



# FCC PART 15B

## TEST AND MEASUREMENT REPORT

For

**AOR USA, INC.**

20655 S. Western Ave., Suite 112,

Torrance, CA 90501, USA

**FCC ID: NVJAR5001D**  
**Model: AR5001D**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Digital Processing Communications Receiver
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**DOCUMENT REVISION HISTORY**

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1207099	Original Report	2012-08-01

## 1 General Information

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### 1.1 Product Description for Equipment under Test (EUT)

This test and measurement report has been prepared on behalf of *AOR USA, INC* on their product model, *AR5001D, FCC ID: NVJAR5001D* or the EUT (Equipment Under Test) as referred to in the rest of this report. The EUT is a Digital Processing Communications Receiver, frequency range from 40 kHz to 3.15 GHz except US Cellular Frequencies.

### 1.2 Mechanical Description of EUT

The EUT measures approximately 30cm (L) x 21m (W) x 9cm (H) and weighs approximately 5 kg.

*The data gathered are from a production sample provided by the manufacturer, serial number: 09350141*

### 1.3 Objective

This report is prepared on behalf of *AOR USA, INC* in accordance with Part 15, Subparts A and B of the Federal Communications Commission rules.

The objective is to determine compliance with Part 15 of the FCC Rules Class B limits for conducted and radiated emission requirements for Information Technology Equipment as well as FCC 15.121 for additional cellular band rejection requirement for scanning receiver.

### 1.4 Related Submittal(s)/Grant(s)

N/A

### 1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All tests were performed at Bay Area Compliance Laboratories Corp.

## 1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2:2003, The Treatment of Uncertainty in EMC Measurements, the values ranging from  $\pm 2.0$  dB for Conducted Emissions tests and  $\pm 4.0$  dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

## 1.7 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2003, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: R-3729, C-4176, G-469, and T-1206. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is an American Association for Laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

<http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b>

## 2 System Test Configuration

### 2.1 Justification

The EUT was configured in accordance to ANSI C63.4-2003 Standards.

### 2.2 EUT Exercise Software

EUT was set to scanning mode, FM mode, AM mode, CW mode and SSB mode etc. During the test the signal from the signal generator with the modulated/CW signal was send to the antenna port of the EUT.

### 2.3 Equipment Modifications

N/A

### 2.4 Local Support Equipment

Manufacturers	Descriptions	Models	Serial Numbers
HP	Signal Generator	8648C	3847M001143

### 2.5 EUT Internal Configuration Details

Manufacturers	Descriptions	Models	Serial Numbers
AOR	Controller Block	AR2300	071109-3
AOR	Decoder	AR2300	080210-5

### 2.6 External I/O Cabling List and Details

Cable Descriptions	Length (m)	From	To
BNC Cable	3	EUT ANT 1	Signal Generator
BNC Cable	3	EUT ANT 2/HF	Signal Generator

### 2.7 Power Supply List and Details

Manufacturer	Description	Model	Serial Number
SINPRO	Power Supply	AA2300	057369470938

### 3 Summary of Test Results

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FCC Rules	Descriptions of Test	Result (s)
§15.107	Conducted Emissions	Compliant
§15.109	Radiated Spurious Emissions	Compliant
§15.121	Scanning Receiver Cellular Band Rejection	Compliant

## 4 FCC §15.107 – AC Line Conducted Emissions

### 4.1 Applicable Standards

#### As per FCC §15.107: Conducted Limits

(a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Table 1- Limits for conducted disturbance at the mains ports of class B ITE

Frequency range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

### 4.2 EUT Setup

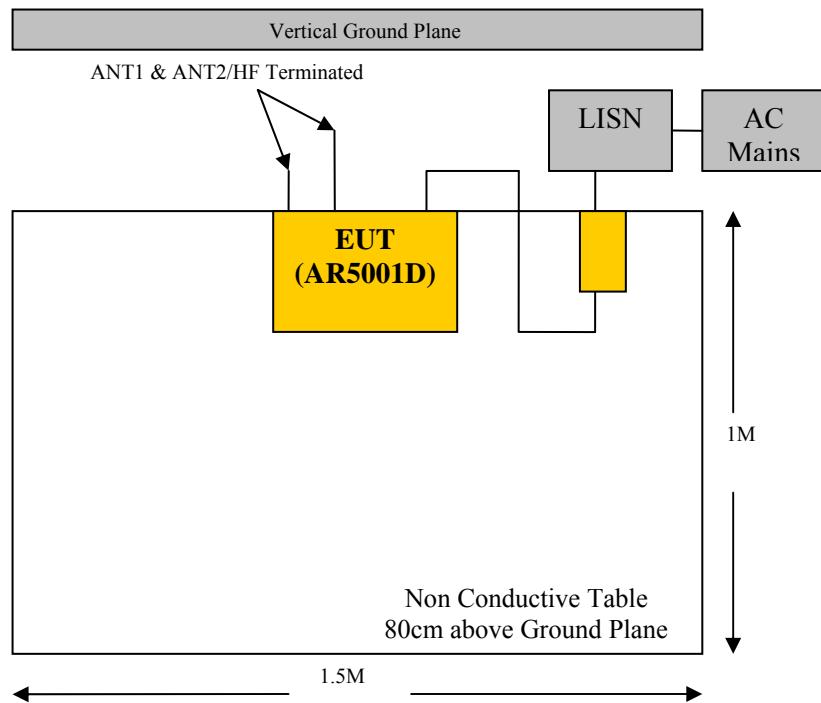
The conducted emissions tests were performed in the 5-meter test chamber, using the setup in accordance with FCC Part 15 measurement procedures. The specifications used were in accordance with FCC Part 15B, Class B limits.

The spacing between the peripherals was 10 cm.

The external I/O cables were draped along the test table and bundled as required.

The EUT was connected to a 120 V, 60 Hz AC line power source and the EUT was set to scanning mode represent the worst case during the testing for conducted emissions.

### 4.3 Test Setup Block Diagram



### 4.4 Test Procedure

During the conducted emissions test, the power cord of the EUT was connected to the main outlet of the LISN.

Maximization procedure was performed on the six (6) highest emission readings from the EUT.

### 4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Cable Loss (CL) and the Attenuator Factor (Atten) to indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + CL + Atten$$

For example, a corrected amplitude of 46 dBuV = Indicated Reading (32.5 dBuV) + Cable Loss (3.5 dB) + Attenuator (10 dB)

The “Margin” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Class B Limit}$$

## 4.6 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950k03	100338	2011-09-14
Solar Electronics	LISN	9252-R-24-BNC	511205	2012-06-25
TTE	High Pass Filter	K7133	H962-150K-50-21378	2012-05-30
HP	Signal Generator	8648C	3847M001143	2010-11-22 <sup>Note1</sup>

*Note1: Based on a two-year calibration cycle*

**Statement of Traceability:** BACL Corp. attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.

## 4.7 Test Environmental Conditions

<b>Temperature:</b>	22° C
<b>Relative Humidity:</b>	44%
<b>ATM Pressure:</b>	102.1kPa

*Testing was performed by Charles Vergonio on 2012-07-12 in 10 meter chamber1.*

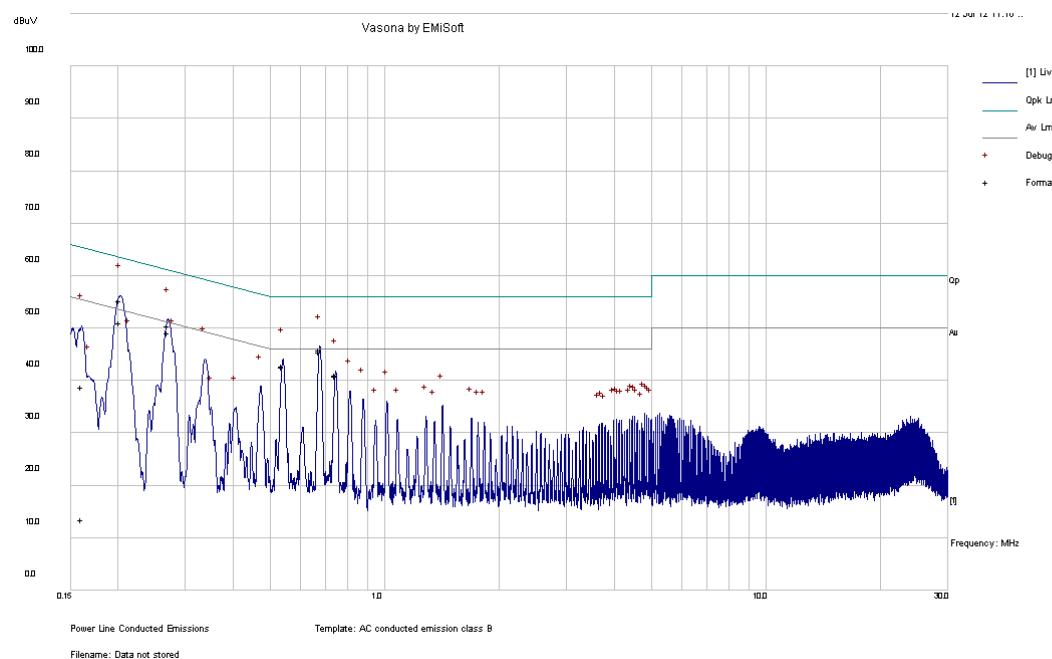
## 4.8 Summary of Test Results

According to the recorded data, the EUT complied with FCC Part 15B Class B limits, and had the worst margin reading of:

<b>Mode: 120 V/60 Hz – Scanning Mode (Worst Case)</b>			
<b>Margin (dB)</b>	<b>Frequency (MHz)</b>	<b>Conductor (Line/Neutral)</b>	<b>Range (MHz)</b>
-0.64	0.67535	Neutral	0.15 MHz to 30 MHz

## 4.9 Conducted Emissions Test Plots and Data

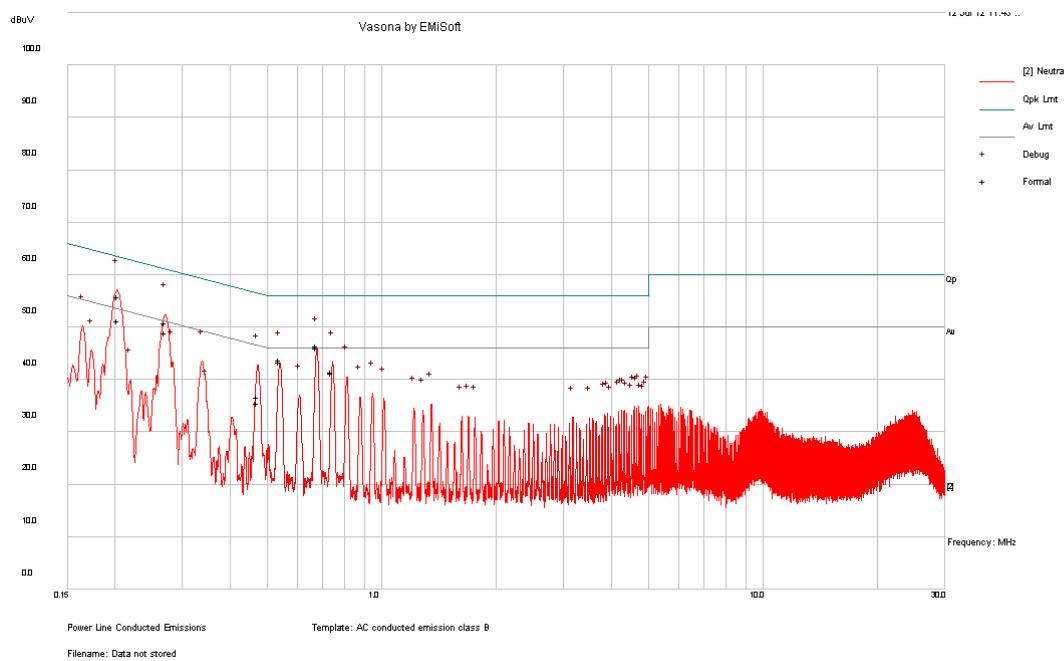
### 120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector
0.20259	55.27	Line	63.5	-8.24	Quasi-Peak
0.675027	45.54	Line	56	-10.46	Quasi-Peak
0.270699	50.5	Line	61.1	-10.60	Quasi-Peak
0.539073	42.69	Line	56	-13.31	Quasi-Peak
0.742887	40.84	Line	56	-15.16	Quasi-Peak
0.160514	38.86	Line	65.44	-26.58	Quasi-Peak

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector
0.675027	44.91	Line	46	-1.09	Average
0.270699	49.09	Line	51.1	-2.01	Average
0.20259	51.13	Line	53.5	-2.38	Average
0.539073	42.88	Line	46	-3.12	Average
0.742887	41.06	Line	46	-4.94	Average
0.160514	13.57	Line	55.44	-41.87	Average

## 120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector
0.202968	55.91	Neutral	63.49	-7.58	Quasi-Peak
0.271113	50.82	Neutral	61.08	-10.26	Quasi-Peak
0.67535	45.04	Neutral	56	-10.96	Quasi-Peak
0.741948	41.32	Neutral	56	-14.68	Quasi-Peak
0.540081	43.47	Neutral	56	-12.53	Quasi-Peak
0.472836	36.68	Neutral	56.46	-19.79	Quasi-Peak

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector
0.67535	45.36	Neutral	46	-0.64	Average
0.271113	49.01	Neutral	51.08	-2.07	Average
0.202968	51.26	Neutral	53.49	-2.23	Average
0.540081	43.7	Neutral	46	-2.30	Average
0.741948	41.54	Neutral	46	-4.46	Average
0.472836	35.58	Neutral	46.46	-10.89	Average

## 5 FCC §15.109 – Radiated Emissions

### 5.1 Applicable Standard

As per FCC §15.109: Radiated Emission Limits

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Field Strength (μV/m)
30-88	100
88-216	150
216-960	200
Above 960	500

(g) As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, “Information Technology Equipment—Radio Disturbance Characteristics—Limits and Methods of Measurement.”

*Note: The CISPR 22 §6 Standard, Class B limits are applied to the test data hereinafter.*

### 5.2 Test Setup

The radiated emissions tests were performed in the 10-meter test chamber, using the setup in accordance with ANSI C63.4-2003 measurement procedures. The specifications used were in accordance with FCC 15.109 Class B limits.

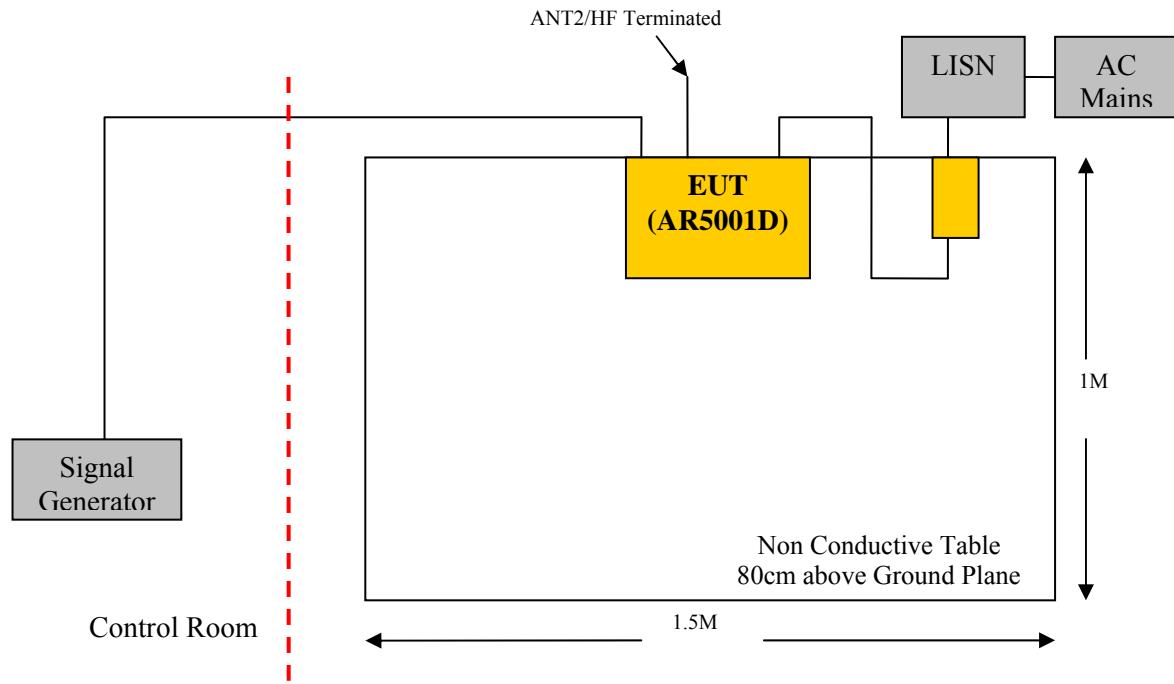
The spacing between the peripherals was 10 cm.

The external I/O cables were draped along the test table and bundled as required.

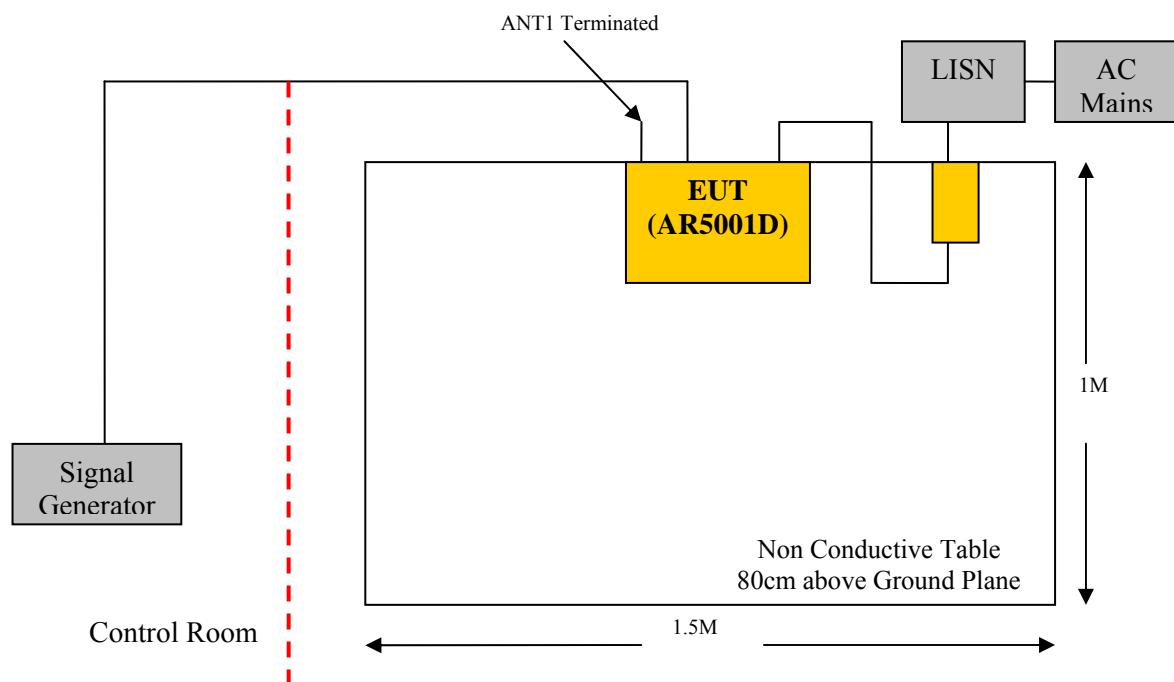
The EUT was connected to a 120 V, 60 Hz AC line power source and the EUT was set to all the possibility scanning mode during the test including AM mode, FM mode(Below 25MHz), FM mode (Above 25MHz), CW mode (Below 25MHz), CW mode (Above 25Mhz), SSB mode and scanning mode.

### 5.3 Test Setup Block Diagram

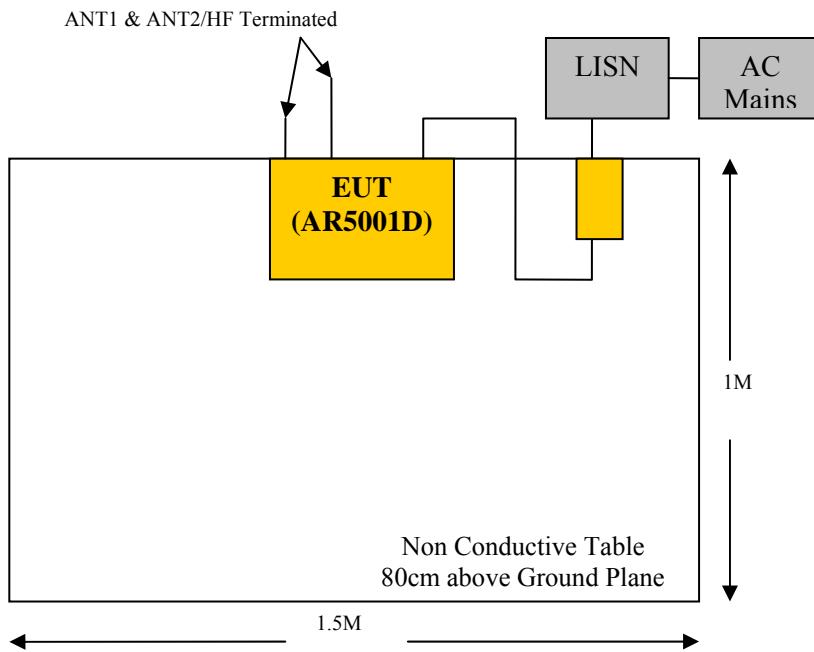
#### Mode: FM, CW & SSB Modulation Mode



#### Mode: AM, FM & CW Modulation Mode



### Mode: Scanning Mode



## 5.4 Test Procedure

Maximizing procedure was performed on the six (6) highest emissions readings to ensure the EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings were performed only when an emission was found to be marginal (within -4 dB of specification limits).

## 5.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + AF + CL + Atten - Ga$$

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

The “Margin” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Class B Limit}$$

## 5.6 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Hewlett Packard	Pre-amplifier	8447D	2944A07030	2012-04-11
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100044	2012-04-14
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-2	2011-08-10
HP	Pre-amplifier	8449B	3147A00400	2012-02-03
Agilent	Spectrum Analyzer	E4440A	MY44303352	2012-05-11
A.R.A Inc.	Horn antenna	DRG-1181A	1132	2012-01-04
HP	Signal Generator	8648C	3847M001143	2010-11-22 <sup>Note1</sup>

*Note1: Based on a two-year calibration cycle*

**Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.

## 5.7 Test Environmental Conditions

<b>Temperature:</b>	22-23° C
<b>Relative Humidity:</b>	43-44%
<b>ATM Pressure:</b>	102.1-101.3kPa

*Testing was performed by Charles Vergonio on 2012-07-12 to 2012-07-13 in 10 meter chamber1.*

## 5.8 Summary of Test Results

According to the recorded data, the EUT complied with FCC §15.109 Standard, Class B limits, and had the worst margin reading of:

### Scanning Mode:

Mode: 30 MHz to 1 GHz			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-17.74	999.488	Horizontal	30 to 1000 MHz

Mode: Above 1 GHz			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-8.49	14895.07	Horizontal	1000 to 15000 MHz

### AM Mode:

Mode: 30 MHz to 1 GHz			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-5.76	999.492	Horizontal	30 to 1000 MHz

### FM Mode 1 below 25 MHz:

Mode: 30 MHz to 1 GHz			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-6.19	999.514	Horizontal	30 to 1000 MHz

### FM Mode 2 above 25 MHz:

Mode: 30 MHz to 1 GHz			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-4.80	999.518	Horizontal	30 to 1000 MHz

Mode: Above 1 GHz			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-33.96	1404.197	Vertical	1000 to 5000 MHz

**CW Mode 1 below 25 MHz:**

<b>Mode: 30 MHz to 1 GHz</b>			
<b>Margin (dB)</b>	<b>Frequency (MHz)</b>	<b>Polarization (Horizontal/Vertical)</b>	<b>Range (MHz)</b>
-5.12	999.49	Horizontal	30 to 1000 MHz

**CW Mode 2 above 25 MHz:**

<b>Mode: 30 MHz to 1 GHz</b>			
<b>Margin (dB)</b>	<b>Frequency (MHz)</b>	<b>Polarization (Horizontal/Vertical)</b>	<b>Range (MHz)</b>
-6.75	999.494	Horizontal	30 to 1000 MHz

<b>Mode: Above 1 GHz</b>			
<b>Margin (dB)</b>	<b>Frequency (MHz)</b>	<b>Polarization (Horizontal/Vertical)</b>	<b>Range (MHz)</b>
-10.00	3991.953	Horizontal	1000 to 5000 MHz

**SSB Mode:**

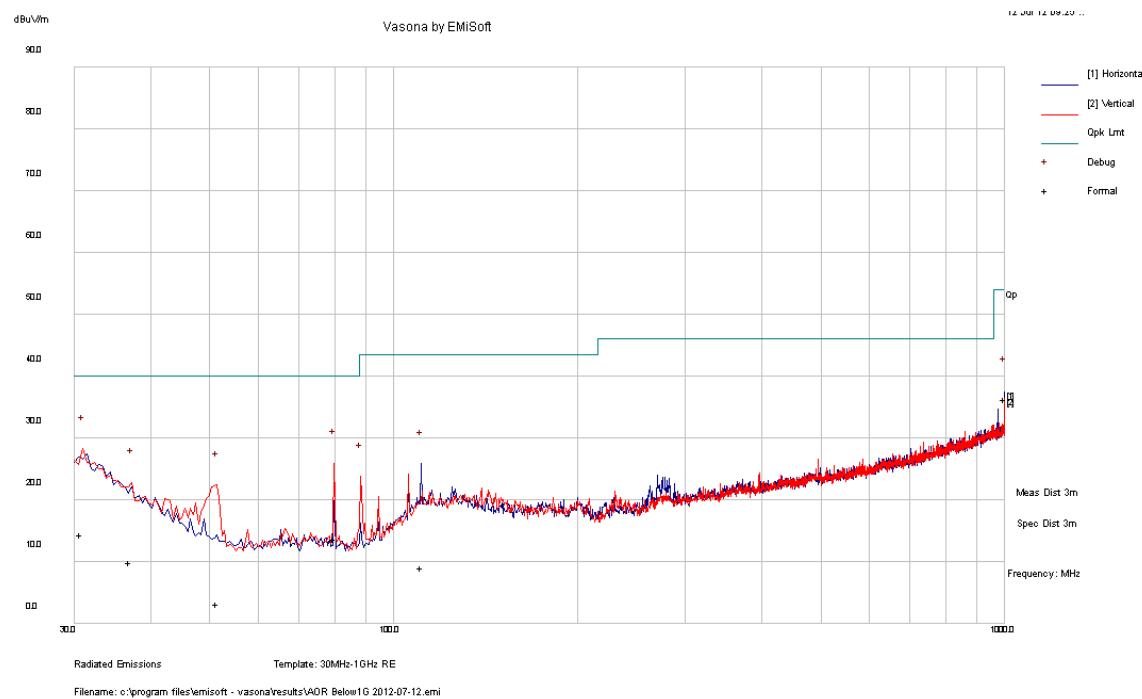
<b>Mode: 30 MHz to 1 GHz</b>			
<b>Margin (dB)</b>	<b>Frequency (MHz)</b>	<b>Polarization (Horizontal/Vertical)</b>	<b>Range (MHz)</b>
-16.02	30.26025	Horizontal	30 to 1000 MHz

<b>Mode: Above 1 GHz</b>			
<b>Margin (dB)</b>	<b>Frequency (MHz)</b>	<b>Polarization (Horizontal/Vertical)</b>	<b>Range (MHz)</b>
-9.95	3992.003	Horizontal	1000 to 15000 MHz

## 5.9 Radiated Spurious Emissions Test Plots and Data

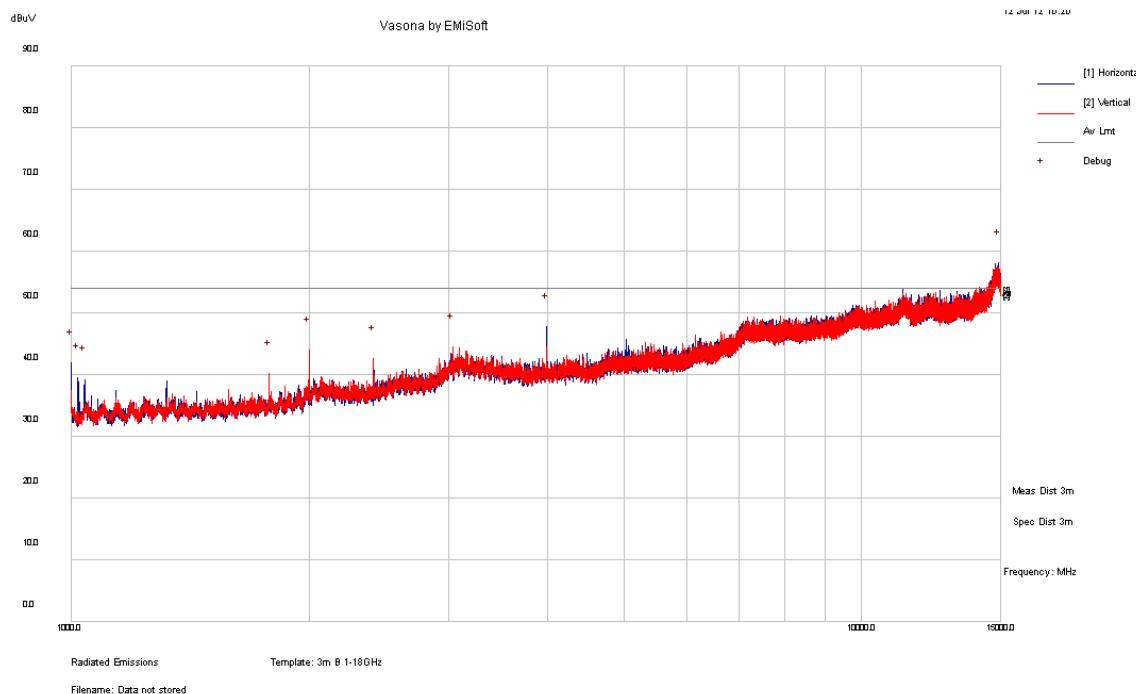
### Scanning Mode:

#### 30-1000 MHz measured at 3 meters distance

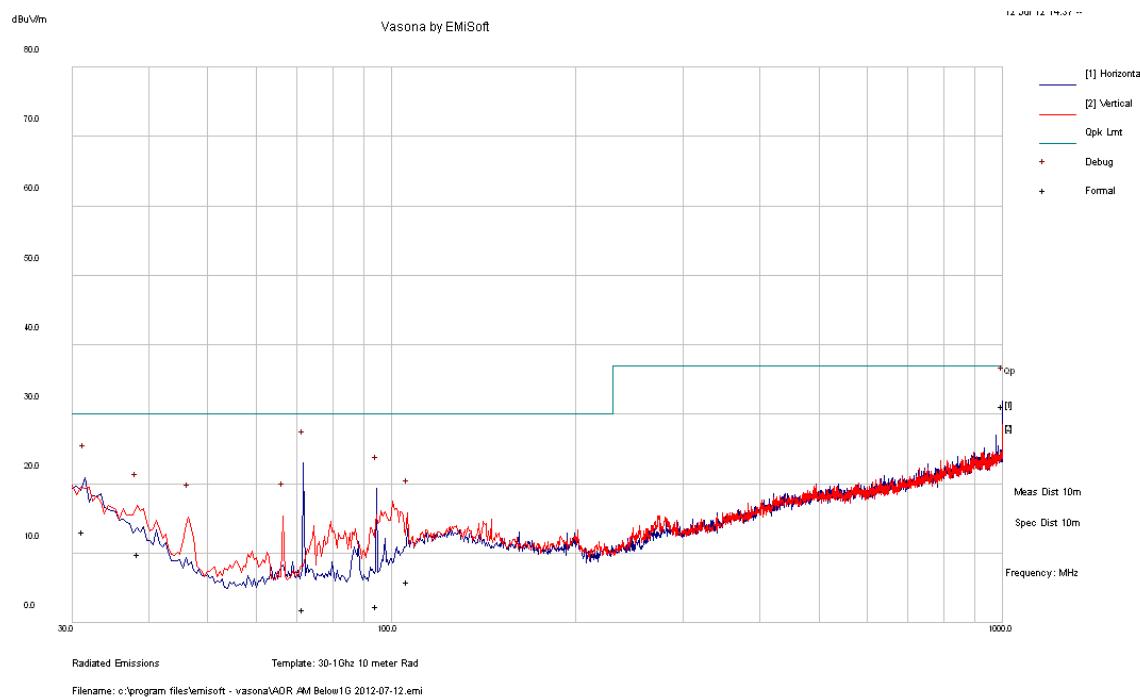


Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
999.488	36.26	100	H	57	54	-17.74	QP
30.72075	14.48	283	V	52	40	-25.52	QP
79.988	13.74	356	V	252	40	-26.26	QP
37.063	9.92	303	V	174	40	-30.08	QP
111.0365	9.13	105	H	139	43.5	-34.37	QP
51.3375	3.21	206	V	87	40	-36.79	QP

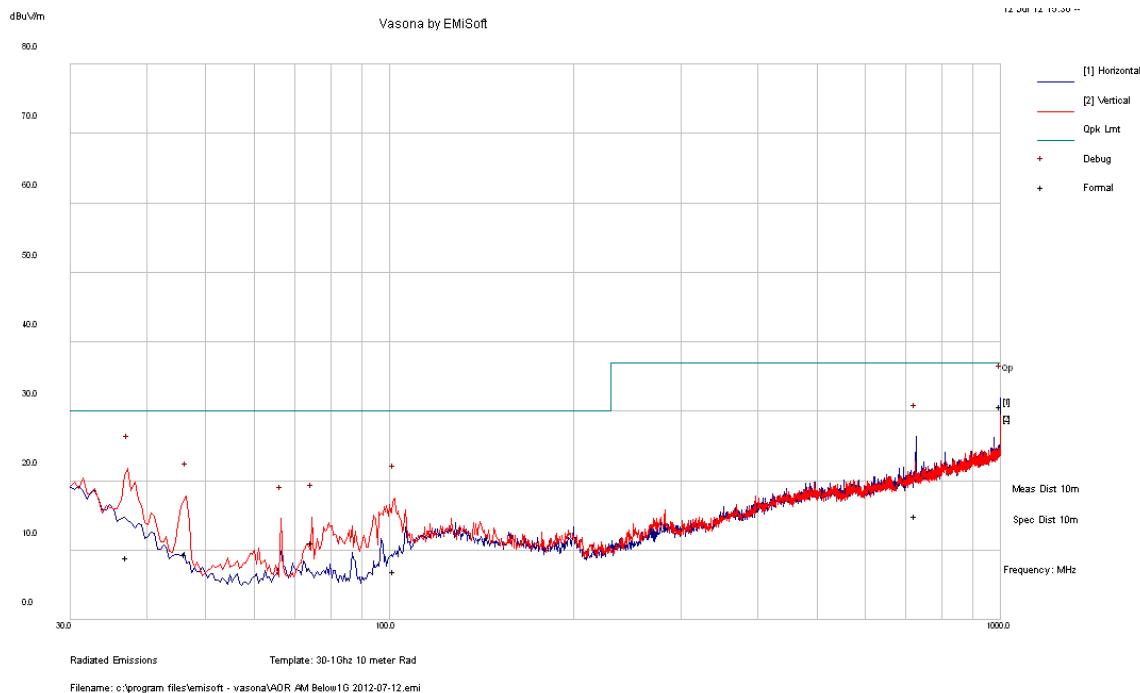
## Above 1 GHz measured at 3 meters distance



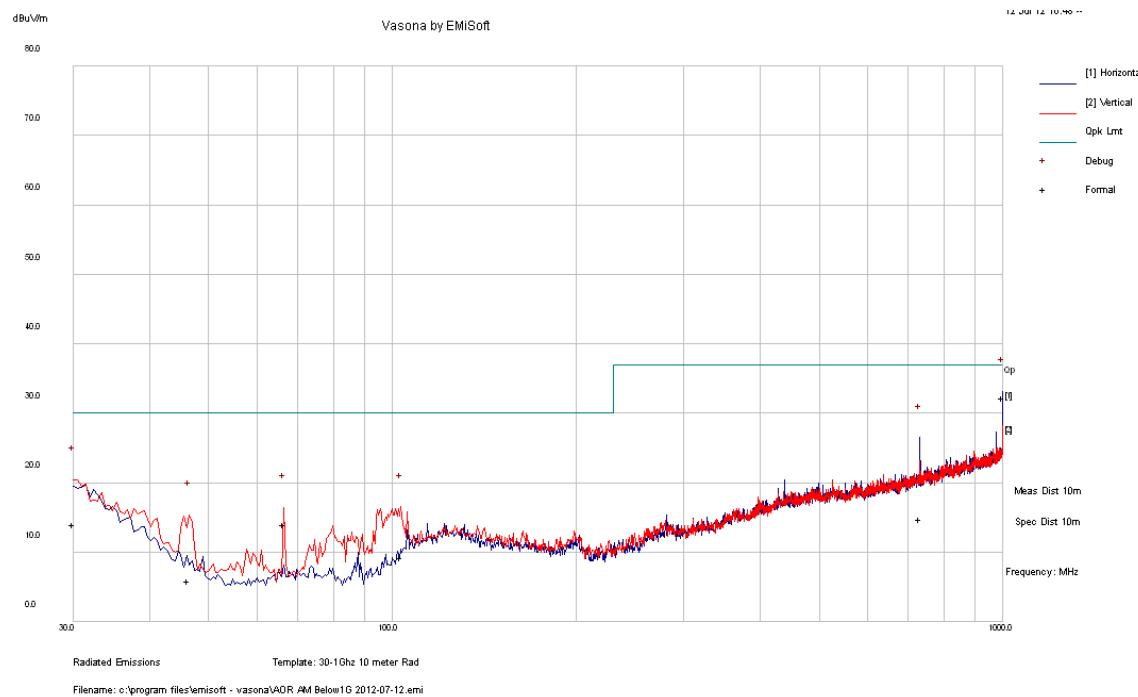
Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
14895.07	45.51	143	H	279	54	-8.49	Ave.
3991.993	44.5	101	H	236	54	-9.50	Ave.
1998.924	41.86	97	V	360	54	-12.14	Ave.
1000	34.83	97	H	40	54	-19.17	Ave.
3034.035	27.75	115	V	349	54	-26.25	Ave.
2407.988	26.6	139	V	101	54	-27.40	Ave.

**AM Mode:****30-1000 MHz measured at 10 meters distance**

Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
999.492	31.24	96	H	88	37	-5.76	QP
31.28525	13.18	109	H	126	30	-16.82	QP
38.46575	9.87	232	V	311	30	-20.13	QP
106.229	5.89	113	V	68	30	-24.11	QP
94.644	2.35	98	H	302	30	-27.65	QP
71.651	1.96	111	H	248	30	-28.04	QP

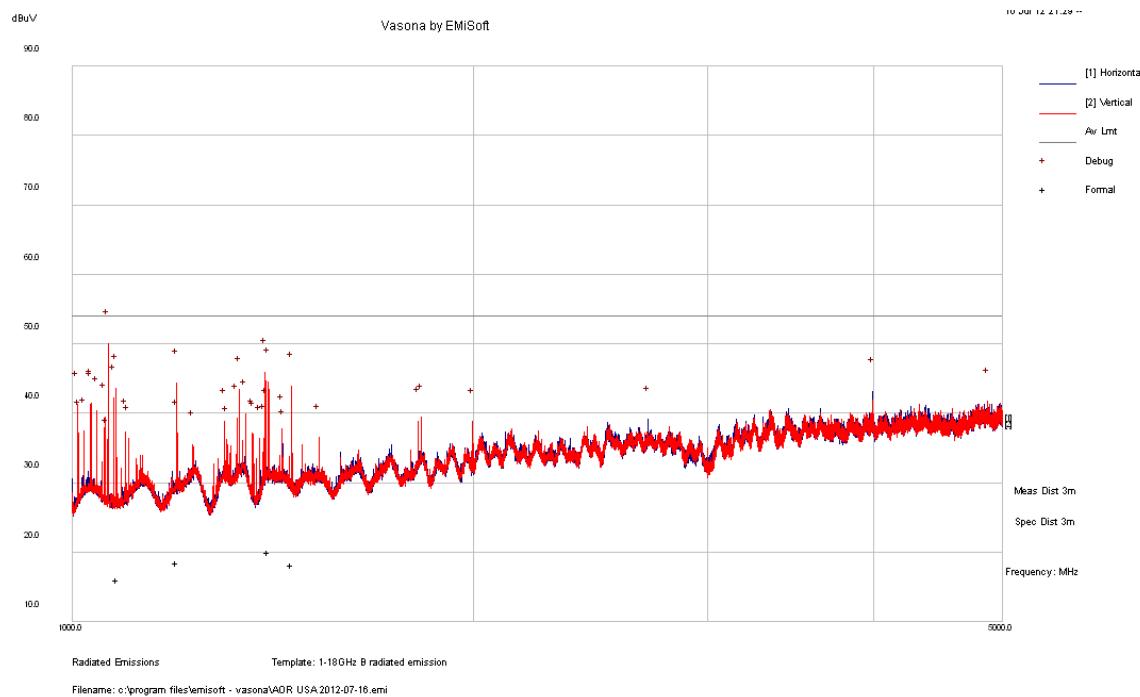
**FM Mode 1:****30-1000 MHz measured at 10 meters distance**

Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
999.514	30.81	103	H	90	37	-6.19	QP
74.5215	11.06	401	V	264	30	-18.94	QP
46.40575	9.36	104	V	348	30	-20.64	QP
37.1835	8.98	361	V	32	30	-21.02	QP
726.058	14.87	352	H	114	37	-22.13	QP
101.5603	7.04	204	V	208	30	-22.96	QP

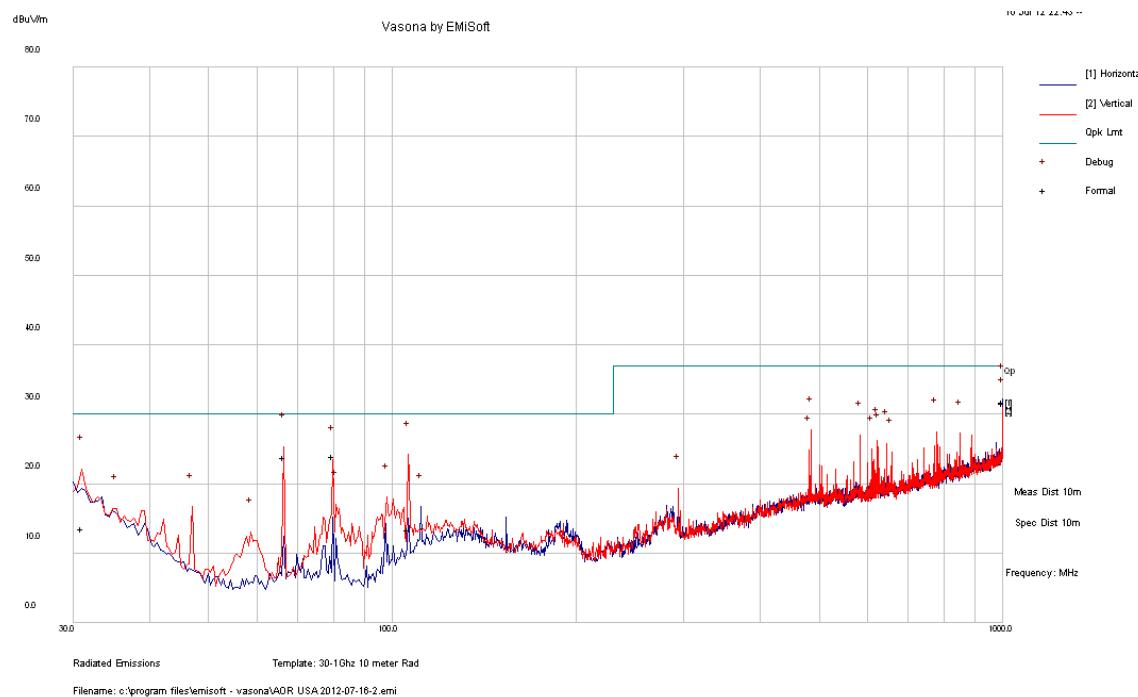
**FM Mode 2:****30-1000 MHz measured at 10 meters distance**

Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
999.518	32.2	98	H	324	37	-4.80	QP
30.00612	14.1	189	V	156	30	-15.9	QP
66.58725	14.03	365	V	84	30	-15.97	QP
103.4585	9.21	378	V	180	30	-20.79	QP
731.3603	14.8	339	H	62	37	-22.20	QP
46.33025	5.94	126	V	196	30	-24.06	QP

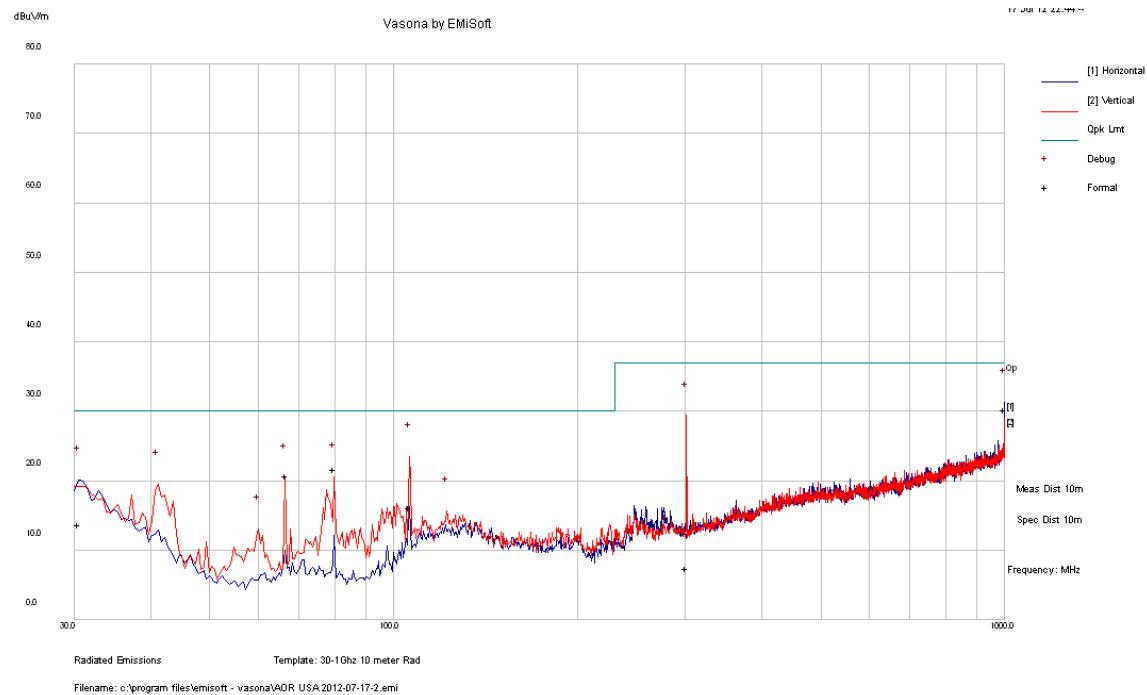
## Above 1 GHz measured at 3 meters distance



Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
1404.197	20.04	142	V	338	54	-33.96	Ave.
1398.509	19.4	196	V	188	54	-34.60	Ave.
1198.896	18.48	170	V	70	54	-35.52	Ave.
1461.046	18.27	138	V	244	54	-35.73	Ave.
1065.779	16.23	152	V	242	54	-37.77	Ave.
1080.094	15.99	180	V	352	54	-38.01	Ave.

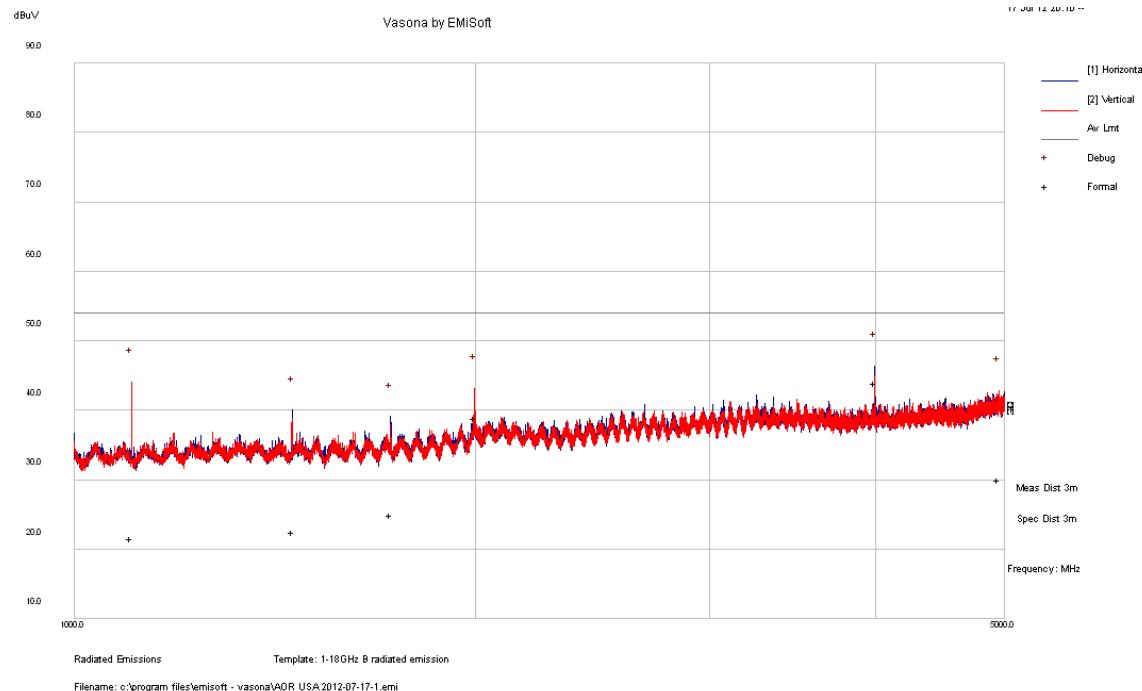
**CW Mode 1:****30-1000 MHz measured at 10 meters distance**

Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
999.49	31.88	98	H	298	37	-5.12	QP
999.492	31.73	113	H	300	37	-5.27	QP
80.00625	24.05	133	V	302	30	-5.95	QP
66.3925	23.83	329	V	51	30	-6.17	QP
31.012	13.54	311	V	210	30	-16.46	QP
106.3943	13.35	142	V	106	30	-16.65	QP

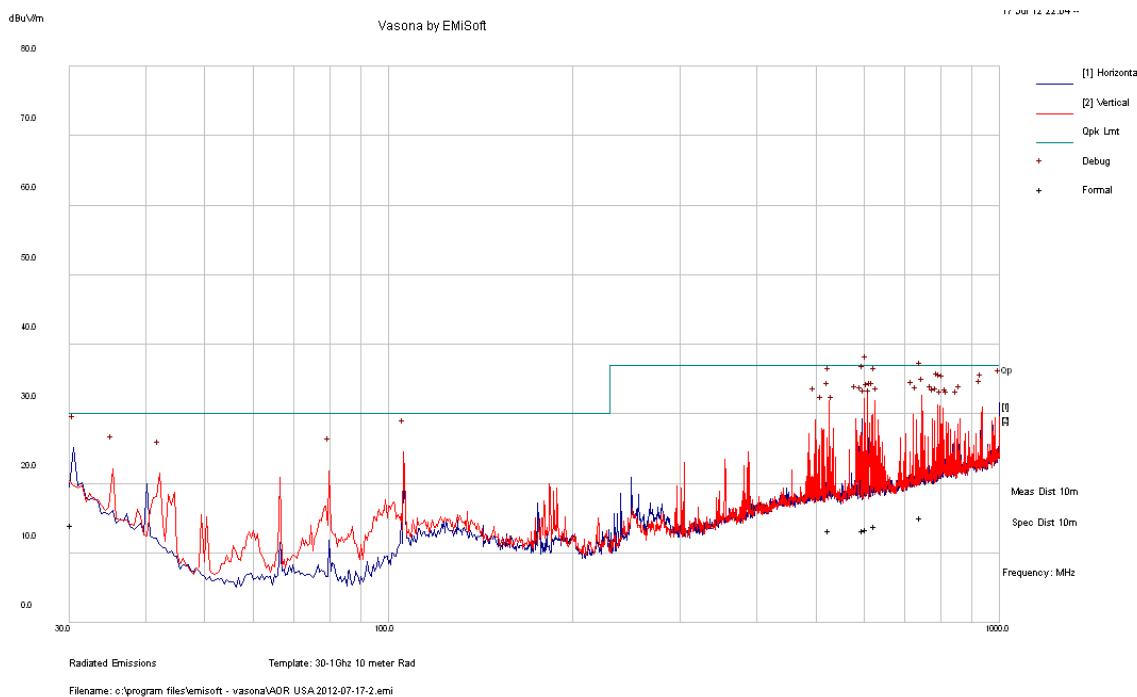
**CW Mode 2:****30-1000 MHz measured at 10 meters distance**

Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
999.494	30.25	107	H	360	37	-6.75	QP
80	21.62	281	V	370	30	-8.38	QP
66.6155	20.72	281	V	62	30	-9.28	QP
106.3933	16.13	383	V	308	30	-13.87	QP
30.5125	13.77	149	H	8	30	-16.23	QP
300.9118	7.43	315	V	241	37	-29.57	QP

## Above 1 GHz measured at 3 meters distance

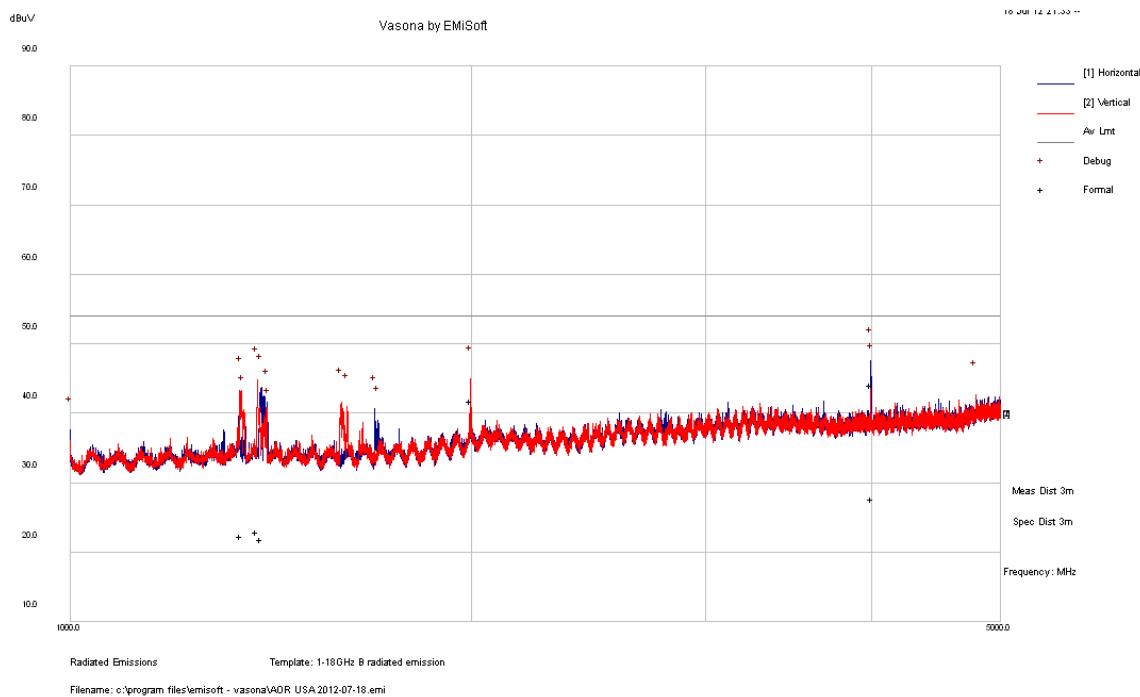


Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
3991.953	44	99	H	160	54	-10.00	Ave.
1999.096	38.95	99	H	272	54	-15.05	Ave.
4948.001	30.02	162	V	86	54	-23.98	Ave.
1727.303	24.98	101	H	298	54	-29.02	Ave.
1459.781	22.49	124	H	126	54	-31.51	Ave.
1103.089	21.55	190	V	342	54	-32.45	Ave.

**SSB Mode:****30-1000 MHz measured at 10 meters distance**

Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
30.26025	13.98	350	H	128	30	-16.02	QP
744.123	15.17	176	V	262	37	-21.83	QP
624.969	13.87	243	V	120	37	-23.13	QP
606.8645	13.43	333	V	112	37	-23.57	QP
526.0548	13.29	395	V	179	37	-23.71	QP
599.2325	13.23	224	V	94	37	-23.77	QP

## Above 1 GHz measured at 3 meters distance



Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
		Height (cm)	Polarity (H/V)				
3992.003	44.05	127	H	236	54	-9.95	Ave.
1999.118	41.84	158	V	356	54	-12.16	Ave.
4000.13	27.69	127	H	354	54	-26.31	Ave.
1380.225	22.89	183	V	22	54	-31.11	Ave.
1342.479	22.37	195	V	142	54	-31.63	Ave.
1391.848	21.94	181	H	94	54	-32.06	Ave.

## 6 FCC §15.121 – Scanning Receiver Cellular Band Rejection

### 6.1 Applicable Standard

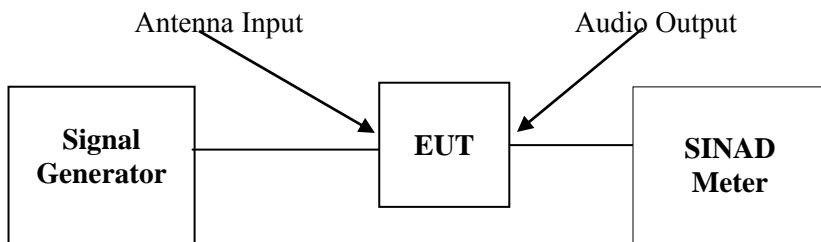
As per FCC §15.121: Scanning receivers and frequency converters used with scanning receivers

(b) Except as provided in paragraph (c) of this section, scanning receivers shall reject any signals from the Cellular Radiotelephone Service frequency bands that are 38 dB or lower based upon a 12 dB SINAD measurement, which is considered the threshold where a signal can be clearly discerned from any interference that may be present.

### 6.2 Test Setup

The EUT is placed in scan mode. Each of the cellular frequencies listed in the table below is injected into the antenna input of the EUT one by one. At each frequency input signal tested, the frequencies at which the EUT stops at are recorded in the data table.

Once this is completed, we measure the scanner's sensitivity to image and spurious responses to cellular band signals.



### 6.3 Test Procedure

Connect the Signal Generator to the EUT antenna input port, and SINAD Meter to the EUT Audio output port. The EUT is placed in scan mode. Each of the cellular frequencies listed in the table below is injected into the antenna input of the EUT one by one. At each frequency input signal tested, the frequencies at which the EUT stops at are recorded in the data table.

Once this is completed, we measure the scanner's sensitivity to image and spurious responses to cellular band signals.

In order to comply with 15.121 (b), when the scanner is tuned to any of the 'received' frequencies tested, its 12 dB SINAD sensitivity to any image and spurious signals in the cellular bands must be at least 38 dB poorer than its primary sensitivity as measured.

## 6.4 Test Equipment List and Details

Manufacturer	Description	Model NO.	Serial Number	Calibration Date
Helper Instruments	SINAD Meter	SL-105	56800	2012-07-13
HP	Signal Generator	8648C	3847M001143	2010-11-22 <sup>Note1</sup>

*Note1: Based on two year calibration cycle*

\***Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.

## 6.5 Test Environmental Conditions

Temperature:	25 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

*\*Testing was performed by Charles Vergonio on 2012-07-20.*

## 6.6 Test Results

Cellular Frequency (MHz)	Image Rejection Ratio (dB)
824	> 38
836	> 38
848	> 38
869	> 38
881	> 38
894	> 38

*\* Image Rejection Ratio = Scanner's sensitivity to image signal – Scanner's primary sensitivity measured*

Note: Scanning Receiver rejects signals from 823.995–849.005 MHz Uplink and 868.995–894.005 MHz Downlink Cellular frequency bands. Therefore there is no specified rejection ratio recorded, the signal generator was set to the level 38 poor then the scanner's sensitivity signal level for all the frequency above.