#### FCC PART 15, SUBPART B and C TEST REPORT

for

**CRESTRON MLX-2 REMOTE '08** 

MODEL: URC-30700BG0-R

Prepared for UNIVERSAL ELECTRONICS, INC. 6101 GATEWAY DRIVE CYPRESS, CALIFORNIA 90630

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DATE: NOVEMBER 12, 2008

	REPORT		APPENDICES			TOTAL	
	BODY	A	В	C	D	E	
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#### GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., 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: Crestron MLX-2 Remote '08

Model: URC-30700BG0-R

S/N: N/A

Product Description: See Expository Statement

Modifications: The EUT was not modified in order to meet the specifications.

Customer: Universal Electronics, Inc.

6101 Gateway Drive

Cypress, California 90630

Manufacturer: Computime Limited

7/F., How Ming Fty. Bldg.,

99 How Ming Street Kwun Tong, Kowloon, Hong Kong

Test Dates: June 11 and 12, 2007

Test Specifications: EMI requirements

CFR Title 47, Part 15 Subpart B; and Subpart C, Sections 15.205, 15.209 and 15.249

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 – 30 MHz	This test was not performed because the EUT performs on battery power only.
2	Radiated RF Emissions, 10 kHz – 25000 MHz (Transmitter Portion)	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and 15.249.
3	Radiated RF Emissions, 10 kHz – 25000 MHz (Digital and Receiver Portion)	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15, Subpart B.

Report Number: **B80903D1**FCC Part 15 Subpart B and FCC Section 15.249 Test Report

Crestron MLX-2 Remote '08 Model: URC-30700BG0-R

#### 1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Crestron MLX-2 Remote '08, Model: URC-30700BG0-R. 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 CFR Title 47, Part 15, Subpart B for the digital and receiver portion; and the limits defined in Subpart C, sections 15.205, 15.209, and 15.249 for the transmitter portion.

#### 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 92823.

#### 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 Senior Electrical Core 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 August 28, 2008.

#### 2.5 Disposition of the Test Sample

The sample was returned to Universal Electronics, Inc. on September 3, 2008.

#### 2.6 Abbreviations and Acronyms

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

RF Radio Frequency

EMI Electromagnetic Interference

EUT Equipment Under Test

P/N Part Number S/N Serial Number HP Hewlett Packard

ITE Information Technology Equipment

CML Corrected Meter Limit

LISN Line Impedance Stabilization Network

**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	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz



4.

DESCRIPTION OF TEST CONFIGURATION

#### 4.1 Description Of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The Crestron MLX-2 Remote '08, Model: URC-30700BG0-R (EUT) was tested as a stand alone unit and tested in three orthogonal axis. The EUT was placed at the center of the non-conductive table. The EUT was transmitting and receiving on a continuous basis.

The final radiated data was taken in the mode above. Please see Appendix E for the data sheets.

## 4.1.1 Cable Construction and Termination

There were no external cables connected to the EUT.



FCC Part 15 Subpart B and FCC Section 15.249 Test Report

Crestron MLX-2 Remote '08

restron MLX-2 Remote 408 Model: URC-30700BG0-R

## 5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

## 5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
CRESTRON MLX-2 REMOTE '08 (EUT)	COMPUTIME LIMITED	URC-30700BG0-R	KRK060805000043	MG3-30700



## 5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU- FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08768	August 22, 2008	August 22, 2009
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22262	August 22, 2008	August 22, 2009
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	August 22, 2008	August 22, 2009
EMI Receiver	Rohde & Schwarz	ESIB40	100172	November 27, 2006	Nov. 27, 2008
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
	RF RA	DIATED EMIS	SIONS TEST EQ	QUIPMENT	
Preamplifier	Com Power	PA-102	1017	January 11, 2008	Jan. 11, 2009
Biconical Antenna	Com Power	AB-900	15226	February 28, 2008	Feb. 28, 2009
Log Periodic Antenna	Com Power	AL-100	16060	June 27, 2008	June 27, 2009
Loop Antenna	Com-Power	AL-130	17089	September 24, 2007	Sept. 24, 2008
Horn Antenna	Antenna Research	AH-118	071175	June 27, 2008	June 27, 2009
Microwave Preamplifier	Com Power	PA-122	181921	March 3, 2008	March 3, 2009
Microwave Preamplifier	Com Power	PA-840	711919	March 3, 2008	March 3, 2009
Horn Antenna	Com Power	AH826	71957	December 12, 2007	Dec. 12, 2009
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A

FCC Part 15 Subpart B and FCC Section 15.249 Test Report

Crestron MLX-2 Remote '08

#### 6. TEST SITE DESCRIPTION

## **6.1** Test Facility Description

Please refer to section 2.1 and 7.1 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 in stand alone mode.

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Crestron MLX-2 Remote '08

Model: URC-30700BG0-R

#### 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 EN 55022. 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 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 operates on battery power only..

Radiated Emissions (Spurious and Harmonics) Test

## 7.1.2

The spectrum analyzer and EMI Receiver were 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, and the Com-Power Microwave Preamplifier Models: PA-122 and PA-840 were used for frequencies above 1 GHz. The spectrum analyzer and EMI Receiver were used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer or EMI Receiver records the highest measured reading over all the sweeps.

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the EMI Receiver to keep the amplitude reading calibrated.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4. 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 gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

FCC Part 15 Subpart B and FCC Section 15.249 Test Report

Crestron MLX-2 Remote '08

Model: URC-30700BG0-R

## 7.1.3 Radiated Emissions (Spurious and Harmonics) Test (Continued)

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 3 meter test distance to obtain the final test data. The final qualification data sheets are located in Appendix E.

#### **Test Results:**

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.249.

FCC Part 15 Subpart B and FCC Section 15.249 Test Report

Crestron MLX-2 Remote '08

## 8. CONCLUSIONS

The Crestron MLX-2 Remote '08, Model: URC-30700BG0-R meets all of the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.207, 15.209, and 15.249 for the transmitter portion.



Report Number: **B80903D1 FCC Part 15 Subpart B** and **FCC Section 15.249** Test Report

Crestron MLX-2 Remote '08 Model: URC-30700BG0-R

## **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



## **APPENDIX B**

## **MODIFICATIONS TO THE EUT**

## MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.249 or FCC 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.



## **APPENDIX C**

## ADDITIONAL MODELS COVERED UNDER THIS REPORT



# ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Crestron MLX-2 Remote '08 Model: URC-30700BG0-R S/N: N/A

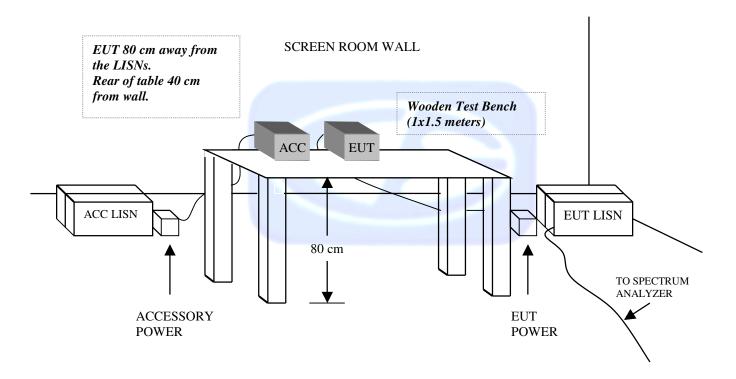
There were no additional models covered under this report.



## APPENDIX D

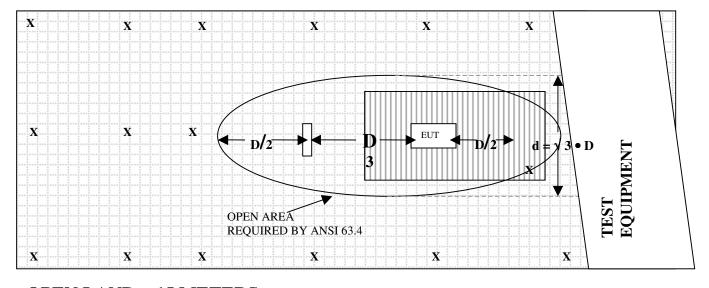
DIAGRAMS, CHARTS, AND PHOTOS

## FIGURE 1: CONDUCTED EMISSIONS TEST SETUP



# FIGURE 2: PLOT MAP AND LAYOUT OF 3 METER RADIATED SITE

## **OPEN LAND > 15 METERS**



#### **OPEN LAND > 15 METERS**

**OPEN LAND > 15 METERS** 

X = GROUND RODS = GROUND SCREEN

D = TEST DISTANCE (meters) = WOOD COVER

## **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: JUNE 27, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	12.7	700	21.2
400	15.3	800	21.7
500	17.4	900	21.8
600	190	1000	22.8

## **COM POWER AH-118**

## HORN ANTENNA

S/N: 071175

CALIBRATION DATE: JUNE 27, 2008

	T		
FREQUENCY	FACTOR	FREQUENCY	FACTOR
(GHz)	(dB)	(GHz)	(dB)
1.0	24.5	10.0	39.4
1.5	25.4	10.5	39.7
2.0	28.3	11.0	39.0
2.5	28.9	11.5	40.0
3.0	29.7	12.0	39.7
3.5	30.8	12.5	41.7
4.0	31.4	13.0	42.7
4.5	32.6	13.5	41.2
5.0	33.7	14.0	41.6
5.5	34.4	14.5	43.2
6.0	34.7	15.0	42.3
6.5	35.4	15.5	39.3
7.0	37.0	16.0	41.7
7.5	37.4	16.5	39.6
8.0	37.6	17.0	43.0
8.5	37.6	17.5	47.1
9.0	38.5	18.0	46.2
9.5	38.6		

## **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	38.3
40	38.0	350	38.0
50	38.3	400	38.1
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	38.0	1000	36.5

## **COM-POWER PA-122**

## **PREAMPLIFIER**

S/N: 181921

## CALIBRATION DATE: MARCH 3, 2008

-			
FREQUENCY	FACTOR	FREQUENCY	FACTOR
(GHz)	(dB)	(GHz)	(dB)
1.0	36.32	10.0	35.47
1.5	35.40	10.5	35.05
2.0	34.77	11.0	34.16
2.5	35.07	11.5	33.75
3.0	34.86	12.0	34.65
3.5	34.48	12.5	34.41
4.0	34.30	13.0	35.36
4.5	33.96	13.5	35.30
5.0	34.06	14.0	35.87
5.5	34.54	14.5	36.44
6.0	35.90	15.0	36.24
6.5	36.85	15.5	35.92
7.0	36.55	16.0	35.53
7.5	35.31	16.5	35.29
8.0	33.57	17.0	34.96
8.5	33.36	17.5	34.02
9.0	35.01	18.0	33.39
9.5	35.97	18.5	32.70

## COM-POWER AL-130

## **LOOP ANTENNA**

S/N: 17089

CALIBRATION DATE: SEPTEMBER 24, 2007

FREQUENCY	MAGNETIC	ELECTRIC
(MHz)	(dB/m)	(dB/m)
0.009	-41.27	10.23
0.01	-41.96	9.54
0.02	-41.73	9.77
0.05	-42.0	9.5
0.07	-41.5	10.0
0.1	-41.43	10.07
0.2	-43.9	7.9
0.3	-41.43	10.07
0.5	-41.40	10.1
0.7	-41.13	10.37
1	-40.83	10.67
2	-40.30	11.20
3	-40.60	10.90
4	-41.00	10.50
5	-40.20	11.30
10	-40.40	11.10
15	-41.67	9.83
20	-41.10	10.40
25	-42.80	8.70
30	-42.80	8.70

## **COM-POWER PA-840**

## MICROWAVE PREAMPLIFIER

S/N: 711919

CALIBRATION DATE: MARCH 3, 2008

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	27.49	29.5	26.84
18.5	28.46	30.0	26.99
19.0	28.98	30.5	26.54
19.5	28.46	31.0	27.31
20.0	28.23	31.5	28.42
20.5	27.44	32.0	29.05
21.0	26.91	32.5	26.55
21.5	26.65	33.0	24.14
22.0	26.50	33.5	22.51
22.5	27.15	34.0	21.84
23.0	27.36	34.5	23.64
23.5	27.08	35.0	25.10
24.0	26.36	35.5	26.04
24.5	24.95	36.0	25.94
25.0	26.83	36.5	21.77
25.5	27.00	37.0	22.70
26.0	27.58	37.5	31.67
26.5	26.02	38.0	22.36
27.0	24.83	38.5	28.31
27.5	24.55	39.0	33.12
28.0	26.65	39.5	25.98
28.5	27.17	40.0	22.29
29.0	26.95		



## **COM-POWER AH826**

## HORN ANTENNA

S/N: 71957

## CALIBRATION DATE: DECEMBER 12, 2007

Ŧ			
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	33.5	22.5	35.5
18.5	33.5	23.0	35.9
19.0	34.0	23.5	35.7
19.5	34.0	24.0	35.6
20.0	34.3	24.5	36.0
20.5	34.9	25.0	36.2
21.0	34.7	25.5	36.1
21.5	35.0	26.0	36.2
22.0	35.0	26.5	35.7



#### **FRONT VIEW**

UNIVERSAL ELECTRONICS, INC. CRESTRON MLX-2 REMOTE '08 MODEL: URC-30700BG0-R FCC SUBPART B AND C – RADIATED EMISSIONS

## PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



#### **REAR VIEW**

UNIVERSAL ELECTRONICS, INC. CRESTRON MLX-2 REMOTE '08 MODEL: URC-30700BG0-R FCC SUBPART B AND C – RADIATED EMISSIONS

## PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



APPENDIX E

**DATA SHEETS** 

Crestron MLX-2 Remote '08 Model: URC-30700BG0-R

### RADIATED EMISSIONS

DATA SHEETS

Universal Electronics, Inc.

Crestron MLX-2 Remote '08

Date: 08/29/08

Lab: B

Model: URC-30700BG0-R Tested By: Kyle Fujimoto

#### X-Axis - Stand Alone Mode Transmit Mode

_					Peak /	Ant.	Table	
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	QP / Avg	Height (m)	Angle (deg)	Comments
2405	88.43	V	114	-25.57	Peak	1.16	135	Low Channel
2405	83.96	V	94	-10.04	Avg	1.16	135	Low Gridinion
						-		
4810	50.05	V	74	-23.95	Peak	1.15	135	Low Channel
4810	43.63	V	54	-10.37	Avg	1.15	135	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the Low Channel
0440	04.55	\ /	444	00.45	Darata	4.45	450	14:11:01
2440	81.55	V	114	-32.45	Peak	1.15	150	Middle Channel
2440	76.85	V	94	-17.15	Avg	1.15	150	
4880	48.21	V	74	-25.79	Peak	1.16	135	Middle Channel
4880	40.71	V	54	-13.29	Avg	1.16	135	whole charmer
1000	10.71	•	01	10.20	7.179	1.10	100	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the Middle Channel
2475	82.41	V	114	-31.59	Peak	1.15	0	High Channel
2475	77.81	V	94	-16.19	Avg	1.15	0	
4050	10.01		-,	0.4.70	<u> </u>	4.40	405	
4950	49.21	V	74	-24.79	Peak	1.16	135	High Channel
4950	41.33	V	54	-12.67	Avg	1.16	135	No Hammaniaa Farrad
								No Harmonics Found Beyond the 2nd Harmonic
								for the High Channel
								TOT THE FIIGH CHANNEL

Universal Electronics, Inc.

Crestron MLX-2 Remote '08

Date: 08/29/08

Lab: B

Model: URC-30700BG0-R Tested By: Kyle Fujimoto

#### X-Axis - Stand Alone Mode Transmit Mode

Freq.	Level				Peak / QP /	Ant. Height	Table Angle	
(MHz)	(dBuV)	Pol (v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2405	87.59	Н	114	-26.41	Peak	1	1.25	Low Channel
2405	83.12	Н	94	-10.88	Avg	1	1.25	
4810	44.31	Н	74	-29.69	Peak	1.25	135	Low Channel
4810	32.43	Н	54	-21.57	Avg	1.25	135	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the Low Channel
2440	84.72	Н	114	-29.28	Peak	1.25	150	Middle Channel
2440	79.75	Н	94	-14.25	Avg	1.25	150	
4880	47.53	Н	74	-26.47	Peak	1.25	135	Middle Channel
4880	37.04	Н	54	-16.96	Avg	1.25	135	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the Middle Channel
0.475	04.50		444	00.47	Б	4.05		
2475	81.53	Н	114	-32.47	Peak	1.25	90	High Channel
2475	77.05	Н	94	-16.95	Avg	1.25	90	
4050	47.21		74	26.70	Peak	1 15	180	Llimb Obannal
4950 4950	36.43	H	74 54	-26.79 -17.57		1.15 1.15	180	High Channel
4950	30.43	П	54	-17.57	Avg	1.15	160	No Harmonics Found
								Beyond the 2nd Harmonic for the High Channel
								ioi tile nigri Chamilei
L								

Universal Electronics, Inc.

Crestron MLX-2 Remote '08

Date: 08/29/08

Lab: B

Model: URC-30700BG0-R Tested By: Kyle Fujimoto

### Y-Axis - Stand Alone Mode Transmit Mode

_					Peak /	Ant.	Table	
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	QP / Avg	Height (m)	Angle (deg)	Comments
2405	94.23	V	114	-19.77	Peak	1.19	180	Low Channel
2405	89.8	V	94	-4.2	Avg	1.19	180	
					_			
4810	51.27	V	74	-22.73	Peak	1.16	150	Low Channel
4810	40.57	V	54	-13.43	Avg	1.16	150	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the Low Channel
2440	93.05	V	114	-20.95	Peak	1.35	180	Middle Channel
2440	89.36	V	94	-4.64	Avg	1.35	180	ivilodie Charinei
2110	00.00	V	01	7.07	7179	1.00	100	
4880	52.42	V	74	-21.58	Peak	1.15	150	Middle Channel
4880	44.67	V	54	-9.33	Avg	1.15	150	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the Middle Channel
2								
2475	93.56	V	114	-20.44	Peak	1.25	180	High Channel
2475	88.84	V	94	-5.16	Avg	1.25	180	
4950	54.79	V	74	-19.21	Peak	1.15	180	High Channel
4950	48.01	V	54	-5.99	Avg	1.15	180	nigri Channei
7330	70.01	V	J <del>T</del>	-5.53	Avy	1.10	100	No Harmonics Found
								Beyond the 2nd Harmonic
								for the High Channel
								· · · · · · · · · · · · · · · · · ·

Universal Electronics, Inc.

Crestron MLX-2 Remote '08

Date: 08/29/08

Lab: B

Model: URC-30700BG0-R Tested By: Kyle Fujimoto

#### Y-Axis - Stand Alone Mode Transmit Mode

					Peak /	Ant.	Table	
Freq.	Level				QP /	Height	Angle	
(MHz)	(dBuV)	Pol (v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2405	88.21	H	114	-25.79	Peak	1.16	135	Low Channel
2405	83.38	Н	94	-10.62	Avg	1.16	135	2011 0110111101
4810	50.31	Н	74	-23.69	Peak	1.16	135	Low Channel
4810	43.81	Н	54	-10.19	Avg	1.16	135	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the Low Channel
2440	87.52	Н	114	-26.48	Peak	1.16	135	Middle Channel
2440	83.17	Н	94	-10.83	Avg	1.16	135	
				21.22				
4880	52.31	Н	74	-21.69	Peak	1.15	135	Middle Channel
4880	46.02	Н	54	-7.98	Avg	1.15	135	
								No Harmoniae Found
								No Harmonics Found Beyond the 2nd Harmonic
								for the Middle Channel
								for the Middle Charifier
2475	85.77	Н	114	-28.23	Peak	1.16	135	High Channel
2475	80.88	Н	94	-13.12	Avg	1.16	135	r ngn enamer
4950	54.52	Н	74	-19.48	Peak	1.15	150	High Channel
4950	47.96	Н	54	-6.04	Avg	1.15	150	<u> </u>
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the High Channel

Universal Electronics, Inc. Crestron MLX-2 Remote '08

Lab: B Model: URC-30700BG0-R Tested By: Kyle Fujimoto

Date: 08/29/08

#### **Z-Axis - Stand Alone Mode Transmit Mode**

					Peak /	Ant.	Table	
Freq.	Level				QP/	Height	Angle	
(MHz)	(dBuV)	Pol (v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2405	83.14	V	114	-30.86	Peak	1.19	150	Low Channel
2405	78.64	V	94	-15.36	Avg	1.19	150	
4810	46.28	V	74	-27.72	Peak	1.18	125	Low Channel
4810	35.14	V	54	-18.86	Avg	1.18	125	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the Low Channel
								10. 0.10 20.0 0.10.11.10.
2440	79.16	V	114	-34.84	Peak	1.15	135	Middle Channel
2440	74.18	V	94	-19.82	Avg	1.15	135	
4880	46.29	V	74	-27.71	Peak	1.19	135	Middle Channel
4880	39.31	V	54	-14.69	Avg	1.19	135	
								No Harmonics Found
								Beyond the 2nd Harmonic for the Middle Channel
								for the Middle Channel
2475	79.71	V	114	-34.29	Peak	1.51	125	High Channel
2475	75.29	V	94	-18.71	Avg	1.51	125	
4950	50.56	V	74	-23.44	Peak	1.15	315	High Channel
4950	43.25	V	54	-10.75	Avg	1.15	315	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the High Channel

Universal Electronics, Inc.

Crestron MLX-2 Remote '08

Date: 08/29/08

Lab: B

Model: URC-30700BG0-R Tested By: Kyle Fujimoto

### **Z-Axis - Stand Alone Mode Transmit Mode**

					Peak /	Ant.	Table	
Freq.	Level				QP /	Height	Angle	
(MHz)	(dBuV)	Pol (v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2405	86.76	H	114	-27.24	Peak	1.16	150	Low Channel
2405	82.25	Н	94	-11.75	Avg	1.16	150	
4810	48.54	Н	74	-25.46	Peak	1.18	135	Low Channel
4810	38.82	Н	54	-15.18	Avg	1.18	135	
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the Low Channel
2440	81.61	Н	114	-32.39	Peak	1.16	135	Middle Channel
2440	77.05	Н	94	-16.95	Avg	1.16	135	
4880	49.43	Н	74	-24.57	Peak	1.16	135	Middle Channel
4880	37.78	Н	54	-16.22	Avg	1.16	135	
								No Harmoniae Found
								No Harmonics Found Beyond the 2nd Harmonic
								for the Middle Channel
								for the Middle Charifier
2475	85.79	Н	114	-28.21	Peak	1.51	135	High Channel
2475	81.21	Н	94	-12.79	Avg	1.51	135	g cac.
						_		
4950	47.72	Н	74	-26.28	Peak	1.26	125	High Channel
4950	38.51	Н	54	-15.49	Avg	1.26	125	<u> </u>
								No Harmonics Found
								Beyond the 2nd Harmonic
								for the High Channel

RSS-210

Universal Electronics, Inc.

Crestron MLX-2 Remote '08

Date: 09/04/08

Lab: B

Model: URC-30700BG0-R Tested By: Kyle Fujimoto

## X-Axis, Y-Axis, and Z-Axis - Stand Alone Mode Receive Mode

					Peak /	A .a.4	Table	
F	Lavial					Ant.	Table	
Freq.	Level		,		QP /	Height	Angle	
(MHz)	(dBuV)	Pol (v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
								No Emissions Found
								in Receive Mode
								for the EUT from 1 GHz
								to 25 GHz
								Tested in Both Vertical
								and Horizontal Polarizations
								All 3 Axis Investigated

#### FCC 15.249 and FCC Class B

Universal Electronics, Inc.
Crestron MLX-2 Remote '08
Model: LIDC 20700BC0 B

Model: URC-30700BG0-R Tested By: Kyle Fujimoto

Date: 08/29/08

Labs: B and D

#### X-Axis, Y-Axis, and Z-Axis - Stand Alone Mode Digital Portion and Non-Harmonic Emissions from the Transmitter

					Peak /	Ant.	Table	
Freq.	Level				QP/	Height	Angle	
(MHz)	(dBuV)	Pol (v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
								No Emissions Found
								for the Digital Portion
								from the EUT from 10 kHz
								to 25 GHz
								No Emissions Found for the
								non-Harmonic Tx Emissions
								from the EUT from 10 kHz
								to 25 GHz
								Tested in Both Vertical
								and Horizontal Polarizations
								All 3 Axis Investigated
		_						
		_						



Report Number: B80903D1
FCC Part 15 Subpart B and FCC Section 15.249 Test Report
Crestron MLX-2 Remote '08

Model: URC-30700BG0-R

**BAND EDGES** 

DATA SHEETS

Universal Electronics, Inc.

Crestron MLX-2 Remote '08

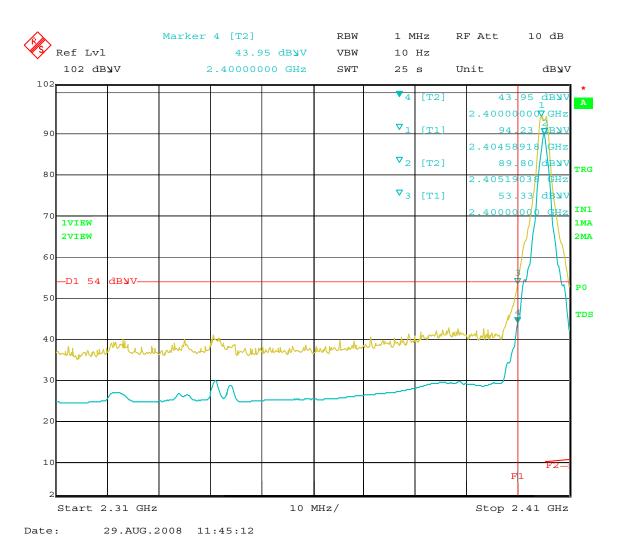
Date: 08/29/08

Lab: B

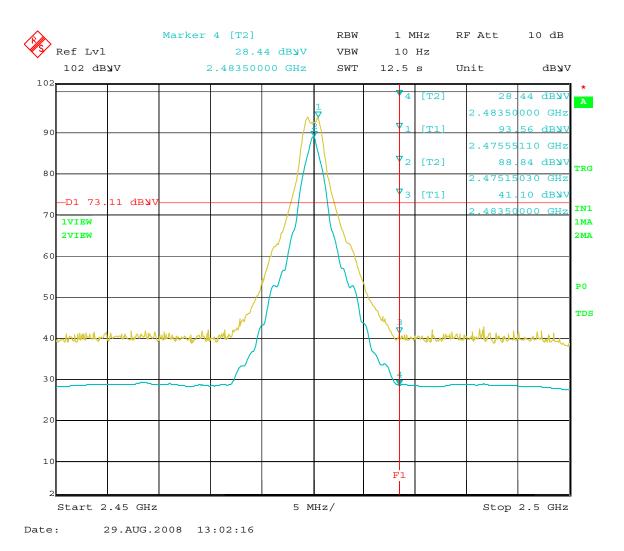
Model: URC-30700BG0-R Tested By: Kyle Fujimoto

# Y-Axis (Worst Case) - Vertical Polarization (Worst Case) Band Edges - Transmit Mode

					Peak /	Ant.	Table	
Freq.	Level				QP/	Height	Angle	
(MHz)	(dBuV)	Pol (v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2405	94.23	V	114	-19.77	Peak	1.19	180	Fundamental of Low Ch.
2405	89.8	V	94	-4.2	Avg	1.19	180	at 3 Meters
2400	53.33	V	74	-20.67	Peak	1.19	180	Band Edge
2400	43.95	V	54	-10.05	Peak	1.19	180	Low Channel
2475	93.56	V	114	-20.44	Peak	1.25	180	Fundamental of High Ch.
2475	88.84	V	94	-5.16	Avg	1.25	180	at 3 Meters
2483.5	41.1	V	74	-32.9	Peak	1.25	180	Band Edge
2483.5	28.44	V	54	-25.56	Avg	1.25	180	High Channel



Band Edge – Low Channel – Vertical Polarization – Y-Axis (Worst Case)



Band Edge – High Channel – Vertical Polarization – Y-Axis (Worst Case)