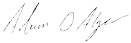
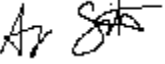



TR3768-165-2.4-4268

Equipment Under Test:	SONA NX611 M.2 2230, 2 MHF
Requirement(s):	AS/NZS 4268
Test Date(s):	02/12/2024-01/03/2025
Prepared for:	Ezurio Attn: Brian Petted W66 N220 Commerce Ct. Cedarburg, WI 53012

Report Issued by: Adam Alger, Manager EMC Laboratory	
Signature: 	Date: 2/13/2025
Report Reviewed by: Anthony Smith, EMC Engineering Specialist	
Signature: 	Date: 2/12/2025
Report Constructed by: Adam Alger, Manager EMC Laboratory	
Signature: 	Date: 2/12/2025

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Company: Ezurio	Page 1 of 48	Name: SONA NX611 M.2 2230, 2 MHF
Report: TR3768-165-2.4-4268		Model: SONA NX611M
Job: C-3768		Serial: Eng Sample

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Ezurio Test Services in Review

The Ezurio laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:



A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025:2017 with Electrical (EMC) Scope

A2LA Certificate Number: 1255.01

Scope of accreditation includes all test methods listed herein unless otherwise noted



Federal Communications Commission (FCC) – USA

Accredited Test Firm Registration Number: 953492

Recognition of two 3 meter Semi-Anechoic Chambers



Innovation, Science and Economic Development Canada

Accredited U.S. Identification Number: US0218

Recognition of two 3 meter Semi-Anechoic Chambers

Company: Ezurio	Page 3 of 48	Name: SONA NX611 M.2 2230, 2 MHF
Report: TR3768-165-2.4-4268		Model: SONA NX611M
Job: C-3768		Serial: Eng Sample

1 TEST REPORT SUMMARY

During **02/12/2024-01/03/2025** the Equipment Under Test (EUT), **SONA NX611 M.2 2230, 2 MHF**, as provided by **Ezurio** was tested to the following requirements:

ETSI EN 300 328, AS/NZS 4268 – DTS 2.4 GHz WLAN

Requirements	Description	Method	Specification	Compliant
AS-NZS 4862 Section 6.2	RF Output Power	ANSI C63.10	≤36 dBm	Yes
AS-NZS 4862 Section 6.2	Power Spectral Density	ANSI C63.10	14 dBm per 3 kHz	Yes

ETSI EN 300 328 - DTS 2.4 GHz WLAN

Requirements	Description	Method	Specification	Compliant
4.3.2.6.3.2.3	Adaptivity (non-FHSS)	5.4.6.2.1.4	2395 or 2488.5 MHz -35 dBm	Yes
4.3.2.7	Occupied Channel Bandwidth	5.4.7	2400-2483.5 MHz	Yes
4.3.2.8	Transmitter Unwanted Emissions in the Out-Of-Band Domain	5.4.8	2400 MHz - 2BW – 2483.5 MHz +2BW	Yes
4.3.2.9	Transmitter Unwanted Emissions in the Spurious Domain	5.4.9	30-12750 MHz	Yes
4.3.2.10	Receiver Spurious Emissions	5.4.10	30-12750 MHz	Yes
4.3.2.11	Receiver Blocking – Category 1	5.4.11	PER ≤ 10%	Yes

Notice:

The results relate only to the item tested as configured and described in this report. Any additional configurations, modes of operation, or modifications made to the equipment under test after the specified test date(s) are at the decision of the client and may not apply to the data seen in this test report.

The decision rule for Pass / Fail assessment to the specification or standard listed in this test report has been agreed upon by the client and laboratory to be as follows:

Measurement Type	Rule
Emissions – Amplitude	0.5 dB below specified limit
Emissions – Frequency	1% less than the specification
Immunity	Tested at specified level

Company: Ezurio	Page 4 of 48	Name: SONA NX611 M.2 2230, 2 MHF
Report: TR3768-165-2.4-4268		Model: SONA NX611M
Job: C-3768		Serial: Eng Sample

2 CLIENT INFORMATION

Company Name	Ezurio
Contact Person	Brian Petted
Address	W66 N220 Commerce Ct. Cedarburg, WI 53012

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	SONA NX611 M.2 2230, 2 MHF
Part Number	453-00165
Serial Number	Eng Sample
FCC ID	SQG-SONANX611M
IC ID	3147A-SONANX611M

2.2 Product Description

The NX611 is based upon NXP IW611 Wi-Fi 6 chipset. Feature-set includes 802.11 a/b/g/n/ac/ax Wi-Fi 6 and Dual-Mode Bluetooth v5.3 (BDR + EDR + BLE).

2.3 Modifications Incorporated for Compliance

None noted at time of test

2.4 Deviations and Exclusions from Test Specifications

None noted at time of test

2.5 EUT Information

Power Supply – INPUT:100-240VAC 50/60 Hz 0.3A

OUTPUT: 5VDC 2A

Firmware - sduart_nw61x_v1.bin.se

Sduart_nw61x_v1_mfg.bin.se

Company: Ezurio	Page 5 of 48	Name: SONA NX611 M.2 2230, 2 MHF
Report: TR3768-165-2.4-4268		Model:SONA NX611M
Job: C-3768		Serial: Eng Sample

2.6 Ancillary Equipment

Equipment used for EUT programming (not part of the EUT)

Development Kit, SU60-SOMC 6.0

P/N: 463-00138-K1 Rev 1

Power Supply: INPUT: 100-240 VAC 50/60Hz 0.7A

OUTPUT: 12VDC 2A

HP Elitebook 840G1

Labtool Version: 1.0.0.45.6

2.7 Antenna Information

Manufacturer	Model	Part Number	Dimension	Type	Peak Gain (dBi)	
					2400-2500 MHz	4900-5925 MHz
Laird Connectivity	FlexMIMO 6E	EFD2471A3S-10MH4L	39.5mm X 39.5mm X 4.7mm	PIFA	2.2	3.8
Laird Connectivity	FlexPIFA 6E	EFB2471A3S-10MH4L	16mm X 36mm X 2.5mm	PIFA	2.2	3.9
Laird Connectivity	Mini NanoBlade Flex 6E	EMF2471A3S-10MH4L	36mm X 12mm X 0.3mm	PCB Dipole	2.4	4.4
Joymax Electronics	N/A	TWX-100BR53B	137mm X 13mm	Dipole	2.0	4.0
Laird Connectivity	FlexPIFA	EFB2455A3S-16MHF1	38.5mm X 12.7 mm X 2.5mm	PIFA	2.5	3.0

2.8 Test Channels

Channel	Frequency (MHz)	Bandwidth (MHz)	Data Rates
1	2402	20	802.11b – 1 and 11 Mbps 802.11g – 6 and 54 Mbps 802.11n – MCS0 and MCS7 802.11ax – MCS0 and MCS11
7	2442	20	
13	2472	20	
3	2422	40	
7	2442	40	
11	2462	40	

2.9 EUT Power Settings

802.11	Channel BW (MHz)	Data Rate	Power Setting
b	20	1 Mbps	18
b	20	11 Mbps	18
g	20	6 Mbps	16
g	20	54 Mbps	16
n	20	MCS0	15
n	20	MCS7	15
ax	20	MCS0	15
ax	20	MCS11	13
n	40	MCS0	15
n	40	MCS7	15
ax	40	MCS0	15
ax	40	MCS11	14

802.11	Channel BW (MHz)	Data Rate	Power Setting
ax	20	MCS0 RU26	15
ax	20	MCS0 RU52	15
ax	20	MCS0 RU106	15
ax	40	MCS0 RU26	15
ax	40	MCS0 RU52	15
ax	40	MCS0 RU106	15
ax	40	MCS0 RU242	15

3 REFERENCES

Publication	Edition	Date	AMD 1
ETSI EN 300 328	2.2.2	2019	-
AS/NZS 4268	4	2017	2021
ANSI C63.10	-	2020	-

4 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of $k = 2$.

References

CISPR 16-4-1

CISPR 16-4-2

CISPR 32

ANSI C63.23

A2LA P103

A2LA P103c

ETSI TR 100-028

Measurement Type	Configuration	Uncertainty \pm
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

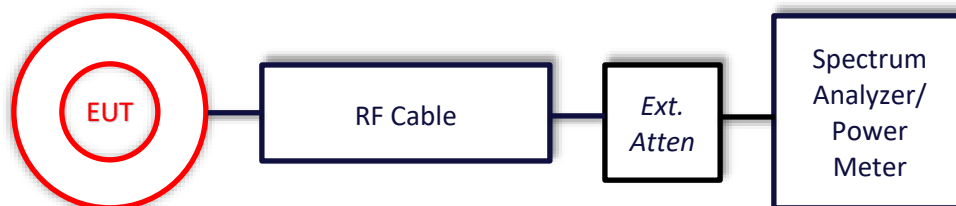
Parameter	ETSI U.C. \pm	U.C. \pm
Radio Frequency, from F0	1×10^{-7}	0.55×10^{-7}
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

5 TEST DATA

5.1 Antenna Port Conducted Emissions

Description of Measurement	<p>The direct measurement of emissions at the antenna port of the EUT is achieved by use of a RF connection to a spectrum analyzer or power meter.</p> <p>The cable and attenuator factors are loaded into the analyzer or power meter allowing for direct measurement readings without the need for further corrections.</p>
Example Calculations	<p>Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm)</p> <p>Margin (dB) = Limit (dBm) – Corrected Reading (dBm)</p>

Block Diagram



Setup Photos



Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960090	Meter - RF Power	Anritsu	ML2495A	1335006	4/13/2024	4/13/2025	Active Calibration
EE 960091	Sensor - RF Power	Anritsu	MA2491A	1249277	4/13/2024	4/13/2025	Active Calibration
AA 960144	Cable	Gore	EKD01D010720	5800373	6/13/2024	6/13/2025	Active Verification
AA 960173	Cable	A.H. Systems, Inc.	SAC-26G-1	388	6/13/2023	6/12/2024	Active Verification
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/11/2024	4/11/2025	Active Calibration

EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	2.4 GHz WLAN Tx
Frequency	2400-2483.5 MHz	Channel	See 2.8

5.1.1 RF Output Power

Operator	Anthony Smith	QA	Dylan Rosenfeldt
Temperature	20.3, 21.2, 20.3°C	R.H. %	27.7, 33.3, 23.1
Test Date	12/6/2024, 12/9/2024, 1/3/2025	Location	Conducted RF Bench
Requirement	AUS/NZ 4268	Method	ANSI C63.10

Limits: 36 dBm EIRP

Test Parameters

Frequency	2400-2483.5 MHz	Setup	Antenna Port
Operating Temperature	-40.0°C to +85.0°C	Sample Speed	1 MS/s

Normal Operating Temperature

Nominal Bandwidth	Channel	Mode	Data Rate	Measurement (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Power Setting
20	1	802.11b	1m	17.6	2.5	20.1	36.0	15.9	18
20	7	802.11b	1m	17.6	2.5	20.1	36.0	15.9	18
20	13	802.11b	1m	17.6	2.5	20.1	36.0	15.9	18
20	1	802.11ax	MCS0 RU26	14.6	2.5	17.1	36.0	18.9	15
20	7	802.11ax	MCS0 RU26	14.6	2.5	17.1	36.0	18.9	15
20	13	802.11ax	MCS0 RU26	14.5	2.5	17.0	36.0	19.0	15
20	1	802.11ax	MCS0 RU106	14.6	2.5	17.1	36.0	18.9	15
20	7	802.11ax	MCS0 RU106	14.6	2.5	17.1	36.0	18.9	15
20	13	802.11ax	MCS0 RU106	14.6	2.5	17.1	36.0	18.9	15
40	3	802.11ax	MCS0 RU26	13.8	2.5	16.3	36.0	19.7	15
40	11	802.11ax	MCS0 RU26	13.8	2.5	16.3	36.0	19.7	15
40	3	802.11ax	MCS0 RU242	14.7	2.5	17.2	36.0	18.8	15
40	11	802.11ax	MCS0 RU242	14.7	2.5	17.2	36.0	18.8	15

Extreme Operating Temperature (-40°C)

Nominal Bandwidth	Channel	Mode	Data Rate	Measurement (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Power Setting
20	1	802.11b	1m	17.4	2.5	19.9	36.0	16.1	18
20	7	802.11b	1m	17.3	2.5	19.8	36.0	16.2	18
20	13	802.11b	1m	17.4	2.5	19.9	36.0	16.1	18
20	1	802.11ax	MCS0 RU26	14.5	2.5	17.0	36.0	19.0	15
20	7	802.11ax	MCS0 RU26	14.4	2.5	16.9	36.0	19.1	15
20	13	802.11ax	MCS0 RU26	14.5	2.5	17.0	36.0	19.0	15
20	1	802.11ax	MCS0 RU106	14.6	2.5	17.1	36.0	18.9	15
20	7	802.11ax	MCS0 RU106	14.5	2.5	17.0	36.0	19.0	15
20	13	802.11ax	MCS0 RU106	14.5	2.5	17.0	36.0	19.0	15
40	3	802.11ax	MCS0 RU26	13.6	2.5	16.1	36.0	19.9	15
40	11	802.11ax	MCS0 RU26	13.6	2.5	16.1	36.0	19.9	15
40	3	802.11ax	MCS0 RU242	14.7	2.5	17.2	36.0	18.8	15
40	11	802.11ax	MCS0 RU242	14.7	2.5	17.2	36.0	18.8	15

Extreme Operating Temperature (+85°C)

Nominal Bandwidth	Channel	Mode	Data Rate	Measurement (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Power Setting
20	1	802.11b	1m	17.2	2.5	19.7	36.0	16.3	18
20	7	802.11b	1m	17.1	2.5	19.6	36.0	16.4	18
20	13	802.11b	1m	17.2	2.5	19.7	36.0	16.3	18
20	1	802.11ax	MCS0 RU26	15.1	2.5	17.6	36.0	18.4	15
20	7	802.11ax	MCS0 RU26	15.1	2.5	17.6	36.0	18.4	15
20	13	802.11ax	MCS0 RU26	15.1	2.5	17.6	36.0	18.4	15
20	1	802.11ax	MCS0 RU106	14.6	2.5	17.1	36.0	18.9	15
20	7	802.11ax	MCS0 RU106	14.5	2.5	17.0	36.0	19.0	15
20	13	802.11ax	MCS0 RU106	14.4	2.5	16.9	36.0	19.1	15
40	3	802.11ax	MCS0 RU26	13.7	2.5	16.2	36.0	19.8	15
40	11	802.11ax	MCS0 RU26	13.7	2.5	16.2	36.0	19.8	15
40	3	802.11ax	MCS0 RU242	14.7	2.5	17.2	36.0	18.8	15
40	11	802.11ax	MCS0 RU242	14.6	2.5	17.1	36.0	18.9	15

5.1.2 Power Spectral Density

Operator	Anthony Smith	QA	Dylan Rosenfeldt
Temperature	20.3, 21.2, 20.3°C	R.H. %	27.7, 33.3, 23.1
Test Date	12/6/2024, 12/9/2024, 1/3/2025	Location	Conducted RF Bench
Requirement	AUS/NZ 4268	Method	ANSI C63.10

Limit: 14 dBm/3kHz

Test Parameters

Frequency	2400-2483.5 MHz	Setup	Antenna Port
RBW	3 kHz	VBW	10 kHz
Detector(s)	Peak	Settings	Max Hold

Measurements

Nominal Bandwidth	Channel	Mode	Data Rate	Measurement (dBm/3kHz)	Antenna Gain (dBi)	Corrected Peak PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)	Power Setting
20	1	802.11b	1m	-1.2	2.5	1.3	14.0	12.7	18
20	7	802.11b	1m	-2.2	2.5	0.3	14.0	13.7	18
20	13	802.11b	1m	-1.0	2.5	1.5	14.0	12.5	18
20	1	802.11b	11m	-0.7	2.5	1.8	14.0	12.2	18
20	7	802.11b	11m	1.5	2.5	4.0	14.0	10.0	18
20	13	802.11b	11m	1.6	2.5	4.1	14.0	9.9	18
20	1	802.11ax	MCS0 RU26	-1.8	2.5	0.7	14.0	13.3	15
20	7	802.11ax	MCS0 RU26	-2.1	2.5	0.4	14.0	13.6	15
20	13	802.11ax	MCS0 RU26	-1.9	2.5	0.6	14.0	13.4	15
20	1	802.11ax	MCS7 RU26	-1.6	2.5	0.9	14.0	13.1	15
20	7	802.11ax	MCS7 RU26	-1.7	2.5	0.8	14.0	13.2	15
20	13	802.11ax	MCS7 RU26	-1.5	2.5	1.0	14.0	13.0	15
20	1	802.11ax	MCS0 RU52	-4.7	2.5	-2.2	14.0	16.2	15
20	7	802.11ax	MCS0 RU52	-4.3	2.5	-1.8	14.0	15.8	15
20	13	802.11ax	MCS0 RU52	-3.8	2.5	-1.3	14.0	15.3	15
20	1	802.11ax	MCS0 RU106	-8.2	2.5	-5.7	14.0	19.7	15
20	7	802.11ax	MCS0 RU106	-7.1	2.5	-4.6	14.0	18.6	15
20	13	802.11ax	MCS0 RU106	-7.6	2.5	-5.1	14.0	19.1	15
40	3	802.11ax	MCS0 RU26	-2.9	2.5	-0.4	14.0	14.4	15
40	11	802.11ax	MCS0 RU26	-2.2	2.5	0.3	14.0	13.7	15
40	3	802.11ax	MCS0 RU52	-5.2	2.5	-2.7	14.0	16.7	15
40	11	802.11ax	MCS0 RU52	-4.9	2.5	-2.4	14.0	16.4	15
40	3	802.11ax	MCS0 RU106	-7.0	2.5	-4.5	14.0	18.5	15
40	11	802.11ax	MCS0 RU106	-6.9	2.5	-4.4	14.0	18.4	15
40	3	802.11ax	MCS0 RU242	-10.7	2.5	-8.2	14.0	22.2	15
40	11	802.11ax	MCS0 RU242	-11.2	2.5	-8.7	14.0	22.7	15

5.1.3 Adaptivity

Operator	Anthony Smith	QA	Adam Alger
Temperature	20.9°C	R.H. %	46.3%
Test Date	06/11/2024	Location	Conducted RF Bench
Requirement	4.3.2.6.3.2.3	Method	5.4.6.2.1.4

Test Parameters

Frequency	2400-2483.5 MHz	Setup	Conducted
Threshold Level	-62.6 dBm/MHz	Unwanted Signal Level	-32.5 dBm
Interference Signal Frequency	2412 MHz 2462 MHz	Unwanted Signal Frequency	2395 MHz 2488.5 MHz
Companion Device Signal Power	-50 dBm/MHz		
Threshold Level Calculation	-70dBm/MHz + 10*log(100mw/EIRP(mW)) = Threshold Level (dBm/MHz)		

Instrumentation

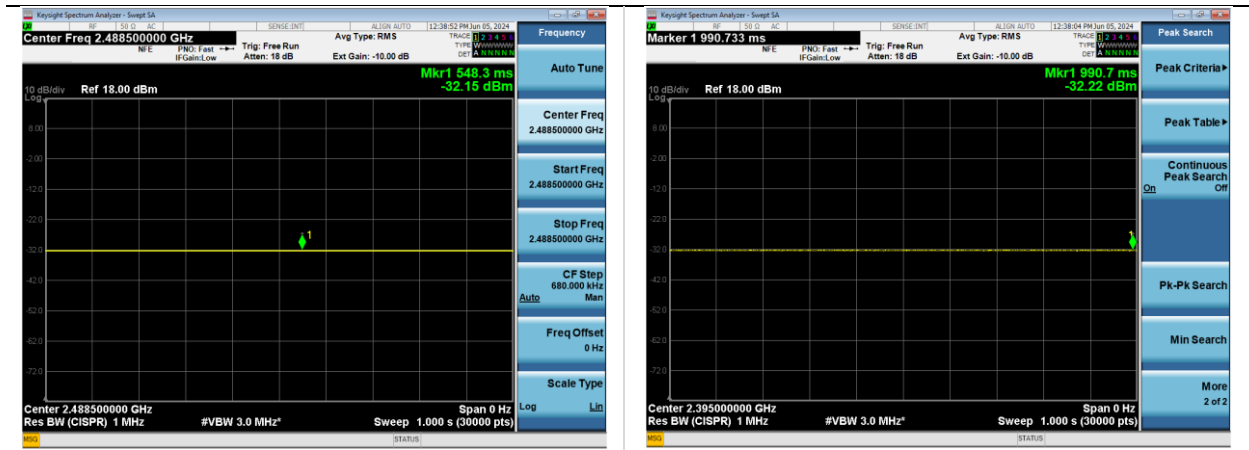
Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960180	Attenuator - Step Variable 1 dB	RF Lambda	RKT2G6A10	16100801	12/12/2023	12/12/2024	Active Verification
AA 960183	RF Splitter/Combiner	Mini-Circuits	ZFSC-2-10G+	F707701704	12/12/2023	12/12/2024	Active Verification
AA 960184	Attenuator - Step Variable 10 dB	RF Lambda	RKT2G6A60	17031005	12/12/2023	12/12/2024	Active Verification
CC 000314C	Vector Signal Generator	Agilent	E4438C	US 41469143	9/21/2022	9/20/2024	Active Calibration
EE 960088	Analyzer - EMI Receiver	Agilent	N9038A	MY51210138	4/10/2023	4/10/2025	Active Calibration
EE 960166	Coupler - Directional	Narda	3202B-10	11605	1/8/2024	1/8/2025	Active Verification
EE 960184	RF Splitter/Combiner	mini-circuits	ZFSC-2-10G +	S F707601702	12/12/2023	12/12/2024	Active Verification
EE 960210	Vector Signal Generator	Rohde & Schwarz	SMM100A	101827	6/30/2022	6/30/2025	Active Calibration

EUT Parameters

Antenna Gain	2.5 dBi	EIRP	18.1 dBm
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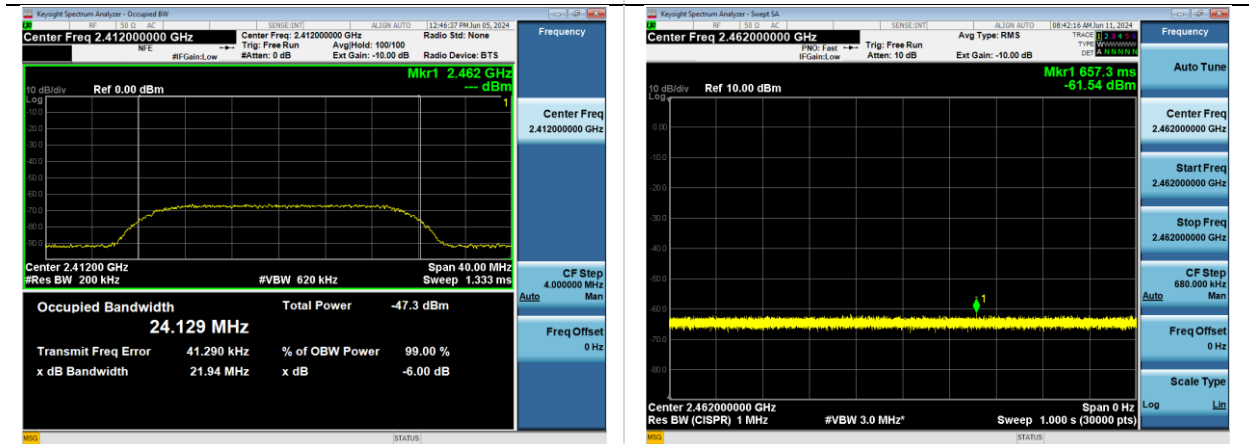
Company: Ezurio	Page 18 of 48	Name: SONA NX611 M.2 2230, 2 MHF
Report: TR3768-165-2.4-4268		Model:SONA NX611M
Job: C-3768		Serial: Eng Sample

Interference Threshold Level



2488.5 MHz Unwanted Signal Level

2395 MHz Unwanted Signal Level

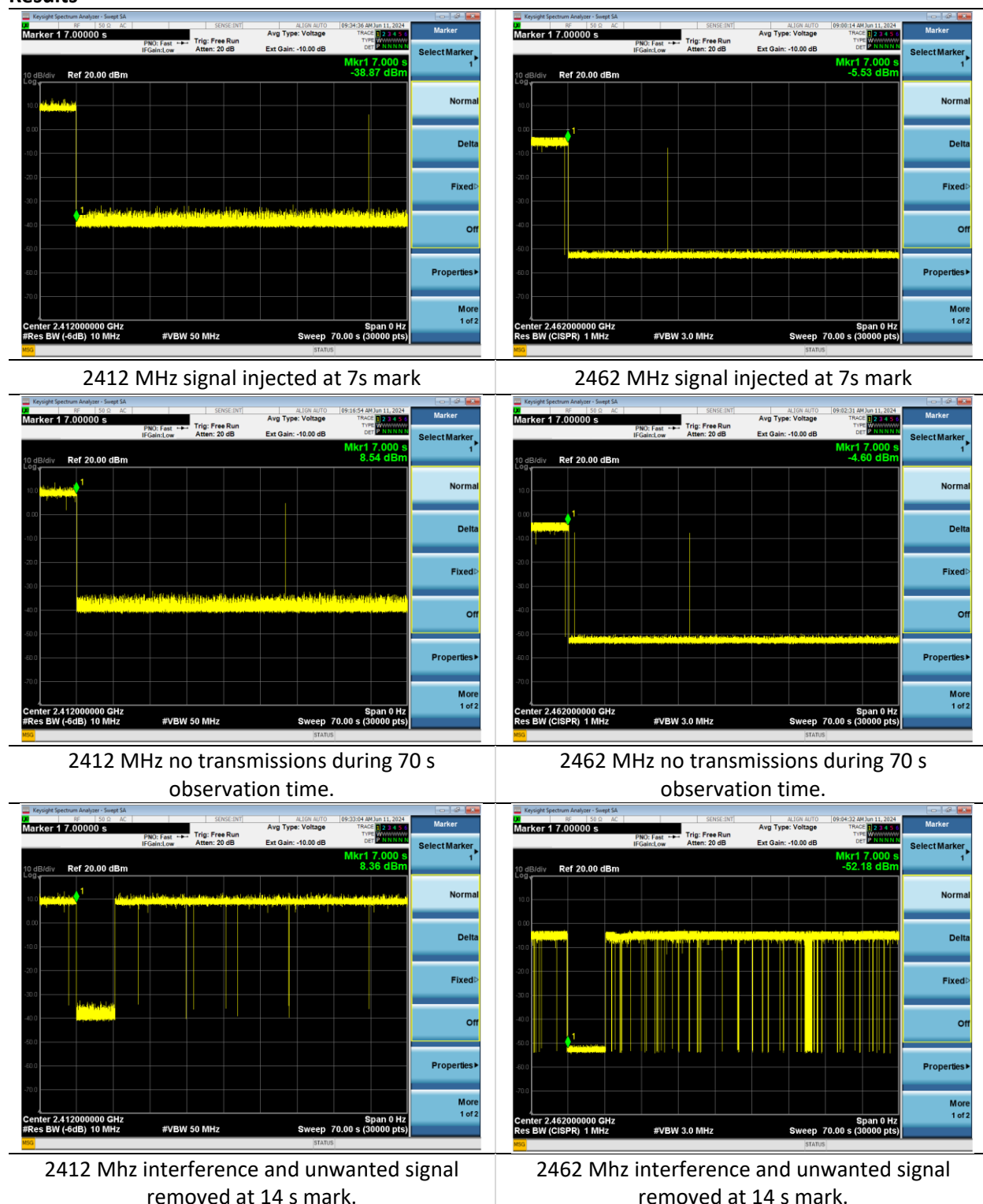


2412 MHz Interference Signal Bandwidth

2462 MHz Interference Signal Bandwidth

Company: Ezurio		Name: SONA NX611 M.2 2230, 2 MHF
Report: TR3768-165-2.4-4268	Page 19 of 48	Model:SONA NX611M
Job: C-3768		Serial: Eng Sample

Results



5.1.4 Occupied Channel Bandwidth

Operator	Dylan Rosenfeldt	QA	Adam Hauke
Temperature	21.6°C	R.H. %	60%
Test Date	05/21/2024	Location	Conducted RF Bench
Requirement	4.3.2.7	Method	5.4.7

Limits: The Occupied Channel Bandwidth shall be within the band 2400 MHz – 2483.5 MHz

Test Parameters

Frequency	2400-2483.5 MHz	Detector(s)	Occupied Bandwidth
RBW	20 MHz BW: 430 kHz 40 MHz BW: 820 kHz	VBW	20 MHz BW: 1.3 MHz 40 MHz BW: 2.4 MHz

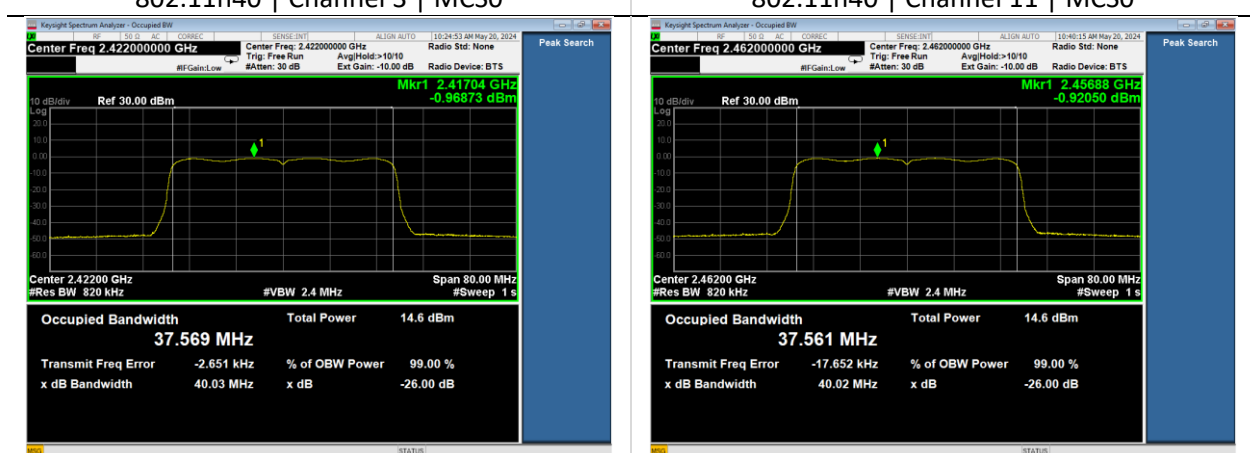
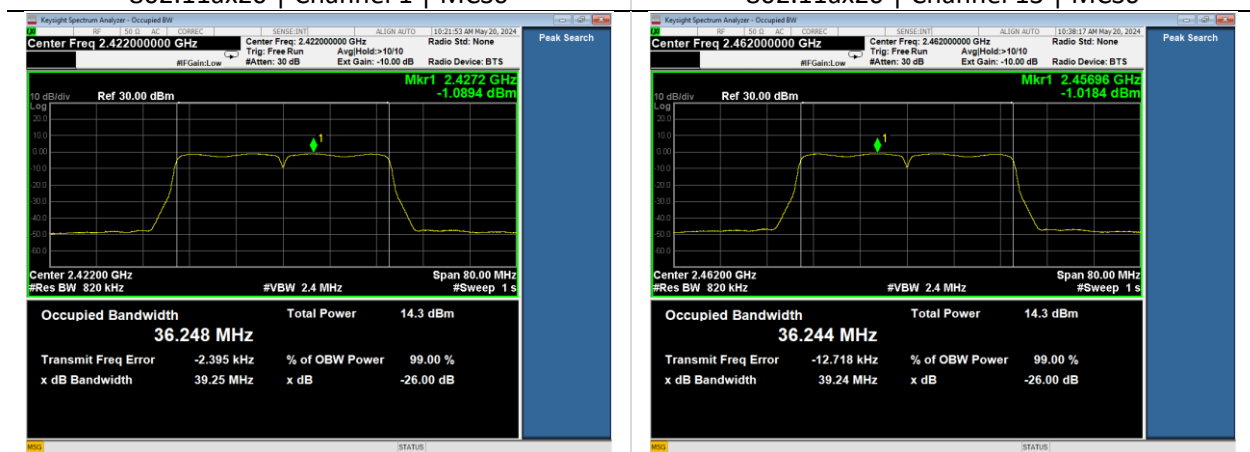
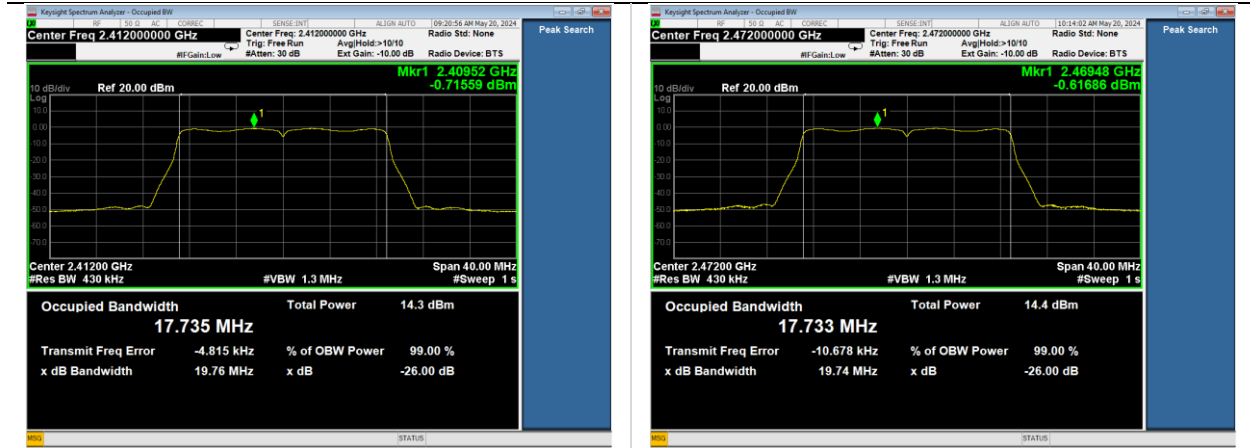
Measurements

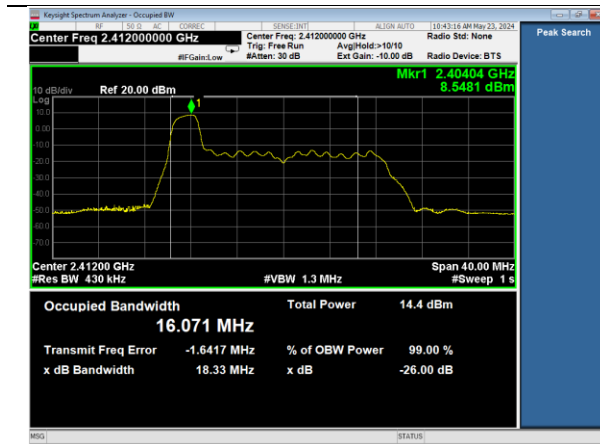
Mode	Rate	Channel	OCBW (MHz)
802.11b	1 Mbps	1	13.4
		13	13.4
	11 Mbps	1	13.3
		13	13.3
802.11g	6 Mbps	1	16.6
		13	16.6
	54 Mbps	1	16.6
		13	16.6
802.11n20	MCS0	1	17.7
		13	17.7
	MCS7	1	17.7
		13	17.7
802.11ax20	MCS0	1	18.8
		13	18.8
	MCS11	1	18.7
		13	18.7
802.11n40	MCS0	3	36.2
		11	36.2
	MCS7	3	36.2
		11	36.2
802.11ax40	MCS0	3	37.6
		11	37.6
	MCS11	3	37.4
		11	37.4

Mode	Rate	Channel	RU	OCBW (MHz)
802.11ax20	MCS0	1	26	16.1
		13	26	15.9
		1	52	15.8
		13	52	16.0
		1	106	15.8
		13	106	15.7
802.11ax40	MCS0	3	26	16.6
		11	26	16.0
		3	52	15.8
		11	52	19.0
		3	106	16.6
		11	106	15.9
		3	242	15.8
		11	242	19.0

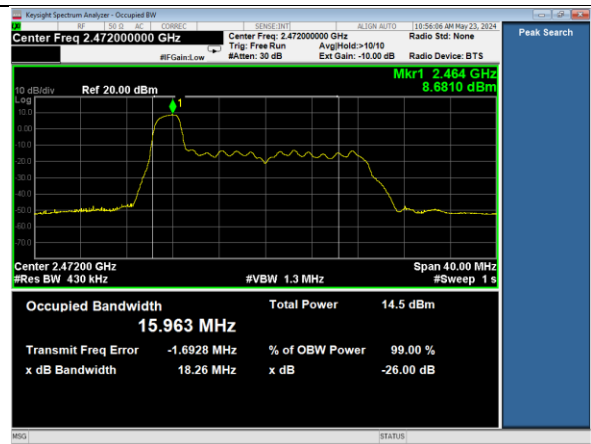
Plots



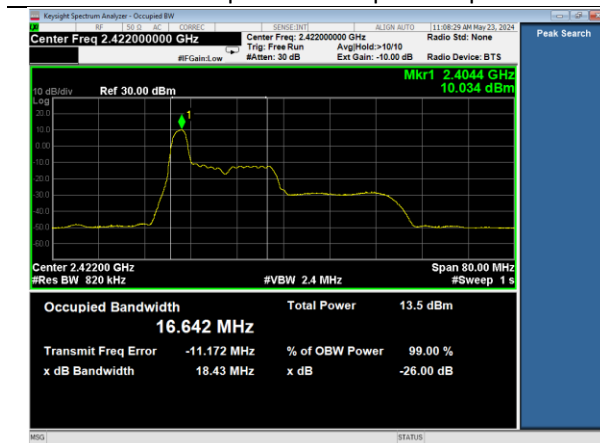




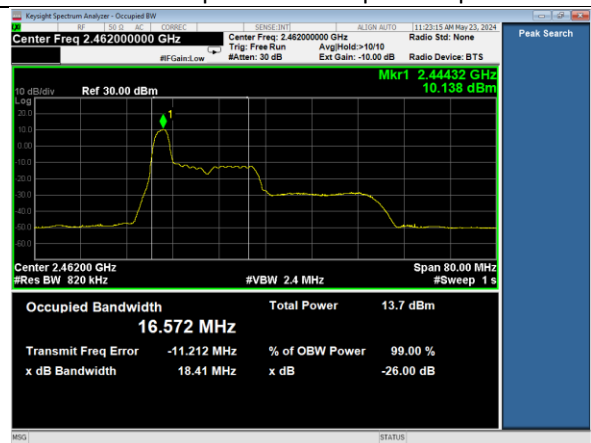
802.11ax20 | Channel 1 | MCS0 | MU26



802.11ax20 | Channel 13 | MCS0 | MU26



802.11ax40 | Channel 3 | MCS0 | MU26



802.11ax40 | Channel 11 | MCS0 | MU26

5.1.5 Transmitter unwanted emissions in the out of band domain

Operator	Dylan Rosenfeldt	QA	Adam Hauke
Temperature	21.6°C	R.H. %	60%
Test Date	05/21/2024	Location	Conducted RF Bench
Requirement	4.3.2.8	Method	5.4.8

Limits:

Frequency (MHz)	Limit
2400 MHz - 2BW – 2400 MHz - BW	-20 dBm/ MHz e.i.r.p.
2400 MHz - BW – 2400 MHz	-10 dBm/ MHz e.i.r.p.
2400 MHz + BW – 2400 MHz	-10 dBm/ MHz e.i.r.p.
2400 MHz + 2BW – 2400 MHz + BW	-20 dBm/ MHz e.i.r.p.

Test Parameters

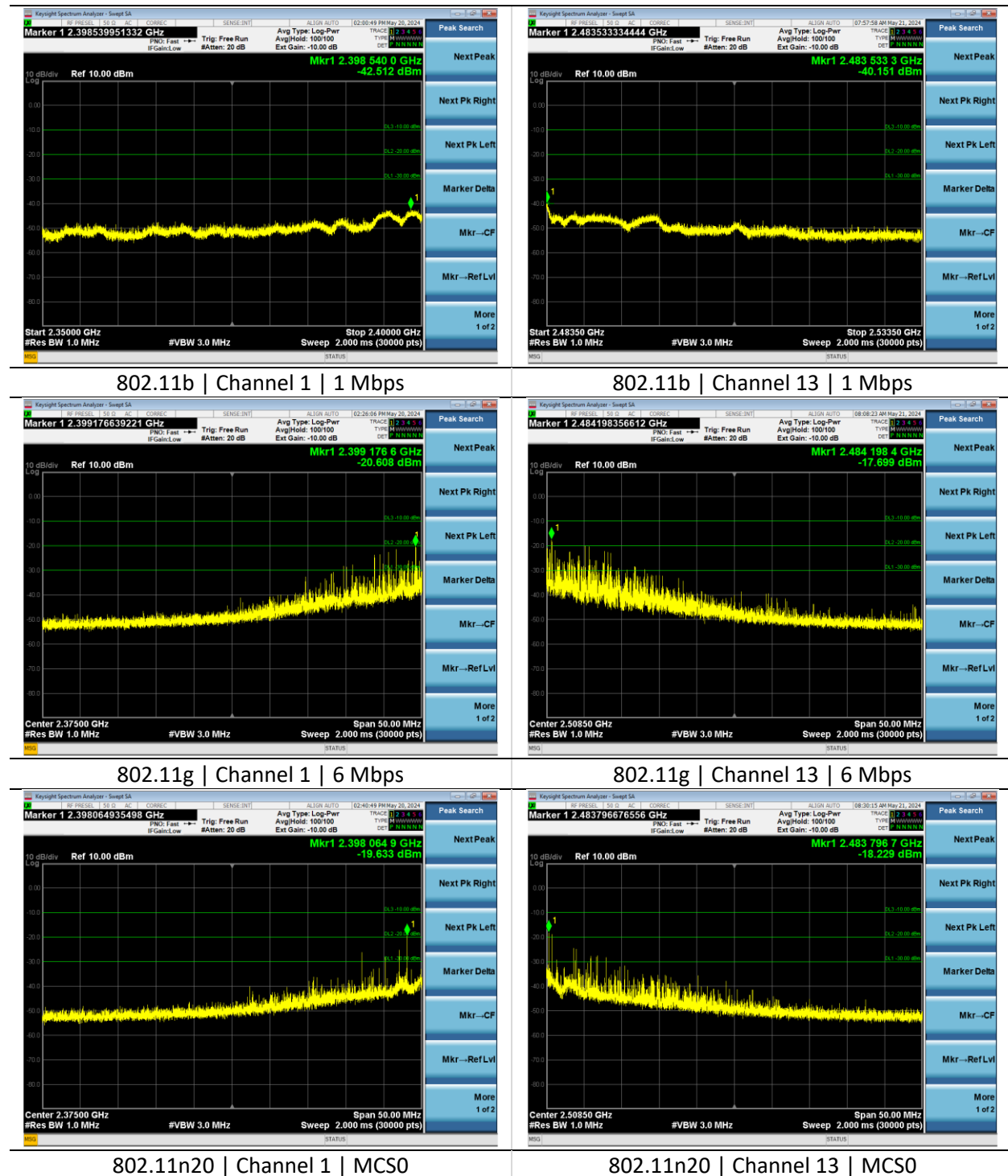
Frequency	2395-2488.5 MHz	Setup	Antenna Port
RBW	1 MHz	VBW	3 MHz
Measurement Mode	Time Domain Power		

Measurements

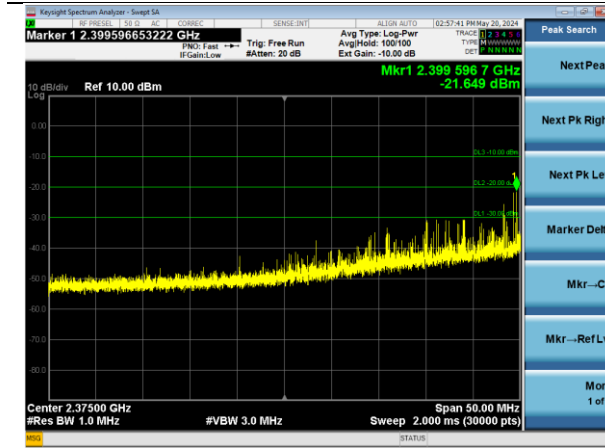
Mode	Rate	Channel	Frequency (MHz)	Measurement (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.11b	1	1	2398.5	-48.1	-45.6	-10.0	35.6
	Mbps	13	2484.0	-52.0	-49.5	-10.0	39.5
	11	1	2399.5	-49.5	-47.0	-10.0	37.0
	Mbps	13	2484.0	-46.9	-44.4	-10.0	34.4
802.11g	6	1	2399.5	-45.5	-43.0	-10.0	33.0
	Mbps	13	2484.0	-44.0	-41.5	-10.0	31.5
	54	1	2399.5	-42.1	-39.6	-10.0	29.6
	Mbps	13	2484.0	-43.6	-41.1	-10.0	31.1
802.11n20	MCS0	1	2398.5	-48.7	-46.2	-10.0	36.2
		13	2484.0	-46.8	-44.3	-10.0	34.3
	MCS7	1	2399.5	-45.1	-42.6	-10.0	32.6
		13	2484.0	-43.1	-40.6	-10.0	30.6
802.11ax20	MCS0	1	2399.5	-46.3	-43.8	-10.0	33.8
		13	2484.0	-45.9	-43.4	-10.0	33.4
	MCS11	1	2399.5	-49.3	-46.8	-10.0	36.8
		13	2484.0	-49.8	-47.3	-10.0	37.3
802.11n40	MCS0	3	2399.5	-47.6	-45.1	-10.0	35.1
		11	2484.0	-44.1	-41.6	-10.0	31.6
	MCS7	3	2399.5	-48.3	-45.8	-10.0	35.8
		11	2484.0	-43.2	-40.7	-10.0	30.7
802.11ax40	MCS0	3	2399.5	-49.1	-46.6	-10.0	36.6
		11	2484.0	-45.4	-42.9	-10.0	32.9
	MCS11	3	2399.5	-47.1	-44.6	-10.0	34.6
		11	2484.0	-44.5	-42.0	-10.0	32.0

Mode	Rate	Channel	RU	Frequency (MHz)	Measurement (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.11ax20	MCS0	1	26	2399.5	-45.7	-43.2	-10.0	33.2
		13	26	2484.0	-46.7	-44.2	-10.0	34.2
		1	52	2399.5	-47.7	-45.2	-10.0	35.2
		13	52	2484.0	-46.2	-43.7	-10.0	33.7
		1	106	2399.5	-44.2	-41.7	-10.0	31.7
		13	106	2484.0	-46.3	-43.8	-10.0	33.8
802.11ax40	MCS0	3	26	2399.5	-45.8	-43.3	-10.0	33.3
		11	26	2484.0	-40.1	-37.6	-10.0	27.6
		3	52	2399.5	-47	-44.5	-10.0	34.5
		11	52	2484.0	-41.6	-39.1	-10.0	29.1
		3	106	2399.5	-44.9	-42.4	-10.0	32.4
		11	106	2484.0	-42.9	-40.4	-10.0	30.4
		3	242	2399.5	-47.2	-44.7	-10.0	34.7
		11	242	2484.0	-44.9	-42.4	-10.0	32.4

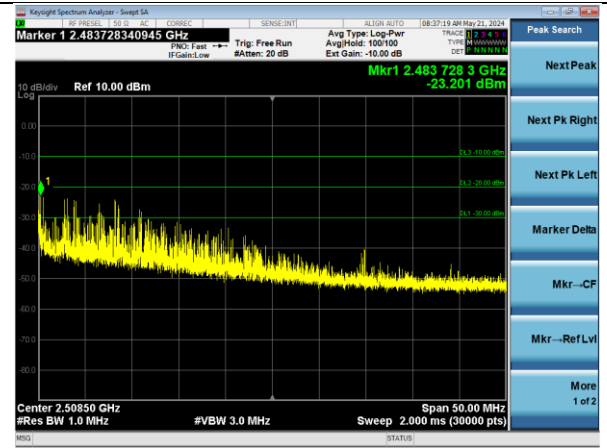
Plots



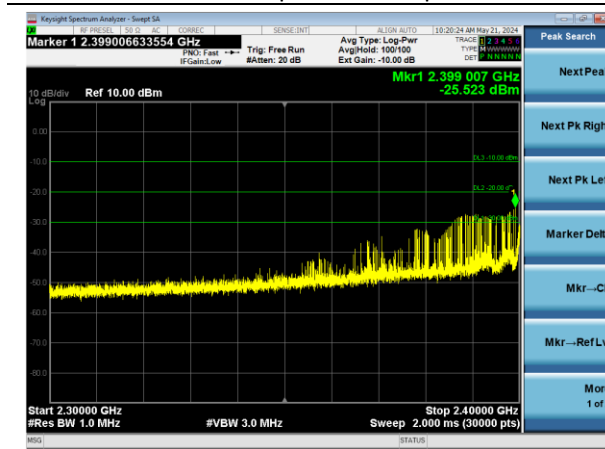
Company: Ezurio	Page 29 of 48	Name: SONA NX611 M.2 2230, 2 MHF
Report: TR3768-165-2.4-4268		Model:SONA NX611M
Job: C-3768		Serial: Eng Sample



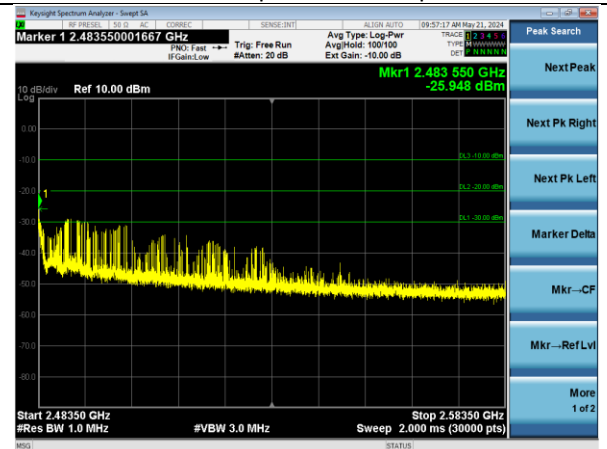
802.11ax20 | Channel 1 | MCS0



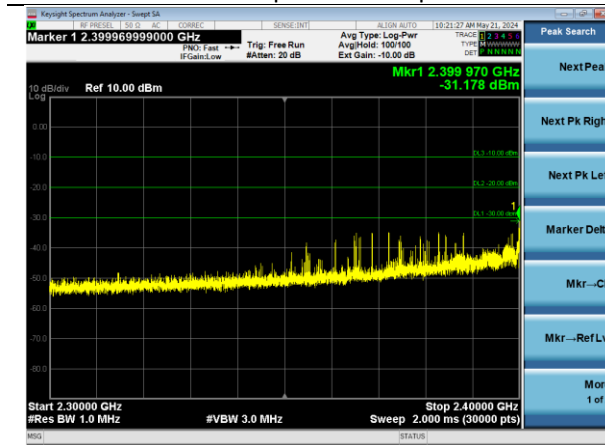
802.11ax20 | Channel 13 | MCS0



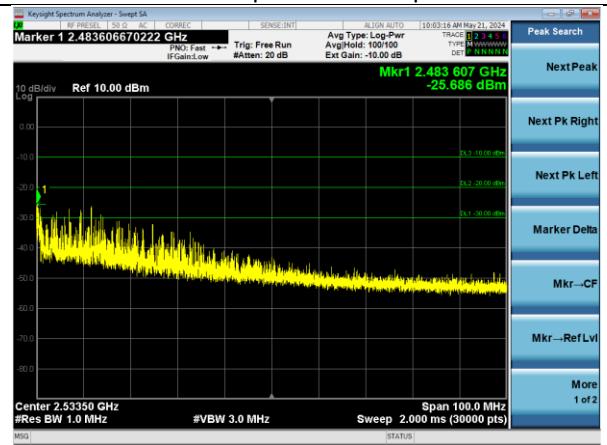
802.11n40 | Channel 3 | MCS0



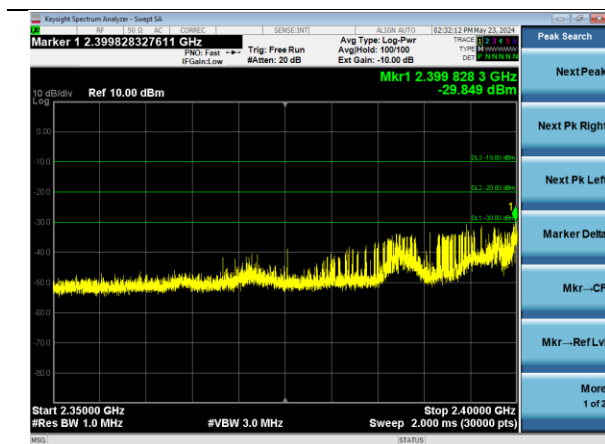
802.11n40 | Channel 11 | MCS0



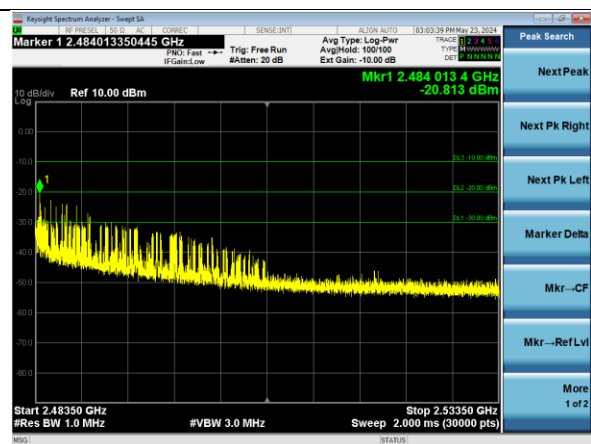
802.11ax40 | Channel 3 | MCS0



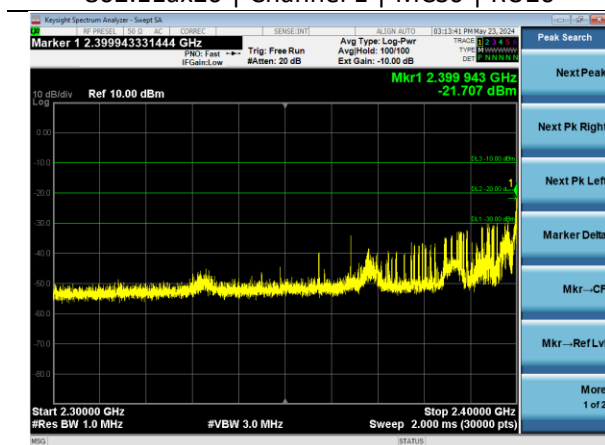
802.11ax40 | Channel 11 | MCS0



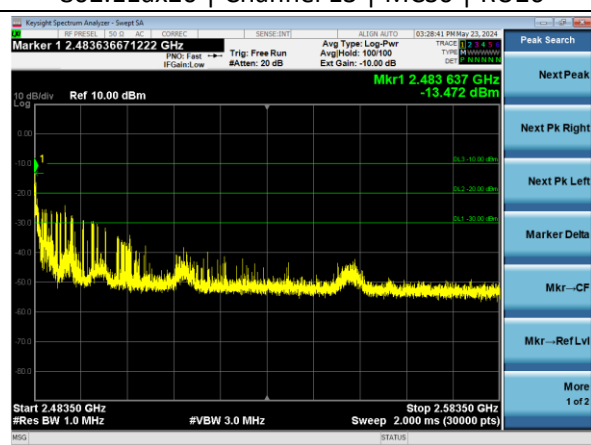
802.11ax20 | Channel 1 | MCS0 | RU26



802.11ax20 | Channel 13 | MCS0 | RU26



802.11ax40 | Channel 3 | MCS0 | RU26



802.11ax40 | Channel 11 | MCS0 | RU26

5.1.6 Transmitter unwanted emissions in the spurious domain

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	22.8°C	R.H. %	47.6%
Test Date	06/06/2024	Location	Conducted RF Bench
Requirement	4.3.2.9	Method	5.4.9

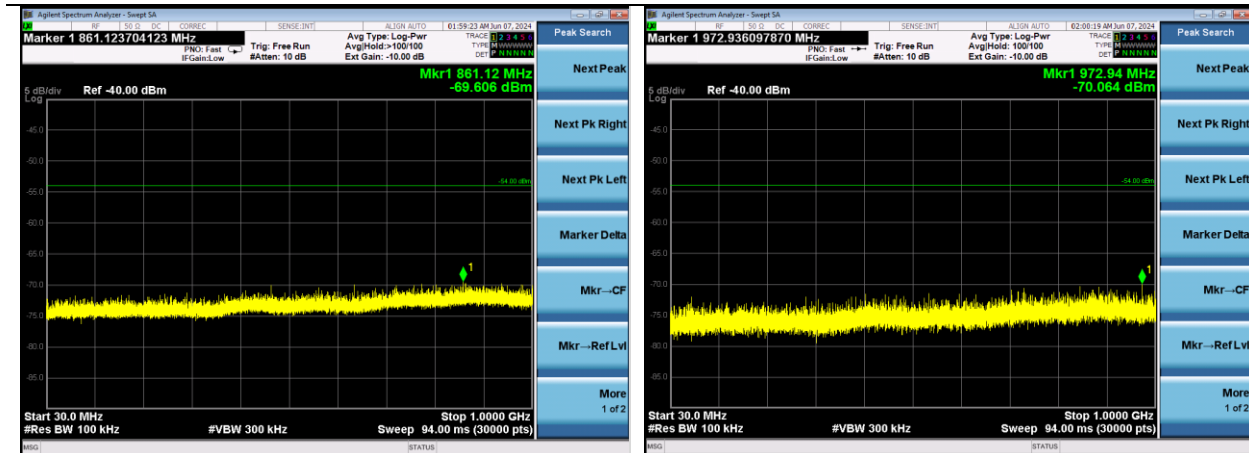
Limits:

Frequency (MHz)	Maximum Power	Bandwidth
30-47	-36 dBm	100 kHz
47-74	-54 dBm	100 kHz
74-87.5	-36 dBm	100 kHz
87.5-118	-54 dBm	100 kHz
118-174	-36 dBm	100 kHz
174-230	-54 dBm	100 kHz
230-470	-36 dBm	100 kHz
470-694	-54 dBm	100 kHz
694-1000	-36 dBm	100 kHz
1000-12750	-30 dBm	1 MHz

Test Parameters

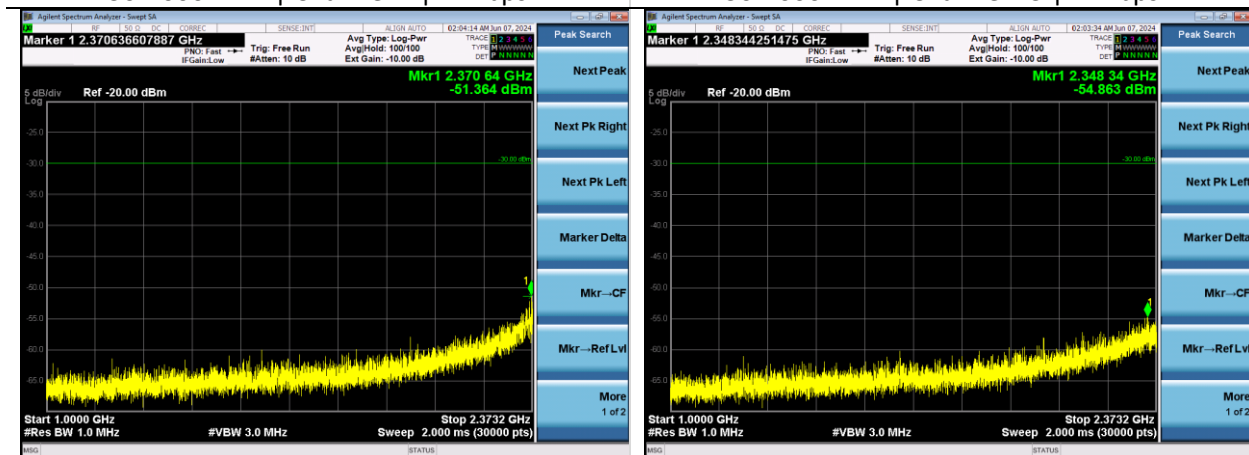
Frequency	30-12750 MHz	Setup	Antenna Port
RBW	<1000 MHz – 100 kHz >1000 MHz – 1 MHz	VBW	<1000 MHz – 300 kHz >1000 MHz – 3 MHz
Note	No emissions within 6 dB of limit		

Plots



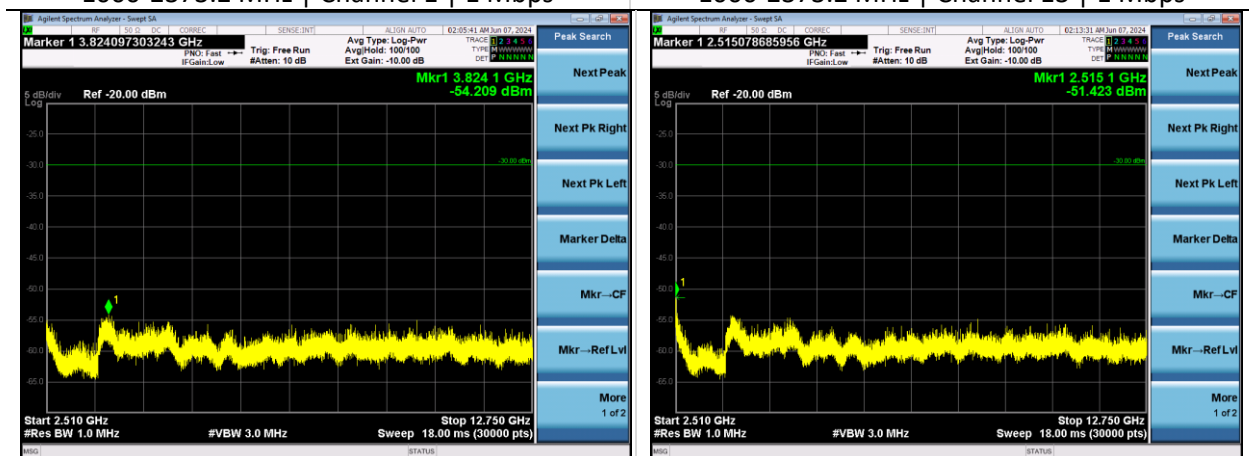
30-1000 MHz | Channel 1 | 1 Mbps

30-1000 MHz | Channel 13 | 1 Mbps



1000-2373.2 MHz | Channel 1 | 1 Mbps

1000-2373.2 MHz | Channel 13 | 1 Mbps



2510.3-12750 MHz | Channel 1 | 1 Mbps

2510.3-12750 MHz | Channel 13 | 1 Mbps

Company: Ezurio		Name: SONA NX611 M.2 2230, 2 MHF
Report: TR3768-165-2.4-4268	Page 33 of 48	Model: SONA NX611M
Job: C-3768		Serial: Eng Sample

5.1.7 Receiver Spurious Domain

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	22.8°C	R.H. %	47.6%
Test Date	06/06/2024	Location	Conducted RF Bench
Requirement	4.3.2.10	Method	5.4.10

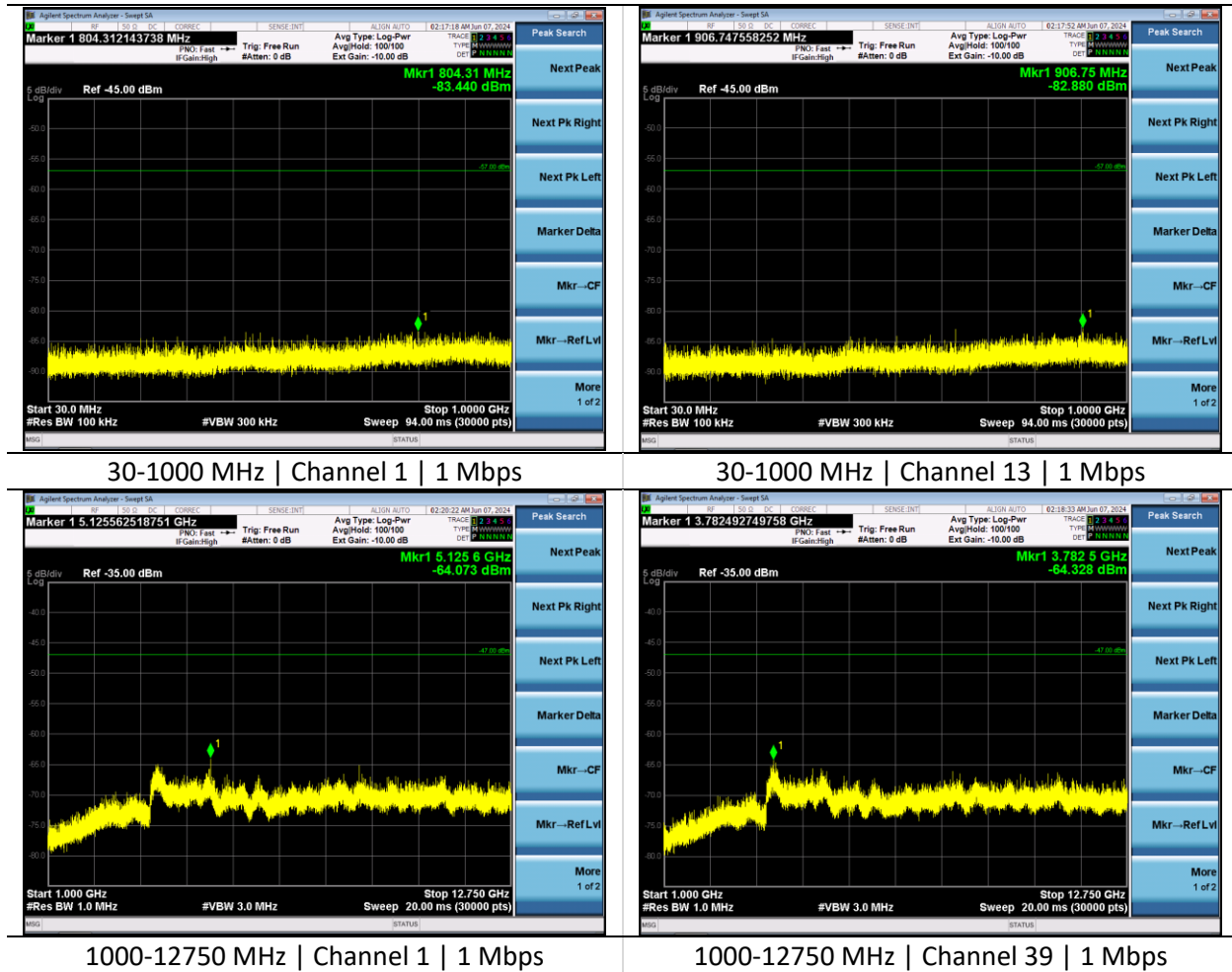
Limits:

Frequency (MHz)	Maximum Power	Bandwidth
30-1000	-57 dBm	100 kHz
1000-12750	-47 dBm	1 MHz

Test Parameters

Frequency	30-12750 MHz	Setup	Antenna Port
RBW	<1000 MHz – 100 kHz >1000 MHz – 1 MHz	VBW	<1000 MHz – 300 kHz >1000 MHz – 3 MHz
Note	No Emissions within 6 dB of limit		

Plots



5.1.8 Receiver Blocking

Operator	Anthony Smith	QA	Adam Alger
Temperature	21.5°C	R.H. %	46.4%
Test Date	05/30/2024	Location	Conducted RF Bench
Requirement	4.3.2.11	Method	5.4.11

Table 14: Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal		
(-133 dBm + $10 \times \log_{10}(\text{OCBW})$) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW		
(-139 dBm + $10 \times \log_{10}(\text{OCBW})$) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674				
NOTE 1: OCBW is in Hz.					
NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{\min} + 26$ dB where P_{\min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.					
NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{\min} + 20$ dB where P_{\min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.					
NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.					

Test Parameters

Receiver Level	1	Performance Criteria	10% PER
Signal Value (dBm)	-70.5 -76.5	Signal Power Companion Device (dBm)	-68.0 -74.0
Blocking Signal Frequencies (MHz)	2380, 2504 2300, 2330, 2360, 2524, 2584, 2674		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/11/2024	4/11/2025	Active Calibration
EE 960184	RF Splitter/Combiner	mini-circuits	ZFSC-2-10G +	S F707601702	12/12/2023	12/12/2024	Active Verification
CC 000314C	Vector Signal Generator	Agilent	E4438C	US 41469143	9/21/2022	9/20/2024	Active Calibration

EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	2.4 GHz WLAN Tx
Frequency	2412-2472 MHz	Channel	1, 13

Channel	Rate	2380 MHz	2504 MHz	2300 MHz	2330 MHz	2360 MHz	2524 MHz	2584 MHz	2674 MHz	Packets Sent
PER %										
1	1 Mbps	0.0%		0.0%	0.5%	0.0%				1000
13	1 Mbps		0.0%				0.0%	0.4%	0.0%	1000
Packets Received										
1	1 Mbps	1000	-	1000	995	1000	-	-	-	1000
13	1 Mbps	-	1000	-	-	-	1000	996	1000	1000

5.2 Radiated Emissions

Description of Measurement	<p>The frequency spectrum is investigated for intentional and / or unintentional signals emanating from the EUT by use of a standardized test site and measurement antenna.</p> <p>The antenna, cable, pre-amp, and other necessary measurement system correction factors are loaded onto the EMI receiver / spectrum analyzer when the measurements are performed allowing the data to be gathered and reported as corrected values.</p> <p>The maximum emissions from the EUT are determined by turn-table azimuth rotation (360°) and scanning of the measurement antenna. Maximized levels are noted at degree values of azimuth, measurement antenna height, and measurement antenna polarity.</p>
Example Calculations	<p>Measurement (dBμV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBμV/m)</p> <p>Margin (dB) = Limit (dBμV/m) - Corrected Reading (dBμV/m)</p> <p>Example at 4000 MHz: Reading = 40 dBμV + 3.4 dB + 0.9 dB + 6.5 dB/m = 50.8 dBμV/m Average Limit = 20 log (500) = 54 dBμV/m Margin = 54 dBμV/m - 50.8 dBμV/m = 3.2 dB</p>

Block Diagram



5.2.1 Transmitter unwanted emissions in the spurious domain

Operator	Mitchell Freund Nicole Sedmak Jon Dilley Zachary Brown	QA	Anthony Smith Adam Alger Adam Hauke Dylan Rosenfeldt
Temperature	24.5°C-25.0°C	R.H. %	36-38
Test Date	05/06/2024-05/14/2024	Location	Chamber 3 Chamber 5
Requirement	4.3.2.9	Method	5.4.9

Limits:

Frequency (MHz)	Maximum Power	Bandwidth
30-47	-36 dBm	100 kHz
47-74	-54 dBm	100 kHz
74-87.5	-36 dBm	100 kHz
87.5-118	-54 dBm	100 kHz
118-174	-36 dBm	100 kHz
174-230	-54 dBm	100 kHz
230-470	-36 dBm	100 kHz
470-694	-54 dBm	100 kHz
694-1000	-36 dBm	100 kHz
1000-12750	-30 dBm	1 MHz

Test Parameters

Frequency	30-12750 MHz	Distance	3 m
Detector(s)	Peak	Table Height	150 cm
RBW	<1000 MHz – 100 kHz >1000 MHz – 1 MHz	VBW	<1000 MHz – 300 kHz >1000 MHz – 3 MHz
Note	No emissions within 6 dB of the limit. Emission below 1000 MHz not a function of the EUT		

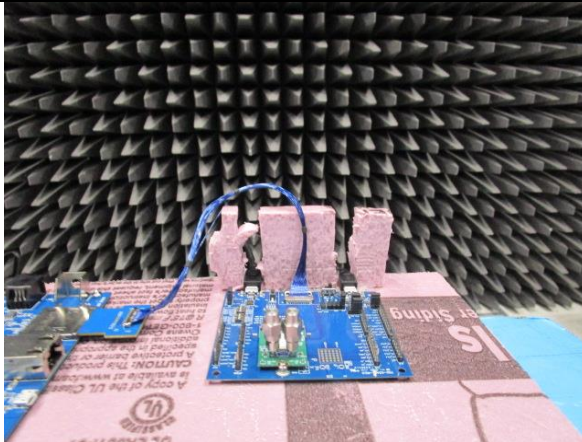
Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	8/10/2023	8/10/2024	Active Calibration
AA 960154	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-02	4/11/2024	4/11/2025	Active Calibration
AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	8/10/2023	8/10/2024	Active Calibration
AA 960217	Antenna - Biconical	A.H. Systems, Inc.	SAS-540	852	7/17/2023	7/17/2024	Active Calibration
AA 960221	Cable	A.H. Systems, Inc.	SAC-26G-6	524	6/13/2023	6/13/2024	Active Verification
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/27/2024	4/27/2025	Active Calibration
EE 960203	Analyzer - EMI Receiver	Keysight	N9038A	MY56400072	4/11/2024	4/11/2025	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	1/5/2024	1/5/2025	Active Verification
LSC-500	Cable	Chamber 5 Emissions	-	-	1/8/2024	1/8/2025	Active Verification

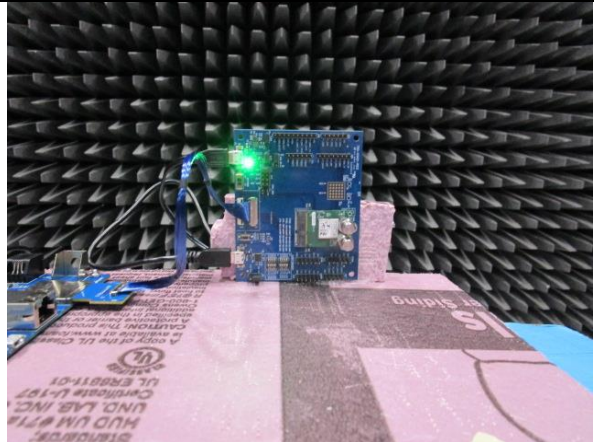
EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	2.4GHz WLAN Tx
EUT	X, Y, Z Plane Orientations Antenna ports terminated with 50 Ω SMA terminators	AE	HP Elitebook 840G1 Ezurio – SOM60 Development Kit
Notes	6000 MHz Emission from auxiliary equipment. Not a function of the EUT.		

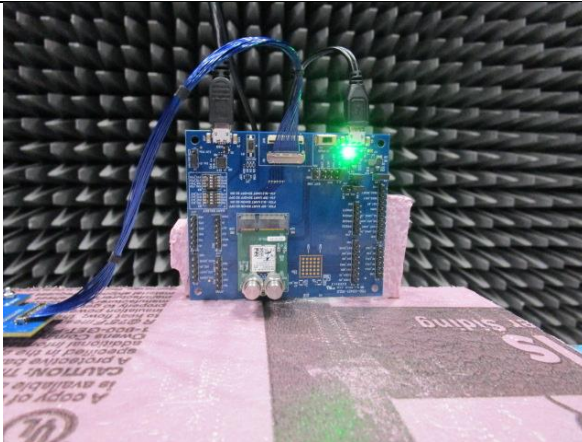
Setup Photos



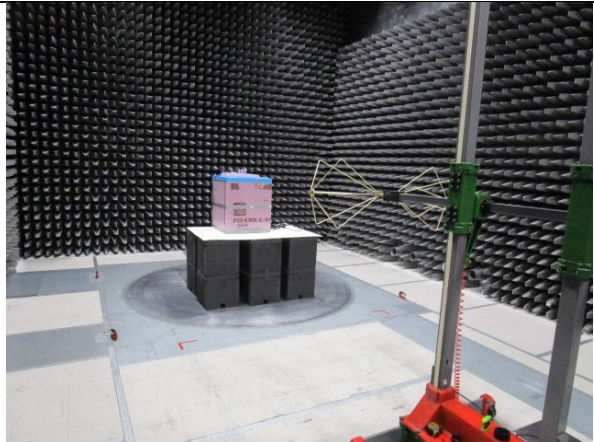
X Plane



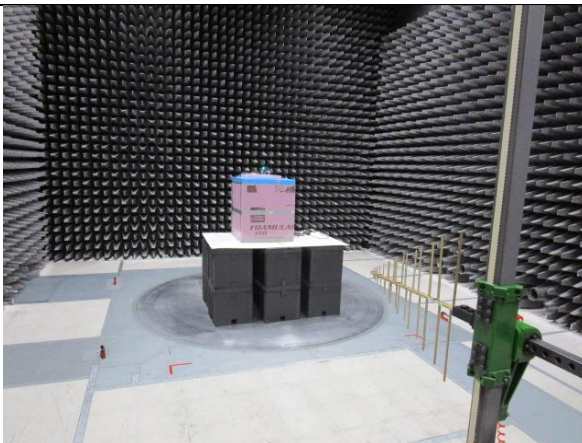
Y Plane



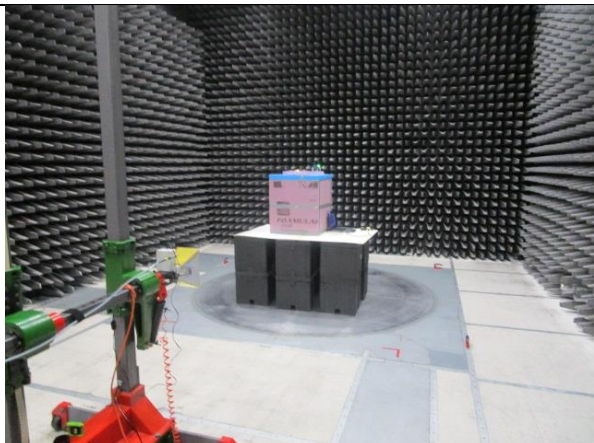
Z Plane



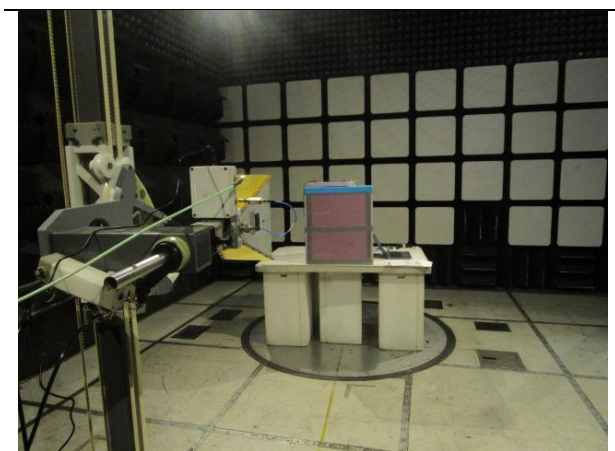
30-200 MHz



200-1000 MHz

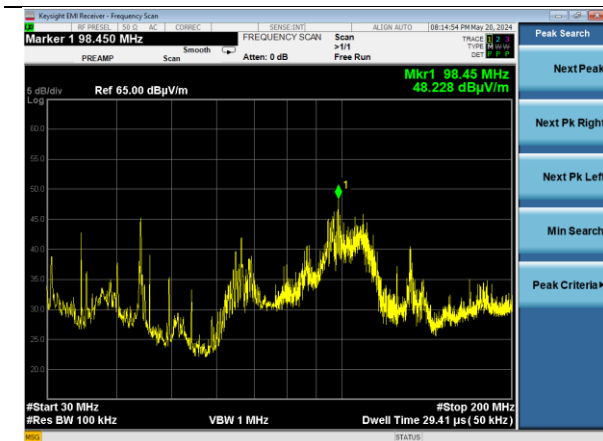


1000-4000 MHz

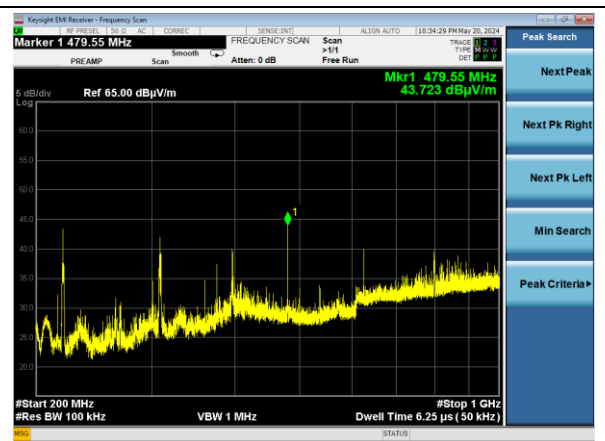


4000-12750 MHz

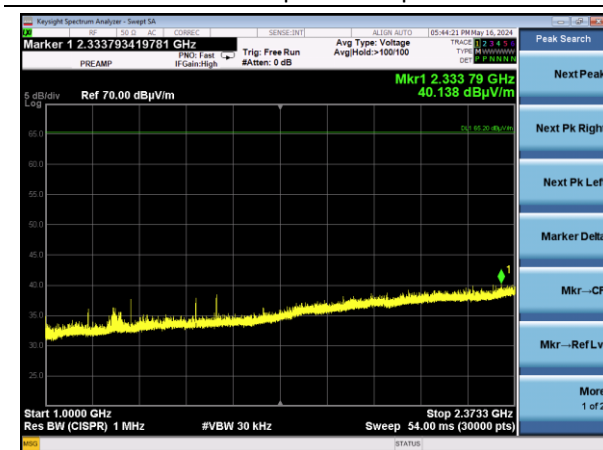
Worst Case Plots



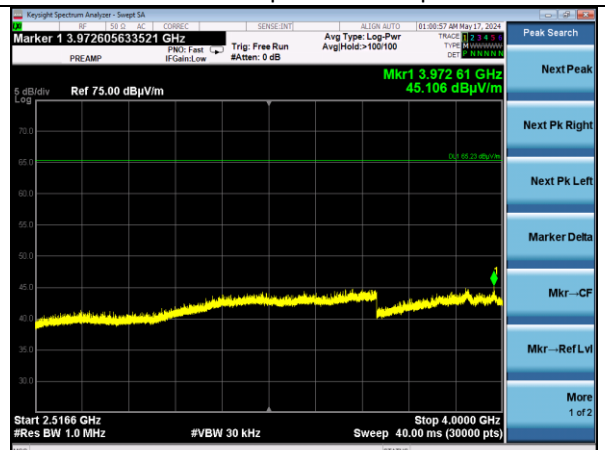
802.11b | Channel 13 | 1 Mbps
30-200 MHz | Vertical | Z Plane



802.11b | Channel 13 | 1 Mbps
200-1000 MHz | Horizontal | Z Plane



802.11b | Channel 1 | 1 Mbps
1000-2373.2 MHz | Horizontal | Z Plane



802.11b | Channel 1 | 1 Mbps |
2510.3-4000 MHz | Horizontal | Z Plane



802.11b | Channel 1 | 1 Mbps
4000-12750 MHz | Horizontal | X Plane

5.2.2 Receiver spurious

Operator	Nicole Sedmak	QA	Dylan Rosenfeldt
Temperature	22.2°C	R.H. %	40.00%
Test Date	02/01/2024	Location	Chamber 3 Chamber 5
Requirement	4.3.2.9	Method	5.4.9

Limits:

Frequency (MHz)	Maximum Power	Bandwidth
30-1000	-57 dBm	100 kHz
1000-12750	-47 dBm	1 MHz

Test Parameters

Frequency	30-12750 MHz	Distance	3 m
Detector(s)	Peak	Table Height	150 cm
RBW	<1000 MHz – 100 kHz >1000 MHz – 1 MHz	VBW	<1000 MHz – 300 kHz >1000 MHz – 3 MHz
Note	No emissions within 6 dB of the limit. Below 1000 MHz emissions not a function of the EUT		

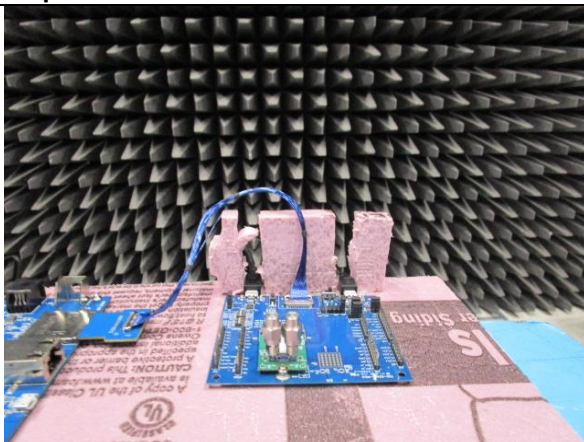
Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	8/10/2023	8/10/2024	Active Calibration
AA 960154	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-02	4/11/2024	4/11/2025	Active Calibration
AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	8/10/2023	8/10/2024	Active Calibration
AA 960217	Antenna - Biconical	A.H. Systems, Inc.	SAS-540	852	7/17/2023	7/17/2024	Active Calibration
AA 960221	Cable	A.H. Systems, Inc.	SAC-26G-6	524	6/13/2023	6/13/2024	Active Verification
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/27/2024	4/27/2025	Active Calibration
EE 960203	Analyzer - EMI Receiver	Keysight	N9038A	MY56400072	4/11/2024	4/11/2025	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	1/5/2024	1/5/2025	Active Verification
LSC-500	Cable	Chamber 5 Emissions	-	-	1/8/2024	1/8/2025	Active Verification

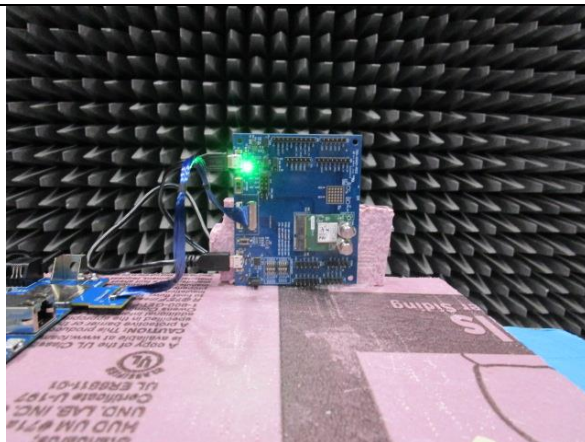
EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	2.4 GHz WLAN Rx
EUT	X, Y, Z Plane Orientations Antenna ports terminated with 50 Ω SMA terminators	AE	HP Elitebook 840G1 Ezurio – SOM60 Development Kit
Notes	6000 MHz Emission from auxiliary equipment. Not a function of the EUT.		

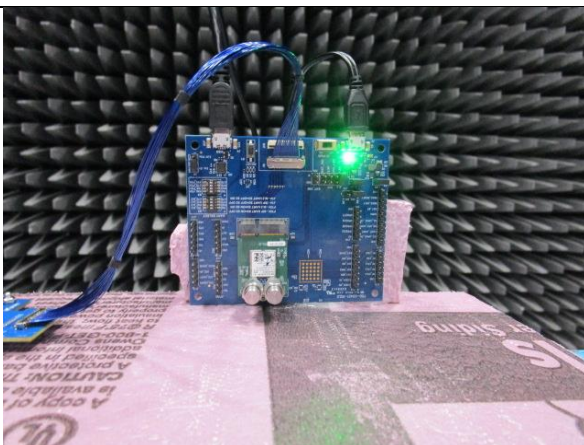
Setup Photos



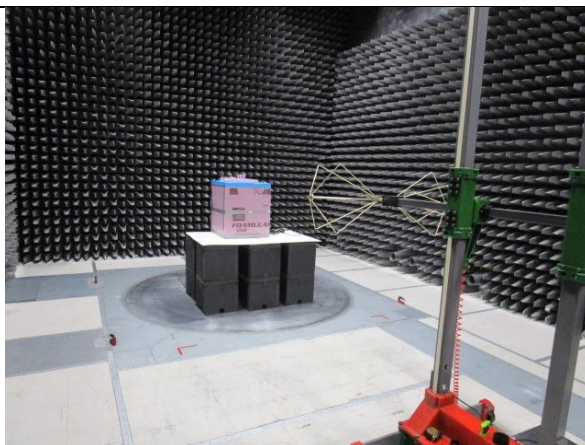
X Plane



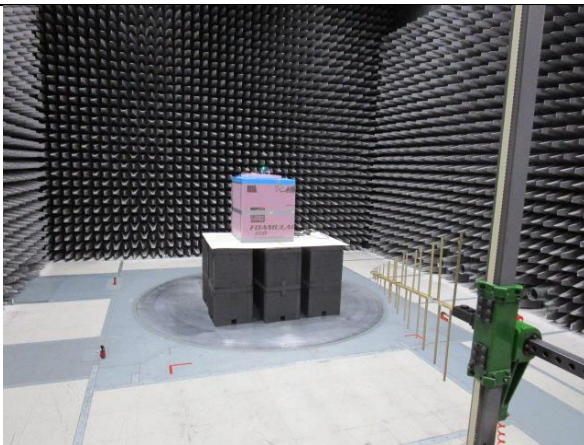
Y Plane



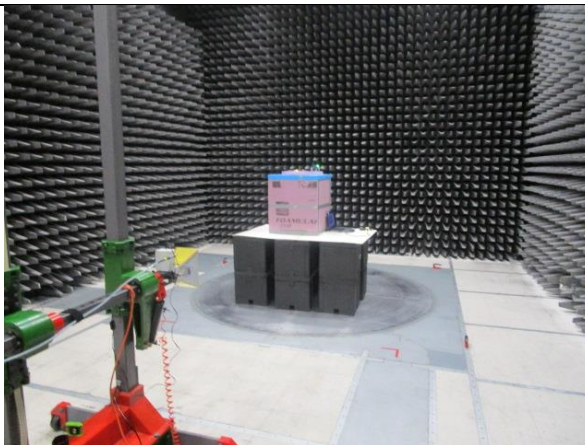
Z Plane



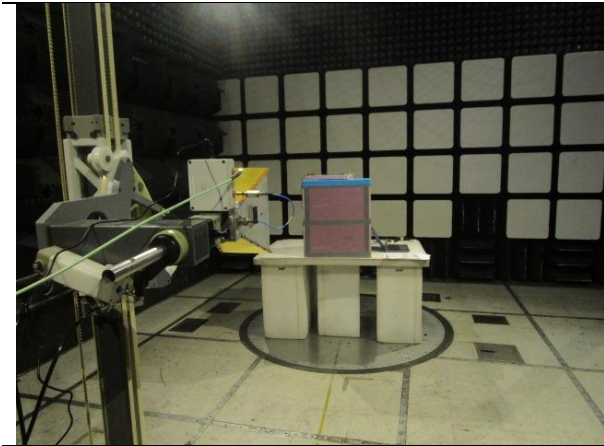
30-200 MHz



200-1000 MHz

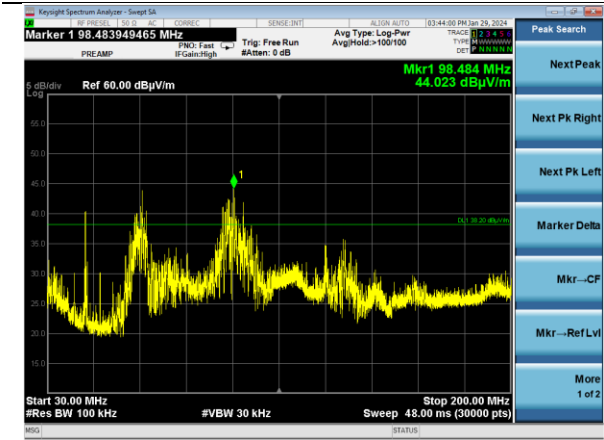


1000-4000 MHz

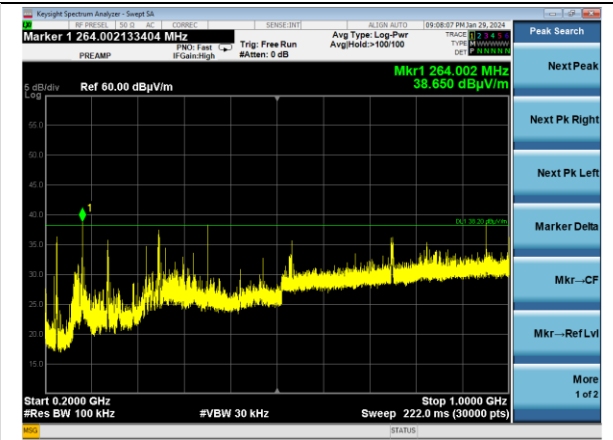


4000-12750 MHz

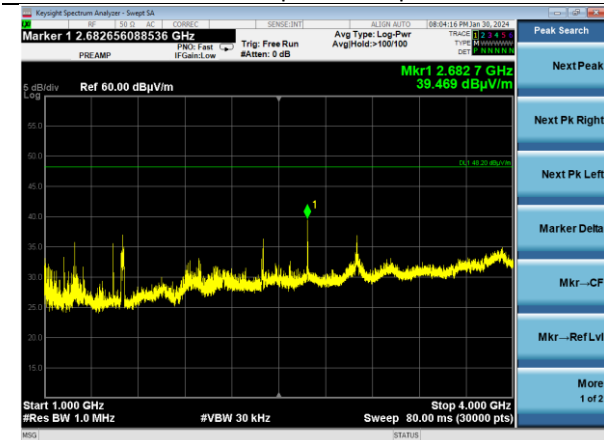
Worst Case Plots



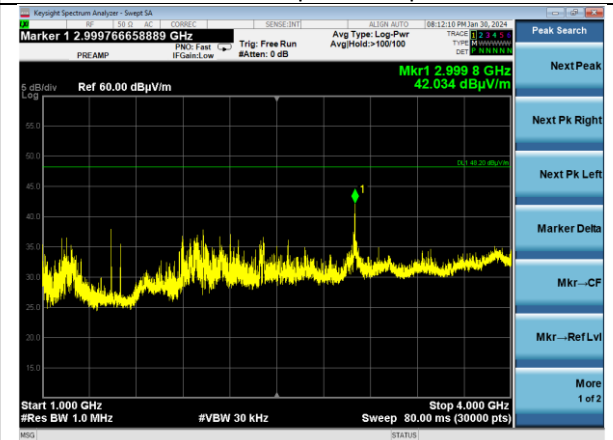
802.11b | Channel 1 | 1 Mbps
30-200 MHz | Vertical | X Plane



802.11b | Channel 1 | 1 Mbps
200-1000 MHz | Vertical | Z Plane



802.11b | Channel 1 | 1 Mbps
1000-4000 MHz | Vertical | Y Plane



802.11b | Channel 1 | 1 Mbps |
4000-12750 MHz | Vertical | Z Plane

Company: Ezurio	Page 47 of 48	Name: SONA NX611 M.2 2230, 2 MHF
Report: TR3768-165-2.4-4268		Model:SONA NX611M
Job: C-3768		Serial: Eng Sample

6 REVISION HISTORY

Version	Date	Notes	Person
0.0	02/12/2025	Initial Draft	Adam Alger
1	2/13/2025	Final	Adam Alger

END OF REPORT