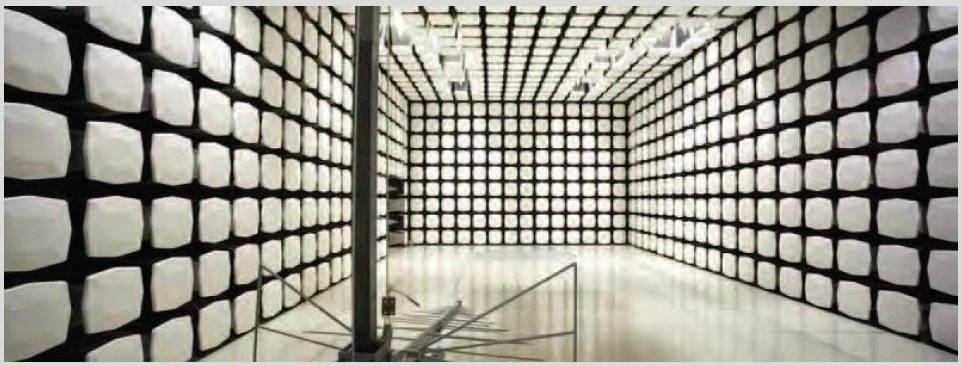
Novidan, Inc.

Kava RIC (Right Ear)

FCC 15.247:2024

Bluetooth LE (DTS) radio

Report: NOVI0032.1 Rev. 0, Issue Date: April 2, 2024



ACCREDITED
CERT #3310.05

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element
2023.04.17

Section	Page Number

CERTIFICATE OF TEST

Last Date of Test: January 15, 2024
Novidan, Inc.
EUT: Kava

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2024	ANSI C63.10:2013

Guidance

FCC KDB 558074 v05r02:2019

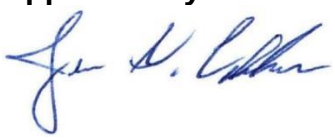
Results

Test Description	Result	Specification Section(s)	Method Section(s)	Comments
Powerline Conducted Emissions	N/A	15.207	6.2	Not required for a battery powered EUT.
Duty Cycle	N/A	KDB 558074 -6.0	11.6	Completed but no Pass/Fail
DTS Bandwidth (6 dB)	Pass	15.247(a)(2), KDB 558074 -8.2	11.8.2	
Occupied Bandwidth (99%)	N/A	KDB 558074 -2.1	6.9.3	Completed but no Pass/Fail
Output Power	Pass	15.247(b)(3), KDB 558074 -8.3.1	11.9.1.1	
Equivalent Isotropic Radiated Power	Pass	15.247(b)(3), KDB 558074 -8.3.1	11.9.1.1	
Power Spectral Density	Pass	15.247(e), KDB 558074 -8.4	11.10.2	
Band Edge Compliance	Pass	15.247(d), KDB 558074 -8.5	11.11	
Spurious Conducted Emissions	Pass	15.247(d), KDB 558074 -8.5	11.11	
Spurious Radiated Emissions	Pass	15.247(d), KDB 558074 - 8.6, 8.7	11.12.1, 11.13.2, 6.5, 6.6	

Deviations From Test Standards

None

Approved By:



Johnny Candelas, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

element
2021.09.01

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 - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

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:

California Minnesota Oregon Texas Washington

FACILITIES

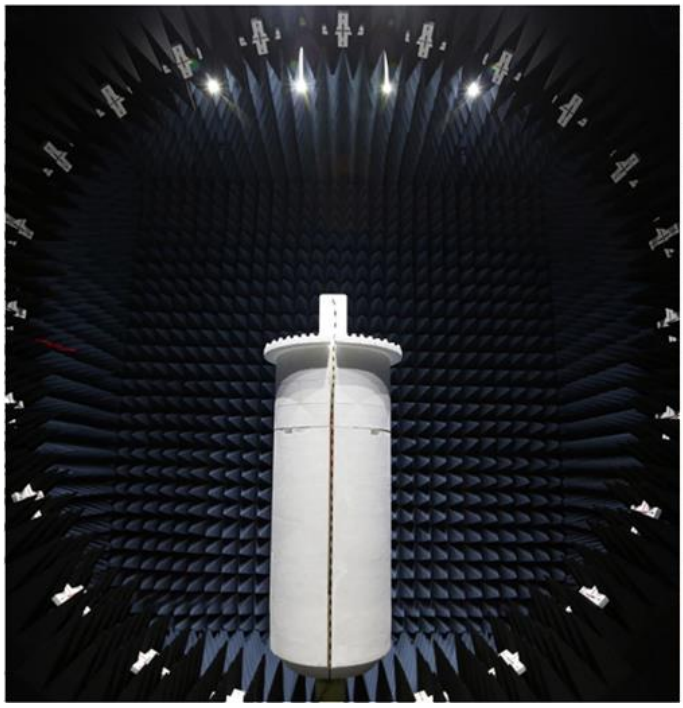
element
2023.09.21

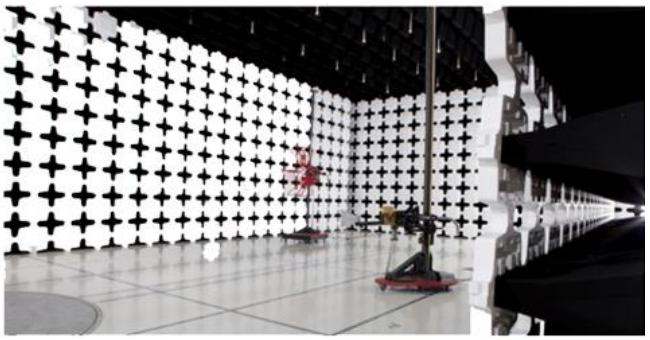
Testing was performed at the following location(s)

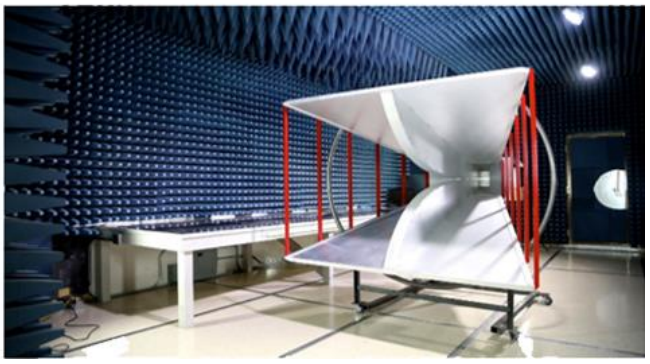
	Location	Labs (1)	Address	A2LA (2)	ISED (3)	BSMI (4)	VCCI (5)	CAB (6)	FDA (7)
☐	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
☐	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
☐	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
☐	Texas	TX01-09	3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	3310.03	2834G	SL2-IN-E-1158R	A-0201	US0191	TL-54
☒	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
☐	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

(1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
(2) A2LA Certificate No.
(3) ISED Company No.
(4) BSMI No.
(5) VCCI Site Filing No.
(6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA
(7) FDA ASCA No.







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)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	3.1 dB	-3.1 dB

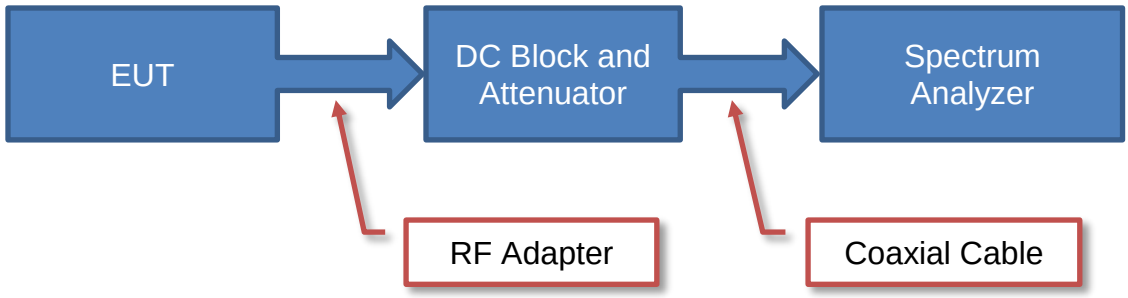
TEST SETUP BLOCK DIAGRAMS

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

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

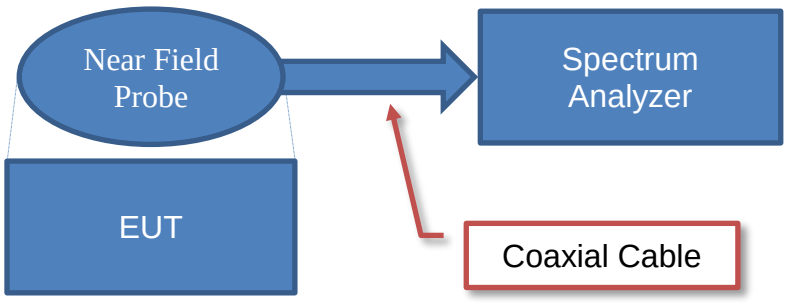
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

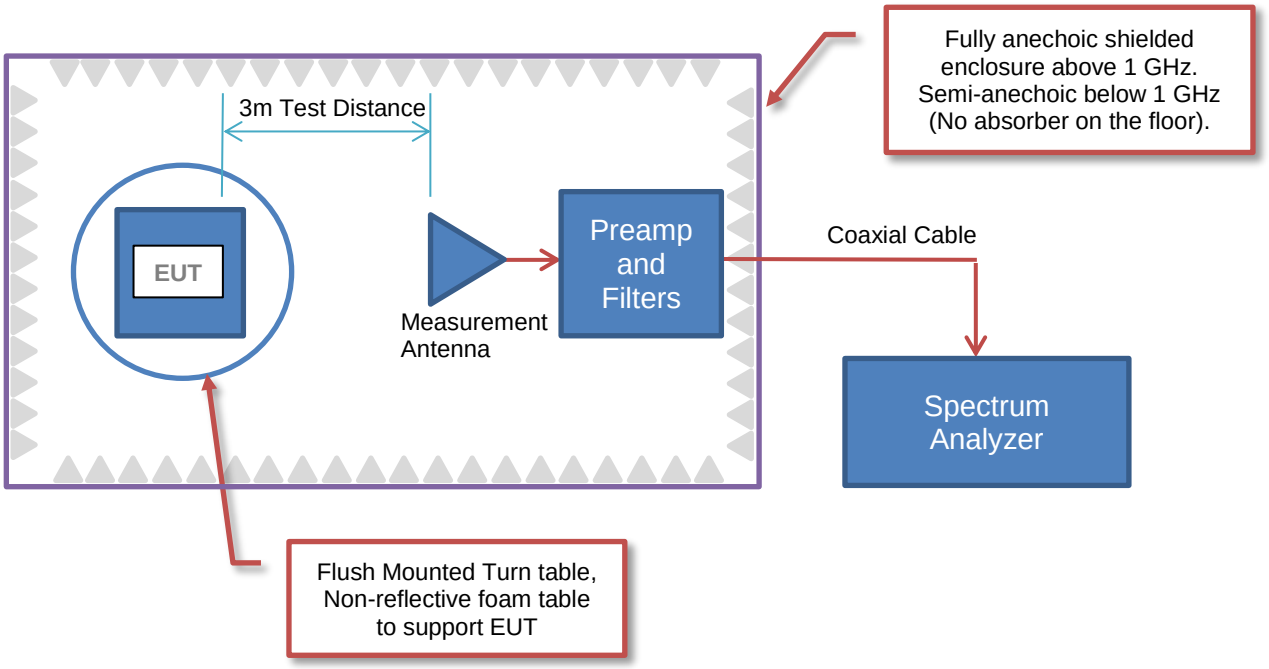


Sample Calculation (logarithmic units)

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

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)		Factor: Antenna Factor		Factor: Cable Factor		Factor: Amplifier Gain		Distance Adjustment Factor		External Attenuation		Field Strength
42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0	=	**33.5**

Conducted Emissions:

Measured Level (Amplitude)		Factor: Transducer Factor		Factor: Cable Factor		External Attenuation		Adjusted Level
26.7	+	0.3	+	0.1	+	20.0	=	**47.1**

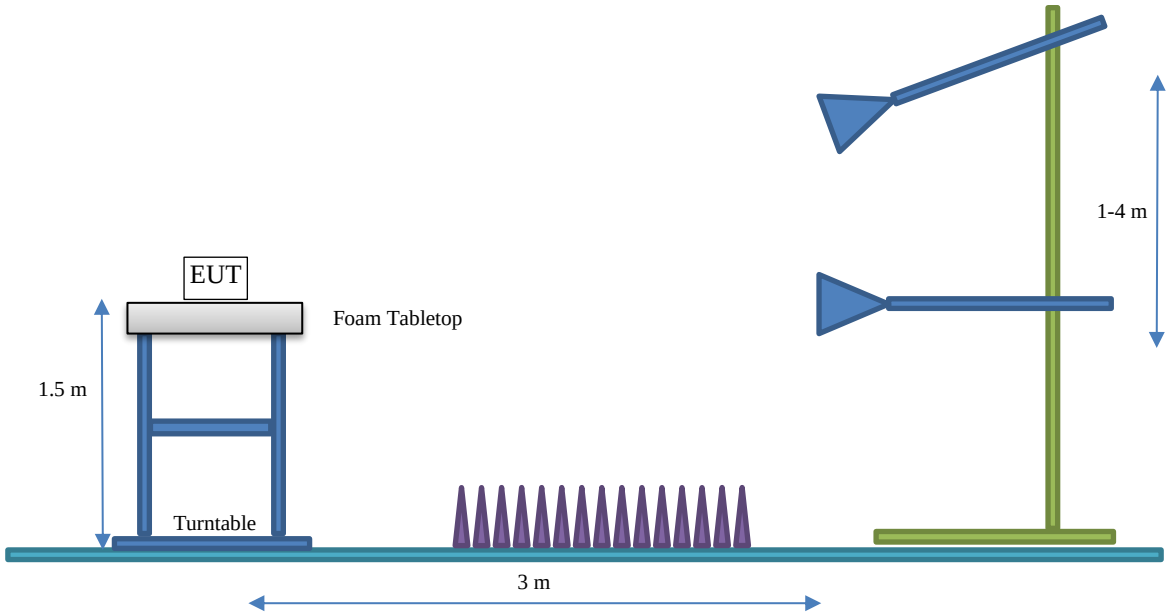
Radiated Power (ERP/EIRP) – Substitution Method:

Measured Level into Substitution Antenna (Amplitude dBm)		Substitution Antenna Factor (dBi)		EIRP to ERP (if applicable)		Measured power (dBm ERP/EIRP)
10.0	+	6.0	-	2.15	=	**13.9/16.0**

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:	Novidan, Inc.
Address:	678 Mendelssohn Avenue North
City, State, Zip:	Golden Valley, MN 55427
Test Requested By:	Pete Salmi
EUT:	Kava RIC
First Date of Test:	January 10, 2024
Last Date of Test:	January 15, 2024
Receipt Date of Samples:	January 10, 2024
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Rechargeable Hearing Aid with Bluetooth LE. When the device is placed in a charger it will turn off and cease transmitting. There are two model variants: without MFi chip & with MFi chip. The variant without the MFi chip can use Apples software authenticator to allow for audio streaming to iOS devices and is depopulated of the MFi chip. The variant with the MFi chip has that chip populated for hardware authentication to allow for audio streaming to iOS devices.

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

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. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Loop	Novidan, Inc.	2402-2480	-3.92

The EUT was tested using the power settings provided by the manufacturer which were based upon:

☒ Test software settings Test software/firmware installed on EUT:_____1.17.1635_____
☐ Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types / Data Rates	Type	Channel	Frequency (MHz)	Power Setting
BLE GFSK 1 Mbps, 2 Mbps	DTS	0 or 37	2402	0 dBm
		20 or 18	2442	0 dBm
		39	2480	0 dBm

CONFIGURATIONS

Configuration NOVI0032-2

Software/Firmware Running During Test	
Description	**Version**
Firmware provided by manufacturer	1.17.1635

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Hearing Aid - Right	Novidan, Inc.	Kava RIC without MFi chip	3290DV10028R

Configuration NOVI0032-4

Software/Firmware Running During Test	
Description	**Version**
Firmware provided by manufacturer	1.17.1635

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Hearing Aid - Right	Novidan, Inc.	Kava RIC without MFi chip	3290DV10092R

Configuration NOVI0032-6

Software/Firmware Running During Test	
Description	**Version**
Firmware provided by manufacturer	1.17.1635

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Hearing Aid - Right	Novidan, Inc.	Kava RIC with MFi chip	3346MFI002R (M002R)

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2024-01-10	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.
2	2024-01-10	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	2024-01-10	DTS 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.
4	2024-01-10	Occupied Bandwidth (99%)	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	2024-01-10	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.
6	2024-01-10	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.
7	2024-01-10	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.
8	2024-01-10	Equivalent Isotropic Radiated Power	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2024-01-15	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

DUTY CYCLE

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2023-12-14	2024-12-14
Block - DC	Weinschel Corp.	7006	AMS	2023-01-18	2024-01-18
Attenuator	S.M. Electronics	SA18H-20	REK	2023-03-08	2024-03-08
Generator - Signal	Agilent	N5183A	TIA	2022-06-25	2024-06-25
Cable	Micro-Coax	UFD150A-1-0720-200200	NCW	2023-01-18	2024-01-18

DUTY CYCLE

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10028R	Date:	2024-01-10
Customer:	Novidan, Inc.	Temperature:	19.4°C
Attendees:	None	Relative Humidity:	38.5%
Customer Project:	None	Bar. Pressure (PMSL):	1006 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	Battery	Configuration:	NOVI0032-2
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

DEVIATIONS FROM TEST STANDARD

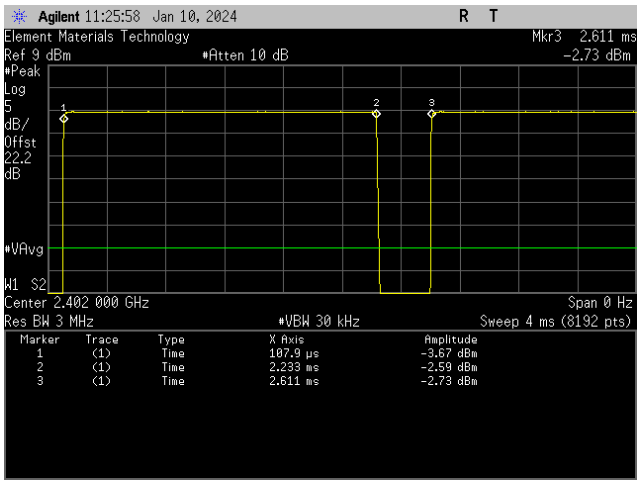
None

TEST RESULTS

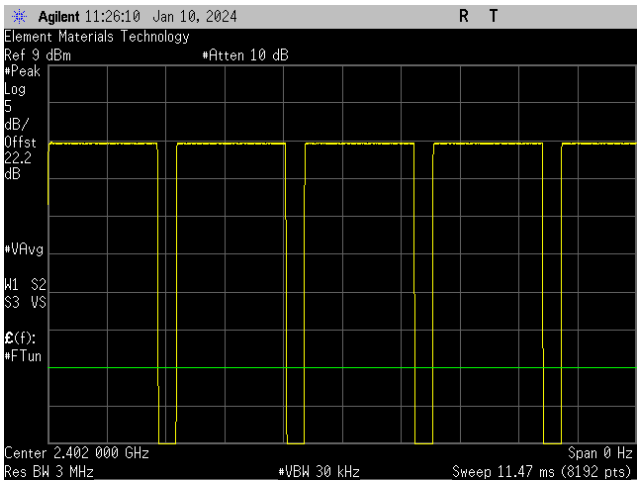
	Pulse Width	Period	Number of Pulses	Value (%)	Limit N/A ()	Results
BLE/GFSK 1 Mbps						
Low Channel, 2402 MHz	2.125 ms	2.503 ms	1	84.9	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
Mid Channel, 2442 MHz	2.126 ms	2.5 ms	1	85	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
High Channel, 2480 MHz	2.124 ms	2.5 ms	1	84.9	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
BLE/GFSK 2 Mbps						
Low Channel, 2402 MHz	1.065 ms	1.875 ms	1	56.8	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
Mid Channel, 2442 MHz	1.065 ms	1.875 ms	1	56.8	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
High Channel, 2480 MHz	1.063 ms	1.875 ms	1	56.7	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A

DUTY CYCLE

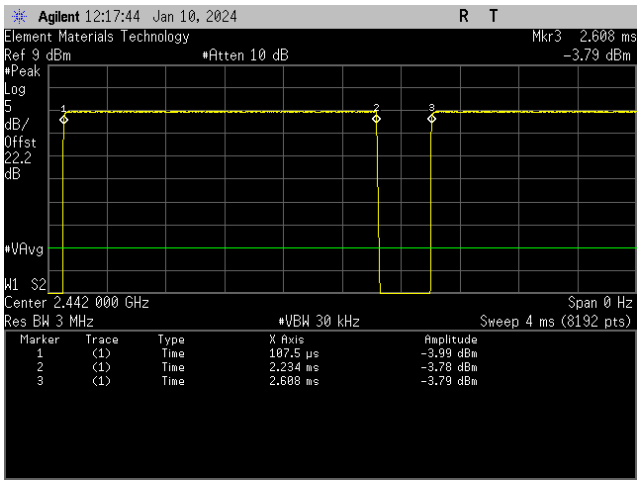
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



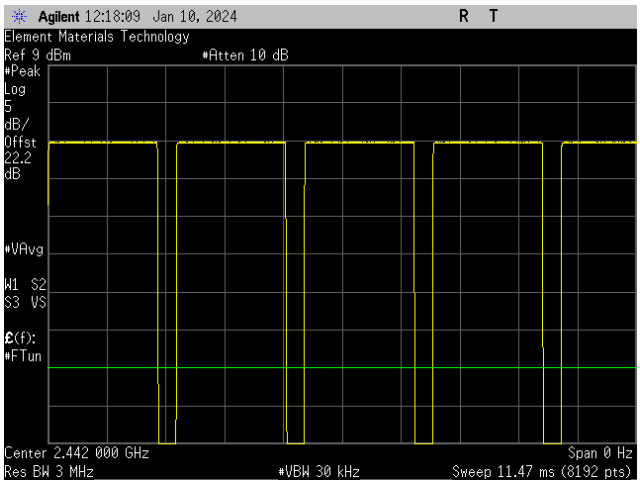
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
Low Channel, 2402 MHz

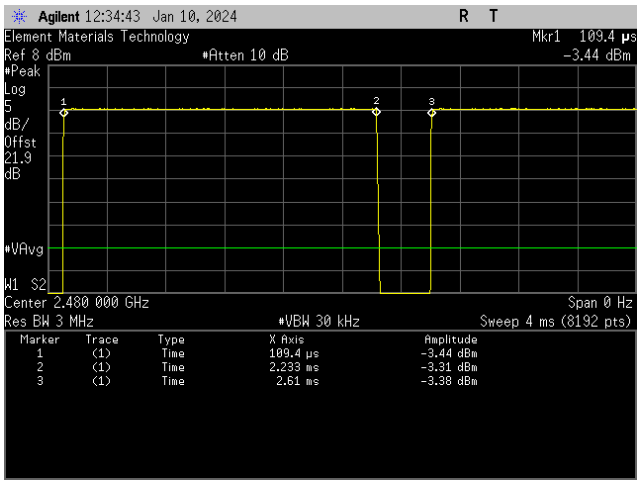


BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz

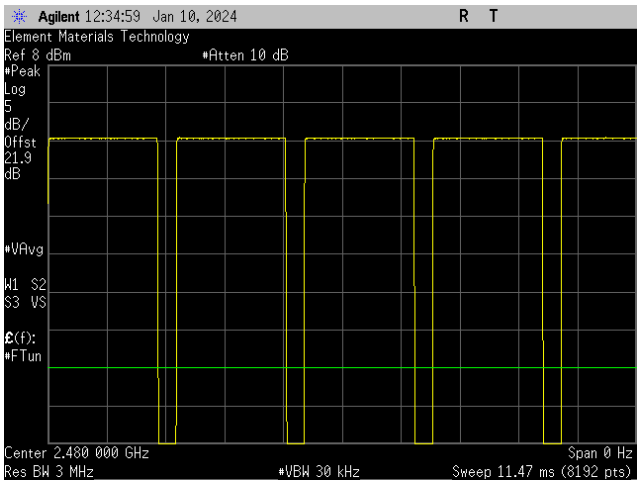


BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz

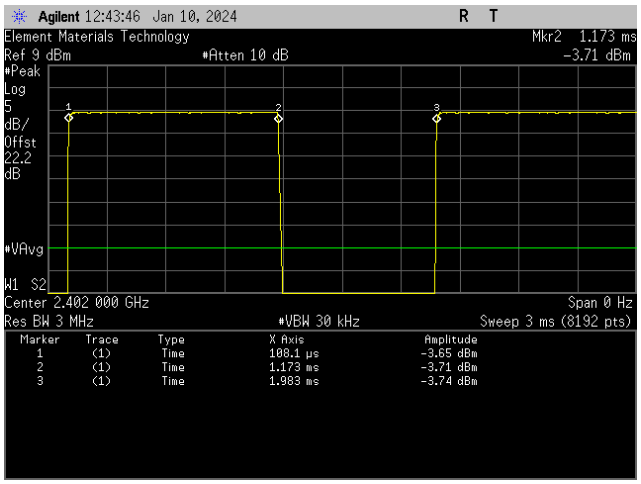
DUTY CYCLE



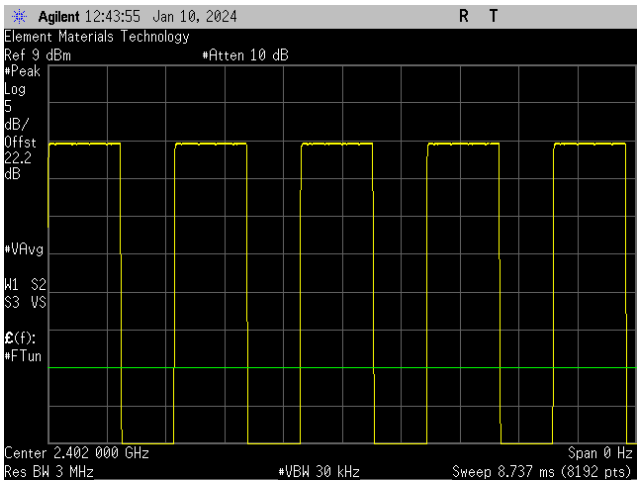
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 1 Mbps
High Channel, 2480 MHz



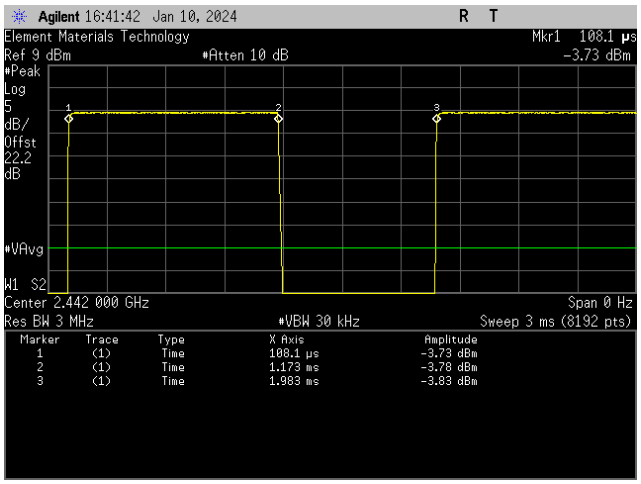
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



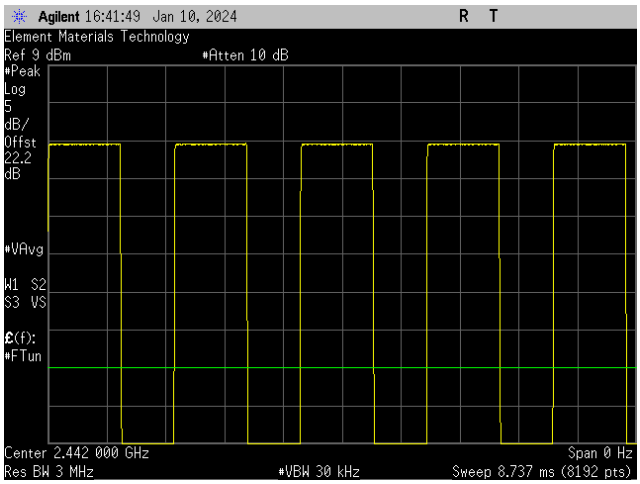
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

DUTY CYCLE

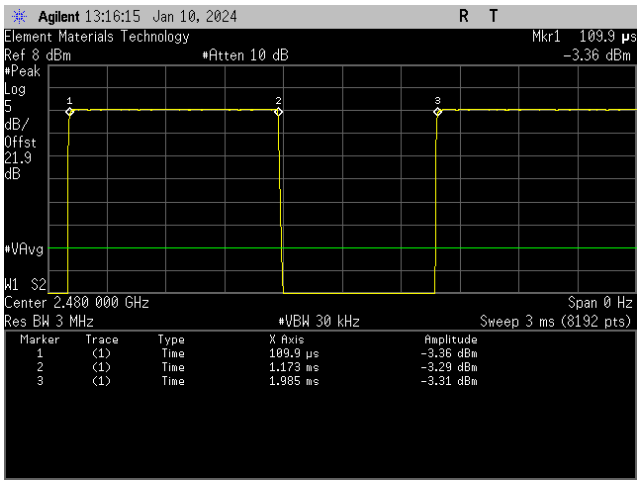
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



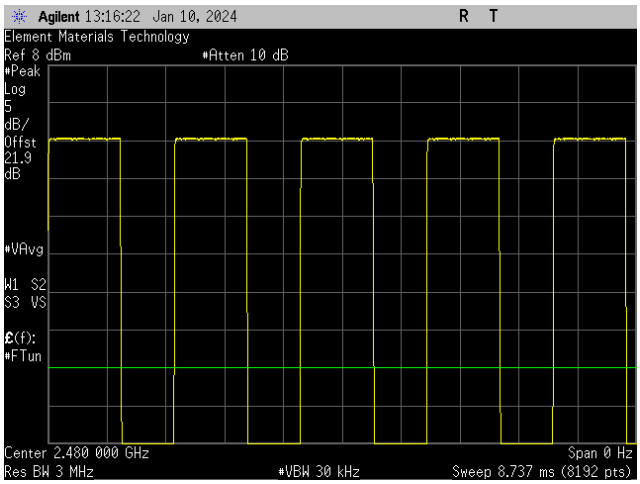
BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

DTS BANDWIDTH (6 dB)

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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

The 6dB DTS bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2023-12-14	2024-12-14
Block - DC	Weinschel Corp.	7006	AMS	2023-01-18	2024-01-18
Attenuator	S.M. Electronics	SA18H-20	REK	2023-03-08	2024-03-08
Generator - Signal	Agilent	N5183A	TIA	2022-06-25	2024-06-25
Cable	Micro-Coax	UFD150A-1-0720-200200	NCW	2023-01-18	2024-01-18

DTS BANDWIDTH (6 dB)

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10028R	Date:	2024-01-10
Customer:	Novidan, Inc.	Temperature:	19.6°C
Attendees:	None	Relative Humidity:	37.9%
Customer Project:	None	Bar. Pressure (PMSL):	1006 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	Battery	Configuration:	NOVI0032-2
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

DEVIATIONS FROM TEST STANDARD

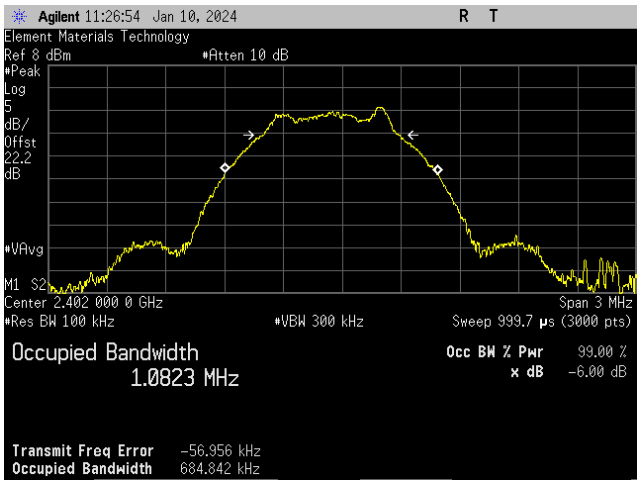
None

TEST RESULTS

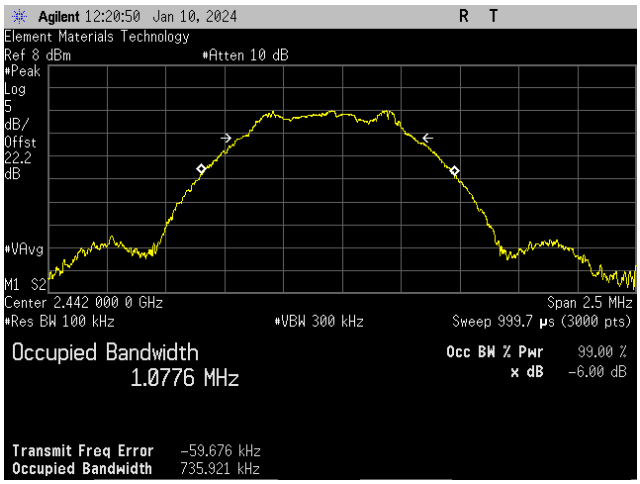
	Value	Limit (≥)	Result
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	684.842 kHz	500 kHz	Pass
Mid Channel, 2442 MHz	735.921 kHz	500 kHz	Pass
High Channel, 2480 MHz	730.343 kHz	500 kHz	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	1.333 MHz	500 kHz	Pass
Mid Channel, 2442 MHz	1.234 MHz	500 kHz	Pass
High Channel, 2480 MHz	1.264 MHz	500 kHz	Pass

DTS BANDWIDTH (6 dB)

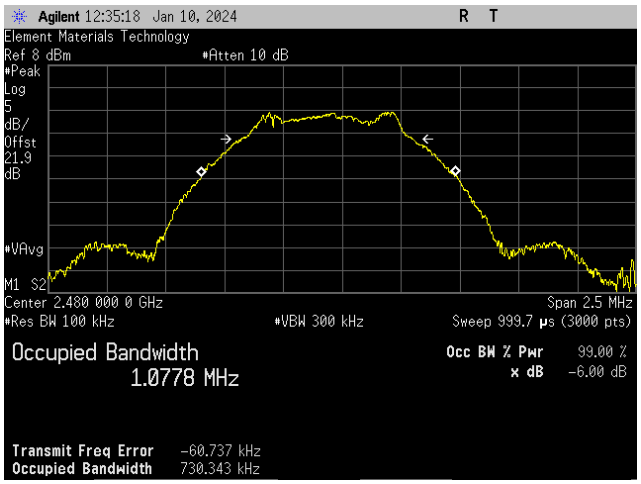
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



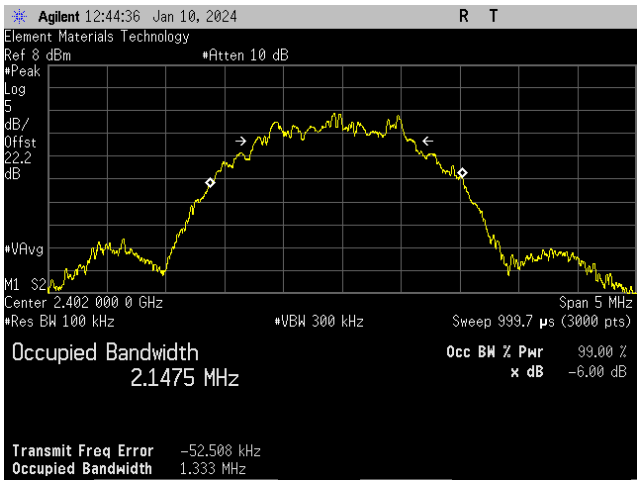
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz



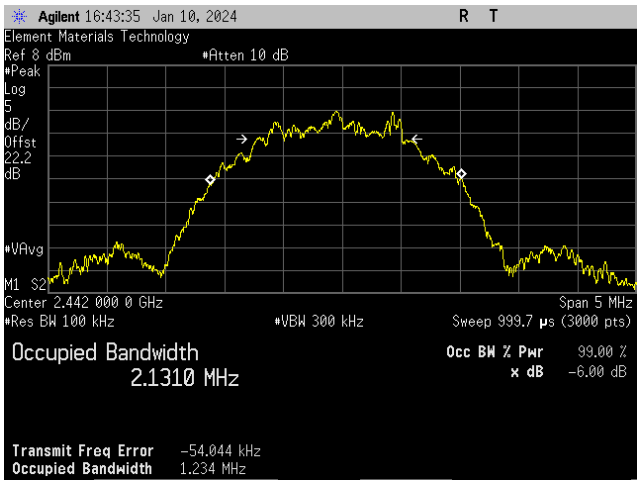
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



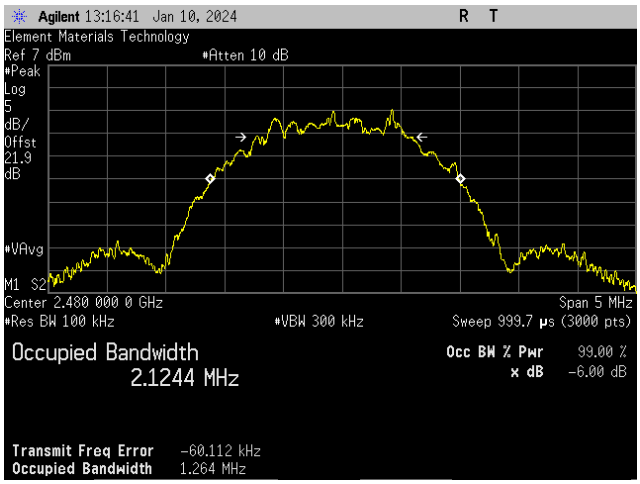
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

DTS BANDWIDTH (6 dB)

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

OCCUPIED BANDWIDTH (99%)

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.

Per ANSI C63.10:2013, 6.9.3, the spectrum analyzer was configured as follows:

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2023-12-14	2024-12-14
Generator - Signal	Agilent	N5183A	TIA	2022-06-25	2024-06-25
Block - DC	Weinschel Corp.	7006	AMS	2023-01-18	2024-01-18
Attenuator	S.M. Electronics	SA18H-20	REK	2023-03-08	2024-03-08
Cable	Micro-Coax	UFD150A-1-0720-200200	NCW	2023-01-18	2024-01-18

OCCUPIED BANDWIDTH (99%)

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10028R	Date:	2024-01-10
Customer:	Novidan, Inc.	Temperature:	19.7°C
Attendees:	None	Relative Humidity:	37.9%
Customer Project:	None	Bar. Pressure (PMSL):	1006 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	Battery	Configuration:	NOVI0032-2
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

DEVIATIONS FROM TEST STANDARD

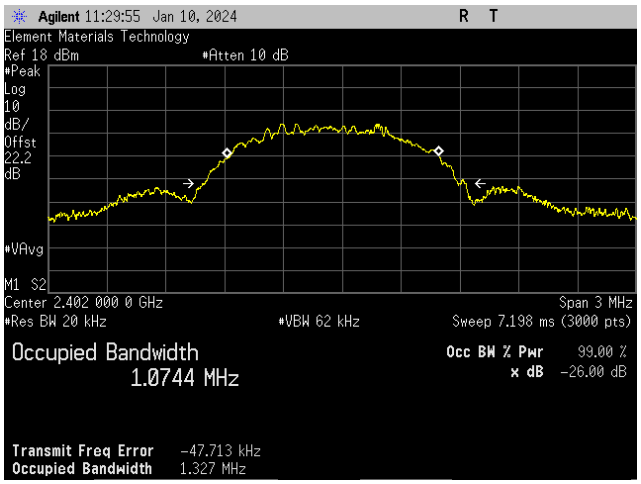
None

TEST RESULTS

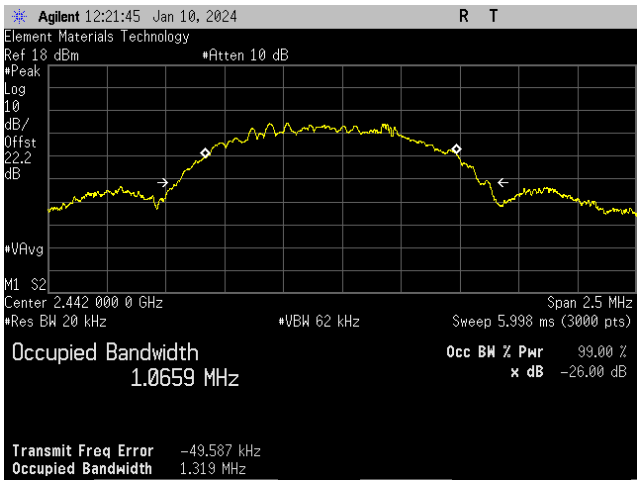
	Value	Limit	Result
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	1.074 MHz	N/A	N/A
Mid Channel, 2442 MHz	1.066 MHz	N/A	N/A
High Channel, 2480 MHz	1.067 MHz	N/A	N/A
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	2.146 MHz	N/A	N/A
Mid Channel, 2442 MHz	2.139 MHz	N/A	N/A
High Channel, 2480 MHz	2.137 MHz	N/A	N/A

OCCUPIED BANDWIDTH (99%)

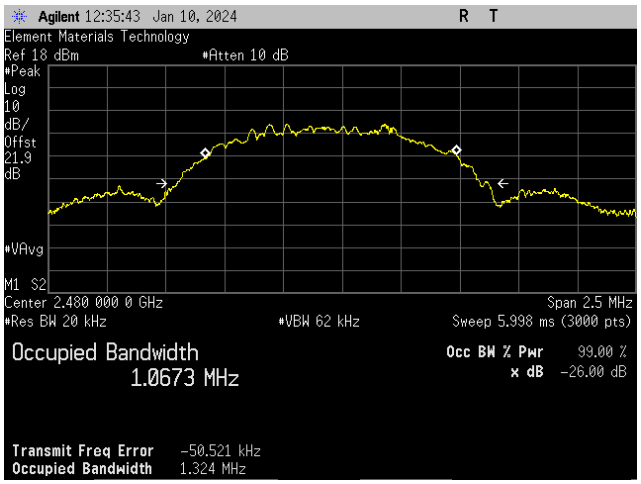
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



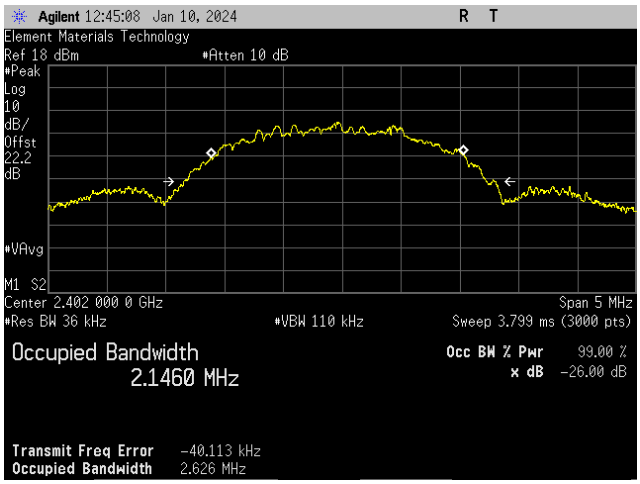
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz



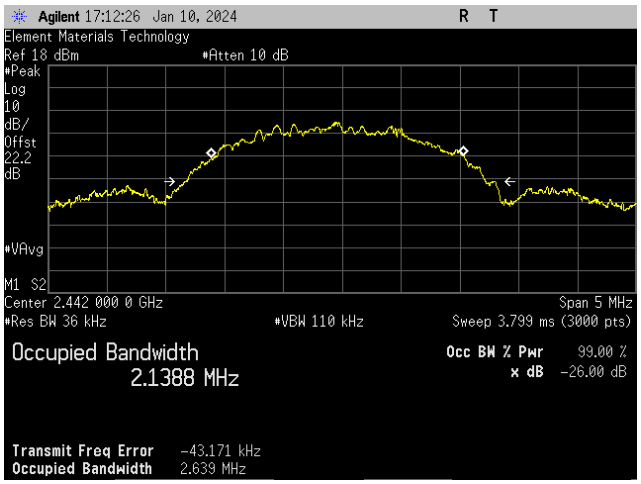
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



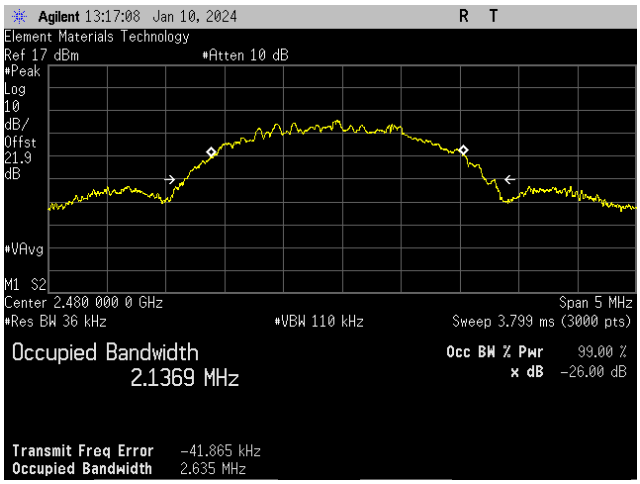
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

OCCUPIED BANDWIDTH (99%)

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

OUTPUT POWER

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2023-12-14	2024-12-14
Generator - Signal	Agilent	N5183A	TIA	2022-06-25	2024-06-25
Block - DC	Weinschel Corp.	7006	AMS	2023-01-18	2024-01-18
Attenuator	S.M. Electronics	SA18H-20	REK	2023-03-08	2024-03-08
Cable	Micro-Coax	UFD150A-1-0720-200200	NCW	2023-01-18	2024-01-18

OUTPUT POWER

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10028R	Date:	2024-01-10
Customer:	Novidan, Inc.	Temperature:	19.7°C
Attendees:	None	Relative Humidity:	37.8%
Customer Project:	None	Bar. Pressure (PMSL):	1007 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	Battery	Configuration:	NOVI0032-2
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

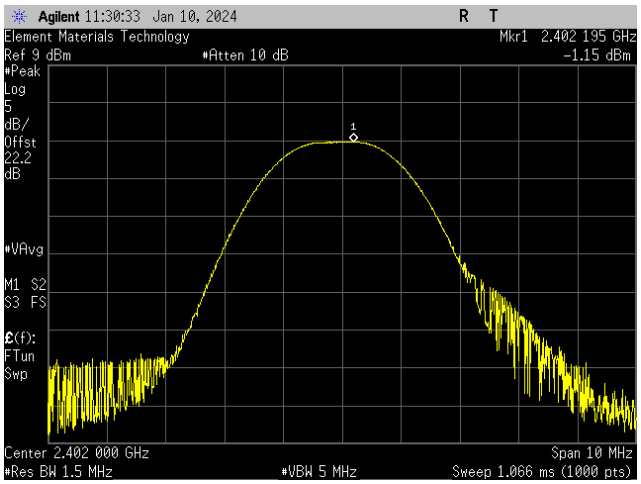
DEVIATIONS FROM TEST STANDARD

None

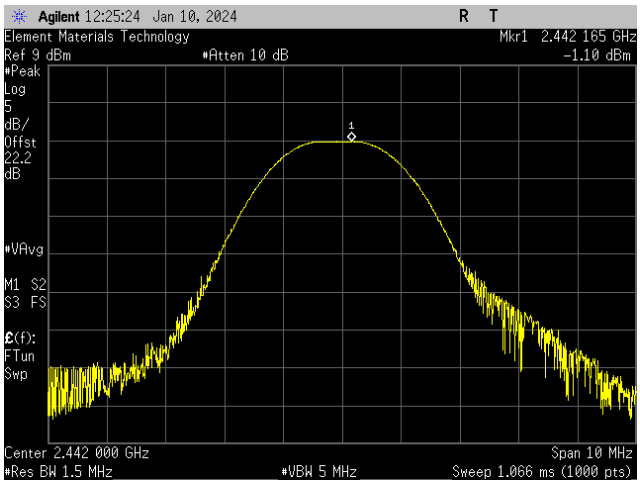
TEST RESULTS

	Out Pwr (dBm)	Limit (dBm)	Result
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-1.153	30	Pass
Mid Channel, 2442 MHz	-1.101	30	Pass
High Channel, 2480 MHz	-1.468	30	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	-0.979	30	Pass
Mid Channel, 2442 MHz	-1.121	30	Pass
High Channel, 2480 MHz	-1.399	30	Pass

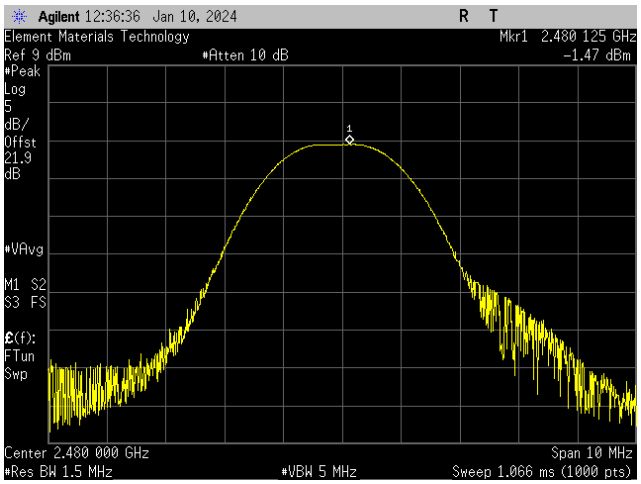
OUTPUT POWER



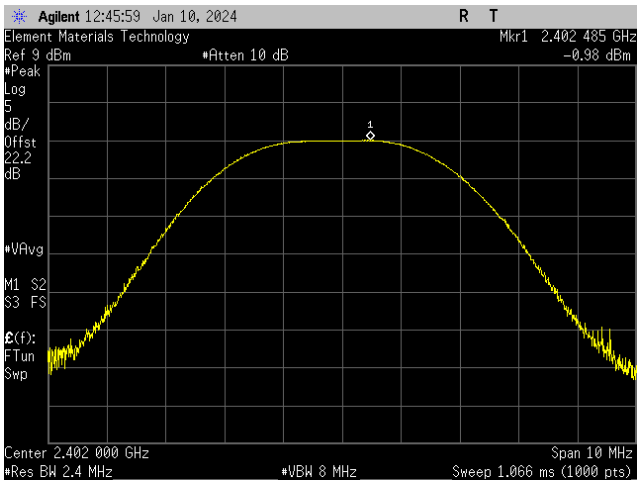
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz



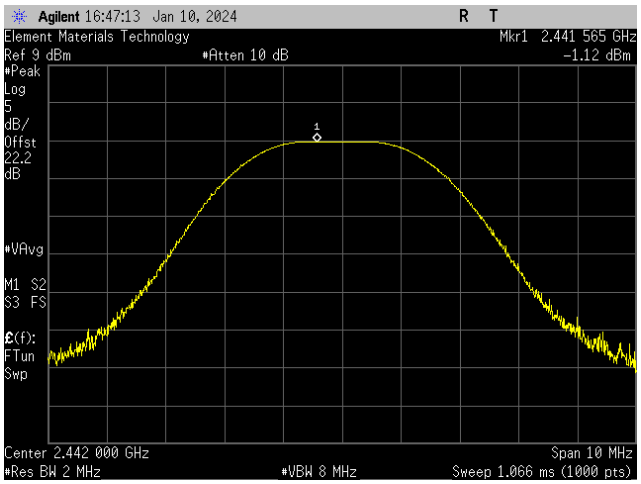
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



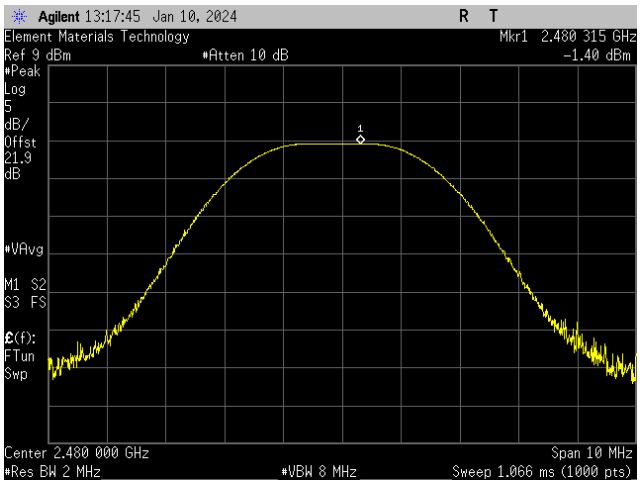
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

OUTPUT POWER

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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)

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2023-12-14	2024-12-14
Generator - Signal	Agilent	N5183A	TIA	2022-06-25	2024-06-25
Block - DC	Weinschel Corp.	7006	AMS	2023-01-18	2024-01-18
Attenuator	S.M. Electronics	SA18H-20	REK	2023-03-08	2024-03-08
Cable	Micro-Coax	UFD150A-1-0720-200200	NCW	2023-01-18	2024-01-18

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10028R	Date:	2024-01-10
Customer:	Novidan, Inc.	Temperature:	19.7°C
Attendees:	None	Relative Humidity:	37.9%
Customer Project:	None	Bar. Pressure (PMSL):	1006 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	Battery	Configuration:	NOVI0032-2
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

DEVIATIONS FROM TEST STANDARD

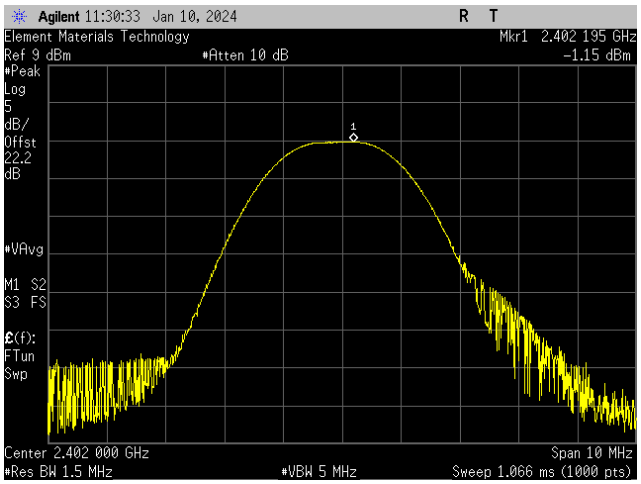
None

TEST RESULTS

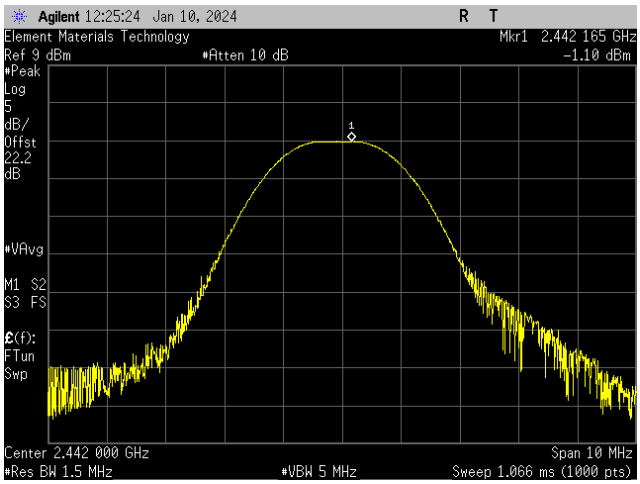
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
BLE/GFSK 1 Mbps					
Low Channel, 2402 MHz	-1.153	-3.92	-5.073	36	Pass
Mid Channel, 2442 MHz	-1.101	-3.92	-5.021	36	Pass
High Channel, 2480 MHz	-1.468	-3.92	-5.388	36	Pass
BLE/GFSK 2 Mbps					
Low Channel, 2402 MHz	-0.979	-3.92	-4.899	36	Pass
Mid Channel, 2442 MHz	-1.121	-3.92	-5.041	36	Pass
High Channel, 2480 MHz	-1.399	-3.92	-5.319	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

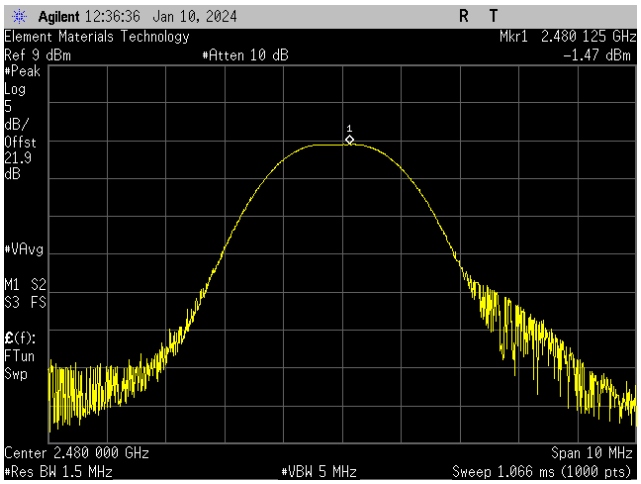
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



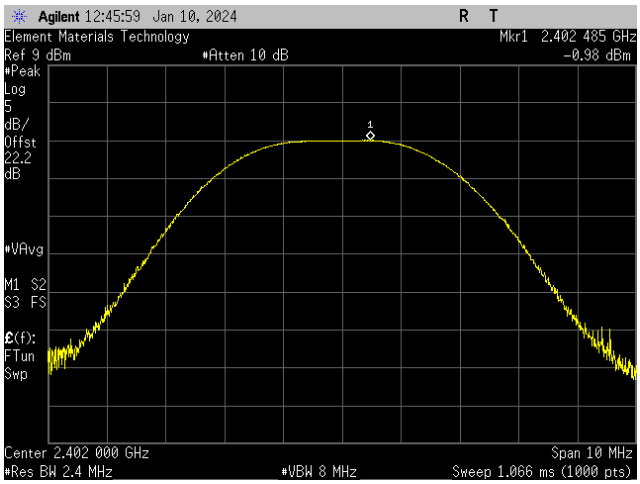
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz



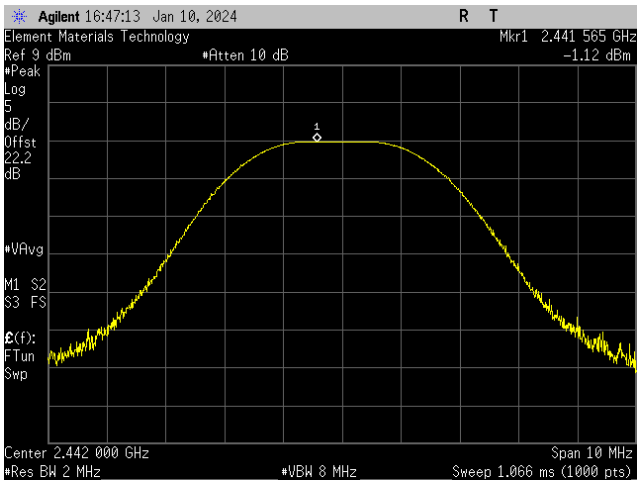
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



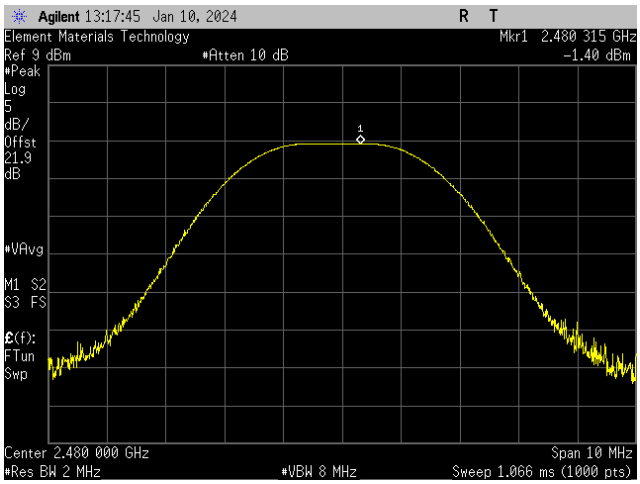
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

POWER SPECTRAL DENSITY

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2023-12-14	2024-12-14
Generator - Signal	Agilent	N5183A	TIA	2022-06-25	2024-06-25
Block - DC	Weinschel Corp.	7006	AMS	2023-01-18	2024-01-18
Attenuator	S.M. Electronics	SA18H-20	REK	2023-03-08	2024-03-08
Cable	Micro-Coax	UFD150A-1-0720-200200	NCW	2023-01-18	2024-01-18

POWER SPECTRAL DENSITY

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10028R	Date:	2024-01-10
Customer:	Novidan, Inc.	Temperature:	19.8°C
Attendees:	None	Relative Humidity:	37.7%
Customer Project:	None	Bar. Pressure (PMSL):	1007 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	Battery	Configuration:	NOVI0032-2
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

DEVIATIONS FROM TEST STANDARD

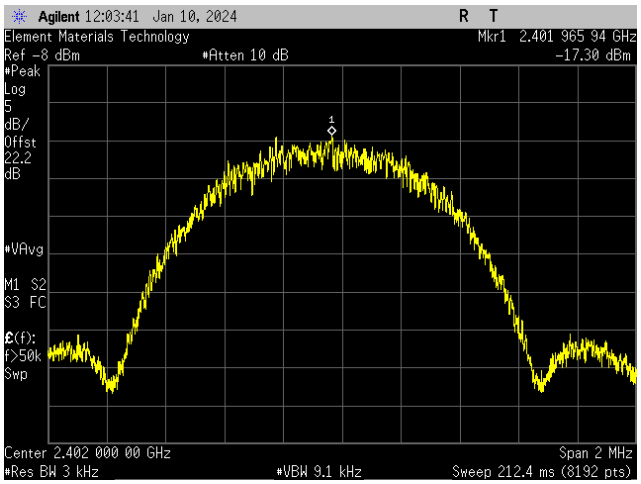
None

TEST RESULTS

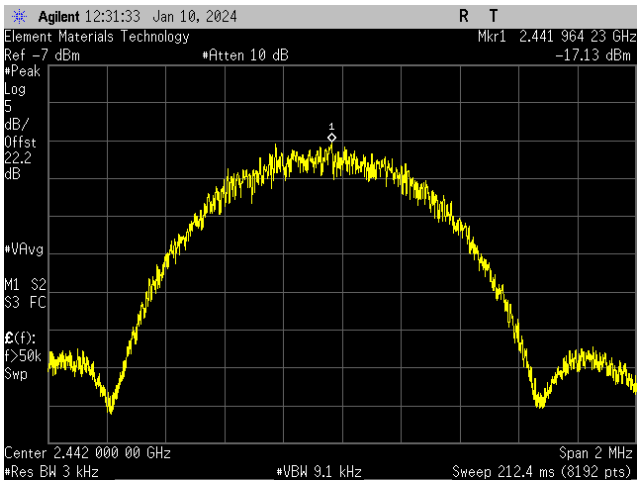
	Value dBm/3kHz	Limit ≤ (dBm/3kHz)	Results
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-17.3	8	Pass
Mid Channel, 2442 MHz	-17.129	8	Pass
High Channel, 2480 MHz	-17.914	8	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	-20.919	8	Pass
Mid Channel, 2442 MHz	-20.763	8	Pass
High Channel, 2480 MHz	-20.934	8	Pass

POWER SPECTRAL DENSITY

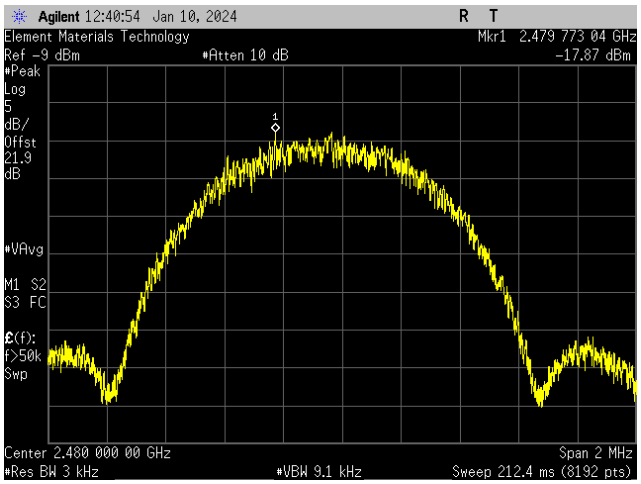
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



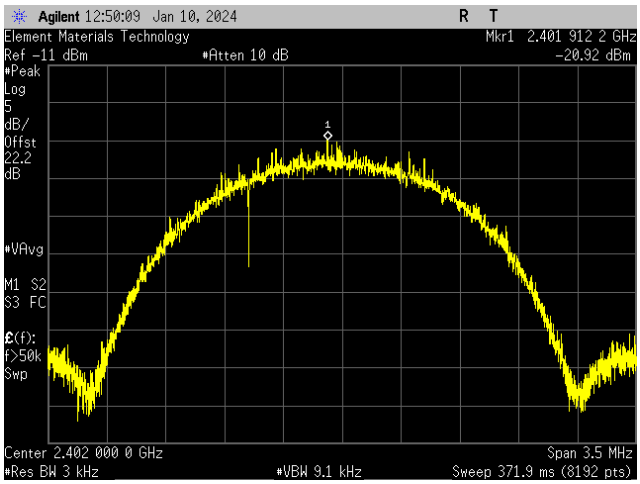
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz



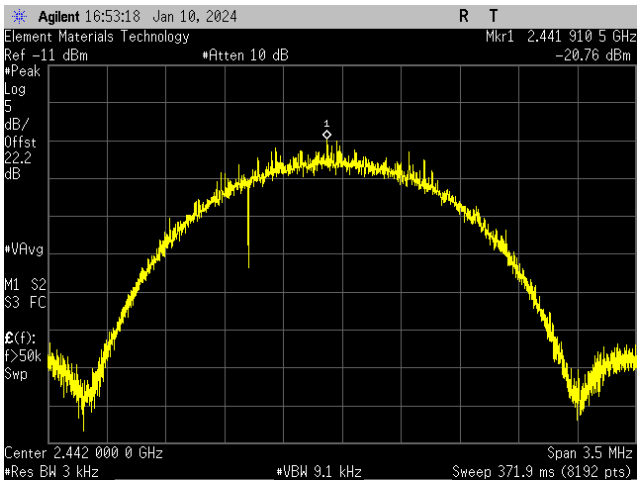
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



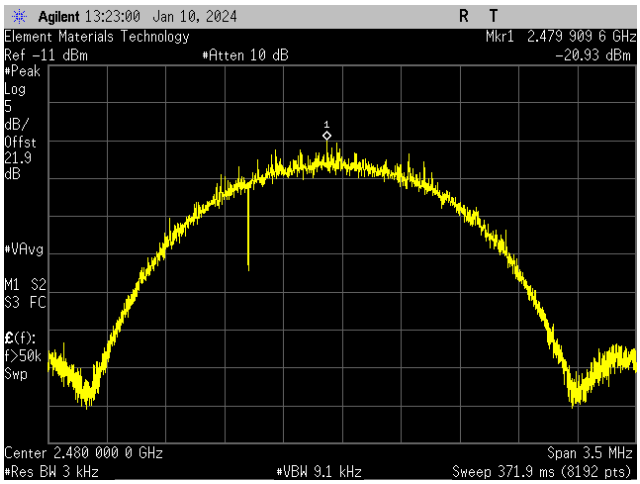
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

POWER SPECTRAL DENSITY

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

BAND EDGE COMPLIANCE

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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. The analyzer screen captures for this test show an example of the emission mask for the test mode also used during the radiated spurious emissions at the restricted band edges test.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2023-12-14	2024-12-14
Generator - Signal	Agilent	N5183A	TIA	2022-06-25	2024-06-25
Block - DC	Weinschel Corp.	7006	AMS	2023-01-18	2024-01-18
Attenuator	S.M. Electronics	SA18H-20	REK	2023-03-08	2024-03-08
Cable	Micro-Coax	UFD150A-1-0720-200200	NCW	2023-01-18	2024-01-18

BAND EDGE COMPLIANCE

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10028R	Date:	2024-01-10
Customer:	Novidan, Inc.	Temperature:	19.8°C
Attendees:	None	Relative Humidity:	37.7%
Customer Project:	None	Bar. Pressure (PMSL):	1007 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	Battery	Configuration:	NOVI0032-2
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

DEVIATIONS FROM TEST STANDARD

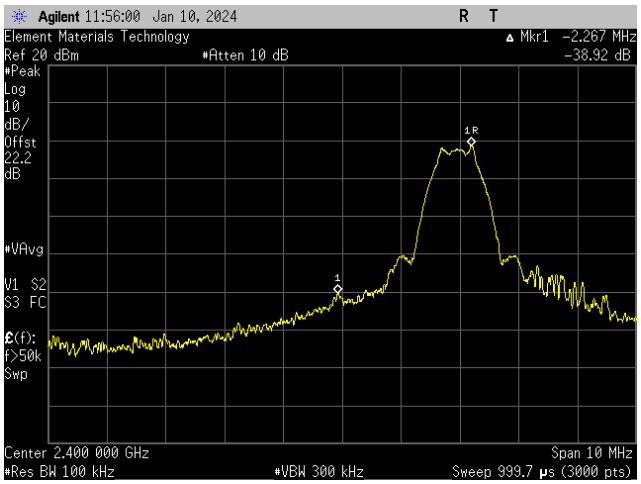
None

TEST RESULTS

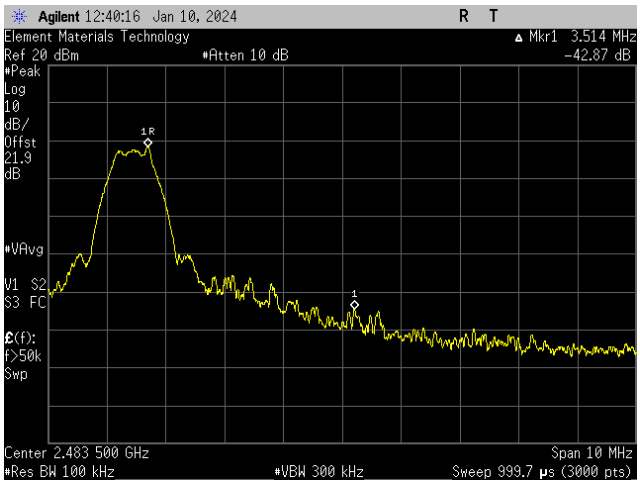
	Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 1 Mbps			
Low Channel, 2402 MHz	-38.92	-20	Pass
High Channel, 2480 MHz	-42.87	-20	Pass
BLE/GFSK 2 Mbps			
Low Channel, 2402 MHz	-29.04	-20	Pass
High Channel, 2480 MHz	-40.56	-20	Pass

BAND EDGE COMPLIANCE

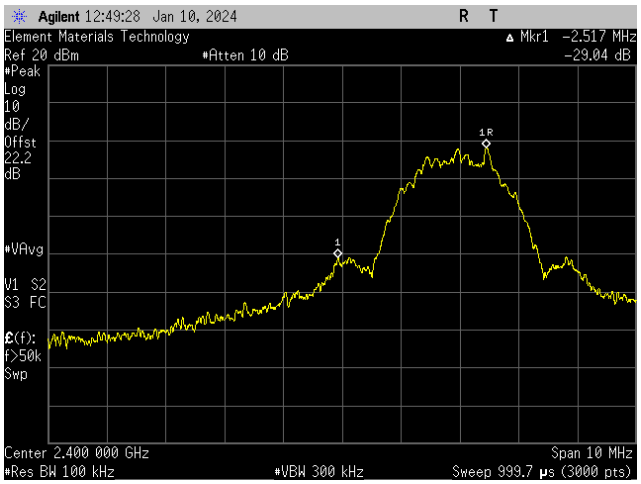
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



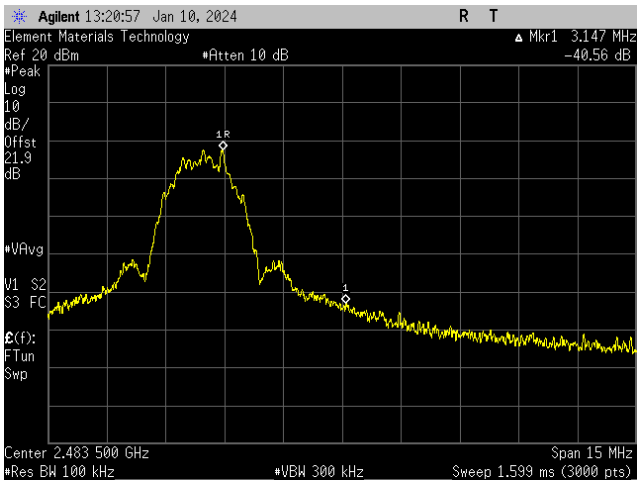
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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 fundamental was measured with a 100 kHz resolution bandwidth and the highest value was recorded. The rest of the spectrum was then measured with a 100 kHz resolution bandwidth and the highest value was found. The difference between the value found on the fundamental and the rest of the spectrum was compared against the limit to determine compliance.

The reference level offset for the fundamental screen capture was based on a measured value of the loss between the spectrum analyzer and the EUT which was verified at the time of test. The remaining screen capture(s) use an internal transducer factor on the analyzer to correct the displayed trace based on the cable loss over frequency. The reference level offset for the additional screen capture(s) is then based on the expected attenuator value and any other losses.

Fundamental Offset = Ref Lvl Offset showing measured composite factor of all losses

Remaining Screen capture(s) Offset = “Internal” cable loss factor not shown on screen capture + Ref Lvl Offset showing expected attenuator value and any other losses

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2023-12-14	2024-12-14
Generator - Signal	Agilent	N5183A	TIA	2022-06-25	2024-06-25
Block - DC	Weinschel Corp.	7006	AMS	2023-01-18	2024-01-18
Attenuator	S.M. Electronics	SA18H-20	REK	2023-03-08	2024-03-08
Cable	Micro-Coax	UFD150A-1-0720-200200	NCW	2023-01-18	2024-01-18

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10028R	Date:	2024-01-10
Customer:	Novidan, Inc.	Temperature:	19.7°C
Attendees:	None	Relative Humidity:	37.7%
Customer Project:	None	Bar. Pressure (PMSL):	1007 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	Battery	Configuration:	NOVI0032-2
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

COMMENTS

Reference level offset includes measurement cable, attenuator, DC block, and customer's patch cable.

DEVIATIONS FROM TEST STANDARD

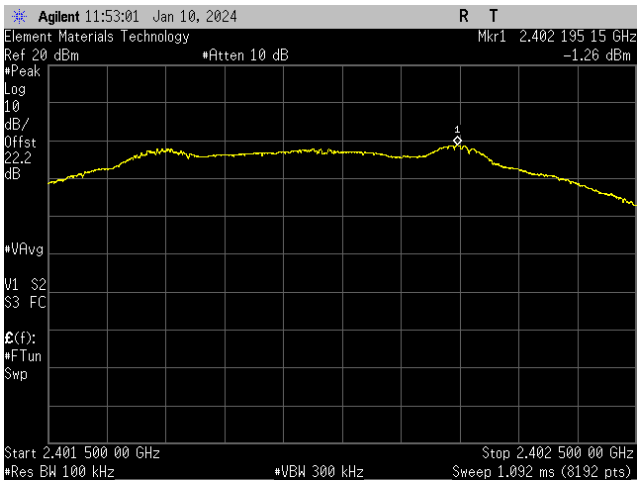
None

TEST RESULTS

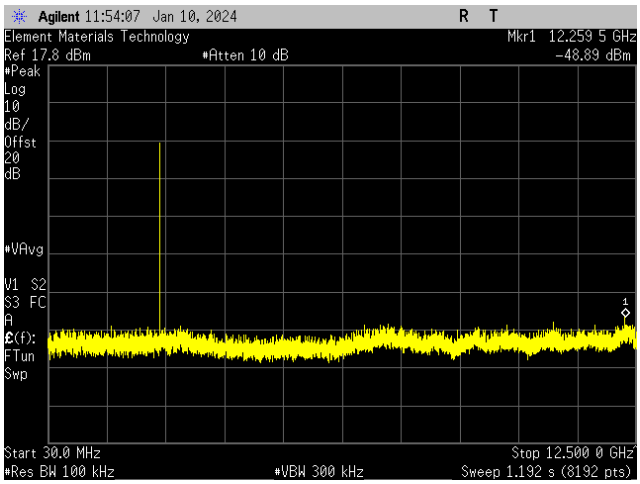
	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
BLE/GFSK 1 Mbps					
Low Channel, 2402 MHz	Fundamental	2402.2	N/A	N/A	N/A
	30 MHz - 12.5 GHz	12259.5	-47.63	-20	Pass
	12.5 GHz - 25 GHz	24913	-44.69	-20	Pass
Mid Channel, 2442 MHz	Fundamental	2442.19	N/A	N/A	N/A
	30 MHz - 12.5 GHz	12401	-49.37	-20	Pass
	12.5 GHz - 25 GHz	23481.6	-45.64	-20	Pass
High Channel, 2480 MHz	Fundamental	2480.19	N/A	N/A	N/A
	30 MHz - 12.5 GHz	12344.7	-49.09	-20	Pass
	12.5 GHz - 25 GHz	24284.3	-44.6	-20	Pass
BLE/GFSK 2 Mbps					
Low Channel, 2402 MHz	Fundamental	2401.96	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2397.3	-46.38	-20	Pass
	12.5 GHz - 25 GHz	24159.1	-44.83	-20	Pass
Mid Channel, 2442 MHz	Fundamental	2441.95	N/A	N/A	N/A
	30 MHz - 12.5 GHz	12398	-48.97	-20	Pass
	12.5 GHz - 25 GHz	24154.6	-45.25	-20	Pass
High Channel, 2480 MHz	Fundamental	2479.95	N/A	N/A	N/A
	30 MHz - 12.5 GHz	12419.3	-47.39	-20	Pass
	12.5 GHz - 25 GHz	24842.8	-44.16	-20	Pass

SPURIOUS CONDUCTED EMISSIONS

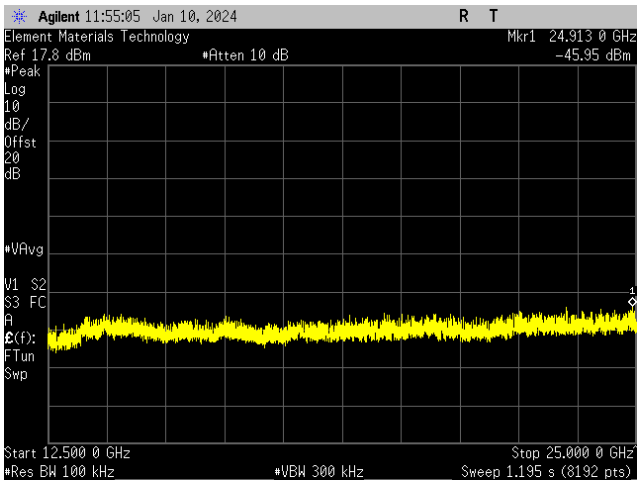
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



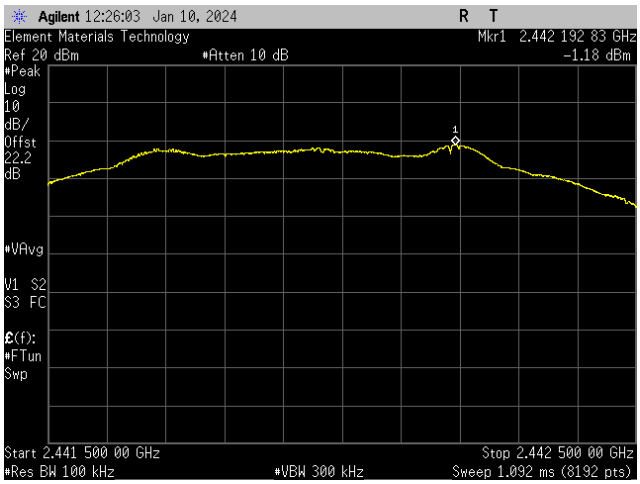
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



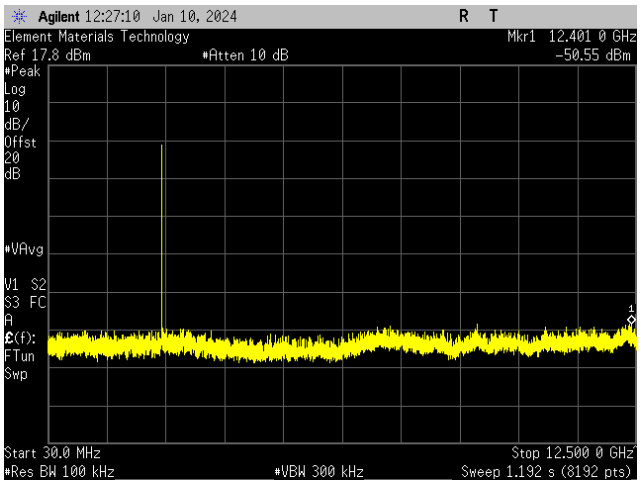
BLE/GFSK 1 Mbps
Low Channel, 2402 MHz



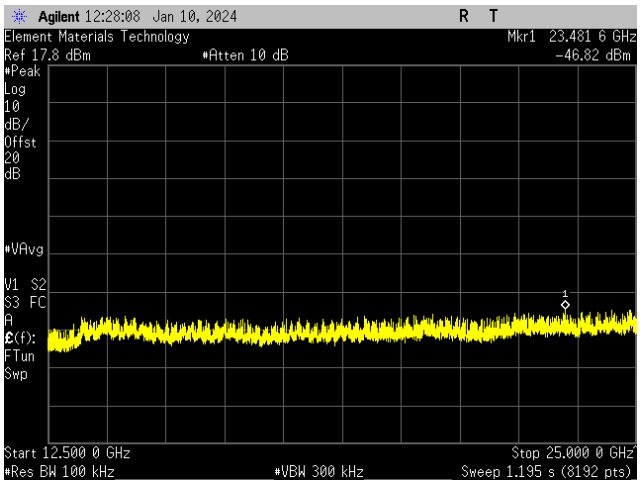
BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz

SPURIOUS CONDUCTED EMISSIONS

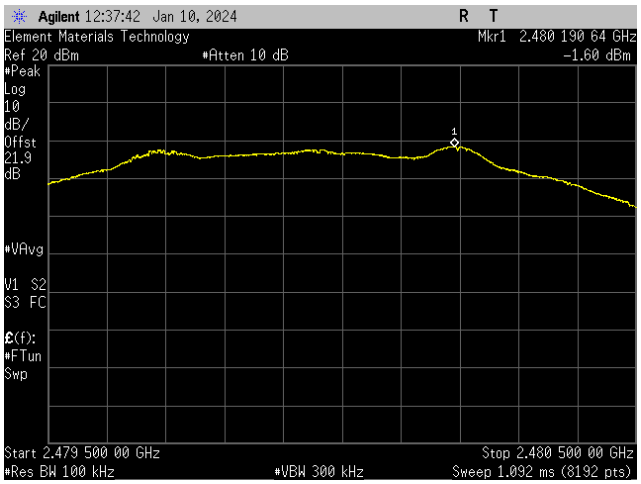
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



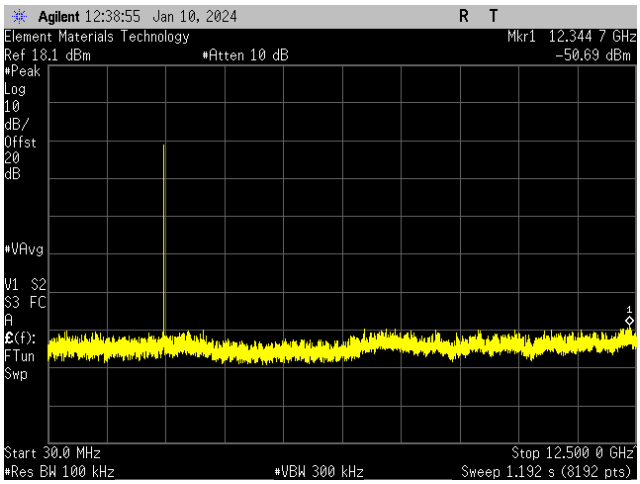
BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 1 Mbps
Mid Channel, 2442 MHz



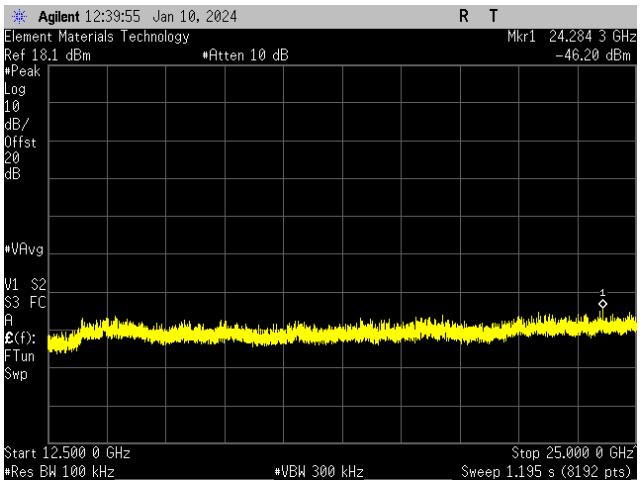
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



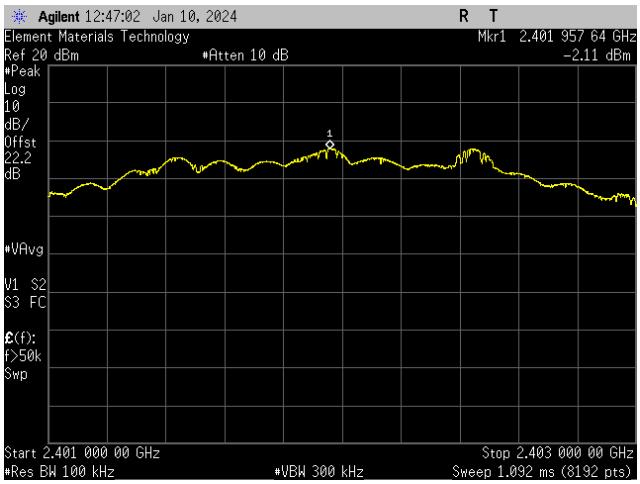
BLE/GFSK 1 Mbps
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS

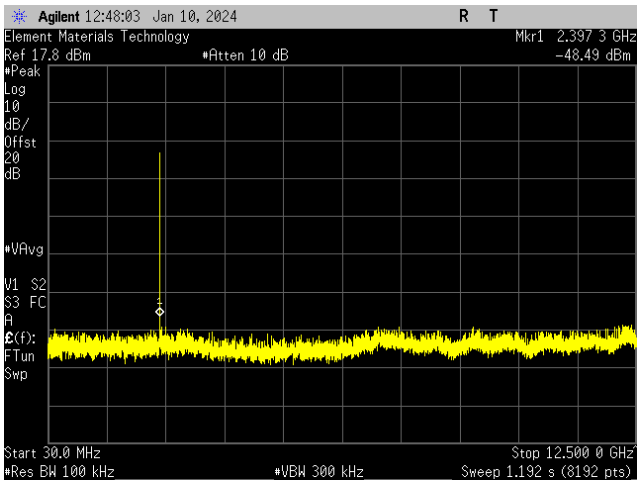
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



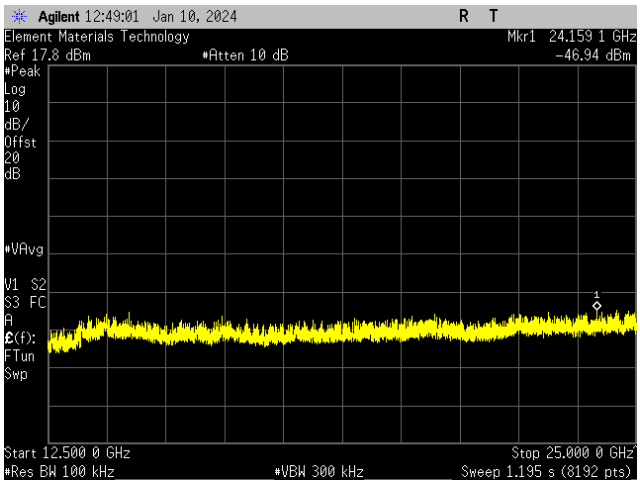
BLE/GFSK 1 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



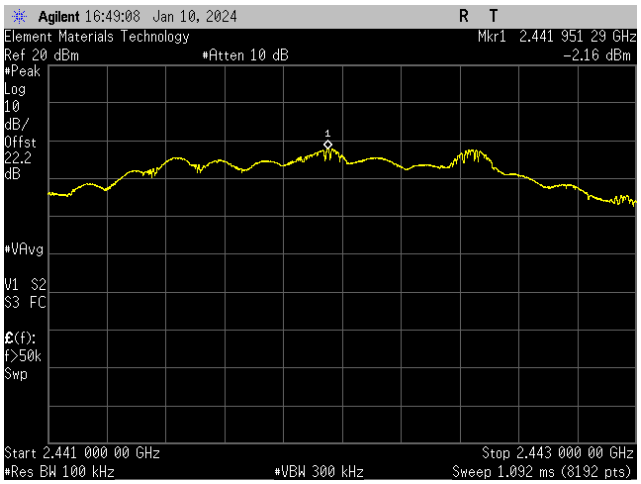
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz



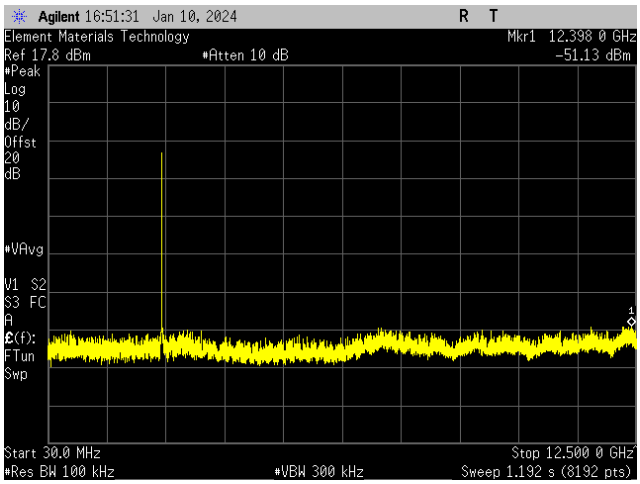
BLE/GFSK 2 Mbps
Low Channel, 2402 MHz

SPURIOUS CONDUCTED EMISSIONS

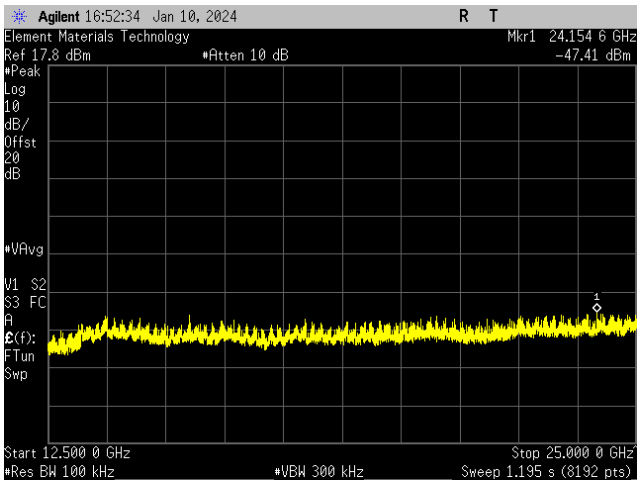
element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



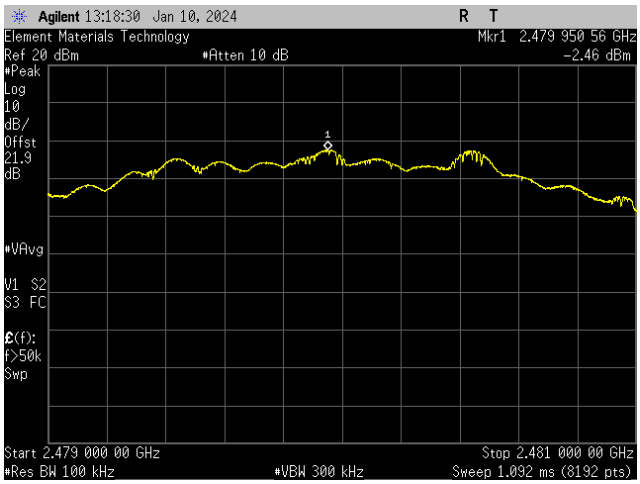
BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



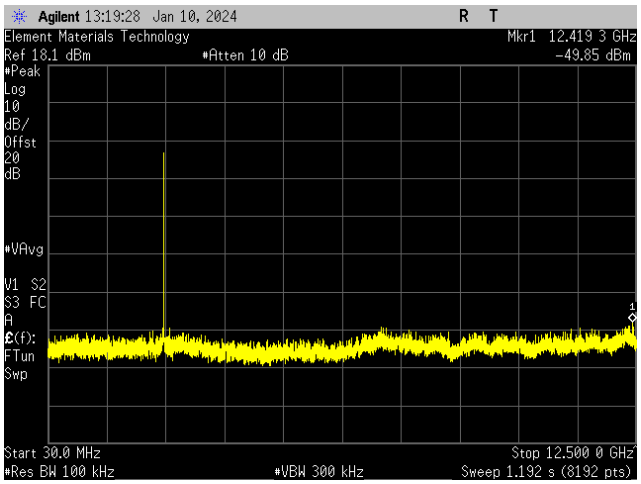
BLE/GFSK 2 Mbps
Mid Channel, 2442 MHz



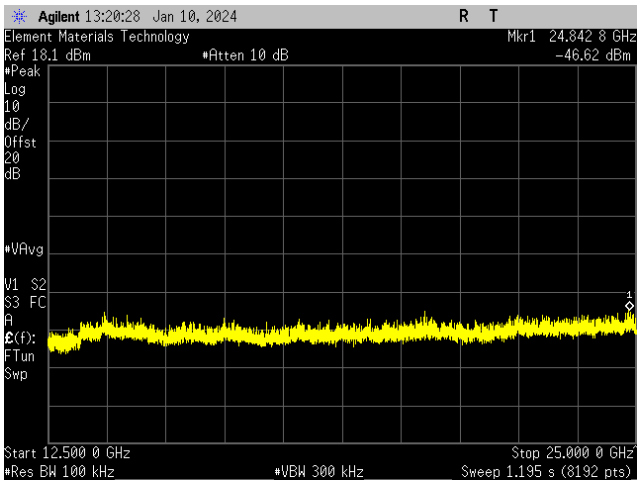
BLE/GFSK 2 Mbps
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.12.06.2
WTD.2023.10.23.0



BLE/GFSK 2 Mbps
High Channel, 2480 MHz



BLE/GFSK 2 Mbps
High Channel, 2480 MHz

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

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).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2023-10-18	2025-10-18
Cable	Northwest EMC	Bilog Cables	NC1	2024-01-05	2025-01-05
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2024-01-05	2025-01-05
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFI	2023-08-29	2024-08-29
Antenna - Double Ridge	EMCO	3115	AHM	2022-07-13	2024-07-13
Cable	Northwest EMC	3115 Horn Cable	NC2	2023-04-25	2024-04-25
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2023-04-25	2024-04-25
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	NCR
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2023-09-01	2024-09-01
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2023-08-09	2024-08-09
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2023-08-09	2024-08-09
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	NCR
Cable	Northwest EMC	N/A	NC8	2023-03-10	2024-03-10
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2023-03-10	2024-03-10
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2023-10-09	2024-10-09
Attenuator	Fairview Microwave	SA18E-10	AQT	2023-07-31	2024-07-31
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2023-10-09	2024-10-09

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	5.2 dB	-5.2 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 26500 MHz

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

POWER INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

NOVI0032-4
NOVI0032-6

MODES INVESTIGATED

Transmitting BLE. Low Channel 0 = 2402 MHz, Middle Channel 20 = 2442 MHz, High Channel 39 = 2480 MHz.

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10092R	Date:	2024-01-12
Customer:	Novidan, Inc.	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	17.8%
Customer Project:	None	Bar. Pressure (PMSL):	1024 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	Battery	Configuration:	NOVI0032-4

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	45	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

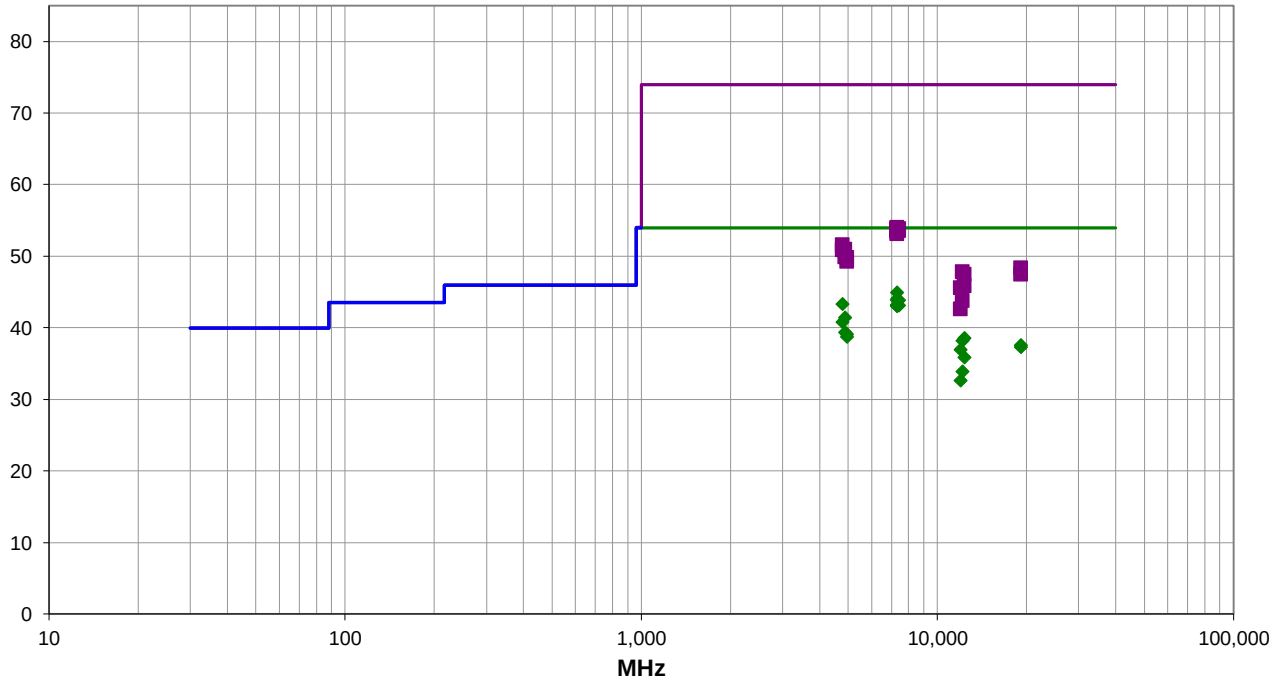
Right Ear non-MFI unit. Test mode duty cycle is 85% for 1 Mbps and 56.6% for 2 Mbps. An upward duty cycle correction factor (DCCF) was applied using DCCF=10*log(1/duty cycle) giving 0.7 dB correction for 1 Mbps and 2.45 dB correction for 2 Mbps. See data comments below for EUT orientation, channel, & data rates.

EUT OPERATING MODES

Transmitting BLE. Low Channel 0 = 2402 MHz, Middle Channel 20 = 2442 MHz, High Channel 39 = 2480 MHz.

DEVIATIONS FROM TEST STANDARD

None



Run #: 45 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

RESULTS - Run #45

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7327.000	27.7	14.7	1.5	37.0	2.5	0.0	Vert	AV	0.0	44.9	54.0	-9.1	Ch. 20, EUT Vertical, 2 Mbps
7326.392	28.6	14.7	2.5	101.0	0.7	0.0	Vert	AV	0.0	44.0	54.0	-10.0	Ch. 20, EUT Vertical, 1 Mbps
7325.183	28.4	14.7	3.6	195.0	0.7	0.0	Horz	AV	0.0	43.8	54.0	-10.2	Ch. 20, EUT Horizontal, 1 Mbps
7440.567	27.7	15.4	1.5	320.0	0.7	0.0	Horz	AV	0.0	43.8	54.0	-10.2	Ch. 39, EUT Horizontal, 1 Mbps
4804.042	32.6	10.0	3.1	342.0	0.7	0.0	Horz	AV	0.0	43.3	54.0	-10.7	Ch. 0, EUT Horizontal, 1 Mbps
7325.783	27.8	14.7	1.5	258.0	0.7	0.0	Horz	AV	0.0	43.2	54.0	-10.8	Ch. 20, EUT button side facing down, 1 Mbps
7325.183	27.7	14.7	1.5	50.0	0.7	0.0	Horz	AV	0.0	43.1	54.0	-10.9	Ch. 20, EUT Vertical, 1 Mbps
7440.508	27.0	15.4	1.3	282.0	0.7	0.0	Vert	AV	0.0	43.1	54.0	-10.9	Ch. 39, EUT Vertical, 1 Mbps
7325.075	27.6	14.7	1.9	188.0	0.7	0.0	Vert	AV	0.0	43.0	54.0	-11.0	Ch. 20, EUT Horizontal, 1 Mbps
7326.017	27.6	14.7	1.5	49.0	0.7	0.0	Vert	AV	0.0	43.0	54.0	-11.0	Ch. 20, EUT button side facing down, 1 Mbps
4883.875	30.4	10.3	3.7	221.0	0.7	0.0	Vert	AV	0.0	41.4	54.0	-12.6	Ch. 20, EUT Vertical, 1 Mbps
4804.325	30.1	10.0	1.5	350.0	0.7	0.0	Vert	AV	0.0	40.8	54.0	-13.2	Ch. 0, EUT Vertical, 1 Mbps
4883.892	28.3	10.3	3.9	246.0	0.7	0.0	Horz	AV	0.0	39.3	54.0	-14.7	Ch. 20, EUT Horizontal, 1 Mbps
4959.675	28.2	10.2	1.5	349.0	0.7	0.0	Vert	AV	0.0	39.1	54.0	-14.9	Ch. 39, EUT Vertical, 1 Mbps
4961.900	27.8	10.2	2.0	297.0	0.7	0.0	Horz	AV	0.0	38.7	54.0	-15.3	Ch. 39, EUT Horizontal, 1 Mbps
12398.610	35.5	2.3	1.4	65.0	0.7	0.0	Horz	AV	0.0	38.5	54.0	-15.5	Ch. 39, EUT Horizontal, 1 Mbps
12210.800	35.1	2.4	2.3	216.0	0.7	0.0	Horz	AV	0.0	38.2	54.0	-15.8	Ch. 20, EUT Horizontal, 1 Mbps
19217.450	34.6	2.2	1.6	227.0	0.7	0.0	Horz	AV	0.0	37.5	54.0	-16.5	Ch. 0, EUT Horizontal, 1 Mbps
19217.270	34.4	2.2	1.5	100.0	0.7	0.0	Vert	AV	0.0	37.3	54.0	-16.7	Ch. 0, EUT Vertical, 1 Mbps
12008.500	36.4	-0.2	1.3	36.0	0.7	0.0	Horz	AV	0.0	36.9	54.0	-17.1	Ch. 0, EUT Horizontal, 1 Mbps
12398.510	32.8	2.3	3.9	78.0	0.7	0.0	Vert	AV	0.0	35.8	54.0	-18.2	Ch. 39, EUT Vertical, 1 Mbps
7325.475	39.3	14.7	3.6	195.0	0.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	Ch. 20, EUT Horizontal, 1 Mbps
12211.060	30.8	2.4	1.5	233.0	0.7	0.0	Vert	AV	0.0	33.9	54.0	-20.1	Ch. 20, EUT Vertical, 1 Mbps
7326.900	39.1	14.7	1.5	49.0	0.0	0.0	Vert	PK	0.0	53.8	74.0	-20.2	Ch. 20, EUT button side facing down, 1 Mbps
7325.125	39.1	14.7	2.5	101.0	0.0	0.0	Vert	PK	0.0	53.8	74.0	-20.2	Ch. 20, EUT Vertical, 1 Mbps
7440.550	38.4	15.4	1.3	282.0	0.0	0.0	Vert	PK	0.0	53.8	74.0	-20.2	Ch. 39, EUT Vertical, 1 Mbps
7326.075	38.9	14.7	1.5	258.0	0.0	0.0	Horz	PK	0.0	53.6	74.0	-20.4	Ch. 20, EUT button side facing down, 1 Mbps
7439.792	38.2	15.3	1.5	320.0	0.0	0.0	Horz	PK	0.0	53.5	74.0	-20.5	Ch. 39, EUT Horizontal, 1 Mbps
7326.925	38.8	14.7	1.5	37.0	0.0	0.0	Vert	PK	0.0	53.5	74.0	-20.5	Ch. 20, EUT Vertical, 2 Mbps
7325.475	38.6	14.7	1.5	50.0	0.0	0.0	Horz	PK	0.0	53.3	74.0	-20.7	Ch. 20, EUT Vertical, 1 Mbps
7324.233	38.4	14.7	1.9	188.0	0.0	0.0	Vert	PK	0.0	53.1	74.0	-20.9	Ch. 20, EUT Horizontal, 1 Mbps
12010.830	32.1	-0.2	1.5	231.0	0.7	0.0	Vert	AV	0.0	32.6	54.0	-21.4	Ch. 0, EUT Vertical, 1 Mbps
4804.600	41.5	10.0	3.1	342.0	0.0	0.0	Horz	PK	0.0	51.5	74.0	-22.5	Ch. 0, EUT Horizontal, 1 Mbps
4884.575	40.6	10.3	3.7	221.0	0.0	0.0	Vert	PK	0.0	50.9	74.0	-23.1	Ch. 20, EUT Vertical, 1 Mbps
4804.675	40.8	10.0	1.5	350.0	0.0	0.0	Vert	PK	0.0	50.8	74.0	-23.2	Ch. 0, EUT Vertical, 1 Mbps
4884.283	39.5	10.3	3.9	246.0	0.0	0.0	Horz	PK	0.0	49.8	74.0	-24.2	Ch. 20, EUT Horizontal, 1 Mbps
4960.125	39.5	10.2	1.5	349.0	0.0	0.0	Vert	PK	0.0	49.7	74.0	-24.3	Ch. 39, EUT Vertical, 1 Mbps
4959.683	39.0	10.2	2.0	297.0	0.0	0.0	Horz	PK	0.0	49.2	74.0	-24.8	Ch. 39, EUT Horizontal, 1 Mbps
19217.280	46.1	2.2	1.6	227.0	0.0	0.0	Horz	PK	0.0	48.3	74.0	-25.7	Ch. 0, EUT Horizontal, 1 Mbps
12210.780	45.4	2.4	2.3	216.0	0.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	Ch. 20, EUT Horizontal, 1 Mbps
12398.200	45.1	2.3	1.4	65.0	0.0	0.0	Horz	PK	0.0	47.4	74.0	-26.6	Ch. 39, EUT Horizontal, 1 Mbps
19214.500	45.3	2.1	1.5	100.0	0.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	Ch. 0, EUT Vertical, 1 Mbps

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12398.360	43.5	2.3	3.9	78.0	0.0	0.0	Vert	PK	0.0	45.8	74.0	-28.2	Ch. 39, EUT Vertical, 1 Mbps
12010.890	45.7	-0.2	1.3	36.0	0.0	0.0	Horz	PK	0.0	45.5	74.0	-28.5	Ch. 0, EUT Horizontal, 1 Mbps
12208.880	41.3	2.4	1.5	233.0	0.0	0.0	Vert	PK	0.0	43.7	74.0	-30.3	Ch. 20, EUT Vertical, 1 Mbps
12011.200	42.8	-0.2	1.5	231.0	0.0	0.0	Vert	PK	0.0	42.6	74.0	-31.4	Ch. 0, EUT Vertical, 1 Mbps

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

EUT:	Kava RIC without MFi chip	Work Order:	NOVI0032
Serial Number:	3290DV10092R	Date:	2024-01-15
Customer:	Novidan, Inc.	Temperature:	21.5°C
Attendees:	None	Relative Humidity:	16.7%
Customer Project:	None	Bar. Pressure (PMSL):	1028 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	Battery	Configuration:	NOVI0032-4

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	48	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

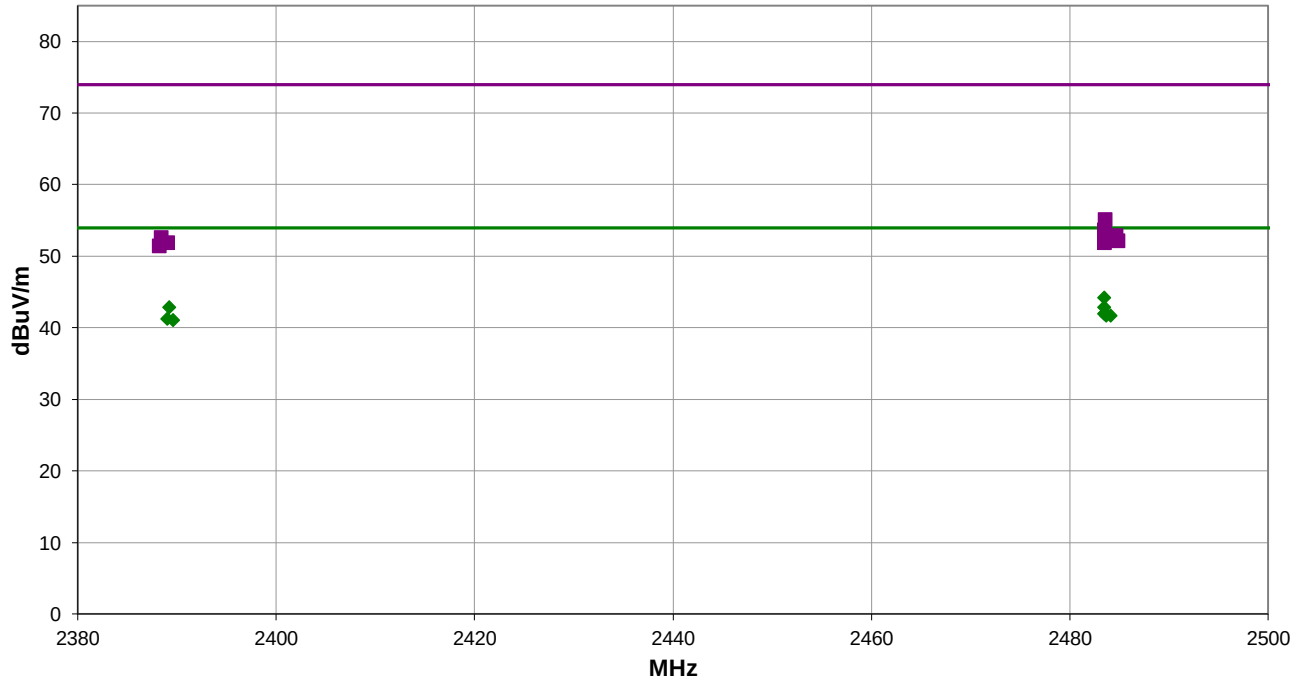
Right Ear non-MFI unit. Test mode duty cycle is 85% for 1 Mbps and 56.6% for 2 Mbps. An upward duty cycle correction factor (DCCF) was applied using DCCF=10*log(1/duty cycle) giving 0.7 dB correction for 1 Mbps and 2.45 dB correction for 2 Mbps. See data comments below for EUT orientation, channel, & data rates.

EUT OPERATING MODES

Transmitting BLE. Low Channel 0 = 2402 MHz, Middle Channel 20 = 2442 MHz, High Channel 39 = 2480 MHz.

DEVIATIONS FROM TEST STANDARD

None



Run #: 48 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

RESULTS - Run #48

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.507	30.5	1.3	1.5	138.0	2.5	10.0	Horz	AV	0.0	44.2	54.0	-9.8	Ch. 39, EUT button side facing down, 2 Mbps
2483.517	30.8	1.3	1.7	345.0	0.7	10.0	Horz	AV	0.0	42.8	54.0	-11.2	Ch. 39, EUT button side facing down, 1 Mbps
2389.203	29.2	1.1	3.5	118.0	2.5	10.0	Vert	AV	0.0	42.8	54.0	-11.2	Ch. 0, EUT button side facing down, 2 Mbps
2483.517	29.9	1.3	2.2	194.0	0.7	10.0	Horz	AV	0.0	41.9	54.0	-12.1	Ch. 39, EUT Horizontal, 1 Mbps
2483.543	29.9	1.3	2.9	216.0	0.7	10.0	Vert	AV	0.0	41.9	54.0	-12.1	Ch. 39, EUT button side facing down, 1 Mbps
2483.543	29.9	1.3	1.5	193.0	0.7	10.0	Vert	AV	0.0	41.9	54.0	-12.1	Ch. 39, EUT Vertical, 1 Mbps
2483.700	29.7	1.3	3.1	261.0	0.7	10.0	Vert	AV	0.0	41.7	54.0	-12.3	Ch. 39, EUT Horizontal, 1 Mbps
2484.137	29.7	1.3	1.5	108.0	0.7	10.0	Horz	AV	0.0	41.7	54.0	-12.3	Ch. 39, EUT Vertical, 1 Mbps
2389.033	29.4	1.1	2.8	244.0	0.7	10.0	Horz	AV	0.0	41.2	54.0	-12.8	Ch. 0, EUT button side facing down, 1 Mbps
2389.643	29.2	1.1	1.5	44.0	0.7	10.0	Vert	AV	0.0	41.0	54.0	-13.0	Ch. 0, EUT button side facing down, 1 Mbps
2483.610	43.7	1.3	1.7	345.0	0.0	10.0	Horz	PK	0.0	55.0	74.0	-19.0	Ch. 39, EUT button side facing down, 1 Mbps
2483.537	42.3	1.3	1.5	193.0	0.0	10.0	Vert	PK	0.0	53.6	74.0	-20.4	Ch. 39, EUT Vertical, 1 Mbps
2484.703	41.5	1.3	1.5	138.0	0.0	10.0	Horz	PK	0.0	52.8	74.0	-21.2	Ch. 39, EUT button side facing down, 2 Mbps
2483.990	41.4	1.3	1.5	108.0	0.0	10.0	Horz	PK	0.0	52.7	74.0	-21.3	Ch. 39, EUT Vertical, 1 Mbps
2483.707	41.2	1.3	2.9	216.0	0.0	10.0	Vert	PK	0.0	52.5	74.0	-21.5	Ch. 39, EUT button side facing down, 1 Mbps
2388.477	41.4	1.1	1.5	44.0	0.0	10.0	Vert	PK	0.0	52.5	74.0	-21.5	Ch. 0, EUT button side facing down, 1 Mbps
2484.937	40.8	1.3	2.2	194.0	0.0	10.0	Horz	PK	0.0	52.1	74.0	-21.9	Ch. 39, EUT Horizontal, 1 Mbps
2483.533	40.5	1.3	3.1	261.0	0.0	10.0	Vert	PK	0.0	51.8	74.0	-22.2	Ch. 39, EUT Horizontal, 1 Mbps
2389.103	40.7	1.1	2.8	244.0	0.0	10.0	Horz	PK	0.0	51.8	74.0	-22.2	Ch. 0, EUT button side facing down, 1 Mbps
2388.263	40.3	1.1	3.5	118.0	0.0	10.0	Vert	PK	0.0	51.4	74.0	-22.6	Ch. 0, EUT button side facing down, 2 Mbps

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

EUT:	Kava RIC with MFi chip	Work Order:	NOVI0032
Serial Number:	3346MFI002R (M002R)	Date:	2024-01-15
Customer:	Novidan, Inc.	Temperature:	22.1°C
Attendees:	None	Relative Humidity:	17.1%
Customer Project:	None	Bar. Pressure (PMSL):	1028 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	Battery	Configuration:	NOVI0032-6

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	84	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

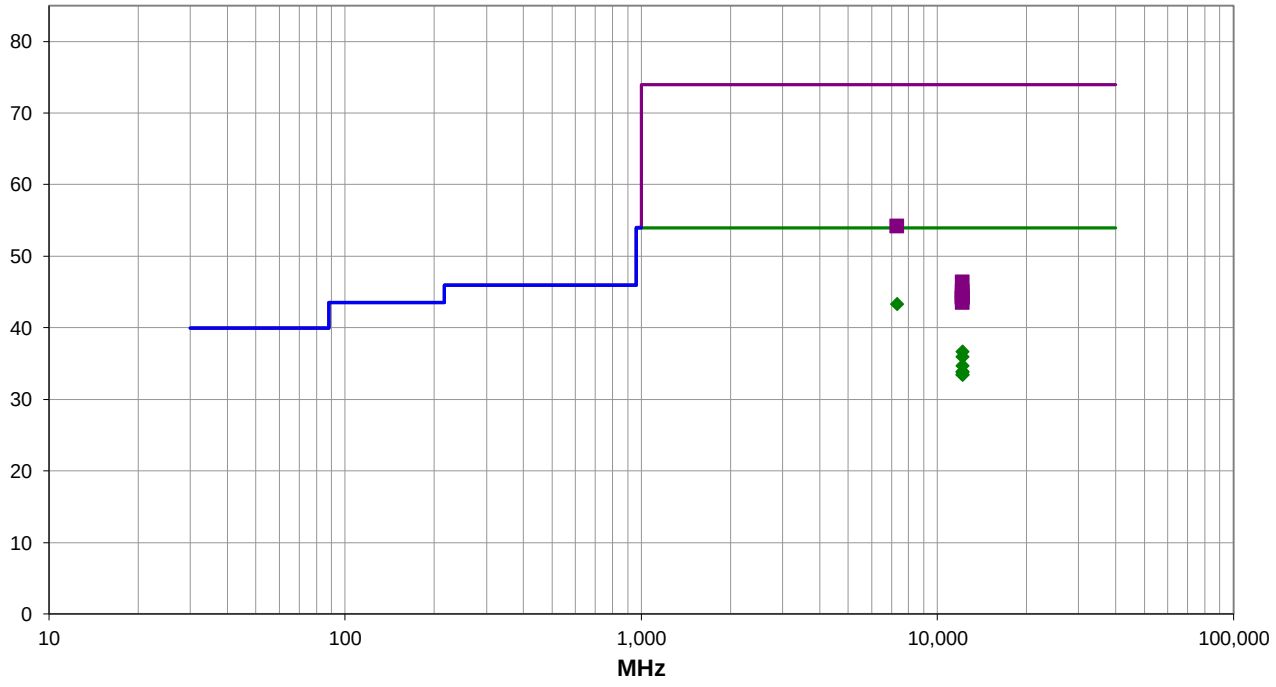
Right ear MFI unit. Test mode duty cycle is 85% for 1 Mbps and 56.6% for 2 Mbps. An upward duty cycle correction factor (DCCF) was applied using DCCF=10*log(1/duty cycle) giving 0.7 dB correction for 1 Mbps and 2.45 dB correction for 2 Mbps. See data comments for EUT orientation, data rates, and channels.

EUT OPERATING MODES

Transmitting BLE. Low Channel 0 = 2402 MHz, Middle Channel 20 = 2442, High Channel 39 = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 84 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

RESULTS - Run #84

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7326.570	27.9	14.7	2.2	98.0	0.7	0.0	Vert	AV	0.0	43.3	54.0	-10.7	Ch. 20, EUT button side facing down, 1 Mbps
12210.880	33.5	2.4	3.8	283.0	0.7	0.0	Vert	AV	0.0	36.6	54.0	-17.4	Ch. 20, EUT button side facing down, 1 Mbps
12210.650	31.0	2.4	4.0	14.0	2.5	0.0	Vert	AV	0.0	35.9	54.0	-18.1	Ch. 20, EUT button side facing down, 2 Mbps
12210.740	31.6	2.4	1.5	284.0	0.7	0.0	Horz	AV	0.0	34.7	54.0	-19.3	Ch. 20, EUT Horizontal, 1 Mbps
7326.813	39.4	14.7	2.2	98.0	0.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	Ch. 20, EUT button side facing down, 1 Mbps
12210.930	30.8	2.4	1.5	252.0	0.7	0.0	Horz	AV	0.0	33.9	54.0	-20.1	Ch. 20, EUT Vertical, 1 Mbps
12210.970	30.7	2.4	1.5	112.0	0.7	0.0	Vert	AV	0.0	33.8	54.0	-20.2	Ch. 20, EUT Horizontal, 1 Mbps
12209.750	30.3	2.4	1.5	113.0	0.7	0.0	Horz	AV	0.0	33.4	54.0	-20.6	Ch. 20, EUT button side facing down, 1 Mbps
12210.780	30.3	2.4	1.5	174.0	0.7	0.0	Vert	AV	0.0	33.4	54.0	-20.6	Ch. 20, EUT Vertical, 1 Mbps
12210.630	43.9	2.4	3.8	283.0	0.0	0.0	Vert	PK	0.0	46.3	74.0	-27.7	Ch. 20, EUT button side facing down, 1 Mbps
12210.600	42.7	2.4	1.5	284.0	0.0	0.0	Horz	PK	0.0	45.1	74.0	-28.9	Ch. 20, EUT Horizontal, 1 Mbps
12210.900	42.1	2.4	1.5	252.0	0.0	0.0	Horz	PK	0.0	44.5	74.0	-29.5	Ch. 20, EUT Vertical, 1 Mbps
12210.420	41.9	2.4	4.0	14.0	0.0	0.0	Vert	PK	0.0	44.3	74.0	-29.7	Ch. 20, EUT button side facing down, 2 Mbps
12209.060	41.8	2.4	1.5	112.0	0.0	0.0	Vert	PK	0.0	44.2	74.0	-29.8	Ch. 20, EUT Horizontal, 1 Mbps
12209.840	41.7	2.4	1.5	174.0	0.0	0.0	Vert	PK	0.0	44.1	74.0	-29.9	Ch. 20, EUT Vertical, 1 Mbps
12209.000	41.1	2.4	1.5	113.0	0.0	0.0	Horz	PK	0.0	43.5	74.0	-30.5	Ch. 20, EUT button side facing down, 1 Mbps

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

element
WTD.2023.11.13.0
EmiR5 2023.08.29.0
PSA-ESCI 2023.04.25.0

EUT:	Kava RIC with MFi chip	Work Order:	NOVI0032
Serial Number:	3346MFI002R (M002R)	Date:	2024-01-15
Customer:	Novidan, Inc.	Temperature:	22.1°C
Attendees:	None	Relative Humidity:	17.1%
Customer Project:	None	Bar. Pressure (PMSL):	1028 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	Battery	Configuration:	NOVI0032-6

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2024	ANSI C63.10:2013

TEST PARAMETERS

Run #:	87	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

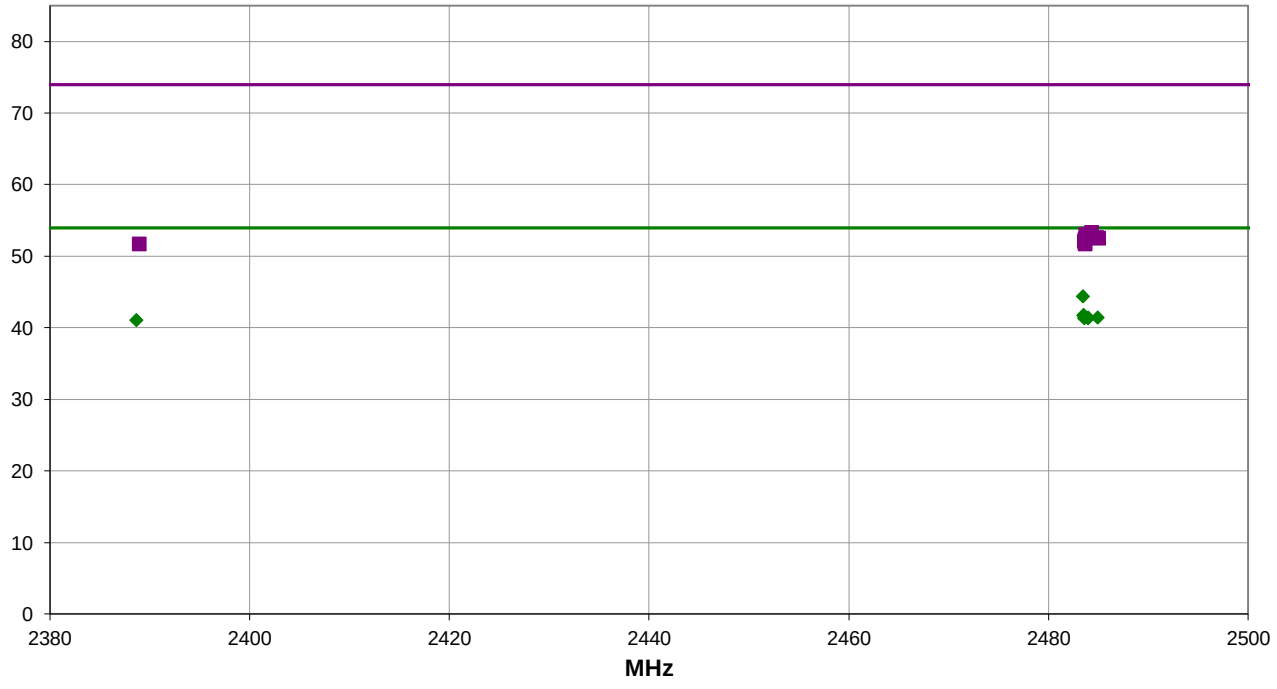
Right ear MFI unit. Test mode duty cycle is 85% for 1 Mbps and 56.6% for 2 Mbps. An upward duty cycle correction factor (DCCF) was applied using DCCF=10*log(1/duty cycle) giving 0.7 dB correction for 1 Mbps and 2.45 dB correction for 2 Mbps. See data comments for EUT orientation, data rates, and channels.

EUT OPERATING MODES

Transmitting BLE. Low Channel 0 = 2402 MHz, Middle Channel 20 = 2442, High Channel 39 = 2480 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 87 ■ PK ◆ AV ● QP

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RESULTS - Run #87

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.507	30.6	1.3	1.0	277.0	2.5	10.0	Vert	AV	0.0	44.4	54.0	-9.6	Ch. 39, EUT Vertical, 2 Mbps
2483.517	29.8	1.3	1.5	262.0	0.7	10.0	Vert	AV	0.0	41.8	54.0	-12.2	Ch. 39, EUT Vertical, 1 Mbps
2483.537	29.7	1.3	1.8	144.0	0.7	10.0	Horz	AV	0.0	41.7	54.0	-12.3	Ch. 39, EUT Horizontal, 1 Mbps
2483.983	29.4	1.3	1.5	66.0	0.7	10.0	Horz	AV	0.0	41.4	54.0	-12.6	Ch. 39, EUT button side facing down, 1 Mbps
2484.947	29.4	1.3	1.5	81.0	0.7	10.0	Vert	AV	0.0	41.4	54.0	-12.6	Ch. 39, EUT button side facing down, 1 Mbps
2483.580	29.3	1.3	1.5	360.0	0.7	10.0	Horz	AV	0.0	41.3	54.0	-12.7	Ch. 39, EUT Vertical, 1 Mbps
2483.963	29.3	1.3	1.1	290.0	0.7	10.0	Vert	AV	0.0	41.3	54.0	-12.7	Ch. 39, EUT Horizontal, 1 Mbps
2388.660	29.2	1.1	1.5	161.0	0.7	10.0	Vert	AV	0.0	41.0	54.0	-13.0	Ch. 0, EUT Vertical, 1 Mbps
2484.403	41.9	1.3	1.0	277.0	0.0	10.0	Vert	PK	0.0	53.2	74.0	-20.8	Ch. 39, EUT Vertical, 2 Mbps
2483.780	41.7	1.3	1.8	144.0	0.0	10.0	Horz	PK	0.0	53.0	74.0	-21.0	Ch. 39, EUT Horizontal, 1 Mbps
2484.910	41.2	1.3	1.5	81.0	0.0	10.0	Vert	PK	0.0	52.5	74.0	-21.5	Ch. 39, EUT button side facing down, 1 Mbps
2485.077	41.1	1.3	1.5	360.0	0.0	10.0	Horz	PK	0.0	52.4	74.0	-21.6	Ch. 39, EUT Vertical, 1 Mbps
2483.767	41.0	1.3	1.5	262.0	0.0	10.0	Vert	PK	0.0	52.3	74.0	-21.7	Ch. 39, EUT Vertical, 1 Mbps
2483.687	40.7	1.3	1.5	66.0	0.0	10.0	Horz	PK	0.0	52.0	74.0	-22.0	Ch. 39, EUT button side facing down, 1 Mbps
2483.763	40.3	1.3	1.1	290.0	0.0	10.0	Vert	PK	0.0	51.6	74.0	-22.4	Ch. 39, EUT Horizontal, 1 Mbps
2388.990	40.5	1.1	1.5	161.0	0.0	10.0	Vert	PK	0.0	51.6	74.0	-22.4	Ch. 0, EUT Vertical, 1 Mbps

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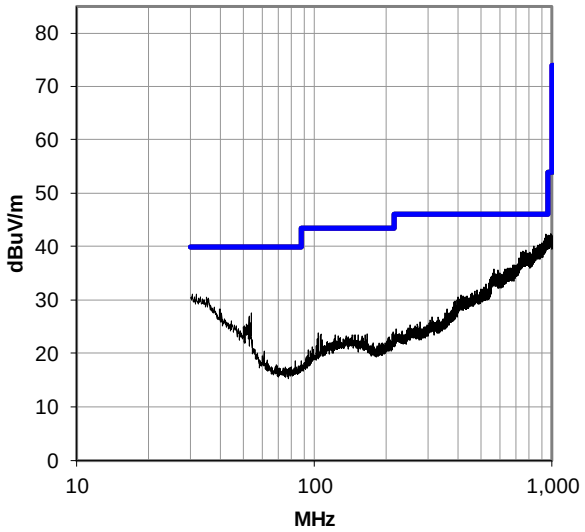
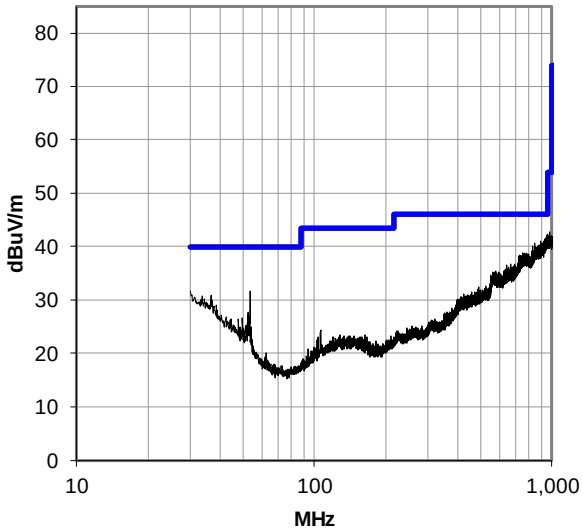
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

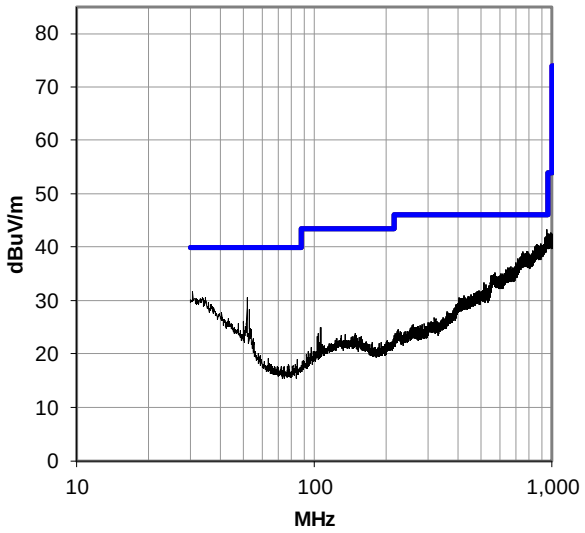
30-1000 MHz, Ch. 0



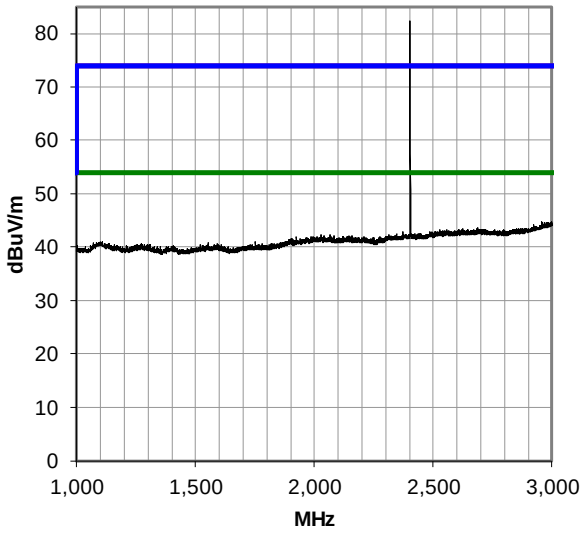
30-1000 MHz, Ch. 20



30-1000 MHz, Ch. 39



1000-3000 MHz, Ch. 0



SPURIOUS RADIATED EMISSIONS

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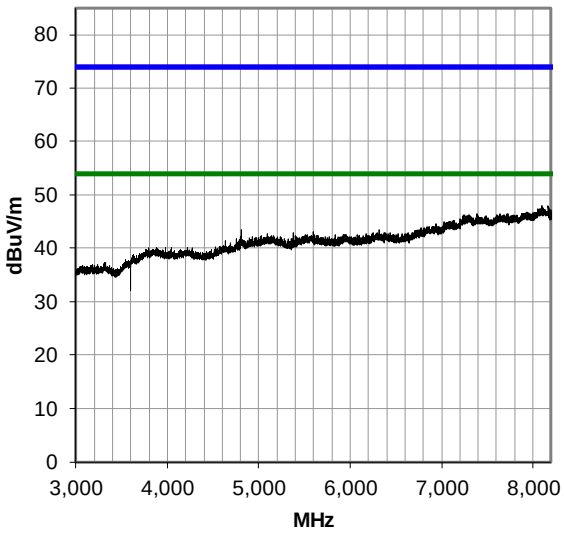
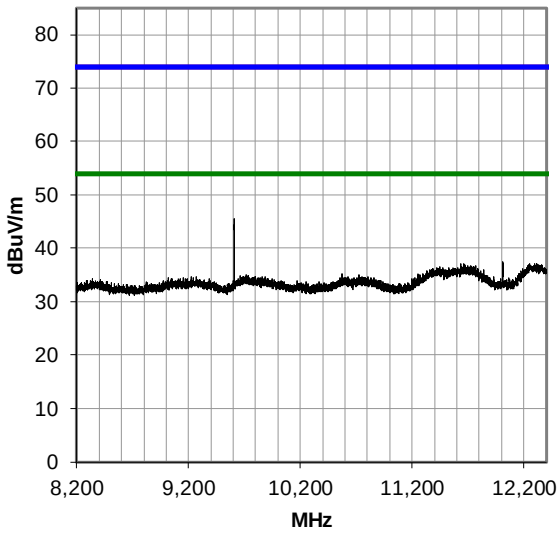
PSA-ESCI 2023.04.25.0

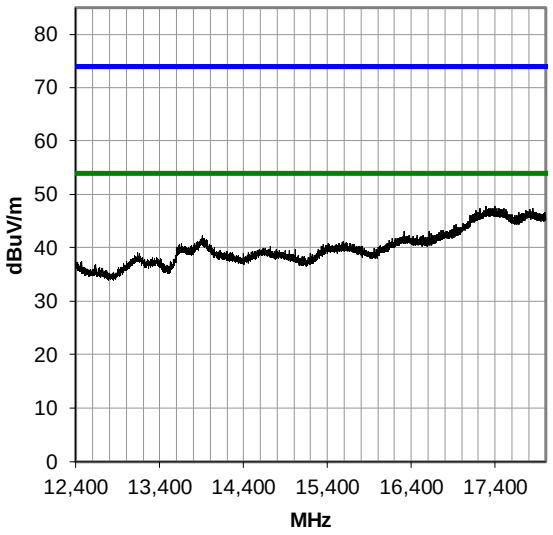
3000-8200 MHz, Ch. 0



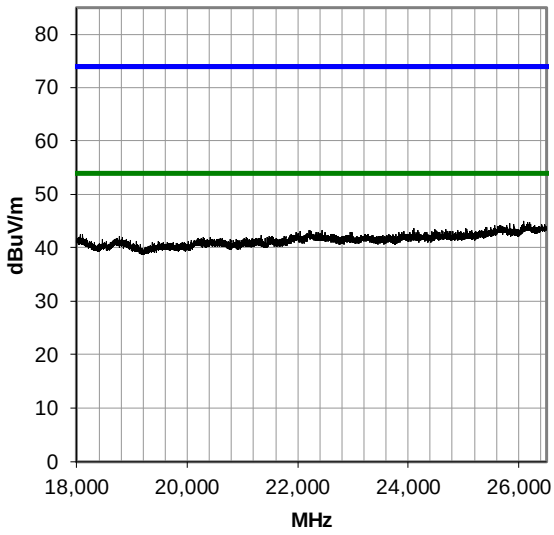
8200-12400 MHz, Ch. 0



12400-18000 MHz, Ch. 0



18000-26500 MHz, Ch. 0



SPURIOUS RADIATED EMISSIONS

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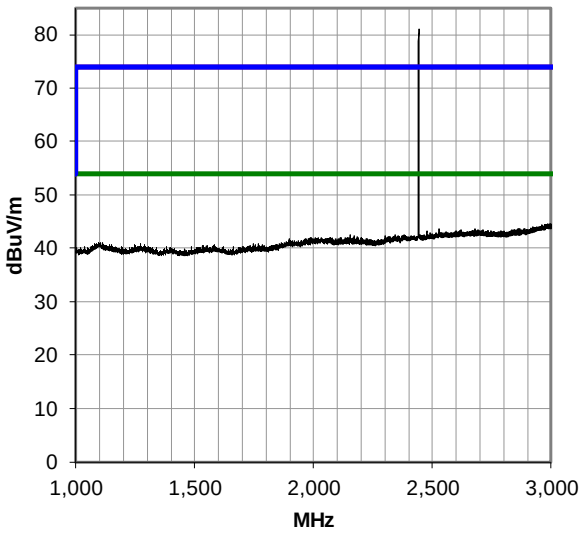
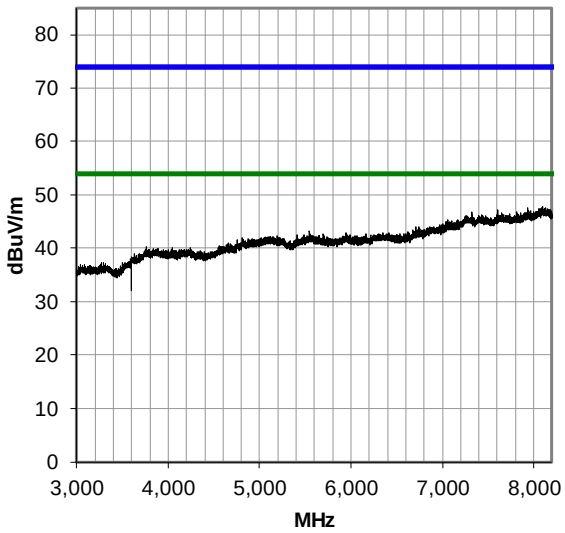
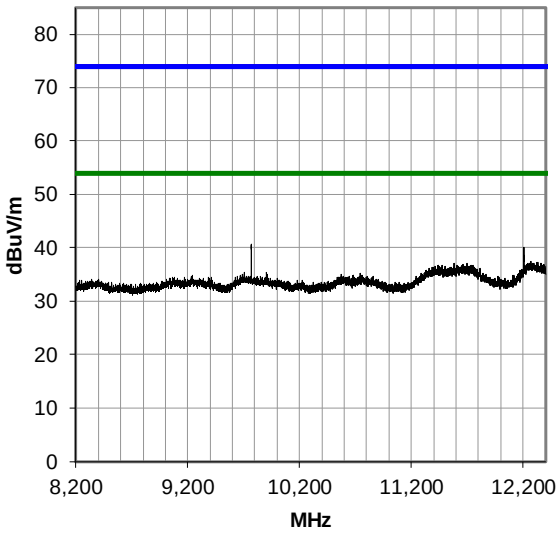
1000-3000 MHz, Ch. 20



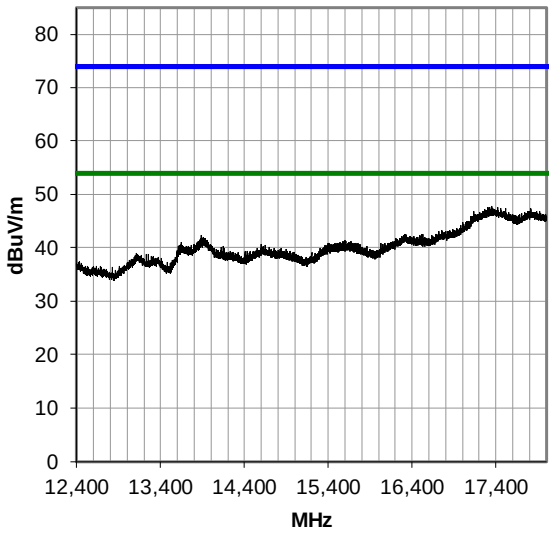
3000-8200 MHz, Ch. 20



8200-12400 MHz, Ch. 20



12400-18000 MHz, Ch. 20



SPURIOUS RADIATED EMISSIONS

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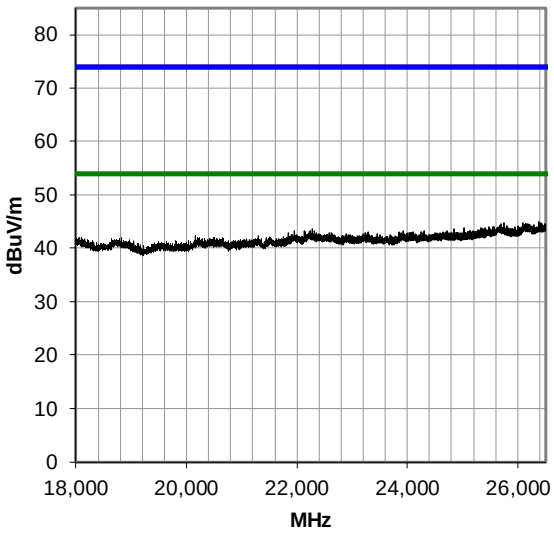
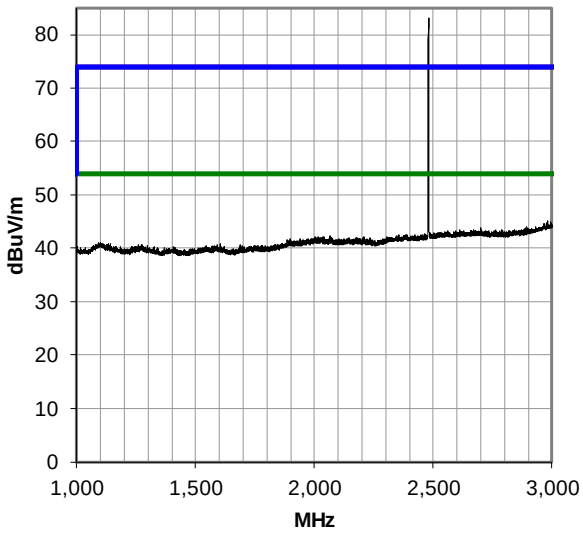
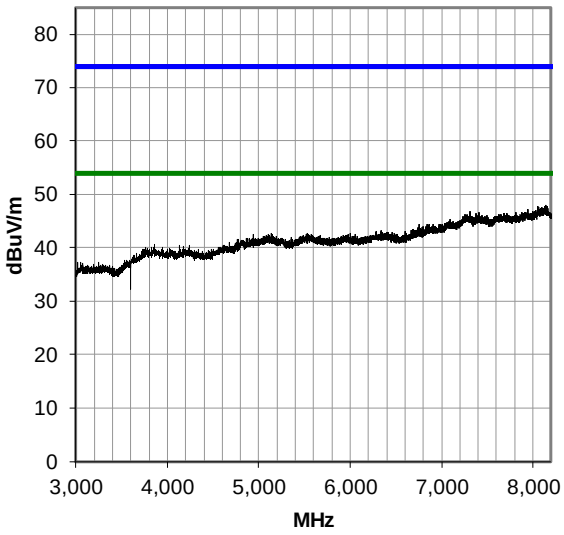
18000-26500 MHz, Ch. 20



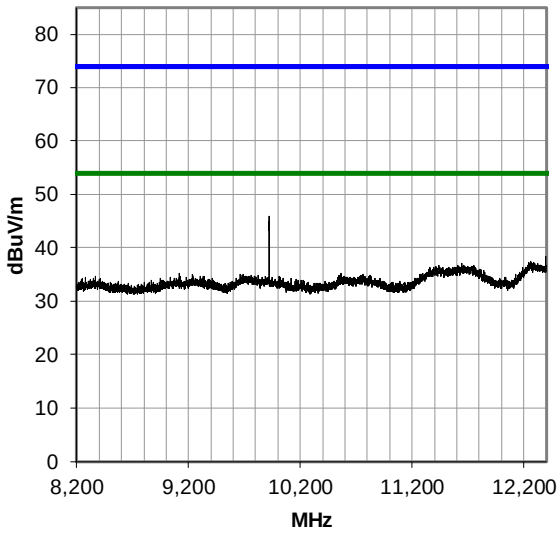
1000-3000 MHz, Ch. 39



3000-8200 MHz, Ch. 39



8200-12400 MHz, Ch. 39



SPURIOUS RADIATED EMISSIONS

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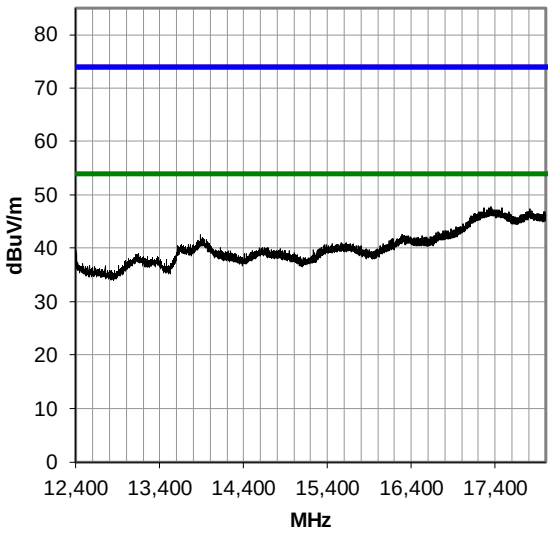
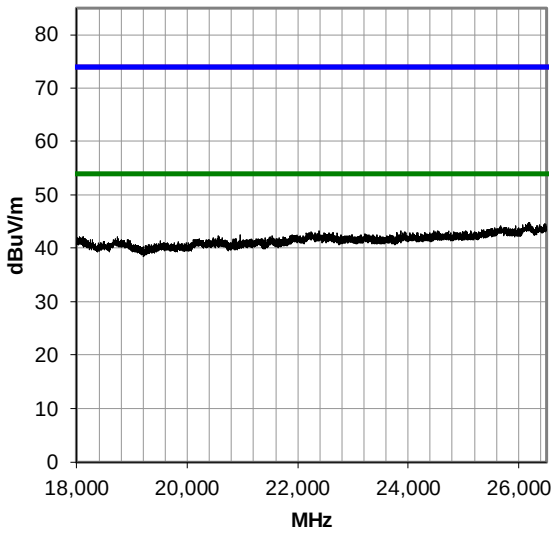
12400-18000 MHz, Ch. 39



18000-26500 MHz, Ch. 39



End of Test Report