



ELECTROMAGNETIC COMPATIBILITY (EMC) REPORT

EMISSIONS ONLY

Aerielle Inc.

Model ATB350

September 14, 2004

Project No.: 04CA41713

Test Report No.: NC5311-091404

REPORT DIRECTORY

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1.0 General Information

1.1 Scope

Underwriters Laboratories Inc., authorizes the above named company to reproduce this Report, provided it is reproduced in it's entirety. The data in this Report reflects only the items tested in the configurations and mode of operations described. All data recorded and photographs represents testing under the worst case conditions permitted by the requirements applied to the product. It is the manufacturer's responsibility to assure that additional production units are manufactured with identical electrical and mechanical components. Any modifications necessary for compliance made during testing must be implemented in all production units for compliance to be maintained.

Underwriters Laboratories Inc., shall have no liability for any deductions, inferences or generalizations drawn from this report. This report shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the United States government.

1.2 Purpose

Testing was performed to the following regulations:

Emissions Standards used: CFR 47 Part 15 Subpart C

Except as noted below, all test methods and data contained in this report are covered by NVLAP accreditation.

Exceptions: None

1.3 Test Results

In Compliance

Statements regarding compliance with requirements and criteria in the subsequent sections of this report are opinions and interpretations provided by Underwriters Laboratories Inc. technical staff.

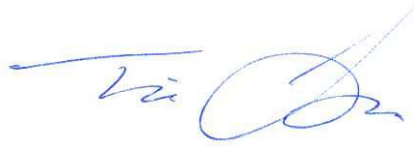
1.4 Documentation Review/Approval

Project Management:



Asim Tirmizi
Project Engineer
International EMC Services
Department 3014A

Technical Review By:



Tim Lee
Staff Engineer
International EMC Services
Department 3014A

2.0 General Product Description

Applicant	: Aerielle Inc.
Manufactured By	: Same as Applicant
License Holder	: Not Applicable
Applicant Address	: 625 Ellis Street, Suite 206 Mountain View, CA 94043
Applicant Contact	: Art Cohen
Model/Type No.	: ATB350i
Date of Issue	: September 14, 2004
File No.	: NC5311
Test Report No.	: NC5311-091404
Project No.	: 04CA41713

Product Description

The Aerielle ATB350 is a low-powered FM Stereo Transmitter designed to operate in the commercial FM broadcast band used in many parts of the world and utilizes a standard 38 kHz L-R subcarrier signal format.

Equipment Size, Mobility, and Identification

Dimensions: 1.03 by 1.660 by 3.80 in.
Mobility: To be connected to an automobile cigarette lighter.
Serial No: 26

Electrical Ratings

	Voltage <u>[Volts]</u>	Current or <u>Power</u>	Frequency <u>[Hz]</u>	<u>Phase</u>
EUT	12 Vdc	25 mA	--	--

Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

<u>Voltage</u>	<u>Frequency</u>
12 V	DC

Tunable Channels

The ATB350 can be tuned to any of the channels within the FM band (88.1-107.9 MHz)

Equipment Type

Pre-Production

Model Differences

Any other model(s) represented by the models tested in this investigation will be documented by the manufacturer.

Device Modifications

The following modifications were necessary for compliance: None

EUT and Peripherals

Description	Manufacturer	Model/Part #	Serial Number
EUT	Aerielle	ATB350	26
Power System	MVP	I-6001	Unknown
MP3 Player	iRiver	IFP595T	Unknown

Cables

Cable Type	Shield	Length (meters)	Ferrite	Connector	Connection Point 1	Connection Point 2
I/O	No	1.5	No	Stereo plug	EUT	MP3 Player

2.1 FCC Section 15.203 Antenna Requirements

The antenna is permanently attached to the PCB and the antenna is internal on the EUT. Therefore, it meets the 15.203 requirements.

2.2 Justification of Configuration

EUT was considered to be operating in a typical mode of operation.

2.3 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

The EUT was connected to an MP3 player and operated both with and without 1 kHz tone depending on the test performed.

3.0 Environmental Conditions in Test Lab

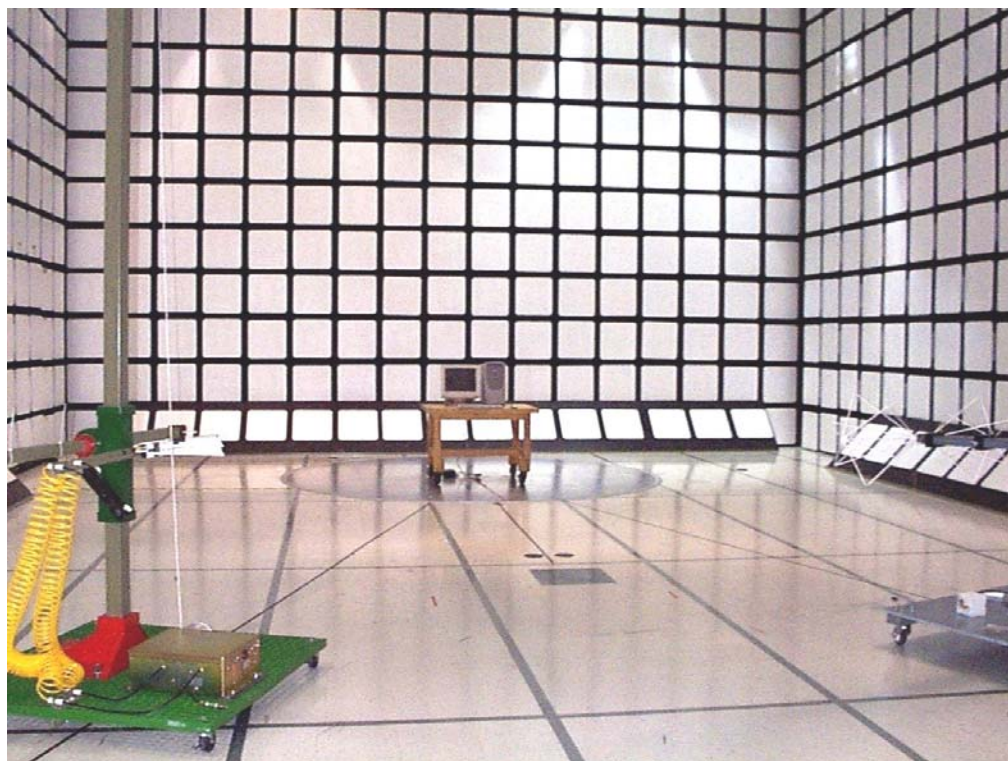
Temperature:	20-25 °C	Atmospheric Pressure:	680-1060 mbar
Relative Humidity:	30-60%		20.1-31.3 in. Hga

4.0 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST), therefore, all test data recorded in this report is traceable to NIST.

5.0 Test Facility

Underwriters Laboratories Inc.
1655 Scott Blvd.
Santa Clara, CA 95050
Phone: (408) 876-2905 Fax: (408) 556-6071



6.0 Accreditations and Authorizations



NVLAP Lab code: 200252-0

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. The specific scope includes IEC/CISPR 22:1997, Amendment 1:1995, Amendment 2:1997, EN 55022:1998, AS/NZS 1044, CNS 13438:1997, ANSI C63.4, FCC Method - 47 CFR Part 15, AS/NZS 3548, AS/NZS CISPR 22, CISPR 14-1, EN 55014-1, CNS 13783-1, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, RSS-112, RSS-117, RSS-118, RSS-119, RSS-123, RSS-125, RSS-128, RSS-129, RSS-130, RSS-131, RSS-132, RSS-133, RSS-134, RSS-135, RSS-136, RSS-137, RSS-139, RSS-141, RSS-142, RSS-170, RSS-181, RSS-182, RSS-187, RSS-188, RSS-191, RSS-192, RSS-193, RSS-210, RSS-212, RSS-213, RSS-215, GR-1089-CORE, SBC-TP-76200 Issue 4, and GR-63-CORE testing.



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland and accepted in a letter dated September 24, 1997 (Ref. No. 31040/SIT 1300F2).



Industry
Canada Industrie
Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3.
File #: IC 2704



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8.
Registration Nos.: (Radiated Emissions) R-672, (Conducted Emissions) C-689.



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6.
U.S. Identifier Number: US0114

7.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

----- United States -----
CFR 47 Part 15 Subpart C : 2004 Code of Federal Regulations, Part 15, Subpart C, Radio Frequency Devices -
Intentional Radiators

7.1 Equipment Classifications

Class A Digital Device: *A digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device which is marketed for use by the general public or is intended to be used in the home.*

Class B Digital Device: *A digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such devices include, but are not limited to, personal computer, calculators, and similar electronic devices that are marketed for use by the general public.*

7.2 Field Strength Calculations

The field strength is calculated by adding the Transducer Factor (Antenna Factor) and Gain/Loss (Cable Loss, Preamp Gain) Factor to the Meter Reading. The basic equation with a sample calculation is as follows:

Field Strength = Meter Reading + Transducer Factor + Gain/Loss

Assume a receiver reading of 53.2 dBuV is obtained. The Transducer Factor of 5.1 dB and a Gain/Loss of -31 dB is added, giving a field strength of 27.3 dBuV.

$$FS = 53.2 + 5.1 + (-31) = 27.3 \text{ dBuV}$$

Use the following formula to convert dBμV to μV: $x = 10^{(y/20)}$, where x is the value in μV and y is the value in dBμV.

$$\text{Level in uV} = 10^{(27.3/20)} = 23.2 \text{ uV}$$

7.3 Measurement Uncertainty

When a measurement is made the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its “true” value.

Uncertainty (dB)

Test Distance	Probability Distribution	Biconical Antenna			Log Periodic Antenna		
		10m +18 deg	10m -14 deg	3m	10m +18 deg	10m -14 deg	3m
Combined Standard Uncertainty $u_c(y)$	Normal	± 1.24	± 1.25	± 1.29	± 1.14	± 1.13	± 1.9
Expanded uncertainty U (level of confidence = 95%)	Normal (k = 2)	± 2.47	± 2.49	± 2.59	± 2.28	± 2.27	± 2.76

Conducted Voltage Emissions	Probability Distribution
Combined Standard Uncertainty $u_c(y)$	Normal
Expanded uncertainty U (level of confidence = 95%)	Normal (k = 2)
	± 1.08
	± 2.16

$u_c(y)$ = square root of the sum of squares of the individual standard deviation uncertainties.

U = combined standard uncertainty multiplied by the coverage factor: k. This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required then k=3 (CL=97%) can be used.

“ISO Guide to the Expression of Uncertainty in Measurements” and ‘NIS81: The Treatment of Uncertainty in EMC Measurements” were the basis for determining the uncertainty levels of our measurements. Details of those calculations are available upon request.

7.4 Measurement Bandwidths

Frequency Range (MHz)	Peak Data BW (kHz)	Quasi-Peak Data BW (kHz)	Average Data BW (kHz)
0.01 - 0.15	1	3	0.2
0.15 - 30	10	9	100
30 - 1000	100	120	120
Above 1000	1000	N/A	1000

7.5 Conducted Voltage Emissions; Section 15.207

UL Procedure

3314-LPG-004

Conducted voltage emissions are performed using a calibrated line impedance stabilization network (LISN), which isolates product emissions. The LISN is connected to a spectrum analyzer which scans the frequency range of measurement.

Remarks

The EUT is powered by a automobile cigarette lighter, therefore, would not connect to the ac mains. This test was not performed.

7.6 Radiated Electric Field Emissions

Test Location

Date Tested: 8/27/04

10 Meter Semi-Anechoic Chamber (Test Station 2) (Last NSA: 1/8/2004; Next NSA 1/8/2005)

Test Instruments

Instrument	Manufacturer	Model	ID#	Last	Cal
					Next
Spectrum Analyzer	Hewlett-Packard	8566B	8034	6/10/2004	6/10/2005

Test Accessories

Instrument	Manufacturer	Model	ID#	Last	Cal
					Next
Biconical Antenna	Electro-Metrics	EM-6912A	8018	12/17/03	12/17/04
Log Periodic Antenna	Electro-Metrics	EM-6950	8017	12/16/03	12/16/04
6dB Res Band Display	Hewlett-Packard	85662A	8031	6/10/2004	6/10/2005
Quasi-Peak Detector	Hewlett-Packard	85650A	8030	6/10/2004	6/10/2005
Switch Driver	Hewlett-Packard	11713A	8036	6/10/2004	6/10/2005
Pre-amplifier	Sonoma Instruments	310N	8085	12/17/03	12/17/04

UL Procedure

3314-LPG-013

Radiated spurious emissions applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in 15.209. The limit for the fundamental emission is listed in 15.239(b) to be 250 $\mu\text{V/m}$ @ 3m, or 37.5 $\text{dB}\mu\text{V/m}$ @ 10m. Radiated spurious emissions tests were performed in a semi-anechoic chamber using a remote controlled turntable and the appropriate measuring antenna. Both antenna and turntable are adjusted to determine maximum emissions levels. The spectrum analyzer scanned up to 1 GHz.

Frequency Range of Measurement

30 MHz to 1 GHz

Measurement Distance

10 meters

Test Results

The requirements are:

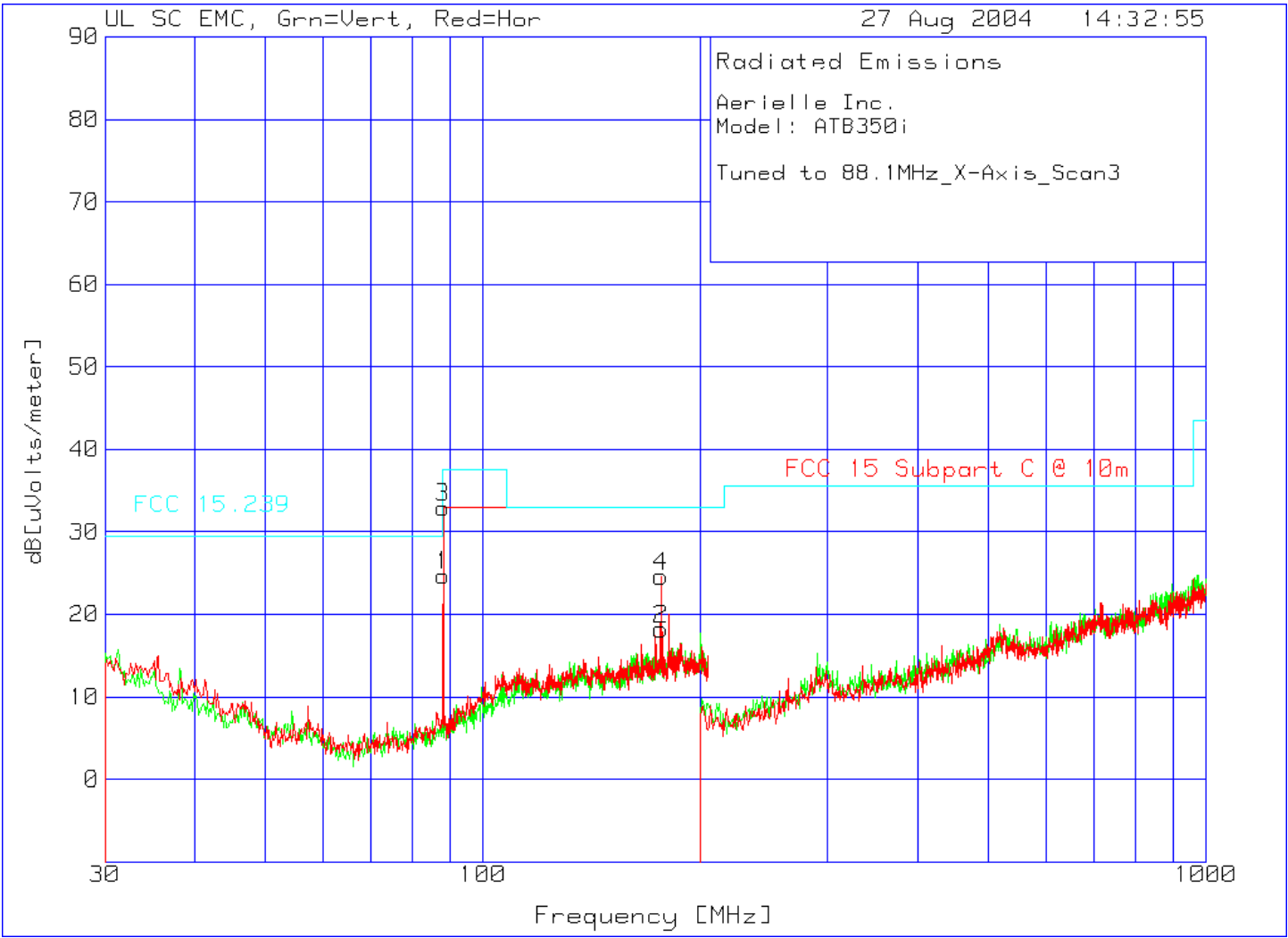
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Tuned Frequency (MHz)	Margin to 15.239		Margin to 15.209	
	dB ($\mu\text{V/m}$)	Frequency (MHz)	dB ($\mu\text{V/m}$)	Frequency (MHz)
88.1	0.9	88.1004	8.4	176.3
98.1	0.1	98.1	206	196.425
107.7	5.3	107.7	1.1	215.4046

Remarks

None

Test Data



Company: Aerielle Inc.
Project: 04CA41713

Model #: ATB350
Report #:NC5311-091404

Aerielle Inc.
Model: ATB350i
Tuned to 88.1MHz_
X-Axis_Scan3

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 205MHz -----							
1	88.275	43.3 pk	-26.9	9.2	25.6	33	37.5
	Azimuth:226	Height:100 Vert		Margin [dB]		-7.4	-11.9
4	176.3	27.8 pk	-26.2	15.9	17.5	33	33
	Azimuth:45	Height:100 Vert		Margin [dB]		-15.5	-15.5

Range: 2 30 - 205MHz -----							
2	88.275	50 pk	-26.9	9.6	32.7	33	37.5
	Azimuth:225	Height:399 Horz		Margin [dB]		-.3	-4.8
3	176.3	34.1 pk	-26.2	15.7	23.6	33	33
	Azimuth:270	Height:399 Horz		Margin [dB]		-9.4	-9.4

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

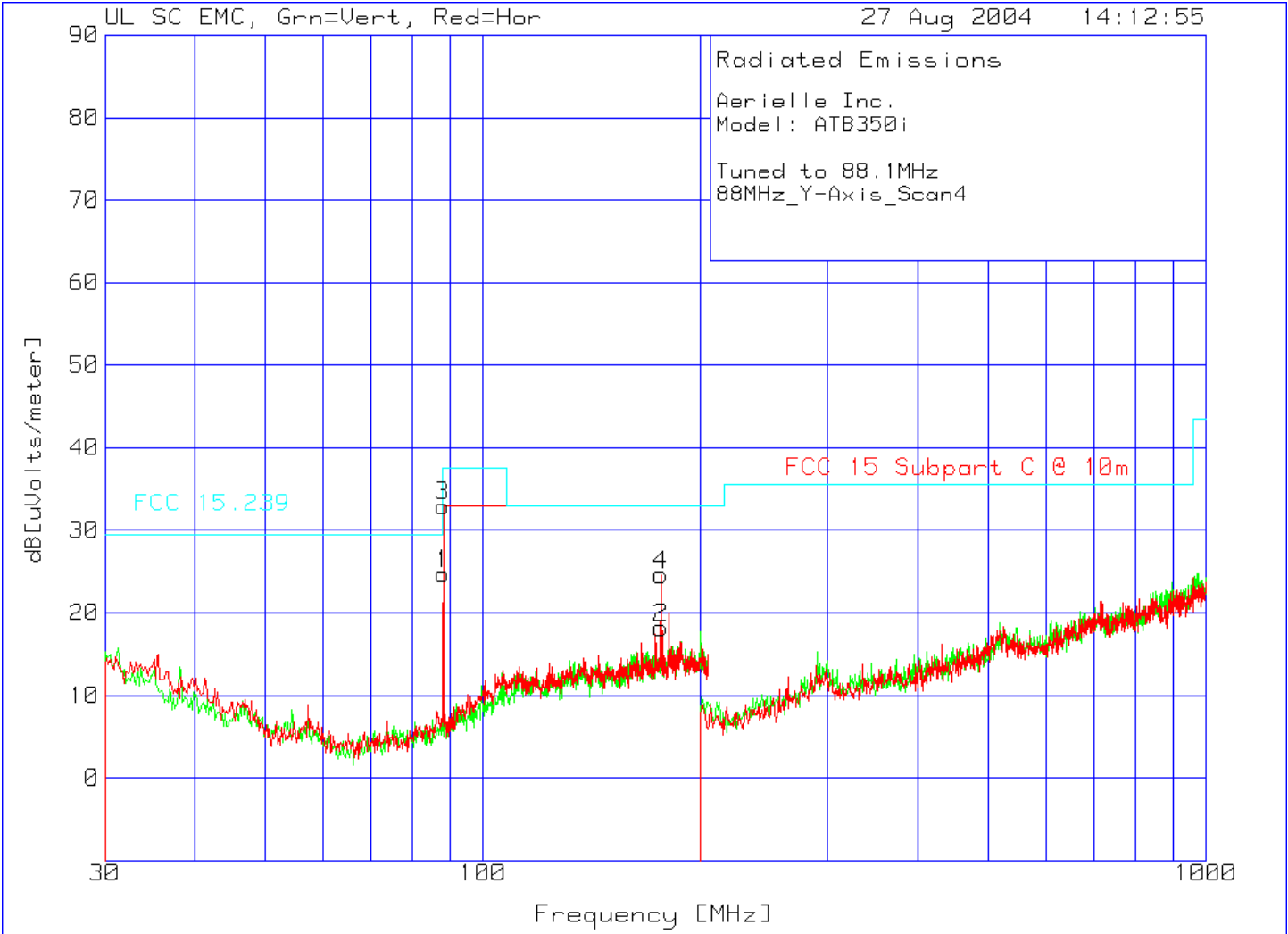
pk - Peak detector

Aerielle Inc.
Model: ATB350i
Tuned to 88.1MHz
88MHz_X-Axis_Scan3

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====						
Range: 2 30 - 205MHz						
88.0962	53.2 pk	-27	9.6	35.8	33	37.5
Azimuth: 254	Height:342 Horz			Margin [dB]:	2.8	-1.7

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector



Company: Aerielle Inc.
Project: 04CA41713

Model #: ATB350
Report #:NC5311-091404

Aerielle Inc.
Model: ATB350i
Tuned to 88.1MHz
88MHz_Y-Axis_Scan4

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 205MHz -----							
1	88.1	42.5 pk	-27	9.2	24.7	33	37.5
	Azimuth:225	Height:100	Vert	Margin [dB]		-8.3	-12.8
2	176.3	28.5 pk	-26.2	15.9	18.2	33	33
	Azimuth:315	Height:100	Vert	Margin [dB]		-14.8	-14.8

Range: 2 30 - 205MHz -----							
3	88.1	50.3 pk	-27	9.6	32.9	33	37.5
	Azimuth:271	Height:400	Horz	Margin [dB]		-.1	-4.6
4	176.3	35.1 pk	-26.2	15.7	24.6	33	33
	Azimuth:271	Height:400	Horz	Margin [dB]		-8.4	-8.4

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

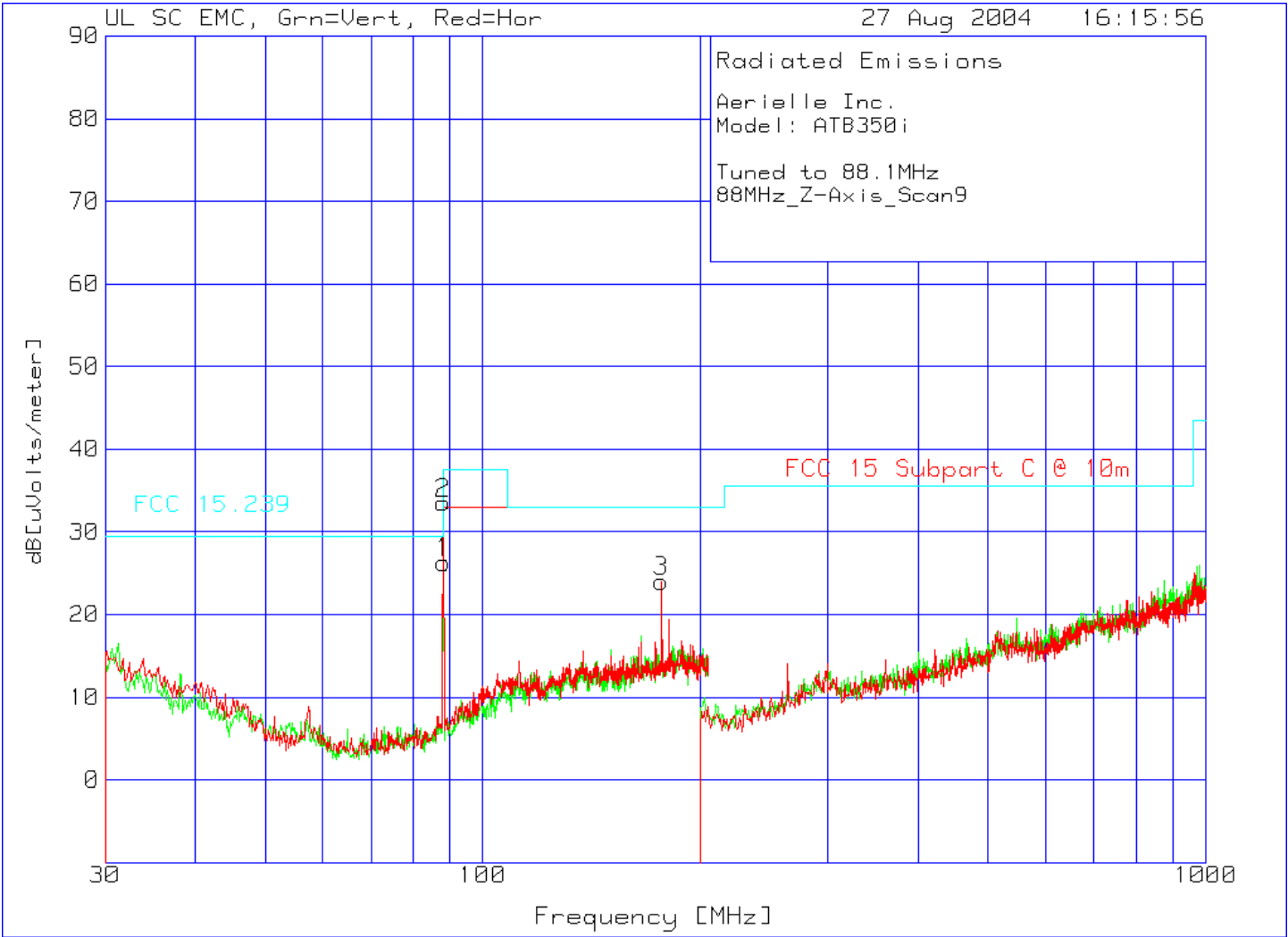
pk - Peak detector

Aerielle Inc.
Model: ATB350i
Tuned to 88.1MHz
88MHz_Y-Axis_Scan4

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====						
Range: 2 30 - 205MHz						
88.0962	53.4 pk	-27	9.6	36	33	37.5
Azimuth: 251	Height:331	Horz	Margin [dB]:		3	-1.5
88.0962	53.3 pk	-27	9.6	35.9	33	37.5
Azimuth: 251	Height:331	Horz	Margin [dB]:		2.9	-1.6

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector



Company: Aerielle Inc.
Project: 04CA41713

Model #: ATB350
Report #:NC5311-091404

Aerielle Inc.
Model: ATB350i
Tuned to 88.1MHz
88MHz_Z-Axis_Scan9

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 205MHz -----							
1	88.275	44 pk	-26.9	9.2	26.3	33	37.5
	Azimuth:226	Height:100	Vert	Margin [dB]		-6.7	-11.2
Range: 2 30 - 205MHz -----							
2	88.1	50.9 pk	-27	9.6	33.5	33	37.5
	Azimuth:225	Height:399	Horz	Margin [dB]		.5	-4
3	176.475	34.5 pk	-26.2	15.7	24	33	33
	Azimuth:45	Height:399	Horz	Margin [dB]		-9	-9

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

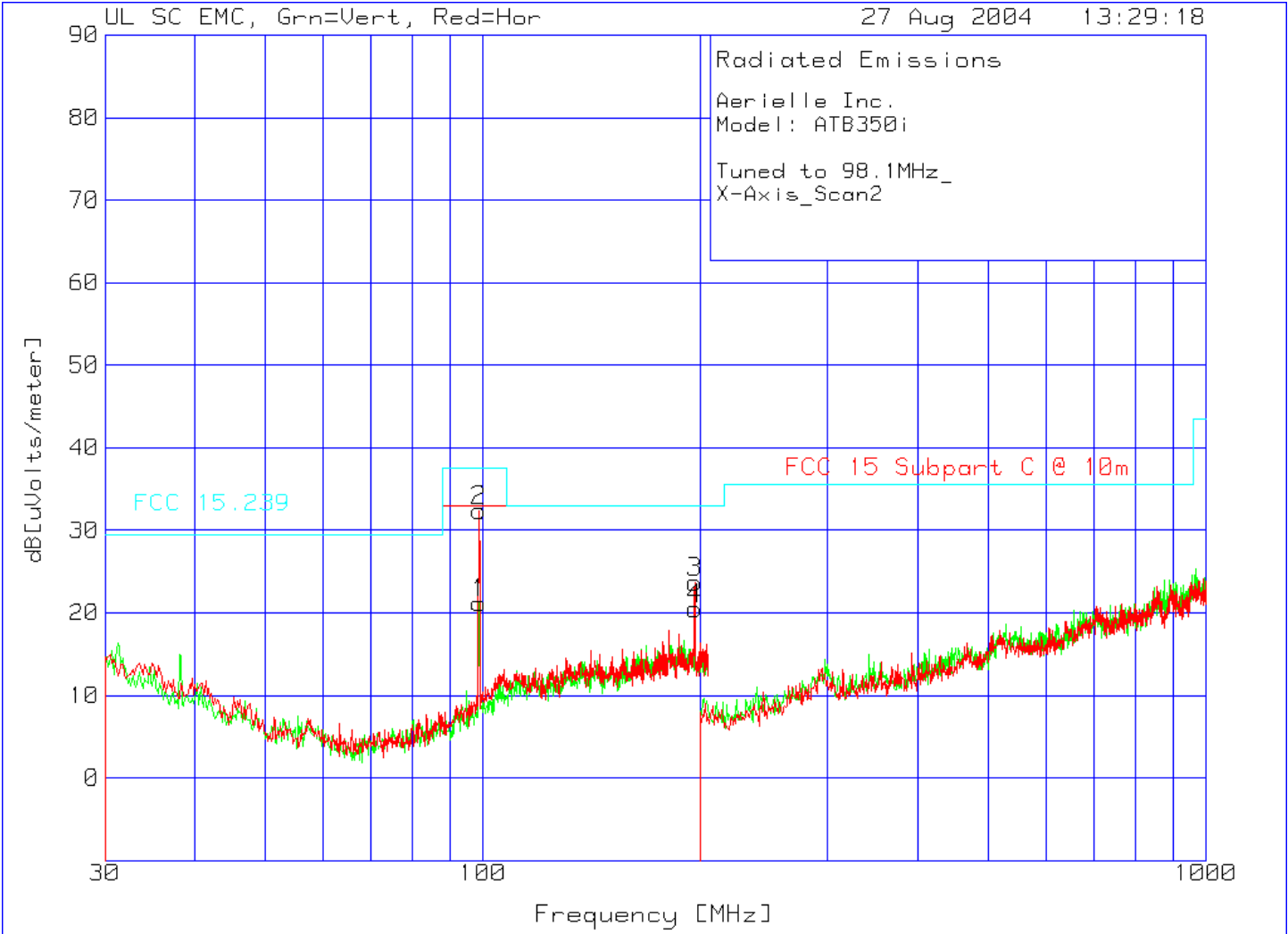
pk - Peak detector

Aerielle Inc.
Model: ATB350i
Tuned to 88.1MHz
88MHz_Z-Axis_Scan9

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency	Reading	Factor	Factor	dB[uVolts/meter]		
[MHz]	[dB (uV)]	[dB]	[dB]			
=====						
Range: 2 30 - 205MHz						
88.1004	54 pk	-27	9.6	36.6	33	37.5
Azimuth: 237	Height:340	Horz	Margin [dB]:	3.6		-.9
88.0844	52.7 pk	-27	9.6	35.3	33	37.5
Azimuth: 237	Height:344	Horz	Margin [dB]:	2.3		-2.2

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector



Company: Aerielle Inc.
Project: 04CA41713

Model #: ATB350
Report #:NC5311-091404

Aerielle Inc.
Model: ATB350i
Tuned to 98.1MHz_
X-Axis_Scan2

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 205MHz -----							
1	98.775	37.7 pk	-27	10.5	21.2	33	37.5
	Azimuth:181	Height:100 Vert		Margin [dB]		-11.8	-16.3
4	196.425	30.3 pk	-25.9	16.1	20.5	33	33
	Azimuth:271	Height:100 Vert		Margin [dB]		-12.5	-12.5

Range: 2 30 - 205MHz -----							
2	98.775	48.1 pk	-27	11.3	32.4	33	37.5
	Azimuth:45	Height:400 Horz		Margin [dB]		-.6	-5.1
3	196.425	33.7 pk	-25.9	15.9	23.7	33	33
	Azimuth:271	Height:400 Horz		Margin [dB]		-9.3	-9.3

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

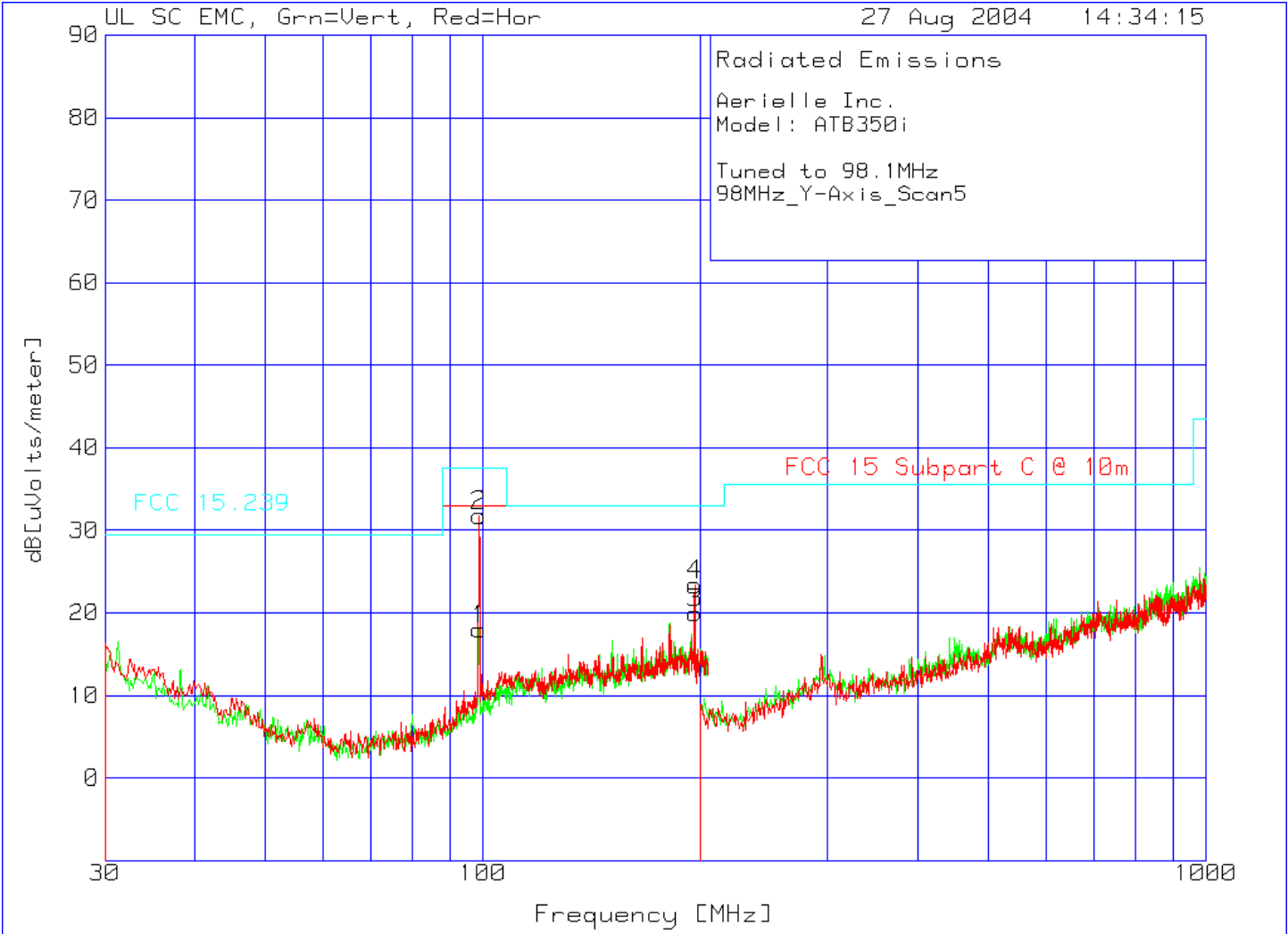
pk - Peak detector

Aerielle Inc.
Model: ATB350i
Tuned to 98.1MHz
98MHz_X-Axis_Scan2

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====						
Range: 2 30 - 205MHz						
98.1	50.5 pk	-27	11.2	34.7	33	37.5
	Azimuth: 253	Height:323 Horz		Margin [dB]:	1.7	-2.8
98.1034	50.4 pk	-27	11.2	34.6	33	37.5
	Azimuth: 253	Height:323 Horz		Margin [dB]:	1.6	-2.9

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector



Company: Aerielle Inc.
Project: 04CA41713

Model #: ATB350
Report #:NC5311-091404

Aerielle Inc.
Model: ATB350i
Tuned to 98.1MHz
98MHz_Y-Axis_Scan5

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 205MHz -----							
1	98.775	34.5 pk	-27	10.5	18	33	37.5
	Azimuth:180	Height:100	Vert	Margin [dB]		-15	-19.5
3	196.425	29.8 pk	-25.9	16.1	20	33	33
	Azimuth:225	Height:100	Vert	Margin [dB]		-13	-13

Range: 2 30 - 205MHz -----							
2	98.775	47.5 pk	-27	11.3	31.8	33	37.5
	Azimuth:271	Height:399	Horz	Margin [dB]		-1.2	-5.7
4	196.425	33.4 pk	-25.9	15.9	23.4	33	33
	Azimuth:271	Height:399	Horz	Margin [dB]		-9.6	-9.6

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector

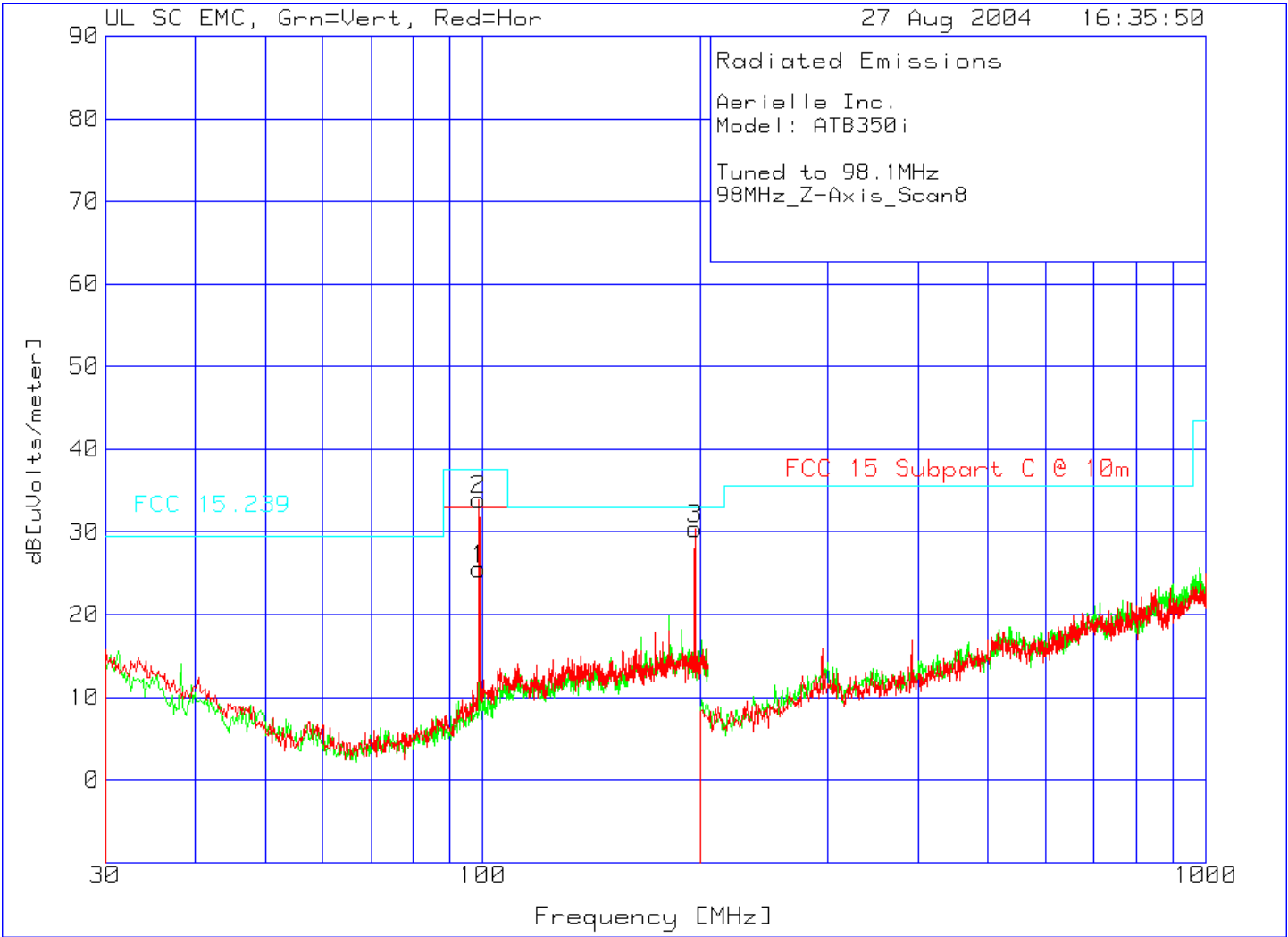
Aerielle Inc.
Model: ATB350i
Tuned to 98.1MHz
98MHz_Y-Axis_Scan5

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====						
Range: 2 30 - 205MHz						
98.0965	50.6 pk	-27	11.2	34.8	33	37.5
Azimuth: 56	Height:326	Horz	Margin [dB]:		1.8	-2.7

98.105	50.6 pk	-27	11.2	34.8	33	37.5
Azimuth: 56	Height:326	Horz	Margin [dB]:		1.8	-2.7

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector



Company: Aerielle Inc.
Project: 04CA41713

Model #: ATB350
Report #:NC5311-091404

Aerielle Inc.
Model: ATB350i
Tuned to 98.1MHz
98MHz_Z-Axis_Scan8

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 205MHz -----							
1	98.775	42 pk	-27	10.5	25.5	33	37.5
	Azimuth:181	Height:100	Vert	Margin [dB]		-7.5	-12

Range: 2 30 - 205MHz -----							
2	98.6	49.6 pk	-27	11.3	33.9	33	37.5
	Azimuth:226	Height:400	Horz	Margin [dB]		.9	-3.6
3	196.425	40.4 pk	-25.9	15.9	30.4	33	33
	Azimuth:271	Height:400	Horz	Margin [dB]		-2.6	-2.6

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

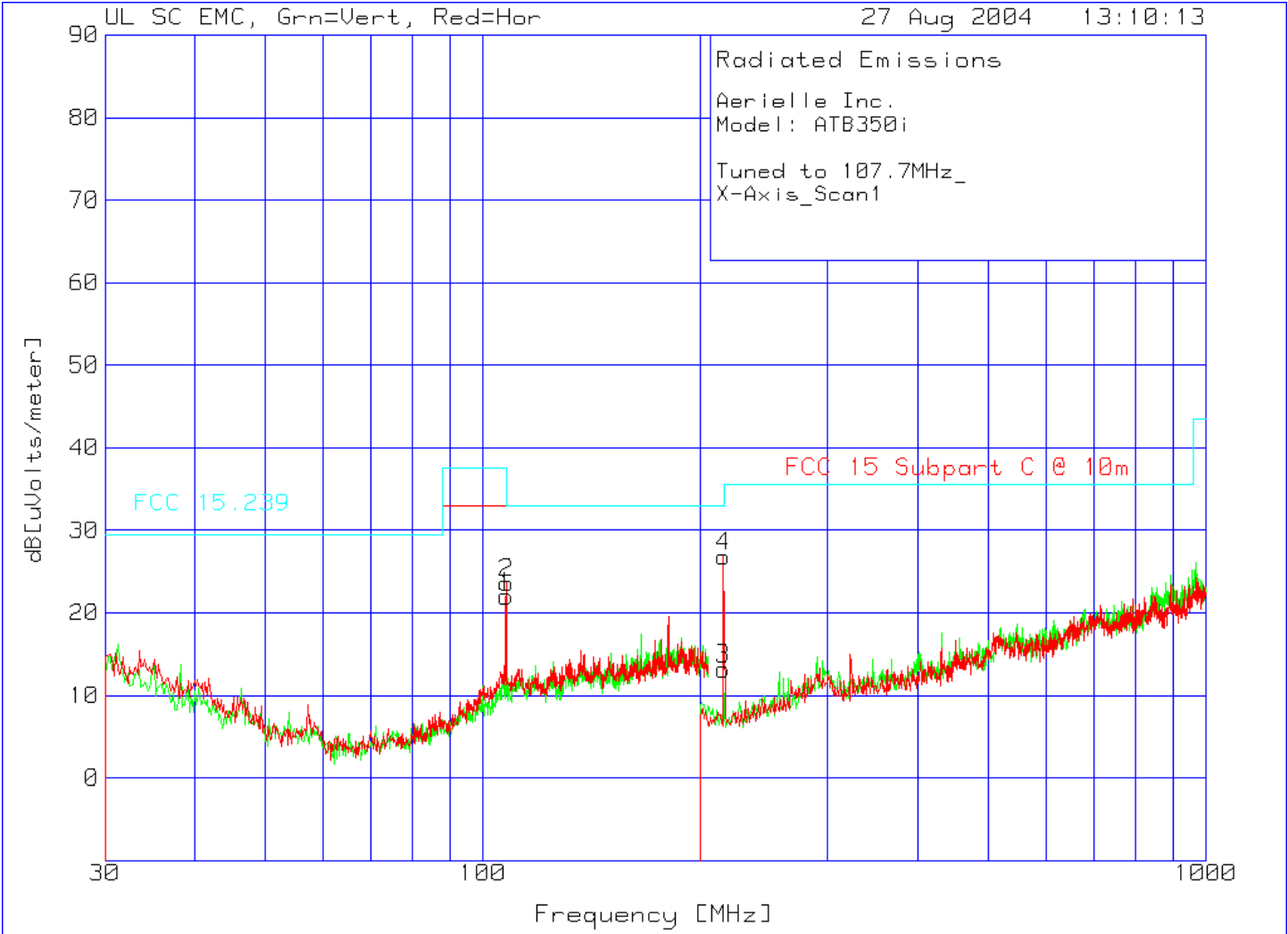
pk - Peak detector

Aerielle Inc.
Model: ATB350i
Tuned to 98.1MHz
98MHz_Z-Axis_Scan8

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency	Reading	Factor	Factor	dB[uVolts/meter]		
[MHz]	[dB (uV)]	[dB]	[dB]			
=====						
Range: 2 30 - 205MHz						
98.1	53.2 pk	-27	11.2	37.4	33	37.5
Azimuth: 240	Height:317	Horz	Margin [dB]:	4.4		-.1
98.1	52.9 pk	-27	11.2	37.1	33	37.5
Azimuth: 240	Height:317	Horz	Margin [dB]:	4.1		-.4

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector



Company: Aerielle Inc.
Project: 04CA41713

Model #: ATB350
Report #:NC5311-091404

Aerielle Inc.
Model: ATB350i
Tuned to 107.7MHz_
X-Axis_Scan1

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 205MHz -----							
1	107.7	36.1 pk	-26.6	12.5	22	33	37.5
	Azimuth:226	Height:100	Vert	Margin [dB]		-11	-15.5
Range: 2 30 - 205MHz -----							
2	107.875	37.7 pk	-26.6	12.5	23.6	33	37.5
	Azimuth:271	Height:400	Horz	Margin [dB]		-9.4	-13.9
Range: 3 200 - 1000MHz -----							
3	215.2	29.5 pk	-27.3	11	13.2	33	33
	Azimuth:315	Height:102	Vert	Margin [dB]		-19.8	-19.8
Range: 4 200 - 1000MHz -----							
4	215.2	43.4 pk	-27.3	10.7	26.8	33	33
	Azimuth:91	Height:400	Horz	Margin [dB]		-6.2	-6.2

LIMIT 1: FCC 15 Subpart C @ 10m

LIMIT 2: FCC 15.239

pk - Peak detector

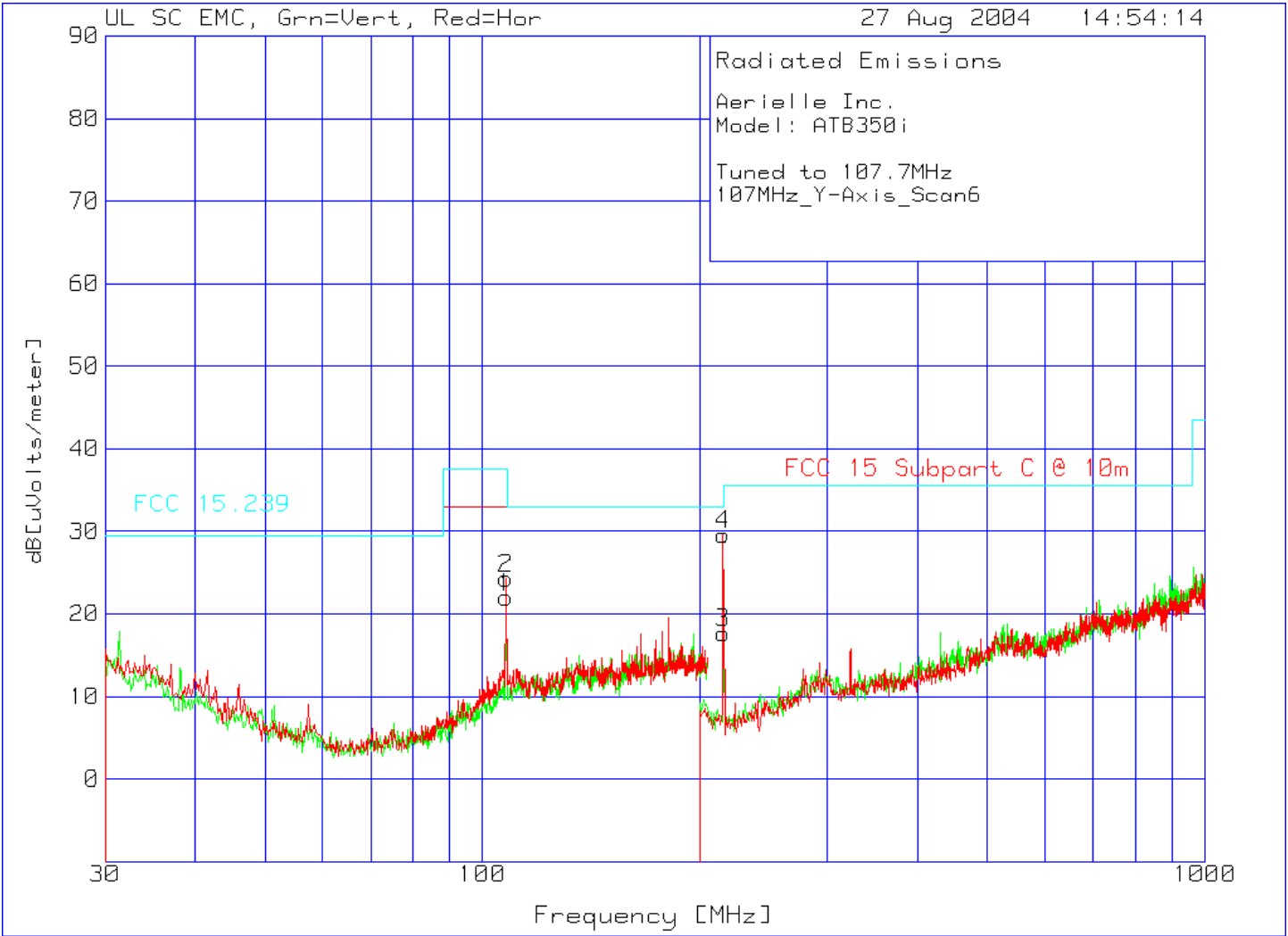
Aerielle Inc.
Model: ATB350i
Tuned to 107.7MHz
107MHz_X-Axis_Scan1

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====						
Range: 2 30 - 205MHz						
107.6996	39.9 pk	-26.6	12.5	25.8	33	37.5
Azimuth: 290	Height:400	Horz	Margin [dB]:		-7.2	-11.7
Range: 4 200 - 1000MHz						
215.4098	46.4 pk	-27.3	10.7	29.8	33	33
Azimuth: 294	Height:376	Horz	Margin [dB]:		-3.2	-3.2

LIMIT 1: FCC 15 Subpart C @ 10m

LIMIT 2: FCC 15.239

pk - Peak detector



Company: Aerielle Inc.
Project: 04CA41713

Model #: ATB350
Report #:NC5311-091404

Aerielle Inc.
Model: ATB350i
Tuned to 107.7MHz
107MHz_Y-Axis_Scan6

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 205MHz -----							
1	107.7	36.1 pk	-26.6	12.5	22	33	37.5
	Azimuth:360	Height:100	Vert	Margin [dB]		-11	-15.5
Range: 2 30 - 205MHz -----							
2	107.7	38.4 pk	-26.6	12.5	24.3	33	37.5
	Azimuth:45	Height:399	Horz	Margin [dB]		-8.7	-13.2
Range: 3 200 - 1000MHz -----							
3	215.2	34 pk	-27.3	11	17.7	33	33
	Azimuth:90	Height:100	Vert	Margin [dB]		-15.3	-15.3
Range: 4 200 - 1000MHz -----							
4	215.2	46.2 pk	-27.3	10.7	29.6	33	33
	Azimuth:91	Height:400	Horz	Margin [dB]		-3.4	-3.4

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

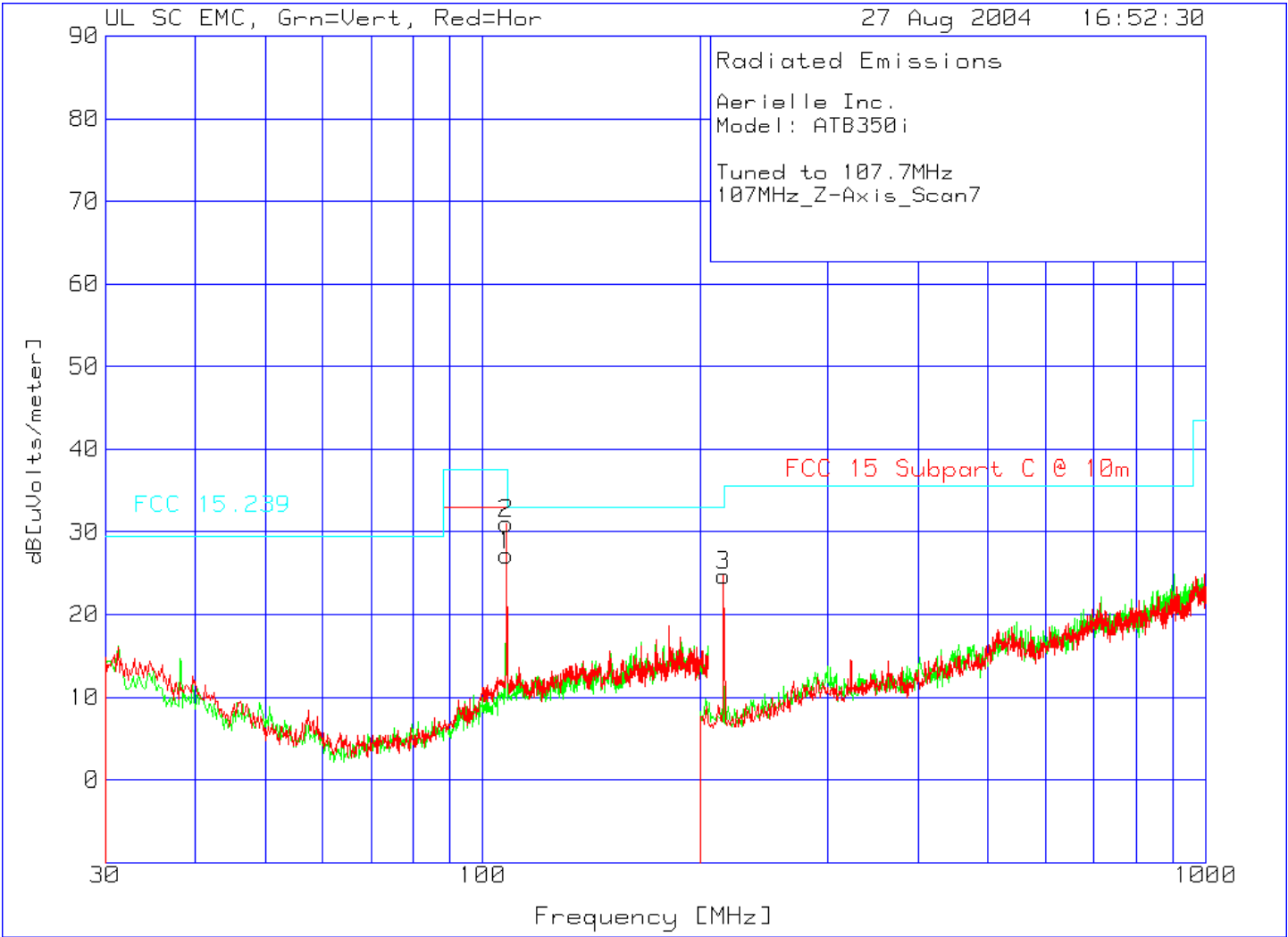
pk - Peak detector

Aerielle Inc.
Model: ATB350i
Tuned to 107.7MHz
107MHz_Y-Axis_Scan6

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====						
Range: 2 30 - 205MHz						
107.704	39.9 pk	-26.6	12.5	25.8	33	37.5
Azimuth: 30	Height:387	Horz	Margin [dB]:		-7.2	-11.7
Range: 4 200 - 1000MHz						
215.4046	48.5 pk	-27.3	10.7	31.9	33	33
Azimuth: 302	Height:381	Horz	Margin [dB]:		-1.1	-1.1
215.3992	48.4 pk	-27.3	10.7	31.8	33	33
Azimuth: 302	Height:381	Horz	Margin [dB]:		-1.2	-1.2

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector



Company: Aerielle Inc.
Project: 04CA41713

Model #: ATB350
Report #:NC5311-091404

Aerielle Inc.
Model: ATB350i
Tuned to 107.7MHz
107MHz_Z-Axis_Scan7

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 205MHz -----							
1	107.7	41.3 pk	-26.6	12.5	27.2	33	37.5
	Azimuth:225	Height:100	Vert	Margin [dB]		-5.8	-10.3

Range: 2 30 - 205MHz -----							
2	107.7	45.1 pk	-26.6	12.5	31	33	37.5
	Azimuth:225	Height:399	Horz	Margin [dB]		-2	-6.5

Range: 4 200 - 1000MHz -----							
3	215.2	41.3 pk	-27.3	10.7	24.7	33	33
	Azimuth:271	Height:400	Horz	Margin [dB]		-8.3	-8.3

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector

Aerielle Inc.
Model: ATB350i
Tuned to 107.7MHz
107MHz_Z-Axis_Scan7

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====						
Range: 2 30 - 205MHz						
107.7	46.3 pk	-26.6	12.5	32.2	33	37.5
Azimuth: 242	Height:400	Horz	Margin [dB]:		-.8	-5.3

Range: 4 200 - 1000MHz						
215.4098	46.3 pk	-27.3	10.7	29.7	33	33
Azimuth: 276	Height:400	Horz	Margin [dB]:		-3.3	-3.3

LIMIT 1: FCC 15 Subpart C @ 10m
LIMIT 2: FCC 15.239

pk - Peak detector

Photographs



7.7 Occupied Bandwidth; Section 15.239(a)

Test Location

Ground Plane #1 (Test Station 5)

Date Tested: 8/27/04

Test Instruments

Instrument	Manufacturer	Model	ID#	Last	Cal
					Next
Spectrum Analyzer	Hewlett-Packard	8546A	8098	10/24/03	10/24/04

UL Procedure

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz. The measurement was made with the spectrum analyzer's resolution bandwidth set to (RBW) = 10 kHz. The VBW = RBW. The frequency difference of two frequencies that are attenuated 26 dB from the peak of the unmodulated signal down the slopes of the modulated signal envelope are recorded. The difference of these two frequencies gives the occupied bandwidth.

Test Data

Fundamental Frequency (MHz)	Bandwidth (kHz)
88.1	137.5
98.1	150.0
107.7	173.5

Test Results

The requirements are:

MET maximum emission bandwidth is 173.5 kHz.

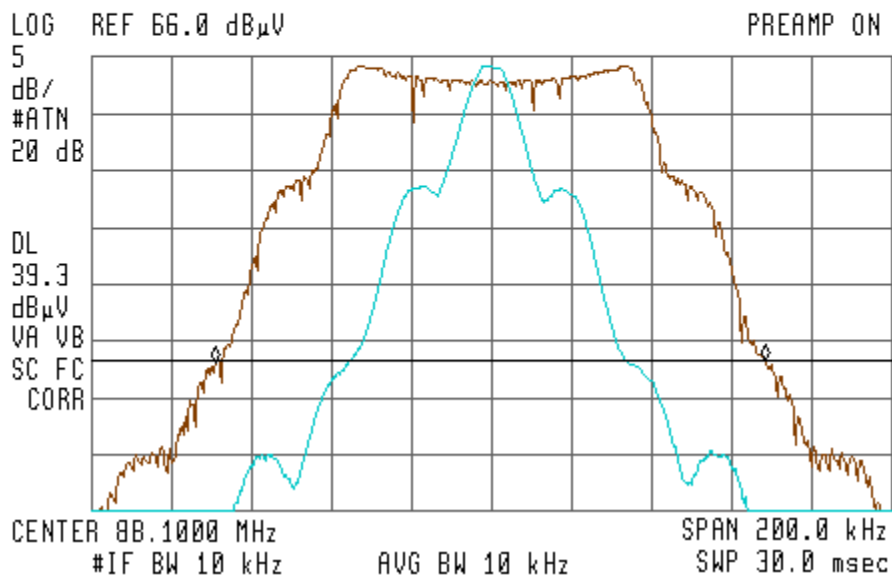
Remarks

None

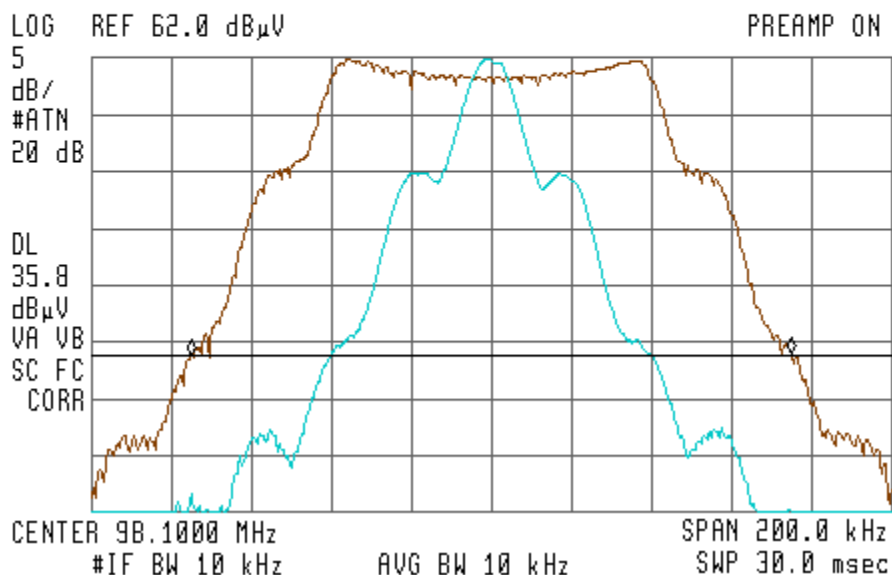
Test Data



ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ 137.5 kHz
.19 dB



ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ -150.0 kHz
-.04 dB





ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRΔ 173.5 kHz
-.09 dB

