mDDL Model: 65900



RSS-GEN and RSS-210 TEST REPORT

for

mDDL

MODEL: 65900

Prepared for

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

Prepared by:

KYLE FUJIMOTO

MICHAEL CHRISTENSEN

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

DATE: MARCH 8, 2013

	REPORT		APPENDICES			TOTAL	
	BODY	A	В	C	D	E	
PAGES	25	2	2	2	20	100	151

This report shall not be reproduced except in full, without the written approval of Compatible Electronics.





TABLE OF CONTENTS

Section / Title	PAGE
GENERAL REPORT SUMMARY	4
SUMMARY OF TEST RESULTS	5
1. PURPOSE	6
2. ADMINISTRATIVE DATA	7
2.1 Location of Testing	7
2.2 Traceability Statement	7
2.3 Cognizant Personnel	7
2.4 Date Test Sample was Received	7
2.5 Disposition of the Test Sample2.6 Abbreviations and Acronyms	7
3. APPLICABLE DOCUMENTS	8
4. DESCRIPTION OF TEST CONFIGURATION	9
4.1 Description of Test Configuration - Emissions	9
4.1.1 Cable Construction and Termination	10
5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT	11
5.1 EUT and Accessory List	11
6. TEST SITE DESCRIPTION	14
6.1 Test Facility Description	14
6.2 EUT Mounting, Bonding and Grounding	14
7. CHARACTERISTICS OF THE TRANSMITTER	15
7.1 Transmitter Power	15
7.2 Channel Description and Frequencies	15
7.3 Antenna Gain	15
8. TEST PROCEDURES	16
8.1 RF Emissions	16
8.1.1 Conducted Emissions Test	16
8.1.2 Radiated Emissions (Spurious and Harmonics) Test8.1.3 RF Emissions Test Results	17 19
8.1.5 RF Emissions Test Results 8.2 Emissions Bandwidth (EBW)	20
8.3 Peak Output Power	21
8.4 RF Antenna Conducted Test	21
8.5 RF Band Edges	22
8.6 Spectral Density Test	23
8.7 -20 dB Bandwidth	24
9. CONCLUSIONS	25





LIST OF APPENDICES

APPENDIX	TITLE			
Α	Laboratory Accreditations and Recognitions			
В	Modifications to the EUT			
С	Additional Models Covered Under This Report			
D	Diagrams, Charts, and Photos			
	Test Setup Diagrams			
	Radiated and Conducted Emissions Photos			
	Antenna and Effective Gain Factors			
Е	Data Sheets			

LIST OF FIGURES

FIGURE	TITLE
1	Conducted Emissions Test Setup
2	Plot Map And Layout of Test Site – 3 Meters
3	Plot Map And Layout of Test Site – 10 Meters

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: See Expository Statement.

Modifications: The EUT was not modified during the testing.

Manufacturer: AeroVironment, Inc.

900 Enchanted Way

Simi Valley, California 93065

Test Dates: February 5 and 14, 2013; and March 4, 5, and 6, 2013

Test Specifications: Emissions requirements

RSS-GEN and RSS-210

Test Procedure: ANSI C63.4

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



RSS-GEN and RSS-210 Test Report $m\overline{D}DL$ Model: 65900

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS	
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the limits of Table 4 of RSS-GEN, Issue 3	
2	Spurious Radiated RF Emissions, 10 kHz – 30 MHz and 1000 MHz – 25000 MHz	Complies with the limits of clause A8.5 of RSS-210, Issue 8 and Table 5 of RSS-GEN, Issue 3	
3	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 25 GHz	Complies with the limits of clause A8.5 of RSS-210, Issue 8	
4	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 25 GHz	Complies with the limits of clause A8.5 of RSS-210, Issue 8 and Table 5 of RSS-GEN, Issue 3	
5	Peak Power Output	Complies with the relevant requirements of clause A8.4 (4) section 4 of RSS-210, Issue 8	
6	RF Conducted Antenna Test	Complies with the limits of clause A8.5 of RSS-210, Issue 8	
7	Peak Power Spectral Density from the Intentional Radiator to the Antenna	Complies with the relevant requirements of clause A8.2 (b) of RSS-210, Issue 8	
8	Occupied Bandwidth	This test was performed to obtain the emission designator as required by clause 4.3 of RSS-GEN, Issue 3	



Report Number: B30306D2
RSS-GEN and RSS-210 Test Report
mDDL
Model: 65900

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the mDDL, Model: 65900. The emission measurements were performed according to the measurement procedure described in ANSI C63.4. 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 limits of Table 4 and 5 of RSS-GEN, Issue 3 and Annex 8 of RSS-210, Issue 8.



Report Number: B30306D2 RSS-GEN and RSS-210 Test Report mDDL

Model: 65900

ADMINISTRATIVE DATA

2.1 Location of Testing

2.

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.

Gil Michaels RF & Communications Manager
Steven Chambers Aero Mechanical Engineering Manager

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer

Michael Christensen Lab Manager, Brea Division

2.4 Date Test Sample was Received

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

2.5 Disposition of the Test Sample

The test sample has not been returned to AeroVironment, Inc as of the date of this test report.

2.6 Abbreviations and Acronyms

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

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



Model: 65900



3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
RSS-GEN, Issue3,	General Requirements and Information for the Certification of Radio
December 2010	Apparatus
RSS-210, Issue 8,	License-exempt Radio Apparatus (All Frequency Bands): Category I
December 2010	Equipment
ANSI C63.4	Methods of measurement of radio-noise emissions from low-voltage
2009	electrical and electronic equipment in the range of 9 kHz to 40 GHz

mDDL. Model: 65900



DESCRIPTION OF TEST CONFIGURATION

4.1 **Description of Test Configuration - Emissions**

Monopole 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 Adapater 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 two monopole antennas via the main and aux ports.

Twin Patch Antenna Mode: 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 Adapater 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 twin patch antenna via the main and aux ports.

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.





COMPATIBLE ELECTRONICS

This is a 7-meter unshielded cable connecting the mDDL TMB interface board with the laptop. The Cable 1 cable has an RJ-45 connector at each end.

This is a 1-meter unshielded cable connecting the mDDL TMB interface board to cable #3. The cable Cable 2 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.

Twin Patch Antenna Mode: Cable 4

This is a 15-centimeter cable connecting the EUT's main port to the twin patch antenna. The cable has a UFL connector at each end.

Twin Patch Antenna Mode: Cable 5

> This is a 13-centimeter cable connecting the EUT's aux port to the twin patch antenna. The cable has a UFL connector at each end.

Cable 6 **Monopole Antenna Mode:**

This is a 20-centimeter cable connecting the EUT's aux port to monopole antenna #1. The cable has a UFL connector at the EUT end and is hard wired into the monopole.

Cable 7 **Monopole Antenna Mode:**

This is a 4-centimeter cable connecting the EUT's main port to monopole antenna #2. The cable has a UFL connector at the EUT end and is hard wired into the monopole.



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

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
mDDL (EUT)	AEROVIRONMENT, INC.	65900	N/A	XV665900
LAPTOP	DELL	PP01X	CN-OUY141-48643- 883-1581	QDS-BRCM1022
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
1/4 WAVE MONOPOLE ANTENNA	LINX TECHNOLOGIES	ANT-2.4-CW-RH	N/A	N/A
TWIN PATCH ANTENNA	AEROVIRONMENT, INC.	AV P/N: 70958	N/A	N/A

 $m\overline{D}DL$



5.2 **Emissions Test Equipment**

EQUIPMENT TYPE	MANU- FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TEST					S
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8568B	2517A01563	May 30, 2012	May 30, 2013
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A15285	May 30, 2012	May 30, 2013
Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00424	May 30, 2012	May 30, 2013
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 19, 2012	November 19, 2014
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
	RF RA	DIATED EMISS	IONS TEST EQ	QUIPMENT	
Loop Antenna	Com-Power	AL-130	17089	January 29, 2013	January 29, 2015
Biconical Antenna	Com Power	AB-900	43028	May 24, 2012	May 24, 2013
Log Periodic Antenna	Com Power	AL-100	16252	May 24, 2012	May 24, 2013
High Pass Filter	AMTI Microwave Circuits	H3G020G4	481230	June 7, 2012	June 7, 2013



5.3 **Emissions Test Equipment (Continued)**

EQUIPMENT TYPE	MANU- FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE		
	RF RADIATED EMISSIONS TEST EQUIPMENT (CONTINUED)						
Horn Antenna	Com-Power	AH-118	071175	February 29, 2012	March 1, 2014		
Horn Antenna	Com-Power	AH826	71957	NCR	N/A		
Preamplifier	Com-Power	CPPA-102	1017	December 27, 2012	December 27, 2013		
Preamplifier	Com-Power	PA-118	181656	December 27, 2012	December 27, 2013		
Preamplifier	Com-Power	PA-840	711013	May 17, 2012	May 17, 2013		
	RF CON	NDUCTED EMIS	SSIONS TEST E	QUIPMENT			
Emissions Program	Compatible Electronics	2.3 (SR19)	N/A	N/A	N/A		
LISN	Com Power	LI-215	12078	June 20, 2011	June 20, 2013		
LISN	Com Power	LI-215	12082	June 20, 2011	June 20, 2013		
Transient Limiter	Com Power	252A910	1	November 7, 2012	November 7, 2013		
Power Measuring Analyzer	Boonton Electronics	4500A-01	1282	May 15, 2012	May 15, 2013		
Peak Power Sensor	Boonton Electronics	57318	3723	May 15, 2012	May 15, 2013		

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 of this report for the emissions 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 Transmitter Power

Transmit power is herein defined as the power delivered to a 50 ohm load at the RF output of the EUT.

Power	Frequency	
25.43 dBm	2403 MHz	
25.38 dBm	2439 MHz	
26.01 dBm	2475 MHz	

7.2 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.

7.3 Antenna Gain

The ¼ wave monopole antenna has a gain of 0 dBi. The twin patch antenna has a gain of 9 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: 2009. 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 limits of Table 4 of RSS-GEN, Issue 3.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer and EMI Receiver were used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: CPPA-102 was used for frequencies from 30 MHz to 1 GHz, the Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above 1 GHz, and the Com Power Microwave Preamplifier Model: PA-840 was used for frequencies above 18 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the spectrum analyzer to keep the amplitude reading calibrated.

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

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2009. 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 by the Radiated Emission Manual Test software. 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 (Spurious and Harmonics) Test (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance from 30 MHz to 25 GHz to obtain the final test data and 10-meters from 10 kHz to 30 MHz.

Test Results:

Complies with the limits of Table 5 of RSS-GEN, Issue 3 and clause A8.5 of RSS-210, Issue 8.

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
0.641 (BL) (Monopole)	43.08	46.00	-2.92
0.637 (WL) (Monopole)	42.94	46.00	-3.06
0.637 (WL) (Twin Patch)	42.54	46.00	-3.46
0.641 (BL) (Twin Patch)	42.14	46.00	-3.86
3.226 (BL) (Twin Patch)	40.43	46.00	-5.57
3.277 (BL) (Twin Patch)	40.24	46.00	-5.76

Table 2.0 RADIATED EMISSION RESULTS mDDL, Model: 65900

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
440.075 (H)	42.45	46.00	-3.55
504.049 (V)	42.08 (QP)	46.00	-3.92
504.048 (V)	41.50	46.00	-4.50
520.050 (V)	41.46	46.00	-4.54
480.048 (V)	41.18	46.00	-4.82
480.075 (H)	41.18	46.00	-4.82

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

8.2 Emissions Bandwidth (EBW)

The 6 dB 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 6 dB Bandwidth.

- 1. Set resolution bandwidth (RBW) = 1-5% of the DTS Bandwidth, not to exceed 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 emissions that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Results:

The EUT complies with the relevant requirements clause A8.2 (a) of RSS-210, Issue 8. Please see the data sheets located in Appendix E.

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 EUT complies with the relevant requirements of clause A8.4 (4) of RSS-210, Issue 8.

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:

The EUT complies with the relevant requirements clause A8.5 of RSS-210, Issue 8. Please see the data sheets located in Appendix E.

8.5 RF Band Edges

The RF band edges were taken at 2390 MHz when the EUT was on the low channel and 2483.5 MHz when the EUT was on the high channel using the EMI Receiver. A preamplifier was used to boost the signal level, with the plots being taken at a 3 meter test distance. The radiated emissions test procedure as describe in section 8.2 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.

Test Results:

The EUT complies with the limits of clause A8.5 of RSS-210, Issue 8. The RF power at the restricted bands closest to the band edges at 2390 MHz and 2483.5 MHz also meet the limits of Table 4 of RSS-GEN, Issue 3. Please see the data sheets located in Appendix E.

8.6 Spectral Density Test

The spectral 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 resolution bandwidth was 3 kHz, and the video bandwidth was 10 kHz. The highest 1.5 MHz of the signal was used as the frequency span with the sweep rate being 1 second for every 3 kHz of span.

Test Results:

The EUT complies with the relevant requirements of clause A8.2 (b) of RSS-210, Issue 8.

REPORT Number: B30306D2
RSS-GEN and RSS-210 Test Report
mDDL
Model: 65900

8.7 -20 dB Bandwidth

The 20 dB 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 20 dB Bandwidth.

- 1. The reference level was established by using a resolution bandwidth that exceeds the signal bandwidth
- 2. The marker was set to peak to establish the reference level.
- 3. A separate plot was taken with the RBW set to >1% of the -20 dB Bandwidth
- 4. The VBW was set to >3 times the RBW
- 5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 20 dB relative to the reference level obtained in step #2

Test Results:

This test was performed to obtain the emission designator as required by clause 4.3 of RSS-GEN, Issue 3. Please see the data sheets located in Appendix E.

9. CONCLUSIONS

The mDDL, Model: 65900 meets all of the specification limits defined in RSS-GEN, Issue 3 and RSS-210, Issue 8.



Report Number: B30306D2 RSS-GEN and RSS-210 Test Report mDDL

Model: 65900

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

Report Number: B30306D2
RSS-GEN and RSS-210 Test Report
mDDL
Model: 65900

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

<u>Agoura Division</u> / <u>Brea Division</u> / <u>Silverado/Lake Forest Division</u> .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).

US/EU MRA list NIST MRA site



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA). **APEC MRA list NIST MRA site**

We are also listed for IT products by the following country/agency:



VCCI Support member: Please visit http://www.vcci.jp/vcci_e/



FCC Listing, from FCC OET site
FCC test lab search https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm



Compatible Electronics IC listing can be found at: http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home

mDDL Model: 65900



APPENDIX B

MODIFICATIONS TO THE EUT



MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass the requirements of RSS-GEN, Issue 3 and the requirements of Annex 8 of RSS-210, Issue 8.

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.





Report Number: B30306D2
RSS-GEN and RSS-210 Test Report
mDDL
Model: 65900

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT



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

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

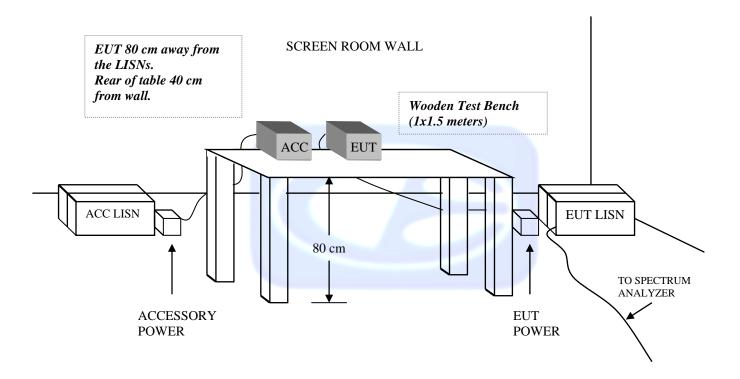
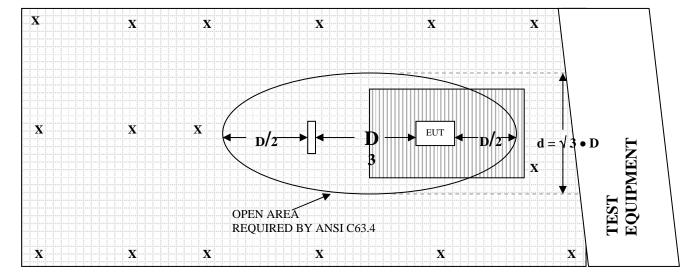




FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE – 3 METERS

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

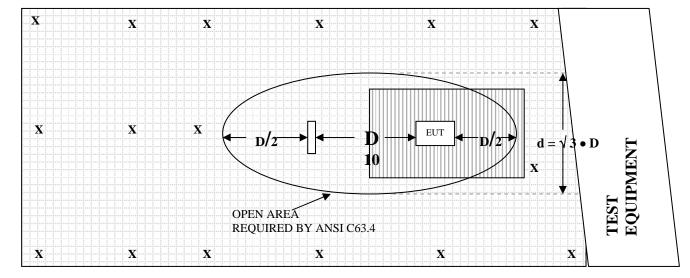
X = GROUND RODS = GROUND SCREEN

D = TEST DISTANCE = WOOD COVER



FIGURE 3: PLOT MAP AND LAYOUT OF RADIATED SITE – 10 METERS

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

X = GROUND RODS = GROUND SCREEN

D = TEST DISTANCE = WOOD COVER



COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: JANUARY 29, 2013

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-42.5 -42.3 -42.1	9
0.01	-42.3	9.2
0.02	-42.1	9.4
0.03	-41.4	10.1
0.04	-41.4 -41.8	9.7
0.05	-42.4	9.1
0.06	-42.4 -42.3 -42.5 -42.4	9.2
0.07	-42.5	9
0.08	-42.4	9.1
0.09	-42.5	9
0.1 0.2 0.3	-42.5	9
0.2	-42.7	8.8
0.3	-42.6	8.9
0.4	-42.5	9
0.5	-42.7	8.8
0.6	-42.7	8.8
0.7	-42.5	9.2 9.3
0.8	-42.3	9.2
0.9	-42.2	9.3
1	-42.2	9.3
2	-41.8	9.7
3	-41.7	9.8
4	-41.7	9.7 9.8 9.8
5	-41.5	10
6	-41.6	9.9
7	-41.4	10.1
8	-41	10.5
9	-40.8	10.7
10	-41.3	10.2
15	-41.4 -41.2	10.1
20	-41.2	10.3
25	-42.6	8.9
30	-41.7	9.8



COM-POWER AB-900

BICONICAL ANTENNA

S/N: 43028

CALIBRATION DATE: MAY 24, 2012

EDECLIENCY	EACTOD	EDECHENCY	EACTOD
FREQUENCY	FACTOR	FREQUENCY	FACTOR
(MHz)	(dB)	(MHz)	(dB)
30	11.80	120	13.20
35	11.20	125	13.30
40	11.90	140	11.60
45	10.70	150	11.80
50	11.40	160	12.70
60	10.30	175	14.80
70	7.60	180	15.70
80	5.70	200	15.80
90	7.90	250	14.80
100	10.7	300	19.80



COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16252

CALIBRATION DATE: MAY 24, 2012

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	13.00	700	20.30
350	13.20	750	20.80
400	14.50	800	21.00
450	15.40	850	23.70
500	15.80	900	21.70
550	16.60	950	24.20
600	18.90	1000	24.30
650	19.10		



COM POWER AH-118

HORN ANTENNA

S/N: 071175

CALIBRATION DATE: FEBRUARY 29, 2012

FREQUENCY	FACTOR	FREQUENCY	FACTOR
(GHz)	(dB)	(GHz)	(dB)
1.0	23.6	10.0	37.7
1.5	22.0	10.5	38.4
2.0	28.7	11.0	38.0
2.5	29.3	11.5	38.2
3.0	30.6	12.0	39.0
3.5	30.4	12.5	42.4
4.0	31.1	13.0	40.8
4.5	33.4	13.5	40.0
5.0	35.3	14.0	39.7
5.5	35.1	14.5	43.5
6.0	36.9	15.0	42.7
6.5	37.4	15.5	39.7
7.0	37.6	16.0	39.2
7.5	36.2	16.5	39.7
8.0	38.4	17.0	42.2
8.5	39.3	17.5	47.6
9.0	37.4	18.0	51.2
9.5	38.0		



COM-POWER AH826

HORN ANTENNA

S/N: 71957

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



COM-POWER PA-840

PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: MAY 17, 2012

FREQUENCY	FACTOR	FREQUENCY	FACTOR
(GHz)	(dB)	(GHz)	(dB)
18.0	25.81	31.0	25.77
19.0	24.57	31.5	25.36
20.0	23.46	32.0	25.15
21.0	22.51	32.5	25.13
22.0	23.85	33.0	25.52
23.0	23.31	33.5	25.24
24.0	24.44	34.0	25.08
25.0	25.42	34.5	25.27
26.0	25.71	35.0	23.99
26.5	25.66	35.5	24.67
27.0	25.84	36.5	24.80
27.5	25.29	37.0	26.27
28.0	25.46	37.5	24.86
28.5	25.58	38.0	24.64
29.0	26.16	38.5	23.46
29.5	26.14	39.0	21.29
30.0	26.01	39.5	20.83
30.5	25.67	40.0	19.96



COM-POWER CPPA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: DECEMEBER 27, 2012

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1	36.9	225	38.14
3	38.1	250	38.15
5	38.1	275	38.14
8	38.2	300	38.18
10	38.3	350	38.22
20	38.2	400	38.26
30	38.3	450	37.53
40	38.2	500	38.24
50	38.5	550	38.53
60	38.5	600	38.69
70	38.4	650	38.66
80	38.4	700	38.58
90	38.5	750	38.37
100	38.4	800	38.23
125	38.6	850	37.68
150	38.4	900	37.38
175	38.5	950	36.82
200	38.5	1000	36.14



COM-POWER PA-118

PREAMPLIFIER

S/N: 181656

CALIBRATION DATE: DECEMBER 27, 2012

FREQUENCY	FACTOR	FREQUENCY	FACTOR
(GHz)	(dB)	(GHz)	(dB)
1.0	24.68	6.0	25.75
1.1	25.08	6.5	25.28
1.2	25.70	7.0	24.83
1.3	25.98	7.5	24.49
1.4	26.11	8.0	24.38
1.5	26.23	8.5	25.06
1.6	26.34	9.0	25.55
1.7	26.39	9.5	25.32
1.8	26.44	10.0	25.25
1.9	26.45	11.0	24.99
2.0	26.48	12.0	25.08
2.5	26.59	13.0	24.44
3.0	26.67	14.0	25.02
3.5	26.66	15.0	26.12
4.0	26.82	16.0	25.67
4.5	26.46	17.0	24.33
5.0	26.22	18.0	26.75
5.5	25.98		



FRONT VIEW

 $\begin{array}{c} \text{AEROVIRONMENT, INC.} \\ \text{mDDL} \end{array}$

MODEL: 65900

RSS-GEN, ISSUE 3 and RSS-210, ISSUE 8 - RADIATED EMISSIONS - MONOPOLE ANTENNA



REAR VIEW

AEROVIRONMENT, INC. MDDL MODEL: 65900

RSS-GEN, ISSUE 3 and RSS-210, ISSUE 8 - RADIATED EMISSIONS - MONOPOLE ANTENNA



FRONT VIEW

AEROVIRONMENT, INC. MDDL

MODEL: 65900

RSS-GEN, ISSUE 3 and RSS-210, ISSUE 8 – RADIATED EMISSIONS – TWIN PATCH ANTENNA



REAR VIEW

AEROVIRONMENT, INC.
MDDL

MODEL: 65900

RSS-GEN, ISSUE 3 and RSS-210, ISSUE 8 - RADIATED EMISSIONS - TWIN PATCH ANTENNA



FRONT VIEW

AEROVIRONMENT, INC. MDDL MODEL: 65900

RSS-GEN, ISSUE 3 and RSS-210, ISSUE 8 - CONDUCTED EMISSIONS - MONOPOLE ANTENNA



REAR VIEW

AEROVIRONMENT, INC. MDDL MODEL: 65900

RSS-GEN, ISSUE 3 and RSS-210, ISSUE 8 - CONDUCTED EMISSIONS - MONOPOLE ANTENNA



FRONT VIEW

AEROVIRONMENT, INC.

MDDL

MODEL: 65900

RSS-GEN, ISSUE 3 and RSS-210, ISSUE 8 – CONDUCTED EMISSIONS –

TWIN PATCH ANTENNA



REAR VIEW

AEROVIRONMENT, INC.

MDDL

MODEL: 65900

RSS-GEN, ISSUE 3 and RSS-210, ISSUE 8 – CONDUCTED EMISSIONS –

TWIN PATCH ANTENNA



mDDL Model: 65900

APPENDIX E

DATA SHEETS



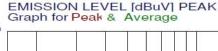


CONDUCTED EMISISONS

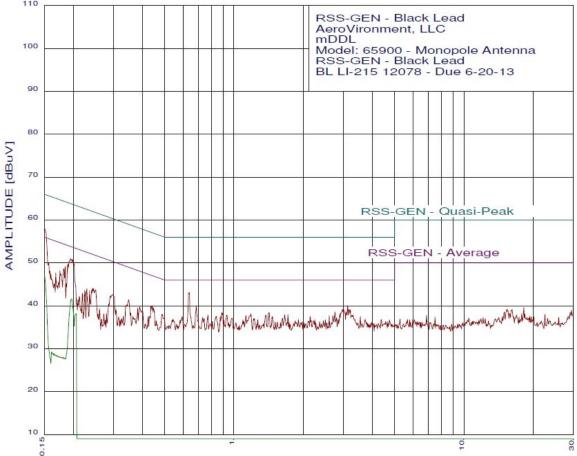
DATA SHEETS







03/06/13 11:12:20





03/06/13 11:12:20

RSS-GEN - Black Lead AeroVironment, LLC

mDDL

Model: 65900 - Monopole Antenna

RSS-GEN - Black Lead

BL LI-215 12078 - Due 6-20-13 Test Engineer: Kyle Fujimoto

42 highest peaks above -50.00 dB of RSS-GEN - Average limit line

Peak cr	iteria: 1.00 dB, C	Curve : Peak	_	,
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.195	51.00	53.84	-2.84**
2	0.641	43.08	46.00	-2.92
3	0.184	49.10	54.28	-5.18**
4	0.182	48.60	54.41	-5.81**
5	3.124	40.04	46.00	-5.96
6	0.686	39.86	46.00	-6.14
7	0.175	48.10	54.72	-6.62**
8	2.963	39.23	46.00	-6.77
9	3.158	39.14	46.00	-6.86
10	0.442	40.02	47.02	-7.00
11	0.168	47.70	55.07	-7.37**
12	2.751	38.53	46.00	-7.47
13	1.426	38.44	46.00	-7.56
14	0.885	38.42	46.00	-7.58
15	0.348	41.40	49.00	-7.60
16	0.297	42.60	50.32	-7.72
17	1.184	38.12	46.00	-7.88
18	0.243	44.10	52.00	-7.90
19	1.717	37.97	46.00	-8.03
20	0.160	47.41	55.47	-8.07**
21	1.663	37.87	46.00	-8.13
22	0.771	37.85	46.00	-8.15
23	1.374	37.84	46.00	-8.16
24	0.929	37.81	46.00	-8.19
25	0.486	38.01	46.23	-8.22
26	2.693	37.72	46.00	-8.28
27	2.596	37.72	46.00	-8.28
28	1.130	37.71	46.00	-8.29
29	0.389	39.72	48.08	-8.36
30	3.547	37.55	46.00	-8.45
31	0.839	37.53	46.00	-8.47
32	0.872	37.53	46.00	-8.47
33	0.229	44.00	52.48	-8.48
34	2.145	37.50	46.00	-8.50
35	0.595	37.49	46.00	-8.51
36	1.472	37.45	46.00	-8.55
37	0.731	37.25	46.00	-8.75
38	0.235	43.50	52.25	-8.75
39	2.796	37.23	46.00	-8.77
40	0.381	39.41	48.25	-8.84
41	0.979	37.10	46.00	-8.90
42	1.629	37.06	46.00	-8.94

^{**}Please See the Average Readings on the Next Page and on the Plot



03/06/13 11:12:20

mDDLModel: 65900

RSS-GEN - Black Lead AeroVironment, LLC **mDDL**

Model: 65900 - Monopole Antenna

RSS-GEN - Black Lead

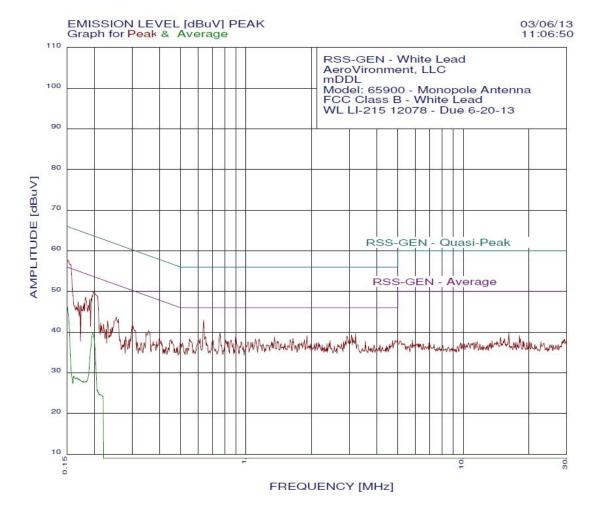
BL LI-215 12078 - Due 6-20-13 Test Engineer: Kyle Fujimoto

11 highest peaks above -50.00 dB of RSS-GEN - Average limit line

Peak crite	eria: 0.00 dB, Cı	urve : Average		
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.197	41.59	53.75	-12.16
2	0.206	38.17	53.35	-15.18
3	0.161	29.20	55.43	-26.22
4	0.165	28.83	55.20	-26.37
5	0.182	27.96	54.41	-26.45
6	0.184	27.79	54.28	-26.49
7	0.170	28.45	54.98	-26.53
8	0.167	28.53	55.11	-26.58
9	0.175	28.13	54.72	-26.59
10	0.172	28.25	54.86	-26.61
11	0.179	27.92	54.54	-26.62

mDDL

Model: 65900





03/06/13 11:06:50

RSS-GEN - White Lead AeroVironment, LLC

mDDL

Model: 65900 - Monopole Antenna

RSS-GEN - White Lead WL LI-215 12078 - Due 6-20-13

Test Engineer: Kyle Fujimoto

42 high	est peaks above -5	50.00 dB of RSS-	GEN - Averag	je limit line	
	iteria : 1.00 dB, C	urve : Peak		B 11 (1B)	
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)	
1	0.637	42.94	46.00	-3.06	
2	0.199	49.93	53.67	-3.74**	
3	0.183	48.64	54.37	-5.73**	
4	0.190	48.13	54.01	-5.88**	
5	0.759	39.91	46.00	-6.09	
6	3.192	39.62	46.00	-6.38	
7	3.059	39.30	46.00	-6.70	
8	1.908	39.06	46.00	-6.94	
9	2.916	38.99	46.00	-7.01	
10	0.899	38.86	46.00	-7.14	
11	1.352	38.73	46.00	-7.27	
12	0.180	47.14	54.50	-7.36**	
13	3.107	38.51	46.00	-7.49	
14	2.995	38.49	46.00	-7.51	
15	1.646	38.46	46.00	-7.54	
16	0.188	46.53	54.10	-7.57**	
17	0.169	47.44	55.03	-7.59**	
18	0.614	38.35	46.00	-7.65	
19	0.550	38.32	46.00	-7.68	
20	1.148	38.28	46.00	-7.72	
21	1.106	38.27	46.00	-7.73	
22	1.594	38.16	46.00	-7.84	
23	4.980	38.09	46.00	-7.91	
24	0.853	38.08	46.00	-7.92	
25	0.252	43.76	51.68	-7.93	
26	1.859	38.06	46.00	-7.94	
27	0.805	38.00	46.00	-8.00	
28	0.705	37.93	46.00	-8.07	
29	2.436	37.88	46.00	-8.12	
30	4.722	37.88	46.00	-8.12	
31	0.178	46.44	54.59	-8.15**	
32	2.870	37.79	46.00	-8.21	
33	3.547	37.78	46.00	-8.22	
34	0.174	46.54	54.77	-8.23**	
35	1.397	37.74	46.00	-8.26	
36	1.311	37.72	46.00	-8.28	
37	0.826	37.69	46.00	-8.31	
38	0.698	37.63	46.00	-8.37	
39	2.811	37.59	46.00	-8.41	
40	0.172	46.44	54.86	-8.42**	
41	1.072	37.56	46.00	-8.44	
42	0.948	37.55	46.00	-8.45	
			70.00	0.40	

^{**}Please See the Average Readings on the Next Page and on the Plot

page 1/1

03/06/13 11:06:50

Model: 65900

FCC Class B - White Lead AeroVironment, LLC

mDDL

Model: 65900 - Monopole Antenna

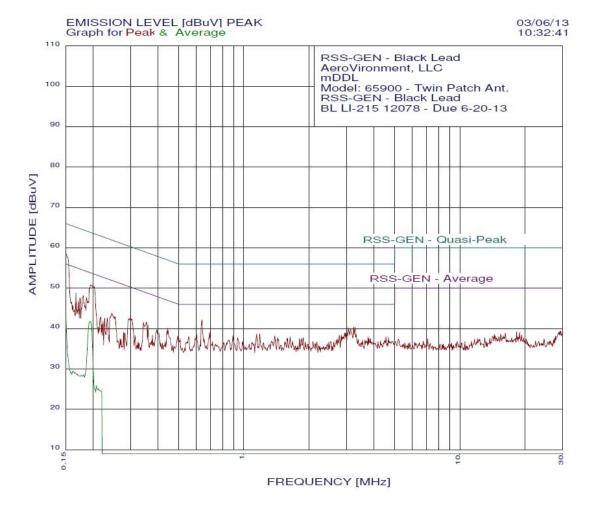
RSS-GEN - White Lead WL LI-215 12078 - Due 6-20-13

Test Engineer : Kyle Fujimoto

13 highest peaks above -50.00 dB of RSS-GEN - Average limit line

				~
Peak crite	ería : 0.00 dB, Cu	urve : Average		
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.198	39.98	53.71	-13.73
2	0.161	29.18	55.43	-26.25
3	0.166	28.81	55.16	-26.35
4	0.170	28.51	54.94	-26.43
5	0.183	27.89	54.33	-26.44
6	0.178	27.97	54.59	-26.62
7	0.173	28.18	54.81	-26.63
8	0.180	27.80	54.50	-26.70
9	0.207	25.65	53.31	-27.66
10	0.210	25.20	53.23	-28.03
11	0.213	24.79	53.09	-28.31
12	0.215	24.47	53.00	-28.53
13	0.220	24.22	52.83	-28.60







03/06/13 10:32:41

RSS-GEN - Black Lead AeroVironment, LLC

mDDL

Model: 65900 - Twin Patch Ant. RSS-GEN - Black Lead BL LI-215 12078 - Due 6-20-13 Test Engineer: Kyle Fujimoto

	est peaks above -5		GEN - Averag	ge limit line
	iteria_: 1.00 dB, Cu	urve : Peak		
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.196	50.83	53.80	-2.97**
2	0.641	42.14	46.00	-3.86
3	3.226	40.43	46.00	-5.57
4	3.277	40.24	46.00	-5.76
5	3.043	40.20	46.00	-5.80
6	3.124	39.91	46.00	-6.09
7	0.167	48.83	55.11	-6.28**
8	0.181	48.14	54.46	-6.32**
9	0.186	47.63	54.19	-6.56**
10	0.445	40.07	46.98	-6.90
11	0.694	39.03	46.00	-6.97
12	2.963	38.99	46.00	-7.01
13	0.174	47.54	54.77	-7.23**
14	1.184	38.69	46.00	-7.31
15	0.354	41.56	48.87	-7.31
16	1.148	38.68	46.00	-7.32
17	0.605	38.55	46.00	-7.45
18	0.343	41.56	49.13	-7.58
19	2.826	38.39	46.00	-7.61
20	2.766	38.39	46.00	-7.61
21	0.890	38.26	46.00	-7.74
22	0.297	42.56	50.32	-7.77
23	1.389	38.14	46.00	-7.86
24	0.360	40.86	48.73	-7.88
25	0.494	38.20	46.09	-7.90
26	0.555	38.03	46.00	-7.97
27	4.552	37.98	46.00	-8.02
28	1.637	37.96	46.00	-8.04
29	0.171	46.84	54.90	-8.06**
30	3.761	37.92	46.00	-8.08
31	0.246	43.76	51.90	-8.15
32	0.396	39.75	47.95	-8.19
33	4.672	37.78	46.00	-8.22
34	1.879	37.76	46.00	-8.24
35	1.434	37.75	46.00	-8.25
36	1.586	37.66	46.00	-8.34
37	0.939	37.65	46.00	-8.35
38	1.810	37.56	46.00	-8.44
39	3.862	37.53	46.00	-8.47
40 41	3.800 2.722	37.52 37.49	46.00	-8.48 -8.51
42	1.849	37.49 37.46	46.00 46.00	-8.51 -8.54
42	1.049	37.46	46.00	-0.54

^{**}Please See the Average Readings on the Next Page and on the Plot





03/06/13 10:32:41

mDDLModel: 65900

RSS-GEN - Black Lead AeroVironment, LLC **mDDL** Model: 65900 - Twin Patch Ant. RSS-GEN - Black Lead BL LI-215 12078 - Due 6-20-13 Test Engineer: Kyle Fujimoto

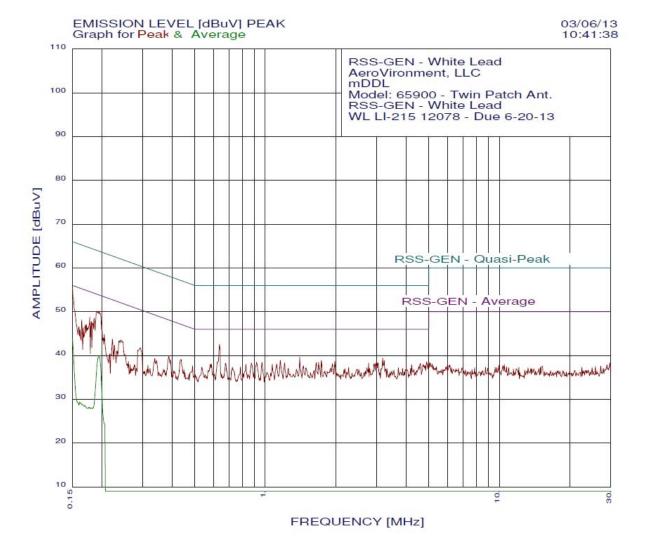
13 highest peaks above -50.00 dB of RSS-GEN - Average limit line

Peak criteria :	0.00 dB,	Curve	: Average

Peak Citt	ena : 0.00 db, Ci			
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.195	41.76	53.84	-12.08
2	0.182	28.55	54.41	-25.87
3	0.162	29.47	55.38	-25.91
4	0.166	29.04	55.16	-26.12
5	0.177	28.35	54.63	-26.28
6	0.170	28.63	54.94	-26.31
7	0.169	28.71	55.03	-26.32
8	0.158	29.22	55.56	-26.34
9	0.175	28.27	54.72	-26.45
10	0.207	25.81	53.31	-27.50
11	0.213	25.09	53.09	-28.01
12	0.220	24.47	52.83	-28.35
13	0.216	24.60	52.96	-28.36









03/06/13 10:41:38

mDDL

RSS-GEN - White Lead AeroVironment, LLC

mDDL

Model: 65900 - Twin Patch Ant.

RSS-GEN - White Lead

WL LI-215 12078 - Due 6-20-13 Test Engineer: Kyle Fujimoto

42 high	est peaks above -5	 60.00 dB of RSS-0	GEN - Averag	je limit line
	iteria : 1.00 dB, Cı			B 1: (1B)
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.637	42.54	46.00	-3.46
2	0.192	50.13	53.97	-3.84**
3	0.185	48.53	54.24	-5.70**
4	0.178	48.74	54.59	-5.85**
5	1.404	39.64	46.00	-6.36
6 7	3.175	39.42 47.74	46.00	-6.58 -6.72**
8	0.181	47.74 47.54	54.46 54.37	-6.72 -6.83**
9	0.183 3.226	38.93	46.00	-6.63 -7.07
10	1.160	38.89	46.00	-7.07 -7.11
11	0.164	48.13	55.25	-7.12**
12	1.735	38.86	46.00	-7.12
13	1.981	38.66	46.00	-7.34
14	4.902	38.59	46.00	-7.41
15	2.995	38.49	46.00	-7.51
16	1.690	38.46	46.00	-7.54
17	0.919	38.45	46.00	-7.55
18	0.969	38.44	46.00	-7.56
19	1.654	38.36	46.00	-7.64
20	1.210	38.30	46.00	-7.70
21	3.027	38.30	46.00	-7.70
22	2.766	38.29	46.00	-7.71
23	0.872	38.27	46.00	-7.73
24	0.676	38.23	46.00	-7.77
25	0.172	47.04	54.86	-7.82**
26	4.600	38.18	46.00	-7.82
27	1.939	38.16	46.00	-7.84
28	0.170	47.04	54.94	-7.90**
29	2.916	38.09	46.00	-7.91
30	1.118	38.07	46.00	-7.93
31	1.072	38.06	46.00	-7.94
32	0.589	38.04	46.00	-7.96
33 34	0.826	37.99	46.00	-8.01
35	4.722 0.438	37.98 39.07	46.00 47.11	-8.02 -8.04
36	4.227	37.86	46.00	-8.14
37	0.387	39.85	48.12	-8.27
38	1.456	37.65	46.00	-8.35
39	0.242	43.56	52.04	-8.48
40	0.205	44.83	53.40	-8.57**
41	0.489	37.59	46.18	-8.59
42	0.783	37.40	46.00	-8.60
· -			,	

^{**}Please See the Average Readings on the Next Page and on the Plot





03/06/13 10:41:38

RSS-GEN - White Lead AeroVironment, LLC

mDDL

Model: 65900 - Twin Patch Ant.

RSS-GEN - White Lead

WL LI-215 12078 - Due 6-20-13 Test Engineer: Kyle Fujimoto

9 highest peaks above -50.00 dB of RSS-GEN - Average limit line

Peak crit	teria: 0.00 dB, C	urve : Average
Peak#	Freq(MHz)	Amp(dBuV)
1	0.195	40.02

. ocur orre	J. 1	arto irtorago		
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.195	40.02	53.84	-13.82
2	0.161	29.32	55.43	-26.11
3	0.162	29.18	55.34	-26.16
4	0.158	29.30	55.56	-26.26
5	0.166	28.81	55.16	-26.35
6	0.182	28.06	54.41	-26.36
7	0.170	28.59	54.98	-26.40
8	0.178	28.14	54.59	-26.45
9	0.176	28.14	54.68	-26.54



mDDL Model: 65900

RADIATED EMISSIONS

DATA SHEETS



Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment

mDDL

Model: 65900 Antenna: Monopole Lab: B Tested

Tested By: Kyle Fujmoto

Date: 03/04/2013

Low Channel

Transmit Mode - X-Axis

Freq.	Level	Pol			Peak / QP /	Ant. Height	Table Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2403				,				N/A
2403								DONE VIA CONDCUTED
4806	50.5	V	74	-23.5	Peak	1.25	135	
4806	40.11	V	54	-13.89	Avg	1.25	135	
7000	54.04	1.7	7.4	00.00	D - 1	4.05	4.45	
7209	51.31	V	74 54	-22.69	Peak	1.35	145	
7209	42.19	V	54	-11.81	Avg	1.35	145	
9612				-		-		No Emission
9612			8				7	Detected
100000000000000000000000000000000000000								
12015								No Emission
12015								Detected
	3					3		
14418								No Emission
14418								Detected
								22 (21)(6)
16821	ž							No Emission
16821				-				Detected
19224	8	3 3	9			2	2	No Emission
19224					-			Detected
10227								Detected
21627					3			No Emission
21627								Detected
114 1114								
24030								No Emission
24030	8							Detected



Date: 03/04/2013

Lab: B

Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment **mDDL**

Model: 65900

Tested By: Kyle Fujmoto Antenna: Monopole

Low Channel

Transmit Mode - X-Axis

Freq.	Level	Pol			Peak / QP /	Ant. Height	Table Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2403								N/A
2403								DONE VIA CONDCUTED
4806	42.7	Н	74	-31.3	Peak	1.25	135	
4806	33.65	Н	54	-20.35	Avg	1.25	135	
7000	50.04	1.1	7.4	04.70	D. I.	4.05	475	
7209	52.21	H	74	-21.79	Peak	1.35	175	
7209	42.37	Н	54	-11.63	Avg	1.35	175	
9612			-					No Emission
9612			-					Detected
12015								No Emission
12015								Detected
14418								No Emission
14418								Detected
16821								No Emission
16821					ş.			Detected
10001						-	i -	
19224				-				No Emission
19224				2				Detected
21627			:				3	No Emission
21627								Detected
_10_1								Dotootou
24030								No Emission
24030								Detected



Model: 65900

Lab: B

Tested By: Kyle Fujmoto

Date: 03/04/2013

FCC 15.247 / RSS-GEN

AeroVironment mDDL

Model: 65900 Antenna: Monopole

Low Channel

Transmit Mode - Y-Axis

					Peak /	Ant.	Table	
Freq.	Level	Pol	111000000	200	QP/	Height	Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2403								N/A
2403							2	DONE VIA CONDCUTED
1								
4806	41.71	V	74	-32.29	Peak	1.25	155	
4806	28.98	V	54	-25.02	Avg	1.25	155	
7209	46.13	V	74	-27.87	Peak	1.35	165	
7209	33.91	V	54	-20.09	Avg	1.35	165	
0040	-	-	-	-			,	No.
9612 9612								No Emission
9612						-		Detected
12015				-				No Emission
12015								Detected
12010	-)						Detected
14418				7				No Emission
14418		2					2	Detected
- FUO-1810-TA	-	0.						
16821								No Emission
16821								Detected
19224								No Emission
19224				3.		_		Detected
21627								No Emission
21627								Detected
							2	
24030								No Emission
24030								Detected
	3							



Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment

mDDL

Model: 65900 Antenna: Monopole

Low Channel

Transmit Mode - Y-Axis

Date: 03/04/2013	
Lab: B	
Tested By: Kyle Fujmoto	

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2403								N/A
2403								DONE VIA CONDCUTED
4806	40.88	Н	74	-33.12	Peak	1.25	155	
4806	28.91	H	54	-25.09	Avg	1.25	155	
							1	
7209	45.69	Н	74	-28.31	Peak	1.35	175	
7209	33.93	Н	54	-20.07	Avg	1.35	175	
9612								No Emission
9612	,							Detected
12015								No Emission
12015								Detected
14418								No Emission
14418		8	-					Detected
16821								No Emission
16821								Detected
19224							-	No Emission
19224		8		3	3		0 3	
13224		*		+	-		÷ ·	Detected
21627								No Emission
21627								Detected
24030				-	,			No Emission
24030				-				
								No Emission Detected No Emission



Date: 03/04/2013

Tested By: Kyle Fujmoto

Lab: B

Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment

mDDL

Model: 65900

Antenna: Monopole

Low Channel

Transmit Mode - Z-Axis

					Peak /	Ant.	Table	
Freq.	Level	Pol			QP/	Height	Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2403								N/A
2403					-		-	DONE VIA CONDCUTED
4806	42.29	V	74	-31.71	Peak	1.25	155	
4806	29.47	V	54	-24.53	Avg	1.25	155	
7000	40.07			07.70		4.05		
7209	46.27	V	74	-27.73	Peak	1.35	145	3
7209	34.11	V	54	-19.89	Avg	1.35	145	
9612		2			-		5.	No Emission
9612				-			=	Detected
3012					2		33	Detected
12015		-				-		No Emission
12015			2				-	Detected
12010								Dottottoa
14418								No Emission
14418								Detected
1								
16821								No Emission
16821								Detected
19224								No Emission
19224								Detected
		ē.			-		=	
21627								No Emission
21627								Detected
0.4000		Ξ.	2		-		-	
24030		87					-	No Emission
24030		+						Detected
5							6	

Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment mDDL Model: 65900 Antenna: Monopole

Lab: B Tested By: Kyle Fujmoto

Date: 03/04/2013

Low Channel

Transmit Mode - Z-Axis

					Peak /	Ant.	Table	
Freq.	Level	Pol		And the state of the state of	QP/	Height	Angle	200
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2403								N/A
2403								DONE VIA CONDCUTED
1,112,700	V/V						- 224	
4806	41.23	Н	74	-32.77	Peak	1.25	155	
4806	29.17	Н	54	-24.83	Avg	1.25	155	
7000								
7209	48.5	Н	74	-25.5	Peak	1.35	145	
7209	39.47	Н	54	-14.53	Avg	1.35	145	
0040								
9612	÷						9	No Emission
9612								Detected
12015			-	;		*		No Emission
12015		5						
12015							,	Detected
14418						-		No Emission
14418						8	-	Detected
11110						8		Detected
16821				-		ž – ž		No Emission
16821	1							Detected
19224								No Emission
19224	8		7					Detected
21627								No Emission
21627								Detected
24030								No Emission
24030								Detected
		2						



mDDLModel: 65900

FCC 15.247 / RSS-GEN

AeroVironment **mDDL**

Model: 65900 Antenna: Monopole

Middle Channel

Transmit Mode - X-Axis

Date: 0	03/04	/201	13
Date: (13/04	201	13

Lab: B

Tested By: Kyle Fujmoto

					Peak /	Ant.	Table	
Freq.	Level	Pol	offic false (176 for	10.15.000	QP/	Height	Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2439								N/A
2439								DONE VIA CONDCUTED
4878	41.91	V	74	-32.09	Peak	1.25	155	
4878	28.86	V	54	-25.14	Avg	1.25	155	
7317	45.23	V	74	-28.77	Peak	1.35	165	
7317	33.73	V	54	-20.27	Avg	1.35	165	
.==.								
9756			i i		1			No Emission
9756				,		-		Detected
12195								No Emission
12195			2			G.		Detected
12100			3					20100104
14634								No Emission
14634								Detected
17073								No Emission
17073			3					Detected
19512								No Emission
19512								Detected
						er en		
21951								No Emission
21951								Detected
24390						S	i i	No Emission
24390			-		-			Detected
					-	_		20100104



Date: 03/04/2013

Tested By: Kyle Fujmoto

Lab: B

FCC 15.247 / RSS-GEN

AeroVironment mDDL

Model: 65900

Antenna: Monopole

Middle Channel

1		257 10			Peak /	Ant.	Table	
Freq.	Level	Pol	2012/2014	2000	QP/	Height	Angle	1788 E
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2439	8							N/A
2439								DONE VIA CONDCUTED
4878	45.69	Н	74	-28.31	Peak	1.25	155	
4878	32.57	Н	54	-21.43	Avg	1.25	155	
70.47	40.00			07.04	-	4.05	405	
7317	46.09	Н	74	-27.91	Peak	1.35	165	
7317	35.28	Н	54	-18.72	Avg	1.35	165	
0750				0	-			No Postorio
9756								No Emission
9756						÷		Detected
12195	e				· · ·	<u> </u>		No Emission
12195			-		-			Detected
12193		1				3		Detected
14634	2				i i	S		No Emission
14634								Detected
11001	3		3					Detected
17073	8				7.			No Emission
17073					-	*		Detected
19512								No Emission
19512								Detected
21951								No Emission
21951								Detected
24390								No Emission
24390								Detected

Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment

mDDL

Model: 65900 Antenna: Monopole Date: 03/04/2013 Lab: B

Tested By: Kyle Fujmoto

Middle Channel

Freq.	Level	Pol			Peak / QP /	Ant. Height	Table Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2439					e.			N/A
2439								DONE VIA CONDCUTED
4878	45.29	V	74	-28.71	Peak	1.25	165	
4878	30.58	V	54	-23.42	Avg	1.25	165	
7317	46.15	V	74	-27.85	Peak	1.15	175	
7317	34.82	V	54	-19.18	Avg	1.15	175	
1311	34.02	V	34	-19.10	Avg	1.15	173	
9756		Ε.			_		ė.	No Emission
9756								Detected
12195								No Emission
12195							2	Detected
14634								No Emission
14634								Detected
17073	1						20	No Emission
17073		-						Detected
			2					233333
19512								No Emission
19512					s			Detected
21951								No Emission
21951			2					Detected
24390							5	No Emission
24390								Detected
2							,	



Date: 03/04/2013

Lab: B

Tested By: Kyle Fujmoto

FCC 15.247 / RSS-GEN

AeroVironment mDDL Model: 65900 Antenna: Monopole

Middle Channel

				3	Peak /	Ant.	Table	
Freq.	Level	Pol			QP/	Height	Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2439								N/A
2439	2							DONE VIA CONDCUTED
4878	43.91	Н	74	-30.09	Peak	1.25	165	
4878	33.73	Н	54	-20.27	Avg	1.25	165	
7317	46.89	Н	7.1	-27.11	Deals	1.45	175	
7317	33.59	H	74 54	-27.11	Peak		175	
1311	33.59	п	54	-20.41	Avg	1.45	1/5	
9756	1		-					No Emission
9756								Detected
0.00								20,000
12195								No Emission
12195								Detected
14634								No Emission
14634								Detected
17073								No Emission
17073								Detected
10510	-		2	-				No Facilities
19512 19512	1			3				No Emission
19512	3.			=				Detected
21951								No Emission
21951	37			3				Detected
21001	>							Bottotteu
24390								No Emission
24390	33					3.		Detected



Date: 03/04/2013

Tested By: Kyle Fujmoto

Lab: B

Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment mDDL

Model: 65900 Antenna: Monopole

Middle Channel

manomi	t Mode - 2	- AMS						
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2439								N/A
2439								DONE VIA CONDCUTED
	17.7							
4878	42.11	V	74	-31.89	Peak	1.25	165	
4878	29.77	V	54	-24.23	Avg	1.25	165	
70.47	45.00			00.04		4.05		
7317	45.36	V	74	-28.64	Peak	1.35	175	
7317	33.77	V	54	-20.23	Avg	1.35	175	
9756	-							No Emission
9756								Detected
3730		7		-			7	Detected
12195								No Emission
12195								Detected
14634								No Emission
14634								Detected
17073		,					,	No Emission
17073								Detected
40540		3					ś	
19512							,	No Emission
19512	-	ļ		-			-	Detected
21951								No Emission
21951		9					,	Detected
21001								Bottottod
24390								No Emission
24390				=				Detected

Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment

mDDL

Model: 65900 Antenna: Monopole

Tested By: Kyle Fujmoto

Date: 03/04/2013

Lab: B

Middle Channel

	-	-		_	D 1 /			
Eroa	Level	Pol			Peak / QP /	Ant. Height	Table	
Freq. (MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	Angle (deg)	Comments
	(ubuv)	(V/II)	Lillin	Margin	Avg	(111)	(ueg)	
2439							0 0	N/A
2439								DONE VIA CONDCUTED
4070	10.45	11	71	20.55	Deals	1.25	445	
4878	43.45	H	74 54	-30.55	Peak	1.25	145 145	
4878	29.91	П	54	-24.09	Avg	1.25	145	
7317	46.25	Н	74	-27.75	Peak	1.15	155	
7317	34.59	Н	54	-19.41	Avg	1.15	155	
1011	54.55	31/1	- 54	15.41	Avg	1.10	100	
9756		8						No Emission
9756							= =====================================	Detected
12195								No Emission
12195								Detected
14634								No Emission
14634								Detected
17073								No Emission
17073								Detected
19512								No Emission
19512							2	Detected
21951								No Emission
21951				-				No Emission Detected
21901							9	Detected
24390								No Emission
24390								Detected

Date: 03/04/2013

Tested By: Kyle Fujmoto

Lab: B



Model: 65900

mDDL

FCC 15.247 / RSS-GEN

AeroVironment

mDDL

Model: 65900 Antenna: Monopole

High Channel

Freq.	Level	Pol			Peak / QP /	Ant. Height	Table Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2475		-					-	N/A
2475								DONE VIA CONDCUTED
			d					
4950	42.07	V	74	-31.93	Peak	1.25	225	
4950	29.94	V	54	-24.06	Avg	1.25	225	
7425	45.75	V	74	-28.25	Peak	1.35	275	
7425	33.86	V	54	-20.14	Avg	1.35	275	
9900					-			No Emission
9900		-					-	No Emission Detected
9900								Detected
12375		-						No Emission
12375							7	Detected
14850								No Emission
14850			-;					Detected
17325			·		2			No Emission
17325								Detected
19800								No Emission
19800								Detected
2227								
22275								No Emission
22275							-	Detected
24750		-			-		-	No Emission
24750			1				ž.	Detected
		*		-	9		**	per consequent parties send out of



Date: 03/04/2013

Tested By: Kyle Fujmoto

Lab: B

mDDLModel: 65900



FCC 15.247 / RSS-GEN

AeroVironment **mDDL** Model: 65900

Antenna: Monopole

High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2475								N/A
2475								DONE VIA CONDCUTED
4950	43.24	Н	74	-30.76	Peak	1.25	155	
4950	29.93	Н	54	-24.07	Avg	1.25	155	
7425	45.13	Н	74	-28.87	Peak	1.35	165	
7425	33.96	Н	54	-20.04	Avg	1.35	165	
9900								No Emission
9900								Detected
12375						-		No Emission
12375	9	22						Detected
44050								
14850 14850								No Emission
14850				-	-			Detected
17325							-	No Emission
17325								Detected
19800		-					-	No Emission
19800							5	Detected
22275								No Footootoo
22275				-				No Emission
22213							-	Detected
24750						,	35	No Emission
24750								Detected



Date: 03/04/2013

Tested By: Kyle Fujmoto

Lab: B

Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment

mDDL

Model: 65900 Antenna: Monopole

itenna: Monopole

High Channel

euro propri	200700021	8000101			Peak /	Ant.	Table	
Freq.	Level	Pol	****		QP/	Height	Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2475		S					8	N/A
2475								DONE VIA CONDCUTED
4950	42.06	V	74	-31.94	Peak	1.35	145	
4950	29.85	V	54	-24.15	Avg	1.35	145	
= 10=	45.00				-			
7425	45.89	V	74	-28.11	Peak	1.25	155	
7425	33.96	V	54	-20.04	Avg	1.25	155	
9900								No Emission
9900	-							No Emission Detected
9900		-		-				Detected
12375				2 70				No Emission
12375		-						Detected
12010	-			8				Detected
14850				2				No Emission
14850	-					-		Detected
17325								No Emission
17325								Detected
19800								No Emission
19800				2				Detected
22275								No Emission
22275	.1			2 /2				Detected
24750								No Francisco
24750				8				No Emission
24750	4	2		9				Detected



Date: 03/04/2013

Tested By: Kyle Fujmoto

Lab: B

Model: 65900

FCC 15.247 / RSS-GEN

AeroVironment

mDDL Model: 65900

Antenna: Monopole

High Channel

Freq.	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2475	(ubuv)	(7/11)	Lillin	wargiii	Avg	(111)	(deg)	N/A
2475			2					DONE VIA CONDCUTED
2473			6		-		-	DONE VIA CONDCUTED
4950	41.81	Н	74	-32.19	Peak	1.25	155	
4950	29.85	Н	54	-24.15	Avg	1.25	155	·
1000	20.00			21.10	7.19	1.20	100	
7425	45.17	Н	74	-28.83	Peak	1.35	145	
7425	33.88	Н	54	-20.12	Avg	1.35	145	
							Ĵ	
9900								No Emission
9900								Detected
					=			
12375								No Emission
12375								Detected
10100000					e i			
14850								No Emission
14850			3					Detected
17325								No Emission
17325							_	Detected
40000					2		35	
19800								No Emission
19800			2					Detected
22275								No Emission
22275								Detected
22213				<.				Detected
24750								No Emission
24750								Detected
7								



FCC 15.247 / RSS-GEN

AeroVironment

mDDL

Model: 65900 Antenna: Monopole

High Channel

Transmit Mode - Z-Axis

Date:	03/04/2013
The state of the s	

Lab: B

Tested By: Kyle Fujmoto

Model: 65900

1					Peak /	Ant.	Table	
Freq.	Level	Pol			QP/	Height	Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2475								N/A
2475								DONE VIA CONDCUTED
4950	51.7	V	74	-22.3	Peak	1.35	145	
4950	40.67	V	54	-13.33	Avg	1.35	145	
7425	43.2	V	74	-30.8	Peak	1.45	155	
7425	33.32	V	54	-20.68	Avg	1.45	155	
9900								No Emission
9900								Detected
12375								No Emission
12375								Detected
14850								No Emission
14850								Detected
17325								No Emission
17325						î i		Detected
19800								No Emission
19800							<u> </u>	Detected
22275						8		No Emission
22275								Detected
24750		7						No Emission
24750								Detected
								25.50.00
l								



Date: 03/04/2013

Tested By: Kyle Fujmoto

Lab: B

FCC 15.247 / RSS-GEN

AeroVironment

mDDL

Model: 65900 Antenna: Monopole

... . ..

High Channel

					Peak /	Ant.	Table	
Freq.	Level	Pol			QP/	Height	Angle	
(MHz)	(dBuV)	(v/h)	Limit	Margin	Avg	(m)	(deg)	Comments
2475								N/A
2475								DONE VIA CONDCUTED
4950	41.91	H	74	-32.09	Peak	1.25	155	
4950	30.11	Н	54	-23.89	Avg	1.25	155	
7425	44.79	Н	74	-29.21	Peak	1.35	165	
7425	33.92	H	54	-20.08	Avg	1.35	165	
7 120	00.02			20.00	7119	1.00	100	
9900								No Emission
9900								Detected
12375								No Emission
12375								Detected
14850								No Emission
14850								Detected
17325								No Emission
17325								Detected
								201001011
19800								No Emission
19800								Detected
_								
22275								No Emission
22275								Detected
24750								No Emission
24750 24750								No Emission
24/50								Detected