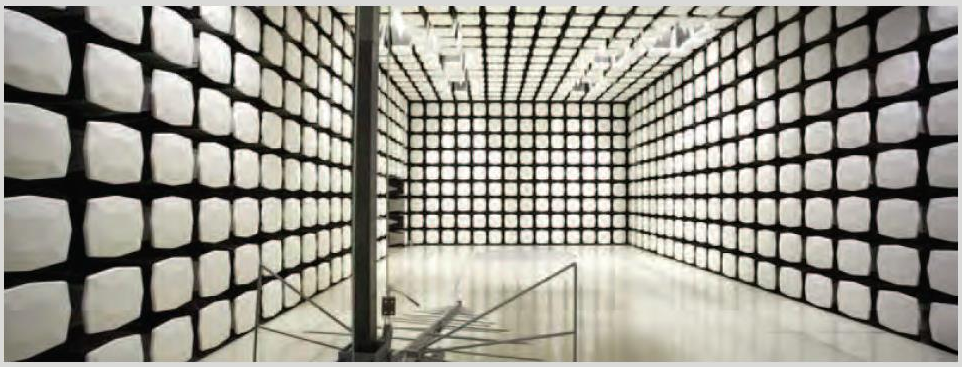
Inspire Medical Systems

Inspire Remote Model 2580

FCC 15.247:2021

Bluetooth LE Radio

Report: INSP0027, Issue Date: May 26, 2021



NVLAP LAB CODE: 200881-0

CERTIFICATE OF TEST

Last Date of Test: May 20, 2021
Inspire Medical Systems
EUT: Inspire Remote Model 2580

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2021	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.
6.5, 6.6, 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	Pass	
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	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	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

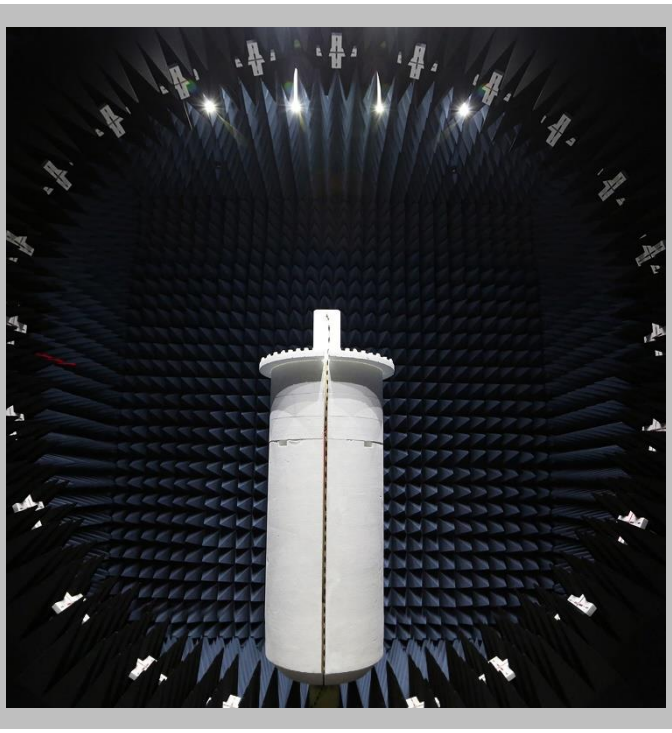
MIC – Recognized by MIC as a CAB for the acceptance of test data.

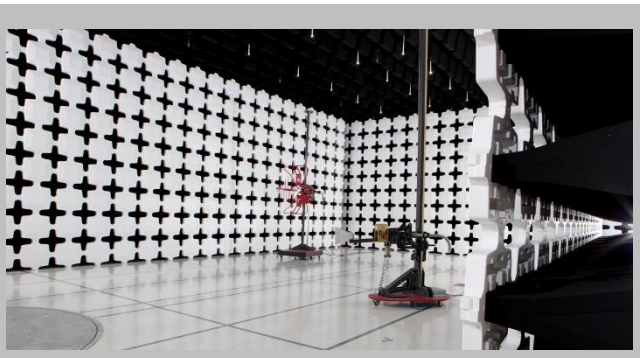
SCOPE

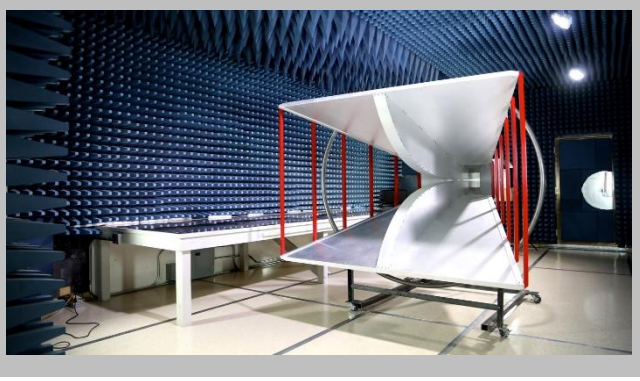
For details on the Scopes of our Accreditations, please visit:
https://www.nwemc.com/emc-testing-accreditations

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.

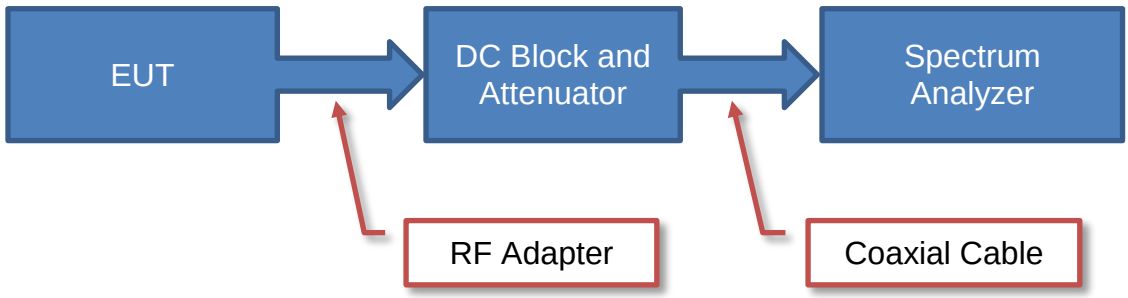
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific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

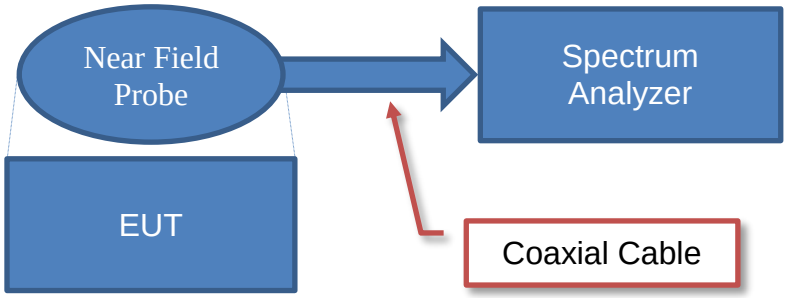
Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field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

Test Setup Block Diagrams

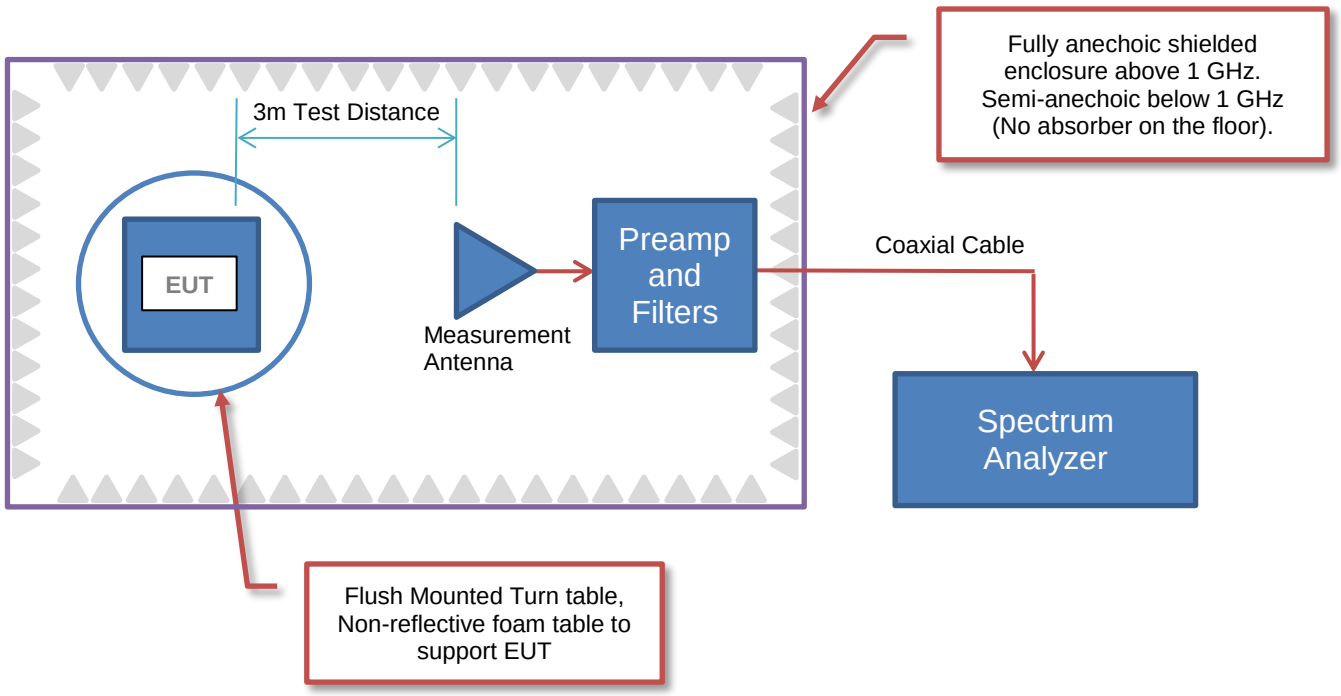
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



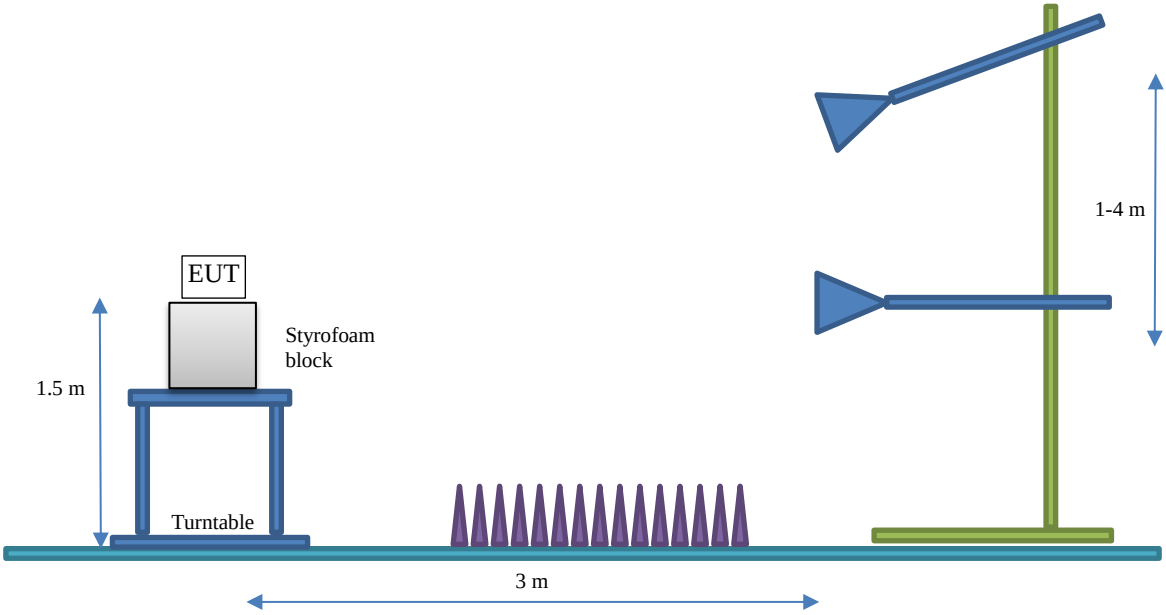
Spurious Radiated Emissions



Test Setup Block Diagrams

Bore Sighting (>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:	Inspire Medical Systems
Address:	5500 Wayzata Blvd., Suite 1600
City, State, Zip:	Golden Valley, MN 55416
Test Requested By:	Charles Steaderman
EUT:	Inspire Remote Model 2580
First Date of Test:	March 12, 2021
Last Date of Test:	May 20, 2021
Receipt Date of Samples:	March 11, 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:
Medical device programmer with BLE and inductive.

Testing Objective:
To demonstrate compliance of the Bluetooth LE radio to FCC 15.247 requirements.

CONFIGURATIONS

Configuration INSP0027- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Inspire Remote	Inspire Medical Systems	2580	REM000100

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Battery Pack	Unknown	None	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Battery Leads (x2)	No	0.1m	No	Inspire Remote	Battery Pack

Configuration INSP0027- 3

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Inspire Remote	Inspire Medical Systems	2580	REM000099

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Battery Pack	Unknown	None	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Battery Leads (x2)	No	0.1m	No	Inspire Remote	Battery Pack

CONFIGURATIONS

Configuration INSP0027- 6

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Inspire Remote	Inspire Medical Systems	2580	REM000098

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Battery Pack	Unknown	None	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Battery Leads (x2)	No	0.1m	No	Inspire Remote	Battery Pack

Configuration INSP0036- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Inspire Remote	Inspire Medical Systems	2580	REM000098

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Battery Pack	Unknown	None	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Battery Leads (x2)	No	0.1m	No	Inspire Remote	Battery Pack

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2021-03-12	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.
2	2021-03-16	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.
3	2021-03-16	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	2021-03-16	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.
5	2021-03-16	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.
6	2021-05-19	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.
7	2021-05-20	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.
8	2021-05-20	Equivalent Isotropic Radiated Power	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)
2.4 GHz High Efficiency Loop Antenna	Inspire Medical Systems	2400-2500	2.5

POWER SETTINGS

Radio	Modulation	Channel	Power Setting (dBm)
Bluetooth Low Energy	1 Mbps	Ch. 0 (2402 MHz)	8 or 6*
Bluetooth Low Energy	1 Mbps	Ch. 20 (2442 MHz)	8 or 6*
Bluetooth Low Energy	1 Mbps	Ch. 39 (2480 MHz)	8 or 6*
Bluetooth Low Energy	2 Mbps	Ch. 0 (2402 MHz)	8 or 6*
Bluetooth Low Energy	2 Mbps	Ch. 20 (2442 MHz)	8 or 6*
Bluetooth Low Energy	2 Mbps	Ch. 39 (2480 MHz)	8 or 6*

*Output Power, EIRP, and Spurious Radiated Emissions spot checks (tested 2021-05-19) used a Power Setting of 6 dBm

SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2021.01.22.0

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 Bluetooth Low Energy - low channel (2402 MHz), mid channel (2442 MHz), and high channel (2480 MHz) modulated. 1 Mbps.
Transmitting Bluetooth low energy Mid Ch (2442 MHz), High Ch (2480 MHz), 2 Mbps

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

INSP0027 - 2
INSP0027 - 6

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.	Cal. Due
Filter - Low Pass	Micro-Tronics	LPM50004	HGG	2020-09-14	2021-09-14
Filter - High Pass	Micro-Tronics	HPM50111	HFM	2020-09-14	2021-09-14
Attenuator	Coaxicom	3910-20	AXY	2020-09-14	2021-09-14
Amplifier - Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	2020-09-11	2021-09-11
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNP	2020-09-11	2021-09-11
Antenna - Standard Gain	ETS Lindgren	3160-09	AHG	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	2021-01-15	2022-01-15
Antenna - Standard Gain	ETS-Lindgren	3160-08	AJP	NCR	NCR
Cable	Element	Standard Gain Cable	MNW	2021-02-01	2022-02-01
Antenna - Standard Gain	ETS-Lindgren	3160-07	AJJ	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2021-02-01	2022-02-01
Cable	Element	Double Ridge Guide Horn Cables	MNV	2021-02-01	2022-02-01
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2021-02-01	2022-02-01
Antenna - Double Ridge	ETS Lindgren	3115	AIB	2020-09-03	2022-09-03
Cable	Element	Biconilog Cable	MNX	2021-02-01	2022-02-01
Amplifier - Pre-Amplifier	Miteq	AM-1064-9079 and SA18E-10	AOO	2021-02-01	2022-02-01
Antenna - Biconilog	Teseq	CBL 6141B	AYD	2020-02-05	2022-02-05
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2020-07-14	2021-07-14
Attenuator	Fairview Microwave	SA18E-20	TWZ	2020-09-14	2021-09-14
Filter - High Pass	Micro-Tronics	HPM50111	LFN	2020-09-14	2021-09-14
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	2021-01-15	2022-01-15
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	2021-01-15	2022-01-15
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

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).

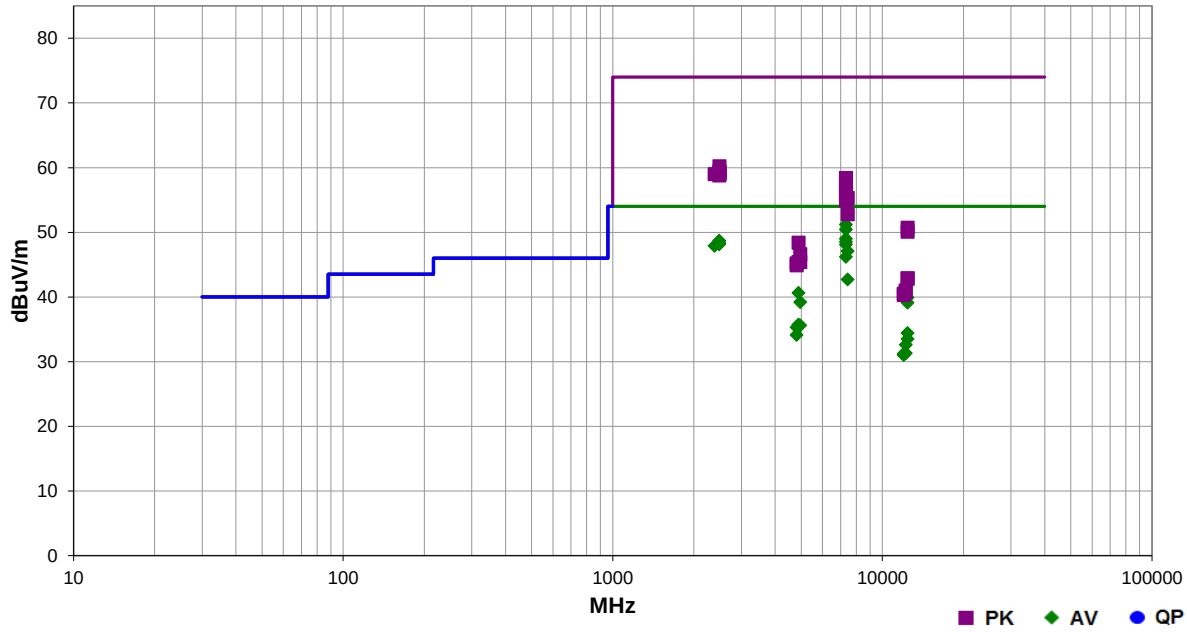
SPURIOUS RADIATED EMISSIONS

EmiR5 2021.01.08.0 PSA-ESCI 2021.01.22.0

Work Order:	INSP0027	**Date:**	2021-03-12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	MN09	**Humidity:**	25.9% RH		
Serial Number:	REM000100	**Barometric Pres.:**	1035 mbar	**Tested by:**	Dustin Sparks
EUT:	Inspire Remote Model 2580				
Configuration:	2				
Customer:	Inspire Medical Systems				
Attendees:	Tom Haider				
EUT Power:	Battery				
Operating Mode:	Transmitting Bluetooth Low Energy - low channel (2402 MHz), mid channel (2442 MHz), and high channel (2480 MHz) modulated. 1 Mbps.				
Deviations:	None				
Comments:	None				

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

Run #	22	**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
7325.425	38.1	13.1	2.6	63.0	3.0	0.0	Horz	AV	0.0	51.2	54.0	-2.8	Mid ch, EUT horizontal
7326.608	37.3	13.1	1.4	8.0	3.0	0.0	Horz	AV	0.0	50.4	54.0	-3.6	Mid ch, EUT vertical
7326.617	35.9	13.1	1.3	149.0	3.0	0.0	Vert	AV	0.0	49.0	54.0	-5.0	Mid ch, EUT horizontal
2483.500	31.9	-3.2	3.8	195.0	3.0	20.0	Horz	AV	0.0	48.7	54.0	-5.3	High ch, EUT horizontal
7326.592	35.4	13.1	2.2	232.0	3.0	0.0	Horz	AV	0.0	48.5	54.0	-5.5	Mid ch, EUT on side
2484.133	31.6	-3.2	1.5	258.0	3.0	20.0	Vert	AV	0.0	48.4	54.0	-5.6	High ch, EUT horizontal
2483.650	31.6	-3.2	1.5	3.0	3.0	20.0	Horz	AV	0.0	48.4	54.0	-5.6	High ch, EUT on side
2483.517	31.4	-3.2	1.5	331.0	3.0	20.0	Vert	AV	0.0	48.2	54.0	-5.8	High ch, EUT on side
2483.933	31.4	-3.2	1.5	140.0	3.0	20.0	Horz	AV	0.0	48.2	54.0	-5.8	High ch, EUT vertical
2483.808	31.4	-3.2	1.5	68.0	3.0	20.0	Vert	AV	0.0	48.2	54.0	-5.8	High ch, EUT vertical
7326.600	35.0	13.1	1.5	208.0	3.0	0.0	Vert	AV	0.0	48.1	54.0	-5.9	Mid ch, EUT on side
2385.117	31.4	-3.5	3.5	9.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	Low ch, EUT horizontal
7439.375	33.4	13.7	3.0	358.0	3.0	0.0	Vert	AV	0.0	47.1	54.0	-6.9	High ch, EUT horizontal
7326.592	33.1	13.1	1.5	42.0	3.0	0.0	Vert	AV	0.0	46.2	54.0	-7.8	Mid ch, EUT vertical
7439.342	29.0	13.7	1.5	189.0	3.0	0.0	Horz	AV	0.0	42.7	54.0	-11.3	High ch, EUT horizontal
4883.875	35.9	4.7	4.0	72.0	3.0	0.0	Vert	AV	0.0	40.6	54.0	-13.4	Mid ch, EUT horizontal
2486.283	43.4	-3.2	3.8	195.0	3.0	20.0	Horz	PK	0.0	60.2	74.0	-13.8	High ch, EUT horizontal
12401.250	26.0	13.9	2.0	85.0	3.0	0.0	Vert	AV	0.0	39.9	54.0	-14.1	High ch, EUT horizontal

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
2486.942	42.6	-3.2	1.5	258.0	3.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High ch, EUT horizontal
2485.608	42.6	-3.2	1.5	331.0	3.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High ch, EUT on side
4959.883	34.5	4.7	2.6	222.0	3.0	0.0	Horz	AV	0.0	39.2	54.0	-14.8	High ch, EUT horizontal
12402.370	25.1	14.0	1.5	164.0	3.0	0.0	Horz	AV	0.0	39.1	54.0	-14.9	High ch, EUT horizontal
2485.100	42.3	-3.2	1.5	68.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High ch, EUT vertical
2488.383	42.1	-3.1	1.5	3.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	High ch, EUT on side
2385.558	42.5	-3.5	3.5	9.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	Low ch, EUT horizontal
2483.875	42.0	-3.2	1.5	140.0	3.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2	High ch, EUT vertical
7326.483	45.3	13.1	2.6	63.0	3.0	0.0	Horz	PK	0.0	58.4	74.0	-15.6	Mid ch, EUT horizontal
7326.767	44.8	13.1	1.4	8.0	3.0	0.0	Horz	PK	0.0	57.9	74.0	-16.1	Mid ch, EUT vertical
7325.217	43.8	13.1	1.3	149.0	3.0	0.0	Vert	PK	0.0	56.9	74.0	-17.1	Mid ch, EUT horizontal
7325.433	43.0	13.1	2.2	232.0	3.0	0.0	Horz	PK	0.0	56.1	74.0	-17.9	Mid ch, EUT on side
7325.050	42.6	13.1	1.5	208.0	3.0	0.0	Vert	PK	0.0	55.7	74.0	-18.3	Mid ch, EUT on side
4884.083	31.0	4.7	1.5	314.0	3.0	0.0	Horz	AV	0.0	35.7	54.0	-18.3	Mid ch, EUT horizontal
4960.025	30.9	4.7	1.3	137.0	3.0	0.0	Vert	AV	0.0	35.6	54.0	-18.4	High ch, EUT horizontal
4804.133	30.4	4.9	1.5	328.0	3.0	0.0	Horz	AV	0.0	35.3	54.0	-18.7	Low ch, EUT horizontal
7439.217	41.6	13.7	3.0	358.0	3.0	0.0	Vert	PK	0.0	55.3	74.0	-18.7	High ch, EUT horizontal
7326.808	41.8	13.1	1.5	42.0	3.0	0.0	Vert	PK	0.0	54.9	74.0	-19.1	Mid ch, EUT vertical
12398.870	35.1	-0.7	1.5	119.0	3.0	0.0	Vert	AV	0.0	34.4	54.0	-19.6	High ch, EUT horizontal
4804.083	29.2	4.9	1.5	167.0	3.0	0.0	Vert	AV	0.0	34.1	54.0	-19.9	Low ch, EUT horizontal
12398.900	34.2	-0.7	2.4	236.0	3.0	0.0	Horz	AV	0.0	33.5	54.0	-20.5	High ch, EUT horizontal
7438.700	39.1	13.7	1.5	189.0	3.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	High ch, EUT horizontal
12211.150	33.1	-0.5	2.1	89.0	3.0	0.0	Vert	AV	0.0	32.6	54.0	-21.4	Mid ch, EUT horizontal
12211.170	31.8	-0.5	1.9	304.0	3.0	0.0	Horz	AV	0.0	31.3	54.0	-22.7	Mid ch, EUT horizontal
12011.060	32.7	-1.5	1.5	89.0	3.0	0.0	Vert	AV	0.0	31.2	54.0	-22.8	Low ch, EUT horizontal
12011.180	32.5	-1.5	1.6	254.0	3.0	0.0	Horz	AV	0.0	31.0	54.0	-23.0	Low ch, EUT horizontal
12401.420	36.8	13.9	2.0	85.0	3.0	0.0	Vert	PK	0.0	50.7	74.0	-23.3	High ch, EUT horizontal
12402.030	36.2	13.9	1.5	164.0	3.0	0.0	Horz	PK	0.0	50.1	74.0	-23.9	High ch, EUT horizontal
4883.875	43.7	4.7	4.0	72.0	3.0	0.0	Vert	PK	0.0	48.4	74.0	-25.6	Mid ch, EUT horizontal
4960.350	41.9	4.7	2.6	222.0	3.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	High ch, EUT horizontal
4883.867	40.7	4.7	1.5	314.0	3.0	0.0	Horz	PK	0.0	45.4	74.0	-28.6	Mid ch, EUT horizontal
4959.842	40.7	4.7	1.3	137.0	3.0	0.0	Vert	PK	0.0	45.4	74.0	-28.6	High ch, EUT horizontal
4804.492	40.3	4.9	1.5	328.0	3.0	0.0	Horz	PK	0.0	45.2	74.0	-28.8	Low ch, EUT horizontal
4803.558	40.0	4.9	1.5	167.0	3.0	0.0	Vert	PK	0.0	44.9	74.0	-29.1	Low ch, EUT horizontal
12398.930	43.6	-0.7	1.5	119.0	3.0	0.0	Vert	PK	0.0	42.9	74.0	-31.1	High ch, EUT horizontal
12398.970	43.5	-0.7	2.4	236.0	3.0	0.0	Horz	PK	0.0	42.8	74.0	-31.2	High ch, EUT horizontal
12209.330	41.5	-0.5	2.1	89.0	3.0	0.0	Vert	PK	0.0	41.0	74.0	-33.0	Mid ch, EUT horizontal
12210.520	41.3	-0.5	1.9	304.0	3.0	0.0	Horz	PK	0.0	40.8	74.0	-33.2	Mid ch, EUT horizontal
12011.180	42.0	-1.5	1.6	254.0	3.0	0.0	Horz	PK	0.0	40.5	74.0	-33.5	Low ch, EUT horizontal
12008.850	41.8	-1.5	1.5	89.0	3.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	Low ch, EUT horizontal

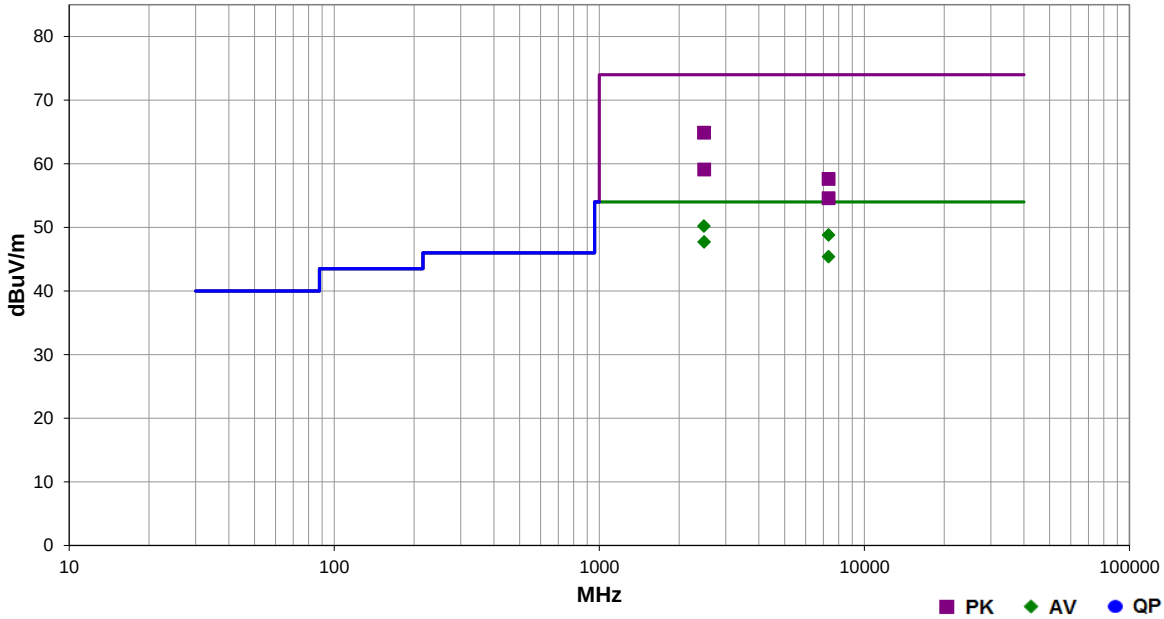
SPURIOUS RADIATED EMISSIONS

EmiR5 2021.03.25.0 PSA-ESCI 2021.03.17.0

Work Order:	INSP0027	**Date:**	2021-05-17		
Project:	None	**Temperature:**	22.4 °C		
Job Site:	MN05	**Humidity:**	46.6% RH		
Serial Number:	REM000098	**Barometric Pres.:**	1023 mbar	**Tested by:**	Christopher Heintzelman
EUT:	Inspire Remote Model 2580				
Configuration:	6				
Customer:	Inspire Medical Systems				
Attendees:	Tom Haider				
EUT Power:	Battery				
Operating Mode:	Transmitting Bluetooth low energy Mid Ch (2442 MHz), High Ch (2480 MHz), 2 Mbps				
Deviations:	None				
Comments:	None				

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

Run #	1	**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
2483.500	35.0	-4.8	2.6	52.9	3.0	20.0	Horz	AV	0.0	50.2	54.0	-3.8	EUT Horz, High Ch, 2 Mbps
7324.758	39.6	9.2	1.4	150.9	3.0	0.0	Vert	AV	0.0	48.8	54.0	-5.2	Mid Ch, EUT Horz, 2 Mbps
2487.250	32.5	-4.8	1.5	353.0	3.0	20.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT Horz, High Ch, 2 Mbps
7324.667	36.2	9.2	3.0	95.9	3.0	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Mid Ch, EUT Horz, 2 Mbps
2483.525	49.7	-4.8	2.6	52.9	3.0	20.0	Horz	PK	0.0	64.9	74.0	-9.1	EUT Horz, High Ch, 2 Mbps
2484.150	43.9	-4.8	1.5	353.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	EUT Horz, High Ch, 2 Mbps
7327.317	48.4	9.2	1.4	150.9	3.0	0.0	Vert	PK	0.0	57.6	74.0	-16.4	Mid Ch, EUT Horz, 2 Mbps
7324.475	45.4	9.2	3.0	95.9	3.0	0.0	Horz	PK	0.0	54.6	74.0	-19.4	Mid Ch, EUT Horz, 2 Mbps

SPURIOUS RADIATED EMISSIONS

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 Bluetooth Low Energy - Low channel (2402 MHz), High channel (2480 MHz), modulated
Transmitting Bluetooth Low Energy - Mid channel (2442 MHz), modulated

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

INSP0036 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	1000 MHz	Stop Frequency	8000 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
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	2020-12-27	2021-12-27
Filter - High Pass	Micro-Tronics	HPM50111	LFN	2020-09-14	2021-09-14
Attenuator	Fairview Microwave	SA18E-20	TWZ	2020-09-14	2021-09-14
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	2021-01-15	2022-01-15
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	2021-01-15	2022-01-15
Antenna - Double Ridge	ETS-Lindgren	3115	AJQ	2021-01-25	2023-01-25

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).

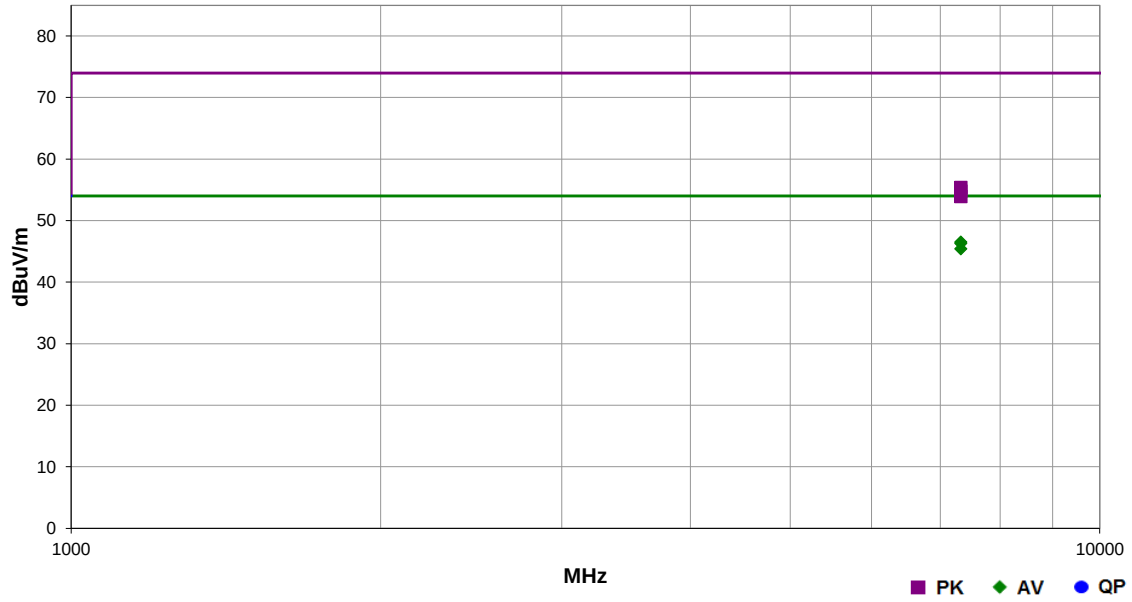
SPURIOUS RADIATED EMISSIONS

EmiR5 2021.03.25.0 PSA-ESCI 2021.03.17.0

Work Order:	INSP0036	**Date:**	2021-05-19		
Project:	None	**Temperature:**	21.9 °C		
Job Site:	MN05	**Humidity:**	53% RH		
Serial Number:	REM000098	**Barometric Pres.:**	1017 mbar	**Tested by:**	Chris Patterson
EUT:	RF Exposure Measurement				
Configuration:	2				
Customer:	Inspire Medical Systems				
Attendees:	Tom Haider				
EUT Power:	Battery				
Operating Mode:	Transmitting Bluetooth Low Energy - Mid channel (2442 MHz), modulated				
Deviations:	None				
Comments:	Data rate listed in the comments. Spotchecked in the worst case orientation from previous testing. EUT using lowered power of 6 dbm.				

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

Run #	0	**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
7326.592	37.3	9.2	2.58	351.0	3.0	0.0	Horz	AV	0.0	46.5	54.0	-7.5	EUT Horz, Mid Ch, 1 Mbps
7327.250	37.1	9.2	1.34	174.9	3.0	0.0	Horz	AV	0.0	46.3	54.0	-7.7	EUT Horz, Mid Ch, 2 Mbps
7326.583	36.2	9.2	1.5	236.9	3.0	0.0	Vert	AV	0.0	45.4	54.0	-8.6	EUT Horz, Mid Ch, 1 Mbps
7327.425	46.2	9.2	1.34	174.9	3.0	0.0	Horz	PK	0.0	55.4	74.0	-18.6	EUT Horz, Mid Ch, 2 Mbps
7326.850	45.6	9.2	2.58	351.0	3.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	EUT Horz, Mid Ch, 1 Mbps
7326.708	44.7	9.2	1.5	236.9	3.0	0.0	Vert	PK	0.0	53.9	74.0	-20.1	EUT Horz, Mid Ch, 1 Mbps

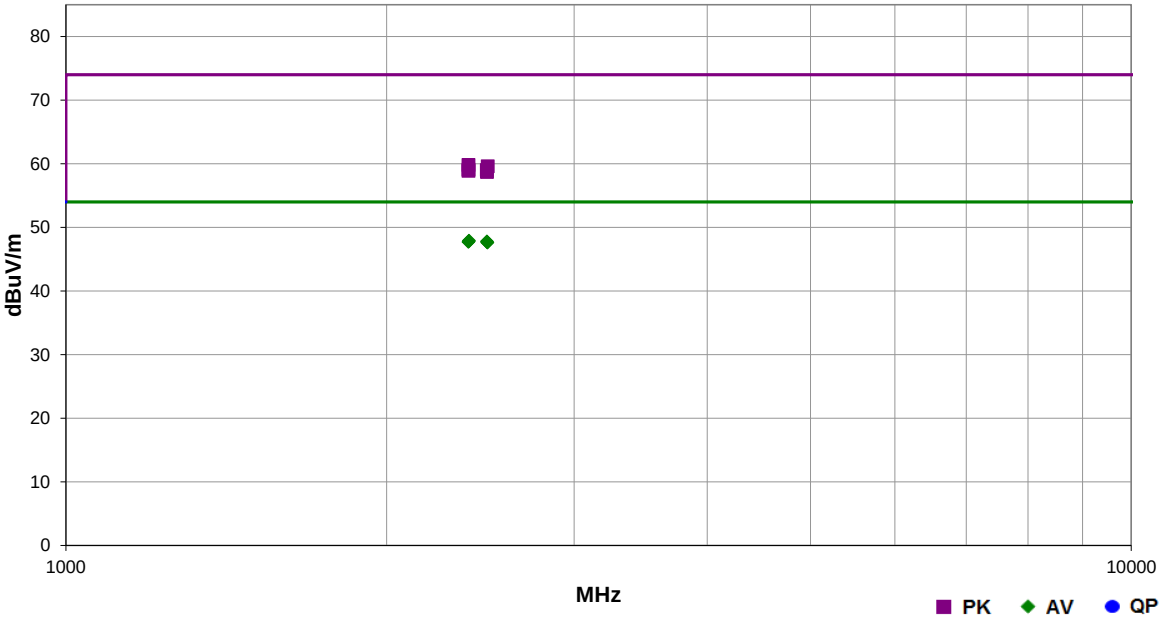
SPURIOUS RADIATED EMISSIONS

EmiR5 2021.03.25.0 PSA-ESCI 2021.03.17.0

Work Order:	INSP0036	**Date:**	2021-05-19		
Project:	None	**Temperature:**	21.9 °C		
Job Site:	MN05	**Humidity:**	53% RH		
Serial Number:	REM000098	**Barometric Pres.:**	1017 mbar	**Tested by:**	Chris Patterson
EUT:	RF Exposure Measurement				
Configuration:	2				
Customer:	Inspire Medical Systems				
Attendees:	Tom Haider				
EUT Power:	Battery				
Operating Mode:	Transmitting Bluetooth Low Energy - Low channel (2402 MHz), High channel (2480 MHz), modulated				
Deviations:	None				
Comments:	Data rate listed in the comments. Spotchecked in the worst case orientation from previous testing. EUT using lowered power of 6 dbm.				

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

Run #	1	**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
2389.858	32.5	-4.6	2.09	322.9	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	EUT Horz, Low Ch, 1 Mbps
2484.300	32.6	-4.8	1.5	121.9	3.0	20.0	Horz	AV	0.0	47.8	54.0	-6.2	EUT Horz, High Ch, 2 Mbps
2389.392	32.4	-4.6	1.31	99.0	3.0	20.0	Horz	AV	0.0	47.8	54.0	-6.2	EUT Horz, Low Ch, 2 Mbps
2387.283	32.3	-4.6	3.67	117.0	3.0	20.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT Horz, Low Ch, 1 Mbps
2486.092	32.4	-4.8	1.5	114.9	3.0	20.0	Horz	AV	0.0	47.6	54.0	-6.4	EUT Horz, High Ch, 1 Mbps
2487.367	32.4	-4.8	3.29	27.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	EUT Horz, High Ch, 1 Mbps
2387.317	44.4	-4.6	2.09	322.9	3.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	EUT Horz, Low Ch, 1 Mbps
2488.333	44.5	-4.9	1.5	114.9	3.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	EUT Horz, High Ch, 1 Mbps
2386.875	43.7	-4.6	3.67	117.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	EUT Horz, Low Ch, 1 Mbps
2483.958	43.8	-4.8	1.5	121.9	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	EUT Horz, High Ch, 2 Mbps
2386.975	43.5	-4.6	1.31	99.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	EUT Horz, Low Ch, 2 Mbps
2484.108	43.5	-4.8	3.29	27.0	3.0	20.0	Vert	PK	0.0	58.7	74.0	-15.3	EUT Horz, High Ch, 1 Mbps

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
Block - DC	Fairview Microwave	SD3379	AMZ	2020-11-04	2021-11-04
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Generator - Signal	Keysight	N5182B	TFX	2020-04-28	2023-04-28
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2020-07-14	2021-07-14

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

element

TbtTx 2019.08.30.0 XMit 2020.12.30.0

EUT:	**Inspire Remote Model 2580**			**Work Order:**	**INSP0027**
Serial Number:	**REM000099**			**Date:**	**16-Mar-21**
Customer:	**Inspire Medical Systems**			**Temperature:**	**22.9 °C**
Attendees:	**Tom Haider**			**Humidity:**	**24.6% RH**
Project:	**None**			**Barometric Pres.:**	**1019 mbar**
Tested by:	**Andrew Rogstad, Chris Patterson**	**Power:**	**Battery**	**Job Site:**	**MN09**

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

COMMENTS

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

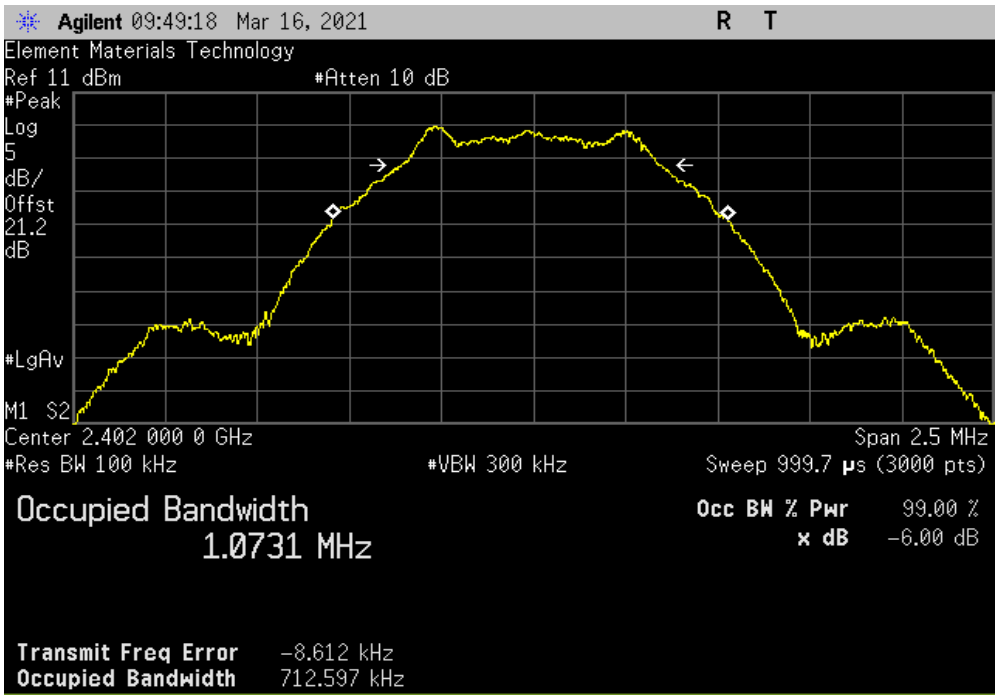
DEVIATIONS FROM TEST STANDARD

None

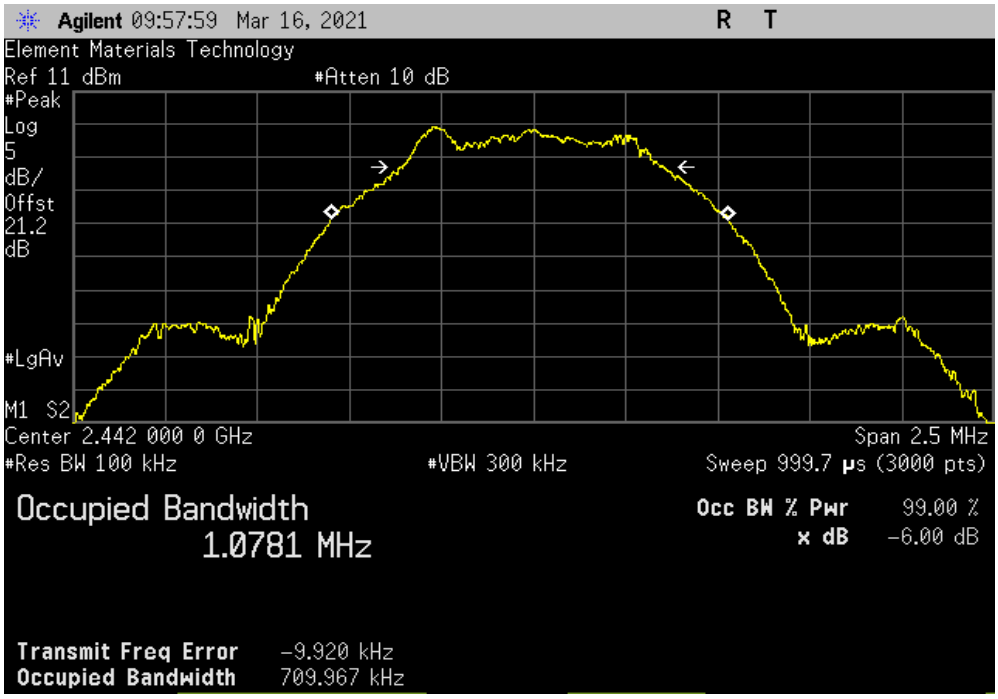
Configuration #	**3**	*Signature* 

	Value	**Limit (≥)**	**Result**
BLE/GFSK 1 Mbps Low Channel, 2402 MHz	712.597 kHz	500 kHz	Pass
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	709.967 kHz	500 kHz	Pass
BLE/GFSK 1 Mbps High Channel, 2480 MHz	710.758 kHz	500 kHz	Pass
BLE/GFSK 2 Mbps Low Channel, 2402 MHz	1.328 MHz	500 kHz	Pass
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz	1.288 MHz	500 kHz	Pass
BLE/GFSK 2 Mbps High Channel, 2480 MHz	1.326 MHz	500 kHz	Pass

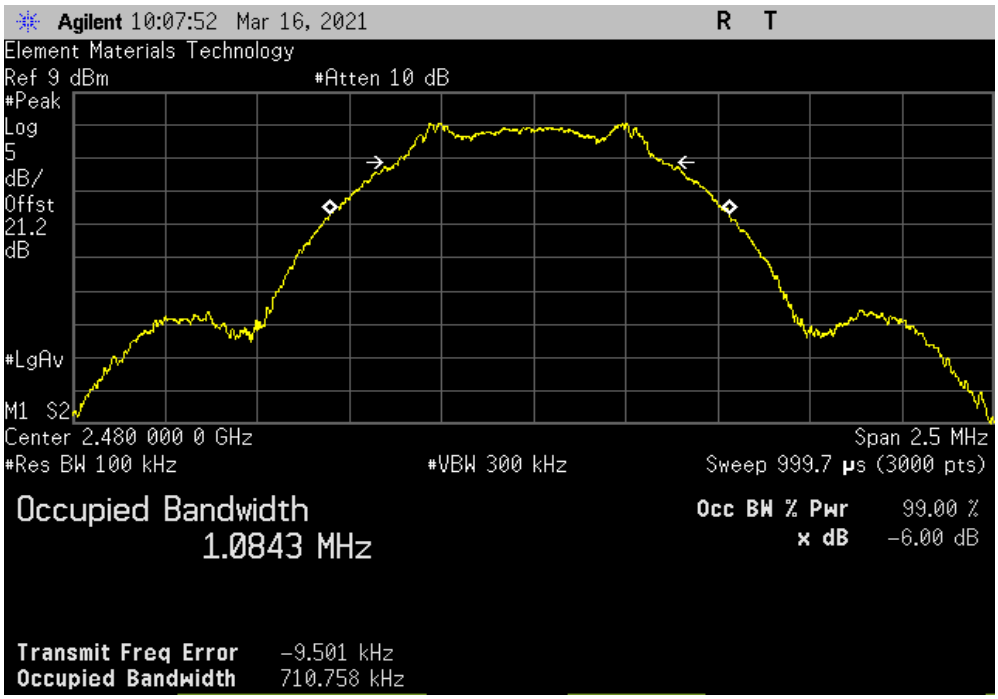
BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Value	Limit (≥)	Result
				712.597 kHz	500 kHz	Pass



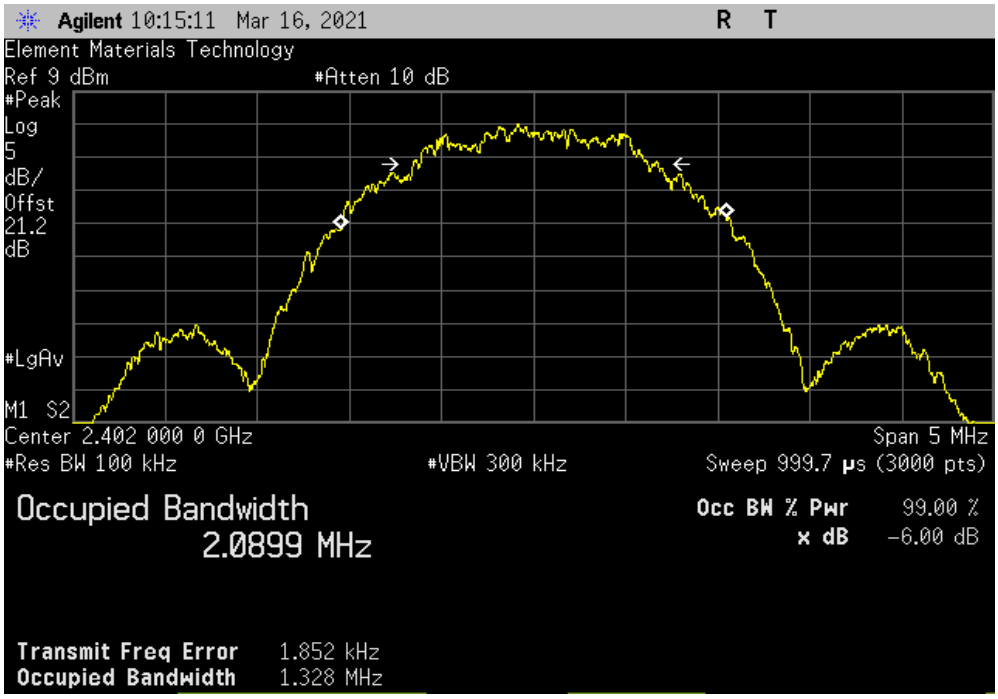
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Value	Limit (≥)	Result
				709.967 kHz	500 kHz	Pass



BLE/GFSK 1 Mbps High Channel, 2480 MHz							
					Value	Limit (≥)	Result
					710.758 kHz	500 kHz	Pass

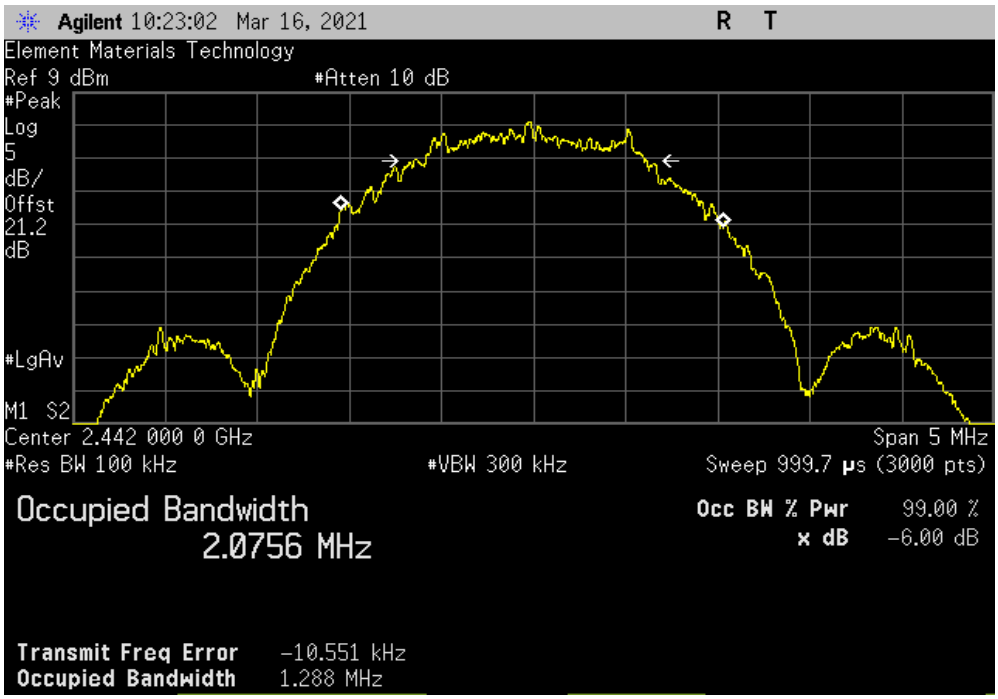


BLE/GFSK 2 Mbps Low Channel, 2402 MHz							
					Value	Limit (≥)	Result
					1.328 MHz	500 kHz	Pass

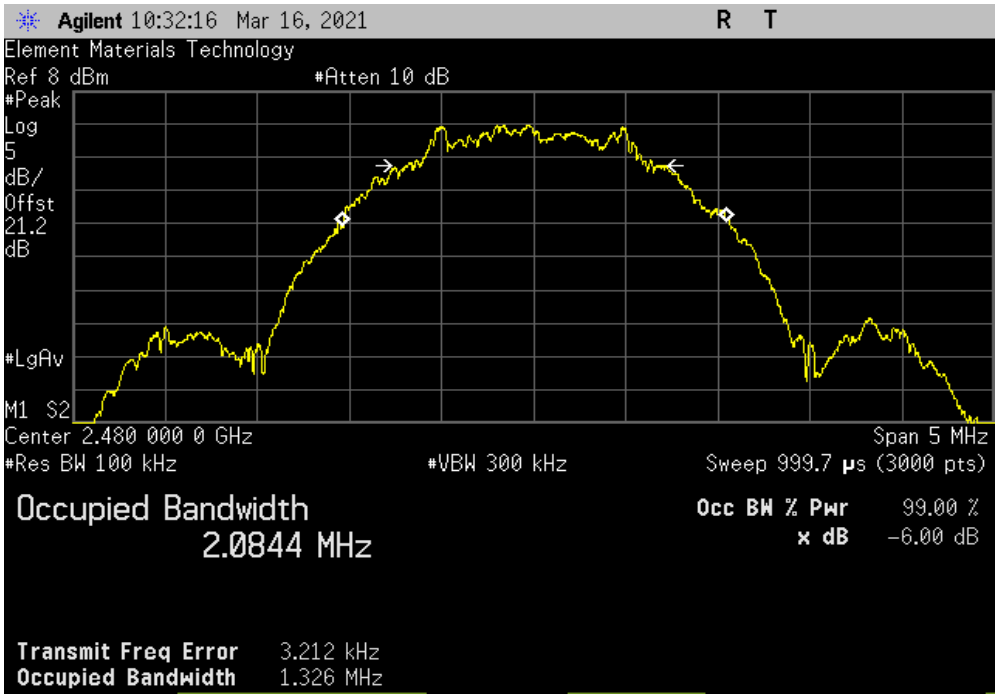


OCCUPIED BANDWIDTH

BLE/GFSK 2 Mbps Mid Channel, 2442 MHz						
				Value	Limit (≥)	Result
				1.288 MHz	500 kHz	Pass



BLE/GFSK 2 Mbps High Channel, 2480 MHz						
				Value	Limit (≥)	Result
				1.326 MHz	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	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Attenuator	S.M. Electronics	SA26B-20	TZP	2020-11-04	2021-11-04
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	2020-05-20	2021-05-20
Block - DC	Fairview Microwave	SD3379	AMI	2020-08-05	2021-08-05

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 2021.03.19.1 XMit 2020.12.30.0

EUT:	2580			**Work Order:**	INSP0036
Serial Number:	REM000098			**Date:**	20-May-21
Customer:	Inspire Medical Systems			**Temperature:**	22 °C
Attendees:	Tom Haider			**Humidity:**	55.8% RH
Project:	None			**Barometric Pres.:**	1022 mbar
Tested by:	Andrew Rogstad, Chris Patterson	**Power:**	Battery	**Job Site:**	MN09

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

COMMENTS

Reference level offset includes DC block, attenuator, and measurement cable. The Align Now All notification appeared on the spectrum analyzer during the test. As the alignment was performed at the end of the test with no issues, the results are unaffected.

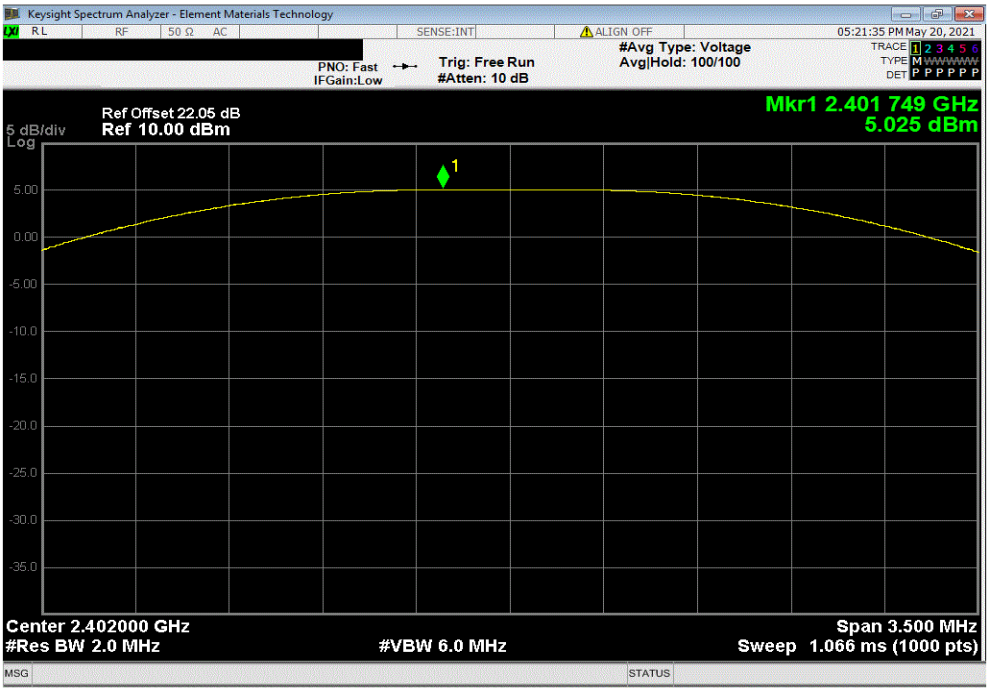
DEVIATIONS FROM TEST STANDARD

None

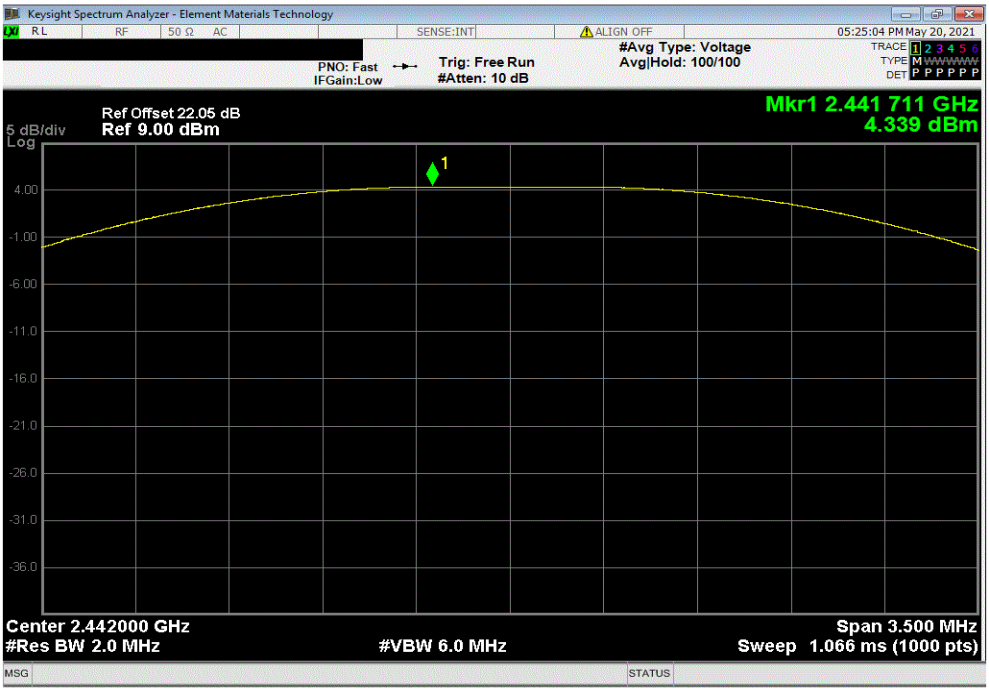
Configuration #	2	*Signature* 

	Out Pwr (dBm)	Limit (dBm)	Result
BLE/GFSK 1 Mbps Low Channel, 2402 MHz	5.025	30	Pass
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	4.339	30	Pass
BLE/GFSK 1 Mbps High Channel, 2480 MHz	3.531	30	Pass
BLE/GFSK 2 Mbps Low Channel, 2402 MHz	5.021	30	Pass
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz	4.333	30	Pass
BLE/GFSK 2 Mbps High Channel, 2480 MHz	3.51	30	Pass

BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				5.025	30	Pass

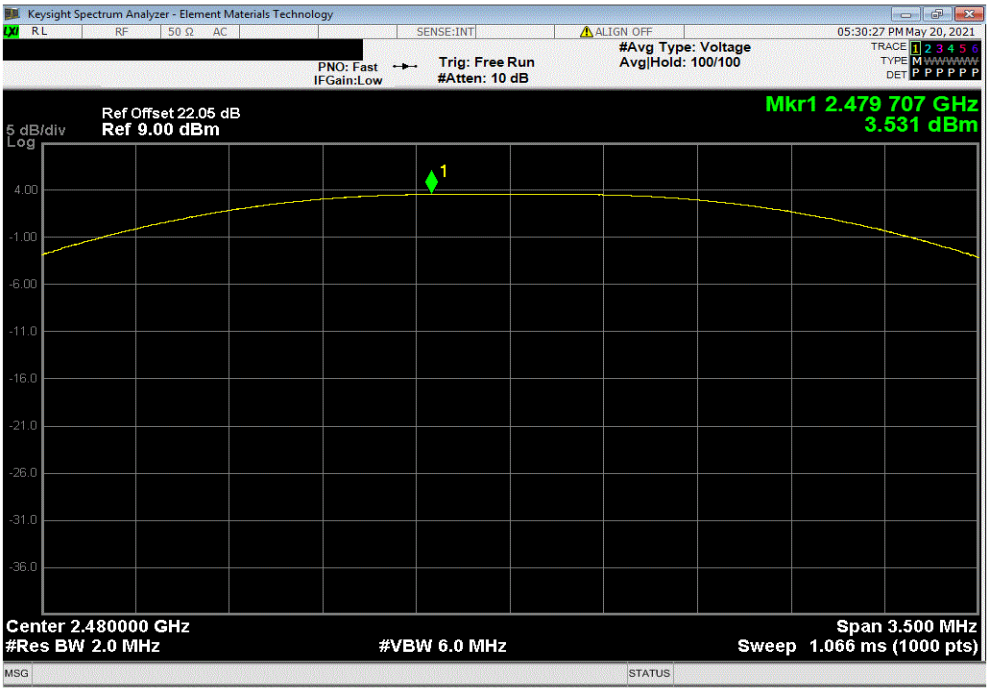


BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				4.339	30	Pass

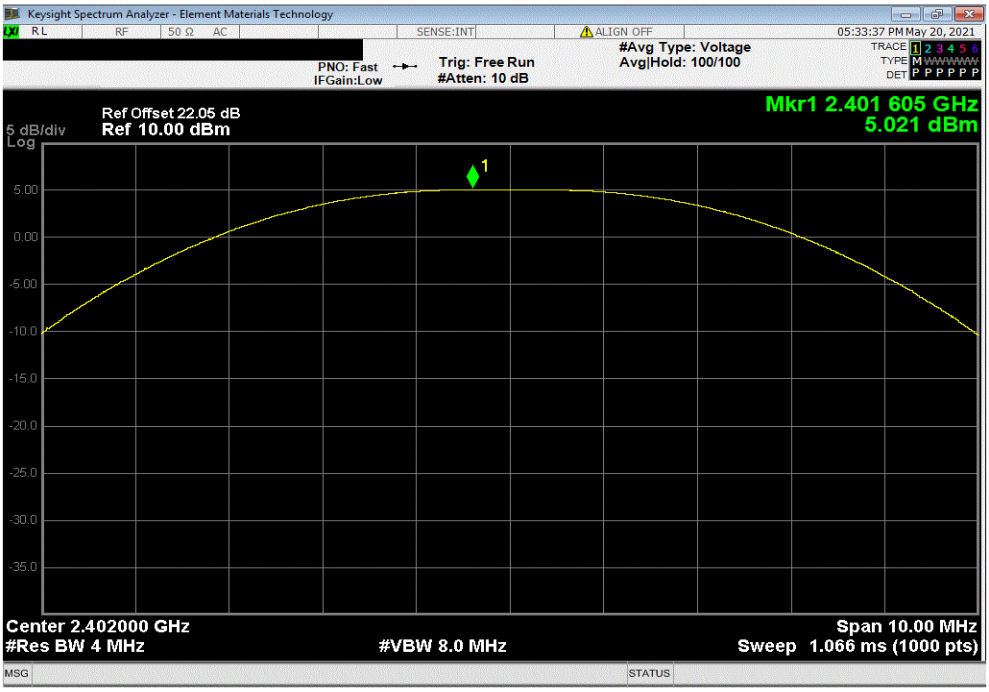


OUTPUT POWER

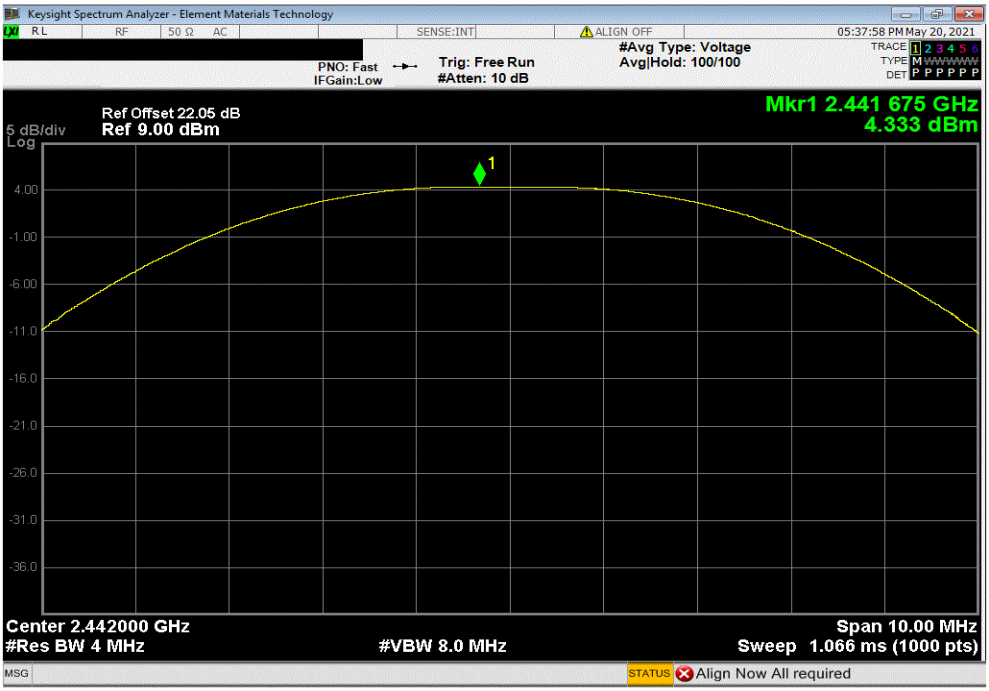
BLE/GFSK 1 Mbps High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				3.531	30	Pass



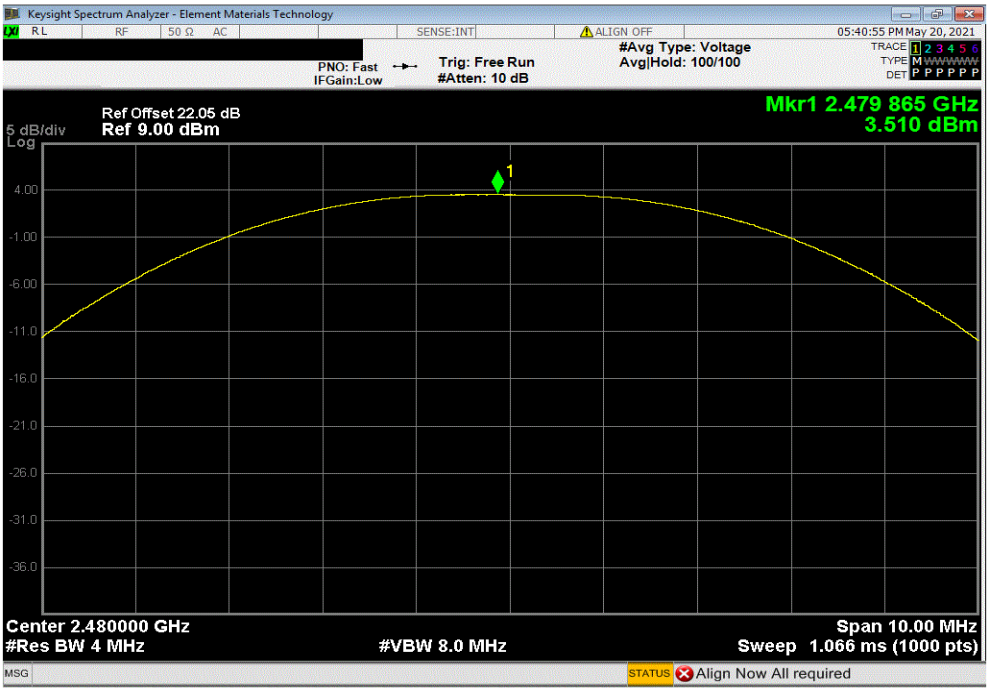
BLE/GFSK 2 Mbps Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				5.021	30	Pass



BLE/GFSK 2 Mbps Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				4.333	30	Pass



BLE/GFSK 2 Mbps High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				3.51	30	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

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	N5171B (EXG)	TEY	2019-12-31	2022-12-31
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Block - DC	Fairview Microwave	SD3379	AMI	2020-08-05	2021-08-05
Attenuator	S.M. Electronics	SA26B-20	TZP	2020-11-04	2021-11-04
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	2020-05-20	2021-05-20

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 (EIRP)

TbtTx 2021.03.19.1 XMit 2020.12.30.0

EUT:	2580			**Work Order:**	INSP0036
Serial Number:	REM000098			**Date:**	20-May-21
Customer:	Inspire Medical Systems			**Temperature:**	22.2 °C
Attendees:	Tom Haider			**Humidity:**	56.3% RH
Project:	None			**Barometric Pres.:**	1022 mbar
Tested by:	Andrew Rogstad, Chris Patterson	**Power:**	Battery	**Job Site:**	MN09

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

COMMENTS

Reference level offset includes DC block, attenuator, and measurement cable. The Align Now All notification appeared on the spectrum analyzer during the test. As the alignment was performed at the end of the test with no issues, the results are unaffected.

DEVIATIONS FROM TEST STANDARD

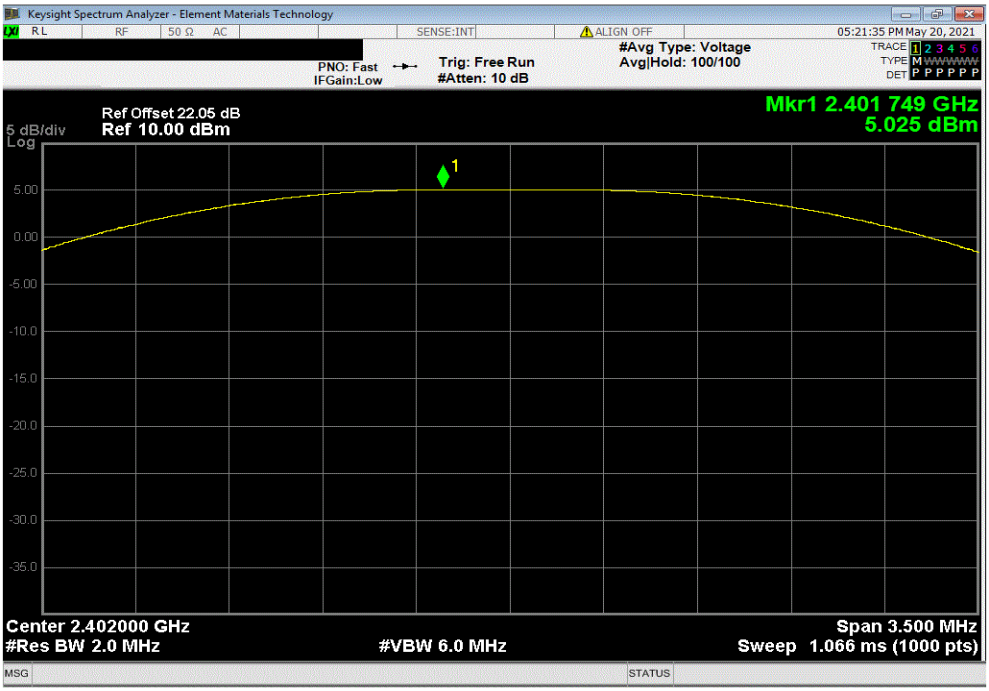
None

Configuration #	2	*Signature*

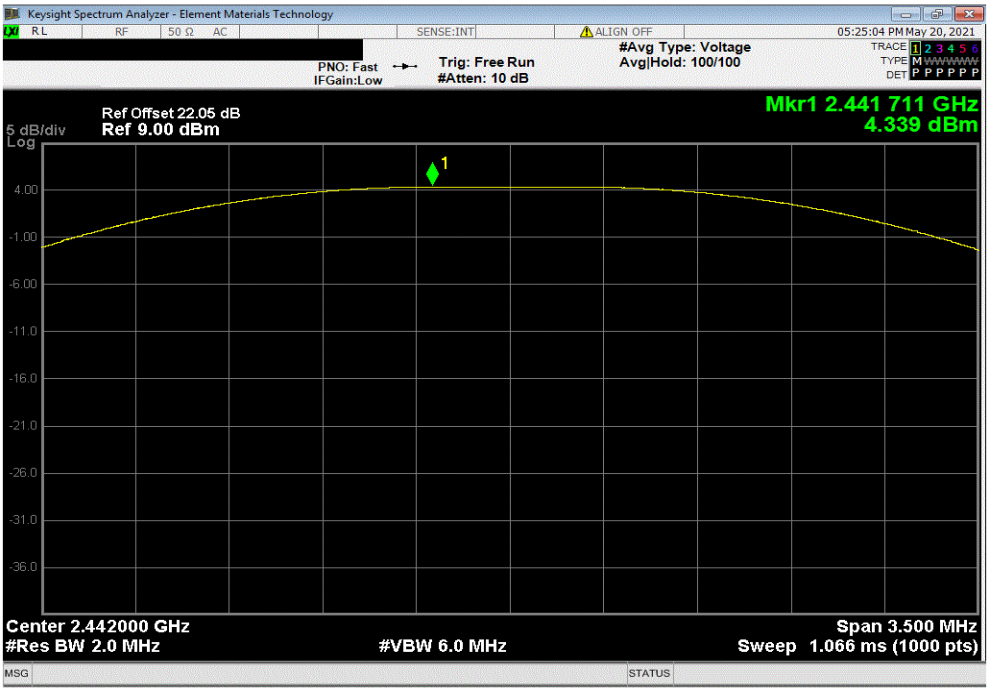
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
BLE/GFSK 1 Mbps Low Channel, 2402 MHz	5.025	2.5	7.525	36	Pass
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	4.339	2.5	6.839	36	Pass
BLE/GFSK 1 Mbps High Channel, 2480 MHz	3.531	2.5	6.031	36	Pass
BLE/GFSK 2 Mbps Low Channel, 2402 MHz	5.021	2.5	7.521	36	Pass
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz	4.333	2.5	6.833	36	Pass
BLE/GFSK 2 Mbps High Channel, 2480 MHz	3.51	2.5	6.01	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		5.025	2.5	7.525	36	Pass

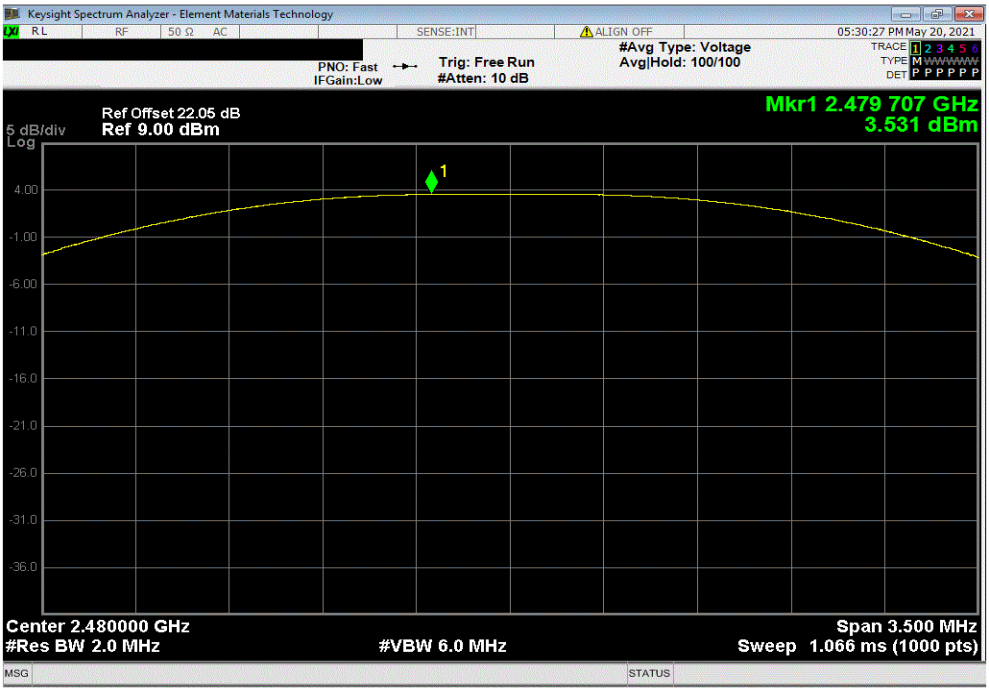


BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		4.339	2.5	6.839	36	Pass

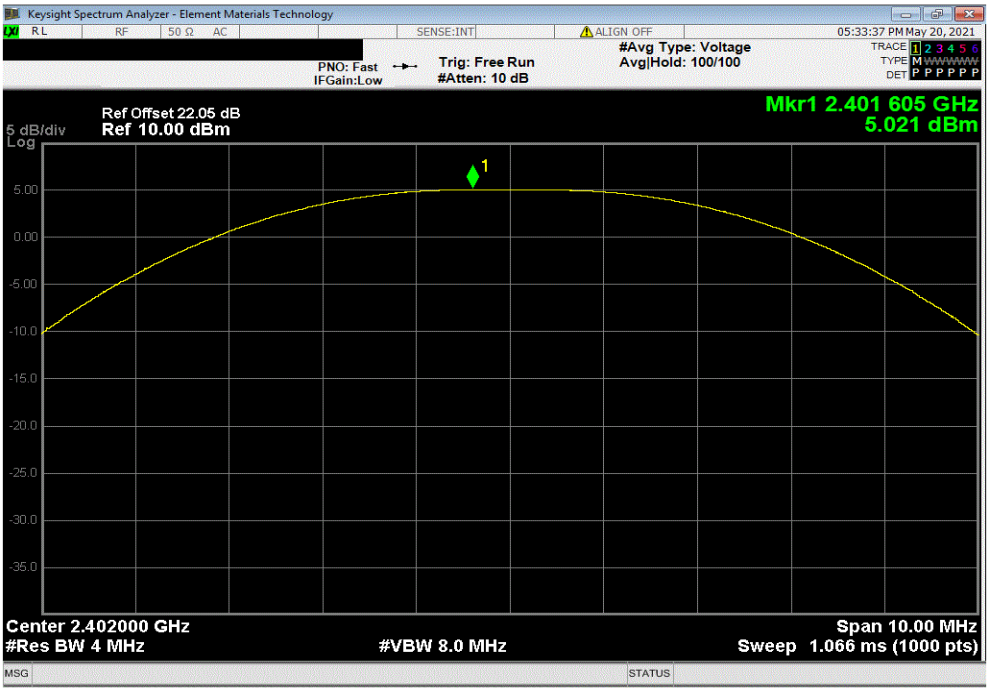


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

BLE/GFSK 1 Mbps High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		3.531	2.5	6.031	36	Pass

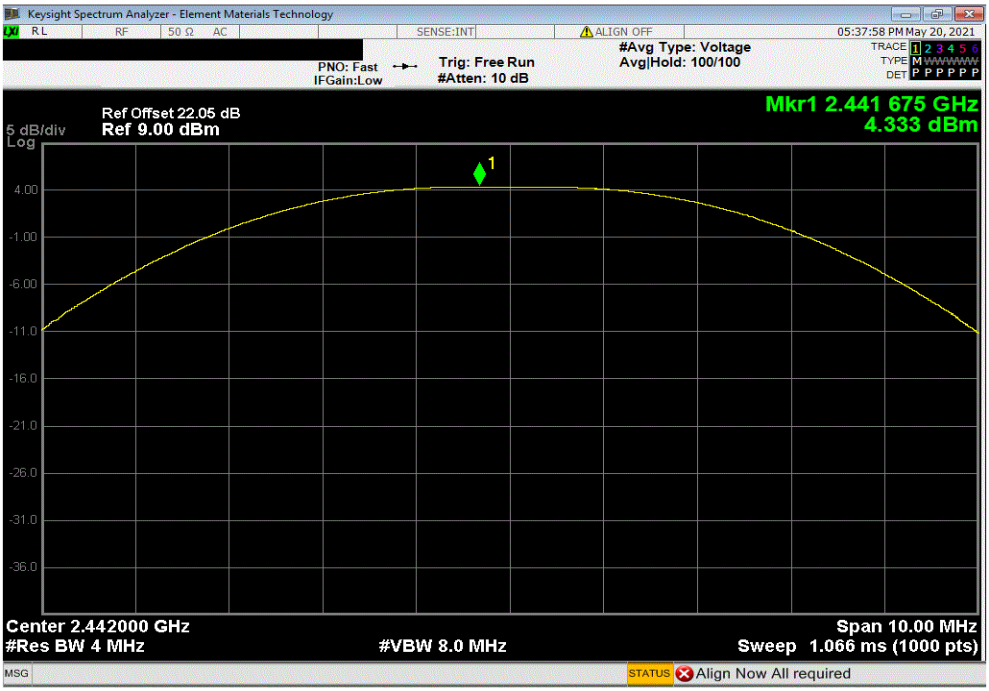


BLE/GFSK 2 Mbps Low Channel, 2402 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		5.021	2.5	7.521	36	Pass

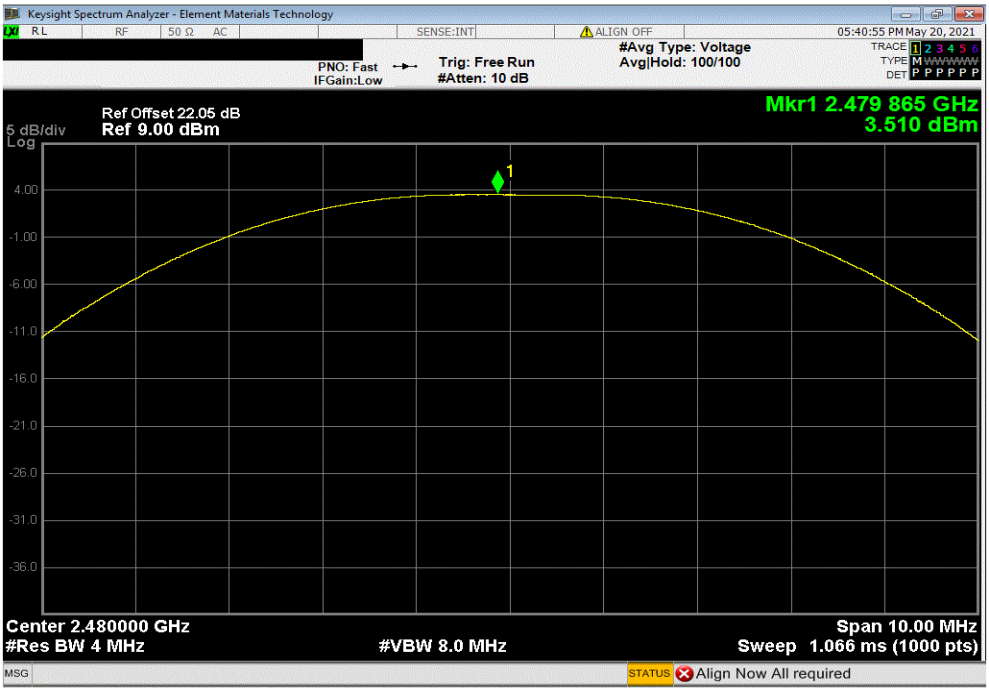


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

BLE/GFSK 2 Mbps Mid Channel, 2442 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		4.333	2.5	6.833	36	Pass



BLE/GFSK 2 Mbps High Channel, 2480 MHz						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		3.51	2.5	6.01	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
Block - DC	Fairview Microwave	SD3379	AMZ	2020-11-04	2021-11-04
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Generator - Signal	Keysight	N5182B	TFX	2020-04-28	2023-04-28
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2020-07-14	2021-07-14

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:	**Inspire Remote Model 2580**			**Work Order:**	**INSP0027**
Serial Number:	**REM000099**			**Date:**	**16-Mar-21**
Customer:	**Inspire Medical Systems**			**Temperature:**	**22.9 °C**
Attendees:	**Tom Haider**			**Humidity:**	**24.6% RH**
Project:	**None**			**Barometric Pres.:**	**1019 mbar**
Tested by:	**Andrew Rogstad, Chris Patterson**	**Power:**	**Battery**	**Job Site:**	**MN09**

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

COMMENTS

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

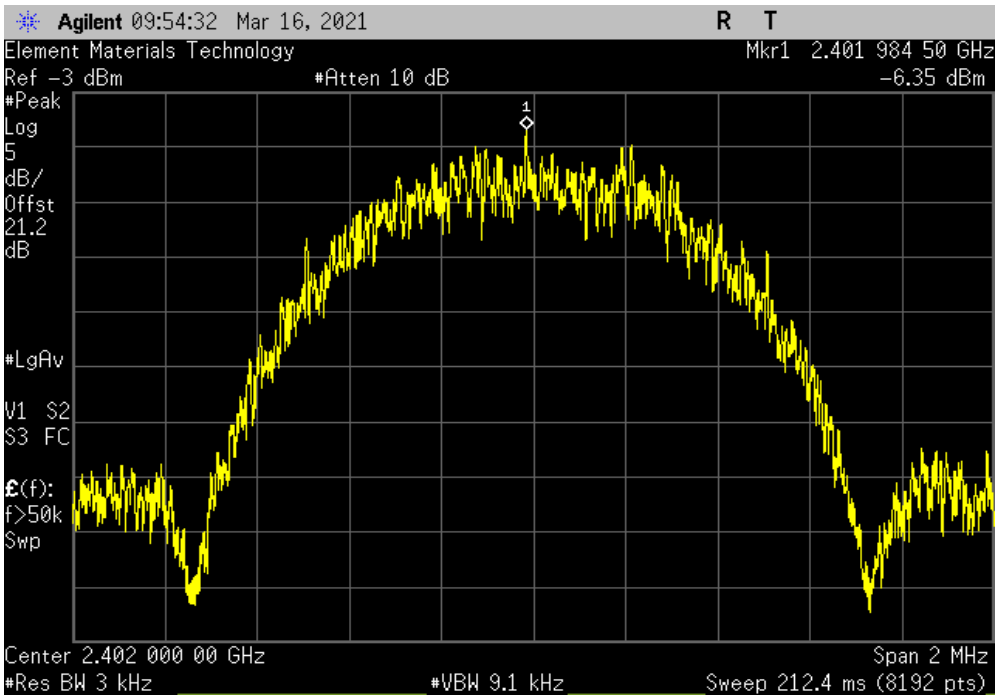
DEVIATIONS FROM TEST STANDARD

None

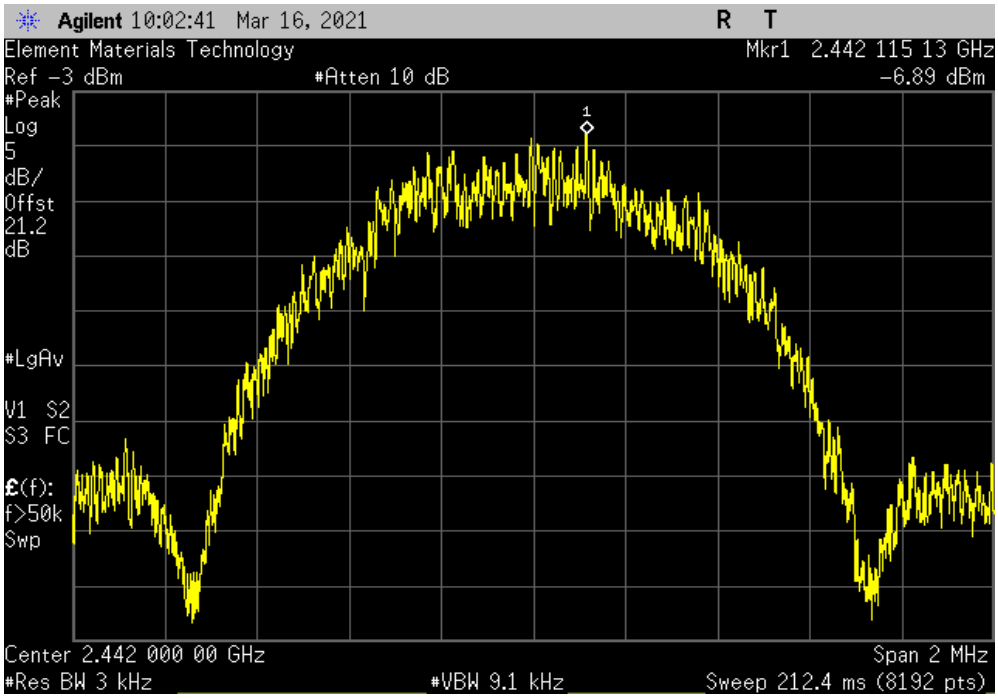
Configuration #	**3**	*Signature* 

	Value dBm/3kHz	**Limit < dBm/3kHz**	**Results**
BLE/GFSK 1 Mbps Low Channel, 2402 MHz	-6.35	8	Pass
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	-6.888	8	Pass
BLE/GFSK 1 Mbps High Channel, 2480 MHz	-7.091	8	Pass
BLE/GFSK 2 Mbps Low Channel, 2402 MHz	-9.477	8	Pass
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz	-10.337	8	Pass
BLE/GFSK 2 Mbps High Channel, 2480 MHz	-11.059	8	Pass

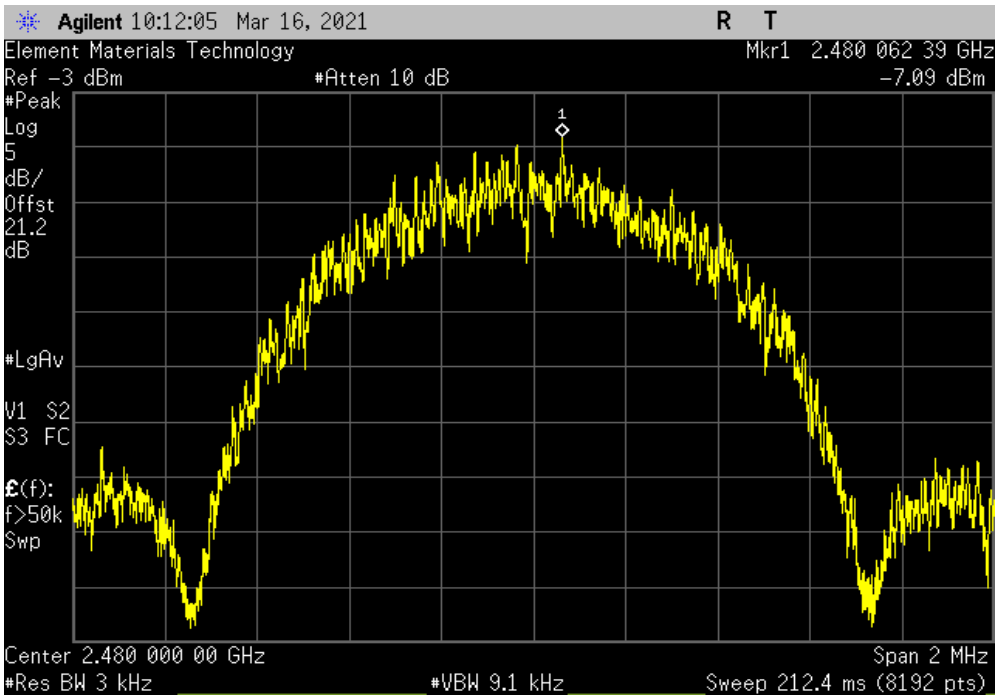
BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-6.35	8	Pass



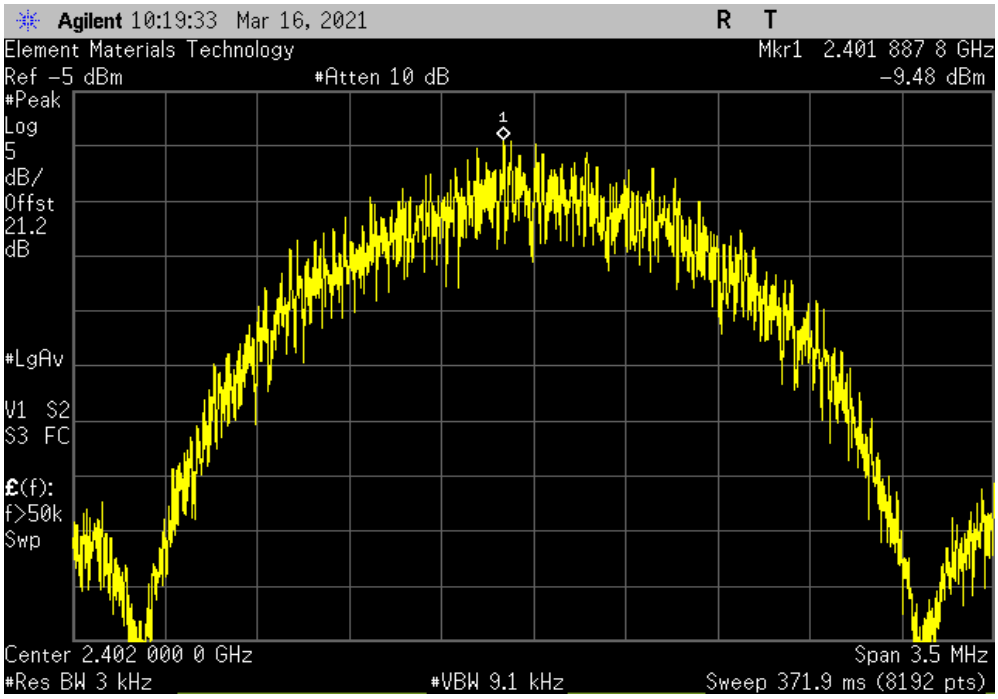
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-6.888	8	Pass



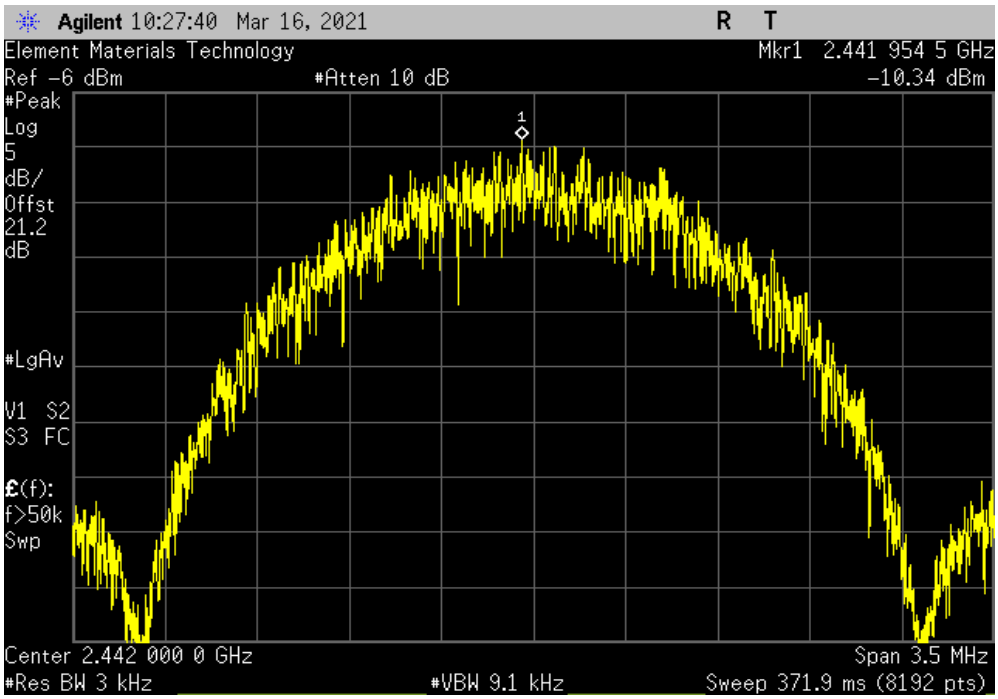
BLE/GFSK 1 Mbps High Channel, 2480 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-7.091	8	Pass



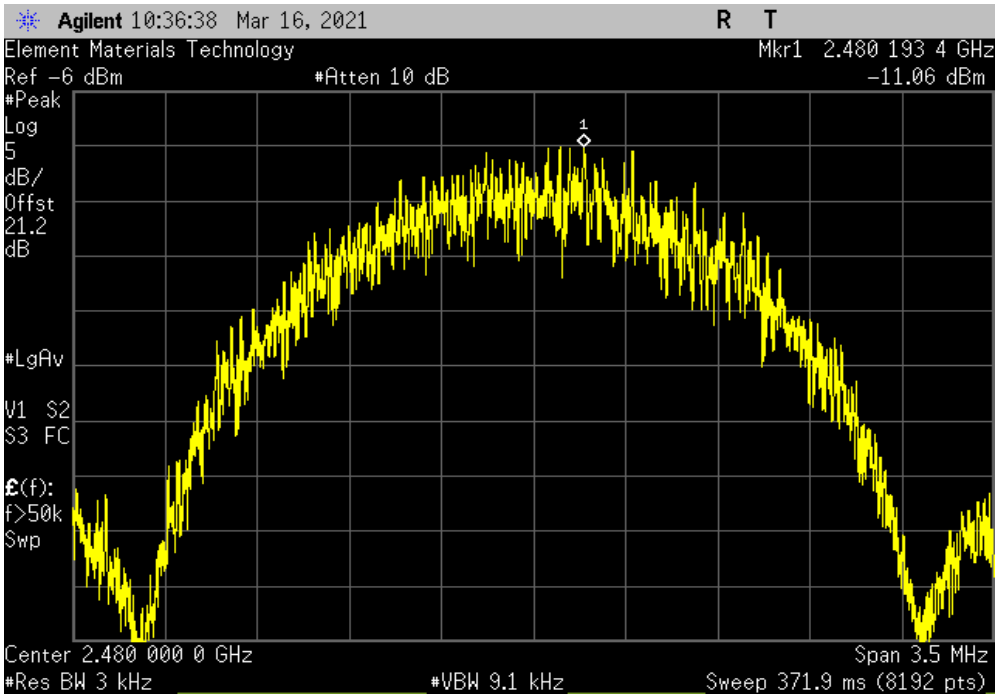
BLE/GFSK 2 Mbps Low Channel, 2402 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-9.477	8	Pass



BLE/GFSK 2 Mbps Mid Channel, 2442 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-10.337	8	Pass



BLE/GFSK 2 Mbps High Channel, 2480 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-11.059	8	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
Block - DC	Fairview Microwave	SD3379	AMZ	2020-11-04	2021-11-04
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2020-07-14	2021-07-14

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

TbtTx 2019.08.30.0 XMit 2020.12.30.0

EUT:	Inspire Remote Model 2580			**Work Order:**	INSP0027
Serial Number:	REM000099			**Date:**	16-Mar-21
Customer:	Inspire Medical Systems			**Temperature:**	23 °C
Attendees:	Tom Haider			**Humidity:**	24.5% RH
Project:	None			**Barometric Pres.:**	1019 mbar
Tested by:	Andrew Rogstad, Chris Patterson	**Power:**	Battery	**Job Site:**	MN09

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

COMMENTS

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

DEVIATIONS FROM TEST STANDARD

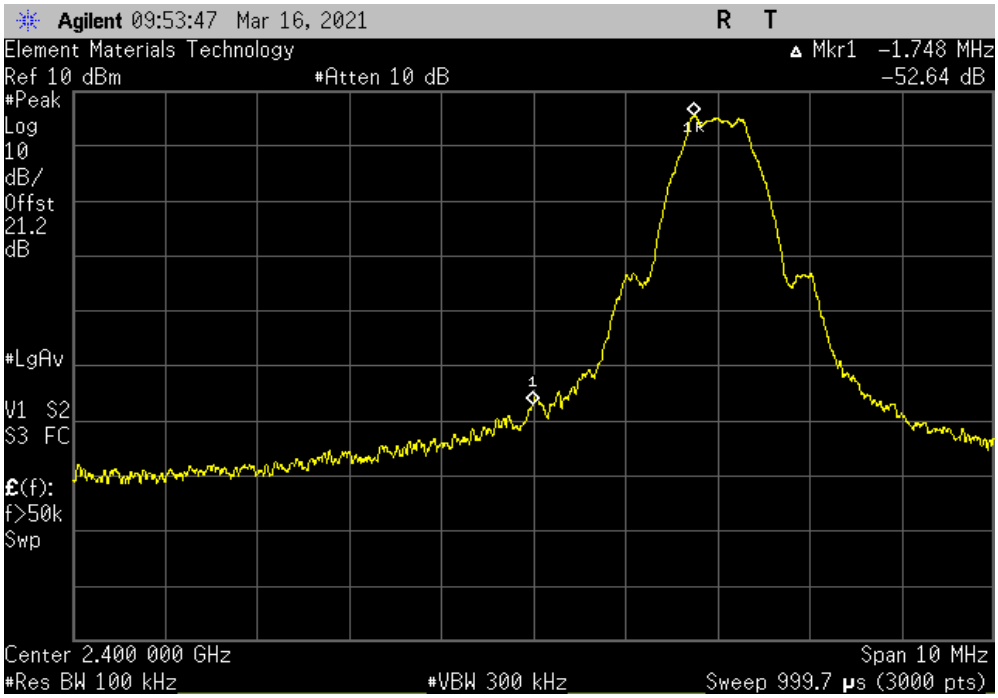
None

Configuration #	3	Signature

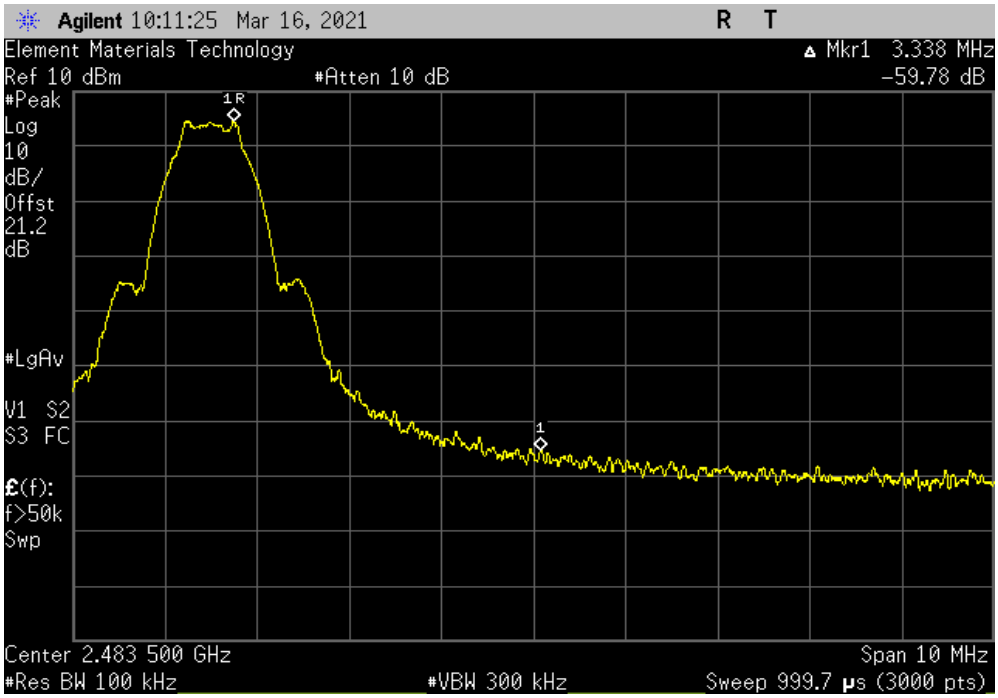
	Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 1 Mbps Low Channel, 2402 MHz	-52.64	-20	Pass
BLE/GFSK 1 Mbps High Channel, 2480 MHz	-59.78	-20	Pass
BLE/GFSK 2 Mbps Low Channel, 2402 MHz	-31.34	-20	Pass
BLE/GFSK 2 Mbps High Channel, 2480 MHz	-54.18	-20	Pass

BAND EDGE COMPLIANCE

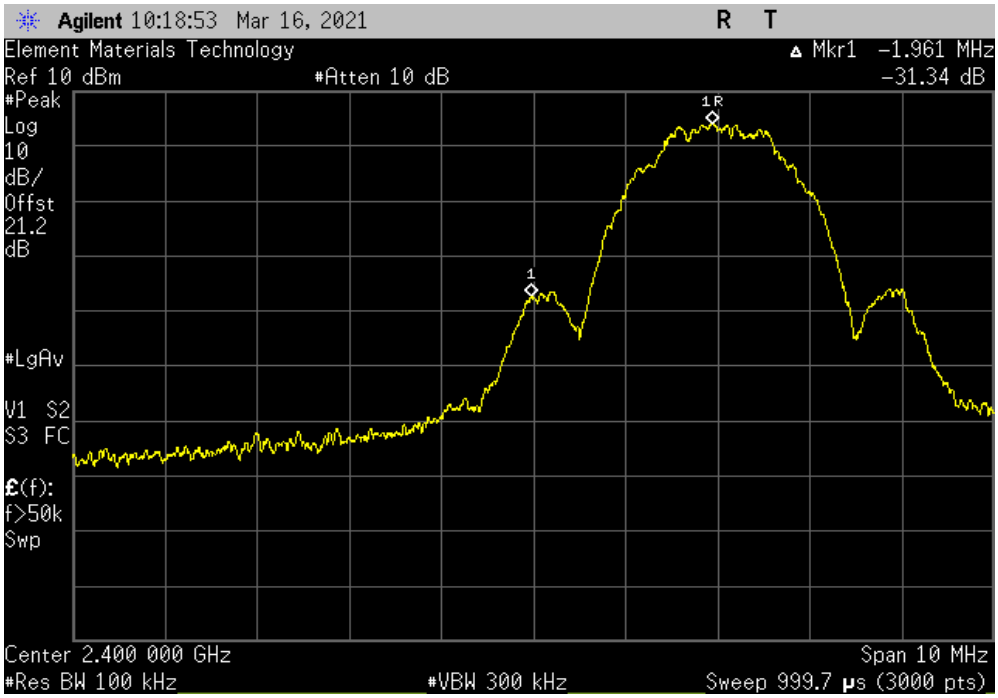
BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-52.64	-20	Pass



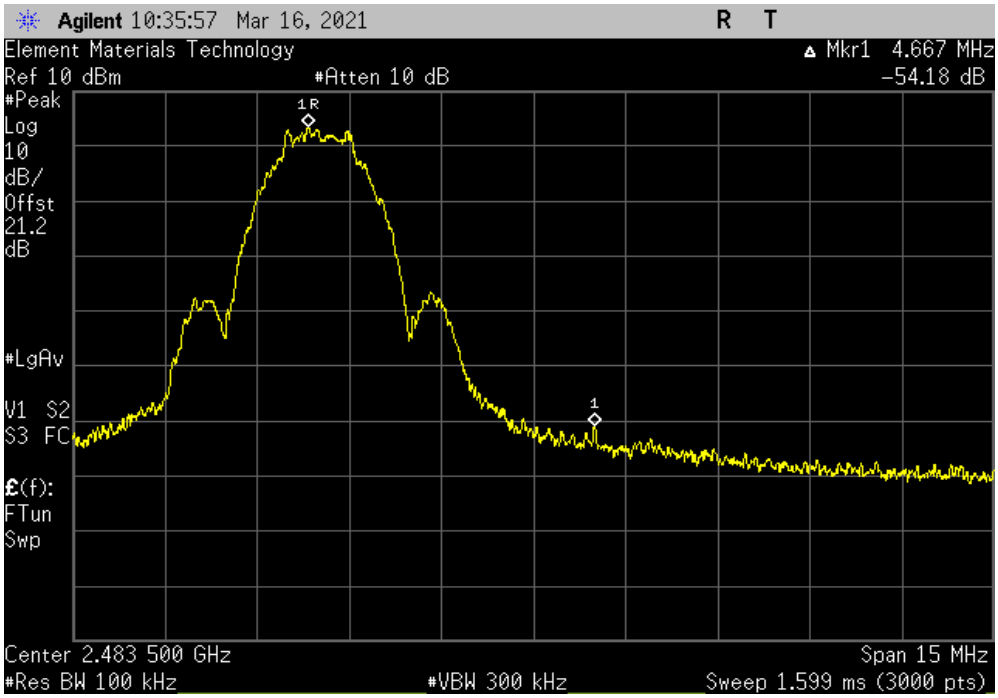
BLE/GFSK 1 Mbps High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-59.78	-20	Pass



BLE/GFSK 2 Mbps Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-31.34	-20	Pass



BLE/GFSK 2 Mbps High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-54.18	-20	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
Block - DC	Fairview Microwave	SD3379	AMZ	2020-11-04	2021-11-04
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Generator - Signal	Keysight	N5182B	TFX	2020-04-28	2023-04-28
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	2020-07-14	2021-07-14

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:	**Inspire Remote Model 2580**			**Work Order:**	**INSP0027**
Serial Number:	**REM000099**			**Date:**	**16-Mar-21**
Customer:	**Inspire Medical Systems**			**Temperature:**	**22.9 °C**
Attendees:	**Tom Haider**			**Humidity:**	**24.6% RH**
Project:	**None**			**Barometric Pres.:**	**1019 mbar**
Tested by:	**Andrew Rogstad, Chris Patterson**	**Power:**	**Battery**	**Job Site:**	**MN09**

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

COMMENTS

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

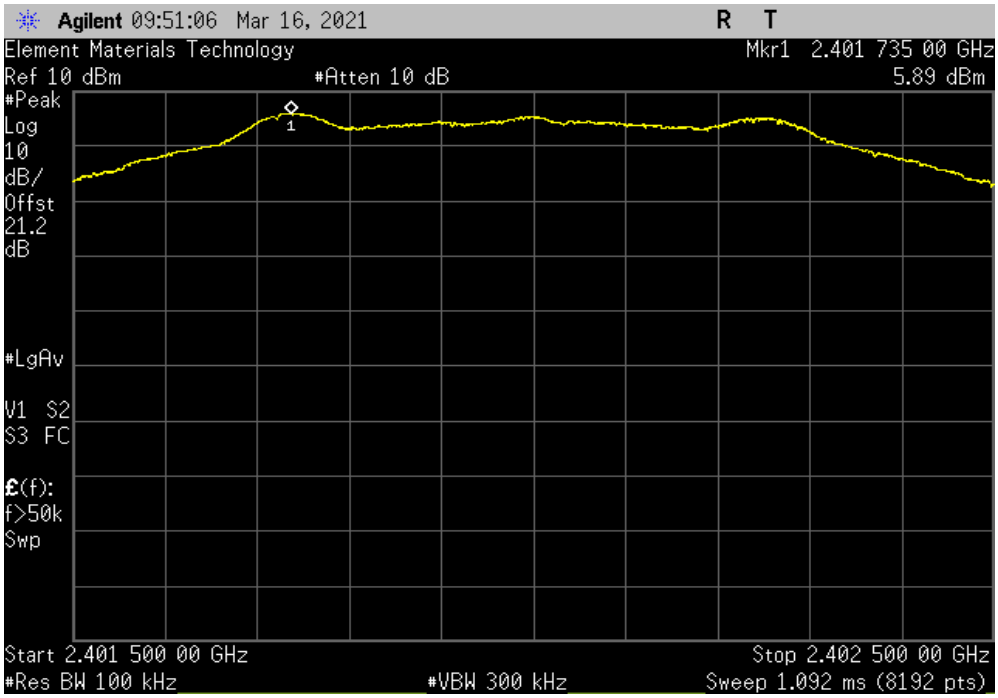
DEVIATIONS FROM TEST STANDARD

None

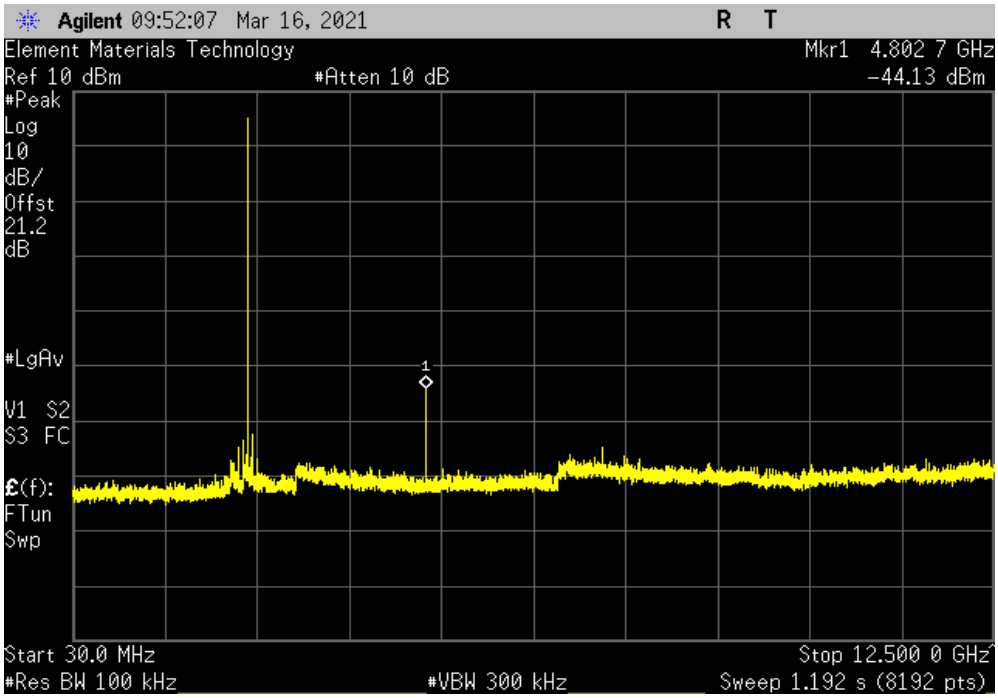
Configuration #	**3**	*Signature*

	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 1 Mbps Low Channel, 2402 MHz	Fundamental	2401.74	N/A	N/A	N/A
BLE/GFSK 1 Mbps Low Channel, 2402 MHz	30 MHz - 12.5 GHz	4802.7	-50.02	-20	Pass
BLE/GFSK 1 Mbps Low Channel, 2402 MHz	12.5 GHz - 25 GHz	24900.8	-55.78	-20	Pass
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	Fundamental	2441.74	N/A	N/A	N/A
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	4883.4	-52.92	-20	Pass
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	24856.5	-56.47	-20	Pass
BLE/GFSK 1 Mbps High Channel, 2480 MHz	Fundamental	2479.74	N/A	N/A	N/A
BLE/GFSK 1 Mbps High Channel, 2480 MHz	30 MHz - 12.5 GHz	4959.5	-52.84	-20	Pass
BLE/GFSK 1 Mbps High Channel, 2480 MHz	12.5 GHz - 25 GHz	24827.6	-55	-20	Pass
BLE/GFSK 2 Mbps Low Channel, 2402 MHz	Fundamental	2401.93	N/A	N/A	N/A
BLE/GFSK 2 Mbps Low Channel, 2402 MHz	30 MHz - 12.5 GHz	4804.3	-48.76	-20	Pass
BLE/GFSK 2 Mbps Low Channel, 2402 MHz	12.5 GHz - 25 GHz	24943.5	-54.02	-20	Pass
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz	Fundamental	2442	N/A	N/A	N/A
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	4884.9	-53.1	-20	Pass
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	24891.6	-55.19	-20	Pass
BLE/GFSK 2 Mbps High Channel, 2480 MHz	Fundamental	2479.82	N/A	N/A	N/A
BLE/GFSK 2 Mbps High Channel, 2480 MHz	30 MHz - 12.5 GHz	4961.1	-51.61	-20	Pass
BLE/GFSK 2 Mbps High Channel, 2480 MHz	12.5 GHz - 25 GHz	24913	-53.2	-20	Pass

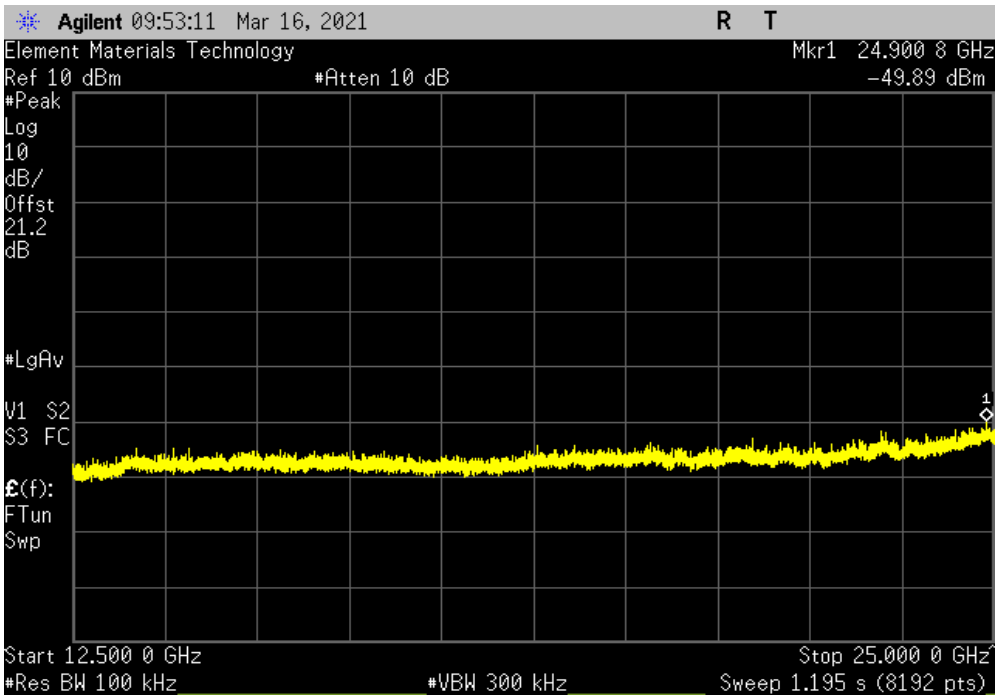
BLE/GFSK 1 Mbps Low Channel, 2402 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental		2401.74	N/A	N/A	N/A



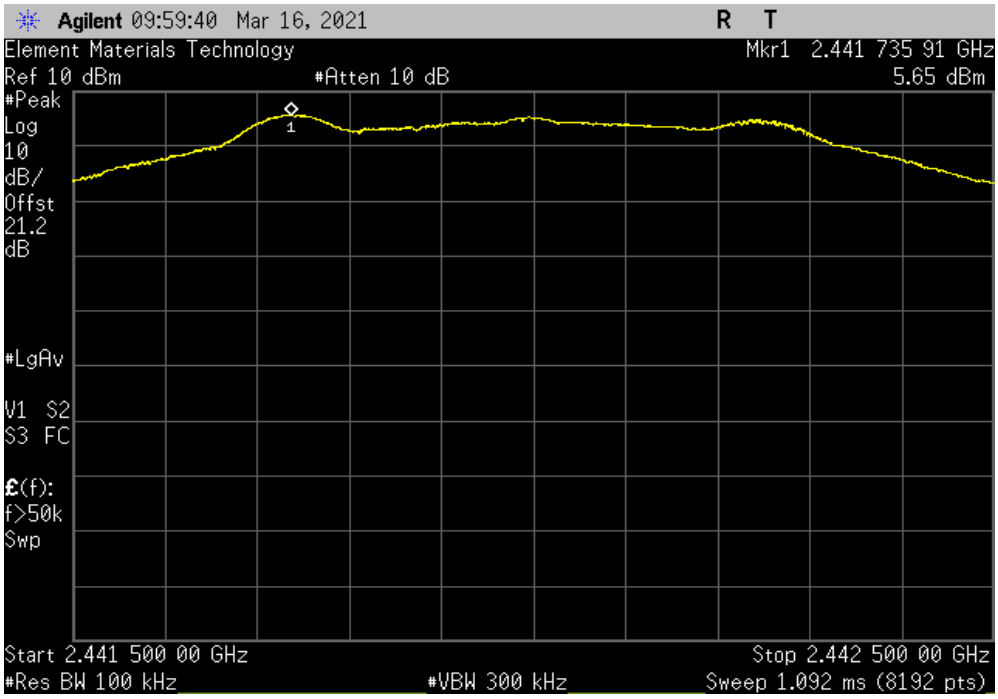
BLE/GFSK 1 Mbps Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4802.7	-50.02	-20	Pass



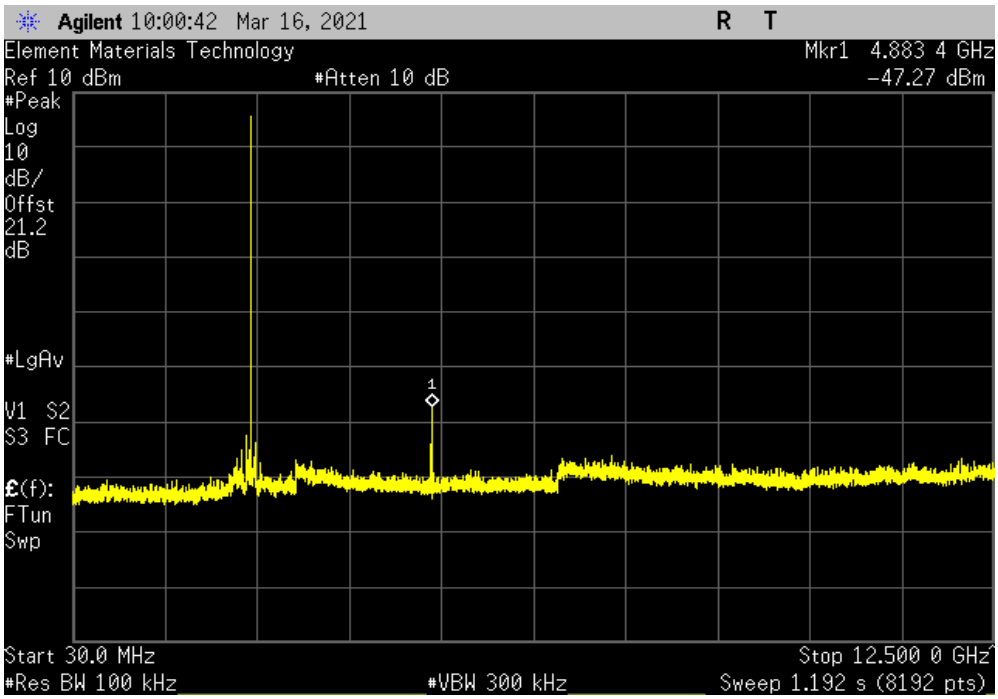
BLE/GFSK 1 Mbps Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24900.8	-55.78	-20	Pass



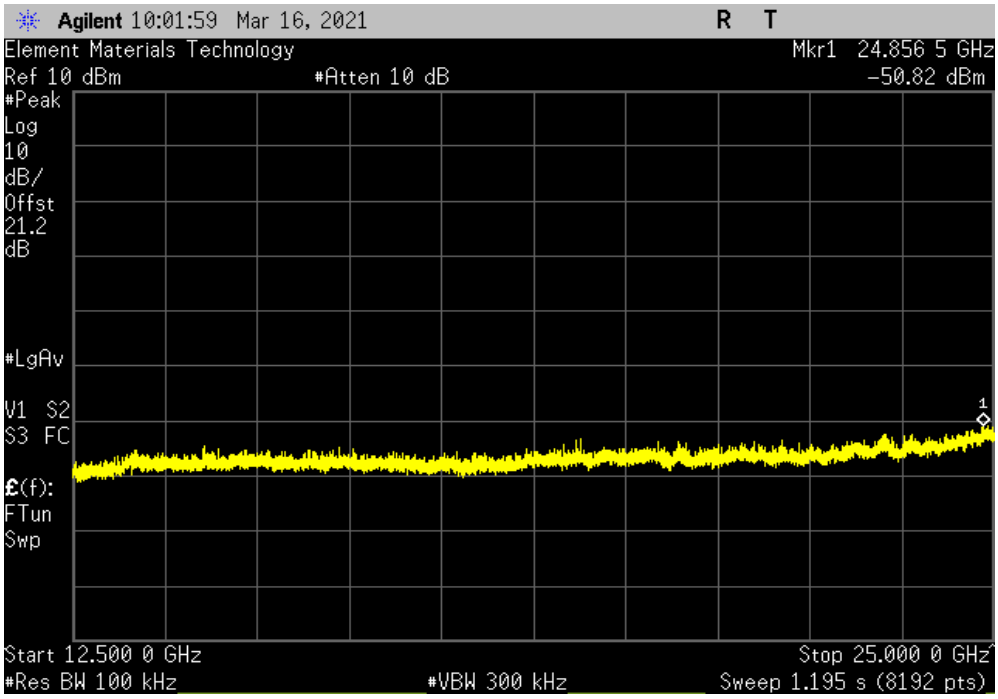
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2441.74	N/A	N/A	N/A



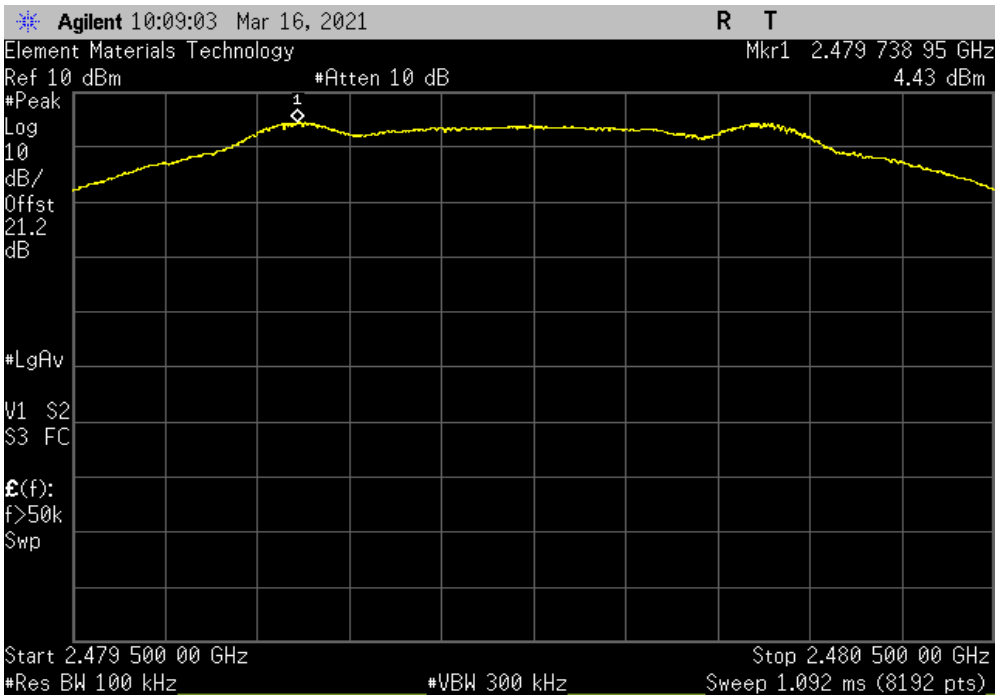
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4883.4	-52.92	-20	Pass



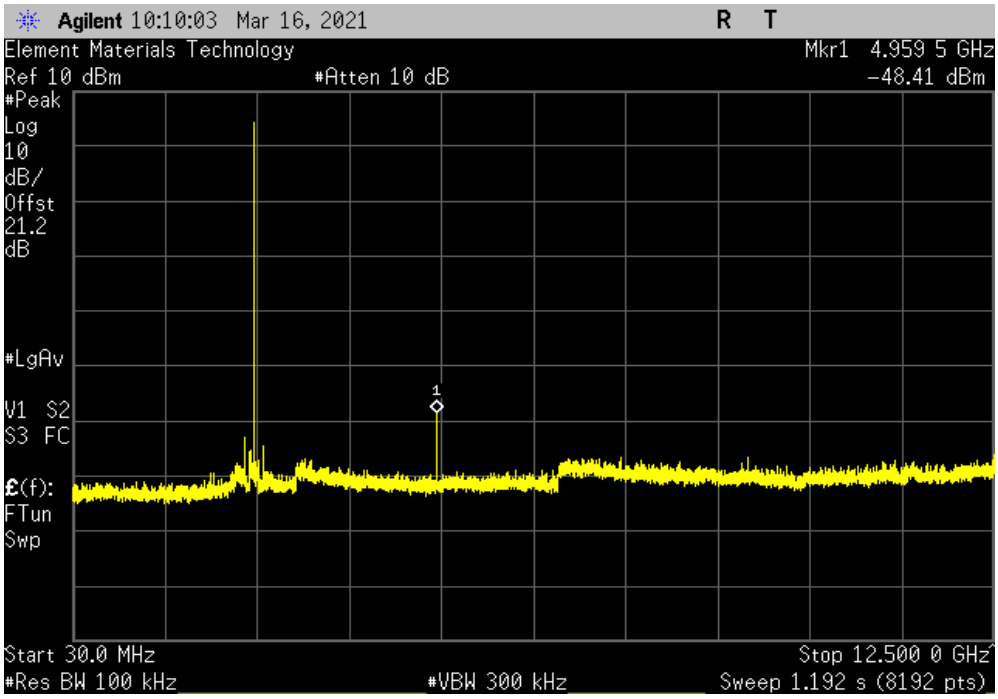
BLE/GFSK 1 Mbps Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24856.5	-56.47	-20	Pass



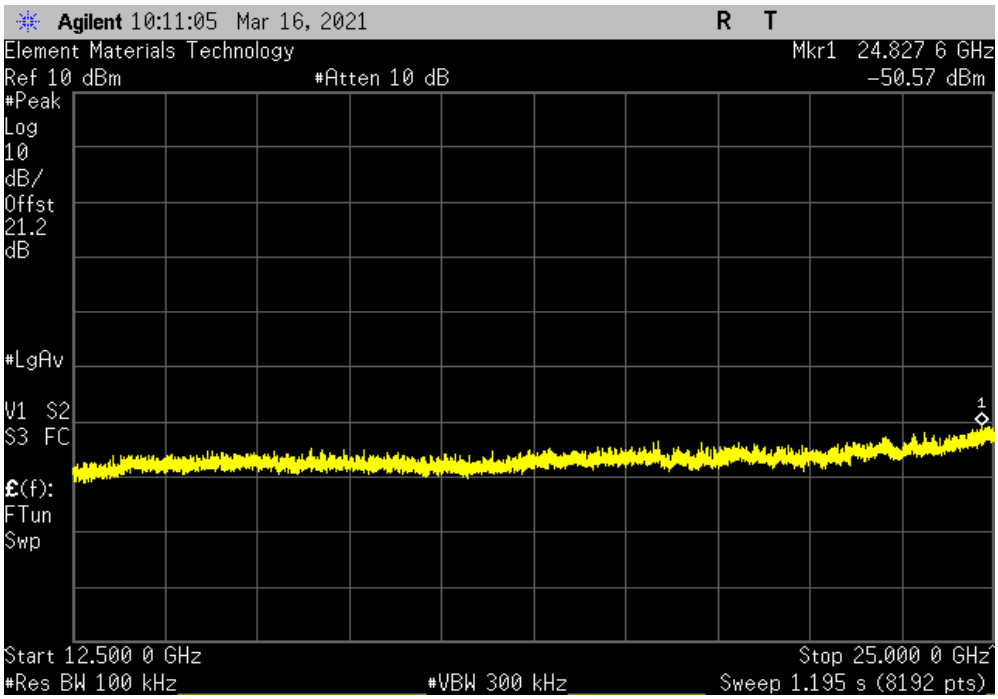
BLE/GFSK 1 Mbps High Channel, 2480 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2479.74	N/A	N/A	N/A



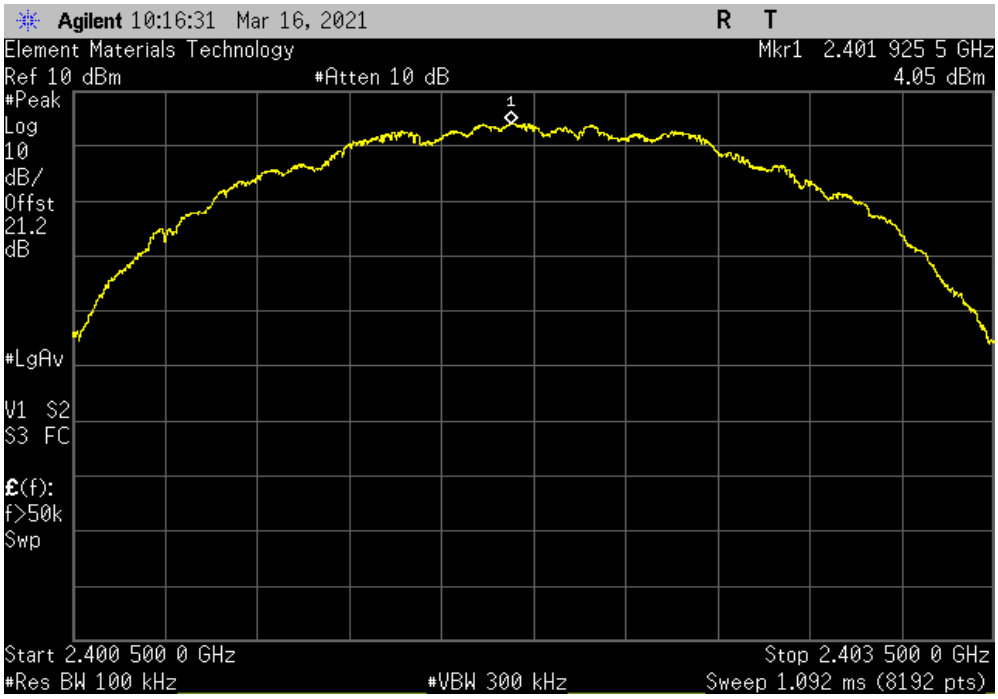
BLE/GFSK 1 Mbps High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4959.5	-52.84	-20	Pass



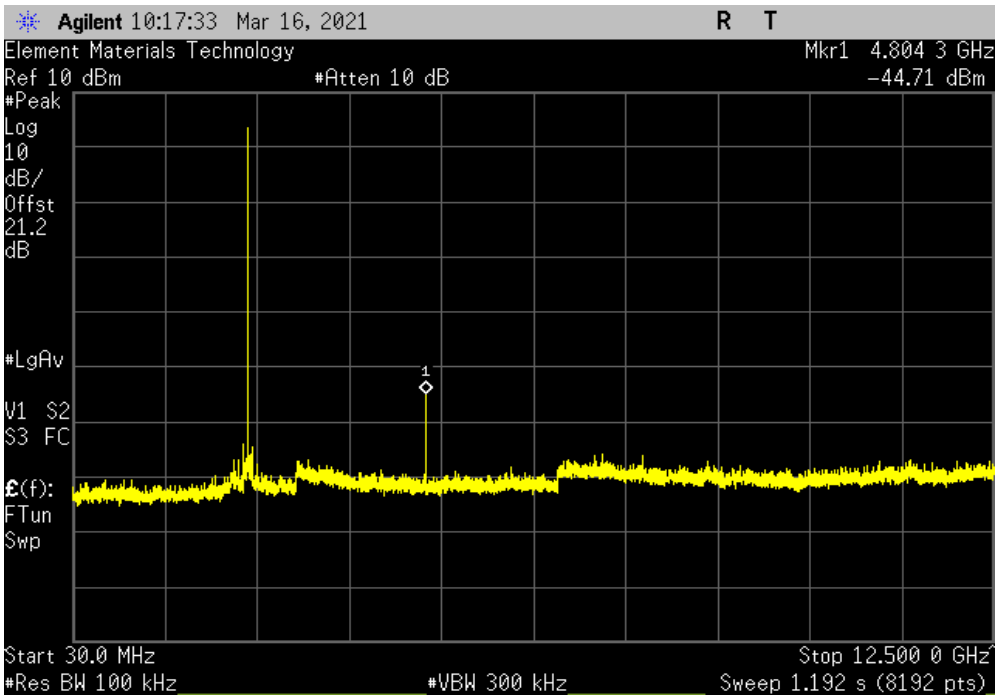
BLE/GFSK 1 Mbps High Channel, 2480 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24827.6	-55	-20	Pass



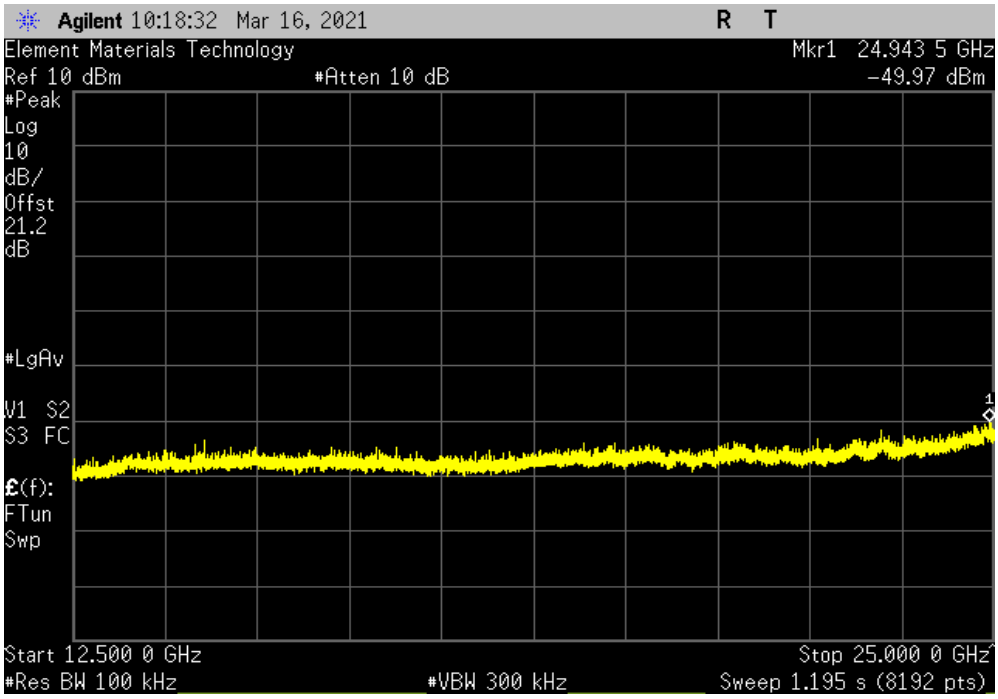
BLE/GFSK 2 Mbps Low Channel, 2402 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2401.93	N/A	N/A	N/A



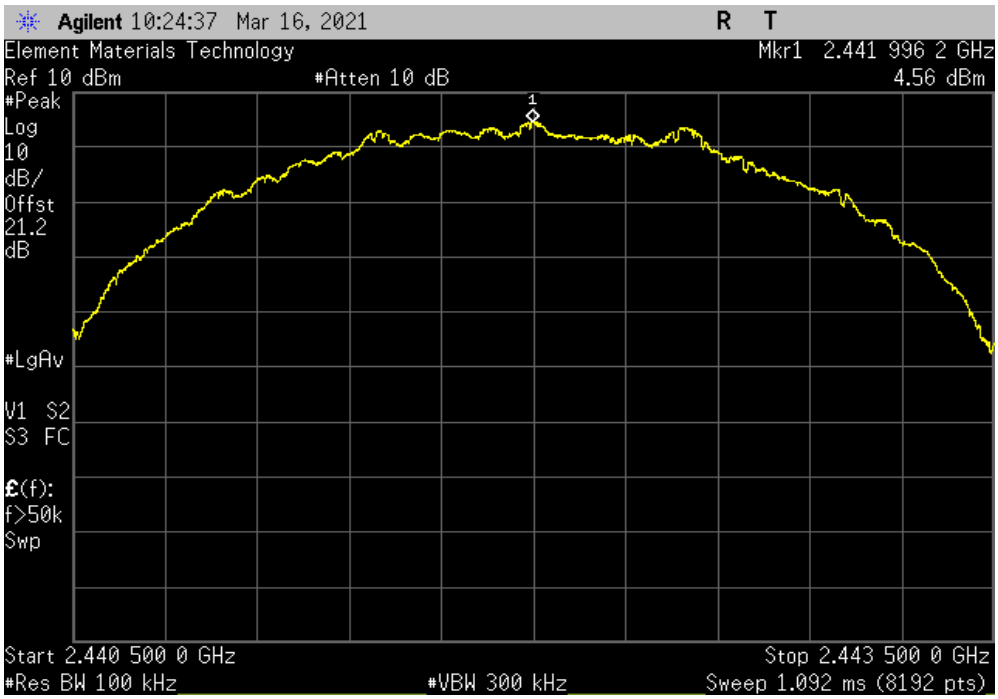
BLE/GFSK 2 Mbps Low Channel, 2402 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	4804.3	-48.76	-20	Pass



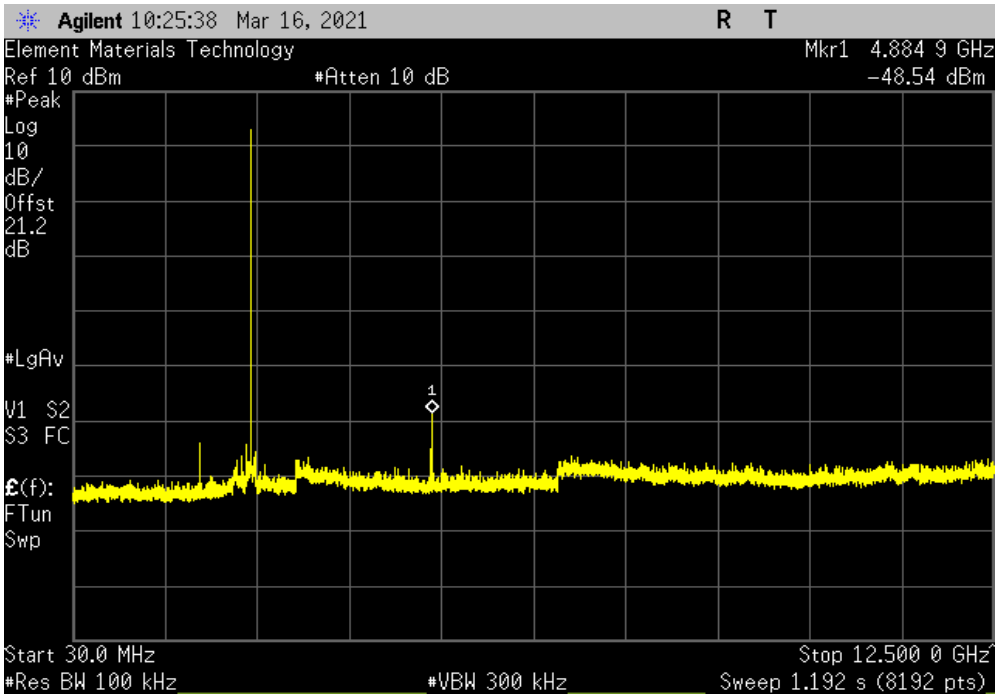
BLE/GFSK 2 Mbps Low Channel, 2402 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24943.5	-54.02	-20	Pass



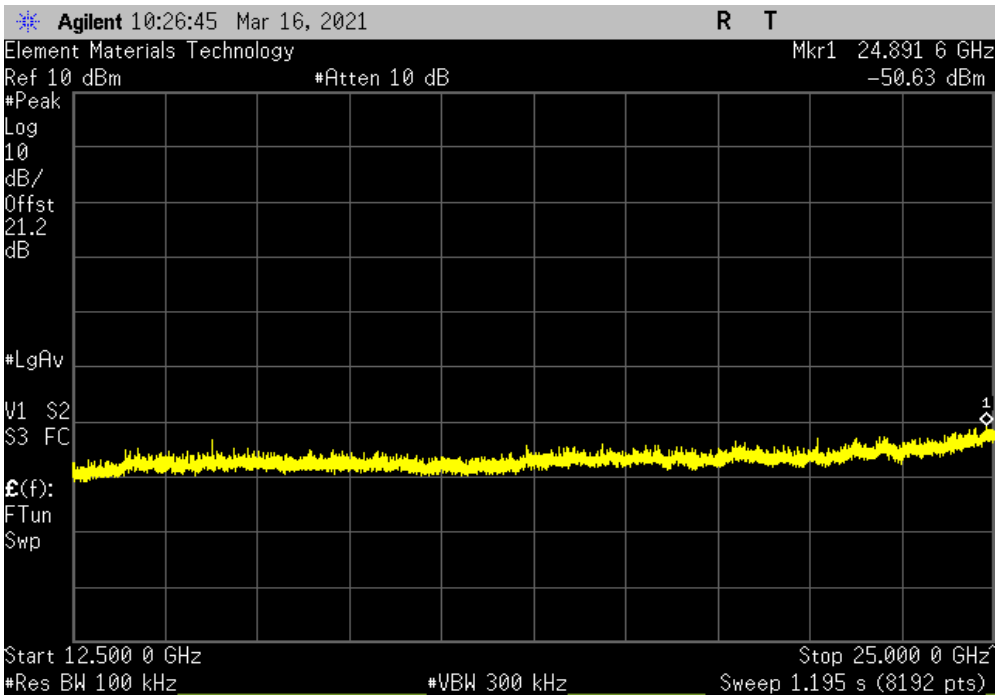
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2442	N/A	N/A	N/A



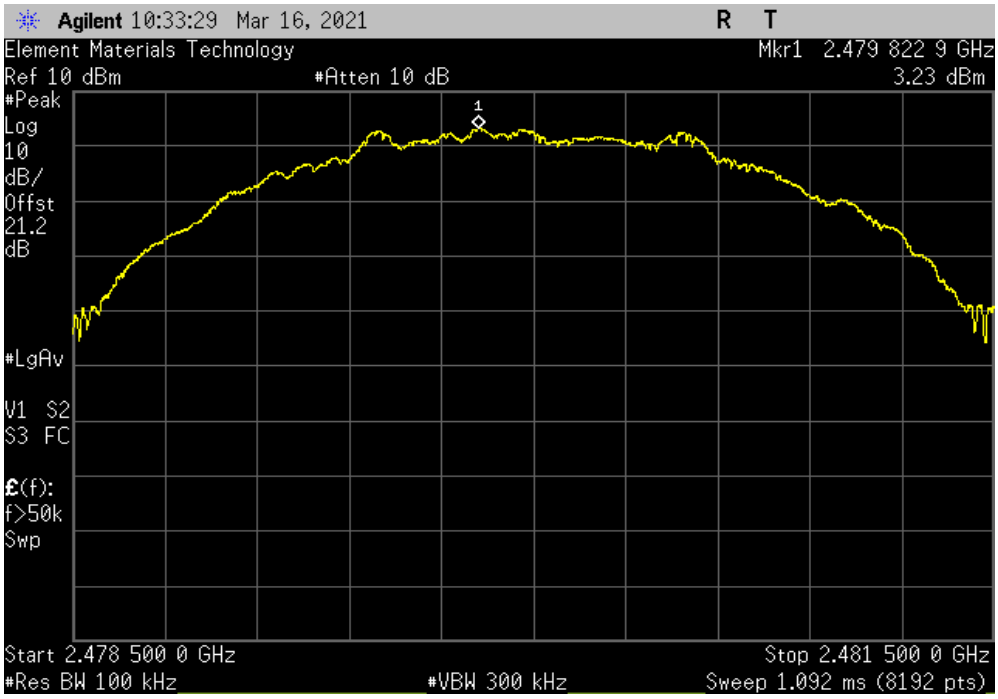
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4884.9	-53.1	-20	Pass



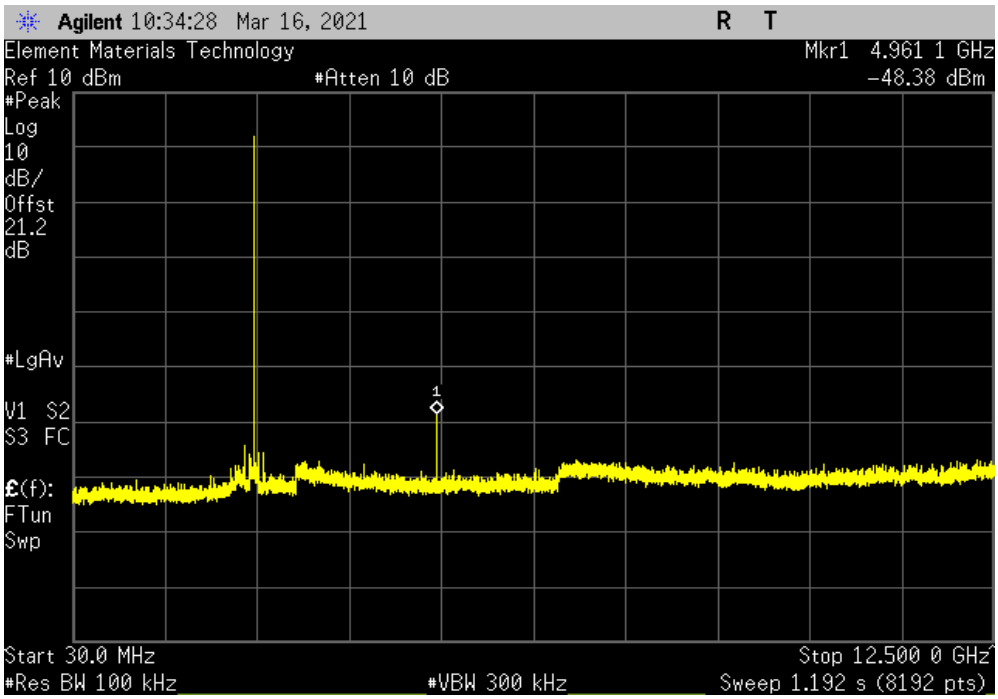
BLE/GFSK 2 Mbps Mid Channel, 2442 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24891.6	-55.19	-20	Pass



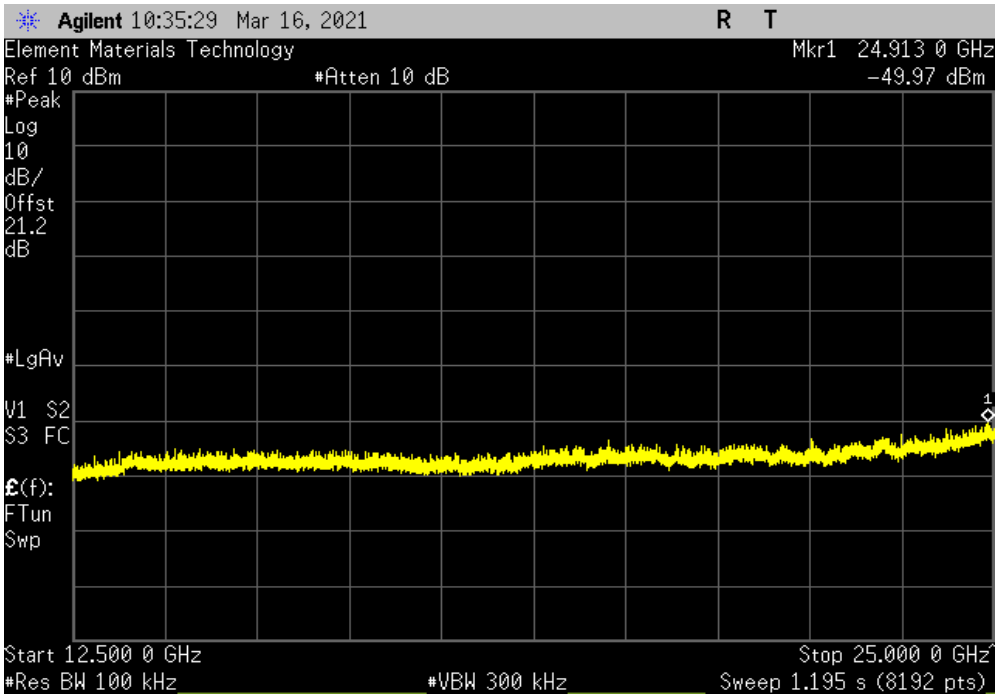
BLE/GFSK 2 Mbps High Channel, 2480 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2479.82	N/A	N/A	N/A



BLE/GFSK 2 Mbps High Channel, 2480 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	4961.1	-51.61	-20	Pass



BLE/GFSK 2 Mbps High Channel, 2480 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24913	-53.2	-20	Pass



End of Test Report