***FCC PART 15 SUBPART B and C***
***TEST REPORT***

*for*

# UEI NEVO PORTAL

# MODEL: URC-8100BC0-XXXX-XX-R

Prepared for

UNIVERSAL ELECTRONICS, INC.
201 EAST SANDPOINTE AVENUE, 8TH FLOOR
SANTA ANA, CALIFORNIA 92707

Prepared by:_____

KYLE FUJIMOTO

Approved by:_____

JAMES ROSS

COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500

DATE: JANUARY 7, 2014

| | 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: | UEI Nevo Portal<br>Model: URC-8100BC0-XXXX-XX-R<br>S/N: N/A |
| Product Description: | See Expository Statement |
| Modifications: | The EUT was not modified in order to meet the specifications. |
| Manufacturer: | Universal Electronics, Inc.<br>201 East Sandpointe Avenue, 8th Floor<br>Santa Ana, California 92707 |
| Test Date(s): | November 26, 2013 |
| Test Specifications: | Emissions requirements<br>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<br>150 kHz to 30 MHz | This test was not performed because the EUT operates on battery power and does not connect to the AC mains. |
| 2 | Radiated RF Emissions<br>10 kHz to 25000 MHz<br>(Transmitter and Digital Portion) | Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249. |

## 1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the UEI Nevo Portal, Model: URC-8100BC0-XXXX-XX-R (EUT). The Emissions 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 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 Emissions 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 | Senior Electrical Core Engineer |

Compatible Electronics Inc.

| | |
|---|---|
| James Ross | Test Engineer |
| Kyle Fujimoto | Test Engineer |

## 2.4 Date Test Sample was Received

The test sample was received prior to the initial test date of November 26, 2013.

## 2.5 Disposition of the Test Sample

The test sample has not been returned to Universal Electronics, Inc. as of the date of the test 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 |
| P/N | Part Number |
| S/N | Serial Number |
| ITE | Information Technology Equipment |
| LISN | Line Impedance Stabilization Network |
| NVLAP | National Voluntary Laboratory Accreditation Program |
| CFR | Code of Federal Regulations |
| N/A | Not Applicable |
| Ltd. | Limited |
| Inc. | Incorporated |
| NCR | No Calibration Required |
| URC | Universal Remote Control |

## 3. APPLICABLE DOCUMENTS

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

| SPEC | TITLE |
|---|---|
| CFR Title 47, Part 15 | FCC Rules – Radio frequency devices (including digital devices) |
| ANSI C63.4: 2009 | 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 – Emissions

The UEI Nevo Portal, Model: URC-8100BC0-XXXX-XX-R (EUT) was tested as a stand alone unit. The EUT had a special test program that allowed the low, middle, or high channels, to be tested while continuously transmitting.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final emissions data was taken in this mode of operation and any cables were maximized. All initial investigations were performed with the measurement receiver 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

There were no external cables connected to the EUT.

# 5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

## 5.1 EUT and Accessory List

| EQUIPMENT | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | FCC ID |
|---|---|---|---|---|
| UEI NEVO PORTAL (EUT) | UNIVERSAL ELECTRONICS, INC. | URC-8100BC0-XXXX-XX-R | N/A | MG3-8100 |

## 5.2 Emissions Test Equipment

| EQUIPMENT TYPE | MANU-FACTURER | MODEL NUMBER | SERIAL NUMBER | CALIBRATION DATE | CAL. CYCLE |
|---|---|---|---|---|---|
| **GENERAL TEST EQUIPMENT USED IN LAB B** | | | | | |
| Computer | Compaq | CQ5210F | CNX9360CF9 | N/A | N/A |
| Monitor | Hewlett Packard | HPs2031a | 3CQ046N3MD | N/A | N/A |
| EMI Receiver | Rohde & Schwarz | ESIB40 | 100194 | November 19, 2012 | 2 Year |
| **GENERAL TEST EQUIPMENT USED IN LAB A** | | | | | |
| Spectrum Analyzer – Main Section | Hewlett Packard | 8566B | 2637A03618 | May 30, 2013 | 1 Year |
| Spectrum Analyzer – Display Section | Hewlett Packard | 85662A | 2648A13404 | May 30, 2013 | 1 Year |
| Quasi-Peak Adapter | Hewlett Packard | 85650A | 2811A01363 | May 30, 2013 | 1 Year |
| Monitor | Hewlett Packard | D5258A | TW74500641 | N/A | N/A |
| Computer | Hewlett Packard | 4530 | US91912319 | N/A | N/A |
| **RF RADIATED EMISSIONS TEST EQUIPMENT** | | | | | |
| CombiLog Antenna | Com-Power | AC-220 | 61060 | May 29, 2013 | 1 Year |
| Preamplifier | Com-Power | PA-103 | 1582 | December 28, 2012 | 1 Year |
| Preamplifier | Com-Power | PA-118 | 181656 | December 27, 2012 | 1 Year |
| Preamplifier | Com-Power | PA-840 | 711013 | May 17, 2012 | 2 Year |
| Loop Antenna | Com-Power | AL-130 | 17089 | January 29, 2013 | 2 Year |
| Horn Antenna | Com-Power | AH-118 | 071175 | February 29, 2012 | 2 Year |
| Horn Antenna | Com-Power | AH-826 | 0071957 | N/A | N/A |
| Antenna Mast | Com Power | AM-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 Emissions 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 measurement receiver was used as a measuring meter. The data was collected with the measurement receiver 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 measurement receiver's input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the measurement receiver. 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 operates on battery power and does not connect to the AC mains.

### 7.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer, along with the quasi-peak adapter, and EMI Receiver were used as a measuring meter. Amplifiers were used to increase the sensitivity of the instrument. The Com-Power Preamplifier Model: PA-103 was used for frequencies from 30 MHz to 1 GHz, the Com-Power Microwave Preamplifier Model: PA-118 was used for frequencies from 1 GHz to 18 GHz, and the Com-Power Microwave Preamplifier Model: PA-840 were used for frequencies above 18 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 and EMI receiver records the highest measured reading over the sweeps.

The quasi-peak function was used only for those readings which are marked accordingly on the data sheets.

The frequencies above 1 GHz were adjusted by a “duty cycle correction factor”, derived from 20 log (dwell time / 100 ms).

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

| FREQUENCY RANGE | EFFECTIVE MEASUREMENT BANDWIDTH | TRANSDUCER |
|---|---|---|
| 10 kHz to 150 kHz | 200 Hz | Active Loop Antenna |
| 150 kHz to 30 MHz | 9 kHz | Active Loop Antenna |
| 30 MHz to 1000 MHz | 120 kHz | CombiLog Antenna |
| 1 GHz to 25 GHz | 1 MHz | Horn Antennas |

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 by the Radiated Emission Manual Test software. 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 gun sight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the vertical axis in order to ensure accurate results.

## 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 from 30 MHz to 25 GHz and at a 10-meter distance from 10 kHz to 30 MHz to obtain the final test data.

**Test Results:**

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

### 7.1.3 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS
UEI Nevo Portal, Model: URC-8100BC0-XXXX-XX-R

| Frequency MHz | Corrected Reading* dBuV | Specification Limit dBuV | Delta (Cor. Reading – Spec. Limit) dB |
|---|---|---|---|
| 2400 (H) | 50.63 (A) | 54 | -3.37 |
| 4804 (H) | 45.99 (A) | 54 | -8.01 |
| 4884 (H) | 45.51 (A) | 54 | -8.49 |
| 4960 (H) | 44.86 (A) | 54 | -9.14 |
| 4960 (V) | 43.16 (A) | 54 | -10.84 |
| 4884 (V) | 41.74 (A) | 54 | -12.26 |

Notes:

* The complete emissions data is given in Appendix E of this report.
(H) Horizontal
(V) Vertical
(A) Average

## 8. CONCLUSIONS

The UEI Nevo Portal, Model: URC-8100BC0-XXXX-XX-R (EUT), as tested, 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, 15.209, and 15.249 for the transmitter portion.

# APPENDIX A

# *LABORATORY ACCREDITATIONS AND RECOGNITIONS*

# LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP LAB CODES 200063-0, 200528-0, 200527-0

For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025. Please follow the link to the NIST/NVLAP site for each of our facilities' NVLAP certificate and scope of accreditation

**NVLAP listing links**

**Agoura Division** / **Brea Division** / **Silverado/Lake Forest Division**

.Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfillment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."

**ANSI listing** CETCB

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).
**US/EU MRA list** NIST MRA site

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).
**APEC MRA list** NIST MRA site

We are also listed for IT products by the following country/agency:

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**FCC Listing, from FCC OET site**
FCC test lab search https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm

Industry Canada / Industrie Canada Compatible Electronics IC listing can be found at:
http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home

# APPENDIX B

# *MODIFICATIONS TO THE EUT*

# MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.249 and/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 during the testing.

# APPENDIX C

# *ADDITIONAL MODELS*

# ADDITIONAL MODELS COVERED UNDER THIS REPORT

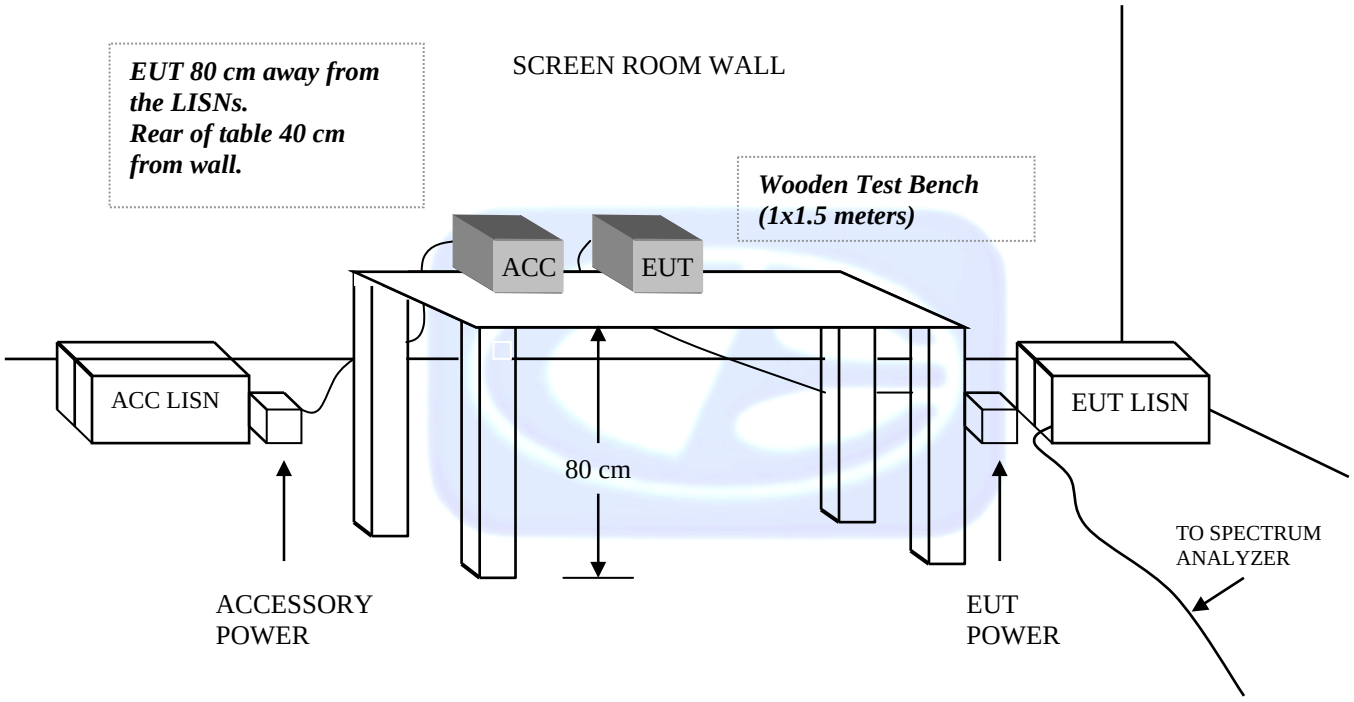
| | |
|---|---|
| USED FOR THE PRIMARY TEST | UEI Nevo Portal<br>Model: URC-8100BC0-XXXX-XX-R<br>S/N: N/A |
| ADDITIONAL MODELS COVERED: | The following models are considered by the manufacturer to be similar to the sample tested, however the test results contained in this report relate only to the sample tested. |

There were no additional models covered under this test report.

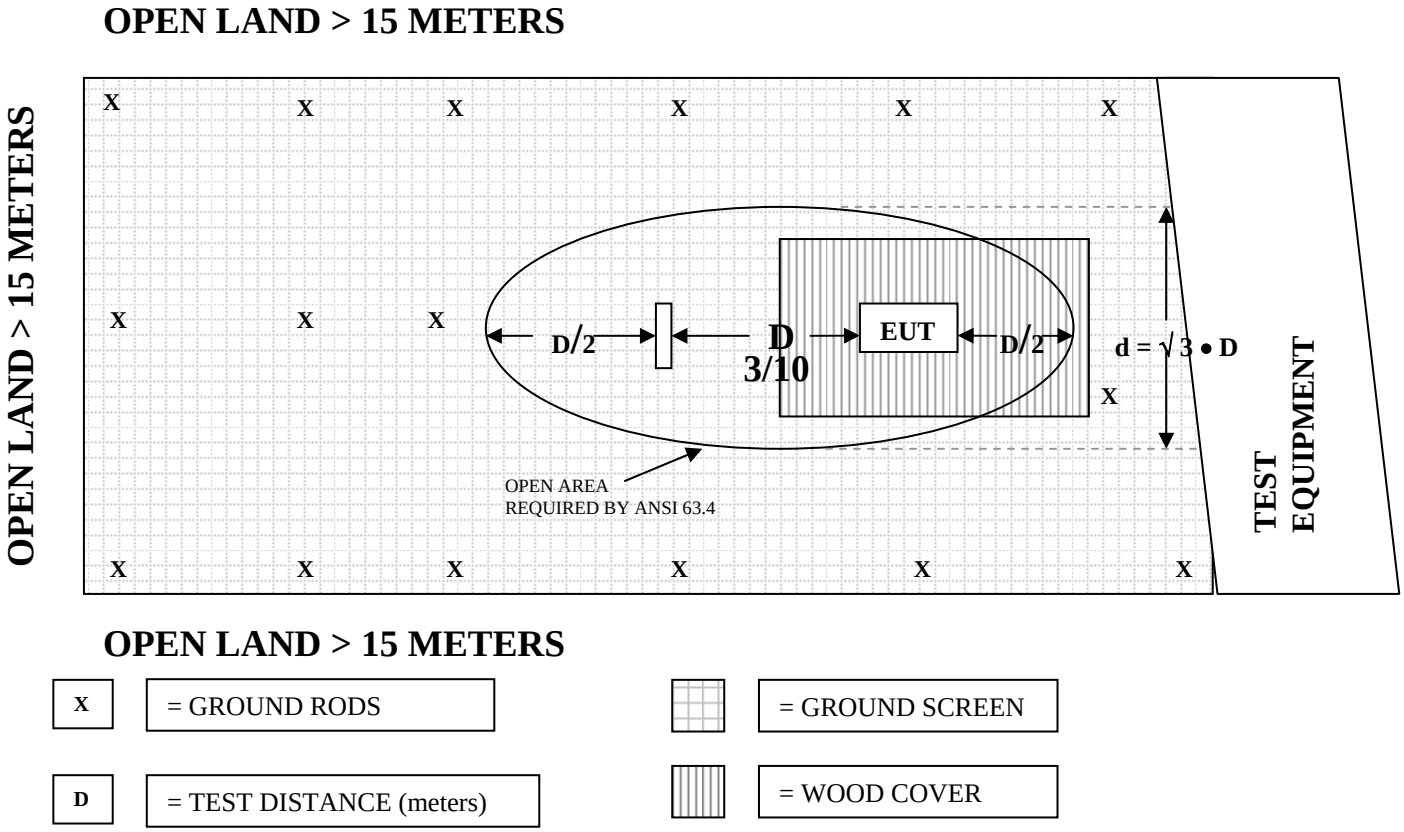
# APPENDIX D

# *DIAGRAMS, CHARTS, AND PHOTOS*

# *FIGURE 1: CONDUCTED EMISSIONS TEST SETUP*



# *FIGURE 2: PLOT MAP AND LAYOUT OF THE RADIATED TEST SITE*



# COM-POWER AL-130

# LOOP ANTENNA

# S/N: 17089

# CALIBRATION DATE: JANUARY 29, 2013

| FREQUENCY (MHz) | MAGNETIC (dB/m) | ELECTRIC (dB/m) |
|---|---|---|
| 0.009 | -42.5 | 9 |
| 0.01 | -42.3 | 9.2 |
| 0.02 | -42.1 | 9.4 |
| 0.03 | -41.4 | 10.1 |
| 0.04 | -41.8 | 9.7 |
| 0.05 | -42.4 | 9.1 |
| 0.06 | -42.3 | 9.2 |
| 0.07 | -42.5 | 9 |
| 0.08 | -42.4 | 9.1 |
| 0.09 | -42.5 | 9 |
| 0.1 | -42.5 | 9 |
| 0.2 | -42.7 | 8.8 |
| 0.3 | -42.6 | 8.9 |
| 0.4 | -42.5 | 9 |
| 0.5 | -42.7 | 8.8 |
| 0.6 | -42.7 | 8.8 |
| 0.7 | -42.5 | 9 |
| 0.8 | -42.3 | 9.2 |
| 0.9 | -42.2 | 9.3 |
| 1 | -42.2 | 9.3 |
| 2 | -41.8 | 9.7 |
| 3 | -41.7 | 9.8 |
| 4 | -41.7 | 9.8 |
| 5 | -41.5 | 10 |
| 6 | -41.6 | 9.9 |
| 7 | -41.4 | 10.1 |
| 8 | -41 | 10.5 |
| 9 | -40.8 | 10.7 |
| 10 | -41.3 | 10.2 |
| 15 | -41.4 | 10.1 |
| 20 | -41.2 | 10.3 |
| 25 | -42.6 | 8.9 |
| 30 | -41.7 | 9.8 |

# COM-POWER AC-220

# COMBILOG ANTENNA

# S/N: 61060

# CALIBRATION DATE: MAY 29, 2013

| FREQUENCY (MHz) | FACTOR (dB) | FREQUENCY (MHz) | FACTOR (dB) |
|---|---|---|---|
| 30 | 19.40 | 200 | 9.10 |
| 35 | 19.10 | 250 | 11.40 |
| 40 | 19.70 | 300 | 11.90 |
| 45 | 18.00 | 350 | 14.20 |
| 50 | 16.80 | 400 | 15.20 |
| 60 | 12.50 | 450 | 16.50 |
| 70 | 7.30 | 500 | 17.10 |
| 80 | 4.40 | 550 | 16.20 |
| 90 | 8.00 | 600 | 17.70 |
| 100 | 8.80 | 650 | 19.10 |
| 120 | 10.50 | 700 | 20.00 |
| 125 | 10.60 | 750 | 21.50 |
| 140 | 8.60 | 800 | 21.50 |
| 150 | 11.20 | 850 | 21.70 |
| 160 | 8.90 | 900 | 22.70 |
| 175 | 9.60 | 950 | 22.10 |
| 180 | 8.50 | 1000 | 22.90 |

# COM POWER AH-118

# HORN ANTENNA

# S/N: 071175

# CALIBRATION DATE: FEBRUARY 29, 2012

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|---|---|---|---|
| 1.0 | 23.6 | 10.0 | 37.7 |
| 1.5 | 22.0 | 10.5 | 38.4 |
| 2.0 | 28.7 | 11.0 | 38.0 |
| 2.5 | 29.3 | 11.5 | 38.2 |
| 3.0 | 30.6 | 12.0 | 39.0 |
| 3.5 | 30.4 | 12.5 | 42.4 |
| 4.0 | 31.1 | 13.0 | 40.8 |
| 4.5 | 33.4 | 13.5 | 40.0 |
| 5.0 | 35.3 | 14.0 | 39.7 |
| 5.5 | 35.1 | 14.5 | 43.5 |
| 6.0 | 36.9 | 15.0 | 42.7 |
| 6.5 | 37.4 | 15.5 | 39.7 |
| 7.0 | 37.6 | 16.0 | 39.2 |
| 7.5 | 36.2 | 16.5 | 39.7 |
| 8.0 | 38.4 | 17.0 | 42.2 |
| 8.5 | 39.3 | 17.5 | 47.6 |
| 9.0 | 37.4 | 18.0 | 51.2 |
| 9.5 | 38.0 | | |

# COM-POWER AH826

# HORN ANTENNA

# S/N: 71957

| 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 |

# COM-POWER PA-103

# PREAMPLIFIER

# S/N: 1582

# CALIBRATION DATE: DECEMBER 28, 2012

| FREQUENCY (MHz) | FACTOR (dB) | FREQUENCY (MHz) | FACTOR (dB) |
|---|---|---|---|
| 30 | 32.80 | 300 | 32.26 |
| 40 | 33.10 | 350 | 32.23 |
| 50 | 33.10 | 400 | 32.17 |
| 60 | 33.10 | 450 | 32.16 |
| 70 | 33.00 | 500 | 32.11 |
| 80 | 33.00 | 550 | 32.07 |
| 90 | 33.10 | 600 | 32.02 |
| 100 | 33.00 | 650 | 31.97 |
| 125 | 33.00 | 700 | 31.87 |
| 150 | 33.00 | 750 | 31.81 |
| 175 | 32.90 | 800 | 31.73 |
| 200 | 32.80 | 850 | 31.57 |
| 225 | 32.34 | 900 | 31.43 |
| 250 | 32.32 | 950 | 31.29 |
| 275 | 32.28 | 1000 | 31.14 |

# COM-POWER PA-118

# PREAMPLIFIER

# S/N: 181656

# CALIBRATION DATE: DECEMBER 27, 2012

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|---|---|---|---|
| 0.50 | 25.29 | 6.00 | 25.75 |
| 0.60 | 25.26 | 6.50 | 25.28 |
| 0.70 | 25.23 | 7.00 | 24.83 |
| 0.80 | 25.13 | 7.50 | 24.49 |
| 0.90 | 24.91 | 8.00 | 24.38 |
| 1.00 | 24.68 | 8.50 | 25.06 |
| 1.25 | 25.85 | 9.00 | 25.55 |
| 1.50 | 26.23 | 9.50 | 25.32 |
| 1.75 | 26.42 | 10.0 | 25.25 |
| 2.00 | 26.48 | 10.5 | 25.31 |
| 2.25 | 26.55 | 11.0 | 24.99 |
| 2.50 | 26.59 | 11.5 | 24.84 |
| 2.75 | 26.64 | 12.0 | 25.08 |
| 3.00 | 26.67 | 12.5 | 24.64 |
| 3.25 | 26.67 | 13.0 | 24.44 |
| 3.50 | 26.66 | 13.5 | 24.85 |
| 3.75 | 26.58 | 14.0 | 25.02 |
| 4.00 | 26.82 | 14.5 | 25.41 |
| 4.25 | 26.60 | 15.0 | 26.12 |
| 4.50 | 26.46 | 15.5 | 26.74 |
| 4.75 | 26.36 | 16.0 | 25.67 |
| 5.00 | 26.22 | 16.5 | 24.48 |
| 5.25 | 26.11 | 17.0 | 24.33 |
| 5.50 | 25.98 | 17.5 | 25.19 |
| 5.75 | 25.90 | 18.0 | 26.75 |

# COM-POWER PA-840

# MICROWAVE PREAMPLIFIER

## S/N: 711013

## CALIBRATION DATE: MAY 17, 2012

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|---|---|---|---|
| 18.0 | 25.81 | 31.0 | 25.77 |
| 19.0 | 24.57 | 31.5 | 25.36 |
| 20.0 | 23.46 | 32.0 | 25.15 |
| 21.0 | 22.51 | 32.5 | 25.13 |
| 22.0 | 23.85 | 33.0 | 25.52 |
| 23.0 | 23.31 | 33.5 | 25.24 |
| 24.0 | 24.44 | 34.0 | 25.08 |
| 25.0 | 25.42 | 34.5 | 25.27 |
| 26.0 | 25.71 | 35.0 | 23.99 |
| 26.5 | 25.66 | 35.5 | 24.67 |
| 27.0 | 25.84 | 36.5 | 24.80 |
| 27.5 | 25.29 | 37.0 | 26.27 |
| 28.0 | 25.46 | 37.5 | 24.86 |
| 28.5 | 25.58 | 38.0 | 24.64 |
| 29.0 | 26.16 | 38.5 | 23.46 |
| 29.5 | 26.14 | 39.0 | 21.29 |
| 30.0 | 26.01 | 39.5 | 20.83 |
| 30.5 | 25.67 | 40.0 | 19.96 |

**FRONT VIEW**

UNIVERSAL ELECTRONICS, INC.
UEI NEVO PORTAL
MODEL: URC-8100BC0-XXXX-XX-R
FCC SUBPART B AND C – RADIATED EMISSIONS

## PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

**REAR VIEW**

UNIVERSAL ELECTRONICS, INC.
UEI NEVO PORTAL
MODEL: URC-8100BC0-XXXX-XX-R
FCC SUBPART B AND C – RADIATED EMISSIONS

## PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

# APPENDIX E

# *DATA SHEETS*

# *RADIATED EMISSIONS*

# *DATA SHEETS*

**FCC 15.249**

Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**Low Channel**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 2402 | 80.32 | V | 114 | -33.68 | Peak | 1.25 | 90 | X-Axis |
| 2402 | 60.32 | V | 94 | -33.68 | Avg | 1.25 | 90 | Vertical Polarization |
| | | | | | | | | |
| 2402 | 92.38 | H | 114 | -21.62 | Peak | 2 | 0 | X-Axis |
| 2402 | 72.38 | H | 94 | -21.62 | Avg | 2 | 0 | Horizontal Polarization |

**FCC 15.249**

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UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**Middle Channel**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 2442 | 77.13 | V | 114 | -36.87 | Peak | 2 | 45 | **X-Axis** |
| 2442 | 57.13 | V | 94 | -36.87 | Avg | 2 | 45 | **Vertical Polarization** |
| | | | | | | | | |
| 2442 | 93.02 | H | 114 | -20.98 | Peak | 2 | 315 | **X-Axis** |
| 2442 | 73.02 | H | 94 | -20.98 | Avg | 2 | 315 | **Horizontal Polarization** |

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Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**High Channel**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 2480 | 78.08 | V | 114 | -35.92 | Peak | 1.5 | 50 | **X-Axis** |
| 2480 | 58.08 | V | 94 | -35.92 | Avg | 1.5 | 50 | **Vertical Polarization** |
| | | | | | | | | |
| 2480 | 92.43 | H | 114 | -21.57 | Peak | 1.5 | 45 | **X-Axis** |
| 2480 | 72.43 | H | 94 | -21.57 | Avg | 1.5 | 45 | **Horizontal Polarization** |

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Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**Low Channel**
**Transmit Mode - X-Axis**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 4804 | 60.73 | V | 74 | -13.27 | Peak | 3 | 0 | |
| 4804 | 40.73 | V | 54 | -13.27 | Avg | 3 | 0 | |
| | | | | | | | | |
| 7206 | | | | | | | | No Emissions |
| 7206 | | | | | | | | Detected |
| | | | | | | | | |
| 9608 | | | | | | | | No Emissions |
| 9608 | | | | | | | | Detected |
| | | | | | | | | |
| 12010 | | | | | | | | No Emissions |
| 12010 | | | | | | | | Detected |
| | | | | | | | | |
| 14412 | | | | | | | | No Emissions |
| 14412 | | | | | | | | Detected |
| | | | | | | | | |
| 16814 | | | | | | | | No Emissions |
| 16814 | | | | | | | | Detected |
| | | | | | | | | |
| 19216 | | | | | | | | No Emissions |
| 19216 | | | | | | | | Detected |
| | | | | | | | | |
| 21618 | | | | | | | | No Emissions |
| 21618 | | | | | | | | Detected |
| | | | | | | | | |
| 24020 | | | | | | | | No Emissions |
| 24020 | | | | | | | | Detected |
| | | | | | | | | |

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Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**Low Channel**
**Transmit Mode - X-Axis**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 4804 | 65.99 | H | 74 | -8.01 | Peak | 1.5 | 315 | |
| 4804 | 45.99 | H | 54 | -8.01 | Avg | 1.5 | 315 | |
| | | | | | | | | |
| 7206 | | | | | | | | No Emissions |
| 7206 | | | | | | | | Detected |
| | | | | | | | | |
| 9608 | | | | | | | | No Emissions |
| 9608 | | | | | | | | Detected |
| | | | | | | | | |
| 12010 | | | | | | | | No Emissions |
| 12010 | | | | | | | | Detected |
| | | | | | | | | |
| 14412 | | | | | | | | No Emissions |
| 14412 | | | | | | | | Detected |
| | | | | | | | | |
| 16814 | | | | | | | | No Emissions |
| 16814 | | | | | | | | Detected |
| | | | | | | | | |
| 19216 | | | | | | | | No Emissions |
| 19216 | | | | | | | | Detected |
| | | | | | | | | |
| 21618 | | | | | | | | No Emissions |
| 21618 | | | | | | | | Detected |
| | | | | | | | | |
| 24020 | | | | | | | | No Emissions |
| 24020 | | | | | | | | Detected |
| | | | | | | | | |

**FCC 15.249**
Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**Middle Channel**
**Transmit Mode - X-Axis**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 4884 | 61.74 | V | 74 | -12.26 | Peak | 2 | 0 | |
| 4884 | 41.74 | V | 54 | -12.26 | Avg | 2 | 0 | |
| | | | | | | | | |
| 7326 | | | | | | | | No Emissions |
| 7326 | | | | | | | | Detected |
| | | | | | | | | |
| 9768 | | | | | | | | No Emissions |
| 9768 | | | | | | | | Detected |
| | | | | | | | | |
| 12210 | | | | | | | | No Emissions |
| 12210 | | | | | | | | Detected |
| | | | | | | | | |
| 14652 | | | | | | | | No Emissions |
| 14652 | | | | | | | | Detected |
| | | | | | | | | |
| 17094 | | | | | | | | No Emissions |
| 17094 | | | | | | | | Detected |
| | | | | | | | | |
| 19536 | | | | | | | | No Emissions |
| 19536 | | | | | | | | Detected |
| | | | | | | | | |
| 21978 | | | | | | | | No Emissions |
| 21978 | | | | | | | | Detected |
| | | | | | | | | |
| 24420 | | | | | | | | No Emissions |
| 24420 | | | | | | | | Detected |
| | | | | | | | | |

**FCC 15.249**
Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**Middle Channel**
**Transmit Mode - X-Axis**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 4884 | 65.51 | H | 74 | -8.49 | Peak | 1 | 315 | |
| 4884 | 45.51 | H | 54 | -8.49 | Avg | 1 | 315 | |
| | | | | | | | | |
| 7326 | | | | | | | | No Emissions |
| 7326 | | | | | | | | Detected |
| | | | | | | | | |
| 9768 | | | | | | | | No Emissions |
| 9768 | | | | | | | | Detected |
| | | | | | | | | |
| 12210 | | | | | | | | No Emissions |
| 12210 | | | | | | | | Detected |
| | | | | | | | | |
| 14652 | | | | | | | | No Emissions |
| 14652 | | | | | | | | Detected |
| | | | | | | | | |
| 17094 | | | | | | | | No Emissions |
| 17094 | | | | | | | | Detected |
| | | | | | | | | |
| 19536 | | | | | | | | No Emissions |
| 19536 | | | | | | | | Detected |
| | | | | | | | | |
| 21978 | | | | | | | | No Emissions |
| 21978 | | | | | | | | Detected |
| | | | | | | | | |
| 24420 | | | | | | | | No Emissions |
| 24420 | | | | | | | | Detected |
| | | | | | | | | |

**FCC 15.249**
Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**High Channel**
**Transmit Mode - X-Axis**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 4960 | 63.16 | V | 74 | -10.84 | Peak | 2 | 0 | |
| 4960 | 43.16 | V | 54 | -10.84 | Avg | 2 | 0 | |
| | | | | | | | | |
| 7440 | | | | | | | | No Emissions |
| 7440 | | | | | | | | Detected |
| | | | | | | | | |
| 9920 | | | | | | | | No Emissions |
| 9920 | | | | | | | | Detected |
| | | | | | | | | |
| 12400 | | | | | | | | No Emissions |
| 12400 | | | | | | | | Detected |
| | | | | | | | | |
| 14880 | | | | | | | | No Emissions |
| 14880 | | | | | | | | Detected |
| | | | | | | | | |
| 17360 | | | | | | | | No Emissions |
| 17360 | | | | | | | | Detected |
| | | | | | | | | |
| 19840 | | | | | | | | No Emissions |
| 19840 | | | | | | | | Detected |
| | | | | | | | | |
| 22320 | | | | | | | | No Emissions |
| 22320 | | | | | | | | Detected |
| | | | | | | | | |
| 24800 | | | | | | | | No Emissions |
| 24800 | | | | | | | | Detected |
| | | | | | | | | |

**FCC 15.249**
Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**High Channel**
**Transmit Mode - X-Axis**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 4960 | 64.86 | H | 74 | -9.14 | Peak | 1 | 315 | |
| 4960 | 44.86 | H | 54 | -9.14 | Avg | 1 | 315 | |
| | | | | | | | | |
| 7440 | | | | | | | | No Emissions |
| 7440 | | | | | | | | Detected |
| | | | | | | | | |
| 9920 | | | | | | | | No Emissions |
| 9920 | | | | | | | | Detected |
| | | | | | | | | |
| 12400 | | | | | | | | No Emissions |
| 12400 | | | | | | | | Detected |
| | | | | | | | | |
| 14880 | | | | | | | | No Emissions |
| 14880 | | | | | | | | Detected |
| | | | | | | | | |
| 17360 | | | | | | | | No Emissions |
| 17360 | | | | | | | | Detected |
| | | | | | | | | |
| 19840 | | | | | | | | No Emissions |
| 19840 | | | | | | | | Detected |
| | | | | | | | | |
| 22320 | | | | | | | | No Emissions |
| 22320 | | | | | | | | Detected |
| | | | | | | | | |
| 24800 | | | | | | | | No Emissions |
| 24800 | | | | | | | | Detected |
| | | | | | | | | |

**FCC 15.249**
Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**Non Harmonic Emissions from the Tx and Digital Portion -- 10 kHz to 25000 MHz**
**Vertical and Horizontal Polarizations**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | No Emissions Found for the |
| | | | | | | | | Digital Portion |
| | | | | | | | | from 10 kHz to 25000 MHz |
| | | | | | | | | for both Vertical and Horizontal |
| | | | | | | | | Polarizations |
| | | | | | | | | |
| | | | | | | | | No Non Harmonic Emissions Found |
| | | | | | | | | for the Tx Mode |
| | | | | | | | | from 10 kHz to 25000 MHz |
| | | | | | | | | for both Vertical and Horizontal |
| | | | | | | | | Polarizations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |

# *BAND EDGES*

# *DATA SHEETS*

**FCC 15.249**
Universal Electronics, Inc.
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**Band Edges Using 20 dB Peak to Average**
**Low Channel**

| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 2402 | 80.32 | V | 114 | -33.68 | Peak | 1.25 | 90 | Fundamental of Low Channel |
| 2402 | 60.32 | V | 94 | -33.68 | Avg | 1.25 | 90 | @ 3 Meters |
| | | | | | | | | |
| 2400 | 59.88 | V | 74 | -14.12 | Peak | 1.25 | 90 | **No** Marker Delta Method |
| 2400 | 39.88 | V | 54 | -14.12 | Avg | 1.25 | 90 | Method Used |
| | | | | | | | | |
| 2402 | 92.38 | H | 114 | -21.62 | Peak | 2 | 0 | Fundamental of Low Channel |
| 2402 | 72.38 | H | 94 | -21.62 | Avg | 2 | 0 | @ 3 Meters |
| | | | | | | | | |
| 2400 | 70.63 | H | 74 | -3.37 | Peak | 2 | 0 | **No** Marker Delta Method |
| 2400 | 50.63 | H | 54 | -3.37 | Avg | 2 | 0 | Method Used |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

**FCC 15.249**
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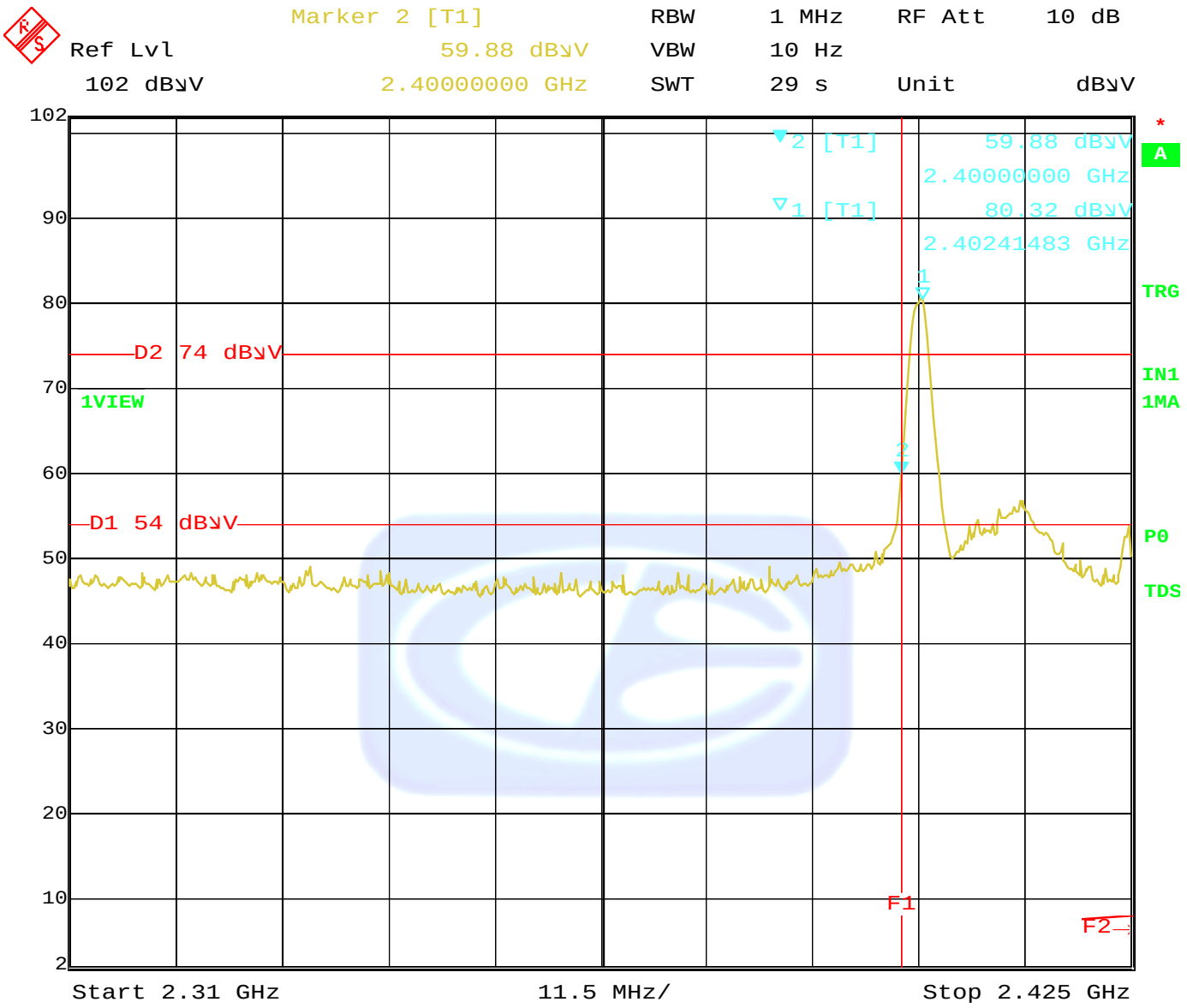
UEI Nevo Portal
Model: URC-8100BC0-XXXX-XX-R

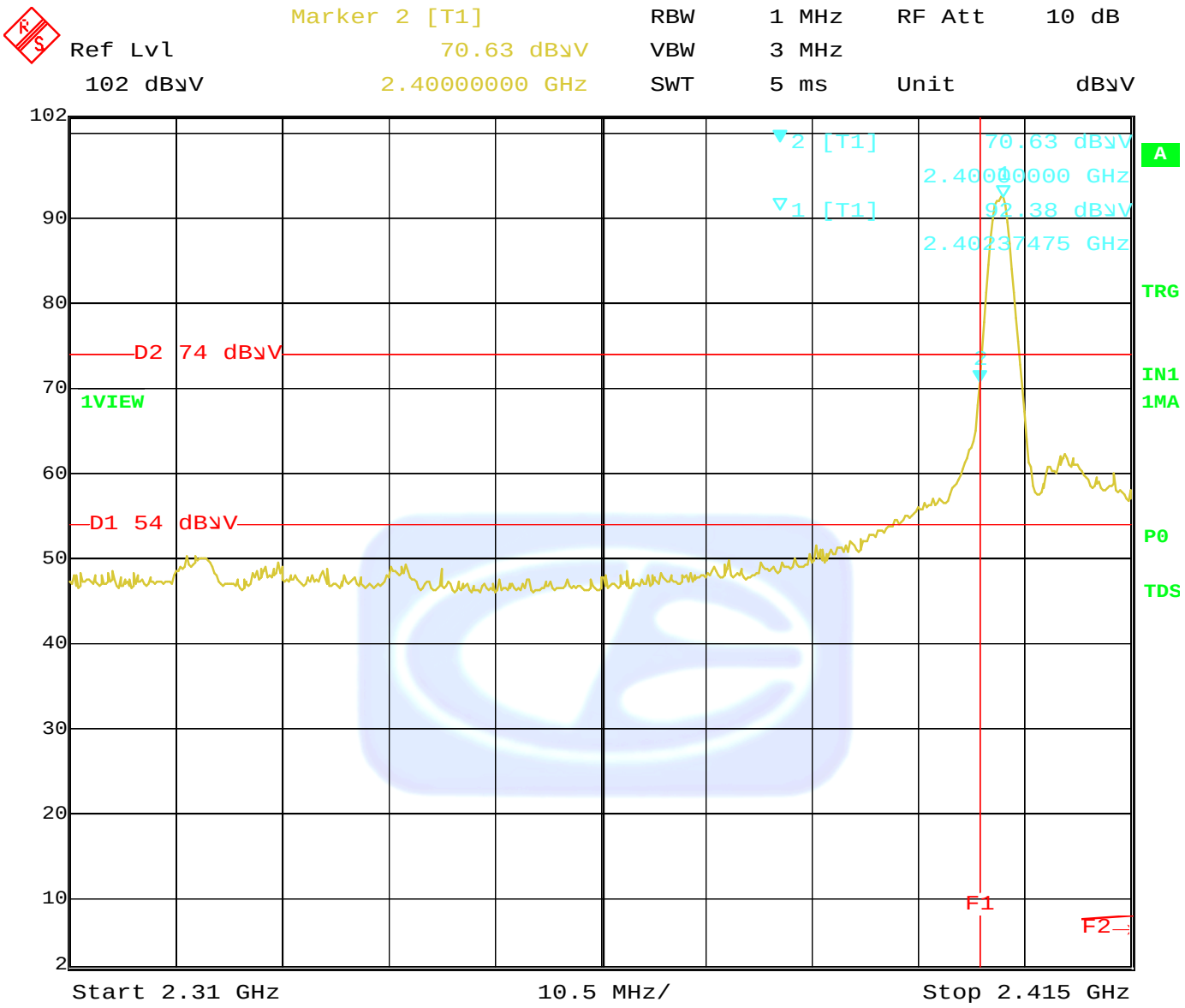
Date: 11/26/2013
Lab: B
Tested By: Kyle Fujimoto

**Band Edges Using 20 dB Peak to Average**
**Low Channel**

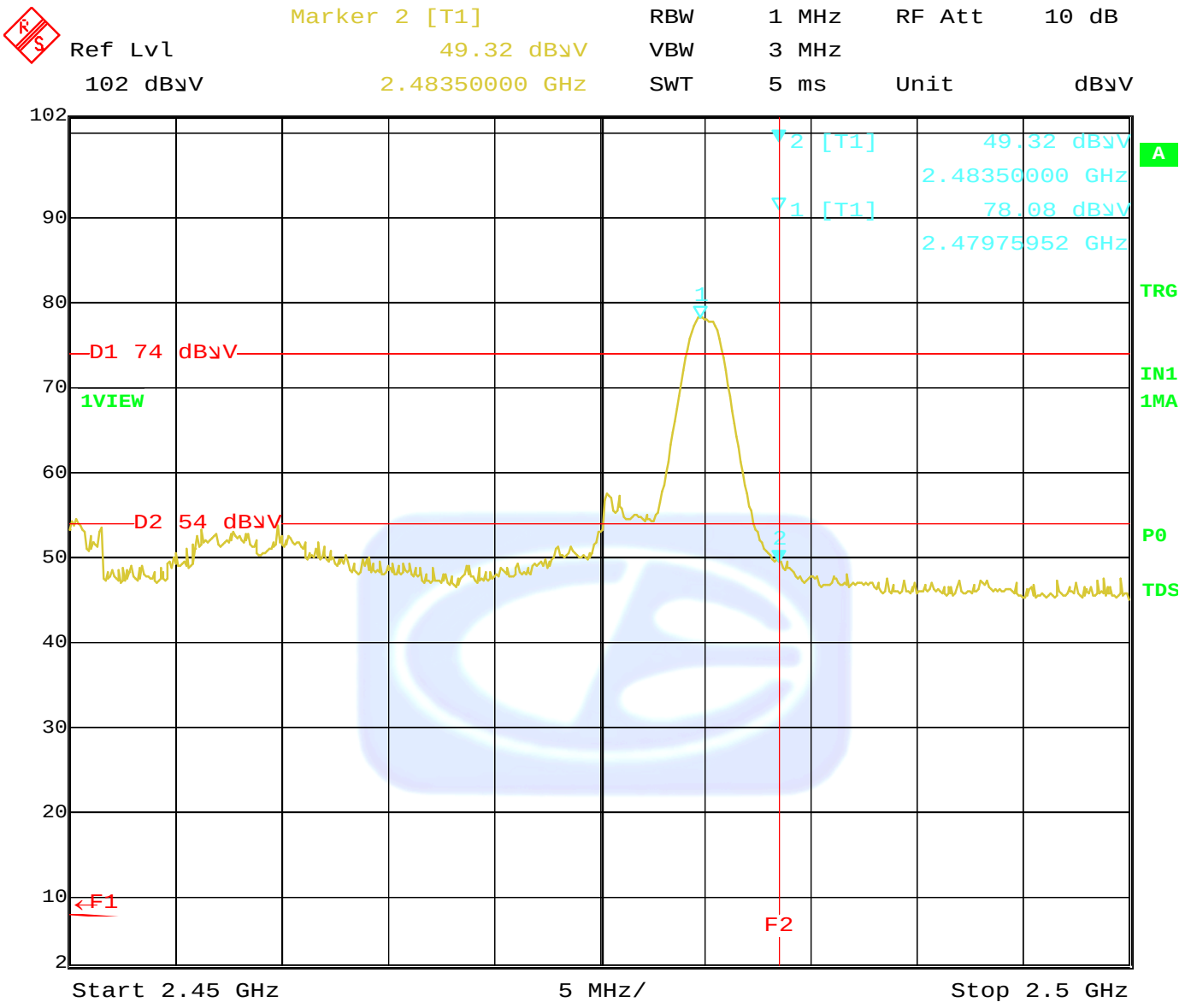
| Freq. (MHz) | Level (dBuV) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Ant. Height (m) | Table Angle (deg) | Comments |
|---|---|---|---|---|---|---|---|---|
| 2480 | 78.08 | V | 114 | -35.92 | Peak | 1.5 | 50 | Fundamental of Low Channel |
| 2480 | 58.08 | V | 94 | -35.92 | Avg | 1.5 | 50 | @ 3 Meters |
| | | | | | | | | |
| 2483.5 | 49.32 | V | 74 | -24.68 | Peak | 1.5 | 50 | **No** Marker Delta Method |
| 2483.5 | 29.32 | V | 54 | -24.68 | Avg | 1.5 | 50 | Method Used |
| | | | | | | | | |
| 2480 | 92.43 | H | 114 | -21.57 | Peak | 1.5 | 45 | Fundamental of Low Channel |
| 2480 | 72.43 | H | 94 | -21.57 | Avg | 1.5 | 45 | @ 3 Meters |
| | | | | | | | | |
| 2483.5 | 61.02 | H | 74 | -12.98 | Peak | 1.5 | 45 | **No** Marker Delta Method |
| 2483.5 | 41.02 | H | 54 | -12.98 | Avg | 1.5 | 45 | Method Used |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |



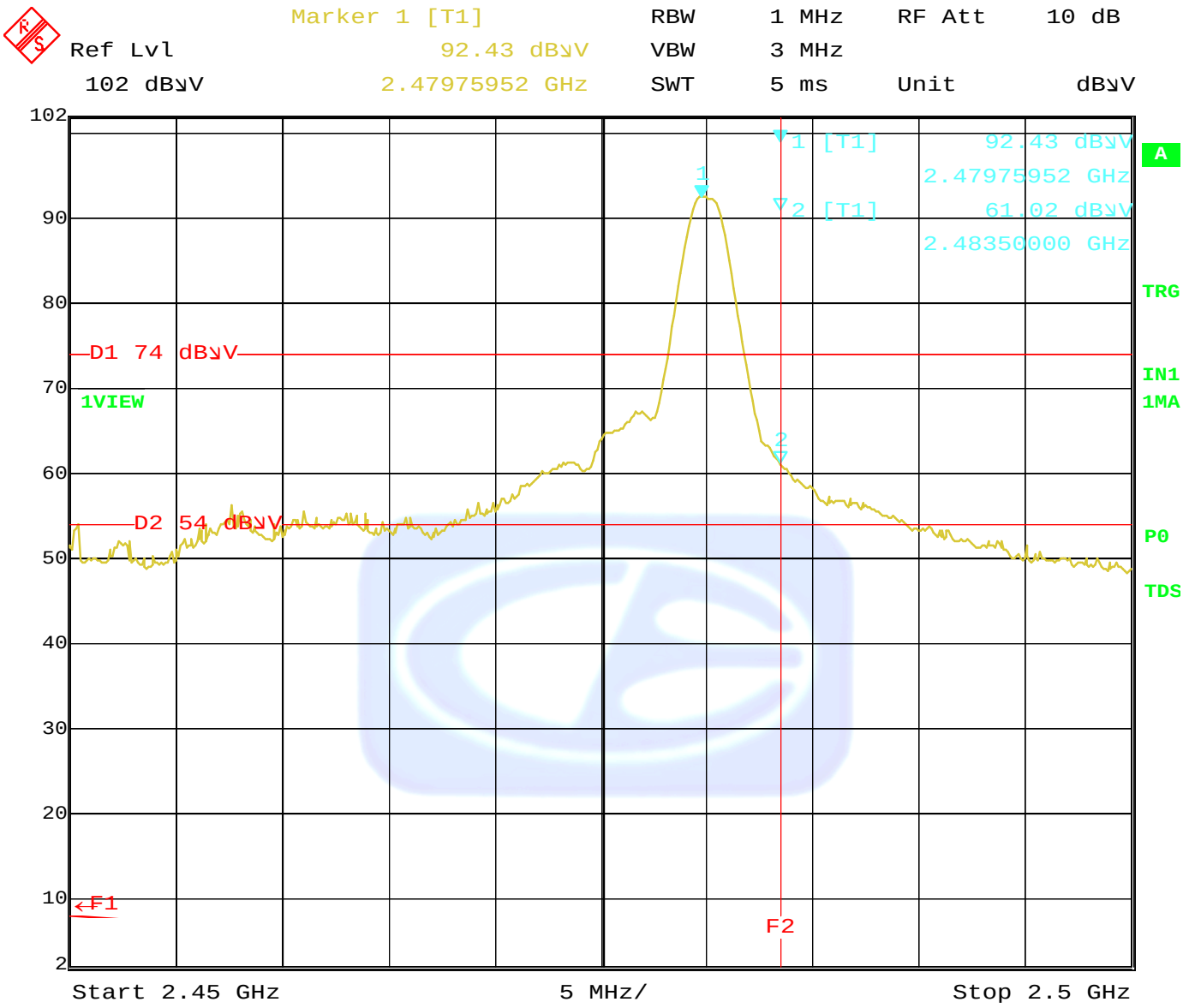

Band Edge – Low Channel – Vertical Polarization




Band Edge – Low Channel – Horizontal Polarization




Band Edge – High Channel – Vertical Polarization




Band Edge – High Channel – Horizontal Polarization