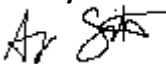


# TR3768-166-ETSI-301893

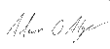
<b>Equipment Under Test:</b>	Module, SONA NX611 M.2 2230, 1 MHF
<b>Requirement(s):</b>	ETSI EN 301 893 AS/NZS 4268
<b>Test Date(s):</b>	01/29/2024 – 12/18/2024
<b>Prepared for:</b>	Ezurio Attn: Brian Petted W66 N220 Commerce Ct. Cedarburg, WI 53012

## Report Issued by:

Signature: 

Date: 2/12/2025

## Report Reviewed by: Adam Alger, Manager EMC Laboratory

Signature: 

Date: 2/12/2025

## Report Constructed by: Anthony Smith, EMC Engineering Specialist

Signature: 

Date: 2/12/2025

*This test report may not be reproduced, except in full, without approval of Ezurio*

Company: Ezurio	Page 1 of 63	Name: Module, SONA NX611 M.2 2230, 1 MHF
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Job: C-3768		Serial: 00047

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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*

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Job: C-3768		Serial: 00047

# 1 TEST REPORT SUMMARY

During **January 29<sup>th</sup>, 2024 through December 18<sup>th</sup>, 2024** the Equipment Under Test (EUT), **Module, SONA NX611 M.2 2230, 1 MHF**, as provided by **Ezurio** was tested to the following requirements:

## ETSI EN 301 893, AS/NZS 4268 – 5 GHz WLAN

Requirements	Description	Method	Specification	Compliant
4.2.1	Nominal Centre Frequencies	5.4.2	±20 ppm	Yes
4.2.2	Nominal Channel Bandwidth and Occupied Channel Bandwidth	5.4.3	16-20 MHz	Yes
4.2.3	RF output power, Transmit Power Control (TPC) and Power Density	5.4.4	23 dBm 10 dBm/MHz	Yes
4.2.4	Transmitter unwanted emissions	5.4.5 5.4.6	30-26000 MHz	Yes
4.2.5	Receiver spurious emissions	5.4.7	30-26000 MHz	Yes
4.2.6	Dynamic Frequency Selection (DFS)	5.4.8	Channel closing transmission time 1s Channel move time 10s	Yes
4.2.7	Adaptivity (Channel Access Mechanism)	5.4.9	-75 dBm/MHz	Yes
4.2.8	Receiver Blocking	5.4.10	-59 dBm CW -53 dBm CW	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

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## 2 CLIENT INFORMATION

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

### 2.1 Equipment Under Test (EUT) Information

*The following information has been supplied by the client*

<b>Product Name</b>	Module, SONA NX611 M.2 2230, 1 MHF
<b>Model Number</b>	453-00166
<b>Serial Number</b>	00047
<b>FCC ID</b>	SQG-SONANX611M
<b>IC ID</b>	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

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## 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

## 2.6 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-100BRS3B	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

## 2.7 Test Channels

Channel	Frequency (MHz)	Bandwidth (MHz)	Data Rates
36	5180	20	802.11a – 6 and 54 Mbps 802.11n – MCS0 and MCS7 802.11ac – MCS0 and MCS9 802.11ax – MCS0 and MCS11
52	5260	20	
64	5320	20	
100	5500	20	
120	5600	20	
144	5720	20	
38	5190	40	
62	5310	40	
102	5510	40	
142	5710	40	
42	5210	80	
58	5290	80	
106	5530	80	
138	5690	80	

## 2.8 Power Table

Mode	Channel BW (MHz)	Power Setting
802.11a	20	15
802.11n	20	14
802.11ac	20	14
802.11ax MCS0	20	14
802.11ax MCS9	20	12
802.11ax MCS11	20	10
802.11n	40	14
802.11ac MCS0	40	14
802.11ac MCS9	40	12
802.11ax MCS0	40	14
802.11ax MCS9	40	12
802.11ax MCS11	40	10
802.11ac MCS0	80	14
802.11ac MCS9	80	12
802.11ax MCS0	80	14
802.11ax MCS9	80	12
802.11ax MCS11	80	10

Mode	Channel BW (MHz)	Power Setting
802.11ax RU	20	6
802.11ax RU	40	6
802.11ax RU	80	6

### 3 REFERENCES

Publication	Edition	Date	AMD 1	AMD 2
ETSI EN 301 893	2.1.1	2017	-	-
AS/NZS 4268	4	2017	2021	-

## 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	$1 \times 10^{-7}$	$0.55 \times 10^{-7}$
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 %

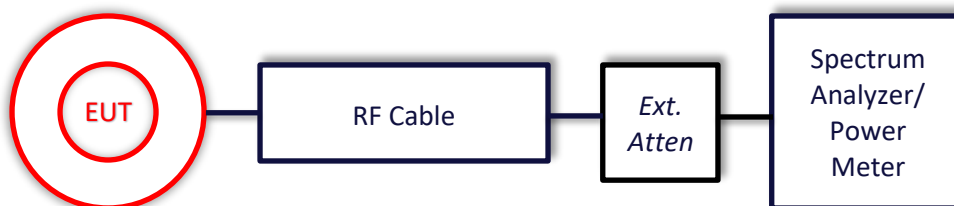
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Job: C-3768		Serial: 00047

## 5 TEST DATA

### 5.1 Antenna Port Conducted Emissions

<b>Description of Measurement</b>	<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>
<b>Example Calculations</b>	<p>Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm)</p> <p>Margin (dB) = Limit (dBm) – Corrected Reading (dBm)</p>

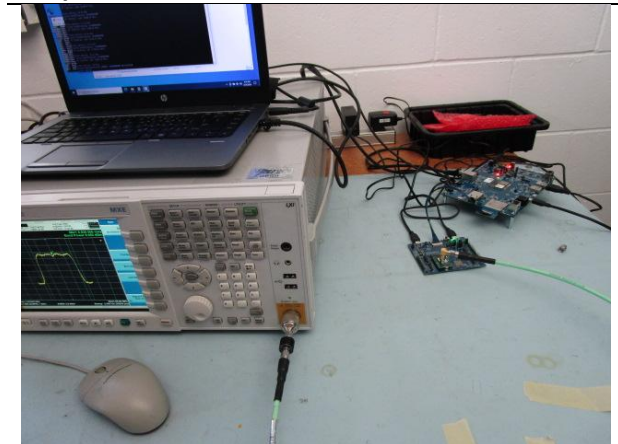
#### Block Diagram



#### Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960144	Cable	Gore	EKD01D010720	5800373	1/28/2025	1/28/2026	Active Verification
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	1/28/2025	1/28/2026	Active Verification
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/10/2024	4/10/2025	Active Calibration
EE 960090	Meter - RF Power	Anritsu	ML2495A	1335006	4/11/2024	4/11/2025	Active Calibration
EE 960091	Sensor - RF Power	Anritsu	MA2491A	1249277	4/11/2024	4/11/2025	Active Calibration

## Setup Photos



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### 5.1.1 Carrier Frequencies

<b>Operator</b>	Anthony Smith	<b>QA</b>	Dylan Rosenfeldt
<b>Temperature</b>	21.6 - 22.8°C	<b>R.H. %</b>	43.7 - 53.4%
<b>Test Date</b>	6/18/2024, 6/19/2024, 6/20/2024, 6/26/2024, 7/8/2024, 8/22/2024, 8/29/2024	<b>Location</b>	Thermotron Temp Chamber
<b>Requirement</b>	ETSI 301 893 4.2.1 AS/NZS 4268 6.6	<b>Method</b>	ETSI 301 893 5.4.2

**Limits:** ETSI 301 893: ±20 ppm

### Test Parameters

<b>Frequency</b>	5150-5725 MHz	<b>Setup</b>	Antenna Port
<b>Detector(s)</b>	Peak		
<b>Example Calculation</b>	Maximum Frequency Deviation = (Nominal Centre Frequency * 20E <sup>-6</sup> )		

### EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5 GHz WLAN Tx
<b>Frequency</b>	5260, 5600 MHz	<b>Channel</b>	52, 120

### Measurements

Channel	Mode	Temp	Frequency (Hz)	Nominal Frequency (Hz)	Limit (Hz)	Margin (Hz)
52	CW	21.5	5259975077	5260000000	105200	80277
120	CW	21.5	5599975452	5600000000	112000	87452
52	CW	-40	5260025127	5260000000	105200	80073
120	CW	-40	5600028637	5600000000	112000	83363
52	CW	85	5260013197	5260000000	105200	92003
120	CW	85	5600027351	5600000000	112000	84649

### 5.1.2 Occupied Channel Bandwidth

<b>Operator</b>	Anthony Smith	<b>QA</b>	Dylan Rosenfeldt
<b>Temperature</b>	21.3, 21.7, 21.6°C	<b>R.H. %</b>	46.3, 41.7, 58.6%
<b>Test Date</b>	6/11/2024, 6/12/2024, 6/17/2024	<b>Location</b>	RF Conducted Bench
<b>Requirement</b>	ETSI 301 893 4.2.2 AS/NZS 4268 6.5	<b>Method</b>	5.4.3

**Limits:** ETSI 301 893: The Occupied Channel Bandwidth shall be between 80 % and 100 % of the Nominal Channel Bandwidth.

AS/NZS: 4268: The upper and lower frequency limits of the transmitter 99% emission power bandwidth shall at all times remain within the operating frequency limits.

#### Test Parameters

<b>Frequency</b>	5150-5725 MHz	<b>Setup</b>	Antenna Port
<b>Detector(s)</b>	Peak		

#### EUT Parameters

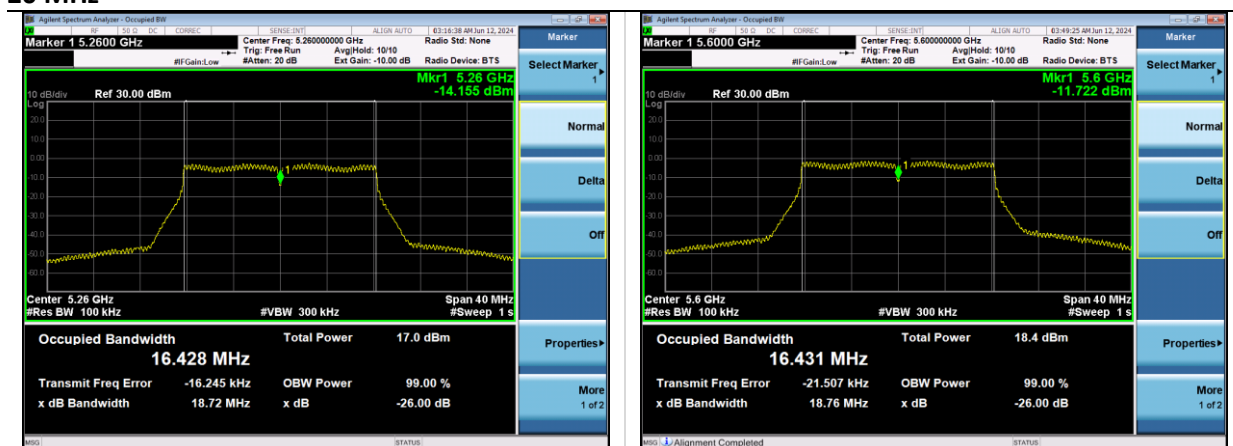
<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5 GHz WLAN Tx
<b>Frequency</b>	5260, 5270, 5290, 5590, 5600, 5610 MHz	<b>Channel</b>	52, 120 (20 MHz) 54, 118 (40 MHz) 58, 122 (80 MHz)

## Measurements

Nominal Bandwidth	Channel	Mode	Data Rate	OBW (MHz)	Limit (MHz)	Margin (MHz)
20	52	802.11a	6	16.4	16.0	0.4
20	52	802.11a	54	16.4	16.0	0.4
20	52	802.11n	MCS0	17.6	16.0	1.6
20	52	802.11n	MCS7	17.6	16.0	1.6
20	52	802.11ac	MCS0	17.6	16.0	1.6
20	52	802.11ac	MCS8	17.6	16.0	1.6
20	52	802.11ax	MCS0	18.8	16.0	2.8
20	52	802.11ax	MCS11	18.6	16.0	2.6
20	120	802.11a	6	16.4	16.0	0.4
20	120	802.11a	54	16.4	16.0	0.4
20	120	802.11n	MCS0	17.6	16.0	1.6
20	120	802.11n	MCS7	17.6	16.0	1.6
20	120	802.11ac	MCS0	17.6	16.0	1.6
20	120	802.11ac	MCS8	17.6	16.0	1.6
20	120	802.11ax	MCS0	18.8	16.0	2.8
20	120	802.11ax	MCS11	18.6	16.0	2.6
40	54	802.11n	MCS0	36.1	32.0	4.1
40	54	802.11n	MCS7	36.1	32.0	4.1
40	54	802.11ac	MCS0	36.1	32.0	4.1
40	54	802.11ac	MCS9	36.1	32.0	4.1
40	54	802.11ax	MCS0	37.5	32.0	5.5
40	54	802.11ax	MCS11	37.3	32.0	5.3
40	118	802.11n	MCS0	36.1	32.0	4.1
40	118	802.11n	MCS7	36.1	32.0	4.1
40	118	802.11ac	MCS0	36.1	32.0	4.1
40	118	802.11ac	MCS9	36.1	32.0	4.1
40	118	802.11ax	MCS0	37.5	32.0	5.5
40	118	802.11ax	MCS11	37.3	32.0	5.3
80	58	802.11ac	MCS0	75.8	64.0	11.8
80	58	802.11ac	MCS9	75.8	64.0	11.8
80	58	802.11ax	MCS0	77.4	64.0	13.4
80	58	802.11ax	MCS11	77.3	64.0	13.3
80	122	802.11ac	MCS0	75.8	64.0	11.8
80	122	802.11ac	MCS9	75.9	64.0	11.9
80	122	802.11ax	MCS0	77.4	64.0	13.4

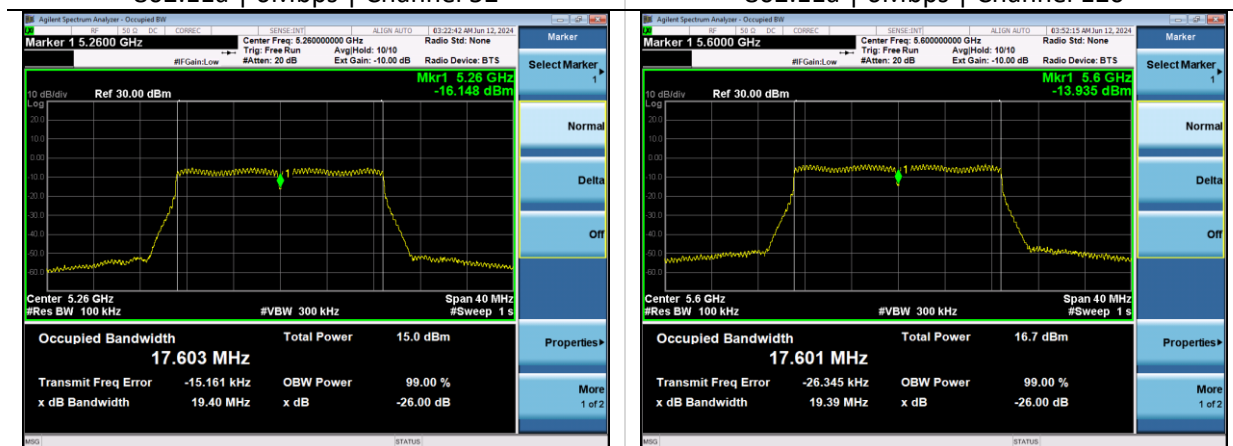
80	122	802.11ax	MCS11	77.3	64.0	13.3
20	52	802.11ax RU26	MCS0	17.7	16.0	1.7
20	120	802.11ax RU26	MCS0	17.8	16.0	1.8
20	52	802.11ax RU52	MCS0	17.6	16.0	1.6
20	120	802.11ax RU52	MCS0	17.7	16.0	1.7
20	52	802.11ax RU106	MCS0	17.7	16.0	1.7
20	120	802.11ax RU106	MCS0	17.7	16.0	1.7

# Plots 20 MHz



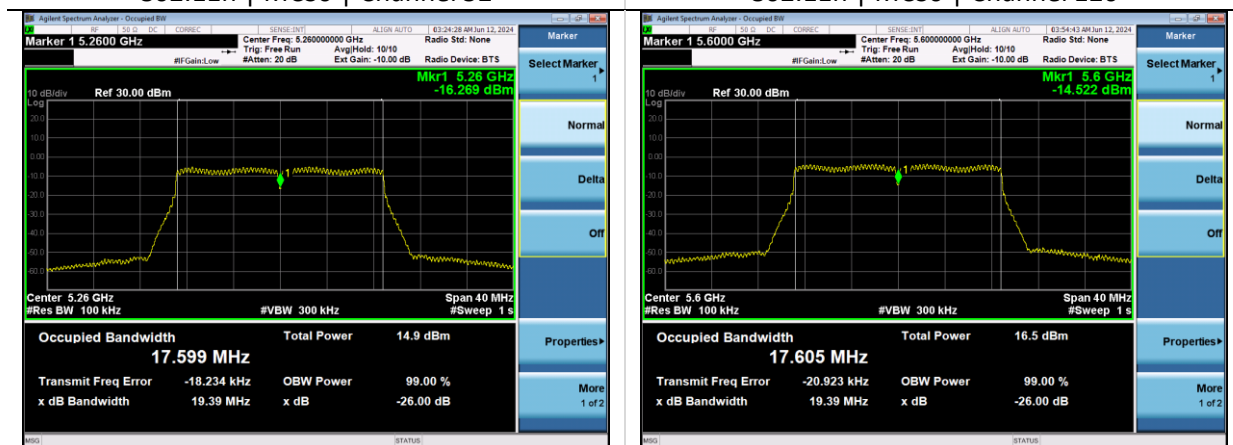
802.11a | 6Mbps | Channel 52

802.11a | 6Mbps | Channel 120



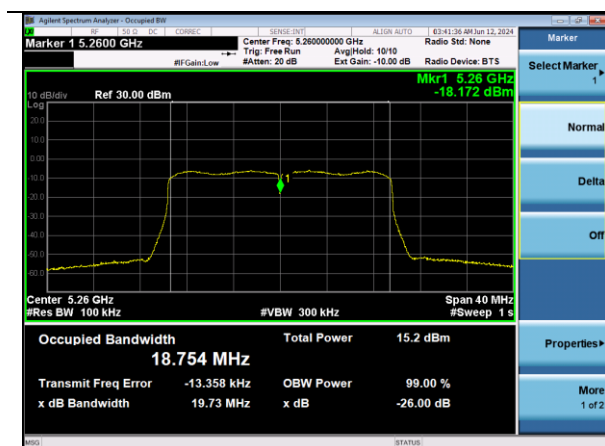
802.11n | MCS0 | Channel 52

802.11n | MCS0 | Channel 120

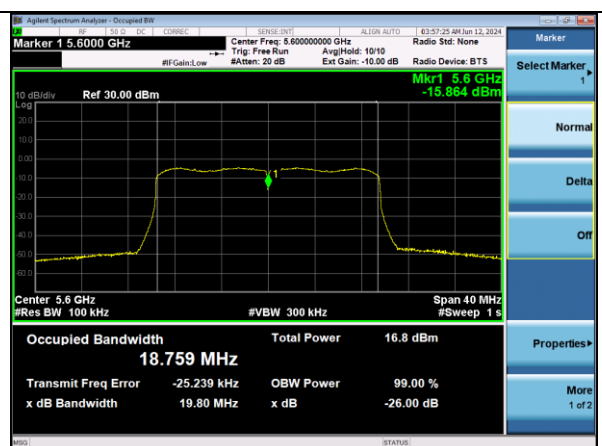


802.11ac | MCS0 | Channel 52

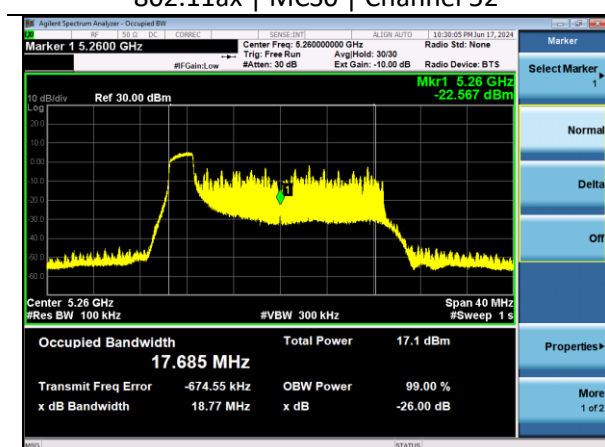
802.11ac | MCS0 | Channel 120



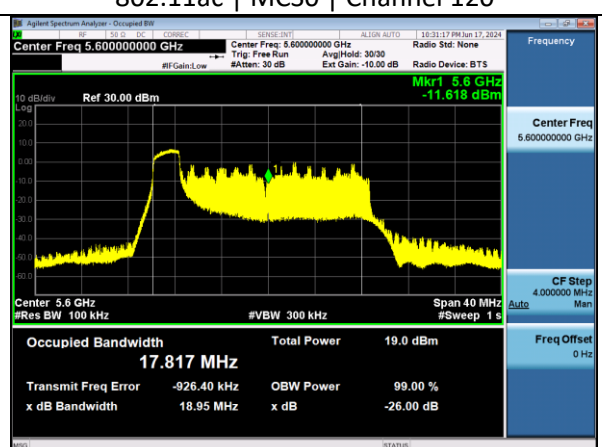
802.11ax | MCS0 | Channel 52



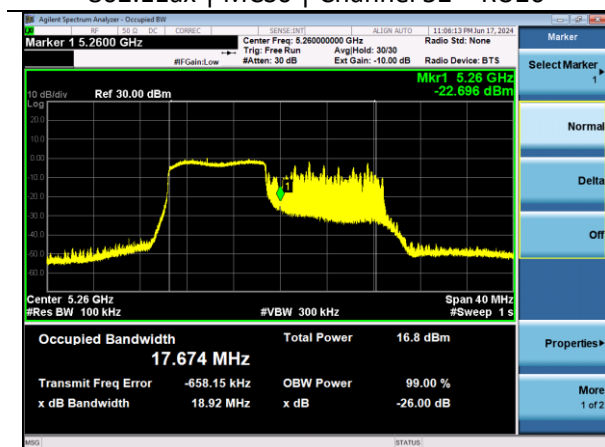
802.11ac | MCS0 | Channel 120



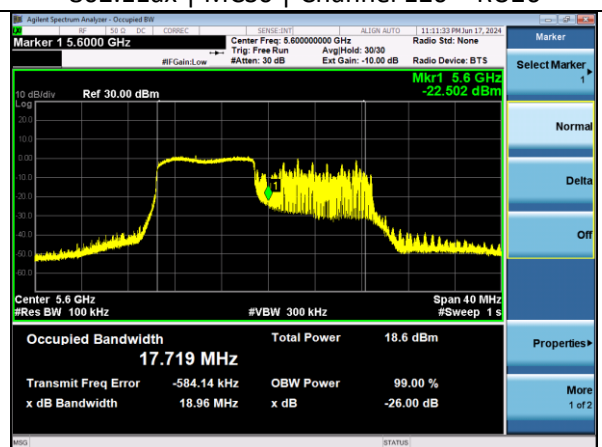
802.11ax | MCS0 | Channel 52 - RU26



802.11ax | MCS0 | Channel 120 - RU26



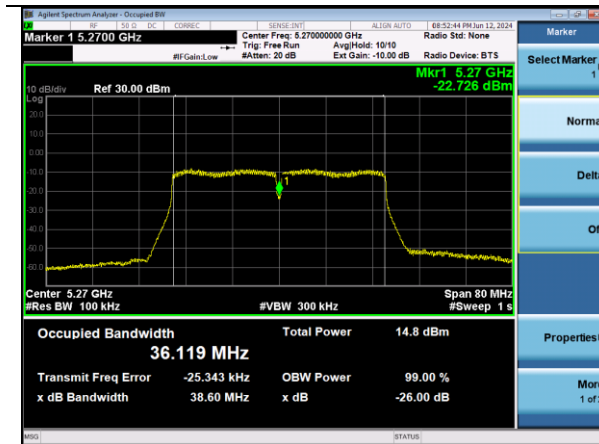
802.11ax | MCS0 | Channel 52 - RU106



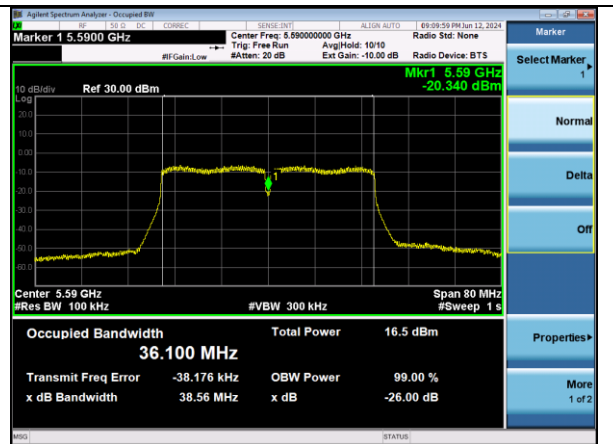
802.11ax | MCS0 | Channel 120 - RU106

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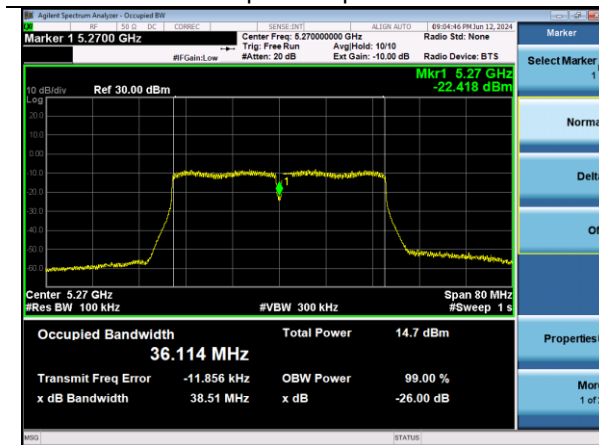
## 40 MHz



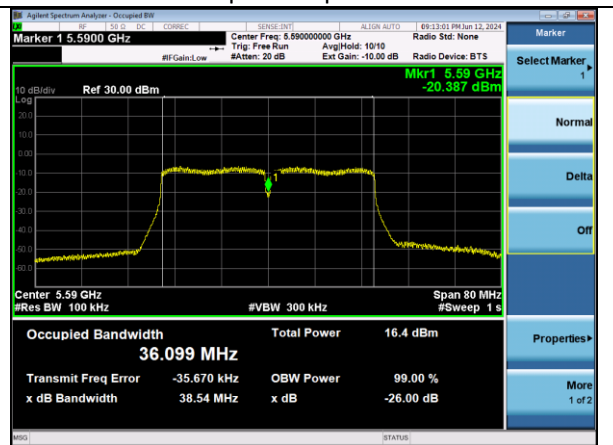
802.11n | MCS0 | Channel 54



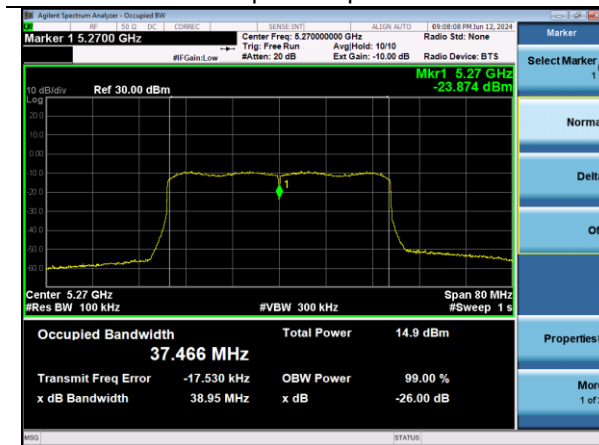
802.11n | MCS0 | Channel 118



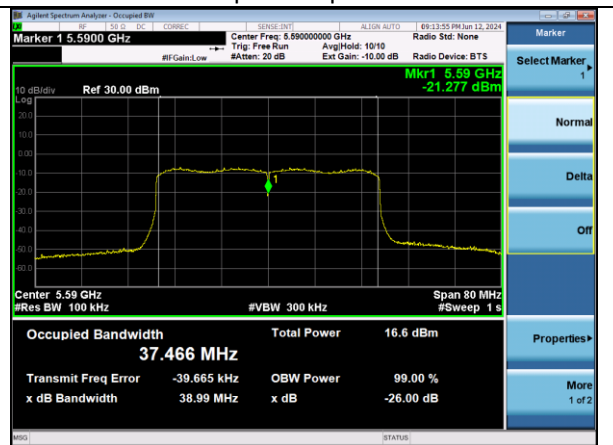
802.11ac | MCS0 | Channel 54



802.11ac | MCS0 | Channel 118



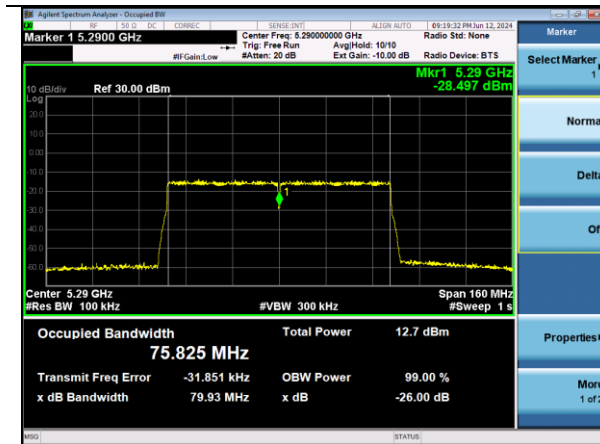
802.11ax | MCS0 | Channel 54



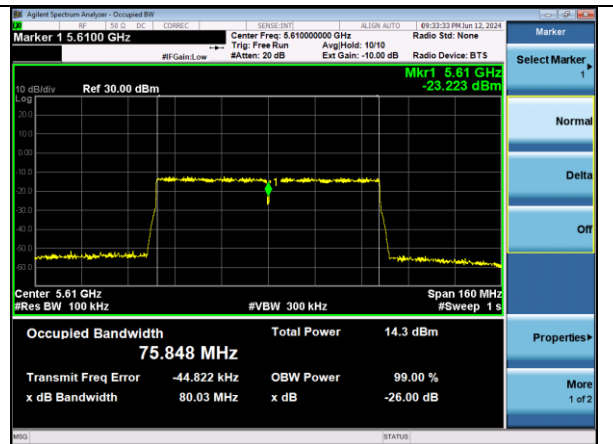
802.11ax | MCS0 | Channel 118

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Job: C-3768		Serial: 00047

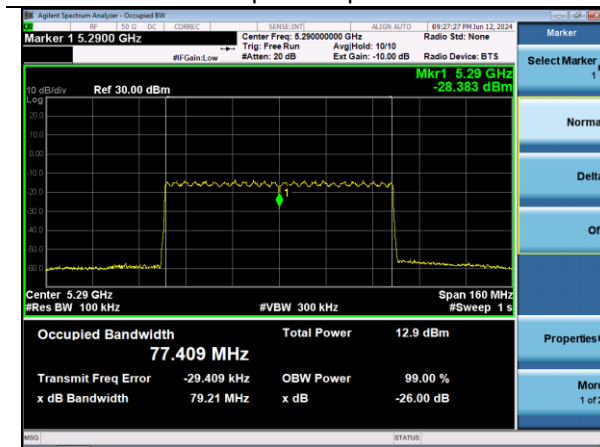
## 80 MHz



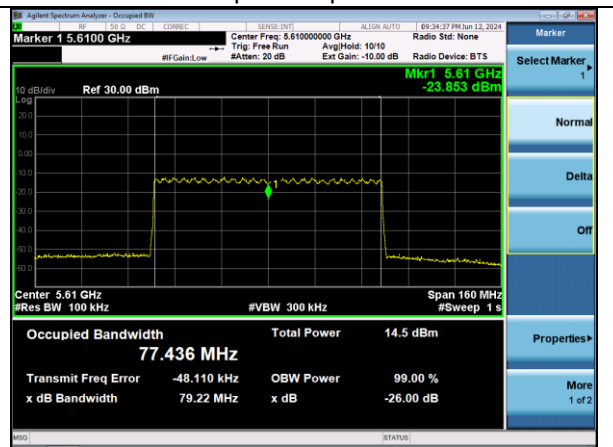
802.11ac | MCS0 | Channel 58



802.11ac | MCS0 | Channel 122



802.11ax | MCS0 | Channel 58



802.11ax | MCS0 | Channel 122

Company: Ezurio	Page 20 of 63	Name: Module, SONA NX611 M.2 2230, 1 MHF
Report: TR3768-166-ETSI-301893		Model: SONA NX611M
Job: C-3768		Serial: 00047



### 5.1.3 RF Output Power

<b>Operator</b>	Anthony Smith	<b>QA</b>	Dylan Rosenfeldt
<b>Temperature</b>	21.6-23.0°C	<b>R.H. %</b>	31.1-48.6%
<b>Test Date</b>	6/20/2024, 6/21/2024, 6/24/2024, 7/1/2024, 7/2/2024, 8/14/2024, 8/23/2024, 12/4/2024	<b>Location</b>	Thermotron Temp Chamber
<b>Requirement</b>	ETSI 301 893 4.2.3 AS/NZS 4268 3.6	<b>Method</b>	ETSI 301 893 5.4.4

**Limits:** ETSI 301 893: The mean e.i.r.p limit for devices with TPC and without Radar Interference Detection is 23 dBm

AS/NZS 4268: Maximum EIRP is 200mW averaged over the entire transmission burst

#### Test Parameters

<b>Frequency</b>	5150-5725 MHz	<b>Setup</b>	Antenna Port
<b>Operating Temperature</b>	-40.0°C to +85.0°C	<b>Sample Speed</b>	32 MS/s

#### Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960144	Cable	Gore	EKD01D010720	5800373	1/28/2025	1/28/2026	Active Verification
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	1/28/2025	1/28/2026	Active Verification
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/10/2024	4/10/2025	Active Calibration
EE 960090	Meter - RF Power	Anritsu	ML2495A	1335006	4/11/2024	4/11/2025	Active Calibration
EE 960091	Sensor - RF Power	Anritsu	MA2491A	1249277	4/11/2024	4/11/2025	Active Calibration

#### EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5 GHz WLAN Tx
<b>Frequency</b>	5180-5700 MHz	<b>Channel</b>	See 2.7

## Output Power Measurements +21.5°C

Nominal Bandwidth	Channel	Mode	Data Rate	Measurement (dBm)	Antenna Gain (dBi)	EIRP (dBm/MHz)	Limit (dBm)	Margin (dB)	Power Setting Index
20	36	802.11a	6	14.0	4.4	18.4	23.0	4.6	15
20	64	802.11a	6	14.3	4.4	18.7	23.0	4.3	15
20	100	802.11a	6	14.9	4.4	19.3	23.0	3.7	15
20	144	802.11a	6	15.3	4.4	19.7	23.0	3.3	15
20	36	802.11n	MCS0	13.1	4.4	17.5	23.0	5.5	14
20	64	802.11n	MCS0	13.3	4.4	17.7	23.0	5.3	14
20	100	802.11n	MCS0	13.9	4.4	18.3	23.0	4.7	14
20	144	802.11n	MCS0	14.3	4.4	18.7	23.0	4.3	14
20	36	802.11ac	MCS0	13.0	4.4	17.4	23.0	5.6	14
20	64	802.11ac	MCS0	13.3	4.4	17.7	23.0	5.3	14
20	100	802.11ac	MCS0	13.8	4.4	18.2	23.0	4.8	14
20	144	802.11ac	MCS0	14.3	4.4	18.7	23.0	4.3	14
20	36	802.11ax	MCS0	13.3	4.4	17.7	23.0	5.3	14
20	64	802.11ax	MCS0	13.5	4.4	17.9	23.0	5.1	14
20	100	802.11ax	MCS0	14.1	4.4	18.5	23.0	4.5	14
20	144	802.11ax	MCS0	14.5	4.4	18.9	23.0	4.1	14
20	36	802.11ax	MCS11	9.1	4.4	13.5	23.0	9.5	10
20	64	802.11ax	MCS11	9.6	4.4	14.0	23.0	9.0	10
20	100	802.11ax	MCS11	9.8	4.4	14.2	23.0	8.8	10
20	144	802.11ax	MCS11	10.3	4.4	14.7	23.0	8.3	10
20	36	802.11ax RU26	MCS0	4.5	4.4	8.9	23.0	14.1	6
20	64	802.11ax RU26	MCS0	5.3	4.4	9.7	23.0	13.3	6
20	100	802.11ax RU26	MCS0	5.4	4.4	9.8	23.0	13.2	6
20	144	802.11ax RU26	MCS0	6.3	4.4	10.7	23.0	12.3	6
40	38	802.11n	MCS0	13.0	4.4	17.4	23.0	5.6	14
40	62	802.11n	MCS0	13.4	4.4	17.8	23.0	5.2	14
40	102	802.11n	MCS0	13.9	4.4	18.3	23.0	4.7	14
40	142	802.11n	MCS0	14.5	4.4	18.9	23.0	4.1	14
40	38	802.11ac	MCS0	13.1	4.4	17.5	23.0	5.5	14
40	62	802.11ac	MCS0	13.4	4.4	17.8	23.0	5.2	14
40	102	802.11ac	MCS0	14.0	4.4	18.4	23.0	4.6	14
40	142	802.11ac	MCS0	14.5	4.4	18.9	23.0	4.1	14
40	38	802.11ac	MCS9	13.0	4.4	17.4	23.0	5.6	12

40	62	802.11ac	MCS9	13.4	4.4	17.8	23.0	5.2	12
40	102	802.11ac	MCS9	13.9	4.4	18.3	23.0	4.7	12
40	142	802.11ac	MCS9	14.5	4.4	18.9	23.0	4.1	12
40	38	802.11ax	MCS0	13.3	4.4	17.7	23.0	5.3	14
40	62	802.11ax	MCS0	13.5	4.4	17.9	23.0	5.1	14
40	102	802.11ax	MCS0	14.3	4.4	18.7	23.0	4.3	14
40	142	802.11ax	MCS0	14.9	4.4	19.3	23.0	3.7	14
40	38	802.11ax	MCS11	9.3	4.4	13.7	23.0	9.3	10
40	62	802.11ax	MCS11	9.7	4.4	14.1	23.0	8.9	10
40	102	802.11ax	MCS11	10.0	4.4	14.4	23.0	8.6	10
40	142	802.11ax	MCS11	10.8	4.4	15.2	23.0	7.8	10
40	38	802.11ax RU26	MCS0	3.8	4.4	8.2	23.0	14.9	6
40	62	802.11ax RU26	MCS0	4.4	4.4	8.8	23.0	14.2	6
40	102	802.11ax RU26	MCS0	4.5	4.4	8.9	23.0	14.1	6
40	142	802.11ax RU26	MCS0	5.7	4.4	10.1	23.0	12.9	6
80	42	802.11ac	MCS0	13.3	4.4	17.7	23.0	5.3	14
80	58	802.11ac	MCS0	13.6	4.4	18.0	23.0	5.0	14
80	106	802.11ac	MCS0	14.3	4.4	18.7	23.0	4.3	14
80	138	802.11ac	MCS0	15.0	4.4	19.4	23.0	3.6	14
80	42	802.11ac	MCS9	11.3	4.4	15.7	23.0	7.3	12
80	58	802.11ac	MCS9	11.6	4.4	16.0	23.0	7.0	12
80	106	802.11ac	MCS9	12.2	4.4	16.6	23.0	6.4	12
80	138	802.11ac	MCS9	13.0	4.4	17.4	23.0	5.6	12
80	42	802.11ax	MCS0	13.7	4.4	18.1	23.0	4.9	14
80	58	802.11ax	MCS0	13.7	4.4	18.1	23.0	4.9	14
80	106	802.11ax	MCS0	14.5	4.4	18.9	23.0	4.1	14
80	138	802.11ax	MCS0	15.3	4.4	19.7	23.0	3.3	14
80	42	802.11ax	MCS11	9.6	4.4	14.0	23.0	9.0	10
80	58	802.11ax	MCS11	9.7	4.4	14.1	23.0	8.9	10
80	106	802.11ax	MCS11	10.3	4.4	14.7	23.0	8.3	10
80	138	802.11ax	MCS11	11.2	4.4	15.6	23.0	7.4	10
80	42	802.11ax RU26	MCS0	5.0	4.4	9.4	23.0	13.6	6
80	58	802.11ax RU26	MCS0	5.6	4.4	10.0	23.0	13.0	6
80	106	802.11ax RU26	MCS0	5.7	4.4	10.1	23.0	12.9	6
80	138	802.11ax RU26	MCS0	7.4	4.4	11.8	23.0	11.2	6

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Report: TR3768-166-ETSI-301893		Model: SONA NX611M
Job: C-3768		Serial: 00047

## Output Power Measurements +85.0°C

Nominal Bandwidth	Channel	Mode	Data Rate	Measurement (dBm)	Antenna Gain (dBi)	EIRP (dBm/MHz)	Limit (dBm)	Margin (dB)	Power Setting Index
20	36	802.11a	6	13.7	4.4	18.1	23.0	4.9	15
20	64	802.11a	6	13.4	4.4	17.8	23.0	5.2	15
20	100	802.11a	6	14.3	4.4	18.7	23.0	4.3	15
20	144	802.11a	6	13.9	4.4	18.3	23.0	4.7	15
20	36	802.11n	MCS0	12.5	4.4	16.9	23.0	6.1	14
20	64	802.11n	MCS0	12.2	4.4	16.6	23.0	6.4	14
20	100	802.11n	MCS0	13.5	4.4	17.9	23.0	5.1	14
20	144	802.11n	MCS0	12.9	4.4	17.3	23.0	5.7	14
20	36	802.11ac	MCS0	12.7	4.4	17.1	23.0	5.9	14
20	64	802.11ac	MCS0	12.4	4.4	16.8	23.0	6.2	14
20	100	802.11ac	MCS0	13.6	4.4	18.0	23.0	5.0	14
20	144	802.11ac	MCS0	13.0	4.4	17.4	23.0	5.6	14
20	36	802.11ax	MCS0	12.6	4.4	17.0	23.0	6.0	14
20	64	802.11ax	MCS0	12.4	4.4	16.8	23.0	6.2	14
20	100	802.11ax	MCS0	13.7	4.4	18.1	23.0	4.9	14
20	144	802.11ax	MCS0	13.1	4.4	17.5	23.0	5.5	14
20	36	802.11ax	MCS11	9.0	4.4	13.4	23.0	9.6	10
20	64	802.11ax	MCS11	9.2	4.4	13.6	23.0	9.4	10
20	100	802.11ax	MCS11	9.8	4.4	14.2	23.0	8.8	10
20	144	802.11ax	MCS11	9.7	4.4	14.1	23.0	8.9	10
20	36	802.11ax RU26	MCS0	4.9	4.4	9.3	23.0	13.7	6
20	64	802.11ax RU26	MCS0	4.7	4.4	9.1	23.0	13.9	6
20	100	802.11ax RU26	MCS0	5.5	4.4	9.9	23.0	13.1	6
20	144	802.11ax RU26	MCS0	5.6	4.4	10.0	23.0	13.0	6
40	38	802.11n	MCS0	12.8	4.4	17.2	23.0	5.8	14
40	62	802.11n	MCS0	12.8	4.4	17.2	23.0	5.8	14
40	102	802.11n	MCS0	13.6	4.4	18.0	23.0	5.0	14
40	142	802.11n	MCS0	13.0	4.4	17.4	23.0	5.6	14
40	38	802.11ac	MCS0	12.4	4.4	16.8	23.0	6.2	14
40	62	802.11ac	MCS0	12.2	4.4	16.6	23.0	6.4	14
40	102	802.11ac	MCS0	13.4	4.4	17.8	23.0	5.2	14
40	142	802.11ac	MCS0	12.9	4.4	17.3	23.0	5.7	14
40	38	802.11ac	MCS9	10.8	4.4	15.2	23.0	7.8	12

40	62	802.11ac	MCS9	10.7	4.4	15.1	23.0	7.9	12
40	102	802.11ac	MCS9	11.8	4.4	16.2	23.0	6.8	12
40	142	802.11ac	MCS9	11.6	4.4	16.0	23.0	7.0	12
40	38	802.11ax	MCS0	12.7	4.4	17.1	23.0	5.9	14
40	62	802.11ax	MCS0	12.5	4.4	16.9	23.0	6.1	14
40	102	802.11ax	MCS0	13.7	4.4	18.1	23.0	4.9	14
40	142	802.11ax	MCS0	13.2	4.4	17.6	23.0	5.4	14
40	38	802.11ax	MCS11	9.1	4.4	13.5	23.0	9.5	10
40	62	802.11ax	MCS11	9.4	4.4	13.8	23.0	9.2	10
40	102	802.11ax	MCS11	10.2	4.4	14.6	23.0	8.4	10
40	142	802.11ax	MCS11	10.0	4.4	14.4	23.0	8.6	10
40	38	802.11ax RU26	MCS0	4.0	4.4	8.4	23.0	14.6	6
40	62	802.11ax RU26	MCS0	3.8	4.4	8.2	23.0	14.8	6
40	102	802.11ax RU26	MCS0	4.7	4.4	9.1	23.0	13.9	6
40	142	802.11ax RU26	MCS0	5.0	4.4	9.4	23.0	13.6	6
80	42	802.11ac	MCS0	12.7	4.4	17.1	23.0	5.9	14
80	58	802.11ac	MCS0	12.4	4.4	16.8	23.0	6.2	14
80	106	802.11ac	MCS0	13.7	4.4	18.1	23.0	4.9	14
80	138	802.11ac	MCS0	13.3	4.4	17.7	23.0	5.3	14
80	42	802.11ac	MCS9	11.3	4.4	15.7	23.0	7.3	12
80	58	802.11ac	MCS9	11.2	4.4	15.6	23.0	7.4	12
80	106	802.11ac	MCS9	12.1	4.4	16.5	23.0	6.5	12
80	138	802.11ac	MCS9	12.2	4.4	16.6	23.0	6.4	12
80	42	802.11ax	MCS0	12.7	4.4	17.1	23.0	5.9	14
80	58	802.11ax	MCS0	12.3	4.4	16.7	23.0	6.3	14
80	106	802.11ax	MCS0	13.4	4.4	17.8	23.0	5.2	14
80	138	802.11ax	MCS0	13.6	4.4	18.0	23.0	5.0	14
80	42	802.11ax	MCS11	9.4	4.4	13.8	23.0	9.2	10
80	58	802.11ax	MCS11	9.2	4.4	13.6	23.0	9.4	10
80	106	802.11ax	MCS11	10.0	4.4	14.4	23.0	8.6	10
80	138	802.11ax	MCS11	10.0	4.4	14.4	23.0	8.6	10
80	42	802.11ax RU26	MCS0	5.3	4.4	9.7	23.0	13.3	6
80	58	802.11ax RU26	MCS0	5.2	4.4	9.6	23.0	13.4	6
80	106	802.11ax RU26	MCS0	6.1	4.4	10.5	23.0	12.5	6
80	138	802.11ax RU26	MCS0	6.7	4.4	11.1	23.0	11.9	6

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Report: TR3768-166-ETSI-301893		Model: SONA NX611M
Job: C-3768		Serial: 00047

## Output Power Measurements -40.0°C

Nominal Bandwidth	Channel	Mode	Data Rate	Measurement (dBm)	Antenna Gain (dBi)	EIRP (dBm/MHz)	Limit (dBm)	Margin (dB)	Power Setting Index
20	36	802.11a	6	12.2	4.4	16.6	23.0	6.4	15
20	64	802.11a	6	13.7	4.4	18.1	23.0	4.9	15
20	100	802.11a	6	12.3	4.4	16.7	23.0	6.3	15
20	144	802.11a	6	14.4	4.4	18.8	23.0	4.2	15
20	36	802.11n	MCS0	11.2	4.4	15.6	23.0	7.4	14
20	64	802.11n	MCS0	12.7	4.4	17.1	23.0	5.9	14
20	100	802.11n	MCS0	11.2	4.4	15.6	23.0	7.4	14
20	144	802.11n	MCS0	13.4	4.4	17.8	23.0	5.2	14
20	36	802.11ac	MCS0	11.3	4.4	15.7	23.0	7.3	14
20	64	802.11ac	MCS0	12.7	4.4	17.1	23.0	5.9	14
20	100	802.11ac	MCS0	11.2	4.4	15.6	23.0	7.4	14
20	144	802.11ac	MCS0	13.4	4.4	17.8	23.0	5.2	14
20	36	802.11ax	MCS0	11.5	4.4	15.9	23.0	7.1	14
20	64	802.11ax	MCS0	12.9	4.4	17.3	23.0	5.7	14
20	100	802.11ax	MCS0	11.4	4.4	15.8	23.0	7.2	14
20	144	802.11ax	MCS0	13.7	4.4	18.1	23.0	4.9	14
20	36	802.11ax	MCS11	7.2	4.4	11.6	23.0	11.4	10
20	64	802.11ax	MCS11	8.5	4.4	12.9	23.0	10.1	10
20	100	802.11ax	MCS11	7.2	4.4	11.6	23.0	11.4	10
20	144	802.11ax	MCS11	9.7	4.4	14.1	23.0	8.9	10
20	36	802.11ax RU26	MCS0	2.5	4.4	6.9	23.0	16.1	6
20	64	802.11ax RU26	MCS0	4.3	4.4	8.7	23.0	14.3	6
20	100	802.11ax RU26	MCS0	2.6	4.4	7.0	23.0	16.0	6
20	144	802.11ax RU26	MCS0	5.5	4.4	9.9	23.0	13.1	6
40	38	802.11n	MCS0	11.4	4.4	15.8	23.0	7.2	14
40	62	802.11n	MCS0	12.6	4.4	17.0	23.0	6.0	14
40	102	802.11n	MCS0	11.4	4.4	15.8	23.0	7.2	14
40	142	802.11n	MCS0	13.3	4.4	17.7	23.0	5.3	14
40	38	802.11ac	MCS0	11.5	4.4	15.9	23.0	7.1	14
40	62	802.11ac	MCS0	12.6	4.4	17.0	23.0	6.0	14
40	102	802.11ac	MCS0	11.4	4.4	15.8	23.0	7.2	14
40	142	802.11ac	MCS0	13.3	4.4	17.7	23.0	5.3	14
40	38	802.11ac	MCS9	9.3	4.4	13.7	23.0	9.3	12

40	62	802.11ac	MCS9	10.6	4.4	15.0	23.0	8.0	12
40	102	802.11ac	MCS9	9.3	4.4	13.7	23.0	9.3	12
40	142	802.11ac	MCS9	11.4	4.4	15.8	23.0	7.2	12
40	38	802.11ax	MCS0	11.7	4.4	16.1	23.0	6.9	14
40	62	802.11ax	MCS0	12.9	4.4	17.3	23.0	5.7	14
40	102	802.11ax	MCS0	11.8	4.4	16.2	23.0	6.8	14
40	142	802.11ax	MCS0	13.6	4.4	18.0	23.0	5.0	14
40	38	802.11ax	MCS11	7.5	4.4	11.9	23.0	11.1	10
40	62	802.11ax	MCS11	8.5	4.4	12.9	23.0	10.1	10
40	102	802.11ax	MCS11	7.6	4.4	12.0	23.0	11.0	10
40	142	802.11ax	MCS11	9.6	4.4	14.0	23.0	9.0	10
40	38	802.11ax RU26	MCS0	1.7	4.4	6.1	23.0	16.9	6
40	62	802.11ax RU26	MCS0	3.2	4.4	7.6	23.0	15.4	6
40	102	802.11ax RU26	MCS0	1.8	4.4	6.2	23.0	16.8	6
40	142	802.11ax RU26	MCS0	4.3	4.4	8.7	23.0	14.3	6
80	42	802.11ac	MCS0	11.8	4.4	16.2	23.0	6.8	14
80	58	802.11ac	MCS0	12.6	4.4	17.0	23.0	6.0	14
80	106	802.11ac	MCS0	11.9	4.4	16.3	23.0	6.7	14
80	138	802.11ac	MCS0	13.5	4.4	17.9	23.0	5.1	14
80	42	802.11ac	MCS9	9.8	4.4	14.2	23.0	8.8	12
80	58	802.11ac	MCS9	10.8	4.4	15.2	23.0	7.8	12
80	106	802.11ac	MCS9	9.7	4.4	14.1	23.0	8.9	12
80	138	802.11ac	MCS9	11.6	4.4	16.0	23.0	7.0	12
80	42	802.11ax	MCS0	12.1	4.4	16.5	23.0	6.5	14
80	58	802.11ax	MCS0	13.0	4.4	17.4	23.0	5.6	14
80	106	802.11ax	MCS0	12.2	4.4	16.6	23.0	6.4	14
80	138	802.11ax	MCS0	13.9	4.4	18.3	23.0	4.7	14
80	42	802.11ax	MCS11	8.0	4.4	12.4	23.0	10.6	10
80	58	802.11ax	MCS11	8.4	4.4	12.8	23.0	10.2	10
80	106	802.11ax	MCS11	7.9	4.4	12.3	23.0	10.7	10
80	138	802.11ax	MCS11	9.8	4.4	14.2	23.0	8.8	10
80	42	802.11ax RU26	MCS0	2.9	4.4	7.3	23.0	15.7	6
80	58	802.11ax RU26	MCS0	4.1	4.4	8.5	23.0	14.5	6
80	106	802.11ax RU26	MCS0	3.0	4.4	7.4	23.0	15.6	6
80	138	802.11ax RU26	MCS0	6.2	4.4	10.6	23.0	12.4	6

### 5.1.4 Power Spectral Density

<b>Operator</b>	Anthony Smith	<b>QA</b>	Dylan Rosenfeldt
<b>Temperature</b>	21.6-23.0°C	<b>R.H. %</b>	31.1-48.6%
<b>Test Date</b>	6/20/2024, 6/21/2024, 6/24/2024, 7/1/2024, 7/2/2024, 8/14/2024, 8/23/2024, 12/4/2024	<b>Location</b>	Conducted RF Bench
<b>Requirement</b>	ETSI 301 893 4.2.3 AS/NZS 4268 Table 1	<b>Method</b>	ETSI 301 893 5.4.4

**Limit:** ETSI 301 893: The mean e.i.r.p density limit for devices with TPC and without Radar Interference Detection is 10 dBm/MHz

AS/NZS 4268: If the emission bandwidth is 1 MHz or greater, the radiated power spectral density in any 1 MHz is limited to 10 mW per MHz.

#### Test Parameters

<b>Frequency</b>	5150-5725 MHz	<b>Setup</b>	Antenna Port
<b>RBW</b>	1 MHz	<b>VBW</b>	3 MHz
<b>Detector(s)</b>	RMS	<b>Settings</b>	Max Hold

#### EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5 GHz WLAN Tx
<b>Frequency</b>	5180-5700 MHz	<b>Channel</b>	See 2.7

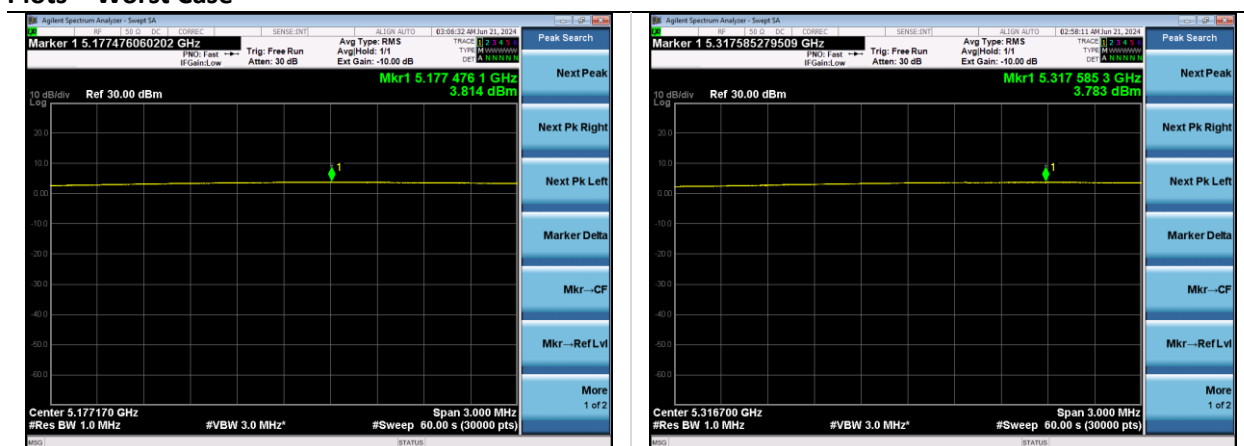


## Measurements

Mode	Data Rate	Channel	PSD e.i.r.p (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Power Setting
802.11a	6Mbps	36	8.2	10.0	1.8	15
		64	8.2	10.0	1.8	15
		100	8.7	10.0	1.3	15
		144	9.2	10.0	0.8	15
802.11n	MCS0	36	7.0	10.0	3.0	14
		64	6.9	10.0	3.1	14
		100	7.3	10.0	2.7	14
		144	8.1	10.0	1.9	14
802.11ac	MCS0	36	7.0	10.0	3.0	14
		64	7.0	10.0	3.0	14
		100	7.3	10.0	2.7	14
		144	7.9	10.0	2.1	14
802.11ax	MCS0	36	6.9	10.0	3.1	14
		64	6.9	10.0	3.1	14
		100	7.3	10.0	2.7	14
		144	7.9	10.0	2.1	14

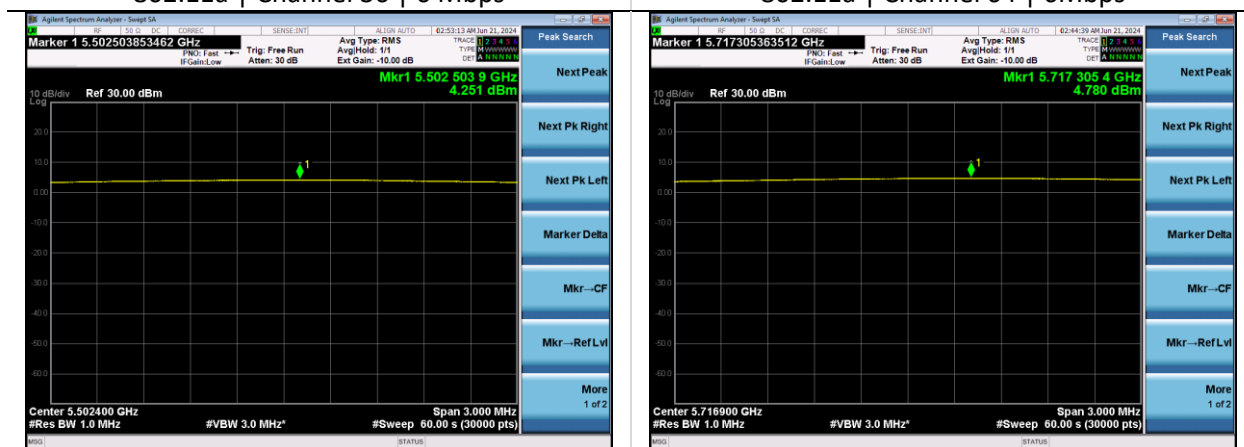
Mode	Data Rate	Channel	PSD e.i.r.p (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Power Setting
802.11ax	MCS0 RU26	36	7.8	10.0	2.2	6
		64	8.1	10.0	1.9	6
		100	8.0	10.0	2.0	6
		144	9.3	10.0	0.7	6

## Plots – Worst Case



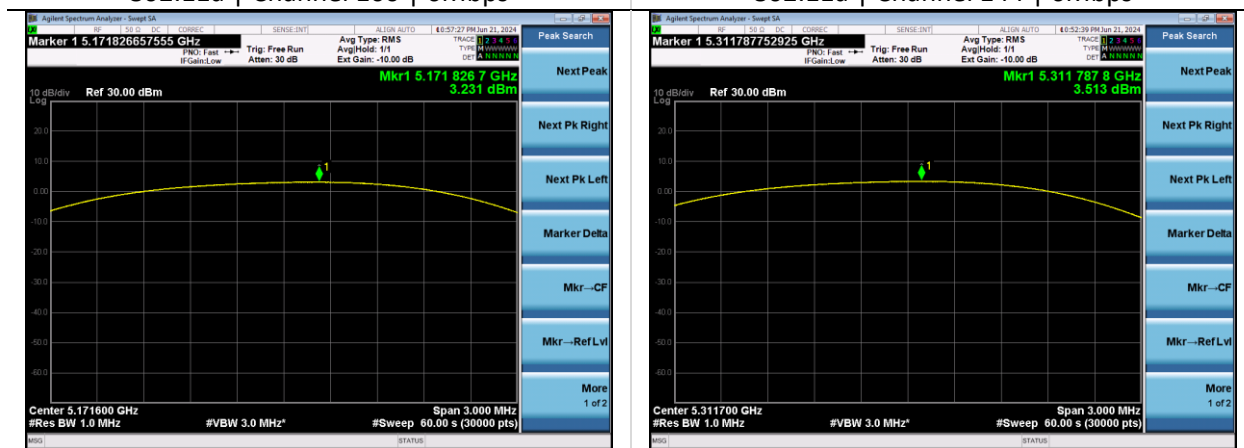
802.11a | Channel 36 | 6Mbps

802.11a | Channel 64 | 6Mbps



802.11a | Channel 100 | 6Mbps

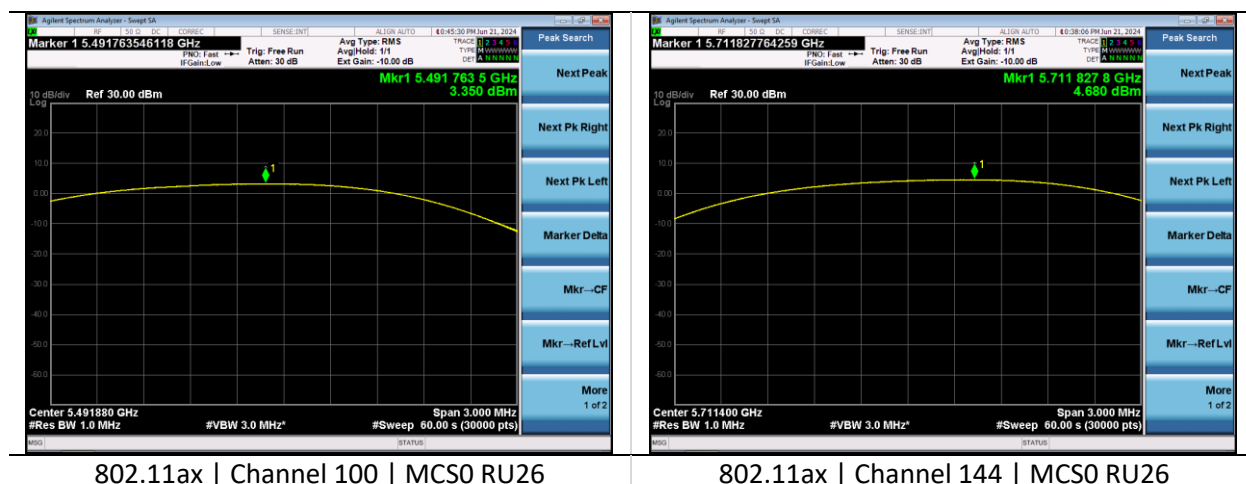
802.11a | Channel 144 | 6Mbps



802.11ax | Channel 36 | MCS0 RU26

802.11ax | Channel 64 | MCS0 RU26

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### 5.1.5 Transmitter unwanted emissions outside the 5 GHz RLAN bands

<b>Operator</b>	Anthony Smith	<b>QA</b>	Dylan Rosenfeldt
<b>Temperature</b>	21.6-23.0°C	<b>R.H. %</b>	31.1-48.6%
<b>Test Date</b>	6/20/2024, 6/21/2024, 6/24/2024, 7/1/2024, 7/2/2024, 8/14/2024, 8/23/2024, 12/4/2024	<b>Location</b>	Conducted RF Bench
<b>Requirement</b>	ETSI 301 893 4.2.4.1 AS/NZS 4268 6.4	<b>Method</b>	ETSI 301 893 5.4.5

#### 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
470-862	-54 dBm	100 kHz
862-1000	-36 dBm	100 kHz
1000-5150	-30 dBm	1 MHz
5350-5470	-30 dBm	1 MHz
5725-26000	-30 dBm	1 MHz

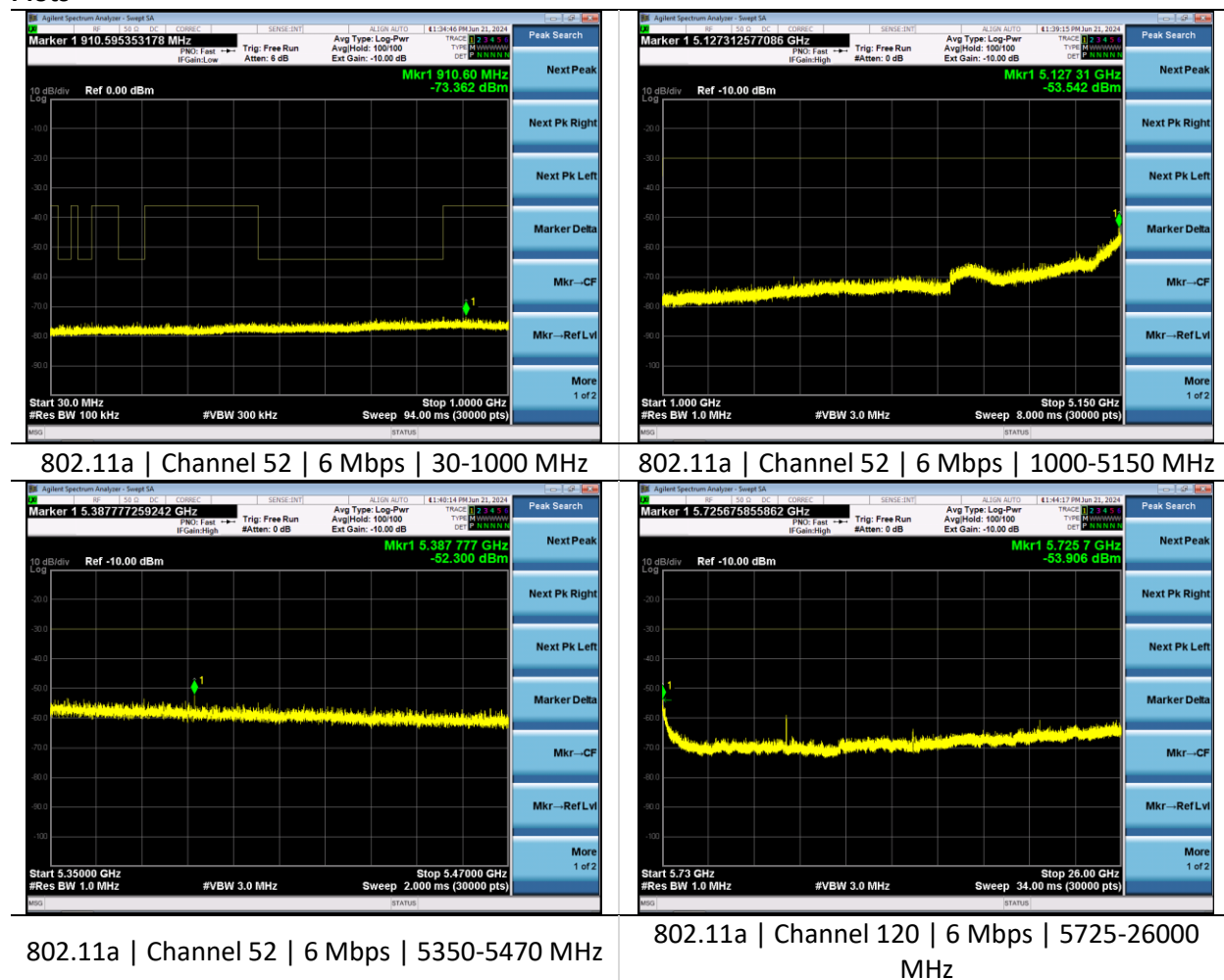
#### Test Parameters

<b>Frequency</b>	30-26000 MHz	<b>Setup</b>	Antenna Port
<b>RBW</b>	100kHz 1MHz	<b>VBW</b>	300kHz 3MHz
<b>Detector(s)</b>	Peak, RMS Average		

#### EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5GHz WLAN Tx
<b>Frequency</b>	5180-5700 MHz	<b>Channel</b>	See 2.7

## Plots

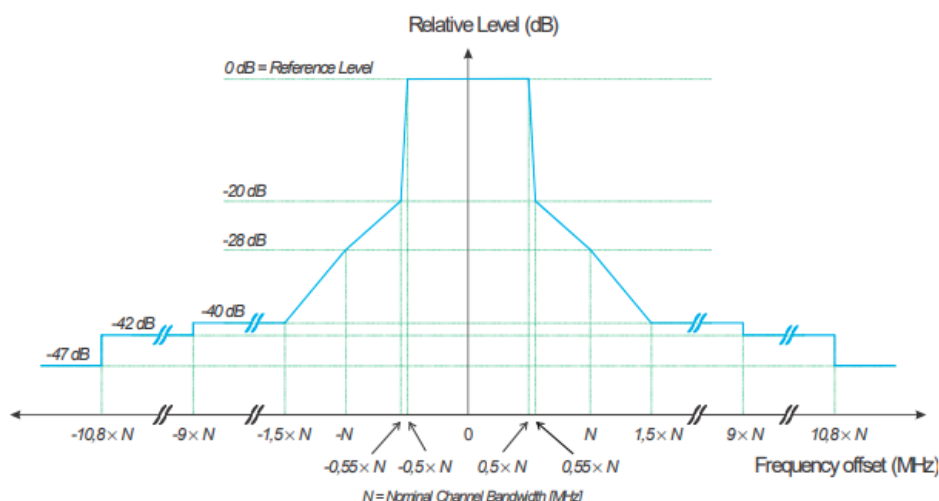


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Job: C-3768		Serial: 00047

### 5.1.6 Transmitter unwanted emissions within the 5 GHz RLAN bands

<b>Operator</b>	Anthony Smith	<b>QA</b>	Dylan Rosenfeldt
<b>Temperature</b>	21.6-23.0°C	<b>R.H. %</b>	31.1-48.6%
<b>Test Date</b>	6/20/2024, 6/21/2024, 6/24/2024, 7/1/2024, 7/2/2024, 8/14/2024, 8/23/2024, 12/4/2024	<b>Location</b>	Conducted RF Bench
<b>Requirement</b>	ETSI 301 893 4.2.4.2 AS/NZS 4268 6.5	<b>Method</b>	ETSI 301 893 5.4.6

Limits: ETSI 301 893



AS/NZS: 4268: The upper and lower frequency limits of the transmitter 99% emission power bandwidth shall at all times remain within the operating frequency limits.

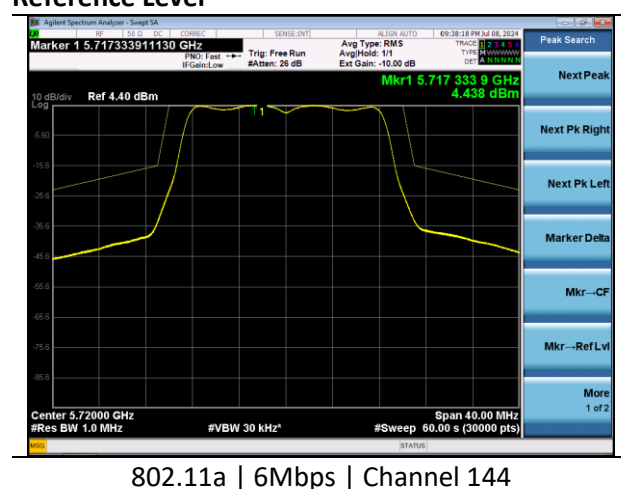
#### Test Parameters

<b>Frequency</b>	5150-5725 MHz	<b>Setup</b>	Antenna Port
<b>RBW</b>	1 MHz	<b>VBW</b>	30 kHz
<b>Detector(s)</b>	Average (RMS)		

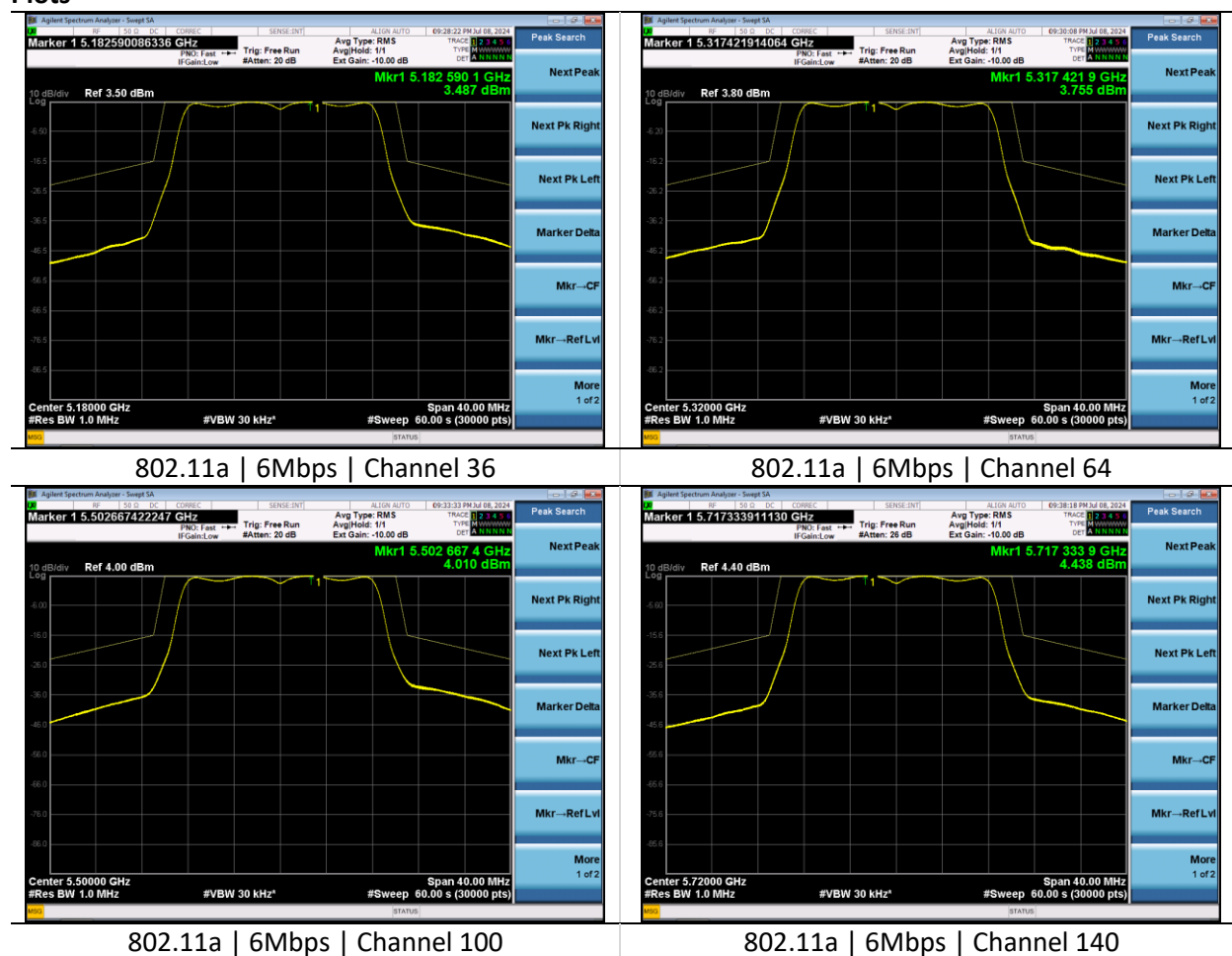
## EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5GHz WLAN Tx
<b>Frequency</b>	5180-5700 MHz	<b>Channel</b>	See 2.7

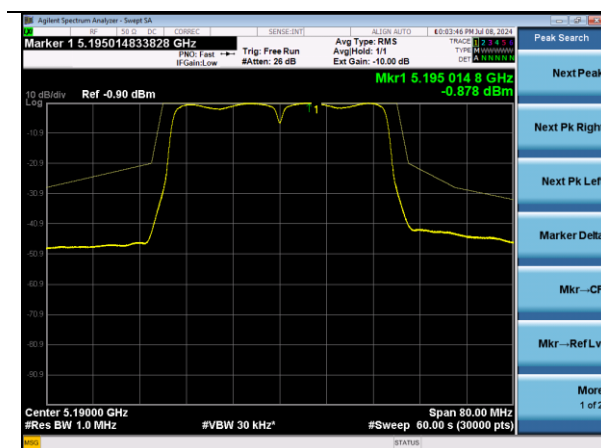
## Reference Level



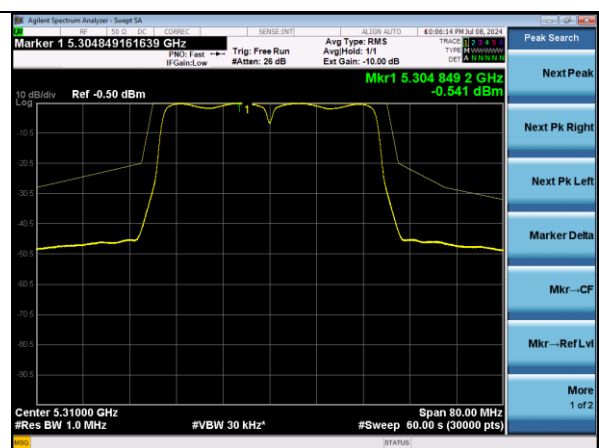
## Plots



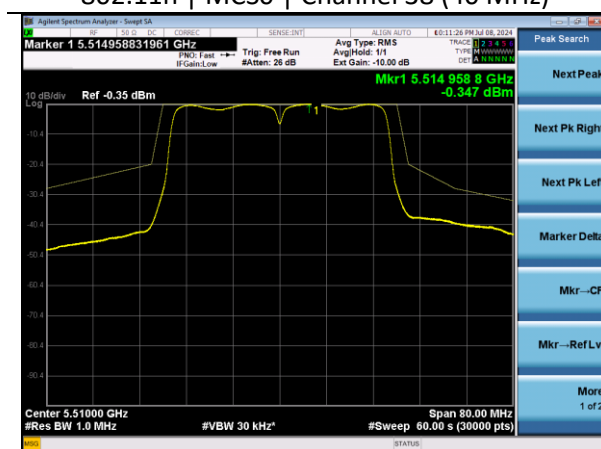




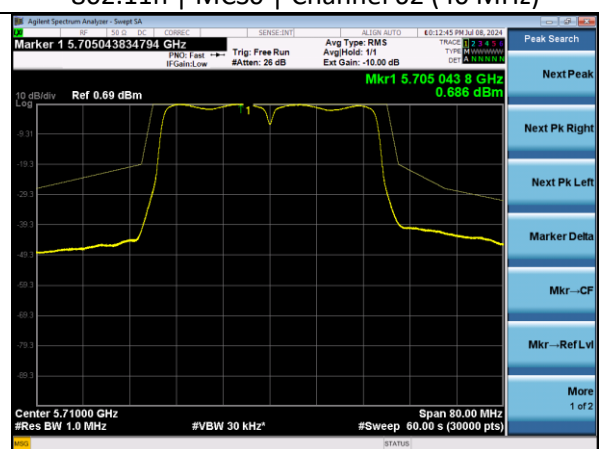
802.11n | MCS0 | Channel 38 (40 MHz)



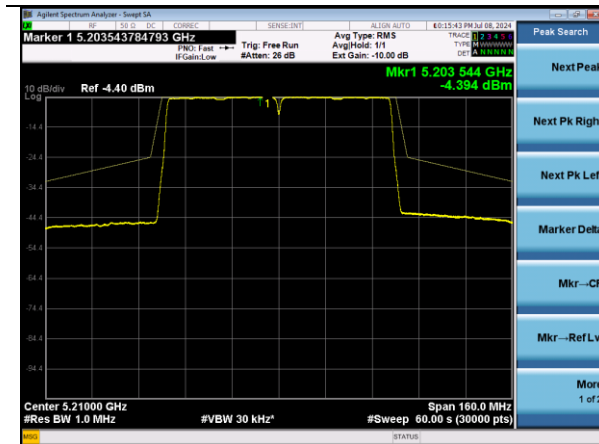
802.11n | MCS0 | Channel 62 (40 MHz)



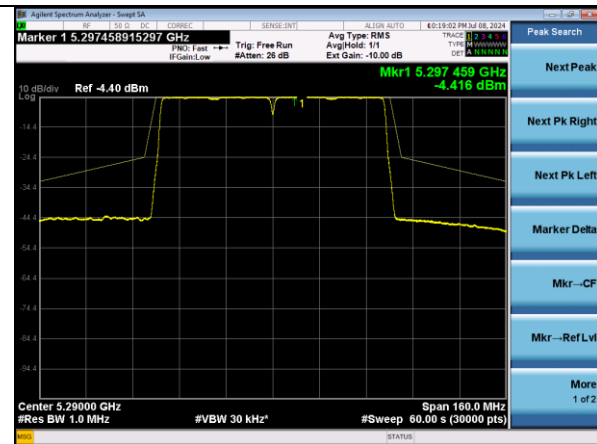
802.11n | MCS0 | Channel 102 (40 MHz)



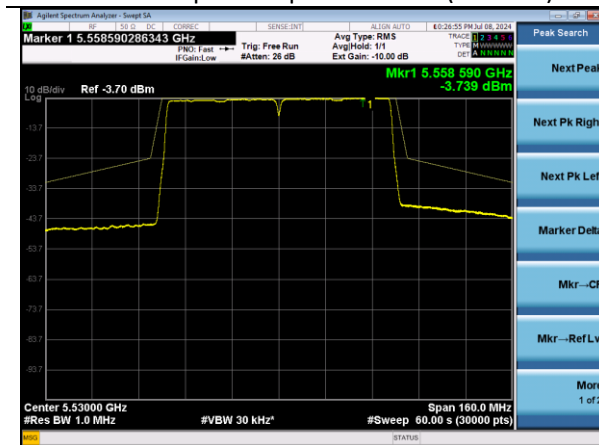
802.11n | MCS0 | Channel 142 (40 MHz)



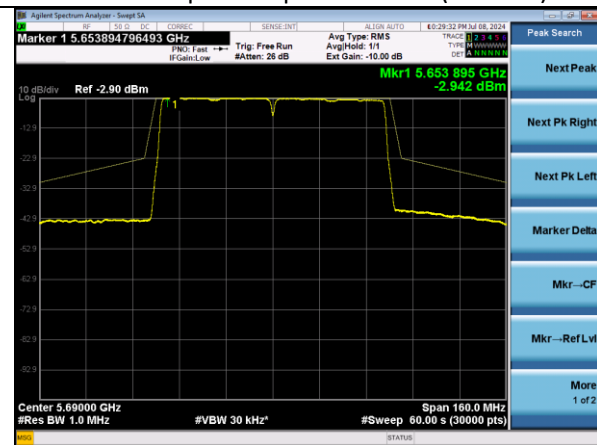
802.11ac | MCS0 | Channel 42 (80 MHz)



802.11ac | MCS0 | Channel 58 (80 MHz)



802.11ac | MCS0 | Channel 106 (80 MHz)



802.11ac | MCS0 | Channel 138 (80 MHz)

### 5.1.7 Receiver spurious emissions

<b>Operator</b>	Anthony Smith	<b>QA</b>	Dylan Rosenfeldt
<b>Temperature</b>	21.6-23.0°C	<b>R.H. %</b>	31.1-48.6%
<b>Test Date</b>	6/20/2024, 6/21/2024, 6/24/2024, 7/1/2024, 7/2/2024, 8/14/2024, 8/23/2024, 12/4/2024	<b>Location</b>	Conducted RF Bench
<b>Requirement</b>	ETSI 301 893 4.2.5 AS/NZS 4268 7.2	<b>Method</b>	ETSI 301 893 5.4.7

#### Limits:

Frequency (MHz)	Maximum Power	Bandwidth
30-1000	-57 dBm	100 kHz
1000-26000	-47 dBm	1 MHz

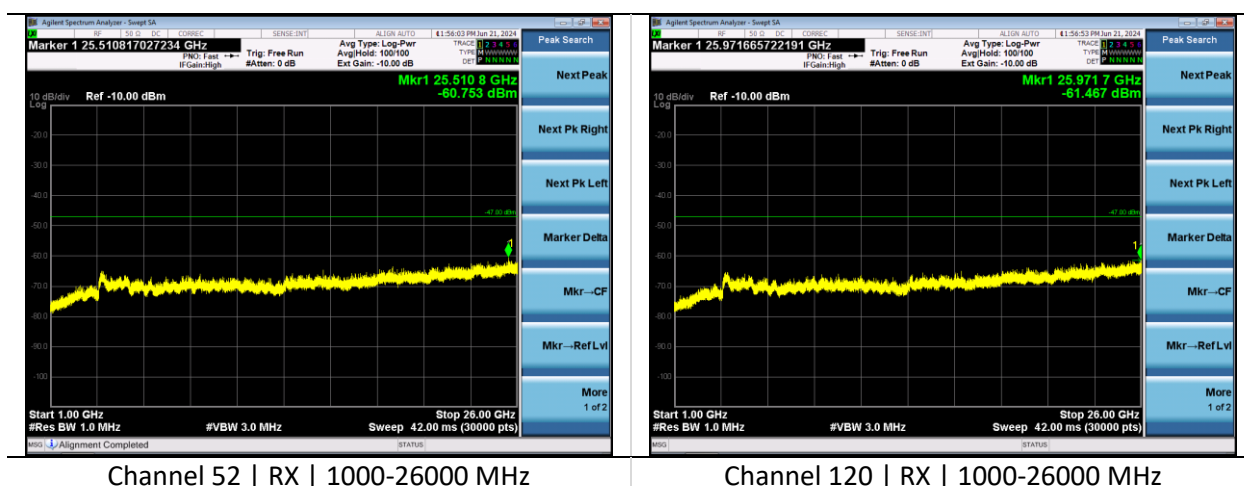
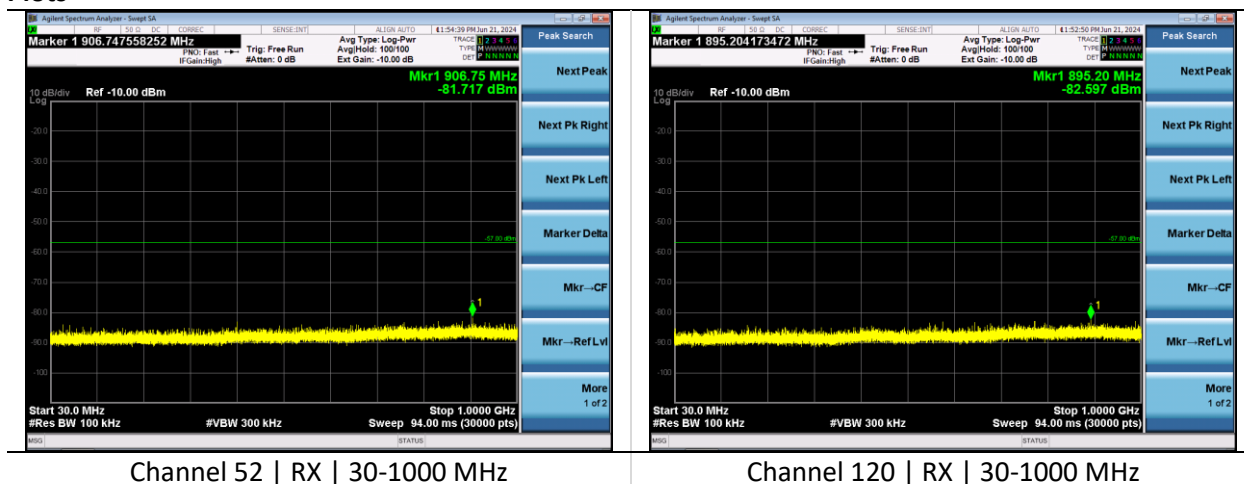
#### Test Parameters

<b>Frequency</b>	30-26000 MHz	<b>Setup</b>	Antenna Port
<b>RBW</b>	100 kHz 1 MHz	<b>VBW</b>	300 kHz 3 MHz
<b>Detector(s)</b>	Peak – Trace Average (RMS) – Final		

#### EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5GHz WLAN Tx
<b>Frequency</b>	5180-5700 MHz	<b>Channel</b>	See 2.7

## Plots



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### 5.1.8 Dynamic Frequency Selection (DFS)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Adam Alger
<b>Temperature</b>	21.8°C	<b>R.H. %</b>	59.5%
<b>Test Date</b>	5/21/2024	<b>Location</b>	Conducted RF Bench
<b>Requirement</b>	ETSI 301 893 4.2.6 AS/NZS 4268 Table 1	<b>Method</b>	ETSI 301 893 5.4.8

#### Requirements:

##### Slave without Radar Detection

1. Channel Closing Time  
1 second
2. Channel Move Time  
10 seconds

##### Radar Test Signal

Pulse Width: 1  $\mu$ second

Pulse Repetition Frequency: 700

Pulses per burst: 18

#### Test Parameters

<b>Frequency</b>	5290 MHz	<b>Setup</b>	Conducted
<b>RBW</b>	3 MHz	<b>VBW</b>	3 MHz
<b>Detector(s)</b>	Peak Detector	<b>Settings</b>	Clear Write – Single Sweep
<b>Notes</b>	Radar Injection at the Master Device.		

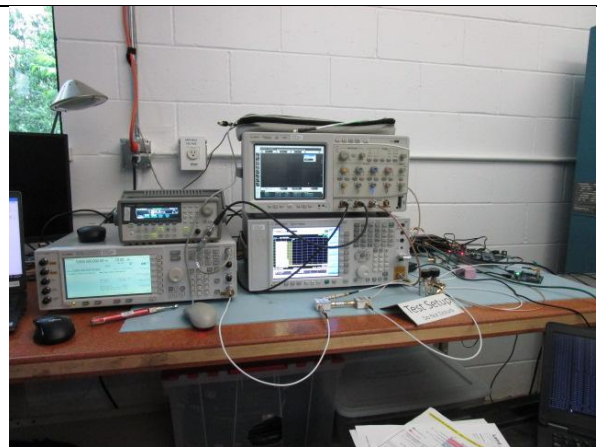
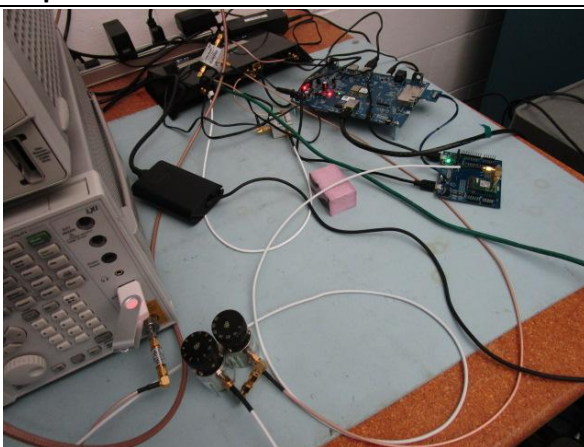
## Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960180	Attenuator - Step Variable 1 dB	RF Lambda	RKT2G6A10	16100801	1/28/2025	1/28/2026	Active Verification
AA 960184	Attenuator - Step Variable 10 dB	RF Lambda	RKT2G6A60	17031005	1/28/2025	1/28/2026	Active Verification
CC 000259C	Generator - Function / Arbitrary Waveform	Agilent	33250A	US40000583	4/10/2024	4/10/2026	Active Calibration
CC 000314C	Vector Signal Generator	Agilent	E4438C	US 41469143	4/10/2024	4/10/2025	Active Calibration
CC 000710C	Oscilloscope	Agilent	MSO8104A	MY45001068	4/9/2024	4/9/2025	Active Calibration
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/10/2024	4/10/2025	Active Calibration
EE 960184	RF Splitter/Combiner	mini-circuits	ZFSC-2-10G +	S F707601702	1/28/2025	1/28/2026	Active Verification
EE 960185	RF Splitter/Combiner	mini-circuits	ZFSC-2-10G +	S F707601702	1/28/2025	1/28/2026	Active Verification

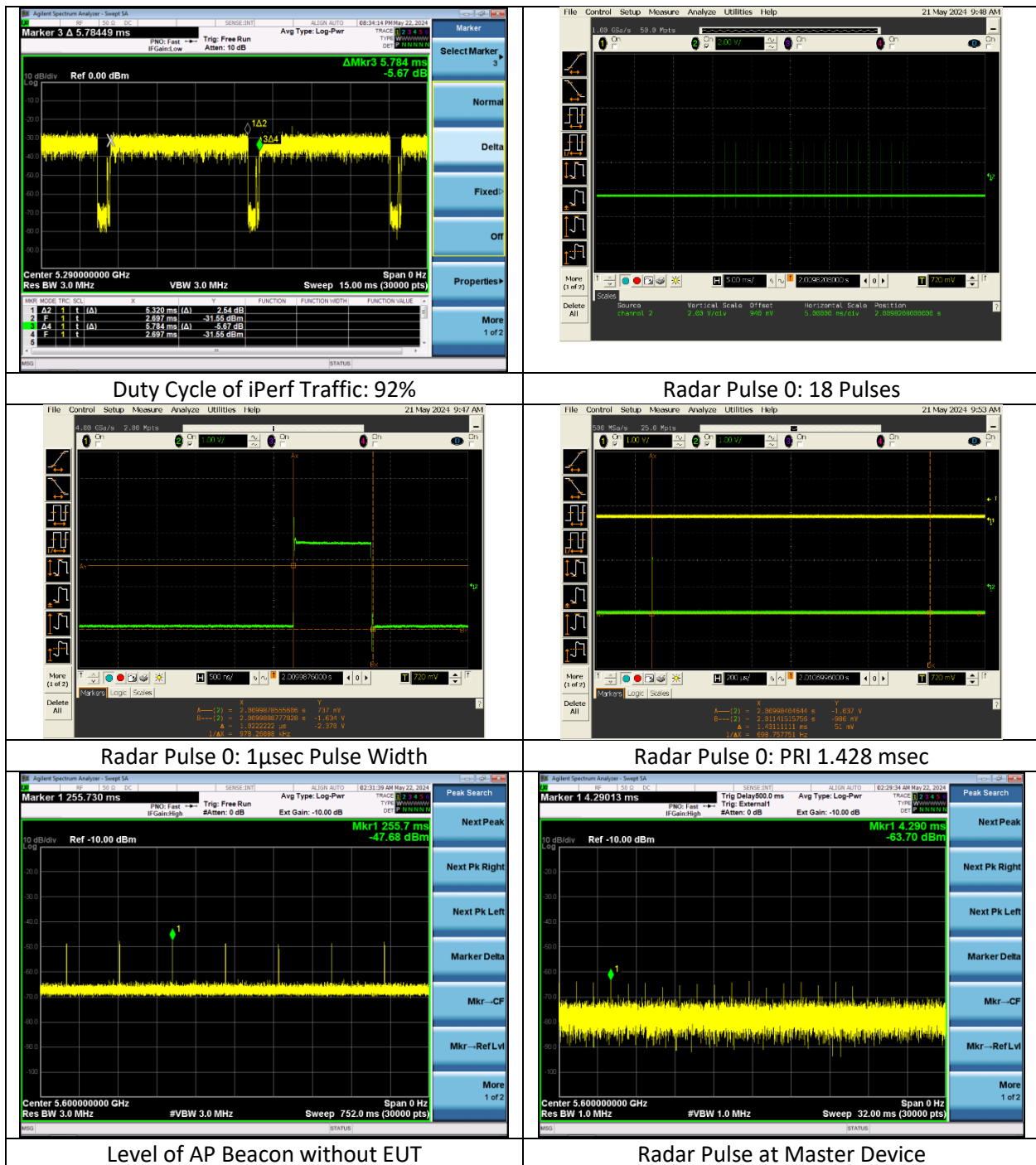
## EUT Parameters

<b>EUT Model</b>	2 MHF M.2 2230	<b>Mode</b>	5G WLAN
<b>Frequency</b>	5290 MHz	<b>Channel</b>	58 (80 MHz BW)
<b>EUT</b>	Client with no monitoring	<b>AE</b>	Linux Laptop and Router as Master Device
<b>Notes</b>	EUT setup to connect to Master device and perform data streaming using iPerf v2 Channel loading greater than 17%		

## Setup Photos



## Plots



Company: Ezurio

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Job: C-3768

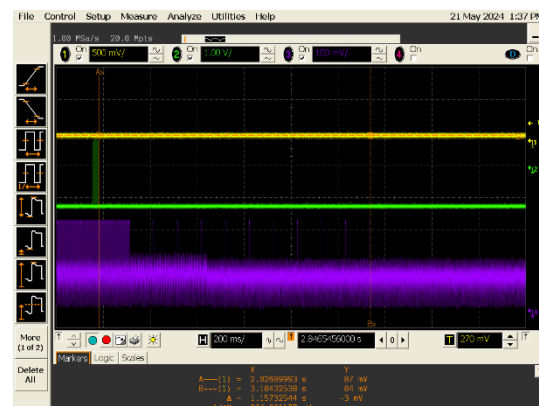
Name: Module, SONA NX611 M.2 2230, 1 MHF

Model: SONA NX611M

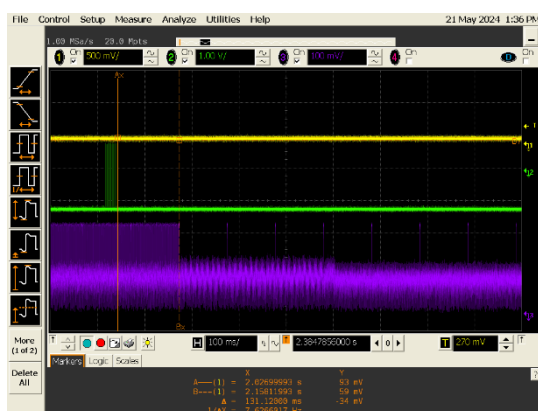
Serial: 00047



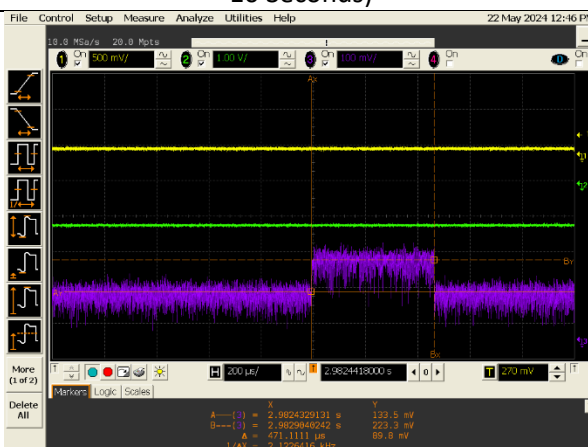
Channel Non-Occupancy Period: 30 Minutes



Channel Move Time: 1.2 Seconds (Required Max 10 Seconds)



10 beacons after transmissions end at 131ms  
 $467\mu\text{sec} * 10 = 4.7\text{ms}$  (Required max 60ms)



Individual Beacon 471  $\mu\text{sec}$

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### 5.1.9 Adaptivity (Channel Access Mechanism)

<b>Operator</b>	Anthony Smith	<b>QA</b>	Dylan Rosenfeldt
<b>Temperature</b>	20.3°C	<b>R.H. %</b>	26.4%
<b>Test Date</b>	12/18/2024	<b>Location</b>	RF Conducted Bench
<b>Requirement</b>	ETSI 301 893 5.4.9 AS/NZS 4268 7.2	<b>Method</b>	ETSI 301 893 5.4.9.3

### Test Parameters

<b>Frequency</b>	5240 MHz	<b>Setup</b>	Antenna Port
<b>Threshold Level</b>	-75 dBm/MHz	<b>Unwanted Signal Level</b>	AWGN: -74.9 dBm/MHz LTE: -74.9 dBm/MHz OFDM: -75.0 dBm/MHz
<b>Interference Signal Frequency</b>	5240 MHz		

### Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960180	Attenuator - Step Variable 1 dB	RF Lambda	RKT2G6A10	16100801	1/28/2025	1/28/2026	Active Verification
AA 960182	RF Splitter/Combiner	Mini-Circuits	ZFSC-2-10G+	F707701704	1/28/2025	1/28/2026	Active Verification
AA 960184	Attenuator - Step Variable 10 dB	RF Lambda	RKT2G6A60	17031005	1/28/2025	1/28/2026	Active Verification
CC 000259C	Generator - Function / Arbitrary Waveform	Agilent	33250A	US40000583	4/10/2024	4/10/2026	Active Calibration
CC 000314C	Vector Signal Generator	Agilent	E4438C	US 41469143	4/10/2024	4/10/2025	Active Calibration
CC 000710C	Oscilloscope	Agilent	MSO8104A	MY45001068	4/9/2024	4/9/2025	Active Calibration
EE 960086	Generator - Signal	Rohde & Schwarz	SMB100A	175512	12/27/2024	12/27/2025	Active Calibration
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/10/2024	4/10/2025	Active Calibration
EE 960166	Coupler - Directional	Narda	3202B-10	11605	1/28/2025	1/28/2026	Active Verification
EE 960184	RF Splitter/Combiner	mini-circuits	ZFSC-2-10G +	S F707601702	1/28/2025	1/28/2026	Active Verification

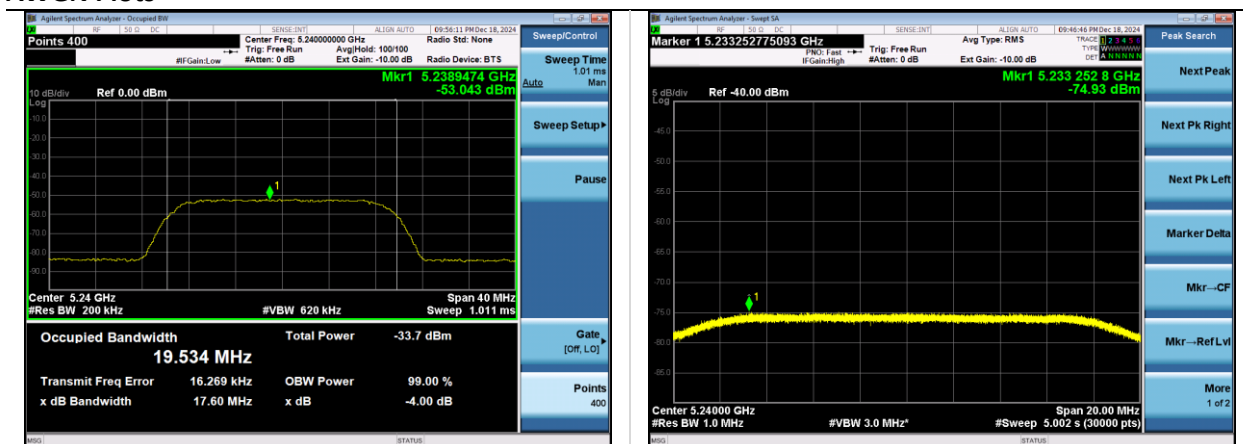
### EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5GHz WLAN
<b>Frequency</b>	5240 MHz	<b>Channel</b>	48

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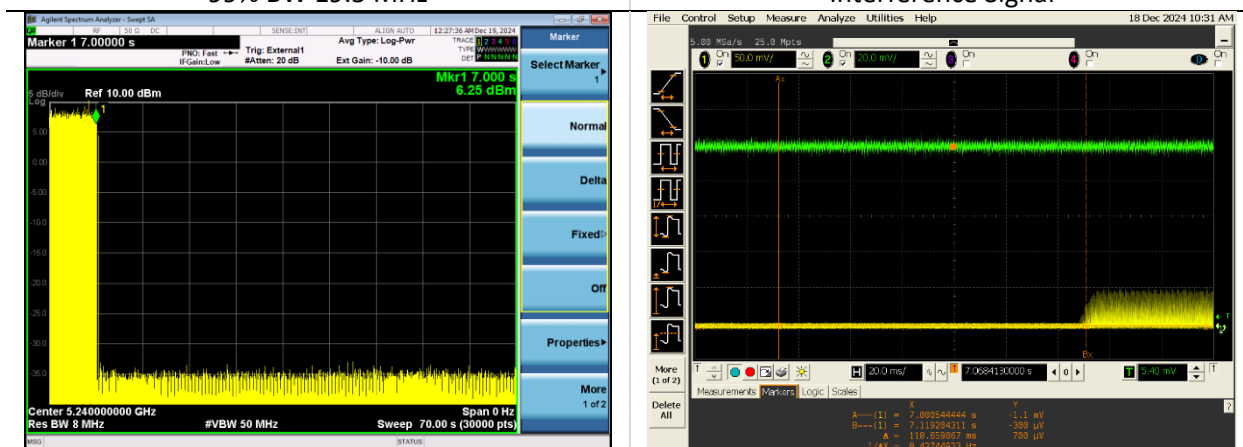
Interference Signal			
Frequency (MHz)	Modulation	Threshold Level (dBm)	Sig Gen Setting (dBm)
5785	AWGN	-74.9	-54.9
5785	LTE	-74.9	-54.7
5785	OFDM	-75.0	-55.0

## AWGN Plots



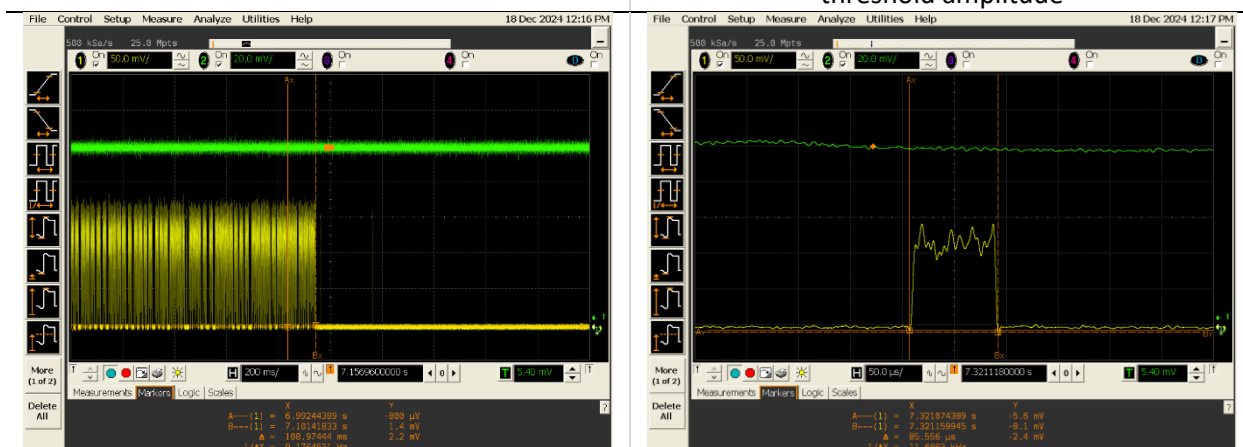
99% BW 19.5 MHz

Interference Signal



Interference Signal starts at 7 seconds

119ms delay for signal generator to reach threshold amplitude



Transmissions stop at 7.10 seconds

1 short control signalling transmission 85.6μs

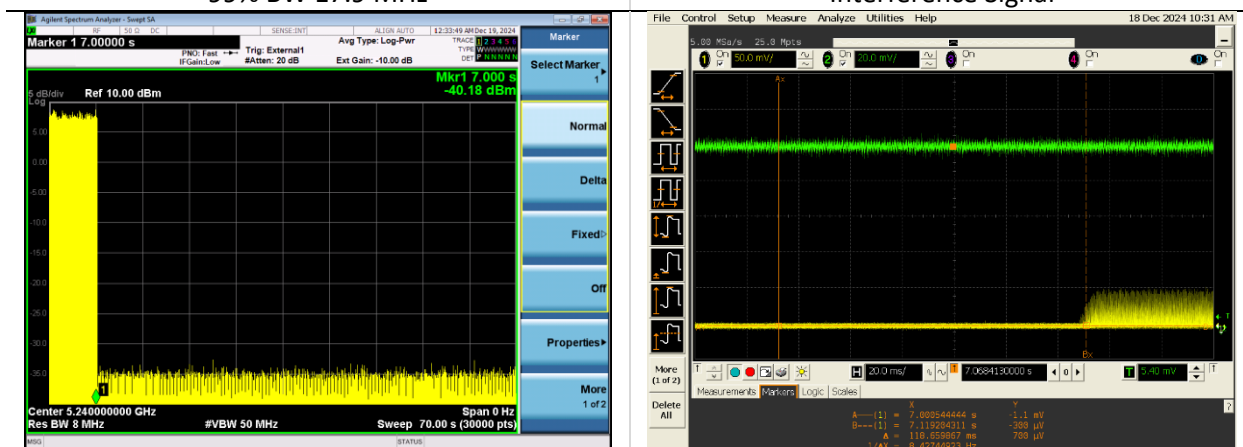
Company: Ezurio		Name: Module, SONA NX611 M.2 2230, 1 MHF
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Job: C-3768		Serial: 00047

## LTE Plots



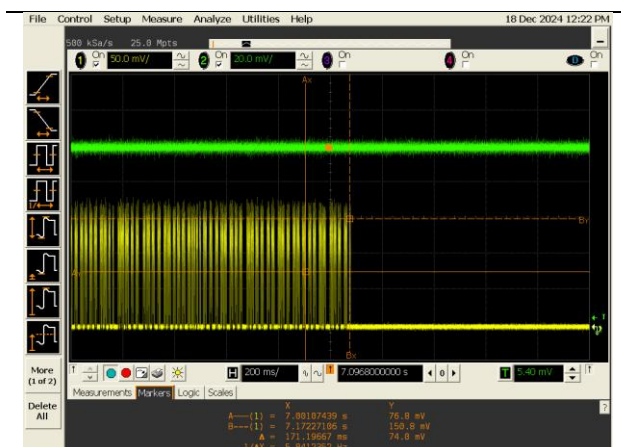
99% BW 17.9 MHz

Interference Signal



Interference Signal starts at 7 seconds

119ms delay for signal generator to reach threshold amplitude



Transmissions stop at 7.17 seconds

Company: Ezurio

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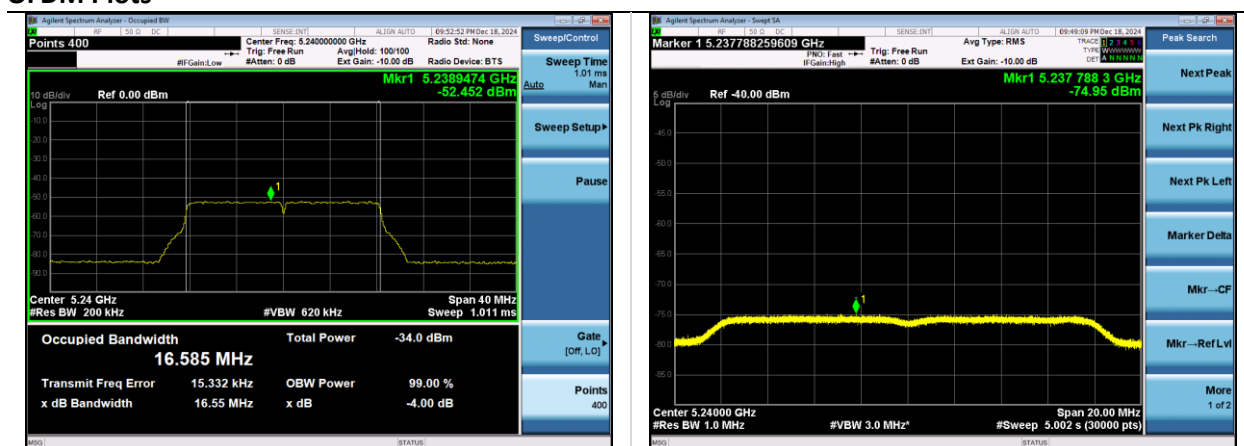
Job: C-3768

Name: Module, SONA NX611 M.2 2230, 1 MHF

Model: SONA NX611M

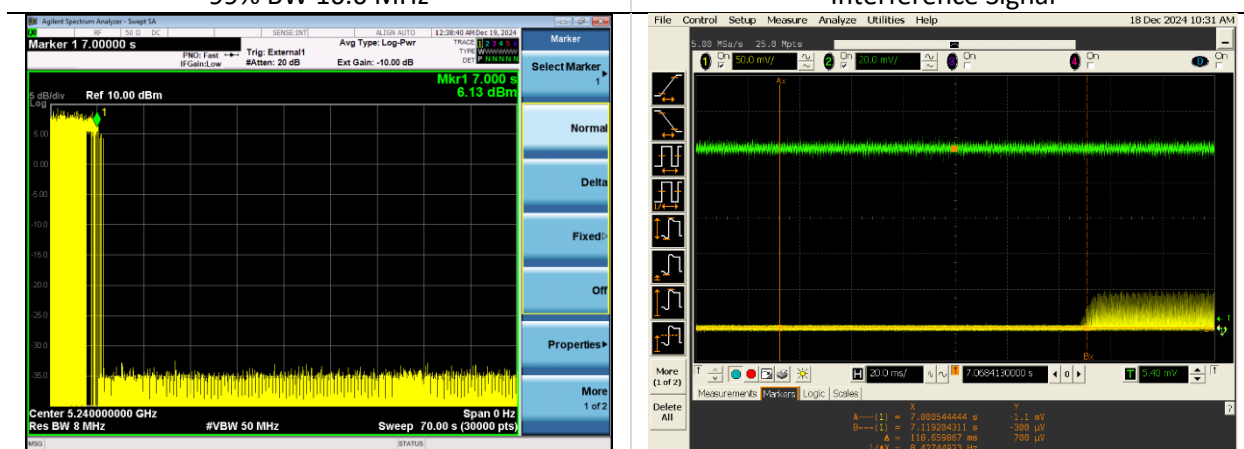
Serial: 00047

## OFDM Plots



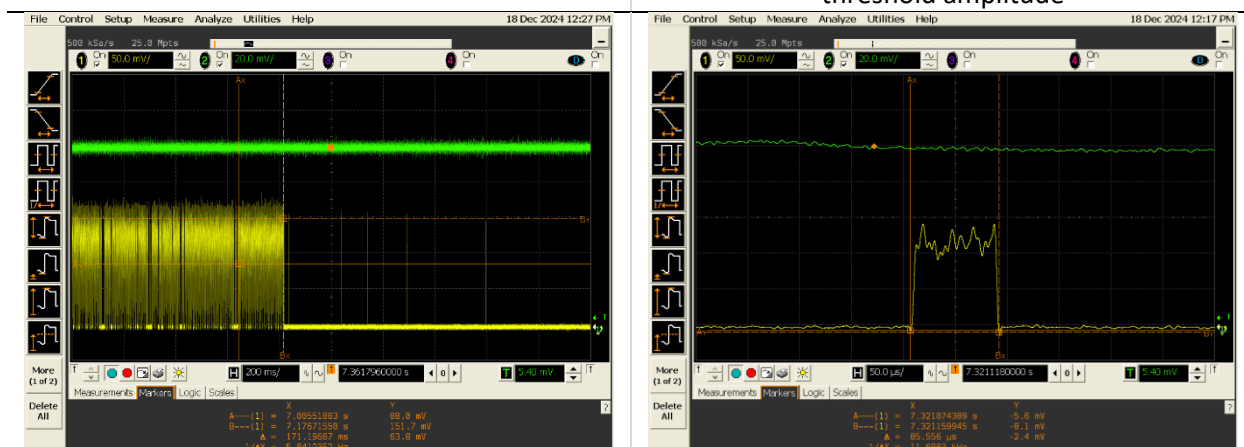
99% BW 16.6 MHz

Interference Signal



Interference Signal starts at 7 seconds

119ms delay for signal generator to reach threshold amplitude



Transmissions stop at 7.18 seconds

short control signalling transmission 85.6μs

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Job: C-3768		Serial: 00047

### 5.1.10 Receiver Blocking

<b>Operator</b>	Anthony Smith	<b>QA</b>	Dylan Rosenfeldt
<b>Temperature</b>	21.7°C	<b>R.H. %</b>	53.4%
<b>Test Date</b>	6/3/2024	<b>Location</b>	Conducted RF Bench
<b>Requirement</b>	ETSI 301 893 4.2.8 AS/NZS 4268 7.2	<b>Method</b>	ETSI 301 893 5.4.10

#### Limits:

**Table 9: Receiver Blocking parameters**

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)		Type of blocking signal
		Master or Slave with radar detection (see table D.2, note 2)	Slave without radar detection (see table D.2, note 2)	
P <sub>min</sub> + 6 dB	5 100	-53	-59	Continuous Wave
P <sub>min</sub> + 6 dB	4 900 5 000 5 975	-47	-53	Continuous Wave
NOTE 1: P <sub>min</sub> is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined clause 4.2.8.3 in the absence of any blocking signal.				
NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.				

#### Test Parameters

<b>Receiver Category</b>	Slave without radar detection	<b>Performance Criteria</b>	10% PER
<b>Wanted signal mean Power from Companion</b>	P <sub>min</sub> + 6db	<b>Actual Signal Power from Companion Device</b>	5260 MHz: -90.5 dBm 5600 MHz: -92.1 dBm
<b>Blocking Signal Frequencies</b>	5100 MHz 4900, 5000, 5975 MHz		

## Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960180	Attenuator - Step Variable 1 dB	RF Lambda	RKT2G6A10	16100801	1/28/2025	1/28/2026	Active Verification
AA 960182	RF Splitter/Combiner	Mini-Circuits	ZFSC-2-10G+	F707701704	1/28/2025	1/28/2026	Active Verification
AA 960184	Attenuator - Step Variable 10 dB	RF Lambda	RKT2G6A60	17031005	1/28/2025	1/28/2026	Active Verification
CC 000314C	Vector Signal Generator	Agilent	E4438C	US 41469143	4/10/2024	4/10/2025	Active Calibration
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	4/10/2024	4/10/2025	Active Calibration

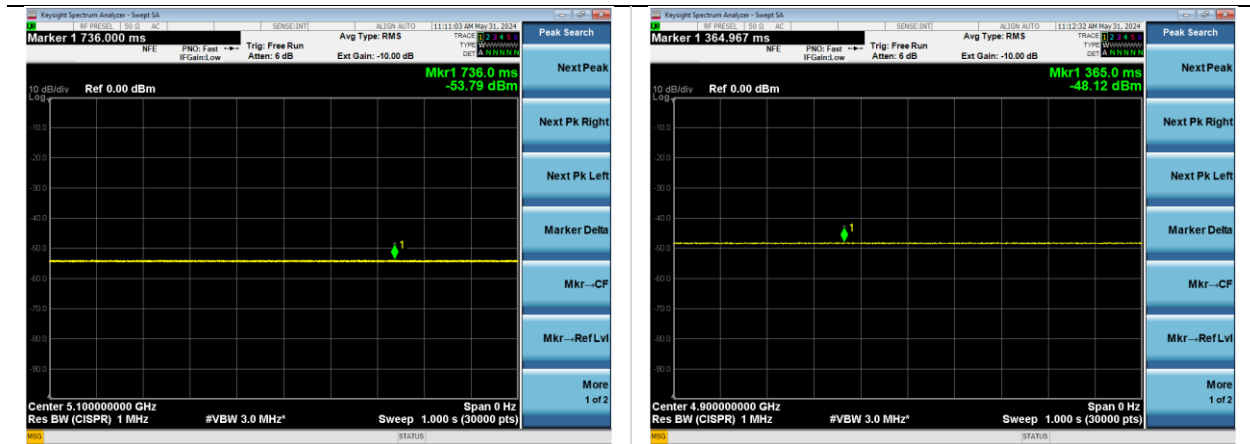
## EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5GHz WLAN Rx
<b>Frequency</b>	5180-5720 MHz	<b>Channel</b>	See 2.7

## Measurements

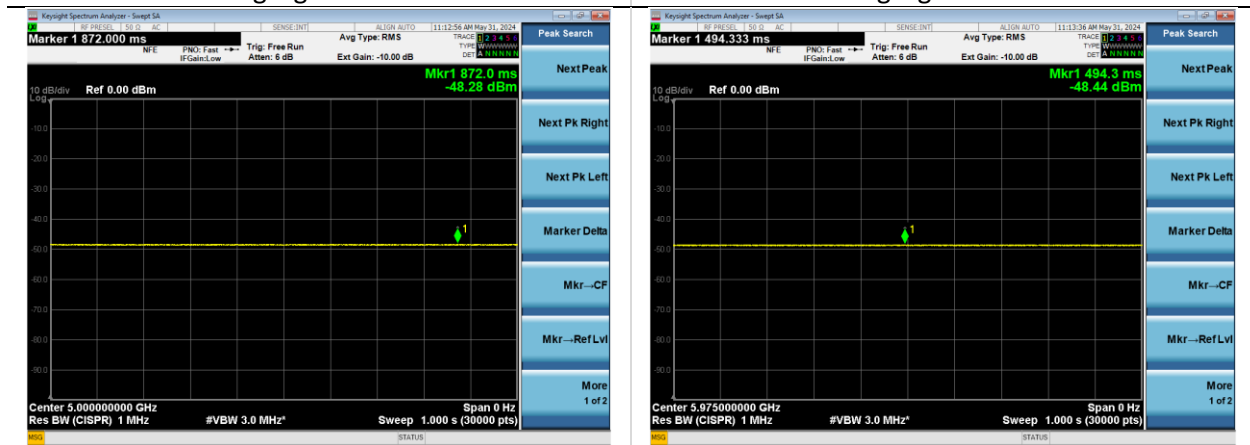
Channel	Rate	5100 MHz	4900 MHz	5000 MHz	5975 MHz	Packets Sent
PER%						
52	6 Mbps	0.0	-	0.0	0.0	1000
120	6 Mbps	-	0.0	-	-	1000
Packets Received						
52	6 Mbps	1000	-	1000	1000	1000
120	6 Mbps	-	1000	-	-	1000

## Plots



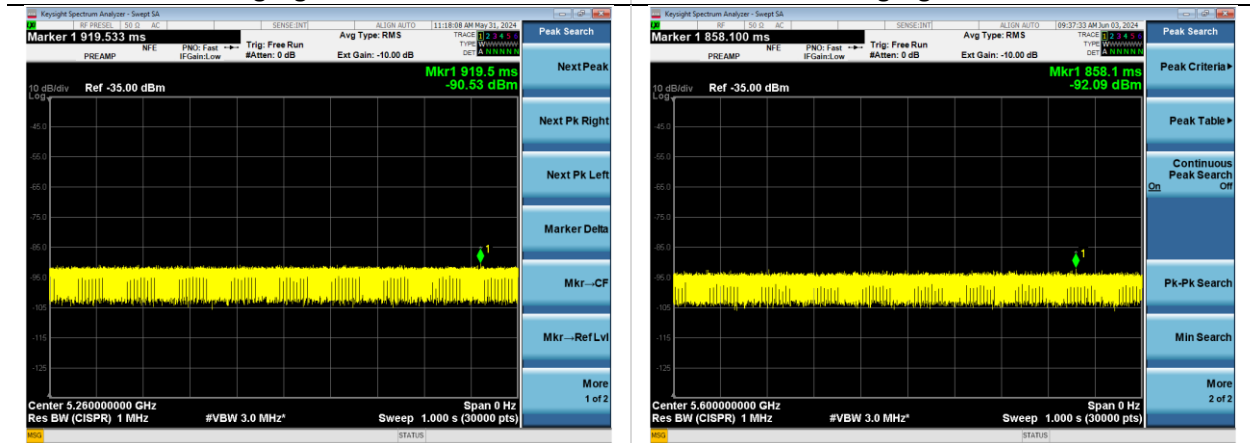
Blocking Signal 5100 MHz

Blocking Signal 4900 MHz



Blocking Signal 5000 MHz

Blocking Signal 5975 MHz



Companion Level low channel

Companion Level high channel

Pmin found at litepoint setting -80, levels taken at -60 to be above noise floor of analyzer

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## 5.2 Radiated Emissions

<b>Description of Measurement</b>	<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>
<b>Example Calculations</b>	<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 outside the 5 GHz RLAN bands

<b>Operator</b>	Nicole Sedmak, Jon Dilley, Zach Brown	<b>QA</b>	Zachary Brown, Adam Alger, Nicole Sedmak
<b>Temperature</b>	25.4°C, 23.1, 24.6, 26.3	<b>R.H. %</b>	37.2%, 42.0, 37.2, 43.0%
<b>Test Date</b>	5/6/2024, 5/8/2024, 5/15/2024, 5/22/2024	<b>Location</b>	Chamber 5, Chamber 3
<b>Requirement</b>	ETSI 301 893 4.2.4.1 AS/NZS 4268 6.4	<b>Method</b>	ETSI 301 893 5.4.5.2.2

#### 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
470-862	-54 dBm	100 kHz
862-1000	-36 dBm	100 kHz
1000-5150	-30 dBm	1 MHz
5350-5470	-30 dBm	1 MHz
5725-26000	-30 dBm	1 MHz

#### Test Parameters

<b>Frequency</b>	30-26000 MHz	<b>Distance</b>	3 m
<b>Detector(s)</b>	Peak Trace Peak and Average Final	<b>Table height</b>	150 cm
<b>RBW</b>	<1000 MHz – 100 kHz >1000 MHz – 1 MHz	<b>VBW</b>	<1000 – 300 kHz >1000 MHz – 3MHz

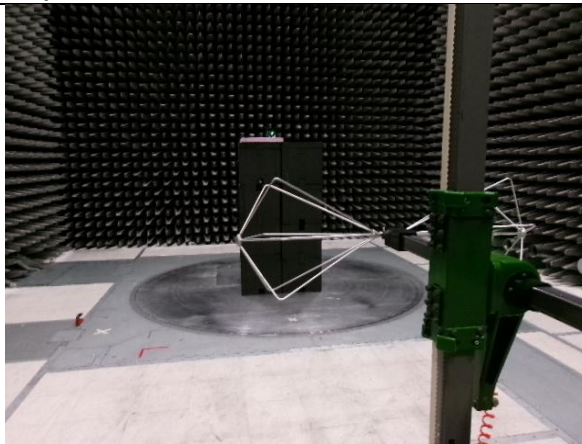
## Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	11/19/2024	11/19/2025	Active Calibration
AA 960150	Antenna - Biconical	ETS Lindgren	3110B	0003-3346	12/9/2024	12/9/2025	Active Calibration
AA 960161	Filter - Highpass 5 GHz	K&L Microwave	11SH10-8000	2	4/10/2024	4/10/2025	Active Calibration
AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	12/11/2024	12/11/2025	Active Calibration
AA 960174	Antenna - Small Horn	ETS Lindgren	3116C-PA	00206880	12/2/2024	12/2/2025	Active Calibration
AA 960209	Antenna - Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	037101808	11/19/2024	11/19/2025	Active Calibration
AA 960217	Antenna - Biconical	A.H. Systems, Inc.	SAS-540	852	1/15/2025	1/15/2026	Active Calibration
AA 960220	Cable	A.H. Systems, Inc.	SAC-26G-6	552	1/28/2025	1/28/2026	Active Verification
EE 960203	Analyzer - EMI Receiver	Keysight	N9038A	MY56400072	4/10/2024	4/10/2025	Active Calibration
LSC-500	Cable	Chamber 5 Emissions	-	-	1/27/2025	1/27/2026	Active Verification
LSC-300	Cable	Chamber 3 Emissions	-	-	1/24/2025	1/24/2026	Active Verification

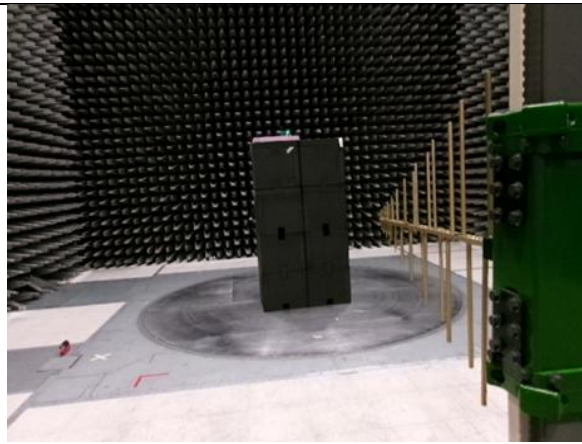
## EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5GHz WLAN Tx
<b>EUT</b>	X, Y, Z Plane Orientations	<b>AE</b>	HP Elitebook 840G1 Ezurio – SOM60 Development Kit
<b>Notes</b>	No radio transmitter emissions within 6dB of limit.		

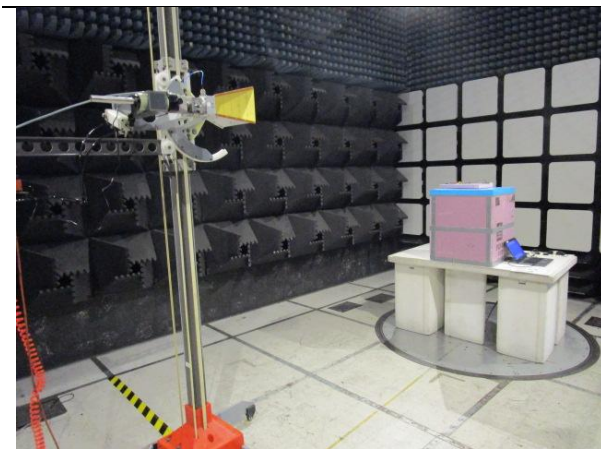
## Setup Photos



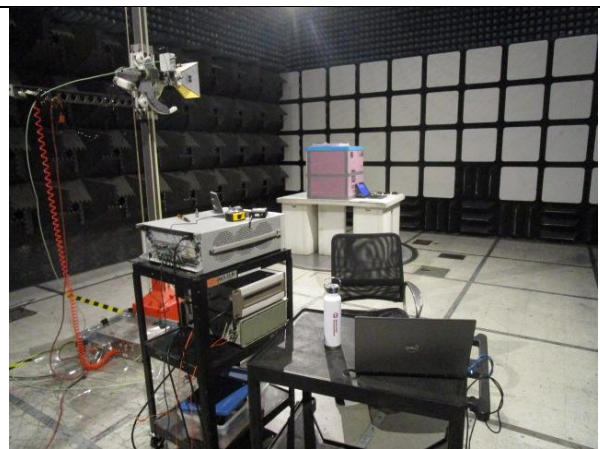
30-200 MHz



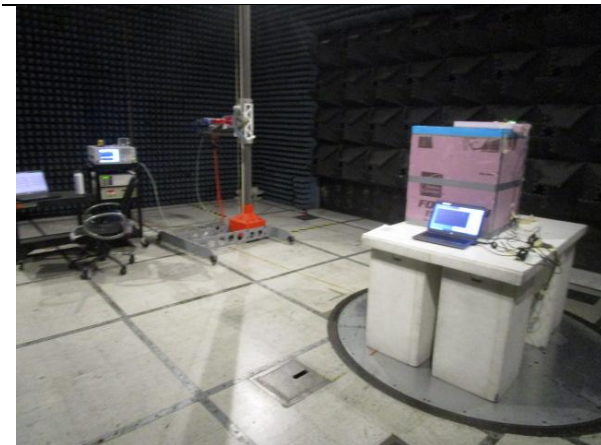
200-1000 MHz



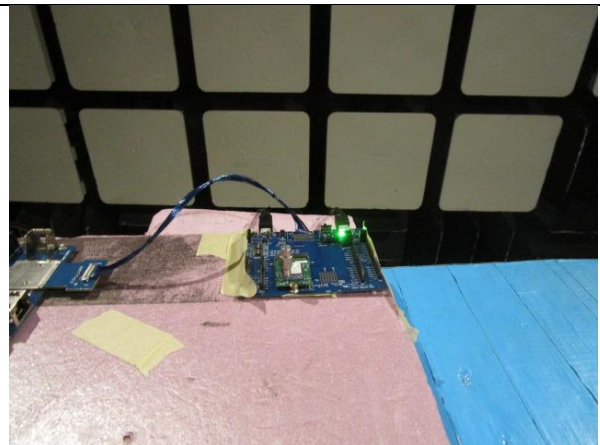
1-4 GHz



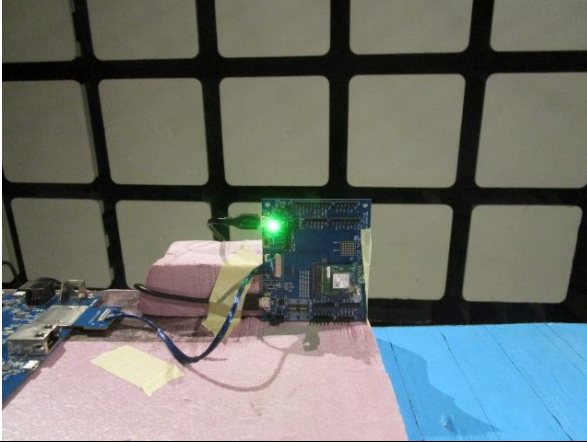
4-18 GHz



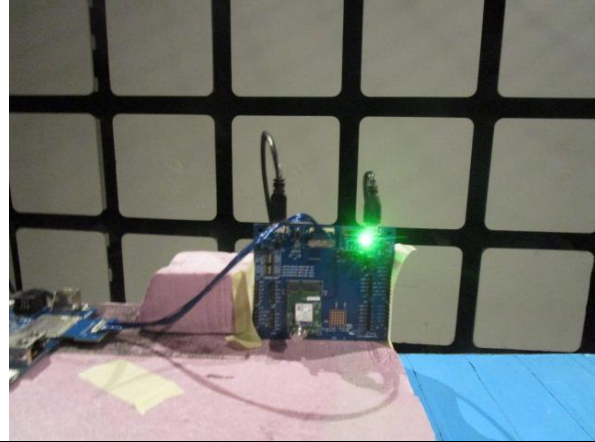
18-26 GHz



X Orientation



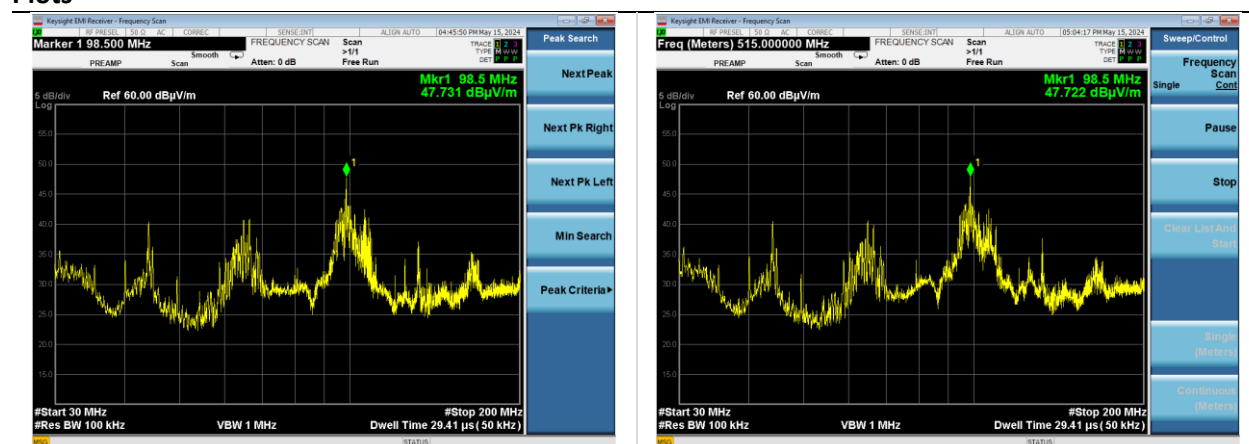
Y Orientation



Z Orientation

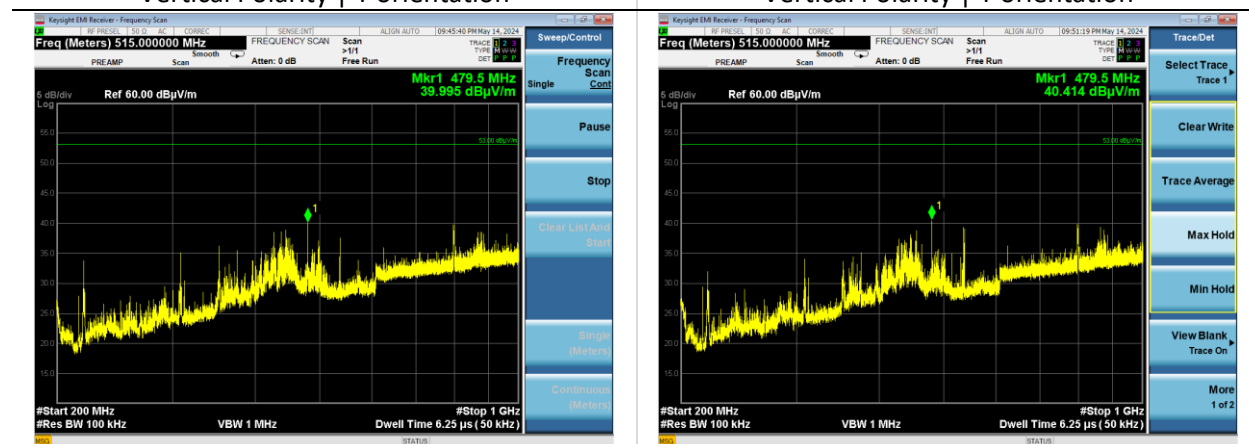


## Plots



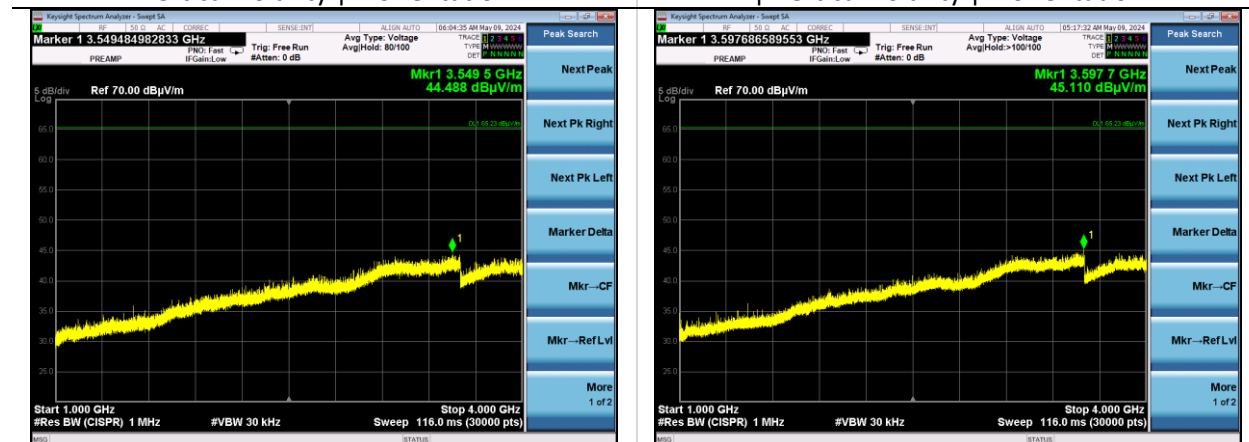
802.11a | Channel 52 | 6 Mbps | 30-200 MHz | Vertical Polarity | Y orientation

802.11a | Channel 120 | 6 Mbps | 30-200 MHz | Vertical Polarity | Y orientation



802.11a | Channel 52 | 6 Mbps | 200-1000 MHz | Vertical Polarity | X orientation

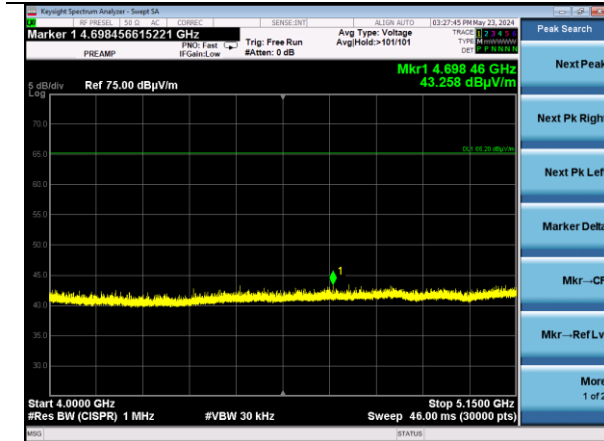
802.11a | Channel 120 | 6 Mbps | 200-1000 MHz | Vertical Polarity | X orientation



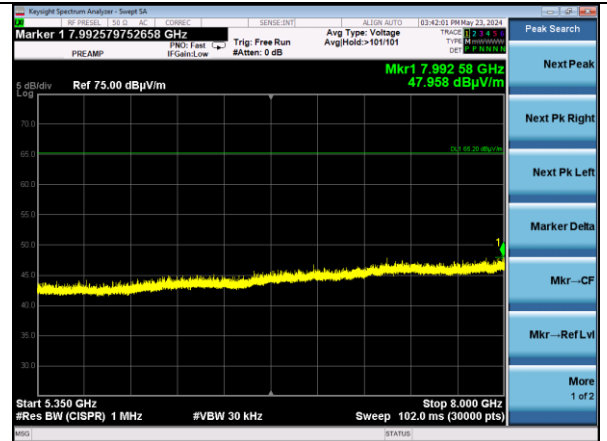
802.11a | Channel 52 | 6 Mbps | 1000-4000 MHz | Horizontal Polarity | X orientation

802.11a | Channel 120 | 6 Mbps | 1000-4000 MHz | Horizontal Polarity | X orientation

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802.11ac | Channel 36 | MCS0 | 4000-5150 MHz  
| Horizontal Polarity | Z orientation



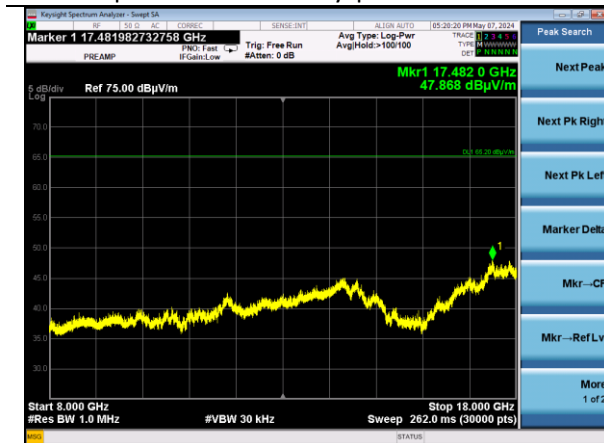
802.11ax | Channel 36 | MCS0 | 5350-8000 MHz  
| Horizontal Polarity | Z orientation



802.11ac | Channel 140 | MCS0 | 5725-8000 MHz  
| Horizontal Polarity | Z orientation



802.11a | Channel 52 | 6 Mbps | 8000-18000 MHz  
| Horizontal Polarity | Z orientation



802.11a | Channel 120 | 6 Mbps | 18000-26000 MHz  
| Vertical Polarity | Z orientation

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Model: SONA NX611M

Serial: 00047

## 5.2.2 Receiver spurious emissions

<b>Operator</b>	Nicole Sedmak, Zach Brown	<b>QA</b>	Dylan Rosenfeldt, Adam Hauke
<b>Temperature</b>	24.5°C, 25.3°C, 24.5, 21.2°C	<b>R.H. %</b>	28.3%, 31.3%, 40.0%, 30.5%
<b>Test Date</b>	1/29/2024, 2/1/2024, 2/2/2024, 2/5/2024	<b>Location</b>	Chamber 3, Chamber 5
<b>Requirement</b>	ETSI 300 328 4.2.5 AS/NZS 4268 7.2	<b>Method</b>	ETSI 300 328 5.4.7.2.2

### Limits:

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

### Test Parameters

<b>Frequency</b>	30-26000 MHz	<b>Distance</b>	3 m
<b>Detector(s)</b>	Peak Trace Peak and Average Final	<b>Table height</b>	150 cm
<b>RBW</b>	<1000 MHz – 100 kHz >1000 MHz – 1 MHz	<b>VBW</b>	<1000 – 300 kHz >1000 MHz – 3 MHz

### Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	11/19/2024	11/19/2025	Active Calibration
AA 960174	Antenna - Small Horn	ETS Lindgren	3116C-PA	00206880	12/2/2024	12/2/2025	Active Calibration
AA 960215	Antenna - LPDA	A.H. Systems, Inc.	SAS-512-2	706	1/15/2025	1/15/2026	Active Calibration
AA 960218	Antenna - Biconical	A.H. Systems, Inc.	SAS-540	853	1/15/2025	1/15/2026	Active Calibration
AA 960220	Cable	A.H. Systems, Inc.	SAC-26G-6	552	1/28/2025	1/28/2026	Active Verification
EE 960203	Analyzer - EMI Receiver	Keysight	N9038A	MY56400072	4/10/2024	4/10/2025	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	1/24/2025	1/24/2026	Active Verification

### EUT Parameters

<b>Input Power</b>	120 VAC @ 60 Hz	<b>Mode</b>	5GHz WLAN Rx
<b>EUT</b>	X, Y, Z Plane Orientations	<b>AE</b>	HP Elitebook 840G1 Ezurio – SOM60 Development Kit
<b>Notes</b>	<1000 MHz Emissions from auxiliary equipment, not a function of the EUT. Emission at 6 GHz is not a function of the receiver.		

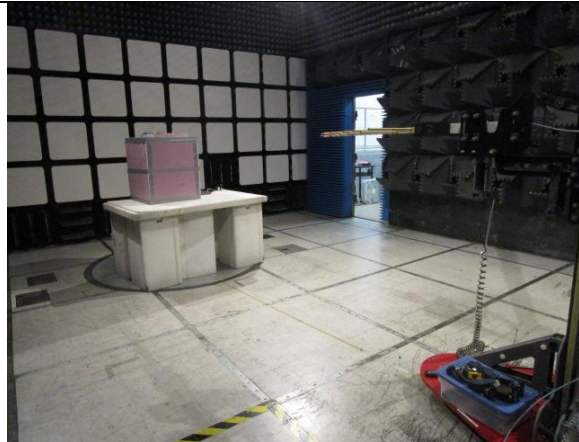
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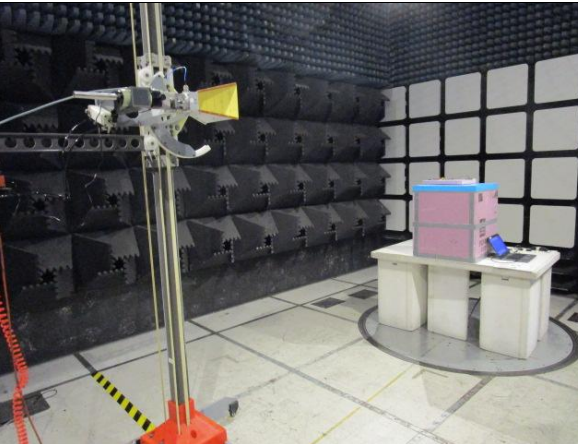
# Setup Photos



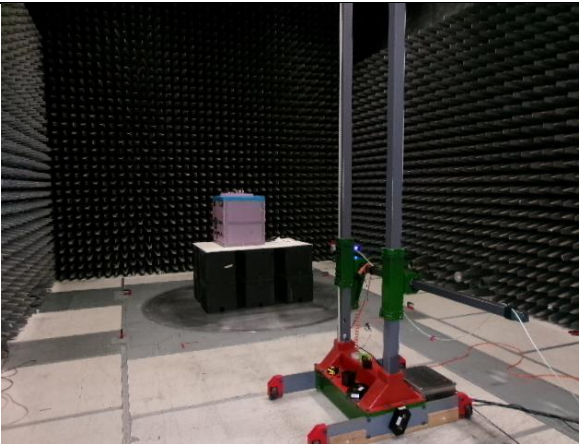
30-200 MHz



200-1000 MHz

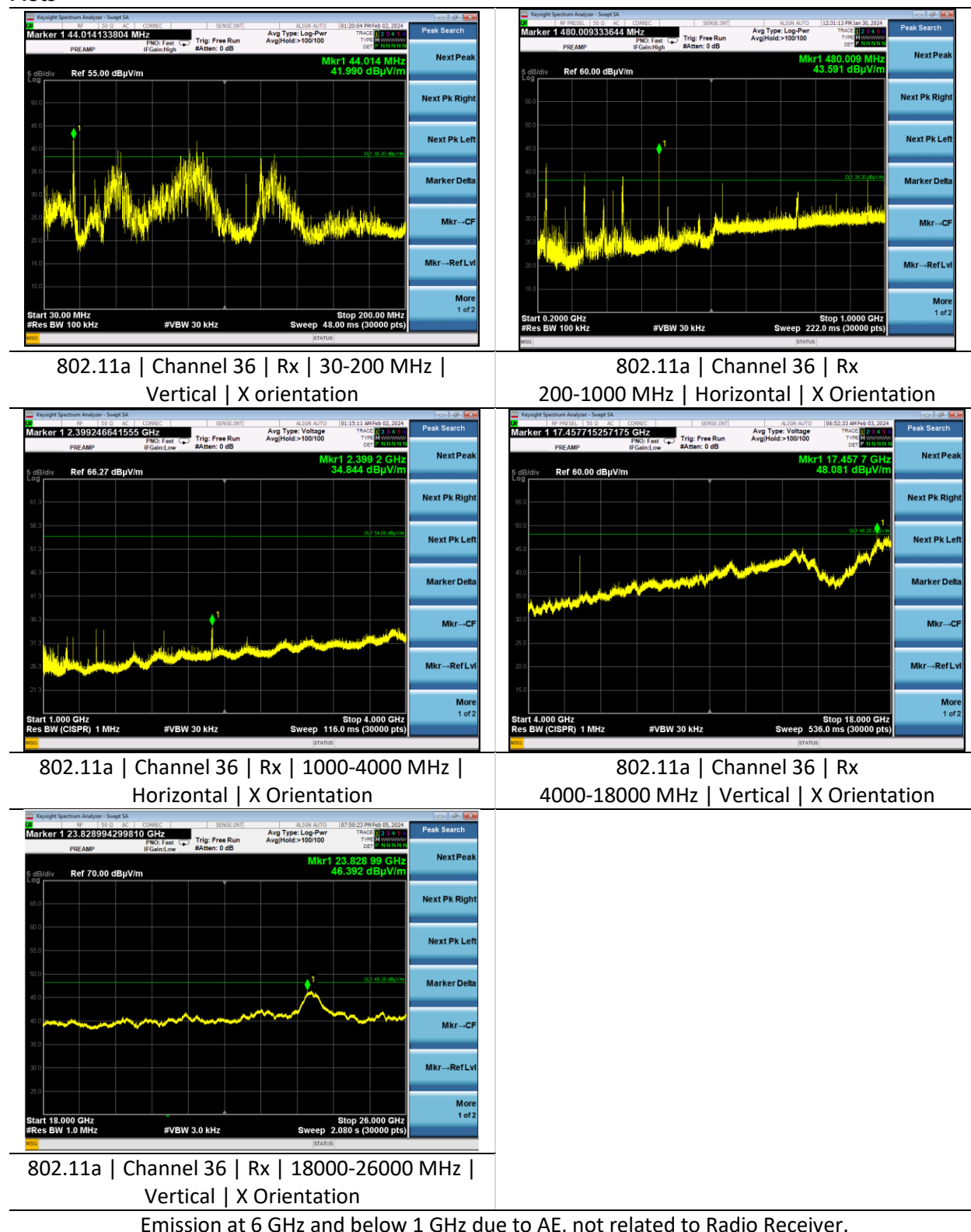


1-18 GHz



18-26 GHz

## Plots



## 6 REVISION HISTORY

Version	Date	Notes	Person
0	1/30/2025	Initial Draft	Anthony Smith
1	2/12/2025	Final Revisions	Anthony Smith

**END OF REPORT**