

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

for

**PROJECT Z-SERIES – TRANSMITTER
Model: 600-855-Z**

Prepared for

KANGAROO PRODUCTS COMPANY
111 KANGAROO DRIVE
COLUMBUS, NORTH CAROLINA 28722

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JAMES ROSS

Approved by: *Kyle Fujimoto*

KYLE FUJIMOTO

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DATE: MARCH 9, 2018

| | REPORT BODY | APPENDICES | | | | | TOTAL |
|-------|----------------|------------|---|---|----|----|-------|
| | | A | B | C | D | E | |
| PAGES | 16 | 2 | 2 | 2 | 11 | 33 | 65 |

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TABLE OF CONTENTS

| Section / Title | PAGE |
|---|----------|
| GENERAL REPORT SUMMARY | 4 |
| SUMMARY OF TEST RESULTS | 5 |
| 1. PURPOSE | 6 |
| 2. ADMINISTRATIVE DATA | 7 |
| 2.1 Location of Testing | 7 |
| 2.2 Traceability Statement | 7 |
| 2.3 Cognizant Personnel | 7 |
| 2.4 Date Test Sample was Received | 7 |
| 2.5 Disposition of the Test Sample | 7 |
| 2.6 Abbreviations and Acronyms | 7 |
| 3. APPLICABLE DOCUMENTS | 8 |
| 4. DESCRIPTION OF TEST CONFIGURATION | 9 |
| 4.1 Description of Test Configuration – Emissions | 9 |
| 4.1.1 Cable Construction and Termination | 9 |
| 5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT | 10 |
| 5.1 EUT and Accessory List | 10 |
| 6. TEST SITE DESCRIPTION | 12 |
| 6.1 Test Facility Description | 12 |
| 6.2 EUT Mounting, Bonding and Grounding | 12 |
| 6.3 Measurement Uncertainty | 12 |
| 7. TEST PROCEDURES | 13 |
| 7.1 RF Emissions | 13 |
| 7.1.1 Conducted Emissions Test | 13 |
| 7.1.2 Radiated Emissions Test | 14 |
| 7.1.3 RF Emissions Test Results | 15 |
| 8. CONCLUSIONS | 16 |

LIST OF APPENDICES

| APPENDIX | TITLE |
|----------|---|
| A | Laboratory Accreditations and Recognitions |
| B | Modifications to the EUT |
| C | Additional Model Covered Under This Report |
| D | Diagrams and Charts <ul style="list-style-type: none"> • Test Setup Diagrams • Antenna and Effective Gain Factors |
| E | Data Sheets |

LIST OF FIGURES

| FIGURE | TITLE |
|--------|--|
| 1 | Layout of the Semi-Anechoic Test Chamber |

LIST OF TABLES

| TABLE | TITLE |
|-------|---------------------------|
| 1.0 | Radiated Emission Results |

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: Project Z-series – Transmitter
Model: 600-855-Z
S/N: N/A

Product Description: The EUT is the handheld transmitter used in the remote guidance system of Kangaroo Products Company remote control golf motorcaddies.

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

Customer: Kangaroo Products Company
111 Kangaroo Drive
Columbus, North Carolina 28722

Test Date: February 21, 2018

Test Specifications covered by accreditation:

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



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

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SUMMARY OF TEST RESULTS

| TEST | DESCRIPTION | RESULTS |
|-------------|--|--|
| 1 | Spurious Radiated RF Emissions, 9 kHz – 9300 MHz (Transmitter and Digital portion) | Complies with the Class B limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15 Subpart C, section 15.205, 15.209 and 15.249 Highest reading in relation to spec limit 93.77 dBuV/m @ 903.37 MHz (*U = 4.54 dB) |
| 2 | Conducted RF Emissions, 150 kHz to 30 MHz | This test was not performed because the EUT does not connect to the AC mains |

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Project Z-series – Transmitter, Model: 600-855-Z. 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, 15.209, and 15.249.



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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

Kangaroo Products Company

Karen Blackburn Senior Purchasing Officer

Compatible Electronics Inc.

James Ross Test Engineer
Kyle Fujimoto Test Engineer

2.4 Date Test Sample was Received

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

2.5 Disposition of the Test Sample

The test sample has not been returned to Kangaroo Products Company as of the date of this report.

2.6 Abbreviations and Acronyms

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

| | |
|------|--------------------------------------|
| RF | Radio Frequency |
| EMI | Electromagnetic Interference |
| EUT | Equipment Under Test |
| P/N | Part Number |
| S/N | Serial Number |
| ASK | Amplitude Shift Key |
| ITE | Information Technology Equipment |
| LISN | Line Impedance Stabilization Network |
| N/A | Not Applicable |
| Tx | Transmit |
| Rx | Receive |
| Inc. | Incorporated |
| RMS | Root Mean Square |

3. APPLICABLE DOCUMENTS

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

| | TITLE |
|---------------------------------|---|
| FCC Title 47, Part 15 Subpart C | FCC Rules – Radio frequency devices (including digital devices) – Intentional Radiators |
| FCC Title 47, Part 15 Subpart B | FCC Rules – Radio frequency devices (including digital devices) – Unintentional Radiators |
| ANSI C63.4 2014 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| ANSI C63.10 2013 | American National Standard of procedure for compliance testing of unlicensed wireless devices |

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – Emissions

The Project Z-series – Transmitter, Model: 600-855-Z (EUT) was setup in a stand-alone configuration. The EUT was investigated in all three orthogonal axis. During the testing, the EUT was continuously transmitting at the low channel of 903.37 MHz, middle channel of 912.37 MHz, and high channel of 921.37 MHz.

The X orientation is when the EUT is parallel to the ground. The Y orientation is when the EUT is perpendicular to the ground mounted vertically. The Z orientation is when the EUT is perpendicular to the ground mounted horizontally.

The EUT had firmware that allowed the EUT to be able to continuously transmit at the low, middle, or high channels. Fresh batteries were installed inside the EUT prior to the testing. The EUT was preset via internal firmware to continuously transmit at the low, middle, or high, respectively.

The firmware is located at the company's servers.

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

4.1.1 Cable Construction and Termination

The EUT had no external cables.

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

| EQUIPMENT | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | FCC ID |
|--------------------------------------|---------------------------|--------------|---------------|--------------|
| PROJECT Z-SERIES – TRANSMITTER (EUT) | KANGAROO PRODUCTS COMPANY | 600-855-Z | N/A | OVP600-855-Z |
| FIRMWARE | LINX TECHNOLOGIES | V01 | N/A | N/A |

5.2 Emissions Test Equipment

| EQUIPMENT TYPE | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | CALIBRATION DATE | CAL. CYCLE |
|--------------------------------|----------------------------|--------------|---------------|-------------------|------------|
| TDK TestLab | TDK RF Solutions, Inc. | 9.22 | 700145 | N/A | N/A |
| Computer | Hewlett Packard | p6716f | MXX1030PX0 | N/A | N/A |
| LCD Monitor | Hewlett Packard | 52031a | 3CQ046N3MG | N/A | N/A |
| EMI Receiver, 20 Hz – 26.5 GHz | Keysight Technologies | N9038A | MY5120150 | December 6, 2017 | 1 Year |
| Preamplifier | Com-Power | PAM-118A | 551024 | May 12, 2016 | 2 Year |
| Loop Antenna | Com-Power | AL-130R | 121090 | February 9, 2017 | 2 Year |
| CombiLog Antenna | Com-Power | AC-220 | 61060 | July 27, 2017 | 1 Year |
| Horn Antenna | Com-Power | AH-118 | 071175 | February 26, 2016 | 2 Year |
| Antenna Mast | Com Power | AM-100 | N/A | N/A | N/A |
| System Controller | Sunol Sciences Corporation | SC110V | 112213-1 | N/A | N/A |
| Turntable | Sunol Sciences Corporation | 2011VS | N/A | N/A | N/A |
| Antenna-Mast | Sunol Sciences Corporation | TWR95-4 | 112213-3 | N/A | N/A |

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

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

6.2 EUT Mounting, Bonding and Grounding

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

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

The EUT was not grounded.

6.3 Measurement Uncertainty

The uncertainty values are in the table below.

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

| MEASUREMENT TYPE | PARTICULAR CONFIGURATION | UNCERTAINTY VALUES |
|--------------------|--------------------------------------|--------------------|
| RADIATED EMISSIONS | 3-METER CHAMBER, COMBILOG ANTENNA | 4.54 dB |
| RADIATED EMISSIONS | 3-METER CHAMBER, HORN ANTENNA | 3.70 dB |

7. TEST PROCEDURES

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

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The 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.

Test Results:

This device is battery powered, handheld device and does not connect to the AC public mains, thus this test was not performed.

7.1.2 Radiated Emissions Test

The EMI Receiver was used as the measuring meter. A built-in, internal preamplifier was 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 (200 Hz for 9 kHz to 150 kHz, 9 kHz for 150 kHz to 30 MHz, 120 kHz for 30 MHz to 1 GHz and 1 MHz for 1 GHz to 9.3 GHz).

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

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

The EUT was tested at a 3-meter test distance. The six highest emissions are listed in Table 1.0.

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

| FREQUENCY RANGE | EFFECTIVE MEASUREMENT BANDWIDTH | TRANSDUCER |
|-------------------|---------------------------------|------------------|
| 9 kHz to 150 kHz | 200 Hz | Loop Antenna |
| 150 kHz to 30 MHz | 9 kHz | Loop Antenna |
| 30 MHz to 1 GHz | 120 kHz | CombiLog Antenna |
| 1 GHz to 9.3 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 15.249 for radiated emissions.

7.1.3 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS
 Project Z-series – Transmitter
 Model: 600-855-Z

| Frequency MHz | Quasi-Peak EMI Reading (dBuV/m) | Quasi-Peak Specification Limit (dBuV/m) | Delta (Cor. Reading – Spec. Limit) dB) |
|--------------------------------------|---------------------------------------|---|--|
| 903.37 (H) (X-Axis) (Low Channel) | 93.77 | 93.97 | -0.20 |
| 903.37 (H) (Z-Axis) (Low Channel) | 93.69 | 93.97 | -0.28 |
| 912.37 (H) (X-Axis) (Middle Channel) | 93.64 | 93.97 | -0.33 |
| 903.37 (V) (Y-Axis) (Low Channel) | 93.23 | 93.97 | -0.74 |
| 921.37 (H) (X-Axis) (High Channel) | 92.61 | 93.97 | -1.36 |
| 921.37 (V) (Y-Axis) (High Channel) | 92.24 | 93.97 | -1.73 |

Notes:

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

8. CONCLUSIONS

The Project Z-series – Transmitter, Model: 600-855-Z, as tested, meets all of the **Class B** specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209 and 15.249.



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APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

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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."

Test Site Number for Innovation, Science and Economic Development Canada: 2154A-3



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APPENDIX B

MODIFICATIONS TO THE EUT

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MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.249 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.



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APPENDIX C

***ADDITIONAL MODEL COVERED
UNDER THIS REPORT***

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ADDITIONAL MODEL COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Project Z-series – Transmitter
Model: 600-855-Z
S/N: N/A

There are no additional Models covered under this report.



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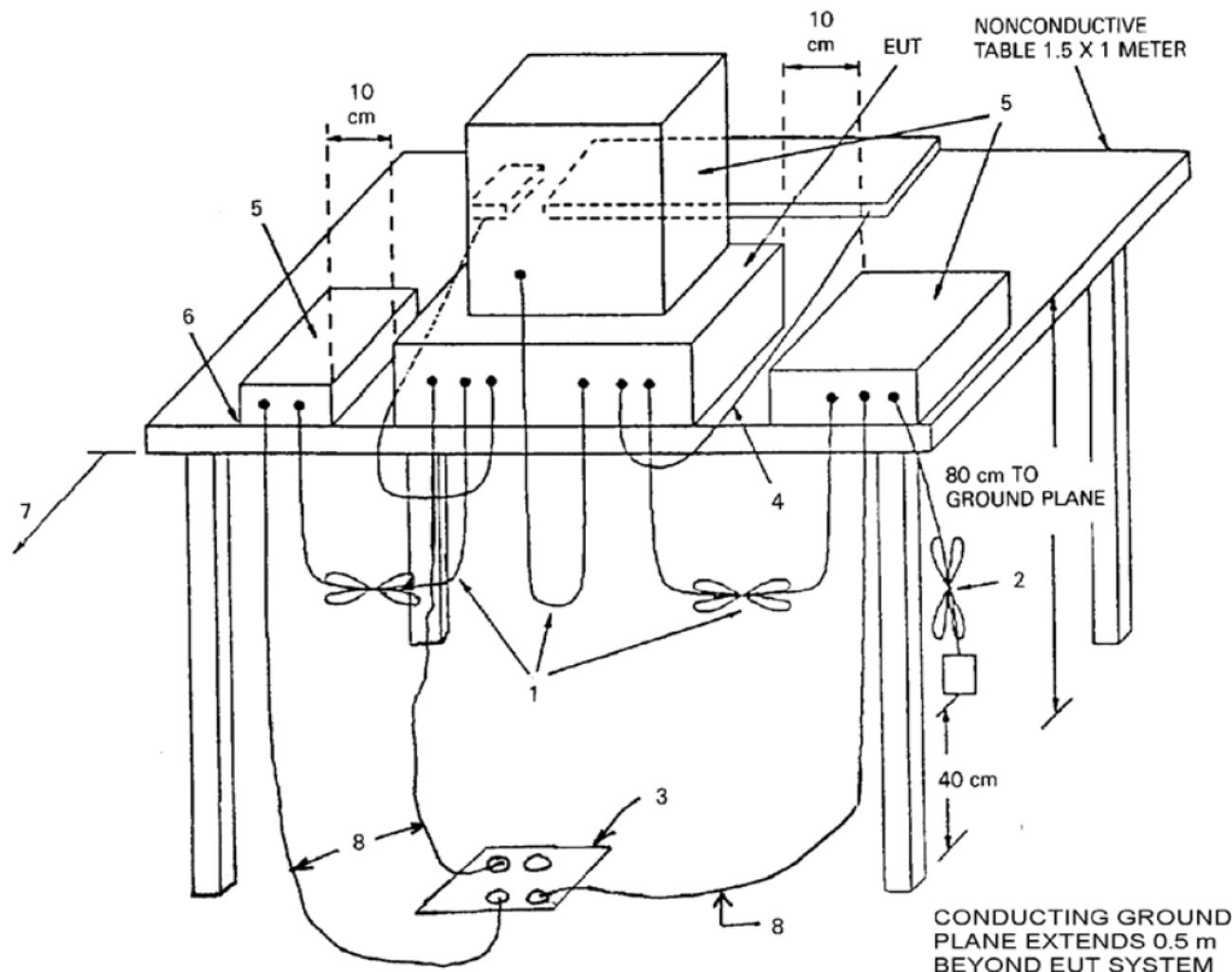
APPENDIX D

DIAGRAMS AND CHARTS

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FIGURE 1: RADIATED EMISSIONS TEST SETUP


Test arrangement for radiated emissions of tabletop equipment

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COM-POWER AL-130R
LOOP ANTENNA
S/N: 121090
CALIBRATION DATE: FEBRUARY 9, 2017

| FREQUENCY (MHz) | MAGNETIC (dB/m) | ELECTRIC (dB/m) |
|--------------------|--------------------|--------------------|
| 0.009 | -36.17 | 15.33 |
| 0.01 | -35.86 | 15.64 |
| 0.02 | -37.30 | 14.20 |
| 0.03 | -36.58 | 14.92 |
| 0.04 | -36.99 | 14.51 |
| 0.05 | -37.66 | 13.84 |
| 0.06 | -37.53 | 13.97 |
| 0.07 | -37.64 | 13.86 |
| 0.08 | -37.52 | 13.98 |
| 0.09 | -37.62 | 13.88 |
| 0.1 | -37.59 | 13.91 |
| 0.2 | -37.79 | 13.71 |
| 0.3 | -37.80 | 13.70 |
| 0.4 | -37.70 | 13.80 |
| 0.5 | -37.79 | 13.71 |
| 0.6 | -37.79 | 13.71 |
| 0.7 | -37.69 | 13.81 |
| 0.8 | -37.49 | 14.01 |
| 0.9 | -37.39 | 14.11 |
| 1 | -37.39 | 14.11 |
| 2 | -37.09 | 14.41 |
| 3 | -37.09 | 14.41 |
| 4 | -37.19 | 14.31 |
| 5 | -36.98 | 14.52 |
| 6 | -37.17 | 14.33 |
| 7 | -37.05 | 14.45 |
| 8 | -36.85 | 14.65 |
| 9 | -36.84 | 14.66 |
| 10 | -36.75 | 14.75 |
| 15 | -37.16 | 14.34 |
| 20 | -36.44 | 15.06 |
| 25 | -37.88 | 13.62 |
| 30 | -39.14 | 12.36 |

COM-POWER AC-220
COMBILOG ANTENNA
S/N: 61060
CALIBRATION DATE: JULY 27, 2017

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

COM POWER AH-118
HORN ANTENNA
S/N: 071175
CALIBRATION DATE: FEBRUARY 26, 2016

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|--------------------|----------------|--------------------|----------------|
| 1.0 | 23.93 | 10.0 | 39.33 |
| 1.5 | 25.54 | 10.5 | 39.64 |
| 2.0 | 28.09 | 11.0 | 41.04 |
| 2.5 | 30.21 | 11.5 | 44.29 |
| 3.0 | 30.15 | 12.0 | 41.22 |
| 3.5 | 30.17 | 12.5 | 41.50 |
| 4.0 | 31.90 | 13.0 | 41.62 |
| 4.5 | 33.51 | 13.5 | 40.63 |
| 5.0 | 33.87 | 14.0 | 39.94 |
| 5.5 | 35.08 | 14.5 | 41.84 |
| 6.0 | 34.81 | 15.0 | 42.69 |
| 6.5 | 34.26 | 15.5 | 39.03 |
| 7.0 | 36.33 | 16.0 | 39.07 |
| 7.5 | 37.03 | 16.5 | 41.40 |
| 8.0 | 37.56 | 17.0 | 43.18 |
| 8.5 | 40.07 | 17.5 | 47.01 |
| 9.0 | 38.92 | 18.0 | 46.48 |
| 9.5 | 38.21 | | |

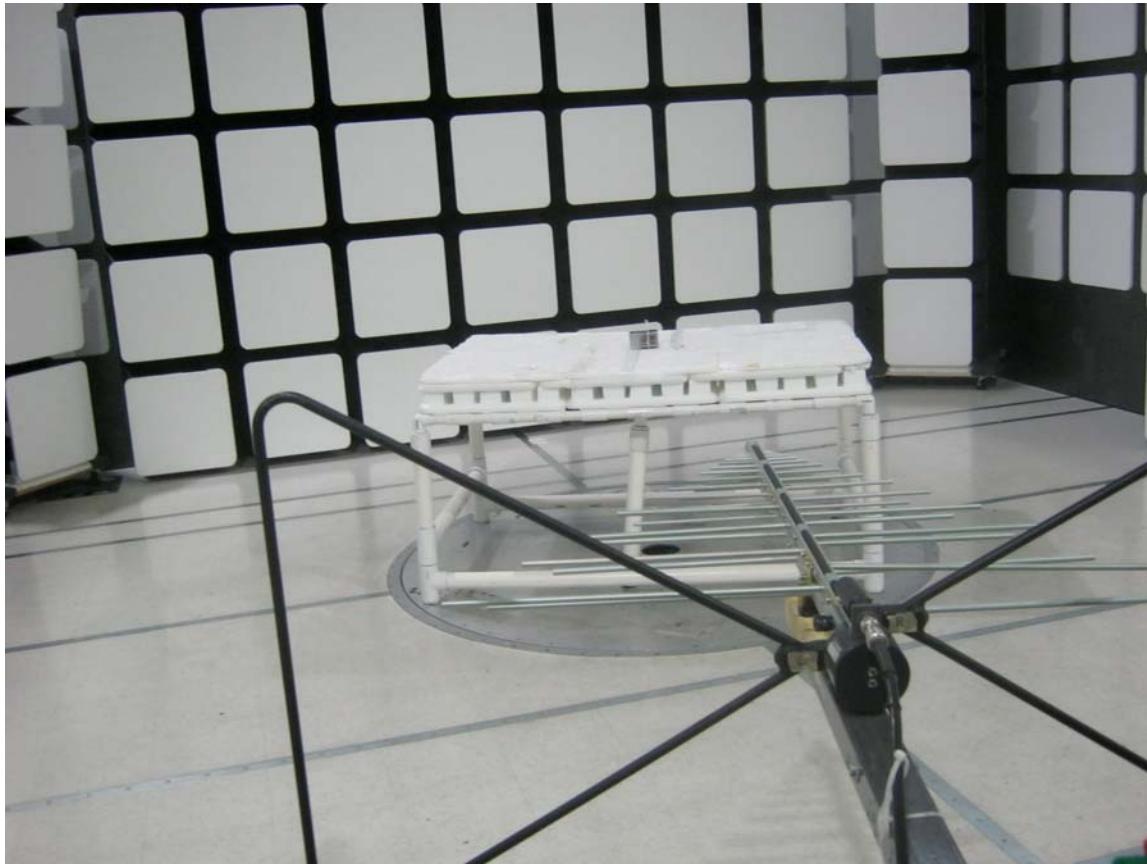
COM-POWER PAM-118A

PREAMPLIFIER

S/N: 551024

CALIBRATION DATE: MAY 12, 2016

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|--------------------|----------------|--------------------|----------------|
| 1.0 | 39.84 | 6.0 | 39.05 |
| 1.1 | 39.40 | 6.5 | 38.94 |
| 1.2 | 39.58 | 7.0 | 39.25 |
| 1.3 | 39.68 | 7.5 | 39.09 |
| 1.4 | 39.91 | 8.0 | 39.01 |
| 1.5 | 39.78 | 8.5 | 38.60 |
| 1.6 | 39.50 | 9.0 | 38.64 |
| 1.7 | 39.81 | 9.5 | 39.67 |
| 1.8 | 39.89 | 10.0 | 39.30 |
| 1.9 | 39.94 | 11.0 | 39.15 |
| 2.0 | 39.57 | 12.0 | 39.24 |
| 2.5 | 40.39 | 13.0 | 39.49 |
| 3.0 | 40.63 | 14.0 | 39.44 |
| 3.5 | 40.80 | 15.0 | 39.94 |
| 4.0 | 40.86 | 16.0 | 40.09 |
| 4.5 | 39.94 | 17.0 | 40.06 |
| 5.0 | 34.47 | 18.0 | 39.76 |
| 5.5 | 39.32 | | |



FRONT VIEW

KANGAROO PRODUCTS COMPANY
PROJECT Z-SERIES – TRANSMITTER
MODEL: 600-855-Z

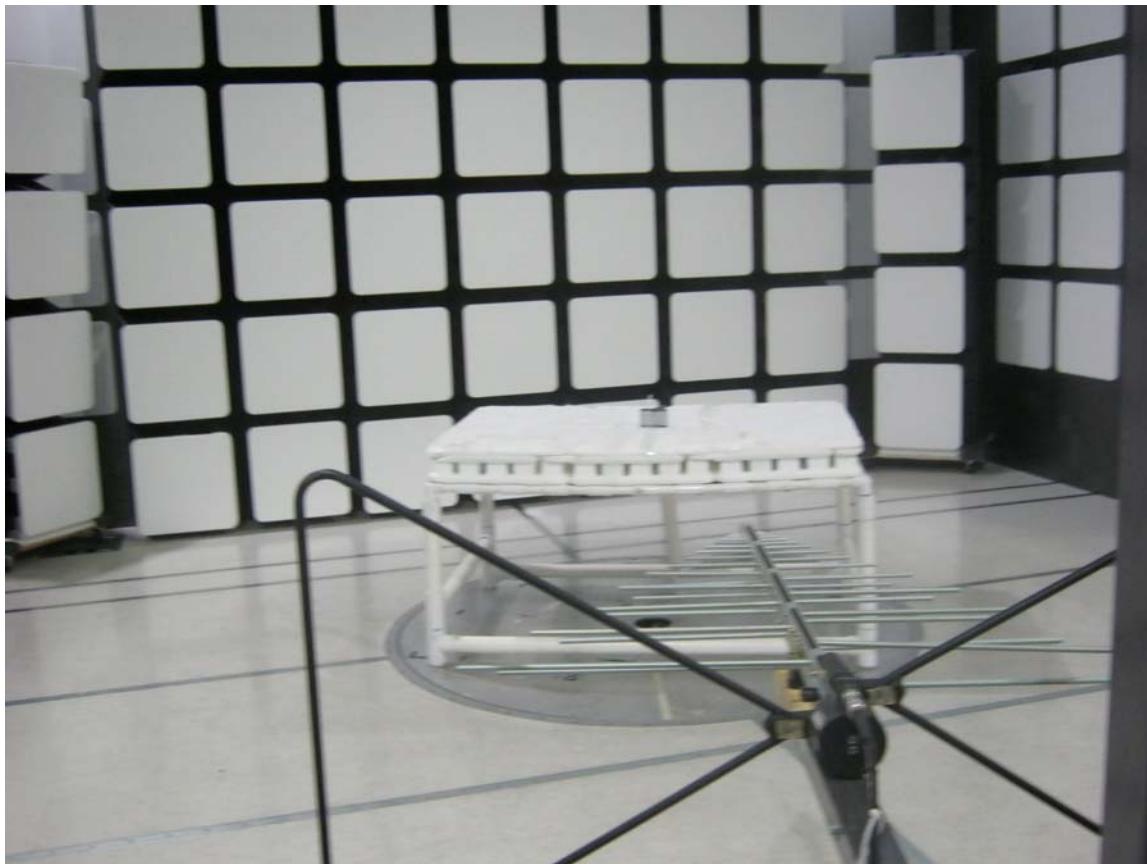
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

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

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

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

**REAR VIEW**

KANGAROO PRODUCTS COMPANY
PROJECT Z-SERIES – TRANSMITTER
MODEL: 600-855-Z

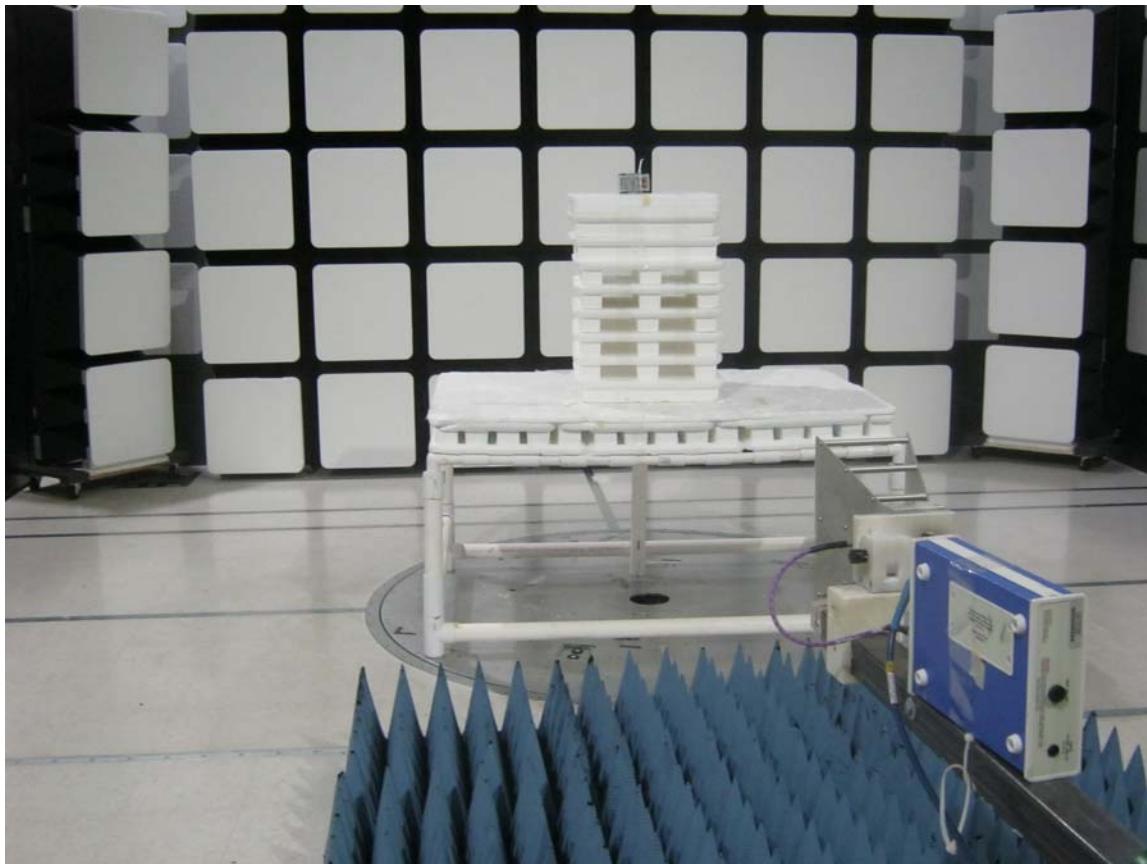
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

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

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

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

**FRONT VIEW**

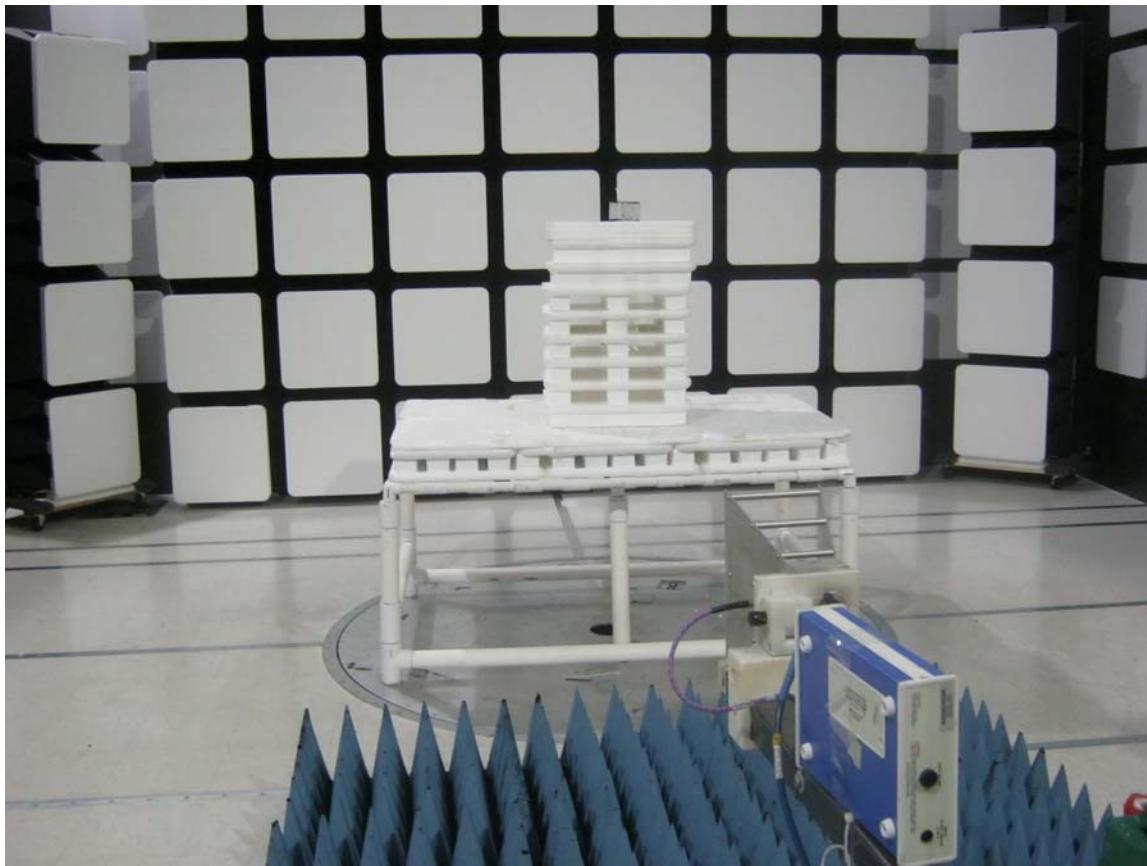
KANGAROO PRODUCTS COMPANY
PROJECT Z-SERIES – TRANSMITTER
MODEL: 600-855-Z
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

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

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Lake Forest, CA 92630
(949) 587-0400

**REAR VIEW**

KANGAROO PRODUCTS COMPANY
PROJECT Z-SERIES – TRANSMITTER
MODEL: 600-855-Z

FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

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

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

APPENDIX E

DATA SHEETS

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

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

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

***RADIATED EMISSIONS
DATA SHEETS***

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

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

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

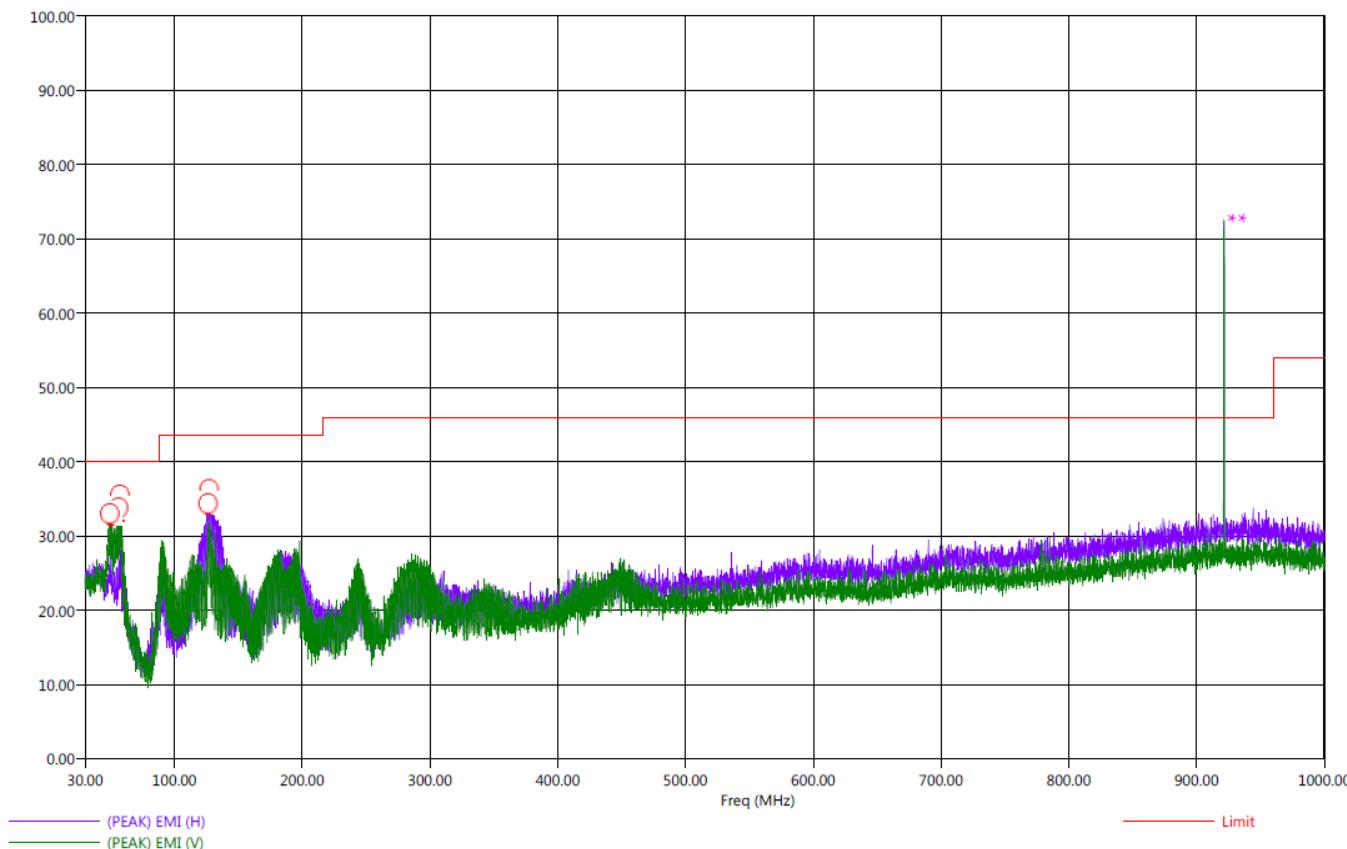
Title: Pre-Scan - FCC Class B
 File: Agilent - Pre-Scan - Tx - FCC Class B.set
 Operator: Kyle Fujimoto
 EUT Type: Project Z-series - Transmitter
 EUT Condition: The EUT is continuously transmitting at 921.37 MHz - Worst Case
 Customer: Kangaroo Products Company
 Model: 600-855-Z
 S/N: N/A

2/20/2018 4:27:38 PM
 Sequence: Preliminary Scan

** Note: The Frequency at 921.37 MHz is from the EUT and is subject to the limits of FCC 15.249 instead

FCC Class B

Electric Field Strength (dB μ V/m)



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

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

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

Title: Radiated Emissions - FCC Class B
 File: Agilent - Final Scan - FCC Class B –Tx – Spurious Emissions.set
 Operator: Kyle Fujimoto
 EUT Type: Project Z-series - Transmitter
 EUT Condition: The EUT is continuously transmitting at 921.37 MHz
 Company: Kangaroo Products, Inc.
 Model: 600-855-Z
 S/N: N/A

2/20/2018 4:57:59 PM
 Sequence: Final Measurements

FCC Class B

| Freq (MHz) | Pol | (PEAK) EMI (dB μ V/m) | (QP) EMI (dB μ V/m) | (PEAK) Margin (dB) | (QP) Margin (dB) | Limit (dB μ V/m) | Transducer (dB) | Cable (dB) | Ttbl Agl (deg) | Twr Ht (cm) |
|---------------|-----|------------------------------|----------------------------|-----------------------|---------------------|-------------------------|--------------------|---------------|-------------------|----------------|
| 49.50 | V | 33.09 | 32.89 | -6.91 | -7.11 | 40.00 | 22.18 | 0.90 | 236.00 | 175.31 |
| 50.40 | V | 33.05 | 32.67 | -6.95 | -7.33 | 40.00 | 21.92 | 0.90 | 284.75 | 158.95 |
| 56.40 | V | 33.88 | 33.45 | -6.12 | -6.55 | 40.00 | 19.23 | 0.90 | 189.75 | 127.55 |
| 57.40 | V | 35.63 | 35.21 | -4.37 | -4.79 | 40.00 | 18.78 | 0.90 | 300.25 | 175.01 |
| 58.40 | V | 33.58 | 33.42 | -6.42 | -6.58 | 40.00 | 18.32 | 0.90 | 257.00 | 143.25 |
| 126.30 | H | 34.47 | 34.21 | -9.03 | -9.29 | 43.50 | 14.81 | 1.25 | 303.25 | 154.35 |
| 127.20 | H | 36.63 | 36.25 | -6.87 | -7.25 | 43.50 | 14.68 | 1.26 | 259.25 | 144.12 |
| 128.20 | H | 35.28 | 35.21 | -8.22 | -8.29 | 43.50 | 14.45 | 1.27 | 12.50 | 222.50 |



Brea Division
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Brea, CA 92823
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20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



COMPATIBLE ELECTRONICS

Report Number: **B80221D1**
FCC Part 15 Subpart B and **FCC Section 15.249** Test Report
Project Z-series – Transmitter
Model: 600-855-Z

Page E5

FCC 15.249
Kangaroo Products Company
Project Z-series - Transmitter
Model: 600-855-Z

Date: 02/21/2018
Lab: D
Tested By: Kyle Fujimoto

Fundamental Low Channel



COMPATIBLE ELECTRONICS

FCC 15.249

Kangaroo Products Company
Project Z-series - Transmitter
Model: 600-855-Z

Date: 02/21/2018

Lab: D

Tested By: Kyle Fujimoto

Fundamental Middle Channel



COMPATIBLE ELECTRONICS

Report Number: **B80221D1**
FCC Part 15 Subpart B and **FCC Section 15.249** Test Report
Project Z-series – Transmitter
Model: 600-855-Z

Page E7

FCC 15.249

Kangaroo Products Company
Project Z-series - Transmitter
Model: 600-855-Z

Date: 02/21/2018

Lab: D

Tested By: Kyle Fujimoto

Fundamental High Channel

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Low Channel
 Transmit Mode - X-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1806.74 | 34.28 | V | 73.97 | -39.69 | Peak | 239.00 | 135.26 | |
| 1806.74 | 22.61 | V | 53.97 | -31.36 | Avg | 239.00 | 135.26 | |
| 2710.11 | 43.28 | V | 73.97 | -30.69 | Peak | 10.50 | 114.91 | |
| 2710.11 | 28.59 | V | 53.97 | -25.39 | Avg | 10.50 | 114.91 | |
| 3613.48 | 42.88 | V | 73.97 | -31.09 | Peak | 273.75 | 130.19 | |
| 3613.48 | 29.67 | V | 53.97 | -24.30 | Avg | 273.75 | 130.19 | |
| 4516.85 | 45.28 | V | 73.97 | -28.69 | Peak | 152.25 | 168.94 | |
| 4516.85 | 30.50 | V | 53.97 | -23.47 | Avg | 152.25 | 168.94 | |
| 5420.22 | 44.51 | V | 73.97 | -29.46 | Peak | 113.25 | 123.62 | |
| 5420.22 | 31.10 | V | 53.97 | -22.87 | Avg | 113.25 | 123.62 | |
| 6323.59 | 40.38 | V | 73.97 | -33.59 | Peak | 94.50 | 112.28 | |
| 6323.59 | 29.05 | V | 53.97 | -24.92 | Avg | 94.50 | 112.28 | |
| 7226.96 | 52.56 | V | 73.97 | -21.41 | Peak | 279.75 | 100.25 | |
| 7226.96 | 36.09 | V | 53.97 | -17.88 | Avg | 279.75 | 100.25 | |
| 8130.33 | | | | | | | | No Emission Detected |
| 8130.33 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Low Channel
 Transmit Mode - Y-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1806.74 | 46.58 | V | 73.97 | -27.40 | Peak | 139.25 | 152.22 | |
| 1806.74 | 30.14 | V | 53.97 | -23.84 | Avg | 139.25 | 152.22 | |
| 2710.11 | 46.42 | V | 73.97 | -27.55 | Peak | 7.25 | 120.22 | |
| 2710.11 | 31.15 | V | 53.97 | -22.83 | Avg | 7.25 | 120.22 | |
| 3613.48 | 42.94 | V | 73.97 | -31.03 | Peak | 168.50 | 149.89 | |
| 3613.48 | 29.55 | V | 53.97 | -24.42 | Avg | 168.50 | 149.89 | |
| 4516.85 | 44.57 | V | 73.97 | -29.40 | Peak | 12.00 | 192.88 | |
| 4516.85 | 31.17 | V | 53.97 | -22.80 | Avg | 12.00 | 192.88 | |
| 5420.22 | 42.43 | V | 73.97 | -31.54 | Peak | 137.25 | 248.22 | |
| 5420.22 | 30.70 | V | 53.97 | -23.27 | Avg | 137.25 | 248.22 | |
| 6323.59 | 41.12 | V | 73.97 | -32.85 | Peak | 27.75 | 205.23 | |
| 6323.59 | 29.01 | V | 53.97 | -24.96 | Avg | 27.75 | 205.23 | |
| 7226.96 | 55.79 | V | 73.97 | -18.18 | Peak | 313.25 | 188.28 | |
| 7226.96 | 39.96 | V | 53.97 | -14.01 | Avg | 313.25 | 188.28 | |
| 8130.33 | | | | | | | | No Emission Detected |
| 8130.33 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Low Channel
 Transmit Mode - Z-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1806.74 | 35.58 | V | 73.97 | -38.39 | Peak | 228.75 | 124.28 | |
| 1806.74 | 23.39 | V | 53.97 | -30.59 | Avg | 228.75 | 124.28 | |
| 2710.11 | 38.58 | V | 73.97 | -35.39 | Peak | 129.50 | 100.00 | |
| 2710.11 | 26.12 | V | 53.97 | -27.85 | Avg | 129.50 | 100.00 | |
| 3613.48 | 44.55 | V | 73.97 | -29.42 | Peak | 149.50 | 134.43 | |
| 3613.48 | 29.44 | V | 53.97 | -24.53 | Avg | 149.50 | 134.43 | |
| 4516.85 | 45.18 | V | 73.97 | -28.79 | Peak | 172.00 | 105.47 | |
| 4516.85 | 31.12 | V | 53.97 | -22.85 | Avg | 172.00 | 105.47 | |
| 5420.22 | 43.26 | V | 73.97 | -30.71 | Peak | 69.25 | 108.34 | |
| 5420.22 | 31.61 | V | 53.97 | -22.36 | Avg | 69.25 | 108.34 | |
| 6323.59 | 42.30 | V | 73.97 | -31.67 | Peak | 25.50 | 110.55 | |
| 6323.59 | 30.79 | V | 53.97 | -23.18 | Avg | 25.50 | 110.55 | |
| 7226.96 | 48.13 | V | 73.97 | -25.84 | Peak | 10.00 | 117.47 | |
| 7226.96 | 34.80 | V | 53.97 | -19.17 | Avg | 10.00 | 117.47 | |
| 8130.33 | | | | | | | | No Emission Detected |
| 8130.33 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Low Channel
 Transmit Mode - X-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1806.74 | 47.92 | H | 73.97 | -26.06 | Peak | 68.00 | 168.62 | |
| 1806.74 | 32.63 | H | 53.97 | -21.34 | Avg | 68.00 | 168.62 | |
| 2710.11 | 48.13 | H | 73.97 | -25.84 | Peak | 57.25 | 119.44 | |
| 2710.11 | 33.32 | H | 53.97 | -20.65 | Avg | 57.25 | 119.44 | |
| 3613.48 | 42.04 | H | 73.97 | -31.93 | Peak | 352.25 | 149.41 | |
| 3613.48 | 26.97 | H | 53.97 | -27.00 | Avg | 352.25 | 149.41 | |
| 4516.85 | 46.64 | H | 73.97 | -27.33 | Peak | 114.75 | 150.61 | |
| 4516.85 | 32.11 | H | 53.97 | -21.86 | Avg | 114.75 | 150.61 | |
| 5420.22 | 41.87 | H | 73.97 | -32.10 | Peak | 233.00 | 120.04 | |
| 5420.22 | 30.37 | H | 53.97 | -23.60 | Avg | 233.00 | 120.04 | |
| 6323.59 | 40.52 | H | 73.97 | -33.45 | Peak | 91.50 | 120.05 | |
| 6323.59 | 28.74 | H | 53.97 | -25.23 | Avg | 91.50 | 120.05 | |
| 7226.96 | 50.41 | H | 73.97 | -23.56 | Peak | 81.25 | 165.23 | |
| 7226.96 | 33.90 | H | 53.97 | -20.07 | Avg | 81.25 | 165.23 | |
| 8130.33 | | | | | | | | No Emission Detected |
| 8130.33 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Low Channel
 Transmit Mode - Y-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1806.74 | 34.80 | H | 73.97 | -39.17 | Peak | 164.75 | 103.74 | |
| 1806.74 | 22.71 | H | 53.97 | -31.26 | Avg | 164.75 | 103.74 | |
| 2710.11 | 39.26 | H | 73.97 | -34.71 | Peak | 153.75 | 100.94 | |
| 2710.11 | 25.42 | H | 53.97 | -28.55 | Avg | 153.75 | 100.94 | |
| 3613.48 | 44.09 | H | 73.97 | -29.88 | Peak | 351.25 | 147.26 | |
| 3613.48 | 30.35 | H | 53.97 | -23.62 | Avg | 351.25 | 147.26 | |
| 4516.85 | 43.98 | H | 73.97 | -29.99 | Peak | 208.25 | 118.31 | |
| 4516.85 | 29.46 | H | 53.97 | -24.51 | Avg | 208.25 | 118.31 | |
| 5420.22 | 42.91 | H | 73.97 | -31.06 | Peak | 11.00 | 102.13 | |
| 5420.22 | 30.83 | H | 53.97 | -23.14 | Avg | 11.00 | 102.13 | |
| 6323.59 | 41.24 | H | 73.97 | -32.73 | Peak | 341.00 | 113.77 | |
| 6323.59 | 29.02 | H | 53.97 | -24.95 | Avg | 341.00 | 113.77 | |
| 7226.96 | 46.65 | H | 73.97 | -27.32 | Peak | 88.25 | 122.61 | |
| 7226.96 | 33.44 | H | 53.97 | -20.53 | Avg | 88.25 | 122.61 | |
| 8130.33 | | | | | | | | No Emission Detected |
| 8130.33 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |

FCC 15.249

 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

 Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

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

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1806.74 | 50.47 | H | 73.97 | -23.50 | Peak | 234.50 | 173.89 | |
| 1806.74 | 34.72 | H | 53.97 | -19.25 | Avg | 234.50 | 173.89 | |
| 2710.11 | 48.55 | H | 73.97 | -25.43 | Peak | 43.75 | 244.76 | |
| 2710.11 | 32.14 | H | 53.97 | -21.83 | Avg | 43.75 | 244.76 | |
| 3613.48 | 43.98 | H | 73.97 | -30.00 | Peak | 235.50 | 213.95 | |
| 3613.48 | 30.16 | H | 53.97 | -23.81 | Avg | 235.50 | 213.95 | |
| 4516.85 | 45.55 | H | 73.97 | -28.42 | Peak | 117.75 | 153.83 | |
| 4516.85 | 32.64 | H | 53.97 | -21.33 | Avg | 117.75 | 153.83 | |
| 5420.22 | 44.63 | H | 73.97 | -29.34 | Peak | 226.25 | 143.92 | |
| 5420.22 | 32.07 | H | 53.97 | -21.90 | Avg | 226.25 | 143.92 | |
| 6323.59 | 43.38 | H | 73.97 | -30.59 | Peak | 339.00 | 143.92 | |
| 6323.59 | 31.48 | H | 53.97 | -22.49 | Avg | 339.00 | 143.92 | |
| 7226.96 | 56.03 | H | 73.97 | -17.94 | Peak | 56.25 | 145.35 | |
| 7226.96 | 41.06 | H | 53.97 | -12.91 | Avg | 56.25 | 145.35 | |
| 8130.33 | | | | | | | | No Emission Detected |
| 8130.33 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |
| 9033.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Middle Channel
 Transmit Mode - X-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1824.74 | 35.86 | V | 73.97 | -38.12 | Peak | 15.75 | 102.19 | |
| 1824.74 | 23.28 | V | 53.97 | -30.69 | Avg | 15.75 | 102.19 | |
| 2737.11 | 43.90 | V | 73.97 | -30.07 | Peak | 286.75 | 174.07 | |
| 2737.11 | 29.85 | V | 53.97 | -24.12 | Avg | 286.75 | 174.07 | |
| 3649.48 | 45.65 | V | 73.97 | -28.32 | Peak | 32.25 | 172.10 | |
| 3649.48 | 29.69 | V | 53.97 | -24.28 | Avg | 32.25 | 172.10 | |
| 4561.85 | 44.88 | V | 73.97 | -29.09 | Peak | 280.50 | 113.83 | |
| 4561.85 | 32.02 | V | 53.97 | -21.95 | Avg | 280.50 | 113.83 | |
| 5474.22 | 45.23 | V | 73.97 | -28.74 | Peak | 69.50 | 118.97 | |
| 5474.22 | 33.25 | V | 53.97 | -20.72 | Avg | 69.50 | 118.97 | |
| 6386.59 | 43.00 | V | 73.97 | -30.97 | Peak | 164.50 | 121.25 | |
| 6386.59 | 31.04 | V | 53.97 | -22.93 | Avg | 164.50 | 121.25 | |
| 7298.96 | 50.84 | V | 73.97 | -23.13 | Peak | 251.75 | 148.82 | |
| 7298.96 | 37.49 | V | 53.97 | -16.48 | Avg | 251.75 | 148.82 | |
| 8211.33 | | | | | | | | No Emission Detected |
| 8211.33 | | | | | | | | No Emission Detected |
| 9123.70 | | | | | | | | No Emission Detected |
| 9123.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

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

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1824.74 | 50.27 | V | 73.97 | -23.70 | Peak | 73.75 | 138.73 | |
| 1824.74 | 34.64 | V | 53.97 | -19.33 | Avg | 73.75 | 138.73 | |
| 2737.11 | 47.36 | V | 73.97 | -26.61 | Peak | 124.25 | 123.74 | |
| 2737.11 | 32.79 | V | 53.97 | -21.18 | Avg | 124.25 | 123.74 | |
| 3649.48 | 46.25 | V | 73.97 | -27.72 | Peak | 321.50 | 182.91 | |
| 3649.48 | 31.74 | V | 53.97 | -22.23 | Avg | 321.50 | 182.91 | |
| 4561.85 | 44.71 | V | 73.97 | -29.26 | Peak | 86.50 | 121.77 | |
| 4561.85 | 30.81 | V | 53.97 | -23.16 | Avg | 86.50 | 121.77 | |
| 5474.22 | 43.63 | V | 73.97 | -30.34 | Peak | 22.25 | 105.83 | |
| 5474.22 | 32.22 | V | 53.97 | -21.75 | Avg | 22.25 | 105.83 | |
| 6386.59 | 43.15 | V | 73.97 | -30.83 | Peak | 329.75 | 110.79 | |
| 6386.59 | 31.36 | V | 53.97 | -22.61 | Avg | 329.75 | 110.79 | |
| 7298.96 | 56.67 | V | 73.97 | -17.30 | Peak | 147.50 | 147.14 | |
| 7298.96 | 41.32 | V | 53.97 | -12.65 | Avg | 147.50 | 147.14 | |
| 8211.33 | | | | | | | | No Emission Detected |
| 8211.33 | | | | | | | | No Emission Detected |
| 9123.70 | | | | | | | | No Emission Detected |
| 9123.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Middle Channel
 Transmit Mode - Z-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------|
| 1824.74 | 35.77 | V | 73.97 | -38.20 | Peak | 202.75 | 104.70 | |
| 1824.74 | 23.76 | V | 53.97 | -30.21 | Avg | 202.75 | 104.70 | |
| | | | | | | | | |
| 2737.11 | 40.66 | V | 73.97 | -33.31 | Peak | 130.75 | 132.28 | |
| 2737.11 | 27.06 | V | 53.97 | -26.92 | Avg | 130.75 | 132.28 | |
| | | | | | | | | |
| 3649.48 | 45.97 | V | 73.97 | -28.00 | Peak | 26.50 | 135.92 | |
| 3649.48 | 31.87 | V | 53.97 | -22.10 | Avg | 26.50 | 135.92 | |
| | | | | | | | | |
| 4561.85 | 45.50 | V | 73.97 | -28.48 | Peak | 279.25 | 117.29 | |
| 4561.85 | 30.52 | V | 53.97 | -23.45 | Avg | 279.25 | 117.29 | |
| | | | | | | | | |
| 5474.22 | 43.88 | V | 73.97 | -30.09 | Peak | 31.75 | 128.52 | |
| 5474.22 | 32.19 | V | 53.97 | -21.78 | Avg | 31.75 | 128.52 | |
| | | | | | | | | |
| 6386.59 | 43.17 | V | 73.97 | -30.80 | Peak | 261.00 | 131.56 | |
| 6386.59 | 31.31 | V | 53.97 | -22.66 | Avg | 261.00 | 131.56 | |
| | | | | | | | | |
| 7298.96 | 48.62 | V | 73.97 | -25.35 | Peak | 59.75 | 114.55 | |
| 7298.96 | 34.60 | V | 53.97 | -19.37 | Avg | 59.75 | 114.55 | |
| | | | | | | | | |
| 8211.33 | | | | | | | | No Emission |
| 8211.33 | | | | | | | | Detected |
| | | | | | | | | |
| 9123.70 | | | | | | | | No Emission |
| 9123.70 | | | | | | | | Detected |
| | | | | | | | | |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Middle Channel
 Transmit Mode - X-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1824.74 | 50.58 | H | 73.97 | -23.39 | Peak | 351.25 | 119.32 | |
| 1824.74 | 34.97 | H | 53.97 | -19.00 | Avg | 351.25 | 119.32 | |
| 2737.11 | 47.80 | H | 73.97 | -26.17 | Peak | 328.25 | 156.58 | |
| 2737.11 | 32.64 | H | 53.97 | -21.33 | Avg | 328.25 | 156.58 | |
| 3649.48 | 43.46 | H | 73.97 | -30.51 | Peak | 23.75 | 134.13 | |
| 3649.48 | 30.17 | H | 53.97 | -23.80 | Avg | 23.75 | 134.13 | |
| 4561.85 | 46.46 | H | 73.97 | -27.51 | Peak | 61.50 | 140.58 | |
| 4561.85 | 33.47 | H | 53.97 | -20.50 | Avg | 61.50 | 140.58 | |
| 5474.22 | 44.75 | H | 73.97 | -29.22 | Peak | 308.00 | 133.00 | |
| 5474.22 | 32.58 | H | 53.97 | -21.40 | Avg | 308.00 | 133.00 | |
| 6386.59 | 42.96 | H | 73.97 | -31.01 | Peak | 102.25 | 126.01 | |
| 6386.59 | 31.13 | H | 53.97 | -22.84 | Avg | 102.25 | 126.01 | |
| 7298.96 | 52.31 | H | 73.97 | -21.66 | Peak | 326.75 | 153.05 | |
| 7298.96 | 36.68 | H | 53.97 | -17.29 | Avg | 326.75 | 153.05 | |
| 8211.33 | | | | | | | | No Emission Detected |
| 8211.33 | | | | | | | | No Emission Detected |
| 9123.70 | | | | | | | | No Emission Detected |
| 9123.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Middle Channel
 Transmit Mode - Y-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1824.74 | 35.24 | H | 73.97 | -38.73 | Peak | 23.50 | 143.38 | |
| 1824.74 | 23.36 | H | 53.97 | -30.61 | Avg | 23.50 | 143.38 | |
| 2737.11 | 42.04 | H | 73.97 | -31.93 | Peak | 299.75 | 133.65 | |
| 2737.11 | 27.65 | H | 53.97 | -26.32 | Avg | 299.75 | 133.65 | |
| 3649.48 | 46.82 | H | 73.97 | -27.15 | Peak | 142.50 | 106.19 | |
| 3649.48 | 32.57 | H | 53.97 | -21.40 | Avg | 142.50 | 106.19 | |
| 4561.85 | 44.72 | H | 73.97 | -29.25 | Peak | 214.50 | 131.08 | |
| 4561.85 | 31.24 | H | 53.97 | -22.73 | Avg | 214.50 | 131.08 | |
| 5474.22 | 44.80 | h | 73.97 | -29.17 | Peak | 34.25 | 119.08 | |
| 5474.22 | 32.68 | H | 53.97 | -21.29 | Avg | 34.25 | 119.08 | |
| 6386.59 | 42.62 | H | 73.97 | -31.35 | Peak | 216.00 | 112.22 | |
| 6386.59 | 31.17 | H | 53.97 | -22.80 | Avg | 216.00 | 112.22 | |
| 7298.96 | 49.16 | H | 73.97 | -24.81 | Peak | 142.75 | 124.52 | |
| 7298.96 | 35.37 | H | 53.97 | -18.60 | Avg | 142.75 | 124.52 | |
| 8211.33 | | | | | | | | No Emission Detected |
| 8211.33 | | | | | | | | No Emission Detected |
| 9123.70 | | | | | | | | No Emission Detected |
| 9123.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - Middle Channel
 Transmit Mode - Z-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------|
| 1824.74 | 48.98 | H | 73.97 | -24.99 | Peak | 229.75 | 177.05 | |
| 1824.74 | 33.04 | H | 53.97 | -20.93 | Avg | 229.75 | 177.05 | |
| | | | | | | | | |
| 2737.11 | 46.11 | H | 73.97 | -27.86 | Peak | 355.50 | 152.10 | |
| 2737.11 | 30.93 | H | 53.97 | -23.05 | Avg | 355.50 | 152.10 | |
| | | | | | | | | |
| 3649.48 | 46.49 | H | 73.97 | -27.48 | Peak | 186.50 | 123.50 | |
| 3649.48 | 31.36 | H | 53.97 | -22.61 | Avg | 186.50 | 123.50 | |
| | | | | | | | | |
| 4561.85 | 45.25 | H | 73.97 | -28.72 | Peak | 0.25 | 148.28 | |
| 4561.85 | 32.43 | H | 53.97 | -21.54 | Avg | 0.25 | 148.28 | |
| | | | | | | | | |
| 5474.22 | 44.18 | H | 73.97 | -29.80 | Peak | 209.50 | 118.73 | |
| 5474.22 | 32.26 | H | 53.97 | -21.71 | Avg | 209.50 | 118.73 | |
| | | | | | | | | |
| 6386.59 | 43.43 | H | 73.97 | -30.54 | Peak | 116.25 | 114.97 | |
| 6386.59 | 31.66 | H | 53.97 | -22.31 | Avg | 116.25 | 114.97 | |
| | | | | | | | | |
| 7298.96 | 53.92 | H | 73.97 | -20.05 | Peak | 123.25 | 100.04 | |
| 7298.96 | 38.95 | H | 53.97 | -15.02 | Avg | 123.25 | 100.04 | |
| | | | | | | | | |
| 8211.33 | | | | | | | | No Emission |
| 8211.33 | | | | | | | | Detected |
| | | | | | | | | |
| 9123.70 | | | | | | | | No Emission |
| 9123.70 | | | | | | | | Detected |
| | | | | | | | | |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel
 Transmit Mode - X-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1842.74 | 38.70 | V | 73.97 | -35.27 | Peak | 224.50 | 107.32 | |
| 1842.74 | 23.75 | V | 53.97 | -30.22 | Avg | 224.50 | 107.32 | |
| | | | | | | | | |
| 2764.11 | 47.08 | V | 73.97 | -26.89 | Peak | 114.75 | 122.85 | |
| 2764.11 | 31.88 | V | 53.97 | -22.10 | Avg | 114.75 | 122.85 | |
| | | | | | | | | |
| 3685.48 | 46.68 | V | 73.97 | -27.30 | Peak | 76.25 | 193.89 | |
| 3685.48 | 31.90 | V | 53.97 | -22.07 | Avg | 76.25 | 193.89 | |
| | | | | | | | | |
| 4606.85 | 47.65 | V | 73.97 | -26.32 | Peak | 76.00 | 178.79 | |
| 4606.85 | 34.13 | V | 53.97 | -19.84 | Avg | 76.00 | 178.79 | |
| | | | | | | | | |
| 5528.22 | 45.29 | V | 73.97 | -28.68 | Peak | 325.75 | 175.68 | |
| 5528.22 | 32.78 | V | 53.97 | -21.19 | Avg | 325.75 | 175.68 | |
| | | | | | | | | |
| 6449.59 | 44.08 | V | 73.97 | -29.89 | Peak | 167.75 | 149.17 | |
| 6449.59 | 31.46 | V | 53.97 | -22.51 | Avg | 167.75 | 149.17 | |
| | | | | | | | | |
| 7370.96 | 49.55 | V | 73.97 | -24.42 | Peak | 151.75 | 136.10 | |
| 7370.96 | 34.10 | V | 53.97 | -19.87 | Avg | 151.75 | 136.10 | |
| | | | | | | | | |
| 8292.33 | | | | | | | | No Emission Detected |
| 8292.33 | | | | | | | | |
| | | | | | | | | |
| 9213.70 | | | | | | | | No Emission Detected |
| 9213.70 | | | | | | | | |
| | | | | | | | | |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel
 Transmit Mode - Y-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1842.74 | 47.15 | V | 73.97 | -26.82 | Peak | 212.50 | 176.04 | |
| 1842.74 | 31.67 | V | 53.97 | -22.30 | Avg | 212.50 | 176.04 | |
| | | | | | | | | |
| 2764.11 | 46.79 | V | 73.97 | -27.18 | Peak | 90.75 | 217.65 | |
| 2764.11 | 30.95 | V | 53.97 | -23.02 | Avg | 90.75 | 217.65 | |
| | | | | | | | | |
| 3685.48 | 46.26 | V | 73.97 | -27.71 | Peak | 61.25 | 192.88 | |
| 3685.48 | 32.26 | V | 53.97 | -21.71 | Avg | 61.25 | 192.88 | |
| | | | | | | | | |
| 4606.85 | 42.54 | V | 73.97 | -31.43 | Peak | 271.75 | 210.97 | |
| 4606.85 | 29.68 | V | 53.97 | -24.29 | Avg | 271.75 | 210.97 | |
| | | | | | | | | |
| 5528.22 | 42.14 | V | 73.97 | -31.83 | Peak | 248.00 | 183.44 | |
| 5528.22 | 30.34 | V | 53.97 | -23.63 | Avg | 248.00 | 183.44 | |
| | | | | | | | | |
| 6449.59 | 43.04 | V | 73.97 | -30.93 | Peak | 70.50 | 146.43 | |
| 6449.59 | 30.32 | V | 53.97 | -23.65 | Avg | 70.50 | 146.43 | |
| | | | | | | | | |
| 7370.96 | 57.53 | V | 73.97 | -16.45 | Peak | 84.50 | 159.08 | |
| 7370.96 | 40.75 | V | 53.97 | -13.22 | Avg | 84.50 | 159.08 | |
| | | | | | | | | |
| 8292.33 | 48.50 | V | 73.97 | -25.47 | Peak | 111.50 | 145.00 | |
| 8292.33 | 34.47 | V | 53.97 | -19.50 | Avg | 111.50 | 145.00 | |
| | | | | | | | | |
| 9213.70 | | | | | | | | No Emission Detected |
| 9213.70 | | | | | | | | |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel
 Transmit Mode - Z-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1842.74 | 34.35 | V | 73.97 | -39.63 | Peak | 87.00 | 122.19 | |
| 1842.74 | 22.09 | V | 53.97 | -31.88 | Avg | 87.00 | 122.19 | |
| 2764.11 | 40.30 | V | 73.97 | -33.67 | Peak | 141.75 | 139.68 | |
| 2764.11 | 27.47 | V | 53.97 | -26.50 | Avg | 141.75 | 139.68 | |
| 3685.48 | 46.11 | V | 73.97 | -27.86 | Peak | 144.25 | 121.77 | |
| 3685.48 | 30.74 | V | 53.97 | -23.23 | Avg | 144.25 | 121.77 | |
| 4606.85 | 46.26 | V | 73.97 | -27.71 | Peak | 149.25 | 150.91 | |
| 4606.85 | 33.10 | V | 53.97 | -20.87 | Avg | 149.25 | 150.91 | |
| 5528.22 | 42.19 | V | 73.97 | -31.78 | Peak | 204.25 | 190.91 | |
| 5528.22 | 30.35 | V | 53.97 | -23.62 | Avg | 204.25 | 190.91 | |
| 6449.59 | 42.36 | V | 73.97 | -31.61 | Peak | 195.25 | 107.50 | |
| 6449.59 | 29.36 | V | 53.97 | -24.61 | Avg | 195.25 | 107.50 | |
| 7370.96 | 47.39 | V | 73.97 | -26.58 | Peak | 252.50 | 117.35 | |
| 7370.96 | 33.19 | V | 53.97 | -20.78 | Avg | 252.50 | 117.35 | |
| 8292.33 | | | | | | | | No Emission Detected |
| 8292.33 | | | | | | | | No Emission Detected |
| 9213.70 | | | | | | | | No Emission Detected |
| 9213.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel
 Transmit Mode - X-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1842.74 | 49.74 | H | 73.97 | -24.23 | Peak | 130.75 | 160.16 | |
| 1842.74 | 34.02 | H | 53.97 | -19.95 | Avg | 130.75 | 160.16 | |
| 2764.11 | 42.29 | H | 73.97 | -31.68 | Peak | 256.00 | 127.20 | |
| 2764.11 | 26.98 | H | 53.97 | -26.99 | Avg | 256.00 | 127.20 | |
| 3685.48 | 43.51 | H | 73.97 | -30.46 | Peak | 206.00 | 160.64 | |
| 3685.48 | 29.47 | H | 53.97 | -24.50 | Avg | 206.00 | 160.64 | |
| 4606.85 | 44.14 | H | 73.97 | -29.83 | Peak | 187.00 | 138.97 | |
| 4606.85 | 30.84 | H | 53.97 | -23.14 | Avg | 187.00 | 138.97 | |
| 5528.22 | 41.91 | H | 73.97 | -32.06 | Peak | 252.50 | 128.46 | |
| 5528.22 | 30.83 | H | 53.97 | -23.15 | Avg | 252.50 | 128.46 | |
| 6449.59 | 41.47 | H | 73.97 | -32.50 | Peak | 190.75 | 128.46 | |
| 6449.59 | 29.53 | H | 53.97 | -24.44 | Avg | 190.75 | 128.46 | |
| 7370.96 | 50.32 | H | 73.97 | -23.65 | Peak | 175.25 | 128.58 | |
| 7370.96 | 36.62 | H | 53.97 | -17.35 | Avg | 175.25 | 128.58 | |
| 8292.33 | | | | | | | | No Emission Detected |
| 8292.33 | | | | | | | | No Emission Detected |
| 9213.70 | | | | | | | | No Emission Detected |
| 9213.70 | | | | | | | | No Emission Detected |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel
 Transmit Mode - Y-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------------------|
| 1842.74 | 40.78 | H | 73.97 | -33.19 | Peak | 192.00 | 157.35 | |
| 1842.74 | 27.47 | H | 53.97 | -26.50 | Avg | 192.00 | 157.35 | |
| 2764.11 | 46.33 | H | 73.97 | -27.65 | Peak | 97.00 | 156.25 | |
| 2764.11 | 31.06 | H | 53.97 | -22.91 | Avg | 97.00 | 156.25 | |
| 3685.48 | 44.77 | H | 73.97 | -29.20 | Peak | 198.00 | 184.10 | |
| 3685.48 | 31.05 | H | 53.97 | -22.92 | Avg | 198.00 | 184.10 | |
| 4606.85 | 44.05 | H | 73.97 | -29.92 | Peak | 114.25 | 133.53 | |
| 4606.85 | 30.56 | H | 53.97 | -23.41 | Avg | 114.25 | 133.53 | |
| 5528.22 | 42.82 | H | 73.97 | -31.15 | Peak | 204.25 | 122.37 | |
| 5528.22 | 30.38 | H | 53.97 | -23.59 | Avg | 204.25 | 122.37 | |
| 6449.59 | 40.91 | H | 73.97 | -33.06 | Peak | 29.00 | 155.58 | |
| 6449.59 | 29.45 | H | 53.97 | -24.52 | Avg | 29.00 | 155.58 | |
| 7370.96 | 49.12 | H | 73.97 | -24.85 | Peak | 140.25 | 152.88 | |
| 7370.96 | 33.69 | H | 53.97 | -20.28 | Avg | 140.25 | 152.88 | |
| 8292.33 | | | | | | | | No Emission Detected |
| 8292.33 | | | | | | | | |
| 9213.70 | | | | | | | | No Emission Detected |
| 9213.70 | | | | | | | | |

FCC 15.249
 Kangaroo Products Company
 Project Z-series - Transmitter
 Model: 600-855-Z

Date: 02/21/2018
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel
 Transmit Mode - Z-Axis

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|----------------|-------------------|--------------|-------|--------|-----------------------|-------------------------|------------------------|-------------|
| 1842.74 | 46.18 | H | 73.97 | -27.79 | Peak | 234.25 | 164.34 | |
| 1842.74 | 31.11 | H | 53.97 | -22.86 | Avg | 234.25 | 164.34 | |
| 2764.11 | 45.25 | H | 73.97 | -28.72 | Peak | 54.50 | 162.13 | |
| 2764.11 | 30.91 | H | 53.97 | -23.06 | Avg | 54.50 | 162.13 | |
| 3685.48 | 46.34 | H | 73.97 | -27.63 | Peak | 308.50 | 155.02 | |
| 3685.48 | 31.93 | H | 53.97 | -22.04 | Avg | 308.50 | 155.02 | |
| 4606.85 | 47.18 | H | 73.97 | -26.79 | Peak | 123.00 | 165.47 | |
| 4606.85 | 33.95 | H | 53.97 | -20.02 | Avg | 123.00 | 165.47 | |
| 5528.22 | 44.04 | H | 73.97 | -29.93 | Peak | 227.25 | 109.95 | |
| 5528.22 | 30.86 | H | 53.97 | -23.11 | Avg | 227.25 | 109.95 | |
| 6449.59 | 41.06 | H | 73.97 | -32.91 | Peak | 264.50 | 105.53 | |
| 6449.59 | 29.39 | H | 53.97 | -24.58 | Avg | 264.50 | 105.53 | |
| 7370.96 | 56.65 | H | 73.97 | -17.32 | Peak | 90.50 | 125.59 | |
| 7370.96 | 40.92 | H | 53.97 | -13.05 | Avg | 90.50 | 125.59 | |
| 8292.33 | | | | | | | | No Emission |
| 8292.33 | | | | | | | | Detected |
| 9213.70 | | | | | | | | No Emission |
| 9213.70 | | | | | | | | Detected |



FCC Class B and FCC 15.249
Kangaroo Products Company
Project Z-series - Transmitter
Model: 600-855-Z

Date: 02/21/2018
Lab: D
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz **Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 9.3 GHz**

***BAND EDGES
DATA SHEETS***

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

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

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



COMPATIBLE ELECTRONICS

Report Number: **B80221D1**
FCC Part 15 Subpart B and **FCC Section 15.249** Test Report
Project Z-series – Transmitter
Model: 600-855-Z

Page E28

FCC 15.249
Kangaroo Products Company
Project Z-series - Transmitter
Model: 600-855-Z

Date: 02/21/2018
Lab: D
Tested By: Kyle Fujimoto

Band Edges



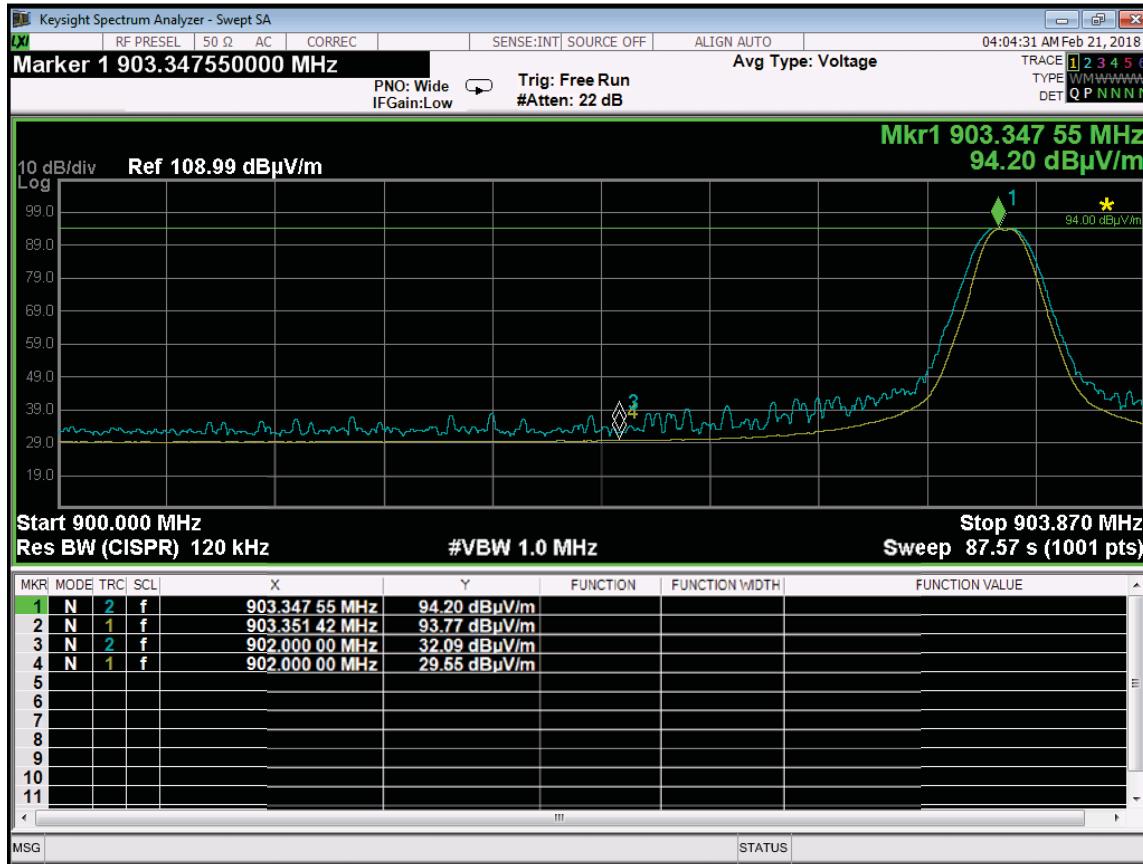
COMPATIBLE ELECTRONICS

FCC 15.249

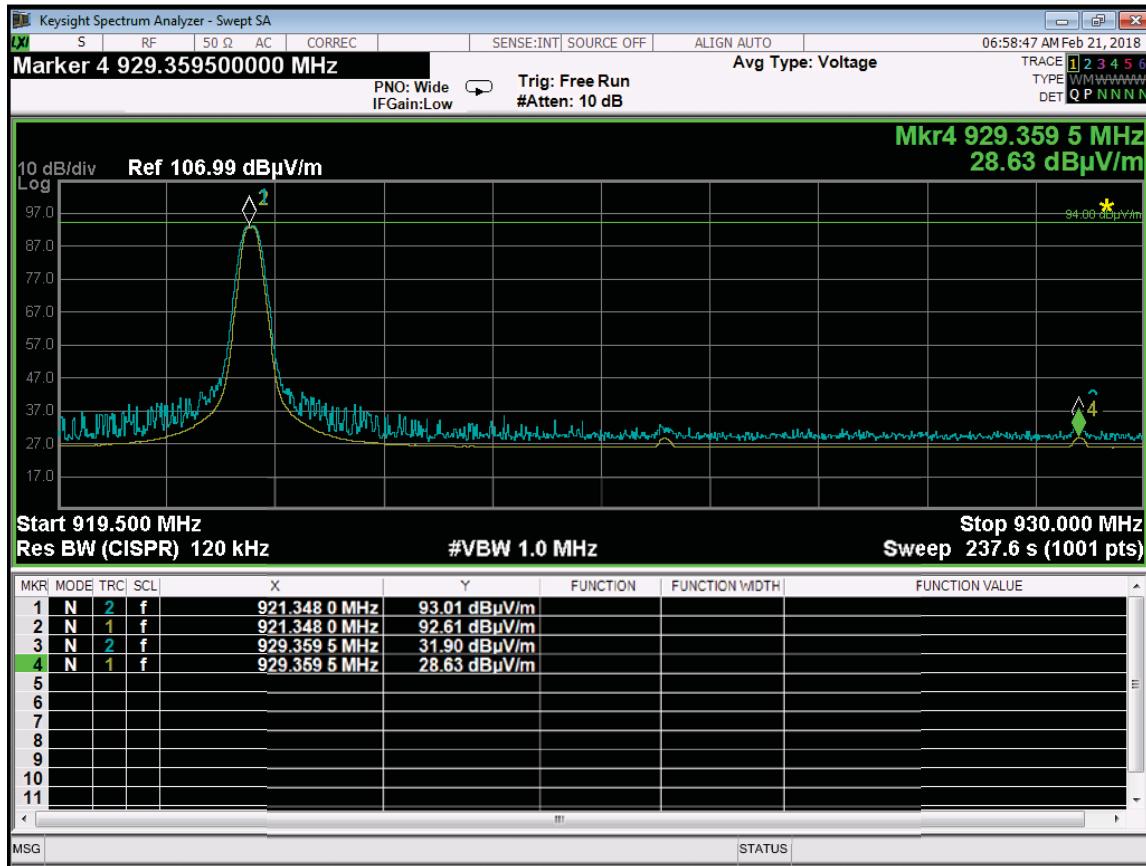
Kangaroo Products Company
Project Z-series - Transmitter
Model: 600-855-Z

Date: 02/21/2018
Lab: D
Tested By: Kyle Fujimoto

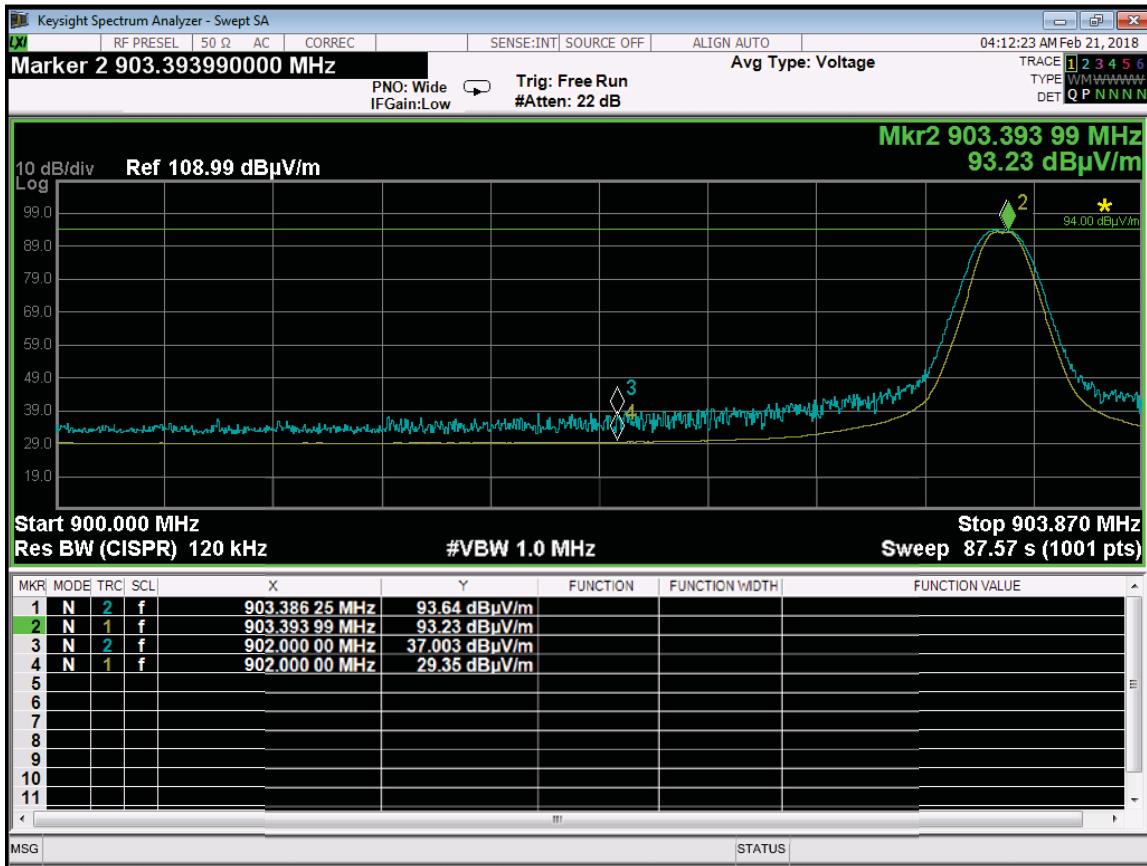
Band Edges



Band Edge - 903.37 MHz - Horizontal- X-Axis - Worst Case



Band Edge – 921.37 MHz - Horizontal - X-Axis - Worst Case

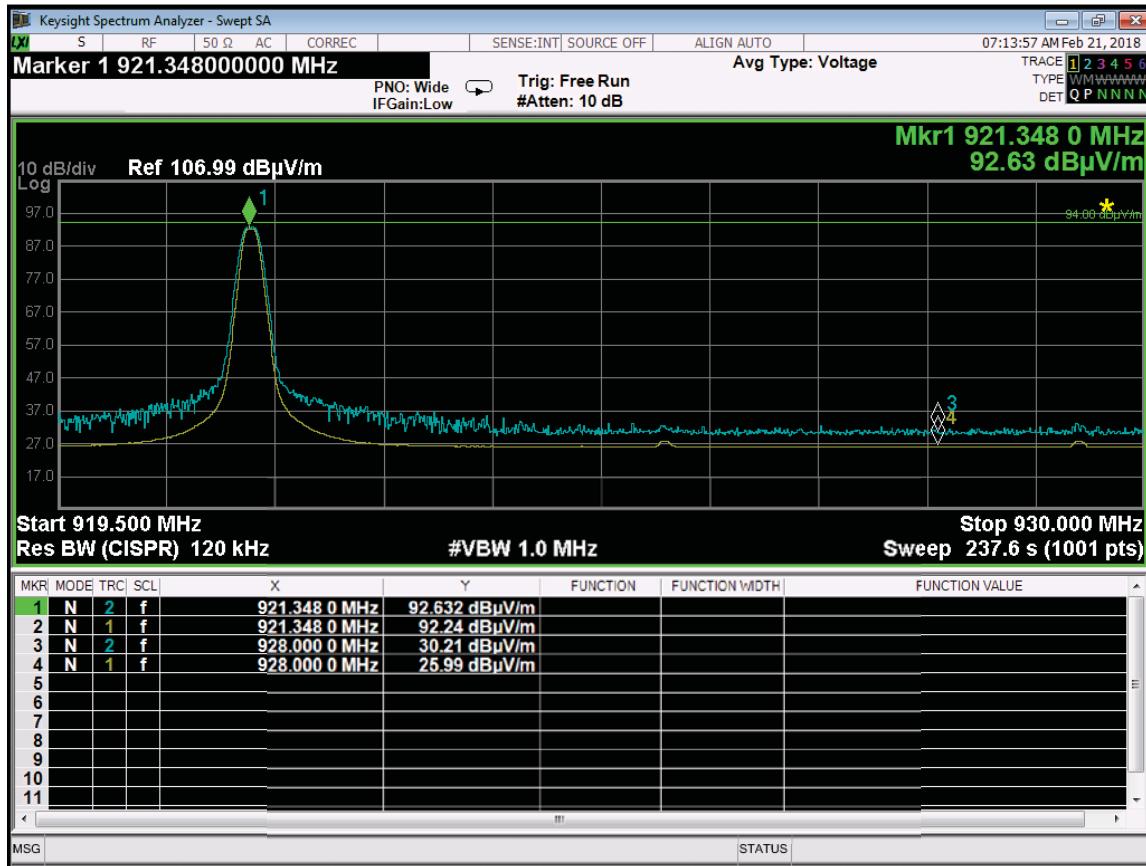


Band Edge – 903.27 MHz - Vertical - Y-Axis - Worst Case

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

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

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



Band Edge – 921.27 MHz - Vertical- Y-Axis - Worst Case