

TEST REPORT

(Application for Certification)

FCC ID : YYC-662910

Applicant Name : Innvo Labs Limited
& Address : Jetta House, 19 On Kui Street, On Lok Tsuen, Fanling, Hong kong
Manufacturing Site : JETTA(CHINA) INDUSTRIES, CO., LTD.
333 CAI XIN LU, LAN HE ZHEN, PAN YU QU, GUANGZHOU, CHINA.

Sample Description :
Product : Electronic toy
Model No. : 662910
Electrical Rating : 7.4VDC Battery
Date Received : 03 November 2010

Date Test Conducted : 03 November 2010 to 18 November 2010

Test standards : FCC Part 15 subpart B:2009

Test Result : Pass

Conclusion : The submitted samples complied with the above rules/standards.

Remark : None.

*****End of Page*****

Prepared and Check By:

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09 May 2011 Date

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1 General Description

1.1 Product Description

The EUT can be connected to the personal computer with the cable provided, through the USB socket located inside the battery compartment.

The internal clock setting of the EUT can be monitored and set by this connection.

Internal highest operation frequency 192MHz

For electronic filing, the brief circuit description is saved with filename: description .pdf.

1.2 Related Submittal(s) Grants

N/A

1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). Radiated Emission measurement was performed in a Semi-anechoic chamber. Preliminary scans were performed in the Semi-anechoic chamber only to determine worst case modes. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the “Justification Section” of this Application.

Conducted emission measurements were performed according to the procedures in ANSI C63.4 (2003). Conducted Emission measurement was performed in a Shielding Room. Preliminary scans were performed in the Shielding Room only to determine worst case modes. All conducted tests were performed at an LISN to EUT distance of 0.8 meters, unless stated otherwise in the “Justification Section” of this Application.

1.4 Test Facility

The Semi-Anechoic Chamber facility used to collect the radiated data and Shielding Room facility used to collect the conducted data are Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District Shenzhen, P.R.China. This test facility and site measurement data have been fully placed on file with File Number 242492.

2 System Test Configuration

2.1 *Justification*

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2003).

For maximizing emission above 30 MHz, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.3

The unit was operated standalone and flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on the turntable and rotate through 360°, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

The EUT transfers the setting of internal clock to PC continuously on testing when it is connected with the PC

2.2 *EUT Exercising Software*

Software PLEO USE Driver , version 1.0 was provided by the Applicant

2.3 *Special Accessories*

There are no special accessories necessary for compliance of this product.

2.4 *Equipment Modification*

No modification.

2.5 *Measurement Uncertainty*

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

Product Name	Manufacturer	Model
Hard disk	Smart.drive	HD3-SU2FW
1394 Line	Smart.drive	Length:180 cm
USB Line (PC to hard disk)	Smart.drive	Length:155 cm
Computer	LENOVO	T61(Model:7663-CY4)
Adapter	LENOVO	92P1103
USB Line (EUT to PC)	Innvo labs	Length:105 cm

3 Emission Results

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 *Field Strength Calculation*

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG - AV$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

$$FS = RR + LF$$

where FS = Field Strength in dB μ V/m

RR = RA - AG - AV in dB μ V

LF = CF + AF in dB

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V}/\text{m}$$

$$AF = 7.4 \text{ dB}$$

$$RR = 18.0 \text{ dB}\mu\text{V}$$

$$CF = 1.6 \text{ dB}$$

$$LF = 9.0 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$AV = 5.0 \text{ dB}$$

$$FS = RR + LF$$

$$FS = 18 + 9 = 27 \text{ dB}\mu\text{V}/\text{m}$$

$$\text{Level in } \mu\text{V}/\text{m} = \text{Common Antilogarithm} [(27 \text{ dB}\mu\text{V}/\text{m})/20] = 22.4 \mu\text{V}/\text{m}$$

3.2 Radiated Emission and conducted emission Configuration Photograph

Worst Case Radiated Emission at 883.16 MHz

Worst Case conducted Emission at 0.425 MHz

For electronic filing, the worst case radiated emission and conducted emission configuration photographs are saved with filename: radiated photos.pdf..and Conducted photos.pdf

3.3 Radiated and conducted Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 0.3 dB for radiated emission

Passed by 7.8 dB for conducted emission

Applicant: Innvo Labs Limited.
Model: 662910
Test Mode: Connected to PC

Date of test: 16 November 2010

Table 1
Radiated Emissions (30M-1GHz)
Pursuant to FCC 15.109: Emissions Requirement

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	192.20	43.6	20	9.9	33.5	43.5	-10.0
H	288.32	44.5	20	8.5	33.0	46.0	-13.0
H	729.15	52.2	20	8.7	40.9	46.0	-5.1
H	744.88	48.6	20	9.4	38.0	46.0	-8.0
H	757.68	45.9	20	11.3	37.2	46.0	-8.8
H	782.37	46.2	20	11.9	38.1	46.0	-7.9
V	31.94	28.8	20	13.2	22.0	40.0	-18.0
V	48.02	36.9	20	9.2	26.1	40.0	-13.9
V	71.99	35.4	20	8.1	23.5	40.0	-16.5
V	120.02	29.4	20	9.9	19.3	43.5	-24.2
V	167.98	33.6	20	8.5	22.1	43.5	-21.4
V	513.40	32.4	20	11.9	24.3	46.0	-21.7

Radiated Emissions (1GHz-2GHz)
Pursuant to FCC 15.109: Emissions Requirement

There were no emissions found above system measuring level (PK and AV) (at least 20 dB below the limit).

Notes: Negative signs (-) in the margin column signify levels below the limit.

Applicant: Innvo Labs Limited.
Model: 662910
Test Mode: Sound and light

Date of test: 16 November 2010

Table 2
Radiated Emissions (30M-1GHz)
Pursuant to FCC 15.109: Emissions Requirement

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	320.10	44.6	20	17.5	42.1	46	-3.9
H	729.01	38.6	20	26.5	45.1	46	-0.9
H	852.59	38.5	20	27.1	45.6	46	-0.4
V	729.01	38.3	20	25.5	43.8	46	-2.2
V	833.16	39.5	20	26.2	45.7	46	-0.3
V	852.59	33.6	20	27.1	40.7	46	-5.3

Table 3
Radiated Emissions (1GHz-2GHz)
Pursuant to FCC 15.109: Emissions Requirement

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net(PK) at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	1493	44.2	20	30.9	55.1	74	-18.9
H	1637	44.0	20	33.2	57.2	74	-16.8
H	1973	45.0	20	35.5	60.5	74	-13.5
V	1135	40.2	20	29.5	49.7	74	-24.3
V	1270	41.9	20	30.0	51.9	74	-22.1
V	1369	43.5	20	31.5	55.0	74	-19.0

Table 4
Radiated Emissions (1GHz-2GHz)
Pursuant to FCC 15.109: Emissions Requirement

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net(AV) at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	1493	18.0	20	30.9	28.9	54	-25.1
H	1637	17.8	20	33.2	31.0	54	-23.0
H	1973	18.1	20	35.5	33.6	54	-20.4
V	1135	18.7	20	29.5	28.2	54	-25.8
V	1270	18.1	20	30.0	28.1	54	-25.9
V	1369	18.6	20	31.5	30.1	54	-23.9

Notes: Negative signs (-) in the margin column signify levels below the limit.

Internal highest operation frequency is 192MHz, the frequency range shall be investigated up to 2GHz

Applicant: Innvo Labs Limited.

Date of test: 19 November 2010

Model: 662910

Test Mode: Connected to PC

Conducted Emissions (0.15-30MHz)

At main terminal

Tested Wire: Live

Table 5

Frequency	Quasi-Peak		Average	
[MHz]	Disturbance level [dB(µV)]	Permitted limit [dB(µV)]	Disturbance level [dB(µV)]	Permitted limit [dB(µV)]
0.158	48.1	65.6	31.9	55.6
0.425	40.6	57.3	39.5	47.3
0.574	40.8	56.0	34.4	46.0
0.915	39.9	56.0	29.6	46.0
1.714	40.1	56.0	32.8	46.0
2.440	38.9	56.0	27.4	46.0

Tested Wire: Neutral

Table 6

Frequency	Quasi-Peak		Average	
[MHz]	Disturbance level [dB(µV)]	Permitted limit [dB(µV)]	Disturbance level [dB(µV)]	Permitted limit [dB(µV)]
0.158	50.4	65.6	35.1	55.6
0.215	40.6	63.0	31.4	53.0
0.562	41.6	56.0	32.6	46.0
1.210	40.3	56.0	25.4	46.0
1.740	39.9	56.0	28.4	46.0
2.170	38.5	56.0	28.6	46.0

4 Equipment photo

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

5 Product Labelling

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

6 Technical Specifications

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

7 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States

8 Miscellaneous Information

This miscellaneous information includes details of the measured bandwidth, the test procedure

8.1 *Emissions Test Procedures*

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules and PC peripherals under Part 15, Subpart B rules

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2003.

Conducted emission:

Test was performed according to ANSI C63.4: 2003. The EUT was set to achieve the maximum emission level. The mains terminal disturbance voltage was measured with the EUT in a shielded room. The EUT was connected to AC power source through an Artificial Mains Network which provides a 50Ω linear impedance Artificial hand is used if appropriate (for handheld apparatus). The load/control terminal disturbance voltage was measured with passive voltage probe if appropriate.

The vertical conducting plane or wall of a screened room shall be located 40 cm to the rear of the EUT. All other surfaces of tabletop EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs. The table-top EUT was placed on a 0.8m high non-metallic table above earthed ground plane(Ground Reference Plane).And for floor standing EUT, was placed on a 0.1m high non-metallic supported on GRP. The Artificial Mains Network is situated at a distance of 0.8m from the EUT.

During the test, mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m.

The bandwidth of test receiver was set at 9 kHz. The frequency range from 150 kHz to 30MHz was checked.

Radiated emission:

The (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and

any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

8.2 *Emissions Test Procedures (cont'd)*

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 2003.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

9 Equipment list

1) Radiated Emission test

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	25-Nov-09	25-May-11
SZ185-01	EMI Receiver	R&S	ESCI	100547	08-Mar-10	08-Mar-11
SZ061-08	Horn Antenna	ETS	3115	00092346	17-Jul-08	17-Jan-11
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	18-Mar-10	18-Mar-11
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	10-Jul-10	10-Jan-11
SZ062-04	RF Cable	RADIALL	RG 213U	--	30-Sep-10	30-Mar-11
SZ062-06	RF Cable	RADIALL	0.04-26.5GHz	--	17-Aug-10	17-Aug-11

2) Conducted Emission test

Equipment No.	Equipment	Model	Manufacturer	Serial No.	Cal. Date	Due Date
SZ185-02	EMI Test Receiver	ESCI	R&S	100692	12-Nov-10	23-Nov-11
SZ187-01	LISN	ENV216	R&S	100072	12-Nov-10	12-Nov-11
SZ067-03	Power Splitter	RVZ	R&S	100410	08-Mar-10	08-Mar-11
SZ066-01	Isolation Transformer	ISO TRAN	Erika Fiedler OHG	89	14-Jan-10	14-Jan-11
SZ067-01	Matching Pad	RAM	R&S	101055	08-Mar-10	08-Mar-11
SZ067-02	Matching Pad	RAM	R&S	101056	08-Mar-10	08-Mar-11
SZ062-09	RF Cable	RG58/AU	MIZU		/	/
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Sep-10	16-Sep-13