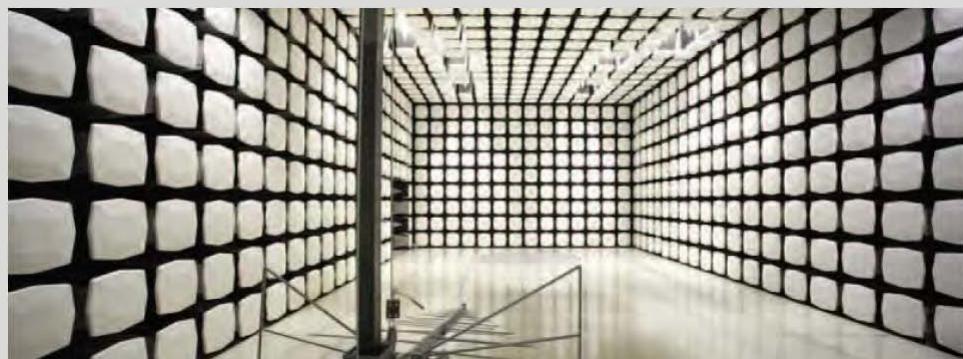




**Green Goose Inc.**  
**GreenGoose Sensor**

**Report #: PTEN0008**



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – [www.nwemc.com](http://www.nwemc.com)

California – Minnesota – Oregon – New York – Washington

**Certificate of Test**  
**Last Date of Test: February 8, 2012**  
**Green Goose, Inc.**  
**Model: GreenGoose Sensor**

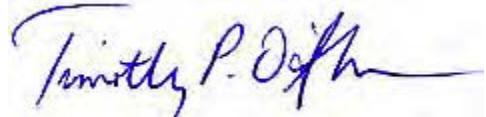
**Emissions**

Test Description	Specification	Test Method	Pass/Fail
Occupied Bandwidth	FCC 15.247:2011	ANSI C63.10:2009	Pass
Output Power	FCC 15.247:2011	ANSI C63.10:2009	Pass
Band Edge Compliance	FCC 15.247:2011	ANSI C63.10:2009	Pass
Spurious Conducted Emissions	FCC 15.247:2011	ANSI C63.10:2009	Pass
Power Spectral Density	FCC 15.247:2011	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.247:2011	ANSI C63.10:2009	Pass

**Deviations From Test Standards**

None

**Approved By:**



Tim O'Shea, Operations Manager



NVLAP Lab Code: 200630-0

**Test Facility**

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.  
 22975 NW Evergreen Parkway, Suite 400  
 Hillsboro, OR 97124

Phone: (503) 844-4066      Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834D-1)

*This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.*

*Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.*



Revision 09/01/11

## Revision History

Revision Number	Description	Date	Page Number
00	None		

## FCC

Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.

## NVLAP

Northwest EMC, Inc. is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.

## Industry Canada

Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS-Gen, Issue 2 and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2, Brooklyn Park: 2834E-1*)

## CAB

Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.

## Australia/New Zealand

The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).

**VCCI**

Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071, R-1025, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-3265, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634*).

**BSMI**

Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017).

**GOST**

Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification

**KCC**

Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157, Brooklyn Park: US0175*)

**VIETNAM**

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.

**SCOPE**

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>



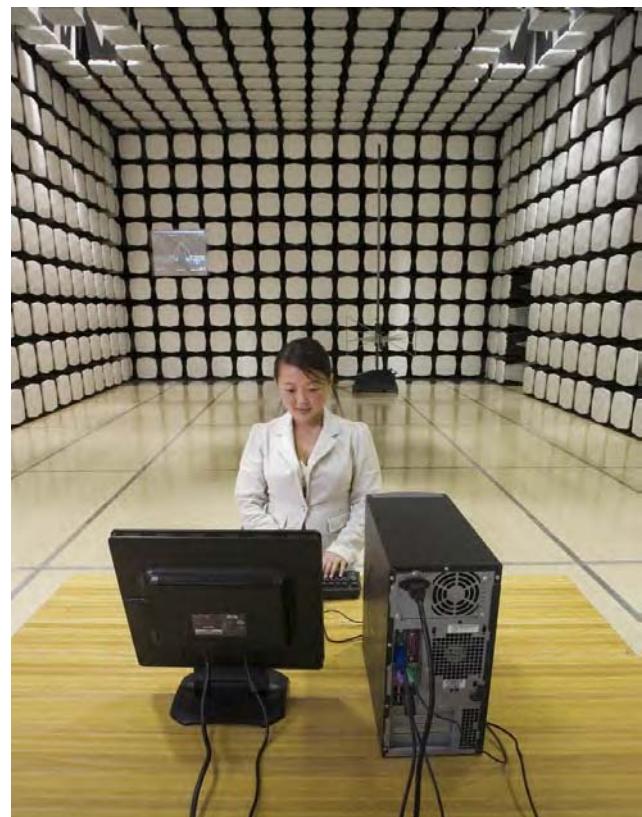
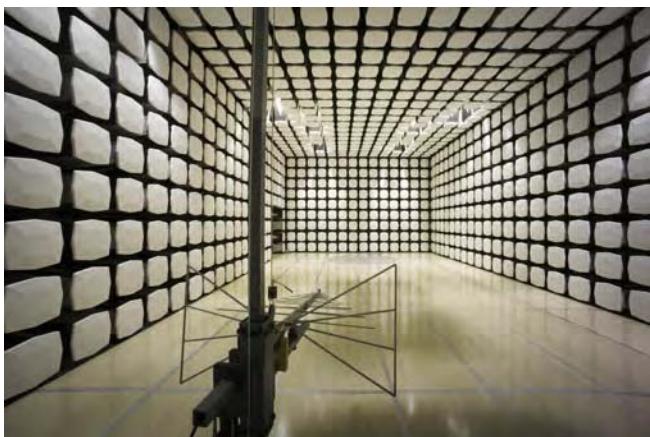
Oregon  
Labs EV01-EV12  
22975 NW Evergreen Pkwy  
Suite 400  
Hillsboro, OR 97124  
(503) 844-4066

California  
Labs OC01-OC13  
41 Tesla  
Irvine, CA 92618  
(949) 861-8918

Minnesota  
Labs MN01-MN08  
9349 W Broadway Ave.  
Brooklyn Park,  
MN 55445  
(763) 425-2281

Washington  
Labs SU01-SU07  
14128 339<sup>th</sup> Ave. SE  
Sultan, WA 98294  
(360) 793-8675

New York  
Labs WA01-WA04  
4939 Jordan Rd.  
Elbridge, NY 13060  
(315) 685-0796



## Product Description

### Client and Equipment Under Test (EUT) Information

<b>Company Name:</b>	Green Goose, Inc.
<b>Address:</b>	153 Townsend St. 9 <sup>th</sup> Floor
<b>City, State, Zip:</b>	San Francisco, CA 94107
<b>Test Requested By:</b>	Ward Ramsdell – Prototype Engineering, LLC
<b>Model:</b>	GreenGoose Sensor
<b>First Date of Test:</b>	December 19, 2011
<b>Last Date of Test:</b>	February 8, 2012
<b>Receipt Date of Samples:</b>	December 19, 2011
<b>Equipment Design Stage:</b>	Preproduction
<b>Equipment Condition:</b>	No Damage

### Information Provided by the Party Requesting the Test

**Functional Description of the EUT (Equipment Under Test):**

Wireless Sensor

**Testing Objective:**

To demonstrate compliance to FCC 15.247 requirements

**Configuration 1 PTEN0008**

<b>EUT</b>			
<b>Description</b>	<b>Manufacturer</b>	<b>Model/Part Number</b>	<b>Serial Number</b>
Wireless Sensor	Green Goose, Inc.	Green Goose	FCC1

**Configuration 3 PTEN0008**

<b>EUT</b>			
<b>Description</b>	<b>Manufacturer</b>	<b>Model/Part Number</b>	<b>Serial Number</b>
Wireless Sensor	Green Goose, Inc.	Green Goose	FCC3

## Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	12/19/2011	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	12/20/2011	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	12/20/2011	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	12/20/2011	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	12/20/2011	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	2/8/2012	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed

# Occupied Bandwidth

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	AT	E4446A;B	R049	1/31/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

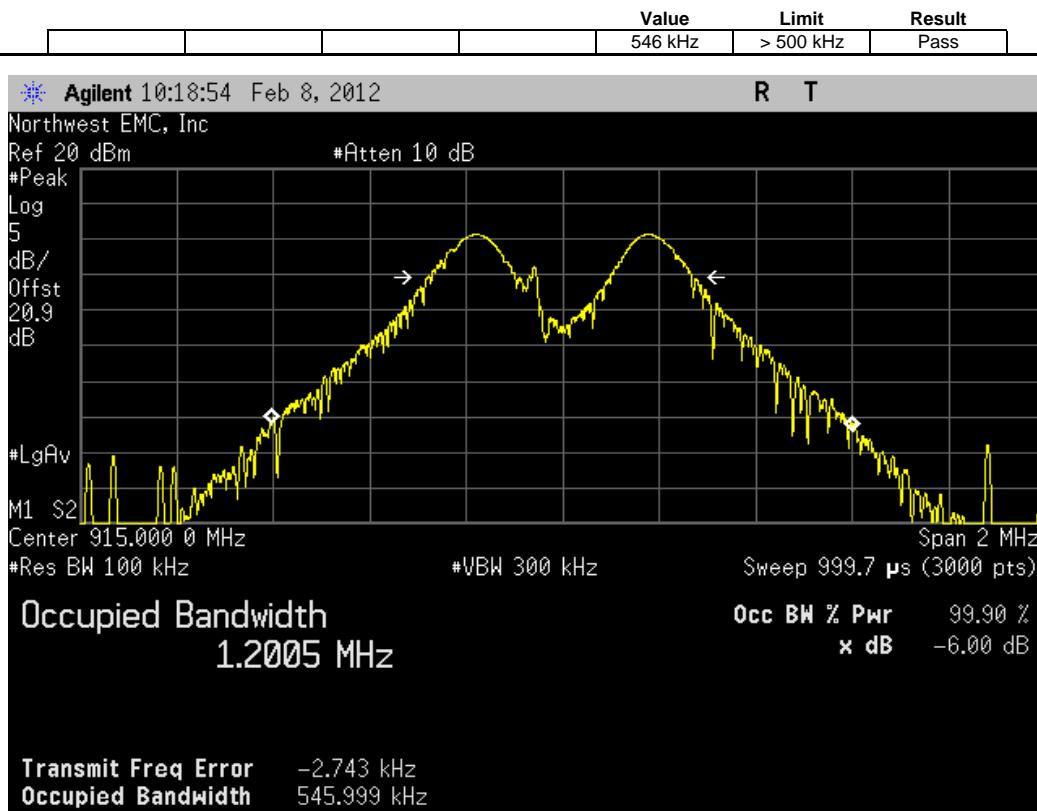
## TEST DESCRIPTION

The occupied bandwidth was measured with the EUT set at the only transmit frequency. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate with the typical modulation.

**EMC****Occupied Bandwidth**

EUT: GreenGoose Sensor	Work Order: PTEN0008			
Serial Number: FCC3	Date: 02/08/11			
Customer: Green Goose Inc.	Temperature: 22.2°C			
Attendees: none	Humidity: 36%			
Project: None	Barometric Pres.: 1019			
Tested by: Ethan Schoonover	Job Site: EV01			
TEST SPECIFICATIONS				
FCC 15.247:2011	Test Method: ANSI C63.10:2009			
COMMENTS				
None				
DEVIATIONS FROM TEST STANDARD				
None				
Configuration #	3	Signature		
		Value	Limit	Result
Mid Channel		546 kHz	> 500 kHz	Pass

## Mid Channel



# Output Power

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

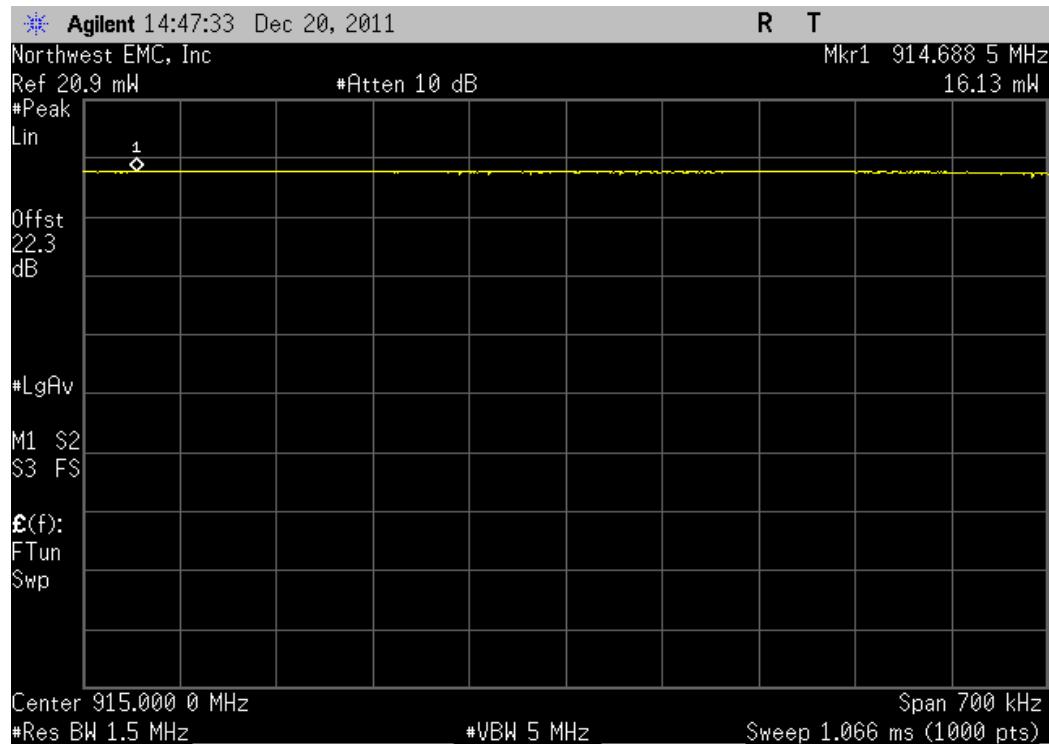
**De Facto EIRP Limit:** Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36dBm.

## Output Power

EUT: GreenGoose Sensor	Work Order: PTEN0008			
Serial Number: FCC3	Date: 12/20/11			
Customer: Green Goose Inc.	Temperature: 22.5°C			
Attendees: none	Humidity: 32%			
Project: None	Barometric Pres.: 1032			
Tested by: Ethan Schoonover	Job Site: EV06			
TEST SPECIFICATIONS				
FCC 15.247:2011	Power: Battery			
	Test Method			
	ANSI C63.10:2009			
COMMENTS				
None				
DEVIATIONS FROM TEST STANDARD				
None				
Configuration #	3	Signature		
		Value	Limit	Result
Mid Channel		16.125 mW	< 125 mW	Pass

## Mid Channel

				Value	Limit	Result
				16.125 mW	< 125 mW	Pass



# Band Edge Compliance

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its only data rate available.

The spectrum was scanned across each band edge from at least 10 MHz below the band edge to 10 MHz above the band edge.

**EMC****Band Edge Compliance**

EUT: GreenGoose Sensor

Work Order: PTEN0008

Serial Number: FCC3

Customer: Green Goose Inc.

Attendees: none

Project: None

Tested by: Ethan Schoonover

TEST SPECIFICATIONS

FCC 15.247:2011

Power: Battery

Date: 12/20/11

Temperature: 22.5°C

Humidity: 32%

Barometric Pres.: 1032

Job Site: EV06

Test Method

ANSI C63.10:2009

**COMMENTS**

None

**DEVIATIONS FROM TEST STANDARD**

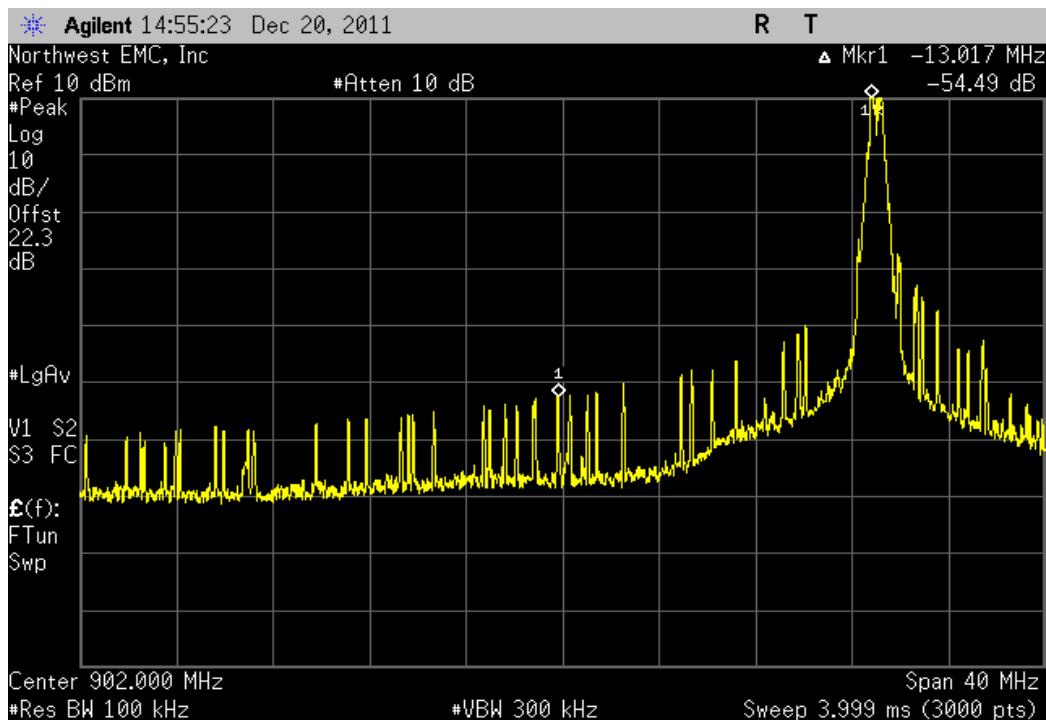
None

Configuration #	3	Signature	SL	LL			
					Value	Limit	Result
Mid Channel					-54.49 dBc	≤ -20 dBc	Pass
Mid Channel					-53.82 dBc	≤ -20 dBc	Pass

Signature

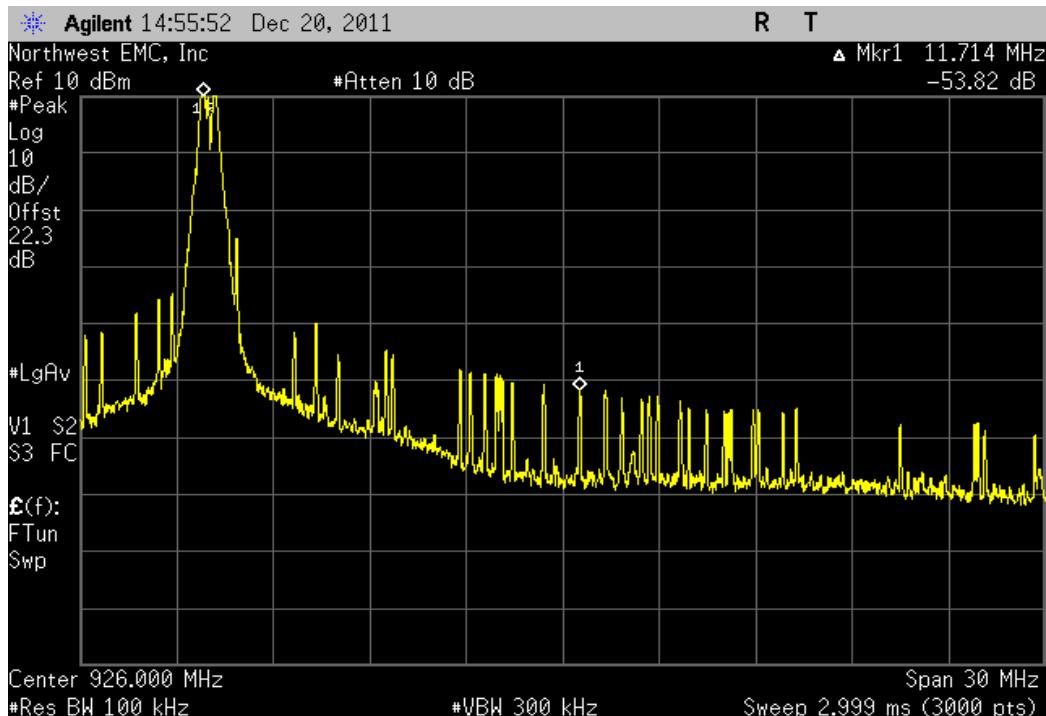
Mid Channel

Value	Limit	Result
-54.49 dBc	≤ -20 dBc	Pass



Mid Channel

Value	Limit	Result
-53.82 dBc	≤ -20 dBc	Pass



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

The spurious RF conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate using direct sequence modulation. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

## Spurious Conducted Emissions

EUT: GreenGoose Sensor	Work Order: PTEN0008					
Serial Number: FCC3	Date: 12/20/11					
Customer: Green Goose Inc.	Temperature: 22.5°C					
Attendees: none	Humidity: 32%					
Project: None	Barometric Pres.: 1032					
Tested by: Ethan Schoonover	Job Site: EV06					
TEST SPECIFICATIONS						
FCC 15.247:2011	Test Method: ANSI C63.10:2009					
COMMENTS						
None						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	3	Signature	Frequency Range	Value	Limit	Result
			30 MHz - 12.5 GHz	-35.08 dBc	≤ -20 dBc	Pass

Mid Channel

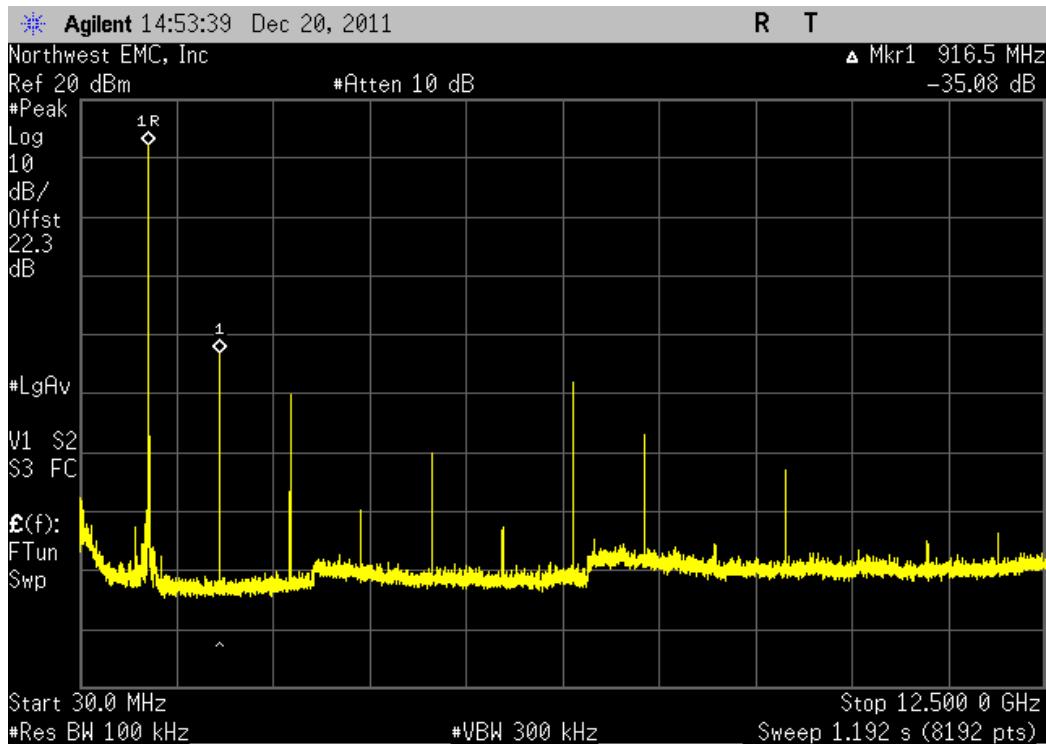
30 MHz - 12.5 GHz

-35.08 dBc

≤ -20 dBc

Pass

Mid Channel				
Frequency Range		Value	Limit	Result
30 MHz - 12.5 GHz		-35.08 dBc	≤ -20 dBc	Pass



# Power Spectral Density

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT					
Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The power spectral density measurements were measured with the EUT set to low, mid, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate for each modulation type available. Since the average output power was measured as defined in section ANSI C63.10:2009, section 6.10.2.2, the procedure outlined in section 6.11.2.4 was used. The spectrum analyzer was set as follows:

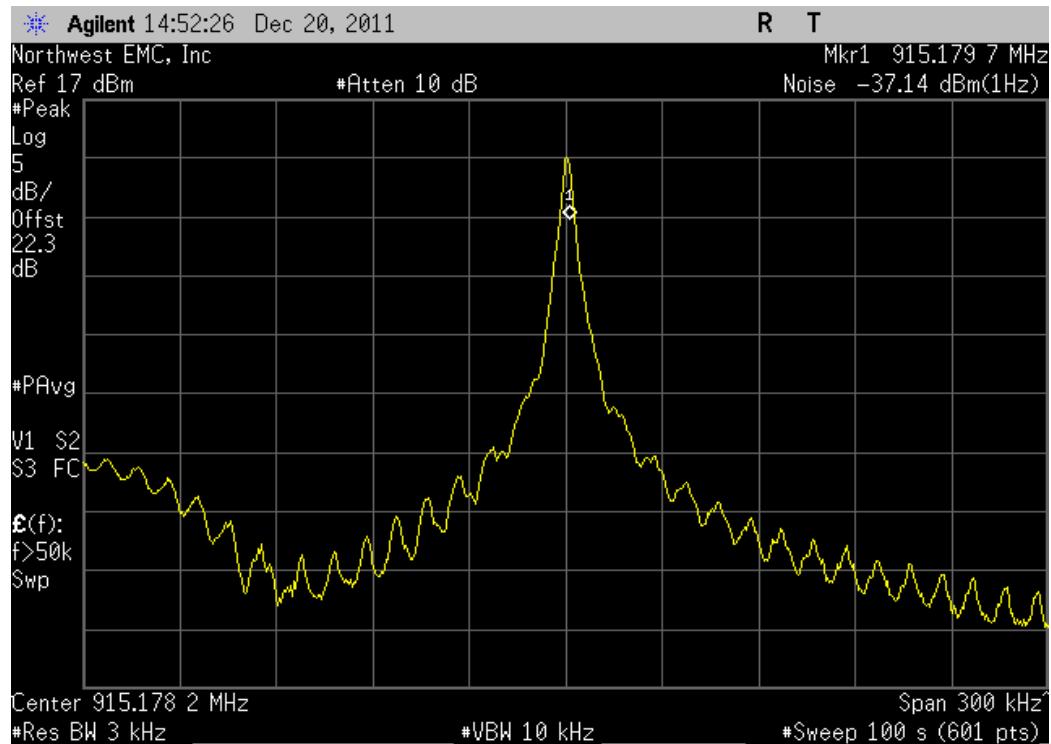
- Locate and zoom in on emission peak(s) within the passband.
- a) Set RBW = 3 kHz
- b) Set VBW = 9 kHz
- c) Set Sweep time to Automatic
- d) Use a peak detector. A sample detector mode can be used only if the following conditions can be achieved with automatic sweep time and adjusting the bin width.
  - 1) Bin width (i.e., span/number of points in spectrum display) < 0.5 RBW.
  - 2) The transmission pulse or sequence of pulses remains at maximum transmit power throughout each of the 100 sweeps of averaging and that the interval between pulses is not included in any of the sweeps.
- e) Use a video trigger (or RF gating) with the trigger level set to enable the sweep only during full power pulses. Transmitter shall operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to "free run."
- f) Trace average 100 traces in power averaging mode. Do not use video averaging mode.

## EMC

## Power Spectral Density

EUT: GreenGoose Sensor	Work Order: PTEN0008					
Serial Number: FCC3	Date: 12/20/11					
Customer: Green Goose Inc.	Temperature: 22.5°C					
Attendees: none	Humidity: 32%					
Project: None	Barometric Pres.: 1032					
Tested by: Ethan Schoonover	Job Site: EV06					
TEST SPECIFICATIONS						
FCC 15.247:2011	Test Method: ANSI C63.10:2009					
COMMENTS						
None						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	3	Signature				
		Value (dBm / Hz)	(dBm / Hz) To (dBm / 3 kHz)	Value (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Result
Mid Channel		-37.14	34.8	-2.34	8	Pass

	Value (dBm / Hz)	Mid Channel (dBm / Hz) To (dBm / 3 kHz)	Value (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Result
	-37.14	34.8	-2.34	8	Pass



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

**MODES OF OPERATION**

Transmitting single channel, +10 dBm, 2FSK spread

**POWER SETTINGS INVESTIGATED**

Battery

**CONFIGURATIONS INVESTIGATED**

PTNE0008 - 1

**FREQUENCY RANGE INVESTIGATED**

Start Frequency	30 MHz	Stop Frequency	12400 MHz
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**SAMPLE CALCULATIONS**

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
5.8 GHz Notch Filter	Micro-Tronics	BR50705	HFQ	7/22/2010	24
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	3/2/2011	12
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	3/2/2011	12
Antenna, Horn	ETS	3160-07	AHU	NCR	0
Spectrum Analyzer	Agilent	E4446A	AAQ	6/24/2011	12
EV12 Cables	N/A	Conducted Cables	EVR	7/27/2011	12
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/28/2011	12
Antenna, Biconilog	EMCO	3142	AXJ	5/17/2011	12
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/28/2011	12
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/28/2011	12
Antenna, Horn	ETS	3115	AIZ	1/24/2011	24

**MEASUREMENT BANDWIDTHS**

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

EUT: Green Goose Sensor	Work Order: PTEN0008
Serial Number: FCC1	Date: 12/19/11
Customer: Green Goose Inc.	Temperature: 24
Attendees: Ward Ramsdell, Pat Mystrom	Humidity: 42%
Project: None	Barometric Pres.: 29.95
Tested by: Ethan Schoonover	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247:2011	ANSI C63.10:2009

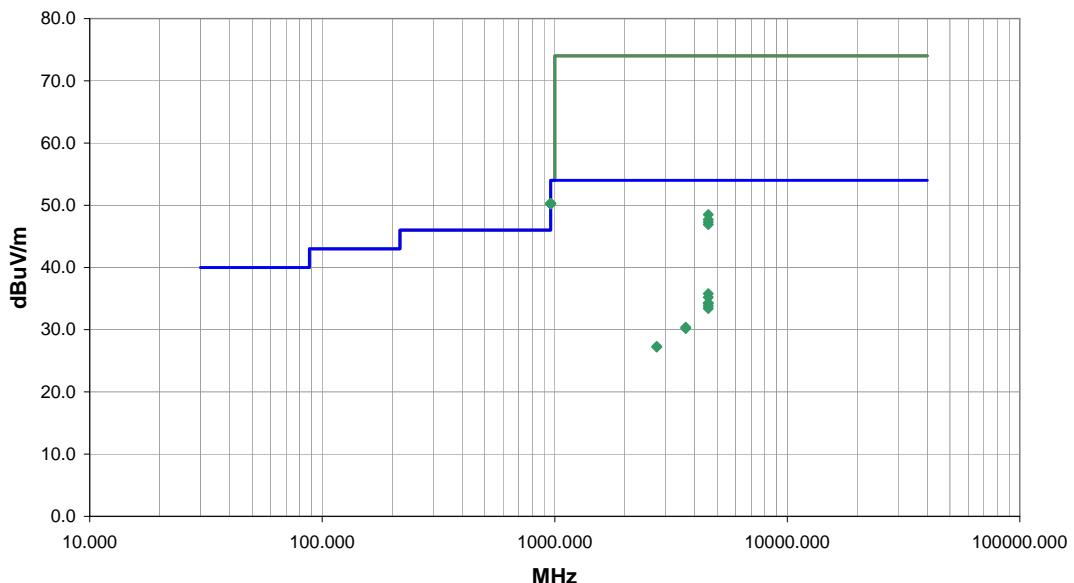
TEST PARAMETERS	
Antenna Height(s) (m)	1 - 4
Test Distance (m)	3

COMMENTS
None

EUT OPERATING MODES
Transmitting single channel, +10 dBm, 2FSK spread

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	1	Signature
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
960.277	17.0	13.3	188.0	1.0	3.0	20.0	V-Bilog	QP	0.0	50.3	54.0	-3.7	EUT Vert
960.445	17.0	13.3	28.0	1.0	3.0	20.0	V-Bilog	QP	0.0	50.3	54.0	-3.7	EUT On side
960.623	17.0	13.3	-1.0	2.4	3.0	20.0	H-Bilog	QP	0.0	50.3	54.0	-3.7	EUT Vert
961.124	17.0	13.3	126.0	1.0	3.0	20.0	H-Bilog	QP	0.0	50.3	54.0	-3.7	EUT On side
960.691	16.9	13.3	33.0	1.0	3.0	20.0	H-Bilog	QP	0.0	50.2	54.0	-3.8	EUT Horz
960.754	16.9	13.3	296.0	1.0	3.0	20.0	V-Bilog	QP	0.0	50.2	54.0	-3.8	EUT Horz
4575.720	27.0	8.8	0.0	1.9	3.0	0.0	H-Horn	AV	0.0	35.8	54.0	-18.2	EUT Onside
4576.105	26.4	8.8	15.0	1.0	3.0	0.0	V-Horn	AV	0.0	35.2	54.0	-18.8	EUT Horz
4575.850	25.5	8.8	360.0	1.0	3.0	0.0	V-Horn	AV	0.0	34.3	54.0	-19.7	EUT Vert
4575.915	25.4	8.8	131.0	1.9	3.0	0.0	H-Horn	AV	0.0	34.2	54.0	-19.8	EUT Horz
4575.970	25.0	8.8	48.0	1.0	3.0	0.0	V-Horn	AV	0.0	33.8	54.0	-20.2	EUT Onside
4575.950	24.6	8.8	95.0	1.9	3.0	0.0	H-Horn	AV	0.0	33.4	54.0	-20.6	EUT Vert
3659.267	24.5	5.9	195.0	1.0	3.0	0.0	H-Horn	AV	0.0	30.4	54.0	-23.6	EUT Vert
3659.575	24.3	5.9	175.0	1.5	3.0	0.0	V-Horn	AV	0.0	30.2	54.0	-23.8	EUT Vert
4576.040	39.7	8.8	15.0	1.0	3.0	0.0	V-Horn	PK	0.0	48.5	74.0	-25.5	EUT Horz
4575.905	38.9	8.8	0.0	1.9	3.0	0.0	H-Horn	PK	0.0	47.7	74.0	-26.3	EUT Onside
2745.667	23.5	3.8	93.0	1.0	3.0	0.0	H-Horn	AV	0.0	27.3	54.0	-26.7	EUT Vert
4576.910	38.5	8.8	131.0	1.9	3.0	0.0	H-Horn	PK	0.0	47.3	74.0	-26.7	EUT Horz
2746.942	23.4	3.8	351.0	1.0	3.0	0.0	V-Horn	AV	0.0	27.2	54.0	-26.8	EUT Vert
4576.260	38.1	8.8	48.0	1.0	3.0	0.0	V-Horn	PK	0.0	46.9	74.0	-27.1	EUT Onside
4575.800	37.3	8.8	360.0	1.0	3.0	0.0	V-Horn	PK	0.0	46.1	74.0	-27.9	EUT Vert
4574.408	37.1	8.8	95.0	1.9	3.0	0.0	H-Horn	PK	0.0	45.9	74.0	-28.1	EUT Vert

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
3660.992	37.5	5.9	195.0	1.0	3.0	0.0	H-Horn	PK	0.0	43.4	74.0	-30.6	EUT Vert
3661.833	36.2	5.9	175.0	1.5	3.0	0.0	V-Horn	PK	0.0	42.1	74.0	-31.9	EUT Vert
2745.292	36.5	3.8	93.0	1.0	3.0	0.0	H-Horn	PK	0.0	40.3	74.0	-33.7	EUT Vert
2745.250	35.7	3.8	351.0	1.0	3.0	0.0	V-Horn	PK	0.0	39.5	74.0	-34.5	EUT Vert