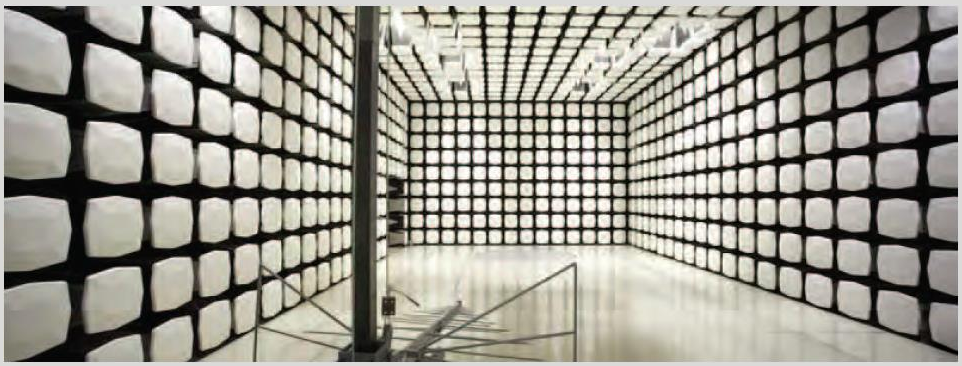
Digi International Inc.

Smart Sensor

FCC 15.247:2019

Bluetooth Low Energy (DTS) Radio

Report # DGII0328.1 Rev. 1



NVLAP LAB CODE: 200881-0

CERTIFICATE OF TEST

Last Date of Test: February 15, 2019
Digi International Inc
Model: Smart Sensor

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2019	ANSI C63.10:2013, KDB 558074

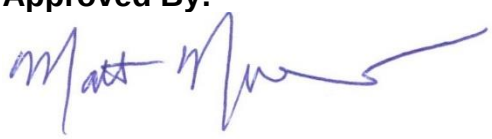
Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required for a battery powered EUT.
11.12.1, 11.13.2, 6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	N/A	Characterization of radio operation.
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Radiated Power EIRP	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:



Matt Nuernberg, Operations 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
	Updated Duty Cycle test description for radiated measurement	2019-08-08	15
01	Updated Spurious Conducted Emissions with the following: Changed title of the column 'Spec. Limit dBuV/m' to 'Spec. Limit dBc'; added the term 'fundamental' to the comments column; removed the comment about measurements being made with the EUT vertical and added it to the header block comment section	2019-08-08	30

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). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

European Commission – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

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

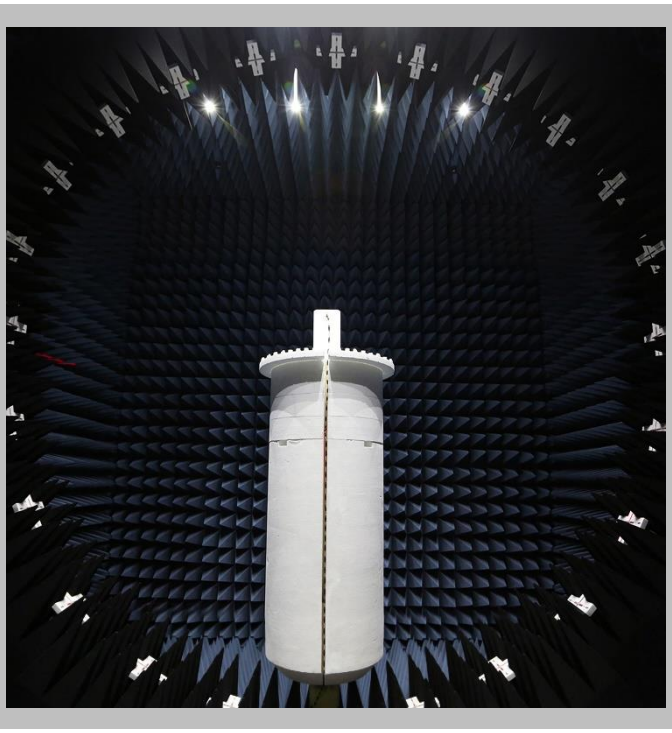
MIC – Recognized by MIC as a CAB for the acceptance of test data.

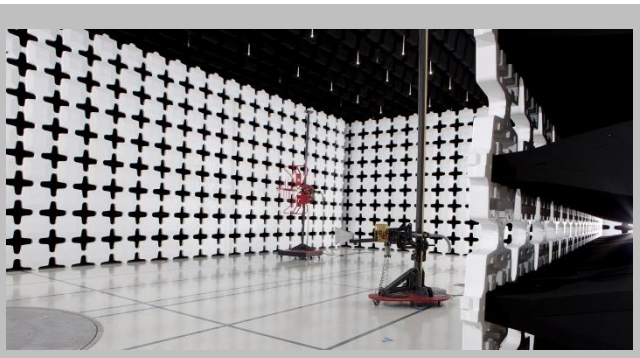
SCOPE

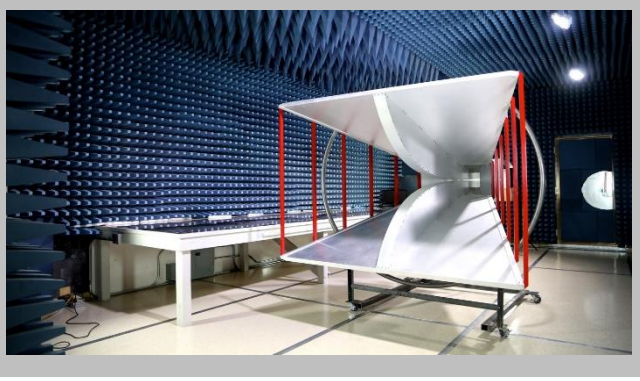
For details on the Scopes of our Accreditations, please visit:
https://www.nwemc.com/emc-testing-accreditations

FACILITIES

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	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: 200761-0	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	N/A	2834D-1	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	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.

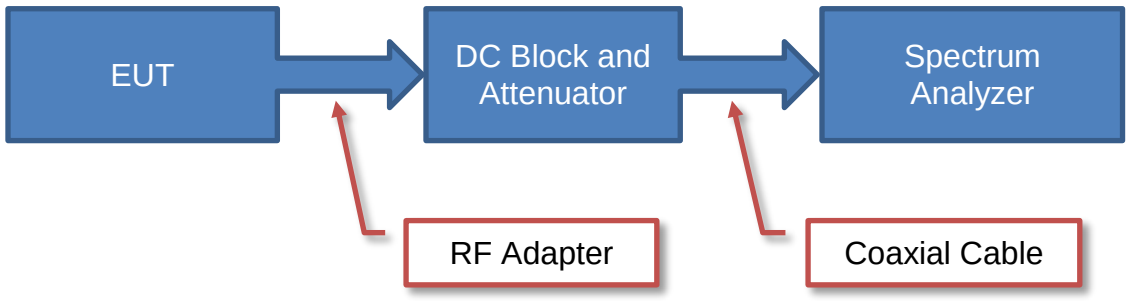
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. 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.

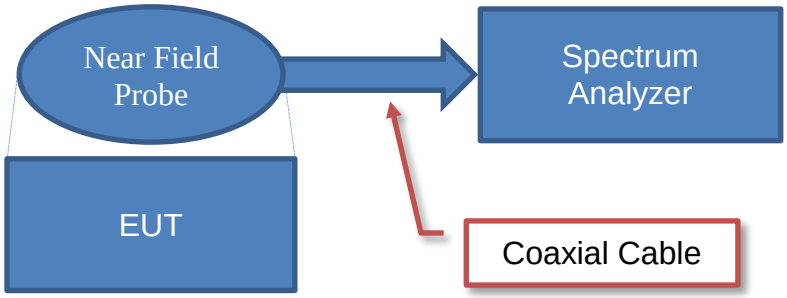
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams

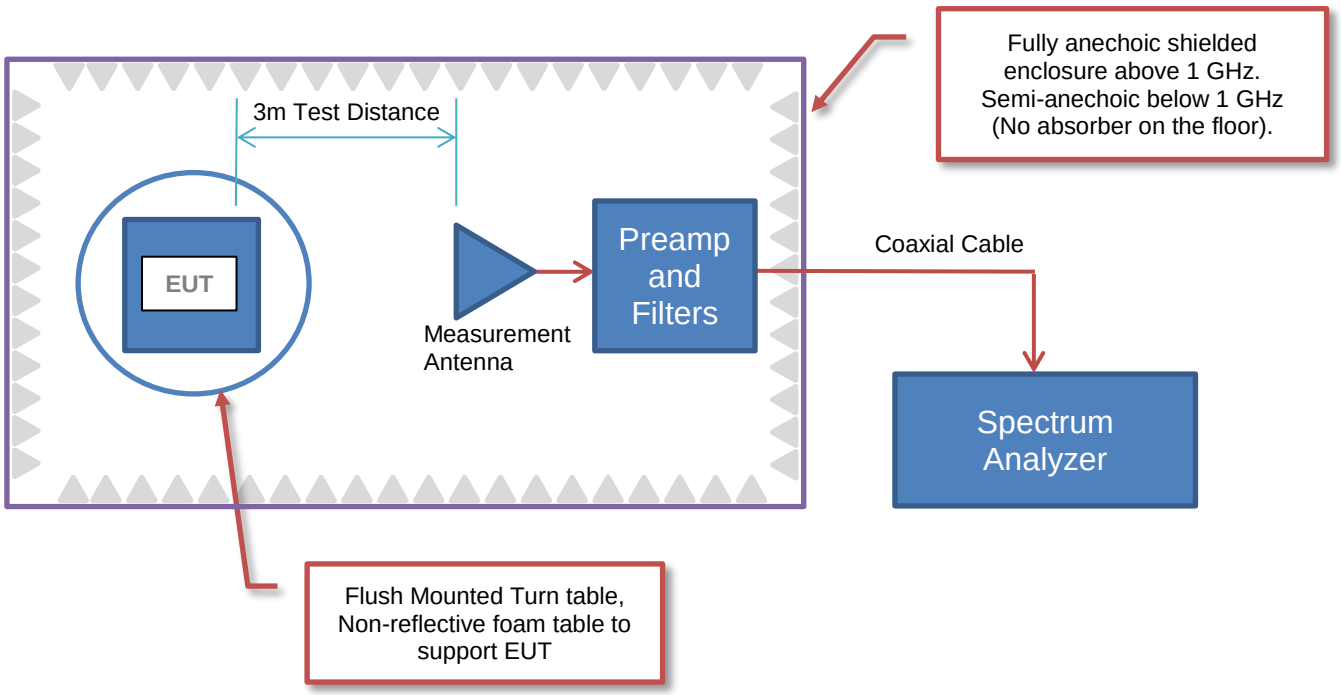
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Digi International Inc
Address:	9350 Excelsior Blvd, Suite 700
City, State, Zip:	Hopkins, MN 55343
Test Requested By:	Jared Hansen
Model:	Smart Sensor
First Date of Test:	February 14, 2019
Last Date of Test:	February 15, 2019
Receipt Date of Samples:	December 17, 2018
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Sensor with a BLE radio

Testing Objective:
To demonstrate compliance of the Bluetooth Low Energy (DTS) radio to FCC 15.247 requirements for operation in the 2.4GHz band.

CONFIGURATIONS

Configuration DGII0339- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Smart Sensor	Digi International, Inc.	50001909-04 rev E	D090423

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
DC Power Supply	Agilent	U8002A	TPZ

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Mains Cable (DC Power Supply)	No	1.8m	No	DC Power Supply	AC Mains
Banana Cables (x2)	No	1.8m	No	DC Power Supply	Smart Sensor

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2019-02-14	Field Strength of Fundamental	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	2019-02-14	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2019-02-15	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.
4	2019-02-15	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.
5	2019-02-15	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2019-02-15	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2018.07.27

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 BLE - low channel (2402 MHz), mid channel (2440 MHz), and high channel (2480 MHz); modulated

POWER SETTINGS INVESTIGATED

3.0VDC

CONFIGURATIONS INVESTIGATED

DGII0339 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Amplifier - Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	13-Sep-2018	12 mo
Cable	ESM Cable Corp	TTBJ141 KMKM-72	MNP	12-Sep-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AHG	NCR	0 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-12001800-30-10P	PAP	24-Feb-2018	12 mo
Antenna	ETS-Lindgren	3160-08	AJP	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	24-Feb-2018	12 mo
Cable	Element	Standard Gain Cable	MNW	24-Feb-2018	12 mo
Antenna	ETS-Lindgren	3160-07	AJJ	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	24-Feb-2018	12 mo
Cable	Element	Double Ridge Guide Horn Cables	MNV	24-Feb-2018	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIB	27-Aug-2018	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	26-Mar-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1064-9079 and SA18E-10	AOO	24-Feb-2018	12 mo
Cable	Element	Biconilog Cable	MNX	24-Feb-2018	12 mo
Antenna - Biconilog	ETS Lindgren	3142D	AXO	15-Dec-2017	24 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HGG	26-Sep-2018	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HFM	26-Sep-2018	12 mo
Attenuator	Coaxicom	3910-20	AXY	26-Sep-2018	12 mo

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 at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

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(dc).

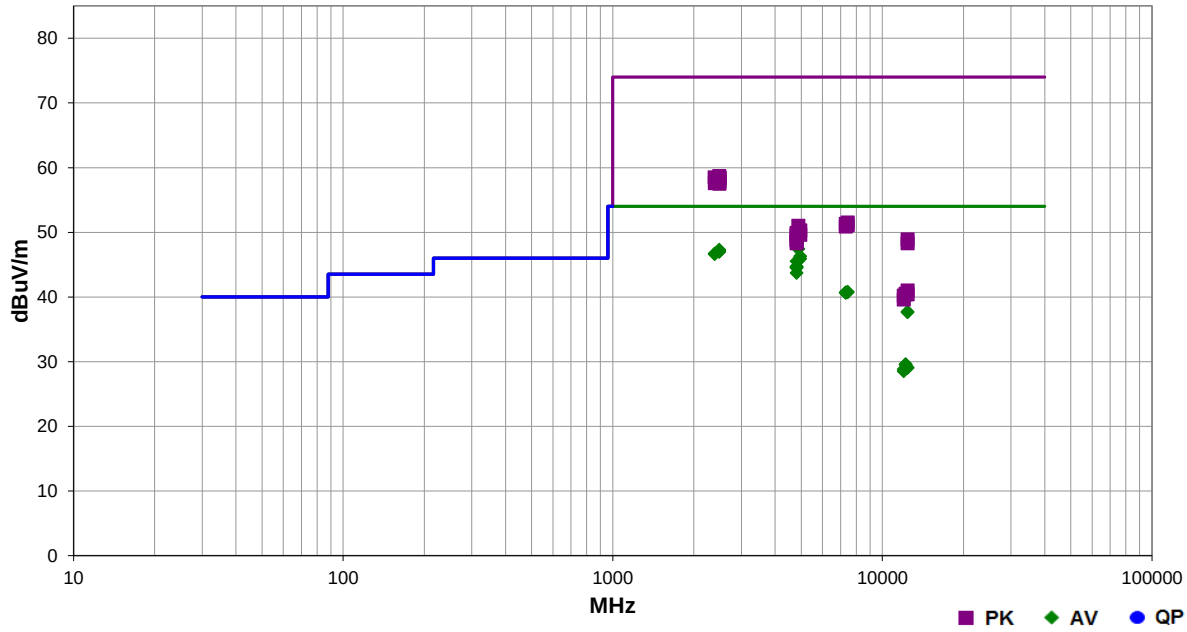
SPURIOUS RADIATED EMISSIONS

EmiR5 2018.09.26 PSA-ESCI 2018.07.27

Work Order:	DGII0339	**Date:**	15-Feb-2019		
Project:	None	**Temperature:**	22.6 °C		
Job Site:	MN09	**Humidity:**	15.2% RH		
Serial Number:	D090423	**Barometric Pres.:**	1020 mbar	**Tested by:**	Dustin Sparks, Andrew Rogstad
EUT:	Smart Sensor				
Configuration:	1				
Customer:	Digi International Inc				
Attendees:	Jared Hansen				
EUT Power:	3.0VDC				
Operating Mode:	Transmitting BLE - low channel (2402 MHz), mid channel (2440 MHz), and high channel (2480 MHz); modulated				
Deviations:	None				
Comments:	See data comments for Tx channel and EUT orientation				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	27	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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
4882.017	43.5	3.9	2.5	5.0	3.0	0.0	Vert	AV	0.0	47.4	54.0	-6.6	Mid ch, EUT horizontal
2483.505	31.5	-4.2	1.0	356.0	3.0	20.0	Horz	AV	0.0	47.3	54.0	-6.7	High ch, EUT vertical
2484.420	31.3	-4.2	1.0	106.0	3.0	20.0	Vert	AV	0.0	47.1	54.0	-6.9	High ch, EUT vertical
2483.675	31.3	-4.2	1.0	344.0	3.0	20.0	Horz	AV	0.0	47.1	54.0	-6.9	High ch, EUT on side
2483.860	31.2	-4.2	1.6	31.0	3.0	20.0	Horz	AV	0.0	47.0	54.0	-7.0	High ch, EUT horizontal
2483.715	31.2	-4.2	2.5	316.0	3.0	20.0	Vert	AV	0.0	47.0	54.0	-7.0	High ch, EUT horizontal
2483.540	31.2	-4.2	1.0	119.0	3.0	20.0	Vert	AV	0.0	47.0	54.0	-7.0	High ch, EUT on side
2389.245	31.1	-4.4	1.0	226.0	3.0	20.0	Horz	AV	0.0	46.7	54.0	-7.3	Low ch, EUT vertical
2387.600	31.0	-4.4	3.6	266.0	3.0	20.0	Vert	AV	0.0	46.6	54.0	-7.4	Low ch, EUT vertical
4958.017	42.4	3.9	2.4	29.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	High ch, EUT horizontal
4958.008	42.0	3.9	1.1	360.0	3.0	0.0	Horz	AV	0.0	45.9	54.0	-8.1	High ch, EUT vertical
4881.933	41.7	3.9	1.0	9.0	3.0	0.0	Horz	AV	0.0	45.6	54.0	-8.4	Mid ch, EUT vertical
4806.000	41.3	4.2	2.2	41.0	3.0	0.0	Vert	AV	0.0	45.5	54.0	-8.5	Low ch, EUT horizontal
4806.008	40.5	4.2	1.0	33.0	3.0	0.0	Horz	AV	0.0	44.7	54.0	-9.3	Low ch, EUT vertical
4806.000	40.4	4.2	2.7	48.0	3.0	0.0	Horz	AV	0.0	44.6	54.0	-9.4	Low ch, EUT horizontal
4806.042	40.4	4.2	4.0	7.0	3.0	0.0	Vert	AV	0.0	44.6	54.0	-9.4	Low ch, EUT on side
4806.008	40.3	4.2	2.5	41.0	3.0	0.0	Horz	AV	0.0	44.5	54.0	-9.5	Low ch, EUT on side
4806.008	39.5	4.2	1.0	138.0	3.0	0.0	Vert	AV	0.0	43.7	54.0	-10.3	Low ch, EUT vertical

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	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
7437.725	28.3	12.5	1.0	146.0	3.0	0.0	Vert	AV	0.0	40.8	54.0	-13.2	High ch, EUT horizontal
7320.250	28.6	12.1	1.0	178.0	3.0	0.0	Horz	AV	0.0	40.7	54.0	-13.3	Mid ch, EUT vertical
7438.383	28.2	12.5	1.0	270.0	3.0	0.0	Horz	AV	0.0	40.7	54.0	-13.3	High ch, EUT vertical
7320.267	28.5	12.1	1.0	64.0	3.0	0.0	Vert	AV	0.0	40.6	54.0	-13.4	Mid ch, EUT horizontal
2483.985	42.9	-4.2	1.0	356.0	3.0	20.0	Horz	PK	0.0	58.7	74.0	-15.3	High ch, EUT vertical
2387.010	42.9	-4.4	1.0	226.0	3.0	20.0	Horz	PK	0.0	58.5	74.0	-15.5	Low ch, EUT vertical
2484.870	42.6	-4.2	1.0	106.0	3.0	20.0	Vert	PK	0.0	58.4	74.0	-15.6	High ch, EUT vertical
2485.180	42.6	-4.2	2.5	316.0	3.0	20.0	Vert	PK	0.0	58.4	74.0	-15.6	High ch, EUT horizontal
2485.105	42.6	-4.2	1.0	344.0	3.0	20.0	Horz	PK	0.0	58.4	74.0	-15.6	High ch, EUT on side
2485.940	42.0	-4.2	1.6	31.0	3.0	20.0	Horz	PK	0.0	57.8	74.0	-16.2	High ch, EUT horizontal
12401.430	25.3	12.4	3.6	134.0	3.0	0.0	Horz	AV	0.0	37.7	54.0	-16.3	High ch, EUT vertical
12400.950	25.2	12.4	2.1	82.0	3.0	0.0	Vert	AV	0.0	37.6	54.0	-16.4	High ch, EUT horizontal
2388.895	42.0	-4.4	3.6	266.0	3.0	20.0	Vert	PK	0.0	57.6	74.0	-16.4	Low ch, EUT vertical
2485.840	41.7	-4.2	1.0	119.0	3.0	20.0	Vert	PK	0.0	57.5	74.0	-16.5	High ch, EUT on side
7437.575	39.0	12.5	1.0	146.0	3.0	0.0	Vert	PK	0.0	51.5	74.0	-22.5	High ch, EUT horizontal
7319.858	39.2	12.1	1.0	64.0	3.0	0.0	Vert	PK	0.0	51.3	74.0	-22.7	Mid ch, EUT horizontal
7439.767	38.6	12.5	1.0	270.0	3.0	0.0	Horz	PK	0.0	51.1	74.0	-22.9	High ch, EUT vertical
4881.842	47.1	3.9	2.5	5.0	3.0	0.0	Vert	PK	0.0	51.0	74.0	-23.0	Mid ch, EUT horizontal
7319.908	38.8	12.1	1.0	178.0	3.0	0.0	Horz	PK	0.0	50.9	74.0	-23.1	Mid ch, EUT vertical
4957.800	46.4	3.9	2.4	29.0	3.0	0.0	Vert	PK	0.0	50.3	74.0	-23.7	High ch, EUT horizontal
4805.958	45.7	4.2	2.2	41.0	3.0	0.0	Vert	PK	0.0	49.9	74.0	-24.1	Low ch, EUT horizontal
4882.233	46.0	3.9	1.0	9.0	3.0	0.0	Horz	PK	0.0	49.9	74.0	-24.1	Mid ch, EUT vertical
4806.308	45.5	4.2	2.7	48.0	3.0	0.0	Horz	PK	0.0	49.7	74.0	-24.3	Low ch, EUT horizontal
12200.940	29.8	-0.2	1.0	314.0	3.0	0.0	Horz	AV	0.0	29.6	54.0	-24.4	Mid ch, EUT vertical
4957.858	45.7	3.9	1.1	360.0	3.0	0.0	Horz	PK	0.0	49.6	74.0	-24.4	High ch, EUT vertical
12200.710	29.7	-0.2	1.0	179.0	3.0	0.0	Vert	AV	0.0	29.5	54.0	-24.5	Mid ch, EUT horizontal
4805.975	45.2	4.2	4.0	7.0	3.0	0.0	Vert	PK	0.0	49.4	74.0	-24.6	Low ch, EUT on side
12399.780	29.6	-0.5	1.0	260.0	3.0	0.0	Vert	AV	0.0	29.1	54.0	-24.9	High ch, EUT horizontal
12399.770	29.5	-0.5	1.0	347.0	3.0	0.0	Horz	AV	0.0	29.0	54.0	-25.0	High ch, EUT vertical
12401.400	36.5	12.4	2.1	82.0	3.0	0.0	Vert	PK	0.0	48.9	74.0	-25.1	High ch, EUT horizontal
12010.400	30.5	-1.7	1.0	89.0	3.0	0.0	Vert	AV	0.0	28.8	54.0	-25.2	Low ch, EUT horizontal
4805.967	44.6	4.2	1.0	33.0	3.0	0.0	Horz	PK	0.0	48.8	74.0	-25.2	Low ch, EUT vertical
4805.908	44.5	4.2	2.5	41.0	3.0	0.0	Horz	PK	0.0	48.7	74.0	-25.3	Low ch, EUT on side
12011.180	30.2	-1.7	1.0	360.0	3.0	0.0	Horz	AV	0.0	28.5	54.0	-25.5	Low ch, EUT vertical
4806.117	44.1	4.2	1.0	138.0	3.0	0.0	Vert	PK	0.0	48.3	74.0	-25.7	Low ch, EUT vertical
12400.050	35.9	12.4	3.6	134.0	3.0	0.0	Horz	PK	0.0	48.3	74.0	-25.7	High ch, EUT vertical
12398.980	41.5	-0.5	1.0	347.0	3.0	0.0	Horz	PK	0.0	41.0	74.0	-33.0	High ch, EUT vertical
12199.400	40.7	-0.2	1.0	314.0	3.0	0.0	Horz	PK	0.0	40.5	74.0	-33.5	Mid ch, EUT vertical
12200.510	40.6	-0.2	1.0	179.0	3.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	Mid ch, EUT horizontal
12399.220	40.9	-0.5	1.0	260.0	3.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	High ch, EUT horizontal
12011.360	41.9	-1.7	1.0	89.0	3.0	0.0	Vert	PK	0.0	40.2	74.0	-33.8	Low ch, EUT horizontal
12009.490	41.4	-1.8	1.0	360.0	3.0	0.0	Horz	PK	0.0	39.6	74.0	-34.4	Low ch, EUT vertical

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 measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power.

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 2017.12.13

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
Attenuator	Coaxicom	3910-20	AXY	26-Sep-18	26-Sep-19
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	24-Feb-18	24-Feb-19
Cable	Element	Double Ridge Guide Horn Cables	MNV	24-Feb-18	24-Feb-19
Antenna - Double Ridge	ETS Lindgren	3115	AIB	27-Aug-18	27-Aug-20
Power Supply - DC	Agilent	U8002A	TPZ	NCR	NCR
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	26-Mar-18	26-Mar-19

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The analyzer was offset based on the calibrated factors in the system. 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 2018.09.13 XMit 2017.12.13

EUT:	Smart Sensor			**Work Order:**	DGII0339
Serial Number:	D090423			**Date:**	15-Feb-19
Customer:	Digi International Inc			**Temperature:**	22.5 °C
Attendees:	Jared Hansen			**Humidity:**	15% RH
Project:	None			**Barometric Pres.:**	1019 mbar
Tested by:	Dustin Sparks	**Power:**	3.0VDC	**Job Site:**	MN05

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

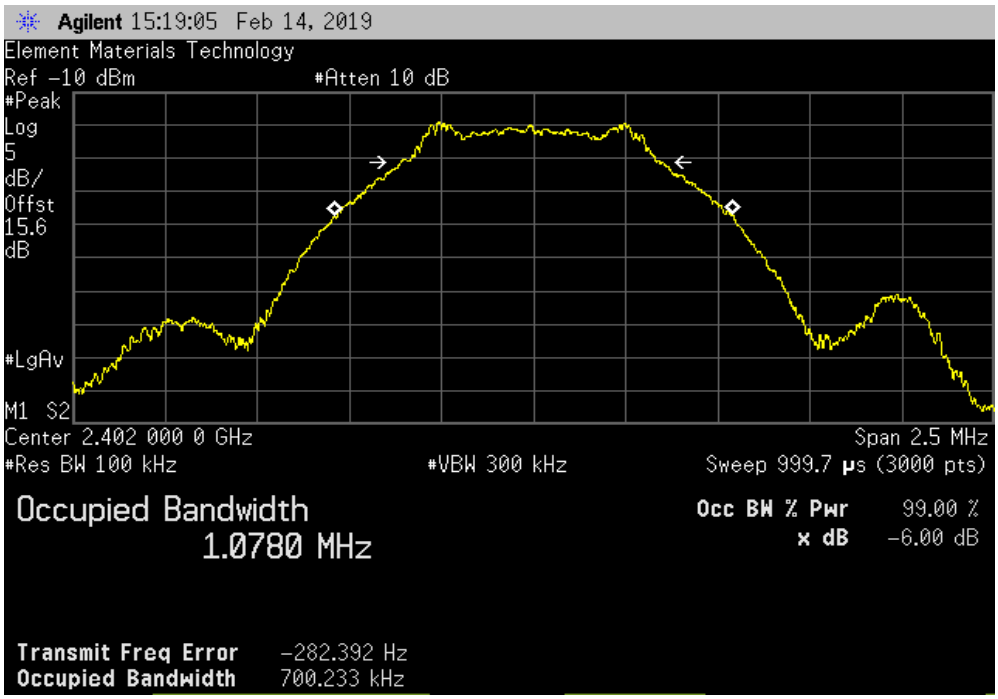
Configuration #	1	*Signature* Dustin Sparks

	Value	Limit (≥)	Result
BLE/GFSK Low Channel, 2402 MHz	700.233 kHz	500 kHz	Pass
BLE/GFSK Mid Channel, 2440 MHz	682.29 kHz	500 kHz	Pass
BLE/GFSK High Channel, 2480 MHz	679.158 kHz	500 kHz	Pass

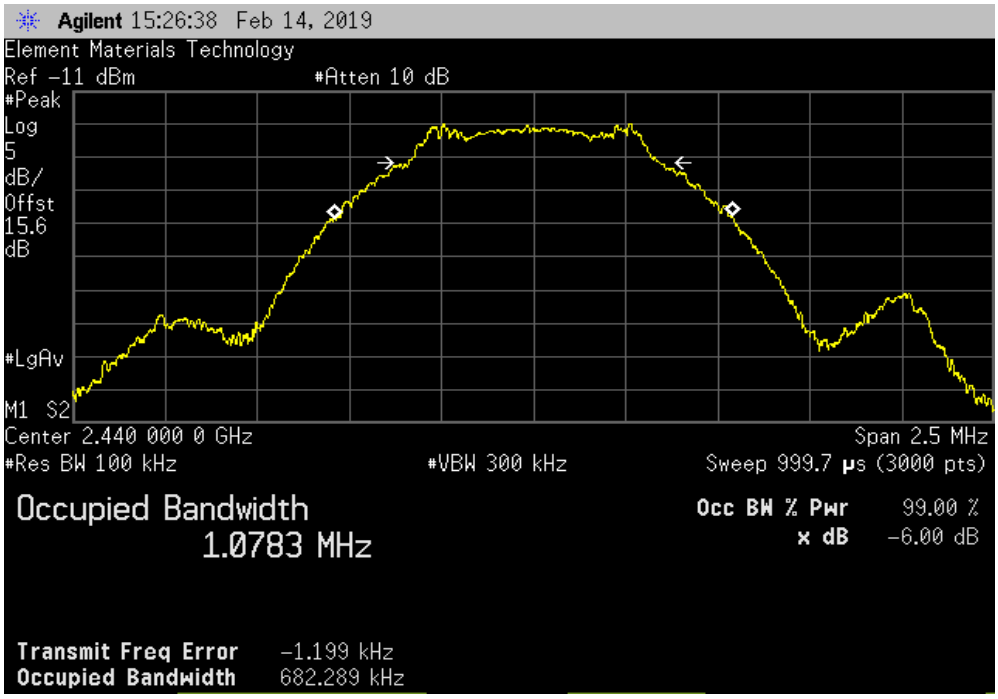
OCCUPIED BANDWIDTH

TbtTx 2018.09.13 XMit 2017.12.13

BLE/GFSK Low Channel, 2402 MHz						
				Value	Limit (≥)	Result
				700.233 kHz	500 kHz	Pass

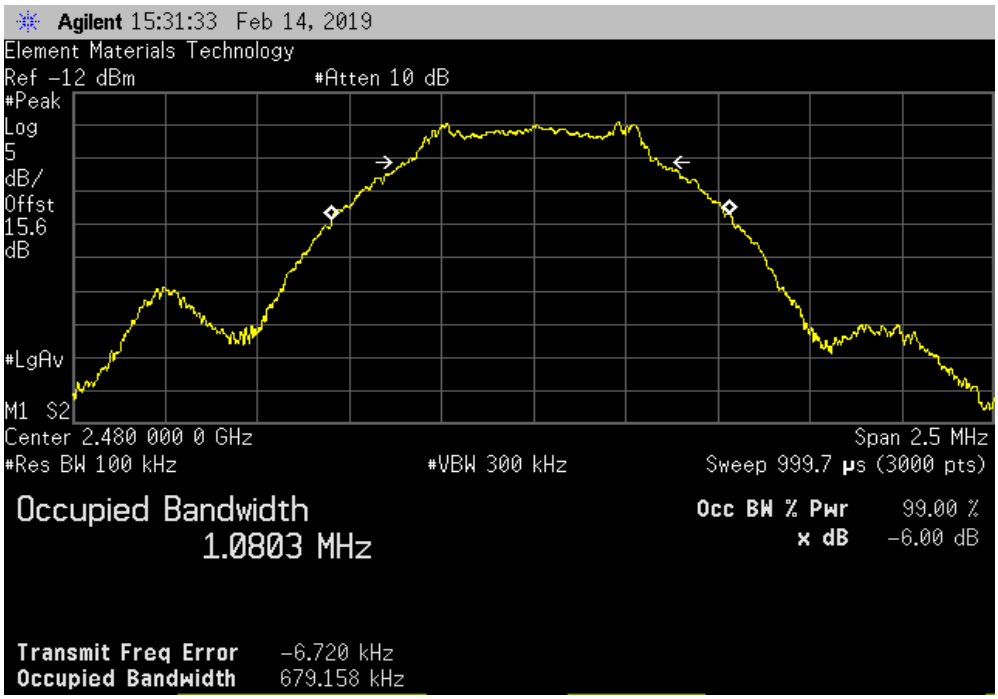


BLE/GFSK Mid Channel, 2440 MHz						
				Value	Limit (≥)	Result
				682.29 kHz	500 kHz	Pass



OCCUPIED BANDWIDTH

BLE/GFSK High Channel, 2480 MHz						
				Value	Limit (≥)	Result
				679.158 kHz	500 kHz	Pass



RADIATED POWER EIRP

PSA-ESCI 2018.07.27

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 BLE - low channel (2402 MHz), mid channel (2440 MHz), and high channel (2480 MHz) modulated

POWER SETTINGS INVESTIGATED

3.0VDC

CONFIGURATIONS INVESTIGATED

DGII0339 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	2400 MHz	Stop Frequency	2483.5 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	24-Feb-2018	12 mo
Attenuator	Coaxicom	3910-20	AXY	26-Sep-2018	12 mo
Cable	Element	uble Ridge Guide Horn Cab	MNV	24-Feb-2018	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIB	27-Aug-2018	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	26-Mar-2018	12 mo

MEASUREMENT BANDWIDTHS

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

TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium and high transmit frequencies. A field strength measurement was made of the fundamental with the carrier fully maximized for its highest radiated power.

The final data was converted from field strength to a radiated power value using equations found in ANSI C63.10:2013 Annex G.2

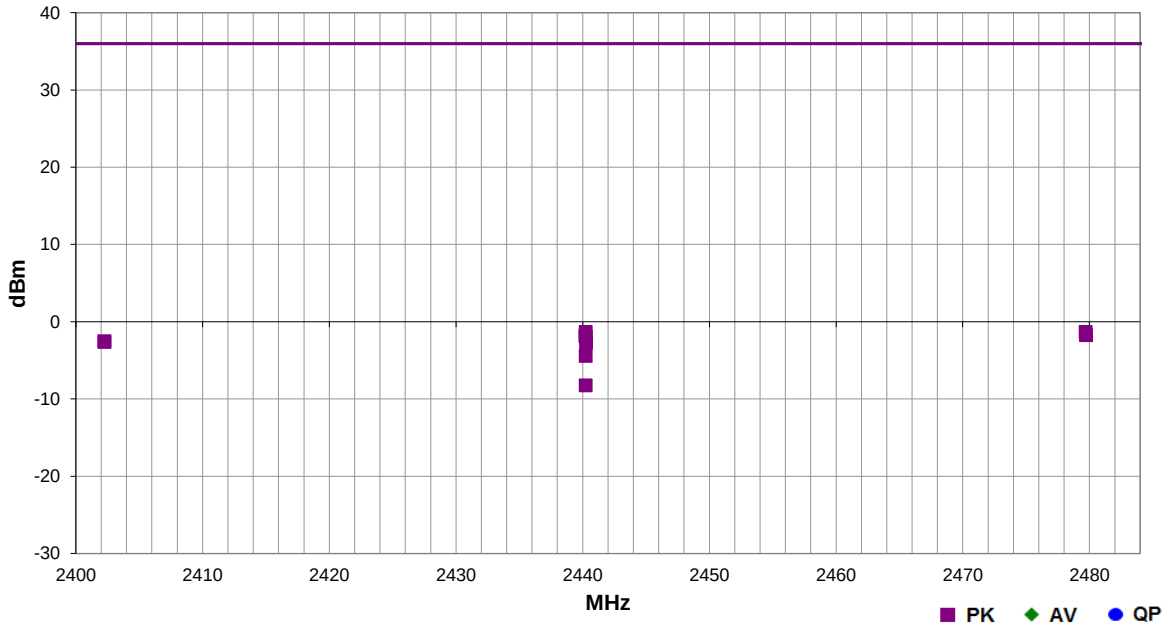
RADIATED POWER EIRP

EmiR5 2018.09.26 PSA-ESCI 2018.07.27

Work Order:	DGII0339	**Date:**	14-Feb-2019		
Project:	None	**Temperature:**	21.7 °C		
Job Site:	MN09	**Humidity:**	20.4% RH		
Serial Number:	D090423	**Barometric Pres.:**	1006 mbar	**Tested by:**	Dustin Sparks
EUT:	Smart Sensor				
Configuration:	1				
Customer:	Digi International Inc				
Attendees:	Jared Hansen				
EUT Power:	3.0VDC				
Operating Mode:	Transmitting BLE - low channel (2402 MHz), mid channel (2440 MHz), and high channel (2480 MHz) modulated				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	2	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	2440.242	2.9	293.0	Horz	PK	7.36E-04	-1.3	36.0	-37.3	Mid ch, EUT vertical
	2479.700	3.7	259.0	Horz	PK	7.36E-04	-1.3	36.0	-37.3	High ch, EUT vertical
	2479.725	1.0	261.0	Vert	PK	6.72E-04	-1.7	36.0	-37.7	High ch, EUT vertical
	2440.225	1.0	197.0	Vert	PK	6.56E-04	-1.8	36.0	-37.8	Mid ch, EUT vertical
	2440.242	1.0	163.0	Vert	PK	6.41E-04	-1.9	36.0	-37.9	Mid ch, EUT horizontal
	2402.250	1.0	241.0	Horz	PK	5.59E-04	-2.5	36.0	-38.5	Low ch, EUT vertical
	2402.250	1.0	253.0	Vert	PK	5.46E-04	-2.6	36.0	-38.6	Low ch, EUT vertical
	2440.267	1.2	291.0	Horz	PK	5.33E-04	-2.7	36.0	-38.7	Mid ch, EUT on side
	2440.233	1.2	250.0	Horz	PK	3.61E-04	-4.4	36.0	-40.4	Mid ch, EUT horizontal
	2440.242	1.2	204.0	Vert	PK	1.50E-04	-8.2	36.0	-44.2	Mid ch, EUT on side

POWER SPECTRAL DENSITY

XMit 2017.12.13

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
Power Supply - DC	Agilent	U8002A	TPZ	NCR	NCR
Cable	Element	Double Ridge Guide Horn Cables	MNV	24-Feb-18	24-Feb-19
Attenuator	Coaxicom	3910-20	AXY	26-Sep-18	26-Sep-19
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	24-Feb-18	24-Feb-19
Antenna - Double Ridge	ETS Lindgren	3115	AIB	27-Aug-18	27-Aug-20
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	26-Mar-18	26-Mar-19

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The analyzer was offset based on the calibrated factors in the system. The maximum power spectral density measurements were measured with the EUT set to the required transmit frequencies in each band. The EUT was transmitting at the lowest, middle, and maximum data rate for each modulation type available.

The final data was converted from a field strength to a radiated power value. The equations in section 9.5 of ANSI C63.10:2013, were used to derive this conversion formula:

dBm/m (field strength) + 11.77 = dBm EIRP

Per the procedure outlined in ANSI C63.10:2013 Section 11.10.2, the peak power spectral density was measured.

POWER SPECTRAL DENSITY

TbtTx 2018.09.13 XMit 2017.12.13

EUT:	Smart Sensor			**Work Order:**	DGII0339
Serial Number:	D090423			**Date:**	15-Feb-19
Customer:	Digi International Inc			**Temperature:**	22.6 °C
Attendees:	Jared Hansen			**Humidity:**	14.9% RH
Project:	None			**Barometric Pres.:**	1019 mbar
Tested by:	Dustin Sparks	**Power:**	3.0VDC	**Job Site:**	MN05

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

None

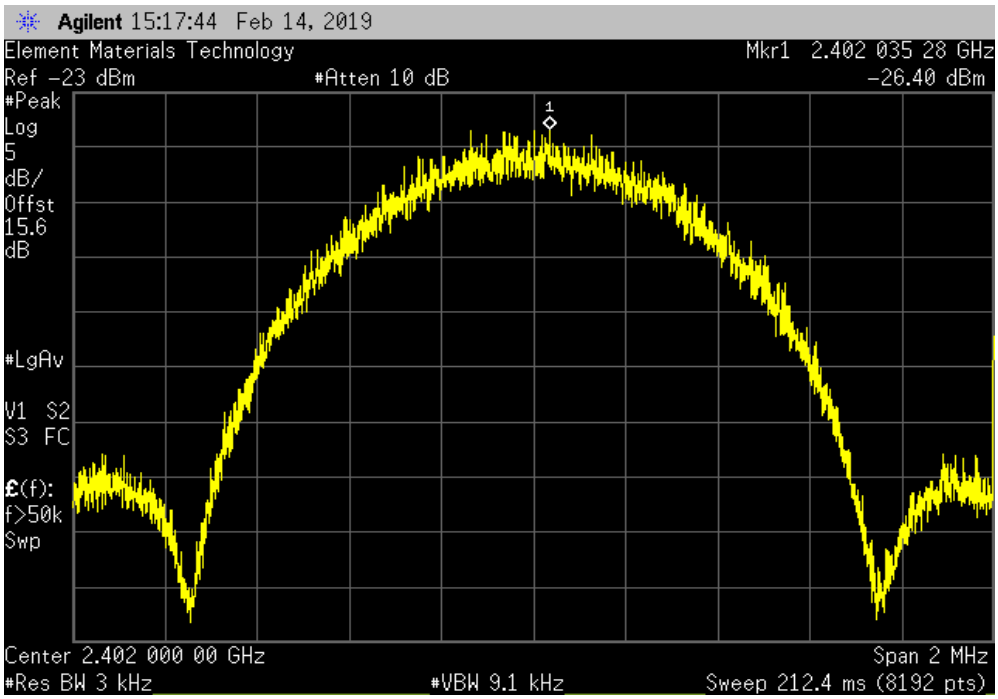
DEVIATIONS FROM TEST STANDARD

None

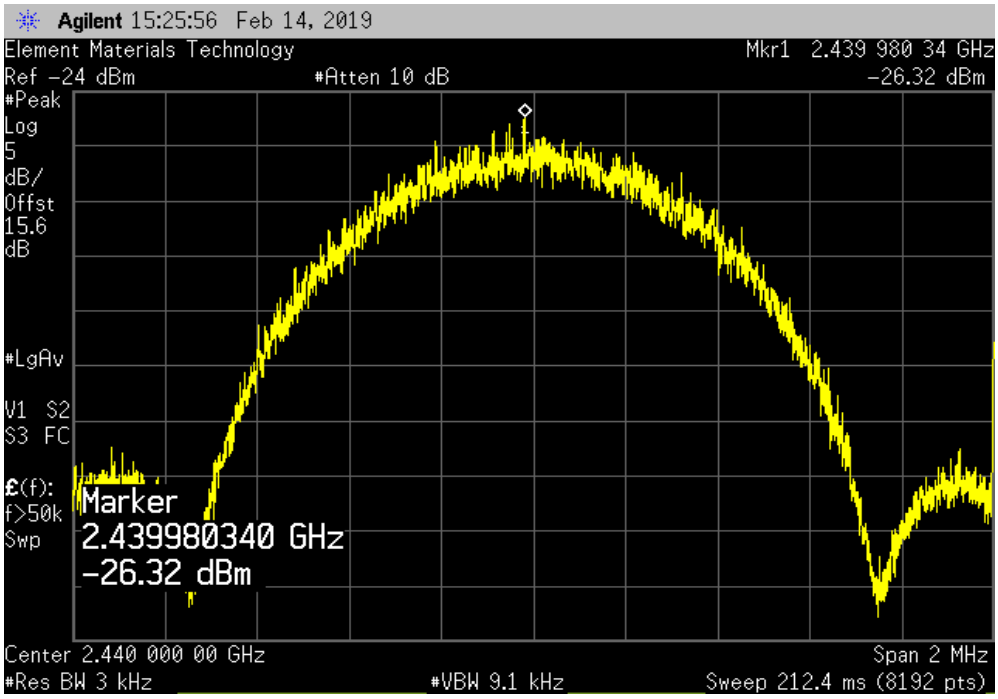
Configuration #	1	*Signature* Dustin Sparks

	Value dBm/m/3kHz	Correction Factor	Value dBm/3kHz	Limit < dBm/3kHz	Results
BLE/GFSK Low Channel, 2402 MHz	-26.399	11.77	-14.629	8	Pass
BLE/GFSK Mid Channel, 2440 MHz	-26.323	11.77	-14.553	8	Pass
BLE/GFSK High Channel, 2480 MHz	-28.327	11.77	-16.557	8	Pass

BLE/GFSK Low Channel, 2402 MHz						
		Value dBm/m/3kHz	Correction Factor	Value dBm/3kHz	Limit < dBm/3kHz	Results
		-26.399	11.77	-14.629	8	Pass

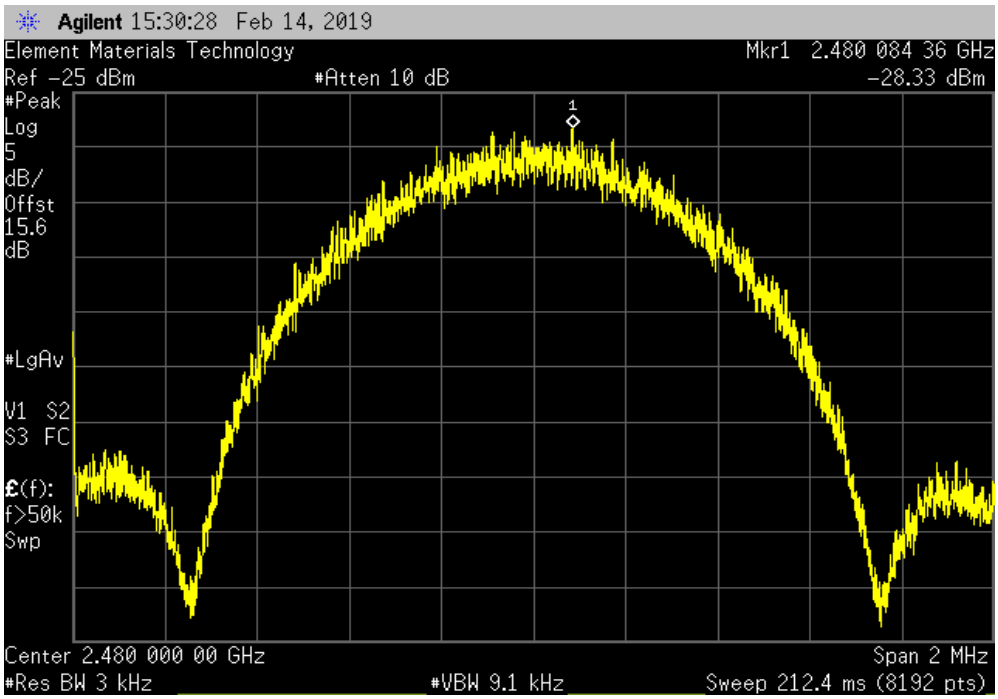


BLE/GFSK Mid Channel, 2440 MHz						
		Value dBm/m/3kHz	Correction Factor	Value dBm/3kHz	Limit < dBm/3kHz	Results
		-26.323	11.77	-14.553	8	Pass



POWER SPECTRAL DENSITY

BLE/GFSK High Channel, 2480 MHz						
		Value dBm/m/3kHz	Correction Factor	Value dBm/3kHz	Limit < dBm/3kHz	Results
		-28.327	11.77	-16.557	8	Pass



BAND EDGE COMPLIANCE

XMit 2017.12.13

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
Cable	Element	Double Ridge Guide Horn Cables	MNV	24-Feb-18	24-Feb-19
Attenuator	Coaxicom	3910-20	AXY	26-Sep-18	26-Sep-19
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	24-Feb-18	24-Feb-19
Antenna - Double Ridge	ETS Lindgren	3115	AIB	27-Aug-18	27-Aug-20
Power Supply - DC	Agilent	U8002A	TPZ	NCR	NCR
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	26-Mar-18	26-Mar-19

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The analyzer was offset based on the calibrated factors in the system. The spurious RF radiated 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

TbtTx 2018.09.13 XMit 2017.12.13

EUT:	Smart Sensor			**Work Order:**	DGII0339
Serial Number:	D090423			**Date:**	15-Feb-19
Customer:	Digi International Inc			**Temperature:**	22.5 °C
Attendees:	Jared Hansen			**Humidity:**	15% RH
Project:	None			**Barometric Pres.:**	1019 mbar
Tested by:	Dustin Sparks	**Power:**	3.0VDC	**Job Site:**	MN05

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

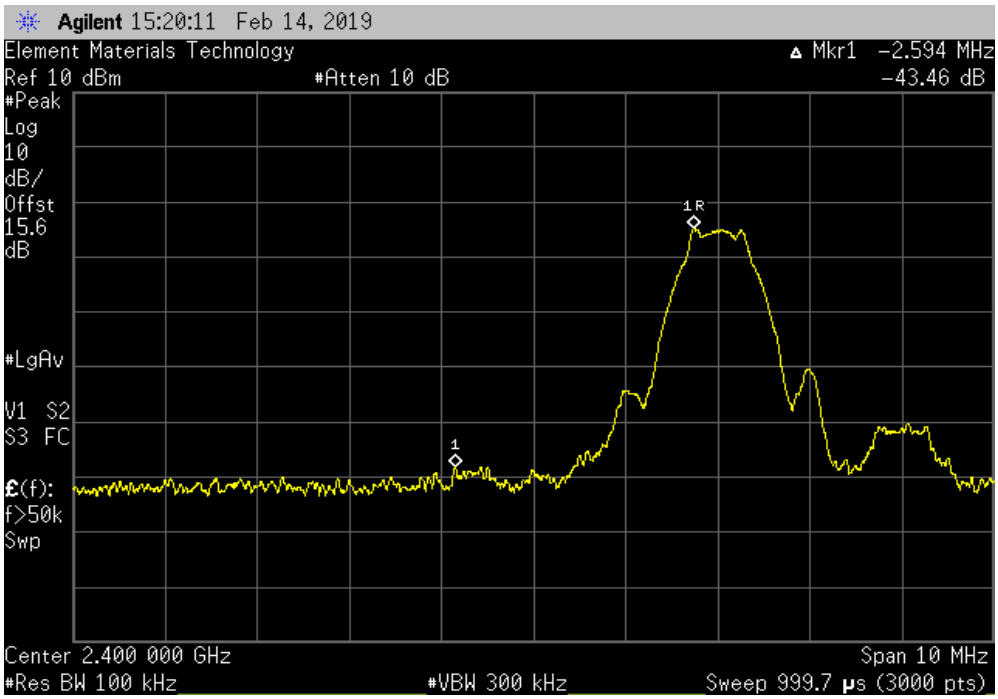
None

Configuration #	1	*Signature* Dustin Sparks

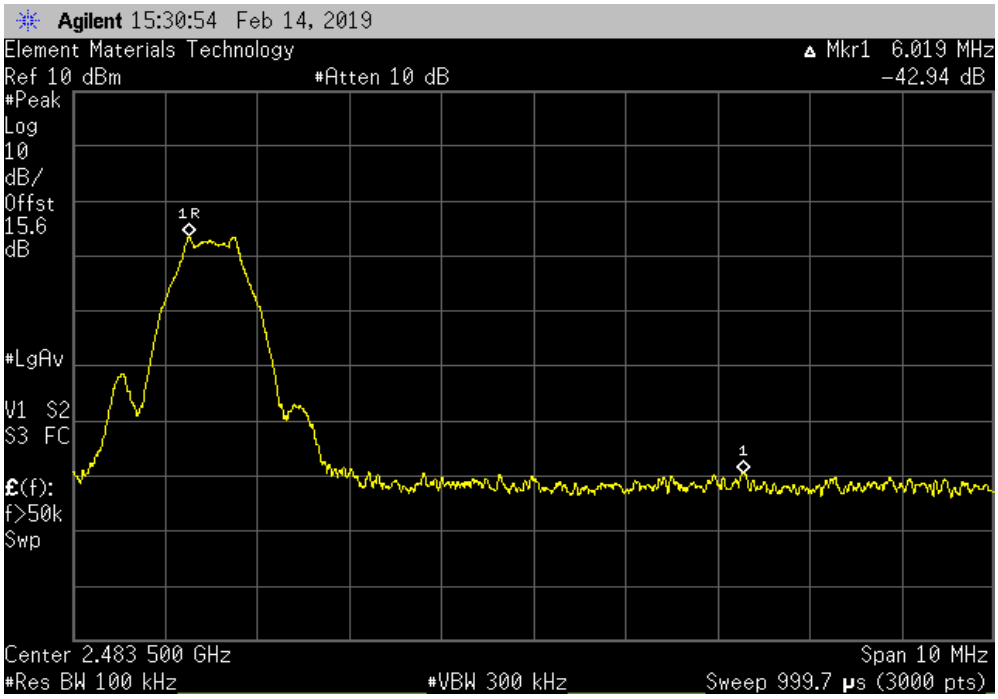
	Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK Low Channel, 2402 MHz	-43.46	-20	Pass
BLE/GFSK High Channel, 2480 MHz	-42.94	-20	Pass

BAND EDGE COMPLIANCE

BLE/GFSK Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.46	-20	Pass



BLE/GFSK High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-42.94	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

PSA-ESCI 2018.07.27

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 BLE - low channel (2402 MHz), mid channel (2440 MHz), and high channel (2480 MHz) modulated

POWER SETTINGS INVESTIGATED

3.0VDC

CONFIGURATIONS INVESTIGATED

DGII0339 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna - Biconilog	ETS Lindgren	3142D	AXO	15-Dec-2017	24 mo
Amplifier - Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	13-Sep-2018	12 mo
Cable	ESM Cable Corp	TTBJ141 KMKM-72	MNP	12-Sep-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AHG	NCR	0 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-12001800-30-10P	PAP	24-Feb-2018	12 mo
Cable	Element	Biconilog Cable	MNX	24-Feb-2018	12 mo
Cable	Element	Standard Gain Cable	MNW	24-Feb-2018	12 mo
Cable	Element	Double Ridge Guide Horn Cables	MNV	24-Feb-2018	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HGG	26-Sep-2018	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HFM	26-Sep-2018	12 mo
Attenuator	Coaxicom	3910-20	AXY	26-Sep-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	24-Feb-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	24-Feb-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1064-9079 and SA18E-10	AOO	24-Feb-2018	12 mo
Antenna	ETS-Lindgren	3160-08	AJP	NCR	0 mo
Antenna	ETS-Lindgren	3160-07	AJJ	NCR	0 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	26-Mar-2018	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIB	27-Aug-2018	24 mo

MEASUREMENT BANDWIDTHS

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

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The spurious RF radiated 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 (30 MHz to 26.5 GHz).

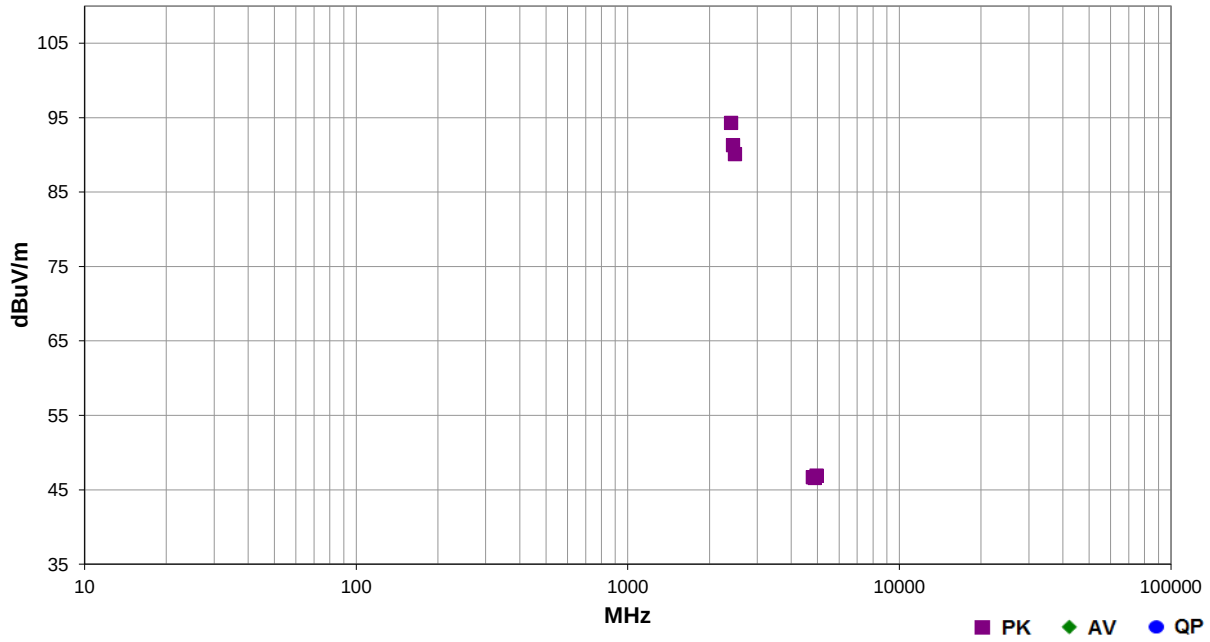
SPURIOUS CONDUCTED EMISSIONS

EmiR5 2018.09.26 PSA-ESCI 2018.07.27

Work Order:	DGII0339	**Date:**	14-Feb-2019		
Project:	None	**Temperature:**	21.7 °C		
Job Site:	MN09	**Humidity:**	20.4% RH		
Serial Number:	D090423	**Barometric Pres.:**	1006 mbar	**Tested by:**	Dustin Sparks
EUT:	Smart Sensor				
Configuration:	1				
Customer:	Digi International Inc				
Attendees:	Jared Hansen				
EUT Power:	3.0VDC				
Operating Mode:	Transmitting BLE - low channel (2402 MHz), mid channel (2440 MHz), and high channel (2480 MHz) modulated				
Deviations:	None				
Comments:	Measurements taken with 100 kHz RBW. EUT in vertical orientation.				

Test Specifications	**Test Method**
FCC 15.247:2019	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)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBc)	Compared to Spec. (dB)	Comments
2480.250	74.4	-4.3	1.0	237.0	3.0	20.0	Horz	PK	0.0	90.1	N/A	N/A	High ch, fundamental
4958.000	43.0	3.9	2.3	28.0	3.0	0.0	Horz	PK	0.0	46.9	-20.0	-43.2	High ch
2402.242	78.7	-4.4	1.0	264.0	3.0	20.0	Horz	PK	0.0	94.3	N/A	N/A	Low ch, fundamental
4806.000	42.5	4.2	2.3	44.0	3.0	0.0	Horz	PK	0.0	46.7	-20.0	-47.6	Low ch
2440.233	75.7	-4.4	1.0	293.0	3.0	20.0	Horz	PK	0.0	91.3	N/A	N/A	Mid ch, fundamental
4881.992	42.7	3.9	1.0	44.0	3.0	0.0	Horz	PK	0.0	46.6	-20.0	-44.7	Mid ch

OUTPUT POWER

XMit 2019.09.05

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
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	5-Apr-19	5-Apr-20
Antenna - Double Ridge	ETS Lindgren	3115	AIB	27-Aug-18	27-Aug-20
Cable	Element	Ridge Guide Horn	MNV	23-Feb-19	23-Feb-20
Attenuator	Coaxicom	3910-20	AXY	17-Sep-19	17-Sep-20
Amplifier - Pre-Amplifier	Miteq	F-3D-00100800-32-	AVX	23-Feb-19	23-Feb-20

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. 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.

Because the EUT was only configured for radiated measurements, the conducted output power values were calculated by subtracting the antenna gain in dBi from the measured EIRP values. The worst-case radiated measurements for each operating channel are shown.

OUTPUT POWER

TbtTx 2019.08.02 XMit 2019.09.05

EUT:	Smart Sensor			**Work Order:**	DGII0339
Serial Number:	D090423			**Date:**	20-Sep-19
Customer:	Digi International Inc			**Temperature:**	21.5 °C
Attendees:	Jared Hansen			**Humidity:**	63.3% RH
Project:	None			**Barometric Pres.:**	1018 mbar
Tested by:	Dustin Sparks	**Power:**	Battery	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Antenna gain of 0 dBi

DEVIATIONS FROM TEST STANDARD

None

Configuration #	1	Signature

	Radiated Power EIRP (dBm)	Antenna Gain (dBi)	Output Power (dBm)	Limit (dBm)	Result
BLE/GFSK Low Channel, 2402 MHz	-2.5	0	-2.5	30	Pass
BLE/GFSK Mid Channel, 2440 MHz	-1.3	0	-1.3	30	Pass
BLE/GFSK High Channel, 2480 MHz	-1.3	0	-1.3	30	Pass