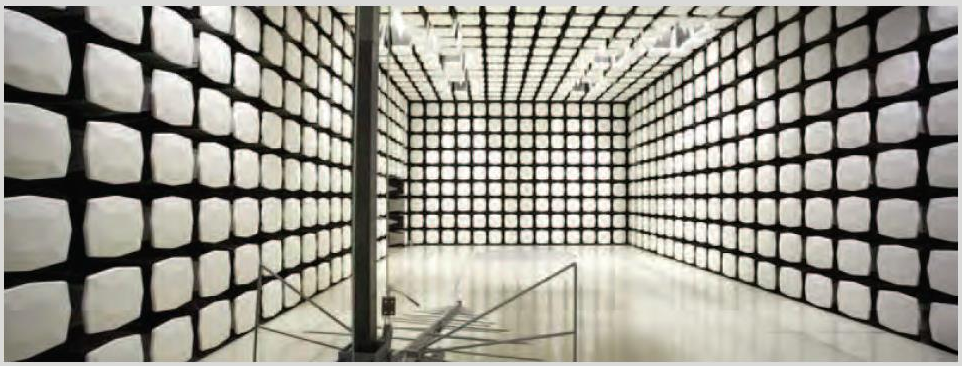
FloLogic Inc.

FloLogic Wireless Flowmeter Control System

FCC 15.247:2021

902 - 928 MHz Other Wideband (DTS) Transceiver

Report: DESO0001.3, Issue Date: May 18, 2021



NVLAP LAB CODE: 200881-0

CERTIFICATE OF TEST

Last Date of Test: March 24, 2021
FloLogic Inc.
EUT: FloLogic Wireless Flowmeter Control System

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2021	ANSI C63.10:2013, KDB 558074
FCC 15.247:2021	

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions (Transmitter)	Yes	Pass	
6.5, 6.6, 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
7.8.2	Carrier Frequency Separation	No	N/A	Not required for DTS devices.
7.8.3	Number of Hopping Frequencies	No	N/A	Not required for DTS devices.
7.8.4	Dwell Time	No	N/A	Not required for DTS devices.
7.8.6	Band Edge Compliance - Hopping Mode	No	N/A	Not required for DTS devices.
11.6	Duty Cycle	Yes	N/A	
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.9.1.1	Equivalent Isotropic Radiated Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Eric Brandon, Department Manager

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		

ACCREDITATIONS AND AUTHORIZATIONS

United States

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

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

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

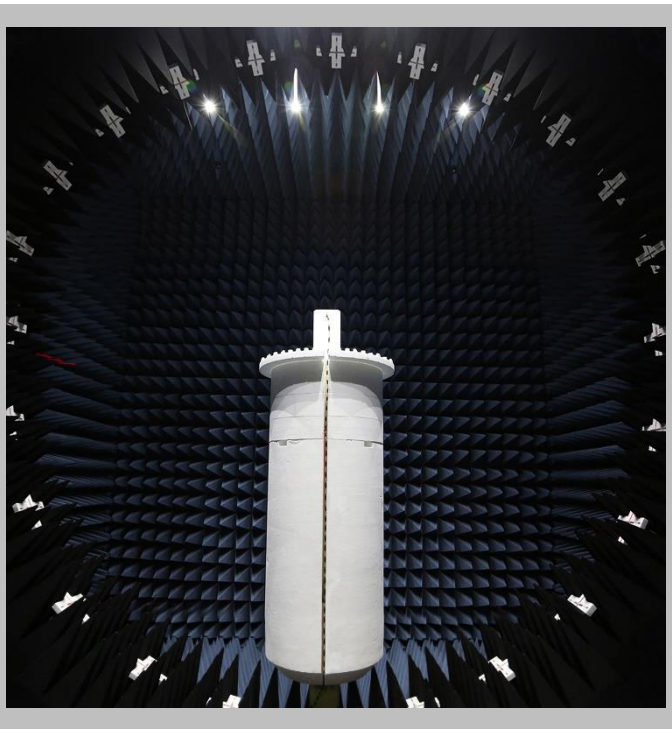
MIC – Recognized by MIC as a CAB for the acceptance of test data.

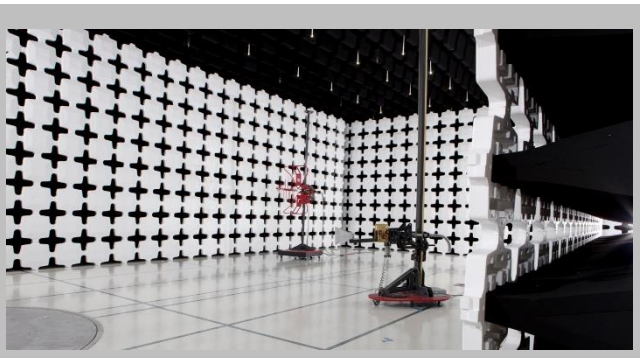
SCOPE

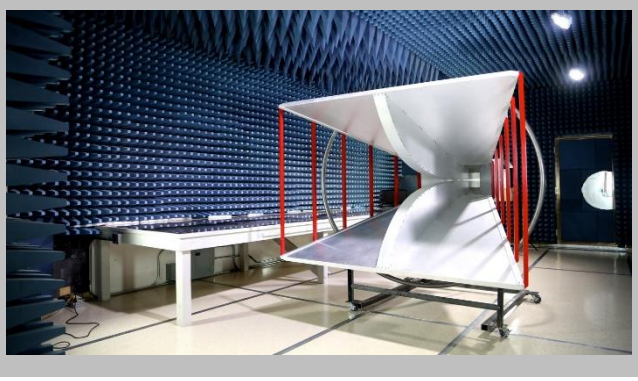
For details on the Scopes of our Accreditations, please visit:
https://www.nwemc.com/emc-testing-accreditations

FACILITIES

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP				
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

element
TMU.2015.07.10

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.

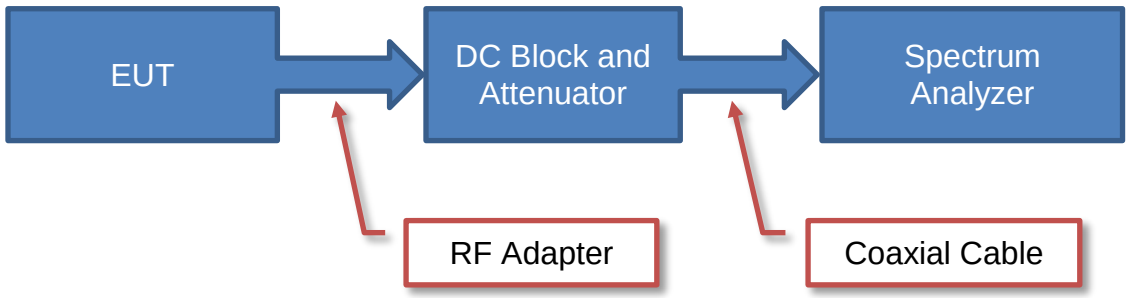
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific 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.

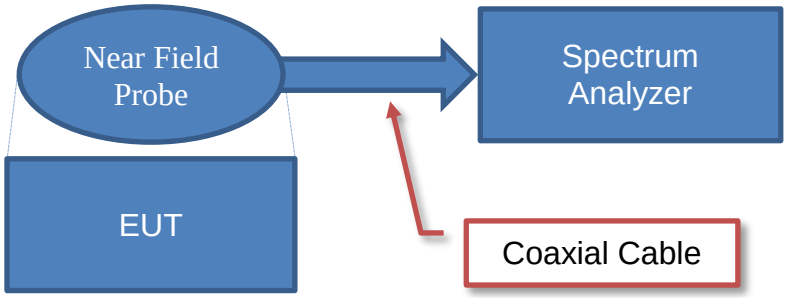
Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.6 dB	-2.6 dB

Test Setup Block Diagrams

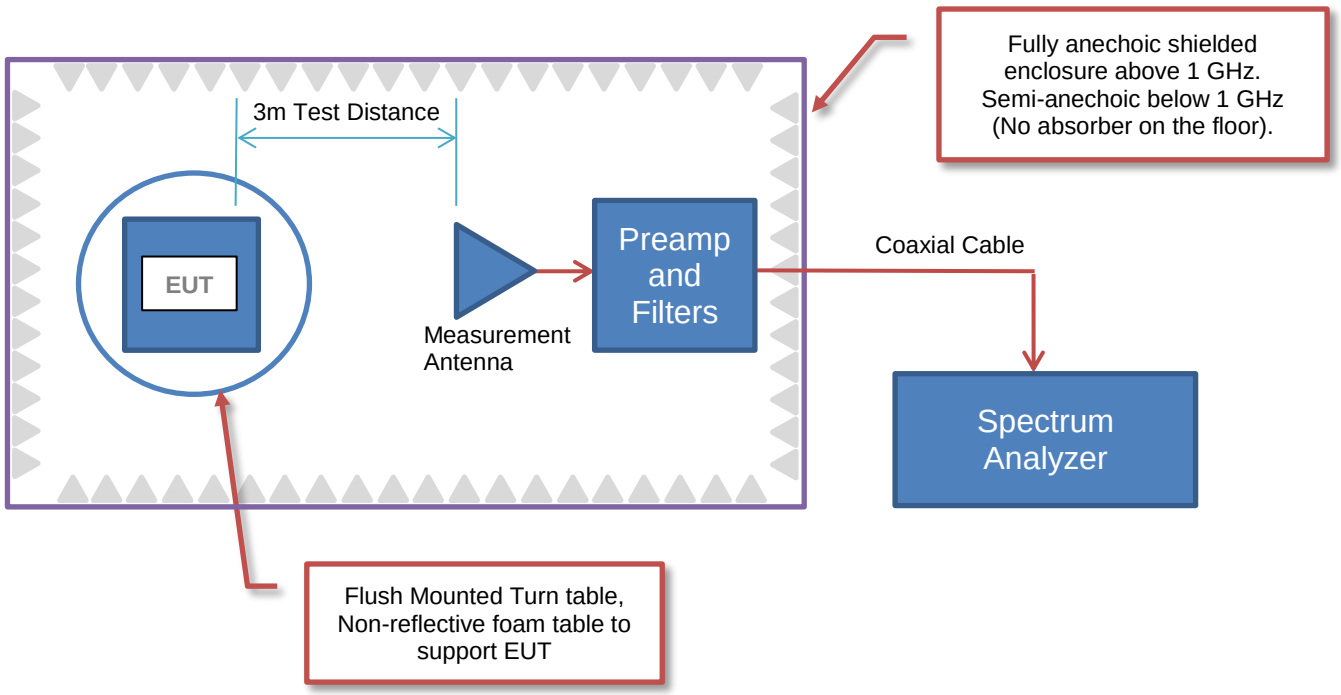
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



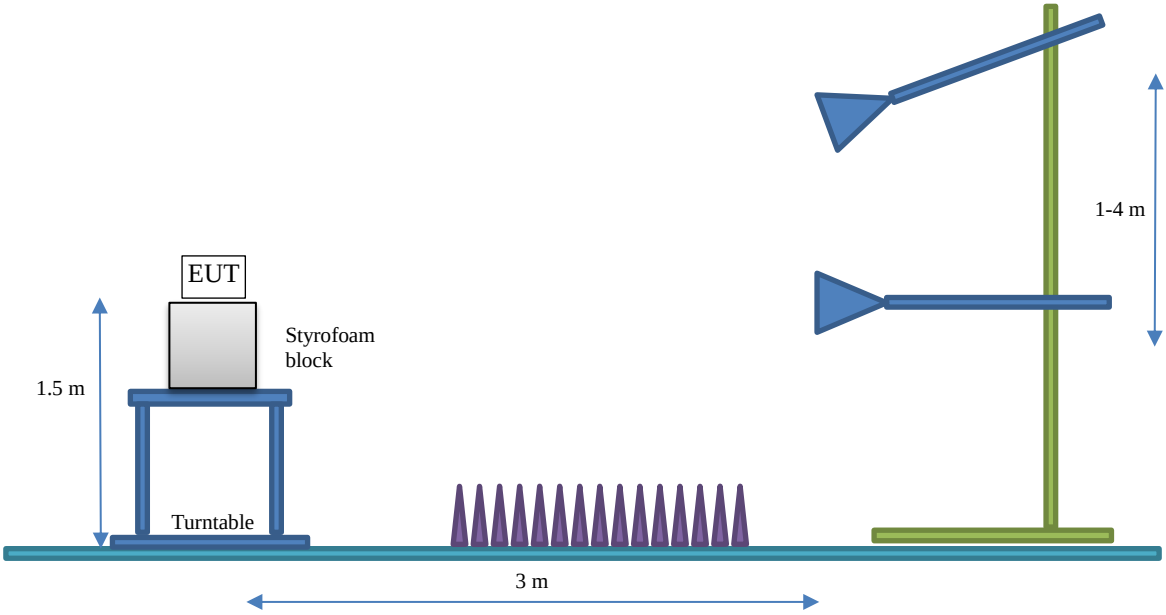
Spurious Radiated Emissions



Test Setup Block Diagrams

Bore Siting (>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:	FloLogic Inc.
Address:	1015 Aviation Parkway, Suite 900
City, State, Zip:	Morrisville, NC 27560
Test Requested By:	Bruce Gibson
EUT:	FloLogic Wireless Flowmeter Control System
First Date of Test:	March 18, 2021
Last Date of Test:	March 24, 2021
Receipt Date of Samples:	February 3, 2021
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Wireless Flowmeter Control System. Contains a Wifi radio that can transmit at the same time as a 915 MHz. Also contains a BLE radio that will not transmit at the same time.

Testing Objective:
Seeking to demonstrate compliance under FCC 15.247:2021 for operation in the 902 - 928 MHz Band.

CONFIGURATIONS

Configuration DESO0001- 3

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Flowmeter Control System	FloLogic, Inc.	None	2001966

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12V Battery	Leoch	None	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
RJ11 Cable	No	1.5m	No	Flowmeter Control System	Unterminated
Power Leads	No	0.4m	No	12V Battery	Flowmeter Control System

Configuration DESO0001- 4

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Flowmeter Control System	FloLogic, Inc.	None	FL-40F5BF

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12V Battery	Universal Power Group	UB1250	04IJE222A
Laptop	Lenovo	ThinkPad X201	3249ERU
AC/DC Adapter (Laptop)	Lenovo	92P1109	11S92P1109Z1ZBT9729GV

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Power Leads	No	0.4m	No	12V Battery	Flowmeter Control System
USB-TTL Cable	Yes	1.9m	No	Laptop	Flowmeter Control System
DC to RJ11 Cable	No	1.0m	No	12V Battery	Flowmeter Control System
AC Cable (Laptop)	No	1.0m	No	AC Mains	AC/DC Adapter (Laptop)
DC Cable (Laptop)	No	1.8m	Yes	AC/DC Adapter (Laptop)	Laptop

CONFIGURATIONS

Configuration DESO0002- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Flowmeter Control System	FloLogic, Inc.	None	2001966

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12V Battery	Leoch	None	None
Control Panel	FloLogic, Inc.	None	None
Water Valve	FloLogic, Inc.	FLS0035_1.5	7424F
Class 2 Power Supply	FloLogic, Inc.	XA005AN1380030	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
RJ11 Cable 1	No	16.4m	No	Flowmeter Control System	Control Panel
RJ11 Cable 2	No	15.2m	No	Flowmeter Control System	Water Valve
DC Cable (Water Valve)	No	3.9m	No	AC/DC Adapter/Charger	Water Valve
Battery Leads (x2)	No	1.7m	No	AC/DC Adapter/Charger	12V Battery
AC Cable	No	1.8m	No	AC/DC Adapter/Charger	AC Mains

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2021-03-18	Occupied 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.
2	2021-03-18	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.
3	2021-03-18	Equivalent Isotropic Radiated 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.
4	2021-03-18	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.
5	2021-03-18	Band Edge Compliance	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	2021-03-18	Spurious 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.
7	2021-03-22	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.
8	2021-03-24	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Ceramic Chip Antenna	Yageo	907-923	3.32

Channel	Frequency (MHz)
Low	907
Mid	913
High	923

No adjustable power settings were provided. The EUT was tested using power settings pre-defined by the manufacturer.

POWERLINE CONDUCTED EMISSIONS

element
WTD.2020.12.03.1
EmiR5 2021.01.08.0, PSA-ESCI 2021.03.17.0

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
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	2021-03-15	2022-03-15
Cable - Conducted Cable Assembly	Northwest EMC	MNC, HGN, TYK	MNCA	2021-03-10	2022-03-10
Receiver	Gauss Instruments	TDEMI 30M	ARK	2020-10-27	2021-10-27

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.6 dB	-2.6 dB

CONFIGURATIONS INVESTIGATED

DESO0002-1

MODES INVESTIGATED

ISM Radio continuous transmit CW mode, Mid ch.913MHz.

POWERLINE CONDUCTED EMISSIONS

element
WTD.2020.12.03.1
EmiR5 2021.01.08.0, PSA-ESCI 2021.03.17.0

EUT:	FloLogic Wireless Flowmeter Control System	Work Order:	DESO0002
Serial Number:	2001966	Date:	2021-03-22
Customer:	FloLogic Inc.	Temperature:	22.3°C
Attendees:	None	Relative Humidity:	27.4%
Customer Project:	None	Bar. Pressure:	1017 mb
Tested By:	Dan Haas	Job Site:	MN03
Power:	120VAC/60Hz	Configuration:	DESO0002-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	3	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

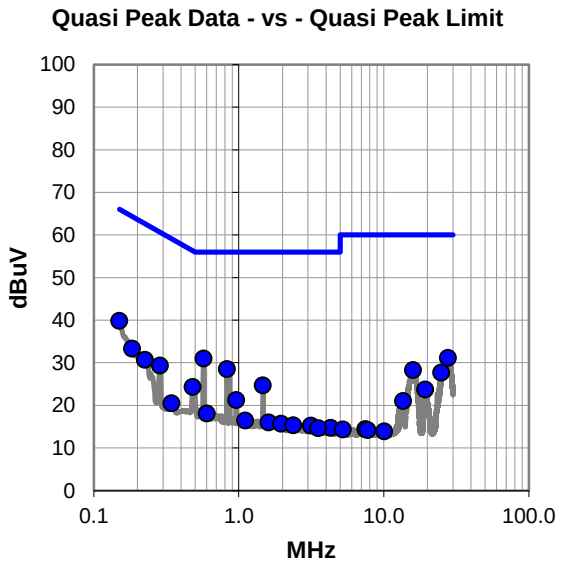
None

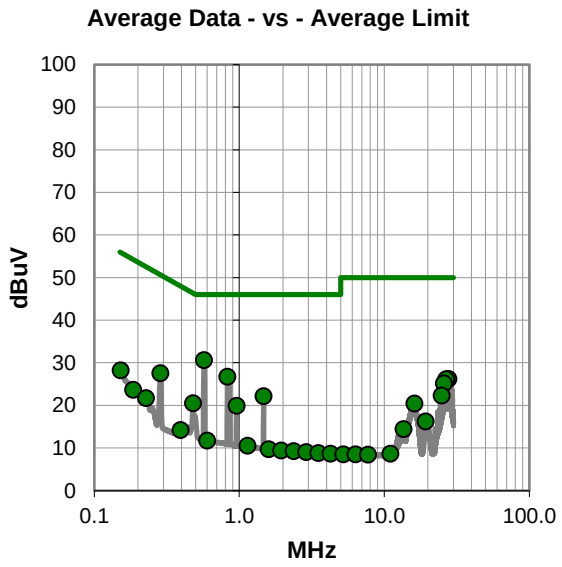
EUT OPERATING MODES

ISM Radio continuous transmit CW mode, Mid ch.913MHz.

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2020.12.03.1
EmiR5 2021.01.08.0, PSA-ESCI
2021.03.17.0

RESULTS - Run #3

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.571	10.6	20.4	31.0	56.0	-25.0
0.150	18.8	21.0	39.8	66.0	-26.2
0.830	8.0	20.5	28.5	56.0	-27.5
27.745	9.7	21.4	31.1	60.0	-28.9
0.183	12.5	20.8	33.3	64.3	-31.0
1.468	4.2	20.5	24.7	56.0	-31.3
0.286	8.8	20.5	29.3	60.7	-31.4
15.932	7.2	21.1	28.3	60.0	-31.7
0.225	10.1	20.6	30.7	62.6	-31.9
0.480	3.8	20.5	24.3	56.3	-32.0
24.939	6.4	21.3	27.7	60.0	-32.3
0.959	0.7	20.5	21.2	56.0	-34.8
19.341	2.6	21.1	23.7	60.0	-36.3
0.601	-2.3	20.4	18.1	56.0	-37.9
0.344	0.0	20.5	20.5	59.1	-38.6
13.629	0.1	20.9	21.0	60.0	-39.0
1.105	-4.1	20.5	16.4	56.0	-39.6
1.606	-4.5	20.5	16.0	56.0	-40.0
1.959	-4.8	20.5	15.7	56.0	-40.3
2.369	-5.3	20.6	15.3	56.0	-40.7
3.143	-5.4	20.6	15.2	56.0	-40.8
4.311	-5.9	20.6	14.7	56.0	-41.3
3.531	-6.0	20.6	14.6	56.0	-41.4
7.463	-6.4	20.8	14.4	60.0	-45.6
5.219	-6.3	20.6	14.3	60.0	-45.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.571	10.2	20.4	30.6	46.0	-15.4
0.830	6.2	20.5	26.7	46.0	-19.3
0.286	7.0	20.5	27.5	50.7	-23.2
27.747	4.8	21.4	26.2	50.0	-23.8
26.810	4.7	21.4	26.1	50.0	-23.9
1.470	1.6	20.5	22.1	46.0	-23.9
25.876	3.7	21.4	25.1	50.0	-24.9
0.480	0.0	20.5	20.5	46.3	-25.8
0.959	-0.6	20.5	19.9	46.0	-26.1
0.152	7.3	20.9	28.2	55.9	-27.7
24.939	1.0	21.3	22.3	50.0	-27.7
16.212	-0.7	21.1	20.4	50.0	-29.6
0.185	2.8	20.8	23.6	54.2	-30.6
0.227	1.1	20.6	21.7	52.6	-30.9
19.328	-4.9	21.1	16.2	50.0	-33.8
0.394	-6.3	20.5	14.2	48.0	-33.8
0.603	-8.7	20.4	11.7	46.0	-34.3
1.141	-10.0	20.5	10.5	46.0	-35.5
13.615	-6.5	20.9	14.4	50.0	-35.6
1.596	-10.8	20.5	9.7	46.0	-36.3
1.944	-11.1	20.5	9.4	46.0	-36.6
2.372	-11.4	20.6	9.2	46.0	-36.8
2.891	-11.6	20.6	9.0	46.0	-37.0
3.508	-11.8	20.6	8.8	46.0	-37.2
4.272	-12.0	20.6	8.6	46.0	-37.4

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2020.12.03.1
EmiR5 2021.01.08.0, PSA-ESCI 2021.03.17.0

EUT:	FloLogic Wireless Flowmeter Control System	Work Order:	DESO0002
Serial Number:	2001966	Date:	2021-03-22
Customer:	FloLogic Inc.	Temperature:	22.3°C
Attendees:	None	Relative Humidity:	27.4%
Customer Project:	None	Bar. Pressure:	1017 mb
Tested By:	Dan Haas	Job Site:	MN03
Power:	120VAC/60Hz	Configuration:	DESO0002-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	4	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

None

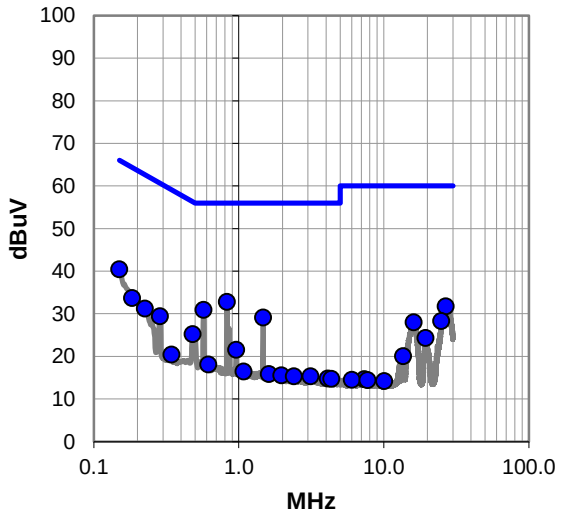
EUT OPERATING MODES

ISM Radio continuous transmit CW mode, Mid ch.913MHz.

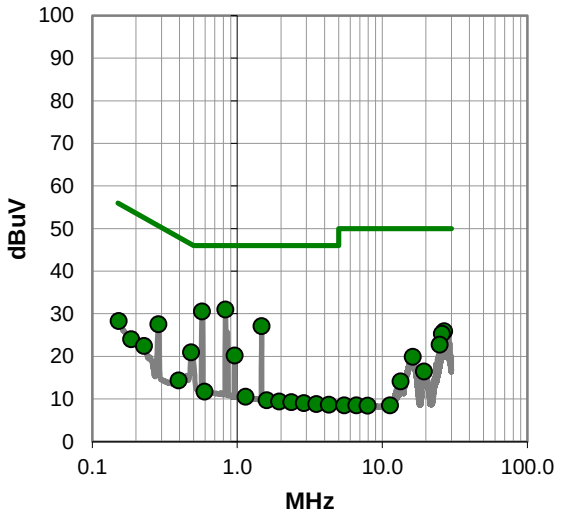
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2020.12.03.1
EmiR5 2021.01.08.0, PSA-ESCI
2021.03.17.0

RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.830	12.3	20.5	32.8	56.0	-23.2
0.571	10.5	20.4	30.9	56.0	-25.1
0.150	19.4	21.0	40.4	66.0	-25.6
1.470	8.6	20.5	29.1	56.0	-26.9
26.815	10.3	21.4	31.7	60.0	-28.3
0.183	12.9	20.8	33.7	64.3	-30.6
0.480	4.7	20.5	25.2	56.3	-31.1
0.286	8.9	20.5	29.4	60.7	-31.3
0.225	10.6	20.6	31.2	62.6	-31.4
24.943	7.0	21.3	28.3	60.0	-31.7
16.053	6.9	21.1	28.0	60.0	-32.0
0.959	1.0	20.5	21.5	56.0	-34.5
19.409	3.2	21.1	24.3	60.0	-35.7
0.615	-2.3	20.4	18.1	56.0	-37.9
0.344	-0.1	20.5	20.4	59.1	-38.7
1.078	-4.1	20.5	16.4	56.0	-39.6
13.634	-0.9	20.9	20.0	60.0	-40.0
1.616	-4.7	20.5	15.8	56.0	-40.2
1.965	-5.0	20.5	15.5	56.0	-40.5
2.399	-5.3	20.6	15.3	56.0	-40.7
3.131	-5.3	20.6	15.3	56.0	-40.7
4.109	-5.8	20.6	14.8	56.0	-41.2
4.359	-5.9	20.6	14.7	56.0	-41.3
7.365	-6.2	20.8	14.6	60.0	-45.4
6.022	-6.2	20.7	14.5	60.0	-45.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.830	10.5	20.5	31.0	46.0	-15.0
0.571	10.1	20.4	30.5	46.0	-15.5
1.470	6.6	20.5	27.1	46.0	-18.9
0.286	7.0	20.5	27.5	50.7	-23.2
26.815	4.5	21.4	25.9	50.0	-24.1
25.880	3.9	21.4	25.3	50.0	-24.7
0.480	0.4	20.5	20.9	46.3	-25.4
0.959	-0.3	20.5	20.2	46.0	-25.8
24.943	1.4	21.3	22.7	50.0	-27.3
0.152	7.4	20.9	28.3	55.9	-27.6
16.214	-1.2	21.1	19.9	50.0	-30.1
0.185	3.2	20.8	24.0	54.2	-30.2
0.227	1.8	20.6	22.4	52.6	-30.2
19.395	-4.7	21.1	16.4	50.0	-33.6
0.394	-6.2	20.5	14.3	48.0	-33.7
0.596	-8.7	20.4	11.7	46.0	-34.3
1.141	-10.0	20.5	10.5	46.0	-35.5
13.406	-6.8	20.9	14.1	50.0	-35.9
1.596	-10.8	20.5	9.7	46.0	-36.3
1.944	-11.1	20.5	9.4	46.0	-36.6
2.367	-11.4	20.6	9.2	46.0	-36.8
2.887	-11.6	20.6	9.0	46.0	-37.0
3.508	-11.8	20.6	8.8	46.0	-37.2
4.282	-12.0	20.6	8.6	46.0	-37.4
5.465	-12.1	20.6	8.5	50.0	-41.5

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

element

PSA-ESCI 2021.03.17.0

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

MODES OF OPERATION

Transmitting SRD Radio High Ch (923 MHz)
Transmitting SRD Radio Low Ch (907 MHz), Mid Ch (913 MHz)

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

DESO0001 - 3

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	10000 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	Element	Biconilog Cable	MNX	2021-02-01	2022-02-01
Cable	Element	Standard Gain Cable	MNW	2021-02-01	2022-02-01
Cable	Element	Double Ridge Guide Horn Cables	MNV	2021-02-01	2022-02-01
Filter - High Pass	Micro-Tronics	HPM50108	HFW	2020-09-14	2021-09-14
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2021-02-01	2022-02-01
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2021-02-01	2022-02-01
Amplifier - Pre-Amplifier	Miteq	AM-1064-9079 and SA18E-10	AOO	2021-02-01	2022-02-01
Antenna - Standard Gain	ETS-Lindgren	3160-07	AJJ	NCR	NCR
Antenna - Double Ridge	ETS Lindgren	3115	AIB	2020-09-03	2022-09-03
Attenuator	Fairview Microwave	SA18E-10	TYA	2020-09-14	2021-09-14
Attenuator	Fairview Microwave	SA18E-20	TWZ	2020-09-14	2021-09-14
Cable	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	2021-03-07	2022-03-07
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	2021-01-15	2022-01-15
Cable	ESM Cable Corp.	Bilog Cables	MNH	2020-10-06	2021-10-06
Filter - High Pass	Micro-Tronics	HPM50108	LFM	2020-09-14	2021-09-14
Filter - Low Pass	Micro-Tronics	LPM50003	LFJ	2020-09-24	2021-09-24
Antenna - Standard Gain	ETS Lindgren	3160-07	AXP	NCR	NCR
Antenna - Biconilog	ETS Lindgren	3142D	AXO	2019-09-03	2021-09-03
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	2021-01-15	2022-01-15
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	2020-10-06	2021-10-06
Antenna - Double Ridge	ETS-Lindgren	3115	AJQ	2021-01-25	2023-01-25
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	2020-12-27	2021-12-27
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	2021-01-15	2022-01-15
Antenna - Biconilog	Teseq	CBL 6141B	AYD	2020-02-05	2022-02-05
Filter - Low Pass	Micro-Tronics	LPM50003	HGL	2020-09-14	2021-09-14

MEASUREMENT BANDWIDTHS

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

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies 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. These “pre-scans” are not 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 axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order 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.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

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).

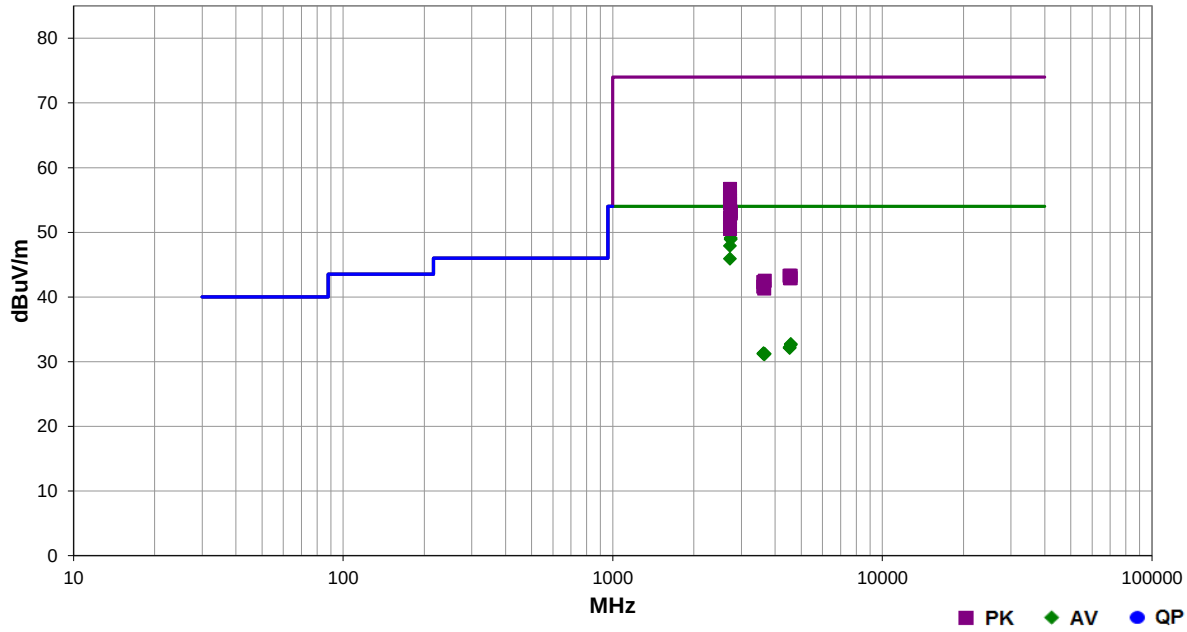
SPURIOUS RADIATED EMISSIONS

EmiR5 2021.01.08.0 PSA-ESCI 2021.03.17.0

Work Order:	DESO0001	**Date:**	2021-03-24		
Project:	None	**Temperature:**	22.2 °C		
Job Site:	MN09	**Humidity:**	35% RH		
Serial Number:	2001966	**Barometric Pres.:**	1001 mbar	**Tested by:**	Christopher Heintzelman, Eric Brandon
EUT:	FloLogic Wireless Flowmeter Control System				
Configuration:	3				
Customer:	FloLogic Inc.				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting SRD Radio Low Ch (907 MHz), Mid Ch (913 MHz)				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

Run #	6	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



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
2720.540	55.6	-2.7	3.85	119.0	3.0	0.0	Horz	AV	0.0	52.9	54.0	-1.1	EUT Horz, Low Ch
2720.540	54.0	-2.7	4.0	257.0	3.0	0.0	Vert	AV	0.0	51.3	54.0	-2.7	EUT On Side, Low Ch
2720.580	53.5	-2.7	1.0	241.0	3.0	0.0	Horz	AV	0.0	50.8	54.0	-3.2	EUT Vert, Low Ch
2720.540	53.0	-2.7	1.01	226.0	3.0	0.0	Vert	AV	0.0	50.3	54.0	-3.7	EUT Vert, Low Ch
2738.620	51.8	-2.7	3.87	340.0	3.0	0.0	Vert	AV	0.0	49.1	54.0	-4.9	EUT On Side. Mid Ch
2738.580	51.6	-2.7	1.0	273.0	3.0	0.0	Horz	AV	0.0	48.9	54.0	-5.1	EUT Horz, Mid Ch
2720.620	50.6	-2.7	1.0	320.0	3.0	0.0	Horz	AV	0.0	47.9	54.0	-6.1	EUT On Side, Low Ch
2720.620	48.6	-2.7	1.02	74.0	3.0	0.0	Vert	AV	0.0	45.9	54.0	-8.1	EUT Horz, Low Ch
2720.460	59.4	-2.7	3.85	119.0	3.0	0.0	Horz	PK	0.0	56.7	74.0	-17.3	EUT Horz, Low Ch
2720.420	58.2	-2.7	4.0	257.0	3.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	EUT On Side, Low Ch
2720.420	57.6	-2.7	1.0	241.0	3.0	0.0	Horz	PK	0.0	54.9	74.0	-19.1	EUT Vert, Low Ch
2720.500	57.2	-2.7	1.01	226.0	3.0	0.0	Vert	PK	0.0	54.5	74.0	-19.5	EUT Vert, Low Ch
2738.210	55.9	-2.7	3.87	340.0	3.0	0.0	Vert	PK	0.0	53.2	74.0	-20.8	EUT On Side. Mid Ch
2739.500	55.6	-2.7	1.0	273.0	3.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	EUT Horz, Mid Ch
4576.670	28.7	4.0	1.5	127.0	3.0	0.0	Vert	AV	0.0	32.7	54.0	-21.3	EUT On Side. Mid Ch
4573.830	28.7	3.9	1.5	192.0	3.0	0.0	Horz	AV	0.0	32.6	54.0	-21.4	EUT Horz, Mid Ch
2720.420	55.0	-2.7	1.0	320.0	3.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	EUT On Side, Low Ch
4535.250	28.4	3.8	1.5	34.0	3.0	0.0	Horz	AV	0.0	32.2	54.0	-21.8	EUT Horz, Low Ch

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
4534.420	28.3	3.8	1.5	115.0	3.0	0.0	Vert	AV	0.0	32.1	54.0	-21.9	EUT On Side, Low Ch
3623.580	30.6	0.7	2.7	256.0	3.0	0.0	Horz	AV	0.0	31.3	54.0	-22.7	EUT Horz, Low Ch
3621.540	30.5	0.7	1.5	135.0	3.0	0.0	Vert	AV	0.0	31.2	54.0	-22.8	EUT On Side, Low Ch
3663.540	30.1	1.1	2.54	283.0	3.0	0.0	Horz	AV	0.0	31.2	54.0	-22.8	EUT Horz, Mid Ch
3652.000	30.1	1.0	1.5	140.0	3.0	0.0	Vert	AV	0.0	31.1	54.0	-22.9	EUT On Side. Mid Ch
2720.380	53.2	-2.7	1.02	74.0	3.0	0.0	Vert	PK	0.0	50.5	74.0	-23.5	EUT Horz, Low Ch
4527.710	39.5	3.8	1.5	115.0	3.0	0.0	Vert	PK	0.0	43.3	74.0	-30.7	EUT On Side, Low Ch
4566.000	39.5	3.8	1.5	127.0	3.0	0.0	Vert	PK	0.0	43.3	74.0	-30.7	EUT On Side. Mid Ch
4535.750	39.1	3.8	1.5	34.0	3.0	0.0	Horz	PK	0.0	42.9	74.0	-31.1	EUT Horz, Low Ch
4572.750	39.0	3.9	1.5	192.0	3.0	0.0	Horz	PK	0.0	42.9	74.0	-31.1	EUT Horz, Mid Ch
3663.960	41.3	1.2	2.54	283.0	3.0	0.0	Horz	PK	0.0	42.5	74.0	-31.5	EUT Horz, Mid Ch
3616.620	41.8	0.5	2.7	256.0	3.0	0.0	Horz	PK	0.0	42.3	74.0	-31.7	EUT Horz, Low Ch
3615.750	41.1	0.5	1.5	135.0	3.0	0.0	Vert	PK	0.0	41.6	74.0	-32.4	EUT On Side, Low Ch
3641.040	40.4	0.9	1.5	140.0	3.0	0.0	Vert	PK	0.0	41.3	74.0	-32.7	EUT On Side. Mid Ch

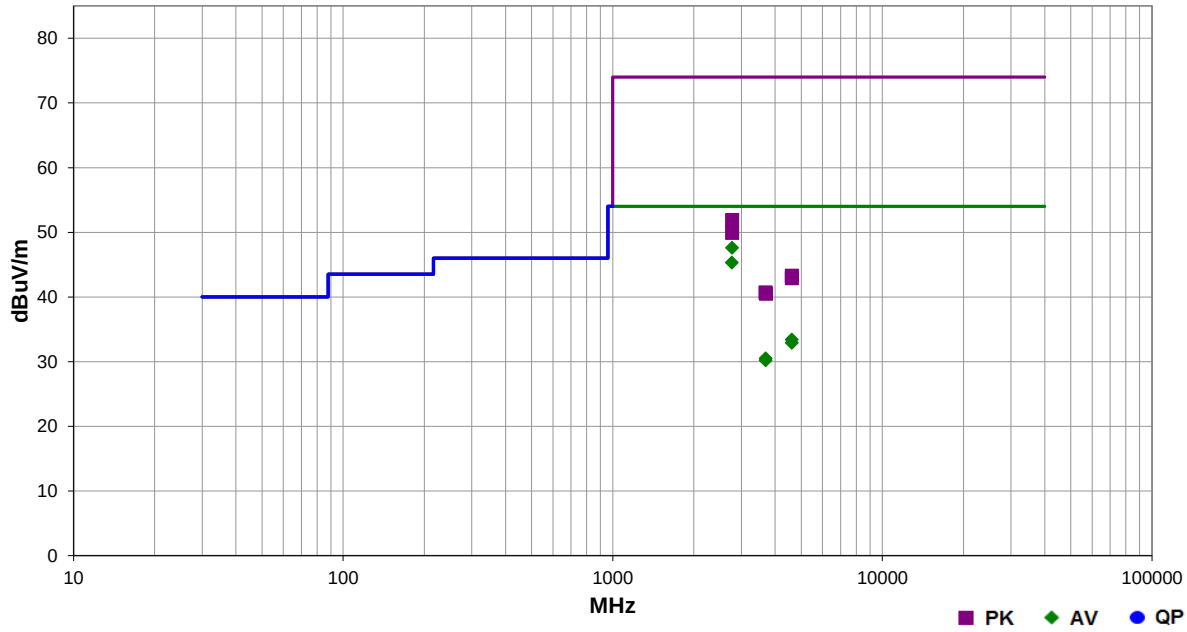
SPURIOUS RADIATED EMISSIONS

EmiR5 2021.01.08.0 PSA-ESCI 2021.03.17.0

Work Order:	DESO0001	**Date:**	2021-03-24		
Project:	None	**Temperature:**	22.4 °C		
Job Site:	MN05	**Humidity:**	34.8% RH		
Serial Number:	2001966	**Barometric Pres.:**	1002 mbar	**Tested by:**	Christopher Heintzelman, Eric Brandon
EUT:	FloLogic Wireless Flowmeter Control System				
Configuration:	3				
Customer:	FloLogic Inc.				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting SRD Radio High Ch (923 MHz)				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

Run #	30	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



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
2769.333	52.1	-4.5	1.33	164.9	3.0	0.0	Horz	AV	0.0	47.6	54.0	-6.4	EUT Horz, High Ch
2768.708	49.8	-4.5	3.43	181.9	3.0	0.0	Vert	AV	0.0	45.3	54.0	-8.7	EUT On Side, High Ch
4614.083	31.3	2.1	1.5	157.9	3.0	0.0	Vert	AV	0.0	33.4	54.0	-20.6	EUT On Side, High Ch
4615.708	30.8	2.1	1.5	167.0	3.0	0.0	Horz	AV	0.0	32.9	54.0	-21.1	EUT Horz, High Ch
2769.708	56.4	-4.5	1.33	164.9	3.0	0.0	Horz	PK	0.0	51.9	74.0	-22.1	EUT Horz, High Ch
3693.708	31.6	-1.1	1.5	274.0	3.0	0.0	Horz	AV	0.0	30.5	54.0	-23.5	EUT Horz, High Ch
3694.292	31.3	-1.1	1.5	4.0	3.0	0.0	Vert	AV	0.0	30.2	54.0	-23.8	EUT On Side, High Ch
2769.500	54.4	-4.5	3.43	181.9	3.0	0.0	Vert	PK	0.0	49.9	74.0	-24.1	EUT On Side, High Ch
4615.375	41.2	2.1	1.5	157.9	3.0	0.0	Vert	PK	0.0	43.3	74.0	-30.7	EUT On Side, High Ch
4617.292	40.7	2.2	1.5	167.0	3.0	0.0	Horz	PK	0.0	42.9	74.0	-31.1	EUT Horz, High Ch
3684.375	41.9	-1.2	1.5	4.0	3.0	0.0	Vert	PK	0.0	40.7	74.0	-33.3	EUT On Side, High Ch
3699.833	41.5	-1.0	1.5	274.0	3.0	0.0	Horz	PK	0.0	40.5	74.0	-33.5	EUT Horz, High Ch

DUTY CYCLE

TEST DESCRIPTION

The Duty Cycle (x) were 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.

The EUT operates at 100% Duty Cycle.

OCCUPIED BANDWIDTH

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFX	2020-04-28	2023-04-28
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Block - DC	Fairview Microwave	SD3379	AMI	2020-08-05	2021-08-05
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2020-05-07	2021-05-07

TEST DESCRIPTION

The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

OCCUPIED BANDWIDTH

TbtTx 2019.08.30.0 XMit 2020.12.30.0

EUT:	**FloLogic Wireless Flowmeter Control System**			**Work Order:**	**DESO0001**
Serial Number:	**FL-40F5BF**			**Date:**	**18-Mar-21**
Customer:	**FloLogic Inc.**			**Temperature:**	**24.3 °C**
Attendees:	**None**			**Humidity:**	**25.6% RH**
Project:	**None**			**Barometric Pres.:**	**1030 mbar**
Tested by:	**Dustin Sparks**	**Power:**	**Battery**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes 20 dB attenuator, measurement cable, and DC block.

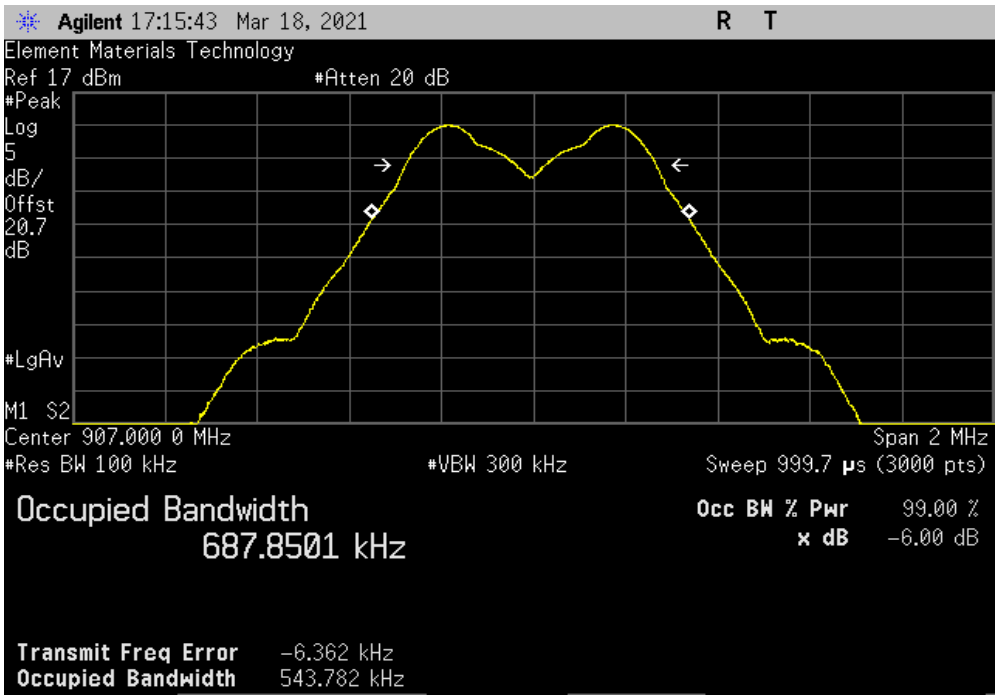
DEVIATIONS FROM TEST STANDARD

None

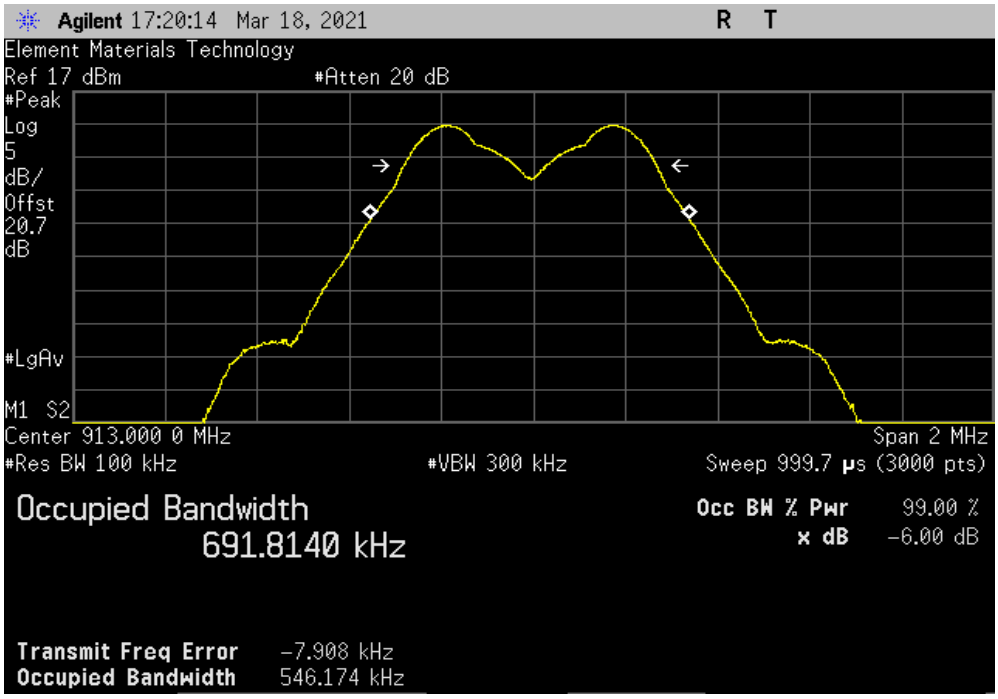
Configuration #	**4**	*Signature* Dustin Sparks

		Value	**Limit (>)**	**Result**
915 MHz ISM				
	Low Channel (907 MHz)	543.782 kHz	500 kHz	Pass
	Mid Channel (913 MHz)	546.174 kHz	500 kHz	Pass
	High Channel (923 MHz)	558.182 kHz	500 kHz	Pass

915 MHz ISM, Low Channel (907 MHz)						
				Value	Limit (>)	Result
				543.782 kHz	500 kHz	Pass



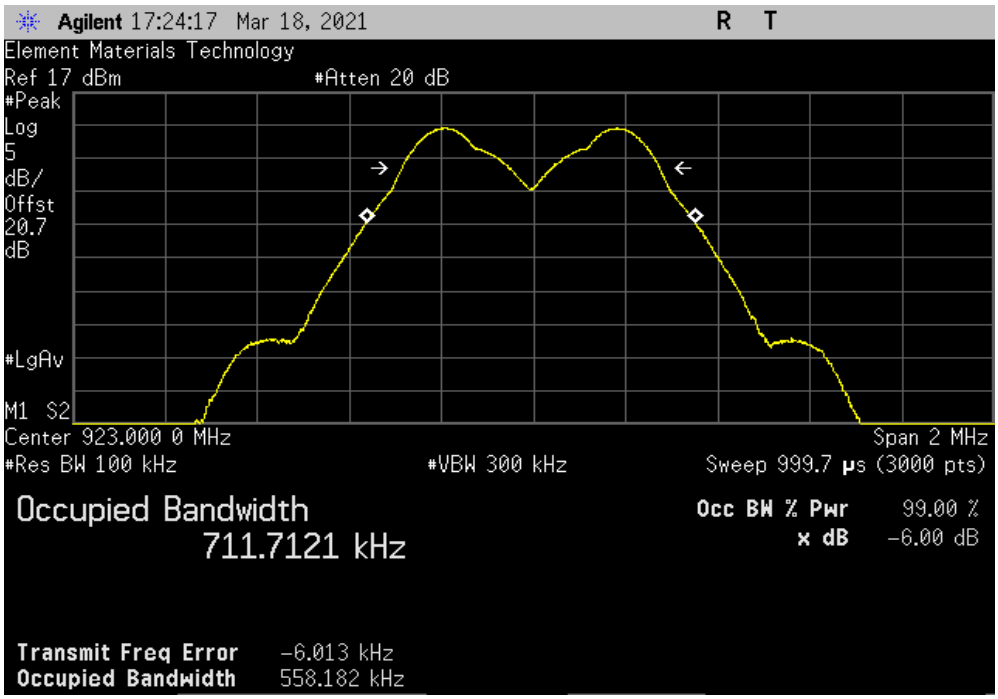
915 MHz ISM, Mid Channel (913 MHz)						
				Value	Limit (>)	Result
				546.174 kHz	500 kHz	Pass



OCCUPIED BANDWIDTH

TbtTx 2019.08.30.0 XMit 2020.12.30.0

915 MHz ISM, High Channel (923 MHz)						
				Value	Limit (>)	Result
				558.182 kHz	500 kHz	Pass



OUTPUT POWER

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFX	2020-04-28	2023-04-28
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Block - DC	Fairview Microwave	SD3379	AMI	2020-08-05	2021-08-05
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2020-05-07	2021-05-07

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

OUTPUT POWER

TbtTx 2019.08.30.0 XMit 2020.12.30.0

EUT:	**FloLogic Wireless Flowmeter Control System**			**Work Order:**	**DESO0001**
Serial Number:	**FL-40F5BF**			**Date:**	**18-Mar-21**
Customer:	**FloLogic Inc.**			**Temperature:**	**24.3 °C**
Attendees:	**None**			**Humidity:**	**25.5% RH**
Project:	**None**			**Barometric Pres.:**	**1030 mbar**
Tested by:	**Dustin Sparks**	**Power:**	**Battery**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes 20 dB attenuator, measurement cable, and DC block.

DEVIATIONS FROM TEST STANDARD

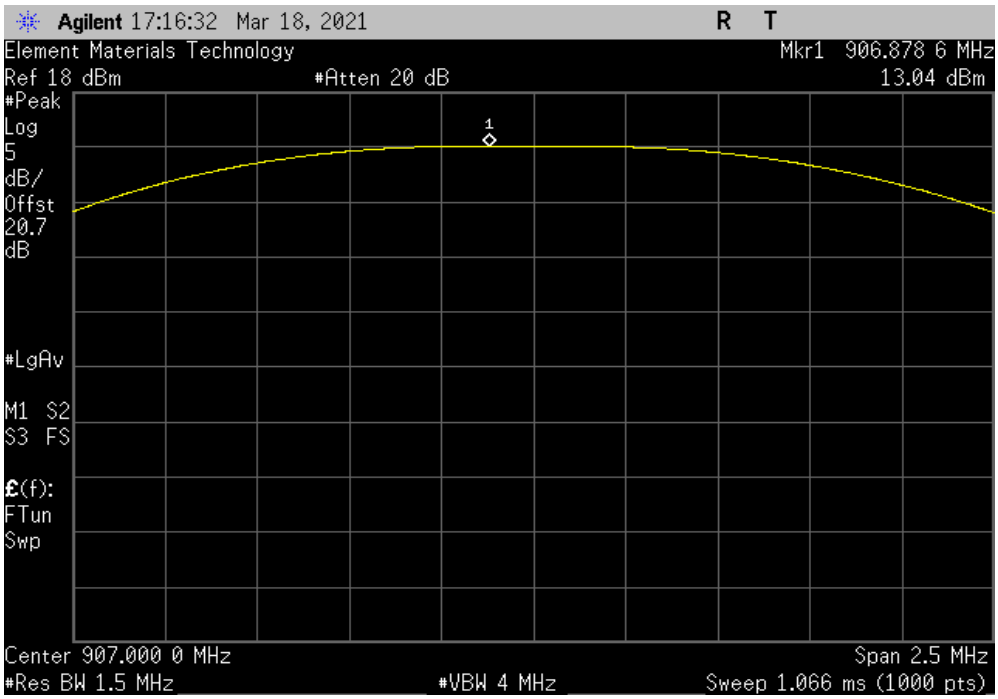
None

Configuration #	**4**	*Signature* Dustin Sparks

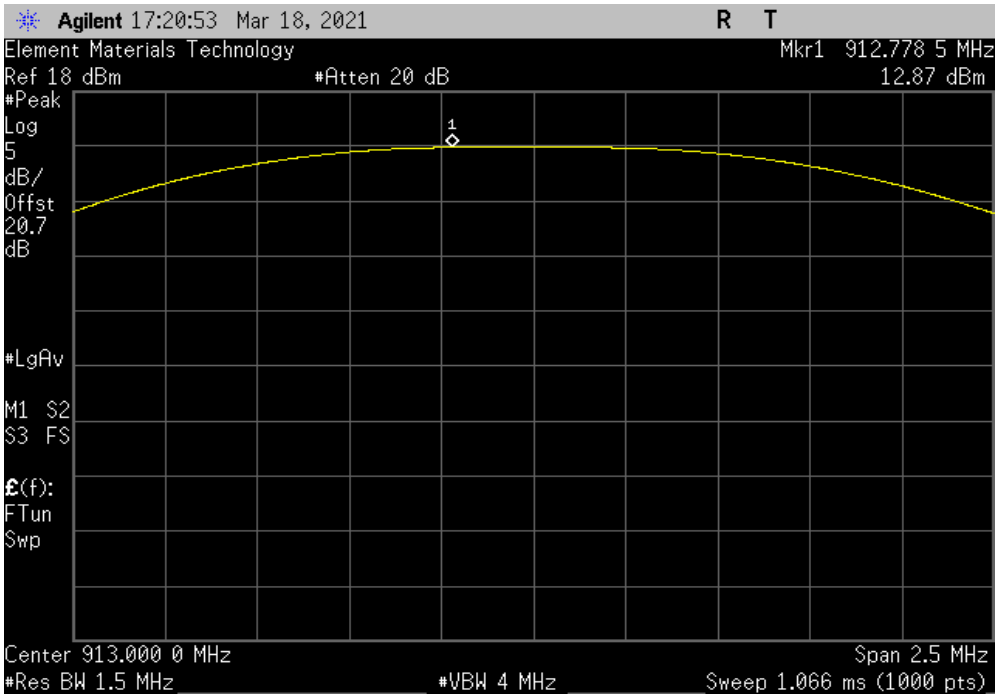
	Out Pwr (dBm)	**Limit (dBm)**	**Result**
915 MHz ISM			
Low Channel (907 MHz)	13.044	30	Pass
Mid Channel (913 MHz)	12.871	30	Pass
High Channel (923 MHz)	12.606	30	Pass

OUTPUT POWER

915 MHz ISM, Low Channel (907 MHz)						
				Out Pwr (dBm)	Limit (dBm)	Result
				13.044	30	Pass



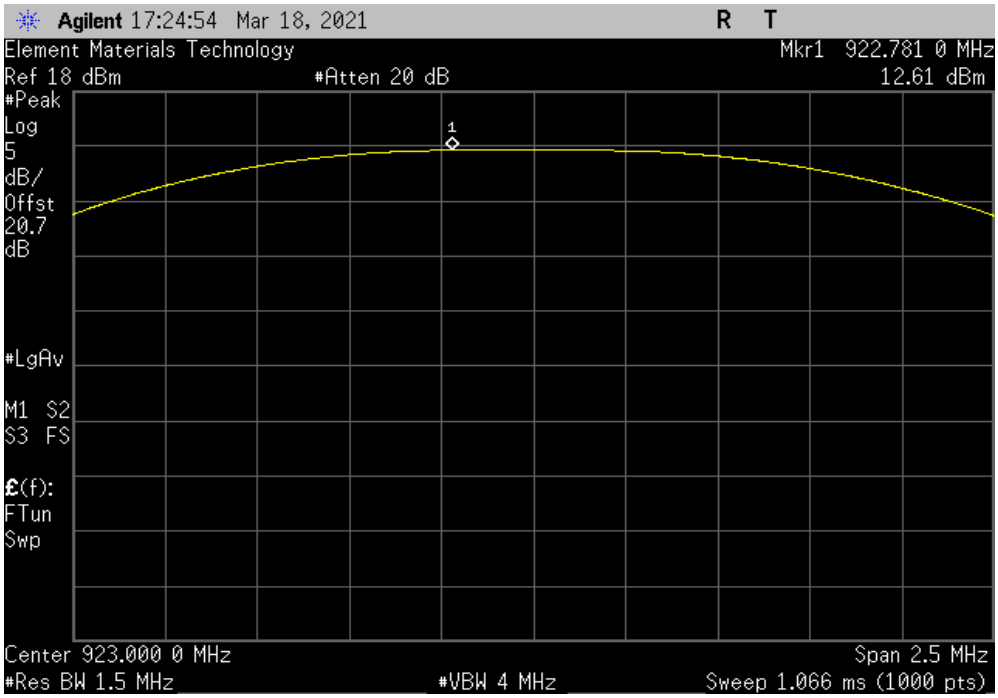
915 MHz ISM, Mid Channel (913 MHz)						
				Out Pwr (dBm)	Limit (dBm)	Result
				12.871	30	Pass



OUTPUT POWER

TbtTx 2019.08.30.0 XMit 2020.12.30.0

915 MHz ISM, High Channel (923 MHz)							
					Out Pwr (dBm)	Limit (dBm)	Result
					12.606	30	Pass



EQUIVALENT ISOTROPIC RADIATED POWER

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFX	2020-04-28	2023-04-28
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Block - DC	Fairview Microwave	SD3379	AMI	2020-08-05	2021-08-05
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2020-05-07	2021-05-07

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

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

EQUIVALENT ISOTROPIC RADIATED POWER

element

TbtTx 2019.08.30.0 XMit 2020.12.30.0

EUT:	**FloLogic Wireless Flowmeter Control System**			**Work Order:**	**DESO0001**
Serial Number:	**FL-40F5BF**			**Date:**	**18-Mar-21**
Customer:	**FloLogic Inc.**			**Temperature:**	**24.3 °C**
Attendees:	**None**			**Humidity:**	**25.5% RH**
Project:	**None**			**Barometric Pres.:**	**1030 mbar**
Tested by:	**Dustin Sparks**	**Power:**	**Battery**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes 20 dB attenuator, measurement cable, and DC block.

DEVIATIONS FROM TEST STANDARD

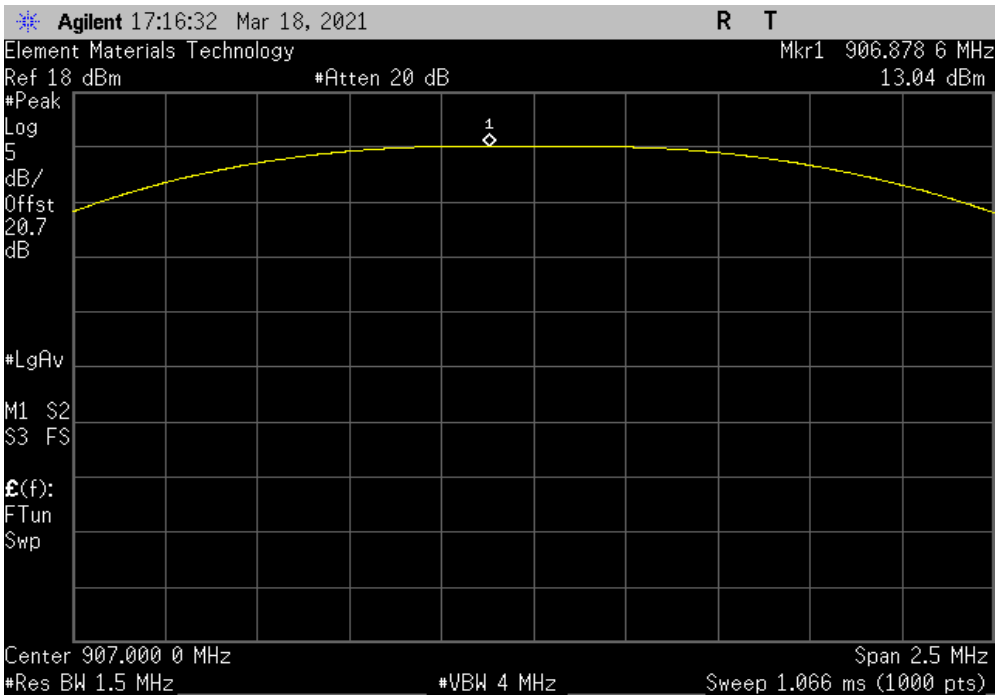
None

Configuration #	**4**	*Signature* Dustin Sparks

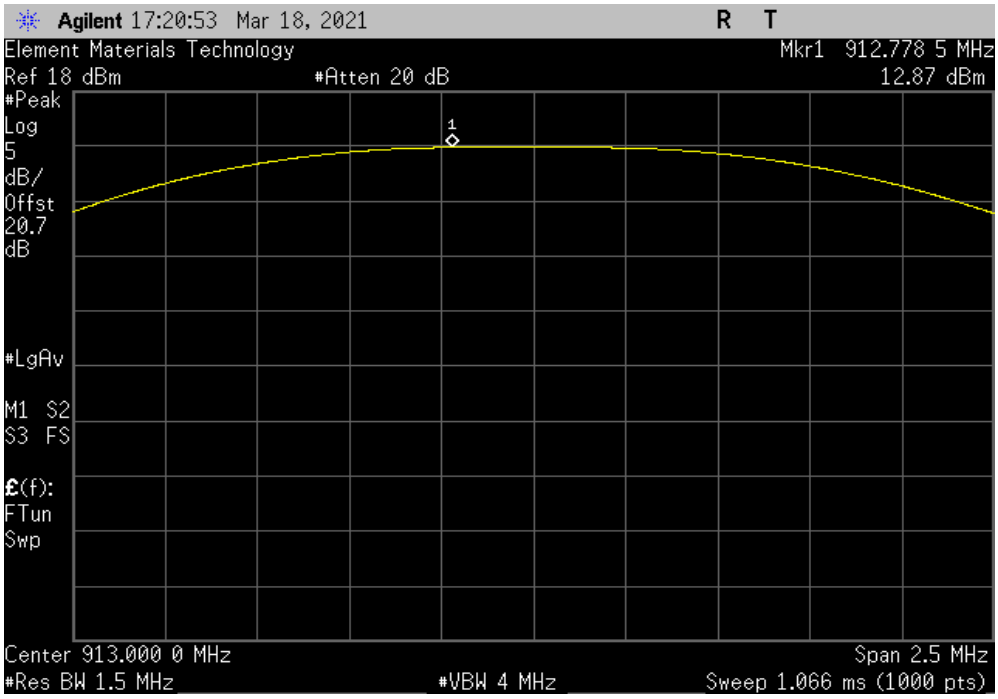
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
915 MHz ISM					
Low Channel (907 MHz)	13.044	3.32	16.364	36	Pass
Mid Channel (913 MHz)	12.871	3.32	16.191	36	Pass
High Channel (923 MHz)	12.606	3.32	15.926	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER

915 MHz ISM, Low Channel (907 MHz)						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		13.044	3.32	16.364	36	Pass

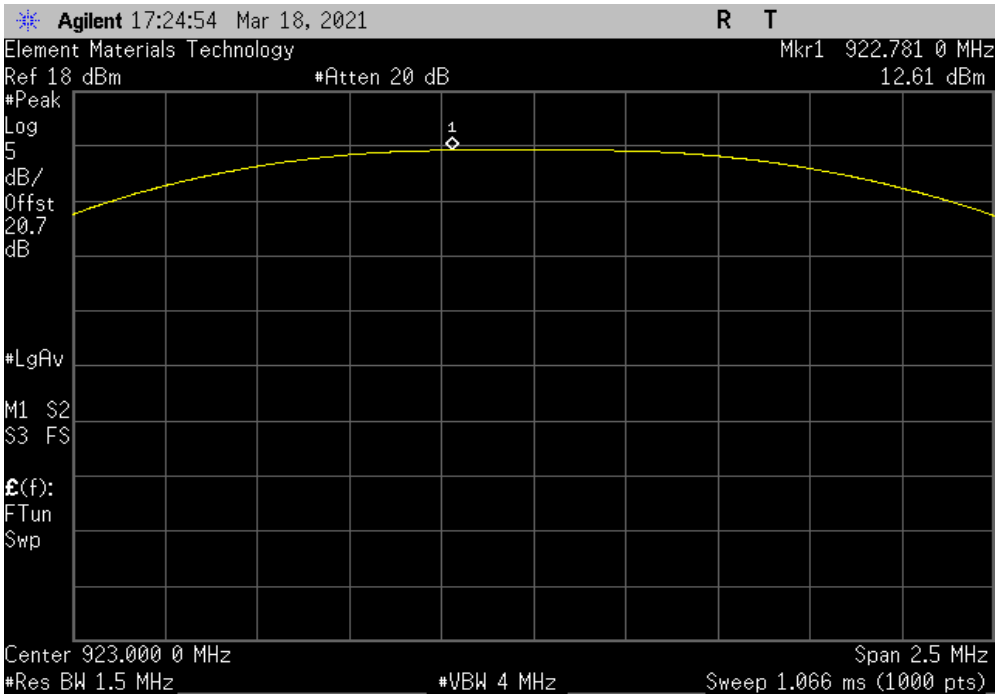


915 MHz ISM, Mid Channel (913 MHz)						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		12.871	3.32	16.191	36	Pass



EQUIVALENT ISOTROPIC RADIATED POWER

915 MHz ISM, High Channel (923 MHz)						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		12.606	3.32	15.926	36	Pass



POWER SPECTRAL DENSITY

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFX	2020-04-28	2023-04-28
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Block - DC	Fairview Microwave	SD3379	AMI	2020-08-05	2021-08-05
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2020-05-07	2021-05-07

TEST DESCRIPTION

The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

POWER SPECTRAL DENSITY

element

TbtTx 2019.08.30.0 XMit 2020.12.30.0

EUT:	**FloLogic Wireless Flowmeter Control System**			**Work Order:**	**DESO0001**
Serial Number:	**FL-40F5BF**			**Date:**	**18-Mar-21**
Customer:	**FloLogic Inc.**			**Temperature:**	**24.3 °C**
Attendees:	**None**			**Humidity:**	**25.5% RH**
Project:	**None**			**Barometric Pres.:**	**1030 mbar**
Tested by:	**Dustin Sparks**	**Power:**	**Battery**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes 20 dB attenuator, measurement cable, and DC block.

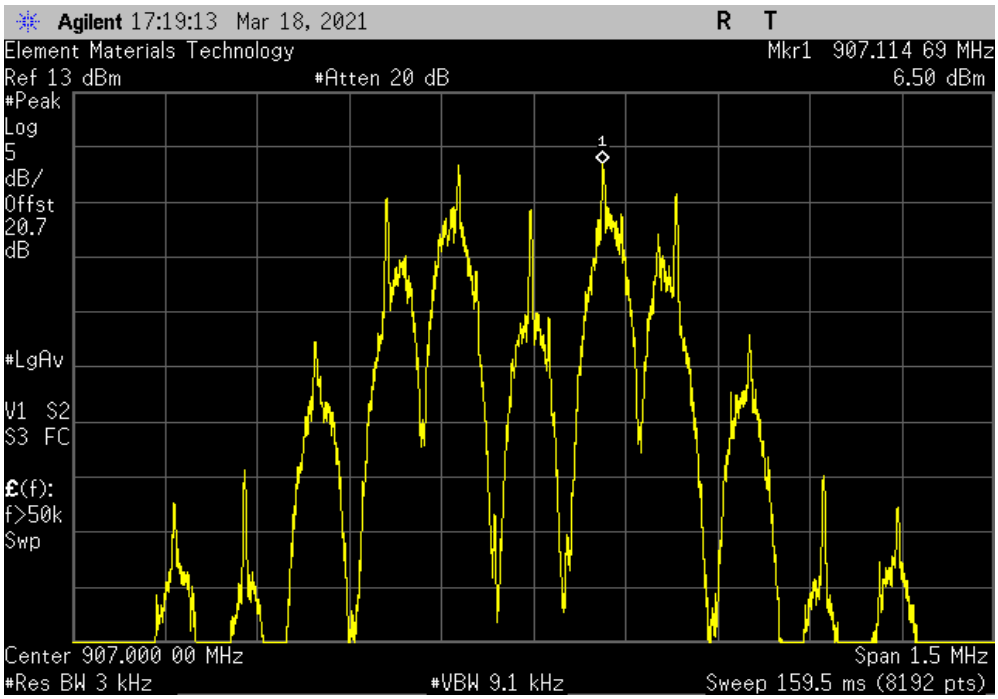
DEVIATIONS FROM TEST STANDARD

None

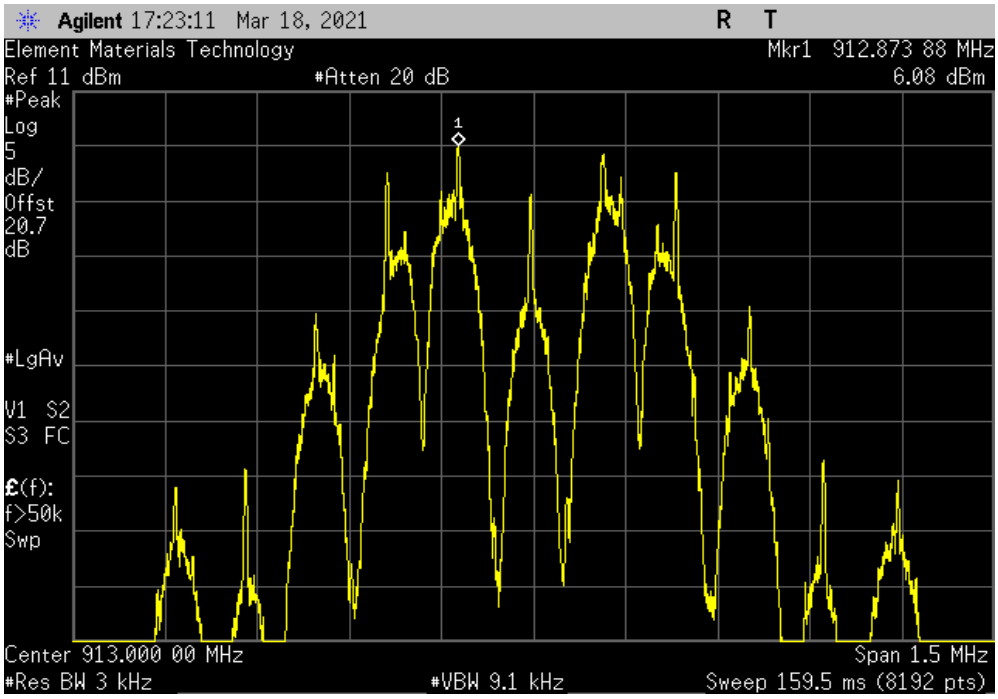
Configuration #	**4**	*Signature* Dustin Sparks

	Value dBm/3kHz	**Limit < dBm/3kHz**	**Results**
915 MHz ISM			
Low Channel (907 MHz)	6.499	8	Pass
Mid Channel (913 MHz)	6.08	8	Pass
High Channel (923 MHz)	6.341	8	Pass

915 MHz ISM, Low Channel (907 MHz)						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				6.499	8	Pass

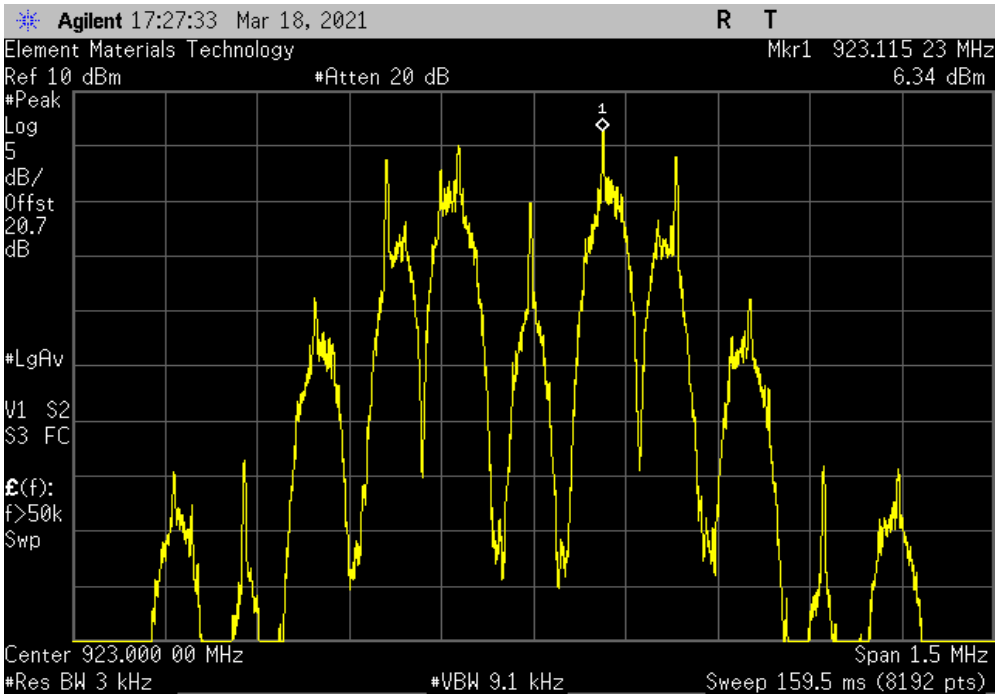


915 MHz ISM, Mid Channel (913 MHz)						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				6.08	8	Pass



POWER SPECTRAL DENSITY

915 MHz ISM, High Channel (923 MHz)							
					Value dBm/3kHz	Limit < dBm/3kHz	Results
					6.341	8	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFX	2020-04-28	2023-04-28
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Block - DC	Fairview Microwave	SD3379	AMI	2020-08-05	2021-08-05
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2020-05-07	2021-05-07

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

TbtTx 2019.08.30.0 XMit 2020.12.30.0

EUT:	**FloLogic Wireless Flowmeter Control System**			**Work Order:**	**DESO0001**
Serial Number:	**FL-40F5BF**			**Date:**	**18-Mar-21**
Customer:	**FloLogic Inc.**			**Temperature:**	**24.3 °C**
Attendees:	**None**			**Humidity:**	**25.6% RH**
Project:	**None**			**Barometric Pres.:**	**1030 mbar**
Tested by:	**Dustin Sparks**	**Power:**	**Battery**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes 20 dB attenuator, measurement cable, and DC block.

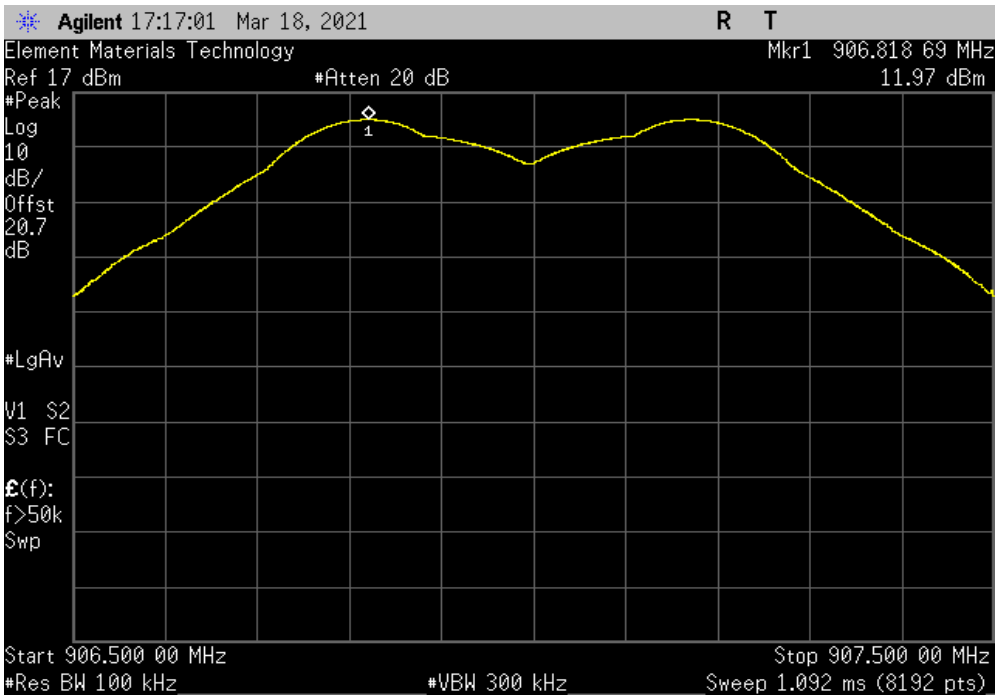
DEVIATIONS FROM TEST STANDARD

None

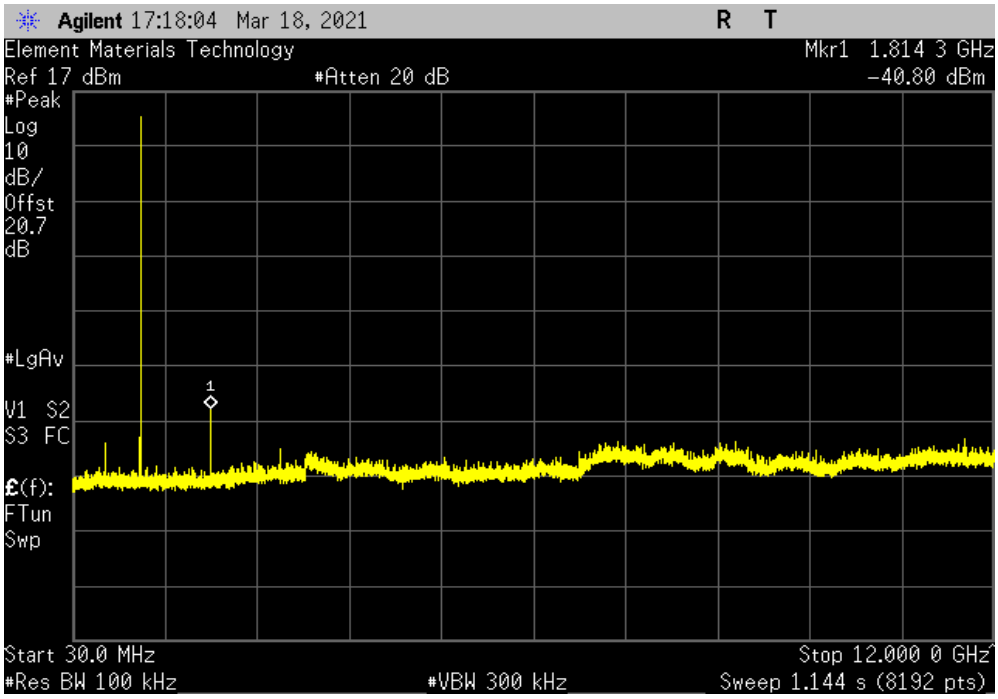
Configuration #	**4**	*Signature* Dustin Sparks

		Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
915 MHz ISM						
	Low Channel (907 MHz)	Fundamental	906.82	N/A	N/A	N/A
	Low Channel (907 MHz)	30 MHz - 12 GHz	1814.3	-52.77	-20	Pass
	Mid Channel (913 MHz)	Fundamental	913.17	N/A	N/A	N/A
	Mid Channel (913 MHz)	30 MHz - 12 GHz	1826	-53.08	-20	Pass
	High Channel (923 MHz)	Fundamental	922.81	N/A	N/A	N/A
	High Channel (923 MHz)	30 MHz - 12 GHz	1846.5	-54.4	-20	Pass

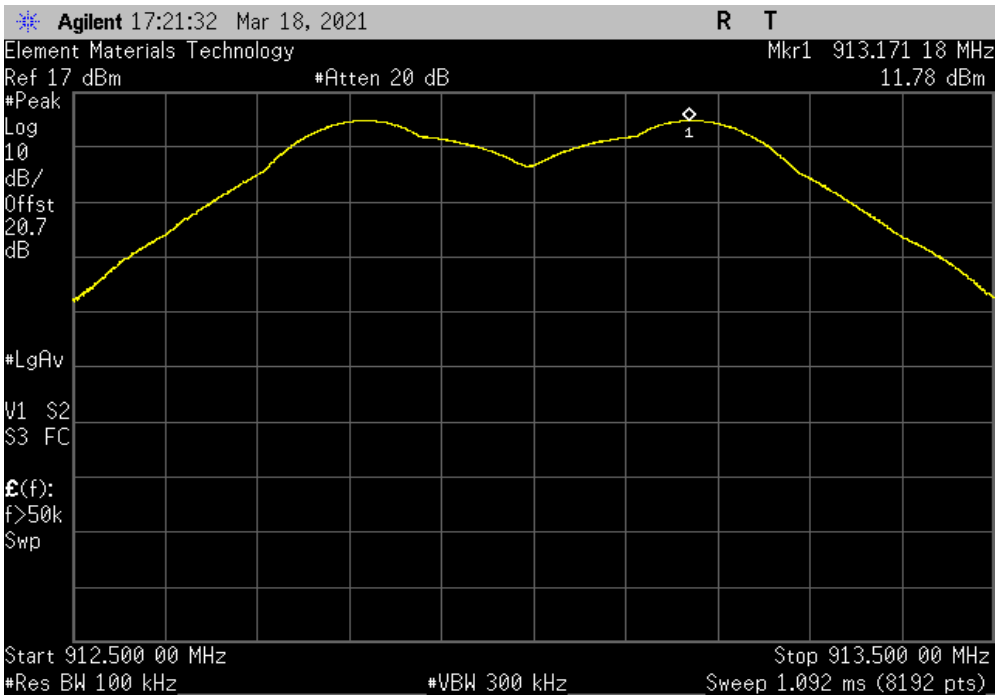
915 MHz ISM, Low Channel (907 MHz)						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		906.82	N/A	N/A	N/A



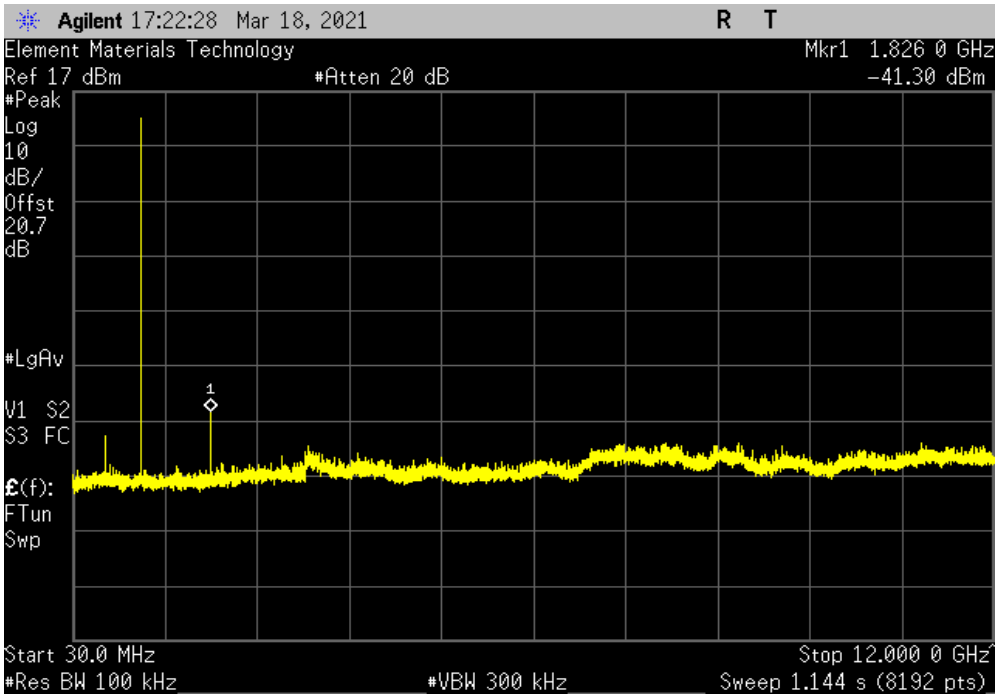
915 MHz ISM, Low Channel (907 MHz)					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12 GHz	1814.3	-52.77	-20	Pass



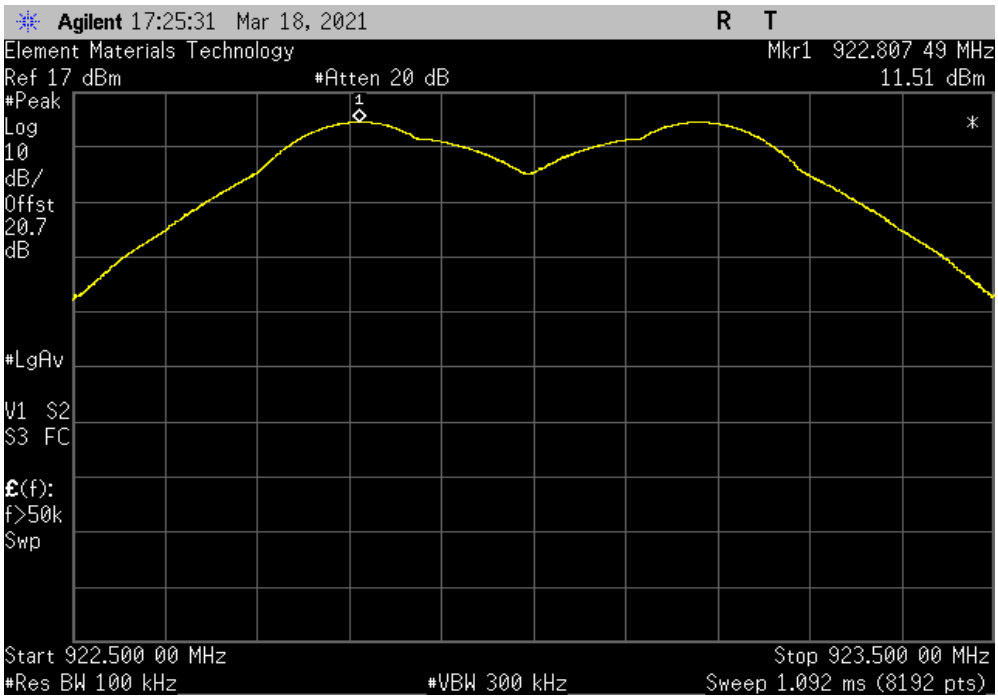
915 MHz ISM, Mid Channel (913 MHz)						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		913.17	N/A	N/A	N/A



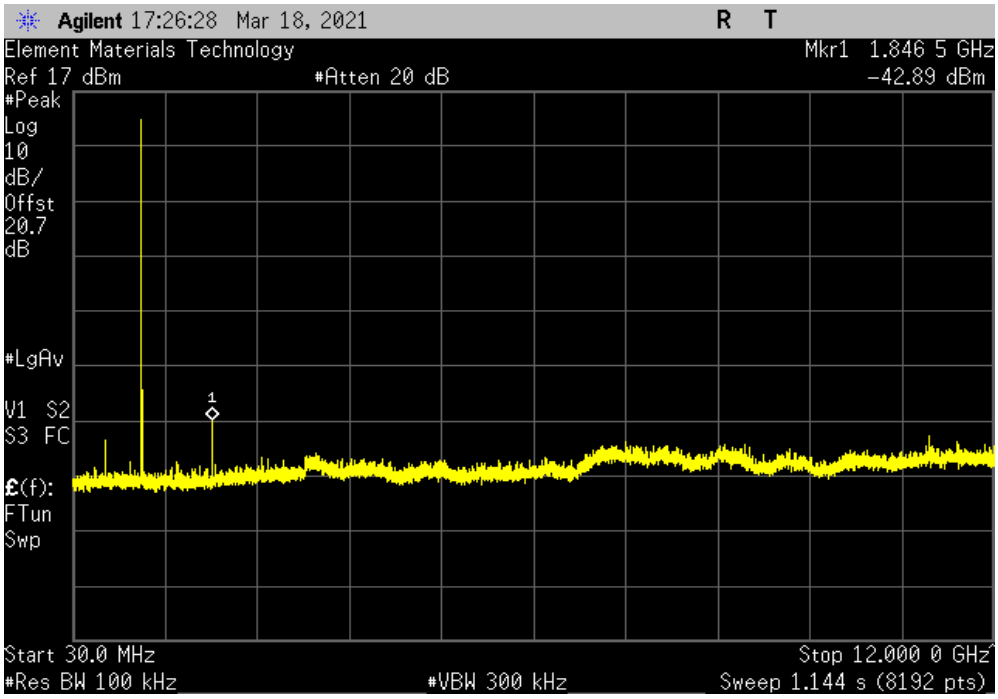
915 MHz ISM, Mid Channel (913 MHz)					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12 GHz	1826	-53.08	-20	Pass



915 MHz ISM, High Channel (923 MHz)					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	922.81	N/A	N/A	N/A



915 MHz ISM, High Channel (923 MHz)				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12 GHz	1846.5	-54.4	-20	Pass



BAND EDGE COMPLIANCE

XMit 2020.12.30.0

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFX	2020-04-28	2023-04-28
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Block - DC	Fairview Microwave	SD3379	AMI	2020-08-05	2021-08-05
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2020-05-07	2021-05-07

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE

element

TbtTx 2019.08.30.0 XMit 2020.12.30.0

EUT:	**FloLogic Wireless Flowmeter Control System**			**Work Order:**	**DESO0001**
Serial Number:	**FL-40F5BF**			**Date:**	**18-Mar-21**
Customer:	**FloLogic Inc.**			**Temperature:**	**24.3 °C**
Attendees:	**None**			**Humidity:**	**25.5% RH**
Project:	**None**			**Barometric Pres.:**	**1030 mbar**
Tested by:	**Dustin Sparks**	**Power:**	**Battery**	**Job Site:**	**MN08**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes 20 dB attenuator, measurement cable, and DC block.

DEVIATIONS FROM TEST STANDARD

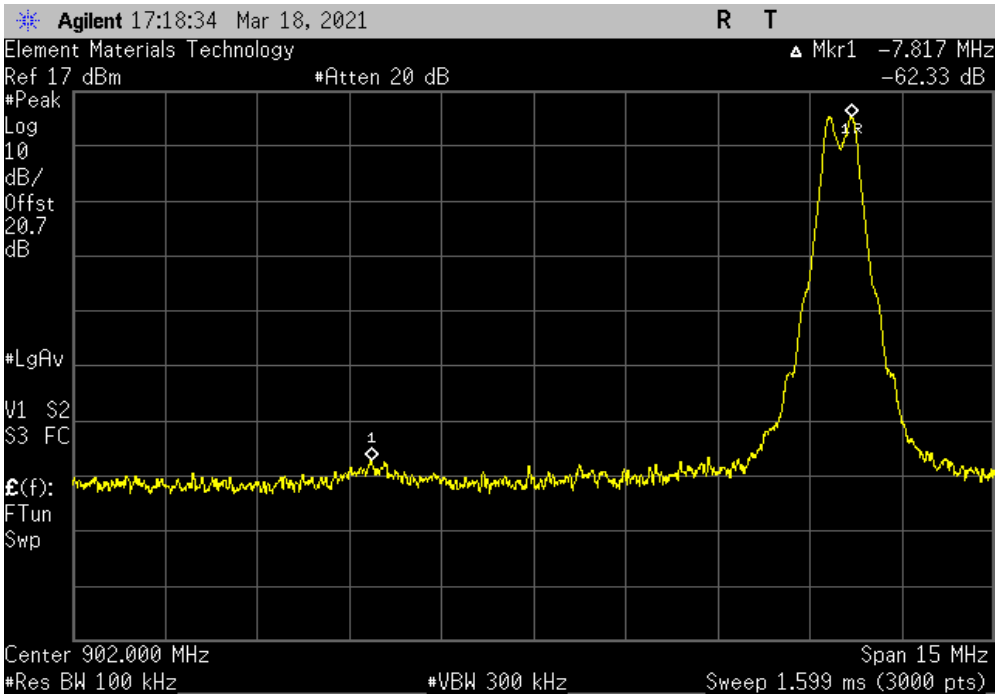
None

Configuration #	**4**	*Signature* Dustin Sparks

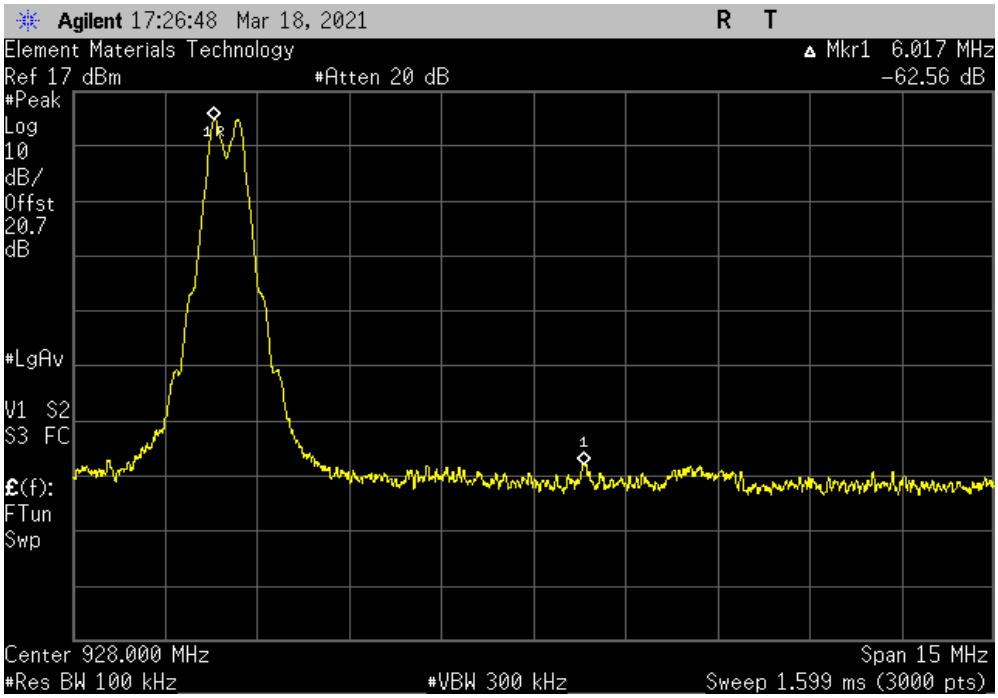
	Value (dBc)	**Limit ≤ (dBc)**	**Result**
915 MHz ISM			
Low Channel (907 MHz)	-62.33	-20	Pass
High Channel (923 MHz)	-62.56	-20	Pass

BAND EDGE COMPLIANCE

915 MHz ISM, Low Channel (907 MHz)						
				Value (dBc)	Limit ≤ (dBc)	Result
				-62.33	-20	Pass



915 MHz ISM, High Channel (923 MHz)						
				Value (dBc)	Limit ≤ (dBc)	Result
				-62.56	-20	Pass



End of Test Report