NVLAP LAB CODE 200707-0

FCC PART 15.249

MEASUREMENT AND TEST REPORT

For

Lantian Electronics (Shenzhen) Co., Limited

Building A2, Area 4, Fuqiao Industrial Park, Qiaotou Village, Fuyong Town,

Bao'an Zone, Shenzhen, Guangdong, China

FCC ID: VXGLK7802
Model: LK-7802

Report Type:	**Product Type:**
Original Report	Wireless Keyboard

Test Engineer:	Alvin Huang
Report Number:	RSZ09123101
Report Date:	2010-04-07
Reviewed By:	Merry Zhao EMC Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Lantian Electronics (Shenzhen) Co., Limited* 's product, model *LK-7802 (FCC ID: VXGLK7802)*, or the "EUT" as referred to in this report is a *Wireless Keyboard* which measures *which* measures approximately 49.0 cm L x 22.7 cm W x 3.0 cm H, rated input voltage: DC 2*1.5V AAA battery.

Product information:

Parameters	Specifications
Modulation:	GFSK
Frequency range:	2405-2476 MHz
Transmission power:	≤ 0 dBm
Transmission channel:	64

** All measurement and test data in this report was gathered from production sample serial number: 0912093 (Assigned by BACL, Shenzhen). The EUT was received on 2009-12-31.*

Objective

This Type approval report is prepared on behalf of *Lantian Electronics (Shenzhen) Co., Limited* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.109, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

FCC ID: VXGR7802 for EUT (Rx) was submitted.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Justification

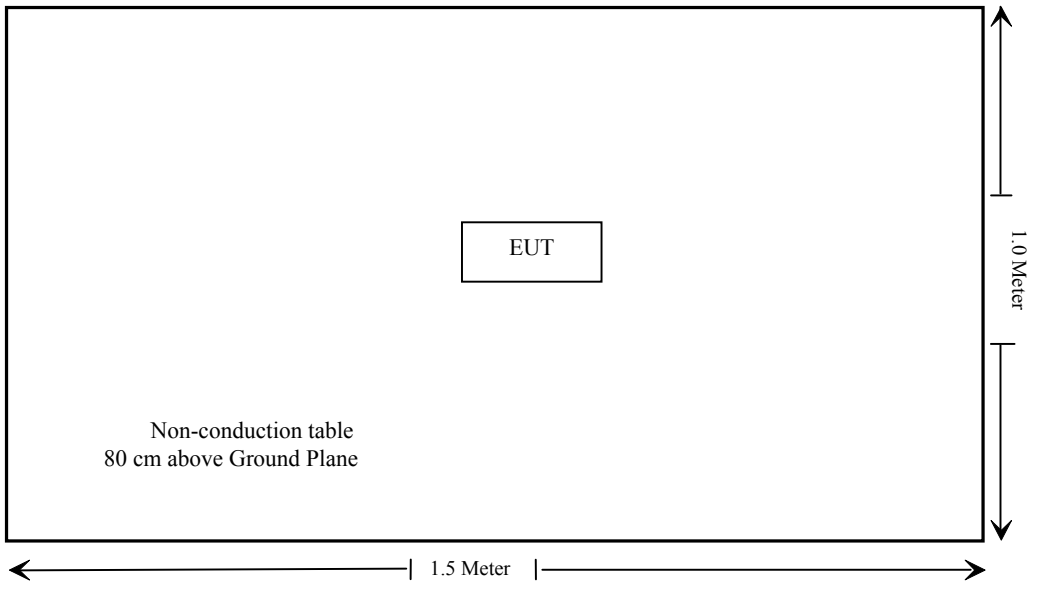
The system was configured for testing in a typical fashion (as normally used by a typical user).

Equipment Modifications

No modifications were made to the unit tested.

Configuration of Test Setup

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emissions	N/A*
§15.205(a), §15.209(a), 15.249(a), §15.249(c), §15.35	Radiated Emissions	Compliant
§15.249(d)	Out of Band Emissions	Compliant

* The EUT was powered by battery only.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

Antenna Connector Construction

The EUT has a printed antenna on PCB, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

Result: Compliant.

Please refer to the EUT photos.

FCC §15.205(a) §15.209(a) & §15.249 - RADIATED EMISSIONS

Applicable Standard

As per FCC §15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC §15.249 (c), Field strength limits are specified at a distance of 3 meters.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is $\pm$4.0 dB.

Test Equipment Setup

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

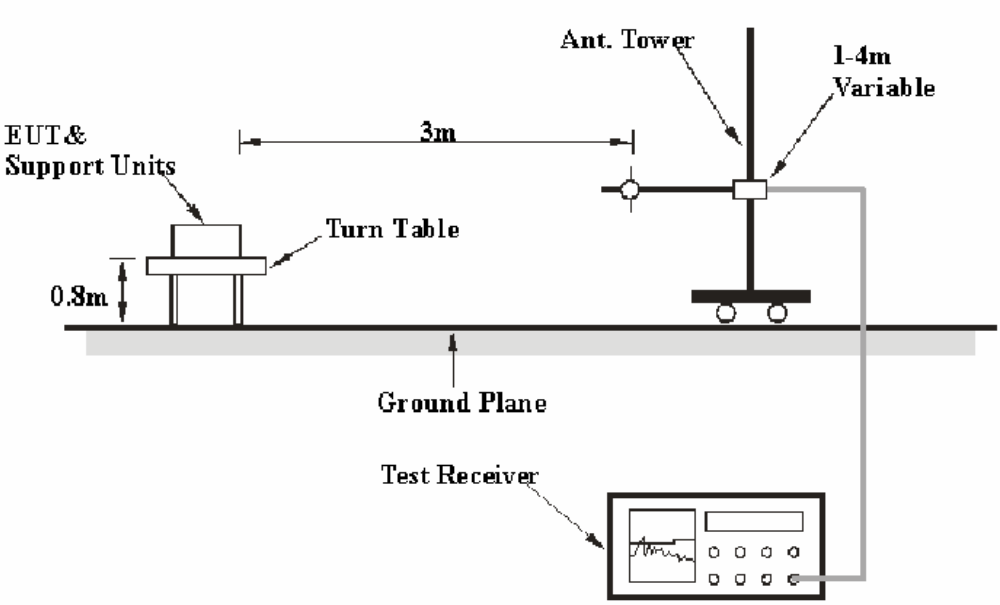
RBW = 100 kHz/VBW = 300 kHz/Sweep = Auto

Above 1000 MHz:

Peak: RBW = 1MHz/VBW = 1MHz/Sweep = Auto

Average: RBW = 1MHz/VBW = 10Hz/Sweep = Auto

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209, FCC 15.109 and FCC 15.249 limits.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2009-08-02	2010-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2009-11-07	2010-11-06
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2009-05-05	2010-05-04
HP	Preamplifier	8449B	3008A00277	2009-09-12	2010-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2009-05-05	2010-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-08-28	2010-08-27

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209, 15.205 and 15.249, with the worst margin reading of:

Below 1 GHz:

16.8 dB at **950.581250 MHz** in the **Horizontal** polarization

Above 1 GHz:

12.10 dB at **4810 MHz** in the **Horizontal** polarization, Low Channel
13.45 dB at **4878 MHz** in the **Vertical** polarization, Middle channel
12.21 dB at **4952 MHz** in the **Vertical** polarization, High channel

Test Data

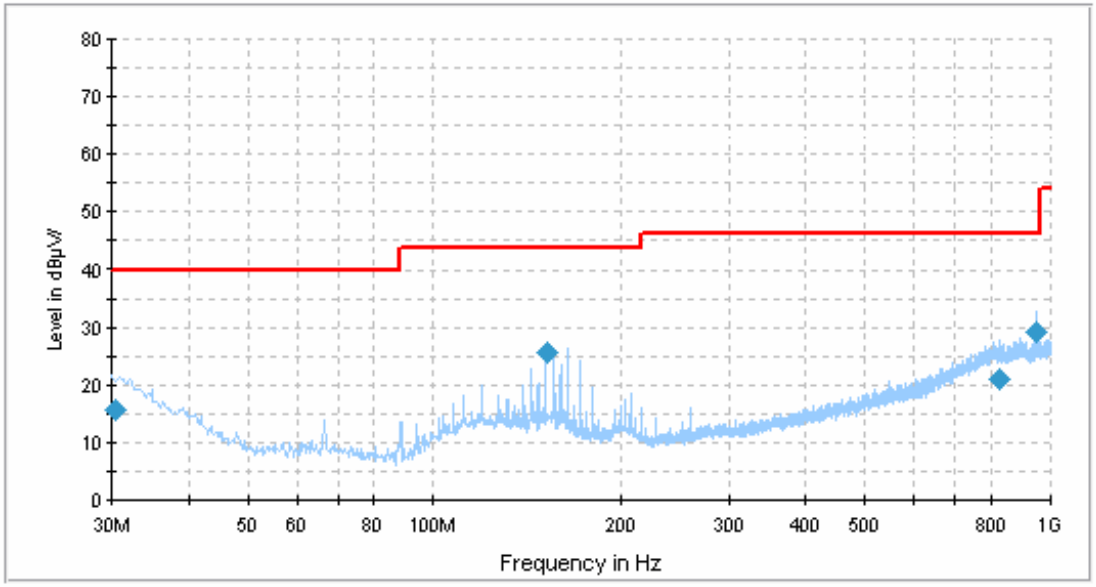
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.2 kPa

The testing was performed by Alvin Huang on 2010-04-01.

Test Mode: Transmitting

Below 1 GHz:



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
950.581250	29.2	104.0	H	231.0	-0.5	46.0	16.8
151.999500	25.7	213.0	H	26.0	-15.3	43.5	17.8
30.381875	15.8	203.0	H	113.0	-6.2	40.0	24.2
828.456500	21.2	259.0	H	353.0	-1.4	46.0	24.8

Above 1 GHz:

Frequency (MHz)	S.A. Reading (dBμV/m)	Detector (PK/AV)	Direction (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.249 & 15.209		
				Height (m)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)	Remarks
Low Channel (2405 MHz)												
4810	28.81	AV	125	1.35	H	36.30	4.30	27.51	41.90	54	12.10	harmonic
2405	73.77	AV	226	1.53	H	30.90	3.03	27.54	80.16	94	13.84	Fund.
4810	28.16	AV	233	2.36	V	35.00	4.30	27.51	39.95	54	14.05	harmonic
4810	42.18	PK	233	2.36	V	35.00	4.30	27.51	53.97	74	20.03	harmonic
4810	40.12	PK	125	1.35	H	36.30	4.30	27.51	53.21	74	20.79	harmonic
2405	64.70	AV	208	2.40	V	30.30	3.03	27.54	70.49	94	23.51	Fund.
2405	73.91	PK	226	1.53	H	30.90	3.03	27.54	80.30	114	33.70	Fund.
2405	64.75	PK	208	2.40	V	30.30	3.03	27.54	70.54	114	43.46	Fund.
Middle Channel (2439 MHz)												
4878	28.76	AV	14	2.13	V	35.00	4.30	27.51	40.55	54	13.45	harmonic
2439	73.90	AV	213	1.58	H	30.90	3.03	27.54	80.29	94	13.71	Fund.
4878	26.60	AV	220	2.10	H	36.30	4.30	27.51	39.69	54	14.31	harmonic
2439	72.13	AV	347	1.86	V	30.30	3.03	27.54	77.92	94	16.08	Fund.
4878	42.09	PK	14	2.13	V	35.00	4.30	27.51	53.88	74	20.12	harmonic
4878	40.32	PK	220	2.10	H	36.30	4.30	27.51	53.41	74	20.59	harmonic
2439	74.07	PK	213	1.58	H	30.90	3.03	27.54	80.46	114	33.54	Fund.
2439	72.43	PK	347	1.86	V	30.30	3.03	27.54	78.22	114	35.78	Fund.
High Channel (2476 MHz)												
4952	30.00	AV	196	2.27	V	35.00	4.30	27.51	41.79	54	12.21	harmonic
4952	27.53	AV	42	2.34	H	36.30	4.30	27.51	40.62	54	13.38	harmonic
2476	73.25	AV	208	1.75	H	30.90	3.03	27.54	79.64	94	14.36	Fund.
2476	73.59	AV	102	2.12	V	30.30	3.03	27.54	79.38	94	14.62	Fund.
4952	43.77	PK	196	2.27	V	35.00	4.30	27.51	55.56	74	18.44	harmonic
4952	41.74	PK	42	2.34	H	36.30	4.30	27.51	54.83	74	19.17	harmonic
2476	73.50	PK	208	1.75	H	30.90	3.03	27.54	79.89	114	34.11	Fund.
2476	73.74	PK	102	2.12	V	30.30	3.03	27.54	79.53	114	34.47	Fund.

Note: The table is the worst case result.

FCC §15.249(d) – OUT OF BAND EMISSIONS

Applicable Standard

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

Test Procedure

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission at the band edge. The receiving antenna should be changed the polarization both of horizontal and vertical.

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

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Test Equipment Setup

The spectrum analyzer or receiver is set as:

Above 1000 MHz:

Peak: RBW = 1MHz/VBW = 1MHz/Sweep = Auto
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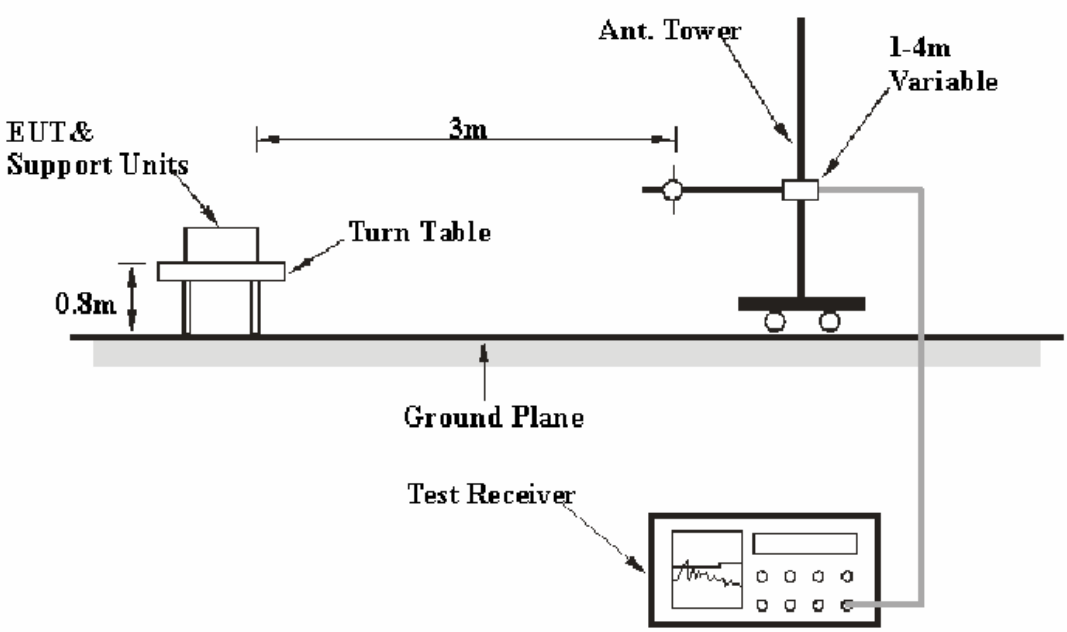
EUT Setup



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*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.2 kPa

The testing was performed by Alvin Huang on 2010-04-01.

Test Result: Compliant

Test Mode: Transmitting

Frequency (MHz)	S.A. Reading (dBμV/m)	Detector (PK/AV)	Direction Degree	Test Antenna			Cable loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC 15.249	
				Height (m)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Out of Left Side Band (2390-2400 MHz)											
2399.80	56.65	PK	360	1.84	V	30.30	3.03	27.54	62.44	74	11.56
2399.95	53.42	PK	153	2.50	H	30.90	3.03	27.54	59.81	74	14.19
2399.95	22.75	AV	153	2.50	H	30.90	3.03	27.54	29.14	54	24.86
2399.80	23.13	AV	360	1.84	V	30.30	3.03	27.54	28.92	54	25.08
Out of Right Side Band (2483.5-2500 MHz)											
2495.44	24.88	AV	145	2.05	V	30.50	3.05	27.54	30.89	54	23.11
2490.15	24.13	AV	95	1.96	H	31.00	3.05	27.54	30.64	54	23.36
2490.15	37.05	PK	95	1.96	H	31.00	3.05	27.54	43.56	74	30.44
2495.44	37.01	PK	145	2.05	V	30.50	3.05	27.54	43.02	74	30.98

Note: The table is the worst case result.

******* END OF REPORT *******