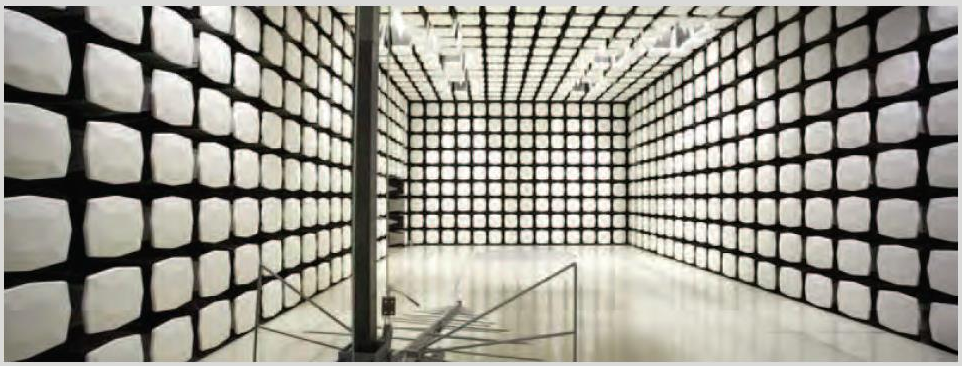
CVRx Inc.

Model 9020 Programmer System

FCC 15.249:2021

2400 - 2483.5 MHz Transceiver

Report: CVRX0024.2, Issue Date: July 8, 2021



NVLAP LAB CODE: 200881-0

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CERTIFICATE OF TEST

Last Date of Test: June 24, 2021
CVRx Inc.
EUT: Model 9020 Programmer System

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2021	ANSI C63.10:2013, KDB 558074
FCC 15.249:2021	

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Field Strength of Harmonics and Spurious Radiated Emissions	Yes	Pass	
6.6	Field Strength of Fundamental	Yes	Pass	
7.5	Duty Cycle	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

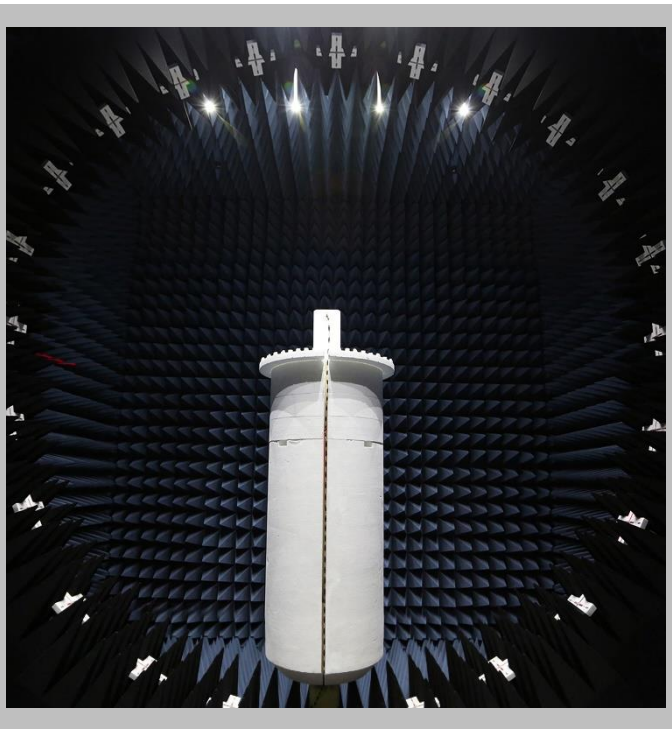
MIC – Recognized by MIC as a CAB for the acceptance of test data.

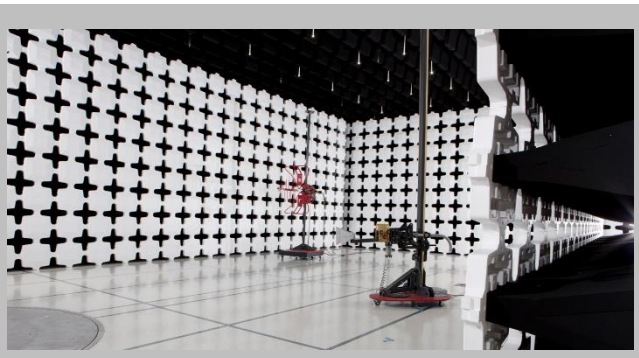
SCOPE

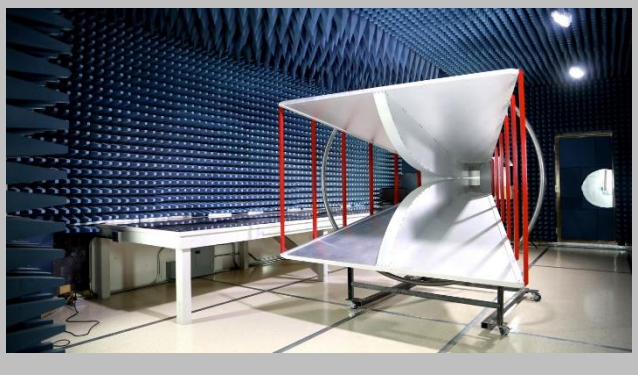
For details on the Scopes of our Accreditations, please visit:
https://www.nwemc.com/emc-testing-accreditations

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.

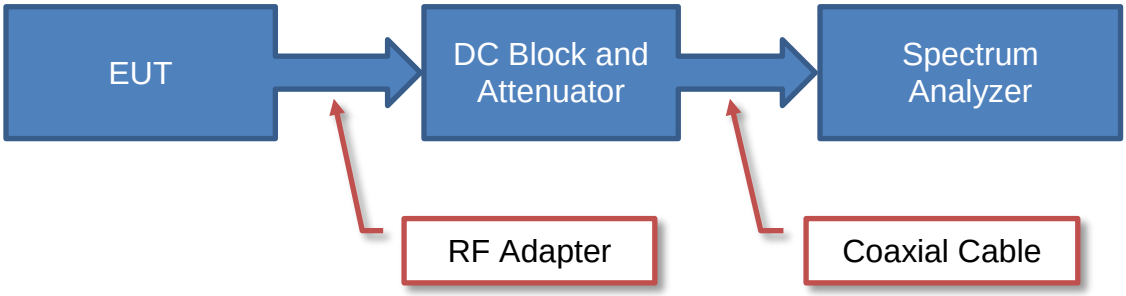
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific 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)	3.2 dB	-3.2 dB

TEST SETUP BLOCK DIAGRAMS

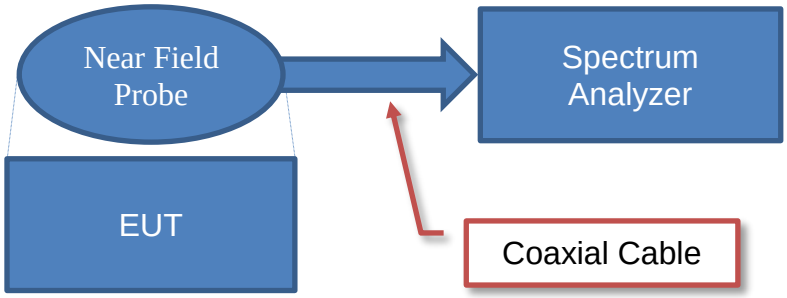
Antenna Port Conducted Measurements



Sample Calculation

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements

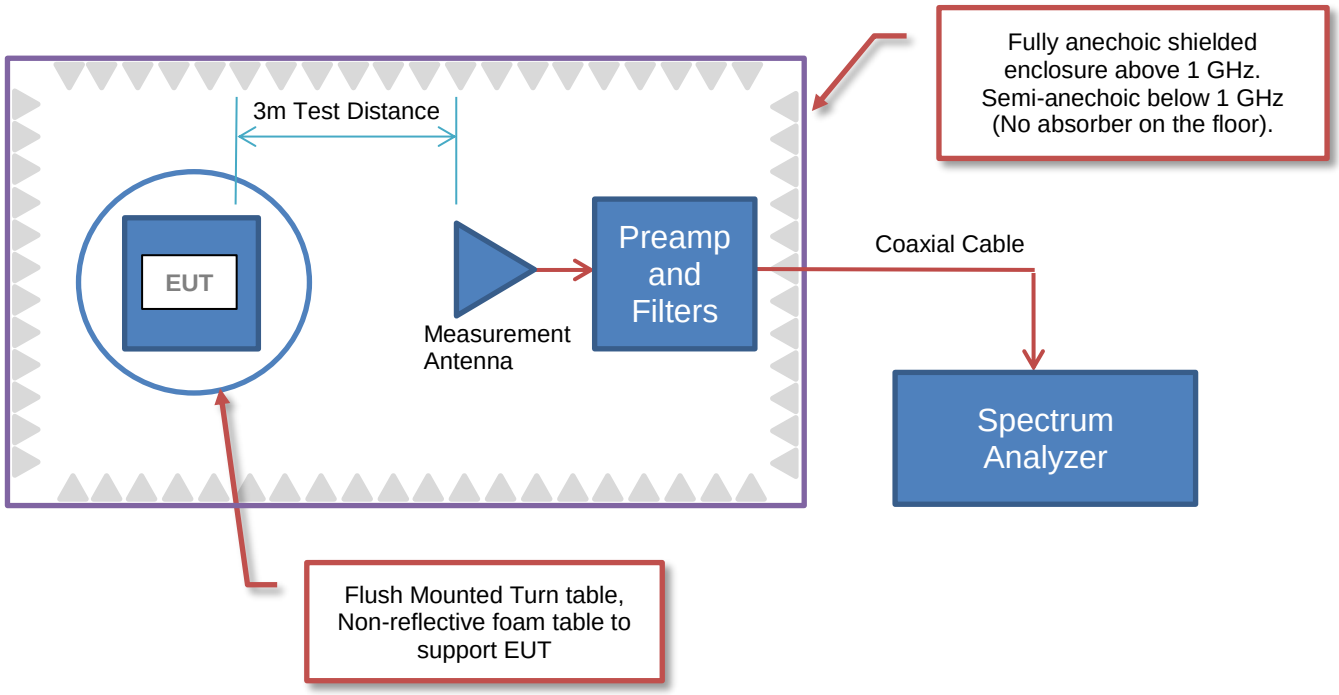


Sample Calculation

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

TEST SETUP BLOCK DIAGRAMS

Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	CVRx Inc.
Address:	9201 West Broadway Avenue, Ste 650
City, State, Zip:	Minneapolis, MN 55445
Test Requested By:	Clifford Rockwell
EUT:	Model 9020 Programmer System
First Date of Test:	June 21, 2021
Last Date of Test:	June 24, 2021
Receipt Date of Samples:	June 17, 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:
Programmer for implantable devices containing a 400 MHz MICS radio and a 2.4 GHz wakeup radio.

Testing Objective:
Seeking to demonstrate compliance under FCC 15.249:2021 for operation in the 2400 - 2483.5 MHz Band.

CONFIGURATIONS

Configuration CVRX0024- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Programmer Interface	CVRx	9020	SWO4960013
Programmer Tablet	CVRx	9020	026996302851
Power Supply	Microsoft	1735	N/A

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Cable	No	1.9 m	No	Power Supply	Programmer Tablet
USB-C Cable	Yes	0.2 m	No	Programmer Tablet	Programmer Interface

Configuration CVRX0024- 4

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Programmer Interface	CVRx	9020	SWO4960019

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Programmer Tablet	CVRx	9020	026996302851
Power Supply	Microsoft	1735	N/A

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Cable	No	1.9 m	No	Power Supply	Programmer Tablet
USB-C Cable	Yes	0.2 m	No	Programmer Tablet	Programmer Interface

Configuration CVRX0024- 5

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Programmer Tablet	CVRx	9020	026996302851
Power Supply	Microsoft	1735	N/A
Programmer Interface	CVRx	9020	SWO4960012

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Cable	No	1.9 m	No	Power Supply	Programmer Tablet
USB-C Cable	Yes	5.0 m	No	Programmer Tablet	Programmer Interface

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2021-06-21	Field Strength of Fundamental	Modified from delivered configuration.	Output power for FCC 15.249 low, mid, and high channels were adjusted. Modification authorized by Clifford Rockwell.	EUT remained at Element following the test.
2	2021-06-23	Duty Cycle	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	2021-06-24	Field Strength of Harmonics and Spurious Radiated Emissions	Modified from delivered configuration.	High transmit channel was changed from 2476 MHz to 2463 MHz. Modification authorized by Cliff Rockwell.	EUT remained at Element following the test.
4	2021-06-24	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWER SETTINGS AND ANTENNAS

The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Ceramic Chip Antenna	Abracon	2350-2550	5.19

POWER SETTINGS

Radio	Channel	Power Setting (hex)
2.4 GHz	Low Channel (2420 MHz)	76
2.4 GHz	Mid Channel (2450 MHz)	D8
2.4 GHz	High Channel (2463 MHz)	87

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

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

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.2 dB	-3.2 dB

CONFIGURATIONS INVESTIGATED

CVRX0024-1

MODES INVESTIGATED

Transmitting 100% duty cycle on Mid channel (2450 MHz).

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

EUT:	Model 9020 Programmer System	Work Order:	CVRX0024
Serial Number:	SWO4960013	Date:	2021-06-24
Customer:	CVRx Inc.	Temperature:	22.6°C
Attendees:	Cliff Rockwell	Relative Humidity:	54.4%
Customer Project:	None	Bar. Pressure:	1008 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	5VDC	Configuration:	CVRX0024-1

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	1	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

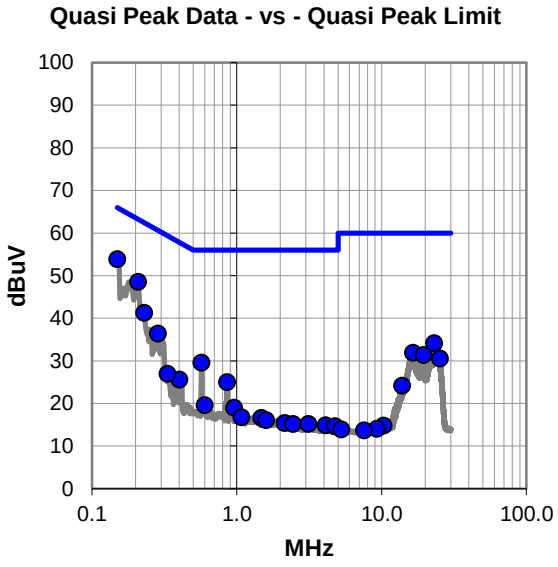
None

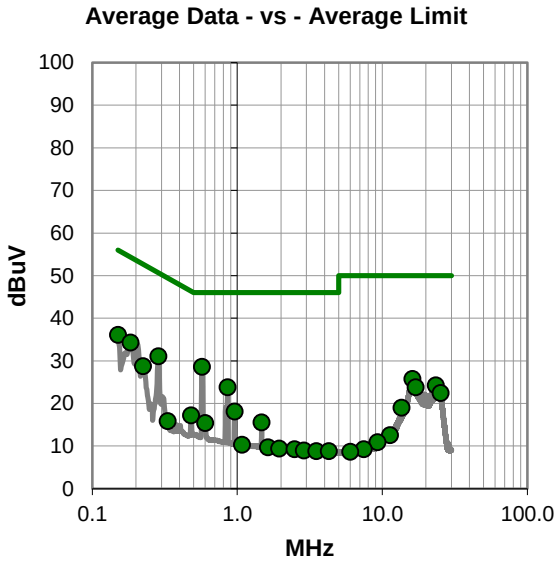
EUT OPERATING MODES

Transmitting 100% duty cycle on Mid channel (2450 MHz).

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

RESULTS - Run #1

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	32.9	21.0	53.9	66.0	-12.1
0.208	27.9	20.7	48.6	63.3	-14.7
0.229	20.7	20.6	41.3	62.5	-21.2
0.286	15.9	20.5	36.4	60.7	-24.3
23.112	12.9	21.3	34.2	60.0	-25.8
0.571	9.2	20.4	29.6	56.0	-26.4
16.458	10.8	21.1	31.9	60.0	-28.1
19.526	10.3	21.1	31.4	60.0	-28.6
25.261	9.3	21.3	30.6	60.0	-29.4
0.857	4.5	20.5	25.0	56.0	-31.0
0.402	5.1	20.5	25.6	57.8	-32.2
0.334	6.5	20.5	27.0	59.4	-32.4
13.892	3.2	21.0	24.2	60.0	-35.8
0.601	-0.8	20.4	19.6	56.0	-36.4
0.959	-1.5	20.5	19.0	56.0	-37.0
1.080	-3.7	20.5	16.8	56.0	-39.2
1.481	-3.9	20.5	16.6	56.0	-39.4
1.596	-4.4	20.5	16.1	56.0	-39.9
2.144	-5.1	20.5	15.4	56.0	-40.6
2.440	-5.4	20.6	15.2	56.0	-40.8
3.116	-5.4	20.6	15.2	56.0	-40.8
4.105	-5.7	20.6	14.9	56.0	-41.1
4.752	-5.9	20.6	14.7	56.0	-41.3
10.327	-6.1	20.9	14.8	60.0	-45.2
9.278	-6.7	20.8	14.1	60.0	-45.9

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.571	8.2	20.4	28.6	46.0	-17.4
0.286	10.6	20.5	31.1	50.7	-19.6
0.150	15.1	21.0	36.1	56.0	-19.9
0.183	13.5	20.8	34.3	54.3	-20.0
0.857	3.3	20.5	23.8	46.0	-22.2
0.223	8.2	20.6	28.8	52.7	-23.9
16.112	4.7	21.1	25.8	50.0	-24.2
23.412	3.0	21.3	24.3	50.0	-25.7
16.963	2.7	21.1	23.8	50.0	-26.2
25.244	1.2	21.3	22.5	50.0	-27.5
0.959	-2.4	20.5	18.1	46.0	-27.9
0.480	-3.3	20.5	17.2	46.3	-29.1
1.470	-4.9	20.5	15.6	46.0	-30.4
0.601	-5.0	20.4	15.4	46.0	-30.6
13.560	-1.9	20.9	19.0	50.0	-31.0
0.331	-4.6	20.5	15.9	49.4	-33.5
1.076	-10.2	20.5	10.3	46.0	-35.7
1.625	-10.8	20.5	9.7	46.0	-36.3
1.944	-11.1	20.5	9.4	46.0	-36.6
2.482	-11.3	20.6	9.3	46.0	-36.7
2.880	-11.6	20.6	9.0	46.0	-37.0
3.508	-11.8	20.6	8.8	46.0	-37.2
4.284	-11.8	20.6	8.8	46.0	-37.2
11.306	-8.3	20.9	12.6	50.0	-37.4
9.280	-9.9	20.8	10.9	50.0	-39.1

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

EUT:	Model 9020 Programmer System	Work Order:	CVRX0024
Serial Number:	SWO4960013	Date:	2021-06-24
Customer:	CVRx Inc.	Temperature:	22.6°C
Attendees:	Cliff Rockwell	Relative Humidity:	54.4%
Customer Project:	None	Bar. Pressure:	1008 mb
Tested By:	Chris Patterson	Job Site:	MN03
Power:	5VDC	Configuration:	CVRX0024-1

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	2	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

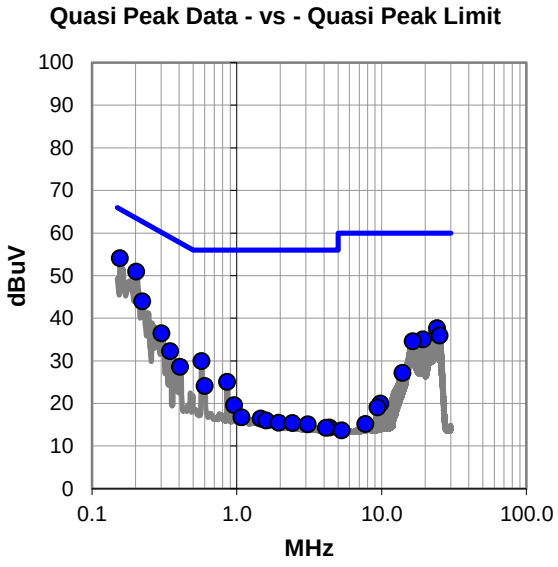
None

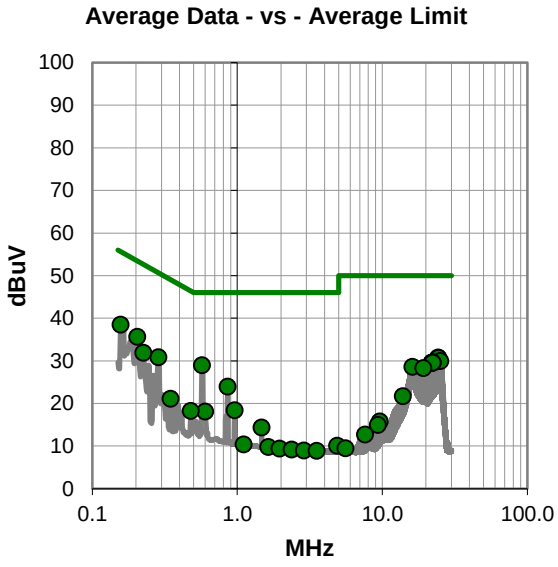
EUT OPERATING MODES

Transmitting 100% duty cycle on Mid channel (2450 MHz).

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

RESULTS - Run #2

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.156	33.2	20.9	54.1	65.7	-11.6
0.202	30.3	20.7	51.0	63.5	-12.5
0.223	23.4	20.6	44.0	62.7	-18.7
24.103	16.4	21.3	37.7	60.0	-22.3
0.302	16.0	20.5	36.5	60.2	-23.7
25.169	14.7	21.3	36.0	60.0	-24.0
19.307	14.0	21.1	35.1	60.0	-24.9
16.393	13.5	21.1	34.6	60.0	-25.4
0.571	9.6	20.4	30.0	56.0	-26.0
0.346	11.8	20.5	32.3	59.1	-26.8
0.407	8.1	20.5	28.6	57.7	-29.1
0.857	4.6	20.5	25.1	56.0	-30.9
0.601	3.7	20.4	24.1	56.0	-31.9
13.923	6.2	21.0	27.2	60.0	-32.8
0.959	-0.9	20.5	19.6	56.0	-36.4
1.076	-3.7	20.5	16.8	56.0	-39.2
1.462	-4.0	20.5	16.5	56.0	-39.5
9.802	-0.8	20.8	20.0	60.0	-40.0
1.596	-4.5	20.5	16.0	56.0	-40.0
1.944	-5.0	20.5	15.5	56.0	-40.5
2.424	-5.2	20.6	15.4	56.0	-40.6
3.087	-5.5	20.6	15.1	56.0	-40.9
9.384	-1.7	20.8	19.1	60.0	-40.9
4.364	-6.2	20.6	14.4	56.0	-41.6
4.130	-6.3	20.6	14.3	56.0	-41.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.571	8.6	20.4	29.0	46.0	-17.0
0.156	17.6	20.9	38.5	55.7	-17.2
0.204	15.0	20.7	35.7	53.4	-17.7
24.272	9.5	21.3	30.8	50.0	-19.2
24.311	9.4	21.3	30.7	50.0	-19.3
0.286	10.4	20.5	30.9	50.7	-19.8
25.169	8.7	21.3	30.0	50.0	-20.0
21.933	8.3	21.3	29.6	50.0	-20.4
21.975	8.3	21.3	29.6	50.0	-20.4
22.192	8.3	21.3	29.6	50.0	-20.4
22.213	8.3	21.3	29.6	50.0	-20.4
22.246	8.3	21.3	29.6	50.0	-20.4
0.225	11.3	20.6	31.9	52.6	-20.7
16.164	7.5	21.1	28.6	50.0	-21.4
19.145	7.2	21.1	28.3	50.0	-21.7
0.857	3.5	20.5	24.0	46.0	-22.0
0.959	-2.1	20.5	18.4	46.0	-27.6
0.598	-2.3	20.4	18.1	46.0	-27.9
0.346	0.6	20.5	21.1	49.1	-28.0
0.477	-2.2	20.5	18.3	46.4	-28.1
13.882	0.7	21.0	21.7	50.0	-28.3
1.470	-6.1	20.5	14.4	46.0	-31.6
9.610	-5.0	20.8	15.8	50.0	-34.2
9.334	-5.8	20.8	15.0	50.0	-35.0
1.103	-10.1	20.5	10.4	46.0	-35.6

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF HARMONICS AND SPURIOUS RADIATED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

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 shown 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 axes, 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.

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	2020-12-27	2021-12-27
Antenna - Standard Gain	ETS Lindgren	3160-08	AIQ	NCR	NCR
Antenna - Double Ridge	ETS-Lindgren	3115	AJQ	2021-01-25	2023-01-25
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	2020-10-06	2021-10-06
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	2021-01-15	2022-01-15
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	2021-01-15	2022-01-15
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	2021-01-15	2022-01-15
Antenna - Biconilog	ETS Lindgren	3142D	AXO	2019-09-03	2021-09-03
Antenna - Standard Gain	ETS Lindgren	3160-07	AXP	NCR	NCR
Filter - Low Pass	Micro-Tronics	LPM50004	LFK	2020-09-24	2021-09-24
Filter - High Pass	Micro-Tronics	HPM50111	LFN	2020-09-14	2021-09-14
Cable	ESM Cable Corp.	Bilog Cables	MNH	2020-10-06	2021-10-06
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	2021-01-15	2022-01-15
Cable	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	2021-03-07	2022-03-07
Attenuator	Fairview Microwave	SA18E-20	TWZ	2020-09-14	2021-09-14
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	JSD4-18002600-26-8P	APU	2020-09-11	2021-09-11

FIELD STRENGTH OF HARMONICS AND SPURIOUS RADIATED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 26500 MHz

POWER INVESTIGATED

5VDC

CONFIGURATIONS INVESTIGATED

CVRX0024-4

MODES INVESTIGATED

Transmitting modulated on High channel (2463 MHz), Low channel (2420 MHz).
Transmitting modulated on Low channel (2420 MHz), Mid channel (2450 MHz), and High channel (2463 MHz).

FIELD STRENGTH OF HARMONICS AND SPURIOUS RADIATED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

EUT:	Model 9020 Programmer System	Work Order:	CVRX0024
Serial Number:	SWO4960019	Date:	2021-06-22
Customer:	CVRx Inc.	Temperature:	21.9°C
Attendees:	Cliff Rockwell	Relative Humidity:	38.5%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Christopher Heintzelman	Job Site:	MN05
Power:	5VDC	Configuration:	CVRX0024-4

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.249:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	50	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

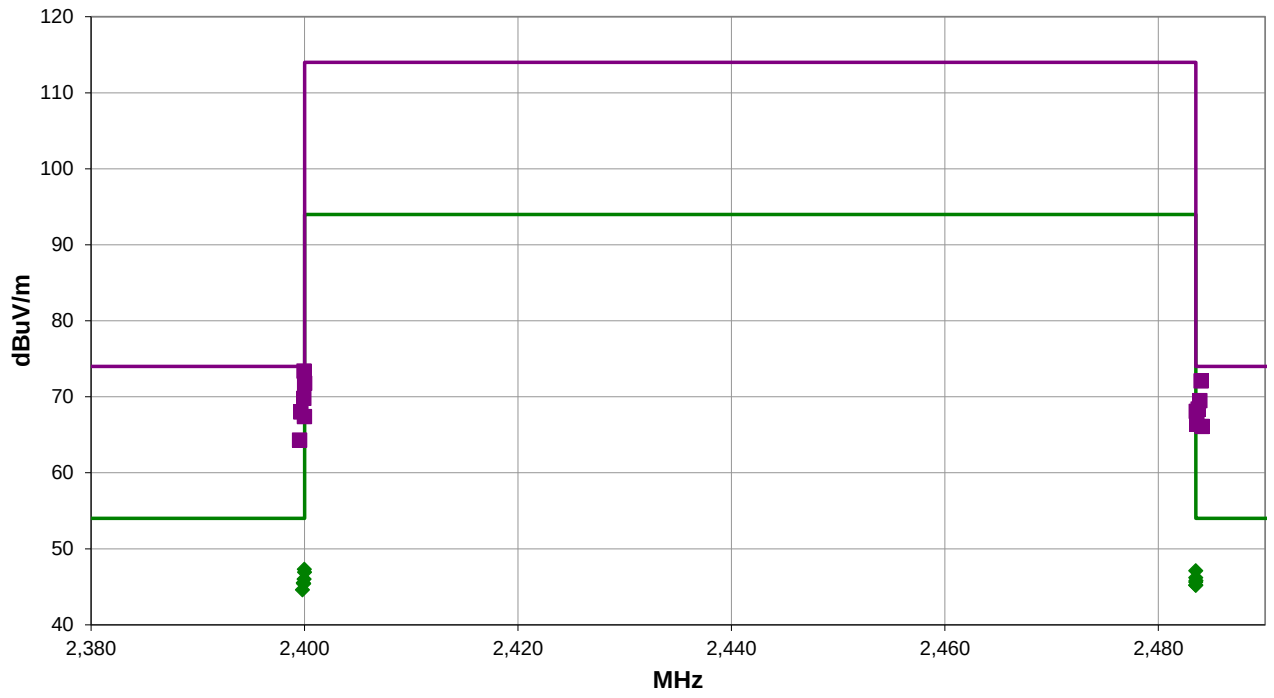
Single data rate.

EUT OPERATING MODES

Transmitting modulated on High channel (2463 MHz), Low channel (2420 MHz).

DEVIATIONS FROM TEST STANDARD

None



Run #: 50 ■ PK ◆ AV ● QP

FIELD STRENGTH OF HARMONICS AND SPURIOUS RADIATED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

RESULTS - Run #50

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
2399.942	58.1	-4.7	1.01	59.9	3.0	20.0	Horz	PK	0.0	73.4	74.0	-0.6	EUT Vert, Low Ch
2484.000	56.9	-4.8	1.02	62.0	3.0	20.0	Horz	PK	0.0	72.1	74.0	-1.9	EUT Vert, High Ch
2400.000	56.5	-4.7	2.87	91.9	3.0	20.0	Vert	PK	0.0	71.8	74.0	-2.2	EUT Horz, Low Ch
2399.933	54.5	-4.7	1.56	239.0	3.0	20.0	Horz	PK	0.0	69.8	74.0	-4.2	EUT On Side, Low Ch
2483.883	54.3	-4.8	2.34	63.0	3.0	20.0	Vert	PK	0.0	69.5	74.0	-4.5	EUT Horz, High Ch
2483.733	53.2	-4.8	1.26	224.0	3.0	20.0	Horz	PK	0.0	68.4	74.0	-5.6	EUT Horz, High Ch
2483.542	52.9	-4.8	2.52	246.9	3.0	20.0	Horz	PK	0.0	68.1	74.0	-5.9	EUT On Side, High Ch
2399.650	52.7	-4.7	1.39	228.0	3.0	20.0	Vert	PK	0.0	68.0	74.0	-6.0	EUT On Side, Low Ch
2399.983	52.1	-4.7	1.5	242.0	3.0	20.0	Horz	PK	0.0	67.4	74.0	-6.6	EUT Horz, Low Ch
2399.992	32.0	-4.7	1.01	59.9	3.0	20.0	Horz	AV	0.0	47.3	54.0	-6.7	EUT Vert, Low Ch
2483.500	31.9	-4.8	1.02	62.0	3.0	20.0	Horz	AV	0.0	47.1	54.0	-6.9	EUT Vert, High Ch
2400.000	31.6	-4.7	2.87	91.9	3.0	20.0	Vert	AV	0.0	46.9	54.0	-7.1	EUT Horz, Low Ch
2483.617	51.2	-4.8	2.14	258.9	3.0	20.0	Vert	PK	0.0	66.4	74.0	-7.6	EUT On Side, High Ch
2483.500	31.0	-4.8	2.34	63.0	3.0	20.0	Vert	AV	0.0	46.2	54.0	-7.8	EUT Horz, High Ch
2484.100	50.9	-4.8	3.99	246.0	3.0	20.0	Vert	PK	0.0	66.1	74.0	-7.9	EUT Vert, High Ch
2399.967	30.7	-4.7	1.56	239.0	3.0	20.0	Horz	AV	0.0	46.0	54.0	-8.0	EUT On Side, Low Ch
2483.533	30.6	-4.8	1.26	224.0	3.0	20.0	Horz	AV	0.0	45.8	54.0	-8.2	EUT Horz, High Ch
2483.500	30.4	-4.8	2.52	246.9	3.0	20.0	Horz	AV	0.0	45.6	54.0	-8.4	EUT On Side, High Ch
2399.892	30.2	-4.7	1.39	228.0	3.0	20.0	Vert	AV	0.0	45.5	54.0	-8.5	EUT On Side, Low Ch
2399.925	30.1	-4.7	1.5	242.0	3.0	20.0	Horz	AV	0.0	45.4	54.0	-8.6	EUT Horz, Low Ch
2483.500	30.0	-4.8	3.99	246.0	3.0	20.0	Vert	AV	0.0	45.2	54.0	-8.8	EUT Vert, High Ch
2483.500	30.0	-4.8	2.14	258.9	3.0	20.0	Vert	AV	0.0	45.2	54.0	-8.8	EUT On Side, High Ch
2399.800	29.3	-4.7	1.45	271.0	3.0	20.0	Vert	AV	0.0	44.6	54.0	-9.4	EUT Vert, Low Ch
2399.533	49.0	-4.7	1.45	271.0	3.0	20.0	Vert	PK	0.0	64.3	74.0	-9.7	EUT Vert, Low Ch

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF HARMONICS AND SPURIOUS RADIATED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

EUT:	Model 9020 Programmer System	Work Order:	CVRX0024
Serial Number:	SWO4960019	Date:	2021-06-21
Customer:	CVRx Inc.	Temperature:	21.7°C
Attendees:	Cliff Rockwell	Relative Humidity:	38.8%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Christopher Heintzelman	Job Site:	MN05
Power:	5VDC	Configuration:	CVRX0024-4

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.249:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	43	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

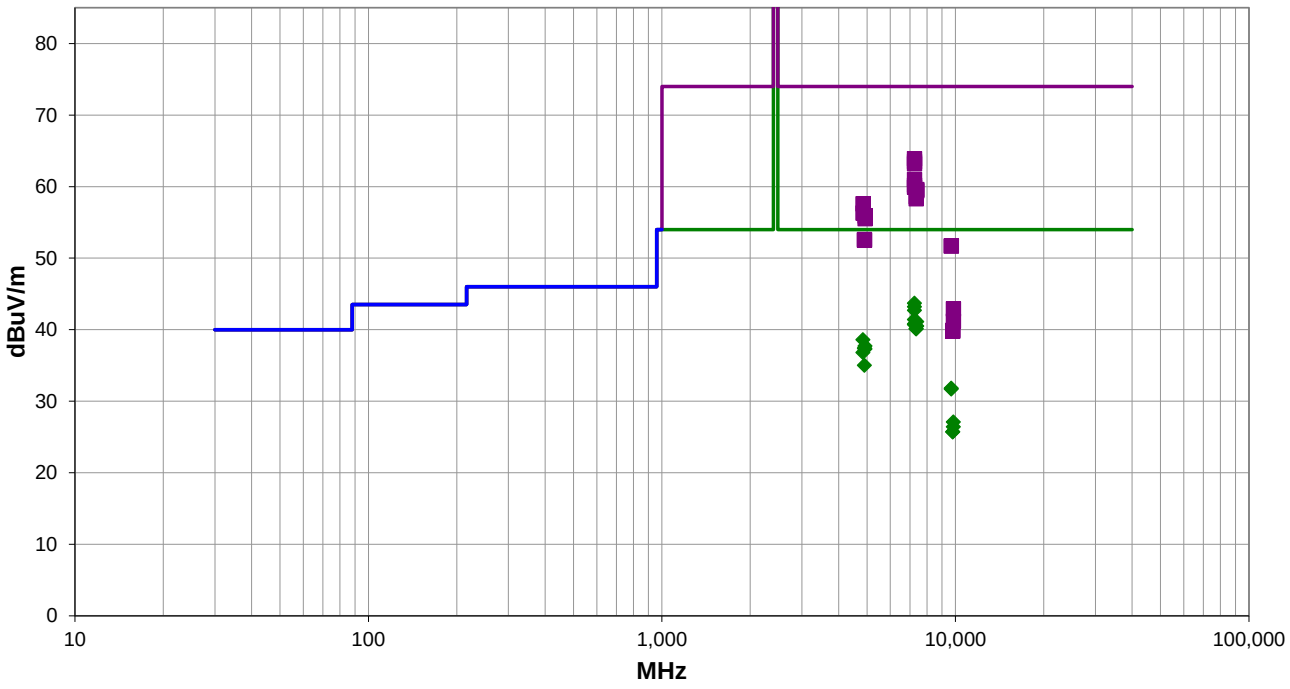
Single data rate.

EUT OPERATING MODES

Transmitting modulated on Low channel (2420 MHz), Mid channel (2450 MHz), and High channel (2463 MHz).

DEVIATIONS FROM TEST STANDARD

None



Run #: 43 ■ PK ◆ AV ● QP

FIELD STRENGTH OF HARMONICS AND SPURIOUS RADIATED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

RESULTS - Run #43

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
7259.800	54.7	9.2	1.8	116.0	3.0	0.0	Horz	PK	0.0	63.9	74.0	-10.1	EUT On Side, Low Ch
7259.808	34.5	9.2	1.8	116.0	3.0	0.0	Horz	AV	0.0	43.7	54.0	-10.3	EUT On Side, Low Ch
7259.800	54.3	9.2	1.7	113.0	3.0	0.0	Vert	PK	0.0	63.5	74.0	-10.5	EUT Horz, Low Ch
7259.808	54.0	9.2	1.8	19.0	3.0	0.0	Vert	PK	0.0	63.2	74.0	-10.8	EUT Vert, Low Ch
7259.817	34.0	9.2	1.7	113.0	3.0	0.0	Vert	AV	0.0	43.2	54.0	-10.8	EUT Horz, Low Ch
7259.817	33.5	9.2	1.8	19.0	3.0	0.0	Vert	AV	0.0	42.7	54.0	-11.3	EUT Vert, Low Ch
7259.817	32.2	9.2	1.5	30.9	3.0	0.0	Horz	AV	0.0	41.4	54.0	-12.6	EUT Vert, Low Ch
7388.858	31.8	9.3	1.5	275.9	3.0	0.0	Vert	AV	0.0	41.1	54.0	-12.9	EUT Horz, High Ch
7259.808	51.8	9.2	1.5	30.9	3.0	0.0	Horz	PK	0.0	61.0	74.0	-13.0	EUT Vert, Low Ch
7259.817	31.6	9.2	1.0	329.0	3.0	0.0	Horz	AV	0.0	40.8	54.0	-13.2	EUT Horz, Low Ch
7259.825	31.5	9.2	1.2	360.0	3.0	0.0	Vert	AV	0.0	40.7	54.0	-13.3	EUT On Side, Low Ch
7388.858	31.2	9.3	1.5	38.9	3.0	0.0	Horz	AV	0.0	40.5	54.0	-13.5	EUT On Side, High Ch
7259.892	51.0	9.2	1.0	329.0	3.0	0.0	Horz	PK	0.0	60.2	74.0	-13.8	EUT Horz, Low Ch
7349.850	30.9	9.2	1.5	95.9	3.0	0.0	Vert	AV	0.0	40.1	54.0	-13.9	EUT Horz, Mid Ch
7349.850	30.9	9.2	1.3	218.9	3.0	0.0	Horz	AV	0.0	40.1	54.0	-13.9	EUT On Side, Mid Ch
7259.800	50.7	9.2	1.2	360.0	3.0	0.0	Vert	PK	0.0	59.9	74.0	-14.1	EUT On Side, Low Ch
7388.675	50.3	9.3	1.5	275.9	3.0	0.0	Vert	PK	0.0	59.6	74.0	-14.4	EUT Horz, High Ch
7388.958	50.1	9.3	1.5	38.9	3.0	0.0	Horz	PK	0.0	59.4	74.0	-14.6	EUT On Side, High Ch
4839.883	36.3	2.3	1.8	110.9	3.0	0.0	Horz	AV	0.0	38.6	54.0	-15.4	EUT On Side, Low Ch
7349.942	49.4	9.2	1.5	95.9	3.0	0.0	Vert	PK	0.0	58.6	74.0	-15.4	EUT Horz, Mid Ch
7349.908	49.1	9.2	1.3	218.9	3.0	0.0	Horz	PK	0.0	58.3	74.0	-15.7	EUT On Side, Mid Ch
4925.908	35.3	2.4	2.6	322.0	3.0	0.0	Vert	AV	0.0	37.7	54.0	-16.3	EUT Horz, High Ch
4839.967	55.3	2.3	1.8	110.9	3.0	0.0	Horz	PK	0.0	57.6	74.0	-16.4	EUT On Side, Low Ch
4899.925	35.0	2.4	1.5	48.9	3.0	0.0	Horz	AV	0.0	37.4	54.0	-16.6	EUT On Side, Mid Ch
4925.917	34.9	2.4	3.4	332.0	3.0	0.0	Horz	AV	0.0	37.3	54.0	-16.7	EUT On Side, High Ch
4839.867	34.5	2.3	1.1	355.9	3.0	0.0	Vert	AV	0.0	36.8	54.0	-17.2	EUT Horz, Low Ch
4839.808	54.0	2.3	1.1	355.9	3.0	0.0	Vert	PK	0.0	56.3	74.0	-17.7	EUT Horz, Low Ch
4925.900	53.5	2.4	3.4	332.0	3.0	0.0	Horz	PK	0.0	55.9	74.0	-18.1	EUT On Side, High Ch
4925.817	53.1	2.4	2.6	322.0	3.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	EUT Horz, High Ch
4899.900	32.6	2.4	1.5	344.9	3.0	0.0	Vert	AV	0.0	35.0	54.0	-19.0	EUT Horz, Mid Ch
4899.867	50.2	2.4	1.5	48.9	3.0	0.0	Horz	PK	0.0	52.6	74.0	-21.4	EUT On Side, Mid Ch
4899.767	50.1	2.4	1.5	344.9	3.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	EUT Horz, Mid Ch
9679.758	35.1	-3.3	1.6	246.0	3.0	0.0	Horz	AV	0.0	31.8	54.0	-22.2	EUT On Side, Low Ch
9679.617	55.0	-3.3	1.6	246.0	3.0	0.0	Horz	PK	0.0	51.7	74.0	-22.3	EUT On Side, Low Ch
9679.842	55.0	-3.3	3.2	290.9	3.0	0.0	Vert	PK	0.0	51.7	74.0	-22.3	EUT Horz, Low Ch
9679.775	35.0	-3.3	3.2	290.9	3.0	0.0	Vert	AV	0.0	31.7	54.0	-22.3	EUT Horz, Low Ch
9851.842	29.7	-2.6	2.4	234.0	3.0	0.0	Horz	AV	0.0	27.1	54.0	-26.9	EUT On Side, High Ch
9851.867	29.0	-2.6	1.6	31.9	3.0	0.0	Vert	AV	0.0	26.4	54.0	-27.6	EUT Horz, High Ch
9799.858	28.2	-2.5	1.8	159.0	3.0	0.0	Horz	AV	0.0	25.7	54.0	-28.3	EUT On Side, Mid Ch
9799.858	28.2	-2.5	1.5	242.0	3.0	0.0	Vert	AV	0.0	25.7	54.0	-28.3	EUT Horz, Mid Ch

FIELD STRENGTH OF HARMONICS AND SPURIOUS RADIATED EMISSIONS

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

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
9851.733	45.5	-2.6	2.4	234.0	3.0	0.0	Horz	PK	0.0	42.9	74.0	-31.1	EUT On Side, High Ch
9851.942	43.8	-2.6	1.6	31.9	3.0	0.0	Vert	PK	0.0	41.2	74.0	-32.8	EUT Horz, High Ch
9799.458	42.4	-2.5	1.8	159.0	3.0	0.0	Horz	PK	0.0	39.9	74.0	-34.1	EUT On Side, Mid Ch
9800.292	42.3	-2.5	1.5	242.0	3.0	0.0	Vert	PK	0.0	39.8	74.0	-34.2	EUT Horz, Mid Ch

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF FUNDAMENTAL

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	2020-12-27	2021-12-27
Antenna - Double Ridge	ETS-Lindgren	3115	AJQ	2021-01-25	2023-01-25
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	2021-01-15	2022-01-15

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

FREQUENCY RANGE INVESTIGATED

2400 MHz TO 2500 MHz

POWER INVESTIGATED

5VDC

CONFIGURATIONS INVESTIGATED

CVRX0024-4

MODES INVESTIGATED

Transmitting modulated on Low channel (2420 MHz), Mid channel (2450 MHz) and high channel (2463 MHz)

FIELD STRENGTH OF FUNDAMENTAL

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

EUT:	Model 9020 Programmer System	Work Order:	CVRX0024
Serial Number:	SWO4960019	Date:	2021-06-21
Customer:	CVRx Inc.	Temperature:	22.3°C
Attendees:	Cliff Rockwell	Relative Humidity:	37.9%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Christopher Heintzelman	Job Site:	MN05
Power:	5VDC	Configuration:	CVRX0024-4

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.249:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	29	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

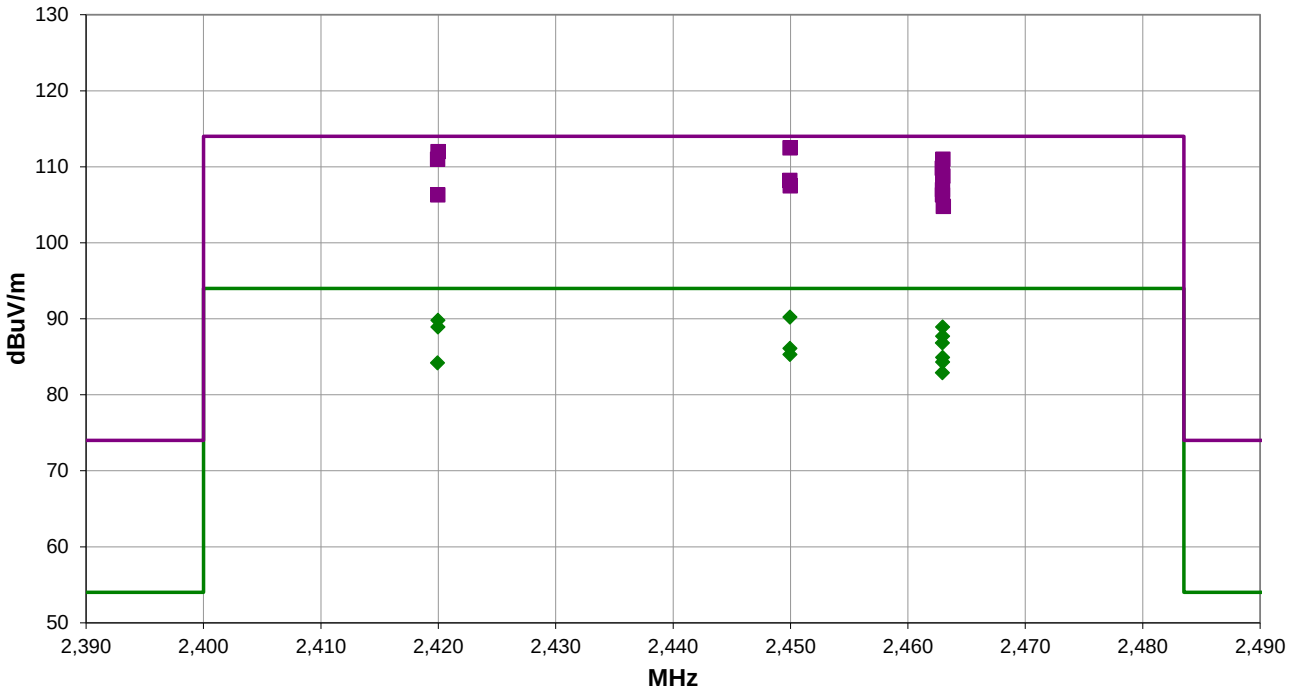
Single data rate.

EUT OPERATING MODES

Transmitting modulated on Low channel (2420 MHz), Mid channel (2450 MHz) and high channel (2463 MHz)

DEVIATIONS FROM TEST STANDARD

None



Run #: 29 ■ PK ◆ AV ● QP

FIELD STRENGTH OF FUNDAMENTAL

element
WTD.2021.04.01.1
EmiR5 2021.05.14.0
PSA-ESCI 2021.03.17.0

RESULTS - Run #29

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
2449.967	77.9	34.6	1.0	73.9	3.0	0.0	Horz	PK	0.0	112.5	114.0	-1.5	EUT Vert, Mid Ch
2419.967	77.5	34.5	2.4	276.9	3.0	0.0	Vert	PK	0.0	112.0	114.0	-2.0	EUT On Side, Low Ch
2419.933	76.5	34.5	1.5	245.0	3.0	0.0	Horz	PK	0.0	111.0	114.0	-3.0	EUT Vert, Low Ch
2462.975	76.4	34.6	2.2	232.0	3.0	0.0	Horz	PK	0.0	111.0	114.0	-3.0	EUT Vert, High Ch
2449.950	55.6	34.6	1.0	73.9	3.0	0.0	Horz	AV	0.0	90.2	94.0	-3.8	EUT Vert, Mid Ch
2419.967	55.3	34.5	2.4	276.9	3.0	0.0	Vert	AV	0.0	89.8	94.0	-4.2	EUT On Side, Low Ch
2462.925	75.2	34.6	2.3	301.9	3.0	0.0	Vert	PK	0.0	109.8	114.0	-4.2	EUT Horz, High Ch
2419.975	54.4	34.5	1.5	245.0	3.0	0.0	Horz	AV	0.0	88.9	94.0	-5.1	EUT Vert, Low Ch
2462.958	54.3	34.6	2.2	232.0	3.0	0.0	Horz	AV	0.0	88.9	94.0	-5.1	EUT Vert, High Ch
2462.983	74.2	34.6	1.5	207.0	3.0	0.0	Horz	PK	0.0	108.8	114.0	-5.2	EUT Horz, High Ch
2449.942	73.6	34.6	3.0	110.9	3.0	0.0	Vert	PK	0.0	108.2	114.0	-5.8	EUT Horz, Mid Ch
2462.958	53.1	34.6	2.3	301.9	3.0	0.0	Vert	AV	0.0	87.7	94.0	-6.3	EUT Horz, High Ch
2449.975	72.9	34.6	2.7	77.0	3.0	0.0	Vert	PK	0.0	107.5	114.0	-6.5	EUT On Side, Mid Ch
2462.942	72.4	34.6	1.5	54.0	3.0	0.0	Horz	PK	0.0	107.0	114.0	-7.0	EUT On Side, High Ch
2462.950	52.2	34.6	1.5	207.0	3.0	0.0	Horz	AV	0.0	86.8	94.0	-7.2	EUT Horz, High Ch
2462.942	71.7	34.6	1.1	206.0	3.0	0.0	Vert	PK	0.0	106.3	114.0	-7.7	EUT Vert, High Ch
2419.958	71.8	34.5	1.5	41.0	3.0	0.0	Vert	PK	0.0	106.3	114.0	-7.7	EUT Horz, Low Ch
2449.950	51.5	34.6	3.0	110.9	3.0	0.0	Vert	AV	0.0	86.1	94.0	-7.9	EUT Horz, Mid Ch
2449.958	50.7	34.6	2.7	77.0	3.0	0.0	Vert	AV	0.0	85.3	94.0	-8.7	EUT On Side, Mid Ch
2462.958	50.3	34.6	1.5	54.0	3.0	0.0	Horz	AV	0.0	84.9	94.0	-9.1	EUT On Side, High Ch
2463.008	70.2	34.6	1.8	246.0	3.0	0.0	Vert	PK	0.0	104.8	114.0	-9.2	EUT On Side, High Ch
2462.958	49.7	34.6	1.1	206.0	3.0	0.0	Vert	AV	0.0	84.3	94.0	-9.7	EUT Vert, High Ch
2419.942	49.7	34.5	1.5	41.0	3.0	0.0	Vert	AV	0.0	84.2	94.0	-9.8	EUT Horz, Low Ch
2462.950	48.3	34.6	1.8	246.0	3.0	0.0	Vert	AV	0.0	82.9	94.0	-11.1	EUT On Side, High Ch

CONCLUSION
Pass

Tested By

Duty Cycle

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
Attenuator	S.M. Electronics	SA26B-20	RFW	2021-02-05	2022-02-05
Block - DC	Fairview Microwave	SD3379	AMI	2020-08-05	2021-08-05
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	2020-09-14	2021-09-14
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	2020-12-27	2021-12-27
Generator - Signal	Agilent	N5183A	TIK	2019-04-30	2022-04-30

TEST DESCRIPTION

The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

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.

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only take the measurement during the burst duration.

Duty Cycle

XMit 2020.12.30.0

EUT:	Model 9020 Programmer System	Work Order:	CVRX0024
Serial Number:	SWO4960012	Date:	23-Jun-21
Customer:	CVRx Inc.	Temperature:	22.3 °C
Attendees:	Cliff Rockwell	Humidity:	44.1% RH
Project:	None	Barometric Pres.:	1012 mbar
Tested by:	Kyle McMullan	Power: 5VDC	Job Site: MN09

TEST SPECIFICATIONS	Test Method
FCC 15.249:2021	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

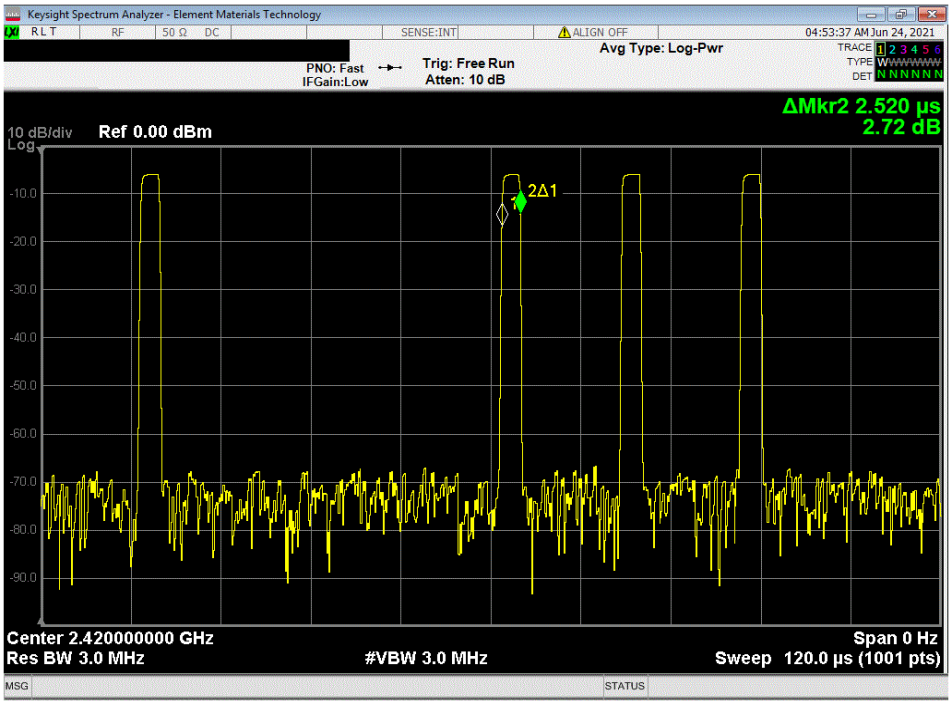
Configuration #	5	Signature

	Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Measured Time Period (ms)	Duty Cycle (%)
Low Channel (2420 MHz)					
120 us	0.0025	N/A	N/A	N/A	N/A
5 ms	N/A	159	0.3975	5	7.95
Mid Channel (2450 MHz)					
120 us	0.0025	N/A	N/A	N/A	N/A
5 ms	N/A	158	0.395	5	7.9
High Channel (2463 MHz)					
120 us	0.0025	N/A	N/A	N/A	N/A
5 ms	N/A	156	0.39	5	7.8

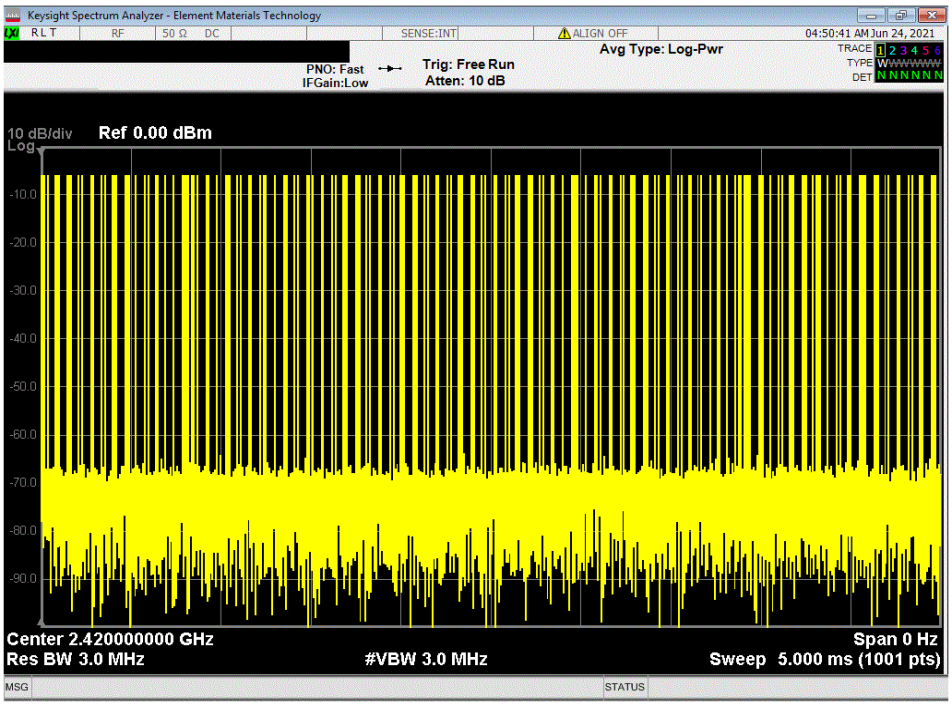
Duty Cycle

XMit 2020.12.30.0

Low Channel (2420 MHz), 120 us						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Measured Time Period (ms)	Duty Cycle (%)
		0.0025	N/A	N/A	N/A	N/A



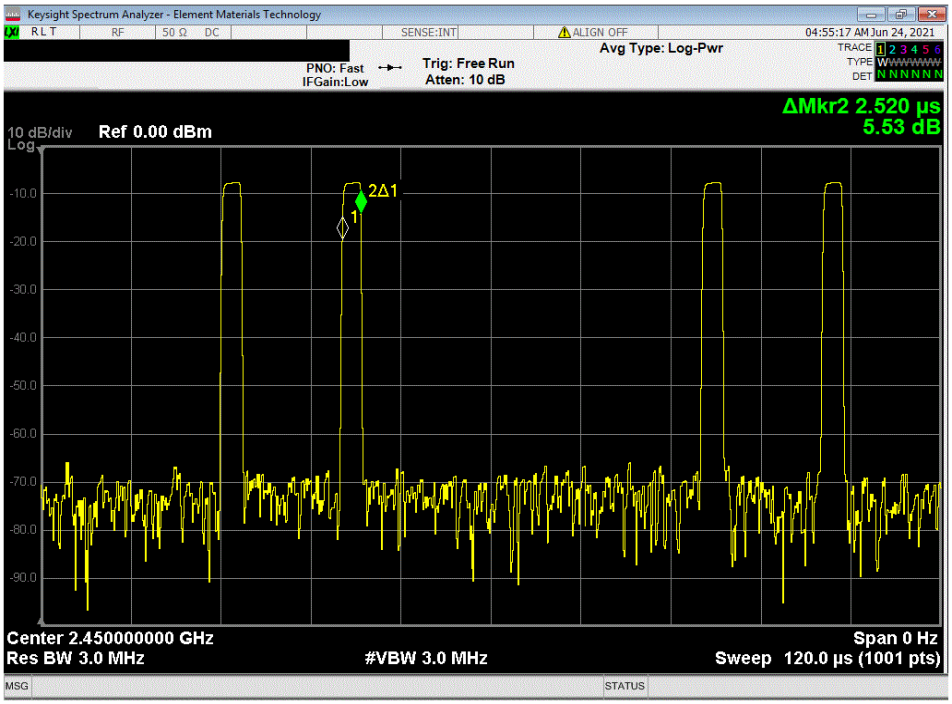
Low Channel (2420 MHz), 5 ms						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Measured Time Period (ms)	Duty Cycle (%)
		N/A	159	0.3975	5	7.95



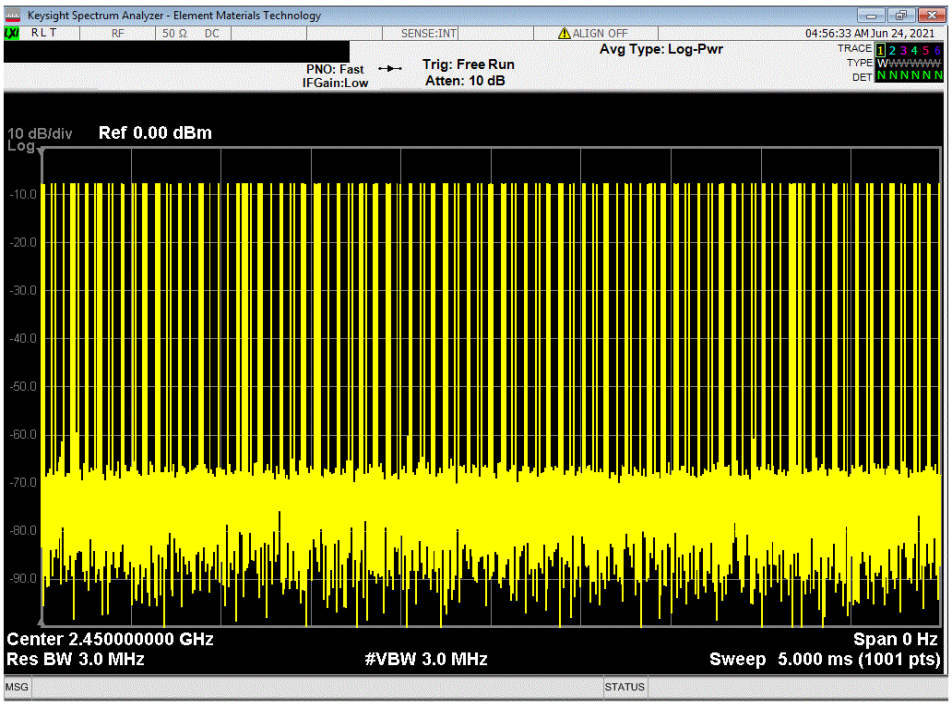
Duty Cycle

XMit 2020.12.30.0

Mid Channel (2450 MHz), 120 us						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Measured Time Period (ms)	Duty Cycle (%)
		0.0025	N/A	N/A	N/A	N/A



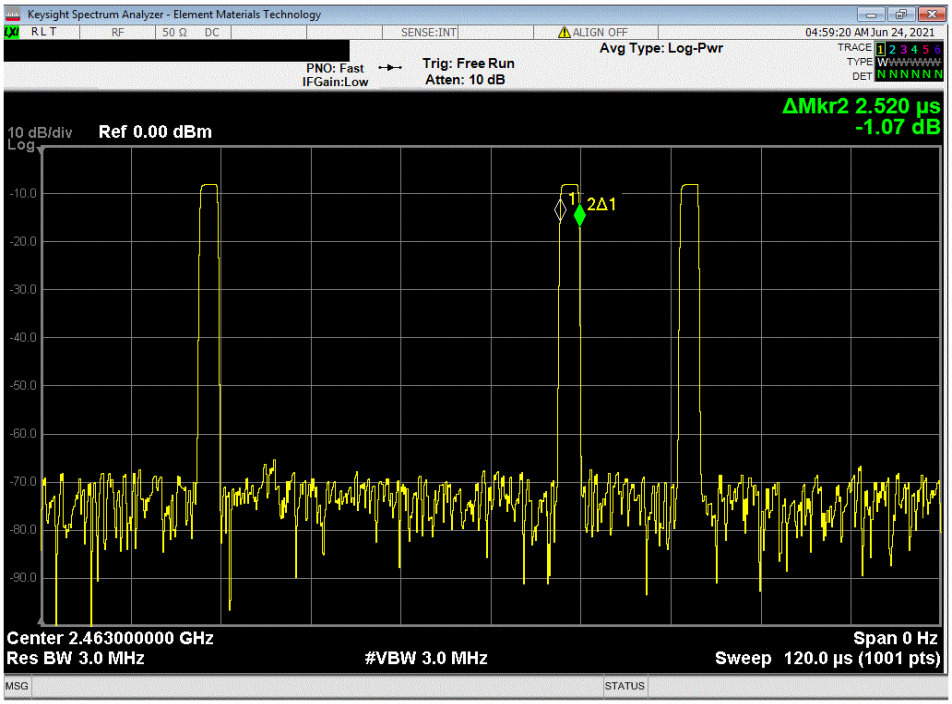
Mid Channel (2450 MHz), 5 ms						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Measured Time Period (ms)	Duty Cycle (%)
		N/A	158	0.395	5	7.9



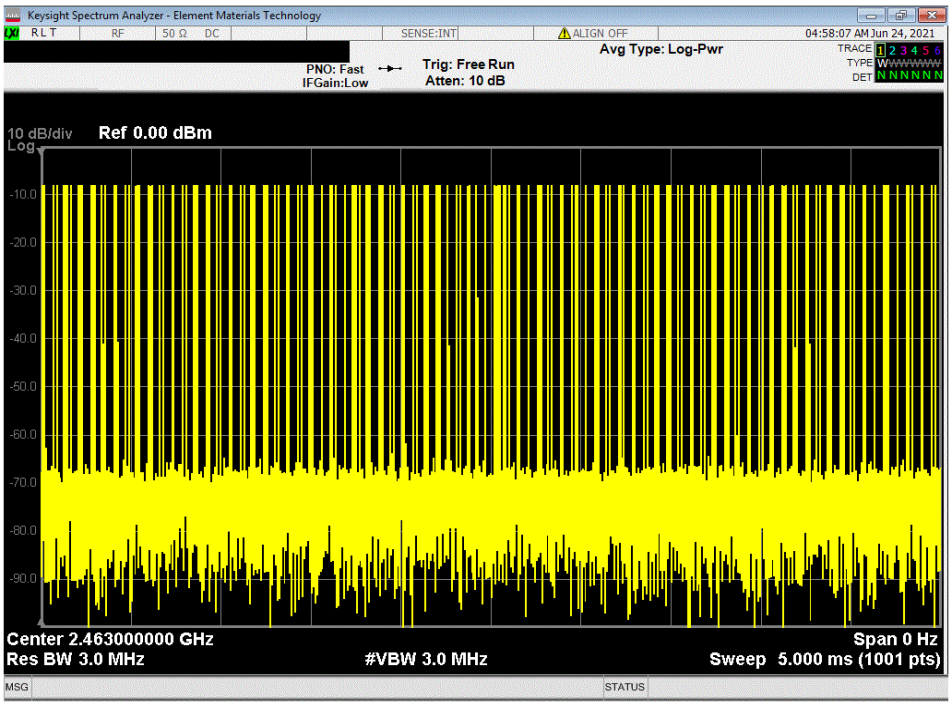
Duty Cycle

XMit 2020.12.30.0

High Channel (2463 MHz), 120 us						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Measured Time Period (ms)	Duty Cycle (%)
		0.0025	N/A	N/A	N/A	N/A



High Channel (2463 MHz), 5 ms						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Measured Time Period (ms)	Duty Cycle (%)
		N/A	156	0.39	5	7.8



End of Test Report