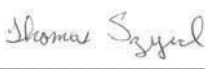


*FCC PART 15, SUBPART B and C
TEST REPORT**for***DISH 54.0 BRISBANE CR 2018****Model: R32027BA00-00006**

Prepared for

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

THOMAS SZYNAL

Approved by: 

KYLE FUJIMOTO

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

DATE: JUNE 4, 2019

	REPORT BODY	APPENDICES					TOTAL
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
PAGES	20	2	2	2	13	43	82



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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

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C	Additional Models Covered Under This Report
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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: Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006
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: May 15, 21, 22, 28, and 29; June 3, 2019; and July 4, 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 48.46 (Avg) dBuV/m @ 2483.50 MHz (*U = 3.19 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 Dish 54.0 Brisbane CR 2018, Model: R32027BA00-00006. 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.

Tom 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 Dish 54.0 Brisbane CR 2018, Model: R32027BA00-00006 (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 (2425 MHz, 2450 MHz, and 2475 MHz), respectively. During the testing, the EUT was continuously transmitting in its RF mode, as well as 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 mode described above. 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
DISH 54.0 BRISBANE CR 2018 (EUT)	UNIVERSAL ELECTRONICS, INC.	R32027BA00-00006	N/A	MG3-R32027B6
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	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
RF RADIATED EMISSIONS TEST EQUIPMENT					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
EMI Receiver, 20 Hz – 26.5 GHz	Keysight Technologies	N9038A	MY51210150	July 26, 2018	1 Year
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
Loop Antenna	Com-Power	AL-130R	121090	February 5, 2019	2 Year
CombiLog Antenna	Com-Power	AC-220	61060	July 27, 2017	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 22, 2018	2 Year
Horn Antenna	Com-Power	AH-826	71957	N/A	N/A
Preamplifier	Com-Power	PAM-118A	551024	May 10, 2018	2 Year
Preamplifier	Com-Power	PA-840	711013	May 10, 2018	2 Year
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	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.

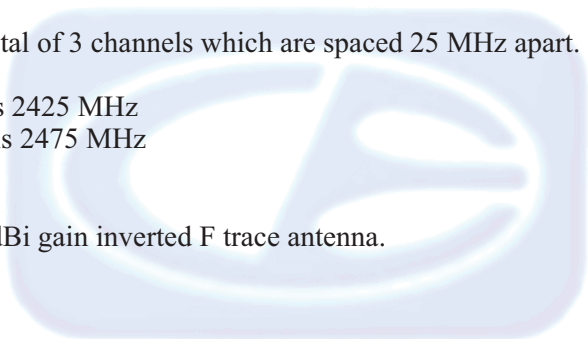
7.1 Channel Number and Frequencies

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 inverted F 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. The six highest emissions are listed in Table 1.0.

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 Results

Table 1.0 RADIATED EMISSION RESULTS
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Frequency (MHz)	EMI Reading (dBuV/m)	Specification Limit (dBuV/m)	Delta (Cor. Reading – Spec. Limit) (dB)
2483.50 (H) (X-Axis)	48.46 (Avg)	53.97	-5.51
2483.50 (V) (Y-Axis)	47.35 (Avg)	53.97	-6.62
786.00 (V) (X-Axis)	37.96 (QP)	46.99	-8.04
38.40 (H) (X-Axis)	27.03 (QP)	40.00	-12.97
40.80 (H) (X-Axis)	26.86 (QP)	40.00	-13.14
36.10 (H) (X-Axis)	26.69 (QP)	40.00	-13.31

Notes:

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

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 high channel, which was 100.89 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.

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

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 Dish 54.0 Brisbane CR 2018, Model: R32027BA00-00006 (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

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***

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Dish 54.0 Brisbane CR 2018
Models: R32027BA00-00006
S/N: N/A

There are no additional models covered under this report.



APPENDIX D

DIAGRAMS AND CHARTS

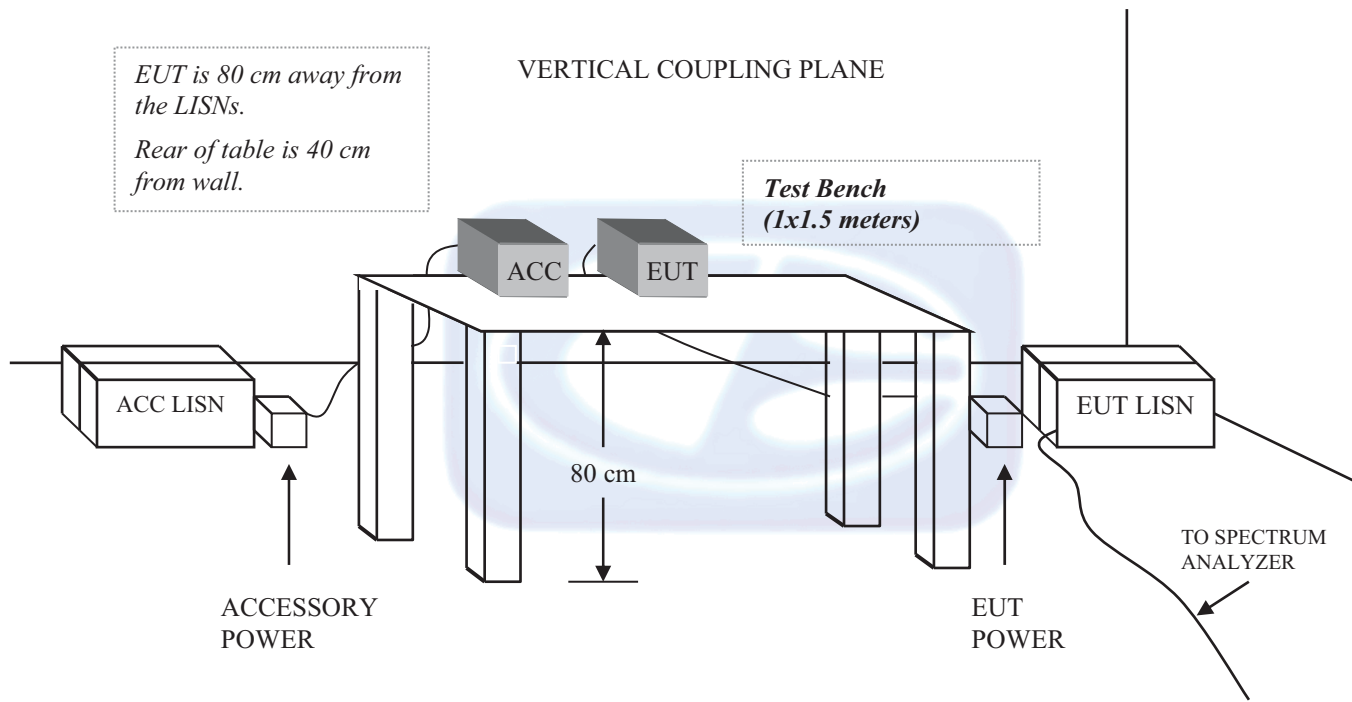
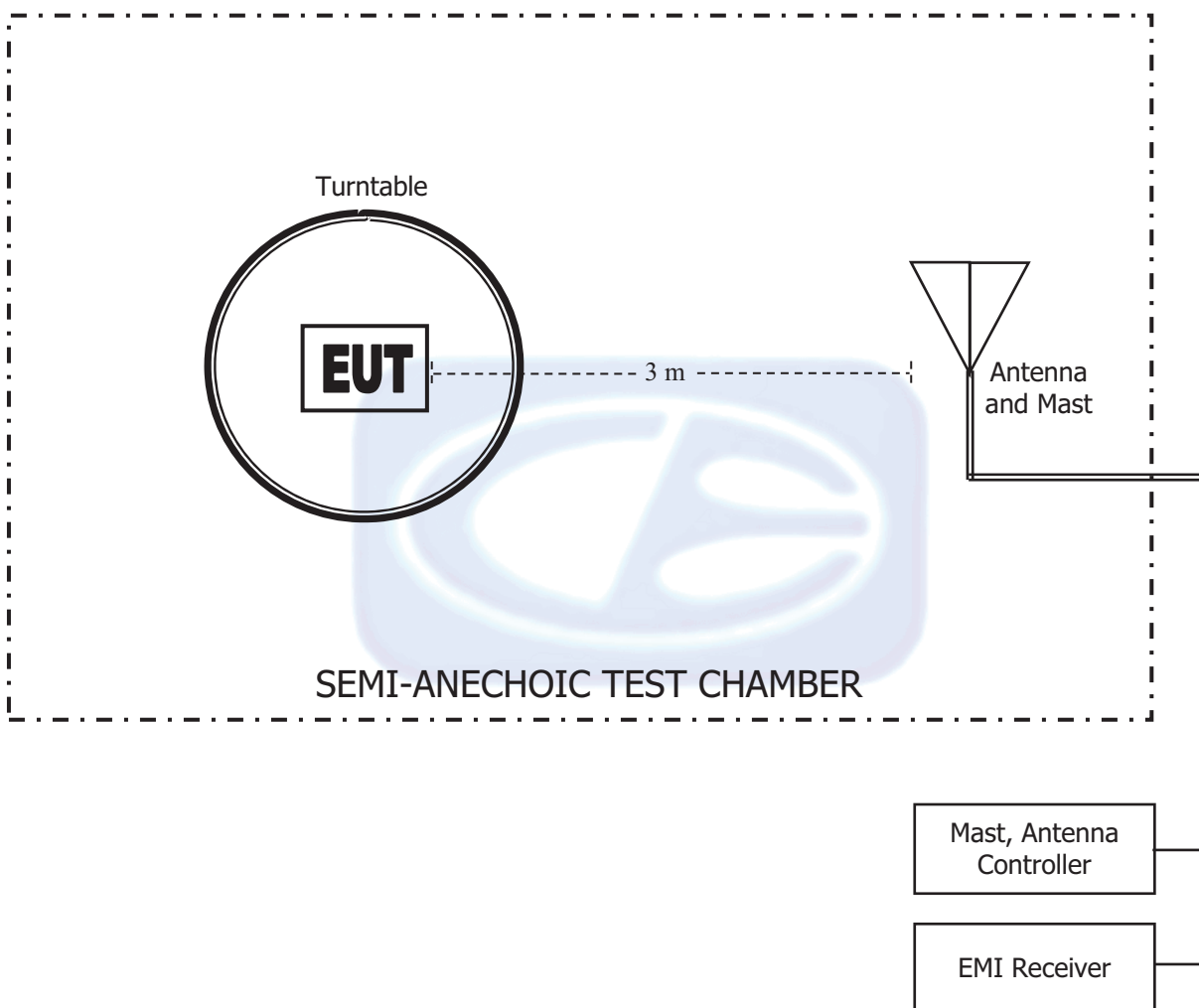
FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

FIGURE 2: LAYOUT OF THE SEMI-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
0.10	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
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

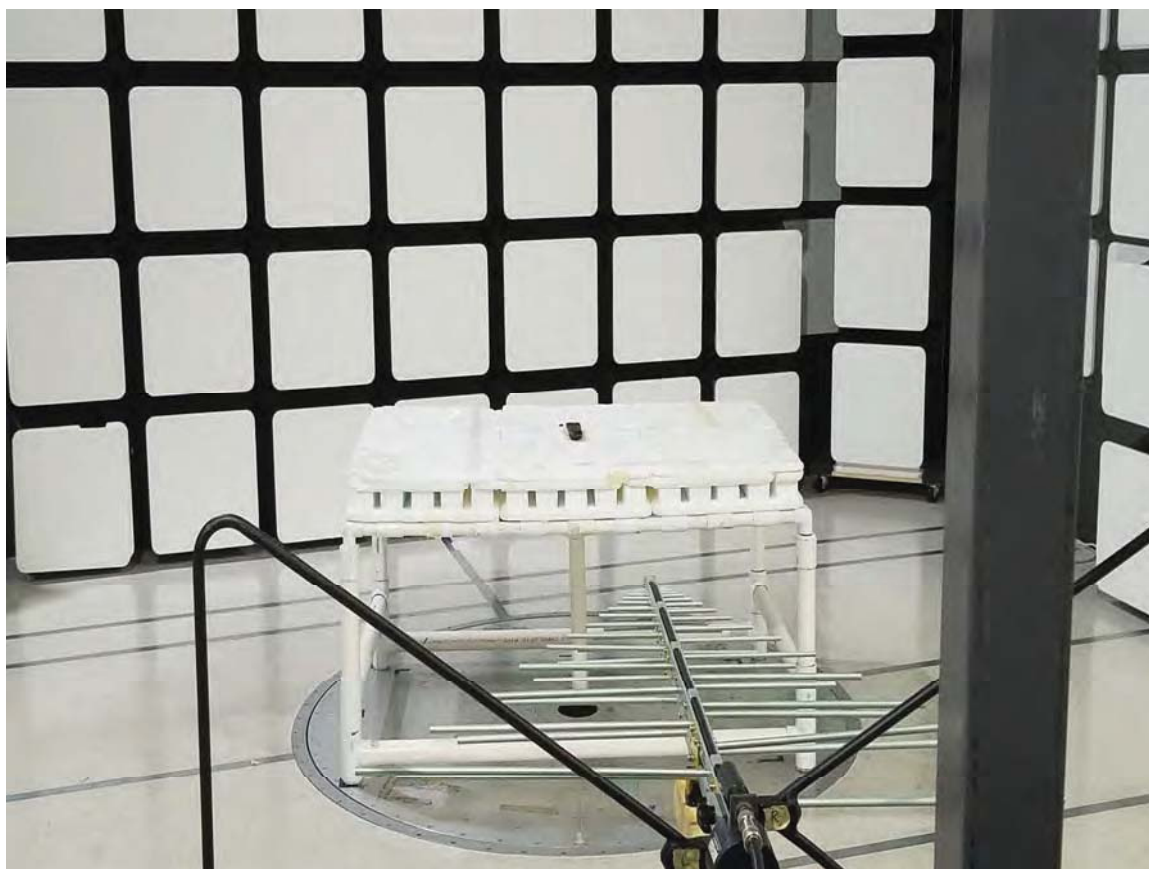
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	26.90	31.0	24.56
19.0	24.65	31.5	25.84
20.0	25.74	32.0	26.93
21.0	24.78	32.5	27.76
22.0	24.83	33.0	25.76
23.0	24.81	33.5	26.76
24.0	25.52	34.0	26.51
25.0	24.90	34.5	27.49
26.0	25.92	35.0	27.64
26.5	26.53	35.5	27.45
27.0	26.41	36.0	25.08
27.5	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.
DISH 54.0 BRISBANE CR 2018
MODEL: R32027BA00-00006
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

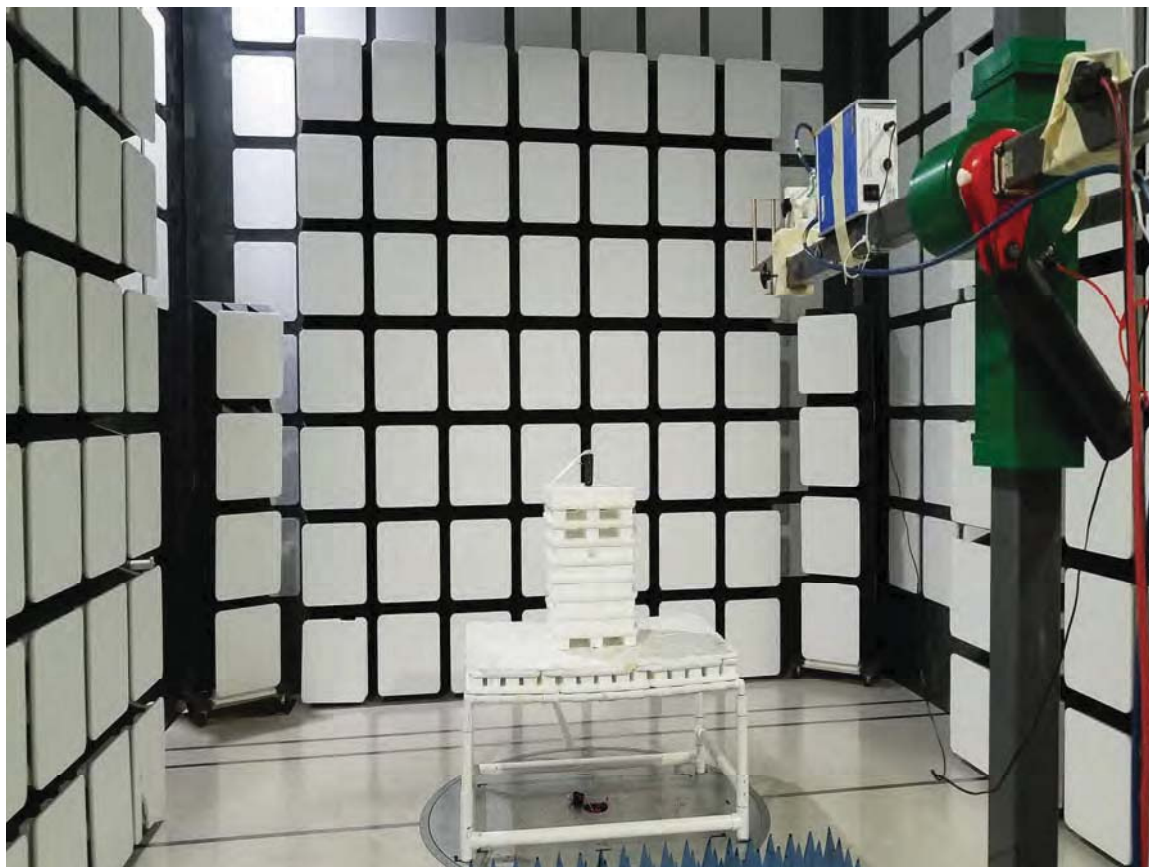
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

UNIVERSAL ELECTRONICS, INC.
DISH 54.0 BRISBANE CR 2018
MODEL: R32027BA00-00006
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

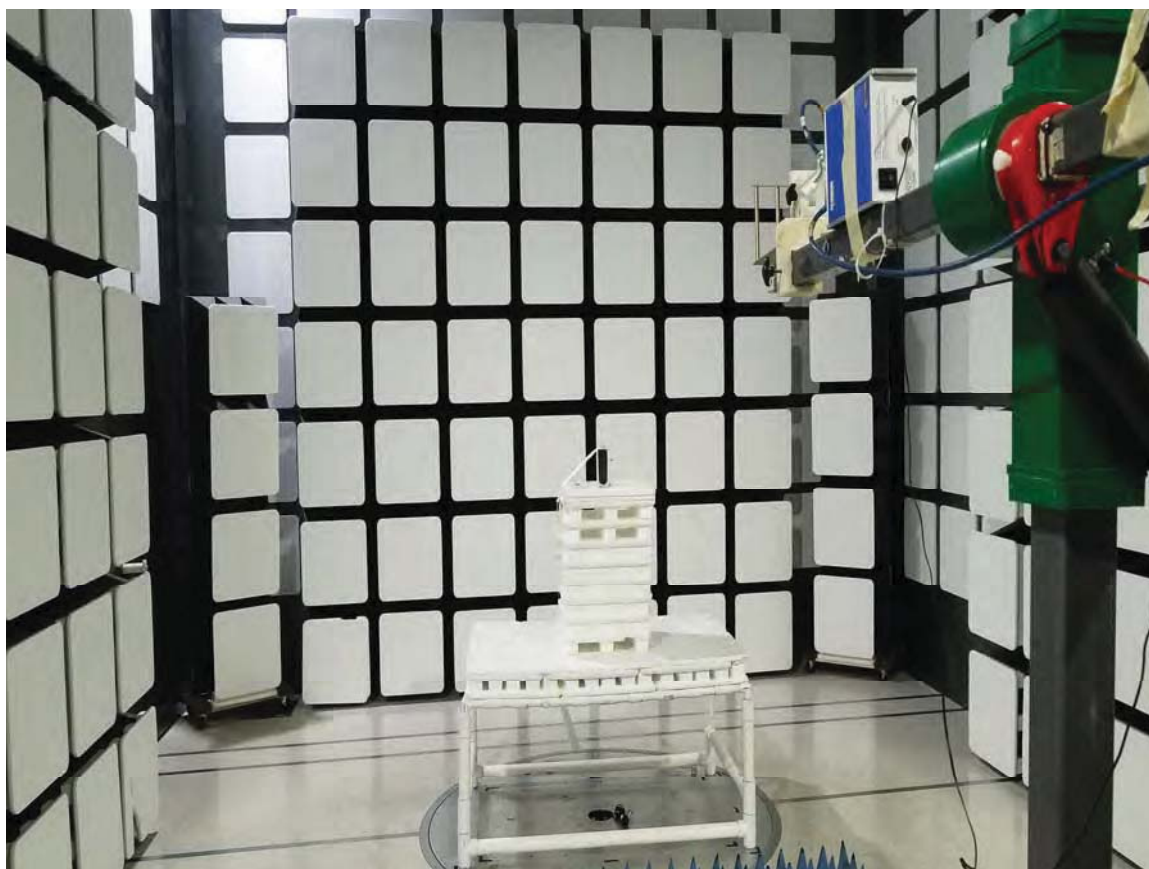
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

UNIVERSAL ELECTRONICS, INC.
DISH 54.0 BRISBANE CR 2018
MODEL: R32027BA00-00006
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

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



REAR VIEW

UNIVERSAL ELECTRONICS, INC.
DISH 54.0 BRISBANE CR 2018
MODEL: R32027BA00-00006
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.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 05/15/2019
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Low Channel - RF4CE Mode
Transmit Mode - X-Axis - Tested at +8 dBm

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	43.51	V	73.97	-30.46	Peak	68.75	111.32	
4850.00	33.57	V	53.97	-20.40	Avg	68.75	111.32	
7275.00	44.73	V	73.97	-29.24	Peak	343.00	159.20	
7275.00	34.20	V	53.97	-19.77	Avg	343.00	159.20	
9700.00	48.78	V	80.89	-32.11	Peak	154.00	159.08	Not in
								Restricted Band
12125.00	45.46	V	73.97	-28.51	Peak	224.25	249.95	
12125.00	34.69	V	53.97	-19.28	Avg	224.25	249.95	
14550.00								No Emission
14550.00								Detected
16975.00								No Emission
16975.00								Detected
19400.00								No Emission
19400.00								Detected
21825.00								No Emission
21825.00								Detected
24250.00								No Emission
24250.00								Detected

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Low Channel - RF4CE Mode
Transmit Mode - Y-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	42.02	V	73.97	-31.95	Peak	0.00	159.14	
4850.00	33.74	V	53.97	-20.23	Avg	0.00	159.14	
7275.00	46.58	V	73.97	-27.39	Peak	293.25	207.14	
7275.00	36.25	V	53.97	-17.72	Avg	293.25	207.14	
9700.00	51.63	V	80.89	-29.26	Peak	96.50	111.38	Not in Restricted Band
12125.00	45.52	V	73.97	-28.45	Peak	359.75	127.26	
12125.00	34.46	V	53.97	-19.51	Avg	359.75	127.26	
14550.00								No Emission Detected
14550.00								
16975.00								No Emission Detected
16975.00								
19400.00								No Emission Detected
19400.00								
21825.00								No Emission Detected
21825.00								
24250.00								No Emission Detected
24250.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

Harmonics - Low Channel - RF4CE Mode
Transmit Mode - Z-Axis - Tested at +8 dBm

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	42.40	V	73.97	-31.57	Peak	38.50	143.44	
4850.00	34.44	V	53.97	-19.53	Avg	38.50	143.44	
7275.00	45.94	V	73.97	-28.03	Peak	127.75	222.97	
7275.00	35.12	V	53.97	-18.85	Avg	127.75	222.97	
9700.00	53.21	V	80.89	-27.68	Peak	62.50	127.20	Not in Restricted Band
12125.00	46.28	V	73.97	-27.69	Peak	159.25	111.38	
12125.00	34.50	V	53.97	-19.47	Avg	159.25	111.38	
14550.00								No Emission Detected
14550.00								
16975.00								No Emission Detected
16975.00								
19400.00								No Emission Detected
19400.00								
21825.00								No Emission Detected
21825.00								
24250.00								No Emission Detected
24250.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 05/15/2019
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Low Channel - RF4CE Mode
Transmit Mode - X-Axis - Tested at +8 dBm

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	42.04	H	73.97	-31.93	Peak	150.00	128.58	
4850.00	32.86	H	53.97	-21.11	Avg	150.00	128.58	
7275.00	45.81	H	73.97	-28.16	Peak	330.25	249.91	
7275.00	35.03	H	53.97	-18.94	Avg	330.25	249.91	
9700.00	54.21	H	80.89	-26.68	Peak	151.75	111.44	Not in Restricted Band
12125.00	44.81	H	73.97	-29.16	Peak	235.25	159.20	
12125.00	34.05	H	53.97	-19.92	Avg	235.25	159.20	
14550.00								No Emission Detected
14550.00								
16975.00								No Emission Detected
16975.00								
19400.00								No Emission Detected
19400.00								
21825.00								No Emission Detected
21825.00								
24250.00								No Emission Detected
24250.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Low Channel - RF4CE Mode
Transmit Mode - Y-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	42.86	H	73.97	-31.11	Peak	36.00	175.14	
4850.00	35.02	H	53.97	-18.95	Avg	36.00	175.14	
7275.00	44.70	H	73.97	-29.27	Peak	341.75	111.38	
7275.00	34.05	H	53.97	-19.92	Avg	341.75	111.38	
9700.00	53.75	H	80.89	-27.14	Peak	210.75	127.26	Not in Restricted Band
12125.00	45.42	H	73.97	-28.55	Peak	64.75	127.20	
12125.00	34.38	H	53.97	-19.59	Avg	64.75	127.20	
14550.00								No Emission Detected
14550.00								
16975.00								No Emission Detected
16975.00								
19400.00								No Emission Detected
19400.00								
21825.00								No Emission Detected
21825.00								
24250.00								No Emission Detected
24250.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Low Channel - RF4CE Mode
Transmit Mode - Z-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4850.00	45.11	H	73.97	-28.86	Peak	321.75	206.85	
4850.00	35.63	H	53.97	-18.34	Avg	321.75	206.85	
7275.00	48.20	H	73.97	-25.77	Peak	176.25	222.91	
7275.00	38.33	H	53.97	-15.64	Avg	176.25	222.91	
9700.00	53.92	H	80.89	-26.97	Peak	59.75	127.26	Not in Restricted Band
12125.00	45.75	H	73.97	-28.22	Peak	359.75	143.32	
12125.00	34.54	H	53.97	-19.43	Avg	359.75	143.32	
14550.00								No Emission Detected
14550.00								
16975.00								No Emission Detected
16975.00								
19400.00								No Emission Detected
19400.00								
21825.00								No Emission Detected
21825.00								
24250.00								No Emission Detected
24250.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 05/15/2019
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Middle Channel - RF4CE Mode
Transmit Mode - X-Axis - Tested at + 8 dBm

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	41.95	V	73.97	-32.02	Peak	66.00	206.97	
4900.00	31.12	V	53.97	-22.85	Avg	66.00	206.97	
7350.00	47.79	V	73.97	-26.18	Peak	158.75	222.91	
7350.00	37.34	V	53.97	-16.63	Avg	158.75	222.91	
9800.00	44.21	V	80.89	-36.68	Peak	336.00	111.38	Not in Restricted Band
12250.00	46.03	V	73.97	-27.94	Peak	86.75	207.32	
12250.00	35.47	V	53.97	-18.50	Avg	86.75	207.32	
14700.00								No Emission Detected
14700.00								
17150.00								No Emission Detected
17150.00								
19600.00								No Emission Detected
19600.00								
22050.00								No Emission Detected
22050.00								
24500.00								No Emission Detected
24500.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 05/15/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
 Transmit Mode - Y-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	43.52	V	73.97	-30.45	Peak	359.50	127.08	
4900.00	34.78	V	53.97	-19.19	Avg	359.50	127.08	
7350.00	48.31	V	73.97	-25.66	Peak	197.25	127.08	
7350.00	38.63	V	53.97	-15.34	Avg	197.25	127.08	
9800.00	55.52	V	80.89	-25.37	Peak	202.50	127.26	Not in Restricted Band
12250.00	46.02	V	73.97	-27.95	Peak	0.00	191.02	
12250.00	35.62	V	53.97	-18.35	Avg	0.00	191.02	
14700.00								No Emission Detected
14700.00								
17150.00								No Emission Detected
17150.00								
19600.00								No Emission Detected
19600.00								
22050.00								No Emission Detected
22050.00								
24500.00								No Emission Detected
24500.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
Transmit Mode - Z-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	46.49	V	73.97	-27.48	Peak	127.75	191.08	
4900.00	37.02	V	53.97	-16.95	Avg	127.75	191.08	
7350.00	46.34	V	73.97	-27.63	Peak	96.25	111.38	
7350.00	36.02	V	53.97	-17.95	Avg	96.25	111.38	
9800.00	53.72	V	80.89	-27.17	Peak	148.75	111.32	
12250.00	46.91	V	73.97	-27.06	Peak	103.25	190.97	
12250.00	35.51	V	53.97	-18.46	Avg	103.25	190.97	
14700.00								No Emission
14700.00								Detected
17150.00								No Emission
17150.00								Detected
19600.00								No Emission
19600.00								Detected
22050.00								No Emission
22050.00								Detected
24500.00								No Emission
24500.00								Detected

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

Harmonics - Middle Channel - RF4CE Mode
Transmit Mode - X-Axis - Tested at +8 dBm

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	46.95	H	73.97	-27.02	Peak	213.50	190.91	
4900.00	38.71	H	53.97	-15.26	Avg	213.50	190.91	
7350.00	45.06	H	73.97	-28.91	Peak	19.00	127.38	
7350.00	34.51	H	53.97	-19.46	Avg	19.00	127.38	
9800.00	53.21	H	80.89	-27.68	Peak	278.25	111.38	Not in Restricted Band
12250.00	46.44	H	73.97	-27.53	Peak	197.75	143.26	
12250.00	35.63	H	53.97	-18.34	Avg	197.75	143.26	
14700.00								No Emission Detected
14700.00								
17150.00								No Emission Detected
17150.00								
19600.00								No Emission Detected
19600.00								
22050.00								No Emission Detected
22050.00								
24500.00								No Emission Detected
24500.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental
of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 05/15/2019
 Lab: D
 Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
 Transmit Mode - Y-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	46.03	H	73.97	-27.94	Peak	36.75	239.80	
4900.00	37.77	H	53.97	-16.20	Avg	36.75	239.80	
7350.00	46.13	H	73.97	-27.84	Peak	351.25	143.32	
7350.00	35.41	H	53.97	-18.56	Avg	351.25	143.32	
9800.00	53.89	H	80.89	-27.00	Peak	208.00	111.26	Not in Restricted Band
12250.00	47.71	H	73.97	-26.26	Peak	58.50	127.14	
12250.00	36.87	H	53.97	-17.10	Avg	58.50	127.14	
14700.00								No Emission Detected
14700.00								
17150.00								No Emission Detected
17150.00								
19600.00								No Emission Detected
19600.00								
22050.00								No Emission Detected
22050.00								
24500.00								No Emission Detected
24500.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Middle Channel - RF4CE Mode
Transmit Mode - Z-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4900.00	46.35	H	73.97	-27.62	Peak	99.50	175.14	
4900.00	37.96	H	53.97	-16.01	Avg	99.50	175.14	
7350.00	45.56	H	73.97	-28.41	Peak	275.50	127.08	
7350.00	34.45	H	53.97	-19.52	Avg	275.50	127.08	
9800.00	54.35	H	80.89	-26.54	Peak	273.00	159.08	Not in Restricted Band
12250.00	47.25	H	73.97	-26.72	Peak	37.50	157.32	
12250.00	35.64	H	53.97	-18.33	Avg	37.50	157.32	
14700.00								No Emission Detected
14700.00								
17150.00								No Emission Detected
17150.00								
19600.00								No Emission Detected
19600.00								
22050.00								No Emission Detected
22050.00								
24500.00								No Emission Detected
24500.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 05/15/2019
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel - RF4CE Mode
Transmit Mode - X-Axis - Tested at +8 dBm

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	41.23	V	73.97	-32.74	Peak	294.25	111.44	
4950.00	31.21	V	53.97	-22.76	Avg	294.25	111.44	
7425.00	45.40	V	73.97	-28.57	Peak	13.75	143.26	
7425.00	34.31	V	53.97	-19.66	Avg	13.75	143.26	
9900.00	44.85	V	80.89	-36.04	Peak	332.50	127.26	Not in Restricted Band
12375.00	47.28	V	73.97	-26.69	Peak	197.50	222.97	
12375.00	36.47	V	53.97	-17.50	Avg	197.50	222.97	
14850.00								No Emission Detected
14850.00								
17325.00								No Emission Detected
17325.00								
19800.00								No Emission Detected
19800.00								
22275.00								No Emission Detected
22275.00								
24750.00								No Emission Detected
24750.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 05/15/2019
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel - RF4CE Mode
Transmit Mode - Y-Axis - Tested at +8 dBm

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	45.85	V	73.97	-28.12	Peak	198.25	175.20	
4950.00	38.59	V	53.97	-15.38	Avg	198.25	175.20	
7425.00	47.60	V	73.97	-26.37	Peak	171.00	127.32	
7425.00	37.43	V	53.97	-16.54	Avg	171.00	127.32	
9900.00	48.24	V	80.89	-32.65	Peak	78.00	222.97	Not in Restricted Band
12375.00	46.83	V	73.97	-27.14	Peak	160.50	222.55	
12375.00	36.29	V	53.97	-17.68	Avg	160.50	222.55	
14850.00								No Emission Detected
14850.00								
17325.00								No Emission Detected
17325.00								
19800.00								No Emission Detected
19800.00								
22275.00								No Emission Detected
22275.00								
24750.00								No Emission Detected
24750.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - High Channel - RF4CE Mode
Transmit Mode - Z-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	43.73	V	73.97	-30.24	Peak	236.00	175.14	
4950.00	34.37	V	53.97	-19.60	Avg	236.00	175.14	
7425.00	46.04	V	73.97	-27.93	Peak	262.00	127.20	
7425.00	35.24	V	53.97	-18.73	Avg	262.00	127.20	
9900.00	44.57	V	80.89	-36.32	Peak	208.25	111.38	Not in Restricted Band
12375.00	47.08	V	73.97	-26.89	Peak	0.50	249.95	
12375.00	36.37	V	53.97	-17.60	Avg	0.50	249.95	
14850.00								No Emission Detected
14850.00								
17325.00								No Emission Detected
17325.00								
19800.00								No Emission Detected
19800.00								
22275.00								No Emission Detected
22275.00								
24750.00								No Emission Detected
24750.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 05/15/2019
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel - RF4CE Mode
Transmit Mode - X-Axis - Tested at +8 dBm

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	47.18	H	73.97	-26.79	Peak	207.00	111.39	
4950.00	40.39	H	53.97	-13.58	Avg	207.00	111.39	
7425.00	44.94	H	73.97	-29.03	Peak	24.00	175.08	
7425.00	34.36	H	53.97	-19.61	Avg	24.00	175.08	
9900.00	50.76	H	80.89	-30.13	Peak	124.25	111.38	Not in Restricted Band
12375.00	47.52	H	73.97	-26.45	Peak	311.00	143.26	
12375.00	36.47	H	53.97	-17.50	Avg	311.00	143.26	
14850.00								No Emission Detected
14850.00								
17325.00								No Emission Detected
17325.00								
19800.00								No Emission Detected
19800.00								
22275.00								No Emission Detected
22275.00								
24750.00								No Emission Detected
24750.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - High Channel - RF4CE Mode
Transmit Mode - Y-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	46.35	H	73.97	-27.62	Peak	187.50	191.08	
4950.00	38.59	H	53.97	-15.38	Avg	187.50	191.08	
7425.00	45.00	H	73.97	-28.97	Peak	138.00	127.32	
7425.00	34.71	H	53.97	-19.26	Avg	138.00	127.32	
9900.00	50.58	H	80.89	-30.31	Peak	336.00	222.91	Not in Restricted Band
12375.00	47.47	H	73.97	-26.50	Peak	187.75	127.14	
12375.00	36.53	H	53.97	-17.44	Avg	187.75	127.14	
14850.00								No Emission Detected
14850.00								
17325.00								No Emission Detected
17325.00								
19800.00								No Emission Detected
19800.00								
22275.00								No Emission Detected
22275.00								
24750.00								No Emission Detected
24750.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247

Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

Date: 05/15/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - High Channel - RF4CE Mode
Transmit Mode - Z-Axis - Tested at +8 dBm**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4950.00	41.33	H	73.97	-32.64	Peak	254.50	175.20	
4950.00	30.56	H	53.97	-23.41	Avg	254.50	175.20	
7425.00	45.75	H	73.97	-28.22	Peak	89.75	207.32	
7425.00	34.28	H	53.97	-19.69	Avg	89.75	207.32	
9900.00	51.52	H	80.89	-29.37	Peak	221.75	127.14	Not in Restricted Band
12375.00	47.80	H	73.97	-26.17	Peak	273.50	111.32	
12375.00	37.17	H	53.97	-16.80	Avg	273.50	111.32	
14850.00								No Emission Detected
14850.00								
17325.00								No Emission Detected
17325.00								
19800.00								No Emission Detected
19800.00								
22275.00								No Emission Detected
22275.00								
24750.00								No Emission Detected
24750.00								

*The limit at the 4th harmonic is 20 dB below the maximum fundamental of 100.89 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

FCC 15.247 and FCC class B

Universal Electronics, Inc.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 05/15/2019
 Lab: D
 Tested By: Kyle Fujimoto

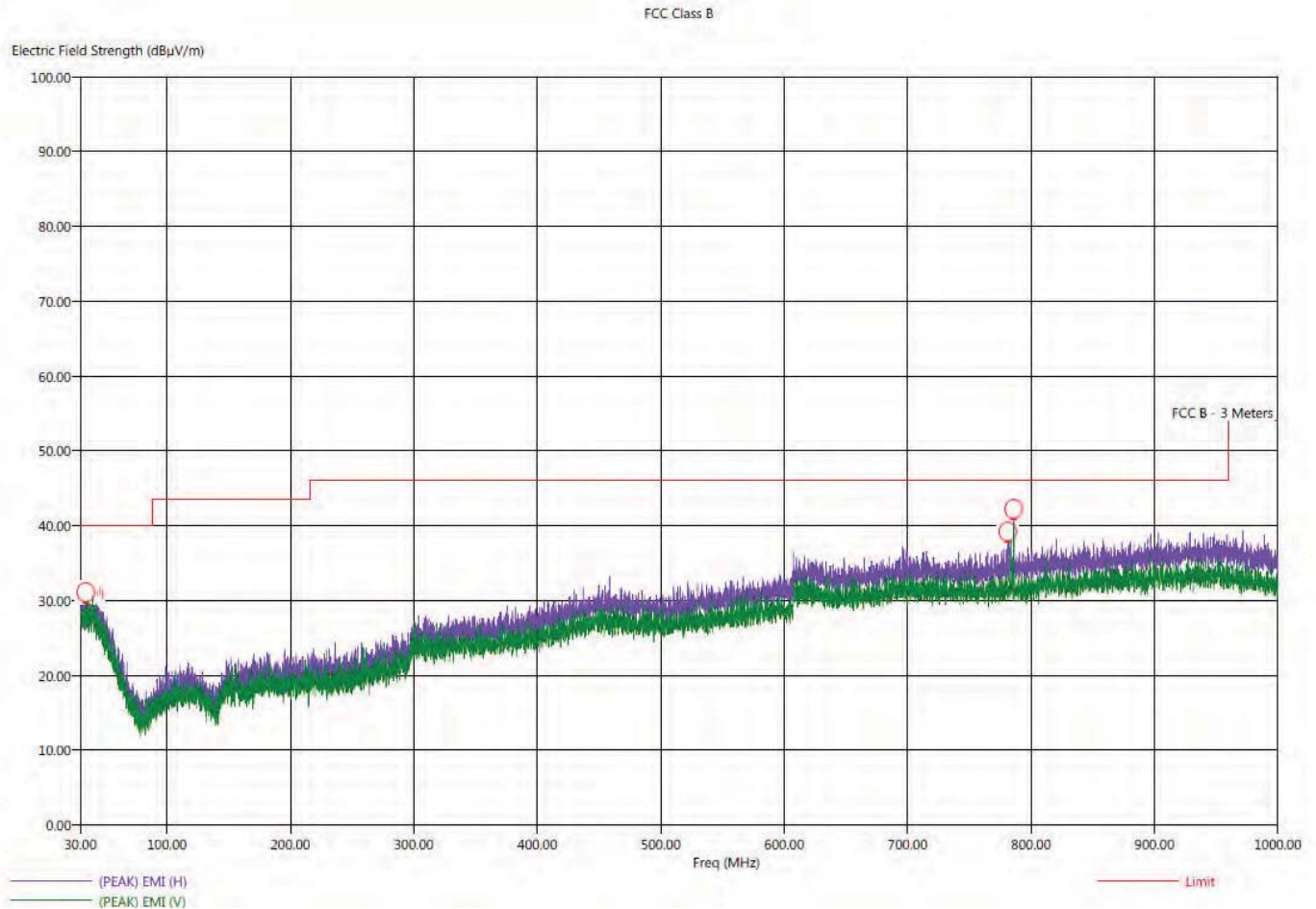
Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz

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 - Dish 54.0 Brisbane CR 2019 - 30 MHz to 1 GHz.set
Operator: Kyle Fujimoto
EUT Type: Dish 54.0 Brisbane CR 2018
EUT Condition: The EUT is continuously transmitting RF4CE at 2425 MHz - X-Axis Worst Case
Comments: Company: Universal Electronics, Inc.
P/N: R32027BA00-00006
S/N: N/A

6/3/2019 3:06:03 PM
Sequence: Preliminary Scan



Title: Radiated Final Scan - FCC Class B

File: 1 - Final Scan - Dish 54.0 Brisbane CR 2019 - 30 MHz to 1 GHz.set

Operator: Kyle Fujimoto

EUT Type: Dish 54.0 Brisbane CR 2018

EUT Condition: The EUT is continuously transmitting RF4CE at 2425 MHz - X-Axis Worst Case

Company: Universal Electronics, Inc.

P/N: R32027BA00-00006

S/N: N/A

6/3/2019 3:30:33 PM

Sequence: Final Measurements

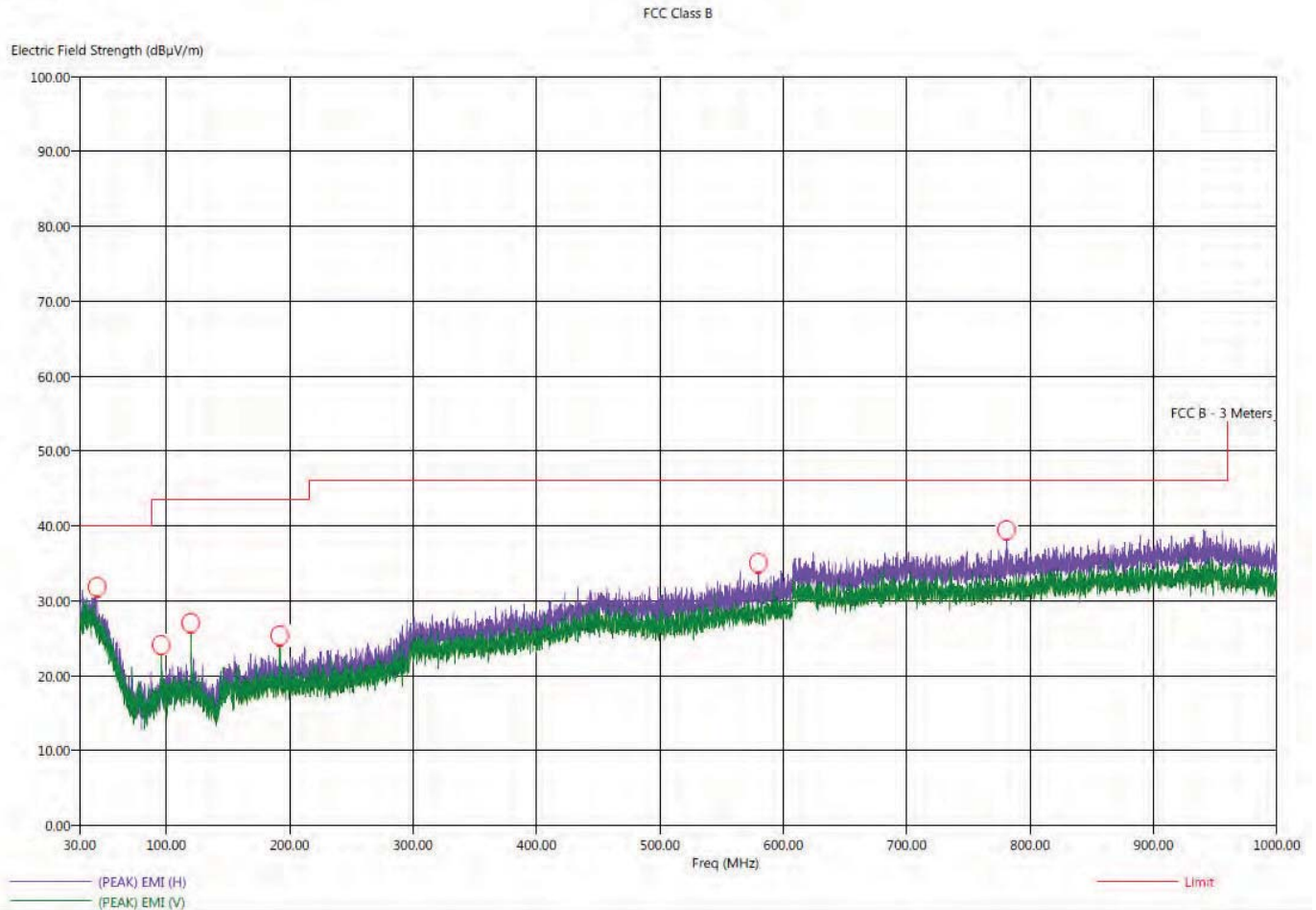
FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(QP) EMI (dBμV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Ttbl Agl (deg)	Twr Ht (cm)
34.40	H	31.35	26.68	-8.65	-13.32	40.00	23.98	0.85	28.50	112.10
36.10	H	32.87	26.69	-7.13	-13.31	40.00	24.17	0.86	123.00	317.77
38.40	H	32.54	27.03	-7.46	-12.97	40.00	24.51	0.89	360.00	270.13
40.80	H	32.69	26.86	-7.31	-13.14	40.00	24.38	0.90	95.00	206.79
781.20	H	37.84	31.76	-8.16	-14.24	46.00	25.07	2.76	253.00	366.19
786.00	V	39.18	37.96	-6.82	-8.04	46.00	25.15	2.77	41.25	398.01



Title: Radiated Pre-Scan - FCC Class B
File: 1 - Pre-Scan - Dish 54.0 Brisbane CR 2019 - 30 MHz to 1 GHz - 06-03-2019.set
Operator: Kyle Fujimoto
EUT Type: Dish 54.0 Brisbane CR 2018
EUT Condition: The EUT is continuously transmitting IR
Comments: Company: Universal Electronics, Inc.
P/N: R32027BA00-00006
S/N: N/A

6/3/2019 4:14:05 PM
Sequence: Preliminary Scan

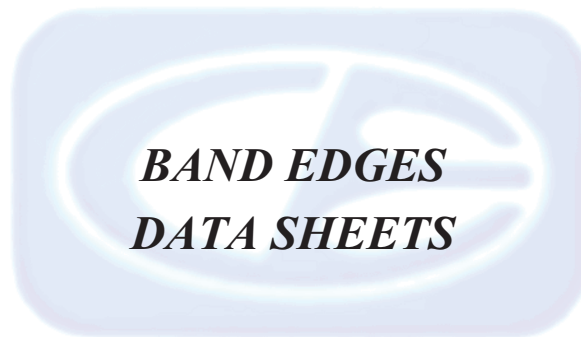


Title: Radiated Final Scan - FCC Class B
File: 1 - Final Scan - Dish 54.0 Brisbane CR 2019 - 30 MHz to 1 GHz - 06-03-2019.set
Operator: Kyle Fujimoto
EUT Type: Dish 54.0 Brisbane CR 2018
EUT Condition: The EUT is continuously transmitting IR
Comments: Company: Universal Electronics, Inc.
P/N: R32027BA00-00006
S/N: N/A

6/3/2019 4:42:25 PM
Sequence: Final Measurements

FCC Class B										
Freq (MHz)	Pol	(PEAK) EMI (dBuV/m)	(QP) EMI (dBuV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBuV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (dea)	Twr Ht (cm)
44.00	H	30.63	25.24	-9.37	-14.76	40.00	23.18	0.90	180.25	238.49
96.00	V	20.89	15.53	-22.61	-27.97	43.50	13.88	1.10	184.50	302.07
120.00	V	22.20	16.77	-21.30	-26.73	43.50	15.30	1.18	184.25	302.31
192.00	V	23.15	18.06	-20.35	-25.44	43.50	14.25	1.44	233.50	222.79
580.00	H	34.65	29.73	-11.35	-16.27	46.00	22.97	2.42	60.75	350.43
781.00	H	37.26	31.77	-8.74	-14.23	46.00	25.07	2.76	336.75	111.32



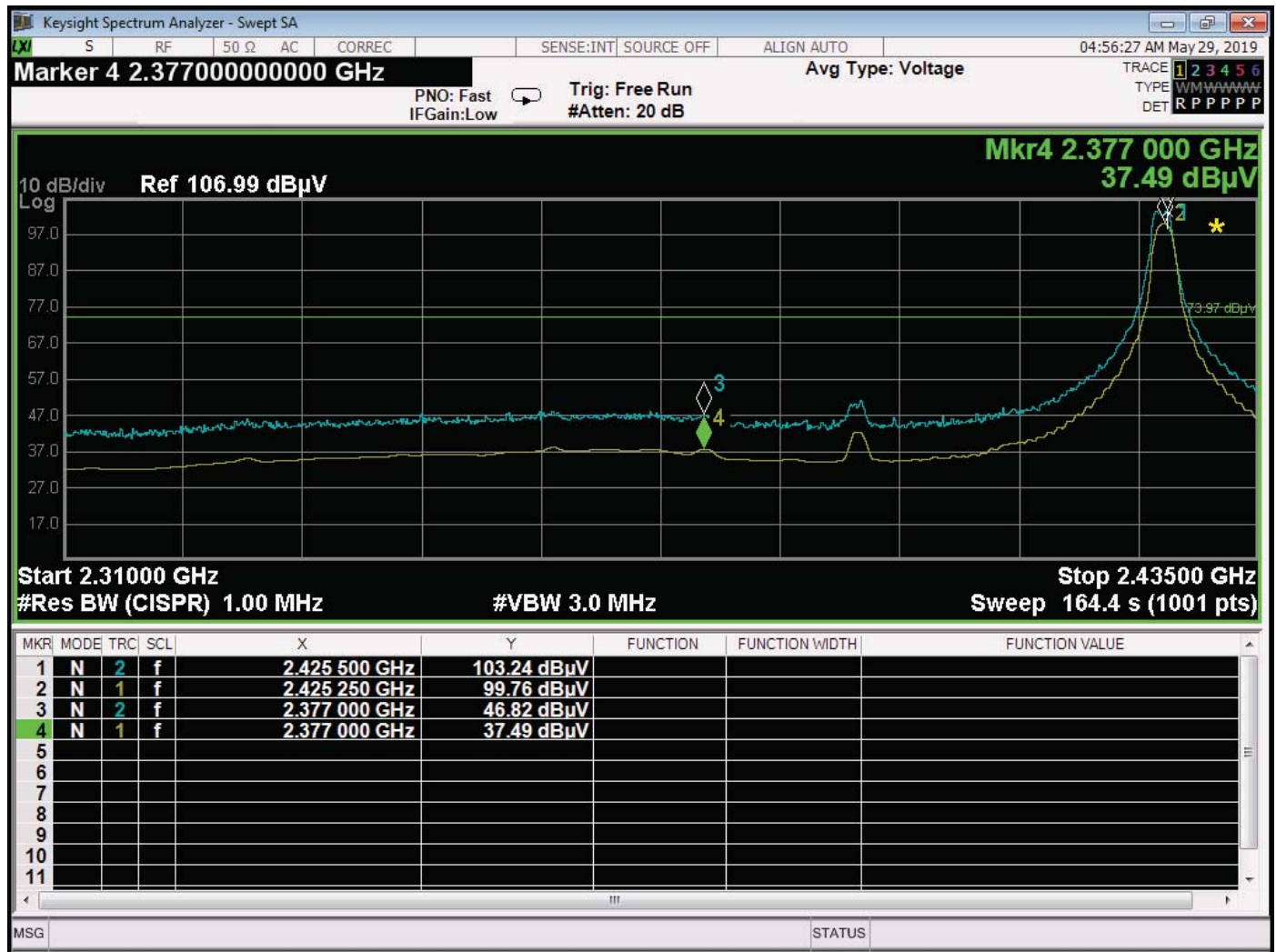


FCC 15.247Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006Date: 05/29/2019
Lab: D
Tested By: Kyle Fujimoto**Band Edges - RF4CE Mode**

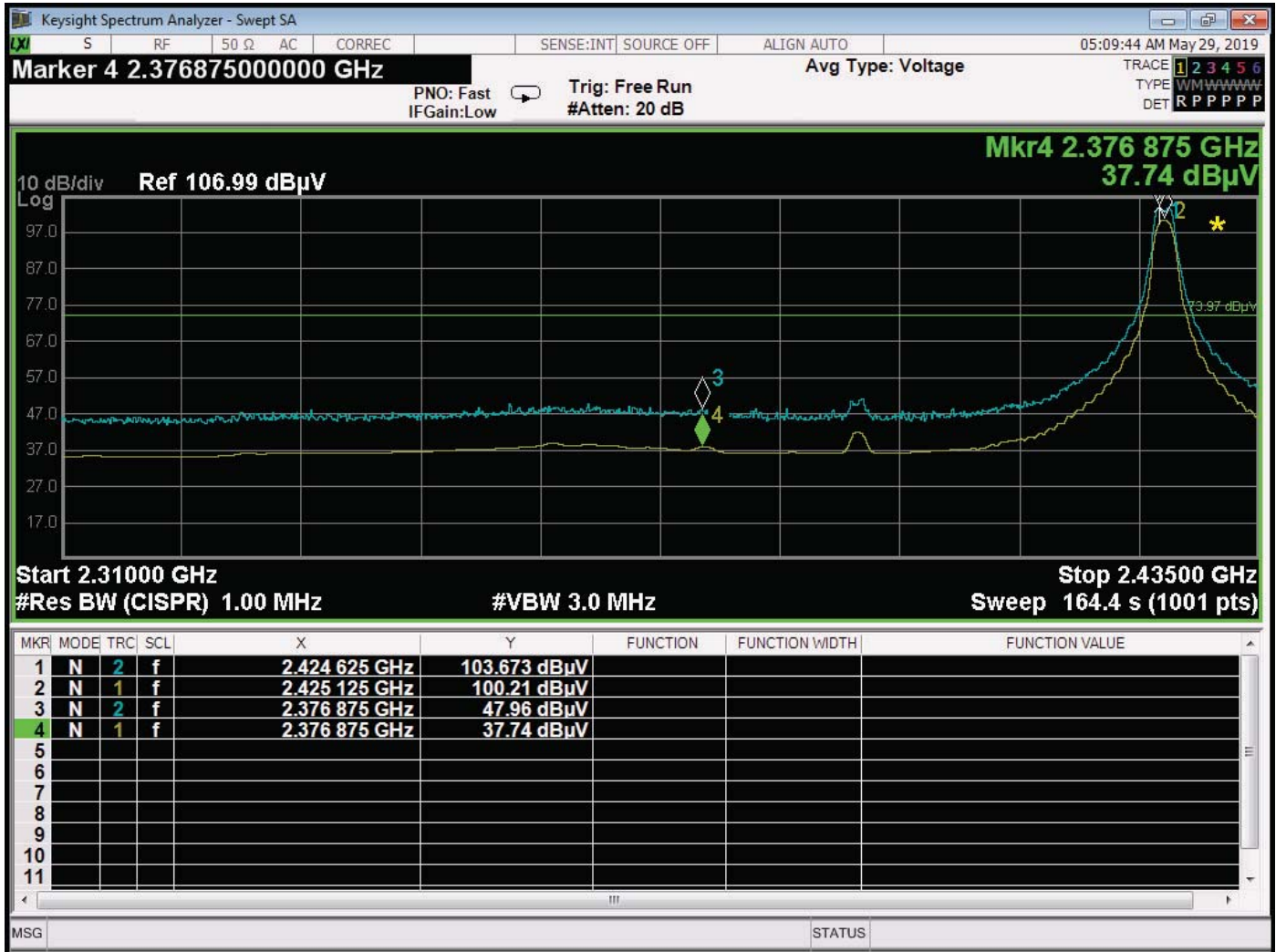
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2425.00	103.24	H	--	--	Peak	27.00	189.29	Fundamental - Low Ch.
2425.00	99.76	H	--	--	Avg	27.00	189.29	X-Axis - Worst Case
2377.00	46.82	H	73.97	-27.15	Peak	27.00	189.29	Band Edge
2377.00	37.49	H	53.97	-16.48	Avg	27.00	189.29	X-Axis - Worst Case
2425.00	103.67	V	--	--	Peak	22.25	174.25	Fundamental - Low Ch.
2425.00	100.21	V	--	--	Avg	22.25	174.25	Y-Axis - Worst Case
2376.88	47.96	V	73.97	-26.01	Peak	22.25	174.25	Band Edge
2376.88	37.74	V	53.97	-16.23	Avg	22.25	174.25	Y-Axis - Worst Case

FCC 15.247Universal Electronics, Inc.
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006Date: 05/29/2019
Lab: D
Tested By: Kyle Fujimoto**Band Edges - RF4CE Mode**

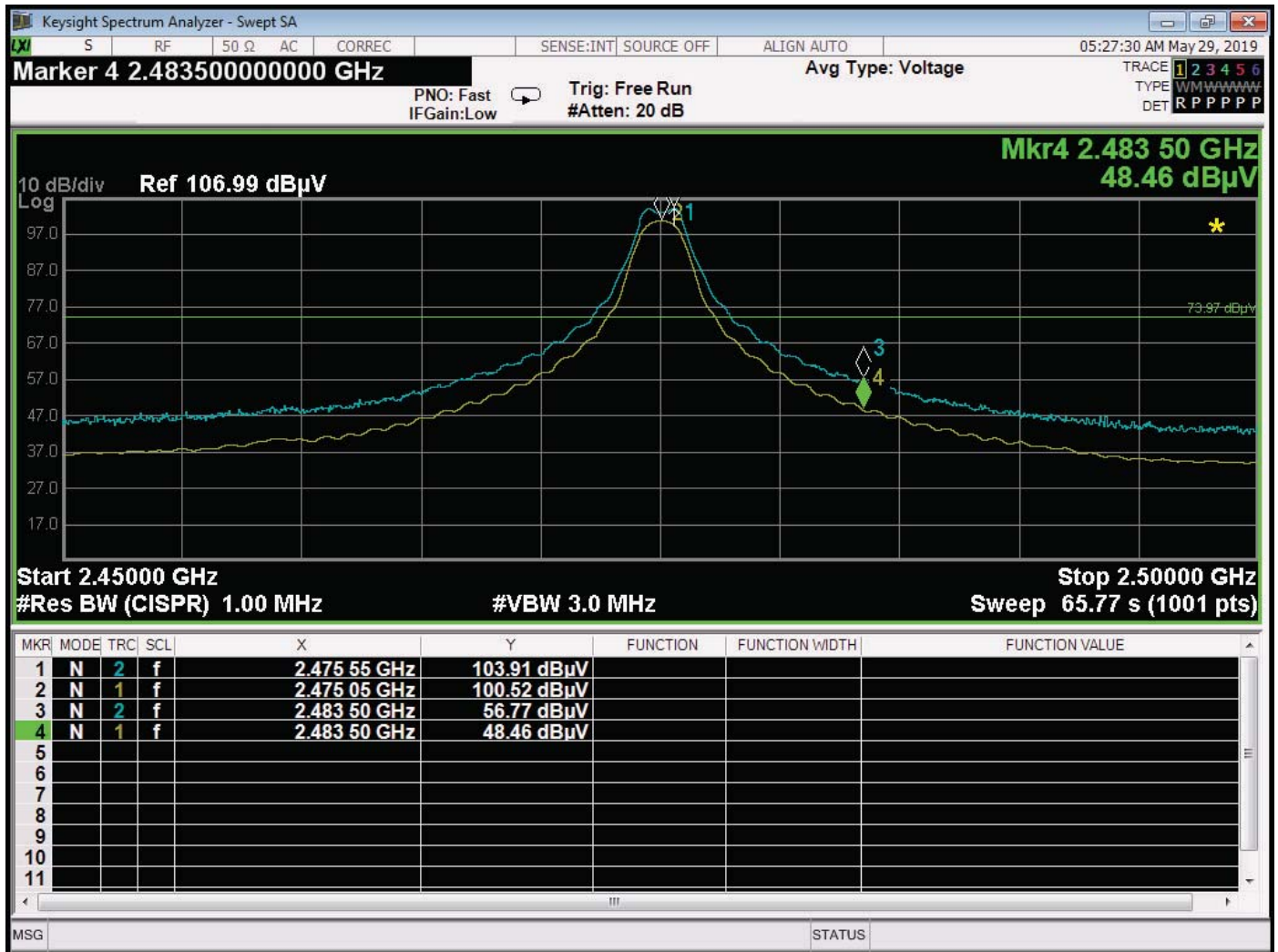
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475.00	103.91	H	--	--	Peak	46.00	173.77	Fundamental - High Ch.
2475.00	100.52	H	--	--	Avg	46.00	173.77	X-Axis - Worst Case
2483.50	56.77	H	73.97	-17.20	Peak	46.00	173.77	Band Edge
2483.50	48.46	H	53.97	-5.51	Avg	46.00	173.77	X-Axis - Worst Case
2475.00	103.57	V	--	--	Peak	44.00	185.25	Fundamental - High Ch.
2475.00	100.13	V	--	--	Avg	44.00	185.25	Y-Axis - Worst Case
2483.50	56.24	V	73.97	-17.73	Peak	44.00	185.25	Band Edge
2483.50	47.35	V	53.97	-6.62	Avg	44.00	185.25	Y-Axis - Worst Case



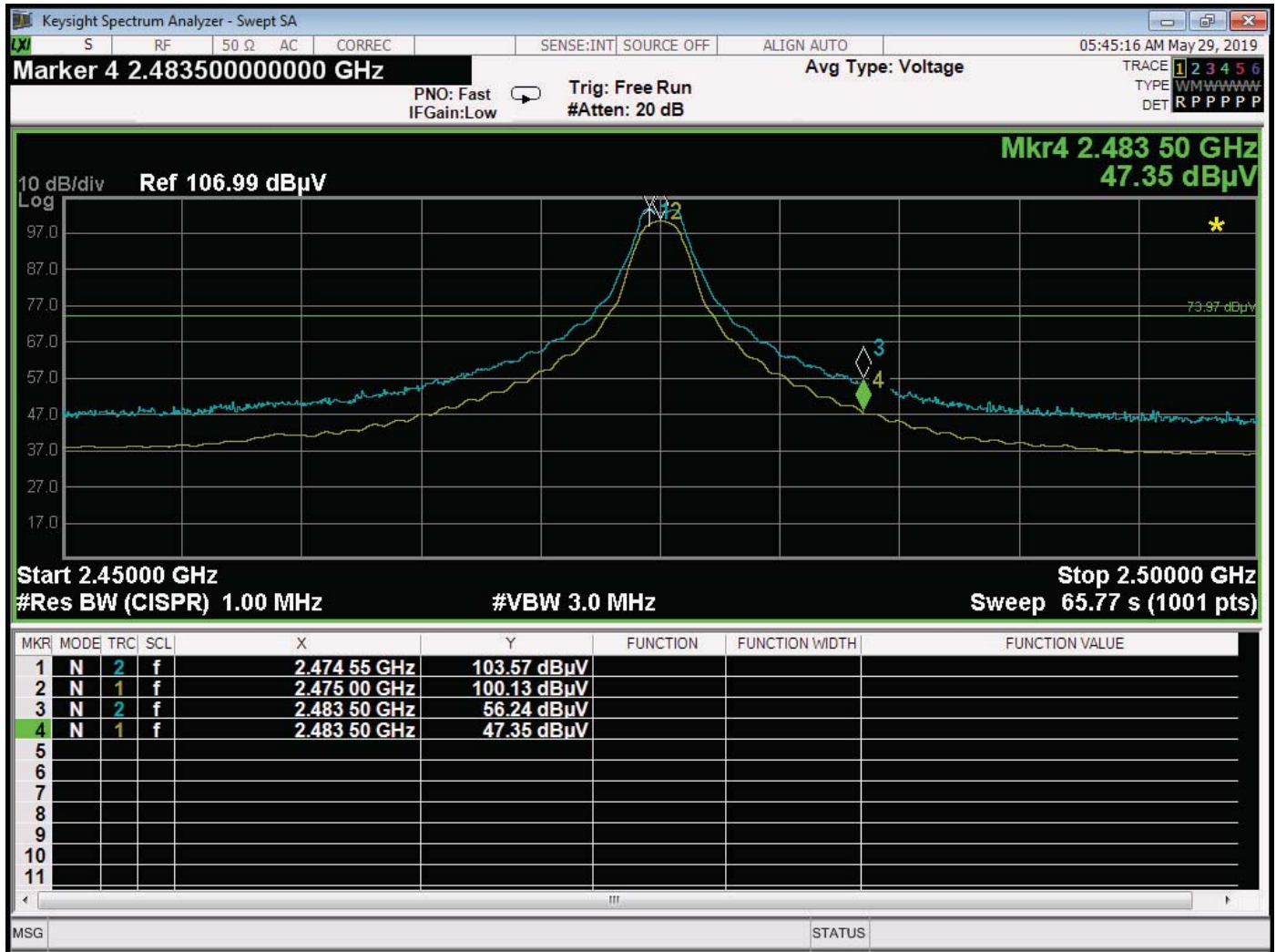
BE - 2425 MHz - Horizontal - X-Axis Worst Case



BE - 2425 MHz - Vertical- Y-Axis Worst Case

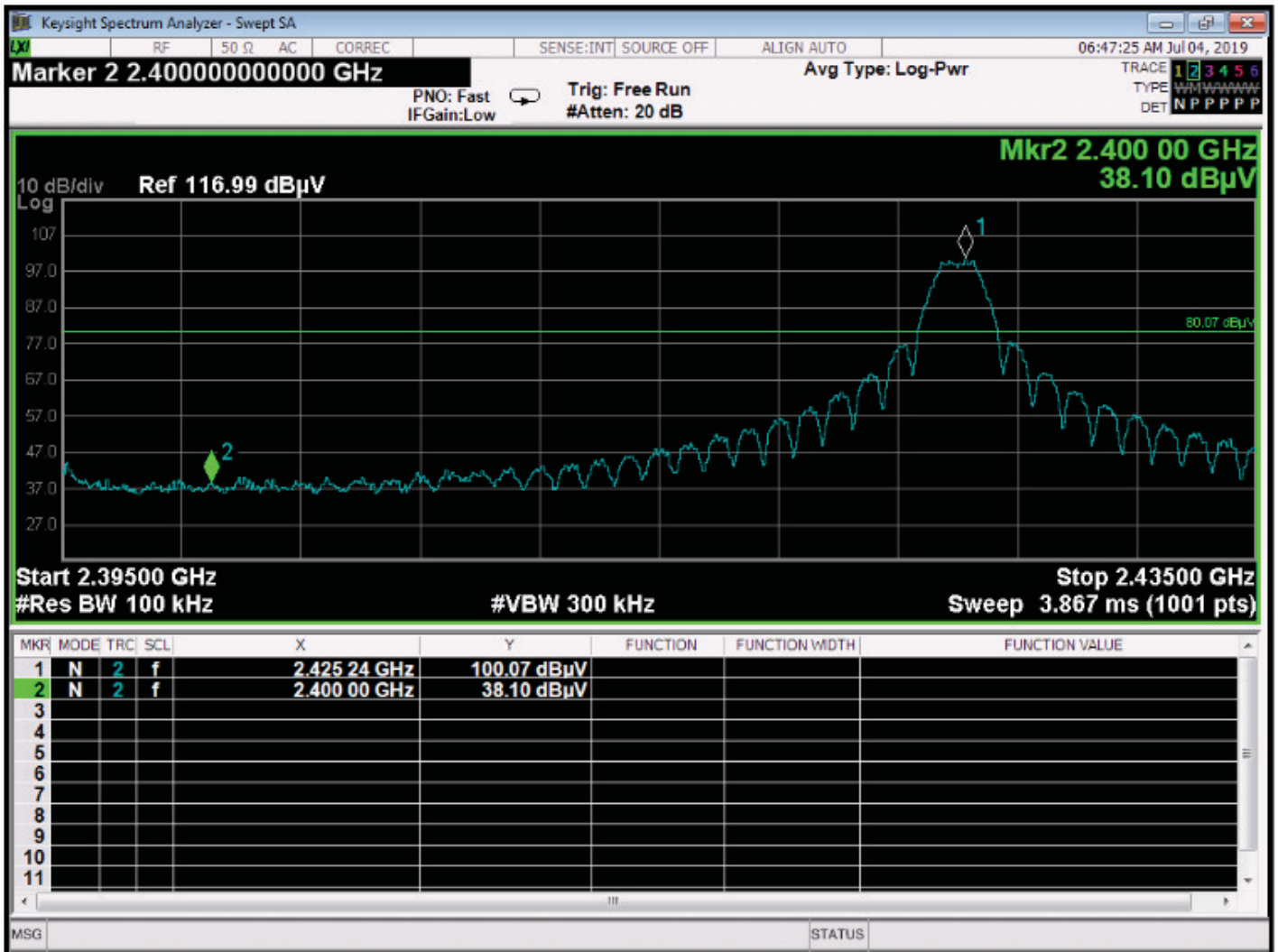


BE - 2475 MHz - Horizontal - X-Axis Worst Case

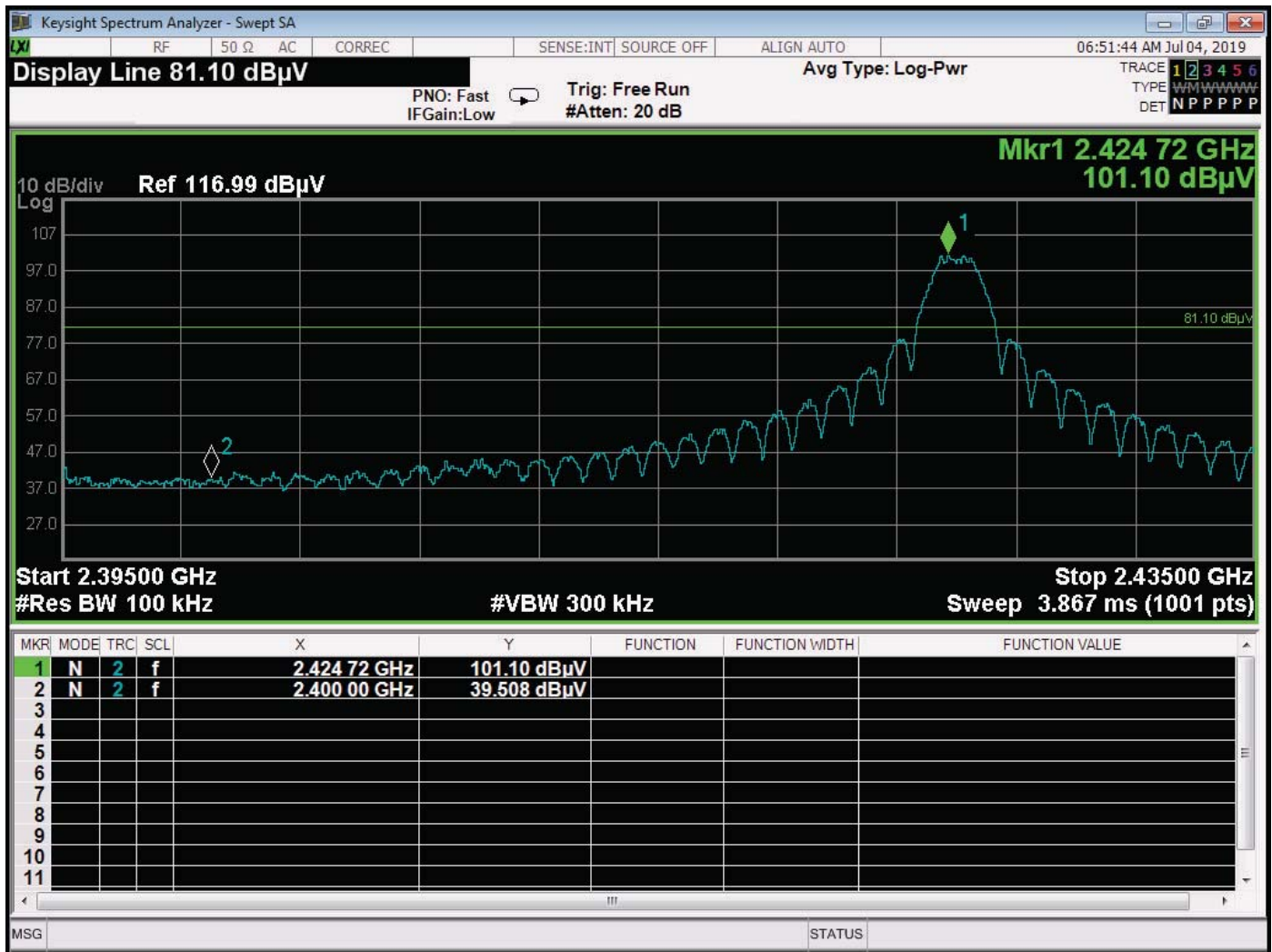


BE - 2475 MHz - Vertical - Y-Axis Worst Case

BAND EDGES
AT 2400 MHz DATA SHEETS

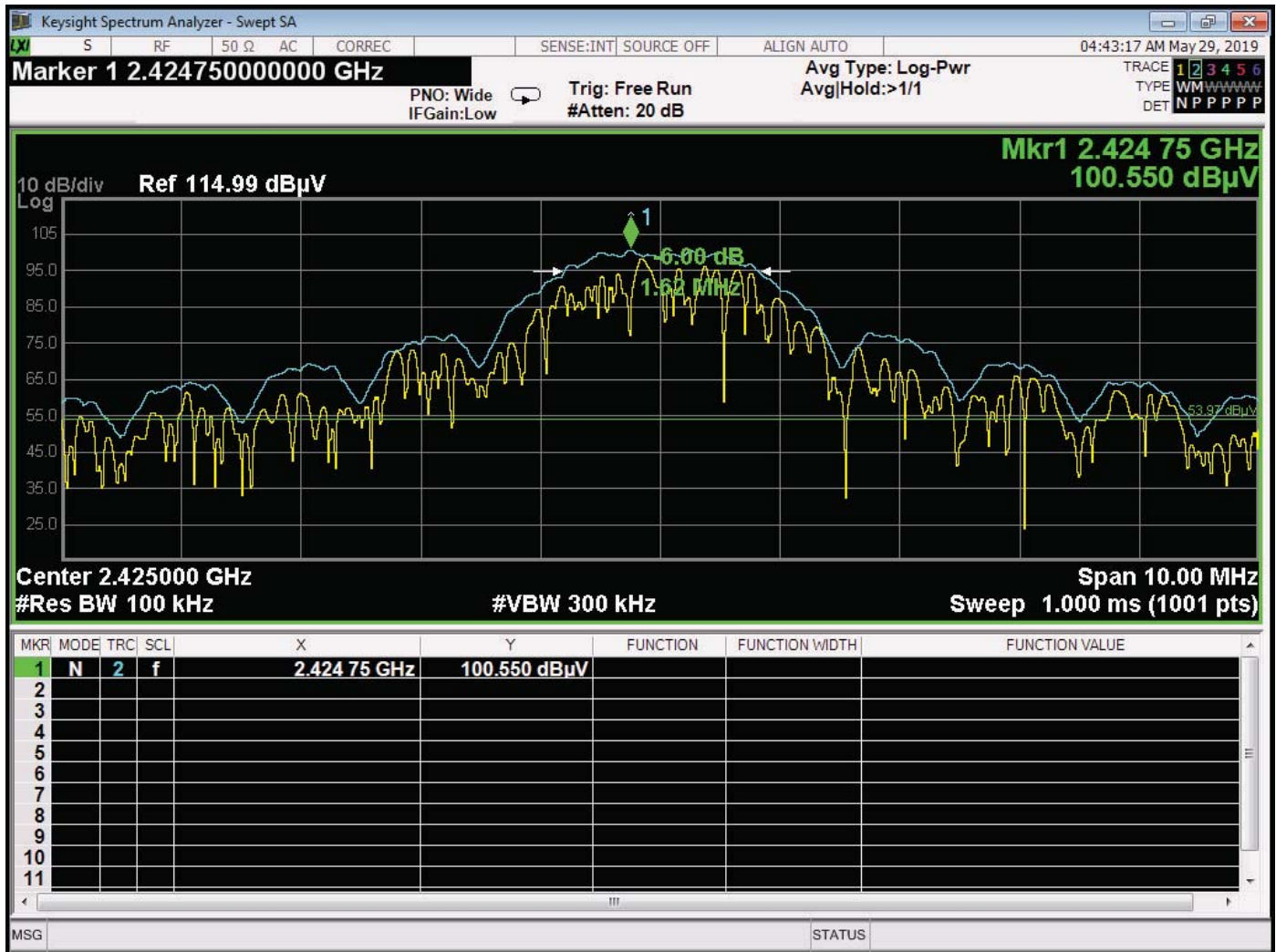


BE – Low Channel at 2400 MHz – Vertical – Y-Axis Worst Case

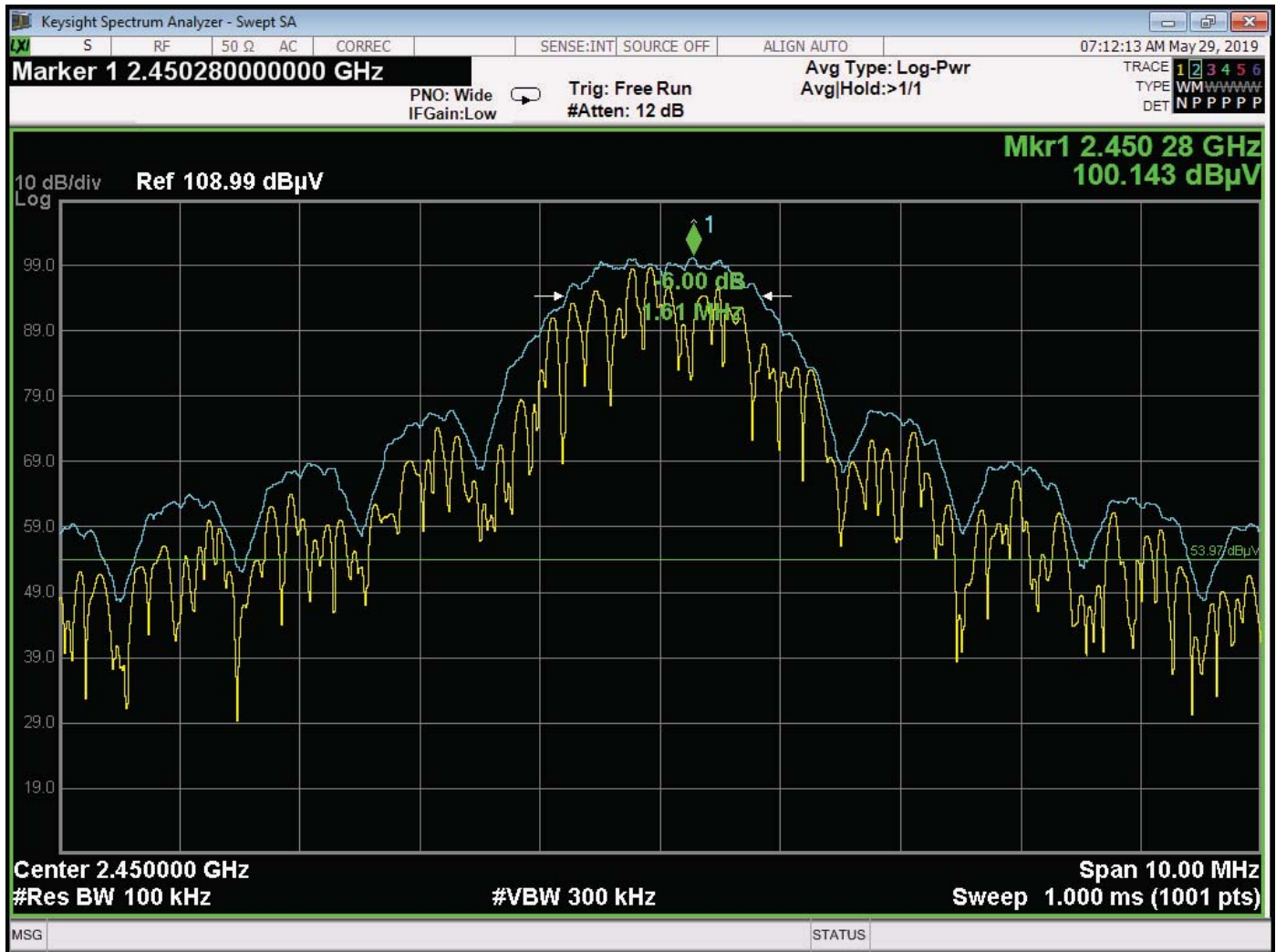


BE – Low Channel at 2400 MHz – Horizontal – X-Axis Worst Case

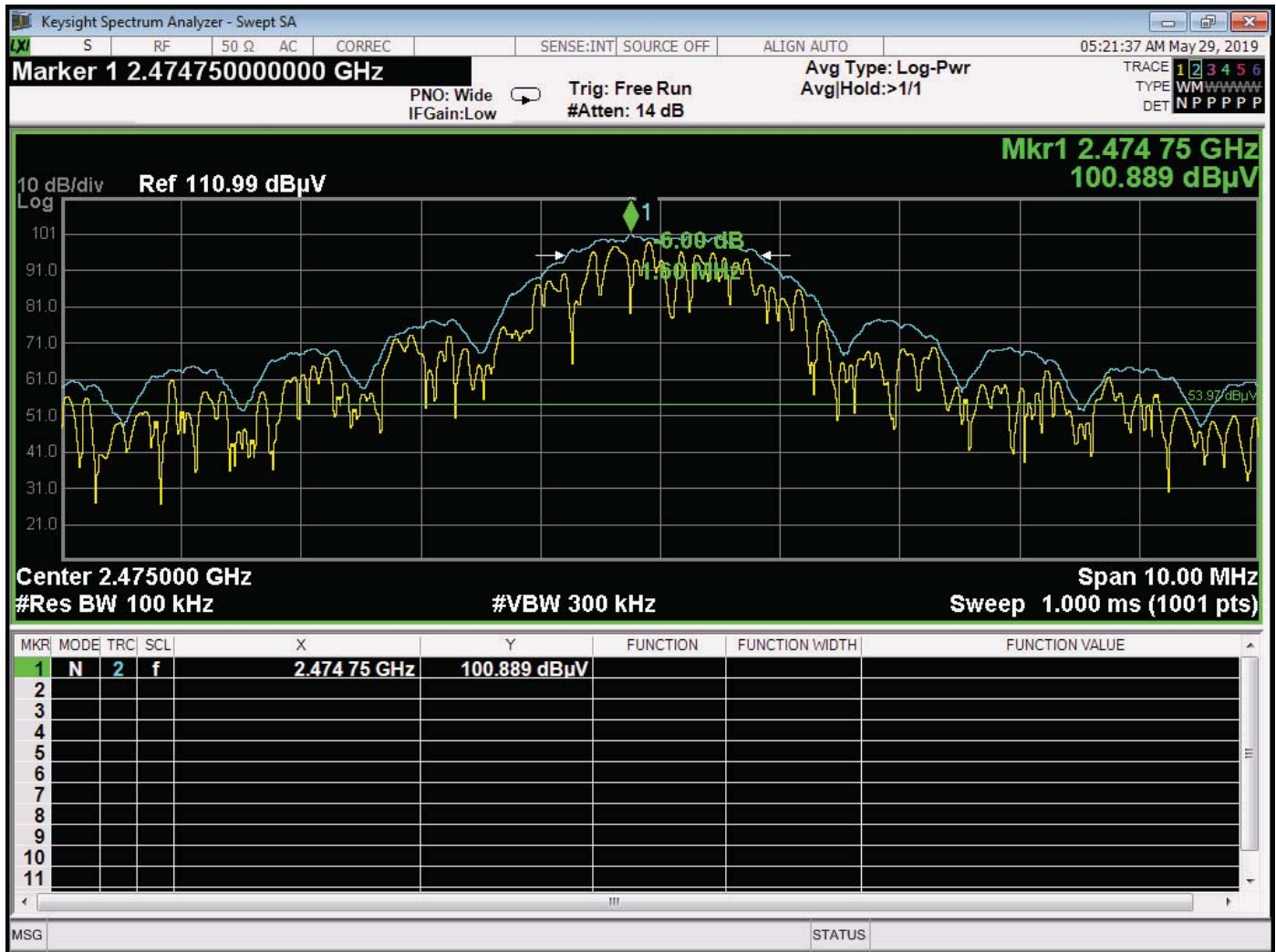
***DTS BANDWIDTH
DATA SHEETS***



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.
Dish 54.0 Brisbane CR 2018
P/N: R32027BA00-00006

Date: 05/21/2019

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	103.67	0.152580839	2	1.584893	0.00440678	4.40678	6.44	30.00	-23.56	Vert. X-Axis
2450.00	100.16	0.101894326	2	1.584893	0.00196527	1.96527	2.93	30.00	-27.07	Vert. X-Axis
2475.00	103.57	0.150834261	2	1.584893	0.00430647	4.30647	6.34	30.00	-23.66	Vert. X-Axis
2425.00	99.19	0.091096145	2	1.584893	0.00157080	1.57080	1.96	30.00	-28.04	Vert. Y-Axis
2450.00	99.65	0.096050582	2	1.584893	0.00174631	1.74631	2.42	30.00	-27.58	Vert. Y-Axis
2475.00	96.61	0.067686179	2	1.584893	0.00086720	0.86720	-0.62	30.00	-30.62	Vert. Y-Axis
2425.00	102.59	0.134741073	2	1.584893	0.00343654	3.43654	5.36	30.00	-24.64	Vert. Z-Axis
2450.00	102.56	0.134276496	2	1.584893	0.00341288	3.41288	5.33	30.00	-24.67	Vert. Z-Axis
2475.00	100.27	0.103157308	2	1.584893	0.00201429	2.01429	3.04	30.00	-26.96	Vert. Z-Axis
2425.00	103.24	0.145211162	2	1.584893	0.00399136	3.99136	6.01	30.00	-23.99	Horiz. X-Axis
2450.00	103.60	0.15140841	2	1.584893	0.00433932	4.33932	6.37	30.00	-23.63	Horiz. X-Axis
2475.00	103.91	0.15685559	2	1.584893	0.00465716	4.65716	6.68	30.00	-23.32	Horiz. X-Axis
2425.00	102.05	0.126619327	2	1.584893	0.00303474	3.03474	4.82	30.00	-25.18	Horiz. Y-Axis
2450.00	100.70	0.108392691	2	1.584893	0.00222393	2.22393	3.47	30.00	-26.53	Horiz. Y-Axis
2475.00	102.24	0.129419584	2	1.584893	0.00317045	3.17045	5.01	30.00	-24.99	Horiz. Y-Axis
2425.00	96.64	0.067920363	2	1.584893	0.00087322	0.87322	-0.59	30.00	-30.59	Horiz. Z-Axis
2450.00	102.24	0.129419584	2	1.584893	0.00317045	3.17045	5.01	30.00	-24.99	Horiz. Z-Axis
2475.00	95.66	0.060673633	2	1.584893	0.00069682	0.69682	-1.57	30.00	-31.57	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.
 Dish 54.0 Brisbane CR 2018
 Model: R32027BA00-00006

Date: 5/29/2019

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	88.03	0.025205772	2	1.584893	0.00012026	0.12026	-9.20	8.00	-17.20	Vert. X-Axis
2450.00	84.11	0.016050923	2	1.584893	0.00004877	0.04877	-13.12	8.00	-21.12	Vert. X-Axis
2475.00	87.21	0.022935066	2	1.584893	0.00009957	0.09957	-10.02	8.00	-18.02	Vert. X-Axis
2425.00	88.35	0.026151704	2	1.584893	0.00012946	0.12946	-8.88	8.00	-16.88	Vert. Y-Axis
2450.00	84.19	0.01619944	2	1.584893	0.00004967	0.04967	-13.04	8.00	-21.04	Vert. Y-Axis
2475.00	87.38	0.023388372	2	1.584893	0.00010354	0.10354	-9.85	8.00	-17.85	Vert. Y-Axis
2425.00	87.63	0.024071325	2	1.584893	0.00010968	0.10968	-9.60	8.00	-17.60	Vert. Z-Axis
2450.00	83.69	0.015293257	2	1.584893	0.00004427	0.04427	-13.54	8.00	-21.54	Vert. Z-Axis
2475.00	84.99	0.017762333	2	1.584893	0.00005972	0.05972	-12.24	8.00	-20.24	Vert. Z-Axis
2425.00	87.31	0.023200642	2	1.584893	0.00010189	0.10189	-9.92	8.00	-17.92	Horiz. X-Axis
2450.00	87.42	0.023496328	2	1.584893	0.00010450	0.10450	-9.81	8.00	-17.81	Horiz. X-Axis
2475.00	88.50	0.026607251	2	1.584893	0.00013401	0.13401	-8.73	8.00	-16.73	Horiz. X-Axis
2425.00	87.21	0.022935066	2	1.584893	0.00009957	0.09957	-10.02	8.00	-18.02	Horiz. Y-Axis
2450.00	85.69	0.01925307	2	1.584893	0.00007017	0.07017	-11.54	8.00	-19.54	Horiz. Y-Axis
2475.00	87.26	0.023067472	2	1.584893	0.00010072	0.10072	-9.97	8.00	-17.97	Horiz. Y-Axis
2425.00	81.54	0.011939881	2	1.584893	0.00002698	0.02698	-15.69	8.00	-23.69	Horiz. Z-Axis
2450.00	87.03	0.022464668	2	1.584893	0.00009553	0.09553	-10.20	8.00	-18.20	Horiz. Z-Axis
2475.00	80.01	0.01001152	2	1.584893	0.00001897	0.01897	-17.22	8.00	-25.22	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