UNIFIED COMPLIANCE LABORATORY

427 West 12800 South
Draper, UT 84020

Test Report

Certification

FCC ID	SWX-UAHOTEL
IC ID	6545A-UAHOTEL
Equipment Under Test	UA-Hotel-R and UA-Hotel-L
Test Report Serial Number	TR5734_02
Date of Test(s)	18 December 2020 and 14 January 2021
Report Issue Date	15 January 2021

Test Specification	Applicant
47 CFR FCC Part 15, Subpart C RSS-210	Ubiquiti Inc. 685 Third Avenue New York, NY 10019 U.S.A.

NVLAP TESTING ilac-MRA

NVLAP LAB CODE 600241-0

Certification of Engineering Report

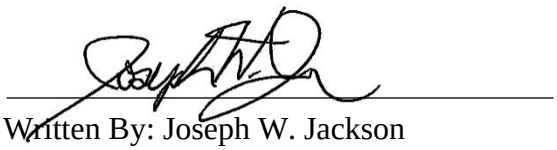
This report has been prepared by Unified Compliance Laboratory (UCL) to document compliance of the device described below with the requirement of Federal Communication Commissions (FCC) Part 15, Subpart C. This report may be reproduced in full. Partial reproduction of this report may only be made with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

Applicant	Ubiquiti Inc.
Manufacturer	Ubiquiti Inc.
Brand Name	UniFi
Model Number	UA-Hotel-R and UA-Hotel-L
FCC ID	SWX-UAHOTEL
IC ID	6545A-UAHOTEL

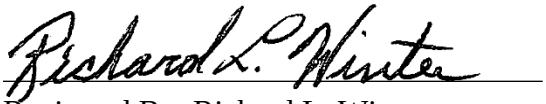
On this 15th day of January 2021, I individually and for Unified Compliance Laboratory certify that the statements made in this engineering report are true, complete and correct to the best of my knowledge and are made in good faith.

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	15 January 2021
02	Amend Standard References and Add Temperature Results	20 January 2021

Table of Contents

1 Client Information

1.1 Applicant

Company	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
Contact Name	Mark Feil
Title	Compliance Manager

1.2 Manufacturer

Company	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
Contact Name	Mark Feil
Title	Compliance Manager

2 Equipment Under Test (EUT)

2.1 Identification of EUT

Brand Name	UniFi
Model Number	UA-Hotel-R and UA-Hotel-L
Serial Number	FCECDAFF773A
Dimensions (cm)	15.87 x 16.46 x 21.08

2.2 Description of EUT

The UA-Hotel-R and UA-Hotel-L are battery powered NFC smart access door locks designed for the lodging and hospitality industry. The UA-Hotel-R is for a right-handed door while the UA-Hotel-L is for a left-handed door. The UA-Hotel-R was tested as a representative sample of both models. A Bluetooth LE transceiver is included for over the air communication.

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: UniFi MN: UA-Hotel-R (Note 1) SN: FCECDAFF773A	Smart Access Door Lock	See Section 2.4
BN: Dell MN: XPS 13 SN: None	Computer	USB (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
Serial	1	Unshielded/1 meter
USB-C	1	N/A

2.5 Operating Environment

Power Supply	Battery
AC Mains Frequency	N/A
Temperature	17.3 – 23.1 °C
Humidity	17.0 – 20.1 %
Barometric Pressure	1023 mBar

2.6 Operating Modes

The UA-Hotel-R was connected to a personal computer laptop and tested using test software in order to enable to constant transmission of the NFC transceiver.

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

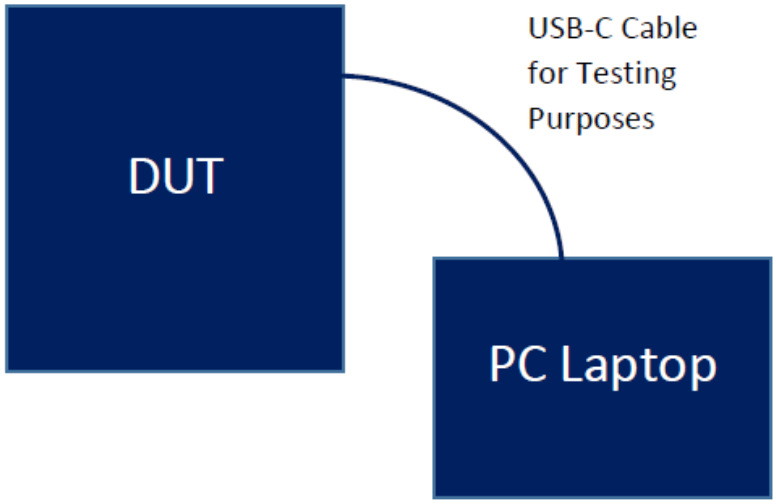


Diagram 1: Test Configuration Block Diagram

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 15.225 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 15.225

See test standard for details.

3.2.2 RSS-210

See test standard for details.

3.3 FCC Part 15, Subpart C, RSS-210 B6

3.3.1 Summary of Tests

FCC Section	ISED Section	Environmental Phenomena	Frequency Range (MHZ)	Result
N/A	RSS-210 B6	Bandwidth Requirement	13.110 to 13.567	Compliant
15.225 (a)	RSS-210 B6	Peak Field Strength	13.110 to 13.567	Compliant
15.225 (b)(c)(d)	RSS-210 B6	Radiated Spurious Emissions	0.009 to 17000	Compliant
15.225 (e)	RSS-210 B6	Frequency Tolerance	13.110 to 13.567	Compliant
The testing was performed according to the procedures in ANSI C63.10-2013 and 47 CFR Part 15.				

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 2021. 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 June 30, 2021. Unified Compliance Laboratory has been assigned Conformity Assessment Number US0223 by ISED.

4 Test Equipment

4.1 Radiated Emissions

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
EMI Receiver	Keysight	N9038A	UCL-2778	6/1/2020	6/1/2021
Pre-Amplifier	Sonoma Instruments	310N	UCL-2889	9/10/2020	9/10/2021
Double Ridge Horn Antenna	Scwarzbeck	BBHA 9120D	UCL-3065	7/8/2020	7/8/2021
Log Periodic	Scwarzbeck	STLP 9129	UCL-3068	5/20/2020	5/20/2021
0.5 – 18 GHz Amplifier	Scwarzbeck	BBV 9718C	UCL-2493	1/24/2020	1/24/2021
Loop Antenna	Com-Power	AL-130R	UCL-2596	12/13/2020	12/13/2021
Spectrum Analyzer	Agilent	E4407B	UCL-2943	3/31/2020	3/31/2021
Test Software	UCL	Revision 1	UCL-3108	N/A	N/A

Table 1: List of equipment used for Radiated Emissions

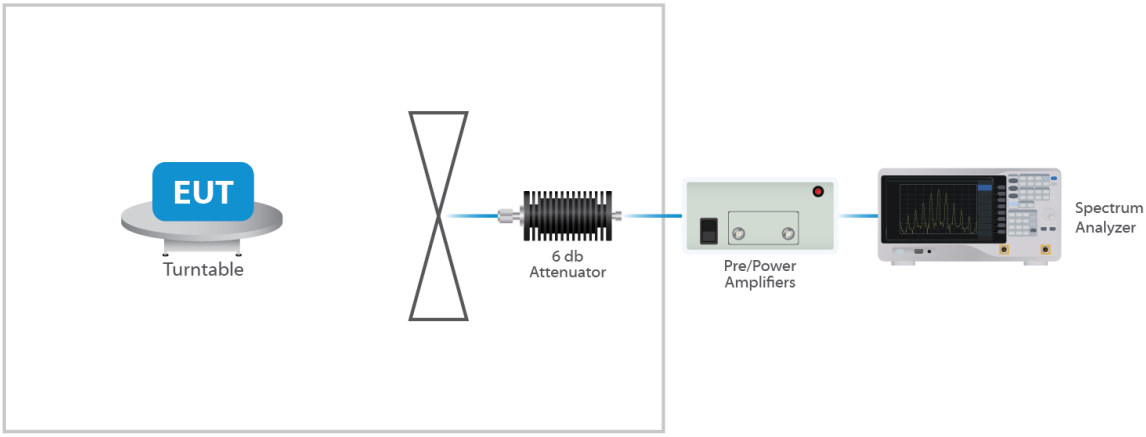


Figure 1: Radiated Emissions Test

4.2 Equipment Calibration

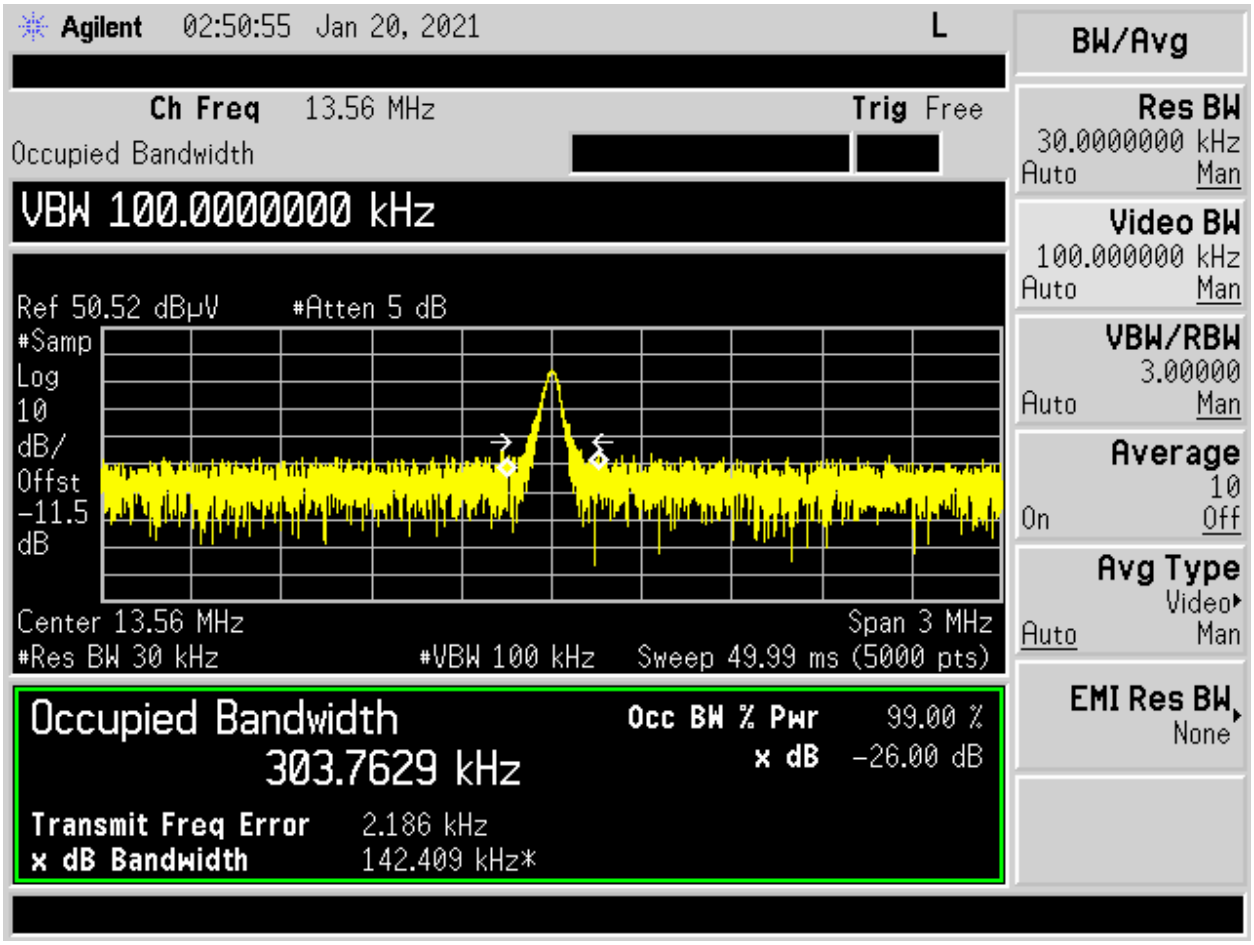
All applicable equipment is calibrated using either an independent calibration laboratory or Unified Compliance Laboratory personnel at intervals defined in ANSI C63.4:2014 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and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

4.3 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 Bandwidth Measurements

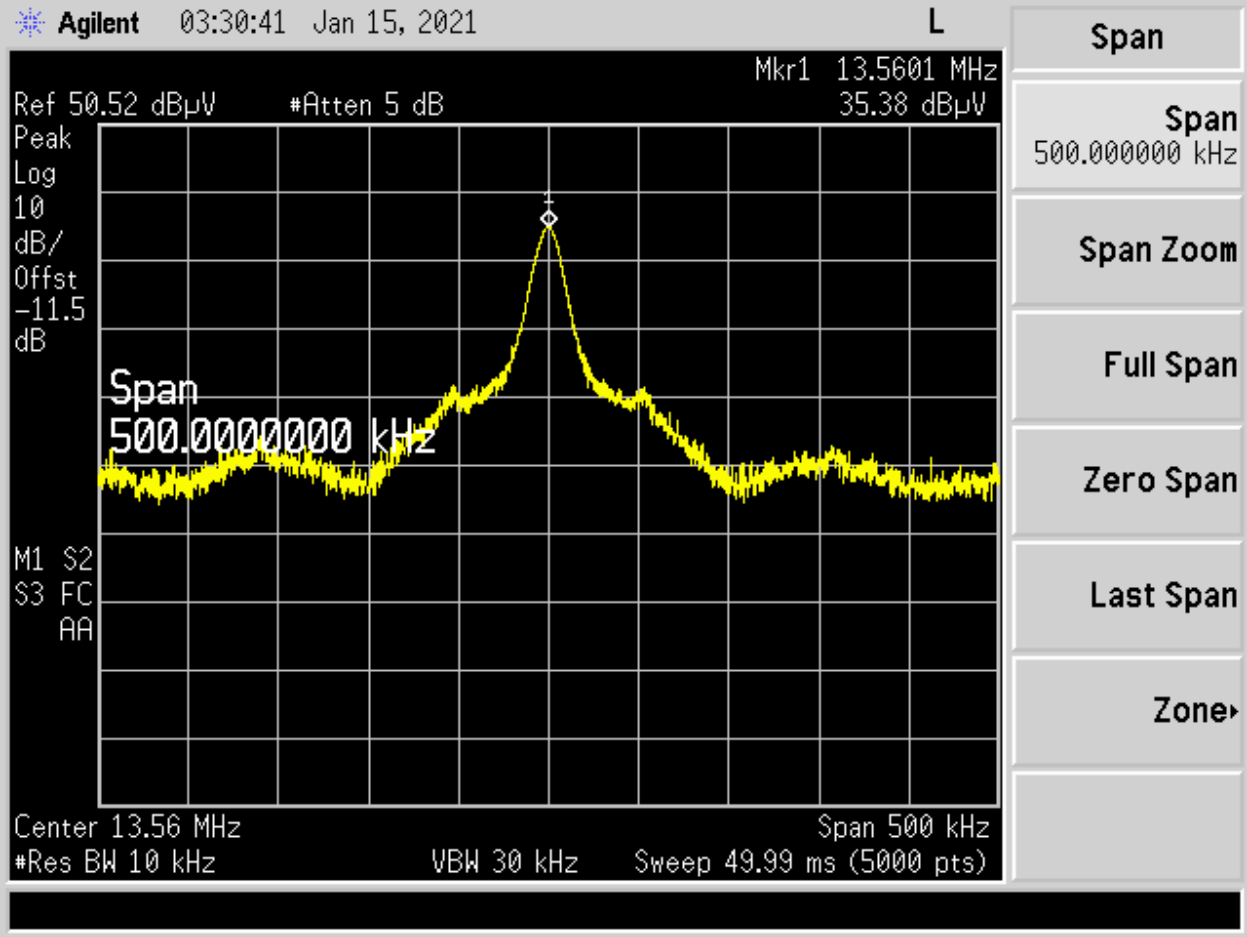


Graph 1: 99 Percent 100kHz Bandwidth

Results

The EUT complied with the specification

5.2 §15.225 (a) Field Strength

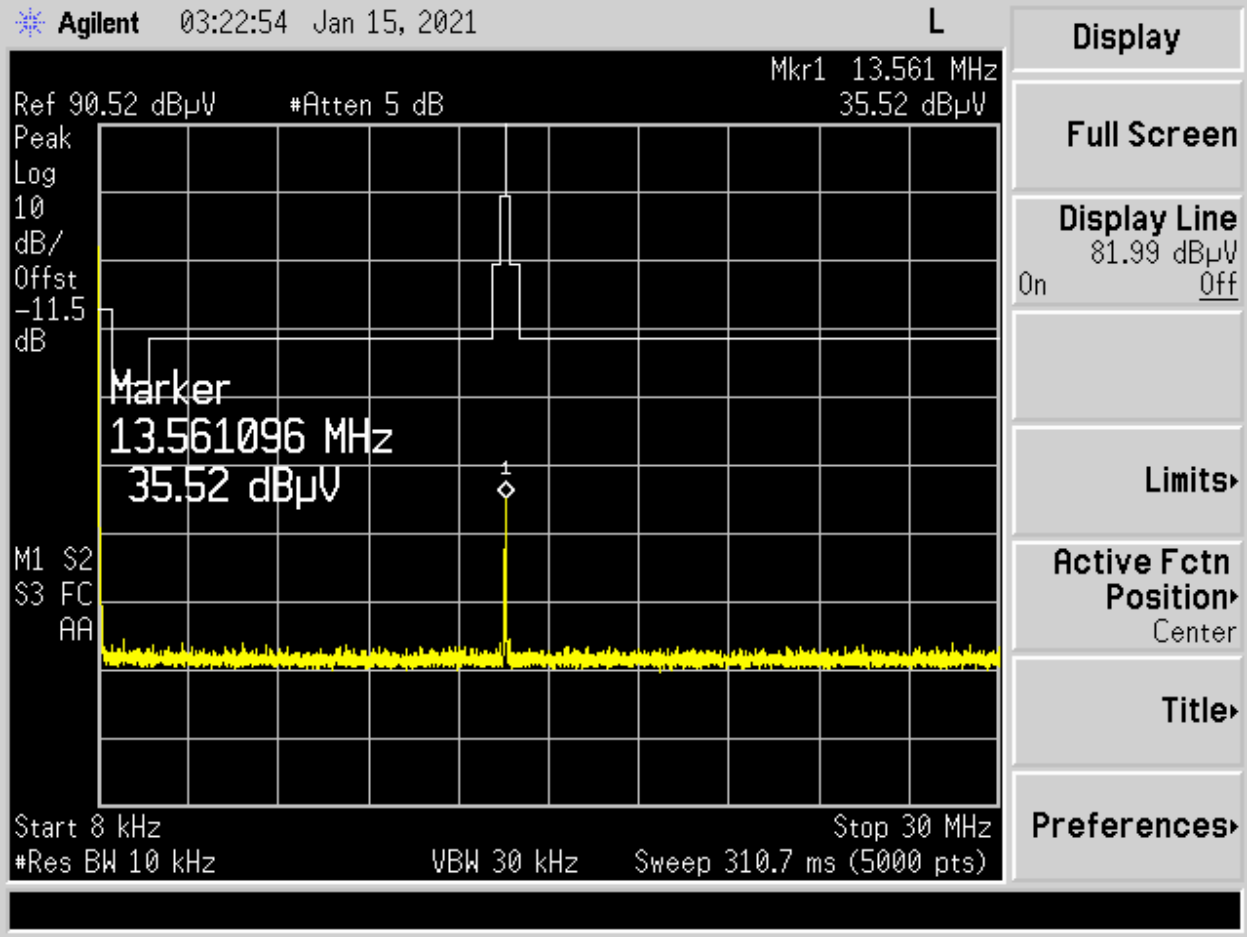


Graph 2: Field Strength

Result

The EUT complied with the specification limit.

5.3 §15.225 (b)(c)(d) Spurious Emissions Requirements



Graph 3: 9kHz – 30 MHz Spurious Emissions

Range (MHz)	µV/m at 30m	V/m at 30m	dBµV/m at 30m	dBµV/m at 1m
13.553-13.567	15848	0.015848	83.99949	113.54
13.410-13.553 and 13.567-13.710	334	0.000334	50.47493	80.02
13.110-13.410 and 13.710-14.010	106	0.000106	40.50612	70.05

Table 2: Example Calculations

Result

The EUT complied with the specification limit.

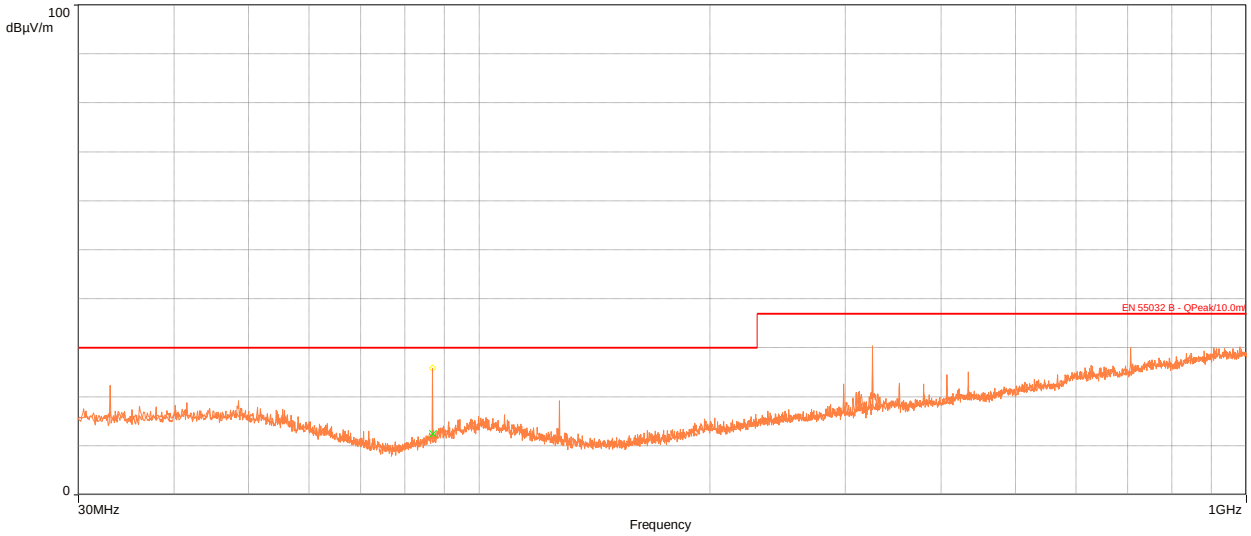
5.4 §15.209 Spurious Emissions

5.4.1 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.

Result

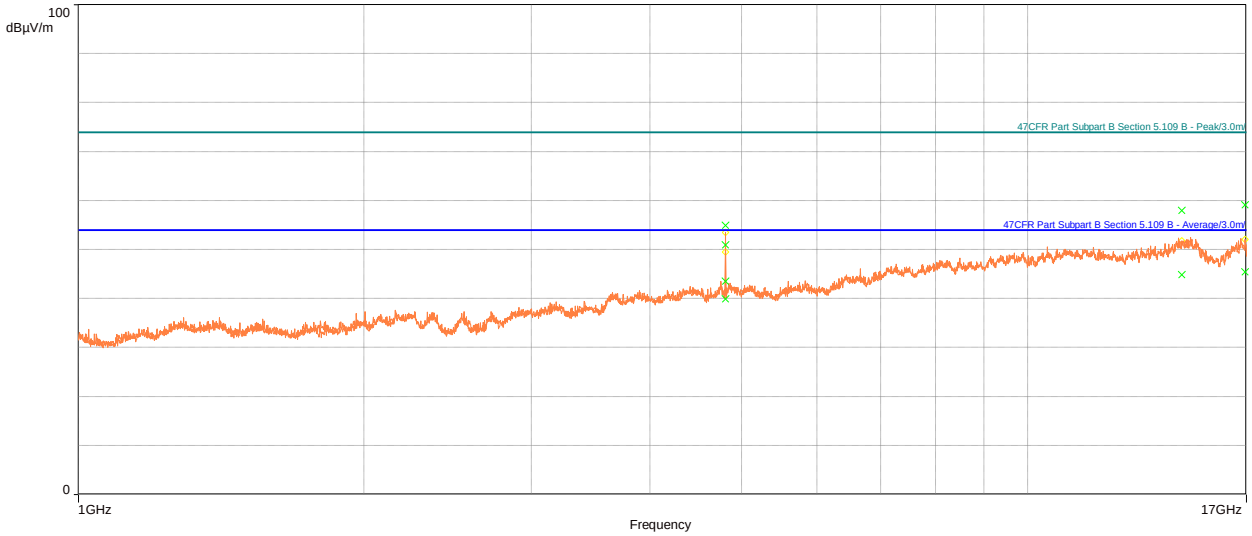
All emissions in the restricted bands of §15.205 met the limits specified in §15.209; therefore, the EUT complies with the specification.



QuasiPeak (1)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
No significant emissions were observed in the Vertical antenna orientation							
86.961	12.49	30.00	-17.51	150.00	3.78	Horizontal	-15.77

Table 3: Radiated Emission 30 – 1000 MHz



Avg

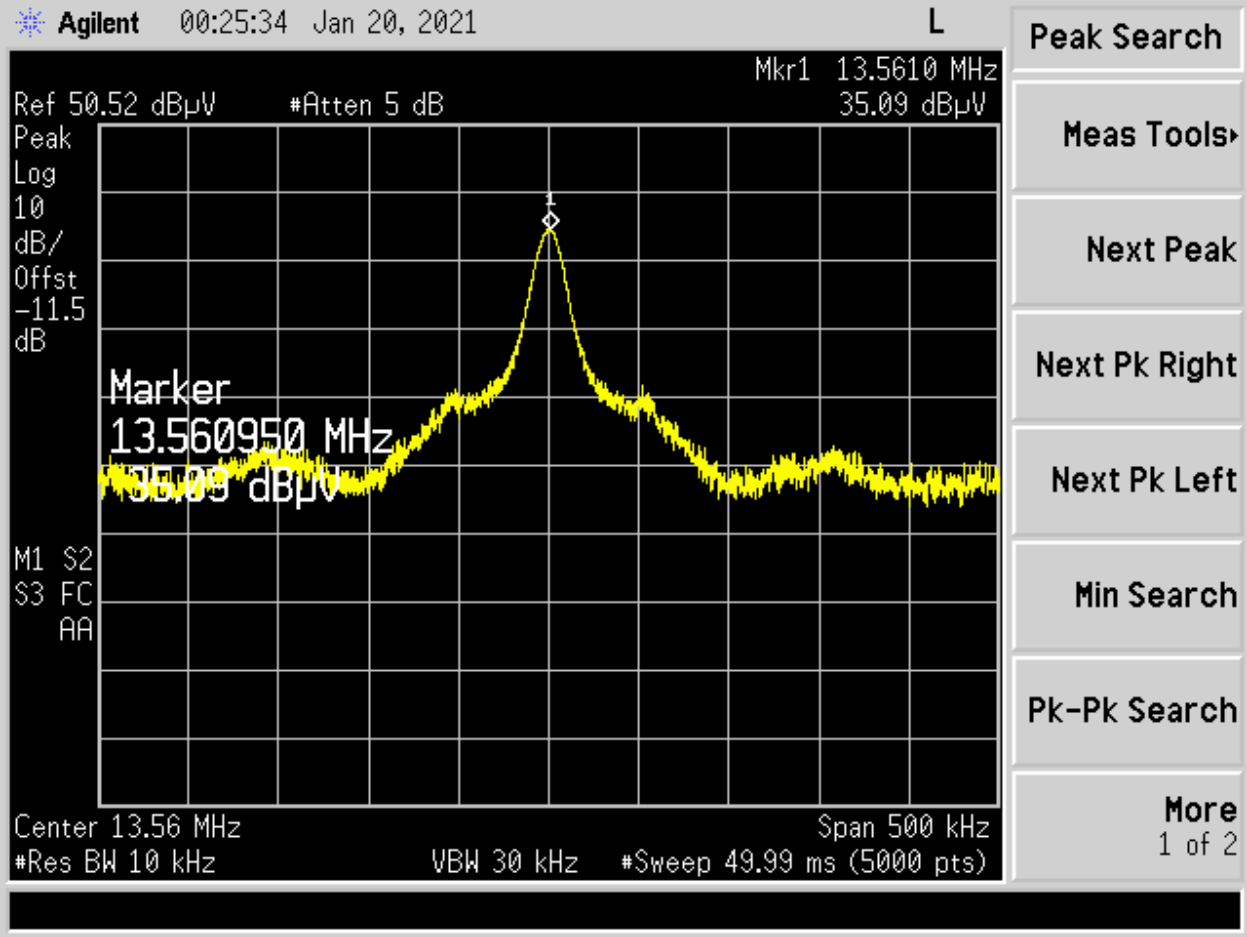
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
4804.5	43.55	54.00	-10.45	46.00	2.75	Vertical	2.14
14537	44.87	54.00	-9.13	192.00	1.92	Vertical	17.08
16947	45.40	54.00	-8.60	26.00	2.50	Vertical	18.59
4803.6	39.93	54.00	-14.07	161.00	1.51	Horizontal	2.14

Peak

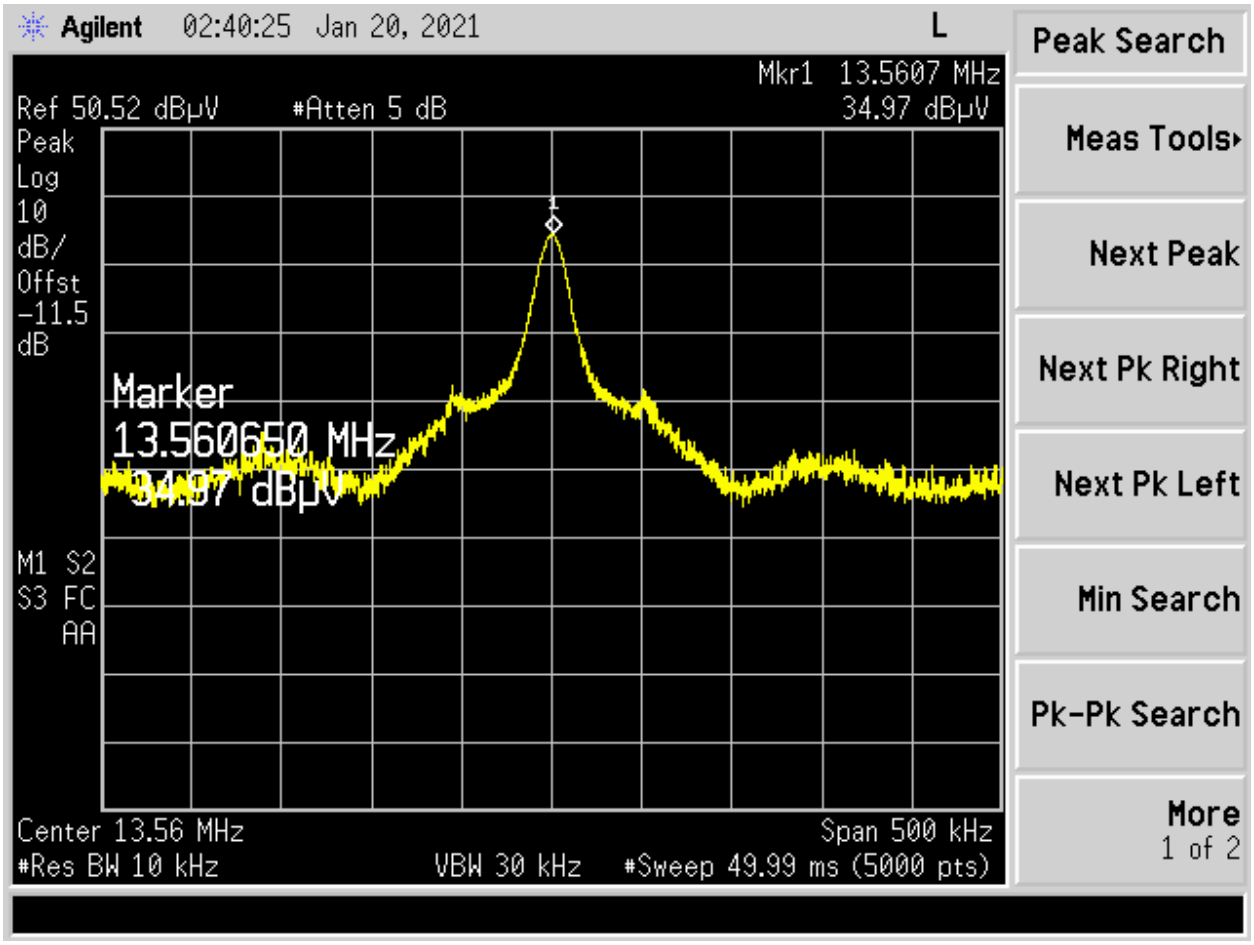
4804.5	54.95	74.00	-19.05	46.00	2.75	Vertical	2.14
14537	57.99	74.00	-16.01	192.00	1.92	Vertical	17.08
16947	59.10	74.00	-14.90	26.00	2.50	Vertical	18.59
4803.6	50.97	74.00	-23.03	161.00	1.51	Horizontal	2.14

Table 4: Radiated Emissions 1 – 17 GHz – Worse Case

5.5 15.225 (e) Frequency Tolerance



Graph 4: Frequency Tolerance Cold (-20° C)



Graph 5: Frequency Tolerance Hot (50° C)

-- End of Test Report --