



Test Report

Product Name : Cordless Keyboard
Model No. : Y-R0002
FCC ID. : JNZYR0002

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

Date of Receipt : 2008/11/14
Issued Date : 2008/11/28
Report No. : 08B212R-RFUSP03V01
Version : V1.0

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 : 2008/11/28

Report No. : 08B212R-RFUSP03V01



Product Name : Cordless Keyboard
 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. : Y-R0002
 FCC ID. : JNZYR0002
 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.

The test report shall not be reproduced except in full without the written approval of Quietek Corporation.

Documented By : *Demi Chang*
 (Demi Chang / Engineering Adm. Specialist)
 Tested By : *Rita Hsu*
 (Rita Hsu / Assistant Engineer)
 Approved By : *Roy Wang*
 (Roy Wang / Manager)

TABLE OF CONTENTS

Description	Page
x	
1. General Information	4
1.1. EUT Description	4
1.2. Operational Description	5
1.3. Test Mode	6
1.4. Tested System Details.....	7
1.5. Configuration of tested System	7
1.6. EUT Exercise Software.....	7
1.7. Test Facility	8
2. Radiated Emission	9
2.1. Test Equipment	9
2.2. Test Setup	10
2.3. Limits.....	11
2.4. Test Procedure	12
2.5. Test Specification	12
2.6. Uncertainty.....	12
2.7. Test Result	13
2.8. Test Photo	19
3. Occupied Bandwidth	21
3.1. Test Equipment	21
3.2. Test Setup	21
3.3. Limits.....	21
3.4. Test Specification	21
3.5. Uncertainty.....	21
3.6. Test Result	22
Attachement.....	24
EUT Photograph	24

1. General Information

1.1. EUT Description

Product Name	Cordless Keyboard
Trade Name	Logitech
Model No.	Y-R0002
Frequency Range	27.095MHz~27.145MHz
Channel Number	2
Channel separation	50KHz
Channel Control	Manual
Type of Modulation	FSK
Antenna Type	Loop Antenna

Component	
Receiver	Logitech, C-BT44, 810-000755
USB Cable	Shielded, 1.32m

Working Frequency of Each Channel			
Channel	Frequency	Channel	Frequency
001	27.095MHz	002	27.145MHz

Note:

1. This device is a Cordless Keyboard.
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 Keyboard intends to use in household and office PC system.

The device adapts FSK modulation.

Double-click the keyboard settings icon to make changes to customize the keyboard. The antenna provides diversity function to improve the transmitting function.

Press the Connect button on the receiver. Quickly press the Connect button under each device. The keyboard LED should blink.

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-27.095MHz Mode 2 : Transmitter-27.145MHz
Final Test Mode	
TX	Mode 1 : Transmitter-27.095MHz Mode 2 : Transmitter-27.145MHz

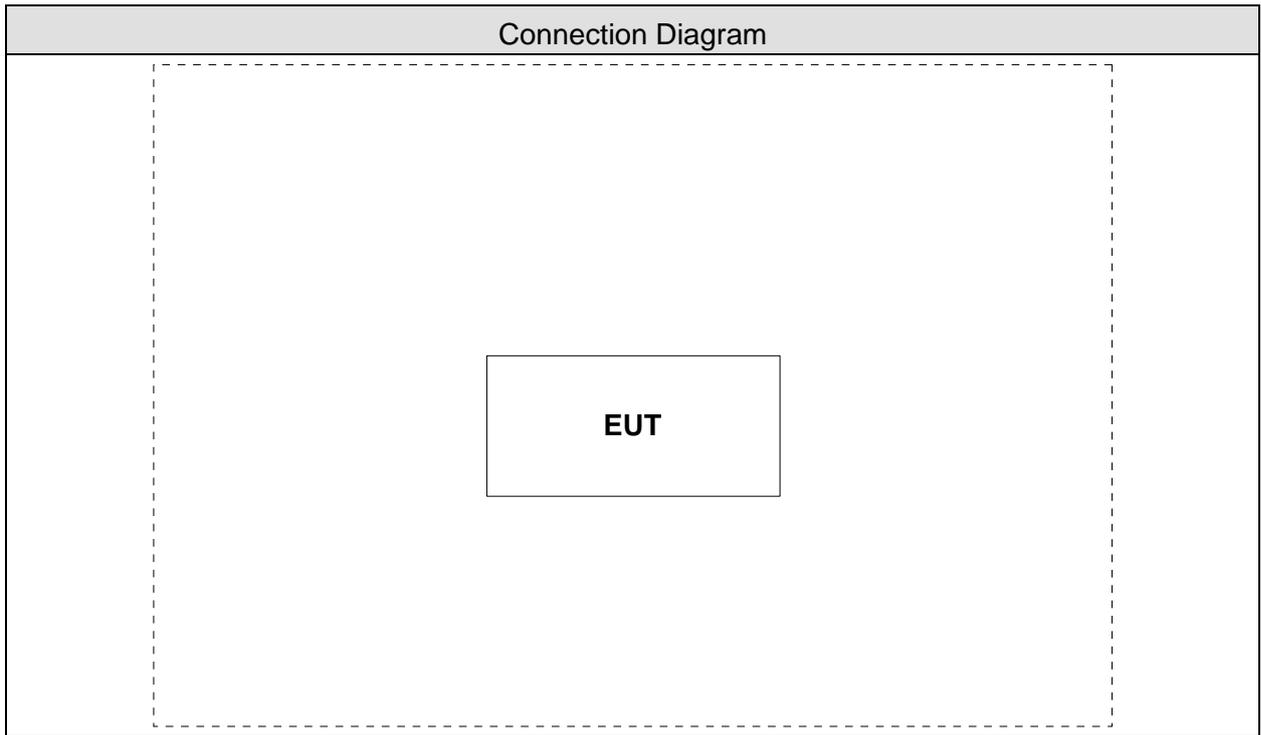
Emission		
Performed Item	Mode 1	Mode 2
Conducted Emission	NO	NO
Radiated Emission	Yes	Yes
Occupied Bandwidth	Yes	Yes

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 - 35	24
Humidity (%RH)	15.209 and 15.227	25 - 75	59
Barometric pressure (mbar)	Radiated Emission (DSSS)	860 - 1060	950-1000
Temperature (°C)	FCC Part 15 Subpart C Paragraph	15 - 35	25
Humidity (%RH)	15.215	25 - 75	50
Barometric pressure (mbar)	Occupied Bandwidth (DSSS)	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 / Site1

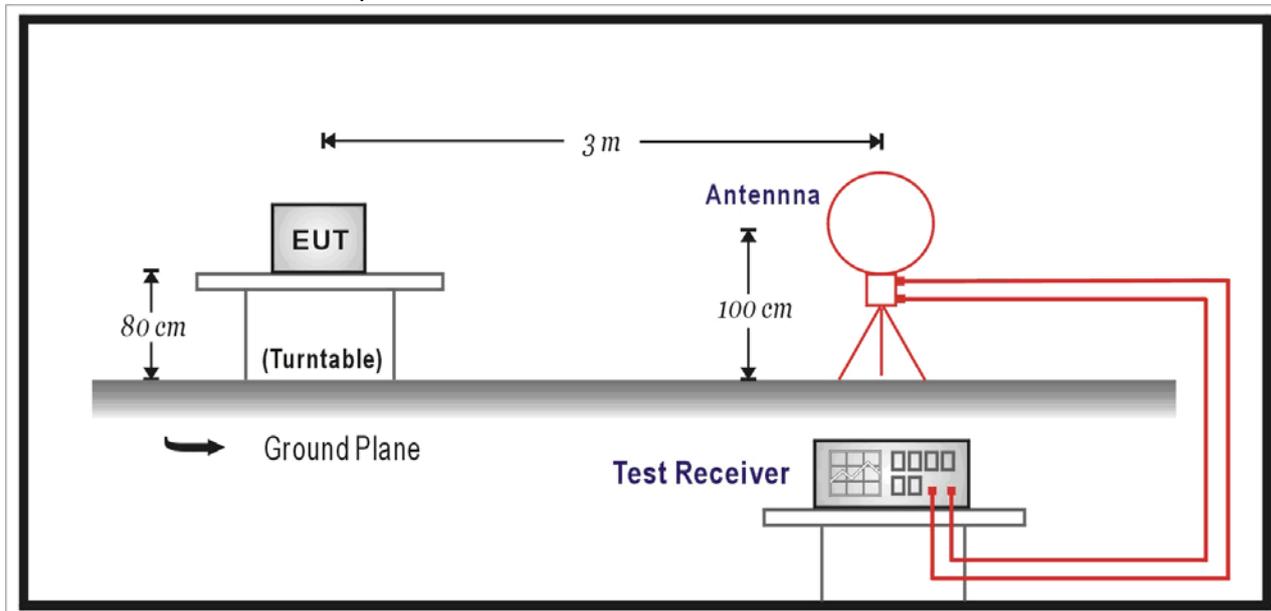
Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2895	2008/09/03
Horn Antenna	Electro Metrics	EM-6961	103325	2008/03/15
Pre-Amplifier	HP	8449B	3008A01123	2008/11/15
Pre-Amplifier	Quietek	AP-025C	N/A	N/A
Spectrum Analyzer	R & S	FSP40	100005	2008/08/25
Spectrum Analyzer	Advantest	R3162	120300649	2007/11/24
Test Receiver	R & S	ESCS 30	825442/017	2008/2/13
Loop Antenna	R & S	HFH2-Z2	833799/004	2008/09/13

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

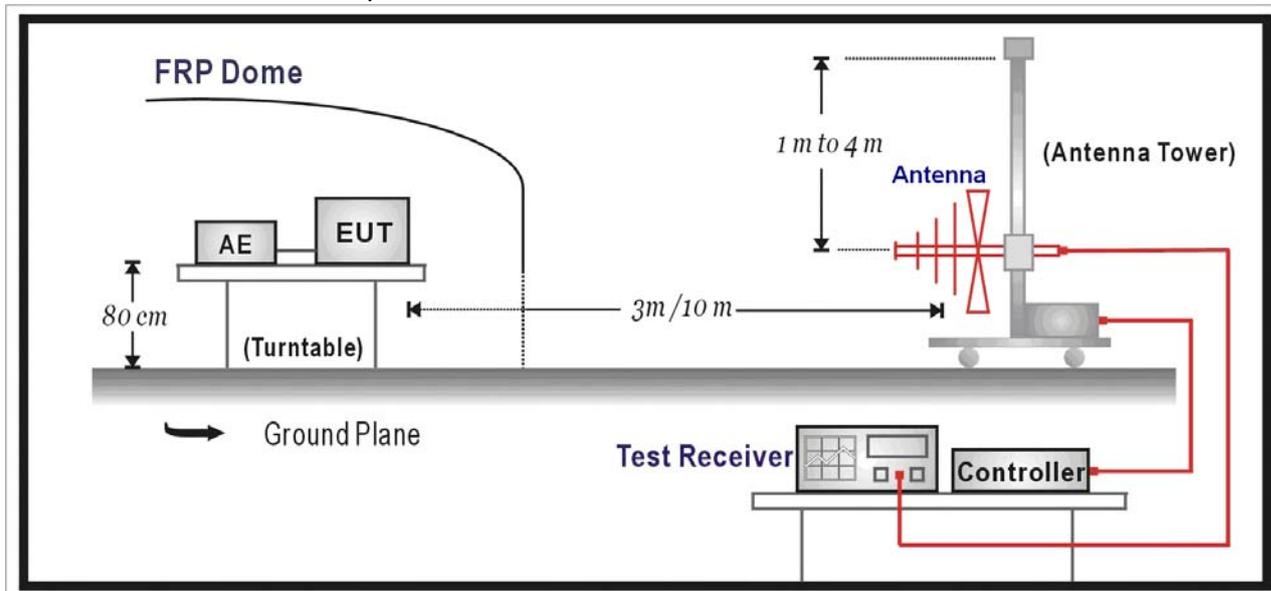
2. "N/A" Ca1.Date is used to Pre-test, not final test.

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 Keyboard		
Test Item	Radiated Emission		
Test Mode	Mode 1 : Transmitter-27.095MHz		
Date of Test	2008/11/28	Test Site	No.1 OATS

Polarization: Horizontal

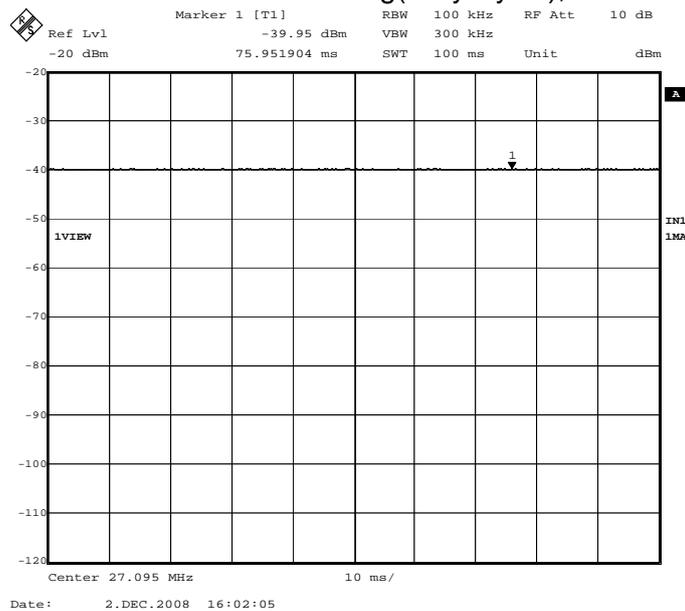
Direction	Frequency (MHz)	Correction Factor (dB)	Peak Reading Level (dBuV)	Peak Emission Level (dBuV/m)	Average Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)
X	27.095	21.39	31.80	53.19	53.19	100	80
Y	27.095	21.39	38.94	60.33	60.33	100	80
Z	27.095	21.39	38.74	60.13	60.13	100	80

Polarization: Vertical

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	27.095	21.39	30.90	52.29	52.29	100	80
Y	27.095	21.39	38.02	59.41	59.41	100	80
Z	27.095	21.39	37.95	59.34	59.34	100	80

Note:

- 1.No other emission were detected above the system noise floor.
- 2.All Readings Levels are performed with peak and/or average measurements as necessary.
- 3.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.
- 4.Average Emission level=Peak Emission level- 20Log(Duty Cycle),and the duty cycle is one as below.



Product	Cordless Keyboard		
Test Item	Radiated Emission		
Test Mode	Mode 2 : Transmitter-27.145MHz		
Date of Test	2008/11/28	Test Site	No.1 OATS

Polarization: Horizontal

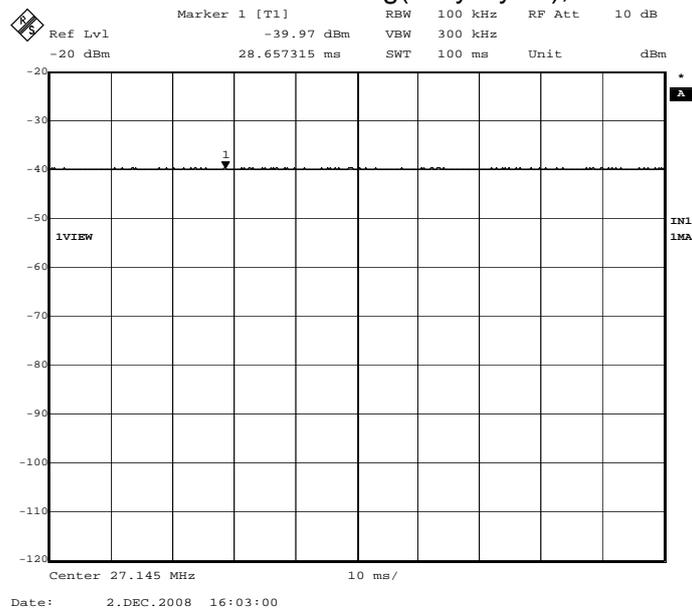
Direction	Frequency (MHz)	Correction Factor (dB)	Peak Reading Level (dBuV)	Peak Emission Level (dBuV/m)	Average Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)
X	27.145	21.39	31.85	53.24	53.24	100	80
Y	27.145	21.39	30.09	60.48	60.48	100	80
Z	27.145	21.39	38.74	60.13	60.13	100	80

Polarization: Vertical

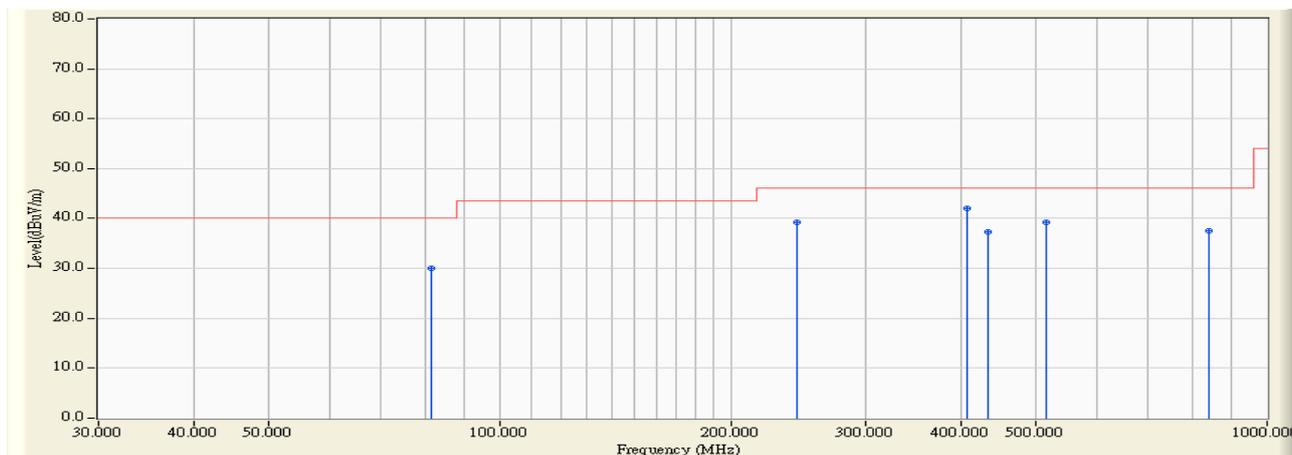
Direction	Frequency (MHz)	Correction Factor (dB)	Peak Reading Level (dBuV)	Peak Emission Level (dBuV/m)	Average Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)
X	27.145	21.39	31.05	52.44	52.44	100	80
Y	27.145	21.39	38.56	59.95	59.95	100	80
Z	27.145	21.39	38.02	59.41	59.41	100	80

Note:

- 1.No other emission were detected above the system noise floor.
- 2.All Readings Levels are performed with peak and/or average measurements as necessary.
- 3.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.
- 4.Average Emission level=Peak Emission level- 20Log(Duty Cycle),and the duty cycle is one as below.



Site : Site 1	Time : 2008/11/22 - 10:10
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Cordless Keyboard	Probe : CBL6112B_2932(30-2000MHz) - HORIZONTAL
Power : DC 3V	Note : Mode 1 : Transmitter-27.095MHz

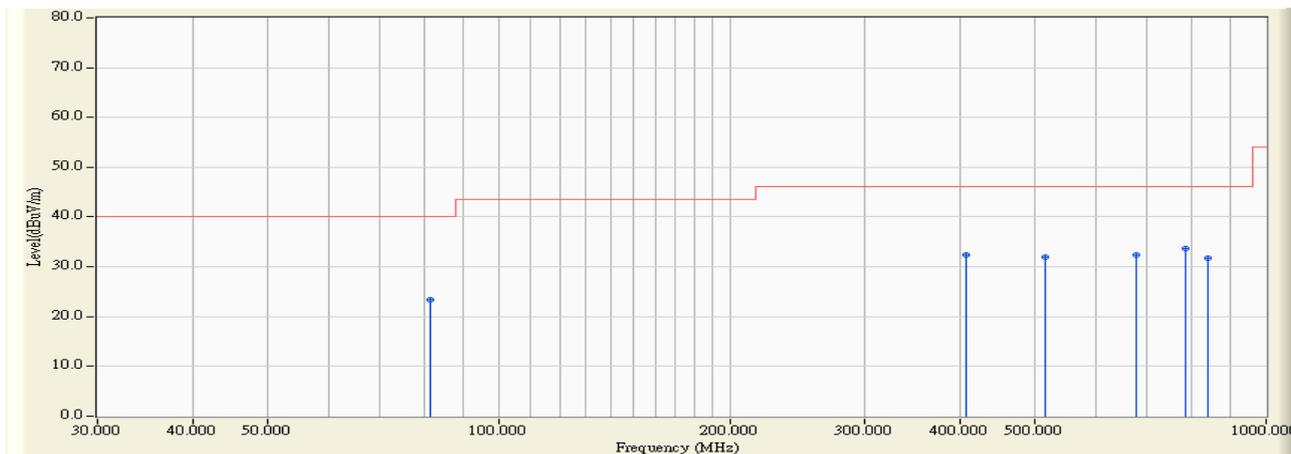


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	81.275	-15.211	45.200	29.989	-10.011	40.000	QUASIPeAK	216.000	216.400
2	243.812	-10.248	49.600	39.352	-6.668	46.020	QUASIPeAK	126.000	11.900
3	* 406.375	-5.086	47.100	42.014	-4.006	46.020	QUASIPeAK	100.000	129.900
4	433.575	-4.827	42.200	37.373	-8.647	46.020	QUASIPeAK	100.000	153.200
5	514.737	-3.399	42.700	39.301	-6.719	46.020	QUASIPeAK	100.000	50.000
6	839.812	0.100	37.400	37.499	-8.521	46.020	QUASIPeAK	100.000	307.000

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 : 2008/11/22 - 10:10
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Cordless Keyboard	Probe : CBL6112B_2932(30-2000MHz) - VERTICAL
Power : DC 3V	Note : Mode 1 : Transmitter-27.095MHz

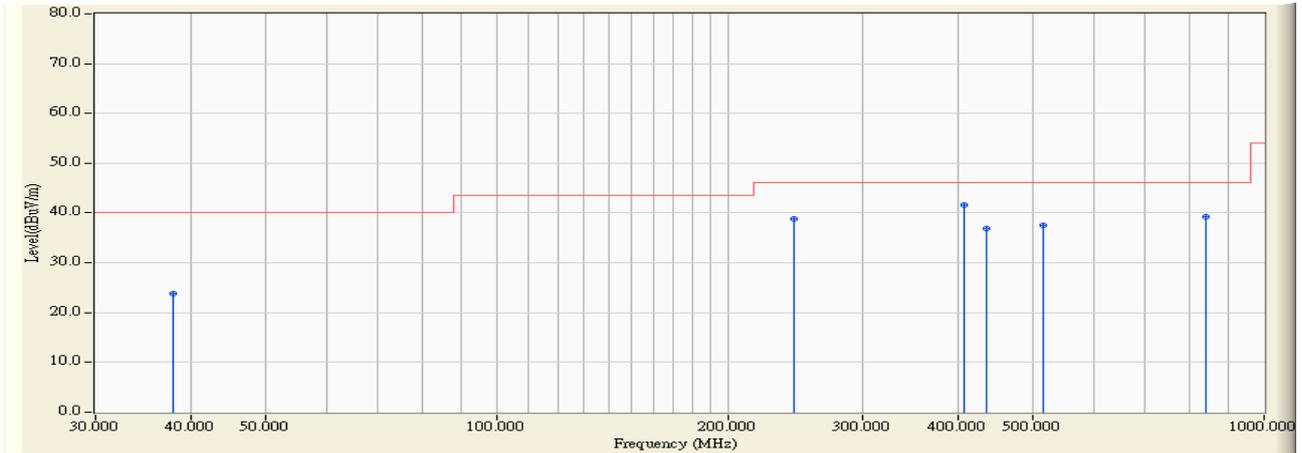


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	81.275	-15.211	38.500	23.289	-16.711	40.000	QUASIPeAK	100.000	340.000
2	406.875	-5.060	37.500	32.440	-13.580	46.020	QUASIPeAK	278.000	279.000
3	514.875	-3.397	35.400	32.003	-14.017	46.020	QUASIPeAK	192.000	100.000
4	677.462	-1.712	34.100	32.388	-13.632	46.020	QUASIPeAK	140.000	272.000
5	* 785.638	-0.140	33.800	33.660	-12.360	46.020	QUASIPeAK	126.000	274.000
6	840.075	0.103	31.700	31.803	-14.217	46.020	QUASIPeAK	100.000	300.000

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 : 2008/11/22 - 10:12
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Cordless Keyboard	Probe : CBL6112B_2932(30-2000MHz) - HORIZONTAL
Power : DC 3V	Note : Mode 2 : Transmitter-27.145MHz

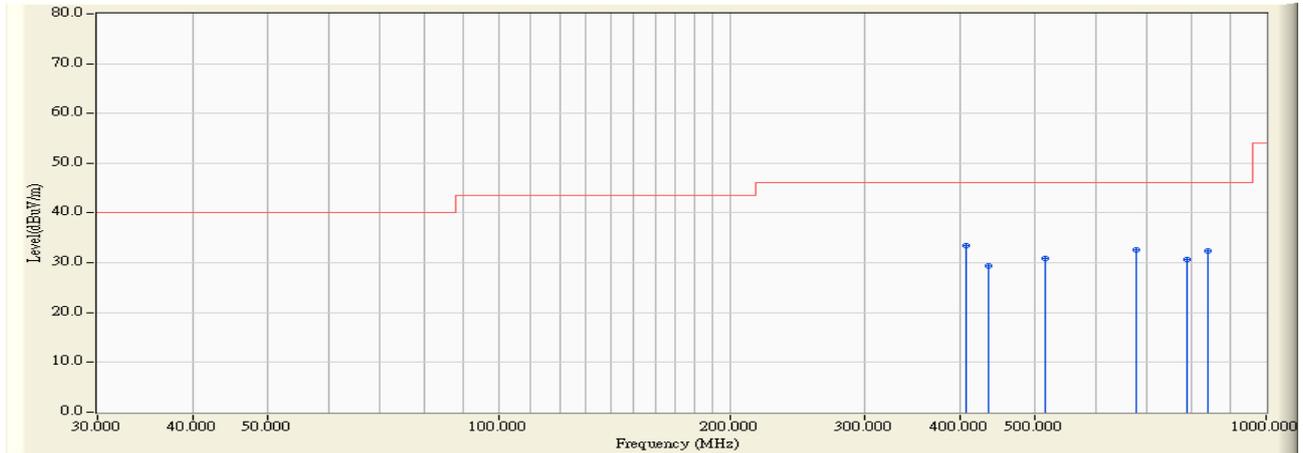


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	37.925	-9.071	32.900	23.829	-16.171	40.000	QUASIPeAK	100.000	198.000
2	244.350	-10.191	49.100	38.909	-7.111	46.020	QUASIPeAK	132.000	15.700
3	* 407.250	-5.040	46.700	41.659	-4.361	46.020	QUASIPeAK	100.000	131.000
4	434.425	-4.836	41.700	36.864	-9.156	46.020	QUASIPeAK	100.000	230.000
5	515.700	-3.382	41.000	37.618	-8.402	46.020	QUASIPeAK	100.000	184.000
6	841.625	0.135	39.100	39.234	-6.786	46.020	QUASIPeAK	121.000	307.000

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 : 2008/11/22 - 10:12
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Cordless Keyboard	Probe : CBL6112B_2932(30-2000MHz) - VERTICAL
Power : DC 3V	Note : Mode 2 : Transmitter-27.145MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	407.225	-5.042	38.500	33.458	-12.562	46.020	QUASIPeAK	283.000	88.800
2		434.413	-4.836	34.200	29.364	-16.656	46.020	QUASIPeAK	116.000	88.500
3		515.725	-3.382	34.300	30.919	-15.101	46.020	QUASIPeAK	215.000	85.000
4		678.725	-1.707	34.400	32.693	-13.327	46.020	QUASIPeAK	154.000	269.000
5		787.150	-0.146	30.900	30.754	-15.266	46.020	QUASIPeAK	130.000	278.000
6		841.600	0.134	32.200	32.334	-13.686	46.020	QUASIPeAK	100.000	281.000

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

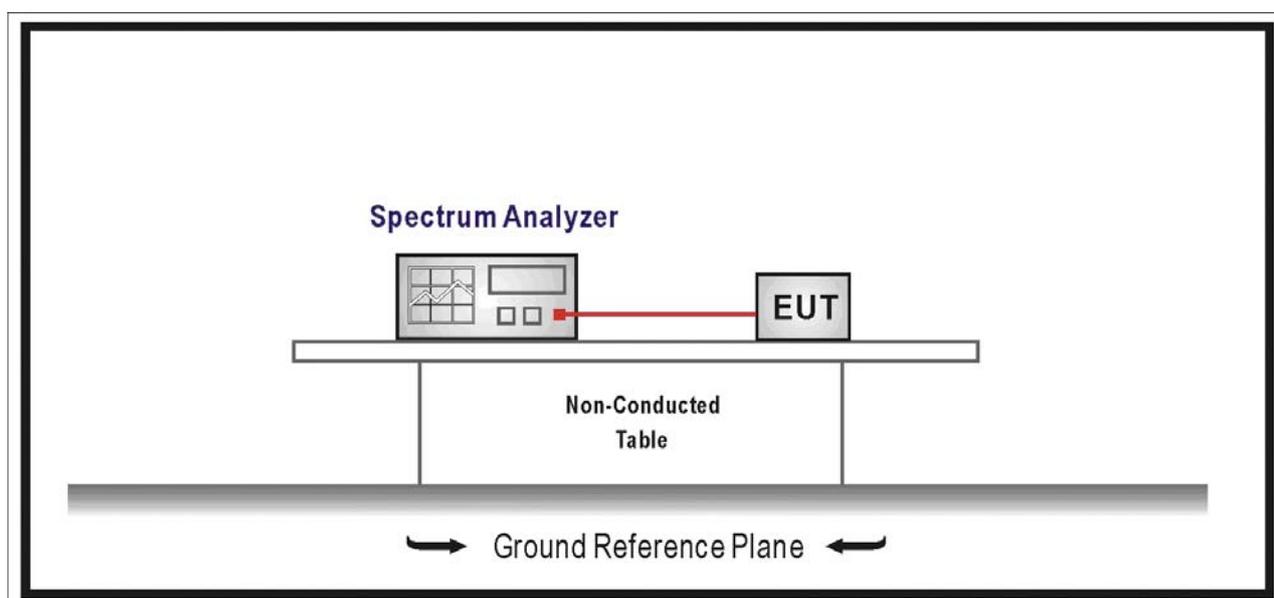
3.1. Test Equipment

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

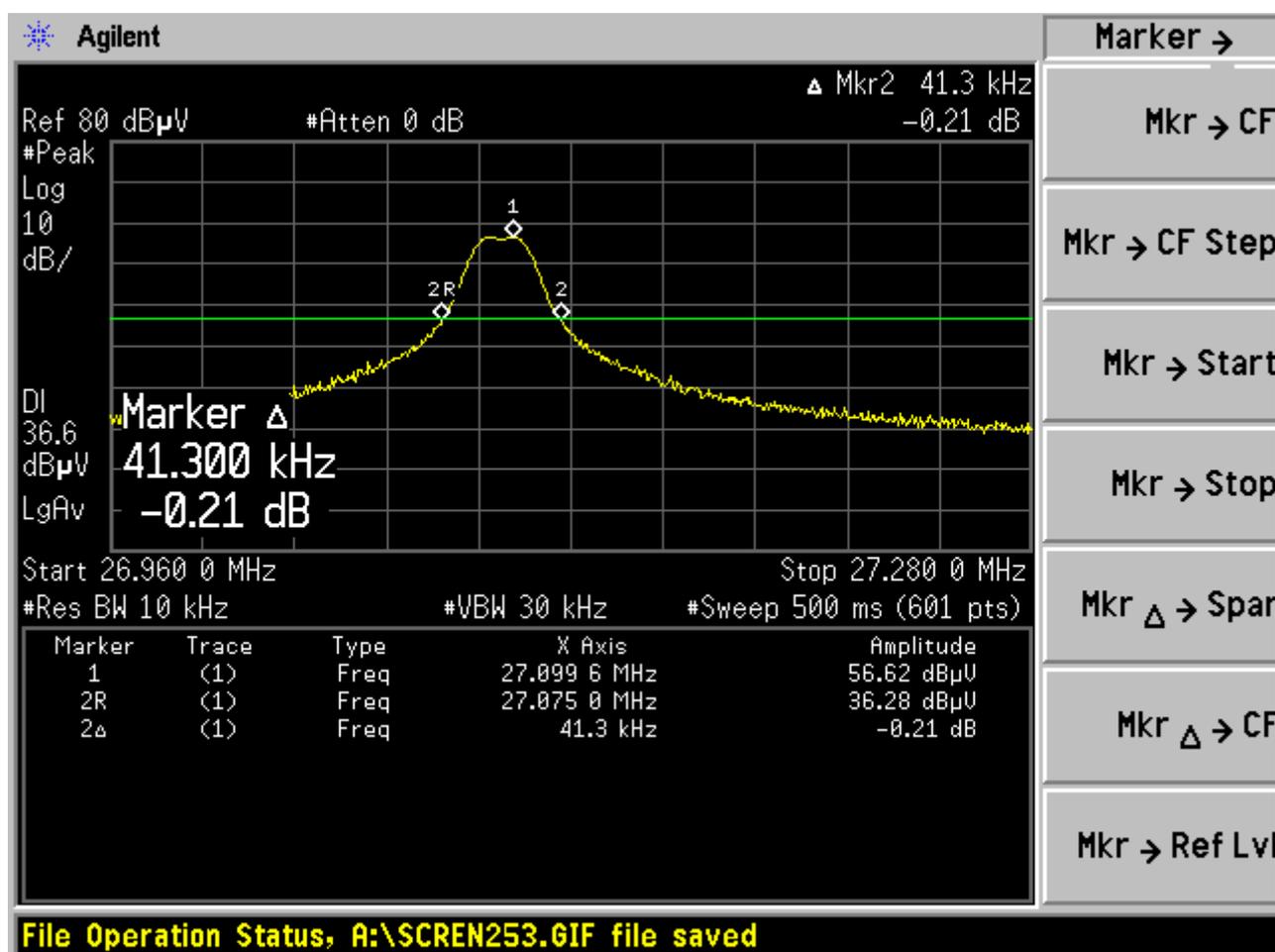
3.5. Uncertainty

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

3.6. Test Result

Product	Cordless Keyboard		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1 : Transmitter-27.095MHz		
Date of Test	2008/11/19	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)
1	27.095	41.3	--



Product	Cordless Keyboard		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2 : Transmitter-27.145MHz		
Date of Test	2008/11/19	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)
2	27.145	40.6	--

