UNIFIED COMPLIANCE LABORATORY

427 West 12800 South
Draper, UT 84020

Test Report

Certification

FCC ID	SWX-UDR7
ISED ID	6545A-UDR7
Equipment Under Test	UDR7
Test Report Serial Number	TR9450_01
Date of Test(s)	10 – 13, 16 – 19 September and 22 October 2024
Report Issue Date	28 October 2024

Test Specification	Applicant
47 CFR FCC Part 15, Subpart E	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.

NVLAP TESTING ilac-MRA

NVLAP LAB CODE 600241-0

Certification of Engineering Report

This report has been prepared by Unified Compliance Laboratory (UCL) to document compliance of the device described below with the requirement of Federal Communication Commissions (FCC) Part 15, Subpart E. This report may be reproduced in full. Partial reproduction of this report may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested.

Applicant	Ubiquiti Inc.
Manufacturer	Ubiquiti Inc.
Brand Name	UBIQUITI
Model Number	UDR7
FCC ID	SWX-UDR7
ISED ID	6545A-UDR7

On this 28th day of October 2024, I individually and for Unified Compliance Laboratory certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge and are made in good faith.

Although NVLAP has accredited the Unified Compliance Laboratory testing facilities, this report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. federal government.

Unified Compliance Laboratory

Written By: Joseph W. Jackson

Reviewed By: Richard L. Winter

Revision History		
Revision	**Description**	**Date**
01	Original Report Release	28 October 2024

Table of Contents

1 Client Information

1.1 Applicant

Company	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
Contact Name	Alex Macon
Title	Compliance

1.2 Manufacturer

Company	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
Contact Name	Alex Macon
Title	Compliance

2 Equipment Under Test (EUT)

2.1 Identification of EUT

Brand Name	UBIQUITI
Model Number	UDR7
Serial Number	168
Dimensions (cm)	11.0 x 11.0 x 18.4

2.2 Description of EUT

The UDR7 is a UniFi Desk Gateway with integrated WiFi 7 and PoE switching. The UDR7 has one 10 GbE SFP port and 4 RJ45 PoE ports. The UDR7 transmits in the 2.4 GHz, 5 GHz and 6 GHz frequency bands using internal integral antennas. The UDR7 has a Bluetooth transmitter for system management. The UDR7 is powered from 110 – 240 Volts AC Mains.

Band	WiFi Mode	Modulation Bandwidth	Modulation Type	Frequency (MHz)
UNII-1	a	20 MHz	OFDM	5180, 5200, 5210, 5240
	ax	20 MHz	HE	5180, 5200, 5210, 5240
	ax	40 MHz	HE	5190, 5230
	ax	80 MHz	HE	5210

This report covers the circuitry of the device subject to FCC Part 15, Subpart E. The circuitry of the device subject to FCC Part 15 Subpart B was found to be compliant and is covered under a separate Unified Compliance Laboratory test report.

2.3 EUT and Support Equipment

The EUT and support equipment used during the test are listed below.

Brand Name Model Number Serial Number	Description	Name of Interface Ports / Interface Cables
BN: UBIQUITI MN: UDR7 SN: 168	Desktop Gateway	See Section 2.4
BN: Dell MN: XPS SN: N/A	Laptop Computer	Ethernet/un-shielded Cat 5

Notes: (1) EUT
(2) Interface port connected to EUT (See Section 2.4)

The support equipment listed above was not modified in order to achieve compliance with this standard.

2.4 Interface Ports on EUT

Name of Ports	No. of Ports Fitted to EUT	Cable Description/Length
AC Mains	1	2 conductor power cable to AC mains/200 cm
10 GbE SFP WAN	1	Shielded cat 5E/7m
PoE Input	4	Unshielded Cat 5E/7m

2.5 Operating Environment

Power Supply	120 Volts AC Mains
AC Mains Frequency	60 Hz
Temperature	23.6 – 24.9 °C
Humidity	25.8 – 30.5 %
Barometric Pressure	1013 mBar

2.6 Operating Modes

The UDR7 was tested using test software in order to enable a constant transmission. The measurements within this report are corrected to reference a 100% duty cycle. All emission modes of 802.11 a/ax were investigated. All measurements are reported with the worst-case mode (802.11ax) unless otherwise stated.

2.7 EUT Exercise Software

EUT firmware version 1.0 was used to operate the transmitter using a constant transmit mode.

2.8 Block Diagram of Test Configuration

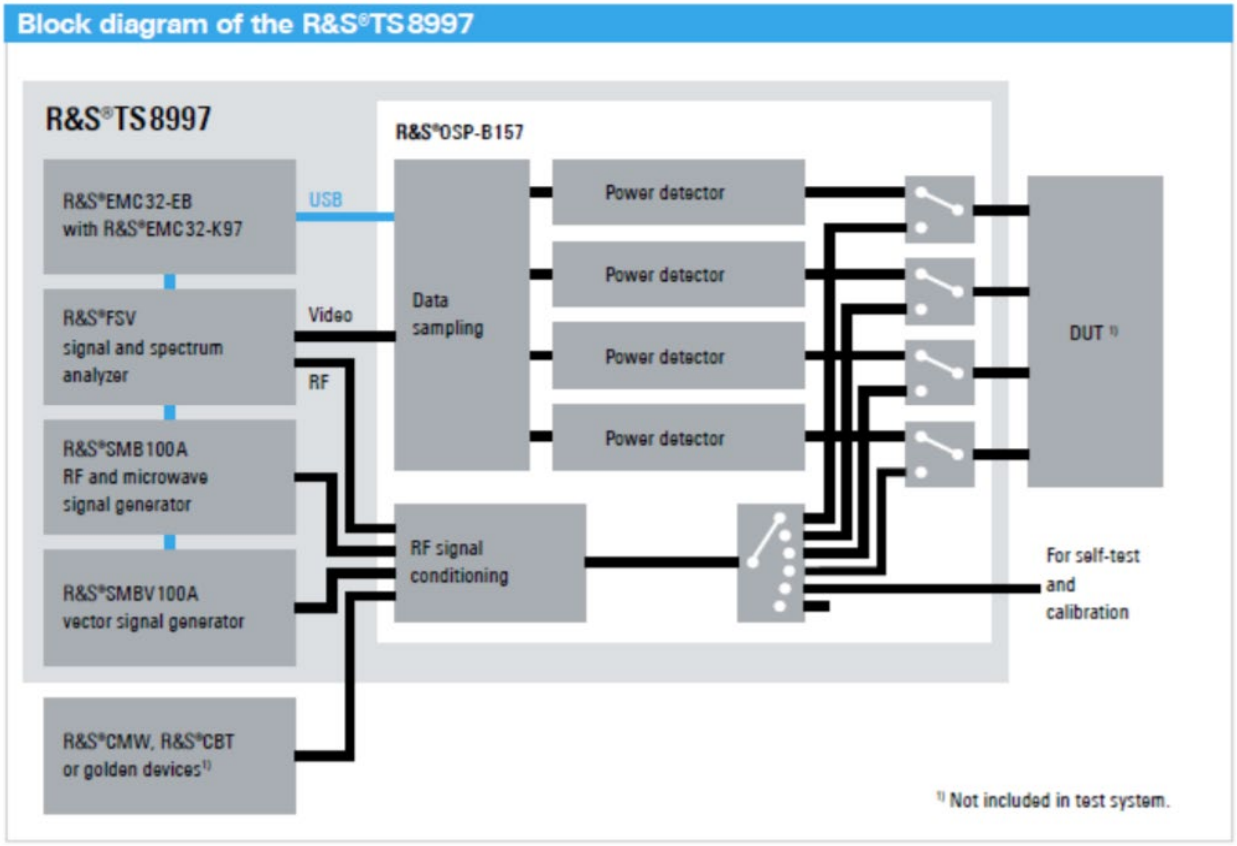


Diagram 1: Test Configuration Block Diagram

2.9 Modification Incorporated/Special Accessories on EUT

There were no modifications made to the EUT during testing to comply with the specification.

2.10 Deviation, Opinions Additional Information or Interpretations from Test Standard

There were no deviations, opinions, additional information or interpretations from the test specification.

3 Test Specification, Method and Procedures

3.1 Test Specification

Title	47 CFR FCC Part 15, Subpart E, Section 15.407 Limits and methods of measurement of radio interference characteristics of Unlicensed National Information Infrastructure Devices
Purpose of Test	The tests were performed to demonstrate initial compliance

3.2 Methods & Procedures

3.2.1 47 CFR FCC Part 15 Section 15.407

See test standard for details.

3.3 FCC Part 15, Subpart E

3.3.1 Summary of Tests

FCC Section	ISED Section	Environmental Phenomena	Frequency Range (MHZ)	Result
15.407(a)	N/A	Antenna requirements	Structural Requirement	Compliant
15.407(b)	RSS-Gen	Conducted Disturbance at Mains Port	0.15 to 30	Compliant
15.407(c)	RSS-247 §6.2.2, §6.2.3	Bandwidth Requirement	5180 to 5210	Compliant
15.407(e)	RSS-247 §6.2.2, §6.2.3	Peak Output Power	5180 to 5210	Compliant
15.407(f)	RSS-247 §6.2.2, §6.2.3	Antenna Conducted Spurious Emissions	0.009 to 40000	N/A
15.407(g)	RSS-247 §6.2.2, §6.2.3	Radiated Spurious Emissions	0.009 to 40000	Compliant
15.407(h)	RSS-247 §6.2.2, §6.2.3	Peak Power Spectral Density	5180 to 5210	Compliant
The testing was performed according to the procedures in ANSI C63.10-2013, KDB 789033 and 47 CFR Part 15. Where applicable, KDB 662911 was followed to sum required measurements.				

3.4 Results

In the configuration tested, the EUT complied with the requirements of the specification.

3.5 Test Location

Testing was performed at the Unified Compliance Laboratory 3-Meter and 10-Meter chambers located at 427 West 12800 South, Draper, UT 84020. Unified Compliance Laboratory is accredited by National Voluntary Laboratory Accreditation Program (NVLAP); NVLAP Code 600241-0 which is effective until 30 June 2025. This site has also been registered with Innovations, Science and Economic Development (ISED) department as was accepted under Appendix B, Phase 1 procedures of the APEC Tel MRA for Canadian recognition. ISED No.: 25346, effective until 30 June 2025.

Unified Compliance Laboratory has been assigned Designation Number US5037 by the FCC and Conformity Assessment Number US0223 by ISED.

4 Test Equipment

4.1 Conducted Emissions at Mains Ports

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
EMI Receiver	AFJ	FFT3010	UCL-6754	1/23/2024	2/26/2025
LISN	AFJ	LS16C/10	UCL-2512	7/08/2024	7/08/2025
ISN	Teseq	ISN T800	UCL-2974	7/09/2024	7/09/2025
LISN	AFJ	LS16C\10	UCL-6749	1/29/2024	1/29/2025
AC Power Source	Laplace Instruments	AC1000A	UCL-2857	N/A	N/A
Test Software	UCL	Revision 1	UCL-3107	N/A	N/A

Table 1: List of equipment used for Conducted Emissions Testing at Mains Port

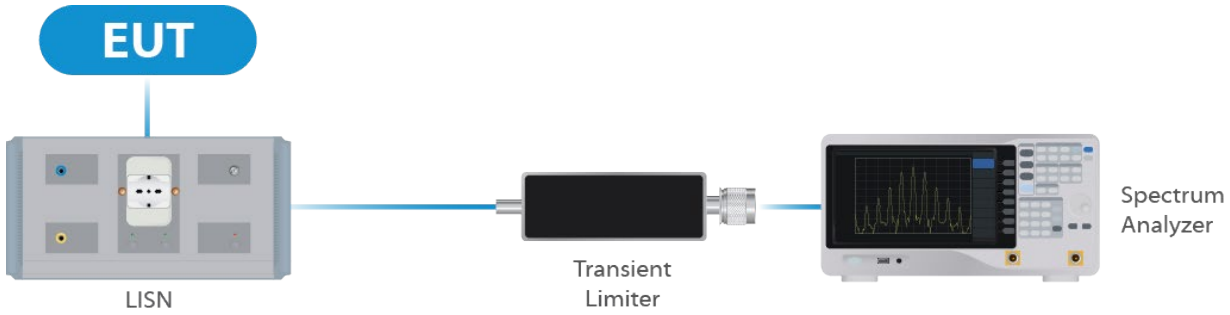


Figure 1: Conducted Emissions Test

4.2 Direct Connect at the Antenna Port Tests

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
Spectrum Analyzer	R&S	FSV40	UCL-2861	11/27/2023	11/27/2024
Signal Generator	R&S	SMB100A	UCL-2864	N/A	N/A
Vector Signal Generator	R&S	SMBV100A	UCL-2873	N/A	N/A
Switch Extension	R&S	OSP-B157WX	UCL-2867	4/12/2024	4/19/2025
Switch Extension	R&S	OSP-150W	UCL-2870	4/12/2024	4/19/2025

Table 2: List of equipment used for Direct Connect at the Antenna Port

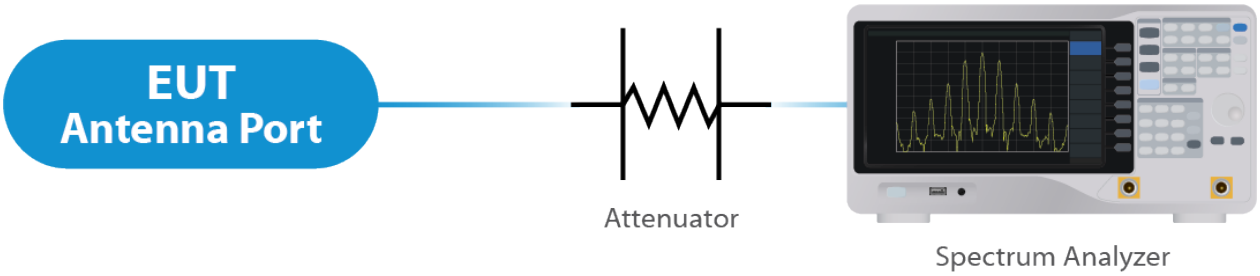


Figure 2: Direct Connect at the Antenna Port Test

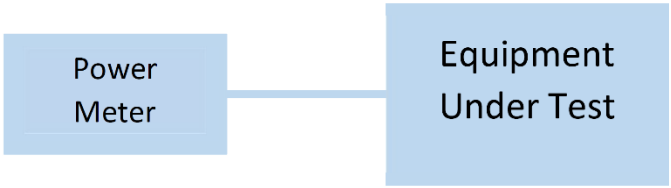


Figure 3: Output Power Measurement

4.3 Radiated Emissions

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
EMI Receiver	Keysight	N9038A	UCL-2778	1/25/2024	1/29/2025
Pre-Amplifier 9 kHz – 1 GHz	Sonoma Instruments	310N	UCL-2889	1/19/2024	1/19/2026
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3062	2/22/2023	2/22/2025
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3071	1/11/2023	1/11/2025
Double Ridge Horn Antenna	Scwarzbeck	BBHA 9120D	UCL-3065	3/10/2023	3/10/2025
Log Periodic	Scwarzbeck	STLP 9129	UCL-3068	1/27/2023	1/27/2025
15 - 40 GHz Horn Antenna	Scwarzbeck	BBHA 9170	UCL-2487	3/10/2023	3/10/2025
1 – 18 GHz Amplifier	Com-Power	PAM 118A	UCL-3833	1/19/2024	1/19/2026
Test Software	UCL	Revision 1	UCL-3108	N/A	N/A

Table 3: List of equipment used for Radiated Emissions

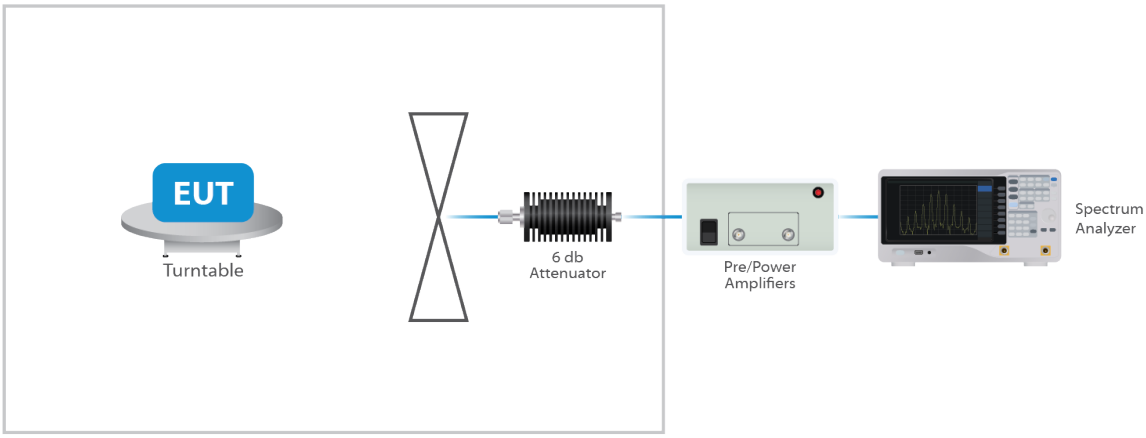


Figure 4: Radiated Emissions Test

4.4 Equipment Calibration

All applicable equipment is calibrated using either an independent calibration laboratory or Unified Compliance Laboratory personnel at intervals defined in ANSI C63.4:2014 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request.

4.5 Measurement Uncertainty

Test	Uncertainty (± dB)	Confidence (%)
Conducted Emissions	1.44	95
Radiated Emissions (9 kHz to 30 MHz)	2.50	95
Radiated Emissions (30 MHz to 1 GHz)	4.38	95
Radiated Emissions (1 GHz to 18 GHz)	4.37	95
Radiated Emissions (18 GHz to 40 GHz)	3.93	95
Direct Connect Tests	**K Factor**	**Value**
Emissions Bandwidth	2	2.0%
Output Power	2	1.0 dB
Peak Power Spectral Density	2	1.3 dB
Band Edge	2	0.8 dB
Transmitter Spurious Emissions	2	1.8 dB

5 Test Results

5.1 §15.203 Antenna Requirements

The EUT uses an internal integral antenna. Per the manufacturer, the Maximum gain of the antenna per chain is 7 dBi. This is an 802.11 device and utilizes CDD as described in KDB 662911 D01. The antenna is not user replaceable. For CDD transmissions, directional gain is calculated as follows.

Array Gain = 10 log(NANT/NSS) dB
NANT = number of transmit antennas and
NSS = number of spatial streams. NSS = 1 considered worst case.

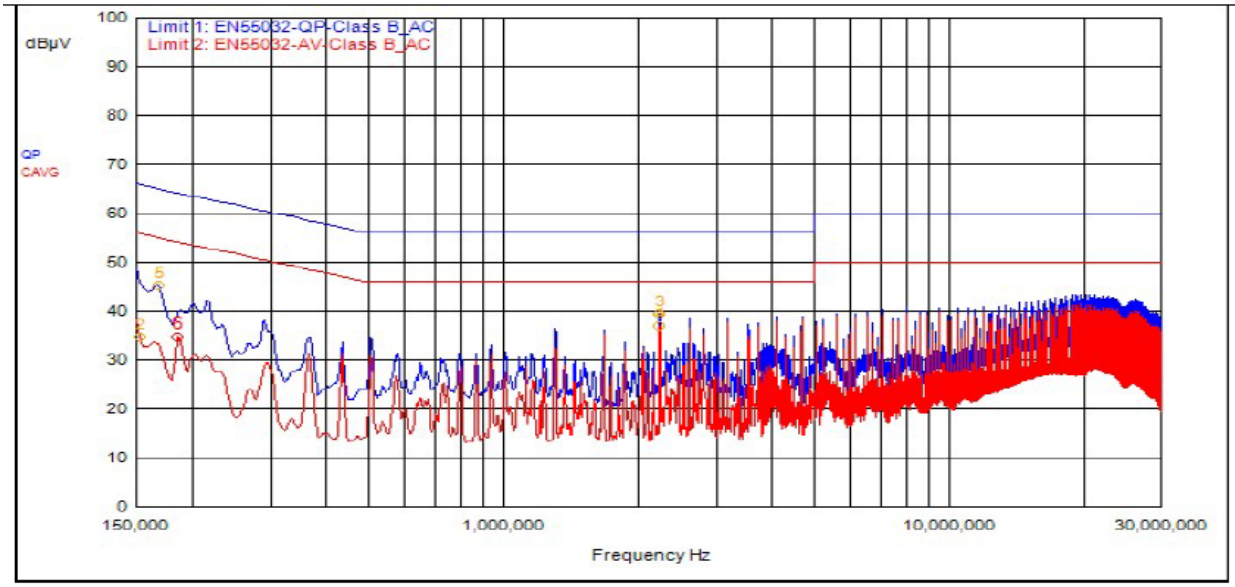
For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for NANT ≤ 4;
For PSD measurements when Nss=1: Array Gain = 10 log(NANT/NSS) dB + Antenna Gain (dBi). Or 3.01 dB + 7 dBi = 10.01 dBi.

Results

The EUT complied with the specification

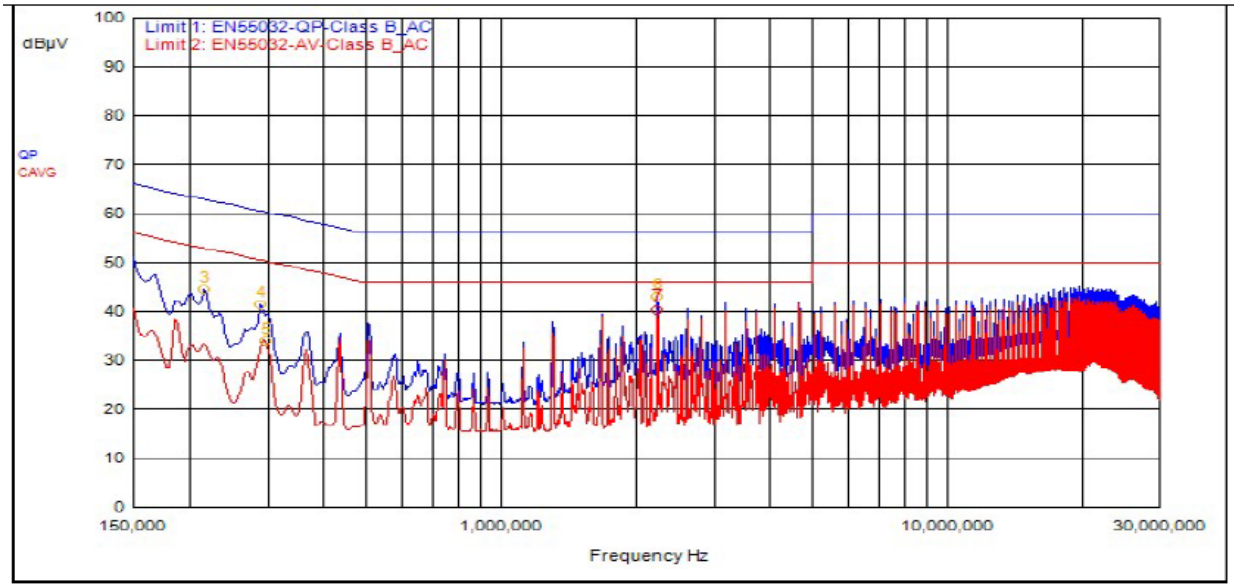
5.2 Conducted Emissions at Mains Ports Data

5.2.1 Line



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.	P/F
MU	MHz	dB	dB	dB	Type	dBµV	dBµV	dBµV	dB	dBµV	dB	P/F
3	2.244	9.59			QPeak	29.98	39.57	56.00	-16.43			
1	150,000kHz	9.49			QPeak	39.46	48.95	66.00	-17.05			
5	168,000kHz	9.49			QPeak	35.88	45.37	65.06	-19.69			
2	153,000kHz	9.49			C_AVG	25.35	34.84			55.84	-21.00	
4	2.244	9.59			C_AVG	27.35	36.94			46.00	-9.06	
6	186,000kHz	9.49			C_AVG	25.10	34.59			54.21	-19.63	

5.2.2 Neutral



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.	P/F
MU	MHz	dB	dB	dB	Type	dBµV	dBµV	dBµV	dB	dBµV	dB	P/F
6	2.244	12.26			QPeak	30.86	43.12	56.00	-12.88			
1	150,000kHz	12.21			QPeak	38.78	50.99	66.00	-15.01			
3	216,000kHz	12.29			QPeak	32.16	44.45	62.97	-18.52			
4	288,000kHz	12.38			QPeak	28.93	41.31	60.58	-19.28			
2	150,000kHz	12.21			C_AVG	28.44	40.65			56.00	-15.35	
5	297,000kHz	12.40			C_AVG	21.47	33.87			50.33	-16.45	
7	2.244	12.26			C_AVG	28.13	40.39			46.00	-5.61	

Result

The EUT complied with the specification limit.

5.3 §15.403(i) 26 dB Emissions Bandwidth

Nominal BW (MHz)	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
OFDM 20 MHz	5180	17.3	22.3
OFDM 20 MHz	5210	26.5	41.8
OFDM 20 MHz	5240	33.5	49.2
HE 20 MHz	5180	19.3	22.4
HE 20 MHz	5210	21.3	45.2
HE 20 MHz	5240	35.2	55.0
HE 40 MHz	5190	38.5	42.8
HE 40 MHz	5230	39.5	70.8
HE 80 MHz	5210	79.0	84.0

Result

All chains were tested and the highest bandwidth per chain is reported above.
The 26 dB bandwidths are reported for information purposes. Please see Annex for all bandwidth measurements.

5.4 §15.407(a)(2) Maximum Average Output Power

All chains were measured and summed under the guidance of KDB 789033 Section II. E.2. and KDB 662911 D01. Please see associated annex for details on instrument settings.
The maximum average RF conducted output power measured for this device was 26.73 dBm or 470.98 mW. The limit is 30 dBm, or 1 Watt when using an antenna with 6 dBi (indoor access point) or less gain. The antenna has a gain of 7 dBi. The adjusted conducted output power is 29 dBm.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
OFDM 20	5180	Mcs0-Nss2	22	22.53	29.53	10.43
OFDM 20	5210	Mcs0-Nss2	26	26.25	33.25	14.21
OFDM 20	5240	Mcs0-Nss2	30	26.68	33.68	14.42
HE 20	5180	Mcs0-Nss2	22	22.58	29.58	9.98
HE 20	5210	Mcs0-Nss2	25	25.44	32.44	12.87
HE 20	5240	Mcs0-Nss2	30	26.73	33.73	13.87
HE 40	5190	Mcs0-Nss2	20	20.63	27.63	5.17
HE 40	5230	Mcs0-Nss2	23	24.24	31.24	8.55
HE 80	5210	Mcs0-Nss2	20	20.59	27.59	1.99

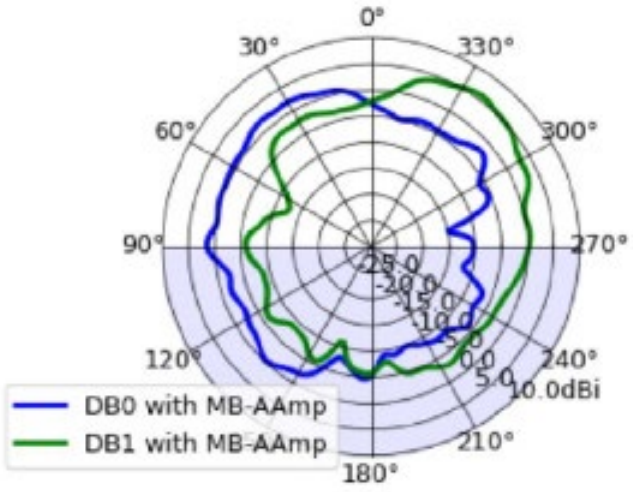
Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
OFDM 20	5180	Mcs0-Nss1	22	22.53	29.53	10.43
OFDM 20	5210	Mcs0-Nss1	24	24.25	31.25	12.21
OFDM 20	5240	Mcs0-Nss1	28	24.68	31.68	12.42
HE 20	5180	Mcs0-Nss1	22	22.58	29.58	9.98
HE 20	5210	Mcs0-Nss1	25	25.44	32.44	12.87
HE 20	5240	Mcs0-Nss1	29	25.73	32.73	12.87
HE 40	5190	Mcs0-Nss1	20	20.63	27.63	5.17
HE 40	5230	Mcs0-Nss1	23	24.24	31.24	8.55
HE 80	5210	Mcs0-Nss1	20	20.59	27.59	1.99

5.4.1 CANADA – Indoor Use Only

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
OFDM 20	5180	Mcs0	14	14.64	21.64	2.58
OFDM 20	5210	Mcs0	14	14.99	21.99	2.98
OFDM 20	5240	Mcs0	14	15.13	22.13	2.92
HE 20	5180	Mcs0	14	14.70	21.70	2.09
HE 20	5210	Mcs0	14	15.11	22.11	2.54
HE 20	5240	Mcs0	14	15.19	22.19	2.49
HE 40	5190	Mcs0	15	15.70	22.70	0.31
HE 40	5230	Mcs0	14	15.37	22.37	-0.31
HE 80	5210	Mcs0	15	15.92	22.92	-2.73

Result

In the configuration tested, the maximum summed average RF output power was less than 1 watt; therefore, the EUT compiled with the requirements of the specification (see spectrum analyzer plots in attached Annex).



Plot 1: Elevation Plot Greater Then 30-Degrees From Horizon

5.5 §15.407(b) Spurious Emissions

5.5.1 Conducted Spurious Emissions

The frequency range from the lowest frequency generated or used in the device to the tenth harmonic of the highest fundamental frequency was investigated to measure any antenna-conducted emissions. The graphs show the measurement data from spurious emissions noted across the frequency range when transmitting at the lowest frequency, middle frequency and upper frequency. Shown below are plots with the EUT turned to the upper and lower channels with the antenna gain of 7 dBi accounted for. These demonstrate compliance with the provisions of this section at the band edges.

The emissions must be remain below -27 dBm EIRP.

Result

Conducted spurious emissions were below -27 dBm; therefore, the EUT complies with the specification.

5.5.2 Radiated Spurious Emissions in the Restricted Bands of § 15.205

The EUT uses various power settings based on the channel in use. In order to reduce test time, the radiated spurious emissions at the lowest, middle, and highest channel were measured at the maximum power of TP30, as this setting was found to be worst case for spurious emissions. Power was subsequently reduced during in-band and band edge testing. The band edge at the restricted band ending at 5180 MHz was measured using radiated measurement or conducted at the antenna port methods. All emissions modes were tested, and the worst-case measurement are shown below. For frequencies above 1 GHz, a measurement of 3 meters was used. For frequencies below 1 GHz, a measurement distance of 10 meters was used.

Correction Factor = Antenna Factor + Cable Loss - Pre-Amplifier Gain, and is added to the Receiver reading.

Result

All emissions in the restricted bands of § 15.205 met the limits specified in § 15.209; therefore, the EUT complies with the specification. All emissions me the limits specified in § 15.407(b). Representative band edge plots are included in this report. See Annex for Conducted Band edge plots.

QuasiPeak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
31.28 MHz	36.62	40	-3.38	1	1.13	Vertical	-11.05
44.62 MHz	38.42	40	-1.58	287	1.13	Vertical	-8.07
50.72 MHz	38.38	40	-1.62	7	1.13	Vertical	-8.03
53.55 MHz	35.94	40	-4.06	62	1.13	Vertical	-8.20
96.10 MHz	32.28	40	-7.72	81	1.13	Vertical	-9.60
152.35 MHz	24.69	40	-15.31	360	1.13	Vertical	-12.72
187.05 MHz	23.28	40	-16.73	359	1.13	Vertical	-10.38
338.56 MHz	34.45	47	-12.55	132	1.13	Horizontal	-5.67

Table 4: Radiated Emissions 30 – 1000 MHz

Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.92 GHz	54.89	74	-19.11	356	1.714	Vertical	11.53
14.65 GHz	58.10	74	-15.90	258	2.292	Vertical	14.22
12.59 GHz	52.54	74	-21.46	233	2.292	Horizontal	9.44
15.56 GHz	57.52	74	-16.49	66	2.292	Horizontal	11.25

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.92 GHz	41.64	54	-12.36	356	1.714	Vertical	11.53
14.65 GHz	44.91	54	-9.09	258	2.292	Vertical	14.22
12.59 GHz	39.63	54	-14.37	233	2.292	Horizontal	9.44
15.56 GHz	43.68	54	-10.32	66	2.292	Horizontal	11.25

Table 5: Radiated Emissions 1 – 17 GHz at the Lowest Frequency

Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.42 GHz	52.82	74	-21.18	160	1.714	Vertical	9.28
11.59 GHz	55.10	74	-18.90	356	2.288	Vertical	10.72
14.66 GHz	59.04	74	-14.96	77	2.288	Vertical	14.25
15.64 GHz	58.84	74	-15.16	326	2.292	Vertical	10.59
10.41 GHz	52.88	74	-21.13	154	1.714	Horizontal	9.28
10.94 GHz	53.73	74	-20.27	109	2.871	Horizontal	11.52
11.50 GHz	53.56	74	-20.44	352	2.04	Horizontal	10.78
15.63 GHz	58.83	74	-15.17	77	2.292	Horizontal	10.66

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.42 GHz	39.57	54	-14.43	160	1.714	Vertical	9.28
11.59 GHz	40.86	54	-13.14	356	2.288	Vertical	10.72
14.66 GHz	44.79	54	-9.21	77	2.288	Vertical	14.25
15.64 GHz	45.53	54	-8.47	326	2.292	Vertical	10.59
10.41 GHz	39.66	54	-14.34	154	1.714	Horizontal	9.28
10.94 GHz	40.51	54	-13.49	109	2.871	Horizontal	11.52
11.50 GHz	40.86	54	-13.14	352	2.04	Horizontal	10.78
15.63 GHz	45.94	54	-8.06	77	2.292	Horizontal	10.66

Table 6: Radiated Emissions 1 – 17 GHz at the Middle Frequency

Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.91 GHz	54.43	74	-19.57	62	1.714	Vertical	11.32
15.71 GHz	53.56	74	-20.44	21	2.287	Vertical	10.37
12.38 GHz	52.59	74	-21.41	294	2.866	Horizontal	11.08
14.63 GHz	57.47	74	-16.53	218	2.041	Horizontal	14.19
15.73 GHz	58.06	74	-15.94	37	2.292	Horizontal	10.38

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.91 GHz	41.17	54	-12.83	62	1.714	Vertical	11.32
15.71 GHz	40.63	54	-13.37	21	2.287	Vertical	10.37
12.38 GHz	40.00	54	-14.00	294	2.866	Horizontal	11.08
14.63 GHz	44.52	54	-9.48	218	2.041	Horizontal	14.19
15.73 GHz	43.65	54	-10.35	37	2.292	Horizontal	10.38

Table 7: Radiated Emissions 1 – 17 GHz at the Highest Frequency

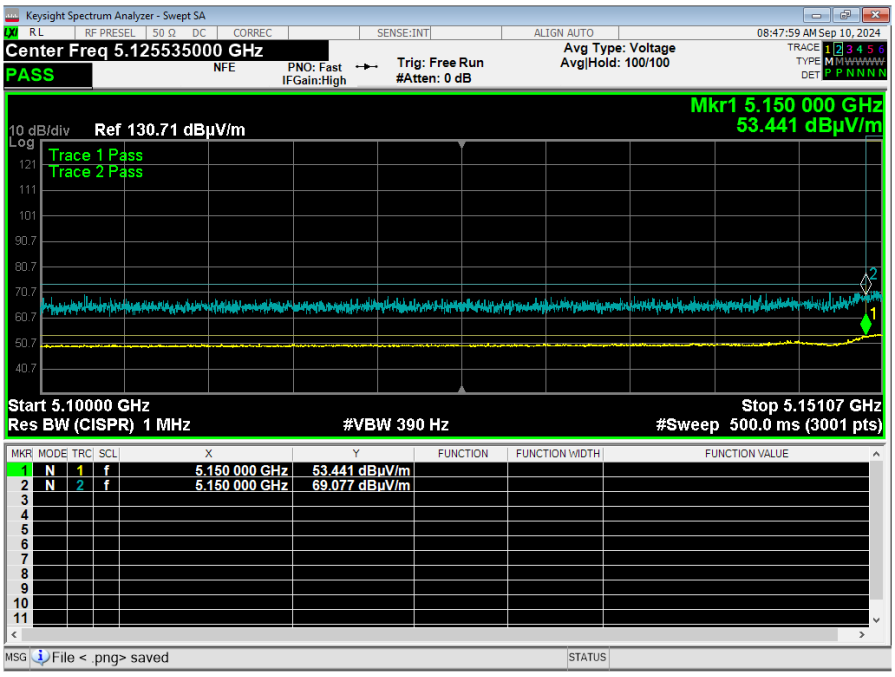
Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
16.64 GHz	51.58	74	-22.42	341	Vertical	1.17
26.76 GHz	53.91	74	-20.09	359	Vertical	3.12
29.72 GHz	52.84	74	-21.16	359	Vertical	1.39
33.48 GHz	55.60	74	-18.40	210	Vertical	4.63
35.00 GHz	57.12	74	-16.88	359	Vertical	6.40
38.92 GHz	56.26	74	-17.74	359	Vertical	4.02
39.53 GHz	56.14	74	-17.86	331	Vertical	4.47
20.72 GHz	55.51	74	-18.49	218	Horizontal	-0.15
27.68 GHz	54.18	74	-19.82	276	Horizontal	3.40
33.80 GHz	56.13	74	-17.87	359	Horizontal	5.30
34.90 GHz	57.15	74	-16.84	359	Horizontal	6.22
36.06 GHz	56.09	74	-17.91	286	Horizontal	5.34
39.52 GHz	56.57	74	-17.43	113	Horizontal	4.59

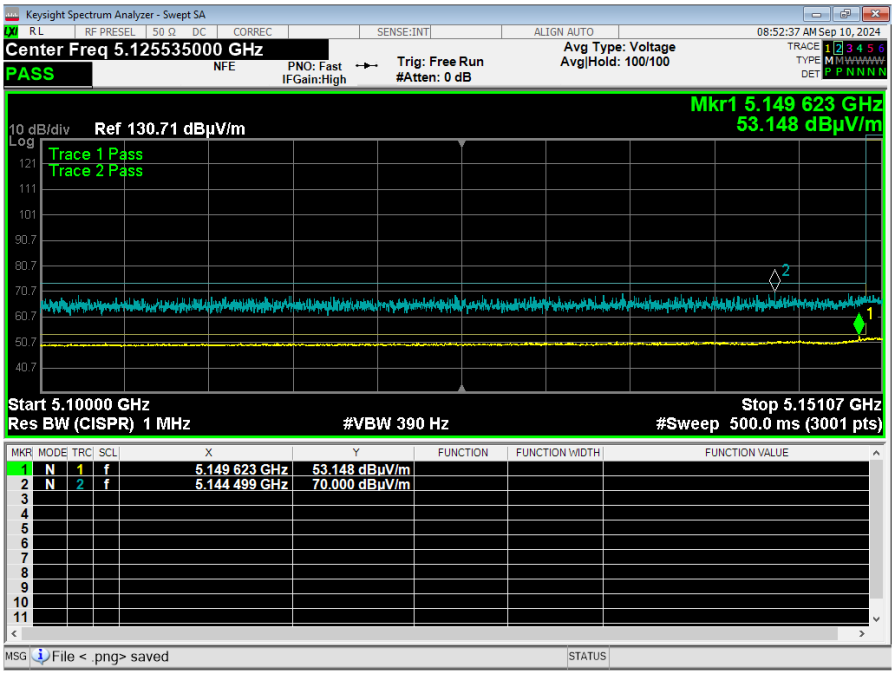
Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
16.64 GHz	38.10	54	-15.90	341	Vertical	1.17
26.76 GHz	39.83	54	-14.17	359	Vertical	3.12
29.72 GHz	39.24	54	-14.76	359	Vertical	1.39
33.48 GHz	42.30	54	-11.70	210	Vertical	4.63
35.00 GHz	44.05	54	-9.95	359	Vertical	6.40
38.92 GHz	42.93	54	-11.07	359	Vertical	4.02
39.53 GHz	43.08	54	-10.92	331	Vertical	4.47
20.72 GHz	41.89	54	-12.11	218	Horizontal	-0.15
27.68 GHz	40.69	54	-13.31	276	Horizontal	3.40
33.80 GHz	42.79	54	-11.21	359	Horizontal	5.30
34.90 GHz	43.65	54	-10.35	359	Horizontal	6.22
36.06 GHz	42.71	54	-11.29	286	Horizontal	5.34
39.52 GHz	43.28	54	-10.72	113	Horizontal	4.59

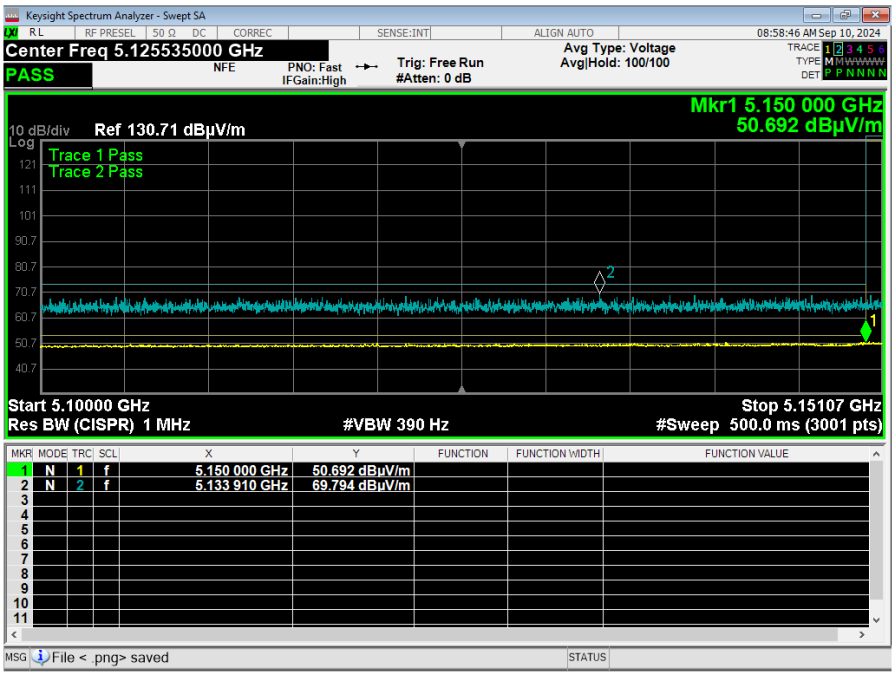
Table 8: Radiated Emissions 17 – 40 GHz at the Lowest Frequency (worse case)



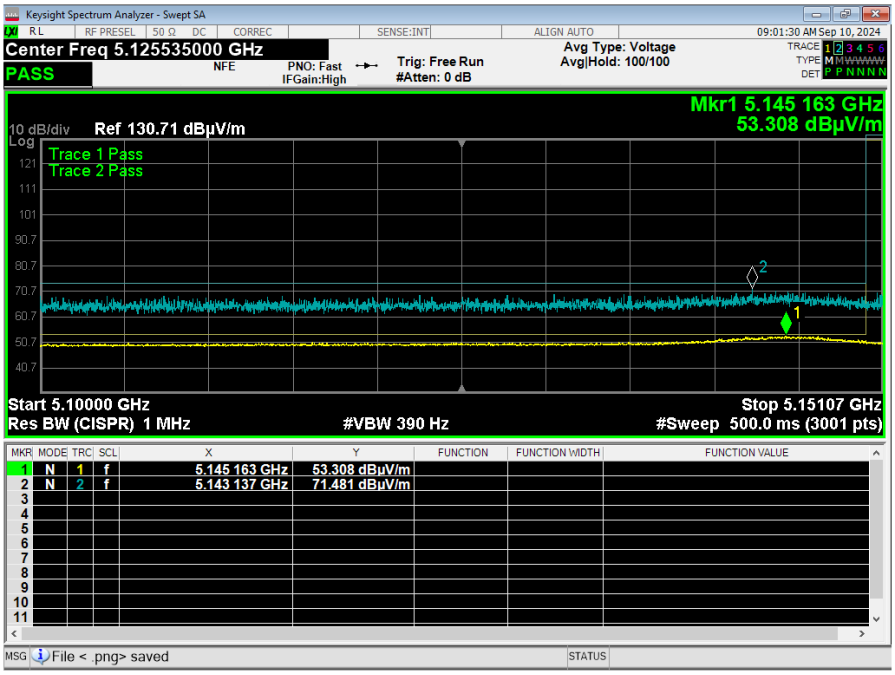
Graph 2: Band Edge Low a Mode 20 MHz



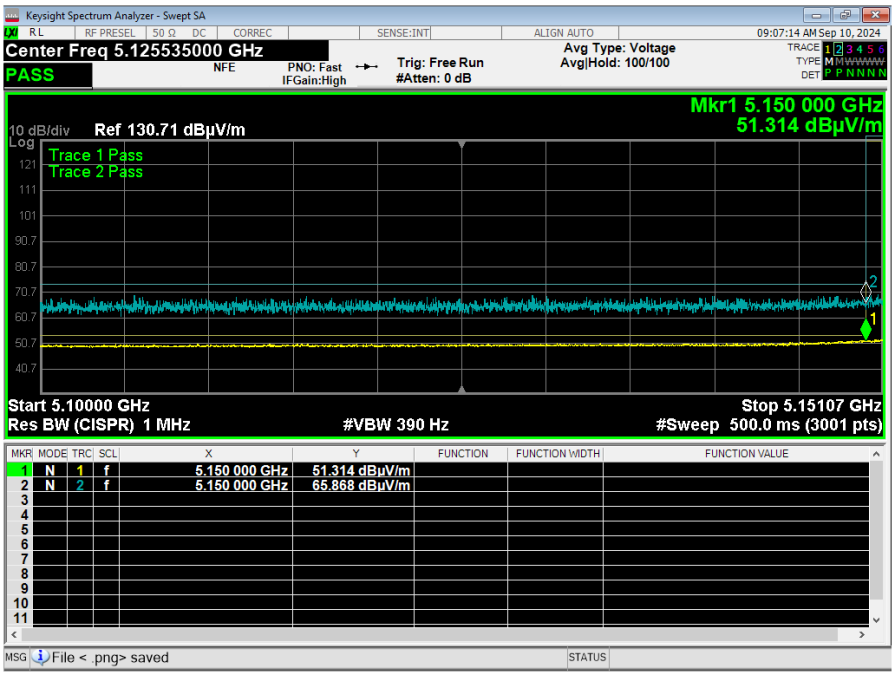
Graph 3: Band Edge Middle a Mode 20 MHz



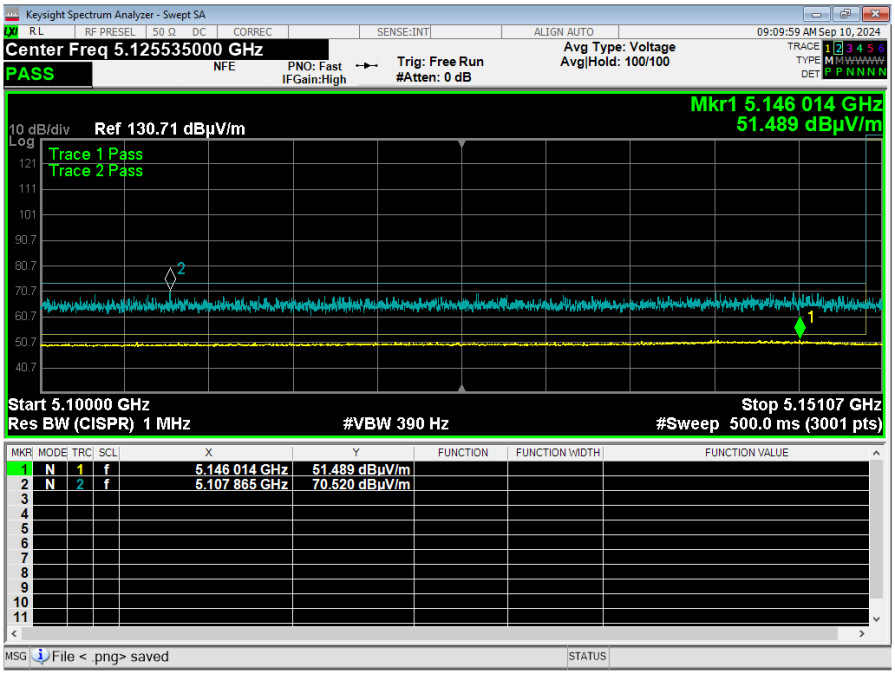
Graph 4: Band Edge High a Mode 20 MHz



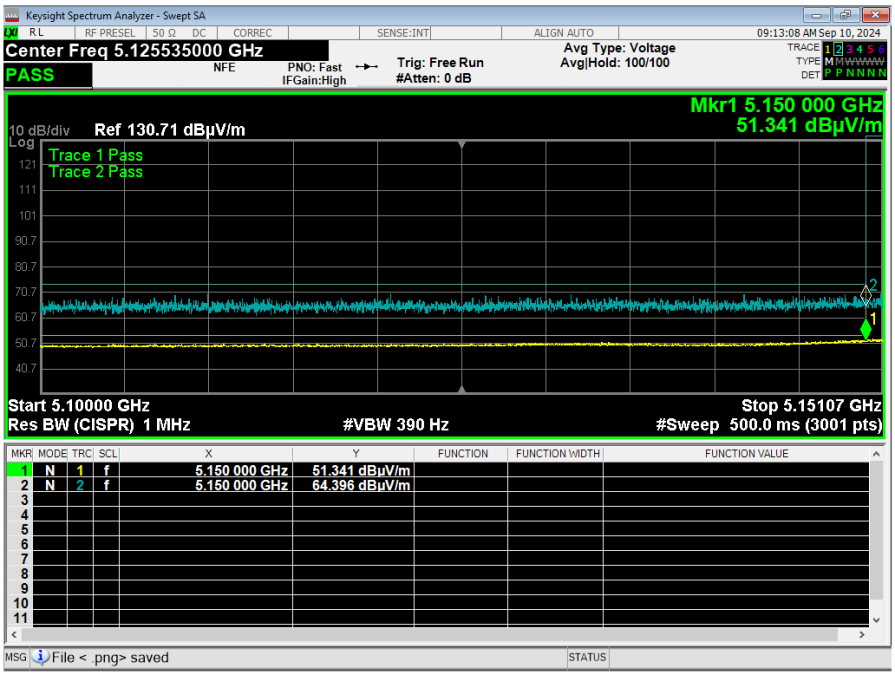
Graph 5: Band Edge Low ax Mode 20 MHz



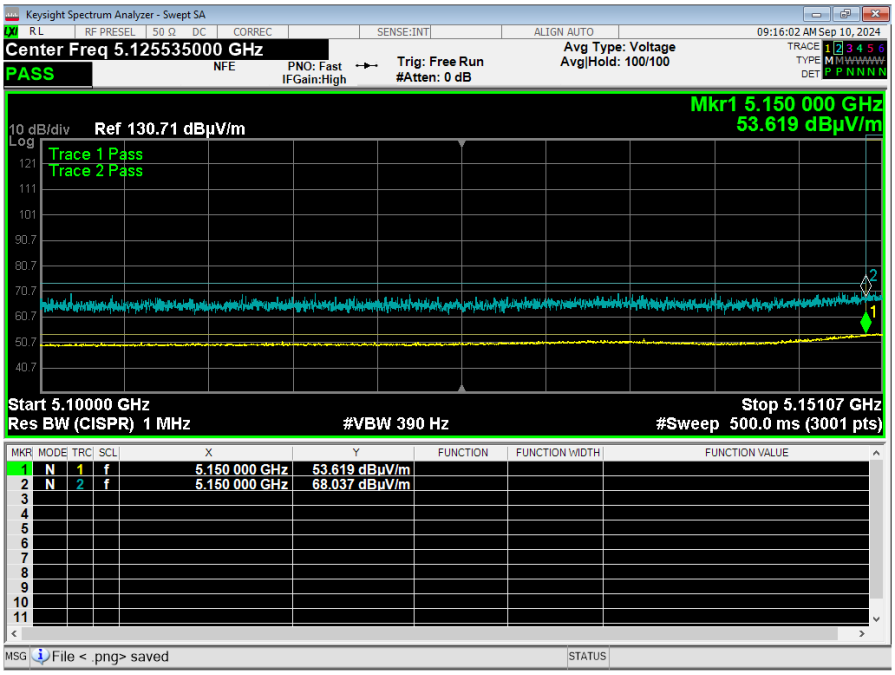
Graph 6: Band Edge Middle ax Mode 20 MHz



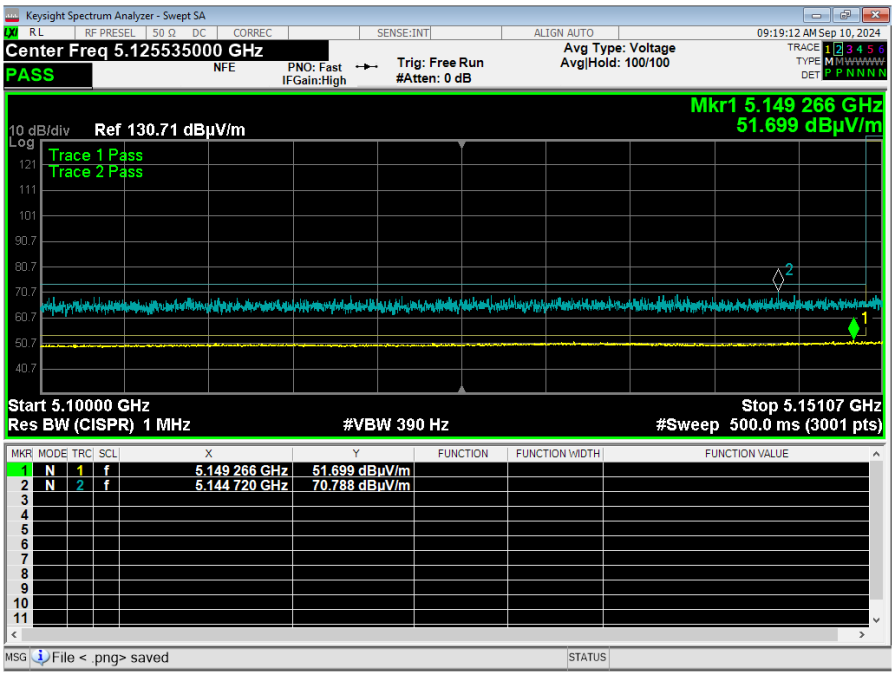
Graph 7: Band Edge High ax Mode 20 MHz



Graph 8: Band Edge Low ax Mode 40 MHz



Graph 9: Band Edge High ax Mode 40 MHz



Graph 10: Band Edge ax Mode 80 MHz

5.6 §15.407(a) Maximum Power Spectral Density

All chains were measured and summed under the guidance of KDB 789033 Section II. F. and KDB 662911 D01. Please see associated annex for details on instrument settings.

The maximum average power spectral density conducted from the intentional radiator of the antenna shall not be greater than 17 dBm in any 1 MHz band during any time interval of continuous transmission.
As per KDB 662911, when the EUT is using spatial-multiplexing in HT to HE modes, there is not additional array gain to accommodate. When the EUT uses Nss=1 data rates, the antenna gain is 7 dBi + Array gain of 3.01 dB which is a total of 10.01 dBi
Results of this testing are summarized.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Measured PSD
OFDM 20	5180	Mcs0_Nss2	22	10.43
OFDM 20	5210	Mcs0_Nss2	26	14.21
OFDM 20	5240	Mcs0_Nss2	30	14.42
HE 20	5180	Mcs0_Nss2	22	9.98
HE 20	5210	Mcs0_Nss2	25	12.87
HE 20	5240	Mcs0_Nss2	30	13.87
HE 40	5190	Mcs0_Nss2	20	5.17
HE 40	5230	Mcs0_Nss2	23	8.55
HE 80	5210	Mcs0_Nss2	20	1.99

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Measured PSD
OFDM 20	5180	Mcs0_Nss1	22	10.43
OFDM 20	5210	Mcs0_Nss1	24	12.21
OFDM 20	5240	Mcs0_Nss1	28	12.42
HE 20	5180	Mcs0_Nss1	22	9.98
HE 20	5210	Mcs0_Nss1	25	12.87
HE 20	5240	Mcs0_Nss1	29	12.87
HE 40	5190	Mcs0_Nss1	20	5.17
HE 40	5230	Mcs0_Nss1	23	8.55
HE 80	5210	Mcs0_Nss1	20	1.99

5.6.1 CANADA – Indoor Use Only

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Measured PSD
OFDM 20	5180	Mcs0_Nss2	14	2.58
OFDM 20	5210	Mcs0_Nss2	14	2.98
OFDM 20	5240	Mcs0_Nss2	14	2.92
HE 20	5180	Mcs0_Nss2	14	2.09
HE 20	5210	Mcs0_Nss2	14	2.54
HE 20	5240	Mcs0_Nss2	14	2.49
HE 40	5190	Mcs0_Nss2	15	0.31
HE 40	5230	Mcs0_Nss2	14	-0.31
HE 80	5210	Mcs0_Nss2	15	-2.73

Result

The maximum summed average power spectral density was less than the limit of 17dBm; therefore, the EUT complies with the specification.

-- End of Test Report --