



**CENTRE OF TESTING SERVICE  
INTERNATIONAL**

**OPERATE ACCORDING TO ISO/IEC 17025**

# **FCC ID TEST REPORT**

**TEST REPORT NUMBER : CGZ3101028-03749-O**



**CENTRE OF TESTING SERVICE CO., LTD.**

Building F, Dachuang industrial park, No.379, Zhongshan Dadao,  
Guangzhou, China.



<b>TEST REPORT For FCC ID</b>	
<b>47 CFR PART 15 OCT, 2009</b>	
<b>Report Reference No.</b> .....	CGZ3101028-03749-O
<b>Date of issue</b> .....	01 November 2010
<b>Testing Laboratory Name</b> .....	<b>CENTRE OF TESTING SERVICE CO., LTD</b>
<b>Address</b> .....	Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China.
<b>Testing location/ procedure</b> .....	Full application of Harmonised standards <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing method <input type="checkbox"/>
<b>Applicant's name</b> .....	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
<b>Address</b> .....	No.25 Jingfeng Road West, Jingding Industrial Park, Jingding Town, Zhuhai City, China
<b>Test specification</b> .....	
<b>Standard</b> .....	<b>47 CFR PART 15 OCT, 2009</b>
<b>Test Report Form No.</b> .....	CTSEMC-1.0
<b>TRF Originator</b> .....	CENTRE OF TESTING SERVICE CO., LTD
<b>Master TRF</b> .....	Dated 2009-01
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<b>Test item description</b> .....	Wireless Optical Mouse
<b>Trade Mark</b> .....	
<b>Manufacturer</b> .....	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
<b>Model/Type reference</b> .....	YT-RFOP721
<b>Ratings</b> .....	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
<b>Operating Frequency</b> .....	2.405 ~ 2.476GHz ISM Band
<b>Result</b> .....	<b>Positive</b>

**Compiled by:**

Quty Liu / File administrators

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**Approved by:**

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## FCC ID -- T E S T R E P O R T

<b>Test Report No. :</b>	<b>CGZ3101028-03749-E</b>	30. November 2010 Date of issue
--------------------------	---------------------------	------------------------------------

Type / Model.....	YT-RFOP721
EUT.....	Wireless Optical Mouse
<b>Applicant.....</b>	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
Address.....	No.25 Jingfeng Road West, Jingding Industrical Park, Jingding Town, Zhuhai City, China
Telephone.....	+86-756-3891785
Fax.....	+86-756-3891780
Contact.....	Mary Liu
<b>Manufacturer.....</b>	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
Address.....	No.25 Jingfeng Road West, Jingding Industrical Park, Jingding Town, Zhuhai City, China
Telephone.....	+86-756-3891785
Fax.....	+86-756-3891780
Contact.....	Mary Liu
<b>Test report holder.....</b>	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
Address.....	No.25 Jingfeng Road West, Jingding Industrical Park, Jingding Town, Zhuhai City, China
Telephone.....	+86-756-3891785
Fax.....	+86-756-3891780
Contact.....	Mary Liu

**Test Result** according to the standards on page 3: **Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## 1 TEST STANDARDS

The tests were performed according to following standards:

- 47 CFR PART 15 OCT, 2009
- ANSI C63.4-2009

## 2 SUMMARY

### 2.1 GENERAL REMARKS

Date of receipt of test sample	29 October 2010
Testing commenced on	01 November 2010
Testing concluded on	08 November 2010

### 2.2 FINAL ASSESSMENT

The FCC requirements pertaining to the technical standards and tested operation modes are

- - fulfilled.
- ☐ - **not** fulfilled.

The equipment under test

- - fulfils the FCC requirements cited on page 3.
- ☐ - **does not** fulfil the FCC requirements cited on page 3.

## 3 EQUIPMENT UNDER TEST

### 3.1 Power supply system utilised

Power supply voltage : USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)

### 3.2 Short description of the Equipment under Test (EUT)

Number of tested samples: 1  
Serial number: Prototype

### 3.3 EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

- ☐ - Standby
- - Test program (customer specific)

Operation mode 1: Channel Low, Channel Mid, Channel High

### 3.4 EUT configuration

#### 3.4.1. Description of configuration (EUT)

Description	:	Wireless Optical Mouse
Model Number	:	YT-RFOP721
Operation frequency	:	2.405 ~ 2.476GHz ISM Band
Radio Technology	:	HFSS
Modulation Technology	:	GFSK modulation
Antenna	:	Integral antenna, met requirement of FCC 15.203
Antenna Assembly Gain	:	2dBi (maximum)

#### 3.4.2. Tested Supporting System Details

##### 3.4.1. Monitor

M/N	:	E7722-f
S/N	:	CN-02W486-64180-3B7-01MP
Manufacturer	:	DELL
Power Cord	:	Unshielded, Detachable, 1.8m , 3Pin
Certificate	:	By DoC

##### 3.4.2. Keyboard

M/N	:	SK-8110
S/N	:	CN-07N244-71616-37T-B293
Manufacturer	:	DELL
Power Cord	:	Shielded, Detachable
Certificate	:	By DoC

##### 3.4.3. Printer

M/N	:	LaserJet 2200d
S/N	:	SGKGB50919
Manufacturer	:	HP
Power Cord	:	Shielded, Detachable, 1.8m. 3Pin
Certificate	:	By DoC

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## 3.4.4. Modem

M/N	:	MT800
S/N	:	421033
Manufacturer	:	HUAWEI
Power Cord	:	Shielded, Detachable, 1.8m , 2Pin
Certificate	:	By DoC

## 3.4.5. Personal Computer

M/N	:	DIMENSION 4600
S/N	:	CN-OTO486-42940-37M-00XB
Manufacturer	:	DELL
Power Cord	:	Unshielded, Detachable, 1.8m , 3Pin
Certificate	:	By DoC

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## 4 TEST ENVIRONMENT

### 4.1 Address of the test laboratory

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

### 4.2 Test facility

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

#### CNAS-Lab Code: L3394

CENTRE OF TESTING SERVICE CO., LTD has been assessed and proved to be in compliance with CNAS-CL01: 2006 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### IC-Registration No.: 8374

The 3m Alternate Test Site of CENTRE OF TESTING SERVICE CO., LTD has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 8374 on June 24, 2009 .

#### FCC-Registration No.: 791995

CENTRE OF TESTING SERVICE CO., LTD, 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 No.791995, July 21, 2009.

### 4.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35 °C
Humidity:	25~75 %
Atmospheric pressure:	86~106 kPa

### 4.4 Definitions of symbols used in this test report

- - The black square indicates that the listed condition, standard or equipment is applicable for this report.
- - The empty square indicates that the listed condition, standard or equipment is **not** applicable for this report.

### 4.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the CTS quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

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#### 4.6 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	$\pm 1.22\text{dB}$	(1)
Power disturbance	30MHz~300MHz	$\pm 1.38\text{dB}$	(1)
Radiation emission (3m)	30MHz~300MHz	$\pm 3.14\text{dB}$	(1)
	300MHz~1000MHz	$\pm 3.18\text{dB}$	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

## 5 Summary of standards and results

### 5.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION		
Description of Test Item	Standard	Results
Conducted Emission Test	FCC Part 15 C: 15.247 ANSI C63.4-2009	PASSED
Radiated Emission Test	FCC Part 15 C: 15.247 ANSI C63.4-2009	PASSED
Carrier Frequency Separation Test	FCC Part 15 C: 15.247 ANSI C63.4-2009	PASSED
20 dB Bandwidth Test	FCC Part 15 C: 15.247 ANSI C63.4-2009	PASSED
Number Of Hopping Frequency Test	FCC Part 15 C: 15.247 ANSI C63.4-2009	PASSED
Dwell Time Test	FCC Part 15 C: 15.247 ANSI C63.4-2009	PASSED
Maximum Peak Output Power Test	FCC Part 15 C: 15.247 ANSI C63.4-2009	PASSED
Occupied Bandwidth (99% BW) test	FCC Part 15 C: 15.247 ANSI C63.4-2009	PASSED
Band Edge Compliance Test	FCC Part 15 C: 15.247 ANSI C63.4-2009	PASSED
RF Exposure Test	FCC Part 2: 2.1307(b)(1)	PASSED

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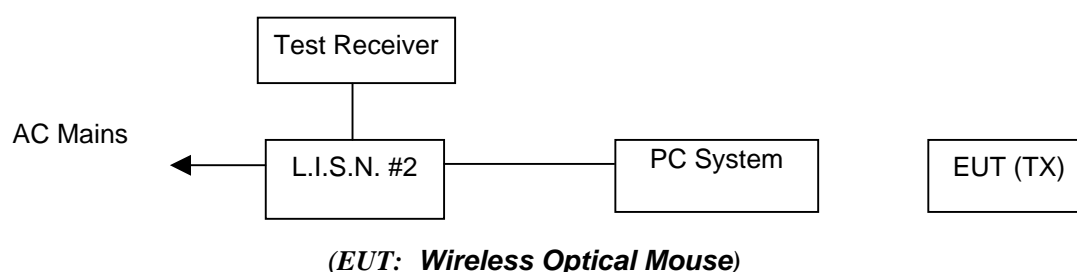


## 6 Power line conducted Emission Test

### 6.1.Test Equipment

Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESHS10	842884/012	2009/12
2	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z5	832479/025	2009/12
3	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z5	832479/026	2009/12
4	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100301	2009/12
5	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2009/12

### 6.2. Block Diagram of Test Setup



### 6.3. Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. \* Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

### 6.4.Test Procedure

The EUT Via PC Power connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). This provides a 50 ohm coupling impedance for the EUT. Please refer the block diagram of the test setup and photographs. The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#1). Power on the PC and let it work normally, we use a keyboard test soft ware, let EUT working in test mode, then test it. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC Part 15C on Conducted Emission Test.

The bandwidth of test receiver (R & S ESHS 10) is set at 10kHz.

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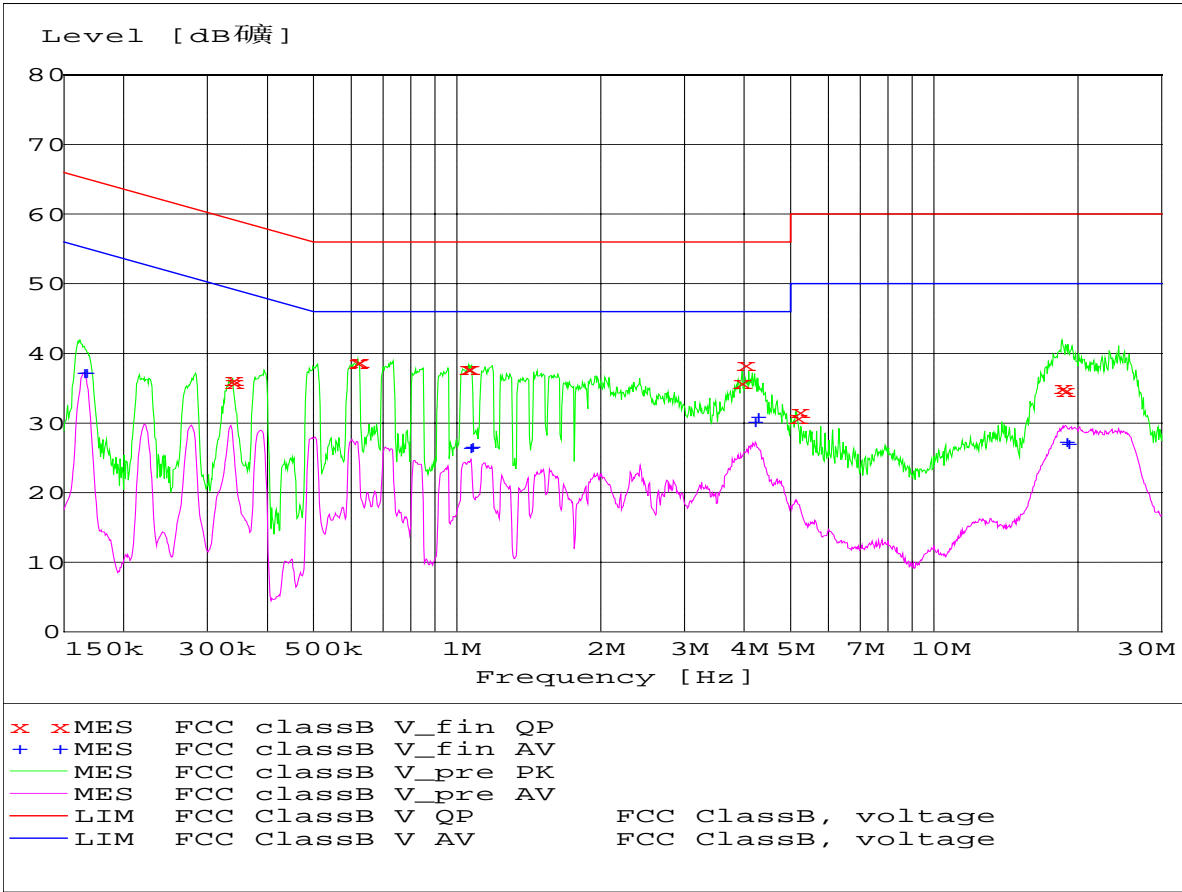


6.5. Power Line Conducted Emission Test Results

PASSED.

Channel:	TX Mode	Result:	■ - passed
Test point:	Va		□ - not passed
Frequency range:	0.15~30MHz		

EUT	Wireless Optical Mouse
Operating Condition	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	01 November 2010 ~ 08 November 2010
Operator	Tony
MODEL NO	YT-RFOP721



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**MEASUREMENT RESULT: "FCC classB V<sub>fin</sub> QP"**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.337414	36.40	10.1	59	22.6	Va	GND
0.336663	35.50	10.1	59	23.5	Va	GND
0.616146	38.30	10.1	56	17.7	Va	GND
0.614811	38.50	10.1	56	17.5	Va	GND
1.048110	37.80	10.1	56	18.2	Va	GND
1.056512	37.90	10.1	56	18.1	Va	GND
3.928870	35.80	10.1	56	20.2	Va	GND
3.992110	38.50	10.1	56	17.5	Va	GND
5.154187	30.80	10.1	60	29.2	Va	GND
5.195503	31.70	10.1	60	28.3	Va	GND
18.490507	35.10	9.9	60	24.9	Va	GND
18.713280	34.70	9.9	60	25.3	Va	GND

**MEASUREMENT RESULT: "FCC classB V<sub>fin</sub> AV"**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.164415	37.30	10.2	55	17.7	Vb	GND
0.165733	37.30	10.2	55	17.7	Vb	GND
1.060740	26.40	10.1	46	19.6	Vb	GND
1.069243	26.60	10.1	46	19.4	Vb	GND
4.188010	30.10	10.1	46	15.9	Vb	GND
4.238467	31.00	10.1	46	15.0	Vb	GND
18.788133	27.40	9.9	50	22.6	Vb	GND
19.014490	27.10	9.9	50	22.9	Vb	GND

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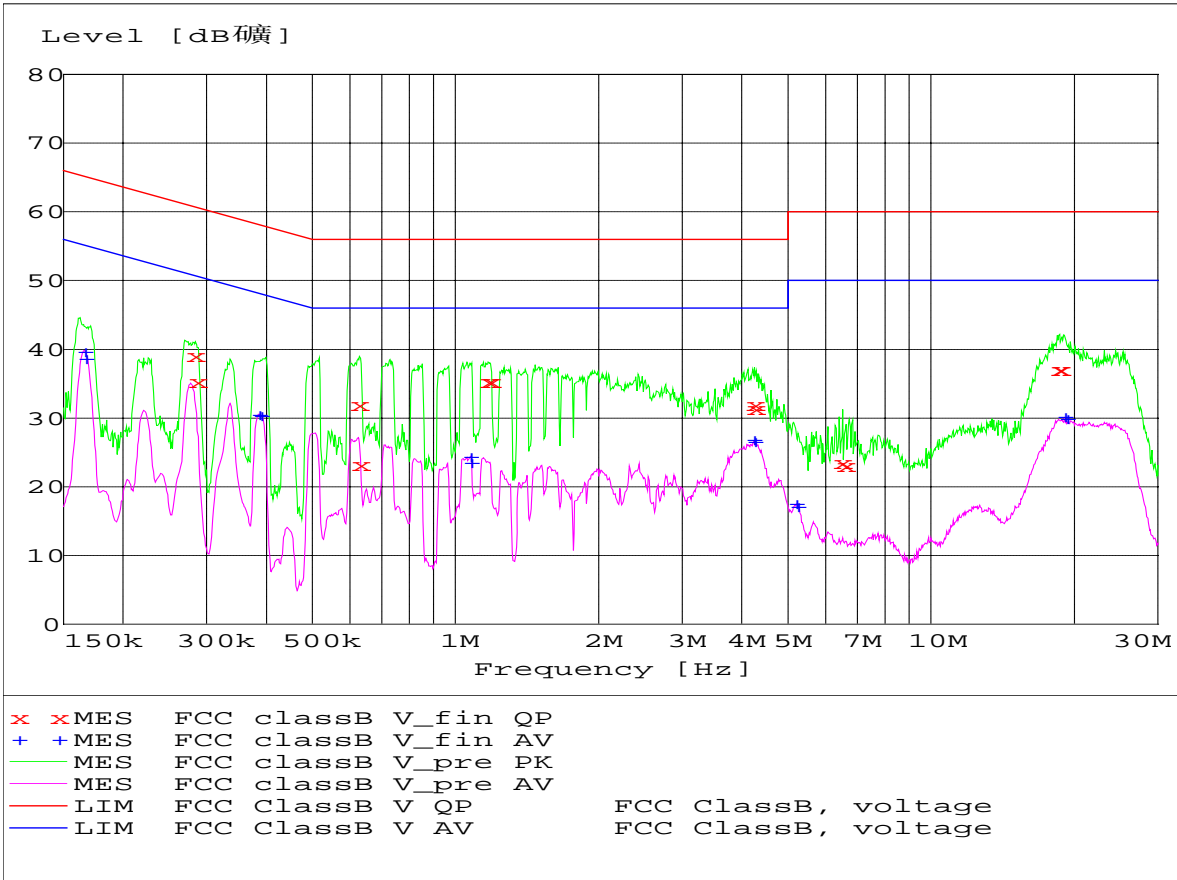
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Channel:	TX Mode	Result:	■ - passed
Test point:	Vb		□ - not passed
Frequency range:	0.15~30MHz		

EUT	Wireless Optical Mouse
Operating Condition	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	01 November 2010 ~ 08 November 2010
Operator	Tony
MODEL NO	YT-RFOP721



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**MEASUREMENT RESULT: "FCC classB V\_fin QP"**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.282840	39.20	10.2	61	21.8	Vb	GND
0.284436	35.60	10.2	61	25.4	Vb	GND
0.623270	32.50	10.1	56	23.5	Vb	GND
0.628370	23.40	10.1	56	32.7	Vb	GND
1.167291	35.70	10.1	56	20.3	Vb	GND
1.181786	35.50	10.1	56	20.5	Vb	GND
4.238366	31.40	10.1	56	24.6	Vb	GND
4.255480	31.30	10.1	56	24.7	Vb	GND
6.471930	23.50	10.0	60	36.5	Vb	GND
6.575720	23.20	10.0	60	36.9	Vb	GND
18.566472	37.00	9.9	60	23.0	Vb	GND
18.638230	37.40	9.9	60	22.6	Vb	GND

**MEASUREMENT RESULT: "FCC classB V\_fin AV"**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.165078	39.60	10.2	55	15.6	Vb	GND
0.166401	38.70	10.2	55	16.4	Vb	GND
0.384810	30.50	10.1	48	17.6	Vb	GND
0.387895	30.30	10.1	48	17.8	Vb	GND
1.069240	24.40	10.1	46	21.6	Vb	GND
1.073517	23.50	10.1	46	22.5	Vb	GND
4.221579	26.80	10.1	46	19.2	Vb	GND
4.238465	26.60	10.1	46	19.4	Vb	GND
5.174810	17.50	10.1	50	32.5	Vb	GND
5.216291	17.20	10.1	50	32.8	Vb	GND
19.014495	30.20	9.9	50	19.8	Vb	GND
19.243580	30.00	9.9	50	20.0	Vb	GND

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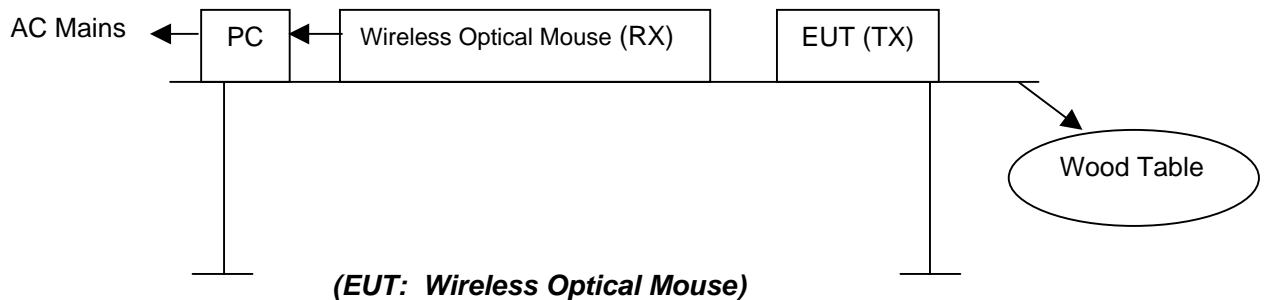
## 7 Radiated disturbance (electric field)

### 7.1.Test Equipment

Radiated disturbance (electric field)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100868	2009/12
2	Biconical Antenna	ROHDE & SCHWARZ	HK116	100221	2009/12
3	Log per Antenna	ROHDE & SCHWARZ	HL223	100226	2009/12
4	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	2009/12
5	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2009/12

### 7.2.Block Diagram of Test Setup

#### 7.2.1 Block Diagram of connection between EUT and simulators



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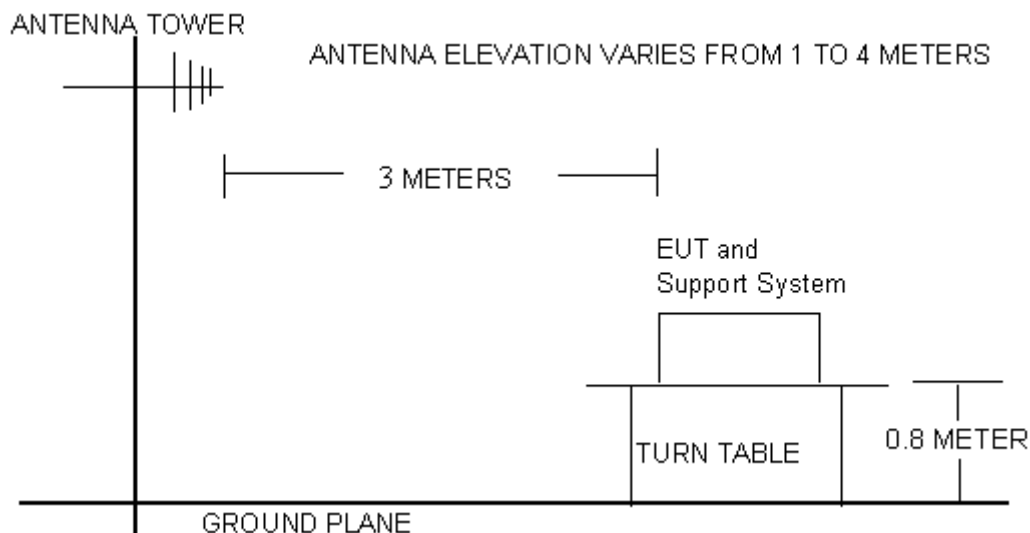
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### 7.2.2 Anechoic Chamber Setup Diagram



### 7.3. Radiated Emission Limit Standard: FCC 15.247

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other: 74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

- Remark:
- (1) Emission level  $\text{dB}\mu\text{V} = 20 \log$  Emission level  $\mu\text{V}/\text{m}$
  - (2) The smaller limit shall apply at the cross point between two frequency bands.
  - (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

### 7.4. Test Procedure

The EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1 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 polarization of the antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2009 on radiated emission Test.

The frequency range from 30MHz to 1000MHz and above 1GHz. is investigated. Please see the following pages.

All measurements for radiated emissions within the restricted bands were performed using a Quasi-Peak detector with 120kHz RBW below 1GHz and a Peak and Average detector with 1MHz RBW above 1GHz,



All measurements for radiated emissions within the restricted bands were performed using a Quasi-Peak detector with 300kHz VBW below 1GHz and a Peak detector with 1MHz VBW above 1GHz, A average detector with 10Hz VBW above 1GHz

Pretest x, y, z position of EUT, final, select the worst case x position test and record the test results in the report.

The test modes (TX Mode) is tested in Anechoic Chamber and all the scanning waveforms are reported on section 7.5

## **7.5.Radiated Emission Test Results**

**PASSED.**

The frequency range from 30MHz to 230MHz, 230MHz to 1000MHz and above 1GHz. is investigated.  
Please see the following pages

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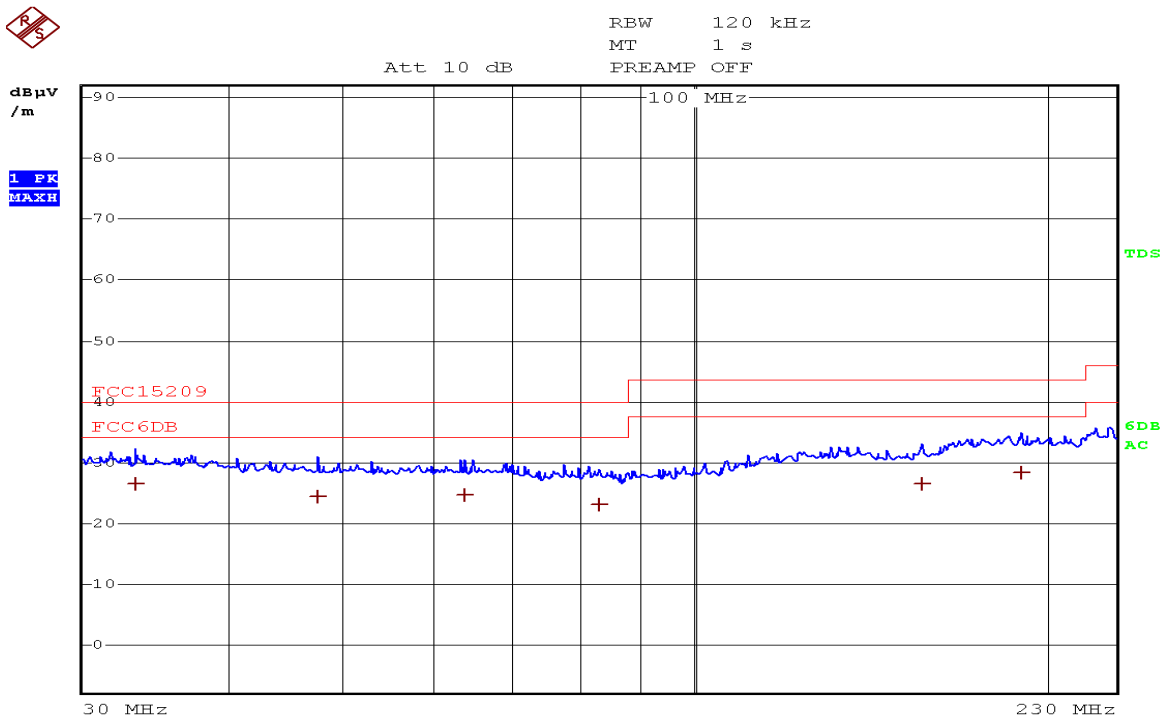
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Channel:	TX Mode	Result:	<input checked="" type="checkbox"/> - passed
Test point:	Horizontal		<input type="checkbox"/> - not passed
Frequency range:	30-230MHz and 230-1000MHz		

EUT	Wireless Optical Mouse
Operating Condition	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	01 November 2010 ~ 08 November 2010
Operator	Tony
MODEL NO	YT-RFOP721



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC15209		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	33.32 MHz	26.41	-13.58
1 Quasi Peak	47.68 MHz	24.49	-15.50
1 Quasi Peak	63.64 MHz	24.58	-15.41
1 Quasi Peak	83.16 MHz	23.18	-16.81
1 Quasi Peak	156.92 MHz	26.59	-16.91
1 Quasi Peak	190.36 MHz	28.33	-15.17

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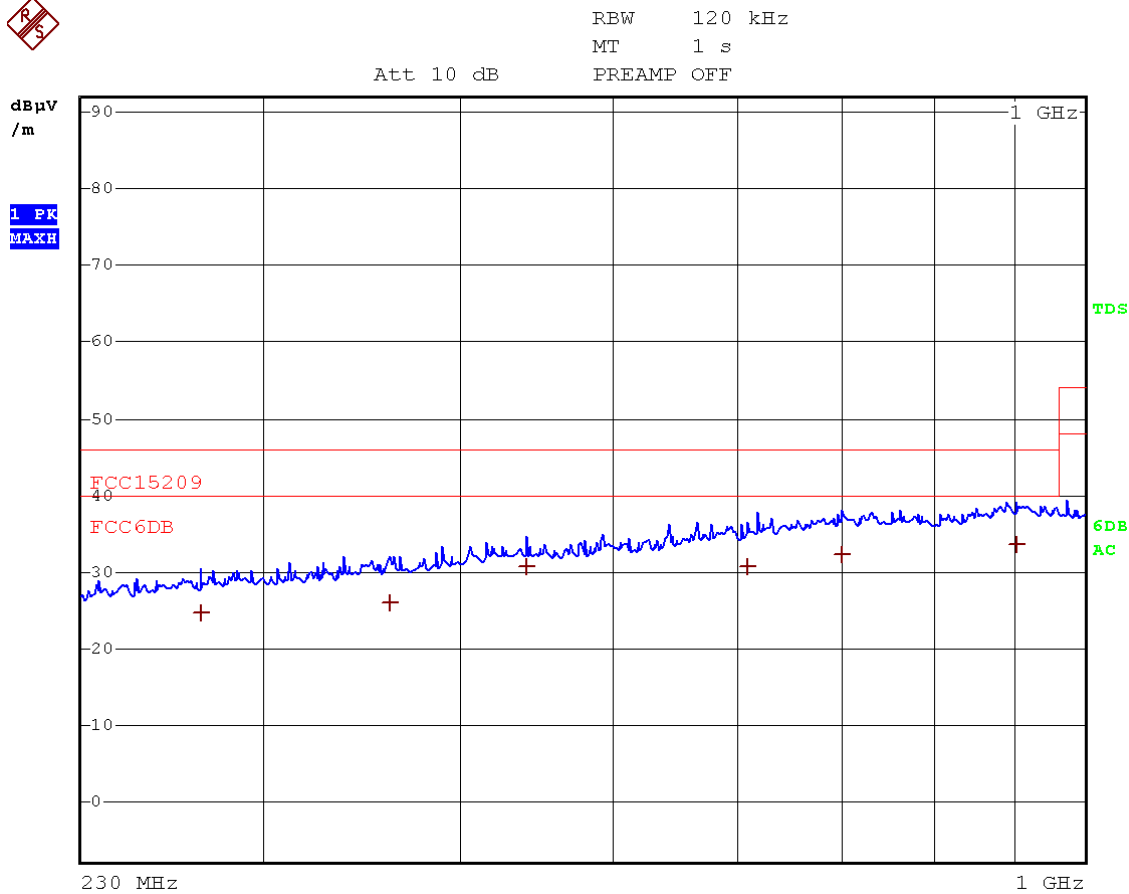
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EDIT PEAK LIST (Final Measurement Results)				
Trace1:	FCC15209			
Trace2:	---			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB	
1 Quasi Peak	274.72 MHz	24.66	-21.34	
1 Quasi Peak	361.56 MHz	26.07	-19.93	
1 Quasi Peak	441.96 MHz	30.82	-15.17	
1 Quasi Peak	610.52 MHz	30.79	-15.20	
1 Quasi Peak	700.6 MHz	32.32	-13.67	
1 Quasi Peak	904.24 MHz	33.52	-12.47	

Note: 1. Emission level=Read level + Factor  
2. Factor=Antenna factor + Cable loss

Channel:	Low 2405MHz	Result:	<input checked="" type="checkbox"/> - passed
Test point:	Horizontal		<input type="checkbox"/> - not passed
Frequency range:	1GHz-26.5GHz		

EUT	Wireless Optical Mouse
Operating Condition	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	01 November 2010 ~ 08 November 2010
Operator	Tony
MODEL NO	YT-RFOP721

Frequency	Result [dBμV]		Limit [dBμV]		Dlimit [dBμV]	
[MHz]	Average	Peak	Average	[MHz]	Average	Peak
1829.7	45.5	53.6	54	74	8.5	20.4
2744.5	45.4	50.8	54	74	8.6	23.2
4810.0	44.3	49.2	54	74	9.7	24.8
7215.1	47.2	56.4	54	74	6.8	17.6
8984.5	41.5	50.2	54	74	12.5	23.8
9620.0	41.4	52.3	54	74	12.6	21.7

Note: 1. Emission level=Read level + Factor  
2. Factor=Antenna factor + Cable loss

Channel:	Mid 2442MHz	Result:	<input checked="" type="checkbox"/> - passed
Test point:	Horizontal		<input type="checkbox"/> - not passed
Frequency range:	1GHz-26.5GHz		

Frequency	Result [dBμV]		Limit [dBμV]		Dlimit [dBμV]	
[MHz]	Average	Peak	Average	Peak	Average	Peak
1829.5	46.2	54.3	54	74	7.8	19.7
2744.5	45.4	51.5	54	74	8.6	22.5
4884.2	45.6	48.8	54	74	8.4	25.2
7326.7	43.4	56.3	54	74	10.6	17.7
8984.3	41.5	51.5	54	74	12.5	22.5
9768.2	40.7	54.8	54	74	13.3	19.2

Note: 1. Emission level=Read level + Factor  
2. Factor=Antenna factor + Cable loss

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Channel:	High 2476MHz	Result:	<input checked="" type="checkbox"/> - passed
Test point:	Horizontal		<input type="checkbox"/> - not passed
Frequency range:	1GHz-26.5GHz		

Frequency	Result [dBμV]		Limit [dBμV]		Dlimit [dBμV]	
[MHz]	Average	Peak	Average	[MHz]	Average	Peak
1849.4	46.3	54.4	54	74	7.7	19.6
2734.1	45.4	51.8	54	74	8.6	22.2
4952.2	45.2	48.2	54	74	8.8	25.8
7428.7	43.7	56.5	54	74	10.3	17.5
8924.1	41.2	54.4	54	74	12.8	19.6
9904.7	41.5	53.7	54	74	12.5	20.3

Note: 1. Emission level=Read level + Factor  
2. Factor=Antenna factor + Cable loss

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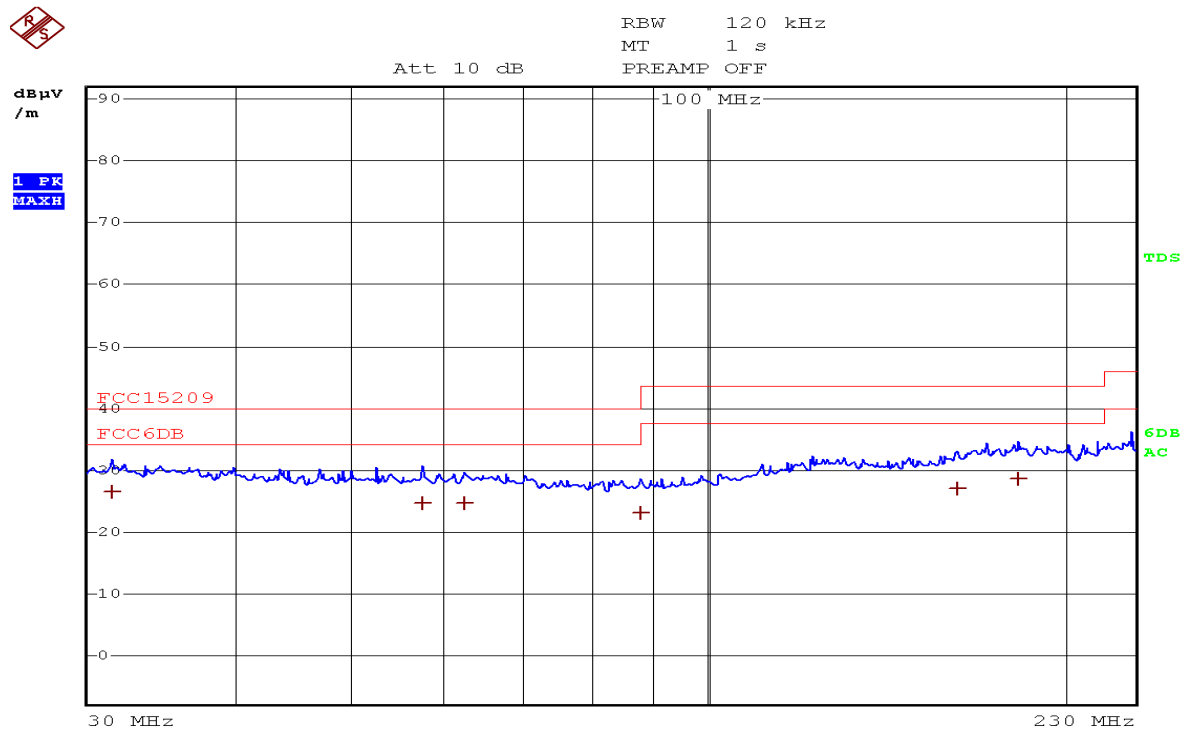
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Channel:	TX Mode	Result:	■ - passed
Test point:	Vertical		□ - not passed
Frequency range:	30-230MHz and 230-1000MHz		

EUT	Wireless Optical Mouse
Operating Condition	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	01 November 2010 ~ 08 November 2010
Operator	Tony
MODEL NO	YT-RFOP721



EDIT PEAK LIST (Final Measurement Results)				
Trace1:	FCC15209			
Trace2:	---			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA	LIMIT dB
1 Quasi Peak	31.44 MHz	26.57	-13.42	
1 Quasi Peak	57.44 MHz	24.54	-15.45	
1 Quasi Peak	62.4 MHz	24.60	-15.40	
1 Quasi Peak	87.8 MHz	23.10	-16.89	
1 Quasi Peak	162.32 MHz	27.13	-16.36	
1 Quasi Peak	182.76 MHz	28.50	-14.99	

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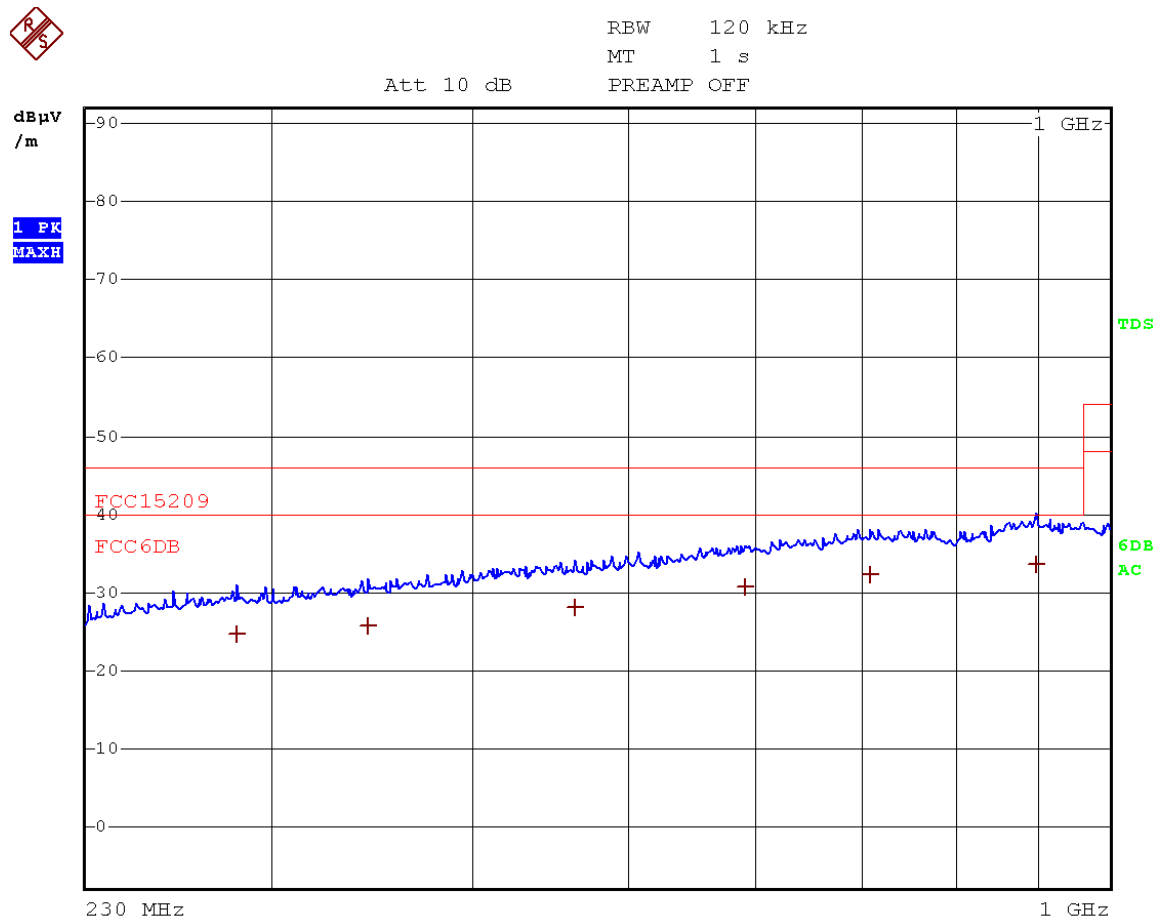
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EDIT PEAK LIST (Final Measurement Results)				
Trace1:		FCC15209		
Trace2:		---		
Trace3:		---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA	LIMIT dB
1 Quasi Peak	285.6 MHz	24.59	-21.40	
1 Quasi Peak	344.88 MHz	25.77	-20.23	
1 Quasi Peak	464.24 MHz	28.18	-17.81	
1 Quasi Peak	593.04 MHz	30.72	-15.27	
1 Quasi Peak	707.92 MHz	32.39	-13.60	
1 Quasi Peak	899.88 MHz	33.60	-12.40	

Note: 1. Emission level=Read level + Factor  
2. Factor=Antenna factor + Cable loss

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Channel:	Low 2405MHz	Result:	<input checked="" type="checkbox"/> - passed
Test point:	Vertical		<input type="checkbox"/> - not passed
Frequency range:	1G-26.5GHz		

EUT	XBOX360 WIRELESS CONTROLLER VERSION2
Operating Condition	AA1.5V*2, AC 100-240V/50-60Hz for Xbox
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	13 September~ 21 September 2010
Operator	Raymond
MODEL NO	AS163

Frequency [MHz]	Result [dBμV]		Limit [dBμV]		Dlimit[dBμV]	
	Average	Peak	Average	Peak	Average	Peak
1829.7	45.3	53.7	54	74	8.7	20.3
2744.5	46.4	55.4	54	74	7.6	18.6
4810.0	44.9	52.8	54	74	9.1	21.2
7215.1	47.3	56.3	54	74	6.7	17.7
8984.5	41.4	50.5	54	74	12.6	23.5
9620.0	41.3	52.5	54	74	12.7	21.5

Note: 1. Emission level=Read level + Factor  
2. Factor=Antenna factor + Cable loss

Channel:	Mid 2442MHz	Result:	<input checked="" type="checkbox"/> - passed
Test point:	Vertical		<input type="checkbox"/> - not passed
Frequency range:	1G-26.5GHz		

Frequency [MHz]	Result [dBμV]		Limit [dBμV]		Dlimit [dBμV]	
	Average	Peak	Average	Peak	Average	Peak
1829.5	45.5	54.4	54	74	8.5	19.6
2744.5	43.6	51.9	54	74	10.4	22.1
4884.2	45.2	48.7	54	74	8.8	25.3
7326.7	46.5	56.2	54	74	7.5	17.8
8984.3	41.3	51.3	54	74	12.7	22.7
9768.2	40.4	51.0	54	74	13.6	23.0

Note: 1. Emission level=Read level + Factor  
2. Factor=Antenna factor + Cable loss

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Channel:	High 2476MHz	Result:	<input checked="" type="checkbox"/> - passed
Test point:	Vertical		<input type="checkbox"/> - not passed
Frequency range:	1G-26.5GHz		

Frequency	Result [dBμV]		Limit [dBμV]		Dlimit [dBμV]	
[MHz]	Average	Peak	Average	Peak	Average	Peak
1849.4	46.4	54.8	54	74	7.6	19.2
2734.1	45.8	51.5	54	74	8.2	22.5
4952.2	45.3	48.3	54	74	8.7	25.7
7428.7	43.2	56.8	54	74	10.8	17.2
8924.1	41.4	54.9	54	74	12.6	19.1
9904.7	41.6	53.0	54	74	12.4	21.0

Note: 1. Emission level=Read level + Factor  
2. Factor=Antenna factor + Cable loss

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## 8 Carrier frequency separation test

### 8.1. Test Equipment

Carrier frequency separation test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	200912
2	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	200912
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	200912

### 8.2. Test Information

EUT:	Wireless Optical Mouse
M/N:	YT-RFOP721
Power supply:	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.247
Test mode:	Transmitting, Hopping on
Test Frequency:	Low: 2405MHz; Mid: 2442MHz; High: 2476MHz
Test Date:	01 November ~ 08 November 2010
Test By:	<b>Tony</b>

### 8.3. Test Results

**PASSED.**

The testing data was attached in the next pages.

CH	Channel separation (kHz)	Limit	Conclusion
(Low)	2116	>the 20dB Bandwidth or 25kHz (whichever is greater)	PASSED
(Mid)	2053	>the 20dB Bandwidth or 25kHz (whichever is greater)	PASSED
(High)	2048	>the 20dB Bandwidth or 25kHz (whichever is greater)	PASSED

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## Test frequency:2405MHz



## Test frequency:2442MHz



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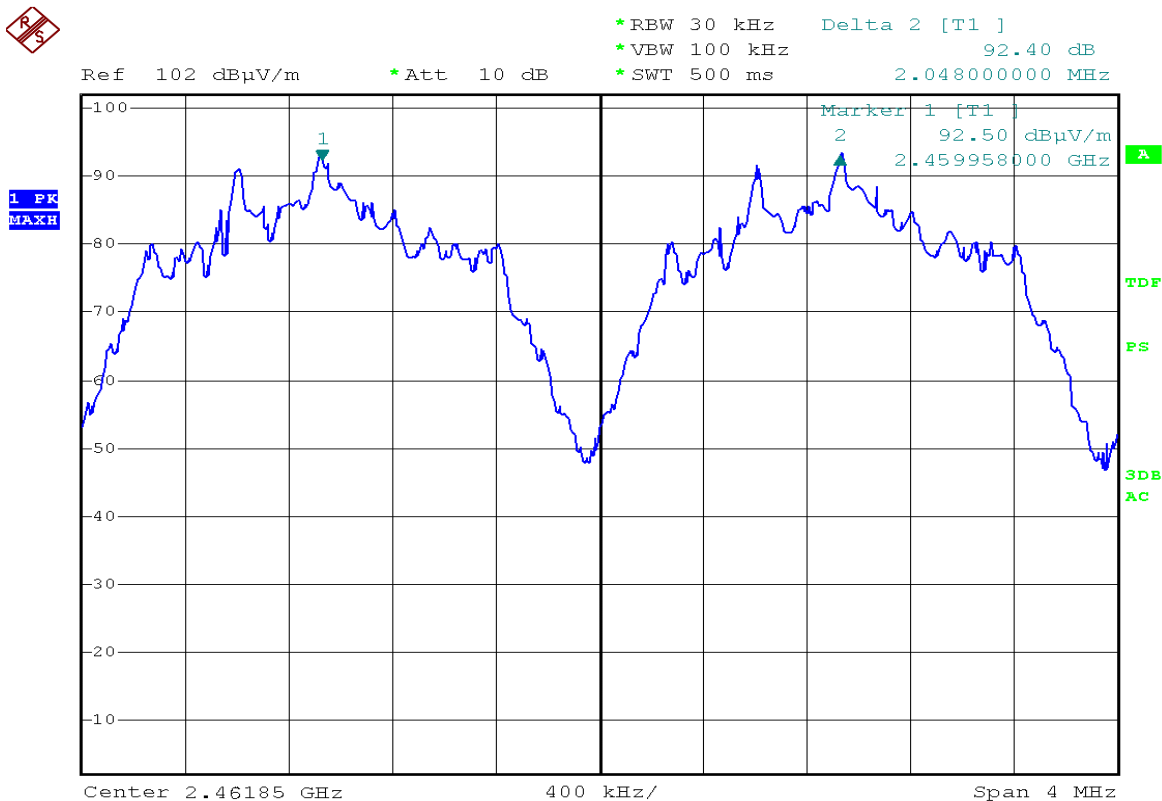
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Test frequency:2476MHz



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## 9 20 dB Bandwidth test

### 9.1. Test Equipment

20 dB Bandwidth test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	200912
2	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	200912
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	200912

### 9.2. Test Information

EUT:	Wireless Optical Mouse
M/N:	YT-RFOP721
Firm Name:	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
Power supply:	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.247
Test mode:	Transmitting, Hopping on
Test Frequency:	Low: 2405MHz; Mid: 2442MHz; High: 2476MHz
Test Date:	01 November ~ 08 November 2010
Test By:	Tony

### 9.3. Test Results

**PASSED.**

The testing data was attached in the next pages.

Channel	20dB Bandwidth (kHz)	Limit (kHz)	Conclusion
(Low)	1444	---	PASSED
(Mid)	1440	---	PASSED
(High)	1440	---	PASSED

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## Test Frequency:2405MHz



## Test Frequency:2442MHz



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Test Frequency:2476MHz



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## 10 Number of Hopping Frequency test

### 10.1. Test Equipment

Number of Hopping Frequency test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	200912
2	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	200912
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	200912

### 10.2. Test Information

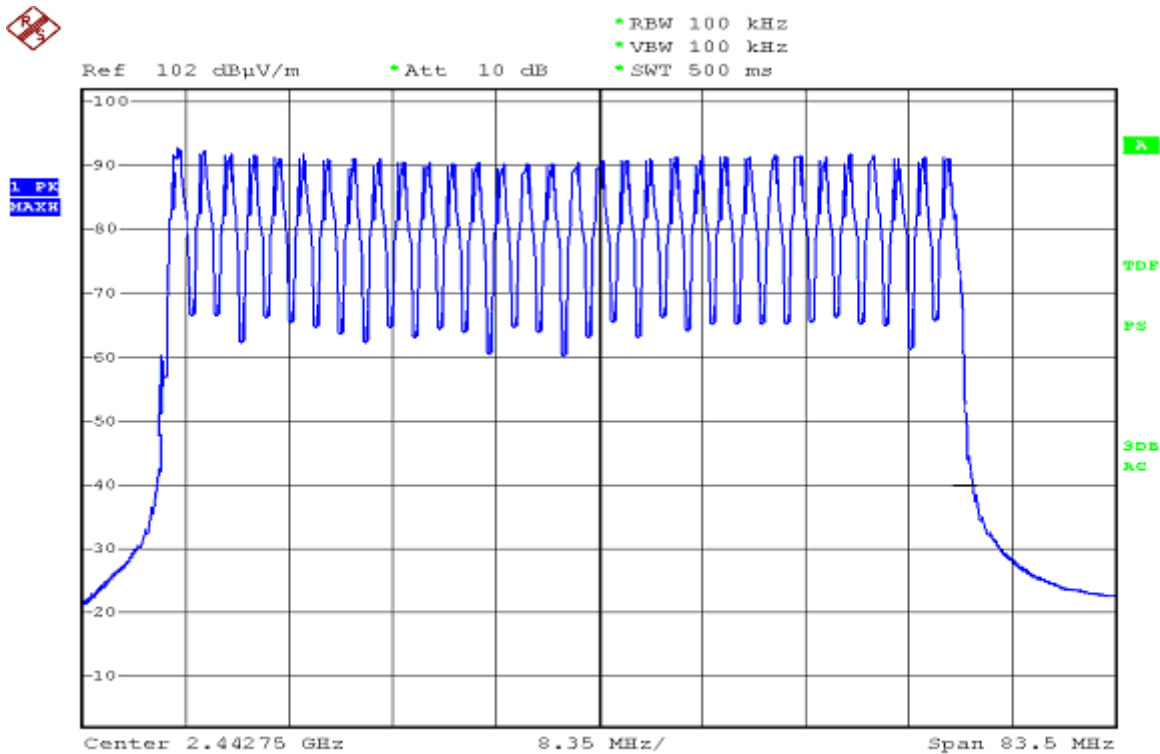
EUT:	Wireless Optical Mouse
M/N:	YT-RFOP721
Firm Name:	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
Power supply:	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.247
Test mode:	Transmitting, Hopping on
Test Frequency:	Low: 2405MHz; Mid: 2442MHz; High: 2476MHz
Test Date:	01 November ~ 08 November 2010
Test By:	<b>Tony</b>

### 10.3. Test Results

**PASSED.**

The testing data was attached in the next pages.

Number of channel	Limit	Conclusion
32	$\geq 15$	PASSED



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## 11 Dwell time test

### 11.1. Test Equipment

Dwell time test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	200912
2	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	200912
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	200912

### 11.2. Test Information

EUT:	Wireless Optical Mouse
M/N:	YT-RFOP721
Firm Name:	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
Power supply:	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.247
Test mode:	Transmitting, Hopping on
Test Frequency:	Low: 2405MHz; Mid: 2442MHz; High: 2476MHz
Test Date:	01 November ~ 08 November 2010
Test By:	Tony

### 11.3. Test Results

#### PASSED.

The testing data was attached in the next pages.

This system hopping 20 hops in any 6s, and for each hop it transmit 2 pulses, each pulse dwell 350μs, so the dwell time is:

$$20/6 \times 32 \times 0.4 \times 2 \times 350 \times 10^{-6} = 372\text{ms}$$

dwell time	Limit	Conclusion
372ms	<400ms	PASSED

## 12 Maximum Peak Output power test

### 12.1. Test Equipment

Maximum Peak Output power test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	200912
2	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	200912
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	200912

### 12.2. Test Information

EUT:	Wireless Optical Mouse
M/N:	YT-RFOP721
Firm Name:	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
Power supply:	USB Port 5V From PC With AC 110V/50Hz (RX), Battery 1.5Vx1(TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.247
Test mode:	Transmitting, Hopping on
Test Frequency:	Low: 2405MHz; Mid: 2442MHz; High: 2476MHz
Test Date:	01 November ~ 08 November 2010
Test By:	Tony

### 12.3. Test Results

**PASSED.**

The testing data was attached in the next pages.

CH	Freq (MHz)	Ant. pol	Emission Level (dBμV)	Result (dBm)	Margin	Limits	
						(mW)	(dBm)
Low	2405.0	H	95.11	0.65	20.30	125	20.95
	2405.0	V	90.13	-6.52	27.47	125	20.95
Mid	2442.0	H	94.36	1.12	19.83	125	20.95
	2442.0	V	87.2 4	-7.19	28.14	125	20.95
High	2476.0	H	92.29	0.67	20.28	125	20.95
	2476.0	V	88.61	-6.58	27.53	125	20.95

Calculation Result =  $30 + 10\log(TP)$

$TP = (Emission\ Level * D)^2 / 30 * G$

(This formula descript in IC RSS-210 clause 11, where D is the distance in meters between the tow antennas, TP is transmitter output power in watts and G is the antenna numerical gain referenced to isotropic gain, in here G = 1 supplied by customer)

Emission Level = Antenna Factor + Cable Loss + Reading.

(RBW=1MHz, VBW=1MHz peak detector.)

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## 13 Band Edge Compliance test

### 13.1. Test Equipment

Band Edge Compliance test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	200912
2	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	200912
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	200912

### 13.2. Test Information

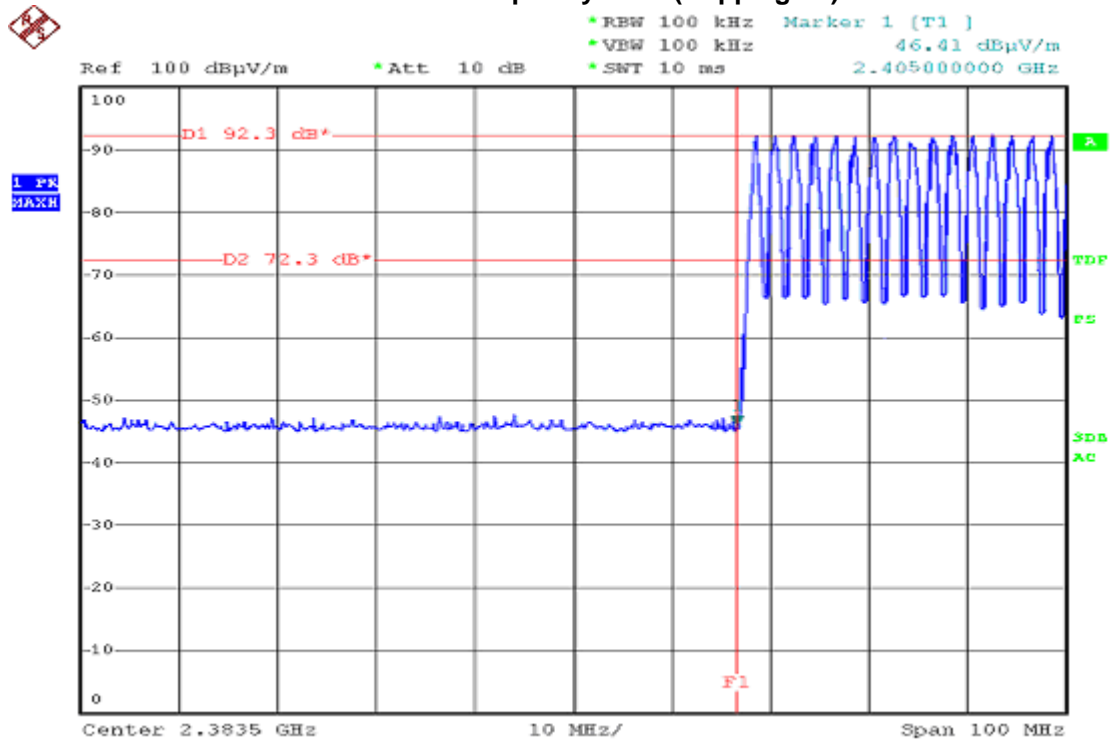
EUT:	Wireless Optical Mouse
M/N:	YT-RFOP721
Firm Name:	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
Power supply:	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.247
Test mode:	Transmitting, Hopping on
Test Frequency:	Low: 2405MHz; Mid: 2442MHz; High: 2476MHz
Test Date:	01 November ~ 08 November 2010
Test By:	<b>Tony</b>

### 13.3. Test Results

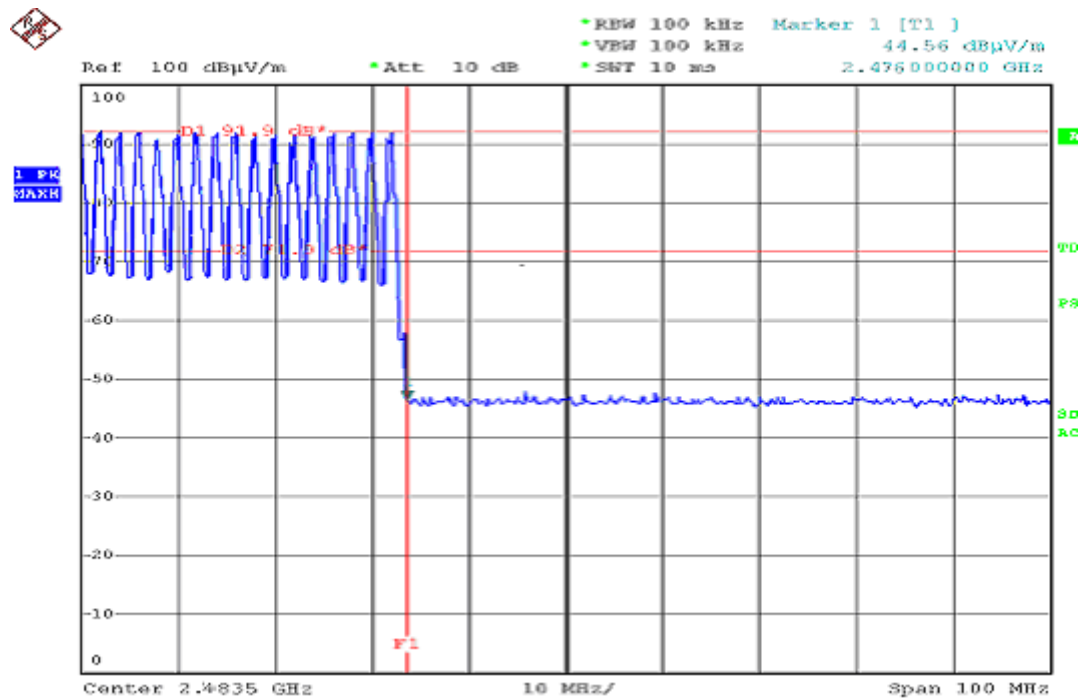
**PASSED.**

The testing data was attached in the next pages.

## Test Frequency: Low (Hopping on)



## Test Frequency: High(Hopping on)



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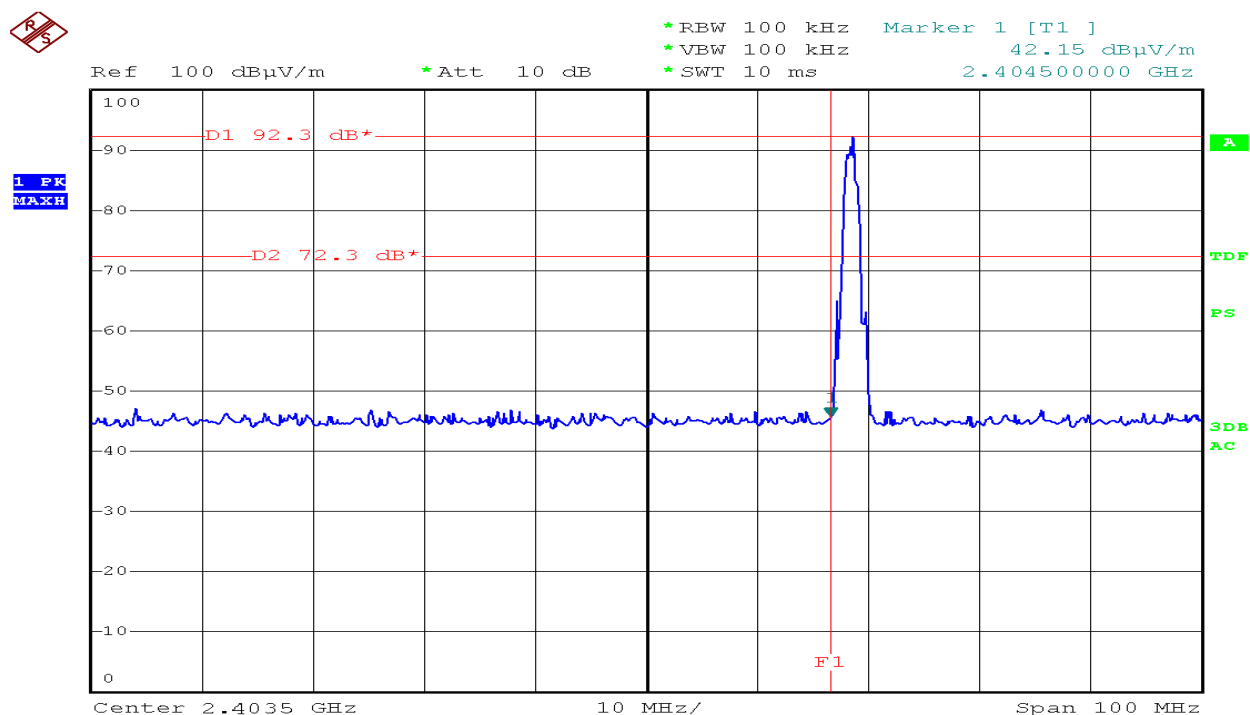
Fax: +86-20-38780406

Complaint line: +86-20-85533471

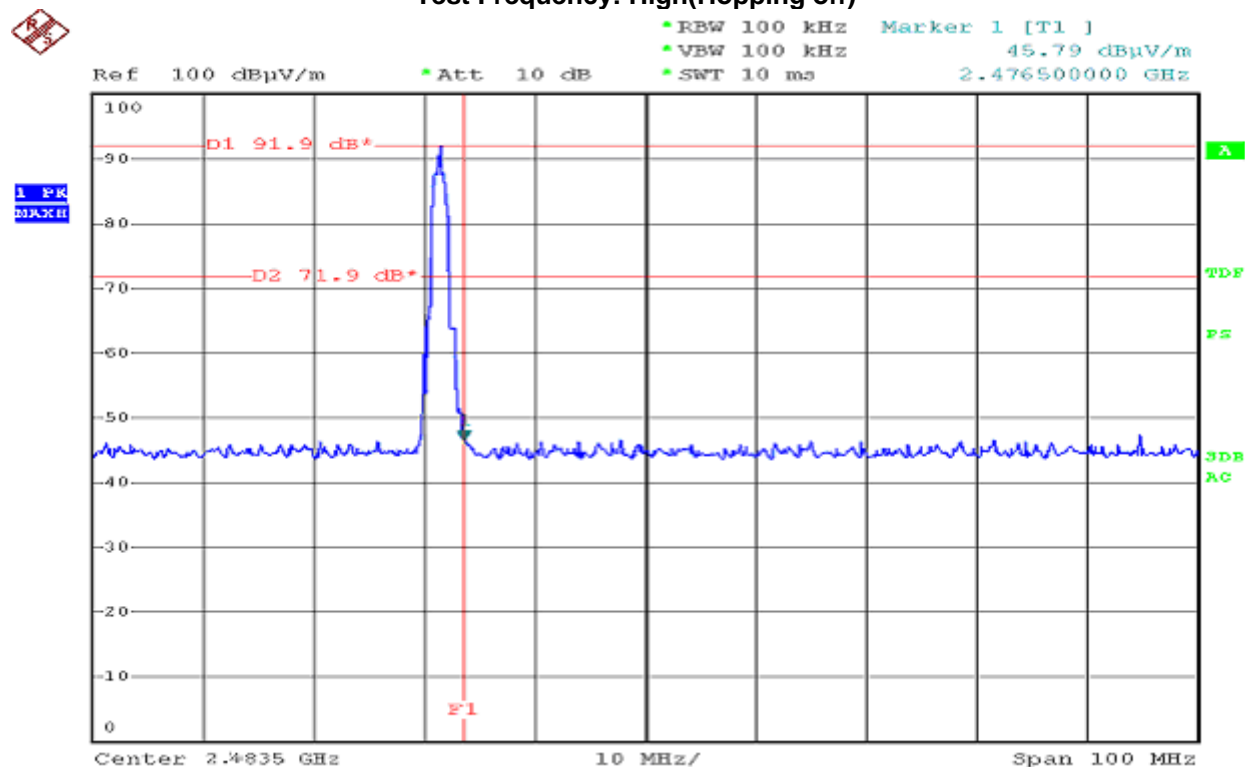
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**Test Frequency: Low (Hopping off)**



**Test Frequency: High(Hopping off)**



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## 14 Occupied Bandwidth (99% BW) test

### 14.1. Test Equipment

Band Edge Compliance test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	200912
2	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	200912
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	200912
4	Spectrum	Agilent	E4446A	44300459	200912

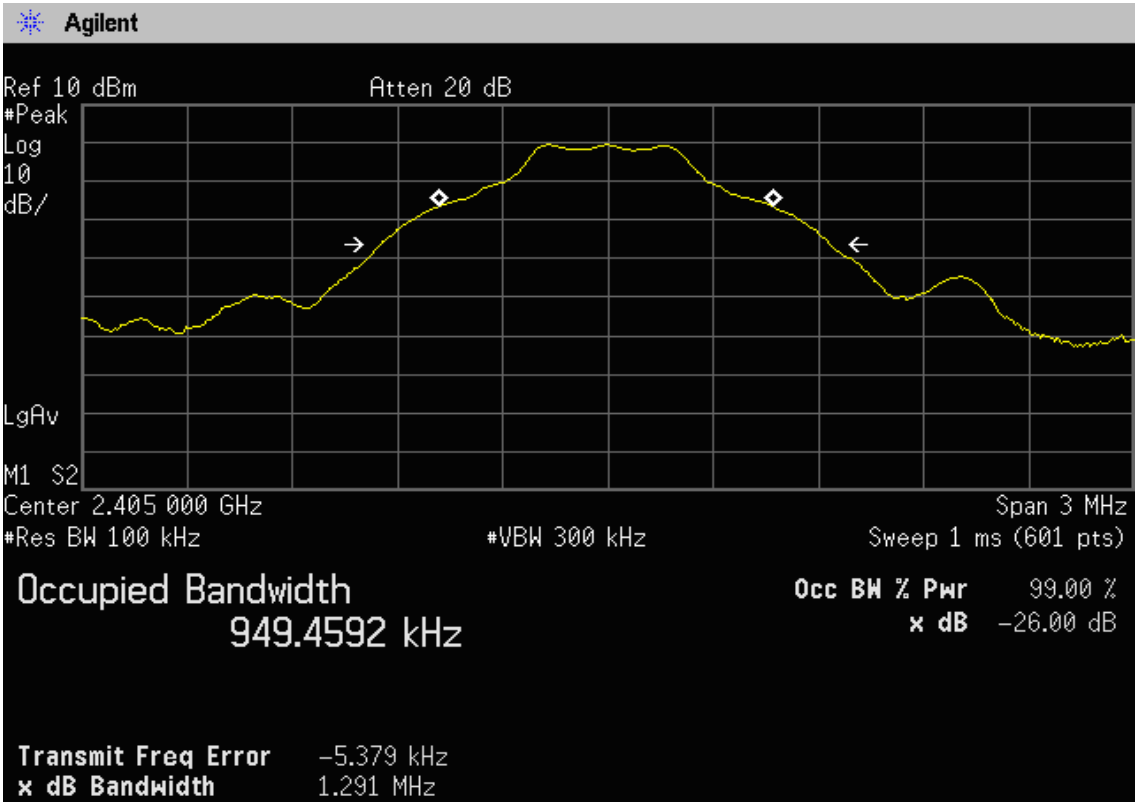
### 14.2. Test Information

EUT:	Wireless Optical Mouse
M/N:	YT-RFOP721
Firm Name:	ZHUHAI YONGTAI ELECTRONIC CO., LTD.
Power supply:	USB Port 5V From PC With AC 110V/60Hz (RX), Battery 1.5Vx1(TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.247
Test mode:	Transmitting, Hopping on and Hopping off
Test Frequency:	2405MHz ,
Test Date:	01 November ~ 08 November 2010
Test By:	<b>Tony</b>

### 14.3. Test Results

**PASSED.**

The testing data was attached in the next pages.



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## 15 Deviation to test specifications

[ NONE ]

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## 16 Manufacturer/ Approval holder Declaration

The following identical model(s):

**YT-RFOP723,YT-RFOP728,YT-RFOP725,YT-RFOP726,YT-RFOP727**

Belong to the tested device:

Product description: **Wireless Optical Mouse**

Model name: **YT-RFOP721**

### Differences among these models

No.	Model Number	Enclose	Color	PCB Layout	Structure	Figure	Button	Component
1	YT-RFOP723	same plastic	same	same	same	same	plastic	same
2	YT-RFOP728	same plastic	same	same	same	same	plastic	same
3	YT-RFOP725	same plastic	same	same	same	same	plastic	same
4	YT-RFOP721	same plastic	same	same	same	same	plastic	same
5	YT-RFOP726	same plastic	same	same	same	same	plastic	same
6	YT-RFOP727	same plastic	same	same	same	same	plastic	same

**Remark: No additional models were tested.**

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