FCC PART 15.227
EMI MEASUREMENT AND TEST REPORT

For

Verbatim

1200 West W.T. Harris Blvd.Charlotte, NC 28262, USA

FCC ID: TL4095209

August 26, 2005

This Report Concerns:	**Equipment Type:**
☒ Original Report	Transmitter, Wireless optical mouse

Test Engineer:	Louise Lu
Report No.:	RSZ05071502
Test Date:	August 16-25, 2005
Reviewed By:	Chris Zeng
Prepared By:	Bay Area Compliance Lab Corp. (ShenZhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China Tel: 86-755-33320018 Fax: 86-755-33320008

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The Verbatim 's product, model number: 095209 or the "EUT" as referred to in this report is a transmitter, the product name is Wireless optical mouse. The EUT is measured approximately 8.7cm L x 4.6cm W x 2.6cm H, rated input voltage: DC 3 V.

** The test data gathered are from production sample, serial number: 0507029, provided by the manufacturer.*

Objective

This Type approval report is prepared on behalf of *Verbatim* in accordance with Part 2, Subpart J, and Part 15, Subparts A , B and C of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules, sec 15.203, 15.205, 15.209 and sec 15.227.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Lab Corp. (ShenZhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China.

Test site at Bay Area Compliance Lab Corp. (ShenZhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Lab Corp. (ShenZhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, H pattern, contained on the hard drive, is started in a DOS window under the Windows 98 operating system. Once loaded, the program sequentially exercises each system component.

The sequence used is as follows:

1. Lines of Hs scroll across the VGA monitor.
2. The modem(s) receives Hs.
3. The printer output Hs.

The complete cycle takes approximately 5 - 10 seconds and the process is continuously repeated.

Special Accessories

N/A.

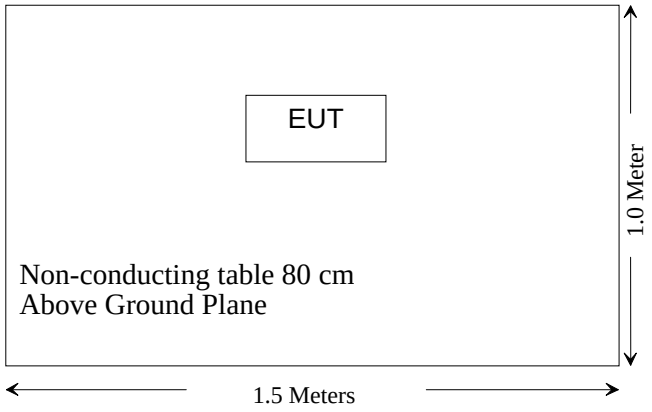
Equipment Modifications

Bay Area Compliance Lab Corp. (ShenZhen) has not done any modification on the EUT.

Configuration of Test Setup

EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna requirement	Compliant
§15.205	Restricted Band of operation	Compliant
§15.209	Radiated Emission Test	Compliant*
§15.227(a)	Field Strength	Compliant
§15.227(b)	Out of Band Emission	Compliant

Note: The highest clocks of the EUT was 27.042 MHz.

* Within measurement uncertainty.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

This product has a permanent antenna, fulfill the requirement of this section.

Test Result: Pass

§15.205, §15.209, §15.227(a) - RADIATED EMISSIONS TEST

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Lab Corp. (ShenZhen) is ±4.4 dB.

The fundamental data was recorded in average detection mode: set the VBW AVE on, then record the data.

EUT Setup

The radiated emission tests were performed in the chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15 Subpart C section 15.227 limits.

EMI Test Receiver Setup

According to FCC Rules, 47 CFR 15.33, the EUT emissions were investigated from 27 to 1000 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency	***RB/W***	***VB/W***	***IF B/W***
9 kHz-30 MHz	10 kHz	10 kHz	9 kHz
30 MHz-1 GHz	100 kHz	100 kHz	120 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447D	2994A09795	2004-9-1	2005-8-31
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2004-9-15	2005-9-15
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2005-4-28	2006-4-28

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corr. Ampl. = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.227&15.209, with the worst margin reading of:

-9.6 dB at **906.48 MHz** in the **Horizontal** polarization.

Test Data

Environmental Conditions

Temperature:	27 ° C
Relative Humidity:	53%
ATM Pressure:	1000mbar

The testing was performed by Louise Lu on 2005-8-24.

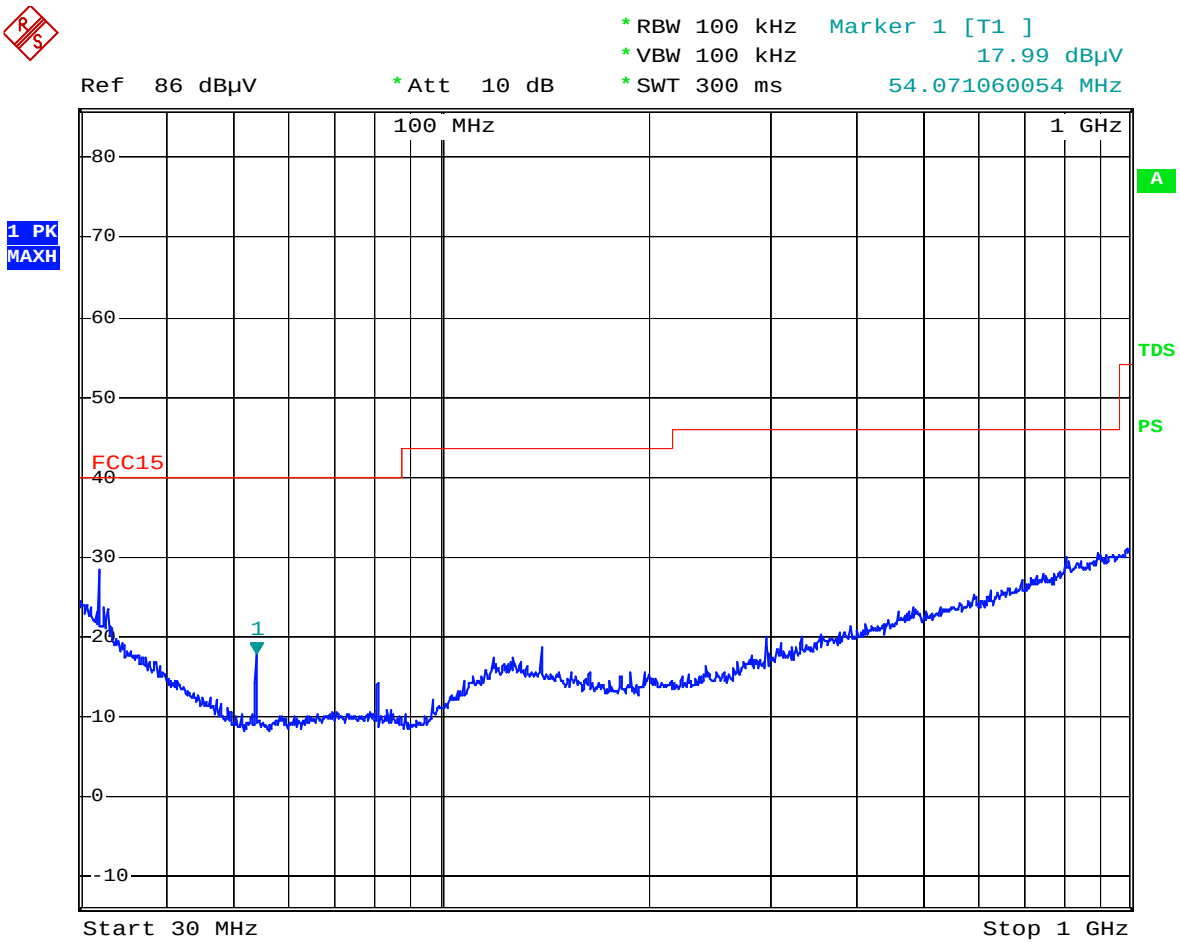
Test Mode: Transmitting

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 15.227&15.209	
Frequency MHz	Meter Reading dBμV	Detector PK /QP	Angle Degree	Height Meter	Polar H/ V	Antenna Loss dB/m	Cable Loss dB	Amp. Gain dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
906.480	33.4	PK(spurious)	45	1.0	H	22.9	6.6	26.5	36.4	46.0	-9.6
31.950	29.8	PK(spurious)	289	1.0	H	24.1	1.2	26.8	28.3	40.0	-11.7
31.950	26.3	PK(spurious)	45	1.0	V	24.1	1.2	26.8	24.8	40.0	-15.2
459.765	30.5	PK(spurious)	45	1.2	V	17.4	4.4	26.5	25.7	46.0	-20.3
486.810	28.7	PK(spurious)	90	1.2	V	17.9	4.5	26.5	24.6	46.0	-21.4
144.330	32.7	PK(spurious)	60	1.2	V	13.8	2.0	26.6	21.9	43.5	-21.6
54.090	34.8	PK(spurious)	289	1.0	H	8.5	1.5	26.8	18.0	40.0	-22.0
297.495	30.8	PK(spurious)	35	3.8	V	13.8	3.2	26.0	21.8	460	-24.2
140.320	29.4	PK(spurious)	45	1.2	H	13.8	2.0	26.6	18.6	43.5	-24.9
351.585	28.4	PK(spurious)	35	3.8	V	15.0	3.6	25.8	21.1	46.0	-24.9
297.495	29.1	PK(spurious)	180	1.2	H	13.8	3.2	26.0	20.1	46.0	-25.9
81.135	30.4	PK(spurious)	60	1.0	H	8.4	1.9	26.8	13.9	40.0	-26.1
27.045	51.1	AV (fundamental)	289	1.0	V	24.1	1.2	26.8	49.6	80.0	-30.4
27.045	49.3	AV (fundamental)	289	1.0	H	24.1	1.2	26.8	47.8	80.0	-32.2
27.045	51.8	PK (fundamental)	289	1.0	V	24.1	1.2	26.8	50.3	100.0	-49.7
27.045	50.1	PK (fundamental)	289	1.0	H	24.1	1.2	26.8	48.6	100.0	-51.4

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

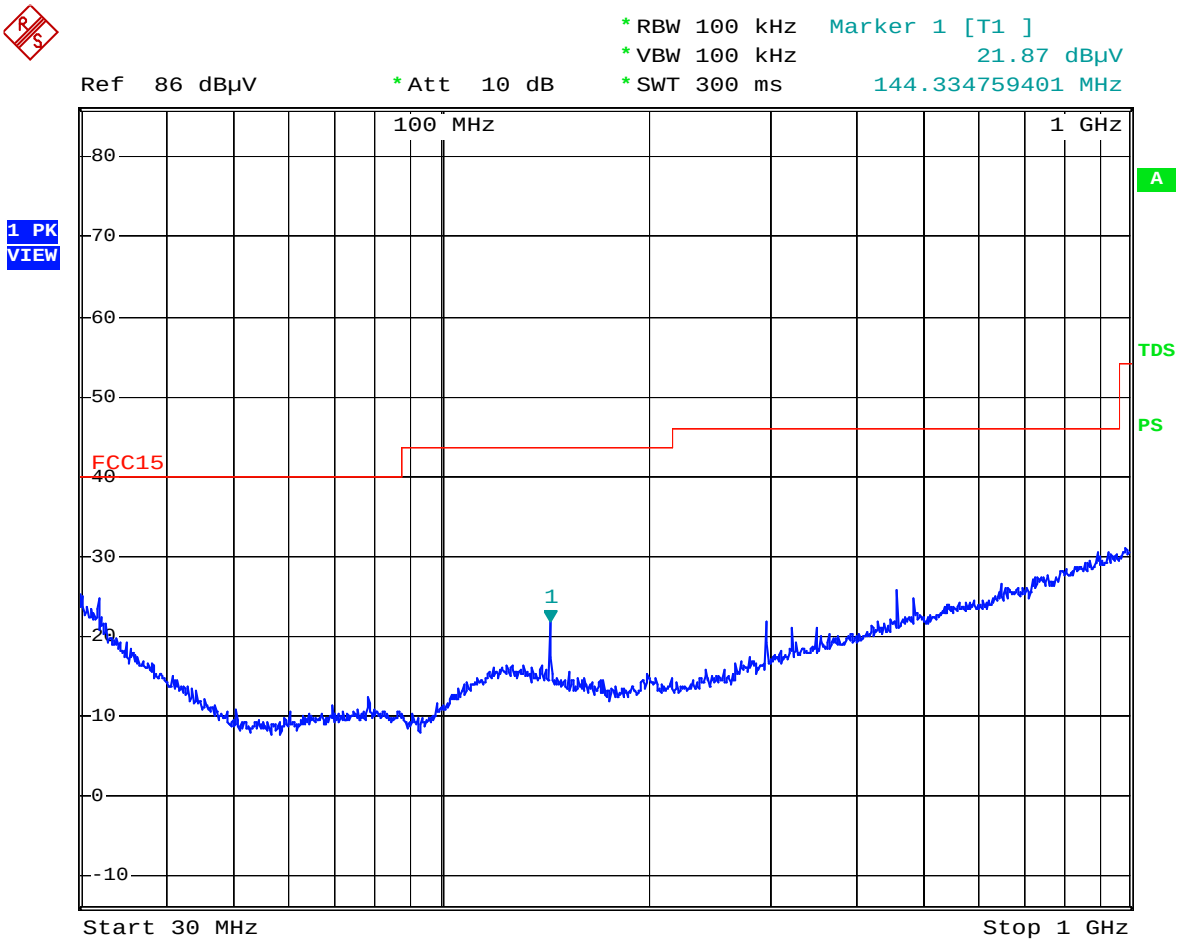
Horizontal:



Verbatim Wireless Optical Mouse M/N:095209 (Horizontal)

Date: 24.AUG.2005 15:32:55

Vertical:



Verbatim Wireless Optical Mouse M/N:095209 (Vertical)

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§15.227(b) - Out of Band Emission

EMI Test Receiver Setup

The system was investigated from 26.8 MHz to 27.3 MHz.

During the out of band emission test, the EMI test receiver was set with the following configurations:

Frequency	RB/W	VB/W	SWT
26.8 MHz-27.3 MHz	*10 kHz*	*10 kHz*	*Auto*

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447D	2994A09795	2004-9-1	2005-8-31
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2004-9-15	2005-9-15
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2005-4-28	2006-4-28

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

Reading the emission of 26.96 MHz and 27.28 MHz to ensure that the EUT complied with the FCC PART 15.227.

All data was recorded in the Peak detection mode.

Test Data

Environmental Conditions

Temperature:	27 ° C
Relative Humidity:	65%
ATM Pressure:	1000mbar

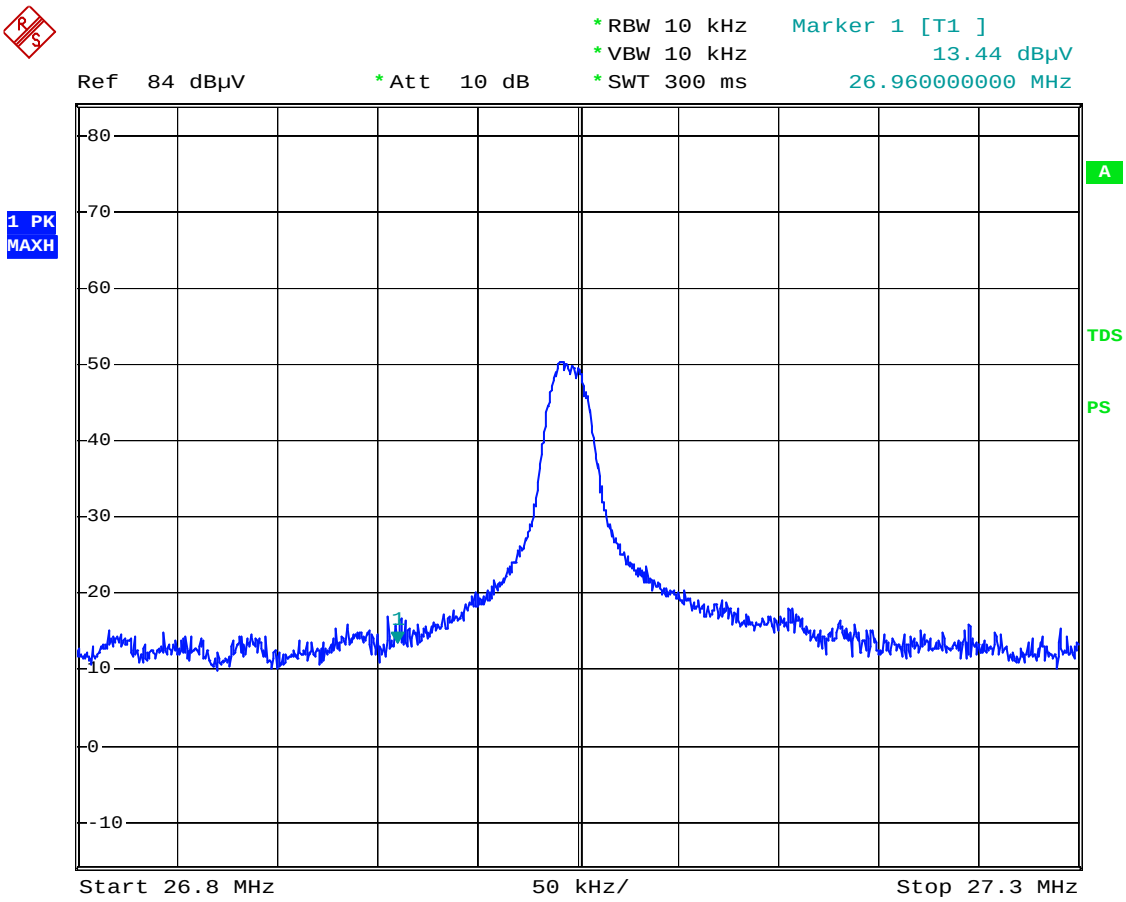
The testing was performed by Louise Lu on 2005-8-24.

Test Mode: Transmitting

The result has been complied with the 15.227(b), see the following plot:

Frequency MHz	Emission dBμV	Limit dBμV/m
26.96	13.44	40
27.28	12.83	40

Test Result: Pass



Verbatim Wireless Optical Mouse M/N:095209 26.96MHz

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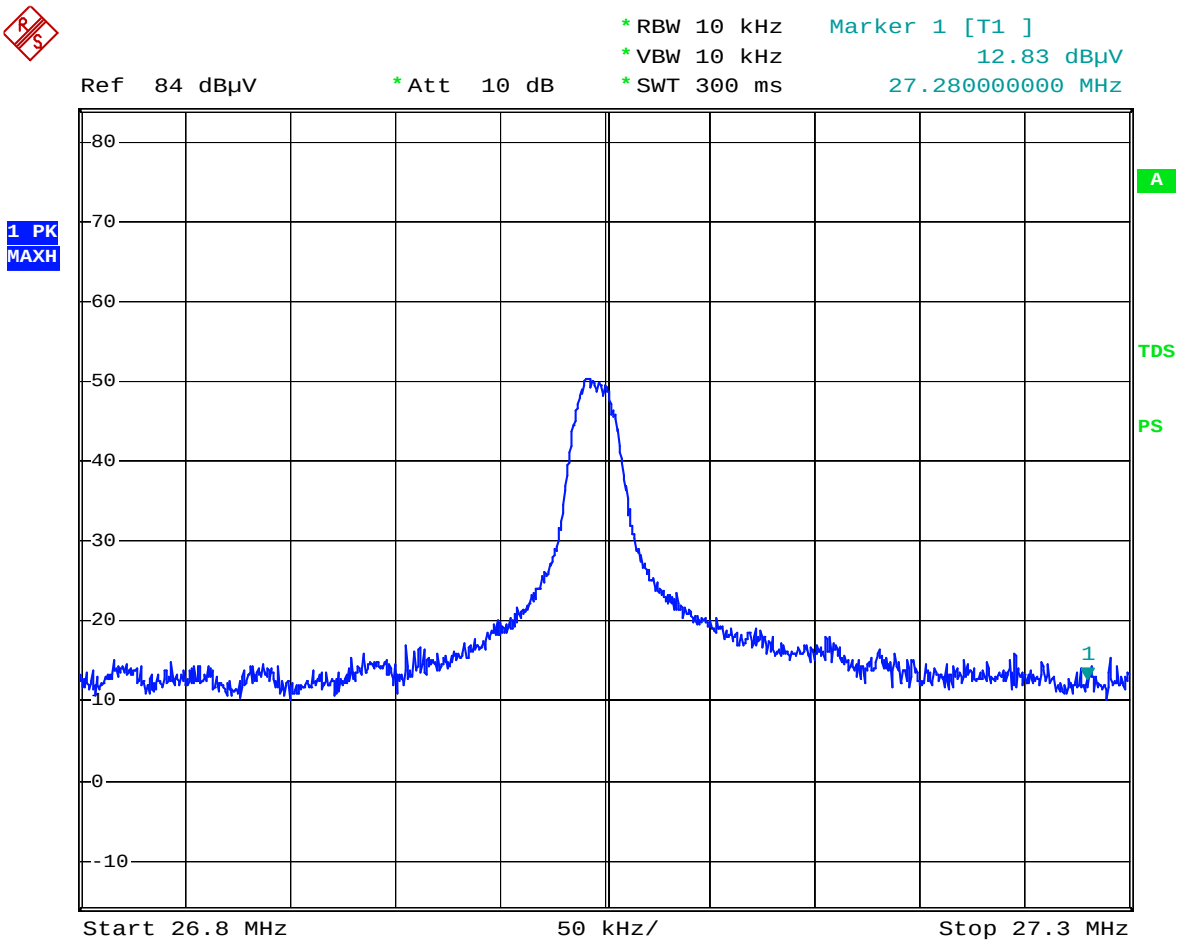

Verbatim Wireless Optical Mouse M/N:095209 27.28MHz

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