IrriGreen, Inc.

Controller 3, Model 705101

FCC 15.207:2024

FCC 15.407:2024

Wi-Fi 802.11 a/b/g/n SISO radio

Report: IRRI0024.2 Rev. 1, Issue Date: September 19, 2024

CERT #3310.02
#3310.05

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element
2023.04.17

Section	Page Number

CERTIFICATE OF TEST

Last Date of Test: September 13, 2024
IrriGreen, Inc.
EUT: Controller 3, Model 705101

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2024	ANSI C63.10:2013
FCC 15.407:2024	

Guidance

FCC KDB 789033 v02r01:2021

Results

Test Description	Result	Specification Section(s)	Method Section(s)	Comments
Powerline Conducted Emissions	Pass	15.407 (b)(6)	6.2	
Frequency Stability	Pass	15.407 (g)	6.8	
Duty Cycle	Pass	15.407 KDB 789033 -B	12.2	
Maximum Conducted Output Power	Pass	15.407(a)(1)-(4), KDB 789033 -E2.d	12.3.2.4	
Equivalent Isotropic Radiated Power (EIRP)	Pass	15.407(a)(1)-(4), KDB 789033 -E2.d	12.3.2.4	
Emission Bandwidth	Pass	15.407(a), KDB 789033 -C1	12.4.1	
Emission Bandwidth 5.8 GHz	Pass	15.407(e), KDB 789033 -C2	6.9.2	
Occupied Bandwidth	Pass	KDB 789033 -D	12.4.2	
Band Edge	Pass	15.407(h)(2)	12.4.2	
Maximum Power Spectral Density	Pass	15.407(a)(1)-(5), KDB 789033 -F	12.5	
Spurious Radiated Emissions	Pass	15.407 (b)(1)-(7), KDB 789033 -G	12.7, 6.5, 6.6	
Measurement of Emission at Elevation Angles	N/A	KDB 789033 -H	KDB 789033 -H	Not required unless the EUT is a Master device used outdoors.

Deviations From Test Standards

None

Approved By:

Cole Ghizzone, Operations Manager
Signed for and on behalf of Element

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. 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. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		
01	Added additional antenna and power setting information	2024-09-19	12
	Updated equipment list – removed terminator added DC block		35, 45, 65, 73, 81, 86
	Updated DCCF and corrected final value for 6 Mbps		46, 62
	Updated DCCF and corrected final value for MCS7		50
	Updated the test description		81
	Updated the DCCF and corrected the adjusted value for MCS7		114, 119
	Clarified language in the comments stating reduced video bandwidth averaging was employed.		125
	Removed duplicate data		139 - 143

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 - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

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

Korea

MSIT / 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.

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

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

California Minnesota Oregon Texas Washington

FACILITIES

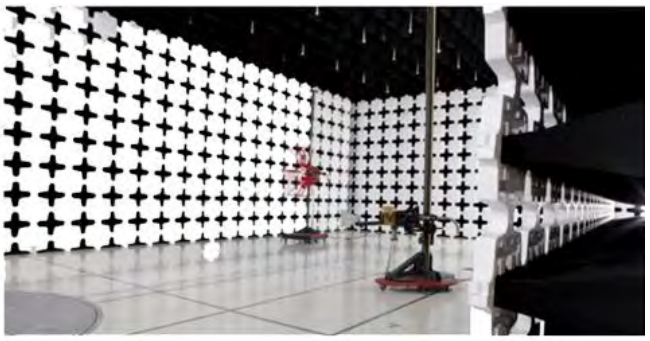
element
2024.08.21

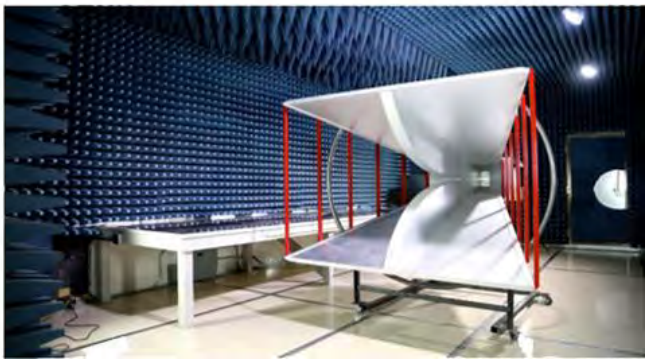
Testing was performed at the following location(s)

	Location	Labs (1)	Address	A2LA (2)	ISED (3)	BSMI (4)	VCCI (5)	CAB (6)	FDA (7)
☐	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
☒	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
☒	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
☐	Plano Texas	PT01-15	1701 E Plano Pkwy, Ste 150 Plano, TX 75074 (972) 509-2566	214.19	32637	SL2-IN-E-057R	A-0426	US0054	N/A
☐	Texas	TX01-09	3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	3310.03	2834G	SL2-IN-E-1158R	N/A	US0191	TL-54
☐	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
☐	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

(1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
(2) A2LA Certificate No.
(3) ISED Company No.
(4) BSMI No.
(5) VCCI Site Filing No.
(6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA
(7) FDA ASCA No.





MEASUREMENT UNCERTAINTY

element
MU 2023-09-21

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 QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (k=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. 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 16-4-2 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.

Various Measurements

Test	All Labs (+/-)
Frequency Accuracy (%)	0.0007
Amplitude Accuracy (dB)	1.2
Conducted Power (dB)	1.2
Radiated Power via Substitution (dB)	0.7
Temperature (degrees C)	0.7
Humidity (% RH)	2.5
Voltage (AC) (%)	1
Voltage (DC) (%)	0.7

Field Strength Measurements (dB)

Range	EV01 (+/-)	EV06 (+/-)	MN05 (+/-)	EV10 (+/-)
10kHz-30MHz	1.8	N/A	1.8	N/A
30MHz-1GHz 3m	4.6	N/A	4.6	N/A
1GHz-6GHz	5.1	N/A	5.1	N/A
6GHz-40GHz	5.2	N/A	5.2	N/A

AC Powerline Conducted Emissions Measurements (dB)

Range	EV07 (+/-)
9kHz-150kHz LISN	3.6
150kHz-30MHz LISN	3.2
150kHz-30MHz CVP	3.2
150kHz-30MHz Telecom-ISN	4.4

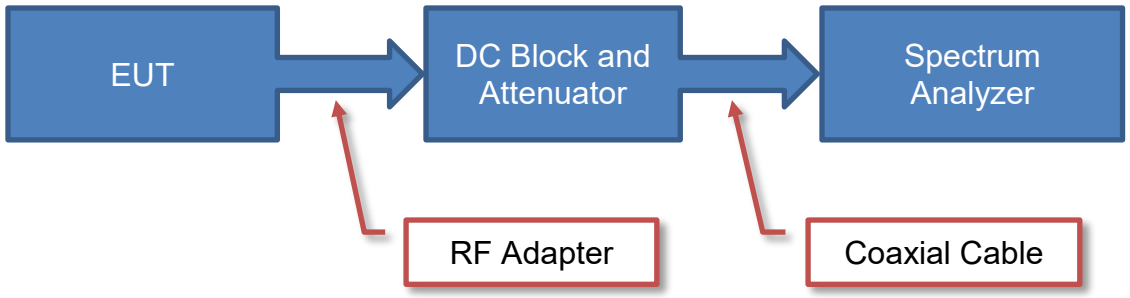
TEST SETUP BLOCK DIAGRAMS

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

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

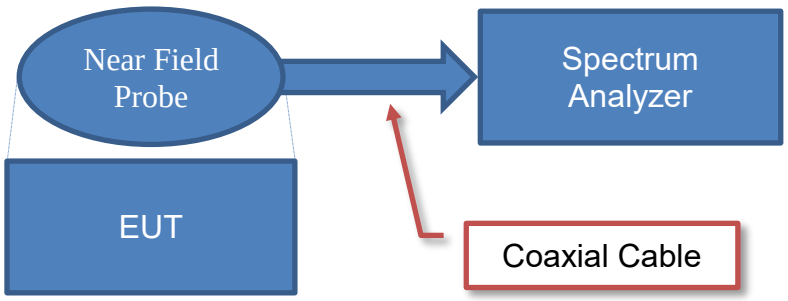
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements

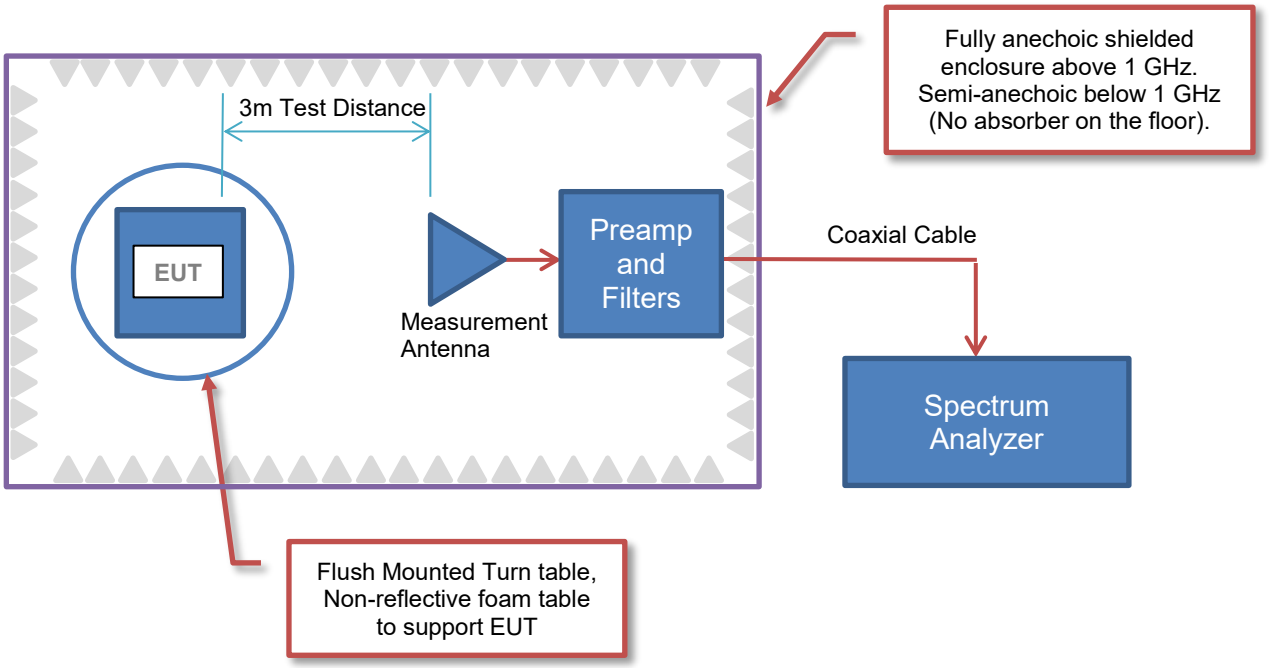


Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)		Factor						Distance Adjustment Factor		External Attenuation		Field Strength
		Antenna Factor		Cable Factor		Amplifier Gain						
42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0	=	**33.5**

Conducted Emissions:

Measured Level (Amplitude)		Factor				External Attenuation		Adjusted Level
		Transducer Factor		Cable Factor				
26.7	+	0.3	+	0.1	+	20.0	=	**47.1**

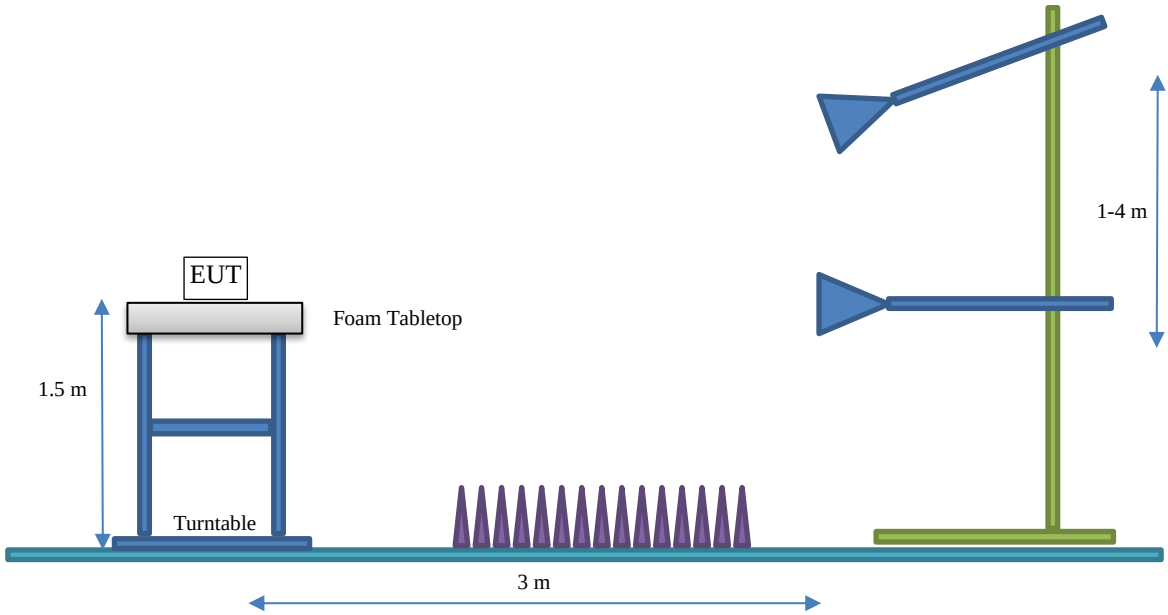
Radiated Power (ERP/EIRP) – Substitution Method:

Measured Level into Substitution Antenna (Amplitude dBm)		Substitution Antenna Factor (dBi)		EIRP to ERP (if applicable)		Measured power (dBm ERP/EIRP)
10.0	+	6.0	-	2.15	=	**13.9/16.0**

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION

Client and Equipment under Test (EUT) Information

Company Name:	IrriGreen, Inc.
Address:	5250 West 73rd Street
City, State, Zip:	Edina, MN 55439
Test Requested By:	Gary Klinefelter
EUT:	Controller 3, Model 705101
First Date of Test:	July 11, 2024
Last Date of Test:	September 13, 2024
Receipt Date of Samples:	July 11, 2024
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

The controller is labeled as a "Controller 3" with an Irrigreen sprinkler model 705101.

The controller contains three radio types:

- BLE
- 2.4 GHz Wi-Fi
- 5 GHz Wi-Fi. The 5 GHz Wi-Fi supports UNII-1 and UNII-3 bands.

The BLE radio uses a PCB Trace antenna.

Wi-Fi has a software-controlled diversity switch that changes the path to two identical antennas placed in two different orientations. The antennas are Shenzhen Keesun Technology Co. ltd., EM60 PCB antennas. Only one antenna can actively transmit at a time.

Testing Objective:

To demonstrate compliance of the Wi-Fi 802.11 a/b/g/n SISO radio under FCC 15.407 for operation in the 5.2 GHz and 5.8 GHz band(s).

POWER SETTINGS AND ANTENNAS

The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

Antenna	Type	Provided by:	Part Number	Frequency Range (MHz)	Gain (dBi)
Ant 1	PCB	Shenzhen Keesun Technology Co. ltd.	EM60	5150-5230	3.4
				5725-5850	4.1
Ant 2	PCB	Shenzhen Keesun Technology Co. ltd.	EM60	5150-5230	3.4
				5725-5850	4.1

The EUT is a SISO radio which contains an RF switch connecting Ant. 1 and Ant. 2 to the RF path. This switch is for diversity purposes only and does not allow for simultaneous transmissions.

The EUT was tested using the power settings provided by the manufacturer which were based upon:

☒ Test software settings Test software/firmware installed on EUT: CC31XX/CC32XX Radio Tool V1.0.3.19
☐ Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Type	Data Rate	Channel Bandwidths (MHz)	Band	Channel Position (20 MHz Ch.)	Frequency Range (MHz)	Power Setting*
OFDM	6 Mbps 36 Mbps 54 Mbps	20	UNII 1	Low (36) Mid (40) High (48)	5150 5200 5250	0
BPSK	MCS0	20	UNII 1	Low (36) Mid (40) High (48)	5150 5200 5250	0
64-QAM	MCS7	20	UNI 1	Low (36) Mid (40) High (48)	5150 5200 5250	0
OFDM	6 Mbps 36 Mbps 54 Mbps	20	UNII 3	Low (149) Mid (157) High (165)	5725 5785 5850	0
BPSK	MCS0	20	UNII 3	Low (149) Mid (157) High (165)	5725 5785 5850	0
64-QAM	MCS7	20	UNII 3	Low (149) Mid (157) High (165)	5725 5785 5850	0

*The power setting indicates the amount of attenuation the radio control software adds to the RF path. A value of 0 indicates that no additional attenuation was added.

CONFIGURATIONS

Configuration IRRI0024-1

Software/Firmware Running During Test	
Description	**Version**
CC31XX/CC32XX Radio Tool	1.0.3.19

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Sprinkler Controller	Irrigreen Inc	Controller 3, Model 705101	1C:63:49:9D:4E:DC

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Vostro 15 3530	7PC3424
AC Adapter	Dell	LA65NS2-01	None
Developer Kit	Ti	LP-EDS110ET	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	4.5	No	Sprinkler W/ Controller	AC mains
USB C	Yes	0.5	No	Developer Kit	USB Extension
USB Extension	Yes	2.9	No	USB C	Laptop
AC Power	No	0.9	No	AC Mains	AC Adapter
Flex cable	No	0.2	No	Sprinkler W/ Controller	Developer Kit
DC Power	No	1.8	Yes	AC Adapter	Laptop

Configuration IRRI0024-3

Software/Firmware Running During Test	
Description	**Version**
CC31XX/CC32XX Radio Tool	1.0.3.19

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Sprinkler Controller	Irrigreen Inc	Controller 3, Model 705101	1C:63:49:9D:4E:DC

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Vostro 15 3530	7PC3424
Developer Kit	Ti	LP-EDS110ET	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	4.5	No	Sprinkler W/ Controller	AC mains
Flex cable	No	0.2	No	Sprinkler W/ Controller	Developer Kit
USB C	Yes	0.5	No	Developer Kit	Laptop

CONFIGURATIONS

Configuration IRRI0024-8

Software/Firmware Running During Test	
Description	**Version**
CC31XX/CC32XX Radio Tool	1.0.3.19

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Sprinkler Controller	Irrigreen Inc	Controller 3, Model 705101	1C:63:49:9D:33:FF

Peripherals in Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Vostro 15 3530	7PC3424
AC Adapter	Dell	LA65NS2-01	None
Developer Kit	Ti	CC-2652-R7	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	4.5	No	Sprinkler W/ Controller	AC mains
AC Power	No	0.9	No	AC Mains	AC Adapter
Ribbon Cable	No	0.1	No	Sprinkler W/ Controller	Developer Kit
Micro USB	Yes	0.9	No	Developer Kit	Laptop
DC Power	No	1.8	Yes	AC Adapter	Laptop

CONFIGURATIONS

Configuration IRRI0024-9

Software/Firmware Running During Test	
Description	**Version**
CC31XX/CC32XX Radio Tool	1.0.3.19

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Sprinkler Controller	Irrigreen Inc	Controller 3, Model 705101	1C:63:49:9D:4E:DC

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Vostro 15 3530	7PC3424
Developer Kit	Ti	LP-EDS110ET	None
Sprinkler Head	Irrigreen Inc	400104	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	4.5	No	Sprinkler Controller	AC mains
Flex cable	No	0.2	No	Sprinkler Controller	Developer Kit
USB C	Yes	0.5	No	Developer Kit	Laptop
I/O Cable	No	15.2	No	Sprinkler Controller	Sprinkler

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2024-07-11	Spurious Radiated Emissions	Modified during testing.	0.2p pF added C2O3	EUT remained at Element following the test.
2	2024-07-24	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2024-08-16	Equivalent Isotropic Radiated Power (EIRP)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2024-08-13	Occupied Bandwidth (99%)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2024-08-13	Maximum Conducted Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2024-08-19	Emission Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2024-08-19	Band Edge	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2024-08-19	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2024-08-19	Maximum Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
10	2024-08-20	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
11	2024-09-11	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
12	2024-09-13	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Gauss Instruments	TDEMI 30M	ARN	2024-05-22	2025-05-22
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKT, VAB	EVGA	2024-04-19	2025-04-19
LISN	Solar Electronics	9252-50-R-24-BNC	LIR	2024-09-13	2025-09-13

CONFIGURATIONS INVESTIGATED

IRRI0024-9

MODES INVESTIGATED

Transmitting 802.11a, 6 Mbps, Ch. 157 = 5785 MHz, Ant. 1
Transmitting 802.11a, 6 Mbps, Ch. 40 = 5200 MHz, Ant. 1

POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-13
Customer:	IrriGreen, Inc.	Temperature:	22°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	22	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

Unable to bundle I/O cable due to excessive length.

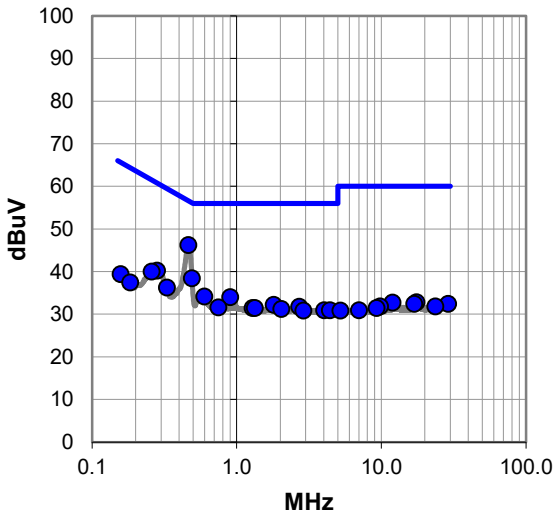
EUT OPERATING MODES

Transmitting 802.11a, 6 Mbps, Ch.157 = 5785, Ant. 1

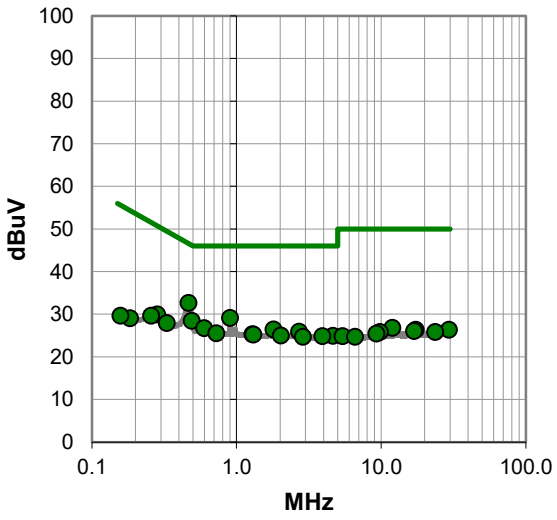
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #22

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.463	26.3	19.9	46.2	56.6	-10.4
0.490	18.5	19.9	38.4	56.2	-17.8
0.281	20.3	19.9	40.2	60.8	-20.6
0.258	20.1	19.9	40.0	61.5	-21.5
0.597	14.2	19.9	34.1	56.0	-21.9
0.902	14.0	20.0	34.0	56.0	-22.0
0.330	16.3	19.9	36.2	59.5	-23.3
1.802	12.2	20.0	32.2	56.0	-23.8
2.704	11.6	20.1	31.7	56.0	-24.3
0.747	11.7	19.9	31.6	56.0	-24.4
1.290	11.4	20.0	31.4	56.0	-24.6
1.336	11.4	20.0	31.4	56.0	-24.6
2.034	11.2	20.0	31.2	56.0	-24.8
4.033	10.6	20.3	30.9	56.0	-25.1
4.413	10.6	20.3	30.9	56.0	-25.1
2.892	10.7	20.1	30.8	56.0	-25.2
0.158	19.3	20.1	39.4	65.6	-26.2
0.184	17.4	20.0	37.4	64.3	-26.9
17.582	11.6	21.2	32.8	60.0	-27.2
12.004	12.0	20.7	32.7	60.0	-27.3
16.914	11.2	21.2	32.4	60.0	-27.6
29.029	10.1	22.3	32.4	60.0	-27.6
9.822	11.3	20.5	31.8	60.0	-28.2
23.640	10.2	21.6	31.8	60.0	-28.2
9.276	10.9	20.5	31.4	60.0	-28.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.466	12.7	19.9	32.6	46.6	-14.0
0.902	9.1	20.0	29.1	46.0	-16.9
0.490	8.5	19.9	28.4	46.2	-17.8
0.597	6.8	19.9	26.7	46.0	-19.3
1.802	6.4	20.0	26.4	46.0	-19.6
2.706	5.8	20.1	25.9	46.0	-20.1
0.727	5.6	19.9	25.5	46.0	-20.5
1.290	5.3	20.0	25.3	46.0	-20.7
1.311	5.2	20.0	25.2	46.0	-20.8
0.283	10.0	19.9	29.9	50.7	-20.8
2.024	5.0	20.0	25.0	46.0	-21.0
4.654	4.6	20.3	24.9	46.0	-21.1
3.926	4.5	20.3	24.8	46.0	-21.2
2.884	4.6	20.1	24.7	46.0	-21.3
0.330	8.0	19.9	27.9	49.5	-21.6
0.257	9.7	19.9	29.6	51.5	-21.9
12.002	6.1	20.7	26.8	50.0	-23.2
17.343	5.1	21.2	26.3	50.0	-23.7
29.525	4.0	22.3	26.3	50.0	-23.7
16.911	4.8	21.2	26.0	50.0	-24.0
9.821	5.3	20.5	25.8	50.0	-24.2
23.637	4.2	21.6	25.8	50.0	-24.2
9.273	4.9	20.5	25.4	50.0	-24.6
5.409	4.5	20.3	24.8	50.0	-25.2
0.184	9.0	20.0	29.0	54.3	-25.3

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-13
Customer:	IrriGreen, Inc.	Temperature:	22°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	23	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

Unable to bundle I/O cable due to excessive length.

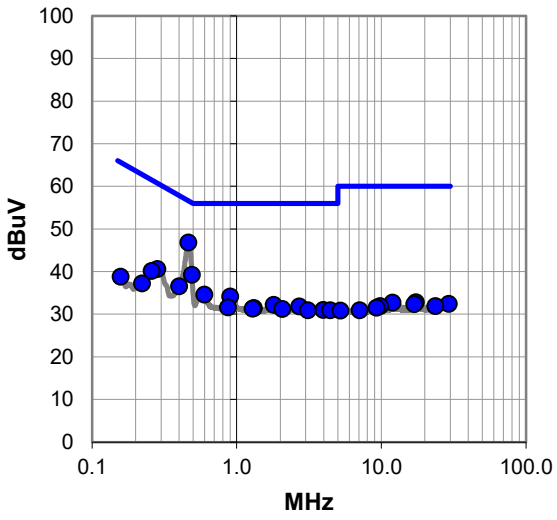
EUT OPERATING MODES

Transmitting 802.11a, 6 Mbps, Ch.157 = 5785, Ant. 1

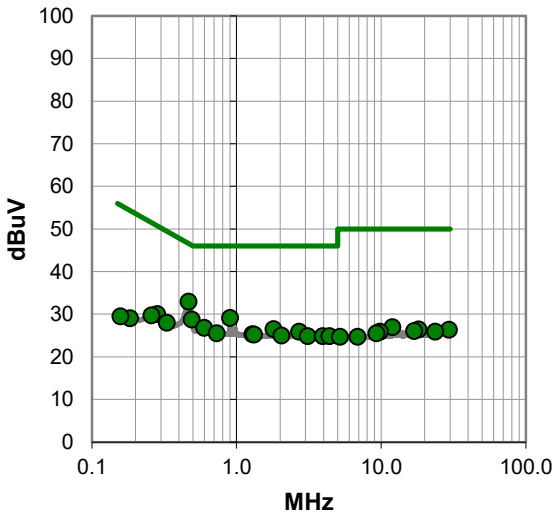
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #23

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.463	26.9	19.9	46.8	56.6	-9.8
0.490	19.3	19.9	39.2	56.2	-17.0
0.283	20.7	19.9	40.6	60.7	-20.1
0.400	16.6	19.9	36.5	57.8	-21.3
0.258	20.2	19.9	40.1	61.5	-21.4
0.597	14.7	19.9	34.6	56.0	-21.4
0.902	14.1	20.0	34.1	56.0	-21.9
1.802	12.2	20.0	32.2	56.0	-23.8
2.706	11.7	20.1	31.8	56.0	-24.2
0.870	11.7	19.9	31.6	56.0	-24.4
1.319	11.4	20.0	31.4	56.0	-24.6
1.288	11.3	20.0	31.3	56.0	-24.7
2.074	11.2	20.0	31.2	56.0	-24.8
3.971	10.7	20.3	31.0	56.0	-25.0
3.109	10.8	20.1	30.9	56.0	-25.1
4.441	10.6	20.3	30.9	56.0	-25.1
0.222	17.2	20.0	37.2	62.8	-25.6
0.158	18.7	20.1	38.8	65.6	-26.8
17.341	11.6	21.2	32.8	60.0	-27.2
12.002	12.0	20.7	32.7	60.0	-27.3
29.372	10.1	22.3	32.4	60.0	-27.6
16.913	11.1	21.2	32.3	60.0	-27.7
9.821	11.4	20.5	31.9	60.0	-28.1
23.637	10.3	21.6	31.9	60.0	-28.1
9.274	11.0	20.5	31.5	60.0	-28.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.466	13.0	19.9	32.9	46.6	-13.7
0.902	9.1	20.0	29.1	46.0	-16.9
0.490	8.8	19.9	28.7	46.2	-17.5
0.597	6.9	19.9	26.8	46.0	-19.2
1.804	6.5	20.0	26.5	46.0	-19.5
2.706	5.8	20.1	25.9	46.0	-20.1
0.728	5.6	19.9	25.5	46.0	-20.5
1.288	5.3	20.0	25.3	46.0	-20.7
0.283	10.1	19.9	30.0	50.7	-20.7
1.322	5.2	20.0	25.2	46.0	-20.8
2.045	5.0	20.0	25.0	46.0	-21.0
3.104	4.7	20.1	24.8	46.0	-21.2
3.949	4.5	20.3	24.8	46.0	-21.2
4.398	4.5	20.3	24.8	46.0	-21.2
0.330	8.1	19.9	28.0	49.5	-21.5
0.258	9.8	19.9	29.7	51.5	-21.8
12.002	6.2	20.7	26.9	50.0	-23.1
18.182	5.2	21.2	26.4	50.0	-23.6
29.444	4.0	22.3	26.3	50.0	-23.7
16.913	4.8	21.2	26.0	50.0	-24.0
9.821	5.4	20.5	25.9	50.0	-24.1
23.637	4.3	21.6	25.9	50.0	-24.1
9.274	5.0	20.5	25.5	50.0	-24.5
0.184	9.0	20.0	29.0	54.3	-25.3
5.207	4.4	20.3	24.7	50.0	-25.3

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-13
Customer:	IrriGreen, Inc.	Temperature:	22°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	24	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

Unable to bundle I/O cable due to excessive length.

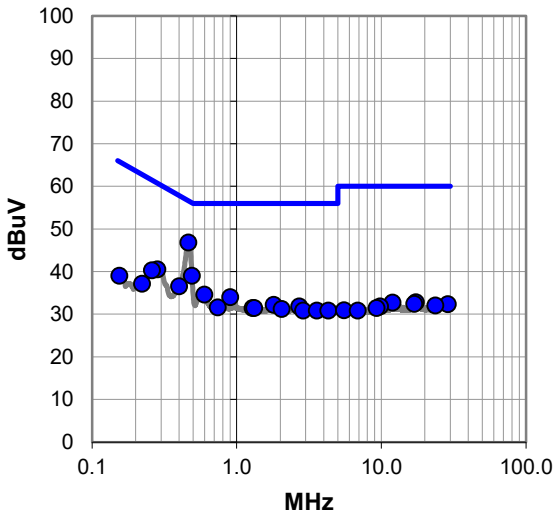
EUT OPERATING MODES

Transmitting 802.11a, 6 Mbps, Ch.40 = 5200, Ant. 1

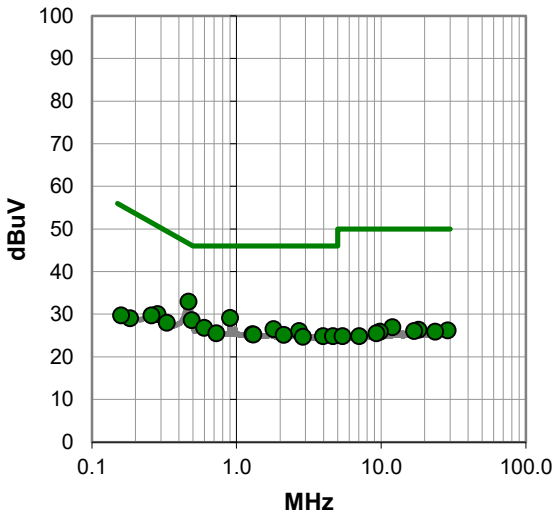
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #24

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.464	26.9	19.9	46.8	56.6	-9.8
0.490	19.1	19.9	39.0	56.2	-17.2
0.283	20.6	19.9	40.5	60.7	-20.2
0.260	20.4	19.9	40.3	61.4	-21.1
0.400	16.6	19.9	36.5	57.8	-21.3
0.597	14.7	19.9	34.6	56.0	-21.4
0.902	14.0	20.0	34.0	56.0	-22.0
1.802	12.2	20.0	32.2	56.0	-23.8
2.704	11.7	20.1	31.8	56.0	-24.2
0.740	11.7	19.9	31.6	56.0	-24.4
1.293	11.4	20.0	31.4	56.0	-24.6
1.320	11.4	20.0	31.4	56.0	-24.6
2.045	11.2	20.0	31.2	56.0	-24.8
2.887	10.7	20.1	30.8	56.0	-25.2
3.589	10.7	20.1	30.8	56.0	-25.2
4.303	10.5	20.3	30.8	56.0	-25.2
0.222	17.1	20.0	37.1	62.8	-25.7
0.155	18.9	20.1	39.0	65.8	-26.8
17.341	11.6	21.2	32.8	60.0	-27.2
12.004	12.0	20.7	32.7	60.0	-27.3
16.913	11.2	21.2	32.4	60.0	-27.6
28.937	10.0	22.3	32.3	60.0	-27.7
23.638	10.4	21.6	32.0	60.0	-28.0
9.822	11.3	20.5	31.8	60.0	-28.2
9.276	10.9	20.5	31.4	60.0	-28.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.466	13.0	19.9	32.9	46.6	-13.7
0.902	9.1	20.0	29.1	46.0	-16.9
0.490	8.7	19.9	28.6	46.2	-17.6
0.597	6.9	19.9	26.8	46.0	-19.2
1.804	6.5	20.0	26.5	46.0	-19.5
2.706	5.9	20.1	26.0	46.0	-20.0
0.727	5.6	19.9	25.5	46.0	-20.5
1.287	5.3	20.0	25.3	46.0	-20.7
0.284	10.1	19.9	30.0	50.7	-20.7
1.313	5.2	20.0	25.2	46.0	-20.8
2.124	5.0	20.1	25.1	46.0	-20.9
3.969	4.5	20.3	24.8	46.0	-21.2
4.653	4.5	20.3	24.8	46.0	-21.2
2.881	4.6	20.1	24.7	46.0	-21.3
0.330	8.1	19.9	28.0	49.5	-21.5
0.258	9.8	19.9	29.7	51.5	-21.8
12.004	6.2	20.7	26.9	50.0	-23.1
18.182	5.1	21.2	26.3	50.0	-23.7
28.927	3.9	22.3	26.2	50.0	-23.8
16.914	4.8	21.2	26.0	50.0	-24.0
9.821	5.4	20.5	25.9	50.0	-24.1
23.637	4.3	21.6	25.9	50.0	-24.1
9.276	5.0	20.5	25.5	50.0	-24.5
5.411	4.5	20.3	24.8	50.0	-25.2
7.042	4.4	20.4	24.8	50.0	-25.2

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-13
Customer:	IrriGreen, Inc.	Temperature:	22°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	25	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

Unable to bundle I/O cable due to excessive length.

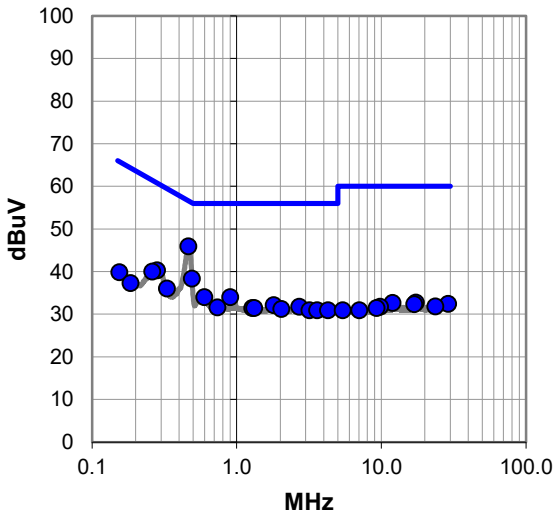
EUT OPERATING MODES

Transmitting 802.11a, 6 Mbps, Ch.40 = 5200, Ant. 1

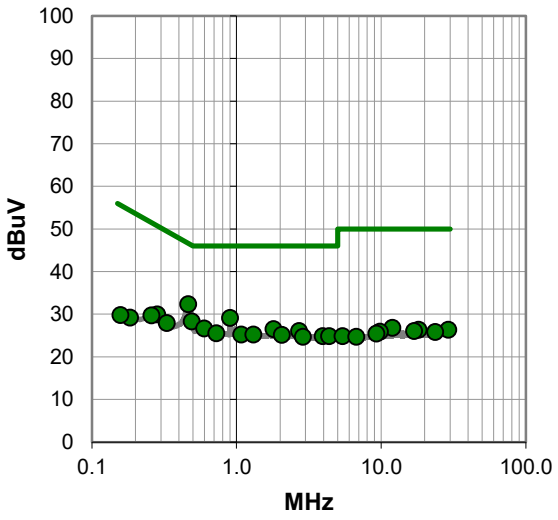
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #25

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.463	26.0	19.9	45.9	56.6	-10.7
0.490	18.4	19.9	38.3	56.2	-17.9
0.281	20.4	19.9	40.3	60.8	-20.5
0.261	20.1	19.9	40.0	61.4	-21.4
0.599	14.1	19.9	34.0	56.0	-22.0
0.902	14.0	20.0	34.0	56.0	-22.0
0.330	16.1	19.9	36.0	59.5	-23.5
1.802	12.1	20.0	32.1	56.0	-23.9
2.704	11.6	20.1	31.7	56.0	-24.3
0.737	11.7	19.9	31.6	56.0	-24.4
1.284	11.4	20.0	31.4	56.0	-24.6
1.322	11.4	20.0	31.4	56.0	-24.6
2.036	11.2	20.0	31.2	56.0	-24.8
3.194	10.8	20.1	30.9	56.0	-25.1
3.607	10.8	20.1	30.9	56.0	-25.1
4.276	10.6	20.3	30.9	56.0	-25.1
0.155	19.7	20.1	39.8	65.8	-26.0
0.185	17.3	20.0	37.3	64.3	-27.0
17.341	11.5	21.2	32.7	60.0	-27.3
12.002	11.9	20.7	32.6	60.0	-27.4
28.994	10.1	22.3	32.4	60.0	-27.6
16.913	11.1	21.2	32.3	60.0	-27.7
23.634	10.2	21.6	31.8	60.0	-28.2
9.819	11.2	20.5	31.7	60.0	-28.3
9.274	10.9	20.5	31.4	60.0	-28.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.464	12.4	19.9	32.3	46.6	-14.3
0.902	9.1	20.0	29.1	46.0	-16.9
0.490	8.4	19.9	28.3	46.2	-17.9
0.597	6.7	19.9	26.6	46.0	-19.4
1.804	6.5	20.0	26.5	46.0	-19.5
2.706	5.9	20.1	26.0	46.0	-20.0
0.727	5.6	19.9	25.5	46.0	-20.5
1.079	5.2	20.0	25.2	46.0	-20.8
1.313	5.2	20.0	25.2	46.0	-20.8
0.283	10.0	19.9	29.9	50.7	-20.8
2.065	5.1	20.0	25.1	46.0	-20.9
3.948	4.5	20.3	24.8	46.0	-21.2
4.370	4.5	20.3	24.8	46.0	-21.2
2.881	4.6	20.1	24.7	46.0	-21.3
0.330	8.0	19.9	27.9	49.5	-21.6
0.258	9.8	19.9	29.7	51.5	-21.8
12.002	6.1	20.7	26.8	50.0	-23.2
18.182	5.1	21.2	26.3	50.0	-23.7
29.200	4.0	22.3	26.3	50.0	-23.7
16.913	4.8	21.2	26.0	50.0	-24.0
9.821	5.4	20.5	25.9	50.0	-24.1
23.638	4.2	21.6	25.8	50.0	-24.2
9.274	4.9	20.5	25.4	50.0	-24.6
0.184	9.2	20.0	29.2	54.3	-25.1
5.411	4.5	20.3	24.8	50.0	-25.2

CONCLUSION

Pass

Tested By

FREQUENCY STABILITY – ANTENNA 2

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made at the edges of the main transmit bands as called out on the data sheets. Testing was done with an absence of modulation in a CW mode of operation.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

Where a ppm limit applies: ppm = (Measured Frequency / Measured Nominal Frequency - 1) * 1,000,000

Per the requirements of FCC 15.407:

“Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user’s manual.”

No specific limits are provided in either FCC 15.407, the product specific rule part, or FCC 2.1055, the equipment authorization procedure for testing frequency stability. While there are no limits called out, any results less than 100ppm will still allow the radio to be operating within the band.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAW	2024-02-14	2025-02-14
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2024-03-13	2025-03-13
Thermometer	Omegaette	HH311	DTY	2024-04-09	2025-04-09
Meter - Multimeter	Tektronix	DMM912	MMH	2024-04-16	2025-04-16
Transformer	Powerstat	236B	XFI	NCR	NCR
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-1-1-H/AC	TBI	NCR	NCR

FREQUENCY STABILITY – ANTENNA 2

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-20
Customer:	IrriGreen, Inc.	Temperature:	22.3°C
Attendees:	None	Relative Humidity:	48.9%
Customer Project:	None	Bar. Pressure (PMSL):	1018 mbar
Tested By:	Christopher Ladwig	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
Antenna 2, UNII-1, 20 MHz - Low Channel, 5180 MHz					
Voltage: 115%	5180.036579	5180.037227	-0.1	100	Pass
Voltage: 100%	5180.037227	5180.037227	0.0	100	Pass
Voltage: 85%	5180.036261	5180.037227	-0.2	100	Pass
Temperature: +50°	5180.019421	5180.037227	-3.4	100	Pass
Temperature: +40°	5180.023067	5180.037227	-2.7	100	Pass
Temperature: +30°	5180.033024	5180.037227	-0.8	100	Pass
Temperature: +20°	5180.045248	5180.037227	1.5	100	Pass
Temperature: +10°	5180.054297	5180.037227	3.3	100	Pass
Temperature: 0°	5180.060445	5180.037227	4.5	100	Pass
Temperature: -10°	5180.060193	5180.037227	4.4	100	Pass
Temperature: -20°	5180.049593	5180.037227	2.4	100	Pass
Temperature: -30°	5180.024619	5180.037227	-2.4	100	Pass
Antenna 2, UNII-3, 20 MHz BW - High Channel, 5825 MHz					
Voltage: 115%	5825.040345	5825.040615	0.0	100	Pass
Voltage: 100%	5825.040615	5825.040615	0.0	100	Pass
Voltage: 85%	5825.041095	5825.040615	0.1	100	Pass
Temperature: +50°	5825.022327	5825.040615	-3.1	100	Pass
Temperature: +40°	5825.026101	5825.040615	-2.5	100	Pass
Temperature: +30°	5825.037963	5825.040615	-0.5	100	Pass
Temperature: +20°	5825.051057	5825.040615	1.8	100	Pass
Temperature: +10°	5825.061867	5825.040615	3.6	100	Pass

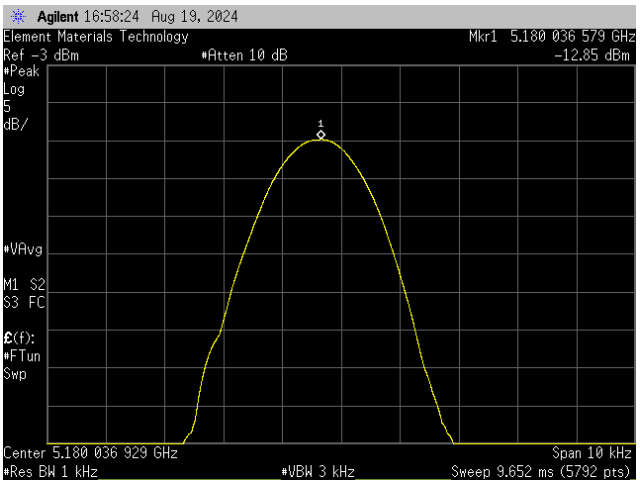
FREQUENCY STABILITY – ANTENNA 2

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

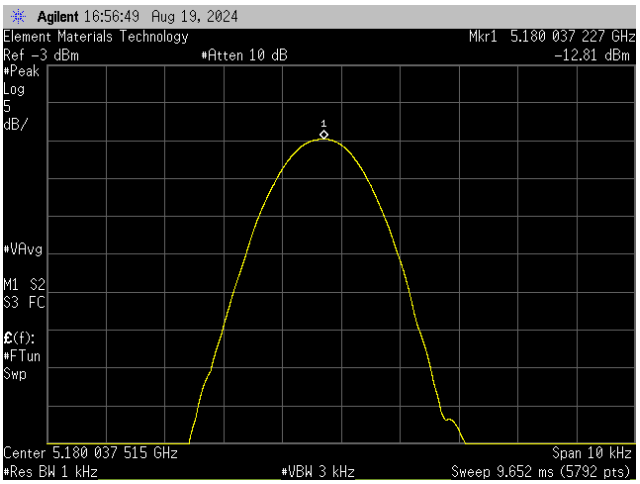
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
Temperature: 0°	5825.068905	5825.040615	4.9	100	Pass
Temperature: -10°	5825.068484	5825.040615	4.8	100	Pass
Temperature: -20°	5825.056452	5825.040615	2.7	100	Pass
Temperature: -30°	5825.031436	5825.040615	-1.6	100	Pass

FREQUENCY STABILITY – ANTENNA 2

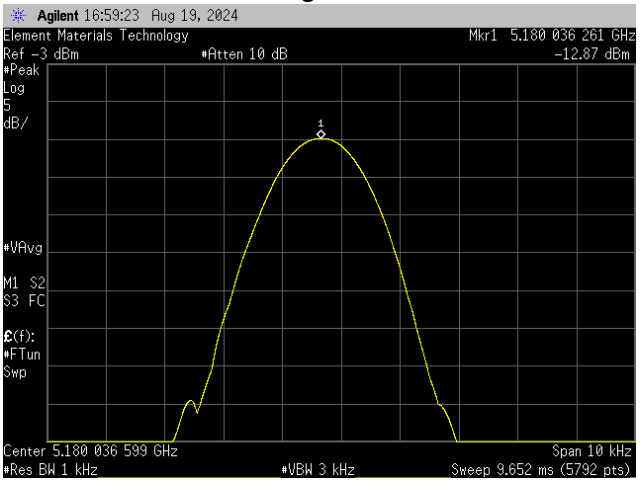
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



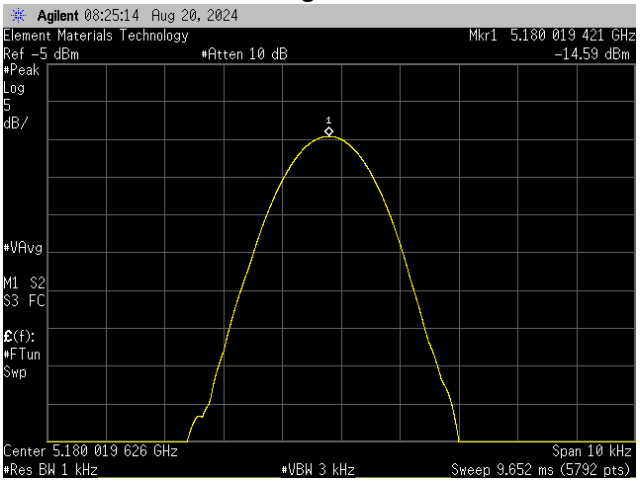
5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Voltage: 115%



5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Voltage: 100%



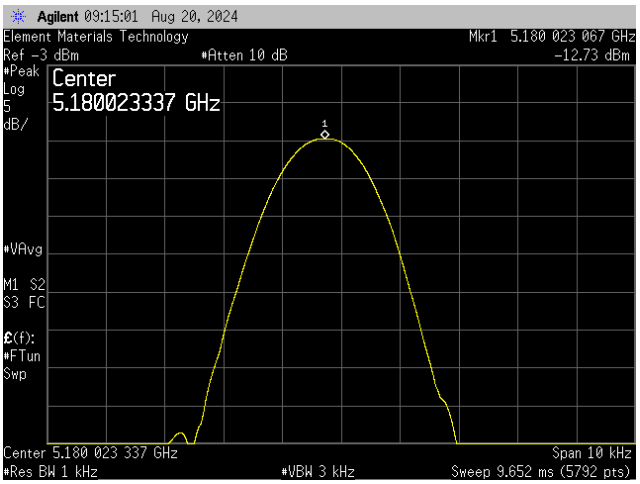
5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Voltage: 85%



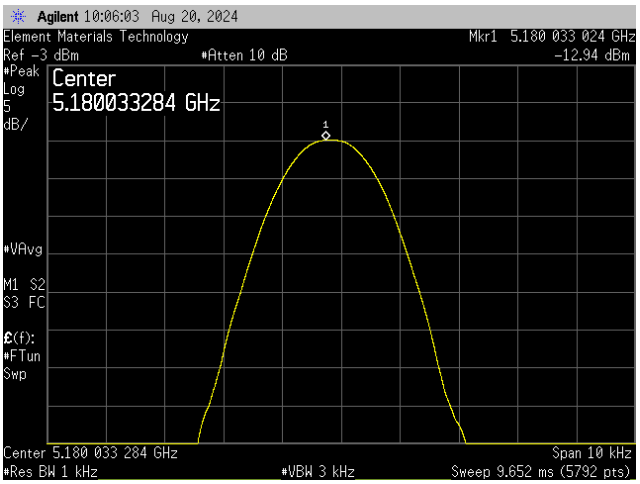
5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Temperature: +50°

FREQUENCY STABILITY – ANTENNA 2

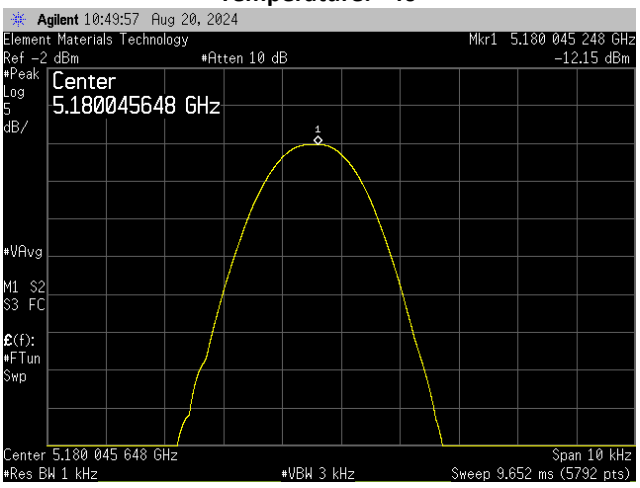
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



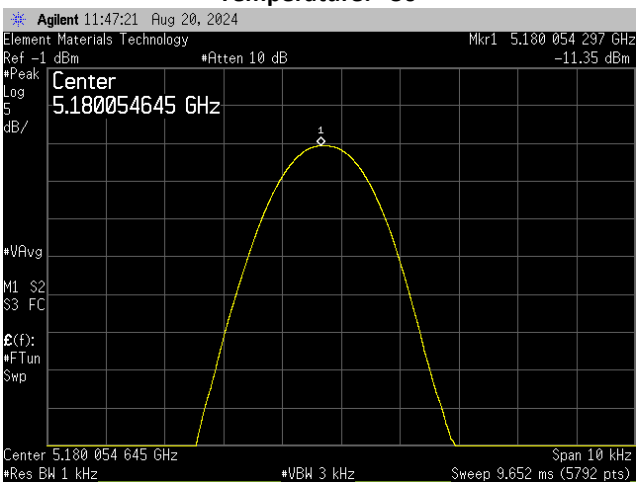
5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Temperature: +40°



5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Temperature: +30°



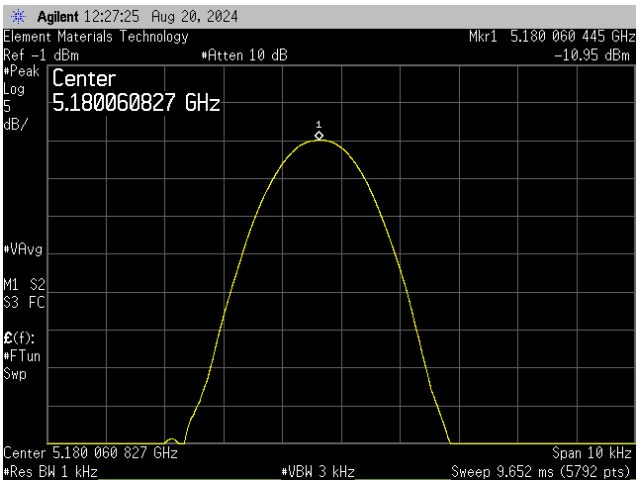
5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Temperature: +20°



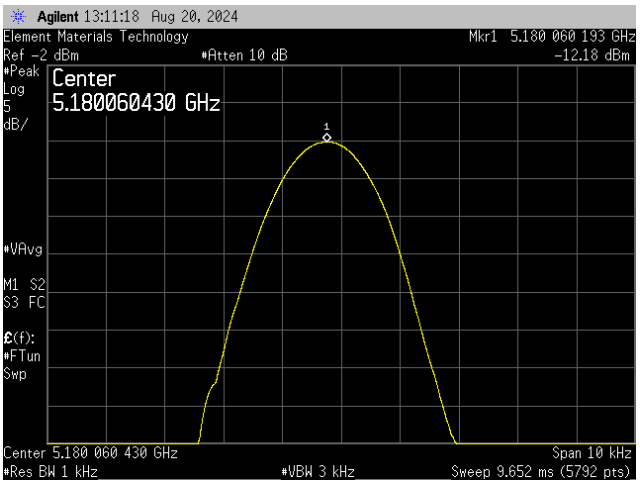
5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Temperature: +10°

FREQUENCY STABILITY – ANTENNA 2

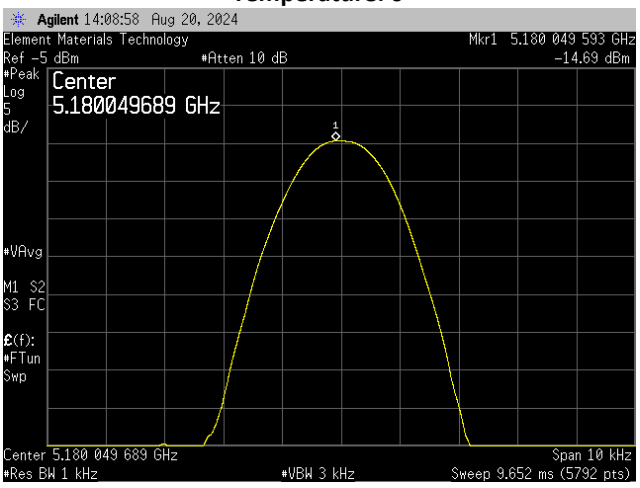
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



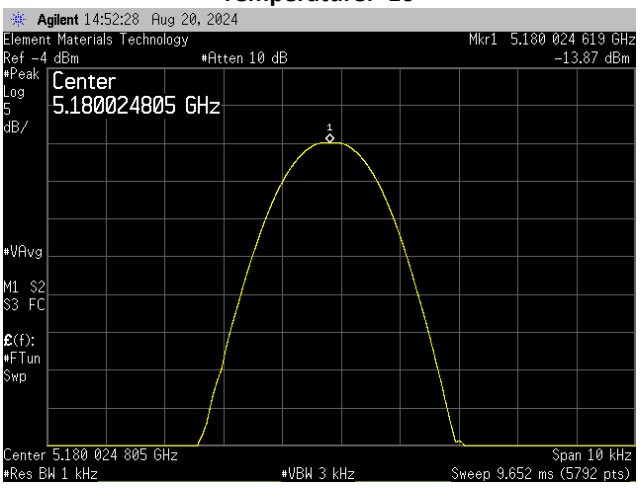
5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Temperature: 0°



5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Temperature: -10°



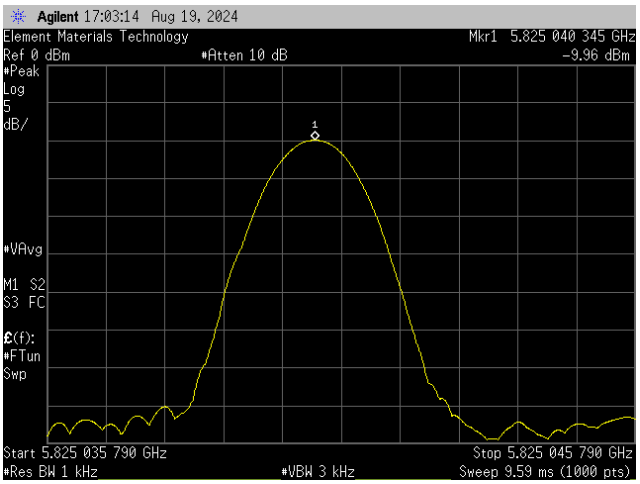
5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Temperature: -20°



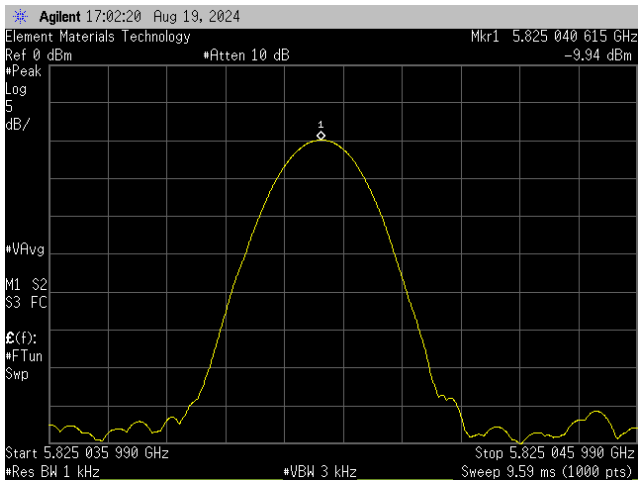
5150 MHz - 5250 MHz, UNII-1, 20 MHz - Low Channel, 5180 MHz
Temperature: -30°

FREQUENCY STABILITY – ANTENNA 2

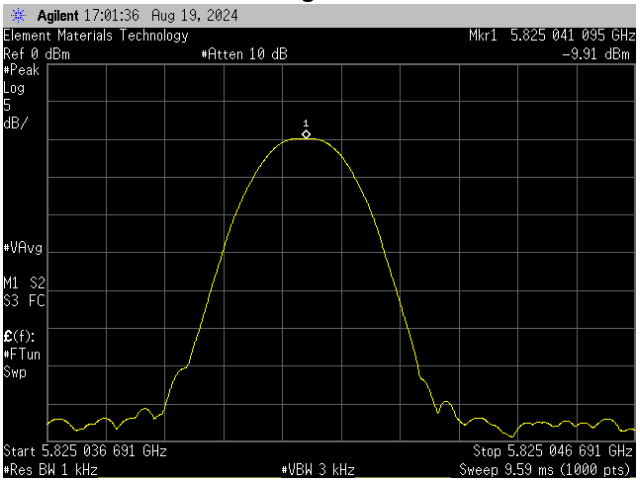
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



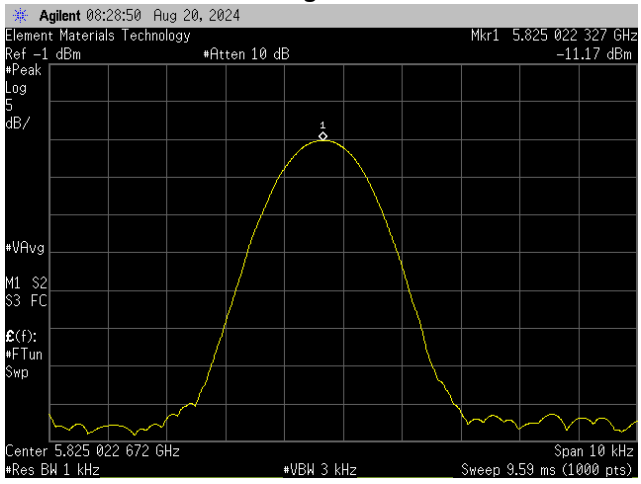
5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz
Voltage: 115%



5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz
Voltage: 100%



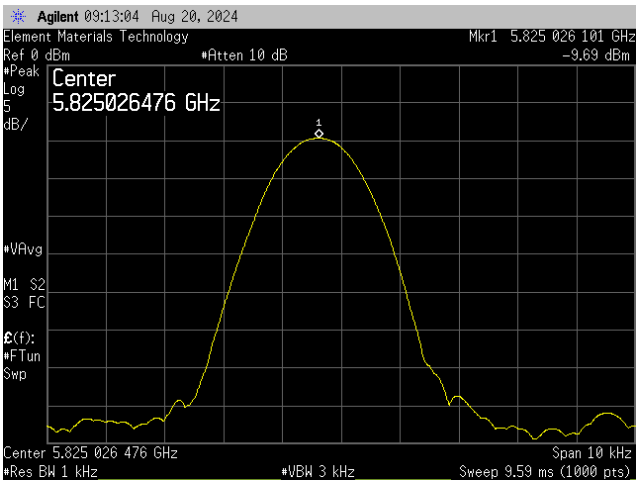
5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz
Voltage: 85%



5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz
Temperature: +50°

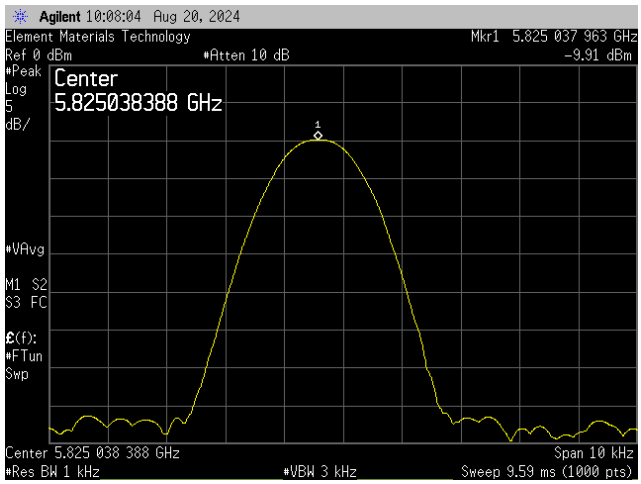
FREQUENCY STABILITY – ANTENNA 2

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



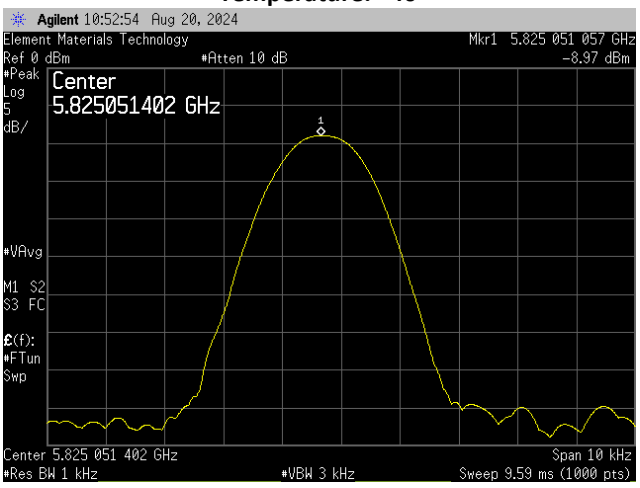
5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz

Temperature: +40°



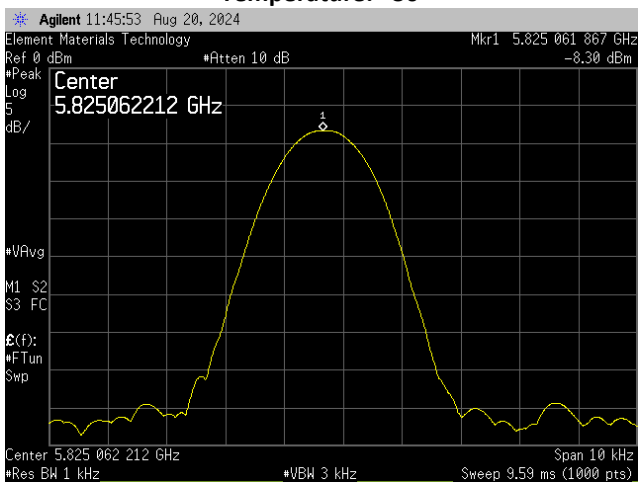
5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz

Temperature: +30°



5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz

Temperature: +20°

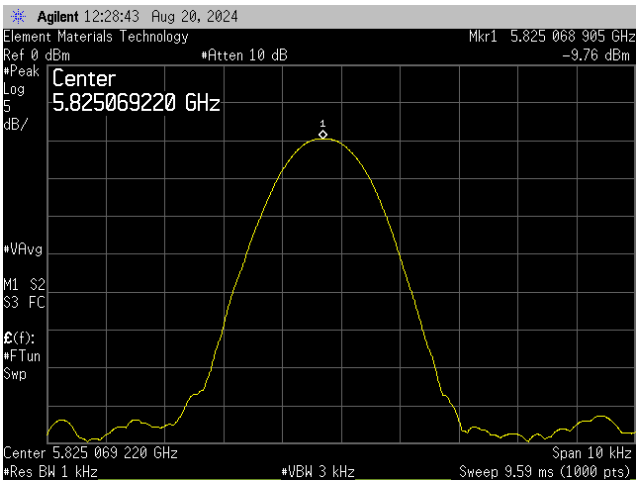


5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz

Temperature: +10°

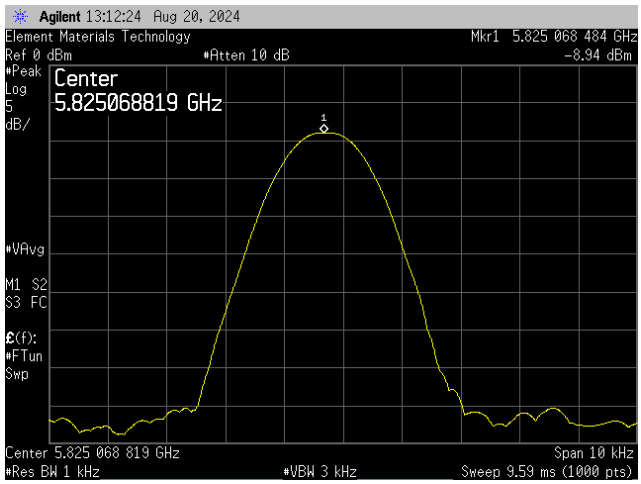
FREQUENCY STABILITY – ANTENNA 2

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



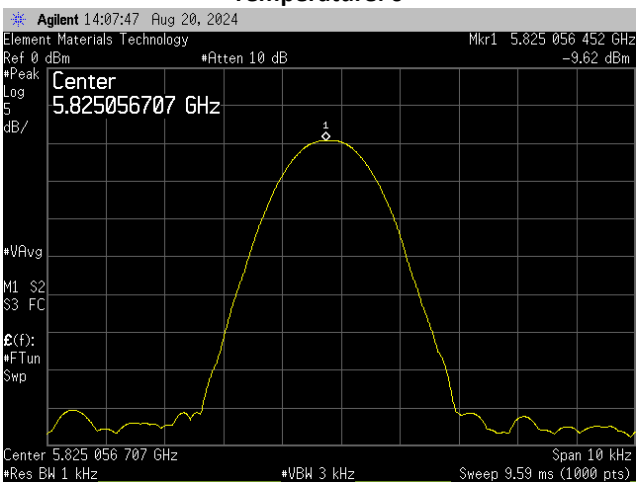
5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz

Temperature: 0°



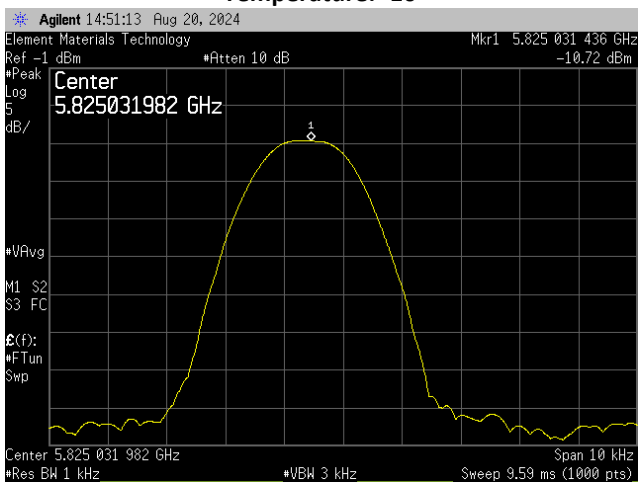
5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz

Temperature: -10°



5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz

Temperature: -20°



5725 MHz - 5850 MHz, UNII-3, 20 MHz BW - High Channel, 5825 MHz

Temperature: -30°

DUTY CYCLE – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

Per ANSI C63.10:2013, all measurements are to be performed with the EUT operating at 100% duty cycle at its maximum power level. In the event the EUT cannot be operated at 100% duty cycle, the transmission pulse duration (T) and Duty Cycle (x) are required to be measured for each of the EUT operating modes.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, a duty cycle correction factor in dB can be calculated to add to power measurements if required in the test method guidance using the following formula

10 * LOG (1/D) = dB

Where D is duty cycle of the radio transmissions

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Generator - Signal	Agilent	E8257D	TGX	2024-01-17	2026-01-17
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2024-03-13	2025-03-13

DUTY CYCLE – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-19
Customer:	IrriGreen, Inc.	Temperature:	21.6°C
Attendees:	None	Relative Humidity:	53.4%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

N/A

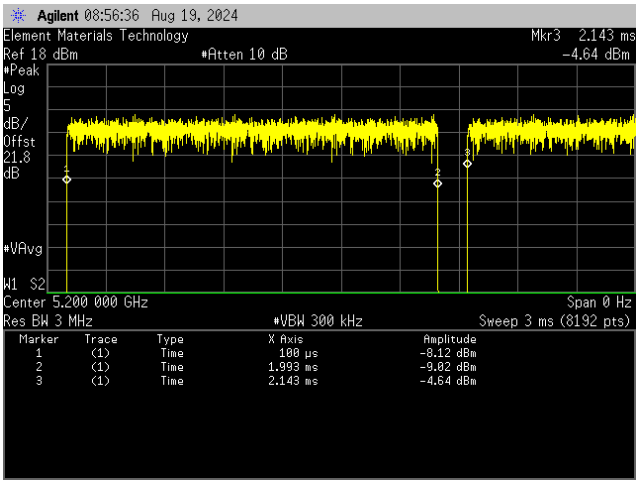
Tested By

TEST RESULTS

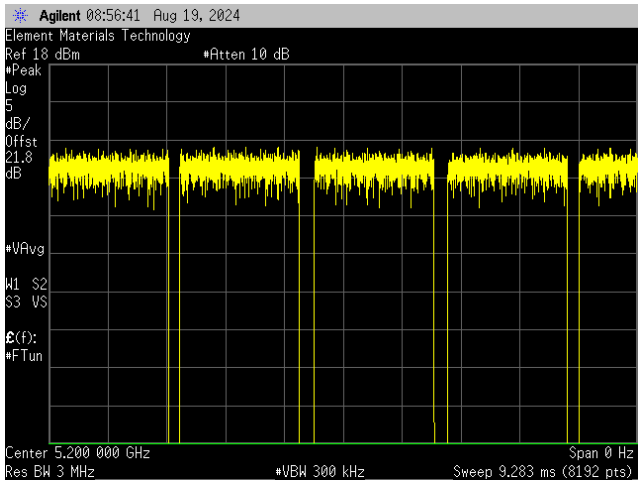
	Pulse Width	Period	Number of Pulses	Value (%)	Limit N/A (N/A)	Results
ANTENNA 1, UNII-1, 20 MHz 802.11(a) 6 Mbps						
Ch 40, Mid Channel 5200 MHz	1.893 ms N/A	2.043 ms N/A	1 5	92.6 N/A	N/A N/A	N/A N/A
ANTENNA 1, UNII-1, 20 MHz 802.11(a) 36 Mbps						
Ch 40, Mid Channel 5200 MHz	332.8 us N/A	780.6 us N/A	1 5	42.6 N/A	N/A N/A	N/A N/A
ANTENNA 1, UNII-1, 20 MHz 802.11(a) 54 Mbps						
Ch 40, Mid Channel 5200 MHz	228.3 us N/A	1.632 ms N/A	2 10	28.0 N/A	N/A N/A	N/A N/A
ANTENNA 1, UNII-1, 20 MHz 802.11(n) HT20 MCS0						
Ch 40, Mid Channel 5200 MHz	1.765 ms N/A	1.96 ms N/A	1 5	90 N/A	N/A N/A	N/A N/A
ANTENNA 1, UNII-1, 20 MHz 802.11(n) HT20 MCS7						
Ch 40, Mid Channel 5200 MHz	194.8 us N/A	1.593 ms N/A	2 10	24.5 N/A	N/A N/A	N/A N/A

DUTY CYCLE – ANTENNA 1 (UNII-1)

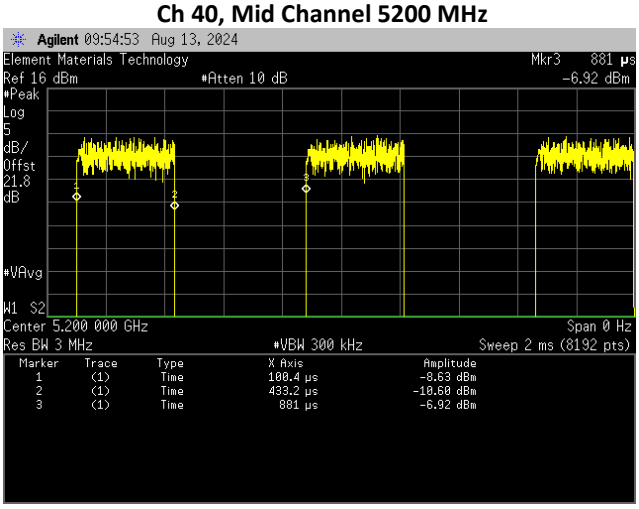
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



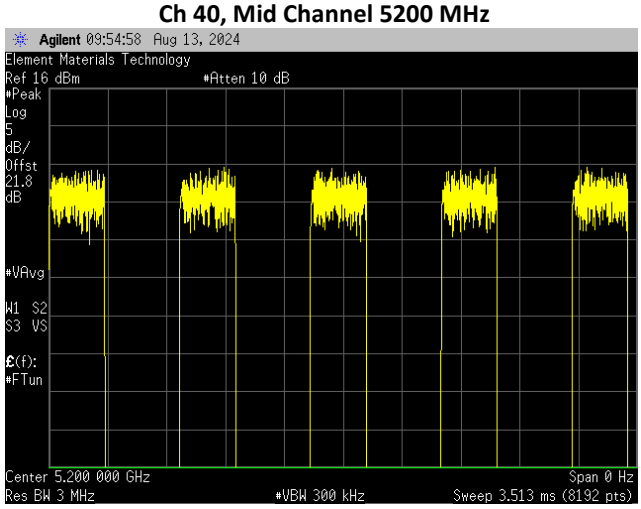
ANTENNA 1, UNII-1, 20 MHz
802.11(a) 6 Mbps
Ch 40, Mid Channel 5200 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(a) 6 Mbps
Ch 40, Mid Channel 5200 MHz



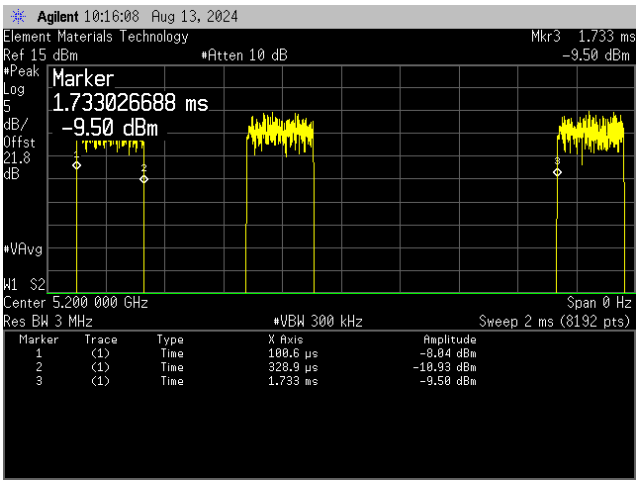
ANTENNA 1, UNII-1, 20 MHz
802.11(a) 36 Mbps
Ch 40, Mid Channel 5200 MHz



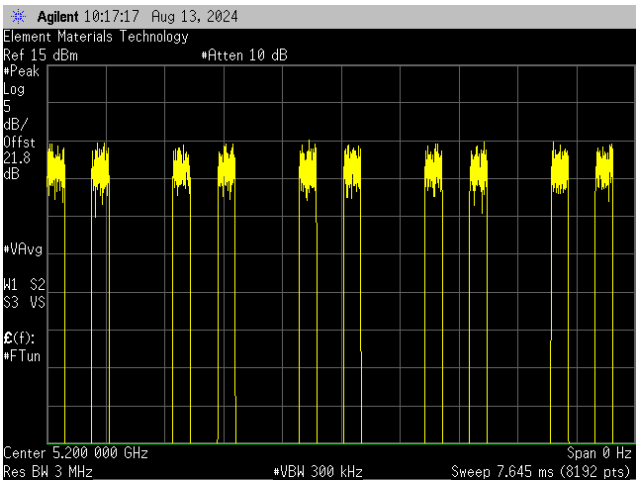
ANTENNA 1, UNII-1, 20 MHz
802.11(a) 36 Mbps
Ch 40, Mid Channel 5200 MHz

DUTY CYCLE – ANTENNA 1 (UNII-1)

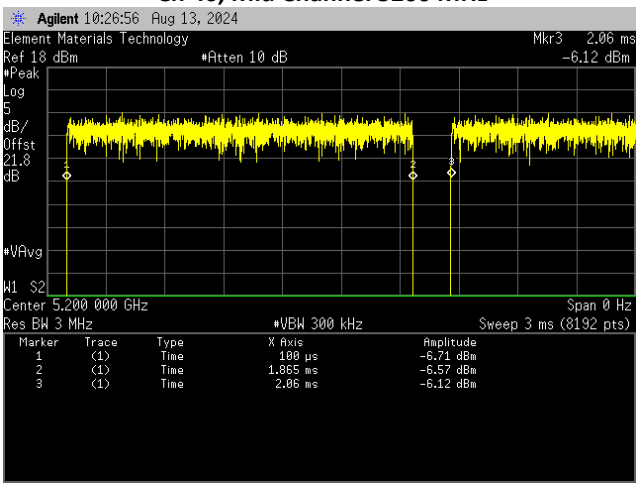
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



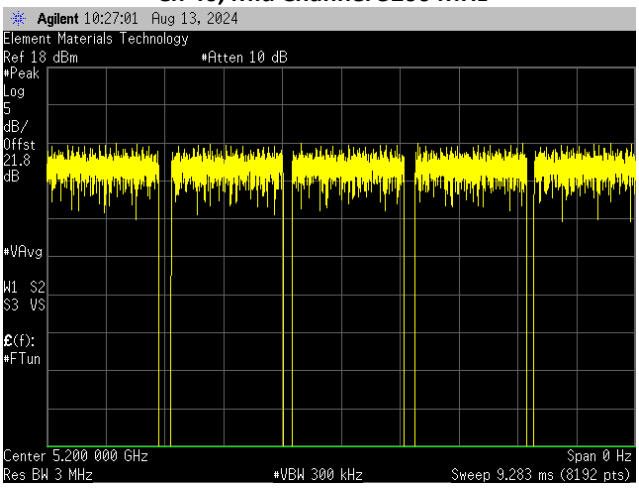
ANTENNA 1, UNII-1, 20 MHz
802.11(a) 54 Mbps
Ch 40, Mid Channel 5200 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(a) 54 Mbps
Ch 40, Mid Channel 5200 MHz



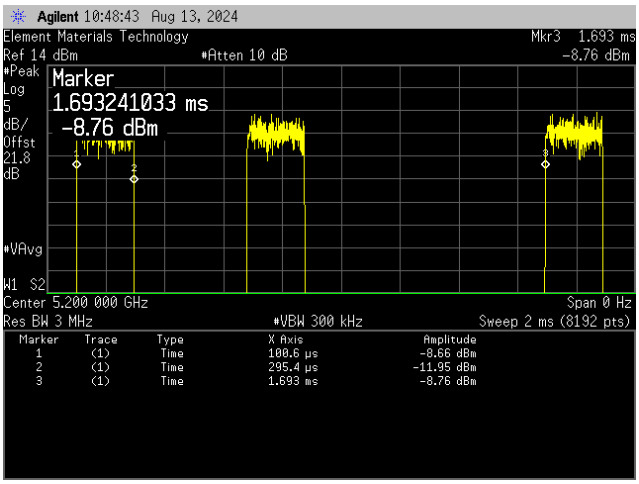
ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS0
Ch 40, Mid Channel 5200 MHz



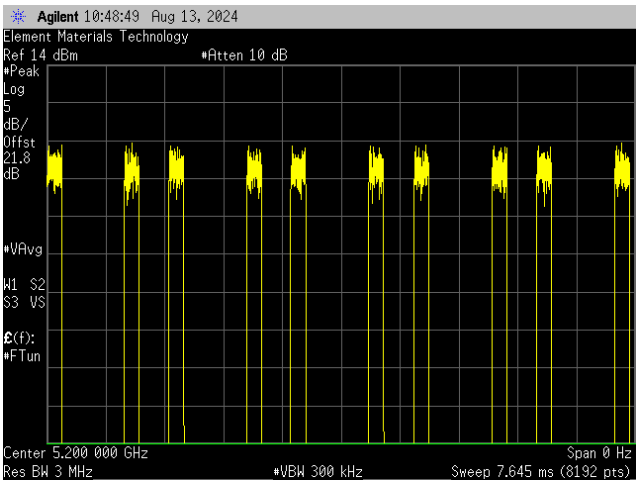
ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS0
Ch 40, Mid Channel 5200 MHz

DUTY CYCLE – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS7
Ch 40, Mid Channel 5200 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS7
Ch 40, Mid Channel 5200 MHz

DUTY CYCLE – ANTENNA 1 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

Per ANSI C63.10:2013, all measurements are to be performed with the EUT operating at 100% duty cycle at its maximum power level. In the event the EUT cannot be operated at 100% duty cycle, the transmission pulse duration (T) and Duty Cycle (x) are required to be measured for each of the EUT operating modes.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, a duty cycle correction factor in dB can be calculated to add to power measurements if required in the test method guidance using the following formula

10 * LOG (1/D) = dB

Where D is duty cycle of the radio transmissions

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Generator - Signal	Keysight	N5182B	TEU	2024-04-18	2027-04-18

DUTY CYCLE – ANTENNA 1 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-13
Customer:	IrriGreen, Inc.	Temperature:	21.6°C
Attendees:	None	Relative Humidity:	52.5%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

N/A

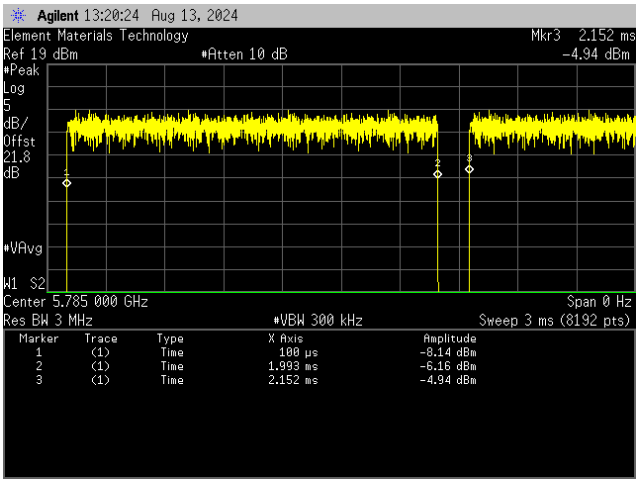
Tested By

TEST RESULTS

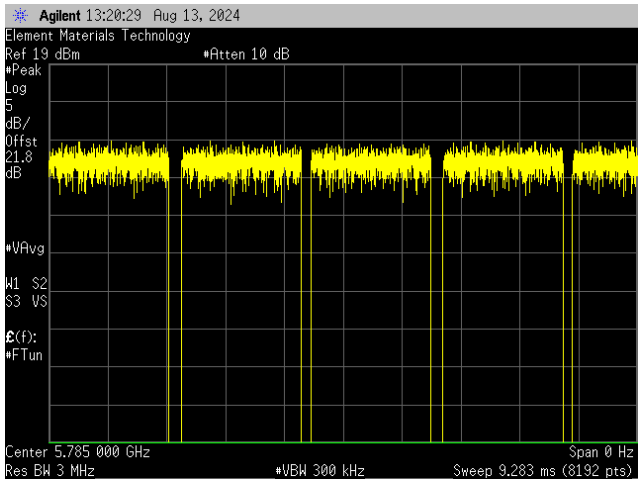
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
ANTENNA 1, UNII-3, 20 MHz BW						
802.11(a) 6 Mbps						
Ch 157, Mid Channel 5785 MHz	1.893 ms N/A	2.052 ms N/A	1 5	92.3 N/A	N/A N/A	N/A N/A
802.11(a) 36 Mbps						
Ch 157, Mid Channel 5785 MHz	332.5 us N/A	771.5 us N/A	1 5	43.1 N/A	N/A N/A	N/A N/A
802.11(a) 54 Mbps						
Ch 157, Mid Channel 5785 MHz	228.7 us N/A	1.633 ms N/A	2 10	28.0 N/A	N/A N/A	N/A N/A
802.11(n) HT20 MCS0						
Ch 157, Mid Channel 5785 MHz	1.765 ms N/A	1.915 ms N/A	1 5	92.2 N/A	N/A N/A	N/A N/A
802.11(n) HT20 MCS7						
Ch 157, Mid Channel 5785 MHz	195 us N/A	1.584 ms N/A	2 10	24.6 N/A	N/A N/A	N/A N/A

DUTY CYCLE – ANTENNA 1 (UNII-3)

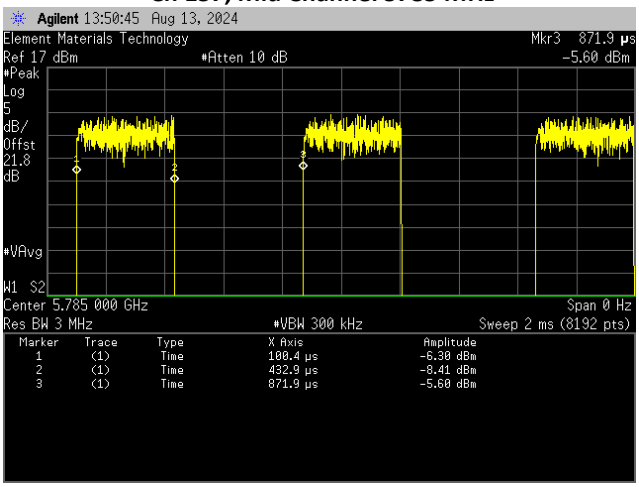
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



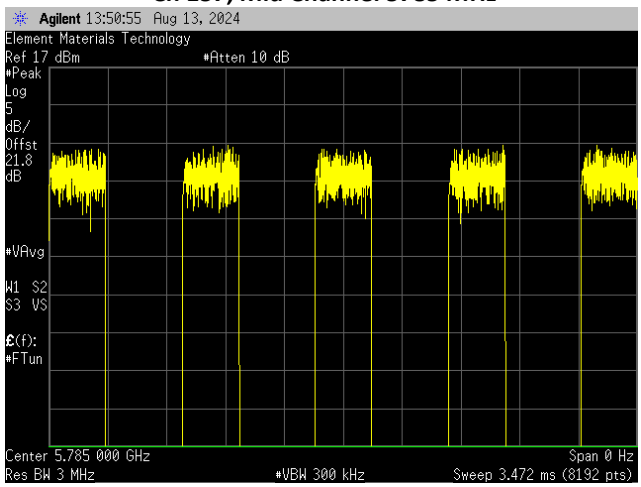
ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 6 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 6 Mbps
Ch 157, Mid Channel 5785 MHz



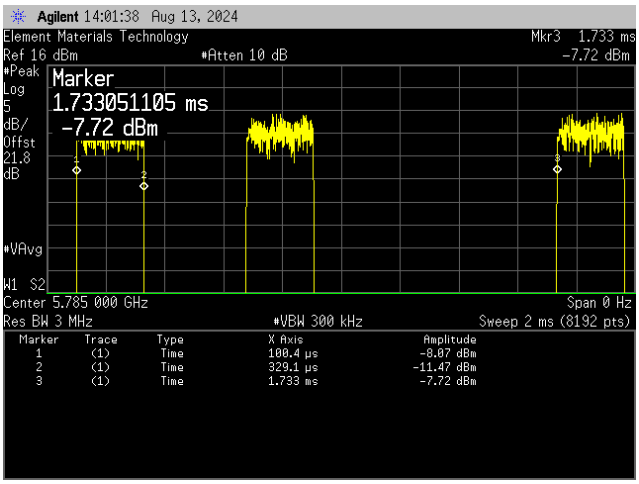
ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 36 Mbps
Ch 157, Mid Channel 5785 MHz



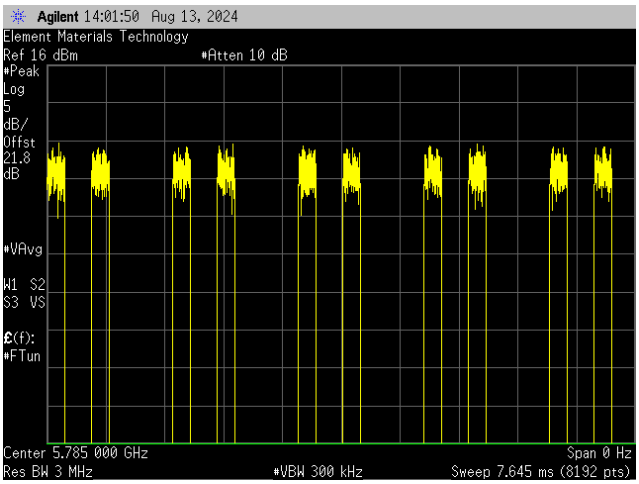
ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 36 Mbps
Ch 157, Mid Channel 5785 MHz

DUTY CYCLE – ANTENNA 1 (UNII-3)

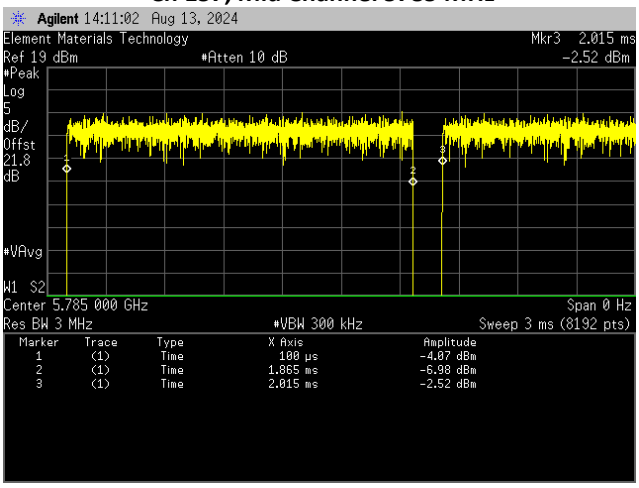
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



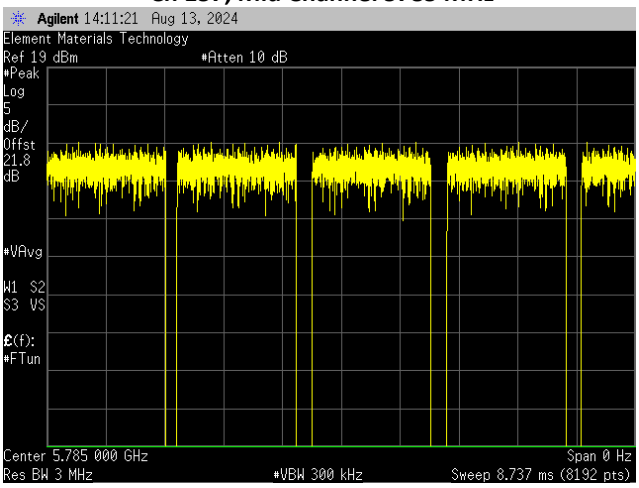
ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 54 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 54 Mbps
Ch 157, Mid Channel 5785 MHz



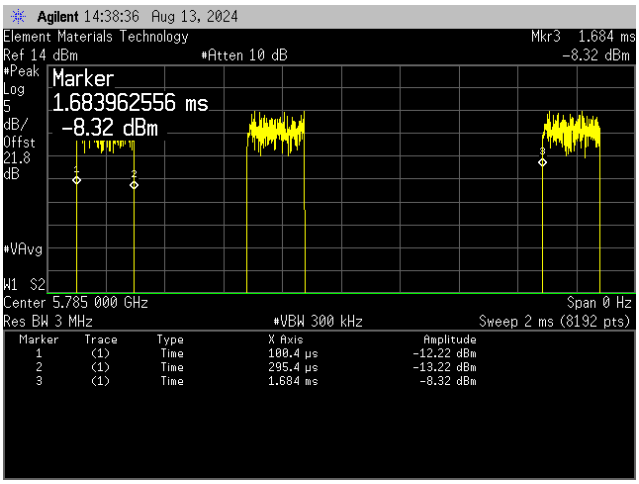
ANTENNA 1, UNII-3, 20 MHz BW
802.11(n) HT20 MCS0
Ch 157, Mid Channel 5785 MHz



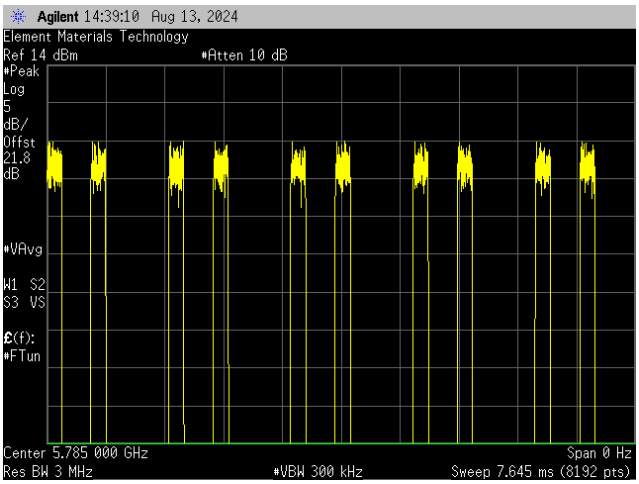
ANTENNA 1, UNII-3, 20 MHz BW
802.11(n) HT20 MCS0
Ch 157, Mid Channel 5785 MHz

DUTY CYCLE – ANTENNA 1 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



ANTENNA 1, UNII-3, 20 MHz BW
802.11(n) HT20 MCS7
Ch 157, Mid Channel 5785 MHz



ANTENNA 1, UNII-3, 20 MHz BW
802.11(n) HT20 MCS7
Ch 157, Mid Channel 5785 MHz

MAXIMUM CONDUCTED OUTPUT POWER – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

A duty cycle correction factor was added to the measurement using the results of the formula of 10*LOG(1/D) where D is the duty cycle.

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (24.0dBm). ISED does not have a conducted limit for this band.
- In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Generator - Signal	Agilent	E8257D	TGX	2024-01-17	2026-01-17
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2024-03-13	2025-03-13

MAXIMUM CONDUCTED OUTPUT POWER – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-13
Customer:	IrriGreen, Inc.	Temperature:	21.6°C
Attendees:	None	Relative Humidity:	53.5%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

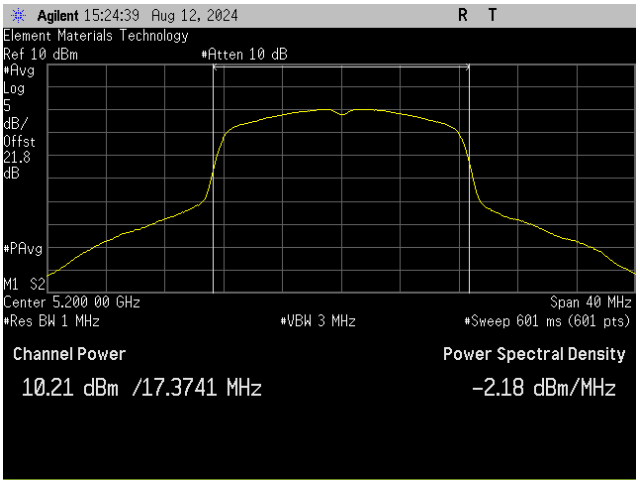
Pass

Tested By

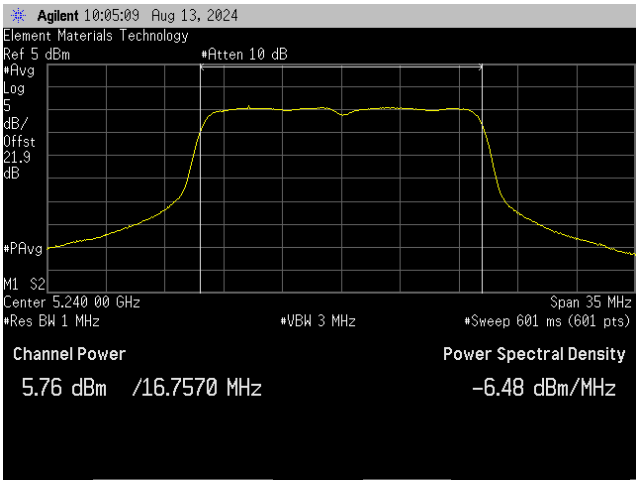
TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result
ANTENNA 1, UNII-1, 20 MHz 802.11(a) 6 Mbps					
Ch 36, Low Channel 5180 MHz	9.821	0.4	10.2	24	Pass
Ch 40, Mid Channel 5200 MHz	10.214	0.4	10.6	24	Pass
Ch 48, High Channel 5240 MHz	10.188	0.4	10.6	24	Pass
ANTENNA 1, UNII-1, 20 MHz 802.11(a) 36 Mbps					
Ch 36, Low Channel 5180 MHz	5.444	3.8	9.2	24	Pass
Ch 40, Mid Channel 5200 MHz	5.454	3.7	9.2	24	Pass
Ch 48, High Channel 5240 MHz	5.758	3.7	9.5	24	Pass
ANTENNA 1, UNII-1, 20 MHz 802.11(a) 54 Mbps					
Ch 36, Low Channel 5180 MHz	2.642	5.5	8.2	24	Pass
Ch 40, Mid Channel 5200 MHz	2.738	5.5	8.3	24	Pass
Ch 48, High Channel 5240 MHz	2.63	5.5	8.2	24	Pass
ANTENNA 1, UNII-1, 20 MHz 802.11(n) HT20 MCS0					
Ch 36, Low Channel 5180 MHz	9.522	0.3	9.8	24	Pass
Ch 40, Mid Channel 5200 MHz	10.021	0.5	10.5	24	Pass
Ch 48, High Channel 5240 MHz	9.854	0.4	10.3	24	Pass
ANTENNA 1, UNII-1, 20 MHz 802.11(n) HT20 MCS7					
Ch 36, Low Channel 5180 MHz	1.162	6.2	7.4	24	Pass
Ch 40, Mid Channel 5200 MHz	1.232	6.2	7.4	24	Pass
Ch 48, High Channel 5240 MHz	1.051	6.2	7.2	24	Pass

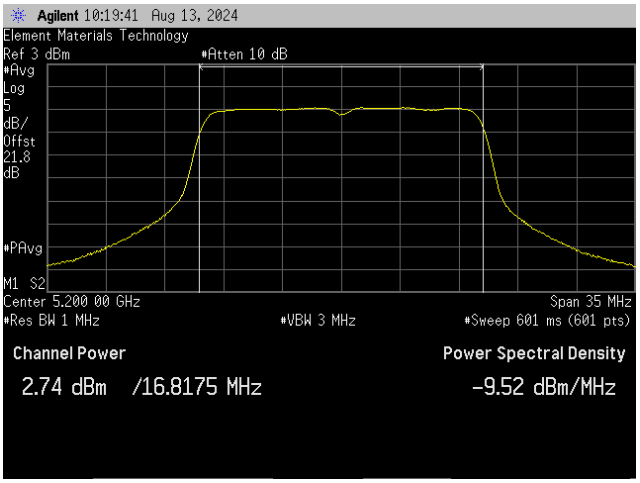
MAXIMUM CONDUCTED OUTPUT POWER – ANTENNA 1 (UNII-1)



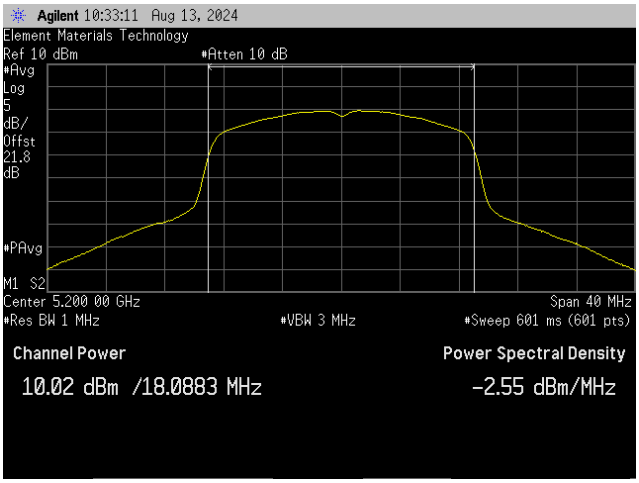
ANTENNA 1, UNII-1, 20 MHz
802.11(a) 6 Mbps
Ch 40, Mid Channel 5200 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(a) 36 Mbps
Ch 48, High Channel 5240 MHz

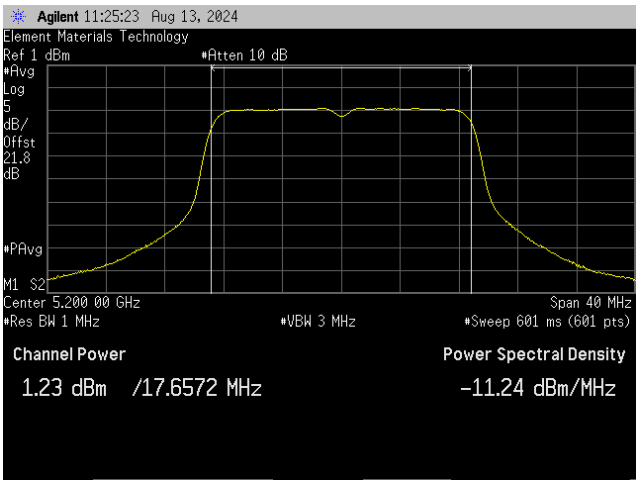


ANTENNA 1, UNII-1, 20 MHz
802.11(a) 54 Mbps
Ch 40, Mid Channel 5200 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS0
Ch 40, Mid Channel 5200 MHz

MAXIMUM CONDUCTED OUTPUT POWER – ANTENNA 1 (UNII-1)



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS7
Ch 40, Mid Channel 5200 MHz

MAXIMUM CONDUCTED OUTPUT POWER – ANTENNA 1 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

A duty cycle correction factor was added to the measurement using the results of the formula of 10*LOG(1/D) where D is the duty cycle.

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (24.0dBm). ISED does not have a conducted limit for this band.
- In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Generator - Signal	Keysight	N5182B	TEU	2024-04-18	2027-04-18

MAXIMUM CONDUCTED OUTPUT POWER – ANTENNA 1 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-13
Customer:	IrriGreen, Inc.	Temperature:	21.6°C
Attendees:	None	Relative Humidity:	52.6%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

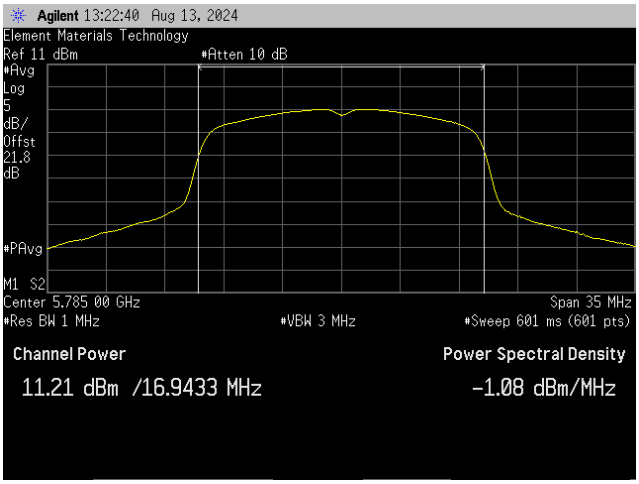
Pass

Tested By

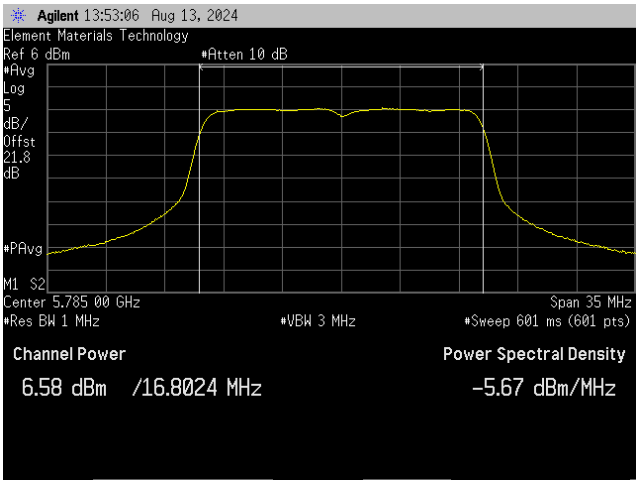
TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit ≤ (dBm)	Result
ANTENNA 1, UNII-3, 20 MHz BW					
802.11(a) 6 Mbps					
Ch 149, Low Channel 5745 MHz	10.55	0.4	11	30	Pass
Ch 157, Mid Channel 5785 MHz	11.215	0.3	11.5	30	Pass
Ch 165, High Channel 5825 MHz	9.861	0.3	10.2	30	Pass
802.11(a) 36 Mbps					
Ch 149, Low Channel 5745 MHz	5.891	3.8	9.7	30	Pass
Ch 157, Mid Channel 5785 MHz	6.582	3.7	10.3	30	Pass
Ch 165, High Channel 5825 MHz	6.245	3.7	9.9	30	Pass
802.11(a) 54 Mbps					
Ch 149, Low Channel 5745 MHz	2.717	5.6	8.3	30	Pass
Ch 157, Mid Channel 5785 MHz	3.393	5.6	9.0	30	Pass
Ch 165, High Channel 5825 MHz	3.072	5.6	8.7	30	Pass
802.11(n) HT20 MCS0					
Ch 149, Low Channel 5745 MHz	10.357	0.5	10.9	30	Pass
Ch 157, Mid Channel 5785 MHz	11.001	0.4	11.4	30	Pass
Ch 165, High Channel 5825 MHz	9.653	0.3	10	30	Pass
802.11(n) HT20 MCS7					
Ch 149, Low Channel 5745 MHz	1.109	6.1	7.2	30	Pass
Ch 157, Mid Channel 5785 MHz	1.734	6.1	7.8	30	Pass
Ch 165, High Channel 5825 MHz	1.571	6.1	7.7	30	Pass

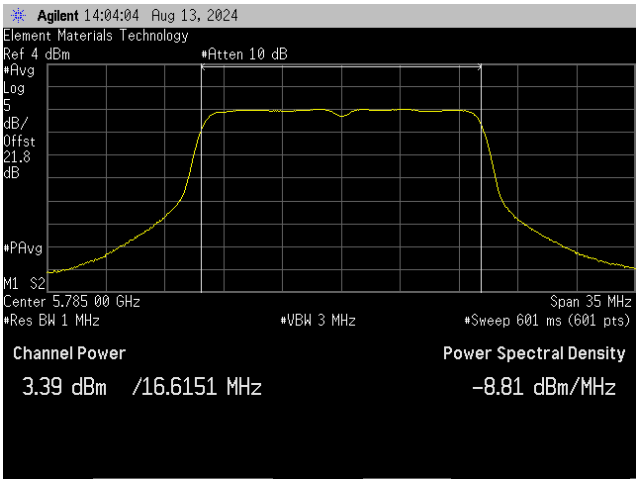
MAXIMUM CONDUCTED OUTPUT POWER – ANTENNA 1 (UNII-3)



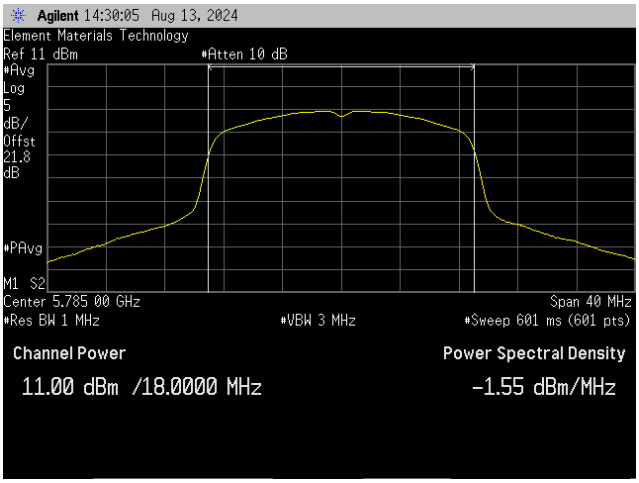
ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 6 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 36 Mbps
Ch 157, Mid Channel 5785 MHz

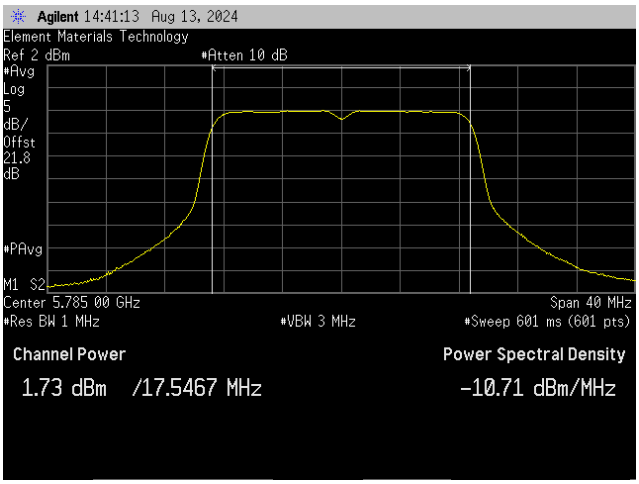


ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 54 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 1, UNII-3, 20 MHz BW
802.11(n) HT20 MCS0
Ch 157, Mid Channel 5785 MHz

MAXIMUM CONDUCTED OUTPUT POWER – ANTENNA 1 (UNII-3)



ANTENNA 1, UNII-3, 20 MHz BW
802.11(n) HT20 MCS7
Ch 157, Mid Channel 5785 MHz

MAXIMUM CONDUCTED OUTPUT POWER - ANTENNA 2 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

A duty cycle correction factor was added to the measurement using the results of the formula of 10*LOG(1/D) where D is the duty cycle.

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (24.0dBm). ISED does not have a conducted limit for this band.
- In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Generator - Signal	Keysight	N5182B	TEU	2024-04-18	2027-04-18

MAXIMUM CONDUCTED OUTPUT POWER - ANTENNA 2 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-16
Customer:	IrriGreen, Inc.	Temperature:	22.6°C
Attendees:	None	Relative Humidity:	50.8%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

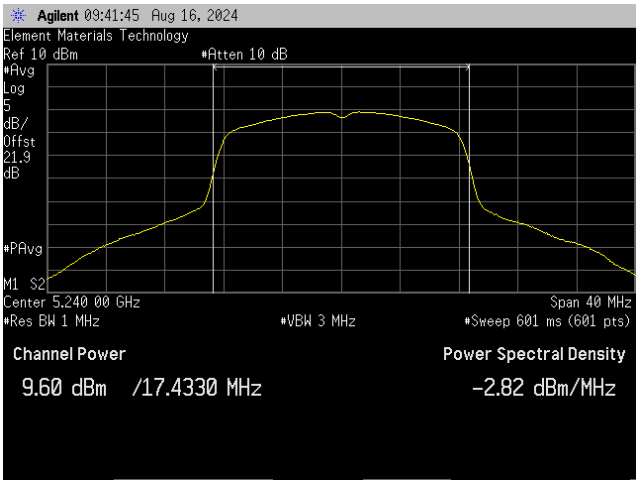
Tested By

TEST RESULTS

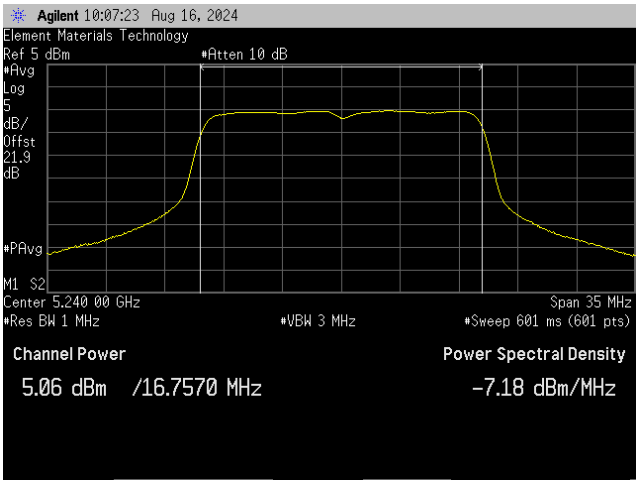
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result
ANTENNA 2, UNII-1, 20 MHz 802.11(a) 6 Mbps					
Ch 36, Low Channel 5180 MHz	9.262	0.3	9.6	24	Pass
Ch 40, Mid Channel 5200 MHz	9.47	0.3	9.8	24	Pass
Ch 48, High Channel 5240 MHz	9.596	0.3	9.9	24	Pass
ANTENNA 2, UNII-1, 20 MHz 802.11(a) 36 Mbps					
Ch 36, Low Channel 5180 MHz	4.592	3.7	8.3	24	Pass
Ch 40, Mid Channel 5200 MHz	4.754	3.7	8.5	24	Pass
Ch 48, High Channel 5240 MHz	5.057	3.7	8.8	24	Pass
ANTENNA 2, UNII-1, 20 MHz 802.11(a) 54 Mbps					
Ch 36, Low Channel 5180 MHz	1.33	5.5	6.8	24	Pass
Ch 40, Mid Channel 5200 MHz	1.716	5.5	7.2	24	Pass
Ch 48, High Channel 5240 MHz	1.939	5.5	7.4	24	Pass
ANTENNA 2, UNII-1, 20 MHz 802.11(n) HT20 MCS0					
Ch 36, Low Channel 5180 MHz	8.184	0.4	8.6	24	Pass
Ch 40, Mid Channel 5200 MHz	8.889	0.4	9.3	24	Pass
Ch 48, High Channel 5240 MHz	9.233	0.4	9.6	24	Pass
ANTENNA 2, UNII-1, 20 MHz 802.11(n) HT20 MCS7					
Ch 36, Low Channel 5180 MHz	-0.219	6.1	5.9	24	Pass
Ch 40, Mid Channel 5200 MHz	0.181	6.1	6.3	24	Pass
Ch 48, High Channel 5240 MHz	0.409	6.1	6.5	24	Pass

MAXIMUM CONDUCTED OUTPUT POWER - ANTENNA 2 (UNII-1)

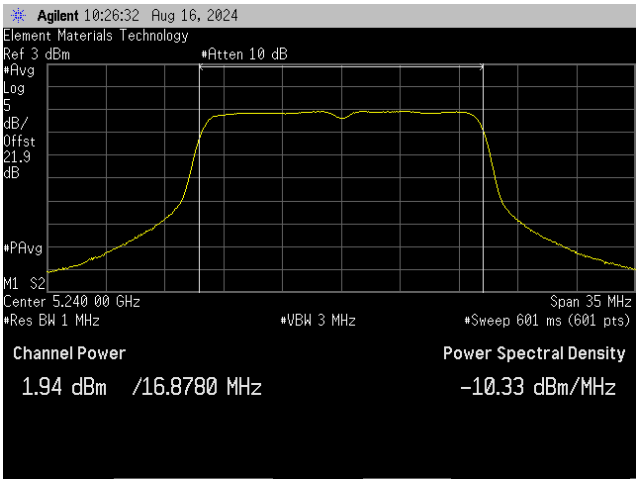
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



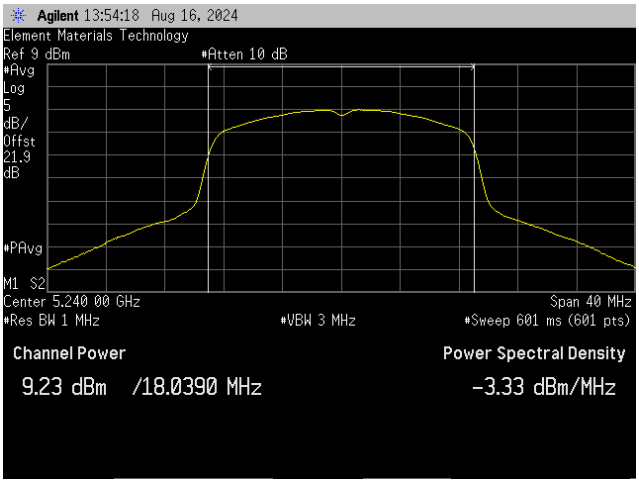
ANTENNA 2, UNII-1, 20 MHz
802.11(a) 6 Mbps
Ch 48, High Channel 5240 MHz



ANTENNA 2, UNII-1, 20 MHz
802.11(a) 36 Mbps
Ch 48, High Channel 5240 MHz



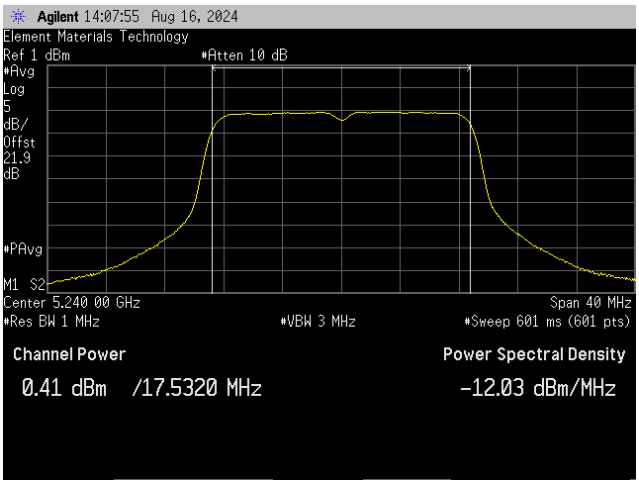
ANTENNA 2, UNII-1, 20 MHz
802.11(a) 54 Mbps
Ch 48, High Channel 5240 MHz



ANTENNA 2, UNII-1, 20 MHz
802.11(n) HT20 MCS0
Ch 48, High Channel 5240 MHz

MAXIMUM CONDUCTED OUTPUT POWER - ANTENNA 2 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



ANTENNA 2, UNII-1, 20 MHz
802.11(n) HT20 MCS7
Ch 48, High Channel 5240 MHz

MAXIMUM CONDUCTED OUTPUT POWER - ANTENNA 2 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

A duty cycle correction factor was added to the measurement using the results of the formula of 10*LOG(1/D) where D is the duty cycle.

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (24.0dBm).
- In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (24.0dBm) or 11 dBm + 10log10(B)
- In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Generator - Signal	Keysight	N5182B	TEU	2024-04-18	2027-04-18

MAXIMUM CONDUCTED OUTPUT POWER - ANTENNA 2 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-13
Customer:	IrriGreen, Inc.	Temperature:	22.7°C
Attendees:	None	Relative Humidity:	51.4%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

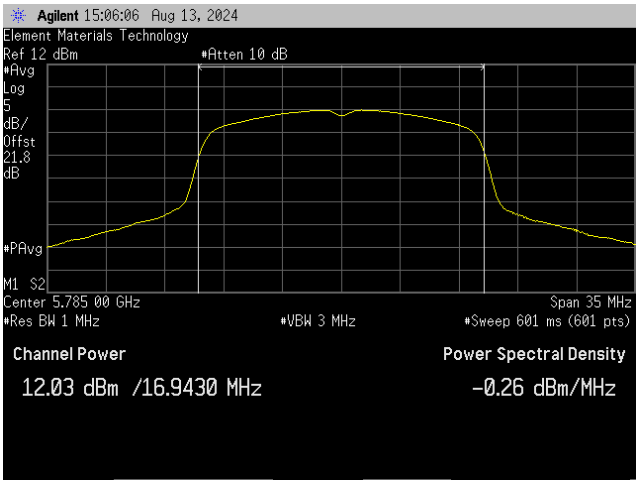
Tested By

TEST RESULTS

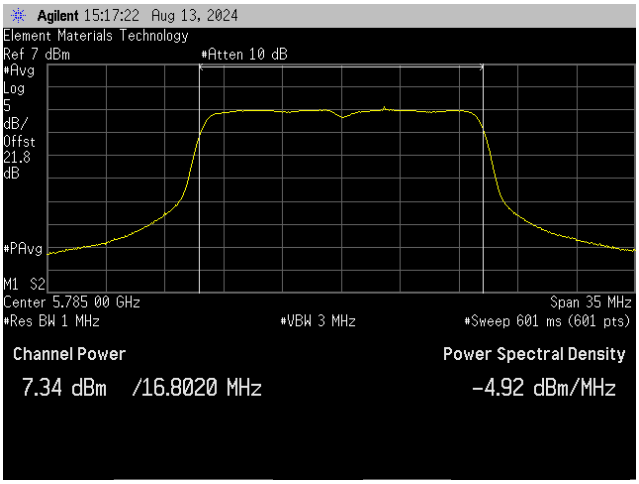
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit ≤ (dBm)	Result
ANTENNA 2, UNII-3, 20 MHz BW					
802.11(a) 6 Mbps					
Ch 149, Low Channel 5745 MHz	11.395	0.4	11.8	30	Pass
Ch 157, Mid Channel 5785 MHz	12.027	0.3	12.3	30	Pass
Ch 165, High Channel 5825 MHz	10.483	0.3	10.8	30	Pass
802.11(a) 36 Mbps					
Ch 149, Low Channel 5745 MHz	6.696	3.8	10.5	30	Pass
Ch 157, Mid Channel 5785 MHz	7.336	3.7	11	30	Pass
Ch 165, High Channel 5825 MHz	6.924	3.7	10.6	30	Pass
802.11(a) 54 Mbps					
Ch 149, Low Channel 5745 MHz	3.446	5.6	9	30	Pass
Ch 157, Mid Channel 5785 MHz	4.169	5.5	9.7	30	Pass
Ch 165, High Channel 5825 MHz	3.797	5.5	9.3	30	Pass
802.11(n) HT20 MCS0					
Ch 149, Low Channel 5745 MHz	11.095	0.5	11.6	30	Pass
Ch 157, Mid Channel 5785 MHz	11.791	0.4	12.2	30	Pass
Ch 165, High Channel 5825 MHz	10.303	0.3	10.6	30	Pass
802.11(n) HT20 MCS7					
Ch 149, Low Channel 5745 MHz	1.88	6.1	8	30	Pass
Ch 157, Mid Channel 5785 MHz	2.533	6.1	8.6	30	Pass
Ch 165, High Channel 5825 MHz	2.227	6.1	8.3	30	Pass

MAXIMUM CONDUCTED OUTPUT POWER - ANTENNA 2 (UNII-3)

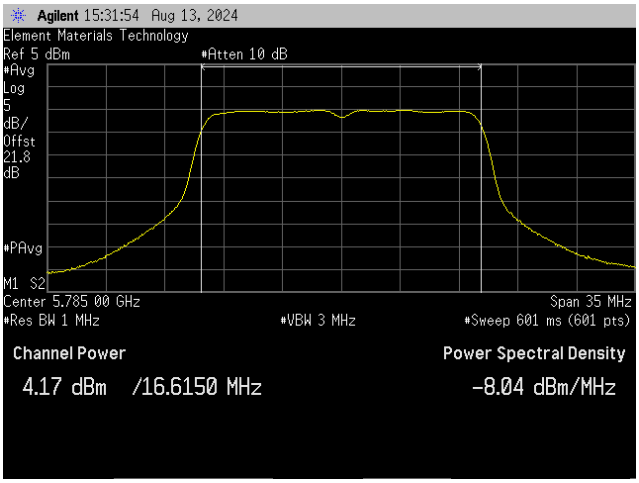
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



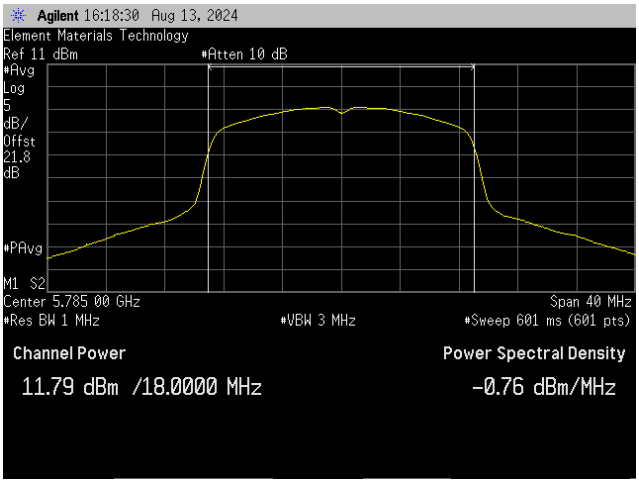
ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 6 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 36 Mbps
Ch 157, Mid Channel 5785 MHz

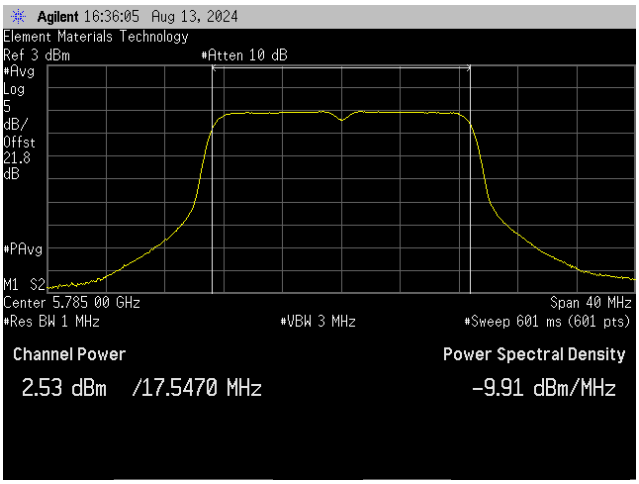


ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 54 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 2, UNII-3, 20 MHz BW
802.11(n) HT20 MCS0
Ch 157, Mid Channel 5785 MHz

MAXIMUM CONDUCTED OUTPUT POWER - ANTENNA 2 (UNII-3)



ANTENNA 2, UNII-3, 20 MHz BW
802.11(n) HT20 MCS7
Ch 157, Mid Channel 5785 MHz

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP) – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi).

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum e.i.r.p. shall not exceed 250 mW (24.0 dBm) + 6 dBi = 30 dBm EIRP
- In the 5.25 – 5.35GHz band, the maximum permissible e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B dBm EIRP.
- In the 5.47 – 5.725GHz band, the maximum permissible e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B, dBm EIRP.
- In the 5.725 – 5.850GHz band, the maximum permissible e.i.r.p. is 36 dBm EIRP.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Generator - Signal	Keysight	N5182B	TEU	2024-04-18	2027-04-18

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP) – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-16
Customer:	IrriGreen, Inc.	Temperature:	22.6°C
Attendees:	None	Relative Humidity:	51.1%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Measurements performed on the port that had the highest measured conducted output power.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
ANTENNA 1, UNII-1, 20 MHz 802.11(a) 6 Mbps							
Ch 36, Low Channel 5180 MHz	9.821	0.4	10.2	3.4	13.6	30	Pass
Ch 40, Mid Channel 5200 MHz	10.214	0.4	10.6	3.4	14.0	30	Pass
Ch 48, High Channel 5240 MHz	10.188	0.4	10.6	3.4	14.0	30	Pass
ANTENNA 1, UNII-1, 20 MHz 802.11(a) 36 Mbps							
Ch 36, Low Channel 5180 MHz	5.444	3.8	9.2	3.4	12.6	30	Pass
Ch 40, Mid Channel 5200 MHz	5.454	3.7	9.2	3.4	12.6	30	Pass
Ch 48, High Channel 5240 MHz	5.758	3.7	9.5	3.4	12.9	30	Pass
ANTENNA 1, UNII-1, 20 MHz 802.11(a) 54 Mbps							
Ch 36, Low Channel 5180 MHz	2.642	5.5	8.2	3.4	11.6	30	Pass
Ch 40, Mid Channel 5200 MHz	2.738	5.5	8.3	3.4	11.7	30	Pass
Ch 48, High Channel 5240 MHz	2.63	5.5	8.2	3.4	11.6	30	Pass
ANTENNA 1, UNII-1, 20 MHz 802.11(n) HT20 MCS0							
Ch 36, Low Channel 5180 MHz	9.522	0.3	9.8	3.4	13.2	30	Pass
Ch 40, Mid Channel 5200 MHz	10.021	0.5	10.5	3.4	13.9	30	Pass
Ch 48, High Channel 5240 MHz	9.854	0.4	10.3	3.4	13.7	30	Pass
ANTENNA 1, UNII-1, 20 MHz 802.11(n) HT20 MCS7							
Ch 36, Low Channel 5180 MHz	1.162	6.2	7.4	3.4	10.8	30	Pass
Ch 40, Mid Channel 5200 MHz	1.232	6.2	7.4	3.4	10.8	30	Pass
Ch 48, High Channel 5240 MHz	1.051	6.2	7.2	3.4	10.6	30	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP) - ANTENNA 2 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

Prior to measuring maximum transmit power; the 99% occupied bandwidth (OBW) and the duty cycle (D) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report.

The maximum conducted output power was measured using ANSI C63.10:2013, Clause 12.3.2.4, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor).

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RMS Detector
- Trace average 100 traces in power averaging mode.
- Power was integrated across “OBW”, by using the channel power function of the analyzer.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi).

The worst case (most stringent) limits are shown on the following datasheet based on the limits below where B is the bandwidth in terms of 99% for ISED and 26dB for the FCC.

- In the 5.15 – 5.25GHz band, the maximum e.i.r.p. shall not exceed 250 mW (24.0 dBm) + 6 dBi = 30 dBm EIRP
- In the 5.25 – 5.35GHz band, the maximum permissible e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B dBm EIRP.
- In the 5.47 – 5.725GHz band, the maximum permissible e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B, dBm EIRP.
- In the 5.725 – 5.850GHz band, the maximum permissible e.i.r.p. is 36 dBm EIRP.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Generator - Signal	Keysight	N5182B	TEU	2024-04-18	2027-04-18

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP) - ANTENNA 2 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-13
Customer:	IrriGreen, Inc.	Temperature:	22.3°C
Attendees:	None	Relative Humidity:	50.9%
Customer Project:	None	Bar. Pressure (PMSL):	1014 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
ANTENNA 2, UNII-3, 20 MHz BW							
802.11(a) 6 Mbps							
Ch 149, Low Channel 5745 MHz	11.395	0.4	11.8	4.1	15.9	36	Pass
Ch 157, Mid Channel 5785 MHz	12.027	0.3	12.3	4.1	16.4	36	Pass
Ch 165, High Channel 5825 MHz	10.483	0.3	10.8	4.1	14.9	36	Pass
802.11(a) 36 Mbps							
Ch 149, Low Channel 5745 MHz	6.696	3.8	10.5	4.1	14.6	36	Pass
Ch 157, Mid Channel 5785 MHz	7.336	3.7	11	4.1	15.1	36	Pass
Ch 165, High Channel 5825 MHz	6.924	3.7	10.6	4.1	14.7	36	Pass
802.11(a) 54 Mbps							
Ch 149, Low Channel 5745 MHz	3.446	5.6	9	4.1	13.1	36	Pass
Ch 157, Mid Channel 5785 MHz	4.169	5.5	9.7	4.1	13.8	36	Pass
Ch 165, High Channel 5825 MHz	3.797	5.5	9.3	4.1	13.4	36	Pass
802.11(n) HT20 MCS0							
Ch 149, Low Channel 5745 MHz	11.095	0.5	11.6	4.1	15.7	36	Pass
Ch 157, Mid Channel 5785 MHz	11.791	0.4	12.2	4.1	16.3	36	Pass
Ch 165, High Channel 5825 MHz	10.303	0.3	10.6	4.1	14.7	36	Pass
802.11(n) HT20 MCS7							
Ch 149, Low Channel 5745 MHz	1.88	6.1	8	4.1	12.1	36	Pass
Ch 157, Mid Channel 5785 MHz	2.533	6.1	8.6	4.1	12.7	36	Pass
Ch 165, High Channel 5825 MHz	2.227	6.1	8.3	4.1	12.4	36	Pass

EMISSION BANDWIDTH – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. The transmit power was set to its default maximum.

Per ANSI C63.10:2013, Clause 12.4, the spectrum analyzer settings were as follows:

- RBW = Approx. 1% of the emission bandwidth (B).
- VBW ≥ 3 x RBW
- Detector = Peak
- Trace mode = max hold

The spectrum analyzer occupied bandwidth measurement function was then used to measure the -26 dB bandwidth.

There is no required limit to be met in the rule part for this test. The purpose of the test is to both report the results as required and to utilize the emission bandwidth for setting the channel power integration bandwidth during conducted output power testing and determine the power limits.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Generator - Signal	Agilent	E8257D	TGX	2024-01-17	2026-01-17
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2024-03-13	2025-03-13

EMISSION BANDWIDTH – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-19
Customer:	IrriGreen, Inc.	Temperature:	22.6°C
Attendees:	None	Relative Humidity:	47.8%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mbar
Tested By:	Christopher Ladwig	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Measurement performed on the antenna port that had the highest conducted output power.
Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

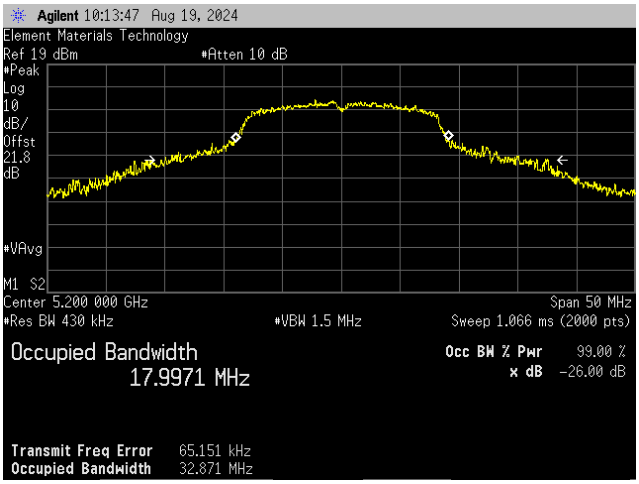
Tested By

TEST RESULTS

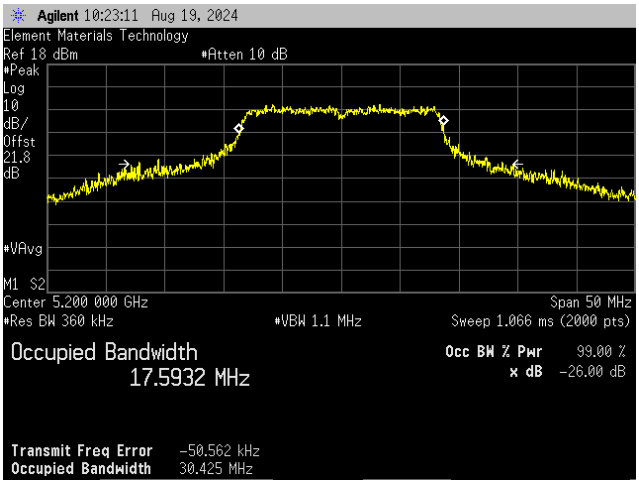
	Value	Limit	Result
ANTENNA 1, UNII-1, 20 MHz			
802.11(a) 6 Mbps			
Ch 36, Low Channel 5180 MHz	27.245 MHz	N/A	N/A
Ch 40, Mid Channel 5200 MHz	32.871 MHz	N/A	N/A
Ch 48, High Channel 5240 MHz	32.454 MHz	N/A	N/A
ANTENNA 1, UNII-1, 20 MHz			
802.11(a) 36 Mbps			
Ch 36, Low Channel 5180 MHz	29.336 MHz	N/A	N/A
Ch 40, Mid Channel 5200 MHz	30.425 MHz	N/A	N/A
Ch 48, High Channel 5240 MHz	25.233 MHz	N/A	N/A
ANTENNA 1, UNII-1, 20 MHz			
802.11(a) 54 Mbps			
Ch 36, Low Channel 5180 MHz	23.452 MHz	N/A	N/A
Ch 40, Mid Channel 5200 MHz	23.529 MHz	N/A	N/A
Ch 48, High Channel 5240 MHz	23.729 MHz	N/A	N/A
ANTENNA 1, UNII-1, 20 MHz			
802.11(n) HT20 MCS0			
Ch 36, Low Channel 5180 MHz	29.357 MHz	N/A	N/A
Ch 40, Mid Channel 5200 MHz	32.247 MHz	N/A	N/A
Ch 48, High Channel 5240 MHz	31.55 MHz	N/A	N/A
ANTENNA 1, UNII-1, 20 MHz			
802.11(n) HT20 MCS7			
Ch 36, Low Channel 5180 MHz	23.77 MHz	N/A	N/A
Ch 40, Mid Channel 5200 MHz	23.257 MHz	N/A	N/A
Ch 48, High Channel 5240 MHz	23.436 MHz	N/A	N/A

EMISSION BANDWIDTH – ANTENNA 1 (UNII-1)

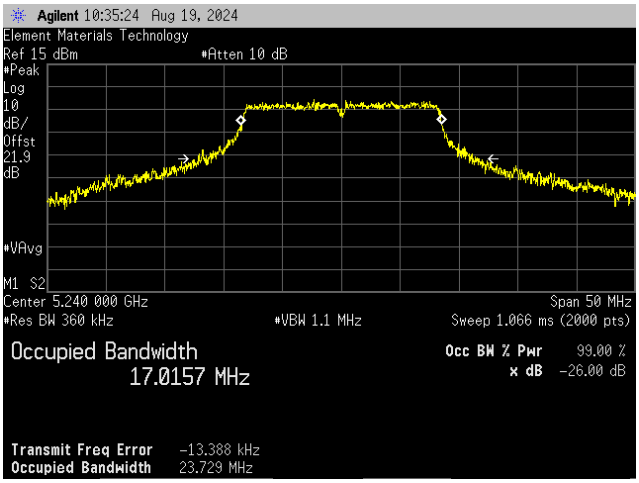
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



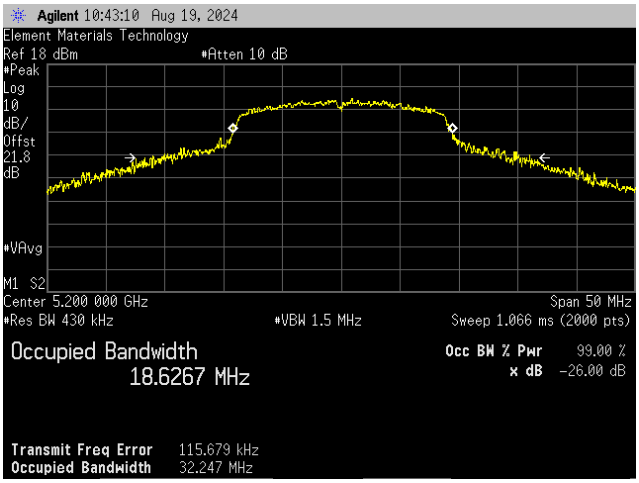
ANTENNA 1, UNII-1, 20 MHz
802.11(a) 6 Mbps
Ch 40, Mid Channel 5200 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(a) 36 Mbps
Ch 40, Mid Channel 5200 MHz

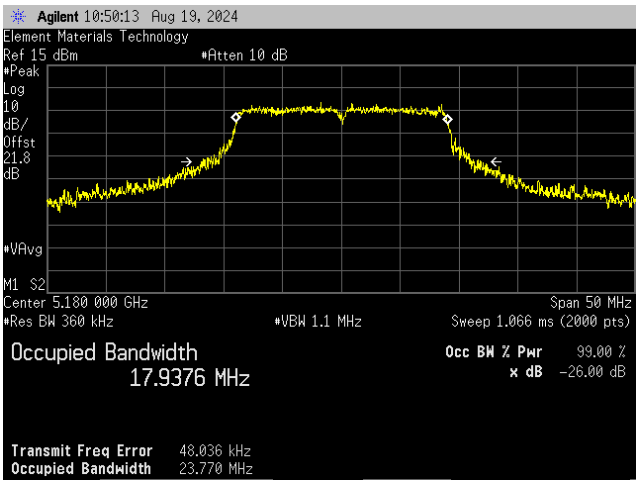


ANTENNA 1, UNII-1, 20 MHz
802.11(a) 54 Mbps
Ch 48, High Channel 5240 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS0
Ch 40, Mid Channel 5200 MHz

EMISSION BANDWIDTH – ANTENNA 1 (UNII-1)



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS7
Ch 36, Low Channel 5180 MHz

EMISSION BANDWIDTH – ANTENNA 2 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. The transmit power was set to its default maximum.

Per ANSI C63.10:2013, section 6.9.2 the spectrum analyzer settings were as follows:

- RBW = 100 kHz
- VBW ≥ 3x RBW
- Detector = Peak
- Trace mode = max hold

The spectrum analyzer occupied bandwidth measurement function was then used to measure the 6 dB emission bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Generator - Signal	Keysight	N5182B	TEU	2024-04-18	2027-04-18

EMISSION BANDWIDTH – ANTENNA 2 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-13
Customer:	IrriGreen, Inc.	Temperature:	22.5°C
Attendees:	None	Relative Humidity:	51.2%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Measurement performed on the port that had the highest conducted output power.
Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

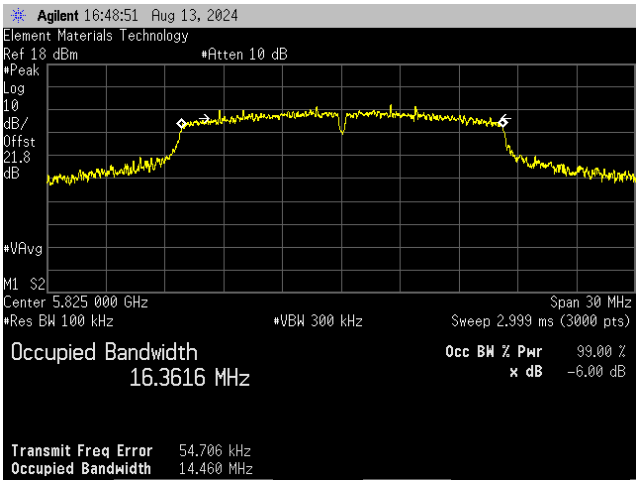
Pass

Tested By

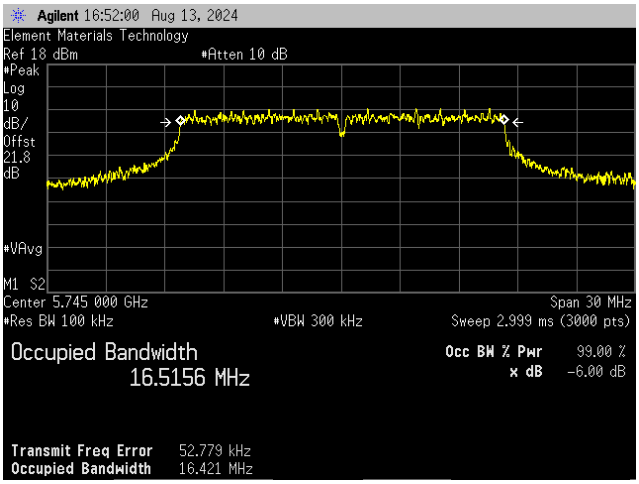
TEST RESULTS

	Value	Limit (>)	Result
ANTENNA 2, UNII-3, 20 MHz BW			
802.11(a) 6 Mbps			
Ch 149, Low Channel 5745 MHz	14.067 MHz	500 kHz	Pass
Ch 157, Mid Channel 5785 MHz	13.455 MHz	500 kHz	Pass
Ch 165, High Channel 5825 MHz	14.46 MHz	500 kHz	Pass
802.11(a) 36 Mbps			
Ch 149, Low Channel 5745 MHz	16.421 MHz	500 kHz	Pass
Ch 157, Mid Channel 5785 MHz	16.394 MHz	500 kHz	Pass
Ch 165, High Channel 5825 MHz	16.229 MHz	500 kHz	Pass
802.11(a) 54 Mbps			
Ch 149, Low Channel 5745 MHz	16.171 MHz	500 kHz	Pass
Ch 157, Mid Channel 5785 MHz	16.257 MHz	500 kHz	Pass
Ch 165, High Channel 5825 MHz	16.254 MHz	500 kHz	Pass
802.11(n) HT20 MCS0			
Ch 149, Low Channel 5745 MHz	13.49 MHz	500 kHz	Pass
Ch 157, Mid Channel 5785 MHz	13.28 MHz	500 kHz	Pass
Ch 165, High Channel 5825 MHz	13.282 MHz	500 kHz	Pass
802.11(n) HT20 MCS7			
Ch 149, Low Channel 5745 MHz	17.623 MHz	500 kHz	Pass
Ch 157, Mid Channel 5785 MHz	17.104 MHz	500 kHz	Pass
Ch 165, High Channel 5825 MHz	17.206 MHz	500 kHz	Pass

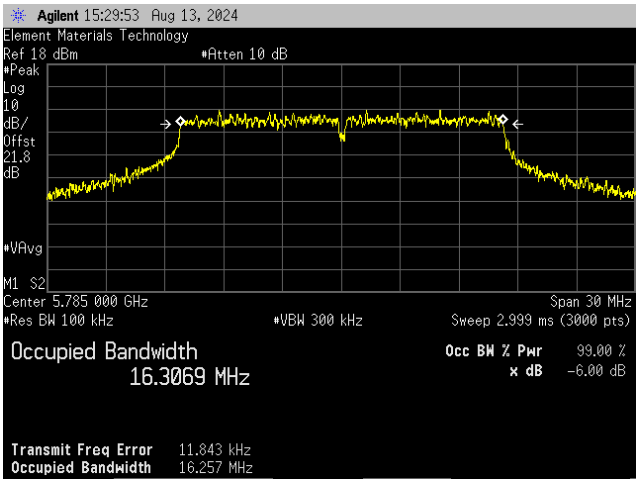
EMISSION BANDWIDTH – ANTENNA 2 (UNII-3)



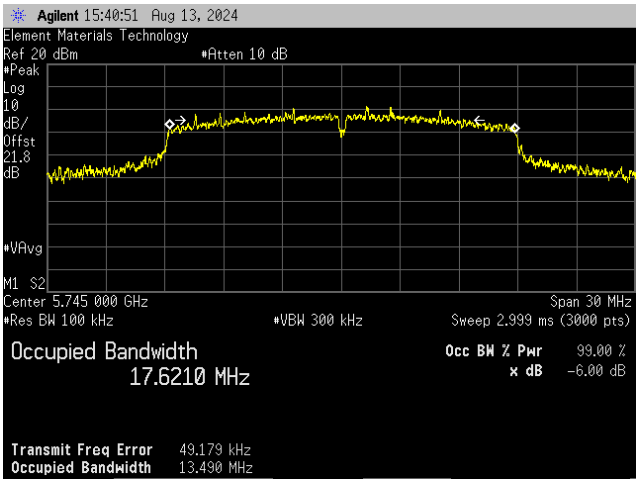
ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 6 Mbps
Ch 165, High Channel 5825 MHz



ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 36 Mbps
Ch 149, Low Channel 5745 MHz

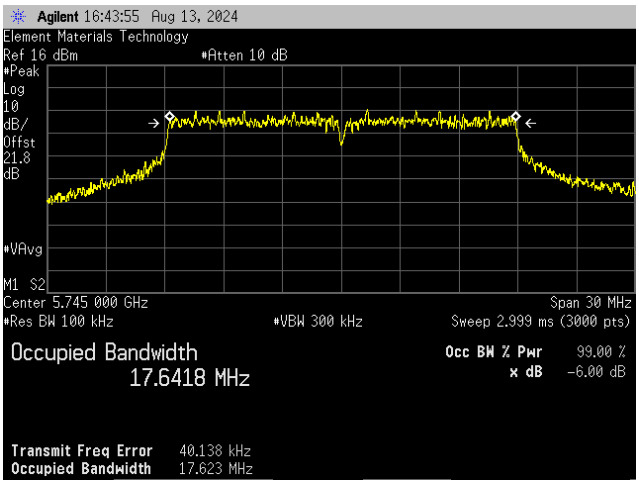


ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 54 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 2, UNII-3, 20 MHz BW
802.11(n) HT20 MCS0
Ch 149, Low Channel 5745 MHz

EMISSION BANDWIDTH – ANTENNA 2 (UNII-3)



ANTENNA 2, UNII-3, 20 MHz BW
802.11(n) HT20 MCS7
Ch 149, Low Channel 5745 MHz

OCCUPIED BANDWIDTH – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth as defined in RSS-Gen Clause 6.7. This value is also used to set the integration bandwidth for output power as allowed per ANSI C63.10 section 12.3.

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Generator - Signal	Agilent	E8257D	TGX	2024-01-17	2026-01-17
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2024-03-13	2025-03-13

OCCUPIED BANDWIDTH – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-13
Customer:	IrriGreen, Inc.	Temperature:	21.6°C
Attendees:	None	Relative Humidity:	53.5%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

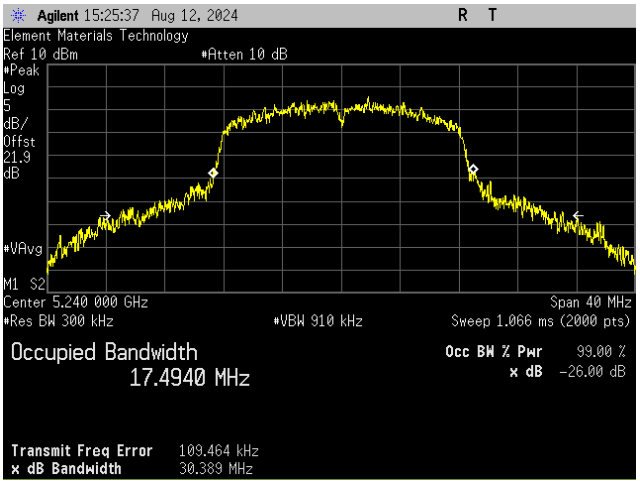
N/A

Tested By

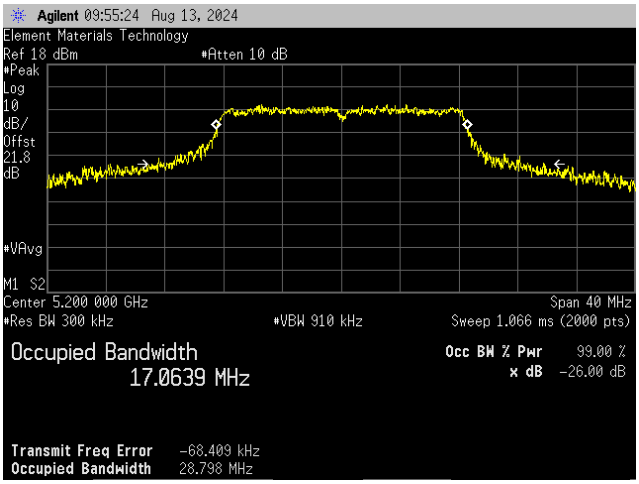
TEST RESULTS

		Value	Limit	Result
ANTENNA 1, UNII-1, 20 MHz				
802.11(a) 6 Mbps				
	Ch 36, Low Channel 5180 MHz	17.228 MHz	N/A	N/A
	Ch 40, Mid Channel 5200 MHz	17.374 MHz	N/A	N/A
	Ch 48, High Channel 5240 MHz	17.433 MHz	N/A	N/A
802.11(a) 36 Mbps				
	Ch 36, Low Channel 5180 MHz	16.908 MHz	N/A	N/A
	Ch 40, Mid Channel 5200 MHz	17.064 MHz	N/A	N/A
	Ch 48, High Channel 5240 MHz	16.757 MHz	N/A	N/A
802.11(a) 54 Mbps				
	Ch 36, Low Channel 5180 MHz	16.34 MHz	N/A	N/A
	Ch 40, Mid Channel 5200 MHz	16.818 MHz	N/A	N/A
	Ch 48, High Channel 5240 MHz	16.876 MHz	N/A	N/A
802.11(n) HT20 MCS0				
	Ch 36, Low Channel 5180 MHz	17.841 MHz	N/A	N/A
	Ch 40, Mid Channel 5200 MHz	18.088 MHz	N/A	N/A
	Ch 48, High Channel 5240 MHz	18.039 MHz	N/A	N/A
802.11(n) HT20 MCS7				
	Ch 36, Low Channel 5180 MHz	17.148 MHz	N/A	N/A
	Ch 40, Mid Channel 5200 MHz	17.657 MHz	N/A	N/A
	Ch 48, High Channel 5240 MHz	17.532 MHz	N/A	N/A

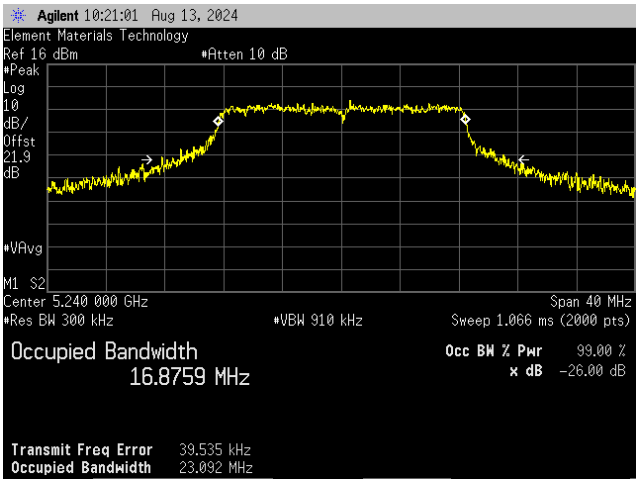
OCCUPIED BANDWIDTH – ANTENNA 1 (UNII-1)



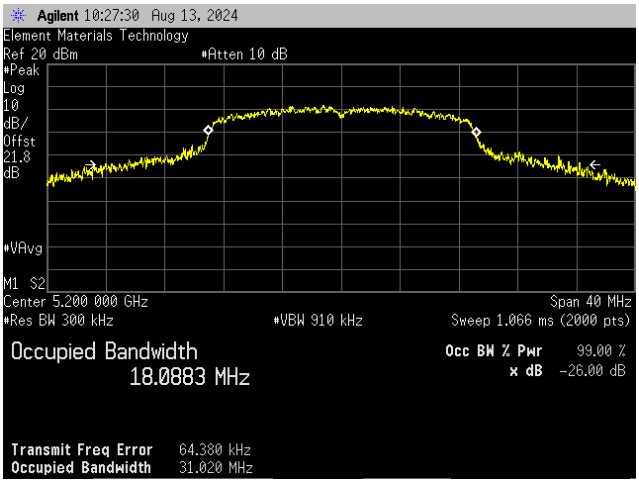
ANTENNA 1, UNII-1, 20 MHz
802.11(a) 6 Mbps
Ch 48, High Channel 5240 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(a) 36 Mbps
Ch 40, Mid Channel 5200 MHz

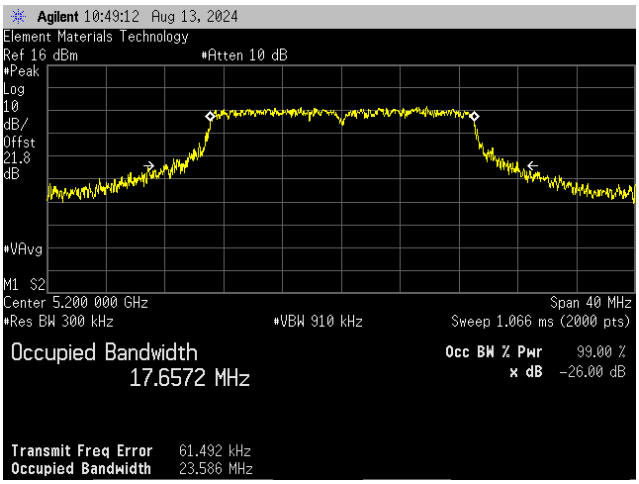


ANTENNA 1, UNII-1, 20 MHz
802.11(a) 54 Mbps
Ch 48, High Channel 5240 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS0
Ch 40, Mid Channel 5200 MHz

OCCUPIED BANDWIDTH – ANTENNA 1 (UNII-1)



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS7
Ch 40, Mid Channel 5200 MHz

OCCUPIED BANDWIDTH – ANTENNA 1 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth as defined in RSS-Gen Clause 6.7. This value is also used to set the integration bandwidth for output power as allowed per ANSI C63.10 section 12.3.

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Generator - Signal	Keysight	N5182B	TEU	2024-04-18	2027-04-18

OCCUPIED BANDWIDTH – ANTENNA 1 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-13
Customer:	IrriGreen, Inc.	Temperature:	21.6°C
Attendees:	None	Relative Humidity:	52.9%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

N/A

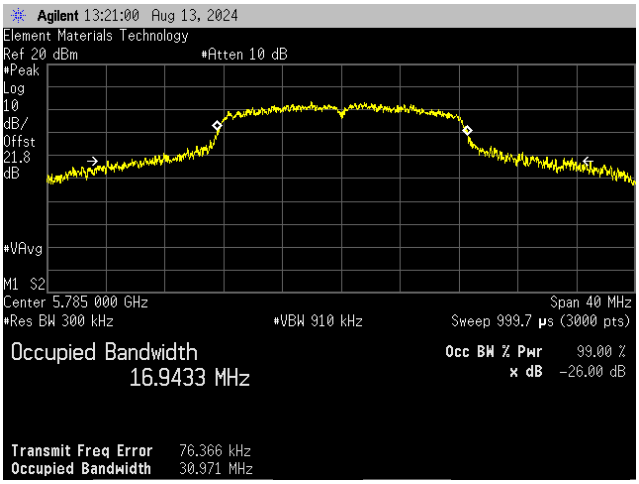
Tested By

TEST RESULTS

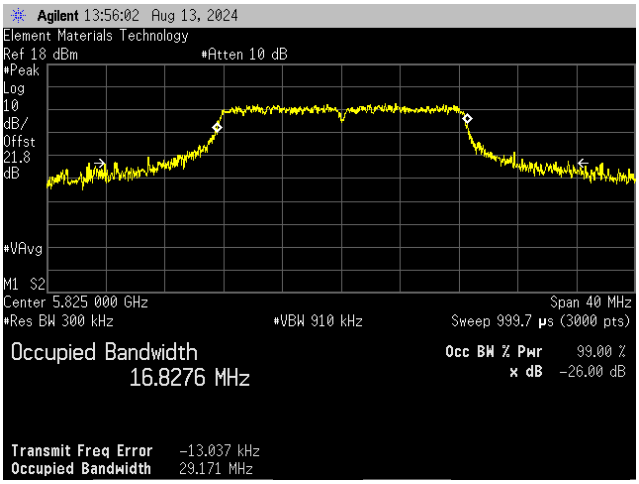
	Value	Limit	Result
ANTENNA 1, UNII-3, 20 MHz BW			
802.11(a) 6 Mbps			
Ch 149, Low Channel 5745 MHz	16.839 MHz	N/A	N/A
Ch 157, Mid Channel 5785 MHz	16.943 MHz	N/A	N/A
Ch 165, High Channel 5825 MHz	16.613 MHz	N/A	N/A
802.11(a) 36 Mbps			
Ch 149, Low Channel 5745 MHz	16.743 MHz	N/A	N/A
Ch 157, Mid Channel 5785 MHz	16.802 MHz	N/A	N/A
Ch 165, High Channel 5825 MHz	16.828 MHz	N/A	N/A
802.11(a) 54 Mbps			
Ch 149, Low Channel 5745 MHz	16.463 MHz	N/A	N/A
Ch 157, Mid Channel 5785 MHz	16.615 MHz	N/A	N/A
Ch 165, High Channel 5825 MHz	16.954 MHz	N/A	N/A
802.11(n) HT20 MCS0			
Ch 149, Low Channel 5745 MHz	17.901 MHz	N/A	N/A
Ch 157, Mid Channel 5785 MHz	18.000 MHz	N/A	N/A
Ch 165, High Channel 5825 MHz	17.731 MHz	N/A	N/A
802.11(n) HT20 MCS7			
Ch 149, Low Channel 5745 MHz	17.622 MHz	N/A	N/A
Ch 157, Mid Channel 5785 MHz	17.547 MHz	N/A	N/A
Ch 165, High Channel 5825 MHz	17.548 MHz	N/A	N/A

OCCUPIED BANDWIDTH – ANTENNA 1 (UNII-3)

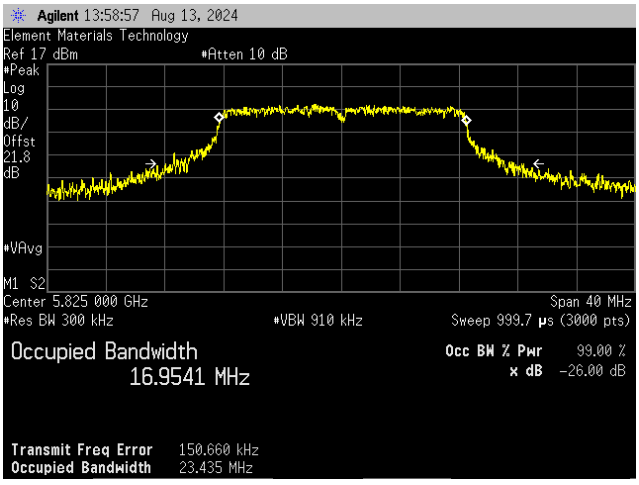
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



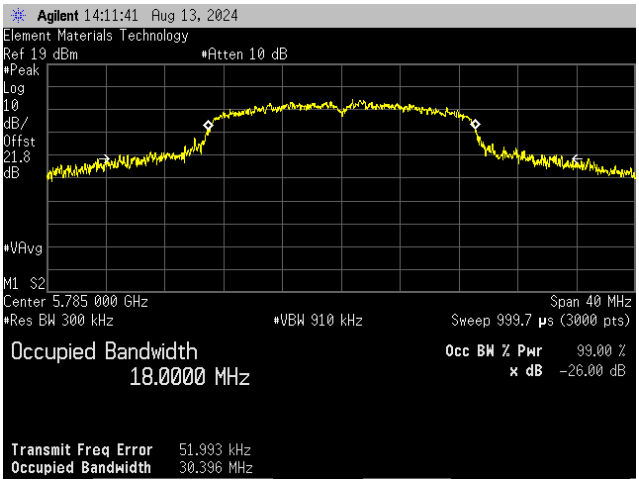
ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 6 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 36 Mbps
Ch 165, High Channel 5825 MHz

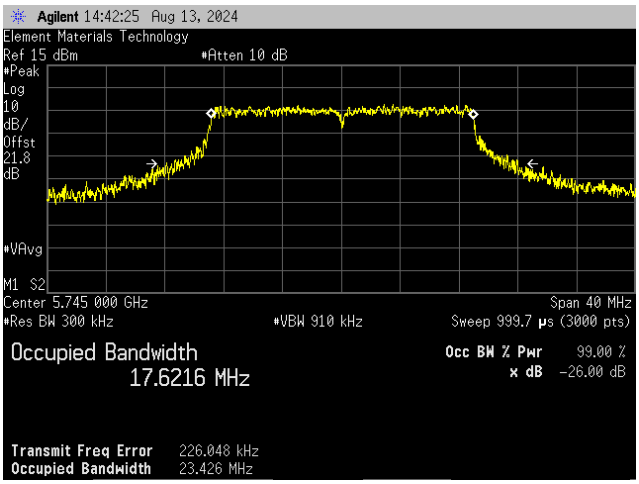


ANTENNA 1, UNII-3, 20 MHz BW
802.11(a) 54 Mbps
Ch 165, High Channel 5825 MHz



ANTENNA 1, UNII-3, 20 MHz BW
802.11(n) HT20 MCS0
Ch 157, Mid Channel 5785 MHz

OCCUPIED BANDWIDTH – ANTENNA 1 (UNII-3)



ANTENNA 1, UNII-3, 20 MHz BW
802.11(n) HT20 MCS7
Ch 149, Low Channel 5745 MHz

BAND EDGE

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

This test is done with the U-NII-1 band (5.2 GHz band) to ensure no portion of the carrier is contained within the U-NII-2A band (5.3 GHz band) and with the U-NII-3 band (5.8 GHz band) to ensure no portion of the carrier is contained in the U-NII-2C band (5.6 GHz band).

Per FCC KDB 789033 DO2 General UNII Test Procedures New Rules v02r01, Clause B.2.a.(i) as an alternative to the 26 dB bandwidth, the 99% bandwidth may used to show compliance to this rule part.

The analyzer was configured to the following settings:

- Center frequency = edge of the allowable band*
- RBW = Approx 1-2% of the emission bandwidth (B)
- VBW => 3x RBW
- Detector = Peak
- Trace mode = max hold

*For the U-NII-1 this is 5250 MHz
*For the U-NII-3 this is 5725 MHz

The markers of the 99% emission bandwidth measurement were evaluated to ensure that no part of the carrier operating in a non-DFS band was operating in a band where DFS testing is required.

The transmit frequencies and data rates listed in the datasheet were measured.

The transmit power was set to its default maximum.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Generator - Signal	Agilent	E8257D	TGX	2024-01-17	2026-01-17
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2024-03-13	2025-03-13

BAND EDGE

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-19
Customer:	IrriGreen, Inc.	Temperature:	22.7°C
Attendees:	None	Relative Humidity:	47.8%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mbar
Tested By:	Christopher Ladwig	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Measurements performed on the antenna ports that had the highest conducted output power.
Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

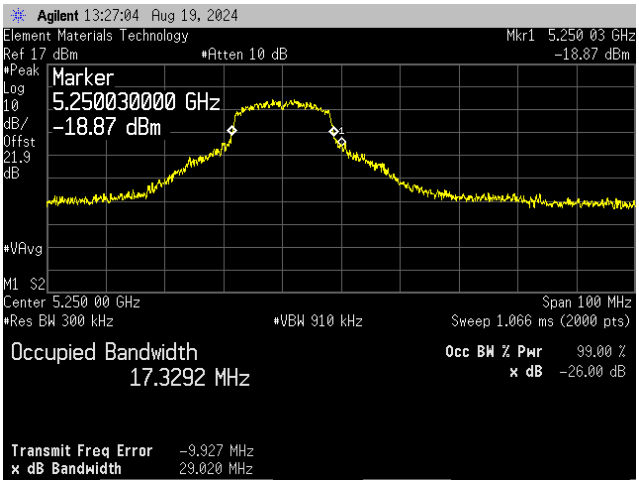
Pass

Tested By

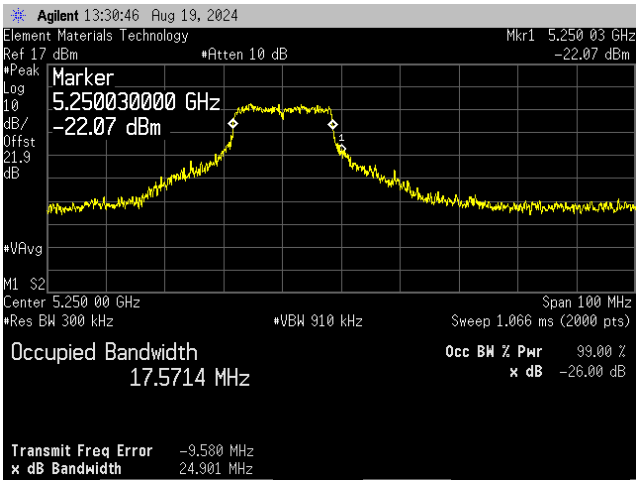
TEST RESULTS

	OBW Within Band	Band Edge (MHz)	Result
ANTENNA 1, UNII-1, 20 MHz BW			
802.11(a) 6 Mbps			
Ch 48, High Channel 5240 MHz	Yes	5250	Pass
802.11(a) 36 Mbps			
Ch 48, High Channel 5240 MHz	Yes	5250	Pass
802.11(a) 54 Mbps			
Ch 48, High Channel 5240 MHz	Yes	5250	Pass
802.11(n) HT20 MCS0			
Ch 48, High Channel 5240 MHz	Yes	5250	Pass
802.11(n) HT20 MCS7			
Ch 48, High Channel 5240 MHz	Yes	5250	Pass
ANTENNA 2, UNII-3, 20 MHz BW			
802.11(a) 6 Mbps			
Ch 149, Low Channel 5745 MHz	Yes	5725	Pass
802.11(a) 36 Mbps			
Ch 149, Low Channel 5745 MHz	Yes	5725	Pass
802.11(a) 54 Mbps			
Ch 149, Low Channel 5745 MHz	Yes	5725	Pass
802.11(n) HT20 MCS0			
Ch 149, Low Channel 5745 MHz	Yes	5725	Pass
802.11(n) HT20 MCS7			
Ch 149, Low Channel 5745 MHz	Yes	5725	Pass

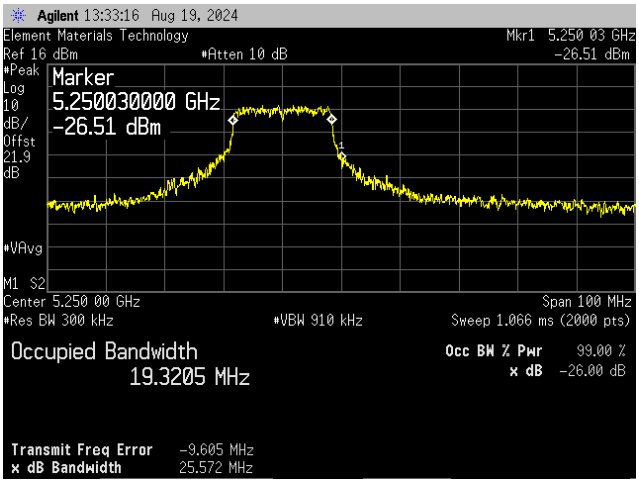
BAND EDGE



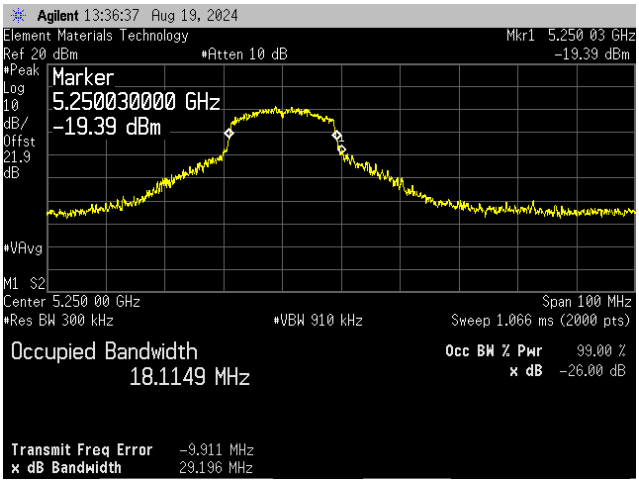
ANTENNA 1, UNII-1, 20 MHz BW
802.11(a) 6 Mbps
Ch 48, High Channel 5240 MHz



ANTENNA 1, UNII-1, 20 MHz BW
802.11(a) 36 Mbps
Ch 48, High Channel 5240 MHz



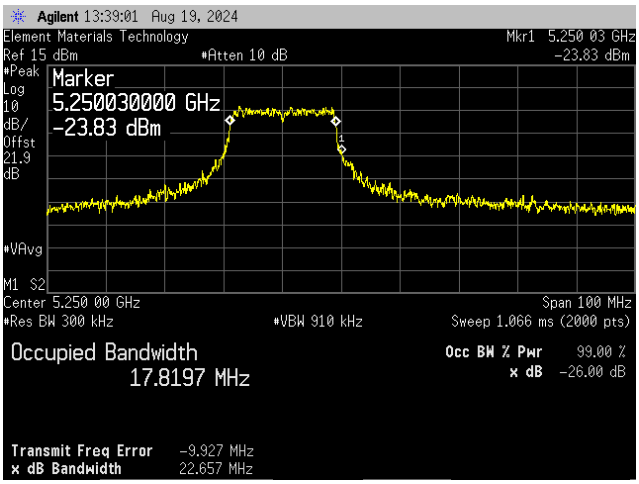
ANTENNA 1, UNII-1, 20 MHz BW
802.11(a) 54 Mbps
Ch 48, High Channel 5240 MHz



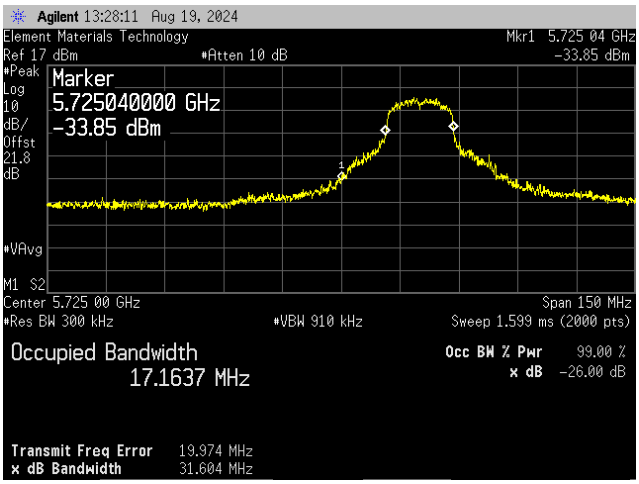
ANTENNA 1, UNII-1, 20 MHz BW
802.11(n) HT20 MCS0
Ch 48, High Channel 5240 MHz

BAND EDGE

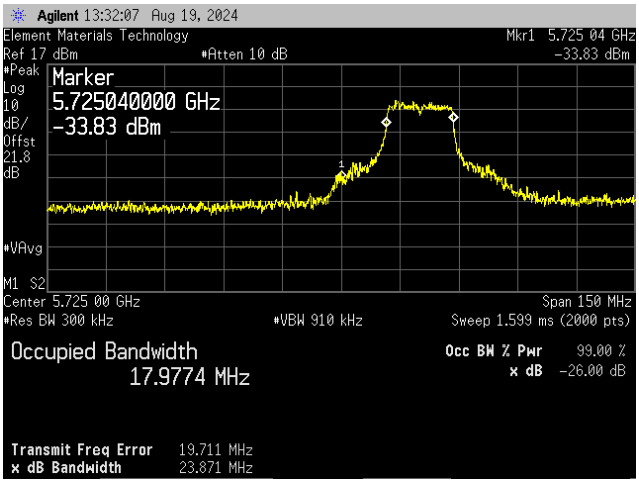
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



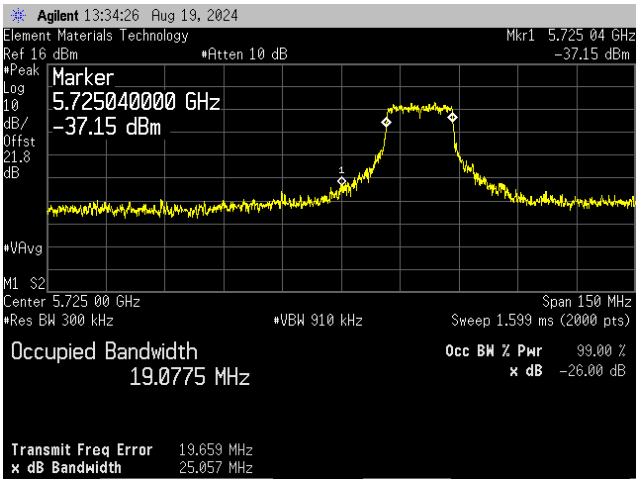
ANTENNA 1, UNII-1, 20 MHz BW
802.11(n) HT20 MCS7
Ch 48, High Channel 5240 MHz



ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 6 Mbps
Ch 149, Low Channel 5745 MHz



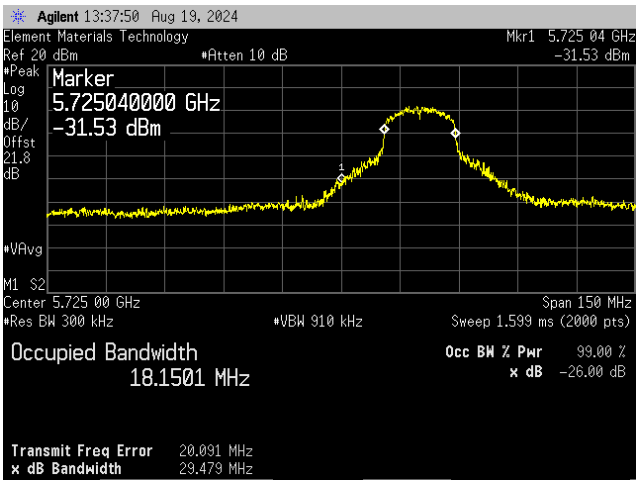
ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 36 Mbps
Ch 149, Low Channel 5745 MHz



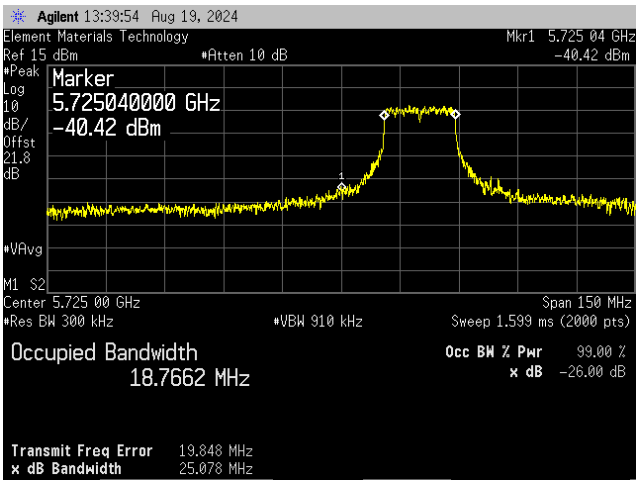
ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 54 Mbps
Ch 149, Low Channel 5745 MHz

BAND EDGE

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



ANTENNA 2, UNII-3, 20 MHz BW
802.11(n) HT20 MCS0
Ch 149, Low Channel 5745 MHz



ANTENNA 2, UNII-3, 20 MHz BW
802.11(n) HT20 MCS7
Ch 149, Low Channel 5745 MHz

MAXIMUM POWER SPECTRAL DENSITY – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

The maximum power spectral density was measured using ANSI C63.10:2013, Clause 12.3.2.3, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor), consistent with the method used for maximum conducted output power.

The spectrum analyzer settings were set to:

- Span set to encompass the entire 99% OBW of the signal
- RBW = 1 MHz (500 kHz in the 5.725-5.85 GHz band)
- VBW = 3 MHz (1.5 MHz in the 5.725-5.85 GHz band)
- RMS Detector
- Trace average 100 traces in power averaging mode

The marker peak search function of the analyzer as used to determine to be the highest level found across the emission in any 1 MHz/500kHz segment after 100 sweeps of power averaging (not video averaging).

A duty cycle correction factor was added to the measurement using the results of the formula of 10*LOG(1/D) where D is the duty cycle.

- In the 5.15 – 5.25GHz, the maximum permissible power spectral density is 11dBm/MHz for the FCC and not applicable for ISED.
- In the 5.25 – 5.35GHz, 5.47 – 5.725GHz bands, the maximum permissible power spectral density is 11dBm/MHz
- In the 5.725 – 5.850GHz band, the maximum permissible power spectral density is 30dBm/500kHz.

The worst case limits are shown on the following datasheet.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Generator - Signal	Agilent	E8257D	TGX	2024-01-17	2026-01-17
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2024-03-13	2025-03-13

MAXIMUM POWER SPECTRAL DENSITY – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-19
Customer:	IrriGreen, Inc.	Temperature:	22.7°C
Attendees:	None	Relative Humidity:	47.8%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mbar
Tested By:	Christopher Ladwig	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Measurement performed on the antenna port that had the highest measured conducted output power.
Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

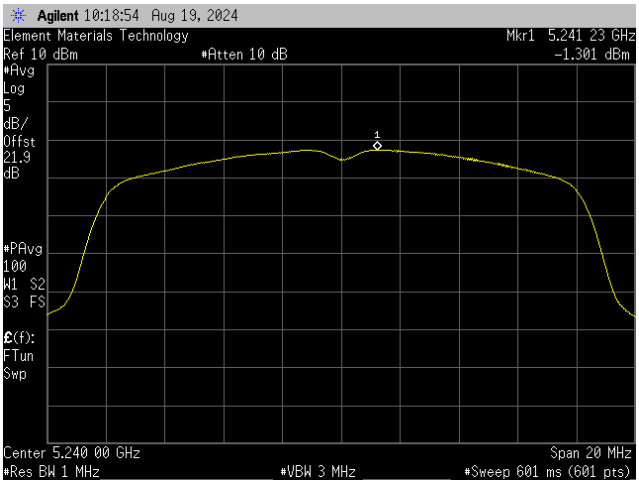
Pass

Tested By

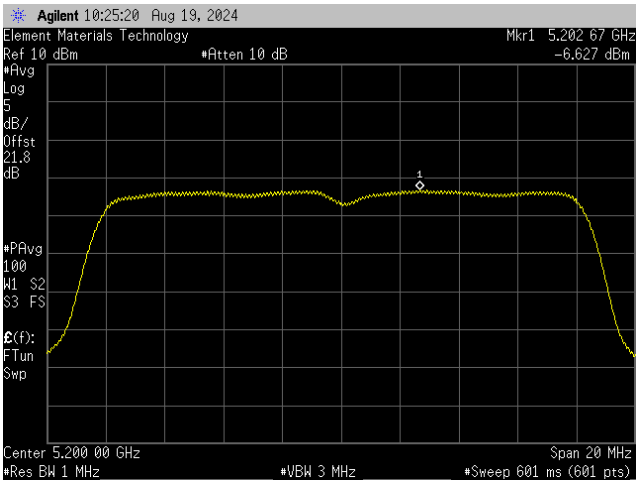
TEST RESULTS

	Power (dBm/Ref BW)	Duty Cycle Factor (dB)	Density (dBm/Ref BW)	Limit ≤ (dBm/Ref BW)	Results
ANTENNA 1, UNII-1, 20 MHz					
802.11(a) 6 Mbps					
Ch 36, Low Channel 5180 MHz	-1.83	0.3	-1.5	11	Pass
Ch 40, Mid Channel 5200 MHz	-1.348	0.3	-1	11	Pass
Ch 48, High Channel 5240 MHz	-1.301	0.3	-1	11	Pass
802.11(a) 36 Mbps					
Ch 36, Low Channel 5180 MHz	-6.715	3.8	-2.9	11	Pass
Ch 40, Mid Channel 5200 MHz	-6.627	3.7	-2.9	11	Pass
Ch 48, High Channel 5240 MHz	-6.664	3.7	-3	11	Pass
802.11(a) 54 Mbps					
Ch 36, Low Channel 5180 MHz	-9.708	5.5	-4.2	11	Pass
Ch 40, Mid Channel 5200 MHz	-9.682	5.5	-4.2	11	Pass
Ch 48, High Channel 5240 MHz	-9.625	5.6	-4	11	Pass
802.11(n) HT20 MCS0					
Ch 36, Low Channel 5180 MHz	-2.216	0.3	-1.9	11	Pass
Ch 40, Mid Channel 5200 MHz	-1.696	0.5	-1.2	11	Pass
Ch 48, High Channel 5240 MHz	-1.719	0.4	-1.3	11	Pass
802.11(n) HT20 MCS7					
Ch 36, Low Channel 5180 MHz	-11.324	6.1	-5.2	11	Pass
Ch 40, Mid Channel 5200 MHz	-11.504	6.1	-5.4	11	Pass
Ch 48, High Channel 5240 MHz	-11.335	6.1	-5.2	11	Pass

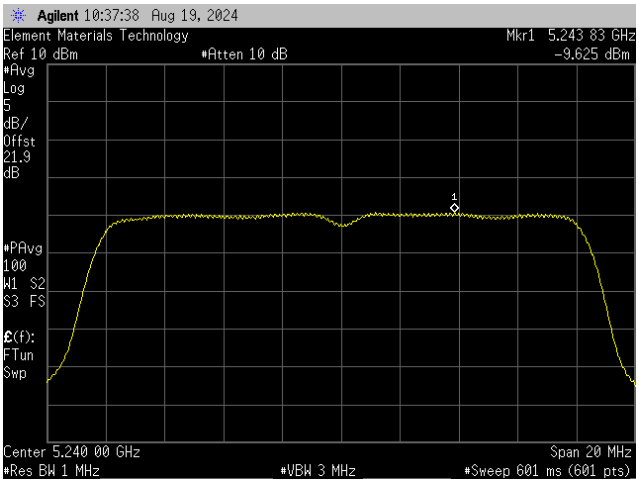
MAXIMUM POWER SPECTRAL DENSITY – ANTENNA 1 (UNII-1)



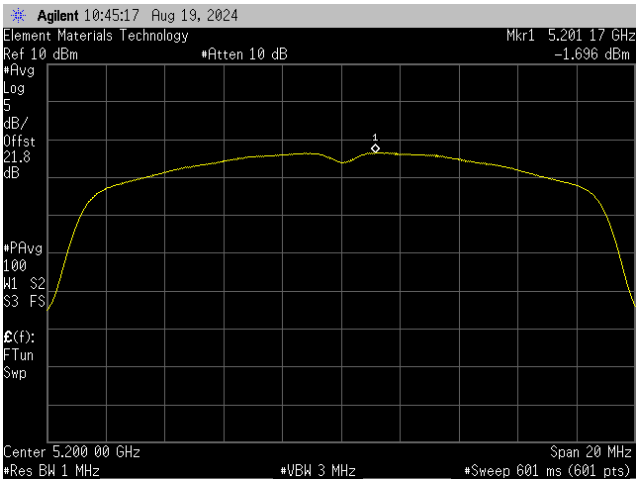
ANTENNA 1, UNII-1, 20 MHz
802.11(a) 6 Mbps
Ch 48, High Channel 5240 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(a) 36 Mbps
Ch 40, Mid Channel 5200 MHz



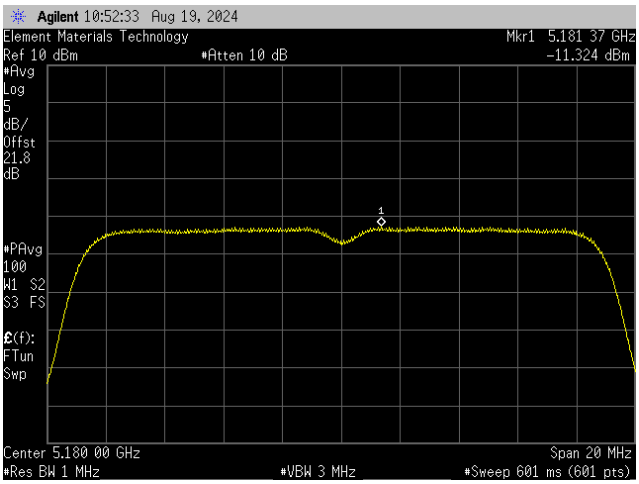
ANTENNA 1, UNII-1, 20 MHz
802.11(a) 54 Mbps
Ch 48, High Channel 5240 MHz



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS0
Ch 40, Mid Channel 5200 MHz

MAXIMUM POWER SPECTRAL DENSITY – ANTENNA 1 (UNII-1)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



ANTENNA 1, UNII-1, 20 MHz
802.11(n) HT20 MCS7
Ch 36, Low Channel 5180 MHz

MAXIMUM POWER SPECTRAL DENSITY – ANTENNA 2 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The radio was operated in the modes as shown in the following data sheets.

The maximum power spectral density was measured using ANSI C63.10:2013, Clause 12.3.2.3, Method SA-2 (RMS detection and trace averaging across the on and off times of the EUT transmission and use of a duty cycle correction factor), consistent with the method used for maximum conducted output power.

The spectrum analyzer settings were set to:

- Span set to encompass the entire 99% OBW of the signal
- RBW = 1 MHz (500 kHz in the 5.725-5.85 GHz band)
- VBW = 3 MHz (1.5 MHz in the 5.725-5.85 GHz band)
- RMS Detector
- Trace average 100 traces in power averaging mode

The marker peak search function of the analyzer as used to determine to be the highest level found across the emission in any 1 MHz/500kHz segment after 100 sweeps of power averaging (not video averaging).

A duty cycle correction factor was added to the measurement using the results of the formula of 10*LOG(1/D) where D is the duty cycle.

- In the 5.15 – 5.25GHz, the maximum permissible power spectral density is 11dBm/MHz for the FCC.
- In the 5.25 – 5.35GHz, 5.47 – 5.725GHz bands, the maximum permissible power spectral density is 11dBm/MHz
- In the 5.725 – 5.850GHz band, the maximum permissible power spectral density is 30dBm/500kHz.

The worst case limits are shown on the following datasheet.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	2024-01-02	2025-01-02
Block - DC	Fairview Microwave	SD3379	AMX	2024-03-16	2025-03-16
Attenuator	Fairview Microwave	SA26B-20	TWJ	2024-03-14	2025-03-14
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Generator - Signal	Keysight	N5182B	TEU	2024-04-18	2027-04-18

MAXIMUM POWER SPECTRAL DENSITY – ANTENNA 2 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:33:FF	Date:	2024-08-13
Customer:	IrriGreen, Inc.	Temperature:	22.6°C
Attendees:	None	Relative Humidity:	51.4%
Customer Project:	None	Bar. Pressure (PMSL):	1015 mbar
Tested By:	Jeff Alcoke	Job Site:	EV10
Power:	110VAC/60Hz	Configuration:	IRRI0024-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

COMMENTS

Measurement performed on the antenna port that had the highest measured conducted output power.
Reference level offset includes: DC Block, 20 dB attenuator and measurement cable

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

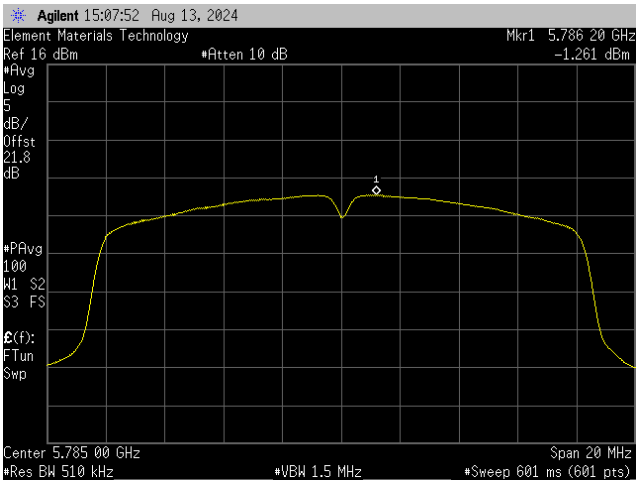
Tested By

TEST RESULTS

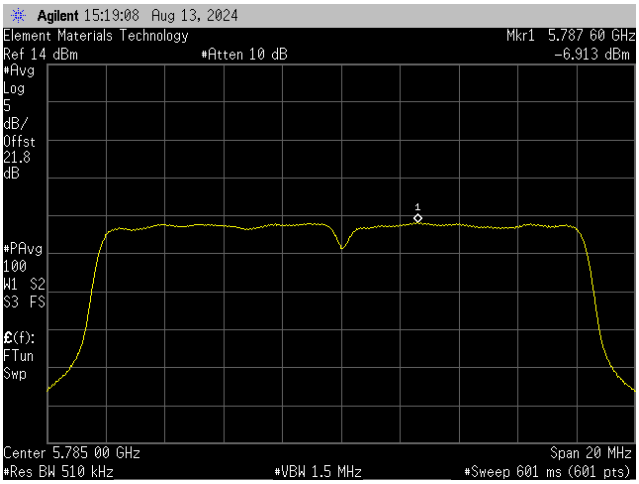
	Power (dBm/Ref BW)	Duty Cycle Factor (dB)	Density (dBm/Ref BW)	Limit ≤ (dBm/Ref BW)	Results
ANTENNA 2, UNII-3, 20 MHz BW					
802.11(a) 6 Mbps					
Ch 149, Low Channel 5745 MHz	-1.903	0.4	-1.5	30	Pass
Ch 157, Mid Channel 5785 MHz	-1.261	0.3	-1	30	Pass
Ch 165, High Channel 5825 MHz	-2.776	0.3	-2.5	30	Pass
802.11(a) 36 Mbps					
Ch 149, Low Channel 5745 MHz	-7.49	3.8	-3.7	30	Pass
Ch 157, Mid Channel 5785 MHz	-6.913	3.7	-3.2	30	Pass
Ch 165, High Channel 5825 MHz	-7.227	3.7	-3.5	30	Pass
802.11(a) 54 Mbps					
Ch 149, Low Channel 5745 MHz	-10.643	5.6	-5	30	Pass
Ch 157, Mid Channel 5785 MHz	-9.884	5.5	-4.4	30	Pass
Ch 165, High Channel 5825 MHz	-10.099	5.5	-4.6	30	Pass
802.11(n) HT20 MCS0					
Ch 149, Low Channel 5745 MHz	-2.458	0.5	-2	30	Pass
Ch 157, Mid Channel 5785 MHz	-1.654	0.4	-1.3	30	Pass
Ch 165, High Channel 5825 MHz	-3.098	0.3	-2.8	30	Pass
802.11(n) HT20 MCS7					
Ch 149, Low Channel 5745 MHz	-12.338	6.1	-6.2	30	Pass
Ch 157, Mid Channel 5785 MHz	-11.724	6.1	-5.6	30	Pass
Ch 165, High Channel 5825 MHz	-11.8	6.1	-5.7	30	Pass

MAXIMUM POWER SPECTRAL DENSITY – ANTENNA 2 (UNII-3)

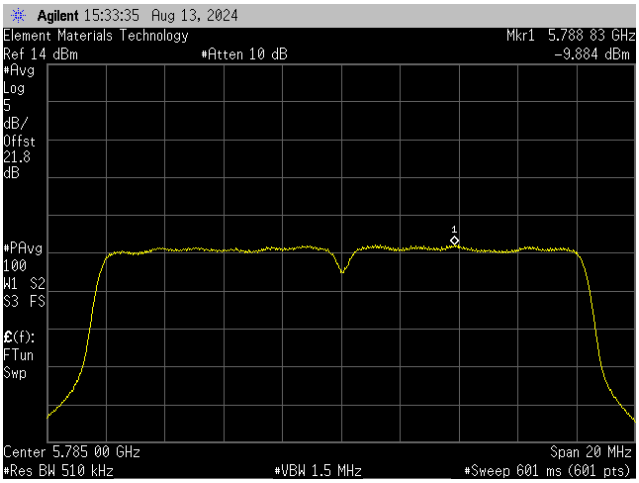
element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



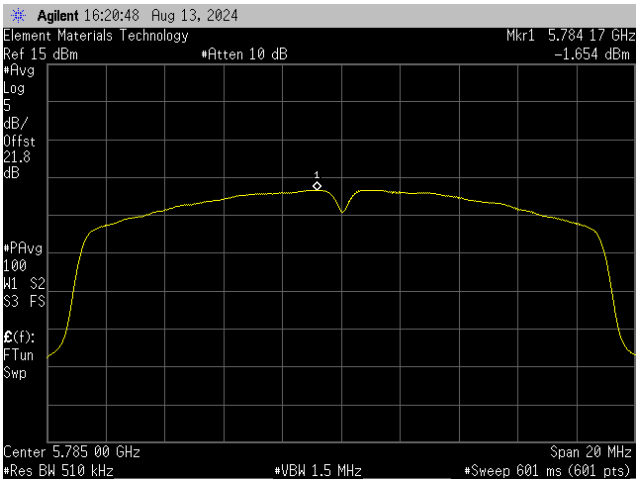
ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 6 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 36 Mbps
Ch 157, Mid Channel 5785 MHz



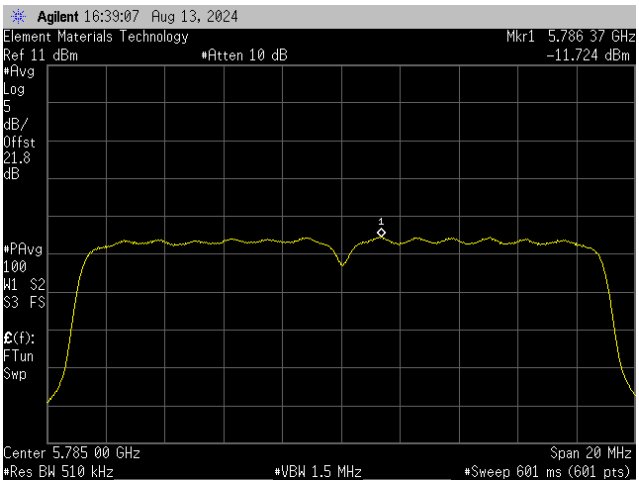
ANTENNA 2, UNII-3, 20 MHz BW
802.11(a) 54 Mbps
Ch 157, Mid Channel 5785 MHz



ANTENNA 2, UNII-3, 20 MHz BW
802.11(n) HT20 MCS0
Ch 157, Mid Channel 5785 MHz

MAXIMUM POWER SPECTRAL DENSITY – ANTENNA 2 (UNII-3)

element
TbtTx 2024.05.24.1
WTD.2024.01.16.0



ANTENNA 2, UNII-3, 20 MHz BW
802.11(n) HT20 MCS7
Ch 157, Mid Channel 5785 MHz

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies in each operational band and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axes if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2013).

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

PK = Peak Detector
AV = Reduced VBW Voltage Detector

Measurements were performed using FCC KDB 789033 DO2 General UNII Test Procedures New Rules v02r01 as called out in sections II.G.5 and II.G.6.d.

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2023-10-04	2024-10-04
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	2024-03-14	2025-03-14
Antenna - Double Ridge	EMCO	3115	AHC	2024-07-18	2026-07-18
Analyzer - Spectrum Analyzer*	Keysight	N9010A	AFO	2023-10-04	2024-10-04

*Analyzer used for testing on 2024-09-11

FREQUENCY RANGE INVESTIGATED

4000 MHz TO 6200 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

IRRI0024-3
IRRI0024-9

MODES INVESTIGATED

Transmitting Antenna 1, 802.11a, Ch. 36 = 5180 MHz
Transmitting Antenna 1, 802.11a, Ch. 149 = 5745 MHz, 36 Mbps
Transmitting Antenna 1, 802.11a, Ch. 165 = 5825 MHz, 36 Mbps
Transmitting Antenna 2, 802.11a, Ch. 36 = 5180 MHz
Transmitting Antenna 2, 802.11a, Ch. 149 = 5745 MHz, 6 Mbps
Transmitting Antenna 2, 802.11a, Ch. 165 = 5825 MHz, 6 Mbps

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-08-14
Customer:	IrriGreen, Inc.	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	52.1%
Customer Project:	None	Bar. Pressure (PMSL):	1018 mb
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	IRRI0024-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	88	Test Distance (m):	0.5	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

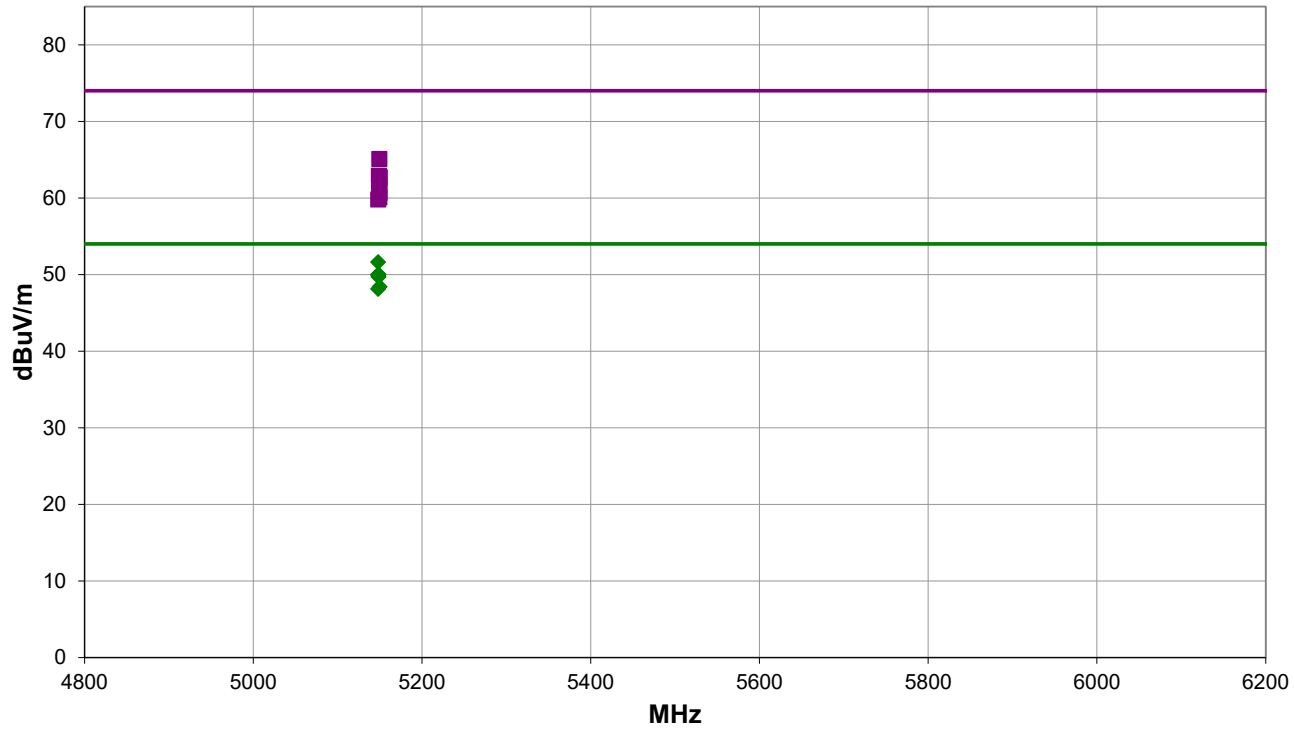
Please reference data comments below for Channel, Data rate and EUT orientation.

EUT OPERATING MODES

Transmitting Antenna 1, 802.11a, Ch. 36 = 5180 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 88 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #88

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
5148.200	30.9	36.3	1.74	59.0	0.5	0.0	Horz	AV	-15.6	51.6	54.0	-2.4	Ch. 36, 36 Mbps, EUT upright
5148.400	29.3	36.3	1.74	59.0	0.5	0.0	Horz	AV	-15.6	50.0	54.0	-4.0	Ch. 36, MCS7, EUT upright
5148.600	29.3	36.3	1.74	59.0	0.5	0.0	Horz	AV	-15.6	50.0	54.0	-4.0	Ch. 36, MCS0, EUT upright
5148.000	29.2	36.3	1.74	59.0	0.5	0.0	Horz	AV	-15.6	49.9	54.0	-4.1	Ch. 36, 6 Mbps, EUT upright
5148.500	29.0	36.3	1.74	59.0	0.5	0.0	Horz	AV	-15.6	49.7	54.0	-4.3	Ch. 36, 54 Mbps, EUT upright
5149.900	27.7	36.3	1.74	310.0	0.5	0.0	Vert	AV	-15.6	48.4	54.0	-5.6	Ch. 36, 6 Mbps, EUT upright
5148.200	27.4	36.3	1.74	310.0	0.5	0.0	Vert	AV	-15.6	48.1	54.0	-5.9	Ch. 36, MCS0, EUT upright
5149.383	44.4	36.3	1.74	59.0	0.5	0.0	Horz	PK	-15.6	65.1	74.0	-8.9	Ch. 36, 36 Mbps, EUT upright
5148.787	42.2	36.3	1.74	59.0	0.5	0.0	Horz	PK	-15.6	62.9	74.0	-11.1	Ch. 36, MCS0, EUT upright
5149.983	42.0	36.3	1.74	59.0	0.5	0.0	Horz	PK	-15.6	62.7	74.0	-11.3	Ch. 36, 6 Mbps, EUT upright
5149.153	40.8	36.3	1.74	310.0	0.5	0.0	Vert	PK	-15.6	61.5	74.0	-12.5	Ch. 36, MCS0, EUT upright
5149.547	40.0	36.3	1.74	59.0	0.5	0.0	Horz	PK	-15.6	60.7	74.0	-13.3	Ch. 36, 54 Mbps, EUT upright
5149.320	39.4	36.3	1.74	59.0	0.5	0.0	Horz	PK	-15.6	60.1	74.0	-13.9	Ch. 36, MCS7, EUT upright
5148.067	39.1	36.3	1.74	310.0	0.5	0.0	Vert	PK	-15.6	59.8	74.0	-14.2	Ch. 36, 6 Mbps, EUT upright

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-08-14
Customer:	IrriGreen, Inc.	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	52.1%
Customer Project:	None	Bar. Pressure (PMSL):	1018 mb
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	IRRI0024-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	89	Test Distance (m):	0.5	Ant. Height(s) (m):	1.25 (m)

COMMENTS

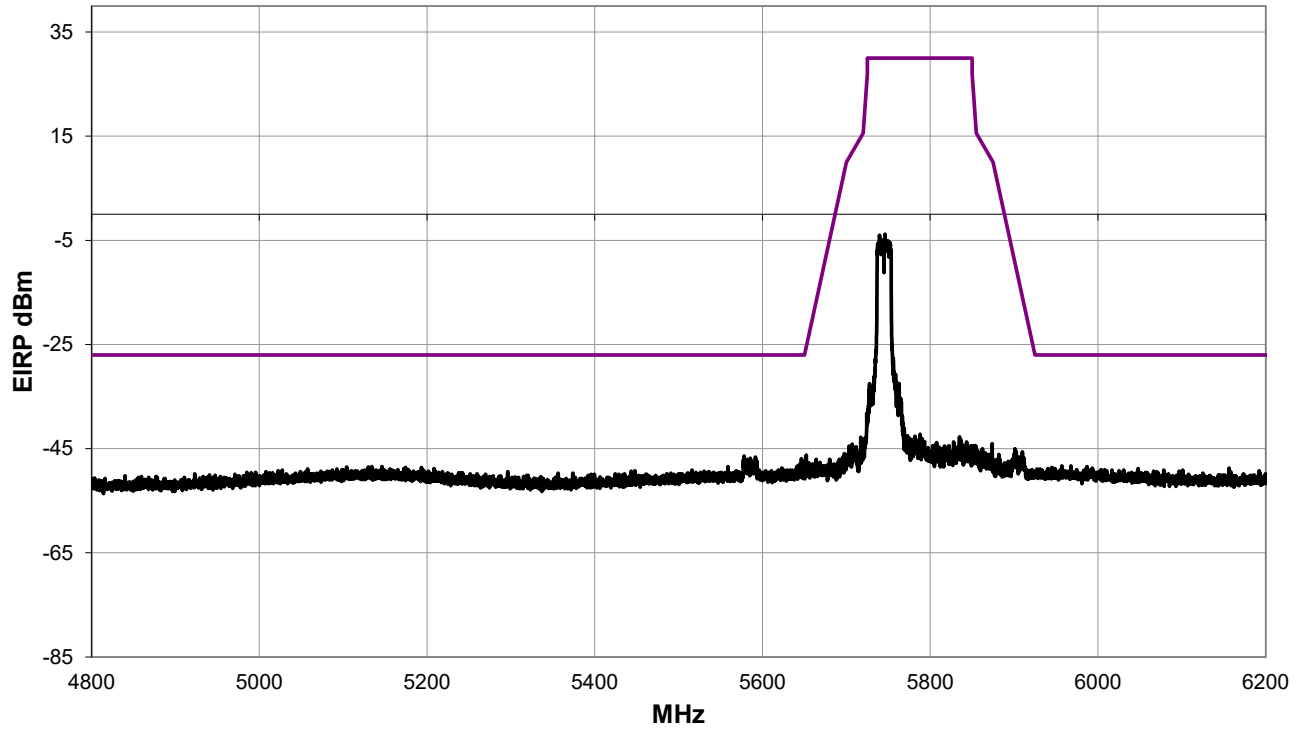
EUT Upright

EUT OPERATING MODES

Transmitting Antenna 1, 802.11a, Ch. 149 = 5745 MHz, 36 Mbps

DEVIATIONS FROM TEST STANDARD

None



Run #: 89 ■ PK ◆ AV ● QP

RESULTS - Run #89

All emissions were below the limit (see graph above).

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

CONCLUSION
Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-08-14
Customer:	IrriGreen, Inc.	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	52.1%
Customer Project:	None	Bar. Pressure (PMSL):	1018 mb
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	IRRI0024-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	90	Test Distance (m):	0.5	Ant. Height(s) (m):	1.25 (m)

COMMENTS

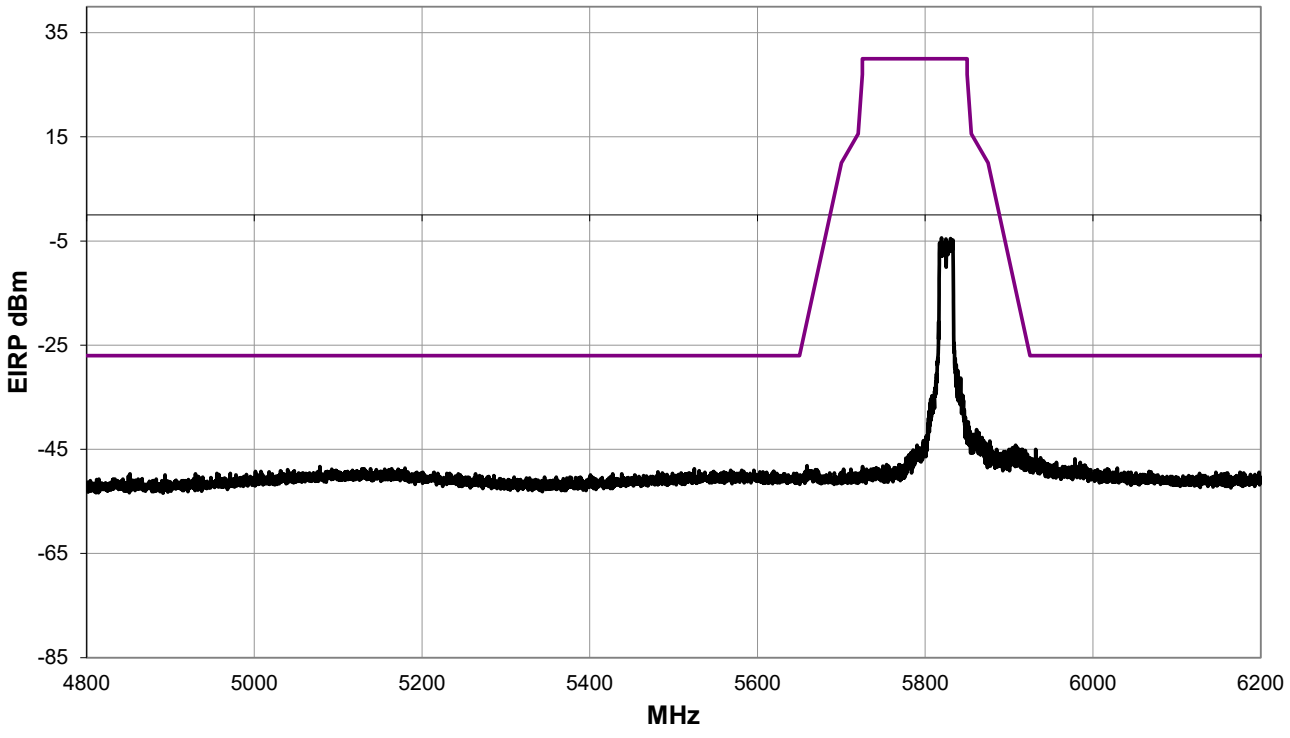
EUT Upright

EUT OPERATING MODES

Transmitting Antenna 1, 802.1a, Ch. 165 = 5825 MHz, 36 Mbps

DEVIATIONS FROM TEST STANDARD

None



Run #: 90 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #90

All emissions were below the limit (see graph above).

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-08-15
Customer:	IrriGreen, Inc.	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	48%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	91	Test Distance (m):	0.5	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

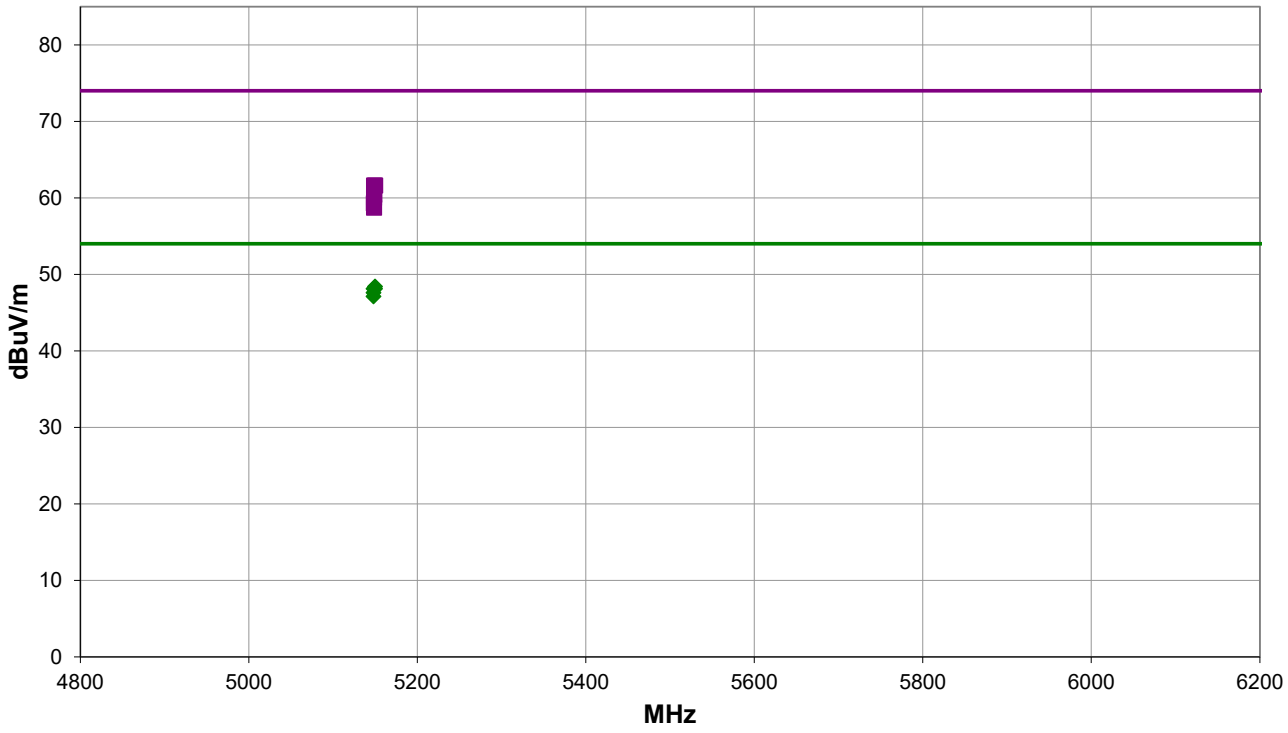
Please reference data comments below for Channel, Data Rate and EUT orientation.

EUT OPERATING MODES

Transmitting Antenna 2, 802.11a, Ch. 36 = 5180 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 91 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #91

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
5149.900	27.7	36.3	1.69	179.0	0.5	0.0	Vert	AV	-15.6	48.4	54.0	-5.6	Ch. 36, 6 Mbps, EUT Horz
5150.000	27.4	36.3	1.64	109.0	0.5	0.0	Horz	AV	-15.6	48.1	54.0	-5.9	Ch. 36, 6 Mbps, EUT on Side
5148.200	27.4	36.3	1.75	180.0	0.5	0.0	Vert	AV	-15.6	48.1	54.0	-5.9	Ch. 36, MCS0, EUT Horz
5148.000	26.9	36.3	1.77	182.0	0.5	0.0	Horz	AV	-15.6	47.6	54.0	-6.4	Ch. 36, 54 Mbps, EUT Horz
5148.100	26.4	36.3	1.75	180.0	0.5	0.0	Vert	AV	-15.6	47.1	54.0	-6.9	Ch. 36, MCS7, EUT Horz
5149.967	40.9	36.3	1.69	179.0	0.5	0.0	Vert	PK	-15.6	61.6	74.0	-12.4	Ch. 36, 6 Mbps, EUT Horz
5148.627	40.9	36.3	1.64	109.0	0.5	0.0	Horz	PK	-15.6	61.6	74.0	-12.4	Ch. 36, 6 Mbps, EUT on Side
5148.887	39.7	36.3	1.77	182.0	0.5	0.0	Vert	PK	-15.6	60.4	74.0	-13.6	Ch. 36, 36 Mbps, EUT Horz
5148.623	39.3	36.3	1.75	180.0	0.5	0.0	Vert	PK	-15.6	60.0	74.0	-14.0	Ch. 36, MCS0, EUT Horz
5148.260	38.6	36.3	1.75	180.0	0.5	0.0	Horz	PK	-15.6	59.3	74.0	-14.7	Ch. 36, MCS7, EUT Horz
5148.747	38.0	36.3	1.77	182.0	0.5	0.0	Vert	PK	-15.6	58.7	74.0	-15.3	Ch. 36, 54 Mbps, EUT Horz

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-08-15
Customer:	IrriGreen, Inc.	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	48%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	93	Test Distance (m):	0.5	Ant. Height(s) (m):	1.25 (m)

COMMENTS

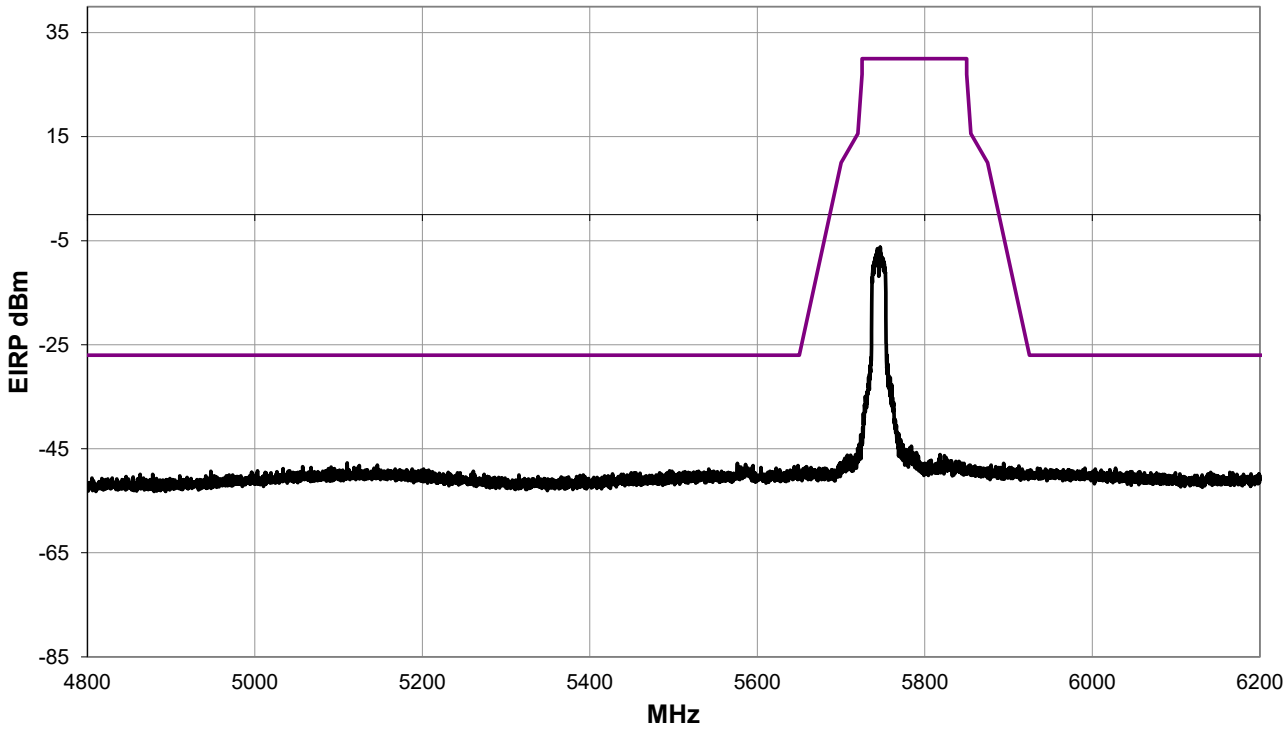
EUT Upright

EUT OPERATING MODES

Transmitting Antenna 2, 802.11a, Ch. 149 = 5745 MHz, 6 Mbps

DEVIATIONS FROM TEST STANDARD

None



Run #: 93 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #93

All emissions were below the limit (see graph above).

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-08-15
Customer:	IrriGreen, Inc.	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	48%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	94	Test Distance (m):	0.5	Ant. Height(s) (m):	1.25 (m)

COMMENTS

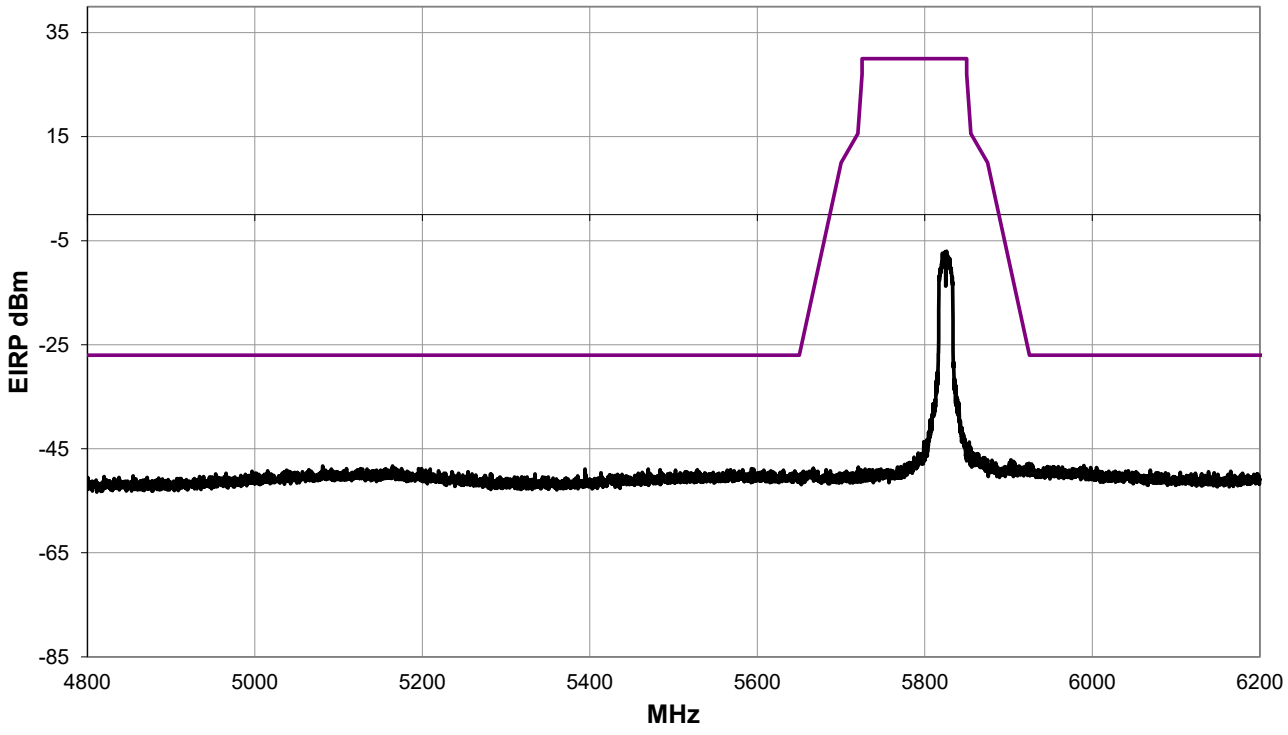
EUT Upright

EUT OPERATING MODES

Transmitting Antenna 2, 802.11a, Ch. 165 = 5825 MHz, 6 Mbps

DEVIATIONS FROM TEST STANDARD

None



Run #: 94 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #94

All emissions were below the limit (see graph above).

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-11
Customer:	IrriGreen, Inc.	Temperature:	21.7°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1008 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	192	Test Distance (m):	0.5	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

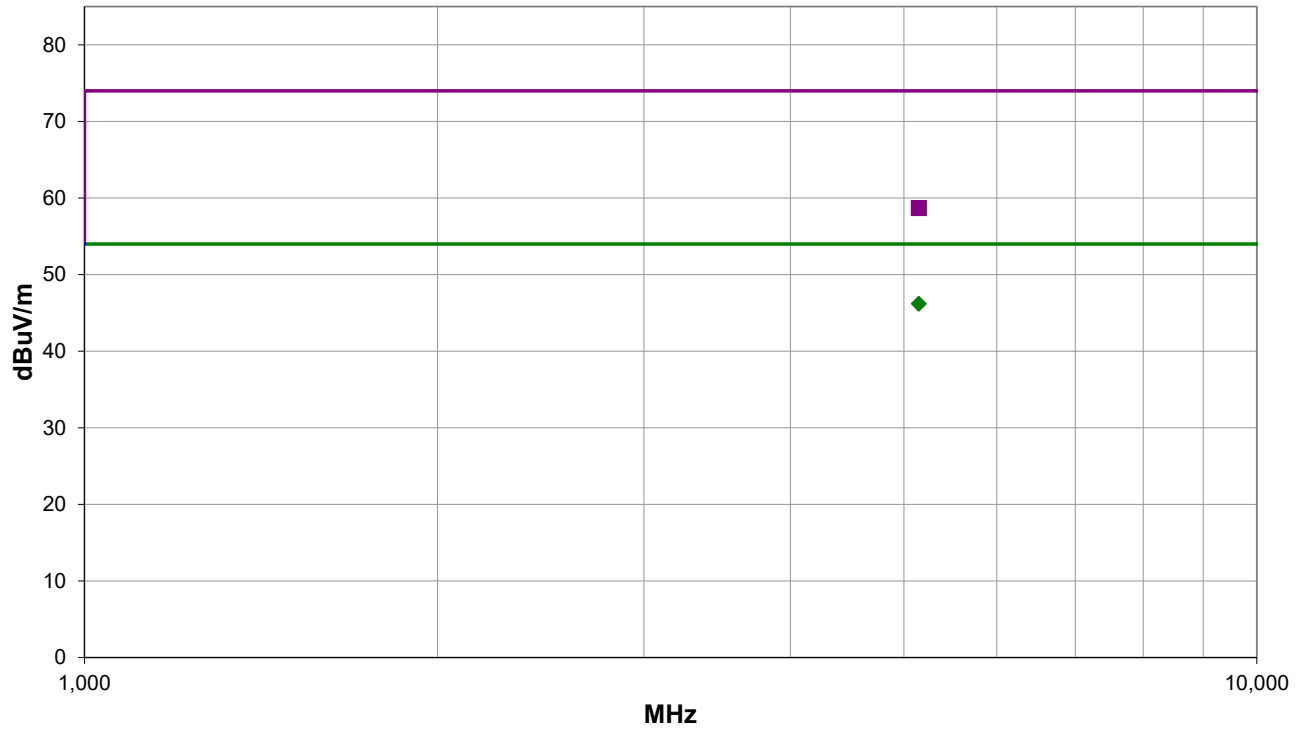
Please reference data comments below for channel, data rate, and EUT orientation. Spot-checking worst-case emissions.

EUT OPERATING MODES

Transmitting Antenna 2 WiFi 802.11a Ch 36. = 5180 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 192 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #192

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
5148.010	25.5	36.3	1.48	158.0	0.5	0.0	Vert	AV	-15.6	46.2	54.0	-7.8	Ch. 36, 6 Mbps, EUT Horz
5148.040	38.0	36.3	1.48	158.0	0.5	0.0	Vert	PK	-15.6	58.7	74.0	-15.3	Ch. 36, 6 Mbps, EUT Horz

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-11
Customer:	IrriGreen, Inc.	Temperature:	21.7°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1008 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	193	Test Distance (m):	0.5	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

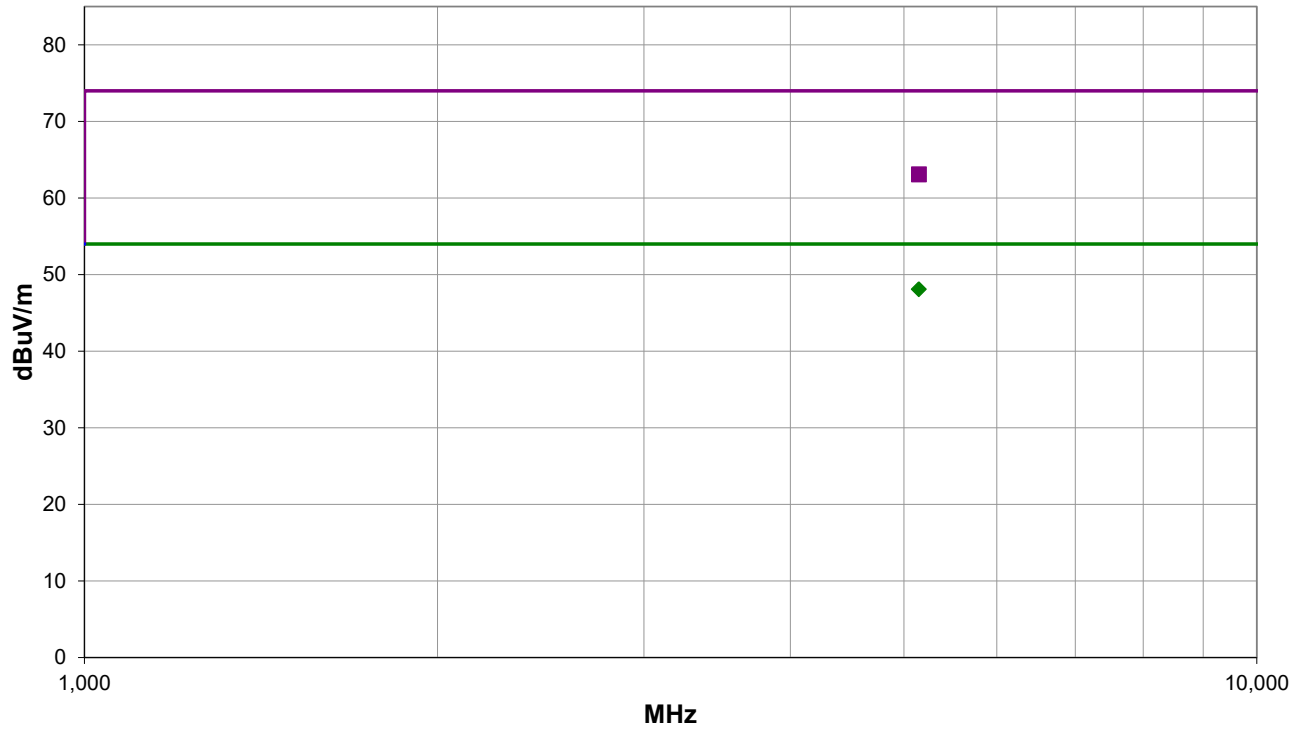
Please reference data comments below for channel, data rate, and EUT orientation. Spot-checking worst-case emissions.

EUT OPERATING MODES

Transmitting Antenna 1, 802.11a, Ch. 36 = 5180 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 193 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (BAND EDGE)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #193

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
5148.353	27.4	36.3	1.61	109.0	0.5	0.0	Horz	AV	-15.6	48.1	54.0	-5.9	Ch. 36, 36 Mbps, EUT Vert
5149.470	42.4	36.3	1.61	109.0	0.5	0.0	Horz	PK	-15.6	63.1	74.0	-10.9	Ch. 36, 36 Mbps, EUT Vert

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies in each operational band and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axes if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2013). A preamp and high pass filter (and notch filter) were used for this test to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of 10*log(1/dc).

TEST EQUIPMENT – MN05

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2024-03-13	2025-03-13
Antenna - Double Ridge	ETS Lindgren	3115	AIP	2024-08-02	2026-08-02
Antenna - Standard Gain	ETS Lindgren	3160-07	AXP	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-08	AIQ	NCR	NCR
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	2024-01-08	2025-01-08
Cable	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	2024-01-28	2025-01-28
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	2024-01-08	2025-01-08
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	2024-01-08	2025-01-08
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	2024-01-08	2025-01-08
Attenuator	Fairview Microwave	SA18H-20	VAF	2024-08-25	2025-08-25
Filter - High Pass	Micro-Tronics	HPM50111	LFN	2024-08-25	2025-08-25

TEST EQUIPMENT – EV01

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2023-10-04	2024-10-04
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	NCR
Cable	None	Standard Gain Horn Cables	EVF	2023-10-31	2024-10-31
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2023-10-31	2024-10-31

FREQUENCY RANGE INVESTIGATED

1000 MHz TO 18000 MHz

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

IRRI0024-1
IRRI0024-9

MODES INVESTIGATED

Transmitting Antenna 1, WiFi 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, Ch. 48 = 5240 MHz, Ch. 149. = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz
Transmitting Antenna 2, WiFi 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, Ch. 48 = 5240 MHz, Ch. 149. = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Sprinkler with Controller Model 705101	Work Order:	IRRI0024
Serial Number:	900636 RevA1 Unit A	Date:	2024-07-11
Customer:	IrriGreen, Inc.	Temperature:	21.9°C
Attendees:	Seth Hammond	Relative Humidity:	57.3%
Customer Project:	None	Bar. Pressure (PMSL):	1018 mb
Tested By:	Arnauld Dedry	Job Site:	MN05
Power:	110VAC/60Hz	Configuration:	IRRI0024-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	59	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

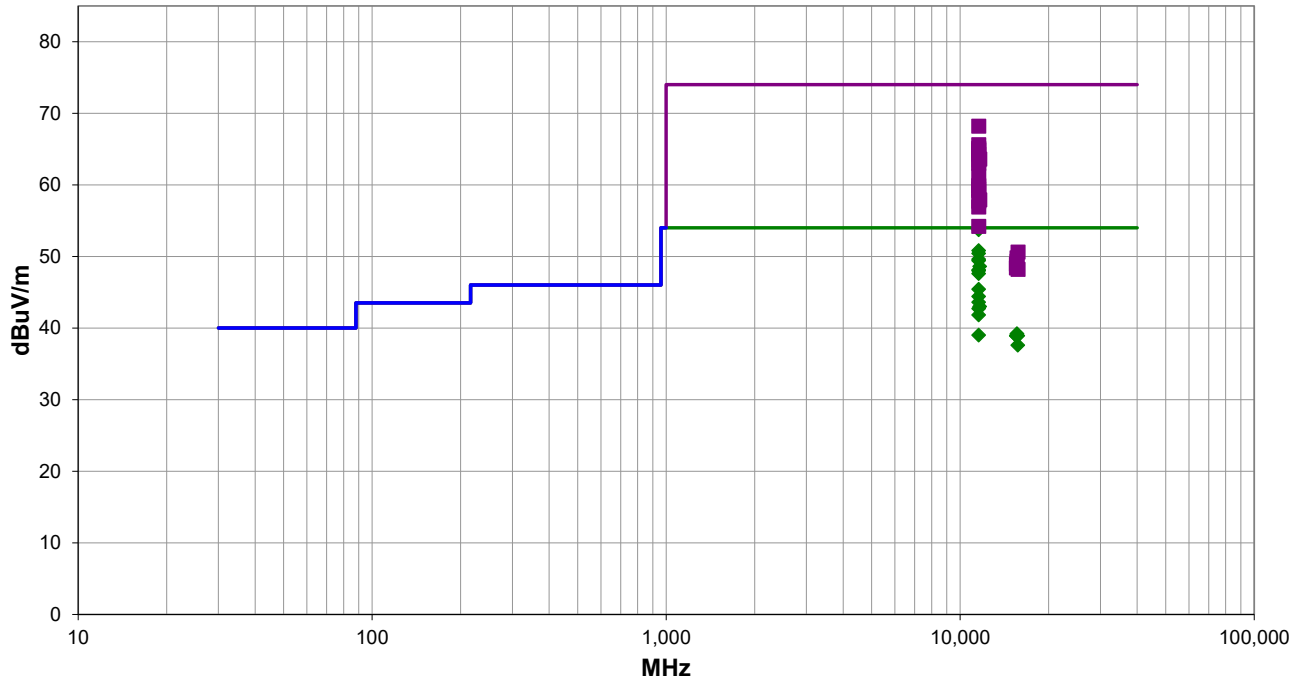
Please reference data comments below for EUT orientation, Channel and Data Rate.

EUT OPERATING MODES

Transmitting Antenna 1 WiFi 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, Ch. 48 = 5240 MHz, Ch. 149. = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 59 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #59

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
11571.480	55.9	-2.5	1.0	12.0	0.3	0.0	Horz	AV	0.0	53.7	54.0	-0.3	EUT Vert, Ch 157, 6 Mbps
11571.410	53.0	-2.5	3.0	322.0	0.3	0.0	Horz	AV	0.0	50.8	54.0	-3.2	EUT On Side, Ch 157, 6 Mbps
11571.400	52.6	-2.5	1.9	293.9	0.3	0.0	Vert	AV	0.0	50.4	54.0	-3.6	EUT On Side, Ch 157, 6 Mbps
11570.460	51.7	-2.5	1.1	296.0	0.4	0.0	Vert	AV	0.0	49.6	54.0	-4.4	EUT On Side, Ch 157, MCS0
11571.440	51.6	-2.5	4.0	27.0	0.3	0.0	Vert	AV	0.0	49.4	54.0	-4.6	EUT Horz, Ch 157, 6 Mbps
11649.930	51.0	-2.7	2.2	56.9	0.3	0.0	Horz	AV	0.0	48.6	54.0	-5.4	EUT Vert, Ch 165, 6 Mbps
11571.230	70.7	-2.5	1.0	12.0	0.0	0.0	Horz	PK	0.0	68.2	74.0	-5.8	EUT Vert, Ch 157, 6 Mbps
11569.560	44.9	-2.5	2.1	12.9	5.6	0.0	Horz	AV	0.0	48.0	54.0	-6.0	EUT Vert, Ch 157, 54 Mbps
11569.510	46.4	-2.5	2.2	41.0	3.7	0.0	Horz	AV	0.0	47.6	54.0	-6.4	EUT Vert, Ch 157, 36 Mbps
11571.030	68.1	-2.5	3.0	322.0	0.0	0.0	Horz	PK	0.0	65.6	74.0	-8.4	EUT On Side, Ch 157, 6 Mbps
11570.480	44.2	-2.5	1.2	85.9	3.7	0.0	Vert	AV	0.0	45.4	54.0	-8.6	EUT On Side, Ch 157, 36 Mbps
11569.500	67.6	-2.5	1.1	296.0	0.0	0.0	Vert	PK	0.0	65.1	74.0	-8.9	EUT On Side, Ch 157, MCS0
11569.510	41.5	-2.5	2.2	36.0	6.1	0.0	Horz	AV	0.0	45.1	54.0	-8.9	EUT Vert, Ch 157, MCS7
11571.660	67.4	-2.5	1.9	293.9	0.0	0.0	Vert	PK	0.0	64.9	74.0	-9.1	EUT On Side, Ch 157, 6 Mbps
11569.590	41.3	-2.5	1.9	270.0	5.6	0.0	Vert	AV	0.0	44.4	54.0	-9.6	EUT On Side, Ch 157, 54 Mbps
11571.330	66.8	-2.5	4.0	27.0	0.0	0.0	Vert	PK	0.0	64.3	74.0	-9.7	EUT Horz, Ch 157, 6 Mbps
11650.130	66.2	-2.6	2.2	56.9	0.0	0.0	Horz	PK	0.0	63.6	74.0	-10.4	EUT Vert, Ch 165, 6 Mbps
11568.660	45.8	-2.5	2.1	109.9	0.3	0.0	Vert	AV	0.0	43.6	54.0	-10.4	EUT Vert, Ch 157, 6 Mbps
11569.510	65.9	-2.5	2.2	41.0	0.0	0.0	Horz	PK	0.0	63.4	74.0	-10.6	EUT Vert, Ch 157, 36 Mbps
11651.220	45.3	-2.6	1.7	285.0	0.3	0.0	Vert	AV	0.0	43.0	54.0	-11.0	EUT On Side, Ch 165, 6 Mbps
11569.540	65.5	-2.5	2.1	12.9	0.0	0.0	Horz	PK	0.0	63.0	74.0	-11.0	EUT Vert, Ch 157, 54 Mbps
11569.530	44.8	-2.5	4.0	326.9	0.4	0.0	Horz	AV	0.0	42.7	54.0	-11.3	EUT Vert, Ch 157, MCS0
11571.490	44.0	-2.5	1.2	48.9	0.3	0.0	Horz	AV	0.0	41.8	54.0	-12.2	EUT Horz, Ch 157, 6 Mbps
11569.570	63.8	-2.5	1.2	85.9	0.0	0.0	Vert	PK	0.0	61.3	74.0	-12.7	EUT On Side, Ch 157, 36 Mbps
11569.670	62.4	-2.5	1.9	270.0	0.0	0.0	Vert	PK	0.0	59.9	74.0	-14.1	EUT On Side, Ch 157, 54 Mbps
11569.560	61.9	-2.5	2.2	36.0	0.0	0.0	Horz	PK	0.0	59.4	74.0	-14.6	EUT Vert, Ch 157, MCS7
11569.520	61.7	-2.5	4.0	326.9	0.0	0.0	Horz	PK	0.0	59.2	74.0	-14.8	EUT Vert, Ch 157, MCS0
15601.980	30.4	8.5	1.0	275.9	0.3	0.0	Vert	AV	0.0	39.2	54.0	-14.8	EUT On Side, Ch 40, 6 Mbps
11569.500	37.8	-2.5	1.5	120.9	3.7	0.0	Vert	AV	0.0	39.0	54.0	-15.0	EUT On Side, Ch 157, MCS7
15598.820	30.1	8.5	1.5	70.9	0.3	0.0	Horz	AV	0.0	38.9	54.0	-15.1	EUT Vert, Ch 40, 6 Mbps
15538.280	30.1	8.5	1.0	299.0	0.3	0.0	Horz	AV	0.0	38.9	54.0	-15.1	EUT Vert, Ch 36, 6 Mbps
15537.600	30.1	8.5	1.7	348.9	0.3	0.0	Vert	AV	0.0	38.9	54.0	-15.1	EUT On Side, Ch 36, 6 Mbps
15718.610	30.9	7.7	2.1	56.9	0.3	0.0	Horz	AV	0.0	38.9	54.0	-15.1	EUT Vert, Ch 48, 6 Mbps
11651.060	60.5	-2.6	1.7	285.0	0.0	0.0	Vert	PK	0.0	57.9	74.0	-16.1	EUT On Side, Ch 165, 6 Mbps
11568.620	60.2	-2.5	2.1	109.9	0.0	0.0	Vert	PK	0.0	57.7	74.0	-16.3	EUT Vert, Ch 157, 6 Mbps
15718.480	29.6	7.7	1.5	41.0	0.3	0.0	Vert	AV	0.0	37.6	54.0	-16.4	EUT On Side, Ch 48, 6 Mbps
11571.360	59.4	-2.5	1.2	48.9	0.0	0.0	Horz	PK	0.0	56.9	74.0	-17.1	EUT Horz, Ch 157, 6 Mbps
11569.530	56.7	-2.5	1.5	120.9	0.0	0.0	Vert	PK	0.0	54.2	74.0	-19.8	EUT On Side, Ch 157, MCS7
15719.500	42.9	7.7	2.1	56.9	0.0	0.0	Horz	PK	0.0	50.6	74.0	-23.4	EUT Vert, Ch 48, 6 Mbps

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
15599.050	41.3	8.5	1.0	275.9	0.0	0.0	Vert	PK	0.0	49.8	74.0	-24.2	EUT On Side, Ch 40, 6 Mbps
15601.330	40.8	8.5	1.5	70.9	0.0	0.0	Horz	PK	0.0	49.3	74.0	-24.7	EUT Vert, Ch 40, 6 Mbps
15539.000	40.4	8.5	1.7	348.9	0.0	0.0	Vert	PK	0.0	48.9	74.0	-25.1	EUT On Side, Ch 36, 6 Mbps
15538.500	39.9	8.5	1.0	299.0	0.0	0.0	Horz	PK	0.0	48.4	74.0	-25.6	EUT Vert, Ch 36, 6 Mbps
15720.480	40.5	7.7	1.5	41.0	0.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	EUT On Side, Ch 48, 6 Mbps

CONCLUSION
Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Sprinkler with Controller Model 705101	Work Order:	IRRI0024
Serial Number:	900636 RevA1 Unit A	Date:	2024-07-11
Customer:	IrriGreen, Inc.	Temperature:	21.9°C
Attendees:	Seth Hammond	Relative Humidity:	57.3%
Customer Project:	None	Bar. Pressure (PMSL):	1018 mb
Tested By:	Arnauld Dedry	Job Site:	MN05
Power:	110VAC/60Hz	Configuration:	IRRI0024-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	61	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

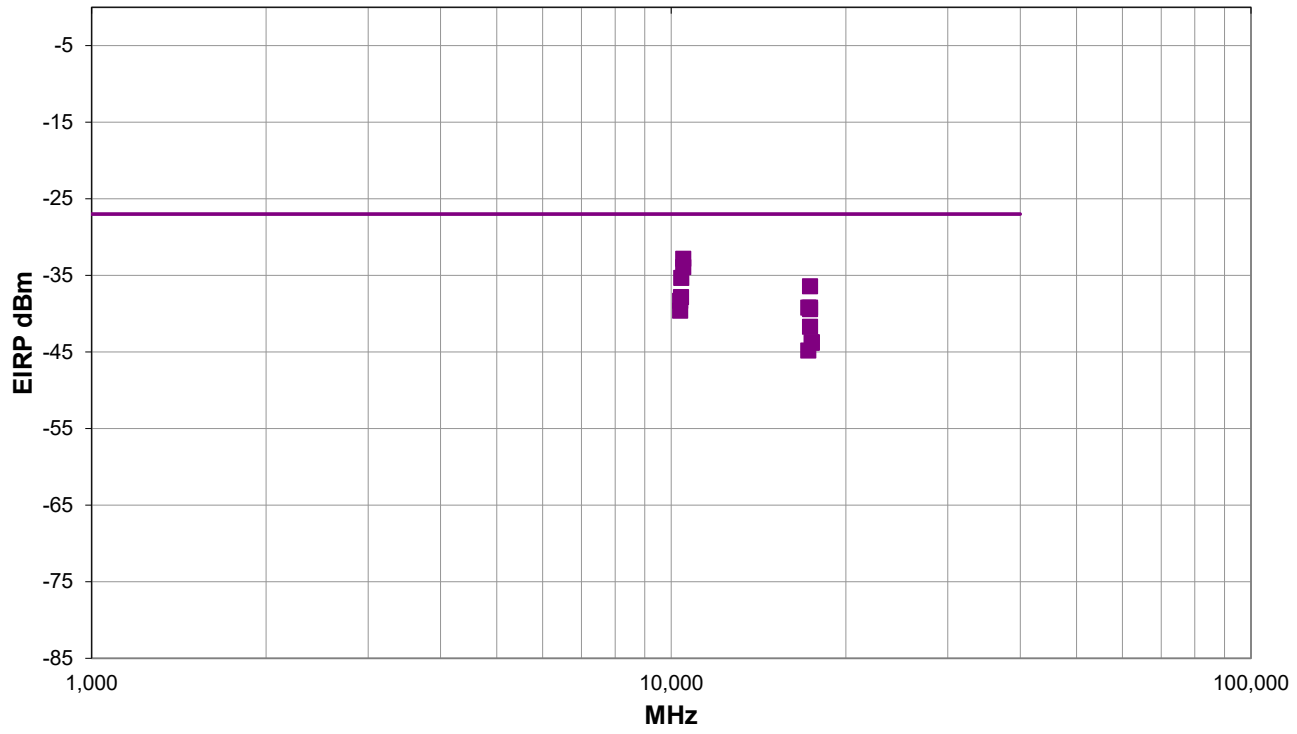
Please reference data comments below for EUT orientation, Channel and Data Rate.

EUT OPERATING MODES

Transmitting Antenna 1 WiFi 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, Ch. 48 = 5240 MHz, Ch. 149. = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 61 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #61

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
10482.420	2.0	78.9	Vert	PK	521.3E-9	-32.8	-27.0	-5.8	EUT On Side, Ch 48, 6 mbps
10482.390	1.0	16.9	Horz	PK	404.7E-9	-33.9	-27.0	-6.9	EUT Vert, Ch 48, 6 Mbps
10401.260	2.0	81.9	Vert	PK	293.2E-9	-35.3	-27.0	-8.3	EUT On Side, Ch 40, 6 Mbps
17354.260	3.2	274.0	Horz	PK	227.6E-9	-36.4	-27.0	-9.4	EUT Vert, Ch 157, 6 Mpbs
10398.760	2.3	59.9	Horz	PK	164.9E-9	-37.8	-27.0	-10.8	EUT Vert, Ch 40, 6 Mbps
10360.530	1.9	77.0	Vert	PK	146.9E-9	-38.3	-27.0	-11.3	EUT On Side, Ch 36, 6 Mbps
17353.270	3.7	8.0	Vert	PK	119.4E-9	-39.2	-27.0	-12.2	EUT Vert, Ch 157, 6 Mpbs
17235.320	3.1	300.9	Horz	PK	119.4E-9	-39.2	-27.0	-12.2	EUT Vert, Ch 149, 6 Mpbs
17354.380	2.8	311.9	Horz	PK	114.1E-9	-39.4	-27.0	-12.4	EUT On Side, Ch 157, 6 Mpbs
10361.870	2.3	29.0	Horz	PK	108.9E-9	-39.6	-27.0	-12.6	EUT Vert, Ch 36, 6 Mbps
17354.870	1.5	250.0	Vert	PK	67.2E-9	-41.7	-27.0	-14.7	EUT On Side, Ch 157, 6 Mpbs
17476.070	1.5	235.9	Vert	PK	42.4E-9	-43.7	-27.0	-16.7	EUT On Side, Ch 165, 6 Mpbs
17474.720	3.1	267.0	Horz	PK	41.4E-9	-43.8	-27.0	-16.8	EUT Vert, Ch 165, 6 Mpbs
17237.380	1.5	235.9	Vert	PK	32.9E-9	-44.8	-27.0	-17.8	EUT On Side, Ch 149, 6 Mpbs

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Sprinkler with Controller Model 705101	Work Order:	IRRI0024
Serial Number:	900636 RevA1 Unit A	Date:	2024-07-12
Customer:	IrriGreen, Inc.	Temperature:	21.8°C
Attendees:	Seth Hammond	Relative Humidity:	56.1%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mb
Tested By:	Arnauld Dedry	Job Site:	MN05
Power:	110VAC/60Hz	Configuration:	IRRI0024-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	77	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

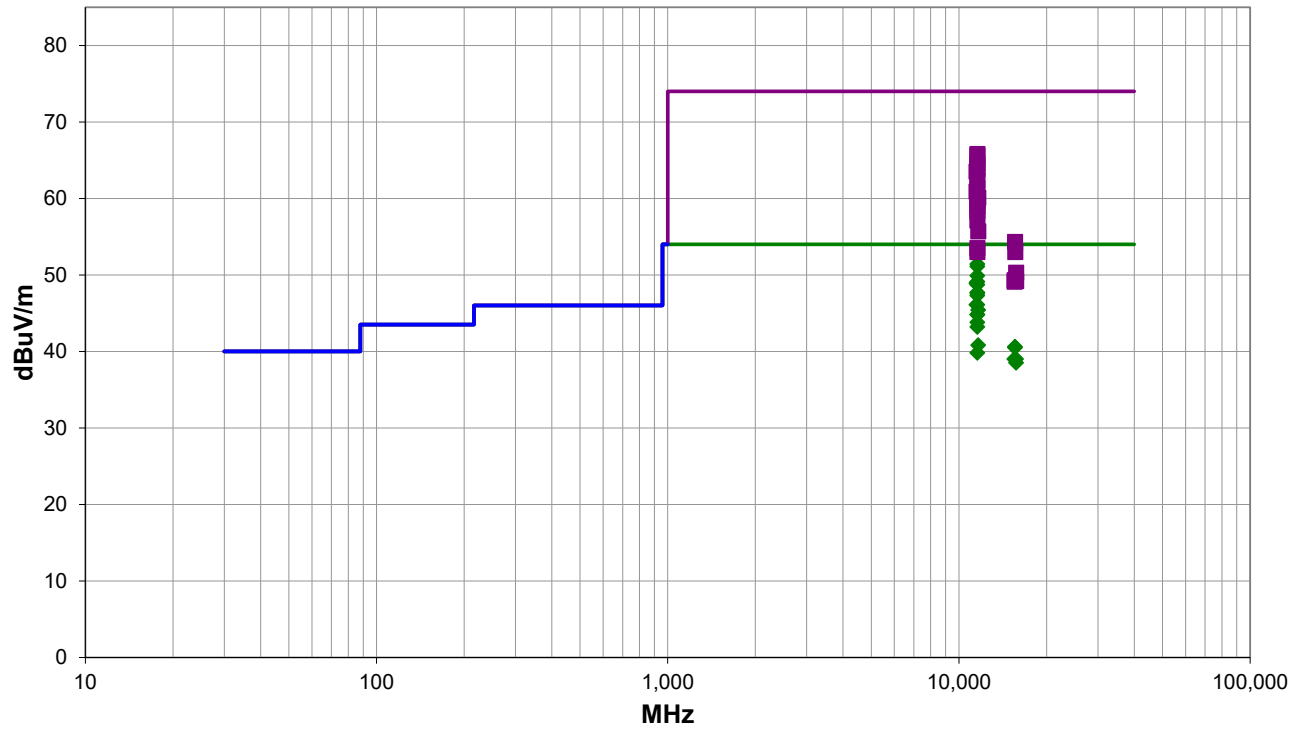
Please reference data comments below for EUT orientation, Channel and Data Rate.

EUT OPERATING MODES

Transmitting Antenna 2, WiFi 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, Ch. 48 = 5240 MHz, Ch. 149. = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 77 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #77

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
11571.410	53.6	-2.5	2.2	63.0	0.3	0.0	Horz	AV	0.0	51.4	54.0	-2.6	EUT Vert, Ch 157, 6 Mbps
11568.830	53.2	-2.5	2.2	63.9	0.4	0.0	Horz	AV	0.0	51.1	54.0	-2.9	EUT Vert, Ch 157, MCS0
11568.640	52.1	-2.5	1.7	324.0	0.3	0.0	Horz	AV	0.0	49.9	54.0	-4.1	EUT On Side, Ch 157, 6 Mbps
11571.440	47.9	-2.5	3.2	40.0	3.7	0.0	Horz	AV	0.0	49.1	54.0	-4.9	EUT Vert, Ch 157, 36 Mbps
11488.690	51.2	-2.6	2.1	9.0	0.3	0.0	Horz	AV	0.0	48.9	54.0	-5.1	EUT Vert, Ch 149, 6 Mbps
11568.730	49.9	-2.5	1.2	297.0	0.3	0.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT On Side, Ch 157, 6 Mbps
11571.390	49.7	-2.5	3.4	281.0	0.4	0.0	Vert	AV	0.0	47.6	54.0	-6.4	EUT On Side, Ch 157, MCS0
11571.490	49.5	-2.5	3.4	48.0	0.3	0.0	Vert	AV	0.0	47.3	54.0	-6.7	EUT Horz, Ch 157, 6 Mbps
11568.930	43.0	-2.5	2.2	62.0	5.6	0.0	Horz	AV	0.0	46.1	54.0	-7.9	EUT Vert, Ch 157, 54 Mbps
11488.810	48.4	-2.6	2.3	294.9	0.3	0.0	Vert	AV	0.0	46.1	54.0	-7.9	EUT On Side, Ch 149, 6 Mbps
11571.450	68.3	-2.5	2.2	63.0	0.0	0.0	Horz	PK	0.0	65.8	74.0	-8.2	EUT Vert, Ch 157, 6 Mbps
11568.810	42.1	-2.5	2.2	63.0	6.1	0.0	Horz	AV	0.0	45.7	54.0	-8.3	EUT Vert, Ch 157, MCS7
11568.430	68.1	-2.5	2.2	63.9	0.0	0.0	Horz	PK	0.0	65.6	74.0	-8.4	EUT Vert, Ch 157, MCS0
11650.330	47.7	-2.6	2.1	67.9	0.3	0.0	Horz	AV	0.0	45.4	54.0	-8.6	EUT Vert, Ch 165, 6 Mbps
11568.640	47.0	-2.5	4.0	6.9	0.3	0.0	Vert	AV	0.0	44.8	54.0	-9.2	EUT Vert, Ch 157, 6 Mbps
11568.780	38.2	-2.5	2.0	270.0	9.1	0.0	Vert	AV	0.0	44.8	54.0	-9.2	EUT On Side, Ch 157, MCS7
11571.660	67.1	-2.5	1.7	324.0	0.0	0.0	Horz	PK	0.0	64.6	74.0	-9.4	EUT On Side, Ch 157, 6 Mbps
11571.590	66.5	-2.5	3.2	40.0	0.0	0.0	Horz	PK	0.0	64.0	74.0	-10.0	EUT Vert, Ch 157, 36 Mbps
11571.510	42.6	-2.5	3.7	267.0	3.7	0.0	Vert	AV	0.0	43.8	54.0	-10.2	EUT On Side, Ch 157, 36 Mbps
11567.780	66.2	-2.5	3.4	281.0	0.0	0.0	Vert	PK	0.0	63.7	74.0	-10.3	EUT On Side, Ch 157, MCS0
11491.330	66.1	-2.6	2.1	9.0	0.0	0.0	Horz	PK	0.0	63.5	74.0	-10.5	EUT Vert, Ch 149, 6 Mbps
11569.000	40.1	-2.5	4.0	263.0	5.6	0.0	Vert	AV	0.0	43.2	54.0	-10.8	EUT On Side, Ch 157, 54 Mbps
11571.630	64.8	-2.5	1.2	297.0	0.0	0.0	Vert	PK	0.0	62.3	74.0	-11.7	EUT On Side, Ch 157, 6 Mbps
11571.120	63.9	-2.5	3.4	48.0	0.0	0.0	Vert	PK	0.0	61.4	74.0	-12.6	EUT Horz, Ch 157, 6 Mbps
11491.270	63.5	-2.6	2.3	294.9	0.0	0.0	Vert	PK	0.0	60.9	74.0	-13.1	EUT On Side, Ch 149, 6 Mbps
11650.340	43.1	-2.6	1.9	261.0	0.3	0.0	Vert	AV	0.0	40.8	54.0	-13.2	EUT On Side, Ch 165, 6 Mbps
15597.580	31.8	8.5	2.0	340.9	0.3	0.0	Horz	AV	0.0	40.6	54.0	-13.4	EUT Vert, Ch 40, 6 Mbps
15598.720	31.7	8.5	3.5	225.0	0.3	0.0	Vert	AV	0.0	40.5	54.0	-13.5	EUT On Side, Ch 40, 6 Mbps
11649.970	62.8	-2.7	2.1	67.9	0.0	0.0	Horz	PK	0.0	60.1	74.0	-13.9	EUT Vert, Ch 165, 6 Mbps
11568.720	42.0	-2.5	1.4	81.9	0.3	0.0	Horz	AV	0.0	39.8	54.0	-14.2	EUT Horz, Ch 157, 6 Mbps
11569.420	62.2	-2.5	2.2	62.0	0.0	0.0	Horz	PK	0.0	59.7	74.0	-14.3	EUT Vert, Ch 157, 54 Mbps
11571.460	61.6	-2.5	4.0	6.9	0.0	0.0	Vert	PK	0.0	59.1	74.0	-14.9	EUT Vert, Ch 157, 6 Mbps
15718.690	31.0	7.7	3.5	239.0	0.3	0.0	Vert	AV	0.0	39.0	54.0	-15.0	EUT On Side, Ch 48, 6 Mbps
15537.670	30.2	8.5	1.5	66.0	0.3	0.0	Horz	AV	0.0	39.0	54.0	-15.0	EUT Vert, Ch 36, 6 Mbps
15537.880	30.2	8.5	1.5	207.9	0.3	0.0	Vert	AV	0.0	39.0	54.0	-15.0	EUT On Side, Ch 36, 6 Mbps
11568.460	61.5	-2.5	3.7	267.0	0.0	0.0	Vert	PK	0.0	59.0	74.0	-15.0	EUT On Side, Ch 157, 36 Mbps
15718.380	30.5	7.7	1.5	2.9	0.3	0.0	Horz	AV	0.0	38.5	54.0	-15.5	EUT Vert, Ch 48, 6 Mbps
11568.780	60.8	-2.5	2.2	63.0	0.0	0.0	Horz	PK	0.0	58.3	74.0	-15.7	EUT Vert, Ch 157, MCS7
11569.480	59.6	-2.5	4.0	263.0	0.0	0.0	Vert	PK	0.0	57.1	74.0	-16.9	EUT On Side, Ch 157, 54 Mbps

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
11648.680	58.4	-2.7	1.9	261.0	0.0	0.0	Vert	PK	0.0	55.7	74.0	-18.3	EUT On Side, Ch 165, 6 Mbps
15600.000	45.8	8.5	3.5	225.0	0.0	0.0	Vert	PK	0.0	54.3	74.0	-19.7	EUT On Side, Ch 40, 6 Mbps
11571.520	56.0	-2.5	1.4	81.9	0.0	0.0	Horz	PK	0.0	53.5	74.0	-20.5	EUT Horz, Ch 157, 6 Mbps
15601.230	44.5	8.5	2.0	340.9	0.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	EUT Vert, Ch 40, 6 Mbps
11569.130	55.5	-2.5	2.0	270.0	0.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	EUT On Side, Ch 157, MCS7
15720.820	42.6	7.7	3.5	239.0	0.0	0.0	Vert	PK	0.0	50.3	74.0	-23.7	EUT On Side, Ch 48, 6 Mbps
15539.840	40.8	8.5	1.5	207.9	0.0	0.0	Vert	PK	0.0	49.3	74.0	-24.7	EUT On Side, Ch 36, 6 Mbps
15718.840	41.5	7.7	1.5	2.9	0.0	0.0	Horz	PK	0.0	49.2	74.0	-24.8	EUT Vert, Ch 48, 6 Mbps
15538.860	40.6	8.5	1.5	66.0	0.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	EUT Vert, Ch 36, 6 Mbps

CONCLUSION
Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Sprinkler with Controller Model 705101	Work Order:	IRRI0024
Serial Number:	900636 RevA1 Unit A	Date:	2024-07-12
Customer:	IrriGreen, Inc.	Temperature:	21.8°C
Attendees:	Seth Hammond	Relative Humidity:	56.1%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mb
Tested By:	Arnauld Dedry	Job Site:	MN05
Power:	110VAC/60Hz	Configuration:	IRRI0024-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	79	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

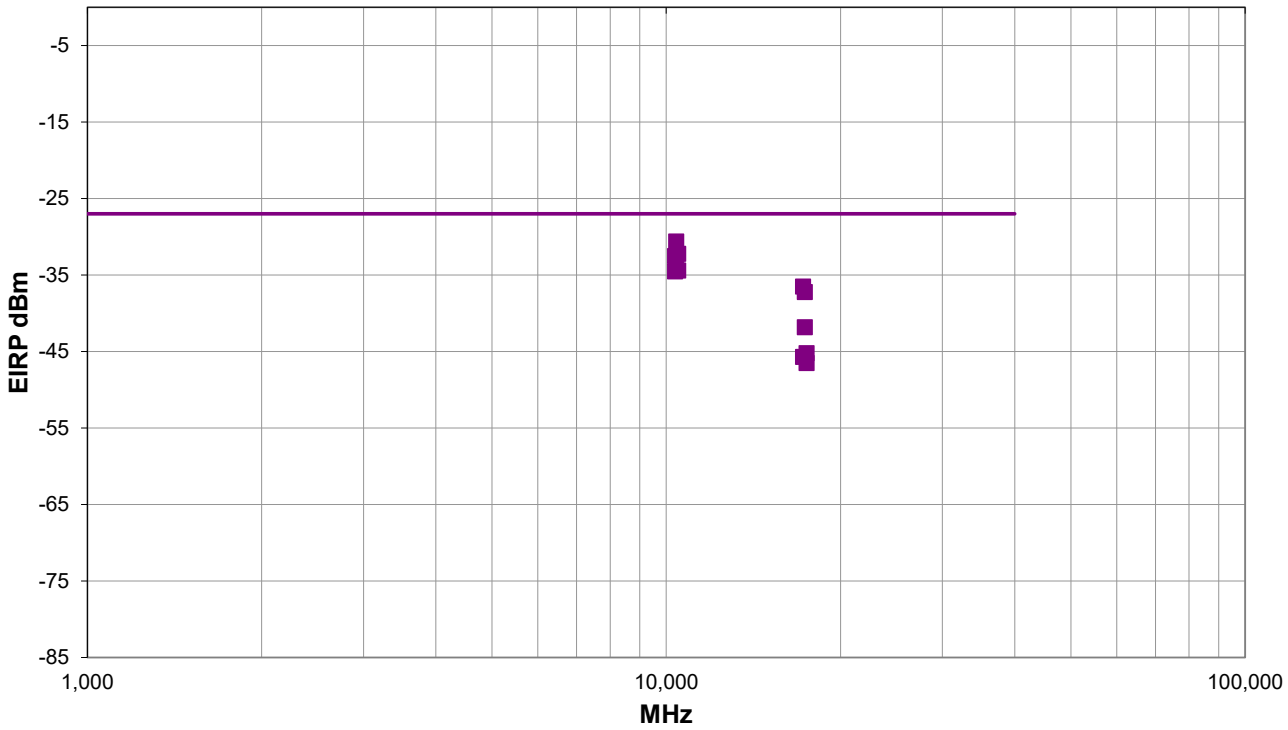
Please reference data comments below for EUT orientation, Channel and Data Rate.

EUT OPERATING MODES

Transmitting Antenna 2, WiFi 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, Ch. 48 = 5240 MHz, Ch. 149. = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 79 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #79

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
10401.130	2.6	294.9	Vert	PK	865.2E-9	-30.6	-27.0	-3.6	EUT On side, Ch 40, 6 Mbps
10481.420	2.0	297.0	Vert	PK	598.6E-9	-32.2	-27.0	-5.2	EUT On Side, Ch 48, 6 Mbps
10362.230	3.4	37.0	Horz	PK	558.6E-9	-32.5	-27.0	-5.5	EUT Vert, Ch 36, 6 Mbps
10401.960	3.9	45.9	Horz	PK	521.3E-9	-32.8	-27.0	-5.8	EUT Vert, Ch 40, 6 Mbps
10481.520	3.9	48.0	Horz	PK	360.7E-9	-34.4	-27.0	-7.4	EUT Vert, Ch 48, 6 Mbps
10358.880	4.0	289.0	Vert	PK	352.5E-9	-34.5	-27.0	-7.5	EUT On Side, Ch 36, 6 Mbps
17234.800	3.0	307.9	Horz	PK	222.4E-9	-36.5	-27.0	-9.5	EUT Vert, Ch 149, 6 Mbps
17354.920	3.1	278.0	Horz	PK	189.3E-9	-37.2	-27.0	-10.2	EUT Vert, Ch 157, 6 Mbps
17353.530	1.5	243.9	Vert	PK	65.6E-9	-41.8	-27.0	-14.8	EUT On Side, Ch 157, 6 Mbps
17472.740	4.0	257.9	Vert	PK	30.0E-9	-45.2	-27.0	-18.2	EUT On Side, Ch 165, 6 Mbps
17237.120	1.5	124.9	Vert	PK	26.7E-9	-45.7	-27.0	-18.7	EUT On Side, Ch 149, 6 Mbps
17470.380	2.1	253.9	Horz	PK	22.2E-9	-46.5	-27.0	-19.5	EUT Vert, Ch 165, 6 Mbps

CONCLUSION

Pass

Arnaud Fee

Tested By

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-11
Customer:	IrriGreen, Inc.	Temperature:	21.7°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1008 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	188	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

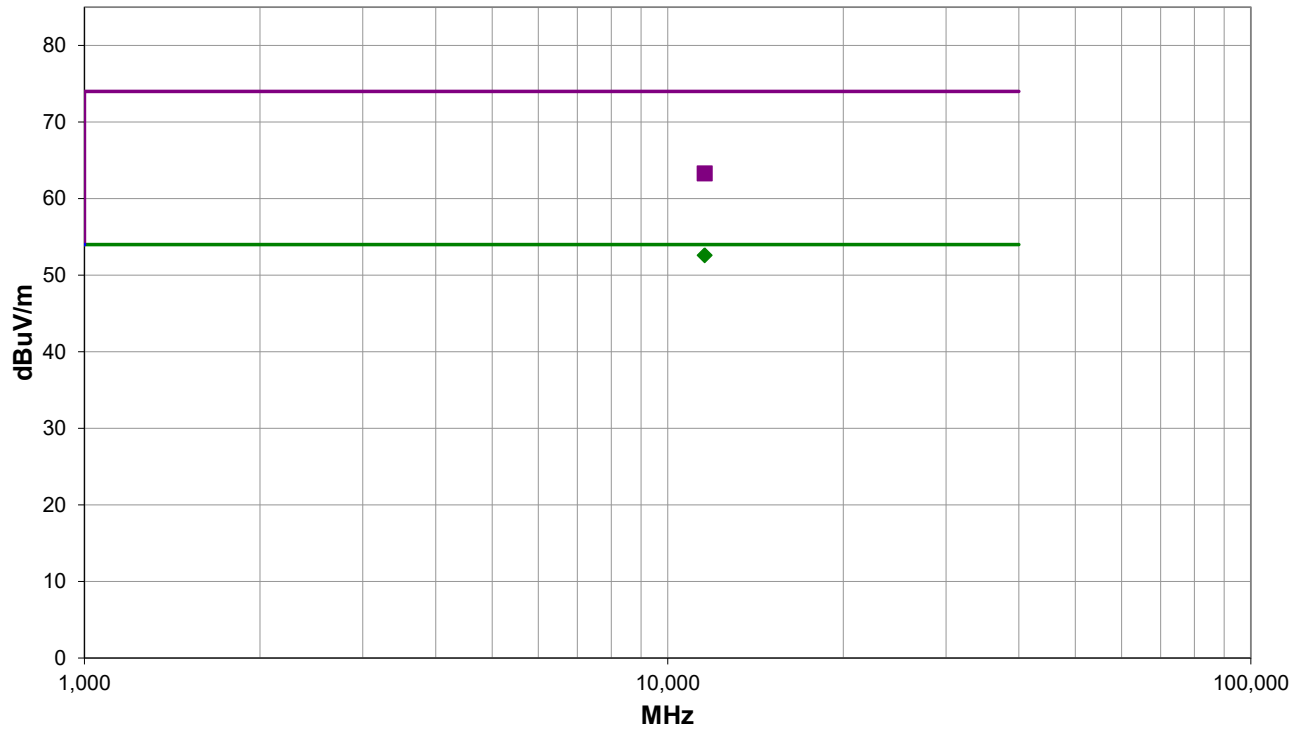
Please reference data comments below for channel, data rate, and EUT orientation. Spot-checking worst-case harmonic.

EUT OPERATING MODES

Transmitting Antenna 2 WiFi 802.11a Ch 36. = 5180 MHz, Ch. 40 = 5200, Ch. 48 = 5240 MHz, Ch. 149 = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 188 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #188

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
11570.000	52.7	-0.4	1.52	349.0	0.3	0.0	Horz	AV	0.0	52.6	54.0	-1.4	Ch. 157, 6 Mbps, EUT Vert
11570.980	63.7	-0.4	1.52	349.0	0.0	0.0	Horz	PK	0.0	63.3	74.0	-10.7	Ch. 157, 6 Mbps, EUT Vert

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-11
Customer:	IrriGreen, Inc.	Temperature:	21.7°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1008 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	189	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

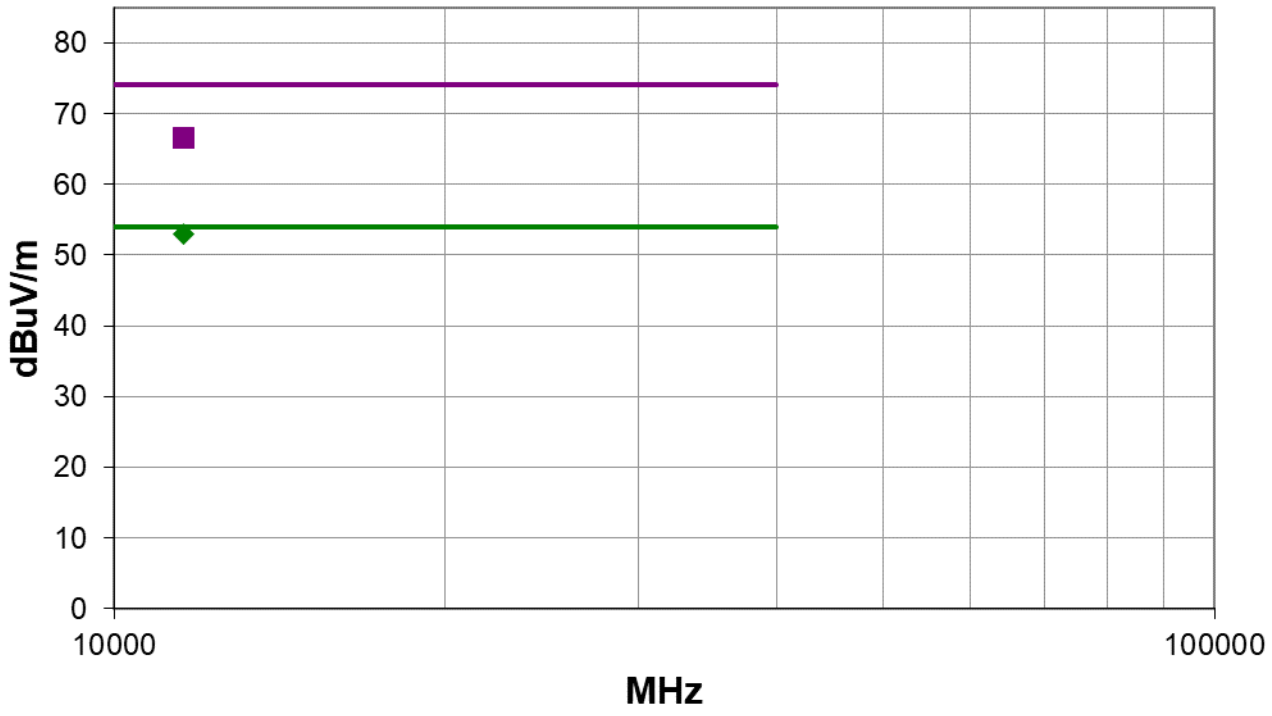
Please reference data comments below for channel, data rate, and EUT orientation. Spot-checking worst-case emissions. Average measurement performed using FCC KDB 789033 DO2 General UNII Test Procedures New Rules v02r01 as called out in sections II.G.5 and II.G.6.d. Method VB (Averaging using reduced video bandwidth)

EUT OPERATING MODES

Transmitting Antenna 1 WiFi 802.11a Ch 36. = 5180 MHz, Ch. 40 = 5200, Ch. 48 = 5240 MHz, Ch. 149 = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 189 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #189

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
11570.000	53.3	-0.4	1.08	17.0	0.0	Horz	AV	0.0	52.9	54.0	-1.1	Ch. 157, 6 Mbps, EUT Vert, Sprinkler
11570.990	66.9	-0.4	1.08	16.0	0.0	Horz	PK	0.0	66.5	74.0	-7.5	Ch. 157, 6 Mbps, EUT Vert, Sprinkler

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-11
Customer:	IrriGreen, Inc.	Temperature:	21.7°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1008 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	190	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

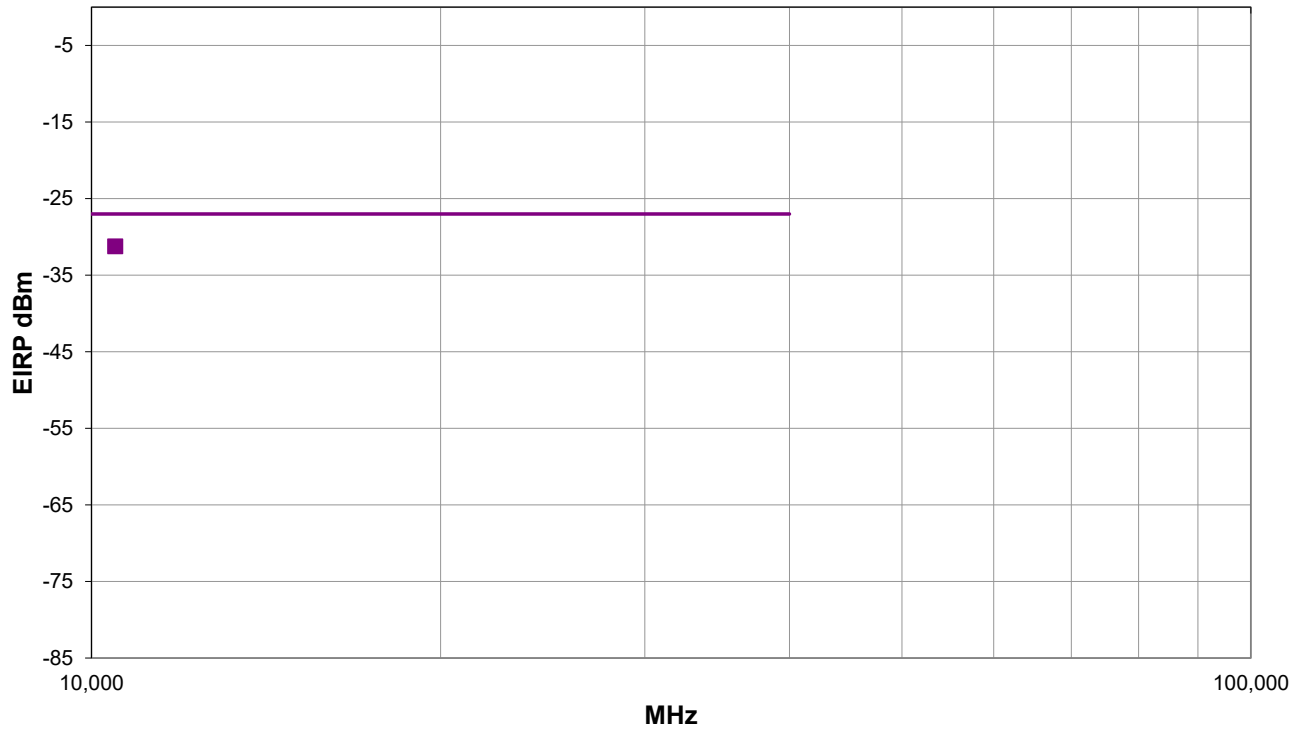
Please reference data comments below for channel, data rate, and EUT orientation. Spot-checking worst-case harmonic

EUT OPERATING MODES

Transmitting Antenna 1 WiFi 802.11a Ch 36. = 5180 MHz, Ch. 40 = 5200, Ch. 48 = 5240 MHz, Ch. 149 = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 190 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #190

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
10480.990	2.35	27.0	Vert	PK	753.6E-9	-31.2	-27.0	-4.2	Ch. 48, EUT on Side, 6 Mbps

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-09-11
Customer:	IrriGreen, Inc.	Temperature:	21.7°C
Attendees:	None	Relative Humidity:	47.7%
Customer Project:	None	Bar. Pressure (PMSL):	1008 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	191	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

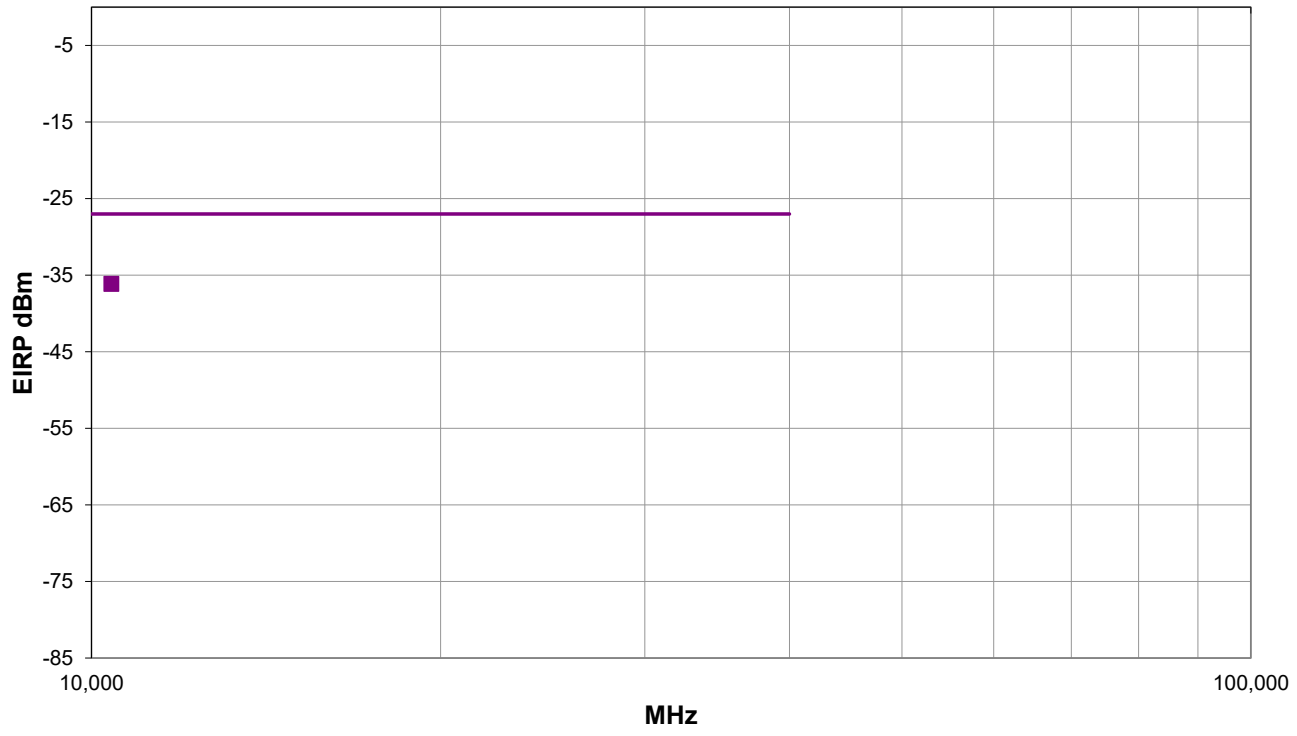
Please reference data comments below for channel, data rate, and EUT orientation. Spot-checking worst-case harmonic.

EUT OPERATING MODES

Transmitting Antenna 2 WiFi 802.11a Ch 36. = 5180 MHz, Ch. 40 = 5200, Ch. 48 = 5240 MHz, Ch. 149 = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 191 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #191

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
10401.450	3.98	74.0	Horz	PK	243.8E-9	-36.1	-27.0	-9.1	Ch. 40, 6 Mbps, EUT on Side

CONCLUSION
Pass

Tested By

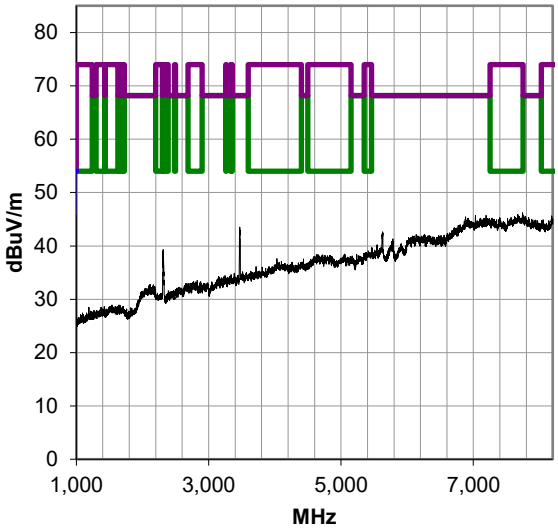
SPURIOUS RADIATED EMISSIONS – (1-18 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

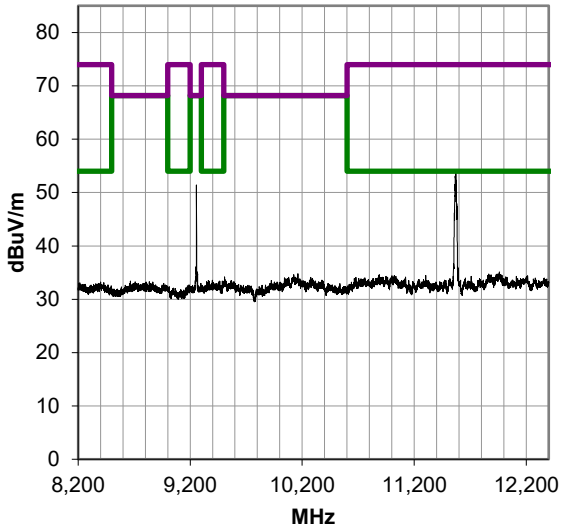
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

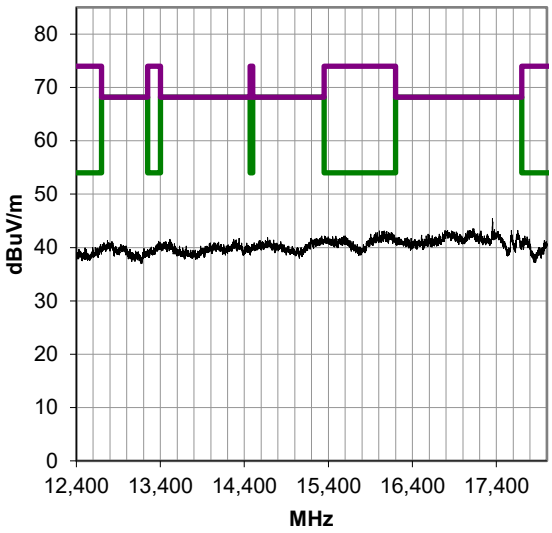
1000-8200 MHz, Run 54



8200-12400 MHz, Run 55



12400-18000 MHz, Run 56



SPURIOUS RADIATED EMISSIONS – (9kHz-1GHz, 18 GHz-40 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies in each operational band and the modes as shown in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axes if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2013). A preamp was used for this test to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements. If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of 10*log(1/dc).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2023-10-04	2024-10-04
Antenna - Loop	EMCO	6502	AOA	2024-07-31	2026-07-31
Antenna - Biconilog	EMCO	3142B	AXJ	2023-04-17	2025-04-17
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-10	AIW	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2023-11-05	2024-11-05
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	2024-07-09	2025-07-09
Amplifier - Pre-Amplifier	Miteq	JSW45-26004000-40-5P	PAE	2024-04-04	2025-04-04
Cable	N/A	Bilog Cables	EVA	2023-11-05	2024-11-05
Cable	ESM Cable Corp.	TTBJ141-KMKM-72	EVY	2024-07-09	2025-07-09
Cable	ESM Cable Corp.	KNKN-72 SMA Cable	EVZ	2024-04-04	2025-04-04

FREQUENCY RANGE INVESTIGATED

9 kHz TO 1 GHz
18 GHz TO 40 GHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

IRRI0024-3

MODES INVESTIGATED

Transmitting Antenna 1, 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, CH 48. = 5240 MHz, Ch. 149 = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz
Transmitting Antenna 2, 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, CH 48. = 5240 MHz, Ch. 149 = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

SPURIOUS RADIATED EMISSIONS – (9kHz-1GHz, 18 GHz-40 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-08-15
Customer:	IrriGreen, Inc.	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	48%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	118	Test Distance (m):	1.5	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

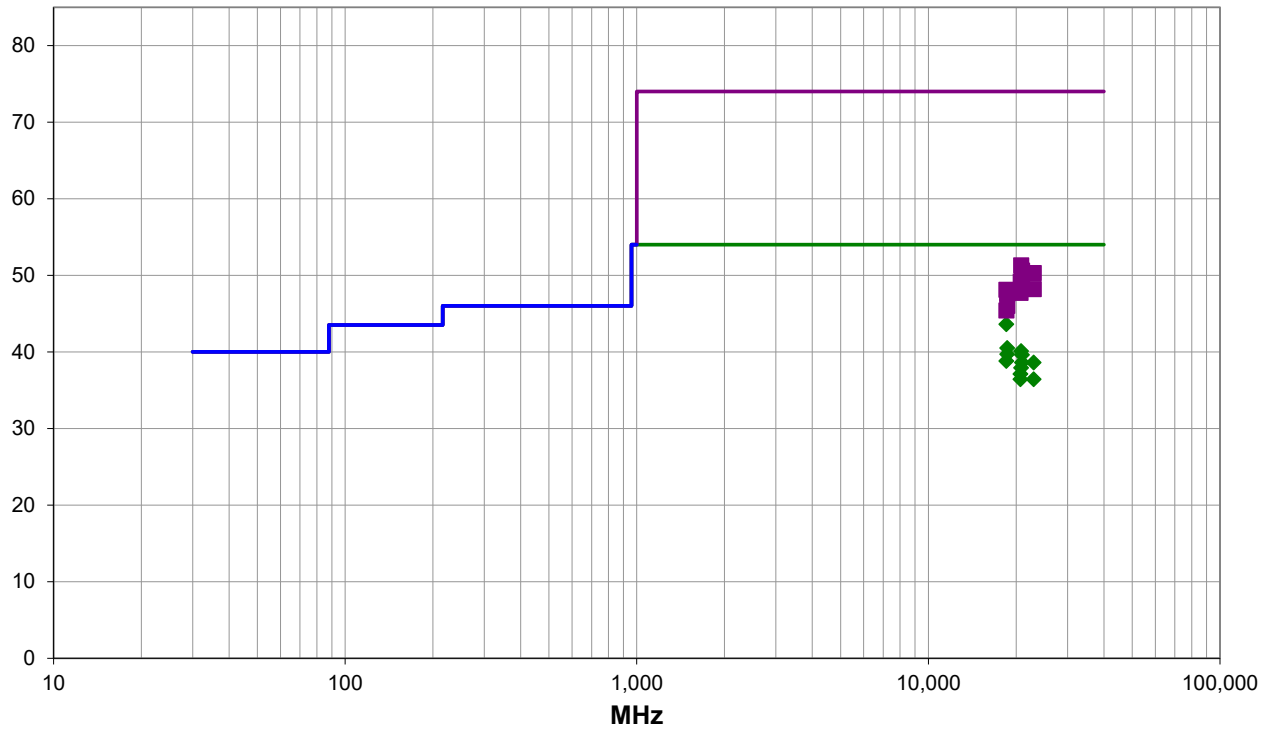
Please reference data comments below for Channel, Data Rate and EUT orientation.

EUT OPERATING MODES

Transmitting Antenna 1, 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, CH 48. = 5240 MHz, Ch. 149 = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 118 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (9kHz-1GHz, 18 GHz-40 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #118

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
18512.100	45.3	4.0	1.5	350.0	0.3	0.0	Vert	AV	-6.0	43.6	54.0	-10.4	Ch. 157, 6 Mbps, EUT on Side
18640.110	42.1	4.1	1.5	53.0	0.3	0.0	Horz	AV	-6.0	40.5	54.0	-13.5	Ch. 165, 6 Mbps, EUT Vert
20800.160	39.6	6.2	1.5	312.0	0.3	0.0	Horz	AV	-6.0	40.1	54.0	-13.9	Ch. 40, 6 Mbps, EUT Vert
18640.090	41.3	4.1	1.5	351.0	0.3	0.0	Vert	AV	-6.0	39.7	54.0	-14.3	Ch. 165, 6 Mbps, EUT on Side
20959.950	39.1	6.2	1.5	26.0	0.3	0.0	Vert	AV	-6.0	39.6	54.0	-14.4	Ch. 48, 6 Mbps, EUT on Side
18512.140	40.5	4.0	1.5	53.0	0.3	0.0	Horz	AV	-6.0	38.8	54.0	-15.2	Ch. 157, 6 Mbps, EUT Vert
22980.080	36.8	7.5	1.5	301.0	0.3	0.0	Horz	AV	-6.0	38.6	54.0	-15.4	Ch. 149, 6 Mbps, EUT Vert
20959.890	38.1	6.2	1.5	312.0	0.3	0.0	Horz	AV	-6.0	38.6	54.0	-15.4	Ch. 48, 6 Mbps, EUT Vert
20800.340	37.4	6.2	1.5	18.0	0.3	0.0	Vert	AV	-6.0	37.9	54.0	-16.1	Ch. 40, 6 Mbps, EUT on Side
20719.990	36.8	6.0	1.5	312.0	0.3	0.0	Horz	AV	-6.0	37.1	54.0	-16.9	Ch. 36, 6 Mbps, EUT Vert
20720.370	36.1	6.0	1.5	18.0	0.3	0.0	Vert	AV	-6.0	36.4	54.0	-17.6	Ch. 36, 6 Mbps, EUT on Side
22979.760	34.6	7.5	1.5	6.0	0.3	0.0	Vert	AV	-6.0	36.4	54.0	-17.6	Ch. 149, 6 Mbps, EUT on Side
20799.720	51.1	6.2	1.5	312.0	0.0	0.0	Horz	PK	-6.0	51.3	74.0	-22.7	Ch. 40, 6 Mbps, EUT Vert
20959.660	50.4	6.2	1.5	26.0	0.0	0.0	Vert	PK	-6.0	50.6	74.0	-23.4	Ch. 48, 6 Mbps, EUT on Side
22982.500	48.8	7.5	1.5	301.0	0.0	0.0	Horz	PK	-6.0	50.3	74.0	-23.7	Ch. 149, 6 Mbps, EUT Vert
20959.980	49.5	6.2	1.5	312.0	0.0	0.0	Horz	PK	-6.0	49.7	74.0	-24.3	Ch. 48, 6 Mbps, EUT Vert
20722.430	49.2	6.0	1.5	312.0	0.0	0.0	Horz	PK	-6.0	49.2	74.0	-24.8	Ch. 36, 6 Mbps, EUT Vert
20799.630	48.8	6.2	1.5	18.0	0.0	0.0	Vert	PK	-6.0	49.0	74.0	-25.0	Ch. 40, 6 Mbps, EUT on Side
22982.070	46.7	7.5	1.5	6.0	0.0	0.0	Vert	PK	-6.0	48.2	74.0	-25.8	Ch. 149, 6 Mbps, EUT on Side
18512.090	50.1	4.0	1.5	350.0	0.0	0.0	Vert	PK	-6.0	48.1	74.0	-25.9	Ch. 157, 6 Mbps, EUT on Side
20719.820	47.7	6.0	1.5	18.0	0.0	0.0	Vert	PK	-6.0	47.7	74.0	-26.3	Ch. 36, 6 Mbps, EUT on Side
18640.170	49.5	4.1	1.5	53.0	0.0	0.0	Horz	PK	-6.0	47.6	74.0	-26.4	Ch. 165, 6 Mbps, EUT Vert
18639.980	47.9	4.1	1.5	351.0	0.0	0.0	Vert	PK	-6.0	46.0	74.0	-28.0	Ch. 165, 6 Mbps, EUT on Side
18512.160	47.4	4.0	1.5	53.0	0.0	0.0	Horz	PK	-6.0	45.4	74.0	-28.6	Ch. 157, 6 Mbps, EUT Vert

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS – (9kHz-1GHz, 18 GHz-40 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

EUT:	Controller 3, Model 705101	Work Order:	IRRI0024
Serial Number:	1C:63:49:9D:4E:DC	Date:	2024-08-15
Customer:	IrriGreen, Inc.	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	48%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	IRRI0024-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	100	Test Distance (m):	1.5	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

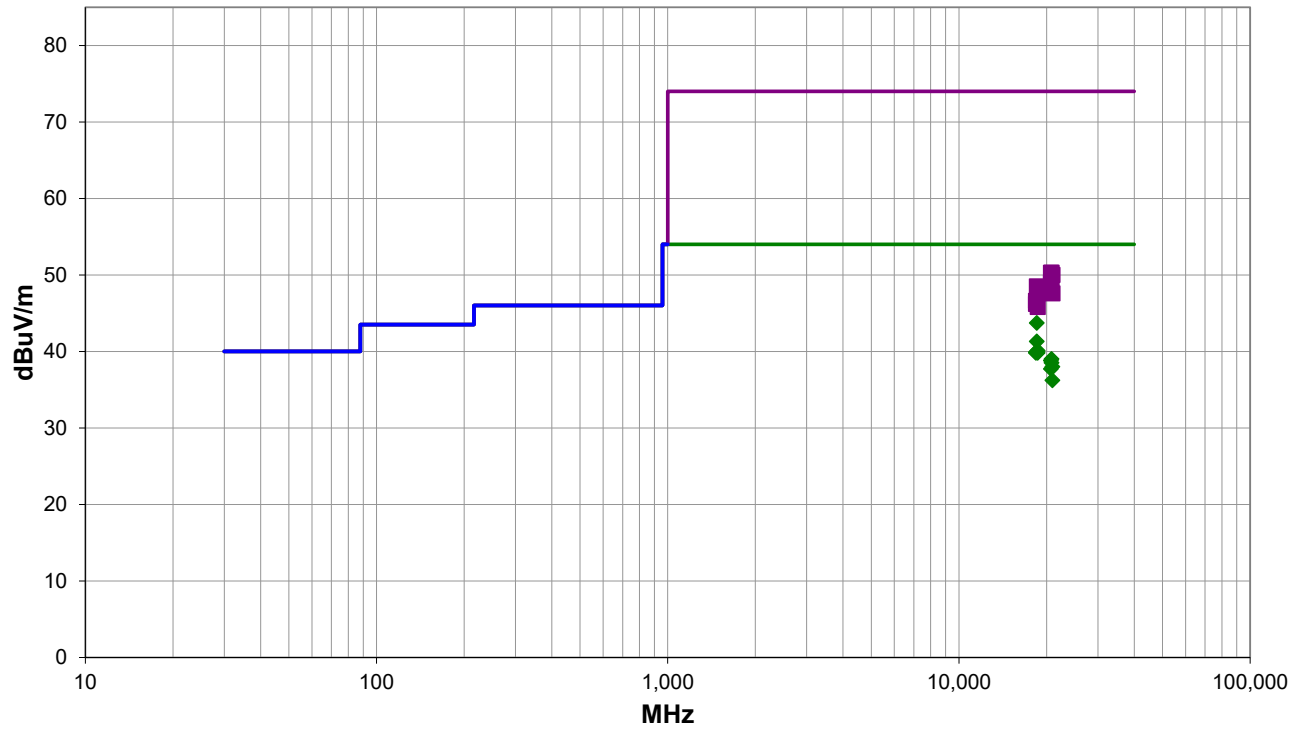
Please reference data comments below for Channel, Data Rate and EUT orientation.

EUT OPERATING MODES

Transmitting Antenna 2, 802.11a, Ch. 36 = 5180 MHz, Ch. 40 = 5200 MHz, CH 48. = 5240 MHz, Ch. 149 = 5745 MHz, Ch. 157 = 5785 MHz, Ch. 165 = 5825 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 100 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS – (9kHz-1GHz, 18 GHz-40 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

RESULTS - Run #100

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
18512.160	45.4	4.0	1.5	349.0	0.3	0.0	Vert	AV	-6.0	43.7	54.0	-10.3	Ch. 157, 6 Mbps, EUT on Side
18512.040	43.0	4.0	1.5	59.0	0.3	0.0	Horz	AV	-6.0	41.3	54.0	-12.7	Ch. 157, 6 Mbps, EUT Vert
18640.070	41.7	4.1	1.5	351.0	0.3	0.0	Vert	AV	-6.0	40.1	54.0	-13.9	Ch. 165, 6 Mbps, EUT on Side
18384.080	41.9	3.7	1.5	341.0	0.3	0.0	Horz	AV	-6.0	39.9	54.0	-14.1	Ch. 149, 6 Mbps, EUT Vert
18640.150	41.4	4.1	1.5	58.0	0.3	0.0	Horz	AV	-6.0	39.8	54.0	-14.2	Ch. 165, 6 Mbps, EUT Vert
18384.060	41.8	3.7	1.5	350.0	0.3	0.0	Vert	AV	-6.0	39.8	54.0	-14.2	Ch. 149, 6 Mbps, EUT on Side
20799.490	38.5	6.2	1.5	22.0	0.3	0.0	Vert	AV	-6.0	39.0	54.0	-15.0	Ch. 40, 6 Mbps, EUT on Side
20719.980	38.5	6.0	1.5	17.0	0.3	0.0	Vert	AV	-6.0	38.8	54.0	-15.2	Ch. 36, 6 Mbps, EUT on Side
20795.330	38.0	6.2	1.5	311.0	0.3	0.0	Horz	AV	-6.0	38.5	54.0	-15.5	Ch. 40, 6 Mbps, EUT Vert
20960.040	37.5	6.2	1.6	24.0	0.3	0.0	Vert	AV	-6.0	38.0	54.0	-16.0	Ch. 48, 6 Mbps, EUT on Side
20720.220	37.4	6.0	1.5	314.0	0.3	0.0	Horz	AV	-6.0	37.7	54.0	-16.3	Ch. 36, 6 Mbps, EUT Vert
20959.960	35.7	6.2	1.6	312.0	0.3	0.0	Horz	AV	-6.0	36.2	54.0	-17.8	Ch. 48, 6 Mbps, EUT Vert
20799.480	50.1	6.2	1.5	22.0	0.0	0.0	Vert	PK	-6.0	50.3	74.0	-23.7	Ch. 40, 6 Mbps, EUT on Side
20719.950	50.3	6.0	1.5	17.0	0.0	0.0	Vert	PK	-6.0	50.3	74.0	-23.7	Ch. 36, 6 Mbps, EUT on Side
20960.000	49.8	6.2	1.6	24.0	0.0	0.0	Vert	PK	-6.0	50.0	74.0	-24.0	Ch. 48, 6 Mbps, EUT on Side
20797.220	49.3	6.2	1.5	311.0	0.0	0.0	Horz	PK	-6.0	49.5	74.0	-24.5	Ch. 40, 6 Mbps, EUT Vert
20719.880	49.0	6.0	1.5	314.0	0.0	0.0	Horz	PK	-6.0	49.0	74.0	-25.0	Ch. 36, 6 Mbps, EUT Vert
18511.980	50.5	4.0	1.5	349.0	0.0	0.0	Vert	PK	-6.0	48.5	74.0	-25.5	Ch. 157, 6 Mbps, EUT on Side
20960.560	47.4	6.2	1.6	312.0	0.0	0.0	Horz	PK	-6.0	47.6	74.0	-26.4	Ch. 48, 6 Mbps, EUT Vert
18639.790	49.5	4.1	1.5	351.0	0.0	0.0	Vert	PK	-6.0	47.6	74.0	-26.4	Ch. 165, 6 Mbps, EUT on Side
18512.170	48.6	4.0	1.5	59.0	0.0	0.0	Horz	PK	-6.0	46.6	74.0	-27.4	Ch. 157, 6 Mbps, EUT Vert
18384.140	48.9	3.7	1.5	350.0	0.0	0.0	Vert	PK	-6.0	46.6	74.0	-27.4	Ch. 149, 6 Mbps, EUT on Side
18383.580	48.5	3.7	1.5	341.0	0.0	0.0	Horz	PK	-6.0	46.2	74.0	-27.8	Ch. 149, 6 Mbps, EUT Vert
18640.040	47.7	4.1	1.5	58.0	0.0	0.0	Horz	PK	-6.0	45.8	74.0	-28.2	Ch. 165, 6 Mbps, EUT Vert

CONCLUSION

Pass

Tested By

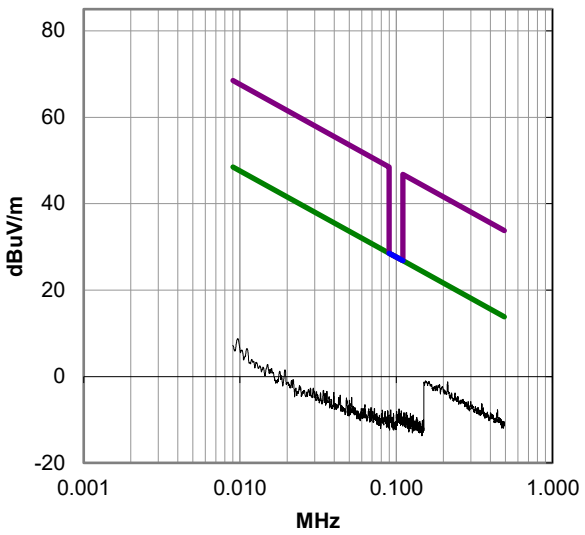
SPURIOUS RADIATED EMISSIONS – (9kHz-1GHz, 18 GHz-40 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0

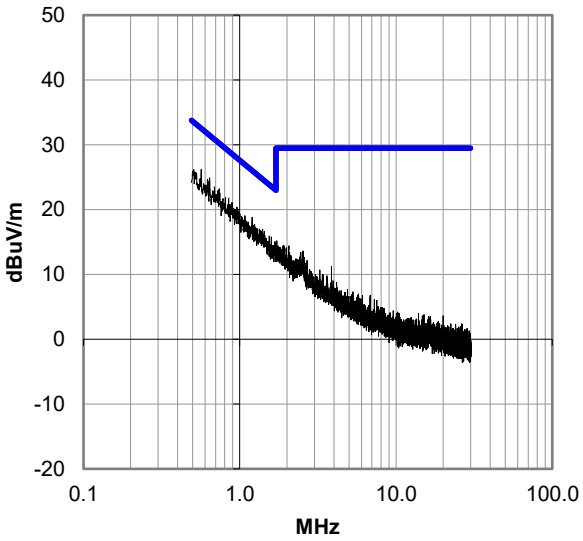
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

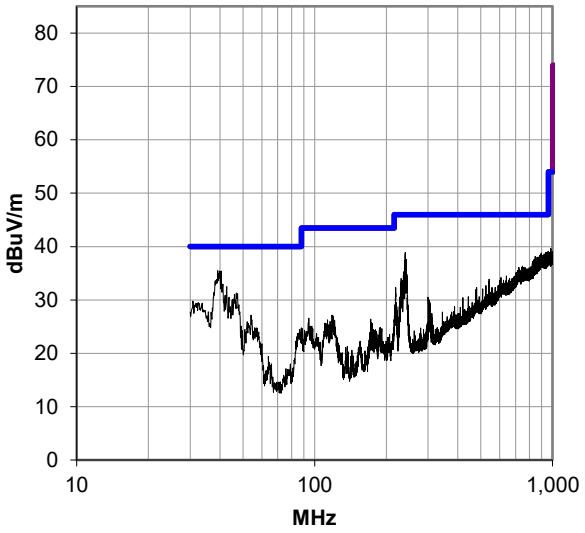
0.009-0.49 MHz, Run 166



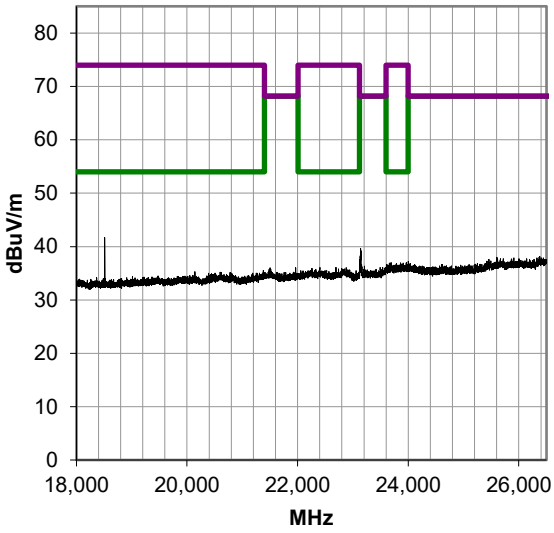
0.49-30 MHz, Run 157



30-1000 MHz, Run 136

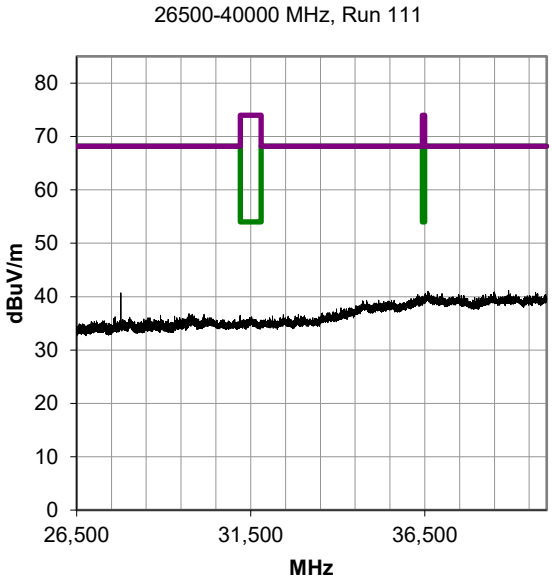


18000-26500 MHz, Run 114



SPURIOUS RADIATED EMISSIONS – (9kHz-1GHz, 18 GHz-40 GHz)

element
WTD.2024.01.16.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.12.23.0



End of Test Report