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).
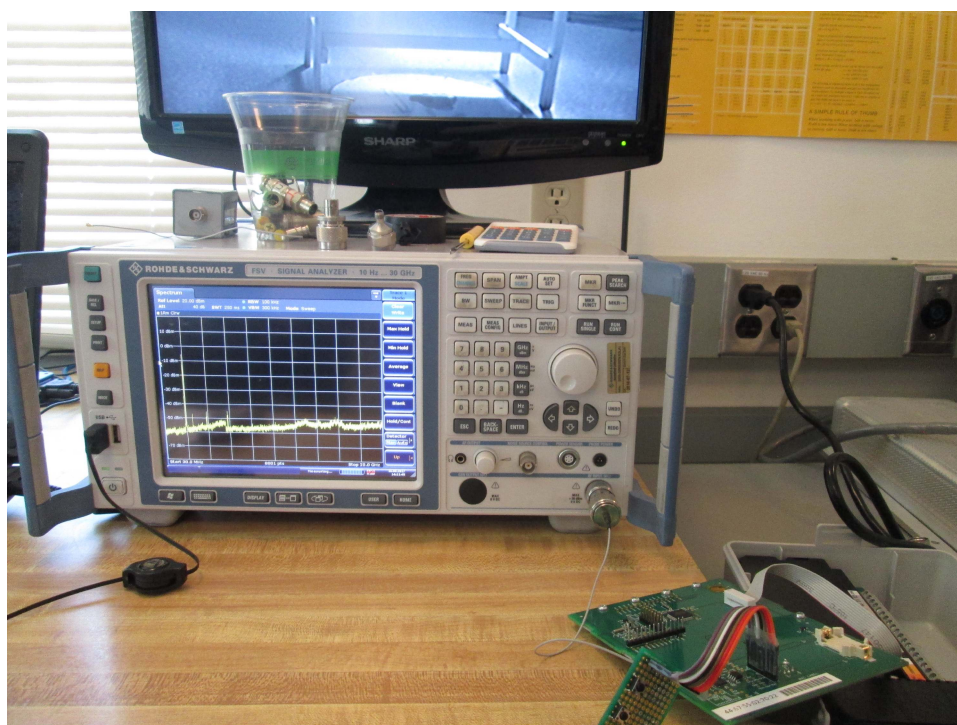
EUT operating conditions:

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)
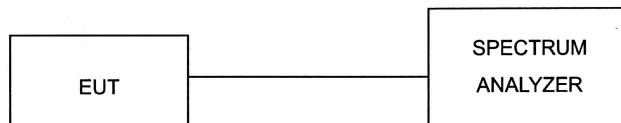
	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Measurement Test Set Up	
DNB Job Number:	86019	Date: 16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.		FCC Part 15
Model Number:	WT25		
Description:	BLE Transmitter		Clause 15.247
Antenna Conducted Measurement Set Up			

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436		6 dB Single Channel Bandwidth	
DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			Clause
Description:	BLE Transmitter			15.247(a,2)
	Test Procedure			

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
21 °C	25 %	101.2 kPa

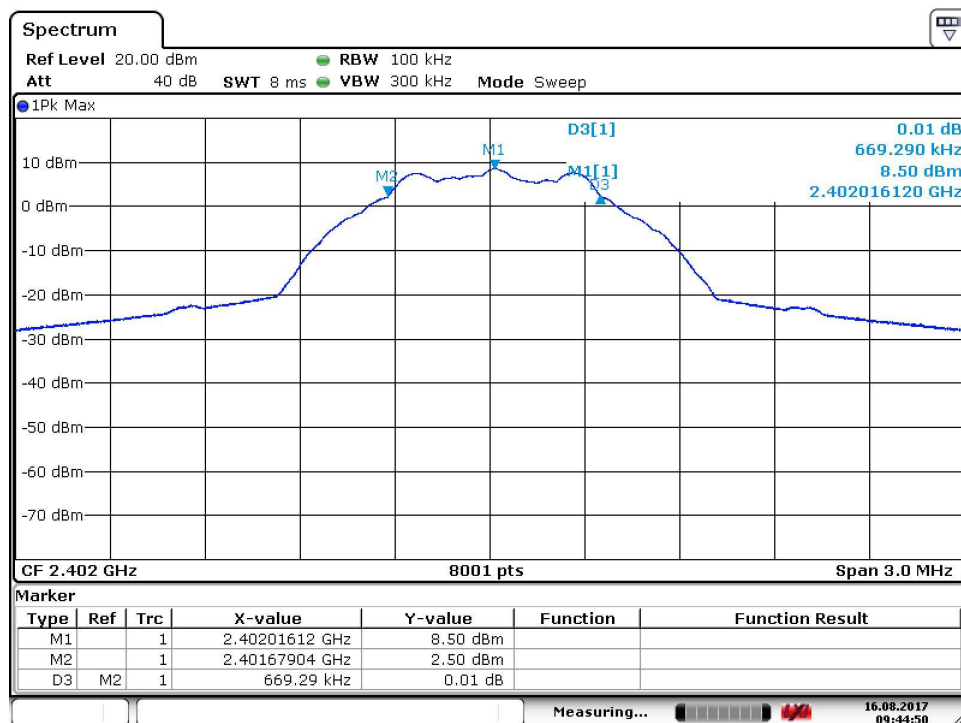| EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   *Les Payne* |
|---|

6 dB Bandwidth

ANSI C63.10-2013 Clause 11.8.1

The steps are as follows:
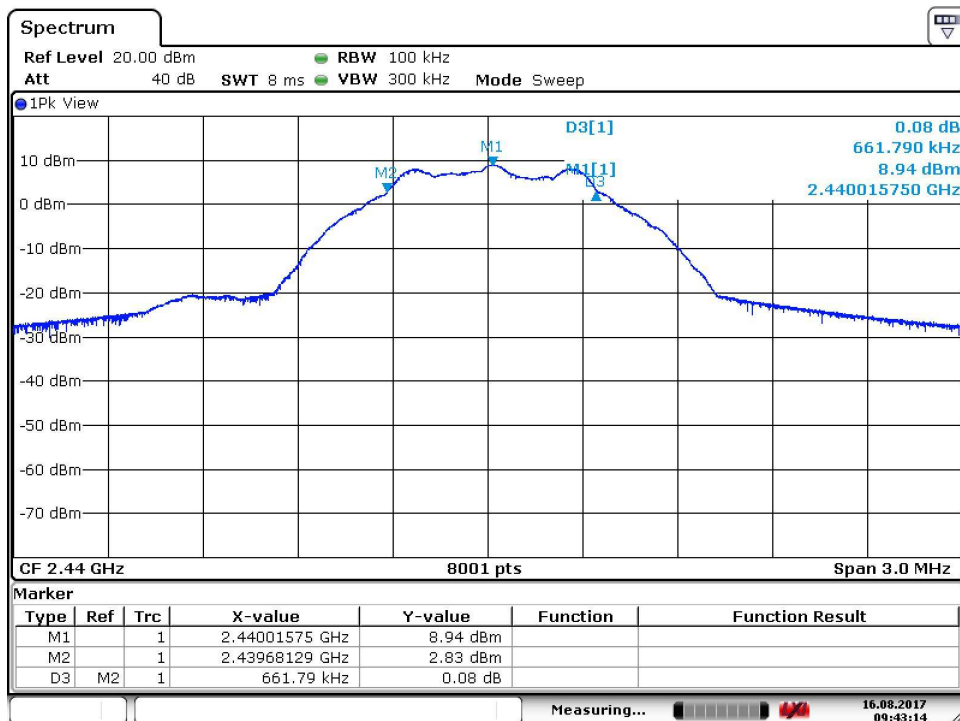
a)   Set RBW = 100 kHz
b)   Set the VBW $\geq$ [3 x RBW]
    * per ANSI C63.10-2013 clause 6.9.2   Set the span to 2 to 5 times the OBW
c)   Detector = peak
d)   Trace mode = max hold
e)   Sweep = auto couple
f)   Allow trace to stabilize
g)   Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.
h)   Submit this plot(s).

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	6 dB Single Channel Bandwidth	

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(a,2)
	1 Mbps (Basic data rate)			

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   *Les Payne*

Channel	Chl Freq (MHz)	6dB BW (kHz)	Limit	Pass/Fail
Low	2402	669.290	> 500 kHz	Pass

Date: 16.AUG.2017 09:44:50

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	6 dB Single Channel Bandwidth	

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(a,2)
	1 Mbps (Basic data rate)			

<table>
<tr><td colspan="3">Environmental Conditions</td></tr>
<tr><td>Ambient Temperature</td><td>Relative Humidity</td><td>Barometric Pressure</td></tr>
<tr><td>26 °C</td><td>30 %</td><td>101.35 kPa</td></tr>
</table>

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   *Les Payne*

Channel	Chl Freq (MHz)	6dB BW (kHz)	Limit	Pass/Fail
Middle	2440	661.790	> 500 kHz	Pass

Date: 16.AUG.2017 09:43:14

<table>
<tr><td rowspan="4">![DNB logo]</td><td rowspan="4">1100 E Chalk Creek Road
Coalville, UT 84017
(435) 336-4433
FAX (435) 336-4436</td><td rowspan="2"></td></tr>
<tr></tr>
<tr><td colspan="2">6 dB Single Channel Bandwidth</td></tr>
</table>

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause
	1 Mbps (Basic data rate)			15.247(a,2)

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   *Les Payne*

Channel	Chl Freq (MHz)	6dB BW (kHz)	Limit	Pass/Fail
High	2480	687.290	> 500 kHz	Pass
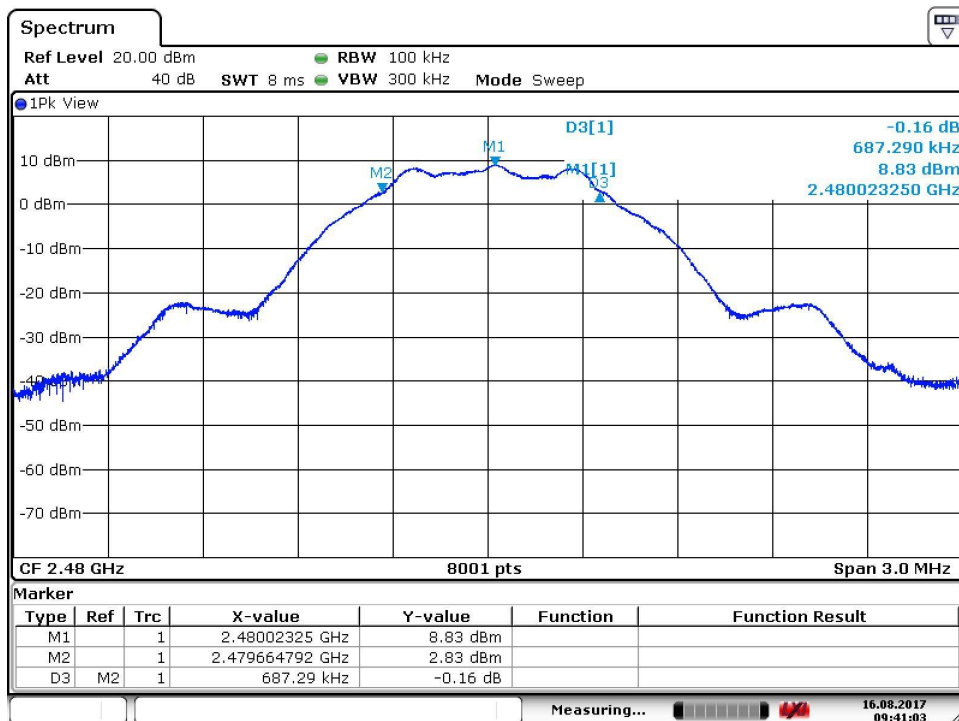
Date: 16.AUG.2017 09:41:03

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	99% Occupied Bandwidth	
DNB Job Number:	86019	Date: 16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.		RSS-Gen
Model Number:	WT25		
Description:	BLE Transmitter		Clause
	1 Mbps (Basic data rate)		Section 6.6

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   *CL Payne*

Channel	Chl Freq (MHz)	99% BW (MHz)
Low	2402	1.046494188

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	99% Occupied Bandwidth	

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			RSS-Gen
Model Number:	WT25			
Description:	BLE Transmitter			Clause Section 6.6
	1 Mbps (Basic data rate)			

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   *CL Payne*

Channel	Chl Freq (MHz)	99% BW (MHz)
Middle	2440	1.048368954

Spectrum

Ref Level 20.00 dBm   RBW 100 kHz
Att   35 dB SWT 8 ms VBW 300 kHz Mode Sweep

1Pk Max

M1[1]   -27.53 dBm
                     2.438500000 GHz
                     1.048368954 MHz

Occ Bw

CF 2.44 GHz   8001 pts   Span 3.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4385 GHz	-27.53 dBm		
T1		1	2.439493438 GHz	-5.41 dBm	Occ Bw	1.048368954 MHz
T2		1	2.440541807 GHz	-5.52 dBm		

Measuring...   16.08.2017
                      09:48:07
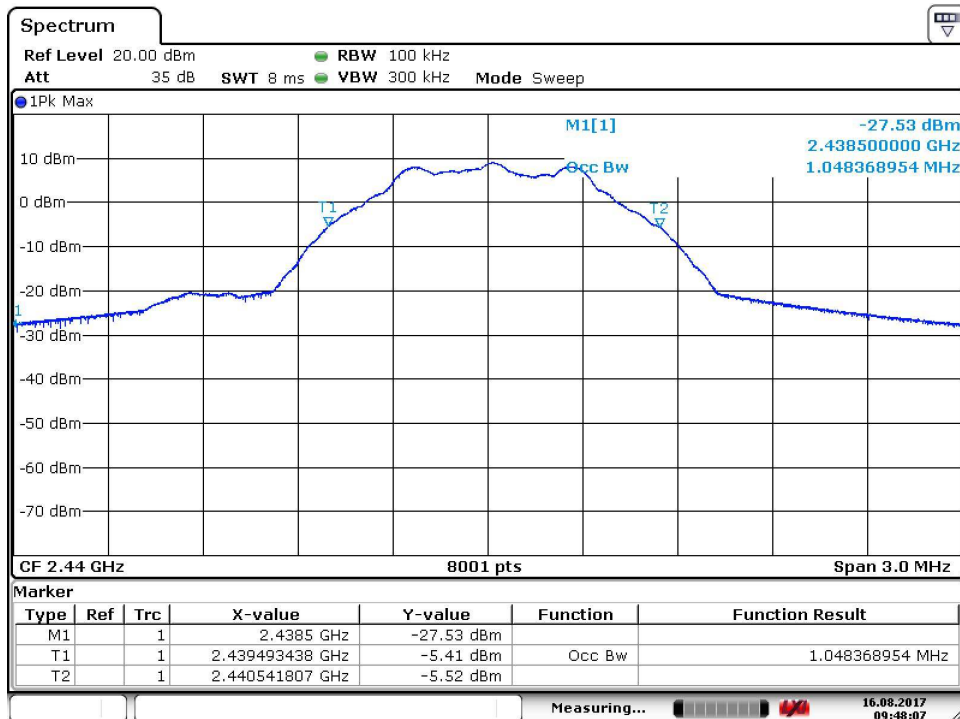
Date: 16.AUG.2017 09:48:07

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	99% Occupied Bandwidth	
DNB Job Number:	86019	Date: 16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.		RSS-Gen
Model Number:	WT25		
Description:	BLE Transmitter		Clause Section 6.6
	1 Mbps (Basic data rate)		

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   *CL Payne*

Channel	Chl Freq (MHz)	99% BW (MHz)
High	2480	1.049118860
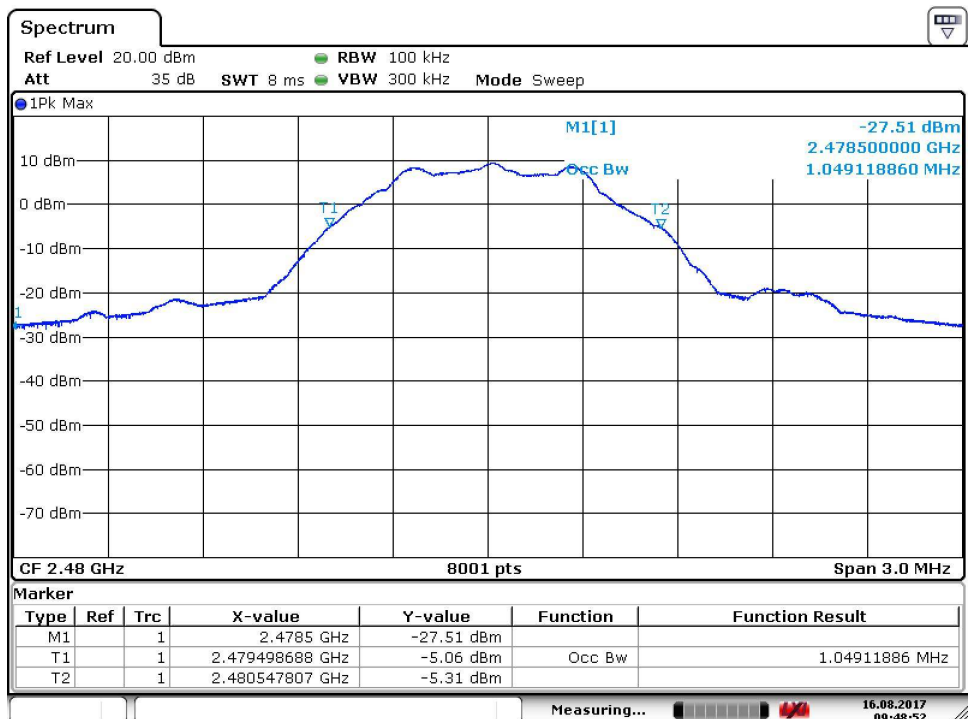
Date: 16.AUG.2017 09:48:52

15.247 (a,2,b3)   Maximum Peak Output Power (Conducted)

Test Procedure: ANSI C63.10-2013

Peak Output Power

Per clause 11.9.1.1 RBW ≥ DTS Bandwidth

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement.

a)   Set the RBW ≥ DTS bandwidth
b)   Set the VBW ≥ [3 x RBW]
c)   Set span ≥ [3 x RBW]
d)   Sweep time = auto couple
e)   Detector = peak
f)   Trace mode = max hold
g)   Allow trace to fully stabilize
h)   Use peak marker function to determine the peak amplitude
i)   Submit plots

Test Set Up:

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Peak Output Power (Cond)

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(b)
	Low Channel - 1 Mbps (Basic data rate)			

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   Les Payne

Freq MHz	Meas Peak Pwr (dBm)	Limit (dBm)	Delta (dBm)	Meas Peak Pwr (mW)	Limit (mW)	Delta (mW)	Pass/Fail
2402	8.51	30.00	-21.49	7.096	1000	-992.904	Pass
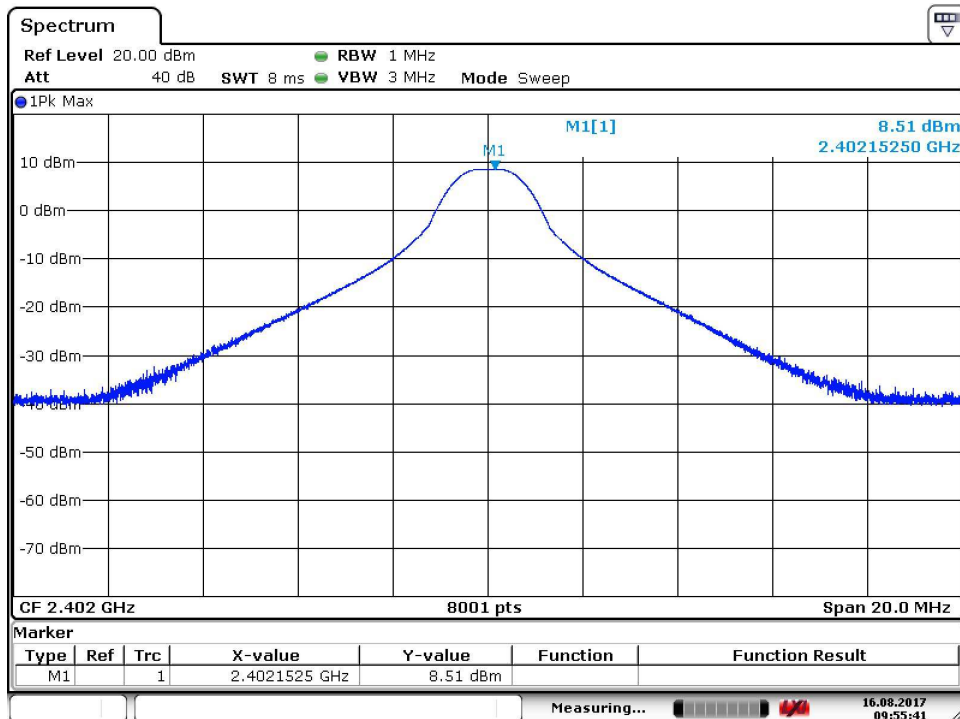
Date: 16.AUG.2017 09:55:41

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Peak Output Power (Cond)

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(b)
	Middle Channel - 1 Mbps (Basic data rate)			

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   CL Payne

Freq MHz	Meas Peak Pwr (dBm)	Limit (dBm)	Delta (dBm)	Meas Peak Pwr (mW)	Limit (mW)	Delta (mW)	Pass/Fail
2440	8.97	30.00	-21.03	7.889	1000	-992.111	Pass

Date: 16.AUG.2017 09:54:18

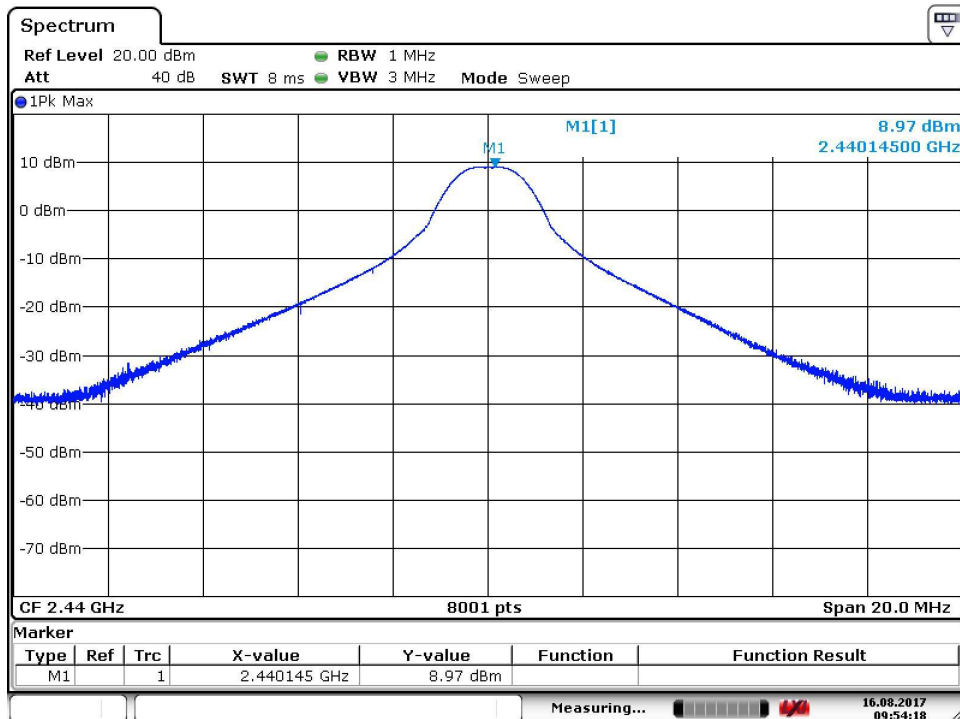| 1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Peak Output Power (Cond)	

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(b)
	High Channel - 1 Mbps (Basic data rate)			

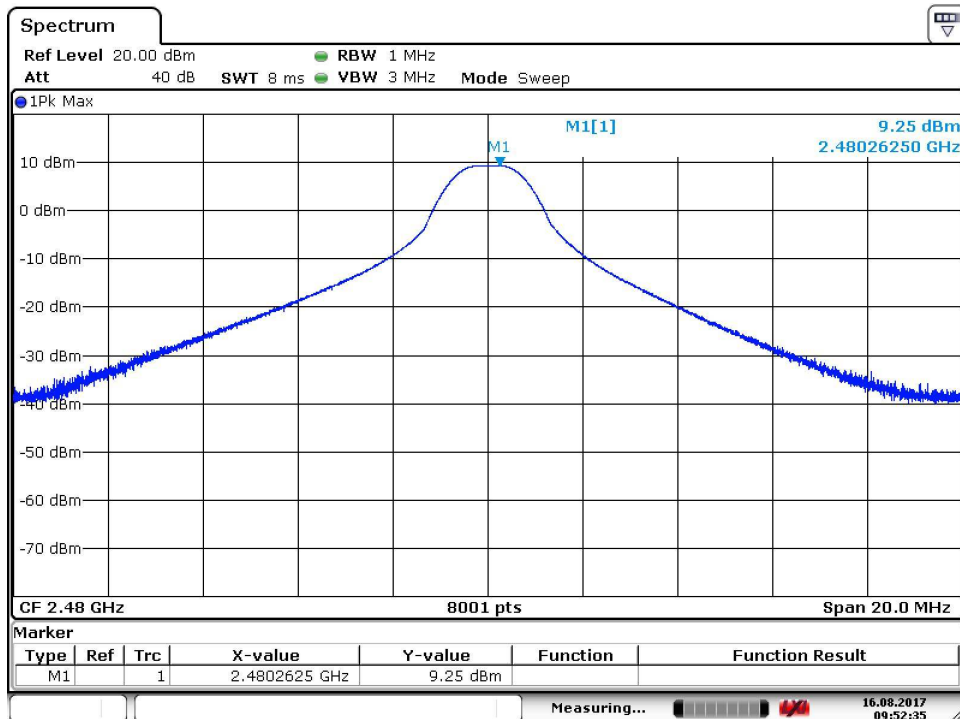| Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   CL Payne

Freq MHz	Meas Peak Pwr (dBm)	Limit (dBm)	Delta (dBm)	Meas Peak Pwr (mW)	Limit (mW)	Delta (mW)	Pass/Fail
2480	9.25	30.00	-20.75	8.414	1000	-991.586	Pass

Date: 16.AUG.2017 09:52:34

15.247 (a,2,d)   Conducted Band Edge and Out of Band Emissions

Test Procedure: ANSI C63.10-2013

Band-edge Compliance of RF Conducted Emissions

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation
RBW   1% of the span
VBW   RBW
Sweep = auto
Detector function = peak
Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section. Submit this plot.

Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit. Submit this plot.

Test Set Up: Same as 15.247 (a,2) 6dB Emission Bandwidth

DNB	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Band Edge Measurements	

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(a,2,d)
	1 Mbps (Basic data rate)			

Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   CL Payne

Conducted Band Edge Measurement			Freq Delta (MHz)	Pass/Fail
Limit	Lower (MHz)	Upper (MHz)		
2400	2401.405074		1.405	Pass
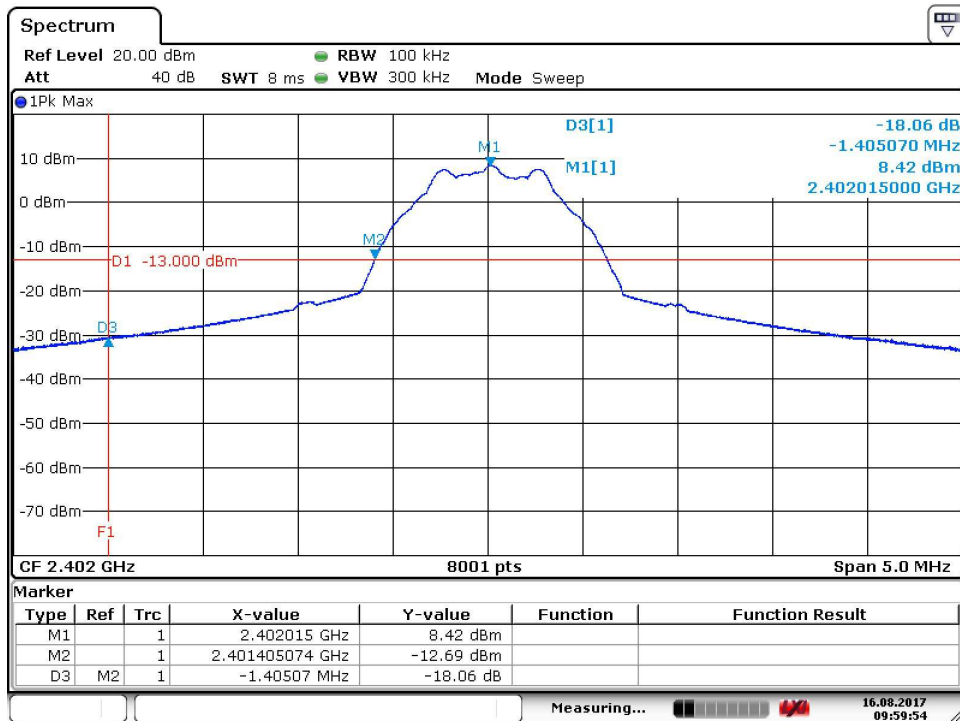
Date: 16.AUG.2017 09:59:53

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Band Edge Measurements

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(a,2,d)
	1 Mbps (Basic data rate)			

Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   CL Payne

Conducted Band Edge Measurement			Freq Delta (MHz)	Pass/Fail
Limit	Lower (MHz)	Upper (MHz)		
2483.5		2480.643670	2.856	Pass

Date: 16.AUG.2017 10:03:39

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436		Conducted Spurious	
DNB Job Number:	86019	Date: 16 Aug 2017	Conformance Standard	
Customer:	Orbit Irrigation Products Inc.		FCC Part 15	
Model Number:	WT25			
Description:	BLE Transmitter		Clause 15.247(a,2,d)	
	Test Procedure			

Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   Les Payne

Test Procedure: ANSI C63.10-2013

15.247 (a,2,d)   Spurious RF Conducted Emissions

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz
VBW   RBW
Sweep = auto
Detector function = peak
Trace = max hold

Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section. Submit these plots.

<table>
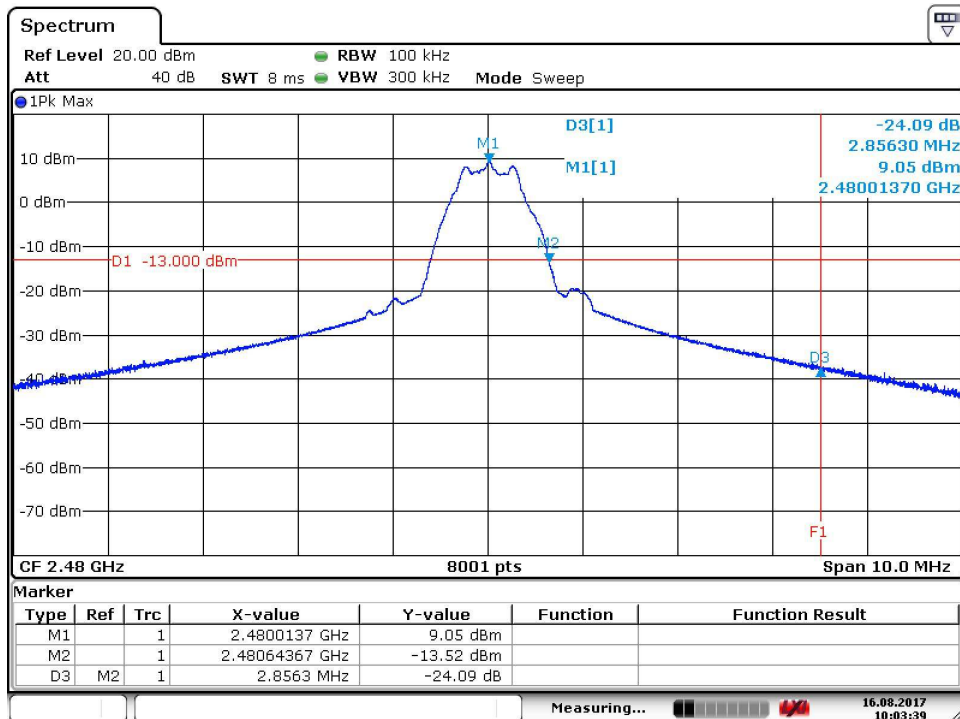<tr><td rowspan="5"><img DNB logo></td><td colspan="2">1100 E Chalk Creek Road
Coalville, UT 84017
(435) 336-4433
FAX (435) 336-4436</td><td>Conducted Spurious</td></tr>
</table>

DNB Job Number:	86019	Date: 16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.		FCC Part 15
Model Number:	WT25		Clause
Description:	BLE Transmitter		15.247(a,2,d)
	Low Channel - 1 Mbps (Basic data rate)		

Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   CL Payne

Peak Output Power	Reading (dBm)	-20dBc (dBm)	Pass/Fail
8.51 dBm	8.15	-11.85	Pass
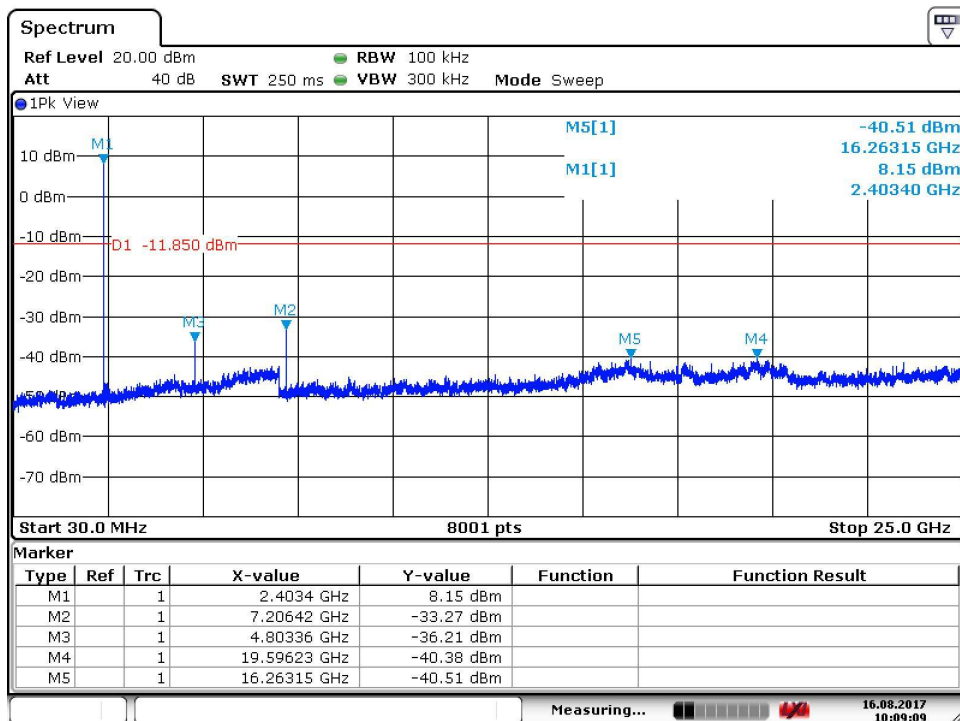
Date: 16.AUG.2017 10:09:09

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Conducted Spurious

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(a,2,d)
	Middle Channel - 1 Mbps (Basic data rate)			

Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard　[X] Yes　[ ] No　CL Payne

Peak Output Power	Reading (dBm)	-20dBc (dBm)	Pass/Fail
8.97 dBm	8.58	-11.42	Pass

Spectrum

Ref Level 20.00 dBm　　RBW 100 kHz
Att　　40 dB　SWT 250 ms　VBW 300 kHz　Mode Sweep

●1Pk View

M5[1]　　-40.28 dBm
16.25379 GHz
M1[1]　　8.58 dBm
2.44090 GHz

D1 -11.420 dBm

Start 30.0 MHz　　8001 pts　　Stop 25.0 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4409 GHz	8.58 dBm		
M2		1	7.31877 GHz	-29.68 dBm		
M3		1	4.88138 GHz	-38.16 dBm		
M4		1	19.51821 GHz	-39.67 dBm		
M5		1	16.25379 GHz	-40.28 dBm		

Measuring...　　16.08.2017
10:11:20

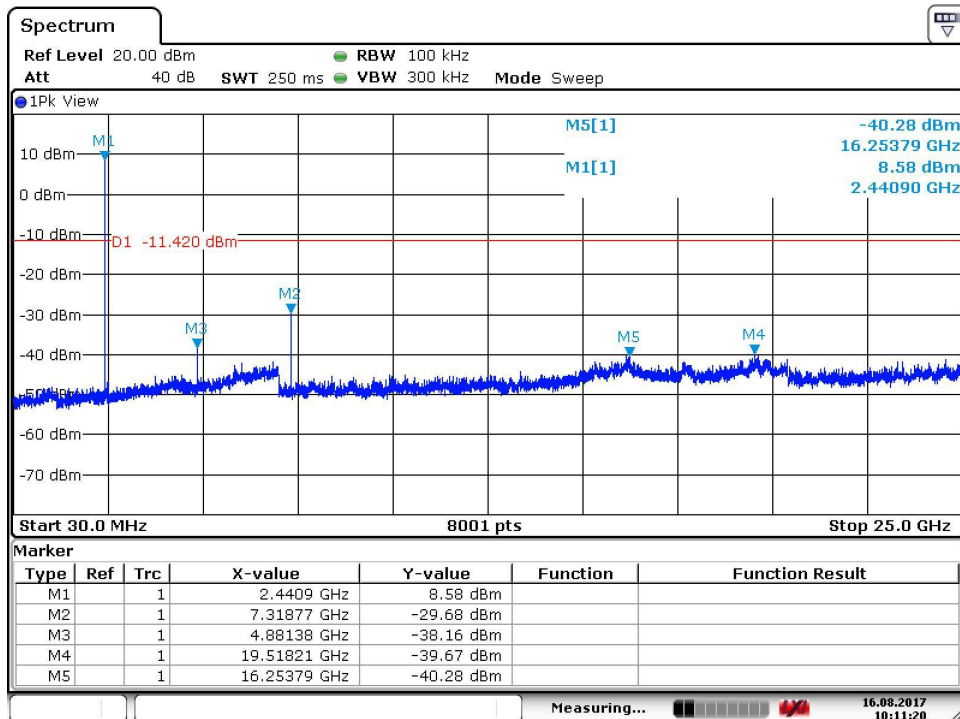Date: 16.AUG.2017 10:11:20
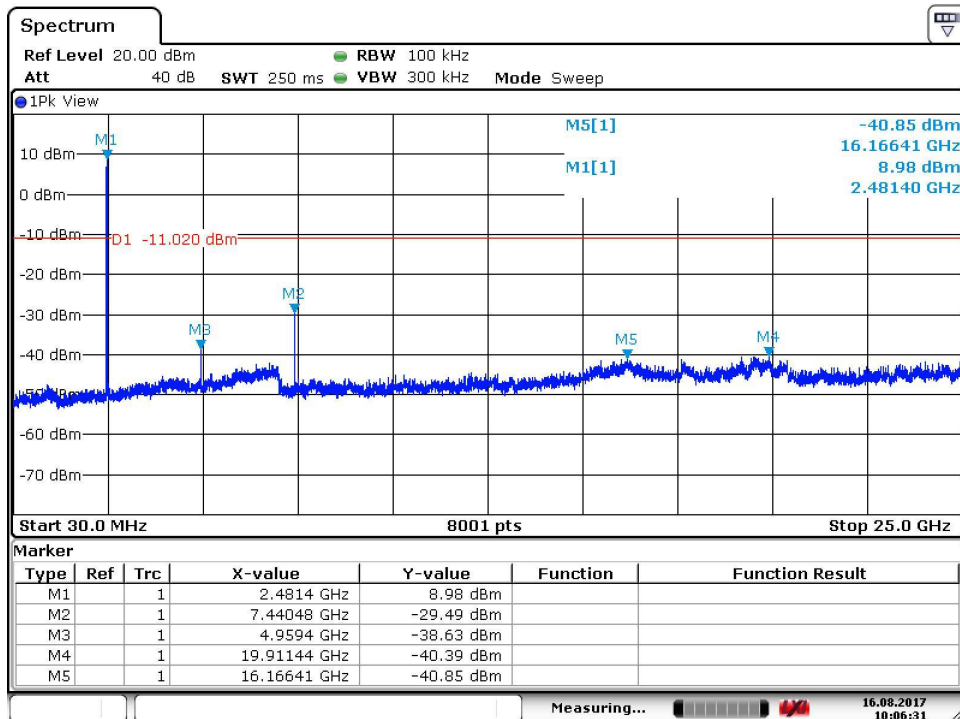
	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Conducted Spurious		
DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(a,2,d)
	High Channel - 1 Mbps (Basic data rate)			

Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   CL Payne

Peak Output Power	Reading (dBm)	-20dBc (dBm)	Pass/Fail
9.25 dBm	8.98	-11.02	Pass

Date: 16.AUG.2017 10:06:31

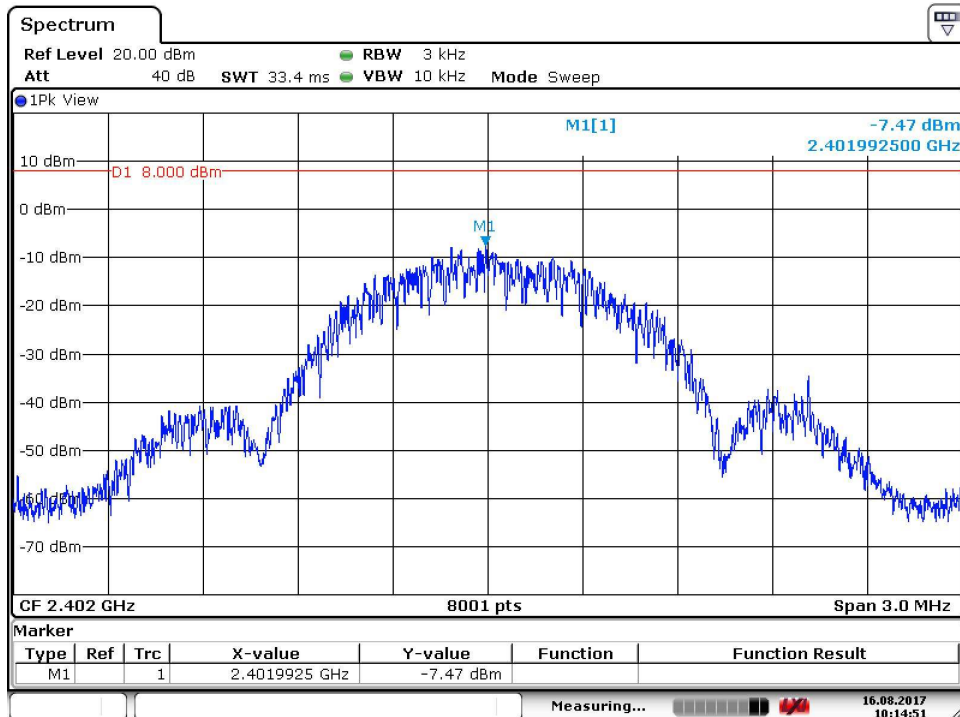15.247(a,2,e):   Power spectral density(PSD).

Test Procedure: ANSI C63.10-2013

Clause 11.10.2 Method PKPSD (peak PSD)

The following procedure shall be used if the maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:

a)   Set analyzer center frequency to DTS channel center frequency
b)   Set the span to 1.5 times the DTS bandwidth
c)   Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz
d)   Set the VBW ≥ [3 x RBW]
e)   Detector = peak
f)   Sweep time = auto couple
g)   Trace mode = max hold
h)   Allow trace to fully stabilize
i)   Use the peak marker function to determine the maximum amplitude level within the RBW
j)   If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat
k)   Submit plots

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Power Spectral Density

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(d)
	Low Channel - 1 Mbps (Basic data rate)			

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard [X] Yes [ ] No CL Payne

Channel	Freq MHz	Meas PSD (dBm)	Limit (dBm)	Delta (dBm)	Pass/Fail
Low	2402	-7.47	8.0	-15.47	Pass

Date: 16.AUG.2017 10:14:51

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Power Spectral Density	

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(d)
	Middle Channel - 1 Mbps (Basic data rate)			

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   CL Payne

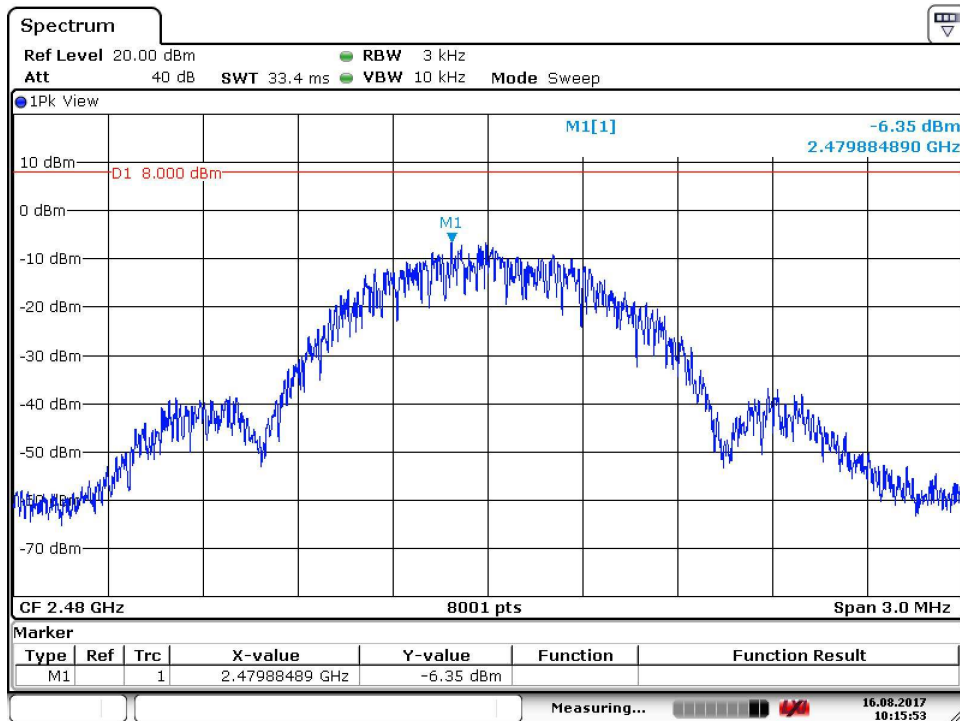| Channel	Freq MHz	Meas PSD (dBm)	Limit (dBm)	Delta (dBm)	Pass/Fail
Middle	2440	-7.03	8.0	-15.03	Pass
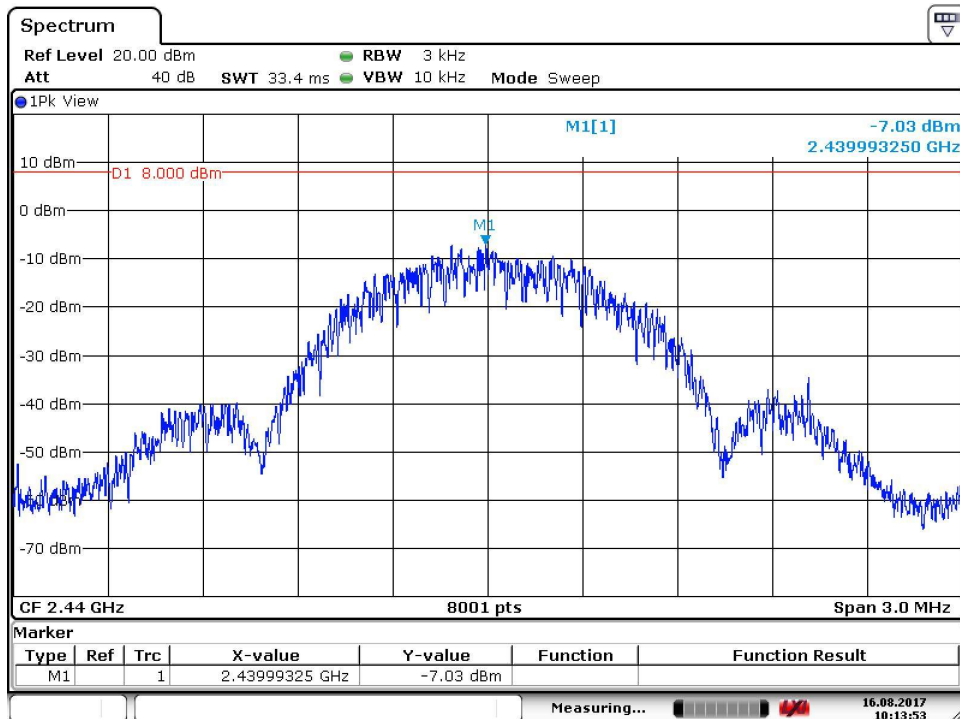
Date: 16.AUG.2017 10:13:52

1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	Power Spectral Density		

DNB Job Number:	86019	Date:	16 Aug 2017	Conformance Standard
Customer:	Orbit Irrigation Products Inc.			FCC Part 15
Model Number:	WT25			
Description:	BLE Transmitter			Clause 15.247(d)
	High Channel - 1 Mbps (Basic data rate)			

Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
26 °C	30 %	101.35 kPa

EUT performed within the requirements of the applicable standard   [X] Yes   [ ] No   CL Payne

Channel	Freq MHz	Meas PSD (dBm)	Limit (dBm)	Delta (dBm)	Pass/Fail
High	2480	-6.35	8.0	-14.35	Pass

```
Spectrum
Ref Level 20.00 dBm          RBW   3 kHz
Att         40 dB   SWT 33.4 ms   VBW 10 kHz   Mode Sweep
1Pk View
                                    M1[1]              -6.35 dBm
                                                 2.479884890 GHz
10 dBm   D1 8.000 dBm
 0 dBm
                              M1
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
CF 2.48 GHz              8001 pts              Span 3.0 MHz
Marker
Type | Ref | Trc |   X-value    |   Y-value   | Function |   Function Result
 M1  |     |  1  | 2.47988489 GHz | -6.35 dBm  |          |
                                    Measuring...  ▮▮▮▮▮▮▮▮▮ ▮  16.08.2017
                                                              10:15:53
```

Date: 16.AUG.2017 10:15:53

2.1033 (b) (7) Equipment Photographs

Supplied separately for confidentiality

End of Report UT86019A-002