

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

for

COMCAST XR16 REMOTE 2019

Model: R34353BA00-00001

Prepared for

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DATE: MAY 16, 2019

	REPORT BODY	APPENDICES					TOTAL
		A	B	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 certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Device Tested: Comcast XR16 Remote 2019
Model: R34353BA00-00001
S/N: N/A

Product Description: The EUT is a universal remote control that allows users to operate devices using radio frequency (RF) signals and/or infrared (IR) signals.

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

Customer: Universal Electronics, Inc.
201 East Sandpointe Avenue, 8th Floor
Santa Ana, California 92707

Test Dates: March 19, 20, 23 and 24 and April 19, 2019

Test Specification covered by accreditation:



Test Specifications: Emissions requirements
CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209,
and 15.247

Test Procedures: ANSI C63.4: 2013, ANSI C63.10: 2014

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 is battery powered only.
2	Radiated RF Emissions, 9 kHz – 25000 MHz	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, 15.205, 15.209 and 15.247 (d) Highest reading in relation to spec limit 48.61 (Avg) dBuV/m @ 2483.50 MHz (*U = 3.67 dB)
3	DTS Bandwidth	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(2)
4	Peak Output Power	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(3)
5	RF Band Edges	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (d)
6	Spectral Density	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (e)

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Comcast XR16 Remote 2019, Model: R34353BA00-00001. The emissions measurements were performed according to the measurement procedure described in ANSI C63.4 and ANSI C63.10. 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; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.



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 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 Staff Engineer, Electrical

Compatible Electronics Inc.

Thomas Szynal Test Technician

Kyle Fujimoto Test Engineer

2.4 Date Test Sample was Received

The test sample was received prior to the initial date of testing.

2.5 Disposition of the Test Sample

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

2.6 Abbreviations and Acronyms

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

EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
ITE	Information Technology Equipment
DoC	Declaration of Conformity
N/A	Not Applicable
Tx	Transmit
Rx	Receive
Inc.	Incorporated
RF	Radio Frequency
IR	Infrared
AT&T	American Telephone & Telegraph

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules – Radio frequency devices (including digital devices) – Intentional Radiators
FCC Title 47, Part 15 Subpart B	FCC Rules – Radio frequency devices (including digital devices) – Unintentional Radiators
558074 D01 DTS Meas Guidance v05r02	Guidance for Performing Compliance Measurements on Digital Transmissions Systems (DTS) Operating Under Section 15.247
ANSI C63.4 2014	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
ANSI C63.10 2013	American National Standard for Testing Unlicensed Wireless Devices

4. DESCRIPTION OF TEST CONFIGURATION

The Comcast XR16 Remote 2019, Model: R34353BA00-00001 (EUT) was setup in a stand-alone configuration. The EUT was investigated in all three orthogonal axis (X, Y, & Z) at its low, middle, and high channels. During the testing, the EUT was continuously transmitting in its RF mode, as well as operating in its IR mode.

Fresh batteries were installed inside the EUT prior to the testing. The EUT was programmed via the Radio Control Console v4.0.3 firmware.

The firmware is stored in one of the network drives in the company's server.

The final radiated emissions data for the EUT was taken in the Y-axis (worse case). Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

The EUT had no external cables.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
COMCAST XR16 REMOTE 2019 (EUT)	UNIVERSAL ELECTRONICS, INC.	R34353BA00-00001	N/A	MG3-R34353B
LAPTOP*	HEWLETT PACKARD	HSTNN-C82C	N/A	N/A
AC ADAPTER FOR LAPTOP*	HEWLETT PACKARD	HSTNN-DA40	N/A	DoC
PROGRAM BOARD*	UNIVERSAL ELECTRONICS, INC.	RMF-TX300C	N/A	N/A
FIRMWARE*	UNIVERSAL ELECTRONICS, INC.	RADIO CONTROL CONSOLE	v4.0.3	N/A

*Used to program the EUT only and was removed prior to the testing

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
CombiLog Antenna	Com-Power	AC-220	61060	July 27, 2017	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 22, 2018	2 Year
EMI Receiver, 20 Hz – 26.5 GHz	Keysight Technologies	N9038A	MY51210150	July 26, 2018	1 Year
Preamplifier	Com-Power	PA-840	711013	May 10, 2018	1 Year
Loop Antenna	Com-Power	AL-130R	121090	February 5, 2019	2 Year
Preamplifier	Com-Power	PAM-118A	551024	May 10, 2018	1 Year
Horn Antenna	Com-Power	AH-826	71957	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for emissions test location.

6.2 EUT Mounting, Bonding and Grounding

For frequencies 1 GHz and below: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

For frequencies above 1 GHz: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 1.5 meters above the ground plane.

The EUT was not grounded.

6.3 Measurement Uncertainty

The uncertainty values are in the table below.

The uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level, using a coverage factor of $k=2$

MEASUREMENT TYPE	PARTICULAR CONFIGURATION	UNCERTAINTY VALUES
RADIATED EMISSIONS	3-METER CHAMBER, COMBILOG ANTENNA	3.26 dB (Vertical) 3.19 dB (Horizontal)
RADIATED EMISSIONS	3-METER CHAMBER, HORN ANTENNA	3.67 dB

7. CHARACTERISTICS OF THE TRANSMITTER

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

7.1 Channel Number and Frequencies

RF4CE Mode – The EUT uses a total of 3 channels which are spaced 25 MHz apart.

The low channel is 2425 MHz
The high channel is 2475 MHz

7.2 Antenna

The EUT has a 2 dBi gain dipole trace antenna.

8. TEST PROCEDURES

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

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The EMI Receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. A transient limiter was used for the protection of the EMI Receiver input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the EMI 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 63:4. 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 computer software. The final qualification data is located in Appendix E.

The EUT was tested at 120 VAC.

Test Results:

This test was not performed because the EUT operates on battery power only and cannot be connected to the AC public mains.

8.1.2 Radiated Emissions Test

The EMI Receiver was used as the measuring meter. Preamplifiers were used to increase the sensitivity of the instrument. The EMI Receiver was initially used with the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. The effective measurement bandwidth used for the radiated emissions test was according to the frequency measured.

The frequencies below 1 GHz were quasi-peaked using the quasi-peak detector of the EMI Receiver.

The frequencies above 1 GHz were averaged using the RMS detector average function on the EMI Receiver.

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with 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 EUT was tested at a 3-meter test distance. The six highest emissions are listed in Table 1.0.

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	Loop Antenna
150 kHz to 30 MHz	9 kHz	Loop Antenna
30 MHz to 1 GHz	120 kHz	CombiLog Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

Test Results:

The EUT complies with the **Class B** limits of **CFR** Title 47, Part 15, Subpart B; and Subpart C sections 15.205, 15.209, and 15.247 (d) for radiated emissions.

8.1.3 RF Emissions Test ResultsTable 1.0 RADIATED EMISSION RESULTS
Comcast XR16 Remote 2019
Model: R34353BA00-00001

Frequency (MHz)	EMI Reading (dBuV/m)	Average Specification Limit (dBuV/m)	Delta (Cor. Reading – Spec. Limit) (dB)
2483.50 (V) (Y-Axis) (RF4CE)	48.61 (Avg)	53.97	-5.36
2483.50 (H) (X-Axis) (RF4CE)	48.01 (Avg)	53.97	-5.96
4900 (H) (Z-Axis) (RF4CE)	47.46 (Avg)	53.97	-6.51
4850 (H) (X-Axis) (RF4CE)	47.11 (Avg)	53.97	-6.86
4900 (H) (X-Axis) (RF4CE)	46.70 (Avg)	53.97	-7.27
4900 (V) (Y-Axis) (RF4CE)	46.62 (Avg)	53.97	-7.35

Notes:

- * The complete emissions data is given in Appendix E of this report.
- (V) Vertical
- (H) Horizontal
- Avg Average
- QP Quasi-Peak

8.2 DTS Bandwidth

The DTS Bandwidth was measured using the EMI Receiver. The following steps were performed for measuring the DTS Bandwidth.

1. Set RBW = 100 kHz
2. Set the video bandwidth (VBW) to equal or greater than 3 times the RBW
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep = Auto Couple
6. Allow the trace to stabilize
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(2).

8.3 Peak Output Power

The Peak Output Power was measured using radiated emissions method described in section 8.1.2 of this test report. The peak power was calculated by the following equation:

$$P = [(E \cdot D)^2] / (30 G)$$

P = Power in Watts for which you are solving

E = the measured maximum field strength in V/m utilizing the widest available RBW.

G = the numeric gain of the transmitting antenna over an isotropic radiator.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (b)(3). The maximum peak output power is less than 1 Watt. Please see the data sheets located in Appendix E.

8.4 Emissions in Non-restricted Frequency Bands

The procedure described in section 8.1.2 of this test report was used to maximize the emissions. The procedure of section 11.11.2 of ANSI C63.10 was then used to determine that the highest reference level was the lower channel, which was 100.39 dBuV/m.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The emissions in the non-restricted frequency bands are at least attenuated by 20 dB below the highest reference level established by section 11.11.2 of ANSI C63.10. Please see the data sheets located in Appendix E.

8.5 RF Band Edges

The RF band edges were taken at 2390 MHz when the EUT was on the low channel and 2483.5 MHz when the EUT was on the high channel using the EMI Receiver. A preamplifier was used to boost the signal level, with the plots being taken at a 3 meter test distance. The radiated emissions test procedure as describe in section 8.1.2 of this test report was used to maximize the emission.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power at the restricted bands closest to the band edges at 2390 MHz and 2483.5 MHz also meet the limits of section 15.209. Please see the data sheets located in Appendix E.

8.6 Spectral Density Test

The spectrum density output was measured using radiated emissions method described in section 8.1.2 of this test report. The spectral density was calculated by the following equation.

$$P = [(E \cdot D)^2] / (30 G)$$

P = Power in Watts for which you are solving

E = the measured maximum field strength in V/m utilizing the an RBW of 3 kHz.

G = the numeric gain of the transmitting antenna over an isotropic radiator.

The EMI Receiver was setup as follows:

1. Set analyzer center frequency to DTS channel center frequency
2. Set the span to at least 1.5 times the OBW.
3. Set the RBW to 3 kHz
4. Set the VBW $\geq 3 \times$ RBW
5. Detector = Peak
6. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW
7. Sweep time = auto couple
8. Use the peak marker function to determine the maximum amplitude level

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (e).

9. CONCLUSIONS

The Comcast XR16 Remote 2019, Model: R34353BA00-00001 (EUT), as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.



APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044

LABORATORY ACCREDITATIONS AND RECOGNITIONS



For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025.

For the most up-to-date version of our scopes and certificates please visit <http://celectronics.com/quality/scope/>

Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfilment 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."





APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.247 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 COVERED
UNDER THIS REPORT***

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Comcast XR16 Remote 2019
Model: R34353BA00-00001
S/N: N/A

There are no additional models covered under this report.



APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

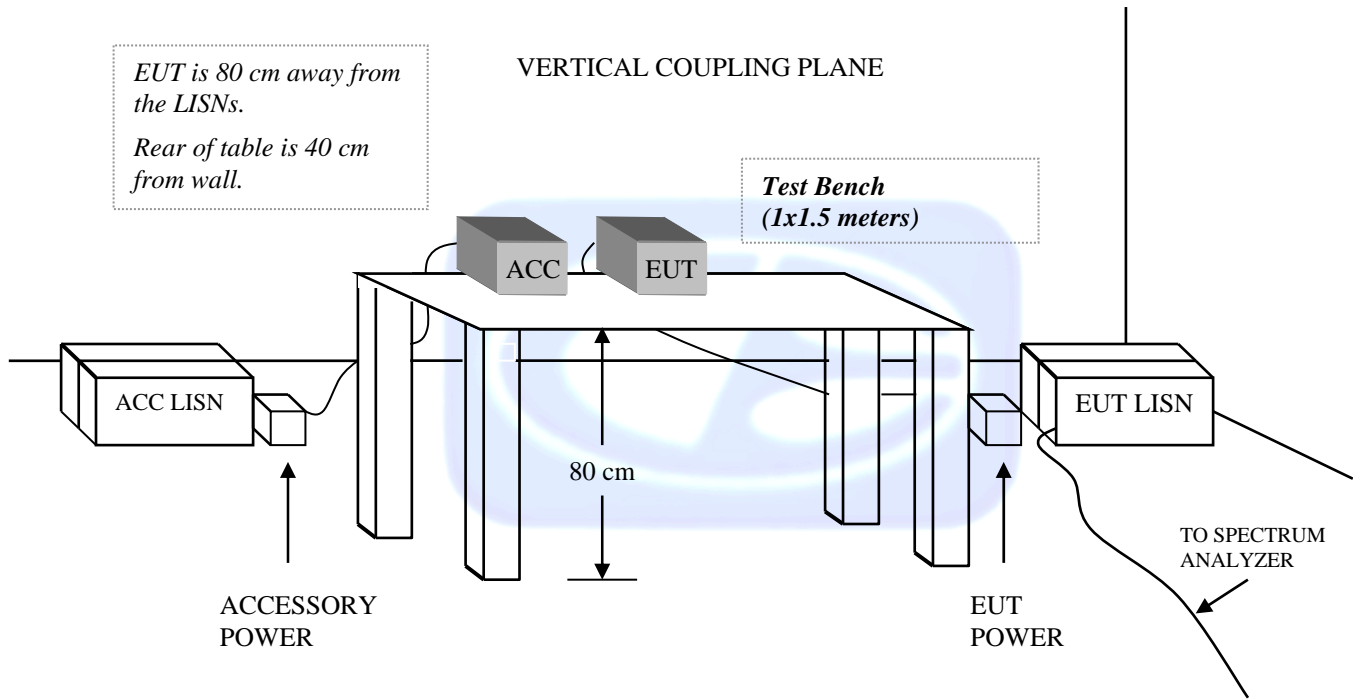
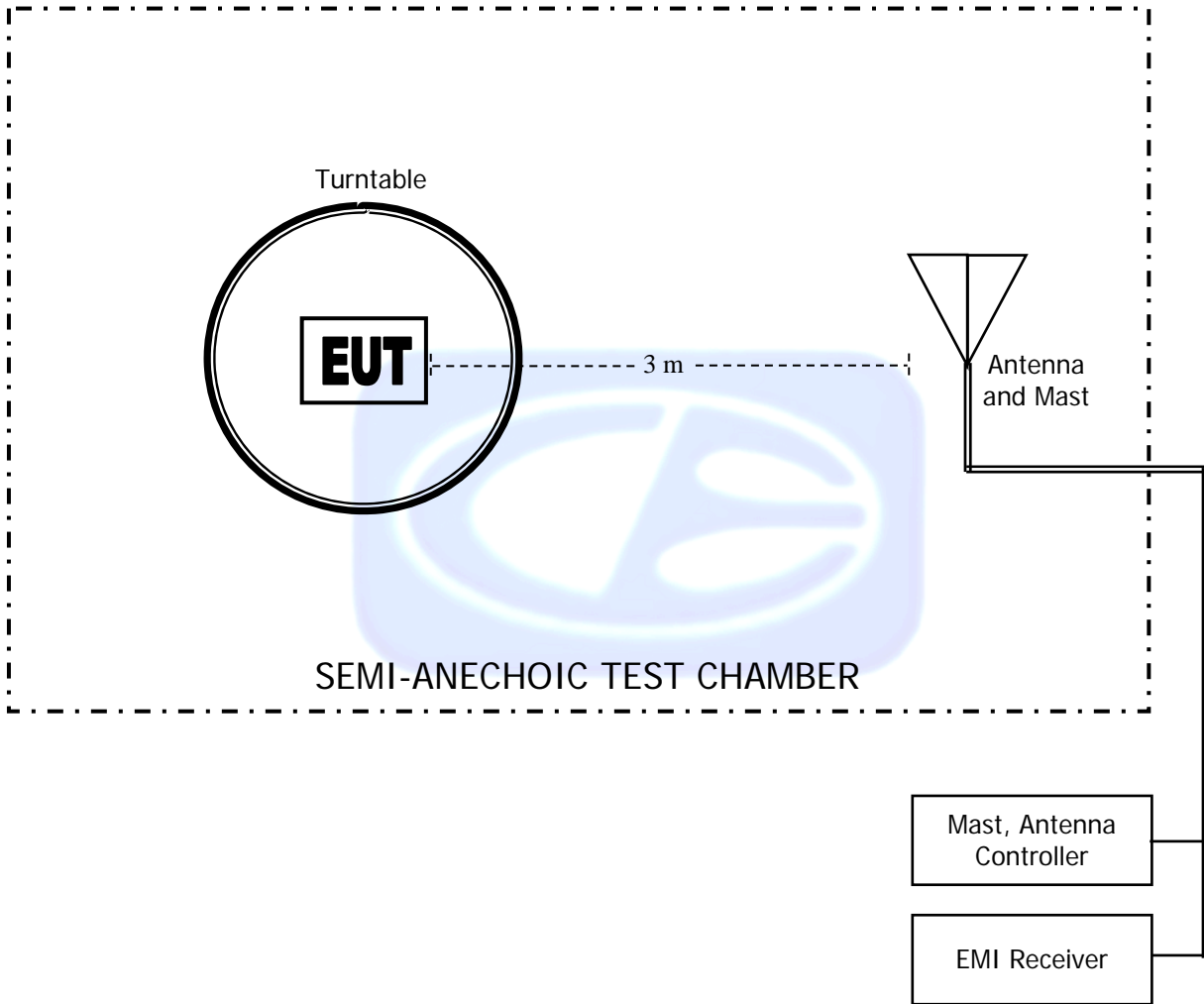


FIGURE 2: LAYOUT OF THE SEMI MI-ANECHOIC TEST CHAMBER



COM-POWER AL-130R**LOOP ANTENNA**

S/N: 121090

CALIBRATION DATE: FEBRUARY 5, 2019

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.01	15.6	-35.9
0.02	14.8	-36.7
0.03	15.6	-35.9
0.04	15.1	-36.4
0.05	14.4	-37.0
0.06	14.6	-36.9
0.07	14.4	-37.1
0.08	14.3	-37.1
0.09	14.5	-36.9
0.10	14.1	-37.3
0.20	14.1	-37.3
0.30	14.0	-37.4
0.40	14.0	-37.4
0.50	14.2	-37.2
0.60	14.2	-37.2
0.70	14.2	-37.2
0.80	14.2	-37.3
0.90	14.3	-37.2
1.00	14.5	-37.0
2.00	14.5	-36.9
3.00	14.5	-36.9
4.00	14.7	-36.8
5.00	14.6	-36.9
6.00	14.6	-36.9
7.00	14.6	-36.9
8.00	14.6	-36.9
9.00	14.6	-36.9
10.00	14.8	-36.6
11.00	14.9	-36.6
12.00	14.8	-36.6
13.00	14.8	-36.7
14.00	14.6	-36.8
15.00	14.5	-36.9
16.00	14.5	-37.0
17.00	14.6	-36.9
18.00	14.7	-36.7
19.00	14.8	-36.6
20.00	14.9	-36.6
21.00	14.6	-36.8
22.00	14.2	-37.2
23.00	13.7	-37.7
24.00	13.3	-38.2
25.00	13.0	-38.5
26.00	12.9	-38.6
27.00	13.0	-38.5
28.00	13.1	-38.4
29.00	13.1	-38.4
30.00	12.9	-38.5

COM-POWER AC-220**COMBILOG ANTENNA**

S/N: 61060

CALIBRATION DATE: JULY 27, 2017

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	23.80	200	14.10
35	24.00	250	15.30
40	24.70	300	17.70
45	22.90	350	17.70
50	22.10	400	19.00
60	17.60	450	21.30
70	12.70	500	21.00
80	11.20	550	22.30
90	13.10	600	23.40
100	14.40	650	22.90
120	15.30	700	24.60
125	15.00	750	24.50
140	12.80	800	25.40
150	16.50	850	26.40
160	12.90	900	27.20
175	14.30	950	27.80
180	14.50	1000	26.80

COM POWER AH-118**HORN ANTENNA**

S/N: 071175

CALIBRATION DATE: FEBRUARY 22, 2018

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.71	10.0	40.08
1.5	25.46	10.5	40.75
2.0	29.26	11.0	41.78
2.5	27.95	11.5	41.02
3.0	29.03	12.0	40.32
3.5	29.70	12.5	40.96
4.0	30.71	13.0	40.29
4.5	31.62	13.5	39.48
5.0	33.23	14.0	39.89
5.5	35.07	14.5	42.75
6.0	34.43	15.0	40.98
6.5	34.98	15.5	38.54
7.0	36.75	16.0	39.40
7.5	37.10	16.5	39.40
8.0	37.66	17.0	41.74
8.5	39.29	17.5	42.58
9.0	37.75	18.0	44.68
9.5	38.23		

COM-POWER PAM-118A**PREAMPLIFIER**

S/N: 551024

CALIBRATION DATE: MAY 10, 2018

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	40.99	6.0	39.01
1.1	39.77	6.5	39.00
1.2	39.02	7.0	39.69
1.3	39.44	7.5	38.96
1.4	39.64	8.0	38.57
1.5	40.23	8.5	39.17
1.6	40.17	9.0	38.82
1.7	40.23	9.5	39.30
1.8	39.48	10.0	38.90
1.9	39.85	11.0	38.86
2.0	39.99	12.0	39.87
2.5	40.38	13.0	39.55
3.0	40.64	14.0	38.92
3.5	40.68	15.0	39.33
4.0	40.87	16.0	39.60
4.5	40.04	17.0	40.28
5.0	39.54	18.0	39.58
5.5	39.58		

COM-POWER AH-826**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-840**MICROWAVE PREAMPLIFIER**

S/N: 711013

CALIBRATION DATE: MAY 10, 2018

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	26.90	31.0	24.56
19.0	24.65	31.5	25.84
20.0	25.74	32.0	26.93
21.0	24.78	32.5	27.76
22.0	24.83	33.0	25.76
23.0	24.81	33.5	26.76
24.0	25.52	34.0	26.51
25.0	24.90	34.5	27.49
26.0	25.92	35.0	27.64
26.5	26.53	35.5	27.45
27.0	26.41	36.0	25.08
27.5	24.78	36.5	25.61
28.0	25.13	37.0	24.69
28.5	29.29	37.5	24.10
29.0	28.44	38.0	24.83
29.5	27.51	38.5	24.41
30.0	27.12	39.0	24.44
30.5	26.42	39.5	22.96
		40.0	22.29



FRONT VIEW

UNIVERSAL ELECTRONICS, INC.
COMCAST XR16 REMOTE 2019
MODEL: R34353BA00-00001
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

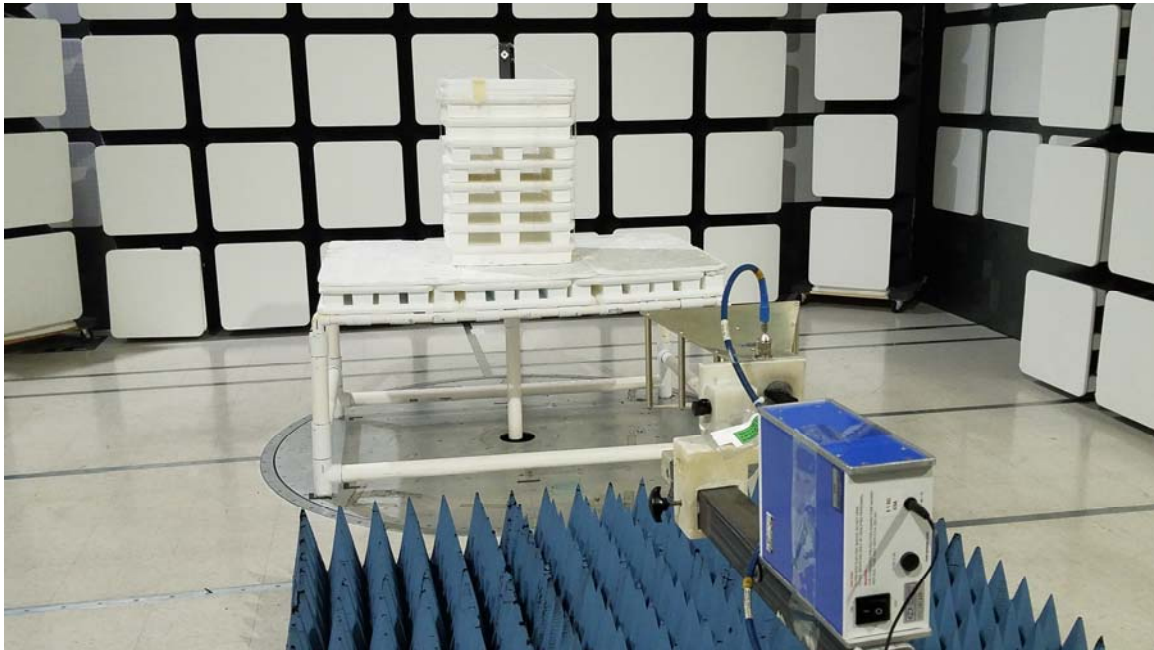
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

UNIVERSAL ELECTRONICS, INC.
COMCAST XR16 REMOTE 2019
MODEL: R34353BA00-00001
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

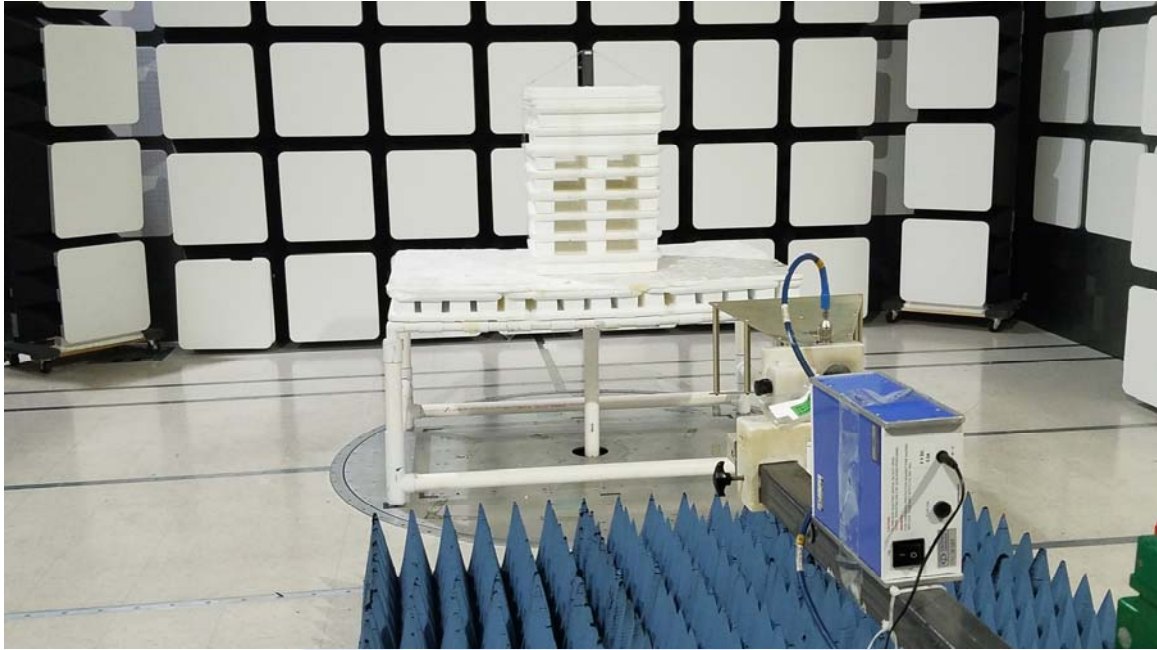
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

UNIVERSAL ELECTRONICS, INC.
COMCAST XR16 REMOTE 2019
MODEL: R34353BA00-00001
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

UNIVERSAL ELECTRONICS, INC.
COMCAST XR16 REMOTE 2019
MODEL: R34353BA00-00001
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

APPENDIX E

DATA SHEETS



***RADIATED EMISSIONS
DATA SHEETS***

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Low Channel - RF4CE Mode
 Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	40.83	V	73.97	-33.14	Peak	162.25	249.91	
4850.00	29.63	V	53.97	-24.34	Avg	162.25	249.91	
7275.00	50.66	V	73.97	-23.31	Peak	186.00	111.38	
7275.00	42.27	V	53.97	-11.70	Avg	186.00	111.38	
9700.00	55.43	V	80.39	-24.96	Peak	180.75	175.26	Not in Restricted Band
12125.00	45.76	V	73.97	-28.21	Peak	0.00	222.91	
12125.00	34.84	V	53.97	-19.13	Avg	0.00	222.91	
14550.00								No Emission Detected
16975.00								No Emission Detected
19400.00								No Emission Detected
21825.00								No Emission Detected
24250.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Low Channel - RF4CE Mode
 Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	51.35	V	73.97	-22.62	Peak	257.25	127.20	
4850.00	45.85	V	53.97	-8.12	Avg	257.25	127.20	
7275.00	50.76	V	73.97	-23.21	Peak	181.50	127.38	
7275.00	42.90	V	53.97	-11.07	Avg	181.50	127.38	
9700.00	55.73	V	80.39	-24.66	Peak	251.00	127.20	Not in Restricted Band
12125.00	45.14	V	73.97	-28.83	Peak	145.75	159.50	
12125.00	34.75	V	53.97	-19.22	Avg	145.75	159.50	
14550.00								No Emission Detected
16975.00								No Emission Detected
19400.00								No Emission Detected
21825.00								No Emission Detected
24250.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Low Channel - RF4CE Mode
 Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	47.85	V	73.97	-26.12	Peak	150.00	127.38	
4850.00	40.57	V	53.97	-13.40	Avg	150.00	127.38	
7275.00	49.24	V	73.97	-24.73	Peak	0.00	127.20	
7275.00	41.18	V	53.97	-12.79	Avg	0.00	127.20	
9700.00	57.98	V	80.39	-22.41	Peak	204.25	191.08	Not in Restricted Band
12125.00	45.47	V	73.97	-28.50	Peak	234.25	223.02	
12125.00	34.53	V	53.97	-19.44	Avg	234.25	223.02	
14550.00								No Emission Detected
16975.00								No Emission Detected
19400.00								No Emission Detected
21825.00								No Emission Detected
24250.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Low Channel - RF4CE Mode
 Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	52.50	H	73.97	-21.47	Peak	73.25	111.32	
4850.00	47.11	H	53.97	-6.86	Avg	73.25	111.32	
7275.00	49.91	H	73.97	-24.06	Peak	358.75	159.20	
7275.00	41.58	H	53.97	-12.39	Avg	358.75	159.20	
9700.00	60.88	H	80.39	-19.51	Peak	115.75	111.20	Not in Restricted Band
12125.00	45.12	H	73.97	-28.85	Peak	186.50	223.14	
12125.00	34.58	H	53.97	-19.39	Avg	186.50	223.14	
14550.00								No Emission Detected
16975.00								No Emission Detected
19400.00								No Emission Detected
21825.00								No Emission Detected
24250.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Low Channel - RF4CE Mode
 Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	47.64	H	73.97	-26.33	Peak	152.50	191.14	
4850.00	40.42	H	53.97	-13.55	Avg	152.50	191.14	
7275.00	45.56	H	73.97	-28.41	Peak	349.50	127.20	
7275.00	34.54	H	53.97	-19.43	Avg	349.50	127.20	
9700.00	58.13	H	80.39	-22.26	Peak	172.75	127.26	Not in Restricted Band
12125.00	45.31	H	73.97	-28.66	Peak	265.75	207.02	
12125.00	34.80	H	53.97	-19.17	Avg	265.75	207.02	
14550.00								No Emission Detected
16975.00								No Emission Detected
19400.00								No Emission Detected
21825.00								No Emission Detected
24250.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Low Channel - RF4CE Mode
 Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	50.62	H	73.97	-23.35	Peak	85.50	111.38	
4850.00	44.90	H	53.97	-9.07	Avg	85.50	111.38	
7275.00	49.53	H	73.97	-24.44	Peak	238.00	127.38	
7275.00	40.70	H	53.97	-13.27	Avg	238.00	127.38	
9700.00	57.63	H	80.39	-22.76	Peak	263.75	127.32	Not in Restricted Band
12125.00	45.53	H	73.97	-28.44	Peak	169.50	190.91	
12125.00	34.86	H	53.97	-19.11	Avg	169.50	190.91	
14550.00								No Emission Detected
16975.00								No Emission Detected
19400.00								No Emission Detected
21825.00								No Emission Detected
24250.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
 Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	43.86	V	73.97	-30.11	Peak	263.00	127.68	
4900.00	34.24	V	53.97	-19.73	Avg	263.00	127.68	
7350.00	51.95	V	73.97	-22.02	Peak	192.00	111.50	
7350.00	44.39	V	53.97	-9.58	Avg	192.00	111.50	
9800.00	54.82	V	80.39	-25.57	Peak	202.00	127.38	Not in Restricted Band
12250.00	46.86	V	73.97	-27.11	Peak	0.25	159.08	
12250.00	35.48	V	53.97	-18.49	Avg	0.25	159.08	
14700.00								No Emission Detected
17150.00								No Emission Detected
19600.00								No Emission Detected
22050.00								No Emission Detected
24500.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
 Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	52.34	V	73.97	-21.63	Peak	78.75	111.44	
4900.00	46.62	V	53.97	-7.35	Avg	78.75	111.44	
7350.00	51.78	V	73.97	-22.19	Peak	357.50	159.38	
7350.00	44.17	V	53.97	-9.80	Avg	357.50	159.38	
9800.00	53.05	V	80.39	-27.34	Peak	83.00	127.20	
12250.00	46.41	V	73.97	-27.56	Peak	340.25	159.20	
12250.00	35.54	V	53.97	-18.43	Avg	340.25	159.20	
14700.00								No Emission Detected
17150.00								No Emission Detected
19600.00								No Emission Detected
22050.00								No Emission Detected
24500.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
 Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	50.87	V	73.97	-23.10	Peak	270.50	158.97	
4900.00	44.26	V	53.97	-9.71	Avg	270.50	158.97	
7350.00	47.82	V	73.97	-26.15	Peak	61.50	159.20	
7350.00	42.23	V	53.97	-11.74	Avg	61.50	159.20	
9800.00	57.35	V	80.39	-23.04	Peak	211.50	127.26	
12250.00	46.33	V	73.97	-27.64	Peak	172.50	127.26	
12250.00	35.45	V	53.97	-18.52	Avg	172.50	127.26	
14700.00								No Emission Detected
17150.00								No Emission Detected
19600.00								No Emission Detected
22050.00								No Emission Detected
24500.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
 Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	52.58	H	73.97	-21.39	Peak	85.25	111.44	
4900.00	46.70	H	53.97	-7.27	Avg	85.25	111.44	
7350.00	50.19	H	73.97	-23.78	Peak	246.75	175.38	
7350.00	41.73	H	53.97	-12.24	Avg	246.75	175.38	
9800.00	60.31	H	80.39	-20.08	Peak	121.00	111.08	Not in Restricted Band
12250.00	46.64	H	73.97	-27.33	Peak	261.75	159.20	
12250.00	35.59	H	53.97	-18.38	Avg	261.75	159.20	
14700.00								No Emission Detected
17150.00								No Emission Detected
19600.00								No Emission Detected
22050.00								No Emission Detected
24500.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
 Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	46.66	H	73.97	-27.31	Peak	6.25	191.20	
4900.00	38.66	H	53.97	-15.31	Avg	6.25	191.20	
7350.00	49.15	H	73.97	-24.82	Peak	151.25	191.08	
7350.00	40.47	H	53.97	-13.50	Avg	151.25	191.08	
9800.00	60.97	H	80.39	-19.42	Peak	131.00	125.09	Not in Restricted Band
12250.00	45.93	H	73.97	-28.04	Peak	148.00	191.20	
12250.00	35.50	H	53.97	-18.47	Avg	148.00	191.20	
14700.00								No Emission Detected
17150.00								No Emission Detected
19600.00								No Emission Detected
22050.00								No Emission Detected
24500.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
 Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	53.25	H	73.97	-20.72	Peak	87.75	111.44	
4900.00	47.46	H	53.97	-6.51	Avg	87.75	111.44	
7350.00	52.28	H	73.97	-21.69	Peak	275.75	111.38	
7350.00	44.67	H	53.97	-9.30	Avg	275.75	111.38	
9800.00	60.31	H	80.39	-20.08	Peak	121.00	111.08	Not in Restricted Band
12250.00	40.31	H	73.97	-33.66	Peak	35.75	249.95	
12250.00	28.96	H	53.97	-25.01	Avg	35.75	249.95	
14700.00								No Emission Detected
17150.00								No Emission Detected
19600.00								No Emission Detected
22050.00								No Emission Detected
24500.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/19/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - High Channel - RF4CE Mode
 Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	41.48	V	73.97	-32.49	Peak	165.75	127.20	
4950.00	30.56	V	53.97	-23.41	Avg	165.75	127.20	
7425.00	50.27	V	73.97	-23.70	Peak	175.25	111.26	
7425.00	42.23	V	53.97	-11.74	Avg	175.25	111.26	
9900.00	54.17	V	80.39	-26.22	Peak	145.00	127.20	Not in Restricted Band
12375.00	48.14	V	73.97	-25.83	Peak	145.50	159.14	
12375.00	37.22	V	53.97	-16.75	Avg	145.50	159.14	
14850.00								No Emission Detected
17325.00								No Emission Detected
19800.00								No Emission Detected
22275.00								No Emission Detected
24750.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/19/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - High Channel - RF4CE Mode
 Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	51.59	V	73.97	-22.38	Peak	277.00	143.32	
4950.00	45.42	V	53.97	-8.55	Avg	277.00	143.32	
7425.00	50.73	V	73.97	-23.24	Peak	20.75	111.32	
7425.00	42.61	V	53.97	-11.36	Avg	20.75	111.32	
9900.00	56.75	V	80.39	-23.64	Peak	332.50	111.02	Not in Restricted Band
12375.00	47.94	V	73.97	-26.03	Peak	189.00	249.89	
12375.00	37.28	V	53.97	-16.69	Avg	189.00	249.89	
14850.00								No Emission Detected
17325.00								No Emission Detected
19800.00								No Emission Detected
22275.00								No Emission Detected
24750.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/19/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - High Channel - RF4CE Mode
 Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	48.61	V	73.97	-25.36	Peak	101.00	190.85	
4950.00	41.46	V	53.97	-12.51	Avg	101.00	190.85	
7425.00	48.66	V	73.97	-25.31	Peak	117.75	111.38	
7425.00	40.58	V	53.97	-13.39	Avg	117.75	111.38	
9900.00	57.34	V	80.39	-23.05	Peak	202.00	127.26	Not in Restricted Band
12375.00	47.70	V	73.97	-26.27	Peak	229.50	223.02	
12375.00	39.70	V	53.97	-14.27	Avg	229.50	223.02	
14850.00								No Emission Detected
17325.00								No Emission Detected
19800.00								No Emission Detected
22275.00								No Emission Detected
24750.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/19/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - High Channel - RF4CE Mode
 Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	51.39	H	73.97	-22.58	Peak	82.00	175.56	
4950.00	45.19	H	53.97	-8.78	Avg	82.00	175.56	
7425.00	50.19	H	73.97	-23.78	Peak	0.00	127.32	
7425.00	41.68	H	53.97	-12.29	Avg	0.00	127.32	
9900.00	57.66	H	80.39	-22.73	Peak	118.75	111.38	Not in Restricted Band
12375.00	47.97	H	73.97	-26.00	Peak	298.25	159.14	
12375.00	37.29	H	53.97	-16.68	Avg	298.25	159.14	
14850.00								No Emission Detected
17325.00								No Emission Detected
19800.00								No Emission Detected
22275.00								No Emission Detected
24750.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/19/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - High Channel - RF4CE Mode
 Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	49.42	H	73.97	-24.55	Peak	151.75	175.14	
4950.00	42.62	H	53.97	-11.35	Avg	151.75	175.14	
7425.00	45.02	H	73.97	-28.95	Peak	301.25	191.20	
7425.00	34.55	H	53.97	-19.42	Avg	301.25	191.20	
9900.00	57.66	H	80.39	-22.73	Peak	118.75	111.38	Not in Restricted Band
12375.00	48.77	H	73.97	-25.20	Peak	246.25	159.38	
12375.00	37.19	H	53.97	-16.78	Avg	246.25	159.38	
14850.00								No Emission Detected
17325.00								No Emission Detected
19800.00								No Emission Detected
22275.00								No Emission Detected
24750.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/19/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - High Channel - RF4CE Mode
 Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	52.03	H	73.97	-21.94	Peak	73.75	127.26	
4950.00	46.19	H	53.97	-7.78	Avg	73.75	127.26	
7425.00	50.88	H	73.97	-23.09	Peak	269.75	103.38	
7425.00	43.73	H	53.97	-10.24	Avg	269.75	103.38	
9900.00	57.66	H	80.39	-22.73	Peak	118.75	111.38	Not in Restricted Band
12375.00	47.66	H	73.97	-26.31	Peak	181.75	238.85	
12375.00	37.17	H	53.97	-16.80	Avg	181.75	238.85	
14850.00								No Emission Detected
17325.00								No Emission Detected
19800.00								No Emission Detected
22275.00								No Emission Detected
24750.00								No Emission Detected

*The limit at the 4th Harmonic is 20 dB below the Maximum Fundamental of 100.39 dBuV/m at 100 kHz RBW per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247 and FCC Class B

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/19/2019
 Lab: D
 Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz
Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 25 GHz

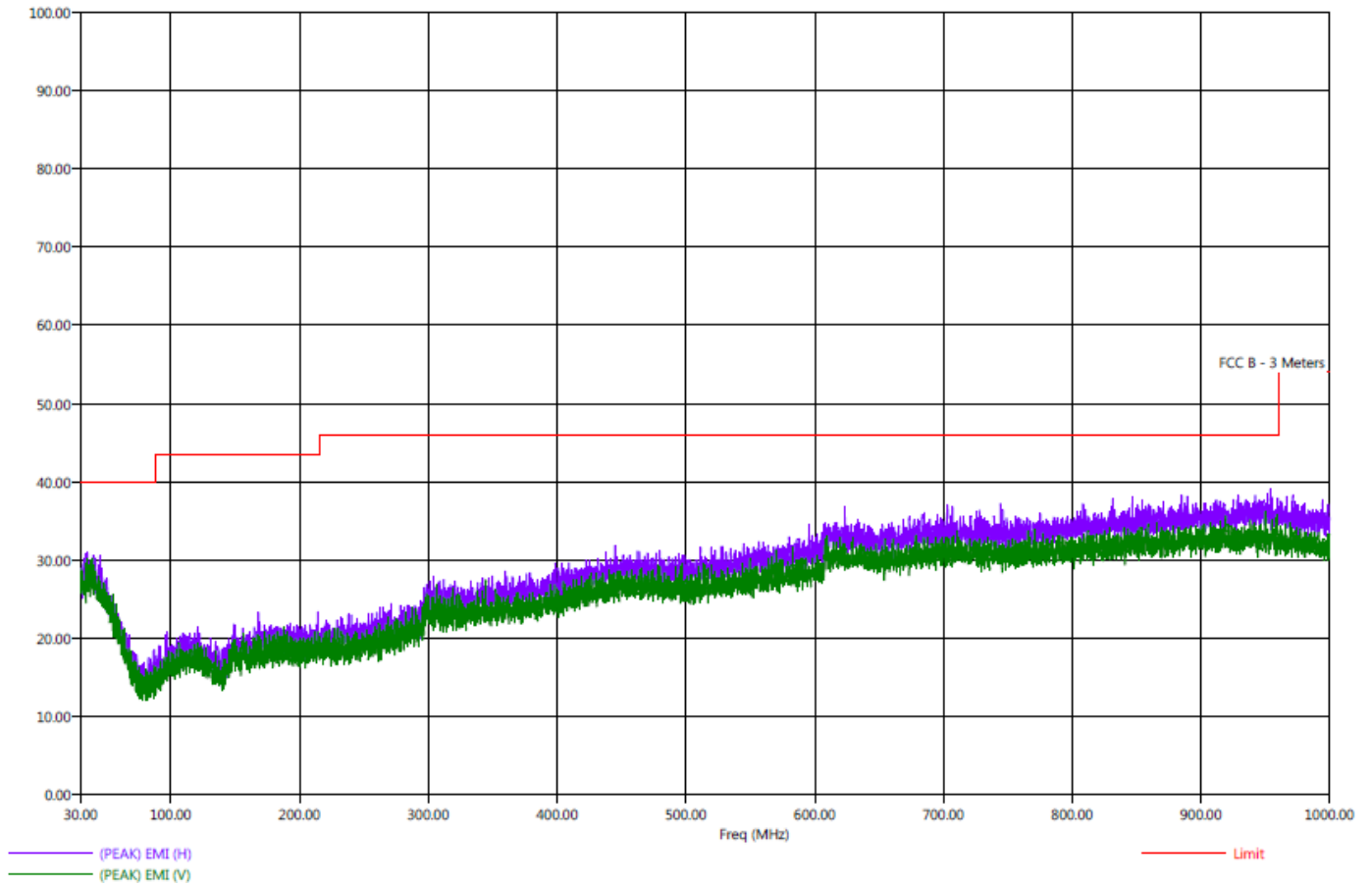
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
								No Emissions Detected from 9 kHz to 30 MHz for the digital portion of the EUT
								No Emissions Detected from 9 kHz to 30 MHz for the Non-Harmonic Emissions of the Transmitter for the EUT
								No Emissions Detected from 1 GHz to 25 GHz for the digital portion of the EUT
								No Emissions Detected from 1 GHz to 25 GHz for the Non-Harmonic Emissions of the Transmitter for the EUT
								Investigated in the X-Axis, Y-Axis, and Z-Axis

Title: Radiated Pre-Scan - FCC Class B
File: 1 - Pre-Scan - RF4CE - FCC Class B - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Comcast XR16 Remote 2019
EUT Condition: The EUT is continuously transmitting RF4CE at 2425 MHz - X-Axis Worst Case
Comments: Company: Universal Electronics, Inc.
P/N: R34353BA00-00001
S/N: N/A

4/19/2019 2:35:09 PM
Sequence: Preliminary Scan

FCC Class B

Electric Field Strength (dB μ V/m)



Title: Radiated Final Scan - FCC Class B
 File: 1 - Final Scan - RF4CE - FCC Class B - 30 MHz to 1000 MHz.set
 Operator: Kyle Fujimoto
 EUT Type: Comcast XR16 Remote 2019
 EUT Condition: The EUT is continuously transmitting RF4CE at 2425 MHz - X-Axis Worst Case
 Comments: Company: Universal Electronics, Inc.
 P/N: R34353BA00-00001
 S/N: N/A

4/19/2019 2:46:40 AM
 Sequence: Final Measurements

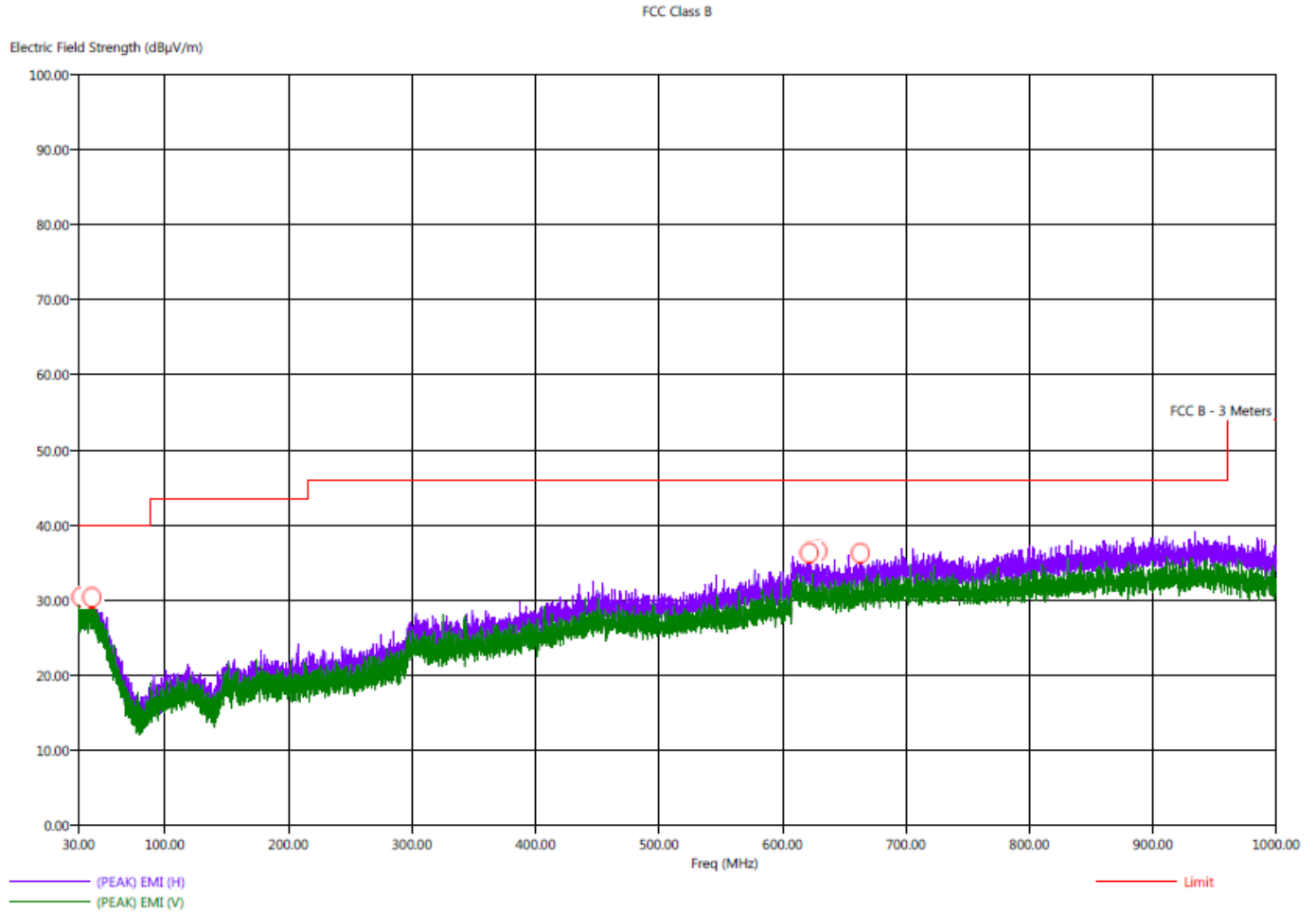
FCC Class B

Freq (MHz)	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Ttbi Aql (deq)	Twr Ht (cm)
33.40	31.53	26.35	-8.47	-13.65	40.00	23.94	0.84	295.00	302.61
35.30	31.26	26.41	-8.74	-13.59	40.00	24.06	0.86	113.50	318.73
39.30	32.24	26.83	-7.76	-13.17	40.00	24.59	0.89	262.50	286.67
39.90	32.72	27.04	-7.28	-12.96	40.00	24.69	0.90	87.25	382.55
40.30	32.36	26.93	-7.64	-13.07	40.00	24.64	0.90	240.50	334.85
44.90	29.72	24.89	-10.28	-15.11	40.00	22.97	0.90	241.50	127.56



Title: Radiated Pre-Scan - FCC Class B
File: 3 - Pre-Scan - IR - FCC Class B - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Comcast XR16 Remote 2019
EUT Condition: The EUT is continuously transmitting IR - X-Axis Worst Case
Comments: Company: Universal Electronics, Inc.
P/N: R34353BA00-00001
S/N: N/A

4/19/2019 3:41:51 PM
Sequence: Preliminary Scan



Title: Radiated Final Scan - FCC Class B
 File: 3 - Final Scan - IR - FCC Class B - 30 MHz to 1000 MHz.set
 Operator: Kyle Fujimoto
 EUT Type: Comcast XR16 Remote 2019
 EUT Condition: The EUT is continuously transmitting IR - X-Axis Worst Case
 Comments: Company: Universal Electronics, Inc.
 P/N: R34353BA00-00001
 S/N: N/A

4/19/2019 3:50:47 PM
 Sequence: Final Measurements

FCC Class B

Freq (MHz)	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (deg)	Twr Ht (cm)
32.30	32.52	26.48	-7.48	-13.52	40.00	23.90	0.83	107.00	334.79
37.20	31.26	26.62	-8.74	-13.38	40.00	24.29	0.87	278.25	398.73
40.90	31.79	26.68	-8.21	-13.32	40.00	24.35	0.90	115.25	127.26
621.90	36.77	30.77	-9.23	-15.23	46.00	23.17	2.50	231.50	143.20
628.80	35.84	30.56	-10.16	-15.44	46.00	23.11	2.50	286.25	238.97
663.20	36.08	30.65	-9.92	-15.35	46.00	23.35	2.50	156.00	366.19





***BAND EDGES
DATA SHEETS***

FCC 15.247

Universal Electronics,
 Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/19/2019
 Lab: D
 Tested By: Kyle Fujimoto

Band Edges - RF4CE Mode

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2425.00	104.57	H	--	--	Peak	324.50	159.80	Fundamental - Low Ch. X-Axis - Worst Case
2400.00	43.74	H	73.97	-30.23	Peak	324.50	159.80	Band Edge
2400.00	35.74	H	53.97	-18.23	Avg	324.50	159.80	X-Axis - Worst Case
2393.59	50.20	H	73.97	-23.77	Peak	324.50	159.80	Band Edge
2393.59	42.71	H	53.97	-11.26	Avg	324.50	159.80	X-Axis - Worst Case
2425.00	104.10	V	--	--	Peak	314.50	215.44	Fundamental - Low Ch. Y-Axis - Worst Case
2400.00	44.70	V	73.97	-29.27	Peak	314.50	215.44	Band Edge
2400.00	36.70	V	53.97	-17.27	Avg	314.50	215.44	Y-Axis - Worst Case
2393.72	50.62	V	73.97	-23.35	Peak	314.50	215.44	Band Edge
2393.72	43.28	V	53.97	-10.69	Avg	314.50	215.44	Y-Axis - Worst Case

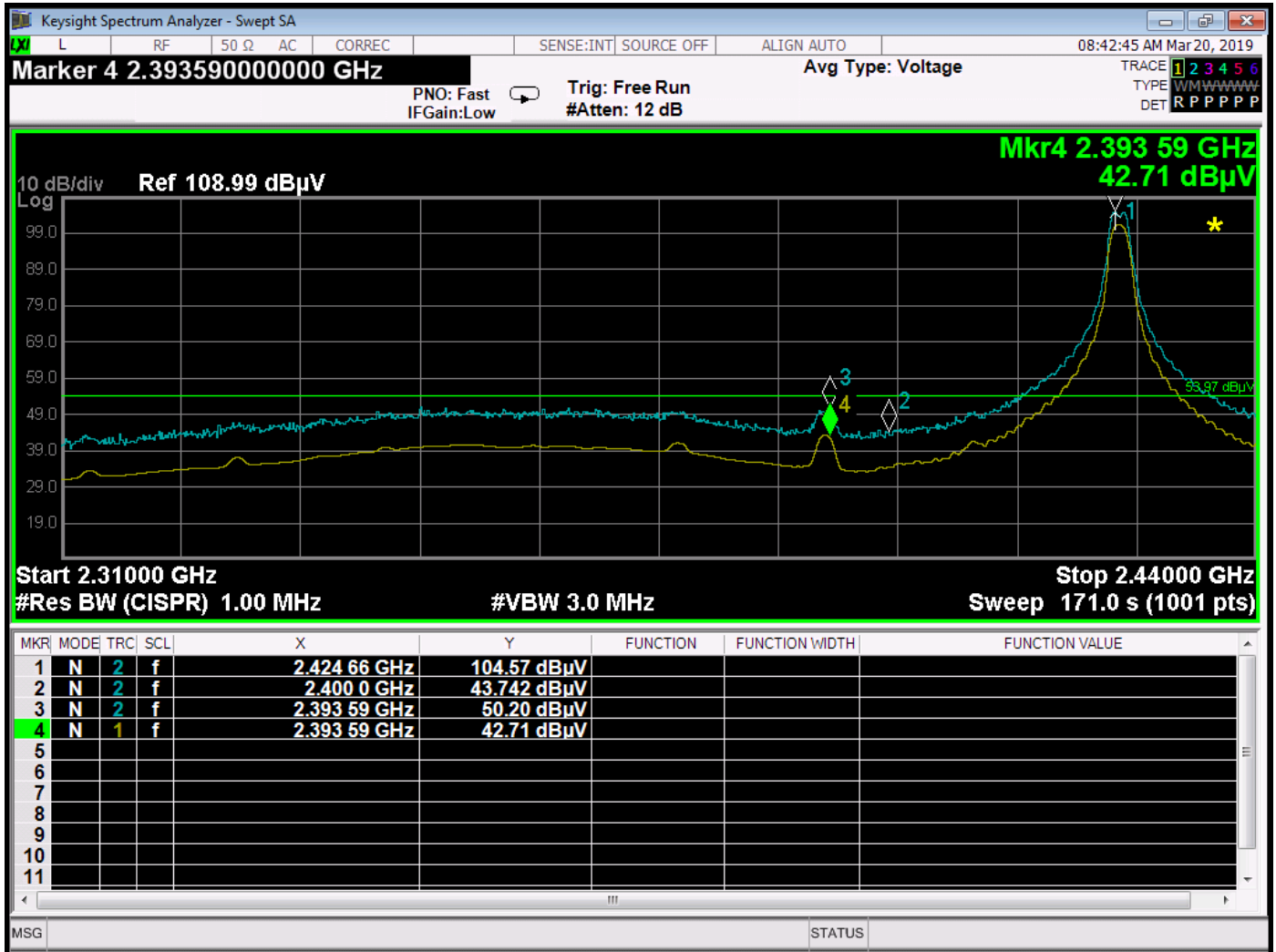
FCC 15.247

Universal Electronics,
 Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

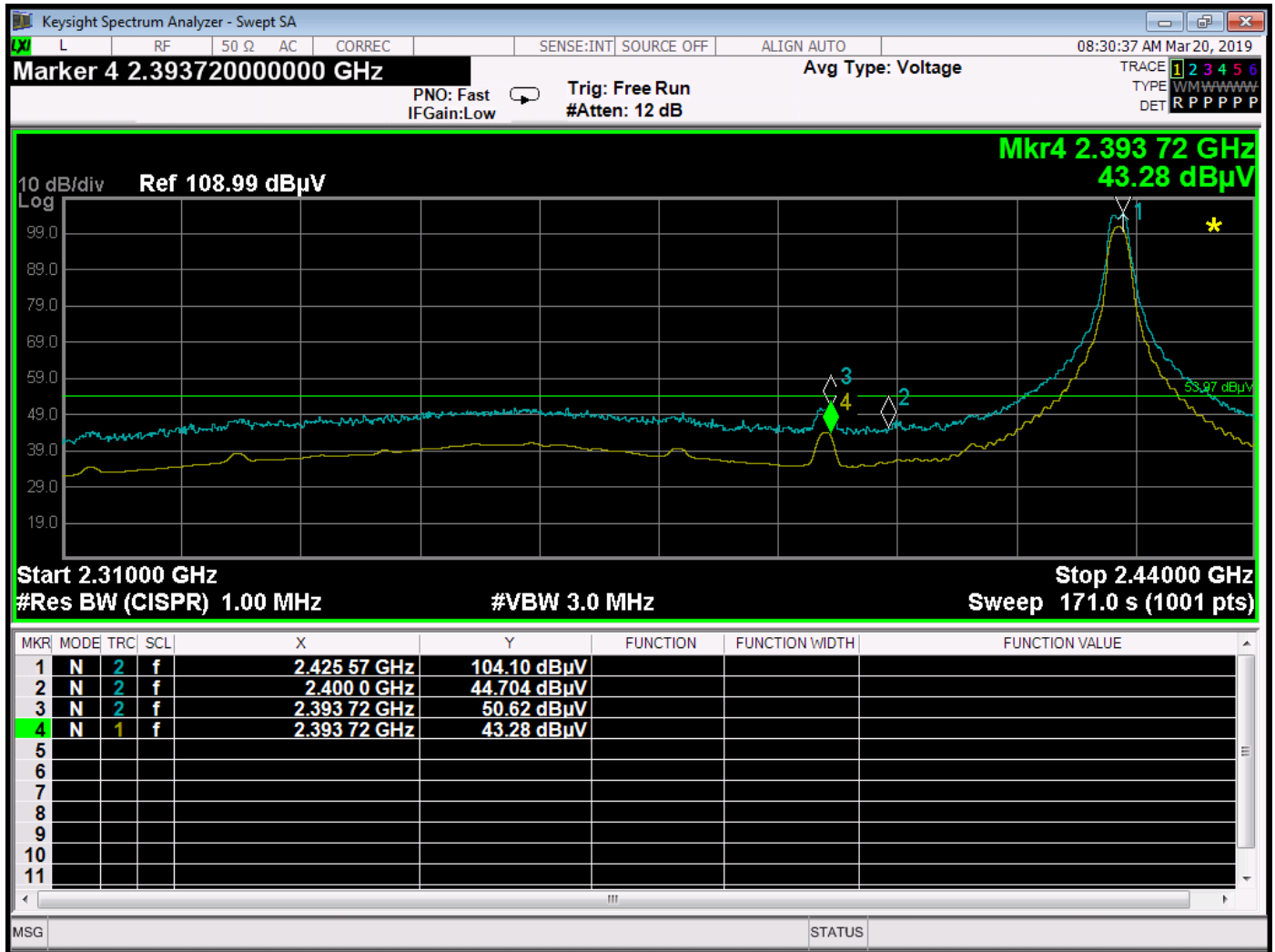
Date: 03/19/2019
 Lab: D
 Tested By: Kyle Fujimoto

Band Edges - RF4CE Mode

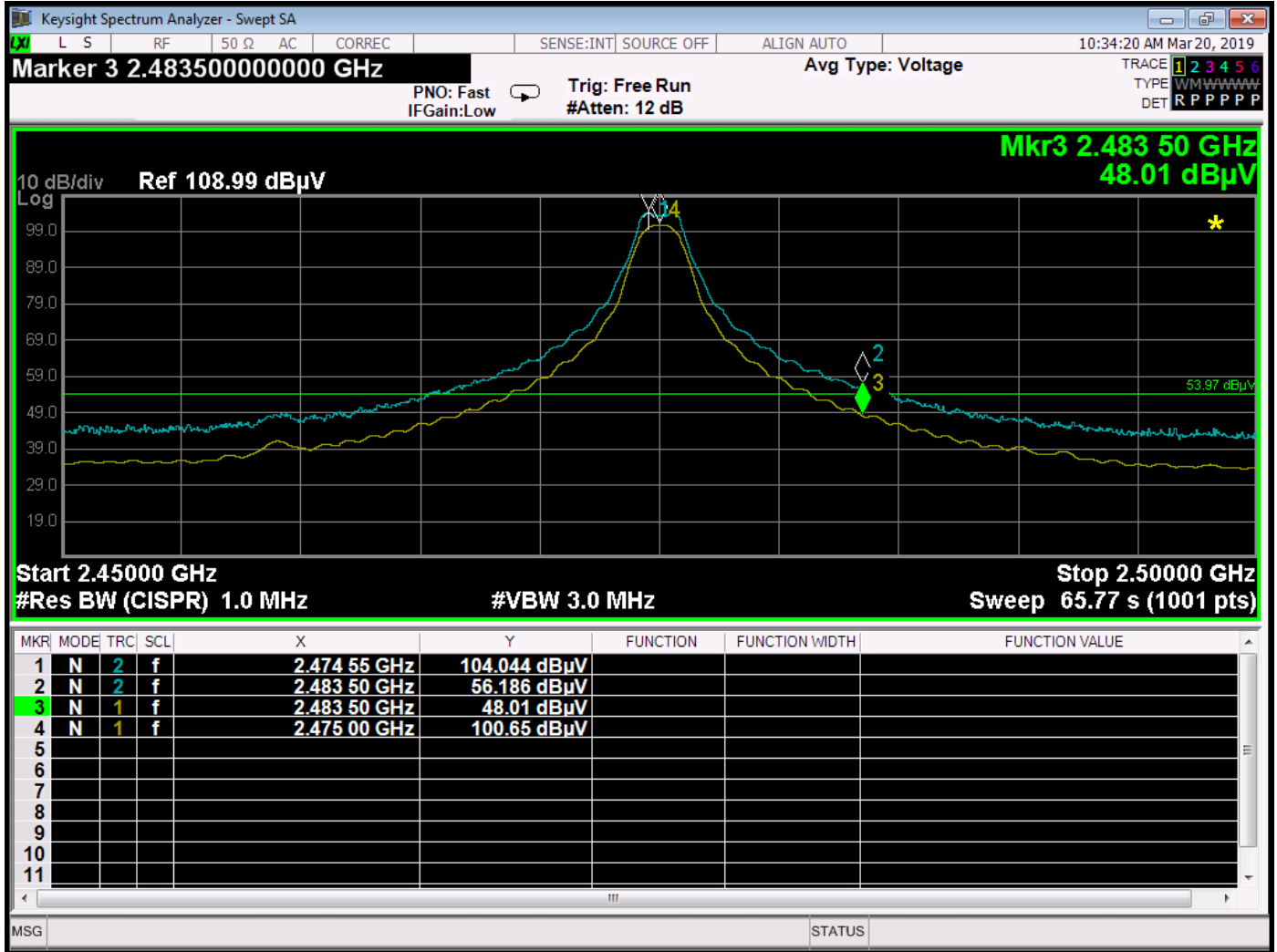
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475.00	104.04	H	--	--	Peak	136.75	100.34	Fundamental - High Ch. X-Axis - Worst Case
2483.50	56.19	H	73.97	-17.78	Peak	136.75	100.34	Band Edge
2483.50	48.01	H	53.97	-5.96	Avg	136.75	100.34	X-Axis - Worst Case
2475.00	104.41	V	--	--	Peak	310.50	214.49	Fundamental - High Ch. Y-Axis - Worst Case
2483.50	58.26	V	73.97	-15.72	Peak	310.50	214.49	Band Edge
2483.50	48.61	V	53.97	-5.36	Avg	310.50	214.49	Y-Axis - Worst Case



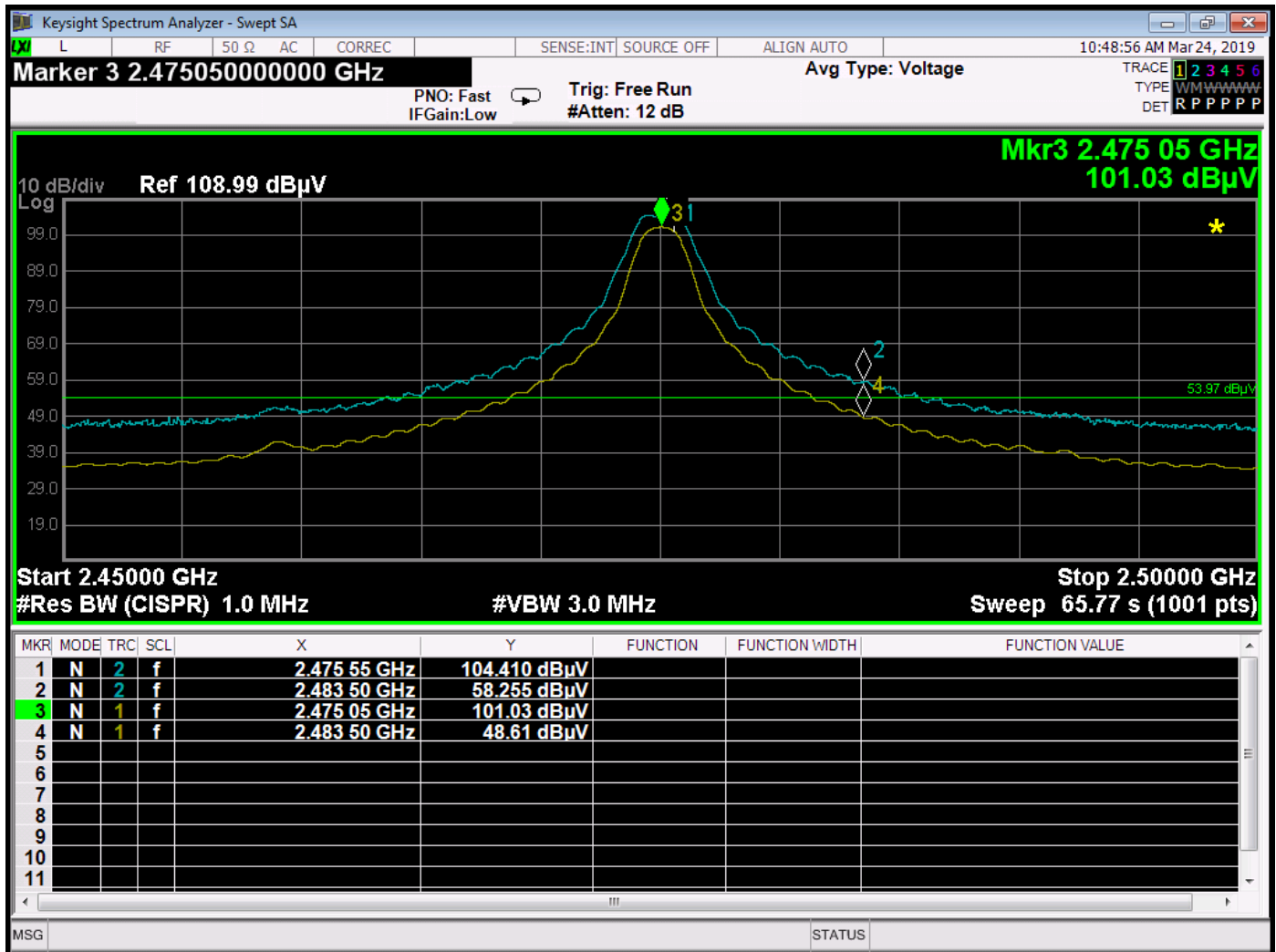
BE - 2425 MHz - Horizontal - X-Axis Worst Case – RF4CE Mode



BE - 2425 MHz - Vertical - Y-Axis Worst Case – RF4CE Mode



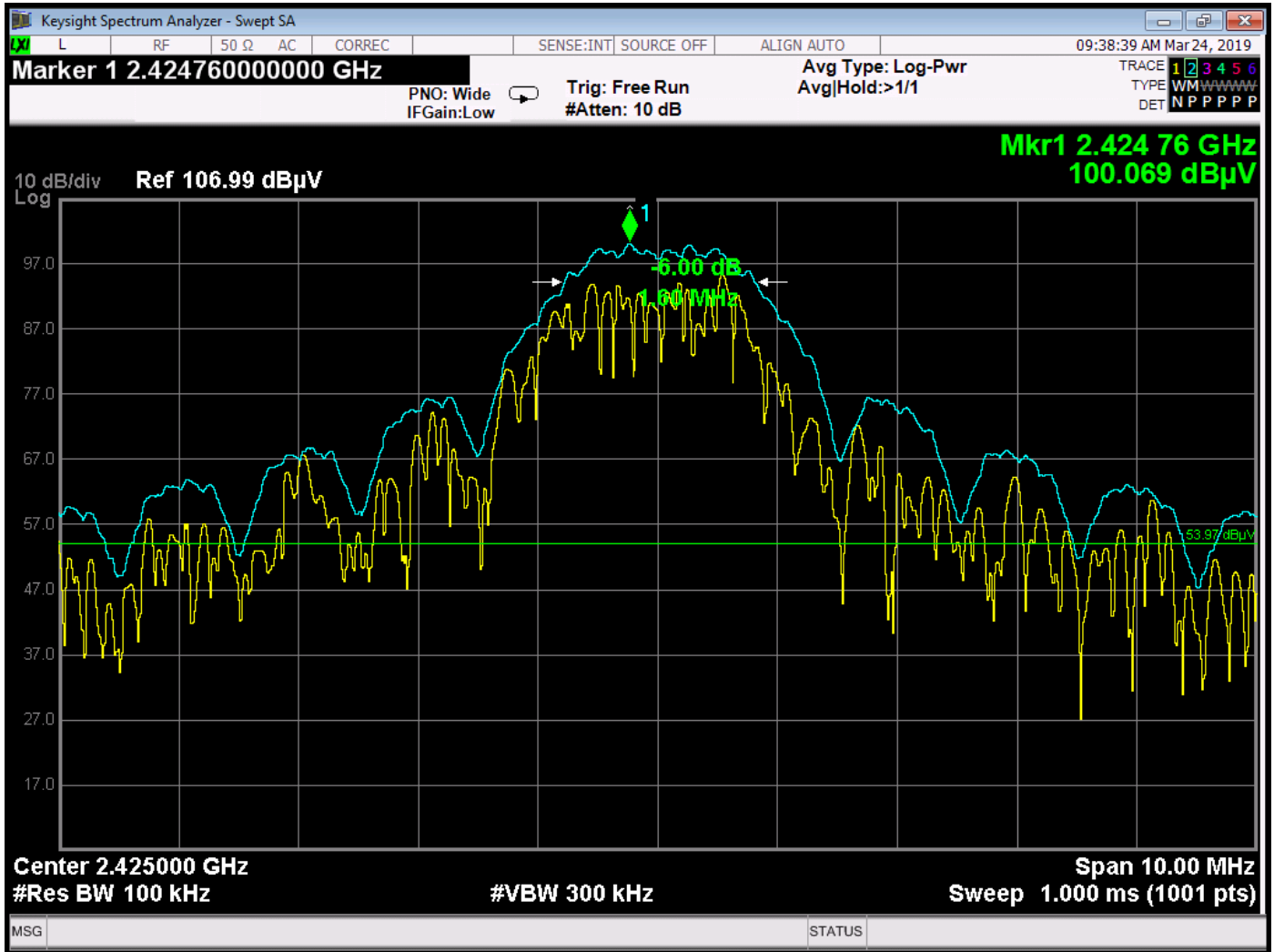
BE - 2475 MHz - Horizontal - X-Axis Worst Case – RF4CE Mode



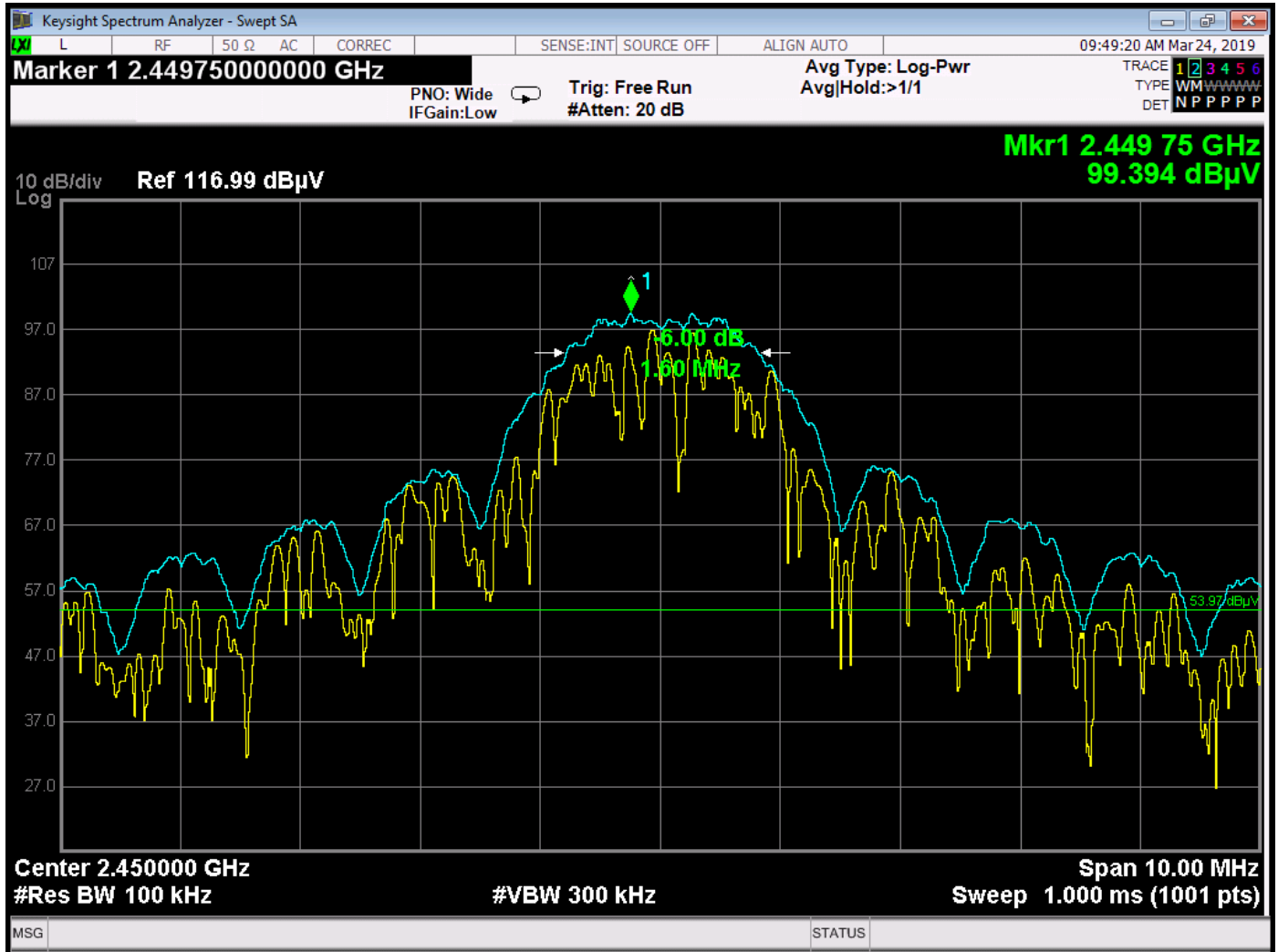
BE - 2475 MHz - Vertical - Y-Axis Worst Case – RF4CE Mode



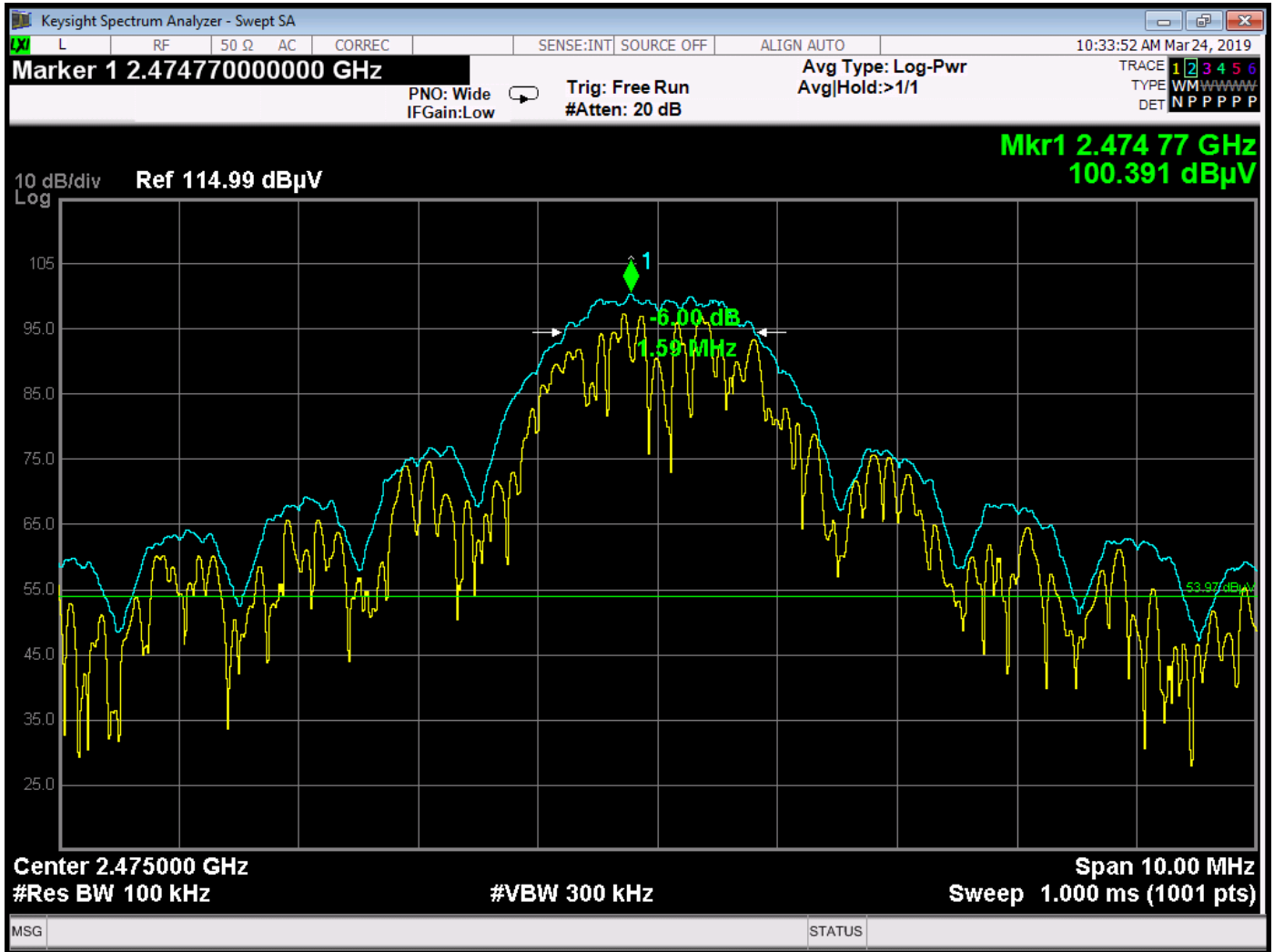
***DTS BANDWIDTH
DATA SHEETS***



Bandwidth 6 dB - 2425 MHz



Bandwidth 6 dB - 2450 MHz



Bandwidth 6 dB - 2475 MHz



***PEAK OUTPUT POWER
DATA SHEETS***

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

Peak Output Power - RF4CE Mode

Freq. (MHz)	Level (dBuV/m)	Level (V/m)	Antenna Gain (dBi)	Numeric Gain	Power Output (Watts)	Power Output (mW)	Power Output (dBm)	Limit (dBm)	Margin (dB)	Comments
2425.00	91.15	0.036099401	2	1.584893	0.00024667	0.24667	-6.08	30.00	-36.08	Vert. X-Axis
2450.00	92.61	0.042707092	2	1.584893	0.00034524	0.34524	-4.62	30.00	-34.62	Vert. X-Axis
2475.00	90.00	0.031622777	2	1.584893	0.00018929	0.18929	-7.23	30.00	-37.23	Vert. X-Axis
2425.00	104.10	0.160324539	2	1.584893	0.00486543	4.86543	6.87	30.00	-23.13	Vert. Y-Axis
2450.00	102.56	0.134276496	2	1.584893	0.00341288	3.41288	5.33	30.00	-24.67	Vert. Y-Axis
2475.00	101.97	0.125458474	2	1.584893	0.00297935	2.97935	4.74	30.00	-25.26	Vert. Y-Axis
2425.00	97.14	0.071944898	2	1.584893	0.00097976	0.97976	-0.09	30.00	-30.09	Vert. Z-Axis
2450.00	99.43	0.093648322	2	1.584893	0.00166005	1.66005	2.20	30.00	-27.80	Vert. Z-Axis
2475.00	99.78	0.097498964	2	1.584893	0.00179937	1.79937	2.55	30.00	-27.45	Vert. Z-Axis
2425.00	104.57	0.169238824	2	1.584893	0.00542152	5.42152	7.34	30.00	-22.66	Horiz. X-Axis
2450.00	102.69	0.136222862	2	1.584893	0.00351254	3.51254	5.46	30.00	-24.54	Horiz. X-Axis
2475.00	104.04	0.159220873	2	1.584893	0.00479867	4.79867	6.81	30.00	-23.19	Horiz. X-Axis
2425.00	73.24	0.00459198	2	1.584893	0.00000399	0.00399	-23.99	30.00	-53.99	Horiz. Y-Axis
2450.00	74.86	0.005533501	2	1.584893	0.00000580	0.00580	-22.37	30.00	-52.37	Horiz. Y-Axis
2475.00	75.01	0.005629891	2	1.584893	0.00000600	0.00600	-22.22	30.00	-52.22	Horiz. Y-Axis
2425.00	102.80	0.138038426	2	1.584893	0.00360679	3.60679	5.57	30.00	-24.43	Horiz. Z-Axis
2450.00	102.36	0.13121999	2	1.584893	0.00325928	3.25928	5.13	30.00	-24.87	Horiz. Z-Axis
2475.00	102.44	0.132434154	2	1.584893	0.00331987	3.31987	5.21	30.00	-24.79	Horiz. Z-Axis

RBW = 8 MHz, VBW = 50 MHz, Sweep Time = Auto

$$P = [(E \cdot D)^2 / (30 \cdot G)]$$

P = Power in Watts

E = The Measured Maximum Field Strength in V/m

D = Test Distance in Meters

G = The Numeric Gain of the Transmitting Antenna over an Isotropic Radiator



***SPECTRAL DENSITY OUTPUT
DATA SHEETS***

FCC 15.247

Universal Electronics, Inc.
 Comcast XR16 Remote 2019
 M/N: R34353BA00-00001

Date: 03/23/2019
 Lab: D
 Tested By: Kyle Fujimoto

Spectral Density Output - RF4CE Mode

Freq. (MHz)	Level (dBuV/m)	Level (V/m)	Antenna Gain (dBi)	Numeric Gain	PPSD Output (Watts)	PPSD Output (mW)	PPSD Output (dBm)	Limit (dBm)	Margin (dB)	Comments
2425.00	76.28	0.006513284	2	1.584893	0.00000803	0.00803	-20.95	8.00	-28.95	Vert. X-Axis
2450.00	77.69	0.007664785	2	1.584893	0.00001112	0.01112	-19.54	8.00	-27.54	Vert. X-Axis
2475.00	75.13	0.005708211	2	1.584893	0.00000617	0.00617	-22.10	8.00	-30.10	Vert. X-Axis
2425.00	92.57	0.042510871	2	1.584893	0.00034207	0.34207	-4.66	8.00	-12.66	Vert. Y-Axis
2450.00	90.24	0.03250873	2	1.584893	0.00020004	0.20004	-6.99	8.00	-14.99	Vert. Y-Axis
2475.00	89.71	0.030584402	2	1.584893	0.00017706	0.17706	-7.52	8.00	-15.52	Vert. Y-Axis
2425.00	81.97	0.012548736	2	1.584893	0.00002981	0.02981	-15.26	8.00	-23.26	Vert. Z-Axis
2450.00	84.06	0.015958791	2	1.584893	0.00004821	0.04821	-13.17	8.00	-21.17	Vert. Z-Axis
2475.00	84.39	0.016576773	2	1.584893	0.00005201	0.05201	-12.84	8.00	-20.84	Vert. Z-Axis
2425.00	90.26	0.03258367	2	1.584893	0.00020097	0.20097	-6.97	8.00	-14.97	Horiz. X-Axis
2450.00	87.47	0.023634695	2	1.584893	0.00010574	0.10574	-9.76	8.00	-17.76	Horiz. X-Axis
2475.00	90.14	0.032136605	2	1.584893	0.00019549	0.19549	-7.09	8.00	-15.09	Horiz. X-Axis
2425.00	60.89	0.001107899	2	1.584893	0.00000023	0.00023	-36.34	8.00	-44.34	Horiz. Y-Axis
2450.00	60.18	0.001020939	2	1.584893	0.00000020	0.00020	-37.05	8.00	-45.05	Horiz. Y-Axis
2475.00	61.29	0.001160112	2	1.584893	0.00000025	0.00025	-35.94	8.00	-43.94	Horiz. Y-Axis
2425.00	86.97	0.022320299	2	1.584893	0.00009430	0.09430	-10.25	8.00	-18.25	Horiz. Z-Axis
2450.00	85.69	0.019261939	2	1.584893	0.00007023	0.07023	-11.53	8.00	-19.53	Horiz. Z-Axis
2475.00	87.21	0.022935066	2	1.584893	0.00009957	0.09957	-10.02	8.00	-18.02	Horiz. Z-Axis

RBW = 3 kHz, VBW = 10 kHz, Sweep Time = 100 Seconds

$$P = [(E \cdot D)^2 / (30 \cdot G)]$$

P = Power in Watts

E = The Measured Maximum Field Strength in V/m

D = Test Distance in Meters

G = The Numeric Gain of the Transmitting Antenna over an Isotropic Radiator

Limit = +8 dBm