

## IrriGreen, Inc. IrriGreen Genius System - Handheld Programmer FCC 15.231:2014 Report #: IRRI0002



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC - (888) 364-2378 - www.nwemc.com

California – Minnesota – Oregon – New York – Washington



### Last Date of Test: May 20, 2014 IrriGreen, Inc. Model: IrriGreen Genius System - Handheld Programmer

### **Emissions**

Test Description	Specification	Test Method	Pass/Fail
Duty Cycle	FCC 15.231:2014	ANSI C63.10:2009	Pass
Occupied Bandwidth	FCC 15.231:2014	ANSI C63.10:2009	Pass
Field Strength of Fundamental	FCC 15.231:2014	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.231:2014	ANSI C63.10:2009	Pass

### **Deviations From Test Standards**

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200881-0

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 HISTORY**

Revision Number	Description	Date	Page Number
00	None		

### **Barometric Pressure**

The recorded barometric pressure has been normalized to sea level.



# ACCREDITATIONS AND AUTHORIZATIONS

### **United States**

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

**A2LA** - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

### Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

### **European Union**

**European Commission** – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

### Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

### Korea

KCC / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

### Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

### Taiwan

BSMI - Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

### Singapore

**IDA** – Recognized by IDA as a CAB for the acceptance of test data.

### Hong Kong

OFTA - Recognized by OFTA as a CAB for the acceptance of test data.

### Vietnam

MIC - Recognized by MIC as a CAB for the acceptance of test data.

### Russia

**GOST** – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

### SCOPE

For details on the Scopes of our Accreditations, please visit: http://www.nwemc.com/accreditations/



# **MEASUREMENT UNCERTAINTY**

### **Measurement Uncertainty**

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

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 (K=2) for each test is listed below. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-1 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy (Hz)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94



FACILITIES



Oregon         California         I           Labs EV01-12         Labs OC01-13         I           22975 NW Evergreen Pkwy         41 Tesla         I           Hillsboro, OR 97124         Irvine, CA 92618         I           (503) 844-4066         (949) 861-8918         I		New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Minnesota Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs NC01-05,SU02,SU07 19201 120 <sup>th</sup> Ave. NE Bothell, WA 98011 (425) 984-6600	
		VCCI			
A-0108	A-0029		A-0109	A-0110	
	•	Industry Canada			
2834D-1, 2834D- <i>2</i>	2834B-1, 2834B-2, 2834B-3		2834E-1	2834F-1	
		NVLAP			
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0	









# **PRODUCT DESCRIPTION**

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

Company Name:	IrriGreen, Inc.
Address:	5250 W. 73rd Street, Suite I
City, State, Zip:	Edina, MN 55439
Test Requested By:	Gary Klinefelter
Model:	IrriGreen Genius System - Handheld Programmer
First Date of Test:	April 22, 2014
Last Date of Test:	May 20, 2014
Receipt Date of Samples:	April 22, 2014
Equipment Design Stage:	Production
Equipment Condition:	No Damage

### Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

Low power transceiver operating in the range of 433.92 - 443.92 MHz.

### **Testing Objective:**

To demonstrate compliance to FCC 15.231 specifications.



### Configuration IRRI0002-1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Watch	IrriGreen, Inc	600101	None



# **MODIFICATIONS**

### **Equipment Modifications**

Item	Date	Test	Modification	Note	Disposition of EUT
			Tested as	No EMI suppression	EUT remained at
1	4/22/2014	Duty Cycle	delivered to	devices were added or	Northwest EMC
			Test Station.	modified during this test.	following the test.
		Field	Tested as	No EMI suppression	EUT remained at
2	4/22/2014	Strength of	delivered to	devices were added or	Northwest EMC
		Fundamental	Test Station.	modified during this test.	following the test.
		Occupied	Tested as	No EMI suppression	EUT remained at
3	4/22/2014	Decupied	delivered to	devices were added or	Northwest EMC
		Danuwiutin	Test Station.	modified during this test.	following the test.
		Spurious	Tested as	No EMI suppression	EUT remained at
4	4/22/2014	Radiated	delivered to	devices were added or	Northwest EMC
		Emissions	Test Station.	modified during this test.	following the test.
		Field	Tested as	No EMI suppression	EUT remained at
5	5/19/2014	Strength of	delivered to	devices were added or	Northwest EMC
		Fundamental	Test Station.	modified during this test.	following the test.
		Occupied	Tested as	No EMI suppression	EUT remained at
6	5/19/2014	Decupied	delivered to	devices were added or	Northwest EMC
		Danuwiutin	Test Station.	modified during this test.	following the test.
			Tested as	No EMI suppression	EUT remained at
7	5/19/2014	Duty Cycle	delivered to	devices were added or	Northwest EMC
			Test Station.	modified during this test.	following the test.
		Spurious	Tested as	No EMI suppression	Schodulad testing
8	5/20/2014	Radiated	delivered to	devices were added or	was somplated
		Emissions	Test Station.	modified during this test.	was completed.



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
Near Field Probe Set	ETS	7405	IPO	NCR	0
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 mo

### **TEST DESCRIPTION**

For software controlled or pre-programmed devices, the manufacturer shall declare the duty cycle class or classes for the equipment under test. For manually operated or event dependant devices, with or without software controlled functions, the manufacturer shall declare whether the device once triggered, follows a pre-programmed cycle, or whether the transmission is constant until the trigger is released or manually reset. The manufacturer shall also give a description of the application for the device and include a typical usage pattern. The typical usage pattern as declared by the manufacturer shall be used to determine the duty cycle and hence the duty class.

Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.

To derive average emission measurements, a duty cycle correction factor per 15.35(c) was utilized:

Duty Cycle = On time/100 milliseconds (or the period, whichever is less) Where "On time" = N1L1 +N2L2 +....

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +...)/100mS or T, whichever is less. Where T is the period of the pulse train.

The measured values for the EUT's pulse train are as follows:

Actual Period = 395.2 mSec Measurement Period = 100 mSec Pulsewidth of Type 1 Pulse = 8.216 mSec Number of Type 1 Pulses = 1

Duty Cycle = 20 log [((8.216)(1) /100] = -21.7 dB

The duty cycle correction factor of -21.7 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz.

The field strength of the fundamental (transmit) frequency meets the limits as defined in 47 CFR 15.231(b). It also meets the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions.



EUT:	IrriGreen Genius System - Handheld Programmer		V	Vork Order:	IRRI0002	Ĩ
Serial Number:	None			Date:	04/22/14	
Customer:	IrriGreen, Inc		Te	emperature:	23.1°C	
Attendees:	None			Humidity:	27%	
Project:	None		Barom	netric Pres.:	1022	
Tested by:	Trevor Buls	Power: Battery		Job Site:	MN08	
TEST SPECIFICATION	DNS	Test Method				
FCC 15.231:2014		ANSI C63.10:2009				
COMMENTS						
None						
DEVIATIONS FROM	TEST STANDARD					
None						
Configuration #	1 Signature Tree	vor Buls				
			Pulse Width	Period		
			(mS)	(mS)	Limit	Result
100 mS Window			8.216	N/A	N/A	N/A
1 S Window			N/A	395.2	N/A	N/A
10 S Window			N/A	N/A	N/A	N/A



Aglient Spectrum An	alyzer - Northwes			Pulse W (mS	/idth	Period	Lineit	_	
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Agilent Spectrum An L <mark>X/</mark> R L RF	alyzer - Northwes			8 21	6	(IIIS) N/A		не	Sult /A
Agilent Spectrum An LXI R L RF	alyzer - Northwes			0.21	0	N/A	N/A	IN	/A
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Г					N/A		395.2	N/A	N 10	V/A
Agilen	Spectrum An	alyzer - Northw	est EMC, Inc							
Mari	ker1Δ3	95.158 ms	-   - - - - - - - - - - - - - - - - - -	PNO: Wide 🔸	Trig Delay: Trig: Video Atten: 10 df	20.00 ms	ALIGN OFF Avg Type:	Log-Pwr	06:27:2 T	211M Apr 22, 2014 RACE 1 2 3 4 5 6 TYPE WWWWWWWW DET P N N N N N
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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
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2013	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 mo

### **TEST DESCRIPTION**

For software controlled or pre-programmed devices, the manufacturer shall declare the duty cycle class or classes for the equipment under test. For manually operated or event dependant devices, with or without software controlled functions, the manufacturer shall declare whether the device once triggered, follows a pre-programmed cycle, or whether the transmission is constant until the trigger is released or manually reset. The manufacturer shall also give a description of the application for the device and include a typical usage pattern. The typical usage pattern as declared by the manufacturer shall be used to determine the duty cycle and hence the duty class.

Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.

To derive average emission measurements, a duty cycle correction factor per 15.35(c) was utilized:

Duty Cycle = On time/100 milliseconds (or the period, whichever is less) Where "On time" = N1L1 +N2L2 +....

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 + N2L2 +...)/100mS or T, whichever is less. Where T is the period of the pulse train.

The measured values for the EUT's pulse train are as follows:

Actual Period = 301.1 mSec Measurement Period = 100 mSec Pulsewidth of Type 1 Pulse = 8.216 mSec Number of Type 1 Pulses = 1

Duty Cycle = 20 log [((8.216)(1) /100] = -21.7 dB

The duty cycle correction factor of -21.7 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz.

The field strength of the fundamental (transmit) frequency meets the limits as defined in 47 CFR 15.231(b). It also meets the



EUT:	IrriGreen Genius System	- Handheld Programmer		Work Order	: IRRI0005		
Serial Number:	None			Date	: 05/19/14		
Customer:	IrriGreen, Inc				Temperature	: 23.3 °C	
Attendees:	Gary Klinefelter				Humidity	: 33.1% RH	
Project:	None			Bar	ometric Pres.	: 1016.2 mbar	
Tested by:	Trevor Buls	I	Power: Battery		Job Site	: MN05	
TEST SPECIFICATION	ONS		Test Method				
FCC 15.231:2014			ANSI C63.10:2009				
COMMENTS							
None							
DEVIATIONS FROM	I TEST STANDARD						
None							
Configuration #	IRRI0002 - 1	Signature J	revor Buls				
				Pulse Width	Period		
				(mS)	(mS)	Limit	Result
100 mS Window				8.216	N/A	N/A	N/A
1 S Window				N/A	301.1	N/A	N/A
10 S Window				N/A	N/A	N/A	N/A



			100 mS Win	dow				
			Pulse Wid (mS)	lth	Period (mS)	Limit	Re	sult
			8.216		N/A	N/A	Ν	I/A
Agilent Spectrum Anz	dvzer - Northwest FM	C hur						
	50 Ω DC		SENSE:INT	A			00:00:0	1 PM May 19, 201 <del>4</del>
		PNO: Wide 🔸	Trig Delay: -5 Trig: Video Atten: 10 dB	.000 ms	Avg Type:	Log-Pwr	Т	RACE 12345 h TYPE WWWWWW DET PINNNNN
10 dB/div Ref	0.00 dBm						ΔMkr1	8.216 ms 0.66 dB
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-20.0								
30.0	<mark>↓</mark> 1∆2							
X2								
-40.0								
-50.0								
-60.0								
-70.0								
-80.0								
-90.0	the line is the	a shi ka shi ka shekara ka shekara k	nie filie die die die die die die die die die d				ware was the	h fi hining
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Center 443.920	0000 MHz							Span 0 Hz
Res BW 100 kl	Hz	#VB	W 300 kHz			Sweep	5 100.2 m	s (3000 pts)
MSG					STATUS			





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						Pulse V	/idth	Period	Limit	Ba	eult
Г						N/A		N/A	N/A	N	I/A
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								STATUS			



### **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**

					Interval
Description	Manufacturer	Model	ID	Last Cal.	(mo.)
Spectrum Analyzer	Agilent	E4443A	AAS	3/27/2014	24
Near Field Probe Set	ETS	7405	IPO	NCR	0

### **TEST DESCRIPTION**

The occupied bandwidth is required to be no wider that 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz.

The measurement was made using near field probe near the integral antenna of the EUT to the input of the spectrum analyzer. The EUT was transmitting at its maximum data rate.



EUT: Infridreen Genus System - Handneid Programmer     Work Order: IRR10002       Serial Number: None     Date: 04/22/14       Customer: InriGreen, Inc     Temperature: 23.1°C       Attendees: None     Humidity: 27%       Project: None     Barometric Pres.: 1022       Tested by: Trevor Buls     Power: Battery     Job Site: MN08       TEST SPECIFICATIONS     Test Method	
Serial Number: None         Date: 04/22/14           Customer: IrriGreen, Inc         Temperature: 23.1°C           Attendees: None         Humidity: 27%           Project: None         Barometric Pres.: 1022           Tested by: Trevor Buls         Power: Battery         Job Site: MN08           TEST SPECIFICATIONS         Test Method         M08	
Customer:     IrriGreen, Inc     Temperature:     23.1°C       Attendees:     None     Humidity:     27%       Project:     None     Barometric Pres.:     1022       Tested by:     Trevor Buls     Power:     Barometric Pres.:     1022       TEST SPECIFICATIONS     Test Method     Test Method	
Attendees: None     Humidity: 27%       Project: None     Barometric Pres.: 1022       Tested by: Trevor Buls     Power: Battery     Job Site: MN08       TEST SPECIFICATIONS     Test Method	
Project: None         Barometric Pres.: 1022           Tested by: Trevor Buls         Power: Battery         Job Site: MN08           TEST SPECIFICATIONS         Test Method         Test Method	
Tested by:         Power:         Battery         Job Site:         MN08           TEST SPECIFICATIONS         Test Method         Test Method <th></th>	
TEST SPECIFICATIONS Test Method	
FCC 15.231:2014 ANSI C63.10:2009	
COMMENTS	
Limit is based on center frequency: 433.92 MHz * 0.25% = 1084.4 MHz.	
DEVIATIONS FROM TEST STANDARD	
None	
Configuration # 1 1	
Signature Stever Contract	
Value Limit	
(kHz) (kHz)	Result
433.92 MHz 100.413 1084.8	Pass







### **OCCUPIED BANDWIDTH**

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### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2013	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 mo

### **TEST DESCRIPTION**

The occupied bandwidth is required to be no wider that 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz.

The measurement was made using a radiated setup connected to the input of the spectrum analyzer. The EUT was transmitting at its maximum data rate.



EUT:	IrriGreen Genius System	- Handheld Programmer			Work Order	: IRRI0005	
Serial Number:	None				Date	: 05/19/14	
Customer:	IrriGreen, Inc				Temperature	: 23.3 °C	
Attendees:	Gary Klinefelter				Humidity	: 33.1% RH	
Project:	None				Barometric Pres.	: 1016.2 mbar	
Tested by:	Trevor Buls		Power	: Battery	Job Site	: MN05	
TEST SPECIFICATI	ONS			Test Method			
FCC 15.231:2014				ANSI C63.10:2009			
COMMENTS							
None							
DEVIATIONS FROM	I TEST STANDARD						
None							
Configuration #	IRRI0002 - 1	Signature	Trevor	Buls			
					Value	Limit	
					(kHz)	(kHz)	Result
443.92 MHz					86.05	1109.8	Pass









### FIELD STRENGTH OF FUNDAMENTAL

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 at 433.92 MHz, Modulated

#### POWER SETTINGS INVESTIGATED

Battery

#### **CONFIGURATIONS INVESTIGATED**

IRRI0002 - 1

#### FREQUENCY RANGE INVESTIGATED

Start Frequency 433 MHz Stop Frequency 435 MHz

#### 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
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2013	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 mo

### **MEASUREMENT BANDWIDTHS**

Frequency Range	Peak Data	Quasi-Peak Data	Average Data
(MHz)	(kHz)	(kHz)	(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

#### **TEST DESCRIPTION**

The antennas to be used with the EUT were tested. The EUT was configured for continuous modulated operation at its single transmit frequency. The field strength of the transmit frequency was maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT in 3 orthogonal planes (per ANSI C63.10:2009).

To derive average emission measurements, a duty cycle correction factor per 15.35(c) was utilized:

Duty Cycle = On time/100 milliseconds (or the period, whichever is less)

Where "On time" = N1L1 + N2L2 +....

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +...)/100mS or T, whichever is less. Where T is the period of the pulse train.

The measured values for the EUT's pulse train are as follows:

Actual Period = 395.2 mSec Measurement Period = 100 mSec Pulsewidth of Type 1 Pulse = 8.216 mSec Number of Type 1 Pulses = 1

Duty Cycle = 20 log [((8.216)(1) /100] = -21.7 dB

The duty cycle correction factor of -21.7 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz.

The field strength of the fundamental (transmit) frequency meets the limits as defined in 47 CFR 15.231(b). It also meets the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions.



# FIELD STRENGTH OF FUNDAMENTAL

	Wo	ork Order:	IRRI0002		Date:	04	/22/14		1		0	0
		Project:	None	Ter	nperature:	23	3.2 °C	-		~	BI	V D
		Job Site:	MN05		Humidity:	26.	9% RH	2)	ter	OC	~	C.L
	Seria	I Number:	None	Barome	tric Pres.:	102	1 mbar	1	Fested by:	Trevor Buls	6	
		EUT:	IrriGreen Genius Sys	tem - Handh	neld Progra	mmer						
	Conf	iguration:	1									
	<u> </u>	Sustomer.	IrriGreen Inc									
		ttendees	None									
		IT Dowor	Battory									
		JI FOWEI.	Dallery		lulate d							
0	perati	ing Mode:										
	D	eviations:	None									
Comments:												
Test	Speci	fications					Test Meth	nod				
FCC	15 22	1.2014	l					10.2009				
F	Run #	1	Test Distance (m)	3	Antenna	a Height(	s)	1-4m		Results	Pa	ass
	120 -											
dBuV/m	100 - 80 - 60 - 40 -					•						
	20 - 0 - 43	33				43	4					435
						MH	Iz			PK	AV	QP
					Duty Cycle	External	Polarity/		Distance			Compared to

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
433.958	74.4	22.8	1.0	212.0		0.0	Horz	PK	0.0	97.2	100.8	-3.6	EUT on Side
433.957	74.2	22.8	1.1	17.0		0.0	Vert	PK	0.0	97.0	100.8	-3.8	EUT Horizontal
433.937	73.0	22.8	2.1	241.0		0.0	Horz	PK	0.0	95.8	100.8	-5.0	EUT Vertical
433.958	74.4	22.8	1.0	212.0	-21.7	0.0	Horz	AV	0.0	75.5	80.8	-5.3	EUT on Side
433.957	74.2	22.8	1.1	17.0	-21.7	0.0	Vert	AV	0.0	75.3	80.8	-5.5	EUT Horizontal
433.957	72.0	22.8	1.2	203.0		0.0	Vert	PK	0.0	94.8	100.8	-6.0	EUT Vertical
433.937	73.0	22.8	2.1	241.0	-21.7	0.0	Horz	AV	0.0	74.1	80.8	-6.7	EUT Vertical
433.958	70.3	22.8	2.0	74.0		0.0	Horz	PK	0.0	93.1	100.8	-7.7	EUT Horizontal
433.957	72.0	22.8	1.2	203.0	-21.7	0.0	Vert	AV	0.0	73.1	80.8	-7.7	EUT Vertical
433.958	70.3	22.8	2.0	74.0	-21.7	0.0	Horz	AV	0.0	71.4	80.8	-9.4	EUT Horizontal
433.960	66.1	22.8	2.3	128.0		0.0	Vert	PK	0.0	88.9	100.8	-11.9	EUT on Side
433.960	66.1	22.8	2.3	128.0	-21.7	0.0	Vert	AV	0.0	67.2	80.8	-13.6	EUT on Side



# FIELD STRENGTH OF FUNDAMENTAL

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 semi-continuously at 443.92 MHz, modulated.

#### POWER SETTINGS INVESTIGATED

Battery

#### CONFIGURATIONS INVESTIGATED

IRRI0002 - 1

#### FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 5 GHz

#### 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
Attenuator, 10db, 'SMA'	S.M. Electronics	SA18H-10	REN	5/15/2014	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/14/2014	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	3/14/2014	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	36 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/14/2014	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2013	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 mo

#### MEASUREMENT BANDWIDTHS

Frequency Range	Peak Data	Quasi-Peak Data	Average Data
(MHz)	(kHz)	(kHz)	(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

#### TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was configured for continuous modulated operation at its single transmit frequency. The field strength of the transmit frequency was maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT in 3 orthogonal planes (per ANSI C63.10:2009).

To derive average emission measurements, a duty cycle correction factor per 15.35(c) was utilized:

Duty Cycle = On time/100 milliseconds (or the period, whichever is less)

Where "On time" = N1L1 + N2L2 + ...

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +...)/100mS or T, whichever is less. Where T is the period of the pulse train.

The measured values for the EUT's pulse train are as follows:

Actual Period = 301.1 mSec Measurement Period = 100 mSec Pulsewidth of Type 1 Pulse = 8.216 mSec Number of Type 1 Pulses = 1

Duty Cycle = 20 log [((8.216)(1) /100] = -21.7 dB

The duty cycle correction factor of –21.7 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz.

The field strength of the fundamental (transmit) frequency meets the limits as defined in 47 CFR 15.231(b). It also meets the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions.



# FIELD STRENGTH OF FUNDAMENTAL

	0	IDDIAAAE		Data	05/10/11							
Work	Order:	IRRI0005		Date:	05/19/14		-	00.				
P	roject:	None	Tempe	erature:	23.3 °C		100 007	Buls				
Jo	b Site:	MN05	Hu	midity:	33.1% RH	0)	0000					
Serial Nu	umber:	None	Barometric	Pres.:	016.2 mbar	1	ested by: Trevor E	Buls				
	EUT:	IrriGreen Genius Sys	tem - Handheld	Programmer								
Configu	ration:	IRRI0002 - 1										
Cus	tomer:	IrriGreen, Inc.										
Atter	ndees:	Gary Klinefelter										
EUT	Power:	Battery										
Operating	Mode:	Transmitting semi-co										
Devia	ations:	None	lone									
Com	ments:	None										
st Specifica	ations				Test Me	thod						
C 15.231:20	014				ANSI C6	3.10:2009						
Run #	9	Test Distance (m	) 3	Antenna Heio	ht(s)	1-4m	Resul	ts Pass				
i i i i i i i i i i i i i i i i i i i	0		, , ,				1000	1 400				
100												
80				•								
60												
40												
40												
40 20 0												

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
443.955	76.9	23.0	1.1	14.0		0.0	Vert	PK	0.0	99.9	101.1	-1.2	EUT Horizontal
443.955	76.8	23.0	2.2	246.0		0.0	Horz	PK	0.0	99.8	101.1	-1.3	EUT on Side
443.953	75.8	23.0	1.9	252.0		0.0	Horz	PK	0.0	98.8	101.1	-2.3	EUT Vertical
443.955	76.9	23.0	1.1	14.0	-21.7	0.0	Vert	AV	0.0	78.2	81.1	-2.9	EUT Horizontal
443.955	76.8	23.0	2.2	246.0	-21.7	0.0	Horz	AV	0.0	78.1	81.1	-3.0	EUT on Side
443.953	75.8	23.0	1.9	252.0	-21.7	0.0	Horz	AV	0.0	77.1	81.1	-4.0	EUT Vertical
443.955	71.6	23.0	1.0	274.0		0.0	Horz	PK	0.0	94.6	101.1	-6.5	EUT Horizontal
443.953	71.4	23.0	1.0	220.0		0.0	Vert	PK	0.0	94.4	101.1	-6.7	EUT Vertical
443.955	71.2	23.0	2.1	128.0		0.0	Vert	PK	0.0	94.2	101.1	-6.9	EUT on Side
443.955	71.6	23.0	1.0	274.0	-21.7	0.0	Horz	AV	0.0	72.9	81.1	-8.2	EUT Horizontal
443.953	71.4	23.0	1.0	220.0	-21.7	0.0	Vert	AV	0.0	72.7	81.1	-8.4	EUT Vertical
443.955	71.2	23.0	2.1	128.0	-21.7	0.0	Vert	AV	0.0	72.5	81.1	-8.6	EUT on Side



### SPURIOUS RADIATED EMISSIONS

Stop Frequency 5 GHz

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 at 433.92 MHz, Modulated

POWER SETTINGS INVESTIGATED

Battery

### CONFIGURATIONS INVESTIGATED

IRRI0002 - 1

#### FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

#### 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
High Pass Filter	Micro-Tronics	HPM50108	HGP	5/31/2012	24 mo
Attenuator, 10db, 'SMA'	S.M. Electronics	SA18H-10	REN	5/20/2013	12 mo
Attenuator, 20 dB, 'SMA'	SM Electronics	SA6-20	REO	5/20/2013	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/14/2014	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	36 mo
MN05 Cables	ESM Cable Corp.	ouble Ridge Guide Horn Cabl	MNI	3/14/2014	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/14/2014	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2013	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 mo

#### MEASUREMENT BANDWIDTHS

Frequency Range	Peak Data	Quasi-Peak Data	Average Data
(MHz)	(kHz)	(kHz)	(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

#### TEST DESCRIPTION

The single, integral antenna to be used with the EUT was tested. The EUT was configured for un-modulated, CW operation at its single transmit frequency. The field strength of the transmit frequency was maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT 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.

To derive average emission measurements, a duty cycle correction factor per 15.35(c) was utilized:

Duty Cycle = On time/100 milliseconds (or the period, whichever is less)

Where "On time" = N1L1 + N2L2 +....

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +...)/100mS or T, whichever is less. Where T is the period of the pulse train.

The measured values for the EUT's pulse train are as follows:

Actual Period = 395.2 mSec Measurement Period = 100 mSec Pulsewidth of Type 1 Pulse = 8.216 mSec Number of Type 1 Pulses = 1

Duty Cycle = 20 log [((8.216)(1) /100] = -21.7 dB

The duty cycle correction factor of -21.7 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz for measurements at or below 1GHz. Above 1GHz, a resolution bandwidth of 1MHz and a video bandwidth of 3MHz was used.



### SPURIOUS RADIATED EMISSIONS

Wor	k Order:	IRRI0002		Date: 04	/22/14	-	2	0
	Project:	None	Ter	mperature: 23	3.2 °C	-1	- B	uss
	Job Site:	MN05		Humidity: 26.	9% RH	ester	DOCO	
Serial	Number:	None	Barom	etric Pres.: 102	1 mbar	Tested	by: Trevor Buls	
	EUT:	IrriGreen Genius Sys	tem - Hand	held Programmer				
Config	guration:	1						
Cı	ustomer:	IrriGreen, Inc						
At	tendees:	None						
EU	T Power:	Battery						
Operatin	ng Mode:	Transmitting at 433.9	2 MHz, Mo	dulated				
De	viations:	None						
Comments:								
Test Specifi	ications				Test Method			
FCC 15 231	(b):2014				ANSI C63 10	:2009		
Run #	2	Test Distance (m)	3	Antenna Height(	5)	1-4m	Results	Pass
100 🖵								
90 -								
80 -								
70								
60 -								
50 -								
40			<b>U</b> '					
30 -								
20 -						\$		
10 -						• •		
0 -								
10			100			1000		10000
				MH	Z		🔳 РК 🔶	AV 😐 QP

Freq	Amplitude	Factor	Antenna Height	Azimuth	Duty Cycle Correction Factor	External Attenuation	Polarity/ Transducer Type	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to Spec.	
(MHz)	(dBuV)	(dB)	(meters)	(degrees)	(dB)	(dB)			(dB)	(dBuV/m)	(dBuV/m)	(dB)	Comments
867.900	25.7	9.5	1.0	193.0		10.0	Vert	PK	0.0	45.2	80.8	-35.6	EUT Horizontal
867.810	25.0	9.5	1.0	227.0		10.0	Horz	PK	0.0	44.5	80.8	-36.3	EUT Vertical
867.800	24.4	9.5	2.7	197.0		10.0	Horz	PK	0.0	43.9	80.8	-36.9	EUT on Side
867.900	25.7	9.5	1.0	193.0	-21.7	10.0	Vert	AV	0.0	23.5	60.8	-37.3	EUT Horizontal
867.810	25.0	9.5	1.0	227.0	-21.7	10.0	Horz	AV	0.0	22.8	60.8	-38.0	EUT Vertical
866.805	23.0	9.5	3.9	343.0		10.0	Horz	PK	0.0	42.5	80.8	-38.3	EUT Horizontal
869.230	22.9	9.6	1.0	176.0		10.0	Vert	PK	0.0	42.5	80.8	-38.3	EUT Vertical
868.800	22.9	9.6	3.9	23.0		10.0	Vert	PK	0.0	42.5	80.8	-38.3	EUT on Side
867.800	24.4	9.5	2.7	197.0	-21.7	10.0	Horz	AV	0.0	22.2	60.8	-38.6	EUT on Side
1301.767	41.0	-5.6	1.0	52.0		0.0	Horz	PK	0.0	35.4	74.0	-38.6	EUT on Side
1301.750	40.8	-5.6	1.9	217.0		0.0	Vert	PK	0.0	35.2	74.0	-38.8	EUT Horizontal
866.805	23.0	9.5	3.9	343.0	-21.7	10.0	Horz	AV	0.0	20.8	60.8	-40.0	EUT Horizontal
869.230	22.9	9.6	1.0	176.0	-21.7	10.0	Vert	AV	0.0	20.8	60.8	-40.0	EUT Vertical
868.800	22.9	9.6	3.9	23.0	-21.7	10.0	Vert	AV	0.0	20.8	60.8	-40.0	EUT on Side
1301.767	41.0	-5.6	1.0	52.0	-21.7	0.0	Horz	AV	0.0	13.7	54.0	-40.3	EUT on Side
1301.750	40.8	-5.6	1.9	217.0	-21.7	0.0	Vert	AV	0.0	13.5	54.0	-40.5	EUT Horizontal
1735.717	39.6	-5.0	1.0	255.0		0.0	Vert	PK	0.0	34.6	80.8	-46.2	EUT Horizontal
1737.042	39.2	-5.0	1.0	56.0		0.0	Horz	PK	0.0	34.2	80.8	-46.6	EUT on Side
1735.717	39.6	-5.0	1.0	255.0	-21.7	0.0	Vert	AV	0.0	12.9	60.8	-47.9	EUT Horizontal
1737.042	39.2	-5.0	1.0	56.0	-21.7	0.0	Horz	AV	0.0	12.5	60.8	-48.3	EUT on Side



### SPURIOUS RADIATED EMISSIONS

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#### MODES OF OPERATION

Transmitting semi-continuously at 443.92 MHz, modulated.

#### POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

IRRI0002 - 1

#### FREQUENCY RANGE INVESTIGATED

Stop Frequency 5 GHz

# Start Frequency 30 MHz 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
Attenuator, 10db, 'SMA'	S.M. Electronics	SA18H-10	REN	5/15/2014	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/14/2014	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	3/14/2014	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	36 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/14/2014	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2013	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 mo

#### 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

#### TEST DESCRIPTION

The single, integral antenna to be used with the EUT was tested. The EUT was configured for un-modulated, CW operation at its single transmit frequency. The field strength of the transmit frequency was maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT 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.

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Duty Cycle = On time/100 milliseconds (or the period, whichever is less)

Where "On time" = N1L1 +N2L2 +....

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +...)/100mS or T, whichever is less. Where T is the period of the pulse train.

The measured values for the EUT's pulse train are as follows:

Actual Period = 301.1 mSec Measurement Period = 100 mSec Pulsewidth of Type 1 Pulse = 8.216 mSec Number of Type 1 Pulses = 1

Duty Cycle = 20 log [((8.216)(1) /100] = -21.7 dB

The duty cycle correction factor of –21.7 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz for measurements at or below 1GHz. Above 1GHz, a resolution bandwidth of 1MHz and a video bandwidth of 3MHz was used.

The field strength of the spurious emissions meet the limits as defined in 47 CFR 15.231(b). The spurious emissions also meet the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions. Further, spurious emissions meet the provisions of 15.205 using the measurement instrumentation specified in that section.



### SPURIOUS RADIATED EMISSIONS

Project Job Site Serial Number	None	Tomporatura							
Job Site Serial Number		Temperature.	23.5 °C		my B.	us			
Serial Number	MN05	Humidity:	41.7% RH	ester					
	None	Barometric Pres.:	1012.8 mbar	Tested by	I revor Buls				
EUT	IrriGreen Genius Sys	em - Handheld Program	mer						
Configuration	IRRI0002 - 1								
Customer	IrriGreen, Inc.								
Attendees	None								
EUT Power	Battery								
Operating Mode	Transmitting semi-continuously at 443.92 MHz, modulated.								
Deviations	None								
Comments	None								
est Specifications			Test Meth	od					
CC 15.231(b):2014			ANSI C63	.10:2009					
<b>Run #</b> 13	Test Distance (m)	3 Antenna H	leight(s)	1-4m	Results	Pass			
00									
90 -									
80 -						++++			
70									
60									
50									
40									
30									
20									
10									
0									
10		100	1000	■ PK ◆ A	10000 V • QP				

Amplitude	Factor	Antenna Height	Azimuth	Duty Cycle Correction Factor	External Attenuation	Polarity/ Transducer Type	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to Spec.		
(abuv)	(dB)	(meters)	(degrees)	(ab)	(ab)			(ab)	(aBuv/m)	(aBuv/m)	(ab)	Comments	
40.3	-5.5	1.0	347.0		10.0	Vert	PK	0.0	44.8	74.0	-29.2	EUT Horizontal	
39.9	-5.5	1.0	151.0		10.0	Horz	PK	0.0	44.4	74.0	-29.6	EUT on Side	
30.5	9.8	2.3	28.0		10.0	Horz	PK	0.0	50.3	81.1	-30.8	EUT on Side	
40.3	-5.5	1.0	347.0	-21.7	10.0	Vert	AV	0.0	23.1	54.0	-30.9	EUT Horizontal	
39.9	-5.5	1.0	151.0	-21.7	10.0	Horz	AV	0.0	22.7	54.0	-31.3	EUT on Side	
30.5	9.8	2.3	28.0	-21.7	10.0	Horz	AV	0.0	28.6	61.1	-32.5	EUT on Side	
28.6	9.8	2.2	79.0		10.0	Horz	PK	0.0	48.4	81.1	-32.7	EUT Vertical	
27.1	9.8	1.0	307.0		10.0	Vert	PK	0.0	46.9	81.1	-34.2	EUT Horizontal	
28.6	9.8	2.2	79.0	-21.7	10.0	Horz	AV	0.0	26.7	61.1	-34.4	EUT Vertical	
40.5	-4.9	1.0	115.0		10.0	Horz	PK	0.0	45.6	81.1	-35.5	EUT on Side	
40.3	-4.9	1.6	273.0		10.0	Vert	PK	0.0	45.4	81.1	-35.7	EUT Horizontal	
27.1	9.8	1.0	307.0	-21.7	10.0	Vert	AV	0.0	25.2	61.1	-35.9	EUT Horizontal	
40.5	-4.9	1.0	115.0	-21.7	10.0	Horz	AV	0.0	23.9	61.1	-37.2	EUT on Side	
24.0	9.8	1.1	209.0		10.0	Vert	PK	0.0	43.8	81.1	-37.3	EUT Vertical	
40.3	-4.9	1.6	273.0	-21.7	10.0	Vert	AV	0.0	23.7	61.1	-37.4	EUT Horizontal	
23.7	9.8	1.0	70.0		10.0	Horz	PK	0.0	43.5	81.1	-37.6	EUT Horizontal	
24.0	9.8	1.1	209.0	-21.7	10.0	Vert	AV	0.0	22.1	61.1	-39.0	EUT Vertical	
23.7	9.8	1.0	70.0	-21.7	10.0	Horz	AV	0.0	21.8	61.1	-39.3	EUT Horizontal	
21.6	9.8	1.0	214.0		10.0	Vert	PK	0.0	41.4	81.1	-39.7	EUT on Side	
21.6	9.8	1.0	214.0	-21.7	10.0	Vert	AV	0.0	19.7	61.1	-41.4	EUT on Side	
	Amplitude (dBuV) 40.3 39.9 30.5 40.3 39.9 30.5 28.6 27.1 28.6 40.5 40.3 27.1 40.5 24.0 40.3 23.7 24.0 23.7 21.6 21.6	Amplitude (dBuV)         Factor (dB)           40.3         -5.5           39.9         -5.5           30.5         9.8           40.3         -5.5           30.5         9.8           40.3         -5.5           30.5         9.8           28.6         9.8           27.1         9.8           40.5         -4.9           40.5         -4.9           27.1         9.8           40.5         -4.9           23.7         9.8           24.0         9.8           23.7         9.8           21.6         9.8	Amplitude (dBuV)         Factor (dB)         Antenna Height (meters)           40.3         -5.5         1.0           39.9         -5.5         1.0           30.5         9.8         2.3           40.3         -5.5         1.0           30.5         9.8         2.3           40.3         -5.5         1.0           30.5         9.8         2.3           28.6         9.8         2.2           27.1         9.8         1.0           28.6         9.8         2.2           40.5         -4.9         1.6           27.1         9.8         1.0           40.5         -4.9         1.6           27.1         9.8         1.0           40.5         -4.9         1.6           27.1         9.8         1.0           24.0         9.8         1.1           40.3         -4.9         1.6           23.7         9.8         1.0           24.0         9.8         1.1           23.7         9.8         1.0           21.6         9.8         1.0	Amplitude (dBuV)         Factor (dB)         Antenna Height (meters)         Azimuth (degrees)           40.3         -5.5         1.0         347.0           39.9         -5.5         1.0         151.0           30.5         9.8         2.3         28.0           40.3         -5.5         1.0         347.0           39.9         -5.5         1.0         347.0           39.9         -5.5         1.0         347.0           39.9         -5.5         1.0         347.0           39.9         -5.5         1.0         347.0           30.5         9.8         2.3         28.0           28.6         9.8         2.2         79.0           27.1         9.8         1.0         307.0           28.6         9.8         2.2         79.0           27.1         9.8         1.0         307.0           40.5         -4.9         1.6         273.0           27.1         9.8         1.0         307.0           40.5         -4.9         1.6         273.0           23.7         9.8         1.0         70.0           24.0         9.8         1.1	Amplitude (dBuV)         Factor (dB)         Antenna Height (meters)         Azimuth (degrees)         Duty Cycle Factor (dB)           40.3         -5.5         1.0         347.0           39.9         -5.5         1.0         151.0           30.5         9.8         2.3         28.0           40.3         -5.5         1.0         347.0           30.5         9.8         2.3         28.0           40.3         -5.5         1.0         347.0           30.5         9.8         2.3         28.0           40.3         -5.5         1.0         347.0           28.6         9.8         2.2         79.0           27.1         9.8         1.0         307.0           28.6         9.8         2.2         79.0           27.1         9.8         1.0         307.0           27.1         9.8         1.0         307.0           27.1         9.8         1.0         307.0           27.1         9.8         1.0         20.0           40.3         -4.9         1.6         273.0           27.1         9.8         1.0         70.0           21.0         9.	Amplitude (dBuV)         Factor (dB)         Antenna Height (meters)         Azimuth (degrees)         Correction Factor (dB)         External Attenuation (dB)           40.3         -5.5         1.0         347.0         10.0           39.9         -5.5         1.0         151.0         10.0           30.5         9.8         2.3         28.0         10.0           30.5         9.8         2.3         28.0         -21.7         10.0           30.5         9.8         2.3         28.0         -21.7         10.0           30.5         9.8         2.3         28.0         -21.7         10.0           30.5         9.8         2.2         79.0         10.0         10.0           28.6         9.8         2.2         79.0         -21.7         10.0           28.6         9.8         2.2         79.0         -21.7         10.0           40.3         -4.9         1.6         273.0         -21.7         10.0           27.1         9.8         1.0         307.0         -21.7         10.0           40.5         -4.9         1.6         273.0         -21.7         10.0           24.0         9.8	Amplitude (dBuV)         Factor (dB)         Antenna Height (meters)         Azimuth (degrees)         Duty Cycle (dB)         External Attenuation (dB)         Factor Type           40.3         -5.5         1.0         347.0         10.0         Vert           39.9         -5.5         1.0         347.0         10.0         Horz           30.5         9.8         2.3         28.0         10.0         Horz           30.5         9.8         2.3         28.0         10.0         Horz           30.5         9.8         2.3         28.0         -21.7         10.0         Horz           30.5         9.8         2.3         28.0         -21.7         10.0         Horz           28.6         9.8         2.2         79.0         -21.7         10.0         Horz           27.1         9.8         1.0         307.0         10.0         Horz           40.3         -4.9         1.6         273.0         10.0         Horz           24.0         9.8         1.0         307.0         -21.7         10.0         Horz           24.0         9.8         1.0         307.0         -21.7         10.0         Horz           <	Amplitude (dBuv)         Factor (dB)         Antenna Height (meters)         Azimuth (degrees)         Duty Cycle (dB)         External Attenuation (dB)         Polarity/ Trype         Detector           40.3         -5.5         1.0         347.0         10.0         Vert         PK           39.9         -5.5         1.0         151.0         10.0         Horz         PK           30.5         9.8         2.3         28.0         10.0         Horz         PK           30.5         9.8         2.3         28.0         -21.7         10.0         Horz         AV           30.5         9.8         2.3         28.0         -21.7         10.0         Horz         AV           30.5         9.8         2.3         28.0         -21.7         10.0         Horz         AV           30.5         9.8         2.2         79.0         10.0         Horz         AV           28.6         9.8         2.2         79.0         -21.7         10.0         Horz         AV           40.3         -4.9         1.6         273.0         10.0         Horz         AV           40.5         -4.9         1.6         273.0         -21.7	Amplitude (dBuv)         Factor (dB)         Antenna Height (meters)         Azimuth (degrees)         Correction (dB)         External Attenuation (dB)         Polarity/ Transducer (dB)         Transducer Type         Detector         Distance Adjustment (dB)           40.3         -5.5         1.0         347.0         10.0         Vert         PK         0.0           39.9         -5.5         1.0         151.0         10.0         Horz         PK         0.0           40.3         -5.5         1.0         347.0         -21.7         10.0         Horz         PK         0.0           30.5         9.8         2.3         28.0         -21.7         10.0         Horz         AV         0.0           30.5         9.8         2.3         28.0         -21.7         10.0         Horz         AV         0.0           30.5         9.8         2.2         79.0         -21.7         10.0         Horz         AV         0.0           28.6         9.8         2.2         79.0         -21.7         10.0         Horz         PK         0.0           40.3         -4.9         1.6         273.0         -21.7         10.0         Horz         AV         0.0	Amplitude (dBuV)         Factor (dB)         Antenna Height (meters)         Azimuth (degrees)         Duty Cycle (dB)         External Attenuation (dB)         Polarity/ Transducer (dB)         Detector         Distance Adjustment (dB)         Adjusted (dB)           40.3         -5.5         1.0         347.0         10.0         Vert         PK         0.0         44.8           39.9         -5.5         1.0         151.0         10.0         Horz         PK         0.0         44.4           30.5         9.8         2.3         28.0         10.0         Horz         PK         0.0         23.1           39.9         -5.5         1.0         347.0         -21.7         10.0         Horz         AV         0.0         23.1           39.9         -5.5         1.0         151.0         -21.7         10.0         Horz         AV         0.0         28.6           28.6         9.8         2.2         79.0         10.0         Horz         AV         0.0         26.7           40.5         -4.9         1.0         307.0         -21.7         10.0         Horz         AV         0.0         26.7           40.5         -4.9         1.0         307.0	Amplitude (dBu/)         Factor (dB)         Antenna Height (meters)         Azimuth (degrees)         Duty Cycle (dB)         External Attenuation (dB)         Transducer Type         Detector         Distance Adjustment (dB)         Adjusted (dBu//m)         Spec. Limit (dBu//m)           40.3         -5.5         1.0         347.0         10.0         Vert         PK         0.0         44.8         74.0           30.5         9.8         2.3         28.0         10.0         Horz         PK         0.0         44.4         74.0           30.5         9.8         2.3         28.0         10.0         Horz         PK         0.0         44.4         74.0           30.5         9.8         2.3         28.0         -21.7         10.0         Horz         PK         0.0         23.1         54.0           30.5         9.8         2.2         79.0         10.0         Horz         AV         0.0         28.6         61.1           28.6         9.8         2.2         79.0         -21.7         10.0         Horz         AV         0.0         28.6         61.1           28.6         9.8         2.2         79.0         -21.7         10.0         Horz         AV	Amplitude (dBu/)         Factor (dB)         Anterna Height (meters)         Azimuth (degrees)         Compared to (dB)         External (dB)         Transducer (dB)         Detector (dB)         Distance (dB)         Adjusted (dBU/m)         Spec. Limit (dBU/m)         Compared to Spec. (dB)           40.3         -5.5         1.0         347.0         10.0         Vert         PK         0.0         44.8         74.0         -29.2           39.9         -5.5         1.0         151.0         10.0         Horz         PK         0.0         44.4         74.0         -29.2           30.5         9.8         2.3         28.0         -21.7         10.0         Horz         PK         0.0         23.1         54.0         -30.8           30.5         9.8         2.3         28.0         -21.7         10.0         Horz         AV         0.0         28.6         61.1         -32.5           28.6         9.8         2.2         79.0         -0.0         Horz         AV         0.0         28.6         61.1         -32.7           28.6         9.8         2.2         79.0         -21.7         10.0         Horz         AV         0.0         26.7         61.1         -34.4	Amplitude (dBW)         Factor (dB)         Antenna Height (dBW)         Azimuth (degrees)         External (dB)         External Attenuation (dB)         Transducer Type         Detector PW         Distance Adjustment (dBW/m)         Adjusted (dBW/m)         Compared to Spec. Limit (dBW/m)         Compared to Spec.           40.3         -5.5         1.0         347.0         10.0         Vert         PK         0.0         44.8         74.0         -29.2         EUT Horizontal           30.5         9.8         2.3         28.0         10.0         Horz         PK         0.0         44.4         74.0         -29.6         EUT no Side           40.3         -5.5         1.0         347.0         -21.7         10.0         Vert         AV         0.0         23.1         54.0         -30.9         EUT Horizontal           30.5         9.8         2.3         28.0         -21.7         10.0         Horz         AV         0.0         23.1         54.0         -31.3         EUT on Side           28.6         9.8         2.2         79.0         -21.7         10.0         Horz         AV         0.0         26.7         61.1         -34.2         EUT Horizontal           27.1         9.8         1.0