UNIFIED COMPLIANCE LABORATORY

427 West 12800 South
Draper, UT 84020

Test Report

Certification

FCC ID	SWX-E7CP
ISED ID	6545A-E7CP
Equipment Under Test	E7-Campus
Test Report Serial Number	TR9076_02
Date of Test(s)	8, 17, 22 – 23 and 28 May 2024
Report Issue Date	17 December 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.

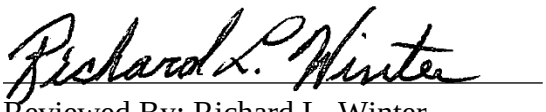
Applicant	Ubiquiti Inc.
Manufacturer	Ubiquiti Inc.
Brand Name	UBIQUITI
Model Number	E7-Campus
FCC ID	SWX-E7CP
ISED ID	6545A-E7CP

On this 17th day of December 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: Clay Allred



Reviewed By: Richard L. Winter

Revision History		
Revision	**Description**	**Date**
01	Original Report Release	24 June 2024
02	Updated RF Power and PSD sections to include NSS-1 data.	17 December 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	E7-Campus
Serial Number	F4E2C61FFB30
Dimensions (cm)	25.0 x 25.0 x 4.6

2.2 Description of EUT

The E7-Campus is a WiFi 7 access point with (1) 10GbE PoE port and (1) 1GbE PoE port. The E7-Campus transmits in the 2.4 GHz, 5 GHz, and 6 GHz frequency bands using integral antennas and is powered by an 802.3++ PoE power adapter.

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: E7-Campus (Note 1) SN: F4E2C61FFB30	Access Point	PoE Input / Shielded Cat 5E cable
BN: UBIQUITI MN: U-POE++ SN: N/A	PoE Injector	PoE Output / Shielded Cat 5E to E7, and Ethernet / unshielded Cat 5E to PC
BN: DELL MN: XPS SN: N/A	Laptop PC	Ethernet / un-shielded Cat 5E

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
PoE Input	1	7m Shielded Cat 5E
PoE Output (PoE Injector)	1	7m Shielded Cat 5E to E7 PoE Input
LAN (PoE Injector)	1	unshielded Cat 5E to Laptop PC
AC (PoE Injector)	1	3 Conductor power cord to AC mains/80cm

2.5 Operating Environment

Power Supply	120 Volts AC to POE 48 Volts
AC Mains Frequency	60 Hz
Temperature	22.5 – 23.7 °C
Humidity	20.2 – 28.5 %
Barometric Pressure	1019 mBar

2.6 Operating Modes

The E7-Campus 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

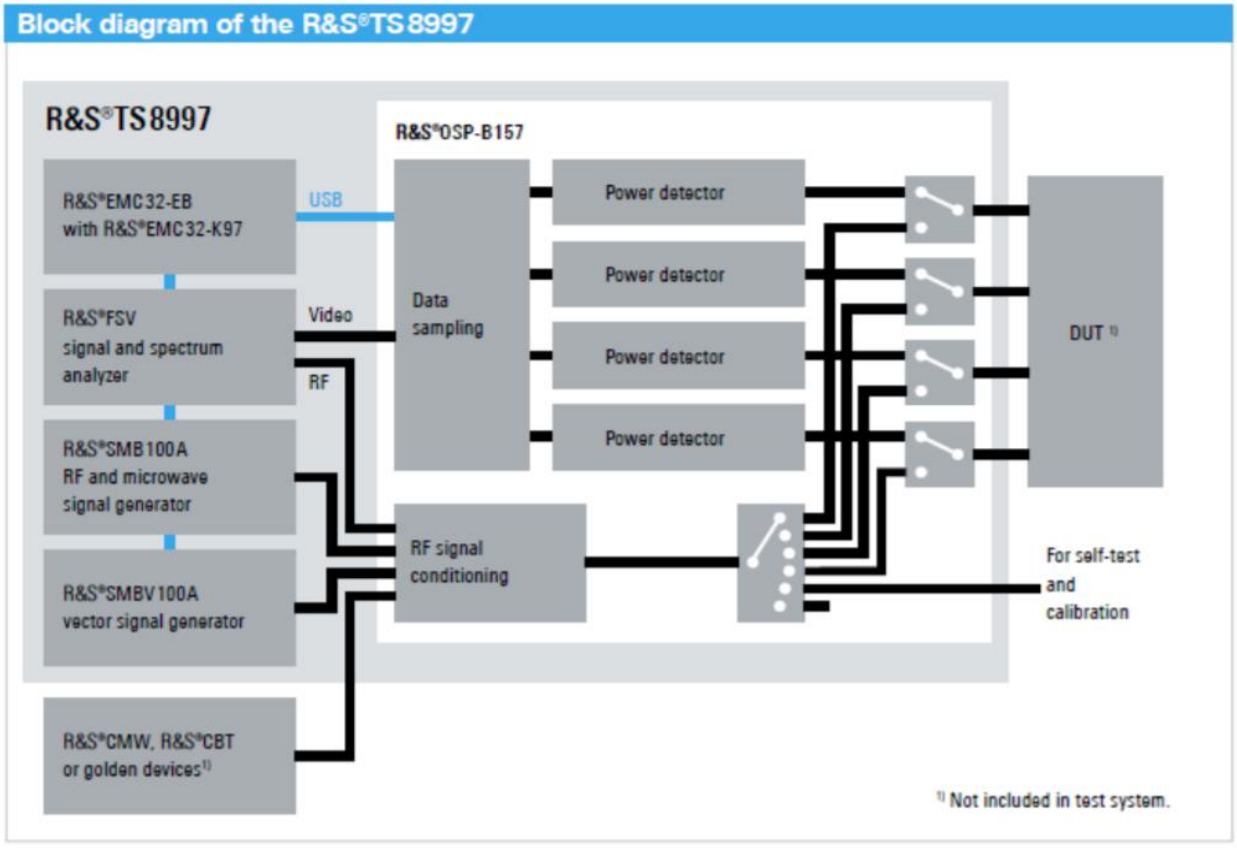


Diagram 1: Test Configuration Block Diagram

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-2500	7/13/2023	7/13/2024
LISN	AFJ	LS16C/10	UCL-2512	5/26/2023	5/26/2024
ISN	Teseq	ISN T800	UCL-2974	6/27/2023	6/27/2024
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

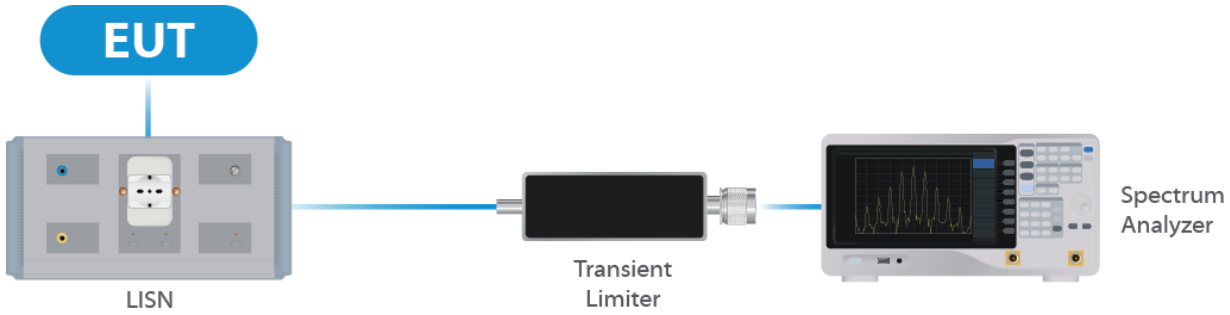


Figure 1: Conducted Emissions Test

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

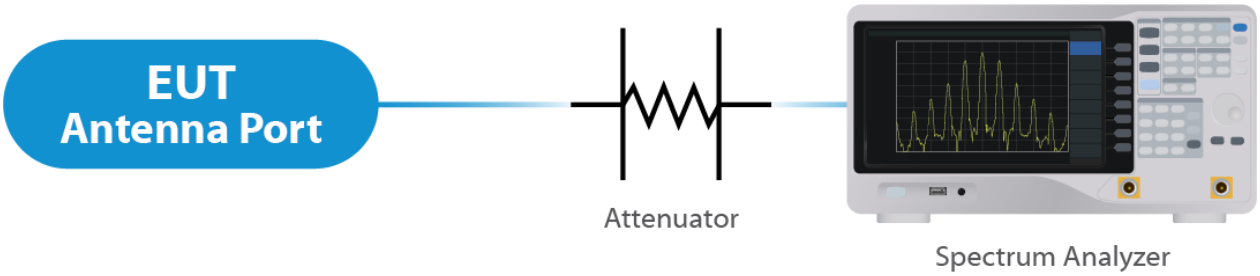


Figure 2: Direct Connect at the Antenna Port Test

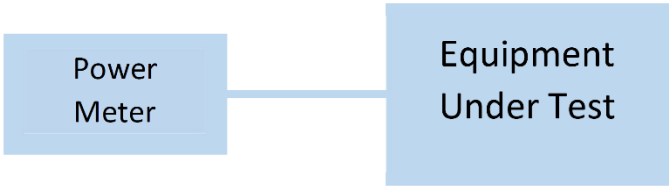


Figure 3: Output Power Measurement

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	9/22/2022	9/22/2024
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

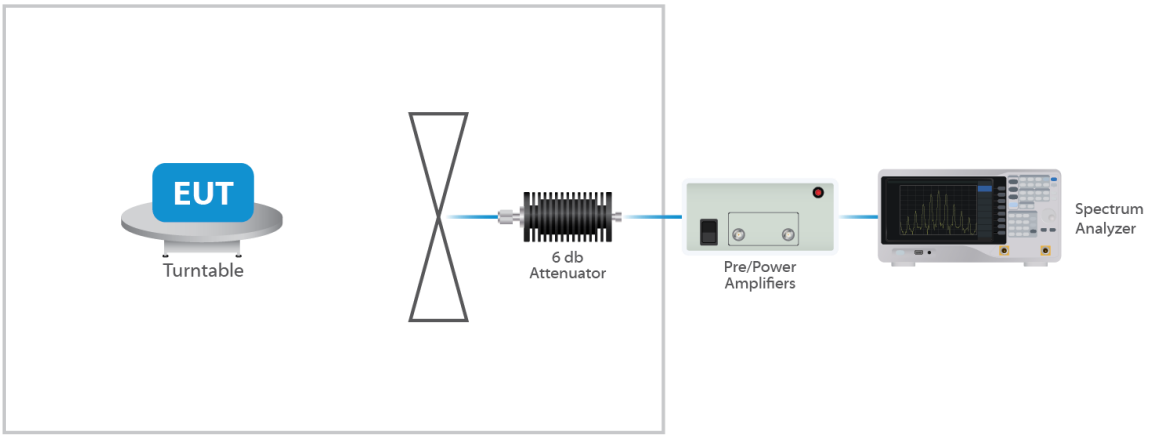


Figure 4: Radiated Emissions Test

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 integrated. Per the manufacturer, the Maximum gain of the antenna per chain is 12.0 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.

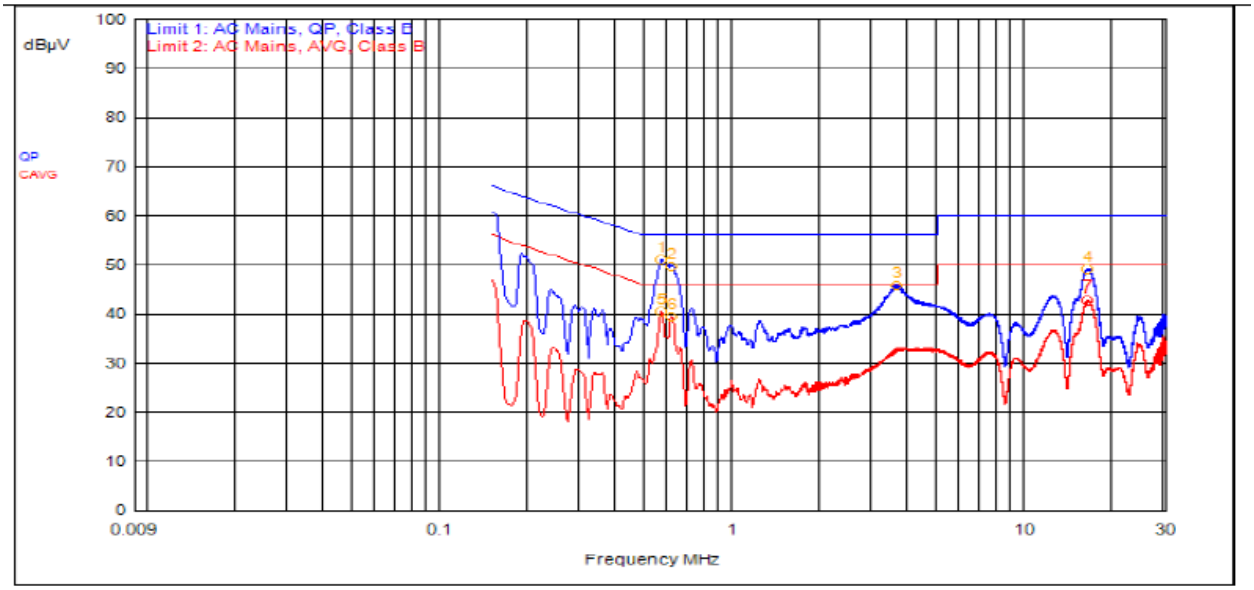
For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for NANT ≤ 4;
For PSD measurements when Nss=1: Array Gain = 10 log(NANT/NSS) dB + Antenna Gain (dBi). Or 6.02 dB + 12.0 dBi = 18.02 dBi.

Results

The EUT complied with the specification

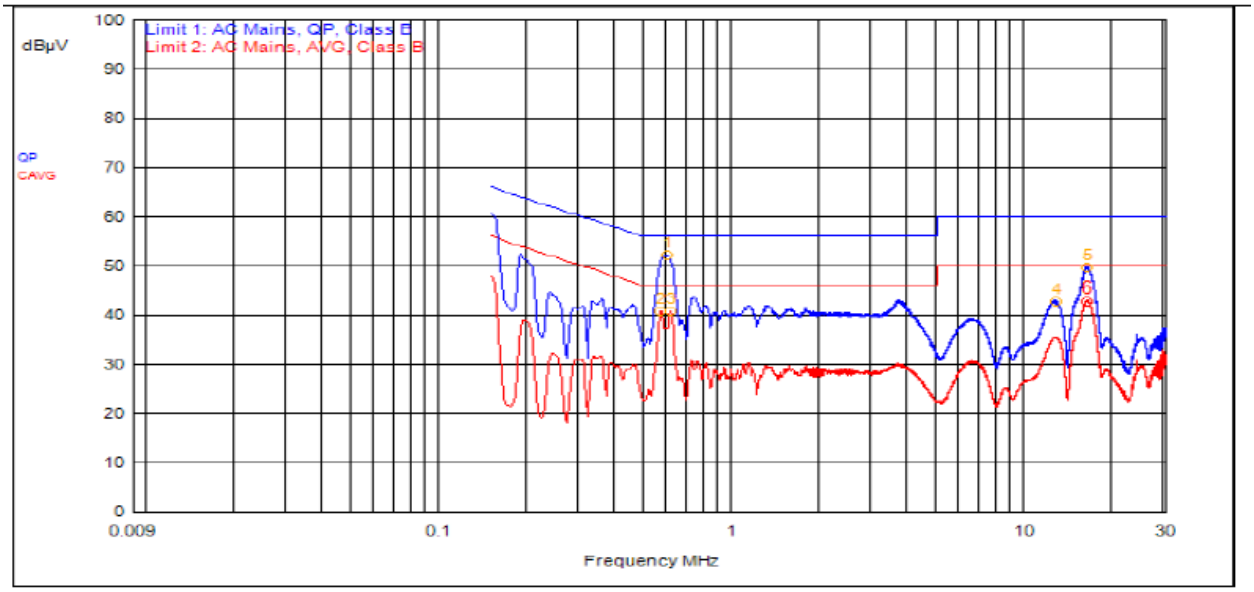
5.2 Conducted Emissions at Mains Ports Data

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
1	567,000kHz	12.40	0.00		QPeak	38.61	51.01	56.00	-4.99			
2	615,000kHz	12.38	0.00		QPeak	37.44	49.82	56.00	-6.18			
3	3.594	12.29	0.10		QPeak	33.37	45.76	56.00	-10.24			
4	16.206	12.40	0.20		QPeak	36.61	49.21	60.00	-10.79			
5	567,000kHz	12.40	0.00		C_AVG	28.23	40.63			46.00	-5.37	
6	609,000kHz	12.38	0.00		C_AVG	27.16	39.54			46.00	-6.46	
7	16.206	12.40	0.20		C_AVG	30.08	42.68			50.00	-7.32	

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
1	591,000kHz	12.40	0.00		QPeak	39.70	52.10	56.00	-3.90			
5	16.143	12.43	0.20		QPeak	37.04	49.67	60.00	-10.33			
4	12.678	12.40	0.20		QPeak	30.24	42.84	60.00	-17.16			
2	567,000kHz	12.41	0.00		C_AVG	28.53	40.94			46.00	-5.06	
3	612,000kHz	12.40	0.00		C_AVG	28.43	40.83			46.00	-5.17	
6	16.155	12.43	0.20		C_AVG	30.17	42.80			50.00	-7.20	

Result

The EUT complied with the specification limit.

5.3 §15.403(i) 26 dB Emissions Bandwidth

All chains were measured under the guidance of KDB 789033 Section II.C. and KDB 66291 D01. Please see associated annex for details on instrument settings.

Nominal BW (MHz)	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
a 20	5180	17.5	22.3
a 20	5210	17.3	22.2
a 20	5240	17.5	23.1
ax 20	5180	19.3	22.5
ax 20	5210	19.5	22.5
ax 20	5240	19.5	22.4
ax 40	5190	38.5	41.9
ax 40	5230	38.5	42.5
ax 80	5210	79.0	85.0

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 66291 D01. Please see associated annex for details on instrument settings.
The maximum average RF conducted output power measured for this device was 23.82 dBm or 240.99 mW. The limit is 30 dBm, or 1 Watt when using an antenna with 23 dBi (Fixed point to point) or 6 dBi (indoor/outdoor access point) or less gain. The antenna has a gain of 12.0 dBi.

NSS>1 Mode

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
OFDM 20	5180	Mcs0 NSS-4	18	22.22	34.22	10.10
OFDM 20	5210	Mcs0 NSS-4	21	23.13	35.13	10.89
OFDM 20	5240	Mcs0 NSS-4	23	23.48	35.48	11.20
HE 20	5180	Mcs0 NSS-4	18	23.27	35.27	10.55
HE 20	5210	Mcs0 NSS-4	18	23.20	35.20	10.48
HE 20	5240	Mcs0 NSS-4	18	23.58	35.58	10.81
HE 40	5190	Mcs0 NSS-4	14	18.68	30.68	3.27
HE 40	5230	Mcs0 NSS-4	18	23.46	35.46	7.84
HE 80	5210	Mcs0 NSS-4	13	18.14	30.14	-0.24

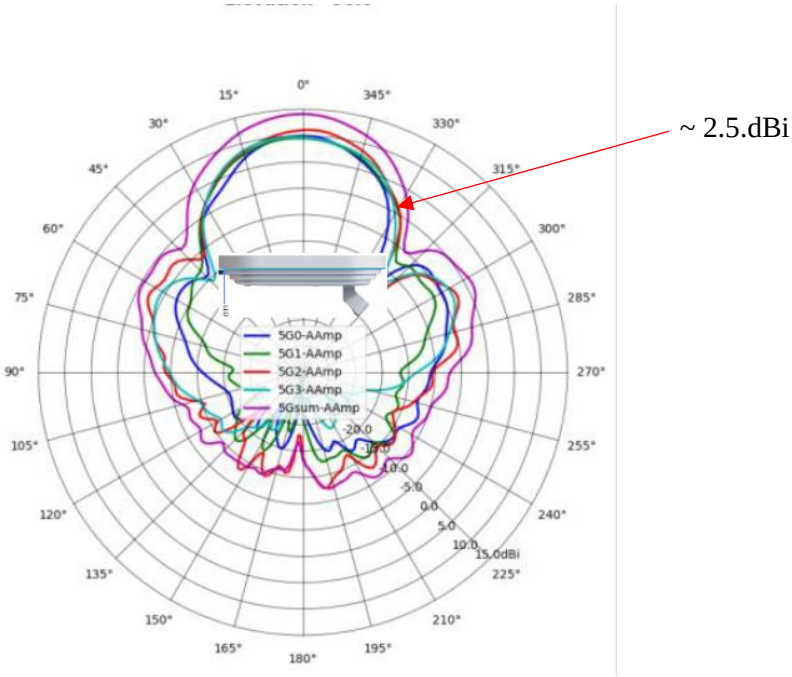
NSS-1 Mode

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
OFDM 20	5180	Mcs0 NSS-1	12	16.22	28.22	4.10
OFDM 20	5210	Mcs0 NSS-1	15	17.13	29.13	4.89
OFDM 20	5240	Mcs0 NSS-1	16	16.48	28.48	4.20
HE 20	5180	Mcs0 NSS-1	13	17.27	29.27	4.55
HE 20	5210	Mcs0 NSS-1	12	17.20	29.20	4.48
HE 20	5240	Mcs0 NSS-1	12	17.58	29.58	4.81
HE 40	5190	Mcs0 NSS-1	14	18.68	30.68	3.27
HE 40	5230	Mcs0 NSS-1	15	20.46	32.46	4.84
HE 80	5210	Mcs0 NSS-1	13	18.14	30.14	-0.24

5.4.1 30 Degree Elevation Gain

The information in this section regarding elevation gain applies to the US (FCC) market only. At 30-degree elevation the antenna gain is approximately 2.5 dBi.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
OFDM 20	5180	Mcs0	14	18.43	20.93	5.92
OFDM 20	5210	Mcs0	13	18.29	20.79	5.74
OFDM 20	5240	Mcs0	13	18.56	20.06	5.01
HE 20	5180	Mcs0	14	18.45	20.95	5.49
HE 20	5210	Mcs0	13	18.38	20.88	5.30
HE 20	5240	Mcs0	12	17.67	20.17	4.65
HE 40	5190	Mcs0	13	17.71	20.21	2.05
HE 40	5230	Mcs0	12	17.56	20.06	1.70
HE 80	5210	Mcs0	13	18.08	20.58	-0.47



The antenna gain is circular and at 30 degrees it is approximately 2.5 dBi.

Figure 1: Internal Antenna Elevation Plot Greater Then 30-Degrees from Horizon

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).

5.5 §15.407(b) Spurious Emissions

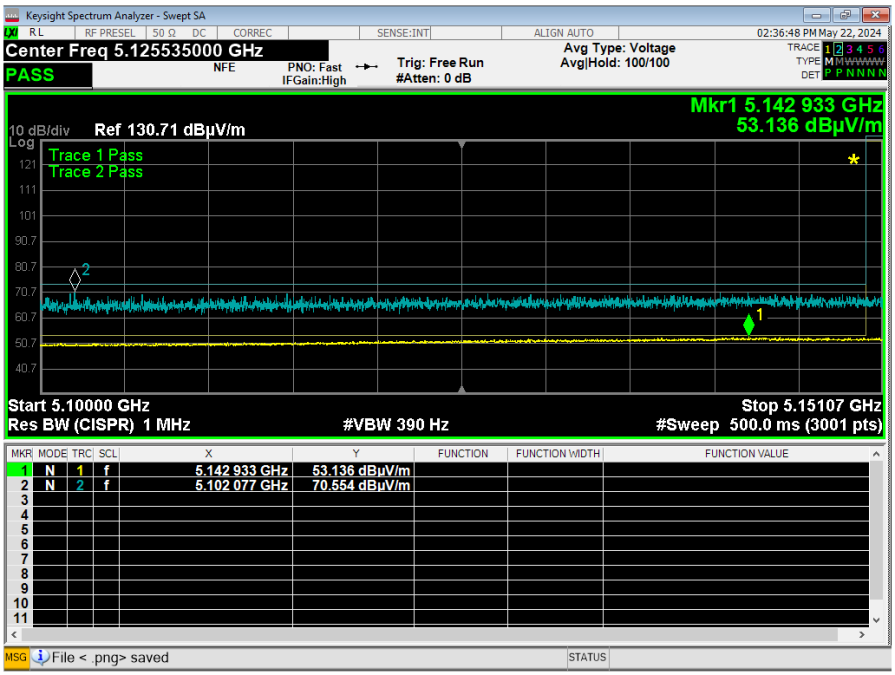
5.5.1 Conducted Spurious Emissions

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 12.0 dBi accounted for. These demonstrate compliance with the provisions of this section at the band edges.

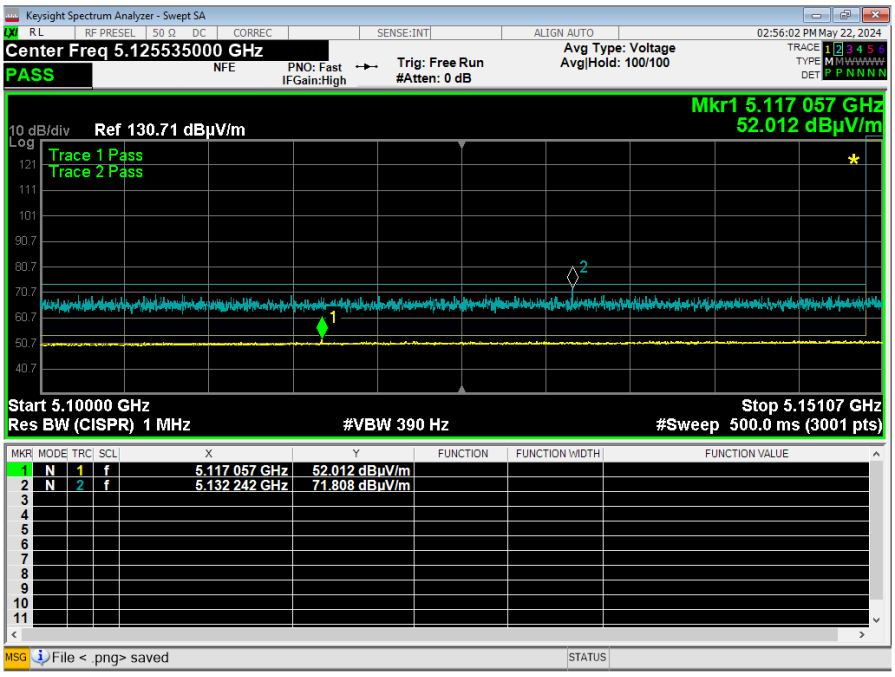
The emissions must be remain below -27 dBm EIRP.

Result

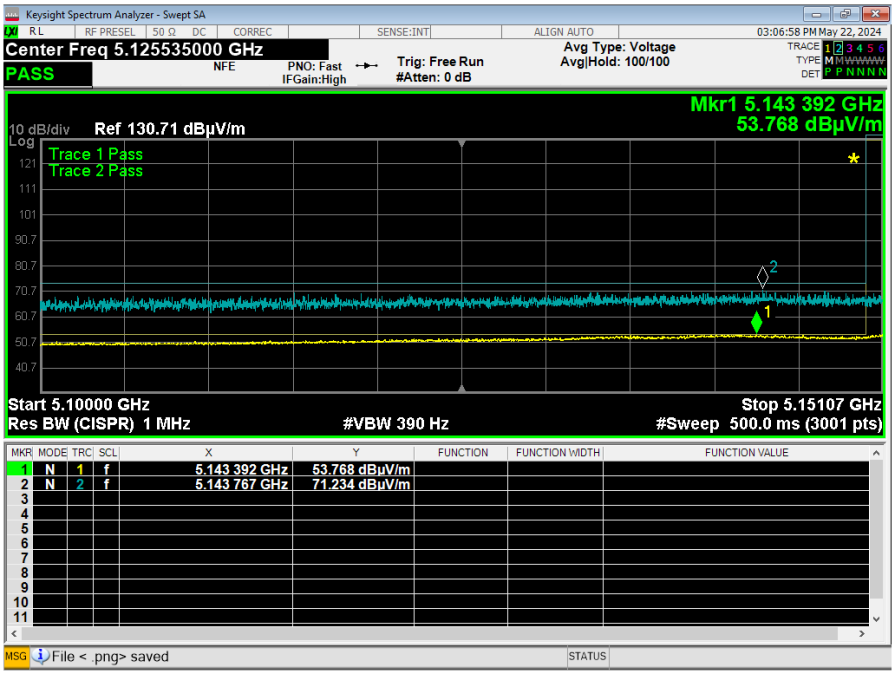
Conducted spurious emissions were below -27 dBm; therefore, the EUT complies with the specification.



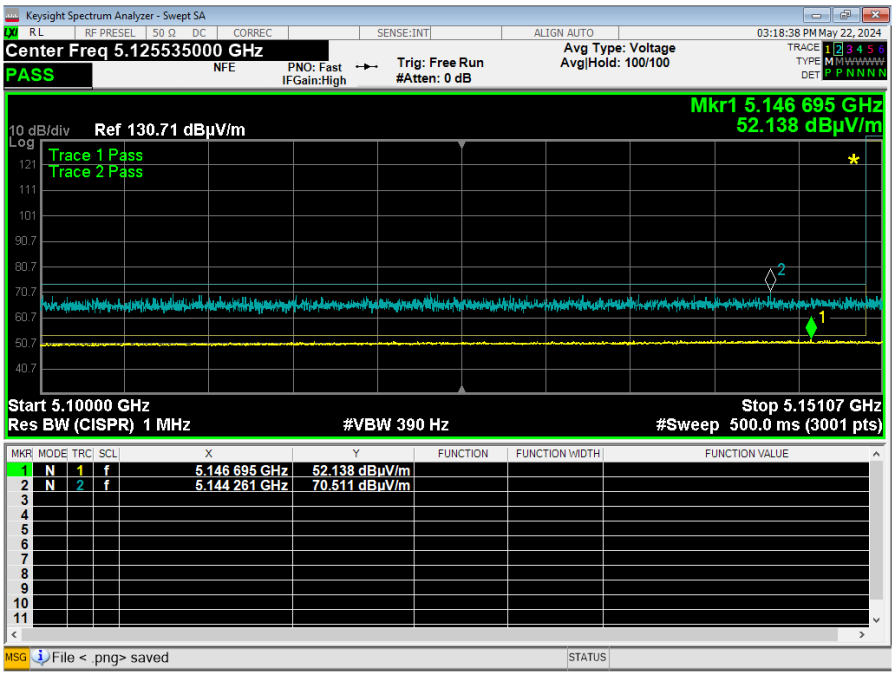
Graph 2: Band Edge Low a Mode 20 MHz



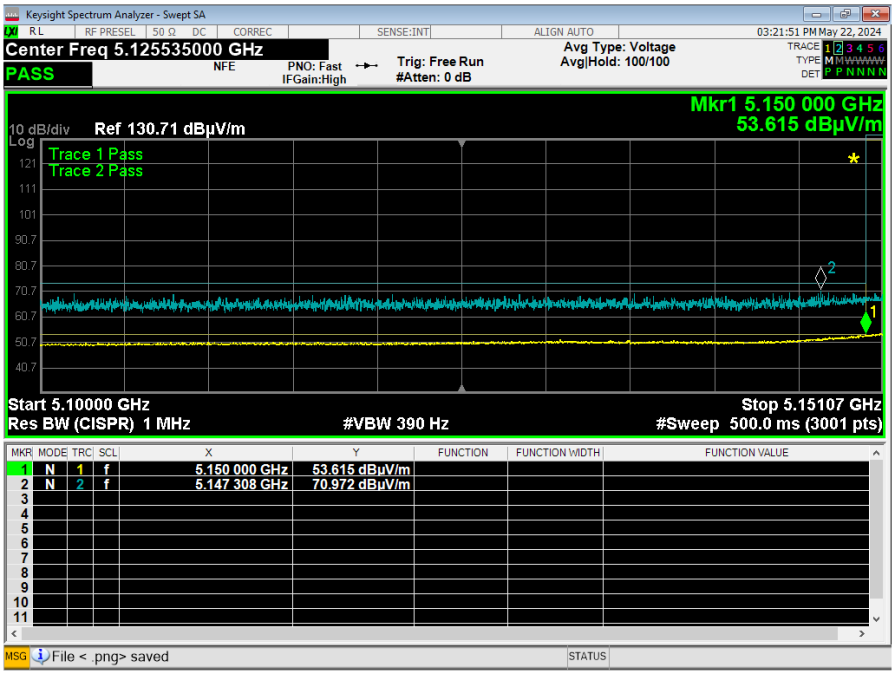
Graph 3: Band Edge High a Mode 20 MHz



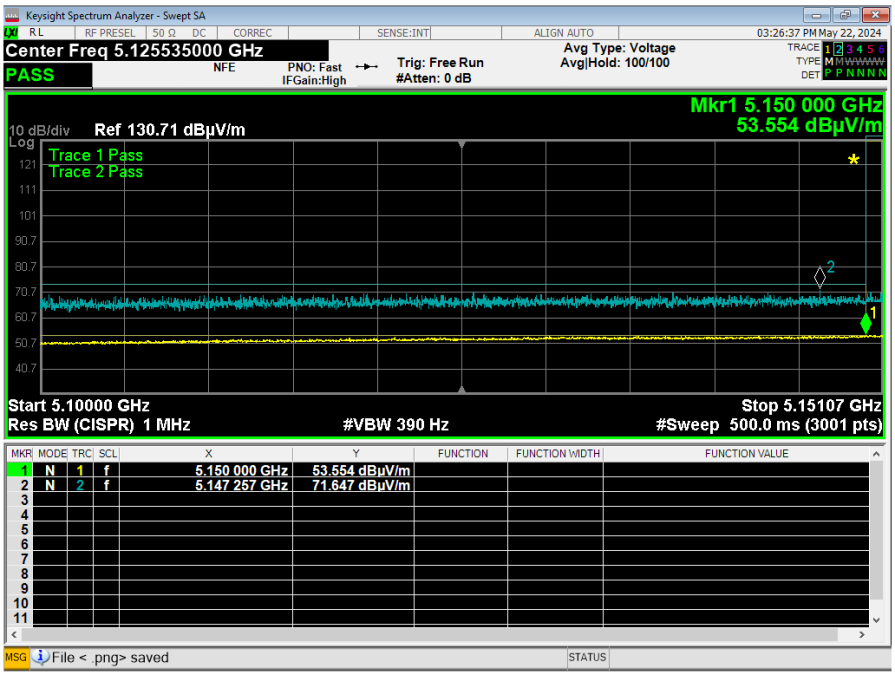
Graph 4: Band Edge Low ax Mode 20 MHz



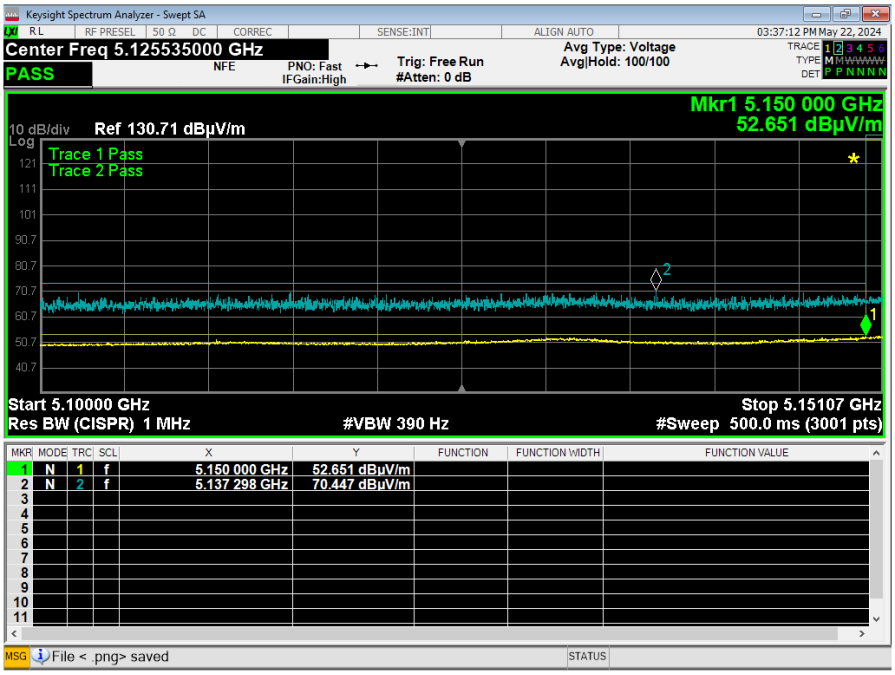
Graph 5: Band Edge High ax Mode 20 MHz



Graph 6: Band Edge Low ax Mode 40 MHz



Graph 7: Band Edge High ax Mode 40 MHz



Graph 8: Band Edge ax Mode 80 MHz

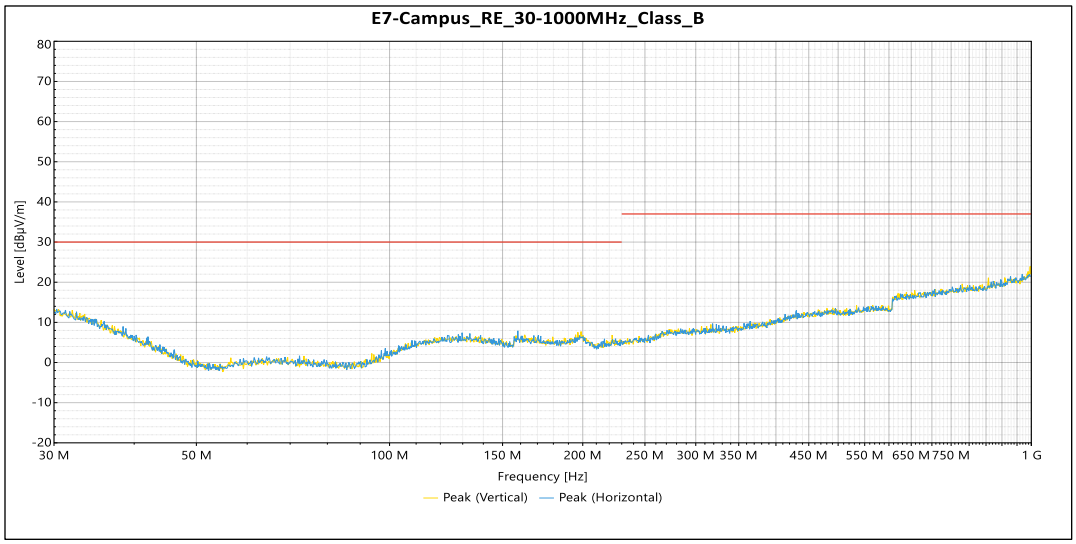
5.5.2 Radiated Spurious Emissions in the Restricted Bands of § 15.205

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 TP31, 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. [For radiated] 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

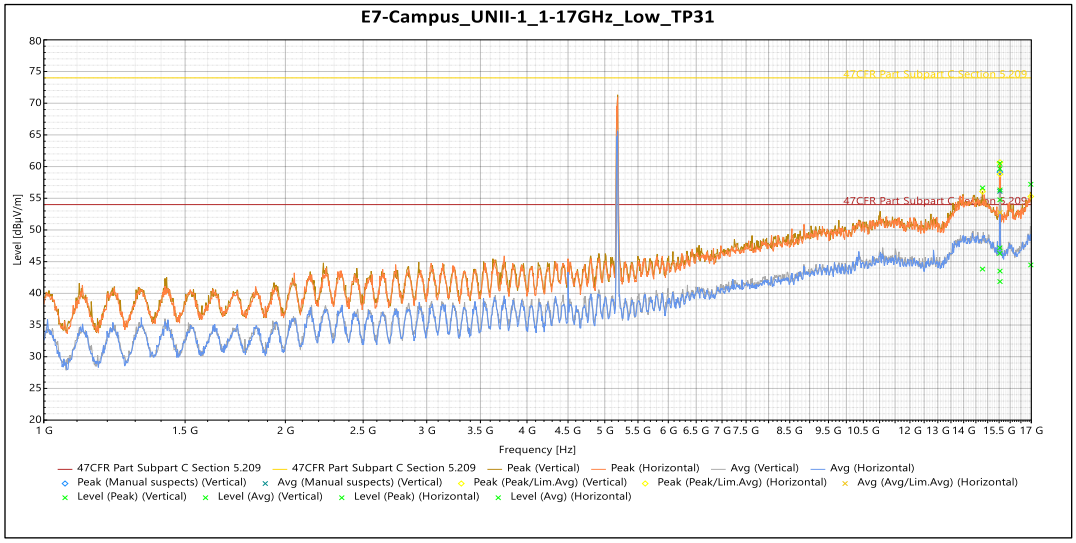
All emissions in the restricted bands of § 15.205 met the limits specified in § 15.209; therefore, the EUT complies with the specification. All emissions me the limits specified in § 15.407(b). Representative band edge plots are included in this report. See Annex for Conducted Band edge plots.



Quasi-Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
No significant emissions were observed from 30 – 1000 MHz in the Vertical orientation of the antenna							
No significant emissions were observed from 30 – 1000 MHz in the Horizontal orientation of the antenna							

Table 4: Radiated Emissions 30 – 1000 MHz



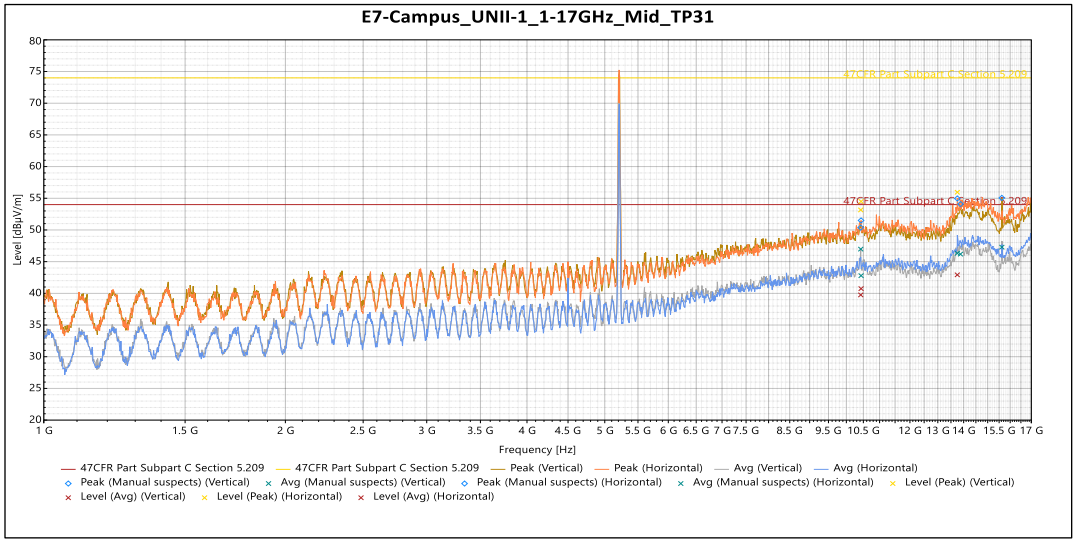
Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
14.779 GHz	56.633	74	-17.367	133	3.311	Vertical	11.504
15.533 GHz	59.654	74	-14.346	2	1.5	Vertical	9.522
15.534 GHz	60.499	74	-13.501	343	2.65	Vertical	9.52
15.539 GHz	56.319	74	-17.681	38	2.142	Horizontal	9.51
15.54 GHz	54.762	74	-19.238	15	2.142	Horizontal	9.508
16.976 GHz	57.214	74	-16.786	57	4	Horizontal	13.552

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
14.779 GHz	43.825	54	-10.175	133	3.311	Vertical	11.504
15.533 GHz	46.305	54	-7.695	2	1.5	Vertical	9.522
15.534 GHz	47.185	54	-6.815	343	2.65	Vertical	9.52
15.539 GHz	43.508	54	-10.492	38	2.142	Horizontal	9.51
15.54 GHz	41.858	54	-12.142	15	2.142	Horizontal	9.508
16.976 GHz	44.479	54	-9.521	57	4	Horizontal	13.552

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



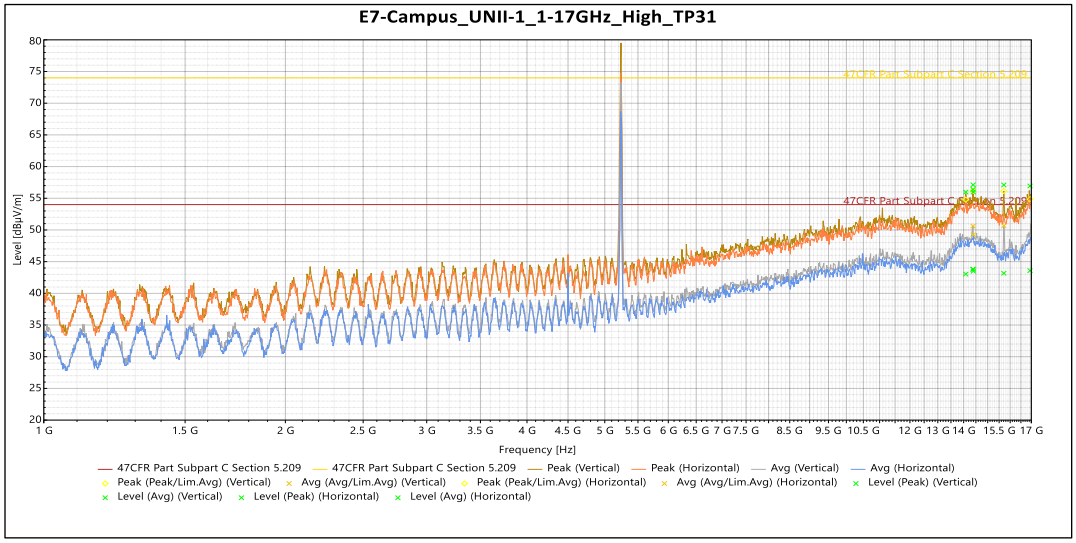
Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.421 GHz	53.156	74	-20.844	210	1.834	Vertical	6.951
10.431 GHz	54.5	74	-19.5	19	1.638	Horizontal	6.977
13.748 GHz	55.948	74	-18.052	299	1.643	Horizontal	10.382

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.421 GHz	39.749	54	-14.251	210	1.834	Vertical	6.951
10.431 GHz	40.735	54	-13.265	19	1.638	Horizontal	6.977
13.748 GHz	42.924	54	-11.076	299	1.643	Horizontal	10.382

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



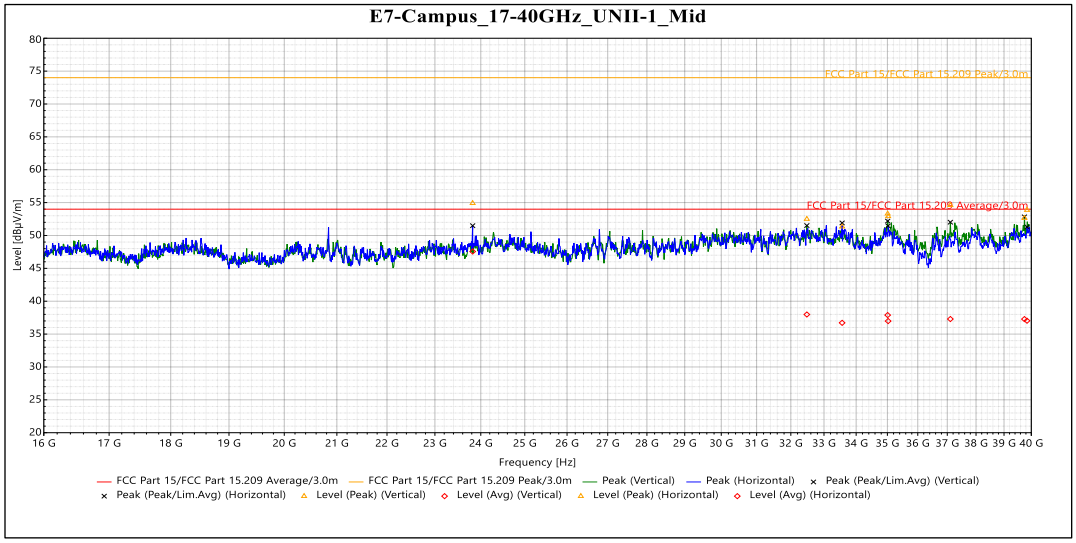
Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
14.384 GHz	56.39	74	-17.61	305	3.812	Vertical	11.999
14.387 GHz	57.123	74	-16.877	263	3.317	Vertical	12.008
15.71 GHz	57.102	74	-16.898	339	2.133	Vertical	9.254
14.085 GHz	55.98	74	-18.02	120	3.812	Horizontal	11.158
14.397 GHz	55.99	74	-18.01	120	2.827	Horizontal	12.038
16.939 GHz	56.939	74	-17.061	63	3.81	Horizontal	13.333

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
14.384 GHz	43.777	54	-10.223	305	3.812	Vertical	11.999
14.387 GHz	43.82	54	-10.18	263	3.317	Vertical	12.008
15.71 GHz	43.171	54	-10.829	339	2.133	Vertical	9.254
14.085 GHz	43.031	54	-10.969	120	3.812	Horizontal	11.158
14.397 GHz	43.502	54	-10.498	120	2.827	Horizontal	12.038
16.939 GHz	43.584	54	-10.416	63	3.81	Horizontal	13.333

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)
32.48 GHz	52.501	74	-21.499	93	Vertical	2.148
35.009 GHz	53.315	74	-20.685	58	Vertical	3.748
37.106 GHz	54.598	74	-19.402	23	Vertical	4.167
39.745 GHz	52.647	74	-21.353	196	Vertical	2.749
23.82 GHz	54.914	74	-19.086	312	Horizontal	0.799
33.56 GHz	51.339	74	-22.661	202	Horizontal	2.004
35.024 GHz	52.912	74	-21.088	48	Horizontal	3.587
39.841 GHz	53.867	74	-20.133	141	Horizontal	3.032

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
32.48 GHz	37.976	54	-16.024	93	Vertical	2.148
35.009 GHz	37.892	54	-16.108	58	Vertical	3.748
37.106 GHz	37.293	54	-16.707	23	Vertical	4.167
39.745 GHz	37.281	54	-16.719	196	Vertical	2.749
23.82 GHz	47.556	54	-6.444	312	Horizontal	0.799
33.56 GHz	36.707	54	-17.293	202	Horizontal	2.004
35.024 GHz	36.983	54	-17.017	48	Horizontal	3.587
39.841 GHz	37.027	54	-16.973	141	Horizontal	3.032

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

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 66291 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 12.0 dBi + Array gain of 6.02 dB which is a total of 18.02 dBi there for the NSS-1 limit = 4.98 dB.
Results of this testing are summarized.

NSS>1 Mode

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Measured PSD
OFDM 20	5180	Mcs0 NSS-4	18	10.10
OFDM 20	5210	Mcs0 NSS-4	21	10.89
OFDM 20	5240	Mcs0 NSS-4	23	11.20
HE 20	5180	Mcs0 NSS-4	19	10.55
HE 20	5210	Mcs0 NSS-4	18	10.48
HE 20	5240	Mcs0 NSS-4	18	10.81
HE 40	5190	Mcs0 NSS-4	14	3.27
HE 40	5230	Mcs0 NSS-4	18	7.84
HE 80	5210	Mcs0 NSS-4	13	-0.24

NSS-1 Mode

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Measured PSD
OFDM 20	5180	Mcs0 NSS-1	18	4.10
OFDM 20	5210	Mcs0 NSS-1	15	4.89
OFDM 20	5240	Mcs0 NSS-1	16	4.20
HE 20	5180	Mcs0 NSS-1	13	4.55
HE 20	5210	Mcs0 NSS-1	12	4.48
HE 20	5240	Mcs0 NSS-1	12	4.81
HE 40	5190	Mcs0 NSS-1	14	3.27
HE 40	5230	Mcs0 NSS-1	15	4.84
HE 80	5210	Mcs0 NSS-1	13	-0.24

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 --