



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test Report No. : E057R-002

Applicant : Responsive Innovations, LLC
Address : 3789, Chesterfield Drive, Akron, OH 44319, United States

Manufacturer : Seoby Electronics Co., Ltd.
Address : #38-2, Anyang 2-Dong, Manan-Gu, Anyang-City, Kyungki-Do, Korea

Type of Equipment : Infrared Remote USB Receiver

FCC ID : R4WRRUSB01

Model Name : RRUSB-01

Serial Number : N/A

Total page of Report : 11 pages (including this page)

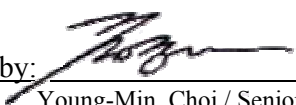
Date of Incoming : June 14, 2005


Date of Issuing : July 1, 2005

SUMMARY

The equipment complies with the requirements of **FCC CFR 47 PART 15 SUBPART B, Class B.**

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by: 
Young-Min, Choi / Senior Engineer
EMC Div.
ONETECH Corp.

Reviewed by: 
Y. K. Kwon / Director
EMC Div.
ONETECH Corp.



CONTENTS

	Page
1. VERIFICATION OF COMPLIANCE	3
2. GENERAL INFORMATION.....	4
2.1 PRODUCT DESCRIPTION.....	4
2.2 MODEL DIFFERENCES:	4
2.3 RELATED SUBMITTAL(S) / GRANT(S)	4
2.4 TEST SYSTEM DETAILS	4
2.5 TEST METHODOLOGY	4
2.6 TEST FACILITY	5
3. SYSTEM TEST CONFIGURATION.....	5
3.1 JUSTIFICATION	5
3.2 EUT EXERCISE SOFTWARE.....	5
3.3 CABLE DESCRIPTION	5
3.4 NOISE SUPPRESSION PARTS ON CABLE	6
3.5 EQUIPMENT MODIFICATIONS	6
3.6 CONFIGURATION OF TEST SYSTEM.....	6
4. PRELIMINARY TEST.....	6
4.1 AC POWER LINE CONDUCTED EMISSION TEST	6
4.2 RADIATED EMISSION TEST	6
5. FINAL RESULT OF MEASUREMENT	7
5.1 CONDUCTED EMISSION TEST.....	7
5.2 RADIATED EMISSION TEST	9
6. FIELD STRENGTH CALCULATION	9
7. LIST OF TEST EQUIPMENT.....	11



1. VERIFICATION OF COMPLIANCE

- APPLICANT : Responsive Innovations, LLC
- ADDRESS : 3789, Chesterfield Drive, Akron, OH 44319, United States
- CONTACT PERSON : Mr. Min-Cheal, Lee / Manager
- TELEPHONE NO : +82-31-474-8001
- FCC ID : R4WRRUSB01
- MODEL NAME : RRUSB-01
- SERIAL NUMBER : N/A
- DATE : July 1, 2005

EQUIPMENT CLASS	JBP-Part 15 Class B computing Device Peripheral
E.U.T. DESCRIPTION	Infrared Remote USB Receiver
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4: 2003
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15, SECTION 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	YES
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

**2. GENERAL INFORMATION****2.1 Product Description**

The Responsive Innovations, LLC, Model RRUSB-01 (referred to as the EUT in this report) is an Infrared Remote USB Receiver. The receiver is connected to a person computer and receives signal from the Infrared Remote Controller, Model: RIXL-01. The EUT is a part of educational system, students using this system can transmit answers through it to PC remotely. Then a receiving part accepts the signal form the each student and passes it over to a PC. Finally, the PC save the answer and reconstructs them. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	4 MHz, 6MHz
ELECTRICAL RATING	DC 5V(Receiver), DC 3V(IR Remote Control)
CARRIER FREQ.	38 kHz
OPERATING RANGE	Max. 30m
EXTERNAL CONNECTOR	USB A Type

2.2 Model Differences:

- None

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Test System Details

The model numbers for all the equipments that were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
RRUSB-01	Seoby Electronics Co., Ltd.	R4WRRUSB01	Infrared Receiver (EUT)	HOST
RIXL-01	Seoby Electronics Co., Ltd.	N/A	Infrared Remote Controller	-
PP05LC	DELL Computer Corp.	DoC	NOTEBOOK PC (HOST)	-
020-0470	Cardinal	GDE0196	MODEM	HOST
2225C	HP	DSI6XU2225	PRINTER	HOST

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

**2.6 Test Facility**

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)

3. SYSTEM TEST CONFIGURATION**3.1 Justification**

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	Seoby Electronics Co., Ltd.	SBRAC-6100-0003	N/A

3.2 EUT exercise Software

- After connecting the EUT to the Notebook PC, the signal was transmitted from the remote control to receiver continuously.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
Infrared Receiver (EUT)	N/A	Y	1.2 (D)
Infrared Remote Controller	N	N	-
NOTEBOOK PC	N	-	1.5 (P)
AC/DC ADAPTER (Notebook PC)	N	N	1.6(P), 1.0(D)
MODEM	N	N	1.6(P), 1.2(D)
PRINTER	N	Y	1.8(P), 1.2(D)

* The marked "(P)" means the Power Cable and "D" means the I/O Cable.



3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Infrared Receiver (EUT)	N	N/A	Y	EUT END
Infrared Remote Controller	N/A	N/A	N/A	N/A
NOTEBOOK PC	-	-	-	-
AC/DC ADAPTER (Notebook PC)	Y	Notebook PC END	Y	Notebook PC END
MODEM	N	N/A	Y	BOTH END
PRINTER	N	N/A	Y	BOTH END

3.5 Equipment Modifications

- For making extension of ground plane on the main board, copper tape was added on the ground plane of the main board.

3.6 Configuration of Test System

Line Conducted Test : The receiver was connected to PC and the power line of PC was connected to LISN. And the remote control used the Lithium battery. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2003 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary radiated emission test was conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
After connecting the EUT to the Notebook PC, the signal from the remote controller was transmitted to the Notebook PC.	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
After connecting the EUT to the Notebook PC, the signal from the remote controller was transmitted to the Notebook PC.	X



5. FINAL RESULT OF MEASUREMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

5.1 Conducted Emission Test

Humidity Level : 41 % Temperature: 21 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)
Type of Test : CLASS B
Result : PASSED BY -8.55 dB at 0.195 MHz under peak detector mode

EUT : Infrared Remote USB Receiver Date: June 19, 2005
Operating Condition : The signal was transmitted from the remote control to receiver continuously.
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

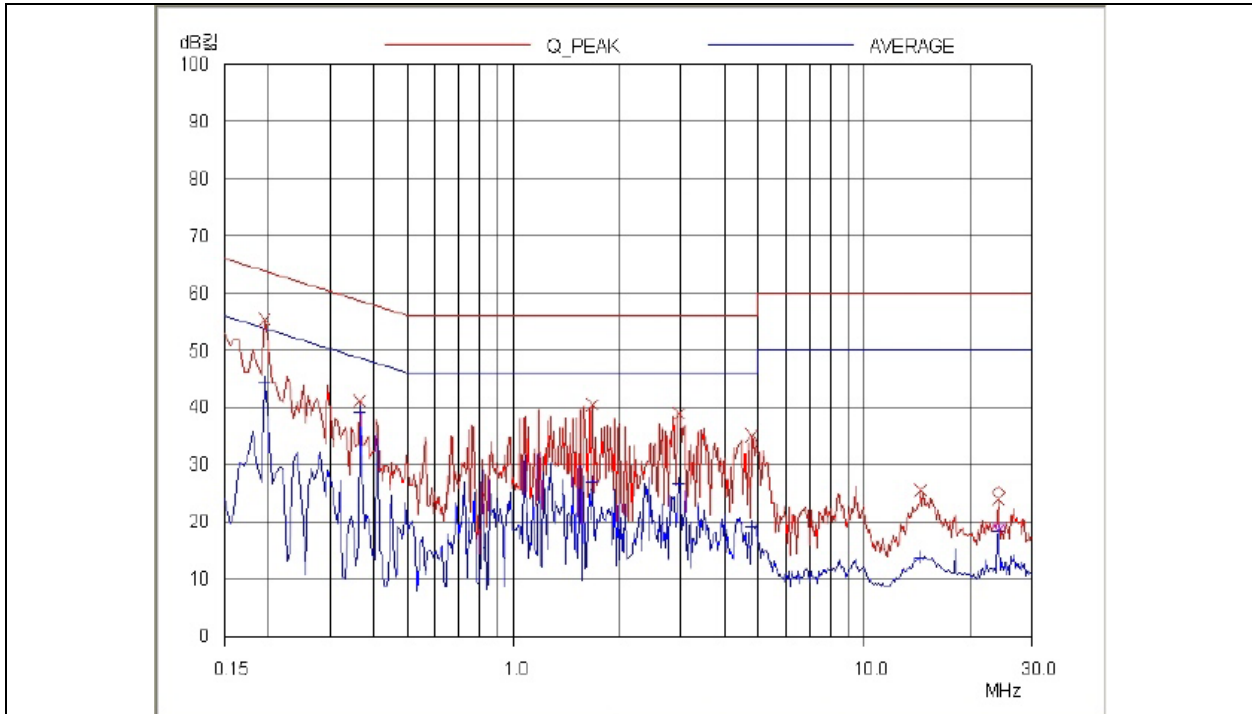
Frequency (MHz)	Line	Quasi-Peak (dBuV)			Margin (dB)	Average (dBuV)		Margin (dB)
		Emission level	Detect Mode	Limits		Emission level	Limits	
0.195	H	55.27	P	63.82	-8.55	44.25	53.82	-9.57
0.365	H	41.20	P	58.61	-17.41			
1.690	H	40.45	P	56.00	-15.55			
1.665	N	39.28	P	56.00	-16.72			
2.815	N	38.02	P	56.00	-17.98			
2.950	H	38.02	P	56.00	-17.98			

Line Conducted Emission Tabulated Data

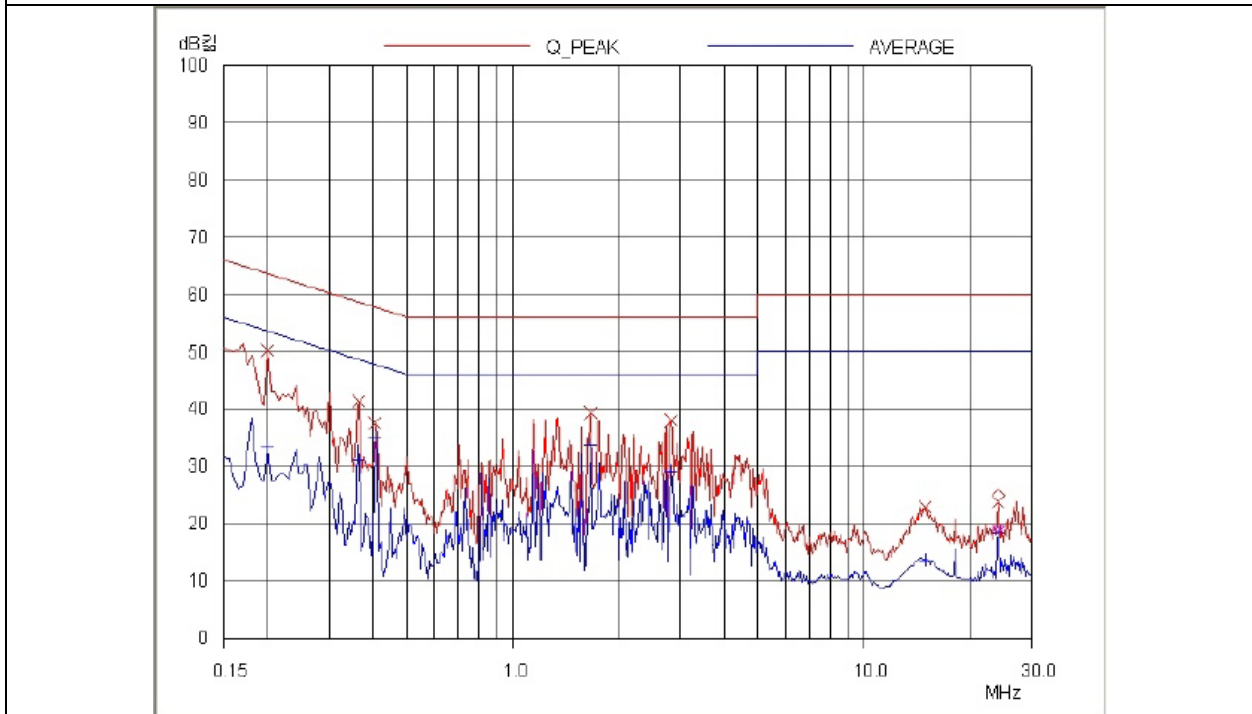
Remark : "H": Hot Line, "N": Neutral line, "P": Peak detector.

See next page for an overview sweep performed with peak and average detector.

Tested by: Ki-Hong, Nam / Test Engineer



HOT LINE



NEUTRAL LINE



5.2 Radiated Emission Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 47 % Temperature: 24 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)
 Type of Test : CLASS B
 Result : PASSED BY -5.57 dB at 72.17 MHz

EUT : Infrared Remote USB Receiver Date: June 23, 2005
 Operating Condition : The signal was transmitted from the remote control to receiver continuously.
 Frequency range : 30MHz – 1000MHz
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amplitude (dBuV)	Pol.	Antenna (dB/m)	Cable (dB)	Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
48.71	17.20	V	11.28	1.58	30.06	40.00	-9.94
54.22	18.80	H	9.26	1.42	29.48	40.00	-10.52
72.17	27.10	H	5.79	1.54	34.43	40.00	-5.57
120.23	20.80	H	12.98	2.00	35.78	43.52	-7.74
144.32	16.80	V	14.88	2.36	34.04	43.52	-9.48
179.96	16.00	H	15.97	2.80	34.77	43.52	-8.75
216.55	17.80	H	16.37	2.93	37.10	43.52	-8.92
360.07	16.00	H	14.57	4.24	34.81	46.02	-11.21

Radiated Emissions Tabulated Data

Tested by: Ki-Hong, Nam / Test Engineer



6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)



7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	DEC/04	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/05	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/04	12MONTH	
4.	Spectrum analyzer	HP	85680B	3001A04955	APR/05	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	APR/05	12MONTH	■
6.	Quasi-Peak Adapter	HP	8574B	2811A01432	APR/05	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/05	12MONTH	
8.	Biconical antenna	EMCO	3104C	9109-4443	MAY/05	12MONTH	
		Schwarzbeck	VHA9103	91031852	JAN/05		■
9.	Log Periodic antenna	EMCO	3146	9109-3213	FEB/05	12MONTH	
				9109-3217	MAY/05		
		Schwarzbeck	9108-A(494)	62281001	JAN/05		■
10.	LISN	EMCO	3825/2	9109-1867	AUG/04	12MONTH	
				9109-1869	OCT/04		■
		Schwarzbeck	NSLK 8126	8126-404	JUN/05		■
11.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
12.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
13.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■