



427 West 12800 South
Draper, UT 84020

Test Report Certification

FCC ID	SWX-U7LITE
IC ID	6545A-U7LITE
Equipment Under Test	U7-Lite
Test Report Serial Number	TR9611_01
Date of Tests	16-19, 22 July; 12 December 2024
Report Issue Date	13 December 2024

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



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 C. 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 with the specifications provided by the manufacturer.

Applicant	Ubiquiti Inc.
Manufacturer	Ubiquiti Inc.
Brand Name	UBIQUITI
Model Number	U7-Lite
FCC ID	SWX-U7LITE
IC ID	6545A-U7LITE

On this 13th 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. Unified Compliance laboratory is not responsible for incorrect information provided by the manufacturer.

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Unified Compliance Laboratory



Written By: Kimberly DeBole



Reviewed By: Richard L. Winter

Revision History		
Revision	Description	Date
01	Original Report Release	13 December 2024

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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	U7-Lite
Serial Number	48F
Dimensions (cm)	17.15 x 17.15 x 3.3

2.2 Description of EUT

The U7-Lite is a WiFi access point with dual-band 2.4/5GHz support. It has 2x2 2.4 GHz and 5 GHz radios with a 5.0 Gbps aggregate throughput rate. The U7-Lite is powered by a PoE In 802.3at adapter via an RJ45 port.

This report covers the circuitry of the device subject to FCC Part 15, Subpart C. 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: U7-Lite (Note 1) SN: 48F	WiFi Access Point	See Section 2.4
BN: UBIQUITI MN: UPOE-at (Note 1) SN: N/A	PoE Power Adapter	Shielded or Un-Shielded Cat 5e cable (Note 2)
BN: Dell MN: XPS 13 SN: N/A	Laptop PC	Shielded or Un-Shielded Cat 5e cable (Note 2)

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
Data	1	Shielded Cat 5e cable/8meters
AC (PoE Injector)	1	3 conductor power cord/80cm
LAN (PoE Injector)	1	Un-shielded Cat 5e cable/1 meter

2.5 Operating Environment

Power Supply	120 Volts AC to 48 Volts PoE
AC Mains Frequency	60 Hz
Temperature	21.5 – 23.4 °C
Humidity	17.0 – 24.6 %
Barometric Pressure	1009 mBar

2.6 Operating Modes

The U7-Lite was connected to a personal computer laptop and tested using test software in order to enable to constant duty cycle greater or equal to 98% of the WiFi transceiver. All emission modes of 802.11 b/g/n/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

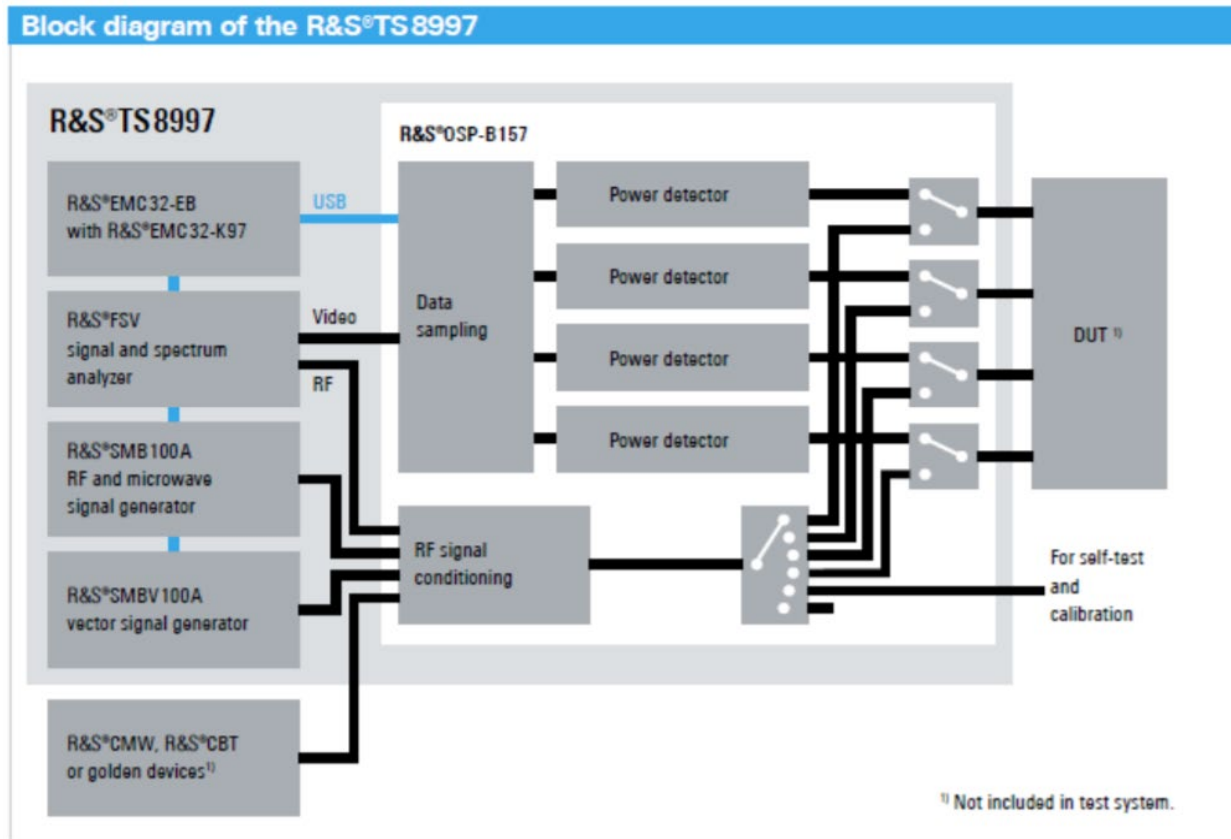


Diagram 1: Test Configuration Block Diagram

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 C 15.203, 15.207 and 15.247 Limits and methods of measurement of radio interference characteristics of radio frequency 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 15.203

See test standard for details.

3.2.2 47 CFR FCC Part 15 Section 15.207

See test standard for details.

3.2.3 47 CFR FCC Part 15 Section 15.247

See test standard for details.

3.3 FCC Part 15, Subpart C

3.3.1 Summary of Tests

FCC Section	ISED Section	Environmental Phenomena	Frequency Range (MHZ)	Result
15.203	N/A	Antenna requirements	Structural Requirement	Compliant
15.207	RSS-Gen	Conducted Disturbance at Mains Port	0.15 to 30	Compliant
15.247(a)	RSS-247 § 5.2	Bandwidth Requirement	2412 to 2462	Compliant
15.247(b)	RSS-247 § 5.4	Peak Output Power	2412 to 2462	Compliant
15.247(d)	RSS-247 § 5.4	Antenna Conducted Spurious Emissions	0.009 to 40000	N/A
15.247(d)	RSS-247 § 5.4	Radiated Spurious Emissions	0.009 to 40000	Compliant
15.247(e)	RSS-247 § 5.2	Peak Power Spectral Density	2412 to 2462	Compliant
The testing was performed according to the procedures in ANSI C63.10-2013, KDB 558074 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 chamber 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 and 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	AFJ	AFJ FFT3010	UCL-3107	N/A	N/A

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

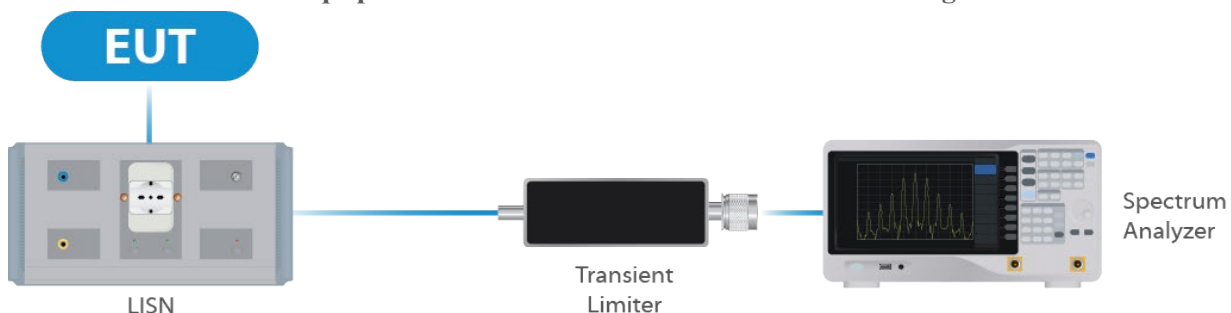


Figure 1: Conducted Emissions Test

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	12/22/2024
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
Test Software	R&S	EMC32	UCL-9442	-	-

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

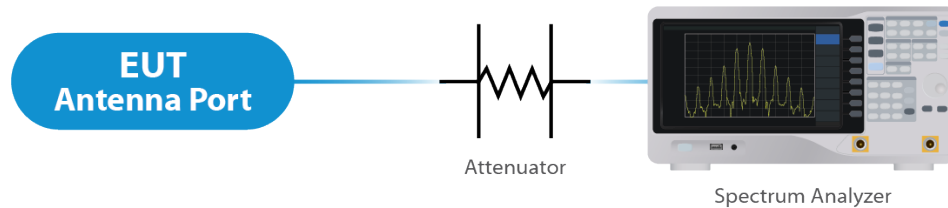


Figure 2: Direct Connect at the Antenna Port Test

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	Nexio	BatEMC	UCL-5253 & UCL-5249	N/A	N/A

Table 3: List of equipment used for Radiated Emissions

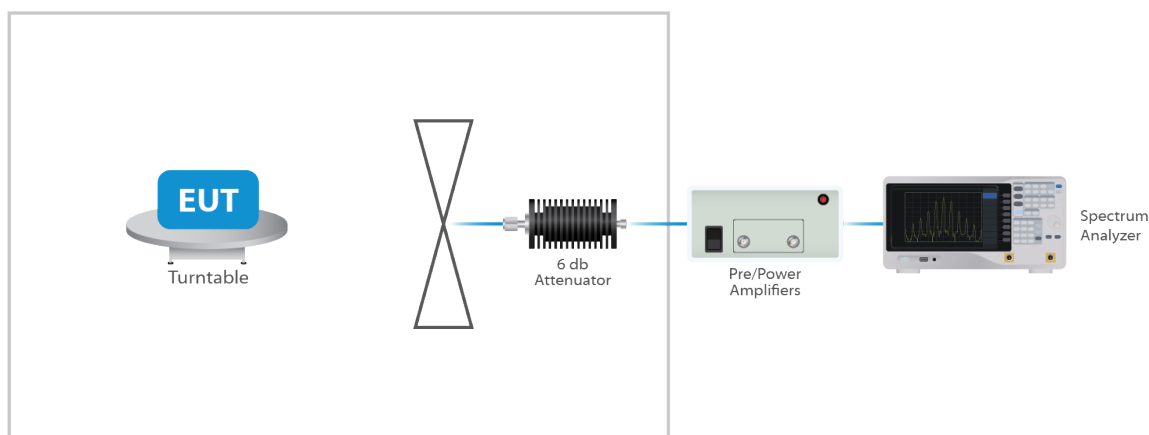


Figure 3: Radiated Emissions Test

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 (\pm 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 integral antenna. Per the manufacturer, the Maximum gain of the antenna per chain is 4 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 = $10 \log(\text{NANT}/\text{NSS})$ 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 $\text{NANT} \leq 4$;

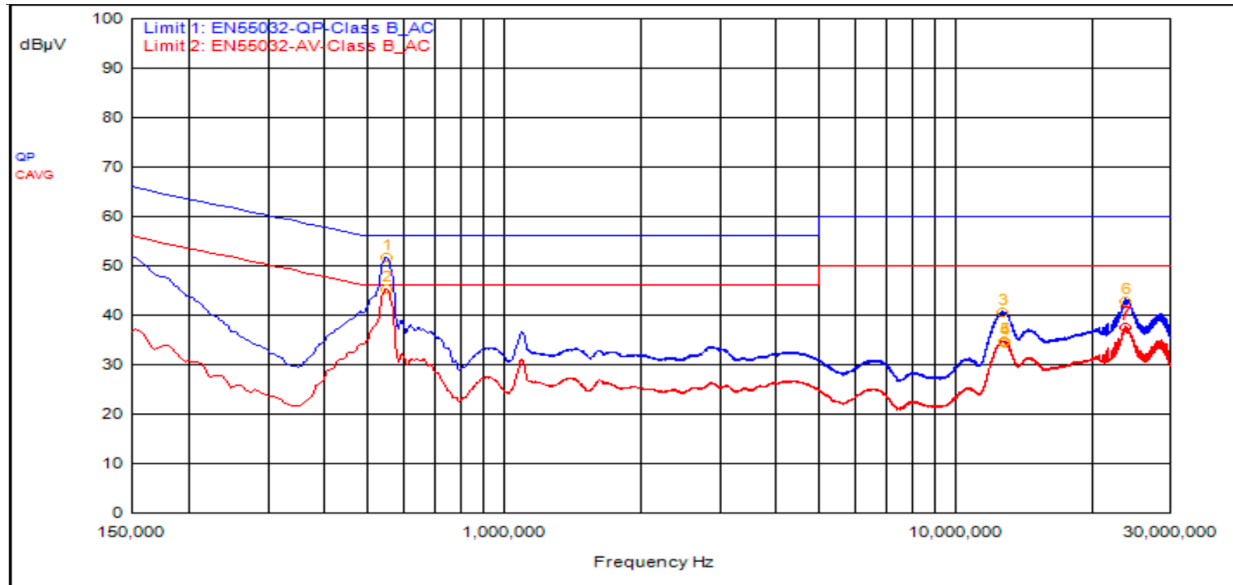
For PSD measurements when $\text{Nss}=1$: Array Gain = $10 \log(\text{NANT}/\text{NSS})$ dB + Antenna Gain (dBi). Or
 $3.01 \text{ dB} + 4 \text{ dBi} = 7.01 \text{ dBi}$.

Results

The EUT complied with the specification

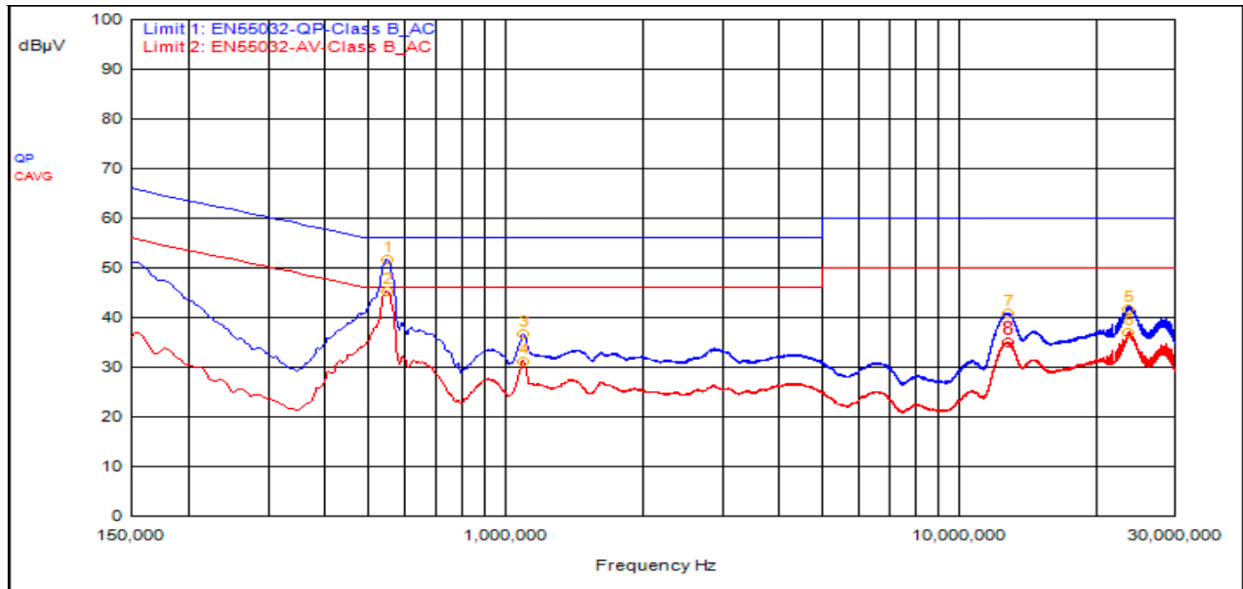
5.2 Conducted Emissions at Mains Ports Data

5.2.1 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	549,000kHz	12.18	0.00		QPeak	39.48	51.66	56.00	-4.34			
6	23.943	12.36	0.10		QPeak	30.34	42.80	60.00	-17.20			
3	12.774	12.29	0.00		QPeak	28.31	40.60	60.00	-19.40			
2	549,000kHz	12.18	0.00		C_AVG	33.05	45.23			46.00	-0.77	
4	12.906	12.29	0.00		C_AVG	22.27	34.56			50.00	-15.44	
5	12.807	12.29	0.00		C_AVG	22.48	34.77			50.00	-15.23	
7	23.907	12.36	0.10		C_AVG	24.96	37.42			50.00	-12.58	

5.2.2 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	549,000kHz	12.23	0.00		QPeak	39.42	51.65	56.00	-4.35			
5	23.661	12.35	0.10		QPeak	29.25	41.70	60.00	-18.30			
7	12.837	12.27	0.00		QPeak	28.46	40.73	60.00	-19.27			
3	1.098	12.20	0.00		QPeak	24.45	36.65	56.00	-19.35			
2	549,000kHz	12.23	0.00		C_AVG	33.06	45.29			46.00	-0.71	
4	1.098	12.20	0.00		C_AVG	18.95	31.15			46.00	-14.85	
6	23.583	12.35	0.10		C_AVG	24.47	36.92			50.00	-13.08	
8	12.837	12.27	0.00		C_AVG	22.67	34.94			50.00	-15.06	

Result

The EUT complied with the specification limit.

5.3 §15.247(a)(2) Emissions Bandwidth

All chains were measured under the guidance of KDB 558074 Section 8.2. and KDB 662911 D01. Please see associated annex for details on instrument settings.

Mode	Frequency (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth (MHz)
b	2412	12.75	6.30
	2437	13.50	6.15
	2462	12.75	8.40
g	2412	17.00	11.40
	2437	17.00	11.40
	2462	16.75	16.35
n 20	2412	18.00	12.60
	2437	18.00	11.75
	2462	18.25	15.90
n 40	2422	37.50	15.80
	2437	37.00	33.30
	2452	36.50	35.80
ax 20	2412	19.25	18.95
	2437	19.25	13.20
	2462	19.00	17.90
ax 40	2422	38.50	28.00
	2437	38.00	29.80
	2452	38.00	36.50

Result

All chains were tested and the highest bandwidth per chain is reported above.

In the configuration tested, the 6 dB bandwidth was greater than 500 kHz; therefore, the EUT complied with the requirements of the specification (see spectrum analyzer plot within the Annex).

5.4 §15.247(b)(3) Maximum Average Output Power

All chains were measured and summed under the guidance of KDB 558074 Section 8.3.2.3. 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 26.71 dBm or 468.81 mW. The limit is 30 dBm or 1 Watt when using antennas with 6 dBi or less gain. The antenna has a gain of 4 dBi.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power *	Measured EIRP
b 20	2412	Mcs0	24	26.71	30.71
	2417	Mcs0	24	26.59	30.59
	2422	Mcs0	24	26.60	30.60
	2427	Mcs0	24	26.55	30.55
	2432	Mcs0	24	26.71	30.71
	2437	Mcs0	24	26.48	30.48
	2442	Mcs0	24	26.58	30.58
	2447	Mcs0	24	26.64	30.64
	2452	Mcs0	24	26.56	30.56
	2457	Mcs0	24	26.61	30.61
g 20	2462	Mcs0	24	26.63	30.63
	2412	Mcs0	21	23.37	27.37
	2417	Mcs0	22	24.24	28.24
	2422	Mcs0	23	25.10	29.10
	2427	Mcs0	23	25.14	29.14
	2432	Mcs0	23	25.20	29.20
	2437	Mcs0	23	25.10	29.10
	2442	Mcs0	23	25.11	29.11
	2447	Mcs0	22	24.16	28.16
	2452	Mcs0	22	24.09	28.09
n 20	2457	Mcs0	22	24.14	28.14
	2462	Mcs0	21	23.04	27.04
	2412	Mcs0	21	23.41	27.41
	2417	Mcs0	23	25.23	29.23
	2422	Mcs0	23	25.07	29.07
	2427	Mcs0	23	25.03	29.03
	2432	Mcs0	23	25.11	29.11
	2437	Mcs0	23	25.06	29.06

	2442	Mcs0	23	24.94	28.94
	2447	Mcs0	23	25.19	29.19
	2452	Mcs0	22	23.91	27.91
	2457	Mcs0	22	24.14	28.14
	2462	Mcs0	18	20.34	24.34
n 40	2422	Mcs0	20	22.57	26.57
	2437	Mcs0	21	23.56	27.56
	2452	Mcs0	17	19.77	23.77
ax 20	2412	Mcs0	20	22.15	26.15
	2417	Mcs0	21	23.27	27.27
	2422	Mcs0	23	25.04	29.04
	2427	Mcs0	23	25.00	29.00
	2432	Mcs0	23	25.12	29.12
	2437	Mcs0	23	25.00	29.00
	2442	Mcs0	23	25.18	29.18
	2447	Mcs0	22	24.25	28.25
	2452	Mcs0	22	24.01	28.01
	2457	Mcs0	21	22.90	26.90
	2462	Mcs0	17	19.35	23.35
ax 40	2422	Mcs0	19	21.59	25.59
	2437	Mcs0	20	22.59	26.59
	2452	Mcs0	16	18.80	22.80

Result

In the configuration tested, the maximum average RF output power was less than 1 watt; therefore, the EUT complied with the requirements of the specification (see spectrum analyzer plot within the Annex).

* Gated EIRP shown in the Annex is the conducted measurement

5.5 §15.247(d) 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 table show the measurement data from spurious emissions noted across the frequency range when transmitting at the lowest frequency, middle frequency and upper frequency. Shown within the Annex are plots with the EUT tuned to the upper and lower channels. These demonstrate compliance with the provisions of this section at the band edges.

The emissions must be attenuated 30 dB below the highest power spectral density level measured within the authorized band as measured with a 100 kHz RBW.

Result

Conducted spurious emissions were attenuated 30 dB or more below the fundamental; therefore, the EUT complies with the specification.

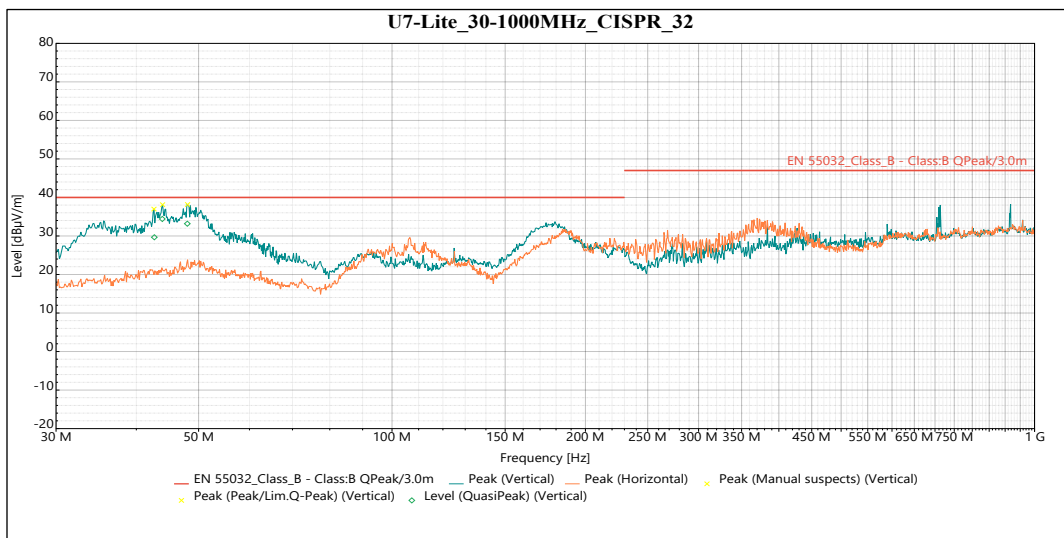
5.5.2 Radiated Spurious Emissions in the Restricted Bands of §15.205

The frequency range from the lowest frequency generated or used in the device to the tenth harmonic of the highest fundamental emissions was investigated to measure any radiated emissions in the restricted bands. The following tables show measurements of any emissions that fell into the restricted bands of §15.205. The tables show the worst-case emissions measured from the EUT. For frequencies above 18.0 GHz, a measurement distance of 1 meter was used. The noise floor was a minimum of 6 dB below the limits. The emissions in the restricted bans must meet the limits specified in §15.209. Tabular data for each of the spurious emissions is shown below for each of the units. Plots of the band edges are also shown.

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

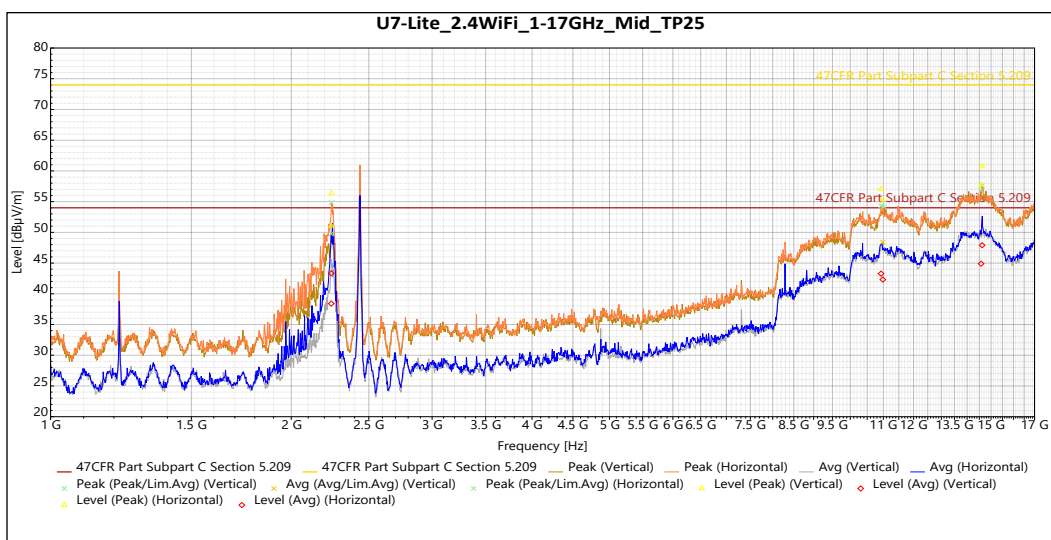
Result

All emissions in the restricted bands of §15.205 met the limits specified in §15.209; therefore, the EUT complies with the specification.

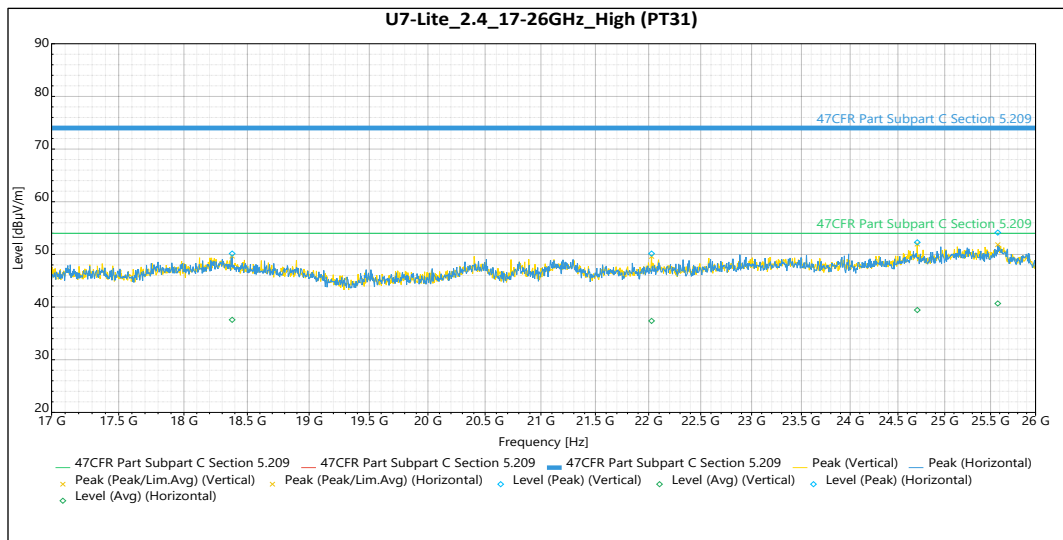


Frequency	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin	Azimuth (°)	Height	Pol.	Meas. Time	RBW (Hz)	Meas.Time (s)	Correction (dB)
42.667388 MHz	1	29.673	40	-10.327	110	1	Vertical	15	120 kHz	0.001	-8.323
43.899701 MHz	1	34.423	40	-5.577	133	1.21	Vertical	15	120 kHz	0.001	-8.164
48.020101 MHz	1	33.192	40	-6.808	95	1	Vertical	15	120 kHz	0.001	-7.919

Table 4: Radiated Emissions within 30MHz-1GHz

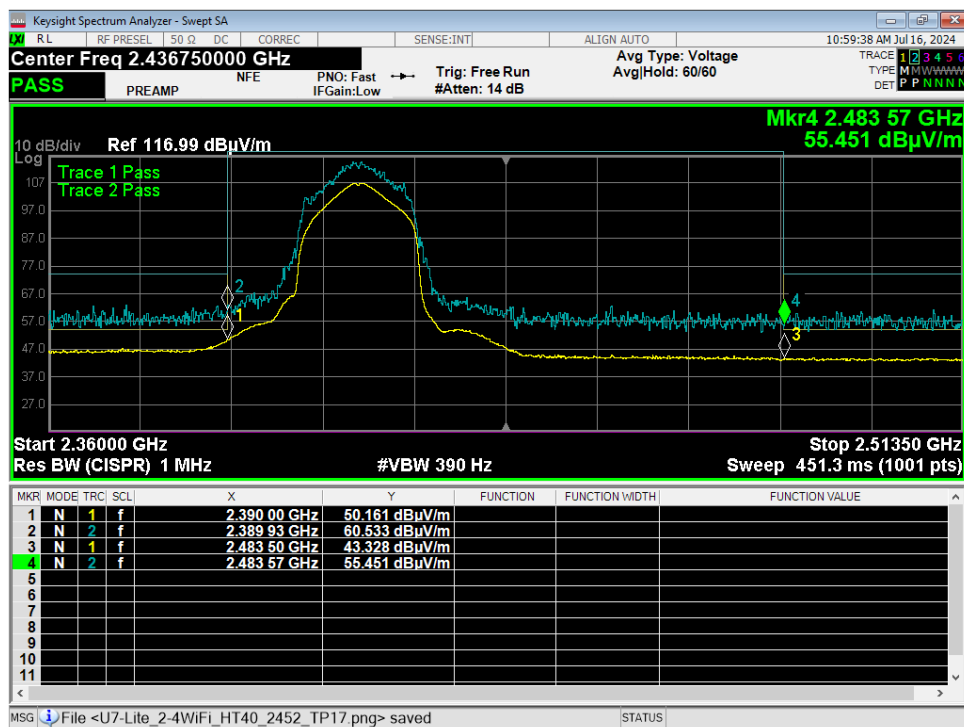


Frequency	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
2.2441 GHz	Peak	51.057	74	-22.943	260	3.311	Vertical	-16.313
10.984 GHz	Peak	55.321	74	-18.679	69	2.645	Vertical	11.028
14.577 GHz	Peak	57.733	74	-16.267	205	1.643	Vertical	13.96
2.2441 GHz	Avg	38.408	54	-15.592	260	3.311	Vertical	-16.313
10.984 GHz	Avg	42.318	54	-11.682	69	2.645	Vertical	11.028
14.577 GHz	Avg	44.895	54	-9.105	205	1.643	Vertical	13.96
2.2446 GHz	Peak	56.37	74	-17.63	85	1.5	Horizontal	-16.314
10.928 GHz	Peak	57.047	74	-16.953	233	4	Horizontal	11.665
14.618 GHz	Peak	60.722	74	-13.278	98	1.5	Horizontal	14.155
2.2446 GHz	Avg	43.349	54	-10.651	85	1.5	Horizontal	-16.314
10.928 GHz	Avg	43.277	54	-10.723	233	4	Horizontal	11.665
14.618 GHz	Avg	47.904	54	-6.096	98	1.5	Horizontal	14.155

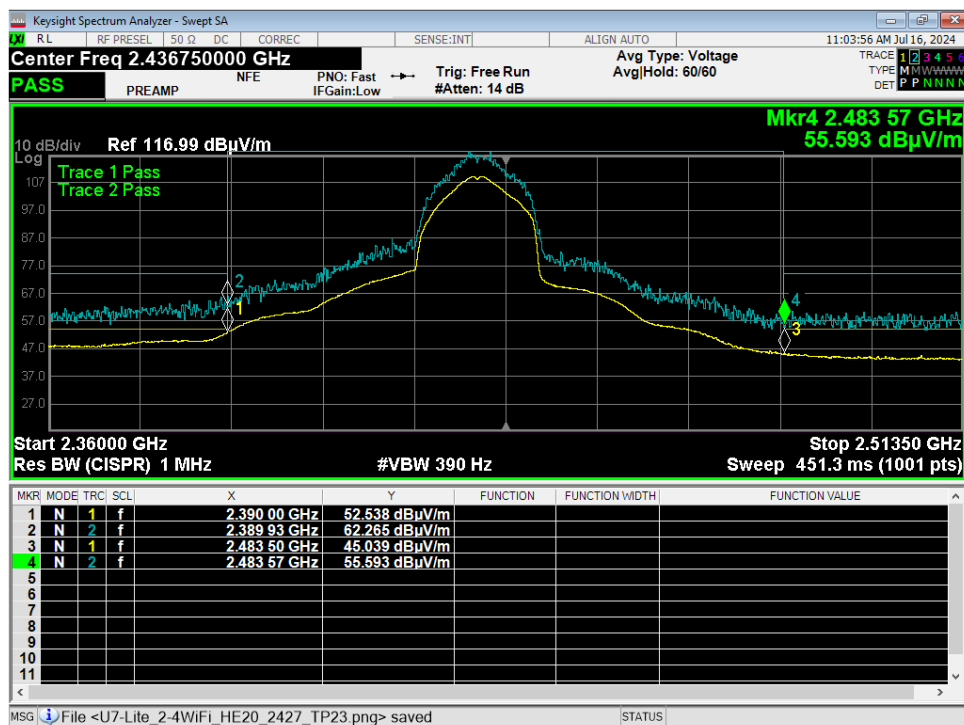
Table 5: Radiated Emissions within 1-17GHz


Frequency	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
22.0277127 GHz	Peak	50.16	74	-23.84	146	Vertical	-0.489
24.7058739 GHz	Peak	52.294	74	-21.706	275	Vertical	1.521
22.0277127 GHz	Avg	37.376	54	-16.624	146	Vertical	-0.489
24.7058739 GHz	Avg	39.437	54	-14.563	275	Vertical	1.521
18.3788131 GHz	Peak	50.162	74	-23.838	336	Horizontal	-0.916
25.5795757 GHz	Peak	54.143	74	-19.857	13	Horizontal	2.853
18.3788131 GHz	Avg	37.58	54	-16.42	336	Horizontal	-0.916
25.5795757 GHz	Avg	40.684	54	-13.316	13	Horizontal	2.853

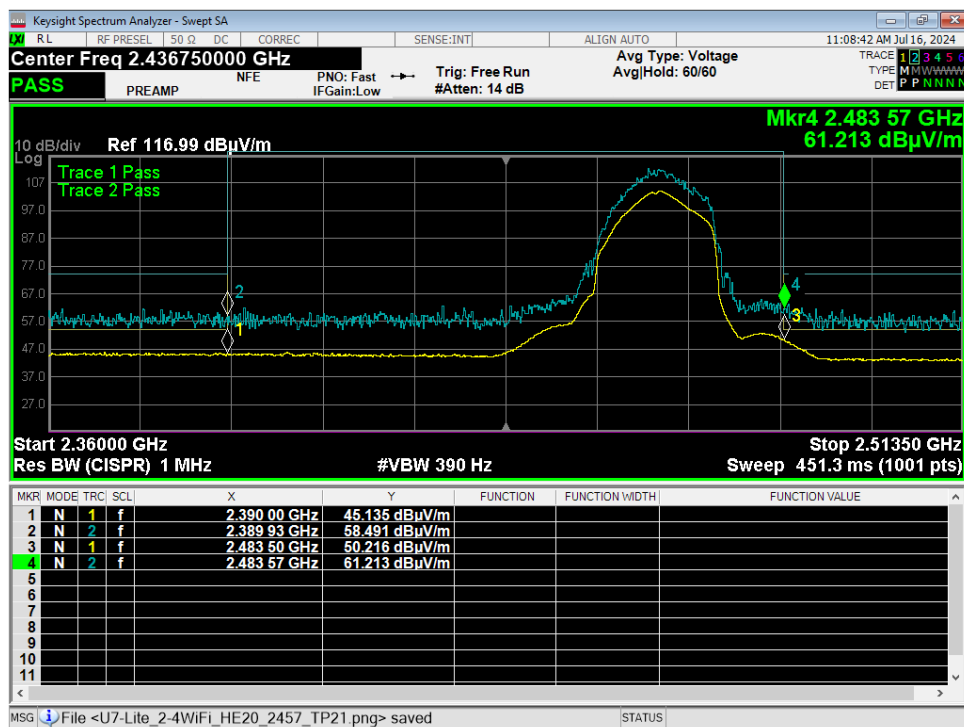
Table 6: Radiated Emissions within 17-26GHz



Graph 1: Radiated Lower Band Edge Plot



Graph 2: Radiated Middle Band Edge Plot



Graph 3: Radiated Upper Band Edge Plot

5.6 §15.247(e) Maximum Average Power Spectral Density

All chains were measured and summed under the guidance of KDB 558074 Section 8.4. 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 8 dBm in any 3 kHz band during any time interval of continuous transmission. The antenna gain is 4 dBi + Array gain of 3.01 dB which is a total of 7.01 dBi.

Mode	Frequency (MHz)	Measurement (dBm)	Criteria (dBm)
b	2412	2.35	8.0
	2437	1.97	8.0
	2462	1.82	8.0
g	2412	-8.52	8.0
	2437	-6.36	8.0
	2462	-8.87	8.0
n 20	2412	-9.48	8.0
	2437	-7.50	8.0
	2462	-12.35	8.0
n 40	2422	-13.45	8.0
	2437	-12.14	8.0
	2452	-16.15	8.0
ax 20	2412	-11.52	8.0
	2437	-8.48	8.0
	2462	-13.92	8.0
ax 40	2422	-14.35	8.0
	2437	-13.06	8.0
	2452	-16.82	8.0

Result

The maximum average power spectral density was less than the limit of 8 dBm; therefore, the EUT complies with the specification.

-- End of Test Report --