# FCC PART 15.231 EMI MEASUREMENT AND TEST REPORT

For

# ANNEX DEPOT INC.

5320 Power Inn Rd., Ste A, Sacramento, CA 95820 USA

FCC ID: VDURF12A

Jun.12,2007

This Report Concerns:

**Original Report** 

Equipment Type:

RF WIRELESS REMOTE

**CONTROL** 

Test Engineer:

Eric Li

Zic &

Report No.:

F07061208A

Receive EUT

Date/Test Date:

Jun05,2007/ Jun 05-12,2007

Reviewed By:

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# TABLE OF CONTENTS

1.	GENERAL INFORMATION									
	1.1.	Report information	3							
	1.2.	Measurement Uncertainty	3							
2.	PRO	PRODUCT DESCRIPTION								
	2.1.	EUT Description	4							
	2.2.	Block Diagram of EUT Configuration	4							
	2.3.	Support Equipment List	4							
	2.4.	Test Conditions	4							
<b>3.</b>	FCC	ID LABEL	5							
4.		Γ RESULTS SUMMARY								
	Modi	fications	6							
<b>5.</b>	TEST	Γ EQUIPMENT USED	7							
6.	RAD	RADIATION EMISSIONS								
	6.1.	Test Equipment								
	6.2.	Test Procedure								
	6.3.	Radiated Test Setup								
	6.4.	Radiated Emission Limit								
	6.5.	Radiated Emission Test Result								
7.	20B 1	BANDWIDTH1								
	7.1.	Test Equipment								
	7.2.	Test Procedure								
	7.3.	FCC 15.231(c) 20B Bandwidth Limit								
	7.4.	Test Result1								
8.		CTIVATION TESTING1								
	8.1.	Test Equipment								
	8.2.	Test Procedure								
	8.3.	Deactivation Requirement								
•	8.4.	Test Result								
9.	_	Y CYCLE1								
	9.1.	Test Equipment								
	9.2.	Test Procedure								
	9.3.	Requirement 1								
	9.4.	Test Result1								
APP.	ENDIX	I TEST PICTURE1	3							

### 1. GENERAL INFORMATION

#### 1.1. Report information

- 1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BEST approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BEST in any way guarantees the later performance of the product/equipment.
- 1.1.2. The sample/s mentioned in this report is/are supplied by Applicant, BEST therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through BEST, unless the applicant has authorized BEST in writing to do so.

Test Facility -

The open area test site used to collect the radiated data is located on the address of Shenzhen Academy of Metrology & Quality Inspection (FCC Registered Test Site Number: 97379) on Longzhu Road, Nanshan, Shenzhen, Guangdong, China.

The Open Area Test Site is constructed and calibrated to meet the FCC requirements.

#### 1.2. Measurement Uncertainty

Available upon request.

BT FCC ID REPORT : F07061208A Page 3/16

# 2. PRODUCT DESCRIPTION

# 2.1. EUT Description

Description : RF WIRELESS REMOTE CONTROL

Applicant : ANNEX DEPOT INC.

5320 Power Inn Rd., Ste A, Sacramento, CA 95820 USA

Model Number : RF12A,RF1A,RF2A,RF4A,RF8A,RF12A,RF4M

**Additional Information** 

Frequency: 433.92MHz

Power Supply : DC12V (Supplied by battery)

Maximum : N/A

Range

Transmitter : The transmitter has a built in antenna and solder on the

Antenna PCB Current N/A

Consumption

# 2.2. Block Diagram of EUT Configuration

EUT

# 2.3. Support Equipment List

1. -- -- --- --- -- --- -- --- 3. -- -- ----

#### 2.4. Test Conditions

Temperature: 23~25

Relative Humidity: 55~63 %

BT FCC ID REPORT : F07061208A Page 4/16

# 3. FCC ID LABEL

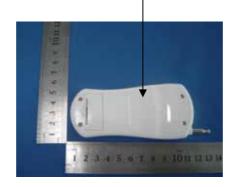
# FCC ID: VDURF12A

Modifications not authorized by the manufacturer may void users authority to operate this device.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Label Location on EUT** 

**EUT Bottom View/ FCC ID Label Location** 



BT FCC ID REPORT : F07061208A Page 5/16

# 4. TEST RESULTS SUMMARY

FCC 15 Subpart C,Paragraph 15.231

Test Standards	Test Items	Test Results
§15.231 (b)	Radiated Emission	Pass
§15.231 (c)	20dB Band Width Testing	Pass
§15.231 (a)(1)	Deactivation Testing	Pass
§15.231	Duty cycle	Pass

Remark: "N/A" means "Not applicable."

# **Modifications**

No modification was made.

BT FCC ID REPORT : F07061208A Page 6/16

# 5. TEST EQUIPMENT USED

Equipment/Facilities	Manufacturer	Model #	Serial no.	Date of Cal.	Cal. Interval
Cable	Resenberger	N/A	NO.1	Mar 10 , 2007	1 Year
Cable	SCHWARZBECK	N/A	NO.2	Mar 10 , 2007	1 Year
Cable	SCHWARZBECK	N/A	NO.3	Mar 10 , 2007	1 Year
LISN	Rohde & Schwarz	ESH3-Z5	100305	Mar 10 , 2007	1 Year
50 Coaxial Switch	ANRITSU CORP	MP59B	6200283933	Mar 10, 2007	1 Year
EMI Test Receiver	Rohde & Schwarz	ESP13	100180	Oct.18,2006	1 Year
Spectrum Analyzer	Rohde & Schwarz	FSP40	100273	Sep.10,2007	1 Year
3m Semi-Anechoic Chamber	Albatross Projects	9m×6m×6m	N/A	Feb.20,2007	1 Year
Signal Generator	FLUKE	PM5418 + Y/C	LO747012	Feb.20,2007	1 Year
Signal Generator	FLUKE	PM5418TX	LO738007	Feb.20,2007	1 Year
Loop Antenna	SCHWARZBECK	FMZB1516	113	Jan.30,2007	1 Year
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	9161-4079	Sep.22,2006	1 Year
Broad-Band Horn	SCHWARZBECK	BBHA9120D	9120D-564	Sep.22,2006	1 Year
Antenna					
Ultra Broadband Antenna	Rohde & Schwarz	HL-562	100110	June.15,2006	1 Year
AMN	Rohde & Schwarz	ESH3-Z5	100196	Oct.11,2006	1 Year
AMN	Rohde & Schwarz	ESH3-Z5	100197	Oct.11,2006	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	N/A	N/A
Power Meter	Rohde & Schwarz	NRVD	100041	Feb.20,2007	1 Year
EMI Test Receiver	Rohde & Schwarz	ESCS30	100003	Feb.20,2007	1 Year
Coaxial Cable with	SCHWARZBECK	AK9515H	95549	Sep.22,2006	1 Year
N-connectors					
Radio Communication	Rohde & Schwarz	CMS 54	846621/024	Feb.20,2007	1 Year
Test Set					
Modulation Analyzer	Hewlett-Packard	8901B	2303A00362	Feb.20,2007	1 Year
Absorbing clamp	Rohde & Schwarz	MDS-21	N/A	Oct.29,2006	1 Year

BT FCC ID REPORT : F07061208A Page 7/16

# 6. RADIATION EMISSIONS

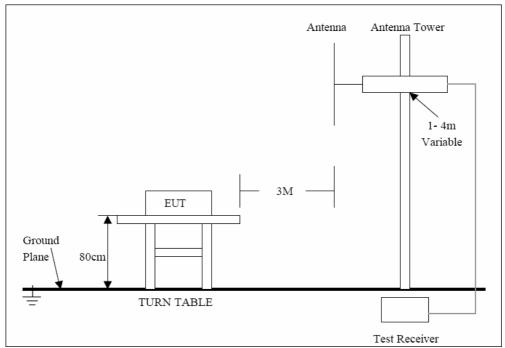
# 6.1. Test Equipment

Please refer to section 4 this report.

#### **6.2. Test Procedure**

The emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part Subpart C limits.

### 6.3. Radiated Test Setup



Setup below 3mMHz,refer to 7.3;For the accrual test configuration,pleas refer to the related items-photos of Testing.

#### 6.4. Radiated Emission Limit

According to §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

=					
Fundamental frequency (MHz)	Field Strength of Fundamental	Field Strength of spurious			
Fundamental frequency (M112)	(Microvolts /meter)	emissions ((Microvolts /meter)			
40.66-40.70	2,250	225			
70-130	1,250	125			
130-174	1,250 to 3,370	125 to375			
174-260	3,750	375			
260-470	3,750 to12, 500	375 to 1,250			
Above 470	12,500	1,250			

Linear interpolations for frequency ranges 130 - 174 MHz and 260 - 470 MHz.

The above field strength limits are specified at a distance of 3-meters the tighter limits apply at the band edges.

BT FCC ID REPORT : F07061208A Page 8/16

#### **6.5. Radiated Emission Test Result**

Temperature: 25 Humidity: 56%RH

Test Result: PASS

Frequency	Meter	Detector	Detector	Heigt	Polar	Antenna	Cable	Amplifier	Corr.Ampl.	Fcc Part 15.231		
MHZ	Reading	Pk/QP/AV	Degree	Meter	H/V	Loss	Loss	Gain	DBuV/m	Limit	Margin	Ĭ.
	DBuV/m	=======================================	100			dB	dB	dB		DBuV/	m dB	
	30-100MHZ											
433.92	59.54	AV	289	1.0	Н	16.80	3.12	27.36	52.1	80.8	-28.70	Fundamental
867.64	32.49	AV	45	1.0	Н	22.20	3.93	26,67	31.95	60.8	-28,85	Harmonic
867.64	31.36	AV	60	1.2	V	22.20	3.93	26.67	30.82	60.8	-29.98	Harmonic
433.92	53.34	AV	45	1.2	V	16.80	3.12	27.36	45.9	80.8	-34.90	Fundamental
867.64	39.36	PK	45	1.0	V	22.20	3.93	26.67	38.82	80.8	-41.98	Harmonic
433.92	64.80	PK	289	1.0	Н	16.80	3.12	27.36	57.36	100.8	-43.44	Fundamental
867.64	37.49	PK	180	1.2	Н	22.20	3.93	26.67	36.95	80.8	-43.85	Harmonic
433.92	56.00	PK	60	1.0	v	16.80	3.12	27.36	48.56	100.8	-52.24	Fundamental
						Above 10	GHZ					
1301.76	43.67	AV	45	1.2	V	23.3	2.6	36.33	33.24	54.00	-20.76	Harmonic
1301.76	40.67	AV	45	1.0	Н	23.3	2.6	36.33	30.24	54.00	-23.76	Harmonic
1735.68	39.67	AV	180	1.2	H	25	3.4	36.33	31.74	60.8	-29.06	Harmonic
2603.52	31.83	AV	45	1.0	Н	28.4	3.4	35.16	28.47	60.8	-32.33	Harmonic
2603.52	30.00	AV	45	1.2	V	28.4	3.4	35.16	26.64	60.8	-34.16	Harmonic
1735.68	34.50	AV	180	1.2	V	25	3.4	36.33	26.57	60.8	-34.23	Harmonic
2169.6	28.33	AV	60	1.0	V	28.1	3.7	34	26.13	60.8	-34.67	Harmonic
2169.6	28.00	AV	60	1.0	Н	28.1	3.7	34	25.8	60.8	-35.0	Harmonic
1301.76	56.31	PK	180	1.0	V	25.4	2.79	36.00	48.50	74.00	-25.50	Harmonic
1301.76	59.22	PK	180	1.0	Н	25.4	2.79	36.00	51.41	74.00	-22.59	Harmonic
1735.68	49.67	PK	180	1.2	Н	25	3.4	36.33	41.74	80.8	-39.06	Harmonic
2603.52	41.83	PK	45	1.0	Н	28.4	3.4	35.16	38.47	80.8	-42.33	Harmonic
2603.52	40.00	PK	45	1.2	V	28.4	3.4	35.16	36.64	80.8	-44.16	Harmonic
1735.68	44.50	PK	180	1.2	V	25	3.4	36.33	36.57	80.8	-44.23	Harmonic
2169.6	38.33	PK	60	1.0	V	28.1	3.7	34	36.13	80.8	-44.67	Harmonic
2169.6	38.00	PK	60	1.0	Н	28.1	3.7	34	35.8	80.8	-45.0	Harmonic

### Note:

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: Corr. Ampl. = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit.

For example, a margin of -5.8dB means the emission is 5.8dB below the limit for Class C. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

#### 7. 20B BANDWIDTH

# 7.1. Test Equipment

Please refer to Section 4 this report.

#### 7.2. Test Procedure

- 1. The EUT was tested according C63.4-2003. The radiated test was performed at FCC Registration laboratory .
- 2. With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

# 7.3. FCC 15.231(c) 20B Bandwidth Limit

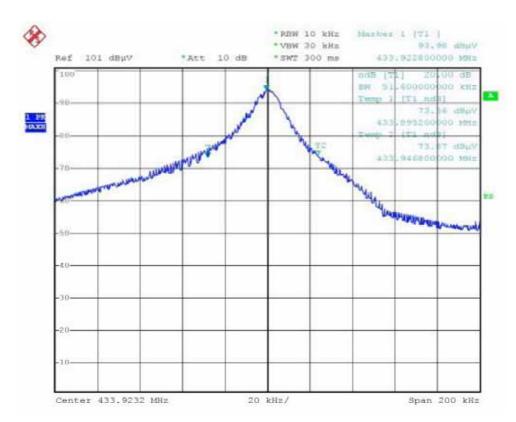
Per 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

#### 7.4. Test Result

Temperature: 25 Humidity: 56%RH

Limit=Frequency×0.25%=433.9220×0.25%=1084.805 kHz

Test data: 51.6KHz Test Result: PASS



BT FCC ID REPORT : F07061208A Page 10/16

# 8. DEACTIVATION TESTING

# 8.1. Test Equipment

Please refer to Section 4 this report.

#### 8.2. Test Procedure

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

# 8.3. Deactivation Requirement

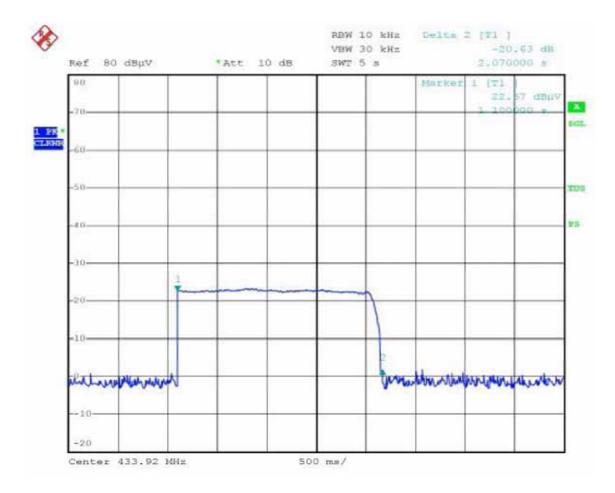
Per 15.231(a) (1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

#### 8.4. Test Result

Temperature: 25 Humidity: 56%RH

THE TRANSMITTER TRANSMITTING TIME NOT MORE THAN 5 SECONDS

Test Result: PASS



BT FCC ID REPORT : F07061208A Page 11/16

# 9. DUTY CYCLE

# 9.1. Test Equipment

Please refer to Section 4 this report.

#### 9.2. Test Procedure

- 1.Place the EUT on the table and set it in transmitting mode.
- 2.Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3.Set center frequency of spectrum analyzer=operation frequency.
- 4.Set the spectrum analyzer as RBW, VBW=100KHz, Span=0Hz, Adjust Sweep=100ms.
- 5.Repeat above procedures until all frequency measured were complete.

# 9.3. Requirement

No dedicated limit specified in the Rules.

#### 9.4. Test Result

Temperature: 25 Humidity: 56%RH

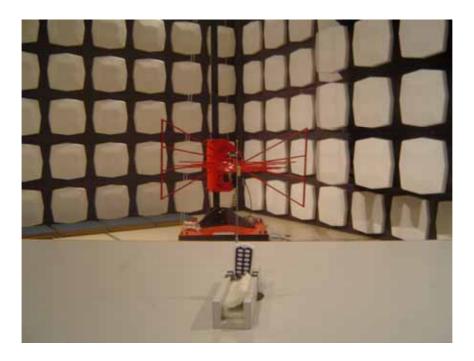
Tp=19.0ms, Ton=0.176\*17+0.442\*7=6.086(ms), Factor=20\*log(Ton/Tp)=-9.89dB.

Test Result: PASS

BT FCC ID REPORT : F07061208A Page 12/16

ANNEX DEPOT INC.	FCC ID: VDURF12A
APPENDIX I TEST PICTURE	
ATTENDIATTESTITETURE	

**Photo 1 Radiated disturbances** 



BT FCC ID REPORT : F07061208A Page 14/16

**Photo 2 General Appearance of the EUT** 

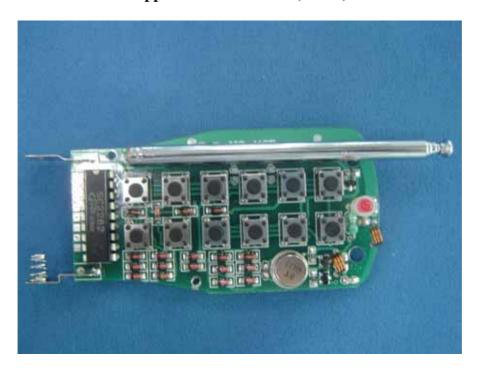


**Photo 3 General Appearance of the EUT(Bottom)** 

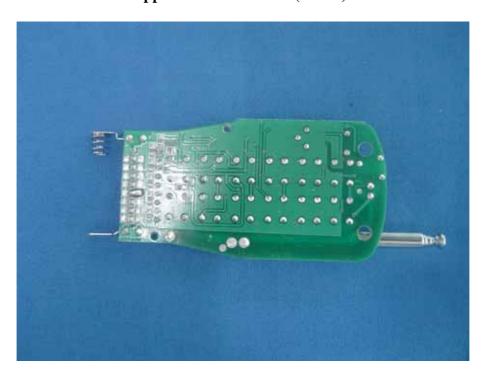


BT FCC ID REPORT : F07061208A Page 15/16

**Photo 4 General Appearance of the EUT(Inside)** 



**Photo 5 General Appearance of the EUT(Inside)** 



BT FCC ID REPORT : F07061208A Page 16/16