TEST REPORT FOR

FCC PART 15 COMPLIANCE

FOR

Invention Planet, LLC.

Prepared by
Daniel C. Swann
July 25, 2009

Invention Planet Pocket Radar
Model Number PR1000

FCC IC : WZK-PR-1000

FCC Class B Test
Part 15.209
Part 15.245

GEL Report File: Invention_Planet_01_2009

GLEN ELLEN LABORATORIES
1876 London Ranch Road
Glen Ellen, CA 95442

MEASUREMENT/TECHNICAL REPORT

Invention Planet Pocket Radar

Model Number PR1000

FCC IC : WZK-PR-1000

This report concerns:	An Original Grant
Equipment type:	47CFR Parts 2, 15.209 and 15.245
Deferred grant requested:	no
Transition rules per 15.37:	no
Confidential Treatment Requested:	47 C.F.R. 0.459
Report prepared by:	Daniel C. Swann Glen Ellen Laboratories 1876 London Ranch Road Glen Ellen, CA 95442 (707) 996-8533 (707) 996-2803 fax dan@glenellenlabs.com
Measurements Certified by:	Daniel C. Swann Daniel C. Swann
	Date 04/25/09
GEL Report File:	GEL Report File Invention_Planet_01_2009

SUMMARY:

This report describes the results of tests of the Invention Planet, LLC Pocket Radar. The equipment complies with FCC Part 15.209 and Part 15.245 requirements with excellent margin.

Report prepared by: Daniel Swann
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1 GENERAL INFORMATION

1.1 Product Description

The Invention Planet Pocket Radar is FCC Part 15.245 intentional radiator using Doppler radar to measure the speed of moving objects. The unit is operated by batteries, two 1.5 Volt Alkaline AAA cells. To conserve battery power, the unit only stays on for a long enough time to make the measurement, then powers down. The speed of the measured object appears on a LCD display on the front of the unit. The device is intended to be used for measuring the speed of baseballs, and similar moving objects.

1.2 Tested System Details

Equipment Under Test:	Invention Planet Pocket Radar Model Number PR1000 Serial Number of Unit Under Test: 00047
Made by:	Invention Planet, LLC 3535 Industrial Drive, Suite A4 Santa Rosa, CA 95403
Contact Details:	Chris Stewart (707) 544-6096 Office (707) 280-1134 Cell chris@inventionplanet.com
Tested by:	Daniel C. Swann and Chris Stewart

1.3 Test Methodology

The conducted and radiated tests were performed in accordance with the procedures specified by ANSI C63.4-2003, ANSI C63.5-2006, and FCC Publication Number 200443, Millimeter Wave Test Procedures. Compliance with applicable standards was determined by comparing the measured results with respect to the limits specified by FCC Part 15, specifically Part 15.209 and Part 15.245.

Radiated electric field testing was performed at an EUT to antenna distance of 3 meters.

1.4 Test Facility

The Glen Ellen Laboratories open field test site complies with the requirements specified by VDE 0876/9.78, VDE 0877 Part 1/11.81, VDE 0877 Part 2/2.85, CISPR 16, CISPR 22, ANSI C63.4-2006, and ANSI C63.5-2006. The test site closely follows the theoretical normalized site attenuation specifications for both horizontal and vertical polarizations. The site has been fully described in a report dated July 22, 2008, submitted to the FCC, and accepted in a letter dated August 13, 2008 (47CFR Part 2.948, Registration Number 90613.) The FCC states that an updated site report is required in three years, by August 13, 2011.

The facility is located near the town of Glen Ellen, California, at the street address of 1876 London Ranch Road. The site is at approximately 175 meters altitude on the East side of Sonoma Mountain, at the coordinates of 38 degrees 22 minutes North Latitude and 122 degrees 32 minutes West Longitude. The site sits north of a ridge approximately 100 meters higher in elevation and 1000 meters to the South, which attenuates VHF and above frequencies from the San Francisco Bay area 60 kilometers to the South. The open field test site consists of a 10 by 20 meter area of galvanized hardware cloth placed on top of a flat asphalt surface located in an open meadow. All seams of adjacent widths of hardware cloth are soldered together. The metal turntable top surface is flush with the ground plane. All metal objects other than the turntable mechanical parts are located a considerable distance further than the standard 10-meter CISPR measurement ellipse.

Test Equipment List

Test equipment used included:

test day April 25, 2009

1. Hewlett Packard 8563E spectrum analyzer, cal due 07-12-09.
2. Hewlett Packard 8591EM spectrum analyzer, cal due 04-22-10.
3. Sonoma Instruments 315 preamplifier, 10 kHz to 1.0 GHz, cal due 04-22-10.
4. GEL BIC9414 biconical antenna, 30 MHz to 300 MHz, cal due 08-06-09.
5. GEL LPA-3 log periodic antenna, 275 MHz to 2 GHz, cal due 08-06-09.
6. ETS Double Ridge Guide horn antenna, Model 3315,

   1GHz to 18 GHz, cal due 08-06-09.
7. ETS Double Ridge Guide horn antenna, Model 3316,

   18 to GHz to 40 GHz, cal due 09-18-09.
8. HP11970 Harmonic Mixers 33 GHz to 110 GHz, cal due 09-18-09.

8\. Standard Gain Horn Antennas, MI Technologies, 33 GHz to 110 GHz.

9\. Precision .141 semi-rigid coax cables, Agilent Technologies PM 5062-6674.

2 PRODUCT LABELING AND MANUAL STATEMENT

2.1 FCC Class B Product Label

In accordance with 47 CFR Section 15.19(a), the FCC ID number is placed on the label. However, the device is too small for the label text specified in 47 CFR Section 15.19, specifically:

"This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

47 CFR Section 15.19(a)(5) states that "When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device."

Therefore, the above text is placed in a prominent location in the instruction manual.

2.2 FCC Class B User Manual Statement

In accordance with 47 CFR Section 15.105(a) the instructions furnished to the user shall include the following:

The following statement appears in a prominent location in the text of the user manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
--Reorient or relocate the receiving antenna.
--Increase the separation between the equipment and receiver.
--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
--Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

3 SYSTEM TEST CONFIGURATION

3.1 Justification

The EUT was tested in accordance with the standard ANSI C63.4-2003, ANSI C63.5-2006 and FCC Publication Number 200443, Millimeter Wave Test Procedures.

3.2 EUT Exercise Equipment and Software

The equipment was tested in the powered up configuration, with a custom firmware set to keep the unit transmitting continuously. This condition is the same as if the "on" button was pushed repeatedly to keep the device transmitting. The equipment was observed over a period of minutes to confirm that the emissions remained stable.

3.3 Special Accessories

No special accessories were used.

3.4 Equipment Modifications

No equipment modifications were made.

3.5 Configuration of Tested System

The unit was placed in an anti-static foam support on the nonconductive tabletop (to simulate being hand held) at a height of 0.8 meters above the turntable, 3.0 meters from the antenna. This conforms to the Millimeter Wave Test Procedures. The unit stayed on continuously. See the photograph attachments for the configuration of the tested system.

4 CONDUCTED EMISSIONS DATA

No conducted measurements were made, since the unit is operated by batteries and no measurements were required.

Test Personnel:

Tester Signature _______________________ Date July 25, 2009

Tester Name Daniel C. Swann

5 RADIATED EMISSIONS DATA

5.1 Data

The following data lists the significant emissions frequencies, measured quasi-peak levels below 1 GHz, and average levels above 1 GHz, and Class B margins. The spectrum analyzer RBW was 120 KHz at 6 dB below 1 GHz, and 1 MHz above 1 GHz. These measurements were made on April 25, 2009, by Daniel Swann and Chris Stewart. See the photographs attachment for the configuration of the test setup.

Frequency MHz	Measured Amplitude dBuV	Antenna Factor dB/m	Cable Loss dB	Amplifier Gain dB	Field Strength dBuV/m	FCC B 3 m Limit dBuV/m	FCC B 3 m Margin dB
Vertical Polarization							
40.012	56.3	10.2	1.4	50.1	17.8	40.0	-22.2
60.047	58.1	9.0	1.9	50.1	18.8	40.0	-21.2
80.567	62.5	9.6	2.1	50.1	24.1	40.0	-15.9
160.108	56.4	13.6	3.0	50.1	22.9	43.5	-20.6
200.049	48.3	15.2	3.4	50.1	16.8	43.5	-26.7
240.054	58.2	15.8	3.7	50.1	27.6	46.0	-18.4
280.066	56.1	18.1	4.0	50.1	28.1	46.0	-17.9
360.084	55.9	16.3	4.6	50.1	26.7	46.0	-19.3
440.209	44.6	17.4	5.2	50.1	17.0	46.0	-29.0
600.147	51.3	19.8	6.1	50.1	27.0	46.0	-19.0

Test Personnel:

Tester Signature Daniel C. Swann Date July 25, 2009

Tester Name Daniel C. Swann

5.1 Data (continued)

Frequency MHz	Measured Amplitude dBuV	Antenna Factor dB/m	Cable Loss dB	Amplifier Gain dB	Field Strength dBuV/m	FCC B 3 m Limit dBuV/m	FCC B 3 m Margin dB
Horizontal Polarization							
40.012	60.9	10.2	1.4	50.1	22.4	40.0	-17.6
60.047	55.9	9.0	1.9	50.1	16.6	40.0	-23.4
80.567	59.3	9.6	2.1	50.1	20.9	40.0	-19.1
160.108	50.1	13.6	3.0	50.1	16.6	43.5	-26.9
200.049	53.6	15.2	3.4	50.1	22.1	43.5	-21.4
240.054	55.8	15.8	3.7	50.1	25.2	46.0	-20.8
280.066	52.9	18.1	4.0	50.1	24.9	46.0	-21.1
360.084	59.1	16.3	4.6	50.1	29.9	46.0	-16.1
440.209	49.8	17.4	5.2	50.1	22.3	46.0	-23.7
600.147	47.1	19.8	6.1	50.1	22.8	46.0	-23.2

Test Personnel:

Tester Signature Daniel C. Swann Date July 25, 2009

Tester Name Daniel C. Swann

5.1 Data (continued)

The following data lists the significant emissions frequencies, measured average levels above 1 GHz, and Class B margins. The spectrum analyzer RBW was 1 MHz. These measurements were made on April 25, 2009, by Daniel Swann and Chris Stewart. See the photographs attachment for the configuration of the test setup.

Frequency MHz	Measured Amplitude dBuV	Antenna Factor dB/m	Cable Loss dB	Amplifier Gain dB	Field Strength dBuV/m	FCC B 3 m Limit dBuV/m	FCC B 3 m Margin dB
Vertical Polarization							
24129.20	68.3	46.0	1.2	0.0	115.5	128.0	-12.5
Horizontal Polarization							
24129.20	65.0	46.0	1.2	0.0	112.2	128.0	-15.8

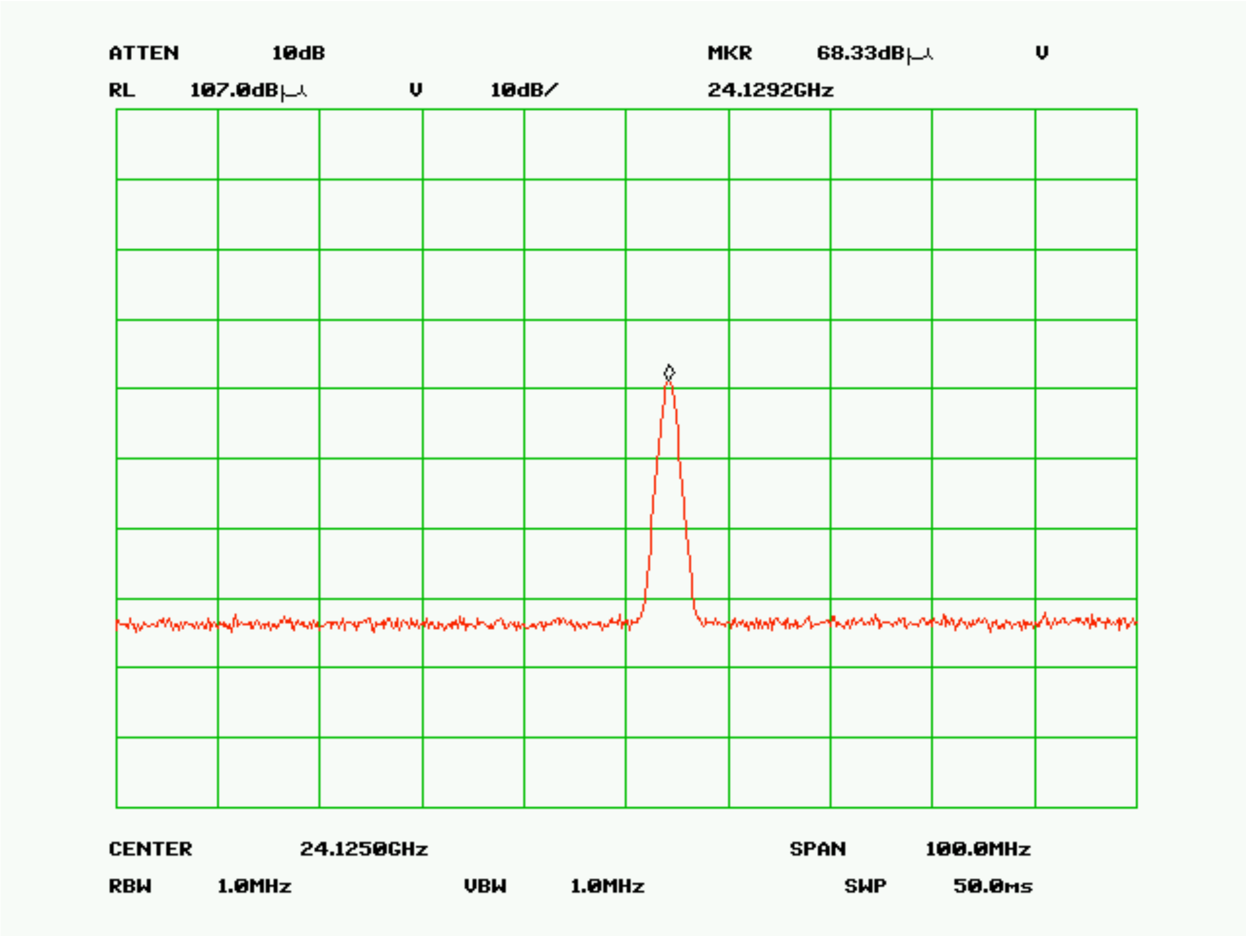
Test Personnel:

Tester Signature Daniel C. Swann Date July 25, 2009

Tester Name Daniel C. Swann

5.1 Data (continued)

The following shows the analyzer plot for the fundamental measured with Vertical Polarization. Measurements were made on April 25, 2009, by Daniel Swann and Chris Stewart. See the photographs attachment for the configuration of the test setup.



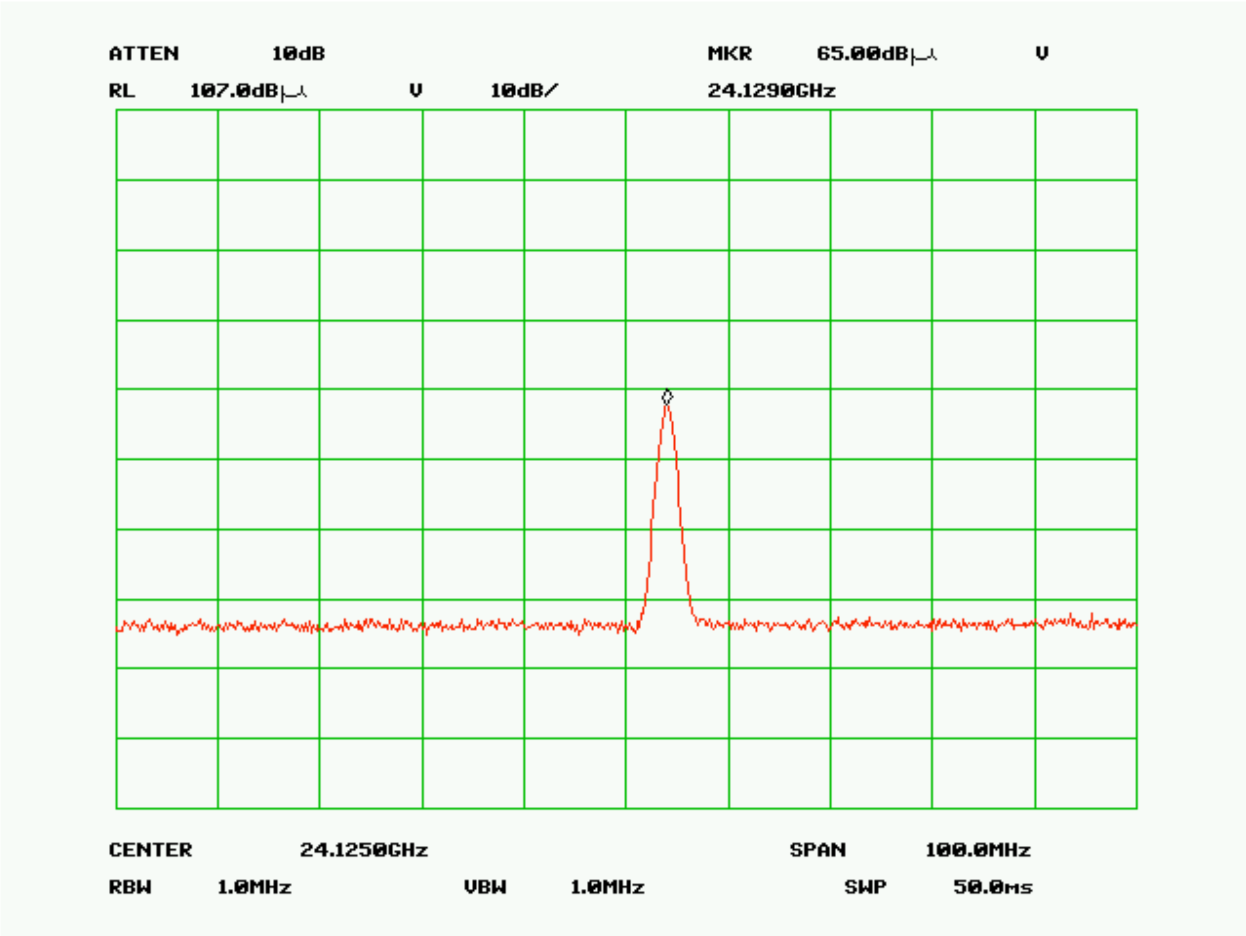
Test Personnel:

Tester Signature ______________________ Date July 25, 2009

Tester Name Daniel C. Swann

5.1 Data (continued)

The following shows the analyzer plot for the fundamental measured with Horizontal Polarization. Measurements were made on April 25, 2009, by Daniel Swann and Chris Stewart. See the photographs attachment for the configuration of the test setup.



Test Personnel:

Tester Signature ______________________ Date July 25, 2009

Tester Name Daniel C. Swann

5.1 Data (continued)

The following data lists the significant emissions frequencies at the second, third, and fourth harmonics of the fundamental frequency. The levels were measured using an average detector with a spectrum analyzer RBW of 1 MHz. These measurements were made on April 25, 2009, by Daniel Swann and Chris Stewart. See the photographs attachment for the configuration of the test setup.

Frequency MHz	Polarization Horizontal or Vertical	Measured Level dBuV	Antenna Factor dB/m	Distance m	Distance Scaling Factor dB	Measured max Field Strength dBuV/m @ 3 m	FCC Limit dBuV/m @ 3 m	FCC Margin dB
Second harmonic								
48258.40	V	27.5	39.4	1	9.5	57.4	88	-30.6
48258.40	H	27.5	39.4	1	9.5	57.4	88	-30.6
Third harmonic								
72387.60	V	32.2	42.4	1	9.5	65.1	88	-22.9
72387.60	H	32.2	42.4	1	9.5	65.1	88	-22.9
Fourth harmonic								
96516.80	V	39.3	44.9	1	9.5	74.7	88	-13.3
96516.80	H	39.3	44.9	1	9.5	74.7	88	-13.3

Note: Measurements reflect noise floor readings.

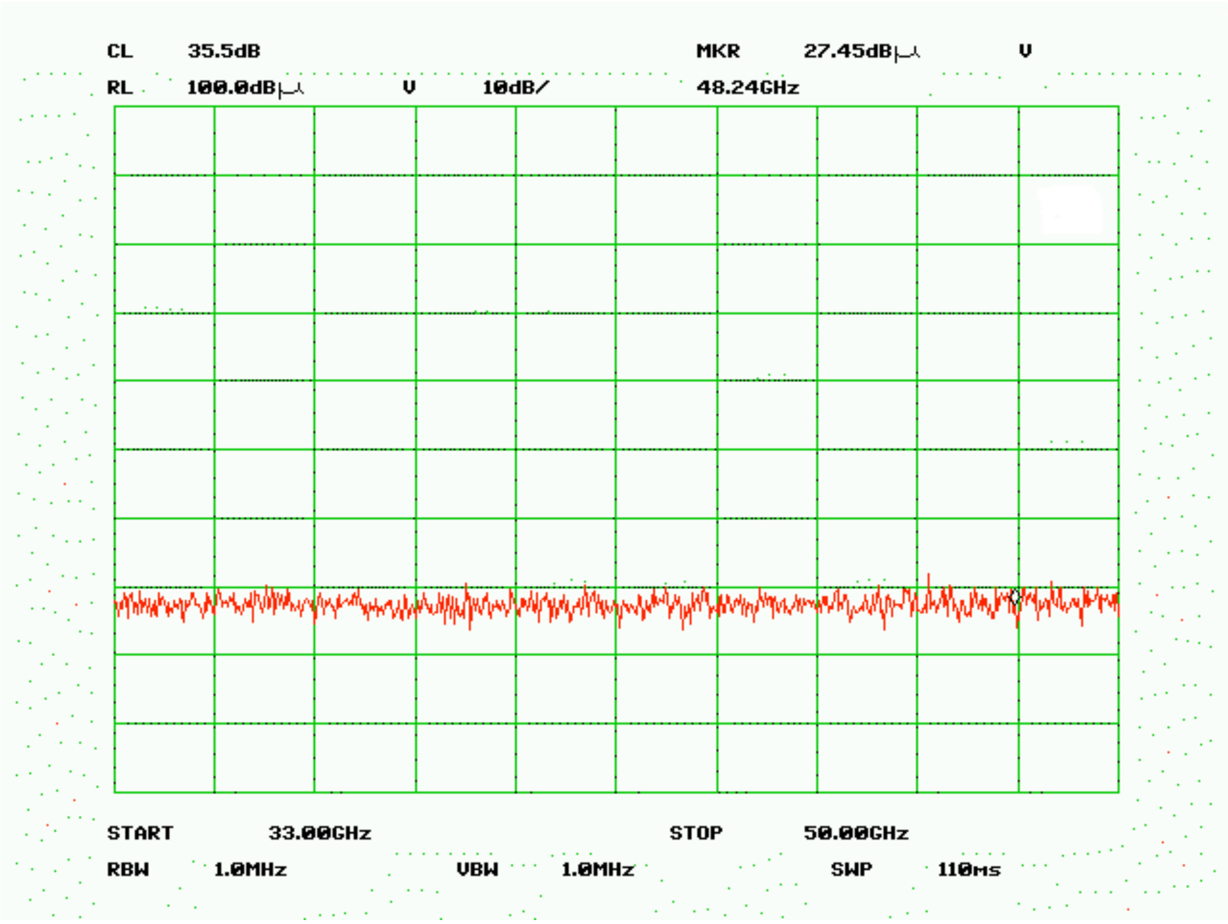
Test Personnel:

Tester Signature Daniel C. Swann Date July 25, 2009

Tester Name Daniel C. Swann

5.1 Data (continued)

The following shows the analyzer plot for the second harmonic. No signal is present. Measurements were made on April 25, 2009, by Daniel Swann and Chris Stewart. See the photographs attachment for the configuration of the test setup.



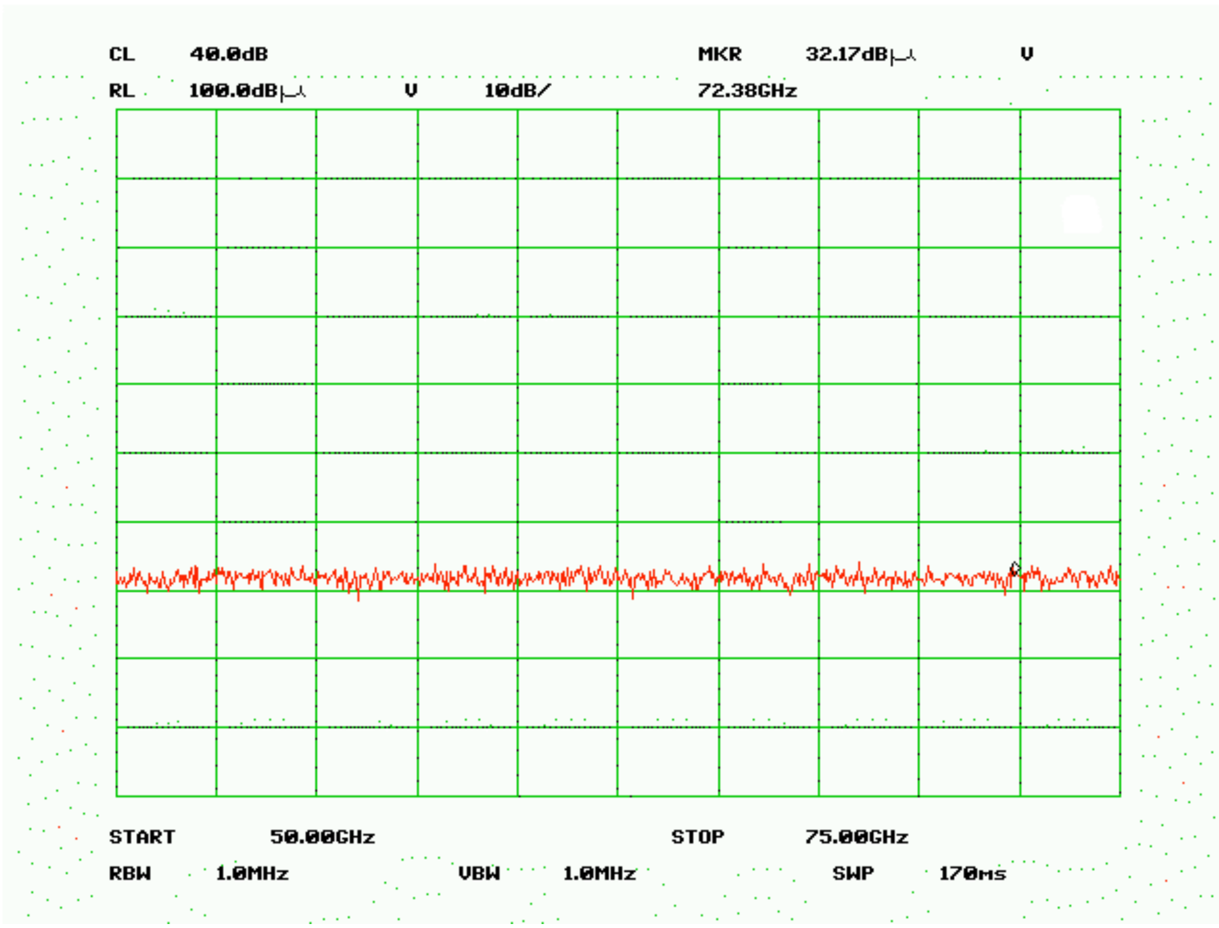
Test Personnel:

Tester Signature ______________________ Date July 25, 2009

Tester Name Daniel C. Swann

5.1 Data (continued)

The following shows the analyzer plot for the third harmonic. No signal is present. Measurements were made on April 25, 2009, by Daniel Swann and Chris Stewart. See the photographs attachment for the configuration of the test setup.



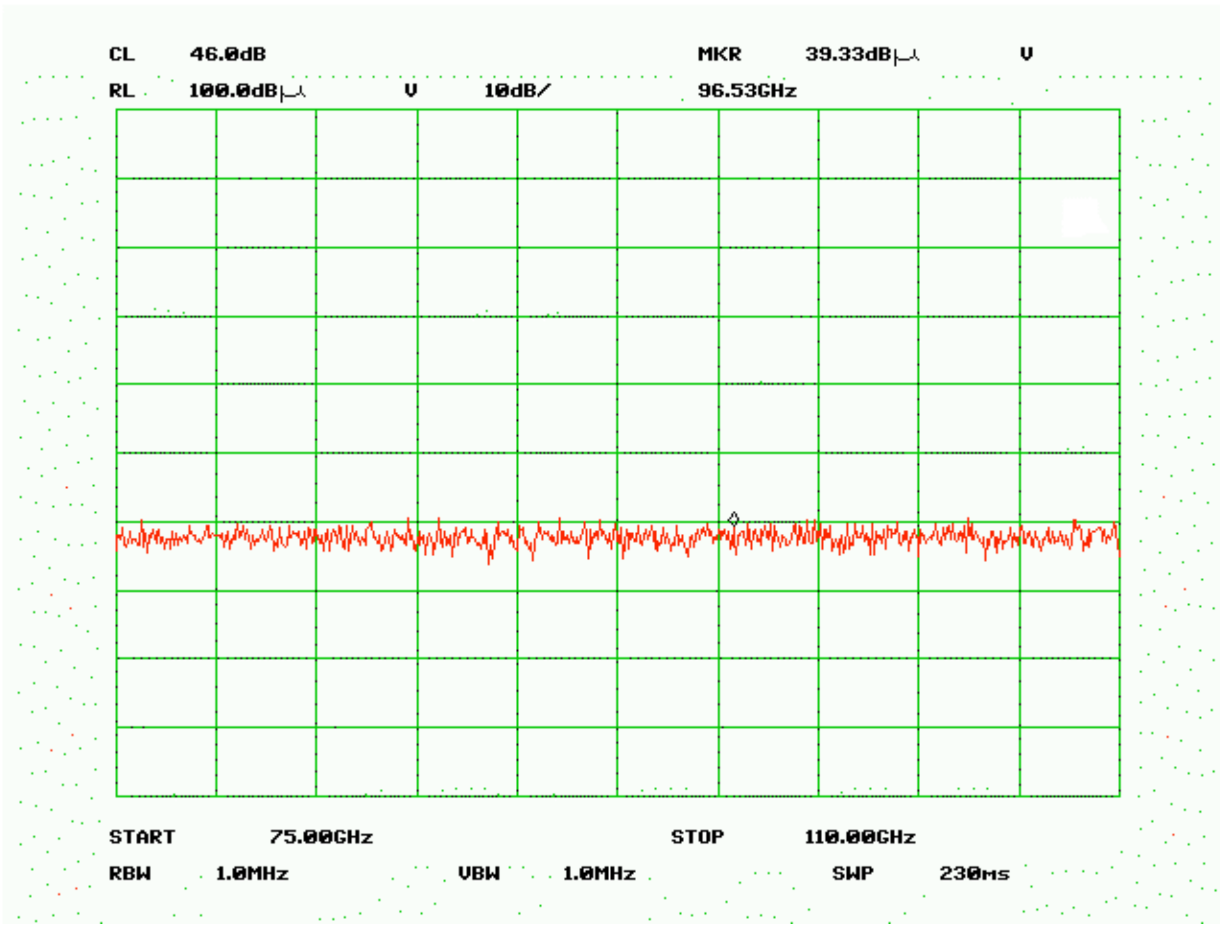
Test Personnel:

Tester Signature ______________________ Date July 25, 2009

Tester Name Daniel C. Swann

5.1 Data (continued)

The following shows the analyzer plot for the fourth harmonic. No signal is present. Measurements were made on April 25, 2009, by Daniel Swann and Chris Stewart. See the photographs attachment for the configuration of the test setup.



Test Personnel:

Tester Signature _______________ Date July 25, 2009

Tester Name Daniel C. Swann

5.2 Field Strength Calculations

The field strength was calculated from the following formula:

FS = MEASURED SIGNAL + AF + CF - GAIN

Where FS = field strength, in dBuV/m

MEASURED SIGNAL = Spectrum Analyzer signal amplitude

AF = antenna factor

CF = cable attenuation factor

GAIN = pre-amplifier gain

FS (uV/m) = antilog[10] FS (dBuV/m)

For example, at 280.066 MHz in vertical polarization a quasi-peak reading of 56.1 dBuV was measured. The antenna factor is 18.1 dB, the cable loss is 4.0 dB, and the pre-amplifier gain is 50.1 dB.

FS (dBuV/m) = 56.1 + 18.1 + 4.0 - 50.1

FS (dBuV/m) = 28.1 dBuV/m

FCC 3 meter Class B Limit = 46.0 dBuV/m

FCC Class B Margin = - 17.9 dB