

# Certificate of Test

February 2008

## Cherry GmbH

Product Type : Wireless Mouse  
Model Number : F670  
Test Report Number : 0710087R-01  
Date of Test : November 01, 2007- December 01, 2007

This Product was tested to the following standards at the laboratory of Global EMC Standard Tech. Corp., and found Compliance.

Standards:  
FCC Part 15 Subpart C Paragraph 15.249  
ANSI C63.4: 2003

<http://www.gestek.com.tw>



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Date: February 12, 2008



NVLAP LAB CODE 200085-0





**Test Report  
Application for  
Certification  
On Behalf Of**

**Cherry GmbH**

**EUT:  
Wireless Mouse**

**Model Number:  
F670**

**FCC ID:  
GDDF670**

**Prepared for:**

**Cherry GmbH  
Cherrystrasse D91275 Auerbach/Opf. Germany**

**Report By :Global EMC Standard Tech. Corp.**

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3. The report must not be used by the client to claim product certification, approval, or endorsement by any agency of the federal government.
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**1. CERTIFICATION**

**Applicant : Cherry GmbH**

EUT Description : Wireless Mouse  
 Model Number : G670  
 Serial Number : N/A  
 Brand Name : CHERRY  
 FCC ID : GDDF670  
 Tested Power Supply : 3.0V By Battery  
 Manufacturer : Sunrex Technology Corp  
 Manufacturer Address : No. 188-1, Chung Cheng Rd., Ta Ya Shiang, Taichung Hsien, Taiwan, R.O.C.

**MEASUREMENT PROCEDURES USED:**

- CFR 47, Part 15** Radio Frequency Device Subpart C Intentional Radiators :2005
- ANSI C63.4** Methods of Measurements of Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment in the range of 9kHz To 40GHz. 2003

THE MEASUREMENT SHOWN IN THE ATTACHMENT WAS MADE IN ACCORDANCE WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE EQUIPMENT WAS FOUND TO BE WITHIN THE ABOVE LIMITS APPLICABLE.



NVLAP LAB CODE 200085-0

Date of est : **November 01, 2007 – December 01, 2007**

In order to ensure the quality and accuracy of this document, the contents have been thoroughly reviewed by the following qualified personnel from GesTek Lab.

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This test data shown below is traceable to National or international standard such as NIST/USA, etc. The laboratory's NVLAP accreditation in no way constitutes or implies product certification, approval, or endorsement by NVLAP or the United States government.

## 2. GENERAL INFORMATION

### 2.1 PRODUCTION DESCRIPTION

<b>Product Name</b>	: Wireless Mouse
<b>Model Number</b>	: F670
<b>Serial Number</b>	: N/A
<b>Brand Name</b>	: CHERRY
<b>FCC ID</b>	: GDDF670
<b>Modulation Type</b>	: GFSK
<b>Antenna Type</b>	: Printed on PCB
<b>Antenna Gain</b>	: 0 dBi
<b>Frequencg Range</b>	: 2412MHz~2475MHz
<b>Channel Number</b>	: 16 Channel
<b>Working Voltage</b>	: 3.0V By Battery

#### Frequency of Each Channel:

Channel	Frequency (MHz)	Frequency (MHz)
0	2412	2460
1	2413	2461
2	2414	2462
3	2415	2463
4	2416	2464
5	2417	2465
6	2418	2466
7	2419	2467
8	2420	2468
9	2421	2469
10	2422	2470
11	2423	2471
12	2424	2472
13	2425	2473
14	2426	2474
15	2427	2475

#### Note:

1. This device is a Wireless Mouse included wireless transmission of mouse and receiver. The test report is for transmitter.
2. This device is 16 channel and perform the test, then record on this report.
3. The antenna of EUT is printer on PCB and conform to FCC 15.203.
4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249.
5. The device of receiver to accordance with Part 15 regulations and under Declaration of Conformity and record of measurment in test report that the report number is 0710084F-01.

**2.2 OPERATIONAL DESCRIPTION**

This device is a Wireless mouse included wireless transmitter of mouse and receiver.  
 This device is 16 channel with two frequency hopping carrier per each channel.  
 The channel control are set by manufacturer and only one channel is used for end users.  
 End users can not change channel by themselves.  
 The device is operated in 2.412 to 2.475GHz with GFSK modulation.  
 The Receiver is USB interface and it is capable to receive signal from transmitter to control PC or notebook.  
 Another information please refer to users manual.

**2.3 TEST MODES & EUT COMPONENTS DESCRIPTION**

<b>EUT: Wireless Mouse, M/N: Transmitter: F670</b>		
<b>The EUT tested with PC System. (DELL, M/N: Latitude D600 PPO5L)</b>		
<b>Test Mode</b>	<b>Mode 1</b>	<b>Mode 2</b>
	Transmitter	Charge Mode

**2.4 SUMMARY OF TEST PROCEDURE AND TEST RESULTS**

<b>Test Item</b>	<b>Applied Standard Section</b>	<b>Test Result</b>
Radistion Emission	15.209, ANSI C63.4 Section 8	Pass (refer to section 3.7)
Peak Power Output	15.249(a), ANSI C63.4 Section 13 & Annex I	Pass (refer to section 3.7)
Band Edge	15.249(d) , ANSI C63.4 Section 13 & Annex I	Pass (refer to section 4.6)

## 2.5 CONFIGURATION OF THE TESTED SYSTEM

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

Device	No.	Configuration
<b>21" COLOR Monitor</b>	<b>M01-060</b>	Manufacturer : COMPAQ Model Number : PE1143-41 Serial Number : N/A BSMI ID : R31708 FCC ID : N/A Data Cable : Shielded, detachable, 1.5m, VGA Cable Power Cord : 3Pin, Shielded, Detachable, 1.5m
<b>Headset &amp; Earphone</b>	<b>E01-167</b>	Manufacturer : Good Vision Model Number : LY-MIC02 Serial Number : N/A Data Cable : Non-Shielded, Undetachable, 1.8 m Power Cord : N/A
<b>PS2 Keyboard</b>	<b>K01-107</b>	Manufacturer : acer Model Number : T200-P BSMI ID : R41097 FCC ID : N/A Data Cable : Shielded, Undetachable, 1.8 m
<b>PS2 Mouse</b>	<b>M02-411</b>	Manufacturer : detrois Model Number : CanMouse CM-309 Serial Number : N/A BSMI ID : R63159 FCC ID : N/A Data Cable : Shielded, Undetachable, 1.5m
<b>Printer</b>	<b>P01-015</b>	Manufacturer : Hewlett Packard Model Number : 2225C Serial Number : 2512S40942 BSMI ID : 3892A957 FCC ID : BS46XU2225C Data Cable : Shielded, Detachable, 1.2m, Parallel Cable Power Cord : Non-Shielded, Detachable, 1.8m

Device	No.	Configuration
<p align="center"><b>PC System</b></p>	<p align="center"><b>HP PC 09</b></p>	<p>Model Number : A1210TW                      BSMI ID : R33001                      C.P.U : AMD Sempron 3200+                      DDR : Samsung DDR-400 256M *1                      H.D.D. : Manufacturer :Hitachi                      M/N:HDT722516DLA380                      BSMI ID:D33373                      DVD-ROM : Manufacturer :Lite-on                      M/N:SOHC-4836C                      BSMI ID:D43008                      Mother Board : HP, M/N:MS-7184                      BSMI ID:D33088                      S.P.S : HIPRP, M/N:SS-330HB                      Input:100-127V/200-240V 47~63 Hz                      Output:+5V/25A,-12V/0.8A,+12V/19A,+3.3V/18A                      +5V<sub>SB</sub>/2A                      BSMI ID:R32098</p>

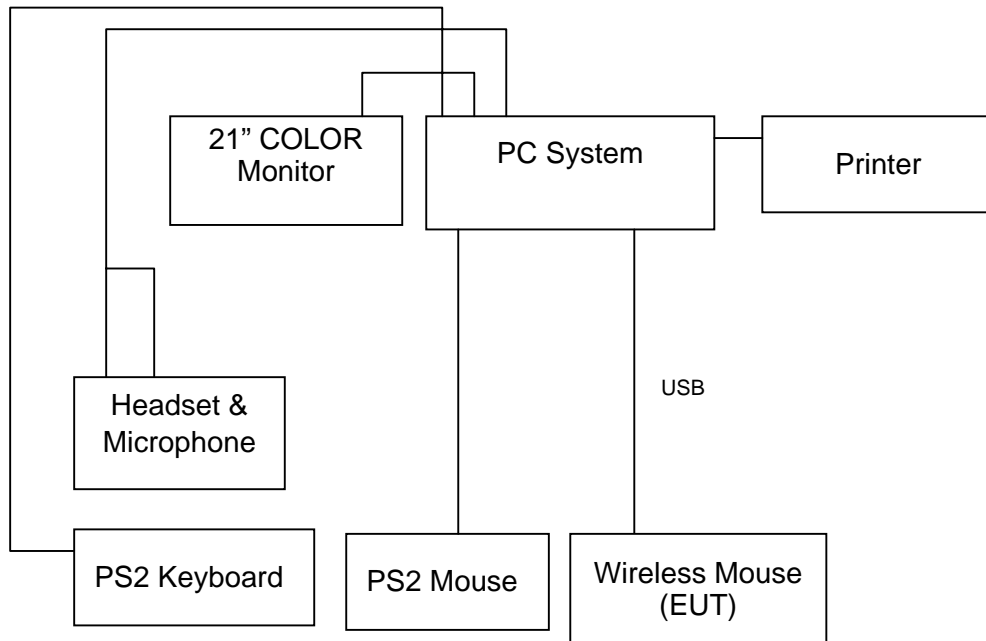


## 2.6 TEST FACILITY

Ambient conditions in the laboratory:

ITEMS	Requirement
<b>TEMPERATURE (°C)</b>	10-40
<b>HUMIDITY (%RH)</b>	10-90
<b>BAROMETRIC PRESSURE (mbar)</b>	860-1060
<b>FCC SITE DESCRIPTION</b>	Aug. 10, 1995 /Aug. 25, 1998 File on FCC Engineering Laboratory Federal Communication Commission 7435 Oakland Mills Road Columbia, MD 21046 Reference 31040/SIT1300F2
<b>NVLAP LAB. CODE</b>	200085-0 United States Department of commerce National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program Accreditation on NVLAP effective through Sep. 30, 2008 For CISPR 22, FCC Method and AS/NZS CISPR 22 Measurement.
<b>Taiwan Accreditation Foundation (TAF)</b>	Recognized by the Council of Taiwan Accreditation Foundation and confirmed to meet the requirements of ISO/IEC 17025. Registration No.: 1082 Registration on TAF effective through Sep. 19,2009

## 2.7 TEST SETUP



## 2.8 EUT OPERATING CONDITIONS

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

1. Setup the EUT and simulators as shown on 2.7.
2. Turn on the power of all equipments.
3. The transmitter will transmit the signal continue.
4. Confirm the receiver is receive signal continue.
5. Repeat the above steps.

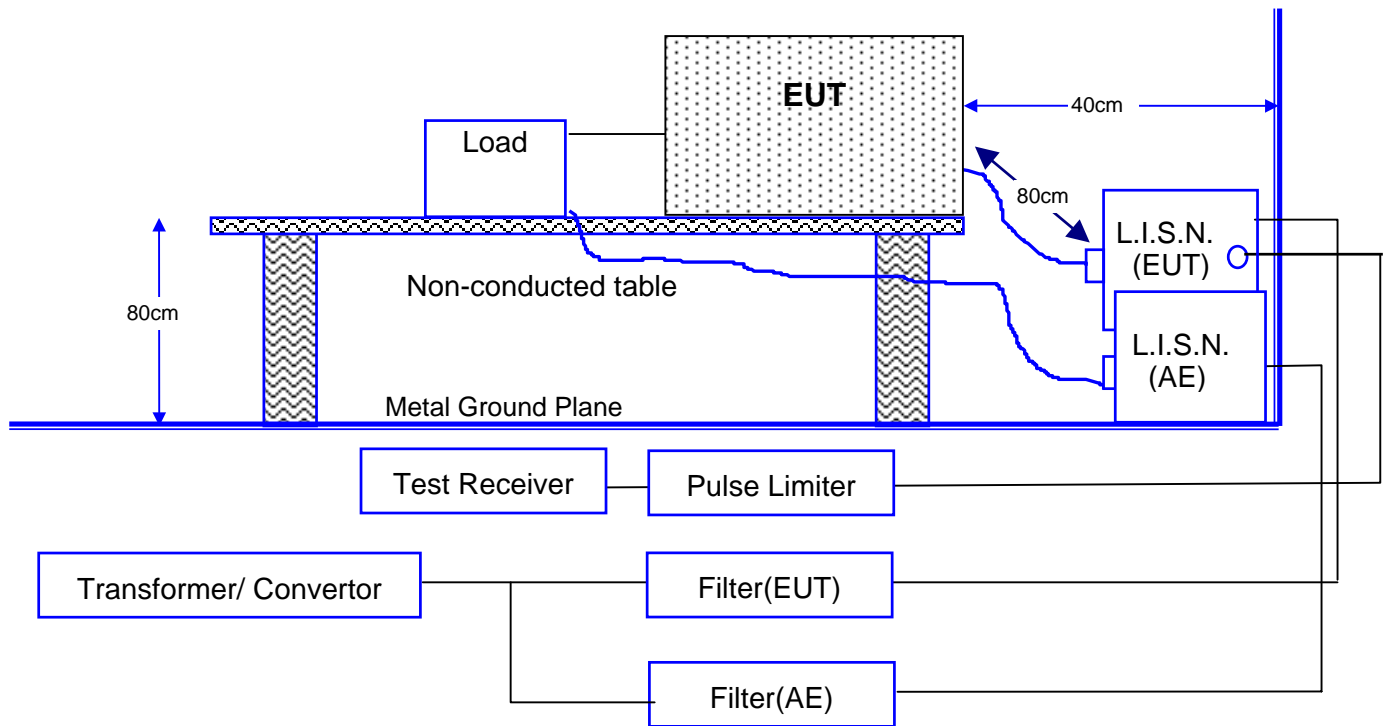
### 3. CONDUCTION EMISSION DATA

#### 3.1 TEST EQUIPMENTS

The following test equipment are used during the conducted power line tests:

Item	Instrument	Manufacturer	Model	Serial No.	Next Cal.
1	Test Receiver	R & S	ESCS30	825022/003	2008.05.25
2	LISN	ROLF HEINE	NNB-2/16Z	99042	2007.12.21
3	LISN	ROLF HEINE	NNB-2/16Z	98091	2008.07.22
4	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	357.8810.52	2008.08.01
5	RF CABLE	GesTek	N/A	GTK-E-A152-01	2007.12.14
6	50 Ohm Terminator	GesTek	N/A	GTK-E-A124-01	N/A
7	Shielded Room	GesTek	N/A	B5	N/A

#### 3.2 BLOCK DIAGRAM OF TEST SETUP



Note: This is a representative setup diagram for Table-top EUT.  
 For Floor-standing EUT, the table will be removed with all others setup condition remain the same.

### 3.3 CONDUCTED EMISSION LIMIT

☒FCC 15.207

Frequency	Conducted Limits dB( $\mu$ V)			
	Class A		Class B	
MHz	QUASI-PEAK	AVERAGE	QUASI-PEAK	AVERAGE
0.15 to 0.50	79	66	66 to 56	56 to 46
0.50 to 5.0	73	60	56	46
5.0 to 30	60	60	60	50

Remarks : In the Above Table, the tighter limit applies at the band edges.

### 3.4 OPERATING CONDITION OF EUT

Same as section 2.8.

### 3.5 EUT CONFIGURATION ON MEASUREMENT

The equipment, which is listed 3.1, is installed on Conducted Power Line Test to meet the Commission requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 3.2, was placed on a non-conductive table whose total height equal to 80cm. Powered from one L.I.S.N. which signal output to receiver, and the other peripherals was powered from another L.I.S.N. which signal output was terminated by 50 $\Omega$ .

### 3.6 CONDUCTED EMISSION DATA

The measurement range of conducted emission from [0.15 MHz to 30 MHz](#) was investigated. All readings are quasi-peak and average values with a resolution Bandwidth of 9 KHz. The initial step in collecting conducted 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

### 3.7 CONDUCTED EMISSIONS MEASUREMENT RESULTS

Date of Test	November 30, 2007	Temperature	26
EUT	Wireless Mouse	Humidity	60 %
Test Mode	Mode 2		

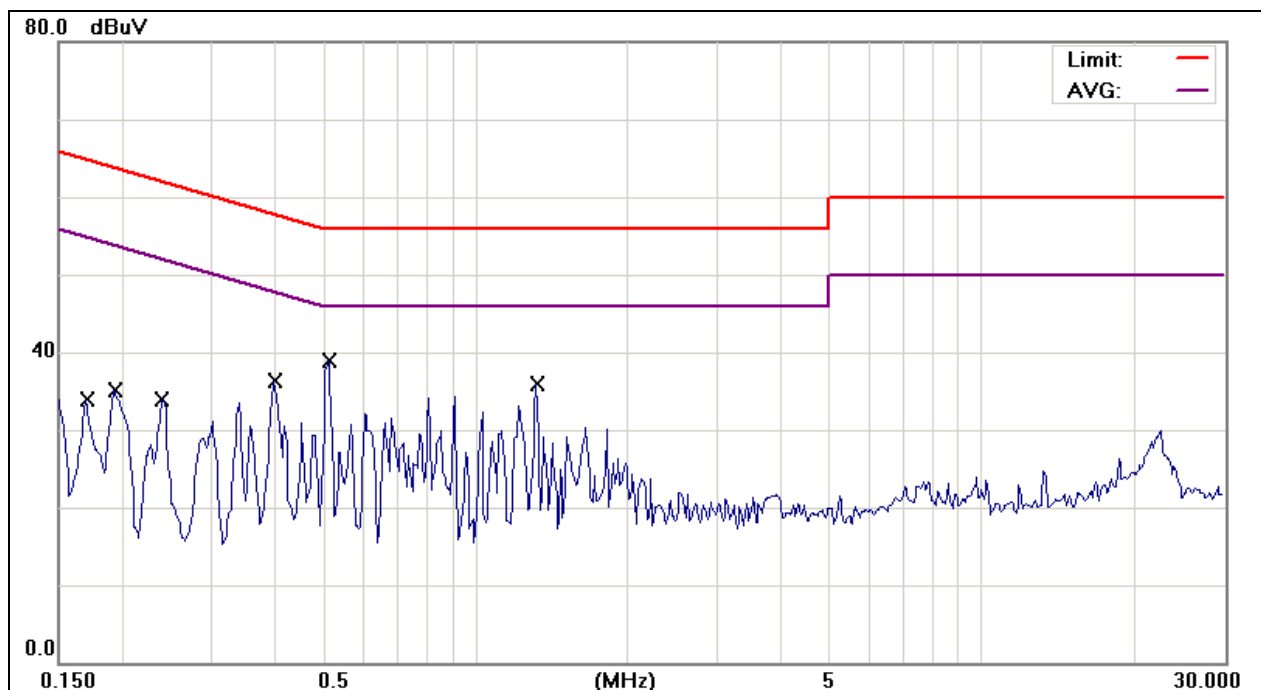
Line

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.1693	21.30	9.59	30.89	64.99	-34.10	QP
2	0.1693	19.15	9.59	28.74	54.99	-26.25	AVG
3	0.1928	23.87	9.59	33.46	63.92	-30.46	QP
4	0.1928	22.93	9.59	32.52	53.92	-21.40	AVG
5	0.2392	23.28	9.59	32.87	62.12	-29.25	QP
6	0.2392	20.19	9.59	29.78	52.12	-22.34	AVG
7	0.3994	25.24	9.58	34.82	57.87	-23.05	QP
8	0.3994	24.13	9.58	33.71	47.87	-14.16	AVG
9	0.5121	28.05	9.58	37.63	56.00	-18.37	QP
10	0.5121	24.40	9.58	33.98	46.00	-12.02	AVG
11	1.3183	26.34	9.61	35.95	56.00	-20.05	QP
12	1.3183	23.22	9.61	32.83	46.00	-13.17	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. " " means that this data is the worse case measurement level.

Line



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "AVG" refers to the limit of Average.

Date of Test	November 30, 2007	Temperature	26
EUT	Wireless Mouse	Humidity	60 %
Test Mode	Mode 2		

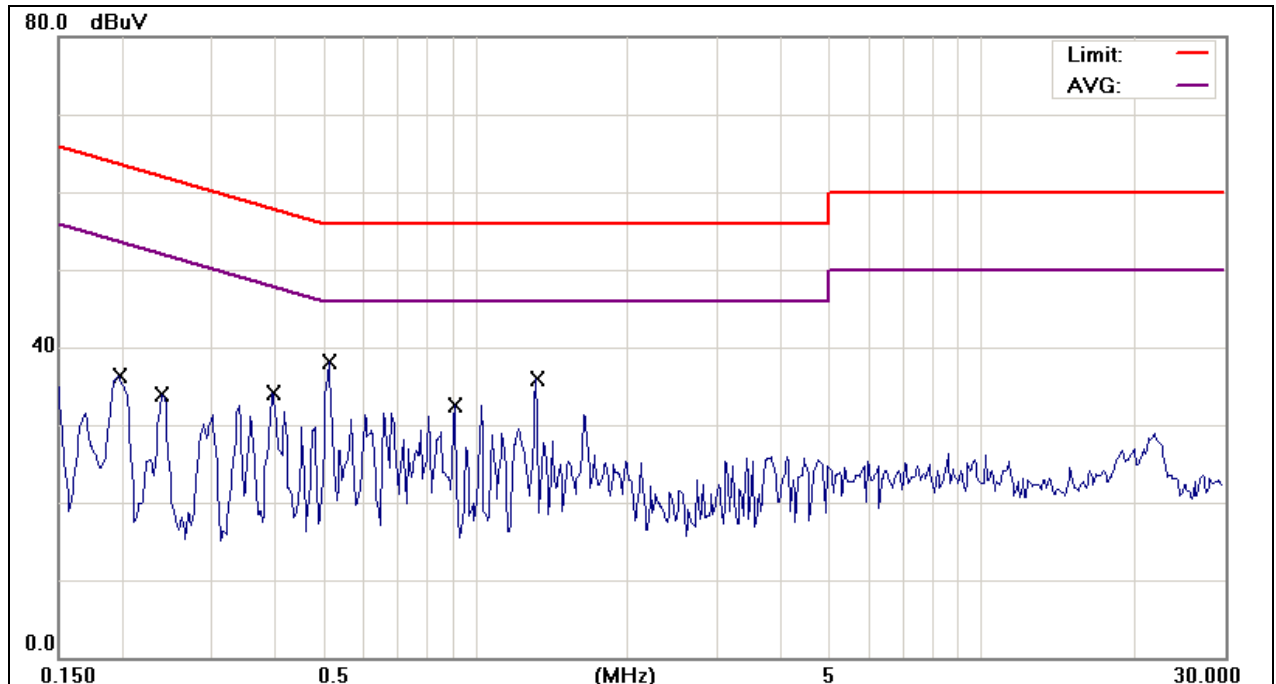
Neutral

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.1968	24.29	9.59	33.88	63.74	-29.86	QP
2	0.1968	22.09	9.59	31.68	53.74	-22.06	AVG
3	0.2394	23.38	9.59	32.97	62.12	-29.15	QP
4	0.2394	20.19	9.59	29.78	52.12	-22.34	AVG
5	0.3952	22.09	9.58	31.67	57.95	-26.28	QP
6	0.3952	21.20	9.58	30.78	47.95	-17.17	AVG
7	0.5125	26.89	9.58	36.47	56.00	-19.53	QP
8	0.5125	23.75	9.58	33.33	46.00	-12.67	AVG
9	0.9105	21.65	9.60	31.25	56.00	-24.75	QP
10	0.9105	20.96	9.60	30.56	46.00	-15.44	AVG
11	1.3187	25.76	9.64	35.40	56.00	-20.60	QP
12	1.3187	22.80	9.64	32.44	46.00	-13.56	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. " " means that this data is the worse case measurement level.

Neutral



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "AVG" refers to the limit of Average.

## 4. RADIATION EMISSION DATA

### 4.1 TEST EQUIPMENT

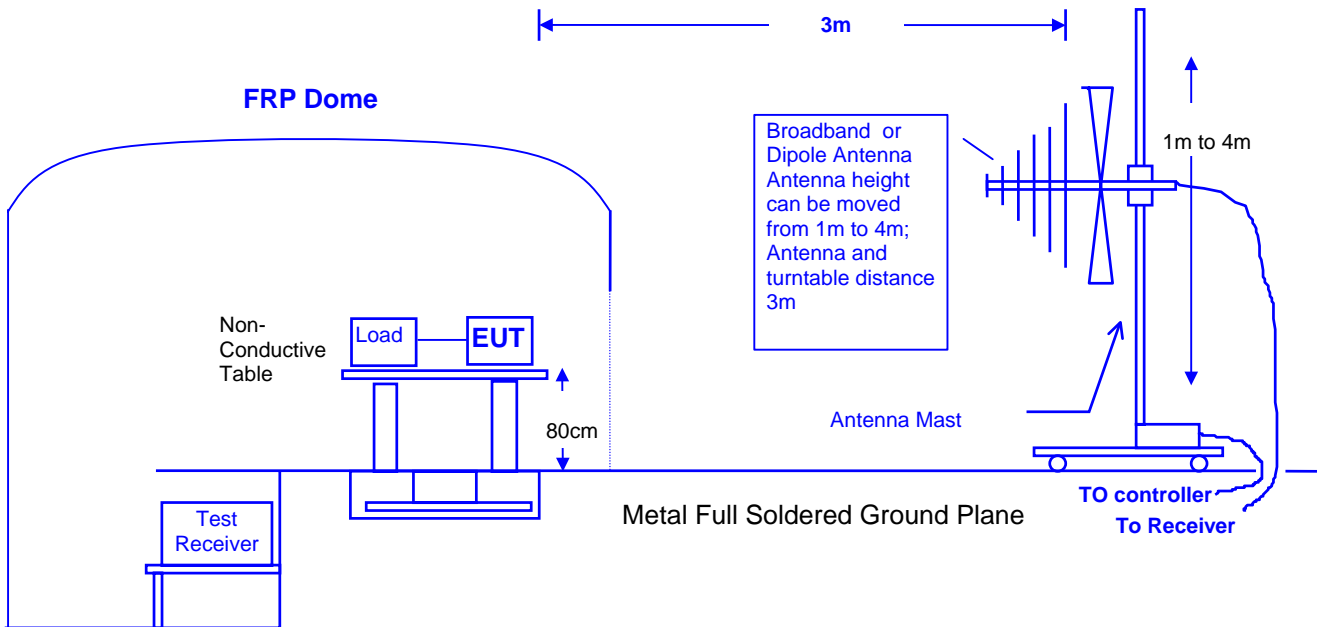
The following test equipments are used during the radiated emission tests:

Item	Instrument	Manufacturer	Model	Serial No.	Next Cal.
1	Test Receiver	R & S	ESCS30	825022/003	2008.05.25
2	Spectrum Analyzer	ADVANTEST	R3172	101202152	2008.08.27
3	Power Meter	Rohde & Schwarz	NRVS	100666	2008.04.03
4	Peak Power Sensor	Rohde & Schwarz	NRV-Z32	836019-058	2008.04.03
5	Pre-Amplifier	EMV-Technik	PA303	N/A	2008.04.18
6	Pre-Amplifier	HP	8447D	2944A08273	2008.10.08
7	BILOG ANTENNA	SCHAFFNER	CBL6112B	2580	2008.11.22
8	HORN ANTENNA	SCHWARZBECK	BBHA 9120	D243	2007.12.24
9	CABLE	GTK	N/A	GTK-E-A152-01	2007.12.14
10	Open Site	GesTek	N/A	B2	2008.11.04
11	Test Program Software	GesTek	N/A	GTK-E-S001-01	N/A

### 4.2 OPEN TEST SITE SETUP DIAGRAM

Note: This is a comprehensive setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



### 4.3 RADIATED EMISSION LIMIT

**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	Distance	Field Strength	
		$\mu\text{V/M}$	$\text{dB}\mu\text{V/M}$
MHz	Meter		
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0

**Remarks :**

1. RF Voltage ( $\text{dB}\mu\text{V/m}$ ) =  $20 \log$  RF Voltage ( $\mu\text{V/m}$ )
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.

**Fundamental and Harmonics Emission Limits**

Frequency	Distance	Field Strength of Fundamental		Field Strength of Harmonics	
		$\text{mV/M}$	$\text{dB}\mu\text{V/M}$	$\mu\text{V/M}$	$\text{dB}\mu\text{V/M}$
MHz	Meter				
902-928	3	50	94	500	54
2400-2483.5	3	50	94	500	54
5725-5875	3	50	94	500	54

**Remarks :**

1. RF Voltage ( $\text{dB}\mu\text{V/m}$ ) =  $20 \log$  RF Voltage ( $\mu\text{V/m}$ )
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.



#### 4.4 EUT CONFIGURATION

The equipment which is listed 2.6 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.

The device under test, installed in a representative system as described in section 3.2, was placed on a non-conductive table whose total height equaled 80 cm. This table can be rotated 360 degree. The measurement antenna was mounted to a non-conductive mast capable of moving the antenna vertically. Antenna height was varied from 1 meter to 4 meters and the system under test was rotated from 0 degree through 360 degrees relative to the antenna position and polarization (Horizontal and Vertical). Also the I/O cable position was investigated to find the maximum emission condition.

#### 4.5 OPERATING CONDITION OF EUT

Same as section 2.7.

#### 4.6 RADIATED EMISSION DATA

The measurement range of radiated emission, which is from 30 MHz to 10<sup>th</sup> harmonic of the fundamental, was investigated. All readings below 1GHz are quasi-peak values with a resolution bandwidth of 120 KHz. Above 1GHz are peak and avg. values with a resolution bandwidth of 1MHz. The initial step in collecting radiated emission data is a spectrum analyzer peak scans of the measurement range for all the test modes and then use test receiver for final measurement. Then the worst modes were reported the following data pages.

### 4.7 RADIATED EMISSIONS MEASUREMENT RESULTS

#### 4.7.1 HARMONIC RADIATED EMISSIONS

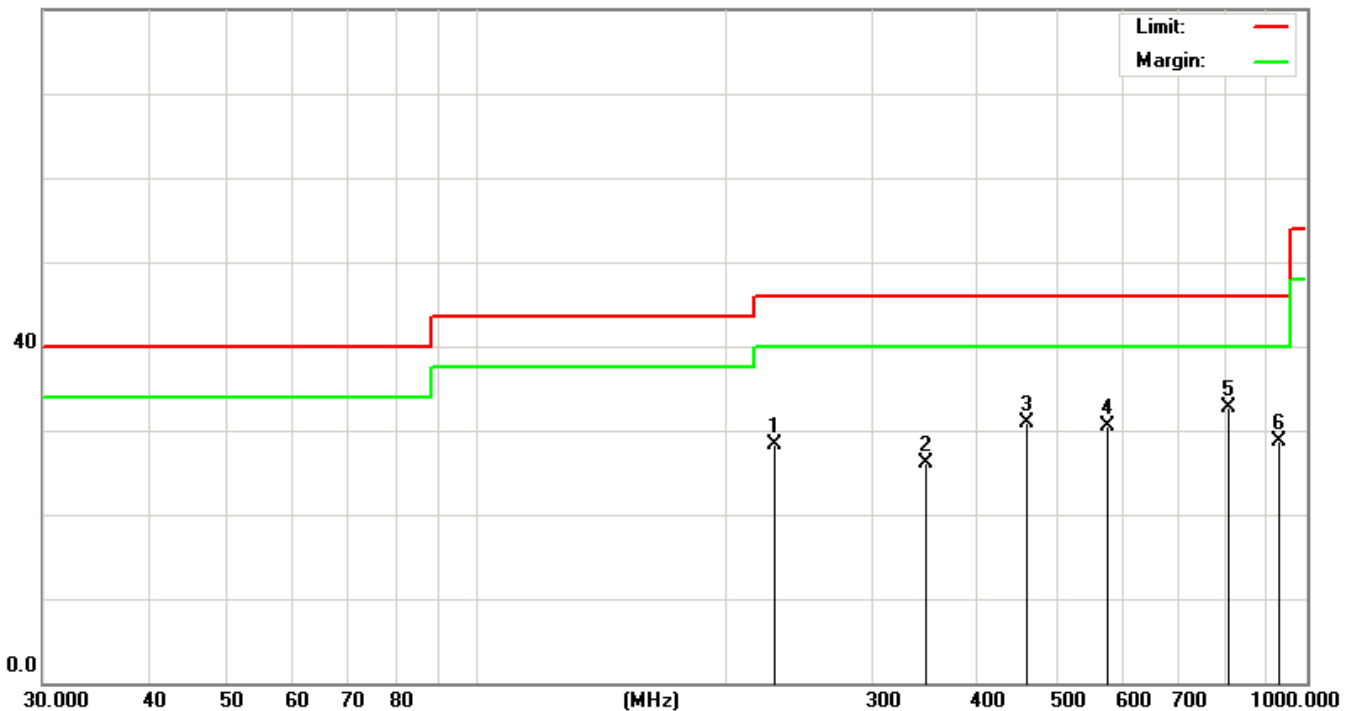
Date of Test	November 07, 2007	Temperature	26 deg/C
EUT	Wireless Mouse	Humidity	60 %RH
Working Cond.	Mode 1	Display Pattern	H Pattern
Antenna distance	3m at Horizontal	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV/m	Limit dBµV/m	Over Limit dB	Detector
1	228.5310	39.89	-11.59	28.30	46.00	-17.70	QP
2	347.8544	33.22	-7.12	26.10	46.00	-19.90	QP
3	460.0275	35.76	-4.90	30.86	46.00	-15.14	QP
4	577.7448	33.15	-2.70	30.45	46.00	-15.55	QP
5	809.2540	31.76	1.02	32.78	46.00	-13.22	QP
6	925.8453	25.71	2.97	28.68	46.00	-17.32	QP

**Remarks:**

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “ ” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dBµV/m



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

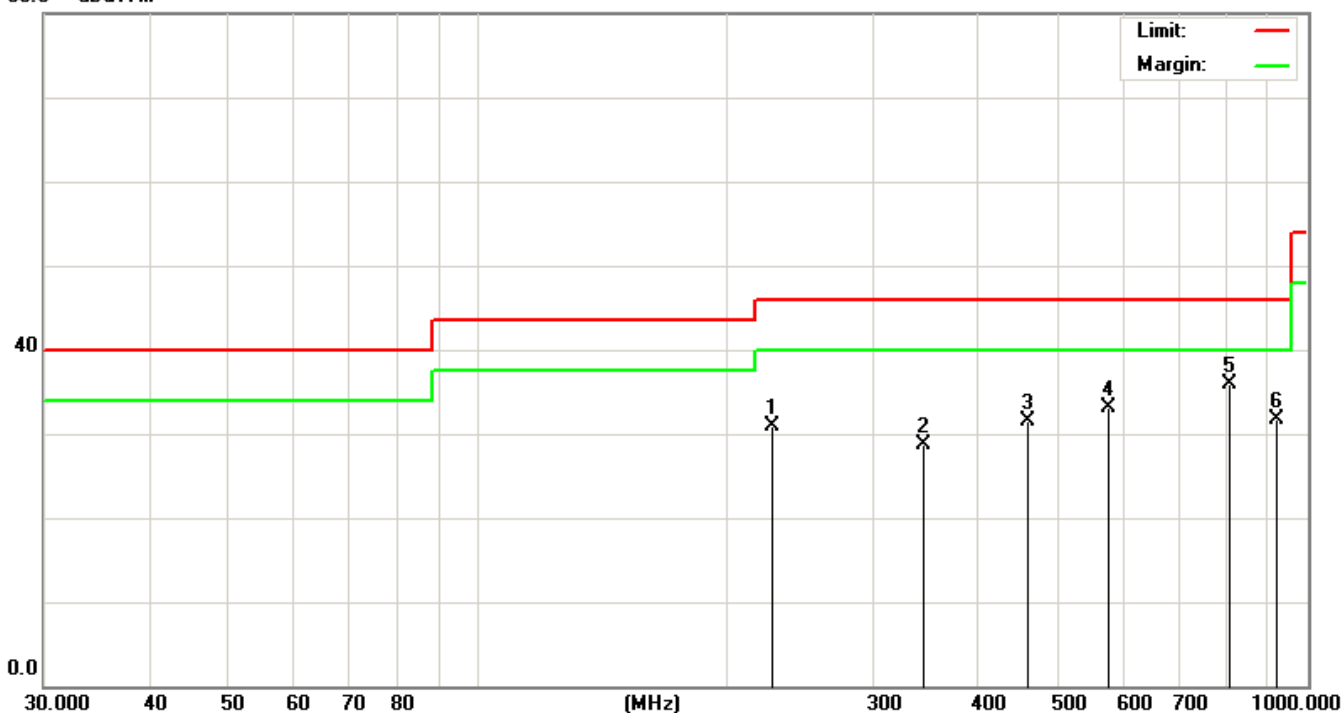
Date of Test	November 07, 2007	Temperature	26 deg/C
EUT	Wireless Mouse	Humidity	60 %RH
Working Cond.	Mode 1	Display Pattern	H Pattern
Antenna distance	3m at Vertical	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	227.5600	42.50	-11.66	30.84	46.00	-15.16	QP
2	346.5400	35.80	-7.15	28.65	46.00	-17.35	QP
3	461.1400	36.40	-4.88	31.52	46.00	-14.48	QP
4	576.6400	35.87	-2.72	33.15	46.00	-12.85	QP
5	808.2400	34.80	1.01	35.81	46.00	-10.19	QP
6	924.4600	28.70	2.94	31.64	46.00	-14.36	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “ ” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dBμV/m



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

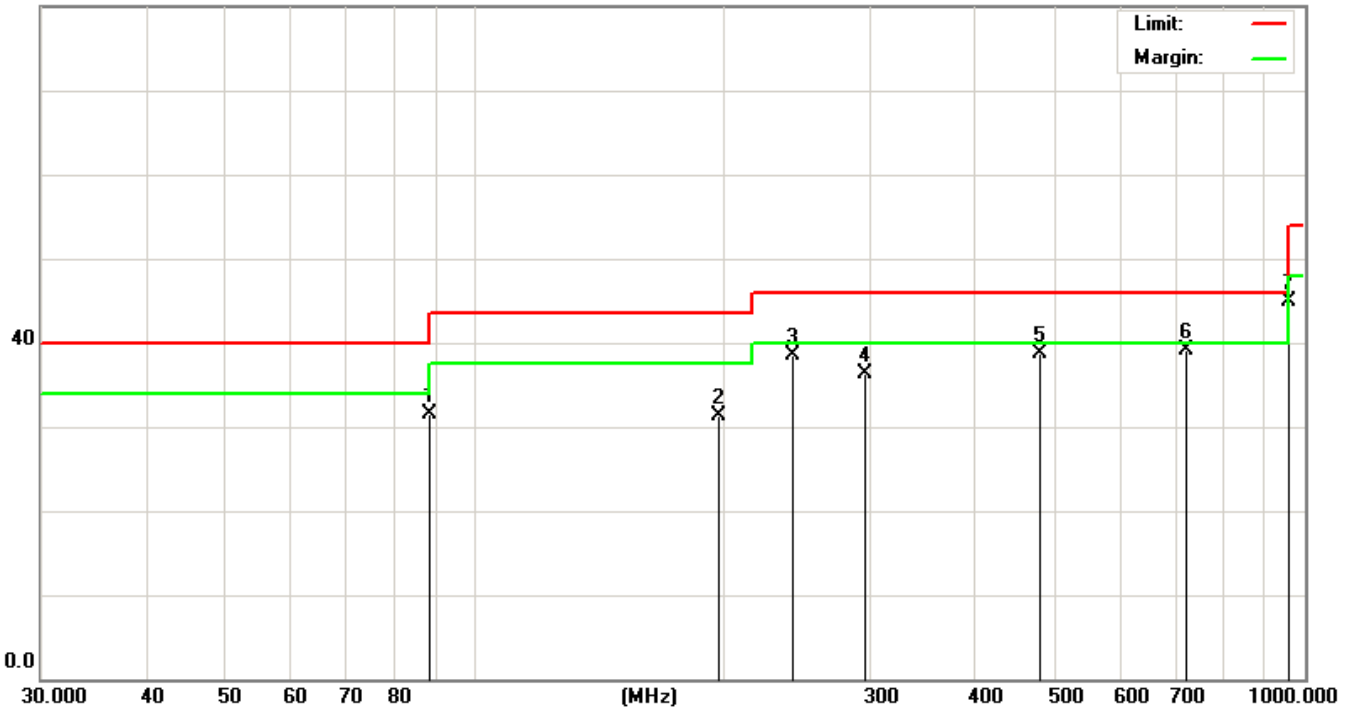
Date of Test	December 01, 2007	Temperature	26 deg/C
EUT	Wireless Mouse	Humidity	60 %RH
Working Cond.	Mode 2	Display Pattern	H Pattern
Antenna distance	3m at Horizontal	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV/m	Limit dBµV/m	Over Limit dB	Detector
1	88.2000	48.74	-17.20	31.54	43.50	-11.96	QP
2	197.3250	45.73	-14.42	31.31	43.50	-12.19	QP
3	241.9500	49.45	-10.97	38.48	46.00	-7.52	QP
4	296.7500	45.27	-8.89	36.38	46.00	-9.62	QP
5	480.3000	43.19	-4.52	38.67	46.00	-7.33	QP
6	720.1150	39.33	-0.13	39.20	46.00	-6.80	QP
7	961.2250	40.42	4.41	44.83	54.00	-9.17	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “ ” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dBµV/m



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

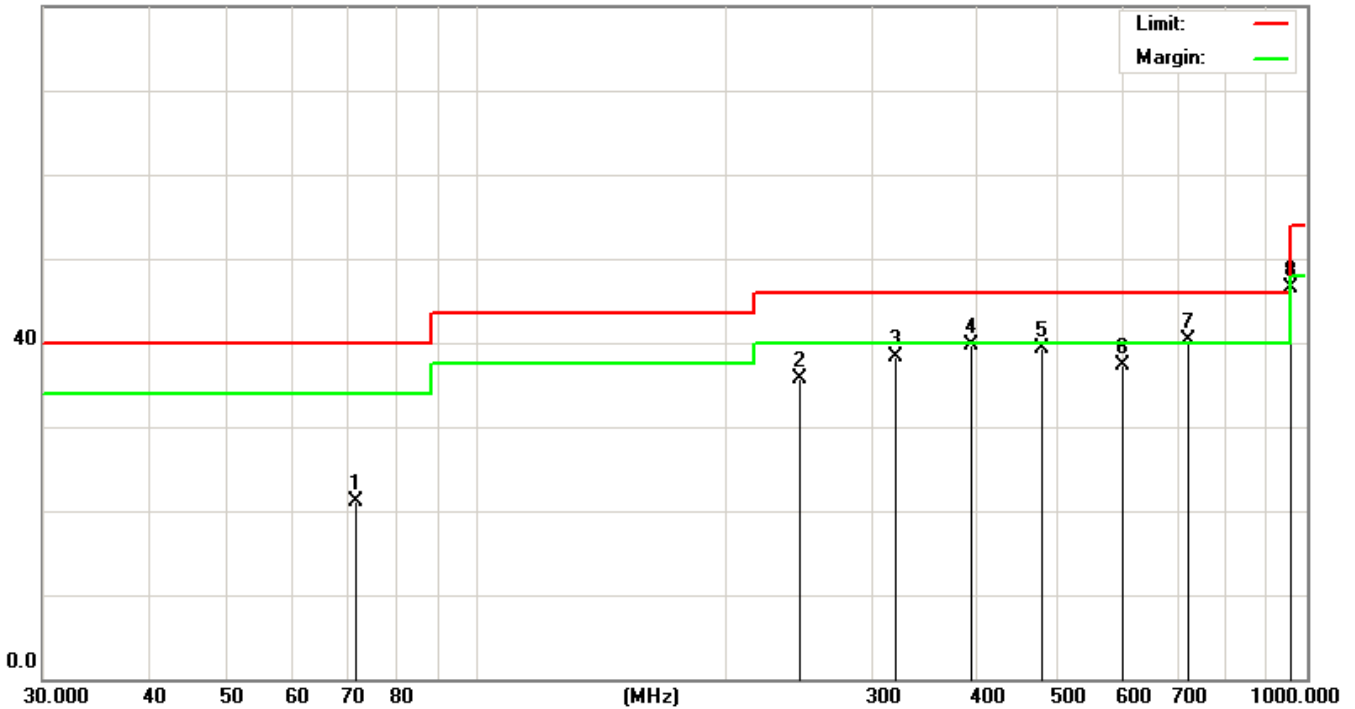
Date of Test	December 01, 2007	Temperature	26 deg/C
EUT	Wireless Mouse	Humidity	60 %RH
Working Cond.	Mode 2	Display Pattern	H Pattern
Antenna distance	3m at Vertical	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	71.2250	40.08	-19.07	21.01	40.00	-18.99	QP
2	245.8250	46.37	-10.66	35.71	46.00	-10.29	QP
3	321.0000	46.46	-8.22	38.24	46.00	-7.76	QP
4	393.7500	45.94	-6.24	39.70	46.00	-6.30	QP
5	481.4000	43.86	-4.50	39.36	46.00	-6.64	QP
6	599.8750	39.32	-2.08	37.24	46.00	-8.76	QP
7	720.1550	40.52	-0.13	40.39	46.00	-5.61	QP
8	960.3350	42.15	4.39	46.54	54.00	-7.46	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “ ” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dBuV/m



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 0	Display Pattern	H Pattern
Antenna distance	3m at Horizontal	Frequency Range	Above 1GHz

## Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	4823.5000	49.92	1.46	51.38	74.00	-22.62
2	4919.5000	49.57	1.39	50.96	74.00	-23.04
3	7235.3000	50.71	9.38	60.09	74.00	-13.91
4	7379.3000	54.08	9.03	63.11	74.00	-10.89
5	9647.0000	45.64	6.70	52.34	74.00	-21.66
6	9840.0000	44.78	5.80	50.58	74.00	-23.42
7	12060.0000	39.77	14.07	53.84	74.00	-20.16
8	12300.0000	42.37	9.39	51.76	74.00	-22.24
9	14472.0000	42.47	8.76	51.23	74.00	-22.77
10	14760.0000	44.12	9.32	53.44	74.00	-20.56

## Average

No.	Frequency MHz	Peak Measurement dB(uV/m)	Duty Cycle dB	Measurement dB(uV/m)	Limit dB(uV/m)	Margin dB
1	7235.3	60.09	-18.24	41.85	54.00	-12.15
2	7379.3	63.11	-18.24	44.87	54.00	-9.13

## Remark

- All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
- Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHz, Span=100MHz.
- AVG Measurement =Peak Measurement + Duty Cycle(Log Scale).
- Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
- Factor = antenna factor + cable loss – amplifier gain.
- Over Limit (Margin Value)=Measurement level-Limit value.
- The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
- The Duty Cycle is refer to section 5.
- If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.
- The emission level of other frequencies are very lower than the limit.

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 0	Display Pattern	H Pattern
Antenna distance	3m at Vertical	Frequency Range	Above 1GHz

## Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	4824.0000	51.23	1.61	52.84	74.00	-21.16
2	4919.8000	51.15	2.35	53.50	74.00	-20.50
3	7236.0000	49.83	8.70	58.53	74.00	-15.47
4	7379.3000	51.90	8.47	60.37	74.00	-13.63
5	9648.0000	43.63	10.06	53.69	74.00	-20.31
6	9840.0000	44.06	9.78	53.84	74.00	-20.16
7	12060.0000	36.55	16.52	53.07	74.00	-20.93
8	12300.0000	41.28	11.92	53.20	74.00	-20.80
9	14472.0000	42.18	7.17	49.35	74.00	-24.65
10	14760.0000	42.87	7.55	50.42	74.00	-23.58

## Average

No.	Frequency MHz	Peak Measurement dB(uV/m)	Duty Cycle dB	Measurement dB(uV/m)	Limit dB(uV/m)	Margin dB
1	7236.0	58.53	-18.24	40.29	54.00	-13.71
2	7379.3	60.37	-18.24	42.13	54.00	-11.87

## Remark

- All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
- Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHz, Span=100MHz.
- AVG Measurement =Peak Measurement + Duty Cycle(Log Scale).
- Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
- Factor = antenna factor + cable loss – amplifier gain.
- Over Limit (Margin Value)=Measurement level-Limit value.
- The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
- The Duty Cycle is refer to section 5.
- If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.
- The emission level of other frequencies are very lower than the limit.

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 7	Display Pattern	H Pattern
Antenna distance	3m at Horizontal	Frequency Range	Above 1GHz

## Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	4837.3000	56.47	1.45	57.92	74.00	-16.08
2	4933.5000	57.23	1.37	58.60	74.00	-15.40
3	7256.3000	47.91	9.43	57.34	74.00	-16.66
4	7400.8000	48.76	8.95	57.71	74.00	-16.29
5	9676.0000	42.67	6.81	49.48	74.00	-24.52
6	9868.0000	43.83	5.39	49.22	74.00	-24.78
7	12095.0000	40.50	13.41	53.91	74.00	-20.09
8	12335.0000	40.74	8.62	49.36	74.00	-24.64
9	14514.0000	42.10	8.65	50.75	74.00	-23.25
10	14802.0000	42.37	8.91	51.28	74.00	-22.72

## Average

No.	Frequency MHz	Peak Measurement dB(uV/m)	Duty Cycle dB	Measurement dB(uV/m)	Limit dB(uV/m)	Margin dB
1	4837.3	57.92	-18.24	39.68	54.00	-14.32
2	4933.5	58.60	-18.24	40.36	54.00	-13.64
3	7256.3	57.34	-18.24	39.10	54.00	-14.90
4	7400.8	57.71	-18.24	39.47	54.00	-14.53

## Remark

- All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
- Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHZ, Span=100MHz.
- AVG Measurement =Peak Measurement + Duty Cycle(Log Scale).
- Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
- Factor = antenna factor + cable loss – amplifier gain.
- Over Limit (Margin Value)=Measurement level-Limit value.
- The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
- The Duty Cycle is refer to section 5.
- If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.
- The emission level of other frequencies are very lower than the limit.



Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 7	Display Pattern	H Pattern
Antenna distance	3m at Vertical	Frequency Range	Above 1GHz

## Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	4837.5000	58.57	1.72	60.29	74.00	-13.71
2	4933.5000	59.86	2.45	62.31	74.00	-11.69
3	7257.0000	47.37	8.67	56.04	74.00	-17.96
4	7400.0000	47.86	8.43	56.29	74.00	-17.71
5	9674.8000	46.93	9.98	56.91	74.00	-17.09
6	9867.8000	47.18	9.78	56.96	74.00	-17.04
7	12095.0000	37.75	15.87	53.62	74.00	-20.38
8	12335.0000	41.36	11.22	52.58	74.00	-21.42
9	14514.0000	42.27	6.96	49.23	74.00	-24.77
10	14802.0000	43.12	7.22	50.34	74.00	-23.66

## Average

No.	Frequency MHz	Peak Measurement dB(uV/m)	Duty Cycle dB	Measurement dB(uV/m)	Limit dB(uV/m)	Margin dB
1	4837.5	60.29	-18.24	42.05	54.00	-11.95
2	4933.5	62.31	-18.24	44.07	54.00	-9.93
3	7257.0	56.04	-18.24	37.80	54.00	-16.20
4	7400.0	56.29	-18.24	38.05	54.00	-15.95
5	9674.8	56.91	-18.24	38.67	54.00	-15.33
6	9867.8	56.96	-18.24	38.72	54.00	-15.28

## Remark

- All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
- Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHz, Span=100MHz.
- AVG Measurement =Peak Measurement + Duty Cycle(Log Scale).
- Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
- Factor = antenna factor + cable loss – amplifier gain.
- Over Limit (Margin Value)=Measurement level-Limit value.
- The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
- The Duty Cycle is refer to section 5.
- If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.
- The emission level of other frequencies are very lower than the limit.

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 15	Display Pattern	H Pattern
Antenna distance	3m at Horizontal	Frequency Range	Above 1GHz

## Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	4853.5000	53.85	1.44	55.29	74.00	-18.71
2	4949.3000	52.72	1.35	54.07	74.00	-19.93
3	7280.3000	47.96	9.42	57.38	74.00	-16.62
4	7424.8000	48.26	8.84	57.10	74.00	-16.90
5	9708.3000	45.89	6.94	52.83	74.00	-21.17
6	9899.0000	46.28	4.93	51.21	74.00	-22.79
7	12135.0000	40.52	12.66	53.18	74.00	-20.82
8	12375.0000	42.01	7.77	49.78	74.00	-24.22
9	14562.0000	43.11	8.79	51.90	74.00	-22.10
10	14850.0000	42.39	8.44	50.83	74.00	-23.17

## Average

No.	Frequency MHz	Peak Measurement dB(uV/m)	Duty Cycle dB	Measurement dB(uV/m)	Limit dB(uV/m)	Margin dB
1	4853.6	55.29	-18.24	37.05	54.00	-16.95
2	4949.3	54.07	-18.24	35.83	54.00	-18.17
3	7280.3	57.38	-18.24	39.14	54.00	-14.86
4	7424.8	57.10	-18.24	38.86	54.00	-15.14

## Remark

- All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
- Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHZ, Span=100MHz.
- AVG Measurement =Peak Measurement + Duty Cycle(Log Scale).
- Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
- Factor = antenna factor + cable loss – amplifier gain.
- Over Limit (Margin Value)=Measurement level-Limit value.
- The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
- The Duty Cycle is refer to section 5.
- If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.
- The emission level of other frequencies are very lower than the limit.

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 15	Display Pattern	H Pattern
Antenna distance	3m at Vertical	Frequency Range	Above 1GHz

## Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	4853.5000	55.02	1.84	56.86	74.00	-17.14
2	4949.8000	54.23	2.57	56.80	74.00	-17.20
3	7280.0000	47.30	8.64	55.94	74.00	-18.06
4	7424.0000	48.03	8.39	56.42	74.00	-17.58
5	9706.8000	46.38	9.89	56.27	74.00	-17.73
6	9900.3000	46.72	9.78	56.50	74.00	-17.50
7	12133.5000	46.91	15.14	62.05	74.00	-11.95
8	12374.8000	45.75	10.45	56.20	74.00	-17.80
9	14562.0000	42.25	7.07	49.32	74.00	-24.68
10	14850.0000	42.44	6.84	49.28	74.00	-24.72

## Average

No.	Frequency MHz	Peak Measurement dB(uV/m)	Duty Cycle dB	Measurement dB(uV/m)	Limit dB(uV/m)	Margin dB
1	4853.5	56.86	-18.24	38.62	54.00	-15.38
2	4949.8	56.80	-18.24	38.56	54.00	-15.44
3	7280.0	55.94	-18.24	37.70	54.00	-16.30
4	7424.0	56.42	-18.24	38.18	54.00	-15.82
5	9706.8	56.27	-18.24	38.03	54.00	-15.97
6	9900.3	56.50	-18.24	38.26	54.00	-15.74
7	12133.5	62.05	-18.24	43.81	54.00	-10.19
8	12374.8	56.20	-18.24	37.96	54.00	-16.04

## Remark

- All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
- Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHZ, Span=100MHz.
- AVG Measurement =Peak Measurement + Duty Cycle(Log Scale).
- Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
- Factor = antenna factor + cable loss – amplifier gain.
- Over Limit (Margin Value)=Measurement level-Limit value.
- The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
- The Duty Cycle is refer to section 5.
- If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.
- The emission level of other frequencies are very lower than the limit.

#### 4.7.2 FUNDAMENTAL RADIATED EMISSIONS

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 0		
Antenna distance	3m at <b>Horizontal</b>		

#### Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	2412.2000	46.45	31.47	77.92	114.00	-36.08
2	2460.0000	45.26	31.36	76.62	114.00	-37.38

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 0		
Antenna distance	3m at <b>Vertical</b>		

#### Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	2412.0000	42.88	24.44	67.32	114.00	-46.68
2	2460.0000	41.64	23.66	65.30	114.00	-48.70

#### Remark

- All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
- Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHz, Span=100MHz.
- AVG Measurement =Peak Measurement + Duty Cycle(Log Scale).
- Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
- Factor = antenna factor + cable loss – amplifier gain.
- Over Limit (Margin Value)=Measurement level-Limit value.
- The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
- The Duty Cycle is refer to section 5.
- If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 7		
Antenna distance	3m at <b>Horizontal</b>		

### Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	2418.7000	50.18	31.46	81.64	114.00	-32.36
2	2466.7000	48.57	31.35	79.92	114.00	-34.08

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 7		
Antenna distance	3m at <b>Vertical</b>		

### Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	2418.7000	41.93	24.33	66.26	114.00	-47.74
2	2466.7000	41.29	23.55	64.84	114.00	-49.16

### Remark

- All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
- Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHz, Span=100MHz.
- AVG Measurement =Peak Measurement + Duty Cycle(Log Scale).
- Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
- Factor = antenna factor + cable loss – amplifier gain.
- Over Limit (Margin Value)=Measurement level-Limit value.
- The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
- The Duty Cycle is refer to section 5.
- If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 15		
Antenna distance	3m at <b>Horizontal</b>		

### Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	2426.7000	50.86	31.44	82.30	114.00	-31.70
2	2474.7000	48.36	31.33	79.69	114.00	-34.31

Date of Test	November 01, 2007	Temperature	24.4 deg/C
EUT	Wireless Mouse	Humidity	61 %RH
Working Cond.	Mode 1-Channel 15		
Antenna distance	3m at <b>Vertical</b>		

### Peak

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB
1	2426.7000	44.00	24.20	68.20	114.00	-45.80
2	2475.0000	43.66	23.42	67.08	114.00	-46.92

### Remark

- All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
- Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHz, Span=100MHz.
- AVG Measurement =Peak Measurement + Duty Cycle(Log Scale).
- Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
- Factor = antenna factor + cable loss – amplifier gain.
- Over Limit (Margin Value)=Measurement level-Limit value.
- The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
- The Duty Cycle is refer to section 5.
- If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

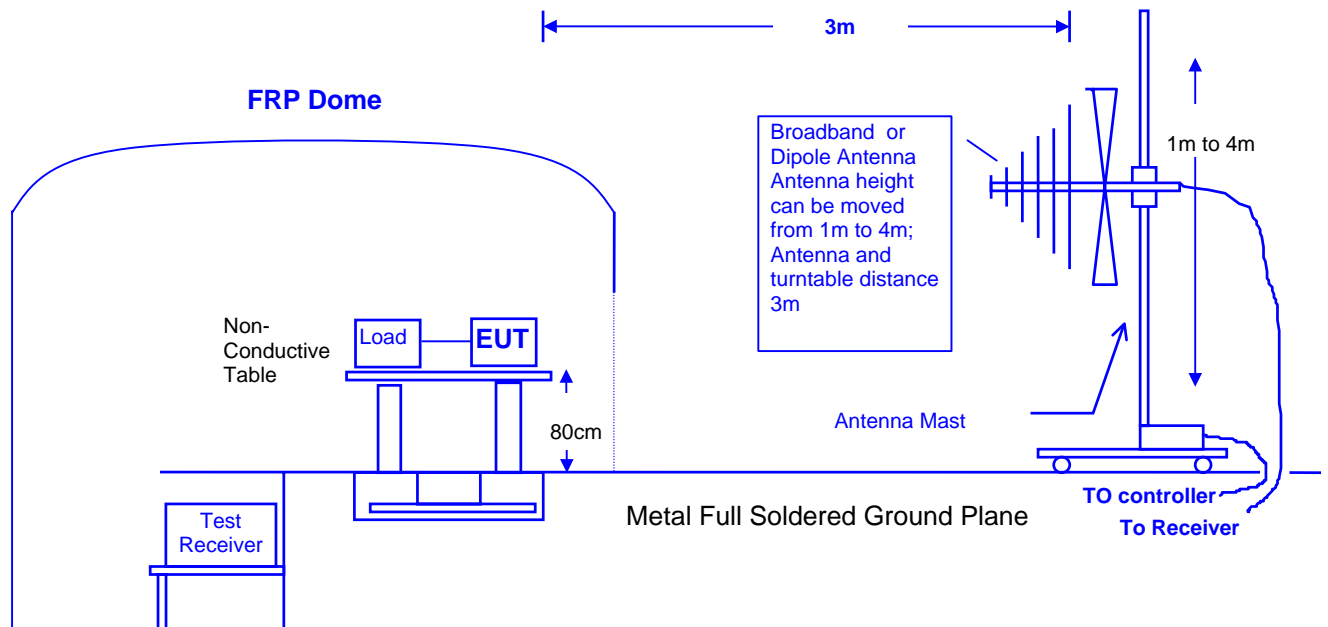
## 5. BAND EDGE

### 5.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	Serial No.	Next Cal.
1	Test Receiver	R & S	ESCS30	825022/003	2008.05.25
2	Spectrum Analyzer	ADVANTEST	R3172	101202152	2008.08.27
3	Power Meter	Rohde & Schwarz	NRVS	100666	2008.04.03
4	Peak Power Sensor	Rohde & Schwarz	NRV-Z32	836019-058	2008.04.03
5	Pre-Amplifier	EMV-Technik	PA303	N/A	2008.04.18
6	Pre-Amplifier	HP	8447D	2944A08273	2008.10.08
7	BILOG ANTENNA	SCHAFFNER	CBL6112B	2580	2008.11.22
8	HORN ANTENNA	SCHWARZBECK	BBHA 9120	D243	2007.12.24
9	CABLE	GTK	N/A	GTK-E-A152-01	2007.12.14
10	Open Site	GesTek	N/A	B2	2008.11.04
11	Test Program Software	GesTek	N/A	GTK-E-S001-01	N/A

### 5.2 BLOCK DIAGRAM OF TEST SETUP

◎ RF Radiated Measurement: ◎



### 5.3 BAND EDGE LIMIT

In any 100KHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 50dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209 (a) (see Section 15.205(c)).

### 5.4 EUT CONFIGURATION

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. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. 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 according to ANSI C63.4:2000 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120KHz, above 1GHz are 1MHz.

### 5.5 OPERATING CONDITION OF EUT

Same as section 2.7.



### 5.6 TEST RELULT

Date of Test	November 03, 2007	Temperature	24.3 deg/C
EUT	Wireless Mouse	Humidity	56 %RH
Working Cond.	Mode 1-Channel 0		
Antenna distance	3m at Horizontal	Test Band	Lower

### Radiation Emission of Fundamental Peak

Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]
2412.2	46.45	31.47	77.92

Remark:

1. All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
2. Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHZ.
3. Emission Level= Reading + Correction Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
4. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor

### TEST Result

The band edge emission plot on next page are Peak and Average. The polt for peak is appear (27.48)dB delta between carry power and maximum emission in restrict band 2326.4 MHz.

The above tables are list of fundamental emission test result.

Therefore, peak field strength of 2326.4 MHz is 77.92 dBuV/m – 27.48dB = 50.44dBuV/m which is under 74dBuV/m.

Remark:

If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

The average measurement was not performed when the peak measured data under the limit of average detection.

<b>Date of Test</b>	November 03, 2007	<b>Temperature</b>	24.3 deg/C
<b>EUT</b>	Wireless Mouse	<b>Humidity</b>	56 %RH
<b>Working Cond.</b>	Mode 1-Channel 0		
<b>Antenna distance</b>	3m at <b>Vertical</b>	<b>Test Band</b>	Lower

## Radiation Emission of Fundamental Peak

Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]
2412.0	42.88	24.44	67.32

**Remark:**

1. All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
2. Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHz.
3. Emission Level= Reading + Correction Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
4. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor

### TEST Result

The band edge emission plot on next page are Peak and Average. The polt for peak is appear (27.48)dB delta between carry power and maximum emission in restrict band 2326.4 MHz.

The above tables are list of fundamental emission test result.

Therefore, peak field strength of 2326.4 MHz is 67.32 dBuV/m – 27.48dB = 39.84dBuV/m which is under 74dBuV/m.

**Remark:**

If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test	November 03, 2007	Temperature	24.3 deg/C
EUT	Wireless Mouse	Humidity	56 %RH
Working Cond.	Mode 1-Channel 15		
Antenna distance	3m at Horizontal	Test Band	Higher

## Radiation Emission of Fundamental Peak

Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]
2474.7	48.36	31.33	79.69

Remark:

1. All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
2. Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHZ.
3. Emission Level= Reading + Correction Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
4. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor

### TEST Result

The band edge emission plot on next page are Peak and Average. The polt for peak is appear (27.11)dB delta between carry power and maximum emission in restrict band 2498.0 MHz.

The above tables are list of fundamental emission test result.

Therefore, peak field strength of 2498.0 MHz is 79.69 dBuV/m – 27.11 dB = 52.58dBuV/m which is under 74dBuV/m.

Remark:

If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test	November 03, 2007	Temperature	24.3 deg/C
EUT	Wireless Mouse	Humidity	56 %RH
Working Cond.	Mode 1-Channel 15		
Antenna distance	3m at Vertical	Test Band	Higher

## Radiation Emission of Fundamental Peak

Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]
2475.0	43.66	23.42	67.08

Remark:

1. All Readings below 1GHz are Quasi-Peak and above 1GHz are peak or average.
2. Spectrum Analyzer Setting(Peak Detector): RBW=1MHz, VBW=1MHZ.
3. Emission Level= Reading + Correction Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
4. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor

### TEST Result

The band edge emission plot on next page are Peak and Average. The polt for peak is appear (27.11)dB delta between carry power and maximum emission in restrict band 2498.0 MHz.

The above tables are list of fundamental emission test result.

Therefore, peak field strength of 2498.0 MHz is 67.08 dBuV/m – 27.11 dB = 39.97dBuV/m which is under 74dBuV/m.

Remark:

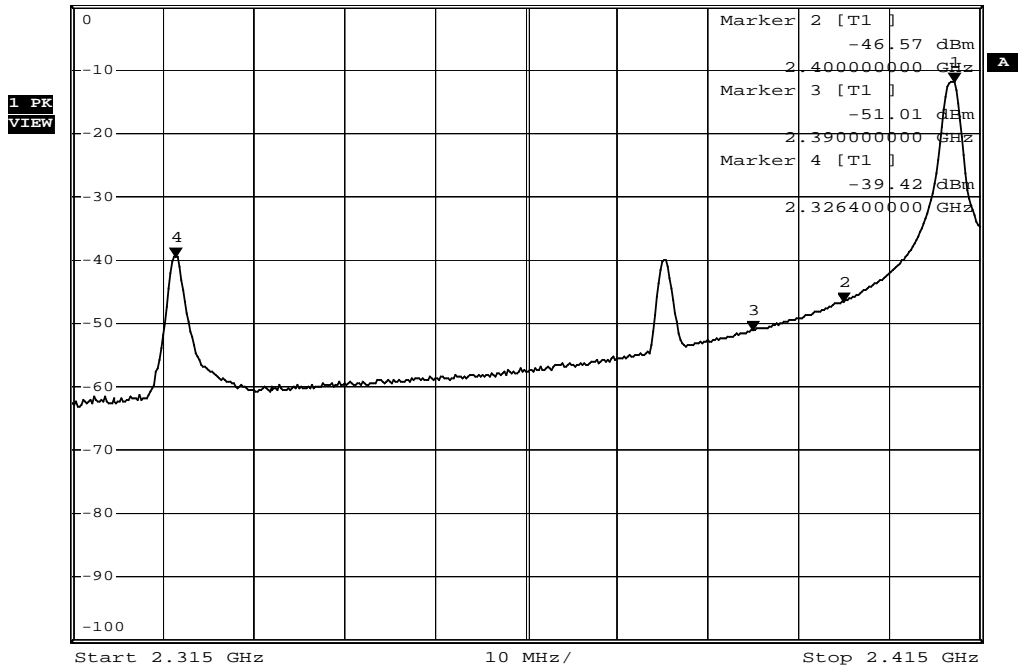
If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

The average measurement was not performed when the peak measured data under the limit of average detection.



\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 1 MHz      -11.94 dBm  
 \*SWT 300 ms      2.412200000 GHz

Ref 0 dBm      \*Att 10 dB

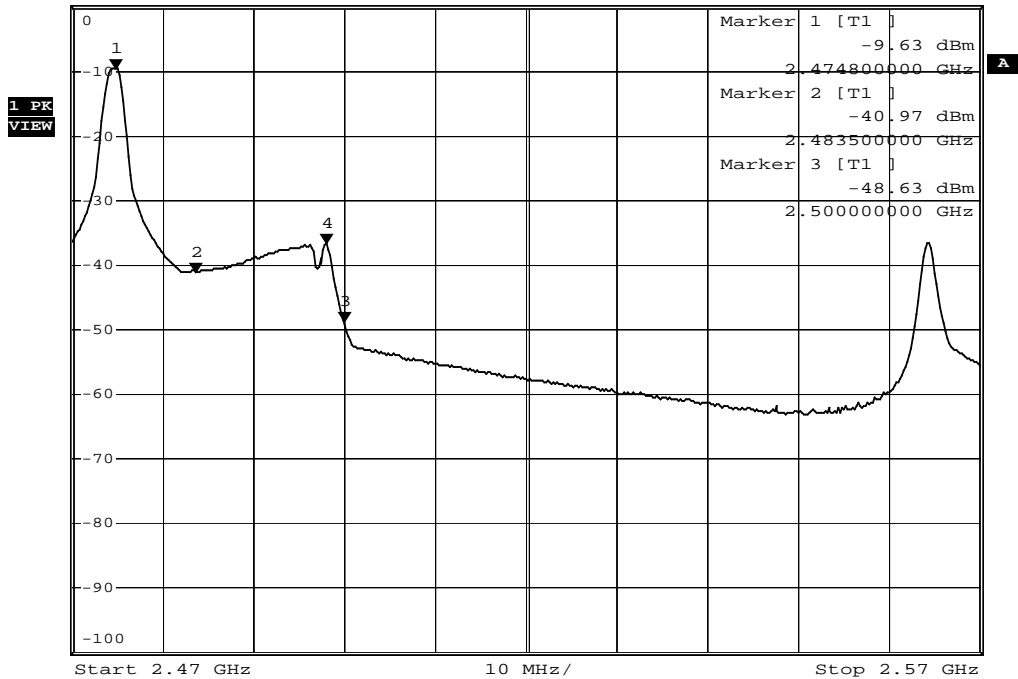


Date: 3.NOV.2007 15:00:26



\*RBW 1 MHz      Marker 4 [T1 ]  
 \*VBW 1 MHz      -36.74 dBm  
 \*SWT 300 ms      2.498000000 GHz

Ref 0 dBm      \*Att 10 dB



Date: 3.NOV.2007 15:24:03

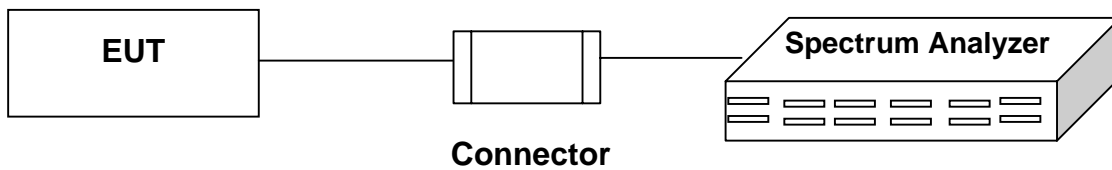
## 6. DUTY CYCLE

### 6.1 TEST EQUIPMENT

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

Item	Instrument	Manufacturer	Model	Serial No.	Next Cal.
1	Spectrum Analyzer	Rohde & Schwarz	FSP40	100061	2008.04.08
2	Spectrum Analyzer	HP	E4407B	US39240339	2008.08.06

### 6.2 BLOCK DIAGRAM OF TEST SETUP



### 6.3 TEST RESULT

Date of Test	November 03, 2007	Temperature	24.3 deg/C
EUT	Wireless Mouse	Humidity	56 %RH
Working Cond.	Mode 1-Channel 0		

Duty Cycle = Time on of 100msec / 100 msec

Frequency 2412 MHz

Time on of one slot length = 720 (μs) = 0.72 (msec)

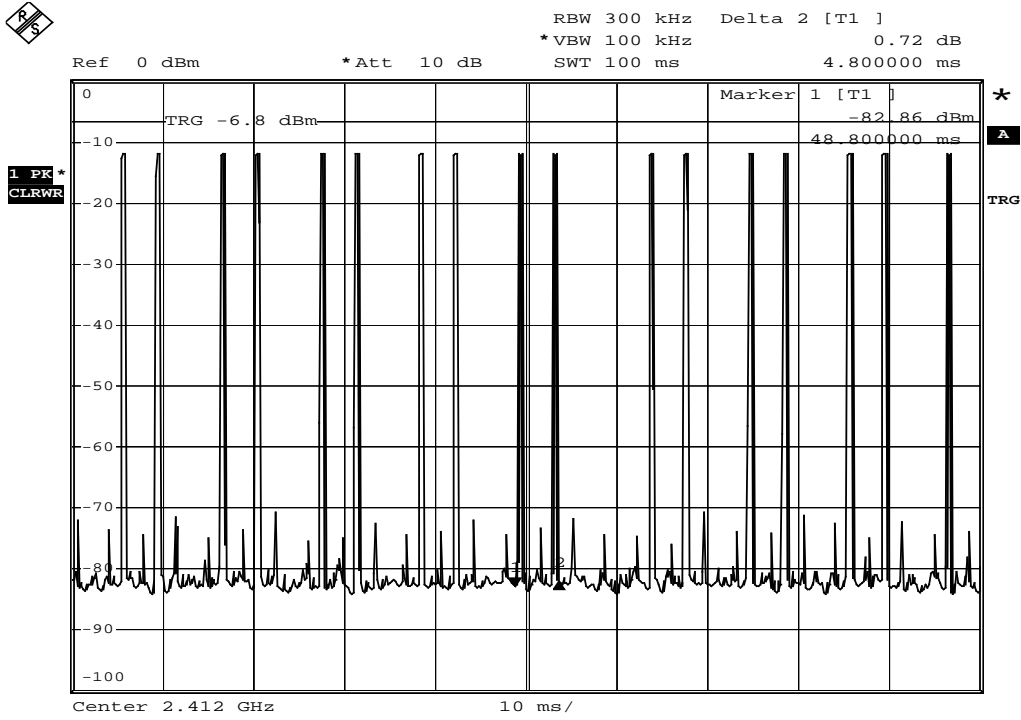
Time on of 100ms = 0.72 × 17 = 12.24 (msec)

Duty Cycle = 12.24 / 100msec = 0.1224

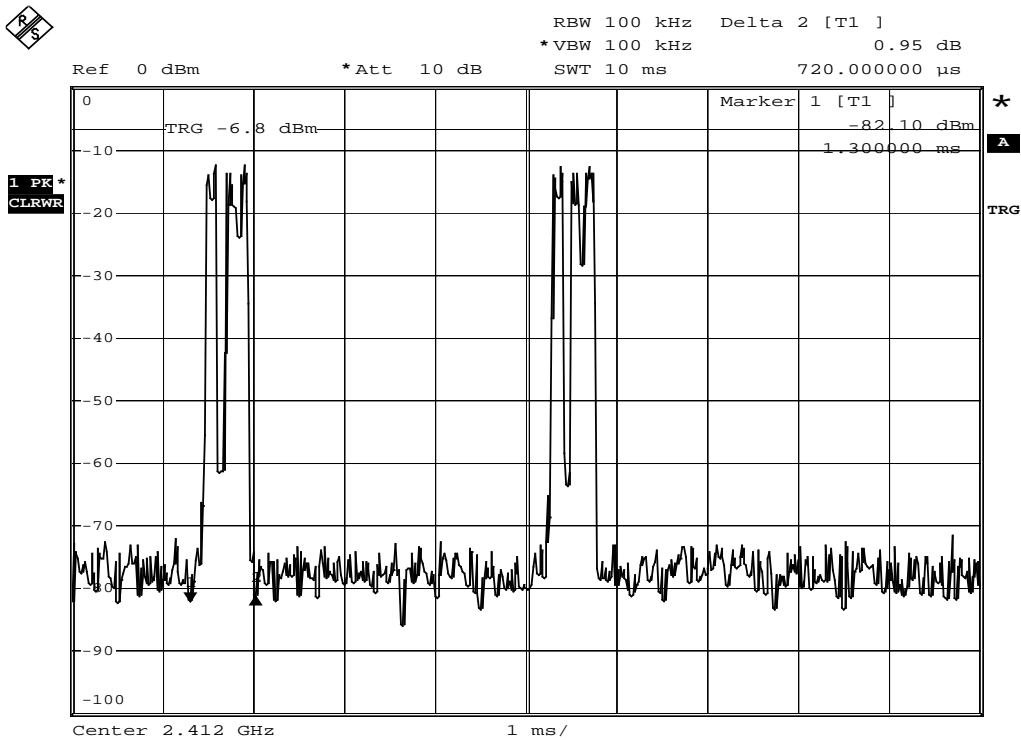
20 log 0.1224 = -18.24 dB

**Remark:**

If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.



Date: 3.NOV.2007 13:55:25

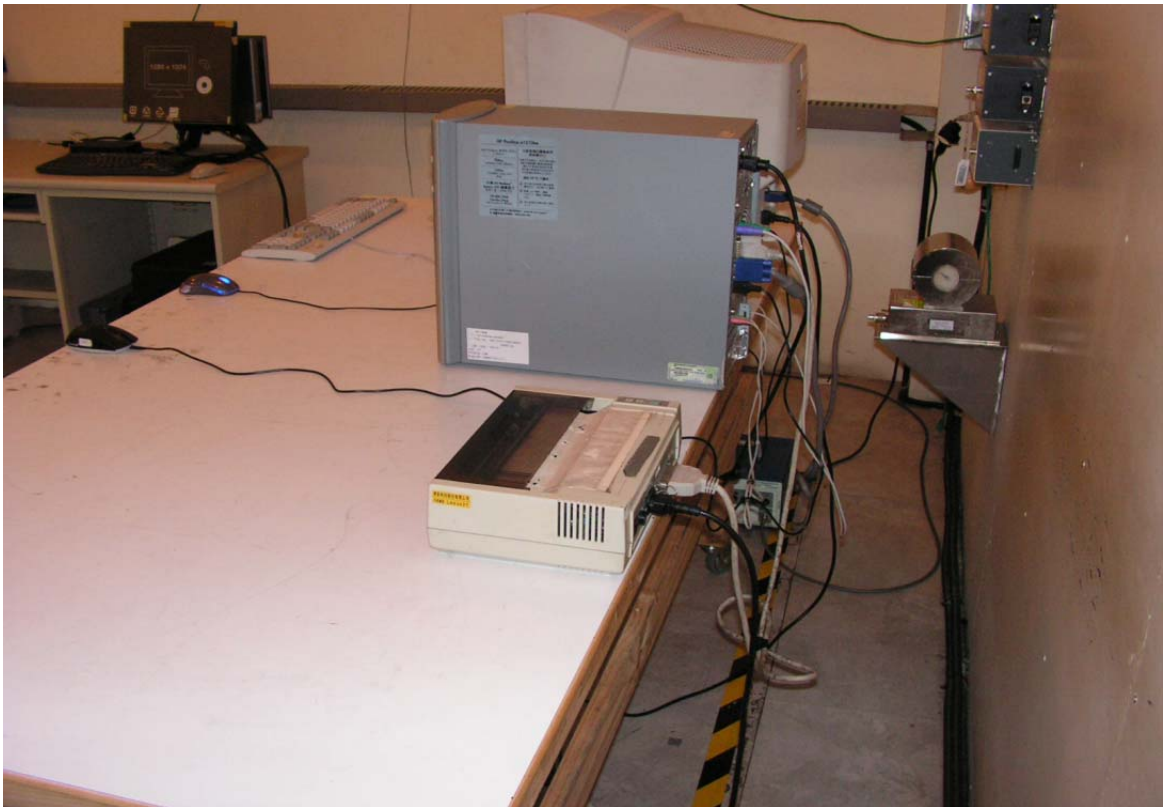


Date: 3.NOV.2007 13:52:06

## 7. PHOTOGRAPHS FOR TEST

### 7.1 TEST PHOTOGRAPHS FOR CONDUCTION

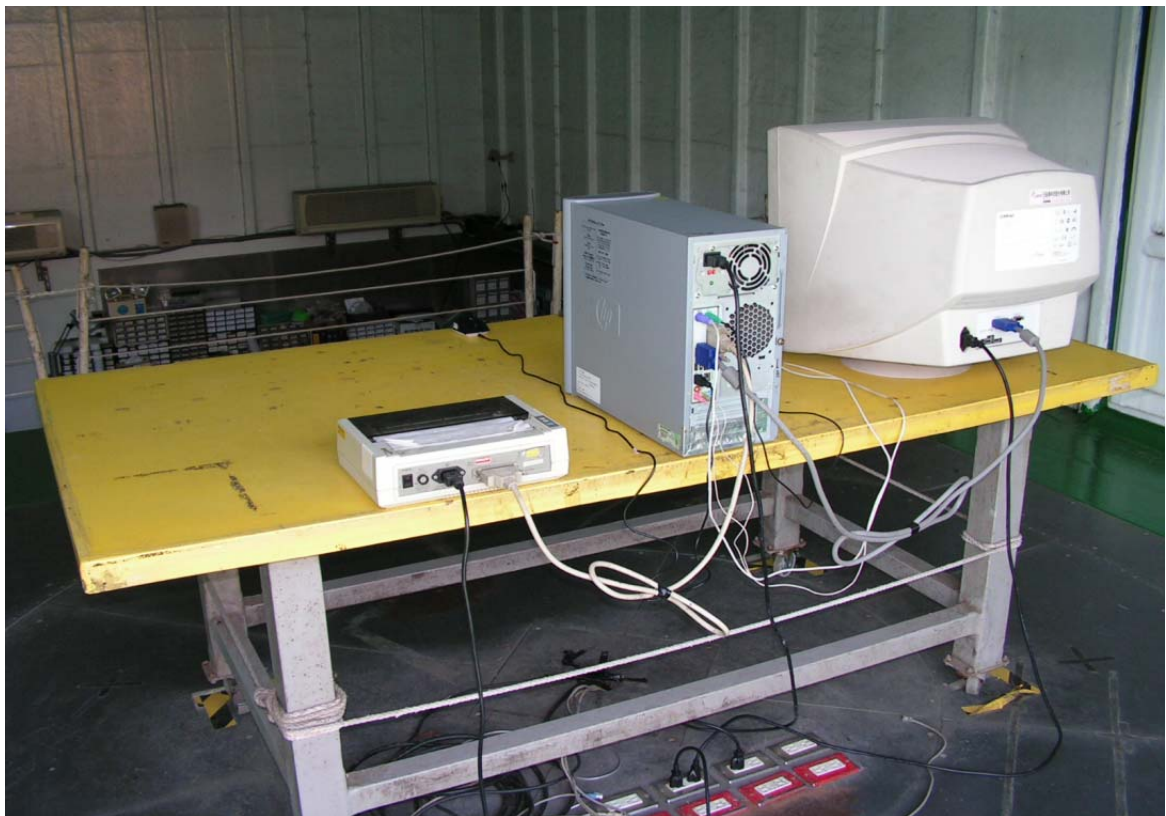
#### Mode 2



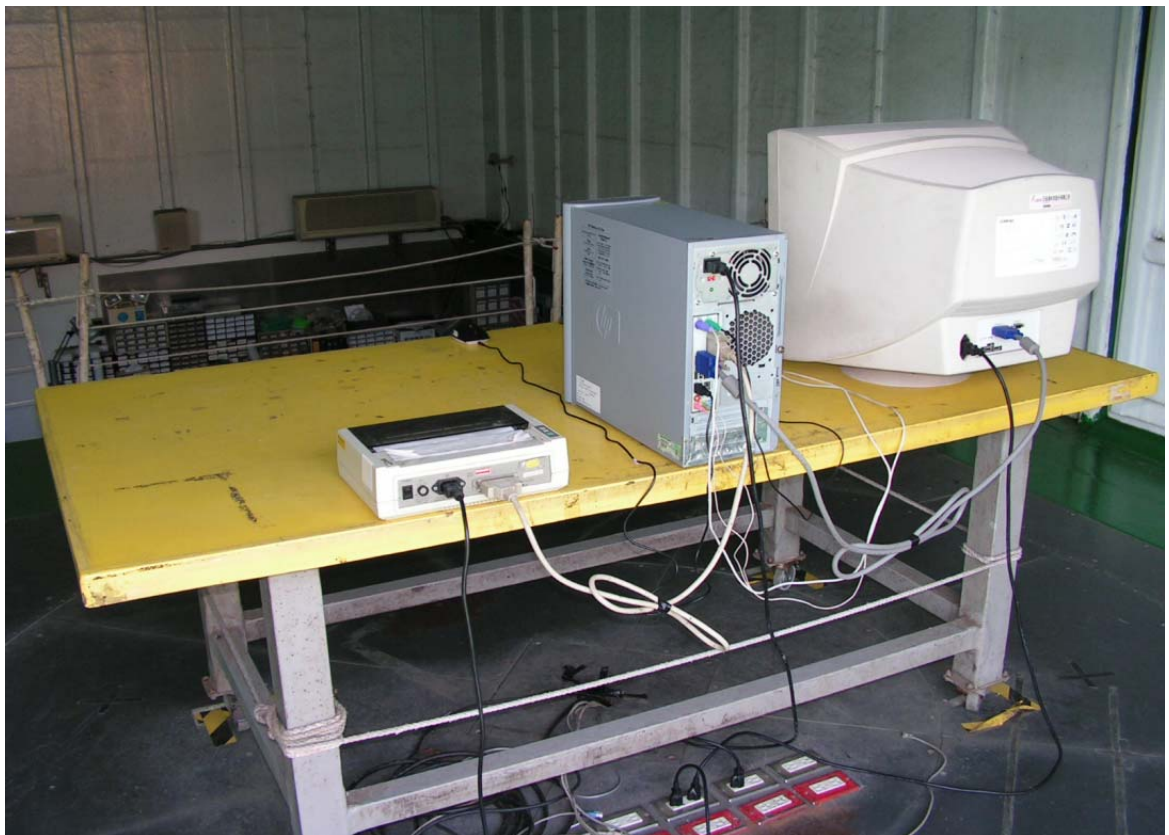


## 7.2 TEST PHOTOGRAPHS FOR RADIATION

(Mode 1) 30-1000MHz



**(Mode 2) 30-1000MHz**



**(Mode 1) Above 1GHz**



## 8. PHOTOGRAPHS FOR PRODUCT

1. Front View Of Wireless Mouse (EUT)
2. Back View Of Wireless Mouse (EUT)



- 3. USB Cable Plug in
- 4. Label Here of TX

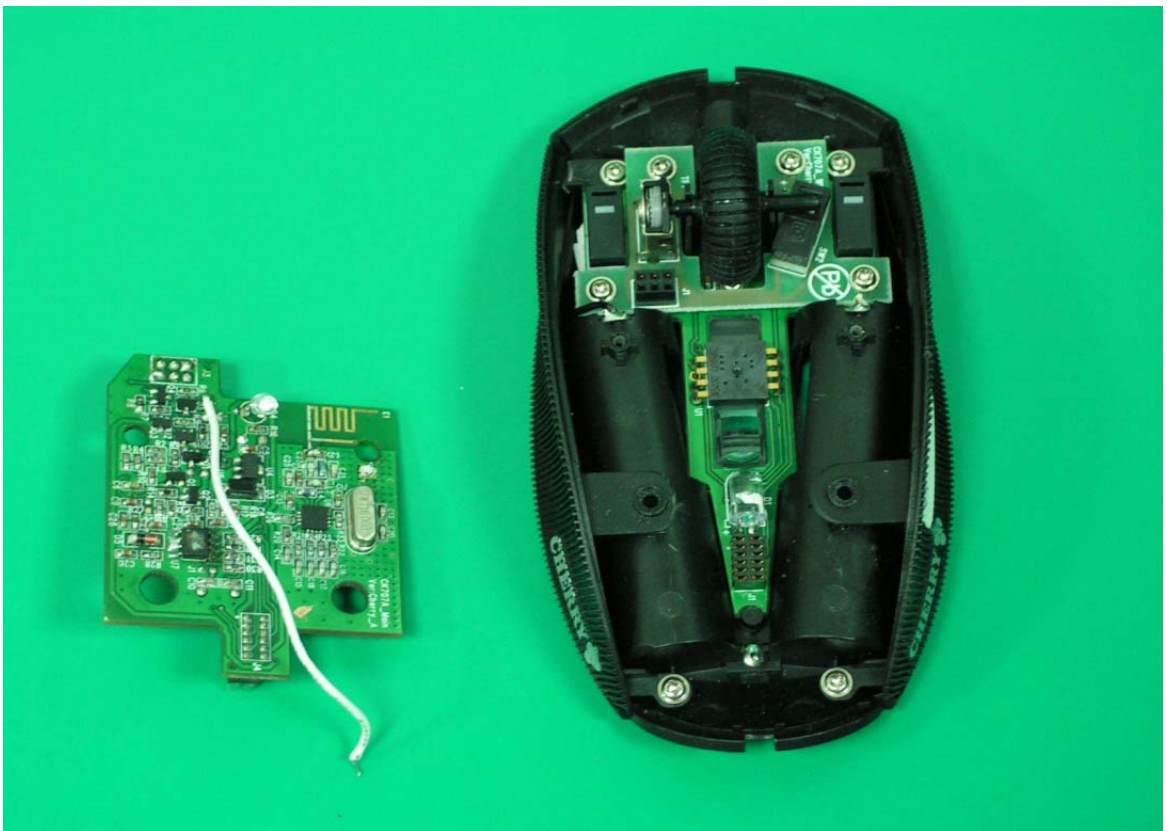


5. USB Cable

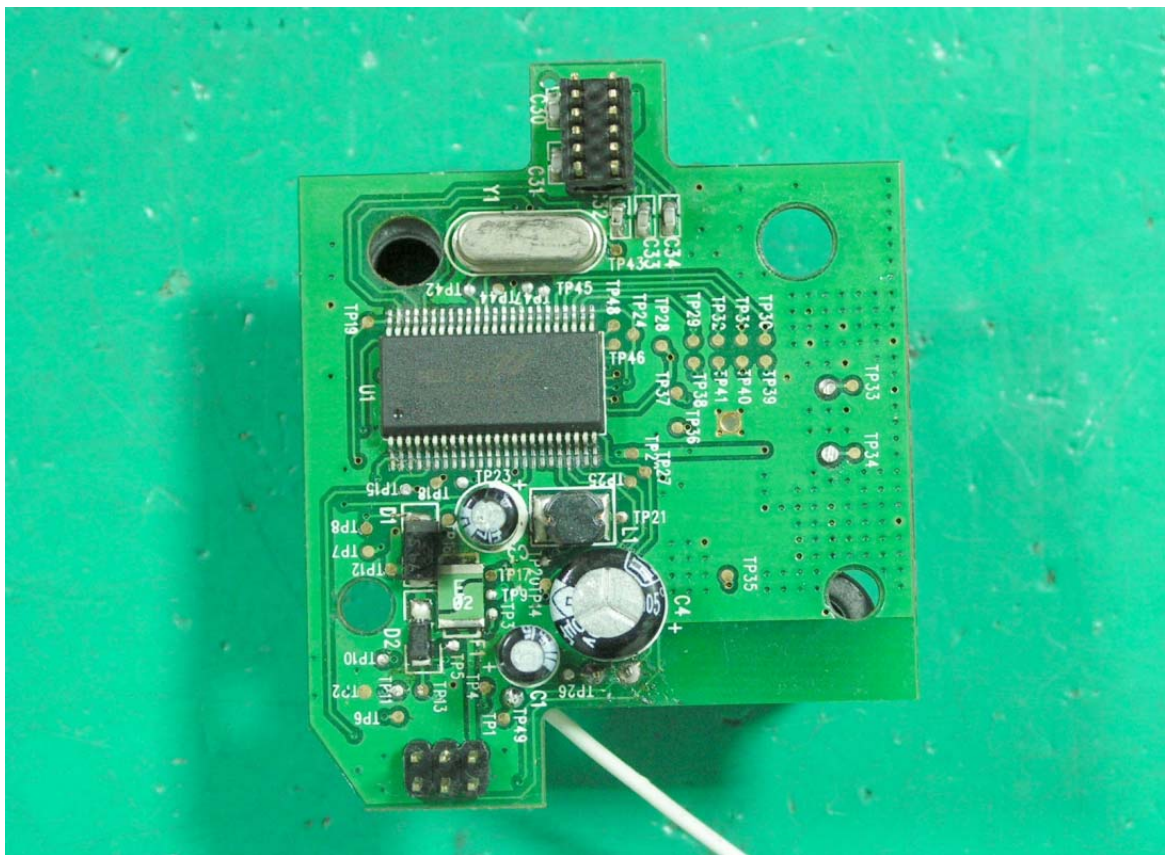
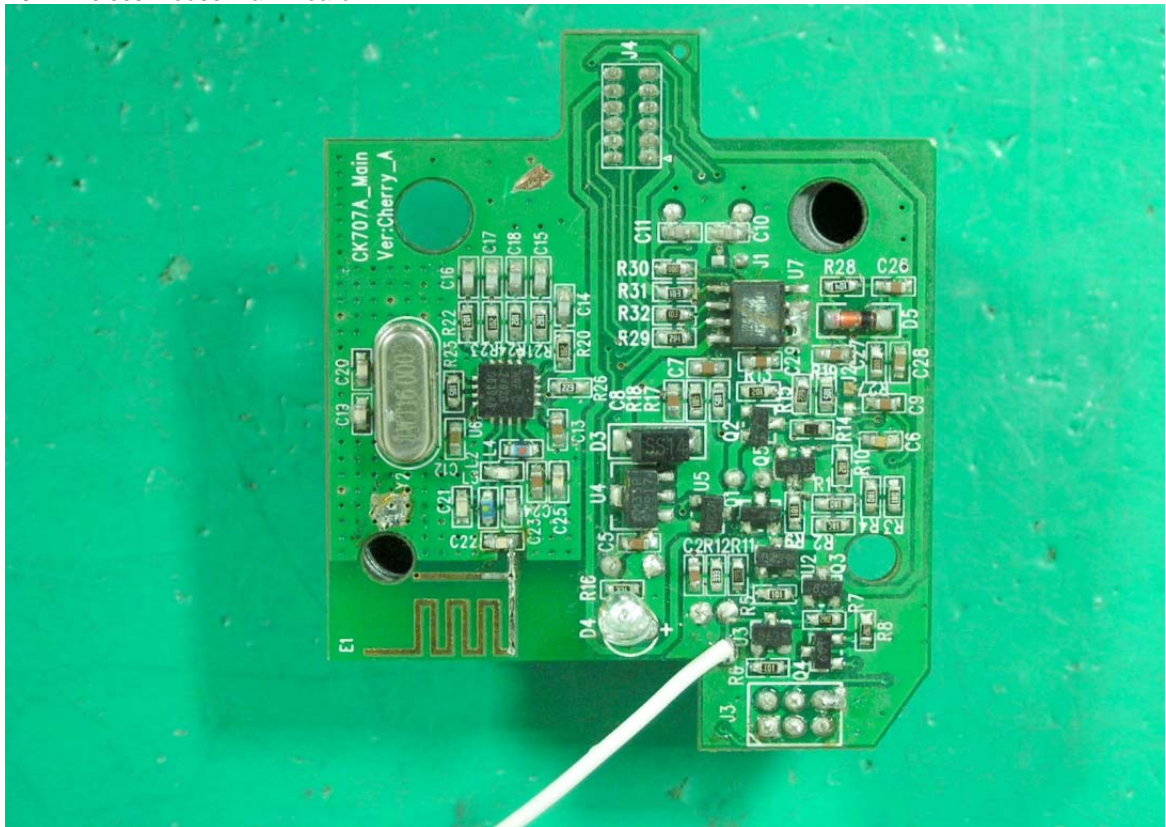
6.



- 7.
- 8.

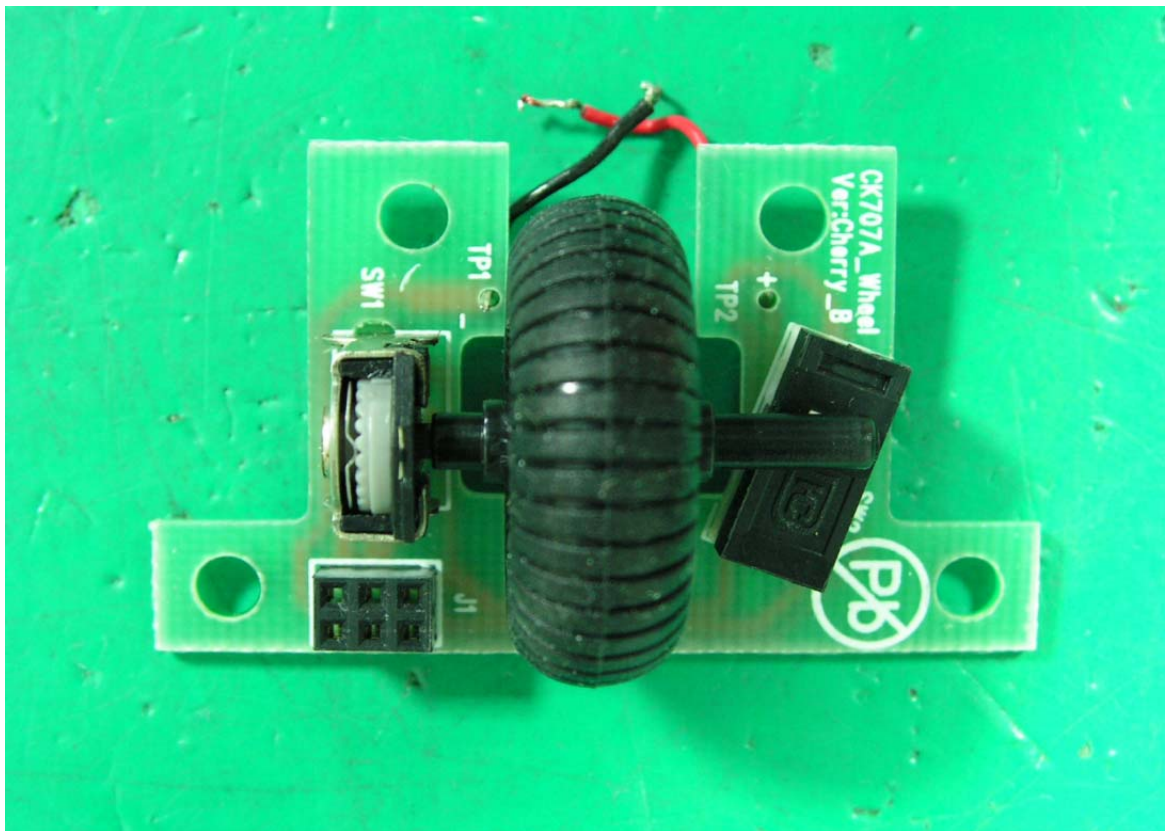
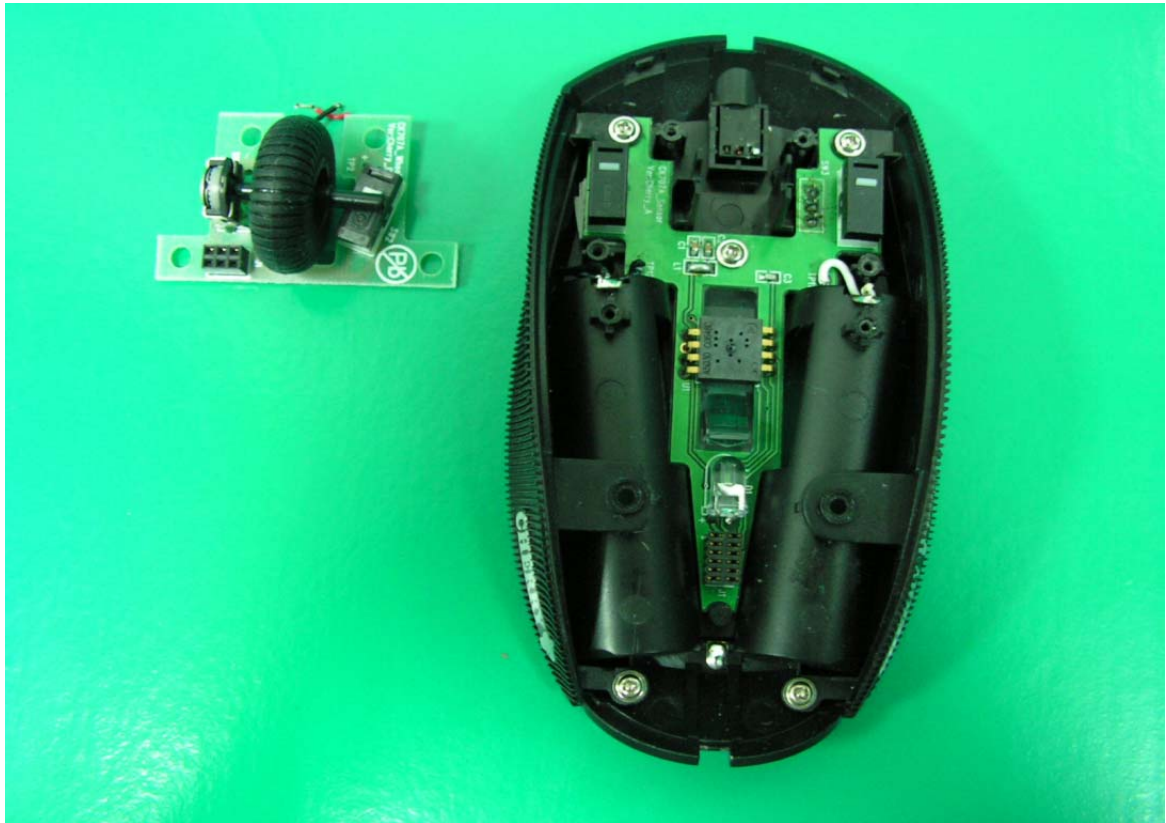


- 9. Wireless Mouse Main Board+
- 10. Wireless Mouse Main Board-

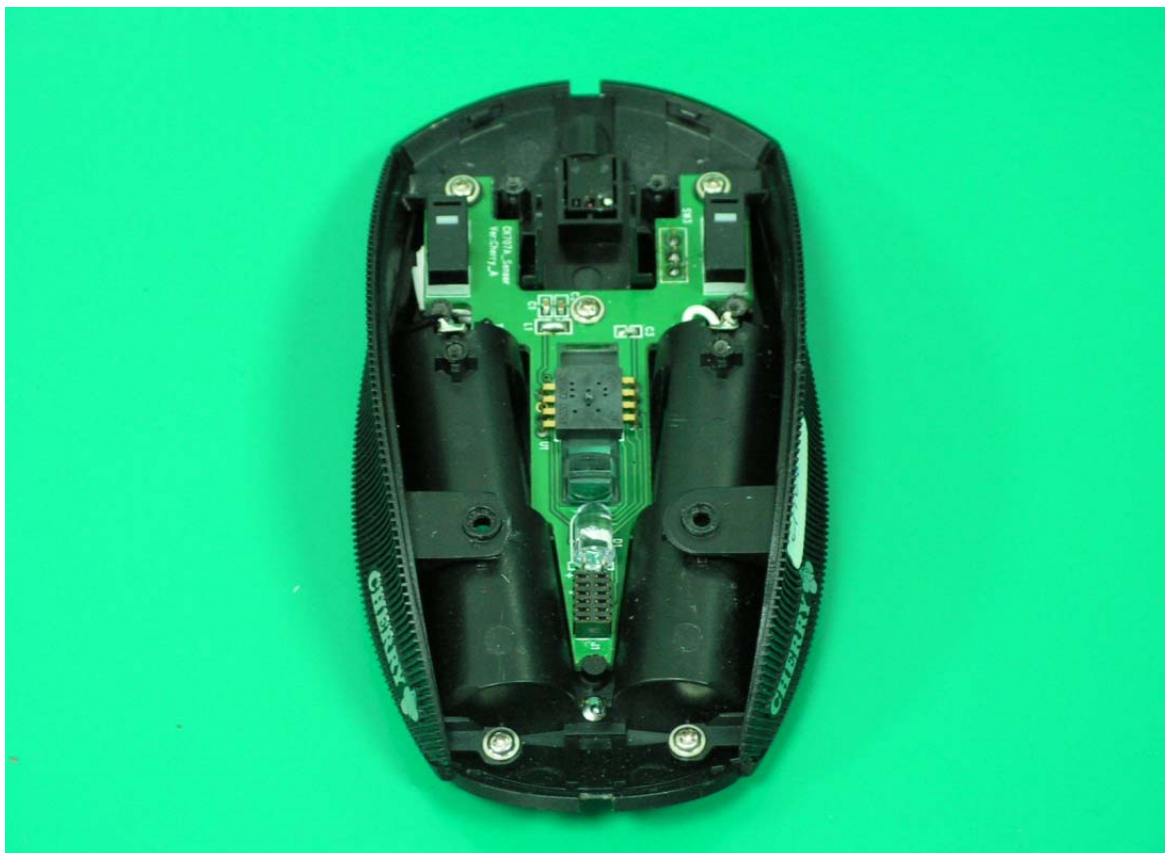
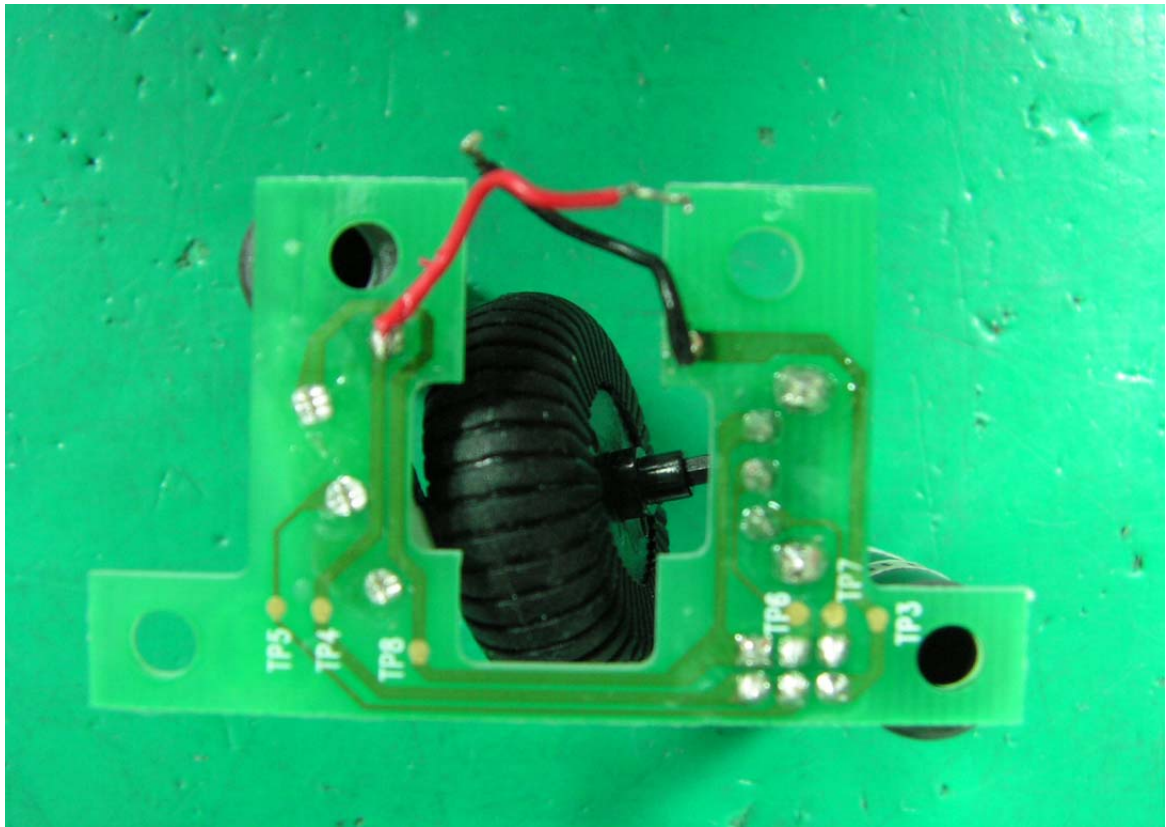




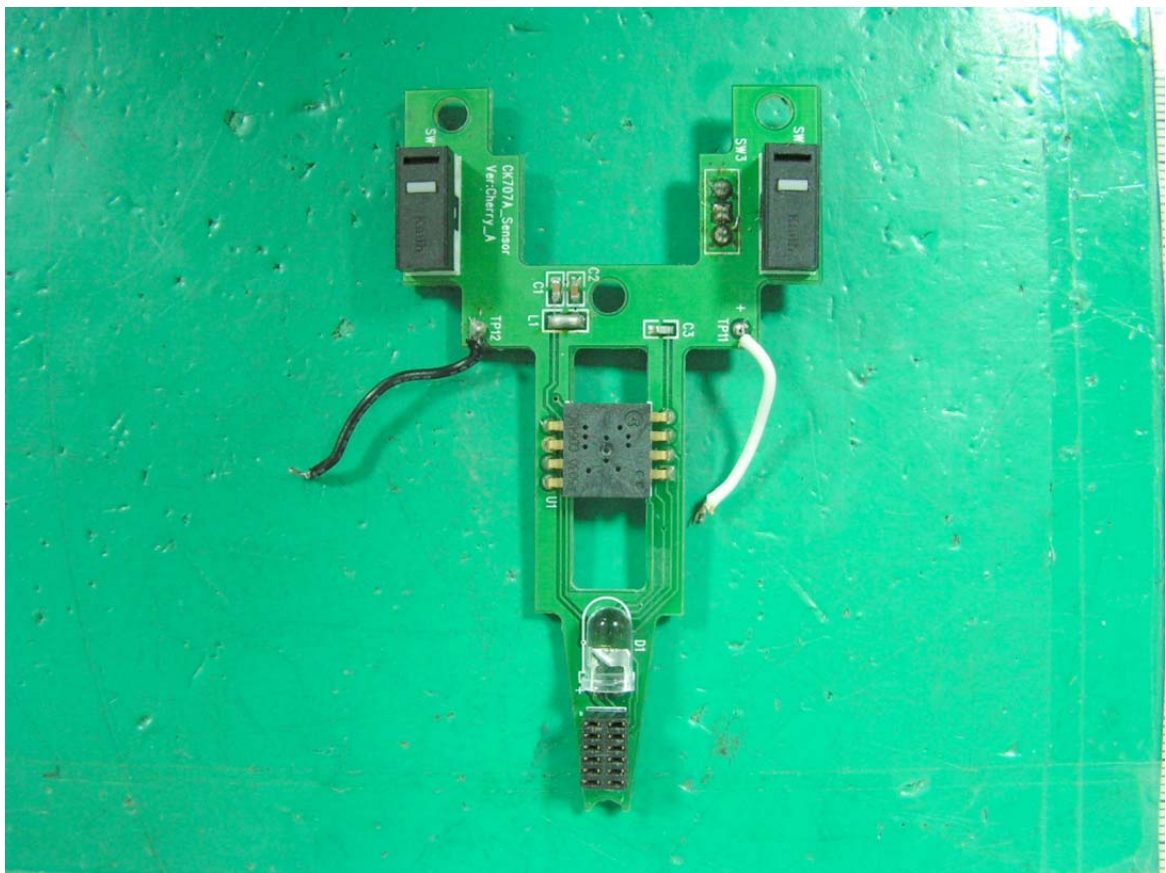
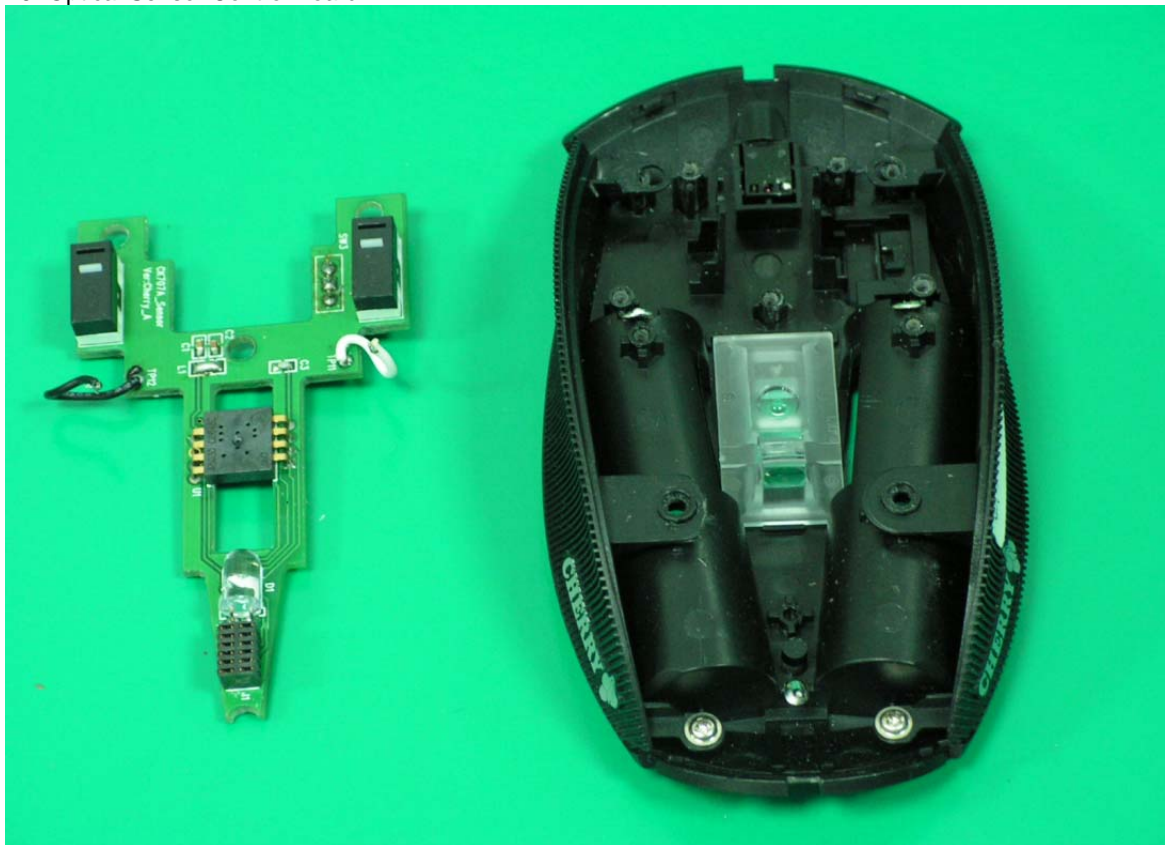
- 11.
- 12. Scroll Wheel Control Board+



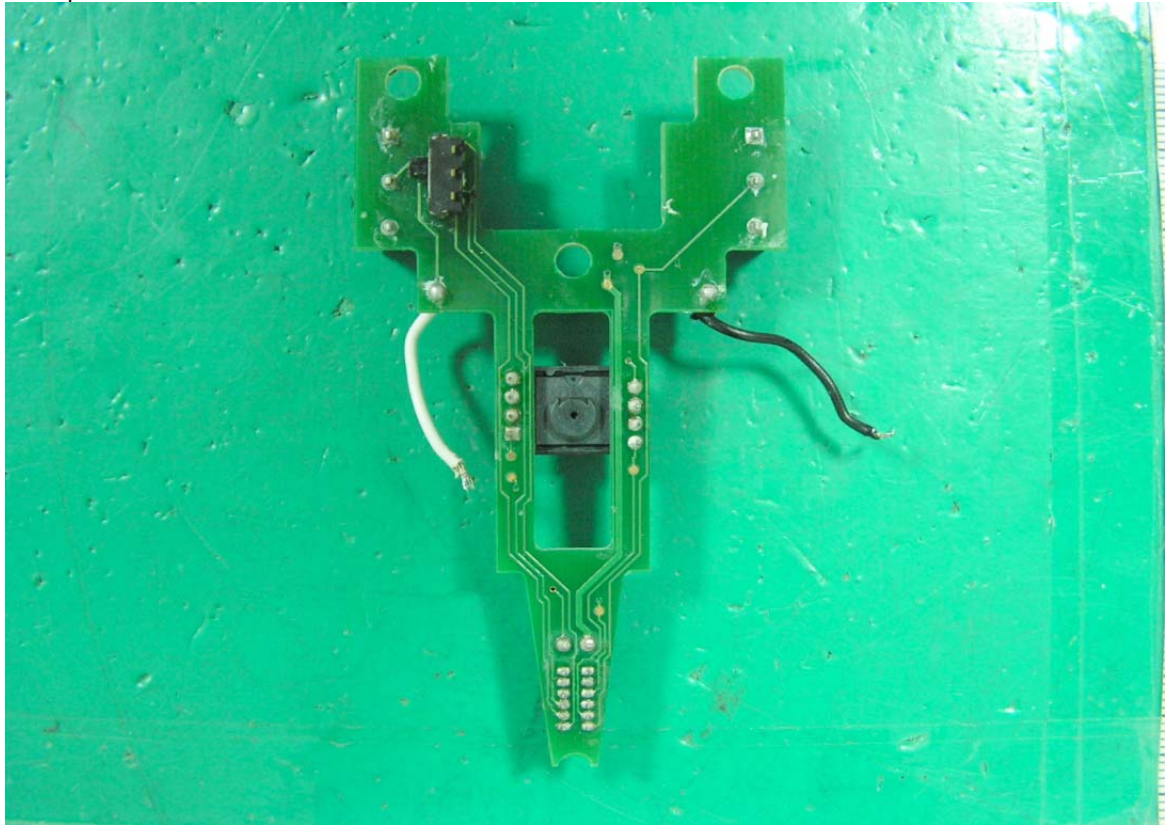
13. Scroll Wheel Control Board-  
14.



- 15.
- 16. Optical Sensor Control Board+



17. Optical Sensor Control Board-



## 9. EMI REDUCTION METHOD DURING COMPLIANCE TESTING

No modification was made during testing.

# Appendix A

## Circuit (Block) Diagram

(Shall be added by Applicant)

# **Appendix B**

## **User Manual**

(Shall be added by Applicant)