

EMISSIONS TEST REPORT

Report Number: 3152279BOX-001

Project Number: 3152279

Testing performed on the

VCA100 Radio

Model: BAEVCA100-V1FCGX-LF

To

CFR47 "Telecommunications"

FCC Part 15 Subpart C "Intentional Radiators" 15.247

For

BAE Systems – Homeland Security Solutions

Test Performed by:
Intertek – ETL SEMKO
70 Codman Hill Road
Boxborough, MA 01719

Test Authorized by:
BAE Systems – Homeland Security Solutions
PTP1-2228
65 River Road
Hudson, NH 03051

Prepared by:



Nicholas Abbondante

Date: 05/12/2008

Reviewed by:



Jeff Goulet

Date: 05/13/08

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1.0 Job Description

1.1 Client Information

This EUT has been tested at the request of:

Company: BAE Systems – Homeland Security Solutions
PTP1-2228
65 River Road
Hudson, NH 03051
Contact: Mr. Ralph Lombardo
Telephone: (603) 885-7172
Fax: N/A
Email: Ralph.Lombardo@BAEsystems.com

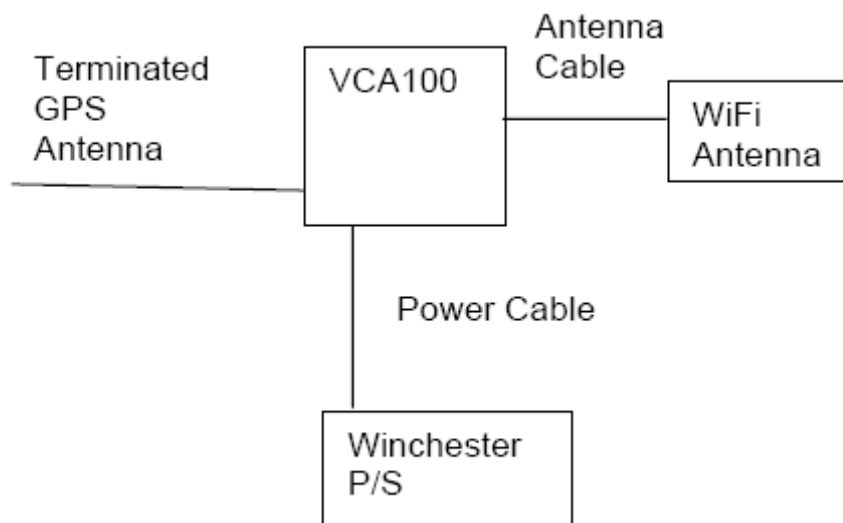
1.2 Equipment Under Test

Equipment Type: VCA100 Radio
Model Number(s): BAEVCA100-V1FCGX-LF
Serial number(s): 0713HNNH000031
Manufacturer: BAE Systems
EUT receive date: 05/01/2008
EUT received condition: Prototype in Good Condition
Test start date: 05/06/2008
Test end date: 05/07/2008

1.3 Test Plan Reference: Tested according to the standards listed, ANSI C63.4:2003, and Public Notice DA 00-705.

1.4 Test Configuration

1.4.1 Block Diagram



1.4.2. Cables:

Cable	Shielding	Connector	Length (m)	Qty.
WiFi Antenna Cable	Braid	SMA	4.2	1
GPS Antenna Cable	Braid	SMA	5.5	1
Power Cable	None	Plastic/Wire	3.25	1

1.4.3. Support Equipment:

Name: Antenex WiFi Antenna 2.4-2.5 GHz
Model No.: A10245
Serial No.: N/L

Name: All-Start Winchester Portable Power Generator
Model No.: WPG103
Serial No.: N/L

1.5 Mode(s) of Operation:

During testing, the EUT was powered from a nominal 12V DC power supply. The EUT was fully powered but only the WiFi transmitter was transmitting at maximum duty cycle.

2.0 Test Summary

TEST STANDARD	RESULTS	
CFR47 Telecommunications FCC Part 15 Subpart C 15.247		
SUB-TEST	TEST PARAMETER	COMMENT
Radiated Emissions FCC §15.205, §15.209, §15.247	Spurious emissions must be at least 20 dB lower than the fundamental field strength when measured with a 100 kHz bandwidth. Emissions which fall in the restricted bands of 15.205 must meet the general limits of 15.209.	Pass

REVISION SUMMARY – The following changes have been made to this Report:

<u>Date</u>	<u>Project</u> <u>No.</u>	<u>Project</u> <u>Handler</u>	<u>Page(s)</u>	<u>Item</u>	<u>Description of Change</u>
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3.0 Sample Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where

- FS = Field Strength in dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$\begin{aligned} RA &= 52.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB/m} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ FS &= 32 \text{ dB}\mu\text{V/m} \end{aligned}$$

$$\text{Level in } \mu\text{V/m} = [10(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

The following is how net line-conducted readings were determined:

$$NF = RF + LF + CF + AF$$

Where

- NF = Net Reading in dB μ V
- RF = Reading from receiver in dB μ V
- LF = LISN Correction Factor in dB
- CF = Cable Correction Factor in dB
- AF = Attenuator Loss Factor in dB

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where UF = Net Reading in } \mu\text{V}$$

Example:

$$\begin{aligned} NF &= RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 \text{ dB}\mu\text{V} \\ UF &= 10^{(49.1 \text{ dB}\mu\text{V} / 20)} = 254 \mu\text{V/m} \end{aligned}$$

3.1 Measurement Uncertainty

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes.

The expanded uncertainty ($k = 2$) for radiated emissions from 30 to 1000 MHz has been determined to be:

± 3.5 dB at 10m, ± 3.8 dB at 3m

The expanded uncertainty ($k = 2$) for mains conducted emissions from 150 kHz to 30 MHz has been determined to be:

± 2.6 dB

The expanded uncertainty ($k = 2$) for telecom port conducted emissions from 150 kHz to 30 MHz has been determined to be:

± 3.2 for ISN and voltage probe measurements

± 3.1 for current probe measurements

3.2 Site Description

Test Site(s): 2

Our OATS are 3m and 10m sheltered emissions measurement ranges located in a light commercial environment in Boxborough, Massachusetts. They meet the technical requirements of ANSI C63.4-2003 and CISPR 22:1993/EN 55022:1994 for radiated and conducted emission measurements. The shelter structure is entirely fiberglass and plastic, with outside dimensions of 33 ft x 57 ft. The structure resembles a quonset hut with a center ceiling height of 16.5 ft.

The testing floor is covered by a galvanized sheet metal groundplane that is earth-grounded via copper rods around the perimeter of the site. The joints between individual metal sheets are bridged with a 2 inch wide metal strips to provide low RF impedance contact throughout. The sheets are screwed in place with stainless steel, round-head screws every three inches. Site illumination and HVAC are provided from beneath the ground reference plane through flush entry ports, the port covers are electrically bonded to the ground plane.

A flush metal turntable with 12 ft. diameter and 5000 lb. load capacity (12,000 lb. in Site 3) is provided for floor-standing equipment. A wooden table 80 cm high is used for table-top equipment. The turntable is electrically connected to the ground plane with three copper straps. The straps are connected to the turntable at the center of it with ground braid. The copper strap is directly connected to the groundplane at the edges of the turntable. The turntable is located on the south end of the structure and the antennas are mounted 3 and 10 meters away to the north. The antenna mast is a non-conductive with remote control of antenna height and polarization. The antenna height is adjustable from 1 to 4 meters.

All final radiated emission measurements are performed with the testing personnel and measurement equipment located below the ground reference plane. The site has a full basement underneath the turntable where support equipment may be remotely located. Operation of the antenna, turntable and equipment under test is controlled by remote controls that manipulate the antenna height and polarization and with a turntable control. Test personnel are located below the ellipse when measurements are performed, however the site maintains the ability of having personnel manipulate cables while monitoring test equipment. Ambient radiated emissions are 6 dB or more below the relevant FCC emission limits.

AC mains power is brought to the equipment under test through a power line filter, to remove ambient conducted noise. 50 Hz (240 VAC single phase), 60 Hz power (120 VAC single phase, 208 VAC three phase), and 60 Hz (480 VAC three phase) are available. Conducted emission measurements are performed with a Line Impedance Stabilization Network (LISN) or Artificial Mains Network (AMN) bonded to the ground reference plane. A removable vertical groundplane (2 meter X 2 meter area) is used for line-conducted measurements for table top equipment. The vertical groundplane is electrically connected to the reference groundplane.

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference groundplanes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.247

Test: Radiated Emissions

Performance Criterion: Spurious emissions must be at least 20 dB lower than the fundamental field strength when measured with a 100 kHz bandwidth. Emissions which fall in the restricted bands of 15.205 must meet the general limits of 15.209.

Test Environment:

Environmental Conditions During Testing:	Ambient (°C):	See Tables	Humidity (%):	See Tables	Pressure (hPa):	See Tables
Pretest Verification Performed	Yes		Equipment under Test:		BAEVCA100-V1FCGX-LF	
Test Engineer(s):	Nicholas Abbondante		EUT Serial Number:		0713HNH000031	

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR2	05/20/2008
2	ANTENNA	EMCO	3142	9711-1225	06/05/2008
3	Site 2 10m in floor cable	ITS	RG214B/U	S2 10M FLR	09/17/2008
4	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	01/25/2009
5	Spectrum Analyzer 40 GHz	Rohde & Schwartz	FSEK-30	100225	11/26/2008
6	HORN ANTENNA	EMCO	3115	9602-4675	09/24/2008
7	40GHz Cable	Megaphase	TM40-K1K1-197	7030801 001	05/23/2008
8	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL029	12/06/2008
9	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/06/2008
10	3GHz High Pass Filter	Reactel, Inc	7HSX-3G/18G-S11	06-1	09/18/2008
11	18GHz High Pass Filter	Reactel, Inc	7HS-18G/40G K11	(06)1	04/11/2009
12	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	12/26/2008
13	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	03/27/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision

Test Results:

Special Radiated Emissions

Company: BAE Systems - Homeland Security Solutions
 Model #: BAEVCA100-V1FCGX-LF
 Serial #: 0713HNNH000031
 Engineers: Nicholas Abbondante
 Project #: 3152279
 Standard: FCC Part 15 Subpart C 15.247
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE9 03-27-09.txt
 PreAmp Used? (Y or N): N
 Antenna & Cables: N
 Bands: N, LF, HF, SHF
 Antenna: LOG4 06-05-08 V10.txt
 Cable(s): S2 10M FLR 9-17-08.txt
 NONE.
 Location: Site 2
 Barometer: BAR2
 Temp/Humidity/Pressure: 18c 35% 1050mB
 Limit Distance (m): 3
 Test Distance (m): 10
 Voltage/Frequency: Fresh 12VDC Battery
 Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC
Note: Channel 1 (2412 MHz)												
QP	V	111.612	9.0	7.4	1.7	0.0	-10.5	28.5	43.5	-15.0	120/300 kHz	RB
QP	V	113.796	5.9	7.2	1.7	0.0	-10.5	25.3	43.5	-18.2	120/300 kHz	RB
QP	V	130.900	12.9	6.8	1.8	0.0	-10.5	32.0	43.5	-11.5	120/300 kHz	RB
PK	V	148.320	21.5	8.4	1.9	0.0	-10.5	42.2	90.1	-47.9	120/300 kHz	
PK	V	161.700	24.1	9.0	2.1	0.0	-10.5	45.6	90.1	-44.5	120/300 kHz	
QP	V	166.500	6.9	9.1	2.1	0.0	-10.5	28.5	43.5	-15.0	120/300 kHz	RB
PK	V	182.100	14.4	9.7	2.1	0.0	-10.5	36.7	90.1	-53.4	120/300 kHz	
PK	V	196.600	16.5	10.2	2.3	0.0	-10.5	39.4	90.1	-50.7	120/300 kHz	
PK	V	206.500	14.9	10.5	2.3	0.0	-10.5	38.3	90.1	-51.8	120/300 kHz	
PK	V	217.500	14.1	11.2	2.4	0.0	-10.5	38.2	90.1	-51.9	120/300 kHz	
PK	V	222.000	14.4	11.5	2.4	0.0	-10.5	38.8	90.1	-51.3	120/300 kHz	
PK	V	224.500	18.8	11.6	2.5	0.0	-10.5	43.3	90.1	-46.8	120/300 kHz	
PK	V	232.600	11.1	11.9	2.5	0.0	-10.5	35.9	90.1	-54.2	120/300 kHz	
PK	V	234.300	16.0	11.9	2.5	0.0	-10.5	40.9	90.1	-49.2	120/300 kHz	
QP	V	262.000	-1.8	12.7	2.7	0.0	-10.5	24.0	46.0	-22.0	120/300 kHz	RB
PK	V	288.400	20.3	13.2	2.8	0.0	-10.5	46.9	90.1	-43.2	120/300 kHz	
PK	V	310.800	20.5	13.9	2.9	0.0	-10.5	47.7	90.1	-42.4	120/300 kHz	
QP	V	327.200	14.0	14.5	3.0	0.0	-10.5	42.0	46.0	-4.0	120/300 kHz	RB
PK	V	348.800	13.2	15.5	3.1	0.0	-10.5	42.3	90.1	-47.8	120/300 kHz	
PK	V	359.200	17.7	15.9	3.2	0.0	-10.5	47.2	90.1	-42.9	120/300 kHz	
PK	V	398.000	19.0	16.2	3.3	0.0	-10.5	49.0	90.1	-41.1	120/300 kHz	
PK	V	414.800	23.6	16.4	3.4	0.0	-10.5	53.8	90.1	-36.3	120/300 kHz	
PK	V	436.400	14.3	17.0	3.6	0.0	-10.5	45.4	90.1	-44.7	120/300 kHz	
PK	V	458.800	8.2	17.8	3.6	0.0	-10.5	40.1	90.1	-50.0	120/300 kHz	
PK	H	720.000	10.7	21.9	4.9	0.0	-10.5	48.0	90.1	-42.1	120/300 kHz	
PK	H	732.800	11.8	22.2	4.9	0.0	-10.5	49.4	90.1	-40.7	120/300 kHz	
PK	H	753.600	11.0	22.7	4.9	0.0	-10.5	49.1	90.1	-41.0	120/300 kHz	
PK	H	767.200	7.3	23.2	5.0	0.0	-10.5	45.9	90.1	-44.2	120/300 kHz	
PK	H	777.200	10.4	23.4	5.0	0.0	-10.5	49.2	90.1	-40.9	120/300 kHz	
PK	H	781.200	20.9	23.3	5.1	0.0	-10.5	59.6	90.1	-30.5	120/300 kHz	
PK	H	789.800	9.3	23.0	5.1	0.0	-10.5	48.0	90.1	-42.1	120/300 kHz	

Special Radiated Emissions

Company: BAE Systems - Homeland Security Solutions Antenna & Cables: N Bands: N, LF, HF, SHF
 Model #: BAEVCA100-V1FCGX-LF Antenna: LOG4 06-05-08 V10.txt LOG4 06-05-08 H10.txt
 Serial #: 0713HNNH000031 Cable(s): S2 10M FLR 9-17-08.txt NONE.
 Engineers: Nicholas Abbondante Location: Site 2 Barometer: BAR2
 Project #: 3152279 Date(s): 05/07/08
 Standard: FCC Part 15 Subpart C 15.247 Temp/Humidity/Pressure: 18c 35% 1050mB
 Receiver: R&S ESCI (ROS002) Limit Distance (m): 3
 PreAmp: PRE9 03-27-09.txt Test Distance (m): 10
 PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
Note: Channel 6 (2437 MHz)												
QP	V	111.528	9.3	7.4	1.7	0.0	-10.5	28.8	43.5	-14.7	120/300 kHz	RB
QP	V	113.964	9.4	7.2	1.7	0.0	-10.5	28.8	43.5	-14.7	120/300 kHz	RB
QP	V	133.138	10.6	7.0	1.8	0.0	-10.5	29.9	43.5	-13.6	120/300 kHz	RB
PK	V	146.220	20.0	8.1	1.9	0.0	-10.5	40.5	90.1	-49.6	120/300 kHz	
QP	V	166.400	6.8	9.1	2.1	0.0	-10.5	28.4	43.5	-15.1	120/300 kHz	RB
PK	V	181.400	8.0	9.7	2.1	0.0	-10.5	30.2	90.1	-59.9	120/300 kHz	
PK	V	196.500	21.4	10.2	2.3	0.0	-10.5	44.3	90.1	-45.8	120/300 kHz	
PK	V	217.500	15.0	11.2	2.4	0.0	-10.5	39.1	90.1	-51.0	120/300 kHz	
PK	V	232.600	9.5	11.9	2.5	0.0	-10.5	34.3	90.1	-55.8	120/300 kHz	
PK	V	234.300	13.0	11.9	2.5	0.0	-10.5	37.9	90.1	-52.2	120/300 kHz	
QP	V	248.200	-1.1	12.3	2.6	0.0	-10.5	24.3	46.0	-21.7	120/300 kHz	RB
QP	V	264.400	-2.3	12.7	2.7	0.0	-10.5	23.6	46.0	-22.4	120/300 kHz	RB
QP	V	283.600	8.8	13.2	2.9	0.0	-10.5	35.3	46.0	-10.7	120/300 kHz	RB
PK	V	310.800	19.8	13.9	2.9	0.0	-10.5	47.0	90.1	-43.1	120/300 kHz	
QP	V	327.200	14.3	14.5	3.0	0.0	-10.5	42.3	46.0	-3.7	120/300 kHz	RB
PK	V	355.200	17.2	15.7	3.2	0.0	-10.5	46.6	90.1	-43.5	120/300 kHz	
PK	V	367.200	14.3	16.1	3.2	0.0	-10.5	44.1	90.1	-46.0	120/300 kHz	
PK	V	393.200	20.5	16.3	3.3	0.0	-10.5	50.5	90.1	-39.6	120/300 kHz	
PK	V	414.400	23.6	16.4	3.4	0.0	-10.5	53.8	90.1	-36.3	120/300 kHz	
PK	V	437.200	13.3	17.0	3.6	0.0	-10.5	44.4	90.1	-45.7	120/300 kHz	
PK	V	458.800	7.4	17.8	3.6	0.0	-10.5	39.3	90.1	-50.8	120/300 kHz	
PK	V	754.000	10.8	22.1	4.9	0.0	-10.5	48.2	90.1	-41.9	120/300 kHz	
PK	V	767.000	7.2	22.6	5.0	0.0	-10.5	45.3	90.1	-44.8	120/300 kHz	
PK	V	777.200	9.3	23.0	5.0	0.0	-10.5	47.7	90.1	-42.4	120/300 kHz	
PK	V	781.200	15.8	22.9	5.1	0.0	-10.5	54.2	90.1	-35.9	120/300 kHz	
PK	V	788.800	8.8	22.8	5.1	0.0	-10.5	47.2	90.1	-42.9	120/300 kHz	

Special Radiated Emissions

Company: BAE Systems - Homeland Security Solutions Antenna & Cables: N Bands: N, LF, HF, SHF
 Model #: BAEVCA100-V1FCGX-LF Antenna: LOG4 06-05-08 V10.txt LOG4 06-05-08 H10.txt
 Serial #: 0713HNNH000031 Cable(s): S2 10M FLR 9-17-08.txt NONE.
 Engineers: Nicholas Abbondante Location: Site 2 Barometer: BAR2
 Project #: 3152279 Date(s): 05/07/08 Temp/Humidity/Pressure: 18c 35% 1050mB
 Standard: FCC Part 15 Subpart C 15.247
 Receiver: R&S ESCI (ROS002) Limit Distance (m): 3
 PreAmp: PRE9 03-27-09.txt Test Distance (m): 10
 PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
Note: Channel 11 (2462 MHz)												
QP	V	111.192	8.1	7.4	1.7	0.0	-10.5	27.6	43.5	-15.9	120/300 kHz	RB
QP	V	116.568	10.6	7.0	1.7	0.0	-10.5	29.8	43.5	-13.7	120/300 kHz	RB
QP	V	132.860	12.9	6.9	1.8	0.0	-10.5	32.1	43.5	-11.4	120/300 kHz	RB
PK	V	146.136	19.3	8.1	1.9	0.0	-10.5	39.8	90.1	-50.3	120/300 kHz	RB
QP	V	166.400	8.0	9.1	2.1	0.0	-10.5	29.6	43.5	-13.9	120/300 kHz	RB
QP	V	171.700	8.2	9.2	2.1	0.0	-10.5	29.9	43.5	-13.6	120/300 kHz	RB
PK	V	183.300	16.3	9.8	2.2	0.0	-10.5	38.7	90.1	-51.4	120/300 kHz	RB
PK	V	221.900	12.9	11.4	2.4	0.0	-10.5	37.2	90.1	-52.9	120/300 kHz	RB
PK	V	232.900	8.6	11.9	2.5	0.0	-10.5	33.4	90.1	-56.7	120/300 kHz	RB
PK	V	234.100	15.6	11.9	2.5	0.0	-10.5	40.4	90.1	-49.7	120/300 kHz	RB
QP	V	246.500	3.9	12.3	2.6	0.0	-10.5	29.3	46.0	-16.7	120/300 kHz	RB
QP	V	266.400	6.7	12.8	2.7	0.0	-10.5	32.6	46.0	-13.4	120/300 kHz	RB
PK	V	288.400	17.4	13.2	2.8	0.0	-10.5	43.9	90.1	-46.2	120/300 kHz	RB
PK	V	310.800	20.2	13.9	2.9	0.0	-10.5	47.4	90.1	-42.7	120/300 kHz	RB
QP	V	327.200	12.6	14.5	3.0	0.0	-10.5	40.6	46.0	-5.4	120/300 kHz	RB
PK	V	349.200	17.7	15.5	3.1	0.0	-10.5	46.9	90.1	-43.2	120/300 kHz	RB
PK	V	360.000	14.8	15.9	3.2	0.0	-10.5	44.4	90.1	-45.7	120/300 kHz	RB
PK	V	399.600	20.5	16.2	3.3	0.0	-10.5	50.5	90.1	-39.6	120/300 kHz	RB
PK	V	414.800	23.5	16.4	3.4	0.0	-10.5	53.8	90.1	-36.3	120/300 kHz	RB
PK	V	437.200	12.5	17.0	3.6	0.0	-10.5	43.6	90.1	-46.5	120/300 kHz	RB
PK	V	458.960	13.0	17.8	3.6	0.0	-10.5	44.9	90.1	-45.2	120/300 kHz	RB
PK	H	753.800	10.1	22.7	4.9	0.0	-10.5	48.2	90.1	-41.9	120/300 kHz	RB
PK	H	767.800	9.0	23.2	5.0	0.0	-10.5	47.6	90.1	-42.5	120/300 kHz	RB
PK	H	777.200	13.7	23.4	5.0	0.0	-10.5	52.5	90.1	-37.6	120/300 kHz	RB
PK	H	791.200	10.2	23.0	5.2	0.0	-10.5	48.8	90.1	-41.3	120/300 kHz	RB

Special Radiated Emissions

Company: BAE Systems - Homeland Security Solutions
 Model #: BAEVCA100-V1FCGX-LF
 Serial #: 0713HNNH000031

Antenna & Cables: HF Bands: N, LF, HF, SHF
 Antenna: Horn2 V1m 9-24-2008.txt Horn2 H1m 9-24-2008.txt
 Cable(s): MEG001 05-23-08.txt NONE.
 Barometer: BAR2

Engineers: Nicholas Abbondante
 Project #: 3152279 Date(s): 05/06/08

Location: Site 2

Temp/Humidity/Pressure: 23c 34% 1050mB

Standard: FCC Part 15 Subpart C 15.247

Receiver: R&S FSEK-30 (ROS001)

Limit Distance (m): 3

PreAmp: PRE9 03-27-09.txt

Test Distance (m): 3

PreAmp Used? (Y or N): N

Voltage/Frequency: Fresh 12VDC Battery

Frequency Range: 1-4 GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
Note: Fundamental Power Reference												
PK	V	2412.000	78.4	28.7	3.0	0.0	0.0	110.1	-	-	100/300 kHz	
PK	V	2437.000	78.3	28.7	3.0	0.0	0.0	110.0	-	-	100/300 kHz	
PK	V	2462.000	77.9	28.7	3.0	0.0	0.0	109.6	-	-	100/300 kHz	
PK	V	2122.500	22.5	28.2	2.8	0.0	0.0	53.5	90.1	-36.6	100/300 kHz	
PK	V	2208.600	28.0	28.3	2.8	0.0	0.0	59.2	74.0	-14.8	1/3 MHz	RB
PK	V	2208.600	14.4	28.3	2.8	0.0	0.0	45.6	54.0	-8.4	1MHz/10Hz	RB
PK	V	2705.500	30.5	29.5	3.2	0.0	0.0	63.2	74.0	-10.8	1/3 MHz	RB
PK	V	2705.500	16.5	29.5	3.2	0.0	0.0	49.3	54.0	-4.7	1MHz/10Hz	RB
PK	V	2112.800	22.8	28.2	2.8	0.0	0.0	53.7	90.1	-36.4	100/300 kHz	
PK	V	2339.800	28.0	28.5	2.9	0.0	0.0	59.5	74.0	-14.5	1/3 MHz	RB
PK	V	2339.800	13.1	28.5	2.9	0.0	0.0	44.5	54.0	-9.5	1MHz/10Hz	RB
PK	V	2732.900	29.5	29.6	3.2	0.0	0.0	62.3	74.0	-11.7	1/3 MHz	RB
PK	V	2732.900	16.9	29.6	3.2	0.0	0.0	49.7	54.0	-4.3	1MHz/10Hz	RB
PK	V	2157.500	21.7	28.3	2.8	0.0	0.0	52.7	90.1	-37.4	100/300 kHz	
PK	V	2336.700	27.1	28.5	2.9	0.0	0.0	58.6	74.0	-15.4	1/3 MHz	RB
PK	V	2336.700	19.3	28.5	2.9	0.0	0.0	50.8	54.0	-3.2	1MHz/10Hz	RB
PK	V	2731.400	29.4	29.6	3.2	0.0	0.0	62.2	74.0	-11.8	1/3 MHz	RB
PK	V	2731.400	17.4	29.6	3.2	0.0	0.0	50.2	54.0	-3.8	1MHz/10Hz	RB

Special Radiated Emissions

Company: BAE Systems - Homeland Security Solutions
 Model #: BAEVCA100-V1FCGX-LF
 Serial #: 0713HNH000031
 Engineers: Nicholas Abbondante
 Project #: 3152279
 Standard: FCC Part 15 Subpart C 15.247
 Receiver: R&S FSEK-30 (ROS001)
 PreAmp: PRE9 03-27-09.txt
 Antenna & Cables: LF Bands: N, LF, HF, SHF
 Antenna: Horn2 V1m 9-24-2008.txt Horn2 H1m 9-24-2008.txt
 Cable(s): MEG001 05-23-08.txt CBL029 12-06-08.txt
 Barometer: BAR2 Filter: REA004
 Location: Site 2
 Temp/Humidity/Pressure: 23c 34% 1050mB
 Limit Distance (m): 3
 Test Distance (m): 3
 PreAmp Used? (Y or N): Y Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 4-18 GHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC
PK	V	4824.000	38.2	33.6	6.3	29.3	0.0	48.8	74.0	-25.2	1/3 MHz	RB
AVG	V	4824.000	31.5	33.6	6.3	29.3	0.0	42.1	54.0	-11.9	1/3 MHz	RB
PK	V	7236.000	26.3	36.7	8.0	28.4	0.0	42.5	90.1	-47.6	100/300 kHz	
PK	V	9648.000	25.4	38.3	9.5	27.4	0.0	45.7	90.1	-44.4	100/300 kHz	
PK	V	12060.000	35.2	39.1	11.1	27.4	0.0	58.0	74.0	-16.0	1/3 MHz	RB
AVG	V	12060.000	26.0	39.1	11.1	27.4	0.0	48.8	54.0	-5.2	1/3 MHz	RB
PK	V	14472.000	34.9	40.7	12.6	27.6	0.0	60.6	74.0	-13.4	1/3 MHz	RB
AVG	V	14472.000	26.0	40.7	12.6	27.6	0.0	51.8	54.0	-2.2	1/3 MHz	RB
PK	V	16884.000	24.9	40.6	15.3	28.1	0.0	52.7	90.1	-37.4	100/300 kHz	
PK	V	4874.000	39.5	33.7	6.4	29.3	0.0	50.3	74.0	-23.7	1/3 MHz	RB
AVG	V	4874.000	34.7	33.7	6.4	29.3	0.0	45.5	54.0	-8.5	1/3 MHz	RB
PK	V	7311.000	36.8	36.8	8.0	28.4	0.0	53.3	74.0	-20.7	1/3 MHz	RB
AVG	V	7311.000	29.2	36.8	8.0	28.4	0.0	45.7	54.0	-8.3	1/3 MHz	RB
PK	V	9748.000	28.2	38.4	9.6	27.4	0.0	48.8	90.1	-41.3	100/300 kHz	
PK	V	12185.000	35.6	39.1	11.1	27.4	0.0	58.4	74.0	-15.6	1/3 MHz	RB
AVG	V	12185.000	26.9	39.1	11.1	27.4	0.0	49.7	54.0	-4.3	1/3 MHz	RB
PK	V	14622.000	25.4	40.2	12.7	27.6	0.0	50.7	90.1	-39.4	100/300 kHz	
PK	V	17059.000	25.6	41.5	15.5	28.1	0.0	54.4	90.1	-35.7	100/300 kHz	
PK	V	4924.000	38.2	33.8	6.4	29.3	0.0	49.1	74.0	-24.9	1/3 MHz	RB
AVG	V	4924.000	32.1	33.8	6.4	29.3	0.0	43.0	54.0	-11.0	1/3 MHz	RB
PK	V	7386.000	31.6	37.0	8.1	28.3	0.0	48.4	54.0	-5.6	100/300 kHz	RB
PK	V	9848.000	32.0	38.5	9.6	27.4	0.0	52.8	90.1	-37.3	100/300 kHz	
PK	V	12310.000	35.5	39.2	11.2	27.4	0.0	58.5	74.0	-15.5	1/3 MHz	RB
AVG	V	12310.000	27.3	39.2	11.2	27.4	0.0	50.3	54.0	-3.7	1/3 MHz	RB
PK	V	14772.000	25.6	39.7	12.9	27.6	0.0	50.5	90.1	-39.6	100/300 kHz	
PK	V	17234.000	25.1	42.5	15.8	28.2	0.0	55.2	90.1	-34.9	100/300 kHz	

Special Radiated Emissions

Company: BAE Systems - Homeland Security Solutions
 Model #: BAEVCA100-V1FCGX-LF
 Serial #: 0713HHN000031

Antenna & Cables: SHF Bands: N, LF, HF, SHF
 Antenna: EMC04 V 1m 12-26-2008.txt EMC04 H 1m 12-26-2008.txt
 Cable(s): CBL029 12-06-08.txt CBL030 12-06-08.txt
 Barometer: BAR2 Filter: REA006

Engineers: Nicholas Abbondante Location: Site 2
 Project #: 3152279 Date(s): 05/06/08

Temp/Humidity/Pressure: 23c 34% 1050mB

Standard: FCC Part 15 Subpart C 15.247

Receiver: R&S FSEK-30 (ROS001) Limit Distance (m): 3

PreAmp: PRE9 03-27-09.txt Test Distance (m): 3

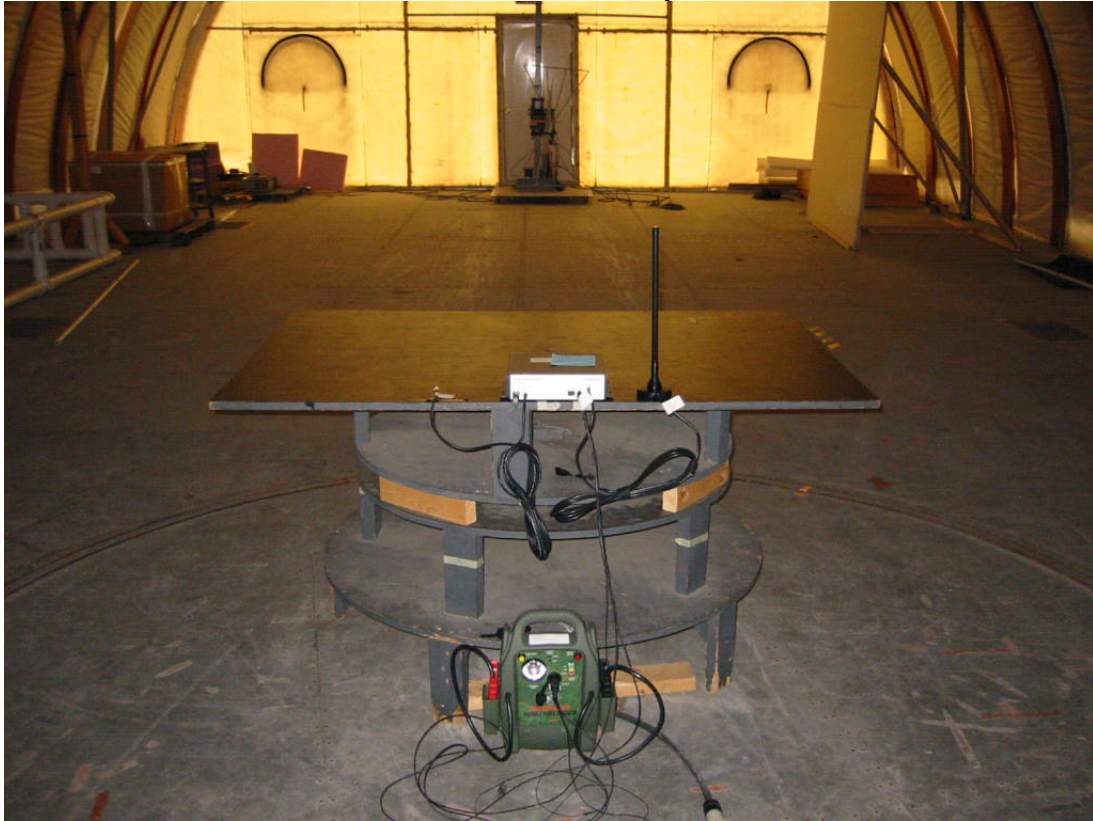
PreAmp Used? (Y or N): Y Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 18-26 GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
PK	V	19296.000	32.6	45.3	9.8	28.7	0.0	59.0	74.0	-15.0	1/3 MHz	FCC
AVG	V	19296.000	22.7	45.3	9.8	28.7	0.0	49.0	54.0	-5.0	1/3 MHz	RB
PK	V	21708.000	24.6	45.4	9.7	28.0	0.0	51.7	90.1	-38.4	100/300 kHz	
PK	V	24120.000	21.9	45.6	10.3	26.7	0.0	51.1	90.1	-39.0	100/300 kHz	
PK	V	19496.000	34.1	45.4	9.7	28.8	0.0	60.5	74.0	-13.5	1/3 MHz	RB
AVG	V	19496.000	23.1	45.4	9.7	28.8	0.0	49.5	54.0	-4.6	1/3 MHz	RB
PK	V	21933.000	23.8	45.3	9.7	27.9	0.0	50.9	90.1	-39.2	100/300 kHz	
PK	V	24370.000	24.2	45.9	10.4	26.6	0.0	54.0	90.1	-36.1	100/300 kHz	
PK	V	19696.000	33.3	45.4	9.7	28.8	0.0	59.6	74.0	-14.4	1/3 MHz	RB
AVG	V	19696.000	22.7	45.4	9.7	28.8	0.0	48.9	54.0	-5.1	1/3 MHz	RB
PK	V	22158.000	32.5	45.4	9.8	27.7	0.0	59.9	74.0	-14.1	1/3 MHz	RB
AVG	V	22158.000	22.2	45.4	9.8	27.7	0.0	49.6	54.0	-4.4	1/3 MHz	RB
PK	V	24620.000	25.4	46.2	10.5	26.4	0.0	55.7	90.1	-34.4	100/300 kHz	

Radiated Emissions Setup Photos



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