

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

Wireless Optical Mouse
Model No.: DS-2060(2060-F +2068-D)

FCC ID: TUVDS2060F

Prepared for : Eastern Times Technology Co., Ltd.
Address : Building 5, Penghua Industry Park, Heping Rd.(W),
Longhua, Shenzhen, Guangdong, China

Prepared by : ACCURATE TECHNOLOGY CO. LTD
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Report Number : ATE20071031
Date of Test : May 10, 2007
Date of Report : May 11, 2007

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Test Report Certification

Applicant : Eastern Times Technology Co., Ltd.
Manufacturer : Eastern Times Technology Co., Ltd.
EUT Description : Wireless Optical Mouse
(A) MODEL NO.: DS-2060(2060-F +2068-D)
(B) SERIAL NO.: N/A
(C) POWER SUPPLY: 2.4V DC (“AAA” batteries 2×)

Measurement Procedure Used:


FCC Rules and Regulations Part 15 Subpart C Section 15.227: 2006

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 : May 10, 2007

Prepared by : 
(Engineer)

Reviewer : 
(Quality Manager)

Approved & Authorized Signer : 
(Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : Wireless Optical Mouse

Model Number : DS-2060(2060-F +2068-D)

Power Supply : 2.4V DC (“AAA” batteries 2×)

Applicant : Eastern Times Technology Co., Ltd.
Address : Building 5, Penghua Industry Park, Heping Rd.(W),
Longhua, Shenzhen, Guangdong, China

Manufacturer : Eastern Times Technology Co., Ltd.
Address : Building 5, Penghua Industry Park, Heping Rd.(W),
Longhua, Shenzhen, Guangdong, China

Date of sample received : April 28, 2007
Date of Test : May 10, 2007

1.2. Description of Test Facility

EMC Lab : Accredited by FCC
The Certificate Registration Number is 274801

Accredited by Industry Canada
The Certificate Registration Number is IC4174

Accredited by China National Accreditation Committee
for Laboratories
The Certificate Registration Number is L0579

Name of Firm : Shenzhen Academy of Metrology & Quality Inspection
Site Location : Bldg. Metrology & Quality Inspection, Longzhu Road,
Nanshan, Shenzhen, Guangdong, P.R. China

1.3. Measurement Uncertainty

Conducted emission expanded uncertainty = 3.5dB, k=2

Radiated emission expanded uncertainty = 4.5dB, 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	03.31.2008
EMI Test Receiver	Rohde&Schwarz	ESI26	838786/013	01.24.2008
Loop Antenna	Schwarzbeck	FMZB1516	113	01.24.2008
Bilog Antenna	Schwarzbeck	VULB9163	9163-194	03.31.2008
Bilog Antenna	Chase	CBL6112B	2591	01.24.2008
Horn Antenna	Rohde&Schwarz	HF906	100013	01.24.2008
Spectrum Analyzer	Anritsu	MS2651B	6200238856	03.31.2008
Pre-Amplifier	Agilent	8447D	2944A10619	03.31.2008

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

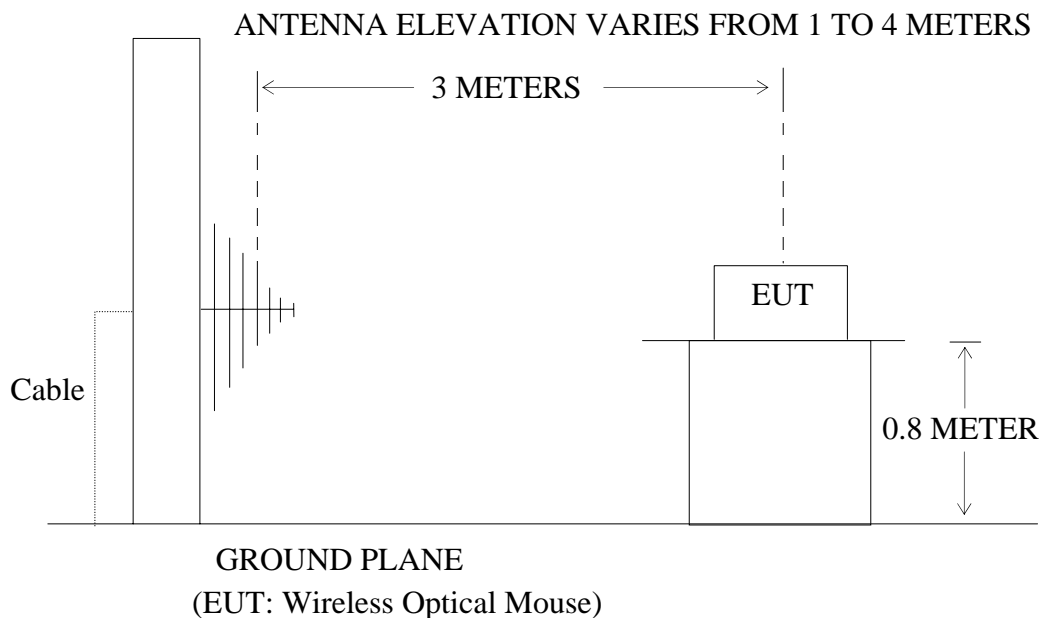
3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Optical Mouse)

3.1.2. Anechoic Chamber Test Setup Diagram



3.2. The Field Strength of Radiation Emission Measurement Limits

3.2.1. 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)

Frequency (MHz)	Limit,		The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those
	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	frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
Above 960	500	54	

3.3. 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.

3.3.1. Wireless Optical Mouse (EUT)

Model Number : DS-2060(2060-F +2068-D)
 Serial Number : N/A
 Manufacturer : Eastern Times Technology Co., Ltd.

3.4. Operating Condition of EUT

3.4.1. Setup the EUT and simulator as shown as Section 3.1.

3.4.2. Turn on the power of all equipment.

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

3.5. 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 C 63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver (R&S ESCS30) is set at 120KHz in 30-1000MHz.

The frequency range from 30MHz to 1000MHz 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.

3.6. The Field Strength of Radiation Emission Measurement Results

PASS.

The frequency range 30MHz to 1000MHz is investigated.

Date of Test:	<u>May 10, 2007</u>	Temperature:	<u>24°C</u>
EUT:	<u>Wireless Optical Mouse</u>	Humidity:	<u>50%</u>
			<u>2.4V DC ("AAA" battery)</u>
Model No.:	<u>DS-2060(2060-F +2068-D)</u>	Power Supply:	<u>2×)</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Andy</u>

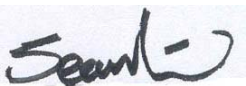
Polarization	Frequency (MHz)	Reading(dBμV/m)	Factor Corr.(dB)	Result(dBμV/m)	Limits(dBμV/m)	Margin(dBμV/m)
		QP		QP	QP	QP
Horizontal	247.280	17.3	9.8	27.1	46	18.9
Horizontal	330.700	14.4	13.3	27.7	46	18.3
Horizontal	632.370	12.6	19.0	31.6	46	14.4
Vertical	84.320	15.5	5.3	20.8	40	19.2
Vertical	465.530	9.1	16.8	25.9	46	20.1
Vertical	856.440	8.8	23.4	32.2	46	13.8

The spectral diagrams in appendix 1 display the measurement of peak values with corrected factors counted.

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

Reviewer : 

4. FUNDAMENTAL RADIATED EMISSION FOR FCC PART 15

SECTION 15.227(A)

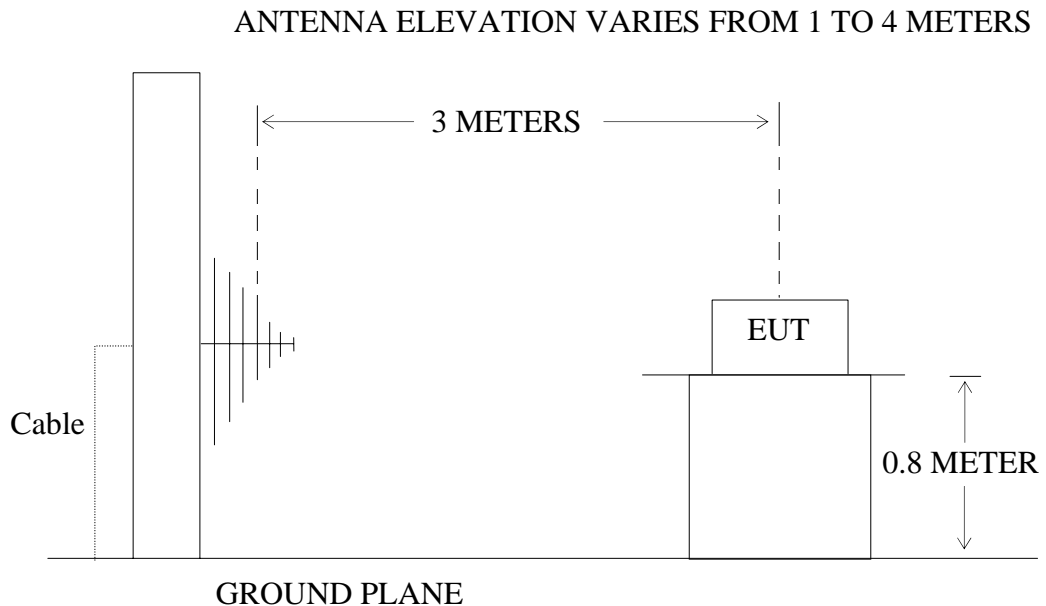
4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Optical Mouse)

4.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Wireless Optical Mouse)

4.2. The Emission Limit For Section 15.227(a)

4.2.1 The field strength of any emission within this band shall not exceed 10,000microvolts/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.

4.3.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.

4.3.1. Wireless Optical Mouse (EUT)

Model Number : DS-2060(2060-F +2068-D)
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 mode and measure it.

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

4.6. The Emission Measurement Result

PASS.

Date of Test:	<u>May 10, 2007</u>	Temperature:	<u>24°C</u>
EUT:	<u>Wireless Optical Mouse</u>	Humidity:	<u>50%</u>
Model No.:	<u>DS-2060(2060-F +2068-D)</u>	Power Supply:	<u>2.4V DC (“AAA” battery</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>2×) Andy</u>

Fundamental Radiated Emissions

Test conditions		Fundamental Frequency	
		27.045MHz	
T _{nom} (24°C)	Unit	(dBμV/m)/ (μ V/m) PEAK	(dBμV/m)/(μ V/m) AV
			48.8/275
limit		100/100,000	80/10,000
Note: Measurement was performed with modulated signal with average detector and peak detector.			

Reviewer : 

5. BAND EDGES

5.1.The Requirement

5.1.1. The wanted emission within the band 26.96-27.28MHz.

5.2.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.

5.2.1.Wireless Optical Mouse (EUT)

Model Number : DS-2060(2060-F +2068-D)
Serial Number : N/A
Manufacturer : Eastern Times Technology Co., Ltd.

5.3.Operating Condition of EUT

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

5.3.2.Turn on the power of all equipment.

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

5.4.Test Procedure

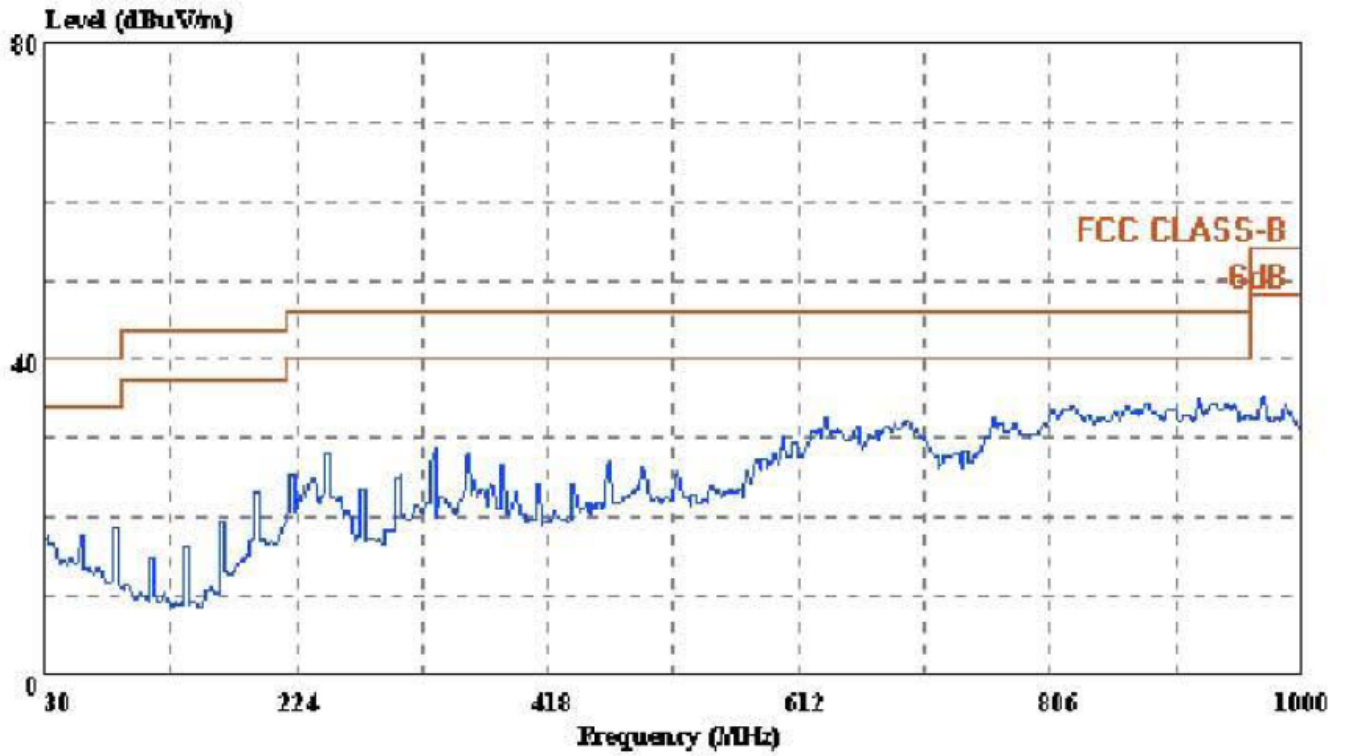
The transmitter output was fed into the spectrum analyzer and photo was taken. The vertical scale is set to 10dB per division; the horizontal scale is set to 32kHz per division. Star frequency are 26.96MHz, stop frequency are 27.28MHz .
RBW are 3kHz, VBW are 10kHz, Sweep time are 50ms.

5.5.The Measurement Result

The EUT does meet the FCC requirement.

The spectral diagrams in appendix 1.

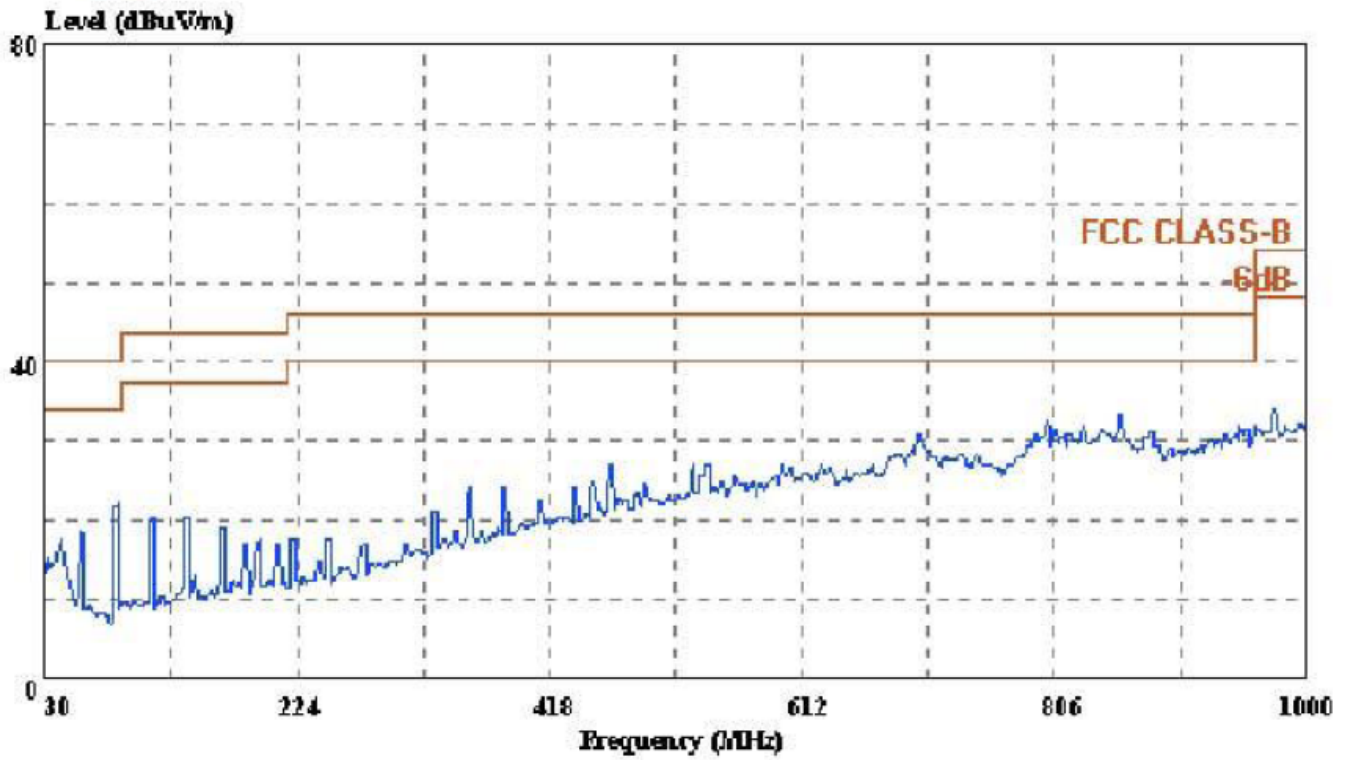
APPENDIX I (Test Curves)



Trace:

Ref Trace:

Condition: FCC CLASS-B 3m ATC VULB9163 (NEW) HORIZONTAL
eut : Wireless Optical Mouse
power : DC 2.4V
memo : TX
manuf : Eastern Times
sample no.: 071961
: m/n: DS-2060 (2060-F+2068-D)



Trace:

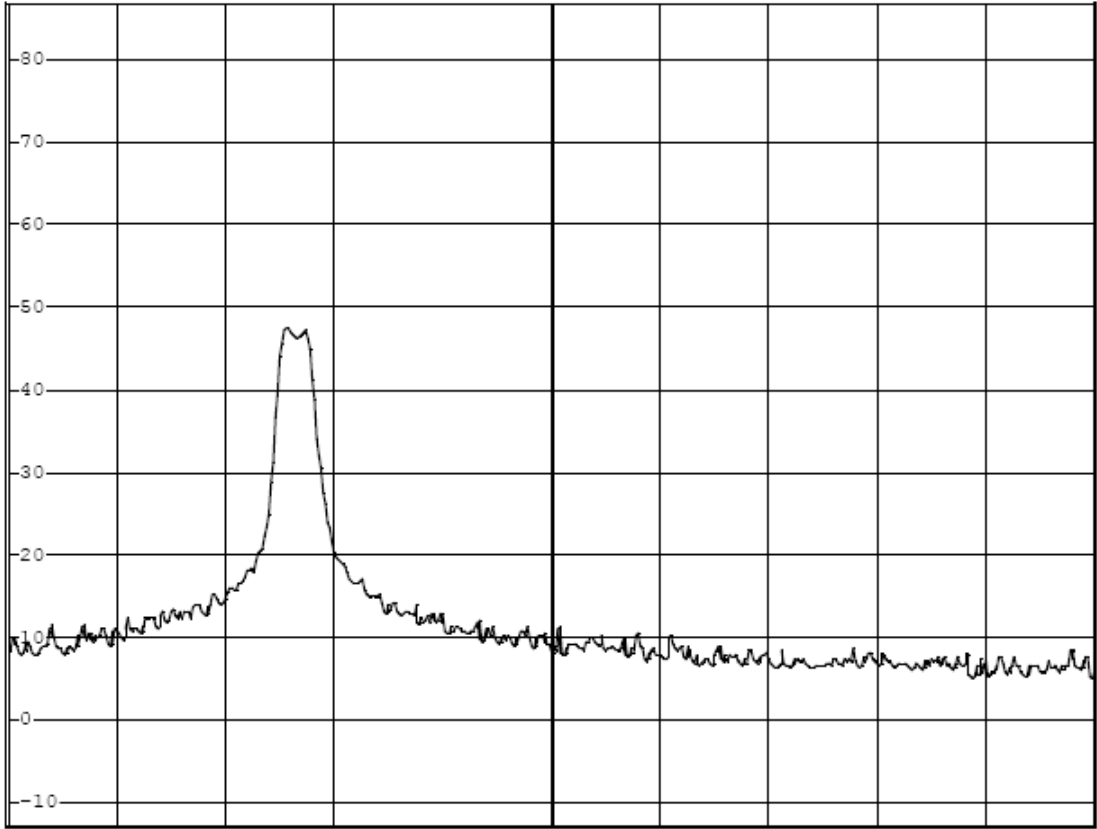
Ref Trace:

Condition: FCC CLASS-B 3m ATC VULB9163 (NEW) VERTICAL
eut : Wireless Optical Mouse
power : DC 2.4V
memo : TX
manuf : Eastern Times
sample no.: 071961
: m/n: DS-2060 (2060-F+2068-D)



Ref 87 dBuV Att 10 dB *RBW 3 kHz
*VBW 10 kHz *SWT 50 ms

1 PK
VIEW



Start 26.96 MHz 32 kHz/ Stop 27.28 MHz