



427 West 12800 South
Draper, UT 84020

Test Report Certification

FCC ID	SWX-U6IWR
ISED ID	645A-U6IWR
Equipment Under Test	U6-IW
Test Report Serial Number	TR6449_02
Date of Tests	22 July; 4, 25-27 August; 2-3 September, 2021
Report Issue Date	15 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.

Applicant	Ubiquiti Inc.
Manufacturer	Ubiquiti Inc.
Brand Name	UniFi
Model Number	U6-IW
FCC ID	SWX-U6IWR
ISED ID	6545A-U6IWR

On this 15th 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: Joseph W. Jackson

Revision History		
Revision	Description	Date
01	Original Report Release	15 September 2021
02	Amend Section 5.7	2 December 2021

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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	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	U6-IW
Serial Number	68D79A1F4699
Dimensions (cm)	13.97 x 9.6 x 3.12

2.2 Description of EUT

The Access Point WiFi 6 In-Wall (U6-IW) is a dual-band, wall-mounted access point that brings the power of plug-and-play WiFi 6 to any home or office and features a built-in PoE switch with (4) Gigabit RJ45 ports to connect and power Ethernet devices. With its 2.4 and 5 GHz WiFi 6 bands, the U6-IW offers an aggregate, over-the-air throughput rate of 5.3 Gbps, which can support over 300 clients. The U6-IW is also Bluetooth-compatible so it can be managed from anywhere via the UniFi Network web application or mobile app.

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.

Brand Name Model Number Serial Number	Description	Name of Interface Ports / Interface Cables
BN: UniFi MN: U6-IW SN: 68D79A1F4699	Wifi Access Point	See section 2.4
BN: Ubiquiti MN: U-POE-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

Name of Ports	No. of Ports Fitted to EUT	Cable Description/Length
PoE	1	Shielded/Un-Shielded Cat 5/< 3 meters
Ethernet Ports	4	Shielded/Un-Shielded Cat 5/< 3 meters

2.5 Operating Environment

Power Supply	120 VAC
AC Mains Frequency	60 Hz
Temperature	25.3-26.7 °C
Humidity	31.62-43.88 %
Barometric Pressure	1013 mBar

2.6 Operating Modes

The U6-IW was tested using test software in order to enable a constant transmission. The measurements within this report are corrected to reference a 100% duty cycle. All emission

modes of 802.11 a/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

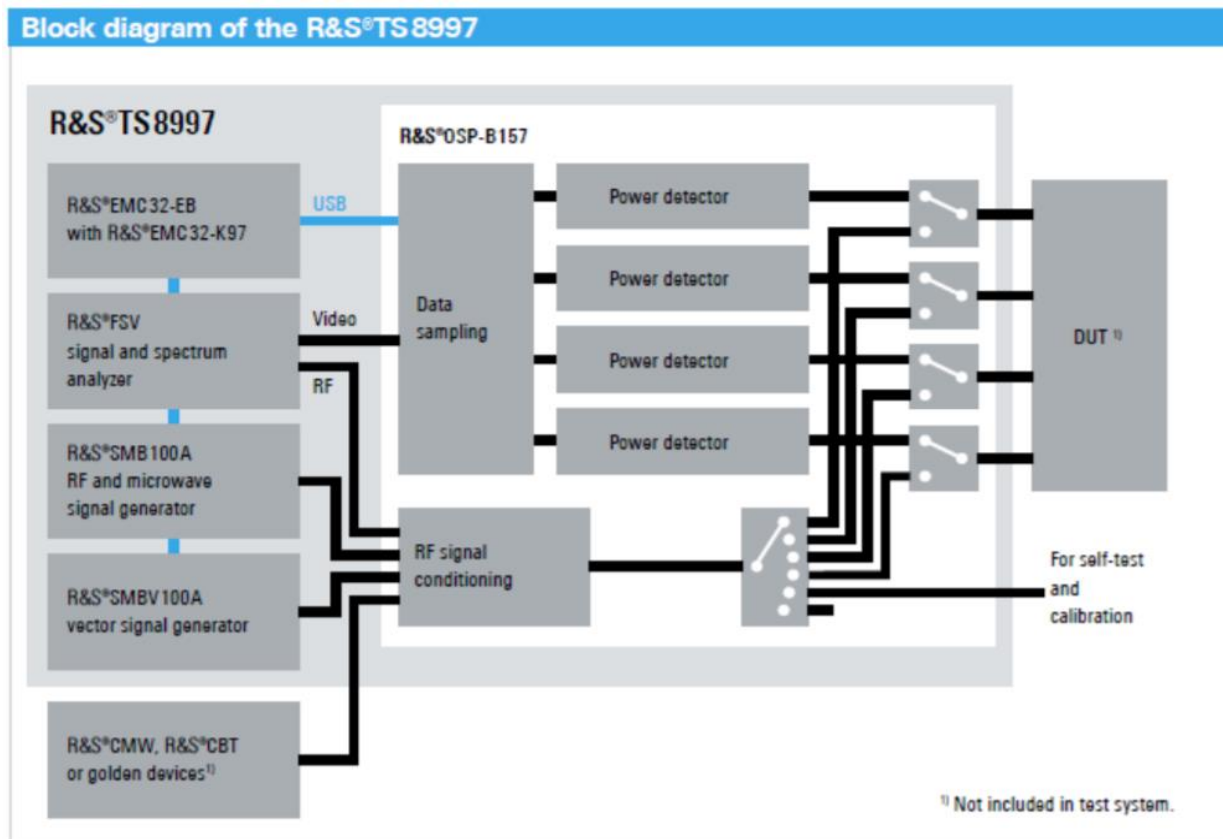


Diagram 1: Test Configuration Block Diagram

2.9 Modification Incorporated/Special Accessories on EUT

There were no modifications made to the EUT during testing to comply with the specification.

2.10 Deviation, Opinions Additional Information or Interpretations from Test Standard

There were no deviations, opinions, additional information or interpretations from the test specification.

3 Test Specification, Method and Procedures

3.1 Test Specification

Title	47 CFR FCC Part 15, Subpart E, Section 15.407 Limits and methods of measurement of radio interference characteristics of Unlicensed National Information Infrastructure Devices
Purpose of Test	The tests were performed to demonstrate initial compliance

3.2 Methods & Procedures

3.2.1 47 CFR FCC Part 15 Section 15.407

See test standard for details.

3.3 FCC Part 15, Subpart E

3.3.1 Summary of Tests

FCC Section	ISED Section	Environmental Phenomena	Frequency Range (MHZ)	Result
15.407(a)	N/A	Antenna requirements	Structural Requirement	Compliant
15.407(b)	RSS-Gen	Conducted Disturbance at Mains Port	0.15 to 30	Compliant
15.407(a)	RSS-247 §6.2.2, §6.2.3	Bandwidth Requirement	5250 to 5720	Compliant
15.407(a)	RSS-247 §6.2.2, §6.2.3	Peak Output Power	5250 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	5250 to 5720	Compliant
15.407(h)	RSS-247 §6.3	DFS Requirements	5250 to 5720	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 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	9/17/2021
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

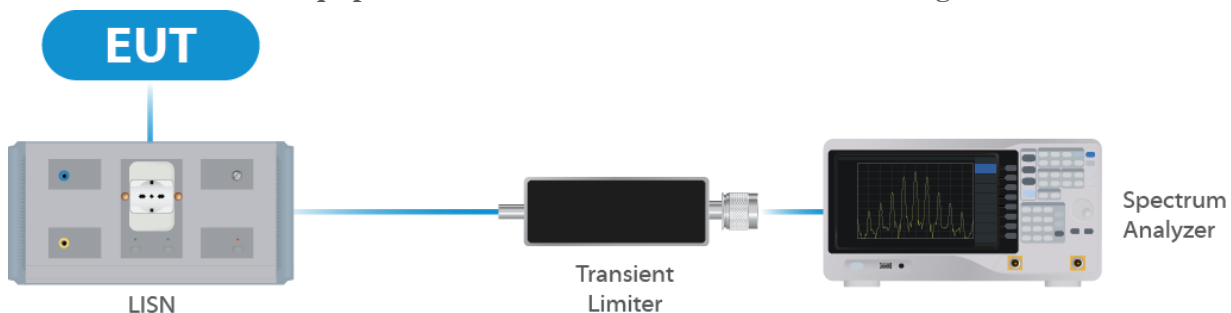


Figure 1: Conducted Emissions Test

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	9/8/2021
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

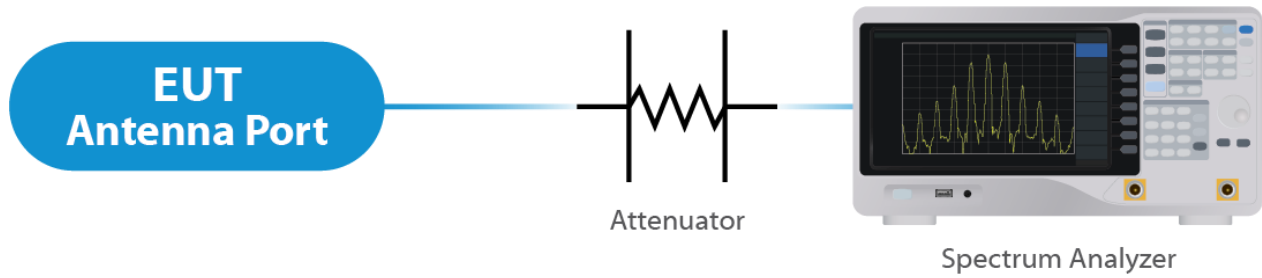


Figure 2: Direct Connect at the Antenna Port Test

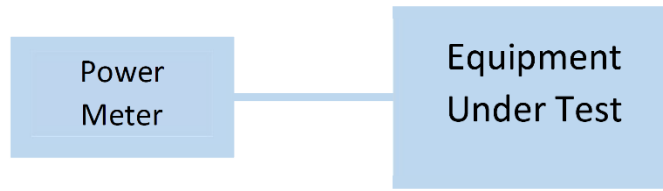


Figure 3: Output Power Measurement

4.3 Radiated Emissions

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
EMI Receiver	Keysight	N9038A	UCL-2778	6/21/2021	6/21/2022
Pre-Amplifier 9 kHz – 1 GHz	Sonoma Instruments	310N	UCL-2889	9/10/2020	9/10/2021
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

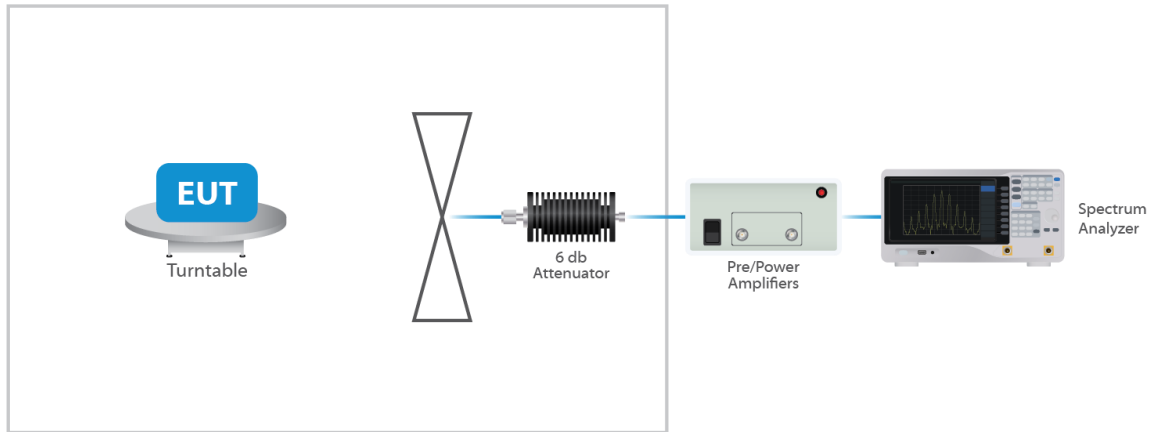


Figure 4: Radiated Emissions Test

4.4 DFS Testing

4.4.1 Master Test Set Up

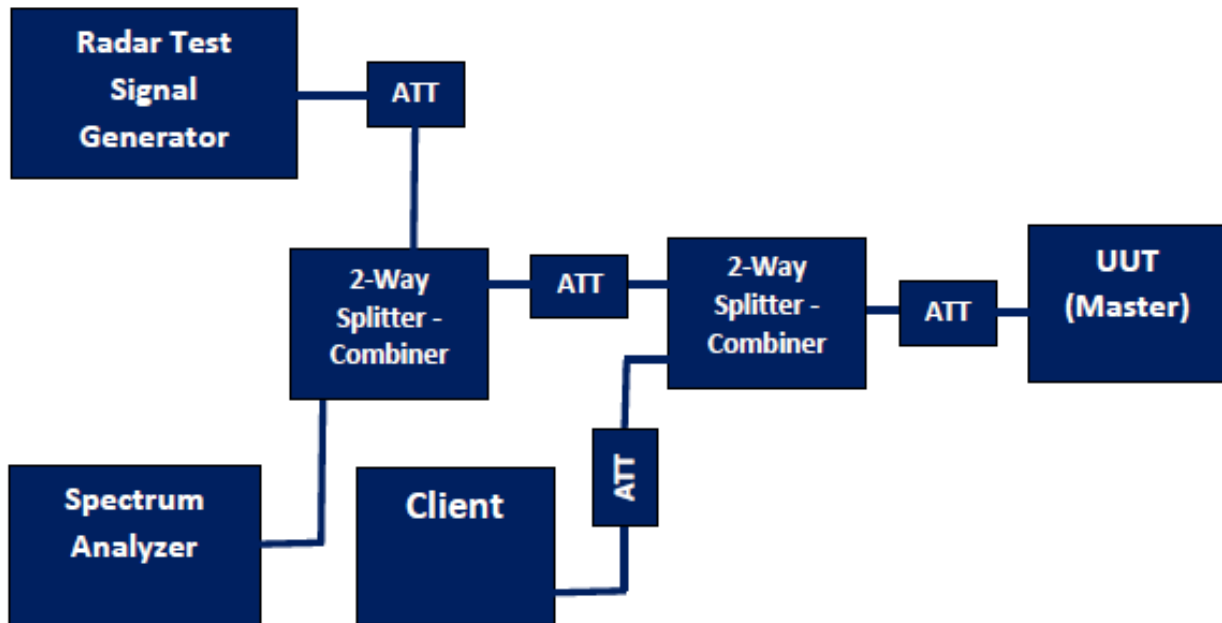


Figure 5: DFS Test Set Up - Master

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
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. The Maximum gain of the antenna is 5.9 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;

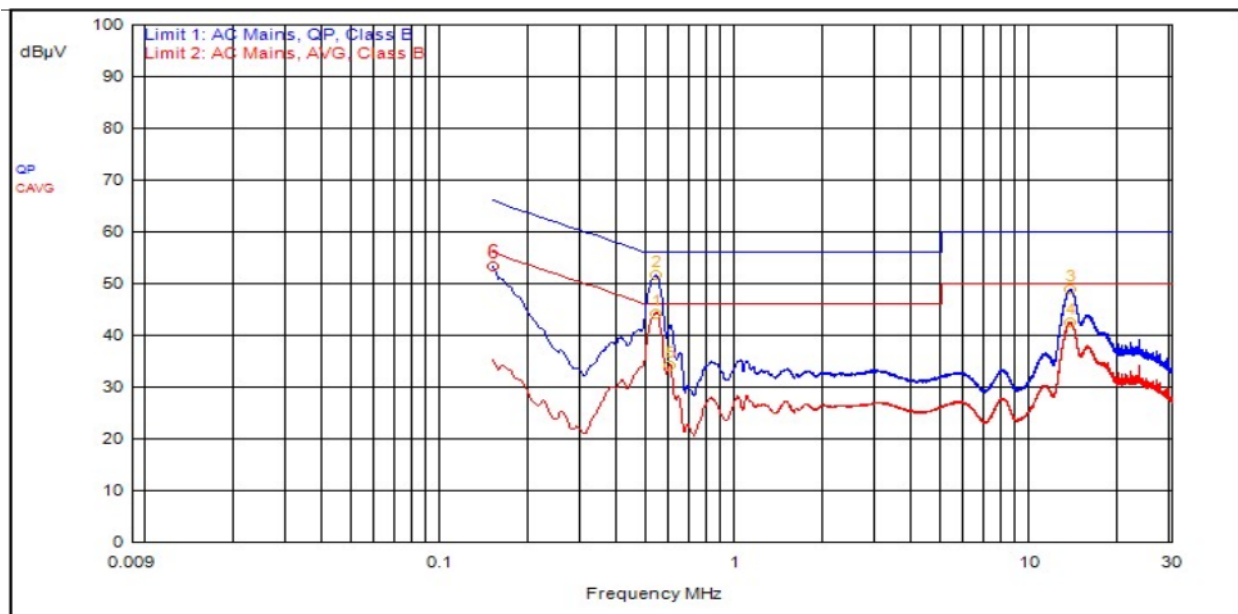
For PSD measurements when Nss=1: Array Gain = 10 log(Nant/Nss) dB = 6.02dB

Results

The EUT complied with the specifications.

5.2 Conducted Emissions at Mains Ports Data

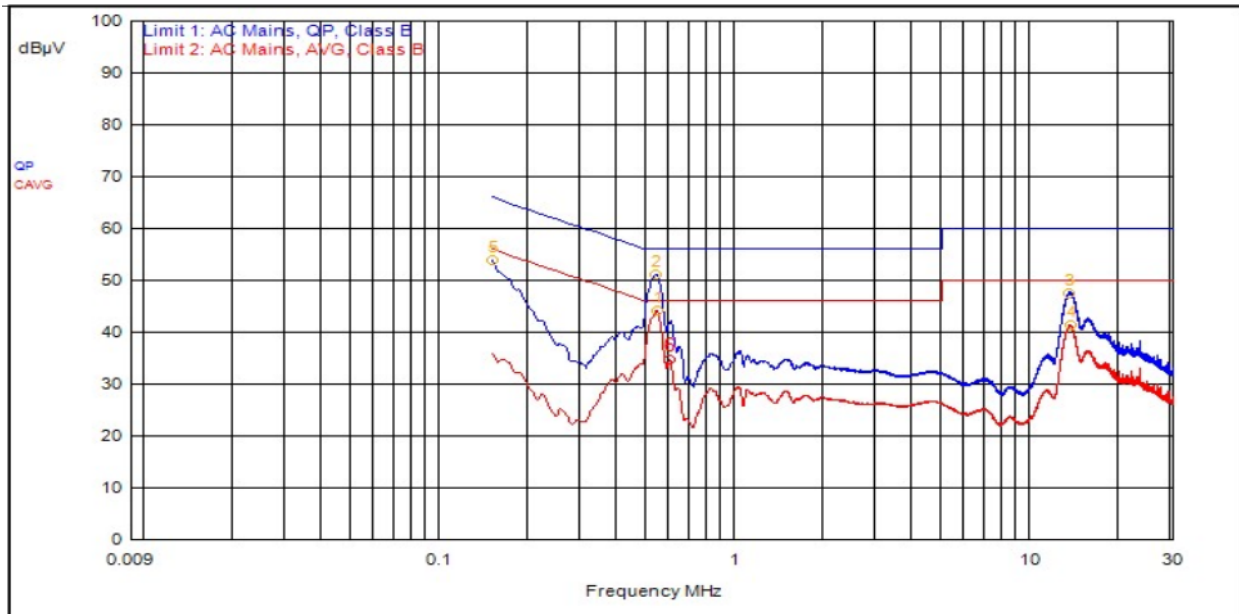
5.2.1 Line



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.
2	531,000kHz	12.4	0.0		QPeak	39.2	51.6	56.0	-4.4		
3	13.533MHz	12.4	0.2		QPeak	36.2	48.8	60.0	-11.2		
6	150,000kHz	12.4	0.0		QPeak	41.1	53.4	66.0	-12.6		
1	531,000kHz	12.4	0.0		C_AVG	31.8	44.2			46.0	-1.8
4	13.503MHz	12.4	0.2		C_AVG	29.8	42.5			50.0	-7.5
5	591,000kHz	12.4	0.0		C_AVG	21.8	34.2			46.0	-11.8

Table 5: AC Mains Conducted Emissions - Line_1

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	534,000kHz	12.4	0.0		QPeak	38.6	51.1	56.0	-4.9		
5	150,000kHz	12.4	0.0		QPeak	41.5	53.9	66.0	-12.1		
3	13.398MHz	12.4	0.2		QPeak	35.0	47.6	60.0	-12.4		
1	540,000kHz	12.4	0.0		C_AVG	31.8	44.2			46.0	-1.8
4	13.440MHz	12.4	0.2		C_AVG	28.6	41.3			50.0	-8.7
6	594,000kHz	12.4	0.0		C_AVG	22.2	34.6			46.0	-11.4

Table 6: AC Mains Conducted Emissions- Neutral

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

Modulation (BW)	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
a20	5260	16.50	19.40
a20	5280	16.60	20.70
a20	5320	16.60	20.80
ac20	5260	17.70	20.90
ac20	5280	17.80	20.80
ac20	5320	17.70	21.80
ac40	5270	36.25	39.45
ac40	5310	36.25	39.15
ac80	5290	75.50	81.50
ac160	5250	154.00	165.00
ax20	5260	19.10	22.10
ax20	5280	19.10	21.50
ax20	5320	19.10	21.60
ax40	5270	37.75	40.20
ax40	5310	37.75	40.20
ax80	5290	77.50	83.00
ax160	5250	154.00	166.00
n20	5260	17.70	21.50
n20	5280	17.80	21.90
n20	5320	17.80	21.10
n40	5270	36.00	39.00

n40	5310	36.25	39.30
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5.3.2 UNII-2C

Modulation (BW)	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
a20	5500	16.50	20.90
a20	5600	16.50	20.90
a20	5720	16.60	20.70
ac20	5500	17.70	22.10
ac20	5600	17.70	21.10
ac20	5720	17.70	20.90
ac40	5510	36.25	39.15
ac40	5590	36.25	39.15
ac40	5710	36.00	39.90
ac80	5530	75.50	81.50
ac80	5610	75.50	82.00
ac80	5690	75.50	81.50
ac160	5570	153.00	165.00
ax20	5500	17.70	21.10
ax20	5600	17.70	21.30
ax20	5720	17.80	21.70
ax20	5510	36.25	39.00
ax40	5590	36.25	39.15
ax40	5710	36.25	39.15
ax80	5530	75.50	81.50
ax80	5610	75.50	82.00
ax80	5690	75.50	82.00
ax160	5570	155.00	165.00

n20	5500	17.70	21.20
n20	5600	17.80	20.70
n20	5720	17.70	21.90
n40	5510	36.25	39.45
n40	5590	36.25	39.15
n40	5710	36.25	39.45

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 §15.403(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 23.7 dBm or 234.42 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 5.9 dBi.

5.4.1 UNII-2A

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured PSD
OFDM 20	5260	Mcs0	40	23.84	9.42
OFDM 20	5280	Mcs0	40	23.84	9.34
OFDM 20	5320	Mcs0	39	23.45	9.3
HT 20	5260	Mcs0	40	23.56	8.17
HT 20	5280	Mcs0	40	23.52	8.09
HT 20	5320	Mcs0	40	23.72	8.17
HT 40	5270	Mcs0	40	23.87	5.48
HT 40	5310	Mcs0	40	23.99	5.48
VHT 20	5260	Mcs0	40	23.52	8.21
VHT 20	5280	Mcs0	40	23.51	8.12
VHT 20	5320	Mcs0	40	23.62	8.24
VHT 40	5270	Mcs0	40	23.87	5.44
VHT 40	5310	Mcs0	40	23.94	5.44
VHT80	5290	Mcs0	40	23.78	2.11
VHT160	5250	Mcs0	40	23.9	0.1
HE20	5260	Mcs0	39	23.55	7.98
HE20	5280	Mcs0	39	23.53	7.93
HE20	5320	Mcs0	39	23.66	7.89
HE40	5270	Mcs0	39	23.53	4.95
HE40	5310	Mcs0	39	23.55	4.91
HE80	5290	Mcs0	39	23.63	1.89

HE160	5250	Mcs0	39	23.63	-0.35
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5.4.2 UNII-2C

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured PSD
OFDM 20	5500	Mcs0	40	23.59	9.42
OFDM 20	5600	Mcs0	40	23.55	9.54
OFDM 20	5720	Mcs0	40	23.84	9.65
HT 20	5500	Mcs0	40	23.34	8.12
HT 20	5600	Mcs0	40	23.38	8.17
HT 20	5720	Mcs0	40	23.61	8.34
HT 40	5510	Mcs0	40	23.74	5.44
HT 40	5590	Mcs0	40	23.76	5.62
HT 40	5710	Mcs0	40	23.93	5.47
VHT 20	5500	Mcs0	40	23.37	8.07
VHT 20	5600	Mcs0	40	23.34	8.18
VHT 20	5720	Mcs0	40	23.54	8.32
VHT 40	5510	Mcs0	40	23.71	5.44
VHT 40	5590	Mcs0	40	23.73	5.55
VHT 40	5710	Mcs0	40	23.96	5.57
VHT80	5530	Mcs0	40	23.59	2.53
VHT80	5610	Mcs0	40	23.57	2.24
VHT80	5690	Mcs0	40	23.75	2.32
VHT160	5570	Mcs0	40	23.76	0.06
HE20	5500	Mcs0	40	23.36	8.08
HE20	5600	Mcs0	40	23.36	8.22
HE20	5720	Mcs0	40	23.54	8.42
HE40	5510	Mcs0	40	23.71	5.47
HE40	5590	Mcs0	40	23.75	5.61
HE40	5710	Mcs0	40	23.96	5.53
HE80	5530	Mcs0	40	23.67	2.51

HE80	5610	Mcs0	40	23.57	2.34
HE80	5690	Mcs0	40	23.77	2.14
HE160	5570	Mcs0	39	23.41	-0.37

Result

In the configuration tested, the maximum average RF outpower 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 ranges within the lowest frequency generated or used in the device to the tenth harmonic of the highest fundamental frequency were 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 5.9 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

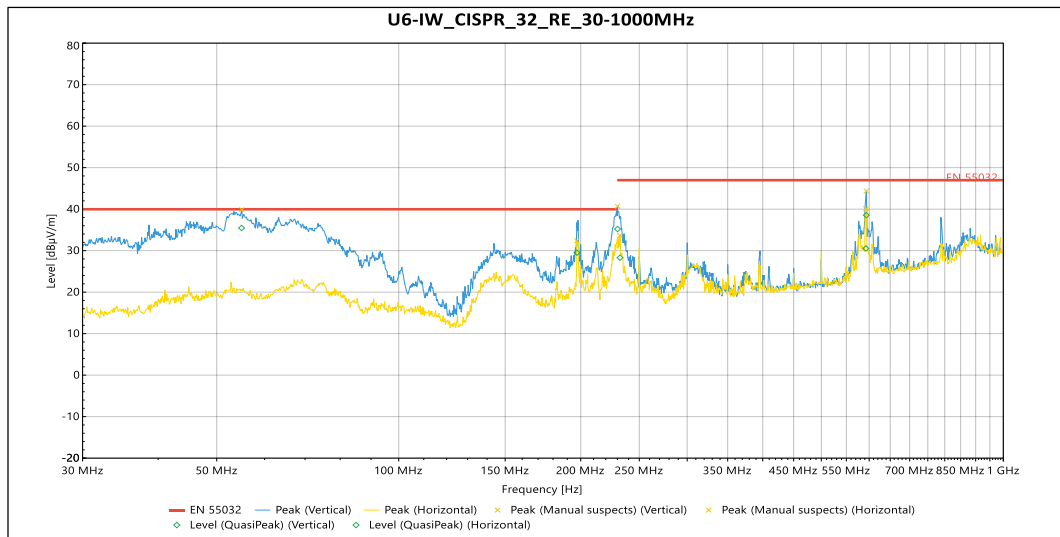
Conducted spurious emissions were below -27 dBm; therefore, the EUT complies with the specification. See Annex for results.

5.5.2 Radiated Spurious Emissions in the Restricted Bands of § 15.205

The frequency ranges within the lowest frequency generated or used in the device to the tenth harmonic of the highest fundamental emissions were 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.

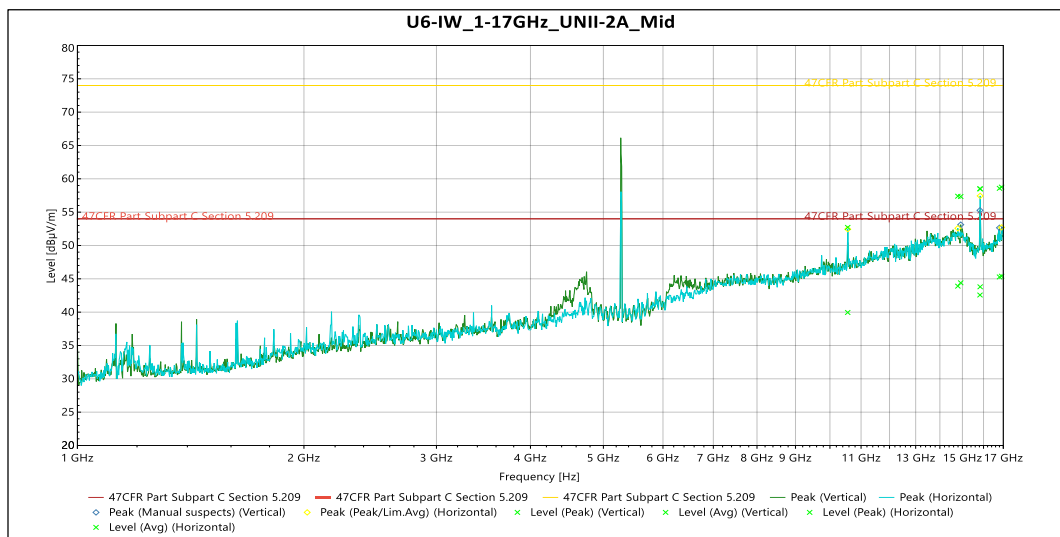
Correction Factor = Antenna Factor + Cable Loss - Pre-Amplifier Gain, and is added to the Receiver reading.

5.5.3 UNII-2A



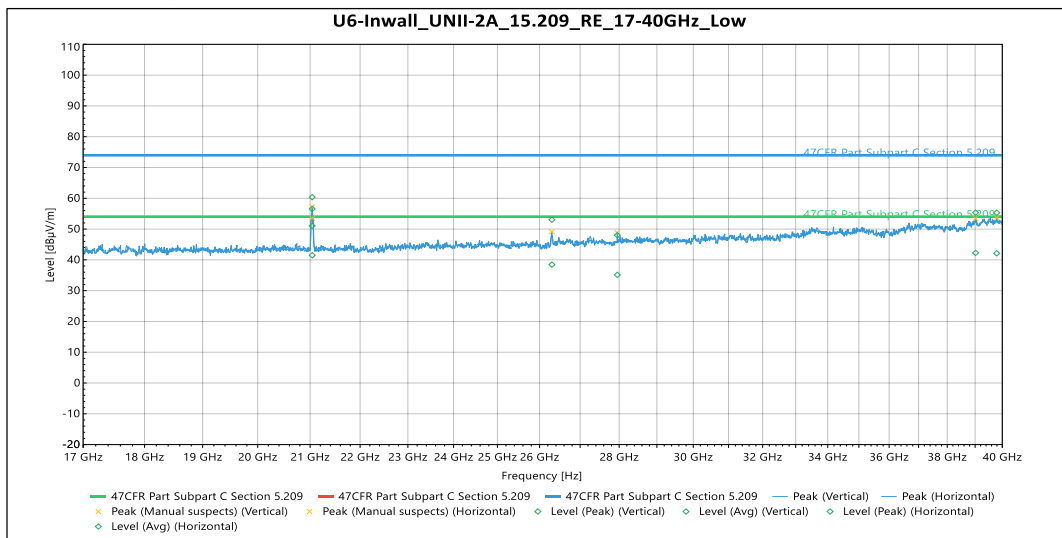
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Meas. Time	RBW	Meas.Time	Correction (dB)
QuasiPeak	54.959 MHz	35.471	40	-4.529	259	3.416	Vertical	15	120000	0.001	-12.73
QuasiPeak	230.09 MHz	35.209	47	-11.791	125	1.12	Vertical	15	120000	0.001	-13.498
QuasiPeak	593.54 MHz	38.548	47	-8.452	4	2.957	Vertical	15	120000	0.001	-5.374
QuasiPeak	197.08 MHz	29.5	40	-10.5	225	3.882	Horizontal	15	120000	0.001	-13.826
QuasiPeak	232.32 MHz	28.288	47	-18.712	258	3.921	Horizontal	15	120000	0.001	-13.365
QuasiPeak	592.59 MHz	30.544	47	-16.456	50	3.855	Horizontal	15	120000	0.001	-5.407

Graph 1: Radiated 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	14.922 GHz	57.342	74	-16.658	45	3.457	Vertical	5	1000000	0	15.145
Peak	15.829 GHz	58.518	74	-15.482	344	3.105	Vertical	5	1000000	0	12.205
Peak	16.803 GHz	58.568	74	-15.432	68	2.403	Vertical	5	1000000	0	16.984

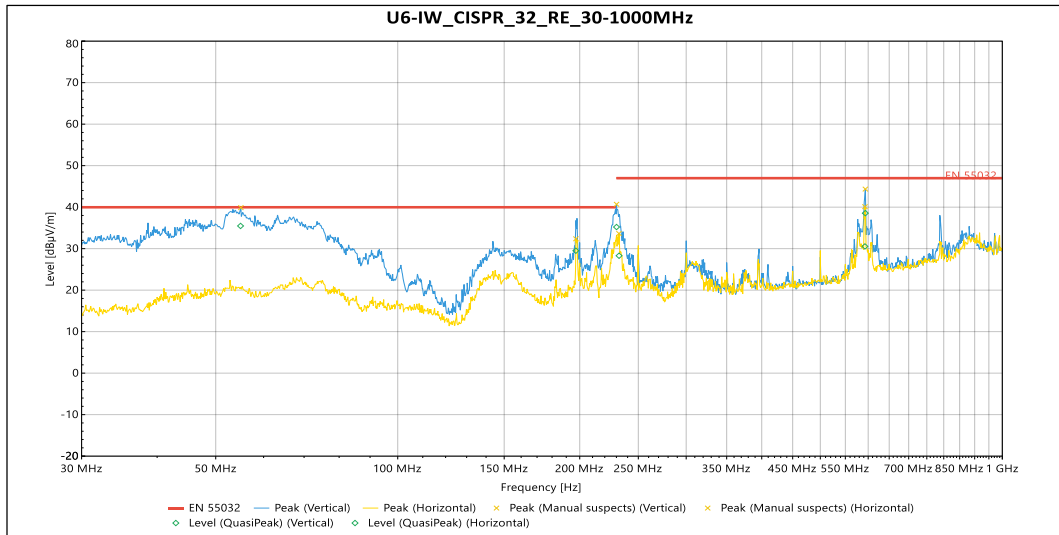
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Meas. Time (s)	RBW	Meas. Time	Correction (dB)
Avg	14.922 GHz	44.404	54	-9.596	45	3.457	Vertical	5	1000000	0	15.145
Avg	15.829 GHz	42.572	54	-11.428	344	3.105	Vertical	5	1000000	0	12.205
Avg	16.803 GHz	45.28	54	-8.72	68	2.403	Vertical	5	1000000	0	16.984
Peak	10.56 GHz	52.715	74	-21.285	134	1.867	Horizontal	5	1000000	0	10.415
Peak	14.792 GHz	57.386	74	-16.614	250	1.634	Horizontal	5	1000000	0	14.612
Peak	15.837 GHz	58.474	74	-15.526	26	2	Horizontal	5	1000000	0	12.214
Peak	16.91 GHz	58.755	74	-15.245	252	3.255	Horizontal	5	1000000	0	17.204
Avg	10.56 GHz	39.945	54	-14.055	134	1.867	Horizontal	5	1000000	0	10.415
Avg	14.792 GHz	43.901	54	-10.099	250	1.634	Horizontal	5	1000000	0	14.612
Avg	15.837 GHz	43.801	54	-10.199	26	2	Horizontal	5	1000000	0	12.214
Avg	16.91 GHz	45.401	54	-8.599	252	3.255	Horizontal	5	1000000	0	17.204

Graph 2: Radiated Emissions Mid, 1 GHz – 16 GHz, Worst-Case


Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Meas. Time (s)	RBW	Meas. Time	Correction (dB)
Peak	21.041 GHz	56.549	74	-17.451	66	Vertical	5	1000000	0	-5.675
Peak	27.952 GHz	48.005	74	-25.995	129	Vertical	5	1000000	0	-5.455
Peak	39.793 GHz	55.313	74	-18.687	84	Vertical	5	1000000	0	3.28
Avg	21.041 GHz	41.5	54	-12.5	66	Vertical	5	1000000	0	-5.675
Avg	27.952 GHz	35.116	54	-18.884	129	Vertical	5	1000000	0	-5.455
Avg	39.793 GHz	42.119	54	-11.881	84	Vertical	5	1000000	0	3.28
Peak	21.04 GHz	60.363	74	-13.637	125	Horizontal	5	1000000	0	-5.68
Peak	26.3 GHz	53.029	74	-20.971	81	Horizontal	5	1000000	0	-5.475
Peak	39.017 GHz	55.34	74	-18.66	310	Horizontal	5	1000000	0	3.129
Avg	21.04 GHz	51.033	54	-2.967	125	Horizontal	5	1000000	0	-5.68
Avg	26.3 GHz	38.438	54	-15.562	81	Horizontal	5	1000000	0	-5.475
Avg	39.017 GHz	42.255	54	-11.745	310	Horizontal	5	1000000	0	3.129

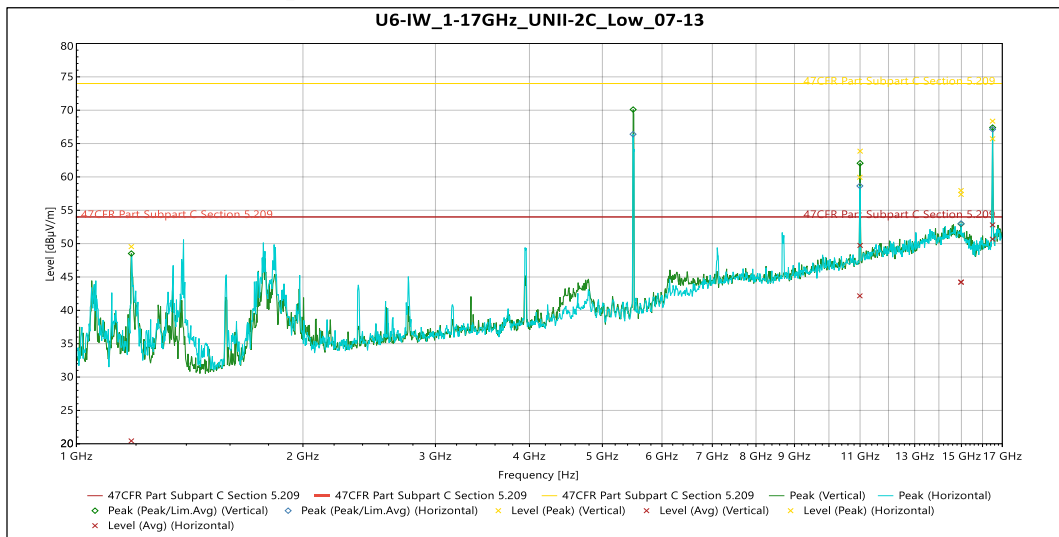
Graph 3: Radiated Emissions Low, 16 GHz – 40 GHz, Worst-Case

5.5.4 UNII-2C



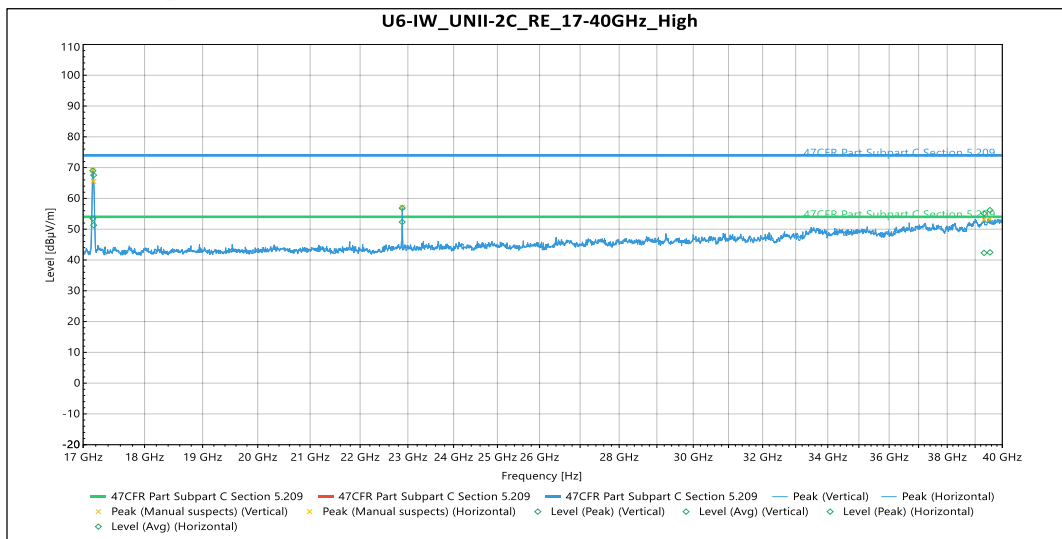
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Meas. Time	RBW	Meas.Time	Correction (dB)
QuasiPeak	54.959 MHz	35.471	40	-4.529	259	3.416	Vertical	15	120000	0.001	-12.73
QuasiPeak	230.09 MHz	35.209	47	-11.791	125	1.12	Vertical	15	120000	0.001	-13.498
QuasiPeak	593.54 MHz	38.548	47	-8.452	4	2.957	Vertical	15	120000	0.001	-5.374
QuasiPeak	197.08 MHz	29.5	40	-10.5	225	3.882	Horizontal	15	120000	0.001	-13.826
QuasiPeak	232.32 MHz	28.288	47	-18.712	258	3.921	Horizontal	15	120000	0.001	-13.365
QuasiPeak	592.59 MHz	30.544	47	-16.456	50	3.855	Horizontal	15	120000	0.001	-5.407

Graph 4: Radiated 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	1.1829 GHz	49.552	74	-24.448	39	2.037	Vertical	5	1000000	0	-11.808
Peak	11.002 GHz	63.857	74	-10.143	9	2.544	Vertical	5	1000000	0	11.026
Peak	14.982 GHz	57.958	74	-16.042	4	2.733	Vertical	5	1000000	0	14.932
Peak	16.502 GHz	65.723	74	-8.277	75	3.079	Vertical	5	1000000	0	14.947

Source	Frequency	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Meas. Time (s)	RBW	Meas.Time	Correction (dB)
Avg	1.1829 GHz	20.429	54	-33.571	39	2.037	Vertical	5	1000000	0	-11.808
Avg	11.002 GHz	49.727	54	-4.273	9	2.544	Vertical	5	1000000	0	11.026
Avg	14.982 GHz	44.198	54	-9.802	4	2.733	Vertical	5	1000000	0	14.932
Avg	16.502 GHz	50.673	54	-3.327	75	3.079	Vertical	5	1000000	0	14.947
Peak	10.992 GHz	59.95	74	-14.05	330	2.742	Horizontal	5	1000000	0	10.947
Peak	14.983 GHz	57.385	74	-16.615	355	2.919	Horizontal	5	1000000	0	14.952
Peak	16.5 GHz	68.361	74	-5.639	342	3.798	Horizontal	5	1000000	0	14.878
Avg	10.992 GHz	42.171	54	-11.829	330	2.742	Horizontal	5	1000000	0	10.947
Avg	14.983 GHz	44.247	54	-9.753	355	2.919	Horizontal	5	1000000	0	14.952
Avg	16.5 GHz	52.808	54	-1.192	342	3.798	Horizontal	5	1000000	0	14.878

Graph 5: Radiated Emissions Low, 1 GHz – 16 GHz, Worst-Case


Source	Frequency	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Azimuth (°)	Pol.	Meas. Time (s)	RBW	Meas.Time	Correction (dB)
Peak	17.155 GHz	69.009	74	-4.991	349	Vertical	5	1000000	0	-5.286
Peak	39.326 GHz	55.102	74	-18.898	107	Vertical	5	1000000	0	3.166
Avg	17.155 GHz	53.46	54	-0.54	349	Vertical	5	1000000	0	-5.286
Avg	39.326 GHz	42.3	54	-11.7	107	Vertical	5	1000000	0	3.166
Peak	17.167 GHz	67.565	74	-6.435	298	Horizontal	5	1000000	0	-5.326
Peak	22.88 GHz	56.861	74	-17.139	317	Horizontal	5	1000000	0	-5.02
Peak	39.541 GHz	56.184	74	-17.816	92	Horizontal	5	1000000	0	3.237
Avg	17.167 GHz	51.295	54	-2.705	298	Horizontal	5	1000000	0	-5.326
Avg	22.88 GHz	52.325	54	-1.675	317	Horizontal	5	1000000	0	-5.02
Avg	39.541 GHz	42.465	54	-11.535	92	Horizontal	5	1000000	0	3.237

Graph 6: Radiated Emissions High, 16 GHz – 40 GHz, 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 5.9 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 6 dBi + Array gain of 6.02 dB which is a total of 11.92 dBi. Results of this testing are summarized.

5.6.1 UNII-2A

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured PSD
OFDM 20	5260	Mcs0_Nss4	40	23.84	9.42
OFDM 20	5280	Mcs0_Nss4	40	23.84	9.34
OFDM 20	5320	Mcs0_Nss4	39	23.45	9.3
HT 20	5260	Mcs0_Nss4	40	23.56	8.17
HT 20	5280	Mcs0_Nss4	40	23.52	8.09
HT 20	5320	Mcs0_Nss4	40	23.72	8.17
HT 40	5270	Mcs0_Nss4	40	23.87	5.48
HT 40	5310	Mcs0_Nss4	40	23.99	5.48
VHT 20	5260	Mcs0_Nss4	40	23.52	8.21
VHT 20	5280	Mcs0_Nss4	40	23.51	8.12
VHT 20	5320	Mcs0_Nss4	40	23.62	8.24
VHT 40	5270	Mcs0_Nss4	40	23.87	5.44
VHT 40	5310	Mcs0_Nss4	40	23.94	5.44
VHT80	5290	Mcs0_Nss4	40	23.78	2.11
VHT160	5250	Mcs0_Nss4	40	23.9	0.1
HE20	5260	Mcs0_Nss4	39	23.55	7.98
HE20	5280	Mcs0_Nss4	39	23.53	7.93
HE20	5320	Mcs0_Nss4	39	23.66	7.89

HE40	5270	Mcs0_Nss4	39	23.53	4.95
HE40	5310	Mcs0_Nss4	39	23.55	4.91
HE80	5290	Mcs0_Nss4	39	23.63	1.89
HE160	5250	Mcs0_Nss4	39	23.63	-0.35

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured PSD
OFDM 20	5260	Mcs0_Nss1	40	23.84	9.42
OFDM 20	5280	Mcs0_Nss1	40	23.84	9.34
OFDM 20	5320	Mcs0_Nss1	39	23.45	9.3
HT 20	5260	Mcs0_Nss1	40	23.56	8.17
HT 20	5280	Mcs0_Nss1	40	23.52	8.09
HT 20	5320	Mcs0_Nss1	40	23.72	8.17
HT 40	5270	Mcs0_Nss1	40	23.87	5.48
HT 40	5310	Mcs0_Nss1	40	23.99	5.48
VHT 20	5260	Mcs0_Nss1	40	23.52	8.21
VHT 20	5280	Mcs0_Nss1	40	23.51	8.12
VHT 20	5320	Mcs0_Nss1	40	23.62	8.24
VHT 40	5270	Mcs0_Nss1	40	23.87	5.44
VHT 40	5310	Mcs0_Nss1	40	23.94	5.44
VHT80	5290	Mcs0_Nss1	40	23.78	2.11
VHT160	5250	Mcs0_Nss1	40	23.9	0.1
HE20	5260	Mcs0_Nss1	39	23.55	7.98
HE20	5280	Mcs0_Nss1	39	23.53	7.93
HE20	5320	Mcs0_Nss1	39	23.66	7.89
HE40	5270	Mcs0_Nss1	39	23.53	4.95
HE40	5310	Mcs0_Nss1	39	23.55	4.91
HE80	5290	Mcs0_Nss1	39	23.63	1.89
HE160	5250	Mcs0_Nss1	39	23.63	-0.35

5.6.2 UNII-2C

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured PSD
OFDM 20	5500	Mcs0_Nss4	40	23.59	9.42
OFDM 20	5600	Mcs0_Nss4	40	23.55	9.54
OFDM 20	5720	Mcs0_Nss4	40	23.84	9.65
HT 20	5500	Mcs0_Nss4	40	23.34	8.12
HT 20	5600	Mcs0_Nss4	40	23.38	8.17
HT 20	5720	Mcs0_Nss4	40	23.61	8.34
HT 40	5510	Mcs0_Nss4	40	23.74	5.44
HT 40	5590	Mcs0_Nss4	40	23.76	5.62
HT 40	5710	Mcs0_Nss4	40	23.93	5.47
VHT 20	5500	Mcs0_Nss4	40	23.37	8.07
VHT 20	5600	Mcs0_Nss4	40	23.34	8.18
VHT 20	5720	Mcs0_Nss4	40	23.54	8.32
VHT 40	5510	Mcs0_Nss4	40	23.71	5.44
VHT 40	5590	Mcs0_Nss4	40	23.73	5.55
VHT 40	5710	Mcs0_Nss4	40	23.96	5.57
VHT80	5530	Mcs0_Nss4	40	23.59	2.53
VHT80	5610	Mcs0_Nss4	40	23.57	2.24
VHT80	5690	Mcs0_Nss4	40	23.75	2.32
VHT160	5570	Mcs0_Nss4	40	23.76	0.06
HE20	5500	Mcs0_Nss4	40	23.36	8.08
HE20	5600	Mcs0_Nss4	40	23.36	8.22
HE20	5720	Mcs0_Nss4	40	23.54	8.42
HE40	5510	Mcs0_Nss4	40	23.71	5.47
HE40	5590	Mcs0_Nss4	40	23.75	5.61
HE40	5710	Mcs0_Nss4	40	23.96	5.53
HE80	5530	Mcs0_Nss4	40	23.67	2.51
HE80	5610	Mcs0_Nss4	40	23.57	2.34

HE80	5690	Mcs0_Nss4	40	23.77	2.14
HE160	5570	Mcs0_Nss4	39	23.41	-0.37

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured PSD
OFDM 20	5500	Mcs0_Nss1	40	23.59	9.42
OFDM 20	5600	v	40	23.55	9.54
OFDM 20	5720	Mcs0_Nss1	40	23.84	9.65
HT 20	5500	Mcs0_Nss1	40	23.34	8.12
HT 20	5600	Mcs0_Nss1	40	23.38	8.17
HT 20	5720	Mcs0_Nss1	40	23.61	8.34
HT 40	5510	Mcs0_Nss1	40	23.74	5.44
HT 40	5590	Mcs0_Nss1	40	23.76	5.62
HT 40	5710	Mcs0_Nss1	40	23.93	5.47
VHT 20	5500	Mcs0_Nss1	40	23.37	8.07
VHT 20	5600	Mcs0_Nss1	40	23.34	8.18
VHT 20	5720	Mcs0_Nss1	40	23.54	8.32
VHT 40	5510	Mcs0_Nss1	40	23.71	5.44
VHT 40	5590	Mcs0_Nss1	40	23.73	5.55
VHT 40	5710	Mcs0_Nss1	40	23.96	5.57
VHT80	5530	Mcs0_Nss1	40	23.59	2.53
VHT80	5610	Mcs0_Nss1	40	23.57	2.24
VHT80	5690	Mcs0_Nss1	40	23.75	2.32
VHT160	5570	Mcs0_Nss1	40	23.76	0.06
HE20	5500	Mcs0_Nss1	40	23.36	8.08
HE20	5600	Mcs0_Nss1	40	23.36	8.22
HE20	5720	Mcs0_Nss1	40	23.54	8.42
HE40	5510	Mcs0_Nss1	40	23.71	5.47
HE40	5590	Mcs0_Nss1	40	23.75	5.61
HE40	5710	Mcs0_Nss1	40	23.96	5.53

HE80	5530	Mcs0_Nss1	40	23.67	2.51
HE80	5610	Mcs0_Nss1	40	23.57	2.34
HE80	5690	Mcs0_Nss1	40	23.77	2.14
HE160	5570	Mcs0_Nss1	39	23.41	-0.37

Result

The maximum average power spectral density was less than the limit of 8 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 in the DFS Annex. The product passes all required DFS tests for a master device 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 --