

FCC PART 15B, CLASS B

TEST REPORT

For

Beijing IRTOUCH SYSTEMS Co.,Ltd.

4th Floor, M8 Building, No.1 Jiuxianqiao East Road, Chaoyang District, Beijing, P.R.China

FCC ID: RDHRS2200W0XXS

Report Type: Original Report	Product Type: Infrared Touchscreen
Test Engineer: Star Xie	
Report Number: R2BJ130311051-00	
Report Date: 2013-03-22	
Reviewed By: EMC Leader	
Test Laboratory: Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★" (Rev.2)

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST FACILITY	3
SYSTEM TEST CONFIGURATION.....	4
JUSTIFICATION	4
EUT EXERCISE SOFTWARE	4
EQUIPMENT MODIFICATIONS	4
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	4
EXTERNAL I/O CABLE.....	4
BLOCK DIAGRAM OF TEST SETUP	5
SUMMARY OF TEST RESULTS	6
FCC §15.107 – AC LINE CONDUCTED EMISSIONS.....	7
MEASUREMENT UNCERTAINTY	7
EUT SETUP.....	7
EMI TEST RECEIVER SETUP.....	8
TEST PROCEDURE	8
TEST EQUIPMENT LIST AND DETAILS.....	8
CORRECTED AMPLITUDE & MARGIN CALCULATION	8
TEST RESULTS SUMMARY	9
TEST DATA	9
FCC §15.109 - RADIATED EMISSIONS	12
MEASUREMENT UNCERTAINTY	12
EUT SETUP	12
EMI TEST RECEIVER SETUP.....	13
TEST PROCEDURE	13
CORRECTED AMPLITUDE & MARGIN CALCULATION	13
TEST EQUIPMENT LIST AND DETAILS.....	14
TEST RESULTS SUMMARY	14
TEST DATA	14
DECLARATION LETTER.....	17

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Beijing IRTOUCH SYSTEMS Co.,Ltd.*'s product, model number: RS2200W055S (FCC ID:RDHRS2200W0XXS) (the "EUT") in this report is a Infrared Touchscreen, which was measured approximately: 127.0 cm (L) x 74.1 cm (W) x 0.8 cm (H), rated input voltage: DC 5V From PC Input AC 120V/60Hz, the highest operating frequency is 48MHz.

Note: the series product, model RS2200W0XXS, RS2200G0XXS, RS2200W0XXC, RS2200G0XXC are electrically identical, and the difference between them please refers to the attached declaration letter, and we selected model RS2200W055S for fully testing.

All measurement and test data in this report was gathered from production sample serial number: 130311051 (Assigned by BACL, Dongguan). The EUT was received on 2013-03-13.

Objective

This report is prepared on behalf of *Beijing IRTOUCH SYSTEMS Co.,Ltd.* in accordance with Part 2, Subpart J, Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine compliance with FCC Part 15B, Class B.

Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s)

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) 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 February 02, 2012. 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.: 273710. 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. (Dongguan) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 500069-0).



The current scope of accreditations can be found at <http://ts.nist.gov/standards/scopes/5000690.htm>

SYSTEM TEST CONFIGURATION

Justification

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

EUT Exercise Software

No software was used.

Equipment Modifications

No modification was made to the EUT.

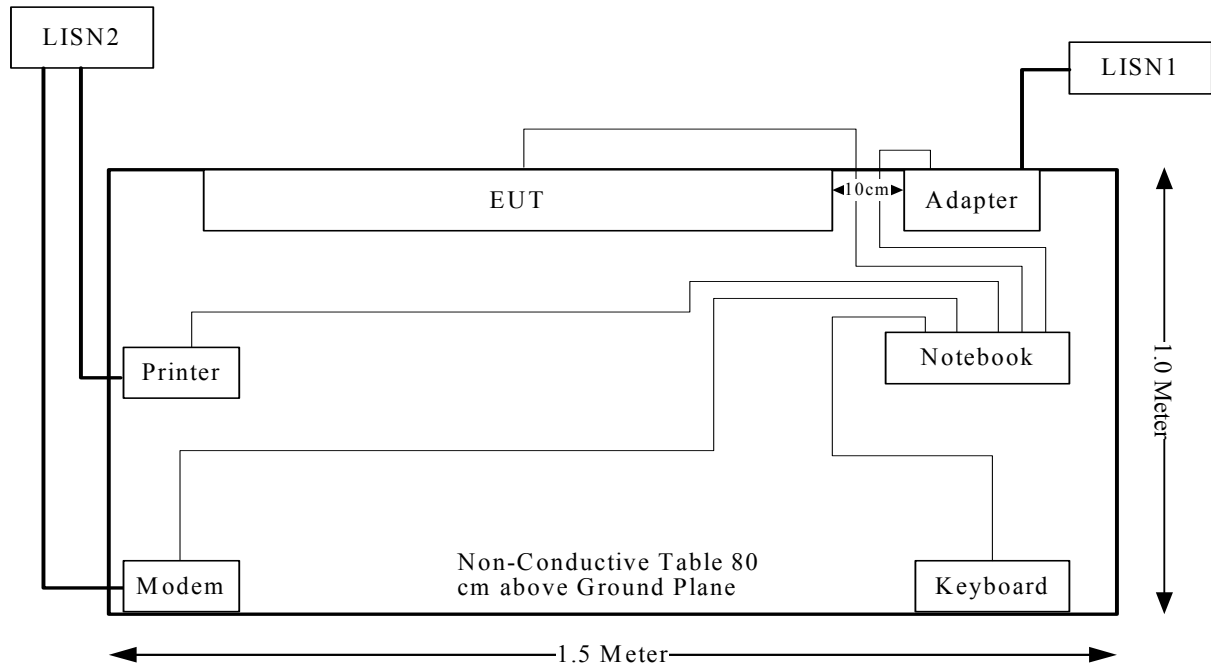
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Notebook computer	PP11L	QDS-BRCM1017
HP	Printer	C3941A	JPTVOB2337
DELL	Keyboard	SK-8115	CN-0DJ313-716716-05A-0DSO
SAST	Modem	AEM-2100	090200213

External I/O Cable

Cable Description	Length (m)	From	To
Shielded Detachable Printer Cable	1.2	Parallel Port of PC	Printer
Shielded Detachable Serial Cable	1.2	Serial Port of PC	Modem
Shielded Detachable Keyboard Cable	2	Keyboard Port of PC	Keyboard
Shielded Detachable USB Extension Cable	1.0	RJ45 Port of PC	EUT
Unshielded undetachable USB Cable	0.6	USB Port of USB Extension Cable	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

FCC §15.107 – AC LINE CONDUCTED EMISSIONS

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cisp} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cisp} of Table 1, then:

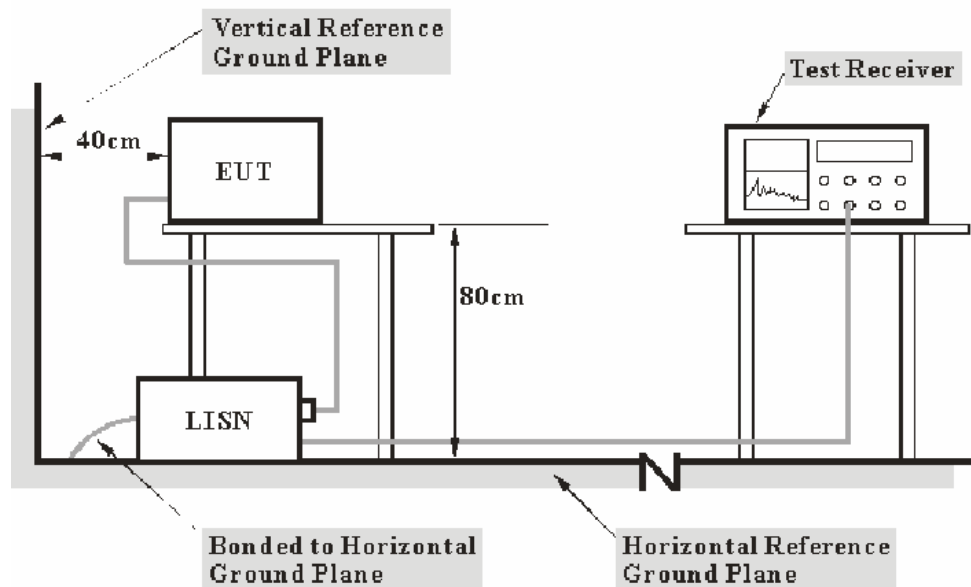
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cisp}

Measurement	U_{cisp}
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

EUT Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 Class B limits.

The notebook was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<u>Frequency Range</u>	<u>IF B/W</u>
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the notebook was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2012-11-29	2013-11-28
R&S	LISN1	ESH3-Z5	843331/015	2012-09-17	2013-09-16
R&S	LISN2	ESH3-Z5	100113	2012-11-29	2013-11-28
BACL	Test Software	BACL-EMC	V1.0-2010	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

V_C (cord. Reading): corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN

C_f : Correction Factor

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107, with the worst margin reading of:

7.78 dB at 0.325MHz in the **Neutral** conducted

Test Data

Environmental Conditions

Temperature:	26.4 °C
Relative Humidity:	52 %
ATM Pressure:	101.4 kPa

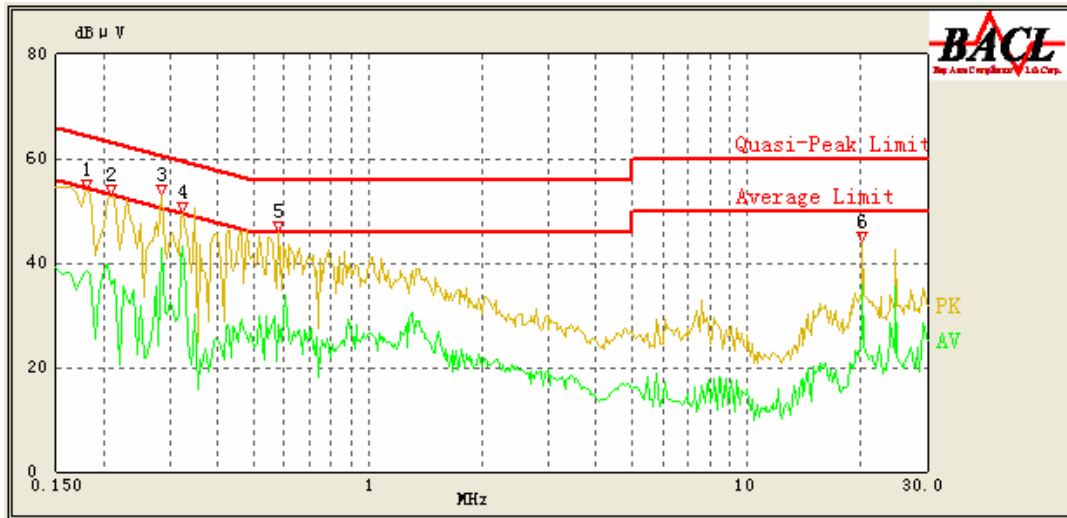
The testing was performed by Star Xie on 2013-03-14.

Test mode: Running

120 V, 60 Hz, Line:



No.	Frequency (MHz)	Cord. Reading (dB μ V)	Correction Factor (dB)	Limit (dB μ V)	Margin (dB)	Detector (PK/AV/QP)
1	0.155	50.03	1.05	65.86	15.83	QP
2	0.155	40.22	1.05	55.86	15.64	AV
3	0.230	43.57	0.93	63.71	20.14	QP
4	0.230	34.52	0.93	53.71	19.19	AV
5	0.320	43.81	0.78	61.14	17.33	QP
6	0.320	41.60	0.78	51.14	9.54	AV
7	0.610	37.36	0.48	56.00	18.64	QP
8	0.610	33.04	0.48	46.00	12.96	AV
9	20.235	42.57	2.63	60.00	17.43	QP
10	20.235	36.23	2.63	50.00	13.77	AV
11	24.765	40.49	2.43	60.00	19.51	QP
12	24.760	36.14	2.43	50.00	13.86	AV

120 V, 60 Hz, Neutral:

No.	Frequency (MHz)	Cord. Reading (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
1	0.180	47.17	1.69	65.14	17.97	QP
2	0.180	38.66	1.69	55.14	16.48	AV
3	0.210	47.00	1.53	64.29	17.29	QP
4	0.210	35.96	1.53	54.29	18.33	AV
5	0.285	44.84	1.15	62.14	17.30	QP
6	0.285	42.91	1.15	52.14	9.23	AV
7	0.325	44.84	1.00	61.00	16.16	QP
8	0.325	43.22	1.00	51.00	7.78	AV
9	0.580	36.12	0.50	56.00	19.88	QP
10	0.580	28.26	0.50	46.00	17.74	AV
11	20.235	41.09	1.52	60.00	18.91	QP
12	20.235	35.85	1.52	50.00	14.15	AV

FCC §15.109 - RADIATED EMISSIONS

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:

30M~200MHz: 5.0 dB

200M~1GHz: 6.2 dB

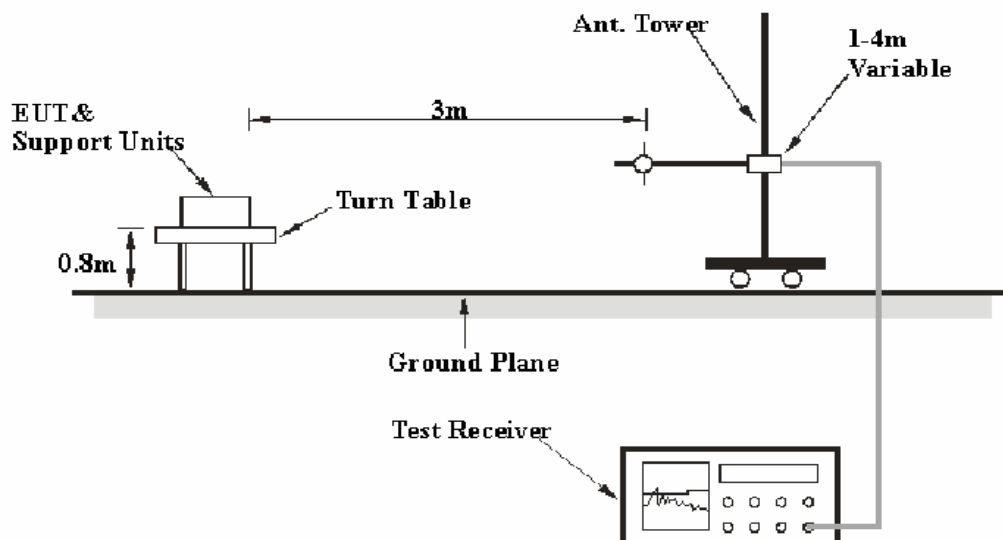
1G~6GHz: 4.45 dB

6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15.109, Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The notebook connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

According to FCC 15.33 requirements, the system was measured from 30 MHz to 1 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>Detector</i>
30MHz – 1000 MHz	120 kHz	300 kHz	QP

Test Procedure

For the radiated emissions test, the notebook was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2012-05-14	2013-05-13
Sunol Sciences	Hybrid Antennas	JB3	A060611-1	2011-09-06	2013-09-05
HP	Pre-amplifier	8447E	2434A02181	2012-10-08	2013-10-07
R&S	Spectrum Analyzer	FSEM 30	DE31388	2013-03-15	2014-03-14
ETS-LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2014-09-05
Mini-Circuits	Amplifier	ZVA-213-S+	054201245	N/A	N/A
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109, Class B, with the worst margin reading of:

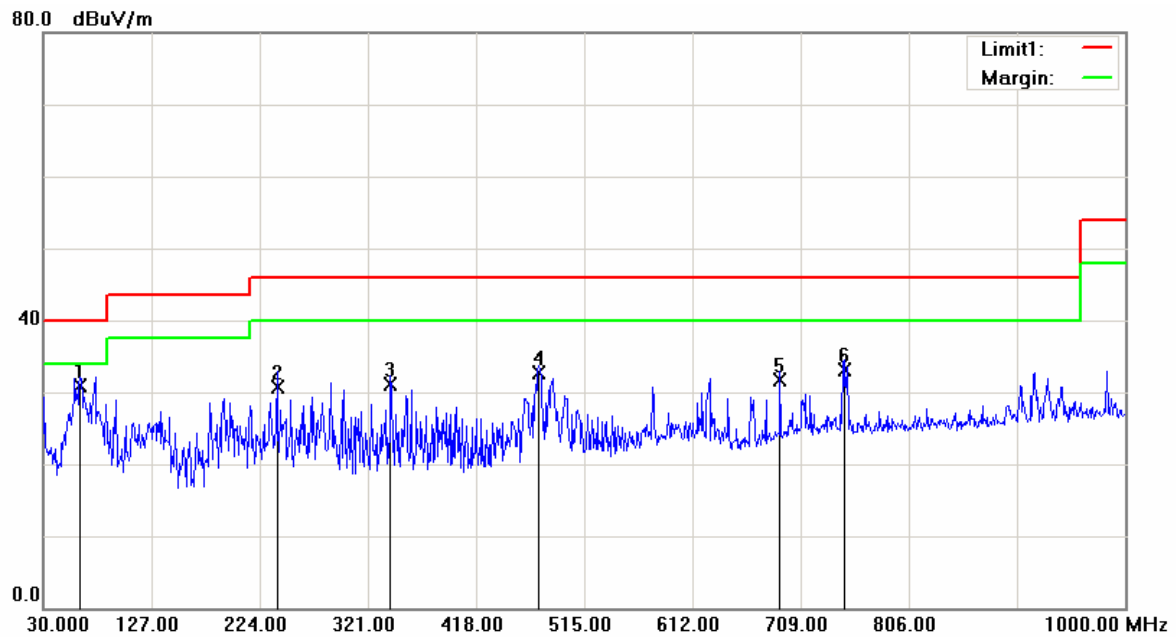
9.10 dB at 62.9800 MHz in the Horizontal polarization

Test Data**Environmental Conditions**

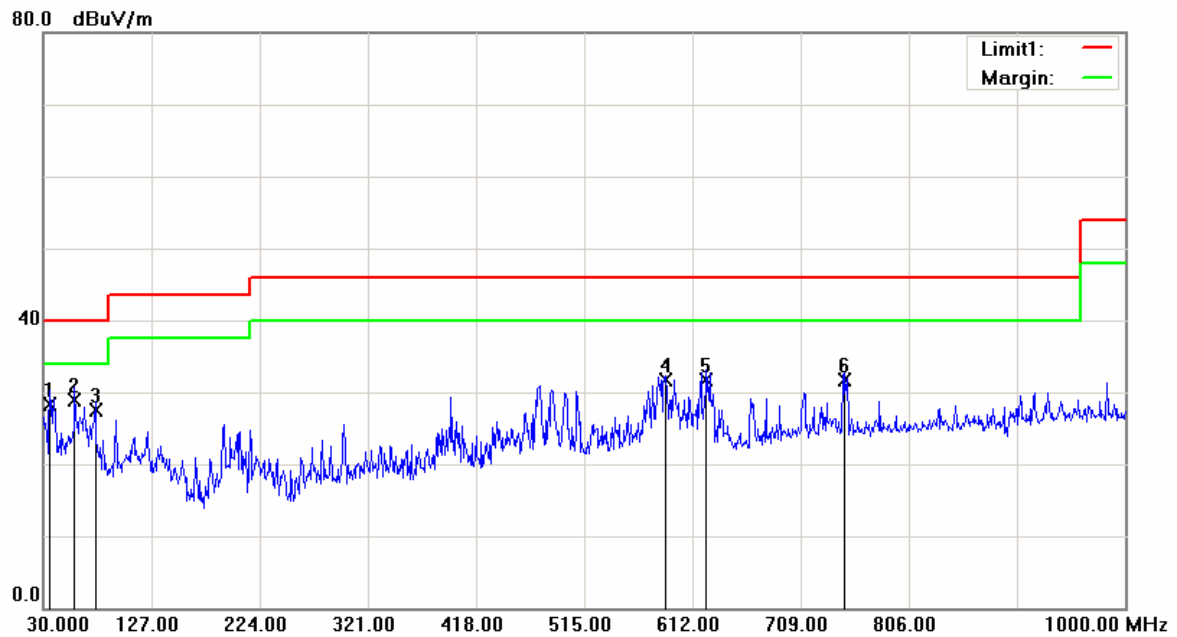
Temperature:	24.1°C
Relative Humidity:	60 %
ATM Pressure:	101.6 kPa

The testing was performed by Star Xie on 2013-03-15.

Test mode: Running

Horizontal:

Frequency (MHz)	Receiver Reading (dBuV/m)	Detector (PK/QP/Ave)	Correction Factor (dB)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
62.9800	43.82	QP	-12.92	30.90	40.00	9.10
239.5200	38.91	QP	-8.11	30.80	46.00	15.20
341.3700	36.59	QP	-5.39	31.20	46.00	14.80
474.2600	35.06	QP	-2.36	32.70	46.00	13.30
690.5700	31.54	QP	0.16	31.70	46.00	14.30
747.8000	32.05	QP	1.15	33.20	46.00	12.80

Vertical:

Frequency (MHz)	Receiver Reading (dBuV/m)	Detector (PK/QP/Ave)	Correction Factor (dB)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
35.8200	31.56	QP	-3.26	28.30	40.00	11.70
58.1300	42.24	QP	-13.34	28.90	40.00	11.10
76.5600	39.86	QP	-12.36	27.50	40.00	12.50
587.7500	32.51	QP	-0.81	31.70	46.00	14.30
624.6100	32.34	QP	-0.54	31.80	46.00	14.20
747.8000	30.65	QP	1.15	31.80	46.00	14.20

DECLARATION LETTER



Beijing IRTOUCH SYSTEM CO.,Ltd.

4/F, M8 Building, No.1 Jiuxianqiao East Road, Chaoyang District, Beijing, P.R., China

Tel: +86 010 84573473 ext. 1043 Fax: +86 010 84573469

<http://www.irtouch.com/en/>

DECLARATION OF SIMILARITY

Mar 8, 2013

To:

Bay Area Compliance Laboratories Corp.(Dongguan)

No.69 Pulong Village, Puxinhu Industry Zone, Tangxia, Dongguan, China

Tel: +86 769 86858888 Fax: +86 769 86858892

<http://www.baclcorp.com>

Dear Sir or Madam:

We, Beijing IRTOUCH SYSTEM CO.,Ltd hereby declare that product: Infrared Touchscreen model(s):RS2200W0XXS/RS2200W0XXC/RS2200G0XXS/RS2200G0XXC (W means wide screen size, G means general screen size, XX means screen size) are electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics. And RS2200W055S is tested by BACL, the results of which is featured in BACL project: R2BJ130311051

A description of the differences between the tested model and those that are declared similar areas follows:

Models: RS2200W0XXS/RS2200W0XXC/RS2200G0XXS/RS2200G0XXC just have different screen size and model name.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Signature:

A handwritten signature in black ink, appearing to be "李令健" (Li Lingjian).

Li, Lingjian
Manager

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