FCC PART 15 SUBPART B & C
TEST REPORT

for

eForce Aperio iClass Keycard Entry System
Model: 3090AC

Prepared for

ADAMS RITE MANUFACTURING CO.
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DATE: FEBRUARY 16, 2012

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
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1	Plot Map And Layout of Test Site
2	Plot Map And Layout of Test Site Above 1GHz

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 in any form unless done so in full with the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP, NIST, or any other agency of the U.S. Government or other governments.

Device Tested:	eForce Aperio iClass Keycard Entry System Model: 3090AC S/N: 1
Product Description:	See Expository Statement.
Modifications:	The EUT was not modified during testing.
Manufacturer:	Adams Rite Manufacturing Co. 260 Santa Fe Street Pomona, California 91767
Test Date:	December 1st & 2nd, 2011
Test Specifications:	EMI requirements CFR Title 47, Part 15 Subpart B and Subpart C Sections 15.205, 15.209 and 15.249
Test Procedure:	ANSI C63.10

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz.	The EUT is battery powered; therefore this test was not performed.
2	Radiated RF Emissions & Harmonics, 9 kHz - 25000 MHz.	Complies with the limits of CFR Title 47 Part 15 Subpart B 15.109 and Subpart C Section 15.205, 15.209, 15.249
3	Peak Transmit EMI	Complies with limits of CFR Title 47 Part 15 Subpart C Section 15.249
4	Band-Edges	Complies with limits of CFR Title 47 Part 15 Subpart C Section 15.249

SIX HIGHEST RADIATED EMISSIONS READINGS

	Reading Type (PK / QP / AV)	Polarization (Vert / Horz)	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Delta (dB)	Test Distance
1	QP	V	888.40	27.91	46.00	-18.09	3-meter
2	QP	V	865.60	26.14	46.00	-19.86	3-meter
3	AV	V	14006.00	33.51	53.98	-20.47	3-meter
4	AV	H	10470.00	33.00	53.98	-20.98	3-meter
5	AV	H	14003.00	32.83	53.98	-21.15	3-meter
6	QP	H	865.60	24.37	46.00	-21.63	3-meter

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the eForce Aperio iClass Keycard Entry System Model: 3090AC. The EMI measurements were performed according to the measurement procedure described in ANSI C63.10. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT (equipment under test) hereafter, are within the **Class B** specification limits defined by the Code of Federal Regulations Title 47, Part 15 Subpart B and Subpart C sections 15.205, 15.209 and 15.249.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 20621 Pascal Way Lake Forest, California 92630.

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

Adams Rite Manufacturing Co.

Brian Whipple	Test Engineer

Compatible Electronics Inc.

Josh Hansen	Lab Manager
Matt Harrison	Test Technician
Jeff Klinger	Director of Engineering

2.4 Date Test Sample was Received

The test sample was received on December 1, 2011.

2.5 Disposition of the Test Sample

The test sample remains at Compatible Electronics, Inc. as 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 PACard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
PCB	Printed Circuit Board
TX	Transmit
RX	Receive

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
CFR Title 47, Part 15 Subpart B	FCC Rules – Radio frequency devices (including digital devices) - Unintentional Radiators
CFR Title 47, Part 15 Subpart C	FCC Rules – Radio frequency devices (including digital devices) - Intentional Radiators
ANSI C63.10: 2009	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The eForce Aperio iClass Keycard Entry System Model: 3090AC (EUT) was setup in a tabletop configuration. The EUT was powered by 4-AA batteries. The EUT was continuously transmitting a data stream and continuously receiving. The low, mid, and high channels were explored to determine the worst case.

The AA batteries were replaced with 4 new AA batteries. Transmitter resulted with no variation of amplitude or frequency.

The EUT was tested in an orientation that would be typical of what would be oriented in the field.

It was determined that the emissions were at their highest level when the EUT was transmitting in the Low channel for Radiated Emissions. The final radiated data was taken in the above configuration. Please see Appendix E for the test data.

4.1.1 Photograph Test Configuration - EMI

4.1.2 Cable Construction and Termination

Cable 1

There were no interconnecting cables.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER	FCC ID
1	eFORCE APERIO ICLASS KEYCARD ENTRY SYSTEM (EUT)	ADAMS RITE	3090AC	1	YBE3090AC
2	BATTERIES	ENERCELL	AA	N/A	N/A

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	Compatible Electronics	NONE	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100219	09/20/2011	09/20/2012
Antenna, Loop	Com Power	AL-130	17085	01/26/2011	01/26/2012
Antenna, CombiLog	Com Power	AC-220	25857	06/07/2011	06/07/2012
Antenna, Horn 1-18GHz	Com Power	AH-118	071250	10/01/2010	10/01/2012
Antenna, Horn 18-26GHz	Com Power	AH-826	81033	N.C.R.	N.C.R.
Pre-Amp, 1-18GHz	Com Power	PA-122	181923	02/01/2010	02/01/2012
Pre-Amp, 1-18GHz	Com Power	PA-122	25196	11/29/2011	11/29/2012
Pre-Amp, 18-40GHz	Com Power	PA-840	181289	06/07/2011	06/07/2012
Mast, Antenna Positioner	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Antenna Mast	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Turntable	Sunol Science Corporation	FM 2001	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Science Corporation	SC104V	020808-1	N/A	N/A
Measurement and Automation Software	TDK, Inc.	TDK Emissions Labs	V5.53	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 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 by 0.8 meter high non-conductive table, which was placed on the ground plane.

The EUT was not grounded.

6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

6.4 Measurement Uncertainty

"Compatible Electronics' U_{lab} value is less than U_{cispr}, thus based on this − compliance is deemed to occur if no measured disturbance exceeds the disturbance limit.

$$u_c(y) = \sqrt{\sum_i c_i^2 \; u^2(x_i)}$$

Measurement		U_{cispr}	$U_{lab} = 2\,uc\,(y)$
Conducted disturbance (mains port)	(150 kHz – 30 MHz)	4,0 dB 3,6 dB	2.88
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(30 MHz – 1 000 MHz)	5,2 dB	4.04

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Number and Frequencies

There are a total of 15 channels. The low channel is at 2405.0 MHz and the high channel is at 2475.0 MHz. There is a 5 MHz separation between each channel.

1 == 2405 MHz
2 == 2410 MHz
3 == 2415 MHz
4 == 2420 MHz
5 == 2425 MHz
6 == 2430 MHz
7 == 2435 MHz
8 == 2440 MHz
9 == 2445 MHz
10 == 2450 MHz
11 == 2455 MHz
12 == 2460 MHz
13 == 2465 MHz
14 == 2470 MHz
15 == 2475 MHz

7.2 Antenna

The antenna is made up of a multilayer chip antenna located on the antenna board and has a gain of 0.5 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

This test was not performed

The EMI receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. The LISN output was measured using the EMI receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The EUT received its power through the LISN, which was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI 63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the computer software. The final qualification data is located in Appendix E.

Test Results:

The EUT is battery powered therefore this test was not performed.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The receiver was used as a measuring meter. The receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the receiver records the highest measured reading over all the sweeps. Amplifiers were used to increase the sensitivity of the instrument. There were two Microwave Preamplifiers used for frequencies above 1 GHz, and one Microwave Preamplifier was used for frequencies above 18 GHz.

The quasi-peak detector was used for frequencies below 1GHz and the average detector was used for frequencies above 1 GHz.

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

FREQUENCY RANGE (MHz)	TRANSDUCER	EFFECTIVE MEASUREMENT BANDWIDTH
.009 to .150	Active Loop Antenna	200 kHz
.150 to 30	Active Loop Antenna	9 kHz
30 to 1000	Combilog Antenna	120 kHz
1000 to 25000	Horn Antenna	1 MHz

The TDK FAC-3 shielded test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.10, EN 50147-2, and CISPR 22. 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 in both vertical and horizontal polarizations (for E field radiated field strength).

Test Results:

The EUT complies with the limits of CFR Title 47 Part 15 Subpart B (Class B devices) and Subpart C sections 15.205, 15.209 and 15.249.

8.1.3 Peak Transmit EMI

The Peak Transmit EMI was measured using the EMI Receiver at a 3-meter test distance to obtain the final test data. The low, mid and high channels were measured. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C, Section 15.249.

8.1.4 Band Edge

The Band Edge measurement was measured using the EMI Receiver at a 3-meter test distance to obtain the final test data. The low and high channels were tuned during the low and high band edge tests respectively. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C, Section 15.249.

9. TEST PROCEDURE DEVIATIONS

The test procedures were not deviated from throughout all tests.

10. CONCLUSIONS

The eForce Aperio iClass Keycard Entry System Model: 3090AC meets all of the relevant Class B specification requirements defined in the Code of Federal Regulations Title 47, Part 15 Subpart B and Subpart C sections, 15.205, 15.209 and 15.249.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP LAB CODES 200063-0, 200528-0, 200527-0

For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

NVLAP listing links
Agoura Division - http://ts.nist.gov/Standards/scopes/2000630.htm
Brea Division - http://ts.nist.gov/Standards/scopes/2005280.htm
Silverado/Lake Forest Division - http://ts.nist.gov/Standards/scopes/2005270.htm

ANSI listing
CETCB
https://www.ansica.org/wwwversion2/outside/ALLdirectoryDetails.asp?menuID=1&prgID=3&orgID=123&status=4

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

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).

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

VCCI Listing, from VCCI site
Enter "Compatible" in search form http://www.vcci.or.jp/vcci_e/activity/registration/setsubi.html

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

Industry Canada Industrie Canada
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

MODIFICATIONS TO THE EUT

No modifications were made to the EUT.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	eFORCE APERIO ICLASS KEYCARD ENTRY SYSTEM Model: 3090AC S/N: 1

No additional models were tested.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

*FIGURE 1: RADIATED EMISSIONS 3-METER SEMI-*ANECHOIC *TEST CHAMBER BELOW 1GHz*

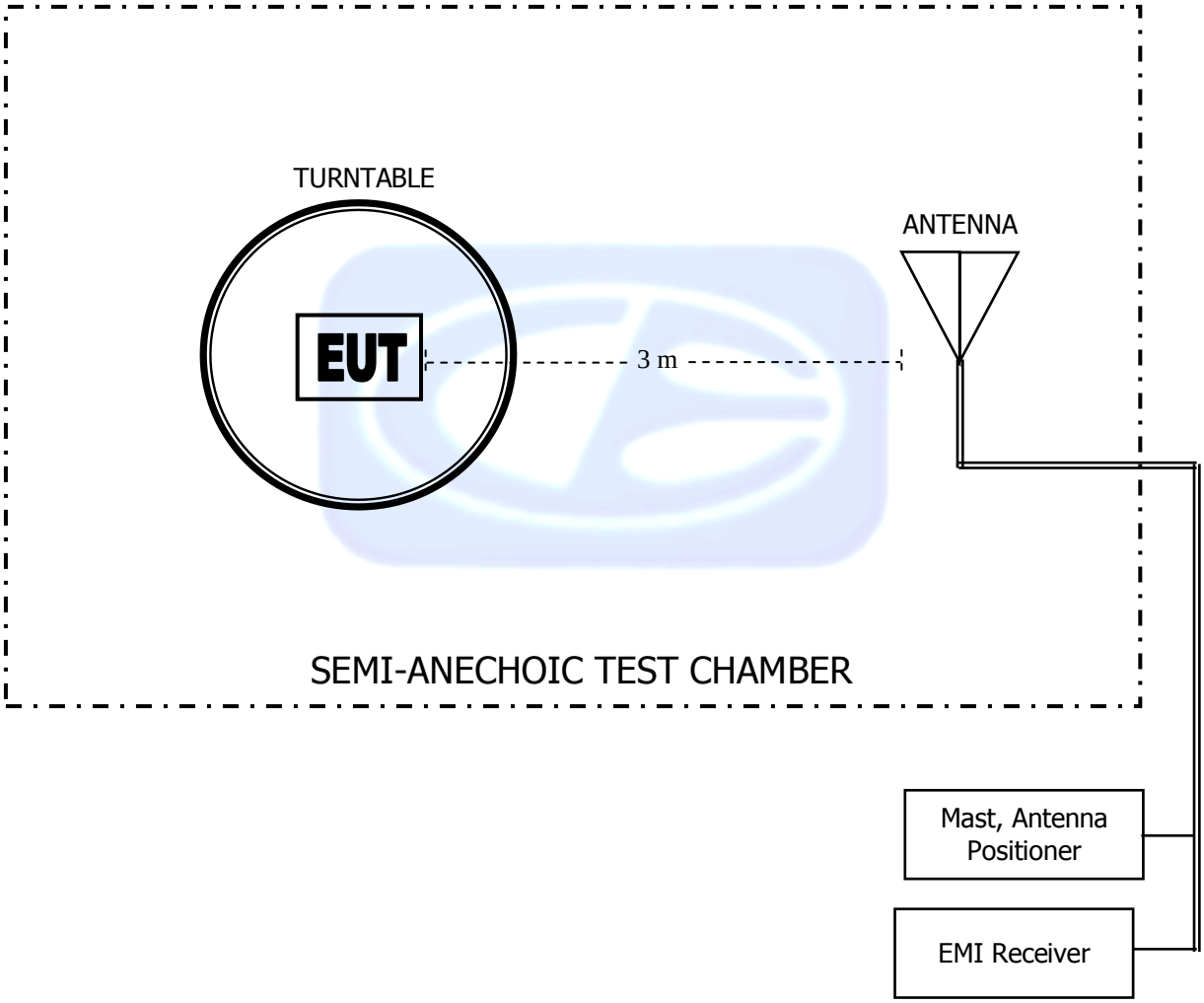
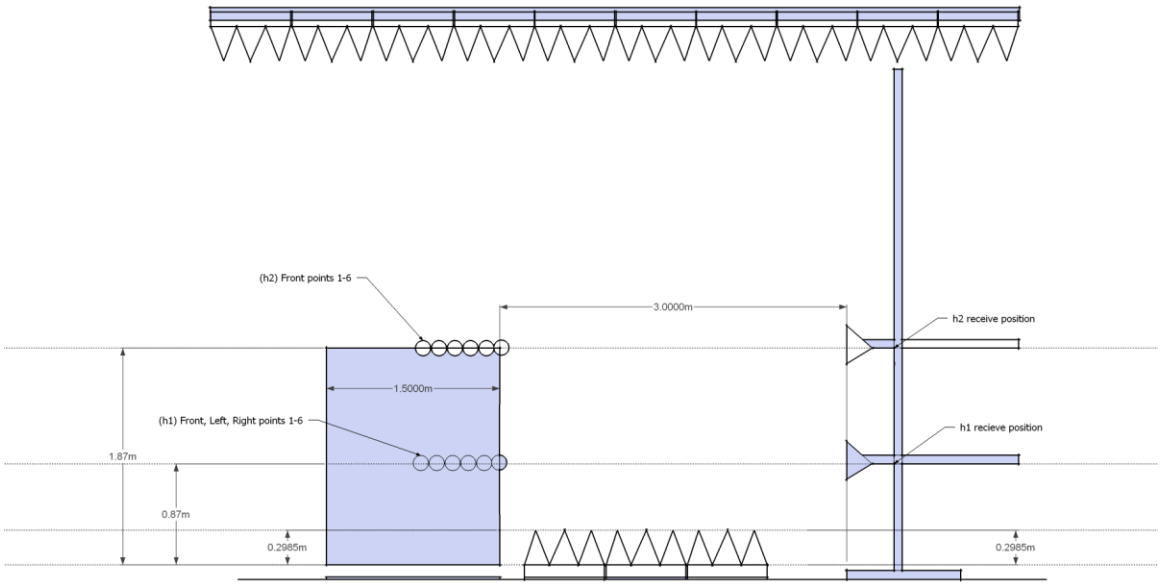


*FIGURE 2: RADIATED EMISSIONS 3-METER SEMI-*ANECHOIC *TEST CHAMBER ABOVE 1 GHz*



COM-POWER AC-220

LAB R - COMBILOG ANTENNA

S/N: 25857

CALIBRATION DUE: JUNE 07, 2012

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	17.2	**180**	8.5
35	17.6	**200**	9.0
40	18.3	**250**	11.7
45	17.1	**300**	14.2
50	16.1	**300**	13.4
60	13.1	**400**	15.0
70	8.6	**500**	16.0
80	5.5	**600**	17.9
90	7.2	**700**	20.2
100	8.2	**800**	21.1
120	9.4	**900**	20.5
140	8.6	**1000**	22.6
160	8.4		

COM-POWER AH-118

LAB R - HORN ANTENNA

S/N: 071250

CALIBRATION DUE: OCTOBER 01, 2012

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	24.00	**9500**	35.90
1500	23.90	**10000**	40.40
2000	27.90	**10500**	41.70
2500	29.60	**11000**	38.90
3000	30.70	**11500**	40.30
3500	30.30	**12000**	38.10
4000	28.60	**12500**	42.80
4500	30.70	**13000**	38.80
5000	33.00	**13500**	36.90
5500	32.90	**14000**	43.70
6000	34.10	**14500**	42.00
6500	37.20	**15000**	42.00
7000	37.90	**15500**	37.90
7500	38.30	**16000**	38.50
8000	38.50	**16500**	38.20
8500	36.90	**17000**	39.20
9000	40.20	**17500**	42.80
		18000	43.20

COM-POWER PA-122

1-18GHz - PREAMPLIFIER

S/N: 181923

CALIBRATION DUE: February 1, 2012

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	37.03	**9500**	34.96
1500	36.17	**10000**	34.23
2000	35.78	**10500**	32.77
2500	35.88	**11000**	32.72
3000	35.74	**11500**	33.73
3500	35.61	**12000**	34.89
4000	35.56	**12500**	35.68
4500	35.35	**13000**	35.81
5000	35.10	**13500**	35.25
5500	35.29	**14000**	35.34
6000	35.48	**14500**	35.59
6500	35.37	**15000**	34.88
7000	35.35	**15500**	34.38
7500	34.49	**16000**	35.25
8000	33.90	**16500**	35.75
8500	33.29	**17000**	35.75
9000	34.35	**17500**	35.28
		18000	34.8

COM-POWER PA-122

1-18GHz - PREAMPLIFIER

S/N: 25196

CALIBRATION DUE: NOVEMBER 29, 2012

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000.00	24.95	**9500.00**	20.75
1500.00	24.08	**10000.00**	19.87
2000.00	23.25	**10500.00**	19.89
2500.00	22.61	**11000.00**	20.43
3000.00	22.17	**11500.00**	21.92
3500.00	21.51	**12000.00**	22.38
4000.00	20.74	**12500.00**	23.34
4500.00	20.57	**13000.00**	21.55
5000.00	20.22	**13500.00**	20.84
5500.00	20.14	**14000.00**	20.83
6000.00	20.05	**14500.00**	21.71
6500.00	20.81	**15000.00**	20.05
7000.00	20.08	**15500.00**	19.93
7500.00	20.88	**16000.00**	20.28
8000.00	20.74	**16500.00**	17.36
8500.00	21.61	**17000.00**	18.42
9000.00	21.30	**17500.00**	16.99
		18000.00	16.59

COM-POWER AH-826

18 – 26 GHz HORN ANTENNA

S/N: 81033

CALIBRATION DUE: N.C.R.

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	32.8	**22500**	32.7
18500	32.2	**23000**	32.7
19000	31.9	**23500**	32.0
19500	31.5	**24000**	32.9
20000	33.3	**24500**	33.7
20500	33.2	**25000**	34.1
21000	32.6	**25500**	33.6
21500	33.2	**26000**	35.1
22000	33.0	**26500**	33.6

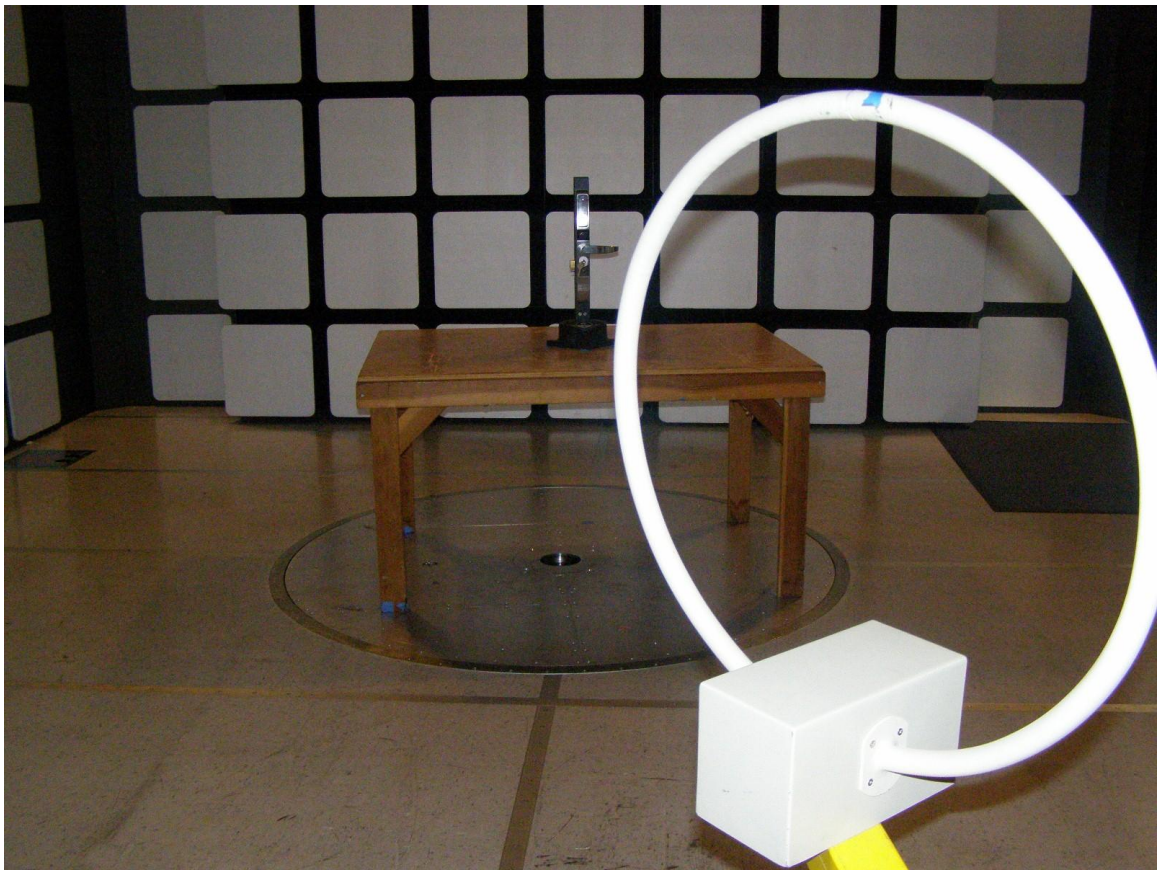
COM-POWER PA-840

18 – 40 GHz PREAMPLIFIER

S/N: 181289

CALIBRATION DUE: JUNE 07, 2012

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	30.8	**31500**	29.8
19000	27.8	**32000**	29.2
20000	28.4	**32500**	30.1
21000	26.7	**33000**	31.2
22000	28.1	**33500**	29.2
23000	26.8	**34000**	28.3
24000	28.7	**34500**	27.8
25000	30.7	**35000**	29.9
26000	32.3	**35500**	28.6
26500	31.2	**36000**	27.7
27000	31.8	**36500**	28.0
27500	32.1	**37000**	30.8
28000	32.3	**37500**	25.9
28500	29.5	**38000**	28.1
29000	30.3	**38500**	30.1
29500	29.3	**39000**	31.1
30000	30.7	**39500**	25.7
30500	29.9	**40000**	31.7



FRONT VIEW

ADAMS RITE MANUFACTURING CO.
eFORCE APERIO iCLASS KEYCARD ENTRY SYSTEM
Model: 3090AC
FCC SUBPART C - RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

ADAMS RITE MANUFACTURING CO.
eFORCE APERIO iCLASS KEYCARD ENTRY SYSTEM
Model: 3090AC
FCC SUBPART C - RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

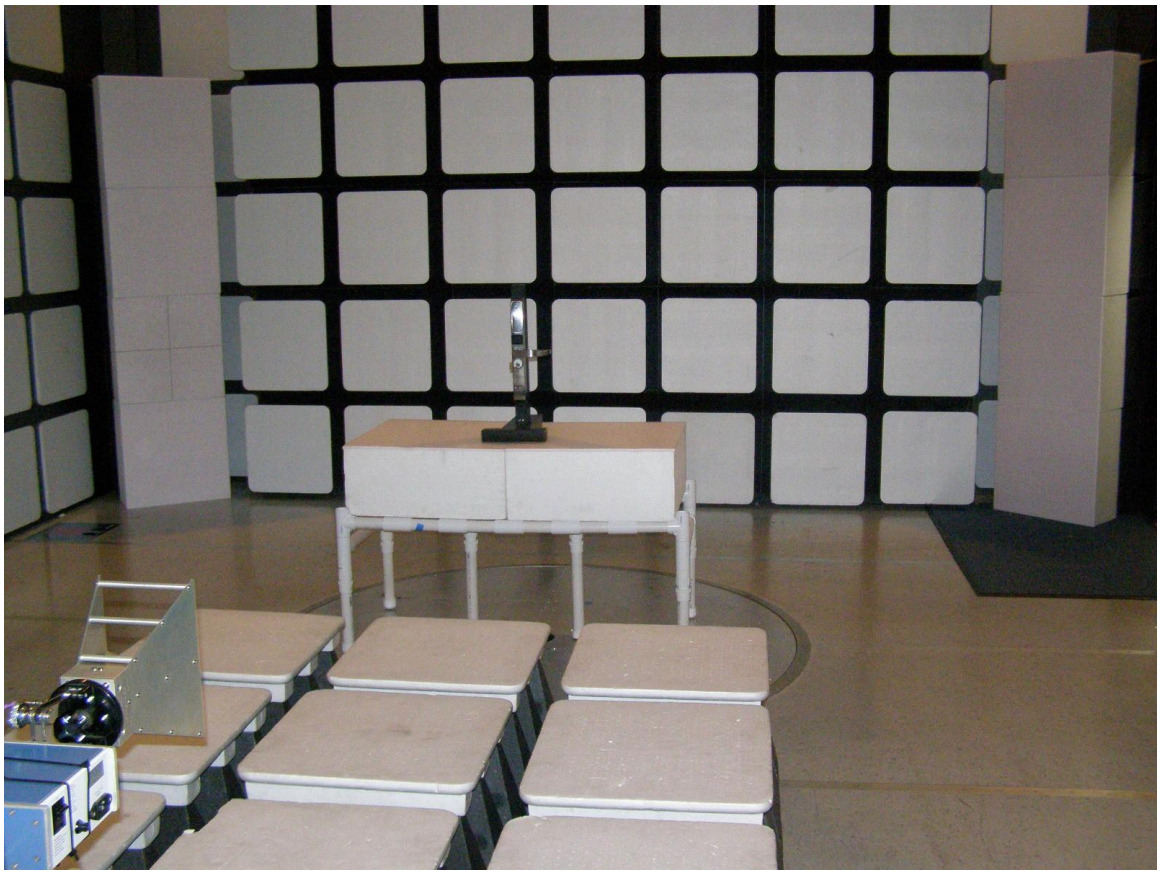
ADAMS RITE MANUFACTURING CO.
eFORCE APERIO iCLASS KEYCARD ENTRY SYSTEM
Model: 3090AC
FCC SUBPART B & C - RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

ADAMS RITE MANUFACTURING CO.
eFORCE APERIO iCLASS KEYCARD ENTRY SYSTEM
Model: 3090AC
FCC SUBPART B & C - RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

ADAMS RITE MANUFACTURING CO.
eFORCE APERIO iCLASS KEYCARD ENTRY SYSTEM
Model: 3090AC
FCC SUBPART B & C - RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

ADAMS RITE MANUFACTURING CO.
eFORCE APERIO iCLASS KEYCARD ENTRY SYSTEM
Model: 3090AC
FCC SUBPART B & C - RADIATED EMISSIONS

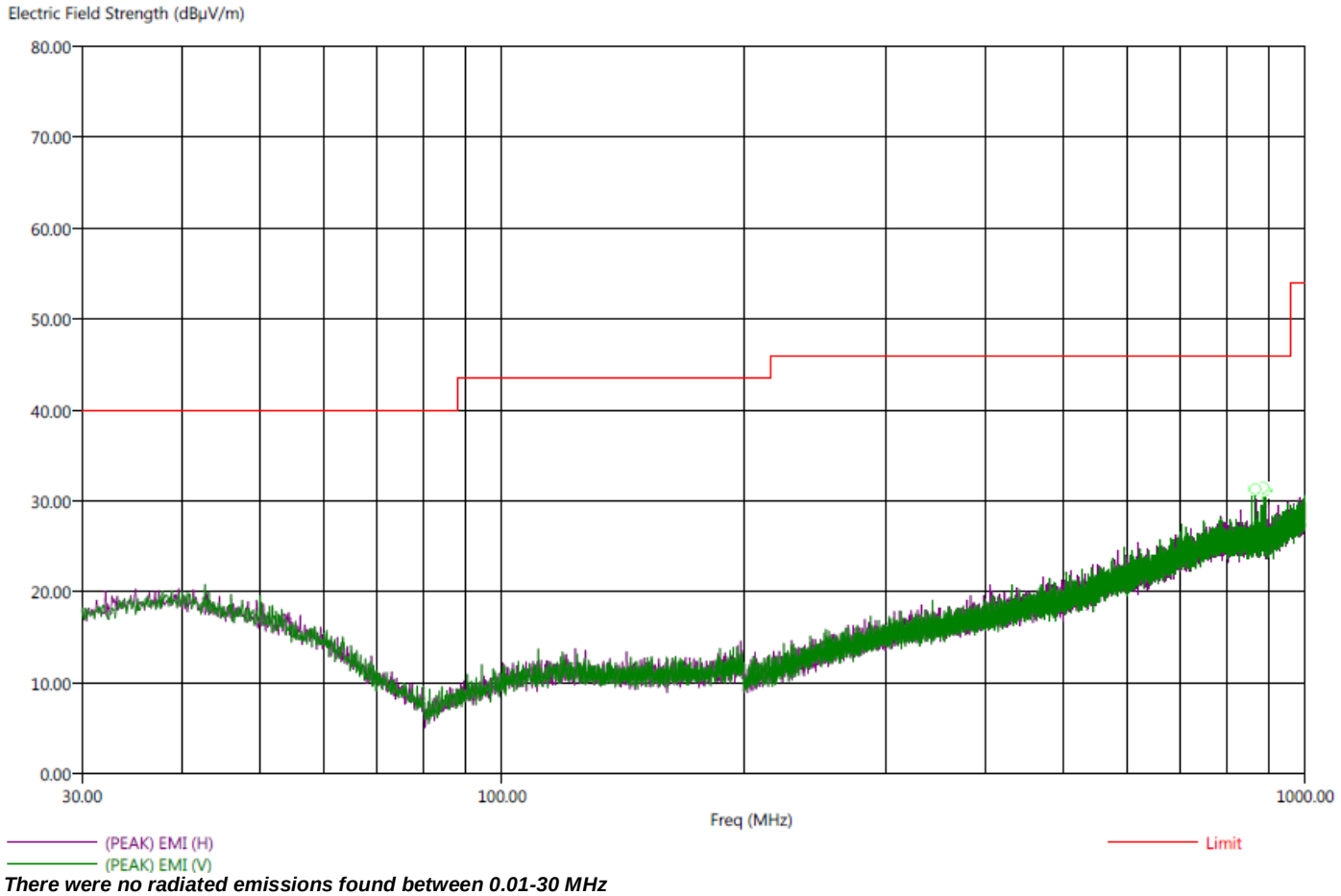
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

RADIATED EMISSIONS DATA SHEETS
(Worst Case Channel)

Title: FCC 15.209 12/1/2011 11:09:47 AM
File: Radiated Pre-Scan 30-1000Mhz_2.4GHz_Low.set Sequence: Preliminary Scan
Operator: Matt Harrison
EUT Type: eForce Aperio iClass Keycard Entry System M/N: 3090AC S/N: 1
EUT Condition: Stand Alone, Transmitting Low Channel 2405 MHz
Comments:
Witness: Brian
Temp: 72f
Hum: 28%
Battery Operated

Compatible Electronics, Inc. FAC-3 (Lab R)



There were no radiated emissions found between 0.01-30 MHz

Title: FCC 15.209 12/1/2011 11:32:04 AM
File: Radiated Final 30-1000Mhz_2.4GHz_Low.set Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: eForce Aperio iClass Keycard Entry System M/N: 3090AC S/N: 1
EUT Condition: Stand Alone, Transmitting Low Channel 2405 MHz
Comments:
Witness: Brian
Temp: 72f
Hum: 28%
Battery Operated

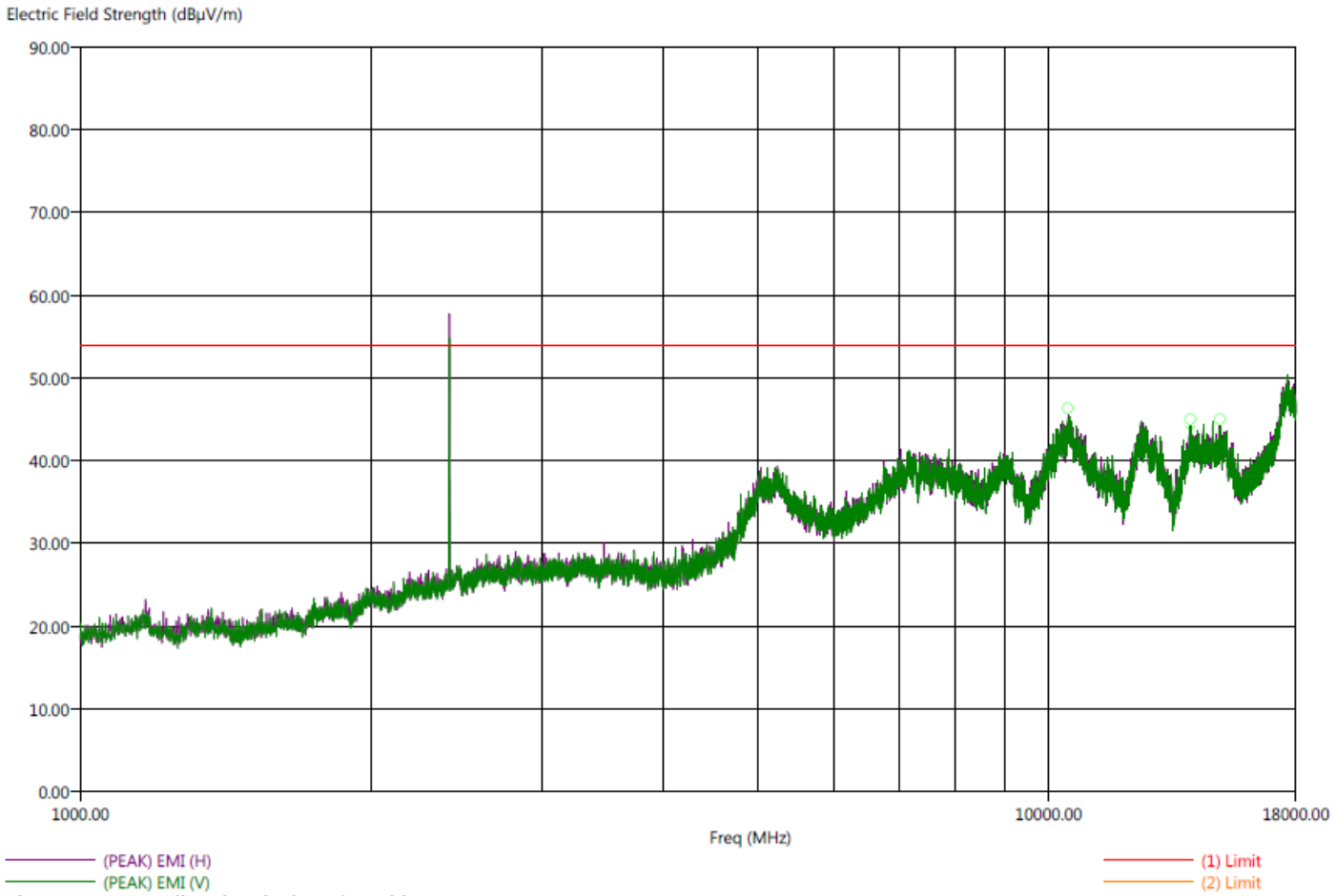
Compatible Electronics, Inc. FAC-3 (Lab R)

Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBµV/m)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable(dB)
865.60	-21.63	24.37	29.70	46.00	H	359.50	334.38	20.70	3.48
865.60	-19.86	26.14	32.84	46.00	V	237.75	140.53	20.70	3.48
888.40	-18.09	27.91	33.84	46.00	V	160.75	362.56	20.57	3.57
888.70	-22.72	23.28	28.68	46.00	H	21.00	323.34	20.56	3.57
889.30	-22.62	23.38	28.86	46.00	H	274.50	170.62	20.56	3.57
892.80	-22.14	23.86	29.95	46.00	V	360.00	184.17	20.54	3.59

There were no radiated emissions found between 0.01-30 MHz

Title: FCC 15.209 12/2/2011 2:06:31 PM
File: Radiated Pre-scan 1-18GHz_Low.set Sequence: Preliminary Scan
Operator: Matt Harrison
EUT Type: eForce Aperio iClass Keycard Entry System M/N: 3090AC S/N: 1
EUT Condition: Stand Alone, Transmitting Low Channel 2405 MHz
Comments: Witness: Brian
Temp: 72f
Hum: 28%
Battery Operated

Compatible Electronics, Inc. FAC-3 (Lab R)



There were no radiated emissions found between 15,049.00-25,000.00 MHz

Title: FCC 15.209 12/2/2011 2:55:53 PM
File: Radiated Final 1-18GHz_Low.set Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: eForce Aperio iClass Keycard Entry System M/N: 3090AC S/N: 1
EUT Condition: Stand Alone, Transmitting Low Channel 2405 MHz
Comments: Witness: Brian
Temp: 72f
Hum: 28%
Battery Operated

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq (MHz)	(AVG) Margin (dB)	(AVG) EMI (dBuV/m)	(PEAK) EMI (dBuV/m)	Limit (dBuV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Preamp (dB)	Cable (dB)
10466.74	-20.98	33.00	45.28	53.98	H	43.00	321.25	41.62	52.75	21.49
13996.53	-21.15	32.83	45.76	53.98	H	231.50	372.65	43.65	56.18	21.60
13999.33	-20.47	33.51	45.93	53.98	V	334.00	162.50	43.69	56.18	21.60
15047.21	-23.34	30.64	43.41	53.98	V	184.00	109.19	41.61	54.87	23.46

There were no radiated emissions found between 15,049.00-25,000.00 MHz

FUNDAMENTAL & HARMONICS
LOW, MID, & HIGH CHANNELS

DATA SHEETS

FCC 15.249
Adams Rite
eForce Aperio iClass
Keycard Entry System
Model: 3090AC
S/N: 1

Date: 12/2/11
Lab: R

Tested By: Matt Harrison

Radiated Field Strength

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2.405	73.75	H	93.97	-20.22	Peak	2.08	340	
2.405	69.07	V	93.97	-24.90	Peak	1.00	300	
2.440	76.59	H	93.97	-17.38	Peak	1.48	0	
2.440	66.49	V	93.97	-27.48	Peak	1.00	360	
2.475	76.84	H	93.97	-17.13	Peak	1.00	180	
2.475	69.26	V	93.97	-24.71	Peak	1.10	0	

Test distance
3 meter

FCC 15.249
Adams Rite
eForce Aperio iClass
Keycard Entry System
Model: 3090AC

Date: 12/2/2011
Lab: R

Tested By: Matt Harrison

Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4810	--	V	--	--	Peak			No Emission Found
4810	--	V	--	--	Avg			No Emission Found
7215	--	V	--	--	Peak			No Emission Found
7215	--	V	--	--	Avg			No Emission Found
9620	--	V	--	--	Peak			No Emission Found
9620	--	V	--	--	Avg			No Emission Found
12025	--	V	--	--	Peak			No Emission Found
12025	--	V	--	--	Avg			No Emission Found
14430	--	V	--	--	Peak			No Emission Found
14430	--	V	--	--	Avg			No Emission Found
16835	--	V	--	--	Peak			No Emission Found
16835	--	V	--	--	Avg			No Emission Found
19240	--	V	--	--	Peak			No Emission Found
19240	--	V	--	--	Avg			No Emission Found
21645	--	V	--	--	Peak			No Emission Found
21645	--	V	--	--	Avg			No Emission Found
24050	--	V	--	--	Peak			No Emission Found
24050	--	V	--	--	Avg			No Emission Found

Test distance
3meter

FCC 15.249
Adams Rite
eForce Aperio iClass
Keycard Entry System
Model: 3090AC

Date: 12/2/2011
Lab: R

Tested By: Matt Harrison

Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4810	--	H	--	--	Peak			No Emission Found
4810	--	H	--	--	Avg			No Emission Found
7215	--	H	--	--	Peak			No Emission Found
7215	--	H	--	--	Avg			No Emission Found
9620	--	H	--	--	Peak			No Emission Found
9620	--	H	--	--	Avg			No Emission Found
12025	--	H	--	--	Peak			No Emission Found
12025	--	H	--	--	Avg			No Emission Found
14430	--	H	--	--	Peak			No Emission Found
14430	--	H	--	--	Avg			No Emission Found
16835	--	H	--	--	Peak			No Emission Found
16835	--	H	--	--	Avg			No Emission Found
19240	--	H	--	--	Peak			No Emission Found
19240	--	H	--	--	Avg			No Emission Found
21645	--	H	--	--	Peak			No Emission Found
21645	--	H	--	--	Avg			No Emission Found
24050	--	H	--	--	Peak			No Emission Found
24050	--	H	--	--	Avg			No Emission Found

Test distance
3meter

FCC 15.249
Adams Rite
eForce Aperio iClass
Keycard Entry System
Model: 3090AC

Date: 12/2/2011
Lab: R

Tested By: Matt Harrison

Middle Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	39.66	V	73.98	-34.32	Peak	1.01	348	Test Distance 3m
4880	29.40	V	53.98	-24.58	Avg	1.01	348	Test Distance 3m
7320	--	V	--	--	Peak			No Emission Found
7320	--	V	--	--	Avg			No Emission Found
9760	--	V	--	--	Peak			No Emission Found
9760	--	V	--	--	Avg			No Emission Found
12200	--	V	--	--	Peak			No Emission Found
12200	--	V	--	--	Avg			No Emission Found
14640	--	V	--	--	Peak			No Emission Found
14640	--	V	--	--	Avg			No Emission Found
17080	--	V	--	--	Peak			No Emission Found
17080	--	V	--	--	Avg			No Emission Found
19520	--	V	--	--	Peak			No Emission Found
19520	--	V	--	--	Avg			No Emission Found
21960	--	V	--	--	Peak			No Emission Found
21960	--	V	--	--	Avg			No Emission Found
24400	--	V	--	--	Peak			No Emission Found
24400	--	V	--	--	Avg			No Emission Found

Test distance
3meter

FCC 15.249
Adams Rite
eForce Aperio iClass
Keycard Entry System
Model: 3090AC

Date: 12/2/2011
Lab: R

Tested By: Matt Harrison

Middle Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	42.00	H	73.98	-31.98	Peak	1.3	245	Test Distance 3m
4880	32.65	H	53.98	-21.33	Avg	1.3	245	Test Distance 3m
7320	--	H	--	--	Peak			No Emission Found
7320	--	H	--	--	Avg			No Emission Found
9760	--	H	--	--	Peak			No Emission Found
9760	--	H	--	--	Avg			No Emission Found
12200	--	H	--	--	Peak			No Emission Found
12200	--	H	--	--	Avg			No Emission Found
14640	--	H	--	--	Peak			No Emission Found
14640	--	H	--	--	Avg			No Emission Found
17080	--	H	--	--	Peak			No Emission Found
17080	--	H	--	--	Avg			No Emission Found
19520	--	H	--	--	Peak			No Emission Found
19520	--	H	--	--	Avg			No Emission Found
21960	--	H	--	--	Peak			No Emission Found
21960	--	H	--	--	Avg			No Emission Found
24400	--	H	--	--	Peak			No Emission Found
24400	--	H	--	--	Avg			No Emission Found

Test distance
3meter

FCC 15.249
Adams Rite
eForce Aperio iClass
Keycard Entry System
Model: 3090AC

Date: 12/2/2011
Lab: R

Tested By: Matt Harrison

High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4950	38.43	V	73.98	-35.55	Peak	1.58	2.25	Test Distance 3m
4950	26.24	V	53.98	-27.74	Avg	1.58	2.25	Test Distance 3m
7425	--	V	--	--	Peak			No Emission Found
7425	--	V	--	--	Avg			No Emission Found
9900	--	V	--	--	Peak			No Emission Found
9900	--	V	--	--	Avg			No Emission Found
12375	--	V	--	--	Peak			No Emission Found
12375	--	V	--	--	Avg			No Emission Found
14850	--	V	--	--	Peak			No Emission Found
14850	--	V	--	--	Avg			No Emission Found
17325	--	V	--	--	Peak			No Emission Found
17325	--	V	--	--	Avg			No Emission Found
19800	--	V	--	--	Peak			No Emission Found
19800	--	V	--	--	Avg			No Emission Found
22275	--	V	--	--	Peak			No Emission Found
22275	--	V	--	--	Avg			No Emission Found
24750	--	V	--	--	Peak			No Emission Found
24750	--	V	--	--	Avg			No Emission Found

Test Distance
3meter

FCC 15.249
Adams Rite
eForce Aperio iClass
Keycard Entry System
Model: 3090AC

Date: 12/2/2011
Lab: R

Tested By: Matt Harrison

High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4950	47.66	H	73.98	-26.32	Peak	1.02	171	Test Distance 3m
4950	39.89	H	53.98	-14.09	Avg	1.02	171	Test Distance 3m
7425	--	H	--	--	Peak			No Emission Found
7425	--	H	--	--	Avg			No Emission Found
9900	--	H	--	--	Peak			No Emission Found
9900	--	H	--	--	Avg			No Emission Found
12375	--	H	--	--	Peak			No Emission Found
12375	--	H	--	--	Avg			No Emission Found
14850	--	H	--	--	Peak			No Emission Found
14850	--	H	--	--	Avg			No Emission Found
17325	--	H	--	--	Peak			No Emission Found
17325	--	H	--	--	Avg			No Emission Found
19800	--	H	--	--	Peak			No Emission Found
19800	--	H	--	--	Avg			No Emission Found
22275	--	H	--	--	Peak			No Emission Found
22275	--	H	--	--	Avg			No Emission Found
24750	--	H	--	--	Peak			No Emission Found
24750	--	H	--	--	Avg			No Emission Found

Test Distance
3meter

LOWER BAND EDGE

DATA SHEETS

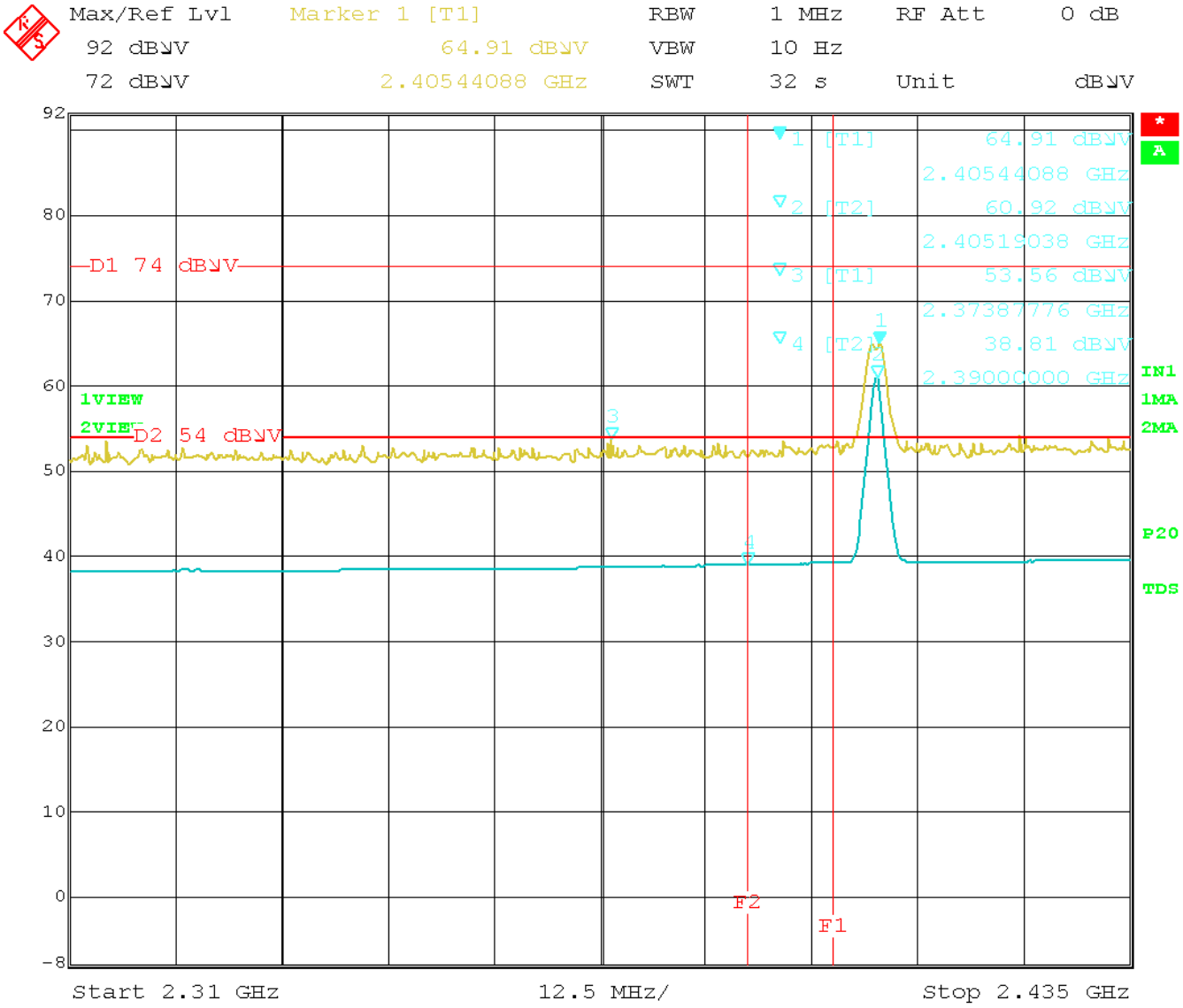
LOWER BAND EDGE

FCC 15.249
Adams Rite
eForce Aperio iClass
Keycard Entry System
Model: 3090AC

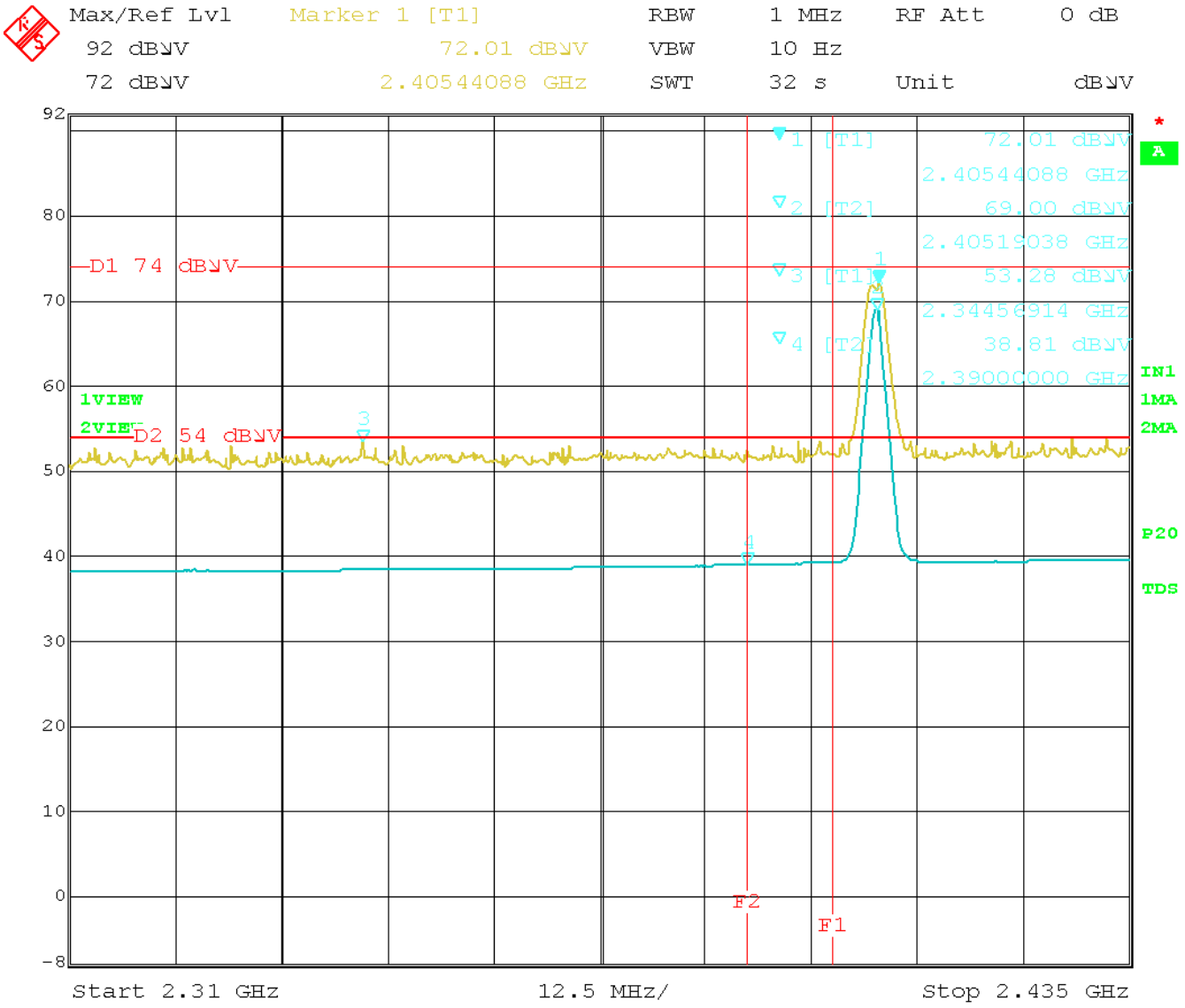
Date: 12/2/2011
Lab: R
Tested By: Matt Harrison

Channel Low - Tx Mode - Fundamental and Band Edge

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2405	64.91	V	--	--	Peak	1	300	Fundamental of Channel 1
2405	60.92	V	--	--	Avg	1	300	@ 3 meters
2373	53.56	V	74	-20.44	Peak	1	300	No Marker Delta
2390	38.81	V	54	-15.19	Avg	1	300	Method Used
2405	72.01	H	--	--	Peak	2.08	340	Fundamental of Channel 1
2405	69.00	H	--	--	Avg	2.08	340	@ 3 meters
2344	53.28	H	74	-20.72	Peak	2.08	340	No Marker Delta
2390	38.81	H	54	-15.19	Avg	2.08	340	Method Used



Title: eForce Aperion
Comment A: Lower Band Edge Vertical
Date: 2.DEC.2011 09:38:27



Title: eForce Aperion
Comment A: Lower Band Edge Horizontal
Date: 2.DEC.2011 09:42:30

UPPER BAND EDGE

DATA SHEETS

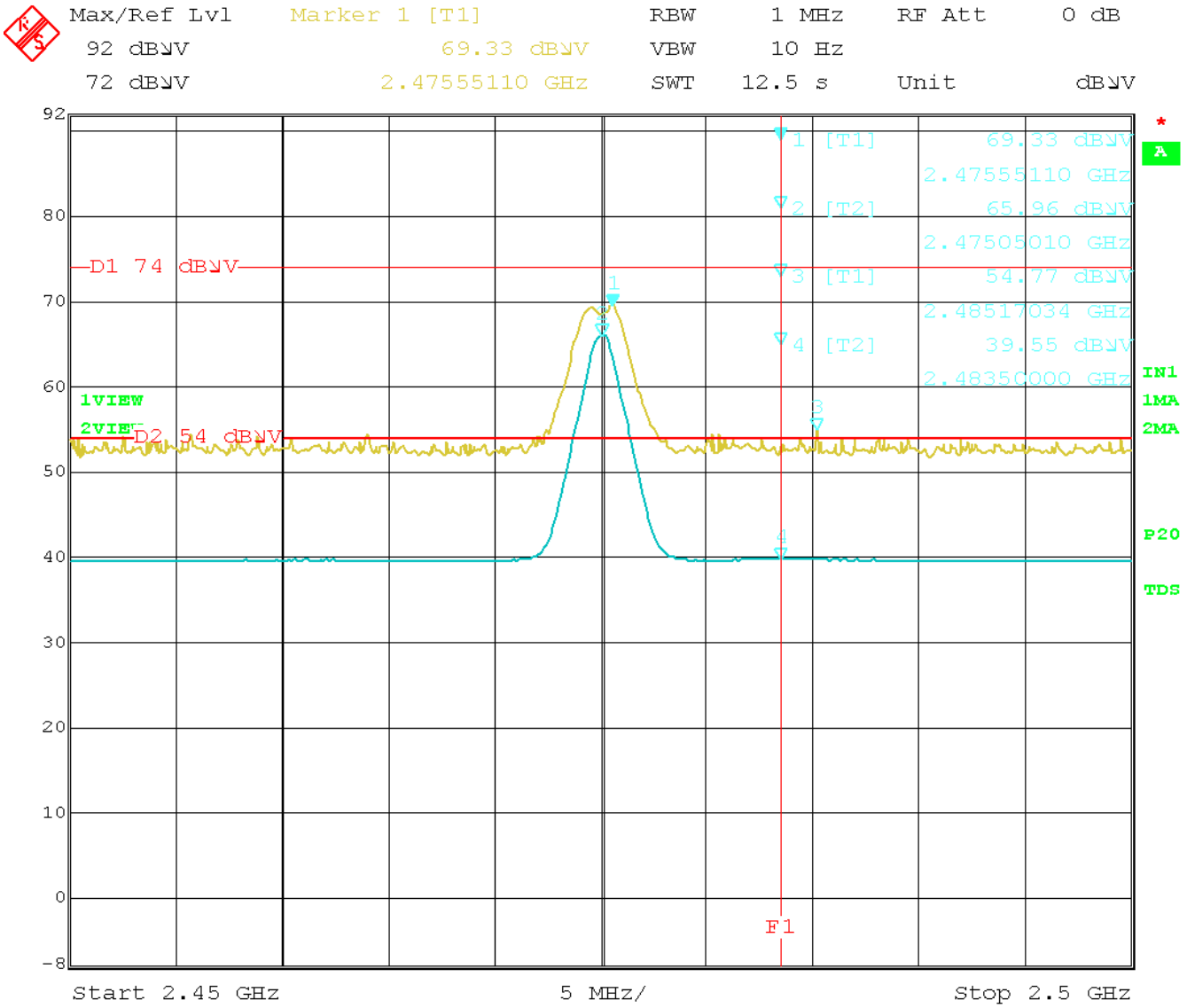
UPPER BAND EDGE

FCC 15.249
Adams Rite
eForce Aperio iClass
Keycard Entry System
Model: 3090AC

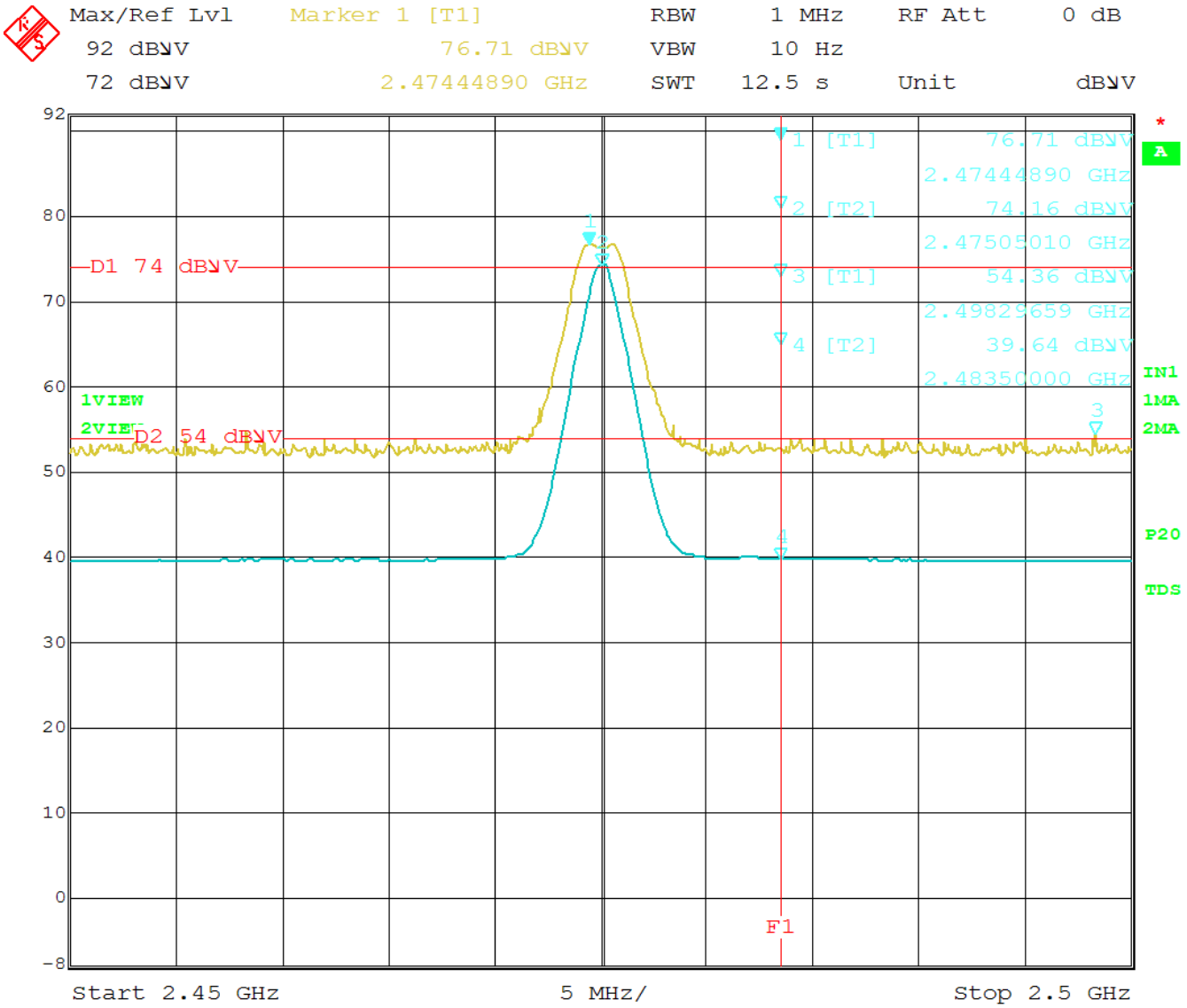
Date: 12/2/2011
Lab: R
Tested By: Matt Harrison

Channel High - Tx Mode - Fundamental and Band Edge

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2475	69.33	V	--	--	Peak	1.1	0	Fundamental of Channel 15
2475	65.96	V	--	--	Avg	1.1	0	@ 3 meters
2485	54.77	V	74	-19.23	Peak	1.1	0	No Marker Delta
2483.5	39.55	V	54	-14.45	Avg	1.1	0	Method Used
2475	76.71	H	--	--	Peak	1	180	Fundamental of Channel 15
2475	74.16	H	--	--	Avg	1	180	@ 3 meters
2498	54.36	H	74	-19.64	Peak	1	180	No Marker Delta
2483.5	39.64	H	54	-14.36	Avg	1	180	Method Used



Title: eForce Aperion
Comment A: Upper Band Edge Vertical
Date: 2.DEC.2011 10:34:22



Title: eForce Aperion
Comment A: Upper Band Edge Horizontal
Date: 2.DEC.2011 10:31:05