



element

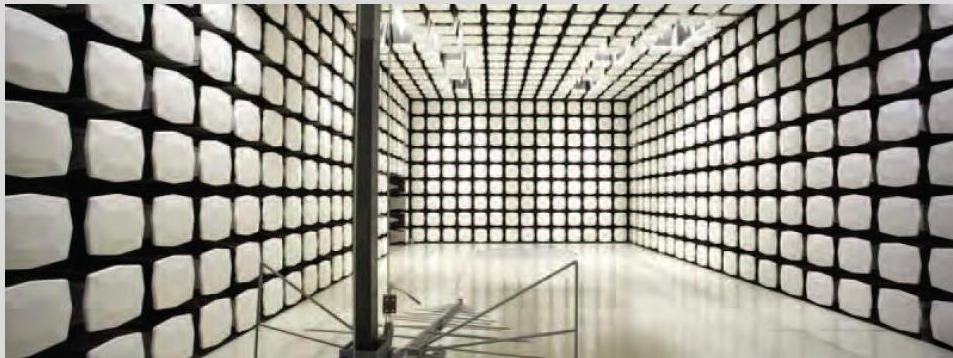
Digi International Inc.

Smart Sensor

FCC 15.247:2019

Bluetooth Low Energy (DTS) Radio

Report # DGI0328.1 Rev. 1



NVLAP LAB CODE: 200881-0



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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
01	Updated Duty Cycle test description for radiated measurement	2019-08-08	15
	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

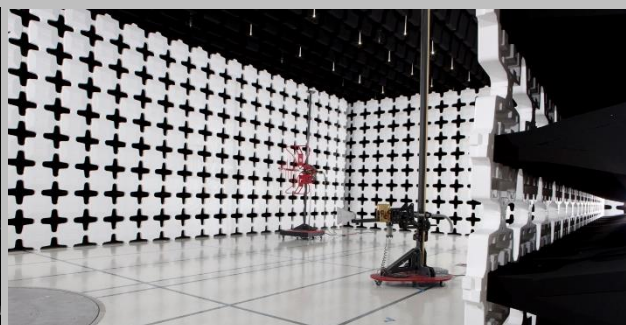
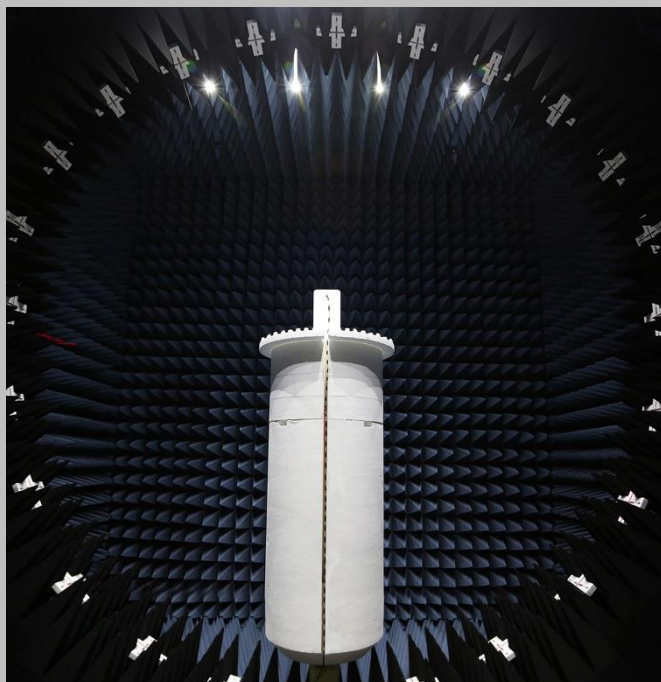
For details on the Scopes of our Accreditations, please visit:

<https://www.nwemc.com/emc-testing-accreditations>

FACILITIES



California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th 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/RRR, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157



MEASUREMENT UNCERTAINTY

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.

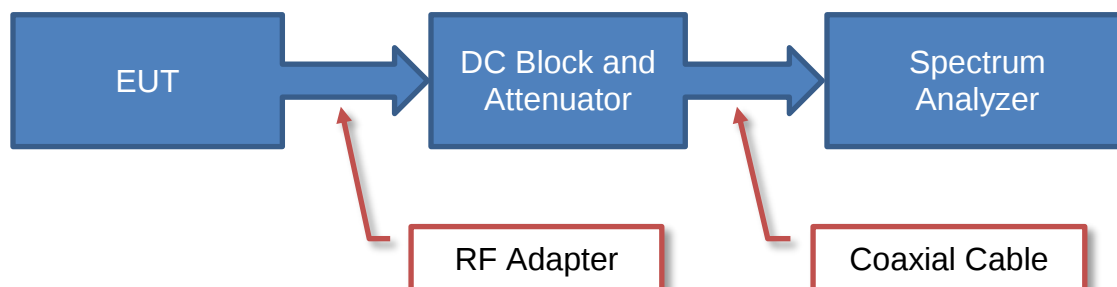
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable 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
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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 $10 \cdot \text{LOG}(\text{dc})$.

SPURIOUS RADIATED EMISSIONS

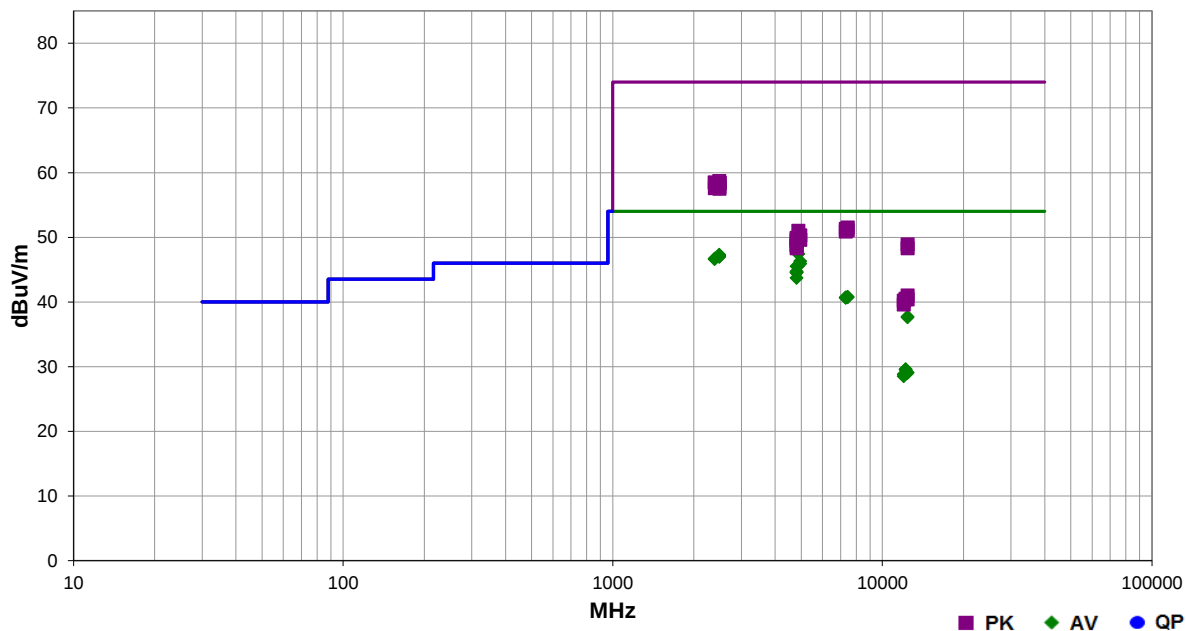


EmiRS 2018.09.26 PSA-ESCI 2018.07.27

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	
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
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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



XMI 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



THxTx 2018.09.13 XMt 2017.12.13

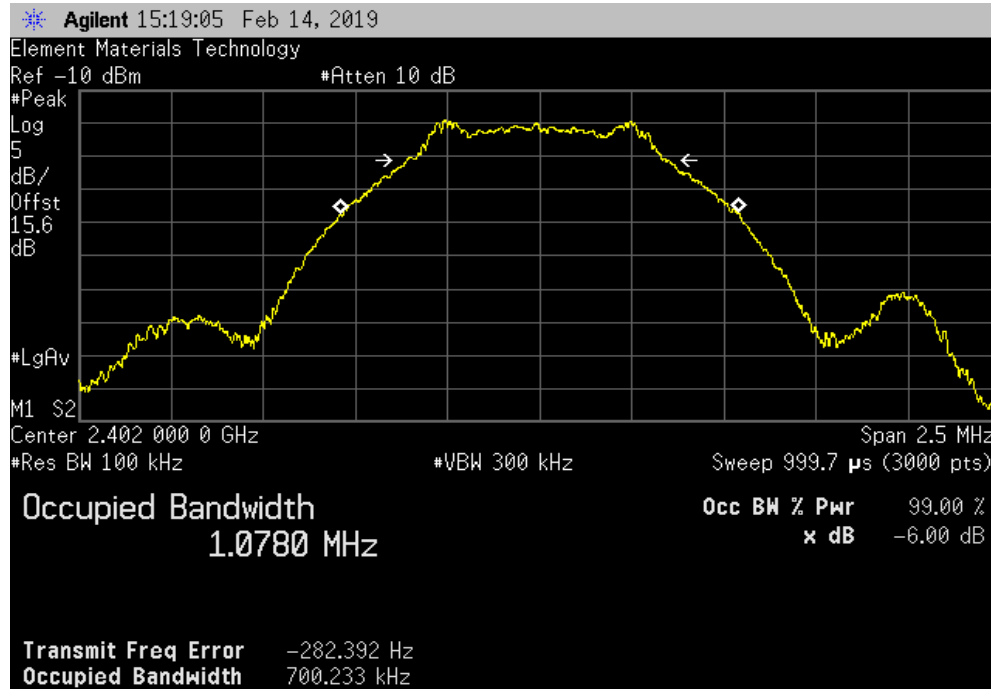
EUT: Smart Sensor		Work Order: DGII0339	
Serial Number: D090423		Date: 15-Feb-19	
Customer: Digi International Inc		Temperature: 22.5 °C	
Attendees: Jared Hansen		Humidity: 15% RH	
Project: None		Barometric Pres.: 1019 mbar	
Tested by: Dustin Sparks	Power: 3.0VDC	Job Site: MN05	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Dustin Sparks</i>	
		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

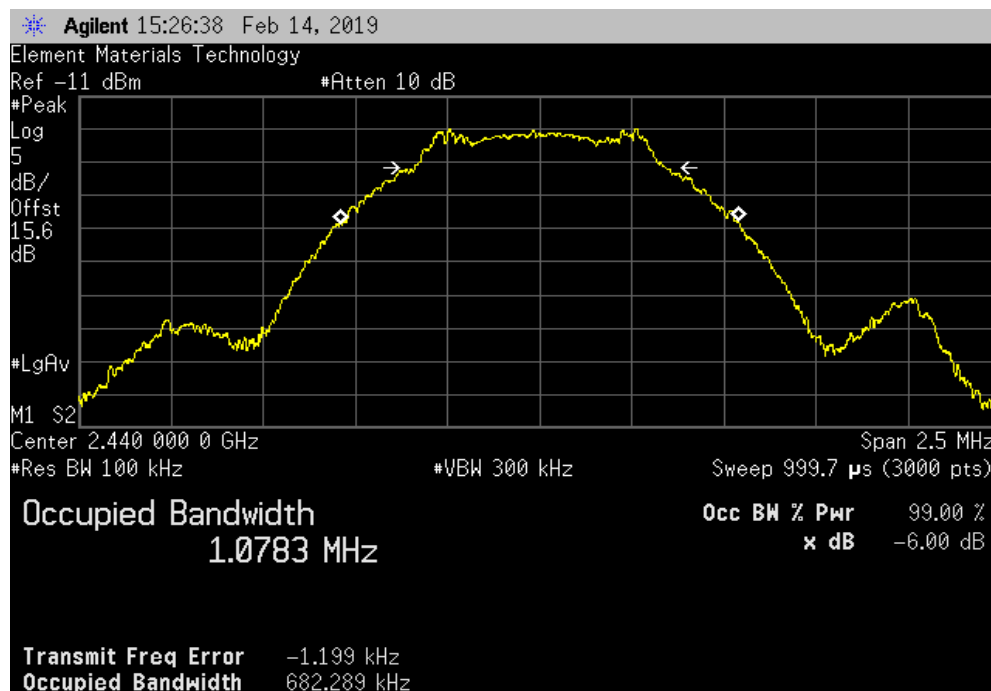


TMTx 2018.09.13 XMt 2017.12.13

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

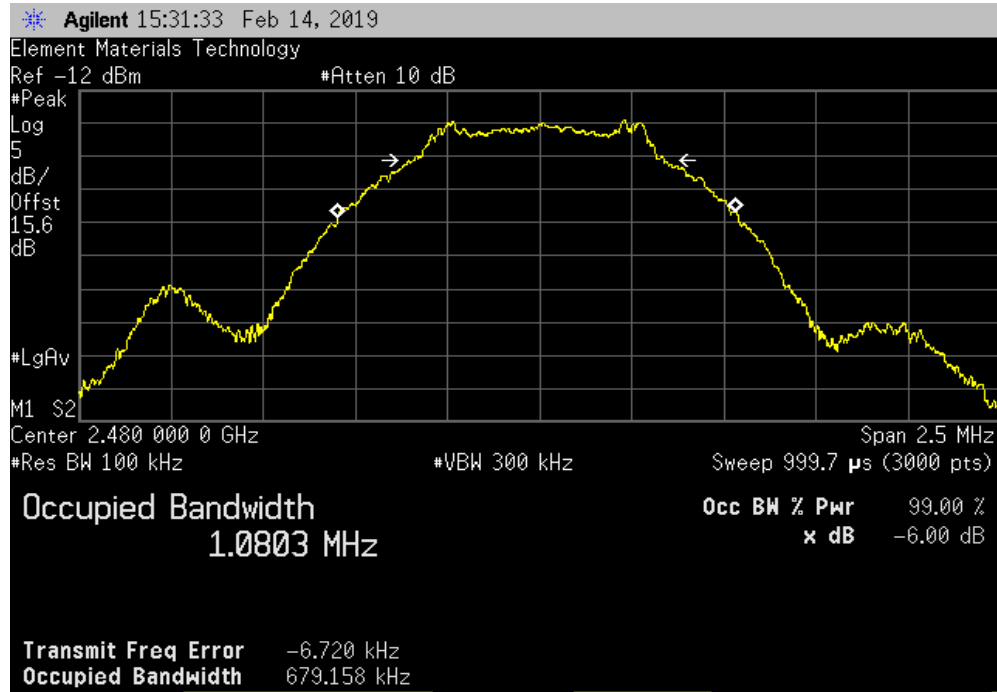


OCCUPIED BANDWIDTH



TMTx 2018.09.13 XMI 2017.12.13

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	Double 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

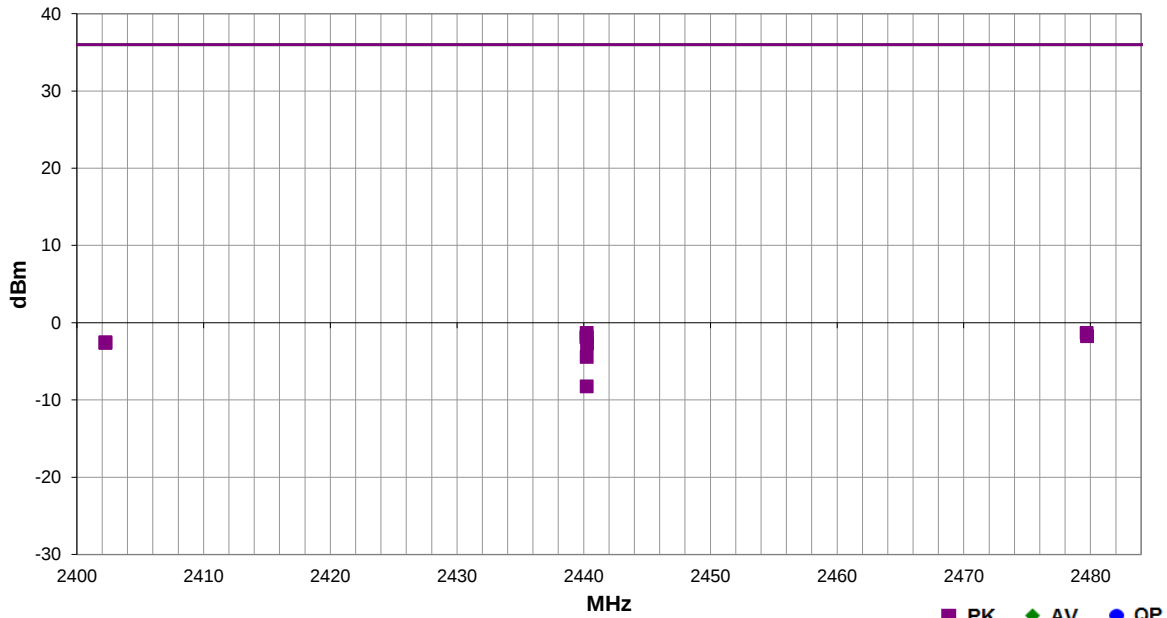
RADIATED POWER EIRP



Work Order:	DGII0339	Date:	14-Feb-2019	<i>Dustin Sparks</i>
Project:	None	Temperature:	21.7 °C	
Job Site:	MN09	Humidity:	20.4% RH	
Serial Number:	D090423	Barometric Pres.:	1006 mbar	
EUT:	Smart Sensor			Tested by: Dustin Sparks
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	FCC 15.247:2019	Test Method	ANSI C63.10:2013
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Run #	2	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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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



XMIR 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:

$$\text{dBm/m (field strength)} + 11.77 = \text{dBm EIRP}$$

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

POWER SPECTRAL DENSITY



THxTx 2018.09.13 XMM 2017.12.13

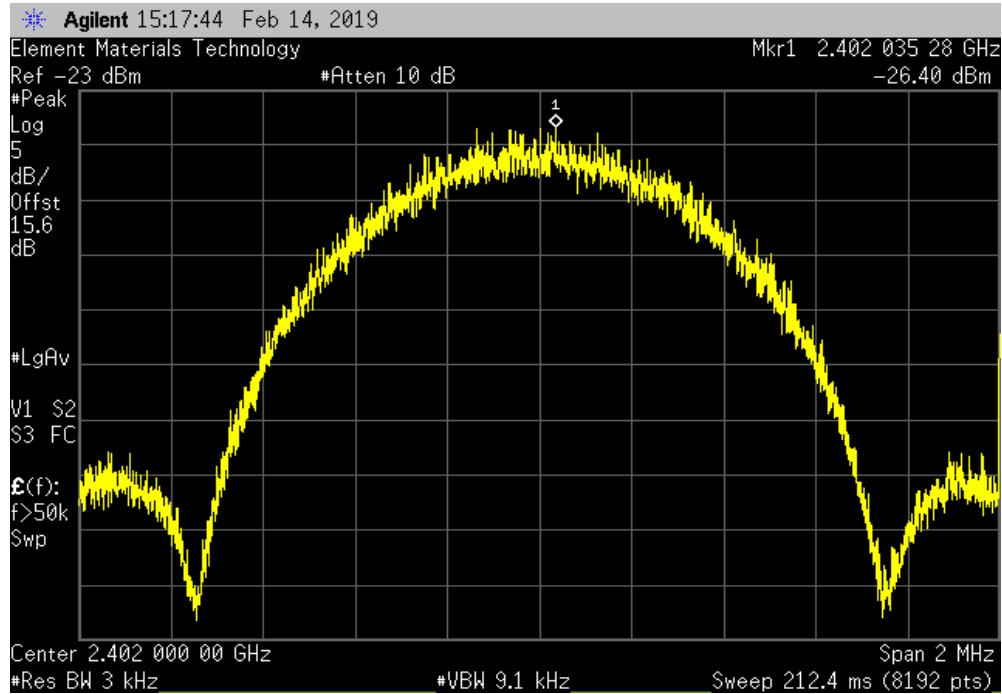
EUT: Smart Sensor		Work Order: DGII0339	
Serial Number: D090423		Date: 15-Feb-19	
Customer: Digi International Inc		Temperature: 22.6 °C	
Attendees: Jared Hansen		Humidity: 14.9% RH	
Project: None		Barometric Pres.: 1019 mbar	
Tested by: Dustin Sparks	Power: 3.0VDC	Job Site: MN05	
TEST SPECIFICATIONS			
FCC 15.247:2019		Test Method	
		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Dustin Sparks</i>	
		Value dBm/m/3kHz	Correction Factor
BLE/GFSK Low Channel, 2402 MHz		-26.399	11.77
BLE/GFSK Mid Channel, 2440 MHz		-26.323	11.77
BLE/GFSK High Channel, 2480 MHz		-28.327	11.77
		Value dBm/3kHz	Limit < dBm/3kHz
		-14.629	8
		-14.553	8
		-16.557	8
			Results
			Pass
			Pass
			Pass

POWER SPECTRAL DENSITY

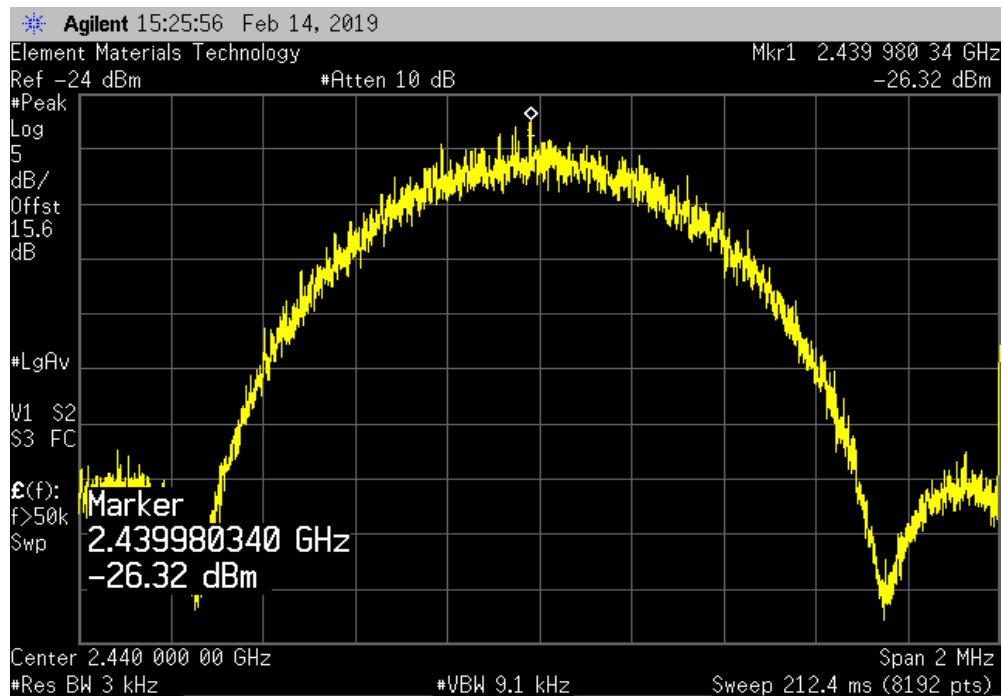


TMTx 2018.09.13 XMt 2017.12.13

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



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

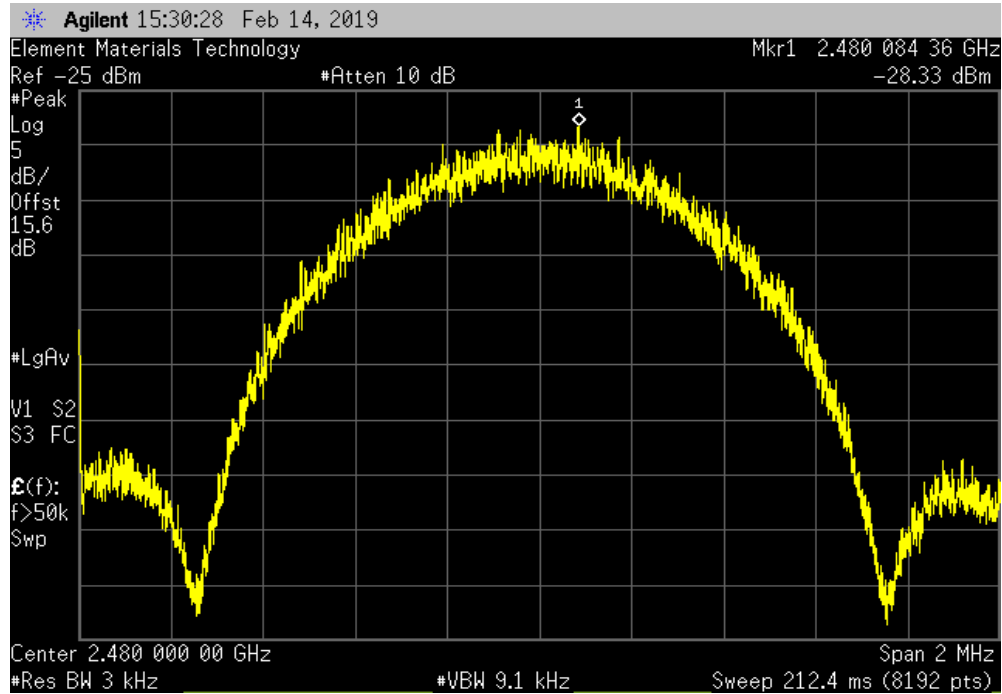


POWER SPECTRAL DENSITY



TMTx 2018.09.13 XMI 2017.12.13

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



BAND EDGE COMPLIANCE



XMIR 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



THxTx 2018.09.13 XMM 2017.12.13

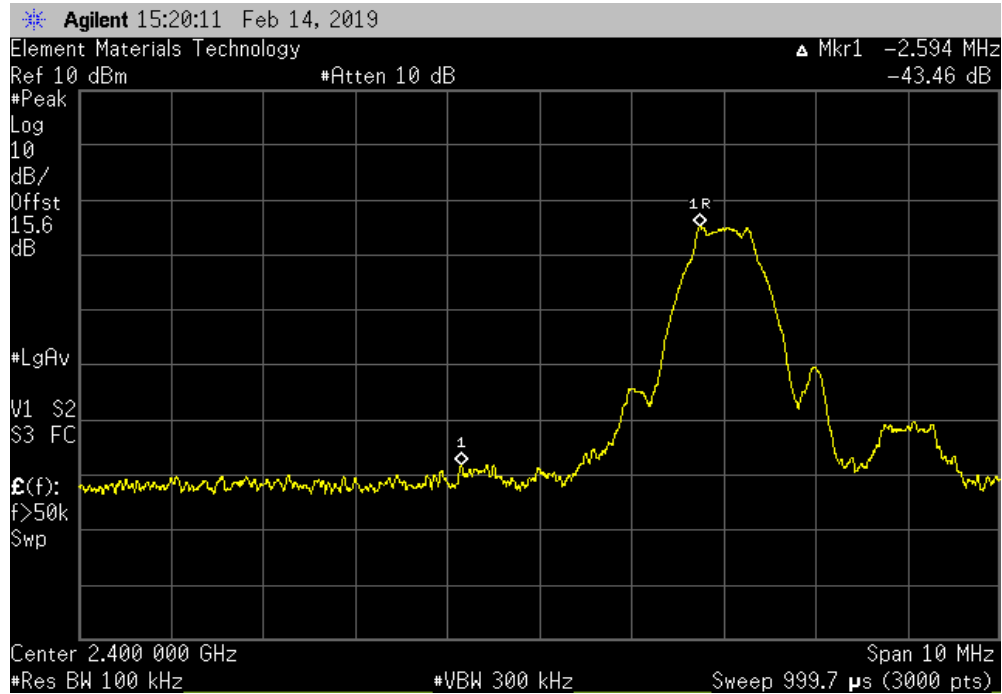
EUT: Smart Sensor		Work Order: DGII0339	
Serial Number: D090423		Date: 15-Feb-19	
Customer: Digi International Inc		Temperature: 22.5 °C	
Attendees: Jared Hansen		Humidity: 15% RH	
Project: None		Barometric Pres.: 1019 mbar	
Tested by: Dustin Sparks		Power: 3.0VDC	
		Job Site: MN05	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Dustin Sparks</i>	
		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

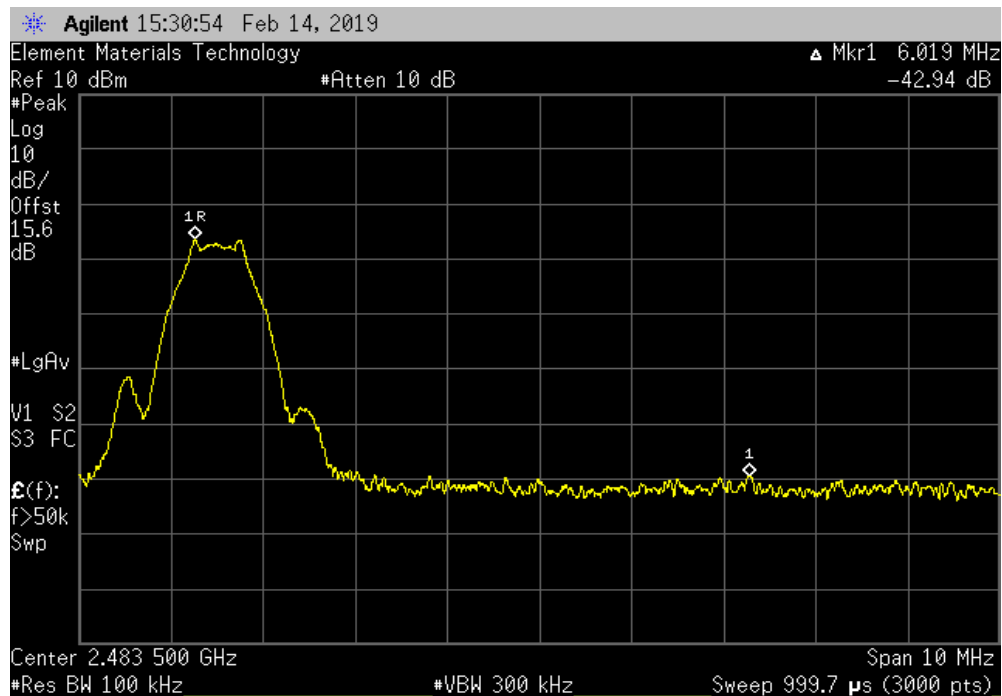


TMTx 2018.09.13 XMt 2017.12.13

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



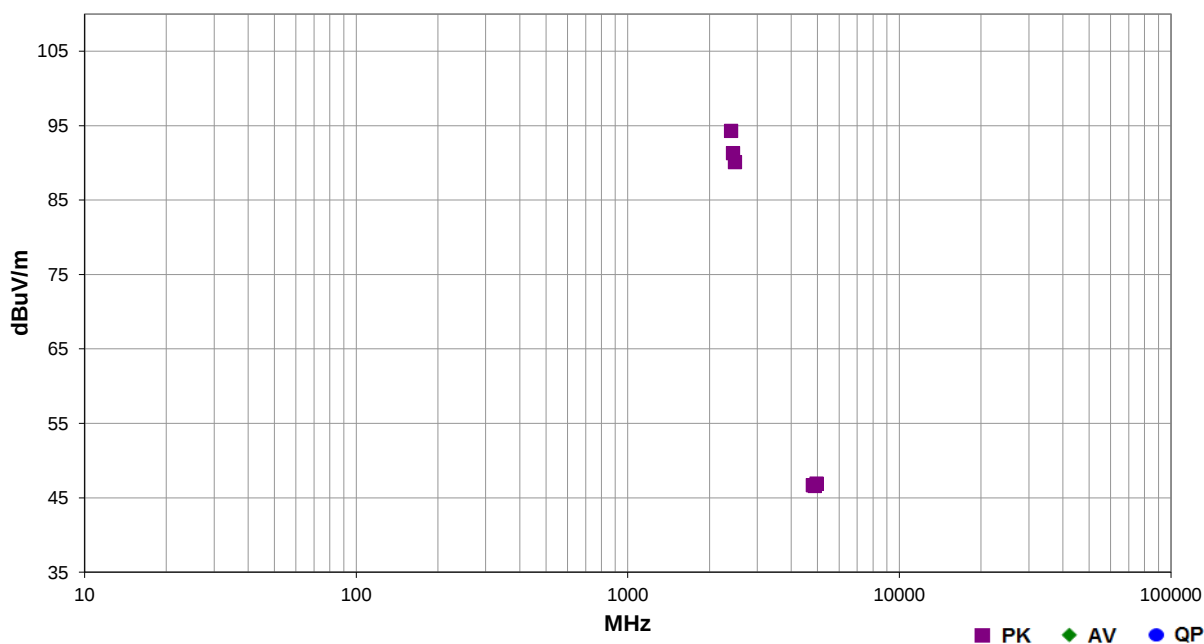
EmiRS 2018.09.26

PSA-ESCI 2018.07.27

EmiRS 2018.09.26		PSA-ESCI 2018.07			
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
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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



TbTb 2019.08.02 XMb 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 <i>Dustin Sparks</i>	
		Radiated Power EIRP (dBm)	Antenna Gain (dBi)
BLE/GFSK Low Channel, 2402 MHz		-2.5	0
BLE/GFSK Mid Channel, 2440 MHz		-1.3	0
BLE/GFSK High Channel, 2480 MHz		-1.3	0
		Output Power (dBm)	Limit (dBm)
		-2.5	30
		-1.3	30
		-1.3	30
			Result
			Pass
			Pass
			Pass