

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

*for*

mDDL

MODEL: 65900

Prepared for

AEROVIRONMENT, INC.  
 900 ENCHANTED WAY  
 SIMI VALLEY, CALIFORNIA 93065

Prepared by:\_\_\_\_\_

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DATE: FEBRUARY 11, 2016

	REPORT	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	23	2	2	15	36	<b>80</b>	

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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 endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested:                   mDDL  
   Model: 65900  
   S/N: N/A

Product Description:           The EUT is a radio transceiver module.

Modifications:                   The EUT was not modified during the testing.

Manufacturer:                   Aerovironment, Inc.  
   900 Enchanted Way  
   Simi Valley, California 93065

Test Dates:                      January 11 and 12, 2016

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

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

Test Deviations:                 The test procedure was not deviated from during the testing.

## SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.207
2	Spurious Radiated RF Emissions, 10 kHz – 25000 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209
3	Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 25 GHz	This test is covered under the Compatible Electronics Report Number: B30306D1.
4	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and section 15.247 (d)
5	Peak Power Output	The output power was verified to confirm the previous value from Compatible Electronics Report Number: B30306D1, but was not recorded.
6	RF Conducted Antenna Test	This test is covered under the Compatible Electronics Report Number: B30306D1.
7	Peak Power Spectral Density from the Intentional Radiator to the Antenna	This test is covered under the Compatible Electronics Report Number: B30306D1.

## 1. PURPOSE

This document is a Class II Permissive change test report based on the Electromagnetic Interference (EMI) tests performed on the mDDL Model: 65900. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2014 and ANSI C63.10: 2013. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

This EUT has the same exact layout and components as the original mDDL, Model: 65900, covered under the Compatible Electronics Report Number B30306D1 except for the antenna. Due to this, the direct measurements were covered under Compatible Electronics Report Number B30306D1.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

## 2. ADMINISTRATIVE DATA

### 2.1 Location of Testing

The EMI 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

Aerovironment, Inc.

Ryan Ashker	Project Manager
Stuart Sechrist	Electrical Engineer

Compatible Electronics, Inc.

Kyle Fujimoto	Test Engineer
Michael Christensen	Lab Manager

### 2.4 Date Test Sample was Received

The test sample was received on January 11, 2016.

### 2.5 Disposition of the Test Sample

The sample was returned to Aerovironment, Inc. on February 4, 2016.

### 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

### 3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 2014	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
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators

## 4. DESCRIPTION OF TEST CONFIGURATION

### 4.1 Description of Test Configuration

**Broadband Dipole Antenna:** The mDDL, Model: 65900 (EUT) was connected directly to an mDDL interface board. The mDDL interface board was also connected to a laptop and AC Adapter via its ethernet and power ports, respectively. The laptop was also connected to an AC Adapter via its power port. The EUT was also connected to the broadband dipole antenna.

The laptop was placed away from the test site in a shielded enclosure.

The EUT was continuously transmitting and/or receiving continuously throughout the testing. A special program on the laptop allowed the EUT to be programmed for the low, middle, and high channels.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final emissions data was taken in both modes of operation described above and any cables were maximized. All initial investigations were performed with the measurement receiver in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

Please see Appendix E for the data sheets.

#### 4.1.1 **Cable Construction and Termination**

**Cable 1** This is a 10-meter unshielded cable connecting the mDDL TMB interface board with the laptop. The cable has an RJ-45 connector at each end.

**Cable 2** This is a 1-meter unshielded cable connecting the mDDL TMB interface board to cable #3. The cable has a 2 pin connector at the mDDL TMB interface board end and has two banana plug connectors at the cable #3 end.

**Cable 3** This is a 1-meter unshielded cable connecting cable #2 to the AC Adapter. The cable has two banana jack connectors at the cable #2 end and is hard wired into the AC Adapter.

**Cable 4** **Broadband Dipole Mode:**

This is a 20-centimeter cable connecting the EUT to Cable #5. It has an SMA connector at the cable #5 end and a UFL connector at the EUT end.

**Cable 5** **Broadband Dipole Mode:**

This is a 1-meter cable connecting the antenna to Cable #4. It has an SMA connector at the cable #5 end and is hard wired into the antenna.

## 5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

### 5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
mDDL (EUT)	AEROVIRONMENT, INC.	65900	N/A	PZR-68460
LAPTOP	DELL	CF-74HCDA28M	86K5B3275	N/A
AC ADAPTER FOR LAPTOP	DELL	PA-1900-02D	CN-09T215-71615-3C9-096B	N/A
AC ADAPTER FOR EUT	OEM	ADS18A-W 050280	N/A	N/A
mDDL TMB INTERFACE BOARD	N/A	N/A	N/A	N/A
DIPOLE ANTENNA	AEROVIRONMENT, INC.	68856	N/A	N/A

**5.2 EMI Test Equipment**

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
<b>RF RADIATED EMISSIONS TEST EQUIPMENT</b>					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
EMI Receiver, 20 Hz – 26.5 GHz	Agilent Technologies	N9038A	MY51100115	April 3, 2015	1 Year
CombiLog Antenna	Com-Power	AC-220	61060	September 3, 2015	1 Year
Preamplifier	Com-Power	PA-118	551024	March 6, 2015	1 Year
Preamplifier	Com-Power	PA-840	711013	May 13, 2014	2 Year
Loop Antenna	Com-Power	AL-130	17089	February 6, 2015	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 26, 2014	2 Year
Horn Antenna	Com-Power	AH-826	0071957	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A

**EMI Test Equipment Continued**

RF CONDUCTED EMISSIONS TEST EQUIPMENT					
Shield Room Test	Compatible Electronics	11CD	N/A	N/A	N/A
LISN	Com-Power	LI-215	12082	June 9, 2015	1 Year
LISN	Com-Power	LI-215	12090	June 9, 2015	1 Year
Transient Limiter	Com-Power	252A910	1	October 14, 2015	1 Year
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08784	May 27, 2015	1 Year
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A14530	May 27, 2015	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	May 27, 2015	1 Year

## 6. TEST SITE DESCRIPTION

### 6.1 Test Facility Description

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

### 6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

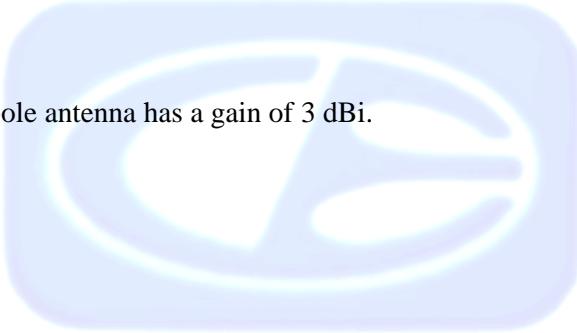
## 7. CHARACTERISTICS OF THE TRANSMITTER

### 7.1 Channel Description and Frequencies

The lowest frequency the EUT will use is 2403 MHz and the highest frequency the EUT will use is 2475 MHz. The EUT will be able to be tuned every 0.5 MHz between the lowest frequency and the highest frequency.

### 7.2 Antenna Gain

The broadband dipole antenna has a gain of 3 dBi.



## 8. TEST PROCEDURES

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

### 8.1 RF Emissions

#### 8.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. 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 C63.4. 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 the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

#### Test Results:

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 15.207.

### 8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The EMI Receiver was used as the measuring meter. Below 1 GHz, a built-in, internal preamplifier was used to increase the sensitivity of the instrument. At frequencies above 1 GHz, external preamplifiers were used. The Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above from 1 GHz to 18 GHz, and the Com Power Microwave Preamplifier Model: PA-840 was used for frequencies above 18 GHz. 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. A quasi-peak reading was taken only for those readings, which are marked accordingly on the data sheets.

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

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

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Loop Antenna
150 kHz to 30 MHz	9 kHz	Loop Antenna
30 MHz to 1 GHz	120 kHz	Combilog Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

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.

#### 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 15.247 (d) for radiated emissions. Please see Appendix E for the data sheets.

### 8.1.3 RF Emissions Test Results

Table 1.0 CONDUCTED EMISSION RESULTS  
 mDDL, Model: 65900

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
0.637 (BL)	43.25	46.00	-2.75
0.199 (BL)	50.21	53.67	-3.46
0.783 (BL)	42.14	46.00	-3.86
0.193 (WL)	46.86	53.93	-7.07
0.641 (WL)	38.42	46.00	-7.58
1.671 (WL)	36.01	46.00	-9.99

Table 2.0 RADIATED EMISSION RESULTS  
 mDDL, Model: 65900

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
208.20 (V)	37.59 (QP)	43.50	-5.91
720.00 (H)	39.67 (QP)	46.00	-6.33
208.60 (V)	35.00 (QP)	43.50	-8.50
199.10 (V)	34.81 (QP)	43.50	-8.69
2483.50 (V)	45.16 (A)	54.00	-8.84
205.90 (H)	33.93 (QP)	43.50	-9.57

Notes:

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

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## 8.2 DTS Bandwidth

The DTS Bandwidth was measured using the EMI Receiver. The bandwidth was measured using a direct connection from the RF output of the EUT. The following steps were performed for measuring the DTS Bandwidth.

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

### Test Results:

This test is covered under the Compatible Electronics Report Number: B30306D1.

### 8.3 Peak Output Power

The Peak Output Power was taken using the power meter and power sensor. The EUT was directly connected to the power sensor, which was directly connected to the power meter. The Peak Output Power was then taken.

#### Test Results:

The output power was verified to confirm the previous value from Compatible Electronics Report Number: B30306D1, but was not recorded.

### 8.4 RF Antenna Conducted Test

The RF antenna conducted test was performed using the EMI Receiver. The RF antenna conducted test measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth was 100 kHz, and the video bandwidth was 300 kHz. The spans were wide enough to include all the harmonics and emissions that were produced by the intentional radiator.

#### Test Results:

This test is covered under the Compatible Electronics Report Number: B30306D1.

**8.5****RF Band Edges**

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

A plot was also taken at 2400 MHz to show that the band edge at that frequency was 20 dB below the fundamental. The band edge at 2400 MHz was measured using a direct connection from the RF output of the EUT to the RF input of the EMI Receiver. Note: This test is covered under the Compatible Electronics Report Number: B30306D1.

**Test Results:**

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

## 8.6 Spectral Density Test

The spectrum density output was measured using the EMI Receiver. The spectral density output was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The following steps were performed for measuring the spectral density.

1. Set analyzer center frequency to DTS channel center frequency
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
4. Set the VBW  $\geq 3 \times \text{RBW}$
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize
9. Use the peak marker function to determine the maximum amplitude level within the RBW
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat..

### Test Results:

This test is covered under the Compatible Electronics Report Number: B30306D1.

## 9. CONCLUSIONS

The mDDL Model: 65900 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.



## APPENDIX A

### ***LABORATORY 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. Please follow the link to the NIST/NVLAP site for each of our facilities' NVLAP certificate and scope of accreditation

[NVLAP listing links](#)

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.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."



[ANSI listing CETCB](#)



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

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Compatible Electronics IC listing can be found at:

<http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home>



## APPENDIX B

### ***MODIFICATIONS TO THE EUT***

---

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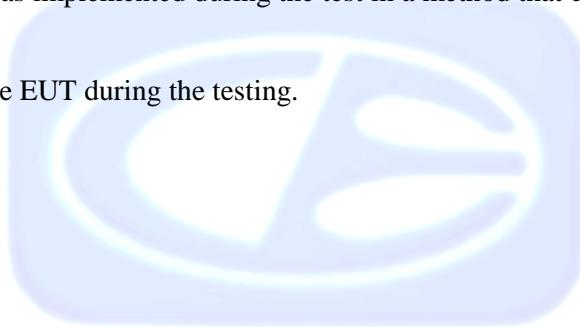
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## MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.247 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.



## APPENDIX C

### ***ADDITIONAL MODELS COVERED UNDER THIS REPORT***

---

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## **ADDITIONAL MODELS COVERED UNDER THIS REPORT**

**USED FOR THE PRIMARY TEST**

mDDL  
Model: 65900  
S/N: N/A

There were no additional models covered under this report.



## APPENDIX D

### *DIAGRAMS, CHARTS, AND PHOTOS*

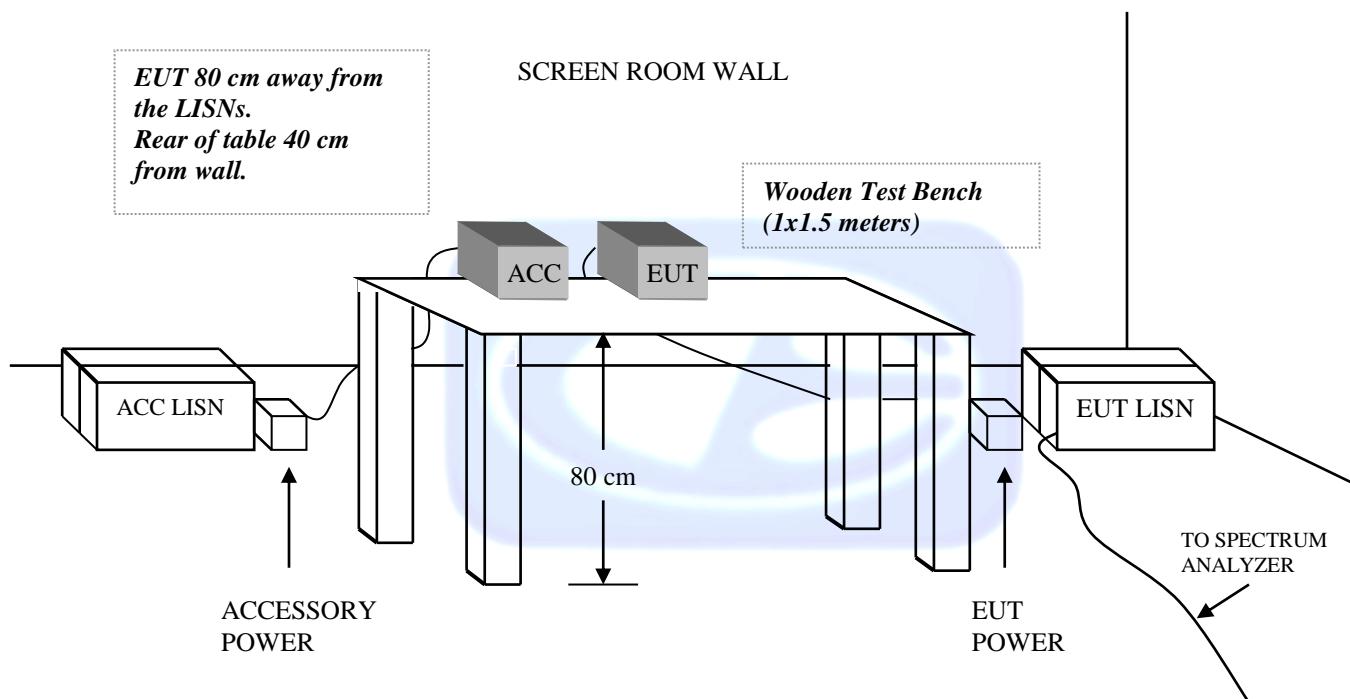
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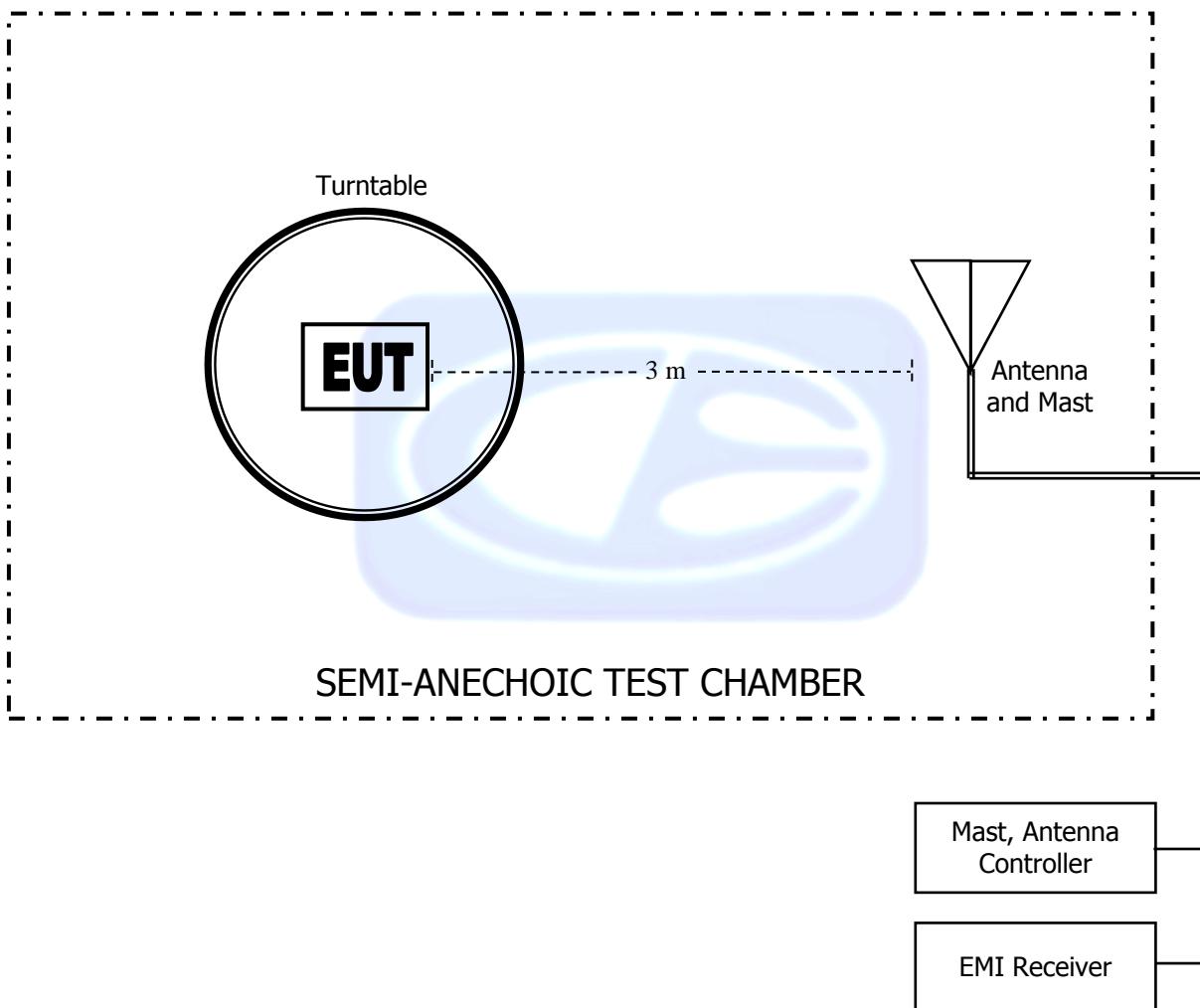
Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

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

**FIGURE 1: CONDUCTED EMISSIONS TEST SETUP**


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

# COM-POWER AL-130

## LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: FEBRUARY 6, 2015

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-33.18	18.32
0.01	-34.10	17.40
0.02	-38.65	12.85
0.03	-39.28	12.22
0.04	-40.09	11.41
0.05	-40.85	10.65
0.06	-40.88	10.62
0.07	-41.07	10.43
0.08	-41.04	10.46
0.09	-41.19	10.31
0.1	-41.20	10.30
0.2	-41.52	9.98
0.3	-41.53	9.97
0.4	-41.42	10.08
0.5	-41.53	9.97
0.6	-41.53	9.97
0.7	-41.43	10.07
0.8	-41.23	10.27
0.9	-41.13	10.37
1	-41.14	10.36
2	-40.80	10.70
3	-40.66	10.84
4	-40.61	10.89
5	-40.33	11.17
6	-40.53	10.97
7	-40.47	11.03
8	-40.48	11.02
9	-39.93	11.57
10	-39.81	11.69
15	-43.35	8.15
20	-39.16	12.34
25	-40.24	11.26
30	-43.18	8.32

COM-POWER AC-220

COMBILOG ANTENNA

S/N: 61060

CALIBRATION DATE: SEPTEMBER 3, 2015

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	24.00	200	13.00
35	24.30	250	15.30
40	25.40	300	18.20
45	21.50	350	17.90
50	22.50	400	18.60
60	15.40	450	19.80
70	12.70	500	21.60
80	11.10	550	22.40
90	13.40	600	23.70
100	13.80	650	24.30
120	15.40	700	24.00
125	15.40	750	24.50
140	13.10	800	24.30
150	17.20	850	26.30
160	13.20	900	26.90
175	14.20	950	26.00
180	14.30	1000	25.60

# COM POWER AH-118

## HORN ANTENNA

S/N: 071175

CALIBRATION DATE: FEBRUARY 26, 2014

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.23	10.0	38.43
1.5	25.84	10.5	40.19
2.0	28.14	11.0	40.49
2.5	29.51	11.5	41.39
3.0	31.20	12.0	42.02
3.5	32.17	12.5	43.30
4.0	31.40	13.0	42.77
4.5	31.86	13.5	40.18
5.0	34.82	14.0	42.59
5.5	34.38	14.5	41.74
6.0	36.31	15.0	41.84
6.5	34.81	15.5	38.48
7.0	37.48	16.0	39.52
7.5	36.98	16.5	37.85
8.0	36.66	17.0	41.33
8.5	38.47	17.5	44.96
9.0	37.22	18.0	48.50
9.5	37.86		

# COM-POWER PA-118

## PREAMPLIFIER

S/N: 551024

CALIBRATION DATE: MARCH 6, 2015

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	39.76	6.0	38.77
1.1	40.46	6.5	38.46
1.2	40.05	7.0	38.27
1.3	40.58	7.5	38.77
1.4	39.50	8.0	39.25
1.5	39.92	8.5	38.63
1.6	40.40	9.0	39.58
1.7	40.10	9.5	42.12
1.8	40.49	10.0	38.53
1.9	38.86	11.0	40.21
2.0	41.53	12.0	41.15
2.5	41.05	13.0	40.51
3.0	40.29	14.0	40.32
3.5	40.82	15.0	39.47
4.0	40.88	16.0	39.88
4.5	41.37	17.0	39.79
5.0	40.73	18.0	40.61
5.5	39.05		

**COM-POWER AH-826****HORN ANTENNA****S/N: 71957**

<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>
18.0	33.5	22.5	35.5
18.5	33.5	23.0	35.9
19.0	34.0	23.5	35.7
19.5	34.0	24.0	35.6
20.0	34.3	24.5	36.0
20.5	34.9	25.0	36.2
21.0	34.7	25.5	36.1
21.5	35.0	26.0	36.2
22.0	35.0	26.5	35.7

**COM-POWER PA-840**
**MICROWAVE PREAMPLIFIER**
**S/N: 711013**
**CALIBRATION DATE: MAY 13, 2014**

<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>
18.0	25.19	31.0	25.69
19.0	24.48	31.5	25.74
20.0	24.39	32.0	26.35
21.0	24.73	32.5	26.64
22.0	23.49	33.0	25.98
23.0	24.23	33.5	24.68
24.0	24.59	34.0	24.61
25.0	25.32	34.5	23.78
26.0	25.66	35.0	24.74
26.5	25.99	35.5	24.39
27.0	26.26	36.0	23.46
27.5	25.33	36.5	23.71
28.0	24.49	37.0	26.35
28.5	24.74	37.5	23.49
29.0	25.93	38.0	25.42
29.5	26.28	38.5	24.87
30.0	26.17	39.0	22.60
30.5	26.11	39.5	20.57
		40.0	19.15



**FRONT VIEW**

AEROVIRONMENT, INC.  
*mDDL*  
MODEL: 65900  
FCC SUBPART B and C – RADIATED EMISSIONS – BELOW 1 GHz

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

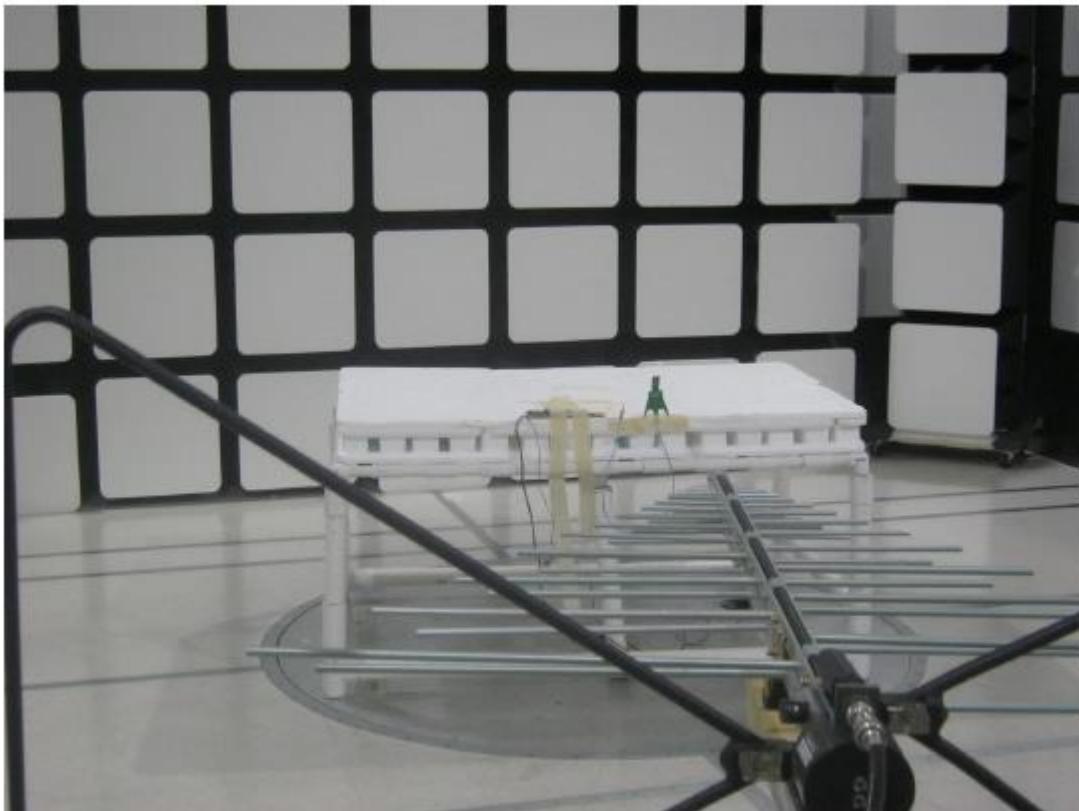
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Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
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Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

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



**REAR VIEW**

AEROVIRONMENT, INC.  
*mDDL*  
MODEL: 65900  
FCC SUBPART B and C – RADIATED EMISSIONS – BELOW 1 GHz

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

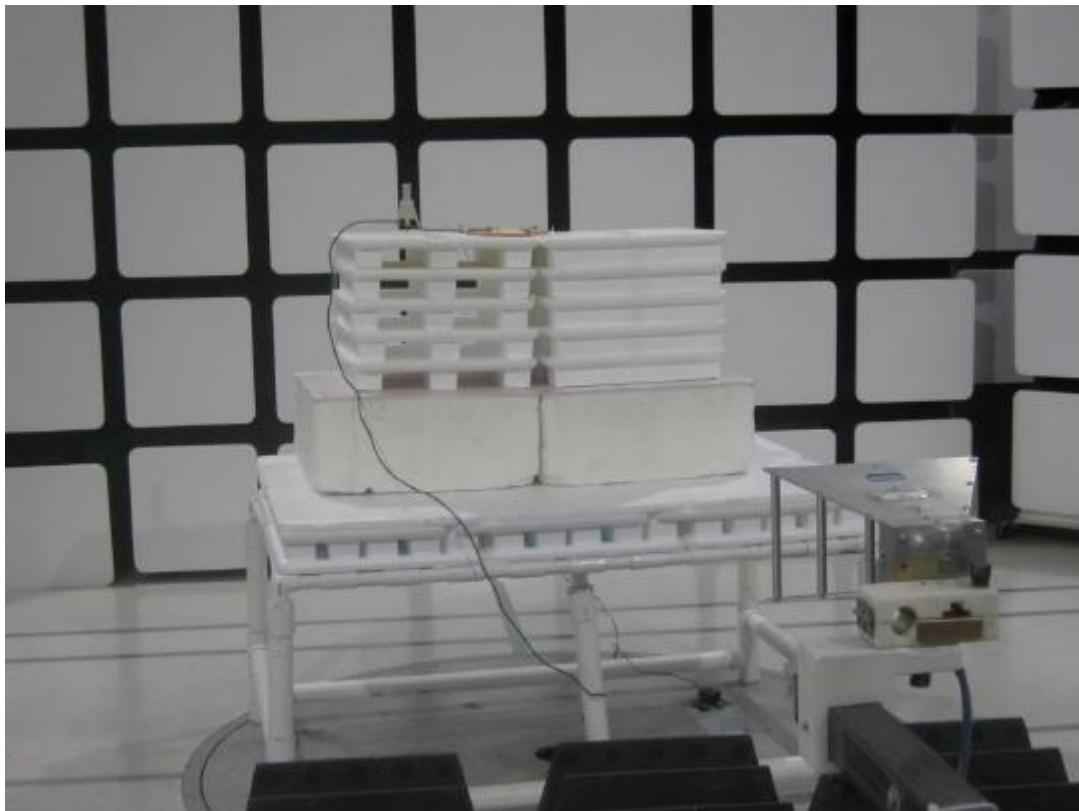
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Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400



#### FRONT VIEW

AEROVIRONMENT, INC.  
*mDDL*  
MODEL: 65900  
FCC SUBPART B and C – RADIATED EMISSIONS – ABOVE 1 GHz

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

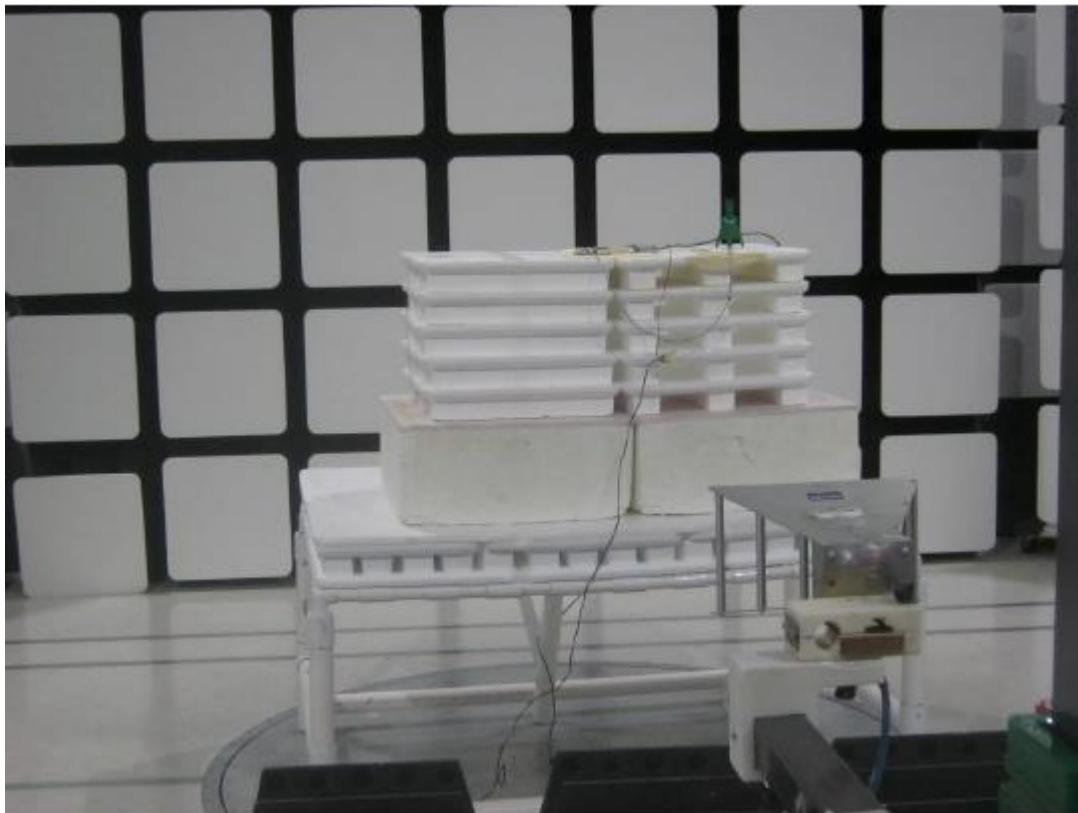
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Brea Division  
114 Olinda Drive  
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(949) 587-0400

**REAR VIEW**

AEROVIRONMENT, INC.  
*mDDL*  
MODEL: 65900  
FCC SUBPART B and C – RADIATED EMISSIONS – ABOVE 1 GHz

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

---

Brea Division  
114 Olinda Drive  
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(949) 587-0400



**FRONT VIEW**

AEROVIRONMENT, INC.  
*mDDL*  
MODEL: 65900  
FCC SUBPART B and C – CONDUCTED EMISSIONS

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

---

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



**REAR VIEW**

AEROVIRONMENT, INC.  
*mDDL*  
MODEL: 65900  
FCC SUBPART B and C – CONDUCTED EMISSIONS

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

---

Brea Division  
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(949) 589-0700

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

## APPENDIX E

### *DATA SHEETS*

---

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

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

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

**CONDUCTED EMISISONS**  
**DATA SHEETS**

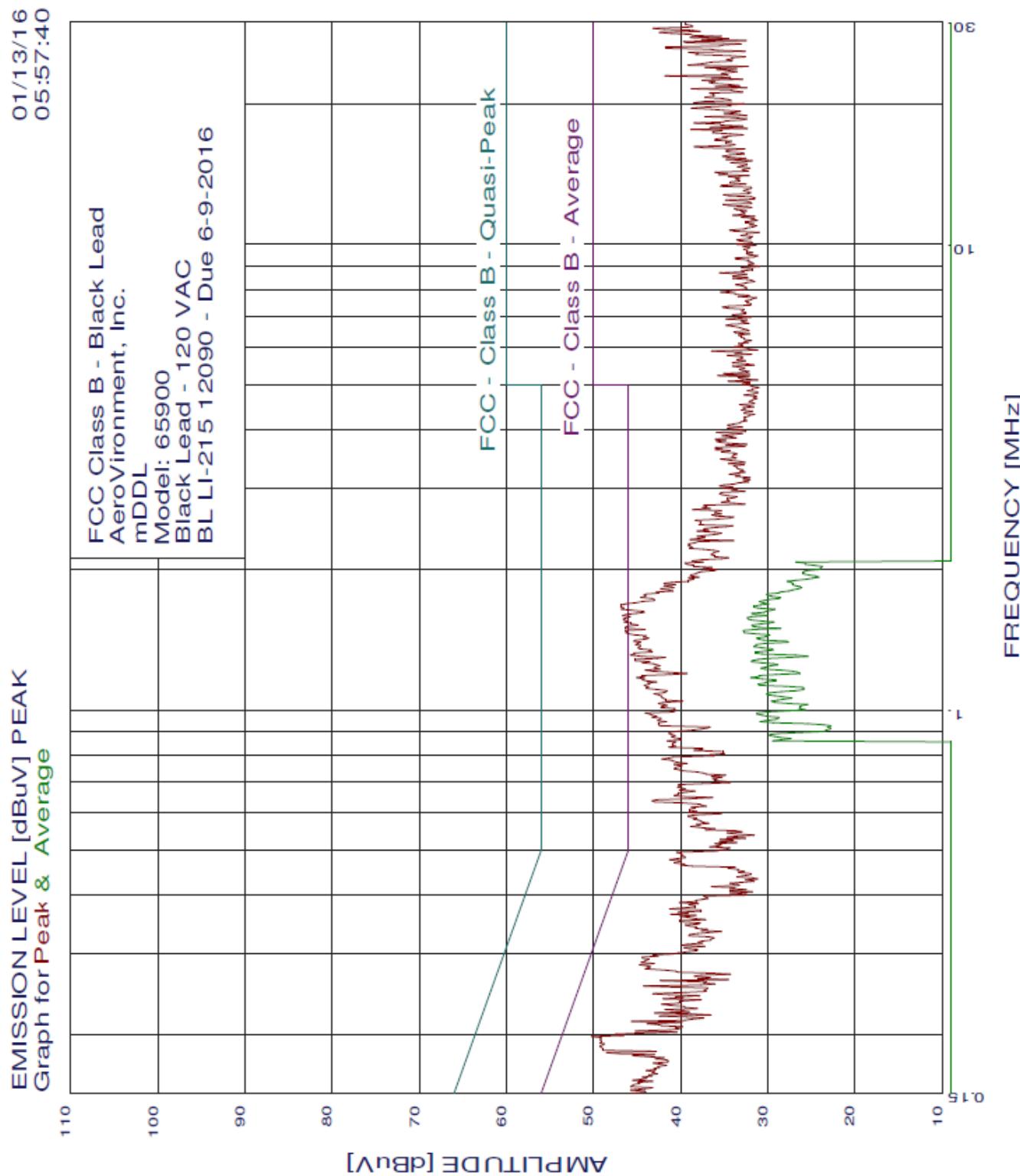
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**Brea Division**  
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**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

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



01/13/16 05:57:40

FCC Class B - Black Lead

AeroVironment, Inc.

*mDDL*

Model: 65900

Black Lead - 120 VAC

BL LI-215 12090 - Due 6-9-2016

Test Engineer : Kyle Fujimoto

39 highest peaks above -50.00 dB of FCC - Class B - Average limit line

Peak criteria : 0.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.680	46.78	46.00	0.78**
2	1.646	46.77	46.00	0.77**
3	1.594	46.67	46.00	0.67**
4	1.569	46.57	46.00	0.57**
5	1.544	46.47	46.00	0.47**
6	1.504	46.37	46.00	0.37**
7	1.480	46.37	46.00	0.37**
8	1.464	46.27	46.00	0.27**
9	1.311	45.76	46.00	-0.24**
10	1.404	45.36	46.00	-0.64**
11	1.325	45.36	46.00	-0.64**
12	1.283	45.26	46.00	-0.74**
13	1.382	45.16	46.00	-0.84**
14	1.172	45.05	46.00	-0.95**
15	1.359	44.86	46.00	-1.14**
16	1.745	44.58	46.00	-1.42**
17	1.184	44.45	46.00	-1.55**
18	1.262	44.36	46.00	-1.64**
19	1.160	44.35	46.00	-1.65**
20	1.434	44.27	46.00	-1.73**
21	1.763	44.18	46.00	-1.82**
22	1.130	44.15	46.00	-1.85**
23	1.217	44.06	46.00	-1.94**
24	0.984	44.05	46.00	-1.95**
25	1.112	43.95	46.00	-2.05**
26	1.142	43.75	46.00	-2.25**
27	1.338	43.66	46.00	-2.34**
28	0.963	43.25	46.00	-2.75**
29	0.637	43.25	46.00	-2.75
30	1.230	43.06	46.00	-2.94**
31	1.083	43.05	46.00	-2.95**
32	1.790	42.78	46.00	-3.22**
33	0.948	42.65	46.00	-3.35**
34	1.032	42.55	46.00	-3.45**
35	0.939	42.55	46.00	-3.45**
36	0.199	50.21	53.67	-3.46
37	1.820	42.28	46.00	-3.72**
38	1.011	42.25	46.00	-3.75**
39	0.783	42.14	46.00	-3.86

01/13/16 05:57:40

 FCC Class B - Black Lead  
 AeroVironment, Inc.

*mDDL*

Model: 65900

Black Lead - 120 VAC

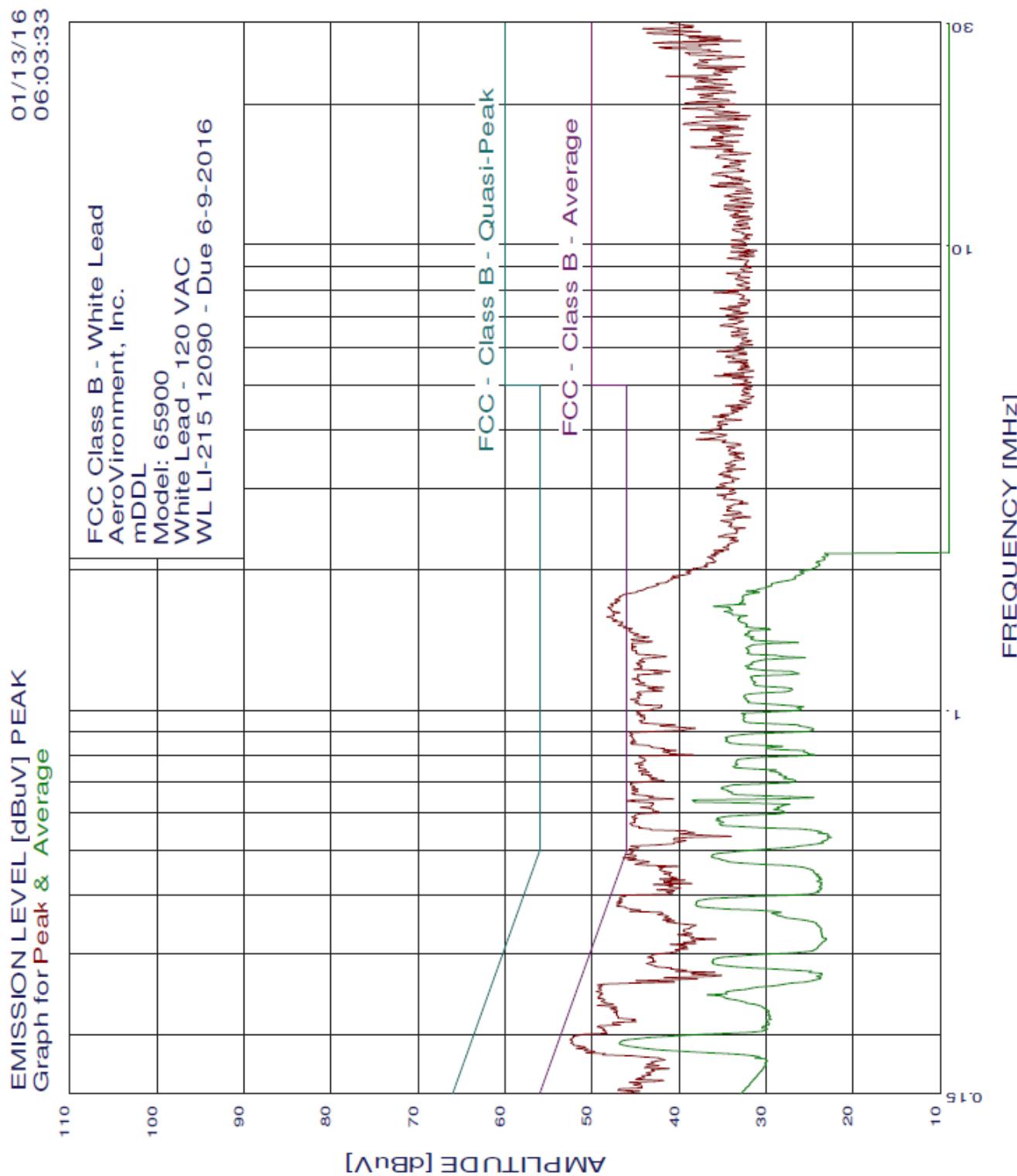
BL LI-215 12090 - Due 6-9-2016

Test Engineer : Kyle Fujimoto

27 highest peaks above -50.00 dB of FCC - Class B - Average limit line

Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.480	32.79	46.00	-13.21
2	1.577	32.35	46.00	-13.65
3	1.172	31.95	46.00	-14.05
4	1.269	31.85	46.00	-14.15
5	1.611	31.83	46.00	-14.17
6	1.520	31.81	46.00	-14.19
7	1.367	31.61	46.00	-14.39
8	1.671	31.52	46.00	-14.48
9	1.331	31.36	46.00	-14.64
10	1.382	31.33	46.00	-14.67
11	1.426	31.27	46.00	-14.73
12	0.979	31.26	46.00	-14.74
13	1.136	31.09	46.00	-14.91
14	1.708	30.95	46.00	-15.05
15	0.944	30.86	46.00	-15.14
16	1.230	30.78	46.00	-15.22
17	1.083	30.11	46.00	-15.89
18	1.772	30.11	46.00	-15.89
19	0.881	29.78	46.00	-16.22
20	1.043	29.58	46.00	-16.42
21	0.858	29.44	46.00	-16.56
22	1.889	27.77	46.00	-18.23
23	2.077	26.79	46.00	-19.21
24	1.006	26.36	46.00	-19.64
25	1.016	26.21	46.00	-19.79
26	1.971	25.89	46.00	-20.11
27	0.919	23.13	46.00	-22.87



01/13/16 06:03:33

 FCC Class B - White Lead  
 AeroVironment, Inc.

 mDDL  
 Model: 65900

White Lead - 120 VAC

WL LI-215 12090 - Due 6-9-2016

Test Engineer : Kyle Fujimoto

## 39 highest peaks above -50.00 dB of FCC - Class B - Average limit line

Peak criteria : 0.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.586	48.27	46.00	2.27**
2	1.663	48.17	46.00	2.17**
3	1.690	47.88	46.00	1.88**
4	1.611	47.57	46.00	1.57**
5	1.552	47.57	46.00	1.57**
6	1.726	47.38	46.00	1.38**
7	1.708	47.28	46.00	1.28**
8	1.520	46.97	46.00	0.97**
9	1.754	46.88	46.00	0.88**
10	1.536	46.67	46.00	0.67**
11	1.504	46.37	46.00	0.37**
12	0.481	46.43	46.32	0.11**
13	0.637	45.93	46.00	-0.07**
14	0.489	46.02	46.18	-0.16**
15	1.480	45.77	46.00	-0.23**
16	0.502	45.72	46.00	-0.28**
17	0.895	45.64	46.00	-0.36**
18	0.881	45.64	46.00	-0.36**
19	0.570	45.63	46.00	-0.37**
20	1.055	45.55	46.00	-0.45**
21	0.849	45.54	46.00	-0.46**
22	0.694	45.53	46.00	-0.47**
23	0.510	45.52	46.00	-0.48**
24	1.419	45.46	46.00	-0.54**
25	1.389	45.46	46.00	-0.54**
26	1.359	45.46	46.00	-0.54**
27	0.858	45.44	46.00	-0.56**
28	0.679	45.43	46.00	-0.57**
29	0.662	45.43	46.00	-0.57**
30	0.494	45.52	46.09	-0.57**
31	0.589	45.43	46.00	-0.57**
32	0.476	45.83	46.40	-0.58**
33	1.166	45.35	46.00	-0.65**
34	0.672	45.33	46.00	-0.67**
35	0.583	45.23	46.00	-0.77**
36	1.449	45.17	46.00	-0.83**
37	1.223	45.16	46.00	-0.84**
38	1.038	45.05	46.00	-0.95**
39	0.767	45.04	46.00	-0.96**

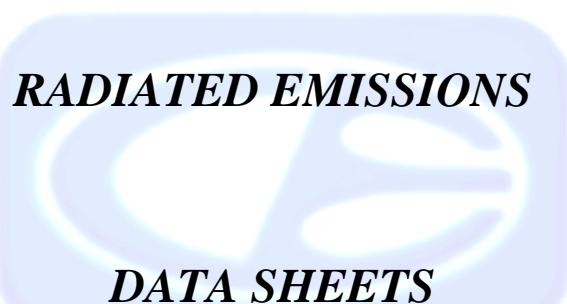
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FCC Class B - White Lead  
 AeroVironment, Inc.  
*mDDL*  
 Model: 65900  
 White Lead - 120 VAC  
 WL LI-215 12090 - Due 6-9-2016  
 Test Engineer : Kyle Fujimoto

39 highest peaks above -50.00 dB of FCC - Class B - Average limit line

Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.193	46.86	53.93	-7.07
2	0.641	38.42	46.00	-7.58
3	1.671	36.01	46.00	-9.99
4	0.484	36.29	46.27	-9.99
5	0.387	37.95	48.12	-10.17
6	0.381	38.06	48.25	-10.19
7	0.580	35.73	46.00	-10.27
8	0.586	35.63	46.00	-10.37
9	0.570	35.37	46.00	-10.63
10	0.679	35.15	46.00	-10.85
11	1.629	34.77	46.00	-11.23
12	0.872	34.68	46.00	-11.32
13	0.858	34.62	46.00	-11.38
14	1.654	34.22	46.00	-11.78
15	0.662	33.95	46.00	-12.05
16	0.755	33.77	46.00	-12.23
17	0.767	33.49	46.00	-12.51
18	1.560	33.23	46.00	-12.77
19	1.586	33.07	46.00	-12.93
20	1.699	33.04	46.00	-12.96
21	0.984	32.80	46.00	-13.20
22	1.754	32.71	46.00	-13.29
23	1.717	32.66	46.00	-13.34
24	0.974	32.63	46.00	-13.37
25	0.953	32.63	46.00	-13.37
26	1.066	32.53	46.00	-13.47
27	1.449	32.43	46.00	-13.57
28	1.243	32.37	46.00	-13.63
29	1.055	32.33	46.00	-13.67
30	1.512	32.33	46.00	-13.67
31	1.359	32.32	46.00	-13.68
32	1.800	32.29	46.00	-13.71
33	1.325	32.16	46.00	-13.84
34	1.230	32.16	46.00	-13.84
35	1.338	32.09	46.00	-13.91
36	1.038	32.08	46.00	-13.92
37	1.472	32.07	46.00	-13.93
38	1.426	31.77	46.00	-14.23
39	1.178	31.77	46.00	-14.23

**RADIATED EMISSIONS**  
  
**DATA SHEETS**

---

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

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

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

**FCC 15.247**

AeroVironment, Inc.

mDDL

Model: 65900

Antenna: Broadband Dipole

Date: 01/12/16

Lab: D

Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2403								N/A - Done via Conducted on Original Report
2403								
4806	50.74	V	74.00	-23.26	Peak	88.75	161.91	
4806	36.75	V	54.00	-17.25	Avg	88.75	161.91	
7209	57.04	V	74.00	-16.96	Peak	235.75	149.43	
7209	43.54	V	54.00	-10.46	Avg	235.75	149.43	
9612								No Emission Detected
9612								
12015								No Emission Detected
12015								
14418								No Emission Detected
14418								
16821								No Emission Detected
16821								
19224								No Emission Detected
19224								
21627								No Emission Detected
21627								
24030								No Emission Detected
24030								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

Date: 01/12/16

Lab: D

Tested By: Kyle Fujmoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2403								N/A - Done via Conducted on Original Report
2403								
4806	50.45	H	74.00	-23.55	Peak	355.55	185.19	
4806	36.65	H	54.00	-17.35	Avg	355.55	185.19	
7209	56.88	H	74.00	-17.12	Peak	158.25	171.76	
7209	43.55	H	54.00	-10.45	Avg	158.25	171.76	
9612								No Emission Detected
9612								
12015								No Emission Detected
12015								
14418								No Emission Detected
14418								
16821								No Emission Detected
16821								
19224								No Emission Detected
19224								
21627								No Emission Detected
21627								
24030								No Emission Detected
24030								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2403								N/A - Done via Conducted on Original Report
2403								
4806	51.10	V	74.00	-22.90	Peak	96.25	153.19	
4806	36.66	V	54.00	-17.34	Avg	96.25	153.19	
7209	56.69	V	74.00	-17.31	Peak	358.00	139.70	
7209	43.37	V	54.00	-10.64	Avg	358.00	139.70	
9612								No Emission Detected
9612								
12015								No Emission Detected
12015								
14418								No Emission Detected
14418								
16821								No Emission Detected
16821								
19224								No Emission Detected
19224								
21627								No Emission Detected
21627								
24030								No Emission Detected
24030								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2403								N/A - Done via Conducted on Original Report
2403								
4806	50.92	H	74.00	-23.08	Peak	160.25	166.02	
4806	36.42	H	54.00	-17.58	Avg	160.25	166.02	
7209	56.89	H	74.00	-17.11	Peak	21.75	173.31	
7209	43.27	H	54.00	-10.73	Avg	21.75	173.31	
9612								No Emission Detected
9612								
12015								No Emission Detected
12015								
14418								No Emission Detected
14418								
16821								No Emission Detected
16821								
19224								No Emission Detected
19224								
21627								No Emission Detected
21627								
24030								No Emission Detected
24030								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2403								N/A - Done via Conducted on Original Report
2403								
4806	50.57	V	74.00	-23.43	Peak	217.25	158.62	
4806	36.32	V	54.00	-17.68	Avg	217.25	158.62	
7209	56.47	V	74.00	-17.53	Peak	329.50	168.47	
7209	43.35	V	54.00	-10.65	Avg	329.50	168.47	
9612								No Emission Detected
9612								
12015								No Emission Detected
12015								
14418								No Emission Detected
14418								
16821								No Emission Detected
16821								
19224								No Emission Detected
19224								
21627								No Emission Detected
21627								
24030								No Emission Detected
24030								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2403								N/A - Done via Conducted on Original Report
2403								
4806	50.81	H	74.00	-23.19	Peak	181.25	153.97	
4806	36.46	H	54.00	-17.54	Avg	181.25	153.97	
7209	57.59	H	74.00	-16.41	Peak	0.25	186.32	
7209	43.32	H	54.00	-10.68	Avg	0.25	183.32	
9612								No Emission Detected
9612								
12015								No Emission Detected
12015								
14418								No Emission Detected
14418								
16821								No Emission Detected
16821								
19224								No Emission Detected
19224								
21627								No Emission Detected
21627								
24030								No Emission Detected
24030								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

Date: 01/12/16

Lab: D

Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2439								N/A - Done via Conducted on Original Report
2439								
4878	50.94	V	74.00	-23.06	Peak	155.00	150.02	
4878	37.44	V	54.00	-16.56	Avg	155.00	150.02	
7317	56.22	V	74.00	-17.78	Peak	130.00	123.28	
7317	42.63	V	54.00	-11.37	Avg	130.00	123.28	
9756								No Emission Detected
9756								
12195								No Emission Detected
12195								
14634								No Emission Detected
14634								
17073								No Emission Detected
17073								
19512								No Emission Detected
19512								
21951								No Emission Detected
21951								
24390								No Emission Detected
24390								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

Date: 01/12/16

Lab: D

Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2439								N/A - Done via Conducted on Original Report
2439								
4878	56.80	H	74.00	-17.20	Peak	148.25	155.70	
4878	42.61	H	54.00	-11.39	Avg	148.25	155.70	
7317	56.64	H	74.00	-17.36	Peak	150.50	171.04	
7317	42.77	H	54.00	-11.23	Avg	150.50	171.04	
9756								No Emission Detected
9756								
12195								No Emission Detected
12195								
14634								No Emission Detected
14634								
17073								No Emission Detected
17073								
19512								No Emission Detected
19512								
21951								No Emission Detected
21951								
24390								No Emission Detected
24390								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

Date: 01/12/16

Lab: D

Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2439								N/A - Done via Conducted on Original Report
2439								
4878	50.31	V	74.00	-23.69	Peak	122.00	139.70	
4878	37.03	V	54.00	-16.97	Avg	122.00	139.70	
7317	56.43	V	74.00	-17.57	Peak	217.25	172.83	
7317	42.44	V	54.00	-11.56	Avg	217.25	172.83	
9756								No Emission Detected
9756								
12195								No Emission Detected
12195								
14634								No Emission Detected
14634								
17073								No Emission Detected
17073								
19512								No Emission Detected
19512								
21951								No Emission Detected
21951								
24390								No Emission Detected
24390								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

Date: 01/12/16

Lab: D

Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2439								N/A - Done via Conducted on Original Report
2439								
4878	50.49	H	74.00	-23.51	Peak	146.00	141.19	
4878	37.13	H	54.00	-16.87	Avg	146.00	141.19	
7317	55.96	H	74.00	-18.04	Peak	126.75	129.00	
7317	42.58	H	54.00	-11.43	Avg	126.75	129.00	
9756								No Emission Detected
9756								
12195								No Emission Detected
12195								
14634								No Emission Detected
14634								
17073								No Emission Detected
17073								
19512								No Emission Detected
19512								
21951								No Emission Detected
21951								
24390								No Emission Detected
24390								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2439								N/A - Done via Conducted
2439								on Original Report
4878	50.78	V	74.00	-23.23	Peak	185.25	142.50	
4878	37.24	V	54.00	-16.76	Avg	185.25	142.50	
7317	56.69	V	74.00	-17.31	Peak	90.50	134.68	
7317	42.58	V	54.00	-11.42	Avg	90.50	134.68	
9756								No Emission
9756								Detected
12195								No Emission
12195								Detected
14634								No Emission
14634								Detected
17073								No Emission
17073								Detected
19512								No Emission
19512								Detected
21951								No Emission
21951								Detected
24390								No Emission
24390								Detected

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2439								N/A - Done via Conducted on Original Report
2439								
4878	51.05	V	74.00	-22.95	Peak	171.25	165.43	
4878	37.21	V	54.00	-16.79	Avg	171.25	165.43	
7317	56.56	V	74.00	-17.44	Peak	79.00	142.50	
7317	42.60	V	54.00	-11.40	Avg	79.00	142.50	
9756								No Emission Detected
9756								
12195								No Emission Detected
12195								
14634								No Emission Detected
14634								
17073								No Emission Detected
17073								
19512								No Emission Detected
19512								
21951								No Emission Detected
21951								
24390								No Emission Detected
24390								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujmoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475								N/A - Done via Conducted on Original Report
2475								
4950	51.10	V	74.00	-22.90	Peak	364.00	159.58	
4950	37.82	V	54.00	-16.18	Avg	364.00	159.58	
7425	55.72	V	74.00	-18.28	Peak	206.25	162.92	
7425	42.48	V	54.00	-11.52	Avg	206.25	162.92	
9900								No Emission Detected
9900								
12375								No Emission Detected
12375								
14850								No Emission Detected
14850								
17325								No Emission Detected
17325								
19800								No Emission Detected
19800								
22275								No Emission Detected
22275								
24750								No Emission Detected
24750								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475								N/A - Done via Conducted on Original Report
2475								
4950	51.28	H	74.00	-22.72	Peak	362.75	157.97	
4950	37.90	H	54.00	-16.10	Avg	362.75	157.97	
7425	55.93	H	74.00	-18.07	Peak	168.25	129.31	
7425	42.40	H	54.00	-11.60	Avg	168.25	129.31	
9900								No Emission Detected
9900								
12375								No Emission Detected
12375								
14850								No Emission Detected
14850								
17325								No Emission Detected
17325								
19800								No Emission Detected
19800								
22275								No Emission Detected
22275								
24750								No Emission Detected
24750								

**FCC 15.247**

AeroVironment, Inc.

mDDL

Model: 65900

Antenna: Broadband Dipole

Date: 01/12/16

Lab: D

Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475								N/A - Done via Conducted on Original Report
2475								
4950	56.56	V	74.00	-17.44	Peak	339.00	137.43	
4950	42.46	V	54.00	-11.54	Avg	339.00	137.43	
7425	55.85	V	74.00	-18.16	Peak	217.00	128.71	
7425	42.36	V	54.00	-11.64	Avg	217.00	128.71	
9900								No Emission Detected
9900								
12375								No Emission Detected
12375								
14850								No Emission Detected
14850								
17325								No Emission Detected
17325								
19800								No Emission Detected
19800								
22275								No Emission Detected
22275								
24750								No Emission Detected
24750								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

Date: 01/12/16

Lab: D

Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475								N/A - Done via Conducted on Original Report
2475								
4950	50.87	H	74.00	-23.14	Peak	25.50	151.76	
4950	38.02	H	54.00	-15.98	Avg	25.50	151.76	
7425	55.90	H	74.00	-18.11	Peak	177.00	178.32	
7425	42.36	H	54.00	-11.64	Avg	177.00	178.32	
9900								No Emission Detected
9900								
12375								No Emission Detected
12375								
14850								No Emission Detected
14850								
17325								No Emission Detected
17325								
19800								No Emission Detected
19800								
22275								No Emission Detected
22275								
24750								No Emission Detected
24750								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475								N/A - Done via Conducted on Original Report
2475								
4950	50.97	V	74.00	-23.03	Peak	195.75	123.28	
4950	37.85	V	54.00	-16.15	Avg	195.75	123.28	
7425	56.57	V	74.00	-17.43	Peak	291.00	154.26	
7425	42.42	V	54.00	-11.58	Avg	291.00	154.26	
9900								No Emission Detected
9900								
12375								No Emission Detected
12375								
14850								No Emission Detected
14850								
17325								No Emission Detected
17325								
19800								No Emission Detected
19800								
22275								No Emission Detected
22275								
24750								No Emission Detected
24750								

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

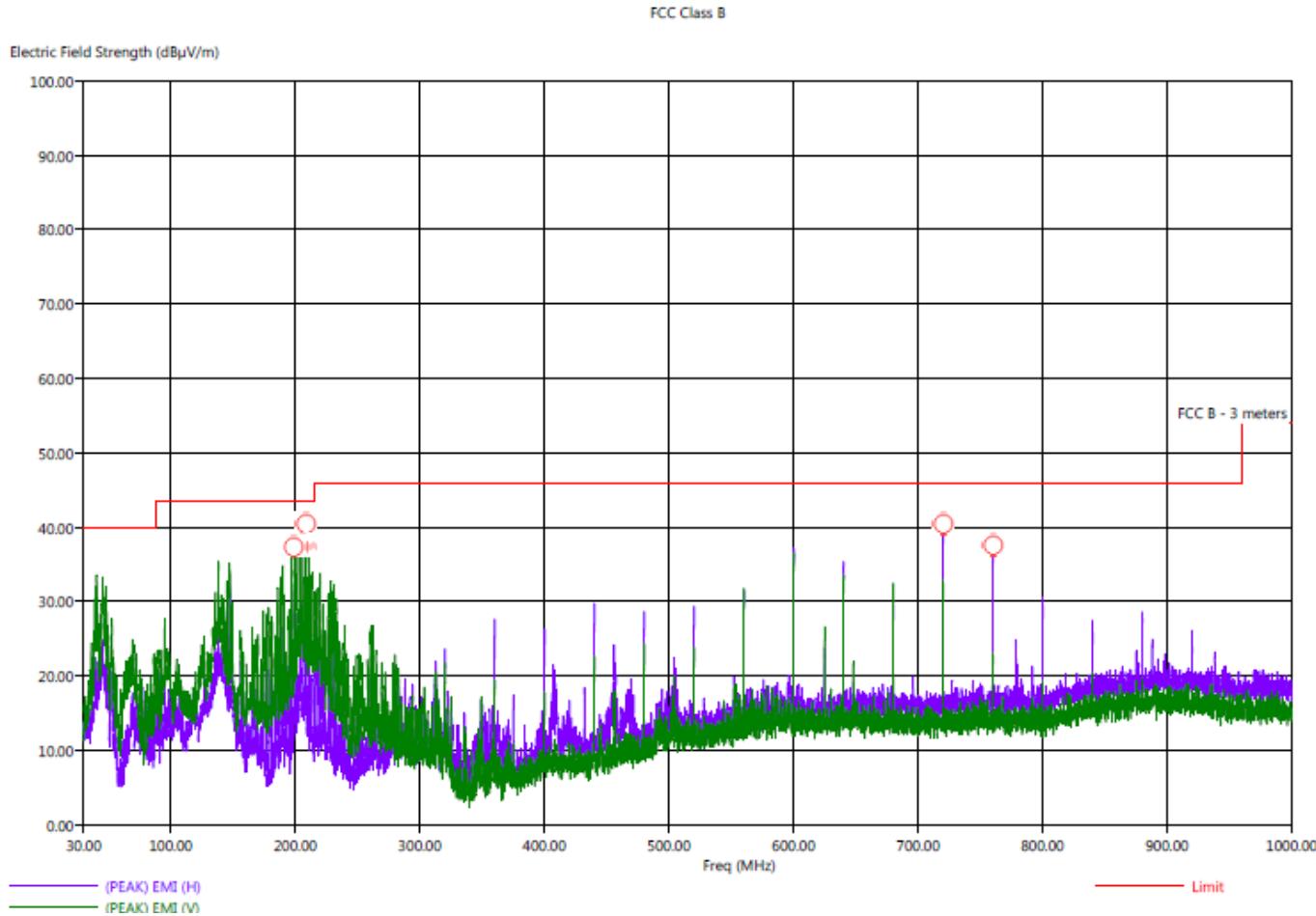
 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475								N/A - Done via Conducted on Original Report
2475								
4950	50.86	H	74.00	-23.14	Peak	202.50	168.23	
4950	37.92	H	54.00	-16.08	Avg	202.50	168.23	
7425	55.88	H	74.00	-18.12	Peak	77.25	151.46	
7425	42.40	H	54.00	-11.60	Avg	77.25	151.46	
9900								No Emission Detected
9900								
12375								No Emission Detected
12375								
14850								No Emission Detected
14850								
17325								No Emission Detected
17325								
19800								No Emission Detected
19800								
22275								No Emission Detected
22275								
24750								No Emission Detected
24750								

Title: Pre-Scan - 30-1000 MHz - FCC Class B  
 File: Agilent - Radiated Pre-Scan 30-1000 MHz - FCC Class B - 01-11-16.set  
 Operator: Kyle Fujimoto  
 EUT Type: mDDL  
 EUT Condition: The EUT is continuously transmitting  
 Comments: Customer: Aerovironment, Inc.  
 Model: 65900  
 Antenna: Broadband Dipole, P/N: 68856

1/11/2016 2:53:13 PM  
 Sequence: Preliminary Scan



X- axis worst case

No additional spurious emissions were found between 10 kHz – 30 MHz and 1 GHz and 25 GHz

Title: Radiated Final - 30-1000 MHz - FCC Class B  
 File: Agilent - Radiated Final Scan 30-1000 MHz - FCC Class B - X-Axis - 01-11-16.set  
 Operator: Kyle Fujimoto  
 EUT Type: mDDL  
 EUT Condition: The EUT is continuously transmitting - X-Axis Worst Case  
 Comments: Customer: AeroVironment, Inc.  
 Model: 65900  
 Antenna: Broadband Dipole, P/N: 60856

1/11/2016 3:50:58 PM  
 Sequence: Final Measurements

## FCC Class B 30 MHz - 1 GHz

Freq (MHz)	Pol	(PEAK) EMI (dB $\mu$ V/m)	(QP) EMI (dB $\mu$ V/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dB $\mu$ V/m)	Transducer (dB)	Cable (dB)	Ttbl Agl (deg)	Twr Ht (cm)
199.10	V	35.60	34.81	-7.90	-8.69	43.50	13.06	1.00	259.75	142.50
203.70	V	33.58	32.35	-9.92	-11.15	43.50	13.18	1.02	252.75	127.04
205.90	V	37.64	33.93	-5.86	-9.57	43.50	13.28	1.03	263.25	111.40
208.20	V	39.96	37.59	-3.54	-5.91	43.50	13.38	1.04	278.25	127.22
208.60	V	37.44	35.00	-6.06	-8.50	43.50	13.40	1.05	273.00	143.52
720.00	H	40.23	39.67	-5.77	-6.33	46.00	24.20	2.30	176.50	111.22
760.00	H	36.51	35.77	-9.49	-10.23	46.00	24.46	2.36	178.25	109.91

No additional spurious emissions were found between 10 kHz – 30 MHz and 1 GHz and 25 GHz



***BAND EDGES***

***DATA SHEETS***

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

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

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

**FCC 15.247**

AeroVironment, Inc.

*mDDL*

Model: 65900

Antenna: Broadband Dipole

Date: 01/12/16

Lab: D

Tested By: Kyle Fujimoto

**Y-Axis (Worst Case) - Low Channel**
**Y-Axis (Worst Case) - High Channel**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2403	114.84	V	--	--	Peak	306.00	165.97	Fundamental of Low Channel
2403	108.09	V	--	--	Avg	306.00	165.97	@ 3 meters
2390	50.77	V	74.00	-23.23	Peak	306.00	165.97	No Marker Delta Method
2390	39.10	V	54.00	-14.90	Avg	306.00	165.97	Method Used
2475	115.14	V	--	--	Peak	4.00	143.40	Fundamental of High Channel
2475	108.36	V	--	--	Avg	4.00	143.40	@ 3 meters
2483.5	60.13	V	74.00	-13.87	Peak	4.00	143.40	No Marker Delta Method
2483.5	45.16	V	54.00	-8.84	Avg	4.00	143.40	Method Used

**FCC 15.247**

 AeroVironment, Inc.  
 mDDL  
 Model: 65900  
 Antenna: Broadband Dipole

 Date: 01/12/16  
 Lab: D  
 Tested By: Kyle Fujimoto

**Y-Axis (Worst Case) - Low Channel**  
**Y-Axis (Worst Case) - High Channel**

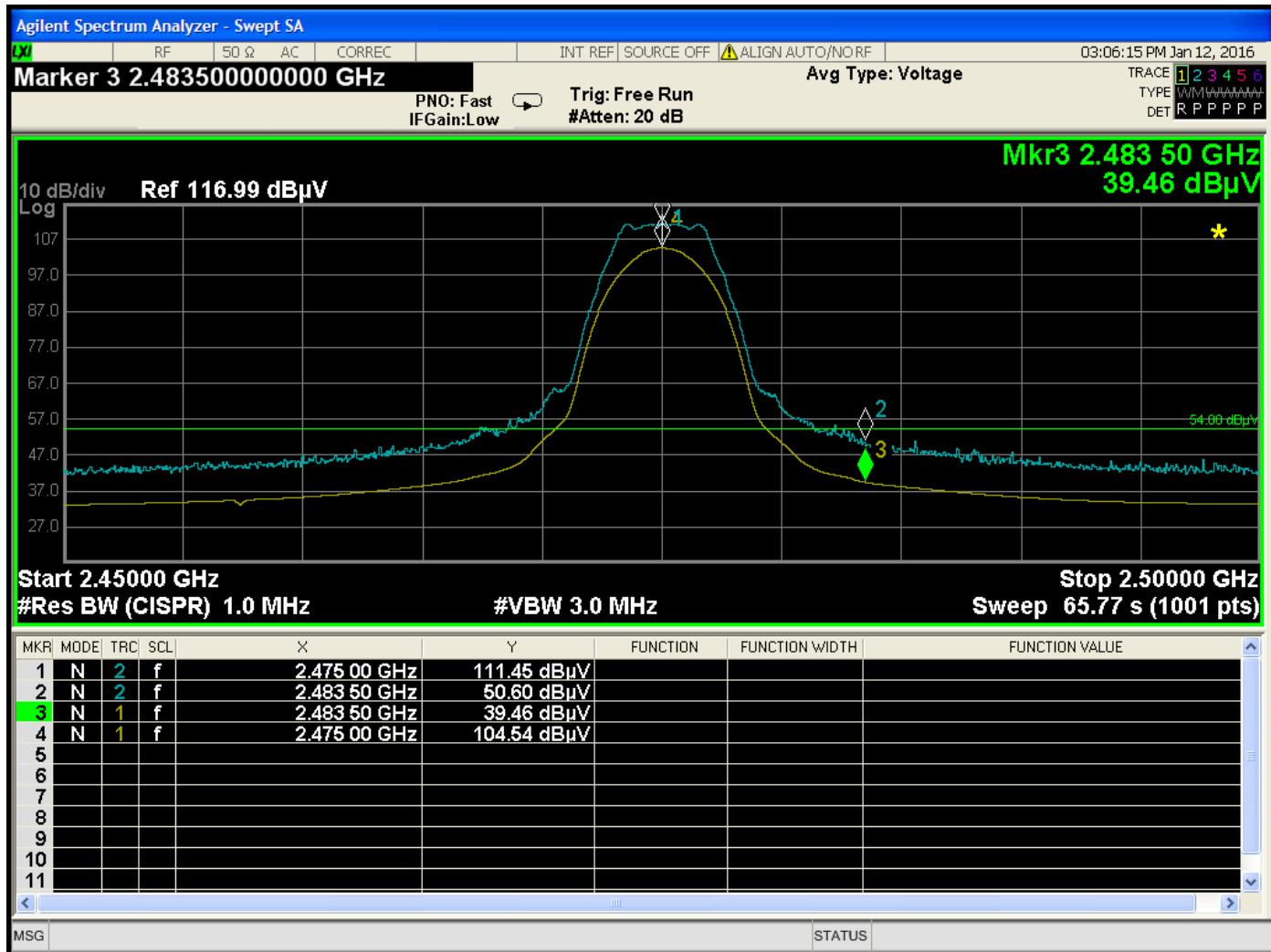
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2403	111.10	H	--	--	Peak	110.25	188.71	Fundamental of Low Channel
2403	104.19	H	--	--	Avg	110.25	188.71	@ 3 meters
2390	48.62	H	74.00	-25.38	Peak	110.25	188.71	No Marker Delta Method
2390	36.17	H	54.00	-17.83	Avg	110.25	188.71	Method Used
2475	111.45	H	--	--	Peak	229.75	159.94	Fundamental of High Channel
2475	104.54	H	--	--	Avg	229.75	159.94	@ 3 meters
2483.5	50.60	H	74.00	-23.40	Peak	229.75	159.94	No Marker Delta Method
2483.5	39.46	H	54.00	-14.54	Avg	229.75	159.94	Method Used



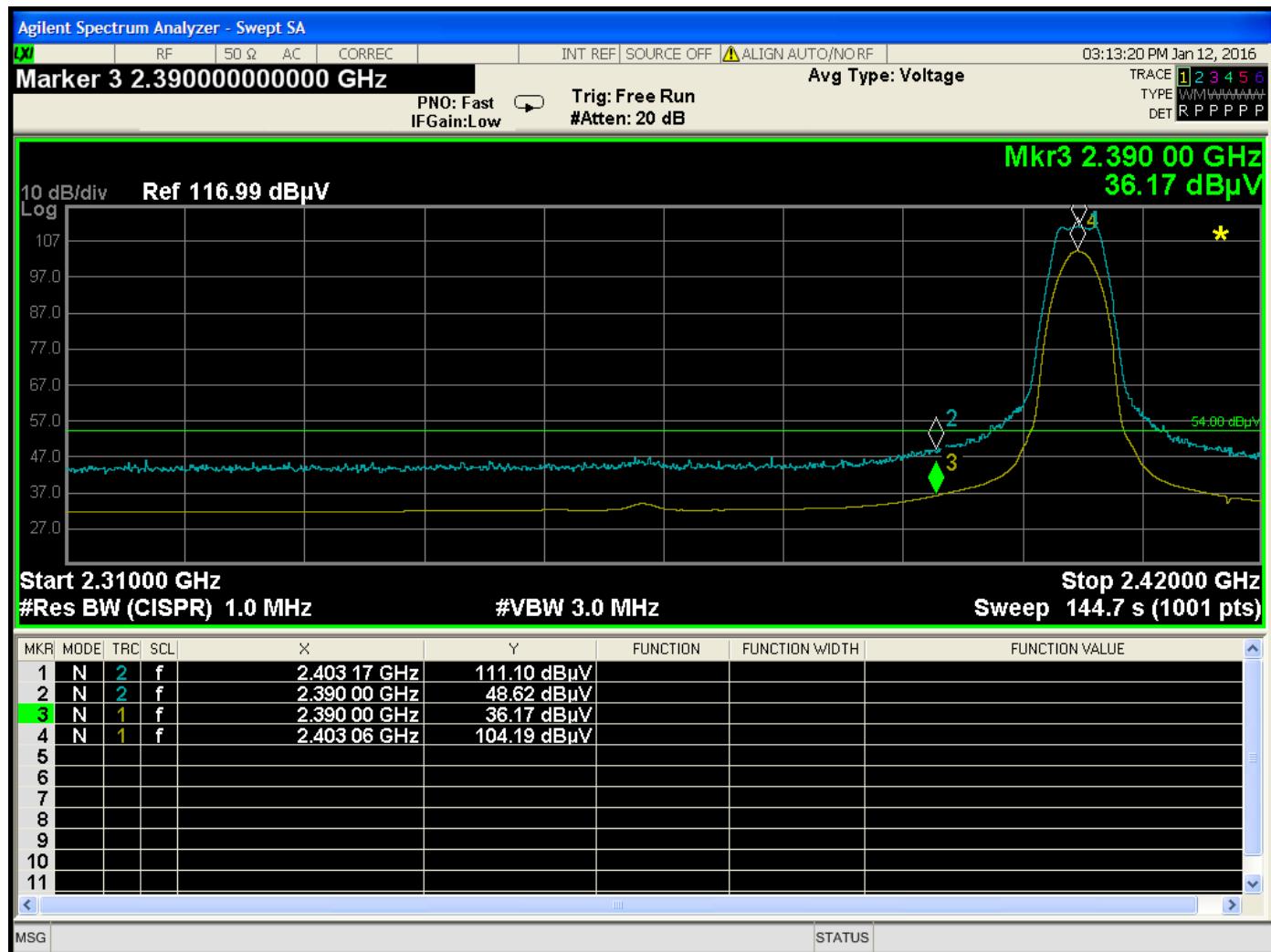
# COMPATIBLE ELECTRONICS

Report Number: B60112A1  
**Class II Permissive Change Test Report**  
*mDDL*  
*Model: 65900*

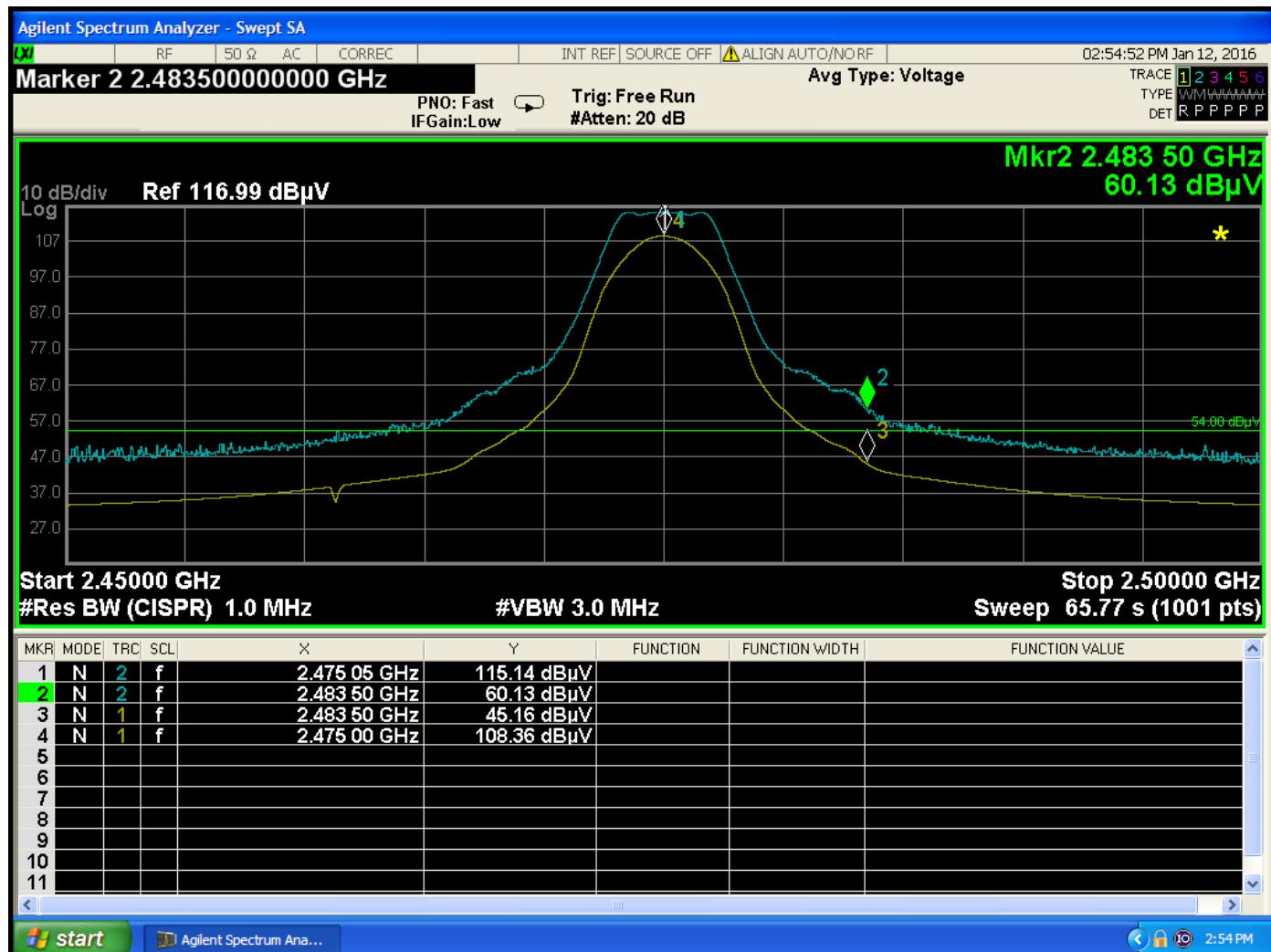
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### High Band Edge – Horizontal – Y axis



Low Band Edge – Horizontal – Y axis



High Band Edge – Vertical – Y axis



Low Band Edge – Vertical – Y axis