Test Report

Compliance with Industry Canada Interference-Causing Equipment Standard ICES-003

Product Name ： Wireless Laser Mouse

Model No. ： MW-92X 0~9, A-Z, or Blank

Applicant ： ASUSTeK COMPUTER INC.

Address ： 4FL., No. 150, Li-Te Rd., Peitou, Taipei, Taiwan, R.O.C.

Date of Receipt ： 2009/04/15

Issued Date ： 2009/04/29

Report No. ： 094289R-ITUSP02V02

Report Version ： V1.0

Test Report Certification

Issued Date : 2009/04/29
Report No. : 094289R-ITUSP02V02

Product Name	:	Wireless Laser Mouse
Applicant	:	ASUSTeK COMPUTER INC.
Address	:	4FL., No. 150, Li-Te Rd., Peitou, Taipei, Taiwan, R.O.C.
Manufacturer	:	Enertronix (Huizhou) inc.
Model No.	:	MW-92X 0~9, A-Z, or Blank
Rated Voltage	:	AC 120 V / 60 Hz
EUT Voltage	:	By Notebook PC
Trade Name	:	ASUS, VENTO by ASUS, VENTO
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart B: 2007 Class B CISPR 22: 2005, ANSI C63.4: 2003 ICES-003 Issue 4: 2004
Test Result	:	Complied
Performed Location	:	Quietek Corporation (Linkou Laboratory) No.5-22,Ruei-Shu Valley, Ruei-Ping Tsuen Lin Kuo Shiang, Taipei, 244 Taiwan, R.O.C. TEL:+866-2-8601-3788 / FAX:+886-2-8601-3789

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Laboratory Information

We , **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scopes:

Taiwan R.O.C.	**:**	**BSMI, NCC, TAF**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC, NVLAP**
Japan	**:**	**VCCI**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site :http://tw.quietek.com/modules/enterprise/services.php?item=100
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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NVLAP Lab Code : 200347-0

Testing Laboratory 1313

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NVLAP Lab Code: 200533-0

Testing Laboratory 0914

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No. 99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou,China.
TEL : +86-512-6251-5088 / FAX : +86-512-6251-5098 E-Mail : service@quietek.com

NVLAP Lab Code: 200533-0

Testing Laboratory 1596

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1. General Information

1.1. EUT Description

Product Name	Wireless Laser Mouse
Trade Name	ASUS, VENTO by ASUS, VENTO
Model No.	MW-92X 0~9, A-Z, or Blank

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Pre-Test Mode	
Mode 1: Normal Operation	
Final Test Mode	
Emission	Mode 1: Normal Operation

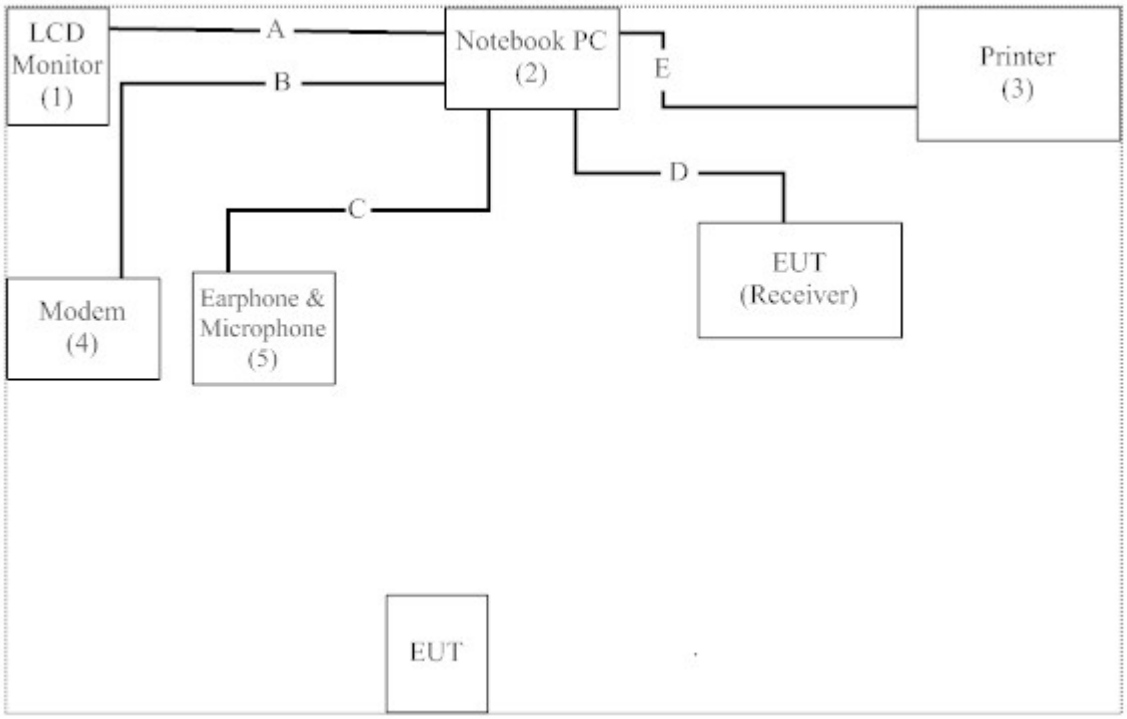
1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	LCD Monitor	CMV	CT-730D	FNC122F57BA1638	Non-Shielded, 1.8m
2	Notebook PC	DELL	PP04X	2D2ZM1S	Non-Shielded, 0.8m
3	Printer	EPSON	StyLus C63	FAPY094331	Non-Shielded, 1.9m
4	Modem	ACEEX	DM-1414	0102027550	Non-Shielded, 1.9m
5	Microphone & Earphone	PCHOME	N/A	N/A	N/A

1.4. Configuration of Tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	D-SUB Cable	Shielded, 1.8m, with two ferrite cores bonded.
B	RS-232 Cable	Shielded, 1.6m
C	Earphone & Microphone Cable	Non-Shielded, 2.0m
D	USB Cable	Shielded, 1.5m
E	USB Cable	Shielded, 1.8m

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	Use the terminal function in window environment.
4	Use “at” comment to link EUT and peripheral.
5	The data will be transmittable between EUT and peripheral and shown on the screen of monitor.
6	Repeat the above procedure (3) to (5).

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

Emission			
Performed Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart B: 2007 Class B ANSI C63.4: 2003	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart B: 2007 Class B ANSI C63.4: 2003	Yes	No

2.2. List of Test Equipment

Conducted Emission / SR1

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMI Test Receiver	R&S	ESCS 30	100366	2008/10/18
LISN	R&S	ENV4200	833209/007	2008/08/12
LISN	R&S	ENV216	100085	2009/02/14
Pulse Limiter	R&S	ESH3-Z2	357.88.10.52	2008/09/04

Radiated Emission / Site1

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2918	2008/09/25
Broadband Horn Antenna	Schwarzbeck	BBHA9170	208	2008/07/25
EMI Test Receiver	R&S	ESCS 30	100122	2009/02/03
Horn Antenna	Schwarzbeck	BBHA9120D	305	2008/08/10
Pre-Amplifier	QTK	N/A	N/A	2009/01/03
Spectrum Analyzer	Advantest	R3162	100803470	2008/11/10

2.3. Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.26 dB.

Radiated Emission

The measurement uncertainty is evaluated as ± 3.19 dB.

2.4. Test Environment

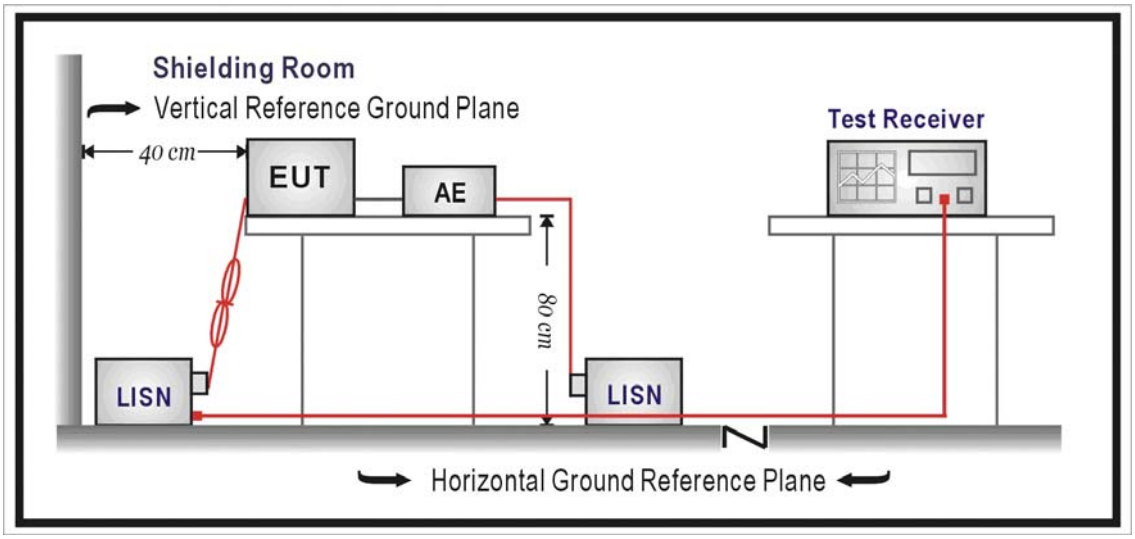
Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	15-35	25
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000
Radiated Emission	Temperature (°C)	15-35	25
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

3.1. Test Specification

According to Standard : FCC Part 15 Subpart B, ANSI C63.4

3.2. Test Setup



3.3. Limit

Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 – 46
0.50-5.0	56	46
5.0 - 30	60	50

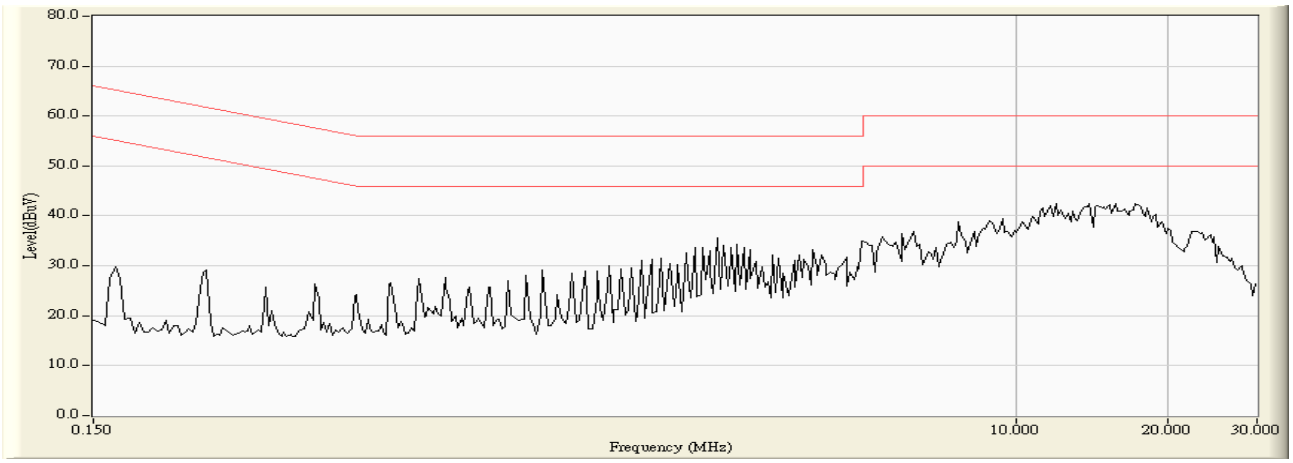
Remarks: In the above table, the tighter limit applies at the band edges.

3.4. Test Procedure

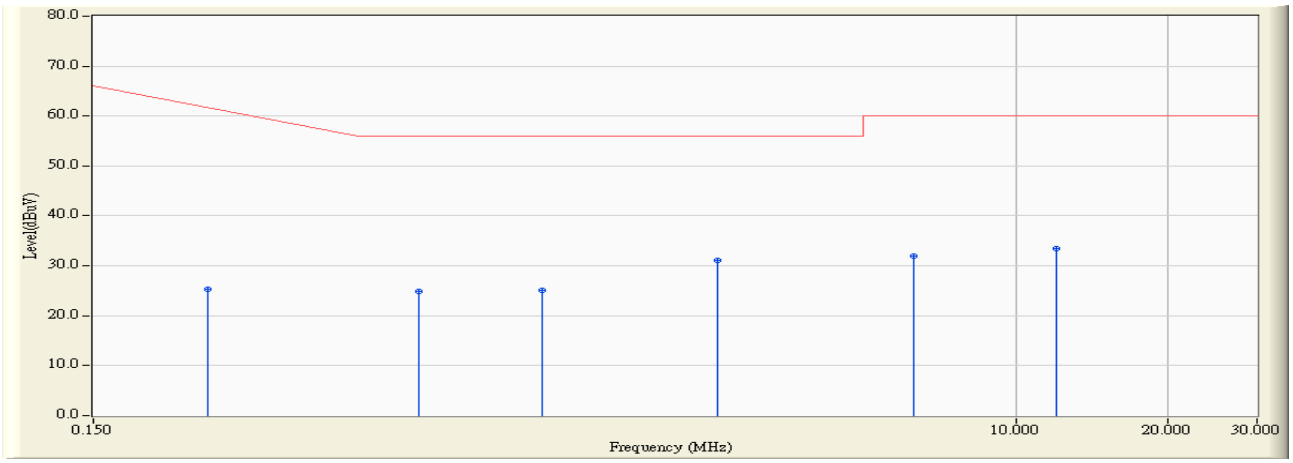
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
(Please refers to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Test Result

Site : SR1	**Time : 2009/04/17 - 09:31**
Limit : CISPR_B_00M_QP	**Margin : 10**
EUT : Wireless Laser Mouse	**Probe : ENV-216-L1 - Line1**
Power : AC 120V/60Hz	**Note : Mode 1**



Site : SR1	**Time : 2009/04/17 - 09:32**
Limit : CISPR_B_00M_QP	**Margin : 0**
EUT : Wireless Laser Mouse	**Probe : ENV-216-L1 - Line1**
Power : AC 120V/60Hz	**Note : Mode 1**

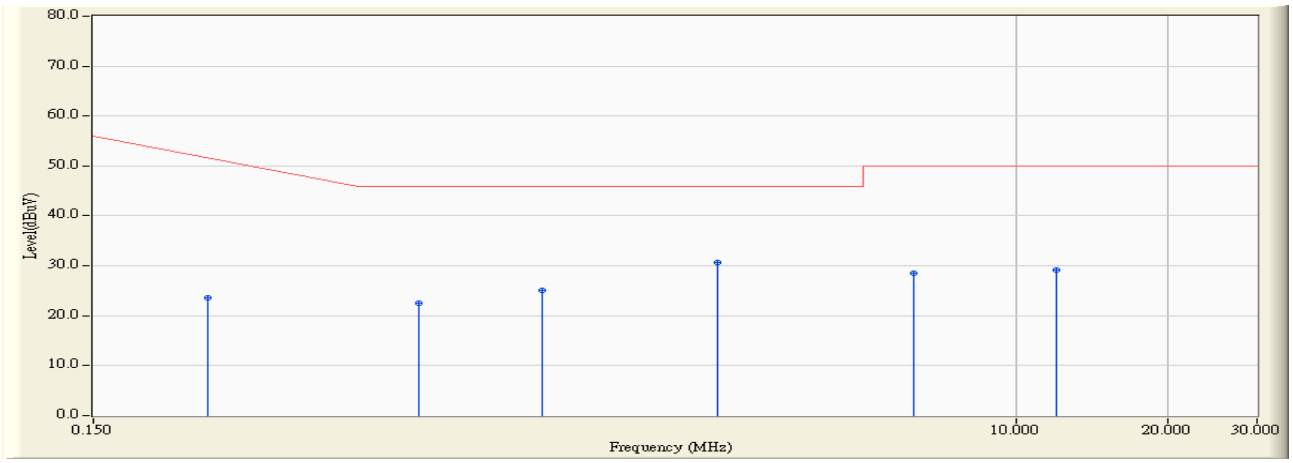


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.252	9.830	15.390	25.220	-37.866	63.086	QUASIPEAK
2		0.662	9.830	14.950	24.780	-31.220	56.000	QUASIPEAK
3		1.158	9.830	15.210	25.040	-30.960	56.000	QUASIPEAK
4	*	2.568	9.850	21.210	31.060	-24.940	56.000	QUASIPEAK
5		6.298	9.880	22.100	31.980	-28.020	60.000	QUASIPEAK
6		12.009	10.018	23.410	33.428	-26.572	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : SR1	**Time : 2009/04/17 - 09:32**
Limit : CISPR_B_00M_AV	**Margin : 0**
EUT : Wireless Laser Mouse	**Probe : ENV-216-L1 - Line1**
Power : AC 120V/60Hz	**Note : Mode 1**

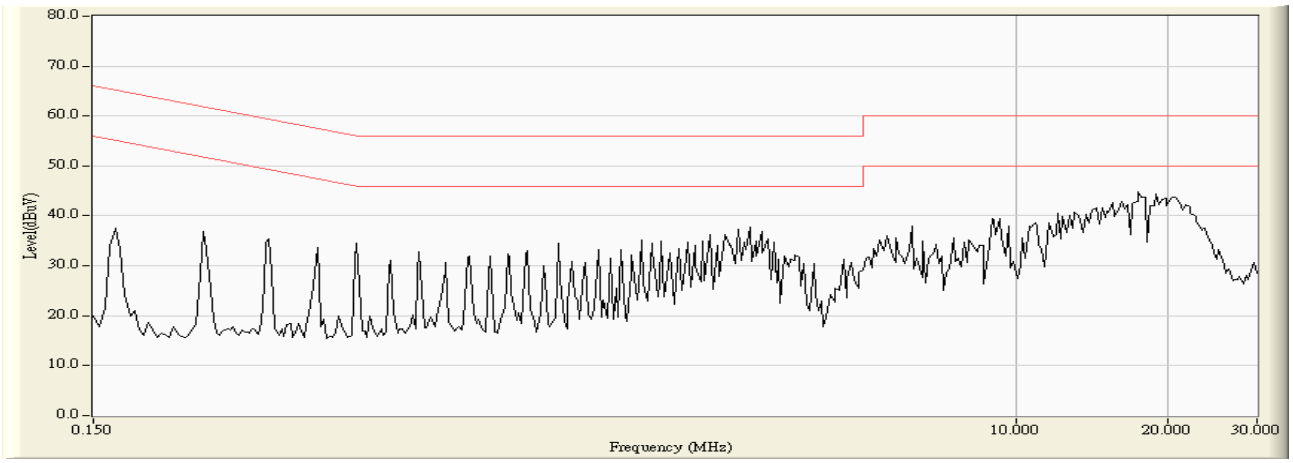


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.252	9.830	13.720	23.550	-29.536	53.086	AVERAGE
2		0.662	9.830	12.680	22.510	-23.490	46.000	AVERAGE
3		1.158	9.830	15.200	25.030	-20.970	46.000	AVERAGE
4	*	2.568	9.850	20.900	30.750	-15.250	46.000	AVERAGE
5		6.298	9.880	18.570	28.450	-21.550	50.000	AVERAGE
6		12.009	10.018	19.060	29.078	-20.922	50.000	AVERAGE

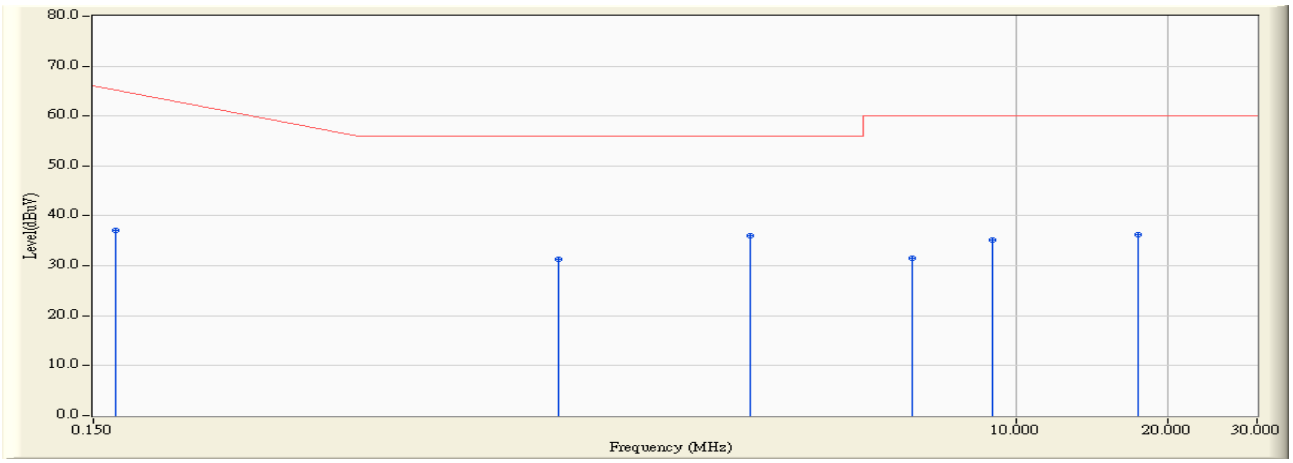
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : SR1	**Time : 2009/04/17 - 09:33**
Limit : CISPR_B_00M_QP	**Margin : 10**
EUT : Wireless Laser Mouse	**Probe : ENV-216-N - Line2**
Power : AC 120V/60Hz	**Note : Mode 1**



Site : SR1	**Time : 2009/04/17 - 09:34**
Limit : CISPR_B_00M_QP	**Margin : 0**
EUT : Wireless Laser Mouse	**Probe : ENV-216-N - Line2**
Power : AC 120V/60Hz	**Note : Mode 1**

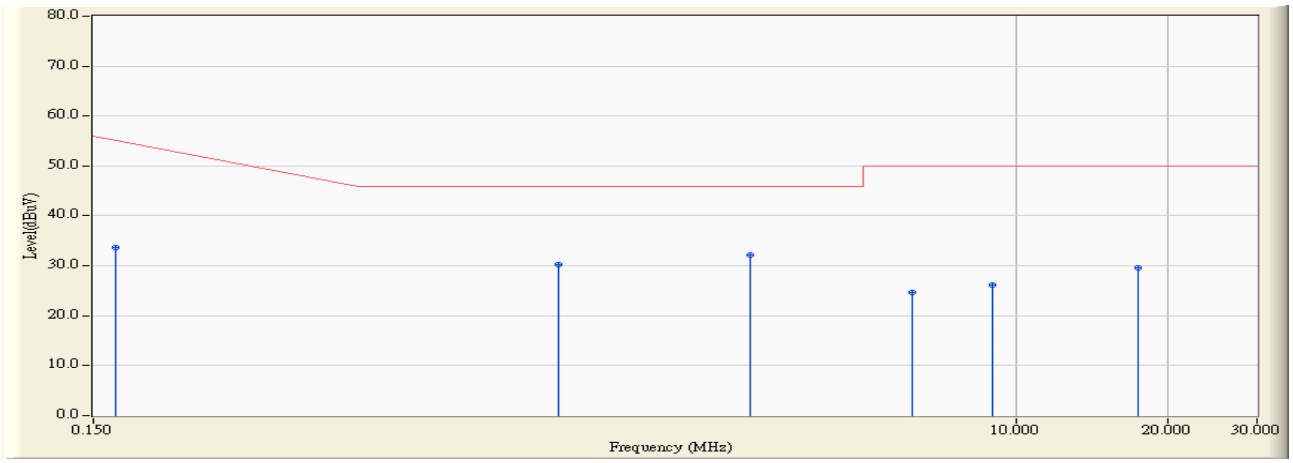


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.166	9.868	27.290	37.158	-28.385	65.543	QUASIPEAK
2		1.244	9.832	21.500	31.332	-24.668	56.000	QUASIPEAK
3	*	2.990	9.860	26.180	36.040	-19.960	56.000	QUASIPEAK
4		6.224	9.890	21.650	31.540	-28.460	60.000	QUASIPEAK
5		8.966	9.920	25.200	35.120	-24.880	60.000	QUASIPEAK
6		17.505	10.220	26.060	36.280	-23.720	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : SR1	**Time : 2009/04/17 - 09:34**
Limit : CISPR_B_00M_AV	**Margin : 0**
EUT : Wireless Laser Mouse	**Probe : ENV-216-N - Line2**
Power : AC 120V/60Hz	**Note : Mode 1**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.166	9.868	23.720	33.588	-21.955	55.543	AVERAGE
2		1.244	9.832	20.390	30.222	-15.778	46.000	AVERAGE
3	*	2.990	9.860	22.290	32.150	-13.850	46.000	AVERAGE
4		6.224	9.890	14.680	24.570	-25.430	50.000	AVERAGE
5		8.966	9.920	16.210	26.130	-23.870	50.000	AVERAGE
6		17.505	10.220	19.300	29.520	-20.480	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3.6. Test Photograph

Test Mode : Mode 1: Normal Operation

Description : Front View of Conducted Test

Test Mode : Mode 1: Normal Operation

Description : Back View of Conducted Test

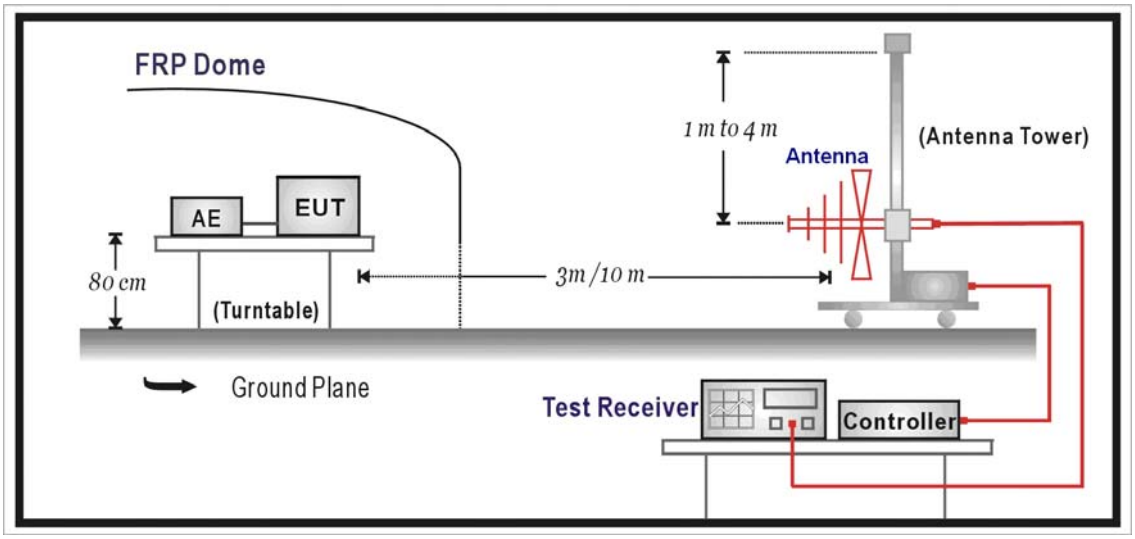
4. Radiated Emission

4.1. Test Specification

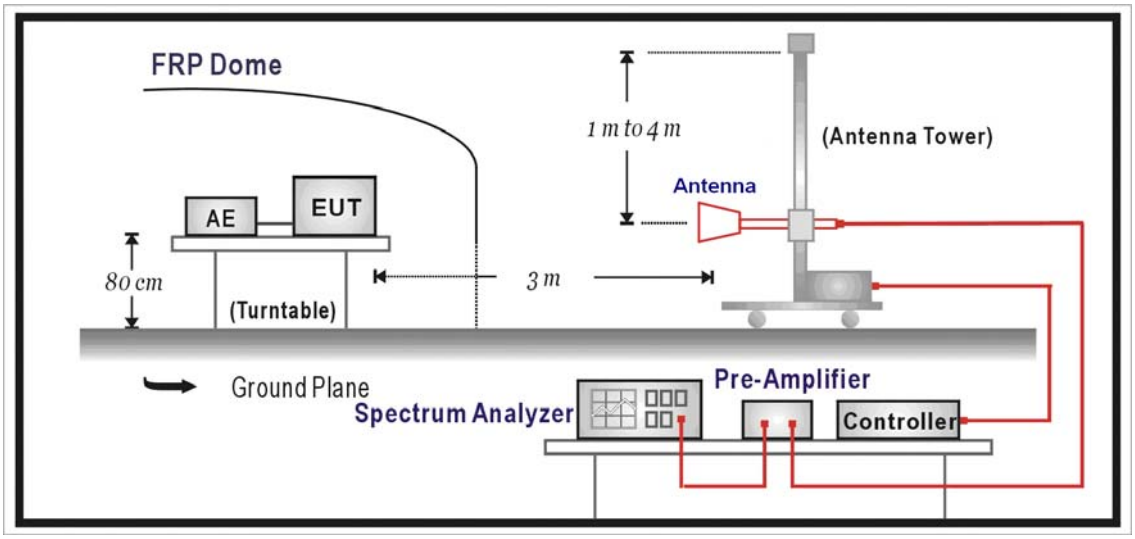
According to EMC Standard : FCC Part 15 Subpart B, ANSI C63.4

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

Under 1GHz test shall not exceed the following value:

Limits		
Frequency (MHz)	Distance (m)	dBuV/m
30 – 230	10	30
230 – 1000	10	37

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Above 1GHz test shall not exceed the following value:

FCC Part 15 Subpart B Paragraph 15.109 Limits (dBuV/m)		
Frequency (MHz)	Distance (m)	dBuV/m
30-88	3	40
88-216	3	43.5
216-960	3	46
Above 960	3	54

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground.

The turn table can rotate 360 degrees to determine the position of the maximum emission level and the antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the folowing table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40 GHz, whichever is lower

On any frequency or frequencies below or equal to 1000 MHz, the radiated limits shown are based on measuring equipment employing a quasi-peak detector function and above 1000 MHz, the radiated limits shown are based measuring equipment employing an average detector function.

When average radiated emission measurement are included emission measurement Above 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

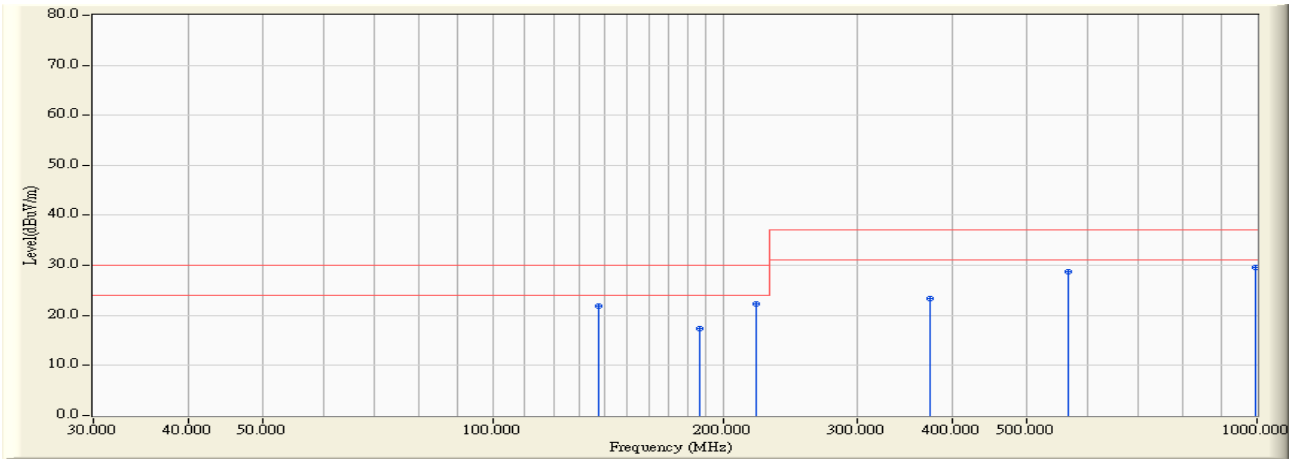
For class A, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and above 1GHz.

For class B, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and 3 meters for above 1GHz.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 kHz and above 1GHz is 1MHz.

4.5. Test Result

Site : OATS1	**Time : 2009/04/16**
Limit : CISPR_B_10M_QP	**Margin : 6**
EUT : Wireless Laser Mouse	**Probe : Site1_CBL6112_10M_0811 - HORIZONTAL**
Power : AC 120V/60Hz	**Note : Mode 1**

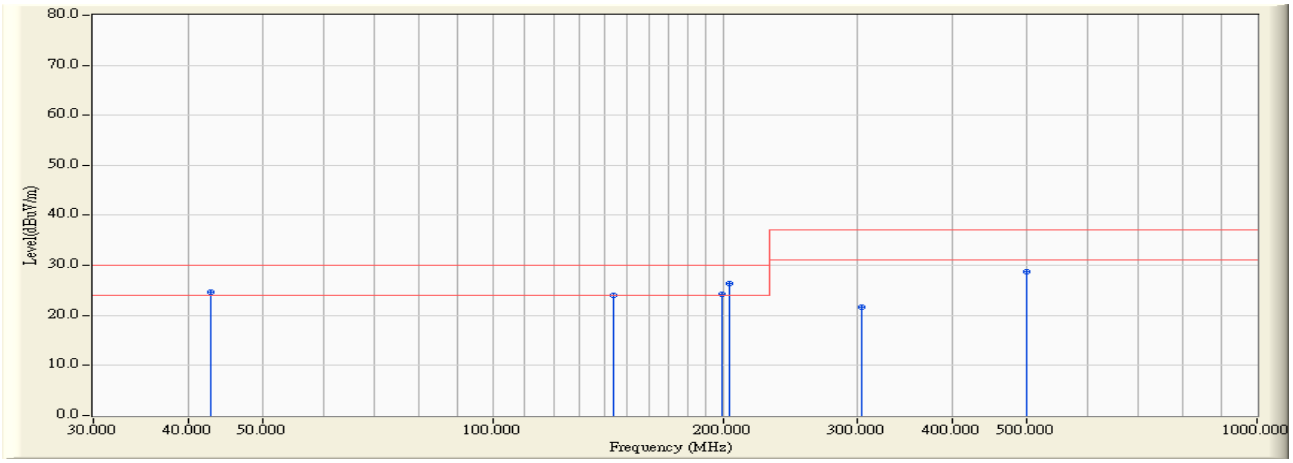


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		137.450	12.979	8.900	21.879	-8.121	30.000	QUASIPEAK
2		186.850	10.572	6.800	17.372	-12.628	30.000	QUASIPEAK
3		221.200	11.046	11.300	22.346	-7.654	30.000	QUASIPEAK
4		374.100	18.222	5.200	23.421	-13.579	37.000	QUASIPEAK
5		566.180	22.468	6.300	28.768	-8.232	37.000	QUASIPEAK
6	*	996.200	26.210	3.400	29.610	-7.390	37.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : OATS1	**Time : 2009/04/16**
Limit : CISPR_B_10M_QP	**Margin : 6**
EUT : Wireless Laser Mouse	**Probe : Site1_CBL6112_10M_0811 - VERTICAL**
Power : AC 120V/60Hz	**Note : Mode 1**

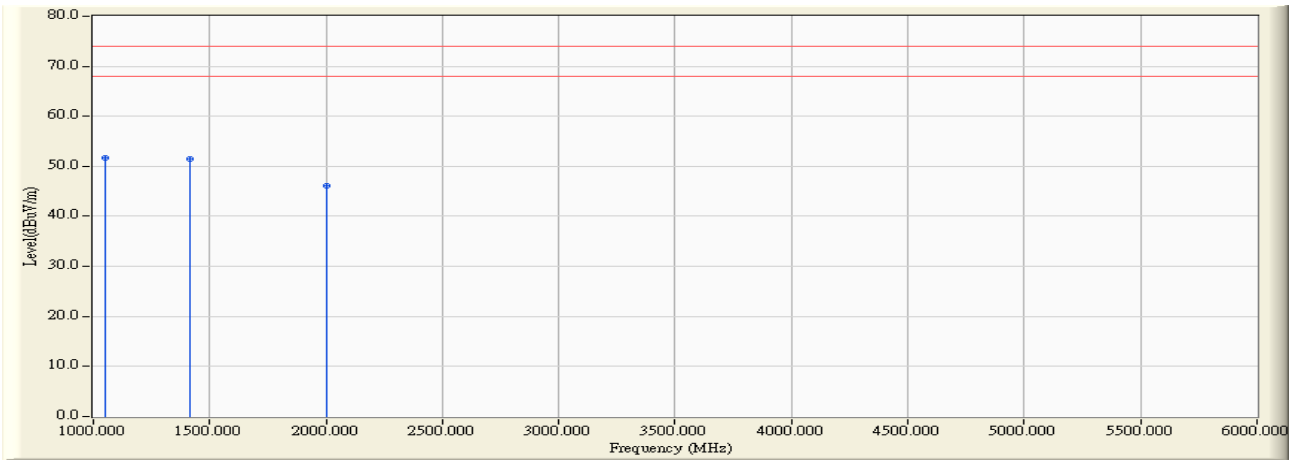


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		42.660	12.462	12.100	24.562	-5.438	30.000	QUASIPEAK
2		144.020	12.527	11.500	24.027	-5.973	30.000	QUASIPEAK
3		199.500	10.910	13.400	24.310	-5.690	30.000	QUASIPEAK
4	*	204.400	10.930	15.500	26.430	-3.570	30.000	QUASIPEAK
5		303.950	15.855	5.800	21.655	-15.345	37.000	QUASIPEAK
6		498.600	20.800	7.900	28.700	-8.300	37.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : OATS1	**Time : 2009/04/16 - 15:50**
Limit : FCC_B_(Above_1G)_03M_PK	**Margin : 6**
EUT : Wireless Laser Mouse	**Probe : 9120D_1-18G_Horn - HORIZONTAL**
Power : AC 120V/60Hz	**Note : Mode 1**

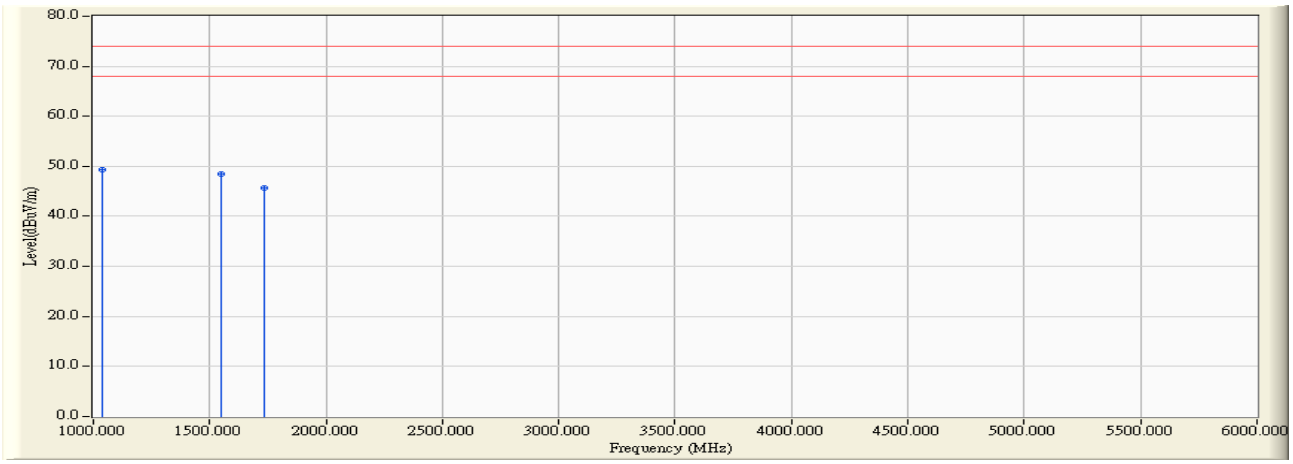


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	1050.000	-4.431	56.210	51.779	-22.221	74.000	PEAK
2		1412.000	-3.662	55.190	51.528	-28.472	74.000	PEAK
3		2000.000	-3.230	49.440	46.209	-27.791	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : OATS1	**Time : 2009/04/16 - 15:52**
Limit : FCC_B_(Above_1G)_03M_PK	**Margin : 6**
EUT : Wireless Laser Mouse	**Probe : 9120D_1-18G_Horn - VERTICAL**
Power : AC 120V/60Hz	**Note : Mode 1**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	1037.000	-4.438	53.800	49.362	-24.638	74.000	PEAK
2		1550.000	-3.797	52.260	48.463	-25.537	74.000	PEAK
3		1737.000	-3.851	49.620	45.769	-28.231	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

4.6. Test Photograph

Test Mode : Mode 1: Normal Operation

Description : Front View of Radiated Test

Test Mode : Mode 1: Normal Operation

Description : Back View of Radiated Test

Test Mode : Mode 1: Normal Operation

Description : Front View of High Frequency Radiated Test