

**Application for Certification
For a Transmitter.**

Orbit Irrigation Products Inc.
845 N. Overland Rd.
North Salt Lake, UT 84054

Irrigation Controller

M/N: BH1

FCC ID: ML6-BH1
IC ID: 3330A-BH1
HVIN: BH1

REPORT # UT86022B-002

This report was prepared in accordance with the requirements of the FCC Rules and Regulations Part 2, Subpart J, 2.1033, Part 15.247, RSS-247 Issue 2, and other applicable sections of the rules as indicated herein.

Prepared By:

DNB Engineering, Inc.
1100 E Chalk Creek Road
Coalville, UT 84017

12 Dec 2017
(Revised 20 Dec 2017)

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Paragraph numbers in this report follow the application section numbers found in the FEDERAL COMMUNICATIONS COMMISSION Rules and Regulations, Part 2, Subpart J for Certification of electronic equipment.

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1.0 ADMINISTRATIVE DATA

1.1 Certifications and Qualifications

I certify that DNB Engineering, Inc conducted the tests performed in order to obtain the technical data presented in this application. Also, based on the results of the enclosed data, I have concluded that the equipment tested meets or exceeds the requirements of the Rules and Regulations governing this application.

1.2 Measurement Repeatability Information

The test data presented in this report has been acquired using the guidelines set forth in FCC Part 2.1031 through 2.1057, Part 15. The test results presented in this document are valid only for the equipment identified herein under the test conditions described. Repeatability of these test results will only be achieved with identical measurement conditions. These conditions include: The same test distance, EUT Height, Measurement Site Characteristics, and the same EUT System Components. The system must have the same Interconnecting Cables arranged in identical placement to that in the test set-up, with the system and/or EUT functioning in the identical mode of operation (i.e. software and so on) as on the date of the test. Any deviation from the test conditions and the environment on the date of the test may result in measurement repeatability difficulties.

All changes made to the EUT during the course of testing as identified in this test report must be incorporated into the EUT or identical models to ensure compliance with the FCC regulations.



C. L. Payne III (Para. 1.1)
Facility Manager
Coalville Facility.
DNB Engineering, Inc.
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1.3 Test Equipment List

TEST EQUIPMENT LIST - CONDUCTED EMISSIONS				
Description	Manufacturer/MN	Asset #	Serial #	Cal Due
LISN	Fisher LISN-50/32-4-01	U-286	2020	17-Dec-17
LISN	FisherFCCLISN-50/250/25/8	U-062	5003	16-Nov-18
Spectrum Analyzer	Agilent/E7401A	U-257	MY42000103	29-Dec-17
CDN 16 amp	Fischer/FCC801M316A	U-169	64	10-Jul-19
TILE Software	ETS Lindgren/ 3.4.11.13	U-317	8112006	01-Dec-18
Current Probe	Solar/ 6741-1	U-267	966727	17-Dec-17

TEST EQUIPMENT LIST - RADIATED EMISSIONS				
Description	Manufacturer/MN	Asset #	Serial #	Cal Due
Amplifier	HP/8447D	U-065	2727A06180	31-May-18
Bicon Antenna	SCH/BBA9106	U-186	7	5-May-19
Log P Antenna	SCH/UHAL09107	U-010	10	21-Dec-17
DRG Horn Antenna	AH Systems/SAS-200/571	U-156	222	23-Apr-18
Spectrum Analyzer	Agilent/E7401A	U-257	MY42000103	29-Dec-17
Spectrum Analyzer	R&S/FSV30	U-248	101367	18-Jun-18
TILE Software	ETS- Lindgern/ 3.4.11.13	U-317	8112006	01-Dec-18

TEST EQUIPMENT LIST - ANTENNA CONDUCTED				
Description	Manufacturer/MN	Asset #	Serial #	Cal Due
Spectrum Analyzer	R&S/FSV30	U-248	101367	18-Jun-18

1.4 Test Summary Cross Reference

Test Item	FCC Requirement	IC Requirement	Test Method	Result
Antenna Requirement	FCC Part 15, Subpart C Section 15.203 / 15.247	RSS-Gen Section 8.1.3	---	Pass
AC Power Line Conducted Emissions	FCC Part 15, Subpart C Section 15.207	RSS-Gen Section 8.8	ANSI C63.10 (2013) Section 6.2	Pass
Minimum 6dB Bandwidth	FCC Part 15, Subpart C Section 15.247 (a,2)	RSS-247 Issue 2 Feb 2017 Section 5.2	ANSI C63.10 (2013) Section 11.8.1	Pass
99% Occupied Bandwidth	---	RSS-Gen Section 6.6	RSS-Gen Section 6.6	Pass
Conducted Peak Output Power	FCC Part 15, Subpart C Section 15.247 (a,2,b,3)	RSS-247 Issue 2 Feb 2017 Section 5.4	ANSI C63.10 (2013) Section 11.9.1.2	Pass
Power Spectrum Density	FCC Part 15, Subpart C Section 15.247 (a,2,e)	RSS-247 Issue 1 May 2015 Section 5.2	ANSI C63.10 (2013) Section 11.10.2	Pass
Conducted Spurious Emissions and Band Edge	FCC Part 15, Subpart C Section 15.247 (a,2,d)	RSS-247 Issue 2 Feb 2017 Section 5.5	ANSI C63.10 (2013) Section 11.12.2.4	Pass
Radiated Spurious Emissions and Band Edge	FCC Part 15, Subpart C Section 15.209 / 15.205	RSS-247 Issue 2 Feb 2017 Section 5.5	ANSI C63.10 (2013) Section 6.4, 6.5, 6.6, 6.10	Pass

Preliminary scans were performed to determine worst case modulation, packet length, and data rates. Only worst case data has been recorded within the body of the test report.

1.5 Measurement Uncertainty

Measurement Type	Uncertainty
AC Conducted Emissions	N/A
OATS - Radiated Emissions - Vertical Biconical (30-300MHz)	± 4.17 dB
OATS - Radiated Emissions - Horizontal Biconical (30-300MHz)	± 4.22 dB
OATS - Radiated Emissions - Vertical Log Periodic (300-100MHz)	± 4.92 dB
OATS - Radiated Emissions - Horizontal Log Periodic (300-1000MHz)	± 4.79 dB
OATS - Radiated Emissions - Vertical DRG Horn (> 1GHz)	± 5.74 dB
OATS - Radiated Emissions - Horizontal DRG Horn (>1GHz)	± 5.80 dB
Antenna Conducted Measurements	± 1.96 dB

2.1033 (b) (1) Application for Certification

Name of Applicant: Orbit Irrigation Products Inc.
845 N. Overland Rd.
West North Salt Lake, UT 84054

FRN Number: 0023422009
IC Number: 3330A

Name of Manufacturer : Edwin McAuley Electronics Limited
8/F, Block C, Seaview Estate
2-8 Watson Road, North Point, Hong Kong

Description: Irrigation Timer with BLE Transmitter

Model Number(s): BH1

Transmitter HVIN: BH1

Anticipated Production Quantity: Multiple Units

Frequency Band: 2402 - 2480 MHz

Rated Power: -0.530 dBm (0.855 mW)

Type of Signal: Digital Transmission System (DTS)

Channels: 40 (BLE)

Max Data Rate: 1Mbps (mega-bit) - Data transmission is not continuous, it happens for short intervals for short periods of time.

Antenna Type: Monopole (PWB Trace)

Antenna Gain: 2dBi

Firmware/Software Version: CSR uEnergy SDK 2.6.2.9

2.1033 (b) (2) FCC Identifier

Model Number: BH1
FCC ID: ML6-BH1
IC ID: 3330A-BH1
HVIN: BH1

Figure 1 - Label



2.1033 (b) (3) Installation and Operating Instructions

Supplied separately.

2.1033 (b) (4) Brief Description of Circuit Function

HT 25 /BH1 Theory of Operation:

The BH1 is a small wireless Hub that bridges the wireless communication from a cloud server to wireless enabled sensors and end devices such as the wireless hose tap timer (HT25). From the BH1 hub, the connection to the cloud is through WiFi and the connection to the end devices is over Bluetooth Low Energy (BLE). The communication to and from the HT25 includes SMART watering communication which utilizes enhanced EPA water smart logic, basic programming, and flow data. The HT25 can be used with the BH1 acting as a hub to the servers or it can be used by connecting directly to a smart phone via BLE.

The HT25 is powered by two internal AA batteries. The BH1 is powered by a 5 volt wall transformer. There are no other cables and or interfaces. The HT25 can be programmed using a smart phone app or a web app.

Using the APP, the consumer is then able to configure the product programming by entering key yard or area characteristics, soil type and slope, area photos and other setup parameters. The consumer will then indicate a desired watering pattern or utilize a SMART watering recommendation. The HT25 is can also manually water by using the single button interface at the device.

BH1 is capable of both BLE and WiFi communication. However, only one transmitter can function at any time. This is controlled through the espressif uP which disables the BLE processor from transmitting when WiFi communication is initiated.

2.1033 (b) (5) Block Diagram

Supplied separately for confidentiality.

2.1033 (b) (6) Report of Measurements

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Pass - Antenna gain is less than 2dBi

Pass - The antenna is part of the pwb and is permanently attached within the device and can not be replaced by the user.

Test Procedure: As specified in ANSI C63.10-2013

To measure conducted emissions, the EUT was set upon a wooden table in the shielded enclosure. AC power was fed into the EUT from the Artificial Mains Network. With the Artificial Mains Network connected to an Rhode & Schwarz FSV Signal and Spectrum Analyzer, and using Personal Computer with TILES Measurement Software, the spectrum was searched from 0.15 - 30 MHz for emissions emanating from the EUT.

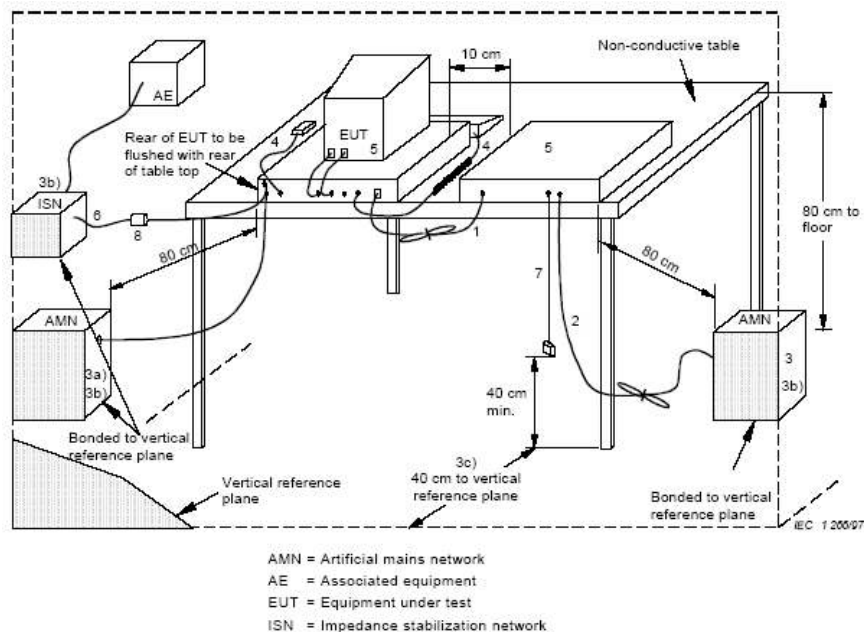
Frequency of emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 - 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

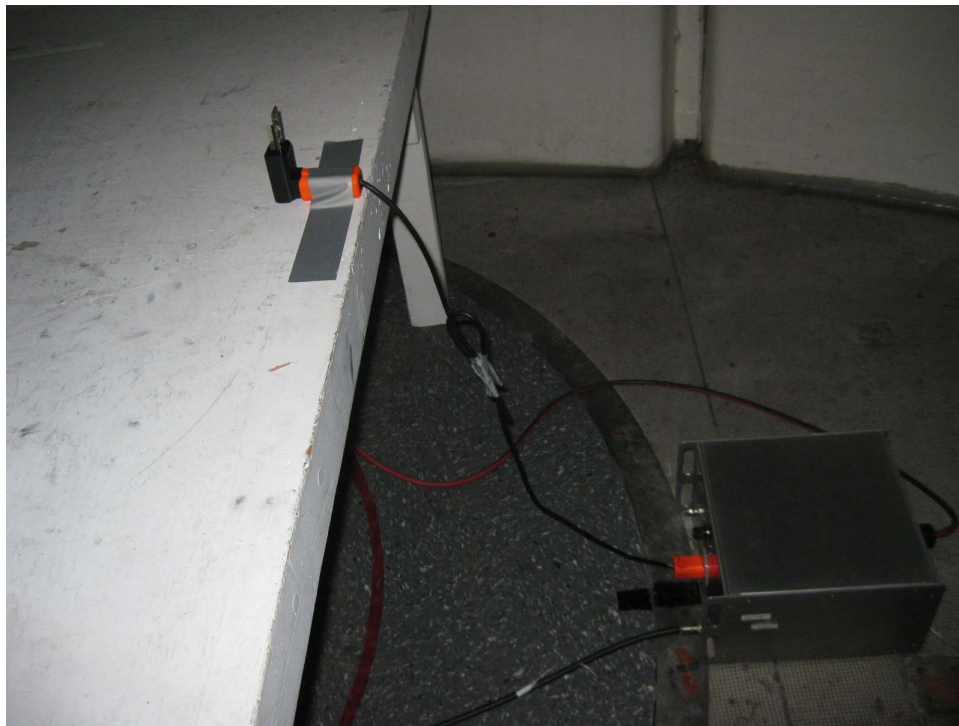
EUT operating conditions:

The software provided by the client to enable the EUT to transmit continuously.

Test Set Up:



	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	<h2>Conducted Emissions</h2>	
DNB Job Number:	86022	Date: 27 Oct 2017	Specification
Customer:	Orbit Irrigation Products Inc.		<input checked="" type="checkbox"/> 15.207
Model Number:	BH1		<input checked="" type="checkbox"/> ANSI C63.10-2013
Description:	BLE Transmitter		
TEST SET UP - CONDUCTED EMISSIONS			





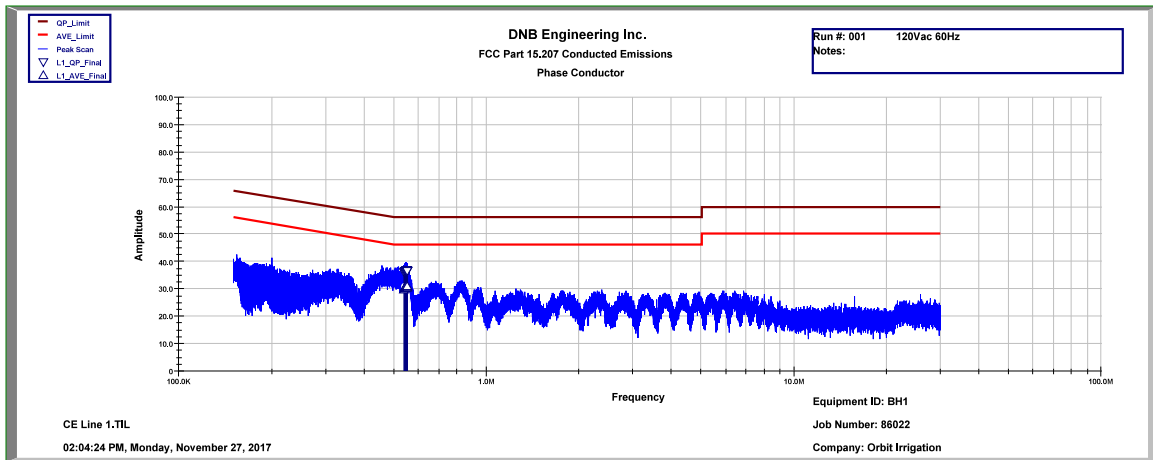
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 FAX (435) 336-4436

Conducted Emissions

DNB Job Number:	88022	Date:	27 Nov 2017	Specification <input checked="" type="checkbox"/> 15.207 <input checked="" type="checkbox"/> ANSI C63.10-2013	
Customer:	Orbit Irrigation Products Inc.				
Model Number:	BH1				
Description:	BLE Transmitter				
EUT is in conformance with FCC 15.207		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	Signed	<i>CL Payne III</i>

CONDUCTED EMISSIONS

Freq in MHz	Meter Reading	Factors in dB		Corr'd Reading	Limit		Lead	Measure Type	Delta
		LISN	Cable		dBuV	Type			
0.549	36.69	0.00	0.10	36.79	56.00	QP	Phase	QP	-19.21
0.549	30.76	0.00	0.10	30.86	46.00	AVE	Phase	AVE	-15.14
0.549	36.69	0.00	0.10	36.79	56.00	QP	Phase	QP	-19.21
0.549	30.73	0.00	0.10	30.83	46.00	AVE	Phase	AVE	-15.17
0.550	36.72	0.00	0.10	36.82	56.00	QP	Phase	QP	-19.18
0.550	30.81	0.00	0.10	30.91	46.00	AVE	Phase	AVE	-15.09
0.551	36.72	0.00	0.20	36.92	56.00	QP	Phase	QP	-19.08
0.551	30.72	0.00	0.20	30.92	46.00	AVE	Phase	AVE	-15.08
0.552	36.73	0.00	0.20	36.93	56.00	QP	Phase	QP	-19.07
0.552	30.75	0.00	0.20	30.95	46.00	AVE	Phase	AVE	-15.05
0.553	36.61	0.00	0.20	36.81	56.00	QP	Phase	QP	-19.19
0.553	30.74	0.00	0.20	30.94	46.00	AVE	Phase	AVE	-15.06





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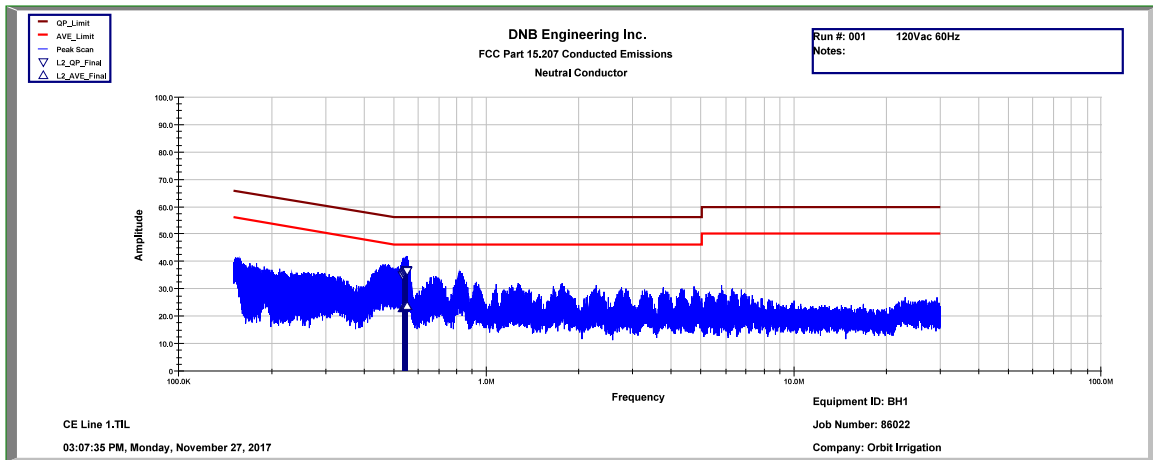
Conducted Emissions

DNB Job Number:	88022	Date:	27 Nov 2017	Specification <input checked="" type="checkbox"/> 15.207 <input checked="" type="checkbox"/> ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

EUT is in conformance with FCC 15.207 YES NO Signed *CL Payne III*

CONDUCTED EMISSIONS

Freq in MHz	Meter Reading	Factors in dB		Corr'd Reading	Limit		Lead	Measure Type	Delta
		LISN	Cable		dBuV	Type			
0.553	36.52	0.00	0.20	36.72	56.00	QP	Neutral	QP	-19.28
0.553	23.72	0.00	0.20	23.92	46.00	AVE	Neutral	AVE	-22.08
0.551	36.90	0.00	0.20	37.10	56.00	QP	Neutral	QP	-18.90
0.551	23.76	0.00	0.20	23.96	46.00	AVE	Neutral	AVE	-22.04
0.550	36.96	0.00	0.20	37.16	56.00	QP	Neutral	QP	-18.84
0.550	23.83	0.00	0.20	24.03	46.00	AVE	Neutral	AVE	-21.98
0.549	36.89	0.00	0.10	36.99	56.00	QP	Neutral	QP	-19.01
0.549	23.83	0.00	0.10	23.93	46.00	AVE	Neutral	AVE	-22.07
0.548	36.69	0.00	0.10	36.79	56.00	QP	Neutral	QP	-19.21
0.548	23.72	0.00	0.10	23.82	46.00	AVE	Neutral	AVE	-22.19
0.547	36.79	0.00	0.10	36.89	56.00	QP	Neutral	QP	-19.11
0.547	23.70	0.00	0.10	23.80	46.00	AVE	Neutral	AVE	-22.21



Test Procedure: ANSI C63.10-2013

The EUT was measured on an open area test site (OATS).

A measuring distance of at least 3 m shall be used for measurements at frequencies up to 1 GHz. For frequencies above 1 GHz, any suitable measuring distance may be used. The equipment size (excluding the antenna) shall be less than 20 % of the measuring distance.

Sufficient precautions shall be taken to ensure that reflections from extraneous objects adjacent to the site do not degrade the measurement results, in particular:

- no extraneous conducting objects having any dimension in excess of a quarter wavelength of the highest frequency tested shall be in the immediate vicinity of the site;
- all cables shall be as short as possible; as much of the cables as possible shall be on the ground plane or preferably below; and the low impedance cables shall be screened.
- EUT was positioned in three orthogonal axis - only the worst case data (X-Axis) has been recorded

The EUT shall be placed upon a non-conductive table (wooden for below 1GHz and styrene above 1GHz) 0.80 meters above the ground plane for frequencies from 30 to 1000MHz and 1.5 meters above the ground plane above 1 GHz and shall be placed in the “worst case” transmitting mode. The EUT shall be rotated 360 degrees to find the azimuth maxima. The receive antenna shall then be raised and lowered between 1 to 4 meters to find the maximum signal emanating from the EUT. This signal strength is then recorded on the data sheets.

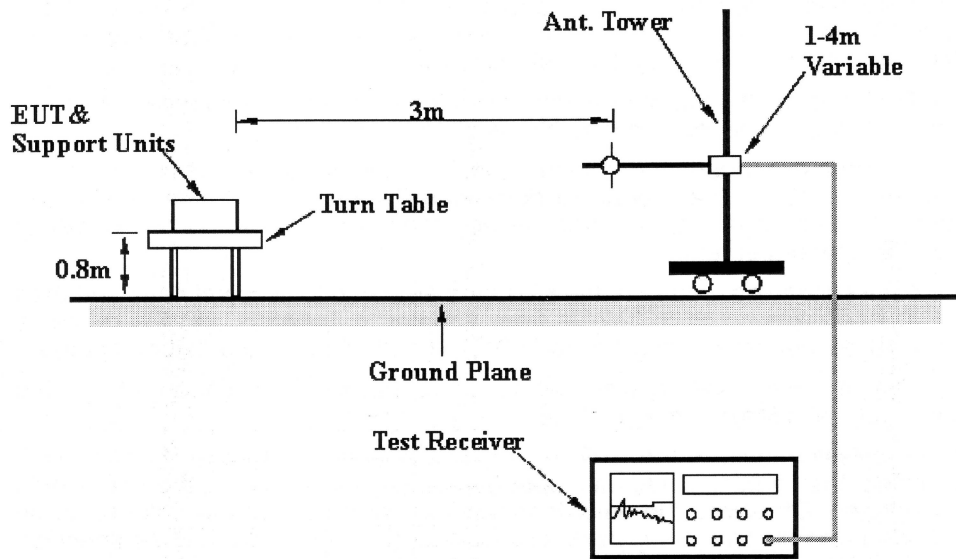
Frequency (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measurement Distance (meters)
.0009 - 0.490	2400/F(kHz)	20*(Log ₁₀ (2400/F(kHz)))	300
0.490 - 1.705	24000/F(kHz)	20*(Log ₁₀ (24000/F(kHz)))	30
1.705 - 30.0	30	29.5	30
30 - 88	100	40.0	3
88 - 216	150	43.5	3
216 - 960	200	46.0	3
Above 960	500	54.0	3




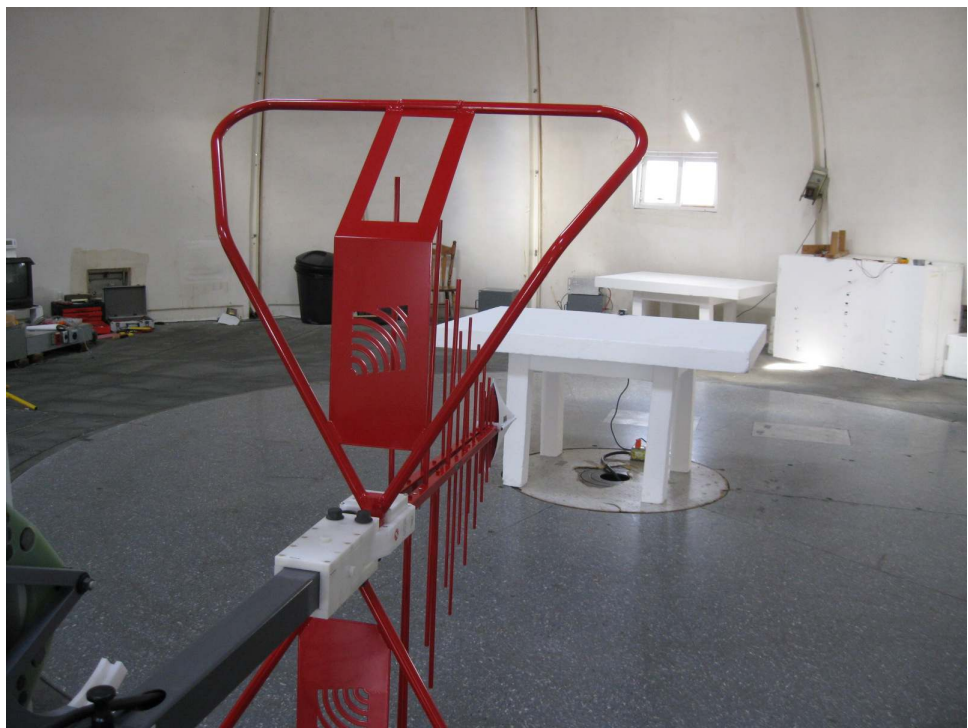
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Radiated Emissions (General)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.209 [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter Test Set Up			




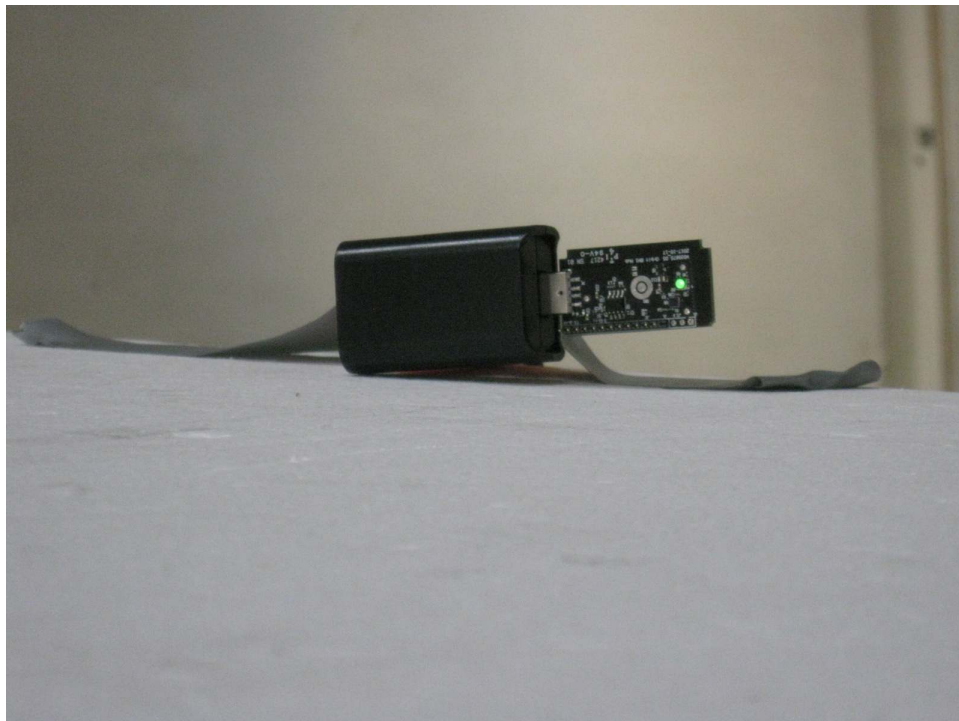
	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Radiated Emissions (General)	
DNB Job Number:	86022	Date: 22 Nov 2017	Specification
Customer:	Orbit Irrigation Products Inc.		<input checked="" type="checkbox"/> 15.209
Model Number:	BH1		<input checked="" type="checkbox"/> ANSI C63.10-2013
Description:	BLE Transmitter		
Test Set Up - Vertical - 30-1000MHz			




	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Radiated Emissions (General)	
DNB Job Number:	86022	Date: 22 Nov 2017	Specification
Customer:	Orbit Irrigation Products Inc.		<input checked="" type="checkbox"/> 15.209 <input checked="" type="checkbox"/> ANSI C63.10-2013
Model Number:	BH1		
Description:	BLE Transmitter		
X-Axis			



	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Radiated Emissions (General)	
DNB Job Number:	86022	Date: 22 Nov 2017	Specification
Customer:	Orbit Irrigation Products Inc.		<input checked="" type="checkbox"/> 15.209 <input checked="" type="checkbox"/> ANSI C63.10-2013
Model Number:	BH1		
Description:	BLE Transmitter		
Y-Axis			



	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Radiated Emissions (General)	
DNB Job Number:	86022	Date: 22 Nov 2017	Specification
Customer:	Orbit Irrigation Products Inc.		[X] 15.209
Model Number:	BH1		[X] ANSI C63.10-2013
Description:	BLE Transmitter		
Z-Axis			





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Radiated Emissions (General)

DNB Job Number:		86022			Date:		22 Nov 2017		Specification		
Customer:		Orbit Irrigation Products Inc.									[X] 15.209 [X] ANSI C63.10-2013
Model Number:		BH1									
Description:		BLE Transmitter X-Axis									
EUT is in conformance with FCC 15.209					X	YES		NO	Signed		<i>J Payne</i>
FREQ (Mhz)	S/A Reading	Correction Factors (dB)			dBuV/m			Positions			
		Ant	Cbl	Amp	Corr	Lim	Delta	Typ	Tbl	Pl	Hgt
38.944	43.94	11.20	0.90	26.60	29.45	40.00	-10.56	Pk	0-360	Vert	1-4
39.990	40.71	10.71	0.90	26.60	25.71	40.00	-14.29	Pk	0-360	Vert	1-4
40.000	40.77	10.70	0.90	26.60	25.77	40.00	-14.24	Pk	0-360	Vert	1-4
40.260	42.23	10.59	0.91	26.60	27.13	40.00	-12.87	Pk	0-360	Vert	1-4
42.386	43.90	9.74	0.95	26.60	27.99	40.00	-12.01	Pk	0-360	Vert	1-4
48.293	45.56	7.58	1.00	26.60	27.54	40.00	-12.46	Pk	0-360	Vert	1-4
49.069	48.02	7.31	1.00	26.60	29.73	40.00	-10.27	Pk	0-360	Vert	1-4
50.000	46.94	7.00	1.00	26.60	28.34	40.00	-11.66	Pk	0-360	Vert	1-4
51.060	45.41	6.94	1.02	26.60	26.78	40.00	-13.22	Pk	0-360	Vert	1-4
52.781	44.39	6.85	1.06	26.60	25.70	40.00	-14.30	Pk	0-360	Vert	1-4
57.641	51.62	6.61	1.16	26.60	32.79	40.00	-7.21	Pk	0-360	Vert	1-4
59.295	46.18	6.53	1.19	26.60	27.30	40.00	-12.71	Pk	0-360	Vert	1-4
60.000	44.74	6.50	1.20	26.60	25.84	40.00	-14.16	Pk	0-360	Vert	1-4
61.658	46.45	6.57	1.22	26.58	27.65	40.00	-12.35	Pk	0-360	Vert	1-4
66.281	48.25	6.76	1.27	26.54	29.74	40.00	-10.26	Pk	0-360	Vert	1-4
68.374	46.47	6.84	1.29	26.52	28.08	40.00	-11.92	Pk	0-360	Vert	1-4
70.000	46.69	6.90	1.30	26.50	28.39	40.00	-11.61	Pk	0-360	Vert	1-4
80.000	48.53	6.70	1.40	26.50	30.13	40.00	-9.87	Pk	0-360	Vert	1-4
86.194	49.32	6.83	1.46	26.50	31.11	40.00	-8.89	Pk	0-360	Vert	1-4
110.000	50.21	8.00	1.81	26.45	33.56	43.50	-9.94	Pk	0-360	Vert	1-4
120.000	46.51	7.50	1.90	26.40	29.51	43.50	-13.99	Pk	0-360	Vert	1-4
130.000	45.84	7.70	2.00	26.35	29.20	43.50	-14.30	Pk	0-360	Vert	1-4
135.772	48.93	7.94	2.06	26.32	32.60	43.50	-10.90	Pk	0-360	Vert	1-4
140.000	48.62	8.10	2.10	26.30	32.52	43.50	-10.98	Pk	0-360	Vert	1-4
147.349	47.64	8.92	2.14	26.30	32.39	43.50	-11.11	Pk	0-360	Vert	1-4
150.000	45.76	9.20	2.15	26.30	30.81	43.50	-12.69	Pk	0-360	Vert	1-4
155.618	43.74	9.71	2.18	26.30	29.33	43.50	-14.17	Pk	0-360	Vert	1-4
160.000	43.99	10.10	2.20	26.30	29.99	43.50	-13.51	Pk	0-360	Vert	1-4
162.469	44.44	9.97	2.23	26.29	30.35	43.50	-13.15	Pk	0-360	Vert	1-4
170.000	44.14	9.60	2.30	26.25	29.79	43.50	-13.71	Pk	0-360	Vert	1-4
94.496	47.60	7.41	1.59	26.50	30.10	43.50	-13.40	Pk	0-360	Horz	1-4
100.000	47.43	8.00	1.70	26.50	30.63	43.50	-12.87	Pk	0-360	Horz	1-4
110.000	52.67	8.00	1.81	26.45	36.03	43.50	-7.47	Pk	0-360	Horz	1-4
730.500	33.09	22.28	5.30	27.67	33.00	46.00	-13.00	Pk	0-360	Horz	1-4
731.550	33.40	22.27	5.30	27.67	33.30	46.00	-12.70	Pk	0-360	Horz	1-4
914.513	35.34	24.45	5.92	27.35	38.36	46.00	-7.64	Pk	0-360	Horz	1-4
925.975	30.09	24.70	6.02	27.32	33.48	46.00	-12.52	Pk	0-360	Horz	1-4

This test is required for any spurious emission or modulation product that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz
VBW = RBW
Sweep = auto
Detector function = peak
Trace = max hold


Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now repeat the measurement using the average detector of the spectrum analyzer. Submit this data.

If the emission on which a radiated measurement must be made is located at the edge of the authorized band of operation, then the alternative “marker-delta” method, listed at the end of this document, may be employed.

Note 1: Limit listed is the general limit as specified in 15.209 in order to show compliance with the restricted bands of operation as well as the out of band limit in 15.247. No other identifiable signals were observed in the restricted bands as specified in 15.205.

Note 2: Highest frequency investigated was the tenth harmonic of the fundamental, no radiated emissions were detected above the 3rd harmonic.

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Radiated Emissions (Spurious)	
DNB Job Number:	86022	Date: 22 Nov 2017	Specification
Customer:	Orbit Irrigation Products Inc.		<input checked="" type="checkbox"/> 15.247 (c) <input checked="" type="checkbox"/> ANSI C63.10-2013
Model Number:	BH1		
Description:	BLE Transmitter		
Test Set Up - (Vertical - DRG)			





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Radiated Emissions (Spurious)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

Low Channel - X Axis

FREQ (Mhz)	Meter	Correction Factors (dB)			dBuV/m			Type		Polarity
		Ant	Cbl	Amp	Corr	Lim	Delta	Lim	Rdng	
2402	69.42	29.45	4.99	26.32	77.54	N/A	N/A	Peak	Peak	Hor
2402	67.33	29.45	4.99	26.32	75.45	N/A	N/A	Ave	Ave	Hor
4804	25.43	32.99	7.04	25.82	39.64	74.00	-34.36	Peak	Peak	Hor
4804	14.99	32.99	7.04	25.82	29.20	54.00	-24.80	Ave	Ave	Hor
7206	23.79	29.50	8.78	25.53	36.53	74.00	-37.47	Peak	Peak	Hor
7206	13.14	29.50	8.78	25.53	25.88	54.00	-28.12	Ave	Ave	Hor
9608	26.42	33.10	10.46	24.91	45.08	74.00	-28.92	Peak	Peak	Hor
9608	13.46	33.10	10.46	24.91	32.11	54.00	-21.89	Ave	Ave	Hor
12010	24.22	39.73	10.95	24.52	50.38	74.00	-23.62	Peak	Peak	Hor
12010	11.64	39.73	10.95	24.52	37.80	54.00	-16.20	Ave	Ave	Hor
14412	22.72	41.51	13.15	23.09	54.29	74.00	-19.71	Peak	Peak	Hor
14412	12.91	41.51	13.15	23.09	44.48	54.00	-9.52	Ave	Ave	Hor
16814	23.67	41.92	14.63	23.56	56.65	74.00	-17.35	Peak	Peak	Hor
16814	9.25	41.92	14.63	23.56	42.23	54.00	-11.77	Ave	Ave	Hor
2402	79.32	29.45	4.99	26.32	87.44	N/A	N/A	Peak	Peak	Vert
2402	75.86	29.45	4.99	26.32	83.97	N/A	N/A	Ave	Ave	Vert
4804	23.82	32.99	7.04	25.82	38.04	54.00	-15.96	Ave	Ave	Vert
4804	31.83	32.99	7.04	25.82	46.05	74.00	-27.95	Peak	Peak	Vert
7206	18.99	29.50	8.78	25.53	31.73	54.00	-22.27	Ave	Ave	Vert
7206	28.54	29.50	8.78	25.53	41.28	74.00	-32.72	Peak	Peak	Vert
9608	16.22	33.10	10.46	24.91	34.87	54.00	-19.13	Ave	Ave	Vert
9608	28.51	33.10	10.46	24.91	47.16	74.00	-26.84	Peak	Peak	Vert
12010	12.78	39.73	10.95	24.52	38.94	54.00	-15.06	Ave	Ave	Vert
12010	24.40	39.73	10.95	24.52	50.56	74.00	-23.44	Peak	Peak	Vert
14412	12.60	41.51	13.15	23.09	44.17	54.00	-9.83	Ave	Ave	Vert
14412	23.06	41.51	13.15	23.09	54.63	74.00	-19.37	Peak	Peak	Vert
16814	9.61	41.92	14.63	23.56	42.59	54.00	-11.41	Ave	Ave	Vert
16814	23.31	41.92	14.63	23.56	56.30	74.00	-17.70	Peak	Peak	Vert



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Radiated Emissions (Spurious)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

Low Channel - Y Axis

FREQ (Mhz)	Meter	Correction Factors (dB)			dBuV/m			Type		Polarity
		Ant	Cbl	Amp	Corr	Lim	Delta	Lim	Rdng	
2402	78.52	29.45	4.99	26.32	86.63	N/A	N/A	Peak	Peak	Hor
2402	75.95	29.45	4.99	26.32	84.06	N/A	N/A	Ave	Ave	Hor
4804	21.87	32.99	7.04	25.82	36.09	54.00	-17.91	Ave	Ave	Hor
4804	33.06	32.99	7.04	25.82	47.28	74.00	-26.72	Peak	Peak	Hor
7206	15.65	29.50	8.78	25.53	28.39	54.00	-25.61	Ave	Ave	Hor
7206	27.04	29.50	8.78	25.53	39.78	74.00	-34.22	Peak	Peak	Hor
9608	14.16	33.10	10.46	24.91	32.81	54.00	-21.19	Ave	Ave	Hor
9608	26.62	33.10	10.46	24.91	45.27	74.00	-28.73	Peak	Peak	Hor
12010	12.74	39.73	10.95	24.52	38.90	54.00	-15.10	Ave	Ave	Hor
12010	24.95	39.73	10.95	24.52	51.11	74.00	-22.89	Peak	Peak	Hor
14412	12.77	41.51	13.15	23.09	44.34	54.00	-9.66	Ave	Ave	Hor
14412	22.42	41.51	13.15	23.09	53.99	74.00	-20.01	Peak	Peak	Hor
16814	10.38	41.92	14.63	23.56	43.36	54.00	-10.64	Ave	Ave	Hor
16814	22.90	41.92	14.63	23.56	55.88	74.00	-18.12	Peak	Peak	Hor
2402	71.30	29.45	4.99	26.32	79.41	N/A	N/A	Peak	Peak	Vert
2402	67.59	29.45	4.99	26.32	75.71	N/A	N/A	Ave	Ave	Vert
4804	13.46	32.99	7.04	25.82	27.67	54.00	-26.33	Ave	Ave	Vert
4804	26.06	32.99	7.04	25.82	40.28	74.00	-33.72	Peak	Peak	Vert
7206	12.06	29.50	8.78	25.53	24.80	54.00	-29.20	Ave	Ave	Vert
7206	24.34	29.50	8.78	25.53	37.08	74.00	-36.92	Peak	Peak	Vert
9608	12.43	33.10	10.46	24.91	31.08	54.00	-22.92	Ave	Ave	Vert
9608	26.35	33.10	10.46	24.91	45.00	74.00	-29.00	Peak	Peak	Vert
12010	12.53	39.73	10.95	24.52	38.69	54.00	-15.31	Ave	Ave	Vert
12010	24.23	39.73	10.95	24.52	50.39	74.00	-23.61	Peak	Peak	Vert
14412	12.32	41.51	13.15	23.09	43.89	54.00	-10.11	Ave	Ave	Vert
14412	25.07	41.51	13.15	23.09	56.64	74.00	-17.36	Peak	Peak	Vert
16814	10.49	41.92	14.63	23.56	43.47	54.00	-10.53	Ave	Ave	Vert
16814	22.98	41.92	14.63	23.56	55.96	74.00	-18.04	Peak	Peak	Vert



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Radiated Emissions (Spurious)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

Low Channel - Z Axis

FREQ (Mhz)	Meter	Correction Factors (dB)			dBuV/m			Type		Polarity
		Ant	Cbl	Amp	Corr	Lim	Delta	Lim	Rdng	
2402	82.09	29.45	4.99	26.32	90.20	N/A	N/A	Peak	Peak	Hor
2402	75.96	29.45	4.99	26.32	84.07	N/A	N/A	Ave	Ave	Hor
4804	26.32	32.99	7.04	25.82	40.54	54.00	-13.46	Ave	Ave	Hor
4804	33.96	32.99	7.04	25.82	48.18	74.00	-25.82	Peak	Peak	Hor
7206	16.96	29.50	8.78	25.53	29.71	54.00	-24.29	Ave	Ave	Hor
7206	27.96	29.50	8.78	25.53	40.70	74.00	-33.30	Peak	Peak	Hor
9608	14.02	33.10	10.46	24.91	32.67	54.00	-21.33	Ave	Ave	Hor
9608	25.78	33.10	10.46	24.91	44.43	74.00	-29.57	Peak	Peak	Hor
12010	12.02	39.73	10.95	24.52	38.19	54.00	-15.81	Ave	Ave	Hor
12010	23.43	39.73	10.95	24.52	49.59	74.00	-24.41	Peak	Peak	Hor
14412	10.01	41.51	13.15	23.09	41.58	54.00	-12.42	Ave	Ave	Hor
14412	24.37	41.51	13.15	23.09	55.93	74.00	-18.07	Peak	Peak	Hor
16814	10.14	41.92	14.63	23.56	43.12	54.00	-10.88	Ave	Ave	Hor
16814	22.73	41.92	14.63	23.56	55.72	74.00	-18.28	Peak	Peak	Hor
2402	77.50	29.45	4.99	26.32	85.61	N/A	N/A	Peak	Peak	Vert
2402	73.65	29.45	4.99	26.32	81.76	N/A	N/A	Ave	Ave	Vert
4804	17.36	32.99	7.04	25.82	31.58	54.00	-22.42	Ave	Ave	Vert
4804	29.16	32.99	7.04	25.82	43.38	74.00	-30.62	Peak	Peak	Vert
7206	13.15	29.50	8.78	25.53	25.89	54.00	-28.11	Ave	Ave	Vert
7206	25.95	29.50	8.78	25.53	38.69	74.00	-35.31	Peak	Peak	Vert
9608	12.83	33.10	10.46	24.91	31.48	54.00	-22.52	Ave	Ave	Vert
9608	26.65	33.10	10.46	24.91	45.30	74.00	-28.70	Peak	Peak	Vert
12010	11.73	39.73	10.95	24.52	37.89	54.00	-16.11	Ave	Ave	Vert
12010	23.57	39.73	10.95	24.52	49.73	74.00	-24.27	Peak	Peak	Vert
14412	10.66	41.51	13.15	23.09	42.23	54.00	-11.77	Ave	Ave	Vert
14412	22.79	41.51	13.15	23.09	54.36	74.00	-19.64	Peak	Peak	Vert
16814	11.57	41.92	14.63	23.56	44.55	54.00	-9.45	Ave	Ave	Vert
16814	21.65	41.92	14.63	23.56	54.63	74.00	-19.37	Peak	Peak	Vert



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Radiated Emissions (Spurious)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

Middle Channel - X axis

FREQ (Mhz)	Meter	Correction Factors (dB)			dBuV/m			Type		Polarity
		Ant	Cbl	Amp	Corr	Lim	Delta	Lim	Rdng	
2440	72.68	29.54	5.03	26.32	80.93	N/A	N/A	Peak	Peak	Hor
2440	68.57	29.54	5.03	26.32	76.82	N/A	N/A	Ave	Ave	Hor
4880	15.43	33.27	7.11	25.80	30.01	54.00	-23.99	Ave	Ave	Hor
4880	27.63	33.27	7.11	25.80	42.21	74.00	-31.79	Peak	Peak	Hor
7320	11.88	37.11	8.83	25.51	32.31	54.00	-21.69	Ave	Ave	Hor
7320	23.68	37.11	8.83	25.51	44.12	74.00	-29.88	Peak	Peak	Hor
9760	10.96	37.90	10.59	24.90	34.55	54.00	-19.45	Ave	Ave	Hor
9760	23.49	37.90	10.59	24.90	47.09	74.00	-26.91	Peak	Peak	Hor
12200	13.11	40.26	11.24	24.44	40.17	54.00	-13.83	Ave	Ave	Hor
12200	25.03	40.26	11.24	24.44	52.09	74.00	-21.91	Peak	Peak	Hor
14640	13.23	41.80	13.46	22.84	45.64	54.00	-8.36	Ave	Ave	Hor
14640	24.27	41.80	13.46	22.84	56.68	74.00	-17.32	Peak	Peak	Hor
17080	11.60	42.53	15.12	23.28	45.97	54.00	-8.03	Ave	Ave	Hor
17080	21.46	42.53	15.12	23.28	55.82	74.00	-18.18	Peak	Peak	Hor
2440	82.70	29.54	5.03	26.32	90.96	N/A	N/A	Peak	Peak	Vert
2440	78.21	29.54	5.03	26.32	86.47	N/A	N/A	Ave	Ave	Vert
4880	26.41	33.27	7.11	25.80	40.99	54.00	-13.01	Ave	Ave	Vert
4880	35.35	33.27	7.11	25.80	49.92	74.00	-24.08	Peak	Peak	Vert
7320	18.74	37.11	8.83	25.51	39.17	54.00	-14.83	Ave	Ave	Vert
7320	29.09	37.11	8.83	25.51	49.52	74.00	-24.48	Peak	Peak	Vert
9760	16.35	37.90	10.59	24.90	39.94	54.00	-14.06	Ave	Ave	Vert
9760	28.64	37.90	10.59	24.90	52.23	74.00	-21.77	Peak	Peak	Vert
12200	13.32	40.26	11.24	24.44	40.38	54.00	-13.62	Ave	Ave	Vert
12200	25.59	40.26	11.24	24.44	52.65	74.00	-21.35	Peak	Peak	Vert
14640	12.73	41.80	13.46	22.84	45.15	54.00	-8.85	Ave	Ave	Vert
14640	23.33	41.80	13.46	22.84	55.75	74.00	-18.25	Peak	Peak	Vert
17080	9.36	42.53	15.12	23.28	43.72	54.00	-10.28	Ave	Ave	Vert
17080	24.27	42.53	15.12	23.28	58.64	74.00	-15.36	Peak	Peak	Vert



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Radiated Emissions (Spurious)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

Middle Channel - Y axis

FREQ (Mhz)	Meter	Correction Factors (dB)			dBuV/m			Type		Polarity
		Ant	Cbl	Amp	Corr	Lim	Delta	Lim	Rdng	
2440	81.95	29.54	5.03	26.32	90.21	N/A	N/A	Peak	Peak	Hor
2440	76.23	29.54	5.03	26.32	84.49	N/A	N/A	Ave	Ave	Hor
4880	25.69	33.27	7.11	25.80	40.26	54.00	-13.74	Ave	Ave	Hor
4880	32.34	33.27	7.11	25.80	46.91	74.00	-27.09	Peak	Peak	Hor
7320	14.20	37.11	8.83	25.51	34.63	54.00	-19.37	Ave	Ave	Hor
7320	27.73	37.11	8.83	25.51	48.16	74.00	-25.84	Peak	Peak	Hor
9760	11.85	37.90	10.59	24.90	35.44	54.00	-18.56	Ave	Ave	Hor
9760	24.78	37.90	10.59	24.90	48.38	74.00	-25.62	Peak	Peak	Hor
12200	13.26	40.26	11.24	24.44	40.32	54.00	-13.68	Ave	Ave	Hor
12200	26.01	40.26	11.24	24.44	53.06	74.00	-20.94	Peak	Peak	Hor
14640	12.85	41.80	13.46	22.84	45.27	54.00	-8.73	Ave	Ave	Hor
14640	24.07	41.80	13.46	22.84	56.49	74.00	-17.51	Peak	Peak	Hor
17080	9.52	42.53	15.12	23.28	43.89	54.00	-10.11	Ave	Ave	Hor
17080	23.09	42.53	15.12	23.28	57.46	74.00	-16.54	Peak	Peak	Hor
2440	74.21	29.54	5.03	26.32	82.47	N/A	N/A	Peak	Peak	Vert
2440	69.51	29.54	5.03	26.32	77.77	N/A	N/A	Ave	Ave	Vert
4880	15.83	33.27	7.11	25.80	30.41	54.00	-23.59	Ave	Ave	Vert
4880	28.37	33.27	7.11	25.80	42.94	74.00	-31.06	Peak	Peak	Vert
7320	13.08	37.11	8.83	25.51	33.51	54.00	-20.49	Ave	Ave	Vert
7320	24.41	37.11	8.83	25.51	44.84	74.00	-29.16	Peak	Peak	Vert
9760	13.78	37.90	10.59	24.90	37.37	54.00	-16.63	Ave	Ave	Vert
9760	25.75	37.90	10.59	24.90	49.35	74.00	-24.65	Peak	Peak	Vert
12200	10.97	40.26	11.24	24.44	38.03	54.00	-15.97	Ave	Ave	Vert
12200	24.38	40.26	11.24	24.44	51.43	74.00	-22.57	Peak	Peak	Vert
14640	12.92	41.80	13.46	22.84	45.34	54.00	-8.66	Ave	Ave	Vert
14640	23.06	41.80	13.46	22.84	55.48	74.00	-18.52	Peak	Peak	Vert
17080	10.72	42.53	15.12	23.28	45.08	54.00	-8.92	Ave	Ave	Vert
17080	22.16	42.53	15.12	23.28	56.52	74.00	-17.48	Peak	Peak	Vert



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Radiated Emissions (Spurious)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

Middle Channel - Z axis

FREQ (Mhz)	Meter	Correction Factors (dB)			dBuV/m			Type		Polarity
		Ant	Cbl	Amp	Corr	Lim	Delta	Lim	Rdng	
2440	81.19	29.54	5.03	26.32	89.44	N/A	N/A	Peak	Peak	Hor
2440	76.96	29.54	5.03	26.32	85.22	N/A	N/A	Ave	Ave	Hor
4880	27.10	33.27	7.11	25.80	41.67	54.00	-12.33	Ave	Ave	Hor
4880	33.63	33.27	7.11	25.80	48.21	74.00	-25.79	Peak	Peak	Hor
7320	16.71	37.11	8.83	25.51	37.15	54.00	-16.85	Ave	Ave	Hor
7320	28.25	37.11	8.83	25.51	48.69	74.00	-25.31	Peak	Peak	Hor
9760	12.87	37.90	10.59	24.90	36.46	54.00	-17.54	Ave	Ave	Hor
9760	27.61	37.90	10.59	24.90	51.21	74.00	-22.79	Peak	Peak	Hor
12200	12.35	40.26	11.24	24.44	39.40	54.00	-14.60	Ave	Ave	Hor
12200	24.22	40.26	11.24	24.44	51.28	74.00	-22.72	Peak	Peak	Hor
14640	12.40	41.80	13.46	22.84	44.82	54.00	-9.18	Ave	Ave	Hor
14640	23.53	41.80	13.46	22.84	55.95	74.00	-18.05	Peak	Peak	Hor
17080	10.18	42.53	15.12	23.28	44.54	54.00	-9.46	Ave	Ave	Hor
17080	23.56	42.53	15.12	23.28	57.93	74.00	-16.07	Peak	Peak	Hor
2440	79.20	29.54	5.03	26.32	87.46	N/A	N/A	Peak	Peak	Vert
2440	74.34	29.54	5.03	26.32	82.60	N/A	N/A	Ave	Ave	Vert
4880	18.73	33.27	7.11	25.80	33.31	54.00	-20.69	Ave	Ave	Vert
4880	31.78	33.27	7.11	25.80	46.36	74.00	-27.64	Peak	Peak	Vert
7320	14.36	37.11	8.83	25.51	34.79	54.00	-19.21	Ave	Ave	Vert
7320	25.03	37.11	8.83	25.51	45.46	74.00	-28.54	Peak	Peak	Vert
9760	13.50	37.90	10.59	24.90	37.09	54.00	-16.91	Ave	Ave	Vert
9760	23.55	37.90	10.59	24.90	47.14	74.00	-26.86	Peak	Peak	Vert
12200	11.17	40.26	11.24	24.44	38.23	54.00	-15.77	Ave	Ave	Vert
12200	23.97	40.26	11.24	24.44	51.03	74.00	-22.97	Peak	Peak	Vert
14640	12.40	41.80	13.46	22.84	44.82	54.00	-9.18	Ave	Ave	Vert
14640	25.88	41.80	13.46	22.84	58.30	74.00	-15.70	Peak	Peak	Vert
17080	10.39	42.53	15.12	23.28	44.76	54.00	-9.24	Ave	Ave	Vert
17080	23.68	42.53	15.12	23.28	58.04	74.00	-15.96	Peak	Peak	Vert



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Radiated Emissions (Spurious)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

High Channel - X axis

FREQ (Mhz)	Meter	Correction Factors (dB)			dBuV/m			Type		Polarity
		Ant	Cbl	Amp	Corr	Lim	Delta	Lim	Rdng	
2480	73.91	29.65	5.08	26.31	82.32	N/A	N/A	Peak	Peak	Hor
2480	68.64	29.65	5.08	26.31	77.05	N/A	N/A	Ave	Ave	Hor
4960	17.49	33.56	7.19	25.79	32.45	54.00	-21.55	Ave	Ave	Hor
4960	29.97	33.56	7.19	25.79	44.93	74.00	-29.07	Peak	Peak	Hor
7440	13.44	37.04	8.90	25.48	33.89	54.00	-20.11	Ave	Ave	Hor
7440	26.49	37.04	8.90	25.48	46.93	74.00	-27.07	Peak	Peak	Hor
9920	12.58	37.97	10.72	24.89	36.38	54.00	-17.62	Ave	Ave	Hor
9920	24.40	37.97	10.72	24.89	48.20	74.00	-25.80	Peak	Peak	Hor
12400	13.42	40.82	11.55	24.37	41.41	54.00	-12.59	Ave	Ave	Hor
12400	24.61	40.82	11.55	24.37	52.61	74.00	-21.39	Peak	Peak	Hor
14880	10.60	42.13	13.61	22.67	43.67	54.00	-10.33	Peak	Peak	Hor
14880	23.61	42.13	13.61	22.67	56.68	74.00	-17.32	Peak	Peak	Hor
17360	9.89	42.98	15.44	23.05	45.26	54.00	-8.74	Ave	Ave	Hor
17360	22.54	42.98	15.44	23.05	57.91	74.00	-16.09	Peak	Peak	Hor
2480	82.82	29.65	5.08	26.31	91.23	N/A	N/A	Peak	Peak	Vert
2480	80.35	29.65	5.08	26.31	88.76	N/A	N/A	Ave	Ave	Vert
4960	27.19	33.56	7.19	25.79	42.15	54.00	-11.85	Ave	Ave	Vert
4960	36.92	33.56	7.19	25.79	51.88	74.00	-22.12	Peak	Peak	Vert
7440	13.34	37.04	8.90	25.48	33.78	54.00	-20.22	Ave	Ave	Vert
7440	27.67	37.04	8.90	25.48	48.11	74.00	-25.89	Peak	Peak	Vert
9920	12.27	37.97	10.72	24.89	36.07	54.00	-17.93	Ave	Ave	Vert
9920	24.68	37.97	10.72	24.89	48.48	74.00	-25.52	Peak	Peak	Vert
12400	13.02	40.82	11.55	24.37	41.02	54.00	-12.98	Ave	Ave	Vert
12400	23.84	40.82	11.55	24.37	51.84	74.00	-22.16	Peak	Peak	Vert
14880	10.86	42.13	13.61	22.67	43.93	54.00	-10.07	Peak	Peak	Vert
14880	23.46	42.13	13.61	22.67	56.53	74.00	-17.47	Peak	Peak	Vert
17360	9.51	42.98	15.44	23.05	44.88	54.00	-9.12	Ave	Ave	Vert
17360	22.07	42.98	15.44	23.05	57.44	74.00	-16.56	Peak	Peak	Vert



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Radiated Emissions (Spurious)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

High Channel - Y axis

FREQ (Mhz)	Meter	Correction Factors (dB)			dBuV/m			Type		Polarity
		Ant	Cbl	Amp	Corr	Lim	Delta	Lim	Rdng	
2480	81.56	29.65	5.08	26.31	89.97	N/A	N/A	Peak	Peak	Hor
2480	76.15	29.65	5.08	26.31	84.57	N/A	N/A	Ave	Ave	Hor
4960	21.85	33.56	7.19	25.79	36.80	54.00	-17.20	Ave	Ave	Hor
4960	30.78	33.56	7.19	25.79	45.73	74.00	-28.27	Peak	Peak	Hor
7440	11.86	37.04	8.90	25.48	32.31	54.00	-21.69	Ave	Ave	Hor
7440	24.58	37.04	8.90	25.48	45.03	74.00	-28.97	Peak	Peak	Hor
9920	13.17	37.97	10.72	24.89	36.97	54.00	-17.03	Ave	Ave	Hor
9920	24.99	37.97	10.72	24.89	48.79	74.00	-25.21	Peak	Peak	Hor
12400	12.80	40.82	11.55	24.37	40.80	54.00	-13.20	Ave	Ave	Hor
12400	23.75	40.82	11.55	24.37	51.75	74.00	-22.25	Peak	Peak	Hor
14880	11.62	42.13	13.61	22.67	44.70	54.00	-9.30	Peak	Peak	Hor
14880	25.00	42.13	13.61	22.67	58.07	74.00	-15.93	Peak	Peak	Hor
17360	10.72	42.98	15.44	23.05	46.09	54.00	-7.91	Ave	Ave	Hor
17360	23.70	42.98	15.44	23.05	59.07	74.00	-14.93	Peak	Peak	Hor
2480	71.28	29.65	5.08	26.31	79.69	N/A	N/A	Peak	Peak	Vert
2480	66.61	29.65	5.08	26.31	75.02	N/A	N/A	Ave	Ave	Vert
4960	17.37	33.56	7.19	25.79	32.32	54.00	-21.68	Ave	Ave	Vert
4960	28.03	33.56	7.19	25.79	42.99	74.00	-31.01	Peak	Peak	Vert
7440	12.14	37.04	8.90	25.48	32.59	54.00	-21.41	Ave	Ave	Vert
7440	26.05	37.04	8.90	25.48	46.49	74.00	-27.51	Peak	Peak	Vert
9920	11.86	37.97	10.72	24.89	35.66	54.00	-18.34	Ave	Ave	Vert
9920	25.09	37.97	10.72	24.89	48.89	74.00	-25.11	Peak	Peak	Vert
12400	12.74	40.82	11.55	24.37	40.74	54.00	-13.26	Ave	Ave	Vert
12400	23.97	40.82	11.55	24.37	51.97	74.00	-22.03	Peak	Peak	Vert
14880	12.21	42.13	13.61	22.67	45.28	54.00	-8.72	Peak	Peak	Vert
14880	23.28	42.13	13.61	22.67	56.35	74.00	-17.65	Peak	Peak	Vert
17360	9.85	42.98	15.44	23.05	45.22	54.00	-8.78	Ave	Ave	Vert
17360	24.18	42.98	15.44	23.05	59.55	74.00	-14.45	Peak	Peak	Vert



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Radiated Emissions (Spurious)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter			

High Channel - Z axis

FREQ (Mhz)	Meter	Correction Factors (dB)			dBuV/m			Type		Polarity
		Ant	Cbl	Amp	Corr	Lim	Delta	Lim	Rdng	
2480	82.68	29.65	5.08	26.31	91.10	N/A	N/A	Peak	Peak	Hor
2480	79.65	29.65	5.08	26.31	88.06	N/A	N/A	Ave	Ave	Hor
4960	28.76	33.56	7.19	25.79	43.71	54.00	-10.29	Ave	Ave	Hor
4960	35.56	33.56	7.19	25.79	50.52	74.00	-23.48	Peak	Peak	Hor
7440	16.41	37.04	8.90	25.48	36.86	54.00	-17.14	Ave	Ave	Hor
7440	26.52	37.04	8.90	25.48	46.96	74.00	-27.04	Peak	Peak	Hor
9920	13.07	37.97	10.72	24.89	36.88	54.00	-17.12	Ave	Ave	Hor
9920	23.62	37.97	10.72	24.89	47.42	74.00	-26.58	Peak	Peak	Hor
12400	13.26	40.82	11.55	24.37	41.26	54.00	-12.74	Ave	Ave	Hor
12400	26.60	40.82	11.55	24.37	54.60	74.00	-19.40	Peak	Peak	Hor
14880	13.16	42.13	13.61	22.67	46.23	54.00	-7.77	Peak	Peak	Hor
14880	22.75	42.13	13.61	22.67	55.82	74.00	-18.18	Peak	Peak	Hor
17360	11.76	42.98	15.44	23.05	47.13	54.00	-6.87	Ave	Ave	Hor
17360	21.97	42.98	15.44	23.05	57.34	74.00	-16.66	Peak	Peak	Hor
2480	80.11	29.65	5.08	26.31	88.52	N/A	N/A	Peak	Peak	Vert
2480	76.96	29.65	5.08	26.31	85.37	N/A	N/A	Ave	Ave	Vert
4960	28.43	33.56	7.19	25.79	43.38	54.00	-10.62	Ave	Ave	Vert
4960	21.42	33.56	7.19	25.79	36.37	54.00	-17.63	Ave	Ave	Vert
4960	39.38	33.56	7.19	25.79	54.34	74.00	-19.66	Peak	Peak	Vert
4960	33.04	33.56	7.19	25.79	48.00	74.00	-26.00	Peak	Peak	Vert
7440	13.48	37.04	8.90	25.48	33.93	54.00	-20.07	Ave	Ave	Vert
7440	25.93	37.04	8.90	25.48	46.38	74.00	-27.62	Peak	Peak	Vert
9920	13.28	37.97	10.72	24.89	37.08	54.00	-16.92	Ave	Ave	Vert
9920	25.84	37.97	10.72	24.89	49.64	74.00	-24.36	Peak	Peak	Vert
12400	11.73	40.82	11.55	24.37	39.73	54.00	-14.27	Ave	Ave	Vert
12400	26.09	40.82	11.55	24.37	54.09	74.00	-19.91	Peak	Peak	Vert
14880	10.89	42.13	13.61	22.67	43.96	54.00	-10.04	Peak	Peak	Vert
14880	26.00	42.13	13.61	22.67	59.07	74.00	-14.93	Peak	Peak	Vert
17360	9.83	42.98	15.44	23.05	45.20	54.00	-8.80	Ave	Ave	Vert
17360	23.30	42.98	15.44	23.05	58.67	74.00	-15.33	Peak	Peak	Vert

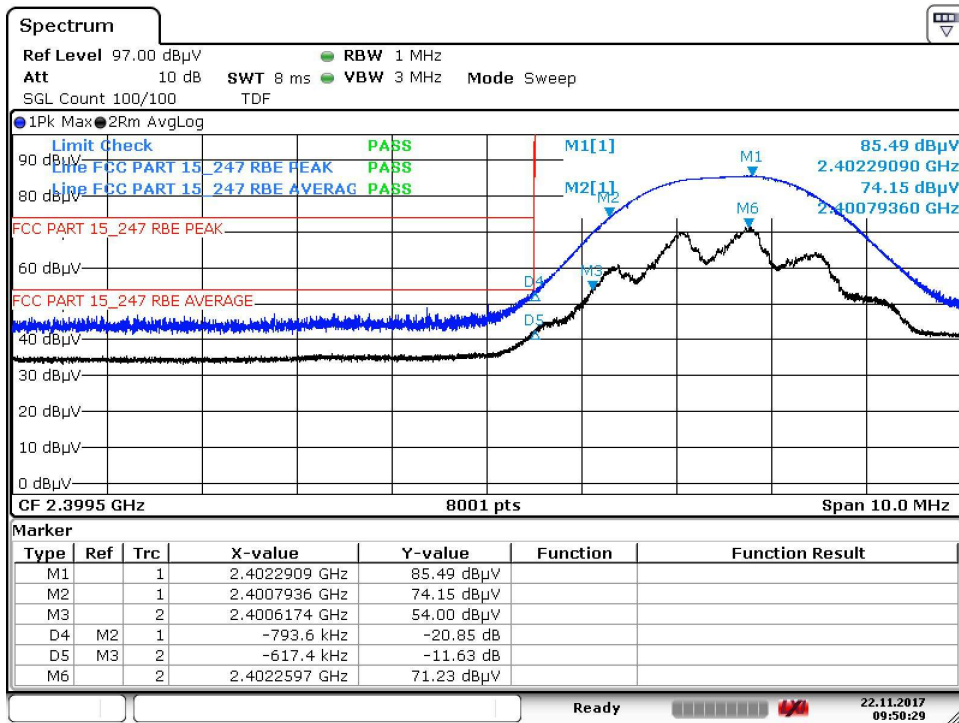


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Lower Edge - X axis - Horizontal



Date: 22.NOV.2017 09:50:29

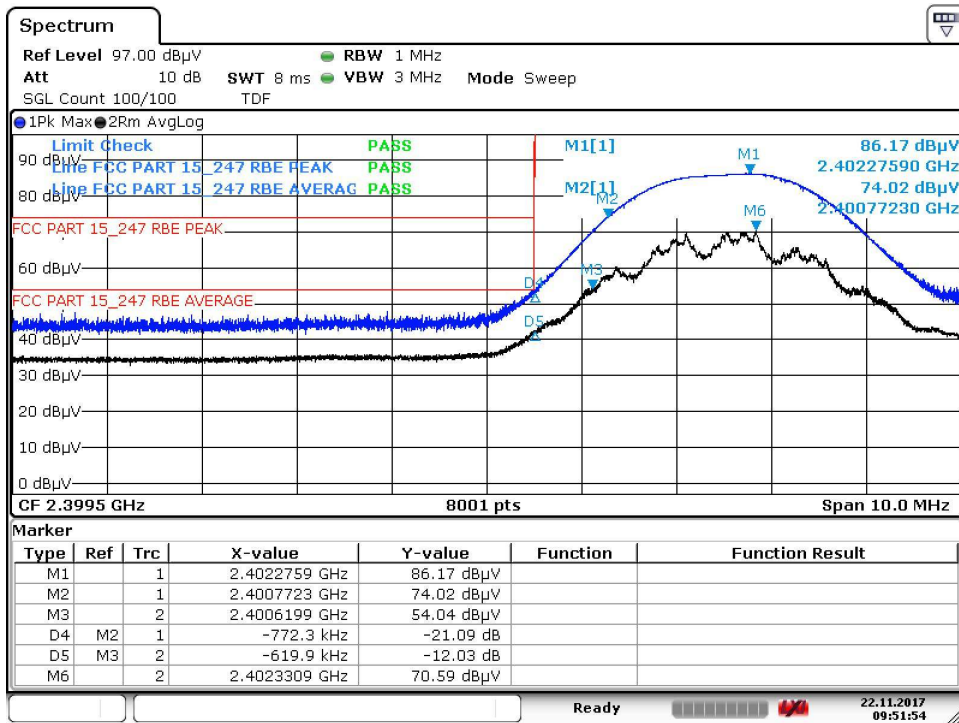


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Lower Edge - X Axis - Vertical



Date: 22.NOV.2017 09:51:54

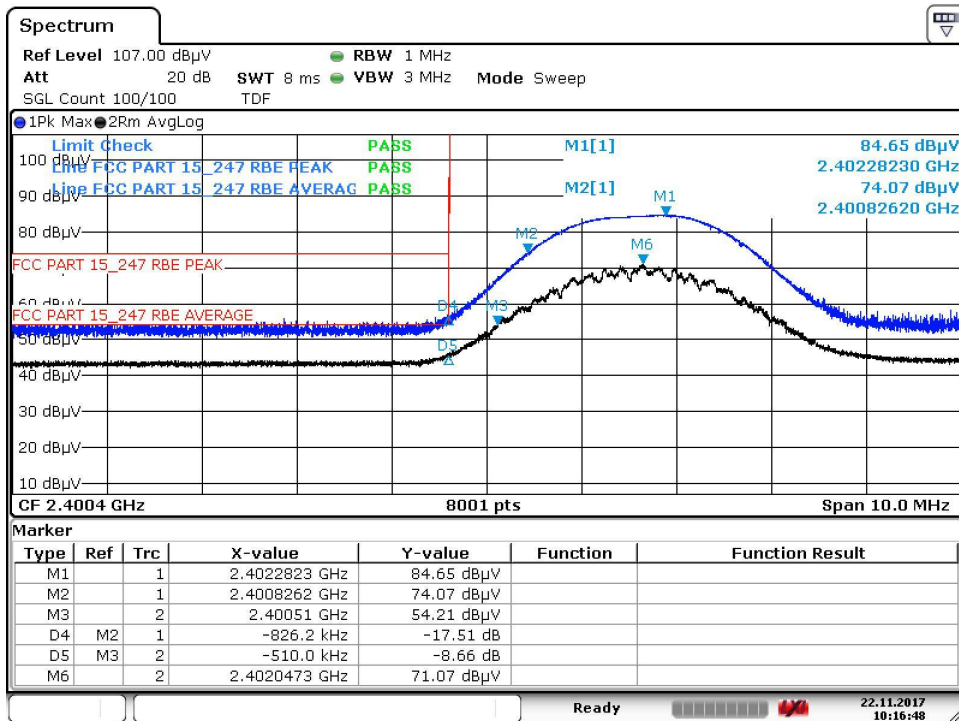


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Lower Edge - Y axis - Horizontal



Date: 22.NOV.2017 10:16:48

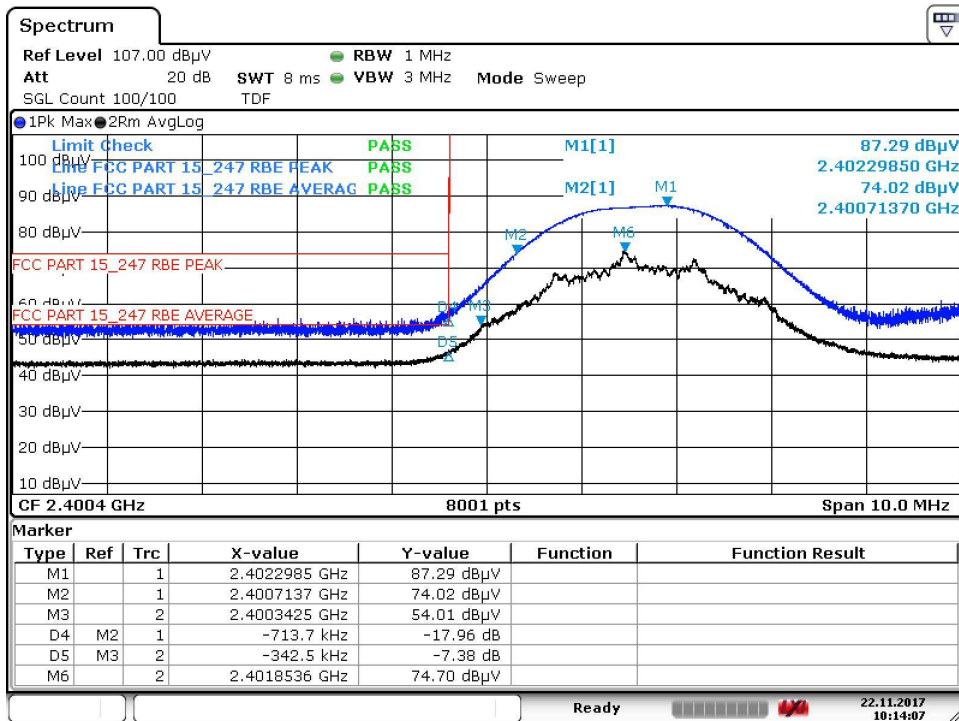


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Lower Edge - Y Axis - Vertical



Date: 22.NOV.2017 10:14:07

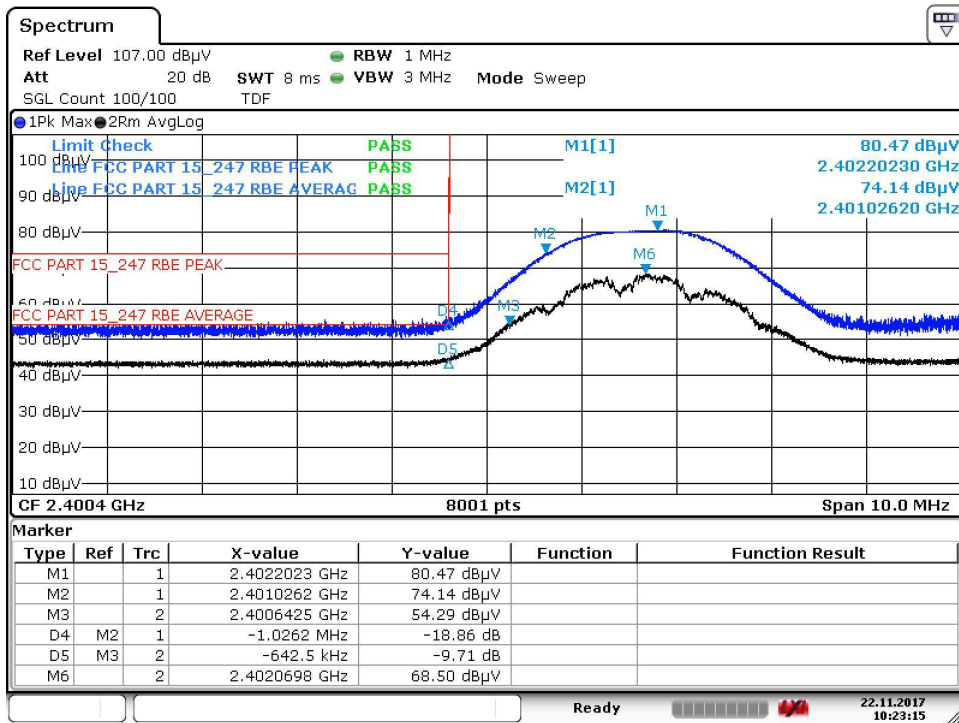


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Lower Edge - Z axis - Horizontal



Date: 22.NOV.2017 10:23:15

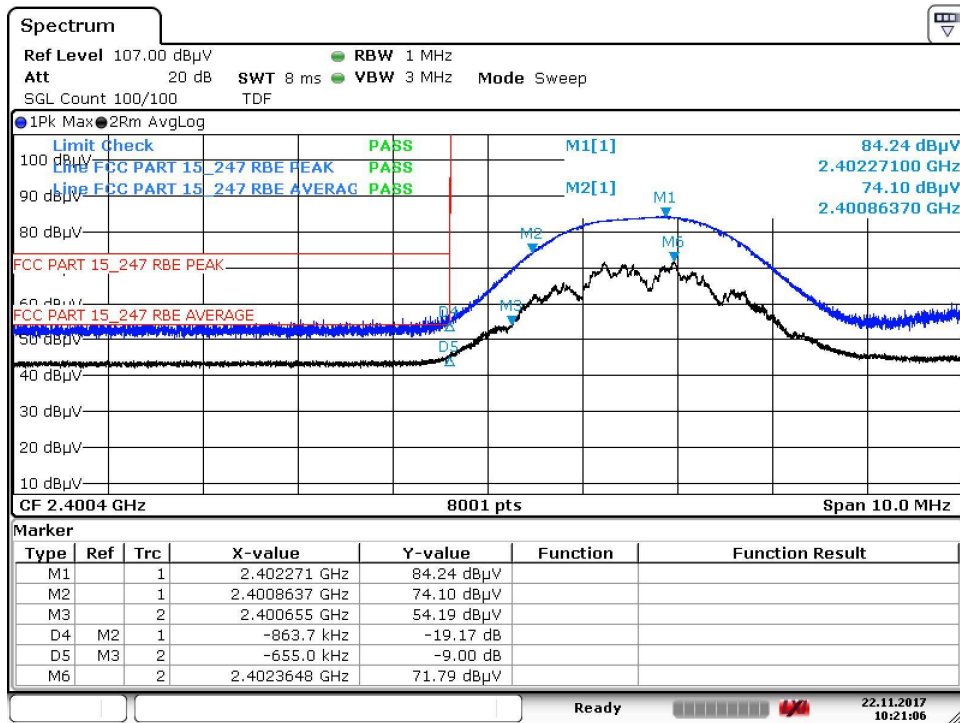


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Lower Edge - Z Axis - Vertical



Date: 22.NOV.2017 10:21:06

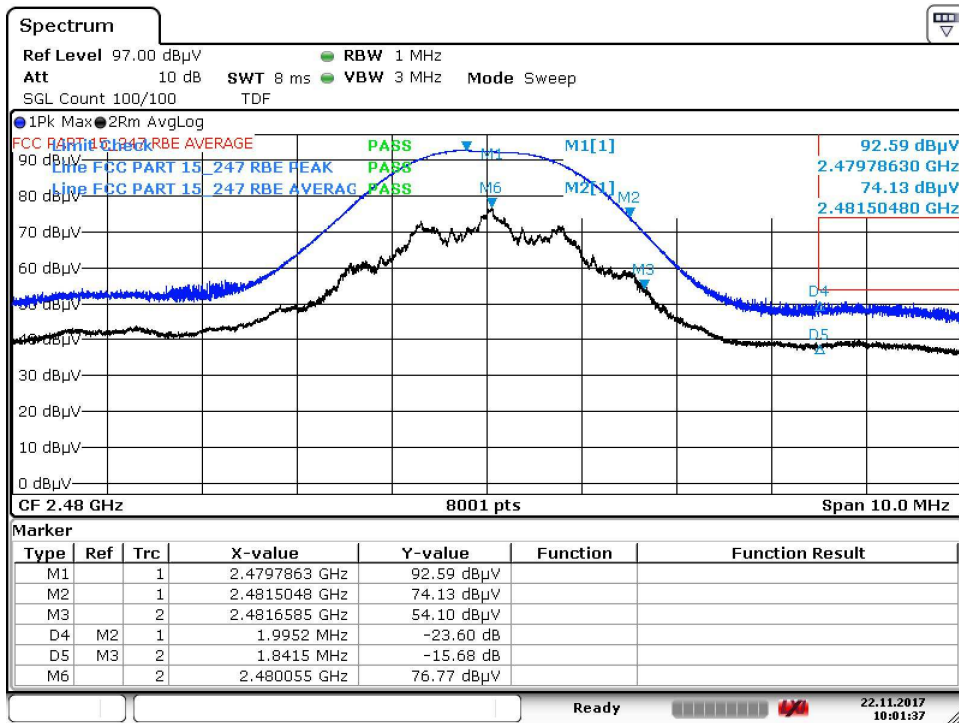


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Upper Edge - X Axis - Horizontal



Date: 22.NOV.2017 10:01:37

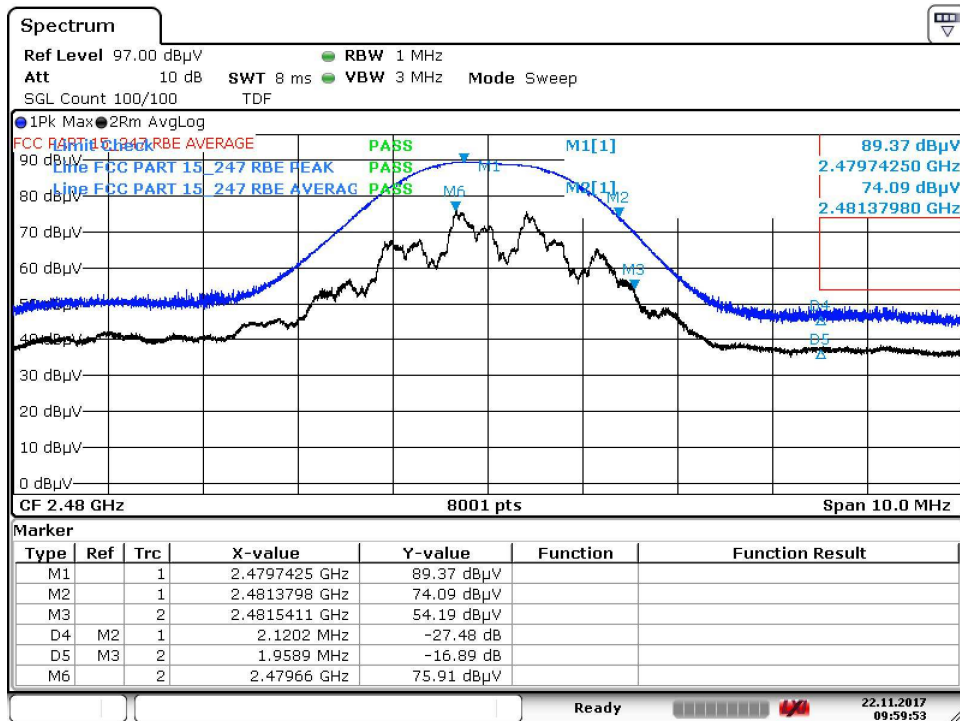


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Upper Edge - X Axis - Vertical



Date: 22.NOV.2017 09:59:53

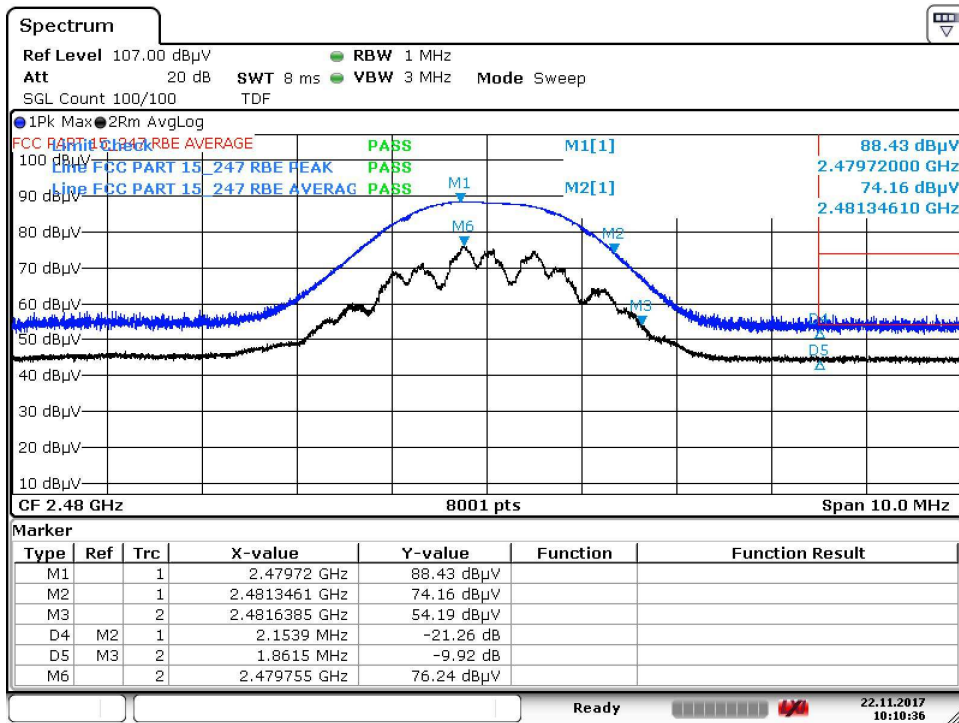


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Upper Edge - Y Axis - Horizontal



Date: 22.NOV.2017 10:10:36

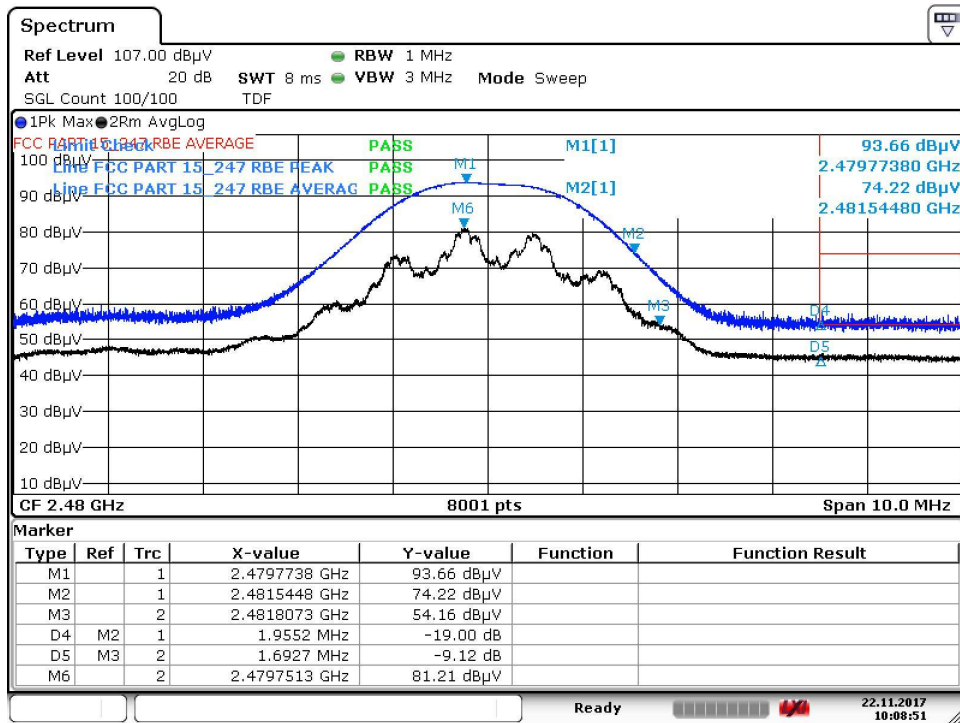


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Upper Edge - Y Axis - Vertical



Date: 22.NOV.2017 10:08:51

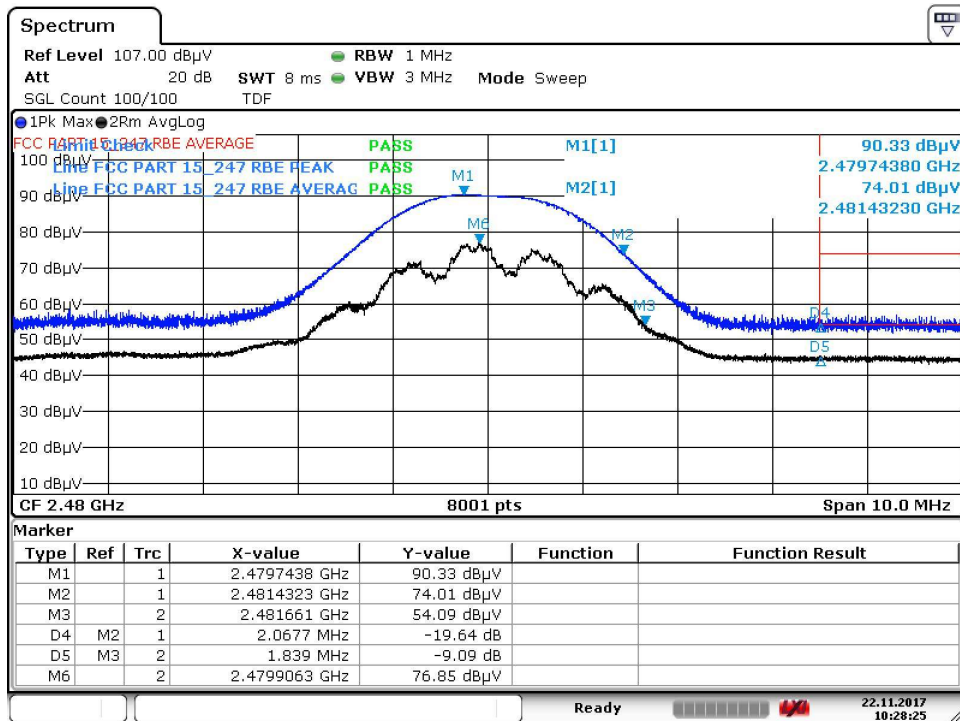


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Upper Edge - Z Axis - Horizontal



Date: 22.NOV.2017 10:28:25

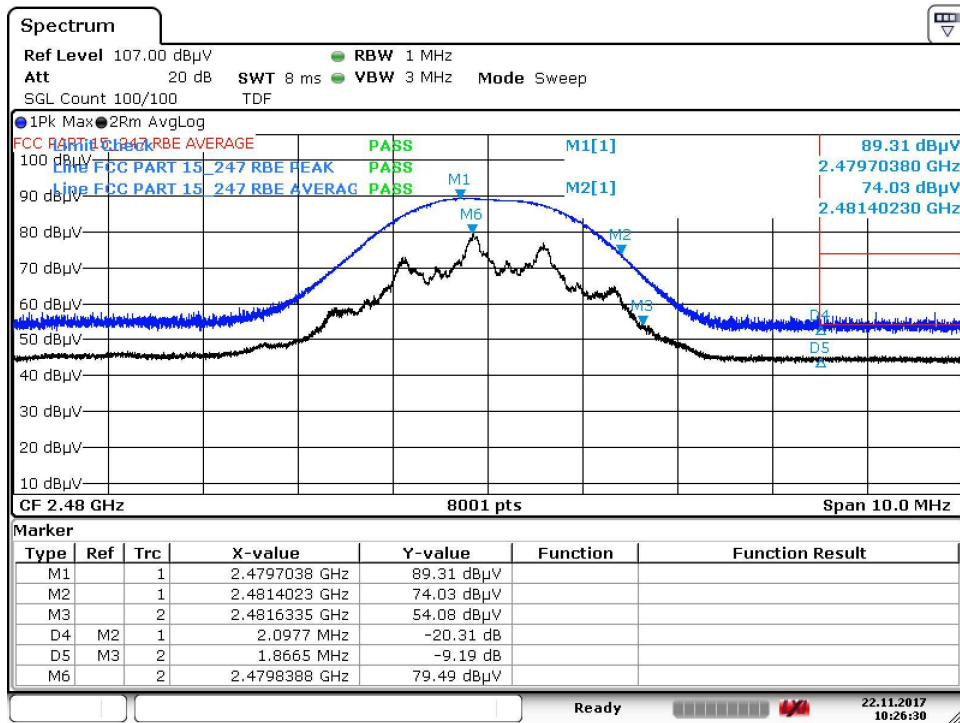


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Radiated Emissions (Bandedge)

DNB Job Number:	86022	Date:	22 Nov 2017	Specification [X] 15.247 (c) [X] ANSI C63.10-2013
Customer:	Orbit Irrigation Products Inc.			
Model Number:	BH1			
Description:	BLE Transmitter 1 Mbps (Basic data rate)			

Radiated Corrected Band Edge - Upper Edge - Z Axis - Vertical



Date: 22.NOV.2017 10:26:30

15.247 (a,2) 6 dB Bandwidth

Test Procedure: ANSI C63.10-2013

6 dB Bandwidth

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 6 dB bandwidth, centered on a hopping channel

RBW 1% of the 6 dB bandwidth

VBW RBW

Sweep = auto

Detector function = peak

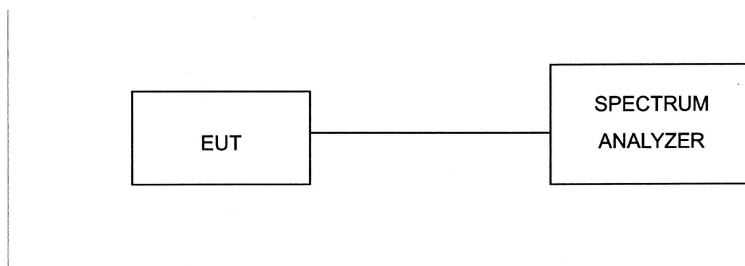
Trace = max hold


The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

EUT operating conditions:

The software provided by the client to enable the EUT to transmit continuously.

Test Set Up: (Note following set up was used for all antenna conducted measurements)



	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436		Measurement Test Set Up	
DNB Job Number:	86022	Date:	10 Oct 2017	
Customer:	Orbit Irrigation Products Inc.			Conformance Standard
Model Number:	BH1	FCC Part 15		
Description:	BLE Transmitter			Clause 15.247
Antenna Conducted Measurement Set Up				

