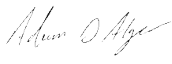


TR3874-WLAN

Equipment Under Test:	Veda SL917
Requirement(s):	eCFR 47 Part 15.247 RSS-247
Test Date(s):	3/24/2025-4/18/2025, 6/23/2025-7/29/2025
Prepared for:	Ezurio Attn: Brian Petted W66 N220 Commerce Ct. Cedarburg, WI 53012

Report Issued by: Dylan Rosenfeldt, EMC Engineer	
Signature: 	Date: 08/06/2025
Report Reviewed by: Adam Alger, Sr. Manager, EMC Laboratory	
Signature: 	Date: 08/06/2025
Report Constructed by: Dylan Rosenfeldt, EMC Engineer	
Signature: 	Date: 08/06/2025

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Company: Ezurio	Page 1 of 42	Name: Veda SL917
Report: TR3874-WLAN		Model: 453-00219, 453-00220
Job: C-3874		Serial: Engineering 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 42	Name: Veda SL917
Report: TR3874-WLAN		Model: 453-00219, 453-00220
Job: C-3874		Serial: Engineering Sample

1 TEST REPORT SUMMARY

During **3/24/2025-4/14/2025, 6/23/2025-7/29/2025** the Equipment Under Test (EUT), **Veda SL917**, as provided by **Ezurio** was tested to the following requirements for the purpose of a Class 2 permissive change to add antennas:

FCC 15.247 | RSS-247 – DTS 2.4 GHz WLAN

Requirements	Description	Method	Compliant
15.247(d) 15.209 RSS-247 Clause 5.5 RSS-GEN Clause 8.10	Spurious Radiated Emissions in Restricted Bands 30-25000 MHz	ANSI C63.10	Yes
15.247(a)(2) RSS-247 Clause 5.2 (a)	6dB and 99% Occupied Bandwidth	ANSI C63.10	Yes
15.247(b)(3) RSS-247 Clause 5.4 (d)	RF Output Power	ANSI C63.10	Yes
15.247(d) RSS-247 Clause 5.5 RSS-GEN A1 Clause 8.9	Out-of-band Emissions	ANSI C63.10	Yes
15.247(e) RSS-247 Clause 5.2 (b)	Power Spectral Density	ANSI C63.10	Yes
2.1055(d) RSS-GEN 6.11	Frequency Stability	ANSI C63.10	Reported
15.207 RSS-GEN 8.8	AC Conducted Emissions	ANSI C63.10	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	1 dB below specified limit
Emissions – Frequency	1% less than the specification
Immunity	Tested at specified level

Company: Ezurio	Page 4 of 42	Name: Veda SL917
Report: TR3874-WLAN		Model: 453-00219, 453-00220
Job: C-3874		Serial: Engineering 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	Veda SL917
Model Number	453-00219, 453-00220
Serial Number	Engineering Sample
FCC ID	SQG-SL917
IC ID	3147A-SL917

2.2 Product Description

The Veda SL917 is based upon Silicon Labs SiWx917 chipset. Feature-set includes 802.11 b/g/n/ax Wi-Fi 6 and Bluetooth Low Energy v5.4.

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 – OUTPUT: 5VDC 0.5A (supplied by laptop USB port)

Programming – STM32CubeIDE Version 1.17.0

2.6 Ancillary Equipment

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

- STM32 NUCLEO-F411RE development board
- Nucleo 64 click shield board
- HP Elitebook 840G1

2.7 Antenna Information

Manufacturer	Model	Part Number	Dimension	Type	Peak Gain (dBi) 2400-2480 MHz
Ezurio	FlexNotch	001-0023	32mm X 21.1mm	Notch	2.0
Ezurio	i-FlexPIFA Mini	EFG2401A3S- 10MH4L	35.9mm X 11mm X 2.9mm	PIFA	2.0
Ezurio	FlexPIFA	001-0022	40.1mm X 11.0mm X 2.5mm	PIFA	2.0
Ezurio	NanoBlue	EBL2400A1- 10MH4L	44.5mm X 12.7mm X 0.8mm	Dipole	2.0
Ezurio	i-FlexPIFA	EFG2400A3S- 10MH4L	40.9mm X 11mm X 2.9mm	PIFA	3.1
Ezurio	mFlexPIFA	EFA2400A3S- 10MH4L	25.4mm x 23.4mm x 2.5mm	PIFA	2.0

2.8 Test Channels

Channel	Frequency (MHz)	Bandwidth (MHz)	Data Rates
1	2412	20	802.11b – 1 Mbps 802.11g – 6 Mbps
6	2437	20	802.11n – MCS0 802.11ax – MCS0
11	2462	20	802.11ax RU26 – MCS0

2.9 Power Table and Reduced Video Bandwidth for Average Measurements

Mode	Channel BW (MHz)	Data Rate	Minimum Average VBW (Hz)
802.11b	20	1 Mbps	10
802.11g	20	6 Mbps	10
802.11n	20	MCS0	10
802.11ax	20	MCS0	10
802.11ax RU26	20	MCS0	10

2.10 Power Table

Channel	Center Freq	802.11B	802.11G	802.11N	802.11AX
1	2412	15	10	9	9
2	2417	18	13	13	12
3	2422	20	15	15	14
4	2427	20	18	18	17
5	2432	20	20	20	18
6	2437	20	20	20	18
7	2442	20	20	20	18
8	2447	20	18	18	18
9	2452	20	17	17	16
10	2457	18	15	15	12
11	2462	13	10	9	9

3 REFERENCES

Publication	Edition	Date	AMD 1	AMD 2
FCC eCFR 47 Part 15	-	2025	-	-
ANSI C63.10	-	2020	2024	-
RSS-247	3	2023	-	-
RSS-GEN	5	2018	2019	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

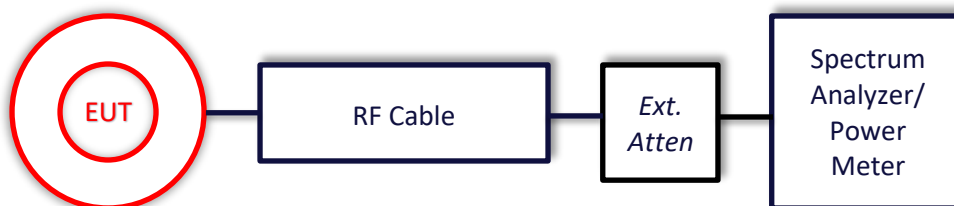
Parameter	ETSI U.C. $\pm$	U.C. $\pm$
Radio Frequency, from F0	1×10^{-7}	0.55×10^{-7}
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9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

5 TEST DATA

5.1 Antenna Port Conducted Emissions

Description of Measurement	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. The cable and attenuator factors are loaded into the analyzer or power meter allowing for direct measurement readings without the need for further corrections.
Example Calculations	Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm) Margin (dB) = Limit (dBm) – Corrected Reading (dBm)

Block Diagram



5.1.1 6dB and 99% Occupied Bandwidth

Operator	Dylan Rosenfeldt	QA	Mitchell Freund
Temperature	21.7°C	R.H. %	25.9%
Test Date	3/24/2025	Location	RF Conducted Bench
Requirement	15.247 (a)(2) RSS-247 Clause 5.2 (a)	Method	ANSI C63.10 6.9.3, 11.8

Limits: The minimum 6 dB bandwidth shall be at least 500 kHz

Test Parameters

Frequency	2400-2483.5 MHz	Setup	Antenna Port
RBW	270 kHz	VBW	1.2 MHz
Detector(s)	Peak	Settings	Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
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

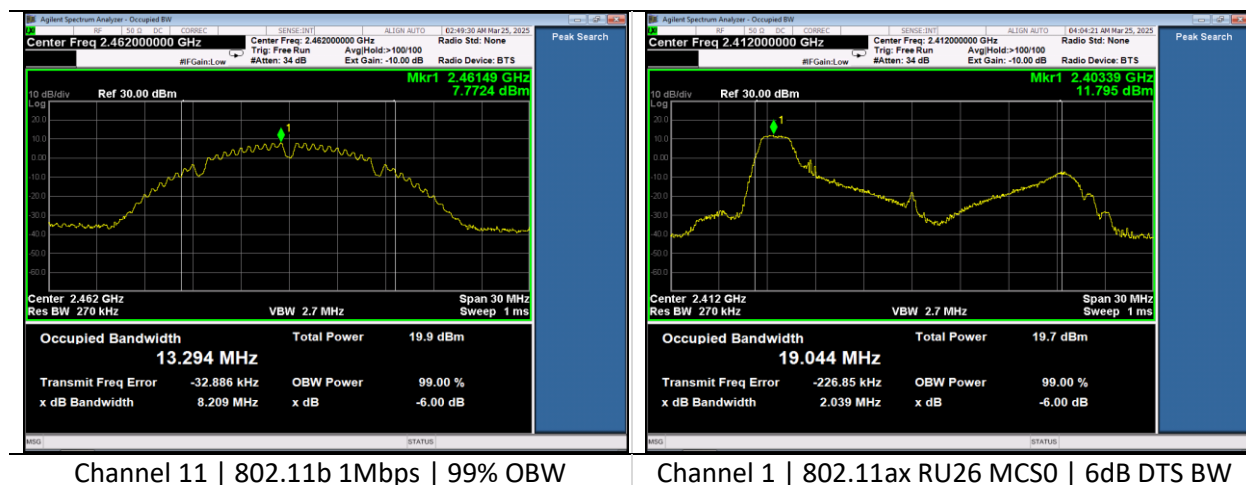
EUT Parameters

Input Power	5VDC	Mode	WLAN Tx
Frequency	2400-2483.5 MHz	Channel	See 2.8

Table

Mode	Rate	Channel	99% BW (MHz)	6 dB BW (MHz)
802.11b	1 Mbps	1	13.489	8.632
		6	13.311	8.212
		11	13.294	8.209
802.11g	6 Mbps	1	16.820	16.410
		6	16.960	16.410
		11	16.812	16.380
802.11n	MCS0	1	17.779	17.600
		6	17.932	17.730
		11	17.789	17.610
802.11ax	MCS0	1	18.869	18.870
		6	18.899	18.930
		11	18.874	18.920
802.11ax RU26	MCS0	1	19.044	2.039
		6	19.051	2.062
		11	18.954	2.105

Plots



5.1.2 RF Output Power

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	18.8°C	R.H. %	62.7%
Test Date	6/23/2025	Location	RF Conducted Bench
Requirement	15.247 (b)(3) RSS-247 Clause 5.4 (d)	Method	ANSI C63.10 11.9.2.3.2 AVGPM-G

Limit: The maximum conducted output power of the intentional radiator shall not exceed 1 Watt.

Test Parameters

Frequency	2400-2483.5 MHz	Setup	Antenna Port
RBW	20 MHz	Sampling Rate	16 MS/s

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960090	Meter - RF Power	Anritsu	ML2495A	1335006	4/3/2025	4/3/2026	Active Calibration
EE 960091	Sensor - RF Power	Anritsu	MA2491A	1249277	4/3/2025	4/3/2026	Active Calibration

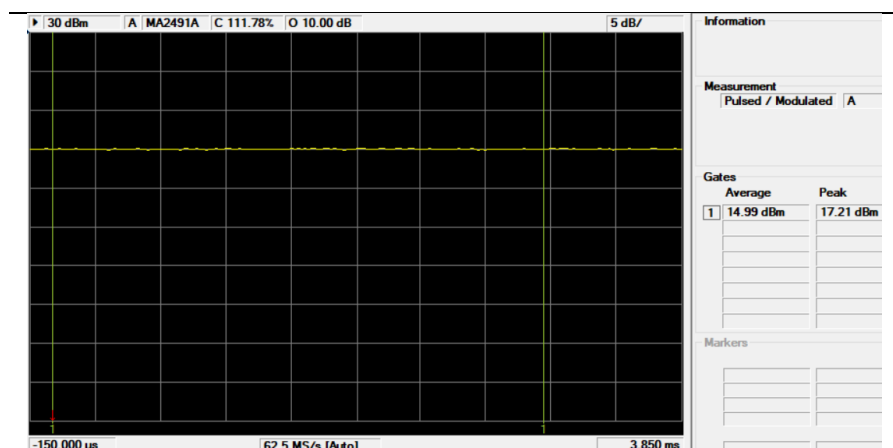
EUT Parameters

Input Power	5VDC	Mode	WLAN Tx
Frequency	2400-2483.5 MHz	Channel	See 2.8

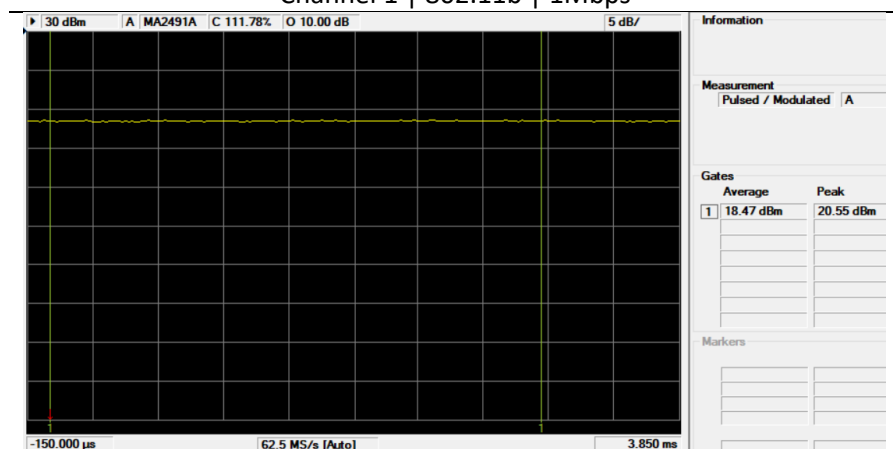
Table

Mode	Rate	Channel	Average Output Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
802.11b	1 Mbps	1	15.0	30	14.2	15
		6	18.5	30	14.3	20
		11	14.3	30	19.2	15
802.11g	6 Mbps	1	12.2	30	18.1	11
		6	18.3	30	13.5	20
		11	9.6	30	19.4	10
802.11n	MCS0	1	11.3	30	18.7	10
		6	18.3	30	14.3	20
		11	9.8	30	19.8	10
802.11ax	MCS0	1	11.0	30	18.1	10
		6	16.7	30	15.6	18
		11	9.3	30	19.4	10
802.11ax RU26	MCS0	1	10.4	30	18.7	10
		6	16.4	30	16.2	18
		11	9.0	30	20.1	10

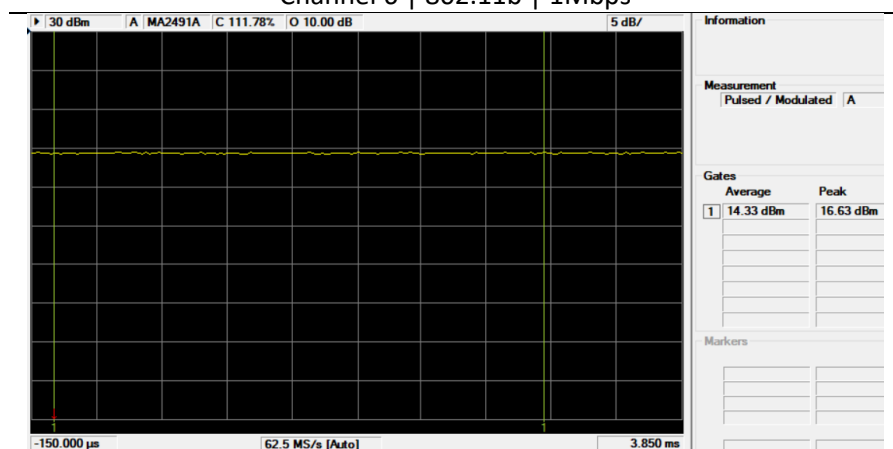
Plots 802.11b



Channel 1 | 802.11b | 1Mbps

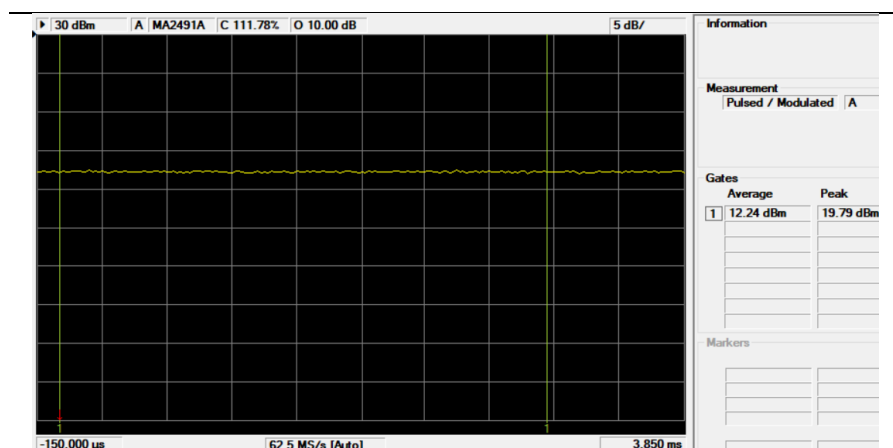


Channel 6 | 802.11b | 1Mbps

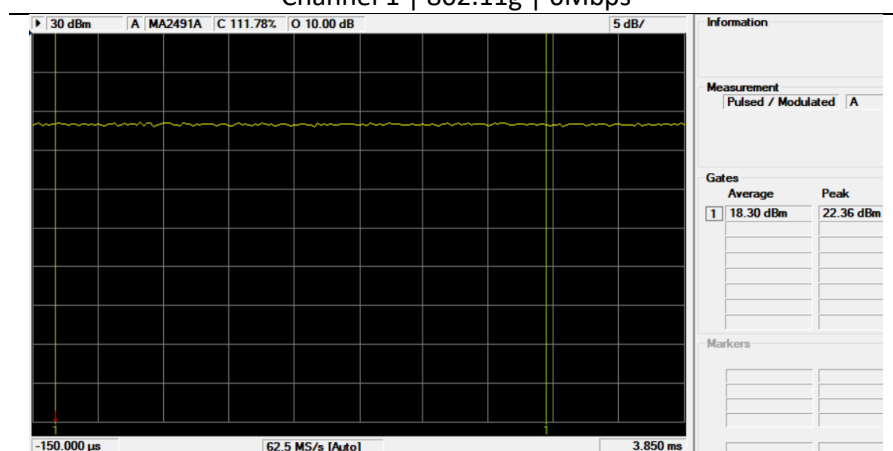


Channel 11 | 802.11b | 1Mbps

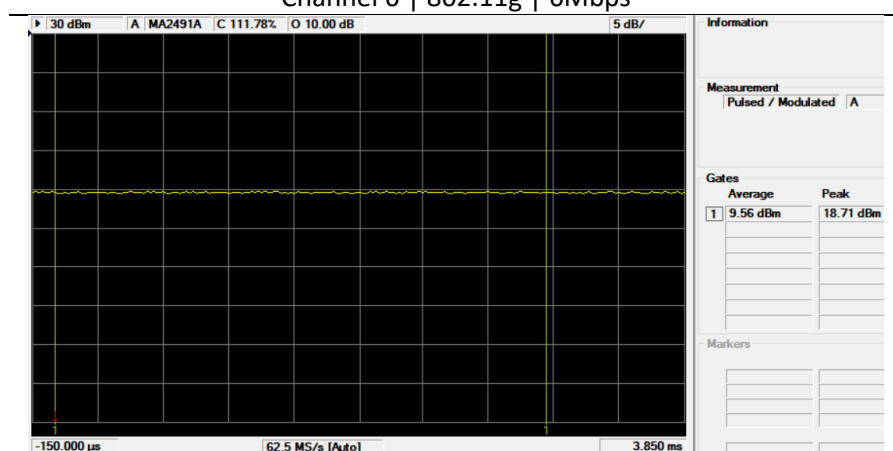
Plots 802.11g



Channel 1 | 802.11g | 6Mbps

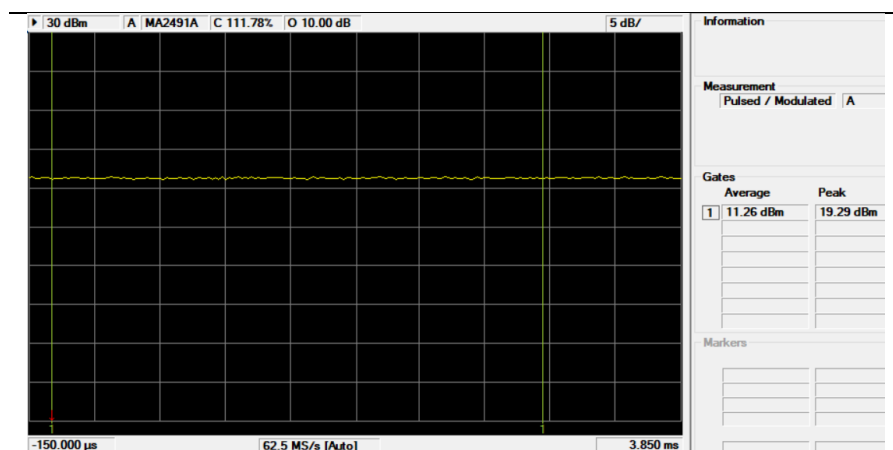


Channel 6 | 802.11g | 6Mbps

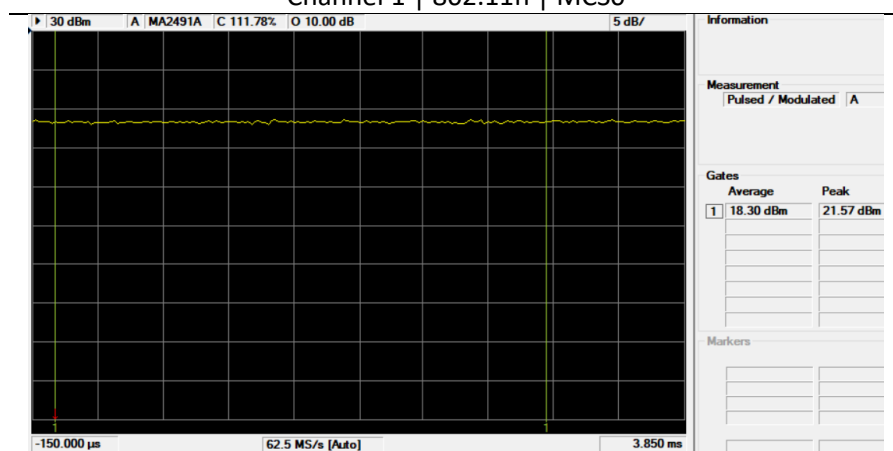


Channel 11 | 802.11g | 6Mbps

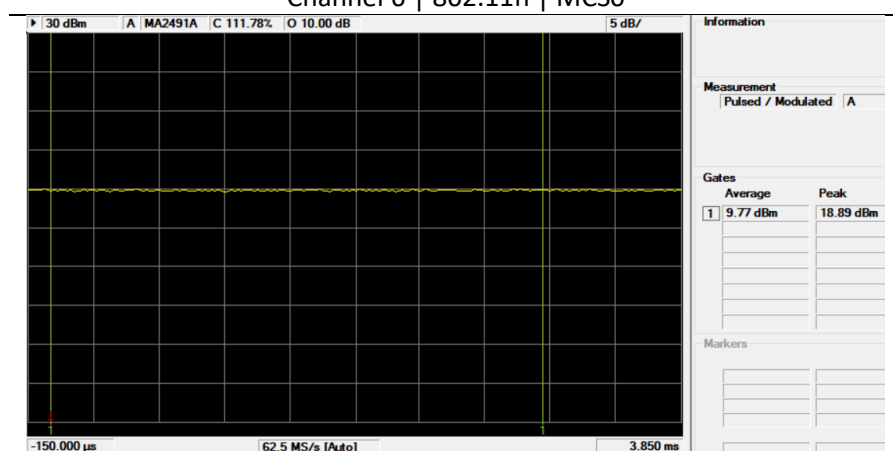
Plots 802.11n



Channel 1 | 802.11n | MCS0

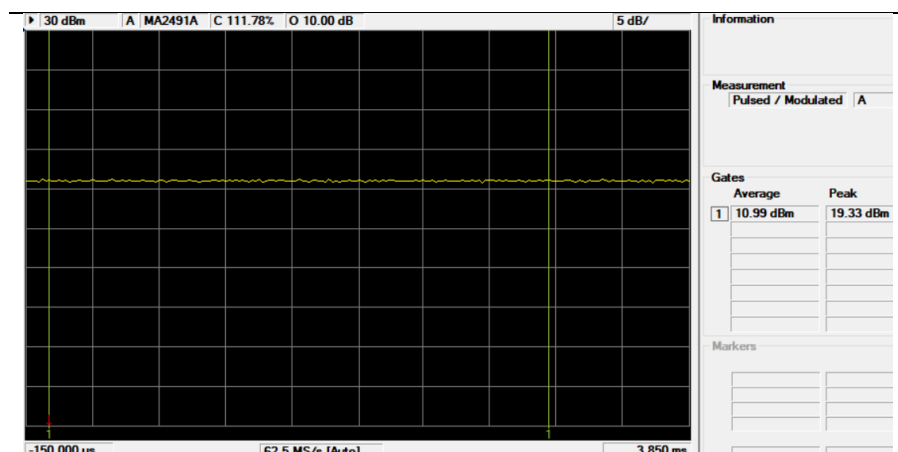


Channel 6 | 802.11n | MCS0

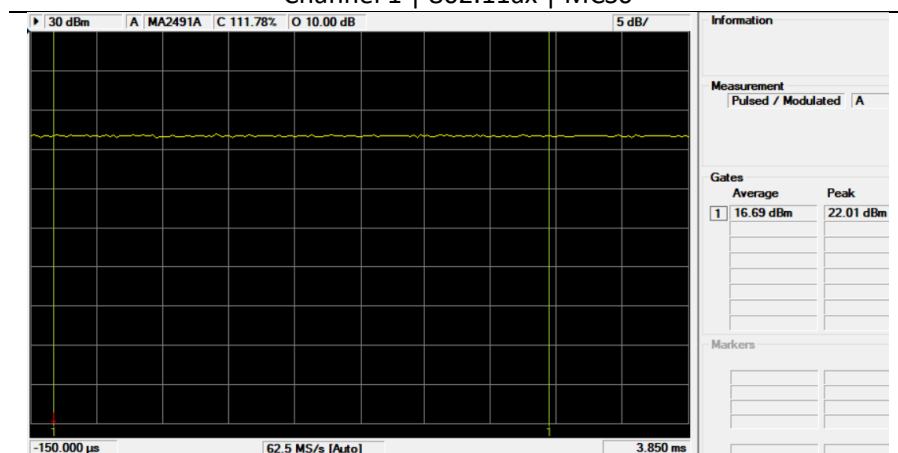


Channel 11 | 802.11n | MCS0

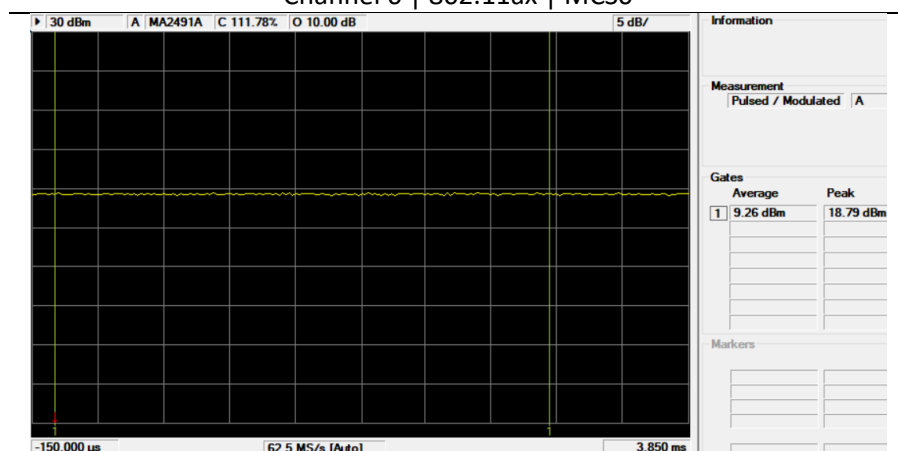
Plots 802.11ax



Channel 1 | 802.11ax | MCS0

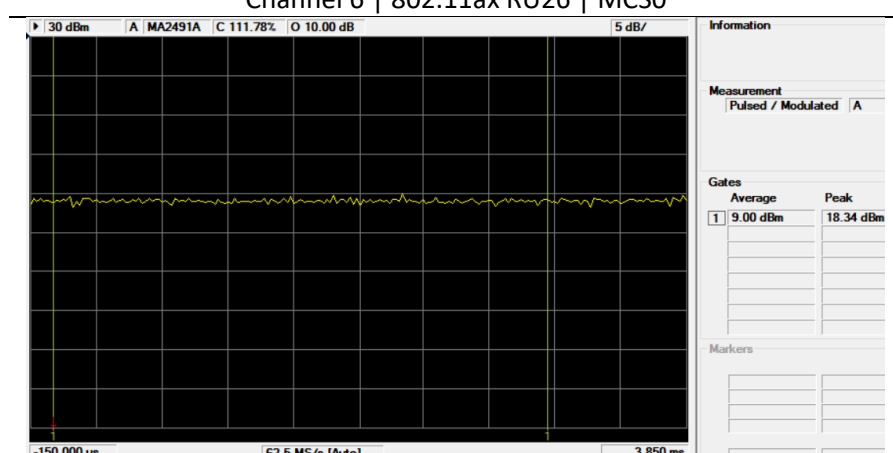
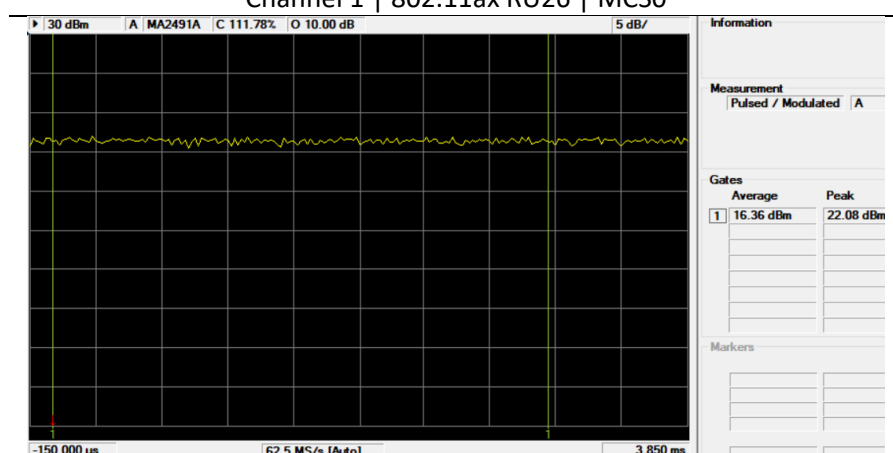
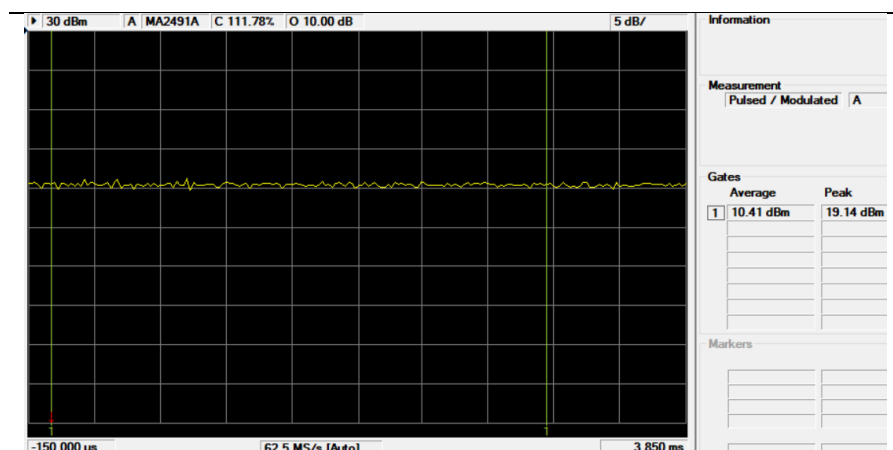


Channel 6 | 802.11ax | MCS0



Channel 11 | 802.11ax | MCS0

Plots 802.11ax RU26



5.1.3 Power Spectral Density

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	22.7°C	R.H. %	50.6%
Test Date	6/24/2025	Location	RF conducted bench
Requirement	15.247 (e) RSS-247 Clause 5.2 (b)	Method	ANSI C63.10 11.10.3 AVGPSD-1

Limits: Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

Test Parameters

Frequency	2400-2483.5 MHz	Detector(s)	RMS
RBW	100 kHz	VBW	300 kHz

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
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	6/1/2025	6/1/2026	Active Calibration

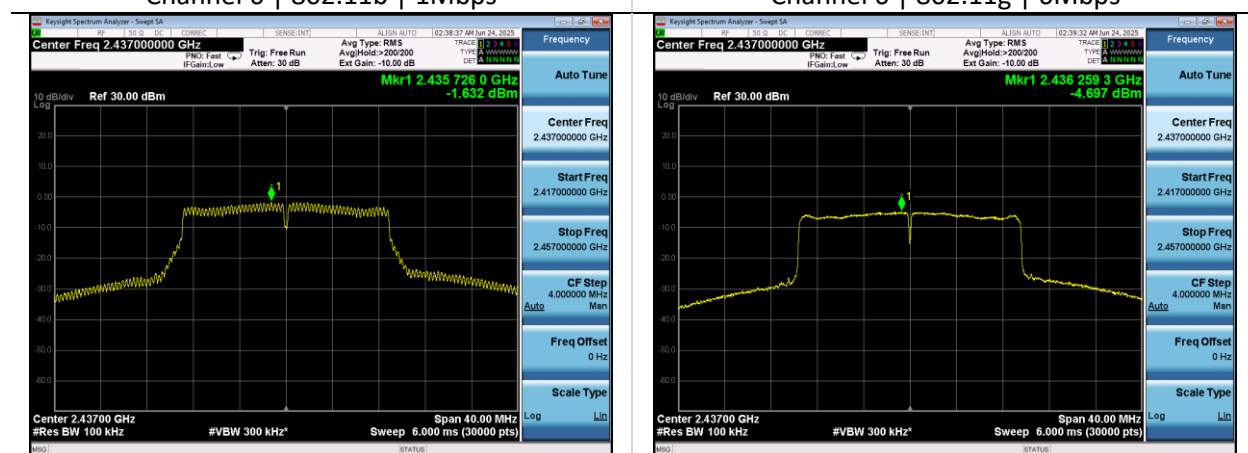
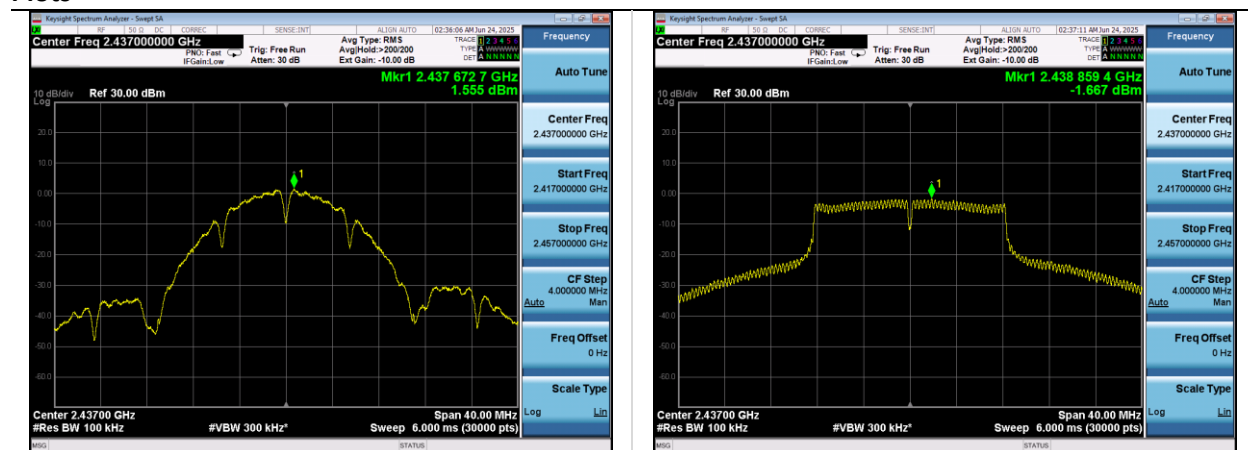
EUT Parameters

Input Power	5VDC	Mode	WLAN Tx
Frequency	2400-2483.5 MHz	Channel	See 2.8

Table

Mode	Rate	Channel	Average PSD (dBm/100kHz)	Limit (dBm/3kHz)	Margin (dB)	Power Setting
802.11b	1 Mbps	1	-2.2	8	9.2	15
		6	1.6	8	8.8	20
		11	-3.2	8	9.5	15
802.11g	6 Mbps	1	-8.1	8	15.8	11
		6	-1.7	8	11.1	20
		11	-10.7	8	17.1	10
802.11n	MCS0	1	-9.5	8	16.6	10
		6	-1.6	8	12.5	20
		11	-10.7	8	17.7	10
802.11ax	MCS0	1	-10.3	8	17.4	10
		6	-4.7	8	14.6	18
		11	-12.0	8	18.6	10
802.11ax RU26	MCS0	1	-1.5	8	8.7	10
		6	4.1	8	6.6	18
		11	-3.4	8	11.6	10

Plots



5.1.4 Emissions in Non-Restricted Frequency Bands

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	22.9°C	R.H. %	49.00%
Test Date	7/28/2025	Location	RF Conducted Bench
Requirement	15.247(d) RSS-247 Clause 5.5	Method	ANSI C63.10 11.11

Limits: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Reference Level (Worst Case PSD)

Channel 6, 802.11ax RU26 MCS0: 12.9 dBm/100kHz

9.9 dBm-30 dB = -17.1 dBm Limit

Test Parameters

Frequency	30-25000 MHz	Setup	Antenna Port
RBW	100 kHz	VBW	300 kHz
Detector(s)	Peak		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
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	6/1/2025	6/1/2026	Active Calibration

EUT Parameters

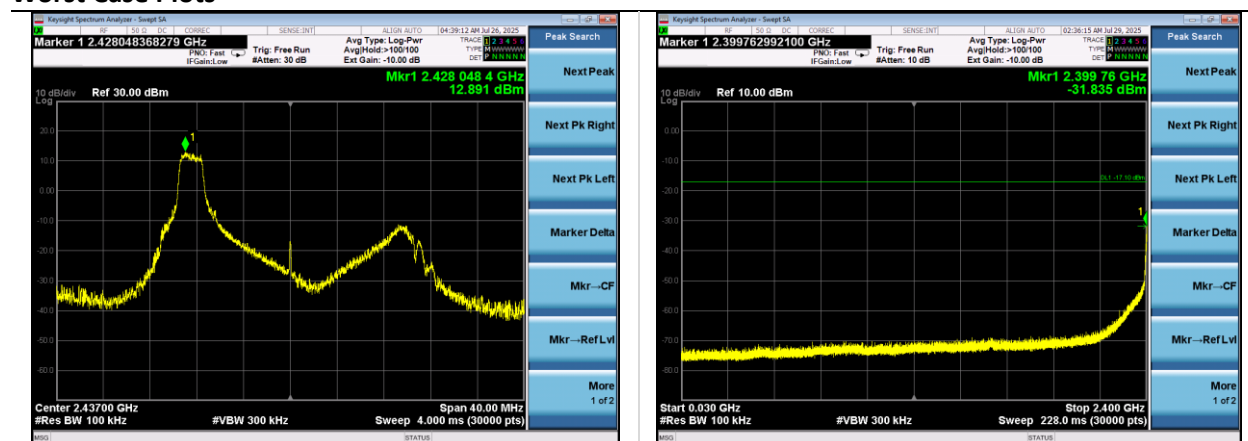
Input Power	5VDC	Mode	WLAN Tx
Frequency	2400-2483.5 MHz	Channel	See 2.8

Company: Ezurio	Page 23 of 42	Name: Veda SL917
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Job: C-3874		Serial: Engineering Sample

Measurements

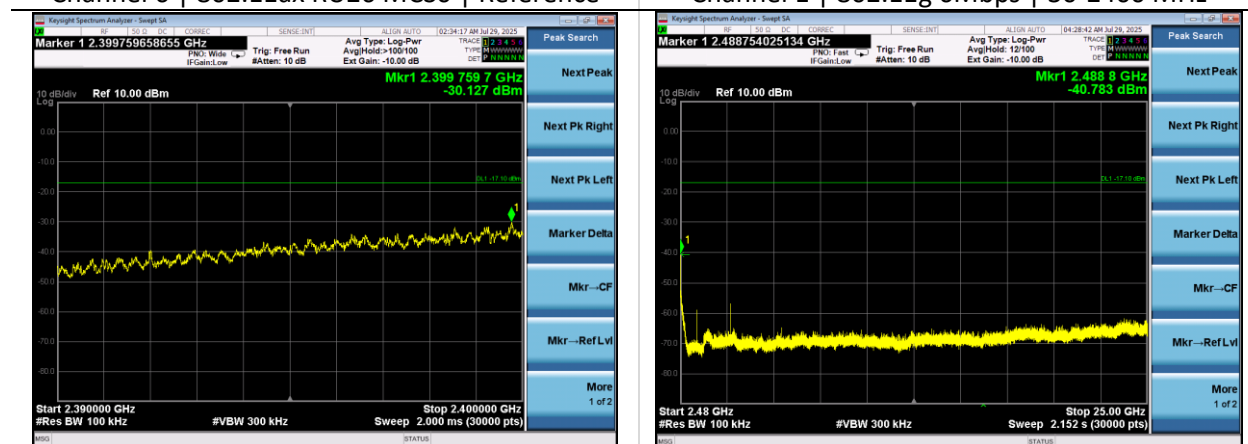
Mode	Rate	Channel	Frequency (MHz)	Measurement (dBm)	Limit (dBm)	Margin (dB)
802.11b	1 Mbps	1	2399.0	-34.4	-17.1	17.3
802.11g	6 Mbps	1	2399.8	-30.1	-17.1	13.0
802.11n	MCS0	1	2398.5	-32.9	-17.1	15.8
802.11ax	MCS0	1	2398.2	-31.1	-17.1	14.0
802.11ax RU26	MCS0	1	2400.0	-33.2	-17.1	16.1
802.11b	1 Mbps	11	2487.2	-39.1	-17.1	22.0
802.11n	MCS0	11	2487.7	-43.5	-17.1	26.4
802.11ax RU26	MCS0	11	2488.3	-43.8	-17.1	26.7

Worst Case Plots



Channel 6 | 802.11ax RU26 MCS0 | Reference

Channel 1 | 802.11g 6Mbps | 30-2400 MHz



Channel 1 | 802.11ax 6Mbps | 2390-2400 MHz

Channel 11 | 802.11b 1Mbps | 2483.5-25000 MHz

5.1.5 Spurious Emissions in Restricted Bands

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	22.8°C	R.H. %	49.10%
Test Date	7/29/2025	Location	RF Conducted Bench
Requirement	15.247(d) RSS-247 Clause 5.5	Method	ANSI C63.10 11.12.2

15.209 Limits:

Frequency (MHz)	Quasi-Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-40000	-	54.0	74.0

Test Parameters

Frequency	30-25000 MHz	Setup	Antenna Port
RBW	1 MHz	VBW	3 MHz Peak See 2.9 for Average
Detector(s)	Peak	Method	RF Conducted
Antenna	Declared antenna gain 3.1 dBi		
Example Calculations	EIRP = Measurement + Antenna Gain + Correction Factor E-Field = EIRP – 20log3 + 104.8		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
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	6/1/2025	6/1/2026	Active Calibration

EUT Parameters

Input Power	5VDC	Mode	WLAN Tx
Frequency	2412-2462 MHz	Channel	See 2.8
Power Setting	See 2.10		

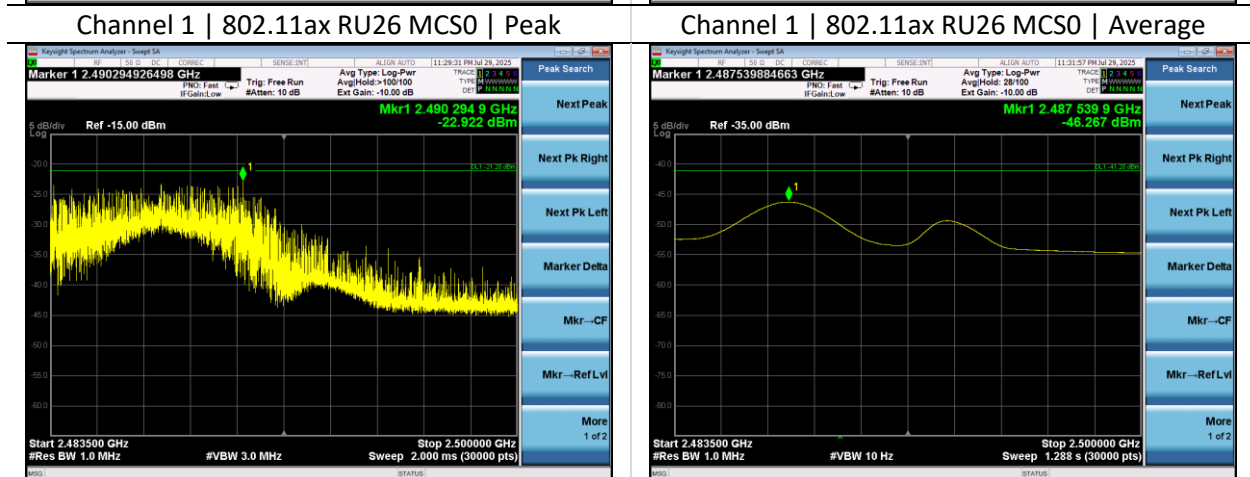
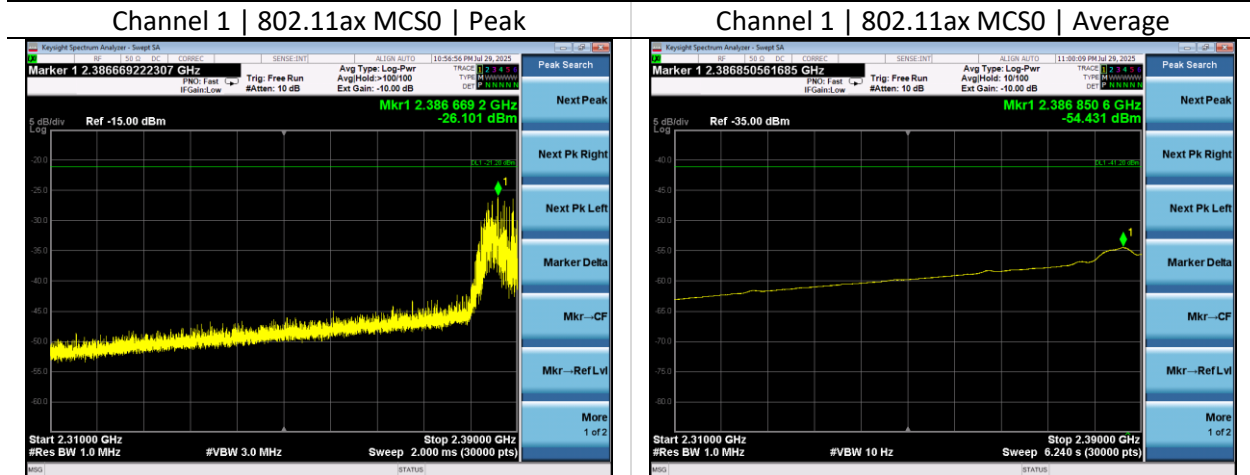
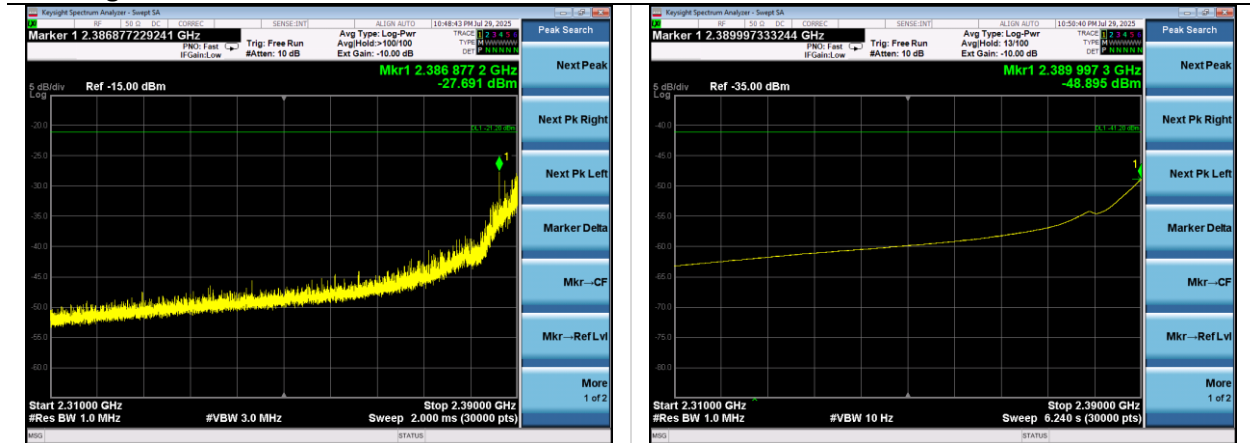
Measurements – Lower Band Edge

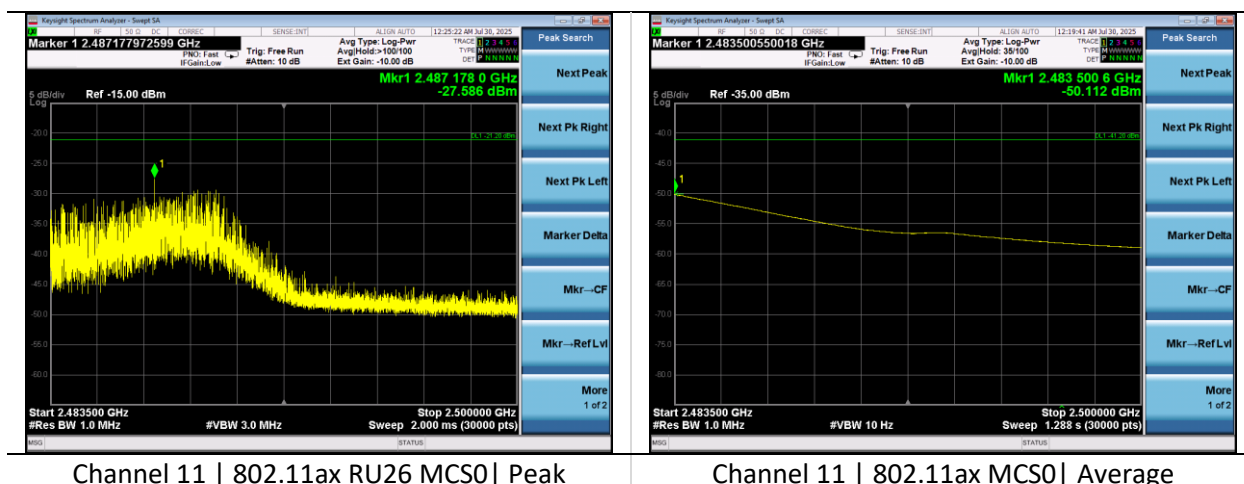
Mode	Rate	Channel	Measurement Type	Frequency (MHz)	Measurement (dBm)	EIRP (dBm)	E-Field (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11b	1 Mbps	1	Peak	2385.5	-38.5	-35.4	59.9	74.0	14.1
		1	Average	2386.7	-49.8	-46.7	48.6	54.0	5.4
802.11g	6 Mbps	1	Peak	2390.0	-32.8	-29.7	65.6	74.0	8.4
		1	Average	2390.0	-51.5	-48.4	46.9	54.0	7.1
802.11n	MCS0	1	Peak	2388.8	-28.6	-25.5	69.8	74.0	4.2
		1	Average	2390.0	-49.6	-46.5	48.8	54.0	5.2
802.11ax	MCS0	1	Peak	2386.9	-27.7	-24.6	70.7	74.0	3.3
		1	Average	2390.0	-48.9	-45.8	49.5	54.0	4.5
802.11ax RU26	MCS0	1	Peak	2386.7	-26.1	-23.0	72.3	74.0	1.7
		1	Average	2386.9	-54.4	-51.3	44.0	54.0	10.0

Measurements – Upper Band Edge

Mode	Rate	Channel	Measurement Type	Frequency (MHz)	Measurement (dBm)	EIRP (dBm)	E-Field (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11b	1 Mbps	11	Peak	2486.4	-27.3	-24.2	71.1	74.0	2.9
		11	Average	2487.4	-49.3	-46.2	49.1	54.0	4.9
802.11g	6 Mbps	11	Peak	2483.6	-33.9	-30.8	64.5	74.0	9.5
		11	Average	2483.5	-52.6	-49.5	45.8	54.0	8.2
802.11n	MCS0	11	Peak	2483.7	-27.7	-24.6	70.7	74.0	3.3
		11	Average	2483.5	-51.0	-47.9	47.4	54.0	6.6
802.11ax	MCS0	11	Peak	2484.3	-29.7	-26.6	68.7	74.0	5.3
		11	Average	2483.5	-50.1	-47.0	48.3	54.0	5.7
802.11ax RU26	MCS0	11	Peak	2487.2	-27.6	-24.5	70.8	74.0	3.2
		11	Average	2489.6	-56.7	-53.6	41.7	54.0	12.3

Band Edge Worst Case Plots

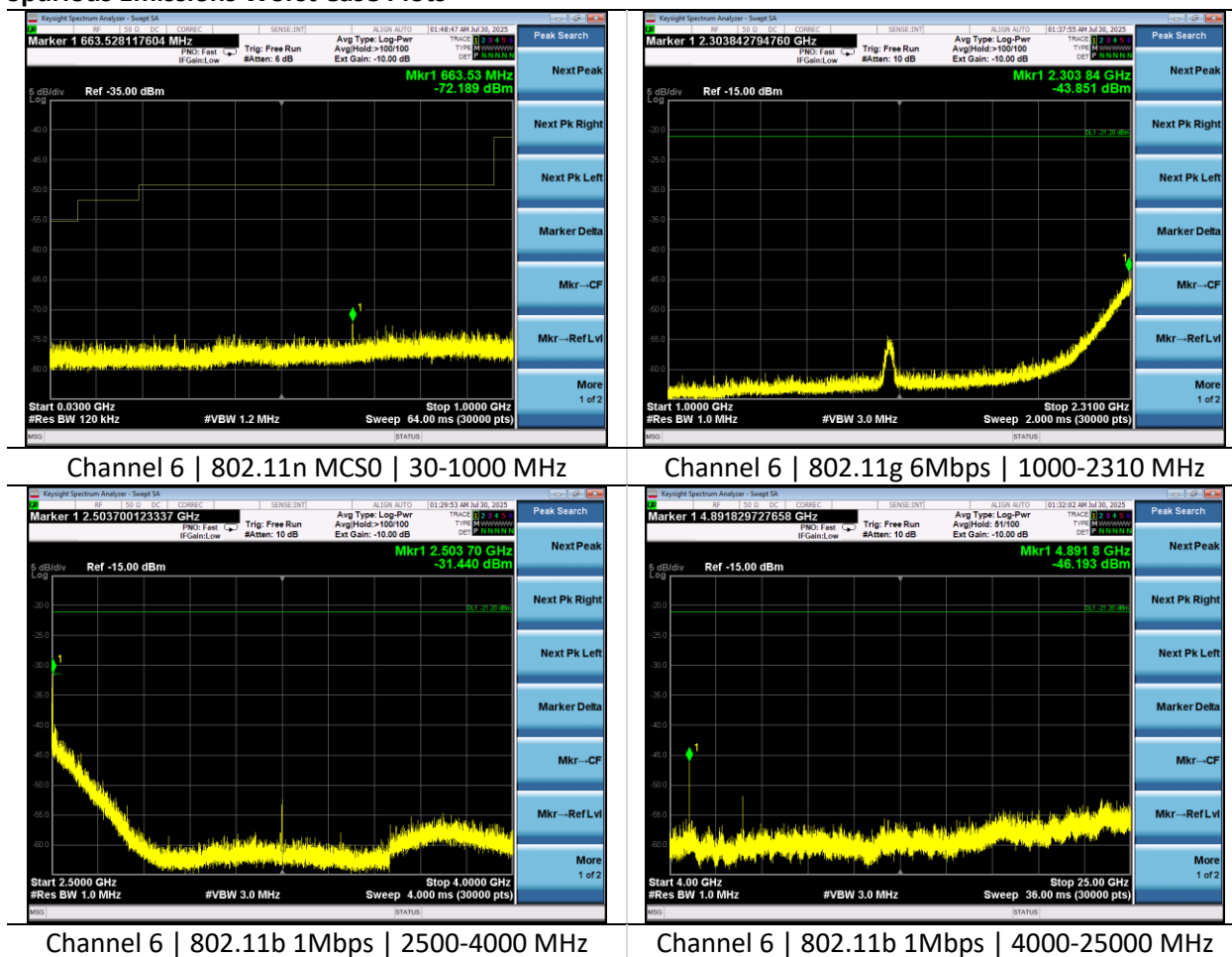




Measurements – Spurious Emissions

Mode	Rate	Channel	Measurement Type	Frequency (MHz)	Measurement (dBm)	EIRP (dBm)	E-Field (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11b	1 Mbps	11	Peak	4808.0	-46.7	-43.6	51.7	74.0	22.3
		11	Average	4807.0	-59.2	-56.1	39.2	54.0	14.8
802.11b	1 Mbps	11	Peak	4907.4	-46.7	-43.6	51.7	74.0	22.3
		11	Average	4907.0	-61.6	-58.5	36.8	54.0	17.2
802.11b	1 Mbps	6	Peak	4891.6	-45.5	-42.4	52.9	74.0	21.1
		6	Average	4891.0	-54.9	-51.8	43.5	54.0	10.5
802.11ax RU26	MCS0	6	Peak	4856.6	-46.5	-43.4	51.9	74.0	22.1
		6	Average	4856.9	-57.1	-54.0	41.3	54.0	12.7

Spurious Emissions Worst Case Plots



5.1.6 Frequency Stability

Operator	Dylan Rosenfeldt	QA	Anthony Smith
Temperature	21.3°C	R.H. %	29.50%
Test Date	3/31/2025	Location	RF Conducted Bench
Requirement	2.1055(d) RSS-GEN Clause 6.11	Method	ANSI C63.10 6.8

Test Parameters

Frequency	2412-2462 MHz	Voltage	4.3 VDC, 5 VDC, and 5.8 VDC
Detector(s)	Peak	Settings	Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
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

Table

Channel	Voltage (VDC)	Center Frequency (Hz)	Deviation (Hz)
1	5.0	2411976497	520
	4.3	2411975977	
	5.8	2411976352	
6	5.0	2436972905	1935
	4.3	2436974244	
	5.8	2436972309	
11	5.0	2461977188	2191
	4.3	2461976365	
	5.8	2461978556	

5.2 Radiated Emissions

Description of Measurement	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. 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. 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.
Example Calculations	Measurement (dBμV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBμV/m) Margin (dB) = Limit (dBμV/m) - Corrected Reading (dBμV/m) 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

Block Diagram



5.2.1 Radiated Emissions

Operator	Dylan Rosenfeldt, Anthony Smith	QA	Anthony Smith, Mitchell Freund
Temperature	18.6°C, 21.5°C	R.H. %	61.90%, 71.50%
Test Date	6/24/2025, 7/8/2025	Location	RF Conducted Bench
Requirement	15.247 (d) 15.209 RSS-247 Clause 5.5 RSS-GEN Clause 8.10	Method	ANSI C63.10 11.12

15.209 Limits:

Frequency (MHz)	Quasi-Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-40000	-	54.0	74.0

Test Parameters

Frequency	30-25000 MHz	Distance	3 m
Detector(s)	Peak Trace Peak and Average Final	Table height	150 cm
RBW	<1000 MHz – 120 kHz >1000 MHz – 1 MHz	VBW	<1000 – 1.2 MHz >1000 MHz – 3MHz See 2.9

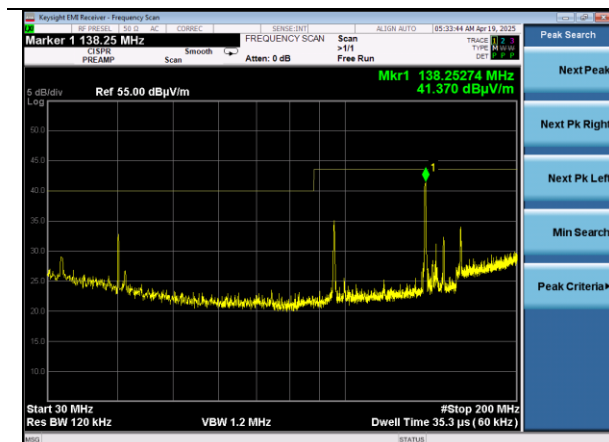
Instrumentation

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 960209	Antenna - Low Noise Amplifier	Mini-Circuits	ZVA-213X-S+	037101808	11/19/2024	11/19/2025	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	1/24/2025	1/24/2026	Active Verification
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/9/2025	4/9/2026	Active Calibration
EE 960203	Analyzer - EMI Receiver	Keysight	N9038A	MY56400072	4/10/2025	4/10/2026	Active Calibration
AA 960220	Cable	A.H. Systems, Inc.	SAC-26G-6	552	1/28/2025	1/28/2026	Active Verification
AA 960174	Antenna - Small Horn	ETS Lindgren	3116C-PA	00206880	12/2/2024	12/2/2025	Active Calibration
AA 960150	Antenna - Biconical	ETS Lindgren	3110B	0003-3346	12/9/2024	12/9/2025	Active Calibration
AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	12/11/2024	12/11/2025	Active Calibration
AA 960153	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-04	4/10/2025	4/10/2026	Active Calibration

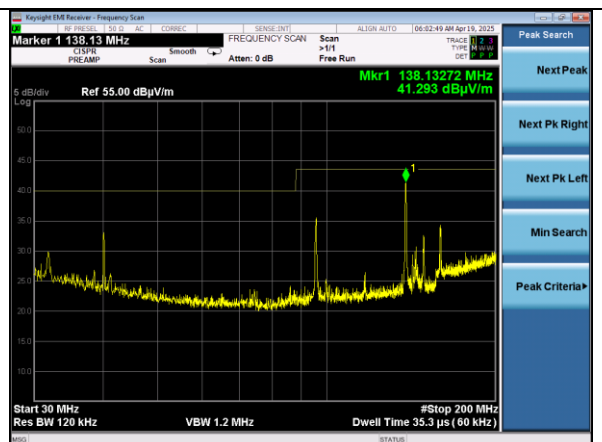
EUT Parameters

Input Power	5VDC	Mode	WLAN Tx
Frequency	2412-2462 MHz	Channel	See 2.8
Note	Antenna port terminated with a 50Ω load		

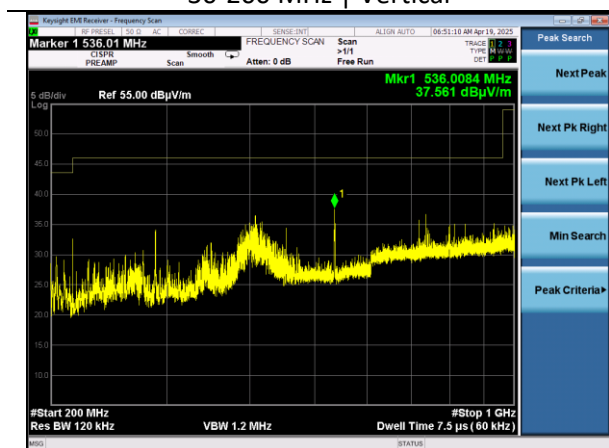
Spurious Emissions <1GHz Worst Case Plots



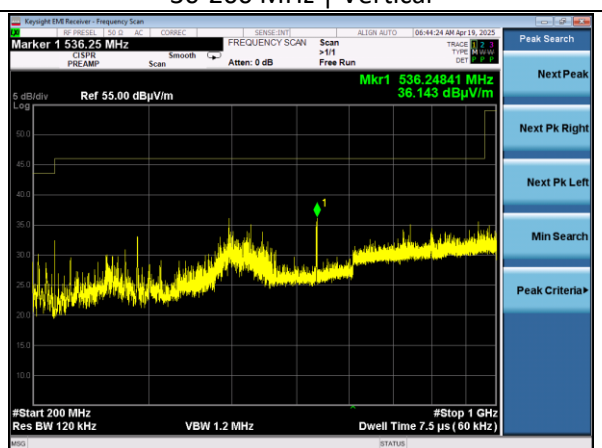
802.11b | Channel 1 | 1 Mbps |
30-200 MHz | Vertical



802.11b | Channel 11 | 1 Mbps |
30-200 MHz | Vertical



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



802.11b | Channel 6 | 1 Mbps |
200-1000 MHz | Vertical

Emissions below 1GHz are not a function of the transmitter

Radiated Spurious Measurements – >1GHz

Measurements – Lower Band Edge

Mode/Rate	Orientation	Polarity	Channel	Measurement Type	Frequency (MHz)	Measurement (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11b	Z	V	1	Peak	2388.3	51.3	74.0	22.7
1Mbps	Z	V	1	Average	2385.4	38.8	54.0	15.2
802.11g	Z	V	1	Peak	2388.7	64.5	74.0	9.5
6Mbps	Z	V	1	Average	2390.0	45.0	54.0	9.0
802.11n	Z	V	1	Peak	2389.2	63.7	74.0	10.3
MCS0	Z	V	1	Average	2390.0	46.0	54.0	8.0
802.11ax	Z	V	1	Peak	2389.8	63.2	74.0	10.8
MCS0	Z	V	1	Average	2390.0	43.8	54.0	10.2
802.11ax	Z	V	1	Peak	2384.4	64.0	74.0	10.0
RU26 MCS0	Z	V	1	Average	2384.2	37.8	54.0	16.2

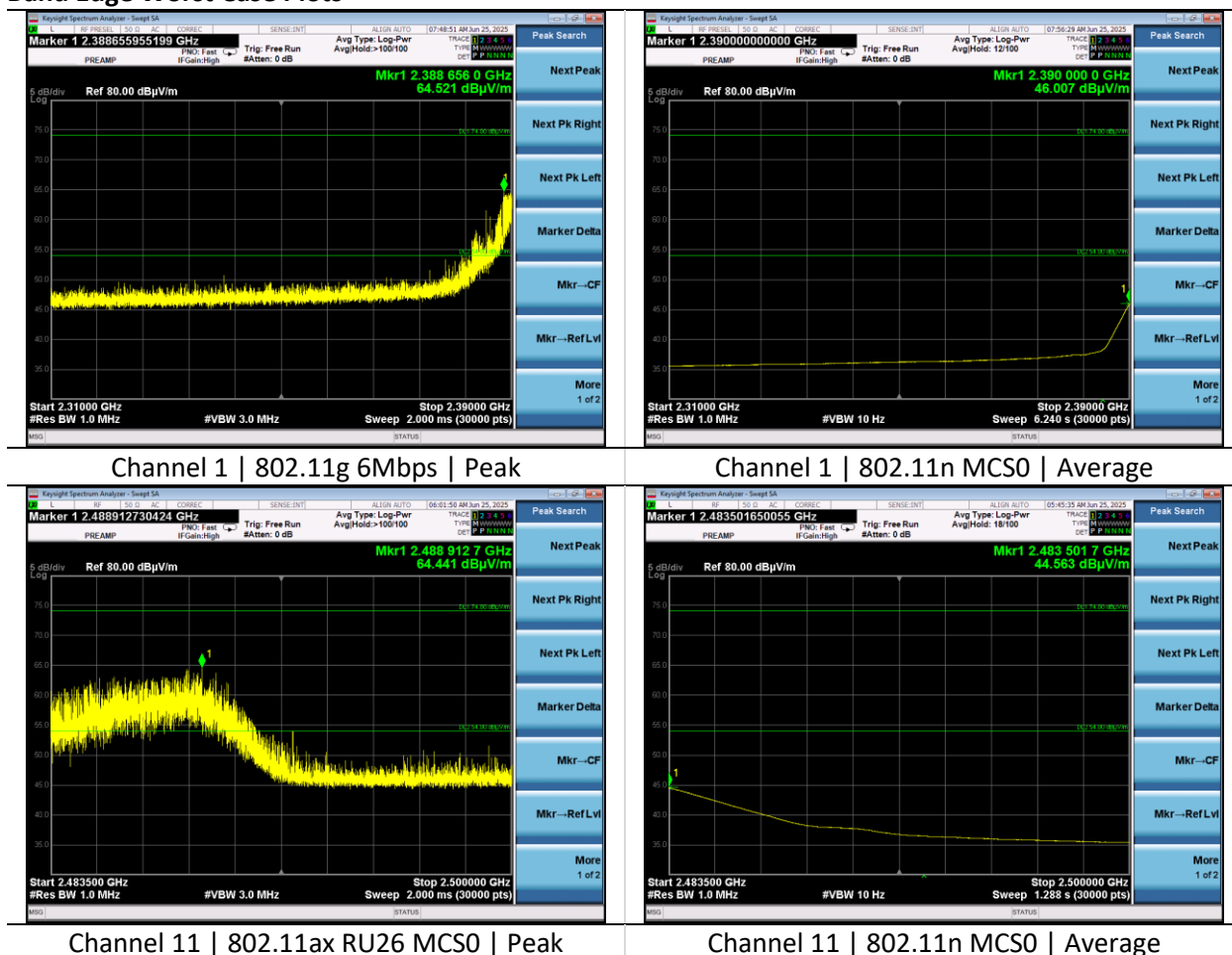
Measurements – Upper Band Edge

Mode/Rate	Orientation	Polarity	Channel	Measurement Type	Frequency (MHz)	Measurement (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11b	X	H	11	Peak	2488.1	49.8	74.0	24.2
1Mbps	X	H	11	Average	2488.6	36.0	54.0	18.0
802.11g	X	H	11	Peak	2483.8	63.1	74.0	10.9
6Mbps	X	H	11	Average	2483.5	44.5	54.0	9.5
802.11n	X	H	11	Peak	2483.9	60.9	74.0	13.1
MCS0	X	H	11	Average	2483.5	44.6	54.0	9.4
802.11ax	X	H	11	Peak	2483.8	62.9	74.0	11.1
MCS0	X	H	11	Average	2483.5	42.4	54.0	11.6
802.11ax	X	H	11	Peak	2488.9	64.4	74.0	9.6
RU26 MCS0	X	H	11	Average	2490.0	36.2	54.0	17.8

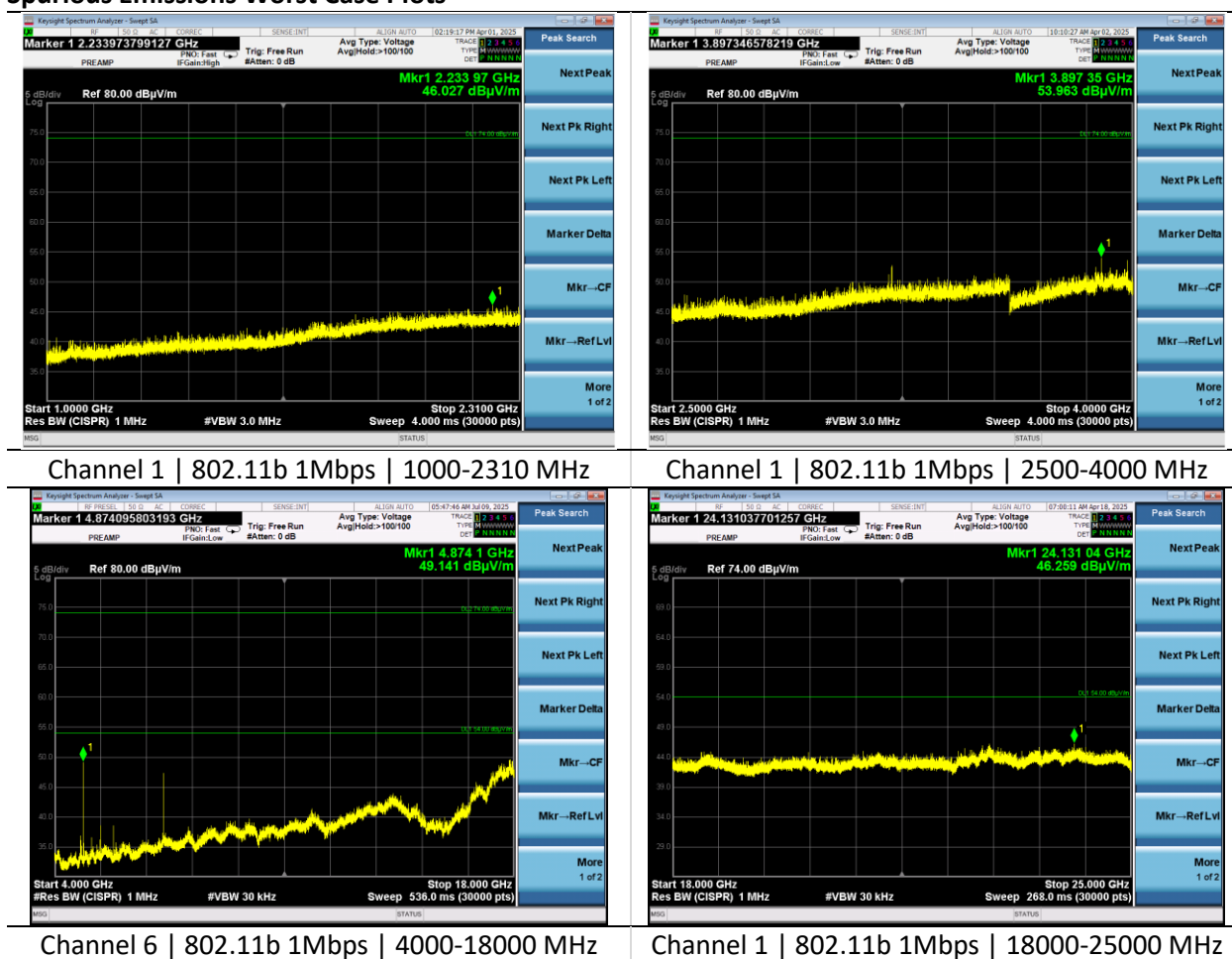
Measurements – Spurious Emissions

Mode/Rate	Orientation	Polarity	Channel	Measurement Type	Frequency (MHz)	Measurement (dBμV/m)	Limit (dBμV/m)	Margin (dB)
802.11b	Z	H	6	Peak	4874.0	51.8	74.0	22.2
1Mbps	Z	H	6	Average	4874.0	49.8	54.0	4.2
802.11b	Z	H	6	Peak	7309.9	53.5	74.0	20.5
1Mbps	Z	H	6	Average	7310.1	49.8	54.0	4.2
802.11b	Z	V	6	Peak	4873.9	50.3	74.0	23.7
1Mbps	Z	V	6	Average	4873.9	47.8	54.0	6.2
802.11b	Z	V	6	Peak	7310.1	52.4	74.0	21.6
1Mbps	Z	V	6	Average	7310.1	48.4	54.0	5.6
802.11b	Y	H	6	Peak	4873.8	49.4	74.0	24.6
1Mbps	Y	H	6	Average	4874.0	46.1	54.0	7.9
802.11b	Y	H	6	Peak	7309.8	51.2	74.0	22.8
1Mbps	Y	H	6	Average	7310.1	46.7	54.0	7.3
802.11b	Y	V	6	Peak	4874.0	51.5	74.0	22.5
1Mbps	Y	V	6	Average	4874.0	48.9	54.0	5.1
802.11b	Y	V	6	Peak	7311.8	51.1	74.0	22.9
1Mbps	Y	V	6	Average	7310.1	46.6	54.0	7.4
802.11b	X	H	6	Peak	4873.9	50.6	74.0	23.4
1Mbps	X	H	6	Average	4874.0	47.7	54.0	6.3
802.11b	X	H	6	Peak	7310.3	51.7	74.0	22.3
1Mbps	X	H	6	Average	7310.1	47.0	54.0	7.0
802.11b	X	V	6	Peak	4873.9	52.8	74.0	21.2
1Mbps	X	V	6	Average	4874.0	50.7	54.0	3.3
802.11b	X	V	6	Peak	7309.9	52.1	74.0	21.9
1Mbps	X	V	6	Average	7310.1	47.9	54.0	6.1

Band Edge Worst Case Plots



Spurious Emissions Worst Case Plots

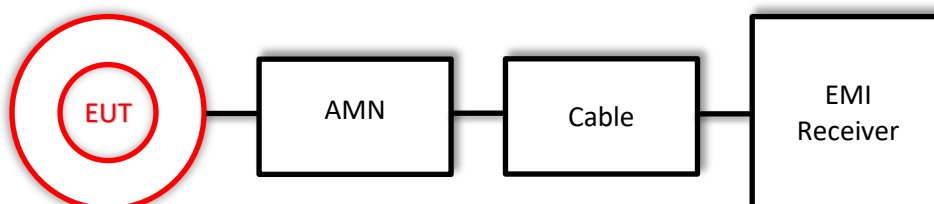


5.3 AC Mains Conducted Emissions

Description of Measurement	A line impedance stabilization network (LISN) or artificial mains network (AMN) allows the emissions of the power supply conductors to be measured while isolating the EUT from the supply mains. The AMN, cable, and other necessary measurement system correction factors are loaded onto the EMI receiver when the measurements are performed. The data is gathered and reported as the corrected values. Maximum emissions are determined with a peak max hold trace then measurements at a selection of the highest points are made with quasi-peak and average detectors. Results are recorded and compared to limit for each line. (e.g. line and neutral)
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Example Calculations	$\text{Measurement (dB}\mu\text{V)} + \text{Cable factor (dB)} + \text{Other (dB)} = \text{Corrected Reading (dB}\mu\text{V)}$ $\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Corrected Reading (dB}\mu\text{V)}$
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Block Diagram



5.3.1 AC Mains Conducted Emissions

Operator	Mitchell Freund	QA	Dylan Rosenfeldt
Temperature	21.6°C	R.H. %	31.0%
Test Date	4/2/2025	Location	AC Conducted Bench
Requirement	15.207 RSS-GEN 8.8	Method	ANSI C63.10

15.207 Limits:

Frequency (MHz)	Quasi-Peak Limit (dBμV)	Average Limit (dBμV)
0.15-0.5	66.0-56.0*	56.0-46.0*
0.5-5	56.0	46.0
5-30	60.0	50.0

*Decreases with the logarithm of the frequency

Test Parameters

Frequency	0.15-30 MHz	Distance	40 cm from wall 80 cm from LISN
Detector(s)	Peak Trace Quasi-Peak, Average Final	Table height	80 cm
RBW	9 kHz	VBW	62 kHz
Notes	Channel has no effect on emission		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960088	Analyzer - EMI Receiver	Agilent	N9038A	MY51210138	4/10/2025	4/10/2026	Active Calibration
EE 960089	LISN	COM-POWER	LI-215A	191943	4/8/2024	4/8/2025	Active Calibration
LSC-203	Cable	Micro-Coax	UFB311A-0- 1440- 70U70U	64639 224071-005	1/29/2025	1/29/2026	Active Verification

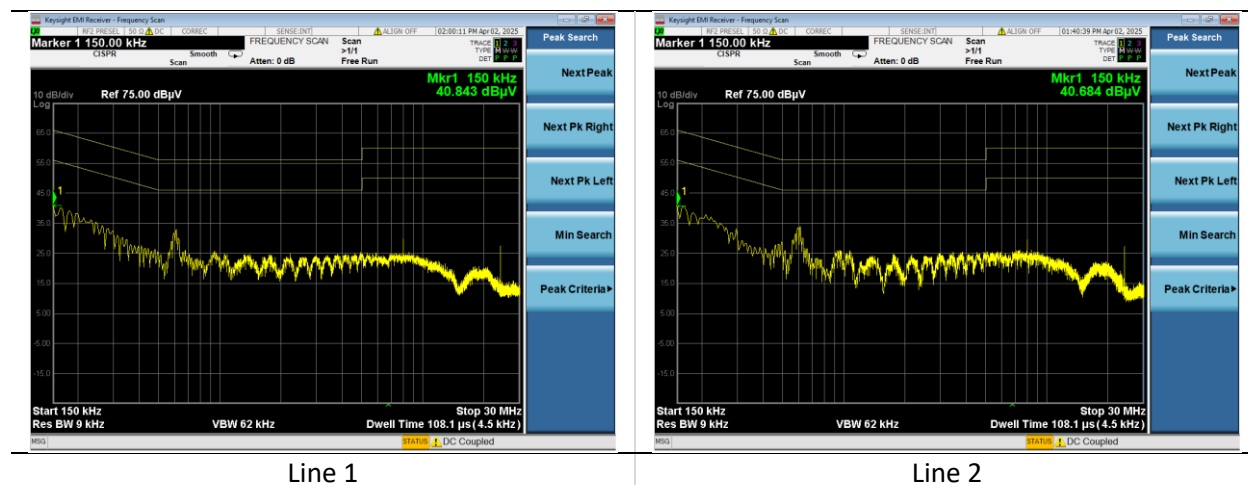
EUT Parameters

Input Power	5VDC via Power adapter	Mode	2.4 GHz WLAN Tx Channel 6
Note	Antenna port terminated with a 50Ω load		

Table

Line	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Average Limit (dBμV)	Average Margin (dB)	Quasi-Peak Reading (dBμV)	Quasi-Peak Limit (dBμV)	Quasi-Peak Margin (dB)
L2	0.150	40.9	9.5	56.0	46.5	16.4	66.0	49.6
L2	0.609	34.9	-3.4	46.0	49.4	3.6	56.0	52.4
L2	24.0	27.5	-9.3	50.0	59.3	-2.5	60.0	62.5
L1	0.150	40.8	16.3	56.0	39.7	9.4	66.0	56.6
L1	0.609	32.6	-3.4	46.0	49.4	3.5	56.0	52.5
L1	24.0	28.1	-9.9	50.0	59.9	-3.0	60.0	63.0

Plots



6 REVISION HISTORY

Version	Date	Notes	Person
0	4/28/2025	Initial Draft	Dylan Rosenfeldt
1	4/30/2025	Final Draft	Dylan Rosenfeldt
2	8/6/2025	Updated Power Settings	Dylan Rosenfeldt
3	8/6/2025	Final Draft	Dylan Rosenfeldt

END OF REPORT