UNIFIED COMPLIANCE LABORATORY

427 West 12800 South
Draper, UT 84020

Test Report

Certification

FCC ID	SWX-U7PRO
ISED ID	6545A-U7PRO
Equipment Under Test	U7-Pro
Test Report Serial Number	TR8556_04
Date of Test(s)	31 August; 5, 8, 19 September and 12, 16 October 2023
Report Issue Date	12 December 2023

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

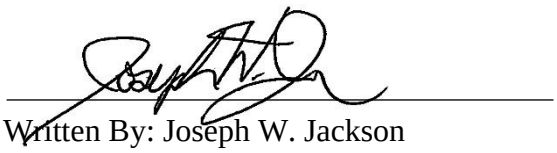
This report has been prepared by Unified Compliance Laboratory (UCL) to document compliance of the device described below with the requirement of Federal Communication Commissions (FCC) Part 15, Subpart E. This report may be reproduced in full. Partial reproduction of this report may only be made with 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	U7-Pro
FCC ID	SWX-U7PRO
ISED ID	6545A-U7PRO

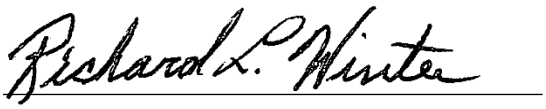
On this 12th day of December 2023, I individually and for Unified Compliance Laboratory certify that the statements made in this engineering report are true, complete and correct to the best of my knowledge and are made in good faith.

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	17 October 2023
02	Amend Sections 5.1 and 5.6	24 October 2023
03	Update Section 5.7	1 December 2023
04	Added CBP Test Equipment to Section 4, RE diagrams to Section 4.3, RU test Data to section 5.6, updated CBP test procedure to include 0dBi antenna gain in section 5.7	12 December 2023

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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-PRO
Serial Number	9AZ 003
Dimensions (cm)	20.6 x 20.6 x 4.6

2.2 Description of EUT

The U7-Pro is WiFi 7 access point that represents the next generation of competitively priced, prosumer wireless technology for home and enterprise users. The U7-Pro provides high aggregate throughput speeds. The U7-Pro transmit in the 2.4 GHz, 5 GHz and 6 GHz frequency bands and uses integrated antennas. The U7-Pro is powered from an 802.3at power adapter.

Band	Modulation Bandwidth	Frequency (MHz)	Maximum Power Setting
UNII-8	ax (HE 20)	6895, 6915, 6935, 6955, 6975, 6995, 7015, 7035, 7055, 7075, 7095, 7115	TP10
	ax (HE 40)	6925, 6945, 6965, 6985	TP13
		7005, 7025, 7045, 7065, 7085	TP13
	ax (HE 80)	6945, 7025	TP16
	ax (HE 160)	6985	TP19
	be (EHT 20)	6895, 6915, 6935, 6955, 6975, 6995, 7015, 7035, 7055, 7075, 7095, 7115	TP10
	be (EHT 40)	6925, 6945, 6965, 6985	TP13
		7005, 7025, 7045, 7065, 7085	TP14
	be (EHT 80)	6945, 7025	TP16
	be (EHT 160)	6985	TP16
	be (EHT 320)	6905	TP20

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	Description	Name of Interface Ports / Interface Cables

Serial Number		
BN: UBIQUITI MN: U7-Pro SN: 9AZ 003	WiFi Access Point	See Section 2.4
BN: UBIQUITI MN: U-POE-at SN: N/A	PoE Power Adapter	Unshielded Cat 5e cable/1 meters
BN: Dell MN: XPS 13 SN: N/A	Laptop Personal Computer	Unshielded Cat 5e cable/1 meters

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	3 conductor power cord/80 cm
POE (POE Injector)	1	Unshielded Cat 5e cable/8 meters
LAN (POE Injector)	1	Unshielded Cat 5e cable/1 meters

2.5 Operating Environment

Power Supply	120 Volts AC Mains to 48 Volts PoE
AC Mains Frequency	60 Hz
Temperature	24.5 – 26.9 °C
Humidity	30.4 – 35.3 %
Barometric Pressure	1021 mBar

2.6 Operating Modes

The U7-Pro was tested using test software in order to enable to constant transmission. The measurements within this report are corrected to reference a 100% duty cycle. All emission modes of 802.11ax/be were investigated. All measurements are reported with the worst-case mode (802.11be) 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

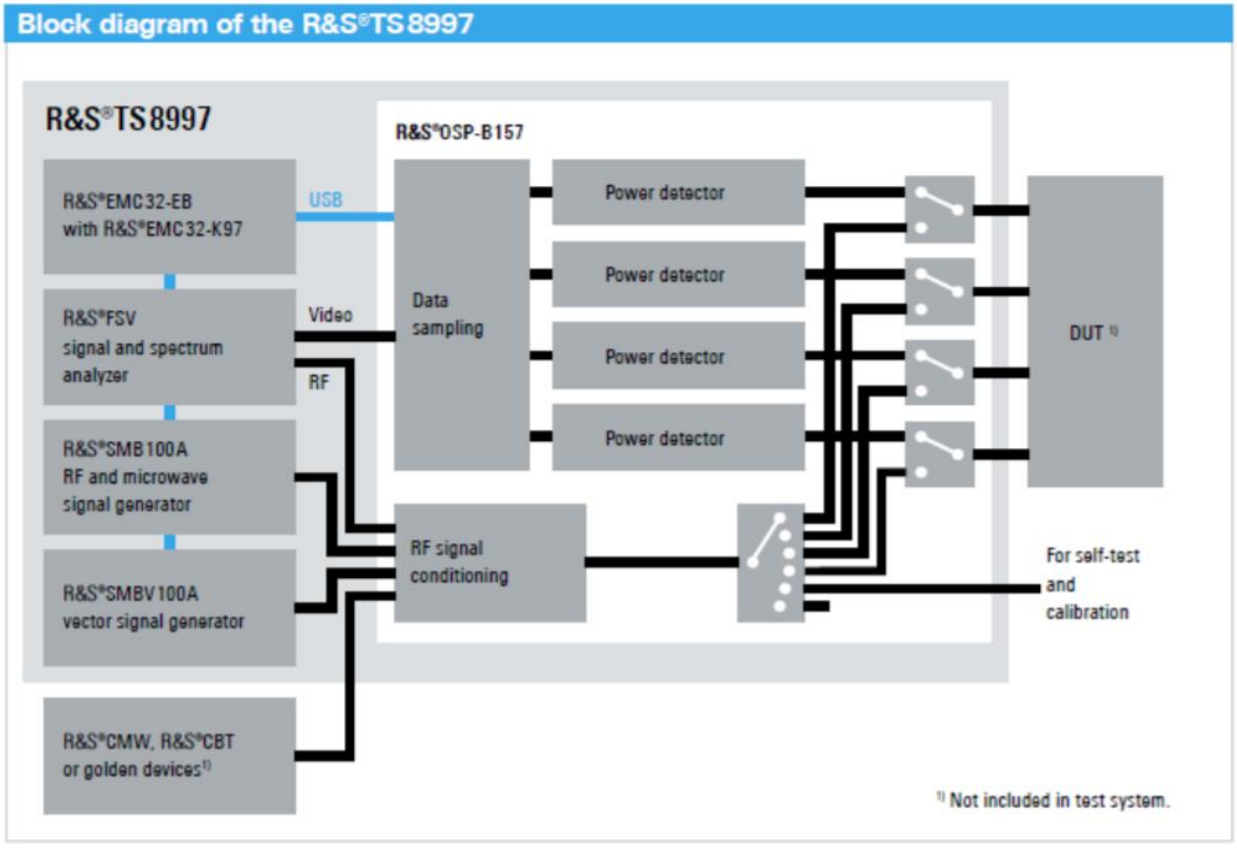


Diagram 1: Test Configuration Block Diagram

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
15.203	N/A	Antenna requirements	Structural Requirement	Compliant
15.207	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	6875 to 7115	Compliant
15.407(e)	RSS-247 §6.2.2, §6.2.3	Peak Output Power[1]	6875 to 7115	Compliant
15.407(f)	RSS-247 §6.2.2, §6.2.3	Antenna Conducted Spurious Emissions[1]	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[1]	6875 to 7115	Compliant
15.407(d)	RSS-247 §6.2.2, §6.2.3	Contention Based Protocol	6875 to 7115	Compliant
The testing was performed according to the procedures in ANSI C63.10-2013, KDB 789033, KDB 987594 and 47 CFR Part 15. Where applicable, KDB 662911 was followed to sum required measurements. Note [1]: Various RU modes were considered for RF Power, PSD, and Spurious Emissions, and the "single client" RU mode is the worst case - the results herein are "single client" RU mode.				

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 2024. 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 2024.

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	2/22/2023	2/22/2024
LISN	AFJ	LS16C/10	UCL-6749	12/6/2021	12/6/2023
ISN	Teseq	ISN T800	UCL-2974	6/27/2022	6/27/2024
LISN	Com-Power	LIN-120C	UCL-2612	1/24/2023	1/24/2024
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

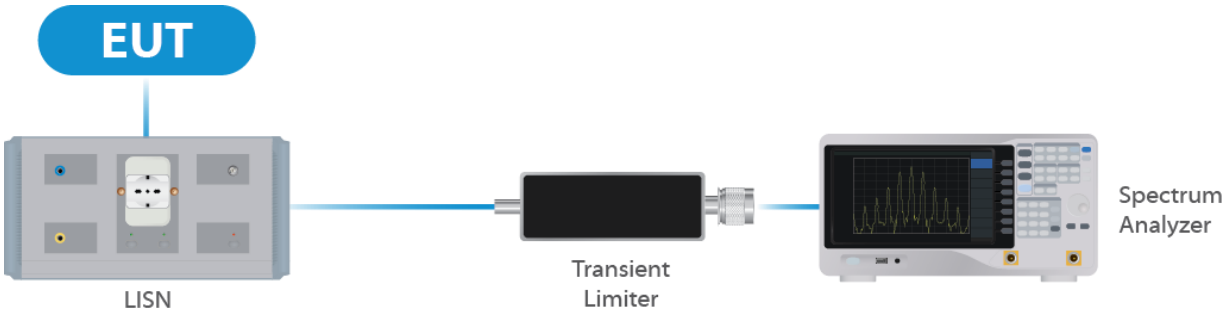


Figure 1: Conducted Emissions Test

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	11/7/2022	11/7/2023
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	2/22/2023	2/22/2024
Switch Extension	R&S	OSP-150W	UCL-2870	2/22/2023	2/22/2024

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

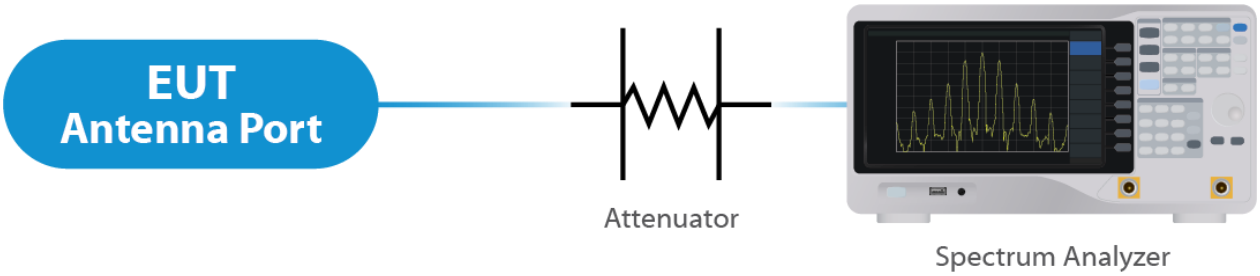


Figure 2: Direct Connect at the Antenna Port Test

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	1/27/2023	1/27/2024
Pre-Amplifier 9 kHz – 1 GHz	Sonoma Instruments	310N	UCL-2889	10/7/2021	10/7/2023
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3062	9/13/2022	9/13/2024
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3071	6/08/2022	6/22/2024
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	6/09/2022	6/09/2024
1 – 18 GHz Amplifier	Com-Power	PAM 118A	UCL-3833	12/9/2022	12/9/2023
Test Software	UCL	Revision 1	UCL-3108	N/A	N/A

Table 3: List of equipment used for Radiated Emissions

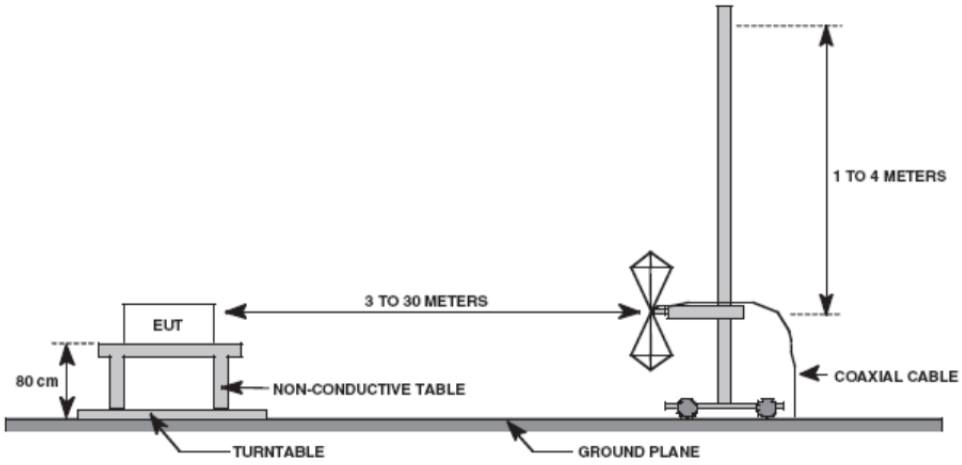


Figure 3a: Radiated Emissions Test 30-1000MHz

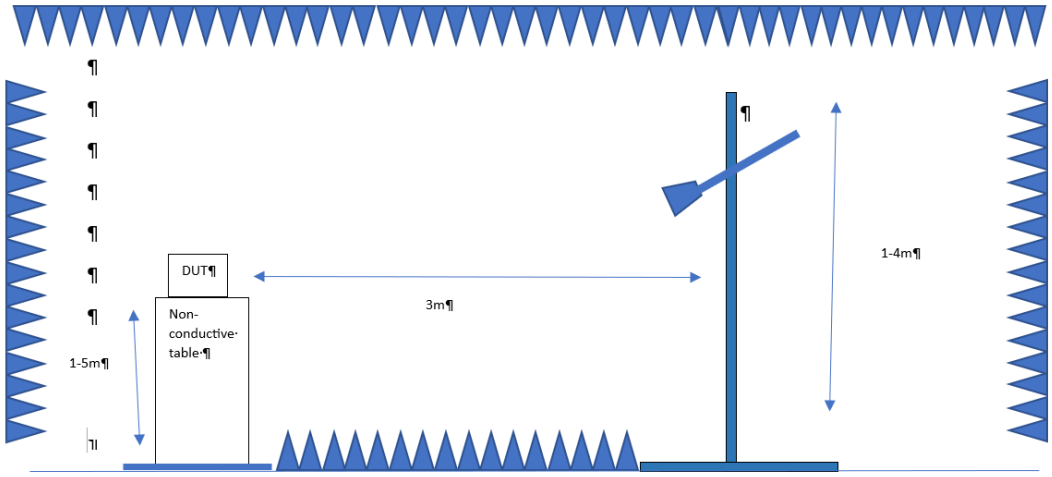


Figure 3b: Radiated Emissions Test Above 1GHz

4.4 Contention Base Protocol Tests

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
Spectrum Analyzer	Keysight	N9010B EXA	UCL-7069	4/25/2023	4/25/2024
Signal Generator	Keysight	MXG-B	UCL-6291	6/29/2023	6/29/2024
MIMO Test Set	Keysight	X8750A	UCL-7373	9/19/2023	9/19/2024

Table 4: List of equipment used for Direct Connect at the Antenna Port

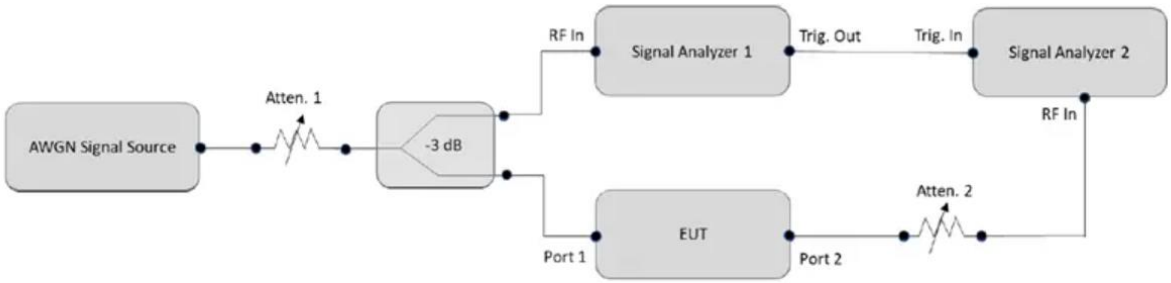


Figure 1. CBP conducted test setup diagram. Source: KDB 987594 D02 V01r01

Figure 4: Contention Base Protocol Test

4.5 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.

4.6 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 a integrated antenna. Per the manufacturer, the Maximum gain of the antenna per chain is 5.8 dBi. This is an 802.11 device and utilizes CDD as described in KDB 662911 D01. The antenna is not user replaceable.

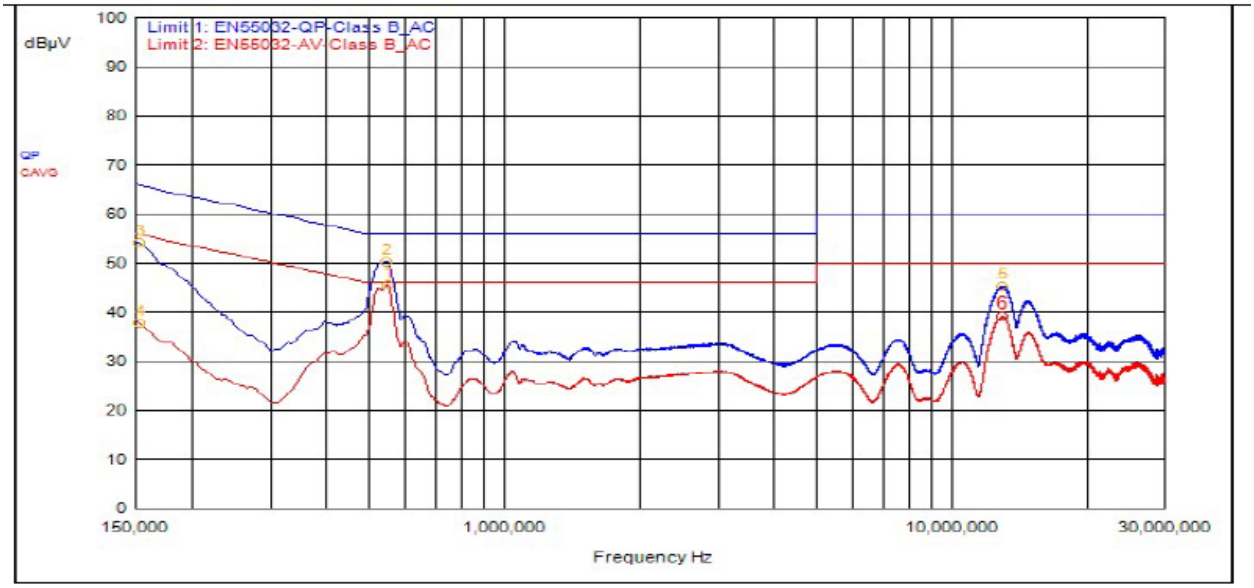
For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for NANT ≤ 4;
For PSD measurements when Nss=1: Array Gain = 10 log(NANT/NSS) dB = 3.01 dB

Results

The EUT complied with the specification

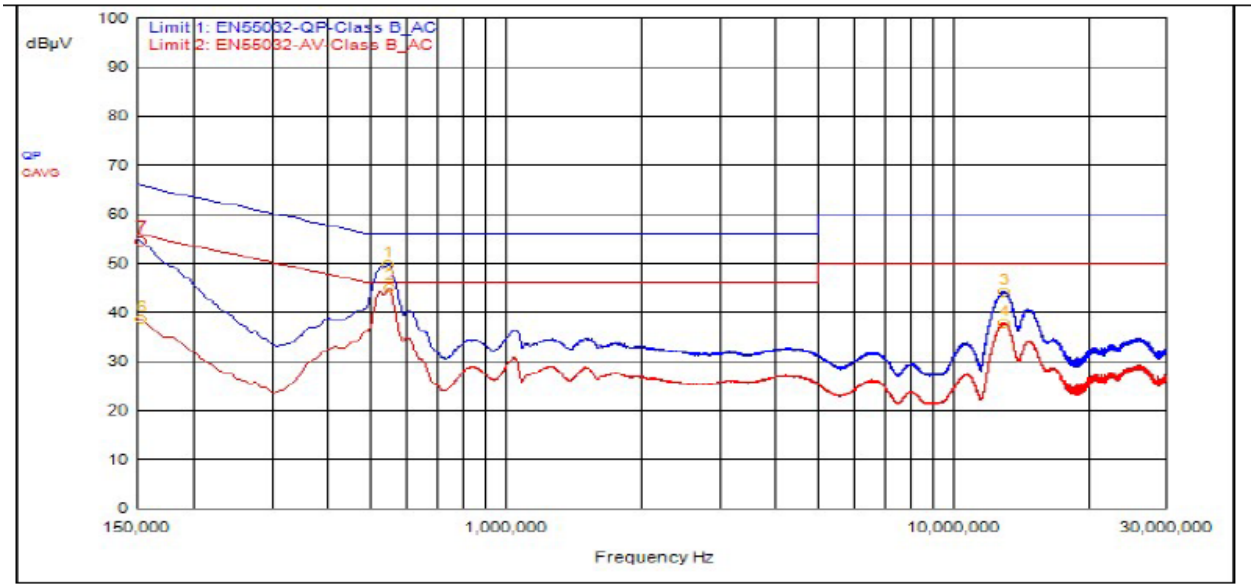
5.2 Conducted Emissions at Mains Ports Data

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
2	546,000kHz	12.23	0.00		QPeak	38.16	50.39	56.00	-5.61			
3	153,000kHz	12.26	0.00		QPeak	41.82	54.08	65.84	-11.76			
5	12.996	12.27	0.00		QPeak	33.02	45.29	60.00	-14.71			
1	549,000kHz	12.23	0.00		C_AVG	33.22	45.45			46.00	-0.55	
4	153,000kHz	12.26	0.00		C_AVG	25.61	37.87			55.84	-17.96	
6	12.981	12.27	0.00		C_AVG	26.77	39.04			50.00	-10.96	

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	546,000kHz	12.18	0.00		QPeak	37.58	49.76	56.00	-6.24			
5	150,000kHz	12.21	0.00		QPeak	42.89	55.10	66.00	-10.90			
7	153,000kHz	12.21	0.00		QPeak	42.12	54.33	65.84	-11.50			
3	12.993	12.29	0.00		QPeak	31.97	44.26	60.00	-15.74			
2	549,000kHz	12.18	0.00		C_AVG	32.76	44.94			46.00	-1.06	
4	12.966	12.29	0.00		C_AVG	25.48	37.77			50.00	-12.23	
6	153,000kHz	12.21	0.00		C_AVG	26.39	38.60			55.84	-17.24	

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)	26 dB Bandwidth (MHz)
ax 20	6895	19.1	23.0
ax 20	7015	19.1	23.1
ax 20	7115	19.1	22.7
ax 40	6925	38.0	42.6
ax 40	7005	38.3	43.8
ax 40	7085	38.3	44.4
ax 80	6945	78.0	91.5
ax 80	7025	78.0	87.5
ax 160	6985	158.0	167.0
be 20	6895	19.1	23.6
be 20	7015	19.1	22.9
be 20	7115	19.1	23.3
be 40	6925	38.3	43.2
be 40	7005	38.3	44.0
be 40	7085	38.3	44.7
be 80	6945	78.0	88.5
be 80	7025	78.0	87.0
be 160	6985	157.0	169.0
be 320	6905	317.5	343.2

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)(3) 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 22.82 dBm or 191.43 mW. The limit is 30 dBm EIRP, or 1 Watt EIRP. The antenna has a gain of 5.8 dBi. When N_{ss} =1, the EUT has a beamforming composite gain of G_{ant} +10log(N_{ANT} /N_{SS}) = 8.81 dBm.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power *	EIRP	Measured PSD
EHT 20	6895	Mcs0_Nss2	10	12.45	18.25	-1.48
EHT 20	7015	Mcs0_Nss2	10	12.50	18.30	-1.55
EHT 20	7115	Mcs0_Nss2	10	11.76	17.56	-1.60
EHT 40	6925	Mcs0_Nss2	13	15.54	21.34	-1.50
EHT 40	7005	Mcs0_Nss2	13	15.27	21.07	-1.61
EHT 40	7085	Mcs0_Nss2	14	15.78	21.58	-0.95
EHT 80	6945	Mcs0_Nss2	16	18.51	24.31	-1.43
EHT 80	7025	Mcs0_Nss2	16	18.14	23.94	-1.44
EHT 160	6985	Mcs0_Nss2	19	21.38	27.18	-1.22
EHT 320	6905	Mcs0_Nss2	20	22.82	28.62	-2.70

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power *	EIRP	Measured PSD
EHT 20	6895	Mcs0_Nss1	7	9.46	15.26	-4.45
EHT 20	7015	Mcs0_Nss1	7	9.38	15.18	-4.72
EHT 20	7115	Mcs0_Nss1	7	8.67	14.47	-4.73
EHT 40	6925	Mcs0_Nss1	11	13.39	19.19	-3.68
EHT 40	7005	Mcs0_Nss1	11	13.06	18.86	-3.77

EHT 40	7085	Mcs0_Nss1	11	12.88	18.68	-3.65
EHT 80	6945	Mcs0_Nss1	13	15.51	21.31	-4.44
EHT 80	7025	Mcs0_Nss1	14	16.24	22.04	-3.68
EHT 160	6985	Mcs0_Nss1	16	18.65	24.45	-4.01
EHT 320	6905	Mcs0_Nss1	19	21.77	27.57	-3.85

Result

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

5.5 §15.407(b)(7) 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 5.8 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 attenuated below the limit; therefore, the EUT complies with the specification.

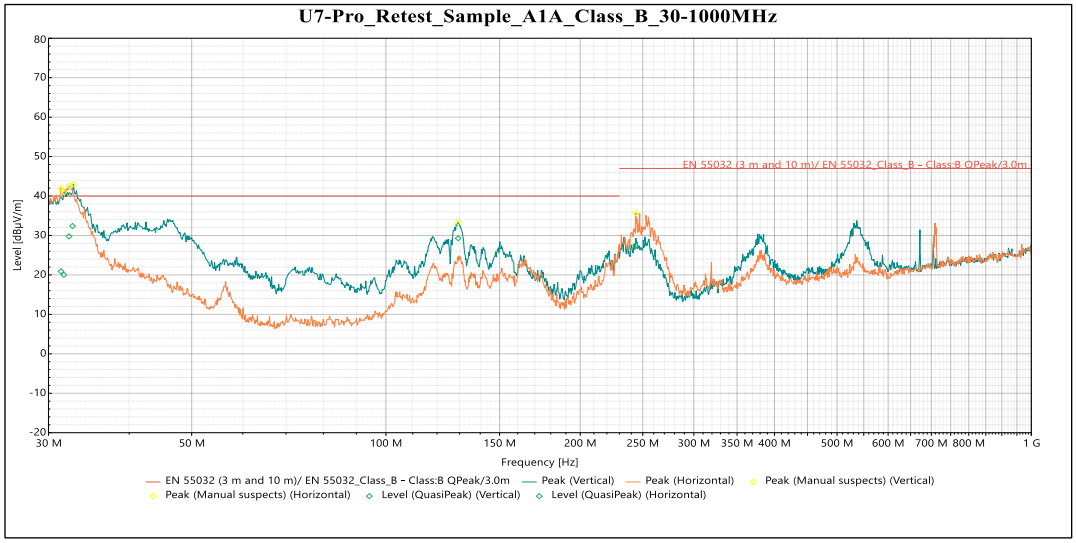
5.5.2 Radiated Spurious Emissions in the Restricted Bands of § 15.205

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 TP20.

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

Result

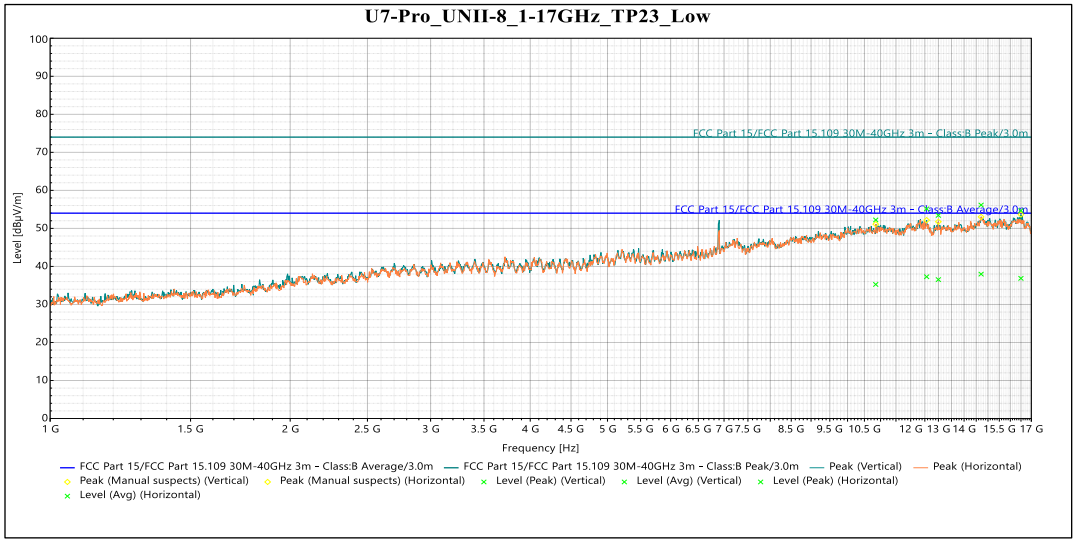
All emissions in the restricted bands of § 15.205 met the limits specified in § 15.209; therefore, the EUT complies with the specification. See Annex for Conducted Band edge plots.



QuasiPeak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
31.692 MHz	20.029	40	-19.971	69	2.759	Vertical	-8.569
32.681 MHz	32.403	40	-7.597	199	1	Vertical	-9.148
129.41 MHz	29.287	40	-10.713	341	1.138	Vertical	-14.232
31.369 MHz	20.912	40	-19.088	251	1.143	Horizontal	-8.51
32.273 MHz	29.759	40	-10.241	50	3.298	Horizontal	-8.831
243.82 MHz	27.376	47	-19.624	278	1.52	Horizontal	-15.915

Table 5: Radiated Emissions 30 – 1000 MHz



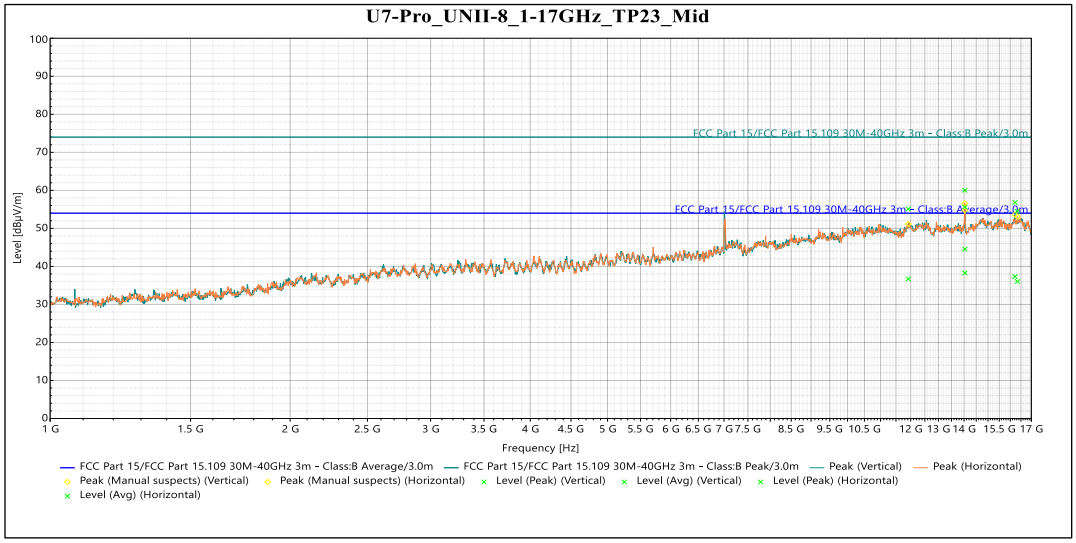
Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
12.566 GHz	55.141	74	-18.859	338	1.643	Vertical	16.676
16.498 GHz	54.67	74	-19.33	253	1.997	Vertical	18.277
10.848 GHz	52.223	74	-21.777	182	3.974	Horizontal	14.825
12.999 GHz	53.418	74	-20.582	227	2.04	Horizontal	16.858
14.706 GHz	56.136	74	-17.864	308	2.902	Horizontal	17.394

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
12.566 GHz	37.281	54	-16.719	338	1.643	Vertical	16.676
16.498 GHz	36.859	54	-17.141	253	1.997	Vertical	18.277
10.848 GHz	35.256	54	-18.744	182	3.974	Horizontal	14.825
12.999 GHz	36.53	54	-17.47	227	2.04	Horizontal	16.858
14.706 GHz	37.965	54	-16.035	308	2.902	Horizontal	17.394

Table 6: Radiated Emissions 1 – 17 GHz Lowest Frequency



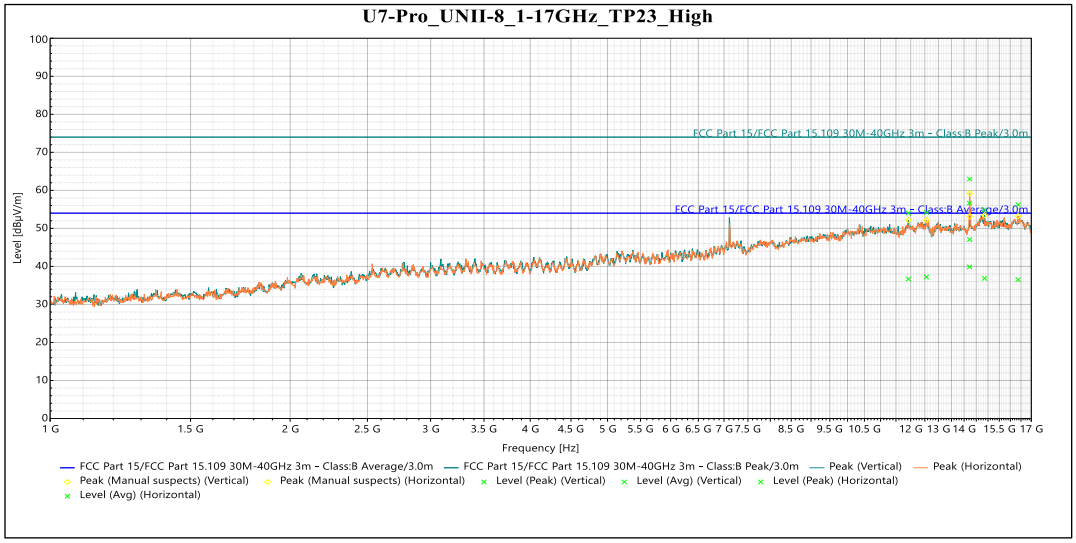
Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
14.032 GHz	55.613	74	-18.387	2	1.643	Vertical	15.127
16.218 GHz	56.806	74	-17.194	314	2.721	Vertical	17.785
11.919 GHz	55.1	74	-18.9	146	2.716	Horizontal	16.532
14.03 GHz	60.015	74	-13.985	33	3.078	Horizontal	15.147
16.333 GHz	54.512	74	-19.488	261	2.747	Horizontal	17.215

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
14.032 GHz	38.288	54	-15.712	2	1.643	Vertical	15.127
16.218 GHz	37.322	54	-16.678	314	2.721	Vertical	17.785
11.919 GHz	36.707	54	-17.293	146	2.716	Horizontal	16.532
14.03 GHz	44.541	54	-9.459	33	3.078	Horizontal	15.147
16.333 GHz	36.045	54	-17.955	261	2.747	Horizontal	17.215

Table 7: Radiated Emissions 1 – 17 GHz Middle Frequency



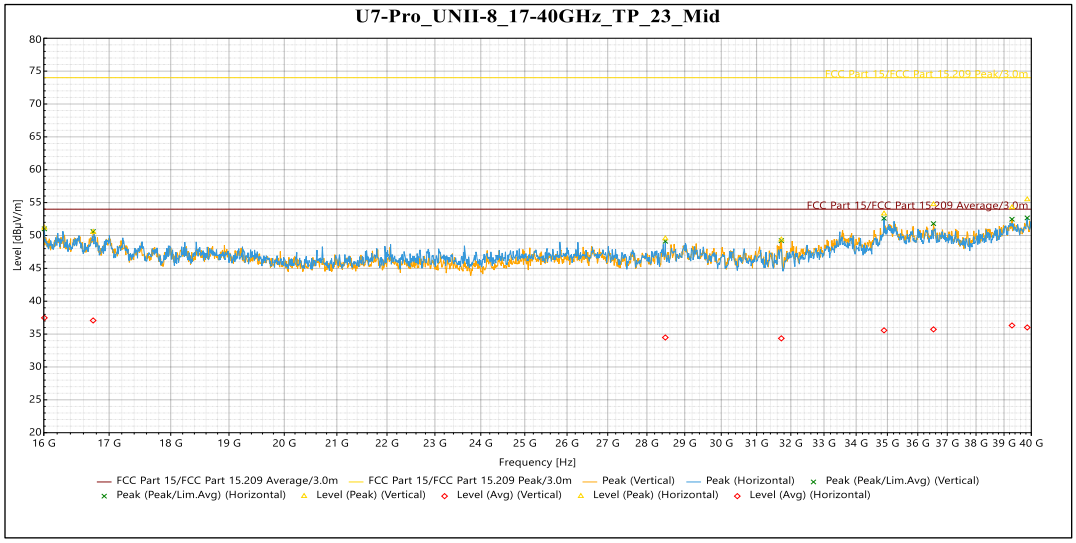
Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
11.921 GHz	54.018	74	-19.982	322	1.643	Vertical	16.529
14.222 GHz	56.635	74	-17.365	58	1.643	Vertical	15.468
14.851 GHz	54.871	74	-19.129	222	1.638	Vertical	16.457
12.559 GHz	54.198	74	-19.802	109	1.638	Horizontal	16.656
14.227 GHz	62.977	74	-11.023	11	2.358	Horizontal	15.494
16.363 GHz	56.235	74	-17.765	17	3.259	Horizontal	17.481

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
11.921 GHz	36.673	54	-17.327	322	1.643	Vertical	16.529
14.222 GHz	39.886	54	-14.114	58	1.643	Vertical	15.468
14.851 GHz	36.845	54	-17.155	222	1.638	Vertical	16.457
12.559 GHz	37.187	54	-16.813	109	1.638	Horizontal	16.656
14.227 GHz	47.067	54	-6.933	11	2.358	Horizontal	15.494
16.363 GHz	36.515	54	-17.485	17	3.259	Horizontal	17.481

Table 8: Radiated Emissions 1 – 17 GHz Highest Frequency



Peak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
16.75 GHz	50.53	74	-23.47	328	Vertical	0.897
31.72 GHz	49.375	74	-24.625	172	Vertical	1.487
36.529 GHz	54.731	74	-19.269	217	Vertical	5.196
39.289 GHz	54.261	74	-19.739	302	Vertical	6.611
16.009 GHz	51.177	74	-22.823	176	Horizontal	3.816
28.483 GHz	49.542	74	-24.458	142	Horizontal	-0.972
34.891 GHz	53.308	74	-20.692	337	Horizontal	5.417
39.85 GHz	55.477	74	-18.523	101	Horizontal	7.041

Avg

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
16.75 GHz	37.068	54	-16.932	328	Vertical	0.897
31.72 GHz	34.355	54	-19.645	172	Vertical	1.487
36.529 GHz	35.72	54	-18.28	217	Vertical	5.196
39.289 GHz	36.31	54	-17.69	302	Vertical	6.611
16.009 GHz	37.472	54	-16.528	176	Horizontal	3.816
28.483 GHz	34.478	54	-19.522	142	Horizontal	-0.972
34.891 GHz	35.574	54	-18.426	337	Horizontal	5.417
39.85 GHz	36.013	54	-17.987	101	Horizontal	7.041

Table 9: Radiated Emissions 17 – 40 GHz 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 5 dBm EIRP in any 1 MHz band during any time interval of continuous transmission. As per KDB 662911, When the EUT is using spatial-multiplexing in HE modes, there is not additional array gain to accommodate. When the EUT uses Nss=1 data rates, the antenna gain is 5.8 dBi + Array gain of 3.01 dB which is a total of 8.81 dBi.
Results of this testing are summarized.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power *	Measured PSD
EHT 20	6895	Mcs0_Nss2	10	12.45	-1.48
EHT 20	7015	Mcs0_Nss2	10	12.50	-1.55
EHT 20	7115	Mcs0_Nss2	10	11.76	-1.60
EHT 40	6925	Mcs0_Nss2	13	15.54	-1.50
EHT 40	7005	Mcs0_Nss2	13	15.27	-1.61
EHT 40	7085	Mcs0_Nss2	14	15.78	-0.95
EHT 80	6945	Mcs0_Nss2	16	18.51	-1.43
EHT 80	7025	Mcs0_Nss2	16	18.14	-1.44
EHT 160	6985	Mcs0_Nss2	19	21.38	-1.22
EHT 320	6905	Mcs0_Nss2	20	22.82	-2.70

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power *	Measured PSD
EHT 20	6895	Mcs0_Nss1	7	9.46	-4.45
EHT 20	7015	Mcs0_Nss1	7	9.38	-4.72
EHT 20	7115	Mcs0_Nss1	7	8.67	-4.73

EHT 40	6925	Mcs0_Nss1	11	13.39	-3.68
EHT 40	7005	Mcs0_Nss1	11	13.06	-3.77
EHT 40	7085	Mcs0_Nss1	11	12.88	-3.65
EHT 80	6945	Mcs0_Nss1	13	15.51	-4.44
EHT 80	7025	Mcs0_Nss1	14	16.24	-3.68
EHT 160	6985	Mcs0_Nss1	16	18.65	-4.01
EHT 320	6905	Mcs0_Nss1	19	21.77	-3.85

Result

The maximum average power spectral density was less than the limit of 5 dBm EIRP; therefore, the EUT complies with the specification.

5.6.1 OFDMA RU Check

If EUT supports OFDMA multiple partial Resource Unit (RU) configurations were verified and the worst case mode was tested.

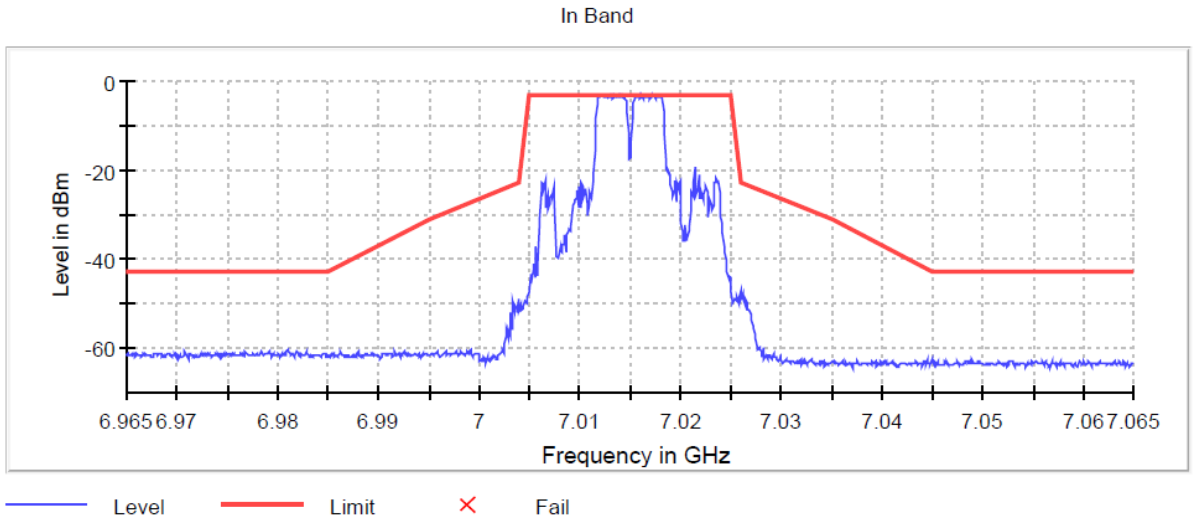


Figure 5: 7015 20MHz RU Vérification - Center

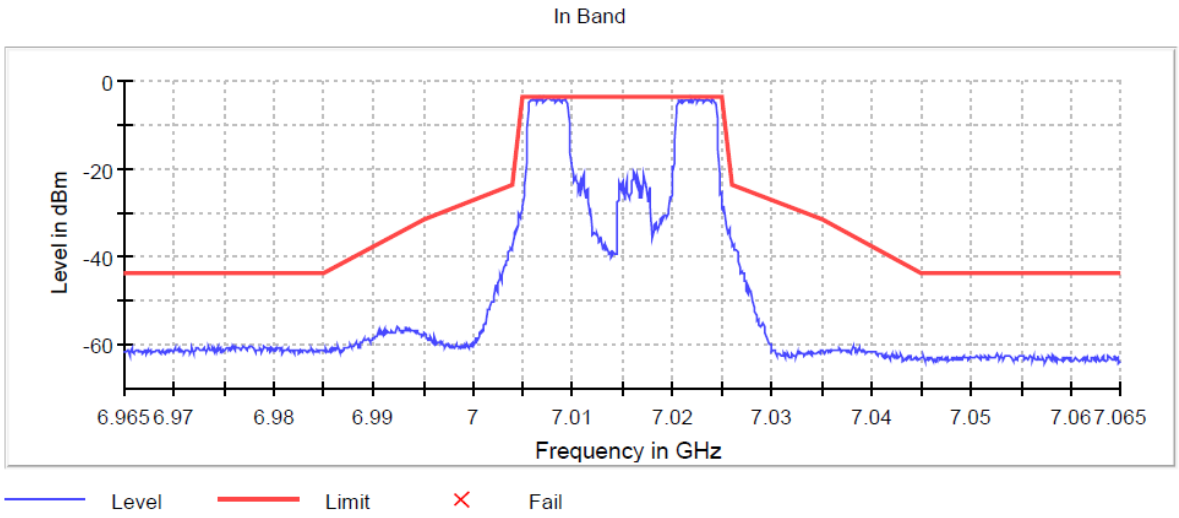


Figure 6: 7015 20MHz RU Vérification - Edge

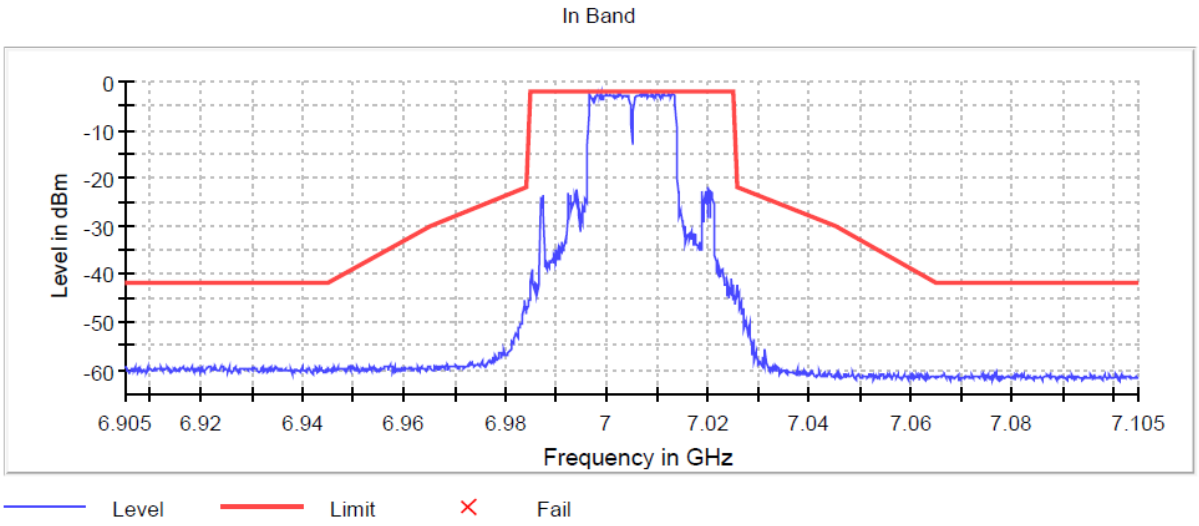


Figure 7: 7005 40MHz RU Vérification - Center

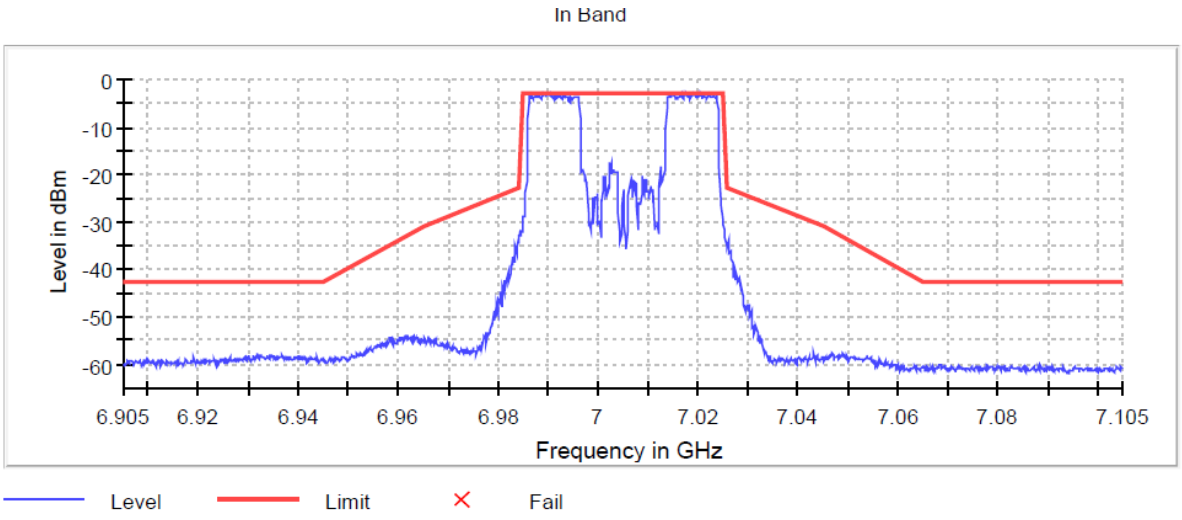


Figure 8: 7005 40MHz RU Vérification - Edge

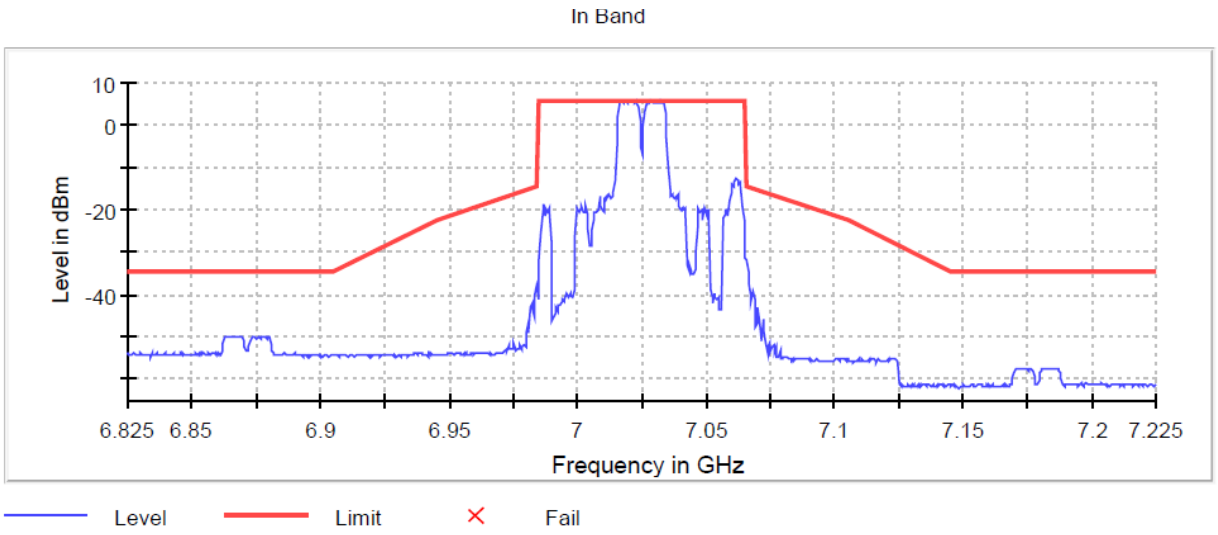


Figure 9: 7025 80MHz RU Vérification - Center

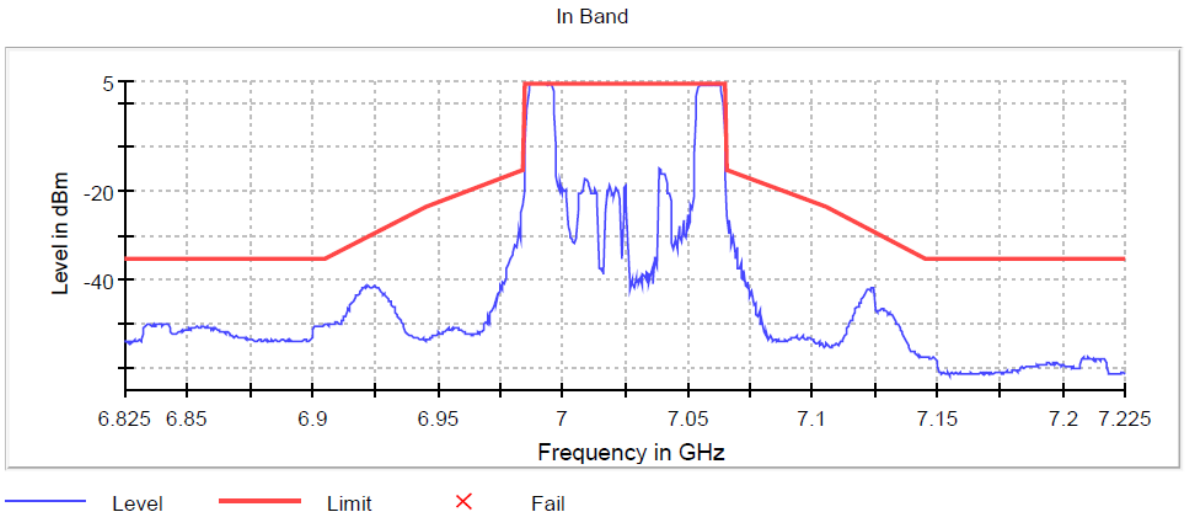


Figure 10: 7025 80MHz RU Vérification - Edge

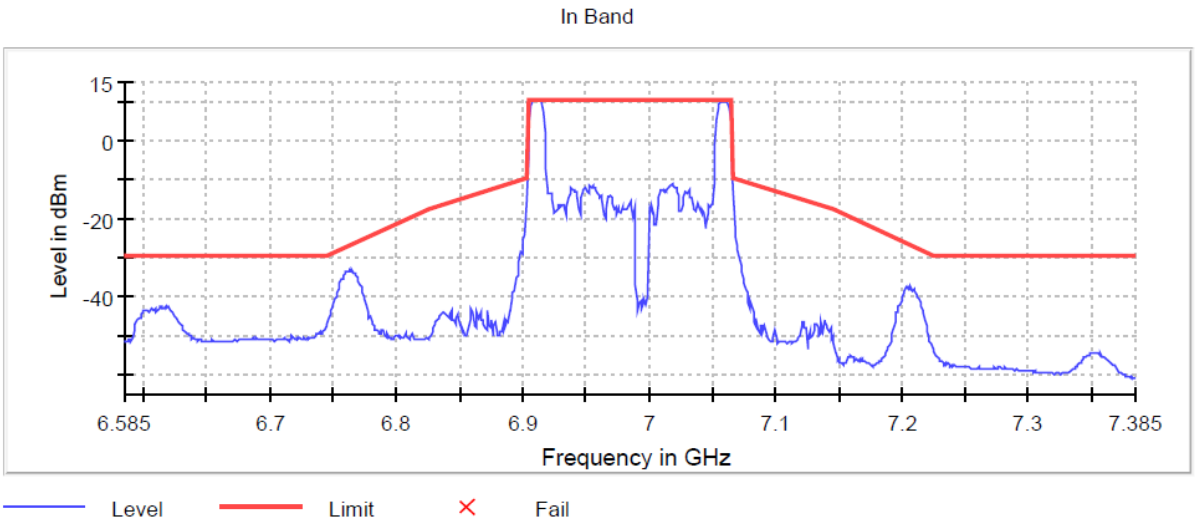


Figure 11: 6985 160MHz RU Vérification - Edge

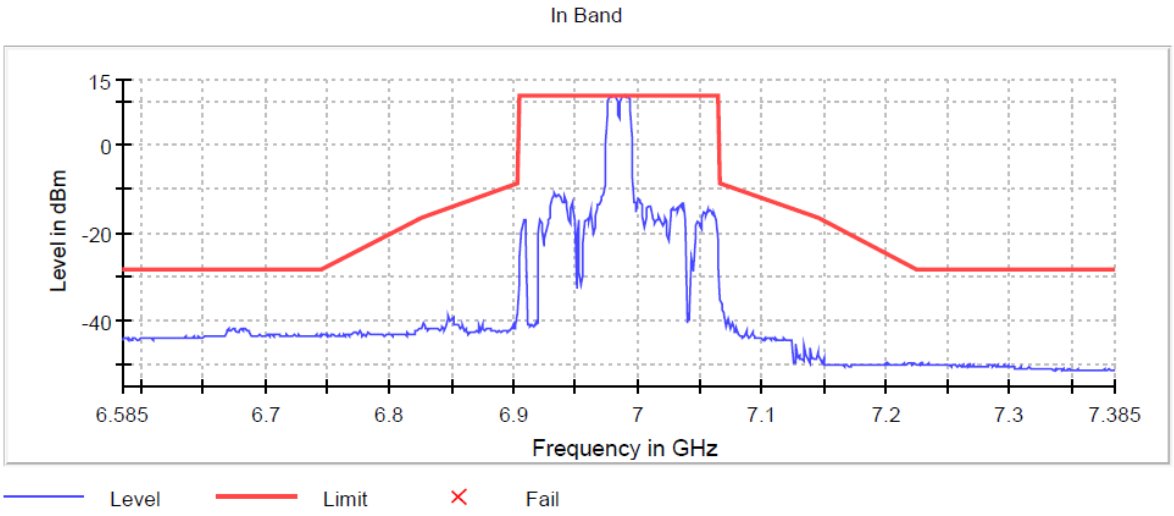


Figure 12: 6985 160MHz RU Vérification - Center

5.7 §15.407(d) Contention Based Protocol

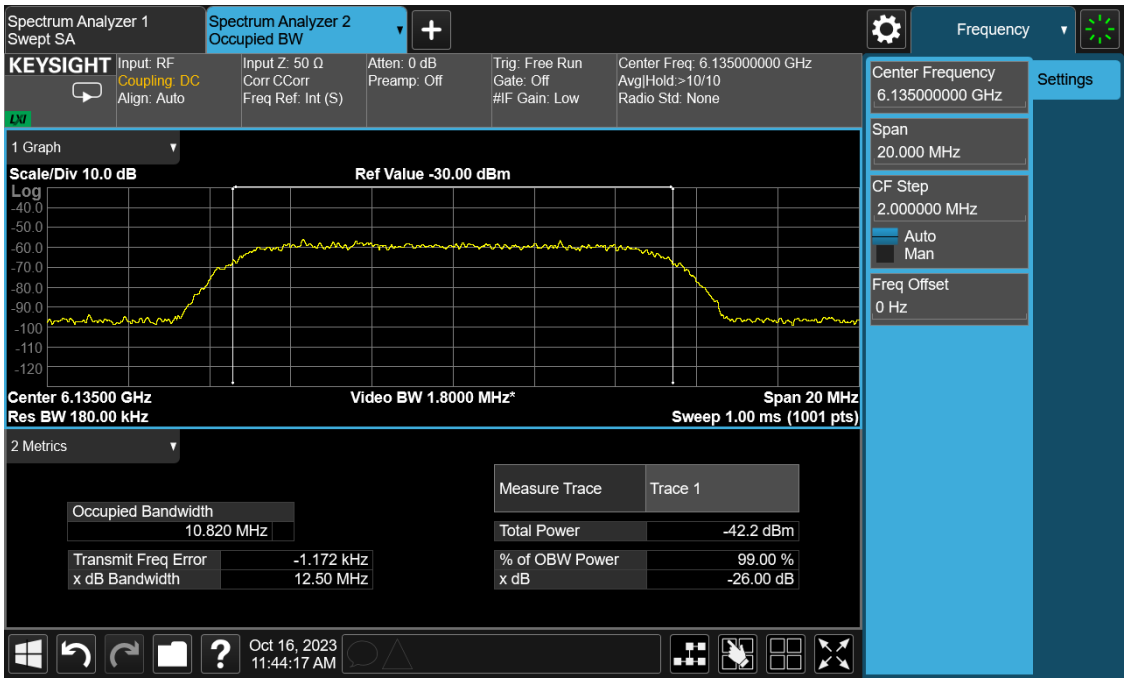
This product was tested and found to be compliant with the requirements of Contention-based Protocol as specified in FCC Part 15.407 and KDB 987594 D02.

Initially the test setup was connected directly to the signal source with all splitters (splitters terminated with a 50-ohm loads on unused ports) and cables in place to verify the AWGN signal is 10MHz wide at a signal level of less than or equal to -82dBm and for conducted measurements the threshold was adjusted for an antenna gain for 0dBi. The level at the signal generator required to achieve the required signal level at the DUT was recorded for use during testing.

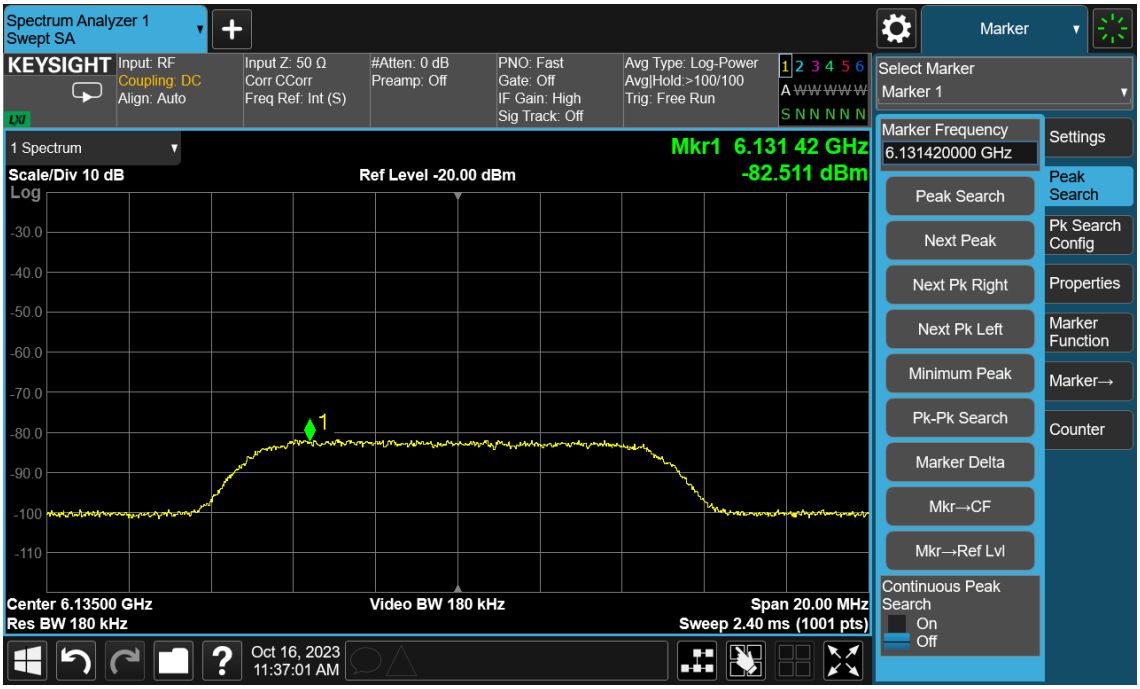
The DUT was connected as shown in figure 4 above and set to transmit at a constant duty cycle at each frequency and bandwidth noted in the table below and verified to be communicating with the companion device as intended.

Starting at the levels established above, the AWGN signal was introduced to the DUT and increased to determine a threshold level at where the DUT will terminate with at least a 90% detection rate. The level at the DUT, which the 90% detection rate was achieved was recorded as the “Sensitivity Level” below.

Testing shall be repeated at each applicable channel and bandwidth as noted in Table 1 of KDB 987594 D02.



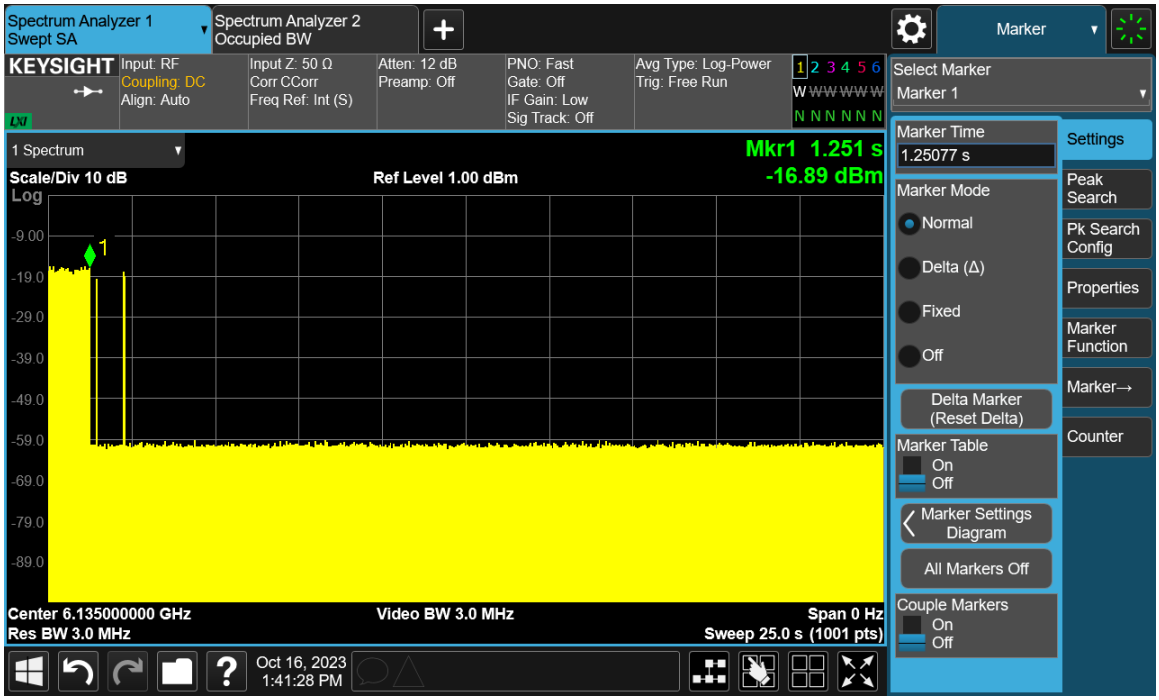
Plot 1: Signal BW Details



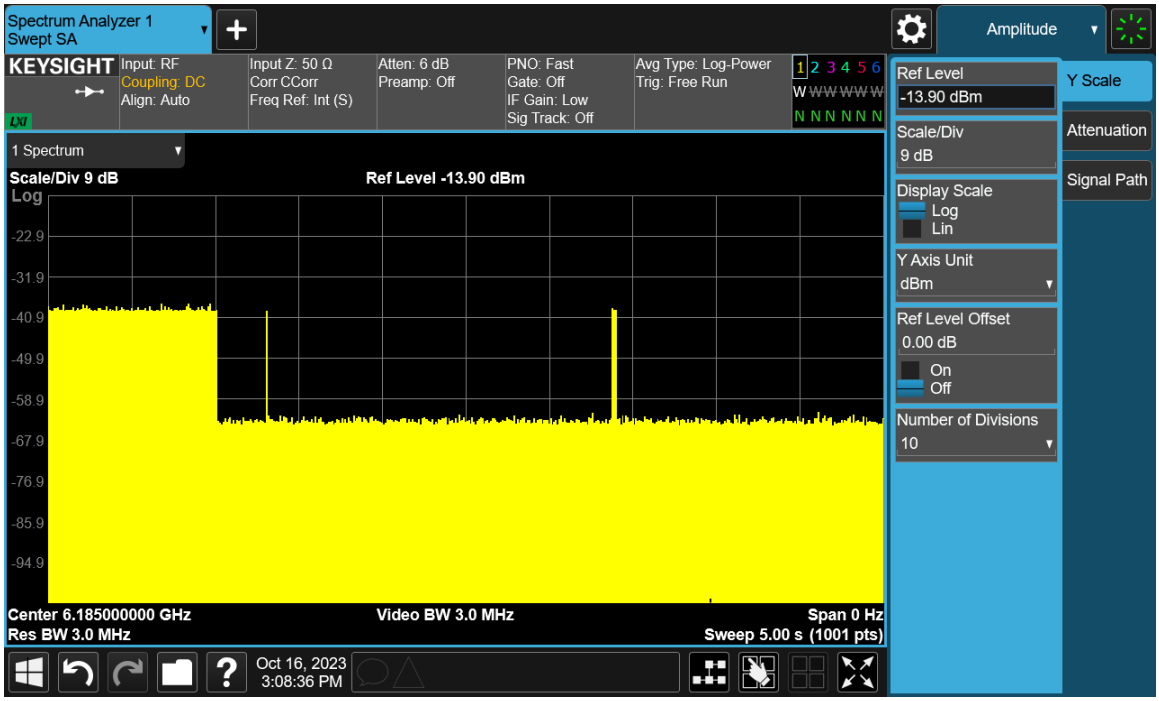
Plot 2: AWGN Signal Level Details

Band	BW_{EUT}	F_{c1}	F_{c2}	Signal Power Level (dBm)	Detection Rate (%)	Margin (dB)
UNII-5 5.925 - 6.425GHz	20	6135	6135	-73	100	16.8
	160	6185	6110	-76	100	19.8
			6185	-75	100	18.8
			6260	-76	100	19.8
	320	6265	6110	-58	100	1.8
			6265	-60	100	3.8
			6410	-57	100	0.8
UNII-6 6.425 - 6.525GHz	20	6455	6455	-73	100	16.8
	160	6505	6430	-76	100	19.8
			6505	-72	100	15.8
			6580	-72	100	15.8
UN1I-7 6.525 - 6.875GHz	20	6695	6695	-72	100	15.8
	160	6665	6590	-68	100	11.8
			6665	-62	100	5.8
			6740	-72	100	15.8
	320	6745	6590	-59	100	2.8
			6745	-64	100	7.8
			6860	-60	100	3.8
UNII-8 6.875 - 7.125GHz	20	7015	7015	-76	100	19.8
	160	6985	6910	-70	100	13.8
			6985	-70	100	13.8
			7060	-73	100	16.8

Table 10: Trial Table



Plot 3: 20MHz Example Detection Trace



Plot 4: 160MHz Example Detection Trace

-- End of Test Report –