



Test Report

Product Name : Cordless Mouse
Model No. : M-R0006
FCC ID. : JNZMR0006

Applicant : Logitech Far East Ltd.
Address : #2 Creation Rd., 4, Science-Based Ind. Park,
Hsinchu, Taiwan, R.O.C.

Date of Receipt : 2008/09/18
Issued Date : 2008/10/22
Report No. : 089299-RFUSP03V01
Version : V3.0

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Test Report Certification

Issued Date : 2008/10/22

Report No. : 089299R-RFUSP03V01



Product Name : Cordless Mouse
 Applicant : Logitech Far East Ltd.
 Address : #2 Creation Rd., 4, Science-Based Ind. Park, Hsinchu,
 Taiwan, R.O.C.
 Manufacturer : Logitech Far East Ltd.
 Model No. : M-R0006
 FCC ID. : JNZMR0006
 Rated Voltage : DC 3V (Power by Battery)
 EUT Voltage : DC 3V (Power by Battery)
 Trade Name : Logitech
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.227: 2007
 Test Result : Complied

The test results relate only to the samples tested.

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Documented By :

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(Rita Hsu / Assistant Engineer)

Approved By :

Roy Wang

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1. General Information

1.1. EUT Description

Product Name	Cordless Mouse
Trade Name	Logitech
Model No.	M-R0006
Frequency Range	27.045MHz~27.195MHz
Channel Number	2
Channel separation	150KHz
Channel Control	Manual
Type of Modulation	FSK
Antenna Type	Loop Antenna

Component	
Receiver	Logitech, C-BT44, 810-000755

Working Frequency of Each Channel			
Channel	Frequency	Channel	Frequency
001	27.045MHz	002	27.195MHz

Note:

1. This device is a Cordless Mouse.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.227.
3. Regards to the frequency band operation; the highest rate that was included the lowest and highest frequency of channel were selected to perform the test, and then shown on this report.

1.2. Operational Description

The EUT is a 27MHz Wireless Mouse intends to use in household and office PC system. The device adapts FSK modulation. The antenna Soldered on PCB Provides diversity function to improve the transmitting function.

1.3. Test Mode

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	
EMI	Mode 1 : Transmitter-27.045MHz Mode 2 : Transmitter-27.195MHz
Final Test Mode	
TX	Mode 1 : Transmitter-27.045MHz Mode 2 : Transmitter-27.195MHz

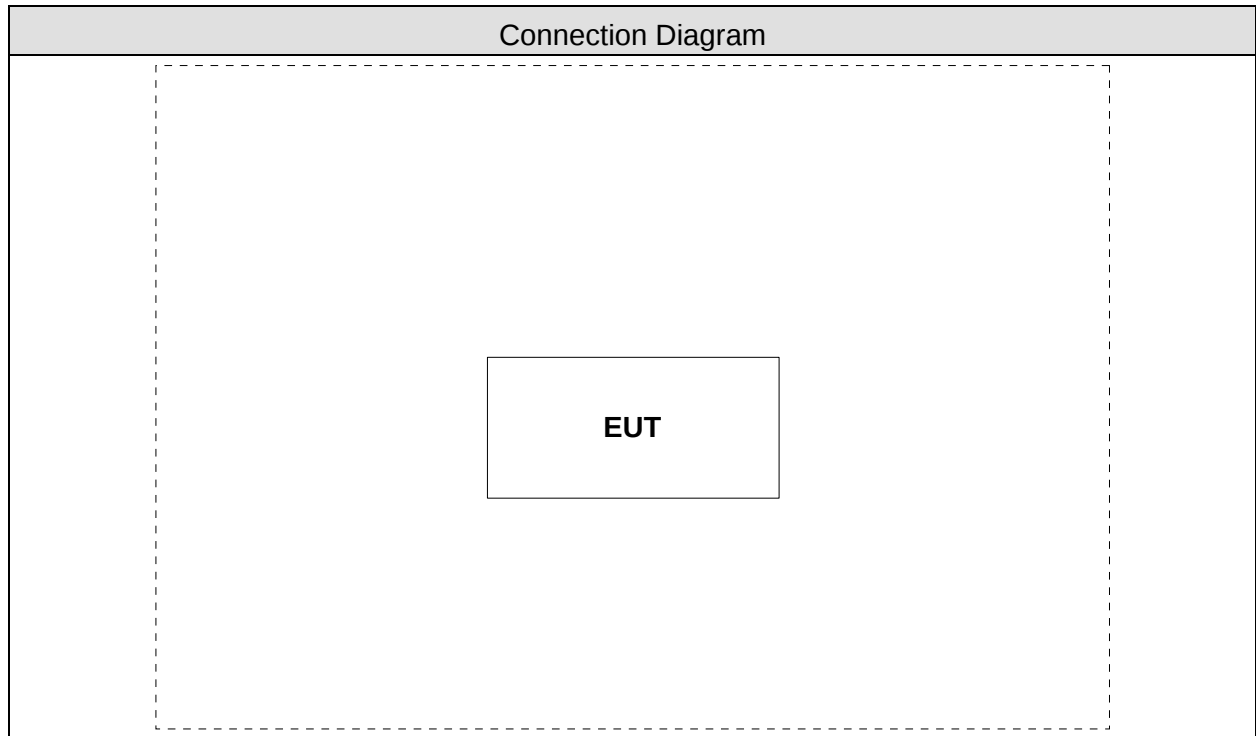
Emission		
Performed Item	Mode 1	Mode 2
Conducted Emission	NO	NO
Radiated Emission	Yes	Yes
Occupied Bandwidth	Yes	Yes

1.4. Tested System Details

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

N/A

1.5. Configuration of tested System



1.6. EUT Exercise Software

1	Setup the EUT as shown on 1.5.
2	Enable RF signal and confirm EUT active.
3	Modulate output capacity of EUT up to specification.

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC Part 15 Subpart C Paragraph 15.209 and 15.227	15 - 35	24
Humidity (%RH)		25 - 75	59
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC Part 15 Subpart C Paragraph 15.215	15 - 35	25
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000

Site Description:

January 24, 2005 File on
Federal Communications Commission
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 365520



Accredited by TAF
Accreditation Number: 1313
Effective through: December 27, 2010



Accredited by NVLAP
NVLAP Lab Code: 200347-0
Effective through: September 30, 2009



Site Name: Quietek Corporation
Site Address: No.75-1, Wang-Yeh Valley, Yung-Hsing,
Chiung-Lin, Hsin-Chu County,
Taiwan, R.O.C.
TEL : 886-3-592-8858 / FAX : 886-3-592-8859
E-Mail : service@quietek.com

2. Radiated Emission

2.1. Test Equipment

The following test equipment are used during the test:

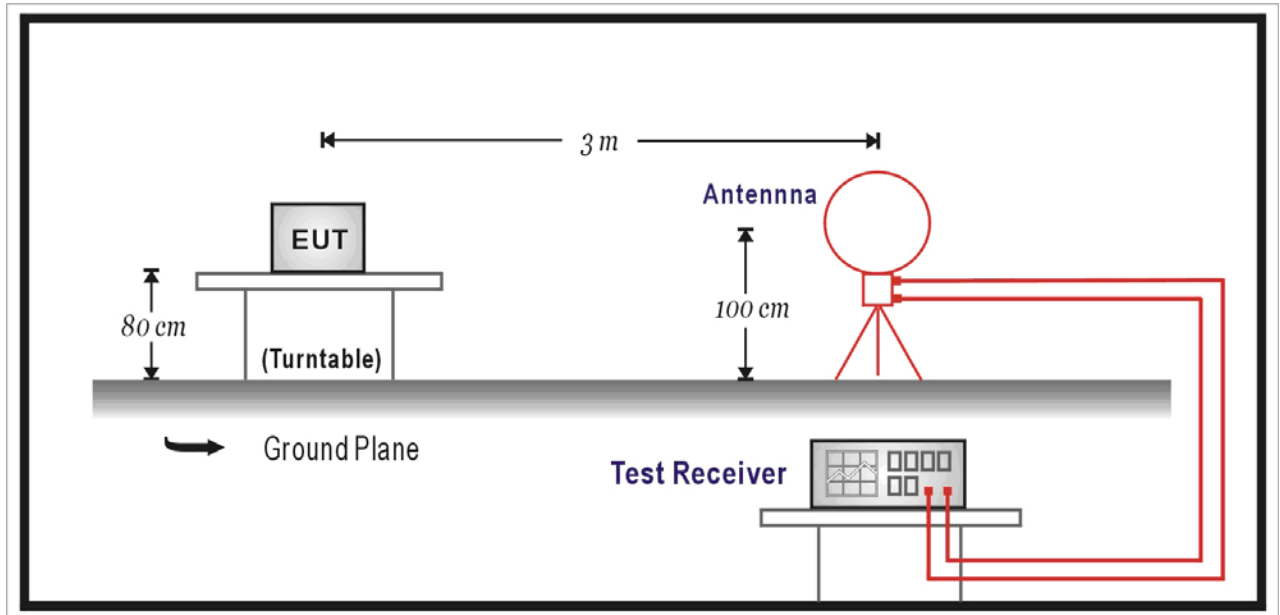
Radiated Emission / Site2

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Loop Antenna	R & S	HFH2-Z2	833799/004	2008/10/08
Bilog Antenna	Schaffner Chase	CBL6112B	2708	2008/09/03
Horn Antenna	Electro Metrics	EM-6961	103325	2008/03/15
Pre-Amplifier	HP	8449B	3008A01123	2007/11/15
Pre-Amplifier	QuieTek	AP-025C	002	N/A
Spectrum Analyzer	R & S	FSP40	100005	2008/08/25
Spectrum Analyzer	Advantest	R3162	121200166	2008/02/19
Test Receiver	R & S	ESCS 30	836858/023	2008/04/01
Bilog Antenna	Schaffner Chase	CBL6112B	2708	2008/09/03

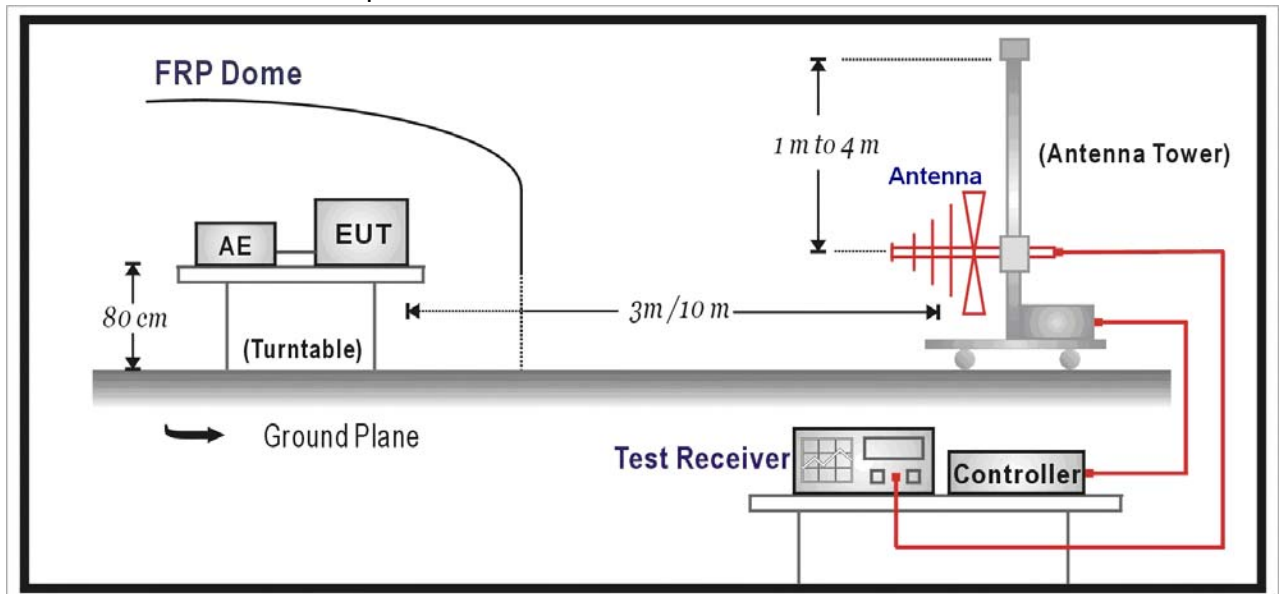
- Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. "N/A" Ca1.Date is used to Pre-test, not final test.

2.2. Test Setup

For 9kHz-30MHz Test Setup



For 30MHz-1GHz Test Setup



2.3. Limits

➤ FCC Part 15 Subpart C Paragraph 15.227 Limit

FCC Part 15 Subpart C Paragraph 15.227 Limits		
Fundamental Frequency MHz	Field strength of fundamental	
	uV/m	dBuV/m
26.96-27.28	10000	80.0

Remarks :

1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
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. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. Measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

➤ Frequencies in restricted band are complied to limits on Paragraph 15.209.

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits			
Frequency MHz	uV/m	dBuV/m	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	See Remark ¹	300
0.490-1.705	24000/F(kHz)	See Remark ¹	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Remarks : 1. RF Voltage (dBuV) = 20 log RF 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.

2.4. 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. 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 on radiated measurement.

On the field strength of fundamental and harmonics, the limits shown are based on measuring equipment employing a average detector function. As an alternative, compliance with the limits may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

On the field strength of spurious electric, on any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function.

When average radiated emission measurement are included emission measurement below 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.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

2.5. Test Specification

According to EMC Standard: FCC Part 15 Subpart C Paragraph 15.209 and 15.227

2.6. Uncertainty

The measurement uncertainty is evaluated as ± 3.19 dB.

2.7. Test Result

Product	Cordless Mouse		
Test Item	Radiated Emission		
Test Mode	Mode 1 : Transmitter-27.045MHz		
Date of Test	2008/10/31	Test Site	No.1 OATS

Polarization: Horizontal

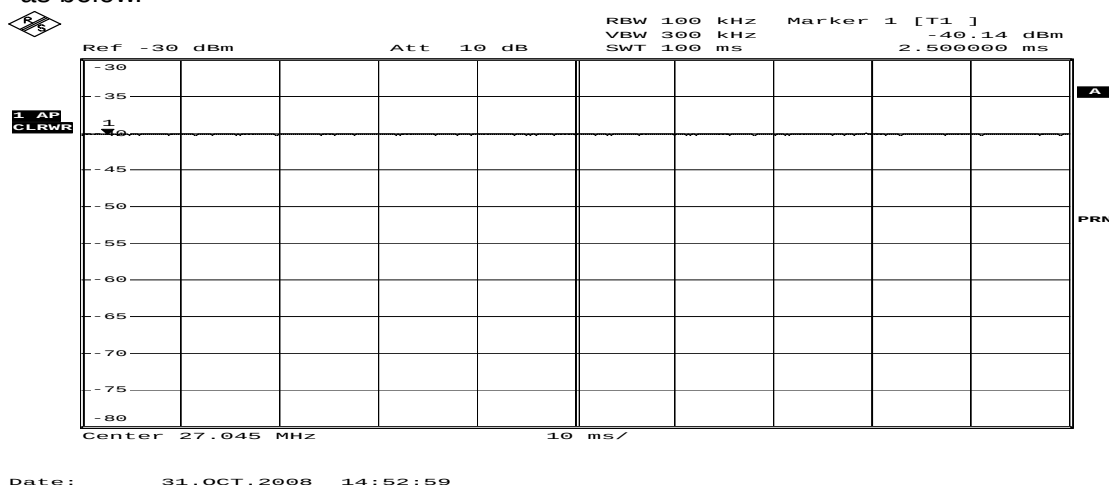
Direction	Frequency (MHz)	Correction Factor (dB)	Peak Reading Level (dBuV)	Peak Emission Level (dBuV/m)	Average Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)
X	27.045	9.65	39.67	49.32	49.32	100	80
Y	27.045	9.65	49.09	58.74	58.74	100	80
Z	27.045	9.65	48.60	58.25	58.25	100	80

Polarization: Vertical

Direction	Frequency (MHz)	Correction Fact (dB)	Peak Reading Level (dBuV)	Peak Emission Level (dBuV/m)	Average Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)
X	27.045	9.65	38.23	47.88	47.88	100	80
Y	27.045	9.65	47.85	57.50	57.50	100	80
Z	27.045	9.65	47.68	57.33	57.33	100	80

Note:

1. All Readings Levels are performed with peak and/or average measurements as necessary.
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
3. Average Emission level=Peak Emission level- 20Log(Duty Cycle),and the duty cycle is one as below.



Product	Cordless Mouse		
Test Item	Radiated Emission		
Test Mode	Mode 2 : Transmitter-27.195MHz		
Date of Test	2008/10/31	Test Site	No.1 OATS

Polarization: Horizontal

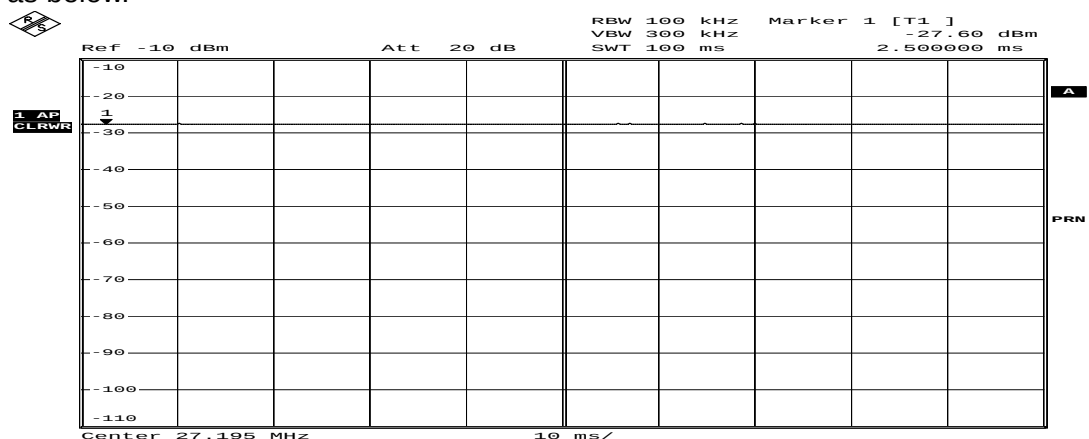
Direction	Frequency (MHz)	Correction Factor (dB)	Peak Reading Level (dBuV)	Peak Emission Level (dBuV/m)	Average Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)
X	27.195	9.65	42.18	51.83	51.83	100	80
Y	27.195	9.65	51.62	61.27	61.27	100	80
Z	27.195	9.65	50.77	60.42	60.42	100	80

Polarization: Vertical

Direction	Frequency (MHz)	Correction Fact (dB)	Peak Reading Level (dBuV)	Peak Emission Level (dBuV/m)	Average Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)
X	27.195	9.65	40.87	50.52	50.52	100	80
Y	27.195	9.65	50.26	59.91	59.91	100	80
Z	27.195	9.65	50.18	59.83	59.83	100	80

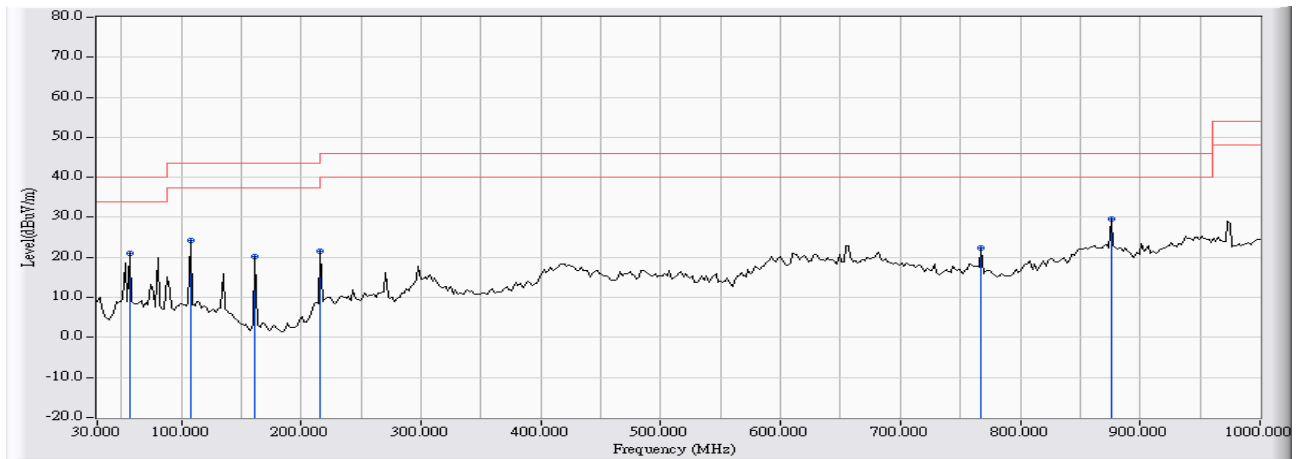
Note:

1. All Readings Levels are performed with peak and/or average measurements as necessary.
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
3. Average Emission level=Peak Emission level- 20Log(Duty Cycle),and the duty cycle is one as below.



Date: 31.OCT.2008 14:42:24

Site : Site 1	Time : 2008/10/21 - 18:32
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - HORIZONTAL	Power : DC 3V(Power by Battery)
EUT : Cordless Mouse	Note : Mode 1 : Transmitter-27.045MHz

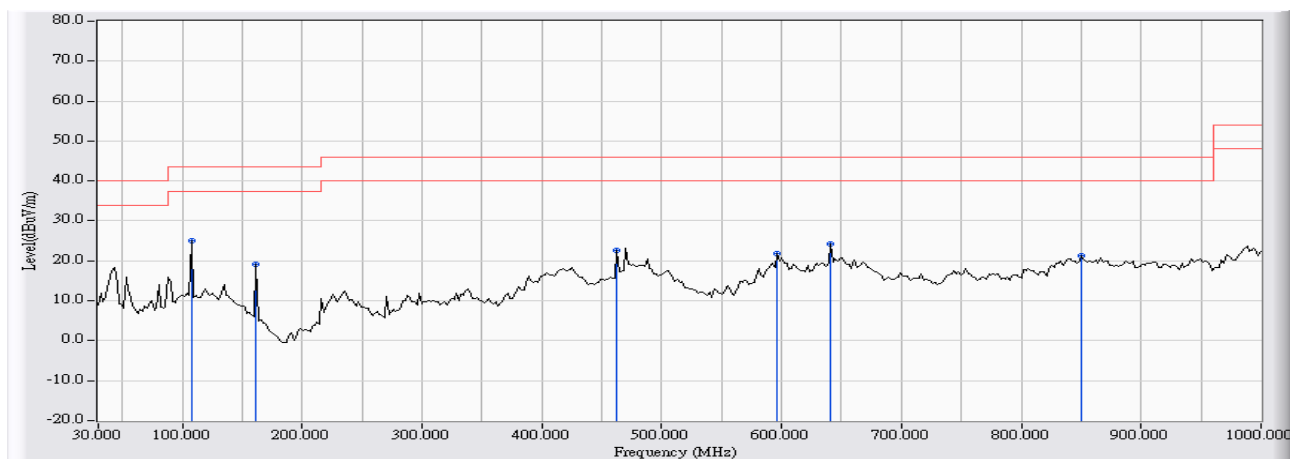


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		57.160	-13.260	34.160	20.900	-19.100	40.000	PEAK
2		107.600	-14.949	39.156	24.206	-19.294	43.500	PEAK
3		161.920	-20.396	40.565	20.169	-23.331	43.500	PEAK
4		216.240	-13.691	35.181	21.491	-24.509	46.000	PEAK
5		767.200	-5.015	27.289	22.274	-23.726	46.000	PEAK
6	*	875.840	0.160	29.568	29.728	-16.272	46.000	PEAK

Note:

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

Site : Site 1	Time : 2008/10/21 - 18:35
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - VERTICAL	Power : DC 3V(Power by Battery)
EUT : Cordless Mouse	Note : Mode 1 : Transmitter-27.045MHz

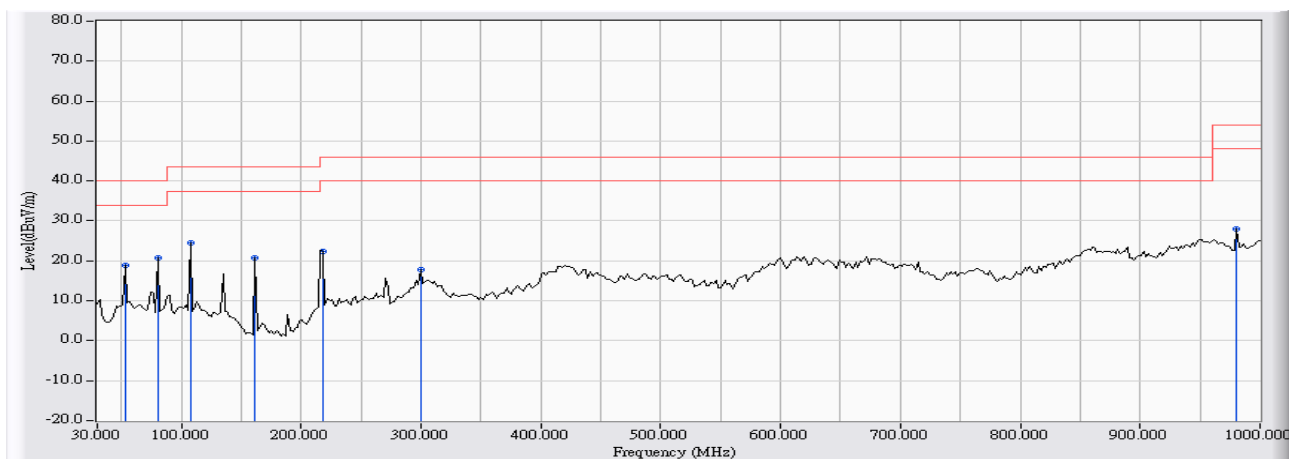


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	107.600	-11.778	36.693	24.915	-18.585	43.500	PEAK
2		161.920	-16.683	35.766	19.083	-24.417	43.500	PEAK
3		462.620	-5.786	28.544	22.757	-23.243	46.000	PEAK
4		596.480	-3.222	25.165	21.943	-24.057	46.000	PEAK
5		641.100	-2.670	26.891	24.221	-21.779	46.000	PEAK
6		850.620	-1.804	23.038	21.233	-24.767	46.000	PEAK

Note:

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

Site : Site 1	Time : 2008/10/21 - 18:05
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - HORIZONTAL	Power : DC 3V(Power by Battery)
EUT : Cordless Mouse	Note : Mode 2 : Transmitter-27.195MHz

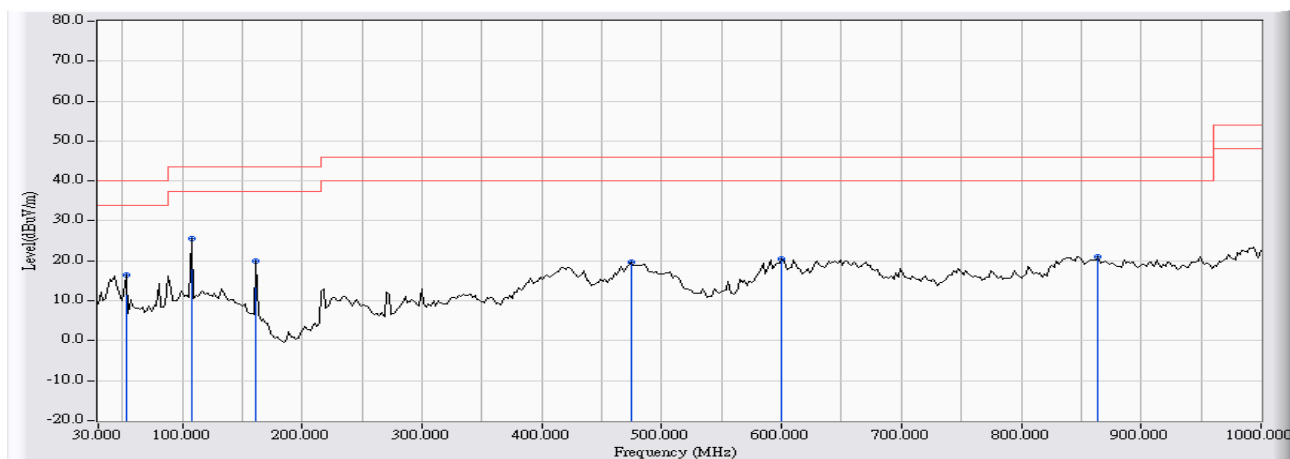


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	53.280	-13.150	32.135	18.985	-21.015	40.000	PEAK
2	80.440	-15.429	36.193	20.764	-19.236	40.000	PEAK
3	* 107.600	-14.949	39.407	24.457	-19.043	43.500	PEAK
4	161.920	-20.396	41.210	20.814	-22.686	43.500	PEAK
5	218.180	-13.408	35.711	22.303	-23.697	46.000	PEAK
6	299.660	-8.205	26.064	17.859	-28.141	46.000	PEAK
7	980.600	1.171	26.853	28.024	-25.976	54.000	PEAK

Note:

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

Site : Site 1	Time : 2008/10/21 - 18:08
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - VERTICAL	Power : DC 3V(Power by Battery)
EUT : Cordless Mouse	Note : Mode 2 : Transmitter-27.195MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		53.280	-14.853	31.379	16.526	-23.474	40.000	PEAK
2	*	107.600	-11.778	37.433	25.655	-17.845	43.500	PEAK
3		161.920	-16.683	36.595	19.912	-23.588	43.500	PEAK
4		474.260	-2.991	22.802	19.811	-26.189	46.000	PEAK
5		600.360	-2.164	22.543	20.379	-25.621	46.000	PEAK
6		864.200	-2.041	23.178	21.138	-24.862	46.000	PEAK

Note:

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

3. Occupied Bandwidth

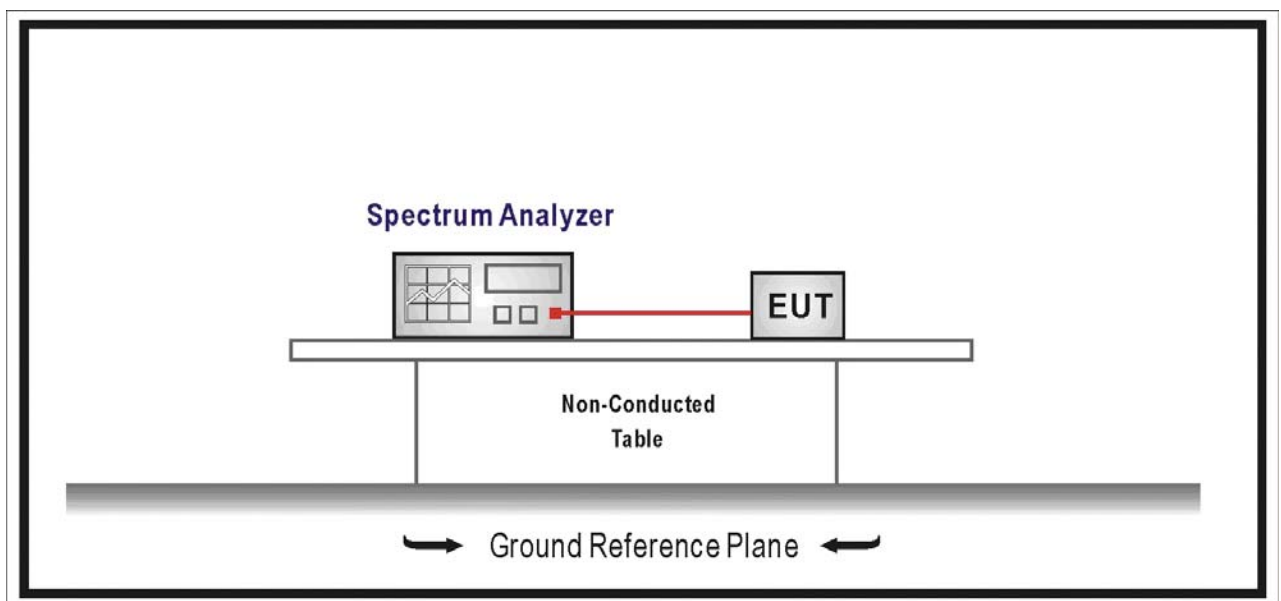
3.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2008
2	No.1 OATS			Sep., 2008

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

3.2. Test Setup



3.3. Limits

N/A

3.4. Test Specification

According to EMC Standard: FCC Part 15 Subpart C Paragraph 15.215

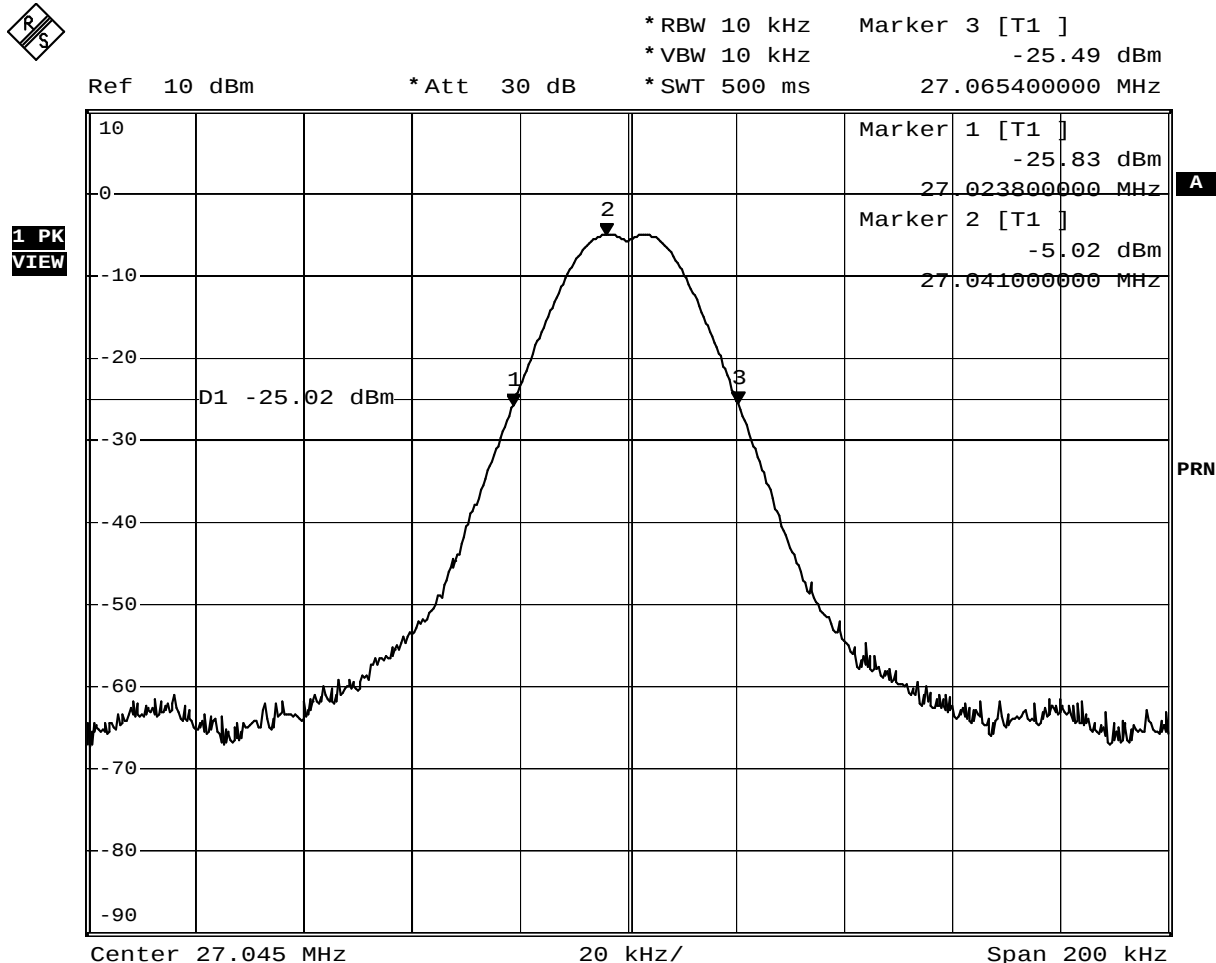
3.5. Uncertainty

The measurement uncertainty is defined as $\pm 50\text{kHz}$

3.6. Test Result

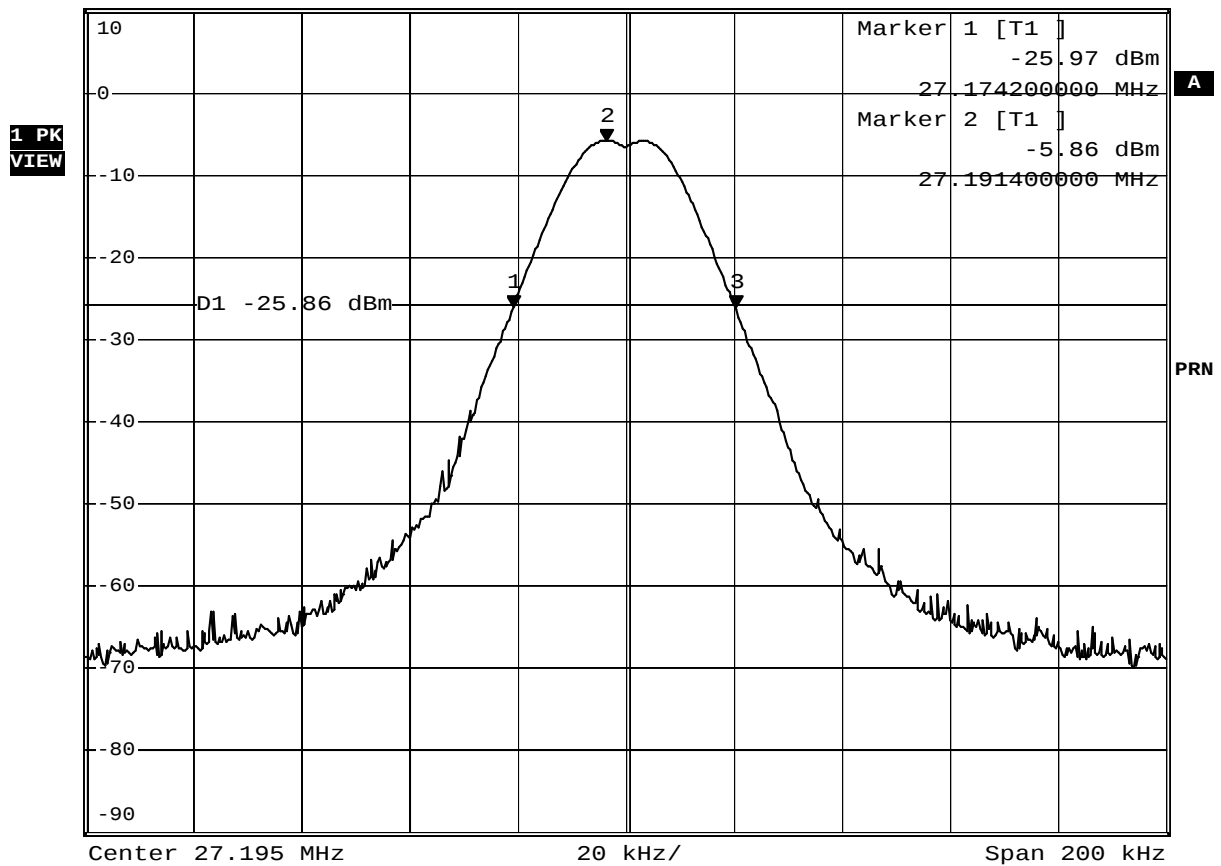
Product	Cordless Mouse		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1 : Transmitter-27.045MHz		
Date of Test	2008/10/16	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)
1	27.045	41.6	--



Date: 16.OCT.2008 18:12:26

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)
2	27.195	41.2	--



Date: 16.OCT.2008 18:09:55