佳和集團
怡 安 科 技
CHIA HEIR GROUP
RF-LINK SYSTEMS INC.

FCC ID.: MIBRF50201

EXHIBIT 3

Test Report With Eut Photograph

Exhibit 3

FCC Test Report
Application for Certification
On Behalf Of
RF-Link Systems Inc.
WL 3D Mouse for 900MHz
Model # : RF 50201

FCC ID : MIBRF50201

Prepared For:

RF-Link Systems Inc.
1F, No.9, Chan Yeh Road 1, Science-Based Industrial Park, HsinChu, Taiwan, R.O.C.

Report By : **QuieTek Corporation**
No.75-1, Wang-Yeh Valley, Yung-Hsing Tsuen, Chiung-Lin, Hsin-Chu County, Taiwan, R.O.C.
Tel : (03) 592-8858
Fax : (03) 592-8859

TABLE OF CONTENTS

1. Test Report Certification

QTK98-F012

Applicant : RF-Link Systems Inc.

EUT Description

(1) Model Name : WL 3D Mouse for 900MHz

(2) Model No. : RF 50201

(3) Serial Number : N/A

(4) FCC ID. : MIBRF50201

(5) Power Supply : **3V DC (Battery)**

MEASUREMENT STANDARD USED :

CFR 47, Part 15 Radio Frequency Device Subpart C Paragraph 15.249

MEASUREMENT PROCEDURE USED :

ANSI C63.4 Methods of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9kHz to 40GHz. :1992

The device described above was tested by QuieTek Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 Subpart C paragraph 15.249 and 15.209 limits for fundamental and harmonics and generated radiated emissions.
The measurement results are contained in this test report and QuieTek Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC Part 15 Subpart C paragraph 15.249 and 15.209 limits. And there are no deviation from the above measurement process.

Sample Received Date : November 19, 1998

Test Date : November 23, 1998

Documented by : Kathy Lee

NVLAP®

Test Engineer: Neil Huang

Neil Huang

Approve & Authorized Signer: Gene Chang

Gene Chang

2. General Information

QTK98-F012

2.1 Production Description

Description	: WL 3D Mouse for 900MHz
Model Number	: RF 50201
Serial Number	: N/A
FCC ID.	: MIBRF50201
Applicant	: RF-Link Systems Inc.
Address	: 1F, No.9, Chan Yeh Road 1, Science-Based Industrial Park, HsinChu, Taiwan, R.O.C.
Manufacturer	: RF-Link Systems Inc.
Address	: 1F, No.9, Chan Yeh Road 1, Science-Based Industrial Park, HsinChu, Taiwan, R.O.C.
Frequency Range	: 902 MHz to 928 Mhz
Channel Number	: 8
Frequency of each Channel	: 905.6, 908, 910.4,912.8, 915.2, 917.6, 920, 922.4MHz
Type of Modulation	: FSK (Frequency Shift Keying)
Operator Selection of Operating Frequency	: Software Controlled

Mode Difference :

(1) Mode 1 : Channel 1 (Fundament Frequency : 905.6 MHz)
(2) Mode 2 : Channel 4 (Fundament Frequency : 912.8 MHz)
(3) Mode 3 : Channel 8 (Fundament Frequency : 922.4 MHz)

Note: 1. The data show in this test report reflects the worst-case data for each operation mode.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249 and 15.209 for non-spread spectrum devices.

2.2 Tested System Details

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

☒ None

2.3 Test Methodology

FCC part 15 Subpart C Paragraph 15.249 Operation within the bands 902-928MHz, 2400-2483.5MHz, 5725-5875 MHz, and 24.0-24.25GHz
The fundamental, harmonics and general radiated emissions testing were performed according to the procedures in ANSI C63.4-1992.
Radiated testing was performed at an antenna to EUT distance of __3__ meters.

2.4 Test Facility

Site Description : November 3, 1998 File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2

NVLAP Lab Code: 200347-0
United Stated Department of commerce
National Institute of Standards and Technology
National Voluntary Laboratory Accreditation Program

Name of firm : QuieTek Corporation

Site location : No.75-1, Wang-Yeh Valley, Yung-Hsing Tsuen,
Chiung-Lin, Hsin-Chu County, Taiwan, R.O.C.

3. Radiation Emission Test

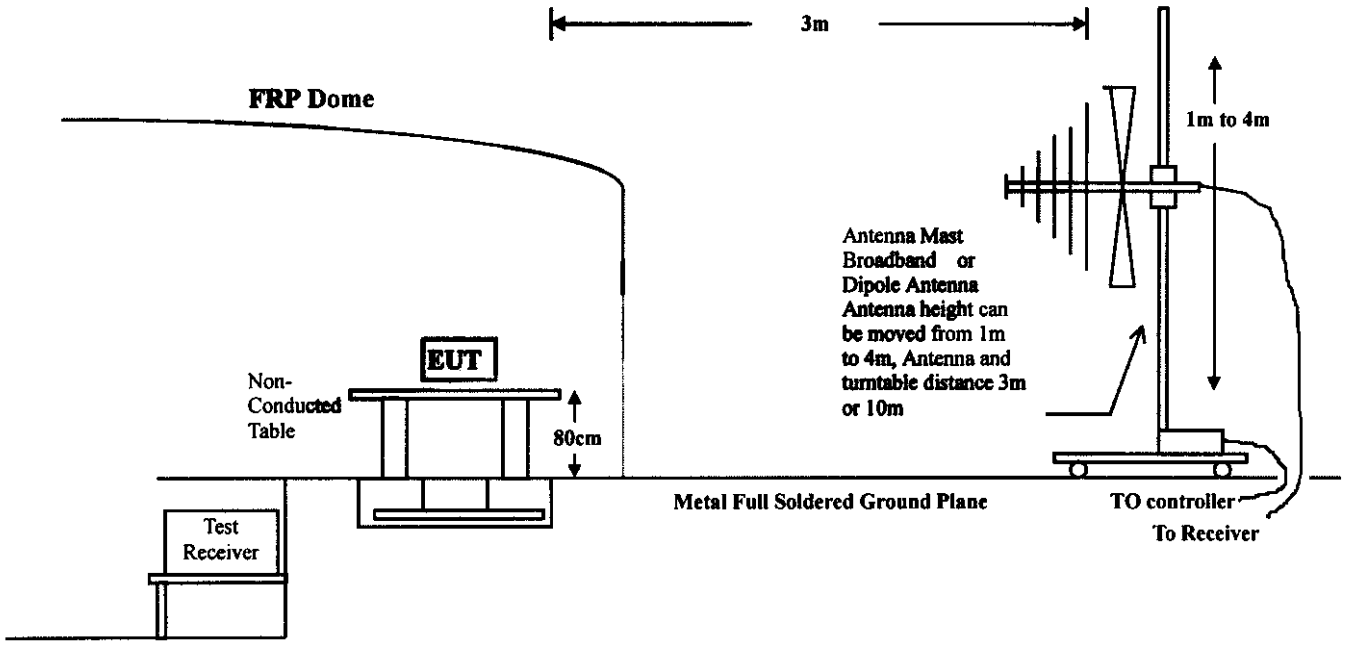
3.1 Test Equipment

The following test equipments are used during the radiated emission tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
SITE # 1	X	Test Receiver	R & S	ESCS 30 / 825442/14	May, 1998
	X	Spectrum Analyzer	Advantest	R3272 / 72421194	May, 1998
	X	Pre-Amplifier	HP	8447D/3307A01812	May, 1998
	X	Pre-Amplifier	HP	8449B / 3008A01123	May, 1998
	X	Bilog Antenna	Chase	CBL6112B / 12452	Sep.., 1998
	X	Horn Antenna	EM	EM6917 / 103325	May, 1998

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

3.2 Test Setup



3.3 Test Condition

Standard Temperature and Humidity, Standard Test Voltage

3.4 Minimum Standard

The fundamental emission shall not exceed the following field strength limits.

➢ **Fundamental and Harmonics Emission Limits**

Frequency	Field Strength of Fundamental		Field Strength of Harmonics	
MHz	(mV/m @3m)	(dBuV/m @3m)	(uV/m @3m)	(dBuV/m @3m)
902-928	50	94 (Average)	500	54 (Average)
		114 (Peak)		74 (Peak)

➢ **General Radiated Emission Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

Frequency	50dB below of the fundamental	15.209 Limits	General Radiated Limits
MHz	(dBuV/m @3m)	(dBuV/m @3m)	(dBuV/m @3m)
30-88	40	40	40
88-216	43.5	43.5	43.5
216-960	44	46	44
Above 960	44	54	44

Remarks : 1. RF Line Voltage (dBuV) = 20 log RF Line Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.5 EUT Configuration

The equipments which is listed 4.2.1 are installed on Radiated Emission Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

3.6 Operating Condition of EUT

Each mode of operation was exercised to produce worst emission. The worst case emissions were with the EUT powered up in the transmit mode.

3.7 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. EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Broadband antenna (calibrated bi-log and horn antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement. And a high frequency preamlifier were used increase the sensitivity of the measuring. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4-1992 on radiated measurement.

The additional latch filter below 1Ghz was used to measure the level of harmonics radiated emission during field dtrength of harmonics measurement.

The bandwidth below 1Ghz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 KHz, above 1Ghz are 1 MHz.

The frequency range from 30MHz to 18000MHz is checked.

3.8 Radiated Emission Data

The initial step in collecting radiated data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages. RADIATED HARMONICS ABOVE 3RD HARMONIC WERE BELOW BACKGROUND NOISE LEVEL.

The uncertainty is calculated in accordance with Namas NIS 81.The total uncertainty for this test is as follows:
- Uncertainty in the field strength measured: $< \pm 4.0$ dB

Fundamental Radiated Emission Data

Date of Test	:	Dec. 15, 1998	Temperature	:	24.3 ℃
EUT	:	WL 3D Mouse for 900MHz	Humidity	:	61 %

Polarization: Horizontal

	Channel	Frequency MHz	Detector	Correction Factor	Reading Level dBuV/m	Field Strength dBuV/m	Limits dBuV/m	Margin DB
	1	905.649	Peak	28.3	41.71	70.01	114	-43.99
*		905.649	Average	28.3	41.69	69.99	94	-24.01
	4	912.849	Peak	28.37	40.52	68.89	114	-45.11
		912.849	Average	28.37	39.89	67.26	94	26.74
	8	922.450	Peak	28.68	39.6	68.28	114	-45.72
		922.450	Average	28.68	38.43	67.11	94	-26.89

Polarization: Vertical

	Channel	Frequency MHz	Detector	Correction Factor	Reading Level dBuV/m	Field Strength dBuV/m	Limits dBuV/m	Margin DB
	1	905.649	Peak	28.3	30.98	59.28	114	-54.72
*		905.649	Average	28.3	30.45	58.75	94	-35.25
	4	912.849	Peak	28.37	30.03	58.40	114	-55.60
		912.849	Average	28.37	29.46	57.83	94	-36.17
	8	922.450	Peak	28.68	29.98	58.66	114	-55.34
		922.450	Average	28.68	29.48	58.16	94	-35.84

Remarks:

1. " * ", means this data is the worse emission level.
2. Field Strength = Reading Level + Correction Factor.
3. Correction Factor = Cable Loss + Antenna Factor.

Harmonics Radiated Emission Data

Date of Test : Nov. 23, 1998 Temperature : 24.3 ℃

EUT : WL 3D Mouse for 900MHz Humidity : 61 %

Polarization: Horizontal

	Channel	Frequency MHz	Detector	CorrectionFactor dBuV/m	Reading Level dBuV/m	Field Strength dBuV/m	Limits dBuV/m	Margin DB
*	1	1811.290	Peak	-5.99	56.72	50.73	74	-23.27
		1811.290	Average	-5.99	45.70	39.71	54	-14.29
		2716.950	Peak	-2.75	47.28	44.53	74	-29.47
		2716.950	Average	-2.75	35.80	33.05	54	-20.95
	4	1825.694	Peak	-5.95	52.57	46.62	74	-27.38
		1825.649	Average	-5.95	45.29	39.34	54	-14.66
		2738.551	Peak	-2.73	46.41	43.68	74	-30.32
		2738.551	Average	-2.73	34.89	32.16	54	-21.84
	8	1844.921	Peak	-5.92	52.61	46.69	74	-27.31
		1844.921	Average	-5.92	42.93	36.71	54	-17.29
		2767.734	Peak	-2.71	49.57	46.86	74	-27.14
		2767.734	Average	-2.71	36.68	33.97	54	-20.03

*

Polarization: Vertical

	Channel	Frequency MHz	Detector	CorrectionFactor dBuV/m	Reading Level dBuV/m	Field Strength dBuV/m	Limits dBuV/m	Margin DB
*	1	1811.290	Peak	-5.99	58.14	52.15	74	-21.85
		1811.290	Average	-5.99	47.40	41.41	54	-12.59
		2716.950	Peak	-2.75	52.45	49.70	74	-24.30
		2716.950	Average	-2.75	39.00	36.25	54	-17.75
	4	1825.694	Peak	-5.95	54.97	49.02	74	-24.98
		1825.649	Average	-5.95	48.70	42.75	54	-11.25
		2738.551	Peak	-2.73	54.17	51.44	74	-22.56
		2738.551	Average	-2.73	39.70	36.97	54	-17.03
	8	1844.921	Peak	-5.92	54.49	48.57	74	-25.43
		1844.921	Average	-5.92	45.30	39.38	54	-14.62
		2767.734	Peak	-2.71	52.56	49.85	74	-24.15
		2767.734	Average	-2.71	38.25	35.54	54	-18.46

*

Remarks:

1. " * ", means this data is the worse emission level.
2. Field Strength = Reading Level + Correction Factor
3. Correction Factor = Cable Loss + Antenna Factor - Preamplifier.

* TEST SITE ADVISED HARMONICS ABOVE 3RD HARMONIC WERE BELOW BACKGROUND NOISE LEVEL.

Generated Radiated Emission Data

Date of Test : Nov. 23, 1998 Temperature : 24.3 ℃

EUT : WL 3D Mouse for 900MHz Humidity : 61 %

Frequency MHz	Cable Loss dB	Ant Factor dB/m	Reading Level Horizontal dBuV/m	Emission Level Horizontal dBuV/m	Limits dBuV/m	Ant Pos cm	Table Pos deg
* 187.250	2.66	9.52	22.56	34.75	43.5	100	164
203.750	2.82	10.14	12.32	25.28	43.5	401	203
217.253	2.95	10.05	4.14	17.14	44	401	83
253.193	3.30	12.97	4.35	20.62	44	401	203
331.737	3.92	14.54	5.40	23.85	44	401	203

Remarks:

1. All Readings below 1GHz are Quasi-Peak..
2. " * ", means this data is the worse emission level.
3. Field Strength = Reading Level + Correction Factor

Generated Radiated Emission Data

Date of Test	:	Nov. 23, 1998	Temperature	:	24.3 ℃
EUT	:	WL 3D Mouse for 900MHz	Humidity	:	61 %

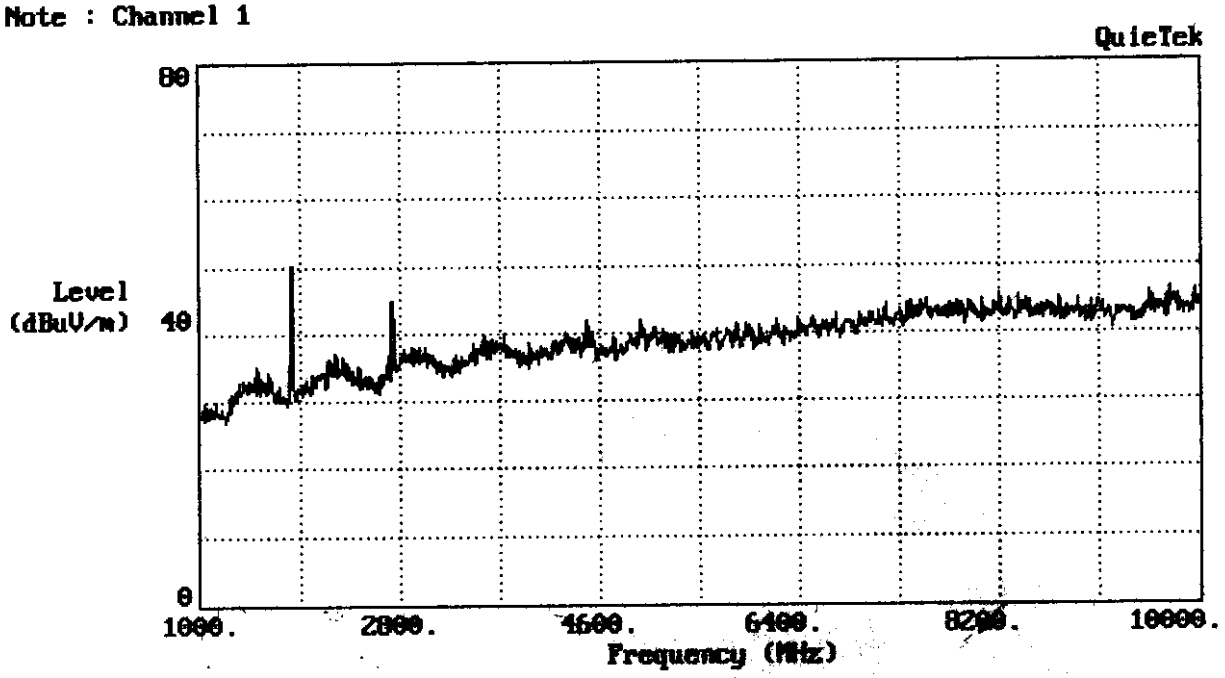
Frequency MHz	Cable Loss dB	Ant Factor dB/m	Reading Level Vertical dBuV/m	Emission Level Vertical dBuV/m	Limits dBuV/m	Ant Pos cm	Table Pos deg
* 187.250	2.66	7.69	19.01	29.37	43.5	100	45
203.745	2.82	9.65	6.85	19.32	43.5	100	144
217.253	2.95	9.83	4.58	17.36	44	100	203
253.193	3.30	13.32	3.40	20.02	44	100	173
331.737	3.92	14.18	10.46	28.56	44	401	203

Remarks:

1. All Readings below 1GHz are Quasi-Peak..
2. " * ", means this data is the worse emission level.
3. Field Strength = Reading Level + Correction Factor

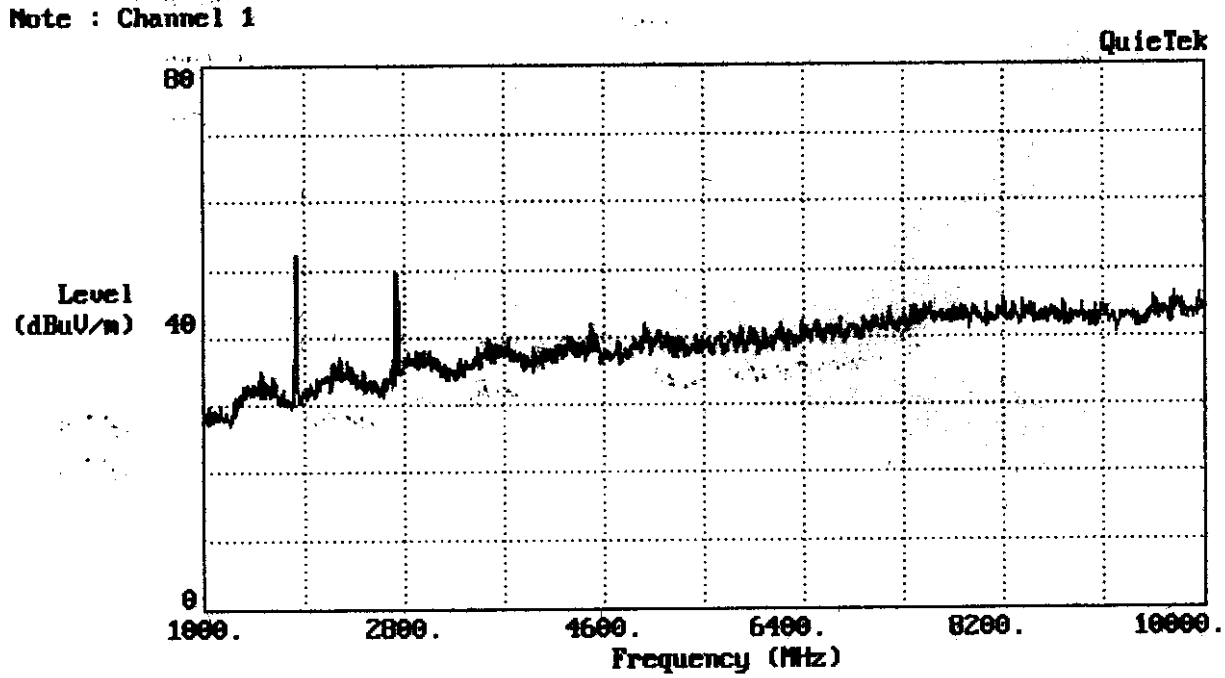
File#: RF-LINK.EMI - 465 Sweep
Site : QuieTek
Limit: 3m
EUT : WL 3D Mouse for 900Mhz
Power:
Note : Channel 1

Date : 01-14,1999 Thu Time: 01:13:24 am
Probe : QTKANT-10C Horizontal
Margin: 6 dB
Std :
Trace :



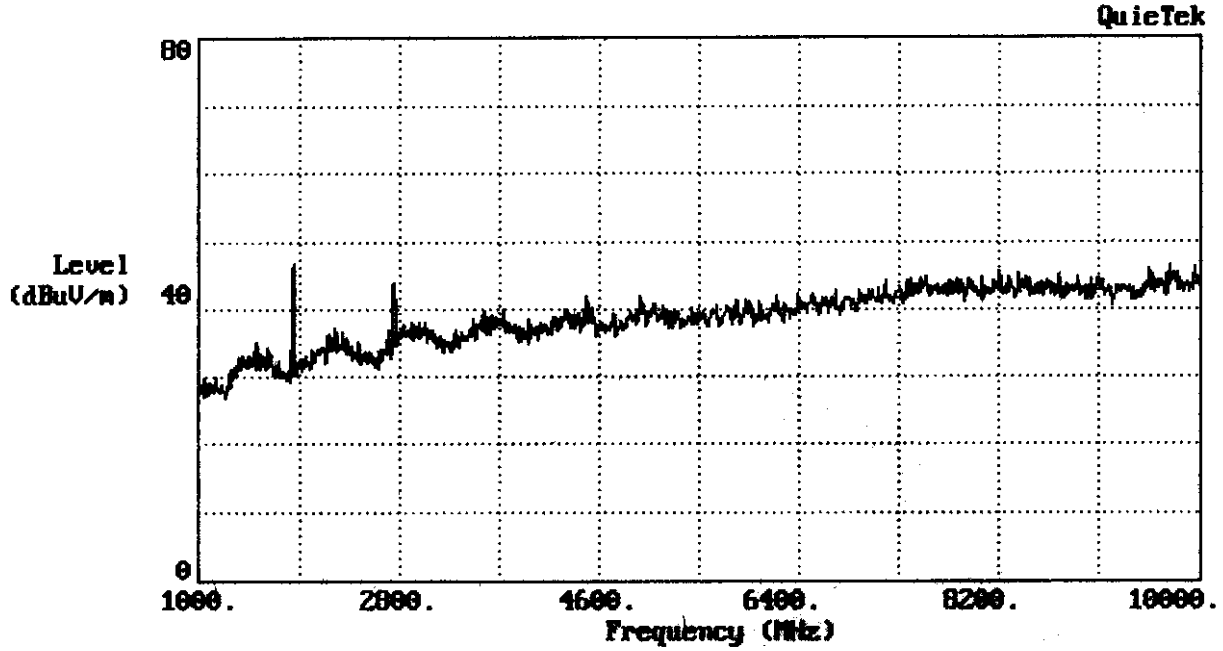
File#: RF-LINK.EMI - 464 Sweep
Site : QuieTek
Limit: 3m
EUT : WL 3D Mouse for 900Mhz
Power:
Note : Channel 1

Date : 01-14,1999 Thu Time: 01:27:53 am
Probe : QTKANT-10C Vertical
Margin: 6 dB
Std :
Trace :



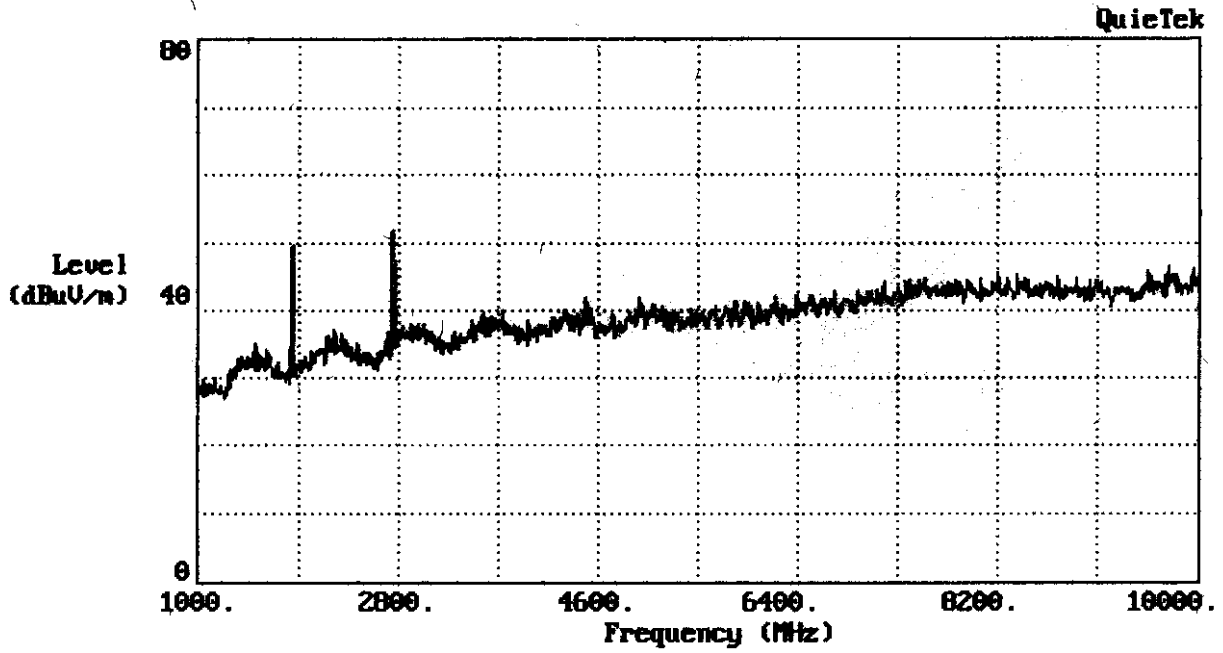
File#: RF-LINK.EMI - 463 Sweep
Site : QuieTek
Limit: 3m
EUT : WL 3D Mouse for 900Mhz
Power:
Note : Channel 4

Date : 01-14,1999 Thu Time: 01:30:15 am
Probe : QTKANT-10C Horizontal
Margin: 6 dB
Std :
Trace :



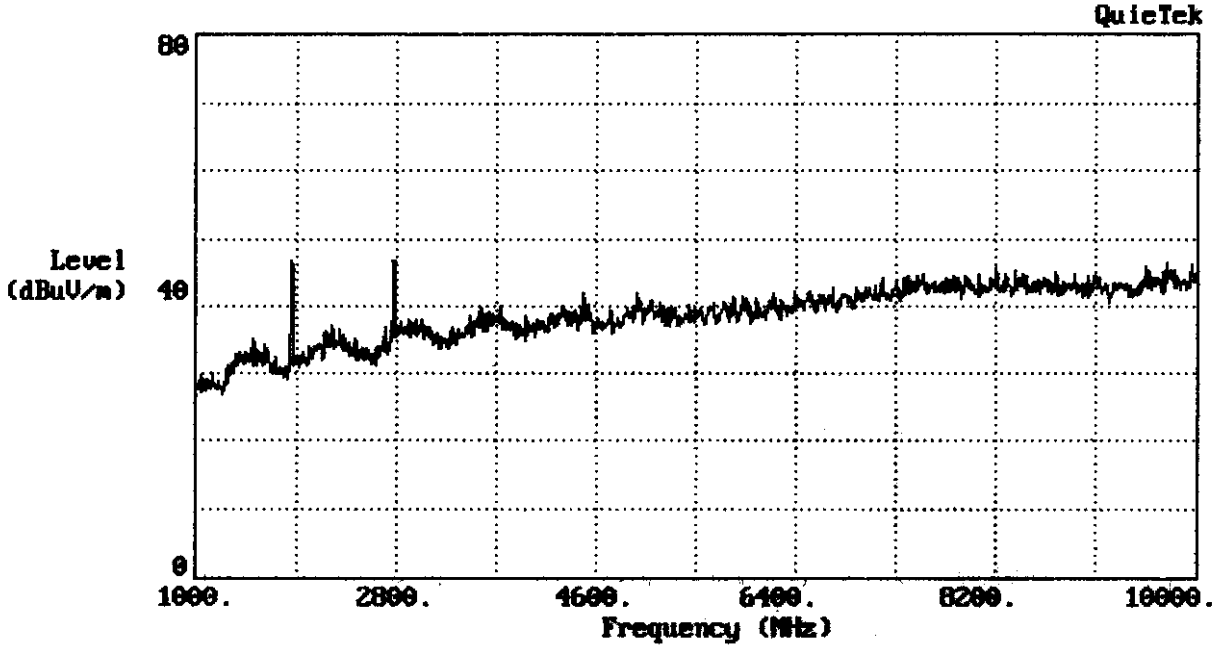
File#: RF-LINK.EMI - 466 Sweep
Site : QuieTek
Limit: 3m
EUT : WL 3D Mouse for 900Mhz
Power:
Note : Channel 4

Date : 01-14,1999 Thu Time: 01:42:23 am
Probe : QTKANT-10C Vertical
Margin: 6 dB
Std :
Trace :



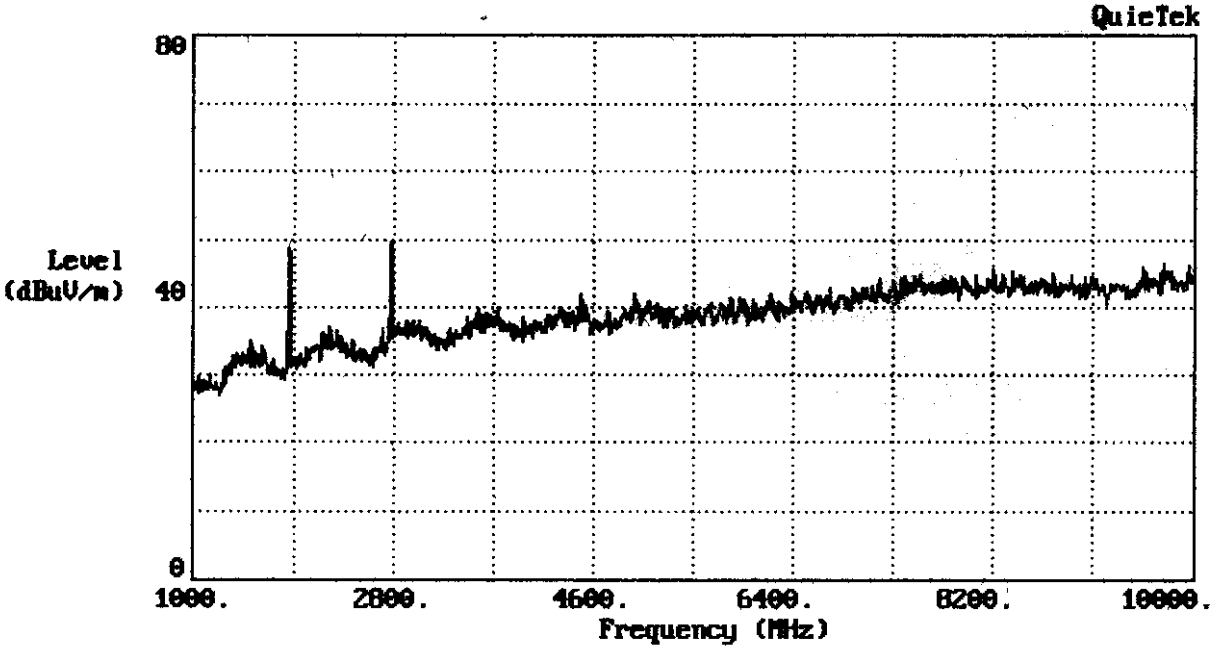
File#: RF-LINK.EMI - 467 Sweep
Site : QuieTek
Limit: 3m
EUT : WL 3D Mouse for 900Mhz
Power:
Note : Channel 8

Date : 01-14,1999 Thu Time: 01:51:32 am
Probe : QTKANT-10C Horizontal
Margin: 6 dB
Std :
Trace :



File#: RF-LINK.EMI - 468 Sweep
Site : QuieTek
Limit: 3m
EUT : WL 3D Mouse for 900Mhz
Power:
Note : Channel 8

Date : 01-14,1999 Thu Time: 02:09:02 am
Probe : QTKANT-10C Vertical
Margin: 6 dB
Std :
Trace :



4. EMI Reduction Method During Compliance Testing

No modification was made during testing.