



427 West 12800 South  
 Draper, UT 84020

## Test Report Certification

<b>FCC ID</b>	SWX-U6EP
<b>ISED ID</b>	6545A-U6EP
<b>Equipment Under Test</b>	U6-Enterprise
<b>Test Report Serial Number</b>	TR6495_03
<b>Date of Tests</b>	20-21, 25-26 May; 15, 21 September 2021
<b>Report Issue Date</b>	24 September 2021

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



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.

<b>Applicant</b>	Ubiquiti Inc.
<b>Manufacturer</b>	Ubiquiti Inc.
<b>Brand Name</b>	UniFi
<b>Model Number</b>	U6-Enterprise
<b>FCC ID</b>	SWX-U6EP
<b>ISED ID</b>	6545A-U6EP

On this 24<sup>th</sup> day of September 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: Kimberly Rodriguez



Reviewed By: Richard L. Winter

---

<b>Revision History</b>		
<b>Revision</b>	<b>Description</b>	<b>Date</b>
01	Original Report Release	24 September 2021
02	Amended Section 5.3 and 5.6	30 September 2021
03	Amended Section 5.7	1 October 2021

## Table of Contents

1	Client Information.....	5
1.1	Applicant.....	5
1.2	Manufacturer.....	5
2	Equipment Under Test (EUT).....	6
2.1	Identification of EUT .....	6
2.2	Description of EUT .....	6
2.3	EUT and Support Equipment.....	7
2.4	Interface Ports on EUT .....	7
2.5	Operating Environment.....	7
2.6	Operating Modes.....	7
2.7	EUT Exercise Software.....	8
2.8	Block Diagram of Test Configuration .....	8
2.9	Modification Incorporated/Special Accessories on EUT.....	8
2.10	Deviation, Opinions Additional Information or Interpretations from Test Standard.....	8
3	Test Specification, Method and Procedures.....	9
3.1	Test Specification.....	9
3.2	Methods & Procedures.....	9
3.3	FCC Part 15, Subpart E.....	9
3.4	Results.....	9
3.5	Test Location .....	10
4	Test Equipment .....	11
4.1	Conducted Emissions at Mains Ports.....	11
4.2	Direct Connect at the Antenna Port Tests.....	11
4.3	Radiated Emissions.....	12
4.4	DFS Testing .....	13
4.5	Equipment Calibration .....	13
4.6	Measurement Uncertainty .....	13
5	Test Results .....	14
5.1	§15.203 Antenna Requirements.....	14
5.2	Conducted Emissions at Mains Ports Data .....	15
5.3	§15.403(i) 26 dB Emissions Bandwidth .....	17
5.4	§15.403(a)(1) Maximum Average Output Power .....	19
5.5	§15.407(b) Spurious Emissions .....	22
5.6	§15.407(a) Maximum Power Spectral Density.....	27
5.7	DFS Requirement.....	32

# 1 Client Information

## 1.1 Applicant

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

## 1.2 Manufacturer

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

## 2 Equipment Under Test (EUT)

### 2.1 Identification of EUT

<b>Brand Name</b>	UniFi
<b>Model Number</b>	U6-Enterprise
<b>Serial Number</b>	68D79A1F0D5A
<b>Dimensions (cm)</b>	22.0 x 22.0 x 4.8

### 2.2 Description of EUT

The U6-Enterprise is a four-stream WiFi 6 access point that provides up to 2.4 Gbps aggregate radio rate with 2.4 GHz (2x2), 5 GHz (4x4) and 6 GHz (4x4) radios. The U6-Enterprise is designed for indoor use. The U6-Enterprise has an Ethernet port for data transfer and is powered by an 803.2at PoE power adapter. The U6-Enterprise has a Bluetooth management radio to achieve setup and operation.

Band	Modulation Bandwidth	Frequency (MHz)
UNII-2A	20 MHz	5260, 5265, 5270, 5275, 5280, 5285, 5290, 5295, 5300, 5305, 5310, 5315, 5320
	40 MHz	5270, 5275, 5280, 5285, 5290, 5295, 5300, 5305, 5310
	80 MHz	5290
	160 MHz	5250
UNII-2C	20 MHz	5500, 5505, 5510, 5515, 5520, 5525, 5530, 5535, 5540, 5545, 5550, 5555, 5560, 5565, 5570, 5575, 5580, 5585, 5590, 5595, 5600, 5605*, 5610*, 5615*, 5620*, 5625*, 5630*, 5635*, 5640*, 5645*, 5650, 5655, 5660, 5665, 5670, 5675, 5680, 5685, 5690, 5695, 5700, 5705, 5710, 5715, 5720
	40 MHz	5510, 5515, 5520, 5525, 5530, 5535, 5540, 5545, 5550, 5555, 5560, 5565, 5570, 5575, 5580, 5585, 5590, 5595, 5600, 5605*, 5610*, 5615*, 5620*, 5625*, 5630*, 5635*, 5640*, 5645*, 5650, 5655, 5660, 5665, 5670, 5675, 5680, 5685, 5690, 5695, 5700, 5705, 5710
	80 MHz	5530, 5535, 5540, 5545, 5550, 5555, 5560, 5565, 5570, 5575, 5580, 5585, 5590, 5595, 5600, 5605*, 5610*, 5615*, 5620*, 5625*, 5630*, 5635*, 5640*, 5645*, 5650, 5655, 5660, 5665, 5670, 5675, 5680, 5685, 5690
	160 MHz	5570
* Frequency not applicable in Canada		

**Table 1: UNII-2A and UNII-2C Channel Settings**

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.

<b>Brand Name Model Number Serial Number</b>	<b>Description</b>	<b>Name of Interface Ports / Interface Cables</b>
BN: UniFi MN: U6-Enterprise SN: 68D79A1F0D5A	WiFi Access Point	See Section 2.4
BN: Ubiquiti MN: UPOE-at SN: N/A	PoE Power Adapter	Shielded or Un-Shielded Cat 5e cable (Note 2)
BN: Dell MN: XPS 13 SN: N/A	Laptop Personal Computer	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

<b>Name of Ports</b>	<b>No. of Ports Fitted to EUT</b>	<b>Cable Description/Length</b>
PoE	1	Shielded or Un-Shielded Cat 5e Cable/> 3 meters
Data	1	Shielded or Un-Shielded Cat 5e Cable/> 3 Meters

## 2.5 Operating Environment

<b>Power Supply</b>	120 Volts ac to 48 Volts PoE Power
<b>AC Mains Frequency</b>	60 Hz
<b>Temperature</b>	22.7 – 23.8 °C
<b>Humidity</b>	25.0 – 27.1 %
<b>Barometric Pressure</b>	1027 mBar

## 2.6 Operating Modes

The U6-Enterprise 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 802.11 a/n/ac/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

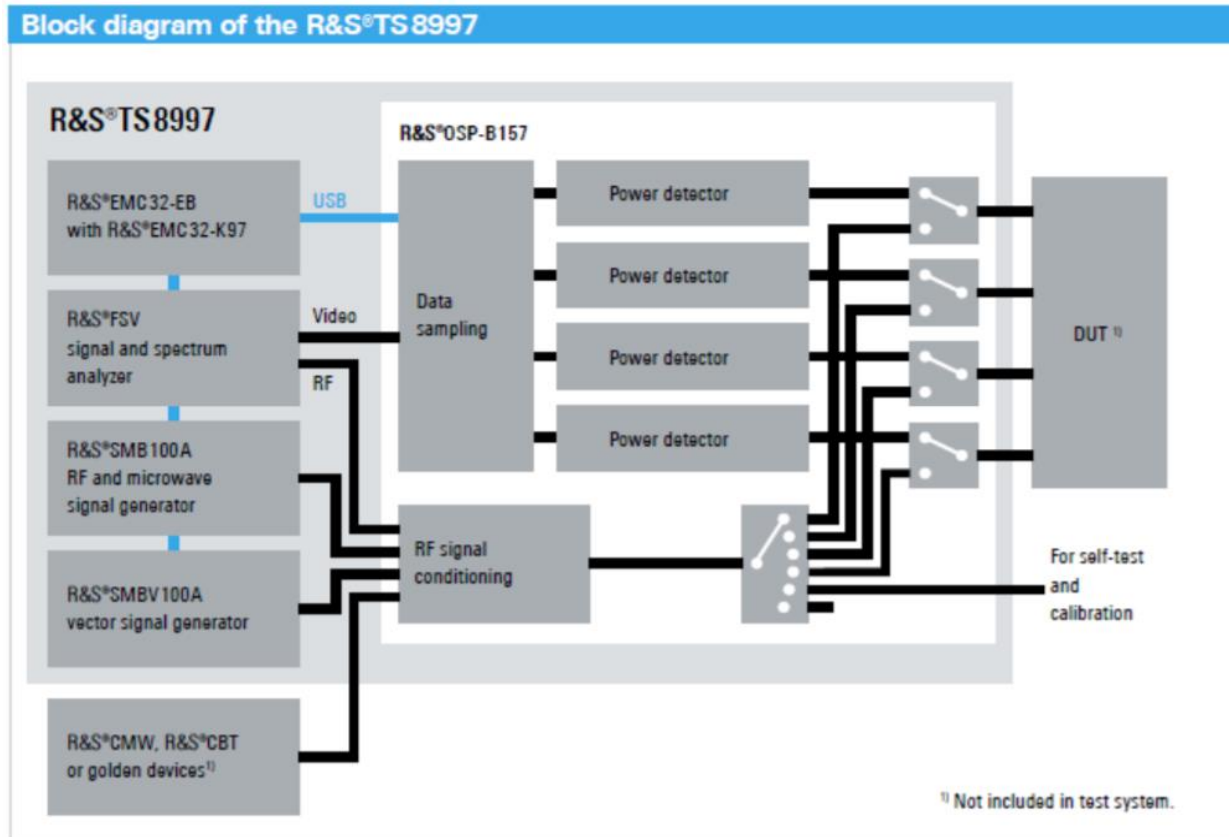


Diagram 1: Test Configuration Block Diagram

## 2.9 Modification Incorporated/Special Accessories on EUT

The following modifications were made to the EUT by the Client during testing to comply with the specification. This report is not complete without an accompanying signed attestation, that the product will have all the documented modification incorporated into the product when manufactured and place on the market.

## 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

<b>Title</b>	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
<b>Purpose of Test</b>	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(a)	RSS-247 §6.2.2, §6.2.3	Bandwidth Requirement	5260 to 5720	Compliant
15.407(a)	RSS-247 §6.2.2, §6.2.3	Peak Output Power	5260 to 5720	Compliant
15.407(b)	RSS-247 §6.2.2, §6.2.3	Antenna Conducted Spurious Emissions	30 to 40000	N/A
15.407(b)	RSS-247 §6.2.2, §6.2.3	Radiated Spurious Emissions	30 to 40000	Compliant
15.407(a)	RSS-247 §6.2.2, §6.2.3	Peak Power Spectral Density	5260 to 5720	Compliant
15.407(h)	RSS-247 §6.3	DFS Requirements	5260 to 5570	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 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 2022. 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 2022. Unified Compliance Laboratory has been assigned 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	9/18/2020	3/17/2022
LISN	AFJ	LS16C/10	UCL-2512	5/26/2020	5/26/2022
Cat6 ISN	Teseq	ISN T8-Cat6	UCL-2971	5/18/2020	5/18/2022
ISN	Teseq	ISN T800	UCL-2974	6/4/2021	6/4/2022
LISN	Com-Power	LIN-120C	UCL-2612	5/19/2021	5/19/2022
AC Power Source	Laplace Instruments	AC1000A	UCL-2857	N/A	N/A
Test Software	UCL	Revision 1	UCL-3107	N/A	N/A

Table 2: List of equipment used for Conducted Emissions Testing at Mains Port

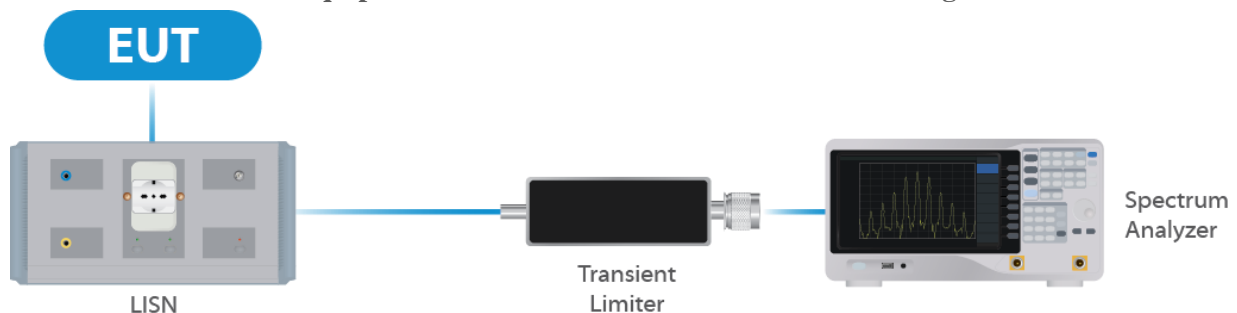


Figure 1: Conducted Emissions Test

### 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	8/24/2020	10/23/2021
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	9/8/2020	10/24/2021
Switch Extension	R&S	OSP-150W	UCL-2870	3/3/2021	3/3/2022

Table 3: List of equipment used for Direct Connect at the Antenna Port

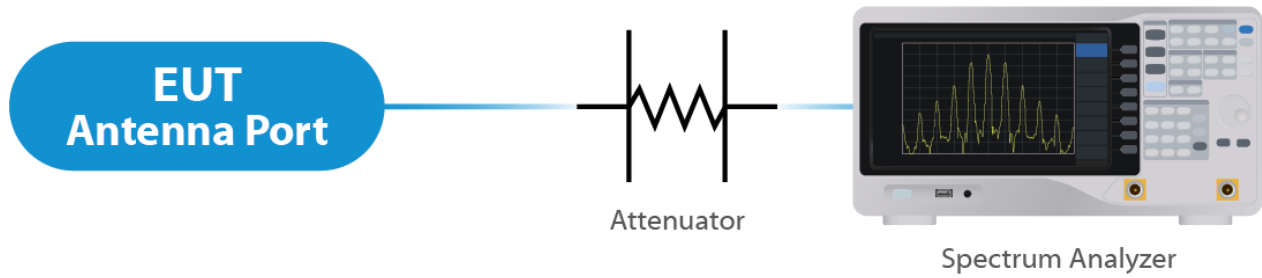


Figure 2: Direct Connect at the Antenna Port Test

### 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	6/21/2021	6/21/2022
Pre-Amplifier 9 kHz – 1 GHz	Sonoma Instruments	310N	UCL-2889	9/10/2020	10/10/2021
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3062	8/28/2020	8/27/2022
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3071	5/19/2020	5/19/2022
Double Ridge Horn Antenna	Scwarzbeck	BBHA 9120D	UCL-3065	7/8/2021	7/8/2022
Log Periodic	Scwarzbeck	STLP 9129	UCL-3068	11/16/2020	11/16/2021
15 - 40 GHz Horn Antenna	Scwarzbeck	BBHA 9170	UCL-2487	5/21/2020	5/21/2022
1 – 18 GHz Amplifier	Com-Power	PAM 118A	UCL-3833	9/29/2020	9/29/2021
Test Software	UCL	Revision 1	UCL-3108	N/A	N/A

Table 4: List of equipment used for Radiated Emissions

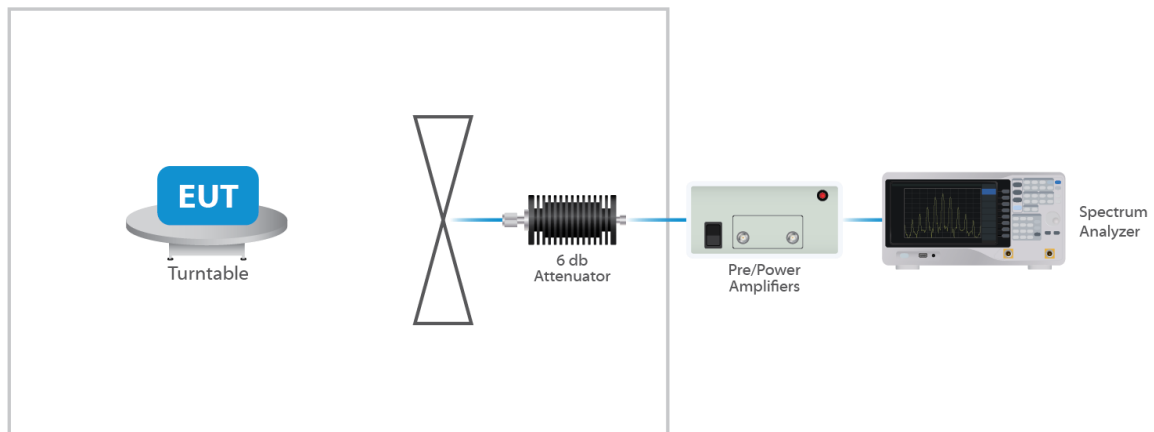


Figure 3: Radiated Emissions Test

## 4.4 DFS Testing

### 4.4.1 Master Test Set Up

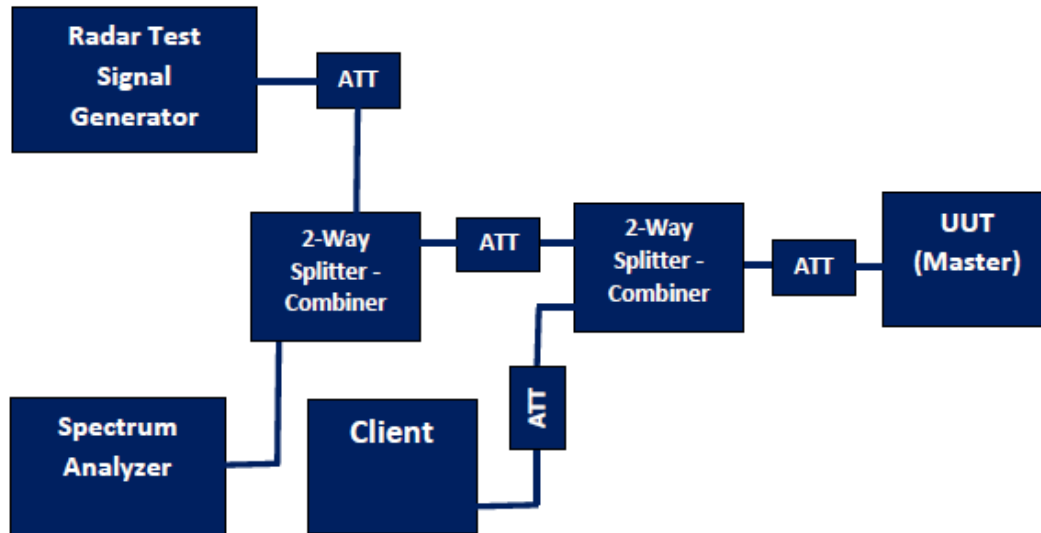


Figure 4: DFS Test Set Up - Master

## 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 ( $\pm$ 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
<b>Direct Connect Tests</b>	<b>K Factor</b>	<b>Value</b>
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. The Maximum gain of the antenna is 5.3 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  $N_{ANT} \leq 4$ ;

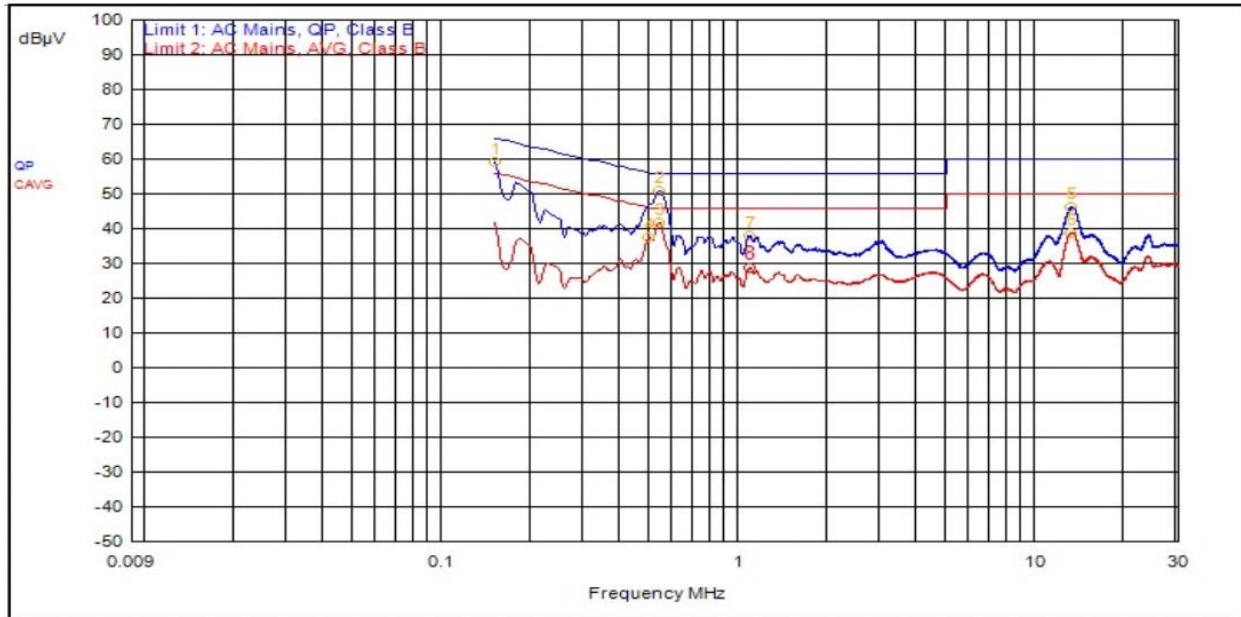
For PSD measurements when  $N_{ss}=1$ : Array Gain =  $10 \log(N_{ant}/N_{ss})$  dB = 6.02dB

#### Results

The EUT complied with the specifications.

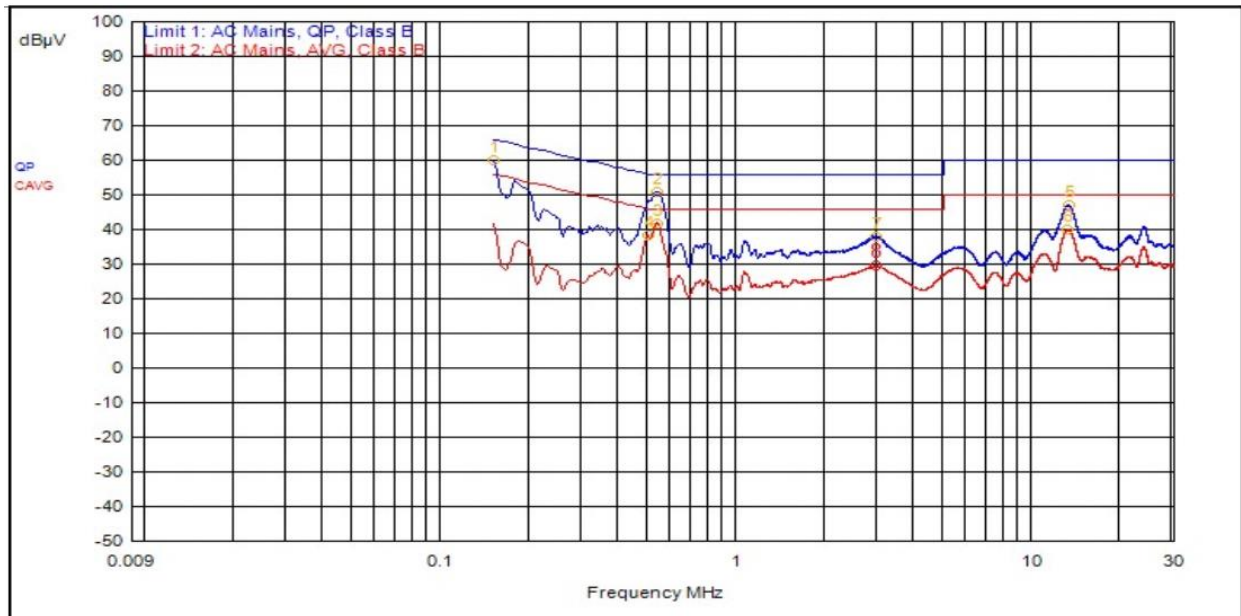
## 5.2 Conducted Emissions at Mains Ports Data

### 5.2.1 Line



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.
2	534,000kHz	12.4			QPeak	38.3	50.7	56.0	-5.3		
1	150,000kHz	12.4			QPeak	46.8	59.2	66.0	-6.8		
5	13.041MHz	12.4			QPeak	33.7	46.2	60.0	-13.8		
7	1.083MHz	12.4			QPeak	25.4	37.8	56.0	-18.2		
3	537,000kHz	12.4			C_AVG	29.2	41.6			46.0	-4.4
4	495,000kHz	12.4			C_AVG	25.1	37.5			46.1	-8.6
6	13.041MHz	12.4			C_AVG	26.4	38.8			50.0	-11.2
8	1.083MHz	12.4			C_AVG	16.3	28.7			46.0	-17.3

## 5.2.2 Neutral



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.
2	531,000kHz	12.4			QPeak	38.4	50.8	56.0	-5.2		
1	150,000kHz	12.4			QPeak	47.5	59.9	66.0	-6.1		
5	13.080MHz	12.4			QPeak	34.5	46.9	60.0	-13.1		
7	2.940MHz	12.3			QPeak	25.7	38.0	56.0	-18.0		
3	531,000kHz	12.4			C_AVG	29.4	41.8			46.0	-4.2
4	498,000kHz	12.4			C_AVG	25.9	38.3			46.0	-7.8
6	12.963MHz	12.4			C_AVG	27.5	39.9			50.0	-10.1
8	2.928MHz	12.3			C_AVG	17.2	29.5			46.0	-16.5

### 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.

#### 5.3.1 UNII-2A

Bandwidth	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
20	5260	19.20	21.30
20	5280	19.10	21.50
20	5320	19.10	21.60
40	5270	38.00	40.05
40	5310	38.00	40.50
80	5290	77.50	82.50
160	5250	155.00	166.00

#### 5.3.2 UNII-2C

Bandwidth	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
20	5500	18.00	23.40
20	5600	17.80	20.80
20	5720	17.80	21.30
40	5510	36.25	46.80
40	5590	36.00	39.75
40	5710	36.25	40.05
80	5530	76.00	118.00
80	5610	76.00	81.50
80	5690	76.00	83.00
160	5570	156.00	190.00

#### Result

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

26 dB bandwidths are reported for information purposes. Please see Annex for all bandwidth measurements.

## 5.4 §15.403(a)(1) 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 23.62 dBm or 230.14 mW. The limit is 24 dBm or 250 mW when using antennas with 6 dBi or less gain. The antenna has a maximum gain of 5.3 dBi.

### 5.4.1 UNII-2A

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
OFDM 20	5280	Mcs0	32	23.82	7.61
OFDM 20	5260	Mcs0	32	23.87	8.04
OFDM 20	5320	Mcs0	32	23.33	7.82
HT 20	5260	Mcs0	33	23.42	7.31
HT 20	5280	Mcs0	33	23.49	7.01
HT 20	5320	Mcs0	34	23.48	7.01
HT 40	5270	Mcs0	33	23.61	4.28
HT 40	5310	Mcs0	33	23.67	4.06
VHT 20	5260	Mcs0	33	23.48	7.32
VHT 20	5280	Mcs0	33	23.53	7.05
VHT 20	5320	Mcs0	34	23.51	6.94
VHT 40	5270	Mcs0	33	23.54	4.3
VHT 40	5310	Mcs0	33	23.64	4.02
VHT80	5290	Mcs0	33	23.48	0.92
VHT160	5250	Mcs0	32	23.11	-1.43
HE20	5260	Mcs0	32	23.38	7.19
HE20	5280	Mcs0	35	23.86	8.42
HE20	5320	Mcs0	35	23.52	7.88
HE40	5270	Mcs0	35	23.82	5.33
HE40	5310	Mcs0	35	23.76	5.04
HE80	5290	Mcs0	35	23.83	2.2
HE160	5250	Mcs0	34	23.5	-0.02

**5.4.2 UNII-2C**

<b>Modulation (BW)</b>	<b>Frequency (MHz)</b>	<b>Data Rate</b>	<b>TP Setting</b>	<b>Conducted Output Power*</b>	<b>Measured PSD</b>
OFDM 20	5500	Mcs0	38	23.6	9.5
OFDM 20	5600	Mcs0	39	23.89	9.79
OFDM 20	5720	Mcs0	38	23.3	9.2
HT 20	5500	Mcs0	39	23.95	8.77
HT 20	5600	Mcs0	39	23.52	8.26
HT 20	5720	Mcs0	38	23.2	7.89
HT 40	5510	Mcs0	38	23.69	5.57
HT 40	5590	Mcs0	39	23.88	5.66
HT 40	5710	Mcs0	38	23.65	5.16
VHT 20	5500	Mcs0	39	23.91	8.78
VHT 20	5600	Mcs0	39	23.56	8.28
VHT 20	5720	Mcs0	38	23.16	7.81
VHT 40	5510	Mcs0	38	23.73	5.53
VHT 40	5590	Mcs0	39	23.89	5.71
VHT 40	5710	Mcs0	38	23.68	5.12
VHT80	5530	Mcs0	39	23.97	2.54
VHT80	5610	Mcs0	39	23.89	2.54
VHT80	5690	Mcs0	38	23.55	2.07
VHT160	5570	Mcs0	38	23.55	-0.09
HE20	5500	Mcs0	39	23.91	8.71
HE20	5600	Mcs0	39	23.52	8.27
HE20	5720	Mcs0	38	23.12	7.86
HE40	5510	Mcs0	38	23.72	5.51
HE40	5590	Mcs0	39	23.87	5.68
HE40	5710	Mcs0	38	23.65	5.17
HE80	5530	Mcs0	39	23.97	2.65
HE80	5610	Mcs0	39	23.89	2.69
HE80	5690	Mcs0	38	23.56	2.05
HE160	5570	Mcs0	38	23.75	-0.03

**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.

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

The emissions must be below -27 dBm EIRP.

#### **Result**

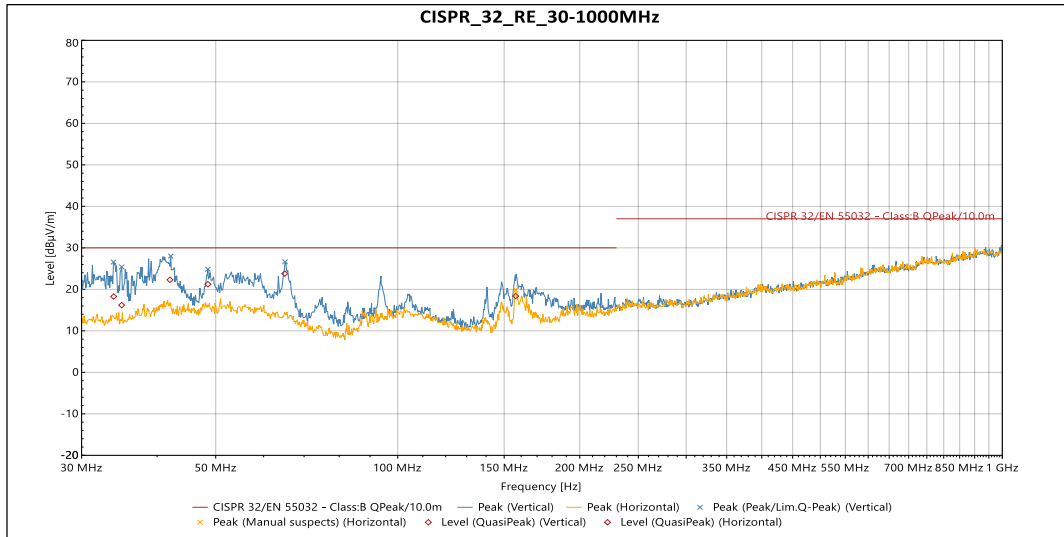
Conducted spurious emissions were below -27 dBm; therefore, the EUT complies with the specification. See Annex for results.

### **5.5.2 Radiated Spurious Emissions in the Restricted Bands of § 15.205**

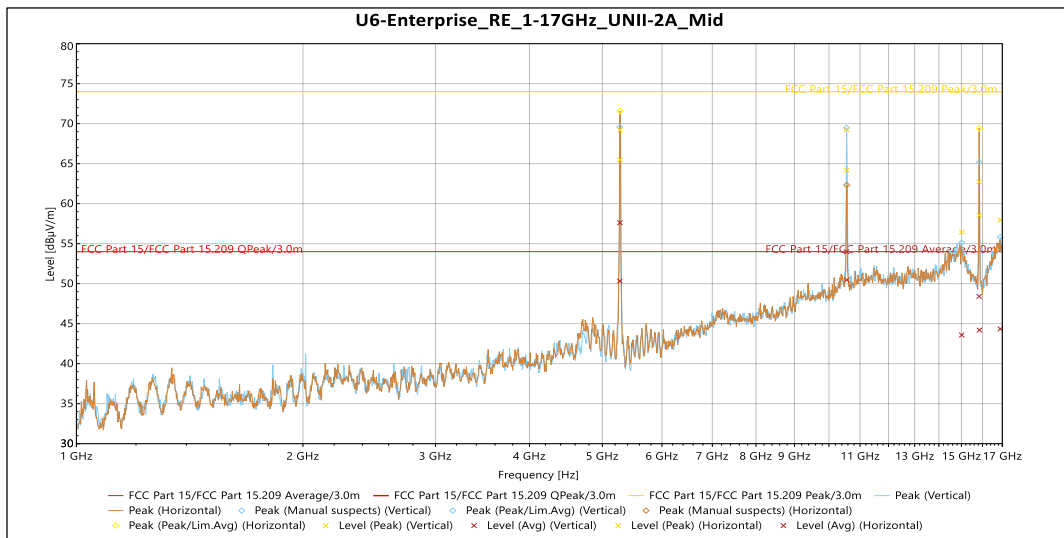
The frequency range from the lowest frequency generated or used in the device to the tenth harmonic of the highest fundamental emissions was investigated to measure any radiated emissions in the restricted bands. For frequencies above 18.0 GHz. The emissions in the restricted bands must meet the limits specified in § 15.209. Conducted measurement results are included in the Annex. Radiated data with the EUT transmitting into a load is included below. All emissions between the required frequencies were investigated, the following plots represent the worst case. The “fail” is the transmitted signal exceeding the spurious limit.

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

### **5.5.3 UNII-2A**

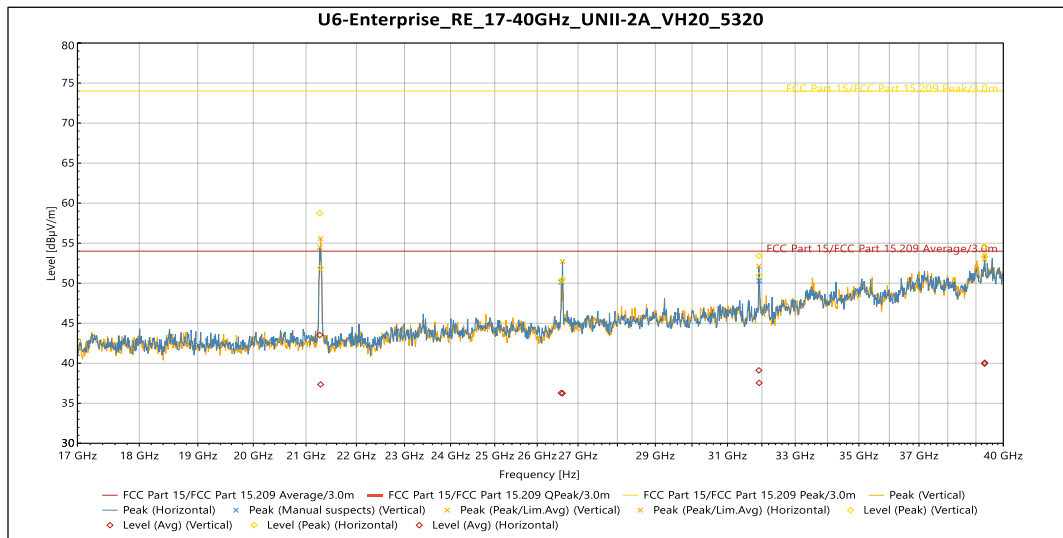


Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Meas. Time	RBW	Meas.Time	Correction (dB)
QuasiPeak	33.896 MHz	18.279	30	-11.721	81	1.106	Vertical	15	120000	0.001	-15.184
QuasiPeak	34.945 MHz	16.188	30	-13.812	319	1.946	Vertical	15	120000	0.001	-14.833
QuasiPeak	42.009 MHz	22.297	30	-7.703	73	2.164	Vertical	15	120000	0.001	-12.832
QuasiPeak	48.534 MHz	21.24	30	-8.76	20	2.62	Vertical	15	120000	0.001	-12.359
QuasiPeak	65.031 MHz	23.786	30	-6.214	108	2.835	Vertical	15	120000	0.001	-14.684
QuasiPeak	156.72 MHz	18.377	30	-11.623	235	3.995	Horizontal	15	120000	0.001	-17.354

**Graph 1: Radiated Spurious Emissions 30 MHz – 1 GHz**


Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Meas. Time (s)	RBW	Meas.Time	Correction (dB)
Peak	5.273 GHz	65.494	74	-8.506	344	3.307	Vertical	5	1000000	0	-8.81
Peak	10.554 GHz	69.248	74	-4.752	355	1.833	Vertical	5	1000000	0	4.859
Peak	15.014 GHz	56.449	74	-17.551	355	1.643	Vertical	5	1000000	0	9.952
Peak	15.849 GHz	58.561	74	-15.439	57	2.65	Vertical	5	1000000	0	4.841
Peak	16.896 GHz	57.935	74	-16.065	46	3.662	Vertical	5	1000000	0	11.931

Source	Frequency	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Meas. Time (s)	RBW	Meas.Time	Correction (dB)
Avg	5.273 GHz	50.331	54	-3.669	344	3.307	Vertical	5	1000000	0	-8.81
Avg	10.554 GHz	53.986	54	-0.014	355	1.833	Vertical	5	1000000	0	4.859
Avg	15.014 GHz	43.58	54	-10.42	355	1.643	Vertical	5	1000000	0	9.952
Avg	15.849 GHz	44.199	54	-9.801	57	2.65	Vertical	5	1000000	0	4.841
Avg	16.896 GHz	44.344	54	-9.656	46	3.662	Vertical	5	1000000	0	11.931
Peak	5.2749 GHz	69.186	74	-4.814	297	3.784	Horizontal	5	1000000	0	-8.784
Peak	10.56 GHz	64.202	74	-9.798	326	2.654	Horizontal	5	1000000	0	4.732
Peak	15.837 GHz	62.738	74	-11.262	36	2.655	Horizontal	5	1000000	0	4.917
Avg	5.2749 GHz	57.615	54	3.615	297	3.784	Horizontal	5	1000000	0	-8.784
Avg	10.56 GHz	50.468	54	-3.532	326	2.654	Horizontal	5	1000000	0	4.732
Avg	15.837 GHz	48.413	54	-5.587	36	2.655	Horizontal	5	1000000	0	4.917

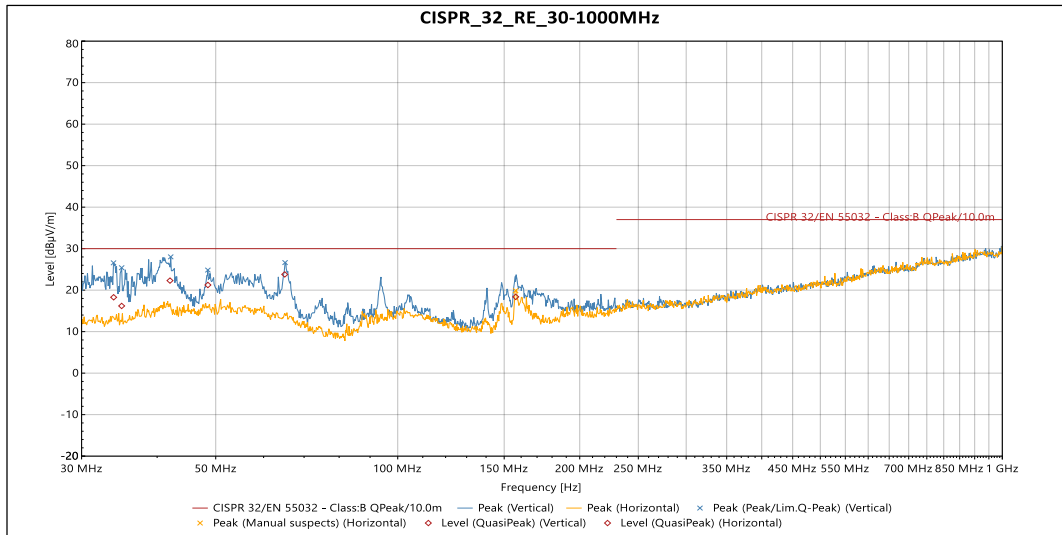
**Graph 2: Radiated Spurious Emissions 1 GHz – 16 GHz Mid (Worst-Case)**


Source	Frequency	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Azimuth (°)	Pol.	Meas. Time (s)	RBW	Meas.Time	Correction (dB)
Peak	21.284 GHz	51.939	74	-22.061	18	Vertical	5	1000000	0	-5.751
Peak	26.585 GHz	50.351	74	-23.649	39	Vertical	5	1000000	0	-5.071
Peak	31.92 GHz	50.962	74	-23.038	356	Vertical	5	1000000	0	-0.221
Peak	39.313 GHz	53.318	74	-20.682	353	Vertical	5	1000000	0	3.284
Avg	21.284 GHz	37.354	54	-16.646	18	Vertical	5	1000000	0	-5.751
Avg	26.585 GHz	36.279	54	-17.721	39	Vertical	5	1000000	0	-5.071
Avg	31.92 GHz	37.54	54	-16.46	356	Vertical	5	1000000	0	-0.221
Avg	39.313 GHz	39.943	54	-14.057	353	Vertical	5	1000000	0	3.284
Peak	21.268 GHz	58.74	74	-15.26	31	Horizontal	5	1000000	0	-5.606
Peak	26.616 GHz	50.522	74	-23.478	310	Horizontal	5	1000000	0	-5.114
Peak	31.911 GHz	53.399	74	-20.601	325	Horizontal	5	1000000	0	-0.249
Peak	39.315 GHz	54.526	74	-19.474	151	Horizontal	5	1000000	0	3.27
Avg	21.268 GHz	43.517	54	-10.483	31	Horizontal	5	1000000	0	-5.606
Avg	26.616 GHz	36.239	54	-17.761	310	Horizontal	5	1000000	0	-5.114
Avg	31.911 GHz	39.113	54	-14.887	325	Horizontal	5	1000000	0	-0.249
Avg	39.315 GHz	40.062	54	-13.938	151	Horizontal	5	1000000	0	3.27

**Graph 3: Radiated Spurious Emissions 16 GHz – 40 GHz; High (Worst-Case)**

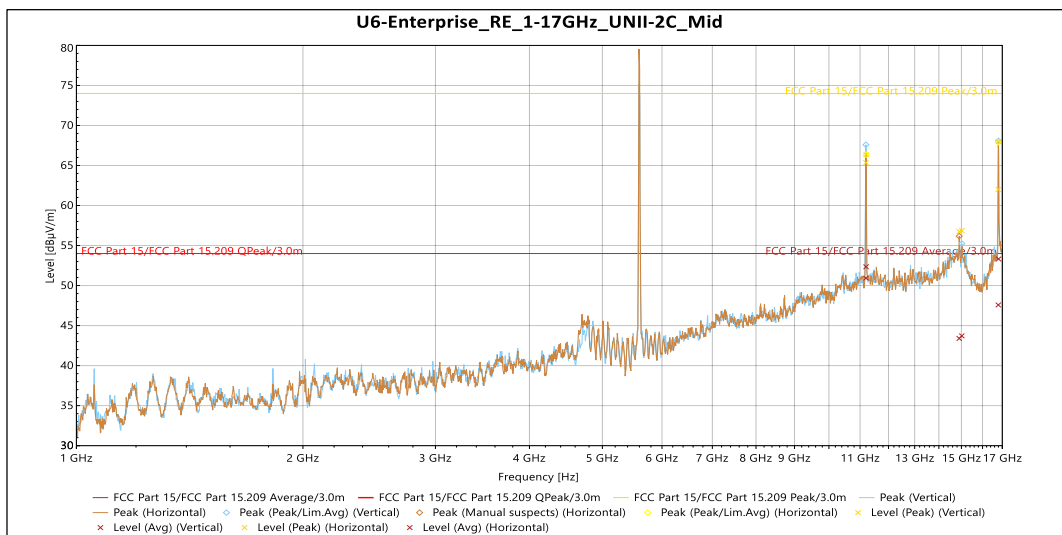


### 5.5.4 UNII-2C



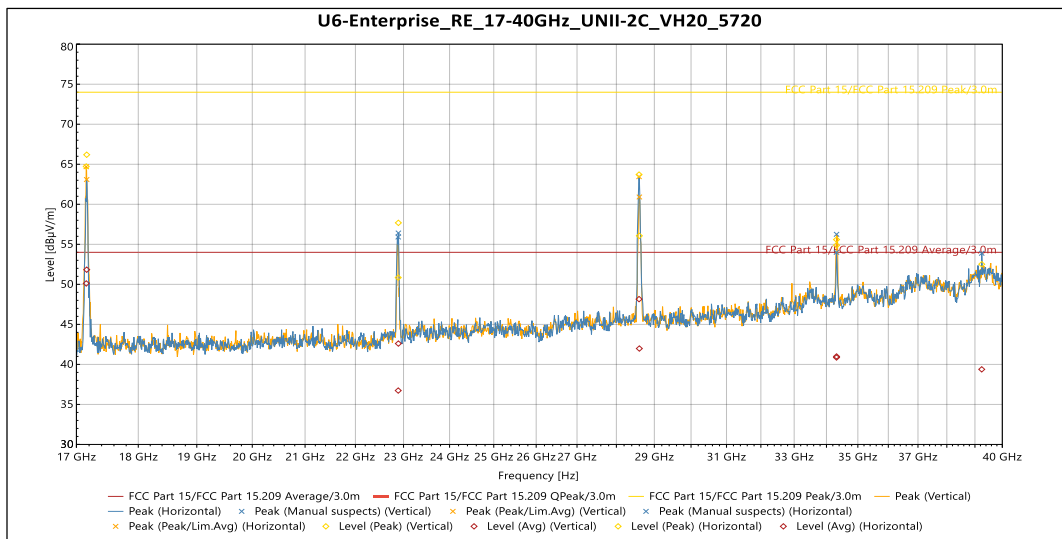
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Meas. Time	RBW	Meas.Time	Correction (dB)
QuasiPeak	33.896 MHz	18.279	30	-11.721	81	1.106	Vertical	15	120000	0.001	-15.184
QuasiPeak	34.945 MHz	16.188	30	-13.812	319	1.946	Vertical	15	120000	0.001	-14.833
QuasiPeak	42.009 MHz	22.297	30	-7.703	73	2.164	Vertical	15	120000	0.001	-12.832
QuasiPeak	48.534 MHz	21.24	30	-8.76	20	2.62	Vertical	15	120000	0.001	-12.359
QuasiPeak	65.031 MHz	23.786	30	-6.214	108	2.835	Vertical	15	120000	0.001	-14.684
QuasiPeak	156.72 MHz	18.377	30	-11.623	235	3.995	Horizontal	15	120000	0.001	-17.354

Graph 4: Radiated Spurious Emissions 30 MHz – 1 GHz



Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Meas. Time (s)	RBW	Meas.Time	Correction (dB)
Peak	11.199 GHz	65.349	74	-8.651	344	2.15	Vertical	5	1000000	0	4.644
Peak	15.018 GHz	56.87	74	-17.13	102	1.643	Vertical	5	1000000	0	10.112
Peak	16.803 GHz	67.988	74	-6.012	11	2.658	Vertical	5	1000000	0	11.444

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Meas. Time (s)	RBW	Meas.Time	Correction (dB)
Avg	11.199 GHz	50.934	54	-3.066	344	2.15	Vertical	5	1000000	0	4.644
Avg	15.018 GHz	43.715	54	-10.285	102	1.643	Vertical	5	1000000	0	10.112
Avg	16.803 GHz	53.32	54	-0.68	11	2.658	Vertical	5	1000000	0	11.444
Peak	11.205 GHz	66.349	74	-7.651	80	3.798	Horizontal	5	1000000	0	4.56
Peak	14.9 GHz	56.747	74	-17.253	207	1.83	Horizontal	5	1000000	0	9.784
Peak	16.793 GHz	62.003	74	-11.997	60	2.65	Horizontal	5	1000000	0	11.604
Avg	11.205 GHz	52.347	54	-1.653	80	3.798	Horizontal	5	1000000	0	4.56
Avg	14.9 GHz	43.395	54	-10.605	207	1.83	Horizontal	5	1000000	0	9.784
Avg	16.793 GHz	47.583	54	-6.417	60	2.65	Horizontal	5	1000000	0	11.604

**Graph 5: Radiated Spurious Emissions 1 GHz – 16 GHz; Mid (Worst-Case)**


Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Meas. Time (s)	RBW	Meas.Time	Correction (dB)
Peak	17.155 GHz	64.721	74	-9.279	19	Vertical	5	1000000	0	-5.286
Peak	22.888 GHz	50.84	74	-23.16	43	Vertical	5	1000000	0	-5.208
Peak	28.601 GHz	56.058	74	-17.942	330	Vertical	5	1000000	0	-4.988
Peak	34.318 GHz	54.895	74	-19.105	359	Vertical	5	1000000	0	0.068
Avg	17.155 GHz	50.106	54	-3.894	19	Vertical	5	1000000	0	-5.286
Avg	22.888 GHz	36.735	54	-17.265	43	Vertical	5	1000000	0	-5.208
Avg	28.601 GHz	41.977	54	-12.023	330	Vertical	5	1000000	0	-4.988
Avg	34.318 GHz	40.99	54	-13.01	359	Vertical	5	1000000	0	0.068
Peak	17.162 GHz	66.186	74	-7.814	357	Horizontal	5	1000000	0	-5.309
Peak	22.891 GHz	57.68	74	-16.32	33	Horizontal	5	1000000	0	-5.34
Peak	28.593 GHz	63.709	74	-10.291	320	Horizontal	5	1000000	0	-5.039
Peak	34.317 GHz	55.592	74	-18.408	328	Horizontal	5	1000000	0	0.061
Peak	39.246 GHz	52.512	74	-21.488	357	Horizontal	5	1000000	0	3.024
Avg	17.162 GHz	51.829	54	-2.171	357	Horizontal	5	1000000	0	-5.309
Avg	22.891 GHz	42.595	54	-11.405	33	Horizontal	5	1000000	0	-5.34
Avg	28.593 GHz	48.154	54	-5.846	320	Horizontal	5	1000000	0	-5.039
Avg	34.317 GHz	40.863	54	-13.137	328	Horizontal	5	1000000	0	0.061
Avg	39.246 GHz	39.382	54	-14.618	357	Horizontal	5	1000000	0	3.024

**Graph 6: Radiated Spurious Emissions 16 GHz – 40 GHz; High (Worst-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 11 dBm in any 1 MHz band during any time interval of continuous transmission.

Results of this testing are summarized. With a 5.3 dBi antenna, the conducted limit for power spectral density is 11 dBm. 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 5.3 dBi + Array gain of 6.02 dB which is a total of 11.32 dBi

Results of this testing are summarized.

**5.6.1 UNII-2A**

<b>Modulation (BW)</b>	<b>Frequency (MHz)</b>	<b>Data Rate</b>	<b>TP Setting</b>	<b>Conducted Output Power</b>	<b>Measured PSD</b>
OFDM 20	5280	Mcs0_Nss4	32	23.82	7.61
OFDM 20	5260	Mcs0_Nss4	32	23.87	8.04
OFDM 20	5320	Mcs0_Nss4	32	23.33	7.82
HT 20	5260	Mcs0_Nss4	33	23.42	7.31
HT 20	5280	Mcs0_Nss4	33	23.49	7.01
HT 20	5320	Mcs0_Nss4	34	23.48	7.01
HT 40	5270	Mcs0_Nss4	33	23.61	4.28
HT 40	5310	Mcs0_Nss4	33	23.67	4.06
VHT 20	5260	Mcs0_Nss4	33	23.48	7.32
VHT 20	5280	Mcs0_Nss4	33	23.53	7.05
VHT 20	5320	Mcs0_Nss4	34	23.51	6.94
VHT 40	5270	Mcs0_Nss4	33	23.54	4.3
VHT 40	5310	Mcs0_Nss4	33	23.64	4.02
VHT80	5290	Mcs0_Nss4	33	23.48	0.92
VHT160	5250	Mcs0_Nss4	32	23.11	-1.43
HE20	5260	Mcs0_Nss4	32	23.38	7.19
HE20	5280	Mcs0_Nss4	35	23.86	8.42
HE20	5320	Mcs0_Nss4	35	23.52	7.88
HE40	5270	Mcs0_Nss4	35	23.82	5.33
HE40	5310	Mcs0_Nss4	35	23.76	5.04
HE80	5290	Mcs0_Nss4	35	23.83	2.2
HE160	5250	Mcs0_Nss4	34	23.5	-0.02

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured PSD
OFDM 20	5280	Mcs0_Nss1	32	23.82	7.61
OFDM 20	5260	Mcs0_Nss1	32	23.87	8.04
OFDM 20	5320	Mcs0_Nss1	32	23.33	7.82
HT 20	5260	Mcs0_Nss1	33	23.42	7.31
HT 20	5280	Mcs0_Nss1	33	23.49	7.01
HT 20	5320	Mcs0_Nss1	34	23.48	7.01
HT 40	5270	Mcs0_Nss1	33	23.61	4.28
HT 40	5310	Mcs0_Nss1	33	23.67	4.06
VHT 20	5260	Mcs0_Nss1	33	23.48	7.32
VHT 20	5280	Mcs0_Nss1	33	23.53	7.05
VHT 20	5320	Mcs0_Nss1	34	23.51	6.94
VHT 40	5270	Mcs0_Nss1	33	23.54	4.3
VHT 40	5310	Mcs0_Nss1	33	23.64	4.02
VHT80	5290	Mcs0_Nss1	33	23.48	0.92
VHT160	5250	Mcs0_Nss1	32	23.11	-1.43
HE20	5260	Mcs0_Nss1	32	23.38	7.19
HE20	5280	Mcs0_Nss1	35	23.86	8.42
HE20	5320	Mcs0_Nss1	35	23.52	7.88
HE40	5270	Mcs0_Nss1	35	23.82	5.33
HE40	5310	Mcs0_Nss1	35	23.76	5.04
HE80	5290	Mcs0_Nss1	35	23.83	2.2
HE160	5250	Mcs0_Nss1	34	23.5	-0.02

**5.6.2 UNII-2C**

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured PSD
OFDM 20	5500	Mcs0_Nss4	38	23.6	9.5
OFDM 20	5600	Mcs0_Nss4	39	23.89	9.79
OFDM 20	5720	Mcs0_Nss4	38	23.3	9.2
HT 20	5500	Mcs0_Nss4	39	23.95	8.77
HT 20	5600	Mcs0_Nss4	39	23.52	8.26
HT 20	5720	Mcs0_Nss4	38	23.2	7.89
HT 40	5510	Mcs0_Nss4	38	23.69	5.57
HT 40	5590	Mcs0_Nss4	39	23.88	5.66
HT 40	5710	Mcs0_Nss4	38	23.65	5.16
VHT 20	5500	Mcs0_Nss4	39	23.91	8.78
VHT 20	5600	Mcs0_Nss4	39	23.56	8.28
VHT 20	5720	Mcs0_Nss4	38	23.16	7.81
VHT 40	5510	Mcs0_Nss4	38	23.73	5.53
VHT 40	5590	Mcs0_Nss4	39	23.89	5.71
VHT 40	5710	Mcs0_Nss4	38	23.68	5.12
VHT80	5530	Mcs0_Nss4	39	23.97	2.54
VHT80	5610	Mcs0_Nss4	39	23.89	2.54
VHT80	5690	Mcs0_Nss4	38	23.55	2.07
VHT160	5570	Mcs0_Nss4	38	23.55	-0.09
HE20	5500	Mcs0_Nss4	39	23.91	8.71
HE20	5600	Mcs0_Nss4	39	23.52	8.27
HE20	5720	Mcs0_Nss4	38	23.12	7.86
HE40	5510	Mcs0_Nss4	38	23.72	5.51
HE40	5590	Mcs0_Nss4	39	23.87	5.68
HE40	5710	Mcs0_Nss4	38	23.65	5.17
HE80	5530	Mcs0_Nss4	39	23.97	2.65
HE80	5610	Mcs0_Nss4	39	23.89	2.69
HE80	5690	Mcs0_Nss4	38	23.56	2.05
HE160	5570	Mcs0_Nss4	38	23.75	-0.03

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured PSD
OFDM 20	5500	Mcs0_Nss1	38	23.6	9.5
OFDM 20	5600	Mcs0_Nss1	39	23.89	9.79
OFDM 20	5720	Mcs0_Nss1	38	23.3	9.2
HT 20	5500	Mcs0_Nss1	39	23.95	8.77
HT 20	5600	Mcs0_Nss1	39	23.52	8.26
HT 20	5720	Mcs0_Nss1	38	23.2	7.89
HT 40	5510	Mcs0_Nss1	38	23.69	5.57
HT 40	5590	Mcs0_Nss1	39	23.88	5.66
HT 40	5710	Mcs0_Nss1	38	23.65	5.16
VHT 20	5500	Mcs0_Nss1	39	23.91	8.78
VHT 20	5600	Mcs0_Nss1	39	23.56	8.28
VHT 20	5720	Mcs0_Nss1	38	23.16	7.81
VHT 40	5510	Mcs0_Nss1	38	23.73	5.53
VHT 40	5590	Mcs0_Nss1	39	23.89	5.71
VHT 40	5710	Mcs0_Nss1	38	23.68	5.12
VHT80	5530	Mcs0_Nss1	39	23.97	2.54
VHT80	5610	Mcs0_Nss1	39	23.89	2.54
VHT80	5690	Mcs0_Nss1	38	23.55	2.07
VHT160	5570	Mcs0_Nss1	38	23.55	-0.09
HE20	5500	Mcs0_Nss1	39	23.91	8.71
HE20	5600	Mcs0_Nss1	39	23.52	8.27
HE20	5720	Mcs0_Nss1	38	23.12	7.86
HE40	5510	Mcs0_Nss1	38	23.72	5.51
HE40	5590	Mcs0_Nss1	39	23.87	5.68
HE40	5710	Mcs0_Nss1	38	23.65	5.17
HE80	5530	Mcs0_Nss1	39	23.97	2.65
HE80	5610	Mcs0_Nss1	39	23.89	2.69
HE80	5690	Mcs0_Nss1	38	23.56	2.05
HE160	5570	Mcs0_Nss1	38	23.75	-0.03

## Result

The maximum average power spectral density was less than the limit of 11.32 dBm; therefore, the EUT complies with the specification.

## 5.7 DFS Requirement

This product is a master device with radar detection. The outcome of the required DFS tests is located in the DFS Annex. The product passes all required DFS tests for a master with radar detection.

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
<i>Non-Occupancy Period</i>	Yes	Not Required	Yes
<i>DFS Detection Threshold</i>	Yes	Not Required	Yes
<i>Channel Availability Check Time</i>	Yes	Not Required	Not Required
<i>U-NII Detection Bandwidth</i>	Yes	Not Required	Yes

Requirement	Operational Mode	
	Master Client Without Radar Detection	Client With Radar Detection
<i>DFS Detection Threshold</i>	Yes	Not Required
<i>Channel Closing Transmission Time</i>	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not Required



-- End of Test Report --