

### FCC CLASS II PERMISSIVE CHANGE TEST REPORT

for

# **DISH 54.0 BRISBANE CR 2018**

Model: R32027BA00-00006

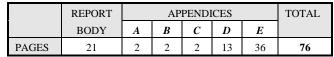
Prepared for

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DATE: DECEMBER 16, 2019





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Dish 54.0 Brisbane CR 2018 Model: R32027BA00-00006

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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: December 13 and December 16-17, 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 <b>Class B</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 48.57 (Avg) dBuV/m @ 4950.00 MHz (*U = 3.61 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                        | This test was not performed since it was unlikely to change due to the modification.   |  |
| 5    | RF Band Edges                            | Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (d)  |  |
| 6    | Spectral Density                         | This test was not performed since it was unlikely to change due to the modification  |  |



Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

### 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.

The EUT was originally granted under the FCC ID: MG3-R32027B6. The EUT is a Class II Permissive Change because a change was made to the non-radio portion of the EUT and it is no longer electrically identical to the original. However, no RF parameters such as power output and frequency has been changed



# 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.

Harvey Samaco 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/ANot ApplicableTxTransmitRxReceiveIncIncorporatedRFRadio Frequency

IR Infrared



# 3. APPLICABLE DOCUMENTS

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

| SPEC   | TITLE   |
|--|---|
| FCC Title 47,<br>Part 15<br>Subpart C        | FCC Rules – Radio frequency devices (including digital devices) – Intentional Radiators   |
| FCC Title 47,<br>Part 15<br>Subpart B        | FCC Rules – Radio frequency devices (including digital devices) – Unintentional Radiators   |
| 558074 D01<br>DTS Meas<br>Guidance<br>v05r02 | Guidance for Performing Compliance Measurements on Digital<br>Transmissions Systems (DTS) Operating Under Section 15.247  |
| ANSI C63.4<br>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<br>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<br>NUMBER | FCC ID       |
|-------------------------------------|--------------------------------|--------------------------|------------------|--------------|
| DISH 54.0 BRISBANE CR 2018<br>(EUT) | UNIVERSAL<br>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<br>ELECTRONICS, INC. | RMF-TX300C               | N/A              | N/A          |
| FIRMWARE*                           | UNIVERSAL<br>ELECTRONICS, INC. | RADIO CONTROL<br>CONSOLE | v4.0.3           | N/A          |

<sup>\*</sup>Used to program the EUT only and was removed prior to the testing



# **5.2** Emissions Test Equipment

| EQUIPMENT<br>TYPE                 | MANU-<br>FACTURER                               | MODEL<br>NUMBER | SERIAL<br>NUMBER | CALIBRATION<br>DATE | CAL. CYCLE |  |
|-----------------------------------|---|-----------------|------------------|---------------------|------------|--|
|                                   | RADIATED AND CONDUCTED EMISSIONS TEST EQUIPMENT |                 |                  |                     |            |  |
| TDK TestLab                       | TDK RF<br>Solutions, Inc.                       | 9.22            | 700145           | N/A                 | N/A        |  |
| Computer                          | Hewlett Packard                                 | p6716f          | MXX1030PX0       | N/A                 | N/A        |  |
| LCD Monitor                       | Hewlett Packard                                 | 52031a          | 3CQ046N3MG       | N/A                 | N/A        |  |
| EMI Receiver,<br>20 Hz – 26.5 GHz | Keysight<br>Technologies                        | N9038A          | MY5120150        | August 23, 2019     | 1 Year     |  |
| CombiLog Antenna                  | Com-Power                                       | AC-220          | 061093           | June 5, 2019        | 2 Year     |  |
| System Controller                 | Sunol Sciences<br>Corporation                   | SC110V          | 112213-1         | N/A                 | N/A        |  |
| Turntable                         | Sunol Sciences<br>Corporation                   | 2011VS          | N/A              | N/A                 | N/A        |  |
| Antenna-Mast                      | Sunol Sciences<br>Corporation                   | TWR95-4         | 112213-3         | N/A                 | N/A        |  |
| Turntable                         | Com-Power                                       | TT-100          | N/A              | N/A                 | N/A        |  |
| Antenna-Mast                      | Com-Power                                       | AM-100          | N/A              | N/A                 | N/A        |  |
| Horn Antenna                      | Com-Power                                       | AH-118          | 071175           | February 22, 2018   | 2 Year     |  |
| Preamplifier                      | Com-Power                                       | PA-118          | 181653           | January 25, 2019    | 1 Year     |  |
| Preamplifier                      | Com-Power                                       | PA-840          | 711013           | May 10, 2018        | 2 Year     |  |
| Horn Antenna                      | Com-Power                                       | AH-826          | 71957            | N/A                 | N/A        |  |
| Loop Antenna                      | Com-Power                                       | AL-130R         | 121090           | February 5, 2019    | 2 Year     |  |



### 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<br>CONFIGURATION          | UNCERTAINTY<br>VALUES                      |
|--------------------|--------------------------------------|--|
| RADIATED EMISSIONS | 3-METER CHAMBER,<br>COMBILOG ANTENNA | 3.26 dB (Vertical)<br>3.19 dB (Horizontal) |
| RADIATED EMISSIONS | 3-METER CHAMBER,<br>HORN ANTENNA     | 3.61 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<br>MEASUREMENT<br>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<br>(MHz)   | EMI Reading<br>(dBuV/m) | Specification Limit (dBuV/m) | Delta<br>(Cor. Reading – Spec. Limit)<br>(dB) |
|----------------------|-------------------------|------------------------------|---|
| 4950.00 (V) (Y-Axis) | 48.57 (Avg)             | 53.97                        | -5.40   |
| 2483.50 (H) (X-axis) | 47.98 (Avg)             | 53.97                        | -5.99   |
| 4900.00 (H) (Z-Axis) | 47.89 (Avg)             | 53.97                        | -6.08   |
| 4900.00 (V) (Y-Axis) | 47.88 (Avg)             | 53.97                        | -6.09   |
| 4950.00 (H) (Z-Axis) | 47.66 (Avg)             | 53.97                        | -6.31   |
| 4950.00 (H) (Y-Axis) | 47.26 (Avg)             | 53.97                        | -6.71   |

#### Notes:

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



### **8.1.4** Sample Calculations

A correction factor for the antenna, cable and a distance factor (if any) must be applied to the meter reading before a true field strength reading can be obtained. This Corrected Meter Reading is then compared to the specification limit in order to determine compliance with the limits.

The equation can be derived in the following manner:

Specification limit ( $\mu V/m$ ) log x 20 = Specification Limit in dBuV

(Specification distance / test distance)  $\log x = 40 = 4$ 

Note: When using an Active Antenna, the Antenna factor shall be subtracted due to the combination of the internal amplification and antenna loss. At lower frequencies the cable loss is negligible.

OR

Corrected Meter Reading = meter reading + F - A + C

where: F = antenna factor

A= amplifier gain C = cable loss

The correction factors for the antenna and the amplifier gain are attached in Appendix D of this report. The data sheets are attached in Appendix E.

The distance factor D is 0 when the test is performed at the required specification distance.

#### 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:

- $P = [(E*D)^2] / (30 G)$
- 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:**

This test was not performed since it was unlikely to change due to the modification.



### 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 101.40 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.

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

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 >= 3 X RBW
- 5. Detector = Peak
- 6. Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span/RBW}$
- 7. Sweep time = auto couple
- 8. Use the peak marker function to determine the maximum amplitude level

#### **Test Results:**

This test was not performed since it was unlikely to change due to the modification.



Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

### 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.



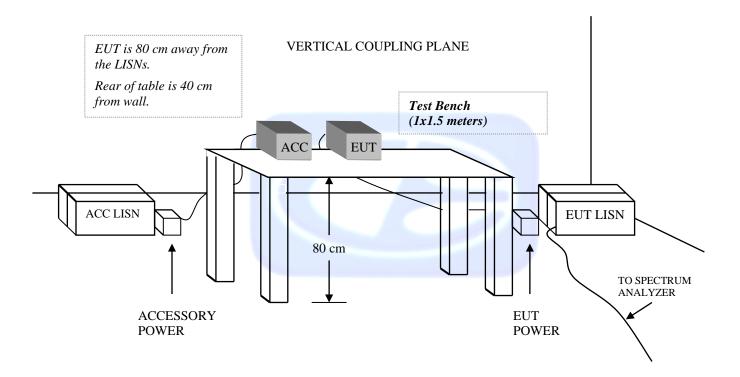


# APPENDIX D

**DIAGRAMS AND CHARTS** 

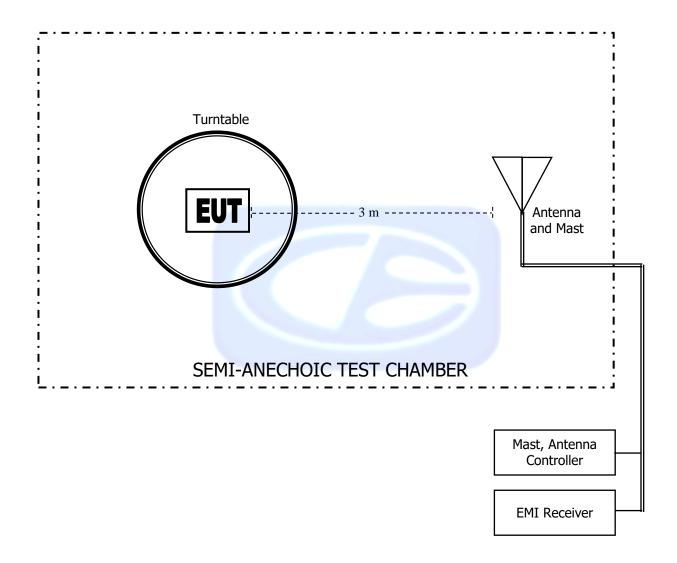


# FIGURE 1: CONDUCTED EMISSIONS TEST SETUP





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





# COM-POWER AL-130R

# **LOOP ANTENNA**

S/N: 121090

CALIBRATION DATE: FEBRUARY 5, 2019

| FREQUENCY<br>(MHz) | MAGNETIC<br>(dB/m) | ELECTRIC<br>(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: 61093

CALIBRATION DATE: JUNE 5, 2019

| FREQUENCY<br>(MHz) | FACTOR (dB) | FREQUENCY<br>(MHz) | FACTOR (dB) |
|--------------------|-------------|--------------------|-------------|
| 30                 | 22.10       | 200                | 15.30       |
| 35                 | 20.90       | 250                | 16.80       |
| 40                 | 20.10       | 300                | 19.00       |
| 45                 | 19.40       | 350                | 19.60       |
| 50                 | 18.40       | 400                | 21.70       |
| 60                 | 15.10       | 450                | 21.60       |
| 70                 | 12.00       | 500                | 22.20       |
| 80                 | 11.60       | 550                | 22.70       |
| 90                 | 13.50       | 600                | 24.20       |
| 100                | 14.70       | 650                | 24.40       |
| 120                | 15.90       | 700                | 24.50       |
| 125                | 15.90       | 750                | 25.40       |
| 140                | 14.80       | 800                | 26.30       |
| 150                | 15.50       | 850                | 26.70       |
| 160                | 19.80       | 900                | 27.50       |
| 175                | 15.20       | 950                | 27.80       |
| 180                | 14.90       | 1000               | 27.90       |



# **COM POWER AH-118**

# HORN ANTENNA

S/N: 071175

# CALIBRATION DATE: FEBRUARY 22, 2018

| FREQUENCY | FACTOR | FREQUENCY | FACTOR |
|-----------|--------|-----------|--------|
| (GHz)     | (dB)   | (GHz)     | (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 PA-118**

# **PREAMPLIFIER**

S/N: 181653

CALIBRATION DATE: JANUARY 25, 2019

| FREQUENCY<br>(GHz) | FACTOR (dB) | FREQUENCY<br>(GHz) | FACTOR (dB) |
|--------------------|-------------|--------------------|-------------|
| 1.0                | 40.10       | 6.0                | 40.60       |
| 1.1                | 40.10       | 6.5                | 39.50       |
| 1.2                | 40.00       | 7.0                | 39.40       |
| 1.3                | 39.70       | 7.5                | 39.30       |
| 1.4                | 39.60       | 8.0                | 39.20       |
| 1.5                | 39.90       | 8.5                | 40.50       |
| 1.6                | 40.00       | 9.0                | 39.60       |
| 1.7                | 39.70       | 9.5                | 39.50       |
| 1.8                | 39.50       | 10.0               | 38.80       |
| 1.9                | 39.60       | 11.0               | 38.70       |
| 2.0                | 39.90       | 12.0               | 42.20       |
| 2.5                | 40.10       | 13.0               | 40.00       |
| 3.0                | 40.80       | 14.0               | 40.30       |
| 3.5                | 40.60       | 15.0               | 40.20       |
| 4.0                | 40.50       | 16.0               | 41.00       |
| 4.5                | 41.60       | 17.0               | 39.70       |
| 5.0                | 39.20       | 18.0               | 40.90       |
| 5.5                | 40.00       |                    |             |



# COM-POWER AH-826

# HORN ANTENNA

S/N: 71957

| FREQUENCY | FACTOR | FREQUENCY | FACTOR |
|-----------|--------|-----------|--------|
| (GHz)     | (dB)   | (GHz)     | (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   |



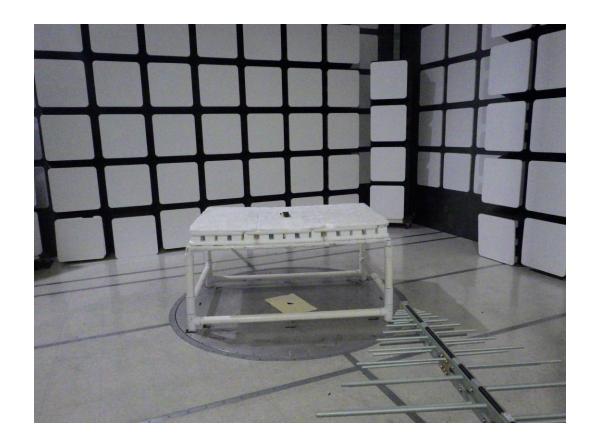
# COM-POWER PA-840

# MICROWAVE PREAMPLIFIER

S/N: 711013

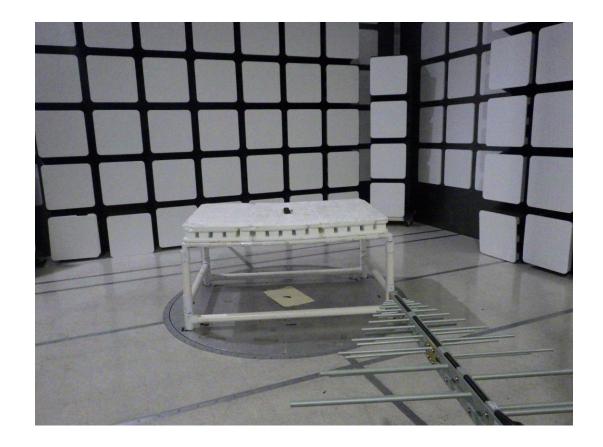
CALIBRATION DATE: MAY 10, 2018

| FREQUENCY<br>(GHz) | FACTOR (dB) | FREQUENCY<br>(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       |



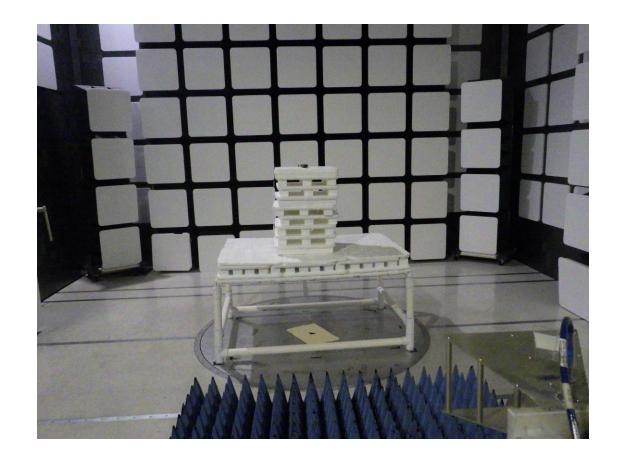
### **FRONT VIEW**

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



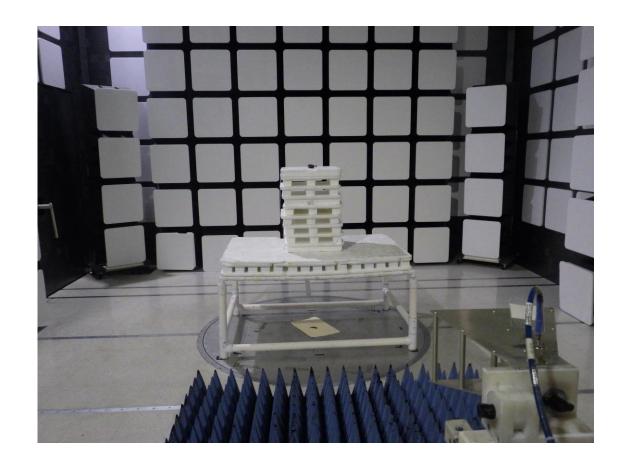
#### **REAR VIEW**

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



#### **FRONT VIEW**

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



#### **REAR VIEW**

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

Model: R32027BA00-00006

**APPENDIX E** 

DATA SHEETS

# RADIATED EMISSIONS DATA SHEETS

Report Number: **B91216D1** FCC Part 15 Subpart B and FCC Section 15.247 Test Report Dish 54.0 Brisbane CR 2018

Model: R32027BA00-00006

Tested By: Harvey Samaco

Date: 12/13/2019

Lab: D

#### FCC 15.247

Universal Electronics, Inc. Dish 54.0 Brisbane CR 2018

Model: R32027BA00-00006

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

|           |          |       |       |        | Peak / | Table  | Ant.   |                 |
|-----------|----------|-------|-------|--------|--------|--------|--------|-----------------|
| Freq.     | Level    | Pol   | Limit | Morain | QP/    | Angle  | Height | Commonto        |
| (MHz)     | (dBuV/m) | (v/h) |       | Margin | Avg    | (deg)  | (cm)   | Comments        |
| 4850.00   | 53.83    | V     | 73.97 | -20.14 | Peak   | 198.00 | 145.50 |                 |
| 4850.00   | 45.30    | V     | 53.97 | -8.67  | Avg    | 198.00 | 145.50 |                 |
| 7275.00   | 47.75    | V     | 73.97 | -26.22 | Peak   | 29.50  | 100.00 |                 |
| 7275.00   | 39.11    | V     | 53.97 | -14.86 | Avg    | 29.50  | 100.00 |                 |
|           |          |       |       |        | J      |        |        |                 |
| 9700.00   | 51.76    | V     | 81.40 | -29.65 | Peak   | 116.75 | 100.00 | Not in          |
|           |          |       |       |        |        |        |        | Restricted Band |
|           |          |       | A     |        |        |        |        |                 |
| 12125.00  |          |       |       |        |        |        |        | No Emission     |
| 12125.00  |          |       |       |        |        |        |        | Detected        |
|           |          |       |       |        |        |        |        |                 |
| 14550.00  |          |       |       |        |        |        |        | No Emission     |
| 14550.00  |          |       |       |        |        |        |        | Detected        |
| 10075.00  |          |       |       |        |        |        |        |                 |
| 16975.00  |          |       |       |        |        |        |        | No Emission     |
| 16975.00  |          |       |       |        |        |        |        | Detected        |
| 19400.00  |          |       |       |        |        |        |        | No Emission     |
| 19400.00  |          |       |       |        |        |        |        | Detected        |
|           |          |       |       |        |        |        |        |                 |
| 21825.00  |          |       |       | -      |        |        |        | No Emission     |
| 21825.00  |          |       |       |        |        |        |        | Detected        |
| 0.4050.00 |          |       |       |        |        |        |        |                 |
| 24250.00  |          |       |       |        |        |        |        | No Emission     |
| 24250.00  |          |       |       |        |        |        |        | Detected        |
|           |          |       |       |        |        |        |        |                 |

<sup>\*</sup>The limit at the 4th harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

FCC 15.247

Universal Electronics, Inc. Date: 12/13/2019

Dish 54.0 Brisbane CR 2018 Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

|          |          |       |       |        | Peak / | Table  | Ant.   |                 |
|----------|----------|-------|-------|--------|--------|--------|--------|-----------------|
| Freq.    | Level    | Pol   |       |        | QP/    | Angle  | Height |                 |
| (MHz)    | (dBuV/m) | (v/h) | Limit | Margin | Avg    | (deg)  | (cm)   | Comments        |
| 4850.00  | 53.47    | V     | 73.97 | -20.50 | Peak   | 186.75 | 197.97 |                 |
| 4850.00  | 46.02    | V     | 53.97 | -7.95  | Avg    | 186.75 | 197.97 |                 |
|          |          |       |       |        |        |        |        |                 |
| 7275.00  | 47.13    | V     | 73.97 | -26.84 | Peak   | 162.00 | 180.23 |                 |
| 7275.00  | 36.97    | V     | 53.97 | -17.00 | Avg    | 162.00 | 180.23 |                 |
|          |          |       |       |        |        |        |        |                 |
| 9700.00  | 52.30    | V     | 81.40 | -29.11 | Peak   | 335.75 | 205.01 | Not in          |
|          |          |       |       |        |        |        |        | Restricted Band |
|          |          |       |       |        |        |        |        |                 |
| 12125.00 |          |       |       |        |        |        |        | No Emission     |
| 12125.00 |          |       |       |        |        |        |        | Detected        |
|          |          |       |       |        |        |        |        |                 |
| 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        |
|          |          |       |       |        |        |        |        |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Dish 54.0 Brisbane CR 2018 Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4850.00        | 52.86             | V            | 73.97 | -21.11 | Peak                  | 166.50                  | 174.98                 |                 |
| 4850.00        | 44.77             | V            | 53.97 | -9.20  | Avg                   | 166.50                  | 174.98                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7275.00        | 46.49             | V            | 73.97 | -27.48 | Peak                  | 177.25                  | 100.00                 |                 |
| 7275.00        | 36.70             | V            | 53.97 | -17.27 | Avg                   | 177.25                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9700.00        | 50.49             | V            | 81.40 | -30.91 | Peak                  | 208.00                  | 100.00                 | Not in          |
|                |                   |              |       |        | 7                     |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12125.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12125.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 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        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018

Model: R32027BA00-00006

#### FCC 15.247

Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

|                |                   |              |       |        | Peak /      | Table          | Ant.        |                 |
|----------------|-------------------|--------------|-------|--------|-------------|----------------|-------------|-----------------|
| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | QP /<br>Avg | Angle<br>(deg) | Height (cm) | Comments        |
| 4850.00        | 53.32             | H            | 73.97 | -20.65 | Peak        | 204.00         | 100.00      | Comments        |
| 4850.00        | 44.02             | H            | 53.97 | -9.95  | Avg         | 204.00         | 100.00      |                 |
| 4030.00        | 44.02             | 11           | 33.91 | -9.93  | Avg         | 204.00         | 100.00      |                 |
| 7275.00        | 48.99             | Н            | 73.97 | -24.98 | Peak        | 47.50          | 100.00      |                 |
| 7275.00        | 38.48             | Н            | 53.97 | -15.49 | Avg         | 47.50          | 100.00      |                 |
| 0700.00        | 50.44             |              | 04.40 | 00.00  | Deel        | 0.44.05        | 400.00      |                 |
| 9700.00        | 52.14             | Н            | 81.40 | -29.26 | Peak        | 241.25         | 100.00      | Not in          |
|                |                   |              | -     |        |             |                |             | Restricted Band |
| 12125.00       |                   |              |       |        |             |                |             | No Emission     |
| 12125.00       |                   |              |       |        |             |                |             | Detected        |
|                |                   |              |       |        |             |                |             |                 |
| 14550.00       |                   |              |       |        |             |                |             | No Emission     |
| 14550.00       |                   |              |       |        |             |                |             | Detected        |
| 16975.00       |                   |              |       |        |             |                |             | No Emission     |
| 16975.00       |                   |              |       |        |             |                |             |                 |
| 16975.00       |                   |              |       |        |             |                |             | Detected        |
| 19400.00       |                   |              |       |        |             |                |             | No Emission     |
| 19400.00       |                   |              |       |        |             |                |             | Detected        |
| 04005.00       |                   |              |       |        |             |                |             | N. E. L. L.     |
| 21825.00       |                   |              |       |        |             |                |             | No Emission     |
| 21825.00       |                   |              |       |        |             |                |             | Detected        |
| 24250.00       |                   |              |       |        |             |                |             | No Emission     |
| 24250.00       |                   |              |       |        |             |                |             | Detected        |
|                |                   |              |       |        |             |                |             |                 |

<sup>\*</sup>The limit at the  $4^{th}$  harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4850.00        | 53.47             | Н            | 73.97 | -20.50 | Peak                  | 159.50                  | 164.00                 |                 |
| 4850.00        | 45.60             | Н            | 53.97 | -8.37  | Avg                   | 159.50                  | 164.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7275.00        | 47.46             | Н            | 73.97 | -26.51 | Peak                  | 147.75                  | 132.11                 |                 |
| 7275.00        | 38.17             | Η            | 53.97 | -15.81 | Avg                   | 147.75                  | 132.11                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9700.00        | 49.37             | Н            | 81.40 | -32.03 | Peak                  | 194.75                  | 100.00                 | Not in          |
|                |                   |              |       |        |                       |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12125.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12125.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 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        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the  $4^{th}$  harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| From           | Level    | Pol   |       |        | Peak /<br>QP / | Table          | Ant.<br>Height |                 |
|----------------|----------|-------|-------|--------|----------------|----------------|----------------|-----------------|
| Freq.<br>(MHz) | (dBuV/m) | (v/h) | Limit | Margin | Avg            | Angle<br>(deg) | (cm)           | Comments        |
| 4850.00        | 53.96    | Н     | 73.97 | -20.01 | Peak           | 170.50         | 100.00         |                 |
| 4850.00        | 45.94    | Н     | 53.97 | -8.04  | Avg            | 170.50         | 100.00         |                 |
|                |          |       |       |        | _              |                |                |                 |
| 7275.00        | 47.92    | Н     | 73.97 | -26.06 | Peak           | 178.25         | 100.00         |                 |
| 7275.00        | 38.61    | Н     | 53.97 | -15.36 | Avg            | 178.25         | 100.00         |                 |
|                |          |       |       |        |                |                |                |                 |
| 9700.00        | 52.23    | Н     | 81.40 | -29.17 | Peak           | 277.50         | 100.00         | Not in          |
|                |          |       |       |        |                |                |                | Restricted Band |
|                |          |       |       |        |                |                |                |                 |
| 12125.00       |          |       |       |        |                |                |                | No Emission     |
| 12125.00       |          |       |       |        |                |                |                | Detected        |
|                |          |       |       |        |                |                |                |                 |
| 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        |
|                |          |       |       |        |                |                |                |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4900.00        | 51.21             | V            | 73.97 | -22.76 | Peak                  | 204.75                  | 151.34                 |                 |
| 4900.00        | 45.19             | V            | 53.97 | -8.78  | Avg                   | 204.75                  | 151.34                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7350.00        | 47.85             | V            | 73.97 | -26.12 | Peak                  | 25.25                   | 100.00                 |                 |
| 7350.00        | 38.10             | V            | 53.97 | -15.87 | Avg                   | 25.25                   | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9800.00        | 53.10             | V            | 81.40 | -28.31 | Peak                  | 120.25                  | 100.00                 | Not in          |
|                |                   |              |       |        |                       |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12250.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12250.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 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        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the  $4^{th}$  harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

FCC 15.247

Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4900.00        | 53.57             | V            | 73.97 | -20.40 | Peak                  | 162.50                  | 188.29                 |                 |
| 4900.00        | 47.88             | V            | 53.97 | -6.09  | Avg                   | 162.50                  | 188.29                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7350.00        | 47.57             | V            | 73.97 | -26.40 | Peak                  | 138.50                  | 100.00                 |                 |
| 7350.00        | 37.16             | V            | 53.97 | -16.81 | Avg                   | 138.50                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9800.00        | 53.32             | V            | 81.40 | -28.08 | Peak                  | 0.00                    | 181.07                 | Not in          |
|                |                   |              |       |        |                       |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12250.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12250.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 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        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

FCC 15.247

Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

|                |                   |              |       |        | Peak /      | Table          | Ant.        |                 |
|----------------|-------------------|--------------|-------|--------|-------------|----------------|-------------|-----------------|
| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | QP /<br>Avg | Angle<br>(deg) | Height (cm) | Comments        |
| 4900.00        | 52.11             | \ \ \        | 73.97 | -21.86 | Peak        | 174.25         | 146.08      | Comments        |
| 4900.00        | 45.88             | V            | 53.97 | -8.09  | Avg         | 174.25         | 146.08      |                 |
| 4300.00        | 45.00             | V            | 33.31 | -0.03  | Avg         | 174.25         | 140.00      |                 |
| 7350.00        | 46.71             | V            | 73.97 | -27.26 | Peak        | 169.25         | 100.00      |                 |
| 7350.00        | 36.80             | V            | 53.97 | -17.17 | Avg         | 169.25         | 100.00      |                 |
|                |                   |              | 41.14 |        |             |                |             |                 |
| 9800.00        | 52.33             | V            | 81.40 | -29.07 | Peak        | 210.75         | 100.00      | Not in          |
|                |                   |              |       |        |             |                |             | Restricted Band |
| 12250.00       |                   |              |       |        |             |                |             | No Emission     |
| 12250.00       |                   |              |       |        |             |                |             | Detected        |
| 12200100       |                   |              |       |        |             |                |             | 20100104        |
| 14700.00       |                   |              |       |        |             |                |             | No Emission     |
| 14700.00       |                   |              |       |        |             |                |             | Detected        |
| 17150.00       |                   |              |       |        |             |                |             | No Emission     |
|                |                   |              |       |        |             |                |             |                 |
| 17150.00       |                   |              |       |        |             |                |             | Detected        |
| 19600.00       |                   |              |       |        |             |                |             | No Emission     |
| 19600.00       |                   |              |       |        |             |                |             | Detected        |
| 200=0.55       |                   |              |       |        |             |                |             |                 |
| 22050.00       |                   |              |       |        |             |                |             | No Emission     |
| 22050.00       |                   |              |       |        |             |                |             | Detected        |
| 24500.00       |                   |              |       |        |             |                |             | No Emission     |
| 24500.00       |                   |              |       |        |             |                |             | Detected        |
|                |                   |              |       |        |             |                |             |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4900.00        | 51.97             | H            | 73.97 | -22.00 | Peak                  | 181.25                  | 100.00                 |                 |
| 4900.00        | 44.52             | Н            | 53.97 | -9.45  | Avg                   | 181.25                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7350.00        | 46.97             | Н            | 73.97 | -27.00 | Peak                  | 332.25                  | 100.00                 |                 |
| 7350.00        | 36.84             | Н            | 53.97 | -17.13 | Avg                   | 332.25                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9800.00        | 52.74             | Η            | 81.40 | -28.66 | Peak                  | 334.75                  | 100.00                 | Not in          |
|                |                   |              |       |        |                       |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12250.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12250.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 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        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013

Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

FCC 15.247

Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

|                |                   |              |       |        | Peak /      | Table          | Ant.        |                 |
|----------------|-------------------|--------------|-------|--------|-------------|----------------|-------------|-----------------|
| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | QP /<br>Avg | Angle<br>(deg) | Height (cm) | Comments        |
| 4900.00        | 52.03             | H            | 73.97 | -21.94 | Peak        | 163.00         | 138.68      |                 |
| 4900.00        | 46.02             | H            | 53.97 | -7.95  | Avg         | 163.00         | 138.68      |                 |
|                |                   |              |       |        |             |                |             |                 |
| 7350.00        | 47.23             | Н            | 73.97 | -26.75 | Peak        | 151.75         | 100.00      |                 |
| 7350.00        | 38.09             | Н            | 53.97 | -15.88 | Avg         | 151.75         | 100.00      |                 |
|                |                   |              |       |        |             |                |             |                 |
| 9800.00        | 51.39             | Н            | 81.40 | -30.01 | Peak        | 39.25          | 115.40      | Not in          |
|                |                   |              |       |        |             |                |             | Restricted Band |
|                |                   |              |       |        |             |                |             |                 |
| 12250.00       |                   |              |       |        |             |                |             | No Emission     |
| 12250.00       |                   |              |       |        |             |                |             | Detected        |
|                |                   |              |       |        |             |                |             |                 |
| 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        |
|                |                   |              |       |        |             |                |             |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

|                |                   |              |       |        | Peak /      | Table          | Ant.        |                 |
|----------------|-------------------|--------------|-------|--------|-------------|----------------|-------------|-----------------|
| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | QP /<br>Avg | Angle<br>(deg) | Height (cm) | Comments        |
| 4900.00        | 53.49             | H            | 73.97 | -20.48 | Peak        | 164.75         | 137.25      |                 |
| 4900.00        | 47.89             | H            | 53.97 | -6.08  | Avg         | 164.75         | 137.25      |                 |
| 1000100        |                   |              |       |        | g           |                |             |                 |
| 7350.00        | 47.59             | Н            | 73.97 | -26.38 | Peak        | 207.00         | 100.00      |                 |
| 7350.00        | 37.62             | Н            | 53.97 | -16.35 | Avg         | 207.00         | 100.00      |                 |
|                |                   |              |       |        |             |                |             |                 |
| 9800.00        | 53.79             | Ι            | 81.40 | -27.61 | Peak        | 216.25         | 100.00      | Not in          |
|                |                   |              |       |        |             |                |             | Restricted Band |
|                |                   |              |       |        |             |                |             |                 |
| 12250.00       |                   |              |       |        |             |                |             | No Emission     |
| 12250.00       |                   |              |       |        |             |                |             | Detected        |
|                |                   |              |       |        |             |                |             |                 |
| 14700.00       |                   |              |       |        |             |                |             | No Emission     |
| 14700.00       |                   |              |       |        |             |                |             | Detected        |
|                |                   |              |       |        |             |                |             |                 |
| 17150.00       |                   |              |       |        |             |                |             | No Emission     |
| 17150.00       |                   |              |       |        |             |                |             | Detected        |
| 19600.00       |                   |              |       |        |             |                |             | No Emission     |
| 19600.00       |                   |              |       |        |             |                |             | Detected        |
| 13000.00       |                   |              |       |        |             |                |             | Detected        |
| 22050.00       |                   |              |       |        |             |                |             | No Emission     |
| 22050.00       |                   |              |       |        |             |                |             | Detected        |
|                |                   |              |       |        |             |                |             |                 |
| 24500.00       |                   |              |       |        |             |                |             | No Emission     |
| 24500.00       |                   |              |       |        |             |                |             | Detected        |
|                |                   |              |       |        |             |                |             |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4950.00        | 51.11             | V            | 73.97 | -22.86 | Peak                  | 207.25                  | 127.40                 |                 |
| 4950.00        | 45.20             | V            | 53.97 | -8.77  | Avg                   | 207.25                  | 127.40                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7425.00        | 47.63             | V            | 73.97 | -26.34 | Peak                  | 212.00                  | 100.00                 |                 |
| 7425.00        | 38.12             | V            | 53.97 | -15.85 | Avg                   | 212.00                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9900.00        | 52.28             | V            | 81.40 | -29.12 | Peak                  | 19.75                   | 100.00                 | Not in          |
|                |                   |              |       |        |                       |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12375.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12375.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 14850.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 14850.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 17325.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 17325.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 19800.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 19800.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 22275.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 22275.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 24750.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 24750.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the  $4^{th}$  harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013





Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4950.00        | 54.13             | V            | 73.97 | -19.84 | Peak                  | 164.25                  | 174.14                 |                 |
| 4950.00        | 48.57             | V            | 53.97 | -5.40  | Avg                   | 164.25                  | 174.14                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7425.00        | 47.59             | V            | 73.97 | -26.38 | Peak                  | 165.25                  | 100.00                 |                 |
| 7425.00        | 38.47             | V            | 53.97 | -15.50 | Avg                   | 165.25                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9900.00        | 53.44             | V            | 81.40 | -27.96 | Peak                  | 0.00                    | 176.53                 | Not in          |
|                |                   |              |       |        |                       |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12375.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12375.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 14850.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 14850.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 17325.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 17325.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 19800.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 19800.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 22275.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 22275.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 24750.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 24750.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the  $4^{th}$  harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013





Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4950.00        | 51.76             | V            | 73.97 | -22.21 | Peak                  | 176.00                  | 150.38                 |                 |
| 4950.00        | 45.88             | V            | 53.97 | -8.09  | Avg                   | 176.00                  | 150.38                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7425.00        | 46.91             | V            | 73.97 | -27.06 | Peak                  | 190.25                  | 100.00                 |                 |
| 7425.00        | 37.01             | V            | 53.97 | -16.96 | Avg                   | 190.25                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9900.00        | 52.08             | V            | 81.40 | -29.32 | Peak                  | 186.25                  | 100.00                 | Not in          |
|                |                   |              |       |        |                       |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12375.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12375.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 14850.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 14850.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 17325.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 17325.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 19800.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 19800.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 22275.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 22275.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 24750.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 24750.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013





Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4950.00        | 51.67             | H            | 73.97 | -22.30 | Peak                  | 287.00                  | 100.00                 |                 |
| 4950.00        | 45.35             | Н            | 53.97 | -8.62  | Avg                   | 287.00                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7425.00        | 47.99             | Н            | 73.97 | -25.98 | Peak                  | 335.25                  | 100.00                 |                 |
| 7425.00        | 38.41             | Н            | 53.97 | -15.56 | Avg                   | 335.25                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9900.00        | 51.86             | Н            | 81.40 | -29.54 | Peak                  | 297.75                  | 100.00                 | Not in          |
|                |                   |              |       |        |                       |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12375.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12375.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 14850.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 14850.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 17325.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 17325.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 19800.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 19800.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 22275.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 22275.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 24750.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 24750.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the  $4^{th}$  harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013





Universal Electronics, Inc. Date: 12/13/2019

Dish 54.0 Brisbane CR 2018 Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4950.00        | 52.99             | Н            | 73.97 | -20.98 | Peak                  | 154.75                  | 154.62                 |                 |
| 4950.00        | 47.26             | Н            | 53.97 | -6.71  | Avg                   | 154.75                  | 154.62                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7425.00        | 47.91             | Н            | 73.97 | -26.06 | Peak                  | 147.00                  | 100.00                 |                 |
| 7425.00        | 39.02             | Н            | 53.97 | -14.95 | Avg                   | 147.00                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        | k -             |
| 9900.00        | 51.39             | Н            | 81.40 | -30.01 | Peak                  | 55.50                   | 100.00                 | Not in          |
|                |                   |              |       |        | 7                     |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12375.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12375.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 14850.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 14850.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 17325.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 17325.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 19800.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 19800.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 22275.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 22275.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 24750.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 24750.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the 4<sup>th</sup> harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

FCC 15.247

Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

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

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments        |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------|
| 4950.00        | 53.25             | Н            | 73.97 | -20.72 | Peak                  | 166.75                  | 100.00                 |                 |
| 4950.00        | 47.66             | Н            | 53.97 | -6.31  | Avg                   | 166.75                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 7425.00        | 46.77             | Н            | 73.97 | -27.20 | Peak                  | 237.00                  | 100.00                 |                 |
| 7425.00        | 37.33             | Н            | 53.97 | -16.64 | Avg                   | 237.00                  | 100.00                 |                 |
|                |                   |              |       |        |                       |                         |                        |                 |
| 9900.00        | 53.34             | Ι            | 81.40 | -28.07 | Peak                  | 219.75                  | 100.00                 | Not in          |
|                |                   |              |       |        |                       |                         |                        | Restricted Band |
|                |                   |              |       |        |                       |                         |                        |                 |
| 12375.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 12375.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 14850.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 14850.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 17325.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 17325.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 19800.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 19800.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 22275.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 22275.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |
| 24750.00       |                   |              |       |        |                       |                         |                        | No Emission     |
| 24750.00       |                   |              |       |        |                       |                         |                        | Detected        |
|                |                   |              |       |        |                       |                         |                        |                 |

<sup>\*</sup>The limit at the  $4^{th}$  harmonic is 20 dB below the maximum fundamental of 101.40 dBuV/m per section 11.11.2 of ANSI C63.10: 2013



Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report

Dish 54.0 Brisbane CR 2018 Model: R32027BA00-00006

#### FCC 15.247 and FCC class B

Universal Electronics, Inc. Dish 54.0 Brisbane CR 2018 Model: R32027BA00-00006 Date: 12/13/2019

Lab: D

Tested By: Harvey Samaco

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.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments                       |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|--------------------------------|
|                |                   |              |       |        |                       |                         |                        |                                |
|                |                   |              |       |        |                       |                         |                        | No Emissions Detected          |
|                |                   |              |       |        |                       |                         |                        | from 9 kHz to 30 MHz           |
|                |                   |              |       |        |                       |                         |                        | for the digital portion        |
|                |                   |              |       |        |                       |                         |                        | of the EUT                     |
|                |                   |              |       |        |                       |                         |                        |                                |
|                |                   |              |       |        |                       |                         |                        | No Emissions Detected          |
|                |                   |              |       |        | 13-                   |                         |                        | 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             |
|                |                   |              |       |        |                       |                         |                        | ·                              |
|                |                   |              |       |        |                       |                         |                        |                                |
|                |                   |              |       |        |                       |                         |                        |                                |
|                |                   |              |       |        |                       |                         |                        |                                |
|                |                   |              |       |        |                       |                         |                        |                                |



Report Number: B91216D1 FCC Part 15 Subpart B and FCC Section 15.247 Test Report

Dish 54.0 Brisbane CR 2018 Model: R32027BA00-00006

Title: Radiated Pre-Scan - FCC Class B

File: 1 - Pre-Scan - Dish 54.0 Brisbane CR 2019 - Low Ch - X-axis - 30 MHz to 1 GHz.set Operator: Harvey Samaco

EUT Type: Dish 54.0 Brisband CR 2019

EUT Condition: The EUT is continuously transmitting RF4CE at 2425 MHz

Company: Universal Electronics, Inc. P/N: R32027BA00-00006

(PEAK) EMI (V)

S/N: N/A

X-axis (Worst case)

12/16/2019 3:51:02 PM Sequence: Preliminary Scan

FCC Class B





Report Number: **B91216D1** FCC Part 15 Subpart B and FCC Section 15.247 Test Report

Dish 54.0 Brisbane CR 2018 Model: R32027BA00-00006

Title: Radiated Final Scan - FCC Class B File: 1 - Final Scan - Dish 54.0 Brisbane CR 2019 - Low Ch - 30 MHz to 1 GHz.set

Operator: Harvey Samaco

EUT Type: Dish 54.0 Brisbane CR 2019 EUT Condition: The EUT is continuously transmitting RF4CE at 2425 MHz

Company: Universal Electronics, Inc.

P/N: R32027BA00-00006

S/N: N/A X-axis

12/16/2019 3:59:39 PM Sequence: Final Measurements

#### FCC Class B

| Freq   | Pol | (PEAK) EMI | (QP) EMI | (PEAK) Margin | (QP) Margin | Limit    | Transducer | Cable | Ttbl Agl | Twr Ht |
|--------|-----|------------|----------|---------------|-------------|----------|------------|-------|----------|--------|
| (MHz)  |     | (dBµV/m)   | (dBµV/m) | (dB)          | (dB)        | (dBµV/m) | (dB)       | (dB)  | (deg)    | (cm)   |
| 707.50 | V   | 40.32      | 33.84    | -5.68         | -12.16      | 46.00    | 24.63      | 2.53  | 304.00   | 270.08 |
| 708.40 | H   | 41.53      | 34.71    | -4.47         | -11.29      | 46.00    | 24.70      | 2.54  | 291.00   | 365.73 |
| 709.40 | V   | 38.78      | 33.95    | -7.22         | -12.05      | 46.00    | 24.70      | 2.54  | 7.00     | 190.56 |
| 711.00 | V   | 38.61      | 33.95    | -7.39         | -12.05      | 46.00    | 24.70      | 2.54  | 155.75   | 238.26 |
| 712.30 | V   | 40.11      | 34.03    | -5.89         | -11.97      | 46.00    | 24.80      | 2.55  | 132.00   | 127.16 |
| 712.80 | V   | 39.02      | 34.03    | -6.98         | -11.97      | 46.00    | 24.80      | 2.55  | 301.50   | 317.79 |







BAND EDGES
DATA SHEETS



Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

FCC 15.247

Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

## Band Edges - RF4CE Mode

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments              |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-----------------------|
| 2425.00        | 104.54            | Н            |       |        | Peak                  | 175.25                  | 100.00                 | Fundamental - Low Ch. |
| 2425.00        | 101.15            | Н            |       |        | Avg                   | 175.25                  | 100.00                 | Z-Axis - Worst Case   |
|                |                   |              |       |        |                       |                         |                        |                       |
| 2377.00        | 45.91             | Η            | 73.97 | -28.06 | Peak                  | 175.25                  | 100.00                 | Band Edge             |
| 2377.00        | 37.58             | Τ            | 53.97 | -16.39 | Avg                   | 175.25                  | 100.00                 | Z-Axis - Worst Case   |
|                |                   |              |       |        |                       |                         |                        |                       |
| 2425.00        | 102.95            | V            |       | 1      | Peak                  | 196.00                  | 144.00                 | Fundamental - Low Ch. |
| 2425.00        | 99.50             | ٧            |       |        | Avg                   | 196.00                  | 144.00                 | X-Axis - Worst Case   |
|                |                   |              |       |        |                       |                         |                        |                       |
| 2377.00        | 48.03             | V            | 73.97 | -25.94 | Peak                  | 196.00                  | 144.00                 | Band Edge             |
| 2377.00        | 38.87             | V            | 53.97 | -15.10 | Avg                   | 196.00                  | 144.00                 | X-Axis - Worst Case   |
|                |                   |              |       |        |                       |                         |                        |                       |
|                |                   |              |       |        |                       |                         |                        |                       |



Report Number: **B91216D1**FCC Part 15 Subpart B and FCC Section 15.247 Test Report
Dish 54.0 Brisbane CR 2018
Model: R32027BA00-00006

FCC 15.247

Universal Electronics, Inc.

Date: 12/13/2019

Dish 54.0 Brisbane CR 2018

Lab: D

Model: R32027BA00-00006 Tested By: Harvey Samaco

## Band Edges - RF4CE Mode

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol<br>(v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Table<br>Angle<br>(deg) | Ant.<br>Height<br>(cm) | Comments               |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|------------------------|
| 2475.00        | 103.98            | Η            | -     |        | Peak                  | 282.00                  | 100.00                 | Fundamental - High Ch. |
| 2475.00        | 100.67            | Ι            | 1     | 1      | Avg                   | 282.00                  | 100.00                 | X-Axis - Worst Case    |
|                |                   |              |       |        |                       |                         |                        |                        |
| 2483.50        | 56.20             | Ι            | 73.97 | -17.78 | Peak                  | 282.00                  | 100.00                 | Band Edge              |
| 2483.50        | 47.98             | Н            | 53.97 | -5.99  | Avg                   | 282.00                  | 100.00                 | X-Axis - Worst Case    |
|                |                   |              |       |        |                       |                         |                        |                        |
| 2475.00        | 102.54            | V            |       |        | Peak                  | 177.00                  | 150.25                 | Fundamental - High Ch. |
| 2475.00        | 99.21             | V            |       |        | Avg                   | 177.00                  | 150.25                 | Z-Axis - Worst Case    |
|                |                   |              |       |        | - 1                   |                         |                        |                        |
| 2483.50        | 55.08             | V            | 73.97 | -18.90 | Peak                  | 177.00                  | 150.25                 | Band Edge              |
| 2483.50        | 46.69             | V            | 53.97 | -7.28  | Avg                   | 177.00                  | 150.25                 | Z-Axis - Worst Case    |
|                |                   |              |       |        |                       |                         |                        |                        |
|                |                   |              |       |        |                       |                         |                        |                        |

Keysight Spectrum Analyzer - Swept SA 02:50:11 AM Dec 14, 2019 S RF PRESEL 50 Ω AC CORREC SENSE:INT SOURCE OFF ALIGN AUTO TRACE 1 2 3 4 5 Marker 1 2.424530000000 GHz Avg Type: Voltage Trig: Free Run TYPE DET RPNNN PNO: Fast 🖵 #Atten: 16 dB IFGain:Low Mkr1 2.424 530 GHz 104.540 dBu\ 10 dB/div Log Ref 112.99 dBµV Start 2.31000 GHz Stop 2.43500 GHz Sweep 164.4 s (1001 pts) #Res BW (CISPR) 1.0 MHz **#VBW 3.0 MHz** FUNCTION VALUE MKR MODE TRC SCL FUNCTION FUNCTION WIDTH 2.425 375 GHz 2.377 000 GHz 101.15 dBµV 45.914 dBµV 2.377 000 GHz 37.58 dBµV N 1 f 8 10

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

STATUS

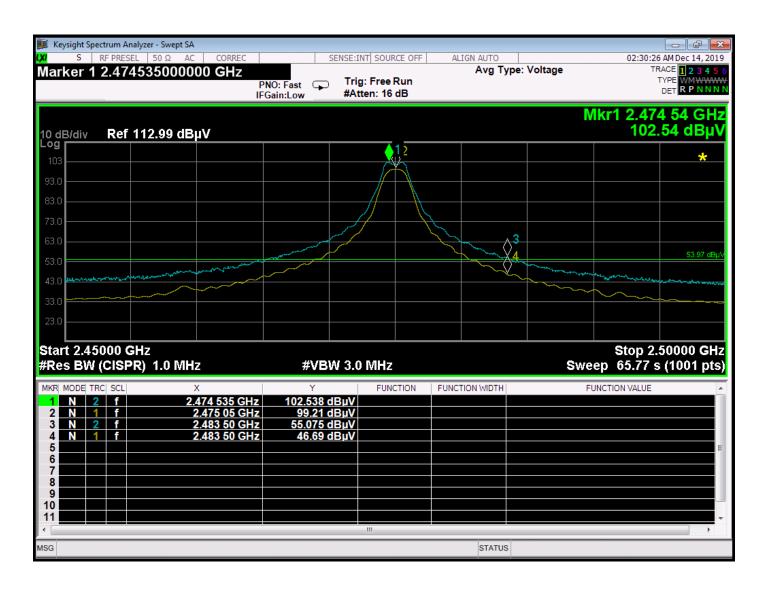
📕 Keysight Spectrum Analyzer - Swept SA S RF PRESEL 50 Ω AC SENSE:INT SOURCE OFF 02:41:13 AM Dec 14, 2019 ALIGN AUTO Marker 1 2.424510000000 GHz Avg Type: Voltage TRACE 1 2 3 4 Trig: Free Run #Atten: 16 dB TYPE PNO: Fast 🖵 DET RPNNN IFGain:Low Mkr1 2.424 510 GHz 102.952 dBu\ 10 dB/div Log Ref 112.99 dBµV Start 2.31000 GHz Stop 2.43500 GHz #Res BW (CISPR) 1.0 MHz Sweep 164.4 s (1001 pts) **#VBW 3.0 MHz** FUNCTION WIDTH FUNCTION VALUE MKR MODE TRC SCL FUNCTION 2.424 510 GHz 2.425 000 GHz 2.377 000 GHz 102.952 dBµV 99.50 dBμV 48.026 dBμV N 2.377 000 GHz 38.87 dBµV 10

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

STATUS

Keysight Spectrum Analyzer - Swept SA S RF PRESEL 50 Ω SENSE:INT SOURCE OFF ALIGN AUTO 02:18:53 AM Dec 14, 2019 TRACE 1 2 3 4 Marker 1 2.474500000000 GHz Avg Type: Voltage Trig: Free Run PNO: Fast IFGain:Low #Atten: 16 dB Mkr1 2.474 50 GHz 103.98 dBµ\ 10 dB/div Log Ref 112.99 dBµV 53.97 dBµ Start 2.45000 GHz Stop 2.50000 GHz #Res BW (CISPR) 1.0 MHz **#VBW 3.0 MHz** Sweep 65.77 s (1001 pts) FUNCTION VALUE FUNCTION FUNCTION WIDTH MKR MODE TROUSOL 2.474 50 GHz 2.475 05 GHz <u>103.978 dBμV</u> 100.67 dBµV 56.195 dBμV 47.98 dBμV N 2 f N 1 f 2.483 50 GHz 2.483 50 GHz 8 9 10 11 STATUS

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



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



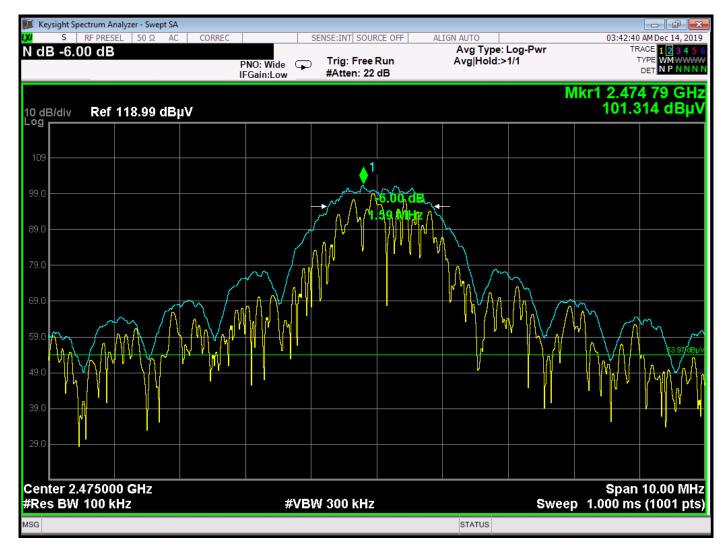
# DTS BANDWIDTH DATA SHEETS



Bandwidth 6 dB - 2425 MHz



Bandwidth 6 dB - 2450 MHz



Bandwidth 6 dB - 2475 MHz

Model: R32027BA00-00006



### **APPENDIX F**

## CLASS II PERMISSIVE CHANGE INFORMATION



The following change(s) were made to the EUT for the Class II Permissive Change:

1. PCB layout changes and component removal to non-RF portion of PCB. Changes are to boost circuit near the middle battery terminals.

No changes were made to the RF parameters such as output power, frequencies, and modulations supported.

# DELTA FROM CLASS II PERSMISSIVE CHANGE TO ORIGINAL UNIT

| FREQUENCY (MHz)         | Worse case Delta from<br>Test Report B90603D2<br>(dBuV/m) | Worst case Delta from<br>Test Report B91216D1<br>(dBuV/m) | DELTA  |
|-------------------------|---|---|--------|
| 4850.00                 | -18.34  | -7.95   | +10.39 |
| 7275.00                 | -15.64  | -14.86  | +0.78  |
| 9700.00                 | -26.68  | -29.11  | -2.43  |
| 4900.00                 | -15.26  | -6.08   | +9.18  |
| 7350.00                 | -15.34  | -15.87  | -0.53  |
| 9800.00                 | -25.37  | -27.61  | -2.24  |
| 4950.00                 | -13.58  | -5.40   | +8.18  |
| 7425.00                 | -16.54  | -14.95  | +1.59  |
| 9900.00                 | -29.37  | -27.96  | +1.41  |
| (LBE) 2425.00 – 2377.00 | -16.23  | -15.10  | +1.13  |
| (HBE) 2475.00 – 2483.50 | -5.51   | -5.99   | -0.48  |

#### Notes

LBE – Low Band Edge HBE – High Band Edge