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

*for*

# PHONE LOCKER TRANSMITTER

## MODEL: PLT.v112

Prepared for

JORDIAM LLC
137 MERIDIAN OAKS DRIVE
GLEN CARBON, ILLINOIS 62034

Prepared by: _____

THOMAS SZYNAL

Approved by: _____

KYLE FUJIMOTO

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

DATE: JULY 12, 2019

| | REPORT BODY | APPENDICES | | | | | TOTAL |
|---|---|---|---|---|---|---|---|
| | | ***A*** | ***B*** | ***C*** | ***D*** | ***E*** | |
| PAGES | 16 | 2 | 2 | 2 | 10 | 22 | **54** |



NVLAP® TESTING
NVLAP LAB CODE 200528-0

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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: | Phone Locker Transmitter<br>Model: PLT.v112<br>S/N: N/A |
| Product Description: | The EUT is a transmitter in a phone locker system . |
| Modifications: | The EUT was not modified in order to comply with specifications. |
| Customer: | Jordiam LLC<br>137 Meridian Oaks Drive<br>Glen Carbon, Illinois 62034 |
| Test Dates: | July 1, 2019 |

Test Specifications covered by accreditation:

| | |
|---|---|
| Test Specifications: | Emissions requirements<br>CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.231. |

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

Test Deviations: There were no deviations from the test procedure during the testing.

# SUMMARY OF TEST RESULTS

| *TEST* | DESCRIPTION | RESULTS |
|---|---|---|
| 1 | Spurious Radiated RF Emissions,<br>9 kHz – 4180 MHz<br>(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 15.231<br>Highest Reading in Relation to Spec Limit: 75.93 dBuV/m @ 418.00 MHz (*U = 3.19) |
| 2 | Conducted RF Emissions,<br>150 kHz to 30 MHz | This test was not performed because the EUT operates on battery power and does not connect to the AC mains. |

## 1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Phone Locker Transmitter, Model: PLT.v112. 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 15.231.

# 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

Jordiam LLC

William Henricks CEO

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer
Tom Szynal Test Technician

## 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 Jordiam LLC as of the date of this test 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 |
| HP | Hewlett Packard |
| ITE | Information Technology Equipment |
| CML | Corrected Meter Limit |
| LISN | Line Impedance Stabilization Network |
| N/A | Not Applicable |
| DNF | Do Not Fit |

## 3. APPLICABLE DOCUMENTS

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

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

# 4. DESCRIPTION OF TEST CONFIGURATION

## 4.1 Description of Test Configuration – Emissions

The Phone Locker Transmitter Model: PLT.v112 (EUT) was tested as a stand alone unit. The EUT was investigated in all three orthogonal axis (X, Y, & Z).

The EUT was continously transmitting at 418 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 final radiated data for the EUT was taken in the mode described.

Fresh batteries were inserted into the EUT prior to the testing.

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

### 4.1.1 Cable Construction and Termination

The EUT had no external cables.

# 5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

## 5.1 EUT and Accessory List

| EQUIPMENT | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | FCC ID |
|---|---|---|---|---|
| PHONE LOCKER TRANSMITTER | JORDIAM LLC | PLT.v112 | N/A | 2ATQO01 |

## 5.2 Emissions Test Equipment

| EQUIPMENT TYPE | MANU-FACTURER | MODEL NUMBER | SERIAL NUMBER | CALIBRATION DATE | CAL. CYCLE |
|---|---|---|---|---|---|
| **GENERAL TEST EQUIPMENT** | | | | | |
| 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 20Hz – 26.5GHz | Keysight | N9038A | MY51210150 | July 26, 2018 | 1 Year |
| **RF RADIATED EMISSIONS TEST EQUIPMENT** | | | | | |
| CombiLog Antenna | Com-Power | AC-220 | 61060 | July 27, 2017 | 2 Year |
| Preamplifier | Com-Power | PAM-118A | 551024 | May 10, 2018 | 2 Year |
| Loop Antenna | Com-Power | AL-130R | 121090 | February 05, 2019 | 2 Year |
| Horn Antenna | Com-Power | AH-118 | 071175 | February 22, 2018 | 2 Year |
| System Controller | Sunol Sciences Corporation | SC110V | 112213-1 | N/A | N/A |
| Turntable | Sunol Sciences Corporation | 2011VS | N/A | N/A | N/A |
| Antenna-Mast | Sunol Sciences Corporation | TWR95-4 | 112213-3 | N/A | N/A |

# 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.

# 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 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 fundamental and harmonic frequencies above 1 GHz were averaged by a "duty cycle correction factor", derived from 20 Log (dwell time / 100ms). This duty cycle correction factor was then subtracted from the peak reading. There were no non-transmitter related spurious emissions detected above 1 GHz.

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 4.18 GHz | 1 MHz | Horn Antenna |

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.

### Radiated Emissions Test (Continued)

The EUT was tested at a 3-meter test distance from 9 kHz to 4.18 GHz.

**Test Results:**

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.231 (a) for radiated emissions. Please see Appendix E for the data sheets.

## 7.1.2 RF Emissions Test Results

Table 1 RADIATED EMISSION RESULTS
Phone Locker Transmitter
Model: PLT.v112

| Frequency MHz | Average Corrected Reading* dBuV/m | Average Specification Limit dBuV/m | Delta (Cor. Reading – Spec. Limit) dB |
|---|---|---|---|
| 418.00 (H) (X-Axis) | 75.93 | 80.28 | -4.35 |
| 1672.00 (V) (Y-Axis) | 48.15 | 53.97 | -5.82 |
| 1672.00 (H) (X-Axis) | 47.65 | 53.97 | -6.32 |
| 1254.00 (H) (X-Axis) | 47.47 | 53.97 | -6.50 |
| 1672.00 (H) (Z-Axis) | 46.87 | 53.97 | -7.11 |
| 418.00 (V) (Z-Axis) | 71.68 | 80.28 | -8.60 |

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

## 7.2 Bandwidth of the Fundamental

The -20 dB bandwidth was checked using the EMI Receiver to see that the emissions were wholly within the 0.25% of the operating frequency centered on the fundamental frequency. The RBW was set to 30 kHz and the VBW and set to 100 kHz. A plot of the -20 dB bandwidth is located in Appendix E.

**Test Results:**

The EUT complies with the requirements of CFR Title 47, Part 15, Subpart C, section 15.231 [c] for the -20 dB bandwidth of the fundamental. The EUT has a -20 dB bandwidth that lies wholly within the 0.25% of the operating frequency centered on the fundamental frequency.

## 7.3 Transmit Timeout

The transmit timeout test was performed using the EMI Receiver to make sure the transmission coming from the transmitter would cease within 5 seconds after the activation. A Plot of the transmission duration is located in Appendix E.

**Test Results:**

The EUT complies with the requirement of CFR Title 47, Part 15, Subpart C, section 15.231 [c] for the Transmit Timeout less than 5 seconds.

## 7.4 Fundamental Field Strength (Duty Cycle Calculations)

The fundamental and harmonics were measured at a 3-meter test distance. The EMI Receiver was used to obtain the final test data. The final qualification data sheets are located in Appendix E.

*Where* $\delta(\mathrm{dB}) = 20\log\left[\sum\left(nt_1 + mt_2 + \ldots + \xi t_x\right)/T\right]$

*n* is the number of pulses of duration *t*1
*m* is the number of pulses of duration *t*2
ξ is the number of pulses of duration *tx*
*T* is the period of the pulse train or 100 ms if the pulse train length is greater than 100 ms

There are a total of 41 pulses, 14 with a duration of 460 us each and 27 with a duration of 870 us each.

14 pulses x 460 us = 6.440 ms
\+ 27 pulses x 870 us = 23.490 ms
29.930 ms

The cumulative total for the pulses (Total On Time) = 29.930 ms

The time between each pulse train (period T) is 65.30 ms

Duty Cycle = 29.930 ms / 65.30 ms x 100% = 45.83%

20 log (0.4583) = -6.77 dB correction factor

For worst case, the Peak to Average ratio of -6.77 dB is utilized.

The complete pulse duration data is given in Appendix E of this report.

## 8. CONCLUSIONS

The Phone Locker Transmitter, Model: PLT.v112 (EUT), as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.231.

# APPENDIX A

# *LABORATORY ACCREDITATIONS AND RECOGNITIONS*

# *LABORATORY ACCREDITATIONS AND RECOGNITIONS*

NVLAP TESTING
NVLAP LAB CODE 200528-0

ilac-MRA

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 — Requirement

# 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 15.231 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 testing.

# APPENDIX C

# *ADDITIONAL MODELS COVERED UNDER THIS REPORT*

# ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

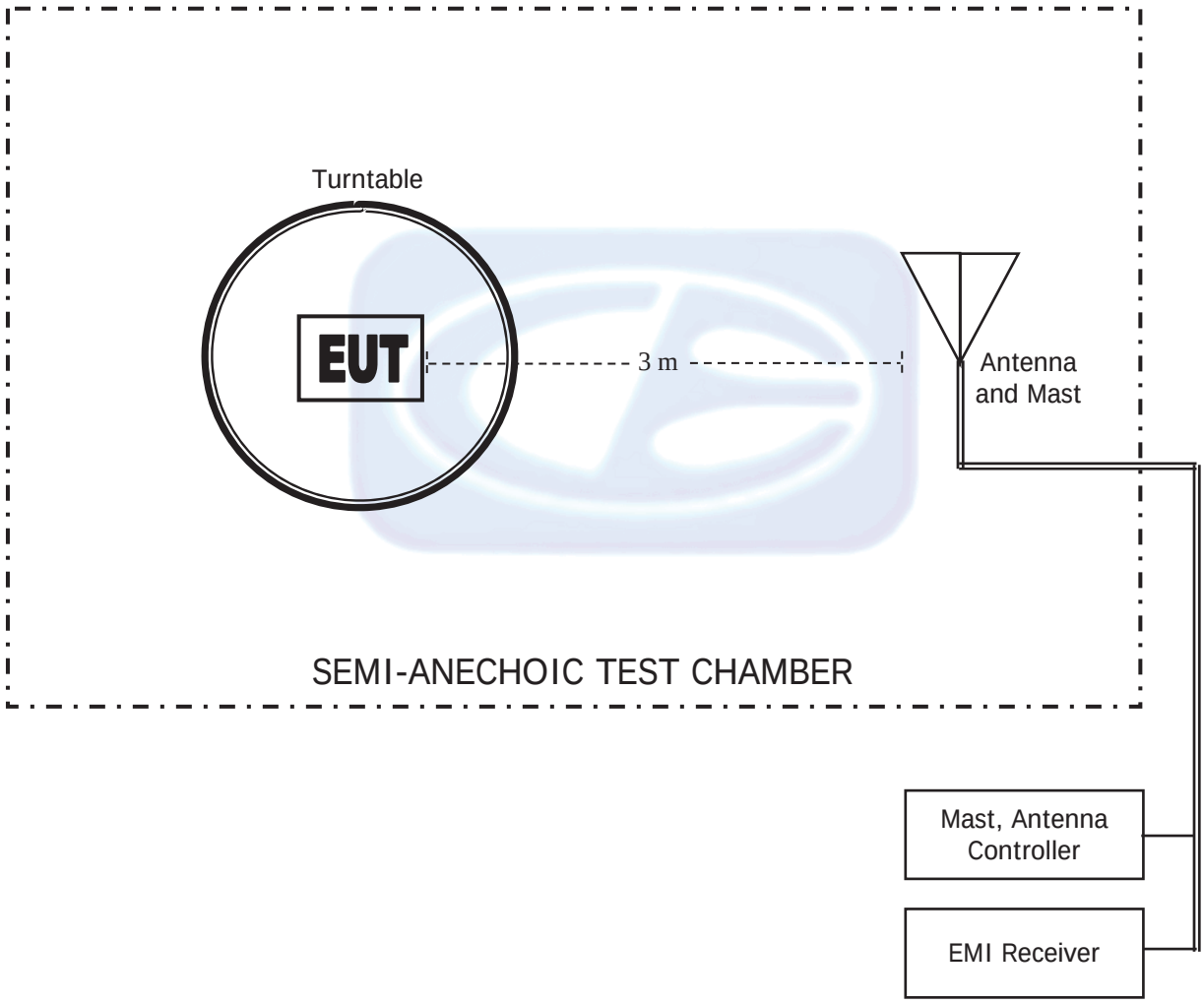
Phone Locker Transmitter
Model: PLT.v112
S/N: N/A

There are no additional models covered under this report.

# APPENDIX D

# *DIAGRAMS AND CHARTS*

# *FIGURE 1: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER*



# COM-POWER AL-130R

# LOOP ANTENNA

# S/N: 121090

# CALIBRATION DATE: FEBRUARY 05, 2019

| FREQUENCY (MHz) | MAGNETIC (dB/m) | ELECTRIC (dB/m) |
|---|---|---|
| 0.009 | -35.4 | 16.1 |
| 0.01 | -35.9 | 15.6 |
| 0.02 | -36.7 | 14.8 |
| 0.03 | -35.9 | 15.6 |
| 0.04 | -36.4 | 15.1 |
| 0.05 | -37.0 | 14.4 |
| 0.06 | -36.9 | 14.6 |
| 0.07 | -37.1 | 14.4 |
| 0.08 | -37.1 | 14.3 |
| 0.09 | -36.9 | 14.5 |
| 0.1 | -37.3 | 14.1 |
| 0.2 | -37.3 | 14.1 |
| 0.3 | -37.4 | 14.0 |
| 0.4 | -37.4 | 14.0 |
| 0.5 | -37.2 | 14.2 |
| 0.6 | -37.2 | 14.2 |
| 0.7 | -37.2 | 14.2 |
| 0.8 | -37.3 | 14.2 |
| 0.9 | -37.2 | 14.3 |
| 1 | -37.0 | 14.5 |
| 2 | -36.9 | 14.5 |
| 3 | -36.9 | 14.5 |
| 4 | -36.8 | 14.7 |
| 5 | -36.9 | 14.6 |
| 6 | -36.9 | 14.6 |
| 7 | -36.9 | 14.6 |
| 8 | -36.9 | 14.6 |
| 9 | -36.9 | 14.6 |
| 10 | -36.6 | 14.8 |
| 15 | -36.9 | 14.5 |
| 20 | -36.6 | 14.9 |
| 25 | -38.5 | 13.0 |
| 30 | -38.5 | 12.9 |

# COM-POWER AC-220

# COMBILOG ANTENNA

# S/N: 61060

# CALIBRATION DATE: JULY 27, 2017

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

# COM POWER AH-118

# HORN ANTENNA

# S/N: 071175

# CALIBRATION DATE: FEBRUARY 22, 2018

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

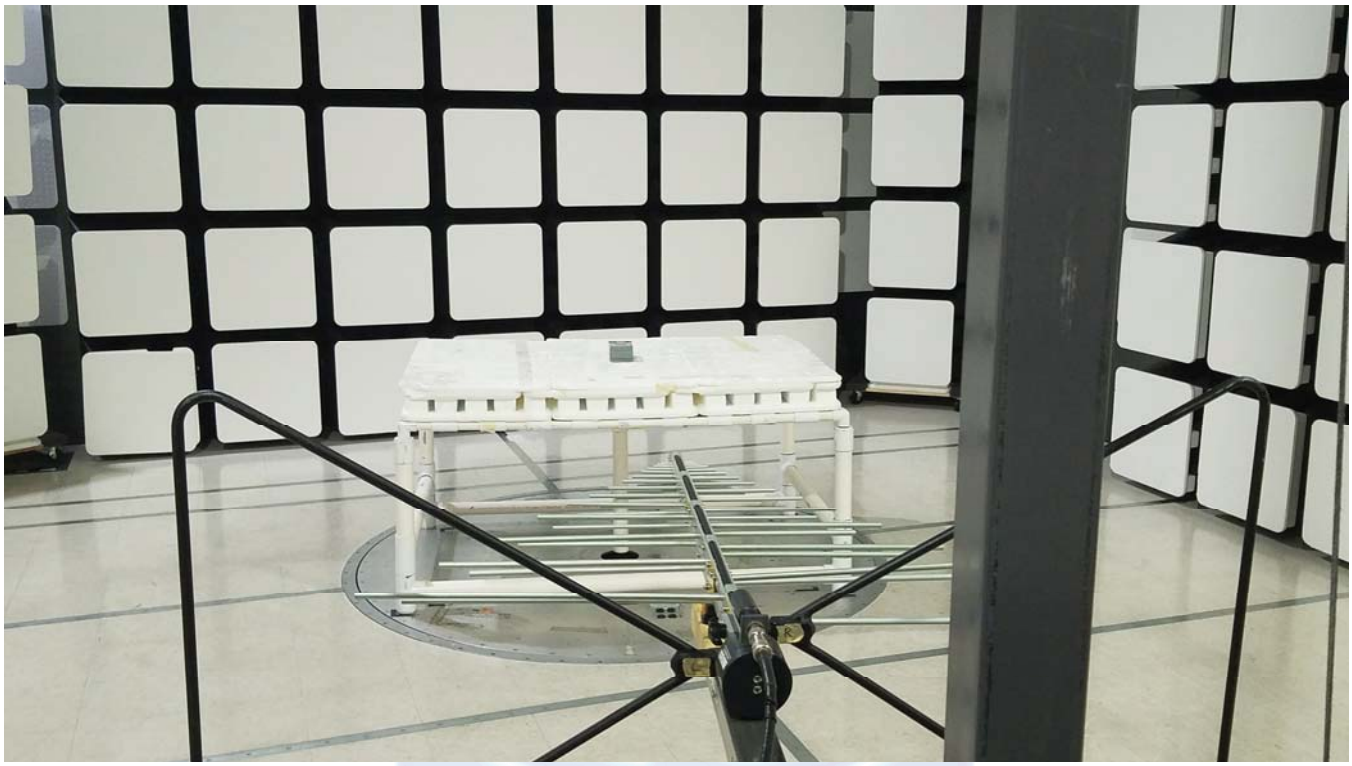
# COM-POWER PA-118

# PREAMPLIFIER

# S/N: 551024

# CALIBRATION DATE: MAY 10, 2018

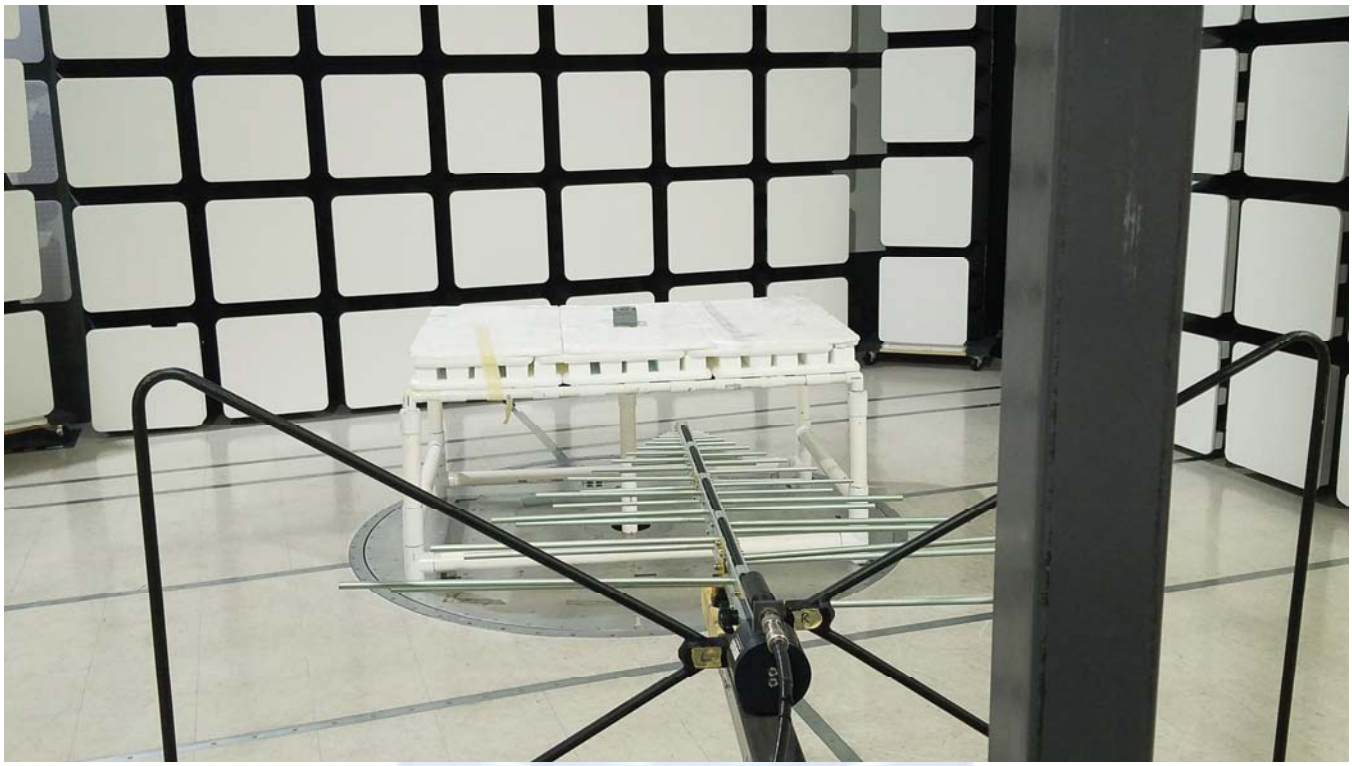
| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|---|---|---|---|
| 1.0 | 40.99 | 6.0 | 39.01 |
| 1.1 | 39.77 | 6.5 | 39.00 |
| 1.2 | 39.02 | 7.0 | 39.69 |
| 1.3 | 39.44 | 7.5 | 38.96 |
| 1.4 | 39.64 | 8.0 | 38.57 |
| 1.5 | 40.23 | 8.5 | 39.17 |
| 1.6 | 40.17 | 9.0 | 38.82 |
| 1.7 |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



**FRONT VIEW**

JORDIAM LLC
PHONE LOCKER TRANSMITTER
MODEL: PLT.v112
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

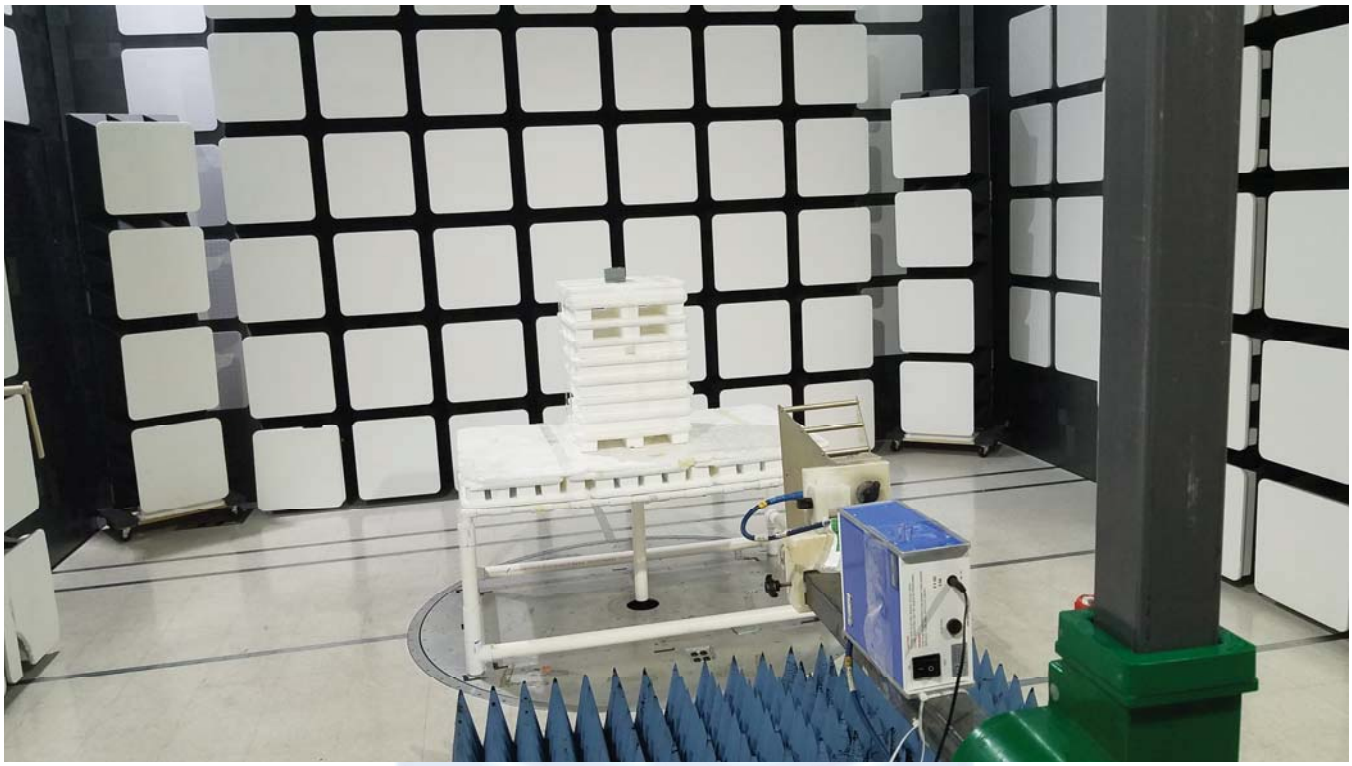
## PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



**REAR VIEW**

JORDIAM LLC
PHONE LOCKER TRANSMITTER
MODEL: PLT.v112
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

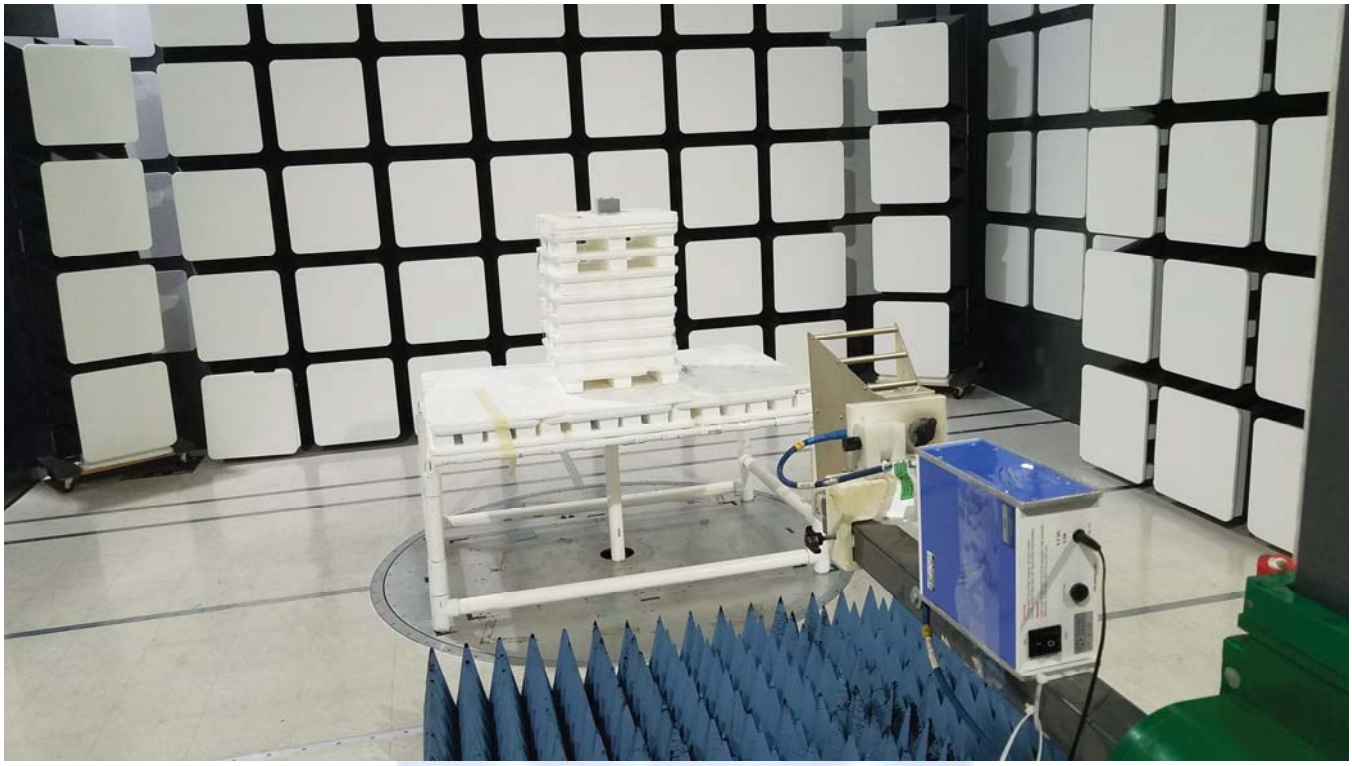
## PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



**FRONT VIEW**

JORDIAM LLC
PHONE LOCKER TRANSMITTER
MODEL: PLT.v112
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

## PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



**REAR VIEW**

JORDIAM LLC
PHONE LOCKER TRANSMITTER
MODEL: PLT.v112
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

## PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

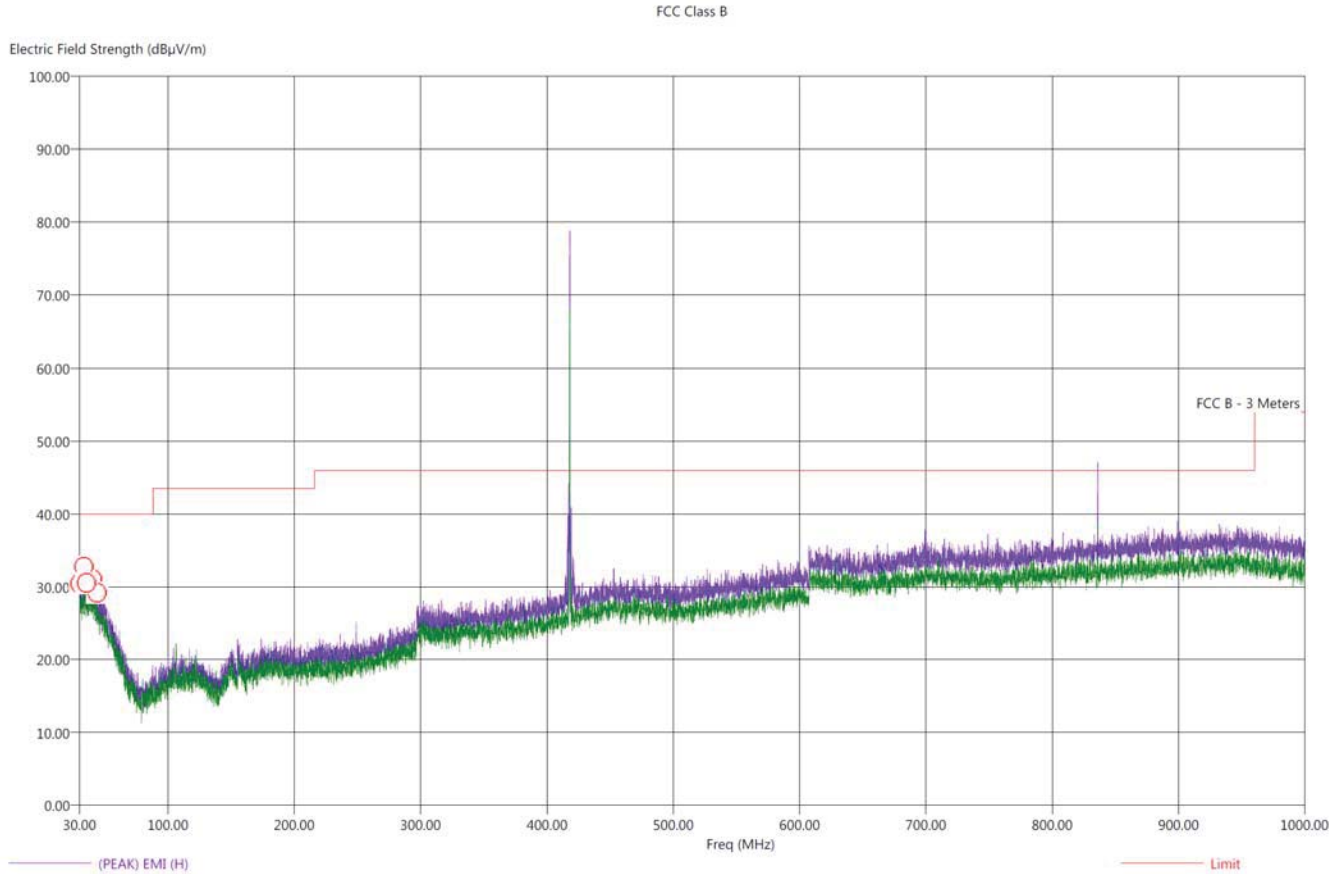
# APPENDIX E

# *DATA SHEETS*

# *RADIATED EMISSIONS DATA SHEETS*

Title: Pre-Scan - FCC Class B
File: 1 - Pre-Scan - X-Axis - FCC Class B - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Phone Locker Transmitter
EUT Condition: The EUT is continuously transmitting
Company: Jordiam
Model: PLT.v112
S/N: N/A
X-Axis
Note: The Frequencies at 418 MHz and 836 MHz are subject to the limits of FCC 15.231 (a) instead

7/1/2019 2:12:20 PM
Sequence: Preliminary Scan




The worst case for emissions was on the X-Axis. No additional spurious emissions were found between 9 kHz – 30 MHz and 1 GHz – 4.18 GHz

Title: Radiated Final - FCC Class B
File: 2 - Final Scan - X-Axis - FCC Class B - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Phone Locker Transmitter
EUT Condition: The EUT is continuously transmitting
Company: Jordiam
Model: PLT.v112
S/N: N/A
X-Axis

7/1/2019 2:43:54 PM
Sequence: Final Measurements

FCC Class B

| Freq (MHz) | Pol | (PEAK) EMI (dBµV/m) | (QP) EMI (dBµV/m) | (PEAK) Margin (dB) | (QP) Margin (dB) | Limit (dBµV/m) | Transducer (dB) | Cable (dB) | Ttbl Aql (deg) | Twr Ht (cm) |
|---|---|---|---|---|---|---|---|---|---|---|
| 30.30 | H | 32.24 | 26.55 | -7.76 | -13.45 | 40.00 | 23.81 | 0.80 | 350.75 | 254.49 |
| 33.50 | H | 32.96 | 26.54 | -7.04 | -13.46 | 40.00 | 23.94 | 0.84 | 80.25 | 400.04 |
| 33.90 | H | 32.16 | 26.60 | -7.84 | -13.40 | 40.00 | 23.96 | 0.84 | 71.50 | 142.91 |
| 35.60 | V | 31.87 | 26.59 | -8.13 | -13.41 | 40.00 | 24.05 | 0.86 | 117.75 | 286.55 |
| 40.20 | H | 32.12 | 27.08 | -7.88 | -12.92 | 40.00 | 24.67 | 0.90 | 167.25 | 127.14 |
| 43.90 | V | 31.11 | 25.54 | -8.89 | -14.46 | 40.00 | 23.36 | 0.90 | 286.50 | 254.31 |

**FCC 15.231**
Jordiam LLC
Phone Locker Transmitter
Model: PLT.v112

Date: 07/01/2019
Lab: D
Tested By: Kyle Fujimoto

**Fundamental - 418 MHz**
**Duty Cycle: 45.83%**

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|---|---|---|---|---|---|---|---|---|
| 418.00 | 73.01 | V | 100.28 | -27.27 | Peak | 253.75 | 133.35 | **X-Axis** |
| 418.00 | 66.24 | V | 80.28 | -14.04 | Avg | 253.75 | 133.35 | **Vertical Polarization** |
| | | | | | | | | |
| 418.00 | 76.09 | V | 100.28 | -24.20 | Peak | 188.75 | 123.38 | **Y-Axis** |
| 418.00 | 69.32 | V | 80.28 | -10.97 | Avg | 188.75 | 123.38 | **Vertical Polarization** |
| | | | | | | | | |
| 418.00 | 78.45 | V | 100.28 | -21.83 | Peak | 118.75 | 193.00 | **Z-Axis** |
| 418.00 | 71.68 | V | 80.28 | -8.60 | Avg | 118.75 | 193.00 | **Vertical Polarization** |
| | | | | | | | | |
| 418.00 | 82.70 | H | 100.28 | -17.58 | Peak | 359.75 | 100.25 | **X-Axis** |
| 418.00 | 75.93 | H | 80.28 | -4.35 | Avg | 359.75 | 100.25 | **Horizontal Polarization** |
| | | | | | | | | |
| 418.00 | 78.25 | H | 100.28 | -22.03 | Peak | 195.75 | 218.61 | **Y-Axis** |
| 418.00 | 71.48 | H | 80.28 | -8.80 | Avg | 195.75 | 218.61 | **Horizontal Polarization** |
| | | | | | | | | |
| 418.00 | 78.01 | H | 100.28 | -22.27 | Peak | 7.00 | 100.25 | **Z-Axis** |
| 418.00 | 71.24 | H | 80.28 | -9.04 | Avg | 7.00 | 100.25 | **Horizontal Polarization** |
| | | | | | | | | |
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**FCC 15.231**
Jordiam LLC
Phone Locker Transmitter
Model: PLT.v112

Date: 07/01/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - X-Axis**
**Duty Cycle: 45.83%**

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|---|---|---|---|---|---|---|---|---|
| 836.00 | 55.99 | V | 80.28 | -24.29 | Peak | 69.25 | 143.38 | |
| 836.00 | 49.22 | V | 60.28 | -11.06 | Avg | 69.25 | 143.38 | |
| | | | | | | | | |
| 1254.00 | 43.43 | V | 73.97 | -30.54 | Peak | 234.50 | 178.13 | |
| 1254.00 | 36.66 | V | 53.97 | -17.31 | Avg | 234.50 | 178.13 | |
| | | | | | | | | |
| 1672.00 | 48.94 | V | 73.97 | -25.03 | Peak | 211.75 | 186.73 | |
| 1672.00 | 42.17 | V | 53.97 | -11.80 | Avg | 211.75 | 186.73 | |
| | | | | | | | | |
| 2090.00 | 41.04 | V | 80.28 | -39.24 | Peak | 249.00 | 121.77 | |
| 2090.00 | 34.27 | V | 60.28 | -26.01 | Avg | 249.00 | 121.77 | |
| | | | | | | | | |
| 2508.00 | 46.06 | V | 80.28 | -34.22 | Peak | 138.25 | 137.17 | |
| 2508.00 | 39.29 | V | 60.28 | -20.99 | Avg | 138.25 | 137.17 | |
| | | | | | | | | |
| 2926.00 | 42.64 | V | 80.28 | -37.64 | Peak | 304.25 | 175.62 | |
| 2926.00 | 35.87 | V | 60.28 | -24.41 | Avg | 304.25 | 175.62 | |
| | | | | | | | | |
| 3344.00 | 50.04 | V | 80.28 | -30.25 | Peak | 253.50 | 153.05 | |
| 3344.00 | 43.27 | V | 60.28 | -17.02 | Avg | 253.50 | 153.05 | |
| | | | | | | | | |
| 3762.00 | 45.83 | V | 73.97 | -28.14 | Peak | 253.00 | 170.13 | |
| 3762.00 | 39.06 | V | 53.97 | -14.91 | Avg | 253.00 | 170.13 | |
| | | | | | | | | |
| 4180.00 | 40.15 | V | 73.97 | -33.82 | Peak | 272.25 | 192.16 | |
| 4180.00 | 33.38 | V | 53.97 | -20.59 | Avg | 272.25 | 192.16 | |
| | | | | | | | | |

**FCC 15.231**
Jordiam LLC
Phone Locker Transmitter
Model: PLT.v112

Date: 07/01/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Y-Axis**
**Duty Cycle: 45.83%**

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|---|---|---|---|---|---|---|---|---|
| 836.00 | 56.28 | V | 80.28 | -24.00 | Peak | 146.25 | 100.25 | |
| 836.00 | 49.51 | V | 60.28 | -10.77 | Avg | 146.25 | 100.25 | |
| | | | | | | | | |
| 1254.00 | 45.10 | V | 73.97 | -28.87 | Peak | 268.50 | 103.26 | |
| 1254.00 | 38.33 | V | 53.97 | -15.64 | Avg | 268.50 | 103.26 | |
| | | | | | | | | |
| 1672.00 | 54.92 | V | 73.97 | -19.05 | Peak | 211.00 | 173.65 | |
| 1672.00 | 48.15 | V | 53.97 | -5.82 | Avg | 211.00 | 173.65 | |
| | | | | | | | | |
| 2090.00 | 44.75 | V | 80.28 | -35.53 | Peak | 253.25 | 183.74 | |
| 2090.00 | 37.98 | V | 60.28 | -22.30 | Avg | 253.25 | 183.74 | |
| | | | | | | | | |
| 2508.00 | 48.20 | V | 80.28 | -32.08 | Peak | 191.75 | 195.68 | |
| 2508.00 | 41.43 | V | 60.28 | -18.85 | Avg | 191.75 | 195.68 | |
| | | | | | | | | |
| 2926.00 | 46.93 | V | 80.28 | -33.35 | Peak | 225.25 | 160.16 | |
| 2926.00 | 40.16 | V | 60.28 | -20.12 | Avg | 225.25 | 160.16 | |
| | | | | | | | | |
| 3344.00 | 50.41 | V | 80.28 | -29.87 | Peak | 347.00 | 203.86 | |
| 3344.00 | 43.64 | V | 60.28 | -16.64 | Avg | 347.00 | 203.86 | |
| | | | | | | | | |
| 3762.00 | 43.24 | V | 73.97 | -30.73 | Peak | 28.75 | 135.44 | |
| 3762.00 | 36.47 | V | 53.97 | -17.50 | Avg | 28.75 | 135.44 | |
| | | | | | | | | |
| 4180.00 | 40.79 | V | 73.97 | -33.18 | Peak | 201.25 | 109.65 | |
| 4180.00 | 34.02 | V | 53.97 | -19.95 | Avg | 201.25 | 109.65 | |
| | | | | | | | | |

**FCC 15.231**
Jordiam LLC
Phone Locker Transmitter
Model: PLT.v112

Date: 07/01/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Z-Axis**
**Duty Cycle: 45.83%**

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|---|---|---|---|---|---|---|---|---|
| 836.00 | 56.16 | V | 80.28 | -24.12 | Peak | 324.75 | 100.26 | |
| 836.00 | 49.39 | V | 60.28 | -10.89 | Avg | 324.75 | 100.26 | |
| | | | | | | | | |
| 1254.00 | 43.29 | V | 73.97 | -30.68 | Peak | 114.25 | 175.62 | |
| 1254.00 | 36.52 | V | 53.97 | -17.45 | Avg | 114.25 | 175.62 | |
| | | | | | | | | |
| 1672.00 | 47.18 | V | 73.97 | -26.79 | Peak | 129.25 | 228.04 | |
| 1672.00 | 40.41 | V | 53.97 | -13.56 | Avg | 129.25 | 228.04 | |
| | | | | | | | | |
| 2090.00 | 43.71 | V | 80.28 | -36.57 | Peak | 259.25 | 126.01 | |
| 2090.00 | 36.94 | V | 60.28 | -23.34 | Avg | 259.25 | 126.01 | |
| | | | | | | | | |
| 2508.00 | 45.17 | V | 80.28 | -35.11 | Peak | 225.25 | 198.25 | |
| 2508.00 | 38.40 | V | 60.28 | -21.88 | Avg | 225.25 | 198.25 | |
| | | | | | | | | |
| 2926.00 | 43.48 | V | 80.28 | -36.80 | Peak | 289.75 | 152.10 | |
| 2926.00 | 36.71 | V | 60.28 | -23.57 | Avg | 289.75 | 152.10 | |
| | | | | | | | | |
| 3344.00 | 48.94 | V | 80.28 | -31.34 | Peak | 68.00 | 203.68 | |
| 3344.00 | 42.17 | V | 60.28 | -18.11 | Avg | 68.00 | 203.68 | |
| | | | | | | | | |
| 3762.00 | 45.13 | V | 73.97 | -28.84 | Peak | 250.50 | 126.37 | |
| 3762.00 | 38.36 | V | 53.97 | -15.61 | Avg | 250.50 | 126.37 | |
| | | | | | | | | |
| 4180.00 | 40.65 | V | 73.97 | -33.33 | Peak | 267.00 | 116.10 | |
| 4180.00 | 33.88 | V | 53.97 | -20.10 | Avg | 267.00 | 116.10 | |
| | | | | | | | | |

**FCC 15.231**
Jordiam LLC
Phone Locker Transmitter
Model: PLT.v112

Date: 07/01/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - X-Axis**
**Duty Cycle: 45.83%**

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|---|---|---|---|---|---|---|---|---|
| 836.00 | 57.52 | H | 80.28 | -22.77 | Peak | 10.00 | 100.02 | |
| 836.00 | 50.75 | H | 60.28 | -9.54 | Avg | 10.00 | 100.02 | |
| | | | | | | | | |
| 1254.00 | 54.24 | H | 73.97 | -19.73 | Peak | 52.25 | 158.79 | |
| 1254.00 | 47.47 | H | 53.97 | -6.50 | Avg | 52.25 | 158.79 | |
| | | | | | | | | |
| 1672.00 | 54.42 | H | 73.97 | -19.55 | Peak | 93.25 | 158.25 | |
| 1672.00 | 47.65 | H | 53.97 | -6.32 | Avg | 93.25 | 158.25 | |
| | | | | | | | | |
| 2090.00 | 44.74 | H | 80.28 | -35.54 | Peak | 299.25 | 176.88 | |
| 2090.00 | 37.97 | H | 60.28 | -22.31 | Avg | 299.25 | 176.88 | |
| | | | | | | | | |
| 2508.00 | 48.66 | H | 80.28 | -31.62 | Peak | 289.25 | 185.53 | |
| 2508.00 | 41.89 | H | 60.28 | -18.39 | Avg | 289.25 | 185.53 | |
| | | | | | | | | |
| 2926.00 | 46.31 | H | 80.28 | -33.97 | Peak | 266.00 | 178.13 | |
| 2926.00 | 39.54 | H | 60.28 | -20.74 | Avg | 266.00 | 178.13 | |
| | | | | | | | | |
| 3344.00 | 50.55 | H | 80.28 | -29.73 | Peak | 301.00 | 147.74 | |
| 3344.00 | 43.78 | H | 60.28 | -16.50 | Avg | 301.00 | 147.74 | |
| | | | | | | | | |
| 3762.00 | 43.74 | H | 73.97 | -30.24 | Peak | 190.75 | 110.85 | |
| 3762.00 | 36.97 | H | 53.97 | -17.01 | Avg | 190.75 | 110.85 | |
| | | | | | | | | |
| 4180.00 | 40.50 | H | 73.97 | -33.47 | Peak | 308.25 | 110.85 | |
| 4180.00 | 33.73 | H | 53.97 | -20.24 | Avg | 308.25 | 110.85 | |
| | | | | | | | | |

**FCC 15.231**
Jordiam LLC
Phone Locker Transmitter
Model: PLT.v112

Date: 07/01/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Y-Axis**
**Duty Cycle: 45.83%**

| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|---|---|---|---|---|---|---|---|---|
| 836.00 | 57.44 | H | 80.28 | -22.84 | Peak | 147.25 | 102.49 | |
| 836.00 | 50.67 | H | 60.28 | -9.61 | Avg | 147.25 | 102.49 | |
| | | | | | | | | |
| 1254.00 | 42.44 | H | 73.97 | -31.53 | Peak | 93.00 | 124.76 | |
| 1254.00 | 35.67 | H | 53.97 | -18.30 | Avg | 93.00 | 124.76 | |
| | | | | | | | | |
| 1672.00 | 49.29 | H | 73.97 | -24.68 | Peak | 351.00 | 166.49 | |
| 1672.00 | 42.52 | H | 53.97 | -11.45 | Avg | 351.00 | 166.49 | |
| | | | | | | | | |
| 2090.00 | 40.78 | H | 80.28 | -39.50 | Peak | 230.25 | 181.59 | |
| 2090.00 | 34.01 | H | 60.28 | -26.27 | Avg | 230.25 | 181.59 | |
| | | | | | | | | |
| 2508.00 | 43.94 | H | 80.28 | -36.34 | Peak | 263.25 | 158.31 | |
| 2508.00 | 37.17 | H | 60.28 | -23.11 | Avg | 263.25 | 158.31 | |
| | | | | | | | | |
| 2926.00 | 45.24 | H | 80.28 | -35.04 | Peak | 112.25 | 110.49 | |
| 2926.00 | 38.47 | H | 60.28 | -21.81 | Avg | 112.25 | 110.49 | |
| | | | | | | | | |
| 3344.00 | 49.89 | H | 80.28 | -30.39 | Peak | 255.00 | 133.53 | |
| 3344.00 | 43.12 | H | 60.28 | -17.16 | Avg | 255.00 | 133.53 | |
| | | | | | | | | |
| 3762.00 | 45.79 | H | 73.97 | -28.18 | Peak | 227.00 | 136.76 | |
| 3762.00 | 39.02 | H | 53.97 | -14.95 | Avg | 227.00 | 136.76 | |
| | | | | | | | | |
| 4180.00 | 40.59 | H | 73.97 | -33.38 | Peak | 246.25 | 100.02 | |
| 4180.00 | 33.82 | H | 53.97 | -20.15 | Avg | 246.25 | 100.02 | |
| | | | | | | | | |

**FCC 15.231**
Jordiam LLC
Phone Locker Transmitter
Model: PLT.v112

Date: 07/01/2019
Lab: D
Tested By: Kyle Fujimoto

**Harmonics - Z-Axis**
**Duty Cycle: 45.83%**

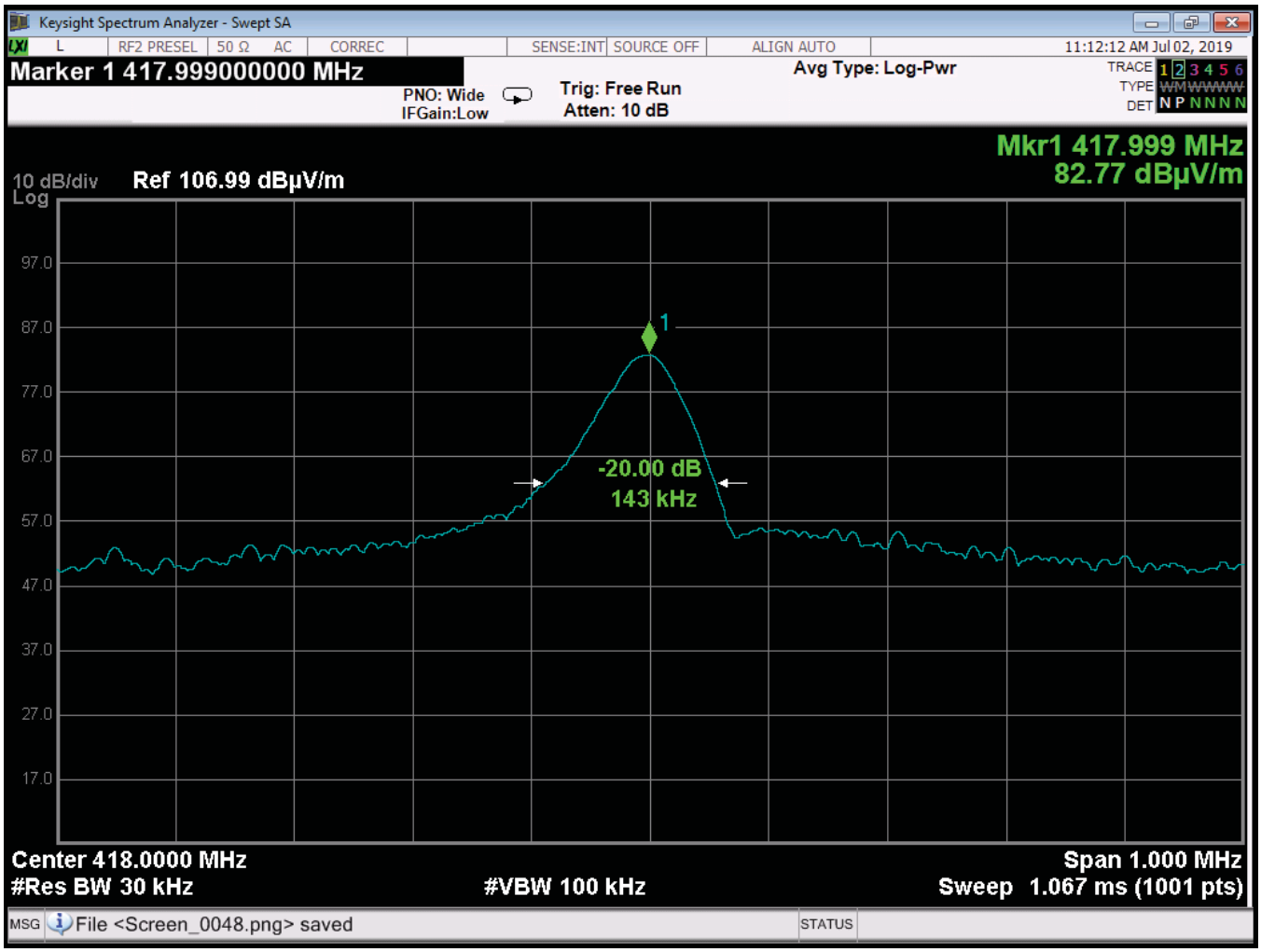
| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|---|---|---|---|---|---|---|---|---|
| 836.00 | 55.47 | H | 80.28 | -24.82 | Peak | 95.00 | 100.25 | |
| 836.00 | 48.70 | H | 60.28 | -11.59 | Avg | 95.00 | 100.25 | |
| | | | | | | | | |
| 1254.00 | 46.47 | H | 73.97 | -27.50 | Peak | 347.25 | 226.85 | |
| 1254.00 | 39.70 | H | 53.97 | -14.27 | Avg | 347.25 | 226.85 | |
| | | | | | | | | |
| 1672.00 | 53.64 | H | 73.97 | -20.34 | Peak | 22.75 | 149.41 | |
| 1672.00 | 46.87 | H | 53.97 | -7.11 | Avg | 22.75 | 149.41 | |
| | | | | | | | | |
| 2090.00 | 44.93 | H | 80.28 | -35.35 | Peak | 192.94 | 325.00 | |
| 2090.00 | 38.16 | H | 60.28 | -22.12 | Avg | 192.94 | 325.00 | |
| | | | | | | | | |
| 2508.00 | 47.55 | H | 80.28 | -32.73 | Peak | 186.50 | 169.29 | |
| 2508.00 | 40.78 | H | 60.28 | -19.50 | Avg | 186.50 | 169.29 | |
| | | | | | | | | |
| 2926.00 | 45.53 | H | 80.28 | -34.75 | Peak | 357.25 | 112.10 | |
| 2926.00 | 38.76 | H | 60.28 | -21.52 | Avg | 357.25 | 112.10 | |
| | | | | | | | | |
| 3344.00 | 50.77 | H | 80.28 | -29.51 | Peak | 186.25 | 174.61 | |
| 3344.00 | 44.00 | H | 60.28 | -16.28 | Avg | 186.25 | 174.61 | |
| | | | | | | | | |
| 3762.00 | 44.95 | H | 73.97 | -29.02 | Peak | 285.50 | 169.59 | |
| 3762.00 | 38.18 | H | 53.97 | -15.79 | Avg | 285.50 | 169.59 | |
| | | | | | | | | |
| 4180.00 | 40.79 | H | 73.97 | -33.18 | Peak | 174.75 | 130.61 | |
| 4180.00 | 34.02 | H | 53.97 | -19.95 | Avg | 174.75 | 130.61 | |
| | | | | | | | | |

**FCC 15.231**
Jordiam LLC
Phone Locker Transmitter
Model: PLT.v112

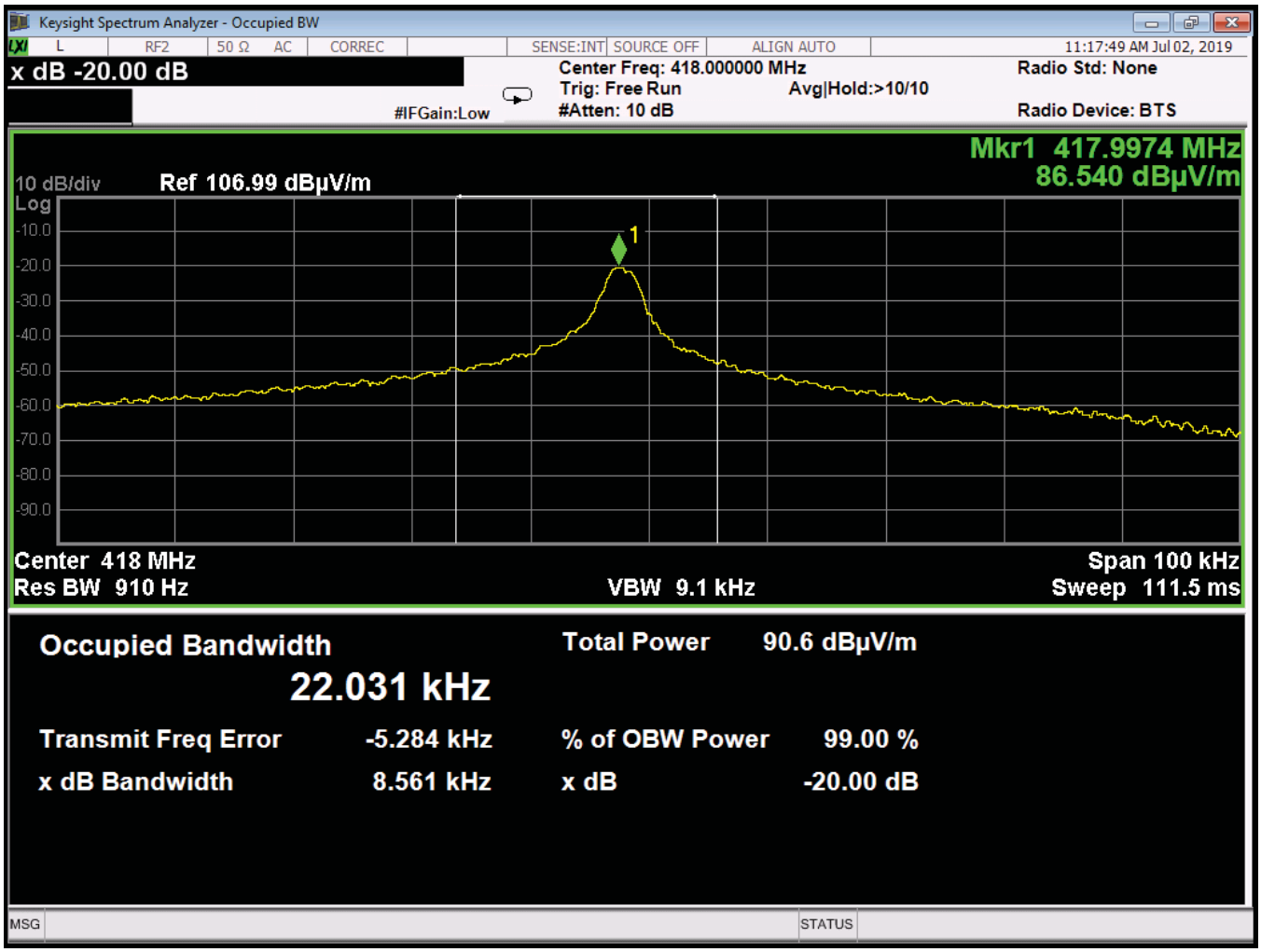
Date: 07/01/2019
Lab: D
Tested By: Kyle Fujimoto

**Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz**
**Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 4.18 GHz**

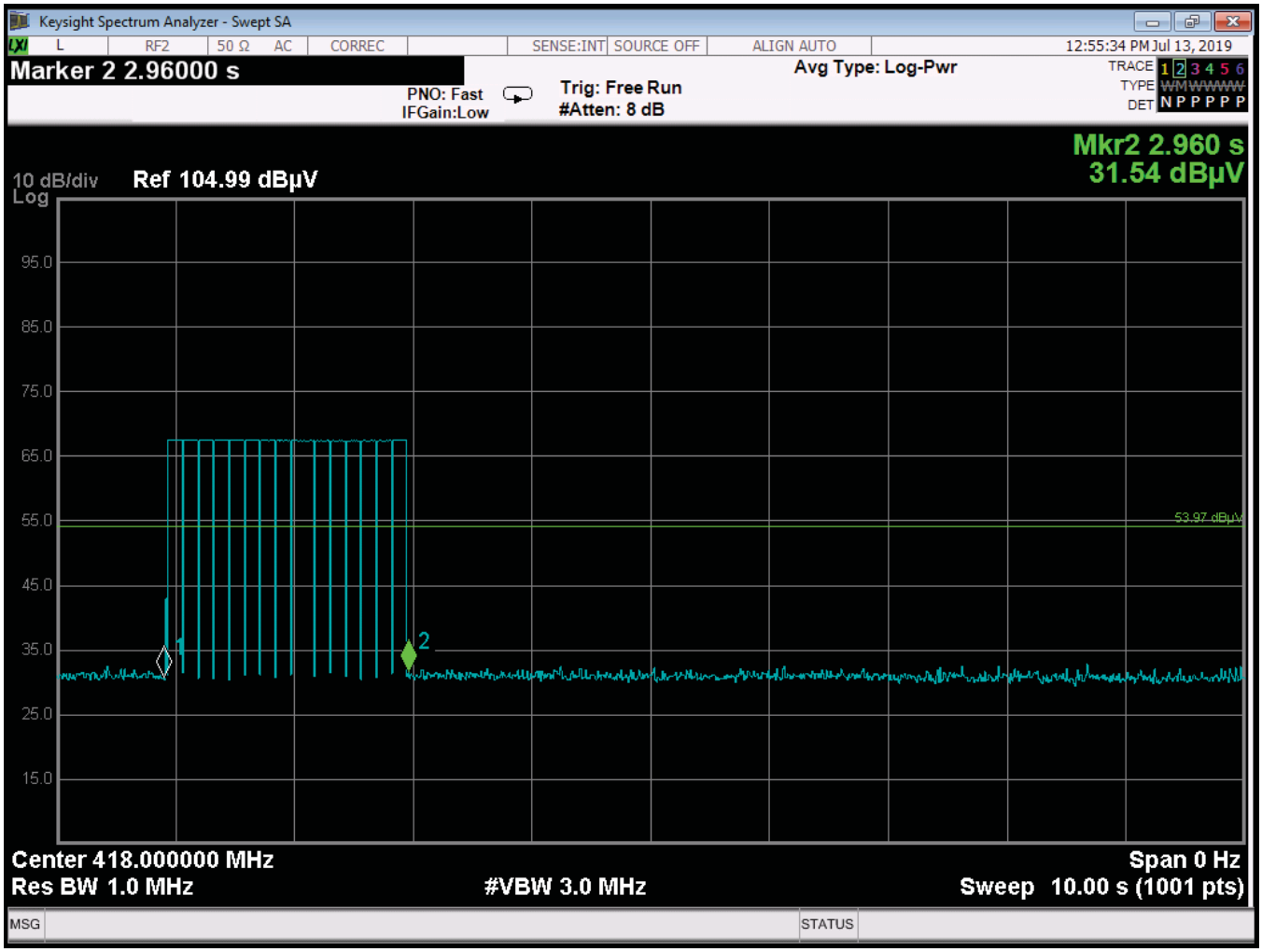
| Freq. (MHz) | Level (dBuV/m) | Pol (v/h) | Limit | Margin | Peak / QP / Avg | Table Angle (deg) | Ant. Height (cm) | Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | No Emissions Detected |
| | | | | | | | | from 9 kHz to 30 MHz |
| | | | | | | | | for the digital portion |
| | | | | | | | | of the EUT |
| | | | | | | | | |
| | | | | | | | | No Emissions Detected |
| | | | | | | | | from 9 kHz to 30 MHz |
| | | | | | | | | for the Non-Harmonic Emissions |
| | | | | | | | | of the Transmitter for the EUT |
| | | | | | | | | |
| | | | | | | | | No Emissions Detected |
| | | | | | | | | from 1 GHz to 4.18 GHz |
| | | | | | | | | for the digital portion |
| | | | | | | | | of the EUT |
| | | | | | | | | |
| | | | | | | | | No Emissions Detected |
| | | | | | | | | from 1 GHz to 4.18 GHz |
| | | | | | | | | for the Non-Harmonic Emissions |
| | | | | | | | | of the Transmitter for the EUT |
| | | | | | | | | |
| | | | | | | | | Investigated in the X-Axis, |
| | | | | | | | | Y-Axis, and Z-Axis |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |



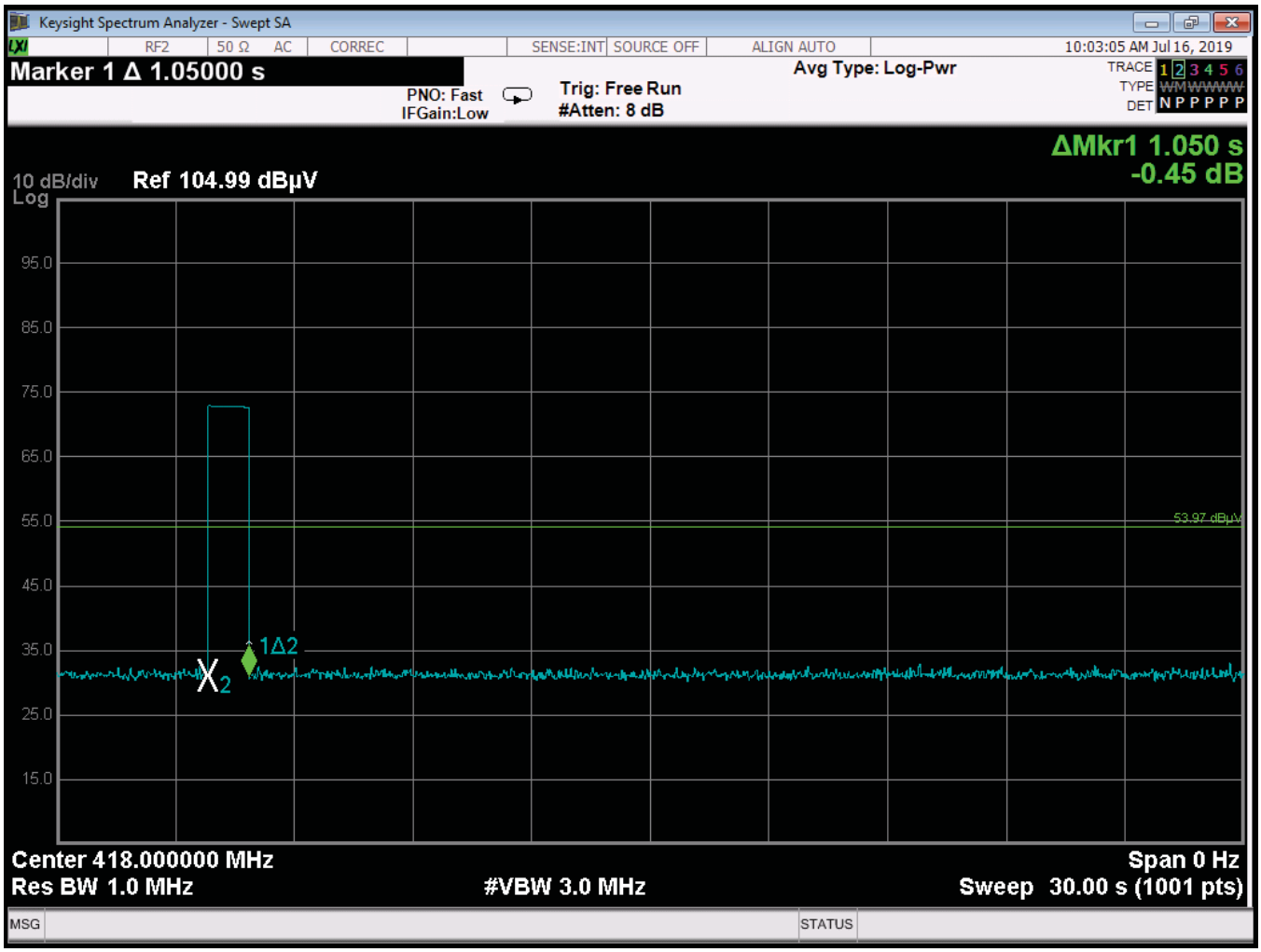

-20 dB Bandwidth Plot




99 Percent Bandwidth – 418 MHz

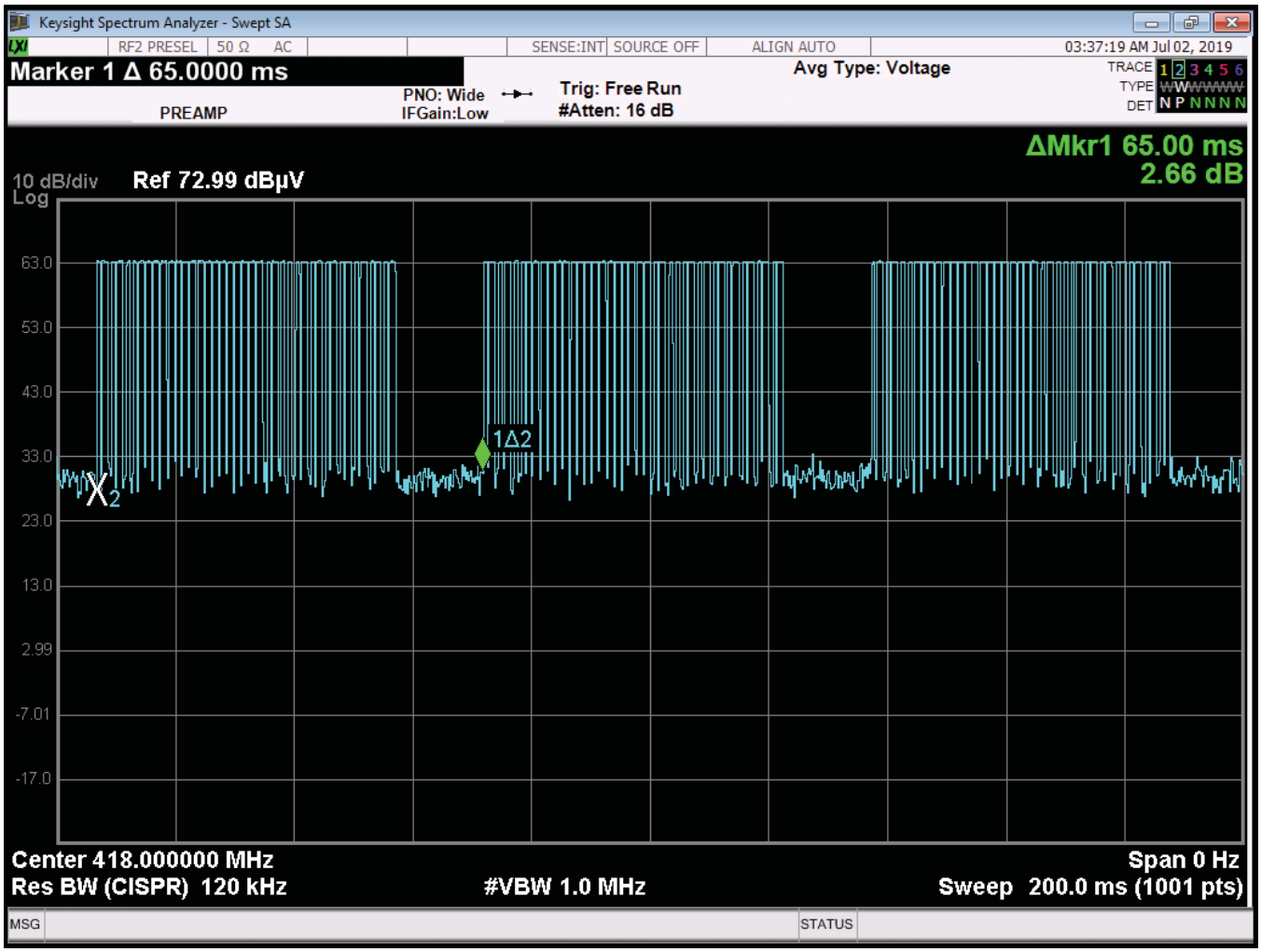



Transmission of EUT from manual activation will stop automatically when transmission button is released.

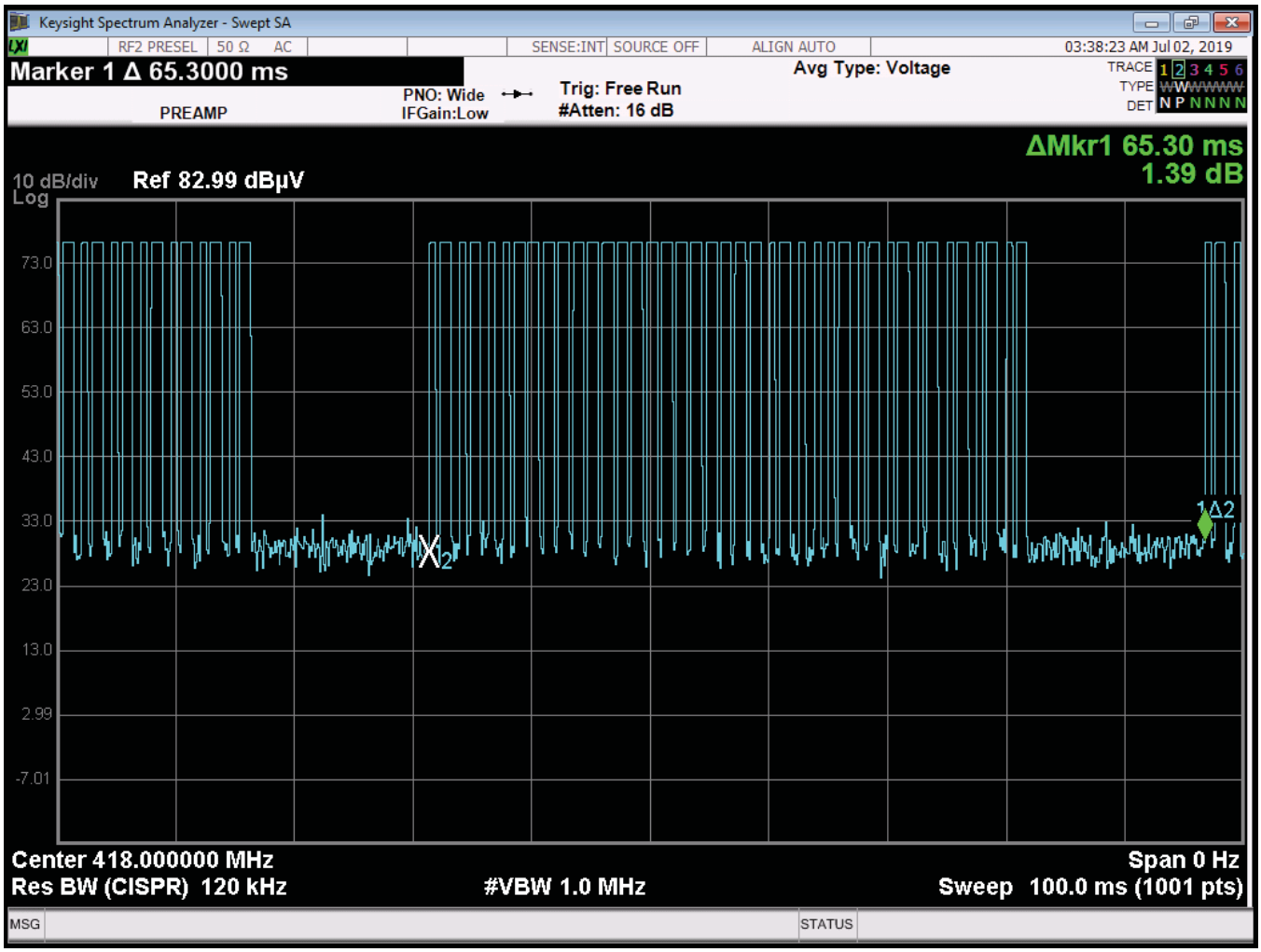



Automatically activated EUT transmitter will cease transmission within 5 seconds after activation.

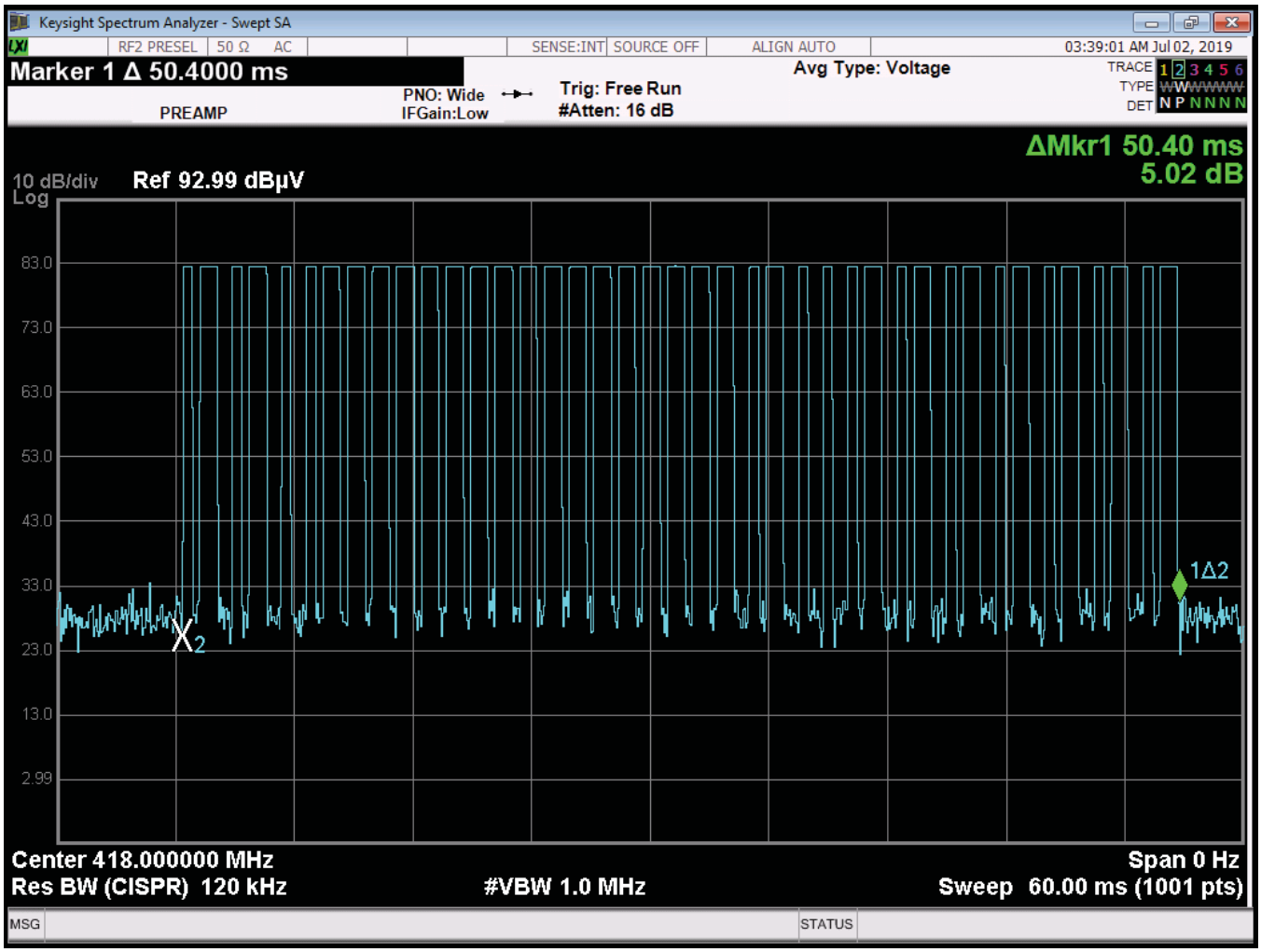
# *DUTY CYCLE DATA SHEETS*



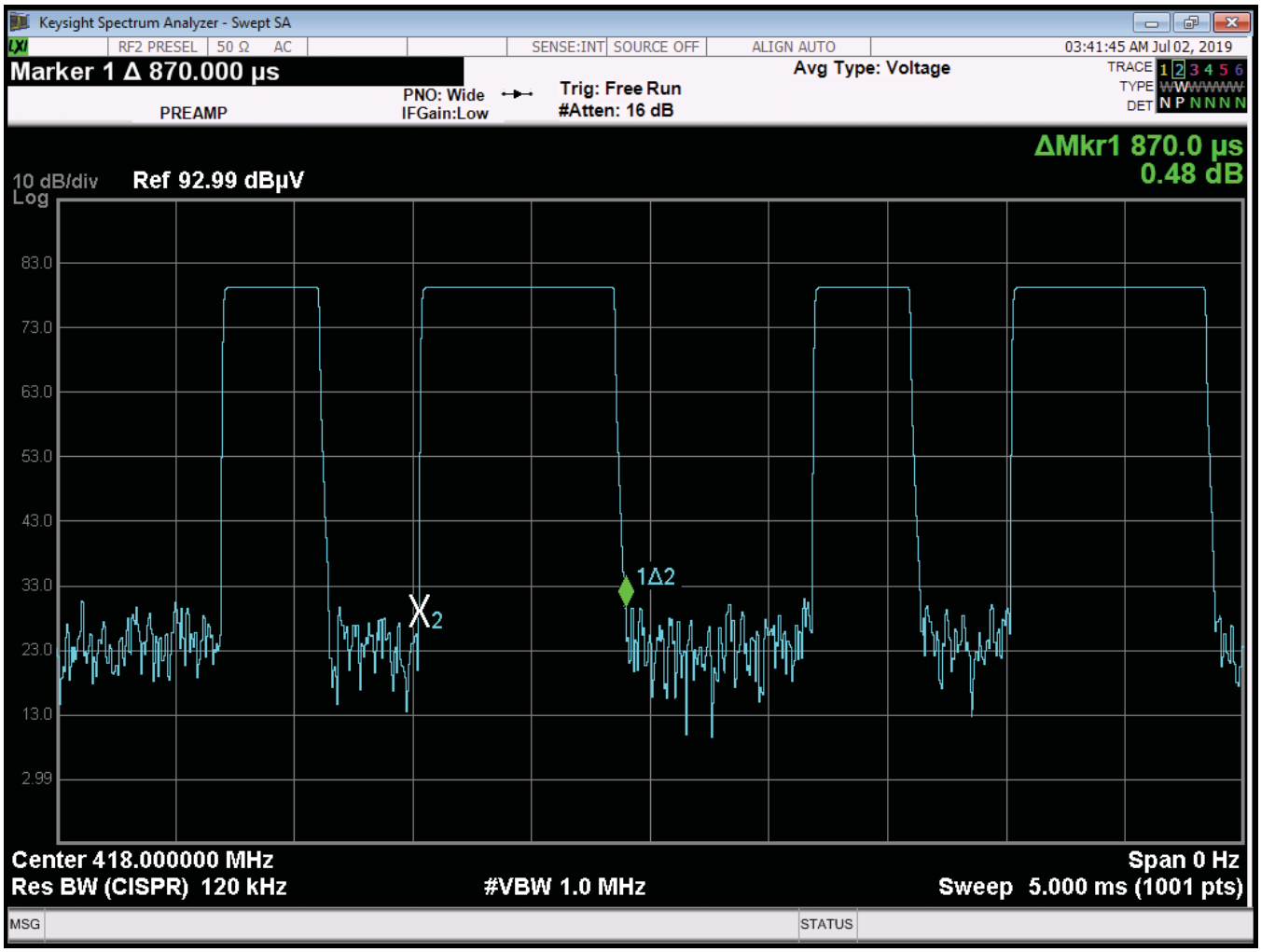

Large Scale view of Pulse Train Cycle



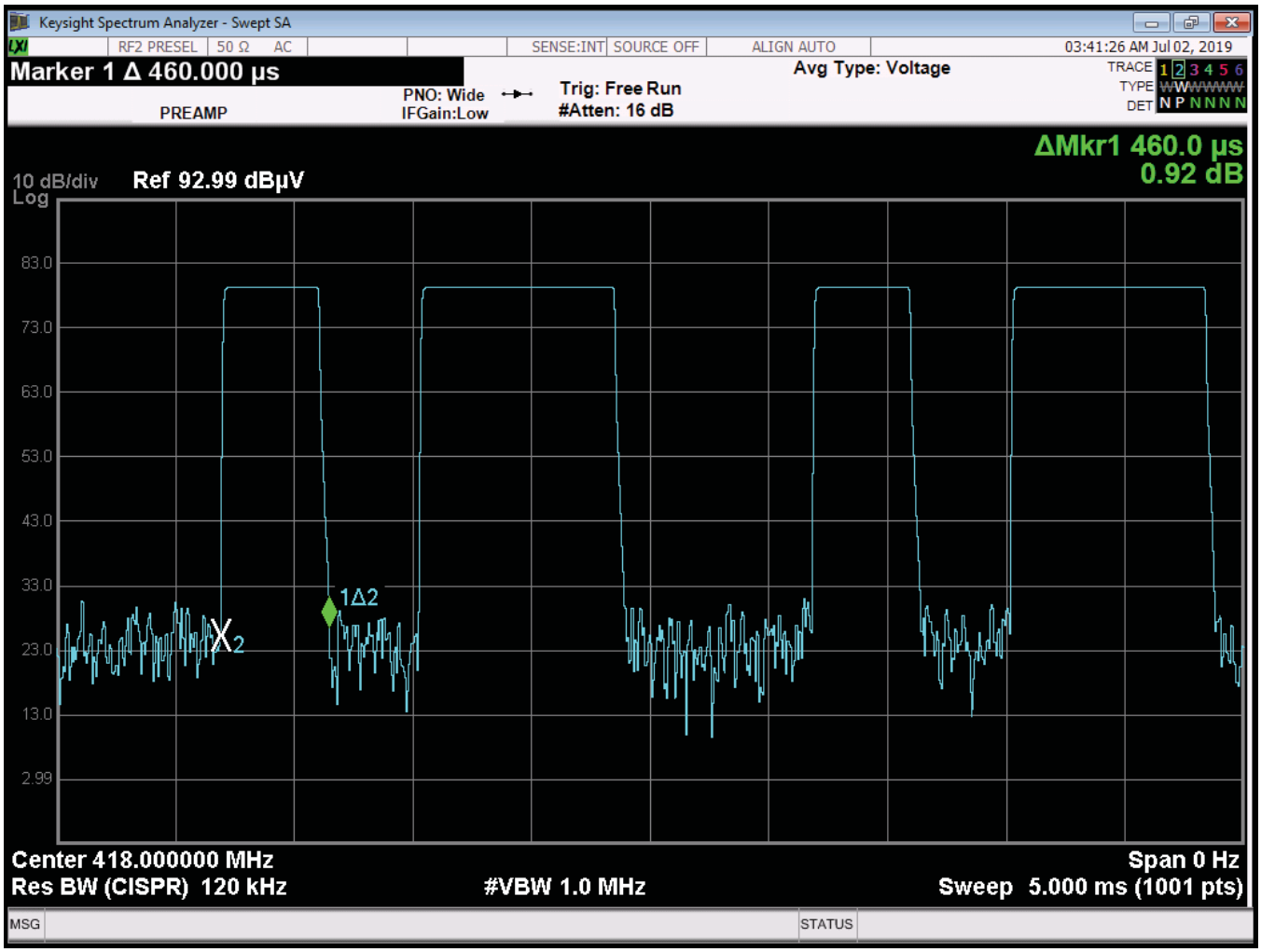

Period of Pulse Train (T): 65.3 ms




27 Long Pulses and 14 Short Pulses




Long Pulse = 870 us




Short Pulse = 460 us

Refer to section 7.4 Fundamental Field Strength (Duty Cycle Calculations) for calculation of correction factor.