FCC ID PER PART 15.227
EMI MEASUREMENT AND TEST REPORT

For

G.tech Technology Ltd.

NO.21, Jinding Industrial Park, West Jinfeng Road,
Tangjiawan Town, Xiangzhou District Zhuhai Guangdong China

FCC ID: OO9K3512

April 17, 2003

This Report Concerns:	**Equipment Type:**
☒ Original Report	Wireless Multimedia keyboard

Test Engineer:	Philo Zhong
Report No.:	RSZ03040405
Test Date:	April 4, 2003
Reviewed By:	Hans Mellberg
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *G.tech Technology Ltd.* 's product, model *K3512* or the "EUT" as referred to in this report is a Wireless Multimedia keyboard.

** The test data gathered is from typical production samples provided by the manufacturer.*

1.2 Objective

This report is prepared on behalf of *G.tech Technology Ltd.* in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules, Part 15, sec 15.209 and sec 15.227.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals.

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2000, 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 BACL. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated electromagnetic disturbance and disturbance voltage measurement data is located in the No. 3 building JingHua Courtyard, Shennanzhong Rd ShenZhen, Guandong 518031, P.R. C, Xinmiao District, Wuhou Avenue, Chengdu City, Sichuan Province, P. R. C, and 230 Commercial St. Ste. 2, Sunnyvale, CA 94085 USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, CISPR 22: 1997: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods.

1.6 Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Due Date
R/S	Spectrum Analyzer	FSEM	849720/019	08/05/2003
R/S	Receiver	ESCS30	828304/014	09/05/2003
HP	Amplifier	8447D	2944A09795	08/05/2003
ETS	Log Periodic Antenna	3146	9603-4421	09/05/2003
ETS	Biconical Antenna	3110B	3360	08/05/2003
Solar Electronics	LISN	TYPE 8012-50-R-24-BNC	21162	09/05/2003
Solar Electronics	LISN	TYPE 8012-50-R-25-BNC	21163	10/05/2003

*** Statement of Traceability**: Bay Area Compliance Laboratory Corp. certifies that all calibration has Been performed using suitable standards traceable to the NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

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

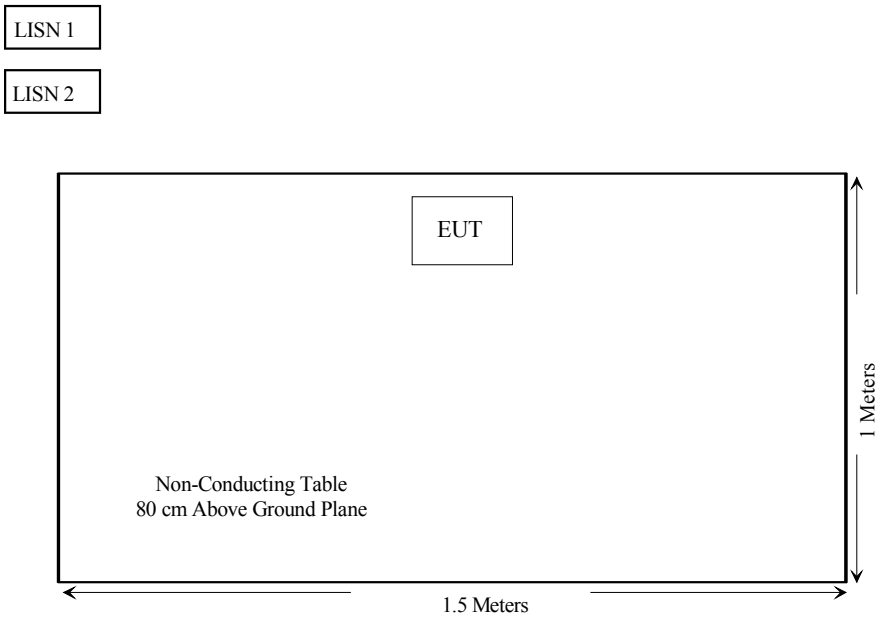
2.2 Equipment Modifications

No modifications were necessary for the EUT to comply.

2.3 Test Setup Configuration

Keyboard

2.4 Test Setup Block Diagram



3 - SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203	Antenna requirement	Compliant
§ 15.205	Restricted Band	Compliant
§ 15.209 § 15.227	Radiated emission limit	Compliant

4 - RADIATED EMISSION TEST

4.1 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 BACL is ±4.0 dB.

4.2 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the ANSI C63.4-1992. The specification used was the FCC Subpart C limits.

The EUT was placed on the center of the test table.

4.3 Spectrum Analyzer Setup

According to FCC Rules, §15.33 (a) (1), the system was tested to 1000 MHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Range	***RBW***	***Video B/W***
Below 30MHz	10kHz	10kHz
30 – 1000MHz	100kHz	100kHz
Above 1000MHz	1MHz	1MHz

4.4 Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combination.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -4 dBμV of specification limitation), and are distinguished with a "**QP**" in the data table.

The EUT was operating at normal to represent worst case during final qualification test. Therefore, this configuration was used for final test data recorded in the table(s) listed under section 4.7 of this report.

4.5 Corrected Amplitude & Margin Calculation

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

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

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

Margin = Corr. Ampl. - Limit

4.6 Summary of Test Results

According to the final data in section 4.7, the EUT complied with the FCC 15.227 and FCC 15.209 standards, and had the worst margin of:

-20.2 dB at 27.035 MHz in the Horizontal polarization, 27-1000MHz, Channel 1

-23.2 dB at 27.185 MHz in the Horizontal polarization, 27-1000MHz, Channel 2

4.7 Radiated Emissions Test Result Data

Indicated		Table	Antenna		Correction Factor			Corrected Amplitude	FCC Subpart C	
Frequency MHz	Ampl. dBμV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Transmitter, Channel 1										
27.035	61.74	45	1.0	H	15.3	7.8	25	59.8	80	-20.2
27.035	60.69	90	1.0	V	15.3	7.8	25	58.8	80	-21.2
80.105	30.0	180	1.2	V	9.6	2.7	27.5	14.8	40	-25.2
80.105	29.0	180	3.5	H	9.6	2.7	27.5	13.8	40	-26.2
54.069	16.1	90	1.2	V	10.5	8.1	25	9.7	40	-30.3
108.14	26.0	160	1	V	11.4	3.2	27.7	12.9	43.5	-30.6
54.07	15.3	0	1.2	H	10.5	8.1	25	8.9	40	-31.1
108.14	25.0	270	3	H	11.4	3.2	27.7	11.9	43.5	-31.6
Transmitter, Channel 2										
27.185	58.7	45	1.0	H	15.3	7.8	25	56.8	80	-23.2
27.185	57.76	90	1.0	V	15.3	7.8	25	55.9	80	-24.1
81.555	29.1	180	3.5	H	9.6	2.7	27.5	13.9	40	-26.1
81.555	28.0	180	1.2	V	9.6	2.7	27.5	12.8	40	-27.2
54.37	16.52	90	1.2	V	10.5	8.1	25	10.1	40	-29.9
108.74	26.0	270	3	H	11.4	3.2	27.7	12.9	43.5	-30.6
54.37	15.24	0	1.2	H	10.5	8.1	25	8.8	40	-31.2
108.74	25.0	160	1	V	11.4	3.2	27.7	11.9	43.5	-31.6

The keyboard transmitter was placed in continuous transmit mode for all tests.