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

Wireless Optical Mouse Pen
Model No.: DS-2166-A

FCC ID: TUVDS2166A

Prepared for	:	Eastern Times Technology Co., Ltd.
Address	:	Building 5, Penghua Industry Park, Heping Rd.(W), Longhua, Shenzhen, Guangdong, P.R. China
Prepared by	:	ACCURATE TECHNOLOGY CO. LTD
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Report Number	:	ATE20061338
Date of Test	:	July 25, 2006
Date of Report	:	July 27, 2006

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Test Report Certification

Applicant	:	Eastern Times Technology Co., Ltd.
Manufacturer	:	Eastern Times Technology Co., Ltd.
EUT Description	:	Wireless Optical Mouse Pen
		(A) MODEL NO.: DS-2166-A
		(B) SERIAL NO.: N/A
		(C) POWER SUPPLY: 3.0V DC ("AAA" batteries 2×)

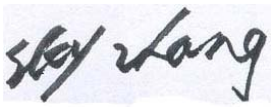
Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.227: 2004 & ANSI C63.4: 2003

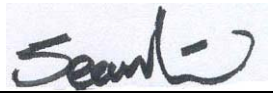
The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.227 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY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

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

Date of Test : July 25, 2006

Prepared by : 

(Engineer)

Reviewer : 

(Quality Manager)

Approved & Authorized Signer : 

(Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Wireless Optical Mouse Pen
Model Number	:	DS-2166-A
Power Supply	:	3.0V DC ("AAA" batteries 2×) ,Can use USB cable to charging
Applicant	:	Eastern Times Technology Co., Ltd.
Address	:	Building 5, Penghua Industry Park, Heping Rd.(W), Longhua, Shenzhen, Guangdong, P.R. China
Manufacturer	:	Eastern Times Technology Co., Ltd.
Address	:	Building 5, Penghua Industry Park, Heping Rd.(W), Longhua, Shenzhen, Guangdong, P.R. China
Date of sample received	:	July 20, 2006
Date of Test	:	July 25, 2006

1.2.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen, May 10, 2004 Accredited by FCC, May 10, 2004 The Certificate Registration Number is 253065 Accredited by Industry Canada, May 18, 2004 The Certificate Registration Number is IC 5077
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	=	4.12dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

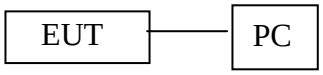
Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	03.31.2007
EMI Test Receiver	Rohde&Schwarz	ESI26	838786/013	01.02.2007
Loop Antenna	Schwarzbeck	FMZB1516	113	01.02.2007
Bilog Antenna	Schwarzbeck	VULB9163	9163-194	03.31.2007
Bilog Antenna	Chase	CBL6112B	2591	03.31.2007
Horn Antenna	Rohde&Schwarz	HF906	100013	01.02.2007
Spectrum Analyzer	Anritsu	MS2651B	6200238856	03.31.2007
Pre-Amplifier	Agilent	8447D	2944A10619	03.31.2007
L.I.S.N.	Rohde&Schwarz	ESH3-Z5	100305	12.16.2006
L.I.S.N.	Rohde&Schwarz	ESH3-Z5	100310	12.16.2006

3. CONDUCTED EMISSION FOR FCC PART 15 SECTION 15.207(A)

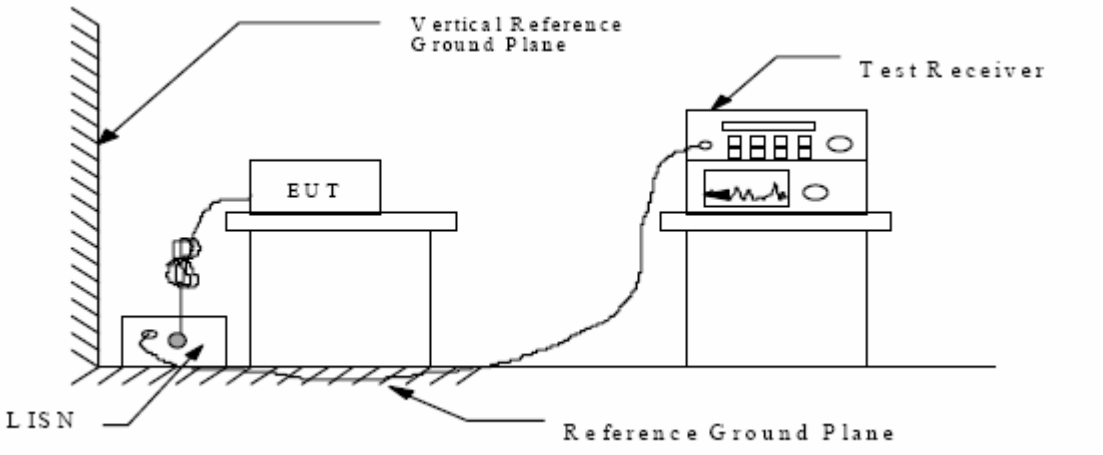
3.1.Block Diagram of Test Setup

3.1.1.Block diagram of connection between the EUT and simulators



(EUT: Wireless Optical Mouse Pen)

3.1.2. Shielding Room Test Setup Diagram



(EUT: Wireless Optical Mouse Pen)

3.2.The Emission Limit For Section 15.207(a)

6.2.1 Radiation Emission Measurement Limits According to Section 15.207(a)

Frequency (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

3.3.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.

3.3.1. Wireless Optical Mouse Pen(EUT)

Model Number	:	DS-2166-A
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 6.1.

3.4.2.Turn on the power of all equipment.

3.4.3. Let the EUT work in Charging modes (use USB cable connect to PC) measure it.

3.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines 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 ANSI C63.4: 2003 on Conducted Emission Measurement.

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

The frequency range from 150kHz to 30MHz is checked.

All the scanning waveforms are attached in Appendix I.

3.6. Power Line Conducted Emission Measurement Results

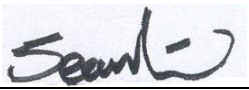
PASS.

The frequency range from 150kHz to 30MHz is checked.

Date of Test:	July 25, 2006	Temperature:	24°C
EUT:	Wireless Optical Mouse Pen	Humidity:	52%
			DC 5V power by PC usb port
Model No.:	DS-2166-A	Power Supply:	PC power: AC120V/60Hz
Test Mode:	Charging	Test Engineer:	Andy

Test Line	Frequency MHz	Emission Level(dBμV) QP	AV	Limits(dBμV) QP	AV	Margin(dBμV) QP	AV
Va	0.150	37.0	21.0	66.0	56.0	29.0	35.0
Va	0.185	39.1	37.1	64.3	54.3	25.2	17.2
Va	0.305	30.6	30.0	60.1	50.1	29.5	20.1
Va	0.370	27.7	27.5	58.5	48.5	30.8	21.0
Va	0.795	24.7	23.5	56.0	46.0	31.3	22.5
Va	15.2	33.1	32.8	60.0	50.0	26.9	17.2
Vb	0.150	40.8	22.9	66.0	56.0	25.2	33.1
Vb	0.185	40.4	39.0	64.3	54.3	23.9	15.3
Vb	0.305	34.6	34.2	60.1	50.1	25.5	15.9
Vb	0.365	32.9	32.7	58.6	48.6	25.7	15.9
Vb	0.550	31.7	31.5	56.0	46.0	24.3	14.5
Vb	15.2	32.5	32.2	60.0	50.0	27.5	17.8

The spectral diagrams in appendix I display the measurement of un-weighted peak values.

Reviewer **:** 

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

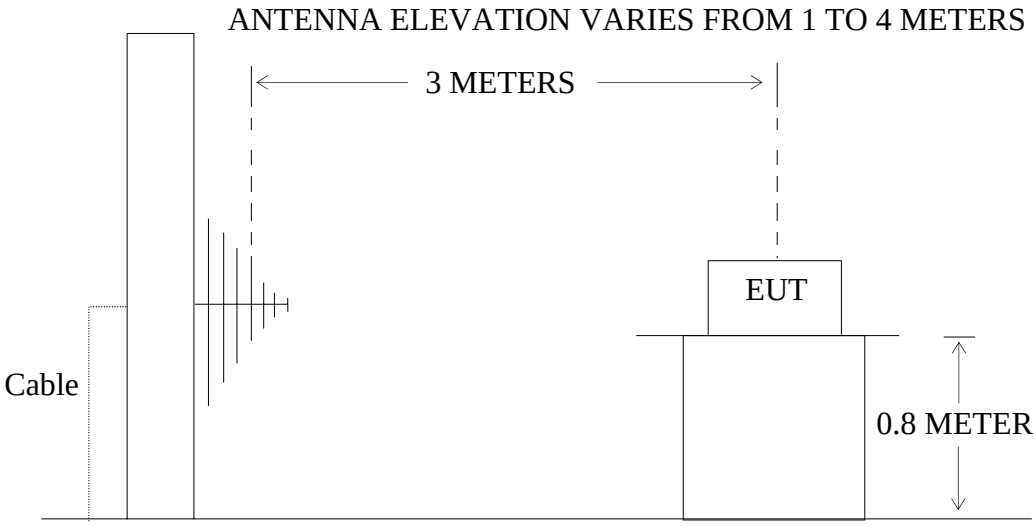
4.1.Block Diagram of Test Setup

4.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Wireless Optical Mouse Pen)

4.1.2.Anechoic Chamber Test Setup Diagram



(EUT: Wireless Optical Mouse Pen)

4.2.The Field Strength of Radiation Emission Measurement Limits

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

Radiation Emission Measurement Limits According to Section 15.209(a)

Frequency (MHz)	Limit,		
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dBμV/m)	The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those
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	

4.3. Configuration of EUT on Measurement

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

4.3.1. Wireless Optical Mouse Pen(EUT)

Model Number : DS-2166-A
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 3.1.

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in TX modes(on) measure it.

4.4.4. Let the EUT work in Charging modes (use USB cable connect to PC) 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. 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 FCC Part 15 Subpart C 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.

4.6. The Field Strength of Radiation Emission Measurement Results

PASS.

The frequency range 30MHz to 1000MHz is investigated.

Date of Test:	July 25, 2006	Temperature:	20°C
EUT:	Wireless Optical Mouse Pen	Humidity:	50%
Model No.:	DS-2166-A	Power Supply:	3.0V DC ("AAA"battery 2×)
Test Mode:	TX	Test Engineer:	Andy

Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	297.512	21.0	12.4	33.4	46	12.6
Horizontal	324.560	24.8	13.2	38.0	46	8.0
Horizontal	486.800	20.3	16.7	37.0	46	9.0
Horizontal	513.864	23.3	17.2	40.5	46	5.5
Horizontal	540.906	22.8	17.7	40.5	46	5.5
Horizontal	567.984	22.4	18.1	40.5	46	5.5
Horizontal	595.026	19.8	18.5	38.3	46	7.7
Vertical	54.096	12.7	7.3	20.0	40	20.0
Vertical	81.145	13.8	5.3	19.1	40	20.9
Vertical	108.190	10.0	7.0	17.0	43.5	26.5
Vertical	135.216	10.2	7.3	17.5	43.5	26.0
Vertical	270.460	11.5	10.0	21.5	46	24.5
Vertical	324.540	10.5	13.0	23.5	46	22.5
Vertical	491.054	10.8	17.5	28.3	46	17.7
Vertical	567.973	11.9	19.0	30.9	46	15.1

The spectral diagrams in appendix 1 display the measurement of un-weighted peak values.

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:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

Date of Test:	July 25, 2006	Temperature:	20°C
EUT:	Wireless Optical Mouse Pen	Humidity:	50%
			5V DC power by PC usb port
Model No.:	DS-2166-A	Power Supply:	PC power: AC120V/60Hz
Test Mode:	Charging	Test Engineer:	Andy

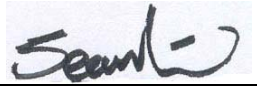
Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	303.540	22.5	12.5	35.0	46	11.0
Horizontal	362.710	21.8	14.1	35.9	46	10.1
Horizontal	390.840	20.3	14.7	35.0	46	11.0
Horizontal	420.910	24.3	15.7	40.0	46	6.0
Horizontal	448.070	24.2	16.4	40.6	46	5.4
Horizontal	478.140	20.3	17.2	37.5	46	8.5
Horizontal	702.210	15.0	21.2	36.2	46	9.8
Vertical	69.770	28.8	5.8	34.6	40	5.4
Vertical	419.940	19.9	15.7	35.6	46	10.4
Vertical	449.040	23.5	16.4	39.9	46	6.1
Vertical	476.200	19.3	17.1	36.4	46	9.6
Vertical	704.150	15.0	21.3	36.3	46	9.7
Vertical	804.060	13.0	22.7	35.7	46	10.3

The spectral diagrams in appendix 1 display the measurement of un-weighted peak values.

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:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

Reviewer **:** 

5. FUNDAMENTAL RADIATED EMISSION FOR FCC PART 15 SECTION 15.227(A)

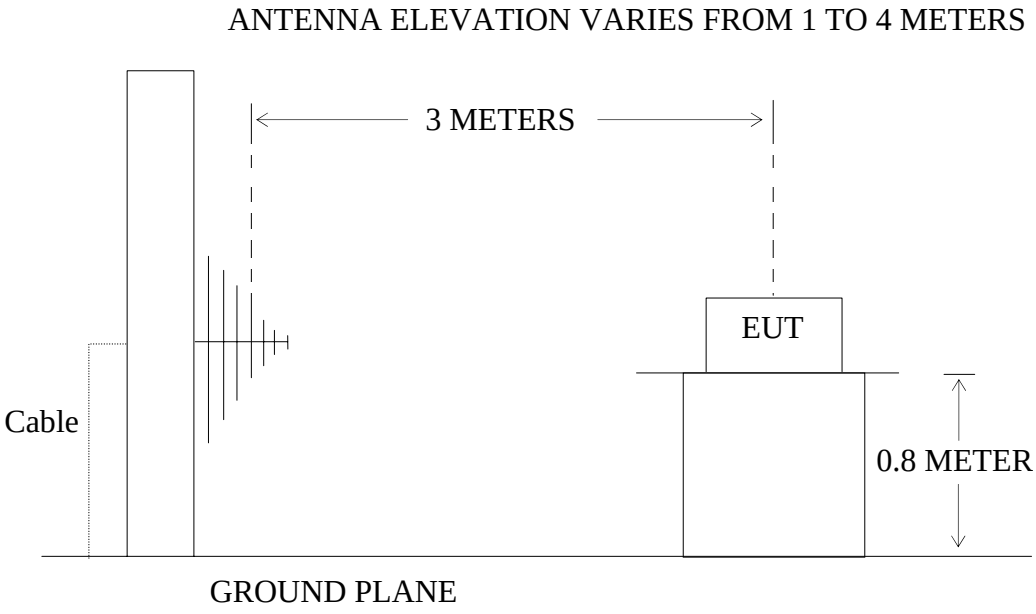
5.1.Block Diagram of Test Setup

5.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Wireless Optical Mouse Pen)

5.1.2.Anechoic Chamber Test Setup Diagram



(EUT: Wireless Optical Mouse Pen)

5.2.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.

5.3.EUT Configuration on Measurement

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

5.3.1. Wireless Optical Mouse Pen(EUT)

Model Number	**:**	DS-2166-A
Serial Number	**:**	N/A
Manufacturer	**:**	Eastern Times Technology Co., Ltd.

5.4.Operating Condition of EUT

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

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in TX mode (On) measure it.

5.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. 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 FCC Part 15 on radiated emission measurement.

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

5.6. The Emission Measurement Result

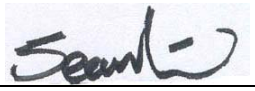
PASS.

Date of Test:	July 25, 2006	Temperature:	20°C
EUT:	Wireless Optical Mouse Pen	Humidity:	50%
Model No.:	DS-2166-A	Power Supply:	3.0V DC ("AAA"battery 2×)
Test Mode:	TX	Test Engineer:	Andy

Fundamental Radiated Emissions

Test conditions		Fundamental Frequency	
		27.045MHz	
T_{nom}(20°C)	Unit	(dBμV/m)/ (μ V/m) AV	(dBμV/m)/(μ V/m) PEAK
		43.6/151	46.9/221
limit		80/10,000	100/100,000
Note: Measurement was performed with modulated signal with average detector and peak detector.			

The spectral diagrams in appendix 1.

Reviewer **:** 

6. BAND EDGES

6.1.The Requirement

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

6.2.EUT Configuration on Measurement

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

6.2.1.Wireless Optical Mouse Pen(EUT)

Model Number	**:**	DS-2166-A
Serial Number	**:**	N/A
Manufacturer	**:**	Eastern Times Technology Co., Ltd.

6.3.Operating Condition of EUT

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

6.3.2.Turn on the power of all equipment.

6.3.3.Let the EUT work in TX mode (On) measure it.

6.4.Test Procedure

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

6.5. The Measurement Result

The EUT does meet the FCC requirement.

The spectral diagrams in appendix 1.

APPENDIX I
(Test Curves)

CONDUCTION EMISSION STANDARD FCC PART15B 25. Jul 06 11:50

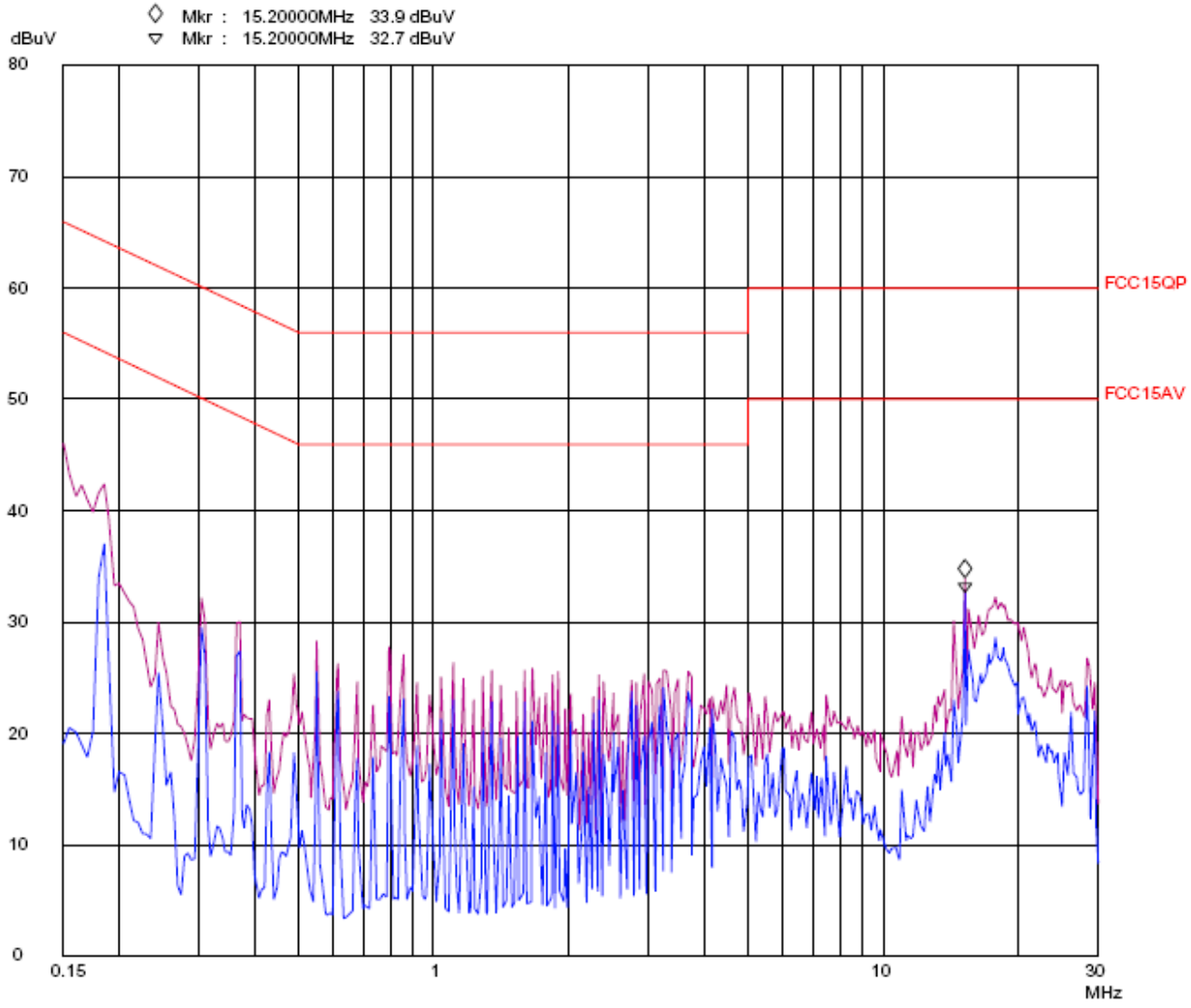
EUT:	Wireless Optical Mouse Pen m/n:DS-2166-A
Manuf:	Eastern Times
Op Cond:	Charging
Operator:	Andy.tan
Test Spec:	Va 120V/60Hz
Comment:	Tem24% Humi52%
	Sample no.:062137

Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	2M	5k	9k	PK+AV	10ms	AUTO LN	OFF
2M	10M	10k	9k	PK+AV	1ms	AUTO LN	OFF
10M	30M	25k	9k	PK+AV	1ms	AUTO LN	OFF

Final Measurement: x QP / + AV
Meas Time: 1 s

Transducer No.	Start	Stop	Name
1	9k	30M	confac



CONDUCTION EMISSION STANDARD FCC PART15B 25. Jul 06 11:46

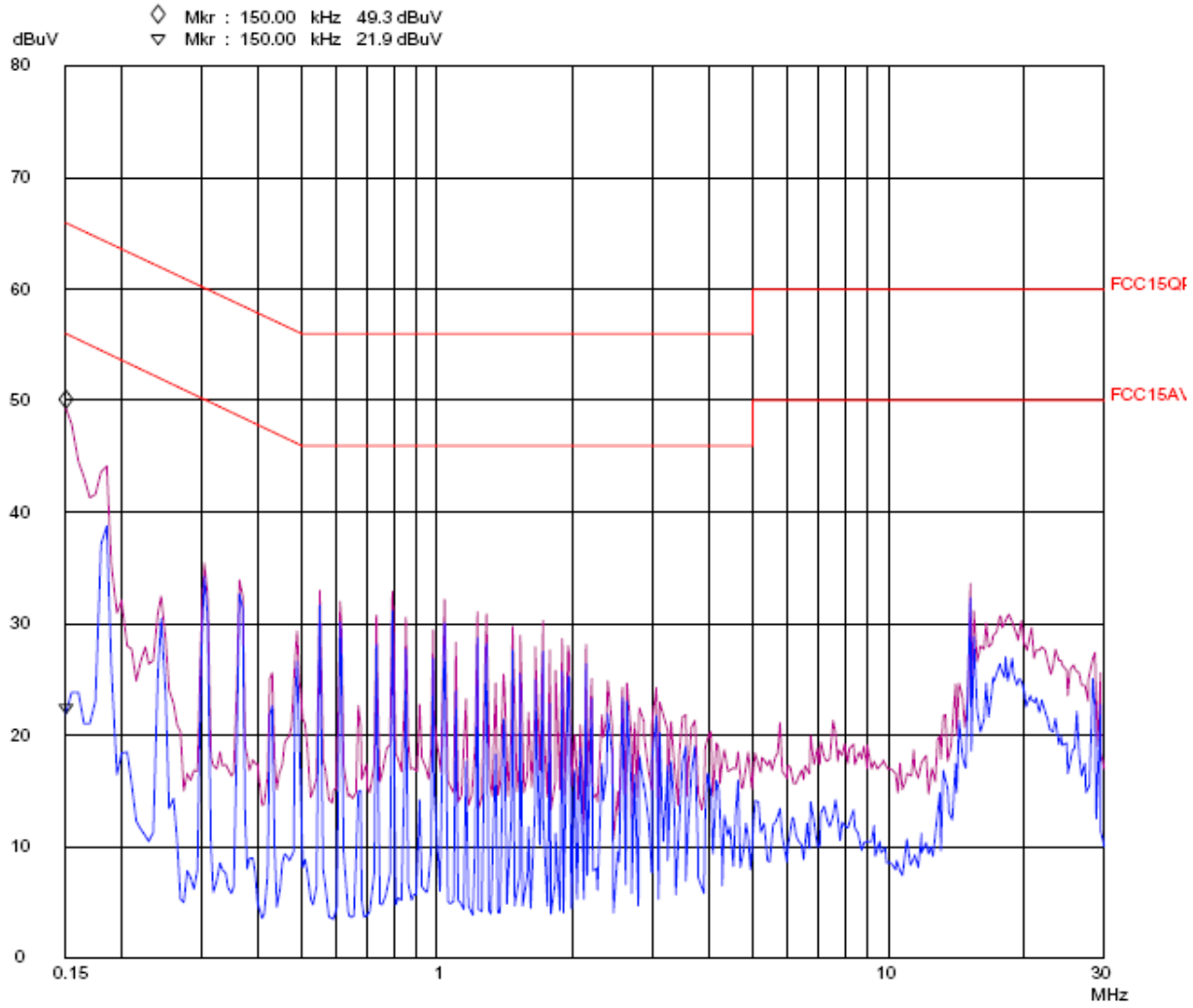
EUT:	Wireless Optical Mouse Pen m/n:DS-2166-A
Manuf:	Eastern Times
Op Cond:	Charging
Operator:	Andy.tan
Test Spec:	Vb 120V/60Hz
Comment:	Tem24% Humi52%
	Sample no.:062137

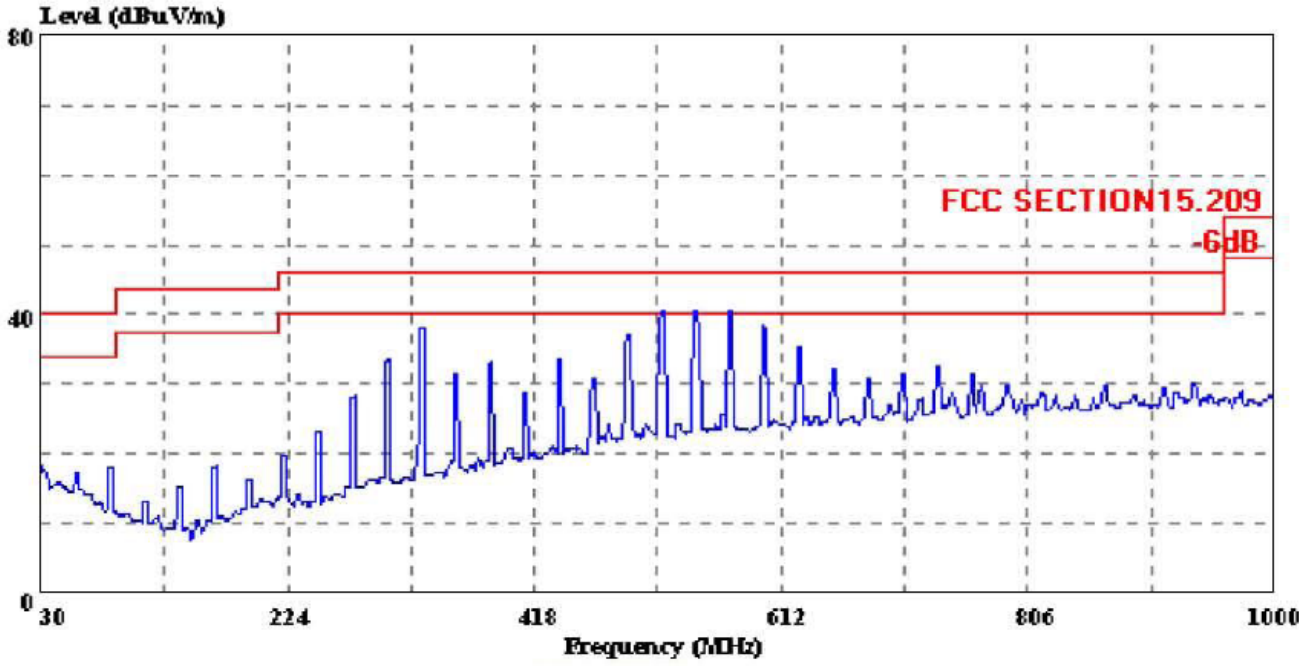
Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	2M	5k	9k	PK+AV	10ms AUTO LN		OFF
2M	10M	10k	9k	PK+AV	1ms AUTO LN		OFF
10M	30M	25k	9k	PK+AV	1ms AUTO LN		OFF

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 20dB

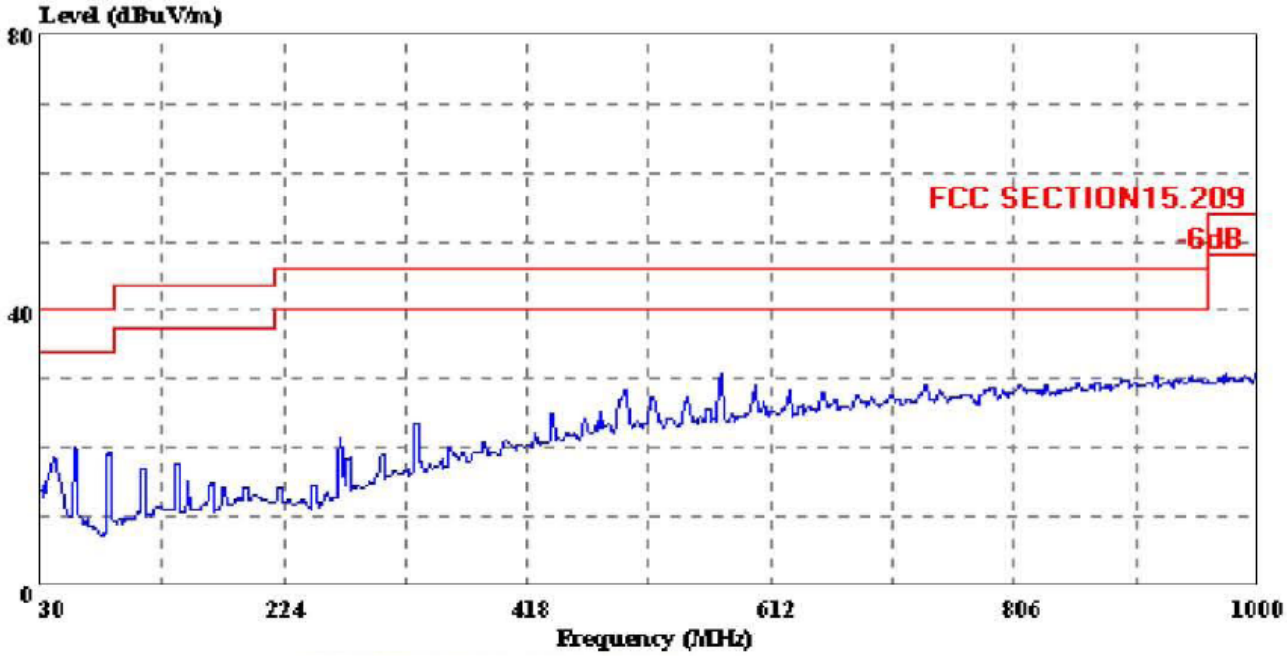
Transducer No.	Start	Stop	Name
1	9k	30M	confac





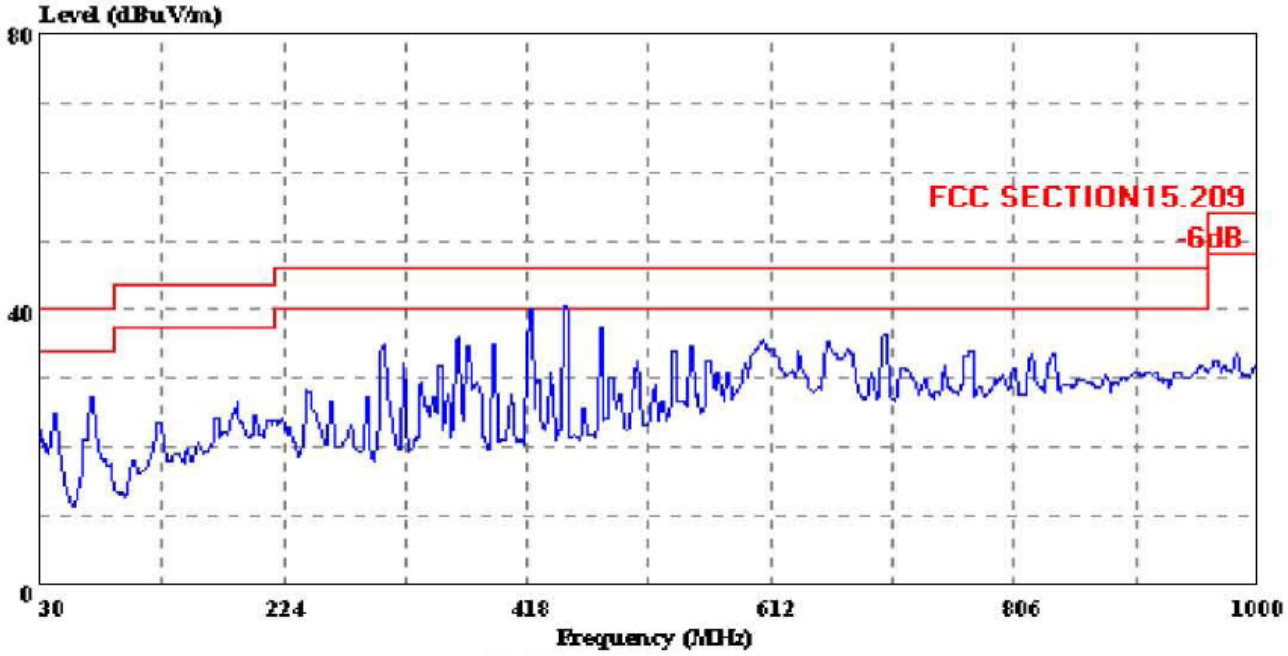
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC VULB9163(NEW) HORIZONTAL
eut : Wireless Optical Mouse Pen m/n:DS-2166-A
power : DC 3.0V
memo : TX
manuf : Eastern Times
sample no.: 062137



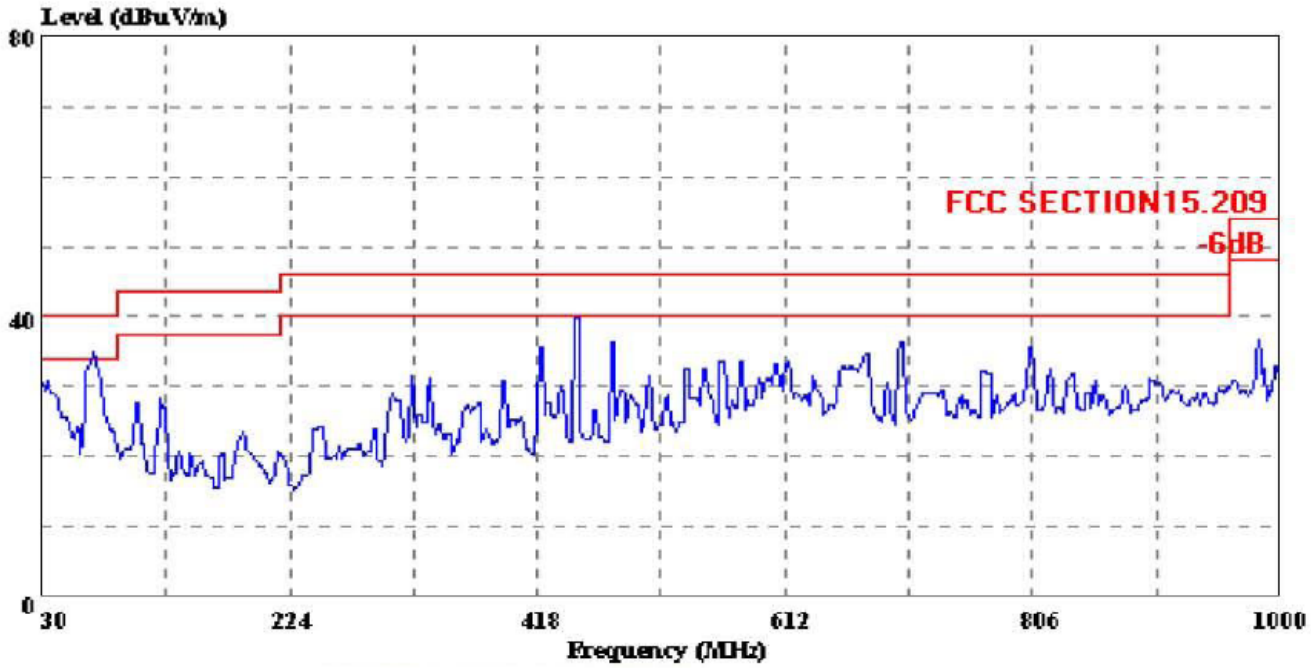
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC VULB9163(NEW) VERTICAL
eut : Wireless Optical Mouse Pen m/n:DS-2166-A
power : DC 3.0V
memo : TX
manuf : Eastern Times
sample no.: 062137



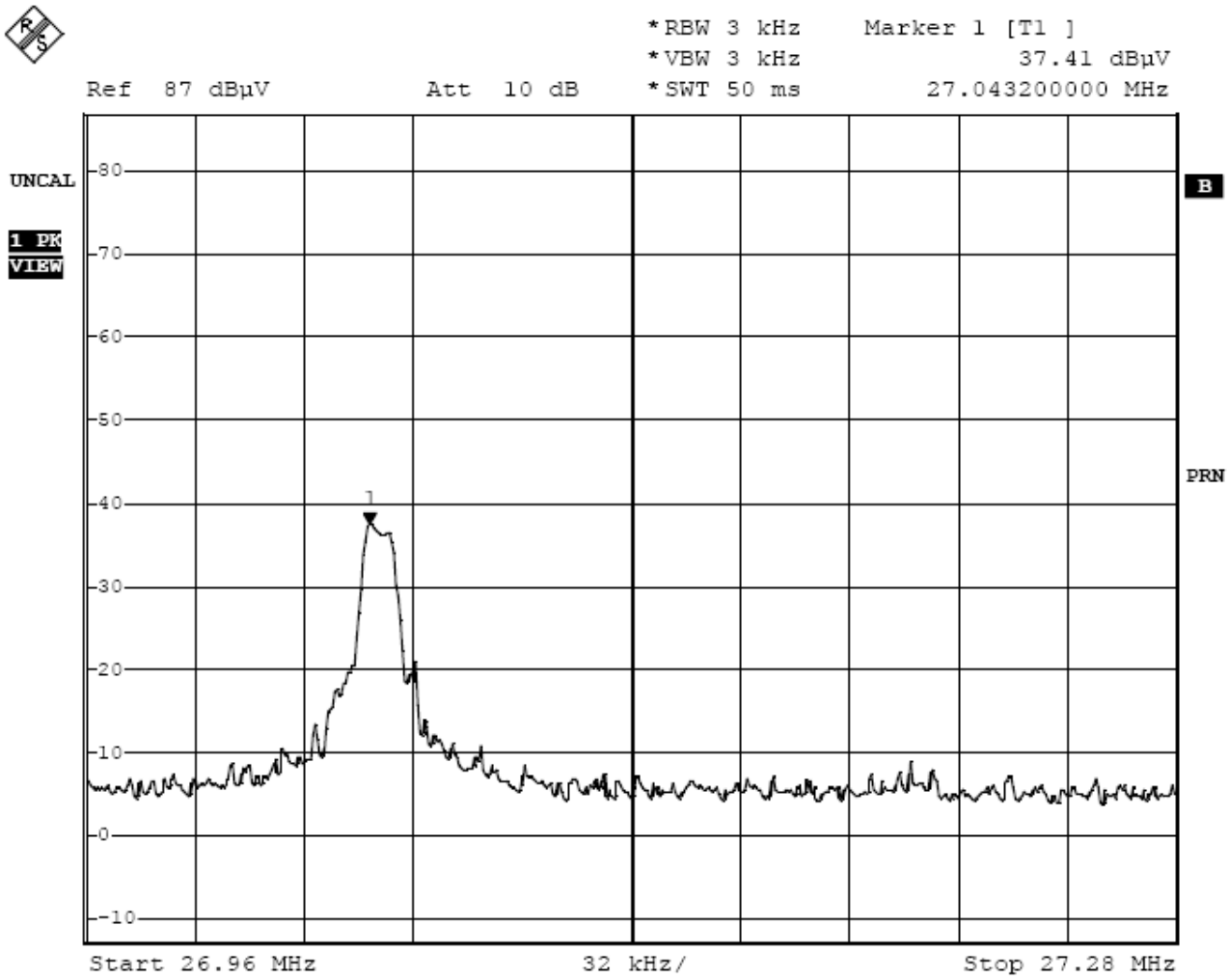
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC VULB9163(NEW) HORIZONTAL
eut : Wireless Optical Mouse Pen m/n:DS-2166-A
power : USB 5.0V
memo : CHARGING
manuf : Eastern Times
sample no.: 062137



Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC VULB9163(NEW) VERTICAL
eut : Wireless Optical Mouse Pen m/n:DS-2166-A
power : USB 5.0V
memo : CHARGING
manuf : Eastern Times
sample no.: 062137


*RBW 3 kHz
*VBW 3 kHz
*SWT 50 ms
Marker 1 [T1]
37.41 dBµV
27.043200000 MHz
Ref 87 dBµV
Att 10 dB
UNCAL
1 PK
VIEW
B
PRN
80
70
60
50
40
30
20
10
0
-10
Start 26.96 MHz
32 kHz/
Stop 27.28 MHz