



FCC PART 15B TEST AND MEASUREMENT REPORT

For

AOR USA Inc.

20655 S. Western Avenue, Suite 112,

Torrance, CA 90501, USA

Model: AR-DV1
FCC ID: NVJARDV1

Report Type: Original Report	Product Type: Multi-mode Digital Voice Receiver
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Report Number: R1504102 Rev A	
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1504102	Original Report	2015-04-28
1	R1504102 Rev A	Revised Report	2015-05-07

1 General Information

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of the AOR USA Inc. and their product model, AR-DV1, FCC ID: NVJARDV1, which will henceforth be referred to as the EUT (Equipment under Test). The EUT is a Multi-mode Digital voice Receiver.

1.2 Mechanical Description of EUT

The EUT measures 22.5 cm (L) x 18 cm (W) x 6.5 cm (H) and 1.55kg.

The data gathered are from a production sample provided by the manufacturer, serial number: 09560000.

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 FCC Part 15.107, 15.109 and 15.121 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 C63.4-2009, 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 CISPR16-4-2:2011, The Treatment of Uncertainty in EMC Measurements, the values ranging from ± 2.0 dB for Conducted Emissions tests and ± 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

Bay area compliance Laboratories Corp. (BACL) is:

1- An independent Commercial Test Laboratory accredited to **ISO 17025:2005** by **A2LA**, in the fields of: Electromagnetic Compatibility & Telecommunications covering Emissions, Immunity, Radio, RF Exposure, Safety and Telecom. This includes NEBS (Network Equipment Building System), Wireless RF, Telecommunications Terminal Equipment (TTE); Network Equipment; Information Technology Equipment (ITE); Medical Electrical Equipment; Industrial, Commercial, and Medical Test Equipment; Professional Audio and Video Equipment; Electronic (Digital) Products; Industrial and Scientific Instruments; Cabled Distribution Systems and Energy Efficiency Lighting.

2- An ENERGY STAR Recognized Laboratory, for the LM80 Testing, a wide variety of Luminaires and Computers.

3- A NIST Designated Phase-I and Phase-II CAB including: ACMA (Australian Communication and Media Authority), BSMI (Bureau of Standards, Metrology and Inspection of Taiwan), IDA (Infocomm Development Authority of Singapore), IC (Industry Canada), Korea (Ministry of Communications Radio Research Laboratory), NCC (Formerly DGT; Directorate General of Telecommunication of Chinese Taipei) OFTA (Office of the Telecommunications Authority of Hong Kong), Vietnam, VCCI - Voluntary Control Council for Interference of Japan and a designated EU CAB (Conformity Assessment Body) (Notified Body) for the EMC and R&TTE Directives.

4- A Product Certification Body accredited to **ISO Guide 65:1996** by **A2LA** to certify:

1- Unlicensed, Licensed radio frequency devices and Telephone Terminal Equipment for the FCC. Scope A1, A2, A3, A4, B1, B2, B3, B4 & C.

2. Radio Standards Specifications (RSS) in the Category I Equipment Standards List and All Broadcasting Technical Standards (BETS) in Category I Equipment Standards List for Industry Canada.

3. Radio Communication Equipment for Singapore.

4. Radio Equipment Specifications, GMDSS Marine Radio Equipment Specifications, and Fixed Network Equipment Specifications for Hong Kong.

5. Japan MIC Telecommunication Business Law (A1, A2) and Radio Law (B1, B2 and B3).

6. Audio/Video, Battery Charging Systems, Computers, Displays, Enterprise Servers, Imaging Equipment, Set-Top Boxes, Telephony, Televisions, Ceiling Fans, CFLs (Including GU24s), Decorative Light Strings, Integral LED Lamps, Luminaires, Residential Ventilating Fans.

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 C63.4-2009, 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.: A-0027. 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 C63.4-2009 Standards.

2.2 EUT Exercise Software

N/A

2.3 BACL EMI Measurement Software

The software used was EMISoft-Vasona 6.0 for EMI testing.

2.4 Equipment Modifications

N/A

2.5 Special Equipment

N/A

2.6 Local Support Equipment

N/A

2.7 EUT Internal Configuration Details

Manufacturer	Description	Model	Serial Number
AOR	Front Panel PCB	140520-2	-
Novatek	Display	NT7534H-TAB0011 REV. A	143802Q03012
-	Speaker	F66A52-5	453C
AOR	Main PCB	140428-1	EJAF52-01-004

2.8 External I/O Cabling List and Details

Cable Description	Length (m)	From	To
Power Cable	2	EUT	AC/DC Adapter

2.9 Power Supply List and Details

Manufacturer	Description	Model	Serial Number
AOR	Power Supply	D12-10	-

2.10 Mode of Operation

11 modes of operation were tested. AM mode (8kHz), Wideband FM mode (200kHz), Narrowband FM mode (6kHz), Upper Sideband mode (2.6kHz), Lower Sideband mode (1.8kHz), CW mode (500Hz), GMSK (D-Star mode), C4FM (dPMR mode).

Per customer request the following modes were not tested: Auto mode, SAH mode, SAL mode, DMR mode and P-25 mode.

2.11 Method of Monitoring

N/A

3 Summary of Test Results

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

4 FCC §15.107 – AC Line Conducted Emissions

4.1 Applicable Standard

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 μ 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.

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

Frequency range (MHz)	Limits (dB μ 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 10-meter test chamber, using the setup in accordance with FCC Part 15 measurement procedures. The specifications used were in accordance with FCC Part 15B and IC ICES-003, 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.

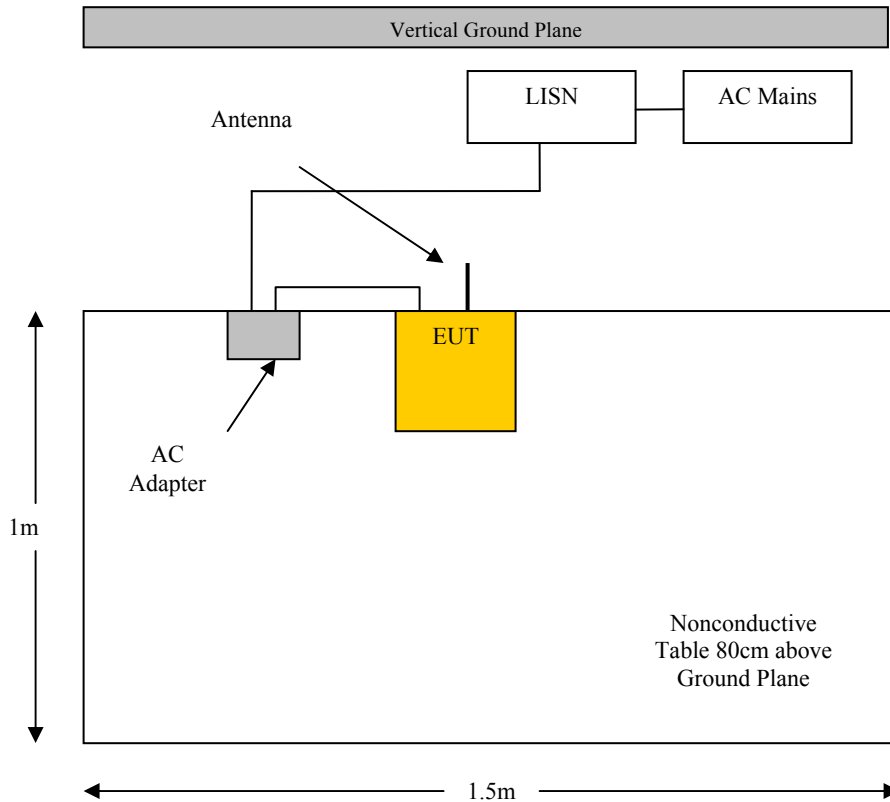
The EUT was connected to a 120 V, 60 Hz AC line power source.

4.3 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.

4.4 Test Setup Block Diagram



4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Cable Loss (CL) plus the High Pass Filter/Attenuator value (HA) and subtracting the Amplifier Gain (Ga) to the indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + CL + HA - Ga$$

For example, a corrected amplitude (CA) of 36 dBuV = Indicated Amplitude reading (Ai) of 50.0 dBuV + Cable Loss (CL) 1.0 dB + High Pass Filter/Attenuator (IA) 5 dB - Amplifier Gain (Ga) 20 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:

$$\text{Margin (dB)} = \text{Corrected Amplitude (dBuV)} - \text{Class B Limit (dBuV)}$$

4.6 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Date	Calibration Interval
Rohde & Schwarz	Pulse Limiter	ESH3 -Z2	101963	2014-07-07	N/A
TTE	High Pass Filter	H985-150k-50-720N	H 885	2015-01-09	1 year
Rohde & Schwarz	Receiver, EMI Test	ESCI 1166.5950K03	100337	2014-05-28	1 year
Times Microwave Systems	N-Type coax	LMR 400	373866	2015-02-02	1 year

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

Temperature:	21 °C
Relative Humidity:	42 %
ATM Pressure:	101.11 kPa

The testing was performed by Bryan Smith on 2015-04-14 at 5 meter chamber2.

4.8 Summary of Test Results

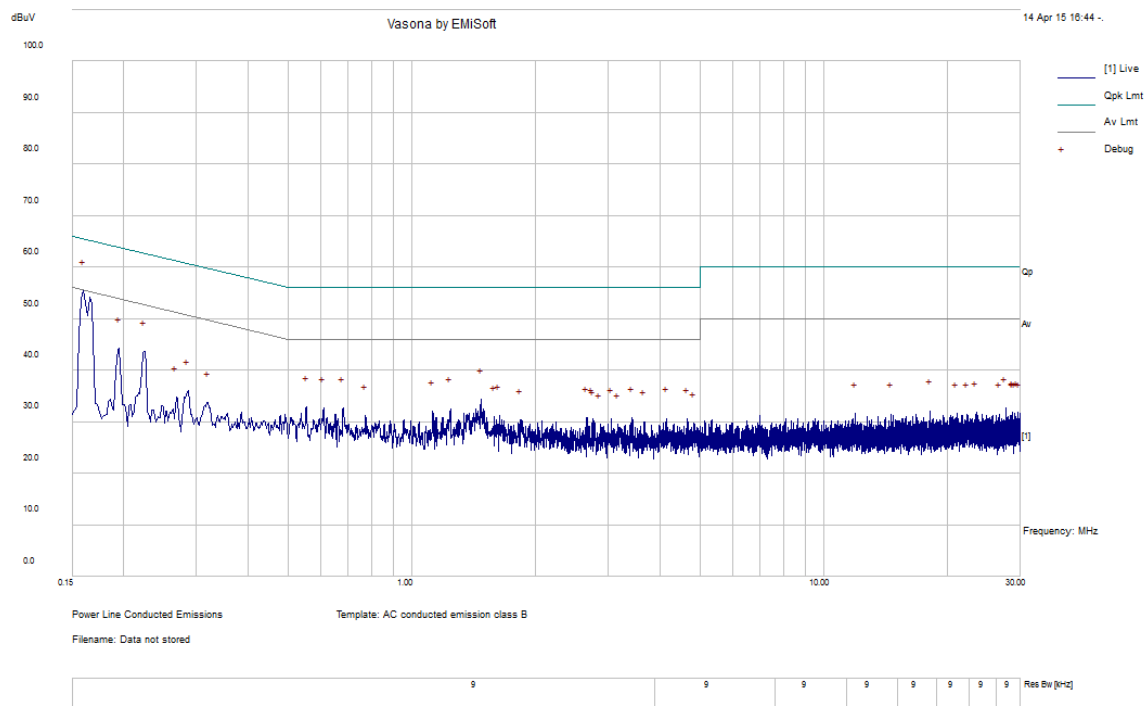
According to the recorded data, the EUT complied with FCC Part 15.107, Class B limits, and had the worst margin reading of:

Mode: 120 V/ 60 Hz			
Margin (dB)	Frequency (MHz)	Conductor (Line/Neutral)	Range (MHz)
-17.12	0.154	Live	0.15 to 30 MHz

Note: Tested under worst case mode: based off radiated emissions formally assets data- Wideband FM.

4.9 Conducted Emissions Test Plots and Data

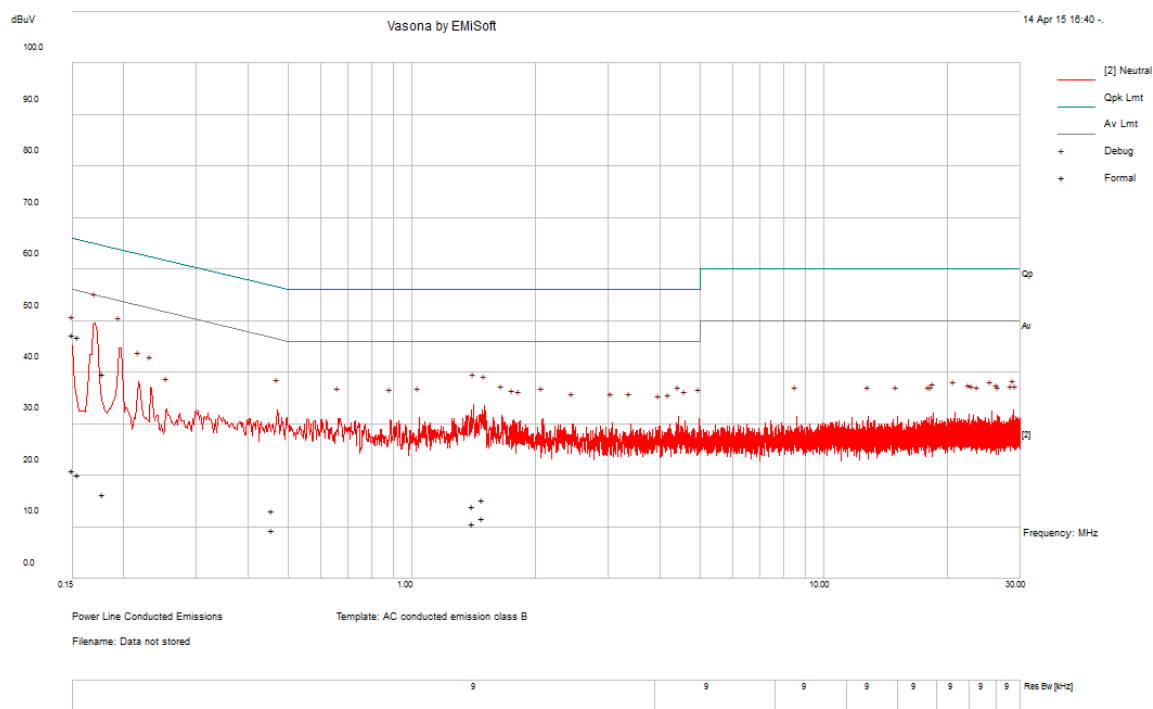
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (PK/QP/Ave.)
0.154	48.62	Line	65.74	-17.12	QP
0.177	42.86	Line	64.62	-21.76	QP
0.241	35.62	Line	62.03	-26.41	QP
1.48	15.17	Line	56	-40.83	QP
0.542	12.6	Line	56	-43.4	QP
0.622	12.26	Line	56	-43.74	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (PK/QP/Ave.)
1.48	11.82	Line	46	-34.18	Ave.
0.154	21.04	Line	55.74	-34.7	Ave.
0.177	17.73	Line	54.62	-36.89	Ave.
0.542	8.86	Line	46	-37.14	Ave.
0.622	8.74	Line	46	-37.26	Ave.
0.241	14.33	Line	52.03	-37.69	Ave.

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (PK/QP/Ave.)
0.155	47.07	Neutral	65.72	-18.65	QP
0.150	47.29	Neutral	65.99	-18.7	QP
0.177	39.8	Neutral	64.58	-24.77	QP
1.48	15.28	Neutral	56	-40.72	QP
1.40	14.2	Neutral	56	-41.8	QP
0.457	13.34	Neutral	56.74	-43.4	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (PK/QP/Ave.)
1.48	11.75	Neutral	46	-34.25	Ave.
0.150	21.04	Neutral	55.99	-34.94	Ave.
1.40	10.82	Neutral	46	-35.18	Ave.
0.155	20.15	Neutral	55.72	-35.58	Ave.
0.457	9.49	Neutral	46.74	-37.25	Ave.
0.177	16.41	Neutral	54.58	-38.17	Ave.

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 ($\mu\text{V/m}$)
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 C63.4-2009 measurement procedures. The specifications used were in accordance with CISPR 22 §6 Standard, Class B limits for frequencies between 30 MHz and 1 GHz, and FCC Part 15B, Class B limits for frequencies above 1 GHz.

The spacing between the peripherals was 10 cm.

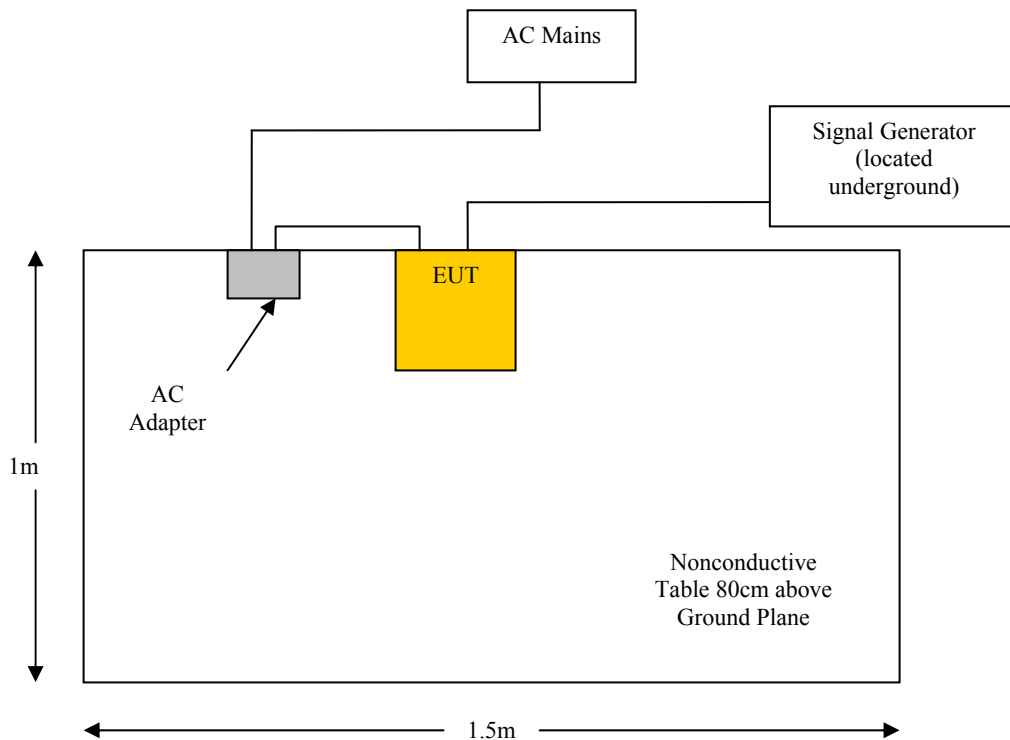
The external I/O cables were draped along the test table and bundled as required.

5.3 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).

5.4 Test Setup Block Diagram



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 Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2014-11-13	1 year
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2014-09-28	1 year
A.R.A.	Antenna, Horn	DRG-118/A	1132	2015-02-19	1 year
HP	Amplifier, Pre	8449B	3147A00400	2015-03-11	1 year
Sunol Science Corp	Combination Antenna	JB3	A020106-3	2014-09-18	1 year
Hewlett Packard	Pre-amplifier	8447D	2944A10187	2014-08-08	1 year
UTiFLEX	SMA Cable	64639	218625007	2014-05-09	1 year
UTiFLEX	High Frequency Cable	223458-002	223458-003	2014-05-09	1 year
Agilent	Generator, Signal	E4438C	MY45091309	2014-07-15	1 year

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

Below 1 GHz:

Temperature:	19 ° C
Relative Humidity:	40 %
ATM Pressure:	101.31 kPa

The testing was performed by Elijah Garcia on 2015-05-05 at Chamber1.

Above 1 GHz:

Temperature:	22 ° C
Relative Humidity:	41 %
ATM Pressure:	101.4 kPa

The testing was performed by Jerry Wang on 2015-04-22 at Chamber1.

5.8 Summary of Test Results

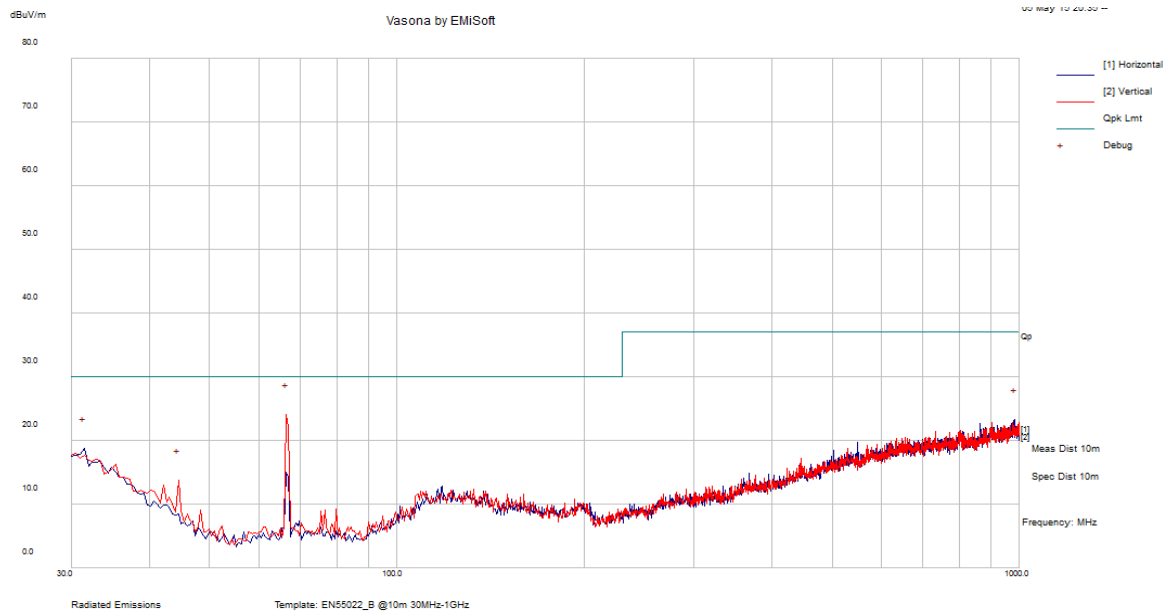
According to the recorded data, the EUT complied with FCC §15.109 Standard, Class B limits, and had the worst margin Class B limits of:

Mode: 30 MHz to 1 GHz, Wide FM Mode			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-5.4	106.1108	Vertical	30 to 1000 MHz

Mode: 1 to 15 GHz, Upper Side Band Mode			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-0.15	2441	Vertical	Above 1000 MHz

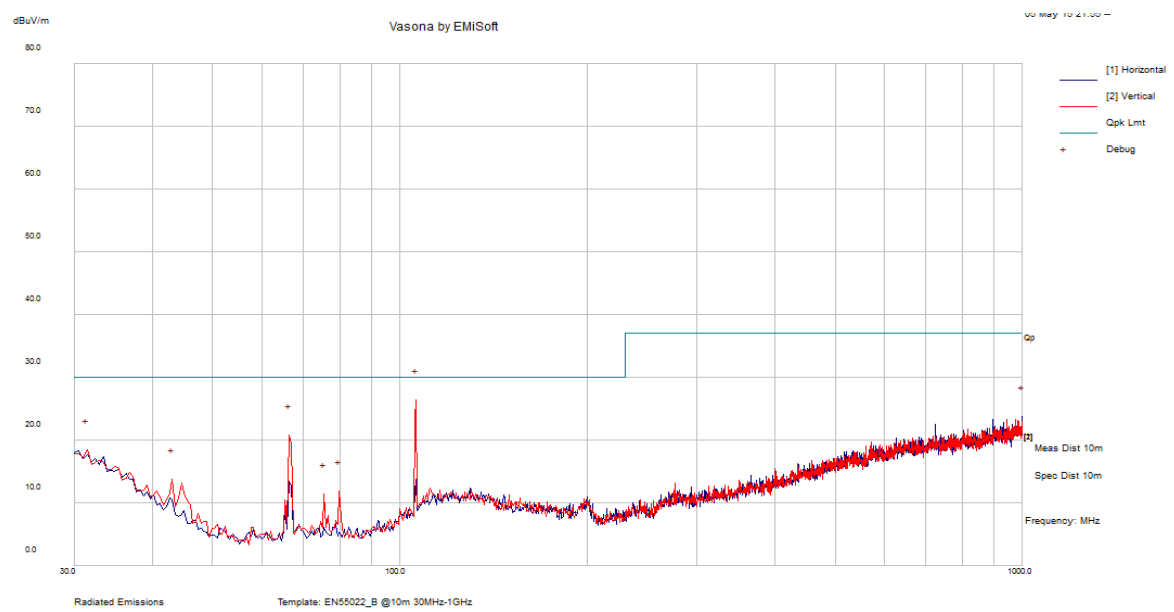
5.9 Radiated Spurious Emissions Test Plots and Data

30-1000 MHz – AM Mode (IF Bandwidth 8 kHz) measured at 10m



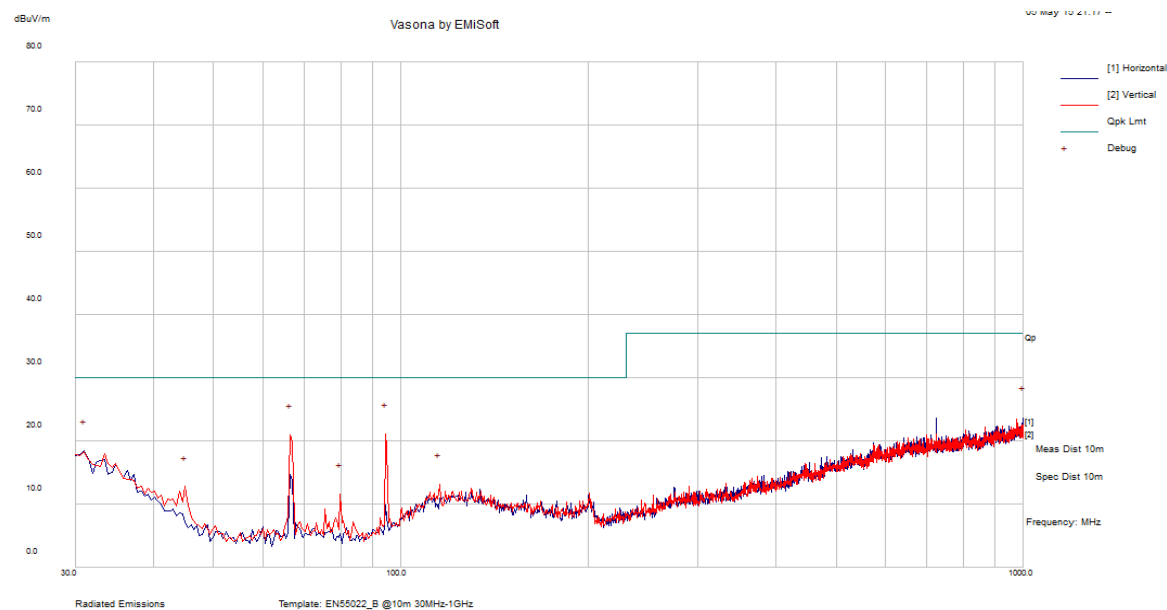
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
		Height (cm)	Polarity (H/V)				
66.6735	15.47	106	V	114	30	-14.53	QP
31.28925	11.89	188	H	248	30	-18.11	QP
983.6128	15.97	169	H	275	37	-21.03	QP
875.1638	15.12	191	H	270	37	-21.88	QP
119.406	6.47	198	H	197	30	-23.53	QP
44.746	4.42	158	V	97	30	-25.58	QP

30-1000 MHz – Wide FM Mode (IF Bandwidth 200 kHz) measured at 10m



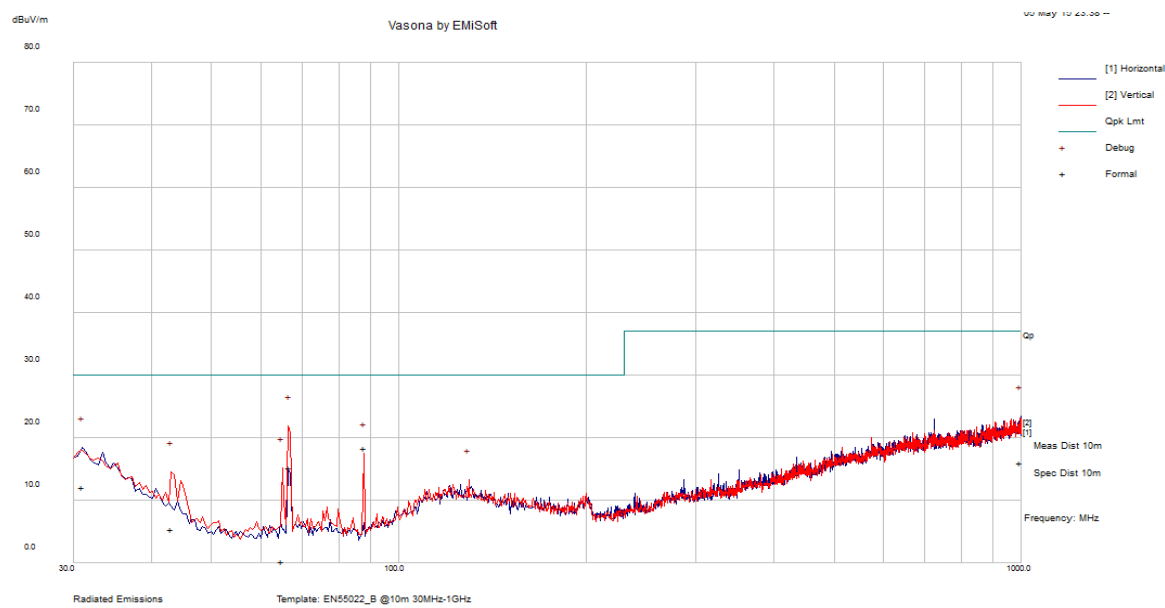
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector (PK/QP/Ave.)
		Height (cm)	Polarity (H/V)				
106.1108	24.6	108	V	205	30	-5.4	QP
66.7155	16.16	101	V	81	30	-13.84	QP
79.9855	14.17	163	V	85	30	-15.83	QP
31.54325	11.78	146	V	341	30	-18.22	QP
999.342	15.99	101	H	351	37	-21.01	QP
43.13175	5.45	151	V	80	30	-24.55	QP

30-1000 MHz – Narrow FM Mode (IF Bandwidth 6 kHz) measured at 10m



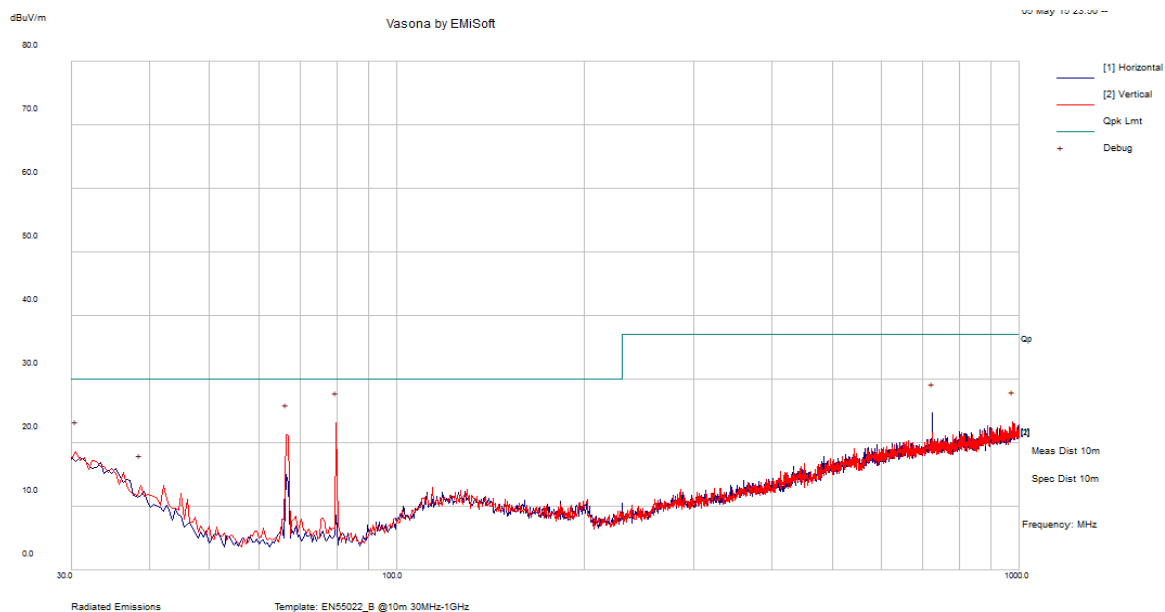
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector (PK/QP/Ave.)
		Height (cm)	Polarity (H/V)				
94.8865	20.62	126	V	14	30	-9.38	QP
66.70275	15.65	102	V	234	30	-14.35	QP
30.7655	12.34	103	H	72	30	-17.66	QP
998.658	15.95	163	H	117	37	-21.05	QP
115.2415	7.77	158	V	307	30	-22.23	QP
44.89225	3.94	121	V	57	30	-26.06	QP

30-1000 MHz – Upper Side Band Mode (IF Bandwidth 2.6 kHz) measured at 10m



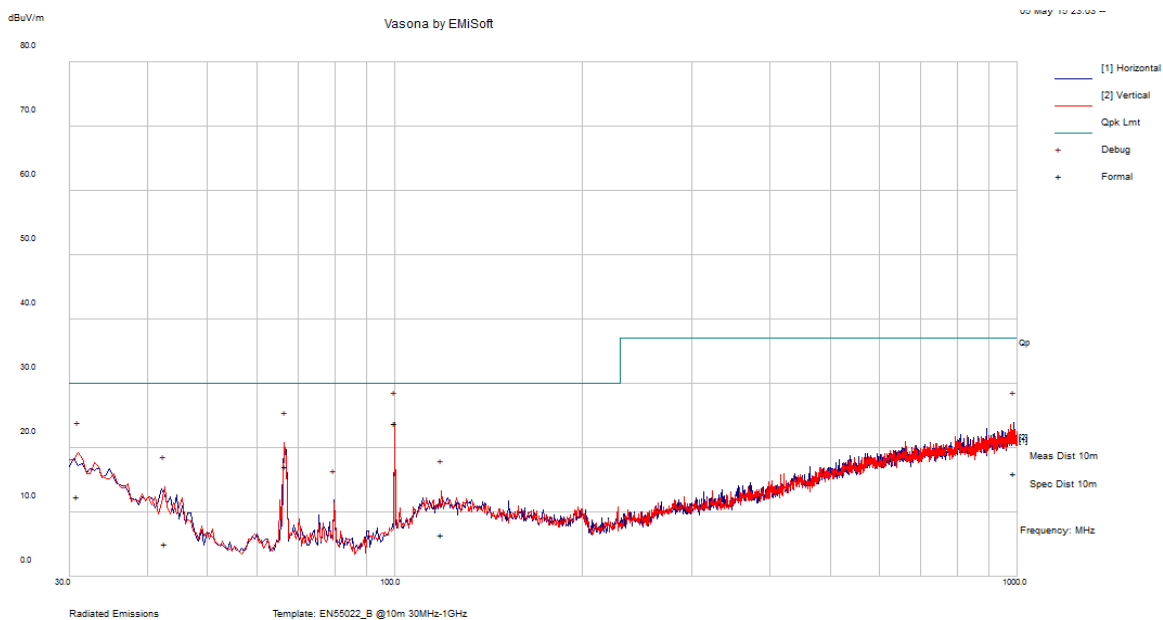
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector (PK/QP/Ave.)
		Height (cm)	Polarity (H/V)				
88.00625	18.42	142	V	2	30	-11.58	QP
66.7055	15.16	109	V	183	30	-14.84	QP
31.0635	12.15	148	H	148	30	-17.85	QP
997.7713	16.04	196	H	313	37	-20.96	QP
43.07325	5.3	142	V	255	30	-24.7	QP
64.77675	0.22	156	V	278	30	-29.78	QP

30-1000 MHz – Lower Side Band Mode (IF Bandwidth 1.8 kHz) measured at 10m



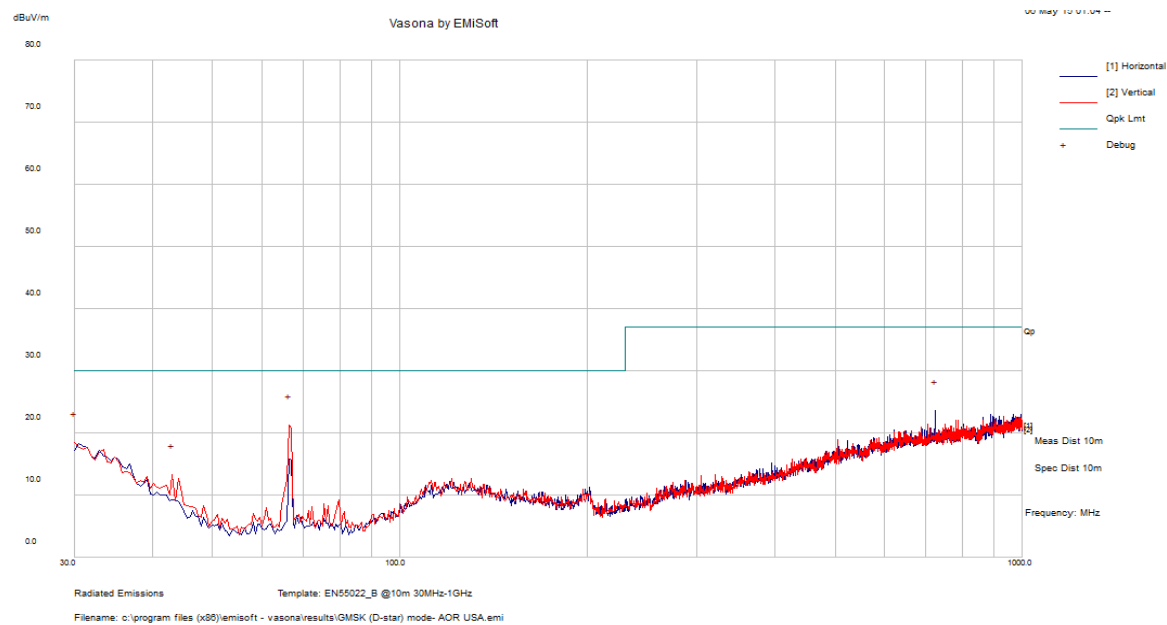
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
		Height (cm)	Polarity (H/V)				
79.994	24.09	167	V	86	30	79.994	QP
66.73825	16.83	101	V	303	30	66.73825	QP
30.29025	12.79	141	V	136	30	30.29025	QP
974.0735	16.13	198	V	9	37	974.0735	QP
724.7123	14.21	128	H	300	37	724.7123	QP
38.5235	7.06	132	V	320	30	38.5235	QP

30-1000 MHz – CW Mode (IF Bandwidth 500Hz) measured at 10m

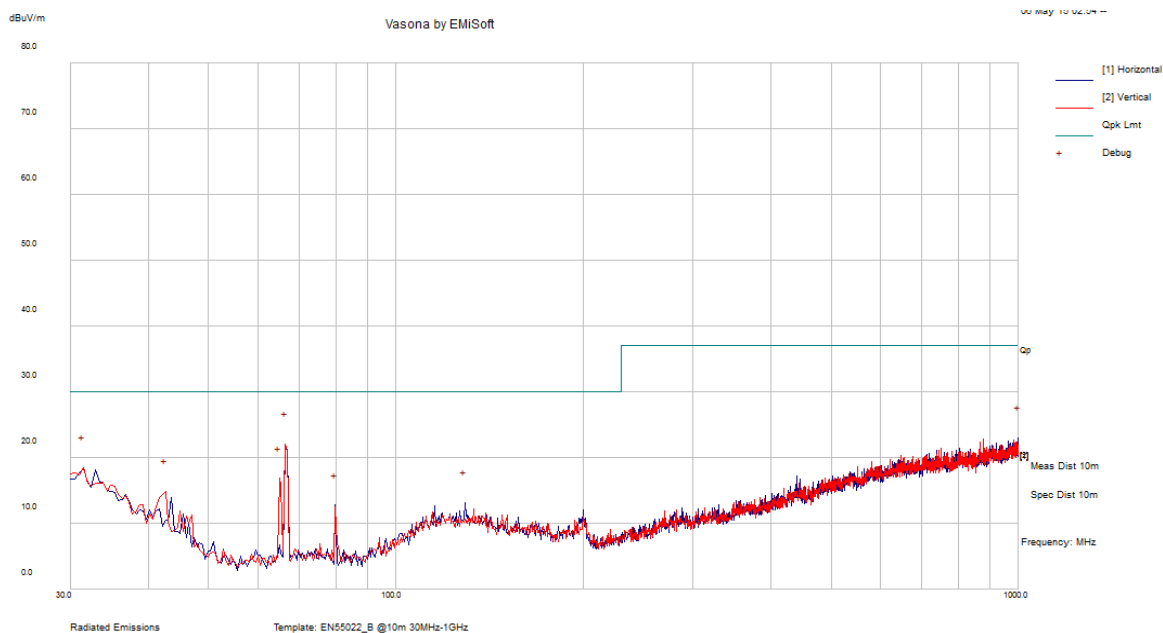


Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector (PK/QP/Ave.)
		Height (cm)	Polarity (H/V)				
99.9865	23.77	130	V	2	30	-6.23	QP
66.6985	17.08	100	V	84	30	-12.92	QP
30.952	12.35	173	V	194	30	-17.65	QP
986.2735	16.03	129	H	213	37	-20.97	QP
118.9448	6.5	129	V	89	30	-23.5	QP
42.75975	5.07	176	V	315	30	-24.93	QP

30-1000 MHz – GMSK Mode measured at 10m

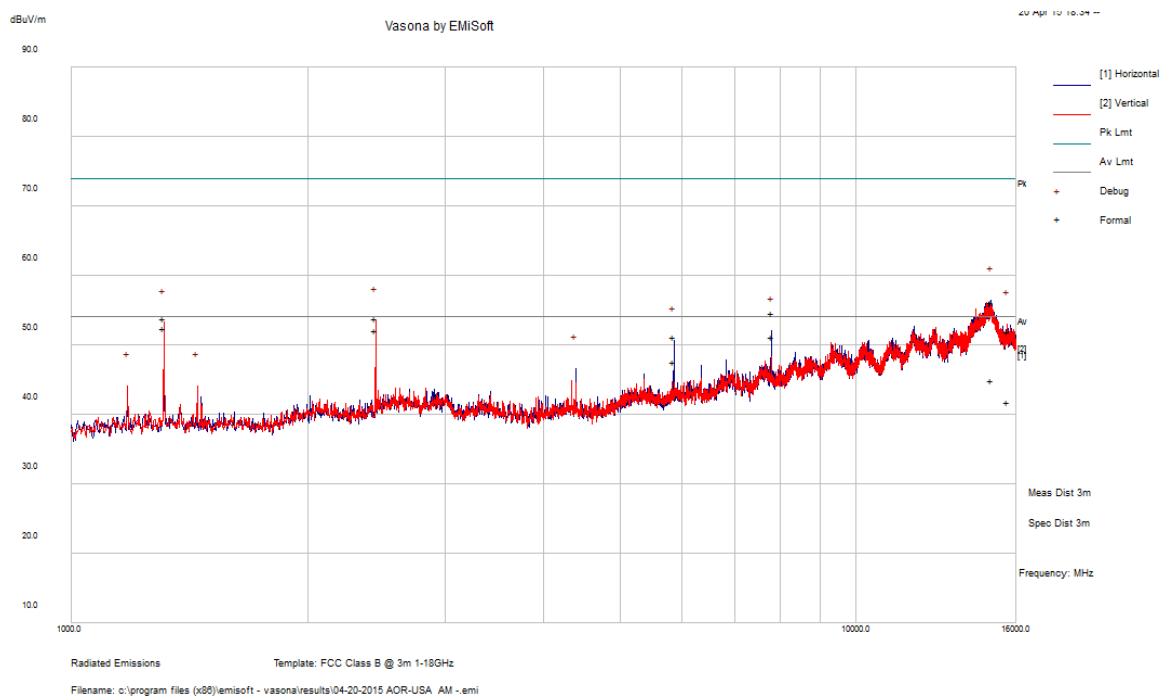


Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector (PK/QP/Ave.)
		Height (cm)	Polarity (H/V)				
66.7015	17.13	102	V	240	30	-12.87	QP
30.01082	13.17	196	V	320	30	-16.83	QP
724.4958	14.17	191	H	183	37	-22.83	QP
122.0615	6.61	105	V	11	30	-23.39	QP
43.27925	5.36	104	V	151	30	-24.64	QP
202.3308	4.13	133	V	96	30	-25.87	QP

30-1000 MHz – C4FM Mode measured at 10m

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
		Height (cm)	Polarity (H/V)				
66.71	18.45	163	V	70	30	-11.6	QP
64.6975	13.4	147	V	203	30	-16.6	QP
31.36375	12.03	110	V	222	30	-18	QP
42.584	11.7	100	V	198	30	-18.3	QP
998.316	16.06	100	H	35	37	-20.94	QP
128.7643	6.6	198	H	66	30	-23.4	QP

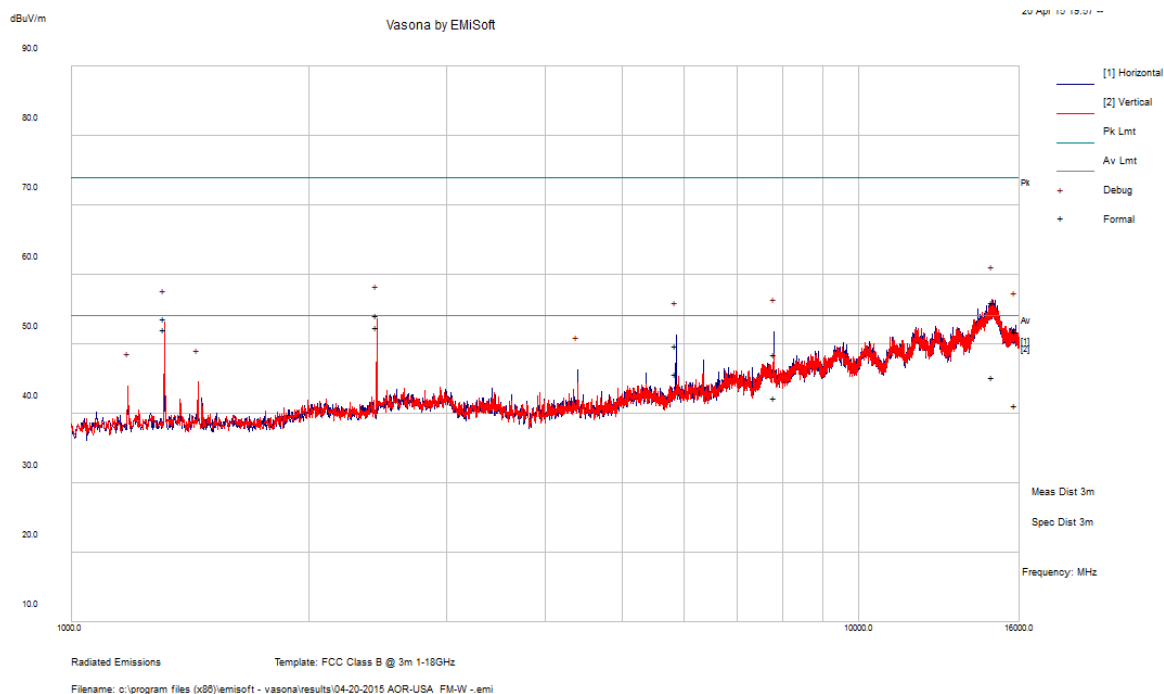
1-15GHz - AM Mode (IF Bandwidth 8 kHz) measured at 3m



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
14867	56.2	125	H	58	74	-17.8	PK
7812	54.53	130	H	132	74	-19.47	PK
2441	53.78	102	V	346	74	-20.22	PK
1312	53.78	162	V	169	74	-20.22	PK
15579	51.94	190	V	229	74	-22.06	PK
5859	51.09	118	H	145	74	-22.91	PK

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
1312	52.38	162	V	169	54	-1.62	Ave.
2441	52.06	102	V	346	54	-1.94	Ave.
7812	51.14	130	H	132	54	-2.86	Ave.
5859	47.52	118	H	145	54	-6.48	Ave.
14867	44.94	125	H	58	54	-9.06	Ave.
15579	41.78	190	V	229	54	-12.22	Ave.

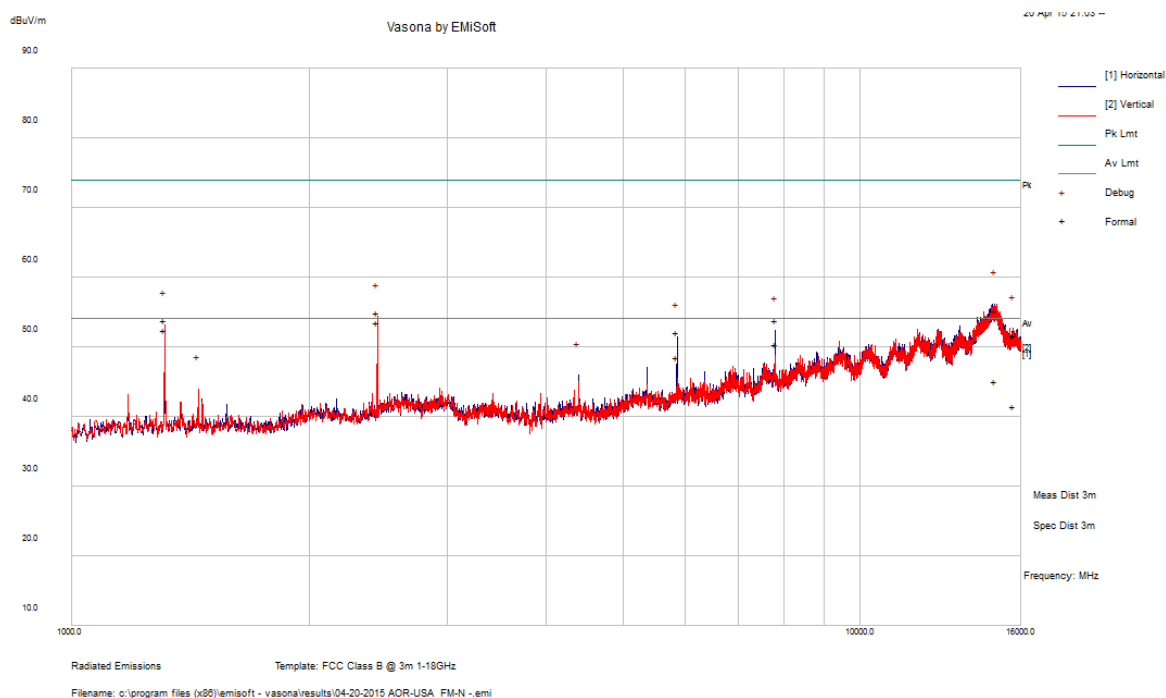
1-15GHz - Wide FM Mode (IF Bandwidth 200 kHz) measured at 3m



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
14782	56.02	184	V	191	74	-17.98	PK
2441	54.07	101	V	344	74	-19.93	PK
1311	53.59	168	V	174	74	-20.41	PK
15805	51.79	113	H	132	74	-22.21	PK
5859	49.74	107	H	151	74	-24.26	PK
7813	48.51	126	H	128	74	-25.49	PK

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
2441	52.35	101	V	344	54	-1.65	Ave.
1311	52.14	168	V	174	54	-1.86	Ave.
5859	45.72	107	H	151	54	-8.28	Ave.
14782	45.21	184	V	191	54	-8.79	Ave.
7813	42.18	126	H	128	54	-11.82	Ave.
15805	41.17	113	H	132	54	-12.83	Ave.

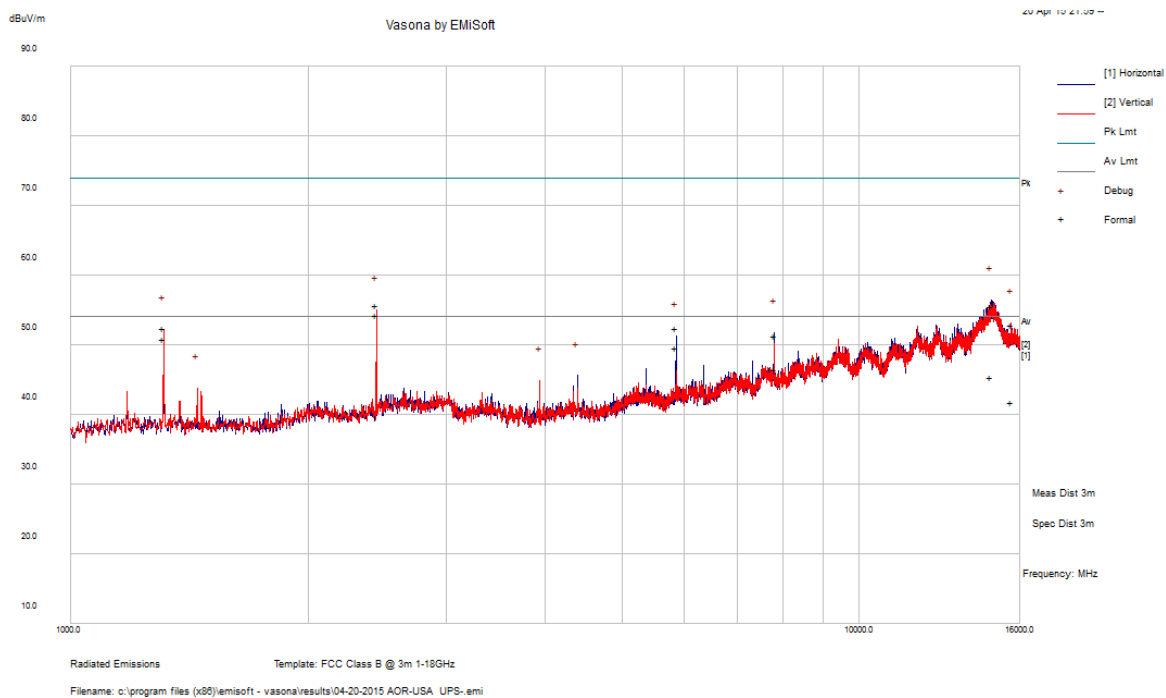
1-15GHz - Narrow FM Mode (IF Bandwidth 6 kHz) measured at 3m



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
14819	55.29	195	H	6	74	-18.71	PK
2441	54.98	100	V	350	74	-19.02	PK
7812	53.88	111	H	136	74	-20.12	PK
1312	53.81	163	V	173	74	-20.19	PK
5859	52.11	105	H	149	74	-21.89	PK
15645	51.7	132	V	264	74	-22.3	PK

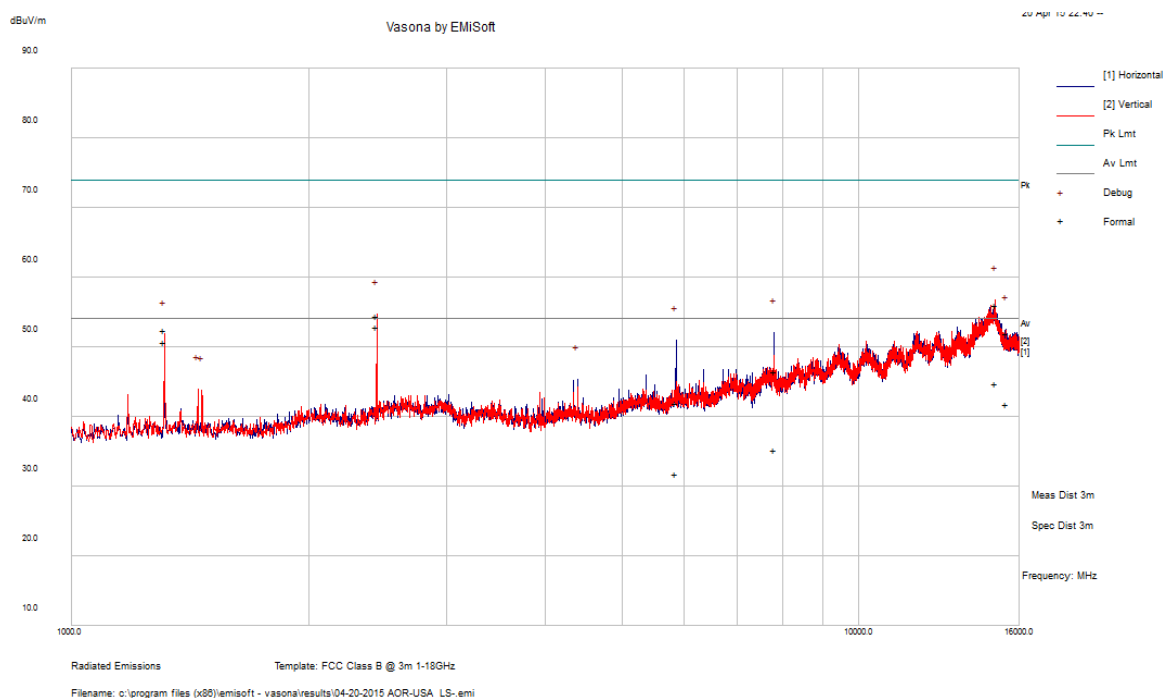
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
2441	53.49	100	V	350	54	-0.51	Ave.
1312	52.49	163	V	173	54	-1.51	Ave.
7812	50.42	111	H	136	54	-3.58	Ave.
5859	48.55	105	H	149	54	-5.45	Ave.
14819	45.01	195	H	6	54	-8.99	Ave.
15645	41.46	132	V	264	54	-12.54	Ave.

1-15GHz - Upper Side Band Mode (IF Bandwidth 2.6 kHz) measured at 3m



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
2441	55.73	100	V	342	74	-18.27	PK
14707	55.48	170	H	20	74	-18.52	PK
15583	52.83	161	V	91	74	-21.17	PK
1312	52.41	100	V	21	74	-21.59	PK
5859	52.41	161	H	144	74	-21.59	PK
7813	51.27	125	H	113	74	-22.73	PK

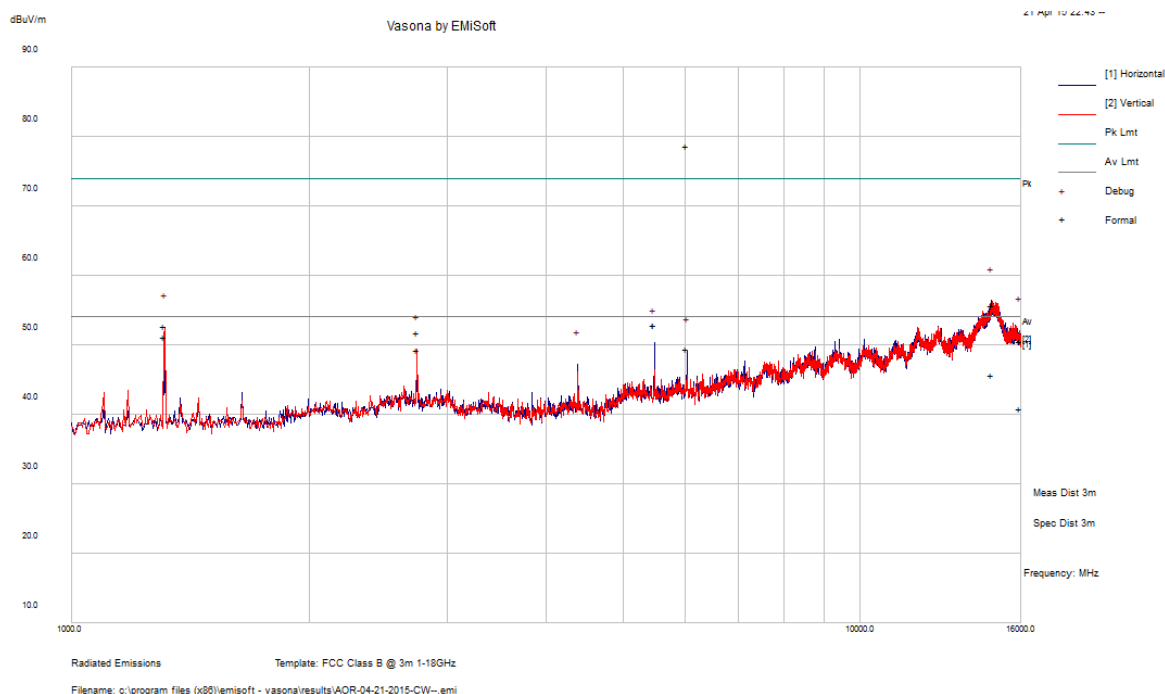
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
2441	53.85	100	V	342	54	-0.15	Ave.
1312	50.81	100	V	21	54	-3.19	Ave.
5859	49.66	161	H	144	54	-4.34	Ave.
7813	46.54	125	H	113	54	-7.46	Ave.
14707	45.46	170	H	20	54	-8.54	Ave.
15583	41.77	161	V	91	54	-12.23	Ave.

1-15GHz - Lower Side Band Mode (IF Bandwidth 1.8 kHz) measured at 3m

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
14901	55.94	126	V	155	74	-18.06	PK
2441	54.49	191	V	339	74	-19.51	PK
1311	52.39	100	V	20	74	-21.61	PK
15394	51.94	180	H	313	74	-22.06	PK
7815	46.46	114	H	78	74	-27.54	PK
5857	41.92	129	H	285	74	-32.08	PK

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
2441	52.96	191	V	339	54	-1.04	Ave.
1311	50.73	100	V	20	54	-3.27	Ave.
14901	44.77	126	V	155	54	-9.23	Ave.
15394	41.74	180	H	313	54	-12.26	Ave.
7815	35.25	114	H	78	54	-18.75	Ave.
5857	31.78	129	H	285	54	-22.22	Ave.

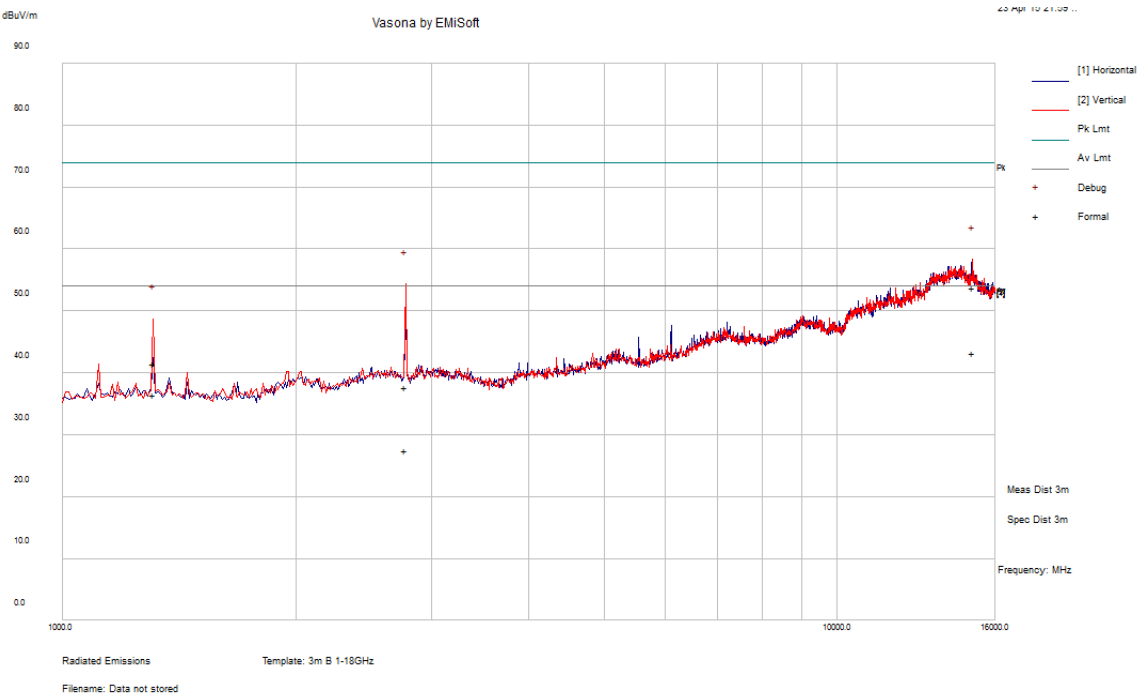
1-15GHz - CW Mode (IF Bandwidth 500 Hz) measured at 3m



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
14679	55.71	160	H	93	74	-18.29	PK
1312	52.78	102	V	17	74	-21.22	PK
15923	50.53	158	V	248	74	-23.47	PK
5484	52.84	124	H	115	74	-21.16	PK
2742	51.84	134	V	192	74	-22.16	PK
6032	49.42	136	H	218	74	-24.58	PK

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
5484	52.84	124	H	115	54	-1.16	Ave.
1312	51.17	102	V	17	54	-2.83	Ave.
2742	49.22	134	V	192	54	-4.78	Ave.
6032	48.66	136	H	218	54	-5.34	Ave.
14679	45.77	160	H	93	54	-8.23	Ave.
15923	40.8	158	V	248	54	-13.2	Ave.

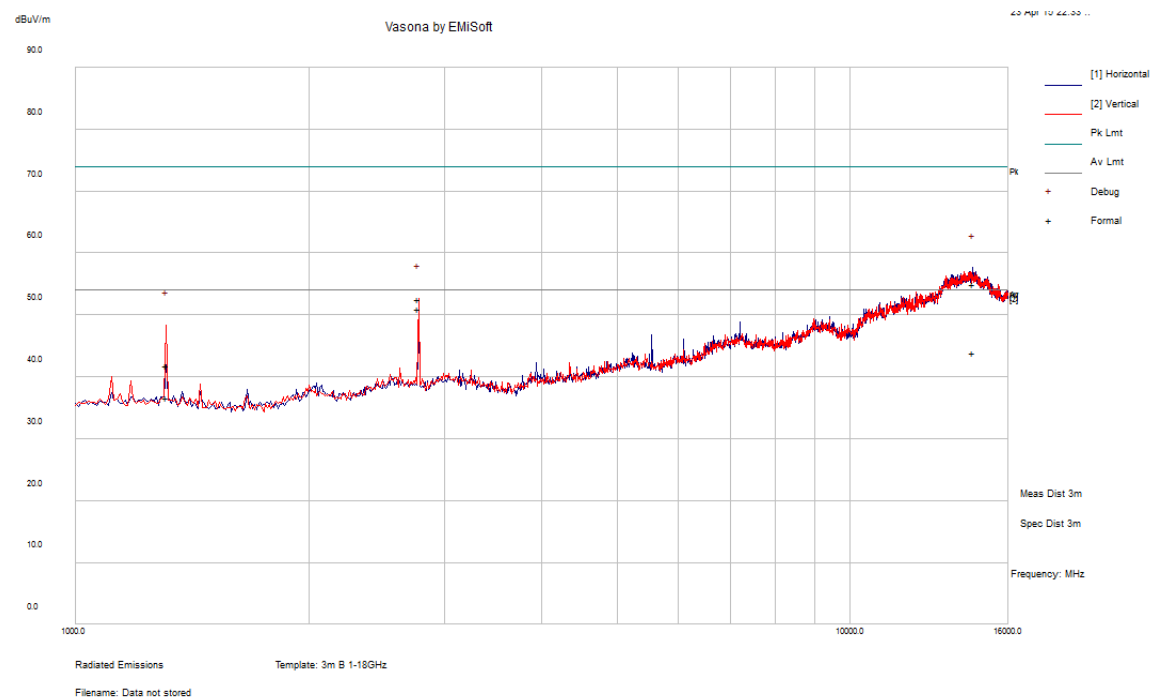
1-15GHz - GMSK (ALINCO) Mode measured at 3m



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector (PK/QP/Ave.)
14948	53.77	186	V	187	74	-20.23	PK
2773	37.67	153	V	187	74	-36.33	PK
1311	41.49	100	V	190	74	-32.51	PK

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector (PK/QP/Ave.)
2773	52.75	153	V	187	54	-1.25	Ave.
1311	51.45	100	V	190	54	-2.55	Ave.
14948	43.13	186	V	187	54	-10.87	Ave.

1-15GHz - C4FM (YAESU) Mode measured at 3m



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
14407	54.91	162	H	300	74	-19.09	PK
2773	52.58	102	V	175	74	-21.42	PK
1311	41.81	171	V	172	74	-32.19	PK

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)	Detector (PK/QP/Ave.)
1311	51.38	171	V	172	54	-2.62	Ave.
2773	51.07	102	V	175	54	-2.93	Ave.
14407	43.94	162	H	300	54	-10.06	Ave.

6 FCC §15.121 – Scanning Receiver Cellular Band Rejection

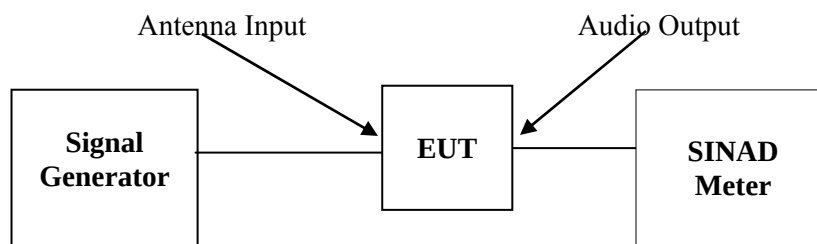
6.1 Applicable Standard

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

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Date	Calibration Interval
Helper Instruments	Meter, SINAD	SL-105	56800	2014-08-15	1 year
Agilent	Generator, Signal	E4438C	MY45091309	2014-07-15	1 year

***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:	22 ° C
Relative Humidity:	41 %
ATM Pressure:	101.2 kPa

**Testing was performed by Elijah Garcia on 2015-05-07.*

6.6 Test Results

Cellular Frequency (MHz)	Image Rejection Ratio (dB)
824	> 38
836	> 38
849	> 38
869	> 38
881	> 38
894	> 38

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