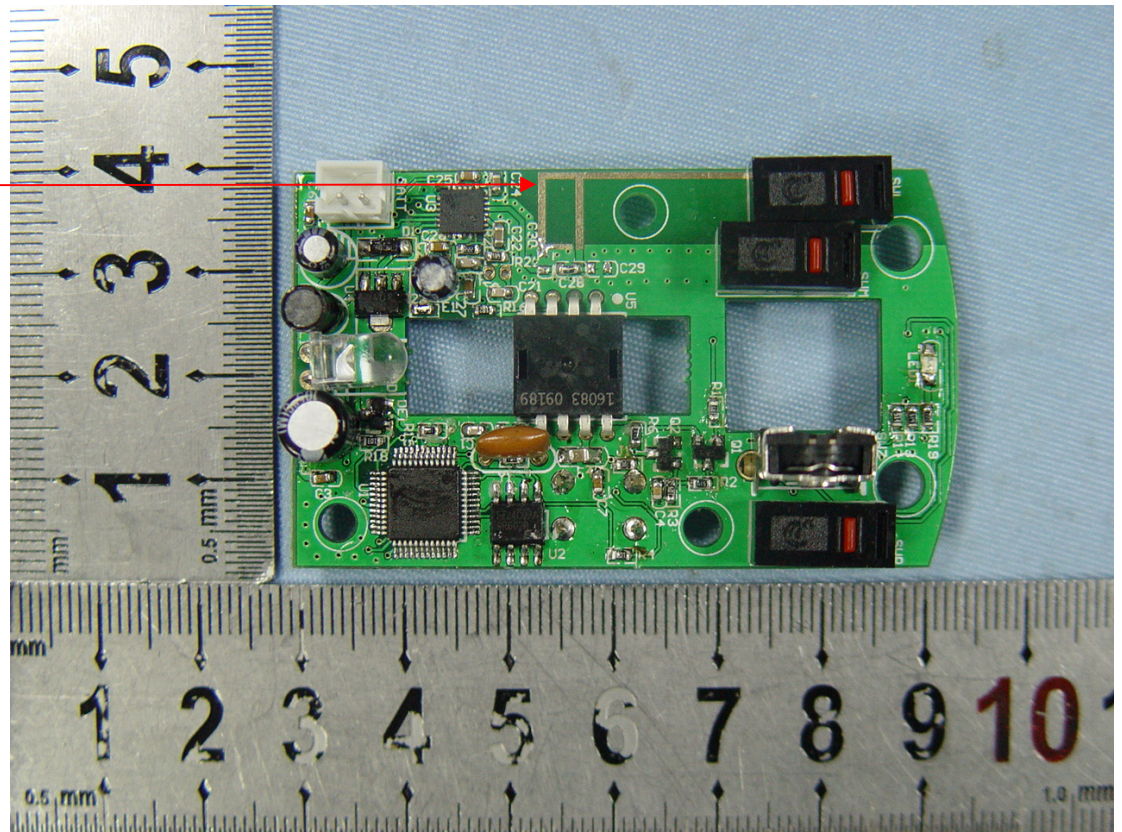
### 7.1.The Requirement

7.1.1. According to Section 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.

### 7.2.Antenna Construction

The antenna is PCB Layout antenna, no consideration of replacement.

Antenna



# APPENDIX I (Test Curves)




**ACCURATE TECHNOLOGY CO., LTD.**

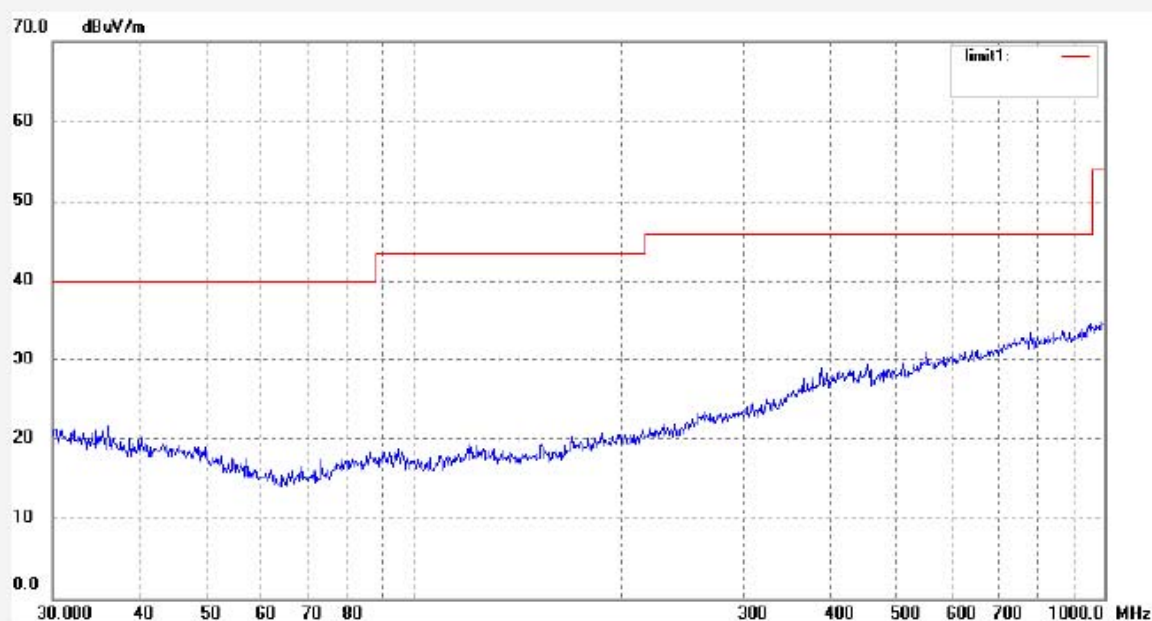
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2643  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2403MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 17:02:28  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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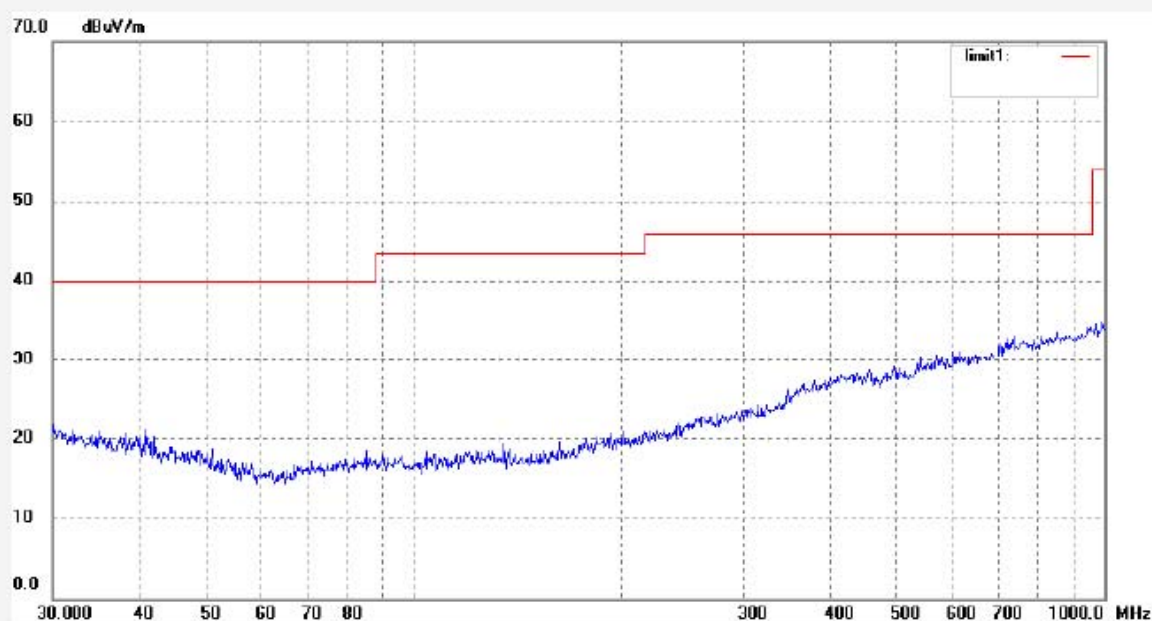
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2644  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2403MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Vertical  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 17:05:34  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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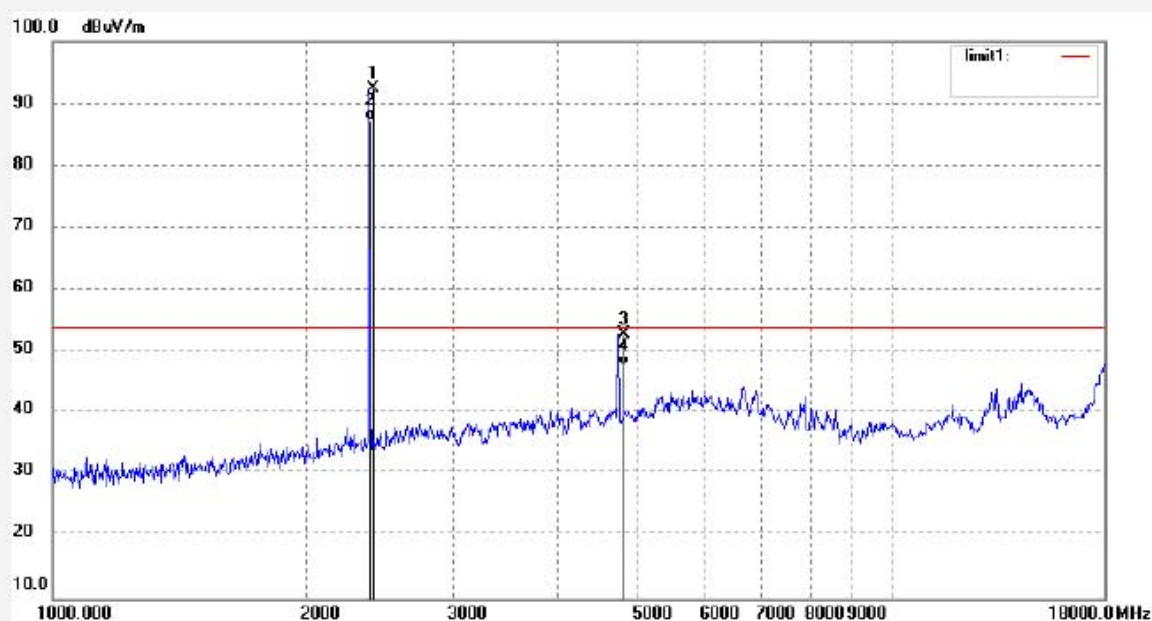
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2543  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2403MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 10:34:06  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.996	99.88	-7.45	92.43	54.00	38.43	peak			
2	2402.996	94.70	-7.45	87.25	54.00	33.25	AVG			
3	4805.982	53.23	-0.28	52.95	54.00	-1.05	peak			
4	4805.982	48.08	-0.28	47.80	54.00	-6.20	AVG			


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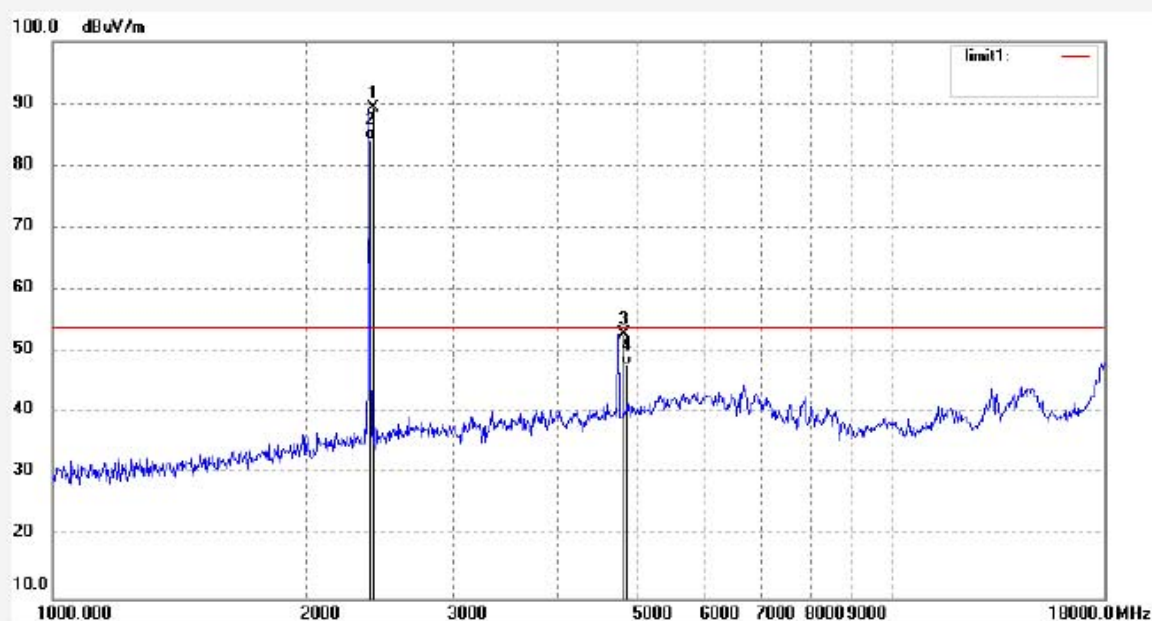
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2544  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2403MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Vertical  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 10:47:33  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.996	96.82	-7.45	89.37	54.00	35.37	peak			
2	2402.996	91.66	-7.45	84.21	54.00	30.21	AVG			
3	4805.982	53.11	-0.28	52.83	54.00	-1.17	peak			
4	4805.982	47.93	-0.28	47.65	54.00	-6.35	AVG			


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

Job No.: RTTE #2562

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 50 %

EUT: 2.4G Wireless Optical Mouse

Mode: TX 2403MHz

Model: GL-2009W

Manufacturer: Sharper Innovations Ltd

Polarization: Horizontal

Power Source: DC 3V

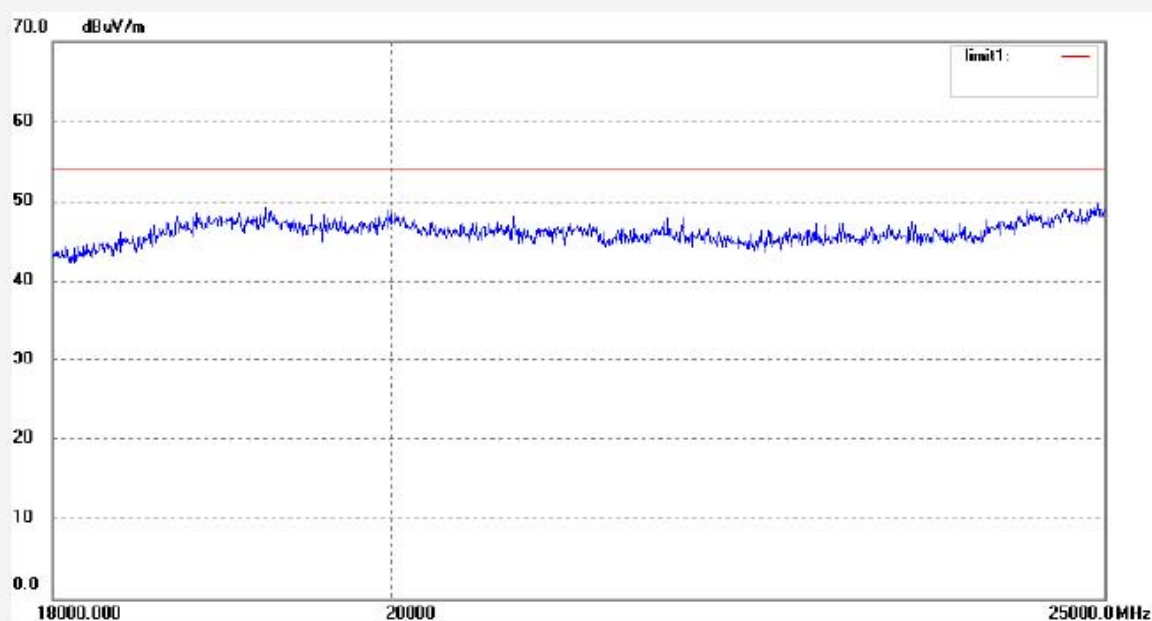
Date: 2009/08/24

Time: 14:30:03

Engineer Signature: Joe

Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: RTTE #2561

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 50 %

EUT: 2.4G Wireless Optical Mouse

Mode: TX 2403MHz

Model: GL-2009W

Manufacturer: Sharper Innovations Ltd

Polarization: Vertical

Power Source: DC 3V

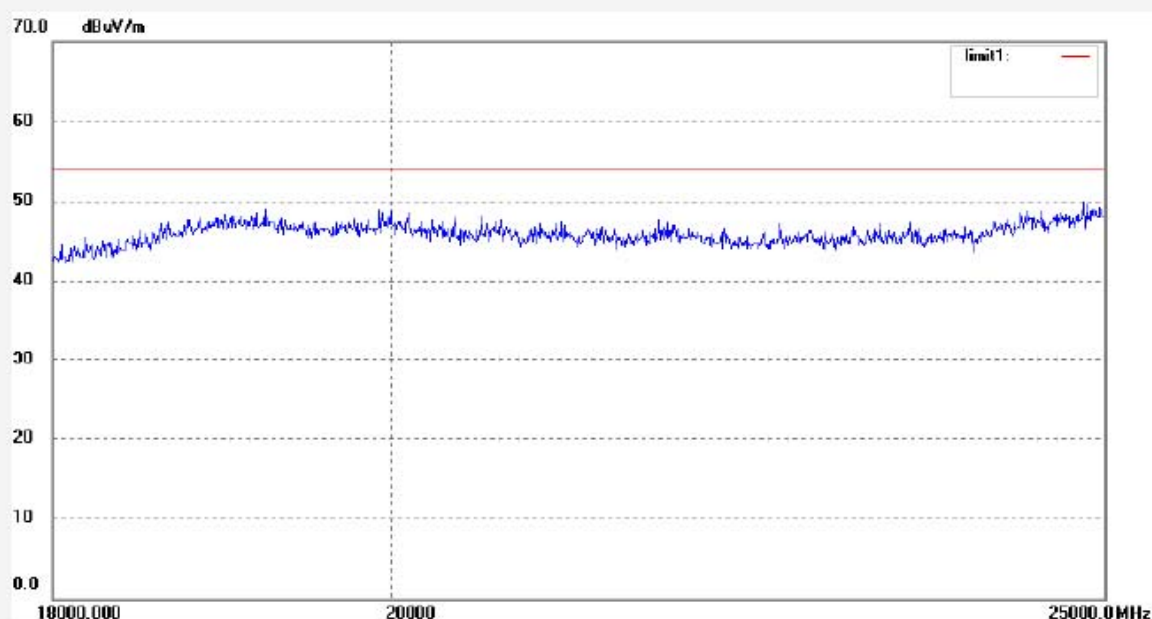
Date: 2009/08/24

Time: 14:26:55

Engineer Signature: Joe

Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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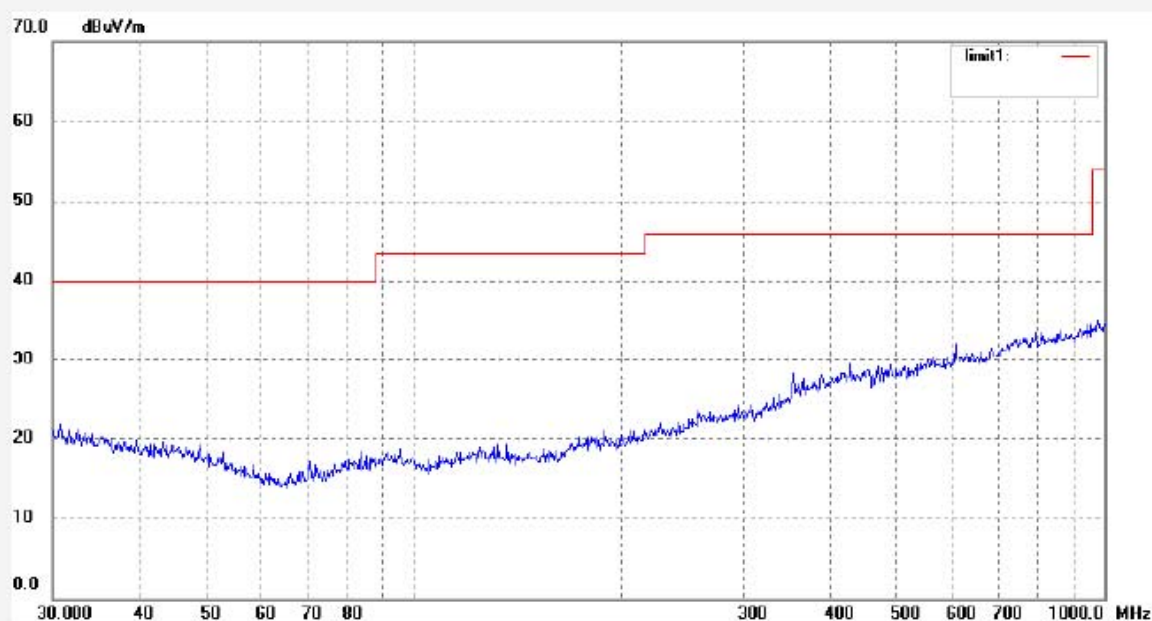
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2646  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2443MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 17:12:52  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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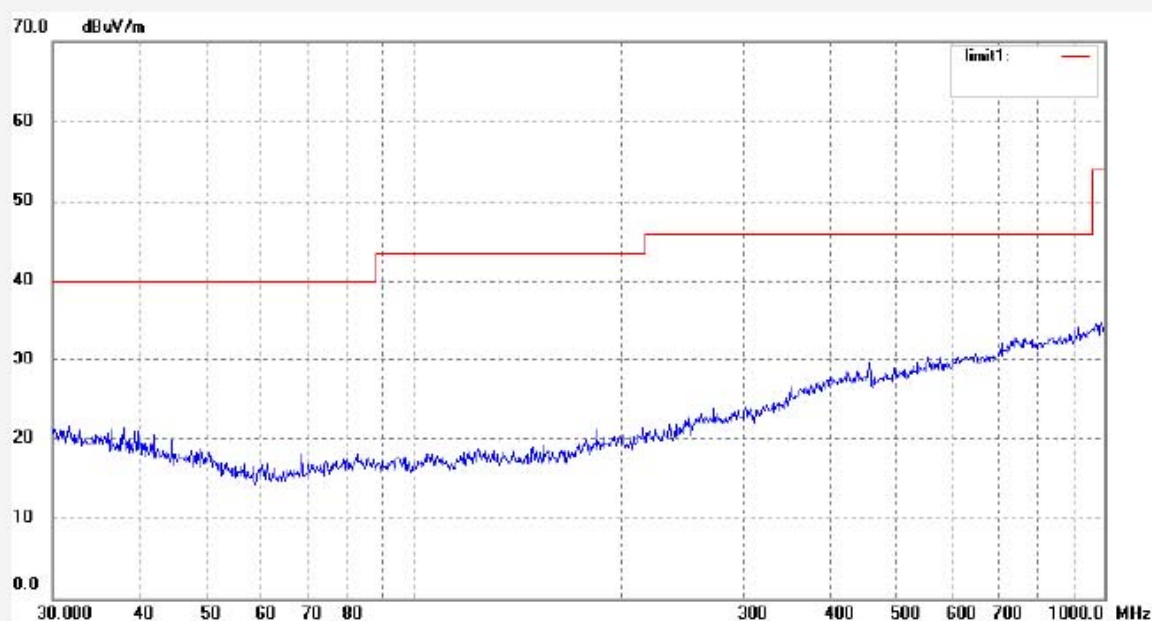
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2645  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2443MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Vertical  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 17:09:36  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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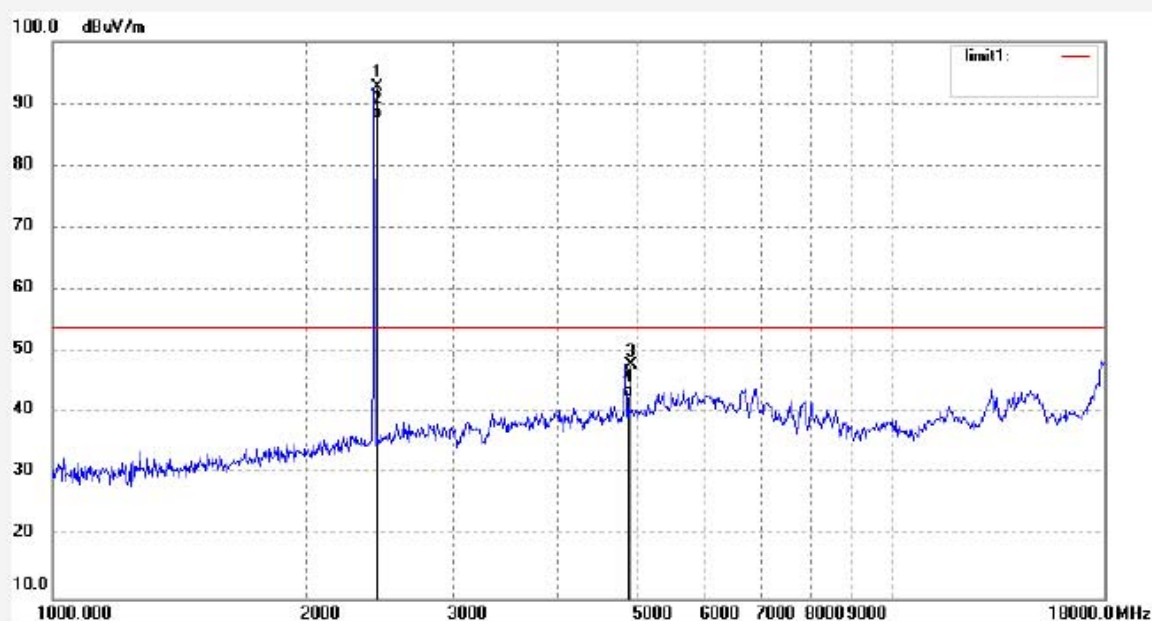
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2546  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2443MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 11:06:37  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2442.994	100.02	-7.35	92.67	54.00	38.67	peak			
2	2442.994	94.82	-7.35	87.47	54.00	33.47	AVG			
3	4885.980	47.43	0.16	47.59	54.00	-6.41	peak			
4	4885.980	42.40	0.16	42.56	54.00	-11.44	AVG			


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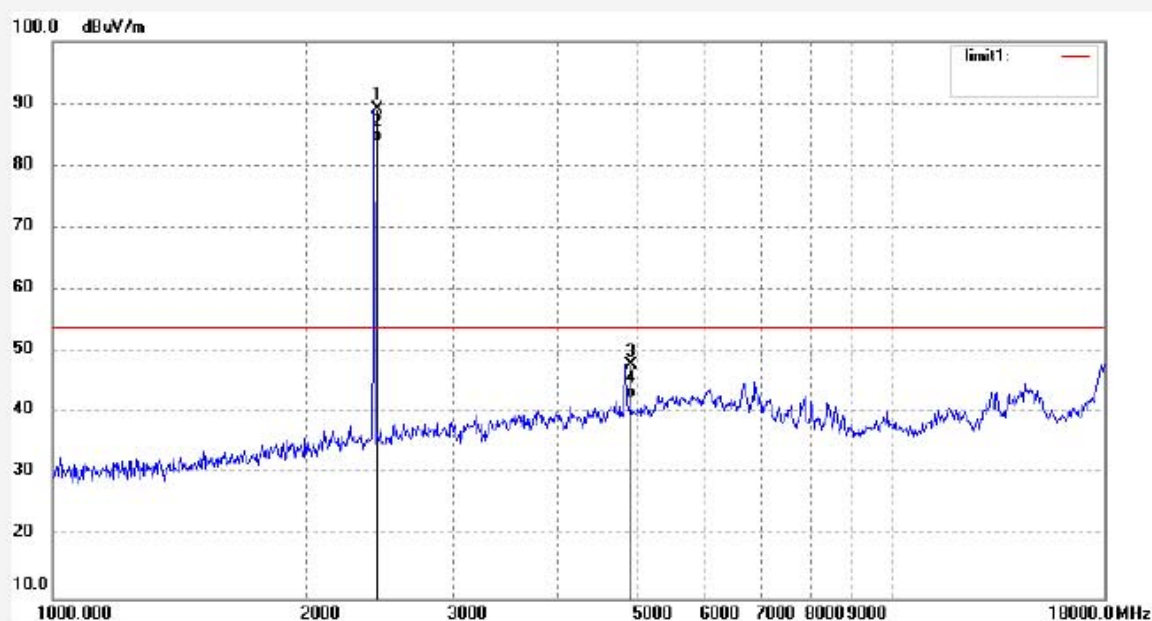
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2545  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2443MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Vertical  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 10:57:09  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2442.994	96.53	-7.35	89.18	54.00	35.18	peak			
2	2442.994	91.35	-7.35	84.00	54.00	30.00	AVG			
3	4885.980	47.60	0.16	47.76	54.00	-6.24	peak			
4	4885.980	42.24	0.16	42.40	54.00	-11.60	AVG			


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

Job No.: RTTE #2563

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 50 %

EUT: 2.4G Wireless Optical Mouse

Mode: TX 2443MHz

Model: GL-2009W

Manufacturer: Sharper Innovations Ltd

Polarization: Horizontal

Power Source: DC 3V

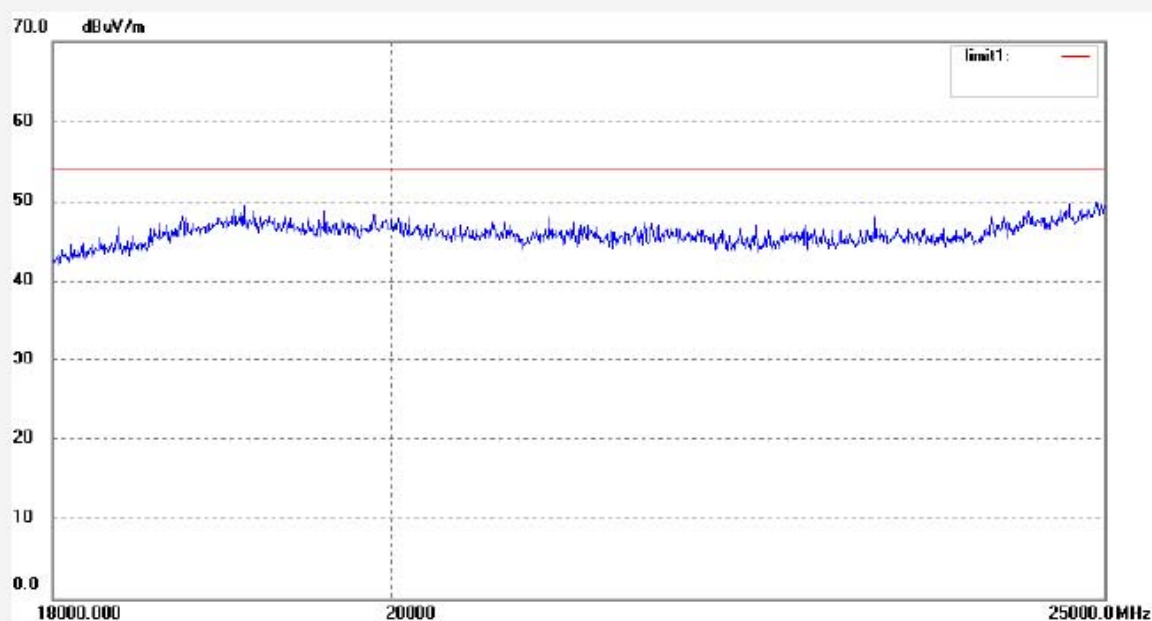
Date: 2009/08/24

Time: 14:34:25

Engineer Signature: Joe

Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: RTTE #2564

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 50 %

EUT: 2.4G Wireless Optical Mouse

Mode: TX 2443MHz

Model: GL-2009W

Manufacturer: Sharper Innovations Ltd

Polarization: Vertical

Power Source: DC 3V

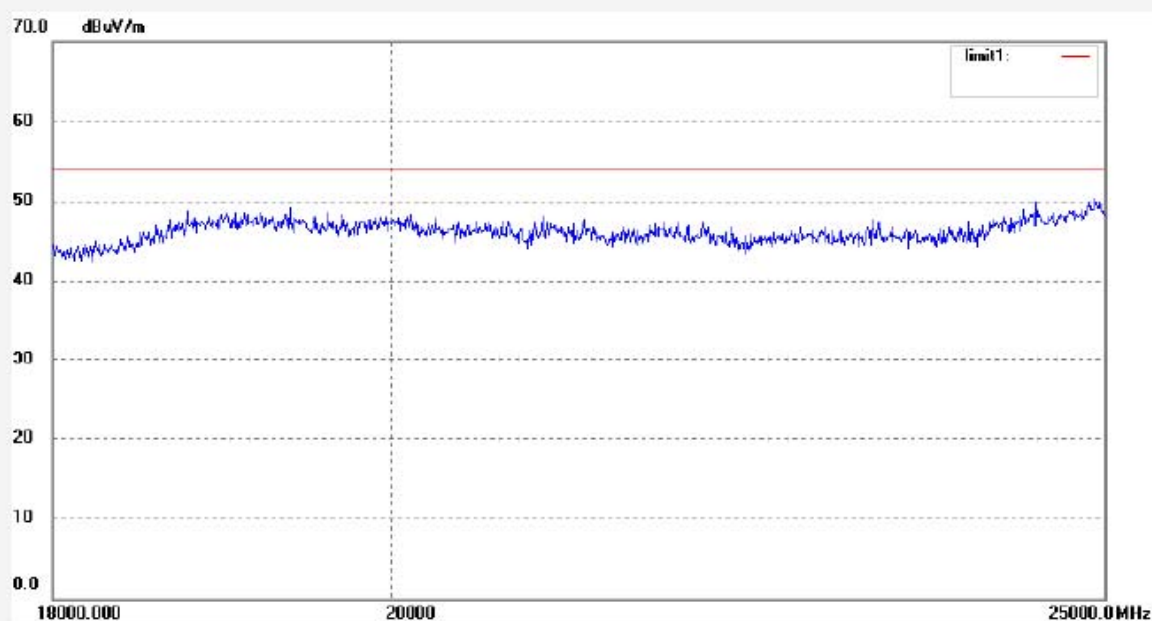
Date: 2009/08/24

Time: 14:38:09

Engineer Signature: Joe

Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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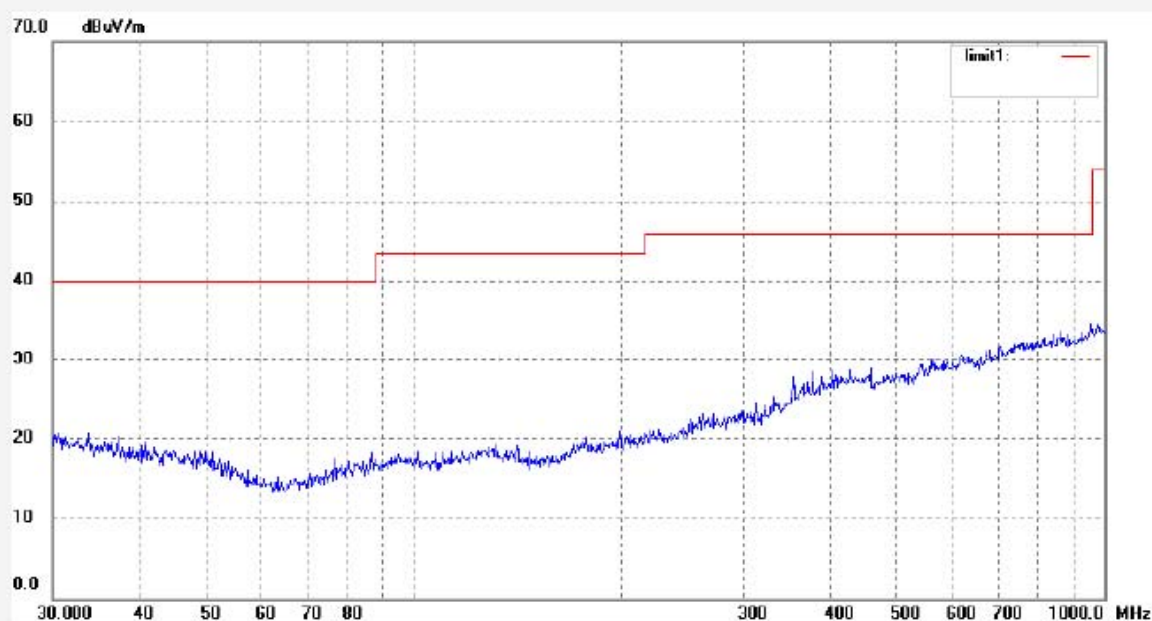
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2647  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2473MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 17:17:07  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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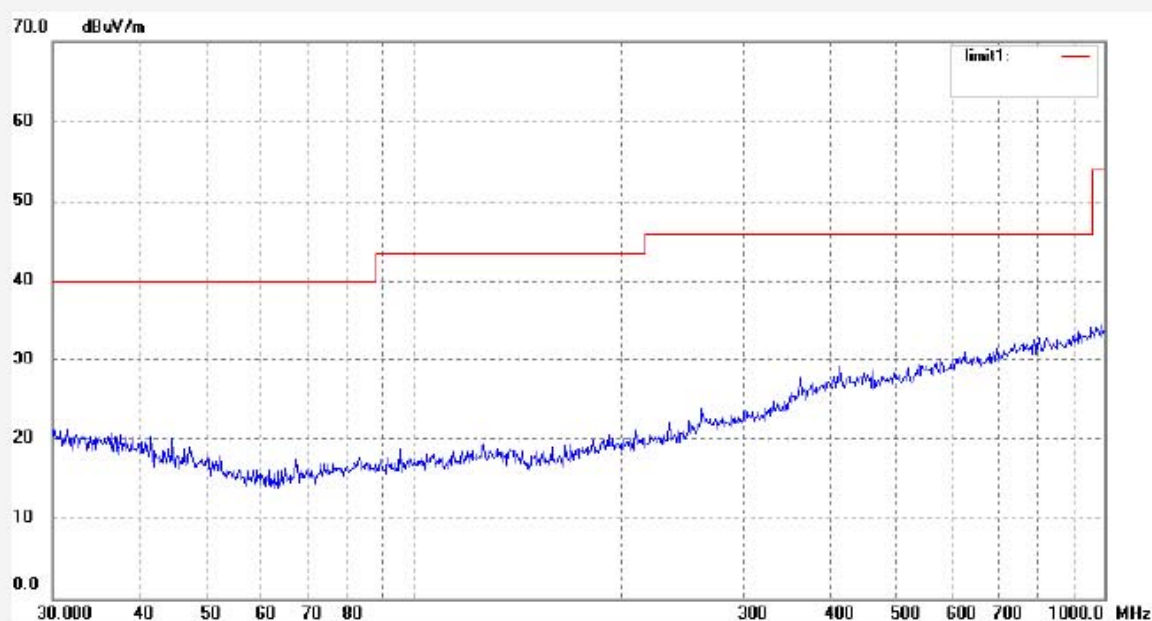
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2648  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2473MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Vertical  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 17:20:23  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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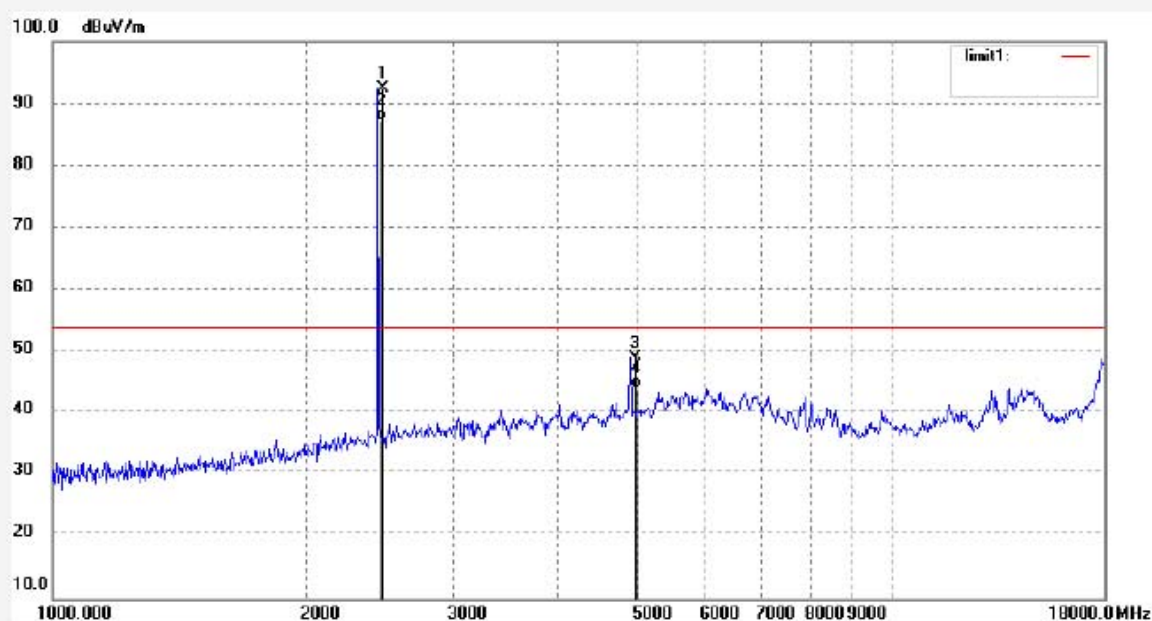
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2547  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2473MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 11:10:29  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2472.996	99.81	-7.36	92.45	54.00	38.45	peak			
2	2472.996	94.68	-7.36	87.32	54.00	33.32	AVG			
3	4945.968	48.58	0.46	49.04	54.00	-4.96	peak			
4	4945.968	43.45	0.46	43.91	54.00	-10.09	AVG			


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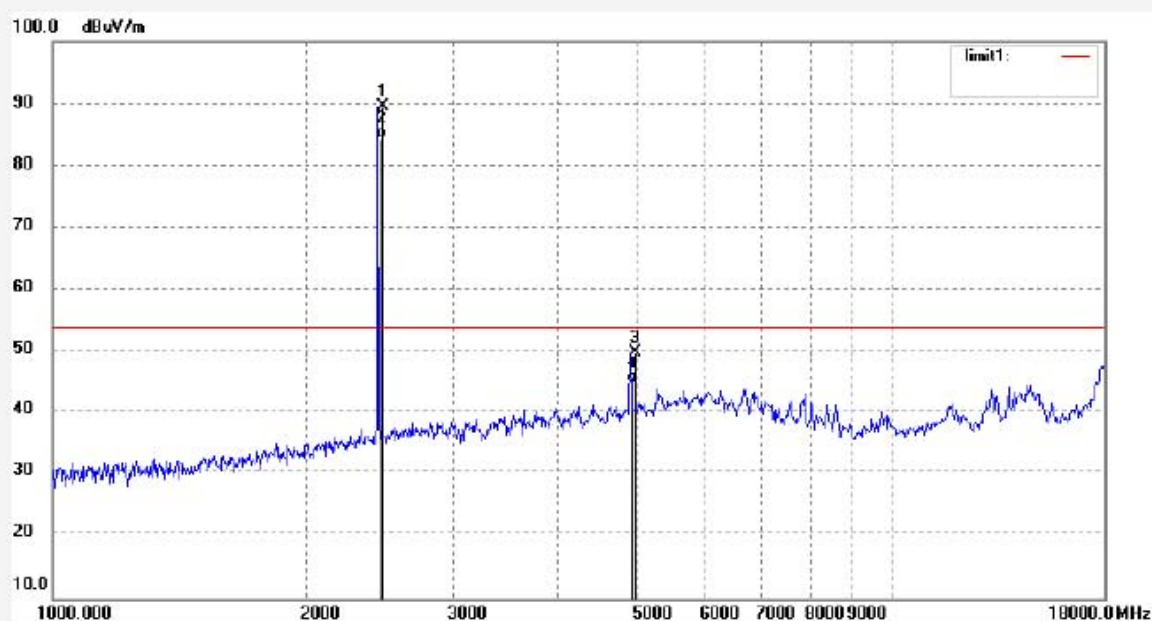
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2548  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2473MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Vertical  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 11:13:49  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2472.996	96.80	-7.36	89.44	54.00	35.44	peak			
2	2472.996	91.68	-7.36	84.32	54.00	30.32	AVG			
3	4945.968	49.55	0.46	50.01	54.00	-3.99	peak			
4	4945.968	44.41	0.46	44.87	54.00	-9.13	AVG			



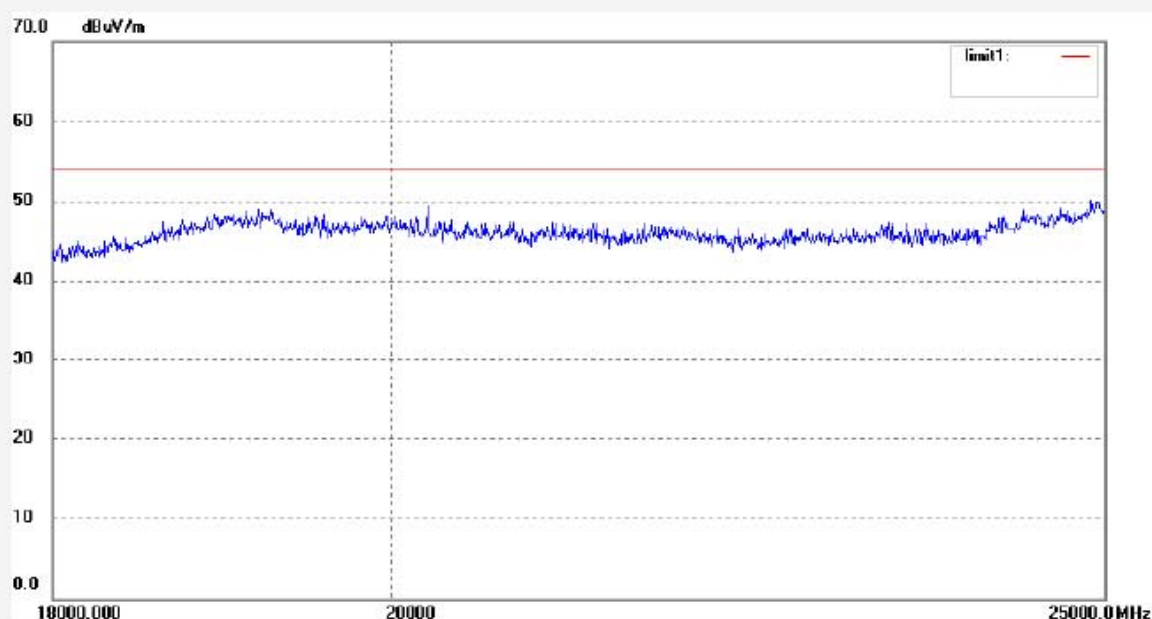

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: RTTE #2566	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 2009/08/24
Temp.( C)/Hum.(%) 25 C / 50 %	Time: 14:46:16
EUT: 2.4G Wireless Optical Mouse	Engineer Signature: Joe
Mode: TX 2473MHz	Distance: 3m
Model: GL-2009W	
Manufacturer: Sharper Innovations Ltd	

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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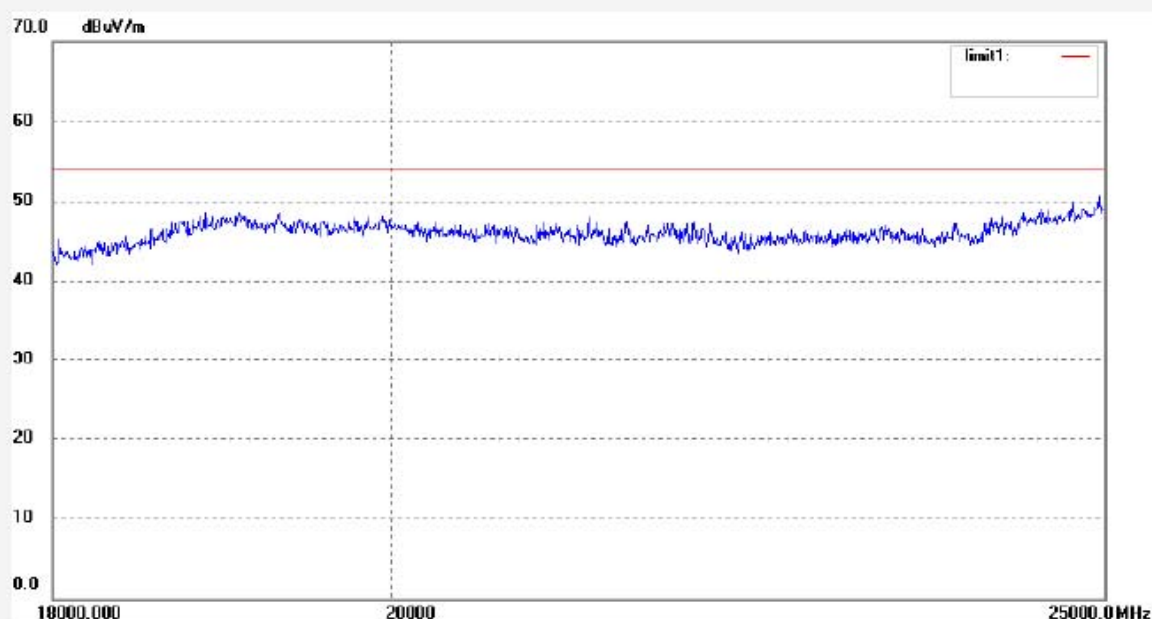
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2565  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2473MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Vertical  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 14:42:24  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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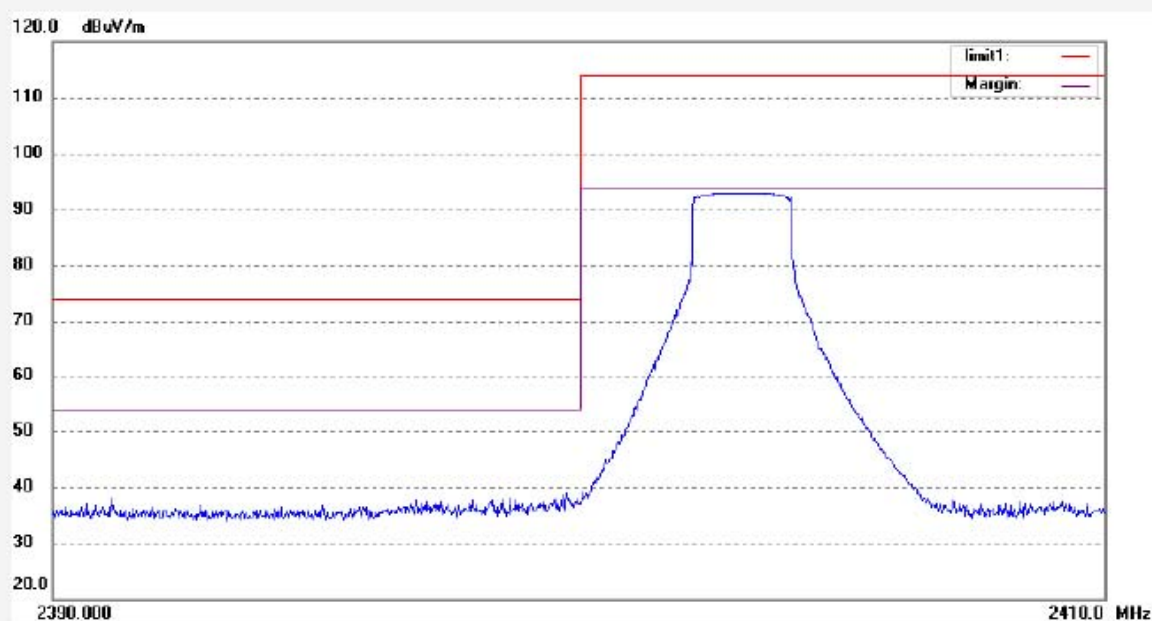
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2650  
 Standard: FCC Part 15 PEAK 2.4G  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2403MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 17:43:45  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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**ACCURATE TECHNOLOGY CO., LTD.**

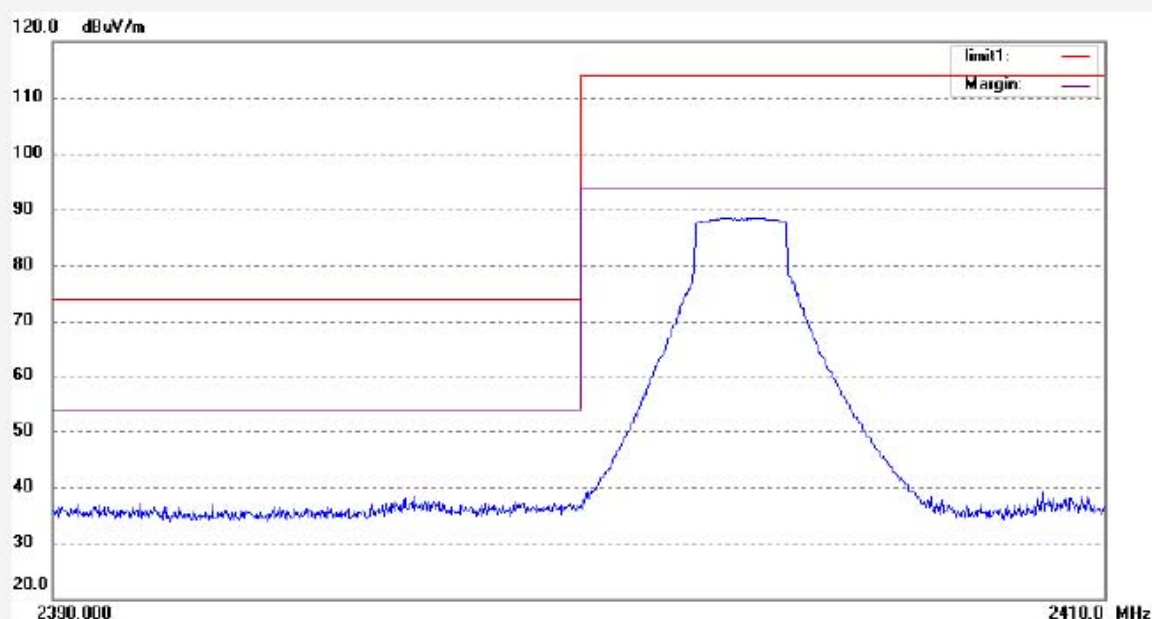
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: RTTE #2649  
Standard: FCC Part 15 PEAK 2.4G  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 50 %  
EUT: 2.4G Wireless Optical Mouse  
Mode: TX 2403MHz  
Model: GL-2009W  
Manufacturer: Sharper Innovations Ltd

Polarization: Vertical  
Power Source: DC 3V  
Date: 2009/08/24  
Time: 17:40:24  
Engineer Signature: Joe  
Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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 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.: RTTE #2651

Standard: FCC Part 15 PEAK 2.4G

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 50 %

EUT: 2.4G Wireless Optical Mouse

Mode: TX 2473MHz

Model: GL-2009W

Manufacturer: Sharper Innovations Ltd

Polarization: Horizontal

Power Source: DC 3V

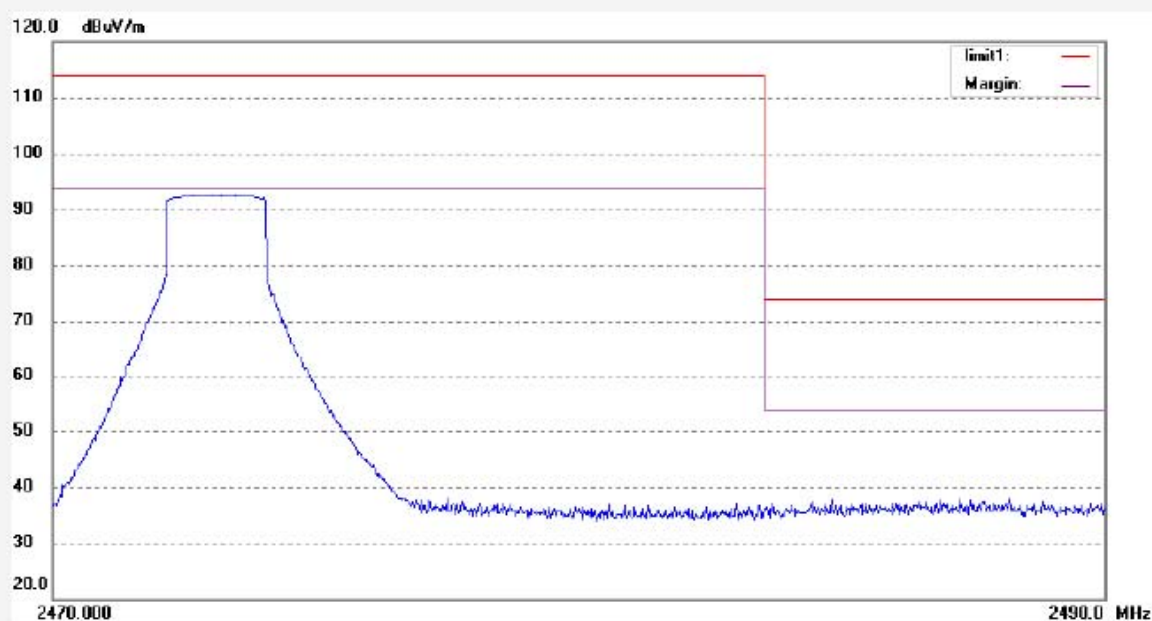
Date: 2009/08/24

Time: 17:48:10

Engineer Signature: Joe

Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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**ACCURATE TECHNOLOGY CO., LTD.**

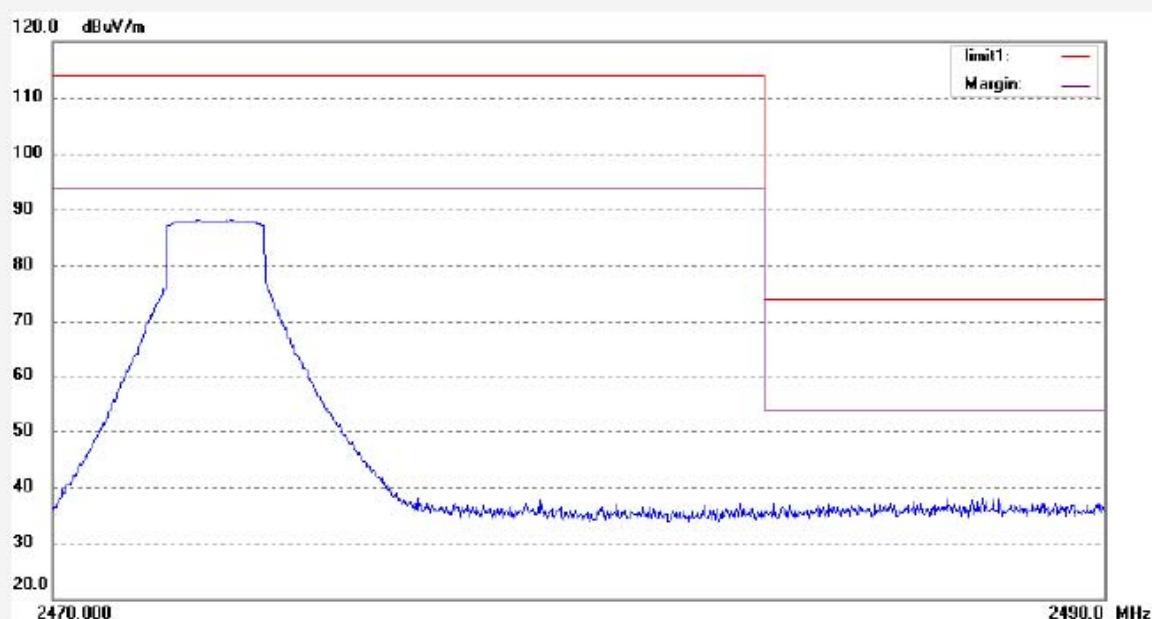
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

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

 Job No.: RTTE #2652  
 Standard: FCC Part 15 PEAK 2.4G  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 50 %  
 EUT: 2.4G Wireless Optical Mouse  
 Mode: TX 2473MHz  
 Model: GL-2009W  
 Manufacturer: Sharper Innovations Ltd

 Polarization: Vertical  
 Power Source: DC 3V  
 Date: 2009/08/24  
 Time: 17:51:17  
 Engineer Signature: Joe  
 Distance: 3m

Note: Sample No.:091794 Report No.:ATE20091554



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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