

Application for FCC Certification
On behalf of
Shanghai Jujo Electronics Co., Ltd.
USB KEY

Model No.: HardKey/BL
FCC ID: PIT-K001

Prepared For : Shanghai Jujo Electronics Co., Ltd.
Room 516-518, Tianlin Building, 300 Tianlin Road,
Shanghai, P.R. China

Prepared By : AUDIX Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F01021
Date of Test : Mar 22 ~ 23, 2001
Date of Report : Mar 23, 2001

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TEST REPORT FOR FCC CERTIFICATION

Applicant : Shanghai Jujo Electronics Co., Ltd.
Room 516-518, Tianlin Building, 300 Tianlin Road,
Shanghai, P.R. China

Manufacturer : Shanghai Jujo Electronics Co., Ltd.
Room 516-518, Tianlin Building, 300 Tianlin Road,
Shanghai, P.R. China

EUT Description : USB KEY
(A) Model No. : HardKey/BL
(B) Serial No. : Jujo2001-001
(C) Power Supply : AC 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 1998
AND ANSI C63.4:1992*

The device described above is tested by AUDIX Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B (Class B) limits both radiated and conducted emissions.

The measurement results are contained in this test report and AUDIX Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology (Shanghai) Co., Ltd.

Date of Test : Mar 23, 2001

Prepared by : Stella Tang
(STELLA TANG)

Test Engineer : Jim Hsu
For and on behalf of
AUDIX TECHNOLOGY (SHANGHAI) CO., LTD.

Reviewer : Hall Wang
(HALL WANG)

Approved Signatory: Jeremy Geng
(JEREMY GENG)
Authorized Signature(s)

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test

Description	:	USB KEY
Type of EUT	:	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model Number	:	HardKey/BL
Serial No.	:	Jujo200-001
FCC ID	:	PIT-K001
Applicant	:	Shanghai Jujo Electronics Co., Ltd. Room 516-518, Tianlin Building, 300 Tianlin Road, Shanghai, P.R. China
Manufacturer	:	Shanghai Jujo Electronics Co., Ltd. Room 516-518, Tianlin Building, 300 Tianlin Road, Shanghai, P.R. China

1.2 Tested System Details

1.2.1 PERSONAL COMPUTER

Model Number	:	HP Pavilion 8626
Serial Number	:	CN03540181
Manufacturer	:	HP
Power Cord	:	Unshielded, Detachable, 1.80m

1.2.2 KEYBOARD

Model Number	:	SK-2506
Serial Number	:	C0006175364
Manufacturer	:	HP
Data Cable	:	Shielded, Nondetachable, 1.52m

1.2.3 MOUSE

Model Number	:	M-S48a
Serial Number	:	LZC01851677
FCC ID	:	JNZ201213
Manufacturer	:	HP
Data Cable	:	shielded, Nondetachable, 1.48m

1.2.4 PRINTER

Model Number	:	C4245A
Serial Number	:	CN1Q043564
Manufacturer	:	HP
Data Cable	:	Shielded, Detachable, 2.00m
Power Cord	:	Unshielded, Detachable, 1.50m

1.2.5 MODEM

Model Number	:	MODEM1414
Serial Number	:	980013576
FCC ID	:	IFAXDM1414
Manufacturer	:	ACEEX
Data Cable	:	Shielded, Detachable, 1.44m

1.2.6 ADAPTOR

Model Number	:	e.net 200
Manufacturer	:	ACEEX
Power Cord	:	Unshielded, Nondetachable, 1.84m
Output Power	:	AC 9V 800mA

1.3 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	:	Sept. 17, 1998 file on Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	:	AUDIX Technology (Shanghai) Co., Ltd.
Site Location	:	3 F., 34 Bldg., 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai, China

1.4 Measurement Uncertainty

Conducted Emission Uncertainty	:	U=2.66dB
Radiated Emission Uncertainty	:	U=3.90dB

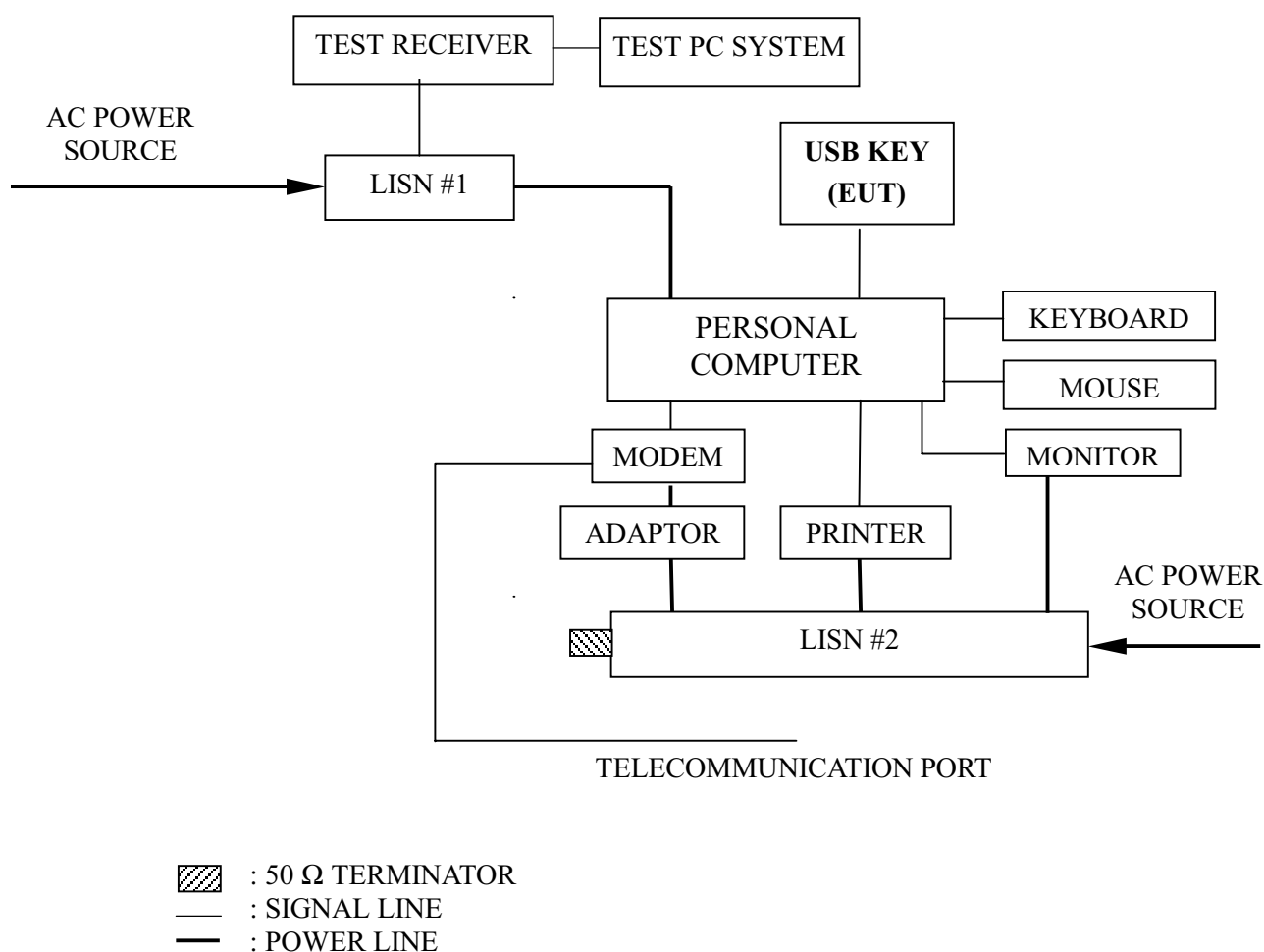
2 CONDUCTED EMISSION TEST

2.1 Test Equipment

The following test equipment are used during the conducted emission test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS10	844077/020	May 20, 2000	1 Year
2.	Line Impedance Stabilization Network (LISN) #1	Kyoritsu	KNW-407	8-1280-4	Jun 02, 2000	1 Year
3.	LISN #2	Kyoritsu	KNW-407	8-1280-5	Apr 15, 2000	1 Year

2.2 Block Diagram of Test Setup



2.3 Conducted Emission Limit

Frequency (MHz)	Maximum RF Line Voltage	
	(μ V)	dB(μ V)
0.45 ~ 30	250	48
NOTE 1 – RF Line Voltage dB(μ V) = 20 log RF Line Voltage (μ V)		

2.4 Test Configuration

The EUT (listed in Sec. 1.1) and the supported simulator (listed in Sec 1.2) were installed to meet FCC requirement and operating in a manner which tends to maximize its emission level in a normal application.

2.5 Operating Condition of EUT

The EUT was connected to the power mains through PC system connected with a Line Impedance Stabilization Network (LISN #1). The other supported simulated device power cords was connected to the power mains through LISN #2. This provided a 50 Ω coupling impedance for the measuring equipment.

Both sides of AC line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4-1992 during conducted emission test.

The bandwidth of Test Receiver ESHS10 was set at 10 kHz.

The frequency range from 450 kHz to 30 MHz was checked. The test mode (Run test program) was done on conducted emission test and all the test results are listed in Sec. 2.7.

2.6 Test Procedure

2.6.1 Setup the EUT and the simulator as shown in section 2.2.

2.6.2 Turn on the power of all equipment.

2.6.3 The EUT was in Run test program mode;

2.6.4 The EUT will be operated normally.

2.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

EUT : USB KEY Temperature : 24°C

Model No. : HardKey/BL Humidity : 53%

Test Mode : Run test program Date of Test : Mar 22, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.609	0.30	30.54	30.84	48.00	17.16
	0.714	0.29	29.41	29.70	48.00	18.30
	1.134	0.27	31.45	31.72	48.00	16.28
	2.229	0.27	38.08	38.35	48.00	9.65
	2.571	0.27	40.51	40.78	48.00	7.22
	3.067	0.27	41.20	41.47	48.00	6.53
VB	0.609	0.30	33.21	33.51	48.00	14.49
	0.714	0.29	32.58	32.87	48.00	15.13
	2.229	0.24	37.98	38.22	48.00	9.78
	2.571	0.25	39.94	40.19	48.00	7.81
	3.067	0.25	41.12	41.37	48.00	6.63
	27.816	0.52	37.26	37.78	48.00	10.22
<p>Note 1. Emission Level = Meter Reading + Factor Note 2. Factor = Insertion Loss + Cable Loss Note 3. All reading are Quasi-Peak Values. Note 4. The worst emission is detected at 3.067 MHz with corrected signal level of 41.47dB(μV) (limit is 48.00 dB(μV)), when the VA of the EUT is connected to LISN.</p>						

TEST ENGINEER: Jim Hsu
(JIM HSU)

3 RADIATED EMISSION TEST

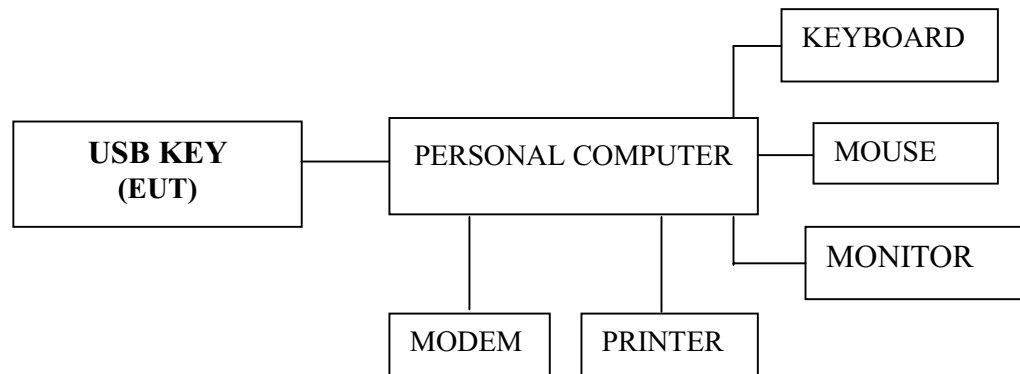
3.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

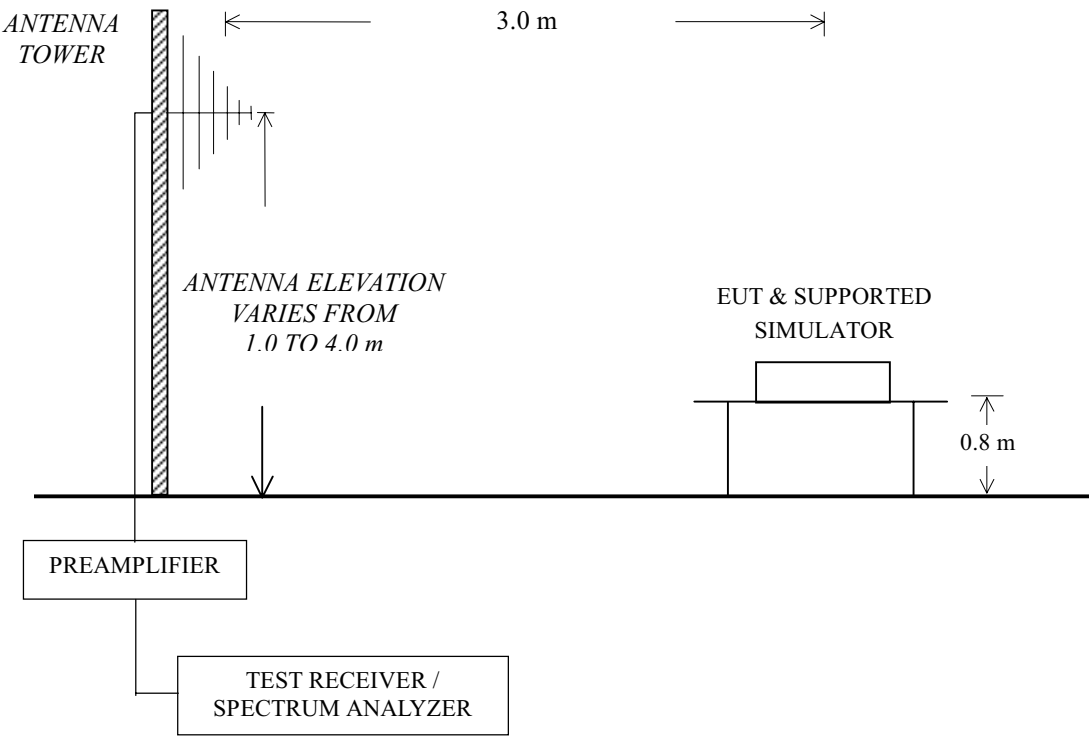
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	85422E	3617A00167	Set 15,2000	1 Year
2.	Preamplifier	HP	8447D	2944A06849	June 03, 2000	1/2 Year
3.	Bilog Antenna	Chase	CBL6111	1146	Dec 10, 2001	1/2 Year
4.	Test Receiver	Rohde & Schwarz	ESVS10	844594/001	May 20,2000	1 Year

3.2 Block Diagram of Test Setup

3.2.1 EUT and supported simulator



3.2.2 Radiated emission test setup



3.3 Radiated Emission Limit

Frequency (MHz)	Distance (m)	Field strength limits	
		($\mu\text{V/m}$)	$\text{dB}(\mu\text{V/m})$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
NOTE 1 - Emission Level $\text{dB}(\mu\text{V/m}) = 20 \log \text{Emission Level } (\mu\text{V/m})$ NOTE 2 - The tighter limit applies at the band edges. NOTE 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.			

3.4 Test Configuration

The configuration of the EUT and simulators are same as those used in conducted test.

Please refer to Sec. 2.4.

3.5 Operating Condition of EUT

Same as conducted test which is listed in Sec. 2.5, except the test set up replaced by Sec. 3.2.

3.6 Test Procedure

The EUT and simulator were placed on a turn table which is 0.8 meter above ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or dipole antenna were used as receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C 63.4-1992 requirements during radiated emission test.

The bandwidth setting on Test Receiver ESVS10 was 120 kHz.

The frequency range from 30 MHz to 1000 MHz was checked. The test mode (Run test program) was done on radiated emission test and all the test results are listed in Sec. 3.7.

3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

EUT : USB KEY Temperature : 24°C

Model No. : HardKey/BL Humidity : 53%

Test Mode : Run test program Date of Test : Mar 23, 2001

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	43.580	11.57	25.42	0.83	45.75	32.73	40.00	7.27
	90.140	7.62	25.14	1.14	53.61	37.23	43.50	6.27
	145.430	11.14	25.10	1.63	48.73	36.40	43.50	7.10
	303.540	14.43	25.16	2.52	47.16	38.95	46.00	7.05
	444.190	18.12	26.34	3.27	43.56	38.61	46.00	7.39
	516.940	19.91	26.70	3.56	41.57	38.34	46.00	7.66
Vertical	43.580	11.57	25.42	0.83	48.51	35.49	40.00	4.51
	71.710	7.15	25.23	1.04	52.31	35.27	40.00	4.73
	101.780	10.62	25.10	1.20	52.27	38.99	43.50	4.51
	145.430	11.14	25.10	1.63	45.65	33.32	43.50	10.18
	187.140	9.47	25.10	1.93	49.01	35.31	43.50	8.19
	303.540	14.43	25.16	2.52	45.36	37.15	46.00	8.85

Note 1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor

Note 2. All reading are Quasi-Peak values.

Note 3. The worst emission at horizontal polarization was detected at 90.140 MHz with corrected signal level of 37.23 dB(μV/m) (limit is 43.50 dB(μV/m)), when the antenna was 2.00m height and the turn table was at 179°.

Note 4. The worst emission at vertical polarization was detected at 43.580 MHz with corrected signal level of 35.49 dB(μV/m) (limit is 40.00 dB(μV/m)) and 101.780 MHz with corrected signal level of 38.99 dB(μV/m) (limit is 43.50 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 185°.

Note 5. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

TEST ENGINEER: Jim Hsu
(JIM HSU)