FCC PART 15 SUBPART B
CLASS B TEST REPORT

for

ECHOSTAR 2-WAY RC IR/UHF 2008

UEI Model: URC-2008BA0
Echostar Model: 21.0 IR/UHF PRO

Prepared for

UNIVERSAL ELECTRONICS, INC.
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CYPRESS, CALIFORNIA 90630

Prepared by:_____

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DATE: MAY 2, 2008

	REPORT BODY	APPENDICES					TOTAL
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GENERAL REPORT SUMMARY

Compatible Electronics Inc. generates this electromagnetic emission test report, which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested:	Echostar 2-way RC IR/UHF 2008 UEI Model: URC-2008BA0, Echostar Model: 21.0 IR/UHF PRO S/N: N/A
Product Description:	The EUT is an infrared audio video universal remote control.
Modifications:	The EUT was not modified during testing.
Customer:	Universal Electronics, Inc. 6101 Gateway Drive Cypress, California 90630
Manufacturer:	Samjin Co., Ltd. 199-6 Anyang7-dong, manan-gu Anyang-si, kyungki-do 430-017, Korea
Test Date:	April 18, 2008
Test Specifications:	EMI requirements EN 55022 **Class B**
Test Procedure:	ANSI C63.4
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz to 30 MHz	This test was not performed because the EUT is a battery-operated device and cannot be plugged into the AC public mains.
2	Radiated RF Emissions, 30 MHz – 1000 MHz	Complies with the **Class B** limits of EN 55022. Highest Reading in Relation to Spec Limit: 28.63 dBµV @ 531.321 MHz (*U_c = 1.96 dB)

*U_c = combined standard uncertainty

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Echostar 2-way RC IR/UHF 2008, UEI Model: URC-2008BA0, Echostar Model: 21.0 IR/UHF PRO. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by C.I.S.P.R. Publication 22 for Information Technology Equipment, as well as the specifications limits defined by ICES-003 Issue 4 for digital apparatus. Under paragraph G of section 15.109 of the Code of Federal Regulations Title 47, Part 15 of the FCC rules, FCC accepts the international standards set forth in C.I.S.P.R. Publication 22.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Universal Electronics, Inc.

Jesse Mendez	Electrical Engineer

Compatible Electronics Inc.

Kyle Fujimoto	Test Engineer
Michael Christensen	Lab Manager

2.4 Date Test Sample was Received

The test sample was received on April 18, 2008.

2.5 Disposition of the Test Sample

The test sample has not been returned to Universal Electronics, Inc. as of the date of this report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

FCC	Federal Communications Commission
RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
S/N	Serial Number
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
N/A	Not Applicable
PC	Personal Computer
Co.	Company
Ltd.	Limited
Cat.	Catalog
Inc.	Incorporated
IR	Infrared

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4: 2003	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
EN 55022: 2006	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
CISPR 22: 1997	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
ICES-003 Issue 4: 2004	Spectrum Management and Telecommunications Policy – Interference-Causing Equipment Standard – Digital Apparatus

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – EMI

The Echostar 2-way RC IR/UHF 2008, UEI Model: URC-2008BA0, Echostar Model: 21.0 IR/UHF-PRO (EUT) was tested as a stand-alone device. During the test the EUT was transmitting an IR signal (this activation method was continuous throughout the test). An IR detector was used to confirm transmission, the detector emitted an audible alert.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final radiated data was taken in this mode of operation. All initial investigations were performed with the spectrum analyzer in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

4.1.1 Cable Construction and Termination

The EUT contains no external cables.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	UEI MODEL NUMBER	ECHOSTAR MODEL	SERIAL NUMBER
ECHOSTAR 2-WAY RC IR/UHF 2008 (EUT)	UNIVERSAL ELECTRONICS, INC.	URC-2008BA0	21.0 IR/UHF PRO	N/A

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
EMI Receiver	Rohde & Schwarz	ESIB40	100149	November 27, 2006	2 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
Preamplifier	Com Power	PA-102	1017	January 11, 2008	1 Year
Biconical Antenna	Com Power	AB-900	15226	February 28, 2008	1 Year
Log Periodic Antenna	Com Power	AL-100	16060	July 9, 2007	1 Year
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1.2 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

This test was not performed because the EUT is a battery-operated device and cannot be plugged into the AC public mains.

7.1.2 Radiated Emissions Test

The EMI Receiver was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com-Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz. The EMI Receiver were used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI Receiver records the highest measured reading over all the sweeps.

FREQUENCY RANGE (MHz)	TRANSDUCER	EFFECTIVE MEASUREMENT BANDWIDTH
30 to 300	Biconical Antenna	120 kHz
300 to 1000	Log Periodic Antenna	120 kHz

The final data was taken with a frequency span of 1 MHz, but the frequency span was reduced during the preliminary investigations as deemed necessary to distinguish between emissions from the EUT and any ambients.

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to CISPR 16. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength).

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 10-meter test distance to obtain final test data. The final qualifications data is located in Appendix E.

Test Results:

The EUT complies with the **Class B** limits of EN 55022 for radiated emissions.

8. CONCLUSIONS

The Echostar 2-way RC IR/UHF 2008, UEI Model: URC-2008BA0, Echostar Model: 21.0 IR/UHF - PRO meets the **Class B** specification limits defined by C.I.S.P.R. Publication 22 for Information Technology Equipment, as well as the specification limits defined by ICES-003 Issue 4 for Digital Apparatus. Under paragraph G of section 15.109 of the Code of Federal Regulations Title 47, Part 15 of the FCC rules, FCC accepts the international standards set forth in C.I.S.P.R. Publication 22.

APPENDIX A

LABORATORY RECOGNITIONS

LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass EN 55022 **Class B** specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during testing.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Echostar 2-way RC IR/UHF 2008
UEI Model: URC-2008BA0, Echostar Model: 21.0 IR/UHF PRO
S/N: N/A

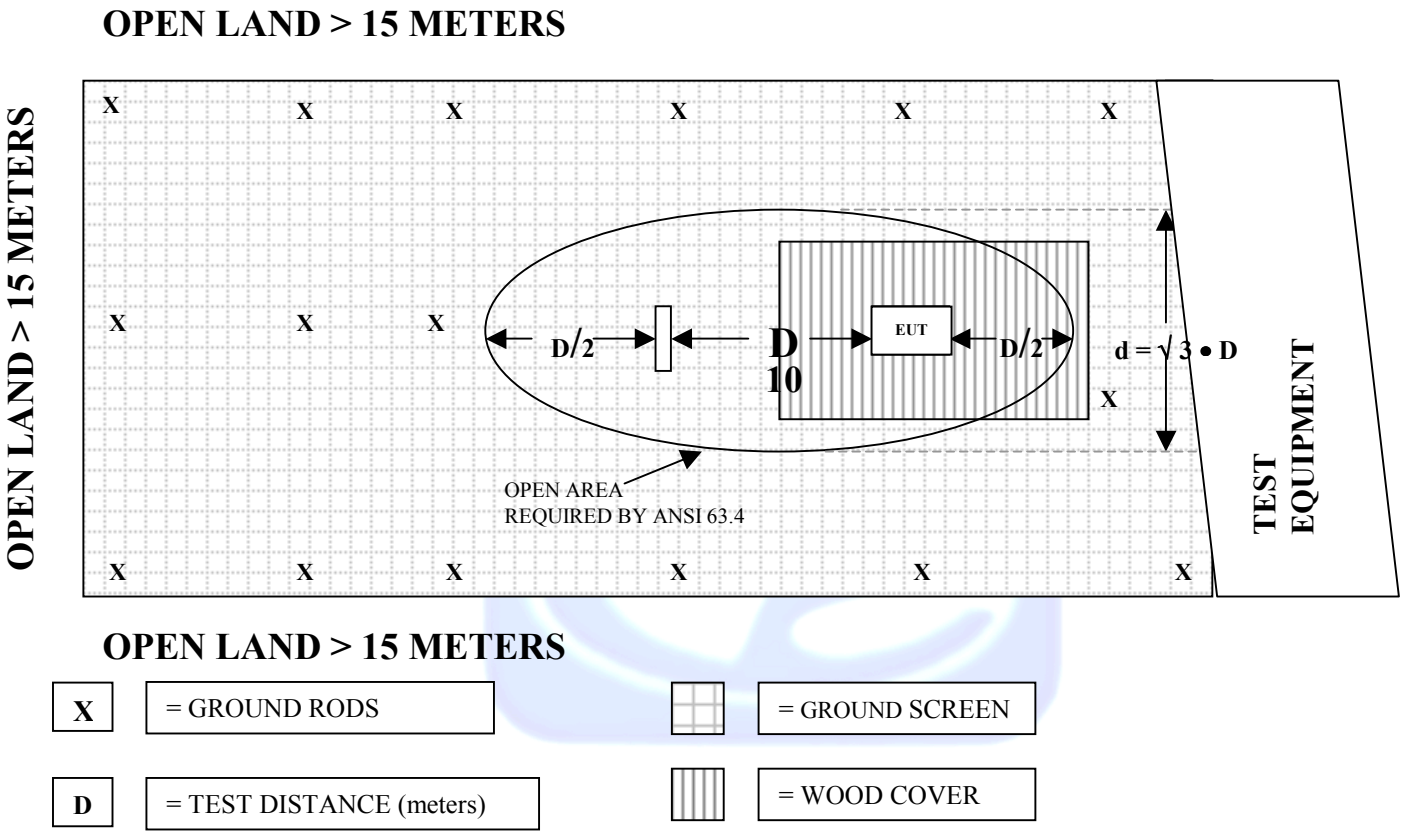
ALSO APPROVED UNDER THIS REPORT:

There were no additional models approved under this report.

APPENDIX D

DIAGRAM, CHARTS, AND PHOTOS

FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED TEST SITE



COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15226

CALIBRATION DATE: FEBRUARY 28, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	12.1	100	10.7
35	12.2	120	13.6
40	11.7	140	12.1
45	9.9	160	12.2
50	11.3	180	15.2
60	9.4	200	16.5
70	7.6	250	16.5
80	6.0	275	18.1
90	6.8	300	21.5

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16060

CALIBRATION DATE: JULY 9, 2007

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	13.5	700	20.5
400	15.8	800	21.6
500	17.0	900	21.3
600	19.2	1000	22.2

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 11, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	38.2	300	38.0
40	38.0	350	38.3
50	38.3	400	38.0
60	38.6	450	37.5
70	38.4	500	37.9
80	38.4	550	37.9
90	38.3	600	37.8
100	38.1	650	37.5
125	38.5	700	38.0
150	38.2	750	37.7
175	38.1	800	37.1
200	38.4	850	37.1
225	38.2	900	37.1
250	38.2	950	37.0
275	38.2	1000	36.5

FRONT VIEW

UNIVERSAL ELECTRONICS, INC.
ECHOSTAR 2-WAY RC IR/UHF 2008
UEI MODEL: URC-2008BA0, ECHOSTAR MODEL: 21.0 IR/UHF PRO
EN 55022 CLASS B - RADIATED EMISSIONS – 04-18-08

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

UNIVERSAL ELECTRONICS, INC.
ECHOSTAR 2-WAY RC IR/UHF 2008
UEI MODEL: URC-2008BA0, ECHOSTAR MODEL: 21.0 IR/UHF PRO
EN 55022 CLASS B - RADIATED EMISSIONS – 04-18-08

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

Test Location : Compatible Electronics **Page** : 1/1
Customer : Universal Electronics, Inc. **Date** : 4/18/2008
Manufacturer : EchoStar Technologies Corporation **Time** : 10:43:27
Eut name : IR/RF Remote **Lab** : D
UEI Model : URC-2008BA0 **Test Distance** : 10 Meters
Serial # : 21.0 IR/UHF PRO
Specification : EN 55022 Class B
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Radiated Emissions
Test Range: 30 MHz - 1 GHz (Vertical & Horizontal)
Test Engineer: Kyle Fujimoto
Echostar Model: 21.0 IR/UHF PRO

Pol	Freq	Rdng	Cable loss	Ant factor	Amp gain	Cor'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV	dBuV/m	dB
1H	75.007	38.30	1.40	6.77	38.40	8.07	30.00	-21.93
2V	85.018	42.30	1.40	6.41	38.35	11.76	30.00	-18.24
3V	119.757	42.80	1.58	13.57	38.42	19.53	30.00	-10.47
4H	125.007	36.70	1.60	13.20	38.50	13.00	30.00	-17.00
5H	150.007	39.20	1.80	12.15	38.20	14.95	30.00	-15.05
6V	260.567	37.60	2.74	17.19	38.20	19.34	37.00	-17.66
7V	270.007	35.50	2.78	17.79	38.20	17.87	37.00	-19.13
8H	300.086	37.60	3.00	13.50	38.00	16.10	37.00	-20.90
9H	419.186	36.50	3.56	16.05	37.80	18.31	37.00	-18.69
10V	421.266	39.20	3.58	16.08	37.78	21.07	37.00	-15.93
11H	498.440	36.50	3.99	16.98	37.89	19.59	37.00	-17.41
12H	531.321	44.80	4.00	17.73	37.90	28.63	37.00	-8.37
13V	531.342	40.20	4.00	17.73	37.90	24.03	37.00	-12.97